# Draft Focused Environmental Impact Report
# Appendices

# CENTERPARK SPECIFIC PLAN

for the City of Ontario

SCH No. 2025060731

Specific Plan PSP24-002

**LEAD AGENCY**

**City of Ontario**
Rafael Torres, Assistant Planner
303 East "B" Street
Ontario, California 91761
(909) 395-2036

**CONSULTANT**

**Kimley-Horn and Associates, Inc.**
Kevin Thomas, CEP
3801 University Street, Suite 300
Riverside, California 92501

**DECEMBER 2025**

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# APPENDIX A

## NOTICE OF PREPARATION AND SCOPING MEETING MATERIALS

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CITY OF ONTARIO PLANNING DEPARTMENT

# Notice of Preparation

303 East B Street, Ontario, California 91764 Phone: 909.395.2036 / Fax: 909.395.2420

**TO:** **Property Owners, Responsible Agencies, and Interested Parties**

**FROM:** **City of Ontario, Planning Department, 303 East "B" Street, Ontario, CA 91764**

**SUBJECT:** **Notice of Preparation of a Draft Focused Environmental Impact Report for the CenterPark Specific Plan**

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NOTICE IS HEREBY GIVEN that the City of Ontario will be the Lead Agency and will prepare a focused environmental impact report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the Focused EIR prepared by our agency when considering your permit or other approval for the project.

The Project description, location and the probable environmental effects are contained in the attached materials. A copy of the Initial Study ☐ is, ☒ **is not**, attached and is available at Ontario City Hall, Planning Department. Electronic format of the document can also be obtained online using the following link: https://www.ontarioca.gov/government/community-development/planning/environmental-documents.

The proposed project ☒ **is**, ☐ is not, considered a project of statewide, regional, or area-wide significance. The proposed project ☐ will, ☒ **will not**, affect highways or other facilities under the jurisdiction of the State Department of Transportation. A scoping meeting ☒ **will**, ☐ will not, be held by the lead agency.

**Scoping Meeting:** If the project meets the criteria requiring the scoping meeting, or if the agency voluntarily elects to hold such a meeting, the date, time, and location of the scoping meeting are as follows:

Date and Time: July 2, 2025, beginning at 6:00 p.m. and ending no later than 7:00 p.m.
Location (this meeting will be held as a virtual meeting via Zoom): The Zoom meeting link will be provided on a request basis.

**Review Period:** The 30-day review period for this Notice of Preparation begins on June 13, 2025. Comments will be received until the close of business day on July 14, 2025, at 5:30 p.m. Please send your response to the contact person identified below. Please be sure to include the name of a contact person for your agency.

Contact Person: Rafael Torres, City of Ontario Planning Department, 303 East B Street, Ontario, CA 91764, Phone: (909) 395-2979, Email: rtorres@ontarioca.gov

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**Project Title/File No.:** Center Park Specific Plan Project/PSP24-002

**Project Location** The Project is located on a 257.34-acre site along the western boundary of the City, within San Bernardino County. The Project site is bounded to the north by a Southern California Edison (SCE) Easement located approximately 330 feet north of Edison Avenue, Eucalyptus Avenue to the south, Campus Avenue to the west, Walker Avenue to the east, and bisected by Edison Avenue (refer to ***Figure 1, Local Vicinity Map***). The Project site consists of 29 parcels that include the Assessor Parcel Numbers (APNs) presented in ***Table 1: Assessor Parcel Numbers for the Project Site***.

**Table 1: Assessor Parcel Numbers for the Project Site**

| | |
|---|---|
| 1053-301-01 | 1053-361-01 |
| 1053-301-02 | 1053-361-02 |
| 1053-311-01 | 1053-361-03 |
| 1053-311-02 | 1053-371-01 |
| 1053-321-01 | 1053-371-02 |
| 1053-321-02 | 0216-311-01 |
| 1053-321-03 | 0216-311-02 |
| 1053-331-01 | 0216-311-09 |
| 1053-331-02 | 0216-321-03 |
| 1053-331-03 | 0216-321-08 |
| 1053-331-04 | 0216-322-03 |
| 1053-341-01 | 0216-322-04 |
| 1053-341-02 | 0216-322-10 |
| 1053-351-01 | |
| 1053-351-02 | |

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Regional access to the Project site is provided by Euclid Avenue approximately 0.8 miles west, which connects State Route 60 (SR-60) and Interstate 10 (I-10) to the north. Interstate 15 (I-15) is approximately 4.0 miles to the east and State Route 71 (SR-71) is approximately 3.5 miles to the southwest. SR-71 connects the Project to State Route 91 (SR 91) in Riverside County.

**Project Description:** The Project consists of a Specific Plan to allow for a residential and mixed-used retail/office development on 29 parcels covering approximately 257.34 acres in the City. The development would include up to 250,919 square feet of commercial retail/office uses, up to 4,293 residential units across medium density and mixed-use residential uses, 67.26 acres of open space parkland/non-recreation uses, and associated on-site and off-site infrastructure improvements, as described further below; refer to **Figure 2, Existing Land Use Plan and Zoning**. The Project site is comprised of two "phases" (representing different ownership conditions) with 22 planning areas. The "Phase I" area (shown in **Figure 3: Project Area Ownership**) is owned by the applicant of the CenterPark Specific Plan. The "Phase II" area are parcels owned by others and are included as part of the Specific Plan. Phase I of the Project includes Planning Areas 5 and 7 through 18, which would allow for the development of up to 2,625 residential dwelling units and 55.98 acres of parkland use. This Focused EIR conservatively evaluates the maximum development potential for Phases I and II, as permitted in the proposed Specific Plan. Phase I is expected to start construction in 2026, with an anticipated opening year in 2029. This Focused EIR evaluates Phase II at a "programmatic" level, representing the potential future developments in Planning Areas 1 through 4 and 6. Planning Areas within Phase II do not propose any development at this time; Therefore, these Planning Areas would be developed at a future date. Phases I and II of the Project would allow for up to 250,919 square feet of Mixed-Use retail and office, 4,293 residential units, and 67.26 acres of open-space parkland and non-recreational uses, as shown in **Table 2: Maximum Project Buildout**, below.

**Table 2: Maximum Specific Plan Build-Out Summary**

| Planning Area | Land Use | TOP 2050 Acreage | Maximum Density Per TOP EIR | Maximum Units | Maximum Retail | Maximum Office |
|---|---|---|---|---|---|---|
| 1 | MDR (11.1 - 25.0 DU/AC) | 15.91 AC | 22.0 DU/AC | 350 DU | | |
| 2 | MDR (11.1 - 25.0 DU/AC) | 15.57 AC | 22.0 DU/AC | 343 DU | | |
| 3 | MDR (11.1 - 25.0 DU/AC) | 7.70 AC | 22.0 DU/AC | 169 DU | | |
| 4 | MIXED-USE RESIDENTIAL | 4.99 AC | 35.0 DU/AC | 175 DU | | |
| 4 | MIXED-USE RETAIL | 1.43 AC | | | 18,635 SF | |
| 4 | MIXED-USE OFFICE | 0.71 AC | | | | 21,741 SF |
| 5 | MIXED-USE RESIDENTIAL | 5.19 AC | 35.0 DU/AC | 182 DU | | |
| 5 | MIXED-USE RETAIL | 1.48 AC | | | 19,367 SF | |
| 5 | MIXED-USE OFFICE | 0.74 AC | | | | 22,595 SF |
| 6 | MDR (11.1 - 25.0 DU/AC) | 7.33 AC | 22.0 DU/AC | 161 DU | | |
| 7 | MDR (11.1 - 25.0 DU/AC) | 23.67 AC | 22.0 DU/AC | 521 DU | | |
| 8 | MDR (11.1 - 25.0 DU/AC) | 24.20 AC | 22.0 DU/AC | 532 DU | | |
| 9 | MDR (11.1 - 25.0 DU/AC) | 12.18 AC | 22.0 DU/AC | 268 DU | | |
| 10 | MIXED-USE RESIDENTIAL | 9.87 AC | 35.0 DU/AC | 345 DU | | |
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| 11 | MIXED-USE RETAIL | 3.13 AC | | | 40,955 SF | |
| 11 | MIXED-USE OFFICE | 1.57 AC | | | | 47,781 SF |
| 12 | MDR (11.1 - 25.0 DU/AC) | 15.46 AC | 22.0 DU/AC | 340 DU | | |
| 13 | MDR (11.1 - 25.0 DU/AC) | 23.75 AC | 22.0 DU/AC | 523 DU | | |
| **Residential Total** | | **176.79 AC** | **24.3 DU/AC** | **4,293 DU** | | |
| **Retail Total** | | **8.86 AC** | | | **115,809 SF** | |
| **Office Total** | | **4.43 AC** | | | | **135,110 SF** |
| 14 | OS-R (PARKLAND) | 13.33 AC | | | | |
| 15 | OS-R (PARKLAND) | 13.11 AC | | | | |
| 16 | OS-R (PARKLAND) | 9.90 AC | | | | |
| 17 | OS-R (PARKLAND) | 6.20 AC | | | | |
| 18 | OS-R (PARKLAND) | 13.44 AC | | | | |
| 19 | OS-NR (NON-RECREATION) | 2.26 AC | | | | |
| 20 | OS-NR (NON-RECREATION) | 2.68 AC | | | | |
| 21 | OS-NR (NON-RECREATION) | 2.96 AC | | | | |
| 22 | OS-NR (NON-RECREATION) | 3.38 AC | | | | |
| **Open Space Total** | | **67.26** | | | | |
| **Project Total** | | **257.34 AC** | | **4,293 DU** | **115,809 SF** | **135,110 SF** |

Notes:
1. The numbers were rounded to present a conservative estimate.
2. This Focused EIR evaluates the total maximum allowable development in the CenterPark Specific Plan.
3. Phase II uses are being evaluated at a programmatic level only; no specific development applications have been submitted; no specific development dates are known.
4. RETAIL in Mixed-Use areas = 20% of Mixed-Use acreage x 0.30 FAR; OFFICE in Mixed-Use areas = 10% of Mixed-Use acreage x 0.70 FAR

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## Environmental Issues to be Evaluated in the Focused EIR

The following issues are anticipated to be addressed in the Focused EIR:

- Historic Resources

The City is processing this Project under a CEQA Guidelines Section 15183 Exemption, except for the issue of historic resources. The Project is consistent with The Ontario Plan Supplemental Program EIR (TOP SEIR), and does not represent any new significant impact, substantially more severe impact, or new significant off-site or cumulative impacts beyond what was evaluated in the TOP SEIR, except for historic resources. With respect to historical resources, the TOP SEIR assumed that there would not be any significant impacts to Tier I or Tier II historic resources. The Project site contains Tier I or II historic resources. City staff have determined that there may be a significant impact to historic resources even after consideration of proposed mitigation measures and compliance with the City's Historic Preservation Ordinance. Therefore, the Focused EIR will be limited to evaluating potential impacts associated with historic resources and will explore reasonable and feasible mitigation measures. The CEQA Guidelines 15183 Exemption Analysis will be an appendix to the Draft Focused EIR.

The Focused EIR will include other sections required by CEQA including sections on: Project Alternatives, Cumulative Impacts, Significant Unavoidable Impacts, Significant Irreversible Environmental Changes, EIR Preparers, EIR References, and EIR Technical Appendices.

**Cortese List Notice**: Pursuant to Public Resources Code §21092.6(a), the Project site is not included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 (California Department of Toxic Substances Control list of various hazardous sites).[1]

**Public Review Period**
In accordance with CEQA, this NOP will be circulated for a 30-day public review period. Should you have any comments, please provide a written response via mail or email to this NOP within the 30-day NOP public review period, which runs from June 13, 2025, through July 14, 2025. Please indicate a contact person for your agency or organization. Pursuant to CEQA Guidelines §15082, responsible and trustee agencies and other interested parties, including members of the public, must submit any comments in response to this notice no later than 30 days after receipt of the notice.

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Please send any comments to:
City of Ontario Planning Department, c/o Rafael Torres
303 East B Street, Ontario, CA 91764
Email: rtorres@ontarioca.gov
Telephone: (909) 395-2979

**Public Scoping Meeting**
Pursuant to §21083.9(a)(2) of CEQA (California Public Resources Code, §21000 et seq.), scoping meetings are required for projects that may have statewide, regional, or area-wide environmental significance. A public scoping meeting will be held by the City on **Wednesday, July 2, 2025**, beginning at 6:00 PM via Zoom. In place of in-person attendance, members of the public can observe and offer comment at this meeting remotely in one of three ways:

1. PROVIDE PUBLIC TESTIMONY DURING THE MEETING: To participate, please email your full name and physical address to Rafael Torres at rtorres@ontarioca.gov prior to July 2, on the day of the meeting to receive the Zoom link and/or call-in phone number.

[1] Department of Toxic Substances Control. EnviroStor. (2021). Retrieved from: https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=ontario.

2. E-MAIL: Please e-mail your comments to the City Contact no later than 5:00 PM on the day of the meeting.
3. TELEPHONE BEFORE THE MEETING: Please call the City Contact no later than 5:00 PM on the day of the meeting.

**Special Accommodations**
Should you require special accommodations at the public scoping meeting, such as assistance for the hearing impaired or an English translator, please contact the City no later than June 25, 2025 (see contact information above). If you do not wish to participate in the scoping meeting, but would like to comment on the project, please send your comments, including contact information, to Rafael Torres, Assistant Planner, Ontario Planning Department, 303 East "B" Street, Ontario, CA 91764, (909) 395-2979 or rtorres@ontarioca.gov no later than **Monday, July 14, 2025**.

**Project Applicant**: Ontario Ranch Venture I & II, LLC, 3501 Jamboree Road, Suite 3000, Newport Beach, CA 92660

**Consulting firm retained to prepare Draft EIR:** Kimley-Horn & Associates, 3801 University Ave, Suite 300, Riverside, CA 92501

| | |
|---|---|
| Signature: Rafael Torres | Date: 6/12/2025 |
| Name: Rafael Torres | Title: Assistant Planner |

**Reference:** California Code of Regulations, Title 14 (CEQA Guidelines) Sections 15082(a), 15103, and 15375.

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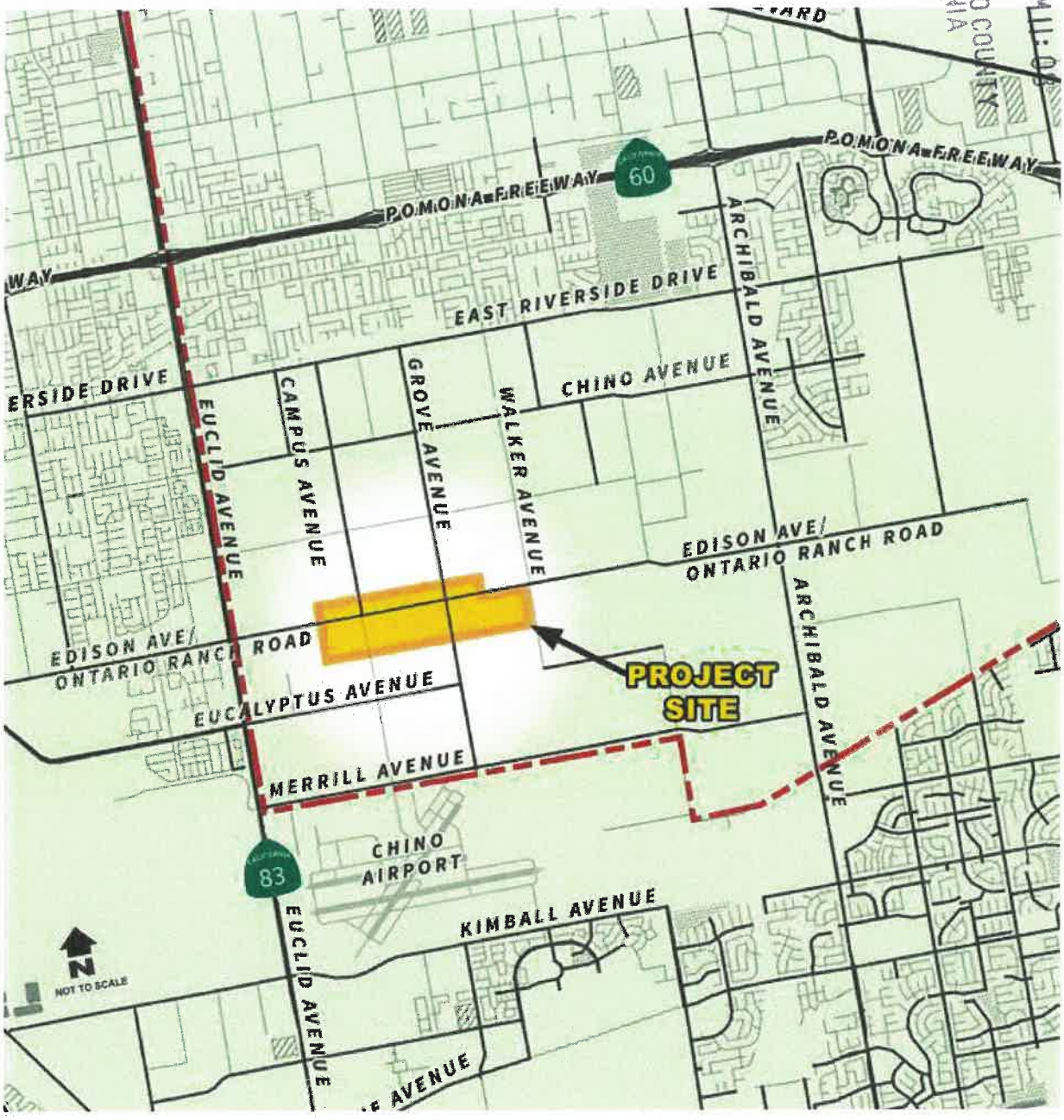


*Source: CenterPark Specific Plan Exhibit 1-2 Vicinity Map, 2024*

**Figure 1:** Local Vicinity Map
*CenterPark Specific Plan, City of Ontario*

Not to scale

Kimley»Horn

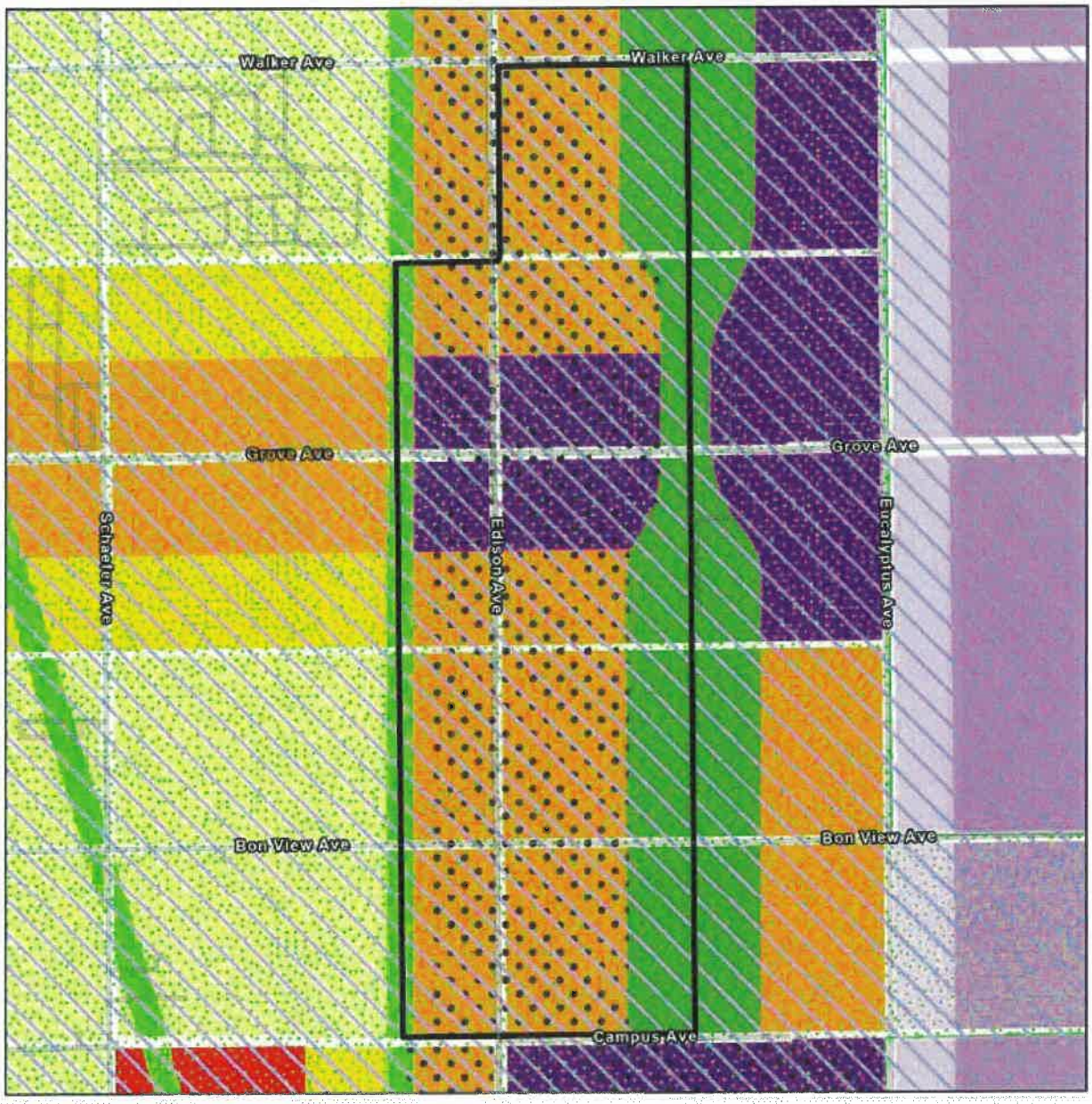


Project Site

**TOP 2050 Land Use Designations**

- RR Rural Residential
- LDR Low Density Residential
- LMDR Low Medium Density Residential
- MDR Medium Density Residential
- HDR High Density Residential
- MU Mixed Use
- NC Neighborhood Commercial
- GC General Commercial
- OC Office Commercial
- HOS Hospitality
- BP Business Park
- IND Industrial
- OS-NR Open Space - Non-Rec
- OS-R Open Space - Recreation
- OS-W Open Space - Water
- PF Public Facility
- PS Public School
- ARPT Airport
- LF Landfill
- Rail

**Zoning Overlay**

- CNO (Chino Airport) Overlay
- AH Affordable Housing
- AG Agricultural

*Source: City of Ontario The Ontario Plan 2050, 2024.*

**Figure 2:** Existing Land Use and Zoning
*CenterPark Specific Plan, City of Ontario*

Not to scale

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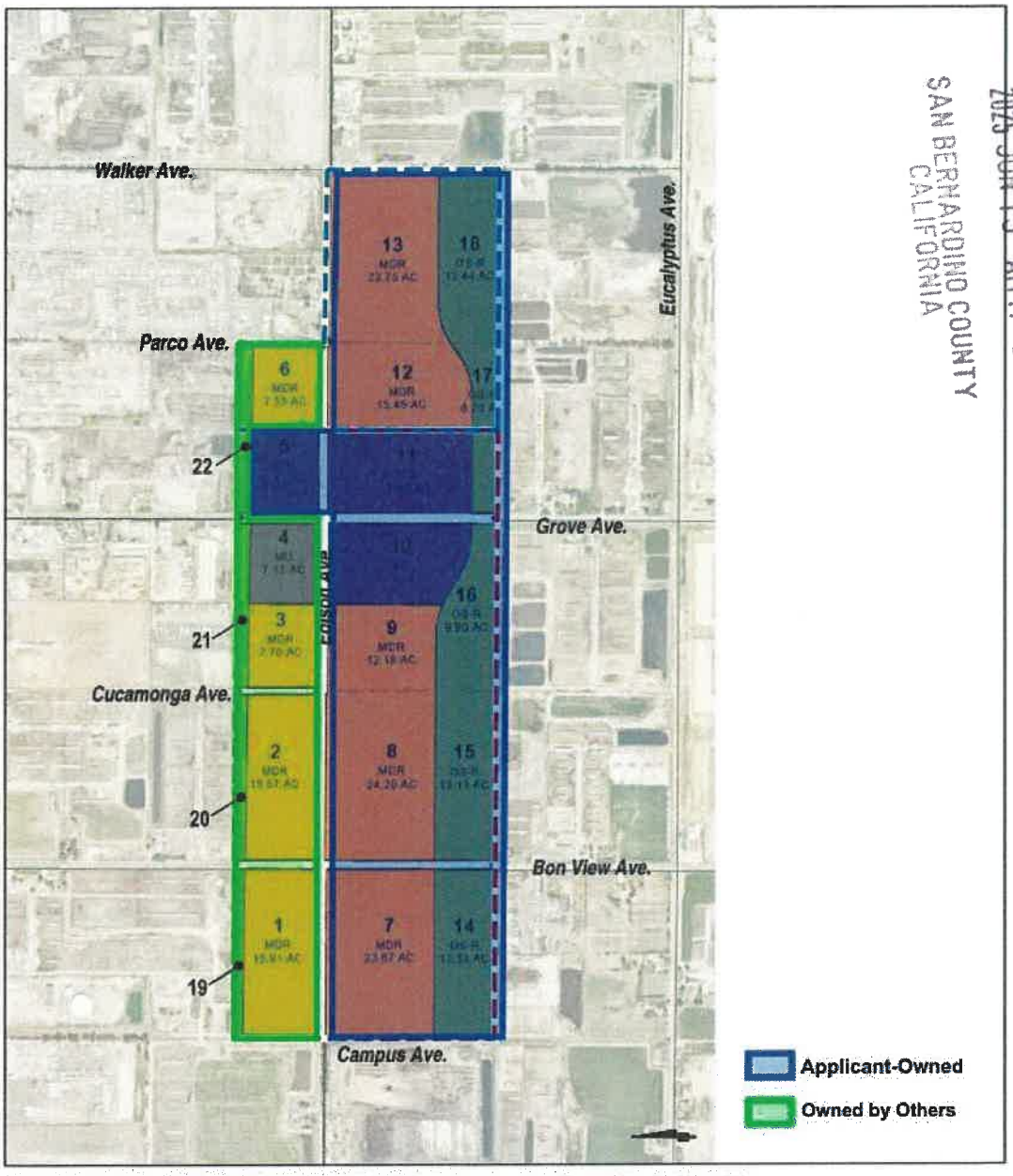


Source: CenterPark Specific Plan Traffic Analysis, Exhibit 1.2 Preliminary Land Use Plan and Phasing Plan, 2025.

**Figure 3:** Project Area Ownership
*CenterPark Specific Plan*

Not to scale

Kimley»Horn

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# WELCOME

## Center Park Specific Plan
## Focused Environmental Impact Report
## Scoping Meeting

July 2, 2025

CITY OF ONTARIO

# Purpose of Scoping Meetings

- Early public consultation
- Learn about environmental concerns regarding the project from potentially affected agencies and individuals
- Opportunity to identify and address issues that might otherwise arise late in the process
- Help focus the Focused EIR's content and identify alternatives

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# CEQA Process

- The California Environmental Quality Act (CEQA) is required for discretionary approvals.
- Purpose is to inform decision makers and the public of potential effects of project approval.
- NOP provides consultation and focuses subsequent efforts.

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# Roles and Responsibilities

| | |
|---|---|
| ***Developer*** | Design and submit development proposal |
| ***City Staff*** | Review and evaluate Developer's project<br>Manage EIR Consultant<br>Make recommendations to Decision Makers |
| ***Environmental Consultant*** | Evaluate impacts of project approval on the existing environment |
| ***Decision Makers*** | Planning Commission and City Council<br>Evaluate and approve or disapprove project |

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# Project Location Map

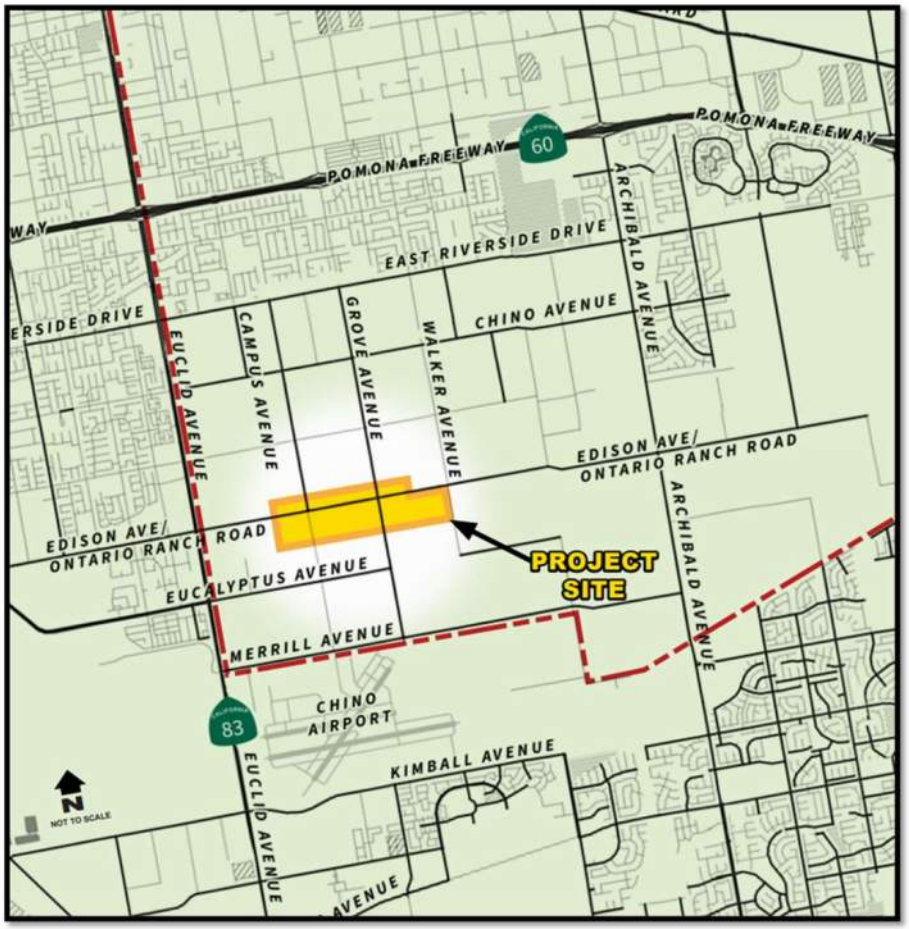


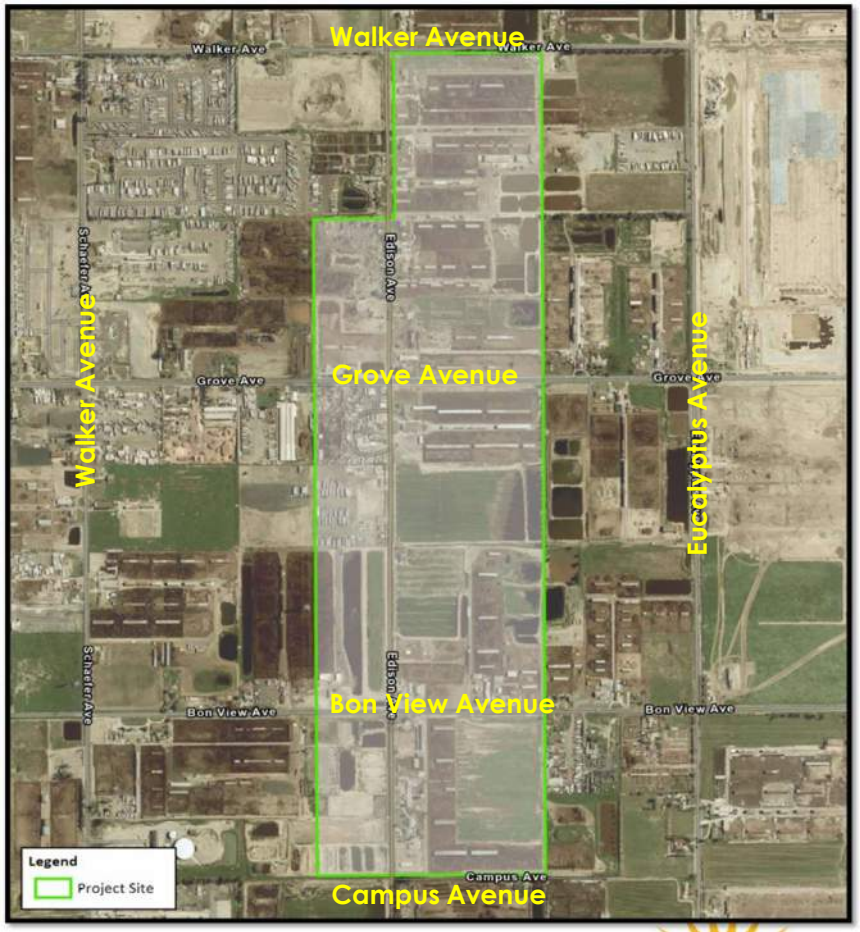

# The Project

The Proposed Project will Include:

- Residential and Mixed-Use developments on 257.34 net acres.
- Bound to the north by a Southern California Edison (SCE) Easement located approximately 330 feet north of Edison Avenue, Eucalyptus Avenue to the south, Campus Avenue to the west, Walker Avenue to the east, and bisected by Edison Avenue.
  - Maximum of 4,293 dwelling units, 115,809 s.f. of retail, and 135,110 s.f. of office.
  - Provide for supporting improvements such as roads, trails, parks, utilities, and landscaping.

- Tentative Tract Maps
  - Create 22 Planning Areas

- Development Agreement
  - Establish development rights, infrastructure financing, acquisition, and construction responsibilities

- Williamson Act Cancellation
  - Cancel the active Williamson Act Contracts

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# Proposed Land Use Plan

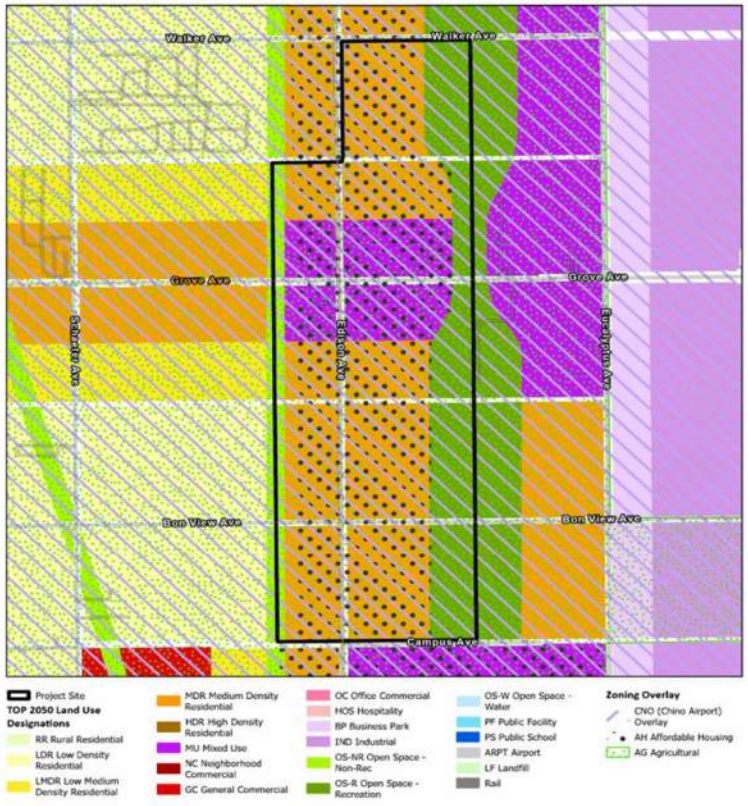


Source: City of Ontario The Ontario Plan 2050, 2024.

**Figure 2:** Existing Land Use and Zoning
*CenterPark Specific Plan, City of Ontario*

Not to scale

Kimley»Horn

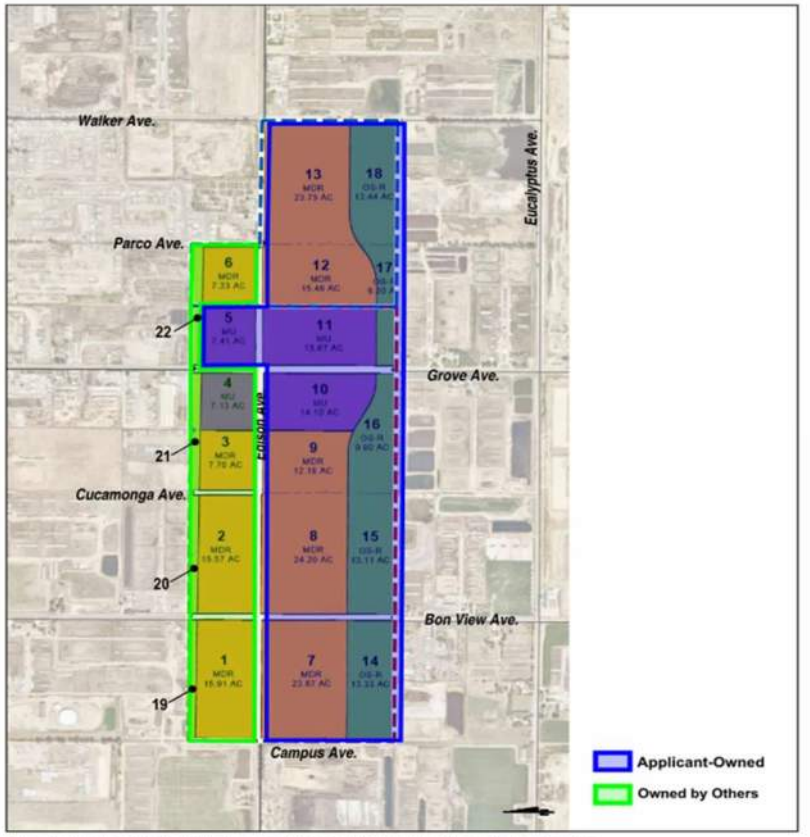


Source: CenterPark Specific Plan Traffic Analysis, Exhibit 1-2 Preliminary Land Use Plan and Phasing Plan, 2025.

**Figure 3:** Project Area Ownership
*CenterPark Specific Plan*

Not to scale

Kimley»Horn

# Proposed Development by Planning Area

**Table 3-1: Project Buildout by Phase**

| Planning Area | Land Use | TOP 2050 Acreage | Maximum Density Per TOP EIR | Maximum Units | Maximum Retail | Maximum Office |
|---|---|---|---|---|---|---|
| **Phase I** | | | | | | |
| 5 | MIXED-USE RESIDENTIAL | 5.19 AC | 35.0 DU/AC | 182 DU | | |
| 5 | MIXED-USE RETAIL | 1.48 AC | | | 19,367 SF | |
| 5 | MIXED-USE OFFICE | 0.74 AC | | | | 22,595 SF |
| 7 | MDR (11.1 - 25.0 DU/AC) | 23.67 AC | 22.0 DU/AC | 521 DU | | |
| 8 | MDR (11.1 - 25.0 DU/AC) | 24.20 AC | 22.0 DU/AC | 532 DU | | |
| 9 | MDR (11.1 - 25.0 DU/AC) | 12.18 AC | 22.0 DU/AC | 268 DU | | |
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| 14 | OS-R (PARKLAND) | 13.33 AC | | | | |
| 15 | OS-R (PARKLAND) | 13.11 AC | | | | |
| 16 | OS-R (PARKLAND) | 9.90 AC | | | | |
| 17 | OS-R (PARKLAND) | 6.20 AC | | | | |
| 18 | OS-R (PARKLAND) | 13.44 AC | | | | |
| **Phase I Total** | | **192.42 AC** | **19.5 DU/AC** | **3,095 DU** | **97,174 SF** | **113,370 SF** |
| **Phase II Future Development Areas** | | | | | | |
| 1 | MDR (11.1 - 25.0 DU/AC) | 15.91 AC | 22.0 DU/AC | 350 DU | | |
| 2 | MDR (11.1 - 25.0 DU/AC) | 15.57 AC | 22.0 DU/AC | 343 DU | | |
| 3 | MDR (11.1 - 25.0 DU/AC) | 7.70 AC | 22.0 DU/AC | 169 DU | | |
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| 6 | MDR (11.1 - 25.0 DU/AC) | 7.33 AC | 22.0 DU/AC | 161 DU | | |
| 19 | OS-NR (NON-RECREATION) | 2.26 AC | | | | |
| 20 | OS-NR (NON-RECREATION) | 2.68 AC | | | | |
| 21 | OS-NR (NON-RECREATION) | 2.96 AC | | | | |
| 22 | OS-NR (NON-RECREATION) | 3.38 AC | | | | |
| **Phase II Total** | | **64.92 AC** | **15.6 DU/AC** | **1,198 DU** | **18,635 SF** | **21,741 SF** |
| **Project Total** | | **257.34 AC** | **16.7 DU/AC** | **4,293 DU** | **115,809 SF** | **135,110 SF** |

# Proposed Land Use Plan

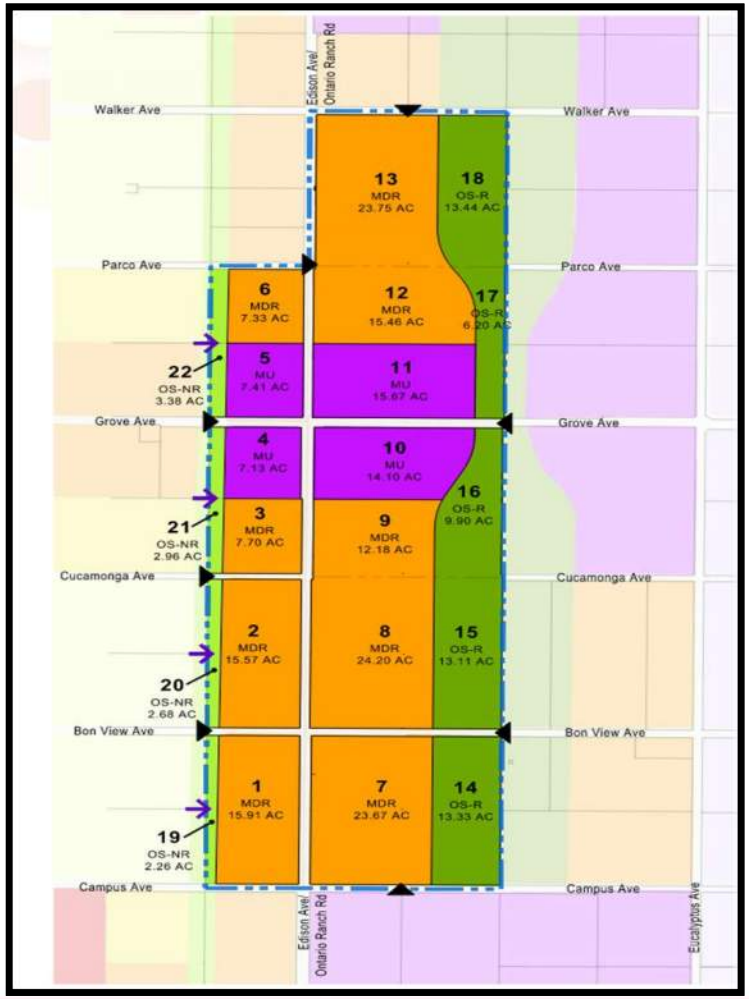


- Specific Plan Boundary
- MDR Medium Density Residential
- MU Mixed-Use
- OS-R Open Space-Recreation
- OS-NR Open Space-Non Rec
- FULL ACCESS
- POTENTIAL ACCESS POINT

N

# Approvals Necessary

- Legislative & Discretionary Approvals Necessary:
  - Certification of the Center Park Specific Plan Focused EIR
  - Adoption of the Center Park Specific Plan
  - Approval of Tentative Tract Maps
  - Approval of Development Agreements
  - Cancellation of Williamson Act Contracts

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# EIR Focus Areas

Based on the NOP and public scoping, the following topic will be addressed in the Focused EIR:

- Historic Resources

Pursuant to CEQA Guidelines Section 15183, the City prepared a 15183 Consistency Analysis (which will be an appendix to the Focused EIR), to document that the proposed Project is consistent with the City's The Ontario Plan 2050 and its associated Supplemental EIR, and with the exception of potential impacts to historic resources, the Project is adequately addressed in the prior EIR and does not represent a new or more severe significant impact that is "peculiar" to the Project, nor does it represent a new or more severe impact related to off-site infrastructure or cumulative impacts.

The following topics will be addressed in the 15183 Consistency Analysis (which will be an appendix to the Focused EIR):

- Aesthetics
- Agriculture/Forestry Resources
- Air Quality
- Biological Resources
- **Cultural Resources**
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards/ Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems
- Wildfire

**The Project only focuses on the potential environmental impacts associated with Historic Resources. All other topics have been analyzed and reviewed through the CEQA 15183 Exemption and are consistent with The Ontario Plan (TOP) 2050.**

CITY OF ONTARIO

# Opportunities for Public Involvement

- Comments on the NOP will be accepted through July 14, 2025.
- 45-day Draft Focused EIR comment period is anticipated to run during Winter 2025.
- Responses to Draft Focused EIR comments will be provided to public agencies not less than ten days prior to public hearings.
- Notices will be provided on dates of Planning Commission and City Council hearings on Final Focused EIR.

CITY OF ONTARIO

# Questions or Comments?

If you have further questions or require additional information, please contact Rafael Torres, Assistant Planner, at RTorres@ontarioca.gov.

CITY OF ONTARIO

## Bauer, Cameron

**From:** Rafael Torres <RTorres@ontarioca.gov>
**Sent:** Tuesday, August 5, 2025 5:26 PM
**To:** Bauer, Cameron; Mauck, Jessica
**Cc:** Wallace, Sabrina (Tamimi)
**Subject:** FW: 6/26/25-City of Ontario Center Park Specific Plan
**Attachments:** 20250624145643.pdf

Good evening,

For your records, please see the response email/attachment from SoCal Gas Company for the CenterPark Project.

Sincerely,

**Rafael Torres**
Assistant Planner
Planning Department
303 East B Street, Ontario, CA 91764
P: (909) 395-2979
E: rtorres@ontarioca.gov
www.ontarioca.gov

---

**From:** SCG SE Region Redlands Utility Request <SCGSERegionRedlandsUtilityRequest@semprautilities.com>
**Sent:** Thursday, June 26, 2025 7:07 AM
**To:** Rafael Torres <RTorres@ontarioca.gov>
**Cc:** SoCalGasTransmissionUtilityRequest <SoCalGasTransmissionUtilityRequest@semprautilities.com>
**Subject:** 6/26/25-City of Ontario Center Park Specific Plan

**This is a SoCalGas Distribution response. I am including SoCalGas Transmission SoCalGasTransmissionUtilityRequest@semprautilities.com as they may have facilities in the area and will need to review this project.**
Hello,
I just reviewed the documents regarding: **City of Ontario Center Park Specific Plan**
SoCalGas Distribution does have facilities in the area. Please note on case to have Developer contact 811 / USA at DigAlert | Utility Locating California | Underground Wire & Cable Locator [digalert.org] prior to any excavation / demolition activities so we can Locate & Mark out our facilities. **Any excavation activity within ten (10) feet of our High-Pressure facilities will require a SoCalGas employee standby.**
If the Developer needs new gas service, please have them contact our Builder Services group to begin the application process as soon as practicable, at https://www.socalgas.com/for-your-business/builder-services [socalgas.com].
**To avoid delays in processing requests and notifications, please have all Franchise correspondence sent to our Utility Request inbox, at SCGSERegionRedlandsUtilityRequest@semprautilities.com**

I cover the **Southeast Region – Redlands**
SCGSERegionRedlandsUtilityRequest@semprautilities.com would be your contact for requests in the southeastern ends of LA County, Riverside County, San Bernardino & Imperial Counties.

**Southeast Region - Anaheim** office which is all of Orange County and the southern ends of Los Angeles County; therefore, any Map and/or Will Serve Letter requests you have in these areas please send them to AtlasRequests/WillServeAnaheim@semprautilities.com

**Northwest Region – Compton HQ** For West and Central LA County, your Map Request and Will Serve Letters, will go to SCG-ComptonUtilityRequest@semprautilities.com

**Northwest Region - Chatsworth**
For any requests from the northern most parts of LA County all the way up to Visalia, San Luis Obispo, Fresno and Tulare you would contact NorthwestDistributionUtilityRequest@semprautilities.com

**Transmission**
For Transmission requests, please contact SoCalGas Transmission, at SoCalGasTransmissionUtilityRequest@semprautilities.com

**READ MORE .....**

**MINOR STREET IMPROVEMENT PROJECTS: (CHIP SEAL, SLURRY SEAL, GRIND & OVERLAY)**
**Please notify Southern California Gas Company 4 months prior to start of pavement projects for the gas company to complete leak survey & repair leaks if found.**

**MAJOR STREET IMPROVEMENT PROJECTS: (PROJECTS REQUIRING EXCAVATIONS GREATER THAN 9 INCHES, WIDENING OF EXISTING STREETS, INSTALLING NEW CURBS & GUTTERS, BUS PADS, TRAFFIC SIGNALS, REALIGNMENT, GRADE SEPARATION, ETC.)**
**&**
**PIPELINE PROJECTS: (STORM DRAIN, WATERLINE, WATER, SEWER, ELECTRICAL, TELECOMUNICATIONS, ETC.)**
**Please provide Southern California Gas Company with your signed designed plans with *gas company facilities posted* on your designs plans, 4-6 months prior to start of construction for possible relocation of SCG medium pressure facilities and 9-12 months for possible relocation of SCG high pressure facilities.**

**This time is needed to analyze plans and to design required alterations to any conflicting SCG gas facilities. Please keep us informed of any and all pre-construction meetings, construction schedules, etc., so that our work can be scheduled accordingly.**
**Potholing may be required to determine if a conflict exists between the proposed development and our facilities. If, for any reason, there are SCG facilities in conflict, and a request to be relocated is needed, it is important to send the request in writing. Please include all required information below:**

- **A Signed "Notice to Owner" request on Official Letterhead from the City, County, and/or company.**
- **Name, Title and Project Number.**
- **Address, Location, Start Date, Parameters & Scope of Entire Job/Project.**
- **Copy of Thomas Guide Page and/or Google Map Screenshot Highlighting Project Area.**
- **Requestor Company's Contact Name, Title, Phone Number, Email, and other pertinent information.**

Thank you,
Josh Rubal
Lead Planning Associate
Distribution Planning & Project Management
Redlands HQ - Southeast Region
(213) 231-7978  Office
SCGSERegionRedlandsUtilityRequest@semprautilities.com

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

SENT VIA E-MAIL: July 09, 2025
rtorres@ontarioca.gov
Rafael Torres, Assistant Planner
City of Ontario, Planning Department
303 East B Street
Ontario, CA 91764

**Notice of Preparation of a Draft Environmental Impact Report for the CenterPark Specific Plan Project (Proposed Project) (SCH No.: 2025060731)**

South Coast Air Quality Management District (South Coast AQMD) staff appreciate the opportunity to comment on the above-mentioned document. Our comments are recommendations on the analysis of potential air quality impacts from the Proposed Project that should be included in the Draft Environmental Impact Report (EIR). Please send a copy of the Draft EIR upon its completion and public release directly to South Coast AQMD as copies of the Draft EIR submitted to the State Clearinghouse are not forwarded. **In addition, please send all appendices and technical documents related to the air quality, health risk, and greenhouse gas analyses (electronic versions of all emission calculation spreadsheets, air quality modeling, and health risk assessment input and output files, not PDF files). Any delays in providing all supporting documentation for our review will require additional review time beyond the end of the comment period.**

**CEQA Air Quality Analysis**

The Lead Agency is recommended to rely on the guidance provided in the South Coast AQMD's CEQA Air Quality Handbook and website[1] when preparing the air quality and greenhouse gas analyses. It is also recommended that the Lead Agency use the California Air Pollution Control Officers Association's California Emissions Estimator Model (CalEEMod)[2] software, to quantify emissions of air pollutants from typical land use development project.

In addition, the South Coast AQMD has adopted regional air quality significance thresholds[3] as well as localized significance thresholds (LST).[4] If the Lead Agency has not adopted its own significance thresholds, the Lead Agency is recommended to rely on South Coast AQMD's adopted thresholds for determining whether the Proposed Project's air quality and greenhouse gas impacts are significant. It is important to note that the localized analysis can be conducted by either using the LST screening tables or performing air dispersion modeling.

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1 South Coast AQMD's CEQA Air Quality Handbook and other resources for preparing air quality analyses can be found at: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook.
2 CalEEMod is available free of charge at: www.caleemod.com.
3 South Coast AQMD's air quality significance thresholds can be found at: https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf
4 South Coast AQMD's guidance for performing a localized air quality analysis can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

The Lead Agency should identify any potential adverse air quality and greenhouse gas impacts that could occur from all phases of the Proposed Project and all air pollutant sources related to the Proposed Project. Air quality and greenhouse gas impacts from both construction (including demolition, if any) and operations should be calculated. Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips, and hauling trips). Operation-related air quality and greenhouse gas impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers and air pollution control devices), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality and greenhouse gas impacts from indirect sources, such as sources that generate or attract vehicular trips, should be included in the analysis. Furthermore, if the Lead Agency elects to rely on South Coast AQMD's air quality significance thresholds, the emissions from the overlapping construction and operational activities should be combined and compared to South Coast AQMD's air quality significance thresholds for *operation* to determine the level of significance.

Also, if implementation of the Proposed Project would require the use of new stationary and portable sources, including but not limited to emergency generators, fire water pumps, boilers, spray booths, etc., one or more air permits from South Coast AQMD will be required, and the role of South Coast AQMD would change from a Commenting Agency under CEQA to a Responsible Agency as defined in CEQA Guidelines Section 15381. The assumptions in the air quality analysis in the EIR will be the basis for evaluating the air permit(s) under CEQA and imposing permit conditions and limits. Questions about air permit requirements should be directed to South Coast AQMD's Engineering and Permitting staff at (909) 396-3385.

In addition, CEQA Guidelines Section 15096 sets forth specific procedures for a Responsible Agency, including making a decision on the adequacy of the CEQA document for use as part of evaluating the applications for air permits. For these reasons, the EIR should include a discussion about any new stationary and portable equipment requiring South Coast AQMD air permits and identify South Coast AQMD as a Responsible Agency for the Proposed Project, if applicable. Also, as set forth in CEQA Guidelines Section 15086, the Lead Agency is required to consult with all Responsible Agencies with discretionary approval power over the Proposed Project. Thus, if air permits are required and South Coast AQMD is identified as a Responsible Agency, please let this comment letter serve as South Coast AQMD's request to convene a meeting with the Lead Agency as required by CEQA Guidelines Section 15104 to discuss the scope and content of the environmental information that will need to be included in the Draft EIR.

To assist with identifying ways to minimize air quality impacts from the Proposed Project, the Lead Agency is also recommended to consult and apply the guidance from the California Air Resources Board (CARB) *Air Quality and Land Use Handbook: A Community Health Perspective*,[5] which is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. CARB has

[5] CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* can be found at: https://www.aqmd.gov/docs/default-source/ceqa/handbook/california-air-resources-board-air-quality-and-land-use-handbook-a-community-health-perspective.pdf.

another helpful technical advisory, *Strategy to Reduce Air Pollution Exposure Near High-Volume Roadways*,[6] which contains additional guidance on strategies to reduce air pollution exposure of Proposed Projects located near high-volume roadways.

Since the Proposed Project is a Specific Plan involving local planning and land use decisions, the Lead Agency is recommended to review and consider applying the recommendations contained in the South Coast AQMD *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*,[7] which includes suggested policies that local governments can use in their General Plans or through local planning to prevent or reduce potential air pollution impacts and protect public health.

**Mitigation Measures**

In the event that the Proposed Project results in significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized to minimize these impacts. Any impacts resulting from mitigation measures must also be analyzed. Several resources to assist the Lead Agency with identifying potential mitigation measures for the Proposed Project include South Coast AQMD's CEQA Air Quality Handbook,[8] South Coast AQMD's Mitigation Monitoring and Reporting Plan for the 2022 Air Quality Management Plan,[9] and Southern California Association of Governments' Mitigation Monitoring and Reporting Plan for the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy.[10]

**Health Risk Reduction Strategies**

Many strategies are available to reduce exposures, including, but not limited to, building filtration systems with MERV 13 or better, or in some cases, MERV 15 or better is recommended; building design, orientation, location; vegetation barriers or landscaping screening, etc. Enhanced filtration units are capable of reducing exposures. However, enhanced filtration systems have limitations. For example, in a study that South Coast AQMD conducted to investigate filters,[11] a cost burden is expected to be within the range of $120 to $240 per year to replace each filter panel. The initial start-up cost could substantially increase if an HVAC system needs to be installed and if standalone filter units are required. Installation costs may vary and include costs for conducting site assessments and obtaining permits and approvals before filters can be installed. Other costs may include filter life monitoring, annual maintenance, and training for conducting maintenance and reporting. In addition, because the filters would not have any effectiveness unless the HVAC system is running, there may be increased energy consumption that the Lead Agency should evaluate in the Draft EIR. It is typically assumed that the filters operate 100 percent of the time while residents are indoors, and the environmental analysis does not generally account for the

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6 CARB's Strategy to Reduce Air Pollution Exposure Near High-Volume Roadways, April 2017, available at: https://ww2.arb.ca.gov/sites/default/files/2017-10/rd_technical_advisory_final.pdf.

7 South Coast AQMD. 2005. *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*. Available at: http://www.aqmd.gov/docs/default-source/planning/air-quality-guidance/complete-guidance-document.pdf.

8 https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook

9 South Coast AQMD's 2022 Air Quality Management Plan can be found at: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan (Chapter 4 - Control Strategy and Implementation).

10 Southern California Association of Governments' 2020-2045 RTP/SCS can be found at: https://www.connectsocal.org/Documents/PEIR/certified/Exhibit-A_ConnectSoCal_PEIR.pdf.

11 This study evaluated filters rated MERV 13 or better. Accessed at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/aqmdpilotstudyfinalreport.pdf. Also see 2012 Peer Review Journal article by South Coast AQMD: https://onlinelibrary.wiley.com/doi/10.1111/ina.12013.

times when the residents have their windows or doors open or are in common space areas of the project. These filters have no ability to filter out any toxic gases. Furthermore, when used filters are replaced, replacement has the potential to result in emissions from the transportation of used filters at disposal sites and generate solid waste that the Lead Agency should evaluate in the Draft EIR. Therefore, the presumed effectiveness and feasibility of any filtration units should be carefully evaluated in more detail prior to assuming that they will sufficiently alleviate exposures to diesel particulate matter emissions.

South Coast AQMD staff is available to work with the Lead Agency to ensure that air quality, greenhouse gas, and health risk impacts from the Proposed Project are accurately evaluated and mitigated where feasible. If you have any questions regarding this letter, please contact Danica Nguyen, Air Quality Specialist, at dnguyen1@aqmd.gov.

Sincerely,

*Sam Wang*

Sam Wang
Program Supervisor, CEQA IGR
Planning, Rule Development & Implementation

SW:DN
SBC250616-05
Control Number

JULY 10, 2025

VIA EMAIL: RTORRES@ONTARIOCA.GOV
CITY OF ONTARIO, PLANNING DEPARTMENT
C/O RAFAEL TORRES
303 EAST B STREET
ONTARIO, CA 91764

Dear Mr. Torres:

NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE CENTER PARK SPECIFIC PLAN PROJECT, SCH# 2025060731

The Department of Conservation's (Department) Division of Land Resource Protection (Division) has reviewed the Notice of Preparation of a Draft Environmental Impact Report for the Center Park Specific Plan Project (Project).

The Division monitors and maps farmland conversion on a statewide basis, provides technical assistance regarding the Williamson Act, and administers various agricultural land conservation programs. Public Resources Code, section 614, subdivision (b) authorizes the Department to provide soil conservation advisory services to local governments, including review of CEQA documents.

Protection of the state's agricultural land resources is part of the Department's mission and central to many of its programs. The CEQA process gives the Department an opportunity to acknowledge the value of the resource, identify areas of Department interest, and offer information on how to assess potential impacts or mitigation opportunities.

The Department respects local decision-making by informing the CEQA process and is not taking a position or providing legal or policy interpretation.

We offer the following comments for consideration with respect to the project's potential impacts on agricultural land and resources within the Department's purview.

PROJECT ATTRIBUTES

The Project consists of a Specific Plan to allow for a residential and mixed-used retail/office development on 29 parcels covering approximately 257.34 acres in the City of Ontario. The development would include up to 250,919 square feet of commercial retail/office uses, up to 4,293 residential units across medium density and mixed-use residential uses, 67.26 acres of open space parkland/non-recreation uses, and associated on-site and off-site infrastructure improvements. The Project site contains

Prime Farmland, Farmland of Statewide Importance, and Unique Farmland as designated by DOC's Farmland Mapping and Monitoring Program.

PROJECT CONSIDERATIONS

The conversion of agricultural land represents a permanent reduction and impact to California's agricultural land resources. The Department generally advises discussion of the following in any environmental review for the loss or conversion of agricultural land:

- Type, amount, and location of farmland conversion resulting directly and indirectly from implementation of the proposed project.
- Impacts on any current and future agricultural operations in the vicinity; e.g., land-use conflicts, increases in land values and taxes, loss of agricultural support infrastructure such as processing facilities, etc.
- Incremental impacts leading to cumulative impacts on agricultural land. This would include impacts from the proposed project, as well as impacts from past, current, and likely future projects.
- Implementation of any City or County Agricultural Mitigation Plans, Programs, or Policies.
- Proposed mitigation measures for impacted agricultural lands within the proposed project area.

MITIGATING AGRICULTURAL LAND LOSS OR CONVERSION

Consistent with CEQA Guidelines, the Department advises that the environmental review address mitigation for the loss or conversion of agricultural land. An agricultural conservation easement is one potential method for mitigating loss or conversion of agricultural land. (*See* Cal. Code Regs., tit. 14, § 15370 [mitigation includes "compensating for the impact by replacing or providing substitute resources or environments, including through permanent protection of such resources in the form of conservation easements."]; *see also King and Gardiner Farms, LLC v. County of Kern* (2020) 45 Cal.App.5th 814.)

Mitigation through agricultural conservation easements can take at least two forms: the outright purchase of easements or the donation of mitigation fees to a local, regional, or statewide organization or agency whose purpose includes the acquisition and stewardship of agricultural easements. The conversion of agricultural land may be viewed as an impact of at least regional significance. Hence, the search for replacement lands may not need to be limited strictly to lands within the project's surrounding area. A helpful source for regional and statewide agricultural mitigation banks is the California Council of Land Trusts. They provide helpful insight into farmland mitigation policies and implementation strategies, including a guidebook with model policies and a model local ordinance. The guidebook can be found at:

California Council of Land Trusts

Of course, the use of conservation easements is only one form of mitigation, and the Department urges consideration of any other feasible measures necessary to mitigate project impacts.

Thank you for giving us the opportunity to comment on the Notice of Preparation of a Draft Environmental Impact Report for the Center Park Specific Plan Project. Please provide the Department with notices of any future hearing dates as well as any staff reports pertaining to this project. If you have any questions regarding our comments, please contact Farl Grundy, Associate Environmental Planner via email at Farl.Grundy@conservation.ca.gov.

Sincerely,

Monique Wilber

Monique Wilber

Conservation Program Support Supervisor

SCAG
INNOVATING FOR A BETTER TOMORROW

SOUTHERN CALIFORNIA
ASSOCIATION OF GOVERNMENTS
900 Wilshire Blvd., Ste. 1700
Los Angeles, CA 90017
T: (213) 236-1800
www.scag.ca.gov

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Transportation
Mike T. Judge, Ventura County
Transportation Commission

**July 10, 2025**

Rafael Torres
City of Ontario, Planning Department
303 East B Street
Ontario, CA 91764
Phone: (909) 395-2979
E-mail: rtorres@ontarioca.gov

Subject: SCAG Staff Comments on the Notice of Preparation of a Draft Environmental Impact Report for the Center Park Specific Plan (PSP24-002) [SCAG NO. IGR11219]

Dear Rafael Torres:

Thank you for submitting the Notice of Preparation of a Draft Environmental Impact Report for the Center Park Specific Plan ("proposed project") to the Southern California Association of Governments (SCAG) for review. SCAG is responsible for providing informational resources to regionally significant plans, projects, and programs per the California Environmental Quality Act (CEQA) to facilitate the consistency of these projects with SCAG's adopted regional plans, to be determined by the lead agencies.[1]

Pursuant to Senate Bill (SB) 375, SCAG is the designated Regional Transportation Planning Agency under state law and is responsible for preparation of the Regional Transportation Plan (RTP), including the Sustainable Communities Strategy (SCS). SCAG's feedback is intended to assist local jurisdictions and project proponents to implement projects that have the potential to contribute to attainment of and alignment with adopted Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) goals and policies. Finally, SCAG is the authorized regional agency for Intergovernmental Review (IGR) of programs proposed for Federal financial assistance and direct Federal development activities, pursuant to Presidential Executive Order 12372.

SCAG staff has reviewed the Notice of Preparation of a Draft Environmental Impact Report for the Center Park Specific Plan in San Bernardino County. The proposed project consists of construction of up to 4,293 residential units, 250,919 square feet of retail/office uses, and 67.26 acres of open space on 257.34 acres.

**When available, please email environmental documentation to IGR@scag.ca.gov providing, at a minimum, the full public comment period for review.**

If you have any questions regarding the attached comments, please contact the IGR Program, attn.: Ryan Bañuelos, Senior Regional Planner, at (213) 630-1532 or IGR@scag.ca.gov. Thank you.

Sincerely,

*Lijin Sun*

Lijin Sun
Planning Supervisor, Planning Strategy Department

[1] Local jurisdictions and other lead agencies shall have the sole discretion to determine a local project's or plan's consistency and/or alignment with Connect SoCal 2024 for the purpose of determining consistency for CEQA purposes.

**COMMENTS ON THE NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE CENTER PARK SPECIFIC PLAN (PSP24-002) [SCAG NO. IGR11219]**

**CONNECT SOCAL 2024**

Connect SoCal 2024 (Plan) is a long-range visioning plan for the six-county SCAG region, reflecting a continuation of the shift towards more efficient resource management including transportation infrastructure resources, land resources and environmental resources. The Plan highlights the existing land use and transportation conditions throughout the SCAG region and forecasts the region's evolving transportation needs between 2024 and 2050. The Plan identifies and prioritizes expenditures of the anticipated funding for transportation projects of all transportation modes: highways, streets and roads, transit, rail, bicycle, and pedestrian, as well as aviation ground access.

The Plan was developed to achieve greenhouse gas (GHG) per capita emission reduction targets, consistent with Senate Bill (SB) 375 and other regional goals. In accordance with federal fiscal constraint requirements, Connect SoCal 2024 is a financially constrained Plan in terms of transportation revenues and expenditures. Connect SoCal 2024 would reduce traffic congestion, improve air quality, and improve the region's long-term economic viability through more than $751 billion in transportation investments and a more sustainable regional development pattern. To view Connect SoCal 2024 and the accompanying technical reports, please visit the Connect SoCal 2024 webpage.

**Connect SoCal 2024 Vision and Goals**

The SCAG Regional Council fully adopted the Plan on April 4, 2024. Connect SoCal 2024 represents the vision for the region and reflects the planned transportation investments, policies, and strategies that integrate with the Forecasted Regional Development Pattern to achieve the Plan's goals. The Vision and Goals for Connect SoCal 2024 are rooted in the direction set forth by Connect SoCal 2020, reflecting both SCAG's statutory requirements, the emerging trends, and persistent challenges facing the region. Reflecting input from engagement with stakeholders and members of the public, SCAG's vision for Southern California in the year 2050 is "*A healthy, prosperous, accessible and connected region for a more resilient and equitable future.*" The following goals and subgoals helps the SCAG region to achieve this vision.

**Mobility:** ***Build and maintain an integrated multimodal transportation network***

- Support investments that are well-maintained and operated, coordinated, resilient and result in improved safety, improved air quality and minimized greenhouse gas emissions
- Ensure that reliable, accessible, affordable and appealing travel options are readily available, while striving to enhance equity in the offerings in high-need communities
- Support planning for people of all ages, abilities and backgrounds

**Communities:** ***Develop, connect and sustain communities that are livable and thriving***

- Create human-centered communities in urban, suburban and rural settings to increase mobility options and reduce travel distances
- Produce and preserve diverse housing types in an effort to improve affordability, accessibility and opportunities for all households

**Environment:** ***Create a healthy region for the people of today and tomorrow***

- Develop communities that are resilient and can mitigate, adapt to and respond to chronic and acute stresses and disruptions, such as climate change
- Integrate the region's development pattern and transportation network to improve air quality, reduce greenhouse gas emissions and enable more sustainable use of energy and water
- Conserve the region's resources

**Economy:** ***Support a sustainable, efficient and productive regional economic environment that provides opportunities for all residents***

- Improve access to jobs and educational resources
- Advance a resilient and efficient goods movement system that supports the economic vitality of the region, attainment of clean air and quality of life for our communities

For ease of review, SCAG staff encourages the use of a side-by-side comparison of SCAG goals with discussions of the consistency, non-consistency, or non-applicability of the goals and supportive analysis in a table format. Suggested format is as follows:

| SCAG CONNECT SOCAL 2024 GOALS AND SUBGOALS | | |
|---|---|---|
| Goal/Subgoal | | Analysis |
| Mobility Goal: | *Build and maintain an integrated multimodal transportation network* | *Consistent: Statement as to why; Not-Consistent: Statement as to why; or Not Applicable: Statement as to why; DEIR page number reference* |
| Mobility Subgoal: | *Support investments that are well-maintained and operated, coordinated, resilient and result in improved safety, improved air quality and minimized greenhouse gas emissions* | *Consistent: Statement as to why; Not-Consistent: Statement as to why; or Not Applicable: Statement as to why; DEIR page number reference* |
| etc. | | etc. |

**Connect SoCal 2024 Key Elements**

Unique to this plan cycle, SCAG developed a set of Regional Planning Policies and Implementation Strategies to guide decision-making in the region toward integrated land use and transportation planning and other goals in Connect SoCal 2024. Eighty-eight Regional Planning Policies provide guidance for integrating land use and transportation planning to realize the vision of Connect SoCal 2024. The Implementation Strategies help the region to achieve this vision for the future and are priorities for SCAG efforts in fulfilling or going beyond the Regional Planning Policies. The Regional Planning Policies and Implementation Strategies were developed to achieve California's greenhouse gas emission reduction goals as set forth in SB 375 and federal Clean Air Act Section 176(c) requirements for transportation conformity while meeting the broader regional objectives, such as improved equity and resilience in addition to preservation of natural lands, improvement of public health, increased roadway safety, support for the region's vital goods movement industries and more efficient use of resources. The Plan also includes a detailed project list; strategic investments to bridge local plans with overarching regional performance targets and goals; a growth forecast and regional development pattern based on population, household and employment growth projections by 2050; and a transportation network including a list of transportation projects and investments.

Connect SoCal 2024 presents a summary of that work in five chapters of the Main Plan with additional details on Plan elements and analysis in the Plan's accompanying 15 Technical Reports. Connect SoCal 2024 builds upon the progress from previous RTP/SCS cycles, reflecting both SCAG's statutory requirements, the emerging trends, and persistent challenges facing the region. These policies offer a resource by which County Transportation Commissions (CTCs) or local jurisdictions within the SCAG region, when seeking resources from state or federal programs, can refer to specific policies to demonstrate alignment with the RTP/SCS.

**Regional Growth Forecast and Forecasted Regional Development Pattern**

As part of developing a Sustainable Communities Strategy per SB 375, SCAG must include a "forecasted development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies …" enables SCAG to reach its per capita GHG emission reduction target of 19 percent below 2005 levels by 2035. SCAG staff prepared a Forecasted Regional Development Pattern for Connect SoCal 2024 through 2050, the horizon year of the Plan. The regional growth forecast determines the projected increase in population, households, and jobs based on local general plans and known development entitlement agreements, including available data from 6th cycle housing element updates. The Connect SoCal 2024 Demographic and Growth Forecast Technical Report includes detailed discussions on socioeconomic data, including additional detail on the growth forecast, growth vision, and Sustainable Communities Strategy (SCS) consistency in Section of the Technical Report. The Connect SoCal 2024 Land Use and Communities Technical Report includes the most recent planning assumptions and estimates of population and housing.

SCAG's work helps facilitate implementation, but SCAG does not directly implement or construct projects or have land use authority. Achieving a sustained regional outcome depends upon informed and intentional local action. To access jurisdictional level growth estimates and forecasts for years 2035 and 2050, please refer to the Final Connect SoCal 2024 growth forecast data. The growth forecasts for the region and the applicable jurisdiction is below.

| | Adopted SCAG Region Growth Forecasts | | | | City of Ontario Growth Forecasts | | |
|---|---|---|---|---|---|---|---|
| | **Year 2019** | **Year 2030** | **Year 2035** | **Year 2050** | **Year 2019** | **Year 2035** | **Year 2050** |
| Population | 18,827,000 | 19,476,000 | 19,946,000 | 20,909,000 | 174,800 | 200,400 | 240,000 |
| Households | 6,193,000 | 7,006,000 | 7,311,000 | 7,814,000 | 50,500 | 76,700 | 95,500 |
| Employment | 8,976,000 | 9,609,000 | 9,885,000 | 10,276,000 | 122,000 | 164,100 | 187,700 |

**Consistency with Connect SoCal 2024**

SCAG provides informational resources to facilitate the lead agency's consistency determination of the proposed project with Connect SoCal 2024. For the purpose of determining consistency with CEQA, local jurisdictions shall have the sole discretion to determine a local project's or plan's consistency and/or alignment with Connect SoCal 2024[2].

**CEQA MITIGATION MEASURES**

The SCAG Regional Council certified the Final Program Environmental Impact Report for Connect SoCal 2024 (2024 PEIR) and adopted the Mitigation Monitoring and Reporting Program (MMRP), Findings of Fact, and a Statement of Overriding Considerations on April 4, 2024. The mitigation approach used in the 2024 PEIR recognizes the limits of SCAG's authority; distinguishes between SCAG commitments and project-level responsibilities and authorities; optimizes flexibility for project implementation; and facilitates CEQA streamlining (e.g., SB 375) and tiering where appropriate on a project-by project basis determined by each lead agency. Consistent with the approach, the 2024 PEIR identifies regional-level mitigation measures to be implemented by SCAG over the lifetime of the Plan as well as project-level mitigation measures that lead agencies can and should consider, as applicable and feasible, in subsequent project-specific design, CEQA review, and decision-making processes. Given that SCAG is not an implementing agency and has no decision-making authority over projects or any land use authority, it is ultimately up to each lead agency's own discretion to determine the appropriateness of mitigation measures, including exploring opportunities of voluntary regional advance mitigation programs, based on project-specific circumstances such as individual site conditions, project specific details, and community values. Therefore, SCAG staff recommends that the proposed project's CEQA lead agency review the 2024 PEIR for guidance, as appropriate.

[2] SCAG. April 2024. Connect SoCal 2024 Demographic and Growth Forecast Technical Report. Accessible at: https://scag.ca.gov/sites/main/files/file-attachments/23-2987-tr-demographics-growth-forecast-final-040424.pdf

CITY OF EASTVALE
12363 Limonite Avenue | Suite 910 | Eastvale, CA 91752
951.361.0900

July 14, 2025

Rafael Torres, Assistant Planner
City of Ontario Planning Department
303 East "B" Street
Ontario, CA 91764

*Sent via email to: rtorres@ontarioca.gov*

**RE: NOTICE OF PREPERATION (NOP) FOR THE CENTER PARK SPECIFIC PLAN DRAFT ENVIRONMENTAL IMPACT REPORT**

Dear Mr. Torres:

Thank you for the opportunity to comment on the Notice of Preparation (NOP) for the City of Ontario's Specific Plan Project Draft Environmental Impact Report (DEIR). Eastvale values its relationship with neighboring jurisdictions and is not opposed to development of this site; however, this project has the potential to generate traffic and air quality impacts in Ontario and Eastvale. The City of Eastvale offers the following comments for your consideration:

- The Focused EIR and CEQA Guidelines Section 15183 Exemption Analysis should describe potential cumulative impacts resulting from the proposed project together with all other reasonably foreseeable, planned, and approved future projects producing related or cumulative impacts. To that end, the DEIR should consider and incorporate the City of Eastvale's General Plan ("Eastvale 2040") when evaluating cumulative effects of the Specific Plan Amendment. Eastvale 2040 is available on the City of Eastvale's website at: https://www.eastvaleca.gov/our-city/what-s-new/eastvale-2040.

- Although the project is over two miles from the City of Eastvale's northwestern city limits, a project involving 4,293 units, 115,809 square feet of mixed-use retail, and 135,11 square feet of mixed-use office could have potential to impact to City of Eastvale maintained roadways and intersections that should be considered.

If needed, City of Eastvale staff would be happy to meet to discuss these comments, potential solutions that address concerns for both cities, and initiate dialogue concerning fare share costs for any potential mitigations. Please feel free to contact me at (951) 703-0488 or dmurray@eastvaleca.gov with any follow up.

We look forward to working cooperatively with the City of Ontario on regional issues that affect our respective communities.

Sincerely,

David Murray
City Planner

## Bauer, Cameron

**From:** Rafael Torres <RTorres@ontarioca.gov>
**Sent:** Wednesday, August 6, 2025 9:34 AM
**To:** Bauer, Cameron; Mauck, Jessica
**Cc:** Wallace, Sabrina (Tamimi)
**Subject:** FW: 2025060731 NOP Center Park Specific Plan
**Attachments:** 2025060731 NOP CenterPark Specific Plan.pdf; 2021070364_CDFW Comment.pdf

Good morning,

For your reference, please see the response attachments and email from the Department of Fish and Wildlife.

**Rafael Torres**
Assistant Planner
Planning Department
303 East B Street, Ontario, CA 91764
P: (909) 395-2979
E: rtorres@ontarioca.gov
www.ontarioca.gov

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**From:** Cardoso, Lisa@Wildlife <Lisa.Cardoso@Wildlife.ca.gov>
**Sent:** Tuesday, July 15, 2025 5:40 PM
**To:** Rafael Torres <RTorres@ontarioca.gov>
**Cc:** state.clearinghouse@opr.ca.gov; Viera, Amelia@Wildlife <Amelia.Viera@wildlife.ca.gov>
**Subject:** 2025060731 NOP Center Park Specific Plan

Hello ,

California Department of Fish and Wildlife (CDFW) has received the Notice of Preparation for the Center Park Specific Park (SCH No. 2025060731). Please see the attached comment letter from CDFW. We also included the 2021 TOP 2050 NOP Comment Letter that the Department sent to the City on August 19, 2021, which includes figures depicting BUOW locations during that time.

Thank you,

**Lisa N. Cardoso**
Environmental Scientist
California Department of Fish and Wildlife
Inland Desert Region, Region 6
3602 Inland Empire Blvd., Ste C-220
Ontario, CA 91764
(805) 712-0346

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764
www.wildlife.ca.gov

***GAVIN NEWSOM, Governor***
***CHARLTON H. BONHAM, Director***

July 15, 2025
*Sent via email*

Rafael Torres
Assistant Planner
City of Ontario
303 East B Street
Ontario, CA 91764
Rtorres@ontarioca.gov

Subject: Notice of Preparation of a Draft Focused Environmental Impact Report
Center Park Specific Plan
State Clearinghouse No. 2025060731

Dear Rafael Torres:

The California Department of Fish and Wildlife (CDFW) received a Notice of Preparation (NOP) of a Notice of Preparation (NOP) from the City of Ontario (City) for the Center Park Specific Plan (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

**CDFW ROLE**

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

[1] CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

CDFW is also submitting comments as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the Project proponent may seek related take authorization as provided by the Fish and Game Code.

## PROJECT DESCRIPTION SUMMARY

**Location**: The Project site contains approximately 257.24 acres within the southwestern portion of the City of Ontario, San Bernardino County, California. The Project site is bounded by Campus Avenue to the west, Walker Avenue to the east, Eucalyptus Avenue to the south (approximately 0.26 miles south of Project boundary), a Southern California Edison (SCE) easement to the north, and is bisected by Edison Avenue.

**Project Description**: The Project consists of a Specific Plan that encompasses residential and mixed-used retail/office development across 29 parcels and 22 planning areas within a 257.24 acre site. The proposed development would include 250,919 square feet (sqft) of commercial retail/office, up to 4,293 residential units across medium density and mixed-use residential, 67.26 acres of open space parkland/non-creation uses, and associated on-site and off-site infrastructure improvements.

The Project will be implemented in two phases. Phase I pertains to areas owned by the Specific Plan applicant, specifically Planning Areas 5 and 7 through 18, allowing for the development of up to 2,625 residential dwelling units and 55.98 acres of parkland use. Phase II includes parcels owned by third parties, covering Planning Areas 1 through 4 and 6, which will be evaluated at a programmatic level in this draft focused EIR. No development is currently proposed for Phase II, with future development anticipated at a later date.

## COMMENTS AND RECOMMENDATIONS

CDFW offers the comments and recommendations below to assist the City of Ontario in adequately identifying, avoiding, and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources. The EIR should provide adequate and complete disclosure of the Project's potential impacts on biological resources [Pub. Resources Code §21061; CEQA Guidelines, §§15003(i), 15151]. CDFW looks forward to commenting on the EIR when it is available.

### The Ontario Plan EIR & New Model Colony EIR

In 1998, the City of Ontario created a Master Plan known as the New Model Colony (NMC) Program EIR, now referred to as the Ontario Ranch community. The NMC would annex 8,200 acres of previous agricultural and dairy lands which would be entirely developed out into housing, retail, office, and schools. Given the NMC EIR would create significant impacts to raptors, waterfowl, Delhi Sands Flower-Loving Fly, and burrowing owls, and mitigation measures to reduce impacts to less than significant levels included: (MM BR-1) *2:1 Mitigation Waterfowl Habitat Mitigation*; and (MM BR-2) *Waterfowl and Raptor Conservation Area*. A lawsuit was filed against the City by the Endangered Habitats League, Inc. and Sierra Club challenging the City's CEQA compliance, where a settlement agreement was reached upon and agreed by all parties.

The NMC Program Final EIR was prepared with the intent that later environmental analysis of individual development projects would be tiered from this document. If the City of Ontario concluded that no new effects would occur, or no new mitigation measures would be required, they could approve the project as being within the scope covered by the program EIR, and no new environmental document(s) would be required. However, the NMC Final EIR clarified that it was not meant to fully satisfy the environmental review requirements that would be necessary for each development within the various planning subareas and therefore, individual specific plans would be prepared with separate environmental documentation.

Due to state law requiring local jurisdictions to update their General Plans every 10 years, the City prepared The Ontario Plan (TOP) DEIR (SCH 2008101140) which was finalized in July 2009. The TOP DEIR included the following biological mitigation measures with details of the settlement agreement included: (MM-1) *Mitigation Fee* of $4,320 per acre on proposed developments within the annexed area; (MM-2) *On Site Land Conservation or Owl Relocation*; (MM-3) *Land Conservation* using all mitigation fees collected; and (MM-4) *Land Easements* for long-term conservation value to benefit wildlife. It was also determined in the TOP EIR that after the collection of the mitigation fees for the acquisition and management of habitat, implementation of the proposed TOP would not have substantial adverse impacts on sensitive animal species, including burrowing owls. In 2021, the City updated their general plan, and prepared the TOP 2050 SEIR, which was finalized in 2022. The TOP 2050 relies on the TOP EIR, and follows the same environmental analysis on whether individual Projects would require new mitigation or not, and that no adverse impacts to sensitive species would occur.

CDFW submitted a NOP comment letter to the City of Ontario, as the Lead Agency, on August 19, 2021, in response to the preparation of TOP 2050 SEIR. In this letter CDFW raised concerns regarding the potential biological impacts associated with the TOP 2050 EIR, including impacts to burrowing owls, cumulative impacts to biological resources, and the need for appropriate mitigation measures. The letter also included several maps highlighting documented burrowing owl observations in the region gathered from past project-related CEQA documents and biological reports. Despite

these comments, the Final EIR did not incorporate any new biological mitigation measures, consider the information provided, nor did it include CDFW's NOP letter in Appendix A, which contains NOPs and comment letters.

Since the adoption of the TOP 2050 in 2022, burrowing owl have now been designated by the Fish and Game Commission as a candidate endangered species, protected under CESA on October 2024 given their decline in California. The agricultural preserve/ Ontario Ranch community has a well-documented history of supporting breeding, wintering, foraging, and migration stopover habitat for resident and migratory burrowing owls. This area remains one of the last strongholds for significant burrowing owl populations within the Inland Empire. Pursuant to CEQA Guidelines §§ 15380, 15064, 15065, 21001(c), 21083, lead agencies are required to make mandatory findings of significance when a project is likely to impact threatened or endangered species, and avoidance or mitigation measures must be presented to reduce impacts to less than significant levels. Additionally, Crotch's bumble bee, another designated candidate endangered species protected under CESA, has known occurrences within the annexed area, with a CNDDB sighting located within the vicinity of the proposed Project, and would also require avoidance or mitigation measures presented to reduce impacts to less than significant levels.

On Page 4 of the Center Park Specific Plan NOP, it states: "*The City is processing this Project under a CEQA Guidelines Section 15183 Exemption, except for the issue of historic resources. The Project is consistent with The Ontario Plan Supplement Program EIR (TOP SEIR), and does not represent any new significant impact […]*". Due to the recent candidacy of several species under CESA that have a high potential of being found within the project area, and the inadequate analysis and assessment of potential Project impacts to said species in the original environmental review, the Center Park Specific Plan should not be exempt from evaluating and mitigating for potential significant impacts to biological resources.

CDFW recommends the City of Ontario amend and recirculate their TOP EIR to include CDFW's 2021 NOP letter and fully assess the potential impacts to burrowing owls, Crotch's bumble bee, nesting birds, and cumulative impacts to natural resources. Appropriate mitigation measures for each species must be identified and incorporated. Mitigation Measures in the TOP EIR should also be amended to eliminate any language referencing burrowing owl relocation. Any relocation activities would be considered a form of "take", as described under CESA, and would require authorization and Project impacts to be fully mitigated (Incidental Take Permit, ITP).

**Assessment of Biological Resources**

Section 15125(c) of the CEQA Guidelines states that knowledge of the regional setting of a project is critical to the assessment of environmental impacts and that special

emphasis should be placed on environmental resources that are rare or unique to the region. To enable CDFW staff to adequately review and comment on the project, the DEIR should include a complete assessment of the flora and fauna within and adjacent to the Project footprint, with particular emphasis on identifying rare, threatened, endangered, and other sensitive species and their associated habitats.

The CDFW recommends that the DEIR specifically include:

1. An assessment of the various habitat types located within the project footprint, and a map that identifies the location of each habitat type. CDFW recommends that floristic, alliance- and/or association-based mapping and assessment be completed following *The Manual of California Vegetation*, second edition[2]. Adjoining habitat areas should also be included in this assessment where site activities could lead to direct or indirect impacts offsite. Habitat mapping at the alliance level will help establish baseline vegetation conditions.

2. A general biological inventory of the fish, amphibian, reptile, bird, and mammal species that are present or have the potential to be present within each habitat type onsite and within adjacent areas that could be affected by the project. CDFW's California Natural Diversity Database (CNDDB) in Sacramento should be contacted at (916) 322-2493 or CNDDB@wildlife.ca.gov or https://wildlife.ca.gov/Data/CNDDB/Maps-and-Data to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code, in the vicinity of the proposed Project.

   Please note that CDFW's CNDDB is not exhaustive in terms of the data it houses, nor is it an absence database. CDFW recommends that it be used as a starting point in gathering information about the *potential presence* of species within the general area of the project site.

3. A complete, *recent* inventory of rare, threatened, endangered, and other sensitive species located within the Project footprint and within offsite areas with the potential to be affected, including California Species of Special Concern (CSSC) and California Fully Protected Species (Fish & G. Code, § 3511). Species to be addressed should include all those which meet the CEQA definition (CEQA Guidelines § 15380). The inventory should address seasonal variations in use of the Project area and should not be limited to resident species. Focused species-specific surveys, completed by a qualified biologist and conducted at the appropriate time of

[2] Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, 2nd ed. California Native Plant Society Press, Sacramento, California. http://vegetation.cnps.org/

year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with CDFW and the U.S. Fish and Wildlife Service, where necessary. Note that CDFW generally considers biological field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. Some aspects of the proposed Project may warrant periodic updated surveys for certain sensitive taxa, particularly if the Project is proposed to occur over a protracted time frame, or in phases, or if surveys are completed during periods of drought.

Species specific surveys for special status species that the Project footprint has the Potential to Support, including burrowing owl, Crotch's bumblebee, and tricolored blackbird.

Burrowing Owl (*Athene cunicularia*)

The Project site, as is expected for Annexed Area 163, has the potential to provide suitable foraging and/or nesting habitat for burrowing owl. According to CNDDB and eBird data, and data gathered from adjacent projects, burrowing owls have been observed on site and adjacent to the proposed Project.

On October 10, 2024, the Fish and Game Commission accepted a petition to list Western Burrowing Owl under CESA, determining the listing "may be warranted" and advancing the species to the candidacy stage of the CESA listing process (Fish & G. Code, § 2050 et seq.). During the candidacy period, western burrowing owl will be afforded the same protection as threatened and endangered species under CESA. If Project activities, including burrow exclusion and closure, could result in take, appropriate CESA authorization (i.e., Incidental Take Permit under Fish and Game Code section 2081) should be obtained prior to commencement of Project activities. Please reference the California Endangered Species Act section below for more guidance.

The City should be aware that burrowing owls may use an area for breeding, wintering, foraging, and/or migration stopovers. Because burrowing owls detected during nonbreeding season surveys may be year-round residents, young from the previous breeding season, pre-breeding territorial adults, winter residents, dispersing juveniles, migrants, and/or transients or new colonizers, burrowing owl seasonal residency status can be difficult to ascertain.

CDFW strongly encourages the City to follow the recommendations and guidelines provided in the *Staff Report on Burrowing Owl Mitigation* (Department of Fish and Game, March 2012); available for download from CDFW's website: https://www.wildlife.ca.gov/conservation/survey-protocols. The Staff Report on Burrowing Owl Mitigation, specifies three steps for project impact evaluations:

a. A habitat assessment;
b. Surveys; and
c. An impact assessment

As stated in the Staff Report on Burrowing Owl Mitigation, the three progressive steps are effective in evaluating whether a project will result in impacts to burrowing owls, and the information gained from the steps will inform any subsequent avoidance, minimization, and mitigation measures. Habitat assessments should be conducted to evaluate the likelihood that a site may be utilized by burrowing owls for different activities throughout the year, followed by both breeding and non-breeding burrowing owl surveys are highly recommended because they each provide necessary information to determine the potential effects of proposed projects and activities on wintering, resident, breeding, migratory and fledgling burrowing owls,, and to avoid take in accordance with Fish and Game Code sections 86, 3503, and 3503.5. Take is defined in Fish and Game Code section 86 as "hunt, pursue, catch, capture or kill, or attempt to hunt, pursue, catch, capture or kill." Impact assessments should determine the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed CEQA project activity or non-CEQA project. CDFW recommends that, at a minimum, the City should:

- Develop criteria for determining acceptable qualifications for individuals who perform burrowing owl habitat assessments, biological surveys, monitoring, and other relevant duties.
- Maintain a list of qualified biologists to cross reference when reviewing and approving CEQA documents.
- Require that project proponents submit survey data (e.g., survey reports, field notes, kmz or GIS files etc.) and survey protocol (survey methods, time, locations, and results) and ensure burrowing owl occurrences are entered into a database (e.g., California NaturalDiversity Database, CNDDB).

CDFW would like to remind the City, that the Ontario Regional Sports Complex EIR (SCH No. 2023110328), currently under construction, is located within two miles of the proposed Project site. The location of the Ontario Ranch Sports Complex site supported both wintering, year-round, and migratory burrowing owls, in addition to Crotch's bumble. Despite this documented presence, the City did not implement appropriate mitigation measures for burrowing owls. The City determined that

burrowing owls were not present on site based on a single non-breeding season survey, a conclusion CDFW expressed concern with. The City did not conduct burrowing owl focused surveys as specified in the 2012 Staff report, or the BOMP as stated and committed to in the adopted EIR.

Crotch's Bumble Bee

The project may impact suitable habitat for Crotch's bumble bee (*Bombus crotchii*), a CESA candidate species, and has the potential for take pursuant to California Fish and Game Code Section 2081(b). The Project could result in loss of suitable nesting and foraging habitat for Crotch's bumble bee. Project ground-disturbing activities may cause death or injury of adults, eggs, and larva; burrow collapse; nest abandonment; and reduced nest success. Crotch's bumble bee primarily nest in late February through late October underground in abandoned small mammal burrows but may also nest under perennial bunch grasses or thatched annual grasses, under-brush piles, in old bird nests, and in dead trees or hollow logs[3, 4] Overwintering sites utilized by Crotch's bumble bee mated queens include soft, disturbed soil[5] , or under leaf litter or other debris[6]. Ground disturbance and vegetation removal associated with Project implementation during the breeding season could result in the incidental loss of breeding success or otherwise lead to nest abandonment in areas adjacent to the Project site. Indirect, permanent impacts include conversion of habitat through the introduction of invasive species. Without sufficient avoidance, minimization, or mitigation measures, the Project activities may result in unmitigated temporal or permanent loss of colonies, and suitable nesting and foraging habitat.

The California Fish and Game Commission accepted a petition to list Crotch's bumble bee as endangered under CESA, determining the listing "may be warranted" and advancing the species to the candidacy stage of the CESA listing process. Crotch's bumble bee are granted protection as a threatened species under CESA. Take of any endangered, threatened, candidate species that results from the Project is prohibited, except as authorized by State law (Fish & G. Code, §§ 86, 2062, 2067, 2068, 2080, 2085; Cal. Code Regs., tit. 14, § 786.9). In addition, Crotch's bumble bee has a State ranking of S1/S2. This means that the Crotch's bumble bee is

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[3] Williams, P. H., R. W. Thorp, L. L. Richardson, and S.R. Colla. 2014. Bumble bees of North America: An Identification guide. Princeton University Press, Princeton, New Jersey. 208pp.
[4] Hatfield, R., Jepsen, S., Foltz Jordan, S., Blackburn, M., Code, Aimee. 2018. A Petition to the State of California Fish and Game Commission to List Four Species of Bumblebees as Endangered Species.
[5] Goulson, D. 2010. Bumblebees: Behavior, Ecology, and Conservation. Oxford University Press, New York. 317pp.
[6] California Department of Fish and Wildlife. 2017. California Terrestrial and Vernal Pool Invertebrates of Conservation Priority. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=148248&inline.

considered critically imperiled or imperiled and is extremely rare (often 5 or fewer populations). Crotch's bumble bee is listed as an invertebrate of conservation priority under the California Terrestrial and Vernal Pool Invertebrates of Conservation Priority.

Prior to any ground disturbance, CDFW recommends the Project conduct site specific surveys for Crotch's bumble bee in accordance with any Crotch's bumble bee survey protocol provided by CDFW (Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species). If "take" or adverse impacts to Crotch's bumble bee cannot be avoided either during Project activities or over the life of the Project, the Project should obtain appropriate take authorization from CDFW pursuant to Fish and Game Code section 2081 subdivision (b).

Bats

The Project site has the potential to provide suitable habitat for several bat species (collectively, bats) potentially roosting (day, night and maternal) and foraging habitat, which may include some Species of Special Concern (SSC) including but not limited to:

- pallid bat (*Antrozous pallidus*) (SSC)
- Townsend's big-eared bat (*Corynorhinus townsendii*) (SSC)
- western mastiff bat (*Eumops perotis*) (SSC)
- small-footed myotis (*Myotis ciliolabrum*) (SSC)
- Yuma myotis (Myotis *yumanensis*) (SSC)
- pocketed free-tailed bat (*Myctinopops ferosaccus*) (SSC)
- big free-tailed bat (*Nyctinomops macrotis*) (SSC)

Project construction and activities may result in direct and indirect impacts to bats. Direct impacts include removal of structures occupied by roosting bats. This could result in injury or mortality to bats as well as loss of roosting habitat. Indirect impacts to bats and roosts could result from increased noise disturbances, human activity, dust, vegetation clearing, ground-disturbing activities (e.g., staging, mobilizing, excavating, and grading), and vibrations caused by heavy equipment.

Bats are considered non-game mammals and are afforded protection by State law from take and/or harassment (Fish & G. Code, § 4150; Cal. Code of Regs, § 251.1). Several bat species are considered SSC.

The DEIR should include results of specific surveys for bats for the Project area proposed to be directly or indirectly affected by Project activities and the results of the surveys included in the DEIR, along with avoidance, minimization and mitigation measures, if appropriate. CDFW recommends if active hibernacula or day roosts are identified in the work area or within 500 feet of the work area, during pre-

construction surveys, they be avoided to the extent feasible. For maternity roosts, Project construction will only occur between October 1 and February 28, outside of the maternity roosting season when young bats are present but are yet ready to fly out of the roost (March 1 to September 30). Maternity roosts shall not be evicted, excluded, removed, or otherwise disturbed.

4. A thorough, recent, floristic-based assessment of special status plants and natural communities, following CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (see https://www.wildlife.ca.gov/Conservation/Plants).

5. Information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis on resources that are rare or unique to the region (CEQA Guidelines § 15125[c]).

6. A full accounting of all open space and mitigation/conservation lands within and adjacent to the Project.

**Analysis of Direct, Indirect, and Cumulative Impacts to Biological Resources**

The DEIR should provide a thorough discussion of the direct, indirect, and cumulative impacts expected to adversely affect biological resources as a result of the Project (including the plan's land use designations, policies and programs). To ensure that Project impacts to biological resources are fully analyzed, the following information should be included in the DEIR:

1. A discussion of potential impacts from lighting, noise, human activity (e.g., recreation), defensible space, and wildlife-human interactions created by zoning of development projects or other project activities adjacent to natural areas, exotic and/or invasive species, and drainage. The latter subject should address Project-related changes on drainage patterns and water quality within, upstream, and downstream of the Project site, including: volume, velocity, and frequency of existing and post-Project surface flows; polluted runoff; soil erosion and/or sedimentation in streams and water bodies; and post-Project fate of runoff from the Project site.

2. A discussion of potential indirect Project impacts on biological resources, including resources in areas adjacent to the project footprint, such as nearby public lands (e.g., National Forests, State Parks, etc.), open space, adjacent natural habitats, riparian ecosystems, wildlife corridors, and any designated and/or proposed reserve or mitigation lands (e.g., preserved lands associated with a Natural Community Conservation Plan, or other conserved lands).

Please note that the Project area supports significant biological resources and contains habitat connections, providing for wildlife movement across the broader landscape, sustaining both transitory and permanent wildlife populations. CDFW encourages project design that avoids and preserves onsite features that contribute to habitat connectivity. The DEIR should include a discussion of both direct and indirect impacts to wildlife movement and connectivity, including maintenance of wildlife corridor/movement areas to adjacent undisturbed habitats.

3. An evaluation of impacts to adjacent open space lands from both the construction of the Project and any long-term operational and maintenance needs.

4. A cumulative effects analysis developed as described under CEQA Guidelines section 15130. The DEIR should analyze the cumulative effects of the plan's land use designations, policies and programs on the environment. Please include all potential direct and indirect Project related impacts to riparian areas, wetlands, vernal pools, alluvial fan habitats, wildlife corridors or wildlife movement areas, aquatic habitats, sensitive species and other sensitive habitats, open lands, open space, and adjacent natural habitats in the cumulative effects analysis. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

**Alternatives Analysis**

CDFW recommends the DEIR describe and analyze a range of reasonable alternatives to the Project that are potentially feasible, would "feasibly attain most of the basic objectives of the Project," and would avoid or substantially lessen any of the Project's significant effects (CEQA Guidelines § 15126.6[a]). The alternatives analysis should also evaluate a "no project" alternative (CEQA Guidelines § 15126.6[e]). The No Project alternative should evaluate how the changing environment, such as climate change and drought, may affect the community if a new or revised general plan were not adopted.

**Mitigation Measures for Project Impacts to Biological Resources**

The DEIR should identify mitigation measures and alternatives that are appropriate and adequate to avoid or minimize potential impacts, to the extent feasible. The City of Ontario should assess all direct, indirect, and cumulative impacts that are expected to occur as a result of the implementation of the Project and its long-term operation and maintenance. When proposing measures to avoid, minimize, or mitigate impacts, CDFW recommends consideration of the following:

1. *Fully Protected Species*: Fully protected species may not be taken or possessed at any time. Project activities described in the DEIR should generally be designed to completely avoid any fully protected species that have the potential to be present within or adjacent to the Project area. CDFW also recommends that the DEIR fully

analyze potential adverse impacts to fully protected species due to habitat modification, loss of foraging habitat, and/or interruption of migratory and breeding behaviors. CDFW recommends that the City of Ontario include in the analysis how appropriate avoidance, minimization, and mitigation measures will reduce indirect impacts to fully protected species.

2. *Sensitive Plant Communities*: CDFW considers sensitive plant communities to be imperiled habitats having both local and regional significance. Plant communities, alliances, and associations with a statewide ranking of S-1, S-2, S-3, and S-4 should be considered sensitive and declining at the local and regional level. These ranks can be obtained by querying the CNDDB and are included in *The Manual of California Vegetation* (Sawyer et al. 2009). The DEIR should include measures to fully avoid and otherwise protect sensitive plant communities from project-related direct and indirect impacts.

3. *California Species of Special Concern* (SSC): As previously stated, California SSC status applies to animals generally not listed under the federal Endangered Species Act or the CESA, but which nonetheless are declining at a rate that could result in listing, or historically occurred in low numbers and known threats to their persistence currently exist. SSCs should be considered during the environmental review process. SSCs have the potential or have been documented to occur within ot adjacent to the Project area, including but not limited to: XXX (*XX*).

4. *Mitigation*: CDFW considers adverse project-related impacts to sensitive species and habitats to be significant to both local and regional ecosystems, and the DEIR should include mitigation measures for adverse project-related impacts to these resources. Mitigation measures should emphasize avoidance and reduction of project impacts. For unavoidable impacts, onsite habitat restoration and/or enhancement, and preservation should be evaluated and discussed in detail. Where habitat preservation is not available onsite, offsite land acquisition, management, and preservation should be evaluated and discussed in detail.

   The DEIR should include measures to perpetually protect the targeted habitat values within mitigation areas from direct and indirect adverse impacts in order to meet mitigation objectives to offset project-induced qualitative and quantitative losses of biological values. Specific issues that should be addressed include restrictions on access, proposed land dedications, long-term monitoring and management programs, control of illegal dumping, water pollution, increased human intrusion, etc.

   If sensitive species and/or their habitat may be impacted from the Project, CDFW recommends the inclusion of specific mitigation in the DEIR. CEQA Guidelines section 15126.4, subdivision (a)(1)(8) states that formulation of feasible mitigation measures should not be deferred until some future date. The Court of Appeal in *San*

*Joaquin Raptor Rescue Center* v. *County* of *Merced* (2007) 149 Cal.App.4th 645 struck down mitigation measures which required formulating management plans developed in consultation with State and Federal wildlife agencies after Project approval. Courts have also repeatedly not supported conclusions that impacts are mitigable when essential studies, and therefore impact assessments, are incomplete *(Sundstrom* v. *County* of *Mendocino* (1988) 202 Cal. App. 3d. 296; *Gentry* v. *City* of *Murrieta (1995)* 36 Cal. App. 4th 1359; *Endangered Habitat League, Inc.* v. *County* of *Orange* (2005) 131 Cal. App. 4th 777).

CDFW recommends that the DEIR specify mitigation that is roughly proportional to the level of impacts, in accordance with the provisions of CEQA (CEQA Guidelines, §§ 15126.4(a)(4)(B), 15064, 15065, and 16355). The mitigation should provide long-term conservation value for the suite of species and habitat being impacted by the Project. Furthermore, in order for mitigation measures to be effective, they need to be specific, enforceable, and feasible actions that will improve environmental conditions.

5. *Habitat Revegetation/Restoration Plans*: Plans for restoration and revegetation should be prepared by persons with expertise in southern California ecosystems and native plant restoration techniques. Plans should identify the assumptions used to develop the proposed restoration strategy. Each plan should include, at a minimum: (a) the location of restoration sites and assessment of appropriate reference sites; (b) the plant species to be used, sources of local propagules, container sizes, and seeding rates; (c) a schematic depicting the mitigation area; (d) a local seed and cuttings and planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity. Monitoring of restoration areas should extend across a sufficient time frame to ensure that the new habitat is established, self-sustaining, and capable of surviving drought.

   CDFW recommends that local onsite propagules from the Project area and nearby vicinity be collected and used for restoration purposes. Onsite seed collection should be initiated in advance of project impacts in order to accumulate sufficient propagule material for subsequent use in future years. Onsite vegetation mapping at the alliance and/or association level should be used to develop appropriate restoration goals and local plant palettes. Reference areas should be identified to help guide restoration efforts. Specific restoration plans should be developed for various project components as appropriate.

   Restoration objectives should include protecting special habitat elements or re-creating them in areas affected by the Project; examples could include retention of

woody material, logs, snags, rocks, and brush piles.

6. *Nesting Birds and Migratory Bird Treaty Act:* Please note that it is the Project proponent's responsibility to comply with all applicable laws related to nesting birds and birds of prey. Fish and Game Code sections 3503, 3503.5, and 3513 afford protective measures as follows: Fish and Game Code section 3503 makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by Fish and Game Code or any regulation made pursuant thereto. Fish and Game Code section 3503.5 makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by Fish and Game Code or any regulation adopted pursuant thereto. Fish and Game Code section 3513 makes it unlawful to take or possess any migratory nongame bird except as provided by the rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. § 703 et seq.).

   CDFW recommends that the DEIR includes the results of avian surveys, as well as specific avoidance and minimization measures to ensure that impacts to nesting birds do not occur. Project-specific avoidance and minimization measures may include, but not be limited to: project phasing and timing (e.g., conducting work outside the peak nesting season), monitoring of project-related noise (where applicable), sound walls, and buffers, where appropriate. The DEIR should also include specific avoidance and minimization measures that will be implemented should a nest be located within the project site. If pre-construction surveys are proposed in the DEIR, the CDFW recommends that they be required no more than three (3) days prior to vegetation clearing or ground disturbance activities, as instances of nesting could be missed if surveys are conducted sooner. CDFW recommends that disturbance of occupied nests of migratory birds and raptors within the Project site and surrounding area be avoided any time birds are nesting on-site. CDFW therefore recommends the completion of nesting bird surveys *regardless of the time of year* to ensure compliance with all applicable laws pertaining to nesting and migratory birds.

7. *Moving out of Harm's Way:* To avoid direct mortality to any non-listed terrestrial wildlife, CDFW recommends that the lead agency condition the DEIR to require that a CDFW-approved qualified biologist be retained to be onsite prior to and during all ground- and habitat-disturbing activities to inspect the Project area prior to any Project activities. Any individuals found shall not be harassed and shall be allowed to leave the Project area unharmed. If needed, a qualified biologist may guide, handle, or capture an individual non-listed, non-fully protected wildlife species to move it to a nearby safe location within nearby refugium, or it shall be allowed to leave the Project site of its own volition. Movement of wildlife out of harm's way should be

limited to only those individuals that would otherwise by injured or killed, and individuals should be moved only as far a necessary to ensure their safety (i.e., CDFW does not recommend relocation to other areas). Only biologists with appropriate authorization by CDFW shall move CESA-listed species. Furthermore, it should be noted that the temporary relocation of onsite wildlife does not constitute effective mitigation for the purposes of offsetting Project impacts associated with habitat loss.

8. *Translocation of Species*: CDFW generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species as studies have shown that these efforts are experimental in nature and largely unsuccessful.

**California Endangered Species Act**

CDFW is responsible for ensuring appropriate conservation of fish and wildlife resources including threatened, endangered, and/or candidate plant and animal species, pursuant to CESA. CDFW recommends that a CESA Incidental Take Permit (ITP) be obtained if the Project has the potential to result in "take" (California Fish and Game Code Section 86 defines "take" as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") of State-listed CESA species, either through construction or over the life of the project. It is the policy of CESA to conserve, protect, enhance, and restore State-listed CESA species and their habitats.

CDFW encourages early consultation, as significant modification to the proposed Project and avoidance, minimization, and mitigation measures may be necessary to obtain a CESA ITP. CDFW must comply with CEQA in order to issue a CESA ITP. CDFW therefore recommends that the DEIR addresses all Project impacts to listed species and specify a mitigation monitoring and reporting program that will meet the requirements of CESA.

Based on review of CNDDB and Biogeographic Information and Observation System (BIOS), and/or knowledge of the project site/vicinity/general area, CDFW is aware that the following CESA-listed species have the potential to occur onsite/have previously been reported onsite: western burrowing owl (*Athene cunicularia*), and Crotch's bumble bee (*Bombus crotchii*).

The DEIR should disclose the potential of the Project to take State-listed species and how the impacts will be avoided, minimized, and mitigated. Please note that mitigation measures that are adequate to reduce impacts to a less-than significant level to meet CEQA mitigation requirements may not be sufficient for "full mitigation" under CESA. To facilitate the issuance of an ITP, if applicable, CDFW recommends the DEIR include measures to minimize and fully mitigate the impacts to any State-listed species the Project has potential to take.

## ADDITIONAL COMMENTS AND RECOMMENDATIONS

### Landscaping

To ameliorate the water demands of this Project, CDFW recommends incorporation of water-wise concepts in any Project landscape design plans. In particular, CDFW recommends xeriscaping with locally native California species and installing water-efficient and targeted irrigation systems (such as drip irrigation). Native plants support butterflies, birds, reptiles, amphibians, small mammals, bees, and other pollinators that evolved with those plants, more information on native plants suitable for the Project location and nearby nurseries is available at CALSCAPE: https://calscape.org/. Local water agencies/districts and resource conservation districts in your area may be able to provide information on plant nurseries that carry locally native species, and some facilities display drought-tolerant locally native species demonstration gardens. Information on drought-tolerant landscaping and water-efficient irrigation systems is available on California's Save our Water website: https://saveourwater.com/.

### Construction Noise

Project-related construction has the potential to generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project. CDFW recommends that the DEIR include an analysis of impacts to wildlife from Project related construction noise, and appropriate avoidance, minimization, and mitigation measures that will reduce impacts to less than significant. Construction may result in substantial noise through road use, equipment, and other Project-related activities. This may adversely affect wildlife species in several ways as wildlife responses to noise can occur at exposure levels of only 55 to 60 dB[7]. Anthropogenic noise can disrupt the communication of many wildlife species including frogs, birds, and bats[8,9,10,11]. Noise can also affect predator-prey relationships as many nocturnal animals such as bats and owls primarily use auditory cures (i.e., hearing) to hunt. Additionally, many prey species increase their vigilance behavior when exposed to noise because they need to rely

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[7] Barber, J. R., K. R. Crooks, and K. M. Fristrup. 2009. The costs of chronic noise exposure for terrestrial organisms. Trends in Ecology and Evolution 25:180-189

[8] Sun, J. W. C., and P. M. Narins. 2005. Anthropogenic sounds differentially affect amphibian call rate. Biological Conservation 121:419–427

[9] Patricelli, G., and J. J. L. Blickley. 2006. Avian communication in urban noise: causes and consequences of vocal adjustment. Auk 123:639– 649

[10] Gillam, E. H., and G. F. McCracken. 2007. Variability in the echolocation of Tadarida brasiliensis: effects of geography and local acoustic environment. Animal Behaviour 74:277–286

[11] Slabbekoorn, H., and E. A. P. Ripmeester. 2008. Birdsong and anthropogenic noise: Implications and applications for conservation. Molecular Ecology 17:72–83

more on visual detection of predators when auditory cues may be masked by noise[12,13]. Noise has also been shown to reduce the density of nesting birds[14] and cause increased stress that results in decreased immune responses[15]. The City should include measures in the DEIR to ensure the following: restricting the use of equipment to hours least likely to disrupt wildlife (e.g., not at night or in early morning); restricting the use of generators except for temporary use in emergencies; provide power to sites by solar PV (photovoltaic) systems, cogeneration systems (natural gas generator), small micro-hydroelectric systems, or small wind turbine systems; ensure the use of noise suppression devices such as mufflers or enclosure for generators; and sounds generated from any means must be below the 55-60 dB range within 50-feet from the source.

**Artificial Nighttime Lighting**

The Project will introduce new sources of artificial lighting. CDFW recommends that the DEIR include lighting design specifications for all artificial nighttime lighting that will be used by the Project, an analysis of the direct and indirect impacts of artificial nighttime lighting on biological resources, and appropriate avoidance, minimization, and mitigation measures that will reduce impacts to less than significant. The direct and indirect impacts of artificial nighttime lighting on biological resources including migratory birds that fly at night, bats, and other nocturnal and crepuscular wildlife should be analyzed, and appropriate avoidance and minimization measures should be included in the DEIR.

Artificial nighttime lighting often results in light pollution, which has the potential to significantly and adversely affect fish and wildlife. Artificial lighting alters ecological processes including, but not limited to, the temporal niches of species; the repair and recovery of physiological function; the measurement of time through interference with the detection of circadian and lunar and seasonal cycles; the detection of resources and natural enemies; and navigation[16]. Many species use photoperiod cues for communication (e.g., bird song[17]), determining when to begin foraging[18], behavioral

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[12] Rabin, L. A., R. G. Coss, and D. H. Owings. 2006. The effects of wind turbines on antipredator behavior in California ground squirrels (Spermophilus beecheyi). Biological Conservation 131:410–420.
[13] Quinn, J. L., M. J. Whittingham, S. J. Butler, W. Cresswell, J. L. Quinn, M. J. Whittingham, S. J. Butler, W. Cresswell, and W. Noise. 2017. Noise, predation risk compensation and vigilance in the chaffinch Fringilla coelebs. Journal of Avian Biology 37:601–608
[14] Francis, C. D., C. P. Ortega, and A. Cruz. 2009. Noise pollution changes avian communities and species interactions. Current Biology 19:1415–1419
[15] Kight, C. R., and J. P. Swaddle. 2011. How and why environmental noise impacts animals: An integrative, mechanistic review. Ecology Letters 14:1052–1061
[16] Gatson, K. J., Bennie, J., Davies, T., Hopkins, J. 2013. The ecological impacts of nighttime light pollution: a mechanistic appraisal. Biological Reviews, 88.4: 912-927.
[17] Miller, M. W. Apparent effects of light pollution on singing behavior of American robins. The Condor 108:130–139.
[18] Stone, 15 Stone, E. L., G. Jones, and S. Harris. 2009. Street lighting disturbs commuting bats. Current Biology 19:1123– 1127.

thermoregulation[19], and migration[20]. Phototaxis, a phenomenon that results in attraction and movement towards light, can disorient, entrap, and temporarily blind wildlife species that experience it. The City of Ontario should include measures in the DEIR to ensure the following: eliminate all nonessential lighting throughout the Project area; avoid or limit the use of artificial light during the hours of dawn and dusk when many wildlife species are most active; lighting for Project activities is fully shielded, cast downward, reduced in intensity to the greatest extent, and does not result in spill over onto other properties or upward into the night sky (see the International Dark-Sky Association standards at http://darksky.org; the use of LED lighting with a correlated color temperature of 3,000 Kelvins or less; proper disposal of hazardous waste; and recycling of lighting that contains toxic compounds with a qualified recycler.

## ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). Information can be submitted online or via completion of the CNDDB field survey form at the following link: https://wildlife.ca.gov/Data/CNDDB/Submitting-Data. The types of information reported to CNDDB can be found at the following link: https://wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

## FILING FEES

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.).

## CONCLUSION

CDFW appreciates the opportunity to comment on the NOP of a DFEIR for the Center Park Specific Plan (SCH No. 2025060731) and recommends that the City of Ontario address CDFW's comments and concerns in the forthcoming DFEIR.

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[19] Beiswenger, R. E. 1977. Diet patterns of aggregative behavior in tadpoles of *Bufo americanus*, in relation to light and temperature. Ecology 58:98–108.
[20] Longcore, T., and C. Rich. 2004. Ecological light pollution - Review. Frontiers in Ecology and the Environment 2:191–198

Questions regarding this letter or further coordination should be directed to Lisa Cardoso, Environmental Scientist, at Lisa.Cardoso@Wildlife.ca.gov or (805) 712-0346.

Sincerely,

Signed by:
Eric Chan
3AF6494545AD4A4...

Eric Kawamura-Chan
Senior Environmental Scientist, Supervisor

ec: Office of Planning and Research, State Clearinghouse, Sacramento
state.clearinghouse@opr.ca.gov

Attachment 1: Notice of Preparation of a Draft Supplemental Environmental Impact Report, Ontario Plan (TOP) 2050 Project, State Clearinghouse No. 2021070364

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Inland Deserts Region
3602 Inland Empire Boulevard, Suite C-220
Ontario, CA 91764
www.wildlife.ca.gov

***GAVIN NEWSOM, Governor***
***CHARLTON H. BONHAM, Director***

Governor's Office of Planning & Research
August 19 2021
STATE CLEARINGHOUSE

August 19, 2021
*Sent via email and US Mail*

Mr. Thomas Grahn
Senior Planner
City of Ontario
303 East B Street
Ontario, CA 91764

Subject: Notice of Preparation of a Draft Supplemental Environmental Impact Report
Ontario Plan (TOP) 2050 Project
State Clearinghouse No. 2021070364

Dear Mr. Grahn:

The California Department of Fish and Wildlife (CDFW) received a Notice of Preparation (NOP) of a Draft Supplemental Environmental Impact Report (SEIR) from the City of Ontario (City) for the Ontario Plan (TOP) 2050 Project (Project) pursuant the California Environmental Quality Act (CEQA) and CEQA Guidelines.[1]

Thank you for the opportunity to provide comments and recommendations regarding those activities involved in the Project that may affect California fish and wildlife. Likewise, we appreciate the opportunity to provide comments regarding those aspects of the Project that CDFW, by law, may be required to carry out or approve through the exercise of its own regulatory authority under the Fish and Game Code.

**CDFW ROLE**

CDFW is California's Trustee Agency for fish and wildlife resources, and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a).) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW is charged by law to provide, as available, biological expertise during public

1 CEQA is codified in the California Public Resources Code in section 21000 et seq. The "CEQA Guidelines" are found in Title 14 of the California Code of Regulations, commencing with section 15000.

agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW is also submitting comments as a Responsible Agency under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) CDFW expects that it may need to exercise regulatory authority as provided by the Fish and Game Code. As proposed, for example, the Project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the Project as proposed may result in "take" as defined by State law of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), the Project proponent may seek related take authorization as provided by the Fish and Game Code.

**PROJECT DESCRIPTION SUMMARY**

The Project is an update to the TOP to guide the City's development and conservation for the next 30 years through 2050. The proposed project is a focused effort, with particular emphasis on conducting technical refinements to the Policy Plan to comply with state housing mandates; conform with new state laws related to community health, environmental justice, climate adaption, resiliency, and mobility; bring long-term growth and fiscal projections into alignment with current economic conditions; and advance the Tracking and Feedback system and Implementation Plan.

Consistent with§ 15168 and§ 15163 of the CEQA Guidelines, the City will prepare a SEIR to address program-level environmental impacts associated with amendments to the City's previous TOP, which was adopted pursuant to the Final Ontario Plan Environmental Impact Report (Ontario Plan EIR) prepared in July 2009 (SCH 2008101140) and certified in January 2010. The proposed project is an update to the City's long-term plan of policies that will guide future development activities and City actions (TOP 2050). No specific development projects are proposed as part of this TOP 2050. However, the program-level SEIR can serve to streamline environmental review of future projects.

**COMMENTS AND RECOMMENDATIONS**

CDFW offers the comments and recommendations below to assist the City in adequately identifying and/or mitigating the Project's significant, or potentially significant, direct and indirect impacts on fish and wildlife (biological) resources. CDFW recognizes that a supplement to an EIR only needs to contain the information necessary to make the previous EIR adequate for the revised project. *(S*tate CEQA Guidelines § 15163(b)) and that the SEIR need not be as detailed as CEQA documents prepared for specific projects that may follow (CEQA Guidelines § 15146). CDFW also recognizes that the level of detail should be reflective of the level contained in the SEIR or SEIR element being considered (Rio Vista Farm Bureau Center v. County of Solano (1992) 5

Cal.App.4th 351). However, please note that the City cannot defer the analysis of significant effects of the SEIR to later-tiered CEQA documents (Stanislaus Natural Heritage Project v. County of Stanislaus (1996) 48 Cal.App.4th 182).

CDFW recommends that the forthcoming SEIR address the following:

**Assessment of Biological Resources**

Section 15125(c) of the CEQA Guidelines states that knowledge of the regional setting of a project is critical to the assessment of environmental impacts and that special emphasis should be placed on environmental resources that are rare or unique to the region. To enable CDFW staff to adequately review and comment on the project, the SEIR should include a complete assessment of the flora and fauna within and adjacent to the Project footprint, with particular emphasis on identifying rare, threatened, endangered, and other sensitive species and their associated habitats.

The CDFW recommends that the SEIR specifically include:

1. An assessment of the various habitat types located within the project footprint, and a map that identifies the location of each habitat type. CDFW recommends that floristic, alliance- and/or association-based mapping and assessment be completed following *The Manual of California Vegetation*, second edition (Sawyer et al. 2009). Adjoining habitat areas should also be included in this assessment where site activities could lead to direct or indirect impacts offsite. Habitat mapping at the alliance level will help establish baseline vegetation conditions.

2. A general biological inventory of the fish, amphibian, reptile, bird, and mammal species that are present or have the potential to be present within each habitat type onsite and within adjacent areas that could be affected by the project. CDFW's California Natural Diversity Database (CNDDB) in Sacramento should be contacted at (916) 322-2493 or CNDDB@wildlife.ca.gov to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code, in the vicinity of the proposed Project.

   Please note that CDFW's CNDDB is not exhaustive in terms of the data it houses, nor is it an absence database. CDFW recommends that it be used as a starting point in gathering information about the *potential presence* of species within the general area of the project site.

3. A complete, *recent* inventory of rare, threatened, endangered, and other sensitive species located within the Project footprint and within offsite areas with the potential to be affected, including California Species of Special Concern (CSSC) and California Fully Protected Species (Fish and Game Code § 3511). Species to be

addressed should include all those which meet the CEQA definition (CEQA Guidelines § 15380). The inventory should address seasonal variations in use of the Project area and should not be limited to resident species. Focused species-specific surveys, completed by a qualified biologist and conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with CDFW and the U.S. Fish and Wildlife Service, where necessary. Note that CDFW generally considers biological field assessments for wildlife to be valid for a one-year period, and assessments for rare plants may be considered valid for a period of up to three years. Some aspects of the proposed Project may warrant periodic updated surveys for certain sensitive taxa, particularly if the Project is proposed to occur over a protracted time frame, or in phases, or if surveys are completed during periods of drought.

Burrowing Owl

The Chino Agricultural Preserve (herein referred to as the Dairy Preserve) was 17,000 acres of dairy and agriculture that encompassed portions of the Cities of Chino and Ontario. In 1999, the City annexed nearly 8,200 acres, which was the catalyst for a dramatic increase in population growth. The City prepared a large master planned community, formerly known as the New Model Colony (NMC) and is currently referred to as the Ontario Ranch, that spans commercial and residential development over a 20-year period. Simarily, the City of Chino annexed the remaining portion of the Dairy Preserve, approximately 6,245 acres, into the City of Chino's Sphere of Influence where it was partitioned into a western and eastern section. The western part, the Chino College Park, or Subarea 1, consists of 1,810 acres; whereas the eastern portion, Subarea 2, or what is now known as ‘the Preserve’, includes approximately 5,435 acres (8.15 square miles). Of the 5,435 acres, 2,779 acres of the Preserve lies within the inundation area created by the raising of Prado Dam.

Burrowing owls (*Athene cunicularia*) have been detected throughout the Dairy Preserve and surrounding area (refer to Exhibit 1). CDFW strongly encourages the City to follow the recommendations and guidelines provided in the Staff Report on Burrowing Owl Mitigation (Department of Fish and Game, March 2012); available for download from CDFW’s website: https://www.wildlife.ca.gov/conservation/survey-protocols**.** The Staff Report specifies three steps for project evaluations: a habitat assessment, surveys, and an impact assessment. The three progressive steps are effective in evaluating whether a project will result in impacts to burrowing owls, and the information gained from the steps will inform any subsequent avoidance, minimization, and mitigation measures.

The City should be aware that burrowing owls may use an area for breeding, wintering, foraging, and/or migration stopovers. Because burrowing owls detected during non-breeding season surveys may be year-round residents, young from the previous

breeding season, pre-breeding territorial adults, winter residents, dispersing juveniles, migrants, and/or transients or new colonizers, burrowing owl seasonal residency status can be difficult to ascertain. Habitat assessments should be conducted to evaluate the likelihood that a site may be utilized by burrowing owls for different activities throughout the year, followed by surveys that provide the information needed to determine the potential effects of proposed projects and activities on burrowing owls, and to avoid take in accordance with Fish and Game Code sections 86, 3503, and 3503.5.

Impact assessments should determine the extent to which burrowing owls and their habitat may be impacted, directly or indirectly, on and within a reasonable distance of a proposed Project. To adequately assess project impacts to burrowing owls and determine appropriate mitigation to offset those affects, CDFW recommends that, at a minimum, the City should:

- Develop criteria for determining acceptable qualifications for individuals who perform burrowing owl habitat assessments, biological surveys, monitoring, and other relevant duties.
- Maintain a list of qualified biologists to cross reference when reviewing and approving CEQA documents.
- Require that project proponents submit data (e.g., survey reports, field notes, etc.) and survey locations and results (e.g. GIS and kmz shape files) and ensure burrowing owl occurrences are entered into a database (e.g., California Natural Diversity Database, CNDDB).

**Analysis of Direct, Indirect, and Cumulative Impacts to Biological Resources**

The SEIR should provide a thorough discussion of the direct, indirect, and cumulative impacts expected to adversely affect biological resources as a result of the Project (including the plan's land use designations, policies and programs). To ensure that Project impacts to biological resources are fully analyzed, the following information should be included in the SEIR:

1. A discussion of potential impacts from lighting, noise, human activity (e.g., recreation), defensible space, and wildlife-human interactions created by zoning of development projects or other project activities adjacent to natural areas, exotic and/or invasive species, and drainage. The latter subject should address Project-related changes on drainage patterns and water quality within, upstream, and downstream of the Project site, including volume, velocity, and frequency of existing and post-Project surface flows; polluted runoff; soil erosion and/or sedimentation in streams and water bodies; and post-Project fate of runoff from the Project site.

   With respect to defensible space: please ensure that the SEIR fully describes and identifies the location, acreage, and composition of defensible space *within* the

proposed Project footprint. Please ensure that any graphics and descriptions of defensible space associated with this project comply with the appropriate agency, (e.g., San Bernardino County Fire, Cal Fire) regulations/ requirements. The City, through its planning processes, should be ensuring that defensible space is provided and accounted for *within proposed development areas*, and not transferred to adjacent open space or conservations lands. CDFW requests that the SEIR clearly identify: (1) if lands are being proposed as mitigation to offset impacts associated with the project; and (2) if these lands are also proposed to serve as defensible space. Please note that lands proposed to be managed for defensible space purposes will have lower conservation resource value as they require in-perpetuity vegetation management.

2. A discussion of potential indirect Project impacts on biological resources, including resources in areas adjacent to the project footprint, such as nearby public lands (e.g. National Forests, State Parks, etc.), open space, adjacent natural habitats, riparian ecosystems, wildlife corridors, and any designated and/or proposed reserve or mitigation lands (e.g., preserved lands associated with a Natural Community Conservation Plan, or other conserved lands).

   Please note that the Project area supports significant biological resources and contains habitat connections, providing for wildlife movement across the broader landscape, sustaining both transitory and permanent wildlife populations. CDFW encourages project design that avoids and preserves onsite features that contribute to habitat connectivity. The SEIR should include a discussion of both direct and indirect impacts to wildlife movement and connectivity, including maintenance of wildlife corridor/movement areas to adjacent undisturbed habitats.

3. An evaluation of impacts to adjacent open space lands from both the construction of the Project and any long-term operational and maintenance needs.

4. A cumulative effects analysis developed as described under CEQA Guidelines section 15130. The SEIR should analyze the cumulative effects of the plan's land use designations, policies and programs on the environment. Please include all potential direct and indirect Project related impacts to riparian areas, wetlands, vernal pools, alluvial fan habitats, wildlife corridors or wildlife movement areas, aquatic habitats, sensitive species and other sensitive habitats, open lands, open space, and adjacent natural habitats in the cumulative effects analysis. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

Burrowing Owl and Raptor Habitat

The City Council approved a General Plan Amendment and associated Final EIR for the Sphere of Influence for the NMC in January 1998 (termed 'NMC Final EIR'). Before mitigation, the NMC Final EIR determined that significant impacts would occur to waterfowl and waterfowl habitat; raptors and raptor habitat; and the Delhi Sands Flower-Loving Fly Ontario Recovery Unit. The mitigation measures to reduce impacts to less than significance included:

*EIR Mitigation Measure BR-1 – 2:1 Mitigation Waterfowl Habitat Mitigation:* Modify the General Plan to require the creation of new waterfowl habitat and specified a mitigation ratio of 2:1 for each acre of such habitat lost. This is off-site mitigation in the Prado Basin.

*EIR Mitigation Measure BR-2 – Waterfowl and Raptor Conservation Area:* The City shall create a Waterfowl and Raptor Conservation Area (WRCA) off-site in the Prado Basin.

Subsequent to the adoption of the NMC Final EIR, a lawsuit was filed against the City by the Endangered Habitats League, Inc. (EHL) and Sierra Club challenging the City's CEQA compliance and approval of the General Plan Amendment. A settlement agreement was reached and agreed to by all parties that set forth revised mitigation measures for potential impacts in the NMC (referred to as Annexation Area 163). Because state law requires that local jurisdictions update their General Plans every 10 years, measures from the settlement agreement were detailed within the Ontario Plan DEIR (Section 5 *Environmental Analysis*) that included:

*DEIR Mitigation Measure 1- Mitigation Fees:* Prior to issuance of grading permits, the City shall impose a $4,320 per acre Mitigation Fee on proposed developments in Annexation Area 163 that require discretionary approval or permitting from the City.

*DEIR Mitigation Measure 2 – On Site Land Conservation or Owl Relocation:* The City, in consultation with CDFW, will identify through CEQA review, lands occupied by burrowing owl and suitable as long-term habitat. The City will require avoidance of those lands to maintain a viable territory and require long-term maintenance through dedication in fee or grant of easement to the Land Trust. If the site is not viable long-term habitat, the developer shall pay the mitigation fee and make provisions for relocation of the owls.

*DEIR Mitigation Measure 3 – Land Conservation:* All mitigation fees collected shall be used for the above-described purposes and may be used to purchase property, conservation easements, or other land with long-term conservation value for the environmental impacts; enhance/restore lands with such values; maintain and

operates these lands; and pay for related administrative costs (not to exceed 10 percent of the total fees).

*DEIR Mitigation Measure 4 - Land Easements:* Land/easements dedicated, conveyed, or purchased to benefit wildlife, waterfowl, raptors/and or burrowing owl must have long-term conservation value for those species and must be managed by the Land Trust. The parcels must be located within the Habitat Area designated as part of the settlement agreement. Unacceptable properties are those that would otherwise by purchased by another entity or group as open space mitigation for environmental impacts.

According to the Ontario Plan DEIR (Chapter 6 *Significant Unavoidable Adverse Impacts*), because buildout of the Ontario Plan will "*convert 3,269 acres of California Resource Agency designated Prime Farmland, Unique Farmland, and Farmland of Statewide Importance to residential, commercial, mixed-use, and industrial land uses, it was determined that impacts to agricultural resources would remain significant, unavoidable, and adverse even after mitigation measures have been applied*". Conversely, it was determined that "*after the collection of the mitigation fees for the acquisition and management of habitat, implementation of the proposed Ontario Plan would not have substantial adverse impacts on sensitive animal species, including the burrowing owl"*. The City prepared the NMC Final EIR with the intent that later environmental analysis of individual development projects would be tiered from this document. To accomplish this, feasible mitigation measures and alternatives developed in the NMC Final EIR needed to be implemented. When the City concluded that no new effects would occur, or no new mitigation measures would be required, the project was approved as being within the scope covered by the NMC Final EIR.

CDFW has reviewed many of the project-specific CEQA documents and accompanying biological reports, as well as, mapped known burrowing owl occurrences compiled from accessible databases (CNDDB, EBird). A comprehensive table (refer to Table 1) and a corresponding color-coded reference illustration were prepared (Exhibit 2) and have been provided by CDFW in past CEQA comments to the City. CDFW continues to maintain that the burrowing owl and raptor foraging habitat has, and continues to be, removed throughout the City and the surrounding area. CDFW strongly encourages the City to include any new substantial information that was not known at the time the previous Ontario Plan EIR was certified into the SEIR so that when it is reviewing future projects as a lead agency, it can rely on a more robust analysis to fully satisfy the necessary environmental review requirements.

Current scientific literature supports the conclusion that mitigation for burrowing owl habitat loss necessitates replacement with an equivalent or greater habitat area for breeding, foraging, wintering, and dispersal. For mitigation measures to be effective, they must be specific, enforceable, and feasible actions that will improve environmental

conditions (e.g., presence of burrows, burrow surrogates, presence of fossorial mammal dens, and abundant and available prey within close proximity to the burrow). CDFW is unclear of the details and implementation status of many of the mitigation measures that pertain to the NMC Final Program EIR, Ontario Plan DEIR, or any subsequent CEQA documents from individual development projects that tiered from these documents (refer to Table 2). Specifically, the SEIR should identify past cumulative impacts that have occurred, past mitigation commitments and what conservation measures, if any, have been/are being conducted, and future opportunities not only within the City (see #1-3 below), but the adjacent lands (#4), including, but not limited to, the following:

1) *NMC/Ontario Ranch* - The Rivers and Land Conservancy (RLC) prepared a report in 2008 that identified strategies and opportunities for habitat protection and restoration within the NMC, with a portion of the mitigation fees being identified to benefit "*the burrowing owl, restore wetlands, and provide connections between the Prado Basin and Chino Hills State Park*". Following consultation with EHL and the Sierra Club, on March 16, 2010, the City Council chose RLC as the land trust. The SEIR should clearly describe where the conservation areas are located, how they have been secured, how they are functioning as habitat for owls, and how accounting records of mitigation money collected and spent are tracked.

2) *Milliken Landfill* - Within the Ontario Plan EIR, the City identified a number of Interest Areas, or prospective mitigation lands, with parts of the closed Milliken Waste Disposal Site being considered for preservation or enhancement to offset loss of burrowing owl habitat. In 2005, 16 adult burrowing owls were observed, with seven breeding pairs of burrowing owls being identified (Tom Dobson 2005). In 2006, three pairs and one individual were observed (MBA, 2006). Prior to grading for the California Commerce Center, eight temporary artificial burrows were constructed along the southern boundary of the project site and all burrowing owls banded (refer to Exhibit 3 and Exhibit 3a). Known burrowing owl occupancy occurs north of the landfill within the Ontario International Airport and in smaller, undeveloped parcels throughout the City and surrounding area. Although no follow up surveys have been conducted since construction commenced, it is reasonable to assume that these owls may have moved onto the Milliken landfill or nearby suitable habitat.

   There have been landfills within northern (e.g., Mountainview, Sunnyvale, and Palo Alto), central (Lemoore), and southern (El Sobrante) California that have implemented enhancement and/or restoration activities for burrowing owls. A summary of the current use and burrowing owl objectives for these landfills is provided in Table 3. The SEIR should include an update on the status of the Milliken landfill (burrowing owl occupation, enhancement activities, etc.) and whether this has, or will, be used for burrowing owl conservation.

3) *Ontario International Airport* - Nonbreeding burrowing owl surveys (Helix, February 2020) were performed on the 322-acre Ontario International Airport, resulting in three active burring owls being detected, along with several suitable burrows being observed (see Exhibit 4). The Pomona Valley Audubon Society members have monitored owl nesting within the adjacent open fields east of Haven Avenue owned by the Ontario International Airport. A number of active burrows, ranging from 12 to 14, have been detected on the 234 acres over the last five years (Exhibit 4a). Burrowing owls are often found in association with airfields and airports, and their presence at such facilities is sometimes considered to conflict with those operations. CDFW has reviewed management plans and long-term studies monitoring burrowing owls on airports and military air bases, with the results suggesting that the maintenance of burrowing owl populations is not necessarily at odds with safe airfield operations (refer to Table 4). The SEIR should include any past, current, and future known impacts to burrowing owls on Ontario Airport owned lands, mitigation strategies for these owls, if necessary, and other pertinent information that can be disclosed for public transparency and planning.

4) *Surrounding Lands* – A number of burrowing owls within the local area have been impacted through loss of habitat within the lands adjacent to the City. To mitigate for these losses, the City of Chino has identified potential conservation areas. For the Preserve, "*300 acres of high-quality wildlife habitat is to be provided* in *three separate areas that are to be located generally below the 566-foot inundation line and within the Preserve boundaries*" (Preserve – Chino Sphere of Influence-Subarea 2 EIR Burrowing Owl Resources Management Plan). New development projects (e.g., Miramonte development, Pine Avenue Expansion) have been planned within two of the three proposed burrowing owl conservation area(s).

   Kimball Bickmore Natural Treatment System (NTS) has also been proposed as a partial regional mitigation area for burrowing owl impacts. Fifty-three artificial burrowing owl burrows were constructed, 20 of which mitigated for impacts to 10 occupied burrows for a development project that was constructed immediately east of the NTS facilities, while an additional 33 burrows were installed to maximize the number of burrows available for burrowing owls within the region. CDFW believes that it is not appropriate to place additional artificial burrows for mitigation to compensate for other impacts to burrowing owls in an area that has already been conserved and is already constricted by surrounding development and other land uses (e.g., water treatment, recreation, etc.), nor does it make sense to establish a high density of artificial burrows in a location where the carrying capacity (primarily food resources) is likely exceeded.

   Finally, the College Park EIR included development impacts to 710 acres. Three water quality basins, approximately 23.6 acres, is managed by a homeowner's association to provide benefits to burrowing owls, while 31.3 acres along Cypress

Channel and within an existing Southern California Edison easement was enhanced to provide a 'wildlife movement corridor'. CDFW is concerned that these designated mitigated areas have not been properly designed or maintained, and that the ecological process and biological values necessary to support burrowing owls are limited. The SEIR should include a full assessment of the cumulative impacts, as well as the mitigation to date for owls that preside and utilize areas within the Dairy Preserve.

Mitigation must be roughly proportional to the level of impacts, including cumulative impacts, in accordance with the provisions of CEQA (CEQA Guidelines, §§ 15126.4(a)(4)(B), 15064, 15065, and 16355). CDFW strongly encourages that mitigation for impacts to nesting, occupied, and satellite burrows, as well as habitat used for foraging, wintering, and migratory stop-overs be on, adjacent, or proximate to the impact site as long as the habitat is sufficient to support the burrowing owls present. If mitigation occurs offsite, it should be adequate in acreage and include permanent conservation of similar vegetation communities (grassland, scrublands, desert, urban, and agriculture) to provide for burrowing owl nesting, foraging, wintering, and dispersal (i.e., during breeding and non-breeding seasons) comparable to, or better than, that of the impact area.

The SEIR should include:

- An updated burrowing owl mitigation strategy based on reliable data and information;
- The location, acreage, and management status of areas that have been conserved in the City and within the general vicinity; and
- Measure(s) for Lead/Agency/future project proponents to identify and/or use conserved habitat before passive relocation occurs.

**Alternatives Analysis**

CDFW recommends the SEIR describe and analyze a range of reasonable alternatives to the Project that are potentially feasible, would "feasibly attain most of the basic objectives of the Project," and would avoid or substantially lessen any of the Project's significant effects (CEQA Guidelines § 15126.6[a]). The alternatives analysis should also evaluate a "no project" alternative (CEQA Guidelines § 15126.6[e]). The no Project alternative should evaluate how the changing environment, such as climate change and drought, may affect the community if a new or revised general plan were not adopted.

**Mitigation Measures for Project Impacts to Biological Resources**

The SEIR should identify mitigation measures and alternatives that are appropriate and adequate to avoid or minimize potential impacts, to the extent feasible. The City should

assess all direct, indirect, and cumulative impacts that are expected to occur as a result of the implementation of the Project and its long-term operation and maintenance. When proposing measures to avoid, minimize, or mitigate impacts, CDFW recommends consideration of the following:

1. *Fully Protected Species*: Fully protected species may not be taken or possessed at any time. Project activities described in the SEIR should be designed to completely avoid any fully protected species that have the potential to be present within or adjacent to the Project area. CDFW also recommends that the SEIR fully analyze potential adverse impacts to fully protected species due to habitat modification, loss of foraging habitat, and/or interruption of migratory and breeding behaviors. CDFW recommends that the Lead Agency include in the analysis how appropriate avoidance, minimization, and mitigation measures will reduce indirect impacts to fully protected species.

2. *Sensitive Plant Communities*: CDFW considers sensitive plant communities to be imperiled habitats having both local and regional significance. Plant communities, alliances, and associations with a statewide ranking of S-1, S-2, S-3, and S-4 should be considered sensitive and declining at the local and regional level. These ranks can be obtained by querying the CNDDB and are included in *The Manual of California Vegetation* (Sawyer et al. 2009). The SEIR should include measures to fully avoid and otherwise protect sensitive plant communities from project-related direct and indirect impacts.

3. *California Species of Special Concern* (CSSC): CSSC status applies to animals generally not listed under the federal Endangered Species Act or the CESA, but which nonetheless are declining at a rate that could result in listing, or historically occurred in low numbers and known threats to their persistence currently exist. CSSCs should be considered during the environmental review process.

4. *Mitigation*: CDFW considers adverse project-related impacts to sensitive species and habitats to be significant to both local and regional ecosystems, and the SEIR should include mitigation measures for adverse project-related impacts to these resources. Mitigation measures should emphasize avoidance and reduction of project impacts. For unavoidable impacts, onsite habitat restoration and/or enhancement, and preservation should be evaluated and discussed in detail. Where habitat preservation is not available onsite, offsite land acquisition, management, and preservation should be evaluated and discussed in detail.

   The SEIR should include measures to perpetually protect the targeted habitat values within mitigation areas from direct and indirect adverse impacts in order to meet mitigation objectives to offset project-induced qualitative and quantitative losses of biological values. Specific issues that should be addressed include restrictions on

access, proposed land dedications, long-term monitoring and management programs, control of illegal dumping, water pollution, increased human intrusion, etc.

If sensitive species and/or their habitat may be impacted from the Project, CDFW recommends the inclusion of specific mitigation in the SEIR. CEQA Guidelines section 15126.4, subdivision (a)(1)(8) states that formulation of feasible mitigation measures should not be deferred until some future date. The Court of Appeal in *San Joaquin Raptor Rescue Center* v. *County* of *Merced* (2007) 149 Cal.App.4th 645 struck down mitigation measures which required formulating management plans developed in consultation with State and Federal wildlife agencies after Project approval. Courts have also repeatedly not supported conclusions that impacts are mitigable when essential studies, and therefore impact assessments, are incomplete *(Sundstrom* v. *County* of *Mendocino* (1988) 202 Cal. App. 3d. 296; *Gentry* v. *City* of *Murrieta (1995)* 36 Cal. App. 4th 1359; *Endangered Habitat League, Inc.* v. *County* of *Orange* (2005) 131 Cal. App. 4th 777).

CDFW recommends that the SEIR specify mitigation that is roughly proportional to the level of impacts, in accordance with the provisions of CEQA (CEQA Guidelines, §§ 15126.4(a)(4)(B), 15064, 15065, and 16355). The mitigation should provide long-term conservation value for the suite of species and habitat being impacted by the Project. Furthermore, in order for mitigation measures to be effective, they need to be specific, enforceable, and feasible actions that will improve environmental conditions.

5. *Habitat Revegetation/Restoration Plans*: Plans for restoration and revegetation should be prepared by persons with expertise in southern California ecosystems and native plant restoration techniques. Plans should identify the assumptions used to develop the proposed restoration strategy. Each plan should include, at a minimum: (a) the location of restoration sites and assessment of appropriate reference sites; (b) the plant species to be used, sources of local propagules, container sizes, and seeding rates; (c) a schematic depicting the mitigation area; (d) a local seed and cuttings and planting schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity. Monitoring of restoration areas should extend across a sufficient time frame to ensure that the new habitat is established, self-sustaining, and capable of surviving drought.

   CDFW recommends that local onsite propagules from the Project area and nearby vicinity be collected and used for restoration purposes. Onsite seed collection should be initiated in order to accumulate sufficient propagule material for subsequent use in future years. Onsite vegetation mapping at the alliance and/or association level

should be used to develop appropriate restoration goals and local plant palettes. Reference areas should be identified to help guide restoration efforts. Specific restoration plans should be developed for various project components as appropriate.

Restoration objectives should include protecting special habitat elements or re-creating them in areas affected by the Project; examples could include retention of woody material, logs, snags, rocks, and brush piles.

6. *Nesting Birds and Migratory Bird Treaty Act:* Please note that it is the Project proponent's responsibility to comply with all applicable laws related to nesting birds and birds of prey. Fish and Game Code sections 3503, 3503.5, and 3513 afford protective measures as follows: Fish and Game Code section 3503 makes it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by Fish and Game Code or any regulation made pursuant thereto. Fish and Game Code section 3503.5 makes it unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by Fish and Game Code or any regulation adopted pursuant thereto. Fish and Game Code section 3513 makes it unlawful to take or possess any migratory nongame bird except as provided by the rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. § 703 et seq.).

   CDFW recommends that the SEIR include the results of avian surveys, as well as specific avoidance and minimization measures to ensure that impacts to nesting birds do not occur. Project-specific avoidance and minimization measures may include, but not be limited to: project phasing and timing, monitoring of project-related noise (where applicable), sound walls, and buffers, where appropriate. The SEIR should also include specific avoidance and minimization measures that will be implemented should a nest be located within the project site. If pre-construction surveys are proposed in the SEIR, the CDFW recommends that they be required no more than three (3) days prior to vegetation clearing or ground disturbance activities, as instances of nesting could be missed if surveys are conducted sooner.

7. *Moving out of Harm's Way:* To avoid direct mortality, CDFW recommends that the lead agency condition the SEIR to require that a CDFW-approved qualified biologist be retained to be onsite prior to and during all ground- and habitat-disturbing activities to move out of harm's way special status species or other wildlife of low or limited mobility that would otherwise be injured or killed from project-related activities. Movement of wildlife out of harm's way should be limited to only those individuals that would otherwise by injured or killed, and individuals should be moved only as far a necessary to ensure their safety (i.e., CDFW does not recommend

relocation to other areas). Furthermore, it should be noted that the temporary relocation of onsite wildlife does not constitute effective mitigation for the purposes of offsetting project impacts associated with habitat loss.

8. *Translocation of Species*: CDFW generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species as studies have shown that these efforts are experimental in nature and largely unsuccessful.

**California Endangered Species Act**

CDFW is responsible for ensuring appropriate conservation of fish and wildlife resources including threatened, endangered, and/or candidate plant and animal species, pursuant to CESA. CDFW recommends that a CESA Incidental Take Permit (ITP) be obtained if the Project has the potential to result in “take” (California Fish and Game Code Section 86 defines “take” as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill”) of State-listed CESA species, either through construction or over the life of the project. CESA identifies that it is the policy of the state to conserve, protect, enhance, and restore State-listed CESA species and their habitats.

CDFW encourages early consultation, as significant modification to the proposed Project and avoidance, minimization, and mitigation measures may be necessary to obtain a CESA ITP. CDFW is required to comply with CEQA for issuance of a CESA ITP. CDFW therefore recommends that the SEIR addresses all Project impacts to listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of CESA.

**Lake and Streambed Alteration Program**

Fish and Game Code section 1602 requires an entity to notify CDFW prior to commencing any activity that may do one or more of the following: Substantially divert or obstruct the natural flow of any river, stream or lake; Substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or Deposit debris, waste or other materials that could pass into any river, stream or lake. Please note that "any river, stream or lake" includes those that are episodic (i.e., those that are dry for periods of time) as well as those that are perennial (i.e., those that flow year-round). This includes ephemeral streams, desert washes, and watercourses with a subsurface flow. It may also apply to work undertaken within the flood plain of a body of water.

Upon receipt of a complete notification, CDFW determines if the proposed Project activities may substantially adversely affect existing fish and wildlife resources and whether a Lake and Streambed Alteration (LSA) Agreement is required. An LSA

Agreement includes measures necessary to protect existing fish and wildlife resources. CDFW may develop measures to protect fish and wildlife resources.

CDFW's issuance of an LSA Agreement is a "project" subject to CEQA (see Pub. Resources Code 21065). To facilitate issuance of an LSA Agreement, if necessary, the SEIR should fully identify the potential impacts to the lake, stream, or riparian resources, and provide adequate avoidance, mitigation, and monitoring and reporting commitments. Early consultation with CDFW is recommended, since modification of the proposed Project may be required to avoid or reduce impacts to fish and wildlife resources. To obtain a Lake or Streambed Alteration notification package, please go to https://www.wildlife.ca.gov/Conservation/LSA/Forms.

**ADDITIONAL COMMENTS AND RECOMMENDATIONS**

To ameliorate the water demands of this Project, CDFW recommends incorporation of water-wise concepts in project landscape design plans. In particular, CDFW recommends xeriscaping with locally native California species, and installing water-efficient and targeted irrigation systems (such as drip irrigation). Local water agencies/districts, and resource conservation districts in your area may be able to provide information on plant nurseries that carry locally native species, and some facilities display drought-tolerant locally native species demonstration gardens (for example the Riverside-Corona Resource Conservation District in Riverside). Information on drought-tolerant landscaping and water-efficient irrigation systems is available on California's Save our Water website: http://saveourwater.com/what-you-can-do/tips/landscaping/

**ENVIRONMENTAL DATA**

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations. (Pub. Resources Code, § 21003, subd. (e).) Accordingly, please report any special status species and natural communities detected during Project surveys to the California Natural Diversity Database (CNDDB). Information can be submitted online or via completion of the CNDDB field survey form at the following link: https://wildlife.ca.gov/Data/CNDDB/Submitting-Data. The completed form can be mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov. The types of information reported to CNDDB can be found at the following link: https://wildlife.ca.gov/Data/CNDDB/Plants-and-Animals.

**FILING FEES**

The Project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination

by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code, § 711.4; Pub. Resources Code, § 21089.).

**CONCLUSION**

CDFW appreciates the opportunity to comment on the NOP of a SEIR for the Ontario Plan 2050 Project (SCH No. 2008101140) and recommends that the City address the CDFW's comments and concerns in the forthcoming SEIR. If you should have any questions pertaining to the comments provided in this letter, please contact Kim Romich, Senior Environmental Scientist, Specialist, at (760) 937-1380 or at kimberly.romich@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Scott Wilson
8091B1A9242F49C...

Scott Wilson
Environmental Program Manager

ec: Kim Freeburn, Senior Environmental Scientist, Supervisor
Inland Deserts Region
Kim.freeburn@wildlife.ca.gov

HCPB CEQA Coordinator
Habitat Conservation Planning Branch

Office of Planning and Research, State Clearinghouse, Sacramento
state.clearinghouse@opr.ca.gov

Attachments:

Exhibit 1 Burrowing owl occurrences with the City of Ontario and surrounding area (City of Chino).
Exhibit 2 Different development (see Table 1 for color reference) and burrowing owl occurrences within the New Model Colony (Ontario Ranch) in Ontario, CA.
Exhibit 3 Milliken landfill located within the City of Ontario, San Bernardino County.
Exhibit 3a Burrowing owl locations surrounding Milliken Landfill.
Exhibit 4 2020 burrowing owl non-breeding survey results at the Ontario International Airport (Helix, 2020).

Exhibit 4a Pomona Valley Audubon Society burrowing owl breeding survey area (red) at adjacent parcels owned by the Ontario International Airport.

Table 1 Different development (see Exhibit 2 for color reference) and burrowing owl occurrences within the New Model Colony (Ontario Ranch) in Ontario, CA.

Table 2 A comparison of CEQA mitigation measures bewteen the NMC Final Program EIR, Ontario Plan DEIR, and projects within the Ontario Ranch

Table 3 Landfills that have implemented burrowing owl measures.

Table 4 Burrowing owl occurrences, findings, and management actions on military air bases and airports.

**Exhibit 1 - Burrowing owl occurrences with the City of Ontario and surrounding area (City of Chino).**

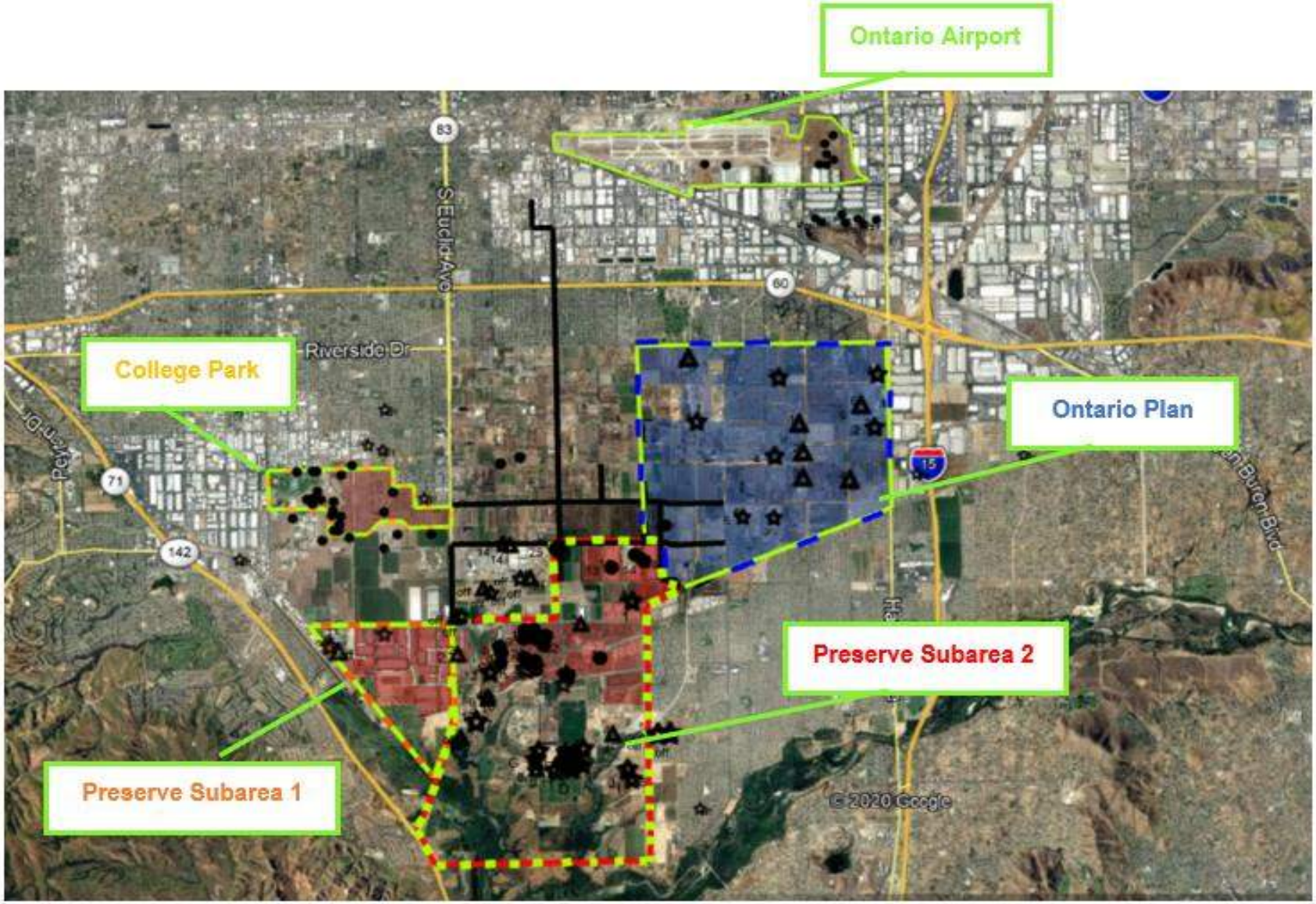

**Exhibit 2 – Different development (see Table 1 for color reference) and burrowing owl occurrences within the New Model Colony (Ontario Ranch) in Ontario, CA.**

**Exhibit 3 – Milliken landfill located within the City of Ontario, San Bernardino County.**

**Exhibit 3a - Burrowing owl locations surrounding Milliken Landfill.**

**Exhibit 4 - 2020 burrowing owl non-breeding survey results at the Ontario International Airport (Helix, 2020).**

**Exhibit 4a - Pomona Valley Audubon Society burrowing owl breeding survey area (red) at adjacent parcels owned by the Ontario International Airport.**

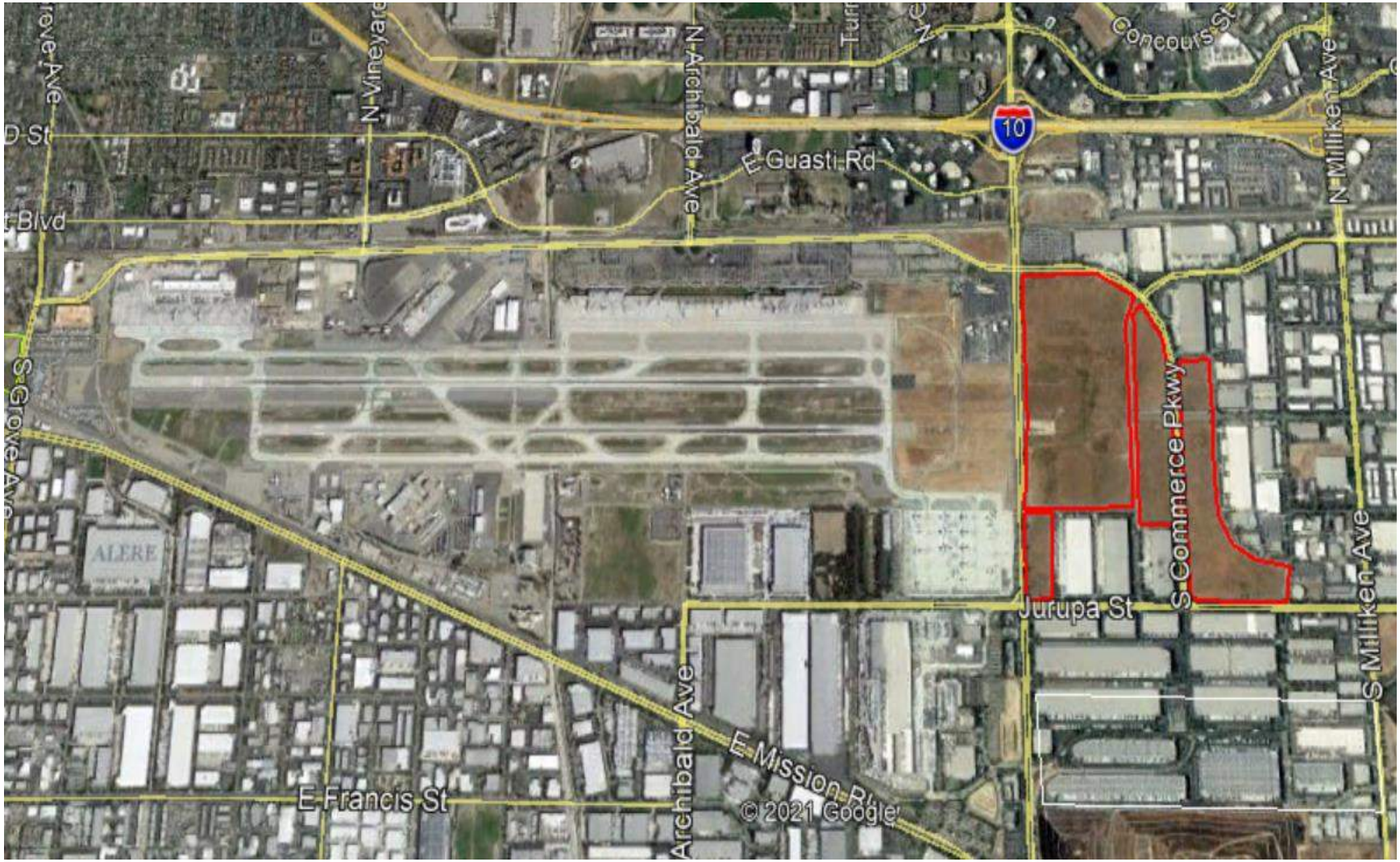

**Table 1 – Different development (see Exhibit 2 for color reference) and burrowing owl occurrences within the New Model Colony (Ontario Ranch) in Ontario, CA.**

| DEVELOPMENT | | | | | | ENVIRONMENTAL DOCUMENTS | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | CEQA | | | | Biological Survey | | | | | CNDDB/BIOS | | | EBird | | | | |
| MAP ID | DEVELOPER | DEVELOPMENT | ACRES | PROJECT DEVELOPED | CONSTRUCTION START DATE | ENVIRONMENTAL DOCUMENT | DATE | ENVIRONMENTAL DOCUMENT BURROWING OWL FINDINGS | BURROWING OWL AVOIDANCE/ MITIGATION REQUIREMENT | SPECIFIC BUOW SURVEY | SURVEYOR/ SURVEY YEAR | BURROWING OWL SURVEY RESULTS | REPORT RECEIVED | MAP SYMBOL | SURVEY YEAR | BURROWING OWL SURVEY RESULTS | MAP SYMBOL/ SOURCE | SURVEY YEAR | BURROWING OWL SURVEY RESULTS | Ebird MAP SYMBOL/ SOURCE | MITIGAION FEES ($) |
| No develoment has occurred (as of when this table was created). No burrowing owl survey reports have been submitted. Each development should have a biological assessment, along with updated focused burrowing owl breeding surveys, and preconstruction burrowing owl surveys. The focused breeding /preconstruction burrowing owl surveys should be conducted by a qualified biologist with results submitted to the City of Chino (CEQA Lead) and CDFW (CEQA Trustee and Responsible Agency) before the commencement of project related activities. | | | | | | | | | | | | | | | | | | | | | | |
| 1 | Brookfield Homes | Edenglen | 160 | | N/A | Specific Plan Final EIR (2004051108) | July 2005 | Recon survey – Suitable habitat | Mitigation fees; precon surveys; passive relocation | N/A | N/A | N/A | N/A | N/A | 3/11 | 2 owls at burrow | ★ A | N/A | N/A | N/A | 691,200 |
| 2 | Foremost Comm | Countryside | 178 | | N/A | Specific Plan Final EIR (2004071001) | March 2006 | N/A | Mitigation fees; consult with CDFW personnel for offsite mitigation areas, whether land purchased by fee or under conservation easement, passive relocation | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | 752,940 |
| 3 | Richland<br>Brookfield Homes | Rich Haven | 510 | | N/A | Draft EIR State 2006-051081 | July 2007 | Burrowing owl survey included in CEQA | Mitigation fees; Focused surveys; precon surveys;; Develop a mitigation plan to compensate for the loss of burrowing owl occupied habitat. | Focused biological surveys | Bonterra August 2005 and Nov 2005 | 5 burrows were found on site. 6 adult and 4 juvenile owls were observed. | No | N/A | 2010 | Up to 15 detectons of owls, 5 occupied burrows, & 1 pair with 2 young | ★ E | 4/16 | 1 owl | ▲ B | 2,157,300 |
| 4 | Stratham Homes<br>Richland<br>Lewis Companies<br>CV Comm | West Haven | 199 | | N/A | Specific Plan Final EIR (2004071095) | 2005 | N/A | Mitigation fees | N/A | N/A | N/A | N/A | N/A | 5/11 | 9 detections of owls; 2 nest sites recorded during construction monitoring Dec 2010 - July 2011 | ★ B | 9/14 | - | - | 841,770 |
| 5 | Brookfield Homes<br>Richland<br>DistinguishHomes<br>Lewis Companies | The Avenue | 569 | | N/A | SEIR | Oct 2008 | N/A | Precon surveys; mitigation fee | N/A | N/A | N/A | N/A | N/A | C-2006 thru 2011<br>D – 5/05 | C- Breeding colony with 4 pairs and numerous juveniles<br>D 4 Owls with nesting burrow and 2 other active owls | ★ C<br>★ D | 9/14<br>4/11 | 7 - A burrow with 2 adults and 2 juveniles. Other with 1 adult and 1 juvenile | ▲ C<br>▲ D | 2,406,870 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | SC Ontario Dev | Parkside | 250 | | N/A | EIR Specific Plan (2004011008) | July 2006 | Habitat assessment included - presence of foraging habitat and previous records of presence | Mitigation fees; precon surveys; passive relocation | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | 1,057,500 |
| 7 | Richland<br><br>Distinguish Homes | Grand Park | 320 | | N/A | EIR (2012061057) | Aug 2013 | Habitat assessment included - Suitable habitat occurs and owls have been recorded as occurring adj to the site. Owls have been observed during by AMEC in 2003, 2006, and 2007. | Focused surveys; Mitigation fees | N/A | N/A | N/A | N/A | N/A | | N/A | N/A | 4/11 | 1 owl | ▲E | 1,353,600 |
| 8 | | The Lakes | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | F- 4/12-13 | 2 owls | ▲F | N/A |
| 9 | GDCI-RCCD, GDC Investment | Esperanza | 233 | N/A | N/A | FEIR (2002061047) | Dec 2006 | Habitat Assessment included 0wls were recorded (L&L Environmental 2001), but were not recorded 2002, 2003, or 2005 surveys | Mitigation fees; precon surveys; passive relocation | N/A | N/A | N/A | N/A | N/A | - | N/A | N/A | 4/12-13 | - | - | 1,006,560 |
| 10 | SL Ontario Develop<br><br>Richland<br><br>Brookfield Homes<br>Lewis Homes (Park Place) | Subarea 29 | 539 | N/A | N/A | Subarea 29 (Hettinga) Specific Plan (2004011009) | June 2006 | Habitat Assessment included - No burrows were observed on site, but this species may forage on site and nest in adjacent areas. | Precon survey; Mitigation fees | N/A | N/A | N/A | N/A | N/A | F –6/06<br><br>G – 6/06 | F - $ adults<br><br>G - Male observed repeatedly on different days; judging by the season and behavior, a female was assumed in the burrow | ★F<br>★G | N/A | - | - | 1,080,000 |
| 11 | SL Ontario Dev Corp. | Subarea 29 Amendment | 25 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | 112,320 |
| 12 | CVRC Ontario Investment | Armstrong | 199 | No | N/A | Specific Plan DEIR | Sept 2016 | Focused survey results included in CEQA | Precon surveys<br>Focused breeding surveys within PA's 1, 6A, 6B or 7<br>Passive relocation | Focused surveys | GLA/2014 and 2015 | None | N/A | N/A | - | - | - | 6/09 | 2 owls | ▲A | 859,680 |
| 13 | CDFI Remington | Colony Commerce Center | 123 | N/A | N/A | DEIR (2015061023) | 2016 | CEQA included focused survey | No mitigation measures proposed | Focused Survey | PCR/2015 | None | N/A | N/A | - | - | - | - | - | - | 531,360 |
| 14 | CDFI Remington | Colony Commerce Center East | 123 | N/A | N/A | DEIR (2015061023) | 2016 | Focused survey results included in CEQA | No mitigation measures proposed | Focused Survey | ESA/2017 | None | N/A | N/A | - | - | - | - | - | - | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | N/A | West Ontaio Commerce Center | 134.5 | N/A | N/A | N/A | N/A | N/A | N/A | Focused Survey | Ecological Sciences/ 2015,2016, 2017<br><br>Hernadez Consulting/ 2019 | None<br><br>Multiple Burrows with 1 BUOW | Yes (GLA)<br><br>Yes<br><br>A | N/A | _ | - | - | - | - | - | 583,200 |
| Development has occurred. Burrowing owl reports have yet to be submitted. The biological assessment, focused burrowing owl breeding surveys, and preconstruction burrowing owl surveys should be submitted to CDFW (CEQA Trustee and Responsible Agency). | | | | | | | | | | | | | | | | | | | | | |
| 1 | L&F Prop north LP | | 37.9 | Yes | 2002 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | |
| 2 | L&F Prop South LP | | 66.8 | Yes | >1994 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | |
| 3 | | | 386 | Yes | >1998 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | |
| 4 | Archibald Ranch Comm Church | Church | 16 | Yes | >1998 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | |
| 5 | | | 44 | Yes | 2016 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | 190,080 |
| Open habitat owned by a public agency that has yet to be developed | | | | | | | | | | | | | | | | | | | | | |
| 1 | KB Home Coastal | N/A | 9.4 | No | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | |
| 1 | San Bernardino Co Flood | N/A | 85.1 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | - | - | - | - | - | - | |
| TOTAL | | | | 3,484 acres | | | | | | | | | | | | | | | | | $13,624,380 |

**Table 2 – A comparison of CEQA mitigation measures bewteen the NMC Final Program EIR, Ontario Plan DEIR, and projects within the Ontario Ranch.**

| Map ID # | PROJECT | SPECIFIC PLAN ENVIRONMENTAL DOCUMENT | EIR MITIGATION MEASURE BR - 1 | EIR MITIGATION MEASURE BR - 2 | DEIR MITIGATION MEASURE 1 | DEIR MITIGATION MEASURE 2 | DEIR MITIGATION MEASURE 3 | DEIR MITIGATION MEASURE 4 |
|---|---|---|---|---|---|---|---|---|
| | | | ~~2:1 Mitigation Waterfowl Habitat Mitigation~~ | ~~Waterfowl and~~ Raptor Conservation Area | Mitigation Fees | On Site Land Conservation or Owl Relocation | Land Conservation | Land Easement |
| 1 | Edenglen | Edenglen Specific Plan FEIR | Eliminated | TBD | X | X | | |
| 2 | Countryside | Countryside Specific Plan FEIR | Eliminated | TBD | | | | |
| 3 | Rich Haven | Rich Haven Specific Plan FEIR | Eliminated | TBD | X | X | X | X |
| 4 | West Haven | West Haven Specific Plan DEIR | Eliminated | TBD | | | | |
| 5 | The Avenue | N/A | Eliminated | TBD | X | | | |
| 6 | Parkside | Parkside Specific Plan FEIR | Eliminated | TBD | | | | |
| 7 | Grand Park | Grand Park Specific Plan FEIR | Eliminated | TBD | X | | | |
| 8 | The Lakes | The Lakes SEIR | Eliminated | TBD | X | | | |
| 9 | Esperanza | Esperanza Specific Plan FEIR | Eliminated | TBD | X | X | | |
| 10 | Subarea 29 (Park Place) | Subarea 29 Specific Plan FEIR | Eliminated | TBD | X | | | |
| 11 | Subarea 29 Amendment | Subarea 29 Specific Plan FEIR | Eliminated | TBD | | | | |
| 12 | Armstrong | Armstrong Specific Plan FEIR | Eliminated | TBD | X | X | | |
| 13 | Colony Commerce Center | Colony Commerce Center Specific Plan DEIR | Eliminated | TBD | | | | |
| 14 | Colony Commerce Center East | Colony Commerce Center East Specific Plan DEIR | Eliminated | TBD | | | | |
| 15 | West Ontario Commerce Center | West Ontario Commerce Center Specific Plan DEIR | Eliminated | TBD | | | | |

**Table 3 - Landfills that have implemented burrowing owl measures.**

| Landfill | Operation Status | Current Use | Burrowing Owl Objectives | Supporting Documents |
|---|---|---|---|---|
| Mountainview Landfill<br><br>Mountainview, CA | Class III Landfill Closed 1983 | 750- acre Shoreline Park with refuse still remaining beneath 440 acres. | • Manage and maintain at least 300 acres of medium- to high-quality habitat.<br>• Monitor population and habitat conditions.<br>• Protect owls from project impacts.<br>• Provide more on-site support from biologists than is currently provided by the part-time biologist.<br>• Actively control predators, especially nonnative and nuisance species.<br>• Support an average breeding season population of at least 10 pairs of owls.<br>• Nest success rate of approximately 50% to 75%. | Burrowing Owl Preservation Plan |
| Sunnyvale Landfill Sunnyvale, CA | Class III Landfill Closed 1993 | 93-acre open space habitat | • Monitor the number and location of owls at the landfill.<br>• Manage vegetation height to ≤ 6 inches at occupied owl burrows and leave islands of taller, denser vegetation to support prey populations.<br>• Improve prey base by planting native perennials in uplands and constructing rock/brush piles.<br>• Install additional artificial burrow mounds.<br>• Implement non-native predator control measures. | Biological Constraints and Opportunities Analysis |
| El Sobrante Landfill Corona, CA | Class III Landfill Active since 1986 | 1,322 acres with 688 acres actively managed as a habitat preserve | • Pay 1 million per year to the Western Riverside County Multiple Species Habitat Conservation Plan.<br>• Full-time biologist employed to oversee the completion of monthly, annual and three-year reports that track progression with the HCP and conservation goals.<br>• 'Rolling closures' where areas are closed and restored in phases and monitored.<br>• Weeding several times each year and reseeding areas to ensure success criteria (plant cover, species diversity and minimal weeds) are being met.<br>• Installation of artificial burrows. | Citizen Oversight Power Point |

| | | | | |
|---|---|---|---|---|
| Lemoore Naval Air Station Lemoore, CA | Class III Landfill Closed 1993 | Of the 18,784 acres, approximately 14,000 acres are allocated to agricultural production and 50 acres provide wildlife habitat from a reclaimed landfill that is designated as Fresno kangaroo habitat. | • Restoration of native grassland.<br>• Implementation of grazing and mowing.<br>• 6 clusters of 3 artificial burrows were established to augment the owl population, with owls successfully nesting in most of these burrows. | Burrowing Owl Adaptive Management Plan |
| Palo Alto Landfill Palo Alto, CA | Class III Landfill Closed 2014 | The entire 137-acre landfill will eventually be converted to park use | • Installation of artificial burrows.<br>• Mow habitat to less than 5 inches.<br>• Implement a nonnative removal program. | Palo Alto Byxbee Proposed Plan |
| Yuma Landfill Yuma, CA | Class III Landfill Closed 1970 | Converted 110 acres into West Wetlands Park with refuse beneath. | • Establish 20 artificial burrows for relocated burrowing owls and built a viewing platform for public observation. | West Wetlands Park Information |

**Table 4 - Burrowing owl occurrences, findings, and management actions on military air bases and airports.**

| Location | State | Management Plan | Comments |
|---|---|---|---|
| | | **Military** | |
| Kirkland Airforce Base | NM | N/A Study (2021) | The number of breeding pairs of Burrowing Owls increased from one pair in 2013 to 28 pairs in 2019 and 2020, and the number of fledglings produced increased from one in 2013 to 84 in 2019 and 61 in 2020. The recovery was not uniform across all areas of Kirtland Air Force Base, and some formerly occupied areas remained unoccupied. We documented dispersal outside the Air Force base boundary and that the number of breeding pairs was more strongly influenced by the number of offspring produced in the prior year than the number of owls returning from prior years, which indicated that the population is part of a larger metapopulation. Our results demonstrate that the maintenance of Burrowing Owl populations is not necessarily at odds with safe airfield operations, that Burrowing Owls exhibit complex population dynamics, and can rapidly recolonize previously occupied areas if habitat and nest sites remain suitable. |
| NAS Lemoore | CA | 2009 | Surveys of burrowing owls at NAS Lemoore in 1997-2000, and again in 2008. 43 - 85 active nests were observed each year and were located in 5 primary areas clustered around the wildlife areas, runway strips in Air Operations, buffer strips near the runways, the capped landfill, and occasionally a nest was seen at the receiver or transmitter site. Many of the owl nest sites were located within 10 m of runways. |
| NAF El Centro | CA | 2005 | Unlike other airfields such as Moffett Federal Airfield in San Jose or NAS Lemoore in the San Joaquin Valley, NAF El Centro does not provide critical habitat in a matrix of unsuitable or poor-quality habitat for the burrowing owl. Management therefore does not need to be focused on maintaining a resident population, but primarily on preventing owl occupancy of areas where they potentially pose a threat to human safety due to bird aircraft strike hazard. Maintenance of owl populations in parts of NAF El Centro away from the airfield is desirable. Although burrowing owls appear to pose only a small hazard to aircraft relative to other avian species in the region such as egrets and gulls, risk due to burrowing owl presence in the airfield can be easily reduced than for these other species. The primary method for reducing risk is is discussed where aircraft altitude is low but engines are at full power for takeoff. |

| | | | |
|---|---|---|---|
| Naval Airforce Base North Island (Coronado) | CA | 2013 | Largest colony of burrowing owl in San Diego County prior to 2007, between 8-30 pairs annually. Management Plan is being developed to maintain owls while reducing likelihood of potential air strikes. Continue mowing and monitoring of owls and burrows. |
| Cannon AFB | NM | | DoD Legacy funded-project evaluating migratory linkages of Burrowing Owls in western North America.200 6- use stable isotopes of owl feathers, genetics from blood samples, and radio telemetry to quantify the importance of DoD lands to Burrowing Owl populations in the region, document the extent to which Burrowing Owls disperse between populations, identify where owls breeding on DoD installations spend the winter, and quantify land-use of migrating and wintering owls in the region. |
| Holloman AFB | NM | | Participant in the DoD Legacy funded-project above |
| Buckley AFB | CO | | Participant in the DoD Legacy funded-project above |
| Pinon Canyon Maneuver Site | CO | | Participant in the DoD Legacy funded-project above |
| Schriever AFB | CO | | Participant in the DoD Legacy funded-project above |
| **AIRPORTS** | | | |
| Oakland Municipal Airport | CA | | Followed banded owls on airport from 1964 - 1966 |
| San Jose | CA | 1997 | |

Transmission Technical
Services Department

9400 Oakdale Ave
Chatsworth, CA 91311
SC9314

*July 28, 2025*

Rafael Torres
City of Ontario, Planning Department
rtorres@ontarioca.gov

**Subject:** **Ontario Center Park Specific Plan**

**DCF:** **1266-25NC**

The Transmission Department of SoCalGas does not operate any facilities within your proposed improvement. However, the Distribution Department of SoCalGas may maintain and operate facilities within your project scope.

To assure no conflict with the Distribution's pipeline system, please e-mail them at:

SCGSERegionRedlandsUtilityRequest@semprautilities.com

Best Regards,
Nerses Papazyan
SoCalGas Transmission Technical Services
SoCalGasTransmissionUtilityRequest@semprautilities.com

# APPENDIX B

## CULTURAL RESOURCES ASSESSMENT

# Cultural Resources Inventory and Evaluation Report for the Center Park Specific Plan Project, City of Ontario, San Bernardino County, California

October 16, 2025

**Prepared By:**

Jessica Mauck & Jamie Parra

Cultural Resources Management

Kimley-Horn and Associates, Inc.

3801 University Ave, Suite 300

Riverside, CA 92501

Kimley»Horn

## EXECUTIVE SUMMARY

Kimley-Horn and Associates, Inc. (Kimley-Horn) is under contract to complete a Cultural Resources Inventory and Evaluation Report for the proposed Center Park Specific Plan Project (Project) in City of Ontario (City), San Bernardino County, California. The proposed Project consists of a land use plan for residential and mixed-used retail/office development and is being reviewed pursuant to California Environmental Quality Act (CEQA) with the City of Ontario acting as the Lead Agency. This report is intended to support the City's review and consideration of the Project and potential impacts it may have on the environment specifically as it relates to cultural resources.

Kimley-Horn conducted research and cultural resources records searches through the Native American Heritage Commission (NAHC), South Central Coastal Information Center (SCCIC), California Office of Historic Preservation (OHP), and the City for the Project area and vicinity. Kimley-Horn staff identified 15 cultural resources in the Project area during the record search, all of which consist of historic-period dairy farms and associated homes. Kimley-Horn also conducted a survey of the Project area and revisited all 15 identified resources. As a result of the record search and survey, it was noted that some previously recorded sites had missing or incomplete records, to include missing data related to the original delineation of site boundaries. As such, Kimley-Horn re-created the site boundaries where possible based on record search data, while creating new ones for those with missing or incomplete information, based on the results of research and survey. Additionally, Kimley-Horn prepared preliminary evaluations for each site's eligibility for listing in the CRHR and local inventory. After survey and initial evaluations were completed, Kimley-Horn was notified that the City had obtained Urbana Preservation & Planning, LLC (Urbana) to complete an updated inventory and evaluation for the broader Ontario Ranch/New Model Colony Area, including the Project area. As such, recordation and evaluation efforts were undertaken in conjunction with Urbana for each resource to identify their potential eligibility for listing in the California Register of Historical Resources (CRHR) and/or designation as City of Ontario Historic Landmark.

As a result of these efforts, a total of 12 cultural resources with historic structures in the Project were identified as a result of this study. Three (3) of the identified resources are recommended eligible for listing in the CRHR and/or for designation as a City of Ontario Historic Landmark, and are considered historical resources under CEQA. Conditions related to reducing impacts to significance historic built environment resources are recommended, though with the understanding that such actions may not reduce impacts to these resources to less than significant. This study also concludes that the Project area has a high sensitivity for historic archaeological resources associated with the dairy farming industry, though maintains a relatively low sensitivity for buried prehistoric archaeological resources as a result of prior disturbance. However, both due to the high sensitivity of historic archaeological resources and due to the fact that the Project area was underlain by Holocene-age soils that would have maintained a moderate-to-high potential for prehistoric archaeological resources prior to disturbance, it is recommended that conditions related to archaeological monitoring during Project implementation and the process for inadvertent discoveries be included as a part of the proposed Project. With these conditions in place, impacts to unique archaeological resources would be reduced to less than significant.

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## INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) is under contract to complete a Cultural Resources Inventory and Evaluation Report for the proposed Center Park Specific Plan Project (Project) in the City of Ontario (City), San Bernardino County, California. The Project is subject to review pursuant to California Environmental Quality Act (CEQA) with the City of Ontario acting as the Lead Agency. This report is intended to support the City's review and consideration of the Project and potential impacts it may have on the environment specifically as it relates to cultural resources. Efforts conducted for this assessment include a pedestrian survey of the Project area, cultural resources records searches, a Sacred Lands File (SLF) search, literature review, a review of cultural databases and repositories, and a review of historic maps and imagery, as well as recordation and evaluation of each resource. Due to a concurrent effort being conducted by Urbana Preservation & Planning, LLC (Urbana) to update inventories and evaluations of the broader Ontario Ranch/New Model Colony Area, recordation and evaluations for resources within the Project area were completed in conjunction with Urbana and the City. This report presents the results of these collective efforts, as well as recommended mitigation measures for the Project.

## PROJECT DESCRIPTION

The Project area is in the southwestern portion of the City of Ontario within San Bernardino County (**Figure 1**). The Project area is bounded to the north by a Southern California Edison (SCE) Easement located approximately 330 feet north of Edison Avenue/Ontario Ranch Road, Eucalyptus Avenue to the south, Campus Avenue to the west, and Walker Avenue to the east (**Figure 2**). The Project area is made up of 29 existing parcels totaling 257.34 acres. The proposed Project consists of a Specific Plan to allow for a residential and mixed-used retail/office development on the existing 29 parcels. The development would include up to 250,919 square feet of commercial retail/office uses, up to 4,293 residential units across low, low-medium, and mixed-use residential uses, 67.26 acres of open space parkland/non-recreation uses, and associated on-site and off-site infrastructure improvements, as described further below. The Project area is anticipated to be developed in four phases within 22 planning areas.

## REGULATORY SETTING

### California Environmental Quality Act

The California Environmental Quality Act (CEQA) applies to all discretionary projects undertaken or subject to approval by the state's public agencies (California Code of Regulations 14(3), § 15002(i)). Under CEQA, "A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (Cal. Code Regs. Tit. 14(3), § 15064.5(b)). Guidelines for Implementation of the California Environmental Quality Act (State CEQA Guidelines) section 15064.5(a) defines a "historical resource" as a resource that meets one or more of the following criteria:

- Listed in, or eligible for listing in, the California Register of Historical Resources (California Register)
- Listed in a local register of historical resources (as defined at Cal. Public Res. Code § 5020.1(k))
- Identified as significant in a historical resource survey meeting the requirements of § 5024.1(g) of the Cal. Public Res. Code

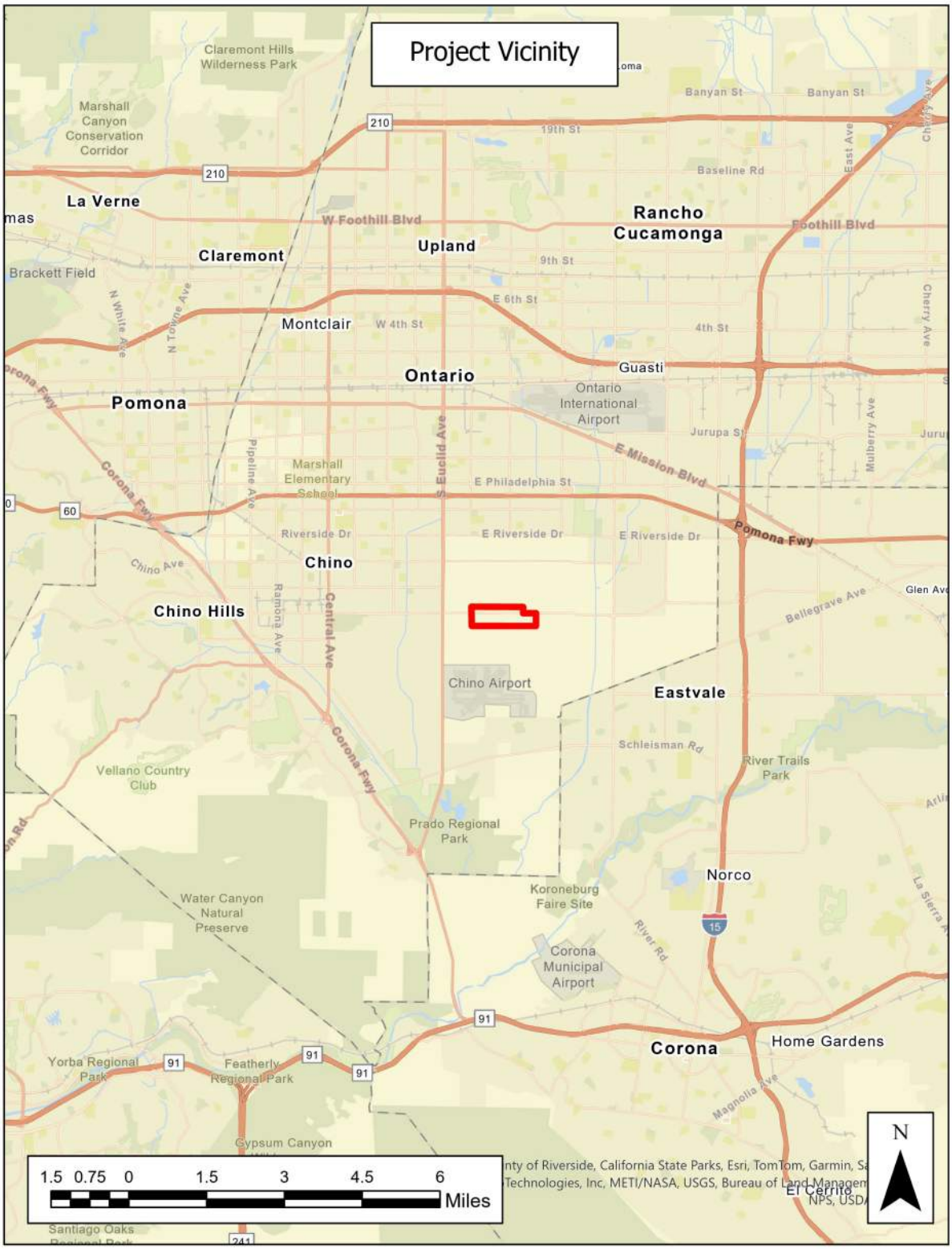


Figure 1: Project Vicinity Map

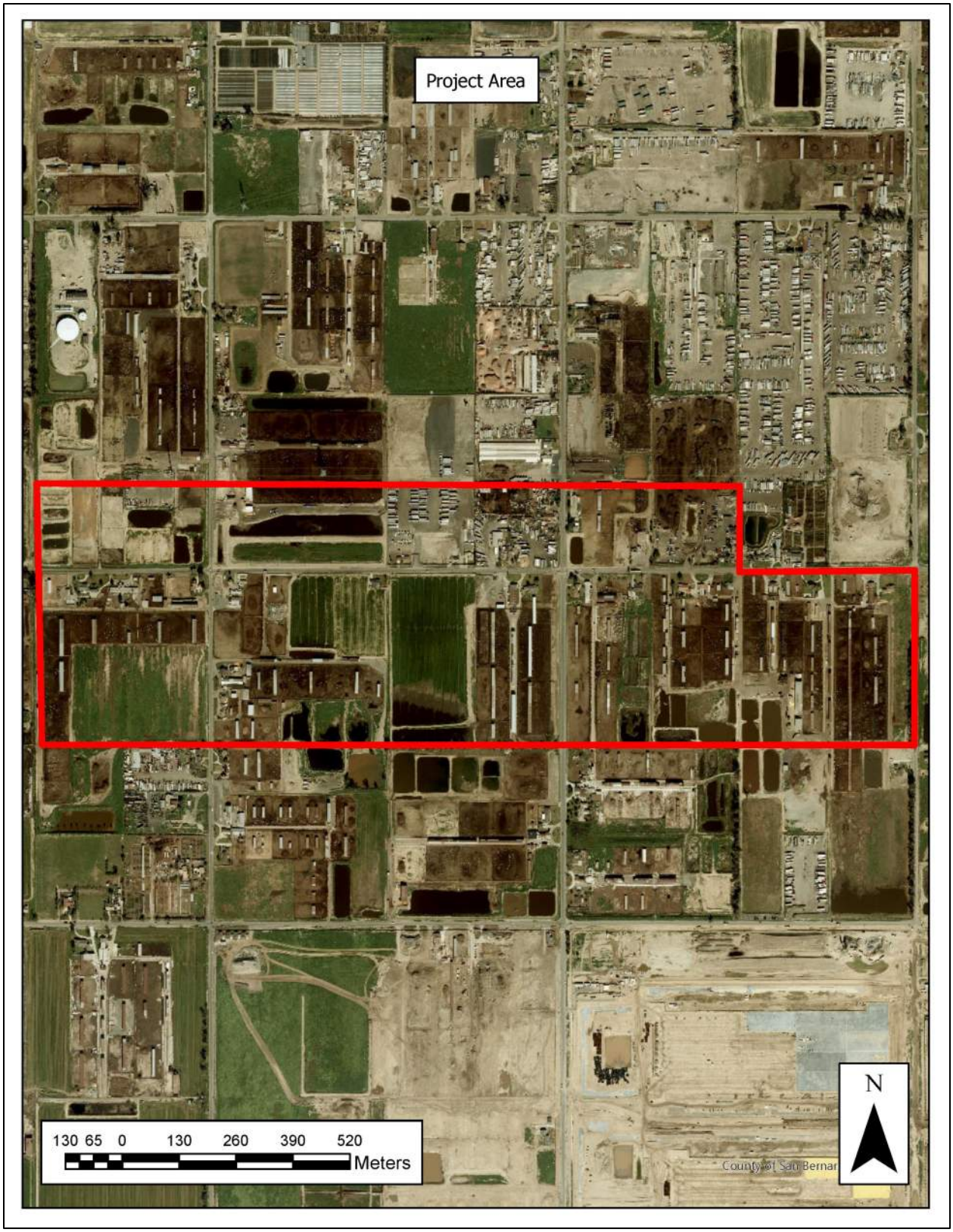


Figure 2: Project Area Map

- Determined to be a historical resource by a project's lead agency (Cal. Code Regs. Tit. 14(3), § 15064.5(a))

A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California… Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources" (Cal. Code Regs. Tit. 14(3), § 15064.5(a)(3)). The significance of a historical resource is impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for the California Register. If an impact on a historical or archaeological resource is significant, CEQA requires feasible measures to minimize the impact (State CEQA Guidelines § 15126.4 (a)(1)). Mitigation of significant impacts must lessen or eliminate the physical impact that the project will have on the resource. Section 5024.1 of the Cal. Public Res. Code established the California Register. Generally, a resource is considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register (Cal. Code Regs. tit. 14(3), § 15064.5(a)(3)).

Finally, CEQA requires that significant effects on unique archaeological resources be considered and addressed. CEQA defines a unique archaeological resource as any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

CEQA Guidelines Section 15064.5 Appendix G includes significance criteria relative to archaeological and historical resources. These have been utilized as thresholds of significance here, and a project would have a significant environmental impact if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in section 10564.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 10564.5;
- Disturb any human remains, include those interred outside of formal cemeteries.

**California Public Resources Code**

California Public Resources Code (PRC) § 5024.1 establishes the California Register of Historical Resources (CRHR). The register lists all California properties considered to be significant historical resources. The

CRHR also includes all properties listed or determined eligible for listing in the NRHP, including properties evaluated and determined eligible under § 106.

California Public Resources Code (PRC) § 5020 to 5029.5 continued the former Historical Landmarks Advisory Committee as the State Historical Resources Commission. The commission oversees the administration of the California Register of Historical Resources and is responsible for designating State Historical Landmarks and Historical Points of Interest.

California Public Resources Code (PRC) § 5079 to 5079.65 define the functions and duties of the Office of Historic Preservation, which administers federal- and state-mandated historic preservation programs in California as well as the California Heritage Fund.

California Public Resources Code (PRC) § 5097.9 to 5097.991 provide protection to Native American historical and cultural resources and sacred sites; identify the powers and duties of the Native American Heritage Commission (NAHC); require that descendants be notified when Native American human remains are discovered; and provide for treatment and disposition of human remains and associated grave goods.

**California Health and Safety Code**

California Health and Safety Code § 7050.5-7055 govern the process for reporting inadvertent discoveries of human remains to the County Coroner; the process for the County Coroner to report human remains of Native American descent to the Native American Heritage Commission (NAHC); and the protections offered against removal or desecration of human remains.

**California Code of Regulations**

The California Code of Regulations govern the nomination of resources to the California Register of Historical Resources (CRHR) (14 California Code of Regulations [CCR] § 4850). The regulations set forth the criteria for eligibility as well as guidelines for assessing historical integrity and resources that have special considerations.

**California Register of Historical Resources (CRHR)**

The State Historical Resources Commission has designed this program for use by state and local agencies, private groups, and citizens to identify, evaluate, register, and protect California's historical resources. The California Register of Historic Resources (CRHR) is the authoritative guide to the state's significant historical and archeological resources.

The California Register of Historic Resources (CRHR) program encourages public recognition and protection of resources of architectural, historical, archeological, and cultural significance; identifies historical resources for state and local planning purposes; determines eligibility for state historic preservation grant funding; and affords certain protections under the California Environmental Quality Act (CEQA). To be eligible for listing in the CRHR, a resource must meet at least one of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- Is associated with the lives of persons important to local, California, or national history.
- Embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of a master; or possesses high artistic values.
- Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance. Alterations to a resource or changes in its use over time may change its historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

Isolated finds, such as a single artifact with no other associated cultural materials, are generally considered to be ineligible for listing in the CRHR. However, the nature of the isolated resource and any available ethnographic data regarding affiliated Native American populations should be carefully considered during the evaluation process, particularly as it relates to potential eligibility under Criterion 4.

**California Historical Landmarks**

California Historical Landmarks are buildings, structures, sites, or places that have been determined to have statewide historical significance. The resource must be approved for designation by the County Board of Supervisors or the City/Town Council in whose jurisdiction it is located; be recommended by the State Historical Resources Commission; and be officially designated by the Director of California State Parks. A resource must meet at least one of these following criteria:

- Be the first, last, only, or most significant of its type in the state or within a large geographic region (Northern, Central, or Southern California).
- Be associated with an individual or group having a profound influence on the history of California.
- Be a prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in a region of a pioneer architect, designer, or master builder.

**California Points of Historical Interest**

California Points of Historical Interest are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points of Historical Interest designated after

December 1997 and recommended by the State Historical Resources Commission are also listed in the CRHR. No historical resource may be designated as both a landmark and a point. If a point is subsequently granted status as a landmark, the point designation is retired. To be eligible for designation as a Point of Historical Interest, a resource must meet at least one of the following criteria:

- Be the first, last, only, or most significant of its type within the local geographic region (city or county).
- Be associated with an individual or group having a profound influence on the history of the local area.
- Be a prototype of, or an outstanding example of, a period, style, architectural movement or construction or be one of the more notable works or the best surviving work in the local region of a pioneer architect, designer or master builder.

**California Historic Building Code**

The California Historic Building Code—California Code of Regulations, Title 24, Part 8—provides regulations for the preservation, restoration, rehabilitation, relocation, or reconstruction of buildings or properties designated as qualified historical buildings or properties. The California Historic Building Code is intended to provide solutions for the preservation of qualified historical buildings or properties, to promote sustainability, to provide access for persons with disabilities, to provide a cost-effective approach to preservation, and to provide for the reasonable safety of the occupants or users.

**City of Ontario**

The City of Ontario is a Certified Local Government (CLG) and a Preserve America Community that maintains a robust Historic Preservation Program (HPP) governed by the City's Historic Preservation Ordinance (HPO) and Article 26 of the City's Development Code. Per the City's process, all aspects of historic preservation are overseen by planning staff, the Historic Preservation Commission (HPC), and the Historic Preservation Subcommittee (HPSC). Cultural resources within the City are subject to evaluation for local listing under the City's Historic Landmark designation criteria:

a. It exemplifies or reflects special elements of the City's history;
b. It is identified with persons or events significant in local, state, or national history;
c. It is representative of the work of a notable builder, designer, architect, or artist;
d. It embodies distinguishing architectural characteristics of a style, type, period, or method of construction;
e. It is a noteworthy example of the use of indigenous materials or craftsmanship;
f. It embodies elements that represent a significant structural, engineering, or architectural achievement or innovation;
g. It has a unique location, a singular physical characteristic, or is an established and familiar visual feature of a neighborhood, community or the City; or
h. It is one of the few remaining examples in the City, region, state, or nation possessing distinguishing characteristics of an architectural or historical type or specimen.

Pursuant to Chapters 4 and 7 of the City's Development Code, minor alterations, restoration, rehabilitation, and demolition of historic resources listed in the local register require issuance of a

Certificate of Appropriateness with findings and an approved replacement structure/building prior to impact. Additionally, as outlined in Subsections G and H of Chapter 4, listed/eligible properties are designated a tier from a 3-tier system by the Historic Preservation Commission (or potentially a subcommittee of the commission) that helps identify a mitigation fee for properties based on size, type, and significance.

*Subsection G: Historic Resources Tiering System*

1. Tier I consists of historic resources that should not be demolished or significantly altered under any circumstances, regardless of their designation status, as they are the City's most significant historical or cultural resources:
    a. A resource listed on the Ontario Register that meets at least one of the criteria within the Architecture/Form category, and 3 criteria within the History category, listed in Subsection H; or
    b. A contributing resource within a district that meets at least one of the criteria within the Architecture/Form Category and 3 criteria within the History Category as listed below.
2. Tier II consists of historic resources wherein demolition of these properties should be avoided:
    a. Any historic resource listed or determined eligible for listing in the National Register of Historic Places;
    b. Any historic resource listed or determined eligible for listing in the California Register of Historic Resources;
    c. A historic resource listed on the Ontario Register and meets at least 2 criteria within the Architecture/Form or History categories, listed in Subsection H; or
    d. A contributing resource within an eligible historic district wherein the district meets at least 2 of the criteria in either the Architecture/Form or History categories as listed in Subsection H (Historic Resource Tiering Criteria) of this Section.
3. Tier III consists of historic resources that are Designated Local Historic Landmarks, are contributing properties within Designated Local Historic Districts, or are eligible historic resources. Demolition of these resources should be avoided where possible but may be appropriate under certain circumstances.

*Subsection H: Historic Resources Tiering Criteria*

1. Local Historic Landmark
    *a.* Architecture/Form
        (1) The resource is prototypical, or one of the finest examples, of a period, style, architectural movement, or construction in the City of a particular style of architecture, building type, or historical or archeological object. Only preeminent examples should be considered. Good representative examples of a style, period or method of construction are not appropriate; or
        (2) The resource is the first, last, only, or one of the finest examples, notable works, or the best surviving work by an architect or designer of major importance to the City, State or Nation.

*b.* History

(1) The resource is the location of a historic event(s) that has significantly contributed to the history of the City, State, or Nation;

(2) The resource is associated with a business, company, or individual that has made a significant cultural, social, or scientific contribution to the City, State, or Nation;

(3) The resource is identified with a person(s) who has exerted a major influence on the heritage or history of the City, State, or Nation;

(4) The resource embodies the ideals or principles of the "Model Colony" or furthers the ideals or principals established by the Chaffey Brothers;

(5) The resource has a direct relationship to one of the principal historic contexts in the City's history, including the "Model Colony," (includes the Chaffey Brothers, the Ontario Land and Improvement Company, or the citrus industry), the Guasti Winery or the wine industry, or the Dairy Preserve or the dairy industry;

(6) The resource is related with a business, company, or individual significant in the agricultural history of the City;

(7) The resource is related to the archeological past of the region.

2. Local Historic Districts

*a.* Architecture/Form

(1) The district contains resources that are a prototype of, or one of the finest examples of, or the first, last, only, or few remaining groupings of a period, style, architectural movement, or construction in the City of a particular style of architecture, building type, or historical or archeological object. Only preeminent examples should be considered. Good representative examples of a style, period or method of construction are not appropriate; or

(2) The district contains resources that are the first, last, only, or the finest examples, notable works, or the best surviving work by an architect or designer of major importance to the City, State or Nation.

*b.* History

(1) The district is the location of a historic event(s) that has significantly contributed to the history of the City, State, or Nation;

(2) The district is associated with a business, company, or individual that has made a significant, cultural, social, or scientific contribution to the City, State, or Nation;

(3) The district is identified with a person(s) who has exerted a major influence on the heritage or history of the City, State, or Nation;

(4) The district embodies the ideals or principles of the "Model Colony," or furthers the ideals or principals established by the Chaffey Brothers;

(5) The district has a direct relationship to one of the principal historic contexts in the City's history, including the "Model Colony," (includes the Chaffey Brothers, the Ontario Land and Improvement Company, or the citrus industry), the Guasti Winery or the wine industry, or the Dairy Preserve or the dairy industry, or the citrus industry; or

(6) The district is related with a business, company, or individual significant in the agricultural history of the City.

## ENVIRONMENTAL SETTING

The Project is situated in the northern Chino Valley region. The Chino Valley is characterized by a Mediterranean climate consisting of warm, dry summers and mild, wet winters. The Santa Ana River is located seven miles southeast of the Project area, and it originates in the San Bernardino Mountains and flows southwest through San Bernardino, Riverside, and Orange Counties to the Pacific Ocean. Elevation at the Project area is approximately 700 feet above mean sea level, and the topography is relatively flat across an alluvial fan. The late Quaternary Central Avenue fault line is located 5.5 miles to the west (U.S. Geological Survey 2024). Soil compositions consist mostly of Hilmar loamy fine sand (Hr) and Tujunga loamy sand (TuB) across the Project area (SoilWeb 2024). Geologic maps for this vicinity indicate that the Project area was originally underlaid by Holocene-age alluvial gravel and sand of valleys areas (Qa) (Dibblee and Ehrenspeck 2001; Dibblee and Minch 2002). However, the entire Project area has been graded and disced as a result of decades of agricultural activities. Minimal vegetation is present on the Project area as a result of the historic and modern agricultural disturbances, but this region would have once been a wet, lush valley that supported a variety of plant and animal resources. Surrounding land uses are also agricultural and rural land.

## CULTURAL AND HISTORICAL SETTING

### Ethnography

The proposed Project area is located within the ancestral territory of the Gabrieleño/Tongva. Although Alfred Kroeber recorded the territories of southern California tribes in 1925, the ancient territorial borders remain inexact for two reasons: first, territorial boundaries were flexible and, secondly, indigenous borders and land use were not recorded until after European settlements displaced many Native American communities. Although firm and defining borders cannot be known, archaeological, ethnographic, and historic evidence exists to support the prehistoric use by the Gabrieleño/Tongva in the Chino Valley.

The Gabrieleño/Tongva have a rich and diverse material culture, traditionally including shell set in asphaltum, carvings, painting, baskets, an extensive steatite industry, and a wide range of stone, shell, and bone materials. At the time of European colonization, they inhabited numerous permanent villages in fertile lowlands along waterways in sheltered areas along the coast, each of which held a population in the low hundreds. Smaller villages were also located at varying distances from these permanent villages, all of which were highly connected via economic, religious, and social ties (Bean and Smith 1978). Villages contained circular and domed homes made of tule mats, fern, or carrizo, as well as small, circular earth-covered sweathouses (Bean and Smith 1978; Kroeber 1925). Their hunting and gathering subsistence strategy included land and offshore efforts that resulted in the take of both small and large land animals, sea mammals, river and ocean fish, and a variety of plant resources. The population sometimes migrated between villages on a temporary basis throughout the year, returning to their permanent villages for ceremony or when resources needed to be replenished (Hudson and Blackburn 1982).

Records show that the long history of European colonization and harmful displacement of Native Americans initially began in 1542 as a result of Juan Rodríguez Cabrillo visiting the area during exploration. Following many subsequent Spanish visits to the region, the colonization of the indigenous population continued in 1769 around the same time as the establishment of Missions San Gabriel in 1771 and San

Fernando in 1797. Due in part to the introduction of new diseases, as well as the harsh conditions of mission life, the indigenous population quickly dwindled and cultural practices were lost. Following the secularization of the missions, most surviving Gabrieleño/Tongva became wage laborers on the ranchos of Mexican California and were later nearly completely wiped out as a result of a smallpox outbreak in the 1860s. The combination of removal, murder, disease, forced labor, and poor diet contributed to the harmful diaspora of the Gabrieleño/Tongva from established villages to scattered areas of the Los Angeles Basin for survival (Bean and Smith 1978). This history of displacement within their own ancestral lands has led to difficulty in attaining federal recognition. However, the 20th century found a revitalization of the Gabrieleño/Tongva people and culture, and though the communities remain unrecognized by the Federal government, they remain a very active people in their ancestral lands today.

**Prehistory**

Cultural theoretic frameworks for southern California archaeology are frequently debated and refined by archaeologists. The early chronologic models proposed by Wallace (1955, 1978) and Warren (1968) continue to be incorporated into current cultural studies with revisions. Archaeologists have developed the cultural frameworks in southern California by generally relying on relative dating methods using diagnostic artifacts, as opposed to absolute dating, due to a general lack of chronometric data available in the regional archaeological record. The framework proposed by Wallace introduced the Early Period, Millingstone Period, Intermediate Period, and Late Prehistoric Period, which generally follows the geologic time scale of Early, Middle and Late Holocene.

<u>Early Holocene (10,000-7500 calibrated years Before Present (cal BP)</u>

A gradual warming of the environment occurred during the Early Holocene. Researchers have proposed that groups from the Early Holocene were highly mobile and traveled across wide ranges. Cultural resources were portable or expedient to accommodate mobility. Archaeologists have recorded artifacts associated with hunting and plant processing at early Holocene sites, such as projectile points, bifaces, and groundstone tools.

<u>Middle Holocene (7500-3500 cal BP)</u>

The Millingstone Period during the Middle Holocene is characterized by new artifact types. The warming of the environment resulted in adaptations to changing environments and associated plant and animal resources. Temporary and seasonal camps were utilized during the Middle Holocene. Tools were intentionally cached, which indicate an intent to return to specific sites over time. Diagnostic artifacts have been recorded at Middle Holocene sites, such as Pinto and Silver Lake projectile points.

<u>Late Holocene (3500 cal BP through Historic Contact)</u>

Archaeological sites from the Late Holocene contain increasingly diverse artifact assemblages. Increased population is evident and multiple family groups likely coexisted within the communities. Proximity to water was an important factor for the seasonal and permanent settlements. Late Prehistoric archaeological sites contained diverse artifact assemblages, including projectile points, ceramics, pendants, incised stones, and shell beads. An increase in hunting efficiency occurred during the Late Prehistoric Period and Protohistoric Period, which is evident by the bow and arrow technology. An

abundance of mortars and pestles have been recorded at village sites and further indicate a transition towards sedentary habitation.

**History**

The Spanish first arrived at San Bernardino County in 1772 with the expedition of Pedro Fages. In 1774, Juan Bautista de Anza reached the San Bernardino Valley due to his commission to set up quarters at the Mission San Gabriel (Beck and Haase 1974). At this time, an estimated thousands of Native Americans, including the Gabrieleño/Tongva, were either taken to the Mission, removed to work as forced agricultural labor at the estancia in Redlands that served as outpost for the Mission, fled the region, or were killed (Beattie 1923). The Mission San Gabriel and its outposts resulted in a large pastoral empire that extended across the San Bernardino Valley. Cattle ranching became a major local industry during the Mission period.

In 1821, Mexico overthrew Spanish rule, and the Missions began to decline. By 1833, the Mexican government passed the Secularization Act and the Missions, reorganized as parish churches, lost their vast land holdings, and released the indigenous people that remained. Following this, land throughout present-day California was organized into Mexican land grants, and these large pastoral estates continued conducting cattle ranching during the Mexican or Rancho Period (Bacich 2017). One of the largest land grants in the area was the 22,000-acre Rancho Santa Ana del Chino, which encompassed the current Project area. In 1841, the Spanish governor Alvarado granted Rancho Santa Ana del Chino to his uncle, Antonio Maria Lugo. After receiving half of the ownership from Lugo, Isaac Williams built the Chino Ranch into an empire. The Treaty of Guadalupe Hidalgo in 1848 ended the Mexican-American War and the Mexican Rancho Period, triggering what is commonly referred to as the American Period (Del Castillo 1992).

California achieved statehood in the U.S. in 1850, which was quickly followed by the establishment of the County of San Bernardino in 1853. The arrival of the Southern Pacific Railroad to the San Bernardino Valley stimulated further development and settlement. The citrus industry continued to fuel the local economy and contributed to the regional land boom. The local area of Ontario began as a township founded in 1881 by two brothers George and William Chaffey. The local landowners and developers named the township after their hometown of Ontario, Canada. The Chaffey brothers purchased 6,000 acres of land with water rights in present-day Ontario to start the township. Part of the land included space for the Chaffey Agricultural College. The planned Ontario township was declared a “Model Colony” by an Act of Congress. The water rights, agricultural college, and access to transportation encouraged farmers to settle there (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2024). Euclid Avenue was established as a main boulevard in the colony. Dairies were established in the local area in the 1890s after dairy cows came to the California market as a part of the Gold Rush (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2024).

The City of Ontario was incorporated in 1891, during which time citrus crops were the staple of the successful agricultural community, with the local dairy industry only just beginning. The Steel and Green Dairy, which was comprised of adobe buildings at the location of the Battle of Chino, is considered to be

the first dairy developed in the area. Large, available tracts of land prime for agricultural uses in the area were a draw for dairy farmers from Los Angeles County, though citrus remained the dominate industry through the 1940s. Dairies remained smaller family-owned businesses during this period, and the 1920s saw an influx of Dutch immigrants establishing dairies in the areas. Despite the smaller sizes of the operations, the industry boomed alongside surrounding population growth, and dairies began switching from free grazing to dry-lot dairying and mechanized milking in order to optimize milk production and improve efficiency (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2004).

After World War I, many dairies were plagued by tuberculosis in dairy cows, leading to new requirements around pasteurization. Around the same time, some of the industry in Ontario transitioned to aviation when aviation enthusiasts Waldo Waterman and Archie Mitchell established Latimer Field. Eventually, the fliers were moved east to Ontario World Airport, which operated as a training facility for pilots during World War II. During this time, the population across the Los Angeles basin began to grow into a large urban area, pushing dairy farms further into the Chino Valley. By 1949, dairies in the local area provided for over 33% of the dairy production within the County. In the 1950s, the City experienced the same post-World War II population and related housing boom that was so common across the region, and many farming families firmly settled in the area so that by the late 1950s/early 1960s, the Chino Valley was home to the most technologically advanced dairies in the entire country (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2004).

During the post-World War II era, an increased popularity in utilizing Herringbone milk parlors that raised cows on platforms for milking became popular as a way of providing safer working conditions and controlling costs of labor. Prior to this in the 1920s through 1940s, milk parlors were more often constructed in an Art Deco style (1920s-1930s) followed by the Streamline Moderne style (1930s-1940). While the Art Deco milk parlors were more decorative with chevrons and zig-zags and maintained geometric and angular edges, the Streamline Moderne style milk parlors were more utilitarian and designed as two-part buildings with a large area for milking with a connected cooling area that would have maintained a smooth symmetrical style with a flat roof, stucco cladding, and glass block windows. The popularity of the glass block windows in milk parlors peaked in the 1950s, though continued to be constructed in the 1960s (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2004).

In 1967, the County of San Bernardino designated 14,000 acres of Chino Valley agricultural land as an agricultural preserve and, by 1980, the local area had evolved into a world-class dairy center (City of Ontario 2024; Galvin and Associates 2004). However, the land was annexed into Ontario, Chino, and Chino Hills during the 1990s due to rising dairy operation costs and housing demands. The City of Ontario then began referring to their annexed 8,200 acres of the former San Bernardino Agricultural Preserve as the New Model Colony (NMC), which was named after the original Model Colony of Ontario established by the Chaffey brothers. The NMC is also modernly known as Ontario Ranch (City of Ontario 2024; Galvin and Associates 2004).

Ontario’s diverse history of irrigation, agriculture, viticulture, dairy, aeronautics, and World War II production transitioned the City to the next stage of expansive growth, which was focused primarily on

service industries and warehouses in the second half of the 20th century. The City's modern economic base is primarily focused on industrial and manufacturing operations and transportation (freeway, rail, and airport). Today, the City is approximately 32,000 acres in size and continues to be a booming and thriving community (City of Ontario 2024; Galvin and Associates 2004).

## METHODS

All efforts made for the completion of this report were completed pursuant to requirements set forth in the California Environmental Quality Act (CEQA). This study is intended to identify whether cultural resources are located within the Project area, whether any cultural resources are potentially significant pursuant to the above-referenced regulations and standards, and to develop specific recommendations that will address potential impacts to existing or potential resources. Tasks completed include:

- A Sacred Lands Files (SLF) search through the Native American Heritage Commission (NAHC) and a cultural records search through the South Central Coastal Information Center (SCCIC),
- A review of local, state, and national registers and inventories,
- A review of the City's 2004 Historic Context and 2025 draft Historic Context,
- Outreach to the California Office of Historic Preservation (OHP), the City, and GPA Consulting (formerly Galvin & Associates),
- A review of historical and topographic maps and other available literature,
- A pedestrian survey of the Project area,
- Recordation and evaluation of identified cultural resources, and
- Development of recommendations and/or mitigation measures for cultural resources identified or potentially unrecorded within the Project area.

## RESEARCH

### Sacred Lands File Search

The NAHC conducted a search of SLFs for the Project area and vicinity at the request of Kimley-Horn. The NAHC responded on June 10, 2024 and indicated that the results are positive for documented sacred lands in or near the Project area. The results are included in **Appendix A** of this report. The NAHC also provided a list of Native American Tribes who should be contacted for further information. The City of Ontario is responsible for conducting the applicable Assembly Bill (AB) 52 and Senate Bill (SB) 18 Tribal consultation with the Native American Tribes. The results of any Tribal consultation conducted by the City, and any information about Tribal Cultural Resources provided during consultation, will be outlined in the environmental documents prepared for the proposed Project.

### Cultural Resource Records Search

Kimley-Horn cultural resources management staff conducted a cultural resource records search at the SCCIC for the Project area plus a 0.5-mile buffer (record search area) on June 10, 2024 (**Figure 3**). No cultural resources were identified within the Project area during the records search at SCCIC, though two (2) cultural resources were identified within the 0.5-mile buffer: two (2) Southern California Edison transmission lines originally constructed during the historic period. According to the SCCIC's records, four (4) previous cultural studies have occurred in the Project area. However, the studies incorporated large-

scale linear surveys for proposed utility projects and covered very little of the Project area. The results of the records search are outlined in **Table 1** and **Table 2** below, as well as in **Appendix B** of this report.

**Table 1: Previously Recorded Cultural Resources in the Record Search Area**

| Resource | Resource Name | Age | Type | Approximate Location |
|---|---|---|---|---|
| P-36-025440 | Chino-Mira Loma No. 1 Transmission Line | Historic | Structure | 0.35 miles northwest of Project area |
| P-36-026051 | Hayfield-Chino 220kV Transmission Line | Historic | Structure | 0.05 miles north of Project area |

**Table 2: Previous Cultural Studies Identified in the Record Search Area**

| Report | Year | Author | Title |
|---|---|---|---|
| SB-01499 | 1985 | Foster, John M. and Roberta S. Greenwood | Cultural Resources Overview: California Portion, Proposed Pacific Texas Pipeline Project |
| SB-03012* | 1995 | Owen, Shelley Marie | Cultural Resources Survey and Impact Assessment for The Cajon/EPTC Pipeline Project Located in Portions of Los Angeles, San Bernardino, And Orange Counties, CA |
| SB-06095 | 2009 | Applied Earthworks | Confidential Cultural Resources Specialist Report for The Tehachapi Renewal Transmission Project |
| SB-07956* | 2007 | Doolittle, Christopher J. | Archaeological Survey Report for Southern California Edison's G.O. 131-D Assessment of The Chino A-Bank System and System Split Project San Bernadino County, CA |
| SB-07968* | 2011 | Holm, Lisa and John Holson | Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segment 8 East (Phases 2 And 3) And West (Phase 4), Los Angeles/San Bernardino Counties, CA |
| SB-07977* | 2010 | Panich, Lee, Tsim D. Schneider, and John Holson | Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segment 8 East (Phases 2 And 3), San Bernardino County, CA |

**Intersects Project Area*

**Local, State, and National Registers and Inventories**

Staff conducted a review of the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), National Historic Landmarks list (NHL), and the Built Environment Resource Directory (BERD). The BERD listed five (5) built environment resources located within the Project area:

- 7587 Edison Avenue
- 7721 Edison Avenue
- 7914 Edison Avenue
- 8185 Edison Avenue
- 14213 Bon View Avenue

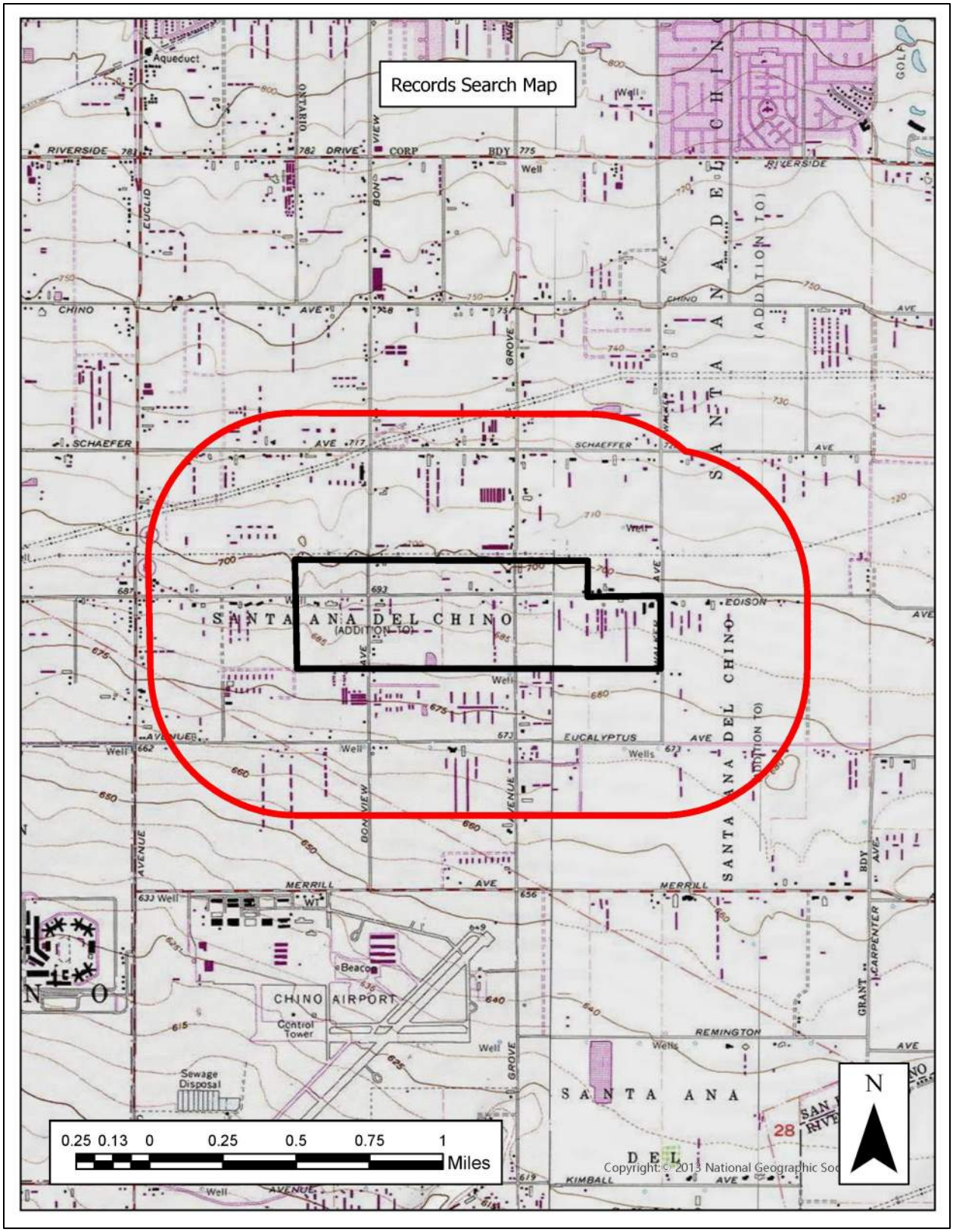


Figure 3: Record Search Area Map

Each resource was assigned a California Historical Resource Status Code of 7R, which indicates they were identified during a reconnaissance level survey but not evaluated for significance. Many additional buildings located in the Project vicinity, but outside of the Project area, were also listed in the BERD, specifically along Edison Avenue, Bon View Avenue, and Grove Avenue.

**2004 Historic Context Review**

In 2024, Kimley-Horn staff reviewed the Historic Context for the City of Ontario dairy industry prepared by Galvin and Associates in 2004. The historic context examined the New Model Colony (NMC) across 711 individual parcels and 8,200 acres, an area now known as Ontario Ranch. The current Project area is entirely located within the Ontario Ranch community. The NMC historic context identified three (3) distinct periods in local and regional dairy farming: 1) Free Grazing, 2) Dry Lot to Mechanization, and 3) Intense High Technology. Most of the dairy properties in their study area encompassed, at the minimum, a single-family residence and a milking parlor (barn). The authors also identified six (6) architectural styles or influences within their study area:

1. Victorian (1870-1915) and Italianate (1890-1935) influences
2. Craftsman Bungalow style (1905-1930)
3. Art Deco/Art Moderne style (1920-1940)
4. Minimal traditional style (1930-1960)
5. Ranch style (1935-1990)
6. Utilitarian buildings (no specific date)

Using this data, Galvin and Associates (2004) defined nine (9) historic contexts for the NMC study area:

1. Pre-1930: Rural Residential or Free-Grazing Dairy Properties
2. 1920-1940: Art Deco or Streamline Moderne Milk Parlors
3. 1930-1949: Dry Lot Dairying with Mechanization
4. Post-1950: Scientific, Large Capacity Dairies
5. No date specified: Dairy Support Industries or Other Commercial Properties
6. No date specified: Ranch Style Houses
7. No date specified: Craftsman Style Houses
8. No date specified: Buildings with Portuguese Design Influence, and
9. No date specified: Buildings with Dutch Design Influences

Galvin and Associates' 2004 study identified 15 properties within the current Project area. The 15 properties consist of the following addresses, also identified in **Table 3** below:

- 14213 Bon View Avenue
- 14283 Bon View Avenue
- 7587 Edison Avenue
- 7691 Edison Avenue
- 7721 Edison Avenue
- 7891 Edison Avenue
- 7914 Edison Avenue
- 8061 Edison Avenue
- 8185 Edison Avenue
- 8292 Edison Avenue
- 8311 Edison Avenue
- 8381 Edison Avenue
- 8485 Edison Avenue
- 14049 Grove Avenue
- 14117 Grove Avenue

The 2004 study indicated each property was recorded, though no site records were located at the SCCIC during the record search. As such, Kimley-Horn contacted the City on Ontario, OHP, and GPA Consulting (formerly Galvin and Associates) to request copies of any existing documentation of the 15 cultural resources. GPA Consulting indicated that the records were digitized in the City's internal California Historical Resources Inventory Database (CHRID) and that they did not have copies of the records. OHP was able to identify and provide DPR forms for four (4) resources, and the City of Ontario was able to provide one (1) additional site record. The City of Ontario also directed Kimley-Horn to the City's digital database, CHRID, to see if any additional information could be obtained for the sites. The platform is no longer managed and, therefore, the majority of the data is no longer retrievable. However, nine (9) of the addresses were located within CHRID and their records did provide data related to the original Assessor Parcel Numbers (APNs) that were recorded as a part of each site. As such, Kimley-Horn staff were able to re-create the majority of the original site boundaries to facilitate early stages of research for this study. More detail related to data available for each resource is located in **Table 3** below, excluding information related to the SCCIC, as the record search did not produce any relevant site data.

| **Color Key for Table 3 (below)** |
|---|
| No records were located |
| A record was located, but is missing key details, such as site information, site boundary data, etc. |
| A record was located and maintains sufficient site information, site boundary data, etc. |

**Table 3: Results of Record Searches and Record Outreach for Each Property**

| Address | CHRID | City of Ontario | OHP |
|---|---|---|---|
| 14213 Bon View Ave | Data Located | Data Located | Data Located |
| 14283 Bon View Ave | No Data Located | No Data Located | No Data Located |
| 7587 Edison Ave | Data Located | Data Located | Data Located |
| 7691 Edison Ave | No Data Located | No Data Located | No Data Located |
| 7721 Edison Ave | Data Located | Data Located | Data Located |
| 7891 Edison Ave | Data Located | No Data Located | No Data Located |
| 7914 Edison Ave | Data Located | Data Located | No Data Located |
| 8061 Edison Ave | Data Located | No Data Located | No Data Located |
| 8185 Edison Ave | No Data Located | Data Located | Data Located |
| 8292 Edison Ave | No Data Located | No Data Located | No Data Located |
| 8311 Edison Ave | Data Located | No Data Located | No Data Located |
| 8381 Edison Ave | No Data Located | No Data Located | No Data Located |
| 8485 Edison Ave | No Data Located | No Data Located | No Data Located |
| 14049 Grove Ave | Data Located | No Data Located | No Data Located |
| 14117 Grove Ave | Data Located | Data Located | No Data Located |

As a result of outreach to the City, it was noted that an update to the 2004 historic context, which would include recordation and evaluation of all historic-era structures in the NMC area, was in development by

Urbana Preservation & Planning, LLC (Urbana) and that site records for the Project area would be available for utilization in this report. As such, Kimley-Horn conducted a review of the updated 2025 historic context as a part of this study, the results of which are noted below. Additionally, site information compiled as a result of both Kimley-Horn and Urbana surveys is included later in this report, and copies of all site records prepared by Urbana can be found in **Appendix C**.

**2025 Draft Historic Context Review**

Kimley-Horn staff reviewed the draft Historic Context for the City of Ontario dairy industry prepared by Urbana in 2025. This historic context served as an update to the 2004 study described above and examined the same 8,200-acre area that makes up the NMC, now known as Ontario Ranch. During review of the 2004 study for a nearby project in 2023, BCR Consulting identified issues with data availability within the historic context and argued that actual construction of Streamline Moderne Milking Parlors did not take place within the Art Deco era (1920-1940). Instead, their study resulted in the recordation and evaluation of this building type with an associated period of significance of 1940-1965 (Brunzell 2023). During the efforts made for the 2025 historic context update, Urbana recognized a similar error in the 2004 study, though differently from BCR Consulting, concluded that both the Art Deco and Streamline Moderne styles were utilized from the 1920s through the 1960s. Additionally, Urbana's investigations identified inaccuracies with the year-built data utilized in the 2004 report, noting that many properties were developed later than what was recorded. As such, the 2025 study not only provides an updated historical narrative for the regional dairy industry but also includes necessary corrections to the prior context.

The 2025 study identified six (6) distinct themes and associated time periods in local and regional dairy farming: 1) Early Dairy Farms in Ontario, 1900s-1929, 2) Depression-Era and Wartime Dairies, 1930s-1945, 3) Postwar, Large-Capacity Dairies, 1945-1980, 4) Consolidation of Dairy Operations, 1980s-1998, 5) Important Persons, Families, and Ethnic Groups, and 6) Historic Architectural Styles, 1880s-1980s. Though significant people and ethnic groups were noted in the 2004 study, the 2025 study provides a much more detailed summary with an emphasis on Mexican, Portuguese, Basque, and Dutch immigrants. Additionally, the 2025 study includes an updated overview of significant architectural styles, categories, and influences for Ontario Ranch:

- Utilitarian, Vernacular Agricultural Architecture (1880s-1930s)
- Folk Victorian (1880s-1915)
- Craftsman (1900s-1930s)
- Art Deco (1920-1960s)
- Streamline Moderne Style (1930-1960s)
- Minimal Traditional Style (1930-1960)
- Ranch Style (1950-1980)
    - Dutch Influences
    - Portuguese Influences

In addition to updates to the historical context, the 2025 study included a large-scale survey of the Ontario Ranch area. The survey effort included recordation and evaluations of historic-era resources using the

updated historic context, significant themes, and architectural styles. As a result of the survey, Urbana identified 14 properties within the current Project area. The information in **Table 4** below includes the addresses for each of these properties, as well as details regarding their relationship to the 15 properties recorded in 2004.

| **Table 4: Properties Identified in 2025 Historic Context and Their Relationship to 2004 Properties** | |
|---|---|
| **Addresses/Name** | **Relationship to 2004 Properties** |
| 13839-13905 Bon View Ave | Not previously recorded within Project area; consists of 3 APNs, though the 1 APN within the Project area does not contain structures |
| 7587-7697 Edison Ave | Includes 2 previously recorded properties (7587 and 7691 Edison Ave) that were recorded separately; now combined |
| 14213-14297, 14333-14353, 14450, and 14451 Bon View Ave | Includes 2 previously recorded properties (14213 and 14283 Bon View Ave) that were recorded separately; now combined |
| 7914 Edison Ave | Previously recorded with the same address |
| 7595 Schaefer Ave and 13752 Bon View Ave | Not previously recorded within Project area; consists of 7 APNs, though the 2 APNs within the Project area do not contain structures |
| 13715-13751 Grove Ave, 13817-13819 Grove Ave, 8270-8292 Edison Ave | Includes 1 previously recorded property (8292 Edison Ave) in the Project area; 8270 Edison Ave was not previously recorded in the Project area; remainder of the properties are not located in the Project area |
| 8040 Schaefer Ave and 14050 Grove Ave | Not previously recorded within the Project area, though resides entirely within the Project area and contains historic structures |
| 8061 Edison Ave | Previously recorded with the same address |
| 7721-7891 Edison Ave | Includes 2 previously recorded properties (7721 and 7891 Edison Ave) that were recorded separately; now combined |
| 8185 Edison Ave | Includes 2 previously recorded properties (8185 Edison Ave and 14117 Grove Ave) that were recorded separately; now combined |
| 8311 Edison Ave | Previously recorded with the same address |
| 8335-8381 Edison Ave | Previously recorded as separate properties; now combined; consists of 4 APNs, though only 2 APNs that make up 8381 Edison Ave are within the Project area; 8335 Edison Ave was not previously recorded in the Project area |
| 8485 Edison Ave and 14350 Walker Ave | Previously recorded only as 8485 Edison Ave; now combined with 14350 Walker Ave, which was not previously recorded |
| 14049 Grove Ave | Previously recorded with the same address |

As indicated in the above table, Urbana's study made numerous changes to the site boundary delineation of the previously recorded properties, including separating resources, combining resources, and adding new APNs to resources, though all of the previously recorded properties in the current Project area were included in the updated inventory. The resource names and site boundaries reported within the 2025 Urbana study are henceforth utilized within this report for consistency.

It is important to note that while 13839-13905 Bon View Avenue and 7595 Schaefer Avenue/13752 Bon View Avenue both overlap with the Project area, the portions of the properties within the Project area consist of vacant land and there are no recorded historic-era features (i.e., buildings or structures) from these properties within the Project area. Therefore, there is no potential to impact these properties as potential historical resources, as defined under CEQA, and these properties will not be reported as cultural resources within the current Project area for the purposes of this study. As such, Kimley-Horn identified 12 cultural resources with historic structures in the Project area via the review of Urbana's 2025 study.

**Archival and Historical Research**

Kimley-Horn conducted a review of historic maps and imagery to determine the land use history across the Project area, as shown in **Figures 4-9** below (Historic Aerials 2024).

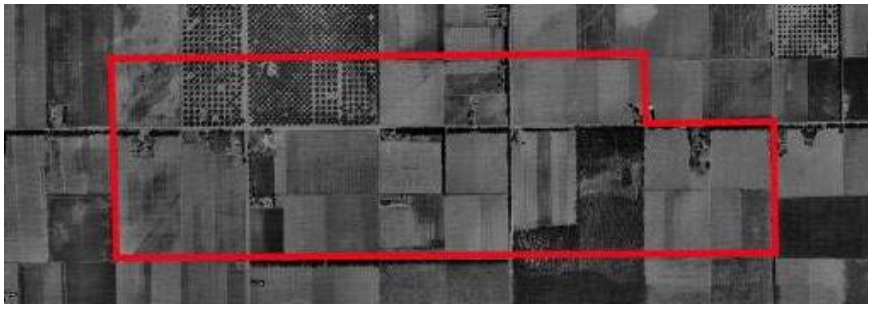

Figure 4: Historic Aerial Image of Project Area (1938)

Figure 5: Historic Aerial Image of Project Area (1946)

Figure 6: Historic Aerial Image of Project Area (1959)

Figure 7: Historic Aerial Image of Project Area (1966)

Figure 8: Historic Aerial Image of Project Area (1980)

Figure 9: Historic Aerial Image of Project Area (2020)

**Cultural Field Survey**

On June 13, July 3, July 10, and July 16, 2024, a pedestrian survey was conducted for the Project area by Kimley-Horn cultural resources management staff utilizing intensive-level and reconnaissance methods (**Figure 10**). All surface exposures were carefully inspected for the presence of cultural resources. Digital photographs were taken at various points in the Project area. Reconnaissance methods were incorporated when access was impeded by active dairy operations or landowner permissions. Survey was limited to the public right-of-way at parcels where access was not granted.

The Project area remains an active dairy and agricultural area. As such, ground visibility ranged widely during the pedestrian survey but averaged 80%. While visibility was excellent in the agricultural pastures,

the Project area also contained many paved areas that affected surface soil visibility. It was also noted that the portions of the Project area with visible soil have been heavily disturbed due to over a century of dairy and agricultural activities. Additionally, while most of the parcels were in use for active dairy operations, some parcels had been modernly developed.

Staff observed multiple building types during the survey, including single-family residences, milk parlors, ancillary buildings (garages, storage sheds), and ancillary dairy farm structures (pole barns, shade structures, troughs, holding tanks). Numerous architectural styles or influences were identified in the Project area during the survey, such as Craftsman, Ranch, Midcentury Modern, Minimal Traditional, Vernacular, Streamline Moderne, and Art Deco. Staff noted that many of the milk parlors and adjacent residences corresponded in their architectural styles. All historic-era structures were photographed and notes were taken for later use in the report. No prehistoric archaeological resources were observed during the survey.

Figure 10: Project Area Overview

Urbana surveyed the entire Ontario Ranch area between October 2024 and April 2025 for the City's updated historic context, with a focus on dairy farms and properties developed and utilized through the 1980s. Their survey observed the Project area in similar condition as the Kimley-Horn surveys.

**Resource Summary**

As noted previously, many of the previously recorded resources within the Project area had either missing or incomplete site records when Kimley-Horn initiated this study in 2024. As such, Kimley-Horn prepared new site descriptions as a result of record search and survey efforts for use in this report. Additionally, Kimley-Horn prepared preliminary evaluations of each resource, though these were conducted utilizing the 2004 historic context. However, upon receiving copies of the updated 2025 historic context and new site records prepared by Urbana from the City, Kimley-Horn made extensive updates within this report to

ensure consistency with the resource names/addresses, boundaries, site descriptions, and evaluations reflected in Urbana's documents.

As a result of this study, a total of 12 cultural resources were identified within the Project area. A list of each resource, including the address and associated APNs for each resource, is included below in **Table 5** below. Additionally, the exact location of all 12 resources, plus the two (2) resources that were excluded from the study due to lack of historic structures in the Project area, can be viewed on **Figure 11** on page 37 of this report.

| **Table 5: List of Properties (Addresses and APNs) Identified within the Project Area** | |
|---|---|
| **Addresses/Name** | **APNs** |
| 7587-7697 Edison Ave | 105337101, 105337102, and 105353101 |
| 14213-14297, 14333-14353, 14450, and 14451 Bon View Ave | 105335101, 105335102, 105354101, 105354102, 105357101, and 105357102 |
| 7914 Edison Ave | 105317101, 105332102, 105332103, and 105317106 |
| 13715-13751 Grove Ave, 13817-13819 Grove Ave, 8270-8292 Edison Ave | 021631105, 021631104, 021631103, 021631108, and 021631109 |
| 8040 Schaefer Ave and 14050 Grove Ave | 105332101 |
| 8061 Edison Ave | 105333101, 105333102, 105333103, 105333104, 105334101, and 105334102 |
| 7721-7891 Edison Ave | 105336101, 105336102, and 105336103 |
| 8185 Edison Ave | 021632103 |
| 8311 Edison Ave | 021632108 |
| 8335-8381 Edison Ave | 021632201, 021632202, 021632203, and 021632204 |
| 8485 Edison Ave and 14350 Walker Ave | 021632205 and 021632210 |
| 14049 Grove Ave | 021631101 and 021631102 |

**RESOURCE DESCRIPTIONS AND EVALUATIONS**

The 12 cultural resources identified within the Project area are briefly described below, along with conclusion made as to their eligibility for listing in the California Register of Historical Resources (CRHR) and designation as a City of Ontario Historic Landmark. Much of the below narrative was retrieved directly from the respective site record prepared by Urbana located in **Appendix C**, though each record contains additional detailed information for each resource.

*7587-7697 Edison Ave*

This property includes three (3) parcels that total 46.58 acres located south of Edison Avenue between Sultana and Bon View Avenues. It includes a Craftsman Bungalow style dwelling and detached garage, a

Ranch style milk parlor, a Ranch style dwelling, several ancillary structures/features associated with dairy operations (silos, troughs, feeding gates, sheds, pole structures, etc.), and a paved driveway. The property dates to pre-1935 with later developments between 1959 and 1966 and was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The pre-1935 Craftsman house has an asymmetrical façade with a one-and-a-half-story irregular floor plan. The exterior is clad in tan stucco with red trim on the windows and doors. The high-pitched, side-gabled roof is covered in composition shingles and includes a wide eave overhang, open eaves, decorative wood brackets below the gable end, and exposed rafter ends. A stucco chimney rises from the front roof slope. The fenestration consists of wood-framed, one-over-one, double-hung and fixed windows with red-painted lintels and sills. The main (north) elevation features a full-width front porch beneath the main roofline, supported by tapered wood/concrete beams, as well as a gabled dormer centered on the roof slope. At the rear (south) elevation, a two-story addition was added to the southwest corner in the late 1970s, which has a gabled roof, aluminum sliding sash windows, and a tan stucco façade. It is easily distinguishable from the original structure but is compatible with the dwelling's historic character and did not result in the removal of original character-defining features. East of the dwelling is a detached one-car garage with a rectangular floorplan, tan stucco facade, and gabled roof.

The Ranch style dwelling at 7587 Edison Avenue and the associated Ranch style milk parlor were constructed between 1959 and 1966. The milk parlor features a horizontal floor plan with two milking parlor wing sections separated by a breezeway. The front section exhibits Ranch style characteristics, including a hip-and-gable roof with wood shake shingles, stucco walls, metal fixed and casement windows, and a stone veneer. The breezeway has metal doors on both the east and west elevations. South of the breezeway, the milking parlor sections have low sloped gable roofs oriented along an east-west axis. Ventilation is provided by horizontal louvered metal shutters on the north and south elevations, positioned between concrete walls. Additional features include a metal door at the main (north) entryway, a circular driveway, and a bulk tank in front with two silos are located at the rear. The dwelling has an asymmetrical façade and a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a stone veneer on the main (north) elevation. The moderately pitched hip-and-gable roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, a cupola above the breezeway, and a stone chimney on the rear roof slope. The fenestration consists of a mix of aluminum fixed and sliding sash windows and vinyl units. The primary elevation features a recessed entryway below the main roofline with two double half-lite wood doors, a small concrete stoop, a stone planter, and box bay windows accented by red horizontal wood siding. A wide, open breezeway on the east elevation connects the three-car garage to the dwelling.

- The entire property is eligible under CRHR and City of Ontario criteria 1/a for its significant association with the "Postwar, Large-Capacity Dairies, 1945–1980" theme.
- The pre-1935 Craftsman Bungalow is individually eligible under CRHR and City of Ontario criteria 3/d within the "Craftsman Bungalow Style, 1900s–1930s" context with a period of significance of 1920s-1930s.

- The Ranch style dwelling is individually eligible under CRHR and City of Ontario criteria 3/d within the "Ranch Style, 1950–1970s" context with a period of significance of 1959-1966.
- The Ranch style milk parlor is not individually significant, though remains a contributor to the overall significance of the property as a Postwar Large Capacity Dairy complex.

*14213-14297, 14333-14353, 14450, and 14451 Bon View Ave*

This property includes six (6) parcels that total 56.47 acres located east of Bon View Avenue between Euclid and Eucalyptus Avenues. It includes two (2) Ranch style milk parlors, two (2) Minimal Traditional residences, two (2) Craftsman Bungalow residences, two (2) Ranch style dwellings, and multiple geometrically spaced ancillary storage structures located to the rear of the buildings. The property dates to pre-1935 with later improvements between the 1950s and 1990s, and was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

Both Craftsman Bungalows were constructed before 1935. One (1) bungalow located at 14213 Bon View Avenue is a one-and-a-half-story dwelling that has a compact rectilinear floorplan and an asymmetrical façade. The exterior is clad in tan stucco with brown trim on the windows. The high-pitched, cross-gabled roof is topped with composition shingles and features a moderate eave overhang, support brackets below the gable, open eaves with exposed rafter ends, and a shed dormer on the main (west) elevation. The fenestration consists primarily of aluminum sliding sash windows and wood panel doors. The main elevation includes a full-length porch supported by two (2) metal columns, a small stoop, and four (4) concrete square columns approximately four (4) feet in height. The rear (east) elevation features an early addition that was added between 1938 and 1946 and features a stucco façade, gabled roof topped with composition shingles, open eaves with exposed rafter ends, and aluminum windows. It likely originally featured wood-framed, double-hung windows as well as columns composed of a different material, which were removed or altered. The other bungalow at 14343 Bon View Avenue features a rectangular footprint and an asymmetrical façade with a tan stucco exterior. The high-pitched, side-gabled roof is topped with composition shingles and includes a minimal eave overhang, boxed eaves, and two (2) gabled dormers on the north and south elevations. The fenestration primarily consists of aluminum sliding sash windows. An addition was constructed at the east elevation between 1959 and 1966. The dwelling exhibits minimal decorative detailing throughout. A few feet north of the dwelling is a one-car garage, which features a front-gabled roof and a metal overhead door.

A Ranch style milk parlor and two (2) Minimal Traditional residences at 14213-14297 Bon View Avenue were constructed between 1959 and 1966. The milk parlor is a one-story structure that has been substantially altered and now consists of three (3) sections: the front milk house with an addition to the south elevation, the original rear milking parlor to the east of the milk house, now modified as a storage shed, and a new milking parlor section extending from the milk house addition. The milk house and milking parlor are separated by a breezeway which features a metal sliding barn door with a handle on the south elevation. Additional elements include metal doors at the front, a dairy association sign below the gable, and a circular driveway in front of the milk parlor. Both associated Minimal Traditional residences feature asymmetrical façades and rectilinear floorplans atop concrete foundations. The 14283 Bon View Avenue

dwelling has a tan stucco exterior, a hipped roof topped with composition shingles, moderate eave overhang, and boxed eaves. The main entryway is recessed, with a partial porch that includes a small stoop and decorative iron railing and columns. Fenestration consists of aluminum sliding sash windows and paneled doors. The 14297 Bon View Avenue dwelling features a tan stucco façade, a side-gabled roof with composition shingles, and an attached narrow garage with an overhead metal door. The main elevation includes a half-width porch supported by decorative metal columns and railing, a small stoop, aluminum sliding sash windows, and paneled doors.

The Ranch style dwellings were both constructed between 1968 and 1975. The dwelling at 14353 Bon View Avenue features an asymmetrical, horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan-painted stucco with brown window trim. The low-pitched hipped roof is topped with terracotta tiles and features a minimal eave overhang with boxed eaves. The fenestration is mostly obscured from the public right-of-way but appears to consist of fixed multi-lite or single pane picture windows. A detached one-car garage is situated south of the dwelling, featuring a tan stucco façade, a hipped roof with terracotta tiles, and a metal overhead door. The dwelling at 14451 Bon View Avenue has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a brick veneer and a planter on the main (west) elevation. The low-pitched hipped roof is topped with composition shingles, featuring a moderate eave overhang, boxed eaves, and a stone chimney on the rear roof slope. The main elevation showcases a recessed entryway beneath the roofline, with two (2) decorative wood-paneled doors and box bays accented by horizontal wood siding. The fenestration throughout consists primarily of vinyl sliding sash windows.

The Ranch style milk parlor at 14450 Bon View Avenue was constructed between 1968 and 1975. It is a one-story milk parlor with a front milk house and rear milking parlor separated by a breezeway. The milk house features modest Ranch style elements, including a hip-and-gable roof with wood shake shingles, a stucco façade with stone accents along the corners of the main (west) elevation, and metal casement windows on the north elevation. The fenestration throughout has since been boarded up. East of the breezeway, the building is divided into a milking area and a wider holding area. The milking area features louvered horizontal shutters on the north and south elevations, set atop concrete walls. The holding area, which extends outward beyond the milking area, is partially open and supported by concrete walls and metal poles. Both sections have gabled roofs oriented along an east-west axis. Additional features include two (2) glass industrial doors at the front, a circular driveway in front of the milk parlor, and a dairy association sign.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- Though the property retains integrity of location, setting, feeling, and association, several buildings have been subjected to extensive alteration and, therefore, the property does not retain integrity of design, materials, or workmanship.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*7914 Edison Ave*

This property includes four (4) parcels that total 18.79 acres located north of Edison Avenue between Bon View and Grove Avenues. It includes two (2) Ranch style dwellings and a Streamline Moderne milk parlor. One (1) Ranch style residence and the milk parlor were constructed between 1952 and 1959, while the second residence was added between 1966 and 1980. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The older Ranch style residence has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with brick and wood shiplap veneer on the main elevation. The low-pitched hipped roof is topped with composition shingles, has a moderate eave overhang, boxed eaves, and a brick chimney along the roof slope at the rear (north) elevation. The fenestration consists of metal casement windows and sliding sash windows. The main elevation features a partial-width porch beneath a shed roof supported by decorative metal beams, a small stoop, and additional decorative metal details. To the west side of the dwelling is a one-car garage installed by the 1980s with a brown paneled overhead door. The Streamline Moderne milk parlor is directly west of the residence, though retains only the front milk house section. The rear milking parlor section was demolished by April 2022.

The second Ranch style residence has an asymmetrical façade and a mostly rectilinear floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a partial brick veneer on the main (south) elevation. The low-pitched hipped roof features a moderate eave overhang and boxed eaves. The fenestration primarily consists of vinyl sliding sash windows, which replaced the original aluminum units in 2022. The main (south) elevation features a recessed main entryway with decorative double wood-paneled doors, a small stoop, a decorative metal beam beneath the roofline and entryway, and an attached garage on the west side with an overhead door.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- While the Streamline Moderne milk parlor may have once been a distinctive example of this architectural type, the building has been subjected to extensive alteration/demolition and, therefore, no longer retains integrity of design, materials, workmanship, feeling, or association.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*13715-13751 Grove Ave, 13817-13819 Grove Ave, 8270-8292 Edison Ave*

This property includes five (5) parcels that total 46.80 acres located east of Grove Avenue between Schaefer and Edison Avenues. It includes two (2) Ranch style dwellings and two (2) associated milk parlors with Dutch style characteristics, as well as two (2) Minimal Traditional style dwellings. The older Minimal Traditional style residences were constructed between 1948 and 1952, while the Ranch Style structures were constructed between 1959 and 1966. It was historically associated with dairy operations and retains

that association today. Historical aerials indicate the built environment has remained the same since that time period.

The first Ranch-style residence features an asymmetrical façade with a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in yellow painted stucco with horizontal wood siding on a portion of the main (west) elevation, accented by white trim around the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and features a moderate eave overhang, open eaves with exposed rafter tails, and decorative scalloped barge board at the gable ends. The fenestration visible from the public right-of-way consists of wood single-hung windows and a wood half-lite diamond patterned door. The main (west) elevation exhibits Northern European or Dutch influences, such as the diamond-patterned door, scalloped barge board, wood spindle porch supports, and a square cupola. The attached two-car garage is connected to the residence by a breezeway on the south elevation. Additional features include a stone planter and concrete steps at the main entryway.

A milk parlor is located south of the residence. The building has a horizontal floor plan and is divided into two sections: the front milk house and a rear milking parlor, separated by an open breezeway. The front section reflects Ranch style characteristics, featuring a front-gabled roof with wood shake shingles, yellow painted stucco walls, and metal casement and fixed windows. An open breezeway separates this front section from the rear portion of the building. South of the breezeway, the milking parlor has a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls and along the gable ridge. Additional features include a circular driveway, metal doors at the main entryway, and a stone planter. The main (west) elevation of the front section also displays Northern European or Dutch influences, such as diamond-patterned fixed windows and a gabled shed roof above the main entryway supported by curved knee brackets.

The second Ranch-style residence also features an asymmetrical façade with a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in beige painted stucco with tan horizontal wood siding on a portion of the main (west) elevation, accented by white trim around the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and features a moderate eave overhang, boxed eaves, horizontal wood siding below the gable, and decorative scalloped barge board at the gable ends. The fenestration visible from the public right-of-way consists of wood single hung windows, some with decorative shutters, and a wood half-lite diamond patterned door. The main (west) elevation exhibits Northern European or Dutch influences, such as the diamond-patterned half-lite door and windows, scalloped barge board, box bay accented with wood-siding, and a square cupola. The attached three-car garage is connected to the residence by a breezeway on the south elevation. Additional features include a stone planter, a stone chimney on the rear elevation, and concrete steps at the main entryway.

The second milk parlor is located south of the second residence. The building is divided into two sections: the front milk house and a rear milking parlor, separated by an open breezeway. The front section reflects Ranch style characteristics, featuring a hip-and-gable roof with wood shake shingles, beige painted stucco

walls, and metal casement and fixed windows. A breezeway, located between the two sections on the north and south elevations, is partially hidden from the public right-of-way. East of the breezeway, the milking parlor features a gable roof oriented along an east-west axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls and along the gable ridge. Additional features include a circular driveway, metal doors at the main entryway, and a stone planter. The main (west) elevation of the front section also displays Northern European or Dutch influences, such as diamond-patterned windows, decorative wood spindles below the roofline, and scalloped barge board at the gable end.

The two Minimal Traditional style dwellings feature asymmetrical compact floor plans with minimal decorative details. The first dwelling has a square floor plan with a hipped roof topped with composition shingles. The exterior is stucco painted white. All the windows and doors have since been boarded up with plywood. The second dwelling features a rectilinear floor plan and a white stucco exterior with red trim around the windows and doors. The hipped roof is also topped with composition shingles and includes a moderate eave overhang. Fenestration consists of a combination of aluminum single-hung windows and wood double-hung windows, along with a flush wood entry door. Both dwellings are modest in appearance and do not exhibit distinctive characteristics of the Minimal Traditional style.

The Ranch style structures exemplify Northern European/Dutch stylistic influences and contain low-pitched roofs, stucco cladding, decorative scalloped barge board, diamond-patterned doors and windows, cupolas, and stone planters in-vogue in the postwar period. These structures are located in the northern portion of the property and are outside of the Project area. The two (2) Minimal Traditional residences are the only structures located in the Project area, and are modest, utilitarian examples of the style that lack distinctive detailing or architectural character.

- The Ranch style structures are eligible under CRHR and City of Ontario criteria 3/d for its significant association with the “Ranch Style, 1950-1970s” theme.
- The Minimal Traditional dwellings are not individually eligible nor contributors to any broader eligibility of the property.

*8040 Schaefer Ave and 14050 Grove Ave*

This property includes one (1) parcel that totals 8.62 acres located at the northwest corner of Grove and Edison Avenues. It includes a Minimal Traditional residence, as well as two (2) Ranch style dwellings and milk parlor. The Minimal Traditional residence was constructed prior to 1935, followed by the milk parlor between 1948 and 1946, and the Ranch Style residences between 1966 and 1968. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Minimal Traditional residence has an asymmetrical façade and a rectilinear floorplan. The exterior is clad in tan-painted stucco. The low-pitched gabled roof is topped with composition shingles and has a moderate eave overhang. The primary (south) elevation includes a recessed entryway beneath the

roofline, a small stoop, and a shed roof over a bay window accented with a brick veneer. The fenestration consists of aluminum windows.

The milk parlor is situated between the two (2) Ranch style residences and consists of a front milk house and the rear milking parlor separated by a breezeway. The milk house has some Ranch-style elements, including a cross-gable roof with wood shake shingles and a stucco façade. It features a gable roof oriented along an east-west axis that is clad in corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the north and south elevations, positioned above concrete walls, along with a vent system along the gable ridge. There is no curved driveway in front of the milk parlor.

The Ranch-style dwelling south of the milk parlor has an asymmetrical façade and an irregular floorplan atop a concrete foundation. Its exterior is clad in tan painted stucco. The moderately pitched hipped roof is topped with composition shingles and features minimal eave overhang and boxed eaves. The recessed main entryway includes a red paneled door, and box bay windows are visible on the primary (east) elevation. The Ranch-style dwelling north of the milk parlor has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The dwelling has a similar appearance to the first residence and features a stucco façade, a bay window, hipped roof topped with composition shingles, and a recessed main entryway.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- Though the property retains integrity of location, setting, feeling, design, materials, and workmanship, it lacks integrity of association.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*8061 Edison Ave*

This property includes six (6) parcels that total 36.18 acres located south of Edison Avenue between Bon View and Grove Avenues. It includes a Ranch style dwelling, a Ranch Style milk parlor, and ancillary structures. The residence was constructed between 1938 and 1946 along with a milk parlor, though that parlor was demolished and replaced with the current milk parlor between 1966 and 1968. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Ranch style residence is a one-story residence with an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with brown trim on the windows and doors. The moderately pitched hipped roof is topped with composition shingles and has a moderate eave overhang, and boxed eaves. The fenestration consists of vinyl multi-lite sliding sash and single-hung windows and wood paneled doors. The main elevation has a bay window and a stone planter. An attached one-car garage is located on the west elevation and features a white paneled overhead door. The milk parlor just west of the dwelling contains a front milk house and rear milking parlor separated by a breezeway. The milk house is modest in design, incorporating Ranch-style elements such as a hip-and-

gable roof with composition shingles, a moderate eave overhang with boxed eaves, and a stucco façade. The fenestration consists of metal multi-lite fixed windows, metal casement windows, and industrial metal glass door. South of the breezeway, the milking parlor features a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Additional features include a circular driveway in front of the milk parlor.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*7721-7891 Edison Ave*

This property includes three (3) parcels that total 18.16 acres located south of Edison Avenue between Bon View and Grove Avenues. It includes a Ranch Style residence, a Craftsman Bungalow residence, an Art Deco milk parlor, and ancillary structures. The residence was constructed before 1935 along with three other structures that are no longer present on the property. The milk parlor was added between 1935 and 1946, followed by the Ranch Style residence between 1959 and 1966. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has been modified via additional construction in the 1990s, as well as the destruction of the rear section of the milk parlor in 2017.

The Ranch style residence at 7891 Edison Avenue is a one-story dwelling with an asymmetrical façade and an irregular floorplan atop a concrete foundation. Its exterior is clad in yellow board-and-batten siding, with a partial stone veneer on the main (north) elevation. The low-pitched cross-gabled roof, covered with composition shingles, has a moderate eave overhang, boxed eaves, and a chimney on the rear roof slope. The fenestration consists of vinyl sliding sash windows. The main elevation includes a recessed entryway with a single paneled door, a concrete stoop, a stone planter, and an attached one-car garage with a paneled overhead door. It is smaller example of its type in the area and exhibits modest characteristics of the style.

The Craftsman Bungalow residence is a one-and-a-half story dwelling with a symmetrical façade and a mostly square floor plan. The exterior is clad in tan-painted stucco with blue trim on the windows and doors. The high-pitched, side-gabled roof is topped with composition shingles and has a wide eave overhang with wood brackets beneath the gable. The fenestration visible from the public right-of-way consists of vinyl single-hung windows and fixed wood windows. The main (north) elevation includes a centered gabled dormer with four vinyl single-hung windows, an enclosed full-width porch, a centered main entryway with a wood-paneled door and metal security door, and concrete steps. The milk parlor is located south of the bungalow, though only the front milk house section remains. It retains some Art Deco characteristics, including smooth stucco walls, a flat roof, a symmetrical boxy form, and glass block windows.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*8185 Edison Ave*

This property includes one (1) parcel that totals 18.56 acres located at the southeast corner of Edison and Grove Avenues. It includes a Ranch style dwelling with Northern European/Dutch influences, a Minimal Traditional residence, and a Streamline Moderne milk parlor constructed between 1952 and 1959. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Minimal Traditional dwelling has an asymmetrical façade and a rectilinear floorplan atop a concrete foundation. The exterior is clad in tan-painted stucco with green trim on the windows and roof fascia. The low-pitched hipped roof is finished with composition shingles and features a minimal eave overhang with boxed eaves. Fenestration visible from the public right-of-way consists of aluminum sliding sash windows. The main (west) elevation includes a recessed main entryway with a concrete stoop, metal security gate, and a wide stone chimney. The detached garage, located directly north of the dwelling, features two (2) paneled overhead doors, a tan stucco façade, and a hipped roof.

The Ranch style dwelling that exhibits Northern European or Dutch influences has an asymmetrical façade and a one-story horizontal floorplan atop a concrete foundation. The exterior is clad in horizontal wood siding painted yellow, with green trim on the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and includes a moderate eave overhang with open eaves and exposed rafter ends. A chimney is located on the rear (south) elevation. Fenestration consists of wood-framed diamond-patterned windows, some with green decorative shutters. The main (north) elevation features diamond-patterned windows, box bays with decorative wood support brackets, a stone planter, and an extended roof girder. A garage is attached to the main dwelling by a wide open breezeway on the west elevation.

The Streamline Moderne milk parlor contains a front milk house and rear milking parlor separated by a breezeway. The front section reflects Streamline Moderne characteristics, with smooth stucco walls, a flat roof, curvilinear corners, a central vertical projection, and curved glass block windows. The west elevation contains metal multi-lite casement windows, though the windows on the east elevation are boarded up. The breezeway features a metal barn-style sliding door on both the east and west elevations. South of the breezeway, the milking parlor has a gable roof oriented along a north-south axis clad in corrugated sheet metal. Ventilation is provided by horizontal metal shutters on the east and west elevations, positioned above concrete walls, along with a vent system along the gable ridge. Additional features include a circular driveway in front of the milk parlor and two (2) metal doors.

- The Ranch Style dwelling and Streamline Moderne milk parlor are eligible under CRHR and City of Ontario criteria 3/d within the "Ranch Style, 1950–1970s" and "Streamline Modern style, 1930s-1960s" contexts with a period of significance of 1952-1959.
- The City's Historic Preservation Subcommittee determined the property (identified as 14117 Grove Ave) met local landmark designation and Tier II criterion in November 2014.
- The Minimal Traditional dwelling is not individually eligible nor a contributor to any broader eligibility of the property.

*8311 Edison Ave*

This property includes one (1) parcel that totals 18.77 acres located south of Edison Avenue and Ontario Ranch Road between Grove and Walker Avenues. It includes a Ranch style dwelling and milk parlor constructed between 1968 and 1975. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has been altered via the addition of ancillary structures in the 1990s.

The Ranch style residence has an asymmetrical façade and an irregular horizontal floorplan atop a concrete foundation. The low-pitched cross-gabled roof has a moderate eave overhang with boxed eaves and is topped with terracotta tiles, which likely replaced the original composition or wood shingles at an unidentified date. The exterior is clad in tan-painted stucco. Additional features include a recessed main entryway accessed via concrete steps, two (2) brown paneled doors, metal sliding sash windows, a stone planter, and decorative blue shutters on some of the windows. An attached three-car garage addition was appended to the east elevation and features a roofline that does not match the original structure, resulting in an uneven and visually uneven roofline. To the east of the dwelling is the milk parlor, which contains a front milk house, rear milking parlor separated by a breezeway, and holding area. The milk house shares a similar design with the main dwelling, incorporating Ranch style elements such as a hip and gable roof topped with terracotta tiles, a moderate eave overhang with boxed eaves, and a stucco façade. Its fenestration consists of metal casement windows. South of the milk house, the milking parlor features a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation elements include metal horizontal louvered shutters set atop concrete walls, along with a vent system along the gable ridge. Further south, the holding area is partially open and enclosed by concrete walls. Additional features include metal doors at the main entryway, bulk tanks, and a circular driveway in front of the milk parlor.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*8335-8381 Edison Ave*

This property includes four (4) parcels that total 37.42 acres located south of Edison Avenue between Grove and Walker Avenues. It includes a Craftsman Bungalow style residence, a Ranch style milk parlor, and ancillary structures. The Craftsman was constructed prior to 1935, while the milk parlor was added

between 1959 and 1966. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Craftsman Bungalow style residence has an asymmetrical façade and an irregular floorplan. The exterior is clad in clapboard siding painted brown with dark brown trim on the windows and doors. The moderately pitched hipped roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, and a dormer on the main (north) elevation. The fenestration visible from the public right-of-way consists of wood-framed fixed and double-hung windows, along with some vinyl sliding sash and single-hung windows. The main elevation features a partial-width porch beneath a hipped roof extension, supported by tapered brick columns, concrete steps, and a brick pony wall. Despite the removal of some original windows and roofing, the dwelling maintains a strong representation of the Craftsman Bungalow style through its massing, roof form, and characteristic design features.

The Ranch style milk parlor has a front milk house, rear milking parlor separated by a breezeway, and an open holding area. The milk house incorporates some Ranch style elements such as a hip-and-gable roof, a moderate eave overhang with boxed eaves, and a stucco façade with wood-siding below the gable end. Its fenestration consists of metal multi-lite windows and vinyl windows. South of the milk house, the milking parlor features a flat roof oriented along a north-south axis. Ventilation elements include metal vertical louvered shutters set between concrete walls. Further south, the holding area is open and enclosed behind concrete walls. Additional features include industrial glass doors at the main entryway and a circular driveway in front of the milk parlor.

- The Craftsman Bungalow is eligible under CRHR and City of Ontario criteria 3/d within the "Craftsman Bungalow Style, 1900s–1930s" context with a period of significance of pre-1935.
- The Ranch style milk parlor is not individually eligible nor a contributor to any broader eligibility of the property.

*8485 Edison Ave and 14350 Walker Ave*

This property includes two (2) parcels that total 36.95 acres located on the southwest corner of Ontario Ranch Road and Walker Avenue. It includes two (2) Ranch style dwellings and milk parlor. One (1) Ranch style residence and the milk parlor were constructed between 1959 and 1966, while the second residence was added between 1966 and 1968. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The older Ranch style residence is a one-story structure with an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. Its exterior is clad in tan-painted stucco with a stone veneer along the lower span of the main (north) elevation. The low-pitched hip-and-gable roof is topped with composition shingles and features a moderate eave overhang, boxed eaves, a stone chimney on the rear roof slope, and a cupola. Below the gable end is white horizontal wood siding and a scalloped fascia board. The fenestration consists of vinyl sliding sash units that replaced the original wood-framed windows, some of which featured a diamond pattern. One (1) of the original window openings to the left

of the main entryway was substantially altered and replaced with a smaller window unit. The main elevation includes a stone planter, box bays accented by white horizontal wood siding, a decorative wood spindle column, and a recessed main entryway. On the west elevation, a partially open breezeway connects the dwelling to a two-car garage with white paneled overhead doors. To the west is the Ranch style milk parlor, which has a front milk house and rear milking parlor separated by a breezeway. The milk house incorporates Ranch style elements such as a hip-and-gable roof, a moderate eave overhang with boxed eaves, and a stucco façade. Its fenestration consists of metal multi-lite fixed and casement windows. The breezeway, located between the two (2) sections on the east and west elevations, features two (2) metal barn-style sliding doors. South of the milk house, the milking parlor features a gabled roof oriented along a north-south axis and steel beams. Ventilation elements include metal vertical louvered shutters set on top concrete walls. Additional features include two (2) metal doors at the main entryway and a circular driveway in front of the milk parlor.

The second Ranch style residence has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in stucco with a stone veneer on the main (east) elevation. The moderately-pitched hipped roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, and a stone chimney on the rear roof slope. The fenestration consists of aluminum windows. An enclosed breezeway is located on the north elevation and connects the dwelling to a two-car garage.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*14049 Grove Ave*

This property includes two (2) parcels that total 9.04 acres located on the northeast corner of Grove Avenue and Ontario Ranch Road. It includes a Ranch style dwelling with a garage, milk parlor, and ancillary structures constructed between 1959 and 1966. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Ranch style residence has rectilinear, two-story floorplan with a flat roof and a moderate eave overhang. The exterior is clad in white stucco and includes vinyl sliding sash windows. The main entryway is sheltered by a portico supported by decorative wood spindle columns. Additional features include an attached one-car garage with a paneled overhead door and a deck enclosed by a decorative metal railing above the garage.

A utilitarian milk parlor is located east of the residence and has a front milk house and side milking parlor separated by a breezeway. The milk house features a concrete façade with a bubbled textured section, industrial glass doors, large, fixed windows, and a flat roof. The breezeway, located between the two (2) sections on the east and west elevations, is enclosed by metal barn-style sliding doors. North of the milk house, the milking parlor has a flat roof oriented along a north-south axis. Ventilation elements include

metal vertical louvered shutters set between concrete walls. Additional features include a curved driveway in front of the milk parlor.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- Though the property retains integrity of location, setting, feeling, design, materials, and workmanship, it lacks integrity of association.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

**FINDINGS**

A total of 12 cultural resources were identified in the Project area during the efforts conducted for this study. The resources consist entirely of historic-period dairy farms with associated milk parlors, residential buildings, and/or ancillary structures. As a result of evaluations of potential eligibility for listing in the CRHR and/or designation as City of Ontario Historic Landmark, a total of four (4) resources were identified as eligible for listing or listed:

1. 7587-7697 Edison Ave – eligible for listing, significant historic structures in the Project area
2. 8185 Edison Ave (previously identified as 14117 Grove Ave) – previously determined by the City's Historic Preservation Subcommittee as meeting local landmark designation and Tier II criterion; also meets criteria for listing in the CRHR and is a historical resource under CEQA
3. 8335-8381 Edison Ave – eligible for listing, significant historic structures in the Project area
4. 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue – eligible for listing, but no significant historic structures in the Project area

As 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue does not contain any buildings or structures within the Project area that are considered eligible/contributors to the eligibility of the site, there is no potential to impact the resource. As such, for the purposes of this study, only three (3) resources (7587-7697 Edison Ave, 8185 Edison Ave, and 8335-8381 Edison Ave) will be considered historical resources identified within the Project area. An overview of the evaluation results is included in **Table 6** and **Figure 11** below, with eligible sites that require further consideration highlighted.

| Table 6: Summary of Resource Evaluations | |
|---|---|
| **Addresses/Name** | **Evaluation Summary** |
| 7587-7697 Edison Ave | The property as a whole is eligible under CRHR criterion 1 and local designation a. Individually, the Craftsman Bungalow and Ranch style residences are each eligible under CRHR criterion 3 and local designation d. The Ranch style milk parlor is not individually eligible but remains a contributor to the eligibility of the whole property. |
| 14213-14297, 14333-14353, 14450, and 14451 Bon View Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 7914 Edison Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 13715-13751 Grove Ave, 13817-13819 Grove Ave, 8270-8292 Edison Ave | Only the Ranch Style properties that are outside of the Project area are eligible under CRHR criterion 3 and local designation d. The Minimal Traditional residences within the Project area are not eligible under any criteria for the CRHR or City of Ontario. |
| 8040 Schaefer Ave and 14050 Grove Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 8061 Edison Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 7721-7891 Edison Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 8185 Edison Ave | The Ranch Style residence and Streamline Moderne milk parlor are each eligible under CRHR criterion 3 and local designation d. The Minimal Traditional dwelling is not eligible. The City's Historic Preservation Subcommittee determined the property (identified as 14117 Grove Ave) met local landmark designation and Tier II criteria in November 2014. |
| 8311 Edison Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 8335-8381 Edison Ave | The Craftsman Bungalow style residence is eligible under CRHR criterion 3 and local designation d. The Ranch style milk parlor is not eligible. |
| 8485 Edison Ave and 14350 Walker Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 14049 Grove Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |

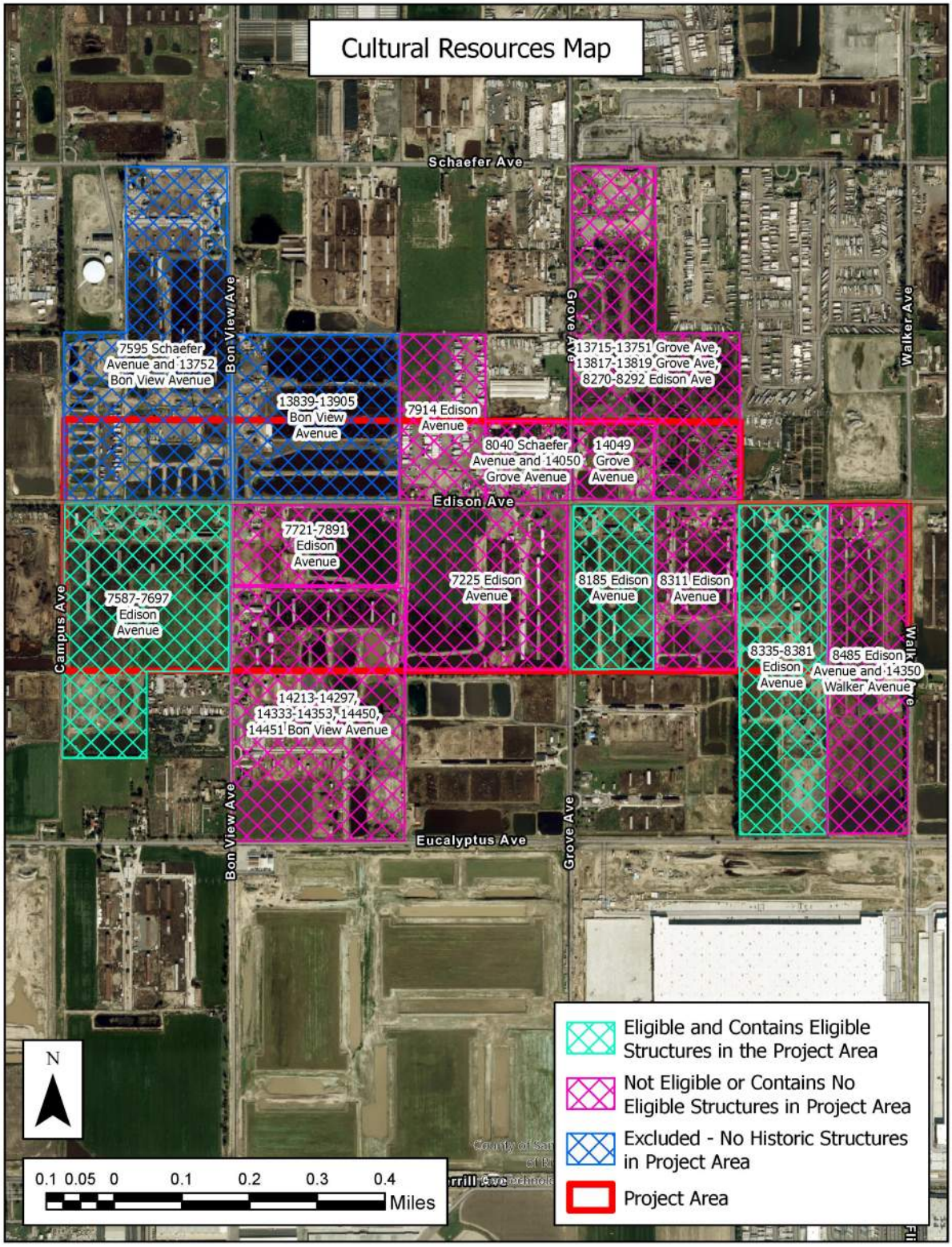


Figure 11: Cultural Resources Map

**Historic Resources Tiering**

As a result of eligibility evaluations, three (3) of the identified resources (7587-7697 Edison Ave, 8185 Edison Ave, and 8335-8381 Edison Ave) are recommended eligible for listing the CRHR and designation as a City of Ontario Historic Landmark, and are considered historical resources under CEQA with the potential to be impacted by the Project. One (1) of these properties, 8185 Edison Ave (previously identified as 14117 Grove Ave) was determined by the City's Historic Preservation Subcommittee to meet local landmark designation and Tier II criteria in November 2014. However, the remaining two (2) properties (7587-7697 Edison Ave and 8335-8381 Edison Ave) have not yet been subject to this review. As such, while the City's Historic Preservation Committee (or a specified subcommittee) maintains authority to make tiering determinations for resources, this report includes a brief discussion related to potential tiers for each of the two (2) remaining resources to provide preliminary insights into potential mitigation fee requirements for each resource and to later support the City's review:

- 7587-7697 Edison Ave – Under the criteria for Local Historic Landmarks, the property seems to meet tiering criteria 1 and 2 under the Architecture/Form section and criteria 4, 5, and 6 under the History section. It is also recommended eligible for listing in the California Register. As such, it is likely that this resource meets criteria within the tiering system as a Tier II property.
- 8335-8381 Edison Ave – Under the criteria for Local Historic Landmarks, the property seems to meet tiering criterion 1 under the Architecture/Form section. It is also recommended eligible for listing in the California Register. As such, it is likely that this resource meets criteria within the tiering system as a Tier II property.

Upon closer review of the Tiering system, it appears that Tiers II and III share a minimum threshold, in that any eligible historic property could be considered a Tier II or III resource. However, given the resources noted above meet additional criteria beyond just the fact that they are eligible resources, and given a property (8185 Edison Ave, formerly identified as 14117 Grove Ave) within the same area was already provided a Tier II determination, it is likely that each of the above-noted properties will be determined Tier II resources as opposed to Tier III.

**RECOMMENDATIONS**

Mitigation is recommended to reduce impacts to the three (3) eligible resources. Such mitigation often includes educational components, such as the requisite Historic American Building Survey (HABS), a documentary, and comparative studies, as well as physical preservation efforts, such as investigating relocation feasibility. For these resources, a HABS level 3 is recommended. However, both a documentary of the Ontario Ranch area and a comparative study of the area with other dairy farming areas in California were recently prepared as a result of mitigation adopted in the City for a nearby project. As such, those actions are not recommended to be included in mitigation for the current Project. Additionally, while it is common to include the preparation of a relocation feasibility study as a mitigation measure, a study for the properties has already been completed (**Appendix D**). The study concluded the following with respect to the three (3) eligible resources:

1. The milk parlor at 7587-7697 Edison Ave can be feasibly relocated in part. Relocation is limited to the front portion of the building, and it may require repairs. It is not feasible to relocate the back portion of the building without disassembling the structure.
2. The milk parlor at 8185 Edison Ave can be feasibly relocated in part. Relocation is limited to the front portion of the building. It is not feasible to relocate the back portion of the building.
3. The Craftsman Bungalow at 8335-8381 Edison Ave can be feasibly relocated in its entirety, excluding crawl space framings and foundations.

As such, it is recommended to include some level of mitigation related to relocating one or more of the structures/portions of structures that have been identified as feasible for relocation. While a series of mitigation measures will support the reduction of impacts to these resources, it is anticipated that mitigation will not reduce impacts to the resources to a less than significant level due to the unique circumstances related to the significance of each resource and the resource type. Measures for consideration are included below as **MM CUL-1** through **MM CUL-6**.

In addition to the identified historical resources, the Project area has a high sensitivity for historic archaeological resources that could be inadvertently discovered and/or impacted during Project implementation. Conversely, the sensitivity for buried prehistoric archaeological resources within the Project area is relatively low as a result of prior extensive disturbance across the Project area. However, the archaeological sensitivity for prehistoric resources in this area may have once been moderate to high due to the Holocene-age sediments underlying the Project area. As such, it is recommended that mitigation measures that outline the process for inadvertent discoveries be incorporated for the proposed Project. Measures for consideration are included below as **MM CUL-7** through **MM CUL-9**. With these mitigation measures in place, impacts to archaeological resources as a result of the proposed Project would be reduced to less than significant.

**MM CUL-1:** The applicant shall obtain a building permit prior to any demolition, relocation, or construction.

**MM CUL-2:** Prior to issuance of a building permit for demolition of any historical resources, at the same time or separately, a HABS (level 3) documentation, including but not limited to as built drawing, historical narrative, and Historic American Building Survey (HABS) photographs of the three (3) historical resources subject properties, shall be submitted to the Planning Department for review, approval, and subsequent release to the Ovitt Family Community Library, Model Colony History Room. Digital files and 2 printed copies are required (one archival and one non-archival).

**MM CUL-3:** Prior to issuance of a demolition building permit, a relocation plan for at least one (1) property identified as feasible for relocation shall be submitted to the City. The plan shall include location options identified by the City, as well as a relocation schedule and any protective measures to ensure minimal impact to the resource during relocation efforts. Every effort shall be made to facilitate the relocation. The buildings shall be offered at no cost for those who can

relocate off-site. Advertisements notifying the public of the opportunity to relocate the building shall be placed for a minimum of 30 days: on-site with temporary signage, in at least three local publications (newspapers, magazines, local organization newsletters), and on local bulletin boards.

**MM CUL-4:** A mitigation fee pursuant to Section 7.01.030 of the Ontario Development Code shall be paid to the Planning Department prior to issuance of building permit for demolition of any of the identified historical resources for which relocation was determined by the City to be infeasible. Mitigation fee is equal to 30% of the price per square foot construction cost as established in the most current International Code Council Building Valuation Data. The fee amount will be provided by the Planning Department at the time of payment. Funds will be deposited into the City's Historic Preservation Trust Fund.

**MM CUL-5:** Prior to issuance of a building permit for demolition of any of the three (3) historical resources, a determination shall be made by the Planning Department whether items within or on the historic properties should be salvaged. The applicant shall be responsible for the removal, relocation, and donation of such items selected for salvaging. An inventory of salvaged items shall be provided by the applicant to the Planning Department prior to the issuance of building permit.

**MM CUL-6:** Should 8185 Edison Ave be subject to demolition, and prior to issuance of a building permit for demolition of the resource, which is listed in the City's Historic Resources Inventory, the applicant shall apply for a Certificate of Appropriateness and approval of a Demolition approval by the Historic Preservation Subcommittee prior to demolition pursuant to the Ontario Development Code, Section 4.02.050. A Certificate of Appropriateness shall not be issued for the demolition of the resource, either in whole or in part, until such time that a demolition permit application and a replacement structure has been approved by the City, and appropriate permits have been issued for its construction.

**MM CUL-7:** Prior to the issuance of any grading permits for the Project area, a Cultural Awareness Training Program shall be provided to all construction managers and construction personnel prior to commencing any ground disturbance work within the Project area. The training shall be prepared and conducted by a Qualified Archaeologist to the satisfaction of the City Planning Department. The training may be discontinued when ground disturbance is completed. Construction personnel shall not be permitted to operate equipment within the construction area unless they have attended the training. A copy of the training transcript and/or training video, as well as a list of the names of all personnel who attended the training and copies of the signed acknowledgment forms shall be submitted to the City Planning Department for their review and approval.

**MM CUL-8:** Should any cultural resources be discovered during Project implementation, the City Planning Department and a Qualified Archaeologist shall be notified to assess the nature and significance of the find. Should any cultural resources be deemed significant, the Qualified

Archaeologist shall draft a treatment plan for review and approval by the City Planning Department. Tribes listed on the City's contact list for the Project shall be notified of any significance discovery that is Native American in origin and be given the opportunity to comment on the treatment plan prior to implementation. All final site records, reports, etc. associated with the discovery, evaluation, and treatment of cultural resources discovered during Project implementation shall be submitted to the South-Central Coastal Information Center (SCCIC).

**MM CUL-9:** If human remains are encountered during the undertaking, California State Health and Safety Code Section 7050.5 states that excavation shall stop and no further disturbance shall occur within 100 feet of the discovery until the County Coroner has made a determination of origin and disposition of the remains pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), who will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery within 48 hours of notification. If the NAHC is unable to identify an MLD, the MLD fails to make a recommendation, or the landowner or his/her authorized representative rejects the recommendation, the human remains and associated items will be interred on the property with appropriate dignity in a location that will not be subject to future disturbance.

## REFERENCES

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# APPENDIX A

## Sacred Lands File (SLF) Search Results from the Native American Heritage Commission (NAHC)

# NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
**Reginald Pagaling**
*Chumash*

VICE-CHAIRPERSON
**Buffy McQuillen**
*Yokayo Pomo, Yuki, Nomlaki*

SECRETARY
**Sara Dutschke**
*Miwok*

PARLIAMENTARIAN
**Wayne Nelson**
*Luiseño*

COMMISSIONER
**Isaac Bojorquez**
*Ohlone-Costanoan*

COMMISSIONER
**Stanley Rodriguez**
*Kumeyaay*

COMMISSIONER
**Laurena Bolden**
*Serrano*

COMMISSIONER
**Reid Milanovich**
*Cahuilla*

COMMISSIONER
**Bennae Calac**
*Pauma-Yuima Band of Luiseño Indians*

EXECUTIVE SECRETARY
**Raymond C. Hitchcock**
*Miwok, Nisenan*

**NAHC HEADQUARTERS**
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

June 10, 2024

Jamie Nord
Kimley-Horn

***Via Email to:*** ***Jamie.Nord@kimley-horn.com***

**Re: Ontario Center Park SP Project, San Bernardino County**

To whom it may concern:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information submitted for the above referenced project. The results were positive. Please contact the tribes on the attached list for information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. A SLF search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with a project's geographic area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites, such as the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center for the presence of recorded archaeological sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: murphy.donahue@nahc.ca.gov

Sincerely,

Murphy Donahue

Murphy Donahue
*Cultural Resources Analyst*

Attachment

**Native American Heritage Commission**
**Native American Contact List**
**San Bernardino County**
**6/17/2024**

| County | Tribe Name | Contact Person | Contact Address | Phone # | Fax # | Email Address | Cultural Affiliation |
|---|---|---|---|---|---|---|---|
| San Bernardino | Agua Caliente Band of Cahuilla Indians | Lacy Padilla, Director of Historic Preservation/THPO | 5401 Dinah Shore Drive<br>Palm Springs, CA, 92264 | (760) 333-5222 | (760) 699-6919 | ACBCI-THPO@aguacaliente.net | Cahuilla |
| | Cahuilla Band of Indians | Erica Schenk, Chairperson | 52701 CA Highway 371<br>Anza, CA, 92539 | (951) 590-0942 | (951) 763-2808 | chair@cahuilla-nsn.gov | Cahuilla |
| | Cahuilla Band of Indians | Anthony Madrigal, Tribal Historic Preservation Officer | 52701 CA Highway 371<br>Anza, CA, 92539 | (951) 763-5549 | | anthonymad2002@gmail.com | Cahuilla |
| | Cahuilla Band of Indians | BobbyRay Esaprza, Cultural Director | 52701 CA Highway 371<br>Anza, CA, 92539 | (951) 763-5549 | | besparza@cahuilla-nsn.gov | Cahuilla |
| | Gabrieleno Band of Mission Indians - Kizh Nation | Christina Swindall Martinez, Secretary | P.O. Box 393<br>Covina, CA, 91723 | (844) 390-0787 | | admin@gabrielenoindians.org | Gabrieleno |
| | Gabrieleno Band of Mission Indians - Kizh Nation | Andrew Salas, Chairperson | P.O. Box 393<br>Covina, CA, 91723 | (844) 390-0787 | | admin@gabrielenoindians.org | Gabrieleno |
| | Gabrieleno/Tongva San Gabriel Band of Mission Indians | Anthony Morales, Chairperson | P.O. Box 693<br>San Gabriel, CA, 91778 | (626) 483-3564 | (626) 286-1262 | GTTribalcouncil@aol.com | Gabrieleno |
| | Gabrielino Tongva Indians of California Tribal Council | Robert Dorame, Chairperson | P.O. Box 490<br>Bellflower, CA, 90707 | (562) 761-6417 | (562) 761-6417 | gtongva@gmail.com | Gabrielino |
| | Gabrielino Tongva Indians of California Tribal Council | Christina Conley, Cultural Resource Administrator | P.O. Box 941078<br>Simi Valley, CA, 93094 | (626) 407-8761 | | christina.marsden@alumni.usc.edu | Gabrielino |
| | Gabrielino/Tongva Nation | Sandonne Goad, Chairperson | 106 1/2 Judge John Aiso St., #231<br>Los Angeles, CA, 90012 | (951) 807-0479 | | sgoad@gabrielino-tongva.com | Gabrielino |
| | Gabrielino-Tongva Tribe | Sam Dunlap, Cultural Resource Director | P.O. Box 3919<br>Seal Beach, CA, 90740 | (909) 262-9351 | | tongvatcr@gmail.com | Gabrielino |
| | Gabrielino-Tongva Tribe | Charles Alvarez, Chairperson | 23454 Vanowen Street<br>West Hills, CA, 91307 | (310) 403-6048 | | Chavez1956metro@gmail.com | Gabrielino |
| | Juaneno Band of Mission Indians Acjachemen Nation - Belardes | Joyce Perry, Cultural Resource Director | 4955 Paseo Segovia<br>Irvine, CA, 92603 | (949) 293-8522 | | kaamalam@gmail.com | Juaneno |
| | Juaneno Band of Mission Indians Acjachemen Nation 84A | Heidi Lucero, Chairperson, THPO | 31411-A La Matanza Street<br>San Juan Capistrano, CA, 92675 | (562) 879-2884 | | jbmian.chairwoman@gmail.com | Juaneno |
| | Morongo Band of Mission Indians | Ann Brierty, THPO | 12700 Pumarra Road<br>Banning, CA, 92220 | (951) 755-5259 | (951) 572-6004 | abrierty@morongo-nsn.gov | Cahuilla Serrano |
| | Morongo Band of Mission Indians | Robert Martin, Chairperson | 12700 Pumarra Road<br>Banning, CA, 92220 | (951) 755-5110 | (951) 755-5177 | abrierty@morongo-nsn.gov | Cahuilla Serrano |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pala Band of Mission Indians | Shasta Gaughen, Tribal Historic Preservation Officer | PMB 50, 35008 Pala Temecula Road Pala, CA, 92059 | (760) 891-3515 | | sgaughen@palatribe.com | Cupeno Luiseno |
| Pala Band of Mission Indians | Alexis Wallick, Assistant THPO | PMB 50, 35008 Pala Temecula Road Pala, CA, 92059 | (760) 891-3537 | | awallick@palatribe.com | Cupeno Luiseno |
| Pala Band of Mission Indians | Christopher Nejo, Legal Analyst/Researcher | PMB 50, 35008 Pala Temecula Road Pala, CA, 92059 | (760) 891-3564 | | cnejo@palatribe.com | Cupeno Luiseno |
| Pechanga Band of Indians | Steve Bodmer, General Counsel for Pechanga Band of Indians | P.O. Box 1477 Temecula, CA, 92593 | (951) 770-6171 | (951) 695-1778 | sbodmer@pechanga-nsn.gov | Luiseno |
| Pechanga Band of Indians | Tuba Ebru Ozdil, Pechanga Cultural Analyst | P.O. Box 2183 Temecula, CA, 92593 | (951) 770-6313 | (951) 695-1778 | eozdil@pechanga-nsn.gov | Luiseno |
| Quechan Tribe of the Fort Yuma Reservation | Manfred Scott, Acting Chairman - Kw'ts'an Cultural Committee | P.O. Box 1899 Yuma, AZ, 85366 | (928) 210-8739 | | culturalcommittee@quechantribe.com | Quechan |
| Quechan Tribe of the Fort Yuma Reservation | Jill McCormick, Historic Preservation Officer | P.O. Box 1899 Yuma, AZ, 85366 | (928) 261-0254 | | historicpreservation@quechantribe.com | Quechan |
| Quechan Tribe of the Fort Yuma Reservation | Jordan Joaquin, President, Quechan Tribal Council | P.O.Box 1899 Yuma, AZ, 85366 | (760) 919-3600 | | executivesecretary@quechantribe.com | Quechan |
| Rincon Band of Luiseno Indians | Joseph Linton, Tribal Council/Culture Committee Member | One Government Center Lane Valley Center, CA, 92082 | (760) 803-3548 | | jlinton@rincon-nsn.gov | Luiseno |
| Rincon Band of Luiseno Indians | Cheryl Madrigal, Cultural Resources Manager/Tribal Historic Preservation Officer | One Government Center Lane Valley Center, CA, 92082 | (760) 648-3000 | | cmadrigal@rincon-nsn.gov | Luiseno |
| Rincon Band of Luiseno Indians | Laurie Gonzalez, Tribal Council/Culture Committee Member | One Government Center Lane Valley Center, CA, 92082 | (760) 484-4835 | | lgonzalez@rincon-nsn.gov | Luiseno |
| Rincon Band of Luiseno Indians | Denise Turner Walsh, Attorney General | One Government Center Lane Valley Center, CA, 92082 | (760) 689-5727 | | dwalsh@rincon-nsn.gov | Luiseno |
| San Manuel Band of Mission Indians | Alexandra McCleary, Senior Manager of Cultural Resources Management | 26569 Community Center Drive Highland, CA, 92346 | (909) 633-0054 | | alexandra.mccleary@sanmanuel-nsn.gov | Serrano |
| Santa Rosa Band of Cahuilla Indians | Vanessa Minott, Tribal Administrator | P.O. Box 391820 Anza, CA, 92539 | (951) 659-2700 | (951) 659-2228 | vminott@santarosa-nsn.gov | Cahuilla |
| Santa Rosa Band of Cahuilla Indians | Steven Estrada, Tribal Chairman | P.O. Box 391820 Anza, CA, 92539 | (951) 659-2700 | (951) 659-2228 | sestrada@santarosa-nsn.gov | Cahuilla |
| Serrano Nation of Mission Indians | Wayne Walker, Co-Chairperson | P. O. Box 343 Patton, CA, 92369 | (253) 370-0167 | | serranonation1@gmail.com | Serrano |
| Serrano Nation of Mission Indians | Mark Cochrane, Co-Chairperson | P. O. Box 343 Patton, CA, 92369 | (909) 578-2598 | | serranonation1@gmail.com | Serrano |
| Soboba Band of Luiseno Indians | Jessica Valdez, Cultural Resource Specialist | P.O. Box 487 San Jacinto, CA, 92581 | (951) 663-6261 | (951) 654-4198 | jvaldez@soboba-nsn.gov | Cahuilla Luiseno |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Soboba Band of Luiseno Indians | Joseph Ontiveros, Tribal Historic Preservation Officer | P.O. Box 487 San Jacinto, CA, 92581 | (951) 663-5279 | (951) 654-4198 | jontiveros@soboba-nsn.gov | Cahuilla Luiseno |

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Sections 65352.3, 65352.4 et seq. and Public Resources Code Sections 21080.3.1 for the proposed Center Park Specific Plan, San Bernardino County.

# APPENDIX B

## Record Search Results from the South Central Coastal Information Center (SCCIC)

# Resource List

**Center Park Ontario**

| Primary No. | Trinomial | Other IDs | Type | Age | Attribute codes | Recorded by | Reports |
|---|---|---|---|---|---|---|---|
| P-36-025440 | | Resource Name - Chino-Mira Loma No. 1 Transmission Line | Structure | Historic | HP11 | 2010 (Wendy Tinsley Becker, Urbana Preservation & Planning) | SB-06037 |
| P-36-026051 | | Resource Name - Devers-San Bernardino 220kV;<br>Other - P-33-015035;<br>Resource Name - SCE Hayfield-Chino 220kV Transmission Line;<br>Other - Julian Hinds-Mirage 220kV, Devers-Mirage 220 kV, Devers-San Bernardino No. 1 220kV;<br>Other - Mira Loma-Vista 220 kV, and Chino Mira Loma No. 3 220 kV Transmission Lines;<br>Voided - 36-027693 | Structure | Historic | HP11 | 2012 (Davidson, et al., LSA Associates, Inc.);<br>2013 (Wendy Tinsley/Steven Treffers, Urbana Preservation/SWCA);<br>2014 (Daniel Ballester, CRM Tech);<br>2018 (Robert Cunningham, ECORP);<br>2019 (Riordan Goodwin, LSA) | SB-07946, SB-07955, SB-08426 |

# Report List

**Center Park Ontario**

| Report No. | Other IDs | Year | Author(s) | Title | Affiliation | Resources |
|---|---|---|---|---|---|---|
| SB-01499 | NADB-R - 1061499; Voided - 85-7.4A-B | 1985 | FOSTER, JOHN M. and ROBERTA S. GREENWOOD | CULTURAL RESOURCES OVERVIEW: CALIFORNIA PORTION, PROPOSED PACIFIC TEXAS PIPELINE PROJECT | GREENWOOD AND ASSOCIATES | |
| SB-03012 | NADB-R - 1063012 | 1995 | OWEN, SHELLEY MARIE | CULTURAL RESOURCES SURVEY AND IMPACT ASSESSMENT FOR THE CAJON/EPTC PIPELINE PROJECT LOCATED IN PORTIONS OF LOS ANGELES, SAN BERNARDINO, AND ORANGE COUNTIES, CA | EIP ASSOCIATES | 36-005689, 36-005690, 36-005691, 36-008124, 36-008125 |
| SB-06095 | NADB-R - 1066095 | 2009 | Applied Earthworks | Confidential Cultural Resources Specialist Report for the Tehachapi Renewal Transmission Project. | Applied Earthworks | 36-003690, 36-019845, 36-019846, 36-019847, 36-019848 |
| SB-07956 | | 2007 | Doolittle, Christopher J. | Archaeological Survey report for Southern California Edison's G.O. 131-D Assessment of the Chino A-Bank System and System Split Project San Bernadino County, California | Eath Tech, Inc. | |
| SB-07968 | | 2011 | Holm, Lisa and John Holson | Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segement 8 East (Phases 2 and 3) and West (Phase 4), Los Angeles and San Bernardino Counties, California | Pacific Legacy, Inc. | 36-012533, 36-012621, 36-012622 |
| SB-07977 | | 2010 | Panich, Lee, Tsim D. Schneider, and John Holson | Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segment 8 East (Phases 2 and 3), San Bernardino County California | Pacific Legacy, Inc. | 36-013330, 36-013636 |

# APPENDIX C

## CA DPR 523 Series Site Records

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 36

Review Code _____ Reviewer _____ Date _____
**Resource Name: 13839-13905 Bon View Avenue**


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ ¼ **of** _ ¼ **of Sec** _; _S. B._ **B.M.** __
c. Address: 13839-13905 Bon View Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441295, 441487, 441487, 441295 mE / 3762377, 3762377, 3762181, 3762181mN
e. Other Locational Data: San Bernardino County APN:105318101, 105318102, 105331101, 105331102

***P3a. Description:** The evaluated property consists of four parcels (APN: 105318101, 105318102, 105331101, and 105331102), historically addressed as 13839-13905 Bon View Avenue. The surrounding area is characterized by open space and agricultural land with historical ties to dairy operations. Encompassing 37.38 acres, the property is located northeast corner of Bon View and Edison Avenues. The property includes a one-story Neo-eclectic residence (13839 Bon View Ave), a Ranch style milk parlor (13905 Bon View Avenue), and several ancillary pole structures. Landscaping and hardscaping are minimal consisting of concrete driveways, and some scattered trees and shrubbery. The property continues to function as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View northeast of 13905 Bon View Ave milk parlor (IMG_8684; October 21, 2024).
***P6. Date Constructed/Age and Source**
1968-1975/NETR HistoricAerials (1968, 1975, 1987, 1994)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
County of San Bernardino
825 E Third Street
San Bernardino CA
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Bon View Farms
**B2. Common Name:** 13839-13905 Bon View Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of four parcels under common ownership. No historic-era building permits were found on file for the property at the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System and supplemented by aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and subsequent years. Aerial imagery indicates that the property was initially developed between 1968 and 1975 with the construction of a Ranch style milk parlor and Neo-eclectic single-family residence. Subsequent aerial imagery suggests that the configuration of the remaining buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980 **Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The 13839-13905 Bon View Avenue property was improved between 1968 and 1975. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former Chino Agricultural Preserve. The property is associated with the historical context of Postwar, Large-Capacity Dairies, 1945-1980, but it does not possess documented significance in relation to the theme. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

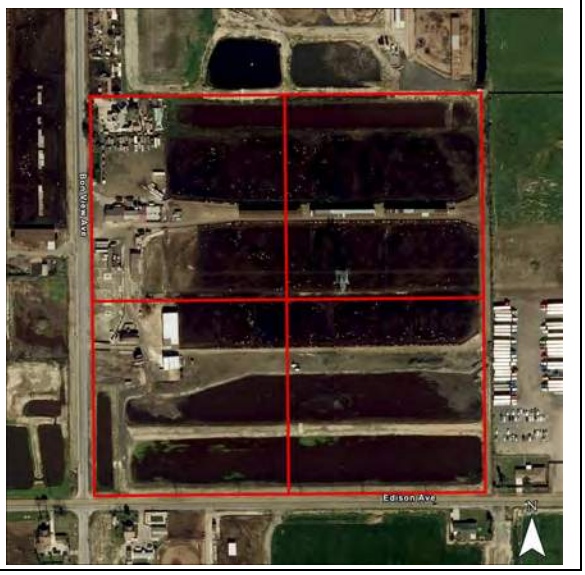


(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name: 13839-13905 Bon View Avenue**
**Page 3 of 5**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 36

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Constructed between 1966 and 1975, the 13839-13905 Bon View Avenue property is located on parcel 105318101 and consist of a one-and-a-half story residence constructed in the Neo-eclectic style and a Ranch style milk parlor. The dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The dwelling features a brick and stucco exterior, brick chimney, a high-pitched cross-gabled roof topped with composition shingles, vinyl multi-lite windows, and arched decorative false columns around the windows on the main (west) elevation. The building is mostly obscured from the public right-of-way.

South of the residence is the Ranch style milk parlor, constructed between 1966 and 1975. The structure is divided into two sections: the front milk house and the rear milking parlor, separated by a breezeway. The milk house is modest in design, incorporating Ranch style elements such as a front gable roof, tan stucco façade, a carport on the main elevation supported by brick columns, aluminum sliding sash windows, and a partial brick veneer on the lower span of the building. The breezeway, located between the two sections on the north and south elevations, is obscured from the public right-of-way. East of the breezeway, the milking parlor features a gable roof oriented along an east-west axis. Ventilation features include louvered vertical shutters on the north and west elevations. Additional features include large metal doors with small openings at the bottom of the main north entryway and a circular driveway in front of the milk parlor.

View east of 13839-13905 Bon View Avenue SFR (IMG_8685; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
In 1983, the property was owned by Bernard Te Velde and known as Bon View Farms.

**B10. Statement of Significance from Page 2:**
For lack of significant association with the theme, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b. as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 13839-13905 Bon View Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 13839-13905 Bon View Avenue property has been found not significant and ineligible and is no longer active, it maintains integrity of location, setting, design, materials, workmanship, feeling, and association as an active and in-use dairy farming property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 3S/3CS/5S3
Other Listings: Urbana Survey No.: 41

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 7587-7697 Edison Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._**B.M.** __
c. Address: 7587-7697 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441085 mE / 3762050mN
e. Other Locational Data: APN: San Bernardino County APN: 105337101, 105337102, 105353101

***P3a. Description:** The evaluated property consists of three parcels (APN: 105337101, 105337102, and 105353101), historically addressed as 7587-7697 Edison Avenue. Covering 46.58 acres, the property is situated south of Edison Avenue, between Sultana and Bon View Avenues. The surrounding area remains largely open space and agricultural land. The property includes a Craftsman Bungalow style dwelling and detached garage, a Ranch style milk parlor, a Ranch style dwelling, and several ancillary structures/features associated with dairy operations (silos, troughs, feeding gates, sheds, pole structures, etc.). The buildings are located on parcel 105337101. Landscaping and hardscaping are minimal, consisting of some trees and shrubs around the dwellings and milk parlor, as well as a paved driveway. The property is partially enclosed behind a metal fence. The property was historically associated with dairy operations and retains that association today. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View south of 7587 Eucalyptus Avenue milk parlor (IMG_8682; October 21, 2024).
***P6. Date Constructed/Age and Source**
pre-1935,1959-1966/UC Santa Barbara FrameFinder (1935)/NETR HistoricAerials (1959-1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
De Groot, Ernest Trust 8/1/81 -EST O
7587 Edison Ave
Ontario CA 91762
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Paul Brockmeier Property/De Groot Dairy
**B2. Common Name:** 7587-7697 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style/Craftsman Bungalow Style

***B6. Construction History:** This property consists of three parcels under common ownership. No historic-era building permits were located in the City of Ontario's records for the site. Construction dates and building characteristics were therefore established using data from the San Bernardino County Assessor's Property Management Information System and reviewed in conjunction with aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and later years. Aerial imagery indicates that the 7587–7697 Edison Avenue property was first developed prior to 1935 with the construction of a Craftsman Bungalow style dwelling. At the time, a large portion of the parcel appears to have been used as farmland, likely for dairy-related purposes. Between 1959 and 1966, a Ranch style dwelling and a Ranch style milk parlor were added to the property. Subsequent aerials suggest that the overall configuration of the built environment has remained largely unchanged since that period. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified **B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Craftsman Bungalow Style, 1900s-1930s, Ranch Style, 1950–1970s **Area:** San Bernardino County **Period of Significance:** Pre-1935-1966
**Property Type:** Postwar, Large-Capacity Dairy/Craftsman Bungalow Style/Ranch Style
**Applicable Criteria:** NRHP/CRHR/Local A and C/1 and 3/a and d

The 7587–7697 Edison Avenue property was initially developed prior to 1935 with the existing Craftsman Bungalow. Between 1959 and 1966, the existing Ranch style milk parlor and Ranch style dwelling were constructed reflecting an expansion of operations. The property and its environs was designated as part of the San Bernardino County Agricultural Preserve in 1967 and later annexed into the City of Ontario in 1999 as part of the New Model Colony, which encompassed portions of the former agricultural preserve. The 7587-7697 Edison Avenue property is eligible as a whole for listing under NRHP, CRHR, and City of Ontario criteria A/1/a for its significant association with the theme Postwar, Large-Capacity Dairies, 1945–1980. Additionally, the two dwellings are also individually significant and eligible. The pre-1935 Craftsman Bungalow is individually eligible under criteria C/3/d within the context Craftsman Bungalow Style, 1900s–1930s, with a period of significance of ca. 1920s to the 1930s (pending identification of original construction date). The Ranch style dwelling is individually eligible under the context Ranch Style, 1950–1970s, with a period of significance of ca. 1959 to 1966 representing its original construction campaign. The ca. 1959-1966 Ranch style milk parlor is not individually significant, however, it remains a significant contributing element of the property as a significant Postwar Large Capacity Dairy complex. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 7587-7697 Edison Avenue


Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 3S/3CS/5S3
Other Listings: Urbana Survey No.: 41

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**

Improved prior to 1935 with later developments between 1959 and 1966, the property includes a Craftsman Bungalow style dwelling and detached garage, a Ranch style milk parlor, a Ranch style dwelling, and several ancillary structures/features associated with dairy operations (silos, troughs, feeding gates, sheds, pole structures, etc.).

Towards the northeast corner of parcel 105337101 is the Craftsman Bungalow dwelling, listed as 7697 Edison Avenue. Constructed before 1935, the house faces Edison Avenue and features an asymmetrical façade with a one-and-a-half-story irregular floor plan. The exterior is clad in tan stucco with red trim on the windows and doors. The high-pitched, side-gabled roof is covered in composition shingles and includes a wide eave overhang, open eaves, decorative wood brackets below the gable end, and exposed rafter ends. A stucco chimney rises from the front roof slope. The fenestration consists of wood-framed, one-over-one, double-hung and fixed windows with red-painted lintels and sills. The main (north) elevation features a full-width front porch beneath the main roofline, supported by tapered wood/concrete beams, as well as a gabled dormer centered on the roof slope.

At the rear (south) elevation, a two-story addition was appended to the southwest corner between 1975 and 1979. This addition has a gabled roof, aluminum sliding sash windows, and a tan stucco façade. It is largely obscured from the public right-of-way and remains subordinate, secondary, and easily distinguishable from the original structure. The addition is compatible with the dwelling's historic character, in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. It did not result in the removal of original character-defining features. East of the dwelling is a detached one-car garage with a rectangular floorplan, tan stucco facade, and gabled roof.

Centered on the north side of the parcel, fronting Edison Avenue, is the Ranch style milk parlor. Constructed between 1959 and 1966, the building features a horizontal floor plan with two milking parlor wing sections, extending from the front milk house section, separated by a breezeway. The front section exhibits Ranch style characteristics, including a hip-and-gable roof with wood shake shingles, stucco walls, metal fixed and casement windows, and a stone veneer. The breezeway, located between the front and rear wing sections, has metal doors on both the east and west elevations. South of the breezeway, the milking parlor sections have low sloped gable roofs oriented along an east-west axis. Ventilation is provided by horizontal louvered metal shutters on the north and south elevations, positioned between concrete walls. Additional features include a metal door at the main (north) entryway, a circular driveway, and a bulk tank in front. Two silos are located at the rear.

West of the milk parlor is the Ranch style dwelling, listed as 7587 Edison Avenue. Constructed between 1959 and 1966, the dwelling has an asymmetrical façade and a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a stone veneer on the main (north) elevation. The moderately pitched hip-and-gable roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, a cupola above the breezeway, and a stone chimney on the rear roof slope. The fenestration consists of a mix of aluminum fixed and sliding sash windows and vinyl units. The primary elevation features a recessed entryway below the main roofline with two double half-lite wood doors, a small concrete stoop, a stone planter, and box bay windows accented by red horizontal wood siding. A wide, open breezeway on the east elevation connects the three-car garage to the dwelling.

Ancillary pole structures, storage sheds, feeding gates and other features are located throughout the property.

**Primary Record Information Continued:**

View southwest of 7587 Eucalyptus Avenue SFR (IMG_8680; October 21, 2024).

View southeast of 7587 Eucalyptus Avenue milk parlor (IMG_8681; October 21, 2024).

**Primary Record Information Continued:**

View south of 7697 Edison Avenue bungalow SFR (IMG_8683; October 21, 2024).

View south of 7697 Edison Avenue bungalow SFR (IMG_9158; October 23, 2024).

**Primary Record Information Continued:**

View southwest of 7697 Edison Avenue bungalow SFR (IMG_9159; October 23, 2024).

View southwest of 7697 Edison Avenue detached garage and bungalow SFR (IMG_9161; October 23, 2024).

**Primary Record Information Continued:**

View southeast of 7697 Edison Avenue bungalow SFR (IMG_9162; October 23, 2024).

View south of 7587 Eucalyptus Avenue milk parlor (IMG_9165; October 23, 2024).

**Primary Record Information Continued:**

View southwest of 7587 Eucalyptus Avenue milk parlor (IMG_9167; October 23, 2024).

View southeast of 7587 Eucalyptus Avenue milk parlor (IMG_9168; October 23, 2024).

**Primary Record Information Continued:**

View southwest of 7587 Eucalyptus Avenue milk parlor front section (IMG_9169; October 23, 2024).

View southwest of 7587 Eucalyptus Avenue milk parlor (IMG_9173; October 23, 2024).

**Primary Record Information Continued:**

View east of 7587 Eucalyptus Avenue milk parlor rear section wing (IMG_9175; October 23, 2024).

View east of 7587 Eucalyptus Avenue silos behind milk parlor (IMG_9182; October 23, 2024).

**Primary Record Information Continued:**

View east of 7587 Eucalyptus Avenue Ranch style SFR (IMG_9177; October 23, 2024).

View east of 7587 Eucalyptus Avenue Ranch style SFR rear elevation (IMG_9179; October 23, 2024).

**Primary Record Information Continued:**

View southwest of 7587 Eucalyptus Avenue Ranch style SFR main elevation (IMG_9185; October 23, 2024).

View south of 7587 Eucalyptus Avenue Ranch style SFR breezeway (IMG_9186; October 23, 2024).

**Primary Record Information Continued:**

View south of 7587 Eucalyptus Avenue Ranch style SFR main entryway (IMG_9187; October 23, 2024).

View southeast of 7587 Eucalyptus Avenue Ranch style SFR (IMG_9188; October 23, 2024).

**Primary Record Information Continued:**

View south of 7587 Eucalyptus Avenue ancillary buildings (IMG_9191; October 23, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**
Over the years, the residences have undergone minor alterations. A two-story addition was appended to the rear (southwest corner) of the Craftsman Bungalow between 1975 and 1979. The addition features a gabled roof, aluminum sliding sash windows, and a tan stucco exterior. It remains subordinate to the original structure, is largely obscured from public view, and is easily distinguishable from the original section. The addition is compatible with the dwelling's historic character and complies with the Secretary of the Interior's Standards for the Treatment of Historic Properties, as it did not result in the removal of original character-defining features. East of the dwelling is a detached one-car garage with a rectangular floorplan, gabled roof, and tan stucco façade.

Some original windows on the main elevation of the Ranch style dwelling have been replaced with vinyl units set within the original openings. Despite these alterations, the dwelling retains most of the seven aspects of integrity and continues to convey its original Ranch style design. It remains one of the better-preserved and more representative examples of the Ranch architectural style in the area.

**Ownership/Occupancy**

**7587 Edison Ave**
Between the mid-1920s and 1931, the property was owned by Paul Brockmeier. Born in 1894 in Freeport, Illinois, Brockmeier was a salesman, dairyman, and farmer who operated a business known as Brockmeier Brothers. In 1925, the Brockmeier Brothers won the highest yielding dairy cow award in the San Bernardino County Testing Association competition held at Chaffey High School. In January 1929, the Daily Report noted that oat and alfalfa hay were for sale at the property. In 1931, the property was sold to an unidentified buyer.

Between 1955 and 1959, Mr. and Mrs. Albert Alluis Jr. acquired and resided at the property. Born in 1908, Mr. Alluis was the son of a French immigrant who arrived in the United States in the early 1900s and worked as a dairyman in Arcadia, California. On the property, he cultivated potatoes.

In 1976, the property was owned by Ernest De Groot and his son, Chuck De Groot, and operated as Twin Palms Dairy. Born in 1910, Ernest De Groot was a native of Norman County, Minnesota, and the son of Dutch immigrants who arrived in the United States in the late 1800s. In the 1930s, his family relocated to Downey, California, in the Los Angeles Basin, where they worked in the dairy industry. By the mid-to-late 1960s, De Groot moved to the Chino Valley/Ontario region, where he later acquired the property.

In 1986, the property was part of a public dairy open house hosted by the Dairy Committee. According to the Chino Champion, the dairy housed nearly 600 cows and grew approximately one-quarter of its own feed on farmland elsewhere in the Chino Valley. Between 1970 and 1977, the De Groot cows ranked among the top-producing dairy cows in the region.

Ernest De Groot passed away in 2003 at the age of 92, and the property remained under the De Groot family trust. By 2008, it was listed as the Paul Huizenga Dairy, still under the De Groot family's ownership.

**7697 Edison Ave**
Between 1959 and 1962, the Craftsman Bungalow style dwelling was occupied by Mr. and Mrs. Homer Gibson. In 1965, the dwelling was occupied Mr. and Mrs. Pirie Grant. Between 1977 and 1982, Mr. and Mrs. Charles De Groot occupied the dwelling.

**Building, Structure, Object Information Continued:**

**FOR SALE**

FOR SALE—Large bronze breeding tom turkey; also persimmons. U. O. Gurlock, 1752 North Euclid, Ontario. Phone Upland 454-R. 2432

FOR SALE—Good vigorous baby chicks from my own stock of selected hens and pedigreed male birds. Glad to show the parent stock. Also chicks from same now in the brooder. 324 Acacia street. Phone 484-R. 2431

FOR SALE—Lion electric brooder, capacity 500 chicks, $10. Phone 1241-W. 2426

FOR SALE—Oat and alfalfa hay. Southwest corner Bon View and Edison avenue. Phone Chino 6072. 2425

"For Sale," Daily Report, January 14, 1929.

**MISCELLANEOUS**

To all real estate brokers: Our property located on the southwest corner of Bon View and Edison avenue is off the market.

Brockmeier Bros.
Paul Brockmeier.
3152

"Miscellaneous," Daily Report, January 3, 1931.

**Building, Structure, Object Information Continued:**

## DeGroot cow tops Andrews testing

A cow owned by Ernest DeGroot of Chino led the honor roll of the Andrews Lab's April report, with production of 938.8 pounds of butterfat and 25,350 pounds of milk.

George Andrews said that the average milk per cow per day was 54.5 pounds, the average butterfat per cow per month was 58.5 pounds and the average test was 3.58 percent.

"DeGroot Cow Tops Andrews Testing," Chino Champion, May 26, 1976.

## DeGroot cow tops testing by Andrews lab for June

Cow number 472 of Ernest DeGroot's Twin Palm dairy of Chino was high cow for the month of June tests done by the Andrews Lab. She produced 978 pounds milk in 23,240 pounds milk during the 305-day lactation period.

"De Groot Cow Tops Testing by Andrews Lab for June," Chino Champion, August 5, 1977.

**Building, Structure, Object Information Continued:**

**Ernest DeGroot** will be honored along with his son **Chuck,** and several other local dairymen at the annual Dairy Appreciation Dinner on Tuesday night. Ernest founded the family dairy which now includes son Chuck as a major administrator.

Chino Champion, September 18, 1981.

1982 California Dairy Industries Association producer raw milk class winners for San Bernardino County as announced by the Dairy Industries Association.

**Grand Trophy Winner**

Ted Miller Dairy, Chino.

Trophy winner—Producing over 19,000 lbs milk daily.

Tie-Andrew Stellingwerf Dairy, Chino; Twin Palms Dairy, Chino, Chuck and Ernest DeGroot.

Trophy Winner—Producing under 19,000 lbs milk daily.

J & L Dairy, Corona, Larry Vander Berge.

Chino Champion, December 17, 1982.

**Building, Structure, Object Information Continued:**

B-10-Chino Champion Fri., June 13, 1986

# Local dairies show how they do it

By Matthew Erlich, Staff Writer

Hundreds of Chino area residents got a taste of the dairy life, literally drinking down its pleasures when the Twin Palms and Costa View dairies hosted open houses June 7. The event was geared to kick off June as Dairy Month.

Highlight of the event was the milk drinking competition which saw children and adults race to finish small cartons and bottles of milk.

At the Twin Palms Dairy, 7587 Edison Ave, people on hand saw Jim Staal hoof trim cows. Mr Staal was demonstrating something he knows well, trimming between 8,000-10,000 head per year.

Mr Staal uses a custom-built truck that lifts cows and holds them in place for the trimming.

The dairy is owned by Mr and Mrs Ernest De Groot, Mr and Mrs Charles De Groot, and Mr and Mrs Paul Huizenga. The family operation milks 590 cows, and calves are raised on the site.

Ernest De Groot went broke once trying to start a dairy. His second effort in 1944 was more successful. He moved to Chino from Artesia in 1964.

At the Costa View Dairy, 14451 Bon View Ave, participants saw a calf with a fifth leg and glimpsed the computerized feeding process at the dairy.

Mr Costa has operated his dairy at Bon View Ave since 1970.

The milk drinking contest at the Twin Palms Dairy was hosted by Larry Bentley. Winners were:

**3-4 year olds;** Nicole Kleiman, Brian Hooper, Michelle Toledo, all of Chino.

**5-7 year olds;** Jennifer Galinbo of Ontario, Justin White, and Kenny Beattie, both of Chino.

**8-10 year olds;** Vincent Edwards-Ramirez of Ontario, Ernest De Groot and Luke Huizenga, both of Chino.

**11-14 year olds;** Shannon Mason, Nancy Garza and Jason Valencich, all of Chino.

**Adults;** Dennis Parker of Chino Hills, Dorita Valencich of Chino, and Mike Miller of the Chino Hills.

**HASTE MAKES WASTE — This young man is too busy to cry over spilt milk as he tries to get started during the milk drinking competition. Besides the milk they drank, winners received ribbons for their performance.**

Staff photo by Matthew Erlich

**ADULT WINNER — Dennis Parker, 34, of the Chino Hills (center) was the winner of the milk drinking contest for adults who were adorned with a bib and had to drink milk from a nipple. Miss Vitality Kim Stueve (left) and the 1986 Southern California Dairy Princess Sherrie Hoekstra (right) also were on hand for the event and led some dairy tours.**

Staff photo by Matthew Erlich

**THE CONVERSATION — Miss Chino Jane Carroll (right) talks with Mrs Ernest De Groot during the Dairy Open House. The chamber sponsored event was considered a success.**

Staff photo by Matthew Erlich

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FOR YOUR SUPPORT

"Local Dairies Show How They Do It," Chino Champion, June 13, 1986. p20

**B12. References Continued:**

2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
The 7587-7697 Edison Avenue property is recommended significant and eligible as an excellent example of a postwar dairy under the historic context theme for Postwar, Large-Capacity Dairies, 1945–1980. It retains multiple contributing features and clearly conveys its historical association with large scale, industrial dairy production that emerged in the region in the postwar era. Contributing features include a Craftsman Bungalow constructed prior to 1935, a Ranch Style residence built between 1959 and 1966, a Ranch Style Milk Parlor with a circular drive, and a range of ancillary structures including but not limited to silos, stalls, pole barns, a detached garage, feeding gates, water features, and bulk tanks. Under the historic context for Postwar, Large-Capacity Dairies, eligible properties must retain integrity of location, design, setting, materials, workmanship, feeling, and association, and demonstrate a direct and significant association with the dairy industry during the postwar period. This property as a whole meets the eligibility criteria for NRHP Criterion A / CRHR Criterion 1 / City of Ontario Criterion a, as it clearly conveys its historical association with large scale dairy operations that emerged in the region in the postwar.

Individually, the Craftsman Bungalow, built before 1935, is also recommended eligible under NRHP Criterion C / CRHR Criterion 3 / City of Ontario Criterion d. It retains its original shape, scale, and design features such as exposed rafter tails, wood siding, and overhanging eaves. Although a two-story rear addition was built between 1975 and 1979, it is set back, secondary in scale, and does not compromise the building's architectural character. The house continues to convey the key qualities of the Craftsman Bungalow style.

The Ranch style residence, constructed between 1959 and 1966, is also recommended individually eligible under NRHP Criterion C / CRHR Criterion 3 / City of Ontario Criterion d, under the context of Ranch Style, 1950–1970s. The dwelling features a horizontal rambling floorplan, low-pitched roof, wide eaves, cupola, and an integrated attached garage via an open breezeway. Although some windows have been replaced with vinyl units within the original openings, the overall design, materials, and feeling remain intact. The dwelling retains the necessary aspects of integrity and clearly represents a postwar Ranch style residence in Ontario.

While the milk parlor was considered for individual eligibility, the building reflects the standard Ranch style form and layout associated with large-capacity dairy operations. The milk parlor does not exhibit distinctive design features or architectural detailing that would elevate it to individual significance. Its configuration, materials, and construction are typical of postwar dairy facilities and do not reflect a uniquely representative or distinguishing example of the style or type. Accordingly, the building is not recommended for individual eligibility.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B. _**B.M.** __
c. Address: 14213-14297, 14333-14353, 14450, 14451 Bon View Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441295, 441487, 441407, 441407, 441407, 441407 mE / 3761773, 3761773, 3761622, 3761522, 3761424, 3761328 mN
e. Other Locational Data: San Bernardino County APN:105335101, 105335102, 105354101, 105354102, 105357101, 105357102

***P3a. Description:** The evaluated property consists of six parcels (APN: 105335101, 105335102, 105354101, 105354102, 105357101, and 105357102), historically addressed as 14213-14297, 14333-14353, 14450, and 14451 Bon View Avenue. The surrounding area is characterized by open space and agricultural land with historical ties to dairy operations. Covering 56.47 acres, the property is situated east of Bon View Avenue, between Euclid and Eucalyptus Avenues. The property includes two Ranch style milk parlors, two Minimal Traditional residences, two Craftsman Bungalow residences, two Ranch style dwellings, and multiple geometrically spaced ancillary storage structures located to the rear of the buildings. Water retention ponds are located to the rear portion of the parcels. Landscaping and hardscaping are minimal, consisting of paved driveways and scattered trees and shrubs. Today, the parcels continue to operate as dairy farms. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: View east of 14213 Bon View Avenue milk parlor (IMG_8730; October 21, 2024).
***P6. Date Constructed/Age and Source** pre-1935, 1959-1966, 1968-1975/UC Santa Barbara FrameFinder (1938, 1959, 1966, 1968, 1975)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Dlazevedo Enterprises LP
13309 Melissa Court
Madera CA 93637
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Rocha Dairy/Dimas Costa Dairy/ Costa View Farms No. 3/ Costa View Dairy/ Costa View Farms No. 1/ H & R Dairy
**B2. Common Name:** 14213-14297, 14333-14353, 14450, 14451 Bon View Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style/Minimal Traditional Style/Craftsman Bungalow Style

***B6. Construction History:** This property consists of six parcels under common ownership. No historic-era building permits were found on file for the property at the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and subsequent years. Aerial imagery indicates that the parcels at 14213-14297 Bon View Avenue and 14333-14353 Bon View Avenue were first improved with the construction of Craftsman Bungalow-style dwellings. Between 1959 and 1966, a Ranch style milk parlor and two Minimal Traditional-style residences were constructed at 14213-14297 Bon View Avenue. Between 1968 and 1975, a Ranch style dwelling was added at 14333-14353 Bon View Avenue.

During the same period (1968–1975), a Ranch style milk parlor and a Ranch style dwelling were constructed at 14450 and 14451 Bon View Avenue. Over the years, the milk parlor at 14213-14297 Bon View Avenue underwent substantial alterations between 1966 and the 1990s. Additionally, the Craftsman Bungalow dwelling features an early rear addition, appended between 1938 and 1946, and both Craftsman Bungalow dwellings have since lost their original windows. Subsequent aerial imagery suggests that the configuration of the remaining buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified **B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Early Dairy Farms in Ontario, 1900s-1929; Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s **Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 14213-14297, 14333-14353, 14450, 14451 Bon View Avenue was initially developed prior to 1935, with subsequent improvements/alterations made between the 1950s and 1990s. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former Chino Agricultural Preserve. The property is associated with the historical contexts of Early Dairy Farms in Ontario, 1900s-1929; Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s; however, the property does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 14213-14297, 14333-14353 , 14450, 14451 Bon View Avenue



Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 48

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
The 14213, 14333, 14450, and 14451 Bon View Avenue property spans multiple parcels fronting Bon View Avenue. Below is a description of each parcel and the buildings/structures located on them.

**14213-14297 Bon View Avenue (APN:105335101 and 105335102), pre-1935, 1959-1966**
Improved prior to 1935 with later developments between 1959 and 1966, the 14213-14297 Bon View Avenue property includes a Craftsman Bungalow style dwelling with a detached garage (14213 Bon View Ave), a Ranch style milk parlor (14239 Bon View Ave), two Minimal Traditional style residences (14283-14297 Bon View Ave), and several geometrically spaced pole structures to the rear.

To the far northwest corner of the parcel is a Craftsman Bungalow-style residence listed as 14213 Bon View Avenue. Constructed prior to 1935, the one-and-a-half-story dwelling has a compact rectilinear floorplan and an asymmetrical façade. The exterior is clad in tan-painted stucco with brown trim on the windows. The high-pitched, cross-gabled roof is topped with composition shingles and features a moderate eave overhang, support brackets below the gable, open eaves with exposed rafter ends, and a shed dormer on the main (west) elevation. The fenestration consists primarily of aluminum sliding sash windows and wood panel doors. The main elevation includes a full-length porch supported by two metal columns, a small stoop, and four concrete square columns approximately four feet in height. The rear (east) elevation features an early addition that was appended between 1938 and 1946. The addition features a stucco façade, gabled roof topped with composition shingles, open eaves with exposed rafter ends, and aluminum windows. The dwelling likely originally featured wood-framed, double-hung windows, as well as columns composed of a different material, which were removed or altered at an unidentified date.

A few feet east of the dwelling is one-car detached garage constructed between 1959 and 1966. The garage has a square floorplan, a gable roof, tan stucco façade, and a white overhead door.

Directly south of the Craftsman Bungalow dwelling is a Ranch style milk parlor listed as 14239 Bon View Avenue. Constructed between 1959 and 1966, the one-story structure has been substantially altered and now consists of three sections: the front milk house with an addition to the south elevation, the original rear milking parlor to the east of the milk house, now modified as a storage shed, and a new milking parlor section extending from the milk house addition. The milk house and milking parlor are separated by a breezeway, which features a metal sliding barn door with a handle on the south elevation. East of the breezeway, the building is divided into a milking area and a wider holding area. The milking area features louvered horizontal shutters on the south elevation, set atop concrete walls, while the north elevation is obscured by the original rear section. The rear section has a gabled roof oriented along an east-west axis. Additional elements include metal doors at the front, a dairy association sign below the gable, and a circular driveway in front of the milk parlor.

South of the milk house are two modest Minimal Traditional residences and a detached garage, historically addressed as 14283-14297 Bon View Avenue. Constructed between 1959 and 1966, the 14283 Bon View Avenue dwelling is situated north of the 14297 Bon View Avenue dwelling, with the detached garage positioned between them. Both residences feature asymmetrical façades and rectilinear floorplans atop concrete foundations. The 14283 Bon View Avenue dwelling has a tan stucco exterior, a hipped roof topped with composition shingles, moderate eave overhang, and boxed eaves. The main entryway is recessed, with a partial porch that includes a small stoop and decorative iron railing and columns. Fenestration consists of aluminum sliding sash windows and paneled doors. The 14297 Bon View Avenue dwelling features a tan stucco façade, a side-gabled roof with composition shingles, and an attached narrow garage with an overhead metal door. The main elevation includes a half-width porch supported by decorative metal columns and railing, a small stoop, aluminum sliding sash windows, and paneled doors.

The detached garage shares a similar appearance with the dwellings, featuring a tan stucco façade, a front-gabled roof, and a metal overhead door. East of the milk parlor and dwellings, several geometrically spaced pole structures are present, along with metal silos and ancillary storage buildings.

## Primary Record Information Continued:

P3a. Continued from Page 1:
The 14213, 14333, 14450, and 14451 Bon View Avenue property spans multiple parcels fronting Bon View Avenue. Below is a description of each parcel and the buildings/structures located on them.

14213-14297 Bon View Avenue (APN:105335101 and 105335102), pre-1935, 1959-1966
Improved prior to 1935 with later developments between 1959 and 1966, the 14213-14297 Bon View Avenue property includes a Craftsman Bungalow style dwelling with a detached garage (14213 Bon View Ave), a Ranch style milk parlor (14239 Bon View Ave), two Minimal Traditional style residences (14283-14297 Bon View Ave), and several geometrically spaced pole structures to the rear.

To the far northwest corner of the parcel is a Craftsman Bungalow-style residence listed as 14213 Bon View Avenue. Constructed prior to 1935, the one-and-a-half-story dwelling has a compact rectilinear floorplan and an asymmetrical façade. The exterior is clad in tan-painted stucco with brown trim on the windows. The high-pitched, cross-gabled roof is topped with composition shingles and features a moderate eave overhang, support brackets below the gable, open eaves with exposed rafter ends, and a shed dormer on the main (west) elevation. The fenestration consists primarily of aluminum sliding sash windows and wood panel doors. The main elevation includes a full-length porch supported by two metal columns, a small stoop, and four concrete square columns approximately four feet in height. The rear (east) elevation features an early addition that was appended between 1938 and 1946. The addition features a stucco façade, gabled roof topped with composition shingles, open eaves with exposed rafter ends, and aluminum windows. The dwelling likely originally featured wood-framed, double-hung windows, as well as columns composed of a different material, which were removed or altered at an unidentified date.

A few feet east of the dwelling is one-car detached garage constructed between 1959 and 1966. The garage has a square floorplan, a gable roof, tan stucco façade, and a white overhead door.

Directly south of the Craftsman Bungalow dwelling is a Ranch style milk parlor listed as 14239 Bon View Avenue. Constructed between 1959 and 1966, the one-story structure has been substantially altered and now consists of three sections: the front milk house with an addition to the south elevation, the original rear milking parlor to the east of the milk house, now modified as a storage shed, and a new milking parlor section extending from the milk house addition. The milk house and milking parlor are separated by a breezeway, which features a metal sliding barn door with a handle on the south elevation. East of the breezeway, the building is divided into a milking area and a wider holding area. The milking area features louvered horizontal shutters on the south elevation, set atop concrete walls, while the north elevation is obscured by the original rear section. The rear section has a gabled roof oriented along an east-west axis. Additional elements include metal doors at the front, a dairy association sign below the gable, and a circular driveway in front of the milk parlor.

South of the milk house are two modest Minimal Traditional residences and a detached garage, historically addressed as 14283-14297 Bon View Avenue. Constructed between 1959 and 1966, the 14283 Bon View Avenue dwelling is situated north of the 14297 Bon View Avenue dwelling, with the detached garage positioned between them. Both residences feature asymmetrical façades and rectilinear floorplans atop concrete foundations. The 14283 Bon View Avenue dwelling has a tan stucco exterior, a hipped roof topped with composition shingles, moderate eave overhang, and boxed eaves. The main entryway is recessed, with a partial porch that includes a small stoop and decorative iron railing and columns. Fenestration consists of aluminum sliding sash windows and paneled doors. The 14297 Bon View Avenue dwelling features a tan stucco façade, a side-gabled roof with composition shingles, and an attached narrow garage with an overhead metal door. The main elevation includes a half-width porch supported by decorative metal columns and railing, a small stoop, aluminum sliding sash windows, and paneled doors.

The detached garage shares a similar appearance with the dwellings, featuring a tan stucco façade, a front-gabled roof, and a metal overhead door. East of the milk parlor and dwellings, several geometrically spaced pole structures are present, along with metal silos and ancillary storage buildings.

## Primary Record Information Continued:

**14333-14353 Bon View Avenue (APN:105354102), pre-1935, 1968-1975**
Improved prior to 1935, with later developments between 1968 and 1975, the property includes a Craftsman Bungalow-style dwelling at 14353 Bon View Avenue, a Ranch style dwelling at 14343 Bon View Avenue, a detached garage, and four ancillary pole structures situated to the rear.

To the far southwest corner of the parcel is a Craftsman Bungalow-style dwelling, historically addressed as 14343 Bon View Avenue. Constructed prior to 1935, the dwelling features a rectangular footprint and an asymmetrical façade. The exterior is clad in tan-painted stucco. The high-pitched, side-gabled roof is topped with composition shingles and includes a minimal eave overhang, boxed eaves, and two gabled dormers on the north and south elevations. The fenestration primarily consists of aluminum sliding sash windows. An addition, constructed between 1959 and 1966, extends from the east elevation. The dwelling exhibits minimal decorative detailing throughout.

A few feet north of the dwelling is a one-car garage, which features a front-gabled roof and a metal overhead door.

To the far northwest corner of the parcel is the Ranch style dwelling at 14353 Bon View Avenue. Constructed between 1968 and 1975, the dwelling features an asymmetrical, horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan-painted stucco with brown window trim. The low-pitched hipped roof is topped with terracotta tiles and features a minimal eave overhang with boxed eaves. The fenestration is mostly obscured from the public right-of-way but appears to consist of fixed multi-lite or single-pane picture windows. A detached one-car garage is situated south of the dwelling, featuring a tan stucco façade, a hipped roof with terracotta tiles, and a metal overhead door. Additional features include a stone planter and a circular driveway in front of the residence.

East of the dwellings, four pole structures are present.

**14450 Bon View Avenue (APN:105354101),1968-1975**
Improved between 1968 and 1975, the parcel includes a Ranch style milk parlor and several ancillary structures associated with dairy operations. The one-story milk parlor consists of two sections: the front milk house and the rear milking parlor, separated by a breezeway. The milk house features modest Ranch style elements, including a hip-and-gable roof with wood shake shingles, a stucco façade with stone accents along the corners of the main (west) elevation, and metal casement windows on the north elevation. The fenestration throughout has since been boarded up. The breezeway, located between the two sections on the north and south elevations, is obscured from the public right-of-way.
East of the breezeway, the building is divided into a milking area and a wider holding area. The milking area features louvered horizontal shutters on the north and south elevations, set atop concrete walls. The holding area, which extends outward beyond the milking area, is partially open and supported by concrete walls and metal poles. Both sections have gabled roofs oriented along an east-west axis. Additional features include two glass industrial doors at the front, a circular driveway in front of the milk parlor, and a dairy association sign.

Several geometrically spaced pole structures are located around the milk parlor, along with metal silos and ancillary storage buildings.

**14451 Bon View Avenue (APN:105357101 and 105357102),1968-1975**
Improved between 1968 and 1975, the 14451 Bon View Avenue property includes a Ranch style dwelling with an attached garage and several geometrically spaced pole structures to the rear. The dwelling is located on parcel 105357101, while parcel 105357102 to the south remains mostly undeveloped. The dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a brick veneer and a planter on the main (west) elevation. The low-pitched hipped roof is topped with composition shingles, featuring a moderate eave overhang, boxed eaves, and a stone chimney on the rear roof slope.
The main elevation showcases a recessed entryway beneath the roofline, with two decorative wood-paneled doors and box bays accented by horizontal wood siding. The fenestration throughout consists primarily of vinyl sliding sash windows. At the far northern end is a one-car attached garage with a white paneled overhead door.

## Primary Record Information Continued:

View east of 14450 Bon View Avenue (IMG_8725; October 21, 2024).

View northeast of 14450 Bon View Avenue (IMG_8726; October 21, 2024).

## Primary Record Information Continued:

View northeast of 14450 Bon View Avenue milk parlor (IMG_8727; October 21, 2024).

View east of 14333 Bon View Avenue Minimal Traditional SFR (IMG_8729; October 21, 2024).

## Primary Record Information Continued:

View east of 14213 Bon View Avenue bungalow and Ranch style SFR (IMG_8731; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**

**14213 Bon View Ave**
In 1957, the 14213 Bon View Avenue property was advertised for rent by local newspapers as a 19 acre ranch with water and soil good for sweet potatoes. In 1962, Frank Bernard lived at the property. In 1970, Mr. and Mrs. Dennis M. Coelho lived at the property. In 1973, Mr. and Mrs. Elcidio Rocha lived at the property. In 1982, the dwelling was part of a dairy known as the Jose Rocha Dairy. In 1987, the property appears to have been under the ownership of the Rocha and Coelho family. In 1989, the dwelling was part of the Costa View Farms No. 3 Dairy.

**14297 Bon View Ave**
In 1969, the milk parlor was listed as part of the Rocha family dairy.

**14283 Bon View Ave**
No Results.

**14297 Bon View Ave**
Between the 1960s and 1970s, the dwelling is listed as part of the Rocha Dairy.

## Building, Structure, Object Information Continued:

**14333 Bon View Ave**
Between 1957-1963, the dwelling was occupied by Gene Souza family. In 1966, the property was occupied by Manuel Costa Cordoza Sr., of the Azores. In 1971, Mr. and Mrs. Antonio R. Cota occupied the dwelling.

**14343-14353 Bon View Ave**
No Results.

**14451 Bon View Ave**
No Results.

**14450 Bon View Ave**
Between 1970-1980s, the dwelling was occupied by the Dimas Costa family and part of the Costa Dairy farm. In 1978, the Costa dairy was part of a tour sponsored by the Chamber of Commerce Dairy Committee. In 1981, the dairy farm was known as the Costa View Farms. In 1989, the dwelling was part of the Costa View Farms No.1. In 2003, the dwelling was part of the H & R Dairy owned by Dorothy Miersma family trust.

Chino Champion--Section 2, page 26 Chino, Calif., Fri., June 2, 1978

# Dairies on tour set for June 24

The Chamber of Commerce Dairy Committee will sponsor a three-dairy open house to celebrate June is Dairy Month on June 24 from 10 a.m. to 3 p.m.

Dimas Costa's dairy at 14451 Bon View will be one of those open to the public. He has been at his present location eight years and has a total of 750 cows,

Continued on page 27

A PORTION of the 30-acre Costa diary is given to storage of hay and feed. — Champion Photo.

AN UNUSUAL FEATURE of the dairy barn at Jennie and Fred DeBoer's new dairy is a large dairy scene stained glass window visible from the East Riverside Dr. location. The newly expanded dairy will still be under construction when it is featured as part of a tri-dairy tour sponsored by the Chamber of Commerce on June 24. — Champion Photo.

GOODYEAR
CONGRATULATIONS! Al Unser Winner Of The 1978 Indianapolis 500 On Goodyear Racing Tires
'Be A Winner...Go Goodyear'
DOUBLE BELTED DOUBLE FEATURE!
BLACKWALL $28 A78-13 blackwall plus $1.71 F.E.T. and old tire
WHITEWALL $31 A78-13 whitewall plus $1.71 F.E.T. and old tire

| Size | Blackwall Price | Whitewall Price | Plus F.E.T. No trade needed |
|---|---|---|---|
| E78-14 | $33.00 | $36.00 | $2.19 |
| F78-14 | $39.00 | $42.00 | $2.34 |

Goodyear's Best-Selling Glass Belted Tire...Custom Cushion Power Polyglas'
POLYESTER SUPERSTAR!
'All-Weather' 78 Goodyear Quality At A Budget Price
$20 B78-13 blackwall plus $1.72 F.E.T. and old tire

"Dairies on Tour set for June 24," Chino Champion, Jun 2, 1978.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b. as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 14213-14297, 14333-14353 , 14450, 14451 Bon View Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 14213-14297, 14333-14353 , 14450, 14451 Bon View Avenue property has been found not significant and ineligible, while it maintains integrity of location, setting, feeling, and association as an active and in-use dairy farming property, some of the buildings have lost integrity of design, materials, and workmanship due to modifications.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 53

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 7914 Edison Avenue
**Page** 1 **of** 5

**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._**B.M.** __
c. Address: 7914 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441677, 441692 mE / 3762364, 3762132mN
e. Other Locational Data: San Bernardino County APN:105317101, 105332102, 105332103, 105317106

***P3a. Description:** The evaluated property consists of four parcels (APN: 105317101, 105332102, 105332103, and 105317106), historically addressed as 7914 Edison Avenue. Located in an area characterized by open space and agricultural land with historical ties to dairy operations, the property spans 18.79 acres. It is situated north of Edison Avenue, between Bon View and Grove Avenues. The property includes two Ranch style single-family residences and a Streamline Modern milk parlor. The property is mostly obscured from the public right-of-way and enclosed by a chain-link fence with privacy fabric. The buildings are located on parcel 105332102, while the remaining parcels are undeveloped. Originally the property was owned by Earl Abram Musser, son of Charles Sumner Musser, founder of the Shady Grove Dairy. Dairy operations have ceased at the property. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View north of 7914 Edison Avenue (IMG_8735; October 21, 2024).
***P6. Date Constructed/Age and Source**
1952-1959, 1966-1980/UC Santa Barbara FrameFinder (1952)/NETR HistoricAerials (1959, 1966,1980)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Edison Ranch LLC
PO Box 1578
Chino CA
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Earl Musser Property
**B2. Common Name:** 7914 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Single-Family Residence
***B5. Architectural Style:** Ranch Style/Streamline Moderne Style

***B6. Construction History:** This property consists of four parcels under common ownership. No historic-era building permits were found in the City of Ontario's records. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System and supplemented by aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and subsequent years. Aerial imagery indicates that initial development occurred between 1952 and 1959 with the construction of the existing Ranch style residence and Streamline Moderne milk parlor. Between 1966 and 1980, a second Ranch style residence was added. Aside from the addition of an attached garage to the first dwelling, aerial imagery suggests that the configuration of the existing buildings has remained largely unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 7914 Edison Avenue was initially developed between 1952 and 1959. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 7914 Edison Avenue
**Page 3 of** 5

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 53

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

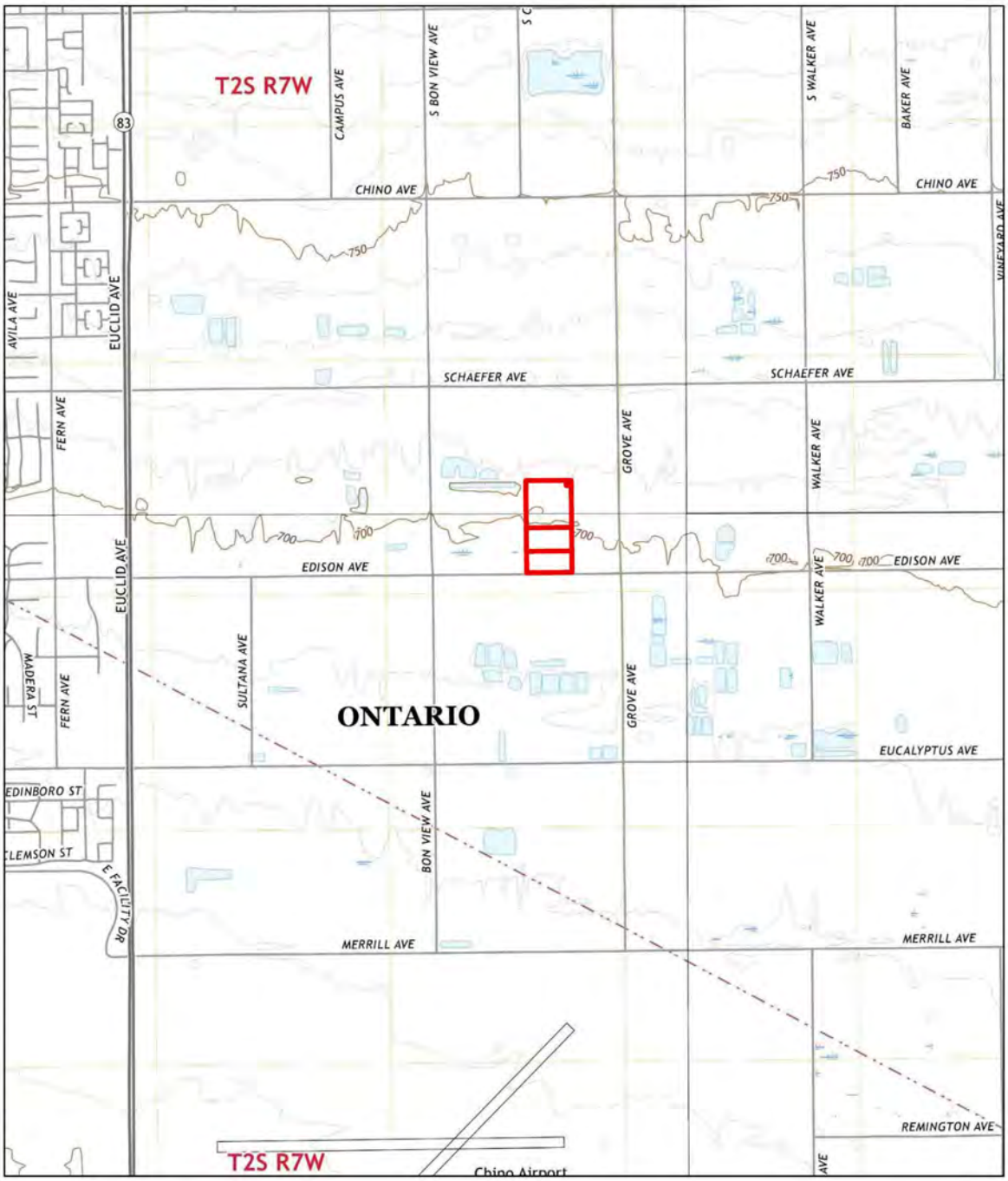


URBANA PRESERVATION & PLANNING LLC

0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**

Improved between 1952 and 1959 with later developments between 1966 and 1980, the 7914 Edison Avenue property includes two Ranch style residences and a Streamline Moderne milk parlor. The property is obscured behind a fence. Based on Google Street View images and aerial imagery, the dwelling features an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with brick and wood shiplap veneer on the main elevation. The low-pitched hipped roof is topped with composition shingles, has a moderate eave overhang, boxed eaves, and a brick chimney along the roof slope at the rear (north) elevation. The fenestration consists of metal casement windows and sliding sash windows. The main elevation features a partial-width porch beneath a shed roof supported by decorative metal beams, a small stoop, and additional decorative metal details. To the west side of the dwelling is a one-car garage addition, installed by the 1980s, with a brown paneled overhead door.

Directly west of the residence is the Streamline Moderne milk parlor. Constructed between 1952 and 1959, the structure retains only the front milk house section, as the rear milking parlor section was demolished by April 2022. The milk house exhibits distinctive Streamline Moderne characteristics, including smooth stucco walls, a flat roof, curvilinear corners, a central vertical projection, and glass block windows, some of which are diamond-shaped. Originally, the milk house featured a white painted stucco exterior, but by 2022, it had been repainted tan. The original metal casement windows on the west and east elevations were replaced with incompatible vinyl single-hung windows. While the milk parlor may have been eligible as a distinctive example of the Streamline Moderne style, it no longer retains sufficient integrity to convey its significance.

To the far southwest corner of the parcel is the second Ranch style residence, constructed between 1966 and 1980. The residence has an asymmetrical façade and a mostly rectilinear floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a partial brick veneer on the main (south) elevation. The low-pitched hipped roof features a moderate eave overhang and boxed eaves. The fenestration primarily consists of vinyl sliding sash windows, which were installed in 2022, replacing the original aluminum units. The main (south) elevation features a recessed main entryway with decorative double wood-paneled doors, a small stoop, a decorative metal beam beneath the roofline and entryway, and an attached garage on the west side with an overhead door.

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**

During the 1970s, Henry Donkers and his wife lived at the subject property.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b. as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 7914 Edison Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

The 7914 Edison Avenue property has been found not significant and ineligible. While the milk parlor may have once been eligible as a distinctive example of the Streamline Moderne style and retains integrity of location and setting, it no longer possesses sufficient integrity of design, materials, workmanship, feeling, or association as an active dairy farming property or a site historically connected to dairy operations.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B. _**B.M.** __
c. Address: 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442103, 442291, 442289 mE / 3762770, 3762181, 3762380mN
e. Other Locational Data: APN: San Bernardino County APN: 021631103, 021631104, 021631105, 021631108, 021631109

***P3a. Description:** The evaluated property consists of five parcels (APN: 021631103, 021631104, 021631105, 021631108, and 021631109), historically addressed as 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, and 8270-8292 Edison Avenue. Covering 46.80 acres, the property is located on the east side of Grove Avenue and extends between Schaefer and Edison Avenues. The surrounding area remains largely open space and agricultural land, historically associated with dairy farming. The property includes a Ranch style dwelling and milk parlor with Dutch style characteristics located at 13715–13751 Grove Avenue on parcel 021631105, as well as a second Ranch style dwelling and milk parlor with Dutch style characteristics at 13817–13819 Grove Avenue on parcel 021631104, with some ancillary structures. It also includes two Minimal Traditional style dwellings at 8270–8292 Edison Avenue on parcel 021631109. Water retention ponds are present on parcels 021631103 and 021631109. Although historically associated with dairy operations, the property no longer functions as an active dairy. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View east of 13715 Grove Avenue Ranch style milk parlor # 2 with perpendicular wing (IMG_8772; October 21, 2024).

***P6. Date Constructed/Age and Source**
1948-1952, 1959-1966/UC Santa Barbara FrameFinder (1952); NETR HistoricAerials (1948, 1959,1966)
☒Historic:
☐ Prehistoric
☐ Both

***P7. Owner and Address:**
Grove Schaefer Ontario LLC
14240 Sapphire Hill Ln
Chino Hills CA 91709

***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com

***P9. Date Recorded:** October 2024

***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.

***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Hofstra Dairy
**B2. Common Name:** 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Single-Family Property
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of five parcels under a single ownership. No historic-era building permits were found in the City of Ontario's records. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System and supplemented by aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and subsequent years. Aerial imagery indicates that initial development occurred between 1948 and 1952, with the construction of two Minimal Traditional residences listed as 8270-8292 Edison Avenue. Between 1959 and 1966, a Ranch style residence and milk parlor was constructed on 13715-13751 Grove Avenue and a Ranch style residence and milk parlor on 13817-13819 Grove Avenue. Several ancillary structures/features were constructed to the rear of the buildings. By the 2018, most of these supporting structures/features had been demolished. Subsequent aerial imagery suggests that the configuration of the existing buildings has remained relatively unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Ranch Style, 1950-1970s **Area:** San Bernardino County
**Period of Significance:** 1959-1966 **Property Type:** Ranch Style
**Applicable Criteria:** NRHP/CRHR/Local C/3/d

The 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue property was improved between 1948 and 1952 with additional developments between 1959 and 1966. In 1967 the area was established as part of the San Bernardino County Agricultural Preserve. In 1999, the area was annexed as part of the New Model Colony, formed from a portion of the former agricultural preserve. The property was evaluated under multiple themes, including the Postwar, Large-Capacity Dairies, 1945-1980; Ranch Style, 1950-1970s; and the Minimal Traditional Style, 1930s-1960s.However, the only Ranch style milk parlor and residences are significant under NRHP / NRHP / CRHR / City of Ontario C/3/d under the context of the Ranch style, with a period of significance of 1959 through 1966, representing original construction of the buildings**. See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue



Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 3S/3CS/5S3
Other Listings: Urbana Survey No.: 69

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**

Improved between 1948 and 1952, with later developments occurring between 1959 and 1966, the property includes two Ranch style milk parlors with associated residences, two Minimal Traditional style dwellings, and several ancillary structures historically associated with dairy operations, including some ancillary structures associated with former dairy operations. The majority of the ancillary structures and features have been demolished. A description of each parcel and its associated buildings is provided below.

**13715-13751 Grove Avenue (APN: 021631105), 1959-1966**

Located on the northeast corner of Grove and Schaefer Avenues, 13715–13751 Grove Avenue includes a Ranch style residence and milk parlor situated on parcel 021631105. The dwelling is located in the northwest corner of the parcel and features an asymmetrical façade with a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in yellow painted stucco with horizontal wood siding on a portion of the main (west) elevation, accented by white trim around the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and features a moderate eave overhang, open eaves with exposed rafter tails, and decorative scalloped barge board at the gable ends. The fenestration visible from the public right-of-way consists of wood single-hung windows and a wood half-lite diamond patterned door. The main (west) elevation exhibits Northern European or Dutch influences, such as the diamond-patterned door, scalloped barge board, wood spindle porch supports, and a square cupola. The attached two-car garage is connected to the residence by a breezeway on the south elevation. Additional features include a stone planter and concrete steps at the main entryway.

South of the residence is the Ranch style milk parlor. The building has a horizontal floorplan and is divided into two sections: the front milk house and a rear milking parlor, separated by an open breezeway. The front section reflects Ranch style characteristics, featuring a front-gabled roof with wood shake shingles, yellow painted stucco walls, and metal casement and fixed windows. An open breezeway separates this front section from the rear portion of the building. South of the breezeway, the milking parlor has a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls and along the gable ridge. Additional features include a circular driveway, metal doors at the main entryway, and a stone planter. The main (west) elevation of the front section also displays Northern European or Dutch influences, such as diamond-patterned fixed windows and a gabled shed roof above the main entryway supported by curved knee brackets.

The dwelling and milk parlor are strong examples of Ranch style architecture with Northern European or Dutch influences, having undergone minimal alterations. While the property is associated with the postwar, large-capacity dairy theme, several key ancillary structures and features related to former dairy operations are no longer extant. As a result, the property no longer represents a strong example of a postwar, large-capacity dairy. However, the buildings appear individually eligible under the Ranch style theme.

**13817-13819 Grove Avenue (APN: 021631104), 1959-1966**

Located east of Grove Avenue, 13817-13819 Grove Avenue includes a Ranch style residence and milk parlor situated on parcel 021631104. The dwelling is located in the northwest corner of the parcel and features an asymmetrical façade with a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in beige painted stucco with tan horizontal wood siding on a portion of the main (west) elevation, accented by white trim around the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and features a moderate eave overhang, boxed eaves, horizontal wood siding below the gable, and decorative scalloped barge board at the gable ends. The fenestration visible from the public right-of-way consists of wood single-hung windows, some with decorative shutters, and a wood half-lite diamond patterned door. The main (west) elevation exhibits Northern European or Dutch influences, such as the diamond-patterned half-lite door and windows, scalloped barge board, box bay accented with wood-siding, and a square cupola. The attached three-car garage is connected to the residence by a breezeway on the south elevation. Additional features include a stone planter, a stone chimney on the rear elevation, and concrete steps at the main entryway.

South of the residence is the Ranch style milk parlor. The building is divided into two sections: the front milk house and a rear milking parlor, separated by an open breezeway. The front section reflects Ranch style characteristics, featuring a hip-and-gable roof with wood shake shingles, beige painted stucco walls, and metal casement and fixed windows. A breezeway, located between the two sections on the north and south elevations, is partially hidden from the public right-of-way. East of the breezeway, the

## Primary Record Information Continued:

milking parlor features a gable roof oriented along an east-west axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls and along the gable ridge. Additional features include a circular driveway, metal doors at the main entryway, and a stone planter. The main (west) elevation of the front section also displays Northern European or Dutch influences, such as diamond-patterned windows, decorative wood spindles below the roofline, and scalloped barge board at the gable end.

The dwelling and milk parlor are good examples of the Ranch style with Northern European or Dutch influences and minimal alterations. The However, several of the ancillary structures and features associated with former dairy operations are no longer extant. As a result, the property does not represent a strong example of a postwar, scientific, large-capacity dairy.

**8270-8292 Edison Avenue (APN: 021631109), 1948-1952**

Located north of Edison Avenue, 8270-8292 Edison Avenue includes two Minimal Traditional style dwellings situated on parcel 021631109. Both dwellings were constructed between 1948 and 1952 and features an asymmetrical compact floorplan with minimal decorative details. The 8270 Edison Avenue dwelling is located west of 8292 Edison Avenue. The dwelling has a square floorplan with a hipped roof topped with composition shingles. The exterior is stucco painted white. All the windows and doors have since been boarded up with plywood.

The 8292 Edison Avenue dwelling features a rectilinear floorplan and a white stucco exterior with red trim around the windows and doors. The hipped roof is also topped with composition shingles and includes a moderate eave overhang. Fenestration consists of a combination of aluminum single-hung windows and wood double-hung windows, along with a flush wood entry door. Both dwellings are modest in appearance and do not exhibit distinctive characteristics of the Minimal Traditional style.

View southeast of 13715 Grove Ave Ranch style SFR (IMG_8765; October 21, 2024).

## Primary Record Information Continued:

View southeast of 13715 Grove Ave Ranch style milk parlor (IMG_8766; October 21, 2024).

View southeast of 13715 Grove Ave Ranch style milk parlor # 2 with perpendicular wing (IMG_8767; October 21, 2024).

**Primary Record Information Continued:**

View east of 13715 Grove Ave Ranch style milk parlor # 2 with perpendicular wing (IMG_8769; October 21, 2024).

View east of 13715 Grove Ave Ranch style milk parlor # 2 with perpendicular wing (IMG_8770; October 21, 2024).

## Primary Record Information Continued:

View east of 13715 Grove Ave Ranch style SFR (IMG_8771; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
**13715-13751 Grove Avenue (APN: 021631105), 1959-1966**
Between the 1960s and 2021, the property was under the Dick Hofstra family's ownership.

**13817-13819 Grove Avenue (APN: 021631104), 1959-1966**
Between the 1960s and 2021, the property was under the Dick Hofstra family's ownership.

**8270-8292 Edison Avenue (APN: 021631109), 1948-1952**
Between the 1960s and 2021, the property was under the Dick Hofstra family's ownership.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
The two Ranch style residences and associated milk parlors, constructed between 1959 and 1966, are individually significant under NRHP, CRHR, and City of Ontario Criterion C/3/d as strong examples of the Ranch style with Northern European or Dutch stylistic influences. Their low-pitched roofs, stucco cladding, decorative scalloped barge board, diamond-patterned doors and windows, cupolas, and stone planters reflect design characteristics in-vogue in the postwar period. The buildings remain largely intact and retain integrity of location, design, materials, workmanship, and feeling. Accordingly, the property is eligible under NRHP, CRHR, and City of Ontario Local Register under C/3/d under the Ranch Style theme.

The property as a whole may have been eligible under NRHP, CRHR, and City of Ontario Criterion A/1/a for its association with the Postwar, Large-Capacity Dairies theme; however, it no longer retains sufficient integrity to convey its significance. As originally developed, the property embodied the postwar dairy type, with two milk parlors, multiple residences, and expansive acreage under single ownership. By 2018, most of the ancillary structures and features historically associated with the dairy, including corrals, barns, silos, pole structures, and feeding areas, had been removed. As a result, the property no longer retains the integrity necessary to convey significance under this theme.

Individually, the two Minimal Traditional style dwellings constructed between 1948 and 1952 are not eligible. They are modest, utilitarian examples of the style that lack distinctive detailing or architectural character and therefore do not rise to the threshold of individual significance.

Under the established context, an eligible property must retain integrity of location, setting, materials, design, feeling, workmanship, and association aspects of integrity to convey significance. The Ranch style milk parlors and residences retains necessary integrity to convey significance including location, setting, feeling, design, materials, workmanship, and association. Accordingly, the property is eligible under NRHP / CRHR / City of Ontario Criterion C/3/d, as it embodies the distinctive characteristics of the Ranch style, qualifying as a historical resource under Section 15064.5 of the CEQA Guidelines.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 103

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 7595 Schaefer Avenue, 13752 Bon View Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._ **B.M.** __
c. Address: 7595 Schaefer Avenue, 13752 Bon View Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441084, 440891, 441084 mE / 3762774, 3762181, 3762377 mN
e. Other Locational Data: San Bernardino County APN: 105311104, 105312101, 105312102, 105319101, 105319102, 105330101, 105330102

***P3a. Description:** The evaluated property consists of seven parcels (APN: 105311104, 105312101, 105312102, 105319101, 105319102, 105330101, and 105330102), historically addressed as 7595 Schaefer Avenue and 13752 Bon View Avenue. Encompassing 61.21 acres, the property is located west of Bon View Avenue, extending between Schaefer and Edison Avenues. The surrounding area remains predominantly open space and agricultural land, historically associated with dairy farming. The property includes a Ranch style residence on parcel 105311104, a Ranch style residence and milk parlor on parcel 105312101, several geometrically spaced ancillary pole structures and sheds, and water retention ponds on parcels 105319101, 105330101, and 105330102. Landscaping and hardscaping features are minimal and consist of paved driveways and some organized trees around the dwellings. The property continues to function as a dairy farm today. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: View west of 13752 Bon View Ave (IMG_8687; October 21, 2024).
***P6. Date Constructed/Age and Source**
1952-1959/UC Santa Barbara FrameFinder (1952, 1959)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Nederand Family Partnership
4998 Hogg Rd
Homedale ID 83628
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Driftwood Dairy Farm/Vander Poel Bros/Nederend Dairy
**B2. Common Name:** 7595 Schaefer Avenue, 13752 Bon View Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of seven parcels under single ownership (APN: 105311104, 105312101, 105312102, 105319101, 105319102, 105330101, and 105330102). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 7595 Schaefer Avenue, 13752 Bon View Avenue was initially developed between 1952 and 1959 with the construction of the existing Ranch style residences and milk parlor. The property was originally part of the Driftwood Dairy. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 7595 Schaefer Avenue, 13752 Bon View Avenue was originally developed between 1952 and 1959. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

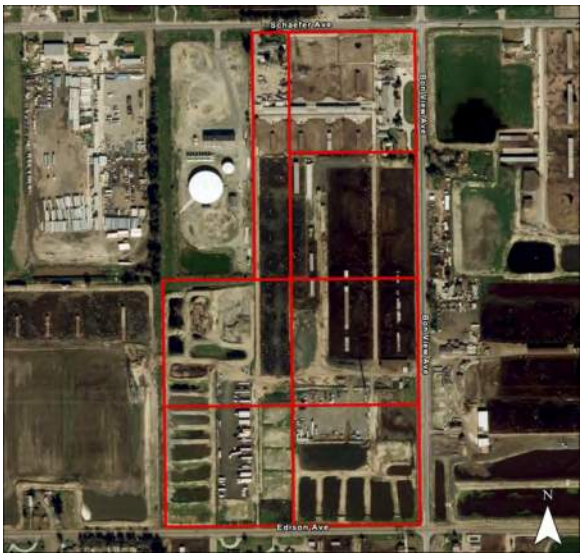


(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 7595 Schaefer Avenue, 13752 Bon View Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 103

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved between 1952 and 1959, the property includes two Ranch style dwellings, a Ranch style milk parlor, several ancillary structures, and water retention ponds. Below is a description of the buildings/structures and parcels.

**7595 Schaefer Avenue, 1952-1959 (APN: 105311104)**
Located on the northern end of parcel 105311104, the Ranch style dwelling at 7595 Schaefer Avenue faces Schaefer Avenue. The residence features an asymmetrical façade and a horizontal, irregular floor plan atop a concrete foundation. Its exterior is clad in yellow painted stucco. The low-pitched cross-gabled roof is covered with composition shingles and includes a moderate eave overhang with open eaves and exposed rafter ends. Fenestration consists of vinyl fixed and sliding sash windows. The main elevation features a combination of stucco and horizontal wood siding, along with a recessed main entryway situated beneath an extended roof girder, supported by a carved wood spindle. An attached garage is located on the west elevation and is clad in both stucco and board-and-batten siding.

**13752 Bon View Avenue, 1952-1959 (APN: 105312101, 105312102)**
Situated on the northwest side of parcels 105312101 and 105312102, the Ranch style milk parlor and residence at 13752 Bon View Avenue face Bon View Avenue. Constructed between 1952 and 1959, the milk parlor has a horizontal layout with two wings and consists of three sections: the front milk house, the rear milking parlor, and two holding areas at the wings. The front section incorporates Ranch style elements, including a cross-gable roof topped with wood shake shingles, a moderate eave overhang, wood siding with decorative brackets below the gable end, a stone planter, diamond-patterned casement windows, and a stucco façade. To the rear of the front section, the milking parlor and holding areas feature a gabled roof oriented along a north-south axis, with concrete walls. Additional features include industrial glass doors, silos, and a circular driveway in front of the milk parlor.

North of the milk parlor, a small rectilinear structure features a gabled roof clad in corrugated sheet metal, concrete walls, and horizontal louvered shutters set between the concrete walls.

South of the milk parlor is a Ranch style residence designed with similar architectural elements. The dwelling features an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. Its exterior is clad in yellow painted stucco. The low-pitched cross-gabled roof is topped with tiles and includes a moderate eave overhang, open eaves, a stone chimney on the rear roof slope, and exposed rafter ends. The main elevation showcases horizontal wood siding along the lower span of the building, a partial stone veneer, and aluminum diamond-patterned casement and fixed windows of various sizes. Additional features include a box bay accented with wood siding, a recessed entryway beneath an extended roof girder supported by a decorative wood spindle, and a wood half-lite door with a diamond pattern. An attached garage is located on the north elevation, featuring board-and-batten siding, diamond-patterned casement windows with wood shutters, and a cupola on the roof ridge.

## Primary Record Information Continued:

View southwest of 13752 Bon View Ave (IMG_8688; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
**7595 Schaefer Ave and 13752 Bon View Avenue (APN: 105311104, 105312101, 105312102)**
In the 1950s and 1960s, the dairy was owned by Albert J. Shaw Dairy and listed as the Driftwood Dairy Farm. By 1971, ownership had transferred to Mr. and Mrs. Pete Vander Poel, and the property was renamed the Vander Poel Bros Dairy. By 1980, it became known as the Nederend Dairy under the ownership of Hans Nederend.

The remaining parcels appear to have been acquired under the Nederend family's ownership.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 7595 Schaefer Avenue, 13752 Bon View Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 7595 Schaefer Avenue, 13752 Bon View Avenue property has been found not significant and ineligible, it maintains integrity of location, setting, design, materials, workmanship, feeling, and association as an active and in-use dairy farming property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 104

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 8040 Schaefer Avenue, 14050 Grove Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B. _**B.M.** __
c. Address: 8040 Schaefer Avenue, 14050 Grove Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441872 mE / 3762194mN
e. Other Locational Data: San Bernardino County APN: 105332101

***P3a. Description:** The evaluated property consists of a single parcel (APN: 105332101), historically addressed as 7595 Schaefer Avenue and 13752 Bon View Avenue. Encompassing 8.62 acres, the property is located northwest corner of Grove and Edison Avenues. The surrounding area remains predominantly open space and agricultural land, historically associated with dairy farming. The property includes a Minimal Traditional residence, two Ranch style residences and milk parlor, and several ancillary structures. Landscaping and hardscaping features consist of paved driveways and some organized trees around the dwellings. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View northwest of 14050 Grove Ave (IMG_8738; October 21, 2024).
***P6. Date Constructed/Age and Source**
Pre-1935, 1938-1946, 1966-1968/UC Santa Barbara FrameFinder (1935, 1938, 1946, 1966, 1968)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ocean Coast LLC
650 Camino De Gloria
Walnut CA 91789
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Silas Koopal Dairy
**B2. Common Name:** 8040 Schaefer Avenue, 14050 Grove Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Goat Farm
***B5. Architectural Style:** Ranch Style/Minimal Traditional Style

***B6. Construction History:** This property consists of one parcel (APN: 105332101). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 8040 Schaefer Avenue and 14050 Grove Avenue were initially developed prior to 1935 with the construction of the existing Minimal Traditional residence at 8040 Schaefer Avenue, followed by a milk parlor between 1938 and 1946. Between 1966 and 1968, the existing Ranch-style residences were constructed on the property. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s **Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 8040 Schaefer Avenue, 14050 Grove Avenue was originally developed prior to 1935, followed by later developments between 1938 and 1946 and 1966 and 1968. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes.
**See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 8040 Schaefer Avenue, 14050 Grove Avenue


Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 104

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

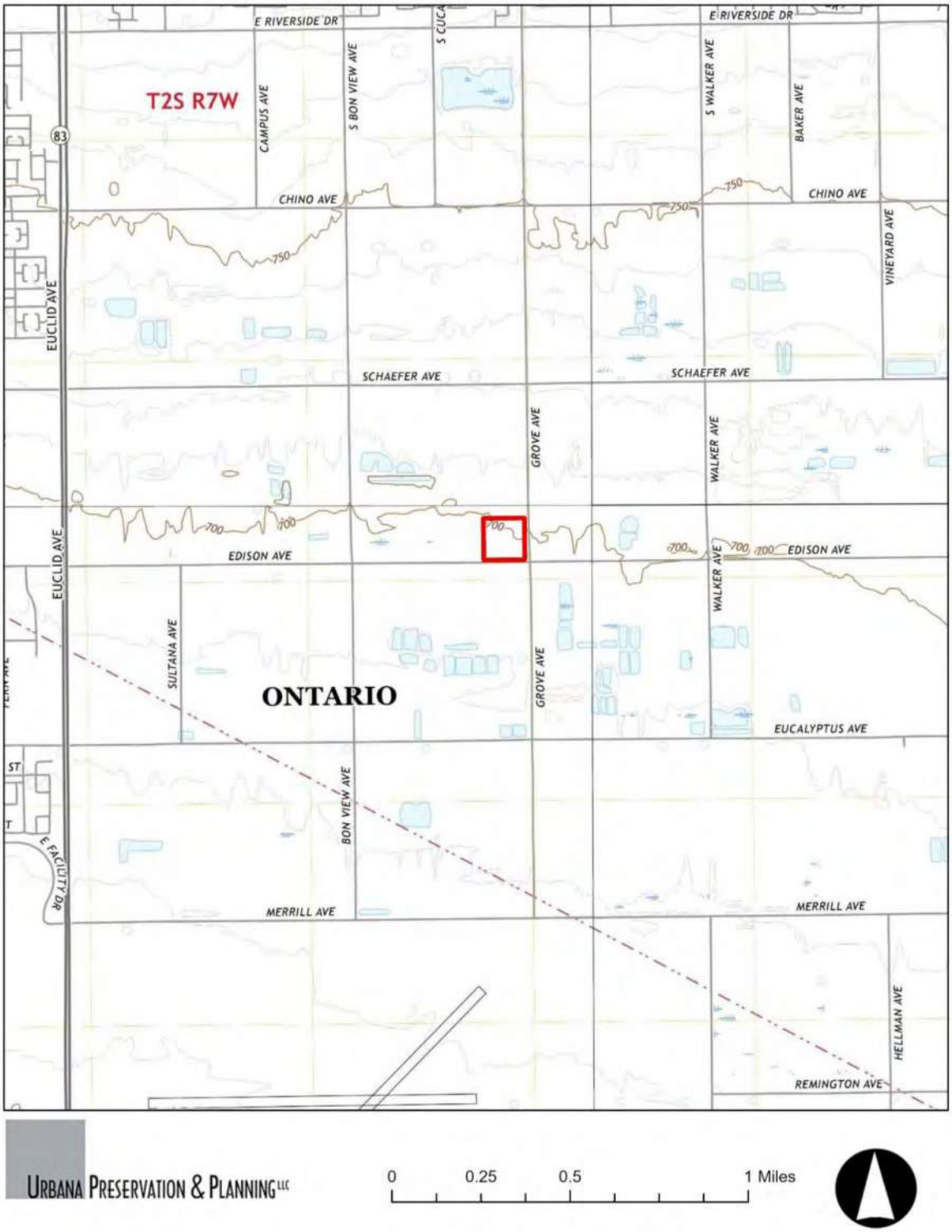

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved prior to 1935, with later developments between 1938 and 1946 and 1966 and 1968, the property includes a Minimal Traditional dwelling (8040 Schaefer Avenue), two Ranch style dwelling and a Ranch style milk parlor (14050 Grove Avenue), and several ancillary structures. Below is a description of the buildings/structures and parcels.

**8040 Schaefer Avenue, pre-1935**
Constructed prior to 1935, the dwelling at 8040 Schaefer Avenue is a modest Minimal Traditional residence facing Schaefer Avenue. It features an asymmetrical façade and a rectilinear floorplan. The exterior is clad in tan-painted stucco. The low-pitched gabled roof is topped with composition shingles and has a moderate eave overhang. The primary (south) elevation includes a recessed entryway beneath the roofline, a small stoop, and a shed roof over a bay window accented with a brick veneer. The fenestration visible from the public right-of-way consists of aluminum windows.

A detached garage is situated east of the dwelling toward the rear of the property. Several shed structures are also present nearby, associated with the property's current goat operations.

**14050 Grove Avenue, 1938-1946, 1966-1968**
The Ranch-style milk parlor and two residences at 14050 Grove Avenue front Grove Avenue and are partially obscured by dense tree cover. Constructed between 1938 and 1946, the milk parlor is centered between the two dwellings. The milk parlor consists of two sections: the front milk house and the rear milking parlor, separated by a breezeway. The milk house has a modest design with some Ranch-style elements, including a cross-gable roof with wood shake shingles and a stucco façade. The fenestration and breezeway are not visible from the public right-of-way. West of the front section, the milking parlor features a gable roof oriented along an east-west axis, clad in corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the north and south elevations, positioned above concrete walls, along with a vent system along the gable ridge. There is no curved driveway in front of the milk parlor.

South of the milk parlor is a Ranch-style dwelling, which is largely obscured from view. Constructed between 1966 and 1968, the dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. Its exterior is clad in tan painted stucco. The moderately pitched hipped roof is topped with composition shingles and features minimal eave overhang and boxed eaves. The recessed main entryway includes a red paneled door, and box bay windows are visible on the primary (east) elevation. A detached garage is located north of the dwelling.

North of the milk parlor is the second Ranch style dwelling. Constructed between 1966 and 1968, dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The dwelling has a similar appearance to the first residence and features a stucco façade, a bay window, hipped roof topped with composition shingles, and a recessed main entryway.

To the rear of the buildings are some pole structures associated with former dairy operations.

## Primary Record Information Continued:

View north of 14050 Grove Avenue (IMG_8739; October 21, 2024).

View west of 14050 Grove Avenue milk parlor (IMG_8740; October 21, 2024).

## Primary Record Information Continued:

View southwest of 14050 Grove Avenue SFR (IMG_8741; October 21, 2024).

View west of 14050 Grove Avenue milk parlor (IMG_8742; October 21, 2024).

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 8040 Schaefer Avenue, 14050 Grove Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 8040 Schaefer Avenue, 14050 Grove Avenue has been found not significant and ineligible for historical designation, it generally retains all aspects of integrity in location, setting, design, materials, workmanship, and feeling. However, the property lacks integrity of association, as it no longer functions as a property associated with the dairy industry.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 108

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 8061 Edison Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ ¼ **of** _ ¼ **of Sec** _; _S. B._**B.M.** __
c. Address: 8061 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441891, 441886 mE / 3761966, 3761776mN
e. Other Locational Data: San Bernardino County APN:105333101, 105333102, 105333103, 105333104, 105334101, 105334102

***P3a. Description:** The evaluated property consists of six parcels (APN: 105333101, 105333102, 105333103, 105333104, 105334101, and 105334102), historically addressed as 7225 Edison Avenue. Encompassing 36.18 acres, the property is located south of Edison Avenue, between Bon View and Grove Avenues. The surrounding area remains predominantly open space and agricultural land, historically associated with dairy farming. The property includes a Ranch style dwelling, a Ranch style milk parlor, several geometrically spaced ancillary pole structures, and water retention ponds. The buildings and structures are located on parcels 105334102 and 105333104, while the water retention ponds are positioned toward the rear on parcel 105334101. Landscaping and hardscaping are minimal, consisting of paved driveways and some organized tree plantings. The property continues to operate as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View southeast of 8061 Edison Ave Ranch style milk parlor (IMG_8736; October 21, 2024).

***P6. Date Constructed/Age and Source**
1966-1968/UC Santa Barbara FrameFinder (1938, 1946, 1966, 1968)
☒Historic:
☐ Prehistoric
☐ Both

***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660

***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com

***P9. Date Recorded:** October 2024

***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.

***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Jack Tuls and Sons Dairy/Jorritsma & Co.
**B2. Common Name:** 8061 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of six parcels under common ownership (APN: 105333101, 105333102, 105333103, 105333104, 105334101, and 105334102). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that the 8061 Edison Avenue was initially developed between 1938 and 1946 with the construction of a milk parlor (no longer extant). Between 1966 and 1968, the original milk parlor was demolished and replaced with the existing milk parlor and single-family residence. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 8061 Edison Avenue was developed between 1966 and 1968. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

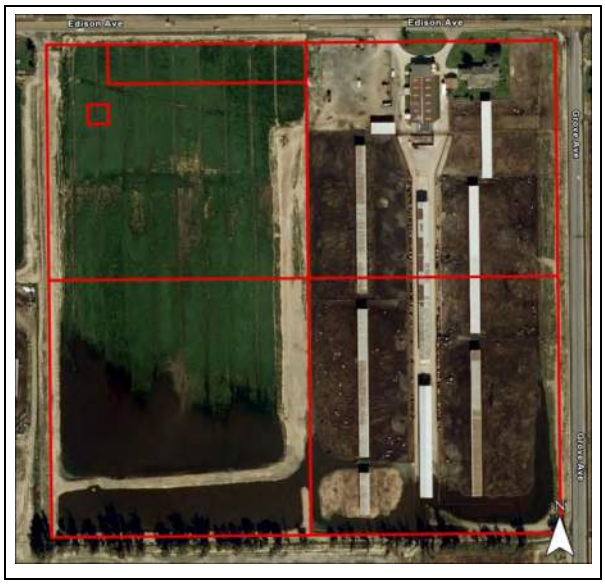


(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8061 Edison Avenue
**Page 3 of 5**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 108

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

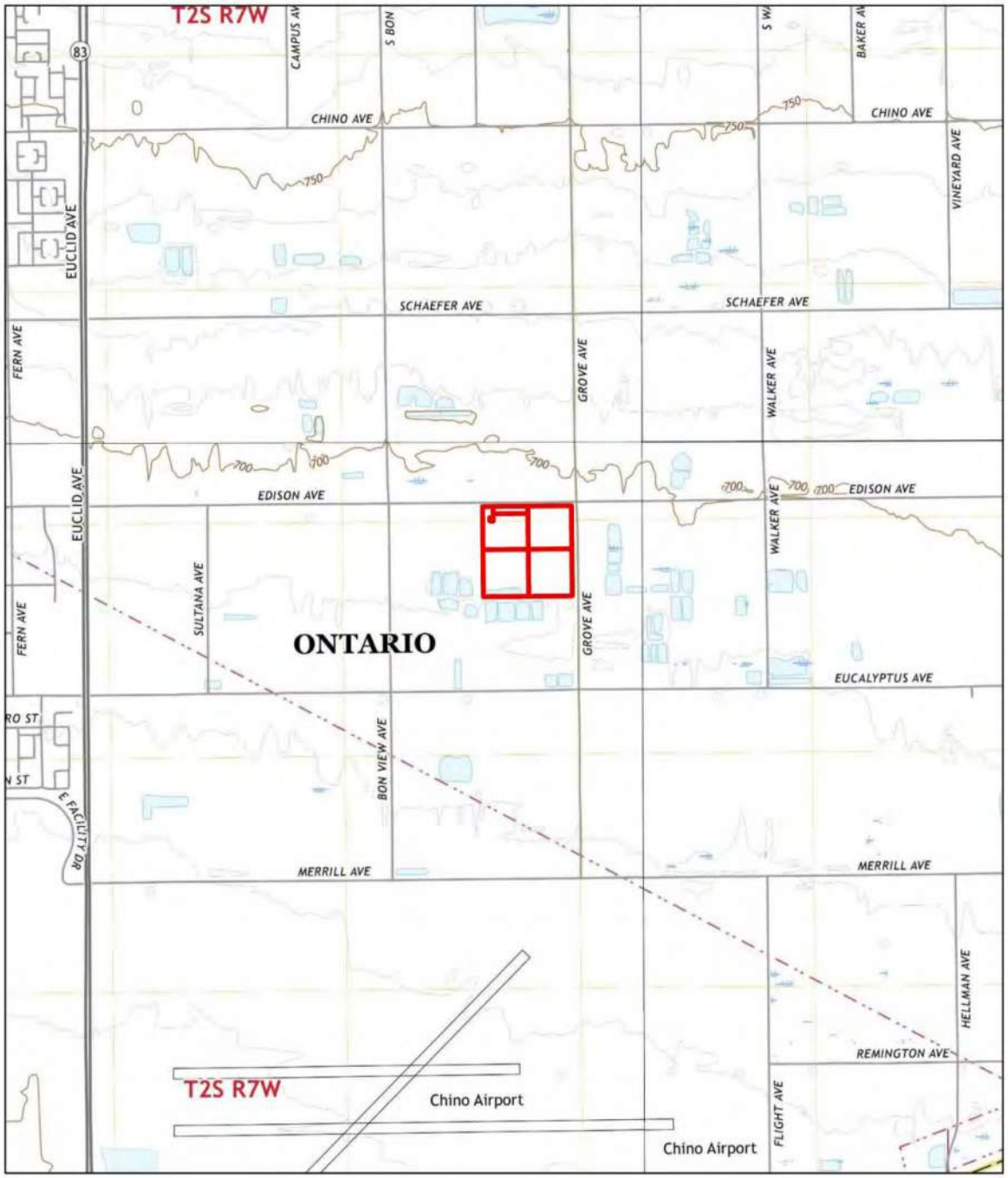

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Constructed between 1966 and 1968, the Ranch style milk parlor and residence are located towards the north end of the parcel fronting Edison Avenue. The dwelling is a one-story residence with an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with brown trim on the windows and doors. The moderately pitched hipped roof is topped with composition shingles and has a moderate eave overhang, and boxed eaves. The fenestration visible from the public right-of-way consists of vinyl multi-lite sliding sash and single-hung windows and wood paneled doors. The main elevation has a bay window and a stone planter. An attached one-car garage is located on the west elevation and features a white paneled overhead door.

West of the dwelling is the Ranch style milk parlor. The structure is divided into two sections: the front milk house and the rear milking parlor, separated by a breezeway. The milk house is modest in design, incorporating Ranch-style elements such as a hip-and-gable roof with composition shingles, a moderate eave overhang with boxed eaves, and a stucco façade. The fenestration consists of metal multi-lite fixed windows and metal casement windows, and industrial metal glass door. The breezeway, situated between the two sections on the east and west elevations, is obscured from the public right-of-way. South of the breezeway, the milking parlor features a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls, along with a vent system along the gable ridge. Additional features include a circular driveway in front of the milk parlor.

To the rear of the buildings are several geometrically spaced ancillary pole structures and storage sheds associated with dairy operations.

View south of 8061 Edison Ave Ranch style SFR (IMG_8737; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
In the 1960s and 1970s, the property was owned by Mr. and Mrs. Jack Tuls and operated as Jack Tuls & Sons Dairy. By 1979, it was acquired by the Jorritsma family and listed as Jorritsma & Company.

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 78061 Edison Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 8061 Edison Avenue property has been found not significant and ineligible, it maintains integrity of location, setting, design, materials, workmanship, feeling, and association as an active and in-use dairy farming property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 109

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 7721-7891 Edison Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B. _**B.M.** _
c. Address: 7721-7891 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441477 mE / 3761957mN
e. Other Locational Data: San Bernardino County APN:105336101, 105336102, 105336103

***P3a. Description:** The evaluated property consists of three parcels (APN: 105336101, 105336102, and 105336103), historically addressed as 7721-7891 Edison Avenue. Encompassing 18.16 acres, it is situated south of Edison Avenue, between Bon View and Grove Avenues. The surrounding area remains predominantly open space and agricultural land, historically associated with dairy farming. The property includes a Craftsman Bungalow style residence, an Art Deco style milk parlor, ancillary structures and features related to former dairy operations, and manufactured trailer offices on parcel 105336101. Additionally, a Ranch style residence is located on parcel 105336103. Landscaping and hardscaping are minimal, consisting primarily of paved driveways. The property no longer functions as an active dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View northeast of 7721 Edison Ave Streamline Moderne Style Milk Parlor and Bungalow residence (IMG_8733; October 21, 2024).
***P6. Date Constructed/Age and Source**
pre-1935, 1935-1946, 1959-1966/UC Santa Barbara FrameFinder (1935, 1946, 1959, 1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Jim Bootsma Dairy **B2. Common Name:** 7721-7891 Edison Avenue **B3. Original Use:** Dairy Farm
**B4. Present Use:** Dairy Farm ***B5. Architectural Style:** Art Deco Style/Bungalow Style/Ranch Style

***B6. Construction History:** This property consists of three parcels under common ownership (APN: 105336101, 105336102, and 105336103). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 7721-7891 Edison Avenue was initially developed before 1935 with the construction of a Craftsman Bungalow dwelling and three unidentified buildings, none of which remain. Between 1935 and 1946, the existing Art Deco milk parlor was constructed south of the dwelling, accompanied by an ancillary pole structure and corrals. Between 1959 and 1966, a Ranch style residence was built on parcel 105336103. By 1998, additional pole structures and silos had been added south of the dwelling. In 2017, the rear section of the milk parlor was demolished, followed by the removal of several pole structures and other ancillary features associated with the property's dairy operations. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Early Dairy Farms in Ontario, 1900s-1929; Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s; Art Deco, 1920-1960s
**Area:** San Bernardino County **Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The 7721-7891 Edison Avenue property was initially improved prior to 1935, with later developments between 1938 and 1946 and 1959 and 1966. In 1999, the area was annexed into the City as part of the New Model Colony, formed from a portion of the former San Bernardino County Agricultural Preserve. The 7721-7891 Edison Avenue property is significant under NRHP / NRHP / CRHR / City of Ontario C/3/c-f under the context of Early Dairy Farms in Ontario, 1900s-1929; Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1940-1970s; Art Deco Style, 1920-1960s, with a period of significance of pre-1935 through 1966, representing original construction through completion of the final residential building.

Under the established context, an eligible property must retain most aspects of integrity to convey significance. This property does not retain the necessary integrity to convey significance. It has been altered and the Art Deco style milk parlor is missing key features associated with the property type. Accordingly, the property is not eligible under NRHP / CRHR / City of Ontario Criterion C/3/c-f and does not qualify as an historical resource pursuant to Section 15064.5 of the CEQA Guidelines.

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 7721-7891 Edison Avenue


Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 109

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

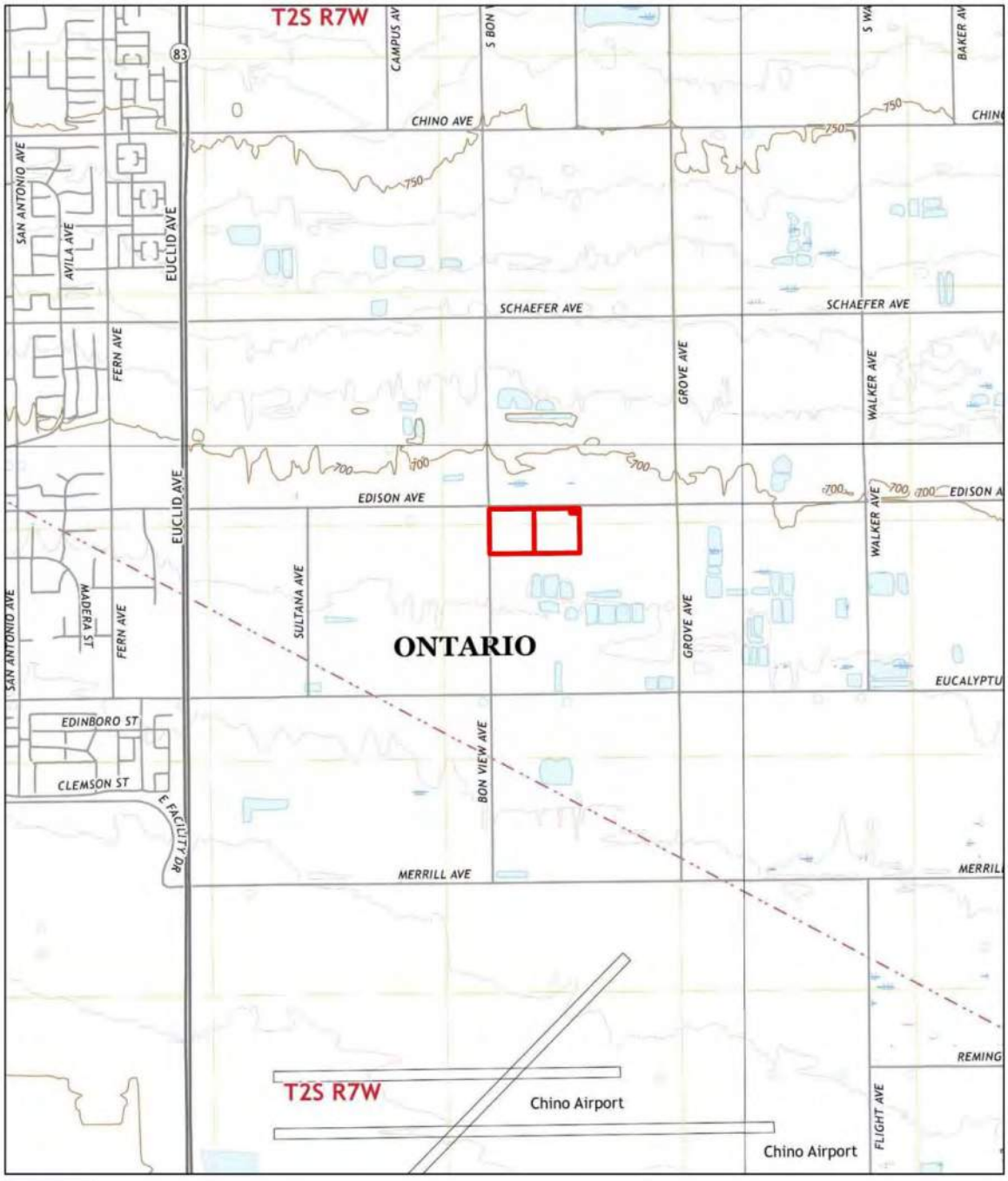


URBANA PRESERVATION & PLANNING LLC

0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
The property includes a Craftsman Bungalow style residence, Art Deco style milk parlor, Ranch style residences, manufactured trailer offices, and ancillary structures/features associated with dairy operations. Below is a description of the buildings and parcels.

**7721 Edison Avenue (APN: 105336101), pre-1935, 1935-1946**
Constructed prior to 1935, with later developments between 1935 and 1946, the parcel includes a Craftsman Bungalow style dwelling, an Art Deco style milk parlor, ancillary structures and features associated with former dairy operations, and manufactured trailer offices. The parcel is partially enclosed behind a concrete masonry unit wall.

The Craftsman Bungalow style residence is located at the northwest corner of the parcel, fronting Edison Avenue. This one-and-a-half story dwelling features a symmetrical façade and a mostly square floor plan. The exterior is clad in tan-painted stucco with blue trim on the windows and doors. The high-pitched, side-gabled roof is topped with composition shingles and has a wide eave overhang with wood brackets beneath the gable. The fenestration visible from the public right-of-way consists of vinyl single-hung windows and fixed wood windows. The main (north) elevation includes a centered gabled dormer with four vinyl single-hung windows, an enclosed full-width porch, a centered main entryway with a wood-paneled door and metal security door, and concrete steps.

Directly south of the dwelling stands the Art Deco-style milk parlor, constructed between 1935 and 1946. Only the front milk house section remains, as the rear milking parlor was demolished in 2017. This remaining section retains some Art Deco characteristics, including smooth stucco walls, a flat roof, a symmetrical boxy form, and glass block windows.

East of the dwelling are two storage sheds with gabled roofs. To the rear of the milk parlor are two manufactured office trailers installed after 2017.

Prior to 2017, the parcel contained several pole structures, large metal silos, cattle feeding gates, and corrals located behind the dwelling. While the property may have once exemplified a Depression-era and Wartime dairy operation, it no longer retains sufficient integrity to convey its historical significance.

**7891 Edison Avenue (APN: 105336103), 1959-1966**
Constructed between 1959 and 1966, the Ranch style residence at 7891 Edison Avenue faces Edison Avenue. The one-story dwelling features an asymmetrical façade and an irregular floorplan atop a concrete foundation. Its exterior is clad in yellow board-and-batten siding, with a partial stone veneer on the main (north) elevation. The low-pitched cross-gabled roof, covered with composition shingles, has a moderate eave overhang, boxed eaves, and a chimney on the rear roof slope.

The fenestration visible from the public right-of-way consists of vinyl sliding sash windows. The main elevation includes a recessed entryway with a single paneled door, a concrete stoop, a stone planter, and an attached one-car garage with a paneled overhead door. Compared to other Ranch style residences in the area, the dwelling is smaller in size and exhibits modest characteristics of the style.

## Primary Record Information Continued:

View south of 7891 Edison Ave Ranch style SFR (IMG_8734; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
**7721 Edison Ave (APN: 105336101)**
In the 1920s, the property was originally owned by Thomas H. Settles, a farmer from Virginia. He retained ownership until 1925, when he relocated to Upland. From the early 1950s to 2017, the property was owned by the Bootsma family, who had moved to the area from Artesia in the Los Angeles Basin during the 1940s.

The family patriarch, Jim Bootsma, immigrated to the United States from Holland and was a member of the California Milk Producers Council. Together with his wife, Tryntje, he had six sons Garret, Symon, Jim Jr., Will, Ike, and John Bootsma and three daughters, Agnes, Nell, and Vicky. In 1979, Jim Bootsma passed away at the age of 76, and the property was passed on to his immediate family.

**7891 Edison Ave (APN: 105336103)**
In 1967, Mr. and Mrs. Symon Bootsma lived at the subject residence.

**Building, Structure, Object Information Continued:**

CHINO CHAMPION
DAIRY FESTIVAL EDITION

Thursday, June 4, 1959
Section 3, page 15

# As the Seed is Planted . .

Both Bootsma boys are vocational agriculture students at Chino high school. Paul Wade, agricultural instructor at the school instructs boys here in the agriculture room, located in the shop building at the high school. —Champion photo

Symon Bootsma works with his milking heifer, part of his Future Farmer project work and a start toward a herd of his own. Boys such as Symon learn not only proper livestock husbandry in vocational agriculture, but are furthered in a science the principles of which they learn by doing on their home ranches. —Champion photo

Milk is one of the world's oldest known foods.

What's a good farm? A good farm boy. And good farm boys are what the Future Farmers are attempting to mould.

Sometimes — in fact most of the time—the FFA leaders have only to direct, for the boy comes to his high school vocational agriculture teachers with a background in farming well moulded by the last remaining industry which is family based in this specialized world of ours.

Such a family is the Bootsma family, 7721 Edison avenue. The 11 member Bootsma family, with Patriarch Jim at their head, run a dairy there, shipping to Arden Creamery.

The family milks some 100 plus head of cows, raise all their own replacements.

This year two of the Bootsma boys, Jim and Symon were in the upper grades at Chino high school. Another, Wilbur, just entered the Chino high school.

The Bootsma boys walked off with their share of the awards at the FFA banquet Thursday night too. The boys raise beef show animals, favoring Angus, and raise milk cows and calves as well.

Symon graduates this year while Jim, Jr., takes over as president of the local FFA chapter next year.

Active in the FFA, the boys rise at 2:30 a.m., to milk before going off to school. Then they leave early again to get home for milking chores.

This year, Jim was vice president and Symon, treasurer of the local chapter. Symon earned 391 points in his work this year, earning his third letter.

Jim not only earned his third letter, but was awarded his state farmer degree and won third in the 20-30 project awards.

The Bootsma's live in a pleasant two-story home on their dairy. Mr. and Mrs. Bootsma, who moved into the valley some 18 years ago from Artesia to found their dairy, were both born in Holland.

Mr. Bootsma presides over a large family, a family which well fills the dinner table even though the two oldest girls have married and moved to homes of their own.

In addition to Mr. and Mrs. Bootsma there are Mrs. Agnes Jacobs, Mrs. Nellie Johnson; Garret Bootsma, 19, a graduate of Chino high school who now works for his father on the dairy; Symon Bootsma, 18, who will graduate and join his father in the dairy; Jim, Jr., 16, and a senior at high school next year; Wilbur, 14; Ike, 12; John, 9; and Vicky, 6.

What do the boys get out of FFA work? They get an eye for beef and dairy cattle. They learn to work with and lead others in the farming community; they learn much about this industry which takes real business sense to operate; and they learn how to use the latest scientific information pouring out of experiment stations and universities to help the farmer make a better living.

Jim Bootsma with his prize Angus bull which he has shown in a number of fairs, and will show at the Junior Fair here this weekend. In the Future Farmers, boys like Jim learn not only scientific farming but leadership as well. Jim is president of the local chapter next year. —Champion photo

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Keep grass from creeping into your best land. Simply sprinkle or spray DOWPON on your thickest grass and watch it wither away. Kills roots too!

*TRADEMARK OF THE DOW CHEMICAL COMPANY

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DEALERS FOR DOW WEED, GRASS, AND BRUSH KILLERS

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OPEN HOUSE

Door Prizes – Refreshments – Entertainment
Saturday, June 6, 8 a.m. to 5 p.m.

We are giving away FREE: $36.95 Skil Drill Kit, $19.95 Redwood Picnic Table, $5.45 Gallon of Paint, An Aluminum Screen Door and many other Prizes.

For Our Open House Specials, See Advertisement in Main News Section

PETE AND ANNE JOHNSON, LEIGHTON JONES, PAUL CARR, FRANK MARTINEZ, R. B. McLAUGHLIN

VALLEY LUMBER CO.
"HOME OWNED AND HOME OPERATED"
13339 Central Ave. -- Chino NA 8-4771

Chino Champion, Jun 4, 1959.

## Building, Structure, Object Information Continued:

**B12. References Continued:**

2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 3S/3CS/5S2
Other Listings: Urbana Survey No.: 112

Review Code _____ Reviewer _____ Date _____
**Resource Name: 8185 Edison Avenue**


**P1. Other Identifier:** 14117 S. Grove Avenue
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ ¼ **of** _ ¼ **of Sec** _; _S. B._**B.M.** __
c. Address: 8185 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442100 mE / 3761854mN
e. Other Locational Data: San Bernardino County APN: 021632103

***P3a. Description:** The evaluated property consists of a single parcel (APN: 021632103) addressed as 8185 Edison Avenue. Covering 18.56 acres, the property is located at the southeast corner of Edison and Grove Avenues. The property and its environs is historically associated with dairy farming and remains largely open space and agricultural land. The property includes a Ranch style dwelling that exhibits Northern European or Dutch influences, a Minimal Traditional style dwelling, a Streamline Moderne style milk parlor, and several ancillary structures and features associated with dairy operations. A water retention pond is located in the southeast corner of the parcel. Landscaping and hardscaping features include trees and shrubs near the buildings and paved driveways. The property continues to function as an active dairy farm.

The property was previously recorded, and the Ranch style dwelling and Streamline Moderne milk parlor were determined eligible in 2014, but not formally designated. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View southeast of 8185 Edison Ave Streamline Moderne Style milk parlor from Ontario Ranch Road (IMG_8758; October 21, 2024).
***P6. Date Constructed/Age and Source**
1952-1959/NETR HistoricAerials (1952, 1959)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Not Identified
**B2. Common Name:** 8185 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Streamline Moderne Style/Ranch Style

***B6. Construction History:** This property consists of a single parcel (APN: 021632103). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that the 8185 Edison Avenue was initially developed between 1952 and 1959 with the construction of a Ranch style dwelling, a Minimal Traditional style dwelling, and Streamline Moderne style milk parlor. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. Based on aerial imagery, most of the ancillary structures/features visible on the property today were added after 1987 into the 1990s.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Streamline Moderne, 1930s-1960s; Ranch Style, 1950-1970s **Area:** San Bernardino County
**Period of Significance:** 1952-1959 **Property Type:** Streamline Moderne Style/Ranch Style
**Applicable Criteria:** NRHP/CRHR/Local C/3/d

The 8185 Edison Avenue property was improved between 1952 and 1959 with the construction of a Ranch style residence, Minimal Traditional style residence, and Streamline Moderne style milk parlor. In 1967 the area was established as part of the San Bernardino County Agricultural Preserve. In 1999, the area was annexed as part of the New Model Colony, formed from a portion of the former agricultural preserve. The 8185 Edison Avenue property is associated with multiple themes, including Postwar, Large-Capacity Dairies, 1945-1980; Ranch Style, 1950-1970s; Streamline Moderne style, 1930s-1960s; Minimal Traditional style, 1930-1950s; and Consolidation of Dairy Operations, 1980s-1998. However, only the Ranch style dwelling and Streamline Moderne style milk parlor are considered significant under NRHP, CRHR, and City of Ontario criteria C/3/d within the context of Ranch Style, 1950-1970s; Streamline Moderne style, 1930s-1960s, with a period of significance of 1952-1959, representing the dwelling and milk parlor's original construction. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8185 Edison Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 3S/3CS/5S2
Other Listings: Urbana Survey No.: 112

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Constructed between 1952 and 1959, the property includes a Ranch style dwelling, a Minimal Traditional style dwelling, a Streamline Moderne milk parlor, and several ancillary structures and features associated with dairy operations. Located on the northeast corner of the parcel is a Ranch style dwelling that exhibits Northern European or Dutch influences. The dwelling features an asymmetrical façade and a one-story horizontal floorplan atop a concrete foundation. The exterior is clad in horizontal wood siding painted yellow, with green trim on the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and includes a moderate eave overhang with open eaves and exposed rafter ends. A chimney is located on the rear (south) elevation. Fenestration consists of wood-framed diamond-patterned windows, some with green decorative shutters. The main (north) elevation features diamond-patterned windows, box bays with decorative wood support brackets, a stone planter, and an extended roof girder. A garage is attached to the main dwelling by a wide open breezeway on the west elevation.

West of the Ranch style dwelling is a Streamline Moderne milk parlor. The building is divided into two sections: the front milk house and the rear milking parlor, separated by a breezeway. The front section reflects Streamline Moderne characteristics, with smooth stucco walls, a flat roof, curvilinear corners, a central vertical projection, and curved glass block windows. The west elevation contains metal multi-lite casement windows. The windows on the east elevation are boarded up. The breezeway, located between the two sections, features a metal barn-style sliding door on both the east and west elevations. South of the breezeway, the milking parlor has a gable roof oriented along a north-south axis, clad in corrugated sheet metal. Ventilation is provided by horizontal metal shutters on the east and west elevations, positioned above concrete walls, along with a vent system along the gable ridge. Additional features include a circular driveway in front of the milk parlor and two metal doors.

Located on the northwest corner of the parcel is a Minimal Traditional dwelling with a detached garage. The dwelling has an asymmetrical façade and a rectilinear floorplan atop a concrete foundation. The exterior is clad in tan-painted stucco with green trim on the windows and roof fascia. The low-pitched hipped roof is finished with composition shingles and features a minimal eave overhang with boxed eaves. Fenestration visible from the public right-of-way consists of aluminum sliding sash windows. The main (west) elevation includes a recessed main entryway with a concrete stoop, metal security gate, and a wide stone chimney. The detached garage, located directly north of the dwelling, features two paneled overhead doors, a tan stucco façade, and a hipped roof.

Several ancillary pole structures, sheds, and features are located throughout the property.

The property features a good example of a postwar Streamline Moderne milk parlor and a Ranch style dwelling that incorporates Northern European or Dutch architectural influences. The milk parlor exhibits Streamline Moderne elements that are evident in the smooth stucco surfaces, rounded corners, glass block windows, and horizontal emphasis that give the building a sleek, aerodynamic appearance typical of the style. A circular driveway situated in front of the milk parlor not only enhances the property's functionality but also reflects the era's emphasis on automobile accessibility and streamlined movement through the site. The dwelling's Ranch style influence is seen in the low horizontal massing, asymmetrical layout, and integration of indoor and outdoor spaces. Northern European or Dutch architectural touches include diamond-patterned windows, decorative shutters, and extended roof girders, lending additional character and ornamentation to the design.

## Primary Record Information Continued:

View southeast of 8185 Edison Ave Ranch style SFR (IMG_8759; October 21, 2024).

**B10. Statement of Significance from Page 2:**
The 8185 Edison Avenue property was developed between 1952 and 1959 and includes a Ranch style dwelling, a Streamline Moderne milk parlor, a Minimal Traditional dwelling, and several later-added ancillary structures. The Ranch style residence and milk parlor date to the postwar era and reflect two distinct architectural styles tied to Ontario's postwar dairy development.

The property was evaluated under the Postwar, Large-Capacity Dairy, 1945-1980 context, however, is not recommended eligible under that theme as the majority of ancillary structures, such as pole barns, feeding gates, and other operational infrastructure, do not appear in aerial imagery until after 1987, placing them outside the defined period of significance. The absence of these character-defining features needed to demonstrate large-capacity operations indicate that the 8185 Edison Avenue property is not significant or eligible as a Postwar, Large-Capacity Dairy operation.

While several ancillary structures, including pole barns and feeding gates within the property, appear to date to the 1980s-1995 period, placing them within the Consolidation of Dairy Operations, 1980s-1998 thematic timeframe, there is no evidence that the property represents a true consolidation of multiple dairy operations. Accordingly, the 8185 Edison Avenue property is not eligible under the theme of Consolidation of Dairy Operations, 1980s-1998. The property does not contain multiple milk parlors or residences from different operations or periods of operation, nor does it exhibit the spatial layout or landscape features, such as retention ponds or geometrically organized infrastructure, associated with a merged or large-scale consolidated dairy.

The property as a whole is not significant or eligible under NRHP/CRHR/Local criteria. The extant improvements appear to reflect continued use or isolated upgrades rather than a large capacity dairy operation or a broader consolidation effort typical of the late twentieth-century shift in dairy operations across Ontario and the Chino Valley.

**Building, Structure, Object Information Continued:**

Individually, the Ranch style dwelling is recommended eligible under NRHP Criterion C / CRHR Criterion 3 / City of Ontario Criterion d, within the context of Ranch Style, 1950–1970s. The residence exhibits key features of the style, including its one-story, low horizontal massing, an asymmetrical layout, horizontal wood siding, and an attached garage connected by an open breezeway. Additionally, Northern European or Dutch architectural influences are evident in diamond-patterned windows, decorative shutters, and extended roof girders, which lend ornamentation and character to the building. The dwelling retains the necessary aspects of integrity and is a representative example of a Ranch style home in the New Model Colony / Ontario Ranch area. The Ranch style dwelling is not individually eligible under any other NRHP/CRHR/Local criteria.

The Streamline Moderne milk parlor, also constructed between 1952 and 1959, is recommended individually eligible under NRHP Criterion C / CRHR Criterion 3 / City of Ontario Criterion d, as a good example reflecting the Streamline Moderne aesthetic. It features smooth stucco walls, a central bay that projects beyond the front wall plane with rounded corners, and large glass block windows. The structure's front milk house and rear milking parlor are separated by a central breezeway. A character-defining circular driveway in installed in front of the milk parlor representing an key operational feature used for deliveries and for large trucks to load milk from the milk house. The milk parlor building retains the necessary aspects of integrity and is a representative example of a postwar milk parlor designed in the Streamline Moderne style in the New Model Colony / Ontario Ranch area. The milk parlor building is not individually eligible under any other NRHP/CRHR/Local criteria.

The Minimal Traditional residence was also evaluated for individual eligibility and although the dwelling retains integrity, it lacks the distinctive features necessary to be considered a strong or representative example of the style within the survey area. Beyond its architectural appearance, no information was identified to support a positive eligibility finding for the house relative to an individual association with significant events, important persons, or information potential. Accordingly, the Minimal Traditional style home is individually ineligible under all NRHP/CRHR/Local criteria.

Under the established historic context, eligibility requires retention of integrity of location, setting, materials, design, feeling, workmanship, and association. Both the Ranch style dwelling and Streamline Moderne milk parlor meet these integrity requirements and embody the distinctive characteristics of their respective types and periods of construction. As such, both buildings qualify as an historical resource under Section 15064.5 of the CEQA Guidelines.

**B12. References Continued:**

2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 113

Review Code _____ Reviewer _____ Date _____
**Resource Name: 8311 Edison Avenue**


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._ **B.M.** __
c. Address: 8311 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442292 mE / 3761854mN
e. Other Locational Data: San Bernardino County APN: 021632108

***P3a. Description:** The evaluated property consists of a single parcel (APN: 021632108) addressed as 8311 Edison Avenue. Covering 18.77 acres, the property is located south of Edison Avenue and Ontario Ranch Road, between Grove and Walker Avenues. The property and its environs are historically associated with dairy farming and remain largely open space and agricultural land. The property includes a modest Ranch style residence and milk parlor, a manufactured dwelling, several geometrically spaced ancillary structures, storage sheds, and various features associated with dairy operations. Water retention ponds are located to the rear of the property. Landscaping and hardscaping consist of paved driveways and a few organized trees and shrubs around the buildings. The property continues to function as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View south of 8311 Edison Ave Ranch style milk parlor (IMG_8836; October 21, 2024).
***P6. Date Constructed/Age and Source**
1968-1975/UC Santa Barbara FrameFinder (1968, 1975)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Martin De Hoog Dairy/Double "D" Dairy
**B2. Common Name:** 8311 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of a single parcel (APN: 021632108). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that the 8311 Edison Avenue was initially developed between 1968 and 1975 with the construction of a Ranch style milk parlor and dwelling. Between 1980 and 1985, a manufactured dwelling was added to the property. Subsequent aerial imagery suggests that the overall configuration of the existing milk parlor has remained unchanged. An early three-car garage addition was appended to the east elevation of the residence. Based on aerial imagery, most of the ancillary structures/features visible on the property today were added in the late 1990s. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The 8311 Edison Avenue property was developed between 1968 and 1975. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945–1980; Consolidation of Dairy Operations, 1980s–1998; and Historic Architectural Styles, 1880s–1980s, but it does not possess documented significance in relation to any of these themes. The Ranch style residence and herringbone-style milk parlor are modest examples of their architectural styles and property types, and while ancillary structures are present, they were constructed after the period of significance for the postwar dairy context. Additionally, there is no evidence that the property functioned as part of a consolidated dairy operation during the 1980s–1998 period. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8311 Edison Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 113

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
The dwelling is located west of the milk parlor and has a modest appearance. It features an asymmetrical facade and an irregular horizontal floorplan atop a concrete foundation. The low-pitched cross-gabled roof has a moderate eave overhang with boxed eaves and is topped with terracotta tiles, which likely replaced the original composition or wood shingles at an unidentified date. The exterior is clad in tan-painted stucco. Additional features include a recessed main entryway accessed via concrete steps, two brown paneled doors, metal sliding sash windows, a stone planter, and decorative blue shutters on some of the windows. An attached three-car garage addition was appended to the east elevation and features a roofline that does not match the original structure, resulting in an uneven and visually uneven roofline.

Directly east of the dwelling is the Ranch style milk parlor, which is divided into three sections: the front milk house, the rear milking parlor separated by a breezeway, and a holding area. The milk house shares a similar design with the main dwelling, incorporating Ranch style elements such as a hip and gable roof topped with terracotta tiles, a moderate eave overhang with boxed eaves, and a stucco façade. Its fenestration consists of metal casement windows. The breezeway, located between the two sections on the north and south elevations, is obscured from the public right of way. South of the milk house, the milking parlor features a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation elements include metal horizontal louvered shutters set atop concrete walls, along with a vent system along the gable ridge. Further south, the holding area is partially open and enclosed by concrete walls. Additional features include metal doors at the main entryway, bulk tanks, and a circular driveway in front of the milk parlor.

East of the milk parlor is the manufactured home. The building features a low-pitched side-gabled roof topped with composition shingles, wood siding painted tan, aluminum sliding sash and single-hung windows, and a shed roof extension.

Within proximity to the buildings are several features and structures associated with dairy operations, including silos, pole structures, feeding gates, corrals, and storage sheds. Water retention ponds are located at the rear of the property. These ancillary features were installed by the late 1990s.

## Primary Record Information Continued:

View south of 8311 Edison Ave Ranch style SFR (IMG_8838; October 21, 2024).

View south of 8311 Edison Ave Ranch style SFR (IMG_8839; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
The property was originally owned by Martin De Hoog and was listed as the De Hoog Dairy. By 1977, it was recorded as the Double "D" Dairy. The property remained under the ownership of the De Hoog family until 2022.

**B10. Statement of Significance from Page 2:**
Comparative study of other Postwar Scientific Large-Capacity Dairies in the survey area reveals that the 8311 Edison Avenue property is a more modest example of the property type. The property contains a single Ranch style residence and a Ranch herringbone-style milk parlor. While these components are associated with the Postwar, Large-Capacity Dairy (1945–1980) theme, the property does not appear to be a significant example. Although ancillary structures such as pole barns and feeding infrastructure are present, aerial imagery and field observations indicate that these features were added in the late 1990s, after the defined period of significance for the postwar large capacity theme. Accordingly, the property does not contain the necessary character-defining features needed to demonstrate a postwar scientific large-capacity dairy operation and is therefore ineligible under this theme.

The property also does not meet the thresholds for significance under the Consolidated Dairy Operations (1980s–1998) theme. Although some extant features, such as pole barns and feeding infrastructure, date to this period, there is no evidence that the property functioned as a consolidated operation formed through the merging of multiple dairy facilities. It lacks multiple milk parlors or residences associated with separate earlier operations, key indicators of consolidation. Instead, the improvements appear to reflect continued individual use or isolated upgrades, rather than consolidation efforts.

Additionally, neither the Ranch style residence nor the Ranch style milk parlor is considered a distinctive example of its type. Both buildings are individually ineligible. The residence appears to have been altered early in its history by the addition of a three-car garage, resulting in a modest and irregular layout that lacks defining Ranch style features such as a breezeway or cupola. Similarly, while the milk parlor includes Ranch style elements such as steel casement windows, and a stucco facade, it does not rise to the level of an exemplary or distinctive Ranch style design.

The property as a whole is not significant or eligible under any NRHP/CRHR/Local criteria. It is not eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a due to lack of a significant association with local, regional, state, or national patterns of dairy farming. It is not eligible under Criterion B / 2 / b as it lacks association with any person, family, or group important in Ontario's dairy history. It does not appear to meet Criterion C / 3 / c–f, as the residence and milk parlor do not embody distinctive characteristics of a type, period, or method of construction and are not the work of a master. The property is also not eligible under City of Ontario Criteria g or h, nor under Criterion D / 4, as it is not likely to yield important historical information.

Although the property has been found not significant and ineligible, it retains integrity of location, setting, design, materials, workmanship, feeling, and association as an active dairy property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 3S/3CS/5S3
Other Listings: Urbana Survey No.: 114

Review Code _____ Reviewer _____ Date _____
**Resource Name: 8335-8381 Edison Avenue**


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._ **B.M.** __
c. Address: 8335-8381 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442498, 442501 mE / 3761964, 3761376mN
e. Other Locational Data: San Bernardino County APN: 021632201, 021632202, 021632203, 021632204

***P3a. Description:** The evaluated property consists of four parcels (APN: 021632201, 021632202, 021632203, and 021632204), historically addressed as 8335-8381 Edison Avenue. Covering 37.42 acres, it is located south of Edison Avenue and Ontario Ranch Road, between Grove and Walker Avenues. The surrounding area remains largely open space and agricultural land, historically associated with dairy farming. The property includes a Craftsman Bungalow style dwelling, a Ranch style milk parlor, several geometrically spaced ancillary structures, storage sheds, and various features associated with dairy operations. Water retention ponds are located to the rear of the property on parcels 021632202 and 021632203. The milk parlor and residence are located on parcel 021632204. Landscaping and hardscaping consist of paved driveways and a few organized trees and shrubs around the buildings. The property continues to function as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View south of 8335 Edison Ave Craftsman Bungalow SFR (IMG_8834; October 21, 2024).
***P6. Date Constructed/Age and Source**
pre-1935,1959-1966/NETR HistoricAerials (1959, 1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** John T. Veenstra Dairy/De Hoog Dairy/Three D Dairy
**B2. Common Name:** 8335-8381 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style/Craftsman Bungalow Style

***B6. Construction History:** This property consists of four parcels under single ownership (APN: 021632201, 021632202, 021632203, 021632204). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 8335 Edison Avenue was initially developed prior to 1935 with the construction of a two-story Craftsman Bungalow style residence and several ancillary structures, which are no longer extant. By 1959, a detached garage had been added to the property. Between 1959 and 1966, a Ranch style milk parlor was constructed. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Craftsman Bungalow Style, 1900s-1930s **Area:** San Bernardino County
**Period of Significance:** Pre-1935 **Property Type:** Craftsman Bungalow Style
**Applicable Criteria:** NRHP/CRHR/Local C/3/d

The 8335 Edison Avenue property was improved prior to 1935 with the construction of a Craftsman Bungalow residence, with additional developments occurring between 1959 and 1966. In 1967 the area was established as part of the San Bernardino County Agricultural Preserve. In 1999, the area was annexed as part of the New Model Colony, formed from a portion of the former agricultural preserve. The 8335 Edison Avenue property is associated with multiple themes, including Depression-Era and Wartime Dairies, 1930s-1945; Craftsman Bungalow Style, 1900s-1930s; Postwar, Large-Capacity Dairies, 1945-1980; Ranch Style, 1950-1970s. However, only the Craftsman Bungalow style dwelling is considered significant under NRHP, CRHR, and City of Ontario criteria C/3/d within the context of Craftsman Bungalow Style, 1900s-1930s, with a period of significance of pre-1935, representing the dwelling's original construction. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8335-8381 Edison Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 3S/3CS/5S3
Other Listings: Urbana Survey No.: 114

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved prior to 1935 with later developments between 1959 and 1966, the property includes a Craftsman Bungalow style dwelling, a Ranch style milk parlor, several ancillary structures and water retention ponds.

The Craftsman Bungalow style residence is located towards the northeast corner of parcel 021632204. The dwelling is two-story and has an asymmetrical façade and an irregular floorplan. The exterior is clad in clapboard siding painted brown with dark brown trim on the windows and doors. The moderately pitched hipped roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, and a dormer on the main (north) elevation. The fenestration visible from the public right-of-way consists of wood-framed fixed and double-hung windows, along with some vinyl sliding sash and single-hung windows. The main elevation features a partial-width porch beneath a hipped roof extension, supported by tapered brick columns, concrete steps, and a brick pony wall.

The dwelling retains key characteristics of the Craftsman Bungalow style, including its use of natural materials such as wood clapboard siding and brick. The dormer, exposed rafter tails, wood-cased windows, and decorative porch elements, such as brick tapered columns and pony wall, further exemplify the style's emphasis on handcrafted architectural details and a connection to nature. Despite the removal of some original windows and roofing, the dwelling maintains a strong representation of the Craftsman Bungalow style through its massing, roof form, and characteristic design features.

South of the dwelling is a detached three-car garage constructed ca. 1959. The garage was designed in a similar fashion to the residence with wood-siding painted brown, hip-and-gable roof with composition shingles, three wood paneled overhead doors, and a small cupola on the top of the roof ridge.

West of the dwelling is the Ranch style milk parlor, which is divided into three sections: the front milk house, the rear milking parlor separated by a breezeway, and an open holding area. Constructed between 1959 and 1966, the milk house incorporates some Ranch style elements such as a hip-and-gable roof, a moderate eave overhang with boxed eaves, and a stucco façade with wood-siding below the gable end. Its fenestration consists of metal multi-lite windows and vinyl windows. The breezeway, located between the two sections on the north and south elevations, is obscured from the public right of way. South of the milk house, the milking parlor features a flat roof oriented along a north-south axis. Ventilation elements include metal vertical louvered shutters set between concrete walls. Further south, the holding area is open and enclosed behind concrete walls. Additional features include industrial glass doors at the main entryway and a circular driveway in front of the milk parlor.

Within proximity to the buildings are several features and structures associated with dairy operations, including silos, pole structures, feeding gates, corrals, and storage sheds. Water retention ponds are located at the rear of the property.

## Primary Record Information Continued:

View south of 8335 Edison Ave Ranch style milk parlor (IMG_8835; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
In the 1950s, the property was owned by John T. Veenstra. By 1981, ownership transferred to Martin De Hoog. The property remained under the De Hoog family's ownership until 2022 and was initially known as the De Hoog Dairy before being renamed Three D Dairy.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
The 8335 Edison Avenue property is an excellent example of a Craftsman Bungalow style residence, retaining key characteristics of the Craftsman Bungalow style, including the use of natural materials such as wood clapboard siding and brick. The dormer, wood-cased windows, and decorative porch elements, such as brick tapered columns and pony wall, further exemplify the style's emphasis on handcrafted architectural details and a connection to nature. Despite the removal of some original windows and roofing, the dwelling maintains a strong representation of the Craftsman Bungalow style through its massing and characteristic design features.

The property also includes a Ranch style milk parlor and a detached garage. Although minimally altered, the milk parlor is not a representative example of the Ranch style within the survey area. The detached garage, constructed circa 1959, well after the original dwelling, does not contribute to the historic character of the property and is not considered a contributing resource.

Under the established context, an eligible property must retain integrity of location, setting, materials, design, feeling, workmanship, and association aspects of integrity to convey significance. Despite minor modifications, the dwelling retains necessary integrity to convey significance including location, setting, feeling, design, materials, workmanship, and association. Accordingly, the property is eligible under NRHP / CRHR / City of Ontario Criterion C/3/d, as it embodies the distinctive characteristics of its type, period, and method of construction, qualifying as a historical resource under Section 15064.5 of the CEQA Guidelines.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 115

Review Code _____ Reviewer _____ Date _____
**Resource Name: 8485 Edison Avenue and 14350 Walker Avenue**


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._ **B.M.** __
c. Address: 8485 Edison Avenue,
14350 Walker Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442694 mE / 3761653mN
e. Other Locational Data: San Bernardino County APN: 021632205, 021632210

***P3a. Description:** The evaluated property consists of two parcels (APN: 021632205 and 021632210), historically addressed as 8485 Edison Avenue and 14350 Walker Avenue. Covering 36.95 acres, it is located on the southwest corner of Ontario Ranch Road and Walker Avenue. The surrounding area remains largely open space and agricultural land, historically associated with dairy farming. The property includes two one-story Ranch style residences, a Ranch style milk parlor, several geometrically spaced ancillary structures, metal storage sheds, and various features associated with dairy operations. Water retention ponds are located to the rear of the property. One of the residences is located towards the rear on the southeast side of the parcel. Landscaping and hardscaping is minimal consisting of paved driveways and some trees. Eucalyptus trees line most of the east side of the parcel. The property continues to function as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View south of 14350 Walker Ave Ranch style milk parlor (IMG_8831; October 21, 2024).
***P6. Date Constructed/Age and Source**
1959-1966, 1966-1968/NETR HistoricAerials (1959, 1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Ed Swager Dairy
**B2. Common Name:** 8485 Edison Avenue and 14350 Walker Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of two parcels under single ownership (APN: 021632205 and 021632210). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 8485 Edison and 14350 Walker Avenue property was initially developed between 1959 and 1966, with the construction of a Ranch style milk parlor and residence listed as 8485 Edison Avenue. Between 1966 and 1968, a second Ranch style residence was constructed on the property, listed as 14350 Walker Avenue. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 8485 Edison and 14350 Walker Avenue was originally developed between 1959 and 1966 with later developments between 1966 and 1968. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8485 Edison Avenue and 14350 Walker Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 115

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC

0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved between 1959 and 1966, with later developments between 1966 and 1968, the property includes two Ranch style dwellings, a Ranch style milk parlor, several ancillary structures/features and water retention ponds.

Fronting Ontario Ranch Road is one of the Ranch style dwellings and the Ranch style milk parlor, listed as 8485 Edison Avenue. Constructed between 1959 and 1966, the dwelling is a one-story structure with an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. Its exterior is clad in tan-painted stucco with a stone veneer along the lower span of the main (north) elevation. The low-pitched hip-and-gable roof is topped with composition shingles and features a moderate eave overhang, boxed eaves, a stone chimney on the rear roof slope, and a cupola. Below the gable end, is white horizontal wood siding and a scalloped fascia board. The fenestration consists of vinyl sliding sash units, which replaced the original wood-framed windows, some of which featured a diamond pattern. One of the original window openings to the left of the main entryway was substantially altered and replaced with a smaller window unit. The main elevation includes a stone planter, box bays accented by white horizontal wood siding, a decorative wood spindle column, and a recessed main entryway. On the west elevation, a partially open breezeway connects the dwelling to a two-car garage with white paneled overhead doors.

West of the dwelling is the Ranch style milk parlor, which is divided into two sections: the front milk house section and the rear milking parlor separated by a breezeway. The milk house incorporates Ranch style elements such as a hip-and-gable roof, a moderate eave overhang with boxed eaves, and a stucco façade. Its fenestration consists of metal multi-lite fixed and casement windows. The breezeway, located between the two sections on the east and west elevations, features two metal barn-style sliding doors. South of the milk house, the milking parlor features a gabled roof oriented along a north-south axis and steel beams. Ventilation elements include metal vertical louvered shutters set on top concrete walls. Additional features include two metal doors at the main entryway and a circular driveway in front of the milk parlor.

To the rear portion of the parcel fronting Walker Avenue is the second Ranch style residence, listed as 14350 Walker Avenue. Constructed between 1966 and 1968, the dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in stucco painted tan and has a stone veneer on the main (east) elevation. The moderately-pitched hipped roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, and a stone chimney on the rear roof slope. The fenestration visible from the public right-of-way consists of aluminum windows. An enclosed breezeway is located on the north elevation and connects the dwelling to a two-car garage.

## Primary Record Information Continued:

View south of 14350 Walker Ave Ranch style SFR (IMG_8830; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
The property was owned by the Edward Swager family between the 1960s and 2022.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 8485 Edison and 14350 Walker Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 8485 Edison and 14350 Walker Avenue property has been found not significant and ineligible, it maintains integrity of location, setting, design, materials, workmanship, feeling, and association as an active and in-use dairy farming property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 120

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 14049 Grove Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._**B.M.** __
c. Address: 14049 Grove Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442052, 442147 mE / 3762180, 3762181mN
e. Other Locational Data: San Bernardino County APN: 021631101, 021631102

***P3a. Description:** The evaluated property consists of two parcels (APN: 021631101 and 021631102), historically addressed as 14049 Grove Avenue. Covering 9.04 acres, the property is located on the northeast corner of Grove Avenue and Ontario Ranch Road. The surrounding area remains largely open space and agricultural land, historically associated with dairy farming. The property includes a two-story Ranch style residence with an attached garage, a utilitarian milk parlor, and some ancillary pole structures and two water retention ponds. Some ancillary pole structures are located to the rear of the buildings. The dwelling and milk parlor are located on parcel 021631102. Landscaping and hardscaping features consist of a paved driveway and walkway, and some organized trees and plantings around the buildings. The property is enclosed behind a metal fence. Today, the property no longer functions as an active dairy and is listed as Agromin, a local soil company. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View northeast of 14049 Grove Avenue milk parlor (IMG_8745; October 21, 2024).
***P6. Date Constructed/Age and Source**
1959-1966/NETR HistoricAerials (1959, 1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Pietersma, Ronald & Kristine Family TR
PO Box 2500
Chino CA
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Jacob Bosma Dairy
**B2. Common Name:** 14049 Grove Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Single-Family
***B5. Architectural Style:** Utilitarian Style/Minimal Traditional Style

***B6. Construction History:** This property consists of two parcels under single ownership (APN: 021631101 and 021631102). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 14049 Grove Avenue was initially developed between 1959 and 1966, with the construction of a Ranch style single-family residence and utilitarian milk parlor. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 14049 Grove Avenue was originally developed between 1959 and 1966. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 14049 Grove Avenue


Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 120

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC

0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved between 1959 and 1966, the property includes a Ranch style single-family residence and a milk parlor. The dwelling features a rectilinear, two-story floorplan with a flat roof and a moderate eave overhang. The exterior is clad in white stucco and includes vinyl sliding sash windows. The main entryway is sheltered by a portico supported by decorative wood spindle columns. Additional features include an attached one-car garage with a paneled overhead door and a deck enclosed by a decorative metal railing above the garage.

East of the dwelling is a utilitarian milk parlor, which is divided into two sections: the front milk house and the side milking parlor, separated by a breezeway. The milk house features a concrete façade with a bubbled textured section, industrial glass doors, large, fixed windows, and a flat roof. The breezeway, located between the two sections on the east and west elevations, is enclosed by metal barn-style sliding doors. North of the milk house, the milking parlor has a flat roof oriented along a north-south axis. Ventilation elements include metal vertical louvered shutters set between concrete walls. Additional features include a curved driveway in front of the milk parlor.

View east of 14049 Grove Avenue SFR (IMG_8743; October 21, 2024).

**Primary Record Information Continued:**

View northeast of 14049 Grove Ave milk parlor (IMG_8744; October 21, 2024).

View northeast of 14049 Grove Avenue milk parlor (IMG_8746; October 21, 2024).

## Primary Record Information Continued:

View north of 14049 Grove Avenue SFR (IMG_8747; October 21, 2024)

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
The property was originally owned by Jacob J. Bosma since the 1960s and remained in the Bosma family's ownership until 2021.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 14049 Grove Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 14049 Grove Avenue has been found not significant and ineligible for historical designation, it generally retains all aspects of integrity in location, setting, design, materials, workmanship, and feeling. However, the property lacks integrity of association, as it no longer functions as a property associated with the dairy industry.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# APPENDIX D

## Relocation Feasibility Study

August 20, 2025

Jason Lee
V.P. RCCD Inc.
jasonl@rccdinc.com

Reference: **RELOCATION OF FIVE STRUCTURES – FEASIBILITY STUDY**
**7587 EDISON AVE, 8311 EDISON AVE, 8381 EDISON AVE, 8485 EDISON AVE, AND 14117 GROVE AVE**
**ONTARIO, CALIFORNIA**
**[S.F. PROJECT #25198]**

Dear Jason:

We have completed our feasibility study for the relocation of four historic milking barns and a historic house located at 7587 Edison Avenue, 8311 Edison Avenue, 8485 Edison Avenue, 14117 Grove Avenue, and 8381 Edison Avenue in Ontario, CA, respectively. Our findings are based on visual observations made while on all five sites on August 8, 2025. Cole Cisakowski of RCCD accompanied Gabriela Pascualy of Structural Focus on the site visit. No existing building drawings or backgrounds were provided for our use, and no exploratory demolition or materials investigation was performed as part of the site visit.

**Building Descriptions**

*7587 Edison Avenue*

The milking barn at 7587 Edison is separated into a smaller wood framed front portion and a larger concrete back portion. The front portion is an enclosed space that is approximately 40 feet wide by 24 feet deep and has a large tank in front of it, along with a tank, washrooms, and storage rooms inside the building. The wood framed stud walls appear to be supported on concrete stem walls which are a few feet tall. There are several window openings and large door openings. The roof is wood framed.

The back portion of the building is much larger at approximately 200 feet wide by approximately 30 feet deep. It consists of concrete roof slabs supported by a central line of built-up steel beams & columns and concrete walls (potentially tilt-up) on the long sides of the building. The roof slabs consist of two spans which overlap & are vertically offset in the center of the building, allowing airflow. The walls contain many window and door openings with five of the window openings infilled with concrete at the northeast corner. The west side of the building is open while the east side has a solid wall. Animal stalls and equipment for milking operations fill this portion of the building.

Foundations for the building were not visible but are presumed to be concrete strip footings below the walls and concrete spread footings below the columns.

*8311 Edison Avenue*

The milking barn at 8311 Edison is separated into a smaller wood framed front portion and a larger metal and wood framed back portion. The front portion is an enclosed space that is approximately 30 feet wide by 15 feet deep with a tank on the exterior of the west side of the building that appears to penetrate the exterior wall. The inside contains washrooms and storage rooms. The wood framed stud walls appear to be supported on concrete stem walls which are a few feet tall. There are several window openings and large door openings. The roof is wood framed with clay tile roofing.

The back portion of the building extends more than three times the depth of the front portion but decreases in width before it expands back to the width of the front portion. The roof consists of corrugated metal sheets

over wood framing, supported by posts only along the exterior in the middle, narrower area and supported by steel posts along the exterior and center in the end, wider area. There are partial height concrete walls along the long sides. Animal stalls and equipment for milking operations fill this portion of the building.

Foundations for the building were not visible but are presumed to be concrete strip footings below the walls and concrete spread footings below the columns.

*8381 Edison Avenue*

The building at 8381 Edison is a craftsman-style single family home. The 2-story house has a covered porch and detached 3-car garage. Interior access to the house was not provided, so our observations are based on what could be seen while walking around the perimeter of the building. The home is likely constructed of wood floor and wall framing, supported by exterior bearing walls and interior posts in the crawl space. Foundations for the bearing walls were not visible but are presumed to be concrete strip footings. In the crawl space, small concrete pad footings were visible below the posts. The garage is also wood framed with what is likely a concrete slab on grade.

*8485 Edison Avenue*

The milking barn at 8485 Edison is separated into a smaller wood framed front portion and a larger metal framed back portion. The front portion is an enclosed space that is approximately 25 feet wide by 15 feet deep and contains storage tanks, washrooms, and storage rooms. Wood framed stud walls are supported on concrete stem walls and there are several window and door openings in the walls. The roof is wood framed.

The back portion of the building is much larger with the same width but extends more than three times the depth of the front portion. The roof consists of corrugated metal sheets supported by metal joists framing into metal frames. There are six total steel beam and column frames with individual concrete pad footings visible below each of the columns. Each frame consists of two exterior columns with a beam spanning between them. There are partial height concrete walls along the long sides of the back portion with metal slats above them spanning vertically to the underside of the roof. Animal stalls and equipment for milking operations fill this portion of the building.

Most foundations are not visible but are presumed to be concrete strip footings below the stem walls (not visible) and concrete spread footings below the columns (visible).

*14117 Grove Avenue*

The building at 14117 Grove is separated into a smaller front portion and a larger back portion. The front portion is an enclosed space that is approximately 35 feet wide by 15 feet deep and contains storage tanks for the milk product, washrooms, and storage rooms. Wood framed stud walls are supported on concrete (or possibly concrete block) stem walls. There are several glass block infill windows in the wood stud walls. The ceiling and roof are wood framed.

The back portion is much larger with the same width but extends more than three times the depth of the front portion. The back portion of the building has a corrugated metal roof supported by wood carpenter trusses spanning to wood beams, supported by steel pipe posts along the exterior of the building. It is an open structure with partial height walls along the sides (likely concrete). Animal stalls and equipment for milking operations fill this portion of the building.

Foundations for the buildings are not visible but are presumed to be concrete spread footings below the stem walls and pipe posts.

**Site Visit Observations**

*7587 Edison Avenue*

The front portion of the milking barn at 7587 Edison appears to have water and weather damage leading to sagging of some of the wood framing. Specifically, the stucco on the underside of the overhang at the southwest corner of the front portion appears to have sagged downward exposing the wood roof joists. The ceiling near the doorway to the back portion has also sagged significantly, presumably from damaged wood framing above.

The back portion is in relatively good condition. During the site visit a crack was observed in the concrete header above the doorway between the front and back portions of the building.

*8311 Edison Avenue*

The front portion of the milking barn at 8311 Edison is in relatively good condition. Some edge members are missing at the north corners of the building, exposing roof members in the area. The visible members show signs of deterioration, but it is presumed that the deterioration is due to exposure to the elements and is limited to the exposed areas.

The back portion also shows some signs of deterioration, likely due to the age of the building and exposure to the elements.

*8381 Edison Avenue*

The house at 8381 Edison was observed from the exterior only. It appears to be in good condition and is currently inhabited.

*8485 Edison Avenue*

The milking barn at 8485 Edison is functioning as a working parlor – both the front and back portions are in relatively good condition.

*14117 Grove Avenue*

The milking barn at 14117 Grove is no longer functioning as a working parlor as of recently and was only observed from the exterior. The front portion appears to be in relatively good condition. The wood trusses in the back portion are deteriorated and in poor condition, with evidence of some previous repairs. In the event that the back portion becomes occupiable again, the roof framing should be shored and repaired.

**Conclusions**

It is our opinion that it is feasible to relocate the front portion of all four milking barns, located at 7587 Edison Ave, 8311 Edison Ave, 8485 Edison Ave, and 14117 Grove Ave; the back portion of the milking barns located at 8311 Edison Ave and 8485 Edison Ave; and the house located at 8381 Edison Ave. The wood framed walls in the front portions of all four milking barns could be detached and lifted off the stem walls. New foundations and stem walls would need to be constructed at the receiver site to support the relocated wood portions. The back portions of the milking barns previously listed could be lifted at the lines of steel/wood posts for relocation of the posts and roofs. The perimeter stem walls and animal stalls would need to be rebuilt at the receiver site. The house could be detached and lifted off the crawl space. New perimeter crawl space walls, interior crawl space posts, and all associated foundations would need to be constructed at the receiver site to support the relocated house.

The back portions of the milking barns located at 7587 Edison Ave and 14117 Grove Ave are not feasible to relocate in their current conditions. The nature of the concrete construction at 7587 Edison Ave makes the structure extremely challenging to relocate without causing damage. However, the structure may be relocated if it is first disassembled and then reassembled at the receiver site.

**Summary**

**7587 Edison Ave** – It **is** feasible to relocate the **front** portion of the building, but it **is not** feasible to relocate the **back** portion of the building without first disassembling the structure. Some repairs to the front portion may be required at the discretion of the relocation specialist.

**8311 Edison Ave** – It **is** feasible to relocate the building in its entirety (with the exception of the stem walls in the front and back portions, the animal stalls in the back, and the foundations).

**8381 Edison Ave** – It **is** feasible to relocate the building in its entirety (with the exception of the crawl space framing and foundations).

**8485 Edison Ave** – It **is** feasible to relocate the building in its entirety (with the exception of the stem walls in the front and back portions, the animal stalls in the back, and the foundations).

**14117 Grove Ave** – It **is** feasible to relocate the **front** portion of the building, but it **is not** feasible to relocate the **back** portion of the building in its current state.

Thank you very much for the opportunity to work with you on this challenging and interesting project. If you have any questions, please feel free to contact us at your convenience.

Sincerely,
STRUCTURAL FOCUS

Russell Kehl, S.E.
Principal, President

Gabriela Pascualy, P.E.
Senior Structural Designer

**APPENDIX C1**

# BIOLOGICAL RESOURCES TECHNICAL REPORT

# Biological Resources Technical Report

## Center Park Specific Plan
## City of Ontario, California

**FINAL REPORT**

***Prepared for:***

**Kimley-Horn**
3801 University Avenue, Suite 300
Riverside, CA 92501
Contact: Sabrina Wallace, (951) 382-0818

***Prepared by:***

**Cadre Environmental**
701 Palomar Airport Road, Suite 300
Carlsbad, CA 92011
Contact: Ruben Ramirez, (949) 300-0212

**October 2024**

CADRE Environmental

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# INTRODUCTION

The following biological resources technical report describes a detailed assessment of potential sensitive natural resources located within and/or immediately adjacent to the "Center Park Specific Plan" project (Specific Plan Boundary). The report has been prepared to support compliance with the California Environmental Quality Act (CEQA) documentation including the preparation of an Initial Study (IS), Environmental Impact Report (EIR) and environmental review process conducted by the City of Ontario. As discussed below, the assessment included a thorough literature review, site reconnaissance characterizing existing conditions (including floral, faunal and dominant vegetation communities), impact analysis, and applicable standards and regulations to ensure impacts remain at a level below significance.

## SPECIFIC PLAN LOCATION

The Specific Plan boundary includes a total of 194.05-acres onsite (Project Site), 63.29-acres within a Programmatic Assessment Area (Project Level Assessment Area), and 19.81-acres of offsite right-of-way impact areas (Offsite Areas), as shown in Figure 1, *Regional Location Map*, Figure 2, *Specific Plan Map*, and summarized in Table 1, *Specific Plan Acreages*.

The 194.05-acre Project Site is located within the southern region of the Specific Plan Boundary including Assessor Parcel Numbers (APNs) 0216-311-01,-02, -09, 0216-321-03, -08, 0216-322-03, -04, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, -03, 1053-331-01 to -04, 1053-341-01, -02, 1053-351-01, -02, 1053-361-01 to -03, 1053-371-01, -02, and portion of 0216-322-10.

The 63.29-acre Project Level Assessment Area is located within the northern region of the Specific Plan Boundary including APN's 0216-311-09, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, and -03. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction, **CM BIO-7** Programmatic Assessment Area CEQA Analysis.

The 19.81-acre Offsite Areas include existing right-of-ways within the Specific Plan Boundary including but not limited to Comet Avenue, Grove Avenue, Cucamonga Avenue, Bon View Avenue, and Ontario Ranch Road/Edison Avenue.

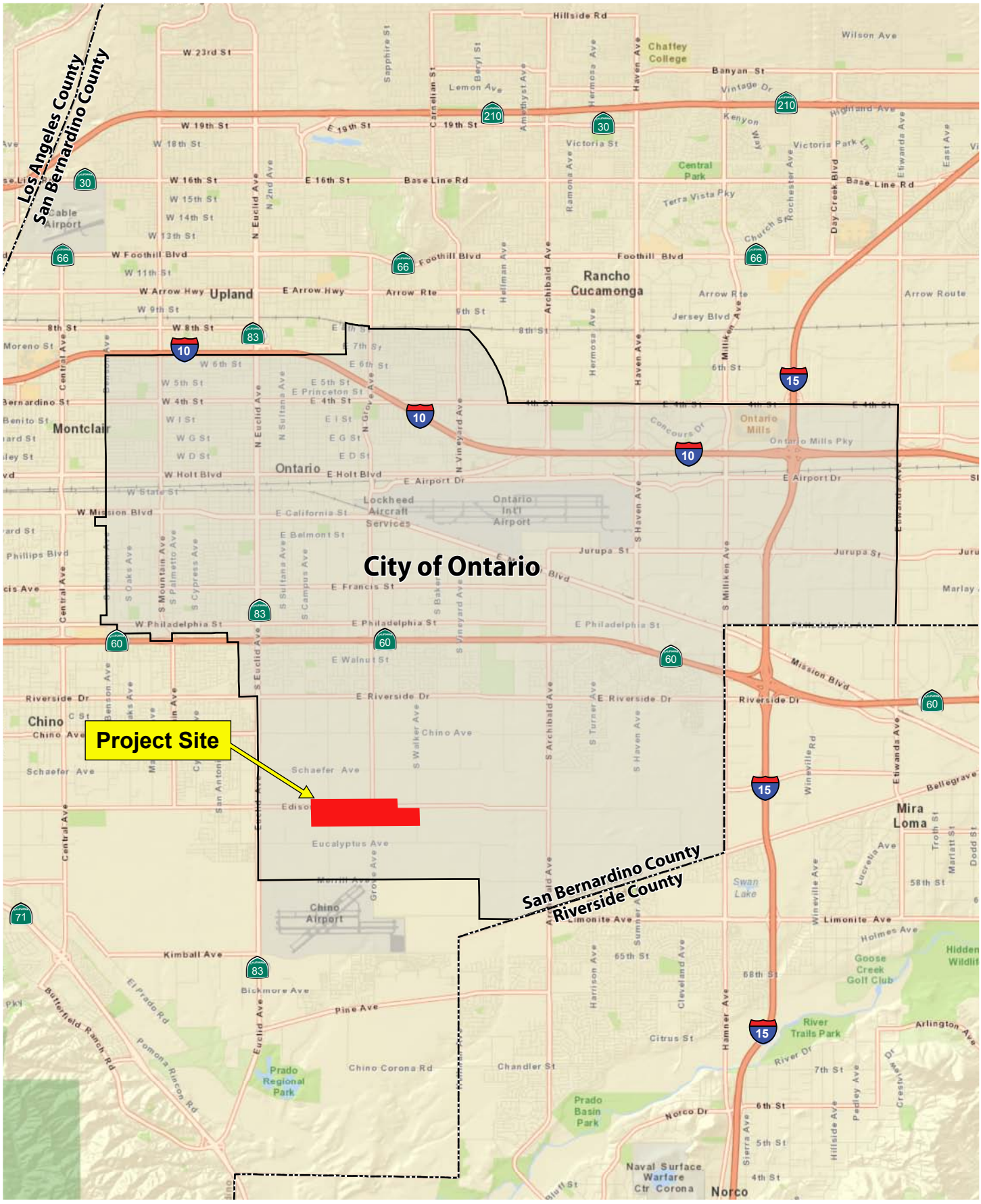
Los Angeles County
San Bernardino County
Project Site
City of Ontario
San Bernardino County
Riverside County
Upland
Rancho Cucamonga
Montclair
Ontario
Chino
Mira Loma
Norco
Chaffey College
Central Park
Ontario Mills
Lockheed Aircraft Services
Ontario Int'l Airport
Chino Airport
Prado Regional Park
Prado Basin Park
River Trails Park
Goose Creek Golf Club
Naval Surface Warfare Ctr Corona
Hillside Rd
Wilson Ave
Banyan St
Vintage Dr
Lemon Ave
Base Line Rd
Foothill Blvd
Arrow Rte
Arrow Route
Jersey Blvd
Terra Vista Pky
Ontario Mills Pky
E Airport Dr
Jurupa St
Mission Blvd
Riverside Dr
Chino Ave
Schaefer Ave
Eucalyptus Ave
Limonite Ave
Kimball Ave
Bellegrave
Pine Ave
Chino Corona Rd
Chandler St
Norco Dr
Citrus St
Butterfield Ranch Rd
El Prado Rd
Pomona Rincon Rd
Bickmore Ave
Euclid Ave
Central Ave
Etiwanda Ave
Haven Ave
Archibald Ave
Hamner Ave
Wineville Rd
Day Creek Blvd
Rochester Ave
Milliken Ave
Vineyard Ave
Hellman Ave
Ramona Ave
Hermosa Ave
Sapphire St
Carnelian St
Beryl St
Amethyst Ave
Victoria St
Victoria Park Ln
Highland Ave
East Ave
Moreno St
Bernardino St
Benito St
Phillips Blvd
Marlay
Holmes Ave
Lucretia Ave
Troth St
Marlatt St
Dodd St
58th St
Swan Lake
Arlington Ave
River Dr
Pedley Ave
Hillside Ave
Sierra Ave
Crestview Dr
Cleveland Ave
Harrison Ave
Sumner Ave
Turner Ave
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Pine Ave
Chino Corona Rd
Chandler St
Norco Dr
Citrus St
Butterfield Ranch Rd
El Prado Rd
Pomona Rincon Rd
Euclid Ave
Central Ave
Etiwanda Ave
Haven Ave
Archibald Ave
Hamner Ave
Wineville Rd
Day Creek Blvd
Rochester Ave
Milliken Ave
Vineyard Ave
Hellman Ave
Ramona Ave
Hermosa Ave
Sapphire St
Carnelian St
Beryl St
Amethyst Ave
Victoria St
Victoria Park Ln
Highland Ave
East Ave
Moreno St
Bernardino St
Benito St
Phillips Blvd
Marlay
Holmes Ave
Lucretia Ave
Troth St
Marlatt St
Dodd St
58th St
Swan Lake
Arlington Ave
River Dr
Pedley Ave
Hillside Ave
Sierra Ave
Crestview Dr
Cleveland Ave
Harrison Ave
Sumner Ave
Turner Ave
Walker Ave
Grove Ave
Merrill Ave
Edison
Merlot St
Chino Ave
Schaefer Ave
Eucalyptus Ave
Limonite

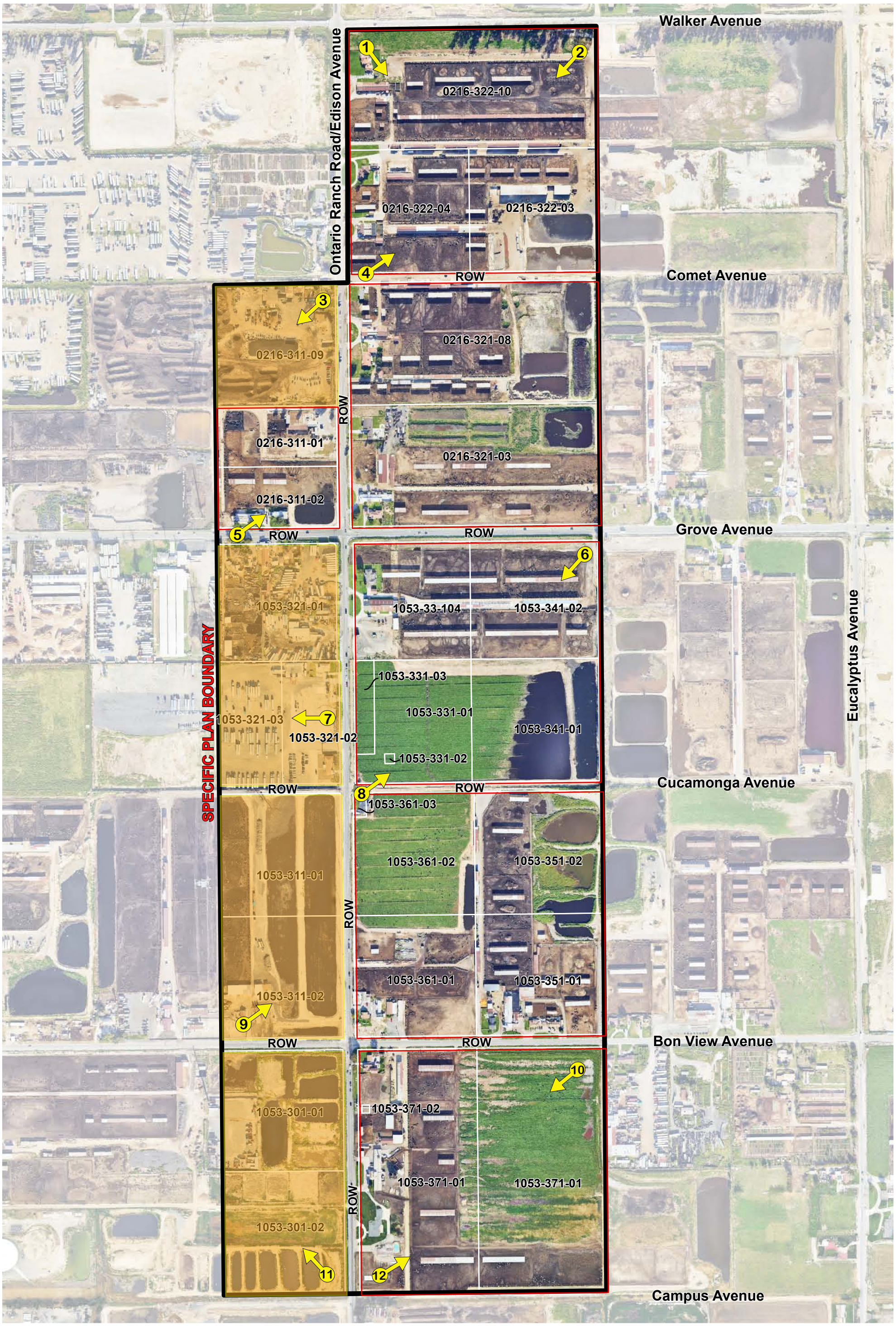


**Figure 2 - Specific Plan Map**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

1 inch = 450 feet

**Table 1.**
**Specific Plan Acreages**

| Specific Plan Boundary | Acres |
|---|---|
| Project Site (Project Site) | 194.05 |
| Programmatic Assessment Area (Project Level Assessment Area) | 63.29 |
| ***subtotal*** | ***257.34*** |
| Offsite Right of Way Impact Areas (Offsite Areas) | 19.81 |
| ***subtotal*** | ***19.81*** |
| **TOTAL** | **277.15** |

## SPECIFIC PLAN DESCRIPTION

The proposed action includes the development of medium density residential (22-35 Dwelling Units/Acre), mixed use (retail (379,029 SF), office (289,521 SF)) and open space-recreational (parkland) within the Specific Plan Boundary.

# METHODOLOGY

The following section details the methods implemented prior to and during the reconnaissance survey conducted throughout the Project Site and Offsite Areas.

## LITERATURE REVIEW

Existing biological resource conditions within and adjacent to the Specific Plan Boundary was initially investigated through review of pertinent scientific literature. Federal register listings, protocols, and species data provided by the United States Fish and Wildlife Service (USFWS) were also reviewed in conjunction with anticipated federally listed species potentially occurring within the region of the Specific Plan Boundary. The California Natural Diversity Database (CNDDB) (CDFW 2024a), a California Department of Fish and Wildlife (CDFW) Natural Heritage Division species account database, was also reviewed for all pertinent information regarding the locations of known occurrences of sensitive species in the vicinity of the property. In addition, numerous regional floral and faunal field guides were utilized in the identification of species and suitable habitats. Combined, the reviewed sources provided an excellent baseline from which to inventory the biological resources potentially occurring in the area. Other CDFW reports and publications consulted include the following:

- Special Animals (CDFW 2024b);
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2024c);
- Endangered, Threatened, and Rare Plants of California (CDFW 2024d); and
- Special Vascular Plants and Bryophytes List (CDFW 2024e).

## FIELD SURVEY

A reconnaissance survey of the Project Site and Offsite Areas was conducted by Ruben Ramirez of Cadre Environmental on June 13th, 2024 in order to characterize and identify potential sensitive plant and wildlife habitats, and to establish the accuracy of the data identified in the literature search. Geologic and soil maps were examined to identify local soil types that may support sensitive taxa. Aerial photograph, topographic maps, vegetation and rare plant maps prepared for previous studies in the region were used to determine community types and other physical features that may support sensitive plants/wildlife, uncommon taxa, or rare communities that occur within or adjacent to the Project Site and Offsite Areas. Habitat assessments were conducted for, but not limited to, the following target species/groups.

- Delhi sands flower loving fly – Federally Endangered (FE)
- Coastal California gnatcatcher – Federally Threatened (FT)/State Species of Special Concern (SSC)
- Burrowing owl - SSC
- San Bernardino kangaroo rat – FE/SSC
- Common and sensitive bat species
- Sensitive plants

As previously stated, authorization to access the Project Level Assessment Area was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction, **CM BIO-7** Programmatic Assessment Area CEQA Analysis.

### Vegetation Communities/Habitat Classification Mapping

Natural community names and hierarchical structure follows the "*Manual of California Vegetation*" (Sayer and Keeler-Wolf 2009) classification system, which has been refined and augmented where appropriate to better characterize the habitat types observed throughout the Specific Plan Boundary.

All plants observed during the survey efforts were either identified in the field or collected and later identified using taxonomic keys. Plant taxonomy follows Hickman (1993). Scientific nomenclature and common names used in this report generally follow Roberts et al. (2004) or Baldwin et al. (2012) for updated taxonomy. Scientific names are included only at the first mention of a species; thereafter, common names alone are used.

### Wildlife Resources Inventory

All animals identified during the reconnaissance survey by sight, call, tracks, scat, or other characteristic sign were documented. In addition to species actually detected, expected use of the site by other wildlife was derived from the analysis of habitats on the site,

combined with known habitat preferences of regionally occurring wildlife species. Vertebrate taxonomy followed in this report is according to the Center for North American Herpetology (2024 for amphibians and reptiles), the American Ornithologists' Union (1988 and supplemental) for birds, and Baker et al. (2003) for mammals. Both common and scientific names are used during the first mention of a species; common names only are used in the remainder of the text.

### Jurisdictional Resources Assessment

The Project Site and Offsite Areas were assessed for the presence/absence of United States Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), and Regional Water Quality Control Board (RWQCB) jurisdictional resources. Non-wetland waters of the United States were assessed based on the limits of the Ordinary High-Water Mark (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in vegetation and soil characteristics. The assessment utilized the methodology for routine wetland determination according to the methods outlined in the USACE Wetland Delineation Manual (Environmental Laboratory 1987) and the Arid West Wetland Delineation Supplement and updated regulatory guidance letters (USACE 2008). Wetlands are identified by the presence of three characteristics: hydrophytic vegetation, wetland hydrology, and hydric soils. If any of these criteria were met, one or more transects were run to determine the extent of the wetland. Specifically, the presence of wetland hydrology was evaluated throughout the Project Site and Offsite Areas by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil pits, where applicable. In addition, indicators of wetland or riverine hydrology were recorded, including water marks, drift lines, rack, debris, and sediment deposits, as warranted. Any indicators of hydric soils, such as redoximorphic features, buried organic matter, organic streaking, reduced soil conditions, gleyed or low-chroma soils, or sulfidic odor were also recorded.

## EXISTING ENVIRONMENTAL SETTING

The following section presents the existing conditions of the Specific Plan Boundary. The Specific Plan Boundary is characterized primarily as heavily disturbed active dairy and agricultural facilities as shown in Figure 3, *Specific Plan Vegetation Communities Map*, Figures 4 to 9, *Current Specific Plan Photographs,* and outlined in Table 2, *Specific Plan Vegetation Community Acreages*. The Specific Plan Boundary is completely bordered by high traffic roads, commercial/residential development and active dairy and agricultural facilities.

The Soil Survey of the San Bernardino County Area has the following soils mapped within the Specific Plan Boundary as shown on Figure 10, *Specific Plan Soils Association Map*:

- Db – Delhi fine sand
- Hr – Hilmar loamy fine sand
- TuB – Tujunga loamy sand 0 to 5 percent slopes.

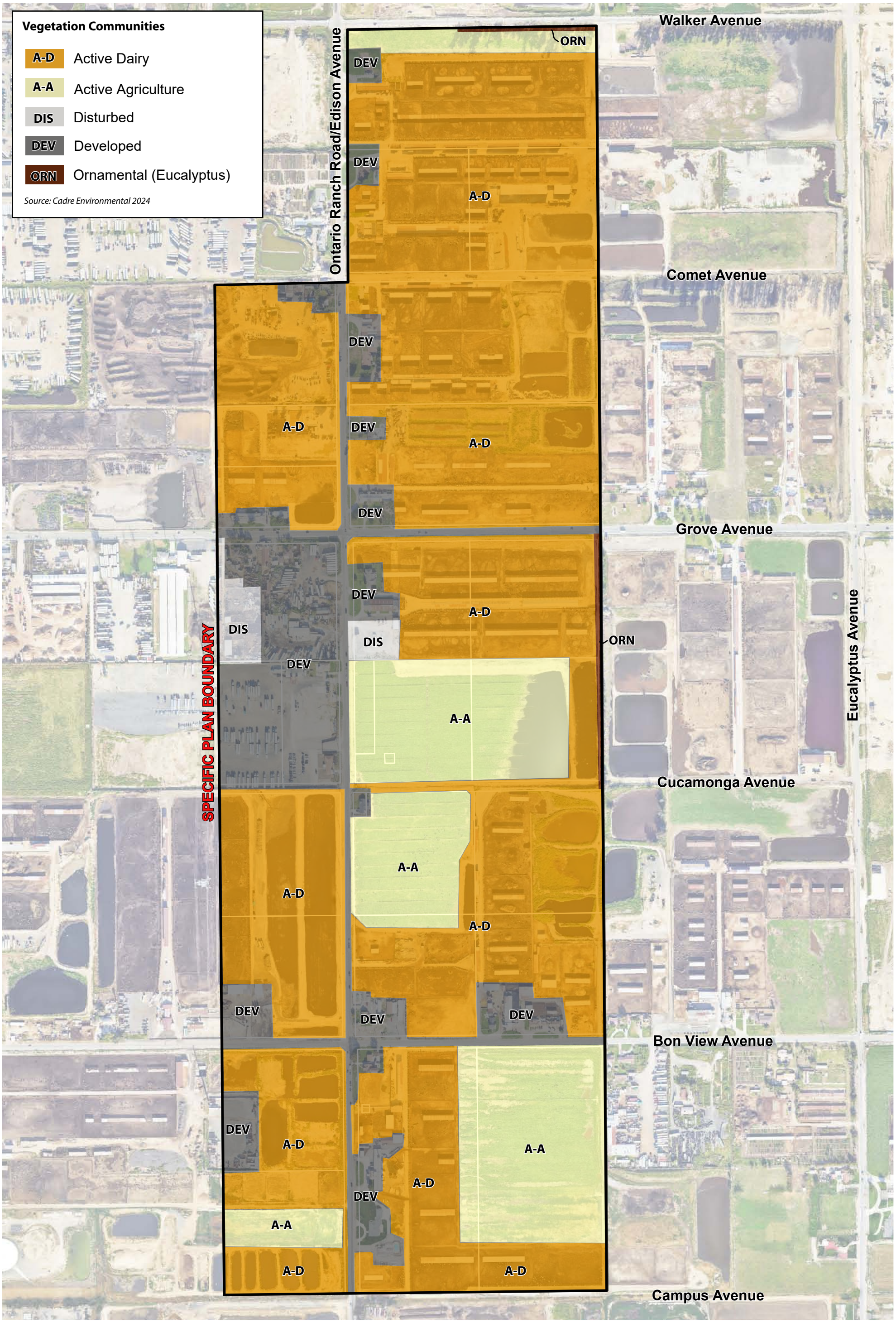


**Figure 3 - Specific Plan Vegetation Communities Map**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

1 inch = 450 feet

PHOTOGRAPH 1 - Southwest view of Specific Plan from Walker Avenue and Ontario Ranch Road/Edison Avenue intersection.

PHOTOGRAPH 2 - Northwest view of Specific Plan from southeast corner adjacent to Walker Avenue.

*Refer to Figure 2 for Photographic Key Map*

**Figure 4 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 3 - Northwest view of eastern region of Specific Plan from Ontario Ranch Road/Edison Avenue.

PHOTOGRAPH 4 - Southeast view of eastern region of Specific Plan from Ontario Ranch Road/Edison Avenue.

*Refer to Figure 2 for Photographic Key Map*

**Figure 5 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 5 - Southeast view of eastern region of Specific Plan from Grove Avenue.

PHOTOGRAPH 6 - Northwest view of eastern region of Specific Plan from Grove Avenue.

*Refer to Figure 2 for Photographic Key Map*

**Figure 6 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 7 - Northward view of central region of Specific Plan from Ontario Ranch Road/Edison Avenue.

PHOTOGRAPH 8 - Southeast view of central region of Specific Plan from Edison Avenue and Cucamonga avenue intersection.

*Refer to Figure 2 for Photographic Key Map*

**Figure 7 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 9 - Southeast view of western region of Specific Plan from Bon View Avenue.

PHOTOGRAPH 10 - Northwest view of western region of Specific Plan from Bon View Avenue.

*Refer to Figure 2 for Photographic Key Map*

**Figure 8 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 11 - Northeast view of western region of Specific Plan from Edison Avenue and Campus Avenue intersection.

PHOTOGRAPH 12 - Southeast view of western region of Specific Plan from Edison Avenue and Campus Avenue intersection.

*Refer to Figure 2 for Photographic Key Map*

**Figure 9 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

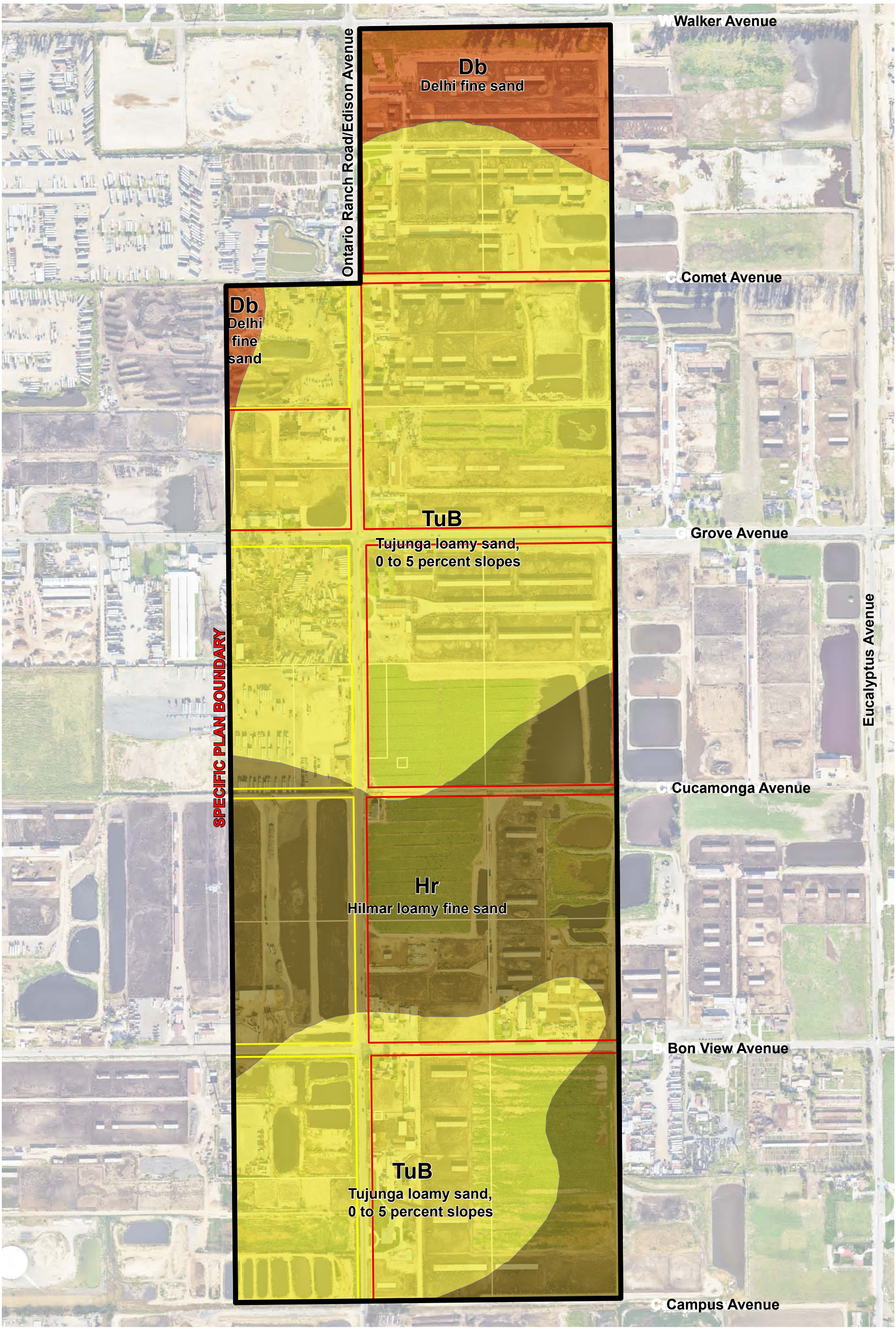


**Figure 10 - Specific Plan Soils Association Map**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

1 inch = 450 feet

## VEGETATION COMMUNITIES

### Active Dairy

The majority of the Specific Plan Boundary has and continues to be utilized as active dairy facilities including dry lots, milking parlors/feed storage facilities and housing. These areas are either devoid of vegetation or dominated by ornamental, ruderal non-native and native species commonly detected in disturbed habitats including Palmer's amaranth (*Amaranthus palmeri*), summer cypress (*Bassia scoparia*), horseweed (*Erigeron canadensis*), Russian thistle (*Salsola tragus*), prostate knotweed (*Polygonum aviculare*), cheeseweed (*Malva parviflora*), red-stemmed filaree (*Erodium cicutarium*), castor bean (*Ricinus communis*), prickly lettuce (*Lactuca serriola*), Bermuda grass (*Cynodon dactylon*), truncate finger grass (*Chloris truncata*), barnyard grass (*Echinochloa crus-galli*), goose grass (*Eleusine indica*), wild oat (*Avena fatua*), foxtail barley (*Hordeum murinum*), and ripgut brome (*Bromus diandrus*). Several dairy effluent retention ponds are located onsite and are either devoid of vegetation or inundated with discharge. No riparian scrub, forest or woodland habitat is associated with these ponds.

### Active Agriculture

Several regions of the Specific Plan Boundary have and continue to be actively farmed including the current production of feed and hay products. These areas area also utilized as cattle pastures and fertilizer spreading grounds.

### Disturbed

Disturbed regions of the Specific Plan Boundary are either devoid of vegetation (dirt roads and fallow fields) or dominated by the following species including golden crown beard (*Verbesina encelioides*), tumbling pigweed (*Amaranthus albus*), puncture vine (*Tribulus terrestris*), London rocket (*Sisymbrium irio*), stinknet (*Oncosiphon pilulifer*), giant reed (*Arundo donax*), salt cedar (*Tamarisk ramosissima*), tree tobacco (*Nicotiana glauca*), sacred datura (*Datura wrightii*), milk thistle (*Silybum marianum*), Australian saltbush (*Atriplex semibaccata*), Boccone's sand spurrey (*Spergularia bocconi*), spiny cocklebur (*Xanthium spinosum*), Mediterranean canarygrass (*Phalaris minor*), field bindweed (*Convolvulus arvensis*), common sow thistle (*Sonchus oleraceus*), annual beard-grass (*Polypogon monspeliensis*), and annual sunflower (*Helianthus annus*).

### Developed

Developed regions of the Specific Plan Boundary include the existing roadways within the rights-of-way and ranch house compounds. Species documented within developed areas include Peruvian peppertree (*Schinus molle*), bougainvillea (*Bougainvillea* sp.), pine (*Pinus* sp.), California sycamore (*Platanus racemosa*), Mexican fan palm (*Washingtonia robusta*), white mulberry (*Morus alba*), ash (*Fraxinus* sp.), olive (*Olea europaea*), Chinese elm (*Ulmus parvifolia*), tree of heaven (*Ailanthus altissima*), and jacaranda (*Jacaranda* sp.).

### Ornamental (Eucalyptus)

Several blue gum (*Eucalyptus globulus*) and red gum trees (*Eucalyptus camaldulensis*) are located adjacent to the eastern and southeastern Specific Plan Boundary.

**Table 2.**
**Specific Plan Vegetation Community Acreages**

| Vegetation Community | Project Site Acres | *Project Level Assessment Area Acres | Offsite Areas Acres | Total Acres |
|---|---|---|---|---|
| Active Dairy | 133.55 | 38.56 | 7.55 | 179.66 |
| Active Agriculture | 45.92 | 2.77 | 1.01 | 49.70 |
| Disturbed | 1.11 | 2.31 | 0.19 | 3.61 |
| Developed | 13.19 | 19.65 | 10.60 | 43.44 |
| Ornamental (Eucalyptus) | 0.28 | 0.00 | 0.46 | 0.74 |
| **TOTAL** | **194.05** | **63.29** | **19.81** | **277.15** |

** The 63.29-acre Project Level Assessment Area is located within the northern region of the Specific Plan Boundary including APN's 0216-311-09, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, and -03. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction,* ***CM BIO-7*** *Programmatic Assessment Area CEQA Analysis.*

## GENERAL PLANT & WILDIFE SPECIES

All plant species documented within the Project Site and Offsite Areas are presented and listed in the previous section. General wildlife species documented on site or within the vicinity of the Project Site and Offsite Areas include white-faced ibis (*Plegadis chihi*), red-winged blackbird (*Agelaius phoeniceus*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), rock dove (*Columba livia*), American kestrel (*Falco sparverius*), northern mockingbird (*Mimus polyglottos*), Anna's hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), western meadowlark (*Sturnella neglecta*), cliff swallow (*Petrochelidon pyrrhonota*), American crow (*Corvus brachyrhynchos*), hooded oriole (*Icterus cucullatus*), Brewer's blackbird (*Euphagus cyanocephalus*), brown-headed cowbird (*Molothrus ater*), European starling (*Sturnus vulgaris*), yellow rumped warbler (*Setophaga coronata*), lesser gold finch (*Spinus psaltria*), house finch (*Haemorhous mexicanus*), scaly-breasted munia (*Lonchura punctulate*), white-crowned sparrow (*Zonotrichia leucophrys*) house sparrow (*Passer domesticus*), desert cottontail rabbit (*Sylvilagus audubonii*), and California ground squirrel (*Otospermophilus beecheyi*).

## JURISDICTIONAL WETLAND RESOURCES

No wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project Site and Offsite Areas. The artificially created

unvegetated dairy effluent retention ponds are isolated located in uplands and currently rotated in use resulting in a wet (inundated) and dry phase. All of the active retention ponds are devoid of wetland vegetation including but not limited to riparian scrub, forest or woodland habitat.

Impacts to water quality would be less than significant during both construction and operation following preparation of a Water Quality Management Plan (WQMP), Storm Water Pollution Prevention Plan (SWPPP) and compliance with National Pollutant Discharge Elimination System (NPDES) permit and San Bernardino County Regional Municipal Separate Stormwater Sewer System (MS4) code provisions.

## SENSITIVE BIOLOGICAL RESOURCES

The following discussion describes the plant and wildlife species present, or potentially present within the property boundaries, that have been afforded special recognition by federal, state, or local resource conservation agencies and organizations, principally due to the species' declining or limited population sizes, usually resulting from habitat loss. Also discussed are habitats that are unique, of relatively limited distribution, or of particular value to wildlife. Protected sensitive species are classified by state and/or federal resource management agencies, or both, as threatened or endangered, under provisions of the state and federal endangered species act. Vulnerable or "at-risk" species that are proposed for listing as threatened or endangered (and thereby for protected status) are categorized administratively as "candidates" by the USFWS. CDFW uses various terminology and classifications to describe vulnerable species.

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, or rare. The CDFW, USFWS, and special groups like the California Native Plant Society (CNPS) maintain watch lists of such resources. For the purpose of this assessment sources used to determine the sensitive status of biological resources are:

**Plants**: USFWS (2024), CNDDB (CDFW 2024a), CDFW (2024d, 2024e), CNPS (2024), and Skinner and Pavlik (1994),

**Invertebrate -** Crotch's bumble bee *Bombus crotchii:* Leif Richardson, Paul Williams, Robbin Thorp and Sheila Colla, et al. (2022), CDFW (2019), CDFW (2023), Hatfield, et al. (2019).

**Wildlife:** California Wildlife Habitat Relationships (2008), USFWS (2024), CNDDB (CDFW 2024a), CDFW (2024b, 2024c, 2024f), and Leif Richardson, Paul Williams, Robbin Thorp and Sheila Colla, et al. (2022).

**Habitats**: CNDDB (CDFW 2024a, 2024f).

## FEDERAL PROTECTION AND CLASSIFICATIONS

The Federal Endangered Species Act of 1973 (FESA) defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range..." Threatened species are defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under provisions of Section 9(a)(1)(B) of the FESA it is unlawful to "take" any listed species. "Take" is defined as follows in Section 3(18) of the FESA: "...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Further, the USFWS, through regulation, has interpreted the terms "harm" and "harass" to include certain types of habitat modification as forms of a "take." These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a federal agency for an action that could affect a federally listed plant and animal species, the property owner and agency are required to consult with USFWS. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants. Recently, the USFWS instituted changes in the listing status of former candidate species. Former C1 (candidate) species are now referred to simply as candidate species and represent the only candidates for listing. Former C2 species (for which the USFWS had insufficient evidence to warrant listing at this time) and C3 species (either extinct, no longer a valid taxon or more abundant than was formerly believed) are no longer considered as candidate species. Therefore, these species are no longer maintained in list form by the USFWS, nor are they formally protected. However, some USFWS field offices have issued memoranda stating that former C2 species are henceforth to be considered Federal Species of Concern. This term is employed in this document but carries no official protections. All references to federally protected species in this report (whether listed, proposed for listing or candidate) include the most current published status or candidate category to which each species has been assigned by USFWS. For purposes of this assessment, the following acronyms are used for federal status species:

| | |
|---|---|
| FE | Federal Endangered |
| FT | Federal Threatened |
| FPE | Federal Proposed Endangered |
| FPT | Federal Proposed Threatened |
| FC | Federal Candidate for Listing |

The designation of critical habitat can also have a significant impact on the development of land designated as "*critical habitat*." The FESA prohibits federal agencies from taking any action that will "*adversely modify or destroy*" critical habitat (16 U.S.C. § 1536(a)(2)). This provision of the FESA applies to the issuance of permits by federal agencies. Before approving an action affecting critical habitat, the federal agency is required to consult with the USFWS who then issues a biological opinion evaluating whether the action will "*adversely modify"* critical habitat. Thus, the designation of critical habitat effectively gives the USFWS extensive regulatory control over the development of land designated as critical habitat.

The Migratory Bird Treaty Act of 1918 (MBTA) makes it unlawful to "*take*" any migratory bird or part, nest, or egg of such bird listed in wildlife protection treaties between the United States and Great Britain, the Republic of Mexico, Japan, and the Union of Soviet States. For purposes of the MBTA, "*take*" is defined as to pursue, hunt, capture, kill, or possess or attempt to do the same.

The Bald Eagle and Golden Eagle Protection Act explicitly protects the bald eagle and golden eagle and imposes its own prohibition on any taking of these species. As defined in this act, take means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb. Current USFWS policy is not to refer the incidental take of bald eagles for prosecution under the Bald Eagle and Golden Eagle Protection Act (16 U.S.C. 668-668d).

## STATE PROTECTION AND CLASSIFICATIONS

California's Endangered Species Act (CESA) defines an endangered species as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." The State defines a threatened species as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as rare on or before January 1, 1985 is a threatened species." Candidate species are defined as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list." Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the Fish and Game Commission. Unlike FESA, CESA does not include listing provisions for invertebrate species.

Article 3, Sections 2080 through 2085, of CESA addresses the taking of threatened or endangered species by stating "No person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided..." Under CESA, "take" is defined as "...hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Exceptions authorized by the state to allow "take" require "...permits or memorandums of understanding..." and can be authorized for "...endangered species, threatened species, or candidate species for scientific, educational, or management purposes." Sections 1901 and 1913 of the California Fish and Game Code provide that notification is required prior to disturbance.

Additionally, some sensitive mammals and birds are protected by the State as Fully Protected Mammals or Fully Protected Birds, as described in the California Fish and Game Code, Sections 4700 and 3511, respectively. SSC ("special" animals and plants)

listings include special status species, including all state and federal protected and candidate taxa, Bureau of Land Management (BLM) and US Forest Service (USFS) sensitive species, species considered to be declining or rare by the CNPS or National Audubon Society, and a selection of species which are considered to be under population stress but are not formally proposed for listing. This list is primarily a working document for the CDFW's CNDDB project. Informally listed taxa are not protected per se, but warrant consideration in the preparation of biotic assessments. For some species, the CNDDB is only concerned with specific portions of the life history, such as roosts, rookeries, or nest sites.

For the purposes of this assessment, the following acronyms are used for State status species:

| | |
|---|---|
| SE | State Endangered |
| ST | State Threatened |
| SCE | State Candidate Endangered |
| SCT | State Candidate Threatened |
| SFP | State Fully Protected |
| SP | State Protected |
| SR | State Rare |
| SSC | California Species of Special Concern |
| CWL | California Watch List |

Nesting birds, including raptors, are protected under California Fish and Game Code Section 3503, which reads, “It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.” In addition, under California Fish and Game Code Section 3503.5, “it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto”. Passerines and non-passerine land birds are further protected under California Fish and Game Code 3513. As such, CDFW typically recommends surveys for nesting birds that could potentially be directly (e.g., actual removal of trees/vegetation) or indirectly (e.g., noise disturbance) impacted by project-related activities. Disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “take” by CDFW.

The CNPS is a private plant conservation organization dedicated to the monitoring and protection of sensitive species in the State. This organization has compiled an inventory comprised of the information focusing on geographic distribution and qualitative characterization of rare, threatened, or endangered vascular plant species of California (Tibor 2001). The list serves as the candidate list for listing as threatened and endangered by CDFW. The CNPS has developed five categories of rarity (CRPR):

| | |
|---|---|
| CRPR 1A | Presumed extinct in California |
| CRPR 1B | Rare, threatened, or endangered in California and elsewhere |
| CRPR 2A | Plants presumed extirpated in California but common elsewhere |
| CRPR 2B | Plants rare, threatened, or endangered in California but more common elsewhere |
| CRPR 3 | Plants about which we need more information – a review list |
| CRPR 4 | Species of limited distribution in California (i.e., naturally rare in the wild), but whose existence does not appear to be susceptible to threat |

As stated by the CNPS:

> "*Threat Rank is an extension added onto the California Rare Plant Rank and designates the level of endangerment by a 1 to 3 ranking with 1 being the most endangered and 3 being the least endangered. A Threat Rank is present for all California Rare Plant Rank 1B's, 2's, 4's, and the majority of California Rare Plant Rank 3's. California Rare Plant Rank 4 plants are seldom assigned a Threat Rank of 0.1, as they generally have large enough populations to not have significant threats to their continued existence in California; however, certain conditions exist to make the plant a species of concern and hence be assigned a California Rare Plant Rank. In addition, all California Rare Plant Rank 1A (presumed extinct in California), and some California Rare Plant Rank 3 (need more information) plants, which lack threat information, do not have a Threat Rank extension."* (CNPS 2024)

| | |
|---|---|
| 0.1 | Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat) |
| 0.2 | Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat) |
| 0.3 | Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known) |

## LOCAL PROTECTION AND CLASSIFICATIONS

<u>The following Local Protection and Classifications sections are excerpted from The Ontario Plan 2050 (Placeworks 2022).</u>

The City of Ontario Plan Environmental Resources Element contains goals and policies which pertain to the protection of biological resources in the City of Ontario:

**Goal ER5** Protected high value habitat and farming and mineral resource extraction activities that are compatible with adjacent development.

**Policy ER5-1** Habitat Conservation Areas. We support the protection of biological resources through the establishment restoration, and conservation of high-quality areas.

**Policy ER5-2** Entitlement and Permitting Process. We comply with state and federal regulations regarding protected species.

**Policy ER5-4** Transition of Farms. We protect both existing farms and sensitive uses around them as agricultural areas transition to urban uses.

### City of Ontario Municipal Codes

#### Municipal Code, Volume II, Chapter 2

Title 10, Parks and Recreation, Chapter 2, Parkway Trees, of the City's Municipal Code provides provisions on the preservation, regulation on the maintenance and removal of parkway trees, and establishes types and the locations for planting parkway trees. Parkway is defined as "…that portion of any public street right-of-way between the right-of-way boundary line and the curb line, and also the area enclosed within the curb lines of a medial divider."

The property owner abutting a public right-of-way is responsible for watering any tree in the parkway and for trimming that can be done from the ground to preserve the neat appearance and non-obstructed use of the parkway; the City is responsible for all major pruning. Removal or relocation of any parkway tree requires prior authorization from the City Public Works Agency through a permit process, and planting a replacement tree, whenever feasible, is a condition on any permit issued by the City for the removal of a parkway tree. Alternatively, an in-lieu deposit may be accepted as an alternate to the actual planting of any required parkway tree based on a fair value established by the Public Facilities Manager (The Ontario Plan 2022).

#### Municipal Code, Section 6.05.020

Section 6.05.020, Tree Preservation Policy and Protection Measures, of the Ontario Development Code establishes policies and measures that will further the preservation, protection, and maintenance of established and healthy heritage trees within the City. A Heritage Tree is one that is designated for preservation as a tree of historic or cultural significance, or a tree of importance to the community due to any one of the following factors:

- It is one of the largest or oldest trees of species located within the City and has a trunk diameter of 18 inches or greater when measured at 54 inches above grade;
- It has a historical significance due to association with a historic building, site, street, person, or event;
- It is a defining landmark or significant outstanding feature of a neighborhood or district, typical of early Ontario Landscapes. This includes Camphor Tree (*Cinnamomum camphora*), Deodar Cedar (*Cedrus deodara*), London Planetree (*Platanus acerifolia*), Cork Oak (*Quercus suber*), Holly Oak (*Quercus ilex*), and California Pepper (*Schinus molle*);

- It is a Native Tree. This means that it is one of the following California native tree species with a trunk diameter of more than 8 inches, measured at 54 inches above natural grade: California Sycamore (*Platanus racemose*), Torrey Pine (*Pinus torreyana*), Coast Live Oak (*Quercus agrifolia*), Engelmann Oak (*Quercus engelmannii*), Valley Oak (*Quercus lobata*), or California Bay (*Umbellularia californica*).

Healthy Heritage Trees that are approved for removal shall be replaced with new trees with a total trunk diameter equal to the tree(s) removed, or as deemed appropriate by the Approve Authority based on lot size and available planting space. Replacement trees are to be in addition to the quantity of trees required for landscaping. The Approving Authority is responsible for reviewing the landscape plan and approving appropriate species for tree replacement (The Ontario Plan 2022).

A tree inventory will be required and prepared by a City approved certified arborist or qualified horticulturalist, to determine the presence/absence of Heritage Trees including assessment of health, structure, condition, and expected life span of all affected specimens.

Property proposed for development on which a Heritage Tree exists, shall require the submittal of a Tree Inventory and Preservation Plan prepared by a licensed landscape architect, horticulturalist, certified arborist, or other related professional. Said plan shall be submitted concurrent with a Development Plan or building permit request for alterations of a site, and shall be reviewed and approved by the Approving Authority for the corresponding application request.

The Tree Inventory and Preservation Plan shall show all existing on-site trees, and those existing trees on abutting lots and public rights-of-way with a canopy or root zone that extends onto the site or within 8 feet of a construction, staging or storage area, or graded site. Furthermore, the Tree Inventory and Preservation Plan shall identify Tree Protection Areas and trees requested to be removed, and shall show replacement trees as required by this Division.

**Sphere of Influence General Plan Amendment, Final EIR, and Settlement Agreement**

In January 1998, the Ontario City Council approved a general plan amendment (GPA) and associated Final EIR for the sphere of influence (SOI), which is now known as the Ontario Ranch (previously the New Model Colony (NMC)). The GPA designated Ontario Ranch for a range of urban and suburban uses, including residential, commercial, business park, industrial, and open space. Most of Ontario Ranch was then in agricultural use. The Final EIR for the GPA assessed the impacts on biological resources of the conversion of Ontario Ranch from agricultural uses to developed urban and suburban uses. Before mitigation, significant impacts were identified for waterfowl and waterfowl habitat, raptors and raptor habitat, and the Delhi Sands Flower-Loving Fly (DSFLF) Ontario Recovery Unit. The EIR included three mitigation measures for impacts to biological resources:

- Mitigation Measure BR-1 modified the general plan to require the creation of new waterfowl habitat and specified a mitigation ratio of 2:1 for each acre of such habitat lost. This is off-site mitigation in the Prado Basin.
- Mitigation Measure BR-2 stipulated that the City shall create a Waterfowl and Raptor Conservation Area (WRCA), and included requirements and definitions for it; mitigation is off-site in the Prado Basin.
- Mitigation Measure BR-3 required the City to cooperate with the USFWS in taking specified actions to mitigate impacts to the Delhi Sands Flower-Loving Fly Recovery Unit.

Subsequent to the 1998 adoption of the SOI GPA and EIR, a lawsuit was filed against the City of Ontario by the Endangered Habitats League and the Sierra Club, challenging the City's CEQA compliance and approval of the SOI GPA. A Settlement Agreement was reached and agreed to by all parties that set forth revised mitigation measures for potential impacts in the New Model Colony (referred to as Annexation Area 163 in the agreement) to the burrowing owl, the DSFLF, raptor foraging and wildlife habitat, loss of open space, actual and potential habitat and agricultural land, and sensitive (listed and non-listed) species. These measures will be in effect until all the developable acres in the Ontario Ranch reach full buildout, as determined by the City.

- Prior to issuance of grading permits, Ontario shall impose a $4,320 per net acre mitigation fee on proposed developments in Annexation Area 163 that require discretionary approval or permitting from the City.
- Ontario, in consultation with CDFW, will identify, through CEQA review, lands occupied by burrowing owl and suitable as long-term habitat. The City will require avoidance of those lands to maintain a viable territory and require long-term maintenance through dedication in fee or grant of easement to the Land Trust. If the site is not viable long-term habitat, the developer shall pay the mitigation fee and make provisions for relocation of the owls.
- Since habitat that benefits DSFLF can be expected to benefit burrowing owl, up to 25 percent of the mitigation fee maybe used by the City for DSFLF recovery.
- All mitigation fees collected shall be used for the above-described purposes and may be used to purchase property, conservation easements, or other land with long-term conservation value for the environmental impacts; enhance/restore lands with such values; maintain and operates these lands; and pay for related administrative costs (not to exceed 10 percent of the total fees).
- Land/easements dedicated, conveyed, or purchased to benefit wildlife, waterfowl, raptors, and/or burrowing owl must have long-term conservation value for those species and must be managed by the land trust. The parcels must be in the habitat area designated as part of the settlement agreement. Unacceptable properties are those that would otherwise be purchased by another entity or group as open space mitigation for environmental impacts.

### City of Ontario Biological Resources Habitat Mitigation Fee

Since the Settlement Agreement, the City has established a habitat mitigation fee to cover potential environmental impacts to the Burrowing Owl, DSFLF, raptor foraging, loss of open space, and agricultural lands. Development impact fees for new development in Ontario Ranch were adopted on June 23, 2003, by the City Council. The Ontario Ranch

development impact fees include a habitat mitigation fee of $4,320 per net acre for proposed residential, commercial, hotel and restaurant, office, and industrial development. Mitigation fees have been collected by the City and have been deposited into a trust fund to be used for the acquisition, restoration, rehabilitation, and maintenance of lands deemed to have long-term conservation value. Up to $500 of the fees may be used for DSFLF. In addition, current City procedure is to require a habitat assessment to determine existing habitat and biological resources on proposed development sites. If the assessment determines that there is potential habitat for sensitive species, focused protocol surveys are required. If potential DSFLF habitat is present, two-year (consecutive) protocol surveys per the USFWS Interim General Survey Guidelines for DSFLF are required (The Ontario Plan 2022).

The land use plan for Ontario Ranch originally provided for establishment of the WRCA, a wetlands and habitat area near the confluence of the Cucamonga Creek and the Lower Deer Creek Channels. Creation of the WRCA as part of Ontario Ranch was intended to provide a concentrated area for wetlands that would receive storm drainage from the west. Funding for the environmental restoration of the existing 85-acre Lower Cucamonga flood control basin under the WRCA would have been provided through the USACE with matching funds from the City of Ontario. This conservation area plus acquisition of 145 acres of off-site mitigation land were intended to provide mitigation for impacts resulting from development of Ontario Ranch. However, under the conditions of the settlement agreement, the WRCA is no longer proposed (The Ontario Plan 2022).

In 2010, the Ontario City Council approved the selection of the Riverside Land Conservancy (today known as River and Land Conservancy) as the administrator of the habitat mitigation fees and to create a habitat program pursuant to the requirements of the Settlement Agreement between the City of Ontario, the Endangered Habitats League, and the Sierra Club. However, due to the economic downturn shortly after 2010, the contract between the City and the Riverside Land Conservancy was never ratified. It was anticipated that once development in Ontario Ranch began to commence, the City would ratify the contract (The Ontario Plan 2022).

In 2022, the City will be going out with a Request for Proposals (RFP) to select a non-profit land trust and/or organization specializing in habitat conservation. The selected non-profit and/or organization will be responsible for the administration of the habitat mitigation fees and creation of a habitat program pursuant to the requirements of the Settlement Agreement between the City of Ontario, the Endangered Habitats League, and the Sierra Club. In partnership with the CDFW, the City will work with the selected non-profit and/or organization to maintain an interactive mapping and current inventory of the burrowing owl occurrences and in the selection of adequate lands for passive relocation (The Ontario Plan 2022).

## SENSITIVE HABITATS

As stated by CDFW:

> "*One purpose of the vegetation classification is to assist in determining the level of rarity and imperilment of vegetation types. Ranking of alliances according to their degree of imperilment (as measured by rarity, trends, and*

*threats) follows NatureServe's Heritage Methodology, in which all alliances are listed with a G (global) and S (state) rank. For alliances with State ranks of S1-S3, all associations within them are also considered to be highly imperiled*". (CDFW 2024f)

No sensitive or undisturbed native habitats were documented within the Project Site and Offsite Areas. The Project Site and Offsite Areas are characterized primarily as heavily disturbed active dairy and agricultural facilities

## SENSITIVE PLANTS

Based on a review of the CNDDB, The Ontario Plan 2050 and existing conditions within and adjacent to the Specific Plan Boundary, a total of thirteen (13) sensitive plant species have potential to occur within the vicinity of the Project Site and Offsite Area. as presented in Table 3, *Sensitive Plant Species Assessment*.

**Table 3.**
**Sensitive Plant Species Assessment**

| **Species Name** (*Scientific Name*) Status | **Habitat Description** | **Comments** |
|---|---|---|
| | | |
| **Nevin's barberry** (*Berberis nevinii*)<br><br>FE/SE<br>CRPR 1B.1 | Perennial evergreen shrub which generally blooms from February to June within chaparral, cismontane woodland, coastal scrub, and riparian scrub in sandy, gravelly substrates (CNPS 2024). | Not detected. |
| **Plummer's mariposa-lily** (*Calochortus plummerae*)<br><br>CRPR 4.2 | Perennial bulbiferous herb which generally blooms from May to June within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and grassland habitats with granite and rocky substrates (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Lucky morning glory** (*Calystegia felix*)<br><br>CRPR 1B.1 | Annual rhizomatous herb generally blooming from March to September within meadows, seeps and riparian scrub habitat (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Parry's spineflower** (*Chorizanthe parryi var. parryi*)<br><br>CRPR 1B.1 | Annual herb which generally blooms from April to June within chaparral, cismontane woodland, coastal scrub and grassland habitats with sandy and/or rocky openings. (CNPS 2024) | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Slender-horned spineflower**<br>(*Dodecahema leptoceras*)<br><br>CRPR 1B.1<br>FE/SE | Annual herb which generally blooms from April to June within chaparral, cismontane woodland and coastal scrub (alluvial fan) with sandy substrates. (CNPS 2024) | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Mesa horkelia**<br>(*Horkelia cuneata ssp. puberula*)<br><br>CRPR 1B.1 | Perennial herb which generally blooms from February to September within chaparral (maritime), cismontane woodland and coastal scrub with sandy or gravelly substrates. (CNPS 2024) | Not detected. |
| **Robinson's pepper-grass**<br>(*Lepidium virginicum var. robinsonii*)<br><br>CRPR 4.3 | Annual herb which generally blooms from January to July within chaparral and coastal sage scrub habitats (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Prostate vernal pool navarretia**<br>(*Navarretia prostrata*)<br><br>CRPR 1B.2 | Annual herb generally blooming from April to July within coastal scrub, meadows and seeps, valley and foothill grasslands and vernal pools (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Brand's star phacelia**<br>(*Phacelia stellaris*)<br><br>CRPR 1B.1 | Annual herb generally blooming from March to June within coastal sage scrub and dune habitats (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **White rabbit tobacco**<br>(*Pseudognaphalium leucocephalum)*<br><br>CRPR 2B.2 | Perennial herb generally blooming from July to December within chaparral, cismontane woodland, coastal scrub and riparian woodland habitats (CNPS 2024). | Not detected. |
| **Salt spring checkerbloom**<br>(*Sidalcea neomexicana*)<br><br>CRPR 2.2 | Perennial herb which generally blooms from March to June within chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas within alkaline/mesic gravelly substrates (CNPS 2024). | Not detected. |
| **San Bernardino aster**<br>(*Symphyotrichum defoliatum*)<br><br>CRPR 1B.2 | Perennial rhizomatous herb generally blooming from July to December within various vegetation communities in associating with wetland substrates (ditches, streams and springs) (CNPS 2024). | Not detected. |

| **Species Name** (*Scientific Name*) Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Rigid fringepod** (*Thysanocarpus rigidus*)<br><br>CRPR 1B.2 | Annual herb generally blooming from February to May within pinyon and juniper woodland habitats (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |

**California Native Plant Society (CNPS): California Rare Plant Rank (CRPR)**
CRPR 1A – plants presumed extinct in California
CRPR 1B – plants rare, threatened, or endangered in California, but more common elsewhere
CRPR 2A – plants presumed extirpated in California but common elsewhere
CRPR 2B – plants rare, threatened, or endangered in California but more common elsewhere
CRPR 3 – plants about which we need more information, a review list
CRPR 4 – plants of limited distribution, a watch list
.1 – Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

**Federal (USFWS) Protection and Classification**
FE – Federally Endangered
FT – Federally Threatened
FC – Federal Candidate for Listing

**State (CDFW) Protection and Classification**
SE – State Endangered
ST – State Threatened

No suitable habitat for sensitive plant species including those listed as federal or state threatened/endangered was documented within the Project Site and Offsite Areas. No sensitive plant species listed in Table 3, *Sensitive Plant Species Assessment* or undisturbed native habitats were documented or expected to occur within the Project Site and Offsite Areas. The Project Site and Offsite Areas are primarily characterized as heavily disturbed active dairy and agricultural facilities.

## SENSITIVE WILDLIFE

Based on a review of the CNDDB, The Ontario Plan 2050 and existing site conditions, a total of fifty (50) sensitive invertebrate and wildlife species have the potential of occurring within the vicinity of the Specific Plan Boundary, as presented in Table 4, *Sensitive Wildlife Species Assessment*.

**Table 4. Sensitive Wildlife Species Assessment**

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **INVERTEBRATES** | | |
| **Crotch bumble bee**<br>(*Bombus crotchii*)<br><br>SC | Range extends from southern to northern California within a variety of habitats including grassland, scrub, chaparral and desert habitats. Food plants include but are not limited to the following genera: *Antirrhinum, Phacelia, Clarkia, Cordylanthus, Dendromecon, Medicago Eschscholzia, Chaenactis, Eriogonum, Hypericum, Lantana, Lupinus, Salvia, Asclepias, Cirsium, Monardella, Keckiella, Acmispon, Euthamia, Ehrendorferia, Vicia,* and/or *Trichostema*. | No Potential. Not expected to occur onsite based on a lack of suitable food sources and heavily disturbed condition of the Project Site and Offsite Areas. |
| **Delhi Sands flower-loving fly**<br>(*Rhaphiomidas terminatus abdominalis*)<br><br>FE | Restricted to Delhi sand formations in Riverside and San Bernardino Counties. | Low Potential. The Delhi Sands flower-loving fly is not expected to occur onsite based on the historic and ongoing impacts to the Project Site and Offsite Areas respective of active dairy and agricultural use. However, approximately 19-acres of the eastern region of the Project Site and Project Level Assessment Area are mapped as Delhi soils, as shown in Figure 10, *Soils Association Map*. |
| **AMPHIBIANS** | | |
| **Western spadefoot**<br>(*Spea hammondii*)<br><br>SSC | Primary habitat for this species includes suitable breeding habitat below 1500 meters (i.e., vernal pools or other standing water that is free of exotic species) with secondary habitats including adjacent chaparral, sage scrub, grassland, and alluvial scrub habitats. | No Potential. Not expected to occur onsite based on a lack of suitable undisturbed soils and continuous dairy and agricultural activities conducted throughout the Project Site and Offsite Areas. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **REPTILES** | | |
| **Southern California legless lizard**<br>(*Anniella stebbinsi*)<br><br>SSC | Broadleaved upland forest, chaparral, coastal dunes, and coastal scrub. Occurs in sandy or loose loamy soils under sparse vegetation, generally in moist, loose soil (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation or soils. |
| **California glossy snake**<br>(*Arizona elegans occidentalis*)<br><br>SSC | Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Impact Area based on a lack of suitable undisturbed vegetation or soils. |
| **Coastal western whiptail**<br>(*Aspidoscelis tigris stejnegeri*)<br><br>SSC | The coastal western whiptail occurs in a wide variety of habitats including coastal sage scrub, desert scrub, Riversidean alluvial fan scrub, woodlands, grasslands, playas, and respective ecotones between these habitats. | No Potential. Not expected to occur within Project Site and Offsite Impact Area based on a lack of suitable undisturbed vegetation or soils. |
| **San Bernardino ringneck snake**<br>(*Diadophis punctatus modestus*) | Chaparral, coastal sage scrub, grassland, riparian, and woodlands (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation or soils. |
| **Western pond turtle**<br>(*Actinemys marmorata*)<br><br>SSC | The western pond turtle inhabits slow moving permanent or intermittent streams, small ponds, small lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stock ponds, and sewage treatment lagoons (Rathbun *et al*., 1992; Holland, 1994). Pools are the preferred habitat within streams (Bury, 1972,) | Not Detected. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed basking sites and permanent water. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Coast horned lizard**<br>(*Phrynosoma blainvillii*)<br><br>SSC | Open areas of sandy soil with coastal sage scrub, chaparral, grassland, riparian, and washes and watercourses (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation or soils. |
| **Coast patch-nosed snake**<br>(*Salvadora hexalepis virgultea*)<br><br>SSC | The coast patch-nosed snake prefers brushy coastal sage scrub/ chaparral habitats. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation or soils. |
| **Two-striped gartersnake**<br>(*Thamnophis hammondii*)<br><br>SSC | Marsh and swamp, riparian scrub, riparian woodland, and wetland. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation, soils or permanent water. |
| **BIRDS** | | |
| **Cooper's hawk**<br>(*Accipiter cooperii*)<br><br>SSC | Cooper's hawk is most commonly found within or adjacent to riparian/oak forest and woodland habitats. This uncommon resident of California increases in numbers during winter migration. | Low Potential – May occasionally forage within Project Site and Offsite Areas and breed within the mature Eucalyptus trees. |
| **Sharp-shinned hawk**<br>(*Accipiter striatus*)<br><br>CWL | Potential habitat for the sharp-shinned hawk includes montane coniferous forest for potential breeding areas and riparian scrub, woodland, forest habitat, oak woodland and forest, chaparral, coastal sage scrub, desert scrub, and Riversidean alluvial fan sage scrub for foraging. | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Tri-colored blackbird**<br>(*Agelaius tricolor*)<br><br>ST/SSC | Marshes, grasslands. Breeding colonies require nearby water, nesting substrate, foraging habitat of grassland, woodland, agricultural cropland (Placeworks 2022). | No Potential. Not expected to occur onsite based on a lack of nesting habitat (cattail, rushes, and willows) within or adjacent to the Project Site and Offsite Areas. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Golden eagle**<br>(*Aquila chrysaetos*)<br><br>CWL, SFP | Within southern California, the species prefers grasslands, brushlands (coastal sage scrub and chaparral), deserts, oak savannas, open coniferous forests, and montane valleys (Garrett and Dunn 1981) | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Great egret**<br>(*Ardea alba*)<br><br>Nesting Colony | Wet areas, fields, margins of open water. | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas but not breed. |
| **Great blue heron**<br>(*Ardea herodias*)<br><br>Nesting Colony | Wet areas, fields, margins of open water. | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas but not breed. |
| **Burrowing owl**<br>(*Athene cunicularia)*<br><br>SSC | The burrowing owl uses predominantly open land, including grassland, agriculture, playa, sparse coastal sage scrub, desert scrub habitats. Some breeding burrowing owls are year-round residents and additional individuals from the north may winter throughout the region. | Moderate Potential – Suitable burrows larger than 4 inches in diameter and foraging habitat documented within the fallow fields within Project Site and Offsite Areas. |
| **Ferruginous hawk**<br>(*Buteo regalis*)<br><br>CWL | Grasslands and other open terrain of the plains and foothills. Wintering species. Primarily open fields with low vegetation (Placeworks 2022). | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Swainson's hawk**<br>(*Buteo swainsoni*)<br><br>ST | Grasslands and other open terrain (Placeworks 2022). | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Mountain plover**<br>(*Charadrius montanus*)<br><br>SSC | Dry upland prairies and plains, semidesert, bare dirt fields (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation. |
| **Northern harrier**<br>(*Circus cyaneus*)<br><br>SSC | The northern harrier frequents open wetlands, wet/lightly grazed pastures, fields, dry uplands/prairies, mesic | High Potential. Observed adjacent to within Project Site and Offsite Areas during previous surveys of adjacent |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| | grasslands, drained marshlands, croplands, meadows, grasslands, open rangelands, fresh and saltwater emergent wetlands. | properties in 2022 (Cadre Environmental 2023). |
| **Western yellow-billed cuckoo**<br>(*Coccyzus americanus occidentalis*)<br><br>FT/SE | Riparian. Uncommon to rare summer resident of valley foothill and desert riparian habitats (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed riparian scrub, forest or woodland vegetation. |
| **Snowy egret**<br>(*Egretta thula*)<br><br>Nesting Colony | Wet areas, fields, margins of open water (Placeworks 2022). | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas but not breed. |
| **White-tailed kite**<br>(*Elanus leucurus*)<br><br>SFP | The white-tailed kite is found in riparian, oak woodlands adjacent to large open spaces including grasslands, wetlands, savannahs and agricultural fields. This non-migratory bird species occurs throughout the lower elevations of California and commonly nests in coast live oaks (Unitt 2004). | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **California horned lark**<br>(*Eremophila alpestris actia*)<br><br>CWL | Variety of open habitats, usually where trees and large shrubs are absent (Placeworks 2022). | Moderate Potential – Expected to occasionally forage and breed within Project Site and Offsite Areas. |
| **Merlin**<br>(*Falco columbarius*)<br><br>CWL | Grasslands, coastal sage scrub and estuaries, windrows, open fields (Placeworks 2022). | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Prairie falcon**<br>(*Falco mexicanus*)<br><br>CWL | Habitat use of the prairie falcon includes annual grasslands to alpine meadows. The prairie falcon is associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields during the winter season, and | Low Potential – May occasionally forage within Project Site and Offsite Areas. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| | desert scrub areas, all typically dry environments of western North American where there are cliffs or bluffs for nest sites (Brown and Amadon 1968) | |
| **American peregrine falcon**<br>(*Falco peregrinus anatum*)<br><br>SFP | Throughout the species' range, peregrine falcons are found in a large variety of open habitats, including tundra, marshes, seacoasts, savannahs and high mountains (AOU 1998) | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation. |
| **Loggerhead shrike**<br>(*Lanius ludovicianus*)<br><br>SSC | This species of shrike hunts in open or grassy areas and nests in large chaparral shrubs such as ceanothus and lemonade berry. | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **California gull**<br>(*Larus californicus*)<br><br>CWL | Nearly all types of fresh and salt water, cropland, landfills, refuse areas, open lawns (Placeworks 2022). | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas. |
| **California black rail**<br>(*Laterallus jamaicensis coturniculus*)<br><br>ST/SFP | Brackish marsh, freshwater marsh, marsh and swamp, salt marsh, wetland. Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering large bays (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Long-billed curlew**<br>(*Numenius americanus*)<br><br>CWL | Coastal estuaries, upland herbaceous areas, croplands, wet areas, open fields, shores of open water. | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas. |
| **Double-crested cormorant**<br>(*Nannopterum auritum*)<br><br>CWL | Lakes, fresh, salt, and estuarine waters (Placeworks 2022). | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas. |
| **White-faced ibis**<br>(*Plegadis chihi*)<br><br>CWL | Freshwater marshes and brackish areas (Placeworks 2022). | High Potential. Observed adjacent to within Project Site and Offsite Areas during previous surveys of adjacent properties in 2022 (Cadre Environmental 2023). |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Coastal California gnatcatcher**<br>(*Polioptila californica californica*)<br><br>FT/SSC | The coastal California gnatcatcher is a non-migratory bird species that primarily occurs within sage scrub habitats in coastal southern California dominated by California sagebrush. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats including coastal sage scrub and associations. |
| **MAMMALS** | | |
| **Pallid bat**<br>(*Antrozous pallidus*)<br><br>SSC | Chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, riparian woodland, Sonoran desert scrub, upper montane coniferous forest, and valley and foothill grassland. Oak and grassland ecotones. Prefers foraging in the open. Roosts in attics or rock cracks; in the open, near foliage at night (Placeworks 2022). | Low Potential. Expected to occasionally forage within Project Site and Offsite Areas. |
| **Northwestern San Diego pocket mouse**<br>(*Chaetodipus fallax fallax*)<br><br>SSC | The northwestern San Diego pocket mouse occurs in coastal sage, upland sage scrubs, and alluvial fan sage scrub, sage scrub/grassland ecotones, chaparral, and desert scrubs at all elevations up to 6,000 feet. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats including coastal sage scrub and associations. |
| **Townsend's big-eared bat**<br>(*Corynorhinus townsendii*)<br><br>SSC | A wide variety of habitats including woodlands and arid grasslands. Roosts in mines and caves (Placeworks 2022). | Low Potential. Expected to occasionally forage within Project Site and Offsite Areas. |
| **San Bernardino kangaroo rat**<br>(*Dipodomys merriami parvus*)<br><br>FE/SSC | Prefers alluvial scrub, coastal sage scrub habitats with sandy and gravelly substrates. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats including Riversidean alluvial fan sage scrub and associations. |
| **Stephens' kangaroo rat**<br>(*Dipodomys stephensi*) | The Stephens' kangaroo rat is found almost exclusively in open | No Potential. Not expected to occur within Project Site and Offsite Areas based on |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| FE/ST | grasslands or sparse shrublands with cover of less than 50 percent during the summer. | a lack of suitable undisturbed habitats. |
| **Western mastiff bat**<br>(*Eumops perotis californicus*)<br><br>SSC | Roosts in rocky areas and forages in grassland, shrublands, and woodlands. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Western yellow bat**<br>(*Lasiurus xanthinus*)<br><br>SSC | Roosts in the skirts of palm trees and forages in adjacent habitats. | Low Potential. Scattered palm trees representing potential roosting habitat documented within the central region of the within Project Site and Offsite Areas. |
| **San Diego black-tailed jackrabbit**<br>(*Lepus californicus bennettii*)<br><br>SSC | The San Diego black-tailed jackrabbit in open habitats, primarily including grasslands, sage scrub, alluvial fan sage scrub, and Great Basin sage scrub. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Western small-footed myotis**<br>(*Myotis ciliolabrum*) | Feeds among trees or over brush. Roosts in caves, mines, and in cliff or rock openings (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Yuma myotis**<br>(*Myotis yumanensis*) | Water and wooded canyon bottoms. Roosts in caves and abandoned buildings (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **San Diego desert woodrat**<br>(*Neotoma lepida intermedia*)<br><br>SSC | Riversidean and coastal sage scrub, chaparral and nonnative grasslands. Shrub and desert habitats, primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Pocketed free-tailed bat**<br>(*Nyctinomops femorosaccus*)<br><br>SSC | Desert habitats. Roosts in rock crevices in cliffs (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Big free-tailed bat**<br>(*Nyctinomops macrotis*)<br><br>SSC | Desert habitats. Roosts in rock crevices in cliffs (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Los Angeles pocket mouse**<br>(*Perognathus longimembris brevinasus*)<br><br>SSC | Low elevation grassland alluvial sage scrub and coastal sage scrub habitats. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |

**Federal (USFWS) Protection and Classification**
FE – Federally Endangered
FT – Federally Threatened
FC – Federal Candidate for Listing

**State (CDFW) Protection and Classification**
SE – State Endangered
SSC – State Species of Special Concern
CWL – California Watch List
SFP – State Fully Protected
SC – State Candidate for Listing

The federally endangered Delhi Sands flower-loving fly (DSFLF) is not expected to occur within Project Site and Offsite Areas based on the historic and ongoing impacts to the Project Site respective of active dairy and agricultural use. However, approximately 19-acres of the eastern region of the Project Site and Project Level Assessment Area are mapped as Delhi soils, as shown in Figure 10, *Specific Plan Soils Association Map*.

The heavily disturbed active dairy and agricultural facilities documented within the within Project Site and Offsite Areas provide low to high likelihood of occurrence (foraging, breeding and roosting habitat) for the following sensitive or locally monitored species:

- Cooper's hawk (*Accipiter cooperii*), SSC
- Sharp-shinned hawk (*Accipiter striatus*), CWL
- Golden eagle (*Aquila chrysaetos*), CWL, SFP
- Great egret (*Ardea alba*), Nesting Colony
- Great blue heron (*Ardea herodias*), Nesting Colony
- Burrowing owl (*Athene cunicularia),* SSC
- Ferruginous hawk (*Buteo regalis*), CWL
- Swainson's hawk (*Buteo swainsoni*), ST
- Northern harrier (*Circus cyaneus*), SSC
- Snowy egret (*Egretta thula*), Nesting Colony
- White-tailed kite (*Elanus leucurus*), SFP
- California horned lark (*Eremophila alpestris actia*), CWL
- Merlin (*Falco columbarius*), CWL
- Prairie falcon (*Falco mexicanus*), CWL
- Loggerhead shrike (*Lanius ludovicianus*), SSC

- California gull (*Larus californicus*), CWL
- Long-billed curlew (*Numenius americanus*), CWL
- Double-crested cormorant (*Nannopterum auritum*), CWL
- White-faced ibis (*Plegadis chihi*), CWL
- Pallid bat (*Antrozous pallidus*), SSC
- Townsend's big-eared bat (*Corynorhinus townsendii*), SSC
- Western yellow bat (*Lasiurus xanthinus*), SSC

The Project Site and Areas do not occur within or adjacent to a USFWS designated critical habitat for any federally listed threatened or endangered species.

### JURISDICTIONAL WETLAND RESOURCES

No wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project Site and Offsite Areas. The artificially created unvegetated dairy effluent retention ponds are isolated, located in uplands and currently rotated in use resulting in a wet (inundated) and dry phase. All of the active retention ponds are devoid of wetland vegetation including but not limited to riparian scrub, forest or woodland habitat.

Impacts to water quality would be less than significant during both construction and operation following preparation of a WQMP, SWPPP and compliance with NPDES permit and San Bernardino County Regional MS4 code provisions.

## ENVIRONMENTAL IMPACTS

The following section includes an analysis of the direct and/or indirect impacts of the proposed action on sensitive biological resources. This analysis characterizes the project related activities that are anticipated to adversely impact the species, and when feasible, quantifies such impacts. Direct effects are defined as actions that may cause an immediate effect on the species or its habitat, including the effects of interrelated actions and interdependent actions. Indirect effects are caused by or result from the proposed actions, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the proposed action.

### THRESHOLD OF SIGNIFICANCE

The environmental impacts relative to biological resources are assessed using impact significance criteria which mirror the policy statement contained in the CEQA at Section 21001 (c) of the Public Resources Code. This section reflects that the legislature has established it to be the policy of the state to:

> "*Prevent the elimination of fish and wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities*…"

The following definitions apply to the significance criteria for biological resources:

- "*Endangered*" means that the species is listed as endangered under state or federal law.

- "*Threatened*" means that the species is listed as threatened under state or federal law.

- "*Rare*" means that the species exists in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens.

- "*Region*" refers to the area within southern California that is within the range of the individual species.

- "*Sensitive habitat*" refers to habitat for plants and animals (1) which plays a special role in perpetuating species utilizing the habitat on the property, and (2) without which there would be substantial danger that the population of that species would drop below self-perpetuating levels.

- "*Substantial effect*" means significance loss or harm of a magnitude which, based on current scientific data and knowledge, (1) would cause a species or a native plant or animal community to drop below self-perpetuating levels on a statewide or regional basis or (2) would cause a species to become threatened or endangered.

Also, the determination of impacts has been made according to the federal definition of "*take*". FESA prohibits the "*taking*" of a member of an endangered or threatened wildlife species or removing, damaging, or destroying a listed plant species by any person (including private individuals and private or government entities). FESA defines "*take*" as "*to harass, harm, pursue, hunt, shoot, would, kill, trap, capture or collect*" an endangered or threatened species, or to attempt to engage in these activities.

## DIRECT IMPACTS

Specifically, the biological resources assessment report addresses the following CEQA Environmental Checklist items.

| **Environmental Issues** | **Potentially Significant Impact** | **Less than Significant with Mitigation** | **Less than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| Would the Project: | | | | |
| **a)** Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | | **X** | | |

| Environmental Issues | Potentially Significant Impact | Less than Significant with Mitigation | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **b)** Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | | **X** | | |
| **c)** Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | | | | **X** |
| **d)** Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | | **X** | | |
| **e)** Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | | X | | |
| **f)** Conflict with the provisions of an adopted Habitat Conservation Plan, Native Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | | | | **X** |

*a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?*

**Less than Significant with Mitigation**. The 213.86-acre Project Site and Offsite Areas would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. No native undisturbed suitable habitat, soils or sensitive plant species observations were documented or expected to occur within the Project Site and Offsite Areas, as outlined in Table 3. *Sensitive Plant Species Assessment*. Therefore, no mitigation is required or proposed.

The 213.86-acre Project Site and Offsite Areas may result in a substantial adverse effect, either directly or through habitat modifications, on wildlife species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS, as outlined in Table 4, *Sensitive Wildlife Species Assessment*.

The federally endangered Delhi Sands flower-loving fly is not expected to occur onsite based on the historic and ongoing impacts to the Project Site and Offsite Areas respective of active dairy and agricultural use. However, approximately 19-acres of the eastern region of the Project Site and Project Level Assessment Area is mapped as Delhi soils, as shown in Figure 10, *Soils Association Map*. Current City procedure is to require a habitat assessment to determine existing habitat and biological resources on proposed development sites. If the assessment determines that there is potential habitat for Delhi Sands flower-loving fly, two-year (consecutive) protocol surveys per the USFWS Interim General Survey Guidelines for DSFLF are required (The Ontario Plan 2022). Potential impacts to DSFLS would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee, and **CM BIO-3**: Delhi Sands Flower-loving Fly Habitat Assessment.

Suitable foraging and nesting habitat for the Cooper's hawk (SSC) was documented within the Project Site and Offsite Areas. Potential impacts to foraging and nesting habitat for this species would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee, and Conservation Measure **CM BIO-4**: Nesting Bird and Raptor Preconstruction Surveys.

Suitable foraging and/or breeding habitat for the *s*harp-shinned hawk *(*CWL), golden eagle (CWL, SFP), great egret, great blue heron, burrowing owl (SSC), ferruginous hawk (CWL), Swainson's hawk (ST), northern harrier (SSC), snowy egret, white-tailed kite (SFP), California horned lark (CWL), merlin (CWL), prairie falcon (CWL), loggerhead shrike (SSC), California gull (CWL), long-billed curlew (CWL), double-crested cormorant (CWL), and white-faced ibis *(*CWL) was documented within the agricultural fields and artificially created unvegetated dairy effluent retention ponds within the Project Site and Offsite Areas. Potential impacts to foraging and/or breeding habitat for these species would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee, and Conservation Measure **CM BIO-4**: Nesting Bird and Raptor Preconstruction Surveys.

Suitable burrows larger than 4-inches in diameter and foraging habitat for the burrowing owl (SSC) were documented within and adjacent to the Project Site and Offsite Areas. Potential impacts to refugia, nesting and foraging habitat for this species would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee, and Conservation Measure **CM-BIO-5:** Focused and Preconstruction Burrowing Owl Surveys.

Suitable foraging and/or roosting habitat for the following bat species including pallid bat (SSC), Townsend's big-eared bat (SSC), and western yellow bat (SSC) was documented onsite. Potential impacts to foraging habitat for these species would be mitigated to a

level of less than significant following implementation of Mitigation Measure **MM BIO-6**: Focused Bat Survey.

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS?*

**Less than Significant with Mitigation**. A total of 194.05-acres within the Project Site and 19.81-acre Offsite Area (213.86-acres total) of vegetation communities and developed areas will be directly and permanently impacted as a result of project implementation, as summarized in Table 5, *Specific Plan Vegetation Community Impacts,* and illustrated on Figure 11*, Vegetation Communities Impact Map*. No riparian (scrub, forest, woodland), sensitive or undisturbed native/natural habitats were documented within or adjacent to the Project Site and Offsite Areas. The Project Site and Offsite Areas are characterized as heavily disturbed active dairy and agricultural facilities. Several artificially created dairy effluent retention ponds are located onsite and are either devoid of vegetation of inundated with discharge. Permanent impacts to primarily dairy, agricultural lands and artificially created dairy effluent retention ponds would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee.

**Table 5.**
**Specific Plan Vegetation Community Impacts**

| Vegetation Community | Project Site Acres | *Project Level Assessment Area Acres | Offsite Areas Acres | Project Site Impact Acres | Offsite Areas Impacts Acres | Total Project Site & Offsite Areas Impacts |
|---|---|---|---|---|---|---|
| Active Dairy | 133.55 | 38.56 | 7.55 | 133.55 | 7.55 | 141.1 |
| Active Agriculture | 45.92 | 2.77 | 1.01 | 45.92 | 1.01 | 46.93 |
| Disturbed | 1.11 | 2.31 | 0.19 | 1.11 | 0.19 | 1.3 |
| Developed | 13.19 | 19.65 | 10.60 | 13.19 | 10.60 | 23.79 |
| Ornamental | 0.28 | 0.00 | 0.46 | 0.28 | 0.46 | 0.74 |
| **TOTAL** | **194.05** | **63.29** | **19.81** | **194.05** | **19.81** | **213.86** |

** The 63.29-acre Project Level Assessment Area is located within the northern region of the Specific Plan Boundary including APN's 0216-311-09, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, and -03. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction,* ***CM BIO-7*** *Programmatic Assessment Area CEQA Analysis.*

c) *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

**No Impact.** No wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project Site and Offsite Areas. The artificially created unvegetated dairy effluent retention ponds are isolated, located in uplands and currently rotated in use resulting in a wet (inundated) and dry phase. All of the active retention ponds are devoid of wetland, riparian scrub, forest or woodland habitats.

Impacts to water quality would be less than significant during both construction and operation following preparation of a Water Quality Management Plan, Storm Water Pollution Prevention Plan and compliance with National Pollutant Discharge Elimination System permit and San Bernardino County Regional Municipal Separate Stormwater Sewer System (MS4) code provisions. Therefore, no mitigation is required or proposed.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

**Less than Significant with Mitigation.** The Project Site and Offsite Areas are completely bordered by high traffic roads, commercial/residential development, active dairy/agricultural facilities and does not represent a wildlife movement corridor or route between open space habitats. Therefore, no mitigation is required or proposed.

The Project Site and Offsite Areas possess vegetation including trees and shrubs expected to potentially provide nesting habitat for raptors and migratory birds protected under the CDFG Codes. Measures for potential direct/indirect impacts to common and sensitive bird and raptor species will require compliance with the CDFG Code Section 3503. Construction outside the nesting season (between September 1st and January 31st) does not require preconstruction nesting bird surveys. However, if construction is proposed between February 1st and August 31st, a qualified biologist will conduct a preconstruction nesting bird and raptor survey(s) no more than three (3) days prior to initiation of grading to document the presence or absence of nesting birds or raptors within or directly adjacent (200 feet, up to 500 feet for raptors) to the Project Site and Offsite Areas.

Loss of an active nest would be considered a potentially significant impact. Impacts to raptor foraging and potential nesting bird habitat would be reduced to less than significant with the implementation of Conservation Measure **CM BIO-4**: Nesting Bird and Raptor Preconstruction Surveys.

e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*

**Less than Significant with Mitigation.** Several mature trees including but not limited to pine, California sycamore white mulberry, California ash, olive, Chinese elm, tree of heaven, blue gum and red gum trees are scattered throughout the Project Site and Offsite Areas primarily within right-of-way's and adjacent to existing residences. Therefore, a

tree inventory will be required and prepared by a City approved certified arborist or qualified horticulturalist, to determine the presence/absence of Heritage Trees including assessment of health, structure, condition, and expected life span of all affected specimens.

Property proposed for development on which a Heritage Tree exists, shall require the submittal of a Tree Inventory and Preservation Plan prepared by a licensed landscape architect, horticulturalist, certified arborist, or other related professional. Said plan shall be submitted concurrent with a Development Plan or building permit request for alterations of a site, and shall be reviewed and approved by the Approving Authority for the corresponding application request. Permanent impacts to Heritage Trees would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-2**: Tree Inventory and Preservation Plan.

*f) Conflict with the provisions of an adopted Habitat Conservation Plan, Native Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

**No Impact**. The Project Site and Offsite Areas are not located within or adjacent to a Conservation Program Area. Therefore, implementation of the project would not result in a conflict with the provisions of an adopted habitat conservation plan and no impact would occur. Therefore, no mitigation is required or proposed.

**INDIRECT IMPACTS**

**Water Quality**

Impacts to water quality would be less than significant during both construction and operation following preparation of a Water Quality Management Plan, Storm Water Pollution Prevention Plan and compliance with National Pollutant Discharge Elimination System permit and San Bernardino County Regional Municipal Separate Stormwater Sewer System (MS4) code provisions. Therefore, no mitigation is required or proposed.

**Toxics**

Toxic sources within the Project Site and Offsite Areas would be limited to those commonly associated with residential and mixed-use developments such as pesticides, insecticides, herbicides, fertilizers, and vehicle emissions. In order to mitigate for the potential effects of these toxics, the project will incorporate structural BMPs, as required in association with compliance with the NPDES permit system as warranted, in order to reduce the level of toxins introduced into the drainage system. Water quality measures will be implemented and no significant impacts are anticipated.

**Lighting**

No impacts related to lighting would occur during both construction and operation. The Project Site and Offsite Areas are not located adjacent to any open space habitats or sensitive biological resources. No impact.

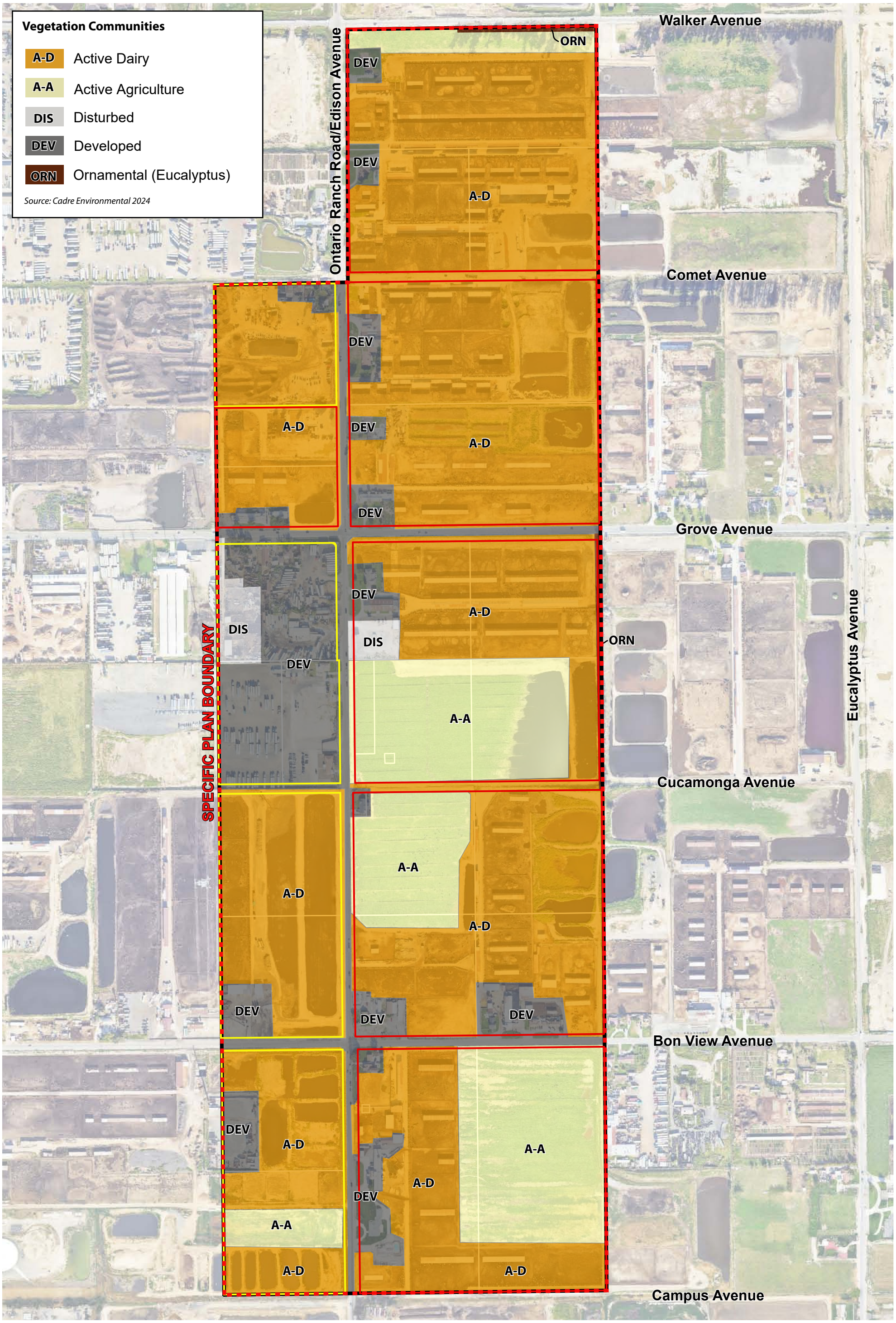


**Figure 11 - Specific Plan Vegetation Communities Impact Map**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

1 inch = 450 feet

### Noise

Noise and vibration associated with the use of heavy equipment during project construction has the potential to disrupt bird nesting, foraging and breeding behavior within or adjacent to the Project Site and Offsite Areas. Conservation Measure **CM BIO-4:** Nesting Bird and Raptor Preconstruction Survey has been incorporated into the project to collectively contribute to reducing potential indirect noise impacts to nesting bird species located within or adjacent to the Project Site and Offsite Areas. No impact anticipated.

## CUMULATIVE IMPACTS

The direct and/or indirect impacts of the project would not result in significant cumulative impacts (CEQA Section 15310) to environmental resources within the region of the Project Site and Offsite Areas. Cumulative impacts refer to incremental effects of an individual project when assessed with the effects of past, current, and proposed projects. The project represents the development of 194.05-acres within the Project Site and 19.81-acre Offsite Areas (213.86-acres total) of primarily dairy, agricultural habitat and disturbed/developed habitats, surrounded by dairy/agricultural, commercial, residential development and high traffic roads, and therefore will not result in an adverse cumulative impact to sensitive resources. Impacts related to buildout of the City and Sphere of Influence are anticipated to be less than significant if projects comply with Ontario Ranch mitigation measures and The Ontario Plan 2050 policies and standard conditions. Following implementation of the following mitigation and conservation measures, the proposed action would not conflict with the general plan policies and standard conditions for the protection of sensitive resources.

## MITIGATION & CONSERVATION MEASURES

The following biological mitigation and conservation measures (Conditions of Approval) are relevant to the protection of biological resources to the extent practicable as part of ensuring all potential impacts to sensitive or regulated biological resources are in compliance with CEQA.

### MM BIO-1: City of Ontario Biological Resources Habitat Mitigation Fee

The City of Ontario has established a habitat mitigation fee to cover potential environmental impacts to the burrowing owl, DSFLF, raptor foraging, loss of open space, and agricultural lands. Development impact fees for new development in Ontario Ranch were adopted on June 23rd, 2003, by the City Council. The Ontario Ranch development impact fees include a habitat mitigation fee of $4,320 per net acre for proposed residential, commercial, hotel and restaurant, office, and industrial development. Mitigation fees have been collected by the City of Ontario and have been deposited into a trust fund to be used for the acquisition, restoration, rehabilitation, and maintenance of lands deemed to have long-term conservation value.

**MM BIO-2: Tree Inventory and Preservation Plan**

A tree inventory will be required and prepared by a City approved certified arborist or qualified horticulturalist, to determine the presence/absence of Heritage Trees including assessment of health, structure, condition, and expected life span of all affected specimens.

Property proposed for development on which a Heritage Tree exists, shall require the submittal of a Tree Inventory and Preservation Plan prepared by a licensed landscape architect, horticulturalist, certified arborist, or other related professional. Said plan shall be submitted concurrent with a Development Plan or building permit request for alterations of a site, and shall be reviewed and approved by the Approving Authority for the corresponding application request.

The Tree Inventory and Preservation Plan shall show all existing on-site trees, and those existing trees on abutting lots and public rights-of-way with a canopy or root zone that extends onto the site or within 8 feet of a construction, staging or storage area, or graded site. Furthermore, the Tree Inventory and Preservation Plan shall identify Tree Protection Areas and trees requested to be removed, and shall show replacement trees as required by this Division.

**CM BIO-3**: **Delhi Sands Flower-loving Fly Habitat Assessment**

The eastern region of the Project Site is mapped as Delhi fine sand soils and may represent suitable habitat for the Delhi sands flower-loving fly (NRCS 2024). Either 1) a habitat assessment is conducted by a USFWS permitted biologist and concurrence from the USFWS is received that suitable habitat for the Delhi sands flower-loving fly does not occur onsite and focused surveys are not warranted or, 2) a two-year protocol survey for the Delhi sands flower-loving fly shall be conducted to determine presence/absence. If the species is detected onsite, formal consultation with the USFWS will be required.

**CM BIO-4: Nesting Bird & Raptor Preconstruction Survey**

Regulatory requirement for potential direct/indirect impacts to nesting common and sensitive bird and raptor species will require compliance with the CDFG Code Section 3503. Construction outside the nesting season (between September 1$^{st}$ and January 31$^{st}$) do not require pre-removal nesting bird surveys. If construction is proposed between February 1$^{st}$ and August 31$^{st}$, a qualified biologist will conduct a nesting bird survey(s) no more than three (3) days prior to initiation of grading to document the presence or absence of nesting birds within or directly adjacent (200 feet, up to 500 feet for raptors) to the Project Site and Offsite Areas.

The survey(s) will focus on identifying any raptors and/or bird nests that are directly or indirectly affected by construction activities. If active nests are documented, species-specific measures will be prepared by a qualified biologist and implemented to prevent abandonment of the active nest. At a minimum, grading in the vicinity of a nest will be postponed until the young birds have fledged. The perimeter of the nest setback zone will be fenced or adequately demarcated with stakes and flagging at 20-foot intervals, and construction personnel and activities restricted from the area. A survey report by a

qualified biologist verifying that no active nests are present, or that the young have fledged, will be submitted to the City of Ontario for review and approval prior to initiation of grading in the nest-setback zone.

The qualified biologist will serve as a construction monitor during those periods when construction activities occur near active nest areas to ensure that no inadvertent impacts on these nests occur. A final monitoring report of the findings, prepared by a qualified biologist, will be submitted to the City of Ontario documenting compliance with the CDFG Code. Any nest permanently vacated for the season would not warrant protection pursuant to the CDFG Code.

### CM BIO-5 Focused and Preconstruction Burrowing Owl Surveys

Focused surveys for burrowing owl will be conducted in accordance with the March 7, 2022, CDFG staff report on Burrowing Owl Mitigation. Specifically, a total of 4 surveys will be conducted: 1) at least one site visit between February 15th and April 15th, and 2) a minimum of three (3) surveys, at least three weeks apart, between Apr$^{il}$ 15th and July 15th, with at least one visit after June 15th. A report of the findings prepared by a qualified biologist shall be submitted to the City of Ontario prior to any permit or approval for ground disturbing activities.

A 14-day burrowing owl preconstruction survey will be conducted immediately prior to the initiation of ground-disturbing construction to ensure protection for this species. The survey will be conducted in compliance with CDFW guidelines (CDFW 2012). A report of the findings prepared by a qualified biologist shall be submitted to the City of Ontario prior to any permit or approval for ground disturbing activities.

If burrowing owls are detected onsite during the focused surveys or 14-day preconstruction survey efforts, during the breeding season (February 1$^{st}$ to August 31$^{st}$) then construction activities shall be limited to beyond 300 feet of the active burrows until a qualified biologist has confirmed that nesting efforts are compete or not initiated. In addition to monitoring breeding activity, if construction is proposed to be initiated during the breeding season or active relocation is proposed, a burrowing owl relocation plan will be developed and approved by the City of Ontario, CDFW and USFWS.

### CM BIO-6 Preconstruction Focused Bat Survey

Prior to implementation of project activities, a qualified biologist shall be retained to determine whether potential roosting sites for bats may be affected. For large ornamental trees and palms suitable for bat roosting/nursery, exit counts and acoustic surveys shall be performed prior to initial ground disturbance, vegetation or structure removal to determine whether the Project Site, Offsite Areas and a 300-foot buffer supports a nursery or roost, and by which species. This work will occur between late -spring and late summer and/or in the fall (generally mid-March through late October).

If the results of the bat survey find a total of a single roosting individual of a special status bat species or 25 or more individuals of a non-special status bat species with potential to be present in the Project Site and Offsite Areas (i.e., pallid bat, Townsend's big-eared bat, and western yellow bat), a Bat Management Plan shall be developed to ensure

mortality to bats does not occur. For each location confirmed to be occupied by bats, the plan will provide details both in text and graphically where exclusion devises/and or staged tree removal will need to occur, the timing for exclusion work and the timeline and methodology needed to exclude the bats. The plan will need to be reviewed and approved by CDFW prior to disturbance of the roosts.

### CM BIO-7 Programmatic Assessment Area CEQA Analysis

The 63.29-acre Project Level Assessment Area is located within the northern region of the Specific Plan Boundary including APN's 0216-311-09, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, and -03. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction

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Certification "*I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge".*

Author:_____ Date: October 2, 2024

Contact: Ruben S. Ramirez, Jr. 949-300-0212, r.ramirez@cadreenvironmental.com

**APPENDIX C2**

# DELHI SANDS FLOWER-LOVING FLY HABITAT SUITABILITY ASSESSMENT

# SARES-REGIS BROOKFIELD SITE

## CITY OF ONTARIO, SAN BERNARDINO COUNTY, CALIFORNIA

within Assessor Parcel Numbers (APNs) 0216-321-01, -02, -03, -06, -07, and -08, and 0216-322-01, -02, -03, -04, and -10.

### Delhi Sands Flower-Loving Fly Habitat Suitability Assessment

---

Prepared For:

**Sares-Regis**
3501 Jamboree Road, Suite 3000
Newport Beach, CA 92620
Contact: *Patrick Russell*

Prepared By:

**ELMT Consulting, Inc.**
2201 N. Grand Avenue #10098
Santa Ana, California 92711
Contact: *Thomas J. McGill, Ph.D.*

August 2024

# SARES-REGIS BROOKFIELD SITE

## CITY OF ONTARIO, SAN BERNARDINO COUNTY, CALIFORNIA

### Delhi Sands Flower-Loving Fly Habitat Suitability Assessment

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The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.


Thomas J. McGill, Ph.D.
Managing Director
ELMT Consulting


August 2024

# Executive Summary

This report contains the findings of a habitat suitability assessment for the Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) (DSF), a federally endangered species, for the Sares-Regis proposed Brookfield site in the City of Ontario, San Bernardino County, California. The purpose of this assessment is to characterize existing site conditions at the project site and assess the quality of Delhi sand soils on the project to determine if they provide suitable habitat for DSF. DSF requires clean, aeolian deposited Delhi Sand soil that has not been mixed with clay soils. Delhi Sand soils mixed with clay soils will harden or consolidate. Consolidated soils prevent DSF from burrowing into the soils and, thus, are unsuitable for the species. The habitat suitability assessment was conducted by Thomas J. McGill, Ph.D. (ELMT Consulting) on July 30, 2024.

The project site is mapped by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey as Delhi Sand soils. However, the site has been subject to several decades of use as cattle ranches and dairy farms. Due to this long-standing agricultural use, there is no native habitat on the site. The site supports one (1) land cover type that is classified as heavily disturbed. Due to this regime of constant site disturbance, the site does not support clean Delhi sand soils and is unsuitable for DSF.

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**Appendix**

Appendix A Site Photographs

# Section 1 Introduction

ELMT Consulting (ELMT) prepared this Delhi Sands Flower-loving Fly (DSF) Habitat Suitability Assessment for the proposed Brookfield Project Site (project site or site) located in the City of Ontario, San Bernardino County, California. Thomas J. McGill, Ph.D., inventoried and evaluated the condition of the habitat on July 30, 2024. This assessment was conducted to determine the project site supports clean Delhi sand soils capable of providing suitable habitat for DSF. DSF requires clean, aeolian (wind) deposited Delhi Sand soil that has not been mixed with clay soils. Delhi Sand soil mixed with clay soil will harden or consolidate. Consolidated soils prevent DSF from burrowing into the soil and, thus, are unsuitable for DSF.

## 1.1 PROJECT LOCATION

The project site is generally located south of State Route 60, west of Interstate 15, north of the State Route 91, and east of State Route 83 in the City of Ontario, San Bernardino County, California. The project site is depicted on the Corona North and Prado Dam quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series in an unsectioned portion of Township 2 South, Range 7 (refer to Exhibit 1, *Site Vicinity*). Specifically, the project site is bordered by Ontario Ranch Road (Edison Avenue) to the north, Walker Avenue to the east, Eucalyptus Avenue to the south, and Grove Avenue to the west (refer to Exhibit 2, *Project Site*). The following Assessor Parcel Numbers (APNs) 0216-321-01, -02, -03, -06, -07, and -08, and 0216-322-01, -02, -03, -04, and -10 occur onsite.

## 1.2 PROJECT DESCRIPTION

The Brookfield project proposes the construction and operation of residential, industrial and commercial uses.

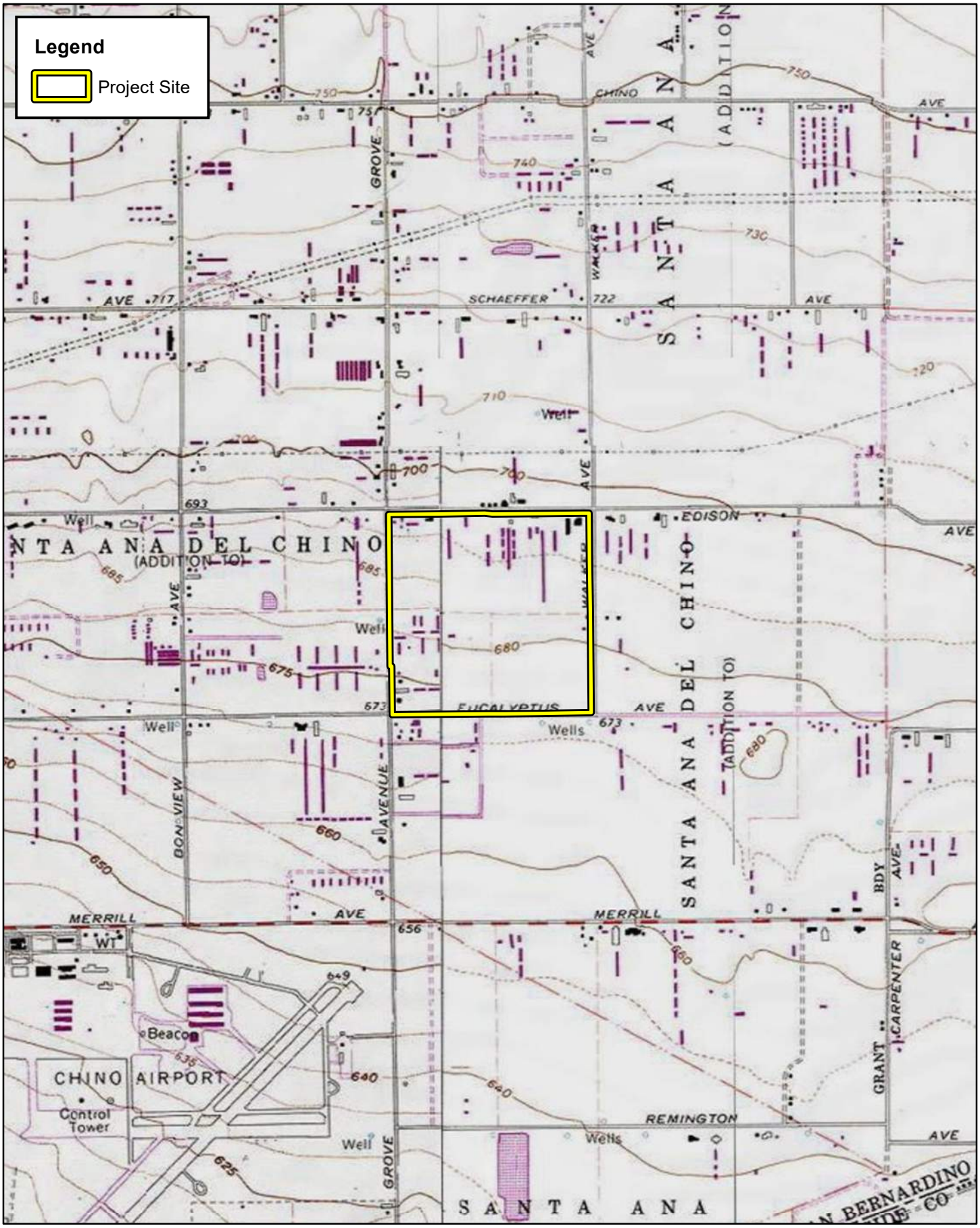


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

# Site Vicinity

ELMT CONSULTING

0 1,000 2,000 4,000 Feet

Source: USA Topographic Map, San Bernardino County

Exhibit 1

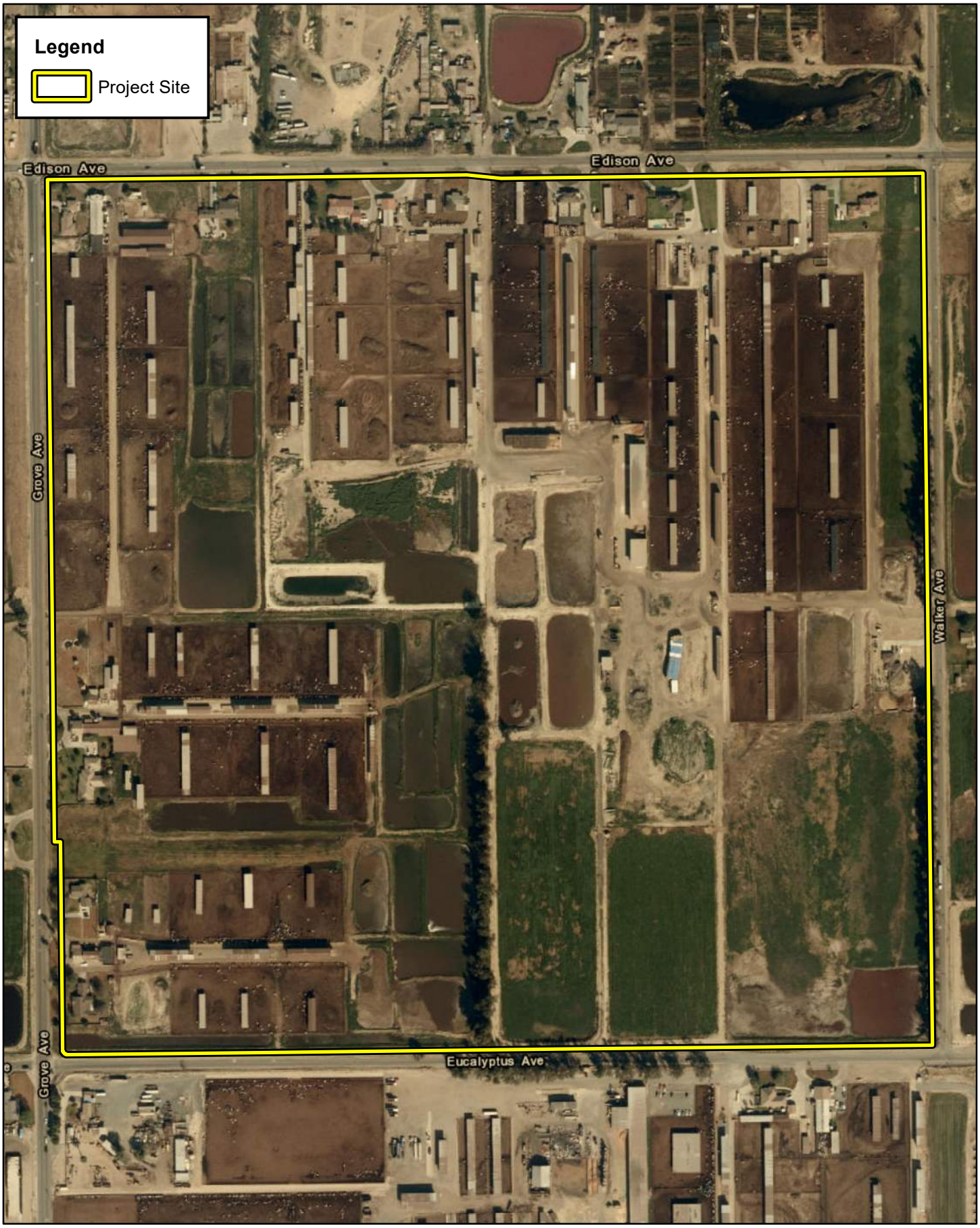


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, San Bernardino County

# Project Site

Exhibit 2

# Section 2 Background

It has been generally acknowledged that DSF occurs in Delhi sand soils, particularly clean dune formations composed of Aeolian sands. Conversely, soils and sands deposited by fluvial processes from the surrounding alluvial fans do not support DSF. These alluvial soils are composed of course sands, cobble and gravel (Tujunga soils) or coarse sands, silts and clays (Cieneba soils). In this part of San Bernardino County, the separation of soil types has been lost due to the mixing and cross contamination from years of agricultural activities, development, and other man-made disturbances.

Depending on the extent of mixing and contamination, some areas formally mapped as Delhi sand soils no longer have potential to support DSF populations. Conversely, some areas formally mapped as Cieneba soils may now support wind deposited Delhi sand soils and have potential to support DSF. Six DSF experts (Ken Osborne, Greg Ballmer, Rudy Matoni, Karin Cleary-Rose, Alison Anderson and Tom McGill) used this criterion, the relative abundance of clean Delhi sand soils versus the amount of Cienba or other alluvial soils, to rate the suitability of the habitat to support DSF (Michael Brandman Associates, 2003). Soils high in gravel and alluvial materials, or high in fine materials such as silts and clays, were rated low, while soils that appear to be high in Aeolian deposited sands were rated high. This qualitative assessment of DSF habitat was further refined by considering the relative degree of soil compaction. Alluvial soils have a tendency to solidify to a hard surface pavement, while Aeolian soils are easier to penetrate and provide good substrate for DSF.

Although it has been common to attribute the presence of four common plant species California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), deer weed (*Acmispon glaber*), and telegraph weed (*Heterotheca grandiflora*) as indicators of habitat suitability, for the assessment, vegetation composition was not given much weight in making this habitat evaluation. These dominant plant species, and plant species composition of habitats, may not be directly relevant to larval development (due to likely predatory or parasitic habitat of DSF larvae) (Osborne, et al. 2003). The known immature life histories of the nine asiloid fly families, including that to which the DSF is classified, are primarily predatory and/or parasitic on other invertebrate species (mainly insects) and the presence or absence of plant species appears not to be relevant to the life history of these flies. Regardless, none of these plant species were observed within the site boundary.

Land with suitable DSF habitat includes those areas with open, clean and unconsolidated Delhi Series soils that have not been permanently altered by residential, commercial, or industrial development, or other human actions. Areas known to contain Delhi sand soils and/or to be occupied by DSF have been divided by USFWS into three recovery units (Colton, Jurupa, and Ontario Recovery Units (USFWS, 1997)). These recovery units are defined as large geographic areas based on geographic proximity, similarity of habitat, and potential genetic exchange. The project site is located within the Ontario Recovery Unit (refer to Exhibit 3, *DSF Recovery Units*).

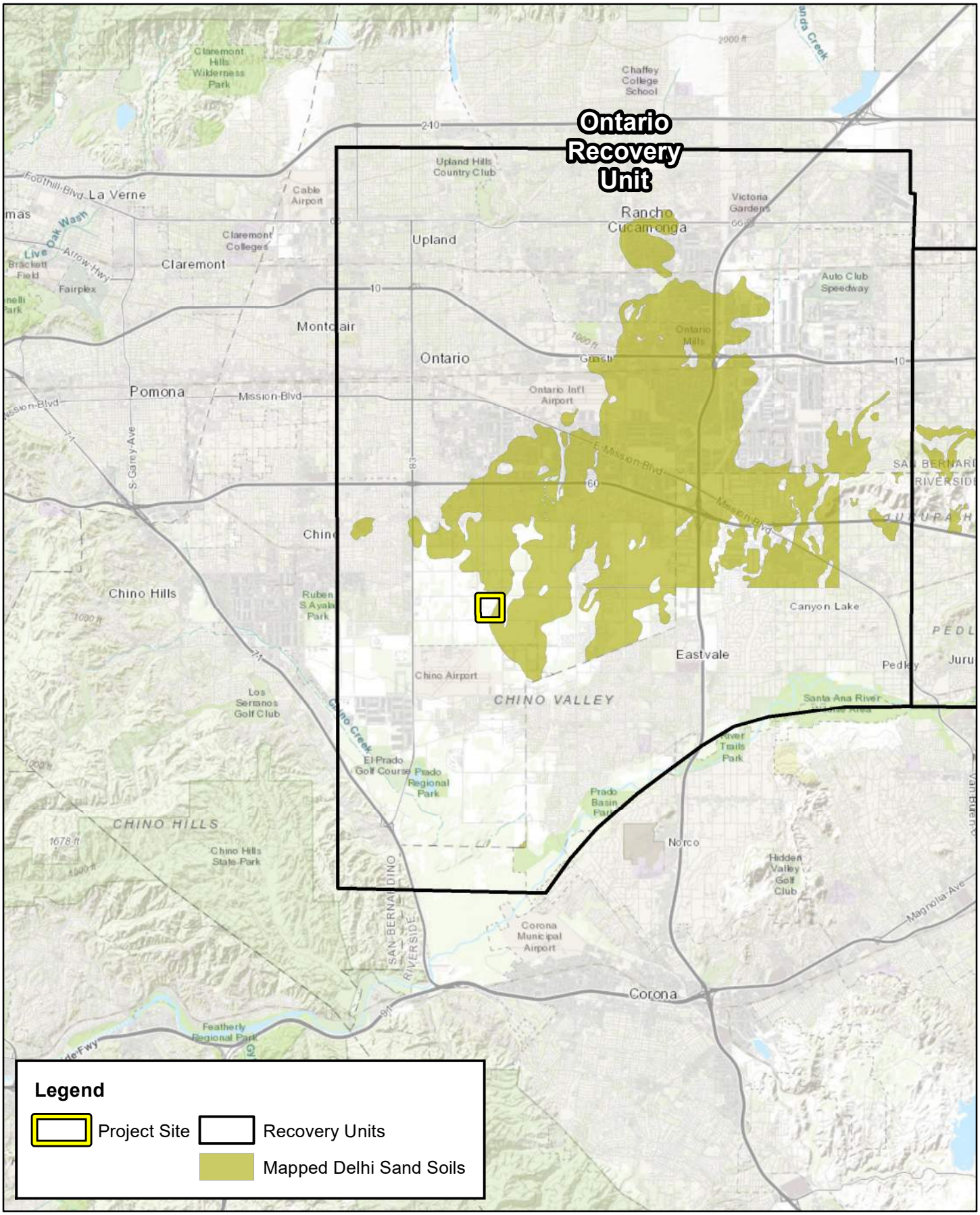


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

# DSF Recovery Units

ELMT CONSULTING

0 1 2 4 Miles

Source: World Topographic Map, Riverside County

Exhibit 3

# Section 3 Methodology

The criteria discussed in detail below were used to rate the relative abundance of clean Delhi sand soils verses the amount of Cieneba Tujunga, or other alluvial soils, to rate the suitability of the habitat to support DSF. Soils high in gravel and alluvial materials, or high in fine materials such as silts and clays, were rated low, while soils that appear to be high in Aeolian deposited sands were rated high. This qualitative assessment of DSF habitat was further refined by considering the relative degree of soil compaction. Alluvial soils have a tendency to solidify to a hard surface pavement, while Aeolian soils are loose sandy soils that are easier to penetrate and provide good substrate for DSF.

## 3.1 SOIL

Onsite soils were researched prior to the field visit using the United States Department of Agricultural (USDA) Natural Resources Conservation Survey (NRCS) Soil Survey for San Bernardino County, California. In particular, the USDA NRCS was reviewed to determine the location of mapped Delhi sand soils on or within the immediate vicinity of the project site.

## 3.2 VEGETATION

Vegetative resources and surrounding land uses were also assessed as part of determining baseline conditions by walking meander transects and recording all species observed and adjacent land uses. Common plant species observed during the field investigation were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less-familiar plants were photographed in the field and identified in the laboratory using taxonomic guides. Taxonomic nomenclature used in this study follows the 2012 Jepson Manual (Hickman 2012). In this report, scientific names are provided immediately following common names of plant species (first reference only).

## 3.3 HABITAT SUITABILITY ASSESSMENT

The scope of the habitat suitability assessment was to determine the presence or absence of unconsolidated Delhi sand deposits and to determine its quality as it pertains to DSF. DSF permitted biologist, ELMT biologist Tom McGill surveyed the project site on July 30, 2024. The habitat suitability assessment consisted of a visual and tactile inspection of all areas on the project site that contain Delhi sand soils. Soils along the eastern portion of the project site are mapped as Delhi fine sands (refer to Exhibit 4, *Soils*). The site was evaluated for the quality or purity of Delhi Sands and for its potential to support DSF. Areas were assigned one or more ratings ranging between 1 and 5, with 5 being the best quality and most suitable habitat, as detailed below in each paragraph:

Ratings

1 Soils dominated by heavy deposits of alluvial material including coarse sands and gravels with little or no Delhi sand soils and evidence of soil compaction. Developed areas, non-Delhi sands soils with high clay, silt, and/or gravel content. Delhi sands extensively and deeply covered by dumping of exotic soils, rubble, trash or organic debris. *Unsuitable.*

2 Delhi sand soils are present, but the soil characteristics include a predominance of alluvial materials (Tujunga Soils and Hilmar loamy sand), or predominance of other foreign contamination. Sever and frequent disturbance (such as maintenance yard or high use roadbed). *Very Low Quality*.

3 Although not clean, sufficient Delhi sand soil are present to prevent soil compaction. Moderately contaminated Delhi sands. Delhi sands with moderate to high disturbance (such as annual disking). Sufficient Delhi sands are present to prevent soil compaction (related to contamination by foreign soils). Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality*.

4 Abundant clean Delhi sand soils with little or no foreign soils (such as alluvial material, Tujunga soils or Hilmar loamy sand) present. Moderate abundance of exposed sands on the soil surface. Low vegetative cover. Evidence of moderate degree of fossorial animal activity by vertebrates and invertebrates. May represent high quality habitat with mild or superficial disturbance. *Moderate Quality*.

5 Sand dune habitat with clean Delhi sand soils. High abundance of exposed sands on the soil surface. Low vegetative cover. Evidence (soil surface often gives under foot) of high degree of fossorial animal activity by vertebrates and invertebrates. Sand associated plant and arthropod species may be abundant. *High Quality*.

It should be noted that habitat qualities often vary spatially within a site so that conditions on a site fall within a range of qualities. Further, overall habitat quality is affected by the overall habitat value of a site.

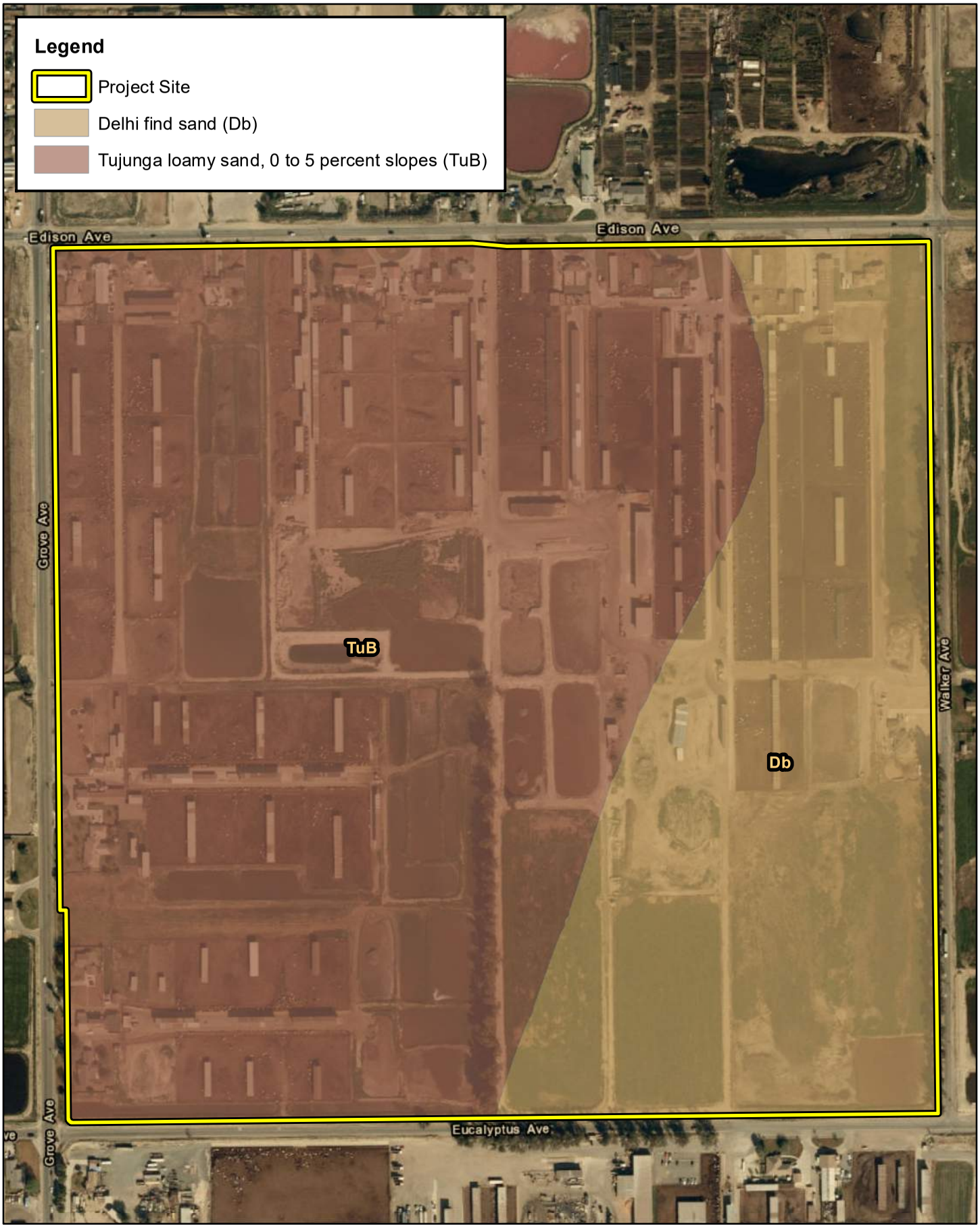


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

# USDA Mapped Soils

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, Soil Survey Geographic Database, San Bernardino County

Exhibit 4

# Section 4 Results

## 4.1 EXISTING CONDITIONS

Due to historic and existing land uses, no native or natural/undisturbed plant communities were observed on the project site. The project site consists of a mixture of land uses, including rural residential structures, cattle stock yards, waste ponds, and other agricultural uses. These disturbances have eliminated the natural plant communities that once occurred on and surrounding the project site (refer to Appendix A, *Site Photographs*, for representative site photographs).

The disturbed from its decadence is a direct result of the long-standing use of the site as a cattle ranch resulting in barren, contaminated soils with little or no vegetation. The dominant land use feature are the numerous stockyards for cows. These areas are completely barren with a thick layer of cow mature on top of the native soil that is periodically removed. Stock ponds created to treat wastewater are the second most dominate feature and are in constant flux as ponds are filled, dried out and refilled.

Developed areas include several rural residences along the northern and western boundaries with landscaped yards. Facilities for hay storage, diary operations and equipment maintenance and repair and stock piling of soils are found in the central portion of the project site.

It should be noted that several small non-native grasslands occur in scattered patches across the site that are dominated by invasive non-native grasses and may contain a variety of native and other non-native species. Areas of non-native grassland are dominated by brome (*Bromus* spp.) and wild oats (*Avena fatua*). In addition, Russian thistle (*Salsola tragus*) and puncture vine (*Tribulus terrestris*), short-podded mustard (*Hirschfeldia incana*), common fiddleneck (*Amsinckia intermedia*), telegraph weed (*Heterotheca grandiflora*), and western ragweed (*Ambrosia psilostachya*) were also identified in these small patches on non-native grasses.

## 4.2 HABITAT SUITABILITY ASSESSMENT

Per USDA NRCS Soil Survey results, Delhi sand soils have been mapped along the eastern boundary of the project site. Since Delhi sand soils are wind deposited (aeolian) as surface soils, they(See Exhibit 1, Regional Location) are affected by surface disturbance. Land with suitable DSF habitat include those areas with open, undisturbed Delhi Series soils that have not been permanently altered by residential, commercial, or industrial development, or other human actions. Areas known to contain Delhi sand soils and/or to be occupied by DSF have been divided by USFWS into three recovery units (Colton, Jurupa, and Ontario Recovery Units (USFWS, 1997)). These recovery units are defined as large geographic areas based on geographic proximity, similarity of habitat, and potential genetic exchange. As noted above, the project site is within the Ontario Recovery Unit.

Areas that have been mapped as supporting Delhi Sand soils have either been converted into pastures/holding pins or large stock ponds used to process wastewater or rural residential housing and infrastructure needed for managing the dairy farms. The stockyards are covered by a thick continuous layer of cow mature that has been mixed over the decades into any underlying Delhi Sand soils by the

constant movement of cow in the stockyards. The underlying soils contaminated with the organic waste found in the cow mature has become compacted and no longer penetrable by DSF.

The stock ponds found throughout the project site are in continuous use and either contain wastewater or are in the process of drying out for the removal of the underlying contaminated soil and deposed of offsite in an appropriate landfill. The repetitive process of contaminating the underlying soils with organic waste products, drying out the ponds and removing and deposing of the soils have eliminated all of the underlying Delhi Sand soils.

All Delhi Sand soils that may have occurred on the project site have either been removed by maintenance of the stock ponds or is so contaminated with cow mature and other waste products that clean Delhi Sand soils needed by DSF no longer exist with the project site. All areas designated as supporting Delhi Sand soils were determined to no longer support clean Delhi Sands needed by the species and were rated as unsuitable with a habitat suitability rating of 1 (see Exhibit 5, *DSF Habitat Suitability*).

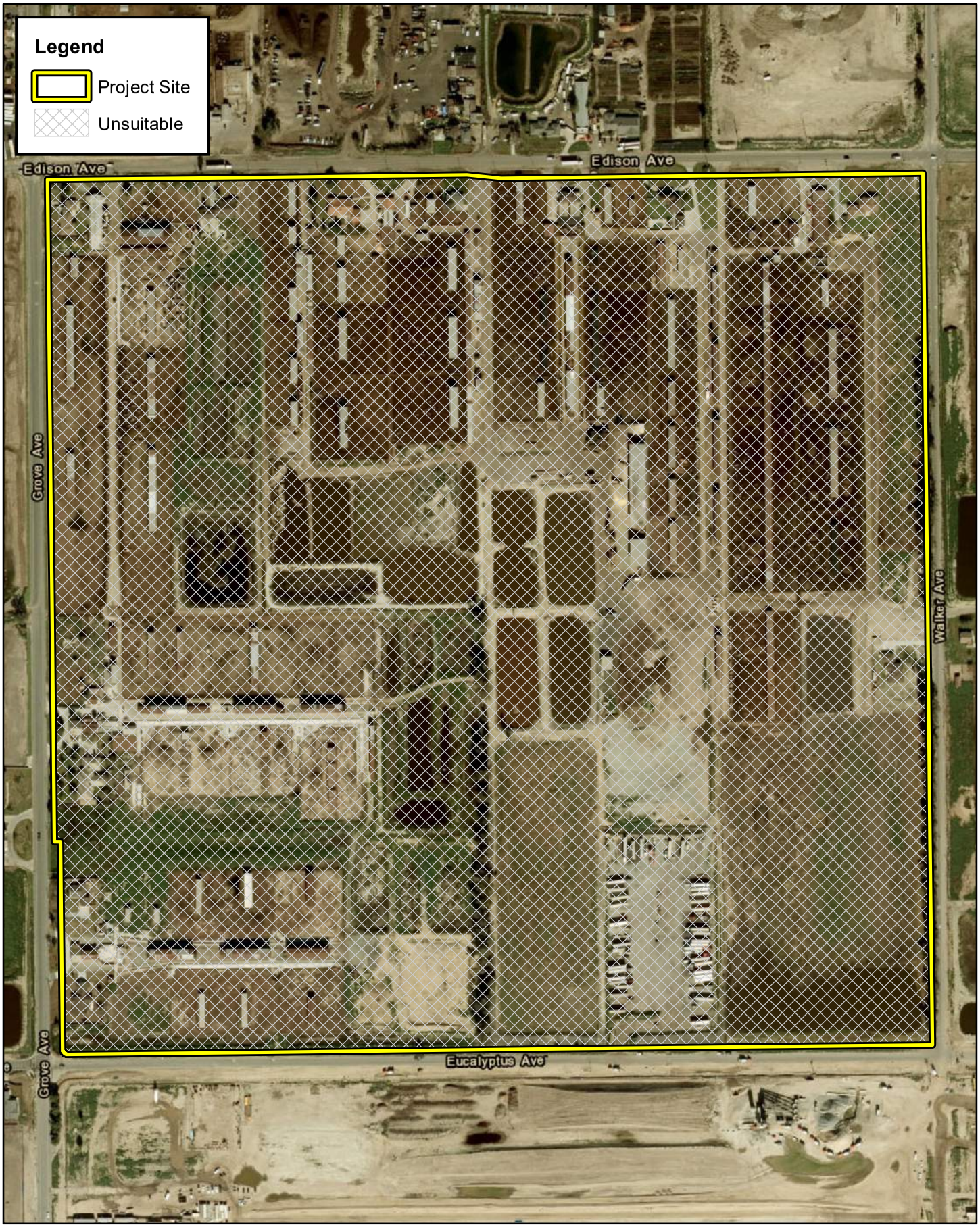


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

# DSF Habitat Suitability

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, San Bernardino County

Exhibit 5

# Section 5 Conclusion and Recommendations

Based on his twenty-five years of experience with DSF and occupied DSF ecosystems, the information provided in this report, and information based on the referenced DSF habitat suitability scale (Ballmer, Osborne, McGill 2003), Dr. McGill determined that the site no longer supports clean Delhi Sand soils and was rated as unsuitable habitat with a habitat rating of 1. Implementation of the project will have no significant impacts on federally or State listed species known to have historically occurred in the general vicinity of the project site, specifically DSF. Critical Habitat has not been designated for the species. No further surveys are recommended.

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# Appendix A Site Photographs

**Photograph 1:** Looking south from the northeast corner of the project site along Walker Road. A row of eucalyptus can be seen in the background.

**Photograph 2:** Looking east along Ontario Ranch Road at the rural residences along the northern boundary of the site.

**Photograph 3:** Stock yard at the northern boundary. Note the extent of manure onsite.

**Photograph 4:** Stock yard at the northern boundary.

**Photograph 5:** Looking north from the center of the project site at cows feeding within one of the stock yards.

**Photograph 6:** One of several stock ponds found throughout the Project Site.

**Photograph 7:** Storage yard and staging area in the center of the Project Site.

**Photograph 8:** Stock pond used to process wastewater in the foreground and eucalyptus row in the background.

**Photograph 9:** Stock ponds are periodically dried out and the accumulated organic matter and other wastes are removed.

**Photograph 10:** Untreated wastewater being added to stock pond.

# APPENDIX D

## GEOTECHNICAL INVESTIGATION

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

# PRELIMINARY GEOTECHNICAL INVESTIGATION & ORGANIC SOIL/MANURE EVALUATION REPORT

## SARES REGIS NORTH

Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernadino County, California

*CONVERSE PROJECT NO. 24-81-184-01*

*Prepared For:*
RCCD, INC.
8101 E. Kaiser Boulevard, Suite 140
Anaheim Hills, California 92808

*Presented By:*
CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

September 10, 2024

**Converse Consultants**
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

September 10, 2024

Mr. Jason Lee
Ontario Ranch Ventures I & II, LP (ORV I & II)
c/o RCCD, Inc.
Vice President
RCCD, Inc.
8101 E. Kaiser Boulevard, Suite 140
Anaheim Hills, California 92808

Subject: **PRELIMINARY GEOTECHNICAL INVESTIGATION AND ORGANIC SOIL/MANURE EVALUATION REPORT**
**Sares Regis North**
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
Converse Project No. 24-81-184-01

Dear Mr. Lee:

Converse Consultants (Converse) is pleased to submit this Preliminary Geotechnical Investigation and Organic Soil/Manure Evaluation Report to assist with the proposed Sares Regis North medium density residential and mixed-use development located at the southwest corner of Edison Avenue and Walker Avenue, in the City of Ontario, San Bernardino County, California. This report was prepared in accordance with our proposals dated May 21, 2024 and your Professional Services Agreement, dated May 21, 2024.

Based upon our field investigation, laboratory data, and analyses, the project site is considered feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into the design and development of the project.

We appreciate the opportunity to be of service to Ontario Ranch Ventures I & II, LP (ORV I & II). Should you have any questions, please do not hesitate to contact us at 909-474-2847.

**CONVERSE CONSULTANTS**

Hashmi S. E. Quazi, PhD, GE, PE
Principal Engineer

Dist.: 1/Addressee (e-mail) HSQ/RLG/SM/kvg

# PROFESSIONAL CERTIFICATION

This report has been prepared by the individuals whose seals and signatures appear herein.

The findings, recommendations, specifications, or professional opinions contained in this report were prepared in accordance with generally accepted professional engineering, engineering geologic principles, and practice in this area of Southern California. There is no warranty, either expressed or implied.

Catherine Nelson, GIT
Project Geologist

Robert Gregorek, PG, CEG
Senior Geologist

Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

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# 1.0 INTRODUCTION

This preliminary geotechnical investigation and organic soil/manure evaluation prepared by Converse for the approximately 185-acre rectangular shaped Sares Regis NORTH site is located at the southwest corner of Edison Avenue and Walker Avenue, in the City of Ontario, San Bernardino County, California. The approximate location of the proposed project is shown in Figure No. 1, *Approximate Site Location Map.*

The purpose of this investigation was to evaluate the current nature and engineering properties of the subsurface soils and groundwater conditions and to provide geotechnical recommendations for the proposed residential development.

This report was prepared for the project described herein and is intended for use solely by Ontario Ranch Ventures I & II, LP (ORV I & II), RCCD, Inc. and their authorized agents. This report may be made available to the prospective bidders for bidding purposes. However, the bidders are responsible for their own interpretation of the site conditions between and beyond the boring locations, based on factual data contained in this report. This report may not contain sufficient information for use by others and/or other purposes.

# 2.0 SITE DESCRIPTION AND BACKGROUND

The approximately 185-acre rectangular site, consisting of several active dairies and agricultural fields, is located at the southeast corner of Ontario Ranch Road and Walker Avenue, in the City of Ontario, San Bernardino County, California. The property is bounded to the north by Edison Avenue, to the east by Walker Avenue, to the west by future Campus Avenue, and to the south by dairies and agricultural land.

The site gently slopes from the northeast to southwest. Elevations range from approximately 696 feet above mean sea level (msl) in the northwest corner of the site to approximately 677 feet above msl in the southwest portion of the site. The present site conditions are depicted in Photographs Nos. 1 through 5.

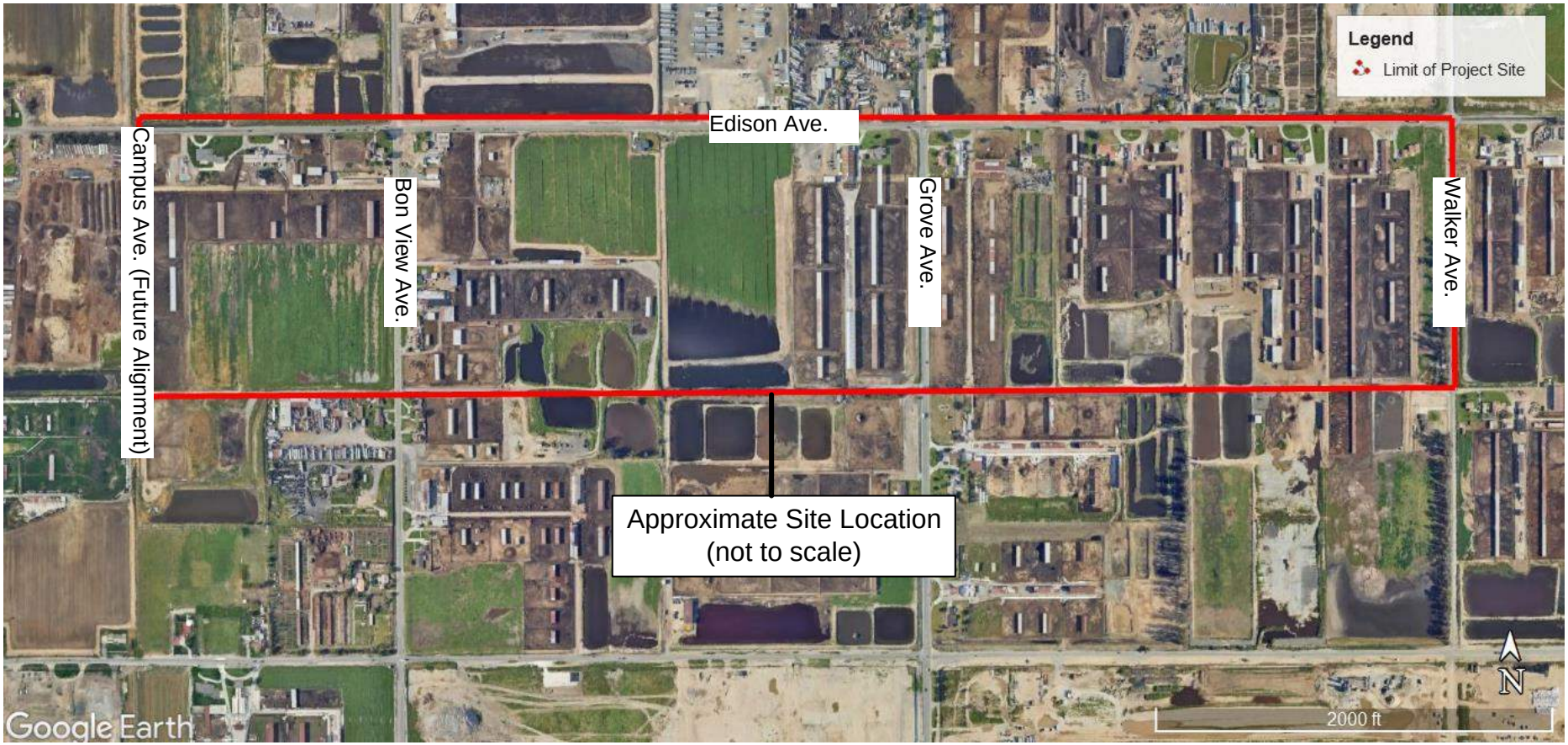


Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Site Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
1

*Photograph No. 1: Current site conditions, facing north.*

*Photograph No. 2: Current site conditions, facing south.*

*Photograph No. 3: Current site conditions, facing southeast.*

*Photograph No. 4: Current site conditions at large southeastern berm, facing south.*

*Photograph No. 5: Current site conditions at stockpile in eastern cow pens, facing southeast.*

# 3.0 PROJECT DESCRIPTION

Based on conversations with Mr. Jason Lee of RCCD, Inc. the property will be developed for medium density residential, mixed use, and open space. No development or grading plans are available at this time. The structures will likely be one to two-story tilt up buildings founded on shallow footings with slab-on-grade with concrete wall, steel and possible block wall construction. Associated with the development will likely be above and below ground utilities, access roads, and interior streets.

# 4.0 PREVIOUS SITE INVESTIGATIONS

The 2 referenced previous geotechnical feasibility studies of the subject site, which were provided, were performed by Southern California Geotechnical (SoCalGeo) in 2022, with the pertinent data incorporated into this report.

# 5.0 SCOPE OF WORK

The scope of Converse's investigation is described in the following sections.

## *5.1 Project Set-up*

The project set-up consisted of the following tasks.

- Reviewed existing plans, geotechnical reports provided, and data relevant to the project.

- Conducted a site reconnaissance to mark the exploration locations and to verify drill rig/backhoe access to the proposed locations were available.
- Notified Underground Service Alert (USA) at least 48 hours prior to conducting field work to clear the exploration locations of any conflict with existing underground utilities.
- Engaged a drill rig company to conduct exploratory borings and a backhoe company to excavate exploratory test pits.

### *5.2 Subsurface Exploration*

Ten exploratory borings (BH-01 through BH-10) were drilled using a truck-mounted GT-16 drill rig equipped with 8-inch diameter hollow-stem augers to investigate the subsurface conditions on May 24, 2024 and May 29, 2024. The borings were drilled to depths ranging from 16.5 feet to 51.5 feet below the existing ground surface (bgs).

Thirteen exploratory test pits (TP-01 through TP-13) were excavated using a backhoe equipped with 24-inch-wide bucket to investigate the subsurface conditions on June 11 and 12, 2024. The test pits were excavated between 4.1 feet and 7.6 feet bgs.

The approximate locations of the current exploratory borings and test pits are shown on Figures No. 2a through 2e, *Approximate Boring, Test Pit, and Overexcavation Location Maps*. A detailed discussion of subsurface exploration is presented in Appendix A, *Field Exploration*.

### *5.3 Laboratory Testing*

Representative samples of the site soils were tested in the laboratory to aid in soil classification, and to evaluate relevant engineering properties. These tests included the following.

- *In-situ* moisture contents and dry densities (ASTM D2216-19 and D2937-17)
- Organic Content (ASTM D2974-20e1, Methods A and C)
- Expansion Index (ASTM D4829-21)
- R-value (California Test 301)
- Soils Corrosivity (CTM 643, 422, 417, 532)
- Collapse (ASTM D4546-21)
- Grain size analysis (ASTM D6913/D6913M-17)
- Maximum dry density and optimum-moisture content (ASTM D1557-12R21)
- Direct shear (ASTM D3080/D3080M-21)
- Consolidation (ASTM D2435/D2435M-11R20)

For *in-situ* moisture and dry density data, see the logs of boring in Appendix A, *Field Exploration*. For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program*.

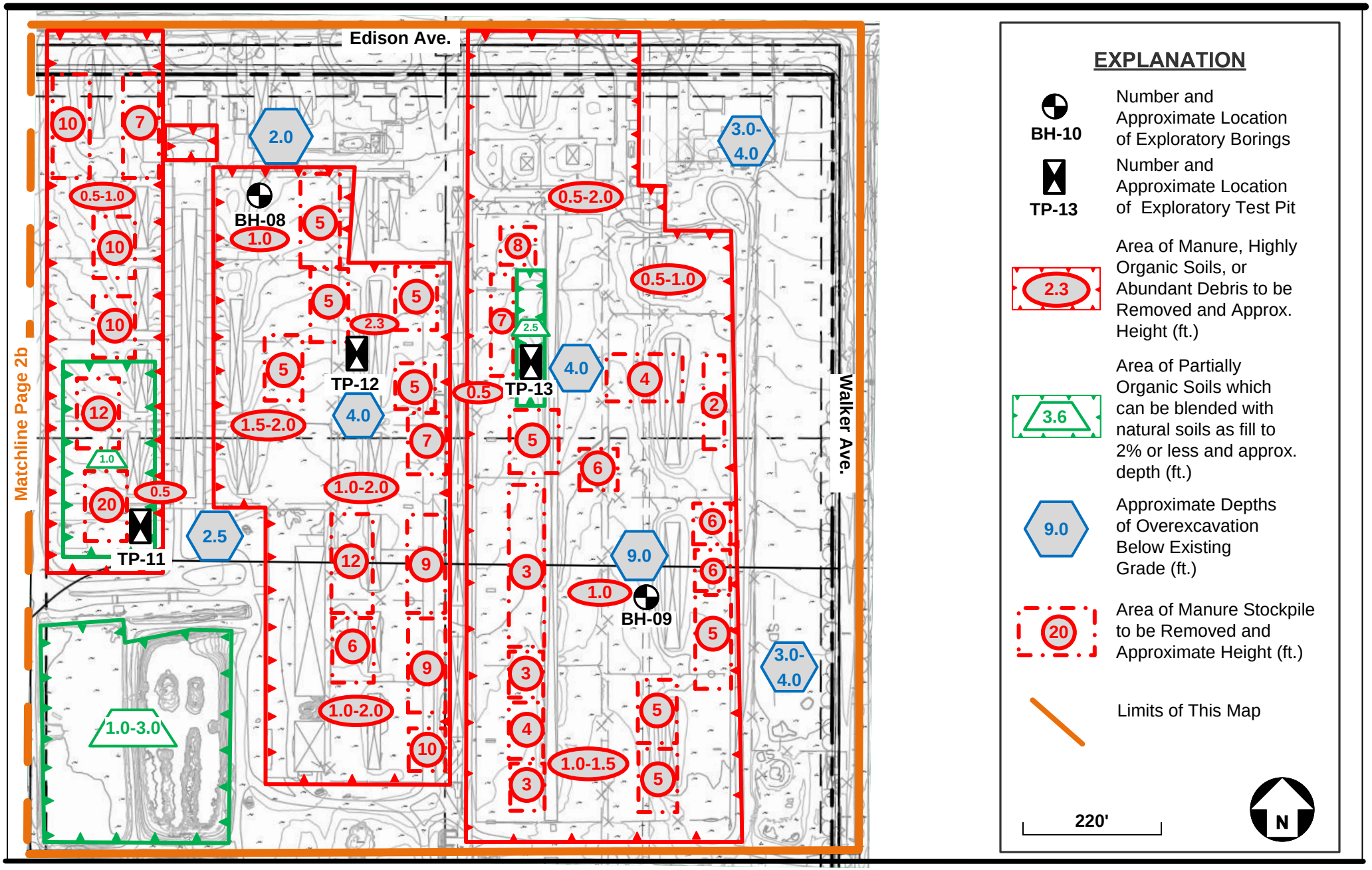


Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2a

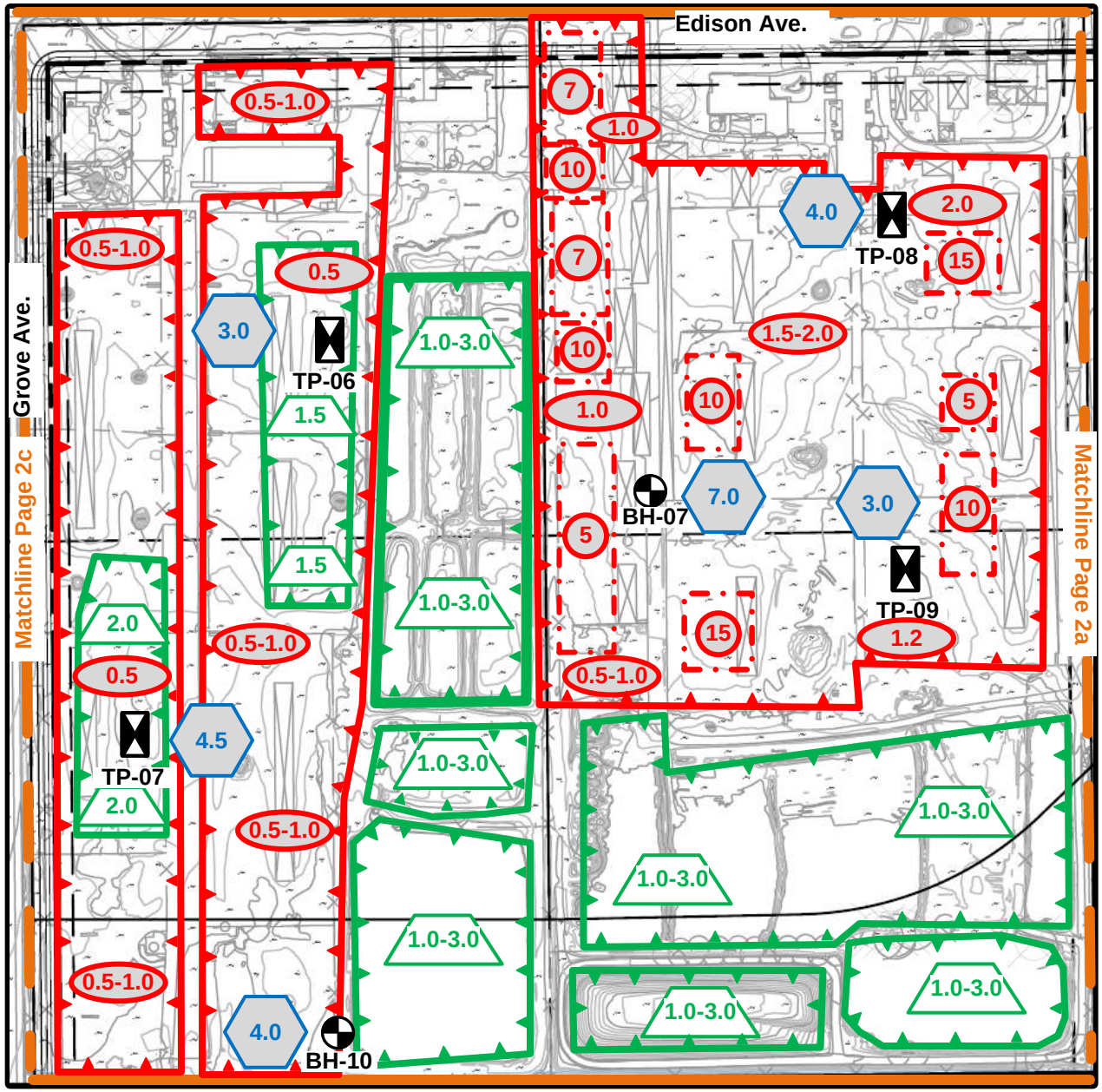


## EXPLANATION

BH-10 — Number and Approximate Location of Exploratory Borings

TP-13 — Number and Approximate Location of Exploratory Test Pit

2.3 — Area of Manure, Highly Organic Soils, or Abundant Debris to be Removed and Approx. Height (ft.)

3.6 — Area of Partially Organic Soils which can be blended with natural soils as fill to 2% or less and approx. depth (ft.)

9.0 — Approximate Depths of Overexcavation Below Existing Grade (ft.)

20 — Area of Manure Stockpile to be Removed and Approximate Height (ft.)

Limits of This Map

220'

N

Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2b

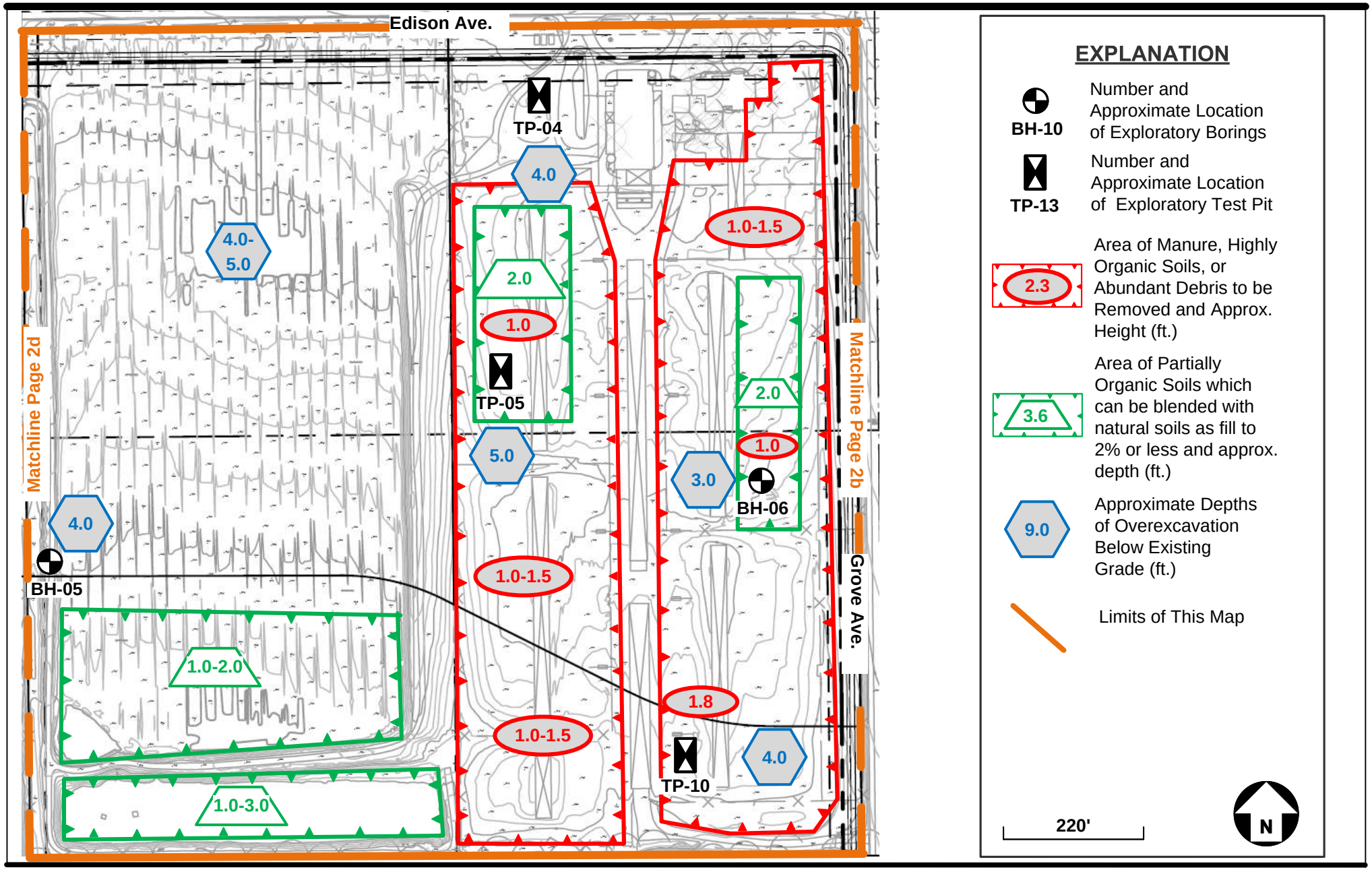


Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2c

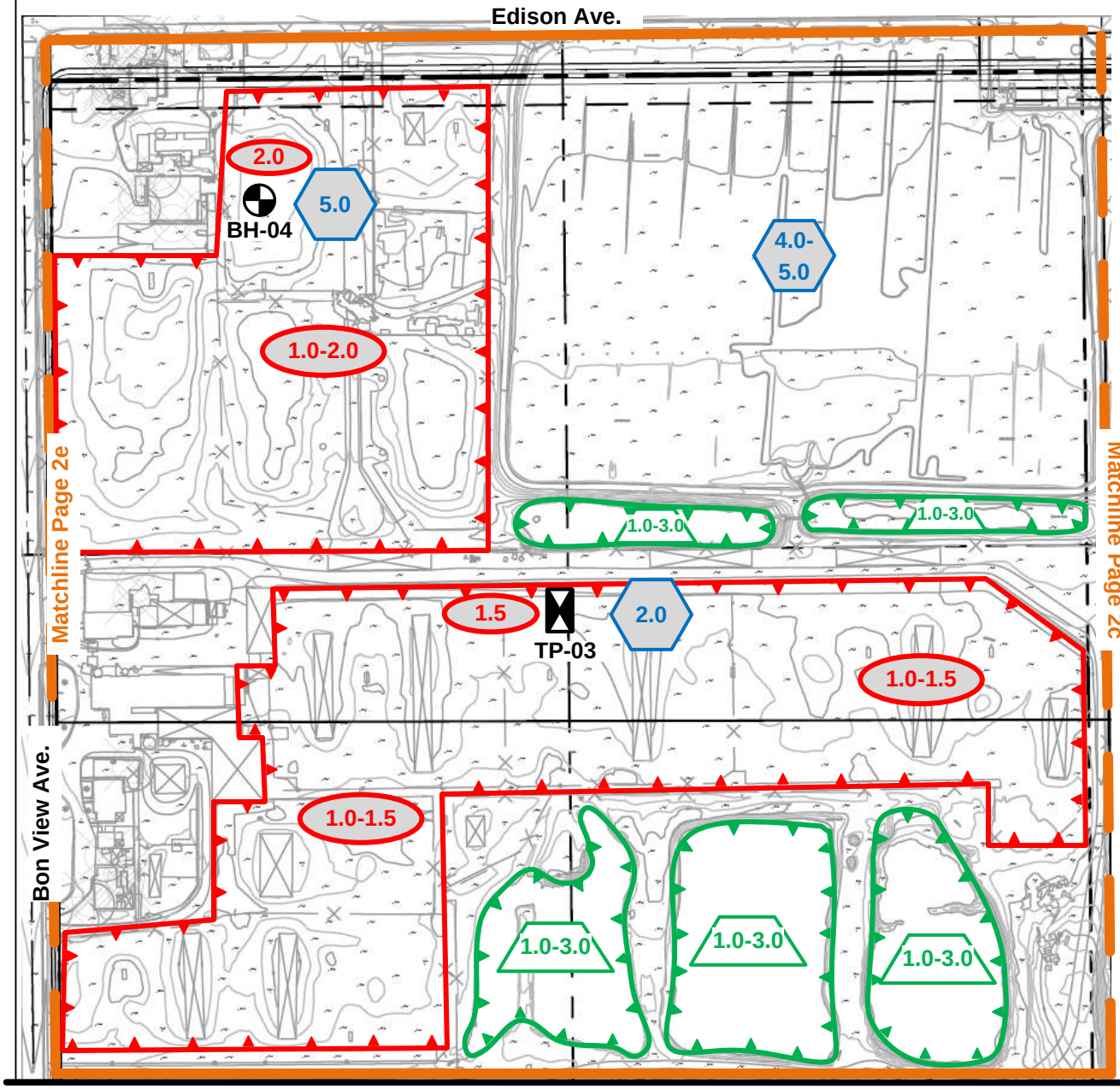


## EXPLANATION

BH-10 — Number and Approximate Location of Exploratory Borings

TP-13 — Number and Approximate Location of Exploratory Test Pit

2.3 — Area of Manure, Highly Organic Soils, or Abundant Debris to be Removed and Approx. Height (ft.)

3.6 — Area of Partially Organic Soils which can be blended with natural soils as fill to 2% or less and approx. depth (ft.)

9.0 — Approximate Depths of Overexcavation Below Existing Grade (ft.)

Limits of This Map

220'

N

Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2d

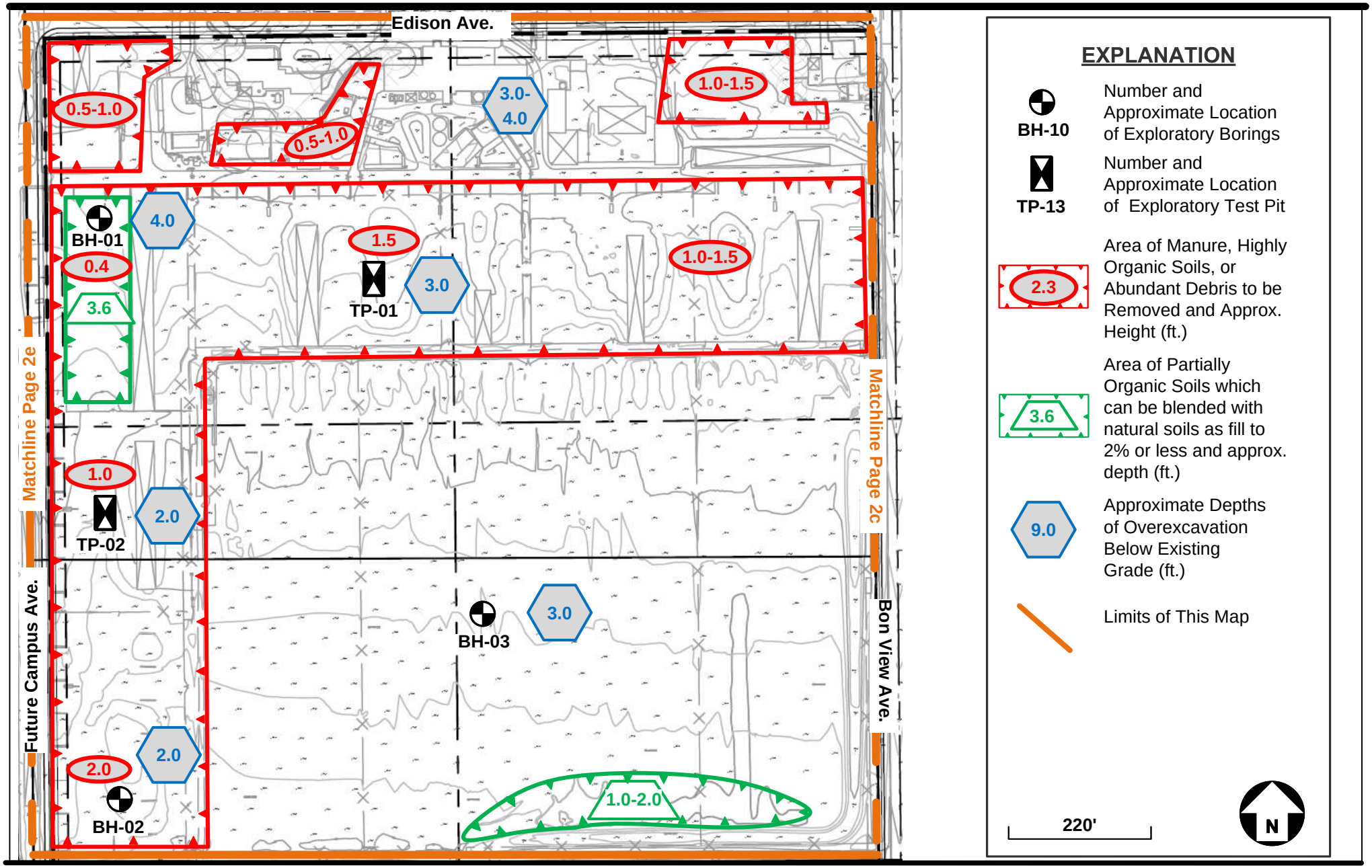


Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2e

### *5.4 Analysis and Report Preparation*

Data obtained from the field exploration and laboratory testing program was assembled and evaluated. Geotechnical analyses of the compiled data were performed, followed by the preparation of this report to present our findings, conclusions, and recommendations for the project.

## 6.0 SITE CONDITIONS

A general description of the subsurface conditions, various materials and groundwater conditions encountered at the site during our field exploration is discussed below.

### *6.1 Subsurface Profile*

Based on our field exploration and laboratory test results, the subsurface soil at the project site consisted primarily of manure, organic artificial fill soil, topsoil and alluvium.

The various subsurface profiles and description of the earth material soils encountered are discussed below.

Manure/Highly Organic Soil: Due to the site being active dairy farms the site is partially covered by generally approximately 0.4 feet to 2.3 foot and locally, within random stockpiles, as much as approximately 3.0 feet to 20.0 feet of manure or highly organic soils. The stockpiles of these materials are located in the eastern portion of the site. This manure and highly organic soils will need to be removed from the site prior to any grading in areas of proposed development. The approximate locations and depth of this material is shown on Figures No. 2a through 2e, *Approximate Boring, Test Pit and Overexcavation Location Maps*.

Artificial Fill Soil: Due to the current dairy and agricultural use the surface of the majority of the project site is generally partially covered by up to approximately 1.0 feet to 9.0 feet of undocumented artificial fill, which is in some areas is partially organic. The partially organic artificial fill is approximately 1.0 feet to 3.6 feet thick. This material was encountered within some of the exploratory excavations and was generally comprised of sandy gravel, silty sand, clayey sand, sandy silt, silt and sandy clay, which was fine to coarse-grained, with trace to few scattered gravel up to 2.0-inches maximum dimension, some localized debris and concrete, some roots and rootlets, locally layered, loose to dense/soft to very stiff, moist and various shades of brown, gray, black, red and orange. The partially organic artificial fill areas were slightly to moderately organic with traces of manure. The approximate locations and depths of the partially organic fill material is shown on Figures No. 2a through 2e, *Approximate Boring, Test Pit and Overexcavation Locations Maps*.

Topsoil: Topsoil was encountered at the surface within some of the exploratory excavations ranging in thickness from approximately 3.0 feet to 4.0 feet bgs. This material was generally comprised of sand and silty sand, which was fine to medium-grained, medium dense to dense, moist and various shades of brown and gray.

Alluvium: Holocene alluvium was encountered below the artificial fill and topsoil in all of the of the exploratory excavations at depths ranging from approximately 1.0 foot to 9.0 feet bgs. Where observed, this material was generally comprised of sand, silty sand, clayey sand, sandy silt, clayey silt and sandy clay, which was fine to coarse-grained, with trace gravel to 1-inch maximum dimension, slightly to very desiccated, some oxidation staining, trace caliche, some pinhole porosity, some scattered carbon, locally micaceous, medium dense to very dense/medium stiff to very stiff, moist and various shades of brown, tan, orange, red, yellow, green and gray. Portions of the upper 0.5 foot to 3.0 feet are weathered and low in density.

For a detailed description of the subsurface materials encountered in the exploratory borings and test pits, see the logs, Drawing Nos. A-2 through A-24, in Appendix A, *Field Exploration.*

### *6.2 Groundwater*

Groundwater was not encountered during our field investigation explored to 51.5 feet.

For comparison, regional groundwater data of available near-by water well information was conducted using the generalized coordinates of 33.9977 N and 117.6193 W were used for the following comparisons.

The GeoTracker database (SWRCB, 2024) was reviewed to evaluate the current and historical groundwater elevation data within a 1.0-mile radius of the project site. A noted active well, named City of Chino Well Number 16/Well #CA3610012_019_019. No groundwater level data was identified in the given well information.

The National Water Information System (USGS, 2024) was reviewed for current and historical groundwater data from sites within an approximately 1.0-mile radius of the project site and no wells with groundwater data were identified.

The California Department of Water Resources database (DWR, 2024) was reviewed for historical groundwater data from sites within a 1.0-mile radius of the project site. One site was identified within a 1.0-mile radius of the project site that contained groundwater elevation data. Details of that record are listed below.

- Well Name CHINO-1208672 (Station 340045N1176407W001), located northwest of the project site, reported groundwater at depths ranging from 137.01 to 145.74 feet bgs between 2011 and 2021.

Based on the available data and the findings of our investigation, the historical high groundwater level and the current groundwater level is estimated to be deeper than approximately 137.0 feet bgs. Groundwater is not expected to be encountered during construction of the proposed project. It should be noted that the groundwater level could vary depending upon the seasonal precipitation and possible groundwater pumping activity in each site vicinity. Perched water layers at depth may be present locally, particularly following high precipitation and irrigation events.

### *6.3 Expansive Soils*

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade. Depending on the extent and location below finish subgrade, expansive soils can have a detrimental effect on structures.

Based on the 2 laboratory tests conducted during this investigation and a previous geotechnical feasibility study by SoCalGeo, the expansion index of the upper 4.0 feet to 5.0 feet of the general site soils was 0 to 12, corresponding to a very low potential.

### *6.4 Collapse Potential*

Soil deposits subjected to collapse/hydro-consolidation generally exist in regions of moisture deficiency. Collapsible soils are generally defined as soils that have potential to suddenly decrease in volume upon increase in moisture content even without an increase in external loads. Moreover, some soils may have a different degree of collapse/hydro-consolidation based on the amount of proposed fill or structure loads. Soils susceptible to collapse/ hydro-consolidation include wind-blown silt, weakly cemented sand, and silt where the cementing agent is soluble (e.g., soluble gypsum, halite), alluvial or colluvial deposits within semi-arid to arid climate, and certain weathered bedrock above the groundwater table.

Granular soils may have a potential to collapse upon wetting in arid climate regions. Collapse/hydro-consolidation may occur when the soluble cements (carbonates) in the soil matrix dissolve, causing the soil to densify from its loose/low density configuration from deposition.

The degree of collapse of a soil can be defined by the collapse potential value, which is expressed as a percentage of collapse of the total sample using the Collapse Potential Test (ASTM D4546-21). According to the ASTM guideline, the severity of collapse potential is commonly evaluated by the following Table No. 1, *Collapse Potential Values*.

**Table No. 1, Collapse Potential Values**

| Collapse Potential Value (%) | Severity of Problem |
|---|---|
| 0 | None |
| 0.1 to 2 | Slight |
| 2.1 to 6.0 | Moderate |
| 6.0 to 10.0 | Moderately Severe |
| >10 | Severe |

Two collapse tests were conducted for this project. Based on the laboratory test result a collapse potential value of 1.6 percent at a depth of 2.0 feet bgs in boring BH-02 was measured. A collapse potential value of 0.2 percent at a depth of 3.0 feet bgs in boring BH-06 was measured. Three consolidation tests were also conducted for this project. No collapse potential value at a depth of 3.0 feet bgs in boring BH-03 was measured. A collapse potential value of 0.2 percent at a depth of 6.0 feet bgs in boring BH-06 was measured. A collapse potential value of 0.1 percent at a depth of 4.0 feet bgs in boring BH-07 was measured. These indicate only a none to slight problem at the site. Collapse potential distress is typically considered a concern when a measured collapse potential value is over 2% (LA County, 2013).

### *6.5 Excavatability*

The subsurface materials of the project are expected to be excavatable by conventional heavy-duty earth moving and trenching equipment.

The phrase “conventional heavy-duty excavation equipment” is intended to include commonly used equipment such as excavators, scrapers, and trenching machines. It does not include hydraulic hammers (“breakers”), jackhammers, blasting, or other specialized equipment and techniques used to excavate hard earth materials. Selection of an appropriate excavation equipment models should be done by an experienced earthwork contractor.

### *6.6 Subsurface Variations*

Based on results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface soil conditions within the project site should be anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations.

### *6.7 Caving*

Caving was not encountered in any of the exploratory borings or test pits. Localized caving may occur in excavations that extend into granular soils that are encountered on-site.

## 7.0 ENGINEERING GEOLOGY

The regional and local geology within the proposed project area is discussed below.

### *7.1 Regional Geology*

The project site is located within the northern Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province consists of a series of northwest-trending mountain ranges and valleys bounded on the north by the San Bernardino and San Gabriel Mountains, on the west by the Los Angeles Basin, and on the south by the Pacific Ocean.

The province is a seismically active region characterized by a series of northwest-trending strike-slip faults. The most prominent of the nearby fault zones include the San Jacinto, Cucamonga, and San Andreas Fault Zones, all of which have been known to be active during Quaternary time.

Topography within the province is generally characterized by broad alluvial valleys separated by linear mountain ranges. This northwest-trending linear fabric is created by the regional faulting within the granitic basement rock of the Southern California Batholith. Broad, linear, alluvial valleys have been formed by erosion of these principally granitic mountain ranges.

The project site is located within the Chino Basin between the Chino Hills to the southwest and San Gabriel Basin to the north. The Elsinore Fault Zone is located approximately four miles south of the project site. This fault is a north to northwest trending reverse fault that dips steeply towards the southwest. The Chino-Central Avenue Fault acts as a groundwater barrier along the western margin of the Chino Basin.

### *7.2 Local Geology*

The project site is primarily underlain by Young alluvial-fan deposits, (Middle Holocene), consisting of slightly to moderately consolidated silt, sand, and coarse-grained sand with some gravel, cobbles and boulders, having slightly to moderately dissected surfaces.

## 8.0 FAULTING AND SEISMICITY

The location of the site with respect to active faults and associated seismicity is discussed below.

### *8.1 Faulting*

The project site is situated in a seismically active region. As is the case for most areas of Southern California, ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site. Review of recent seismological and geophysical publications indicates that the seismic hazard for the project is high.

The project site is not located within a currently mapped State of California or San Bernadino County Earthquake Fault Zone for surface fault rupture.

Table No. 2, *Summary of Regional Faults,* summarizes selected data of known faults capable of seismic activity within 100 kilometers of the project site (coordinate 33.9977 Nand 117.6193 W). The data presented below was calculated using the National Seismic Hazard Maps Database and other published geologic data.

**Table No. 2, Summary of Regional Faults**

| Fault Name and Section | Closest Distance (km) | Slip Sense | Length (km) | Slip Rate (mm/year) | Maximum Magnitude |
|---|---|---|---|---|---|
| Chino, alt 2 | 8.40 | strike slip | 29 | 1 | 6.80 |
| Chino, alt 1 | 8.61 | strike slip | 24 | 1 | 6.70 |
| San Jose | 14.08 | strike slip | 20 | 0.5 | 6.70 |
| Elsinore | 15.95 | strike slip | 241 | n/a | 7.85 |
| Cucamonga | 17.00 | thrust | 28 | 5 | 6.70 |
| Sierra Madre Connected | 17.88 | reverse | 76 | 2 | 7.30 |
| Sierra Madre | 17.88 | reverse | 57 | 2 | 7.20 |
| Puente Hills (Coyote Hills) | 25.54 | thrust | 17 | 0.7 | 6.90 |
| San Jacinto | 28.44 | strike slip | 241 | n/a | 7.88 |
| S. San Andreas | 33.58 | strike slip | 512 | n/a | 8.18 |
| Clamshell-Sawpit | 34.12 | reverse | 16 | 0.5 | 6.70 |
| San Jacinto | 35.30 | strike slip | 196 | n/a | 7.03 |

| Fault Name and Section | Closest Distance (km) | Slip Sense | Length (km) | Slip Rate (mm/year) | Maximum Magnitude |
|---|---|---|---|---|---|
| Cleghorn | 37.57 | strike slip | 25 | 3.0 | 6.80 |
| Puente Hills (Santa Fe Springs) | 37.65 | strike slip | 11 | 0.7 | 6.70 |
| Raymond | 38.90 | strike slip | 22 | 1.5 | 6.80 |
| San Joaquin Hills | 39.21 | thrust | 27 | 0.5 | 7.10 |
| Elysian Park (Upper) | 45.14 | reverse | 20 | 1.3 | 6.70 |
| Puente Hills (LA) | 47.01 | reverse | 22 | 1.3 | 7.00 |
| North Frontal (West) | 47.89 | reverse | 50 | 1.0 | 7.50 |
| Newport-Inglewood, alt 1 | 49.87 | strike slip | 65 | 1.0 | 7.20 |
| Verdugo | 51.57 | reverse | 29 | 0.5 | 6.90 |
| Newport-Inglewood (Offshore) | 52.78 | strike slip | 66 | 1.5 | 7.00 |
| Hollywood | 58.06 | strike slip | 66 | 1.0 | 6.70 |
| Santa Monica Connected alt 2 | 62.69 | strike slip | 93 | 2.4 | 7.40 |
| Palos Verdes | 65.04 | strike slip | 99 | 3 | 7.30 |
| Palos Verdes Connected | 65.04 | strike slip | 285 | 3 | 7.70 |
| Sierra Madre (San Fernando) | 69.75 | thrust | 18 | 2 | 6.70 |
| San Gabriel | 70.60 | strike slip | 71 | 1 | 7.30 |
| Santa Monica, alt 1 | 73.69 | strike slip | 14 | 1 | 6.60 |
| Santa Monica Connected alt 1 | 73.69 | strike slip | 79 | 2.6 | 7.30 |
| Northridge | 78.13 | thrust | 33 | 1.5 | 6.90 |
| Helendale-So Lockhart | 78.63 | strike slip | 114 | 0.6 | 7.40 |
| Pinto Mtn | 83.13 | strike slip | 74 | 2.5 | 7.30 |
| Malibu Coast, alt 1 | 83.82 | strike slip | 38 | 0.3 | 6.70 |
| Malibu Coast, alt 2 | 83.82 | strike slip | 38 | 0.3 | 7.00 |
| Coronado Bank | 84.34 | strike slip | 186 | 3.0 | 7.40 |
| North Frontal (East) | 84.34 | thrust | 27 | 0.5 | 7.00 |
| Anacapa-Dume, alt 2 | 86.28 | thrust | 65 | 3 | 7.20 |
| Santa Susana, alt 1 | 88.62 | reverse | 27 | 5 | 6.90 |
| Holser, alt 1 | 97.52 | reverse | 20 | 0.4 | 6.80 |
| Lenwood-Lockhart-Old Woman Springs | 98.05 | strike slip | 145 | 0.9 | 7.50 |
| Rose Canyon | 98.72 | strike slip | 70 | 1.5 | 6.90 |
| Anacapa-Dume, alt 1 | 99.49 | thrust | 51 | 3.0 | 7.20 |

(Source: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/)

### *8.2 Seismic Design Parameters*

Seismic parameters based on the 2022 California Building Code (CBSC, 2022) and ASCE 7-16 are provided in the following table. These parameters were determined using the coordinate (33.9977N and 117.6193W) and the Seismic Design Maps ATC online tool.

**Table No. 3, CBC Seismic Design Parameters**

| Seismic Parameters | |
|---|---|
| Site Coordinates | 333.9977N and 117.6193W |
| Site Class | D* |
| Risk Category | II |
| Mapped Short period (0.2-sec) Spectral Response Acceleration, $S_s$ | 1.629g |
| Mapped 1-second Spectral Response Acceleration, $S_1$ | 0.585g |
| Site Coefficient (from Table 11.4-1), $F_a$ | 1.000 |
| Site Coefficient (from Table 11.4-2), $F_v$ | 1.700 |
| MCE 0.2-sec period Spectral Response Acceleration, $S_{MS}$ | 1.629g |
| MCE 1-second period Spectral Response Acceleration, $SM_1$ | 1.000g |
| Design Spectral Response Acceleration for short period $S_{DS}$ | 1.086g |
| Design Spectral Response Acceleration for 1-second period, $S_{D1}$ | 0.700g |
| Site Modified Maximum Peak Ground Acceleration, $PGA_M$ | 0.745g |

** Stiff Soil Classification*

### *8.3 Secondary Effects of Seismic Activity*

In general, secondary effects of seismic activity include surface fault rupture, soil liquefaction, landslides, lateral spreading, and settlement due to seismic shaking, tsunamis, seiches, and earthquake-induced flooding. The site-specific potential for each of these seismic hazards is discussed in the following sections.

***Surface Fault Rupture:*** No portion of the project site is located within a currently designated State of California or San Bernadino County Earthquake Fault Zone (CGS, 2007 and San Bernadino County, 2010). The potential for surface rupture resulting from the movement of nearby or distant faults is not known with certainty but is considered very low.

***Liquefaction:*** Liquefaction is defined as the phenomenon in which a cohesionless soil mass within the upper 50 feet of the ground surface suffers a substantial reduction in its shear strength, due to the improvement of excess pore pressures. During earthquakes,

excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction.

Soil liquefaction generally occurs in submerged granular soils and non-plastic silts during or after strong ground shaking. There are several general requirements for liquefaction to occur and they are as follows.

- Soils must be submerged.
- Soils must be loose to medium-dense.
- Ground motion must be intense.
- Duration of shaking must be sufficient for the soils to lose shear resistance.

Based on review of hazard maps, the site is not located within a State of California or San Bernadino County designated zone of liquefaction susceptibility (CGS, 2007; San Bernadino County, 2010). Based on a site-specific settlement analysis presented in Appendix C, *Liquefaction and Settlement Analysis*, and groundwater being deeper than approximately 137 feet bgs we estimate that liquefaction induced settlement of the site is negligible.

***Seismic Settlement***: Dynamic dry settlement may occur in loose, granular, unsaturated soils during a large seismic event. Our analysis of the potential dynamic settlement is presented in Appendix C, Liquefaction and Settlement Analysis. Based on our analysis, we anticipate the site has the potential for up to 1.15 inches of seismically induced settlement. The dynamic differential settlement resulting from dynamic loads is anticipated to be equal to one-half of the total dry seismic settlement over a lateral distance of 40 feet.

***Landslides:*** Seismically induced landslides and slope failures are common occurrences during or soon after large earthquakes. Due to the flat nature of the project site, the potential for seismically induced landslides affecting the pump station is considered to be negligible.

***Lateral Spreading:*** Seismically induced lateral spreading involves primarily lateral movement of earth materials over underlying materials which are liquefied due to ground shaking. It differs from slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. Generally due to the negligible risk for liquefaction and flat nature of project site, the risk of lateral spreading is considered very low.

***Tsunamis:*** Tsunamis are large waves generated in open bodies of water by fault displacement or major ground movement. Due to the inland location of the project site, tsunamis are not considered to be a risk.

***Seiches:*** Seiches are large waves generated in enclosed bodies of water in response to ground shaking. There are no enclosed bodies of water near the project site, therefore, seiching is not considered to be a risk during construction.

***Earthquake-Induced Flooding***: Dams or other water-retaining structures may fail as a result of large earthquakes. The project site is not located within a designated dam inundation area (DSOD, 2024).

# 9.0 LABORATORY TEST RESULTS

Laboratory testing was performed to determine the physical and chemical characteristics and engineering properties of the subsurface soils. Current physical test results are included in Appendix A, *Field Exploration* and Appendix B, *Laboratory Testing Program*. Discussions of the various test results are presented below.

## *9.1 Physical Testing*

- *In-situ* Moisture and Dry Density: *In-situ* dry densities and moisture contents of the site soils were determined in accordance with ASTM Standard D2216-19 and D2937-17. The dry densities of the soils in borings BH-01 to BH-10 ranged from 82 to 139 pounds per cubic foot (pcf) with moisture contents of 3 to 33 percent. The dry density of the manure and highly organic soils in boring BH-01 was 64 pounds per cubic foot (pcf) with a moisture content of 67 percent. Results are presented on the Log of Borings and Test Pits in Appendix A, *Field Exploration.*
- Organic Content: Eight organic content tests were performed during the current geotechnical investigation, in accordance with ASTM Standard D2974-20e1 on representative bulk soil samples. The amount of organic material present in the organic artificial fill soils ranged from 2.1 percent to 12.2 percent and in the undisturbed natural soils ranged from 1.1 percent to 1.9 percent.
- Expansion Index: Two representative bulk soil samples were tested during the current geotechnical investigation of the general site soils to evaluate the expansion potential in accordance with ASTM Standard D4829-21. The test results indicated in both samples returned an expansion index of 0, corresponding to very low expansion potential.
- R-Value: Two representative bulk samples were tested in accordance with Caltrans Test Method 301. The result of the R-value test was 59 and 64.
- Collapse Potential: Two representative samples were tested to determine the collapse potential in accordance with the ASTM Standard D4596. The test results of 0.2 and 1.6 percent correspond to a slight collapse potential.
- Grain Size Analysis: Three representative samples were tested to determine the relative grain size distribution in accordance with the ASTM Standard D6913/D6913M-17. Test results are graphically presented in Drawing No. B-1, *Grain Size Distribution Results.* Based on the test results, soils are typically silty sand.

- Maximum Dry Density and Optimum Moisture Content: Two typical moisture-density relationships of representative soil samples were tested, in accordance with ASTM Standard D1557-12R21, with the results presented in Drawing No. B-2, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program.* The laboratory maximum dry densities were 117.5 and 118.6 pounds per cubic feet (pcf), with optimum moisture contents of 11.1 and 12.7 percent, respectively.
- Direct Shear: Three direct shear tests were performed in accordance with ASTM Standard D3080/D3080M-23. The results of the direct shear tests are presented in Drawing Nos. B-3 through B-5, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.
- Consolidation Test: Three consolidation tests were performed on relatively undisturbed samples of the site soil, in accordance with ASTM Standard D2435/D2435-11R20. The test results also indicated a collapse potential of 0.0 and 0.3 percent, which corresponds to a none to slight collapse potential. The test results are shown on Drawing No. B-6 through B-8, *Consolidation Test Results,* in Appendix B, *Laboratory Testing Program.*

### *9.2 Chemical Testing - Corrosivity Evaluation*

One representative soil sample was tested during the current geotechnical investigation within site to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of site soils when placed in contact with common pipe materials. The current test was performed by Keegan Labs, LLC (Pomona, CA) in accordance with California Test Methods 643, 422, and 417. The current and previous test results are presented in Appendix B, *Laboratory Testing Program and* are summarized in below*.*

- The pH measurement of the sample tested ranged was 6.7.
- The sulfate contents of the sample tested was 90 ppm (0.0090 percent by weight).
- The chloride concentration of the sample tested was 25 ppm.
- The minimum electrical resistivity when saturated was 4,620 ohm-cm.

## 10.0 EARTHWORK AND SITE GRADING RECOMMENDATIONS

Earthwork for the project will include grading, trench excavation, pipe subgrade preparation, pipeline bedding placement and trench backfill, as well as roadway pavement construction. Recommendations for earthwork are presented in the following subsections. General Earthwork Specifications are presented in Appendix D*, Earthwork Specifications.*

### *10.1 General*

This section contains our general recommendations regarding earthwork for the proposed medium density residential and mixed use Sares Regis North development in the City of Ontario, San Bernardino County, California.

These recommendations are based on the results of our field exploration and laboratory testing as well as our experience with similar projects, and data evaluation as presented in the preceding sections. These recommendations may require modification by the geotechnical consultant based on observation of the actual field conditions during remedial grading.

Prior to the start of construction, all underground existing utilities and appurtenances should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing structures or utilities.

All existing structures, debris, deleterious material and surficial soils containing roots and perishable materials should be stripped and removed from the project site. Deleterious material, including manure, significant organics, highly organic disturbed fill soils, concrete, and debris generated during excavation, should not be placed as fill.

It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.

### *10.2 Private Sewage System Abandonment*

From a geotechnical standpoint, any seepage pits, other private sewage systems, and/or other subsurface structures that may be encountered should be located, mapped on the grading plans, removed and/or properly abandoned. Abandonment and/or removal of septic systems that may exist should be in accordance with local codes and recommendations by Converse. Seepage pits, if abandoned in-place, should be pumped clean, backfilled with gravel or clean sand jetted into place, and then capped with a minimum of 2 feet of a 2-sack or greater slurry or concrete for a minimum distance of 2 feet outside the edge of the seepage pit. The top of the slurry or concrete cap should be at a minimum 10 feet below the proposed grade.

### *10.3 Overexcavation*

The site is generally underlain by approximately 1.5 feet to 5.0 feet of potentially compressible soils (artificial fill, topsoil and the upper low-density portions of the alluvium), and locally as much as 7.0 feet to 9.0 feet, which may be prone to future settlement under the surcharge of foundation, improvements and/or fill loads. Therefore, these materials should be over-excavated to competent alluvium, within all areas of proposed structures and other improvements, and replaced with compacted fill soils. Within the entire level

portions of the building pad areas, over-excavations should also extend at least 5.0 feet below proposed pad grade, or at least 3.0 feet below the lowest proposed footings, within the proposed building areas, whichever is deeper. Within any proposed wall footings areas over-excavation should also be a minimum of 5.0 feet below proposed pad grade or 2.0 feet below the proposed wall footings areas, whichever is deeper. All over-excavations should extend at least 5.0 feet or equal to the depth of over-excavation, whichever is greater, outside the entire level portions of the building pad area.

The final bottom surfaces of all excavations should be observed and approved by the project geotechnical consultant prior to placing any fill or structures. However, localized, deeper over-excavation could be encountered, based on findings observations and field testing by the geotechnical consultant during grading of the final bottom surfaces of all excavations, prior to any scarification.

The estimated locations and approximate depths of over-excavation of unsuitable, compressible soil materials are indicated on Figures No. 2a through 2e, *Approximate Boring, Test Pit and Overexcavation Location Maps*.

If isolated pockets of very soft, loose, eroded, or pumping soil are encountered, the unstable soil should be excavated as needed to expose undisturbed, firm, and unyielding soils.

The contractor should determine the best manner to conduct the excavations, such that there are no losses of bearing and/or lateral support to the existing structures or utilities (if any).

Areas to receive fill and/or other surface improvements should be scarified to a minimum depth of 6 inches, brought to a near-optimum moisture condition, and recompacted to at least 90 percent relative compaction (based on ASTM Test Method D1557-12R21).

### *10.4 Cut and Shallow Fill Under Building Pad Areas*

Fill building pads with shallow cut and fill areas should be capped with a minimum of 5.0 feet of engineered structural fill, so that all footings for structures and walls are founded into engineered fill with a minimum of 3.0 feet of fill below footings for proposed structures and 2.0 feet below footings for proposed walls. Over-excavation should extend to the entire level portions of the building pad area with proposed structures or walls, to the depth of fill.

### *10.5 Cut/Fill Transition and Fill Differentials*

To mitigate distress to structures related to the potential adverse effects of excessive differential settlement, cut/fill transitions should be eliminated from all level portions of the building pad areas. This should be accomplished by overexcavating the entire "cut" portion of the building pad area by at least 5.0 feet below proposed grade and replacing the excavated materials as properly compacted fill, so that all footings for structures and walls are founded into engineered fill with a minimum of 3.0 feet of fill below footings for proposed structures and 2.0 feet below footings for proposed walls. Recommended depths of over-excavation are provided in the following table.

**Table No. 4, Overexcavation Depth for Cut/Fill Transitions**

| Depth of Fill ("Fill" Portion) | Depth of Overexcavation ("Cut" Portion) |
|---|---|
| Up to 5.0 feet | 5.0 feet |
| Greater than 5.0 feet | One-third the maximum thickness of fill placed on the "fill" portion (15 feet maximum) |

### *10.6 Engineered Fill*

No fill should be placed until excavations and/or natural ground preparation have been observed by the geotechnical consultant. The native soils encountered within the project sites are generally considered suitable for re-use as compacted fill. Excavated soils should be processed, including removal of roots and debris, removal of oversized particles, mixing, and moisture conditioning, before placing as compacted fill. On-sites soils used as fill should meet the following criteria.

- No particles larger than 8 inches in largest dimension.
- Rocks larger than 4 inches should not be placed within the upper 12 inches of subgrade soils.
- Free of all significant organic matter, debris, or other deleterious material.
- Expansion index of 20 or less.
- Sand Equivalent greater than 15 (greater than 30 for pipe bedding).
- Contain less than 30 percent by weight retained in 3/4-inch sieve.
- Contain less than 45 percent fines (passing #200 sieve).

Based on field investigation and laboratory testing results, on-sites soils may be suitable as fill materials.

Imported materials, if required, should meet the above criteria prior to being used as compacted fill. Any imported fills should be tested and approved by geotechnical representative at least 72 hours prior to delivery to the site.

### *10.7 Organic Content*

Based on the current and previous laboratory test results of the approximately the upper 1.0 foot to 3.7 feet of the partially organic fill soils on portions of the site has about 2.1 percent to 10.3 percent of organic content. This would be an average organic content of about 5.3 percent, for an average depth of approximately 2.0 feet, in the subject areas. Laboratory testing also indicated that generally the undisturbed natural soils below these depths (alluvium) had natural organic contents of about 1.1 percent to 2.4 percent. This would be an average organic content of about 1.9 percent. Therefore, these partially organic should be blended with undisturbed natural soils or removed from the site.

Fill materials should contain no more than 2 percent overall organics. The partially organic soils can be blended with the on-site natural soils at a ratio of at least 3 to 1 (natural soils/clean imported soils to partially organic soils) and placed as compacted fill, provided they are completely mixed during fill placement. The type of equipment and method of placement; blending and mixing of the partially organic materials with onsite natural soils or clean imported soils to be utilized by the grading contractor, should be reviewed and accepted by the geotechnical consultant prior to implementation. A possible method of placement that could be considered would be to place the partially organic materials at an angle to the pattern of the placement of the onsite natural soils or clean imported soils. The testing frequency for verifying the percent organic content should be established by the geotechnical consultant prior to fill placement once the method of blending, placement, and mixing of the partially organic materials with onsite natural soils or clean imported soils. The estimated locations and approximate depths of partially organic to be removed from the site or blended are also indicated on Figures No. 2a through 2e, *Approximate Boring, Test Pit and Overexcavation Location Maps*.

### *10.8 Compacted Fill Placement*

All surfaces to receive structural fills should be scarified to a depth of 12 inches. The soil should be moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils. The scarified soils should be recompacted to at least 90 percent of the laboratory maximum dry density.

Fill soils should be thoroughly mixed, and moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils. Fill soils should be evenly spread in horizontal lifts not exceeding 8 inches in uncompacted thickness.

Fill soils should be thoroughly mixed, and moisture conditioned to at least 0 to 2 percent above optimum moisture content. Fill soils should be evenly spread in horizontal lifts not exceeding 8 inches in uncompacted thickness.
All fill placed at the site should be compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Standard D1557-12R21 test method unless a higher compaction is specified herein. The upper 12 inches of subgrade soils

underneath pavements intended to support vehicle loads should be scarified, moisture conditioned, and compacted to at least 95 percent of the laboratory maximum dry density.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

Observations and field tests should be performed by the project soils consultant to confirm that the required degree of compaction has been obtained. Where compaction is less than specified, additional compactive effort should be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.

Additional expansion index and corrosion testing should be completed after all fill has been placed and compacted at the site in order to confirm the soil properties and revise the foundation design parameters if necessary.

### *10.9 Backfill Recommendations Behind Walls*

Compaction of backfill adjacent to retaining walls, which may be proposed, can produce excessive lateral pressures. Improper types and locations of compaction equipment and/or compaction techniques may damage the walls. The use of heavy compaction equipment should not be permitted within a horizontal distance of 5 feet from the wall. Backfill behind any structural walls within the recommended 5-foot zone should be compacted using lightweight construction equipment such as handheld compactors to avoid overstressing the walls.

### *10.10 Shrinkage and Subsidence*

The volume of excavated and recompacted soils will decrease as a result of grading. The shrinkage would depend on, among other factors, the depth of cut and/or fill, and the grading method and equipment utilized. Based on our exploration as well as previous experience in the other projects in close vicinity of this site, for the preliminary estimation, shrinkage factors for various units of earth material at the site may be taken as presented below.

- The shrinkage factor (defined as a percentage of soil volume reduction when moisture conditioned and compacted to the average of 92 percent relative compaction) for the upper 15 feet of soils is estimated to range from approximately 1 to 24 percent. An average value of 3 percent to 8 percent may be used for preliminary earthwork planning.
- Subsidence (defined as the settlement of native materials from the equipment load applied during grading and proposed fill loads) would depend on the construction methods including type of equipment utilized. Ground subsidence is estimated to be approximately 0.20 foot to 0.25 foot.

Although these values are only approximate, they represent our best estimates of the factors to be used to calculate lost volume that may occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field-testing using the actual equipment and grading techniques be conducted.

### *10.11 Site Drainage*

Adequate positive drainage should be provided away from the structures and excavation areas to prevent ponding and to reduce percolation of water into the foundation soils. A desirable drainage gradient is 1 percent for paved areas and 2 percent for landscaped areas. Surface drainage should be directed to suitable non-erosive devices.

### *10.12 Utility Trench Backfill*

The following sections present earthwork recommendations for utility trench backfill, including subgrade preparation and trench zone backfill.

Open cuts adjacent to existing roadways or structures are not recommended within a 1:1 (horizontal: vertical) plane extending down and away from the roadway or structure perimeter (if any).

Soils from the trench excavation should not be stockpiled more than 6 feet in height or within a horizontal distance from the trench edge equal to the depth of the trench. Soils should not be stockpiled behind the shoring, if any, within a horizontal distance equal to the depth of the trench, unless the shoring has been designed for such loads.

#### 10.12.1 Pipeline Subgrade Preparation

The final subgrade surface should be level, firm, uniform, and free of loose materials and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles larger than 2 inches in dimension, if any, should be removed from the trench bottom and replaced with compacted on-site materials.

Any loose, soft and/or unsuitable materials encountered at the pipe subgrade should be removed and replaced with an adequate bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom as near its full length as is practicable.

### 10.12.2 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 1 foot above the pipe. Recommendations for pipe bedding are provided below.

To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. The pipe designer should determine if the soils are suitable as pipe bedding material.

The type and thickness of the granular bedding placed underneath and around the pipe, if any, should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe.

Bedding materials should be vibrated in-place to achieve compaction. Care should be taken to densify the bedding material below the spring line of the pipe. Prior to placing the pipe bedding material, the pipe subgrade should be uniform and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom as near its full length as is practicable.

Based on the design groundwater depth, migration of fines from the surrounding native and/or fill soils may not be considered in selecting the gradation of any imported bedding material.

### 10.12.3 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. Excavated sites soil free of oversize particles and deleterious matter may be used to backfill the trench zone. Detailed trench backfill recommendations are provided below.

- Trench excavations to receive backfill should be free of trash, debris or other unsatisfactory materials at the time of backfill placement.
- Trench zone backfill should be compacted to at least 90 percent of the laboratory maximum dry density as per ASTM D1557-12R21 test method. At least the upper 1 foot of trench backfill underlying pavement should be compacted to at least 95

percent of the laboratory maximum dry density as per ASTM D1557-12R21 test method.

- Particles larger than 1 inch should not be placed within 12 inches of the pavement subgrade. No more than 30 percent of the backfill volume should be larger than ¾-inch in the largest dimension. Gravel should be well mixed with finer soil. Rocks larger than 3 inches in the largest dimension should not be placed as trench backfill.
- Trench backfill should be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers or mechanical tampers to achieve the density specified herein. The backfill materials should be brought to within ± 3 percent of optimum moisture content for coarse-grained soil, and between optimum and 2 percent above optimum for fine-grained soil, then placed in horizontal layers. The thickness of uncompacted layers should not exceed 8 inches. Each layer should be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.
- The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, structures, utilities and completed work.
- It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.
- The field density of the compacted soil should be measured by the ASTM D1556 (Sand Cone) or ASTM D6938 (Nuclear Gauge) or equivalent.
- Trench backfill should not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations should not resume until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are in compliance with project specifications.

# 11.0 DESIGN RECOMMENDATIONS

Design recommendations for the structures are provided in the following section.

## *11.1 General Evaluation*

The various design recommendations provided in this section are based on the laboratory testing as well as the assumption that in preparing the site, the earthwork recommendations provided in this report will be implemented.

### *11.2 Preliminary Shallow Foundation Design Parameters*

The proposed one- and two-story concrete tilt up buildings and possible retaining walls may be supported on continuous or isolated spread footings founded completely within competent compacted fill. The design of the shallow foundations should be based on the recommended parameters presented in the table below.

**Table No. 5, Recommended Foundation Parameters**

| Parameter | 1-Story Value | 2-Story Value |
|---|---|---|
| Minimum continuous width (interior and exterior) | 12 inches | 15 inches |
| Minimum continuous or isolated footing depth of embedment below lowest adjacent grade (interior and exterior) | 15 inches | 18 inches |
| Allowable net bearing capacity | 3,000 psf | 3,300 psf |

The isolated interior and exterior footings should be at least 24 inches wide. The footing dimensions and reinforcement should be based on structural design. The allowable bearing capacity can be increased by 500 pounds per square foot (psf) with each foot of additional embedment and 100 psf with each foot of additional width up to a maximum of 4,000 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity. If normal code requirements are applied for design, the above vertical bearing value may be increased by 33 percent for short duration loadings, which will include loadings induced by wind or seismic forces.

### *11.3 Lateral Earth Pressures and Resistance to Lateral Loads*

In the following subsections, the lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils strength parameters obtained from laboratory testing.

#### 11.3.1 Active Earth Pressures

The active earth pressure behind any buried walls or foundation depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall or foundation inclination, surcharges, and any hydrostatic pressures. The lateral earth pressures for the project site are presented in the following table.

**Table No. 6, Active and At-Rest Earth Pressures**

| Loading Conditions | Lateral Earth Pressure[1] (psf) | Lateral Earth Pressure[2] (psf) |
|---|---|---|
| | Level backfill | 2:1 backfill |
| Active earth conditions (wall is free to deflect at least 0.001 radian) | 40 | 65 |
| At-rest (wall is restrained) | 60 | 110 |

These pressures assume no surcharge and no hydrostatic pressure. If water pressure is allowed to build up behind the structure, the active pressures should be reduced by 50 percent and added to a full hydrostatic pressure to compute the design pressures against the structure.

### 11.3.2 Passive Earth Pressure

Resistance to lateral loads can be assumed to be provided by a combination of friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.35 between formed concrete and soil may be used with the dead load forces. An allowable passive earth pressure of 240 psf per foot of depth may be used for the sides of footings poured against recompacted soils. A factor of safety of 1.5 was applied in calculating passive earth pressure. The maximum value of the passive earth pressure should be limited to 2,400 psf for compacted fill.

Vertical and lateral bearing values indicated above are for the total dead loads and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing and lateral resistance values may be increased by 33 percent for short duration loading, which will include the effect of wind or seismic forces.

Due to the low overburden stress of the soil at shallow depth, the upper 1 foot of passive resistance should be neglected unless the soil is confined by pavement or slab.

## *11.4 Retaining Walls Drainage*

The recommended lateral earth pressure values do not include lateral pressures due to hydrostatic forces. Therefore, wall backfill should be free draining and provisions should be made to collect and dispose of excess water that may accumulate behind earth retaining structures. Behind wall drainage may be provided by free-draining gravel surrounded by synthetic filter fabric or by prefabricated, synthetic drain panels or weep holes. In either case, drainage should be collected by perforated pipes and directed to a sump, storm drain, or other suitable location for disposal. We recommend drain rock should consist of durable stone having 100 percent passing the 1-inch sieve and less than 5 percent passing the No. 4 sieve. Synthetic filter fabric should have an equivalent opening size (EOS), U.S. Standard Sieve, of between 40 and 70, a minimum flow rate of

110 gallons per minute per square foot of fabric, and a minimum puncture strength of 110 pounds.

### *11.5 Slabs-on-Grade*

Slabs-on-grade should be supported on properly compacted fill. Compacted fill used to support slabs-on-grade should be placed and compacted in accordance with Section 10.8 *Compacted Fill Placement*.

Slabs should be designed and constructed as promulgated by the American Concrete Institute (ACI) and the Portland Cement Association (PCA). Care should be taken during concrete placement to avoid slab curling. Prior to the slab pour, all utility trenches should be properly backfilled and compacted.

Concrete floors should be underlain with a moisture-vapor retarder consisting of a 10-mil thick vapor barrier. Laps within the membrane should be sealed and overlapped at least 6 inches. Two inches or more of clean sand should be placed above and below the membrane. These recommendations must be confirmed (and/or modified) by the foundation engineer with our concurrence, based upon the performance expectations of the foundation. It is the responsibility of the contractor to ensure that the moisture/vapor barrier systems are placed in accordance with the project plans and specifications, and that the moisture/vapor retarder materials are free of tears and punctures prior to concrete placement. Additional moisture reduction and/or prevention measures may be needed, depending on the performance requirements of future interior floor coverings.

In hot weather, the contractor should take appropriate curing precautions after placement of concrete to minimize cracking or curling of the slabs. The potential for slab cracking may be lessened by the addition of fiber mesh to the concrete and/or control of the water/cement ratio (maximum 0.45).

Concrete should be cured by protecting it against loss of moisture and rapid temperature change for at least 7 days after placement. Moist curing, waterproof paper, white polyethylene sheeting, white liquid membrane compound, or a combination thereof may be used after finishing operations have been completed. The edges of concrete slabs exposed after removal of forms should be immediately protected to provide continuous curing.

### *11.6 Expansion Potential*

Based on the results of the current and previous expansion testing of representative site soils, the general on-site soils have an expansion index of 0 to 12 for an expansion potential of **Very Low.**

The expansion indices of the final finish-grade soils will vary from the results obtained during our current and previous investigations. The expansion potential of the finish-grade soils should be tested at the completion of grading.

### 11.6.1 Very Low Expansion Potential

The following are additional recommendations where foundation soils exhibit **Very Low** expansion potential (E.I. of 0 to 20) as classified in accordance with 2022 CBC.

Slabs-on-grade should have a minimum thickness of 5 inches for support of nominal live loads and reinforced with No. 3 bars spaced 24 inches or less on-centers, both ways. Slab reinforcement should be supported on concrete chairs so that the desired placement is properly placed by the design engineer. Structural design elements of slabs-on-grade, including but not limited to thickness, reinforcement, joint spacing of more heavily loaded slabs will be dependent upon the anticipated loading conditions and the modulus of subgrade reaction (200 kcf) of the supporting materials and should be designed by a structural engineer.

Subgrade for slabs-on-grade should be firm and uniform. All loose or disturbed soils including under-slab utility trench backfill should be recompacted. Prior to placing concrete, the subgrade soils below all floor slabs should be pre-watered to achieve a moisture content that is equal to 100% of the optimum moisture content of the subgrade soils. The moisture content should penetrate to a minimum depth of 12 inches. This should promote uniform curing of the concrete and minimize the development of shrinkage cracks.

## *11.7 Settlement*

The total settlement of shallow footings, designed as recommended above, from static structural loads and short-term settlement of properly compacted fill is anticipated to be 0.35 inch or less. The static differential settlement can be taken as equal to one-half of the static total settlement over a lateral distance of 40 feet.

Our analysis of the potential dynamic settlement is presented in Appendix C, *Liquefaction and Settlement Analysis*. Based on our analysis, we anticipate the reservoir site has the potential for up to 1.15 inches of dry seismic settlement and negligible liquefaction induced settlement. The differential dry seismic settlement resulting from dynamic loads is anticipated to be equal to one-half of the total dry seismic settlement over a lateral distance of 40 feet. The structural engineer should consider this in the design.

## *11.8 Pipe Design for Underground Utilities*

The structural design of pipes requires proper evaluation of all possible loads acting on pipes. The stresses and strains induced on buried pipes depend on many factors, including the type of soil, density, bearing pressure, angle of internal friction, coefficient

of passive earth pressure, and coefficient of friction at the interface between the backfill and native soils. The recommended values of the various soil parameters for the pipe design are provided in Table No. 7, *Soil Parameters for Pipe Design*.

Where pipes are connecting to rigid structures near, or at its lower levels, and then are subjected to significant loads as the backfill is placed to finish grade, we recommend that provisions be incorporated in the design to provide support of these pipes where they exit the structure. Consideration can be given to flexible connections, concrete slurry support beneath the pipes where they exit the structures, overlaying and supporting the pipes with a few inches of compressible material, (i.e., Styrofoam, or other materials), or other techniques. Automatic shutoffs should be installed to limit the potential leakage from seismic event related damage.

**Table No. 7, Soil Parameters for Pipe Design**

| Soil Parameters | Parameters |
|---|---|
| Total unit weight of compacted backfill (assuming 92% average relative compaction), $\gamma$ | 123 pcf |
| Angle of internal friction of soils, $\phi$ | 29º |
| Soil cohesion, c | 136 psf |
| Coefficient of friction between concrete and native soils, fs | 0.35 |
| Coefficient of friction between pipe and native soils, fs | 0.25 for metal or HDPE pipe<br>0.30 for CML&C pipe |
| Bearing pressure against Compacted Fill or Natural Soils | 3,000 psf |
| Coefficient of passive earth pressure, Kp | 1.86 |
| Coefficient of active earth pressure, Ka | 0.54 |
| Modulus of Soil Reaction, E’ | 1,500 psi |

### *11.9 Soil Corrosivity*

The results of current and previous chemical testing of representative site soils with respect to common construction materials such as concrete and steel are presented in Appendix B, *Laboratory Testing Program*, and a general discussion are presented below.

The sulfate contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category S0 for these sulfate concentrations (ACI 318-19, Table 19.3.1.1). No concrete type restrictions are specified for exposure category S0 (ACI 318-19, Table 19.3.2.1). A minimum compressive strength of 2,500 psi is recommended.

We anticipate that concrete will be exposed to moisture from precipitation and irrigation. Based on the project location and the results of chloride testing of the soils, we do not anticipate that concrete structures will be exposed to external sources of chlorides, such

as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-19, Table 19.3.1.1). ACI provides concrete design recommendations in ACI 318-19, Table 19.3.2.1, including a compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent.

The measured values of the minimum electrical resistivities of the samples when saturated were between 1,360 and 4,620 Ohm-cm. This indicates that the soils tested are moderately corrosive to corrosive to ferrous metals in contact with the soils (Keegan, 2024). Converse does not practice in the area of corrosion consulting. If needed, a qualified corrosion consultant should provide appropriate corrosion mitigation measures for any ferrous metals in contact with the site and site soils.

According to Keegan Labs LLC, 2024, the following tables provide general guidelines of soil corrosion based on electrical resistivity, sulfates, chlorides and pH.

**Table No. 8a, Correlation Between Resistivity and Corrosion**

| Electrical Resistivity of Soil | |
|---|---|
| **Soil Resistivity (ohm-cm) per Caltrans CT 643** | **Corrosivity Category** |
| Greater than 10,000 | Mildly Corrosive |
| 2,001 to 10,000 | Moderately Corrosive |
| 1,001 to 2,000 | Corrosive |
| 0 to 1,000 | Severe Corrosive |

**Table No. 8b, Correlation Between Sulfates and Corrosion**

| Sulfate in Soil per ACI 318 | |
|---|---|
| **Sulfate Level (mg/kg)** | **Classification** |
| Less than 1,000 (<0.1%) | Negligible |
| 1,000 to 2,000 (0.1 to 0.2%) | Moderate |
| 2,000 to 20,000 (0.2 to 2.0%) | Severe |
| Over 20,000 (>2.0%) | Very Severe |

**Table No. 8c, Correlation Between Chlorides and Corrosion**

| Chloride in Soil per ACI 318 | |
|---|---|
| **Concentration (mg/kg)** | **Classification** |
| ND to 100 | Negligible |
| 100 to 350 | Little Added Concern |
| 350 to 500 | Potential Concern |
| Over 500 | Definite Concern |

**Table No. 8d, Correlation Between pH and Corrosion**

| pH | |
|---|---|
| **pH Range** | **Description** |
| <3.5 | Ultra Acidic |
| 3.5 to 4.4 | Extremely Acidic |
| 4.5 to 5.0 | Very Strongly Acidic |
| 5.1 to 5.5 | Strongly Acidic* |
| 5.6 to 6.0 | Moderately Acidic |
| 6.1 to 6.5 | Slightly Acidic |
| 6.6 to 7.3 | Neutral |
| 7.4 to 7.8 | Slightly Alkaline |
| 7.9 to 8.4 | Moderately Alkaline |
| 8.5 to 9.0 | Strongly Alkaline |
| >9.0 | Very Strongly Alkaline |

*This range and below should have total acidity testing performed to evaluate corrosivity.

### *11.10 Asphalt Concrete Pavement*

Two soil samples were tested by Converse to determine the R-value of the subgrade soils. Based on laboratory testing, the R-values were 59 and 64. For pavement design, we have utilized a maximum design R-value of 50, and City of Ontario designated design Traffic Indices (TIs) ranging from 5.0 to 10.0.

Based on the above information, asphalt concrete and aggregate base thickness results are presented using the Caltrans Highway Design Manual (Caltrans, 2020), Chapter 630 with a safety factor of 0.2 for asphalt concrete/aggregate base section and 0.1 for full depth asphalt concrete section. Preliminary asphalt concrete pavement sections are presented in the following table below. The city of Ontario minimum asphalt pavement and aggregate base thickness requirements were also considered in the pavement designs.

**Table No. 9, Recommended Preliminary Pavement Sections**

| R-value | Traffic Index (TI) | Pavement Section | | |
|---|---|---|---|---|
| | | Option 1 | | Option 2 |
| | | Asphalt Concrete (inches) | Aggregate Base (inches) | Full AC Section (inches) |
| 50 | 5.0 (alleys) | 4.0 | 6.0 | 4.5 |
| | 5.5 (interior street) | 4.0 | 6.0 | 5.0 |
| | 8.0 (exterior street) | 6.0 | 8.0 | 8.0 |
| | 10.0 (exterior street) | 7.0 | 8.0 | 10.0 |

At or near the completion of grading, subsurface samples should be tested to evaluate the actual subgrade R-value for final pavement design.

Prior to placement of aggregate base, at least the upper 12 inches of finish grade should be scarified, moisture-conditioned if necessary, and recompacted to at least 95 percent of the laboratory maximum dry density as defined by ASTM Standard D1557-12R21 test method. Base materials should conform with Section 200-2.2,"*Crushed Aggregate Base*," of the current Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2021) and should be placed in accordance with Section 301.2 of the SSPWC.

Asphaltic concrete materials should conform to Section 203 of the SSPWC and should be placed in accordance with Section 302-5 of the SSPWC.

### *11.11 Concrete Flatwork*

Except as modified herein, concrete walks, driveways, access ramps, curb and gutters should be constructed in accordance with Section 303-5, *Concrete Curbs, Walks, Gutters, Cross-Gutters, Alley Intersections, Access Ramps, and Driveways*, of the Standard Specifications for Public Works Construction (Public Works Standards, 2018).

The subgrade soils under the above-mentioned improvements should consist of compacted fill placed as described in section 9.8 of this report. Prior to placement of concrete, the upper 12 inches of finish grade should be moisture conditioned to within 3 percent of optimum moisture content for coarse-grained soils and 0 and 2 percent above optimum for fine-grained soils.

The thickness of driveways for passenger vehicles should be at least 4 inches, or as required by the civil or structural engineer. Transverse control joints for driveways should be spaced not more than 10 feet apart. Driveways wider than 12 feet should be provided with a longitudinal control joint.

Concrete walks subjected to pedestrian and bicycle loading should be at least 4 inches thick, or as required by the civil or structural engineer. Transverse joints should be spaced 15 feet or less and should be cut to a depth of one-fourth the slab thickness.

Positive drainage should be provided away from all driveways and sidewalks to prevent seepage of surface and/or subsurface water into the concrete base and/or subgrade.

# 12.0 CONSTRUCTION RECOMMENDATIONS

Temporary sloped excavation recommendations are presented in the following sections.

## *12.1 General*

Prior to the start of construction, all existing underground utilities (if any) should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

Vertical braced excavations can be considered for the foundations. Sloped excavations may not be feasible in locations adjacent to existing utilities, pavement, or structure (if any). Recommendations pertaining to temporary excavations are presented in this section.

Excavations near existing structures may require vertical side wall excavation. Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met. The soils exposed in cuts should be observed during excavation by the geotechnical consultant and the competent person designated by the contractor. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

## *12.2 Temporary Sloped Excavations*

Temporary open-cut trenches may be constructed with side slopes as recommended in the following table. Temporary cuts encountering soft and wet fine-grained soils; dry loose, cohesionless soils or loose fill from trench backfill may have to be constructed at a flatter gradient than presented below.

**Table No. 10, Slope Ratios for Temporary Excavations**

| Soil Type | OSHA Soil Type | Depth of Cut (feet) | Recommended Maximum Slope (Horizontal:Vertical)[1] |
|---|---|---|---|
| Silty Sand (SM) | C | 0-10 | 1.5:1 |

[1] Slope ratio assumed to be uniform from top to toe of slope.

For shallow excavations up to 4 feet bgs can vertical. For steeper temporary construction slopes or deeper excavations, or unstable soil encountered during the excavation, shoring or trench shields should be provided by the contractor to protect the workers in the excavation. Design recommendations for temporary shoring are provided in the following section.

Surfaces exposed in slope excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5 feet of the unsupported slope edge. Stockpiled soils with a height higher than 6 feet will require greater distance from trench edges.

## 13.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

The project geotechnical consultant should review plans and specifications as the project design progresses. Such review is necessary to identify design elements, assumptions, or new conditions which require revisions or additions to our geotechnical recommendations.

The project geotechnical consultant should be present to observe conditions during construction. Geotechnical observation and testing should be performed as needed to verify compliance with project specifications. Additional geotechnical recommendations may be required based on subsurface conditions encountered during construction.

## 14.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Ontario Ranch Ventures I & II, LP (ORV I & II), RCCD, Inc. and their authorized agents, to assist in the development of the proposed project. Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

Converse Consultants is not responsible or liable for any claims or damages associated with interpretation of available information provided to others. Site exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in

areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed, and the recommendations of this report are modified or verified in writing. In addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. Converse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

As the project evolves, a continued consultation and construction monitoring by a qualified geotechnical consultant should be considered an extension of geotechnical investigation services performed to date. The geotechnical consultant should review plans and specifications to verify that the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this report are valid. Where significant design changes occur, Converse may be required to augment or modify the recommendations presented herein. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and, possibly, modified recommendations.

Design recommendations given in this report are based on the assumption that the recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

## 15.0 REFERENCES

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# Appendix A

## Field Exploration

# APPENDIX A

# FIELD EXPLORATION

Our field investigation included a site reconnaissance and a subsurface exploration program consisting of drilling exploratory borings and excavating test pits. During the site reconnaissance, the surface conditions were noted, and the test pit and boring locations were marked in the field using the referenced topographic maps and from approximate distances from local streets as a guide and should be considered accurate only to the degree implied by the method used to locate them. Description of the field investigation method is presented below.

***Exploratory Borings***

Ten exploratory borings (BH-01 through BH-10) were drilled on May 24, 2024 and May 29, 2024, within the project site to investigate the subsurface conditions. The borings were drilled to depths ranging from 16.5 to 51.5 feet (bgs).

The borings were advanced using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers for soils sampling. Encountered materials were continuously logged by a Converse geologist and classified in the field by visual classification in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches. Blow counts at each sample interval are presented on the boring logs. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Representative bulk samples were collected from selected depths and placed in large plastic bags for delivery to our laboratory.

Standard Penetration Testing (SPT) were also performed in borings (BH-02, BH-05. BH-06, BH-08 and BH-10) in accordance with the ASTM Standard D1586 using a standard (1.4 inches inside diameter and 2.0 inches outside diameter) split-barrel sampler. The mechanically driven hammer for the SPT sampler was 140 pounds, falling 30 inches for each blow. The recorded blow counts for every 6 inches for a total of 1.5 feet of sampler penetration are shown on the Logs of Borings.

Following completion of logging and sampling, borings BH-01 through BH-10 were backfilled with excavated soil cuttings and compacted by pushing down with the auger using the weight of the drill rig. If construction is delayed the ground surface at the boring locations may settle over time. We recommend the owner monitor the boring locations

and backfill any depressions that occur or provide protection around the boring locations to prevent trip and fall injuries from occurring.

***Test Pits***

Thirteen exploratory test pits (TP-01 through TP-13) were excavated using a backhoe equipped with 24-inch-wide bucket to investigate the subsurface conditions on June 11 and 12, 2024. The test pits were excavated between 4.1 feet and 7.6 feet below the existing ground surface (bgs).

During exploration, encountered materials were continuously logged by a Converse geologist and classified in the field by visual classification in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained from the test pits using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven at selected level benches in the test pit using manual hand-operated equipment with successive drops of a 35-pound driving weight falling 30 inches. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. In-situ dry densities and moisture contents of the site soils were also determined in the test pits with a nuclear gauge in accordance with ASTM Standard D6938. Representative bulk samples were collected from selected depths and placed in plastic bags for delivery to our laboratory.

Test pits were backfilled in lifts with excavated soil, tamped, and then wheel rolled at the surface using the bucket under the weight of the backhoe. If construction is delayed the ground surface at the test pit locations may settle over time. We recommend the owner monitor the test pit locations and backfill any depressions that occur or provide protection around the test pit locations to prevent trip and fall injuries from occurring.

For a key to soil symbols and terminology used in the test pit and boring logs, refer to Drawing Nos. A-1a and A-1b, *Unified Soil Classification and Key to Boring Log and Test Pit Symbols*. For logs of Borings and Test Pits, see Drawings No. A-2 through A-24, *Logs of Borings and Test Pits*.

# SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| COARSE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS<br>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | CLEAN GRAVELS<br>(LITTLE OR NO FINES) | | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | | | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | GRAVELS WITH FINES<br>(APPRECIABLE AMOUNT OF FINES) | | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | | | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| | SAND AND SANDY SOILS<br>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | CLEAN SANDS<br>(LITTLE OR NO FINES) | | SW | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | | | SP | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES |
| | | SANDS WITH FINES<br>(APPRECIABLE AMOUNT OF FINES) | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 | | ML | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | | | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | | | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 | | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS |
| | | | | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | | | OH | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS |
| HIGHLY ORGANIC SOILS | | | | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

## FIELD AND LABORATORY TESTS

| | |
|---|---|
| C | Consolidation (ASTM D 2435) |
| CL | Collapse Potential (ASTM D 4546) |
| CP | Compaction Curve (ASTM D 1557) |
| CR | Corrosion, Sulfates, Chlorides (CTM 643-99; 417; 422) |
| CU | Consolidated Undrained Triaxial (ASTM D 4767) |
| DS | Direct Shear (ASTM D 3080) |
| EI | Expansion Index (ASTM D 4829) |
| M | Moisture Content (ASTM D 2216) |
| OC | Organic Content (ASTM D 2974) |
| P | Permeablility (ASTM D 2434) |
| PA | Particle Size Analysis (ASTM D 6913 [2002]) |
| PI | Liquid Limit, Plastic Limit, Plasticity Index (ASTM D 4318) |
| PL | Point Load Index (ASTM D 5731) |
| PM | Pressure Meter |
| PP | Pocket Penetrometer |
| R | R-Value (CTM 301) |
| SE | Sand Equivalent (ASTM D 2419) |
| SG | Specific Gravity (ASTM D 854) |
| SW | Swell Potential (ASTM D 4546) |
| TV | Pocket Torvane |
| UC | Unconfined Compression - Soil (ASTM D 2166)<br>Unconfined Compression - Rock (ASTM D 7012) |
| UU | Unconsolidated Undrained Triaxial (ASTM D 2850) |
| UW | Unit Weight (ASTM D 2937) |
| WA | Passing No. 200 Sieve |

## BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE — 2.42" I.D. sampler (CMS).
- DRIVE SAMPLE — No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING

## DRILLING METHOD SYMBOLS

- Auger Drilling
- Mud Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

# UNIFIED SOIL CLASSIFICATION AND KEY TO BORING AND TEST PIT LOGS SYMBOLS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-1a

## CONSISTENCY OF COHESIVE SOILS

| Descriptor | Unconfined Compressive Strength (tsf) | SPT Blow Counts | Pocket Penetrometer (tsf) | CA Sampler | Torvane (tsf) | Field Approximation |
|---|---|---|---|---|---|---|
| Very Soft | <0.25 | < 2 | <0.25 | <3 | <0.12 | Easily penetrated several inches by fist |
| Soft | 0.25 - 0.50 | 2 - 4 | 0.25 - 0.50 | 3 - 6 | 0.12 - 0.25 | Easily penetrated several inches by thumb |
| Medium Stiff | 0.50 - 1.0 | 5 - 8 | 0.50 - 1.0 | 7 - 12 | 0.25 - 0.50 | Can be penetrated several inches by thumb with moderate effort |
| Stiff | 1.0 - 2.0 | 9 - 15 | 1.0 - 2.0 | 13 - 25 | 0.50 - 1.0 | Readily indented by thumb but penetrated only with great effort |
| Very Stiff | 2.0 - 4.0 | 16 - 30 | 2.0 - 4.0 | 26 - 50 | 1.0 - 2.0 | Readily indented by thumbnail |
| Hard | >4.0 | >30 | >4.0 | >50 | >2.0 | Indented by thumbnail with difficulty |

## APPARENT DENSITY OF COHESIONLESS SOILS

| Descriptor | SPT $N_{60}$- Value (blows / foot) | CA Sampler |
|---|---|---|
| Very Loose | <4 | <5 |
| Loose | 4- 10 | 5 - 12 |
| Medium Dense | 11 - 30 | 13 - 35 |
| Dense | 31 - 50 | 36 - 60 |
| Very Dense | >50 | >60 |

## MOISTURE

| Descriptor | Criteria |
|---|---|
| Dry | Absence of moisture, dusty, dry to the touch |
| Moist | Damp but no visible water |
| Wet | Visible free water, usually soil is below water table |

## PERCENT OF PROPORTION OF SOILS

| Descriptor | Criteria |
|---|---|
| Trace (fine)/ Scattered (coarse) | Particles are present but estimated to be less than 5% |
| Few | 5 to 10% |
| Little | 15 to 25% |
| Some | 30 to 45% |
| Mostly | 50 to 100% |

## SOIL PARTICLE SIZE

| Descriptor | | Size |
|---|---|---|
| Boulder | | > 12 inches |
| Cobble | | 3 to 12 inches |
| Gravel | Coarse | 3/4 inch to 3 inches |
| | Fine | No. 4 Sieve to 3/4 inch |
| Sand | Coarse | No. 10 Sieve to No. 4 Sieve |
| | Medium | No. 40 Sieve to No. 10 Sieve |
| | Fine | No. 200 Sieve to No. No. 40 Sieve |
| Silt and Clay | | Passing No. 200 Sieve |

## PLASTICITY OF FINE-GRAINED SOILS

| Descriptor | Criteria |
|---|---|
| Nonplastic | A 1/8-inch thread cannot be rolled at any water content. |
| Low | The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit. |
| Medium | The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit. |
| High | It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit. |

## CEMENTATION/ Induration

| Descriptor | Criteria |
|---|---|
| Weak | Crumbles or breaks with handling or little finger pressure. |
| Moderate | Crumbles or breaks with considerable finger pressure. |
| Strong | Will not crumble or break with finger pressure. |

**NOTE:** This legend sheet provides descriptions and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

# UNIFIED SOIL CLASSIFICATION AND KEY TO BORING AND TEST PIT LOGS SYMBOLS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01** Drawing No. **A-1b**

# Log of Boring No. BH-01

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 684 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.4 feet thick. | | | | | | |
| | | **TOPSOIL**<br>**SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, dark grayish brown. | ■ | | 5/7/11 | 5 | 102 | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, dense, moist, light grayish brown. | ■ | ▨ | 20/22/24 | 5 | 105 | OC<br>CR, PA, CP, DS |
| | | -@7.0': medium dense, light brown. | ■ | ▨ | 8/12/18 | 5 | 109 | DS |
| 10 | | -@10.0':orange oxidation. | ■ | ▨ | 10/10/13 | 11 | 107 | |
| 15 | | -@15.0': orange oxidation staining, dense, light orangish gray. | ■ | | 8/20/31 | 5 | 113 | |

End of boring at 16.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with augers using the weight of the drill rig on 5/29/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-2

# Log of Boring No. BH-02

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 679 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.4 feet thick. | | | | | | OC |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, moderately to highly organic, loose to medium dense, moist, black. | ■ | | 5/10/15 | 10 | 111 | CL, R |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine-grained, trace rootlets, brown oxidation, medium dense, moist, light brown. | ■ | | 7/12/18 | 10 | 111 | |
| | | -@8.0': light green brown. | ■ | | 6/9/12 | 23 | 100 | |
| 10 | | | | | | | | |
| | | **SANDY CLAY (CL):** fine-grained sand, orange oxidation, medium stiff, moist to wet, light brownish grey. | ■ | | 4/5/6 | 33 | 88 | |
| 15 | | -@16.0': orange and brown oxidation staining, very stiff. | ■ | | 4/9/18 | 30 | 97 | |
| 20 | | -@21.0': trace silt, orange oxidation, stiff. | ☒ | | 6/5/10 | 13 | | |
| 25 | | -@26.0': trace sand, very stiff, moist, brown. | ■ | | 4/12/21 | 16 | 116 | |
| | | End of boring at 27.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings and compacted with augers using the weight of the drill rig on 5/29/2024. | | | | | | |

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-3

# Log of Boring No. BH-03

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 679 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **TOPSOIL**<br>**SAND (SP):** fine to medium-grained, medium dense, moist, gray-brown. | ■ | | 7/11/19 | 15 | 114 | |
| | | **ALLUVIUM**<br>**CLAYEY SAND (SC):** fine to medium-grained, medium dense, moist, gray-brown. | ■ | | 8/13/15 | 15 | 117 | C, R |
| 5 | | -@6.0': caliche, brown | ■ | | 4/8/11 | 18 | 115 | |
| 10 | | **SANDY CLAY (CL):** fine to medium grained sand, trace caliche, stiff, moist, brown. | ■ | | 5/6/8 | 24 | 101 | |
| 15 | | **SAND (SP):** coarse-grained, trace silt, orange oxidation, scattered gravel up to 0.5 inch maximum dimension, dense, moist, brown. | ■ | | 14/21/29 | 12 | 120 | |
| 20 | | **SILTY SAND (SM):** fine to coarse-grained, orange oxidation, very dense, moist, brown. | ■ | | 11/37/40 | 13 | 117 | |
| 25 | | **CLAYEY SILT (CL):** trace fine to medium-grained sand, stiff, wet, brown. | ■ | | 4/8/10 | 29 | 97 | |

End of boring at 25.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with augers using the weight of the drill rig on 5/24/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-4

# Log of Boring No. BH-04

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 683 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ARTIFICIAL FILL**<br>**SILT (ML):** fine-grained, highly organic material, soft, moist, dark brown to black. | | | | | | |
| | | **ALLUVIUM** | | | 11/24/23 | | | *no recovery |
| 5 | | **SILTY SAND (SM):** medium-grained, dense, moist, brown. | ■ | | 19/18/26 | 11 | 110 | |
| | | -@8.0': dessicated, medium dense. | ■ | | 10/16/15 | 16 | 107 | |
| 10 | | **CLAYEY SILT (ML):** trace fine to medium-grained sand, very stiff, moist, tan brown. | ■ | | 4/7/11 | 20 | 110 | |
| 15 | | **SILTY SAND (SM):** fine to medium-grained, dense, moist, orange oxidation, brown. | ■ | | 10/18/31 | 15 | 113 | |
| 20 | | -@21.0': very dense. | ■ | | 12/23/50-6" | 15 | 118 | |
| 25 | | **SAND (SP):** fine to coarse-grained, medium dense, moist, orange oxidation, brown. | ■ | | 14/13/11 | 9 | 82 | |
| | | End of boring at 27.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings and compacted with augers using the weight of the drill rig on 5/24/2024. | | | | | | |

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City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-5

# Log of Boring No. BH-05

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 682 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **TOPSOIL**<br>**SILTY SAND (SM):** fine to medium-grained, dense, moist, dark brown. | ■ | | 11/24/23 | 8 | 111 | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, dense, moist, gray-brown. | ■ | | 8/17/30 | 11 | 120 | |
| | | **CLAYEY SAND (SC):** fine to medium-grained, medium dense, some caliche, moist, tan brown. | ■ | | 7/14/17 | 17 | 112 | |
| 10 | | | ■ | | 6/9/13 | 24 | 104 | |
| 15 | | | | | 7/11/14 | | | *no recovery |
| 20 | | **SAND (SP):** fine to coarse-grained, trace silt, medium dense, moist, light brown. | ☒ | | 8/14/19 | 6 | | |
| 25 | | **SILTY SAND (SM):** fine to medium-grained, trace clay, medium dense, moist, brown. | ■ | | 7/11/19 | 16 | 116 | |
| 30 | | | ☒ | | 4/5/7 | 22 | | |

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Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-6a

# Log of Boring No. BH-05

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 682 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, trace clay, dense, moist, reddish-brown. | ■ | | 8/15/28 | 14 | 119 | |
| 40 | | -@40.0': medium dense. | ☒ | | 5/7/9 | 19 | | |
| 45 | | -@45.0': very dense. | ■ | | 16/34/50-6" | 13 | 120 | |
| 50 | | -@50.0': fine to medium grained, medium dense, brown. | ☒ | | 8/11/14 | 18 | | |
| | | End of boring at 51.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings<br>and compacted with augers using the weight of the drill rig on 5/24/2024. | | | | | | |

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Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
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Drawing No. A-6b

# Log of Boring No. BH-06

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 683 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ARTIFICIAL FILL**<br>**SILT (ML):** soil with organic material and manure, soft, moist, brown-black. | ■ | | 22/25/39 | 13 | 121 | |
| | | **SANDY CLAY (CL):** fine to medium-grained sand, trace silt, hard, moist, brown-black. | ■ | ▨ | 15/21/21 | 5 | 101 | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, dense, moist, brown.<br>-@6.0': medium dense. | ■ | ▨ | 8/9/15 | 7 | 109 | CL, C |
| 10 | | | ■ | | 9/11/15 | 12 | 120 | |
| 15 | | -@14.0': trace clay, caliche, light brown. | ■ | ▨ | 9/11/22 | 14 | 123 | |
| 20 | | -@19.0': slight orange oxidation, dense. | ■ | | 14/20/30 | 11 | 124 | |
| 25 | | **SANDY CLAY (CL):** fine to medium-grained sand, trace silt, scattered carbon fragments, medium stiff, moist, tan brown. | ▨ | | 7/4/4 | 20 | | |

End of boring at 25.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with augers using the weight of the drill rig on 5/24/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-7

# Log of Boring No. BH-07

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 680 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.3 feet thick. | | | | | | OC |
| | | **ARTIFICIAL FILL**<br>**SANDY SILT (ML):** fine to coarse-grained sand, organics and manure, soft, brown-black. | ■ | | 9/11/12 | 5 | 108 | DS, CP |
| 5 | | **SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, light orange-brown.<br>-@5.0': loose. | ■ | | 4/4/6 | 6 | 103 | C |
| | | **ALLUVIUM**<br>**CLAYEY SAND/ SANDY CLAY (SC-CL):** medium-grained, pinhole porosity, moderately to very desiccated, trace caliche, slight orange oxidation staining, medium dense/stiff, moist, orange-brown. | ■ | | 6/10/14 | 13 | 117 | |
| 10 | | -@10.0': trace silt, caliche stringers. | ■ | | 7/10/14 | 12 | 121 | |
| 15 | | -@15.0': caliche stringers, orange oxidation, medium dense/very stiff. | ■ | | 8/13/17 | 12 | 121 | |

End of boring at 16.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with augers using the weight of the drill rig on 5/29/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-8

# Log of Boring No. BH-08

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 687 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE** 1.0 foot thick. | | | | | | |
| | | **ALLUVIUM** | | | | | | |
| | | **SILTY SAND (SM):** fine to coarse-grained, slightly desiccated, very dense, moist, light brown. | ■ | ▨ | 20/32/36 | 5 | 116 | EI, R, CR, PA. |
| 5 | | -@5.0': medium dense. | ■ | | 12/15/18 | 5 | 110 | |
| | | -@8.0': moderately desiccated. | ■ | | 7/12/16 | 7 | 114 | |
| 10 | | | | | | | | |
| | | **SAND WITH SILT (SP-SM):** fine to coarse-grained, trace clay, medium dense, moist, light brown. | ■ | ▨ | 7/9/10 | 17 | 103 | |
| 15 | | -@16.0': moderate orange and brown oxidation. | ■ | | 12/13/14 | 4 | 97 | |
| 20 | | | | | | | | |
| | | **SILTY SAND (SM):** fine to coarse-grained, trace clay, moderate orange oxidation, medium dense, moist, light gray brown. | ■ | | 6/6/12 | 19 | 104 | |
| 25 | | | ╳ | | 4/7/10 | 13 | | |
| | | End of boring at 27.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings<br>and compacted with augers using the weight of the drill rig on 5/29/2024. | | | | | | |

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-9

# Log of Boring No. BH-09

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 693 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.3 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SANDY SILT (ML):** fine-grained sand, organics and manure, soft, dark brown to black. | ■ | | 6/12/6 | 8 | 98 | |
| | | | | ▨ | 13/23/20 | | | -no recovery |
| 5 | | **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 0.5 inches maximum dimension, medium dense, moist, brown.<br>-@3.0': dense.<br>-@6.0': loose, light brown. | ■ | | 3/4/7 | 6 | 106 | |
| 10 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, light to orange brown. | ■ | | 6/7/12 | 5 | 112 | |
| 15 | | -@14.0': fine to medium grained, trace clay, pinhole porosity. | ■ | ▨ | 5/6/10 | 17 | 106 | |
| 20 | | -@19.0': slight to moderate orange oxidation, light greenish brown. | ■ | | 7/9/15 | 6 | 101 | |
| 25 | | | ■ | | 8/11/16 | 7 | 98 | |
| | | End of boring at 25.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings and compacted with augers using the weight of the drill rig on 5/29/2024. | | | | | | |

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Drawing No. A-10

# Log of Boring No. BH-10

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 685 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine-grained sand, moist, very stiff, brown. | ■ | | 10/10/17 | 11 | 118 | EI, PA |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, slightly desiccated, medium dense, moist, orangish brown. | ■ | | 9/9/12 | 5 | 113 | |
| | | -@7.0': trace clay, caliche stringers, dense. | ■ | | 8/12/17 | 11 | 111 | |
| 10 | | -@10.0': slight to moderate desiccated, light green brown. | ■ | | 7/10/14 | 9 | 115 | |
| 15 | | -@15.0': orange oxidation. | ■ | | 5/7/14 | 17 | 110 | |
| 20 | | -@20.0': few clay. | ■ | | 8/12/17 | 3 | 100 | |
| 25 | | **SANDY CLAY (CL):** fine-grained sand, orange oxidation, moist, stiff, greenish brown. | ☒ | | 3/5/6 | 29 | | |

End of boring at 26.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with auger using the weight of the drill rig on 5/29/2024.

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Drawing No. A-11

# Log of Test Pit No. TP-01

Date Drilled: 6/12/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 684 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.6 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, moderate to highly organic, loose, dark brown. | | | | | | |
| 5 | | **SANDY GRAVEL (GP):** medium-grained, channel deposit, gravel up 0.5 inch maximum dimension, loose, light brown. | | | | | | |
| | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, medium dense, moist, brown.<br>-@3.0': dense. | | | | | | |
| | | End of Test Pit at 5.2 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-12

# Log of Test Pit No. TP-02

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 680 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.7 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, moderatly to highly organic, dense, moist, green and reddish brown. | | | | | | OC |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** medium-grained, medium dense, moist, light brown to brown.<br>-@2.0': dense. | | | | | | |
| | | End of Test Pit at 5.5 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-13

# Log of Test Pit No. TP-03

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 681 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.7 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, trace clay, slightly to highly organic, layered, medium dense to dense, moist, light brown to brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**CLAYEY SAND (SC):** fine to medium-grained, medium dense, moist, brown. | | | | | | |
| | | End of Test Pit at 5.8 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-14

# Log of Test Pit No. TP-04

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 690 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **0.2' ASPHALT CONCRETE/1.8' AGGREGATE BASE** | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, layered, dense to very dense, moist, reddish brown and light brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, slight red oxidation staining, medium dense, reddish-brown.<br>-@4.0': dense | | | | | | |
| | | End of Test Pit at 8.5 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-15

# Log of Test Pit No. TP-05

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 685 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE** 1.0 foot thick. | | | | | | OC |
| | | **ARTIFICIAL FILL**<br>**CLAYEY SAND (SC):** fine to medium-grained alternating layers, scattered debris, moist, dense, brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND/CLAYEY SAND (SM-SC):** fine to medium-grained, moist, medium dense, brown.<br>-@5.0: some carbon, dense. | | | | | | |
| | | End of Test Pit at 5.8 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-16

# Log of Test Pit No. TP-06

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 687 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, some gravel up to 0.5 inches maximum dimension, dense, moist, brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, yellow brown.<br>-@3.0': dense, light brown. | | | | | | |
| | | End of Test Pit at 4.8 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-17

# Log of Test Pit No. TP-07

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 684 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**CLAYEY SAND (SC):** fine to coarse-grained, scattered gravel 1.5 inches maximum dimension, slight to moderate organics, medium dense, moist, dark reddish brown. | | | | | | OC |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, slightly desiccated, medium dense, moist, light orange brown.<br>-@4.5': dense. | | | | | | |
| | | End of Test Pit at 5.0 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-18

# Log of Test Pit No. TP-08

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 690 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.4 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to medium-grained, slightly to moderately organic, dense, moist, reddish-brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, medium dense, moist, light brown.<br>-@4.0': dense. | | | | | | OC |
| | | End of Test Pit at 5.1 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-19

# Log of Test Pit No. TP-09

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 687 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.3 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, slightly to highly organic, dense, moist, brown. | | | | | | |
| | | **ALLUVIUM** | | | | | | |
| 5 | | **SAND WITH SILT (SP-SM):** fine to medium-grained, medium dense, moist, light brown.<br>-@3.0': dense. | | | | | | |
| | | End of Test Pit at 6.0 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-20

# Log of Test Pit No. TP-10

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 684 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.3 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 1 inch maximum dimension, slightly to highly organic, dense, moist, orange-brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SAND WITH SILT (SP-SM):** fine to medium-grained, medium dense, moist, light brown.<br>-@4.0': dense. | | | | | | |
| | | End of Test Pit at 5.6 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-21

# Log of Test Pit No. TP-11

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 685 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2 inches maximum dimension, dense, moist, orange-light, gray-brown.<br>-@1.0': continuous 1.5 inch red layer. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SAND WITH SILT (SP-SM):** fine to medium-grained, medium dense to dense, moist, orange brown.<br>-@2.5': dense. | | | | | | OC |
| | | End of Test Pit at 6.0 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-22

# Log of Test Pit No. TP-12

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 690 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND WITH GRAVEL (SM):** fine to coarse-grained, scattered gravel up to 2 inches maximum dimension, slightly to highly organic, dense, moist, light gray. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SAND WITH SILT (SP-SM):** fine to medium-grained, dense, moist, light orange brown.<br>-@4.0': dense. | | | | | | |
| | | End of Test Pit at 5.3 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-23

# Log of Test Pit No. TP-13

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 691 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND WITH GRAVEL (SM):** fine to coarse-grained, some pieces of concrete, dense, moist, light grayish brown.<br>-@2.0': 4 inch concrete slab. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SAND (SP):** fine to medium-grained, dune deposit, moist, medium dense to dense, brown.<br>-@4.0': dense. | | | | | | |
| | | End of Test Pit at 5.4 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-24

# Appendix B

## Laboratory Testing Program

# APPENDIX B

## LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their physical properties and engineering characteristics. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings and Test Pits, in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

### ***In-Situ* Moisture Content and Dry Density**

In-situ dry density and moisture content tests were performed on relatively undisturbed ring samples, in accordance with ASTM Standard D2216-19 and D2937-17 to aid in soils classification and to provide qualitative information on strength and compressibility characteristics of the site soils. For test results, see the Logs of Borings and Test Pits in Appendix A, *Field Exploration*.

### **Organic Content (OC)**

Tests were performed on eight select bulk samples during the current geotechnical investigation and eighteen select samples during the previous geotechnical feasibility study by SoCalGeo of the soil on the site, to determine the organic content, in accordance with the ASTM Standard D2974-20e1 test, Methods A and C. Test results are summarized in the table below.

**Table No. B-1, Summary of Organic Content Test Results**

| Boring/Test Pit No. | Depth (feet) | Soil Description | Total Organic Content (%) |
|---|---|---|---|
| BH-01 | 4.0-10.0 | Silty Sand (SM), Native | 1.1 |
| BH-02 | 0.4-2.0 | Silty Sand (SM), Fill | 2.1 |
| BH-07 | 0.3-1.0 | Sandy Silt (ML), Fill | 7.1 |
| TP-02 | 0.7-1.0 | Silty Sand (SM), Fill | 6.0 |
| TP-05 | 0.0-1.0 | Manure/Clayey Sand (SC), Fill | 12.2 |
| TP-07 | 0.5-2.5 | Clayey Sand/Sandy Clay (SC-CL), Fill | 2.1 |
| TP-08 | 5.0-6.0 | Silty Sand (SM), Native | 1.3 |
| TP-11 | 5.0-6.0 | Silty Sand (SM), Native | 1.9 |

**Table No. B-1a, Summary of Organic Content Test Results (SoCalGeo, 1 & 3/2022)**

| Test Pit No. | Depth (feet) | Soil Description | Total Organic Content (%) |
|---|---|---|---|
| HA-1 (1/22) | 0.0-0.5 | Silty Sand (SM), Fill | 13.0 |
| HA-1 (1/22) | 0.5-1.0 | Silty Sand (SM), Fill | 5.9 |
| HA-1 (1/22) | 1.0-1.5 | Silty Sand (SM), Fill | 7.9 |
| HA-1 (1/22) | 1.5-2.0 | Silty Sand (SM), Fill | 2.5 |
| HA-1 (1/22) | 3.0-3.5 | Sand, trace silt (SP), Native | 1.6 |
| HA-2 (1/22) | 0.0-0.5 | Silty Sand (SM), Fill | 24.3 |
| HA-2 (1/22) | 0.5-1.0 | Silty Sand (SM), Fill | 19.0 |
| HA-2 (1/22) | 1.0-1.5 | Sand, trace silt (SP), Fill | 10.3 |
| HA-2 (1/22) | 1.5-2.0 | Sand, trace silt (SP), Fill | 2.7 |
| HA-2 (1/22) | 3.0-3.5 | Sand, trace silt (SP), Native | 2.0 |
| HA-1 (3/22) | 0.0-0.5 | Silty Sand (SM), Fill | 6.6 |
| HA-1 (3/22) | 0.5-1.0 | Silty Sand (SM), Fill | 5.9 |
| HA-1 (3/22) | 1.0-1.5 | Silty Sand (SM), Fill | 4.0 |
| HA-1 (3/22) | 1.5-2.0 | Sandy Silt (ML), Native | 2.4 |
| HA-2(3/22) | 0.0-0.5 | Silty Sand (SM), Fill | 14.4 |
| HA-2(3/22) | 0.5-1.0 | Silty Sand (SM), Fill | 18.5 |
| HA-2(3/22) | 1.0-1.5 | Silty Sand (SM), Fill | 8.5 |
| HA-2(3/22) | 1.5-2.0 | Silty Sand (SM), Fill | 2.7 |

**Expansion Index (EI)**

Two representative bulk samples were tested during the current geotechnical investigation and one bulk sample weas tested during a previous geotechnical feasibility study by SoCalGeo of the soil on the site, to evaluate the expansion potential of materials encountered at the site in accordance with ASTM D4829-21 Standard. The test results are presented in the following table.

**Table No. B-2, Expansion Index Test Results**

| Boring No. | Depth feet) | Soil Description | Expansion Index | Expansion Potential |
|---|---|---|---|---|
| BH-08 | 0.0-5.0 | Silty Sand (SM) | 0 | Very Low |
| BH-10 | 0.0-4.0 | Silty Sand (SM) | 0 | Very Low |

**Table No. B-2a, Expansion Index Test Results (SoCalGeo, 1/2022)**

| Boring No. | Depth feet) | Soil Description | Expansion Index | Expansion Potential |
|---|---|---|---|---|
| B-7 | 0-5 | Clayey Sand (SC) | 12 | Very Low |

**R-value (R)**

Two representative bulk soil samples were tested for resistance value (R-value) in accordance with California Test Method CT301. This test provides a relative measure of soil strength for use in pavement design. The test result is presented in the table below.

**Table No. B-3, R-Value Test Result**

| Boring No. | Depth (feet) | Soil Classification | Measured R-value |
|---|---|---|---|
| BH-02 | 2.0-5.0 | Silty Sand (SM) | 64 |
| BH-08 | 0-5.0 | Silty Sand (SM) | 59 |

**Soil Corrosivity (CR)**

One representative soil sample was tested during the current geotechnical investigation and three bulk samples were tested during previous geotechnical feasibility studies by SoCalGeo within site, to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of this test was to determine the corrosion potential of site soils when placed in contact with common construction materials. The tests were performed by Keegan Labs. (Pomona, CA) in accordance with Caltrans Test Methods 643, 422 and 417. Test results are presented in the following table.

**Table No. B-4, Summary of Soil Corrosivity Test Results**

| Boring No. | Depth (feet) | pH | Soluble Sulfates (CA 417) (ppm) | Soluble Chlorides (CA 422) (ppm) | Min. Resistivity (CA 643) (Ohm-cm) |
|---|---|---|---|---|---|
| BH-08 | 0.0-5.0 | 6.7 | 90 | 25 | 4,620 |

**Table No. B-4a, Soil Corrosivity Test Result (SoCalGeo, 1 & 3/2022)**

| Boring No. | Depth (feet) | pH | Soluble Sulfates (CA 417) (ppm) | Soluble Chlorides (CA 422) (ppm) | Min. Resistivity (CA 643) (Ohm-cm) |
|---|---|---|---|---|---|
| B-1 (1/22) | 0-5 | 7.5 | 17 | 119.0 | 1,360 |
| B-7 (3/22) | 0-5 | 8.3 | 122 | 94.4 | 2.435 |
| B-9 (3/22) | 0-5 | 9.4 | 72 | 33.1 | 3,216 |

**Collapse (CL)**

To evaluate the moisture sensitivity (collapse/swell potential) of the encountered soils, two collapse tests were performed in accordance with the ASTM Standard D4546-21 laboratory procedure. The samples were loaded to approximately 1 kip per square foot (ksf), allowed to stabilize under load, and then submerged. The test results are presented in the following table.

**Table No. B-5, Collapse Test Results**

| Boring No. | Depth (feet) | Soil Classification | Percent Swell (+) Percent Collapse (-) | Collapse Potential |
|---|---|---|---|---|
| BH-02 | 2.0-3.5 | Silty Sand (SM) | -1.6 | Slight |
| BH-06 | 3.0-4.5 | Silty Sand (SM) | -0.2 | Slight |

**Grain-Size Analysis (PA)**

To assist in soil classification, mechanical grain-size analyses was performed on three select samples in accordance with the ASTM Standard D6913/D6913M-17 test method. Grain-size distribution is summarized in the table below and plotted in Drawing No. B-1, *Grain Size Distribution Results*.

**Table No. B-6, Grain Size Distribution Test Results**

| Boring No. | Depth (ft) | Soil Classification | % Gravel | % Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|
| BH-01 | 4.0-10.0 | Silty Sand (SM) | 0.0 | 82.3 | 17.7 | |
| BH-08 | 0.0-5.0 | Silty Sand (SM) | 0.0 | 72.9 | 27.1 | |
| BH-10 | 0.0-4.0 | Silty Sand (SM) | 0.0 | 59.9 | 40.1 | |

**Maximum Dry Density and Optimum Moisture Content (CP)**

Laboratory maximum dry density-optimum moisture content relationship tests were performed on two representative bulk samples. These tests were conducted in accordance with the ASTM Standard D1557-12R21 test method. The test results are presented in Drawing No. B-2, *Moisture-Density Relationship Results,* and is summarized in the following table.

**Table No B-7, Summary of Moisture-Density Relationship Results**

| Boring No. | Depth (feet) | Soil Description | Optimum Moisture (%) | Maximum Density (lb./cft) |
|---|---|---|---|---|
| BH-01 | 4.0-10.0 | Silty Sand (SM), Brown | 11.1 | 118.6 |
| BH-07 | 1.0-4.0 | Silty Sand (SM), Brown | 12.7 | 117.5 |

**Direct Shear (DS)**

Three direct shear tests were performed; one direct shear test was performed on a relatively undisturbed sample and two direct shear tests were performed on samples remolded to 90% of the maximum dry density under soaked moisture conditions in accordance with ASTM D3080/D3080M-23. on relatively undisturbed samples in accordance with ASTM D3080. For each test, three samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.02 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawings No. B-3 through B-5*, Direct Shear Test Results,* and the following table.

**Table No. B-8, Summary of Direct Shear Test Results**

| Boring No. | Depth (feet) | Soil Description | Peak Strength Parameters | |
|---|---|---|---|---|
| | | | Friction Angle (degrees) | Cohesion (psf) |
| *BH-01 | 4.0-10.0 | Silty Sand (SM) | 31 | 70 |
| BH-01 | 7.0-8.5 | Silty Sand (SM) | 27 | 150 |
| *BH-07 | 1.0-4.0 | Silty Sand (SM) | 31 | 190 |

*Remolded to 90% of the maximum dry density

**Consolidation (C)**

Three consolidation tests were conducted in accordance with ASTM Standard D2435/D2435M-11R20 method. Data obtained from the test performed on relatively undisturbed ring samples were used to evaluate the settlement characteristics of the on-site soils under load. Preparation for these tests involved trimming the sample, placing it in a 1-inch-high brass ring, and loading it into the test apparatus, which contained porous stones to accommodate drainage during testing. Normal axial loads were applied to one end of the sample through the porous stones, and the resulting deflections were recorded at various time periods. The load was increased after the sample reached a reasonable state of equilibrium. Normal loads were applied at a constant load-increment ratio, successive loads being generally twice the preceding load. For test results, including sample density and initial moisture content, see Drawings No. B-6 through B-8, *Consolidation Test Results*.

**Sample Storage**

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.

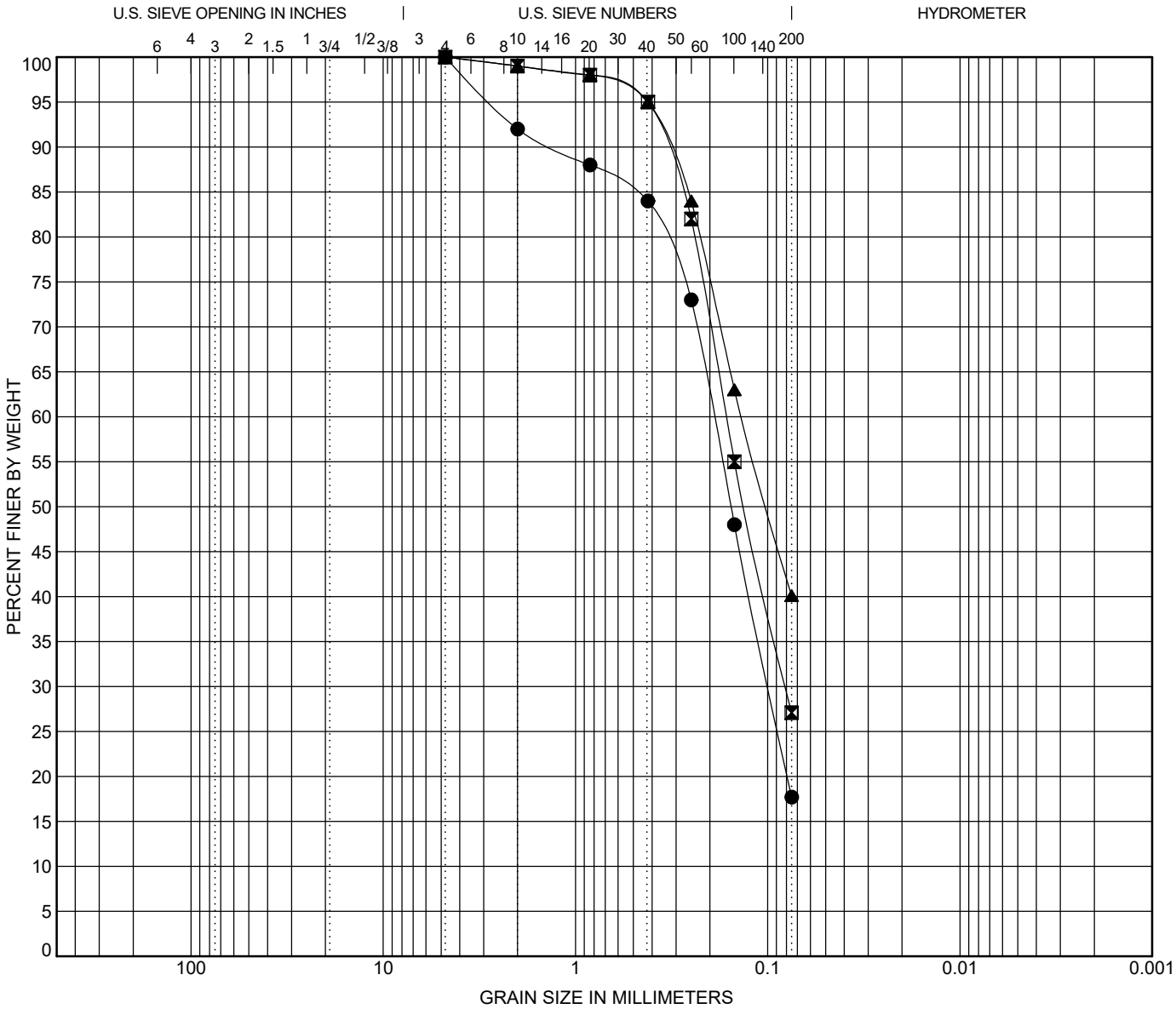


| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Boring No. | Depth (ft) | Description | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● | **BH-01** | **4.0-10.0** | **SILTY SAND (SM)** | | | | | |
| ⊠ | **BH-08** | **0.0-5.0** | **SILTY SAND (SM)** | | | | | |
| ▲ | **BH-10** | **0.0-4.0** | **SANDY CLAY (CL)** | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| | Boring No. | Depth (ft) | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | **BH-01** | **4.0-10.0** | **4.75** | **0.191** | **0.099** | | **0.0** | **82.3** | **17.7** | |
| ⊠ | **BH-08** | **0.0-5.0** | **4.75** | **0.164** | **0.081** | | **0.0** | **72.9** | **27.1** | |
| ▲ | **BH-10** | **0.0-4.0** | **4.75** | **0.136** | | | **0.0** | **59.9** | **40.1** | |
| | | | | | | | | | | |
| | | | | | | | | | | |

# GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **B-1**

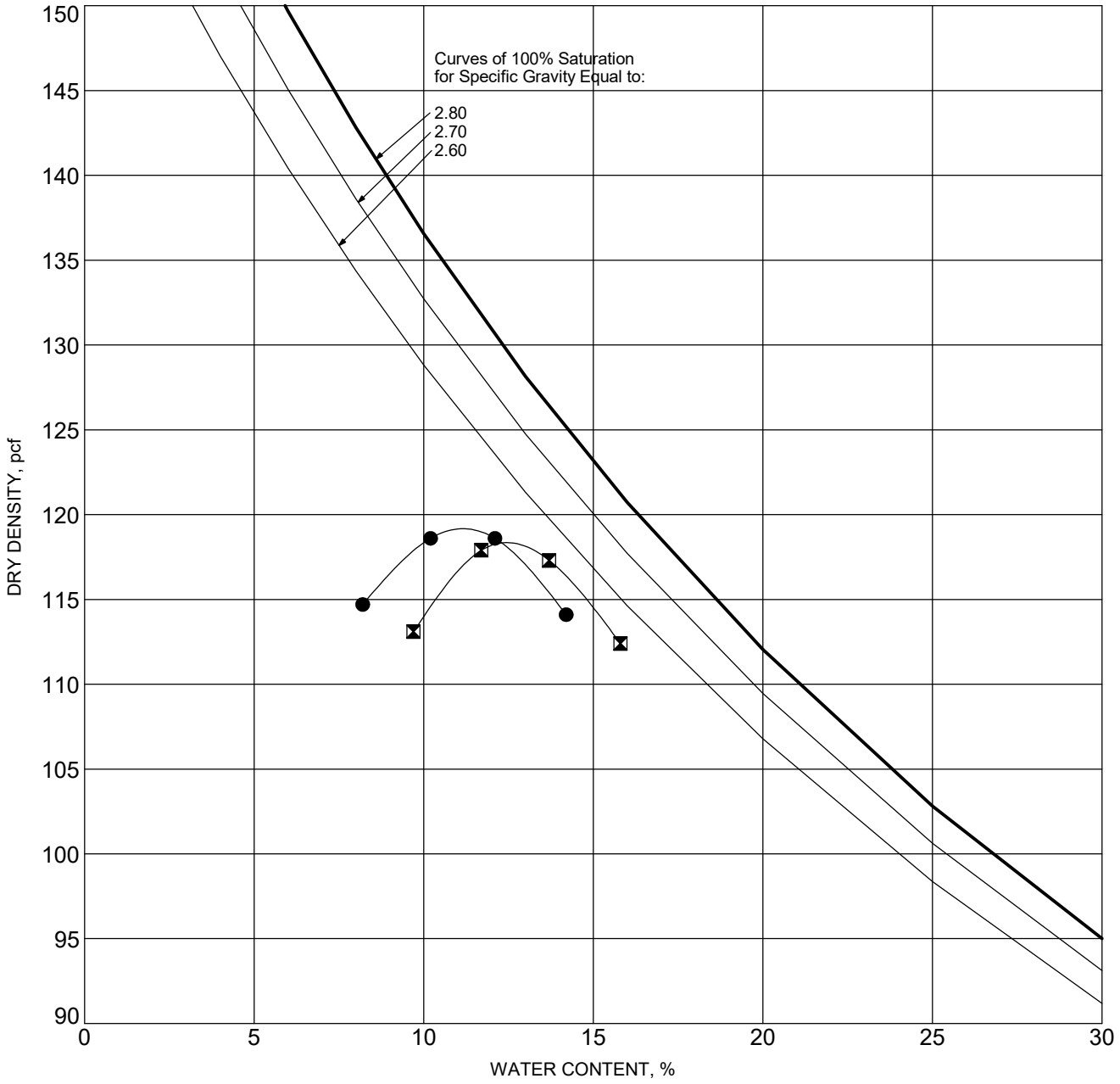


| SYMBOL | BORING NO. | DEPTH (ft) | DESCRIPTION | ASTM TEST METHOD | OPTIMUM WATER, % | MAXIMUM DRY DENSITY, pcf |
|---|---|---|---|---|---|---|
| ● | **BH-01** | **4.0-10.0** | **SILTY SAND (SM), Light Grayish Brown** | **D1557 - A** | **11.1** | **118.6** |
| ⊠ | **BH-07** | **1.0-4.0** | **SILTY SAND (SM), Light Orange-Brown** | **D1557 - A** | **12.7** | **117.5** |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For RCCD, Inc.

Project No.
**24-81-184-01**

Drawing No.
**B-2**

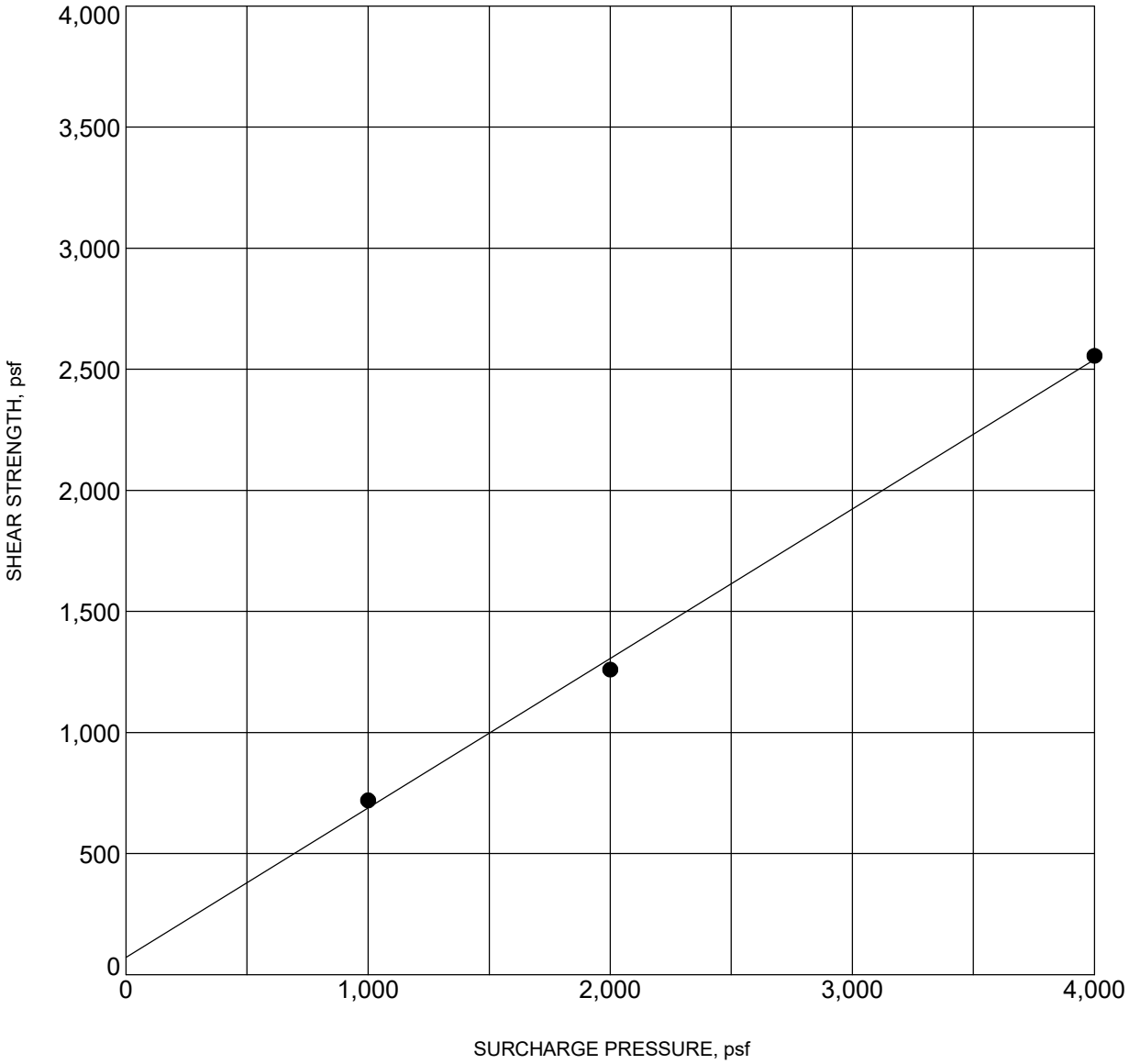


| | | | |
|---|---|---|---|
| BORING NO. : | **BH-01** | DEPTH (ft) : | **4.0-10.0*** |
| DESCRIPTION : | **SILTY SAND (SM)** | | |
| COHESION (psf) : | **80** | FRICTION ANGLE (degrees): | **32** |
| MOISTURE CONTENT (%) : | **11.1** | DRY DENSITY (pcf) : | **116.0** |

* Remolded to 90% laboratory maximum dry density

NOTE: Ultimate Strength.

# DIRECT SHEAR TEST RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **B-3**

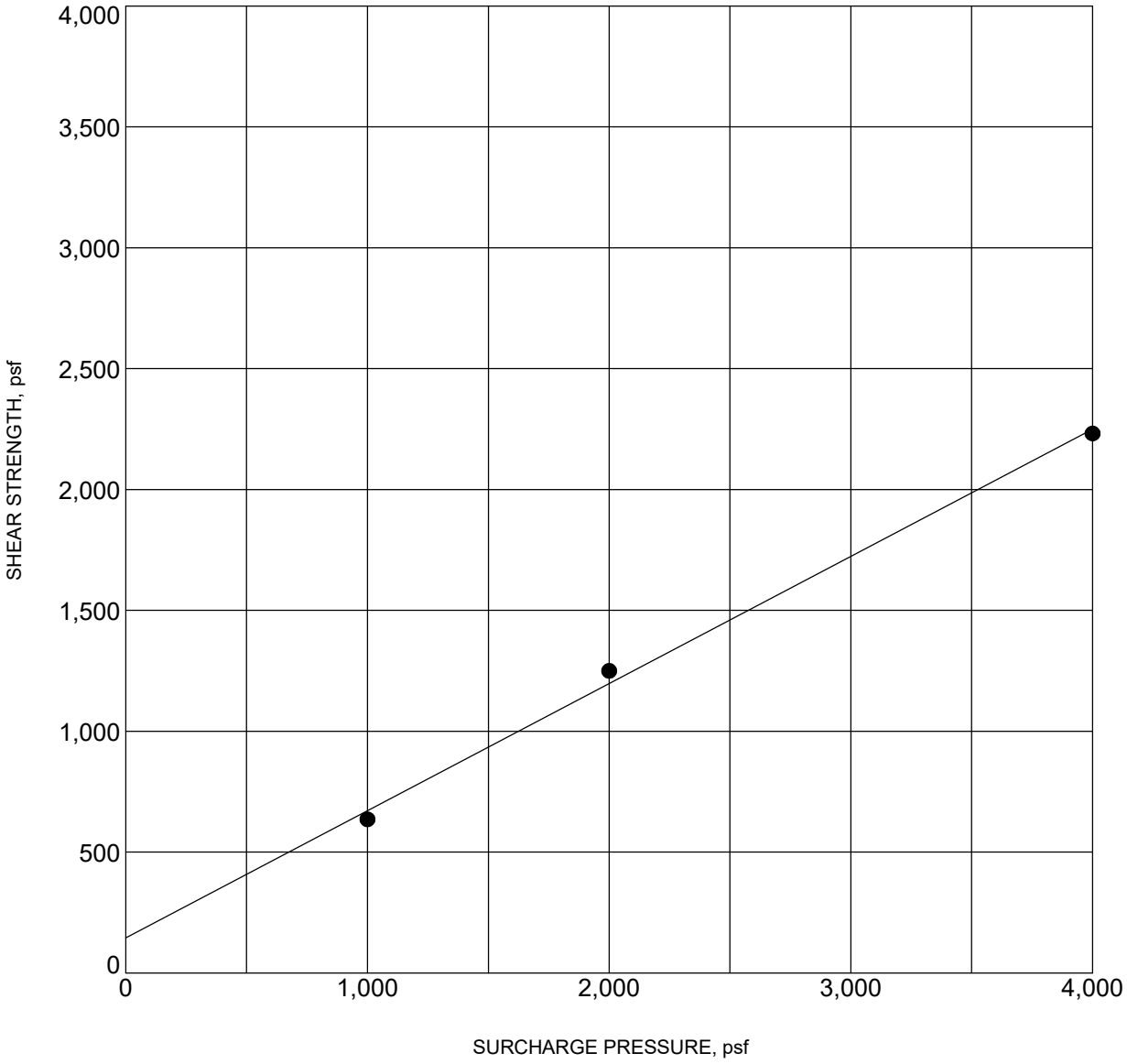


| | | | |
|---|---|---|---|
| BORING NO. : | **BH-01** | DEPTH (ft) : | **7.0-8.5** |
| DESCRIPTION : | **SILTY SAND (SM)** | | |
| COHESION (psf) : | **150** | FRICTION ANGLE (degrees): | **28** |
| MOISTURE CONTENT (%) : | **8.0** | DRY DENSITY (pcf) : | **101.0** |

NOTE: Ultimate Strength.

# DIRECT SHEAR TEST RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **B-4**

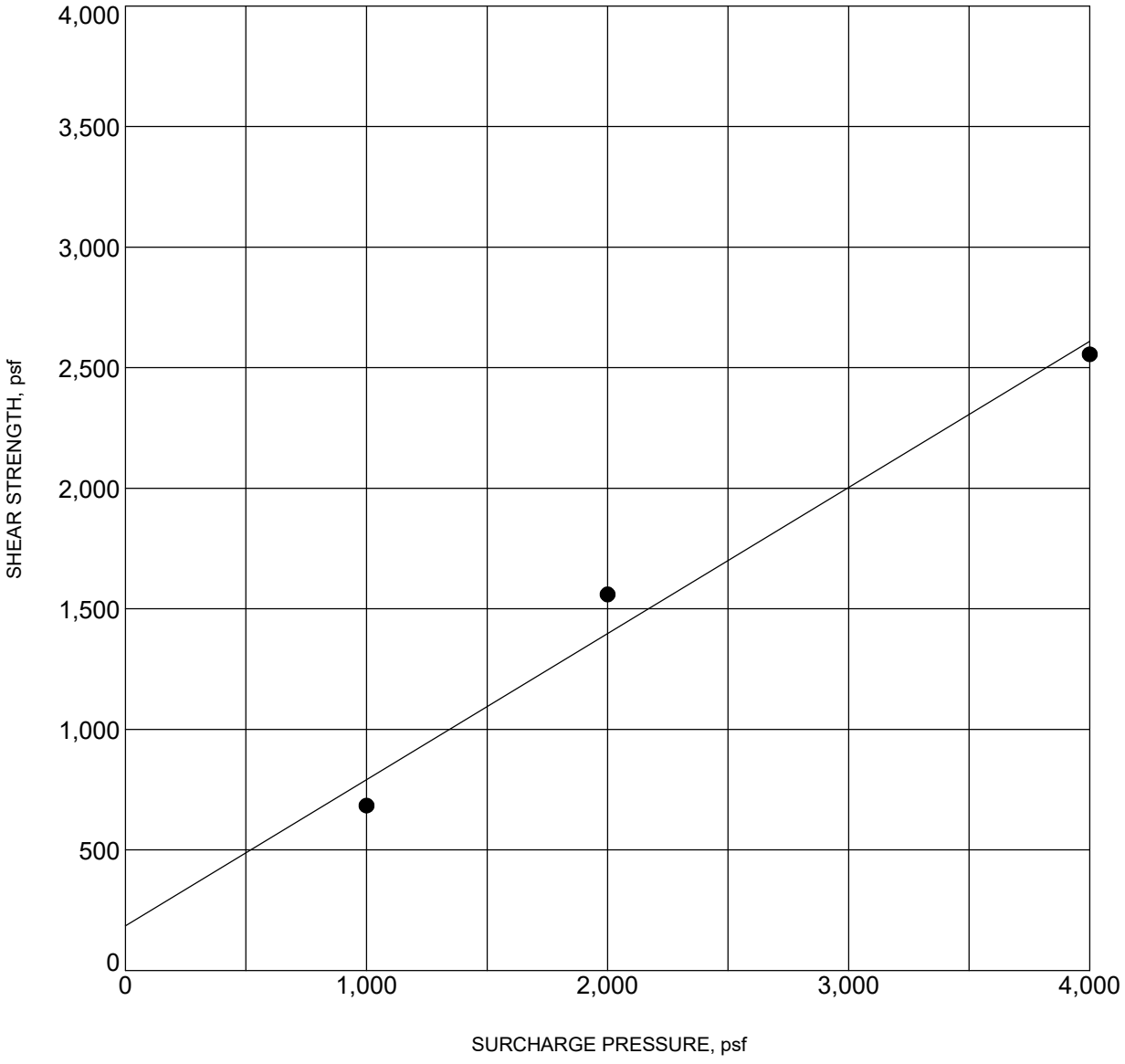


| | | | |
|---|---|---|---|
| BORING NO. : | **BH-07** | DEPTH (ft) : | **1.0-4.0*** |
| DESCRIPTION : | **SILTY SAND (SM)** | | |
| COHESION (psf) : | **190** | FRICTION ANGLE (degrees): | **31** |
| MOISTURE CONTENT (%) : | **12.7** | DRY DENSITY (pcf) : | **116.0** |

* Remolded to 90% laboratory maximum dry density

NOTE: Ultimate Strength.

# DIRECT SHEAR TEST RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **B-5**

# Appendix C

## Liquefaction & Dynamic Settlement Analysis

# APPENDIX C

## LIQUEFACTION AND DYNAMIC SETTLEMENT ANALYSIS

The subsurface data obtained from the boring BH-05 was used to evaluate the liquefaction potential and associated dry seismic settlement when subjected to ground shaking during earthquakes.

A simplified liquefaction hazard analysis was performed using the program SPTLIQ (InfraGEO Software, 2021) using the liquefaction triggering analysis method by Boulanger and Idriss (2014). A modal earthquake magnitude of M 6.66 was selected based on the results of seismic deaggregation analysis using the USGS interactive online tool (https://earthquake.usgs.gov/hazards/interactive/).

A peak ground acceleration ($PGA_M$) of 0.749g for the MCE design event, where g is the acceleration due to gravity, was selected for this analysis. The PGA was based on the CBC seismic design parameters presented in Section 8.2, *CBC Seismic Design Parameters.* The result of our analysis is presented on Plates No. C-1 through C-3 and summarized in the following table.

**Table C-1, Estimated Dynamic Settlements**

| Location | Groundwater Conditions | Groundwater Depth (feet bgs) | Dry Seismic Settlement (inches) | Liquefaction Induced Settlement (inches) |
|---|---|---|---|---|
| BH-05 | Current | >50 | 1.01 | Negligible |
| | Historical | >50 | | |

Based on our analysis, the project site has the potential for up to 1.01 inches of dry seismic settlement with negligible liquefaction induced settlement under the current groundwater conditions. For design purpose, the dynamic differential settlement of the site should be equal to one-half of the total dry seismic settlement over a lateral distance of 40 feet.

# SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

(Copyright © 2015, 2021, SPTLIQ, All Rights Reserved; By: InfraGEO Software)

## PROJECT INFORMATION

| | |
|---|---|
| Project Name | Sares Regis North |
| Project No. | 24-81-184-01 |
| Project Location | City of Ontario, San Bernardino County, California |
| Analyzed By | Catherine Nelson |
| Reviewed By | Hashmi S. Quazi |

## SELECTED METHODS OF ANALYSIS

| | |
|---|---|
| Analysis Description | |
| Triggering of Liquefaction | Boulanger-Idriss (2014) |
| Severity of Liquefaction | LPI: Liquefaction Potential Index based on Iwasaki et al. (1978) |
| Seismic Compression Settlement (Dry/Unsaturated Soil) | Pradel (1998) |
| Liquefaction-Induced Settlement (Saturated Soil) | Ishihara and Yoshimine (1992) |
| Liquefaction-Induced Lateral Spreading | Zhang et al. (2004) |
| Residual Shear Strength of Liquefied Soil | Idriss and Boulanger (2008) |

## SEISMIC DESIGN PARAMETERS

| | | |
|---|---|---|
| Earthquake Moment Magnitude, $M_w$ | 6.66 | |
| Peak Ground Acceleration, $A_{max}$ | 0.75 | g |
| Factor of Safety Against Liquefaction, FS | 1.20 | |

## BORING DATA AND SITE CONDITIONS

| | | |
|---|---|---|
| Boring No. | BH-05 | |
| Ground Surface Elevation | 682.00 | feet |
| Proposed Grade Elevation | 682.00 | feet |
| GWL Depth Measured During Test | 52.00 | feet |
| GWL Depth Used in Design | 52.00 | feet |
| Borehole Diameter | 8.00 | inches |
| Hammer Weight | 140.00 | pounds |
| Hammer Drop | 30.00 | inches |
| Hammer Energy Efficiency Ratio, ER (%) | 86.00 | % |
| Hammer Distance to Ground Surface | 5.00 | feet |
| Topographic Site Condition: | TSC1 | (Level Ground with No Nearby Free Face) |
| - Ground Slope, S (%) | <<= Leave this blank | |
| - Free Face Distance to Slope Height Ratio, (L/H) | 5.00 | <<= Leave this blank Set H to zero =>> 15.00 feet |

## INPUT SOIL PROFILE DATA

| Depth to Top of Soil Layer (feet) | Depth to Bottom of Soil Layer (feet) | Material Type USCS Group Symbol (ASTM D2487) | Liquefaction Screening *Susceptible Soil? (Y, N)* | Total Soil Unit Weight $\gamma_t$ (pcf) | Type of Soil Sampler | Field Blow Count $N_{field}$ (blows/ft) | Fines Content FC (%) |
|---|---|---|---|---|---|---|---|
| 0.00 | 5.00 | SM | N | 119.9 | MCal | 47.00 | 28.30 |
| 5.00 | 7.50 | SM | Y | 126.5 | MCal | 47.00 | 28.30 |
| 7.50 | 10.00 | SC | Y | 132.2 | MCal | 31.00 | 30.00 |
| 10.00 | 15.00 | SC | Y | 130.2 | MCal | 27.00 | 30.00 |
| 15.00 | 20.00 | SC | Y | 129.2 | MCal | 25.00 | 30.00 |
| 20.00 | 25.00 | SP | Y | 110.5 | SPT1 | 33.00 | 20.00 |
| 25.00 | 30.00 | SM | Y | 134.6 | MCal | 30.00 | 28.30 |
| 30.00 | 35.00 | SM | Y | 141.5 | SPT1 | 12.00 | 28.30 |
| 35.00 | 40.00 | SM | Y | 135.7 | MCal | 43.00 | 28.30 |
| 40.00 | 45.00 | SM | Y | 141.6 | SPT1 | 16.00 | 28.30 |
| 45.00 | 50.00 | SM | Y | 135.6 | MCal | 84.00 | 28.30 |

# SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

(Copyright © 2015, 2021, SPTLIQ, All Rights Reserved; By: InfraGEO Software)

## PROJECT INFORMATION

| | |
|---|---|
| Project Name | Sares Regis North |
| Project No. | 24-81-184-01 |
| Project Location | City of Ontario, San Bernardino County, California |
| Analyzed By | Catherine Nelson |
| Reviewed By | Hashmi S. Quazi |

## SEISMIC DESIGN PARAMETERS

| | |
|---|---|
| Earthquake Moment Magnitude, $M_w$ | 6.66 |
| Peak Ground Acceleration, $A_{max}$ | 0.75 g |
| Factor of Safety Against Liquefaction, FS | 1.20 |

## BORING DATA AND SITE CONDITIONS

| | |
|---|---|
| Boring No. | BH-05 |
| Ground Surface Elevation | 682.00 feet |
| Proposed Grade Elevation | 682.00 feet |
| GWL Depth Measured During Test | 52.00 feet |
| GWL Depth Used in Design | 52.00 feet |
| Borehole Diameter | 8.00 inches |
| Hammer Weight | 140.00 pounds |
| Hammer Drop | 30.00 inches |
| Hammer Energy Efficiency Ratio, ER | 86.00 % |
| Hammer Distance to Ground Surface | 5.00 feet |
| Topographic Site Condition: | TSC1 (Level Ground with No Nearby Free Face) |
| - Ground Slope, S | 0.00 % |
| - Free Face (L/H) Ratio | 5.00 H = 15 feet |

## SUMMARY OF RESULTS

**Severity of Liquefaction:**

Total Thickness of Liquefiable Soils: 0.00 feet (cumulative total thickness in the upper 65 feet)

Liquefaction Potential Index (LPI): 0.00 *** (Very low risk, with no surface manifestation of liquefaction)

| Seismic Ground Settlements: | Analysis Method | Upper 30 feet | Upper 50 feet | Upper 65 feet | |
|---|---|---|---|---|---|
| Seismic Compression Settlement: | Pradel (1998) | 0.38 inches | 1.01 inches | 1.01 inches | (Dry/Unsaturated Soils) |
| Liquefaction-Induced Settlement: | Ishihara and Yoshimine (1992) | 0.00 inches | 0.00 inches | 0.00 inches | (Saturated Soils) |
| Total Seismic Settlement: | | 0.38 inches | 1.01 inches | 1.01 inches | |

| Seismic Lateral Displacements: | Analysis Method | Upper 30 feet | Upper 50 feet | Upper 65 feet | |
|---|---|---|---|---|---|
| Cyclic Lateral Displacement: | Tokimatsu and Asaka (1998) | 0.38 inches | 0.79 inches | 0.79 inches | (During Ground Shaking) |
| Lateral Spreading Displacement: | Zhang et al. (2004) | 0.00 inches | 0.00 inches | 0.00 inches | (After Ground Shaking) |

## NOTES AND REFERENCES

\+ This method of analysis is based on observed seismic performance of level ground sites using correlation with normalized and fines-corrected SPT blow count, $(N_1)_{60cs} = f\{(N_1)_{60}, FC\}$ where $(N_1)_{60} = N_{field}\, C_N\, C_E\, C_B\, C_R\, C_S$

++ Liquefaction susceptibility screening is performed to identify soil layers assessed to be non-liquefiable based on laboratory test results using the criteria proposed by Cetin and Seed (2003), Bray and Sancio (2006), or Idriss and Boulanger (2008).

* $FS_{liq}$ = Factor of Safety against liquefaction = (CRR/CSR), where $CRR = CRR_{7.5}\, MSF\, K_\sigma\, K_\alpha$, MSF = Magnitude Scaling Factor, $K_\sigma = f[(N_1)_{60}, \sigma'_{vo}]$, $K_\alpha$ =1.0, (level ground), CSR = Cyclic Stress Ratio = $0.65\, A_{max}\, (\sigma_{vo}/\sigma'_{vo})\, r_d$, and $CRR_{7.5}$ = Cyclic Resistance Ratio is a function of $(N_1)_{60cs}$ and corrected for an earthquake magnitude $M_w$ of 7.5.

** Residual strength values of liquefied soils are based on correlation with post-earthquake, normalized and fines-corrected SPT blow count derived by Idriss and Boulanger (2008).

*** Based on Iwasaki et al. (1978) and Toprak and Holzer (2003)

+ Reference: Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.

## INPUT SOIL PROFILE DATA / LIQUEFACTION TRIGGERING ANALYSIS BASED ON R.W. BOULANGER AND I.M. IDRISS (2014) METHOD +

| Depth to Top of Soil Layer (feet) | Depth to Bottom of Soil Layer (feet) | Material Type USCS Group Symbol (ASTM D2487) | Liquefaction Susceptibility Screening ++ Susceptible Soil? (Y/N) | Total Soil Unit Weight $\gamma_t$ (pcf) | Type of Soil Sampler | Field SPT Blow Count $N_{field}$ (blows/ft) | Fines Content FC (%) | Total Vert. Stress (Design) $\sigma_{vo}$ (psf) | Effective Vert. Stress (Design) $\sigma'_{vo}$ (psf) | SPT Corr. for Vert. Stress $C_N$ | SPT Corr. for Hammer Energy $C_E$ | SPT Corr. for Borehole Size $C_B$ | SPT Corr. for Rod Length $C_R$ | SPT Corr. for Sampling Method $C_S$ | Corrected SPT Blow Count $N_{60}$ | Normalized SPT Blow Count $(N_1)_{60}$ | Fines Corrected SPT Blow Count $(N_1)_{60cs}$ | Shear Stress Reduction Coefficient $r_d$ | Correction for High Overburden Stress $K_\sigma$ | Cyclic Stress Ratio CSR | Cyclic Resistance Ratio CRR | Factor of Safety * $FS_{liq}$ | Liquefaction Analysis Results | Residual Shear Strength ** $S_r$ (psf) | Seismic Porewater Pressure Ratio $r_u$ (%) | Cumulative Seismic Settlement (inches) | Cumulative Cyclic Lateral Displacement (inches) | Cumulative Lateral Spreading Displacement (inches) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 5.00 | SM | N | 119.90 | MCal | 47.00 | 28.30 | 299.75 | 299.75 | | | | | | | | | 0.999 | | 0.486 | | | | | | 1.01 | 0.79 | 0.00 |
| 5.00 | 7.50 | SM | Y | 126.50 | MCal | 47.00 | 28.30 | 757.63 | 757.63 | 1.259 | 1.433 | 1.150 | 0.800 | 0.650 | 40.3 | 50.7 | 56.0 | 0.985 | 1.100 | 0.479 | | | | | | 1.01 | 0.79 | 0.00 |
| 7.50 | 10.00 | SC | Y | 132.18 | MCal | 31.00 | 30.00 | 1,080.97 | 1,080.97 | 1.227 | 1.433 | 1.150 | 0.850 | 0.650 | 28.2 | 34.6 | 40.0 | 0.974 | 1.100 | 0.474 | | | | | | 1.01 | 0.79 | 0.00 |
| 10.00 | 15.00 | SC | Y | 130.18 | MCal | 27.00 | 30.00 | 1,571.65 | 1,571.65 | 1.097 | 1.433 | 1.150 | 0.850 | 0.650 | 24.6 | 27.0 | 32.3 | 0.957 | 1.043 | 0.466 | | | | | | 0.99 | 0.75 | 0.00 |
| 15.00 | 20.00 | SC | Y | 129.21 | MCal | 25.00 | 30.00 | 2,220.13 | 2,220.13 | 0.959 | 1.433 | 1.150 | 0.950 | 0.650 | 25.4 | 24.4 | 29.8 | 0.931 | 0.983 | 0.453 | | | | | | 0.89 | 0.64 | 0.00 |
| 20.00 | 25.00 | SP | Y | 110.45 | SPT1 | 33.00 | 20.00 | 2,819.28 | 2,819.28 | 0.916 | 1.433 | 1.150 | 0.950 | 1.000 | 51.7 | 47.3 | 51.8 | 0.903 | 0.897 | 0.440 | | | | | | 0.75 | 0.52 | 0.00 |
| 25.00 | 30.00 | SM | Y | 134.56 | MCal | 30.00 | 28.30 | 3,431.81 | 3,431.81 | 0.804 | 1.433 | 1.150 | 0.950 | 0.650 | 30.5 | 24.6 | 29.8 | 0.873 | 0.914 | 0.425 | | | | | | 0.75 | 0.52 | 0.00 |
| 30.00 | 35.00 | SM | Y | 141.52 | SPT1 | 12.00 | 28.30 | 4,122.01 | 4,122.01 | 0.697 | 1.433 | 1.150 | 1.000 | 1.000 | 19.8 | 13.8 | 19.1 | 0.842 | 0.923 | 0.410 | | | | | | 0.63 | 0.41 | 0.00 |
| 35.00 | 40.00 | SM | Y | 135.66 | MCal | 43.00 | 28.30 | 4,814.96 | 4,814.96 | 0.746 | 1.433 | 1.150 | 1.000 | 0.650 | 46.1 | 34.4 | 39.6 | 0.811 | 0.778 | 0.395 | | | | | | 0.26 | 0.21 | 0.00 |
| 40.00 | 45.00 | SM | Y | 141.61 | SPT1 | 16.00 | 28.30 | 5,508.13 | 5,508.13 | 0.619 | 1.433 | 1.150 | 1.000 | 1.000 | 26.4 | 16.3 | 21.6 | 0.780 | 0.882 | 0.380 | | | | | | 0.21 | 0.14 | 0.00 |
| 45.00 | 50.00 | SM | Y | 135.60 | MCal | 84.00 | 28.30 | 6,201.16 | 6,201.16 | 0.901 | 1.433 | 1.150 | 1.000 | 0.650 | 90.0 | 81.0 | 86.3 | 0.749 | 0.661 | 0.365 | | | | | | 0.00 | 0.00 | 0.00 |

# SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

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| PROJECT INFORMATION | |
|---|---|
| Project Name | Sares Regis North |
| Project No. | 24-81-184-01 |
| Project Location | City of Ontario, San Bernardino County, California |
| Analyzed By | Catherine Nelson |
| Reviewed By | Hashmi S. Quazi |

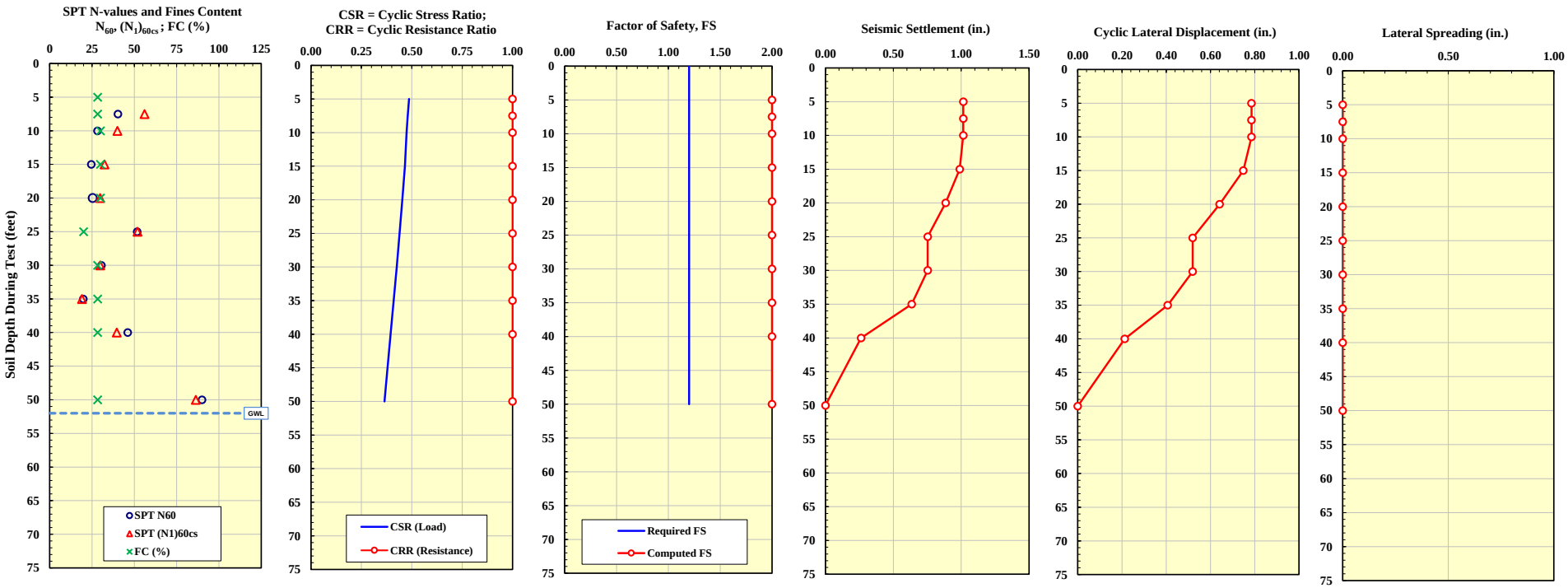


| Analysis Methods Used ==>> | Liquefaction Triggering: | | Seismic Settlements: | Cyclic Lateral Displacements: | Lateral Spreading: |
|---|---|---|---|---|---|
| | Boulanger-Idriss (2014) | Above GWL: | Pradel (1998) | Pradel (1998) | Zhang et al. (2004) |
| | | Below GWL: | Ishihara and Yoshimine (1992) | Tokimatsu and Asaka (1998) | |

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# Appendix D

## Earthwork Specifications

# APPENDIX D

# EARTHWORK SPECIFICATIONS

## D1.1 Scope of Work

The work includes all labor, supplies and construction equipment required to construct the building pads in a good manner, as shown on the drawings and herein specified. The major items of work covered in this section include the following.

- Site Inspection
- Authority of Geotechnical Engineer
- Site Clearing
- Excavations
- Preparation of Fill Areas
- Placement and Compaction of Fill
- Observation and Testing

## D1.2 Site Inspection

1. The Contractor should carefully examine the site and make all inspections necessary in order to determine the full extent of the work required to make the completed work conform to the drawings and specifications. The Contractor should satisfy himself as to the nature and location of the work, ground surface and the characteristics of equipment and facilities needed prior to and during prosecution of the work. The Contractor should satisfy himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered. Any inaccuracies or discrepancies between the actual field conditions and the drawings, or between the drawings and specifications must be brought to the Owner's attention in order to clarify the exact nature of the work to be performed.
2. This *Preliminary Geotechnical Investigation and Organic Soil/Manure Evaluation Report, dated September 10, 2024,* by Converse Consultants may be used as a reference to the surface and subsurface conditions on this project. The information presented in this report is intended for use in design and is subject to confirmation of the conditions encountered during construction. The exploration logs and related information depict subsurface conditions only at the particular time and location designated on the boring logs. Subsurface conditions at other locations may differ from conditions encountered at the exploration locations. In addition, the passage of time may result in a change in subsurface conditions at the exploration locations. Any review of this information should not relieve the Contractor from performing such independent investigation and evaluation to satisfy himself as to the nature of the surface and subsurface conditions to be encountered and the procedures to be used in performing his work.

## D1.3 Authority of the Geotechnical Engineer

1. The Geotechnical Engineer will observe the placement of compacted fill and will take sufficient tests to evaluate the uniformity and degree of compaction of filled ground.
2. As the Owner's representative, the Geotechnical Engineer will (a) have the authority to cause the removal and replacement of loose, soft, disturbed and other unsatisfactory soils and uncontrolled fill; (b) have the authority to approve the preparation of native ground to receive fill material; and (c) have the authority to approve or reject soils proposed for use in building areas.
3. The Civil Engineer and/or Owner will decide all questions regarding (a) the interpretation of the drawings and specifications, (b) the acceptable fulfillment of the contract on the part of the Contractor and (c) the matters of compensation.

## D1.4 Site Clearing

1. Clearing and grubbing should consist of the removal from areas to be graded: all existing pavement, utilities, and vegetation.
2. Organic and inorganic materials resulting from the clearing and grubbing operations should be hauled away from the areas to be graded.

## D1.5 Excavations

Based on observations made during our field explorations, the surficial soils can be excavated with conventional earthwork equipment.

## D1.6 Preparation of Fill Areas

1. All highly organic soils, manure and debris should be removed from the proposed foundation, improvements and/or fill areas.
2. After the required removals have been made, the exposed earth materials (undocumented artificial fill, topsoil and the upper low-density portions of the alluvium), should be overexcavated to provide a zone of structural fill for the support of footings, slabs-on-grade, and exterior flatwork or proposed improvements. All loose, soft or disturbed earth materials should be removed from the bottom of excavations before placing structural fill. Any structures will require a minimum of 3.0 feet of compacted fill beneath building footings and 2.0 feet below any proposed wall footings or 5.0 feet below proposed grade, whichever is deeper.
3. The subgrade in all areas to receive fill should be scarified to a minimum depth of 6 inches. Scarification may be terminated on moderately hard to hard, cemented earth materials with the approval of the Geotechnical Engineer. The soil moisture should be adjusted to at least 2 percent above optimum for fine-grained soils and within 3 percent of optimum moisture content for granular soils, and then

compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Standard D1557-12R21 test method.

4. Compacted fill may be placed on native soils that have been properly scarified and recompacted as discussed above.
5. All areas to receive compacted fill will be observed and approved by the Geotechnical Engineer before the placement of fill.

## D1.7 Placement and Compaction of Fill

1. Compacted fill placed for the construction of the embankment or for any planned structures will be considered structural fill. Structural fill may consist of approved on-site soils or imported fill that meets the criteria indicated below.
2. Fill consisting of selected on-site earth materials or imported soils approved by the Geotechnical Engineer should be placed in layers on approved earth materials. Soils used as compacted structural fill should have the following characteristics:
   a. All fill soil particles should not exceed 8 inches in nominal size and should not have an organic content greater than 2%, as well as free of matter and miscellaneous inorganic debris and inert rubble.
   b. Imported fill materials should have an Expansion Index (EI) of less than 20. All imported fill should be compacted to at least 90 percent of the laboratory maximum dry density (ASTM Standard D1557-12R21) at about 2 percent above optimum moisture for fine-grained soils, and within 3 percent of optimum for granular soils.
3. Fill exceeding 5 feet in height should not be placed on native slopes that are steeper than 5:1 horizontal:vertical (H:V). Where native slopes are steeper than 5:1 H:V, and the height of the fill is greater than 5 feet, the fill should be benched into competent materials. The height and width of the benches should be at least 2 feet.
4. Representative samples of materials being used, as compacted fill will be analyzed in the laboratory by the Geotechnical Engineer to obtain information on their physical properties. Maximum laboratory density of each soil type used in the compacted fill will be determined by the ASTM Standard D1557-12R21 compaction method.
5. Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not resume until the Geotechnical Engineer approves the moisture and density conditions of the previously placed fill.
6. It should be the Grading Contractor's obligation to take all measures deemed necessary during grading to provide erosion control devices in order to protect slope areas and adjacent properties from storm damage and flood hazard originating on this project. It should be the Contractor's responsibility to maintain slopes in their as-graded form until all slopes are in satisfactory compliance with

job specifications, all berms have been properly constructed, and all associated drainage devices meet the requirements of the Civil Engineer.

## D1.8 Fill Slope Construction

1. Fill slopes placed above existing surfaces or cut slopes should be constructed with keyways.
2. Where fill is placed against existing slopes steeper than 5:1 H:V, the new fill slopes should be keyed and benched to provide increased lateral support after removal of the unsuitable surficial soils, when present.

## D1.9 Observation and Testing

1. During the progress of grading and trench backfill, the Geotechnical Engineer will provide observation of the fill placement operations.
2. Field density tests of all compacted fill will be made during grading and trench backfill to provide an opinion on the degree of compaction being obtained by the Contractor. Where compaction of less than specified herein is indicated, additional compactive effort with adjustment of the moisture content should be made as necessary, until the required degree of compaction is obtained.
3. A sufficient number of field density tests will be performed to provide an opinion to the degree of compaction achieved. In general, density tests will be performed on each one-foot lift of fill, but not less than one for each 500 cubic yards of fill placed.

# APPENDIX E

## PHASE I ENVIRONMENTAL SITE ASSESSMENT

# Phase I Environmental Site Assessment

Edison Avenue and Walker Avenue
Ontario, California

March 24, 2025

Prepared for:

**Ontario Ranch Venture, LLC and**
**Ontario Ranch Venture II, LLC**

Prepared by:

**Roux Associates, Inc.**
5150 E. Pacific Coast Highway, Suite 450
Long Beach, California, 90804

3669.0004L101/R

Environmental Consulting
& Management
+1.800.322.ROUX
rouxinc.com

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# 1. Title Page

# Phase I Environmental Site Assessment

**Subject Property:**
Ontario Ranch Proposed Residential Development
Edison Avenue and Walker Avenue
Ontario, California

**Report Date:** March 24, 2025

**Site Visit Date:** January 22 and 31, 2025

**Database Report Date:** February 27, 2025

**Prepared by:**

Mauricio Escobar, Principal Geologist/Vice President
Kasia Anderson, Project Geologist

**Roux Associates, Inc**.
5150 East Pacific Coast Highway, Suite 450
Long Beach, California 90804
Main: 310-879-4900

# 2. Executive Summary

Ontario Ranch Venture, LLC and Ontario Ranch Venture II, LLC (the User) retained Roux Associates, Inc. (Roux) to perform a Phase I Environmental Site Assessment (ESA) of an approximately 180-acre rectangular parcel located south of Edison Avenue and west of Walker Avenue in the City of Ontario, California (Subject Property; Figures 1 and 2). The Subject Property is proposed for residential development and encompasses the northern half of the properties referred to by the User as the Ontario Ranch I and Ontario Ranch II properties (Figure 3). The Subject Property consists of all or portions of seven (7) individual properties referred to herein as the DeGroot Trust (DeGroot), Costa, GH Dairy, Alewyn, DeHoog I, DeHoog II, and Swager Properties (Figures 2 and 3 in Appendix A).Roux performed this Phase I ESA in general accordance with the American Society for Testing and Materials (ASTM) International *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E1527-21) in an effort to identify, to the extent feasible, the presence of Recognized Environmental Conditions (RECs) with respect to the Subject Property as defined in ASTM E1527-21. Exceptions to, or deletions from, this practice are described in Section 3 of this report.

On January 22 and 31, 2025, Roux representative Ms. Tahsin Annoor visually assessed the Subject Property for potential RECs, including, but not limited to, potential underground storage tanks (USTs), aboveground storage tanks (ASTs), polychlorinated biphenyl (PCB)-containing equipment, hazardous materials storage or handling areas, containerized or bulk wastes, and visual indications of impacted soil. At the time of this assessment, the properties were used as dairies and for residential purposes. The User purchased the Alewyn, DeHoog I, DeHoog II, and Swager Properties (associated with Ontario Ranch I) in 2022 and GH Dairy in 2024 and is considering purchasing the remaining portions of the Subject Property for residential development.

From at least 1938 to 1953, the Subject Property was used for agricultural purposes (row crops and orchards) with a few dwellings. By the mid-1950s, the Subject Property became increasingly used for dairy farming purposes. Each of the individual properties at the Subject Property are used for dairy farming purposes and are improved with at least one and up to three residences, a milking barn, wastewater pond(s), and various ancillary dairy farm structures including corral canopies, sheds, and feed silos.

Roux also performed a records review in an effort to identify potential RECs in connection with the Subject Property. This records review addressed the Subject Property and surrounding properties. Roux reviewed commercially available records associated with these nearby properties to assess potential concerns associated with the migration of hazardous substances. The records review also included reasonably ascertainable historical data, which can be helpful in identifying the past uses of the Subject Property and surrounding areas, as it may relate to the environmental condition of the Subject Property.

Roux performed interviews and file reviews with various government agencies and other parties with possible knowledge of the Subject Property and surrounding properties in an effort to identify current and past uses of the Subject Property and surrounding areas, as they may relate to the environmental condition of the Subject Property.

ASTM E 1527-21 defines:

A REC as:

> "The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions."

A Controlled Recognized Environmental Condition (CREC) as:

> "A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a No Further Action (NFA) letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls)."

And a Historical Recognized Environmental Condition (HREC) as:

> "A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a historical recognized environmental condition, the environmental professional must determine whether the past release is a recognized environmental condition at the time the Phase I ESA is conducted (for example, if there has been a change in the regulatory criteria). If the Environmental Professional considers the past release to be a recognized environmental condition at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as a recognized environmental condition."

The term recognized environmental condition is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

This Executive Summary provides a brief overview of the findings of this Phase I ESA. Although the Executive Summary is an integral part of a report, it does not substitute for reading the entire report or the appended or referenced documents in order to fully understand the findings and potential environmental concerns associated with the Subject Property.

Based on the information obtained through the performance of this Phase I ESA, Roux identified the following REC:

**REC 1 – Historical Agricultural Use (Subject Property).** Based on the historical use of the Subject Property for agricultural purposes from at least the 1930s through 1950s, it is likely that pesticides were used. In 2005, soil sampling at the eastern portion of the Subject Property (Swager Property) was conducted to further investigate the potential presence of pesticides. No detectable to low concentrations of organochlorine pesticides were reported in the samples collected and all but one were below regulatory

screening levels. The sample that exceeded residential screening levels was collected from the central portion of the Swager Property and contained slightly elevated dieldrin.

**REC 2 – Vapor Encroachment Concern (Off-Site Hindelang Property).** Historical records for the south adjoining Hindelang Property (immediately south of the DeGroot Property) indicate that manufacturing of fiberglass camper shells from at least 1986 through 1992 included the use and storage of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-trichloroethane (1,1,1-TCA) and hydrocarbon solvents, rubber adhesive, etc. Previous environmental reports noted poor housekeeping practices and automobile repair operations at the Hindelang Property. Based on the documented use of chlorinated solvents (1,1,1-TCA), poor general housekeeping, and noted automobile repair operations, the south adjoining Hindelang Property represents a potential vapor encroachment concern and a REC.

Based upon the information described in this report, this Phase I ESA did not reveal evidence of CRECs, HRECs, or independent Business Environmental Risks (BERs) in connection with the Subject Property.

Other environmental features (OEFs) identified in connection with the current and historical operations at the Subject Property or adjacent properties include:

**OEF 1 – Dairy Farm Operations (Methane).** Due to the historical and current use of the Subject Property for dairy farming purposes, methane gas may be present in shallow soil. Methane gas is naturally produced during the biodegradation of organic matter such as animal manure. Based on the historical dairy farming land use of the Subject Property, methane gas surveys were reportedly completed by others at the Alewyn, DeHoog II, and Swager properties. Results of these surveys indicate sporadic elevated concentrations of methane gas exceeding the Lower Explosive Limit (LEL) of methane (i.e., 50,000 parts per million [ppm]).

Prior to the redevelopment of dairy farms, the City of Ontario Building Department requires that an investigation be performed to evaluate the possible build-up of methane gas in shallow soils and to determine the level of methane gas mitigation required. Proper removal and disposal of manure-laden shallow soil in accordance with local regulatory guidance may also be required prior to redevelopment of the Subject Property.

**OEF 2 – Private Groundwater Wells.** During the site reconnaissance, Roux observed a total of eight groundwater wells throughout the Subject Property that have been used for agricultural, residential, and/or dairy water supply purposes. Groundwater has been identified immediately south of the Subject Property to occur at depths of approximately 120 feet below the ground surface (bgs) and flows in a south to southwesterly direction. These features would not be considered an environmental concern to the Subject Property, but may need to be abandoned prior to redevelopment per State and County guidance.

**OEF 3 – Septic Systems.** Each residential structure on the Subject Property is reportedly equipped with a septic tank. Based on the non-hazardous nature of the domestic waste discharged to the septic systems, these represent an OEF.

**OEF 4 – Hazardous Materials Storage.** A total of eight ASTs containing diesel fuel were observed on the Subject Property including the DeGroot, Costa, GH Dairy, DeHoog II, and Swager Properties; the ASTs ranged from approximately 100 to 500 gallons in size. No significant signs of a release were observed in the vicinity of the ASTs. Additionally, various other chemicals associated with the dairy activities are stored in 55-

gallon drums and used on-site including, but not limited to, iodine, acid wash, and hydrogen peroxide for sanitation purposes. The hazardous material use on-site therefore represents an OEF.

**OEF 5 – Regional Dairy Farm Operations (Groundwater Degradation).** The Subject Property is located within the Chino Groundwater Basin. Concentrated animal feeding lots such as dairy farms can be a source of local groundwater degradation due to nitrates and total dissolved solids (TDS). According to information provided on the EPA website, the Chino Basin once had the highest concentration of dairy animals in the world, with approximately 350 dairies located within a 20-square mile area. Although the number of dairies has declined significantly, historical land application of manure and process water has resulted in significant groundwater degradation due to high levels of TDS and nitrate. The Dairy Farm General Permit was created to minimize continued degradation of groundwater in the Chino Basin as well as other parts of the Santa Ana Region. According to the California Regional Water Quality Control Board, Santa Ana Region (SARWQCB) website, the Subject Property is located within the Chino 2 "antidegradation" management zone which indicates that the SARWQCB has determined that the lowering of water quality is not of maximum benefit to the public. The SARWQCB has reportedly noted that new property owners are not being held liable for this regional issue associated with historical land uses. Based on the known regional groundwater degradation issues in the Chino Basin, the potential presence of elevated TDS and nitrates in groundwater beneath the Subject Property represents an OEF.

**OEF 6 – South Archibald TCE Plume.** The eastern portion of the Subject Property is located within a large regional VOC groundwater plume comprised mostly of trichloroethene (TCE), referred to as the South Archibald TCE Plume. This plume originates from a source approximately 1.7 miles northeast of the Subject Property as a result of historical land use of numerous metal plating and finishing facilities. Low concentrations of TCE were reported from 2017 to 2022 in groundwater from two on-site wells on the DeHoog II and Swager Properties at concentrations of 1.2 and 0.46 micrograms per liter (ug/l), respectively, well below the State Water Resources Control Board (SWRCB), Division of Drinking Water Maximum Contaminant Levels (MCLs) for TCE in drinking water of 5 ug/l. Based on the depth of groundwater and low concentrations of VOCs detected beneath the Subject Property, there is a low likelihood that a vapor intrusion issue is present. Since there are low concentrations of TCE detected beneath the Subject Property and no vapor intrusion issue is present, the regional TCE groundwater plume would be considered an OEF.

**OEF 7 – Former UST, 7587 Edison Avenue (DeGroot Property).** The DeGroot Property reportedly previously operated a 500-gallon diesel UST that was removed in 1987. In 2000, the San Bernardino County Fire Department (SBCFD) was informed of the UST removal following purchase of the property by Paul Huizenga and requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs in the reported location of the former UST. The laboratory results indicated no detectable concentrations of total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tertiary butyl ether (MTBE). No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a NFA letter dated February 13, 2001. Based on this information, the former UST represents an OEF.

**OEF 8 – Former UST, 8185 Edison Avenue (Alewyn Property).** The Alewyn Property reportedly used a 250-gallon diesel UST that was removed in 1978 without regulatory oversight and no confirmation soil samples were collected. In 2021, soil samples were collected in the reported former location of the UST. Laboratory results indicated no detectable concentrations of total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) above laboratory reporting limits. Based on these results, the former 250-gallon

diesel UST would not be considered an environmental concern to the Subject Property and represents an OEF.

**OEF 9 – Former UST, 8311 Edison Avenue (DeHoog I Property).** The DeHoog I Property reportedly used a 500-gallon diesel UST that was removed in 1998 with oversight from the SBCFD. A soil sample was collected from beneath the center of the former tank location. The soil sample was analyzed for TPHg, BTEX, and MTBE. Laboratory results indicated no detectable concentrations of these constituents above laboratory reporting limits. Based on these concentrations, the UST was issued a NFA letter, dated January 6, 1999. Based on the regulatory closure and sampling results, the former UST would not be considered an environmental concern to the Subject Property and represents an OEF.

**OEF 10 – Former UST, 8381 Edison Avenue (DeHoog II Property).** A previous Phase I ESA completed by others included an interview with the former property owner, Mr. Joe De Hoog, in which Mr. De Hoog indicated that a 500-gallon gasoline UST was historically present immediately south of the detached three-car garage and was removed in the late-1970s. In 2021, soil samples were collected in the reported former location of the UST. Laboratory results indicated no detectable concentrations of TPH and VOCs above laboratory reporting limits. Based on these results, the former 500-gallon gasoline UST would not be considered an environmental concern to the Subject Property and represents an OEF.

Roux identified the following de minimis condition:

**De Minimis Condition 1 – Surficial Staining.** Roux observed evidence of surficial petroleum stains associated with aboveground storage tanks ASTs and/or equipment storage areas at the GH Dairy, Costa, and DeHoog II properties. The surficial staining noted on these properties appeared to be limited in scale and are not anticipated to present a threat to human health or the environment. A SMP should be implemented to manage any potentially impacted areas encountered during redevelopment of the Subject Property.

During conduct of this ESA, the following data gaps, as defined in ASTM Standard E1527-21, were identified:

- Previous Subject Property owners/operators were not available for an interview. This data gap is not considered significant due to sufficient information regarding Subject Property history available from Environmental Data Resources (EDR) historical documents, previous environmental reports for the Subject Property, GeoTracker and Freedom of Information Act (FOIA)/ Public Records Act (PRA) requests.

- During the site reconnaissance, Roux staff was provided guided access through the Alewyn, DeHoog I, Dehoog II and Swager properties. Roux's reconnaissance of the remaining properties, DeGroot, LMSAME and GH Dairy, was self-guided. Roux staff was not able to access the private residences, areas within the cattle corrals, feeding pastures, or other fenced areas. Due to the types of uses (residential, cattle corrals, etc.), the lack of entry into these areas is not considered a significant data gap in accordance with ASTM Standards.

- Due to time constraints associated with completion of this Phase I ESA, not all regulatory agencies have responded to public records requests. This data gap is not considered significant due to sufficient information regarding Subject Property history available from EDR historical documents, previous environmental reports for the Subject Property, and other regulatory agency responses.

- The DeGroot Property reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. During a property inspection in 1994, a SBCFD inspector was shown the removed

USTs, which were reportedly still stored on-site. The inspection report indicated the UST file had already been removed from the “alpha list” and that the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed and the location of these features was also not documented. Based on the lack of official regulatory closure following removal of the USTs, these USTs would be considered a data gap.

# 3. Qualifying Conditions

Roux Associates, Inc. (Roux) completed this Phase I Environmental Site Assessment (ESA) an approximately 180-acre rectangular parcel located south of Edison Avenue and west of Walker Avenue in the City of Ontario, California (the Subject Property). Figures 1 and 2 (Appendix A) show the location of the Subject Property. Roux performed this Phase I ESA in compliance with the scope and limitations of ASTM E1527-21 and the terms and conditions of Roux's proposal dated February 6, 2025. Roux conducted this Phase I ESA for the benefit of Ontario Ranch Venture, LLC and Ontario Ranch Venture II, LLC (the User).

The Subject Property is proposed for residential development and encompasses the northern half of the properties referred to by the User as the Ontario Ranch I and Ontario Ranch II properties (Figure 3). The Subject Property consists of all or portions of seven (7) individual properties referred to herein as the DeGroot Trust (DeGroot), Costa, GH Dairy, Alewyn, DeHoog I, DeHoog II, and Swager Properties (Figures 2 and 3 in Appendix A). The User purchased the Alewyn, DeHoog I, DeHoog II, and Swager Properties (associated with Ontario Ranch I) in 2022 and GH Dairy in 2024 and is considering purchasing the remaining portions of the Subject Property for residential development.

The following sections of this report present Phase I ESA findings and conclusions. Appendices presented at the end of the report consist of figures, photographic documentation, historic sources, a third party vendor database report, local and state agency records, records of communication, references, resumes for the individuals who prepared the Phase I ESA, previous investigations, regulatory records, closure reports, and permits.

## 3.1 Purpose

The purpose of this Phase I ESA is to identify and report, to the extent feasible, RECs with respect to the Subject Property. Performing a Phase I ESA in general compliance with ASTM E 1527-21 may enable a User to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser defenses pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and the Small Business Liability Relief and Brownfields' Revitalization Act of 2002, 42 U.S.C. 9601-9675 (collectively referred to hereinafter as "CERCLA") liability. That is, the practice that constitutes one of the requirements for "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 USC Section 9601(35) (B).

## 3.2 Scope of Services

The scope of services for this Phase I ESA included, but was not limited to, the activities listed below.

- A review of reasonably ascertainable and practicably reviewable topographic maps, historical aerial photographs, and city directories, if available, to investigate past Subject Property conditions;
- A review of specific government lists pursuant to ASTM Standard E 1527-21 regarding environmental activities for the Subject Property and local area properties;
- A review of recorded land title records, building, assessors, and fire department records, for permits, citations, and reports connected to the Subject Property that were reasonably ascertainable, practicably reviewable, and publicly available within reasonable time and cost;

- An inspection by an environmental professional to investigate the current use of the Subject Property and to identify environmental concerns including but not limited to, the presence of hazardous substances or petroleum products, wastes, USTs, ASTs, or other environmental concerns;
- An inspection by an environmental professional to investigate the current use of the adjoining properties from reasonably available public viewpoints to identify the current use of these properties to identify environmental concerns including but not limited to, the presence of hazardous substances or petroleum products, wastes, USTs, ASTs, or other environmental concerns;
- Interviews with available representatives of the owner of the Subject Property, occupants, key Subject Property manager, and local government officials by an environmental professional; and
- Preparation of this Phase I ESA report.

Roux initiated this Phase I ESA pursuant to receipt of written authorization to proceed on January 8, 2025.

## 3.3 Standard of Care

Roux conducted this Phase I ESA using a defined scope of services considered appropriate and agreed upon by all parties on the date the service was authorized, unless the scope of services or the methods used were later modified, in writing, and accepted by all parties prior to performance. Roux conducted this Phase I ESA in accordance with generally accepted practices in a manner consistent with that level of care exercised by other members of our profession in the same locality and under similar conditions of time and accessibility of improvements and information. No other representations expressed or implied, and no warranty or guarantee is included or intended to be part of this Phase I ESA.

Please note that the scope of services performed in execution of this assessment may not be appropriate to satisfy the needs of other parties. We, therefore, are not responsible for independent conclusions, opinions, or recommendations of others based on our assessment. Furthermore, this Phase I ESA relates to the environmental conditions of the Subject Property and does not address issues raised in transactions such as business risk, purchase of business entities, or interests therein, or of their assets, that may well involve environmental liabilities pertaining to properties previously owned or operated or other offsite liabilities.

Additionally, the findings of this Phase I ESA are based on Roux's observations, inquiries, and historical research using reasonably ascertainable and practically reviewable information obtained within reasonable time and cost constraints. Roux does not represent that this Phase I ESA is an exhaustive investigation that reflects the findings of all of the information available for the Subject Property, nor is it representative of future Subject Property conditions. If additional information is generated from the Subject Property, it should be provided to Roux so that we may evaluate its impact on our conclusions. As such, activities or episodes that transpire subsequent to this Phase I ESA are not considered in this assessment. It is not intended that a Phase I ESA in accordance with ASTM E1527-21 be an exhaustive assessment of a property nor can it wholly eliminate uncertainty regarding the potential for RECs in connection with a property.

## 3.4 Assumptions

This Phase I ESA Report, including the exhibits attached hereto, describes the results of Roux's investigation to identify the presence of RECs connected with the Subject Property in accordance with ASTM E1527-21, as allowed by and consistent with the regulatory requirements of the All Appropriate Inquiry Rule, 40 CFR Part 312, Amendment to Standards and Practices for All Appropriate Inquires Under CERCLA, Final Rule, published December 30, 2021 (AAI Rule). Specifically, the preamble to the amended AAI Rule states:

*The Environmental Protection Agency (EPA) today is taking final action to amend the standards and practices for conducting all appropriate inquiries under the CERCLA to reference a standard practice recently made available by ASTM International, a widely recognized standards development organization. Specifically, this final rule amends the "All Appropriate Inquiries Rule" at 40 CFR Part 312 to reference ASTM International's E1527–21 "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" and make clear that persons conducting all appropriate inquiries may use the procedures included in this standard to comply with the All Appropriate Inquiries Rule*[1].

One of the requirements that a person acquiring real property must meet in order to qualify for either the innocent landowner, contiguous owner, or bona fide prospective purchaser (collectively hereinafter "Prospective Purchaser") defense to liability under CERCLA is that person must conduct all appropriate inquiries into the previous ownership and uses of the property in conformance with the AAI Rule (or the ASTM E1527-21) prior to acquisition of the property. The Client has acknowledged that, under the AAI Rule, Roux's performance of this Phase I ESA in accordance with ASTM E1527-21 will not alone result in the Client satisfying all requirements of the AAI Rule and will not in itself provide a defense to CERCLA liability. The Client has acknowledged that the AAI Rule also requires that the Prospective Purchaser undertake certain additional inquiries and post-acquisition activities to satisfy the CERCLA AAI requirements. Accordingly, Roux makes no guarantees or warranties, expressed or implied, regarding this Phase I ESA, including without limitation, that this Phase I ESA alone will qualify the Client for a defense to CERCLA liability.

Roux has performed this Phase I ESA in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. Professional judgments expressed herein are based on the facts currently available to Roux.

The AAI Rule requires, and the conclusions and recommendations stated herein represent, the application of a variety of engineering and technical disciplines to material facts and conditions associated with the Subject Property. As such, these conclusions and recommendations are based on subjective interpretations and the exercise of discretion based on the facts available to Roux and conditions at the time of the performance of this Phase I ESA. Many of these facts and conditions are subject to change over time. Accordingly, the conclusions and recommendations must be considered within this context.

Client has agreed that Roux shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time this Phase I ESA was performed. To the extent practicable, Roux has identified data gaps, and has evaluated the potential significance of such data gaps. Recommendations to address those data gaps are presented herein and are based on the data available at the time of the performance of this Phase I ESA. Implementation of the recommendations may not fully address the data gaps, and the information obtained from execution of those recommendations may alter and/or modify the interpretation of the Subject Property conditions and conclusions, herein. This Phase I ESA does not include consideration of matters specifically excluded by ASTM E1527-21, including but not limited to, asbestos-containing building materials, radon, lead-based paint, lead in drinking water, wetlands,

[1] Federal Register: December 30, 2013 (Volume 78, Number 250) Page 79319

regulatory compliance, and mold unless specifically identified herein. PFAS[2] in drinking water was considered in this Phase I ESA as a REC.

This Phase I ESA Report should not be considered a legal interpretation of existing environmental laws and regulations. This Phase I ESA was conducted with a reasonable degree of inquiry to identify RECs, but uncertainty is not eliminated. No Phase I ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. The Phase I ESA process is intended to reduce, but not eliminate, the uncertainty involved with identifying RECs.

This Phase I ESA Report is not an appraisal or value judgment of the Subject Property. Client has agreed that Roux shall not be liable for any use of this Phase I ESA Report as an appraisal or value judgment of the Subject Property.

This Phase I ESA Report has been prepared for the exclusive use of Client for specific application to the Subject Property covered by this Phase I ESA Report. Client has agreed that, except as set forth in any written agreement by Roux, any third-party use of this Phase I ESA Report, upon disclosure by Client, is the sole responsibility and at the sole liability of Client.

## 3.5 Limitations and Exceptions

There were no limitations or exceptions associated with the performance of this Phase I ESA other than the data gaps identified in Section 3.8.

## 3.6 Special Terms and Conditions

There were no special terms and conditions associated with performing this assessment.

## 3.7 User Reliance

This report is confidential and has been prepared for the exclusive use of the User. No additional parties may use the information contained in this report without obtaining the written permission of Roux or the User. Roux's duties and obligations extend to the User and to no other party. Roux's duties and obligations to the User are not transferable to persons, corporations, or organizations without the express written consent of the User and Roux.

This Phase I ESA report must be read and interpreted as a whole and can only be considered representative of the conditions of the Subject Property as of the date of our site reconnaissance described herein. Roux makes no representation whatsoever concerning the condition of the Subject Property beyond the date of our site reconnaissance described herein. Individual sections and appendices of this report are dependent on the balance of this report, and on the terms, conditions, and stipulations contained in the proposal and written amendments accepted by Roux.

## 3.8 Data Gaps

During conduct of this ESA, the following data gaps, as defined in ASTM Standard E1527-21 were identified:

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[2] PFAS have been used in a wide variety of industrial and commercial processes and products and have been recently added to the hazardous substances list in the Commonwealth of Pennsylvania.

- During the site reconnaissance, Roux staff was provided guided access through the Alewyn, DeHoog I, Dehoog II and Swager properties. Roux's reconnaissance of the remaining properties, DeGroot, LMSAME and GH Dairy, was self-guided. Roux staff was not able to access the private residences, areas within the cattle corrals, feeding pastures, or other fenced areas. Due to the types of uses (residential, cattle corrals, etc.), the lack of entry into these areas is not considered a significant data gap in accordance with ASTM Standards.

- Previous site owners/operators were not available for an interview. This data gap is not considered significant due to sufficient information regarding Subject Property history available from EDR historical documents, previous environmental reports for the Subject Property, and FOIA/OPRA requests.

- Due to time constraints associated with completion of this Phase I ESA, not all regulatory agencies have responded to public records requests. This data gap is not considered significant due to sufficient information regarding Subject Property history available from EDR historical documents, previous environmental reports for the Subject Property, and other regulatory agency responses.

- The DeGroot Property reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. During a property inspection in 1994, a SBCFD inspector was shown the removed USTs, which were reportedly still stored on-site. The inspection report indicated the UST file had already been removed from the "alpha list" and that the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed and the location of these features was also not documented. Based on the lack of official regulatory closure following removal of the USTs, these USTs would be considered a data gap.

## 3.9 Deviations

Roux performed this assessment in accordance with the generally accepted practices for environmental assessments at the time of implementation. Roux made a reasonable effort to ensure that the information presented in this report is materially complete and accurate.

# 4. Property Overview

## 4.1 Site and Vicinity General Characteristics

The Subject Property is located southwest of the intersection of Edison Avenue and Walker Avenue in Ontario, California and consists of approximately 180-acres of mostly dairy farms and few residences. The Subject Property consists of seven (7) individual properties referred to herein as the DeGroot, Costa, GH Dairy, Alewyn, DeHoog I, DeHoog II, and Swager Properties (Figures 2 and 3 in Appendix A). Roux photographed the Subject Property to support this written report. Those photographs are included in **Appendix B** – Photographic Documentation. The following table presents the addresses and Assessor's Parcel Numbers (APNs) associated with the Subject Property.

| Property | Address | APN |
|---|---|---|
| DeGroot Trust | 7325, 7371, 7397, 7587, and 7697 Edison Avenue | 1053-371-01-0000<br>1053-371-02-0000 |
| Costa | 14213, 14239, 14279, 14283, and 14297 Bon View Avenue | 1053-351-01-0000<br>1053-351-02-0000 |
| GH Dairy | 7721, 7891, 8061, and 8065 Edison Avenue<br>14203 Bon View Ave | 1053-361-01-0000<br>1053-361-02-0000<br>1053-361-03-0000<br>1053-331-01-0000<br>1053-331-02-0000<br>1053-331-03-0000<br>1053-331-04-0000<br>1053-341-01-0000<br>1053-341-02-0000 |
| Alewyn | 8185 Edison Avenue<br>14117 Grove Ave | 0216-321-03-0000 |
| DeHoog I | 8245, 8295, 8285, and 8311 Edison Avenue | 0216-321-08-0000 |
| DeHoog II | 8335, 8377, and 8381 Edison Avenue | 0216-322-03-0000<br>0216-322-04-0000 |
| Swager | 8405 and 8485 Edison Avenue | 0216-322-10-0000 |

As depicted on the Prado Dam, California (2022) 7.5-minute quadrangle topographic map published by the United States Geological Survey (USGS) and included as **Appendix A** – Subject Property Location Map and the EDR Radius Report Map (EDR Report), the Subject Property has an approximate elevation of 682 feet above mean sea level (msl) and generally slopes to the south.

## 4.2 Current and Past Use of the Site

From at least 1938 to 1953, the Subject Property was used for agricultural purposes (row crops and orchards) with a few dwellings. By the mid-1950s, the Subject Property became increasingly used for dairy farm purposes with some residences.

At the time of this assessment, the Subject Property was used for dairy farming and residential purposes. Additional information regarding on-site features and current operations is discussed below in Section 7.

## 4.3 Current Uses of the Adjoining Properties

The Subject Property is located in a mixed agricultural/dairy farm and residential area. Current uses/occupants of surrounding properties are as follows and are presented on Figure 2:

- North – The Subject Property is bound to the north by Edison Avenue, beyond which are dairy farms, residences, a nursery, truck storage yards, and vacant land;
- East – The Subject Property is bound to the east by Walker Avenue, beyond which is a dairy farm and residences;
- South – The Subject Property is bound to the south by dairy farms and residences including the larger properties associated with the DeGroot, LMSAME, et al, Alewyn, DeHoog II, and Swager Properties, and a storage yard; and
- West – The Subject Property is bound to the west by a potting soil production property.

During the site visits on January 22 and 31, 2025, Roux did not identify RECs on the adjacent properties based on observations from public rights-of-way.

# 5. Property Background/Operating History

## 5.1 Historical Use Information

Pursuant to ASTM, Roux requested the following standard historical sources from EDR:

- Historical Sanborn fire insurance maps;
- Historical aerial photographs;
- Historical USGS 7.5-minute topographic quadrangle maps; and
- Local street directories.

Presented in the following sections is Roux's review of standard historical sources obtained during this Phase I ESA. Copies of the historical records that Roux obtained are included in **Appendix C** – Historic Sources.

### 5.1.1 Historical Sanborn Fire Insurance Maps

Roux requested historical Sanborn fire insurance maps from EDR. Sanborn Fire Insurance Maps were not identified for the Subject Property.

### 5.1.2 Historical Aerial Photographs

Roux requested from EDR a search for historical aerial photographs. Aerial photographs were provided by EDR for the years 1938 through 2020.

**DeGroot**

- **1938, 1946, 1948, and 1953** – The property consisted of agricultural land with approximately two residences present along Edison Avenue. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the northern portion of the property was expanding use for dairy farming and by 2002, the western and southwestern portions of the property were as well. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**Costa**

- **1938, 1946, 1948, and 1953** – The property consisted of agricultural land with a residence present along Bon View Avenue. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the property was expanding use for dairy farming. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**GH Dairy**

- **1938, 1946, 1948, and 1953** – The property consisted of mostly agricultural land with approximately two residences noted along the northern boundary of the property and a possible other residence was noted in the central portion of the property. Edison Avenue, Grove Avenue, and Bon View Avenue were present to the north, east, and west of this property. By 1946, an additional dwelling and a farm building associated with a dairy farm were developed in the northeast portion of the property. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the northwest portion of the property was expanding dairy farm uses and by 1975, the east portion of the

property was as well. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**Alewyn**

- **1938, 1946, 1948, and 1953** – The property was used for agricultural purposes or undeveloped land with a residence noted in the northwest corner of the property. The southern portion of the property appeared to consist of forested land. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the property was developed with the existing northeastern residence and hay barn and was partially developed for dairy farm use as noted by the presence of corrals. By 1985, the dairy farm uses expanded and a wastewater pond was noted in the southeast corner of the property. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**DeHoog I**

- **1938, 1946, 1948, 1953, and 1966** – The property appeared to consist of forested land. By 1966, the land was cleared and vacant. The property vicinity generally consisted of agricultural land and spare residences.
- **1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1975, the property was used for dairy farming purposes and feature residential buildings along the northern portion of the property along Edison Avenue. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**DeHoog II**

- **1938, 1946, 1948, and 1953** – The property consisted of agricultural land with two residences noted in the northeastern corner of the property. By 1946, corrals and a possible barn were noted west of the residences. The Subject Property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the dairy farming operations began expanding into the remainder of the property was as well. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**Swager**

- **1938, 1946, 1948, and 1953** – The property consisted of agricultural land. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the property began development of a dairy farm with a residence. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

### 5.1.3 Historical USGS Topographic Maps

Roux requested from EDR a search for historical USGS topographic maps. Coverage was available for select years from 1902 through 2022.

- **1902** – This map had a large scale and did not show site specific details, although the Subject Property and vicinity were generally depicted as vacant land.
- **1933, 1941, 1947, 1949, 1950, and 1967** – These maps depicted the Subject Property and vicinity as vacant land with sporadic residences. Bon View Avenue, Edison Avenue, and Grove Avenue were noted.
- **1973 and 1981** – The Subject Property showed evidence of dairy farm use. The Subject Property vicinity was increasingly depicted with likely dairy farm use.
- **2012, 2018, and 2022** – These maps did not show site specific details.

### 5.1.4 Local City Directories

Roux requested from EDR a search for city directories for select Subject Property addresses and the immediate vicinity. City directories between the years 1922 and 2020 were reviewed using select addresses for each property. Listings for the Subject Property included farming and/or residential occupant listings since at least 1960. Listings for the Subject Property vicinity reflected similar uses.

# 6. Environmental Setting

Roux obtained and reviewed published, reasonably ascertainable information concerning the physical setting of the Subject Property. The following is a summary of our review of those physical setting sources.

## 6.1 Topography

Roux reviewed the Prado Dam, CA (2021) 7.5-minute quadrangle topographic map showing the area in which the Subject Property is located (see **Appendix A** for Subject Property Location Map). The Subject Property slopes slightly to the south with an approximate elevation of 682 feet above msl.

## 6.2 Subsurface Geology and Hydrogeology

The table below, based on information obtained from the EDR Radius Map Report, the United States Department of Agriculture Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm), and the Statewide Geologic Map and Fault Activity Map of California (California Geological Survey, 1977) summarizes mapped geologic conditions in the vicinity of the Subject Property.

| Feature | Description |
|---|---|
| Surficial Geology | Quaternary age alluvium, lake, playa, and terrace deposits; unconsolidated and semi-consolidated |
| Soil | Tujunga loamy sand; Hilmar loamy fine sand; Grangeville fine sandy loam; Chino silt loam |

According to the *Winter and Spring 2024 Semiannual Groundwater Monitoring Report* by Tetra Tech, shallow groundwater at the northern portion of Chino Airport, located approximately 0.5-miles south of the Subject Property, occurs at depths of approximately 56 to 87 feet bgs and flows in a south to southwesterly direction. Based on State Water Resource Control Board (SWRCB) records for the south adjoining property, 14400 South Grove Avenue, groundwater was identified in 2004 at a depth of 120 feet bgs.

The Subject Property is located within the Chino Groundwater Basin. Concentrated animal feeding lots such as dairy farms can be a source of local groundwater degradation due to nitrates and TDS. According to information provided on the EPA website, the Chino Basin once had the highest concentration of dairy animals in the world, with approximately 350 dairies located within a 20-square mile area. Although the number of dairies has declined significantly, historical land application of manure and process water has resulted in significant groundwater degradation due to high levels of TDS and nitrate. The Dairy Farm General Permit was created to minimize continued degradation of groundwater in the Chino Basin as well as other parts of the Santa Ana Region. According to the California Regional Water Quality Control Board, Santa Ana Region (SARWQCB) website, the Subject Property is located within the Chino 2 “antidegradation” management zone which indicates that the SARWQCB has determined that the lowering of water quality is not of maximum benefit to the public. These contaminants do not pose a potential human health risk to occupants of the Subject Property.

Additionally, based on a review of the Chino Basin Watermaster online Map Viewer, the eastern portion of the Subject Property is located within a large regional VOC groundwater plume comprised mostly of TCE, referred to as the South Archibald TCE Plume. This plume originates from a source approximately 1.7 miles northeast of the Subject Property as a result of historical land use of numerous metal plating and finishing

facilities. Based on the 2022 State of the Basin Report, low concentrations of TCE were reported from 2017 to 2022 in groundwater from two on-site wells on the DeHoog II and Swager Properties at concentrations of 1.2 and 0.46 ug/l, respectively, well below the SWRCB, Division of Drinking Water MCLs for TCE in drinking water of 5 ug/l. Based on the depth of groundwater and low concentrations of VOCs detected beneath the Subject Property, there is a low likelihood that a vapor intrusion issue is present. At least three of the Subject Property occupants (Swager, DeHoog I, and DeHoog II Properties) have drinking water supplied by the City of Ontario. Based on the historical and current land use at the Subject Property (i.e., agricultural, diaries, and residential), there is a low likelihood that on-site land use activities have contributed to the regional groundwater issue. Groundwater monitoring within the plume area is on-going and a remediation system to treat the contaminated groundwater is currently in the design and permitting phases.

# 7. Results of On-Site Inspection

Roux representative Ms. Tahsin Annoor conducted a reconnaissance of the Subject Properties and surrounding areas on January 22 and 31, 2025. During the site reconnaissance, the weather was sunny and 75° Fahrenheit.

Roux's site reconnaissance methods included a site visit to physically observe the Subject Properties in an effort to identify RECs in connection with the Subject Properties. Ms. Tahsin Annoor traversed the Subject Properties to observe conditions during the site reconnaissance. Photographs taken to document conditions encountered at the time of the site reconnaissance are included in Appendix B – Photographic Documentation. Ms. Tahsin Annoor also visually and/or physically observed adjoining properties from reasonably accessible locations on the Subject Property and public thoroughfares. The following sections summarize observations during the inspection.

## 7.1 Discussion of Property Operations

At the time of the January 22 and 31, 2025 site visits, the Subject Property consisted of seven properties (referred to as the DeGroot, Costa, GH Dairy, Alewyn, DeHoog I, DeHoog II, and Swager Properties) that were occupied by dairy farms and/or residences. Roux staff was provided guided access through the Alewyn, DeHoog I, Dehoog II and Swager properties. Roux's reconnaissance of the remaining properties, DeGroot, LMSAME and GH Dairy, was self-guided. Roux staff was not able to access the private residences, areas within the cattle corrals, feeding pastures, or other fenced areas. Due to the types of uses (residential, cattle corrals, etc.), the lack of entry into these areas is not considered a significant data gap in accordance with ASTM Standards.

As previously noted, select properties located within the boundaries of the Subject Property are part of a larger property. The following presents a summary description of each property (or portions of properties thereof) as they pertain to the boundaries of the Subject Property:

- **DeGroot Property (portion) –** The DeGroot Property is part of a larger property, comprising of two parcels. The larger, northern parcel associated with APN: 1053-371-01-0000 is located within the Subject Property boundary. Within this select portion of the DeGroot property consists of an active dairy farm and is developed with two residences (7587 and 7697 Edison Avenue), a milking barn, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed one agricultural water well.

- **Costa Property (portion) –** The LMSAME Property is part of a larger property, comprising of six parcels. Two of these parcels, associated with APNs: 1053-351-01-0000 and 1053-351-02-0000, are located within the Subject Property boundary. Within the select portions of the LMSAME property consists of an active dairy farm and is developed with various private residence (14213 through 14297 Bon View Avenue), a milking barn, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed an agricultural water well and an in-ground truck scale.

- **GH Dairy Property –** The entirety of the GH Dairy Property is located within the Subject Property boundary. The GH Dairy Property consists of an active dairy farm and is developed with three residences (7721, 7891, and 8061 Edison Avenue), a milking barn, wastewater pond, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux observed one active agricultural water well, one active residential well, and one idle water well.

- **Alewyn Property (portion) –** The Alewyn Property is part of a larger property, comprising of three parcels. Of these, the larger, northern parcel associated with APN: 0216-321-03-0000 is located within the Subject Property boundary. Within this select portion of the Alewyn property is an active dairy farm and is developed with two residences (8185 Edison Avenue and 14117 Grove Avenue), a decommissioned milking barn, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed an agricultural water well.

- **DeHoog I Property –** The entirety of the DeHoog I Property is located within the Subject Property boundary. The DeHoog I Property consisted of an active dairy farm and is developed with two residences (8295 and 8311 Edison Avenue), a milking barn, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos.

- **DeHoog II Property (portion) –** The DeHoog II Property is part of a larger property, comprising of four parcels. Of these, the two northern parcels associated with APNs: 0216-322-03-0000 and 0216-322-04-0000 are located within the Subject Property boundary. Within the select portions of the DeHoog II Property is an active dairy farm and is developed with one single-family home (8381 Edison Avenue), a milking barn, an office building, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed agricultural water well and an in-ground truck scale.

- **Swager Property (portion) –** The Swager Property is part of a larger property, comprising of an approximately 36.95-acre parcel. In general, the northern half (approximately 18.48-acres) of the Swager Property is located within the Subject Property boundary. Within this select portion of the Swager Property is an active dairy farm and is developed with one single-family home (8485 Edison Avenue), an active milking barn, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed an agricultural water well.

The following sections summarize other of Roux's Subject Property reconnaissance observations.

## 7.2 Site Inspection Observations

### 7.2.1 Stained Soil, Pavement, or Interior Staining

Roux observed evidence of staining, unusual odors, petroleum sheens, or distressed vegetation at the Subject Property during the site visit on January 22 and 31, 2025. In general, Roux observed surficial staining in the milk barns and feed silos areas associated with the dairy farm operations. According to the staff, the staining observed in the milk barn and feed silos areas are a result of acid wash (a concentrated, non-foaming, tri-blend detergent) and molasses (liquid cattle feed), respectively. Roux also observed small areas of surficial staining along the area surrounding diesel ASTs observed in the LMSAME Property. Moderate to heavy oil staining was noted on and within the vicinity of the diesel ASTs located in the central area of the DeHoog II Property. This area of the DeHoog II Property appeared to concrete/asphalt paved, although the hardscape appeared to be damaged and/or broken.

During the January 2025 site reconnaissance, the surficial staining observed on the different properties located within the Subject Property appeared to be limited in scale and are not anticipated to present a threat to human health or the environment. The staining observed is considered to be de minimis in nature.

### 7.2.2 Wastewater

With the exception of DeGroot Property, wastewater ponds associated with dairy farm operations were observed on all properties located within the boundaries of the Subject Property. These ponds represent permitted features, and no chemical uses were noted to be associated with these features.

### 7.2.3 Oil/Water Separators (OWS)

No evidence of OWS were observed during the site reconnaissance on January 22 and 31, 2025.

### 7.2.4 Utilities

No utilities of environmental concern were noted during the site visit on January 22 and 31, 2025.

### 7.2.5 Flooring and Paved Surfaces

Flooring and paved surfaces were observed to be in good condition throughout the Subject Property. Surface staining was observed on the flooring and paved surfaces of several of the properties within the Subject Property as discussed in Section 7.2.1.

### 7.2.6 Surface Water

Wastewater ponds associated with dairy farm operations were observed on all properties with the exception of the portion of the DeGroot Property located within the Subject Property boundary.

### 7.2.7 Archeological / Endangered Species / Landmarks

No potential for historic landmarks/structures, and/or archaeological features were identified during the January 22 and 31, 2025 site visit.

### 7.2.8 Industrial Processes

Dairy farm operations were noted on the Subject Property during the January 22 and 31, 2025 site visit. Subject Property occupant activities include dairy farm operations, storage, shipping, and receiving of products. Milk manufacturing processes occur on-site.

### 7.2.9 Exterior Industrial Features

Exterior industrial features were observed by Roux during the January 22 and 31, 2025 site visit including milk barns, cattle corral canopies, and feed silos. No railroad spurs, baghouses, air emissions, or barrels were observed. All properties were equipped with milk ASTs and feed silos.

### 7.2.10 Interior Industrial Features

Interior industrial features were observed by Roux during the January 22 and 31, 2025 site visit including milk pump rooms and cattle wash areas.

### 7.2.11 Hydraulic Equipment and PCBs

During the Subject Property reconnaissance on January 22 and 31, 2025, Roux observed several single to triple pole-mounted electrical transformers along Bon View Avenue, and one triple pole-mounted transformer on the DeGroot Property. Based on the available information, all observed transformers are expected to be non-PCB containing and/or dry-type transformers. No staining was observed in the areas of the pole-mounted transformers; therefore, the transformers are not considered a REC and do not warrant additional investigation.

No hydraulic equipment was observed on the Subject Property during the January 22 and 31, 2025 site visit.

### 7.2.12 Surface Features

Roux did not observe landfills or evidence of dumping at the Subject Property during the site visit on January 22 and 31, 2025. Odors associated with dairy farm operations (manure, wastewater ponds) were observed throughout the Subject Property and surrounding area.

### 7.2.13 Aboveground Storage Tanks (ASTs) & Underground Storage Tanks (USTs)

The following features were noted during the January 22 and 31, 2025 site visit:

- **DeGroot Property –** Roux observed a 10,000-gallon water AST, one 10,000-gallon milk AST, two feed silos, and three 500-gallon diesel ASTs.

- **Costa Property –** Roux observed a 4,000-gallon water AST located south of the milk barn; a 500-gallon fuel AST; two 10,000-gallon milk ASTs located north and south of the milking barn; an emergency generator with a 100-gallon diesel fuel AST located immediately south of the milk barn.

- **GH Dairy Property –** Roux observed two 2,000-gallon water ASTs, a 4,000-gallon water AST, two 7,000-gallon milk ASTs, and two 4,000-gallon liquid feed ASTs, and an emergency electrical generator with a 100-gallon diesel fuel AST located immediately west of the milk barn.

- **Alewyn Property –** Roux observed a 2,500-gallon water AST, and 10,000-gallon milk barn wash AST located immediately east of the decommissioned milking barn.

- **DeHoog I Property –** Roux observed one steel AST for storing water west of the milking barn, and two additional ASTs located west of the milking barn, likely used to store water from an associated water well.

- **DeHoog II Property –** Roux observed an AST located southeast of the residence. This AST was viewed from a distance; therefore, the contents are not known. Roux also observed 12,000-gallon milking barn wash tank located in the central north boundary, a water well and associated 4,000-gallon water pressure AST located northwest of the office building, and an emergency generator with a 250-gallon diesel fuel tank located immediately east of the milking barn.

- **Swager Property –** Roux observed an emergency generator with a 200-gallon diesel fuel tank, a water well and associated 2,000-gallon water pressure AST, and a 12,000-gallon water AST located west of the milking barn.

### 7.2.14 On-site Chemical Storage

During the site visit on January 22 and 31, 2025, Roux observed chemical storage, specifically within milk barns, at all properties associated with the dairy farm operations. Chemicals observed in the milk barn areas included numerous 55-gallon drums of iodine, acid wash, and hydrogen peroxide for sanitation purposes.

### 7.2.15 Agricultural

Cattle wash and other sanitation chemicals, farm waste, and feed lot spoils, and wastewater ponds were seen used or stored on-site during the January 22 and 31, 2025 site visit on each of the dairy farm operations located on the Subject Property.

### 7.2.16 Oil / Gas / Mineral Exploration

Roux did not identify any well exploration or refinery activities during the site visit.

### 7.2.17 Asbestos-Containing Materials (ACM)

The manufacture of most ACMs in the United States was phased out in the 1970s. Based on the age of the buildings (1930s to mid-1960s), it is possible that ACM are present. Additionally, underground asbestos-cement pipelines (ACPs) were commonly used to transfer irrigation water. Based on the historical agricultural use of the Subject Property, ACPs may be present.

### 7.2.18 Lead Based Paint (LBP)

The manufacture of LBP was phased out in the United States in approximately 1978. Based on the age of the buildings (1930s to mid-1960s), it is possible that LBP are present.

### 7.2.19 Water Intrusion and Mold

No water intrusion or mold was noted during the site visit on January 22 and 31, 2025.

## 7.3 Interviews

During the site reconnaissance, Roux staff was provided guided access through the Alewyn, DeHoog I, Dehoog II and Swager properties by Mr. Jason Lee, a representative of the residential redevelopment contractor, RCCD, Inc. The information obtained is provided throughout the report.

Roux was unable to conduct interviews with previous site owners or operators. This data gap is not considered significant due to sufficient information regarding Subject Property history available from EDR historical documents, previous environmental reports for the Subject Property, GeoTracker and FOIA/PRA requests. The User was able to provide information and assist in identifying possible RECs in connection with the Subject Property.

## 7.4 User Provided Information

The following sections summarize information provided by the User to assist in identifying possible environmental concerns associated with the Subject Property.

ASTM E1527-21 provides an optional User Questionnaire to present select User-provided information that can assist in identifying possible RECs in connection with the Subject Property. According to ASTM E1527-21, these tasks do not require the technical expertise of an environmental professional and the environmental professional generally does not perform these tasks. Roux administered the optional questionnaire to the User at the beginning of this Phase I ESA to assist them with these tasks. The following sections outline the parts of the questionnaire that the User completed. The questionnaire was completed by Ms. Janine Padia, User representative. The completed questionnaire is provided in Appendix D.

### 7.4.1 Environmental Liens or Activity and Use Limitations

The User indicated that they have no knowledge regarding environmental liens or activity use limitations with respect to the Subject Property.

### 7.4.2 Specialized Knowledge

The User did not report any specialized knowledge related to the Subject Property or nearby properties. The User provided previous environmental reports summarized in Section 7.4.6.

### 7.4.3 Valuation Reduction for Environmental Issues

The User did not report any valuation reduction for environmental issues.

### 7.4.4 Commonly Known or Reasonably Ascertainable Information

The User did not report knowledge of any commonly known or reasonably ascertainable information, other than the historical use of the Subject Property includes dairy farm uses.

### 7.4.5 Specialized Knowledge

The User did not report specialized knowledge of the Subject Property.

### 7.4.6 Other User Provided Information

The User provided Roux with multiple previous environmental reports that included portions of the Subject Property. The Subject Property consists of the northern portions of larger properties referred to cumulatively as Ontario Ranch I and Ontario Ranch II (Figure 3). The Alewyn, DeHoog I, DeHoog II, and Swager properties of the Subject Property are associated with the northern portion of Ontario Ranch I. The DeGroot, LMSAME et al., and GH Dairy properties of the Subject Property are associated with the northern portion of Ontario Ranch II. The following presents a summary of the previous environmental reports provided by the User. Copies of these reports are provided in **Appendix D**.

#### *7.4.6.1 Previous Reports for Ontario Ranch I*

The following presents previous environmental reports associated with Ontario Ranch I. Only information associated with the Subject Property is included in these report summaries.

**Phase I ESA and Limited Site Characterization (LOR, 2005) – Swager Property**

At the time of LOR's report, the property was improved with the existing residence and dairy farm. The following presents the findings and conclusions:

- Three water wells were present on-site. If the wells are destroyed/abandoned during redevelopment, these activities should be completed in accordance with regulatory requirements.
- Due to the extensive dairy farming activities, the potential exists for elevated soil organic levels and the associated presence of subsurface methane gas.
- Portions of the property were utilized for agricultural purposes, therefore pesticides may be present in soils.

To further investigate the potential presence of pesticides, LOR conducted limited soil sampling for pesticides. Seven soil samples were collected in various locations throughout the property at depths of 6 to 12 inches bgs. Trace to low concentrations of organochlorine pesticides were detected in the sampled locations, below residential screening levels, except for one location. One soil sample from the center of the property reported slightly elevated dieldrin. Considering that this was an isolated area, the clearing and grading of the property will reduce the dieldrin level below screening levels, therefore unrestricted use of the property is warranted.

**Phase I ESA (GeoKinetics, 2006a) – DeHoog II Property**

At the time of GeoKinetics's report, the property was improved with the existing residence and dairy farm. The following presents the findings and conclusions:

- Due to the historic dairy farming activities since the 1940s, the potential exists for elevated soil organic levels and the associated presence of subsurface methane gas.
- Portions of the property were utilized for agricultural purposes between the early 1900s and early 1960s, therefore pesticides may be present in soils.
- Surficial staining was noted in various locations throughout the property.
- The on-site septic system will need to be properly removed prior to redevelopment.
- One active water supply well is present east of the milking barn and one sump and associated pump are located at the south end of the feed lanes, which should be abandoned during redevelopment of the property.
- Twelve ASTs are present on the property and should be properly removed and disposed of prior to redevelopment of the property.
- A 500-gallon gasoline UST was reportedly previously operated and removed during the 1970s and soil contamination was not detected.
- Organic rich sediment from wastewater holding ponds should be removed.

**Phase I ESA (GeoKinetics, 2006b) – Alewyn Property**

At the time of GeoKinetics's report, the property was improved with the existing residences and dairy farms. The following presents the findings and conclusions:

- Due to the historic dairy farming activities since the 1950s, the potential exists for elevated soil organic levels and the associated presence of subsurface methane gas.
- Portions of the property were utilized for agricultural purposes between the early 1900s and early 1950s, therefore pesticides may be present in soils.
- Surficial staining was noted in various locations throughout the property.
- The on-site septic system will need to be properly removed prior to redevelopment.
- Two active water supply wells and one sump and associated pump are present, which should be abandoned during redevelopment of the property.
- Nine ASTs are present on the property and should be properly removed and disposed of prior to redevelopment of the property.
- Underground clay drain lines should be removed.
- Organic rich sediment from wastewater holding ponds should be removed.

- A former 250-gallon diesel UST was reportedly removed from the northern dairy. Soil contamination was reportedly not encountered during the tank removal.

**Phase I ESA (GeoKinetics, 2007) – Swager Property**

At the time of GeoKinetics's report, the property was improved with the existing residence and dairy farm. The following presents the findings and conclusions:

- Due to the historic dairy farming activities since the 1960s, the potential exists for elevated soil organic levels and the associated presence of subsurface methane gas.
- Portions of the property were utilized for agricultural purposes between the early 1900s and early 1960s, therefore pesticides may be present in soils.
- Surficial staining was noted in various locations throughout the property.
- The two on-site septic systems will need to be properly removed prior to redevelopment.
- Three active water supply wells are present, which should be abandoned during redevelopment of the property.
- Four ASTs are present on the property and should be properly removed and disposed of prior to redevelopment of the property.
- Underground drain lines should be removed.
- Organic rich sediment from wastewater holding ponds should be removed.

**Phase I ESA (Hillman, 2014) – DeHoog I Property**

At the time of Hillman's report, the property was improved with the existing residence and dairy farm. The following presents the findings and conclusions:

- Chlorinated solvents identified in on-site well water from an upgradient source represents a REC.
- The likely use of pesticides represents a REC.
- Two large evaporation ponds were noted on the south portion of the Property. The evaporation ponds are likely to contain significant accumulations of organically rich sediment. Further, cleaning and sanitizing chemicals are reported to be washed down the barn floor drains to the ponds and spray fields. This was noted as a REC.
- A historic 500-gallon gasoline UST represents a hREC.

**Draft Phase I ESA (Ardent, 2021a)**

Ardent's Phase I ESA was completed for the entirety of Ontario Ranch I. At the time of Ardent's report, the Alewyn, DeHoog I, DeHoog II, and Swager properties were used as dairies. The Subject Property was mainly used for agricultural purposes from at least 1938 through 1953.

- Based on the historical dairy land use, methane gas surveys have been completed by others at the Alewyn, DeHoog II, and Swager properties. Results of these surveys indicate sporadic elevated concentrations of methane gas exceeding the Lower Explosive Limit (LEL) of methane (i.e., 50,000 ppm). Based on our experience, the City of Ontario will require the developer to complete a comprehensive methane gas survey under its jurisdiction following the removal of the source materials (i.e., organic debris) and grading activities to determine the type of methane gas mitigation system that will be required for the proposed buildings. At a minimum, the City requires a passive system. It has been our experience that methane gas surveys completed following the source removal and grading activities result in much lower concentrations (i.e., below guidelines requiring an active methane gas mitigation system). Due to the City requirement, the possible presence of methane gas beneath the site would be considered a de-minimis condition.

- There are 10 groundwater wells located throughout Ontario Ranch I that have been used for agricultural, residential, and/or dairy water supply purposes. These features would not be considered an environmental concern, however, would be identified as a de minimis condition by ASTM Standards. Other unknown wells may be present.

- The Alewyn Property reportedly operated a former 250-gallon diesel UST at JAD #1 was located immediately west of one of the groundwater wells and removed in 1978. This UST was removed prior to UST regulations, and therefore, no regulatory oversight or confirmation soil samples were collected. Based on this information, the former 250-gallon diesel UST at the Alewyn Property would be considered a REC.

- The DeHoog II Property reportedly operated a former 500-gallon gasoline UST was reportedly removed during the late-1970s. This UST was removed prior to UST regulations, and therefore, no regulatory oversight or confirmation soil samples were collected. Based on this information, the former 500-gallon gasoline UST at the DeHoog II Property would be considered an REC.

- Ardent noted that the Subject Property lies within the "South Archibald TCE Plume." Low concentrations of TCE were recently detected at the time of Ardent's report in groundwater from an on-site well, far below the state standards for purveyors of drinking water. Based on the depth of groundwater and low concentrations of VOCs detected beneath the Subject Property, Ardent concluded there is a low likelihood that a vapor intrusion issue is present. Based on the historical and current land use (i.e., agricultural, diaries, and residential), there is a low likelihood that on-site land use activities have contributed to the regional groundwater issue. Groundwater monitoring within the plume area is on-going and a remediation system to treat the contaminated groundwater is currently in the design and permitting phases. Since there are low concentrations of TCE detected beneath the Subject Property and no vapor intrusion issue is present, the regional TCE groundwater plume would be considered a de minimis condition.

- The site is located within the Chino Groundwater Basin. Groundwater in the basin has been reportedly contaminated with elevated salts, namely nitrates, associated with the historical agricultural and dairy activities in this area. According to the SARWQCB, new property owners are not being held liable for this regional issue associated with historical land uses. Groundwater in the basin is undergoing remedial treatment at designed desalination plants. Based on the agency involvement and active remediation, the regional groundwater nitrate issue associated with the Chino Groundwater Basin would be considered a CREC.

- Based on the age of the buildings (1930s to mid-1960s), it is possible that ACM and LBP are present. Based on the historical agricultural use at the site, underground ACPs were commonly used to transfer irrigation water. Based on this information, the possible presence of ACPs would be considered a de minimis condition.

**Draft Subsurface Investigation (Ardent, 2021b)**

Based on the preliminary findings of the Phase I ESA, Ardent completed a subsurface investigation to further evaluate potential impacts associated with the former 250-gallon diesel UST at the Alewyn Property (8185 Edison Avenue) and former 500-gallon gasoline UST at the DeHoog II Property. The location of the 250-gallon diesel UST former UST was generally provided by others in a previous 2006 Phase I ESA and general area was verified by the property owner during a site visit by Ardent personnel during completion of its Phase I ESA. Due to the small size and general location provided, Ardent drilled two soil borings at this location. The location of 500-gallon gasoline UST was verified by the property owner during a site visit by Ardent personnel during completion of its Phase I ESA. Due to the concretely identified location of the former UST, Ardent advanced one soil boring in the reported location of this former feature.

Borings were advanced to 15 feet bgs and soil samples were collected at 5, 10, and 15 feet bgs. Soil samples collected at 10 feet bgs from each boring (the anticipated bottom of the former excavation associated with the tanks) was analyzed for TPH and VOCs in general accordance with EPA Method Nos. 8015 (modified) and 8260B/5035. Laboratory results indicated no detectable concentrations of TPH and VOCs above laboratory reporting limits. Based on these results, the former 250-gallon diesel UST removed from the Alewyn Property and the 500-gallon gasoline UST removed from the DeHoog II property would no longer be considered an REC.

#### *7.4.6.2 Previous Reports for Ontario Ranch II*

The following presents previous environmental reports associated with Ontario Ranch II. Only information associated with the Subject Property is included in these report summaries.

**Draft Phase I ESA (Ardent, 2022)**

Ardent's Phase I ESA was completed for the entirety of Ontario Ranch II. At the time of Ardent's report, the GH Dairy and the DeGroot properties were used as dairies. The Costa Property (referred to by Ardent as the LMSAME et al. Property) was a vacant diary. Ardent identified the following findings and conclusions:

- Based on the historical land use of the site as a dairy, there is a moderate likelihood that methane gas might be present. Methane gas is naturally produced during the biodegradation of organic materials such as animal manure. Based on our experience, the City of Ontario will require the developer to complete a comprehensive methane gas survey under its jurisdiction following the removal of the source materials (i.e., organic debris) and grading activities to determine the type of methane gas mitigation system that will be required for the proposed buildings. Due to the City requirement, the possible presence of methane gas beneath the site would be considered a de-minimis condition.

- There are seven groundwater wells located on Ontario Ranch II that have been used for agricultural, residential, and/or dairy water supply purposes. These features would not be considered an environmental concern, however, would be identified as a de-minimis condition by ASTM Standards. Other unknown wells may be present.

- The DeGroot Property at 7325 Edison Avenue reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. A SBCFD inspector was present at the removal and indicated the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed. The location of these features was also not documented. Although no confirmation laboratory results were available for review, based on the County inspectors' closure, the small volume of the USTs, and depth to groundwater, there is a low likelihood that a significant release has occurred from these

USTs. Based on this information, these USTs would not be considered an environmental concern to the site.

- The DeGroot Property, 7587 Edison Avenue, reportedly used a 500-gallon diesel UST that was removed in 1987. When later informed of the removal, the SBCFD requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs. The laboratory results indicated no detectable concentrations of TPHg, BTEX, and MTBE. No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a no further action (NFA) letter dated February 13, 2001. Ardent agrees with this determination.

- The LMSAME,et al. Property, 14451 Bon View Avenue, reportedly removed a 550-gallon gasoline UST in 1998. A confirmation soil sample was collected. Laboratory results indicated no detectable to low concentrations of metals, TPHg, BTEX, and MTBE. Based on these results, the SBCFD issued a NFA letter dated May 5, 2000. Ardent compared these results to current regulatory guidelines. Based on these results, Ardent concurred with the SBCFD that no further work is needed.

- The Subject Property is located within the Chino Groundwater Basin. Groundwater in the basin has been reportedly contaminated with elevated salts, namely nitrates, associated with the historical agricultural and dairy activities in this area. According to the SARWQCB, new property owners are not being held liable for this regional issue associated with historical land uses. Groundwater in the basin is undergoing remedial treatment at designed desalination plants. Based on the agency involvement and active remediation, the regional groundwater nitrate issue associated with the Chino Groundwater Basin would be considered a CREC.

- Based on the age of the buildings (1930s to mid-1960s), it is possible that ACM and LBP are present. Based on the historical agricultural use at the site, underground ACPs were commonly used to transfer irrigation water. Based on this information, the possible presence of ACPs would be considered a de minimis condition.

**Phase I ESA (Roux, 2024)**

Roux's Phase I ESA was completed for the entirety of Ontario Ranch II. At the time of this assessment, the GH Dairy, Costa, and DeGroot properties were used as dairies and for residential purposes. From at least 1938 to 1953, the Subject Property was used for agricultural purposes (row crops and orchards) with a few dwellings. By 1966, the Subject Property became increasingly used for dairy farm purposes.

Based on the findings of the Phase I ESA, Roux identified the following other environmental features (OEFs) in connection with the current and historical operations at the Subject Property or adjacent properties:

**OEF 1 – Dairy Farm Operations (Methane).** Due to the historical and current use of the Subject Property for dairy farming purposes, methane gas may be present in shallow soil. Methane gas is naturally produced during the biodegradation of organic matter such as animal manure. Prior to the redevelopment of dairy farms, the City of Ontario Building Department requires that an investigation be performed to evaluate the possible build-up of methane gas in shallow soils. Proper removal and disposal of manure-laden shallow soil in accordance with local regulatory guidance may be required prior to redevelopment of the Subject Property.

**OEF 2 – Private Groundwater Wells.** During the site reconnaissance, Roux observed a total of eight groundwater wells throughout the Subject Property that have been used for agricultural, residential, and/or dairy water supply purposes. Groundwater has been identified at the Subject Property to occur at depths of approximately 120 feet bgs and flows in a south to southwesterly

direction. These features would not be considered an environmental concern to the Subject Property, but may need to be abandoned per State and County guidance.

**OEF 3 – Septic Systems.** Each residential structure on the Subject Property is reportedly equipped with a septic tank. Based on the non-hazardous nature of the domestic waste discharged to the septic systems, these represent an OEF.

**OEF 4 – Hazardous Materials Storage.** A total of five ASTs containing diesel fuel were observed on-site; the ASTs ranged from approximately 100 to 500 gallons in size. No secondary containment was observed with the exception of the two emergency generators which are typically constructed with built-in secondary containment. No significant signs of a release were observed in the vicinity of the ASTs. The on-site ASTs containing hazardous materials therefore represent an OEF.

**OEF 5 – Regional Dairy Farm Operations (Groundwater Degradation).** The Subject Property is located within the Chino Groundwater Basin. Concentrated animal feeding lots such as dairy farms can be a source of local groundwater degradation due to nitrates and TDS. According to information provided on the EPA website, the Chino Basin once had the highest concentration of dairy animals in the world, with approximately 350 dairies located within a 20-square mile area. Although the number of dairies has declined significantly, historical land application of manure and process water has resulted in significant groundwater degradation due to high levels of TDS and nitrate. The Dairy Farm General Permit was created to minimize continued degradation of groundwater in the Chino Basin as well as other parts of the Santa Ana Region. According to the SARWQCB website, the Subject Property is located within the Chino 2 “antidegradation” management zone which indicates that the SARWQCB has determined that the lowering of water quality is not of maximum benefit to the public. The SARWQCB has reportedly noted that new property owners are not being held liable for this regional issue associated with historical land uses. Based on the known regional groundwater degradation issues in the Chino Basin, the potential presence of elevated TDS and nitrates in groundwater beneath the Subject Property represents an OEF.

**OEF 6 – Former UST, 14451 Bon View Avenue.** A 550-gallon gasoline UST was removed from the LMSAME,et al. Property on October 28, 1998 with oversight from the SBCFD. One confirmation soil sample was collected from beneath the UST at a reported depth of 8 feet bgs. Laboratory results indicated low concentrations of lead, TPHg, BTEX, and MTBE. Based on these results, the SBCFD issued a NFA letter dated May 5, 2000. Roux compared these results to current regulatory screening levels for the protection of human health at commercial/industrial properties. Based on this review, the results do not exceed current regulatory screening levels. Therefore, Roux agrees with the SBCFD that no further investigation is necessary. Based on the confirmation sample results and regulatory oversight approval of no further investigation, this former UST represents an OEF.

**OEF 7 – Former UST, 7587 Edison Avenue.** The DeGroot Property reportedly previously operated a 500-gallon diesel UST that was removed in 1987. In 2000, the SBCFD was informed of the UST removal following purchase of the property by Paul Huizenga and requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs in the reported location of the former UST. The laboratory results indicated no detectable concentrations of TPHg, BTEX, and MTBE. No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a NFA letter dated February 13, 2001. Based on this information, the former UST represents an OEF.

**OEF 8 – Former UST, 7325 Edison Avenue.** The DeGroot Property reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. During a property inspection in 1994, a SBCFD inspector was shown the removed USTs, which were reportedly still stored on-site. The inspection report indicated the UST file had already been removed from the “alpha list” and that the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed and the location of these features was also not documented. Although no confirmation laboratory

results were available for review, based on the County inspectors' closure, the small volume of the USTs, and depth to groundwater, there is a low likelihood that a significant release has occurred from these USTs. Based on this information, these USTs would not be considered an environmental concern to the Subject Property and represent an OEF.

Roux identified the following de minimis condition:

**De Minimis Condition 1 – Surficial Staining.** Roux observed evidence of surficial petroleum stains associated with aboveground storage tanks ASTs and/or equipment storage and truck repair areas at the GH Dairy and Costa properties. The surficial staining noted on these properties appeared to be limited in scale and are not anticipated to present a threat to human health or the environment.

Roux identified an REC associated with two properties, referred to as the Hindelang and B&G Properties, within Ontario Ranch II that are located off-site immediately south of the eastern portion of the DeGroot Property.

**REC 1 – General Industrial Uses (Hindelang and B&G Properties).** Historical records for the Hindelang Property indicate that the property was used to manufacture fiberglass camper shells from at least 1986 through 1992. This operation reportedly used and stored small quantities of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-trichloroethane (1,1,1-TCA) and hydrocarbon solvents, rubber adhesive, etc. No other regulatory records associated with this facility were provided. During the site reconnaissance of the Hindelang Property, Roux observed general poor housekeeping practices and automobile repair operations. This property is unpaved outside of the storage building and automobile repair canopy areas. Based on the documented use of chlorinated solvents (1,1,1-TCA), lack of regulatory records, poor general housekeeping, and noted automobile repair operations, the general industrial uses of the Hindelang Property represent a REC.

Environmental database records for the B&G property report hazardous wastes including 0.17-tons of halogenated solvents (chloroforms, methyl chloride, perchloroethylene [PCE], etc.) in 1997. During Roux's site reconnaissance, access to this property was not provided, however, storage of large piles of tires was visible from the fence line and the property was noted to be unpaved. From a 2024 Google Earth aerial photograph of the property, possible soil stockpiles are visible along the western and eastern portions of the property. Based on the documented use of chlorinated solvents, lack of records providing clear information regarding the historical use of the property, and possible soil stockpiles, the general industrial uses of the B&G Property represent a REC.

# 8. Regulatory/Government Agency Inquiries

Roux contacted governmental agencies for reasonably ascertainable information concerning environmental conditions at the Subject Property. Roux contacted or reviewed information from the agencies in the following table. Copies of relevant records are provided in **Appendix E**.

| **Federal and State Agencies** | |
|---|---|
| U.S. Environmental Protection Agency (EPA) – FOIAonline | Roux was referred to the USEPA My Property Database. |
| U.S. EPA MyProperty Database | GH Dairy (7721 and 8061 Edison Avenue) and Costa (14213 Bon View Avenue) were listed for Waste Discharge Requirements associated with the dairy farm operations. |
| National Pipeline Mapping System (NPMS) Online Database | Gas Transmission and Hazardous Liquid pipelines were reported within 500 feet of the Subject Property running through Edison Ave. |
| State Water Resources Control Board (SWRCB): GeoTracker Online Database | Roux was provided a Waste Discharge permit associated with the DeGroot Property (7325 Edison Avenue). See below for further information. |
| SWRCB: Storm Water Multiple Application and Report Tracking System (SMARTS) Online Database | Listings were associated with wastewater discharge permits. See below for further information. |
| Department of Toxic Substances Control (DTSC) | No records were associated with the Subject Property. |
| DTSC: EnviroStor Online Database | No listings were associated with the Subject Property. |
| DTSC: Hazardous Waste Tracking System (HWTS) Online Database | Subject Property addresses 8061 Edison Avenue (GH Dairy) was listed with hazardous waste generator ID numbers, but no waste manifests were recorded. Listing on this database is for permitting purposes. |
| California Air Resources Board (CARB) | No records were associated with the Subject Property. |
| California Office of Environmental Health Hazard Assessment (OEHHA) | No response has been received as of this report date. |
| CalEPA CalRecycle | No records were associated with the Subject Property. |
| State of California Department of Conservation: Geological Energy Management (CalGEM) Online Database | No oil wells were associated with the Subject Property or located within 500 feet of the Subject Property. |

| Regional and Local Agencies | |
|---|---|
| Santa Ana Regional Water Quality Control Board (SARWQCB) | The SARWQCB referred Roux to records available on the GeoTracker online database. |
| South Coast Air Quality Management District (SCAQMD) Facility Information Detail (FIND) Online Database | Records were identified for the Facility and Subject Property and are discussed below. |
| San Bernardino County Fire Department | The SBCFD provided records associated with hazardous material permitting and inspections reports for various Subject Property addresses. Records provided also documented the removal of multiple USTs on the Subject Property. See below for further information. |
| City of Ontario Building Department | Various building records associated with the existing residential buildings and AST permits were provided. |

*SWRCB GeoTracker Database/SARWQCB*

Roux requested records from the SARWQCB for the Subject Property addresses. The SARWQCB shared a GeoTracker web-link for the Subject Property address 7325 Edison Avenue (DeGroot Property). These records were associated with Residuals Recovery Group, Inc. and included a Notice of Intent (NOI) for waste discharge requirements for composting operations from June 2021, an associated Technical Report from September 2023, and a Notice of Applicability (NOA) permitting the composting operations from November 2023. This permitted activity does not represent an environmental concern to the Subject Property.

*SWRCB SMARTS Database*

The Subject Property was listed on this database twice for 7325 Edison Avenue (DeGroot Property). One listing included the permit for Residuals Recovery Group, Inc. discussed above. The other listing was for Material Recovery Solutions, Inc. and associated with the management of dairy wastewater collection, retention and disposal system at the SNS Dairy operation. Wastewater/stormwater is stored in on-site retention ponds.

The Subject Property was also listed for 8381 Edison Avenue (DeHoog II Property). Records included a Notice of Intent to discharge stormwater.

*South Coast Air Quality Management District (SCAQMD) FINDS Database*

Records available on the FINDS online database include emissions permits for 7325 and 7587 Edison Avenue (DeGroot Property) associated with the dairy farm and composting operations and permits for an emergency electrical generator. Records for the 8061 Edison Avenue (GH Dairy Property) included emissions permits for the dairy farm operations and for an emergency electrical generator. Records for 8311 Edison Avenue (DeHoog I Property) included a permit to operate a 500-gallon gasoline AST from 1971. Records for 8381 Editon Avenue (DeHoog II Property) included emissions permits for the dairy farm operations and for an emergency electrical generator. Records for 8485 Edison Avenue (Swager Property) included emissions permits for the dairy farm operations. The Alewyn Property (8185 Edison Avenue) was listed with the Facility ID 147414 and was reportedly issued a Notice to Comply in 2006 associated with a diesel powered emergency generator, which was brought to compliance.

*San Bernardino County Fire Department*

Roux requested records from the SBCFD associated with the known current and historical Subject Property addresses. The SBCFD provided records associated with the following Subject Property addresses: 8311 Edison Avenue (DeHoog I Property), 8381 Edison Avenue (DeHoog II Property), 7325, 7371, 7587 Edison Avenue (DeGroot Property), 7721 and 8061 Edison Avenue (GH Dairy), 14213 Bon View Avenue (Costa Property), 8185 Edison Avenue (Alewyn Property), and 8485 Edison Avenue (Swager Property). A majority of the records provided by the SBCFD were associated with permits and inspection reports for hazardous materials associated with the dairy operations, including the storage of chemicals such as soap detergent, acid cleaner, chlorine bleach, iodine, sodium hypochlorite, diesel fuel, etc. No environmentally significant violations were noted.

The following presents a summary of the UST records for the Subject Property. It should be noted that earlier SBCFD documents reportedly indicated the Subject Property addresses as located in the City of Chino, rather than Ontario.

**DeGroot Property**

**7325 Edison Avenue**

The DeGroot Property reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. During a property inspection in 1994, a SBCFD inspector was shown the removed USTs, which were reportedly still stored on-site. The inspection report indicated the UST file had already been removed from the “alpha list” and that the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed and the location of these features was also not documented. Although no confirmation laboratory results were available for review, based on the County inspectors’ closure, the small volume of the USTs, and depth to groundwater, there is a low likelihood that a significant release has occurred from these USTs. Based on this information, these USTs would not be considered an environmental concern to the Subject Property.

**7587 Edison Avenue**

The DeGroot Property reportedly previously operated a 500-gallon diesel UST that was removed in 1987. In 2000, the SBCFD was informed of the UST removal following purchase of the property by Paul Huizenga and requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs in the reported location of the former UST. The laboratory results indicated no detectable concentrations of TPHg, BTEX, and MTBE. No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a NFA letter dated February 13, 2001.

**Alewyn Property**

**8185 Edison Avenue**

An inspection of the property was conducted in 2007 and a Notice of Violation was issued due to the removal of the 250-gallon UST in 1978 without regulatory oversight or confirmation soil samples being collected.

**DeHoog I Property**

**8311 Edison Avenue**

The DeHoog I Property reportedly previously operated a 500-gallon gasoline UST that was removed in 1998. A Site Closure report by A&J Environmental, dated November 30, 1998 indicated that the UST removal activities were overseen by the SBCFD and a soil sample was collected from beneath the center of the former tank location. The soil sample was analyzed for TPHg, BTEX, and MTBE. Laboratory results indicated no detectable concentrations of these constituents above laboratory reporting limits. Based on these concentrations, the UST was issued a NFA letter, dated January 6, 1999. Based on the regulatory closure and sampling results, the former UST would not be considered an environmental concern to the Subject Property.

## 8.1 Vapor Encroachment Condition

In accordance with ASTM E2600 Standard Guide for Vapor Encroachment Screening and in accordance with applicable federal and local guidance Roux conducted a review of potential vapor encroachment concerns at the Subject Property.

Historical records for the south adjoining Hindelang Property indicate that the property was used to manufacture fiberglass camper shells from at least 1986 through 1992. This operation reportedly used and stored small quantities of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-trichloroethane (1,1,1-TCA) and hydrocarbon solvents, rubber adhesive, etc. No other regulatory records associated with this facility were provided. Previous environmental reports that include this property note poor housekeeping practices and automobile repair operations. Based on the documented use of chlorinated solvents (1,1,1-TCA), poor general housekeeping, and noted automobile repair operations, the south adjoining Hindelang Property represents a potential vapor encroachment concern.

## 8.2 Standard Environmental Record Sources

According to ASTM Standard E1527-21, the purpose of reviewing regulatory records is to obtain and review records that will help identify RECs in connection with the Subject Property. In addition, some records to be reviewed pertain not only to the Subject Property, but also to properties within an additional “approximate minimum search distance” in order to help assess the likelihood of problems from migrating hazardous substances or petroleum products. The basis of the “approximate minimum search distance” is the Subject Property boundary.

Roux retained EDR of Shelton, Connecticut to provide an EDR Report for this Subject Property. This report is a computerized search of select state and federal environmental databases that identify various properties with a record of environmental activity. Roux reviewed the report and summarized the relevant findings in the following sections. A copy of the compiled EDR Report has been included in **Appendix F** – Third Party Vendor Database Report.

The following sections describe the findings of the database search. Properties that meet the criteria presented below are discussed in this report.

- Properties with listings indicative of a release (e.g., State Hazardous Waste Sites [SHWS], LUST, VCP, RELEASE). Nonadjacent sites with hazardous waste generator, FINDS, ECHO, NPDES, AIRS, or UST listings only will not be discussed in this report.

- Properties adjoining the Subject Site are examined due to their proximity to the Subject Site and the potential for surface water discharges (e.g., storm water runoff, surface water effluent discharges) to enter the Subject Site or through the migration of groundwater.
- Properties located within 1/8-mile topographically upgradient of the Subject Property. Based on local topography and drainage, groundwater flow in the Subject Property vicinity is interpreted to be to the south/southeast. Therefore, properties considered upgradient are located north/northwest of the Subject Property. Sites that are located downgradient or cross gradient to the Subject Property but do not adjoin the Subject Property are not discussed in this report.

### 8.2.1 Subject Property

An EDR Report was generated on February 27, 2025, and is provided in **Appendix F**. The Subject Property was identified on the following databases searched by EDR.

**DeGroot**

- **7325 Edison Avenue:** SWF/LF, LDS, NPDES, CERS

  The SWF/LF listings Residuals Recovery Group and Recycled Wood Products indicate the facility is actively used as an agricultural material composting operation.

- **7371 Edison Avenue:** San Bernardino County Permit

  This listing for SNS Dairy reports an inactive permit from 1997 with no additional relevant details.

- **7397 Edison Avenue:** FINDS, CIWQS
- **7587 Edison Avenue:** AST, EMI, ENF, CIWQS, CERS, EMI, San Bernardino County Permit, UST

  These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1990s with animal wastewater discharge. The AST and UST databases did not provide any detailed information.

**Costa**

- **14213 Bon View Avenue:** FINDS, ECHO, WDS, ENF, San Bernardino County Permit, CIWQS, CERS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1980s with animal wastewater discharge.

**GH Dairy**

- **7721 Edison Avenue:** ENF, San Bernardino County Permit, CIWQS
- **8061 Edison Avenue:** ECHO, FINDS, EMI, ENF, HWTS, San Bernardino County Permit, CIWQS, CERS, WDS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1990s with animal wastewater discharge.

**Alewyn**

- **8185 Edison Avenue:** ENF, San Bernardino County Permit, UST, SWEEPS UST, CA FID UST, HIST UST, CIWQS, FINDS, WDS, ECHO, CERS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1980s with animal wastewater discharge. The UST databases are associated with the former 250-gallon UST discussed above in Section 8.

**DeHoog I**

- **8311 Edison Avenue:** ENF, San Bernardino County Permit, CIWQS, ECHO, CERS, FINDS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least 2001 with animal wastewater discharge.

**DeHoog II**

- **8381 Edison Avenue:** ENF, San Bernardino County Permit, CIWQS, ECHO, CERS, FINDS, AST

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1980s with animal wastewater discharge. The AST database did not provide any detailed information.

**Swager**

- **8485 Edison Avenue:** HIST UST, WDS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least 1994 with animal wastewater discharge. The HIST UST database is associated with the former 250-gallon UST at the Alewyn Property (8185 Edison Avenue).

### 8.2.2 Site Vicinity

Roux reviewed a Database Report prepared by EDR for the Subject Property. A copy of the Database Report is provided in **Appendix F**. Based on Roux's review, facilities near the Subject Property were generally reported as dairy farms and listed on similar databases to the Subject Property. One notable upgradient facility was identified and is summarized below:

- Redwood Products of Chino Inc., located at 13814 South Grove Avenue, approximately 0.32-miles north to northeast of the Subject Property, was listed on the SWF/LF, CERS HAZ WASTE, CERS TANKS, LDS, HWTS, San Bernardino County Permit, and CERS databases. These databases indicate this facility is an active green materials transfer and processing operation. No hazardous material/waste releases have been reported at this facility.

Based on the information listed in the databases, this facility is not considered a REC.

### 8.2.3 Orphan Sites

The EDR Report includes a section addressing "Orphan Sites." Orphan sites are sites, which, due to incomplete geographic location data, incomplete address information or incorrect address information, cannot be plotted correctly. The database report identified thirteen unmapped facilities. Based on the noted locations or listed databases, these listings are not considered to represent RECs in the context of this Phase I ESA.

# 9. Small Business Administration

Reliance to the US Small Business Administration and the participating Community Development Corporation is not applicable. Therefore, a reliance letter will not be provided at this time.

# 10. Conflict Certification

Roux has no present or contemplated future ownership interest or financial interest in the real estate that is the subject of this Report; and Roux has no personal interest with respect to the subject matter of the Report of the parties involved and consultant has no relationship with the property or the owners thereof which would prevent an independent analysis of the environmental or other conditions of the property.

# 11. Environmental Professional Statement

Roux performed this assessment in accordance with the generally accepted practices for environmental assessments at the time of implementation. Roux made a reasonable effort to ensure that the information presented in this report is materially complete and accurate.

Roux completed a Phase I ESA in general compliance with the scope and limitations of ASTM Practice E1527-21 of the 180-acre proposed residential development property south of Edison Avenue and west of Walker Avenue in the City of Ontario, California.

"We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental professional as defined in §312.10 of 40 CFR 312" and,

"We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312."

Roux performed this Phase I ESA by, or under direct supervision of, the undersigned environmental professionals. Resumes are included in **Appendix G**. Resumes for the individuals who prepared the Phase I ESA**.**

Respectfully Submitted,

**ROUX ASSOCIATES, INC.**

Kasia Anderson
Project Geologist

Mauricio H. Escobar, P.G.
Vice President / Principal Geologist

# 12. Conclusions, Opinions and Recommendations

Roux has performed this Phase I ESA in general compliance with the scope and limitations of ASTM Standard Practice E1527-21. Roux separated the findings of this assessment into the following four categories: RECs, controlled RECs, historical RECs and de minimis conditions. Exceptions to or deletions from this practice are described in Section 3.5 and Section 3.8 of this report.

## 12.1 Recognized Environmental Conditions

Based on the information obtained through the performance of this Phase I ESA, Roux identified the following REC:

**REC 1 – Historical Agricultural Use (Subject Property).** Based on the historical use of the Subject Property for agricultural purposes from at least the 1930s through 1950s, it is likely that pesticides were used. In 2005, soil sampling at the eastern portion of the Subject Property (Swager Property) was conducted to further investigate the potential presence of pesticides. No detectable to low concentrations of organochlorine pesticides were reported in the samples collected and all but one were below regulatory screening levels. The sample that exceeded residential screening levels was collected from the central portion of the Swager Property and contained slightly elevated dieldrin.

**REC 2 – Vapor Encroachment Concern (Off-Site Hindelang Property).** Historical records for the south adjoining Hindelang Property (immediately south of the DeGroot Property) indicate that manufacturing of fiberglass camper shells from at least 1986 through 1992 included the use and storage of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-TCA and hydrocarbon solvents, rubber adhesive, etc. Previous environmental reports noted poor housekeeping practices and automobile repair operations at the Hindelang Property. Based on the documented use of chlorinated solvents (1,1,1-TCA), poor general housekeeping, and noted automobile repair operations, the south adjoining Hindelang Property represents a potential vapor encroachment concern and a REC.

## 12.2 Controlled Recognized Environmental Conditions

Based upon the information described in this report, this Phase I ESA did not reveal evidence of CRECs.

## 12.3 Historical Recognized Environmental Conditions

Based upon the information described in this report, this Phase I ESA did not reveal evidence of HRECs.

## 12.4 De Minimis Conditions

Roux identified the following de minimis condition:

**De Minimis Condition 1 – Surficial Staining.** Roux observed evidence of surficial petroleum stains associated with aboveground storage tanks ASTs and/or equipment storage areas at the GH Dairy, Costa, and DeHoog II properties. The surficial staining noted on these properties appeared to be limited in scale and are not anticipated to present a threat to human health or the environment. A SMP should be implemented to manage any potentially impacted areas encountered during redevelopment of the Subject Property.

## 12.5 Business Environmental Risks

Based upon the information described in this report, this Phase I ESA did not reveal evidence of independent Business Environmental Risks (BERs) in connection with the Subject Property.

## 12.6 Other Environmental Features

Other environmental features (OEFs) identified in connection with the current and historical operations at the Subject Property or adjacent properties include:

**OEF 1 – Dairy Farm Operations (Methane).** Due to the historical and current use of the Subject Property for dairy farming purposes, methane gas may be present in shallow soil. Methane gas is naturally produced during the biodegradation of organic matter such as animal manure. Based on the historical dairy farming land use of the Subject Property, methane gas surveys were reportedly completed by others at the Alewyn, DeHoog II, and Swager properties. Results of these surveys indicate sporadic elevated concentrations of methane gas exceeding the Lower Explosive Limit (LEL) of methane (i.e., 50,000 parts per million [ppm]).

Prior to the redevelopment of dairy farms, the City of Ontario Building Department requires that an investigation be performed to evaluate the possible build-up of methane gas in shallow soils and to determine the level of methane gas mitigation required. Proper removal and disposal of manure-laden shallow soil in accordance with local regulatory guidance may also be required prior to redevelopment of the Subject Property.

**OEF 2 – Private Groundwater Wells.** During the site reconnaissance, Roux observed a total of eight groundwater wells throughout the Subject Property that have been used for agricultural, residential, and/or dairy water supply purposes. Groundwater has been identified immediately south of the Subject Property to occur at depths of approximately 120 feet below the ground surface (bgs) and flows in a south to southwesterly direction. These features would not be considered an environmental concern to the Subject Property, but may need to be abandoned prior to redevelopment per State and County guidance.

**OEF 3 – Septic Systems.** Each residential structure on the Subject Property is reportedly equipped with a septic tank. Based on the non-hazardous nature of the domestic waste discharged to the septic systems, these represent an OEF.

**OEF 4 – Hazardous Materials Storage.** A total of eight ASTs containing diesel fuel were observed on the Subject Property including the DeGroot, Costa, GH Dairy, DeHoog II, and Swager Properties; the ASTs ranged from approximately 100 to 500 gallons in size. No significant signs of a release were observed in the vicinity of the ASTs. Additionally, various other chemicals associated with the dairy activities are stored in 55-gallon drums and used on-site including, but not limited to, iodine, acid wash, and hydrogen peroxide for sanitation purposes. The hazardous material use on-site therefore represents an OEF.

**OEF 5 – Regional Dairy Farm Operations (Groundwater Degradation).** The Subject Property is located within the Chino Groundwater Basin. Concentrated animal feeding lots such as dairy farms can be a source of local groundwater degradation due to nitrates and TDS. According to information provided on the EPA website, the Chino Basin once had the highest concentration of dairy animals in the world, with approximately 350 dairies located within a 20-square mile area. Although the number of dairies has declined significantly, historical land application of manure and process water has resulted in significant groundwater degradation due to high levels of TDS and nitrate. The Dairy Farm General Permit was created to minimize continued degradation of groundwater in the Chino Basin as well as other parts of the Santa Ana Region. According to the SARWQCB website, the Subject Property is located within the Chino 2 “antidegradation” management zone which indicates that the SARWQCB has determined that the lowering of water quality is not of maximum

benefit to the public. The SARWQCB has reportedly noted that new property owners are not being held liable for this regional issue associated with historical land uses. Based on the known regional groundwater degradation issues in the Chino Basin, the potential presence of elevated TDS and nitrates in groundwater beneath the Subject Property represents an OEF.

**OEF 6 – South Archibald TCE Plume.** The eastern portion of the Subject Property is located within a large regional VOC groundwater plume comprised mostly of TCE, referred to as the South Archibald TCE Plume. This plume originates from a source approximately 1.7 miles northeast of the Subject Property as a result of historical land use of numerous metal plating and finishing facilities. Low concentrations of TCE were reported from 2017 to 2022 in groundwater from two on-site wells on the DeHoog II and Swager Properties at concentrations of 1.2 and 0.46 ug/l, respectively, well below the SWRCB, Division of Drinking Water MCLs for TCE in drinking water of 5 ug/l. Based on the depth of groundwater and low concentrations of VOCs detected beneath the Subject Property, there is a low likelihood that a vapor intrusion issue is present. Since there are low concentrations of TCE detected beneath the Subject Property and no vapor intrusion issue is present, the regional TCE groundwater plume would be considered an OEF.

**OEF 7 – Former UST, 7587 Edison Avenue (DeGroot Property).** The DeGroot Property reportedly previously operated a 500-gallon diesel UST that was removed in 1987. In 2000, the SBCFD was informed of the UST removal following purchase of the property by Paul Huizenga and requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs in the reported location of the former UST. The laboratory results indicated no detectable concentrations of TPHg, BTEX, and MTBE. No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a NFA letter dated February 13, 2001. Based on this information, the former UST represents an OEF.

**OEF 8 – Former UST, 8185 Edison Avenue (Alewyn Property).** The Alewyn Property reportedly used a 250-gallon diesel UST that was removed in 1978 without regulatory oversight and no confirmation soil samples were collected. In 2021, soil samples were collected in the reported former location of the UST. Laboratory results indicated no detectable concentrations of TPH and VOCs above laboratory reporting limits. Based on these results, the former 250-gallon diesel UST would not be considered an environmental concern to the Subject Property and represents an OEF.

**OEF 9 – Former UST, 8311 Edison Avenue (DeHoog I Property).** The DeHoog I Property reportedly used a 500-gallon diesel UST that was removed in 1998 with oversight from the SBCFD. A soil sample was collected from beneath the center of the former tank location. The soil sample was analyzed for TPHg, BTEX, and MTBE. Laboratory results indicated no detectable concentrations of these constituents above laboratory reporting limits. Based on these concentrations, the UST was issued a NFA letter, dated January 6, 1999. Based on the regulatory closure and sampling results, the former UST would not be considered an environmental concern to the Subject Property and represents an OEF.

**OEF 10 – Former UST, 8381 Edison Avenue (DeHoog II Property).** A previous Phase I ESA completed by others included an interview with the former property owner, Mr. Joe De Hoog, in which Mr. De Hoog indicated that a 500-gallon gasoline UST was historically present immediately south of the detached three-car garage and was removed in the late-1970s. In 2021, soil samples were collected in the reported former location of the UST. Laboratory results indicated no detectable concentrations of TPH and VOCs above laboratory reporting limits. Based on these results, the former 500-gallon gasoline UST would not be considered an environmental concern to the Subject Property and represents an OEF.

# 13. Appendices

A. Figures
B. Photographic Documentation
C. Historic Sources
D. User Provided Information
E. Regulatory Agency Records
F. Third Party Vendor Database Report
G. Resumes
H. References

# APPENDICES

A. Figures

B. Photographic Documentation

C. Historic Sources

D. User Provided Information

E. Regulatory Agency Records

F. Third Party Vendor Database Report

G. Resumes

H. References

# Figures

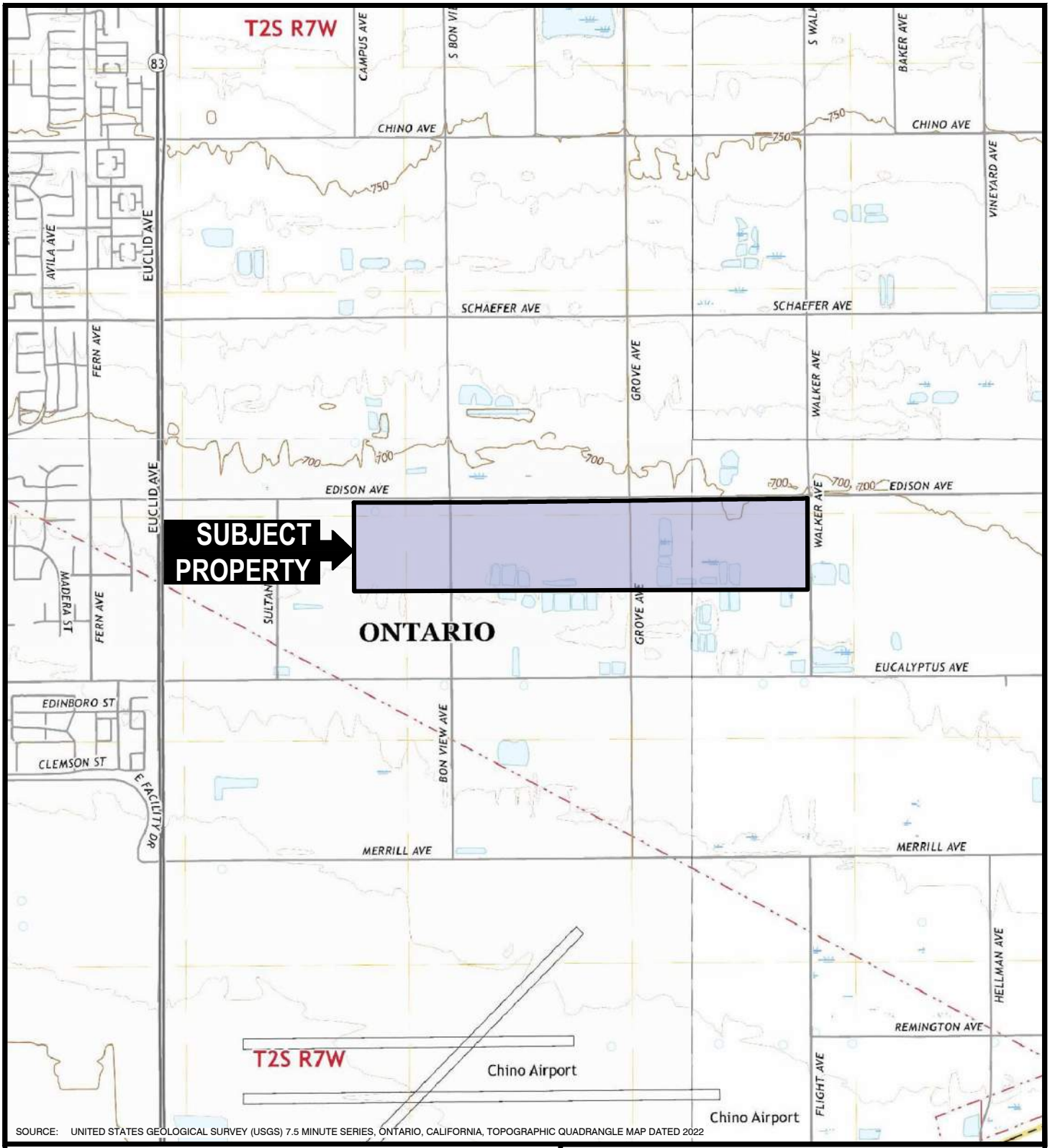


SOURCE: UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5 MINUTE SERIES, ONTARIO, CALIFORNIA, TOPOGRAPHIC QUADRANGLE MAP DATED 2022

QUADRANGLE LOCATION

N

2,000' 0 2,000

Title:

# SITE LOCATION MAP

PROPOSED RESIDENTIAL - ONTARIO RANCH
ONTARIO, CALIFORNIA

Prepared for:

ONTARIO RANCH VENTURE, LLC AND
ONTARIO RANCH VENTURE II, LLC

ROUX

| | | |
|---|---|---|
| Compiled by: K.A. | Date: 2025-03-24 | FIGURE |
| Prepared by: A.W. | Scale: AS SHOWN | 1 |
| Project Mgr: K.A. | Project: 3669.0004L | |
| File: 010_3669.0004 - SITE LOCATION MAP.DWG | | |

S:\CLIENTS\3669.0004L SRG ONTARIO RANCH II MHE\10CAD\010_3669.0004 - SITE LOCATION MAP.DWG

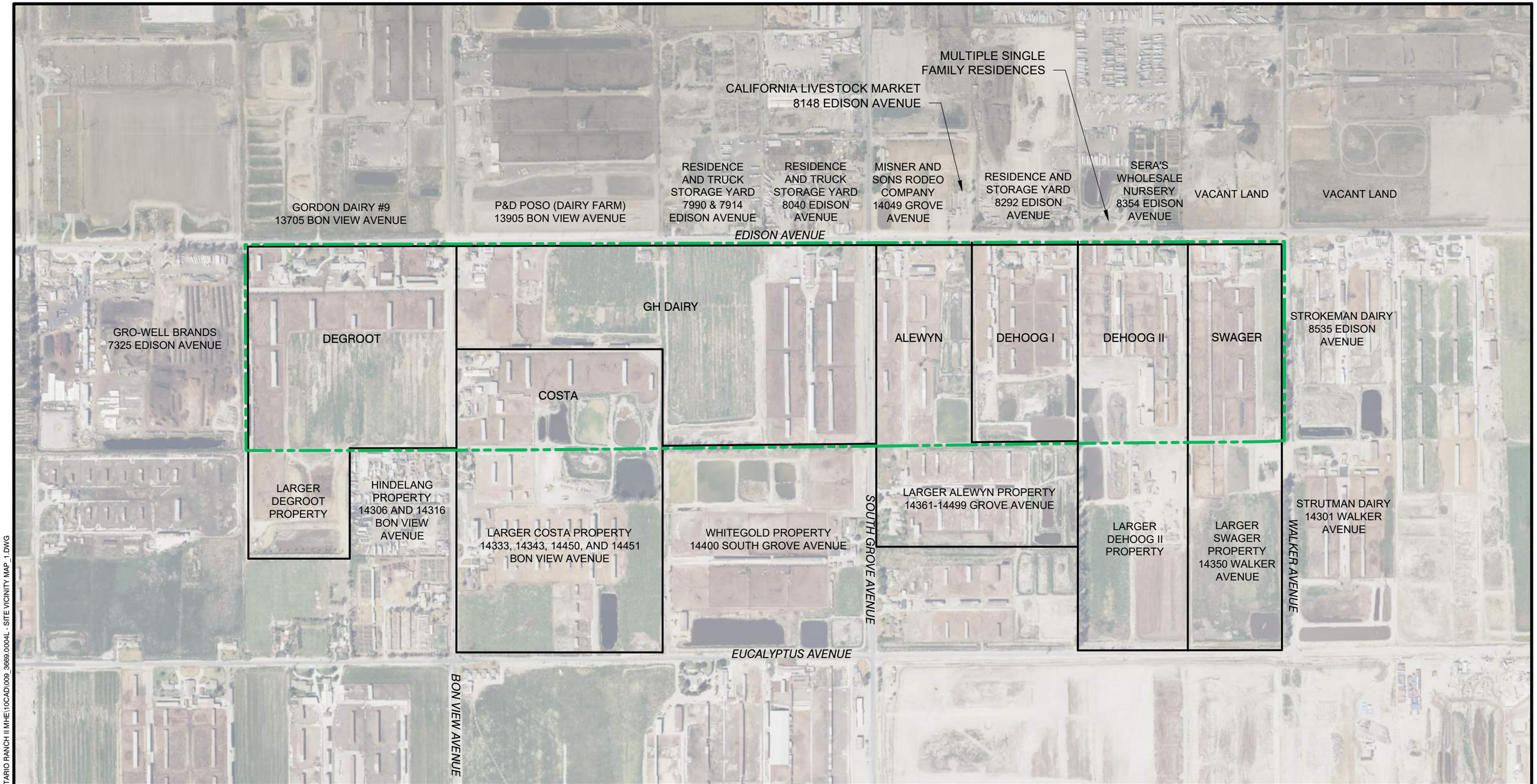


LEGEND

APPROXIMATE SUBJECT PROPERTY BOUNDARY

PROPERTY BOUNDARY

N

600' 0 600'

Title:

**SITE VICINITY MAP**

PROPOSED RESIDENTIAL - ONTARIO RANCH
ONTARIO, CALIFORNIA

Prepared For:

ONTARIO RANCH VENTURE, LLC AND
ONTARIO RANCH VENTURE II, LLC

ROUX

| | | |
|---|---|---|
| Compiled by: K.A. | Date: 2025-03-21 | FIGURE |
| Prepared by: A.W. | Scale: AS SHOWN | 2 |
| Project Mgr: K.A. | Project: 3669.0004L | |
| File: 009_3669.0004L - SITE VICINITY MAP_1.DWG | | |

\\SRVLACAFP1\LA SHARED\CLIENTS\3669.0004L SRG ONTARIO RANCH II MHE\10CAD\009_3669.0004L - SITE VICINITY MAP_1.DWG

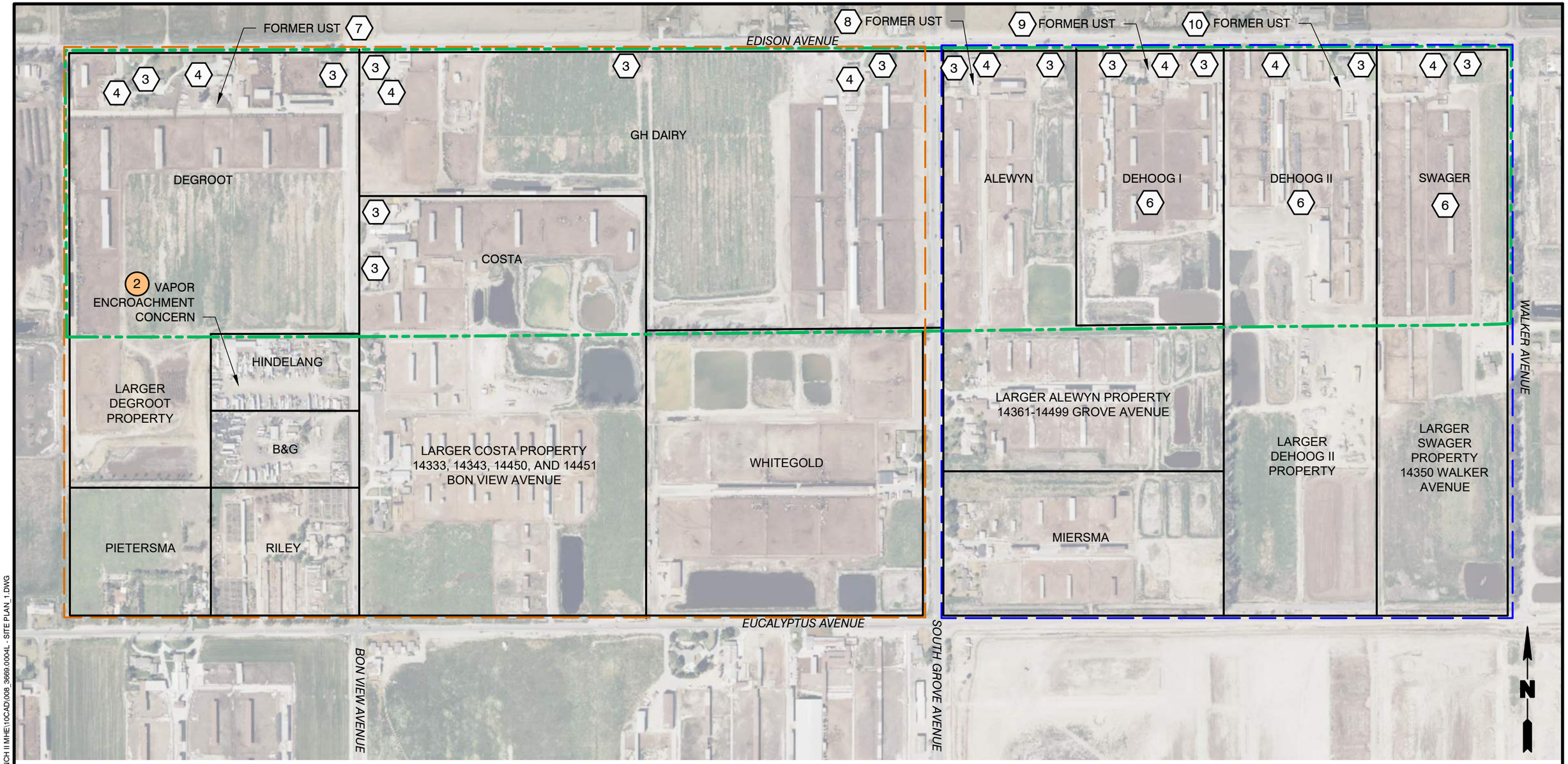


## LEGEND

- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- ONTARIO RANCH I BOUNDARY
- ONTARIO RANCH II BOUNDARY
- # RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- # OTHER ENVIRONMENTAL FEATURE (OEF)
- 1 HISTORICAL AGRICULTURAL USE - SITEWIDE
- 1 DAIRY FARM OPERATIONS (METHANE) - SITEWIDE
- 2 PRIVATE GROUNDWATER WELLS
- 3 SEPTIC SYSTEMS
- 4 HAZARDOUS MATERIALS STORAGE
- 5 REGIONAL DAIRY FARM OPERATIONS (GROUNDWATER DEGRADATION) - SITEWIDE
- 6 SOUTH ARCHIBALD TCE PLUME

## NOTES

1. UST = UNDERGROUND STORAGE TANK
2. TCE = TRICHLOROETHENE

440' 0 440'

Title:

# SITE PLAN

PROPOSED RESIDENTIAL - ONTARIO RANCH
ONTARIO, CALIFORNIA

Prepared For:

ONTARIO RANCH VENTURE, LLC AND
ONTARIO RANCH VENTURE II, LLC

ROUX

| | | |
|---|---|---|
| Compiled by: K.A. | Date: 2025-03-21 | FIGURE |
| Prepared by: A.W. | Scale: AS SHOWN | 3 |
| Project Mgr: K.A. | Project: 3669.0004L | |
| File: 008_3669.0004L - SITE PLAN_1.DWG | | |

\\SRVLACAFP1\LA SHARED\CLIENTS\3669.0004L SRG ONTARIO RANCH II MHE\10CAD\008_3669.0004L - SITE PLAN_1.DWG

# APPENDIX B

Photographic Documentation

# Appendix B. Photo Documentation

**B-1.** Private residence (7587 Edison Avenue) located at the northwestern area of DeGroot Property, facing Southwest. (01/22/2025)

**B-2.** Active Milk Barn associated 10,000-gallon milk AST located in the northern portion of the DeGroot Property, facing South. (01/22/2025)

**B-3.** View the interior/entrance area of the DeGroot Milk Barn. (01/22/2025)

**B-4.** View of the rear exterior (cattle entrance) portion of the DeGroot Milk Barn, facing Northwest. (01/22/2025)

**B-5.** View of the attached commodity bays used for equipment storage located in the rear exterior of the DeGroot Milk Barn, facing North. (01/22/2025)

**B-6.** A close-up view of commodity bays used for equipment storage located in the rear exterior of the DeGroot Milk Barn, facing North. (01/22/2025)

**B-7.** View of two feed silos (left) and one bulk grain hopper (right) located immediately south of the DeGroot Milk Barn, looking West. (01/22/2025)

**B-8.** View of commodity bays with metal canopy located in northeastern area of the DeGroot Property, facing Northeast. (01/22/2025)

**B-9.** Water well and associated 10,000-gallon water AST located in the northern portion of DeGroot Property, facing West. (01/22/2025)

**B-10.** Another view of cattle corrales and feed area located in the central portions of the DeGroot Property, facing East. (01/22/2025)

**B-11.** View of vacant land located immediately south of the DeGoot cattle corrales, facing West. (01/22/2025)

**B-12**. Private residences (14213 through 14297 Bon View Avenue) in the western portion of the Costa Property, along Bon View Avenue, facing Northeast. (01/22/2025)

**B-13.** Active Milk Barn and associated 10,000-gallon milk AST located in the western portion of the Costa Property, facing East. (01/22/2025)

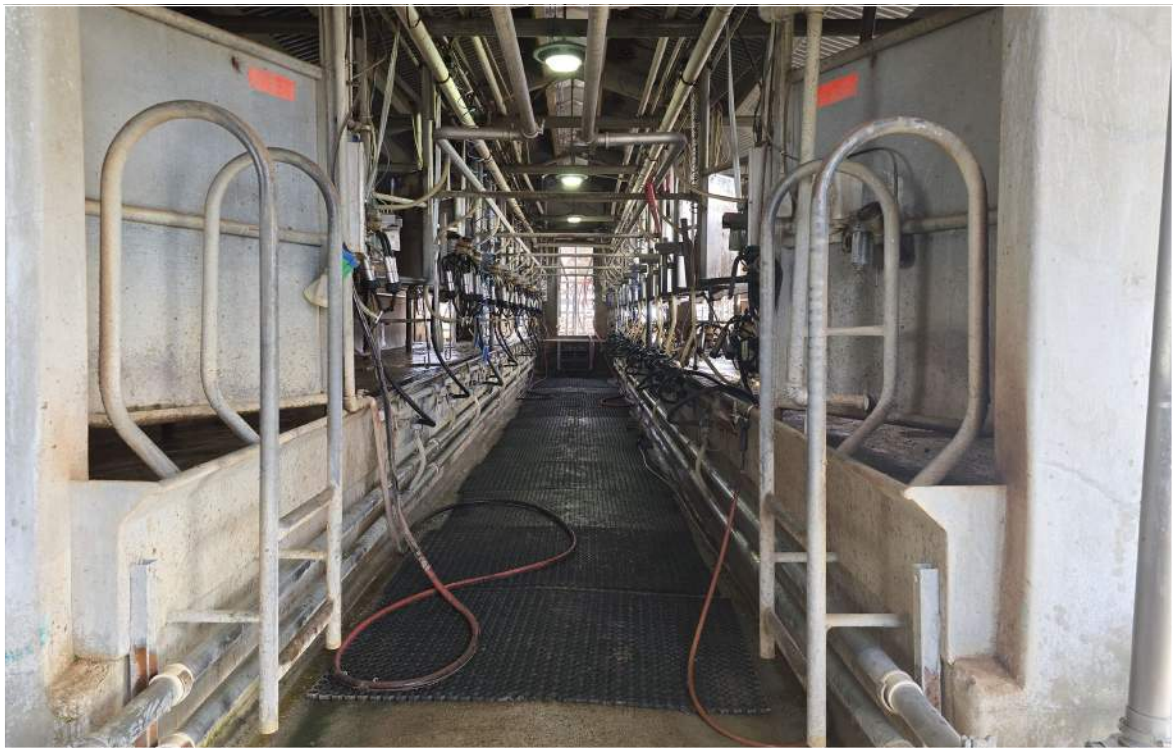

**B-14.** View of the milking parlor of the Costa Milk Barn. (01/22/2025)

**B-15.** View of an interior storage room wihin the Costa Milk Barn, with 55-gallon drums of iodine, acid wash, and/or hydrogen peroxide for sanitation purposes. (01/22/2025)

**B-16.** Another view of the interior storage room wihin the Costa Milk Barn with various miscellaneous items. (01/22/2025

**B-17.** View of two Liquid Feed (molasses) silos (left) and the 10,000-gallon milk AST located immediately north of the Costa Milk Barn, facing Southeaset. (01/22/2025)

**B-18.** View of two diesel ASTs and bulk grain hoppers located in the northwestern area of the Costa Property, facing Northeast. (01/22/2025)

**B-19.** Commodity bay with metal capoy cover located immediately east of the diesel fuel ASTs in the Costa Property, facing Southeast. (01/22/2025)

**B-20.** View of feeding corral within Costa Property, facing West. (01/22/2025)

**B-21.** Wasterwater pond in the southern portion of the Costa Property, facing Northeast. (01/22/2025)

**B-22.** Private residence (8061 Edison Avenue) located on the northeastern corner of the GH Dairy Property, facing Southeast. (01/22/2025)

**B-23.** Active Milk Barn located in the northeastern portion of the GH Dairy Property, facing Southeast. (01/22/2025)

**B-24.** Interior view of the active GH Dairy Milk Barn. (01/22/2025)

**B-25.** Two 7,000-gallon milk ASTs loacted immediately east of the active GH Dairy Milk Barn, facing West. (01/22/2025)

**B-26.** Emergency generator located immediately west of the active GH Dairy Milk Barn, facing East. (01/22/2025)

**B-27.** Water well and associated water pressure AST located west of the active GH Dairy Milk Barn, facing East. (01/22/2025)

**B-28.** Water well and standpipe located east of the private residence (7891 Edison Avenue) within the GH Dairy Property. (01/22/2025)

**B-29.** Cattle corrals and feeding area located within the GH Dairy Property, facing Southeast. (01/22/2025)

**B-30.** Grazing pastures/vacant land within the GH Dairy Property, facing Southwest. (01/22/2025))

**B-31.** View of the wastewater pond and pasture area/vacant land of the GH Dairy Property, facing Northeast. (01/22/2025)

**B-32.** Private residence (8185 Edison Avenue) located in the northern portion of the Alewyn Property, facing Southeast. (01/31/2025)

**B-33.** Inactive Milk Barn located in the northern portion of the Alewyn Property, facing Southwest. (01/31/2025)

**B-34.** Interior view of the entrance area of the inactive Alewyn Milk Barn. (01/31/2025)

**B-35.** Interior view of the inactive Alewyn Milk Barn. (01/31/2025)

**B-36.** View 10,000-gallon milk AST located within the inactive Alewyn Milk Barn. (01/31/2025)

**B-37.** A vehicle and equipment storage area located immidiately south of the private residence (8185 Edison Avenue) of the Alewyn Property, facing East. (01/31/2025)

**B-38.** View of vehicle and equipment storage area, facing Southeast. (01/31/2025)

**B-39.** View of miscellaneous items stored in the vehicle and equipment storage area, facing East. (01/31/2025)

**B-40.** Cattle corral and feeding area loacted within the Alewyn Property, facing South. (01/31/2025)

**B-41.** View of the corral area within the Alewyn Property, facing South. (01/31/2025)

**B-42.** View of pasture area/vacant land and wasterwater pond located in the southeastern area of the Alewyn Property, facing Southwest. (01/31/2025)

**B-43.** Private residence (8311 Edison Avenue) located in the northern portion of the DeHoog I Property, facing Southeast. (01/31/2025)

**B-44.** Active Milk Barn and three ASTs located in the northern portion of the DeHoog I Property, facing Southeast. (01/31/2025)

**B-45.** View of 10,000-gallon milk AST (left), water well and associated water pressure AST (center) and a water AST (right) located immediately west of the DeHoog I Milk Barn, facing Northeast. (01/31/2025)

**B-46.** Idle water well located in the southeastn area of the DeHoog I Property, facing North. (01/31/2025)

**B-47.** A 5,000-gallon water AST located in the northern portion the DeHoog I Property, facing North. (01/31/2025)

**B-48.** View metal storage shed and feeding corral within the DeHoog I Property, facing South. (01/31/2025)

**B-49.** Typical interior view of storage sheds located within the dairy farm properties. (01/31/2025)

**B-50.** View cattle corrals and feeding area of the DeHoog I Property, facing East. (01/31/2025)

**B-51.** Corral area of the DeHoog I Property, facing Southwest. (01/31/2025)

**B-52.** Pasture area/vacant land located in the south portion of the DeHoog I Property, facing Southwest. (01/31/2025)

**B-53.** Waterwater pond located in the southern area of the DeHoog I Propertry, facing Southeast. (01/31/2025)

**B-54.** Private residence (8381 Edison Avenue) located in the northern area of the DeHoof II Property, facing Southeast. (01/31/2025)

**B-55.** Milk Barn located in the northern area of the DeHoog II Property, facing Southeast. (01/31/2025)

**B-56.** View of the milking parlor of the DeHoog II Milk Barn. (01/31/2025)

**B-57.** View of the 10,000-gallon milk AST located inside the DeHoog II Milk Barn. (01/31/2025)

**B-58.** Water well and associated pressure water AST located east of the DeHoog II Milk Barn, facing Southeast. (01/31/2025)

**B-59.** Water well and pump located northeast of the private residence (8381 Edison Avenue), facing Northwest. (01/31/2025)

**B-60.** Standpipe and 12,000-gallon milking barn wash tank located in the northeastern area of the DeHoog II Property, by Edison Avenue, facing South. (01/31/2025)

**B-61.** Water well located in the northeastern corner of the wastewater ponds at the DeHoog II Property, facing South. (01/31/2025)

**B-62.** Diesel fuel ASTs located in the central area of the DeHoog II Property, facing North. (01/31/2025)

**B-63.** View of a weigh scale located in the south-central area of the DeHoog II Property, facing Southeast. (01/31/2025)

**B-64.** View cattle corrals and feeding areas within the DeHoog II Property, facing Northwest. (01/31/2025)

**B-65.** View of cattle corrals and hay bales storage canopies located within the DeHoog II Property, facing Sothwest. (01/31/2025)

**B-66.** View of commodity bays with metal canopies and a wastewater pond located int he southern portion of the DeHoog II Property, facing Northeast. (01/31/2025)

**B-67.** Private residence (8485 Edison Avenue) located in the northeastern area of the Swager Property, facing Southeast. (01/31/2025)

**B-68.** Active Milk Barn located in the northern area of the Swager Property, facing Southeast. (01/31/2025)

**B-69.** Interior view of the Swager Milk Barn with 55-gallon dums containing iodine, acid wash, and hydrogen peroxide for sanitation purposes. (01/31/2025)

**B-70.** View of the milking parlor of the Swager Milk Barn. (01/31/2025)

**B-71.** Water well and associated water pressure AST and water AST, facing Southeast. (01/31/2025)

**B-72.** Emergency generator immidiately west-adjacent to the active Swager Milk Barn, facing East. (01/31/2025)

**B-73.** Corral and feeding area f the Swager Property, facing Southwest. (01/31/2025)

**B-74.** Corral area of the Swager Property, facing Northwest. (01/31/2025)

**B-75.** View of corral area of the Swager Property, facing Northeast. (01/31/2025)

**B-76.** View of western vacant area of the Swager Property, facing Northeast. (01/31/2025)

# APPENDIX C

Historic Sources

**Ontario Ranch I**

8185 Edison Avenue

Ontario, CA 91762

Inquiry Number: 7869218.8

January 13, 2025

# The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Aerial Photo Decade Package

01/13/25

**Site Name:**

Ontario Ranch I
8185 Edison Avenue
Ontario, CA 91762
EDR Inquiry # 7869218.8

**Client Name:**

Roux Associates
5150 E Pacific Coast Highway
Long Beach, CA 90804
Contact: Ashley Whitaker

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

***Search Results:***

| *Year* | *Scale* | *Details* | *Source* |
|---|---|---|---|
| 2020 | 1"=500' | Flight Year: 2020 | USDA/NAIP |
| 2016 | 1"=500' | Flight Year: 2016 | USDA/NAIP |
| 2012 | 1"=500' | Flight Year: 2012 | USDA/NAIP |
| 2009 | 1"=500' | Flight Year: 2009 | USDA/NAIP |
| 2006 | 1"=500' | Flight Year: 2006 | USDA/NAIP |
| 2002 | 1"=500' | Acquisition Date: January 01, 2002 | USGS/DOQQ |
| 1994 | 1"=500' | Acquisition Date: June 01, 1994 | USGS/DOQQ |
| 1990 | 1"=500' | Flight Date: August 29, 1990 | USDA |
| 1989 | 1"=500' | Flight Date: August 03, 1989 | USDA |
| 1985 | 1"=500' | Flight Date: July 28, 1985 | USDA |
| 1975 | 1"=500' | Flight Date: August 01, 1975 | USGS |
| 1966 | 1"=500' | Flight Date: April 16, 1966 | USGS |
| 1953 | 1"=500' | Flight Date: March 03, 1953 | USDA |
| 1948 | 1"=500' | Flight Date: July 10, 1948 | USGS |
| 1946 | 1"=500' | Flight Date: December 29, 1946 | USGS |
| 1938 | 1"=500' | Flight Date: June 03, 1938 | USDA |

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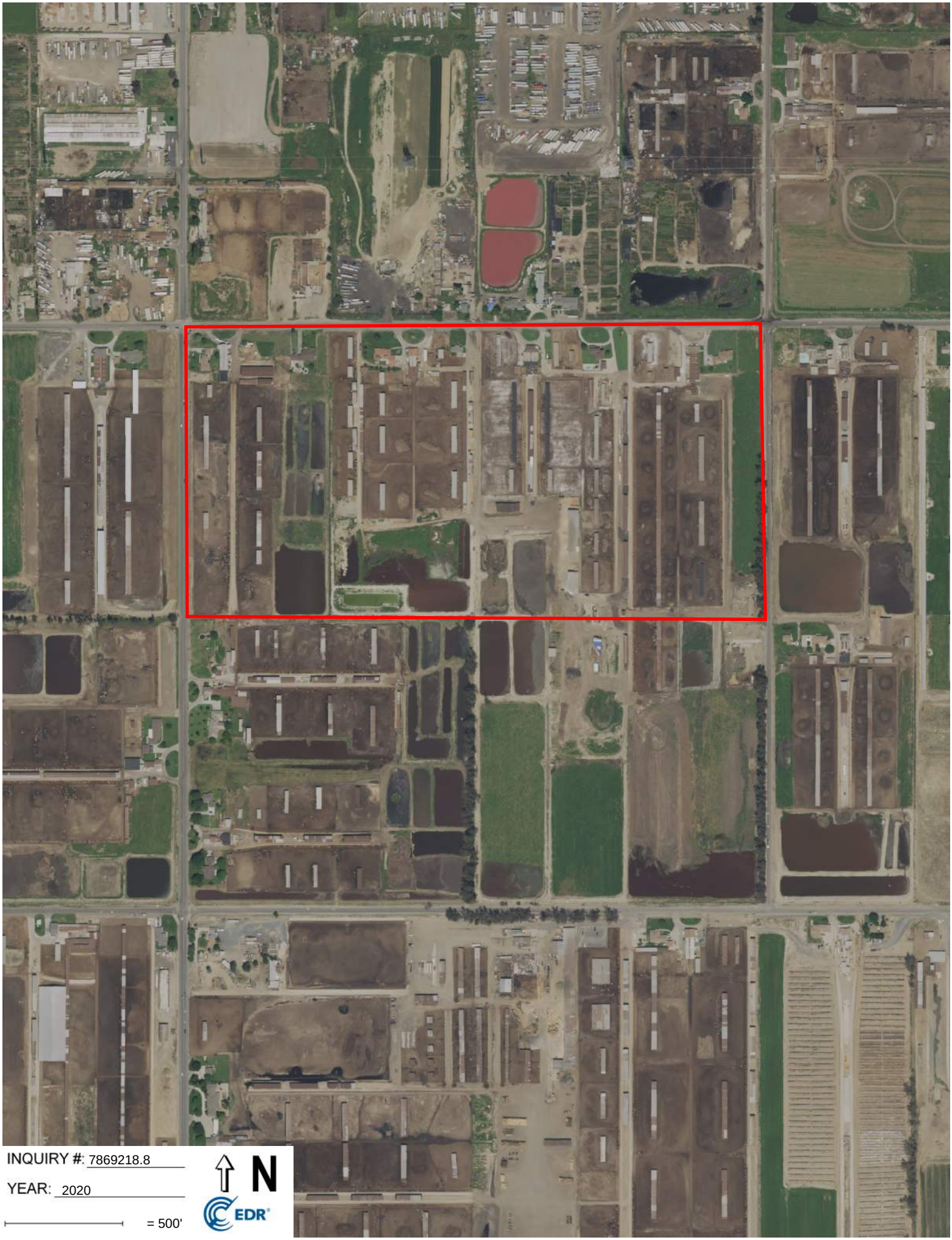
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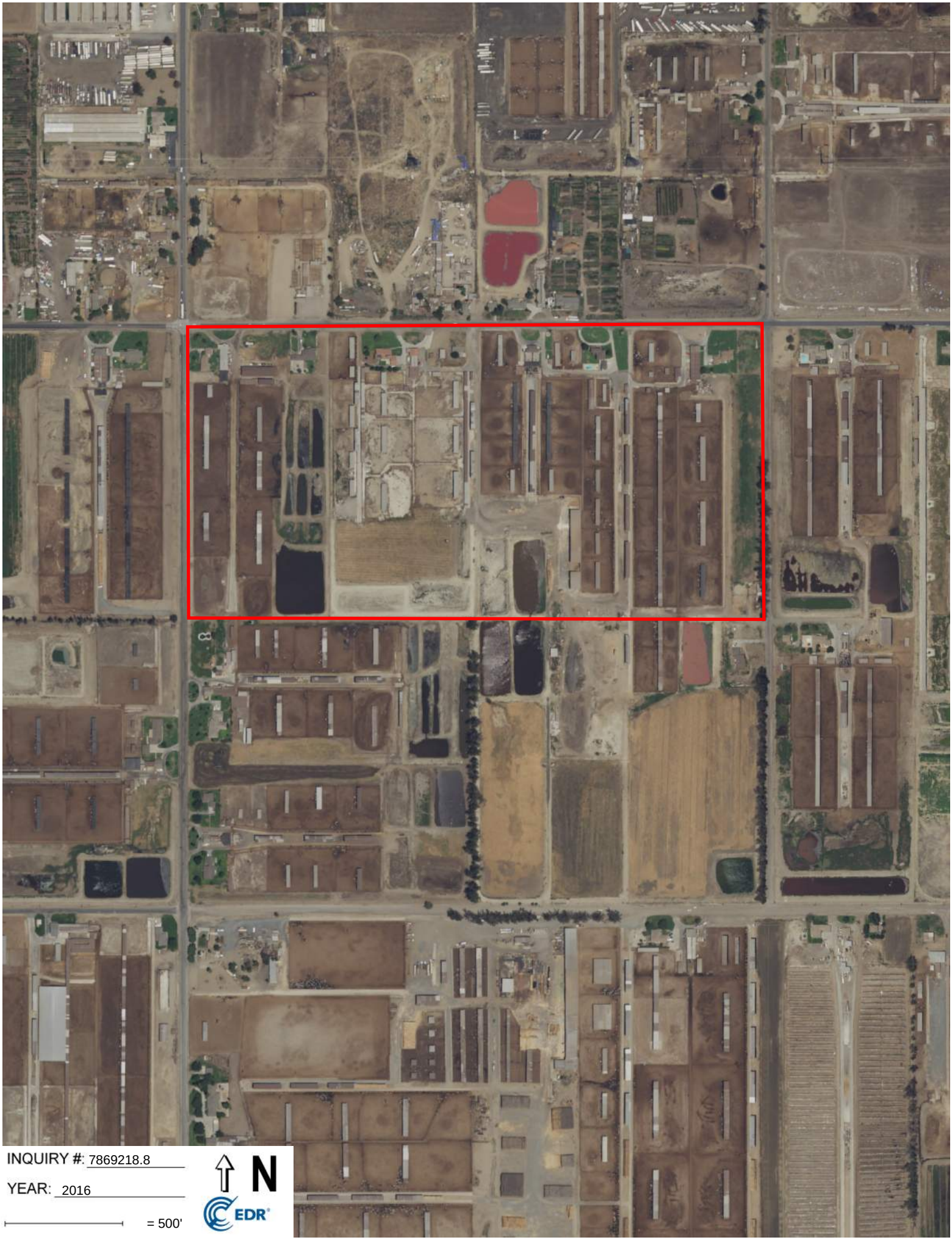

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EDR

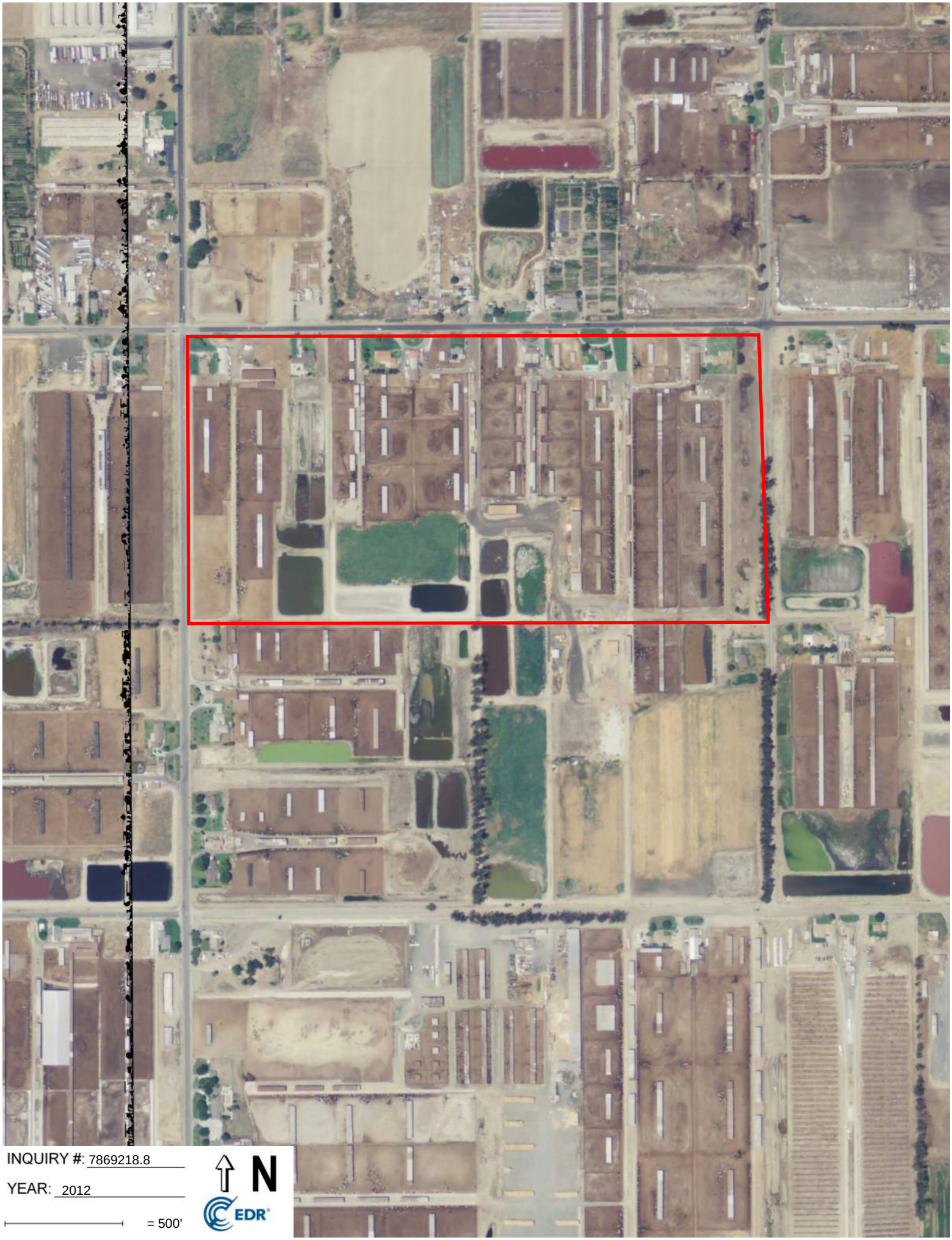
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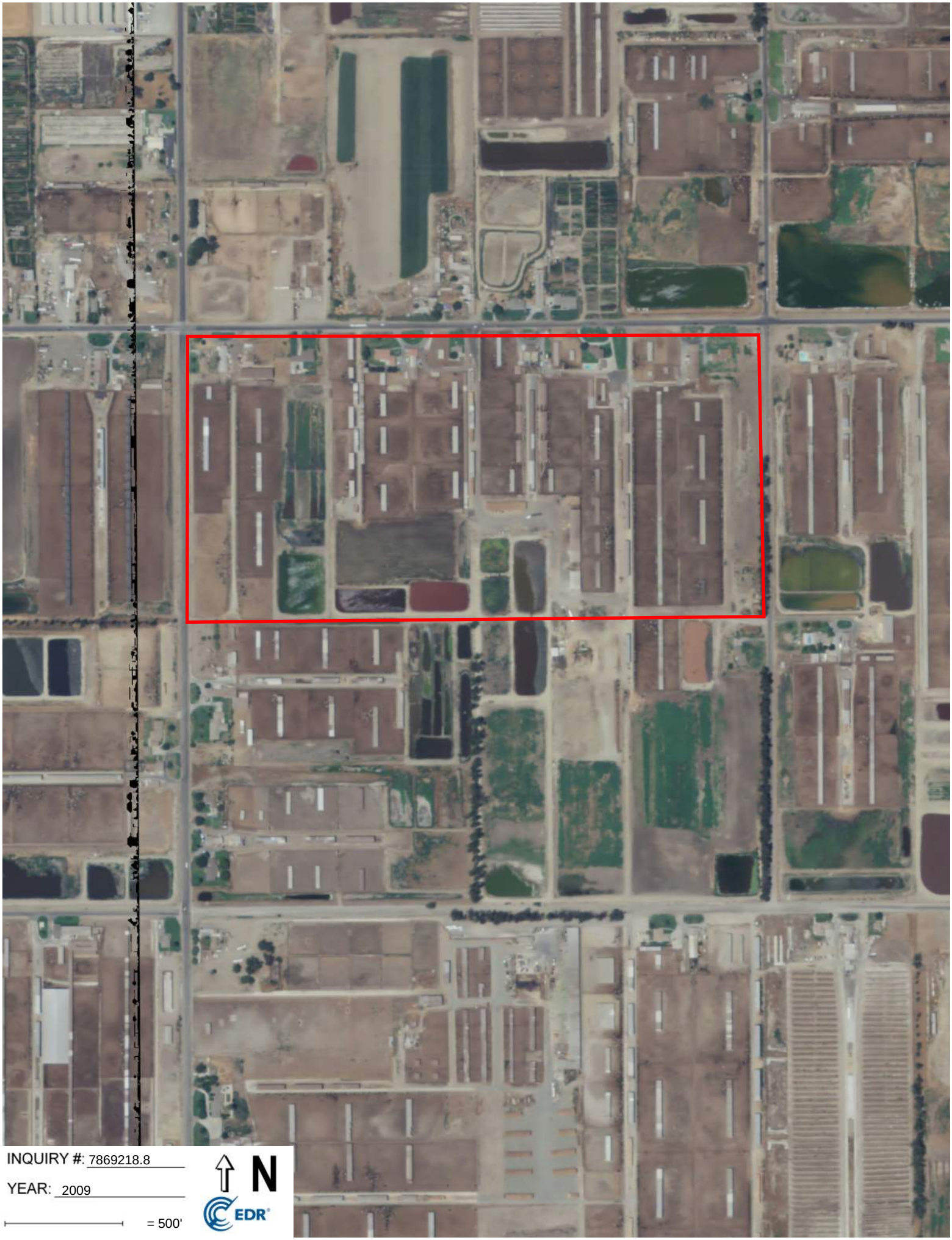
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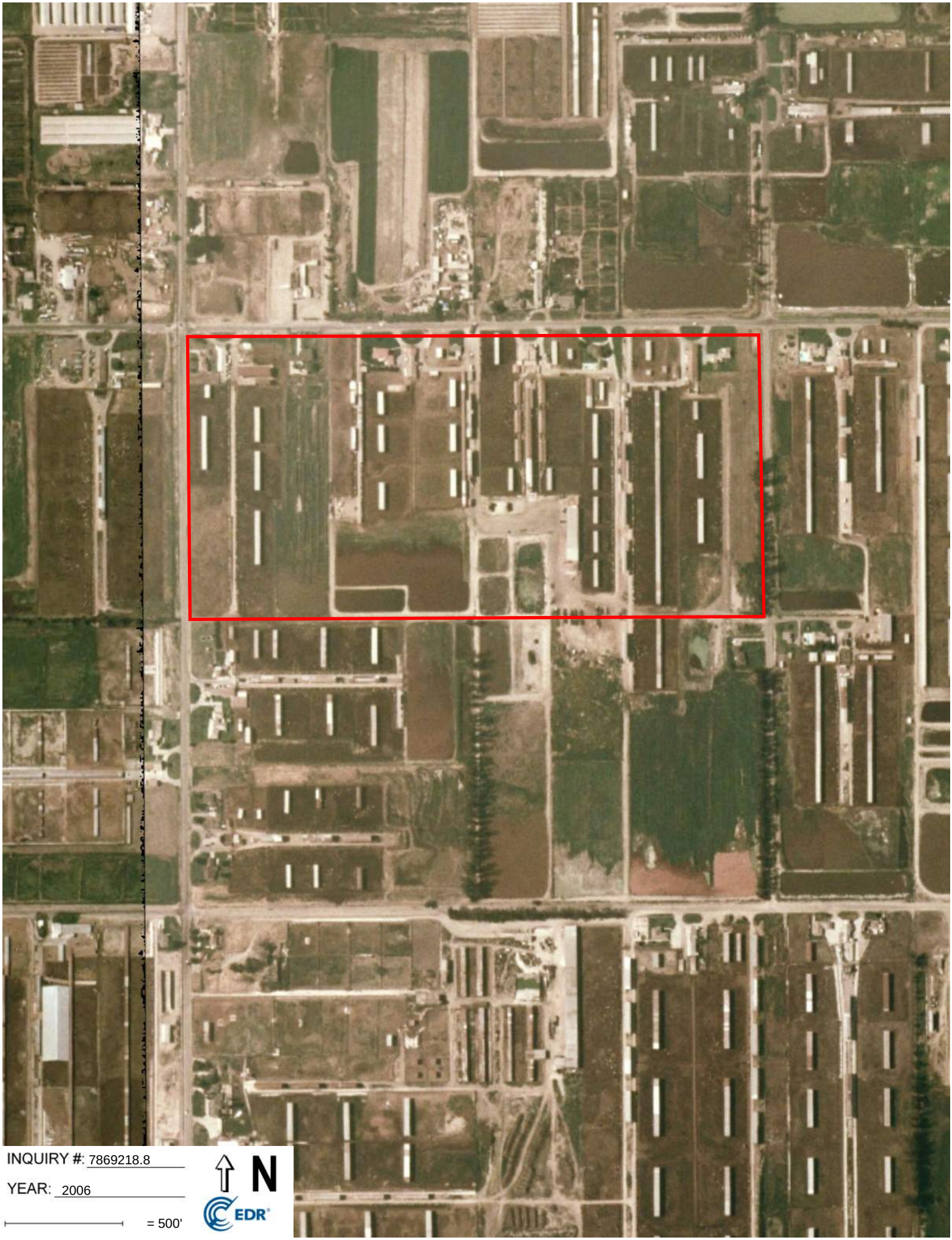

INQUIRY #: 7869218.8

YEAR: 2006

= 500'

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EDR

INQUIRY #: 7869218.8
YEAR: 2002
= 500'
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EDR

INQUIRY #: 7869218.8
YEAR: 1994
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EDR

INQUIRY #: 7869218.8
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EDR

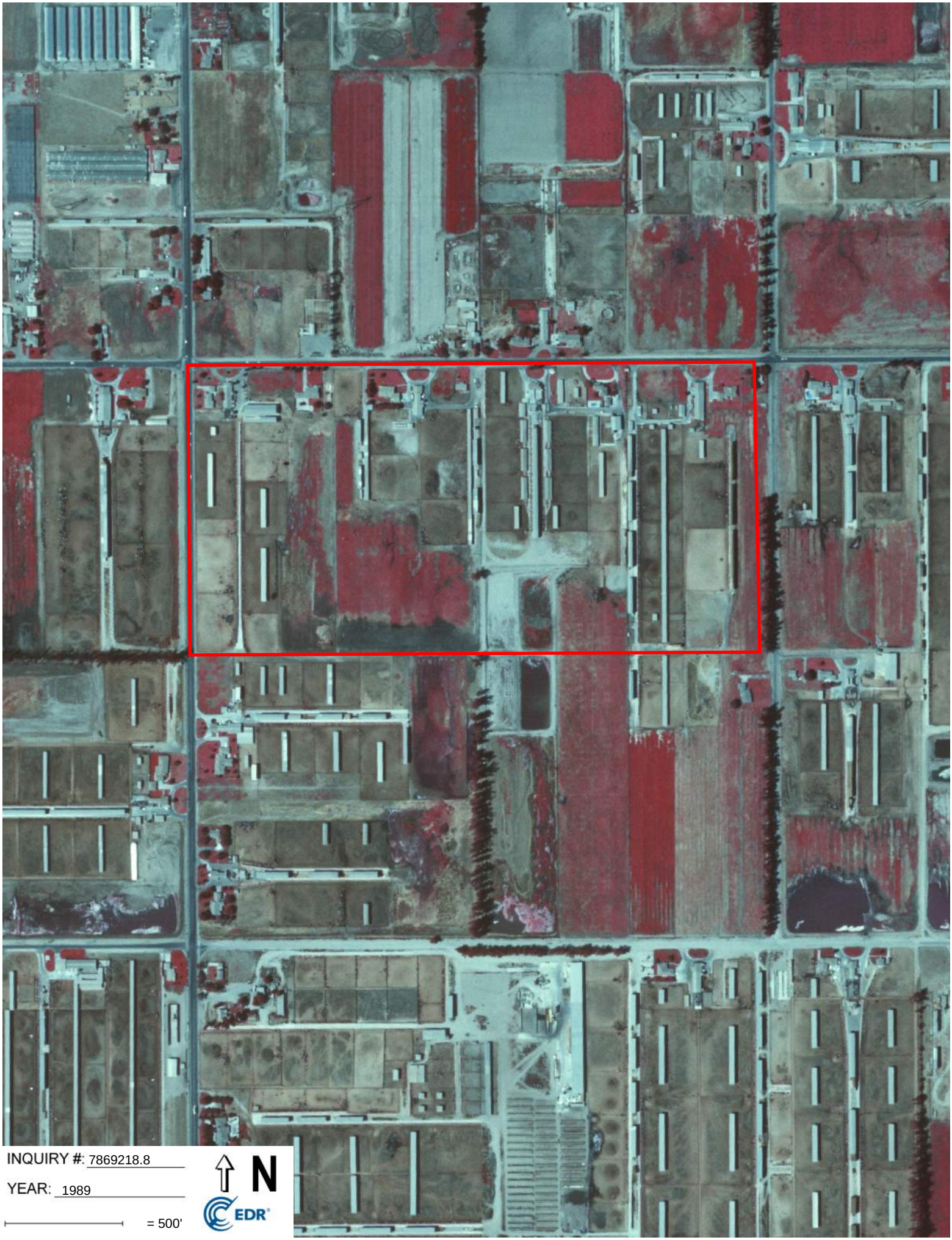
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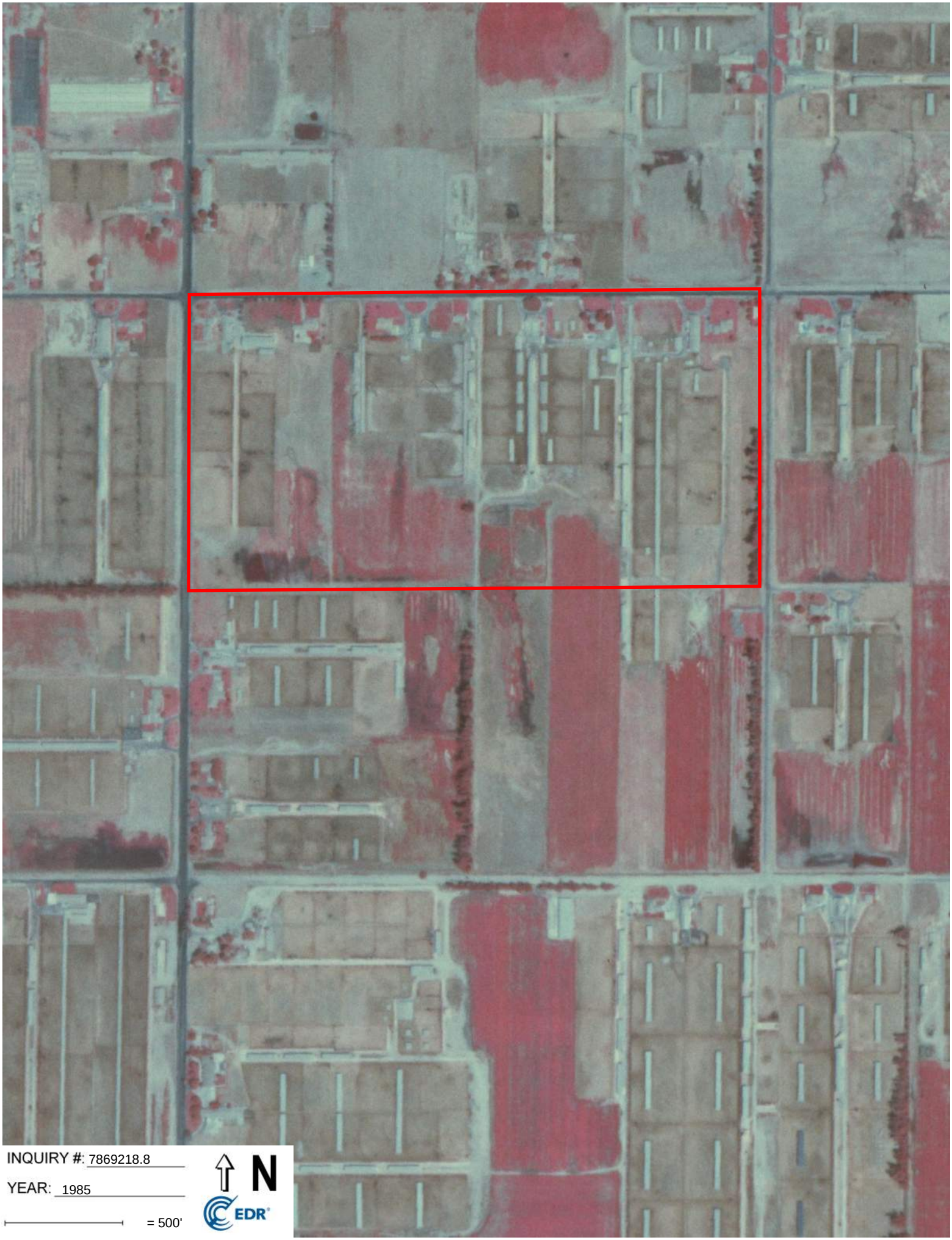
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EDR

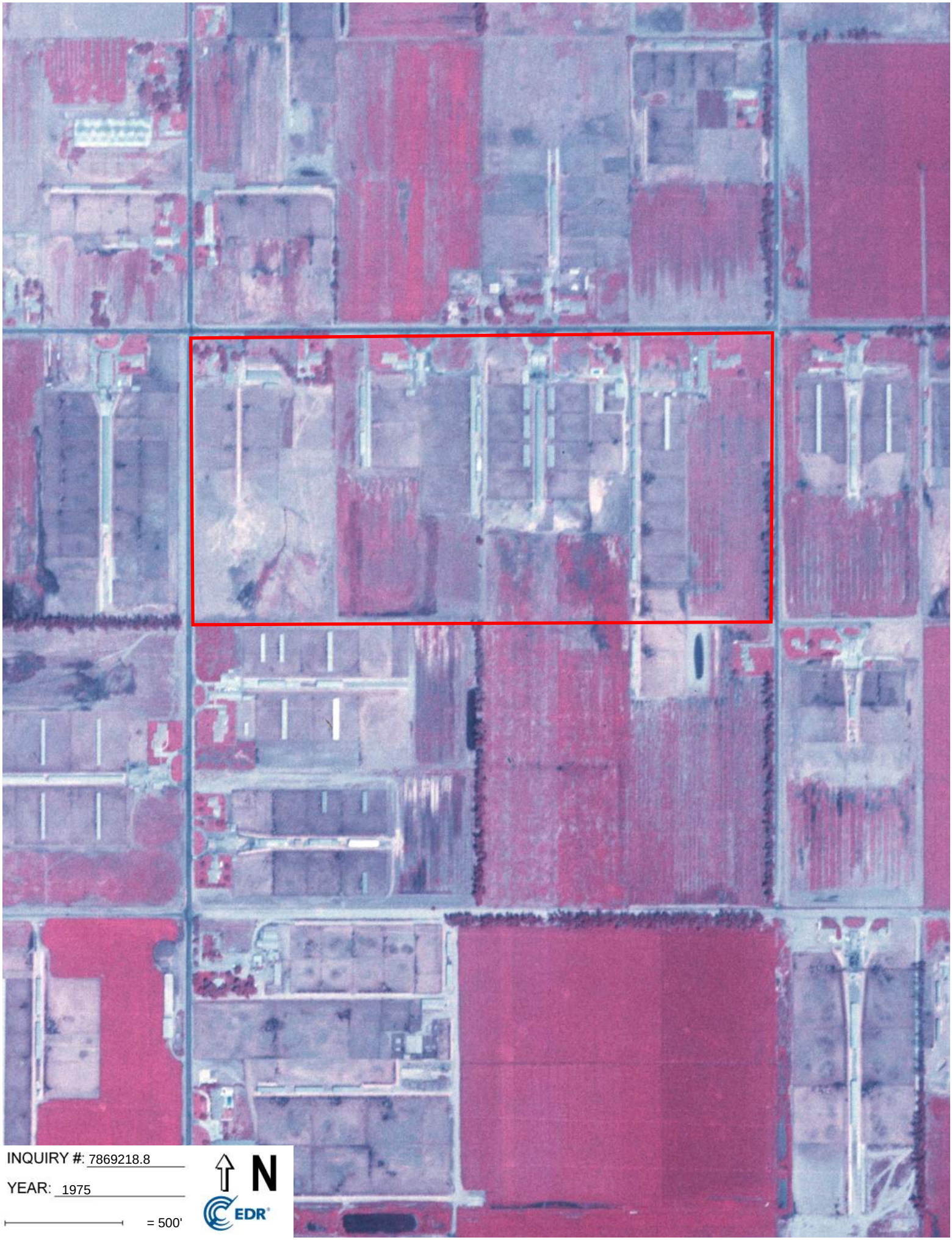

INQUIRY #: 7869218.8

YEAR: 1975

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EDR

INQUIRY #: 7869218.8

YEAR: 1966

= 500'

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EDR

INQUIRY #: 7869218.8
YEAR: 1953
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EDR

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YEAR: 1948
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EDR

INQUIRY #: 7869218.8

YEAR: 1946

= 500'

N

EDR

INQUIRY #: 7869218.8

YEAR: 1938

= 500'

N

EDR

**Ontario Ranch II**

14366 Bon View Avenue

Ontario, CA 91762

Inquiry Number: 7568463.8

February 15, 2024

# The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Aerial Photo Decade Package

02/15/24

**Site Name:**

Ontario Ranch II
14366 Bon View Avenue
Ontario, CA 91762
EDR Inquiry # 7568463.8

**Client Name:**

Roux Associates
5150 E Pacific Coast Highway
Long Beach, CA 90804
Contact: Kasia Anderson

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

***Search Results:***

| *Year* | *Scale* | *Details* | *Source* |
|---|---|---|---|
| 2020 | 1"=625' | Flight Year: 2020 | USDA/NAIP |
| 2016 | 1"=625' | Flight Year: 2016 | USDA/NAIP |
| 2012 | 1"=625' | Flight Year: 2012 | USDA/NAIP |
| 2009 | 1"=625' | Flight Year: 2009 | USDA/NAIP |
| 2006 | 1"=625' | Flight Year: 2006 | USDA/NAIP |
| 2002 | 1"=625' | Acquisition Date: January 01, 2002 | USGS/DOQQ |
| 1994 | 1"=625' | Acquisition Date: June 01, 1994 | USGS/DOQQ |
| 1990 | 1"=625' | Flight Date: August 29, 1990 | USDA |
| 1989 | 1"=625' | Flight Date: August 03, 1989 | USDA |
| 1987 | 1"=625' | Flight Date: March 29, 1987 | USDA |
| 1975 | 1"=625' | Flight Date: August 01, 1975 | USGS |
| 1966 | 1"=625' | Flight Date: April 16, 1966 | USGS |
| 1953 | 1"=625' | Flight Date: March 03, 1953 | USDA |
| 1948 | 1"=625' | Flight Date: July 10, 1948 | USGS |
| 1946 | 1"=625' | Flight Date: December 29, 1946 | USGS |
| 1938 | 1"=625' | Flight Date: June 03, 1938 | USDA |

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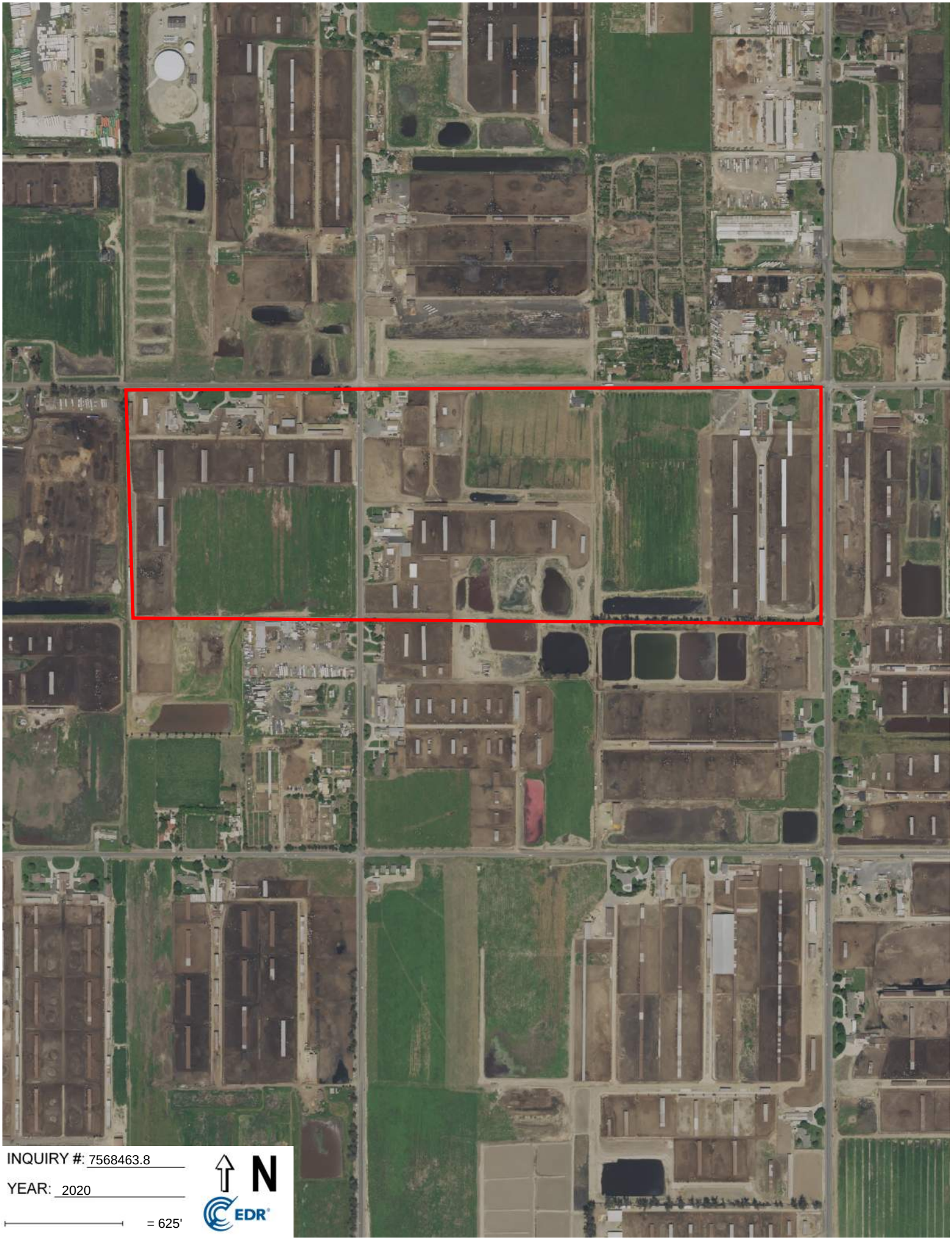
INQUIRY #: 7568463.8
YEAR: 2020
= 625'
N
EDR

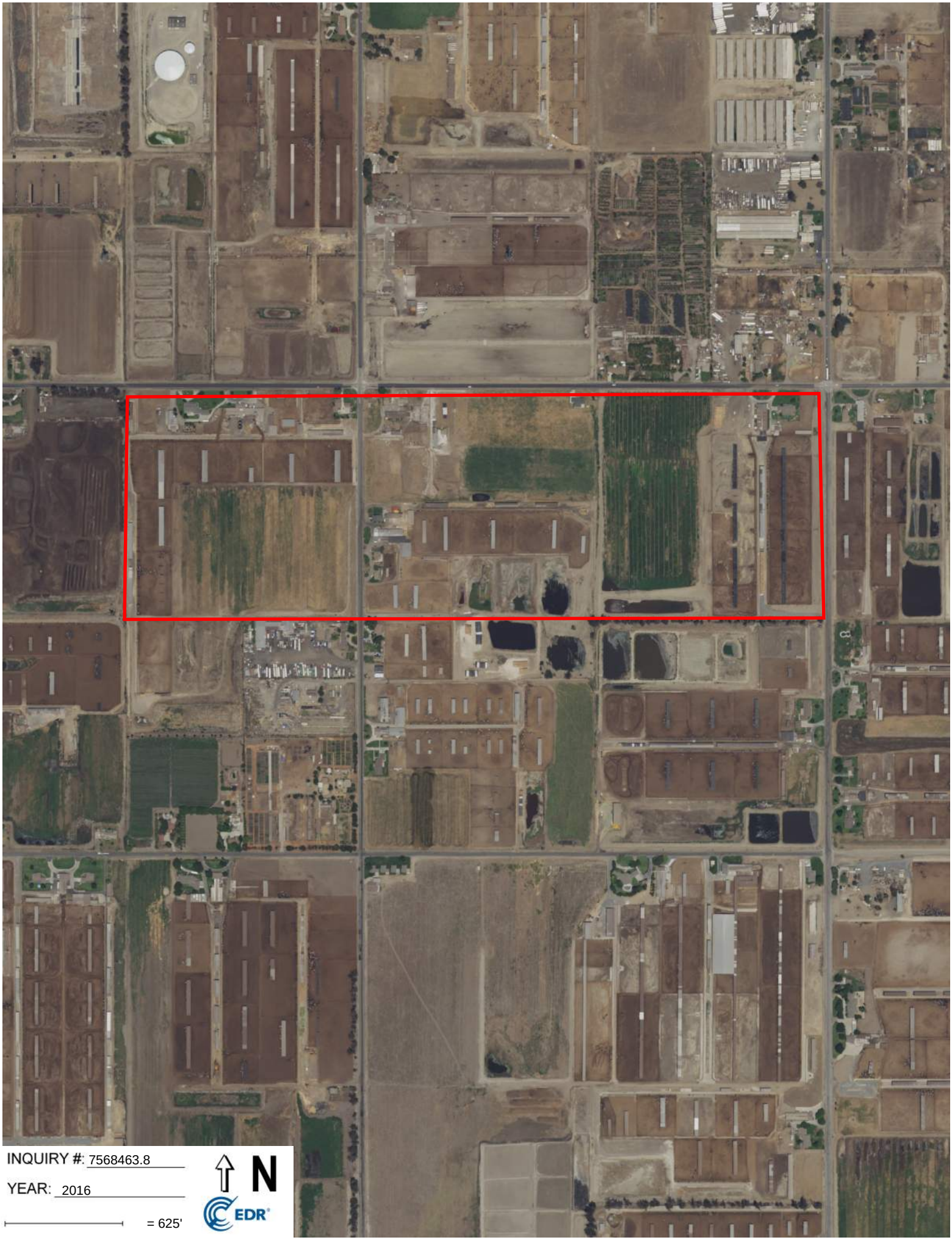
INQUIRY #: 7568463.8
YEAR: 2016
= 625'
N
EDR

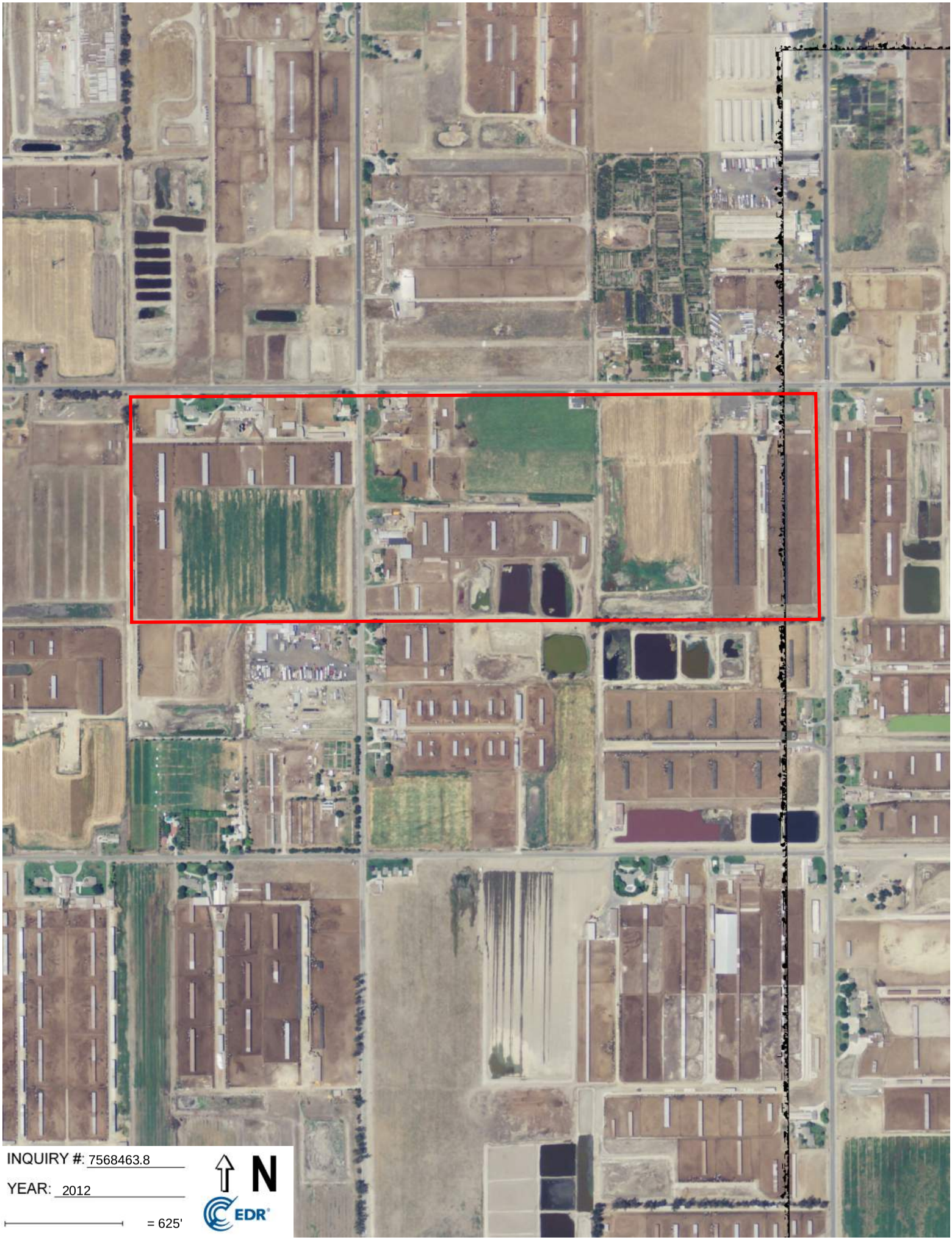
INQUIRY #: 7568463.8
YEAR: 2012
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 2009
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 2006
= 625'
N
EDR

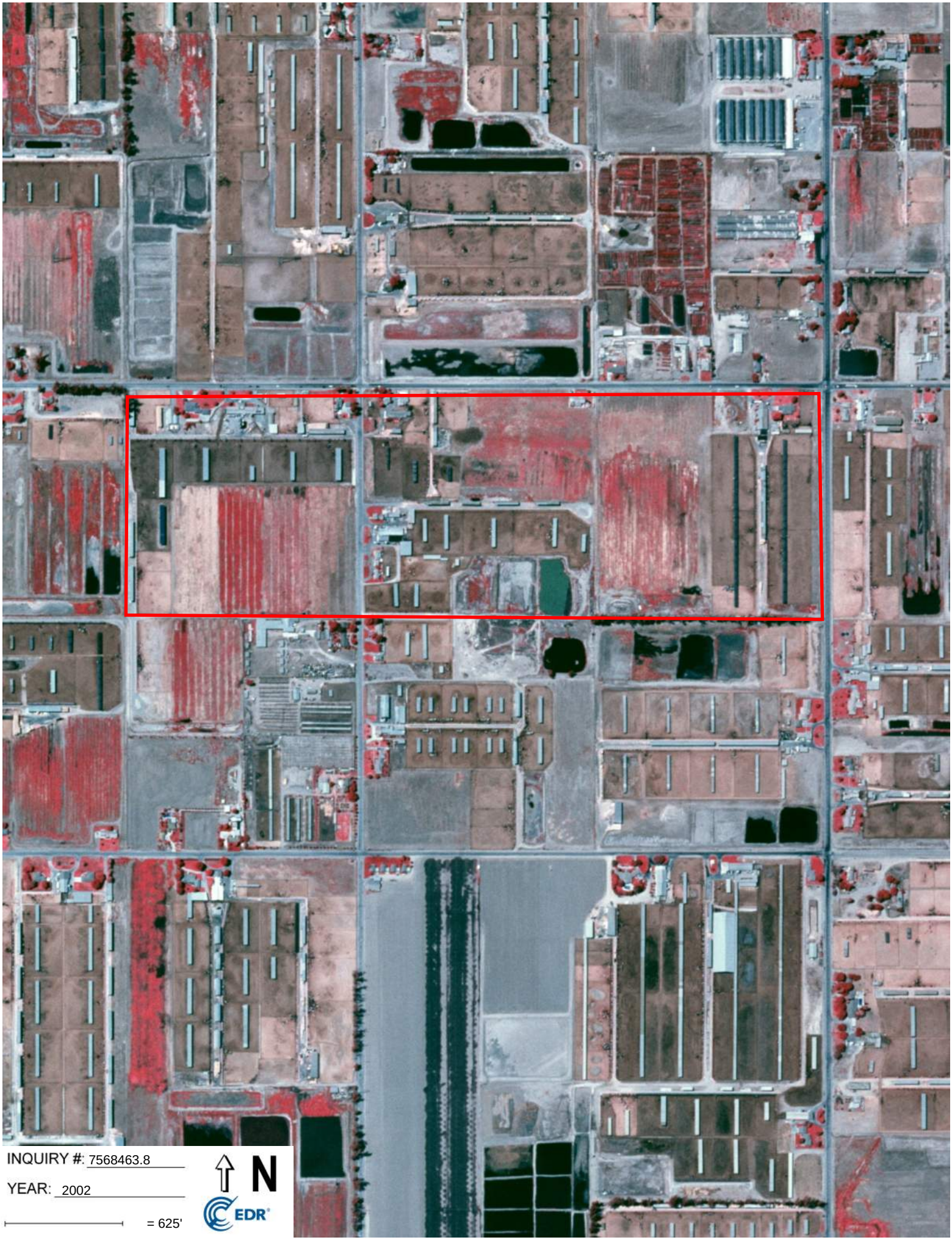
INQUIRY #: 7568463.8
YEAR: 2002
= 625'
N
EDR

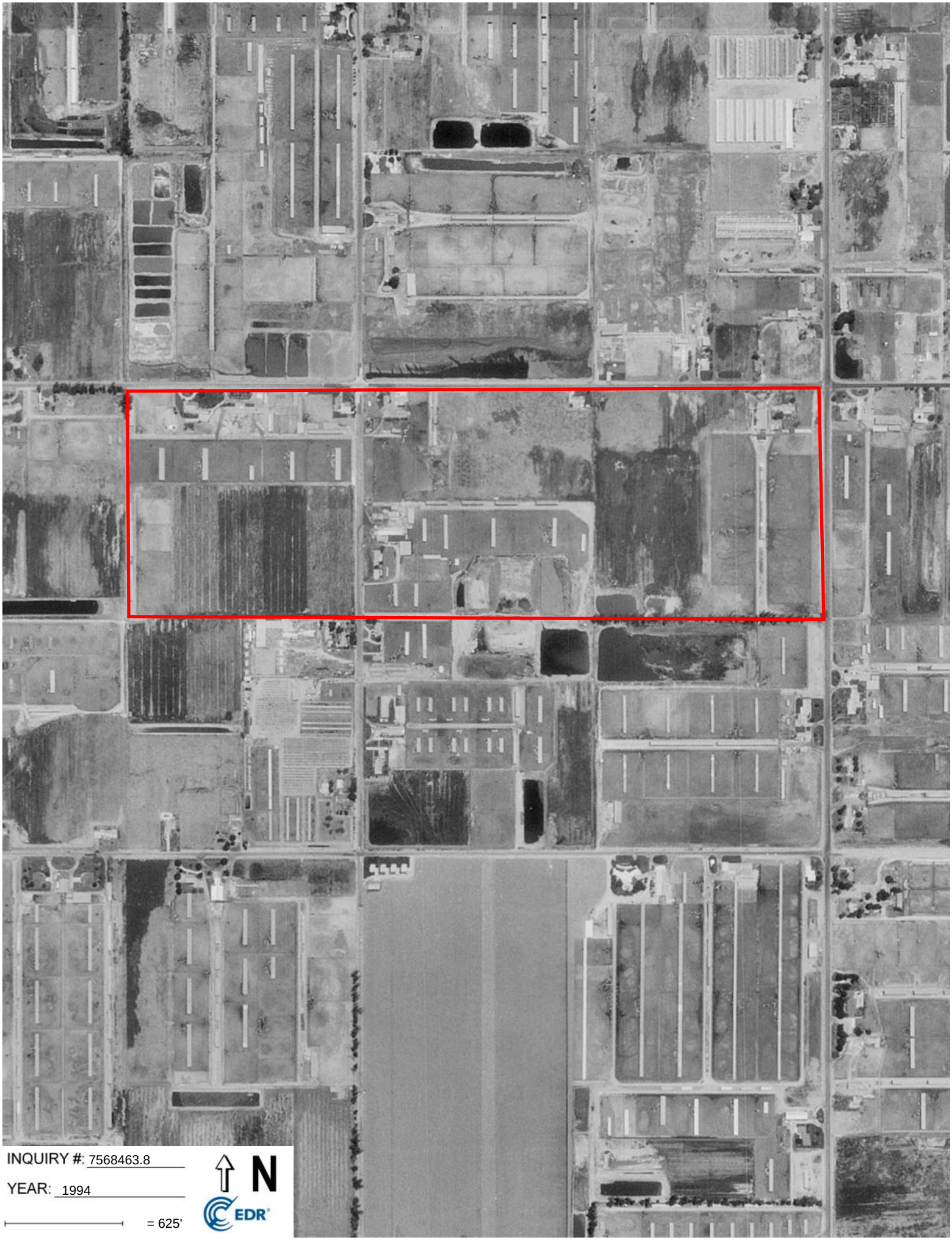
INQUIRY #: 7568463.8
YEAR: 1994
= 625'
N
EDR

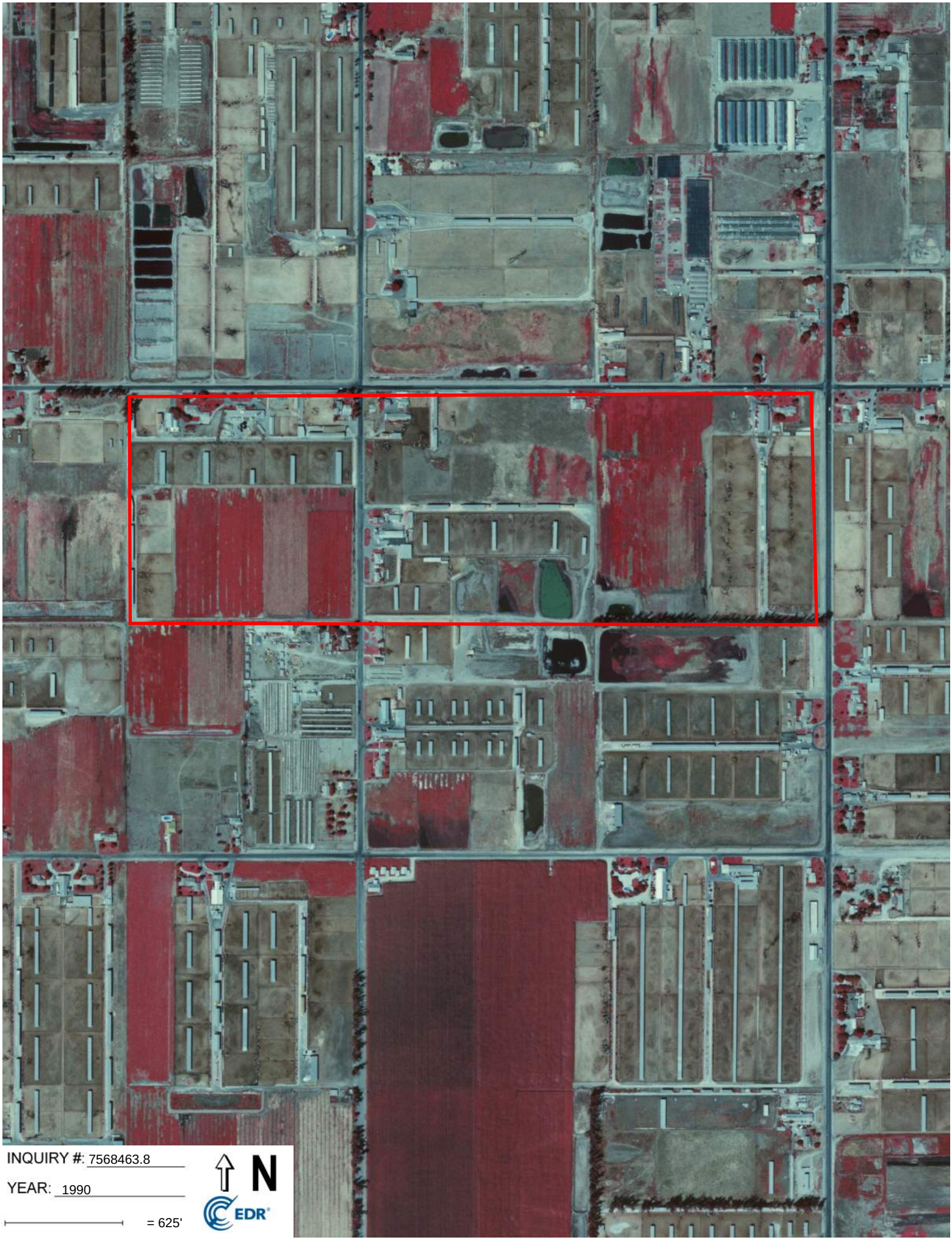
INQUIRY #: 7568463.8
YEAR: 1990
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1989
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1987
= 625'
N
EDR

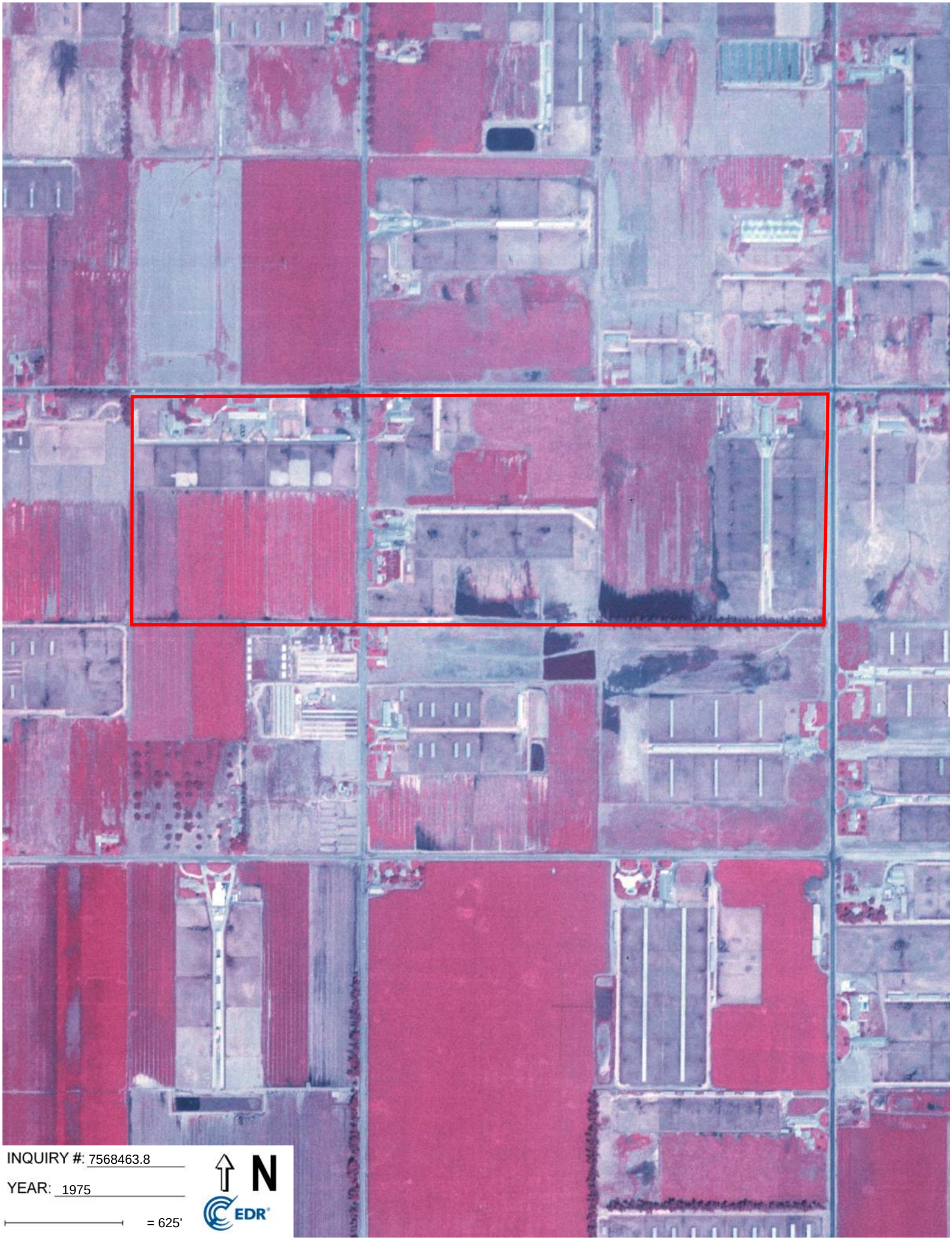
INQUIRY #: 7568463.8
YEAR: 1975
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1966
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1953
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1948
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1946
= 625'
N
EDR

INQUIRY #: 7568463.8

YEAR: 1938

= 625'

N

EDR

**Ontario Ranch II**
14366 Bon View Avenue
Ontario, CA 91762

Inquiry Number: 7568463.5
February 14, 2024

# The EDR-City Directory Abstract

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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**Executive Summary**

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

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# EXECUTIVE SUMMARY

## DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at approximately five year intervals.

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1922 through current. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 1320 feet of the target property.

Summary information obtained is provided in the text of this report.

## RECORD SOURCES

The EDR City Directory Report accesses a variety of business directory sources, including Haines, InfoUSA, Polk, Cole, Bresser, and Stewart. Listings marked as EDR Digital Archive access Cole and InfoUSA records. The various directory sources enhance and complement each other to provide a more thorough and accurate report.

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## RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

| Year | Source | TP | Adjoining | Text Abstract | Source Image |
|---|---|---|---|---|---|
| 2020 | EDR Digital Archive | - | X | X | - |
| | EDR Digital Archive | X | X | X | - |
| 2017 | Cole Information | - | X | X | - |
| | Cole Information | X | X | X | - |
| 2014 | Cole Information | X | X | X | - |
| 2010 | Cole Information | X | X | X | - |
| 2008 | Haines Company, Inc. | X | X | X | - |
| 2005 | Cole Information | X | X | X | - |
| 2003 | Haines & Co Publishers | X | X | X | - |
| 2002 | Cole Information Services | - | - | - | - |
| 2000 | Cole Information | X | X | X | - |
| 1996 | GTE | X | X | X | - |
| 1995 | Cole Information | X | X | X | - |
| 1992 | Cole Information | X | X | X | - |
| 1991 | GTE California Incorporated | - | - | - | - |
| 1990 | GTE California Incorporated | X | X | X | - |

# EXECUTIVE SUMMARY

| Year | Source | TP | Adjoining | Text Abstract | Source Image |
|---|---|---|---|---|---|
| 1985 | GTE | X | X | X | - |
| 1981 | General Telephone Company of California | - | - | - | - |
| 1980 | GTE | X | X | X | - |
| 1975 | Pacific Telephone Co | X | - | X | - |
| 1970 | General Telephone Company of California | X | X | X | - |
| 1965 | GTE | X | - | X | - |
| 1964 | Luskey Brothers & Co | - | - | - | - |
| 1961 | Luskey Brothers& Co Publishers | - | - | - | - |
| 1960 | Luskey Brothers & Co Publishers | X | - | X | - |
| 1956 | General Telephone Company Publishers | - | - | - | - |
| 1955 | Luskey Brothers Co Publishers | - | - | - | - |
| 1951 | Los Angeles Directory Co Publishers | - | - | - | - |
| 1950 | The Pacific Telephone and Telegraph Co | - | - | - | - |
| 1949 | San Bernardino Directory Co. Publishers | - | - | - | - |
| 1946 | Los Angeles Directory Company Publishers | - | - | - | - |
| 1945 | Southern Califronia Telephone Company | - | - | - | - |
| 1942 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1941 | Associated Telephone Company Limited | - | - | - | - |
| 1940 | Los Angeles Directory Co. | - | - | - | - |
| 1938 | Los Angeles Directory Co. | - | - | - | - |
| 1936 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1934 | Los Angeles Directory Co. | - | - | - | - |
| 1931 | Los Angeles Directory Co. | - | - | - | - |
| 1930 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1926 | Los Angeles Directory Co. | - | - | - | - |
| 1923 | Los Angeles Directory Company | - | - | - | - |
| 1922 | R.L. Polk & Co Publishers | - | - | - | - |

# EXECUTIVE SUMMARY

## SELECTED ADDRESSES

The following addresses were selected by the client, for EDR to research. An "X" indicates where information was identified.

| *Address* | *Type* | *Findings* |
|---|---|---|
| 8061 Edison Avenue | Client Entered | |
| 14400 South Grove Avenue | Client Entered | |
| 7587 Edison Avenue | Client Entered | |
| 14451 Bon View Avenue | Client Entered | |
| 7325 Edison Avenue | Client Entered | |
| 14316 Bon View Avenue | Client Entered | |
| 7634 Eucalyptus Avenue | Client Entered | |
| 7721 Edison Avenue | Client Entered | |
| 14213 Bon View Avenue | Client Entered | |

# FINDINGS

## TARGET PROPERTY INFORMATION

### ADDRESS

14366 Bon View Avenue
Ontario, CA 91762

### FINDINGS DETAIL

Target Property research detail.

### BON VIEW AVE

**14213 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | GORDON | EDR Digital Archive |
| 2017 | GORDON | Cole Information |
| 2014 | GORDON | Cole Information |
| 2005 | JESUS CARDENAS | Cole Information |
| 2003 | COSTA D | Haines & Co Publishers |
| 2000 | COSTA VIEW FARMS NO 3 | Cole Information |
| | DOLORES VIVEROS | Cole Information |
| 1996 | COSTA VIEW FARMS NO | GTE |
| | VIveros Dolores | GTE |
| 1995 | COSTA VIEW FARMS | Cole Information |
| | VELASCO, JOSE G | Cole Information |
| 1992 | COSTA VIEW FARMS 3 | Cole Information |
| 1970 | ROCHA ELCIDIO | General Telephone Company of California |

**14316 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | LAUREN HINDELANG | EDR Digital Archive |
| | MICHAEL HINDELANG | EDR Digital Archive |
| 2017 | MIKE HINDELANG | Cole Information |
| 2014 | ALBERT HINDELANG | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| 2005 | ALBERT HINDELANG | Cole Information |
| 1992 | HINDELANG, ALBERT | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 1992 | QUALITY BLT FBRGLSS | Cole Information |
| 1990 | HINDELANG ALBERT | GTE California Incorporated |
| | QUALITY BUILT | GTE California Incorporated |
| 1985 | HINDELANG ALBERT | GTE |
| 1970 | BENTO TONY | General Telephone Company of California |

**14366 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| | WHY PRODUCE CO | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | B & G CATTLE CO | Cole Information |
| | OCCUPANT UNKNOWN | Cole Information |
| 2003 | XXXX | Haines & Co Publishers |
| 2000 | BEKENDAM CATTLE COMPANY | Cole Information |
| | OCCUPANT UNKNOWN | Cole Information |
| 1996 | BEKENDAM CATTLE CO | GTE |
| | VEstrada Albert | GTE |
| 1995 | BEKENDAM CATTLE CO | Cole Information |
| 1992 | BEKENDAM CATTLE CO | Cole Information |
| 1990 | B 8 G CATTLE CO | GTE California Incorporated |
| | BEKENDAM CATTLE CO | GTE California Incorporated |
| 1985 | B & G CATTLE CO | GTE |
| | GARCIA CARLOS | GTE |
| 1980 | NB & G CATTLE CO | GTE |

**14451 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | CAROL KUHL | EDR Digital Archive |
| | JORDAN KUHL | EDR Digital Archive |
| | PETER KUHL | EDR Digital Archive |
| | STARLA KUHL | EDR Digital Archive |
| 2017 | LENA ALBERS | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2017 | RAYMOND ALBERS | Cole Information |
| 2014 | RAYMOND ALBERS | Cole Information |
| 2010 | H & R DAIRY | Cole Information |
| | RON MIERSMA | Cole Information |
| 2008 | MIERSMA Ron | Haines Company, Inc. |
| 2005 | H & R DAIRY | Cole Information |
| 2003 | MIERSMA Ron | Haines & Co Publishers |
| 2000 | COSTA VIEW FARMS NO 1 | Cole Information |
| | DENISE MIERSMA | Cole Information |
| 1996 | Costa Dimas | GTE |
| | COSTA VIEW FARMS | GTE |
| 1995 | COSTA VIEW FARMS | Cole Information |
| | COSTA, DIMAS | Cole Information |
| 1992 | COSTA VIEW FARMS 1 | Cole Information |
| | COSTA, DIMAS | Cole Information |
| 1990 | COSTA DIMAS | GTE California Incorporated |
| | COSTA VIEW FARMS | GTE California Incorporated |
| 1985 | COSTA DIMAS | GTE |
| 1980 | COSTA DIMAS | GTE |

## Bon View Avenue

**14213 Bon View Avenue**

| Year | Uses | Source |
|---|---|---|

**14316 Bon View Avenue**

| Year | Uses | Source |
|---|---|---|

**14451 Bon View Avenue**

| Year | Uses | Source |
|---|---|---|

# FINDINGS

## EDISON AVE

**7325 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 1970 | MELLO JOE | General Telephone Company of California |

**7587 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2008 | HUIZENGA Paul | Haines Company, Inc. |
| 2003 | DE Groat Ernest | Haines & Co Publishers |
| 1996 | De Groot Ernest | GTE |
| | TWIN PALMS DAIRY | GTE |
| 1990 | De Groot Ernest | GTE |
| | Or | GTE |
| | Twin Palms Dairy | GTE |
| | Twinkee The Clown Mntclr | GTE |
| | DE GROOT ERNEST | GTE California Incorporated |
| | TWIN PALMS DAIRY | GTE California Incorporated |
| 1985 | DE GROOT ERNEST | GTE |
| 1980 | DE GROOT ERNEST | GTE |
| | DE GROOT ERNEST | GTE |
| 1975 | De Groot Ernest | GTE Directories |
| 1970 | DE GRCOT ERNEST | General Telephone Company of California |
| | DE GROOT ERNEST | General Telephone Company of California |
| 1965 | DE GROOT ERNEST | GTE |
| 1960 | Alluis Albeft Jr | General Telephone Company Publishers |

**7721 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2008 | BOOTSMA Garret | Haines Company, Inc. |
| 2003 | BOOTSMA Garret | Haines & Co Publishers |
| | BOOTSMA Wilbur | Haines & Co Publishers |
| 1996 | Bootsma Garret | GTE |
| 1990 | Bootsma Garret | GTE |
| | BOOTSMA GARRET | GTE California Incorporated |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 1985 | BOOTSMA GARRET | GTE |
| 1980 | + BOOTSMA GARRET | GTE |
| | BOOTSMA JIM | GTE |
| 1975 | Bootsma Jim | GTE Directories |
| 1970 | BOOTSMA JIM | General Telephone Company of California |
| 1965 | BOOTSMA J NA | GTE |
| 1960 | Bootsma Jim | General Telephone Company Publishers |

**8061 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2008 | JORRITSMA Jas D | Haines Company, Inc. |
| 2003 | JORRITSMA Jas D | Haines & Co Publishers |
| 1996 | Jorritsma Jas D | GTE |
| 1990 | Jorritsma Jas D | GTE |
| | JORRITSMA JAS D | GTE California Incorporated |
| 1985 | CERDA REYES | GTE |
| | JORRITSMA JAS | GTE |
| 1980 | JORRITSMA JAS D | GTE |
| 1975 | Tuls Jack G | GTE Directories |
| 1970 | TULS JACK G | General Telephone Company of California |

## Edison Avenue

**7325 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**7587 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**7721 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

# FINDINGS

**8061 Edison Avenue**

| *Year* | *Uses* | *Source* |
|---|---|---|

## EUCALYPTUS AVE

**7634 EUCALYPTUS AVE**

| *Year* | *Uses* | *Source* |
|---|---|---|
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | CHINO CORONA VETERINARY SERVICES | Cole Information |

## Eucalyptus Avenue

**7634 Eucalyptus Avenue**

| *Year* | *Uses* | *Source* |
|---|---|---|

## South Grove Avenue

**14400 South Grove Avenue**

| *Year* | *Uses* | *Source* |
|---|---|---|

# FINDINGS

## ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

## BON VIEW AVE

**14214 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2000 | OCCUPANT UNKNOWN | Cole Information |

**14283 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | CAESAR URIBE | Cole Information |
| 2014 | ANA VARGAS | Cole Information |
| 2010 | ANA VARGAS | Cole Information |
| 2003 | XXXX | Haines & Co Publishers |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1996 | Boettcher Shane | GTE |
| 1995 | BOETTCHER, SHANE | Cole Information |
| 1985 | COELHO DENNIS | GTE |
| 1980 | COELHO DENNIS | GTE |
| 1970 | FRANCO FRANCISCO | General Telephone Company of California |

**14297 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | MARIA AVINA | Cole Information |
| 2005 | MARIA AVINA | Cole Information |
| 2000 | CRAIG CARR | Cole Information |
| 1996 | VBoettcher Wayne | GTE |
| 1995 | HANSEN, MAX | Cole Information |

**14306 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2010 | ALBERT HINDELANG | Cole Information |
| 2005 | WILLIAM HINDELANG | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2003 | HINDELANG William | Haines & Co Publishers |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1995 | HERNANDEZ, IRMA | Cole Information |
| 1992 | HERNANDEZ, IRMA | Cole Information |
| | QEVEDO, MIGUEL | Cole Information |
| | BON VIEW HORSE BRDN | Cole Information |
| 1990 | BON VIEW HORSE BRDNG | GTE California Incorporated |
| 1985 | BON VIEW HORSE BRDNG | GTE |
| | MARTINEZ JUAN | GTE |
| 1980 | LE EQUESTRIAN CENTRE | GTE |
| 1970 | HINOELANG JR WM | General Telephone Company of California |

**14330 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | GEROGEANN RILEY | Cole Information |
| 2014 | GEORGEANN RILEY | Cole Information |
| 2005 | OCCUPANT UNKNOWN | Cole Information |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1995 | OCCUPANT UNKNOWNN | Cole Information |

**14333 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | DELILAH RODIGUEZ | Cole Information |
| 2014 | BEATRIZ HERNANDEZ | Cole Information |
| 2010 | JOAQUIN CORRAL | Cole Information |
| 2003 | COSTA D | Haines & Co Publishers |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1996 | Silva Joso | GTE |
| 1995 | SILVA, JOAO | Cole Information |
| 1990 | MEDEIROS RUI | GTE California Incorporated |
| 1985 | LOURENCO JOHN | GTE |
| 1980 | LOURENCO JOHN | GTE |
| 1970 | COTA ANTONIO | General Telephone Company of California |

# FINDINGS

**14343 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | LIZ BARAJAS | Cole Information |
| 2014 | JOEL FLORES | Cole Information |
| 2008 | BARAJAS Irene | Haines Company, Inc. |
| 2003 | XXXX | Haines & Co Publishers |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1996 | Costa Teresa | GTE |
| 1995 | OCCUPANT UNKNOWNN | Cole Information |
| 1990 | BOOTSMA JIM | GTE California Incorporated |
| 1970 | ROCHA JOE C | General Telephone Company of California |

**14450 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2003 | COSTA Dimas | Haines & Co Publishers |

## EUCALYPTS AVE

**7565 EUCALYPTS AVE**

| Year | Uses | Source |
|---|---|---|
| 2000 | LOYOLA DAIRY | Cole Information |

**7698 EUCALYPTS AVE**

| Year | Uses | Source |
|---|---|---|
| 2000 | GOLDEN STATE HOLSTEINS INCORPORATED | Cole Information |

## EUCALYPTUS AVE

**7511 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | BRAD OWEN | EDR Digital Archive |
| | AMY OWEN | EDR Digital Archive |
| 2017 | BRAD OWEN | Cole Information |
| 2014 | BRAD OWEN | Cole Information |
| 2010 | BRAD OWEN | Cole Information |
| 2008 | OWEN Brad | Haines Company, Inc. |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2005 | BRAD OWEN | Cole Information |

**7556 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | TOM WORTHINGTON | Cole Information |
| 2014 | TOM WORTHINGTON | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | THOMAS WORTHINGTON | Cole Information |

**7565 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | CHINO VALLEY DAIRY | EDR Digital Archive |
| 2017 | MARTY VANLEEUWEN | Cole Information |
| 2014 | MARTY VANLEEUWEN | Cole Information |
| 2010 | FRANK SOUZA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | OCCUPANT UNKNOWN | Cole Information |

**7698 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | MODESTO MILLING | EDR Digital Archive |
| 2008 | AMYS FARM TOURS | Haines Company, Inc. |
| | GOLDEN STATE HOLSTEINS INC | Haines Company, Inc. |
| 2005 | GOLDEN STATE HOLSTEINS INC | Cole Information |
| | AMYS FARM TOURS | Cole Information |

**7721 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | CARMEN MONTANEZ | Cole Information |
| 2014 | CARMEN MONTANEZ | Cole Information |
| 2010 | CARMEN MONTANEZ | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |

**7735 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | ROCIO VEGA | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2014 | SOLEDAD MENDEZ | Cole Information |
| 2010 | SOLEDAD MENDEZ | Cole Information |
| 2008 | MENDEZ Soledad | Haines Company, Inc. |

**7745 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | JAVIER CAYETANO | Cole Information |
| 2014 | JAVIER CAYETANO | Cole Information |
| 2010 | SILMA CAYETANO | Cole Information |
| 2008 | CAYETANO Francisco | Haines Company, Inc. |
| 2005 | FRANCISCO CAYETANO | Cole Information |

**7755 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| 2008 | ARANDA Yvonne | Haines Company, Inc. |
| 2005 | EDUARDO ARANDA | Cole Information |

## W EUCALYPTUS AVE

**7698 W EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2000 | AMYS FARM TOURS | Cole Information |

# FINDINGS

## ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14214 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14450 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7556 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7556 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7556 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7556 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 7565 EUCALYPTS AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 EUCALYPTS AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 EUCALYPTUS AVE | 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 W EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7721 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 7721 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7721 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7721 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7735 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7735 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7735 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7735 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7755 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
| --- | --- |
| 7755 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7755 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7755 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

## TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

| Address Researched | Address Not Identified in Research Source |
| --- | --- |
| 14366 Bon View Avenue | 2002, 1991, 1981, 1964, 1961, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

**Ontario Ranch I**
8185 Edison Avenue
Ontario, CA 91762

Inquiry Number: 7869218.5
January 14, 2025

# The EDR-City Directory Abstract

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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## SECTION

**Executive Summary**

**Findings**

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

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# EXECUTIVE SUMMARY

## DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at approximately five year intervals.

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1922 through current. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 1320 feet of the target property.

Summary information obtained is provided in the text of this report.

## RECORD SOURCES

The EDR City Directory Report accesses a variety of business directory sources, including Haines, InfoUSA, Polk, Cole, Bresser, and Stewart. Listings marked as EDR Digital Archive access Cole and InfoUSA records. The various directory sources enhance and complement each other to provide a more thorough and accurate report.

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## RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

| Year | Source | TP | Adjoining | Text Abstract | Source Image |
|---|---|---|---|---|---|
| 2020 | EDR Digital Archive | - | X | X | - |
| | EDR Digital Archive | X | X | X | - |
| 2017 | Cole Information | - | X | X | - |
| | Cole Information | X | X | X | - |
| 2014 | Cole Information | X | X | X | - |
| 2010 | Cole Information | X | X | X | - |
| 2008 | Haines Company, Inc. | X | X | X | - |
| 2005 | Cole Information | X | X | X | - |
| 2003 | Haines Co Publishers | X | - | X | - |
| 2002 | Cole Information Services | - | - | - | - |
| 2000 | Cole Information | - | - | - | - |
| 1996 | GTE | X | - | X | - |
| 1995 | Cole Information | X | - | X | - |
| | GTE Directories | X | - | X | - |
| 1992 | Cole Information | - | - | - | - |
| 1991 | GTE California Incorporated | - | - | - | - |

# EXECUTIVE SUMMARY

| Year | Source | TP | Adjoining | Text Abstract | Source Image |
|---|---|---|---|---|---|
| 1990 | GTE California Incorporated | X | - | X | - |
| 1985 | GTE | X | - | X | - |
| 1981 | General Telephone Company of California | - | - | - | - |
| 1980 | GTE | X | - | X | - |
| 1975 | Pacific Telephone Co | X | - | X | - |
| 1970 | General Telephone Company of California | X | X | X | - |
| 1965 | GTE | - | X | X | - |
| 1964 | Luskey Brothers & Co | - | - | - | - |
| 1961 | Luskey Brothers& Co Publishers | - | - | - | - |
| 1960 | Luskey Brothers & Co Publishers | X | - | X | - |
| 1956 | General Telephone Company Publishers | - | - | - | - |
| 1955 | Luskey Brothers Co Publishers | - | - | - | - |
| 1951 | Los Angeles Directory Co Publishers | - | - | - | - |
| 1950 | The Pacific Telephone and Telegraph Co | - | - | - | - |
| 1949 | San Bernardino Directory Co. Publishers | - | - | - | - |
| 1946 | Los Angeles Directory Company Publishers | - | - | - | - |
| 1945 | Southern Califronia Telephone Company | - | - | - | - |
| 1942 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1941 | Associated Telephone Company Limited | - | - | - | - |
| 1940 | Los Angeles Directory Co. | - | - | - | - |
| 1938 | Los Angeles Directory Co. | - | - | - | - |
| 1936 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1934 | Los Angeles Directory Co. | - | - | - | - |
| 1931 | Los Angeles Directory Co. | - | - | - | - |
| 1930 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1926 | Los Angeles Directory Co. | - | - | - | - |
| 1923 | Los Angeles Directory Company | - | - | - | - |
| 1922 | R.L. Polk & Co Publishers | - | - | - | - |

# EXECUTIVE SUMMARY

## SELECTED ADDRESSES

The following addresses were selected by the client, for EDR to research. An "X" indicates where information was identified.

| *Address* | *Type* | *Findings* |
|---|---|---|
| 14361 Grove Avenue | Client Entered | |
| 14117 Grove Avenue | Client Entered | |
| 8311 Edison Avenue | Client Entered | |
| 8295 Edison Avenue | Client Entered | |
| 8381 Edison Avenue | Client Entered | |
| 8335 Edison Avenue | Client Entered | |
| 8485 Edison Avenue | Client Entered | |
| 14350 Walker Avenue | Client Entered | |
| 14474 Grove Avenue | Client Entered | |
| 14441 Grove Avenue | Client Entered | |

# FINDINGS

## TARGET PROPERTY INFORMATION

### ADDRESS

8185 Edison Avenue
Ontario, CA 91762

### FINDINGS DETAIL

Target Property research detail.

## Edison

**8335 Edison**

| Year | Uses | Source |
|---|---|---|
| 2003 | DEHOOG Michael | Haines & Co Publishers |

**8381 Edison**

| Year | Uses | Source |
|---|---|---|
| 2008 | DEHOOG DAIRY | Haines Company, Inc. |
| | DEHOOG Michael | Haines Company, Inc. |
| | DEHOOG Michelle | Haines Company, Inc. |
| 2003 | DE Hoog Michael | Haines & Co Publishers |
| | DE Hoog Michelle | Haines & Co Publishers |
| | DEHOOG DAIRY | Haines & Co Publishers |
| 1995 | Dehoog Michael | GTE Directories |
| | DEHOOG DAIRY | GTE Directories |
| 1990 | De Hoog Michael | GTE |
| | De Hoog Michelle | GTE |
| | Kooi Holsteins Inc | GTE |
| 1985 | DE HOOG MICHAEL | GTE General Telephone Company of California |
| | s K 0001 HOLSTEINS INC | GTE General Telephone Company of California |
| 1980 | KOOI HOLSTEIN | GTE General Telephone Company of California |
| | KOOI HOLSTEINS INC | GTE General Telephone Company of California |
| 1975 | Van Der Koni Charlie | GTE Directories |
| 1960 | Veenstra John | General Telephone Company Publishers |

# FINDINGS

**8485 Edison**

| Year | Uses | Source |
|---|---|---|
| 2008 | GIBSON Leanne | Haines Company, Inc. |
| 2003 | SWAGER Edw | Haines & Co Publishers |
| 1995 | Swager Edw | GTE Directories |
| 1990 | Swager Edw | GTE |
| 1985 | SWAGER EDW | GTE General Telephone Company of California |
| 1980 | SWAGER EDW 947 516f | GTE General Telephone Company of California |
| 1975 | Swager Edw | GTE Directories |

## EDISON AVE

**8185 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | NOE BRACAMONTES | Cole Information |
| 2010 | JACK ALEWYN | Cole Information |
| 2008 | ALEWYN Jack | Haines Company, Inc. |
| 2005 | JACK ALEWYN | Cole Information |
| | JACK ALEWYN DAIRY | Cole Information |

**8295 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | MARIA LOZANO | Cole Information |
| 2014 | CARLOS RODRIGUEZ | Cole Information |
| 2010 | CARLOS RODRIGUEZ | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | CARLOS RODRIGUEZ | Cole Information |

**8311 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | ELIZABETH DEHOOG | EDR Digital Archive |
| | REBECCA DE HOOG | EDR Digital Archive |
| | SARAH DEHOOG | EDR Digital Archive |
| 2017 | ELIZABETH DEHOOG | Cole Information |
| 2014 | DEHOOG MARTIN L | Cole Information |
| | MARTIN DEHOOG | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2010 | DEHOOG MARTIN L | Cole Information |
| | MARTIN DEHOOG | Cole Information |
| | MICHAEL DEHOOG | Cole Information |
| 2008 | DEHOOG MARTIN L | Haines Company, Inc. |
| 2005 | MARTIN DEHOOG | Cole Information |

## Edison Avenue

**8295 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**8311 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**8335 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**8381 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**8485 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

## grove

**14117 grove**

| Year | Uses | Source |
|---|---|---|
| 1985 | BROWN S COW SERVICE | GTE |
| 1980 | SMITH THOS | GTE |
| 1975 | Sieperda Peter | GTE Directories |
| 1970 | SIEPERDA PETER | General Telephone Company of California |

# FINDINGS

**14361 grove**

| Year | Uses | Source |
|---|---|---|
| 2008 | ALEWYN Elane R | Haines Company, Inc. |
| 2003 | ALEWYN Jake J | Haines & Co Publishers |
| 1990 | Alewyn Jake J | GTE |
| 1980 | ALEWYN JAKE J | GTE |
| 1975 | Alewyn Jake J | GTE Directories |

**14441 grove**

| Year | Uses | Source |
|---|---|---|
| 2008 | XXXX | Haines Company, Inc. |
| 2003 | XXXX | Haines & Co Publishers |
| 1990 | ENGELSMA JEFF | GTE California Incorporated |
| 1980 | MIERSMA BOB | GTE |
| 1975 | Miersma Harlan | GTE Directories |
| 1970 | VANOERVEEN JOE | General Telephone Company of California |

**14474 grove**

| Year | Uses | Source |
|---|---|---|
| 2008 | MOUW Travis N | Haines Company, Inc. |
| 2003 | MIERSMA Harlan | Haines & Co Publishers |
| 1996 | Miersma Harlan | GTE |
| 1990 | Miersma Harlan | GTE |
| | MIERSMA HARLAN | GTE California Incorporated |
| 1985 | MIERSMA HARLAN | GTE |
| 1980 | MIERSMA HARLAN | GTE |
| 1975 | Miersma Harry | GTE Directories |
| 1970 | VANDER VEEN WILBUR | General Telephone Company of California |

## GROVE AVE

**14117 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | PEDRO CASTRO | EDR Digital Archive |
| 2014 | JACK ALEWYN | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2005 | OCCUPANT UNKNOWN | Cole Information |

## Grove Avenue

**14117 Grove Avenue**

| Year | Uses | Source |
|---|---|---|

**14361 Grove Avenue**

| Year | Uses | Source |
|---|---|---|

**14441 Grove Avenue**

| Year | Uses | Source |
|---|---|---|

**14474 Grove Avenue**

| Year | Uses | Source |
|---|---|---|

## walker

**14350 walker**

| Year | Uses | Source |
|---|---|---|
| 2008 | XXXX | Haines Company, Inc. |
| 2003 | DEHOOG Joe | Haines & Co Publishers |
| | SWAGER Johanna | Haines & Co Publishers |
| 1995 | Dehoog Joe | GTE Directories |
| 1990 | Swager Dale R | GTE |
| 1985 | SWAGER DALE R | GTE General Telephone Company of California |
| 1980 | END OF SECTION | GTE General Telephone Company of California |
| | LA BRUCHERIE RONALD | GTE General Telephone Company of California |
| 1975 | Swager John E | GTE Directories |

# FINDINGS

## Walker Avenue

**14350 Walker Avenue**

| *Year* | *Uses* | *Source* |
|---|---|---|

# FINDINGS

## ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

## EDISON AVE

**7990 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | JAY HARP | Cole Information |
| 2014 | OCCUPANT UNKNOWN | Cole Information |

**8040 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | JOSE DELEON | Cole Information |
| 2014 | JOSE DELEON | Cole Information |
| 2010 | LUIS DELEON | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | NUTRIUS INC | Cole Information |

**8061 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | DIANA PEREZ | EDR Digital Archive |
| 2017 | ISIDRO PEREZ | Cole Information |
| 2014 | ISIDRO PEREZ | Cole Information |
| 2010 | GREG ANEMA | Cole Information |
| 2008 | JORRITSMA Jas D | Haines Company, Inc. |
| 2005 | JORRITSMA AND ANEMA DAIRY | Cole Information |
| | JAMES JORRITSMA | Cole Information |

**8148 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | CALIFORNIA LIVESTOCK MKT INC | EDR Digital Archive |
| 2017 | CHINO LIVESTOCK MARKET | Cole Information |
| 2014 | CHINO LIVESTOCK MARKET | Cole Information |
| 2010 | CHINO LIVESTOCK MARKET | Cole Information |
| 2008 | CHINO LIVESTOCK MARKET | Haines Company, Inc. |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2005 | LIBERTY LIVESTOCK AUCTION | Cole Information |

**8250 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | P B SOD FARM | Cole Information |

**8270 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | DALVINA NEWBOLT | EDR Digital Archive |
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | VALVINA NEWBOLT | Cole Information |
| 2008 | NEWBOLT Valvina | Haines Company, Inc. |
| 2005 | VALVINA NEWBOLD | Cole Information |

**8292 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | JOHN ESQUEDA | EDR Digital Archive |
| 2017 | STEPHANIE WANTUCH | Cole Information |
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | DON GRIEPSMA | Cole Information |
| 2008 | GRIEPSMA Don | Haines Company, Inc. |
| 2005 | DON GRIEPSMA | Cole Information |

**8314 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | ADRIANA ARROYO | Cole Information |
| 2014 | ADRIANA ARROYO | Cole Information |
| 2010 | RIOS FONSECA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |

**8332 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | CARLY HUGHES | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| 2008 | LATCHIC Rick | Haines Company, Inc. |

# FINDINGS

## GROVE AVE

**13908 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2010 | JENILE BORBA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | SOUTH WEST POOL & SPA | Cole Information |
| | OCCUPANT UNKNOWN | Cole Information |
| 1970 | REARICK RICHARD | General Telephone Company of California |
| 1965 | HAYS J E NA | GTE |

**13932 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | ABEL VILLAPANDO | Cole Information |
| 2010 | ABEL VILLAPANDO | Cole Information |
| 1965 | JENNINGS C R | GTE |

**13934 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 1965 | GONSALVES J L | GTE |

**13960 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | VOORTMAN'S EGG RANCH | EDR Digital Archive |
| | BROOK VOORTMAN | EDR Digital Archive |
| | MELISSA VOORTMAN | EDR Digital Archive |
| | EDWIN VOORTMAN | EDR Digital Archive |
| 2017 | BROOK VOORTMAN | Cole Information |
| | VOORTMANS EGG RANCH | Cole Information |
| 2014 | BROOK VOORTMAN | Cole Information |
| | VOORTMANS EGG RANCH | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| | VOORTMANS EGG RANCH | Cole Information |
| 2008 | VOORTMAN B M | Haines Company, Inc. |
| | VOORTMANS EGG RANCH | Haines Company, Inc. |
| 2005 | OCCUPANT UNKNOWN | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2005 | VOORTMANS EGG RANCH | Cole Information |

**14016 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | RAMON MARTINEZ | Cole Information |
| 2014 | RAMON MARTINEZ | Cole Information |
| 2010 | RAMON MARTINEZ | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | RAMON MARTINEZ | Cole Information |

**14049 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | DAVID MISNER | EDR Digital Archive |
| 2017 | DAVID MISNER | Cole Information |
| 2014 | DAVID MISNER | Cole Information |
| 2010 | JOHN BOSMA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | JOHN BOSMA | Cole Information |

**14050 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | ANNABELLE MARTINEZ | EDR Digital Archive |
| | EDUARDO MARTINEZ | EDR Digital Archive |
| 2017 | EDUARDO MARTINEZ | Cole Information |
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | BRUCE IDSINGA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | BRUCE IDSINGA | Cole Information |

# FINDINGS

## ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 13908 GROVE AVE | 2020, 2017, 2014, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 13932 GROVE AVE | 2020, 2017, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 13934 GROVE AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 13960 GROVE AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14016 GROVE AVE | 2020, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14049 GROVE AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14050 GROVE AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7990 EDISON AVE | 2020, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8040 EDISON AVE | 2020, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8061 EDISON AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8148 EDISON AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8250 EDISON AVE | 2020, 2017, 2014, 2010, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8270 EDISON AVE | 2017, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8292 EDISON AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
| --- | --- |
| 8314 EDISON AVE | 2020, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8332 EDISON AVE | 2020, 2017, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

## TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

| Address Researched | Address Not Identified in Research Source |
| --- | --- |
| 8185 Edison Avenue | 2002, 2000, 1992, 1991, 1981, 1965, 1964, 1961, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

Ontario Ranch I

8185 Edison Avenue

Ontario, CA 91762

Inquiry Number: 7869218.3

January 13, 2025

# Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# Certified Sanborn® Map Report

01/13/25

| Site Name: | Client Name: |
|---|---|
| Ontario Ranch I | Roux Associates |
| 8185 Edison Avenue | 5150 E Pacific Coast Highway |
| Ontario, CA 91762 | Long Beach, CA 90804 |
| EDR Inquiry # 7869218.3 | Contact: Ashley Whitaker |

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Roux Associates were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

## *Certified Sanborn Results:*

**Certification #** 953A-4D1D-AA64

**PO #** 3669.0004L

**Project** Ontario Ranch I

**UNMAPPED PROPERTY**

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 953A-4D1D-AA64

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

*The Sanborn Library LLC Since 1866™*

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Ontario Ranch I

8185 Edison Avenue

Ontario, CA 91762

Inquiry Number: 7869218.4

January 13, 2025

# EDR Historical Topo Map Report

## with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Historical Topo Map Report

01/13/25

| Site Name: | Client Name: |
|---|---|
| Ontario Ranch I | Roux Associates |
| 8185 Edison Avenue | 5150 E Pacific Coast Highway |
| Ontario, CA 91762 | Long Beach, CA 90804 |
| EDR Inquiry # 7869218.4 | Contact: Ashley Whitaker |

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Roux Associates were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

| *Search Results:* | | *Coordinates:* | |
|---|---|---|---|
| **P.O.#** | 3669.0004L | **Latitude:** | 33.995819 33° 59' 45" North |
| **Project:** | Ontario Ranch I | **Longitude:** | -117.62695 -117° 37' 37" West |
| | | **UTM Zone:** | Zone 11 North |
| | | **UTM X Meters:** | 442099.25 |
| | | **UTM Y Meters:** | 3761869.53 |
| | | **Elevation:** | 690.00' above sea level |

**Maps Provided:**

| | | |
|---|---|---|
| 2022, 2021 | 1966, 1967 | 1903 |
| 2018 | 1954 | 1902 |
| 2015 | 1950, 1953, 1954 | 1900 |
| 2012 | 1949 | 1897 |
| 1981 | 1944, 1947 | |
| 1976 | 1942 | |
| 1975 | 1941 | |
| 1973 | 1933 | |

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## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 2022, 2021 Source Sheets

Prado Dam
2022
7.5-minute, 24000

Corona North
2022
7.5-minute, 24000

Ontario
2021
7.5-minute, 24000

Guasti
2021
7.5-minute, 24000

### 2018 Source Sheets

Prado Dam
2018
7.5-minute, 24000

Corona North
2018
7.5-minute, 24000

Ontario
2018
7.5-minute, 24000

Guasti
2018
7.5-minute, 24000

### 2015 Source Sheets

Prado Dam
2015
7.5-minute, 24000

Corona North
2015
7.5-minute, 24000

Ontario
2015
7.5-minute, 24000

Guasti
2015
7.5-minute, 24000

### 2012 Source Sheets

Prado Dam
2012
7.5-minute, 24000

Corona North
2012
7.5-minute, 24000

Ontario
2012
7.5-minute, 24000

Guasti
2012
7.5-minute, 24000

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1981 Source Sheets

Guasti
1981
7.5-minute, 24000
Aerial Photo Revised 1978

Corona North
1981
7.5-minute, 24000
Aerial Photo Revised 1978

Ontario
1981
7.5-minute, 24000
Aerial Photo Revised 1978

Prado Dam
1981
7.5-minute, 24000
Aerial Photo Revised 1978

### 1976 Source Sheets

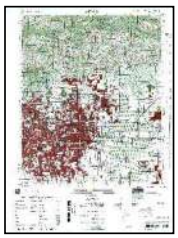

ONTARIO
1976
15-minute, 50000

### 1975 Source Sheets

Corona North
1975
7.5-minute, 24000
Aerial Photo Revised 1975

### 1973 Source Sheets

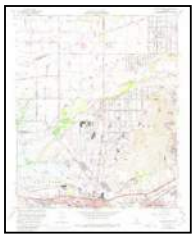

Corona North
1973
7.5-minute, 24000
Aerial Photo Revised 1973

Prado Dam
1973
7.5-minute, 24000
Aerial Photo Revised 1973

Guasti
1973
7.5-minute, 24000
Aerial Photo Revised 1973

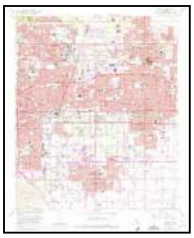

Ontario
1973
7.5-minute, 24000
Aerial Photo Revised 1973

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1966, 1967 Source Sheets

Guasti
1966
7.5-minute, 24000
Aerial Photo Revised 1966

Corona North
1967
7.5-minute, 24000
Aerial Photo Revised 1966

Prado Dam
1967
7.5-minute, 24000
Aerial Photo Revised 1966

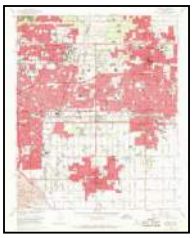

Ontario
1967
7.5-minute, 24000
Aerial Photo Revised 1966

### 1954 Source Sheets

Ontario
1954
15-minute, 62500
Aerial Photo Revised 1952

### 1950, 1953, 1954 Source Sheets

Prado Dam
1950
7.5-minute, 24000
Aerial Photo Revised 1946

Guasti
1953
7.5-minute, 24000
Aerial Photo Revised 1952

Corona North
1954
7.5-minute, 24000
Aerial Photo Revised 1952

### 1949 Source Sheets

Prado Dam
1949
7.5-minute, 24000
Aerial Photo Revised 1946

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1944, 1947 Source Sheets

CUCAMONGA
1944
15-minute, 50000

CORONA
1947
15-minute, 50000

### 1942 Source Sheets

Ontario and Vicinity
1942
7.5-minute, 31680

Corona and Vicinity
1942
7.5-minute, 31680

### 1941 Source Sheets

Prado
1941
7.5-minute, 31680

GUASTI VICINITY
1941
7.5-minute, 31680

### 1933 Source Sheets

Prado
1933
7.5-minute, 31680

Ontario
1933
7.5-minute, 31680

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1903 Source Sheets

Cucamonga
1903
15-minute, 62500

### 1902 Source Sheets

Corona
1902
30-minute, 125000

### 1900 Source Sheets

Cucamonga
1900
15-minute, 62500

### 1897 Source Sheets

Cucamonga
1897
15-minute, 62500

# Historical Topo Map

2022, 2021

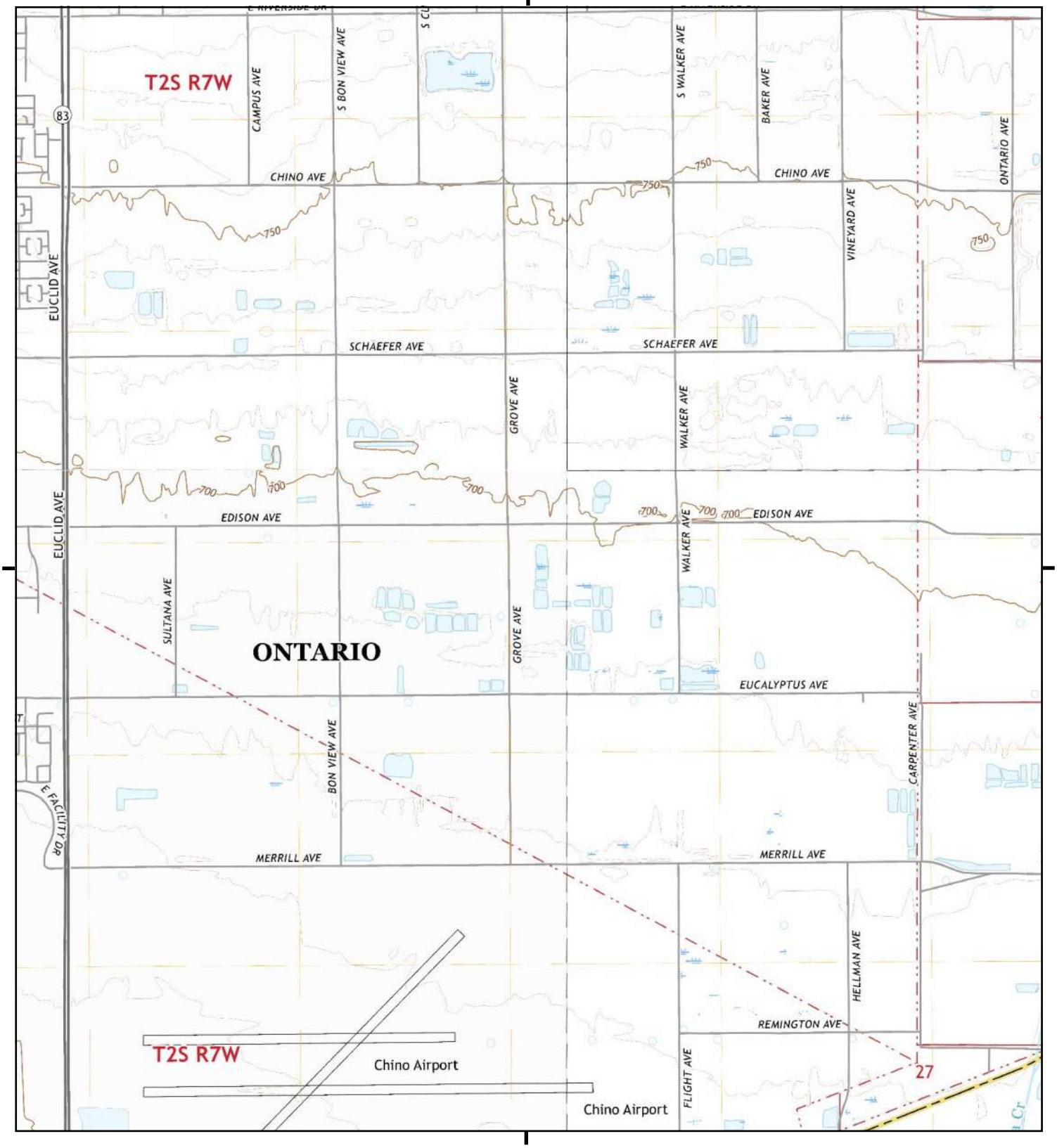


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

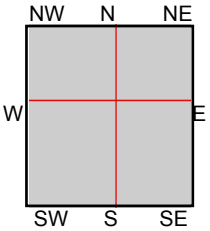


TP, Prado Dam, 2022, 7.5-minute
NE, Guasti, 2021, 7.5-minute
SE, Corona North, 2022, 7.5-minute
NW, Ontario, 2021, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

2018

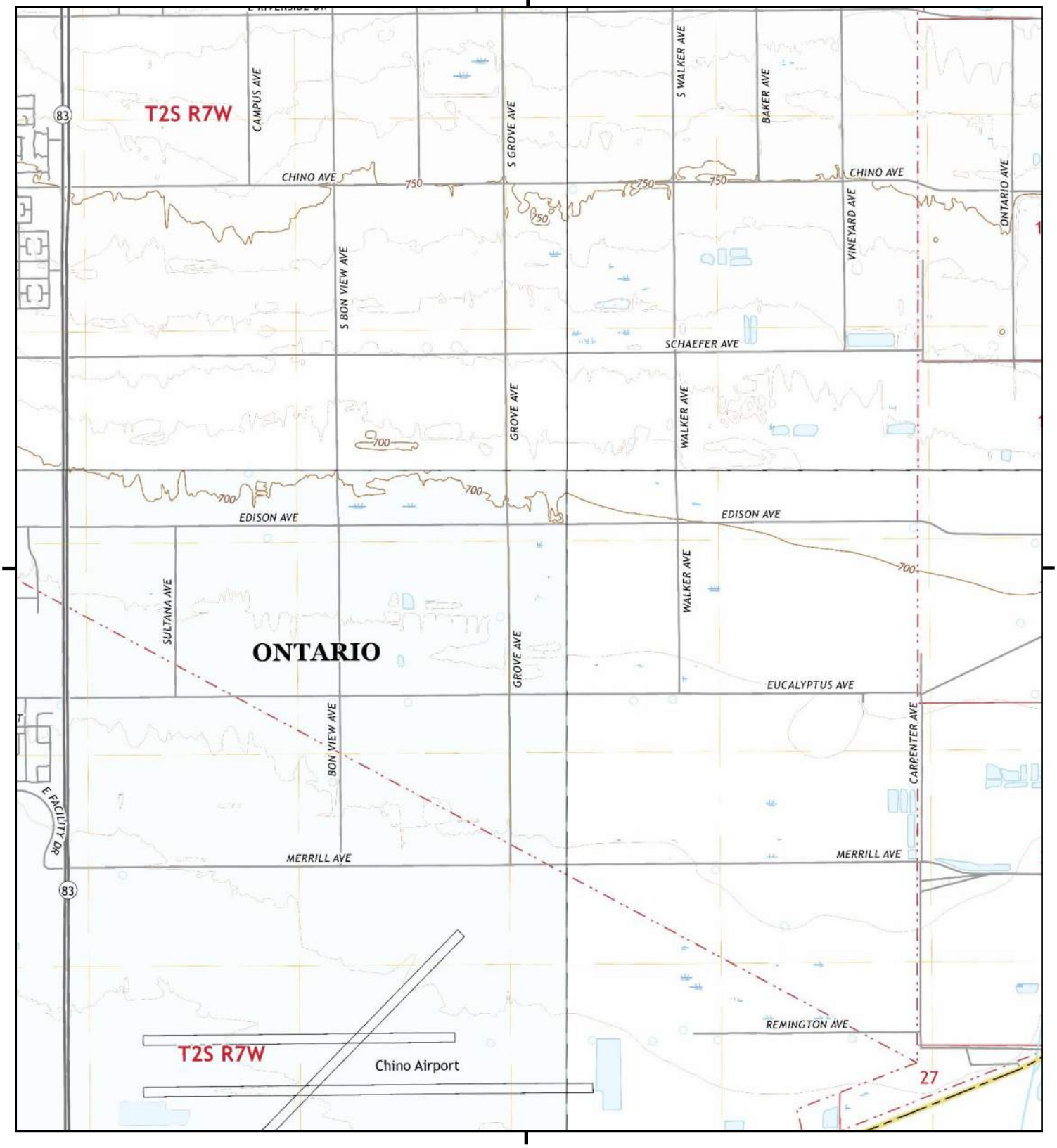


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

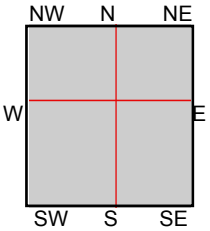


TP, Prado Dam, 2018, 7.5-minute
NE, Guasti, 2018, 7.5-minute
SE, Corona North, 2018, 7.5-minute
NW, Ontario, 2018, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

2015

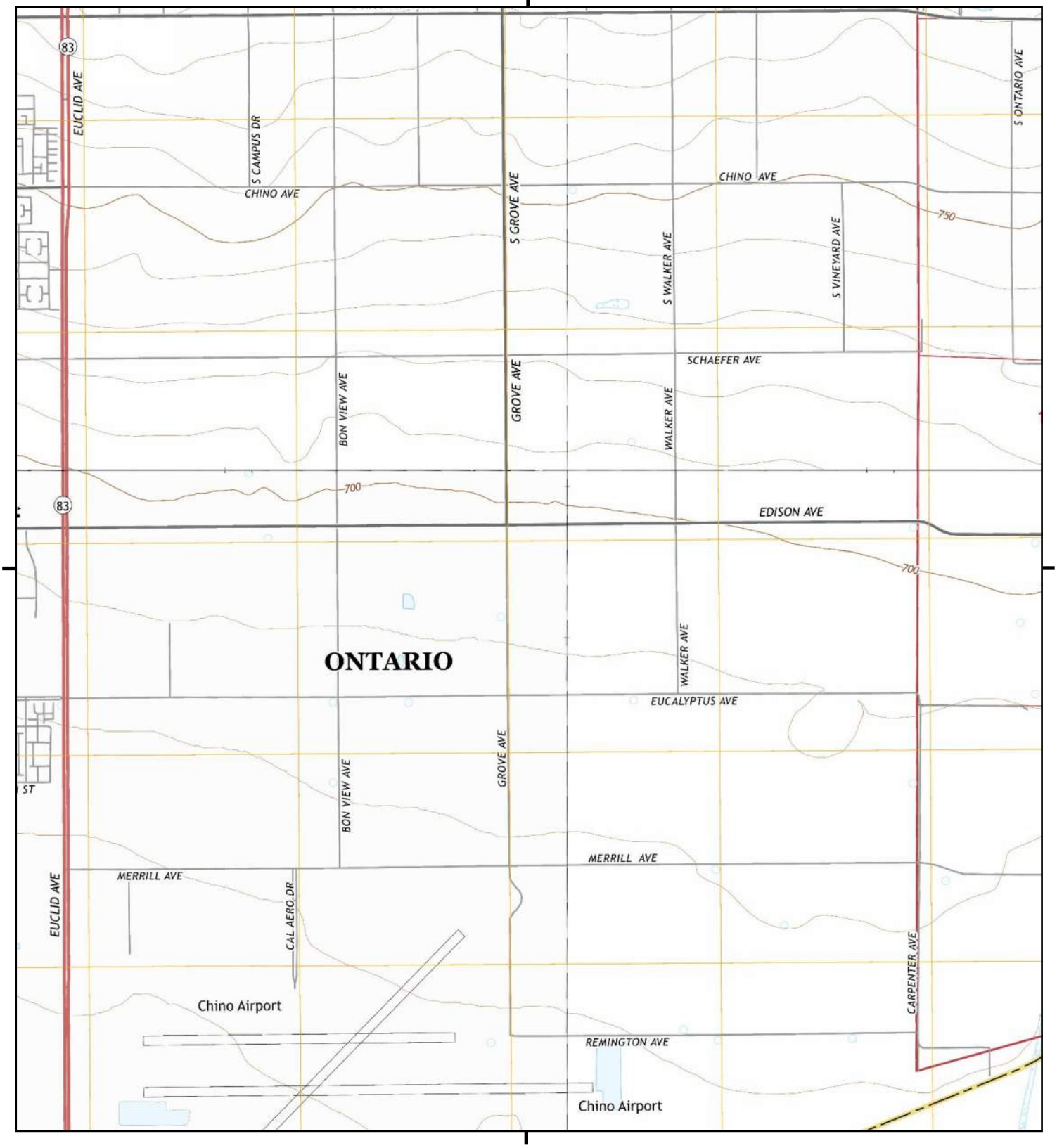


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

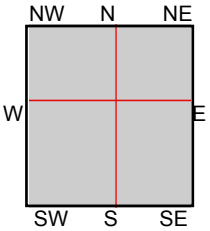


TP, Prado Dam, 2015, 7.5-minute
NE, Guasti, 2015, 7.5-minute
SE, Corona North, 2015, 7.5-minute
NW, Ontario, 2015, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

2012

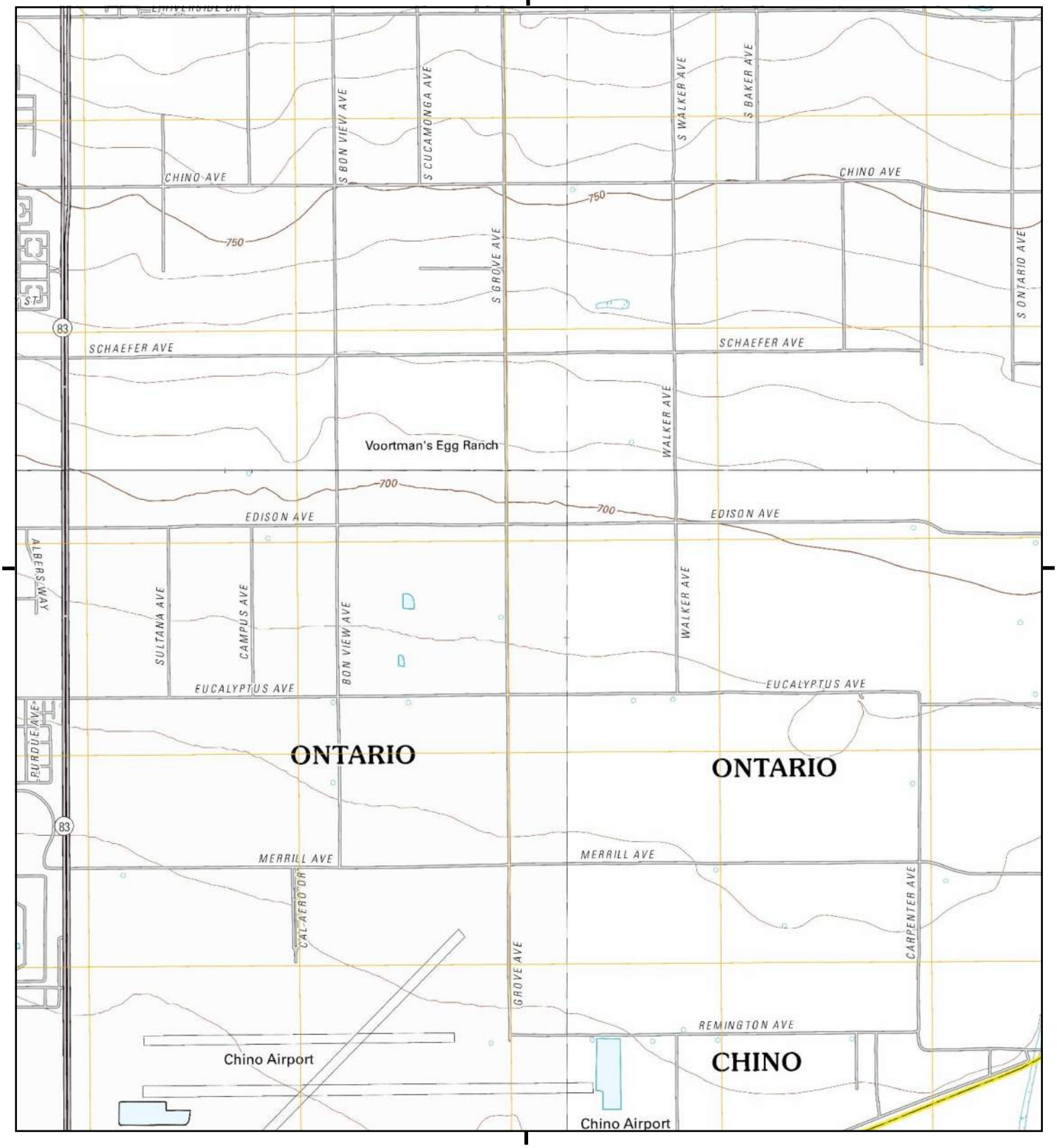


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Prado Dam, 2012, 7.5-minute
NE, Guasti, 2012, 7.5-minute
SE, Corona North, 2012, 7.5-minute
NW, Ontario, 2012, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1981

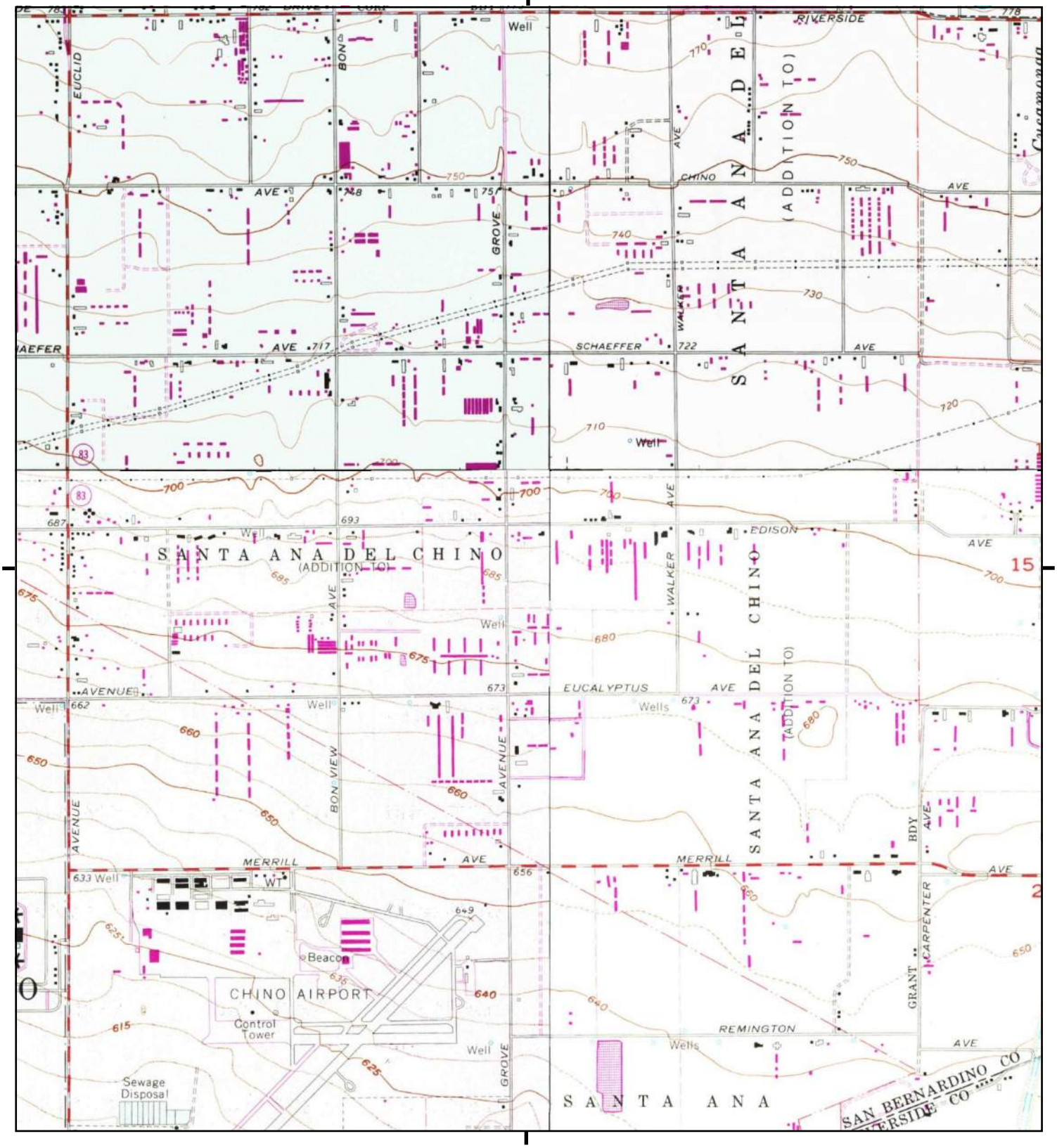


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

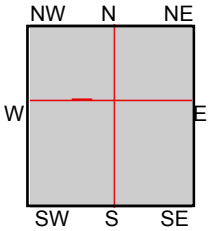


TP, Prado Dam, 1981, 7.5-minute
NE, Guasti, 1981, 7.5-minute
SE, Corona North, 1981, 7.5-minute
NW, Ontario, 1981, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1976

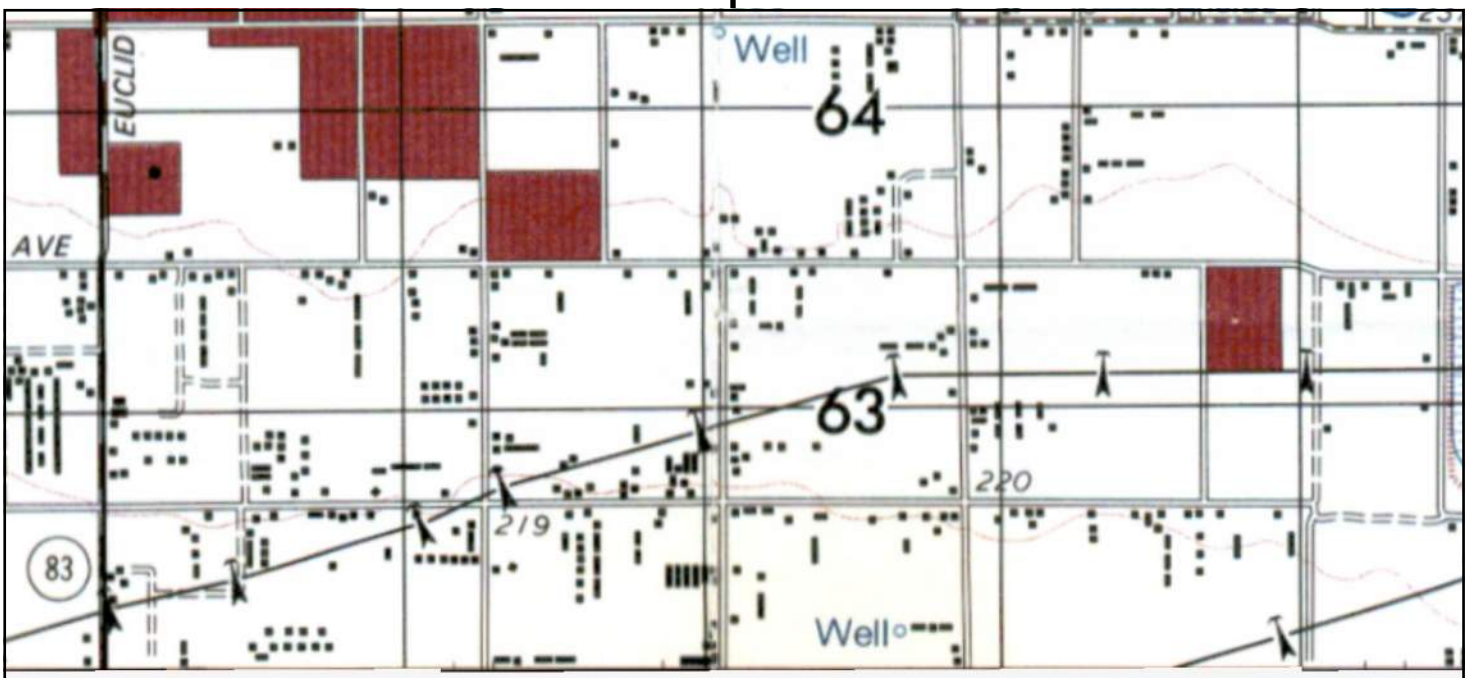


UNMAPPED

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

N, ONTARIO, 1976, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1975

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

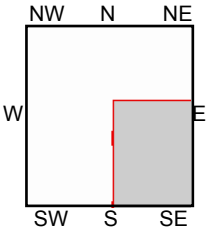


SE, Corona North, 1975, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1973

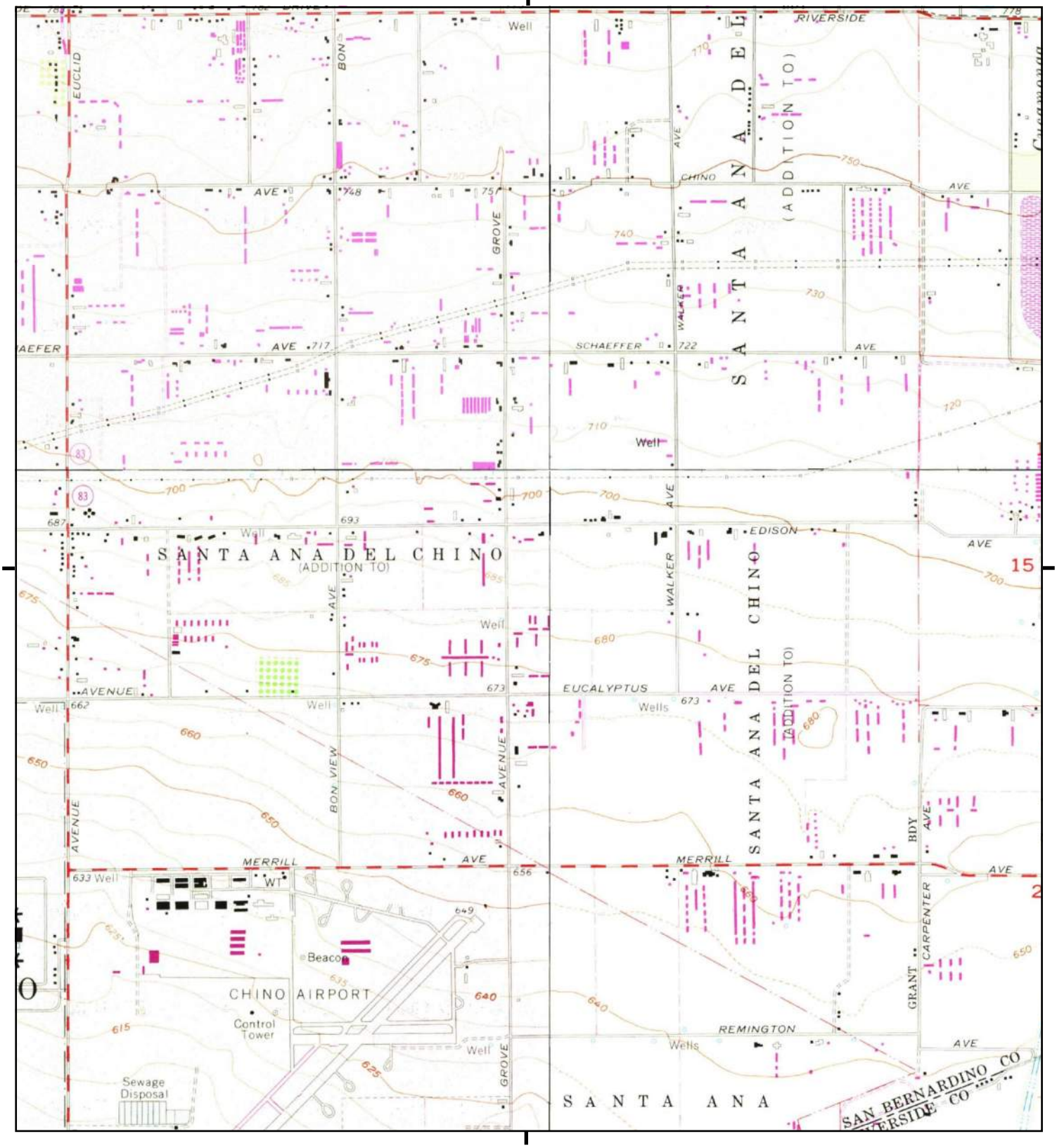


This report includes information from the following map sheet(s).

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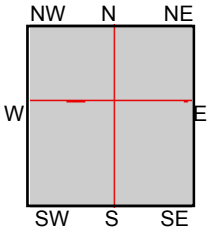


TP, Prado Dam, 1973, 7.5-minute
NE, Guasti, 1973, 7.5-minute
SE, Corona North, 1973, 7.5-minute
NW, Ontario, 1973, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1966, 1967

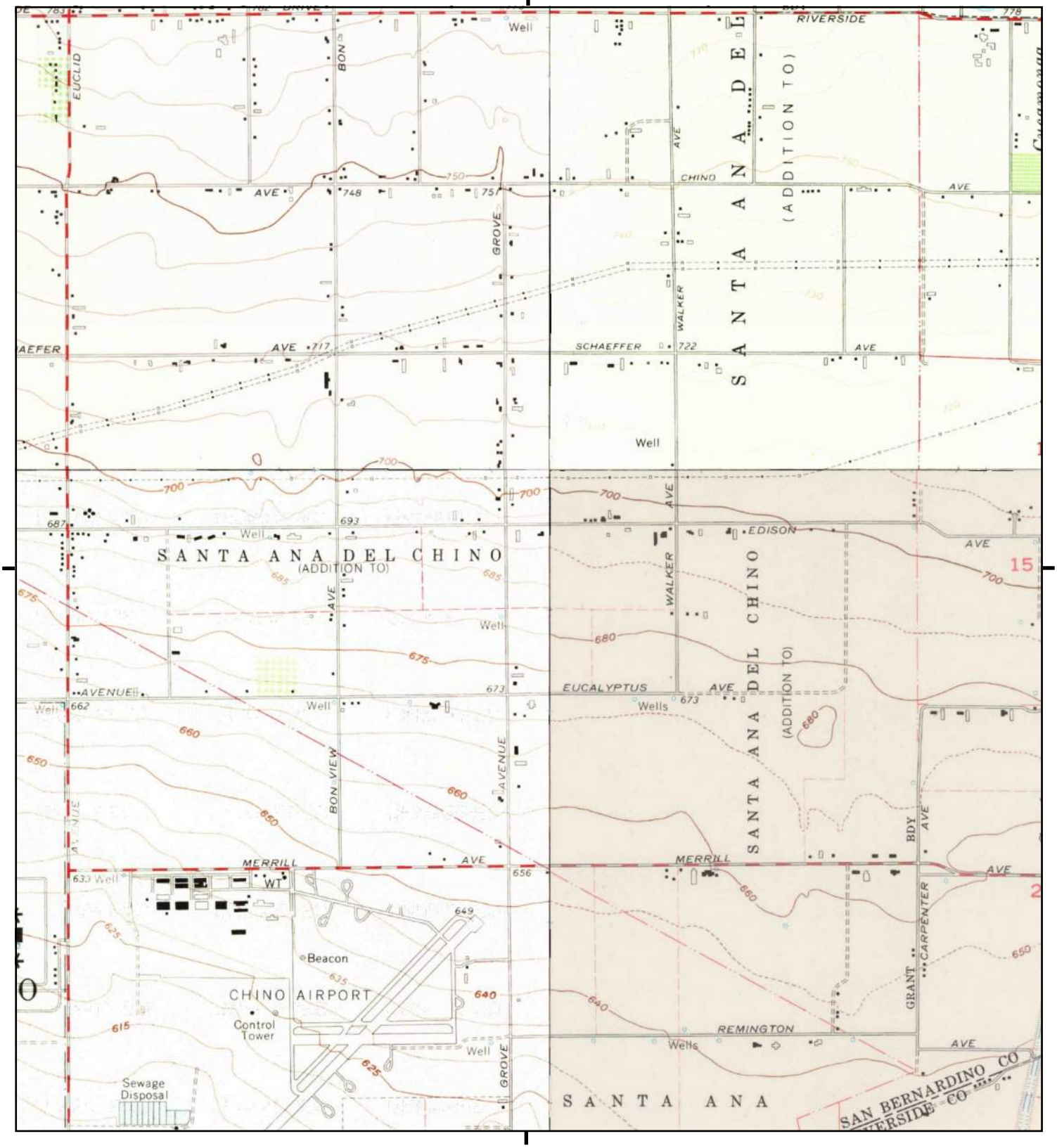


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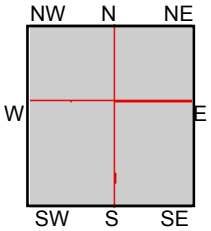


TP, Prado Dam, 1967, 7.5-minute
NE, Guasti, 1966, 7.5-minute
SE, Corona North, 1967, 7.5-minute
NW, Ontario, 1967, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1954

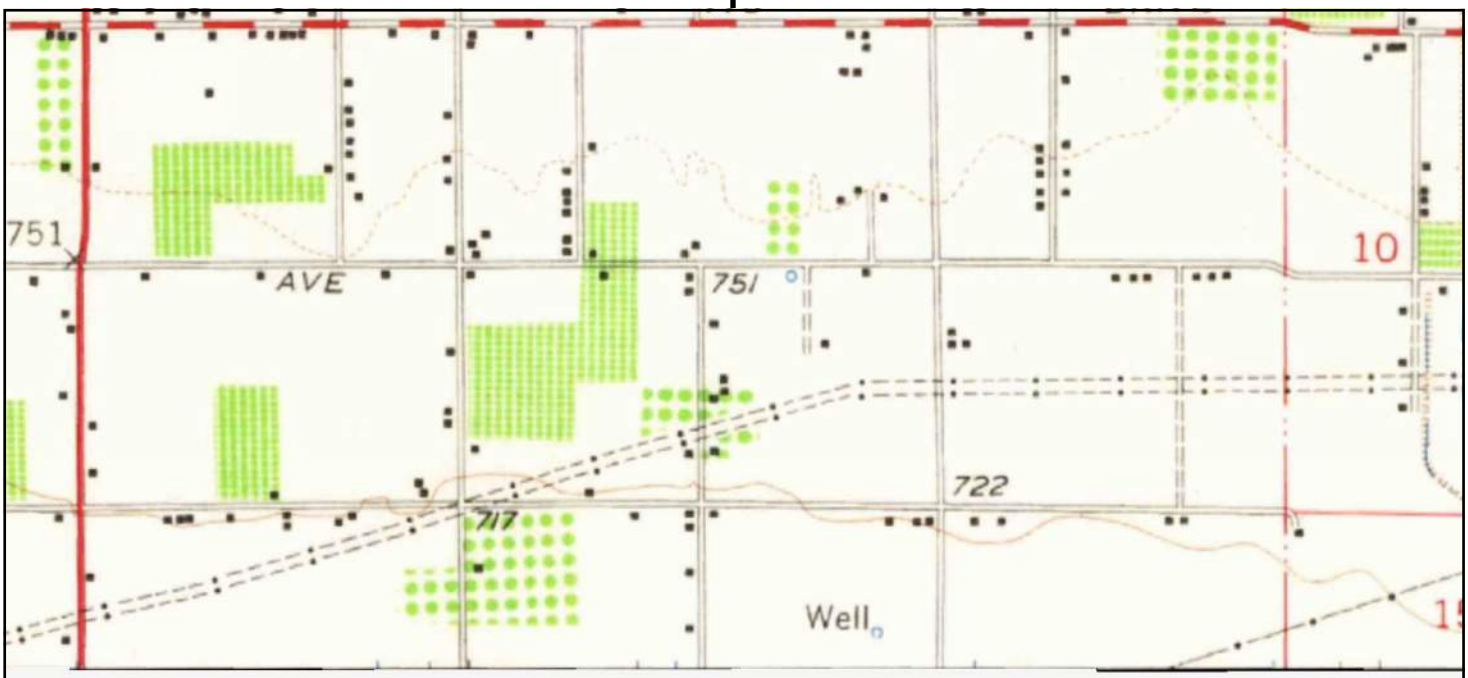


UNMAPPED

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0 Miles 0.25 0.5 1 1.5

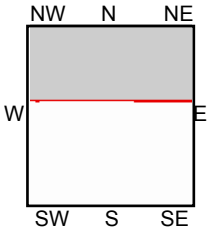


N, Ontario, 1954, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1950, 1953, 1954

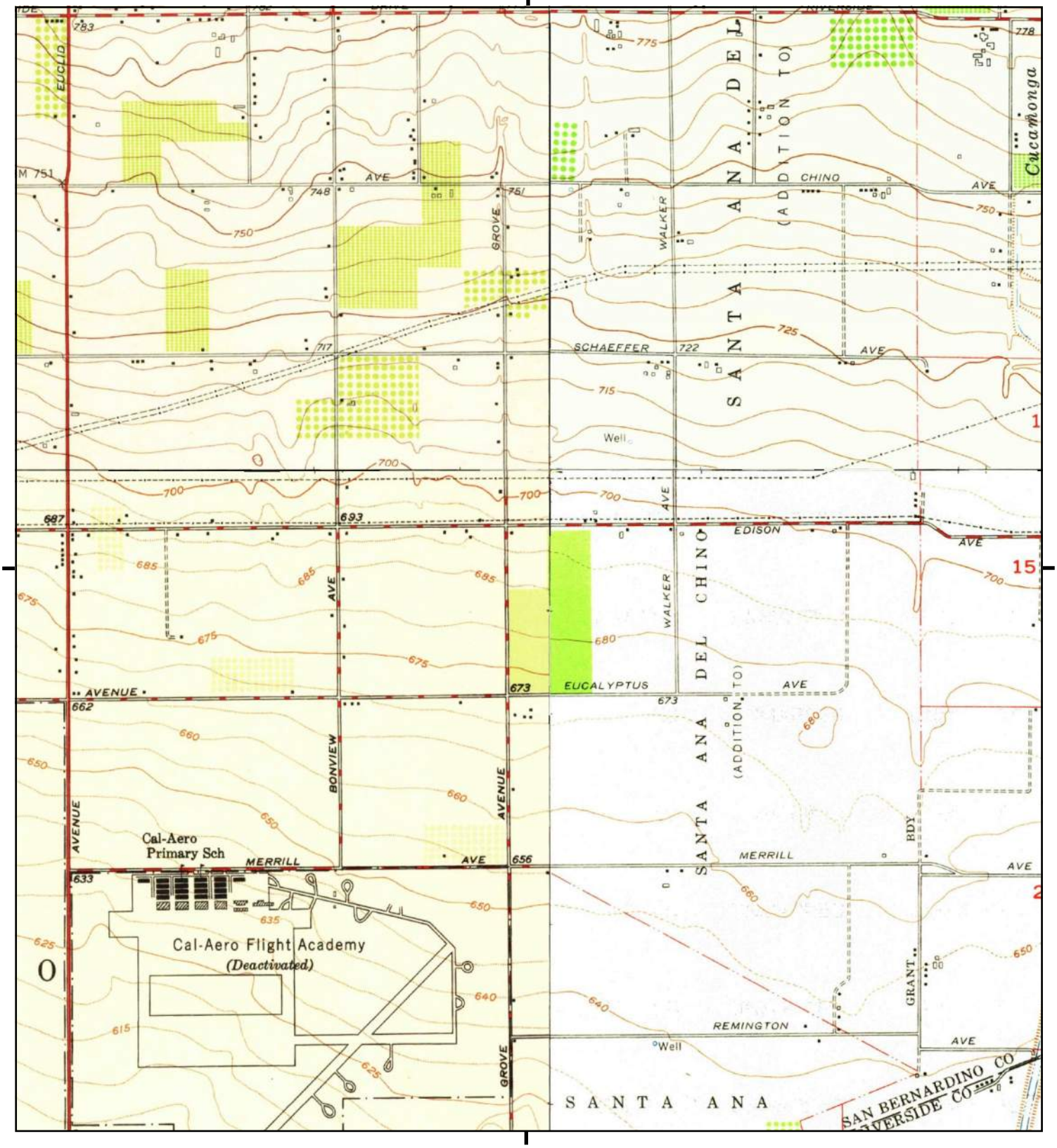


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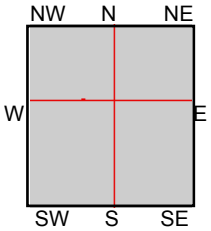


TP, Prado Dam, 1950, 7.5-minute
NE, Guasti, 1953, 7.5-minute
SE, Corona North, 1954, 7.5-minute
NW, Ontario, 1954, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1949

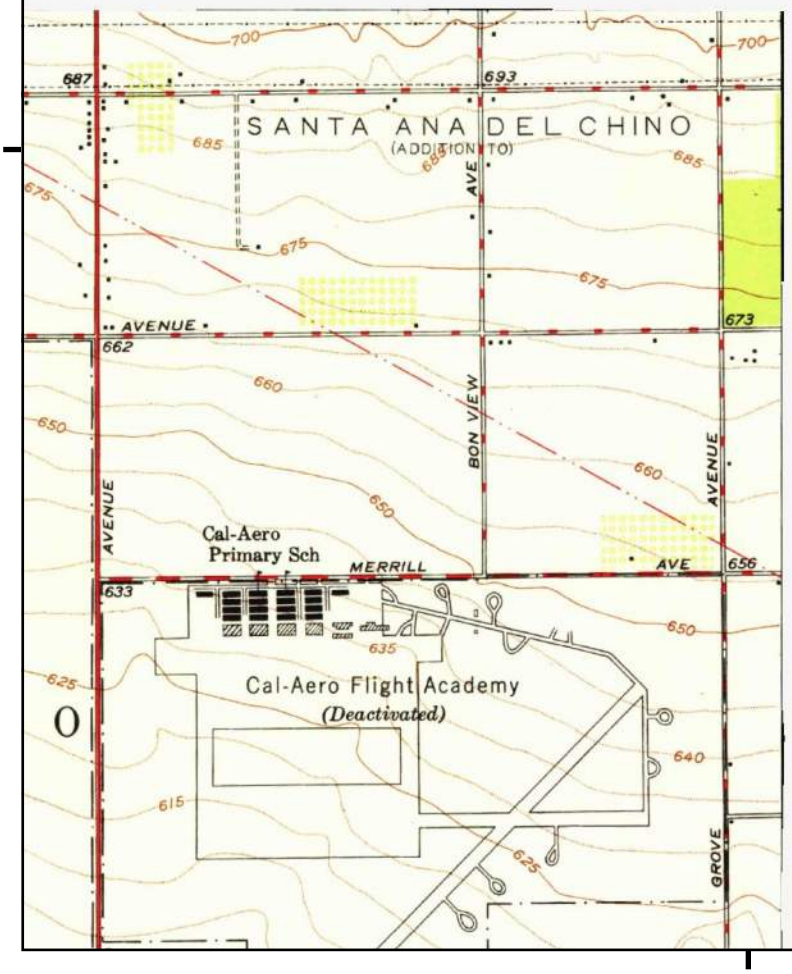


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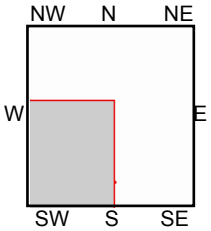


TP, Prado Dam, 1949, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1944, 1947

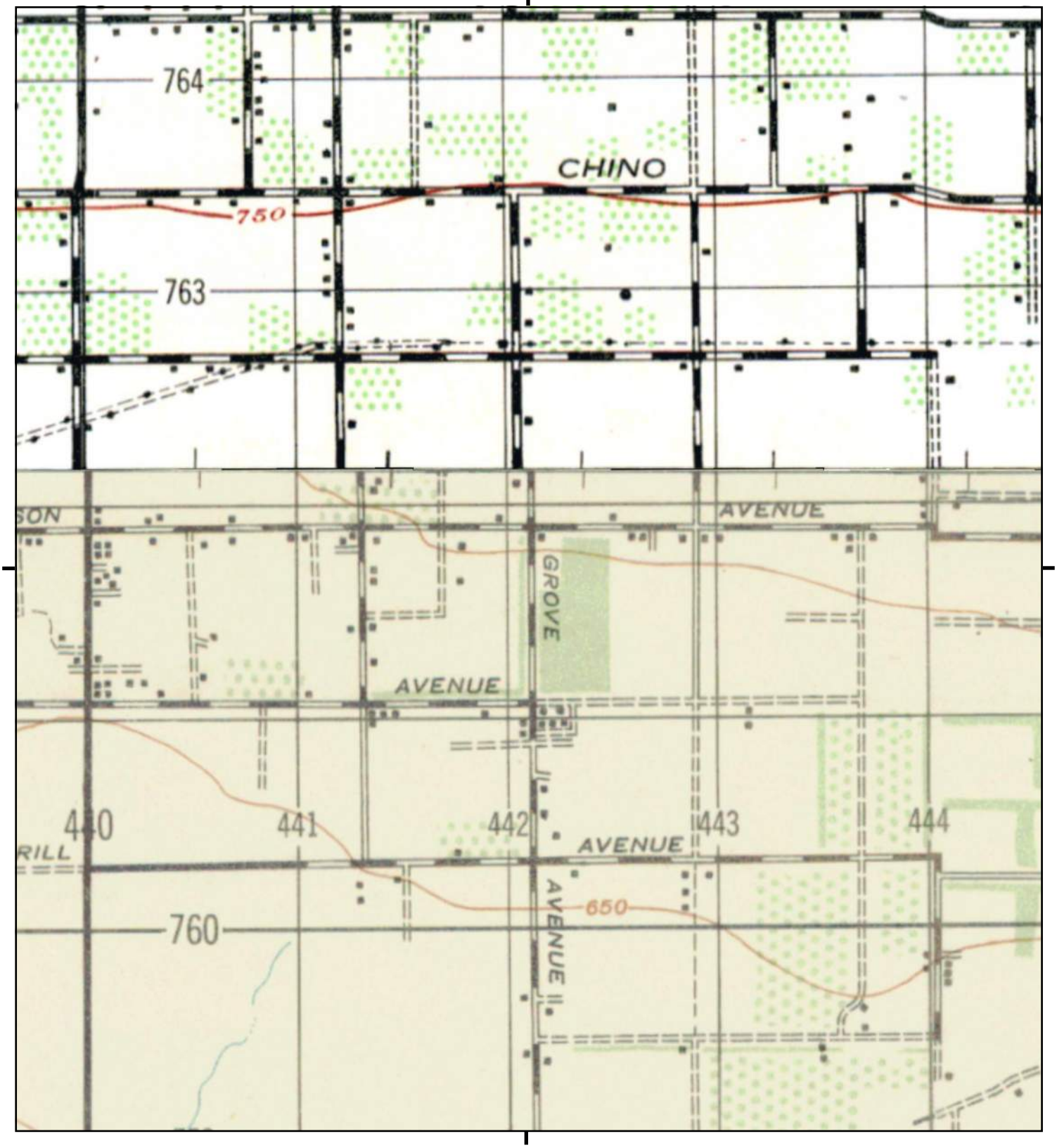


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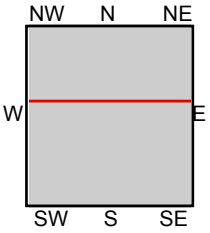


TP, CORONA, 1947, 15-minute
N, CUCAMONGA, 1944, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1942

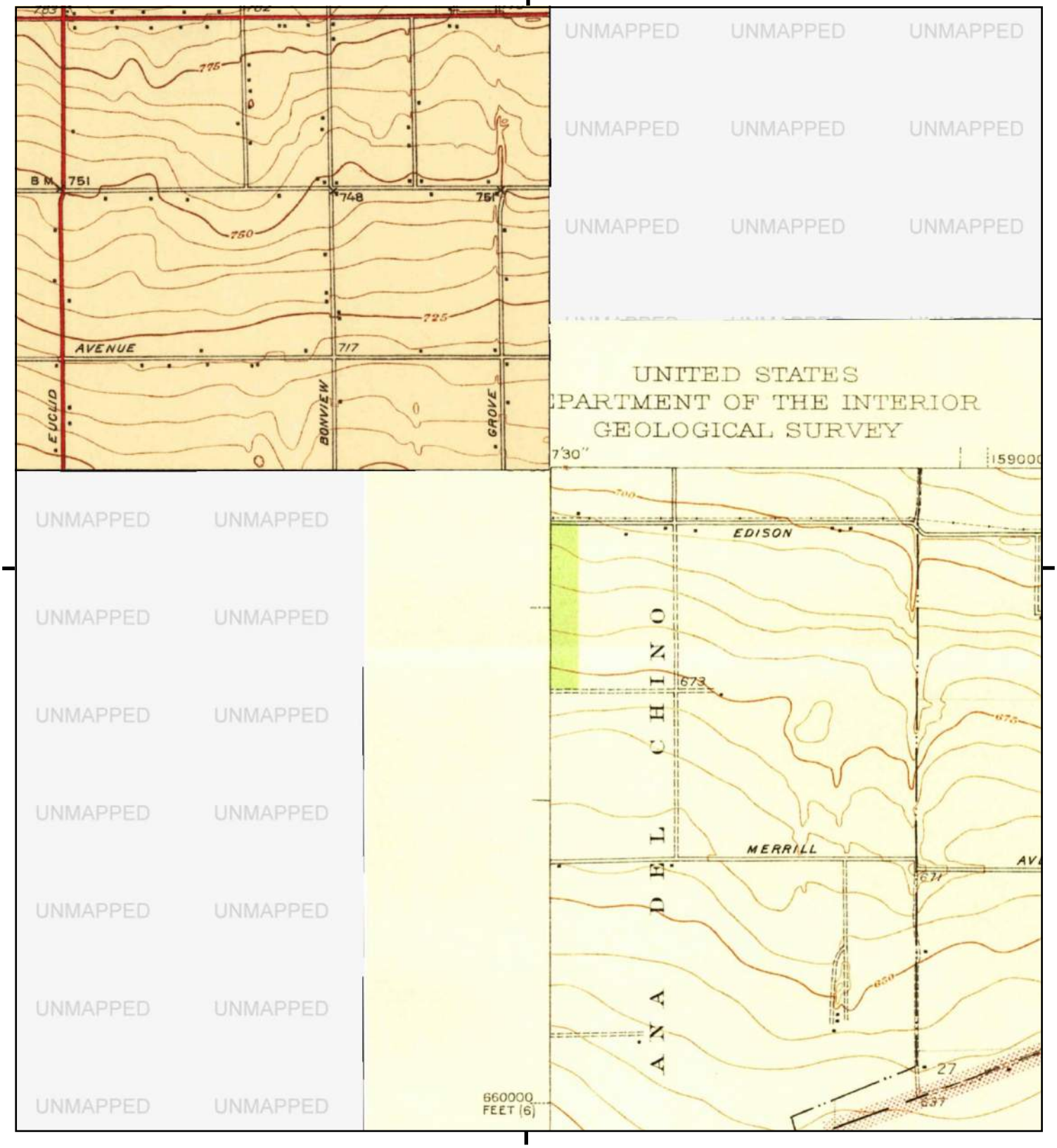


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

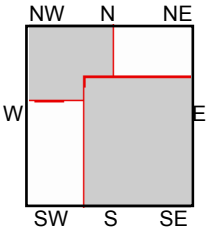


SE, Corona and Vicinity, 1942, 7.5-minute
NW, Ontario and Vicinity, 1942, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1941

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

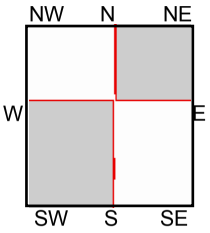


TP, Prado, 1941, 7.5-minute
NE, GUASTI VICINITY, 1941, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1933

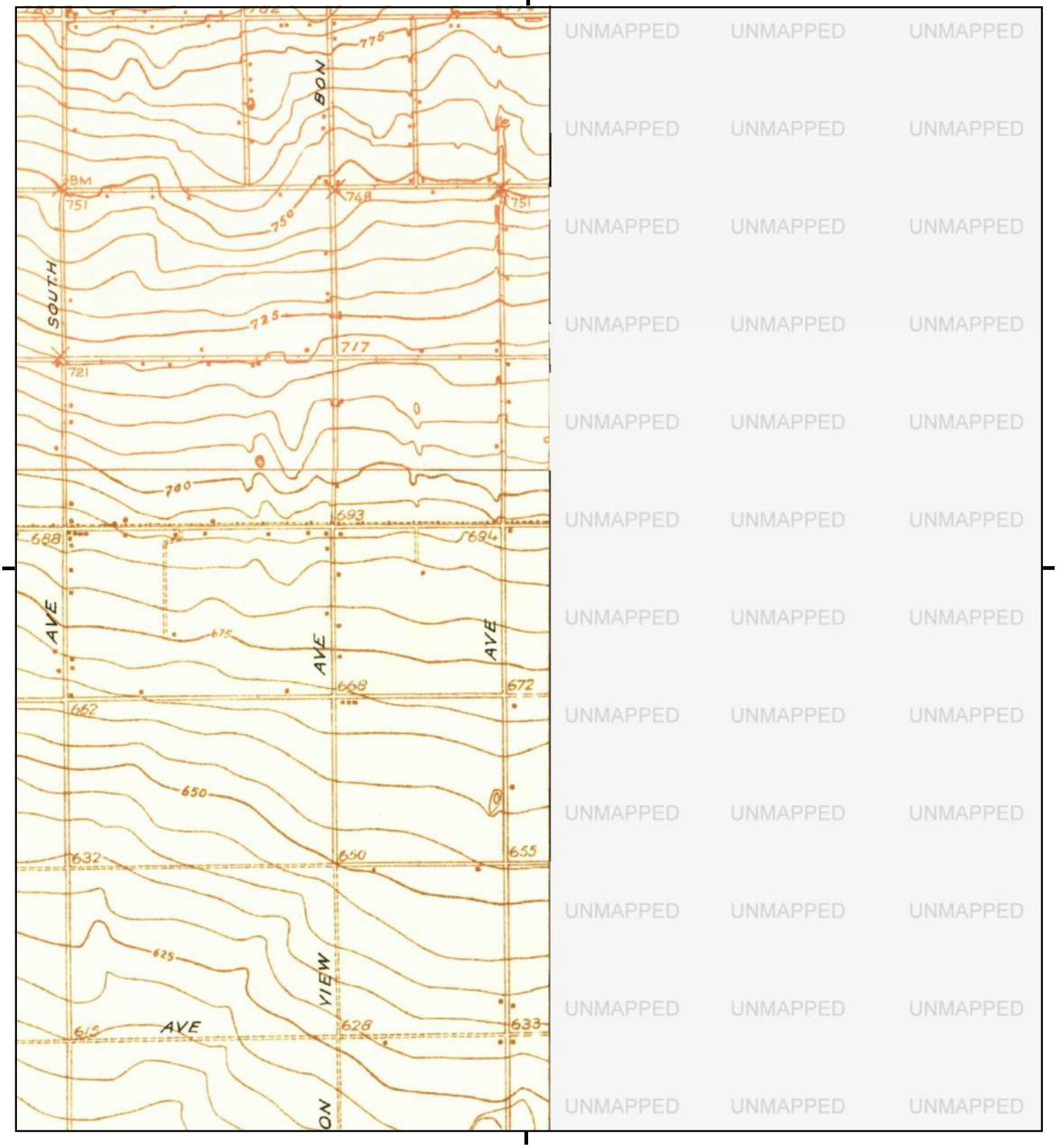


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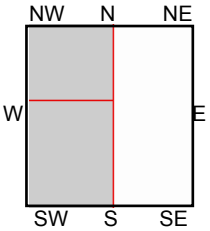


TP, Prado, 1933, 7.5-minute
NW, Ontario, 1933, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1903

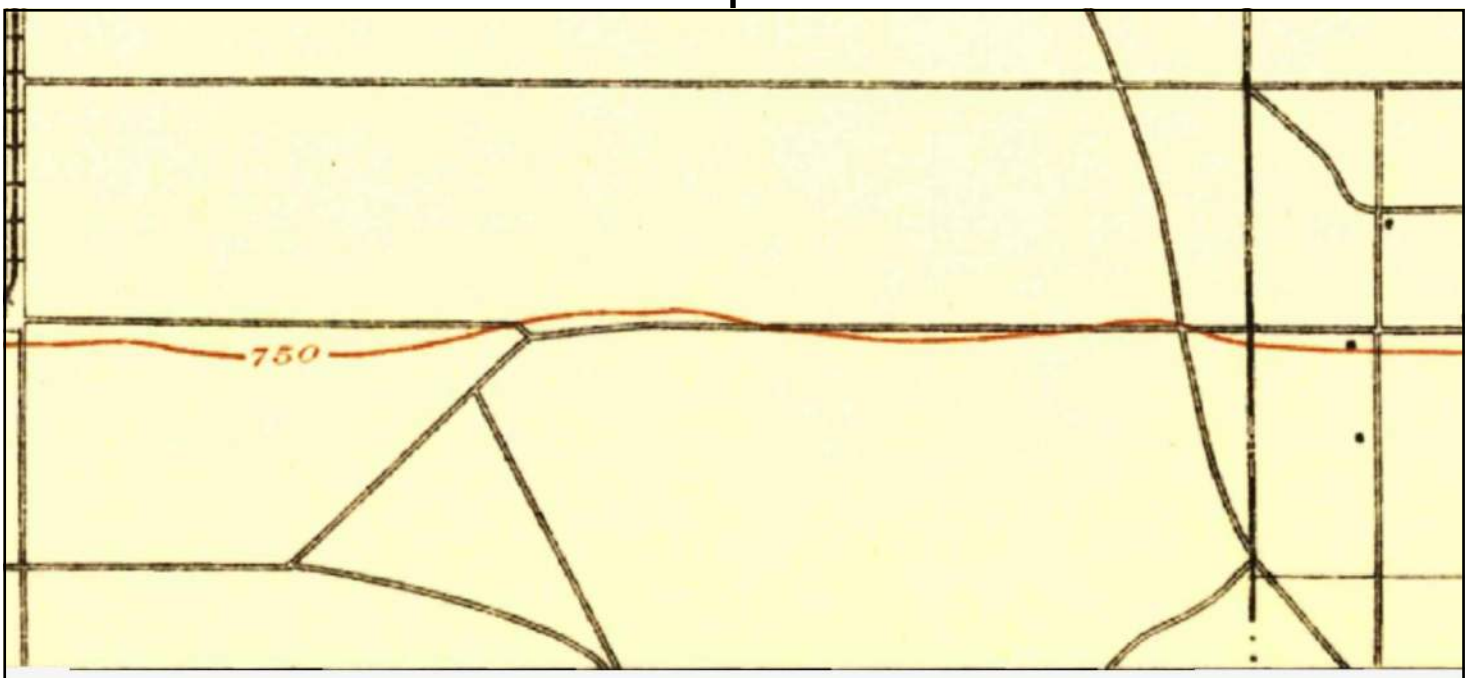


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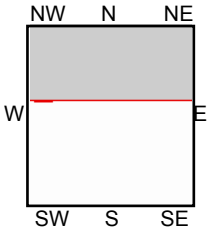


N, Cucamonga, 1903, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1902

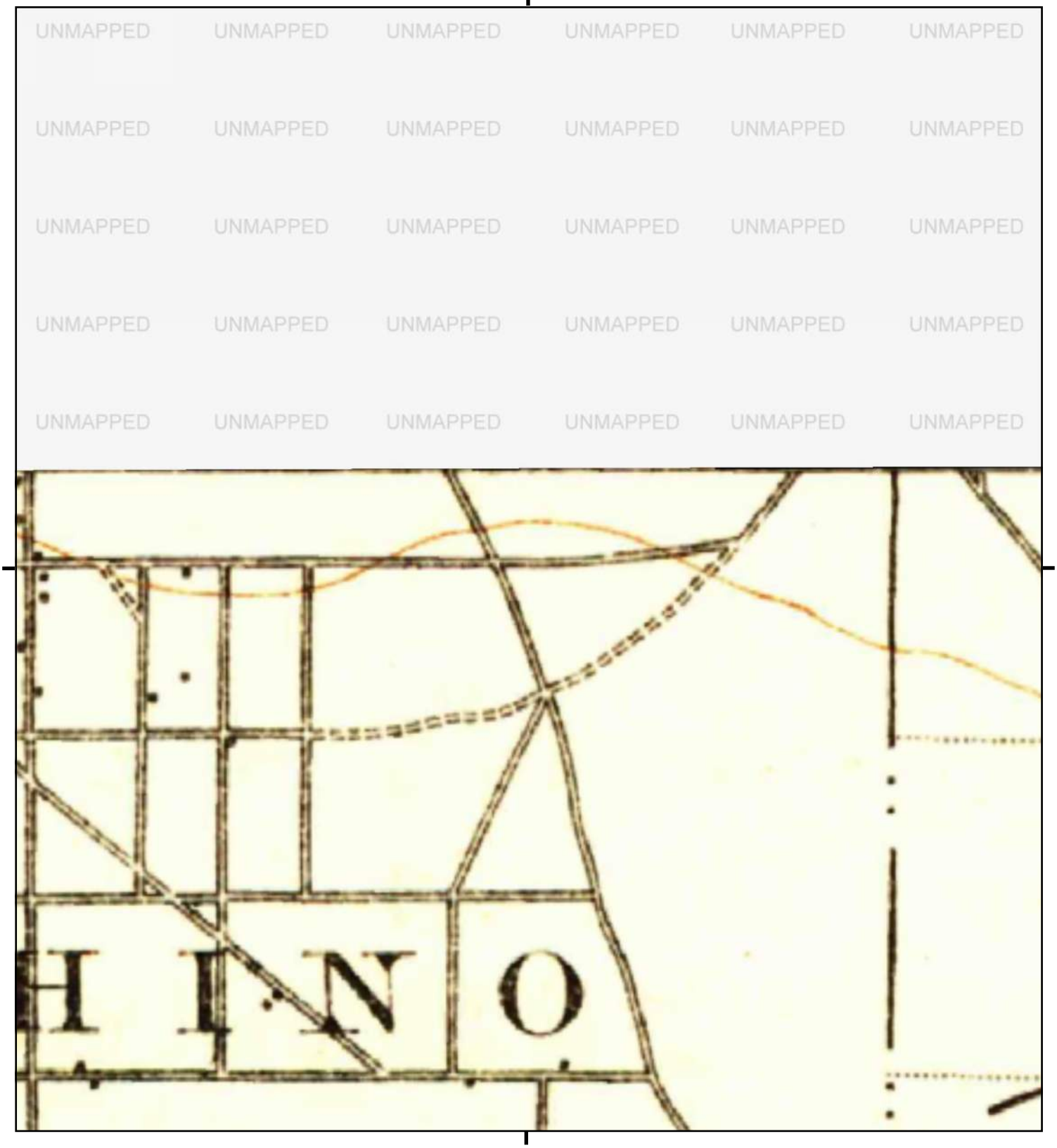


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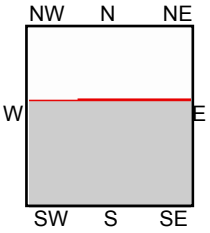


TP, Corona, 1902, 30-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1900

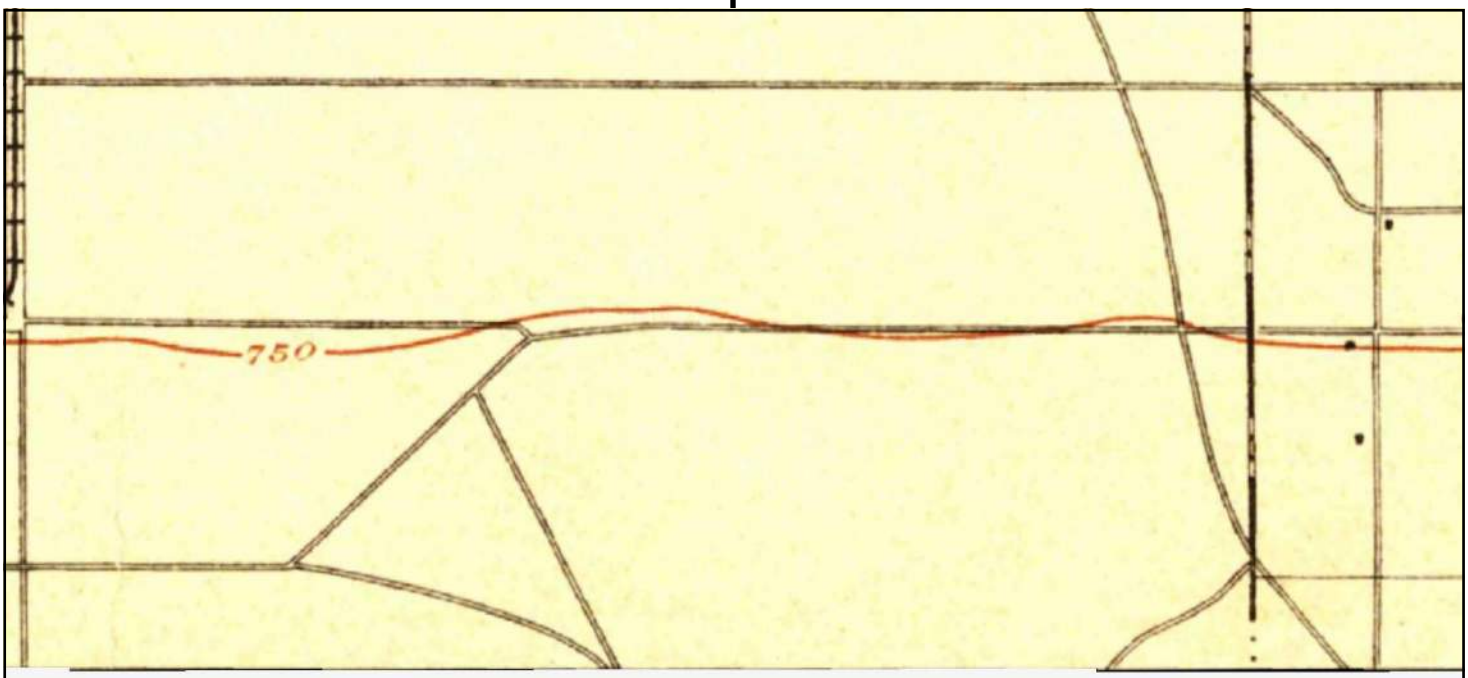


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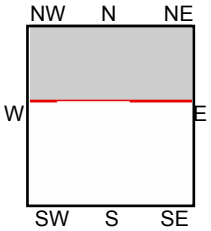


N, Cucamonga, 1900, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1897

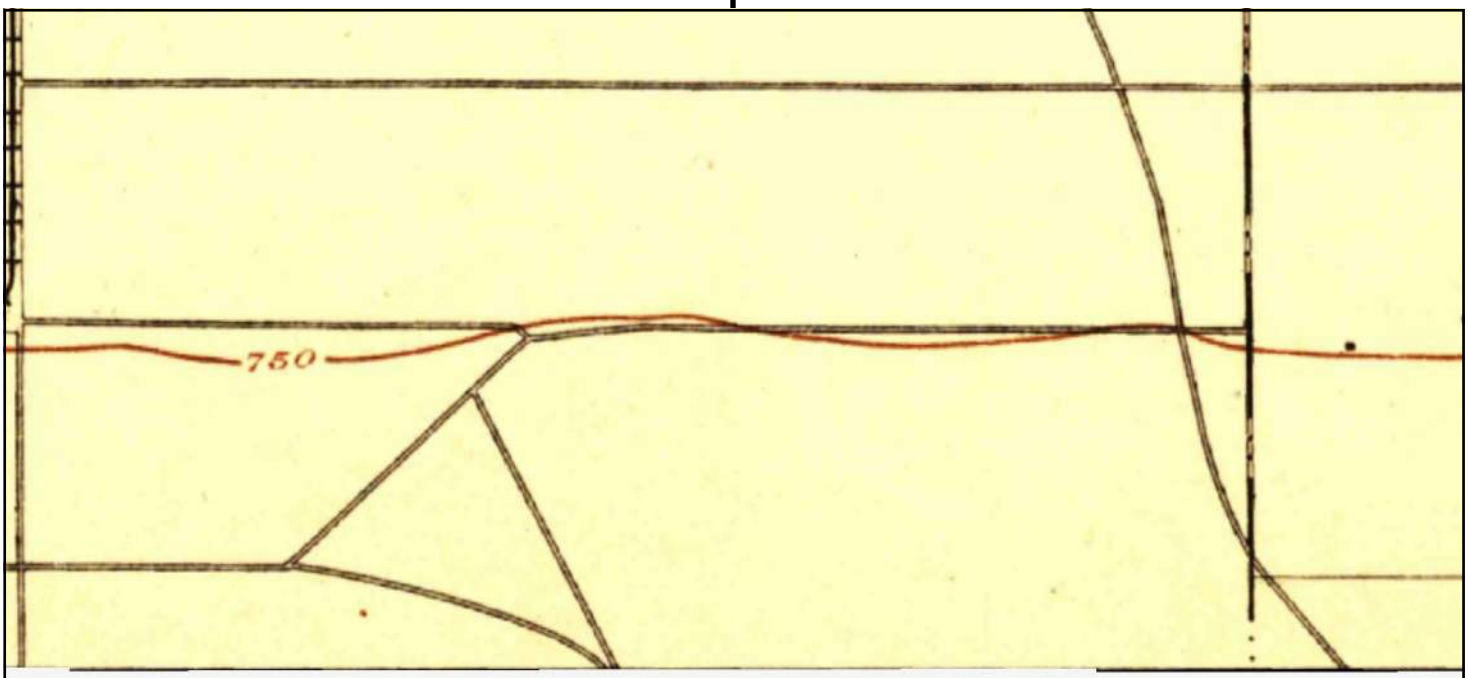


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This report includes information from the following map sheet(s).

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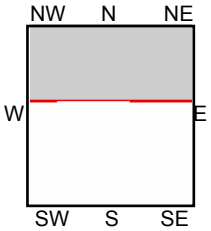


N, Cucamonga, 1897, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# APPENDIX D

User Provided Information

(Provided as separate document)

# APPENDIX E

Regulatory Agency Records

State Water Resources Control Board

# NOTICE OF INTENT

GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH INDUSTRIAL ACTIVITY (WQ ORDER No. 2014-0057-DWQ)
(Excluding Construction Activities)

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR
ENVIRONMENTAL PROTECTION

WDID: 8 36I006432 Status: Terminated

## Operator Information

Type: Private Business

Name: Michael DeHoog Dairy
Contact Name: Michael De Hoog
Address: 8381 Edison Ave
Title:
Address 2:
Phone Number: 909-947-4712
City/State/Zip: Chino CA 91710
Email Address:
Federal Tax ID:

## Facility Information

Level:

Contact Name: Michael De Hoog
Title:
Site Name: Michael De Hoog Dairy
Address: 8381 Edison
City/State/Zip: Ontario CA 91762
Site Phone #: 909-947-4712
County: San Bernardino
Email Address:
Latitude: 33.99775 Longitude: -117.62196
Site Size:
Industrial Area Exposed to Storm Water:
Percent of Site Impervious (Including Rooftops): %

## SIC Code Information

1.
2.
3.

## Additional Information

Receiving Water: Sata Ane River
Flow: Indirectly
Storm Drain System:
Compliance Group:

RWQCB Jurisdiction: Region 8 - Santa Ana
Phone: 951-782-4130
Email: r8_stormwater@waterboards.ca.gov

## Certification

Name:
Date:
Title:

State Water Resources Control Board

# NOTICE OF INTENT

GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH INDUSTRIAL ACTIVITY (WQ ORDER No. 2014-0057-DWQ)
(Excluding Construction Activities)

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR
ENVIRONMENTAL PROTECTION

WDID: 8 36NNA000183 Status: No Action Required

## Operator Information

Type: Private Business

Name: Material Recovery Solutions Inc
Contact Name: Brent Van kampen
Address: 7325 Edison Ave
Title:
Address 2:
Phone Number: 562-577-9047
City/State/Zip: Ontario CA 91762
Email Address: Materialrecoverysolutions@gmail.com
Federal Tax ID:

## Facility Information

Level:

Contact Name: Brent Van kampen
Title:
Site Name: Material Recovery Solutions Inc
Address: 7325 Edison Ave
City/State/Zip: Ontario CA 91762
Site Phone #: 562-577-9047
County: San Bernardino
Email Address: Materialrecoverysolutions@gmail.com
Latitude: 33.99427 Longitude: -117.64495
Site Size: 110200 Sq.Feet
Industrial Area Exposed to Storm Water:
Percent of Site Impervious (Including Rooftops): %

## SIC Code Information

1. 2875 Fertilizers, Mixing Only
2.
3.

## Additional Information

Receiving Water:
Flow: Indirectly
Storm Drain System:
Compliance Group:

RWQCB Jurisdiction: Region 8 - Santa Ana
Phone: 951-782-4130
Email: r8_stormwater@waterboards.ca.gov

## Certification

Name: Brent Van kampen
Date: September 20, 2016
Title: Vice president

D

Rec'd 1/7/04

# ENGINEERED WASTE MANAGEMENT PLAN

Accepted 8-22-05

Prepared For:

SNS DAIRY
7325 Edison Avenue
Chino, CA 91710
(909) 732-8165
(909) 627-9432

NOLTE
BEYOND ENGINEERING

JOB NO.IEB0103
December 2003

This Engineered Waste Management Plan was prepared under the direction and supervision of Paul Hacunda, Professional Engineer.

Paul J. Hacunda, P.E. No. 41627

REGISTERED PROFESSIONAL ENGINEER
PAUL J. HACUNDA
No. 41627
Exp. 12/31/07
CIVIL
STATE OF CALIFORNIA

For additional questions and comments, please contact:


Paul Hacunda
Associate

Gary Koontz
Project Manager

NOLTE ASSOCIATES, INC.
255 East Rincon Street, Suite 110
Corona, CA 92879
Tel: (909) 739-5700
Fax: (909) 739-7510

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Plot Plan ..... Plate 1

**ENGINEERED WASTE MANAGEMENT PLAN**
**for**
**SNS DAIRY**
**7325 Edison Avenue**
**Chino, CA 91710**
**(909) 732-8165**

## I. INTRODUCTION

This plan describes the operational setting of SNS Dairy and recommended procedures of the operation and management of the dairy wastewater collection, retention, and disposal system at the:

SNS Dairy

| | |
|---|---|
| Owner/Operator: | Sam Souza |
| Location: | 7325 Edison Avenue, Chino,California |
| Mailing Address: | same |

| | | | |
|---|---|---|---|
| EWMP Responsible Party: | Primary: | Sam Souza | (909) 732-8165 |
| | Secondary: | Sam Souza Jr. | (909) 203-5905 |

The dairy is situated on the south side of Edison Avenue. The west boundary of the dairy is adjacent to the Sultana Avenue right-of-way. The east boundary is adjacent to the Campus Avenue right-of-way.

The gross area of the dairy is approximately 36.55 acres. The dairy operations occupy approximately 33.41 acres of the total acres and include the following uses:

- Corrals,
- Hay barns,
- Commodity barn,
- Milk barn, and
- Wastewater lagoons

The current typical animal population is:

- 850 milk cows, and
- 150 dry cows

This onsite stock count equates to 1400 animal units. SNS Dairy has not plans for expansion at this time. However, the operator does intend to abandon milking operations in the near future and use the facility for raising his heifers. The EWMP is designed for a milking herd to provide the option of leasing out the facility to a dairy operator if he chooses.

At the time this report was prepared, this dairy could not comply with the RWQCB's 2001 Guidelines for the Development of EWMPs. The quantities reported are the result of the proposed improvements described herein under Section II, Recommendations.

Portions of SNS Dairy that require containment of runoff include approximately 12.73 acres of corrals, 1.49 acres of concrete feed alleys, 3.15 acres of dirt areas, and 6.97 acres of fields and pastures. The wastewater lagoon and evaporation basins occupy 8.74 acres and have a combined storage capacity of 10,301,007 gallons (31.61 acre-ft). SNS Dairy generates approximately 24,861 gallons of wash water per day (See Appendix A, page 1).

SNS Dairy has a very efficient and effective way of managing its wash water and storm water. Wash water from the milk barn gravity flows to a sump located just east of the milk barn. From the sump the wash water continues by gravity flow through a 4 inch PVC line to a series of check valves located along the northerly portion of Field #2. Water can be dispersed via the check valves to various portions of Field #2 to evaporate and percolate. Any wash water or storm runoff from Field #2 is collected in a series of evaporation basins located to the south.

Storm runoff from Corral #1 flows south, then east to commingle with runoff from Corrals #2 through #5 and continue south via a swale located along the west boundary of the corrals. Just south of Corral #5, a berm directs the runoff to the east and ultimately into Basin #1. Storm runoff from Corrals #6 through #9 flows east to the west boundary of Field #1, then south to Basin #1. Storm runoff from Corral #10 flows south to Field #1 and ultimately to Basin #1. Corrals #11 through #13 drain south to Field #2 and ultimately into Evaporation Basins #1 through #5.

Corral #14 receives some runoff from the dirt area located to the north of the corral. There is a potential for runoff exiting the corral along the south fence line to flow southeast and offsite. Any runoff that exits the facility along the east fence line will be contained within a small swale located between the east fence line for SNS Dairy and the Feed Alley for the adjacent facility to the east. The runoff will then be channeled, within the swale, to the south along the Campus Avenue right-of-way. This report includes a recommendation that Corral #14 be abandoned, the manure removed and a two foot berm constructed along the west fence line between Corral #13 and #14. By implementing this recommendation, runoff from the dirt area and Corral #14 will remain uncontaminated with manure and, therefore, can flow offsite along the natural drainage course within the Campus Avenue right-of-way.

SNS Dairy has adequate protection against on-site storm water leaving the property. In general, storm runoff drains from north to south to either Basin #1 or Evaporation Basins #1 through #5. The west boundary is protected by a berm along the west part of the Sultana Avenue right-of-way. Potential runoff along the south boundary is contained by the west to east extension of the west berm. Runoff is directed in an easterly direction into Basin #1. Runoff along the east boundary, south of the dirt area and Corral #14, is contained within Evaporation Basin #5.

SNS Dairy also has excellent protection against offsite entering the property. The northern property line is protected from run-on by a series of dirt and asphalt berms depicted on the Plot Plan. The storm runoff from Edison Avenue is directed west and away from the dairy. The remaining boundaries of the dairy are protected by the berms and Basin #1, as discussed above and depicted on the Plot Plan.

SNS Dairy was built prior to November 27, 1984. Therefore, they are not required to protect their manured areas from the 100-year peak stream flow. However, they are required to protect all manured areas from the 20-year peak stream flow. Studies have not been done to calculate the flood elevations of a 20-year peak stream flow. In order to protect the dairy from, and prepare for, a 20-year peak flow, it must maintain regular maintenance programs as described herein. All onsite flows and the required volumes for the 25-year, 24-hour storm must be contained (See Appendix H, 100 Year Flood Plain Data).

## II. DESIGN

SNS Dairy was originally contracted to comply with Order No. 99-11. Since that time, guidelines for achieving compliance with Order No. 99-11 have been issued (Guidelines for the Development of Engineered Waste Management Plans for Concentrated Animal Feeding Operations, February 5, 2001). This Engineered Waste Management Plan (EWMP) was prepared under the recommendations of the new guidelines.

Order No. 99-11 required the containment of the daily production of wastewater and storm water runoff from a 24-hour, 25-year storm. The new guidelines to Order No. 99-11 require the containment of:

- 150 days of the daily production of wastewater,
- A 24-hour, 25-year storm,
- 150 days of winter precipitation, and
- The 150-day accumulation of 10% of manure solids that could end up in the lagoons.

Although evaporation and percolation can be accounted for, the new guidelines require a large change in containment from Order No. 99-11.

In order to accommodate the new guidelines, this report contains two sets of calculations. The first set of calculations determines the amount of capacity required for 150 days storage. The second set of calculations performs a month-by-month water balance analysis of the amount of wastewater generated and eliminated. This second set of calculations was developed for those dairies that do not meet the requirements of the new guidelines. This second set of calculations optimizes the amount of storage required by including percolation and evaporation on a month by month basis.

The Engineered Wastewater Management Plan (EWMP) developed for SNS Dairy in December 2003 determined that the dairy has appreciable wastewater storage. SNS Dairy meets all of the requirements of the new guidelines. In Table 1, wastewater volumes and the capacity of the settling basin & lagoon are summarized.

| Table 1<br>Capacity Summary | | |
|---|---|---|
| Total Days Required | 150 | days |
| Total Milkhouse and Parlor Water Rate | 3,045 | gal per day |
| Total Wash Pen Rate | 21,816 | gal per day |
| Total Milkhouse and Wash Pen Rate | 24,861 | gal per day |
| Total Required Storm Water Volume | 15.44 | acre-ft |
| Total Manure Volume | 0.66 | acre-ft |
| Total Required Containment Facility Volume | 27.54 | acre-ft |
| Total Available Volume | 31.61 | acre-ft |
| ADDITIONAL VOLUME REQUIRED | 0 | acre-ft |
| | | |
| Total Annual Washwater and Storm Water Accumulation | 59.07 | acre-ft |
| Total Annual Evaporation and Percolation Capability | 134.57 | acre-ft |
| | | |
| Total Winter (Nov.-Dec.-Jan.-Feb.-Mar.) Washwater and Storm Water Accumulation (Inflow) | 35.46 | acre-ft |
| Total Winter (Nov.-Dec.-Jan.-Feb.-Mar.) Evaporation and Percolation Capability (Outflow) | 9.72 | acre-ft |

The data presented in this report was generated in the spreadsheets labeled "Worksheet for Determining Containment Facility Volume" (Appendix A). The first page[1] details the current animal population and the daily wash water generated on the dairy. All numbers for milk house and wash pen water rates were generated from Rain Bird and Weather Tech Sprinkler Volume Ratings for single and double nozzles. An average of 5.05 Gallons per minute was used for single nozzles and 7.1 gallons per minute was used for double nozzles. These numbers were confirmed by watching the total run time of the wash pen sprinklers per cow pen and matched with research from the University of California Cooperative Extension Program for Dairies (see Appendix C).

The second page[1] shows the equivalent gallons per cow per day. This calculation was generated in response to the EWMP guidelines adopted by the Regional Board. The guidelines recommend that as much as 100 gal/cow/day should be used to generate

[1] Appendix A, "Worksheet for Determining Containment Facility Volume".

wastewater during winter months. The calculation on the second page[1] shows a more accurate estimate of the volume of water used per cow per day on SNS Dairy.

Page two[1] also shows the total storm water accumulation generated on the dairy. Evaporation was considered, based on data from the California Department of Water Resources. Manure was also considered in the total volume calculations. The Total Required Containment Facility Volume is shown on the bottom of the second page[1].

The Total Available Volume is shown on page three[1] for SNS Dairy. The Additional Volume Required was found by subtracting the Total Required Volume from the Current Capacity. In the case of SNS Dairy, no additional volume is required.

Also included on page three[1] is a calculation showing the total depth needed in the basins to contain the 24-hr, 25-yr storm. This calculation was developed to show how much depth should be retained at the top of the basins to ensure that the 24-hr, 25-yr storm can be fully contained. This calculation also shows the maximum fill depth of the basins before pumping must be initiated. The calculation assumes that all storm water flows by gravity to the basins and is contained before it is pumped to application fields. In the case of SNS Dairy, 3.00 feet must be maintained at the top of the Basins #1 and 0.60 feet maintained at the top of Evaporation Basins #1-5 to ensure capacity of the 24-hr, 25-yr storm.

Shown below are two examples of wastewater lagoons. Figure 1 shows an optimum dairy lagoon that is able to contain all of the required wastewater and runoff volumes. Figure 2 shows a more common situation where two lagoons are used to split the total wastewater and runoff volumes. There should always be enough room in one lagoon to hold the 24-hr, 25-yr storm. By leaving enough room for the 24-hr, 25-yr storm, it eliminates dependency on the pump and eliminates potential spills due to pump failure. The calculation on the bottom of page three[1] shows exactly how much depth is needed at the top of the lagoon to ensure containment of the 24-hr, 25-yr storm.

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[1] Appendix A, "Worksheet for Determining Containment Facility Volume"

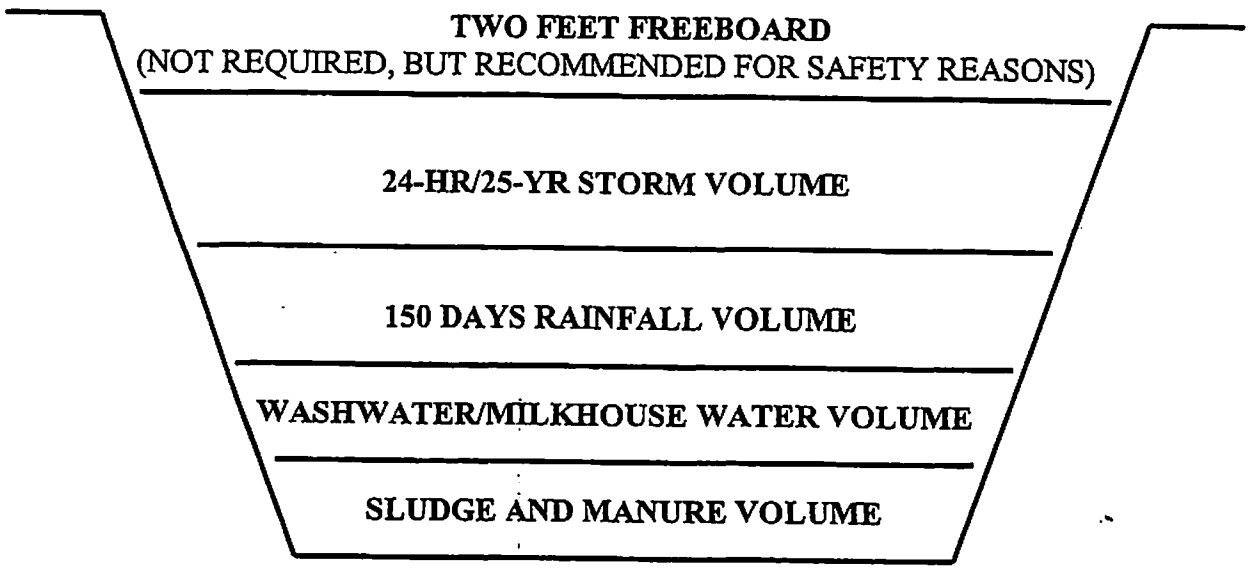


**Figure 1.** Cross section of optimum dairy lagoon.

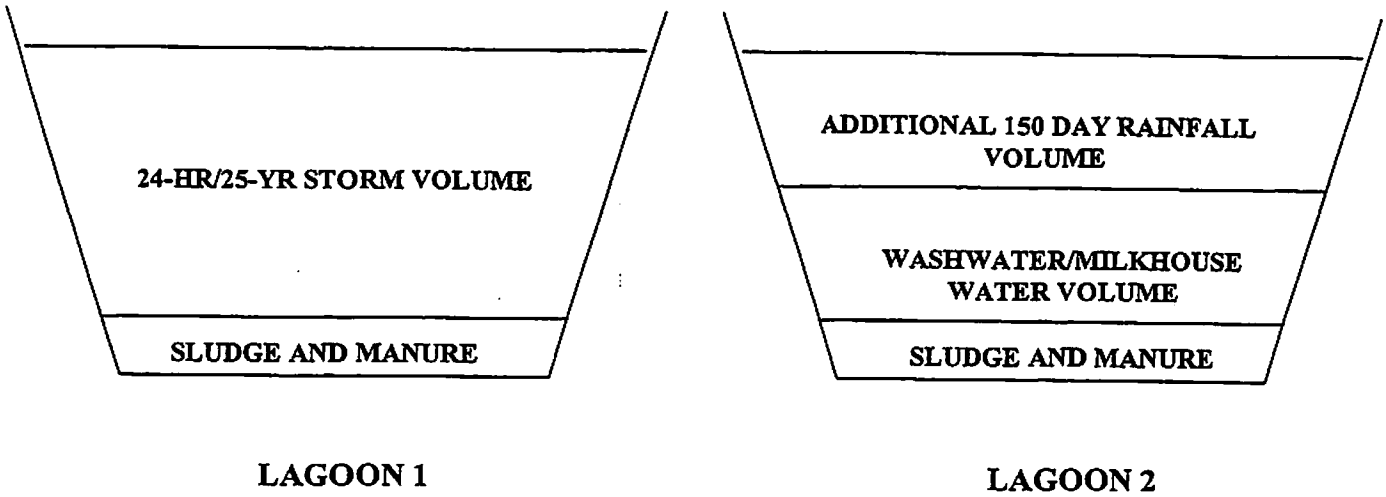


**Figure 2.** Cross sections of typical dairy lagoons with split volumes.

Appendix B contains the Inflow-Outflow computations designed to optimize the amount of storage required. This spreadsheet models the month-by-month totals of operations water, precipitation, 24-hour, 25-year storm data, evaporation and percolation. Although the 24-hour - 25-year storm could occur at any time, it was assumed to occur during the month of

January. Percolation is not included for November through March. All data is referenced in Appendices D-G. As can be seen in the spreadsheets, SNS Dairy has 19,245,907 million gallons of total inflow (Column [15]), and 43,846,695 gallons of total outflow (Column [27]).

Column [28] compares the total inflow with the total outflow on a month-by-month basis. The calculation subtracts the total outflow from the total inflow to give a clear estimate of which months have more inflow than outflow. If there is more inflow than outflow, additional storage is required. Since all factors including evaporation and percolation are included, this calculation gives an accurate estimate of how much storage is needed per month. The total capacity needed on the dairy based on all the months that have more inflow than outflow is then shown at the bottom of the calculation sheet. In the case of SNS Dairy, there are 5 months (November through March) where there is more inflow than outflow. There is a total of 8,386,434 gallons that need to be contained over the year. This number when compared with the total available capacity on the dairy shows if the lagoons need to be expanded or not. Since the SNS Dairy has 10,301,007 gallons of capacity, there is no need to expand the lagoons.

Following the spreadsheets are two charts showing the results of the Inflow-Outflow Computation, titled "Inflow-Outflow Comparison Chart" and "3D Inflow-Outflow Comparison Chart." The 3D Inflow-Outflow Comparison Chart is simply a 3D version of the Inflow-Outflow Comparison Chart. The dark blue line on the chart depicts the total operation water generated in gallons per month. The light blue line shows the total precipitation over the site in gallons per month. The yellow line shows the combination of operation water and precipitation water. The light red line shows the Total Inflow for the dairy including the operations water, precipitation, and the 24-hour, 25-year storm. The large jump in the light blue line denotes the 24-hour, 25-year storm. The purple line shows the evaporation from the fields and lagoons per month. The orange line shows the percolation from the fields per month. The large drop in the line denotes the lack of percolation in the winter months. The green line shows the Total Outflow from the dairy, including evaporation and percolation, per month.

This chart is an excellent reference because it shows the total amount of storage time that would be needed to properly manage the wastewater and storm water. In the case of SNS Dairy, there is more total inflow than total outflow in the months of November through March. This shows that the dairy technically needs 150 days of storage to properly manage the wastewater and storm runoff. In every other month there is more potential evaporation and percolation than there is inflow.

The SNS Dairy meets the requirements of the guidelines to Order No. 99-11 for 150 days storage. The following recommendations should be performed to meet the other requirements of the guidelines to Order No. 99-11.

**Recommendations**

1. Remove all animals from Corral #14. Clean the manure from the corral and construct a berm along the west fence line per Section I-I on the Plot Plan. Continue the berm south of the Corral to divert runoff from Corral #14 and run-on from the adjacent dairy away from Field #2. This portion of the berm should be constructed per Section L-L on the Plot Plan.

2. Construct a spillway near the southeast corner of Basin #1 per Detail 1 of the Plat Plan. The spillway shall be constructed of a material such as concrete, asphalt, or rip rap and shall include aprons designed to control slope erosion.

## III. PLOT (SITE) PLAN

Please see Plot Plan at the end of this report. (Plate 1)

## IV. COMPACTION

For construction and/or replacement of berms, the following procedures should be followed:

A. Over excavate the soil to 1'-2' below original ground before building berms.

B. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Backfill and fill materials should be completely free from manure.

C. Uniformly moisten sub-grade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

    1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
    2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

D. The excavation shall be backfilled and compacted to a relative compaction of no less than 90 percent. A Soils Engineer will need to be hired to ensure 90 percent compaction.

## V. OPERATION AND MAINTENANCE

The basic maintenance objectives are to ensure the reliable storage and disposal of accumulated wastewater and waste solids. To achieve this, there are several tasks that must be accomplished on a routine basis:

- Disposal of accumulated wastewater
- Measurement of accumulated waste solids
- Removal and disposal of accumulated waste solids
- Repair and maintenance of dikes and berms
- Maintenance of site grading
- Weed Abatement
- Record keeping

### Accumulated Wastewater Disposal

It is important that the water level in the wastewater holding ponds be properly maintained so that the ponds can provide the required storage capacity during wet weather periods. The California Regional Water Quality Control Board - Santa Ana Region (CRWQCB) has developed specific standards for the handling and storage of wastewater and storm water collected from the dairy operations. This portion of the Engineered Waste Management Plan describes the recommended maintenance procedures for the wastewater holding ponds to ensure compliance with CRWQCB standards.

In order to meet the requirements of the CRWQCB, the following general guidelines should be followed in disposing of wastewater in the ponds:

- Empty ponds just prior to the start of the wet weather season (November 1st) to ensure maximum capacity for the winter months. If stagnant water remains at the bottom of the ponds below the reach of the pumps, portable pumps should be used to remove all wastewater before the start of the wet season.
- Take advantage of dry weather periods during the annual wet weather period to dispose of accumulated wastewater. Fields must be bermed to prevent overflow from disposal areas onto adjacent properties.
- Start to empty ponds at end of wet weather season (March 31st) to maximize percolation and to create additional capacity in the lagoons.

General Equipment Maintenance. Pumps, pipelines and all pertinent equipment used in the handling of wastewater must be routinely checked and serviced to ensure proper operation:

- Check all wastewater distribution and application equipment weekly to ensure proper operation condition.
- Check and service motors and pumps three times a year. Portable replacement pumps should be available in case of a pump failure. If portable pumps are not available on-site, a rental company phone number should be posted with high visibility for all

employees. Rental company phone numbers are also listed on the last page of this report.

- Check transmission pipes for proper condition.
- Take inventory of spare parts and check sources of emergency repair.
- Disc percolation areas (fields) to about 18 inches to assure maximum percolation during wet seasons. Disking of the disposal area should occur as early in the year as possible, as soon as the fields are dry enough for the procedure to be effective. All of the disposal area should be disked at least once each year.

Dry Weather Disposal. Following the annual wet weather months, wastewater accumulated in the ponds should be disposed of in a timely manner in preparation of the coming wet weather months. The following guidelines should be followed for wastewater disposal during dry weather conditions:

- Apply wastewater to each of the evaporation/percolation disposal areas (fields) on a rotational basis.
- Wastewater should be applied to fields in a manner so that all wastewater will percolate and evaporate. Wastewater should be applied to all parts of the field to improve percolation and evaporation and to prevent stagnant wastewater.
- Observe the wastewater levels in the disposal areas on a daily basis and apply additional wastewater as the drying and percolation rates permit.
- Avoid having the fields completely flooded for extended periods of time. The best disposal rates will occur if the fields are flooded 4 to 6 inches and then allowed to evaporate and percolate. Fields can only be flooded to 4 to 6 inches if proper berms exist around the boundaries of the field. If stagnant wastewater develops, a portable pump or other measures should be used to help spread the water and prevent insect breeding conditions.

Wet Weather Disposal. During the wet weather months, there may be weeks of dry weather available to dispose of accumulated wastewater. Take advantage of every opportunity to reduce the wastewater levels in the holding basins/lagoons so that in the event of a large storm the chances of overflow and inadvertent runoff are reduced. The following guidelines should be followed for wastewater disposal during wet weather months:

- Apply wastewater to each of the disposal areas on a rotational basis.
- Apply wastewater in a manner so that all wastewater will percolate and evaporate. Fields should be watered so that all parts of the field receive wastewater. This will help percolation and evaporation and will help prevent stagnant wastewater.
- Observe the wastewater levels in the disposal areas on a daily basis. Apply additional wastewater only if the previously applied wastewater has evaporated or percolated and if a large storm is not eminent.
- Do not flood the fields and leave standing water for a long period of time unless it has so been designated.

## Accumulated Solids Removal and Disposal

Solids contained in the dairy-generated wastewater and in the storm water will naturally settle and accumulate in the bottom of the holding basins/lagoons. The settled solids will reduce the holding capacity of the ponds. To maintain holding pond storage capacity, solids must be routinely checked and periodically removed. The frequency of solids removal will depend on how quickly solids accumulate in the ponds.

Solids Removal. Remove accumulated solids 1st by agitation and pumping, 2nd by dredging, and 3rd by draining and scraping. If dredging is used, ensure that dredging runoff and excess wastewater taken from the ponds is contained and returned to the ponds. Lagoon solids should be removed *every summer* to ensure full capacity in the lagoons before the start of the next winter season.

Solids Disposal. Solids removed from the ponds can be applied to application areas on-site or must be hauled off-site to farm ground for land application. Solids from lagoon applied to application areas should be tilled and mixed into the native soils shortly after application.

## Levee, Berm and Dike Maintenance

The integrity of pond berms, levees, and dikes must be maintained. Follow these guidelines to ensure proper maintenance of the levees and berms:

- Check pond dikes, levees, and berms a minimum of two times per year for erosion and settlement, and repair as necessary (one inspection to occur just prior to the rainy season).
- Check pond dikes, levees, and berms a minimum of two times per year for rodent damage, and repair as necessary (one inspection to occur just prior to the rainy season).
- If immediate repairs must be made, compacted soil should be used to fill all cracks and holes until further repair can be performed.
- Apply suitable rodent control measures for widespread or frequent rodent damage. These may include Anti-Coagulant Bait, Trapping or Fumigation. Pest Control Specialists should be contacted before using any of these methods.

## Site Grading Maintenance

Site grading must be maintained to ensure proper drainage patterns across the dairy. The goal is to minimize the amount of water contaminated with manure and flowing into the holding ponds and to prevent contaminated wastewater from running off-site. The following guidelines should be followed to maintain site grading:

- Ensure that all wastewater generated by the daily dairy operations flows to the wastewater holding ponds. Re-grade as needed.
- Clean and repair buried drain lines as needed.

- Ensure that rainfall collected from cow holding pens, feed storage areas, and other manured areas flows to the holding ponds or containment areas. Re-grade as needed.
- Check the condition of containment walls and berms surrounding the cow confined areas, and repair as necessary.
- Ensure that storm water from off-site areas is diverted away from holding pens and other manured areas.
- Ensure that storm water from other off-site areas does not drain into the holding ponds.

**Weed Abatement**

Weed abatement measures such as pesticides and clearing and grubbing should be used to control weeds in fields, lagoons, wastewater transport channels, and wastewater access paths. Clearing manure out of lagoons once a year and discing fields at a minimum of once a year will help ensure weed abatement.

**Maintenance and Operations Records**

Keep records of all maintenance activities for future reference.

| Maintenance Activity | | Frequency |
|---|---|---|
| Holding Basin/Lagoon Levels | Pond Depth in Feet | Weekly |
| Holding Basin/Lagoon General Inspection | Berm and Lagoon Wall Stability | Weekly |
| Wastewater distribution/ Application Equipment | Pump/Pipe/Ditch Inspection | Weekly |
| Rainfall Totals | Days of Rain & Inches of Rainfall | Daily/Monthly |
| Solids Level | Solids Depth in Feet | Annually |
| Wastewater Application | Wastewater Depth in Inches | Daily |
| Wastewater Application | Days Applied & Approximate Volume | Weekly |
| Lagoon Solids Removal/Disposal | Days Removed & Volume Removed | Annually |
| Corral Solids Removal/Disposal | Days Removed & Volume Removed | Semi-Annually |
| Dikes and Berms Maintenance | Damage Found & Date Repairs Made | Semi-Annually |
| Site Grading Maintenance | Improvements Made & Date | Annually |
| Equipment Maintenance | Service and Repair Records & Dates | Semi-Annually |

- Daily inspections should be made upon all ponds, berms and wastewater distribution and application equipment following the first significant rain event of each Winter season. These daily inspections should continue until large rain events cease in the Spring.

- Should an unauthorized discharge be made from the facility, the dairy operator should follow the guidelines described in Monitoring and Reporting Program No. 99-11. (See back pages of Order No. 99-11.) Emergency phone numbers are located on the next page of this report.

**Emergency Spill Plan**

In the case of an emergency spill on the dairy, these directions should be followed.

First, the Regional Water Quality Control Board should be contacted if a spill occurs. This requirement is based on Order 99-11.
At least one of these people should be contacted in the case of a spill.

Regional Water Quality Control Board
Steve Mayville (909) 782-4130
Chief of the Dairy Units

Should a pump or piece of equipment break down, these numbers should be used to pursue emergency temporary equipment.

Vandenberg Manufacturing Company, Inc.
(909)-597-3412

Below is a list of spare parts that could be used in the case of an emergency spill.

There are no spare parts on-site.

## VII. GLOSSARY

| | | |
|---|---|---|
| **AFO** | - - | Animal Feeding Operation |
| **BMP** | - - | Best Management Practices |
| **Board** | - - | See CRWQCB, SAR |
| **CAFO** | - - | Concentrated Animal Feeding Operation |
| **Catastrophic Rainfall:** | | Any single event which would total the volume of the 25 year, 24 hour storm event; this could include tornadoes, hurricanes or other catastrophic conditions which could cause overflow due to winds or mechanical damage. |
| **CFR** | - - | Code of Federal Regulations |
| **Chronic Rain fall:** | - | A series of wet weather conditions which would not provide opportunity for dewatering and which total the volume of the 25 year, 24 hour storm event. |
| **CNMP** | - - | Comprehensive Nutrient Management Plan |
| **CRWQCB** | - - | California Regional Water Quality Control Board |
| **CWA** | - - | Clean Water Act |
| **Discharger** | - - | Persons discharging, or proposing to discharge, dairy wastes or other similar kinds of wastes from an existing dairy or related facility in any manner that may affect water quality. |
| **EWMP** | - - | Engineered Waste Management Plan |
| **NPDES** | - - | National Pollutant Discharge Elimination System |
| **Process Wastewater:** | | Water directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems |
| **Regional Board:** | - | See CRWQCB, SAR |
| **Run-on** | - - | Storm water that occurs off-site, but enters the CAFO |
| **SAR** | - - | Santa Ana Region |
| **SWRCB** | - - | State Water Resources Control Board |
| **TDS** | - - | Total Dissolved Solids |
| **TMDL** | - - | Total Maximum Daily Load |
| **USDA** | - - | United States Department of Agriculture |
| **USEPA** | - - | United States Environmental Protection Agency |
| **Washwater** | - - | Water used to wash cows prior to milking, milk equipment & milk barn |

# APPENDIX A

## WORKSHEET FOR DETERMINING CONTAINMENT FACILITY VOLUME

NOLTE
BEYOND ENGINEERING

WORKSHEET FOR DETERMINING
CONTAINMENT FACILITY VOLUME

NAME OF FACILITY: SNS Dairy

NAME OF OPERATOR: Sam Souza
7325 Edison Avenue
Chino, CA 91710

DATE: 12/03/03
PHONE: (909) 627-9432

**TOTAL ACRES OF PROPERTY** 36.55
**DAIRY SITE (Manured Areas)** 33.41 Acres

**TOTAL DAYS STORAGE:** 150

## ANIMAL UNITS

| | Milk Cows | Dry Cows | Bred Heifers | Heifers 1 yr/breed | Calves 3 m to 1yr | Baby Calves |
|---|---|---|---|---|---|---|
| Number (N) | 850 | 150 | 0 | 0 | 0 | 0 |
| Weights (lbs) | 1,400 | 1,400 | 1,100 | 775 | 450 | 150 |
| Pounds (lbs.x N) | 1,190,000 | 210,000 | 0 | 0 | 0 | 0 |
| Units ((N x lbs.)/1000) | 1,190.0 | 210.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | TOTAL ANIMAL UNIT | 1400.0 |

## MILKHOUSE AND PARLOR WATER RATE

| | Gal Per Milking | # Milkings Per Day | # Cows | Totals (Gal Per Day) |
|---|---|---|---|---|
| Bulk Tank Wash Volume [1] | 35 | 2 | | 70 |
| Pipeline Wash Volume [1] | 250 | 2 | | 500 |
| Milkhouse Parlor Floor Wash [1] | 250 | 2 | | 500 |
| Cow Prep (hose wash per cow) [1] | 0.25 | 2 | 850 | 425 |
| Miscellaneous Equipment (buckets etc.) [1] | 250 | 2 | | 500 |
| Miscellaneous Wash (wash/drip pen hose etc.) [1] | 525 | 2 | | 1050 |
| TOTAL DAILY MILK HOUSE AND PARLOR WATER USE | | | | 3,045 |

## WASH PEN/HOLDING PEN WATER RATE

| | | # Strings | Totals (Gal Per Day) |
|---|---|---|---|
| Number of Holding Pen Sprinklers | 54 | | |
| Duration of Sprinkler Wash Cycle (minutes) | 5 | | |
| Number of Wash Cycles (cow pens) | 8 | | |
| Sprinkler Flow Rate (gallons per minute) [1] | 5.05 | | |
| TOTAL WASH PEN WATER USE | 10,908 | 2 | 21,816 |

## WASHWATER VOLUME

| | | |
|---|---|---|
| Milkhouse and Wash Pen (gal per day) | | 24,861 |
| Required days for Containment Facility to hold | | 150 |
| TOTAL WASHWATER VOLUME | Gallons | 3,729,150 |
| | Cu. Ft. | 498,549 |

| EQUIVALENT GALLONS PER COW PER DAY | Gal Per Day | # Cows | # Cows |
|---|---|---|---|
| | 24,861 | 850 | 29.25 Gal/Cow/Day |

[1] University of California Cooperative Extension - Dairy Management Series, Planning and designing dairy waste storage

## WHOLE DAIRY: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 64,725 | 100% | 64,725 |
| Roofed Surface Area Draining Into Lagoon | 14,000 | 100% | 14,000 |
| Surface Area Of The Lagoon | 380,900 | 100% | 380,900 |
| Corral Surface Area Draining Into Lagoon | 554,525 | 50% | 277,263 |
| Pasture Area Draining Into Lagoon | 303,575 | 15% | 45,536 |
| Any Other Dirt Surface Area Draining Into Lagoon | 137,400 | 30% | 41,220 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 1,455,125 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | 33.41 | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **823,644** |

| REQUIRED STORM WATER AND RAINFALL RATES (WHOLE DAIRY) | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| TOTAL STORMWATER RUNOFF VOLUME | | |
|---|---|---|
| | **Gallons** | **7,582,986** |
| | **Cu Ft.** | **1,013,768** |
| | **Acre-Ft.** | **23.27** |

**EVAPORATION CALCULATION FOR WINTER MONTHS**

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 70,684 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| E. Basin 1-5 | 680 | 445 | 0 | 5.00 | 0.00 | - | - | 302,600 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| **Total Lagoon Area #1, #2 & #3** | | | | | | | | **373,284** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

| | | | | |
|---|---|---|---|---|
| *This data is provided by the State of California,* | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPORATION | | | |
|---|---|---|---|
| Area of coverage: 57% | Gallons | 2,553,341 |
| | Cu Ft. | 341,356 |
| | Acre-Ft. | 7.84 |

| NET REQUIRED STORM WATER STORAGE VOLUME | | |
|---|---|---|
| | Gallons | 5,029,645 |
| | Cu Ft. | 672,412 |
| | Acre-Ft. | 15.44 |

| WASHWATER AND STORM WATER TOTAL VOLUME | | |
|---|---|---|
| (Wash Water and Storm Water) | Gallons | 8,758,795 |
| | Cu Ft. | 1,170,962 |

## MANURE CONSIDERATION

(daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet)

| | | | |
|---|---|---|---|
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 1,400.00 | | |
| Total Volume: | 1,918.00 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 191.80 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 28,770 |
| | | Acre-Ft. | 0.66 |

| Total Required Containment Facility Volume | | |
|---|---|---|
| | Gallons | 8,973,994 |
| | Cu Ft. | 1,199,732 |
| | Acre-Ft. | 27.54 |

## AREA #1: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 64,725 | 100% | 64,725 |
| Roofed Surface Area Draining Into Lagoon | 14,000 | 100% | 14,000 |
| Surface Area Of The Lagoon | 78,300 | 100% | 78,300 |
| Corral Surface Area Draining Into Lagoon | 428,125 | 50% | 214,063 |
| Pasture Area Draining Into Lagoon | 156,625 | 15% | 23,494 |
| Any Other Dirt Surface Area Draining Into Lagoon | 71,550 | 30% | 21,465 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 813,325 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | **18.67** | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **416,046** |

| REQUIRED STORM WATER AND RAINFALL RATES (Area 1) | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| TOTAL STORMWATER RUNOFF VOLUME | | |
|---|---|---|
| | **Gallons** | **3,830,385** |
| | **Cu Ft.** | **512,084** |
| | **Acre-Ft.** | **11.76** |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| | Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 70,684 |
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 |
| **Total Lagoon Area #1** | | | | | | | | | **70,684** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** **150.00** =Storgae Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| | | | |
|---|---|---|---|
| TOTAL WINTER MONTHS EVAPOARTION | | Gallons | 424,117 |
| Area of coverage: | 50% | Cu Ft. | 56,700 |
| | | Acre-Ft. | 1.30 |

| | | |
|---|---|---|
| NET REQUIRED STORM WATER STORAGE VOLUME | Gallons | 3,406,268 |
| | Cu Ft. | 455,383 |
| | Acre-Ft. | 10.45 |

| | | | |
|---|---|---|---|
| **WASHWATER AND STORM WATER TOTAL VOLUME** | | | |
| (Wash Water and Storm Water) | 0% | **Gallons** | **3,406,268** |
| | | **Cu Ft.** | **455,383** |

| | | | |
|---|---|---|---|
| **MANURE CONSIDERATION** | | | |
| (daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet) | | | |
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 782.51 | (Percentage) | 55.89% |
| Total Volume: | 1,072.04 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 107.20 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 16,081 |
| | | Acre-Ft. | 0.37 |

| | | |
|---|---|---|
| **Total Required Containment Facility Volume** | **Gallons** | **3,526,551** |
| | **Cu Ft.** | **471,464** |
| | **Acre-Ft.** | **10.82** |

## AREA #2: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 0 | 100% | 0 |
| Roofed Surface Area Draining Into Lagoon | 0 | 100% | 0 |
| Surface Area Of The Lagoon | 302,600 | 100% | 302,600 |
| Corral Surface Area Draining Into Lagoon | 126,400 | 50% | 63,200 |
| Pasture Area Draining Into Lagoon | 146,950 | 15% | 22,043 |
| Any Other Dirt Surface Area Draining Into Lagoon | 65,850 | 30% | 19,755 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 641,800 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | **14.73** | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **407,598** |

## REQUIRED STORM WATER AND RAINFALL RATES (Area #2)

| | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| | | |
|---|---|---|
| **TOTAL STORMWATER AND RUNOFF VOLUME** | **Gallons** | **3,752,601** |
| | **Cu Ft.** | **501,685** |
| | **Acre-Ft.** | **11.52** |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| E. Basin 1-5 | 680 | 445 | 445 | 5.0 | 0.0 | - | - | 302,600 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| **Total Lagoon Area #2** | | | | | | | | **302,600** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPOARTION | | | |
|---|---|---|---|
| Area of coverage: 60% | Gallons | 2,178,787 |
| | Cu Ft. | 291,282 |
| | Acre-Ft. | 6.69 |

| NET REQUIRED STORM WATER STORAGE VOLUME | | |
|---|---|---|
| | Gallons | 1,573,814 |
| | Cu Ft. | 210,403 |
| | Acre-Ft. | 4.83 |

| WASHWATER AND STORM WATER TOTAL VOLUME | | |
|---|---|---|
| (Wash Water and Storm Water) % Wash Water : 100% | Gallons | 5,302,964 |
| | Cu Ft. | 708,952 |

| MANURE CONSIDERATION | | | | |
|---|---|---|---|---|
| (daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet) | | | | |
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | | |
| Total Units | 617.49 | (Percentage) | | 44.11% |
| Total Volume: | 845.96 | (Cubic ft Per Day) | | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | | 84.60 |
| Storage Period (days) | | | | 150 |
| TOTAL MANURE VOLUME | | | Cu Ft. | 12,689 |
| | | | Acre-Ft. | 0.29 |

| Total Required Containment Facility Volume | | |
|---|---|---|
| | Gallons | 5,397,880 |
| | Cu Ft. | 721,642 |
| | Acre-Ft. | 16.57 |

## AREA #3: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 0 | 100% | 0 |
| Roofed Surface Area Draining Into Lagoon | 0 | 100% | 0 |
| Surface Area Of The Lagoon | 0 | 100% | 0 |
| Corral Surface Area Draining Into Lagooh | 0 | 50% | 0 |
| Pasture Area Draining Into Lagoon | 0 | 15% | 0 |
| Any Other Dirt Surface Area Draining Into Lagoon | 0 | 30% | 0 |
| TOTAL SQUARE FEET OF DAIRY OPERATIONS | 0 | (MANURED AREAS) | |
| TOTAL ACREAGE OF DAIRY OPERATIONS | 0.00 | (MANURED AREAS) | |
| TOTAL SQUARE FEET OF SURFACE RUNOFF | | | 0 |

## REQUIRED STORM WATER AND RAINFALL RATES (Area #3)

| | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | TOTAL INCHES | 14.77 |

| | | |
|---|---|---|
| TOTAL STORMWATER AND RUNOFF VOLUME | Gallons | 0 |
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| Total Lagoon Area #3 | | | | | | | | 0 |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPOARTION | | Gallons | 0 |
|---|---|---|---|
| Area of coverage: | 50% | Cu Ft. | 0 |
| | | Acre-Ft. | 0.00 |

| NET REQUIRED STORM WATER STORAGE VOLUME | Gallons | 0 |
|---|---|---|
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

## WASHWATER AND STORM WATER TOTAL VOLUME

| (Wash Water and Storm Water) | % Wash Water : 0% | Gallons | 0 |
|---|---|---|---|
| | | Cu Ft. | 0 |

## MANURE CONSIDERATION

(daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet)

| | | | |
|---|---|---|---|
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 0.00 | (Percentage) | 0.00% |
| Total Volume: | 0.00 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 0.00 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 0 |
| | | Acre-Ft. | 0.00 |

| Total Required Containment Facility Volume | Gallons | 0 |
|---|---|---|
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

TOTAL AVAILABLE VOLUME (Cu.ft.)

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. | Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 78,300 | 620,640 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| E. Basin 1-5 | 680 | 445 | 445 | 5 | 0 | - | - | 302,600 | 756,500 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 | 0 |
| | | | | | | | Total: | 380,900 | 1,377,140 |

## WHOLE DAIRY

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **10,301,007** |
| | | **Cu Ft.** | **1,377,140** |
| | | **Acre-Ft.** | **31.61** |
| **Additional Volume Required** | -1,327,013 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-1

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **4,642,387** |
| | | **Cu Ft.** | **620,640** |
| | | **Acre-Ft.** | **14.25** |
| **Additional Volume Required** | -1,115,836 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-2

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **5,658,620** |
| | | **Cu Ft.** | **756,500** |
| | | **Acre-Ft.** | **17.37** |
| **Additional Volume Required** | -260,740 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-3

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |
| **Additional Volume Required** | 0 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## DEPTH IN STORAGE AREA-1 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 228,748 |
| | Total Area #1 | 78,300 |
| **Total Depth Needed at Top of Lagoon to Hold 24 HR, 25 Year Storm** | | 3.00 |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

## DEPTH IN STORAGE AREA-2 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 180,506 |
| | Total Area #2 | 302,600 |
| **Total Depth Needed at Top of Basin to Hold 24 HR, 25 Year Storm** | | 0.60 |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

## DEPTH IN STORAGE AREA-3 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 0 |
| | Total Area #3 | 0 |
| **Total Depth Needed at Top of Basin to Hold 24 HR, 25 Year Storm** | | #DIV/0! |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

# APPENDIX B

## INFLOW-OUTFLOW COMPUTATION

**Annual Totals Worksheet (Per Month)**

| Month | [1] Operations Water | [2] | [3] Precipitation | [4] | [5] Drainage Per Month | [6] | [7] | [8] Total Inflow | [9] 25 Year Storm | [10] | [11] Drainage Per Month | [12] | [13] | [14] Manure Inflow | [15] Total Inflow |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | [4] x [5] | [5] x 7.48 | [2] + [7] | | | | [10] x [11] | [12] x 7.48 | | [8] + [13] + [14] |
| | Volume | | | | Area | Volume | | Volume | | | Area | Volume | | Volume | Volume |
| | Gal per day | Gal per Month[A] | Inches | Feet | Square feet | Cubic feet | Gal per Month | Gal per Month | Inches | Feet | Square feet | Cubic feet | Gal per Month | Gallons per Month | Gallons per Month |
| August | 24,661 | 770,891 | 0.20 | 0.02 | 823,844 | 13,727 | 102,661 | 673,372 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 918,412 |
| September | 24,861 | 745,830 | 0.39 | 0.03 | 823,644 | 26,788 | 200,228 | 946,058 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 989,098 |
| October | 24,861 | 770,691 | 0.37 | 0.03 | 823,844 | 25,396 | 189,960 | 960,651 | 0.0 | 0.00 | 823,844 | 0 | 0 | 44,475 | 1,005,125 |
| November | 24,861 | 745,830 | 1.54 | 0.13 | 823,844 | 105,701 | 790,843 | 1,536,473 | 0.0 | 0.00 | 823,844 | 0 | 0 | 43,040 | 1,579,513 |
| December | 24,861 | 770,891 | 1.85 | 0.15 | 823,844 | 128,978 | 949,799 | 1,720,490 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 1,764,964 |
| January | 24,861 | 770,891 | 2.35 | 0.20 | 823,644 | 181,297 | 1,206,501 | 1,977,192 | 4.5 | 0.38 | 823,644 | 308,858 | 2,310,321 | 44,475 | 4,331,987 |
| February | 24,861 | 696,108 | 2.64 | 0.22 | 623,644 | 181,202 | 1,355,388 | 2,051,496 | 0.0 | 0.00 | 823,644 | 0 | 0 | 40,171 | 2,091,667 |
| March | 24,861 | 770,891 | 1.89 | 0.16 | 823,644 | 129,724 | 970,335 | 1,741,028 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 1,785,500 |
| April | 24,861 | 745,830 | 0.83 | 0.07 | 823,644 | 56,969 | 426,126 | 1,171,956 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 1,214,996 |
| May | 24,861 | 770,891 | 0.21 | 0.02 | 823,644 | 14,414 | 107,615 | 878,506 | 0.0 | 0.00 | 623,644 | 0 | 0 | 44,475 | 922,981 |
| June | 24,861 | 745,830 | 0.04 | 0.00 | 823,644 | 2,745 | 20,536 | 788,366 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 809,406 |
| July | 24,661 | 770,891 | 0.03 | 0.00 | 823,644 | 13,727 | 102,681 | 848,511 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 917,847 |
| | | | | | | | | | | | | | Total | | 19,245,907 [B] |
| | | | | | | | | | | | | | | *Annual Total* | *59.07 [B] Acre-Ft.* |
| | | | | | | | | | | | | | | *Winter Months Total* | *35.46 [F] Acre-Ft.* |

| Month | [15] Evaporation (Inches) | [17] | [18] Area (sq ft.) | [19] | [20] Total Evaporation | [21] | [22] | [23] Percolation Application | [24] | [25] Percolation Field Area[C] | [25] | [27] Total Outflow | [28] Total Balance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | [18] + [19] | [17] x [20] | [21] x 7.48 | | | | [23] x [25] | [21] + [24] | [15] - [27] |
| | | | | | Area | Volume | | Rate Per Day | Rate Per Month | Rate | | Rate | Volume |
| | Inches[E] | Feet | Field[D] | Lagoon | Square feet | Cubic Feet | Gal per Month | Gallon / feet$^2$ x Day | Gallon / feet$^2$ x Days | Square feet | Gal per Month | Gallons per Month | Gallons per Month |
| August | 10.00 | 0.83 | 146,950 | 380,900 | 527,850 | 439,874 | 3,290,258 | 0.7 | 21.7 | 146,950 | 3,188,815 | 8,479,073 | -5,562,682 |
| September | 7.91 | 0.88 | 148,950 | 380,900 | 527,850 | 348,089 | 2,603,708 | 0.7 | 21 | 145,950 | 3,085,950 | 5,689,658 | -4,700,561 |
| October | 5.87 | 0.47 | 148,950 | 380,900 | 527,850 | 249,377 | 1,865,343 | 0.7 | 21.7 | 146,950 | 3,186,815 | 5,054,158 | -4,049,033 |
| November | 2.11 | 0.18 | 148,950 | 380,900 | 527,850 | 92,851 | 693,027 | 0 | 0 | 146,950 | 0 | 693,027 | 888,486 |
| December | 1.69 | 0.14 | 148,950 | 380,900 | 527,850 | 74,487 | 557,012 | 0 | 0 | 146,950 | 0 | 557,012 | 1,207,952 |
| January | 1.71 | 0.14 | 146,950 | 380,900 | 527,850 | 75,333 | 563,489 | 0 | 0 | 146,950 | 0 | 563,489 | 3,768,498 |
| February | 1.75 | 0.15 | 148,950 | 380,900 | 527,850 | 77,065 | 576,443 | 0 | 0 | 148,950 | 0 | 578,443 | 1,515,224 |
| March | 2.38 | 0.20 | 148,950 | 380,900 | 527,850 | 103,907 | 777,228 | 0 | 0 | 146,950 | 0 | 777,226 | 1,008,274 |
| April | 8.14 | 0.61 | 146,950 | 380,900 | 527,850 | 270,159 | 2,020,789 | 0.7 | 21 | 146,950 | 3,085,950 | 5,106,739 | -3,891,743 |
| May | 7.68 | 0.64 | 148,950 | 380,900 | 527,850 | 337,899 | 2,525,988 | 0.7 | 21.7 | 146,950 | 3,188,815 | 5,714,801 | -4,791,820 |
| June | 8.62 | 0.72 | 148,950 | 380,900 | 527,850 | 379,282 | 2,838,878 | 0.7 | 21 | 146,950 | 3,085,950 | 5,922,828 | -5,113,420 |
| July | 10.71 | 0.89 | 146,950 | 380,900 | 527,850 | 471,048 | 3,523,426 | 0.7 | 21.7 | 146,950 | 3,188,815 | 8,712,241 | -5,795,829 |
| | | | | | | | | | | | Total | 43,846,895 [B] | -25,518,835 |
| | | | | | | | | | | | | *Annual Total* | *134.57 [B] Acre-Ft.* |
| | | | | | | | | | | | | *Winter Months Total* | *9.72 [F] Acre-Ft.* |

[A] Calculation includes actual number of days in each month
[B] Annual totals are calculated January through December
[C] Assumes no percolation during winter months (Nov.-Mar.)
[D] Assumes field is barred for winter disposal. Null values are inserted if field cannot be used for winter disposal.
[E] Evaporation inches reduced 50% during winter months (Nov.-Mar.)
[F] Winter months totals are calculated November through March

| | | |
|---|---|---|
| TOTAL CAPACITY NEEDED ON DAIRY | 8,388,434 | Gallons |
| | 1,121,161 | Cubic Feet |
| | 25.74 | Acre-Ft. |

| | | |
|---|---|---|
| TOTAL AVAILABLE CAPACITY | 10,301,007 | Gallons |
| | 31.61 | Acre-Ft. |

## Inflow - Outflow Comparison Chart

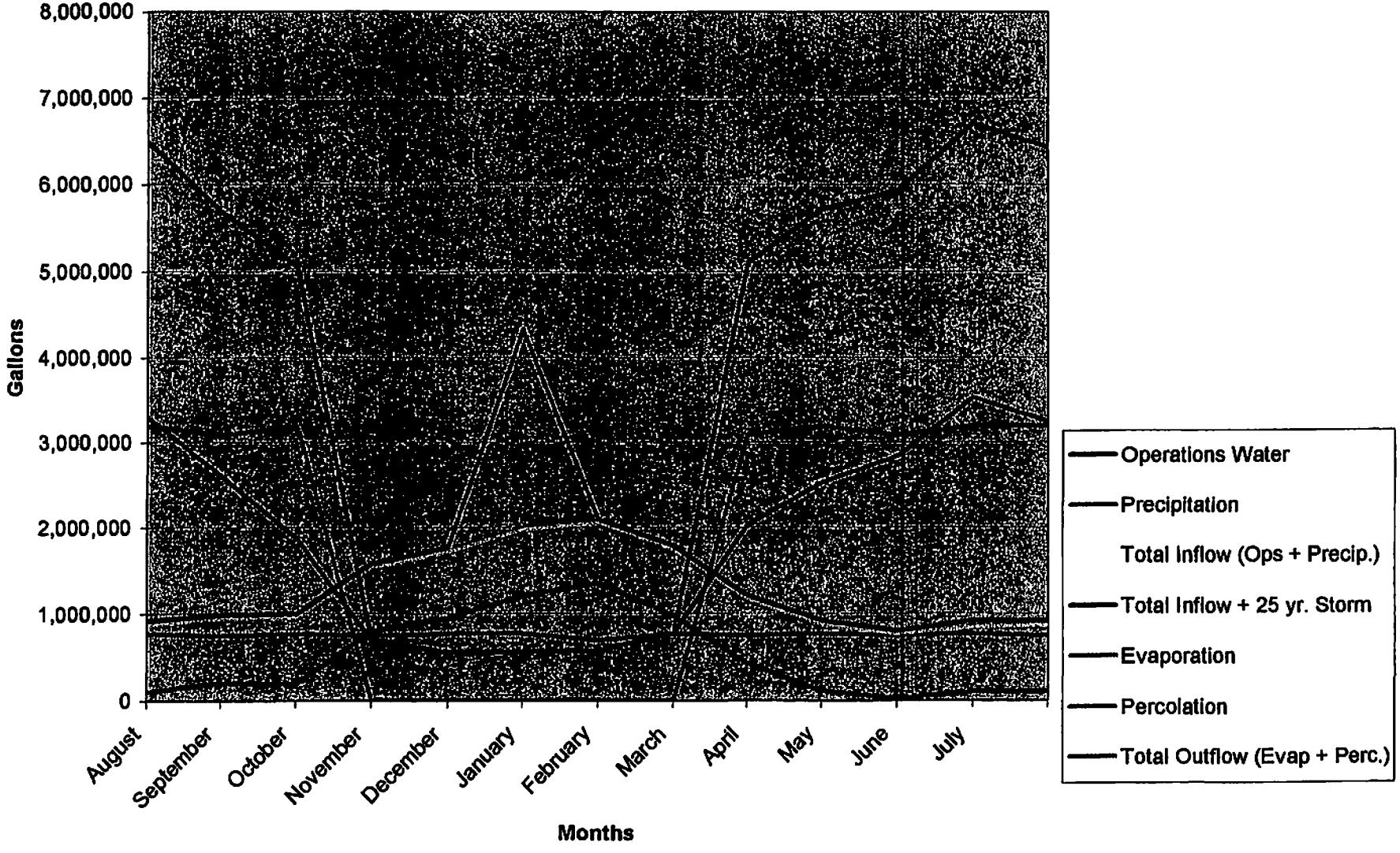

**Evaporation-vs-Percipitation Comparison Chart**

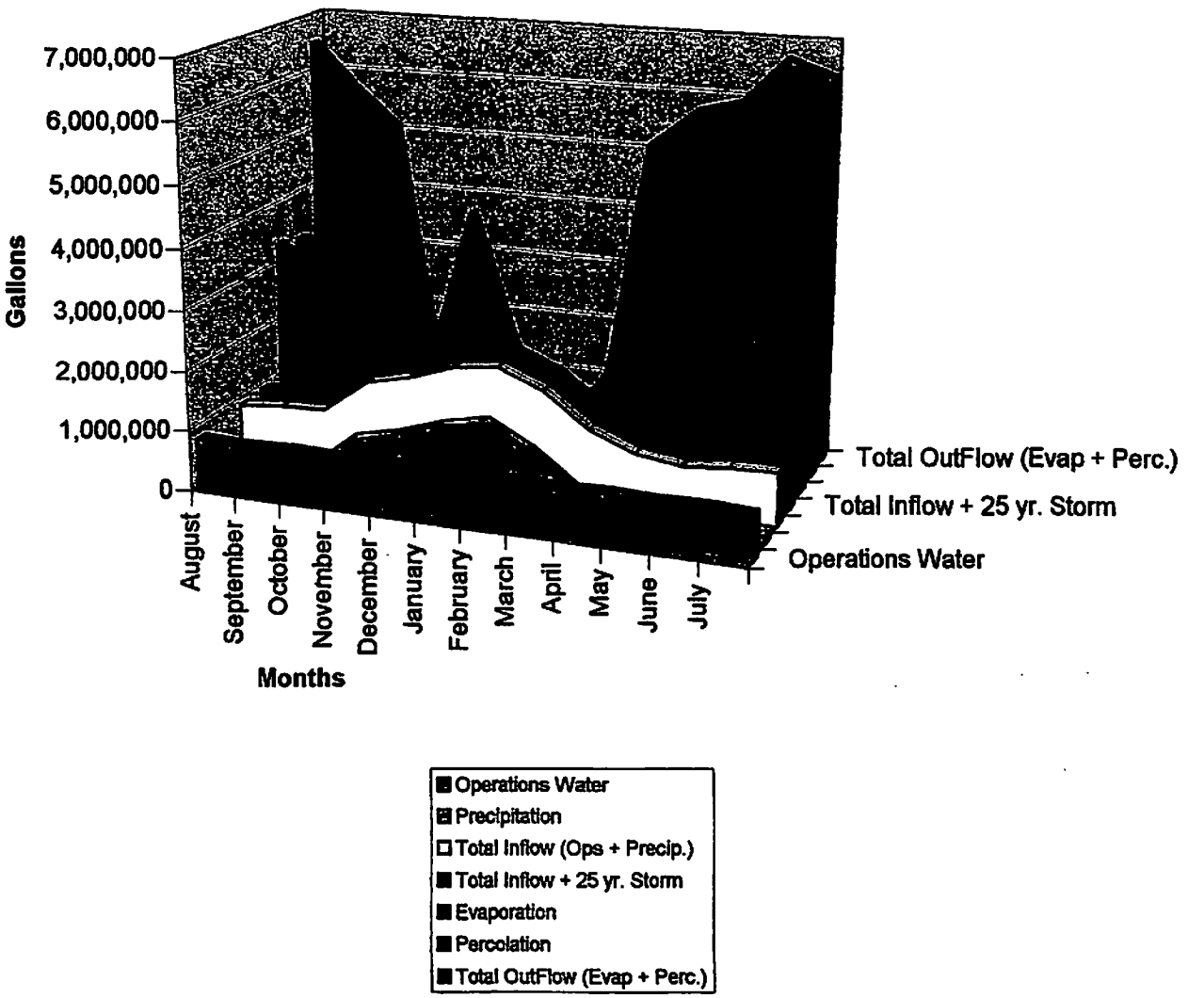

# APPENDIX C

## MILKHOUSE AND WASH PEN VOLUME ESTIMATION DATA

*University of California*
*Cooperative Extension*

# *Dairy Manure Management Series*

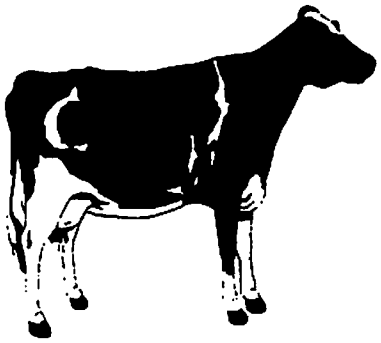

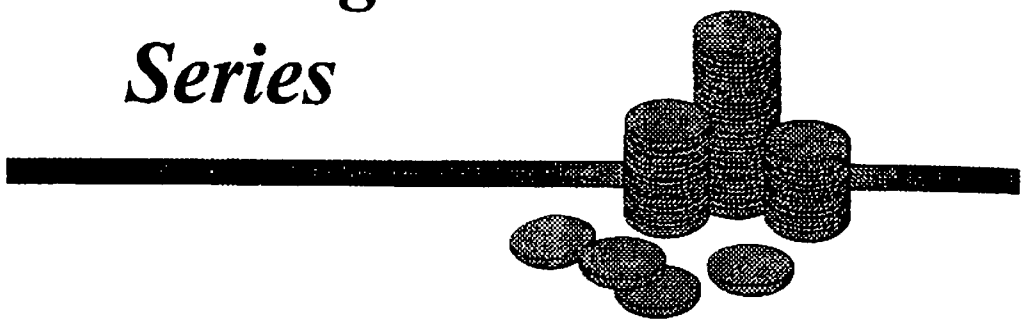

## PLANING AND DESIGNING DAIRY WASTE STORAGE FACILITIES

**Alison Van Eenennaam[1]**

A dairy waste management system must be planned, designed and managed to:

- Prevent water pollution
- Control odors
- Eliminate breeding places for insects
- Provide a convenient and efficient operation for the dairy owner/operator
- Require minimal investment, maintenance and operational costs
- Meet legal requirements.

Proper management of manure and waste water ensures further benefits in providing a healthy atmosphere for the animals. A facility that is clean, dry and free of manure provides a less desirable environment for disease organisms to thrive.

The purposes of this document are to:

- detail the factors to consider in designing a waste management storage facility;
- outline the major factors to be considered when designing dairy waste holding ponds; and
- provide an example of how to size a dairy manure holding pond.

[1]University of California Cooperative Extension Postdoctoral Associate.

## TABLES

**Table 1.** Waste produced daily by a 1,000 pound dairy cow and where it is deposited (2).

| Area | Percent | Cubic Feet |
|---|---|---|
| Housing area | 40 | .548 |
| Feeding area | 45 | .617 |
| Holding pen | 10 | .137 |
| Milk parlor | 5 | .068 |
| Total cubic feet/1,000 lb cow | | 1.370 |

**Table 2.** Volume of milkhouse and parlor water (2, and D. Johnson, NRCS, pers. comm.).

| Washing operation | Water Volume |
|---|---|
| Bulk Tank | |
| Automatic, 3 cycle wash | 60 to 110 gal/wash |
| Manual wash | 30 to 50 gal/wash |
| Pipeline | |
| In parlor (volume is higher for long flat barns) | 75 to 150 gal/wash |
| Milkhouse and parlor floors | 300 to 700 gal/wash |
| Pail milkers | 30 to 40 gal/wash |
| Miscellaneous equipment | 30 gal/day |
| Cow preparation wash | |
| Automatic | 1 to 4.5 gal/wash/cow |
| Manual | .25 to .5 gal/wash/cow |
| Holding pen (sprinklers) | 5 gal/min/head (dependent upon nozzle size & pressure) |

# APPENDIX D

RAINFALL DATA

# CORONA , CALIFORNIA (042031)

## 1961-1990 Monthly Climate Summary

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 67.40 | 69.40 | 71.10 | 75.20 | 79.40 | 85.10 | 91.80 | 92.10 | 88.70 | 82.30 | 70.80 | 67.40 | 78.60 |
| Average Max. Temperature (F) | 40.60 | 41.70 | 43.00 | 45.70 | 50.40 | 54.60 | 58.50 | 59.90 | 56.90 | 50.90 | 42.90 | 39.80 | 48.90 |
| Average Total Precipitation (in.) | 2.35 | 2.64 | 1.89 | 0.83 | 0.21 | 0.04 | 0.03 | 0.20 | 0.39 | 0.37 | 1.54 | 1.85 | 12.32 |

Unofficial values based on averages/sums of smoothed daily data. Information is computed from available daily data during the 1961-1990 period. Smoothing, missing data and observation-time changes may cause these 1961-1990 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made for missing data or time of observation. Check **NCDC normals** table for official data.

---

*Western Regional Climate Center,* wrcc@dri.edu

*Total Rainfall Winter Months:*

| November | | December | | January | | Febuary | | March | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1.54* | + | *1.85* | + | *2.35* | + | *2.64* | + | *1.89* | = | *10.27* | inches |

# CORONA, CALIFORNIA

## 1961 - 1990 Temperature and Precipitation

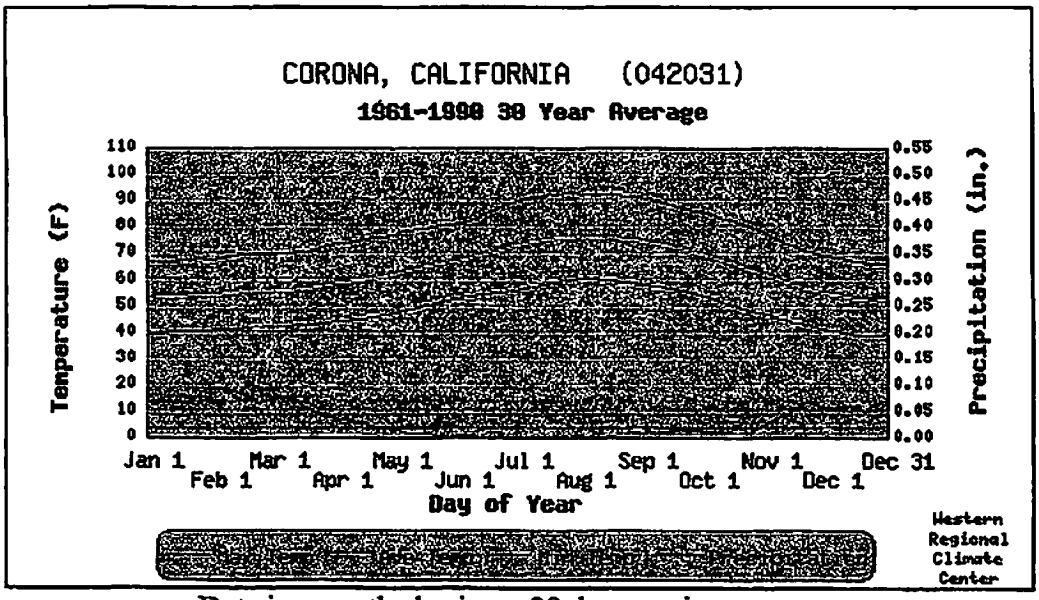


Data is smoothed using a 29 day running average.

■ - Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1961 and 1990.
■ - Ave. Temp. is the average of all daily average temperatures recorded for the day of the year the years 1961 and 1990.
■ - Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1961 and 1990.
■ - Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1961 and 1990.

# APPENDIX E

EVAPORATION DATA

State of California
The Resources Agency

Department of
Water Resources

save water
DWR

# Evaporation from Water Surfaces in California

Bulletin 73-79
November 1979

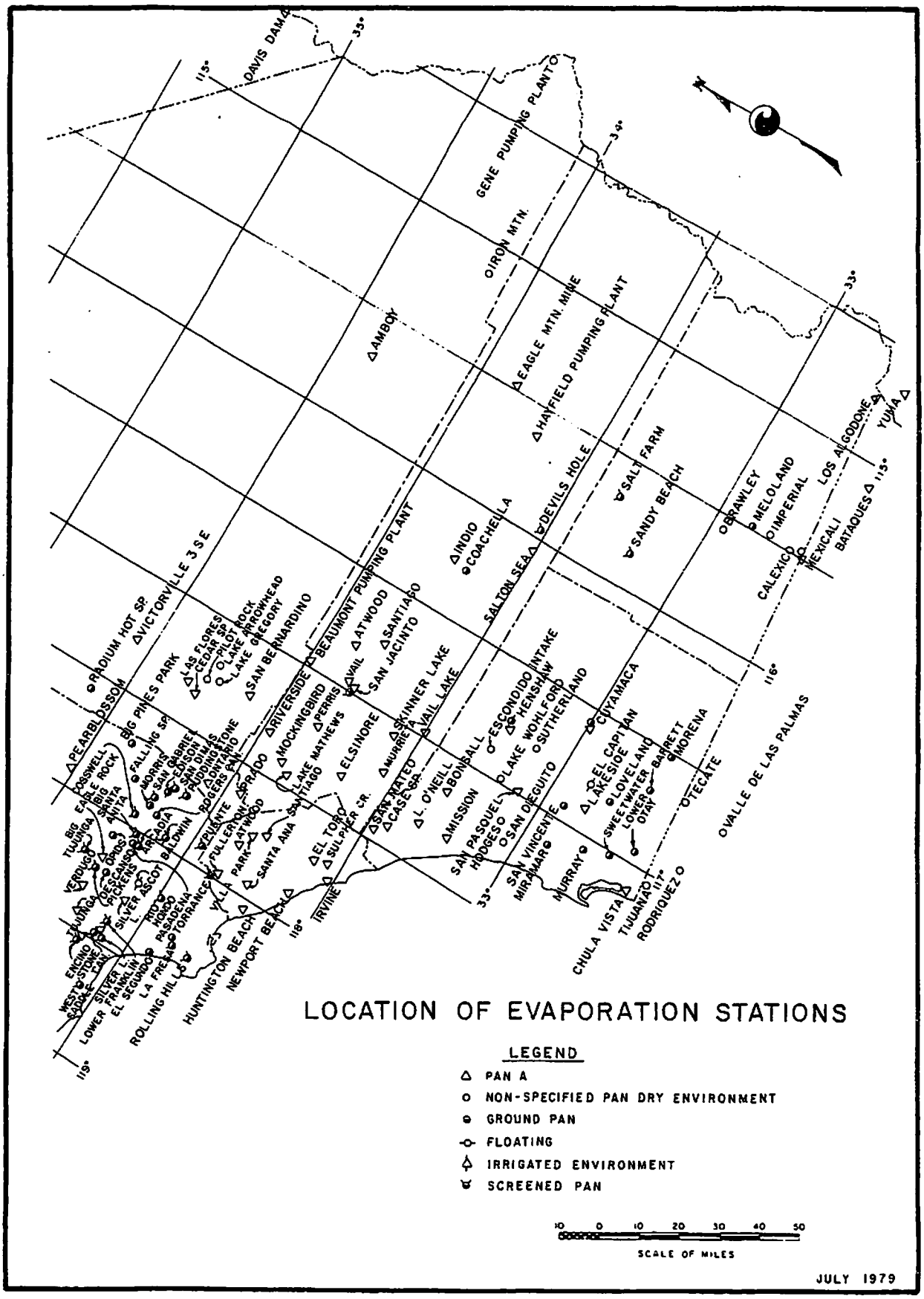
LOCATION OF EVAPORATION STATIONS
LEGEND
PAN A
NON-SPECIFIED PAN DRY ENVIRONMENT
GROUND PAN
FLOATING
IRRIGATED ENVIRONMENT
SCREENED PAN
10 0 10 20 30 40 50
SCALE OF MILES
JULY 1979
DAVIS DAM
GENE PUMPING PLANT
IRON MTN.
AMBOY
EAGLE MTN. MINE
HAYFIELD PUMPING PLANT
SALT FARM
SANDY BEACH
DEVILS HOLE
INDIO
COACHELLA
SALTON SEA
BEAUMONT PUMPING PLANT
VICTORVILLE 3 SE
RADIUM HOT SP.
PEARBLOSSOM
BIG PINES PARK
LAS FLORES
CEDAR SP.
PILOT ROCK
LAKE ARROWHEAD
LAKE GREGORY
SAN BERNARDINO
RIVERSIDE
PERRIS
AVAIL
ATWOOD
SANTIAGO
SAN JACINTO
SKINNER LAKE
AVAIL LAKE
ESCONDIDO INTAKE
HENSHAW
LAKE WOHLFORD
SUTHERLAND
CUYAMACA
EL CAPITAN
LAKESIDE
LOVELAND
SWEETWATER
LOWER OTAY
BARRETT
MORENA
OTECATE
VALLE DE LAS PALMAS
BRAWLEY
MELOLAND
IMPERIAL
CALEXICO
MEXICALI
LOS ALGODONES
YUMA
BATAQUES
MOSSWELL
EAGLE ROCK
BIG TUJUNGA
SANTA ANITA
FALLING SP.
MORRIS
SAN GABRIEL
EDISON
SAN DIMAS
FLUDDINGTONE
ONTARIO
ROGERS PAN
PRADO
MOCKINGBIRD
LAKE MATHEWS
SANTIAGO
ELSINORE
MURRIETA
VERDUGO
GRIDS
PICKENS
ARCADIA
BALDWIN
PUENTE
FULLERTON
ATWOOD
PARK
SANTA ANA
EL TORO
SULPHUR CR.
SAN MATEO
CASESA
L. O'NEILL
BONSALL
MISSION
SAN PASQUEL
HODGES
SAN DIEGUITO
SAN VINCENTE
MIRAMAR
MURRAY
CHULA VISTA
TIJUANA
RODRIQUEZ
ENCINO
WESTSTONE
SADDLE PAK
SILVER LAKE
LOWER FRANKLIN
EL SEGUNDO
SILVER
L. ASCOT
PICO
HOOD
PASADENA
TORRANCE
LA FREE
ROLLING HILLS
HUNTINGTON BEACH
NEWPORT BEACH
IRVINE
33°
34°
115°
116°
117°
118°

EVAPORATION MEASUREMENT REPORT
UNIT OF MEASURE = MILLIMETRES



| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 705010 | POMONA (NEAR)-AGR EXPT ST | 857 | 01S 09W 27 S | 34 03 | 117 49 | LAX | 907 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | 1903 | | | | | | | | | | | 230 | 238 | 160 |
| | 1904 | 1729 | 168 | 108 | 64 | 71 | 65 | 94 | 127 | 165 | 208 | 237 | 238 | 184 |
| | 1905 | 1597 | 136 | 103 | 75 | 49 | 42 | 95 | 104 | 152 | 196 | 227 | 229 | 189 |
| | 1906 | | 134 | 103 | 75 | | | | | | | | | |
| G | MEAN | 1552 | 146 | 105 | 71 | 60 | 54 | 95 | 116 | 159 | 202 | 231 | 235 | 178 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 705011 | POMONA SPRR | 876 | 01S 08W 29 S | 34 03 17 | 117 45 02 | LAX | 410 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1933 | | | | | | | | | | | 306 | 272 | 183 |
| | 1934 | | 157 | 170 | 73 | 118 | 84 | 178 | 200 | 259 | | 314 | 282 | 251 |
| A | MEAN | 2043 | 157 | 170 | 73 | 118 | 84 | 178 | 200 | 259 | | 310 | 277 | 217 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 712301 | PRADO DAM | 565 | 03S 07W 20 P S | 33 53 30 | 117 38 03 | RIV | 415 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1930 | | | | | | | | | | | 279 | 250 | |
| | 1931 | | | 128 | 97 | 102 | 62 | 146 | 154 | 197 | 232 | 293 | 250 | 194 |
| | 1932 | 1914 | 137 | 90 | 64 | 107 | 94 | 131 | 153 | 208 | 232 | 253 | 266 | 179 |
| | 1933 | 1942 | 152 | 137 | 70 | 30 | 112 | 134 | 138 | 191 | 229 | 270 | 241 | 188 |
| | 1934 | 1346 | 130 | 113 | 57 | 100 | 69 | 124 | 161 | 232 | 182 | 257 | 225 | 196 |
| | 1935 | 1630 | 119 | 65 | 52 | 52 | 69 | 90 | 118 | 170 | 216 | 266 | 227 | 186 |
| | 1936 | 1916 | 139 | 86 | 85 | 82 | 78 | 115 | 132 | 197 | 258 | 285 | 256 | 203 |
| | 1937 | 1737 | 130 | 105 | 69 | 41 | 58 | 93 | 148 | 171 | 231 | 256 | 230 | 205 |
| | 1938 | | 139 | 70 | 77 | | | | | | 45 | 255 | 235 | 197 |
| | 1939 | 1789 | 137 | 151 | 90 | 68 | 87 | 91 | 138 | 179 | 217 | 241 | 221 | 169 |
| | 1940 | 1533 | 135 | 70 | 57 | 41 | 70 | 114 | 105 | 174 | 165 | 215 | 204 | 163 |
| | 1941 | 1771 | 114 | 99 | 54 | 66 | 61 | 114 | 135 | 225 | 225 | 281 | 221 | 176 |
| | 1942 | 2245 | 148 | 136 | 72 | 117 | 109 | 177 | 131 | 269 | 243 | 315 | 308 | 220 |
| | 1943 | 2297 | 178 | 148 | 104 | 146 | 130 | 110 | 148 | 242 | 262 | 307 | 288 | 234 |
| | 1944 | 2105 | 166 | 166 | 107 | 114 | 81 | 182 | 178 | 211 | 236 | 272 | 229 | 163 |
| | 1945 | 2034 | 148 | 91 | 88 | 49 | 87 | 133 | 192 | 219 | 218 | 296 | 278 | 235 |
| | 1946 | 2073 | 116 | 117 | 81 | 113 | 125 | 80 | 200 | 168 | 275 | 319 | 301 | 178 |
| | 1947 | 2081 | 154 | 94 | 60 | 100 | 77 | 129 | 195 | 204 | 245 | 312 | 284 | 227 |
| | 1948 | 2167 | 146 | 120 | 98 | 144 | 106 | 114 | 179 | 210 | 223 | 288 | 290 | 249 |
| | 1949 | 2095 | 141 | 188 | 93 | 93 | 65 | 90 | 178 | 191 | 258 | 280 | 288 | 230 |
| | 1950 | 2017 | 167 | 136 | 83 | 68 | 51 | 139 | 164 | 197 | 248 | 302 | 272 | 190 |
| | 1951 | 2139 | 188 | 138 | 69 | 93 | 86 | 191 | 151 | 179 | 228 | 311 | 283 | 222 |
| | 1952 | 2080 | 201 | 118 | 81 | 67 | 115 | 123 | 136 | 230 | 229 | 294 | 275 | 211 |
| | 1953 | 2081 | 135 | 88 | 76 | 106 | 134 | 155 | 154 | 233 | 241 | 304 | 253 | 202 |
| | 1954 | 1978 | 140 | 84 | 167 | 67 | 122 | 97 | 130 | 186 | 203 | 262 | 220 | 200 |
| | 1955 | 1924 | 149 | 104 | 92 | 63 | 94 | 137 | 186 | 165 | 198 | 255 | 260 | 221 |
| | 1956 | 1829 | 116 | 88 | 42 | 55 | 89 | 142 | 179 | 181 | 227 | 260 | 226 | 224 |
| | 1957 | 2057 | 155 | 158 | 128 | 66 | 65 | 78 | 148 | 190 | 255 | 306 | 292 | 216 |
| | 1958 | 1950 | 119 | 92 | 94 | 103 | 64 | 49 | 182 | 202 | 275 | 276 | 253 | 241 |
| | 1959 | 2089 | 160 | 123 | 118 | 78 | 68 | 168 | 172 | 195 | 238 | 304 | 268 | 197 |
| | 1960 | 2270 | 169 | 181 | 120 | 53 | 100 | 125 | 185 | 218 | 242 | 325 | 288 | 264 |
| | 1961 | 2273 | 169 | 63 | 124 | 147 | 133 | 146 | 196 | 225 | 254 | 311 | 300 | 205 |
| | 1962 | 1589 | 138 | 95 | 98 | 118 | 33 | 73 | 134 | 145 | 172 | 220 | 221 | 142 |
| | 1963 | 1558 | 91 | 69 | 67 | 81 | 79 | 97 | 102 | 162 | 190 | 235 | 220 | 165 |
| | 1964 | 1672 | 102 | 82 | 99 | 111 | 141 | 112 | 146 | 166 | 181 | 185 | 192 | 155 |
| | 1965 | 1614 | 123 | 108 | 83 | 71 | 106 | 72 | 157 | 159 | 190 | 171 | 222 | 152 |
| | 1966 | 1811 | 144 | 46 | 60 | 76 | 85 | 124 | 163 | 173 | 215 | 267 | 249 | 209 |
| | 1967 | 2045 | 196 | 73 | 136 | 107 | 121 | 130 | 125 | 209 | 201 | 271 | 274 | 202 |
| | 1968 | 1850 | 177 | 68 | 101 | 88 | 65 | 118 | 166 | 191 | 202 | 203 | 248 | 223 |
| | 1969 | | 117 | 89 | 51 | 75 | | | | 138 | 156 | | | |
| A | MEAN | 1930 | 144 | 107 | 86 | 87 | 89 | 120 | 156 | 195 | 219 | 272 | 254 | 201 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 747300 | RIVERSIDE CITRUS EXP | 1015 | 02S 04W 30 K S | 33 58 00 | 117 20 05 | RIV | 900 | D |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1925 | | | | | 90 | 67 | 127 | 134 | 166 | 213 | 269 | 242 | 182 |
| | 1926 | 1773 | 58 | 128 | 75 | 112 | 97 | 123 | 116 | 200 | 189 | 230 | 237 | 178 |
| | 1927 | 1609 | 150 | 65 | 48 | 30 | 24 | 105 | 102 | 193 | 193 | 253 | 262 | 184 |
| | 1928 | 1756 | 143 | 96 | 50 | 65 | 114 | 99 | 171 | 146 | 193 | 242 | 240 | 197 |
| | 1929 | 1656 | 119 | 82 | 72 | 61 | 60 | 105 | 117 | 175 | 219 | 256 | 253 | 137 |
| | 1930 | 1665 | 140 | 139 | 91 | 45 | 56 | 99 | 138 | 148 | 195 | 241 | 216 | 157 |
| | 1931 | 1806 | 126 | 106 | 75 | 72 | 124 | 145 | 149 | 178 | 191 | 248 | 237 | 155 |
| | 1932 | | 109 | 68 | 46 | | | 133 | 149 | 155 | 155 | 227 | 220 | 147 |
| | 1933 | 1546 | 100 | 101 | 54 | 60 | 91 | 122 | 97 | 160 | 191 | 227 | 202 | 141 |
| | 1934 | 1763 | 115 | 129 | 45 | 99 | 64 | 120 | 188 | 215 | 170 | 232 | 217 | 169 |
| | 1935 | 1508 | 110 | 67 | 55 | 51 | 64 | 85 | 118 | 164 | 203 | 225 | 203 | 163 |
| | 1936 | 1603 | 120 | 75 | 61 | 60 | 65 | 106 | 137 | 188 | 208 | 210 | 207 | 166 |
| | 1937 | 1499 | 112 | 85 | 41 | 35 | 52 | 100 | 152 | 145 | 195 | 195 | 209 | 178 |
| | 1938 | 1584 | 127 | 59 | 67 | 76 | 62 | 92 | 139 | 176 | 182 | 219 | 209 | 176 |
| | 1939 | 1630 | 115 | 99 | 65 | 59 | 81 | 94 | 144 | 173 | 212 | 228 | 214 | 146 |
| | 1940 | 1765 | 149 | 71 | 69 | 68 | 101 | 120 | 166 | 198 | 189 | 241 | 216 | 177 |
| | 1941 | 1529 | 153 | 108 | 52 | 39 | 44 | 96 | 156 | 165 | 181 | 236 | 164 | 135 |
| | 1942 | 1671 | 134 | 75 | 82 | 64 | 77 | 129 | 114 | 193 | 183 | 251 | 215 | 154 |
| | 1943 | 1591 | 113 | 81 | 59 | 74 | 76 | 82 | 117 | 187 | 198 | 217 | 212 | 175 |
| | 1944 | 1548 | 111 | 94 | 51 | 56 | 62 | 134 | 132 | 158 | 168 | 203 | 226 | 153 |
| | 1945 | 1503 | 106 | 64 | 55 | 55 | 67 | 94 | 144 | 171 | 165 | 218 | 196 | 168 |
| | 1946 | 1575 | 107 | 81 | 47 | 91 | 71 | 105 | 137 | 135 | 211 | 205 | 215 | 170 |

# APPENDIX F

PERCOLATION DATA

NOLTE

## SOILS SURVEY

**Percolation Data:**

| *Soil Series* [1] | *Type* [1] | *USDA Texture* [1] | *Depth from Surface* | *Soils Table* [1] | *Soils Survey Map* [1] |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | | |
| 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | | |

**Table 13-9** [2]

| Recommended rates of wastewater application for Trench and Bed Bottom Areas [a] | | |
|---|---|---|
| Soil Texture | Percolation rate, min/in | *Application rate, gal / ft² x d* [b,c] |
| Gravel, coarse sand | <1 | Not Suitable [d] |
| Coarse to medium sand | 1-5 | 1.20 |
| Fine sand, loamy sand | 5-15 | 0.80 |
| Sand loam, loam | 16-30 | 0.60 |
| Loam, porous silt loam | 31-60 | 0.45 |
| Silty clay loam, clay loam [a,f] | 61-120 | 0.20 |
| Clays, colloidal clays | >120 | Not Suitable [g] |

Use Application Rate of 0.7 to Fit B/Re( Classification"

[a] From U.S. EPA (1980).

[b] Rates based on septic tank effluent from a domestic waste source. A factor of safety may be desirable for wastewater's of significantly different strength or character.

[c] May be suitable for sidewall infiltration rates.

[d] Soils with percolation rates less than 1 min/in may be suitable for septic tank effluent if a 2ft layer of loamy sand or other soil is placed above or in place of the native topsoil.

[e] These soils are suitable if they are without significant amounts of expandable clays.

[f] Soil easily damaged during construction.

[g] Alternative pretreatment may be needed and alternative disposal (wetlands or evaporation systems) may be required.

Bibliography:


1 Refer to Pecolation Appendix

2 Crites & Tchobanoglous, "Small and Decentralized Wastewater Management Systems", McGraw-Hill, Boston, 1998

SOIL SURVEY OF

# San Bernardino County Southwestern Part, California

United States Department of Agriculture
Soil Conservation Service
in cooperation with
University of California
Agricultural Experiment Station

TABLE 4.—*Estimated soil properties*

[Absence of information indicates that a determination was not made or that it would not be applicable. The symbol > means made up of two or more kinds of soil. The soils in such mapping units have different properties and limitations and for this reason

| Soil series and map symbols | Depth to bedrock or hardpan | Depth from surface of typical profile | (Typical profile) USDA texture | Classification | | Coarse fraction greater than 3 inches | Percentage less than 3 in. passing sieve— | |
|---|---|---|---|---|---|---|---|---|
| | | | | Unified | AASHTO | | No. 4 (4.7 mm) | No. 10 (2.0 mm) |
| | *Feet* | *Inches* | | | | | | |
| Alo: AaF | 2–3 | 0–36 | Clay | CH, CL | A–7 | | 100 | 100 |
| | | 36 | Shale and sandstone. | | | | | |
| Chino: Cb | >5 | 0–16 | Silt loam | ML, CL-ML | A–4 | | 100 | 100 |
| | | 16–60 | Silty clay loam | CL | A–6 | | 100 | 100 |
| Chualar: CkA, CkC, CkD | >5 | 0–36 | Clay loam | CL | A–6 | | 100 | 100 |
| | | 36–60 | Loam | CL, CL-ML | A–4 | | 100 | 100 |
| *Cieneba: CnD, Cp, Cr. For properties of Friant soils in Cp, refer to Friant series. | 1–1½ | 0–14 | Sandy loam | SM | A–2 | 0–10 | 90–100 | 90–100 |
| | | 14 | Weathered granitic rock. | | | | | |
| Crafton: Cs2 | 1½–3 | 0–26 | Sandy loam | SM | A–2 | 0–15 | 80–100 | 75–100 |
| | | 26 | Weathered micaceous schist. | | | | | |
| Delhi: Db | >5 | 0–18 | Fine sand | SM | A–2 | | 100 | 95–100 |
| | | 18–60 | Sand | SP-SM or SW-SM | A–3 | | 100 | 90–100 |
| Fontana: FoE, FoF | 2–3 | 0–28 | Clay loam, some shale fragments. | CL | A–6 | 0–10 | 85–100 | 70–95 |
| | | 28 | Weathered fractured shale. | | | | | |
| Friant: Fr | 1–1½ | 0–14 | Fine sandy loam | SM | A–4 | | 95–100 | 80–95 |
| | | 14 | Hard mica schist. | | | | | |
| Garretson: GaC | >5 | 0–7 | Very fine sandy loam | ML | A–4 | | 100 | 100 |
| | | 7–28 | Loam | CL-ML, CL | A–4 | | 100 | 100 |
| | | 28–34 | Fine sandy loam | SM | A–4 | | 95–100 | 90–100 |
| | | 34–42 | Gravelly sandy loam | SM | A–2 | | 65–90 | 65–80 |
| | | 42–60 | Loam | CL-ML, CL | A–4 | | 100 | 100 |
| Gaviota: Go | 1–1½ | 0–15 | Fine sandy loam | SM | A–4 | 0–5 | 95–100 | 80–95 |
| | | 15 | Hard sandstone. | | | | | |
| Grangeville: | | | | | | | | |
| Gr | >5 | 0–60 | Fine sandy loam | SM | A–4 | | 100 | 100 |
| Gs | | 0–60 | Fine sandy loam | SM | A–4 | | 100 | 100 |
| Greenfield: | | | | | | | | |
| GtC, GtD | >5 | 0–16 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| | | 16–50 | Fine sandy loam | SM | A–4 | | 95–100 | 85–100 |
| | | 50–60 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| GuD | >5 | 0–16 | Cobbly sandy loam | SM | A–2 | 25–40 | 90–100 | 85–95 |
| | | 16–50 | Fine sandy loam | SM | A–4 | | 95–100 | 85–100 |
| | | 50–60 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| Hanford: HaC, HaD, HbA | >5 | 0–60 | Sandy loam | SM | A–2 | | 100 | 90–100 |
| Hilmar: Hr | >5 | 0–23 | Loamy fine sand and loamy sand. | SM | A–2 | | | 95–100 |
| | | 23–60 | Stratified loam.[2] | CL-ML, CL | A–4 | | 100 | 100 |
| Merrill: Me | 2–3½ | 0–25 | Silt loam | CL-ML or ML | A–4 | | 100 | 95–100 |
| | | 25–43 | Loam that is 25 to 50 percent extremely hard lime nodules. | GM | A–4 or A–2 | 0–5 | 40–70 | 35–65 |
| | | 43–60 | Loam | CL-ML or CL | A–4 | | 100 | 95–100 |
| Metz: MgC | >5 | 0–19 | Coarse sandy loam | SM | A–2 | | 95–100 | 90–100 |
| | | 19–60 | Gravelly sand and loamy coarse sand. | SM | A–1 | | 70–80 | 55–75 |
| Monserate: MoC | 2½–3 | 0–10 | Sandy loam | SM | A–2, A–4 | | 100 | 100 |
| | | 10–30 | Clay loam | CL | A–6 | | 100 | 100 |
| | | 30–45 | Indurated hardpan | | | | | |
| | | 45–60 | Coarse sandy loam | SM | A–2 | | 95–100 | 90–100 |

## Hilmar Series

The Hilmar series consists of somewhat poorly drained, nearly level soils on alluvial valley floors and fans. These soils formed in wind-laid coarse-textured material underlain by medium-textured granitic alluvium. Slopes are 0 to 2 percent. Elevation is 600 to 900 feet. Vegetation is annual grasses and forbs. The average annual precipitation is 12 to 16 inches, the mean annual air temperature is 62° to 65° F, and the frost-free season is 230 to 280 days.

In a representative profile, the surface layer is grayish-brown loamy fine sand about 13 inches thick. The underlying material, to a depth of 23 inches, is light yellowish-brown and grayish-brown loamy sand. Below this, to a depth of 60 inches, it is light brownish-gray mottled loam stratified with thin lenses of sandy loam and loamy sand. Hilmar soils are moderately alkaline throughout the profile and are slightly calcareous in the upper 23 inches and strongly calcareous below.

In these soils the surface layer and the upper part of the underlying material that formed in coarse-textured material are rapidly permeable. The lower part of the underlying material that formed in medium-textured material is slowly permeable. Available water capacity is about 7 to 9 inches. Roots penetrate to a depth of 60 inches or more. Originally the soils were somewhat poorly drained, but the drainage has been altered by lowering the ground water table through pumping.

These soils are used mainly for such irrigated crops as grapes, alfalfa, pasture plants, and small grains.

Representative profile of Hilmar loamy fine sand, about 100 feet south of Edison Road and about 200 feet west of Cucamonga Creek, SE¼NW¼NW¼ sec. 22, T. 2 S., R. 7 W; San Bernardino base line and meridian:

Ap—0 to 13 inches, grayish-brown (2.5Y 5/2) loamy fine sand, very dark grayish brown (2.5Y 3/2) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; many very fine and fine roots; slightly effervescent; moderately alkaline; gradual, smooth boundary.

C1—13 to 16 inches, light yellowish-brown (2.5Y 6/4) loamy sand, light olive brown (2.5Y 5/4) when moist; few, fine, distinct, brownish-yellow (10YR 6/6) mottles, yellowish brown (10YR 5/6) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline; gradual, smooth boundary.

C2—16 to 23 inches, grayish-brown (2.5Y 5/2) loamy sand, light brownish gray (2.5Y 6/2) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline; abrupt, smooth boundary.

IIC3—23 to 60 inches, light brownish-gray (2.5Y 6/2) loam stratified with thin lenses of sandy loam and loamy sand, grayish brown (2.5Y 5/2) when moist; common, medium, distinct, brownish-yellow (10YR 6/6) mottles, yellowish brown (10YR 5/6) when moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; strongly effervescent; moderately alkaline.

The A horizon is grayish brown, dark grayish brown, or brown loamy fine sand or loamy sand. The soil material is dominantly single grained but has weak, very fine to fine, subangular blocky structure in small areas, and in some places it is massive. The soil material is slightly effervescent but is strongly effervescent in a few spots. The A horizon ranges from 8 to 14 inches in thickness but is 13 inches thick in most places.

The C horizon is generally light yellowish brown to grayish brown, but in a few places it is light brownish gray. Yellowish-brown, brownish-yellow, or dark yellowish-brown mottles are common. They range from few to common in abundance, fine to medium in size, and faint to distinct in contrast. The C horizon is loamy sand or loamy fine sand. The soil material is typically single grained, but in some places it is massive. Lime content varies from slight to strong. Thickness is about 10 inches but ranges from 8 to 12 inches.

The IIC horizon is light brownish gray, grayish brown, or light gray. Brownish-yellow or yellowish-brown mottles range from common to many in abundance, fine to medium in size, and distinct to prominent in contrast. The IIC horizon is generally loam that has thin lenses of sandy loam, coarse sandy loam, or loamy sand, but in a few places, it is clay loam or silt loam stratified with thin lenses of coarse-textured material. The IIC horizon is typically massive, but in some places it has weak, moderate, subangular blocky structure. Reaction ranges from mildly alkaline to strongly alkaline.

**Hilmar loamy fine sand (Hr).**—This nearly level soil is on valley floors and alluvial fans. Included with it in mapping are areas of Delhi fine sand that make up about 10 percent of each area. Also included are patches of Tujunga loamy sand, 0 to 5 percent slopes, and small areas where slopes are 2 or 3 percent.

Runoff is slow, and the hazard of water erosion is slight. If the soils are left without a protective cover of vegetation, the hazard of soil blowing is high.

The Hilmar soil is used chiefly for irrigated alfalfa, grapes, small grains, and pasture plants. Capability unit IIe-4 irrigated.

## Merrill Series

The Merrill series consists of somewhat poorly drained, nearly level soils that formed on alluvial fans in medium-textured granitic alluvium. Slopes are 0 to 2 percent, elevation is 500 to 700 feet. Vegetation is mainly annual grasses and forbs, but perennial grasses grow in some areas. The average annual precipitation is 12 to 16 inches, the mean annual air temperature is 62° to 65° F, and the frost-free season is 230 to 280 days.

In a representative profile, the surface layer is gray silt loam about 25 inches thick. The underlying material, to a depth of 43 inches, is light-gray loam that is weakly cemented and contains many extremely hard silica-lime cemented nodules. Below this the underlying material is light brownish-gray loam that extends to a depth of 60 inches or more. Merrill soils are strongly calcareous and moderately alkaline throughout their profile.

These soils are slowly permeable. Their available water capacity is 4 to 7 inches. Roots can penetrate to a depth of 25 to 40 inches. Drainage has been altered on these soils by pumping ground water for irrigation.

These soils are used for such irrigated crops as pasture plants, alfalfa, small grains, and some truck crops.

Representative profile of Merrill silt loam, about 300 feet northwest of Eucalyptus and Central Avenue;

SHEET NO. 11

SAN BERNARDINO COUNTY, SOUTHWESTERN PART, CALIFORNIA

(PRADO DAM)

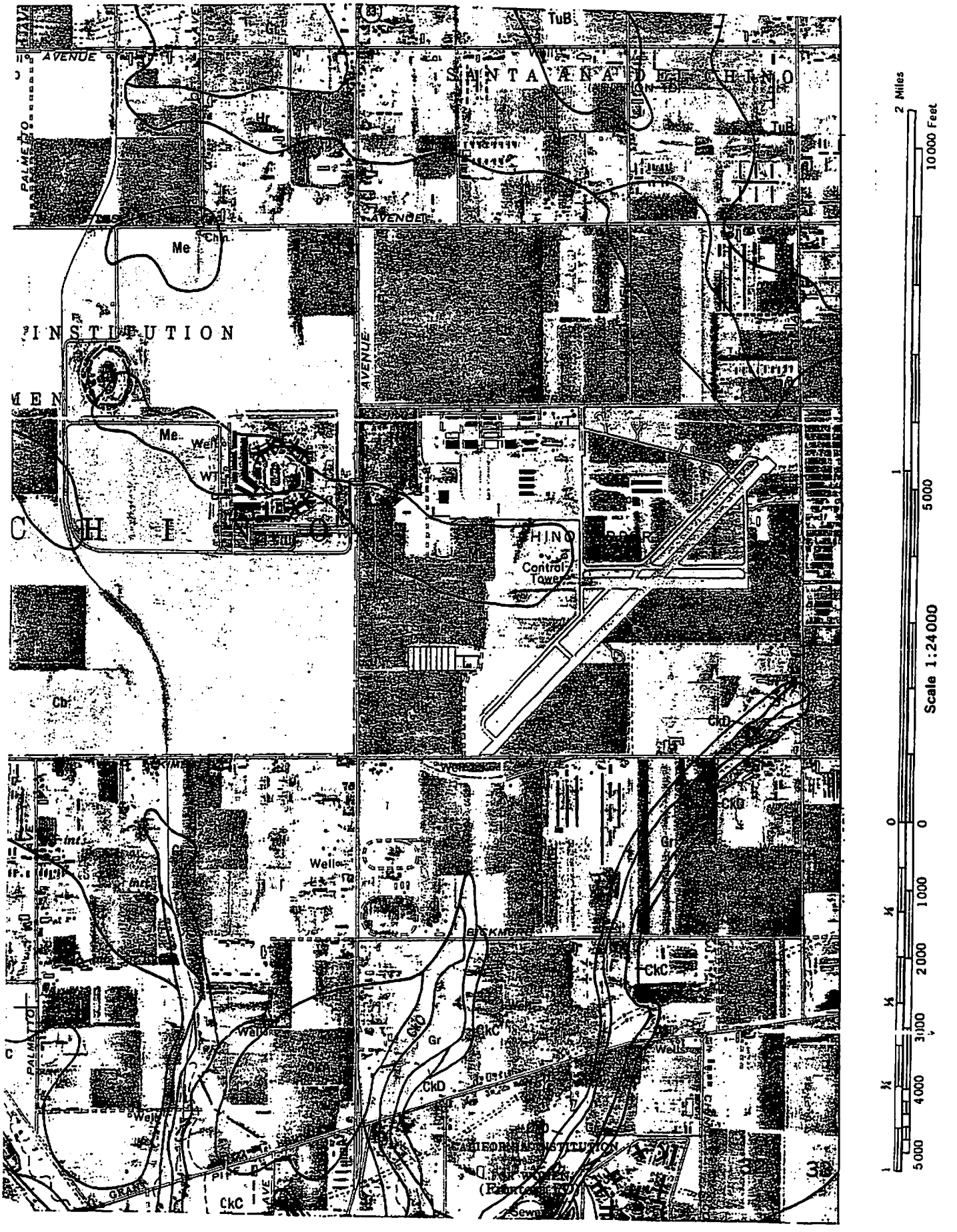


U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

# APPENDIX G

24 HOUR – 25 YEAR STORM DATA

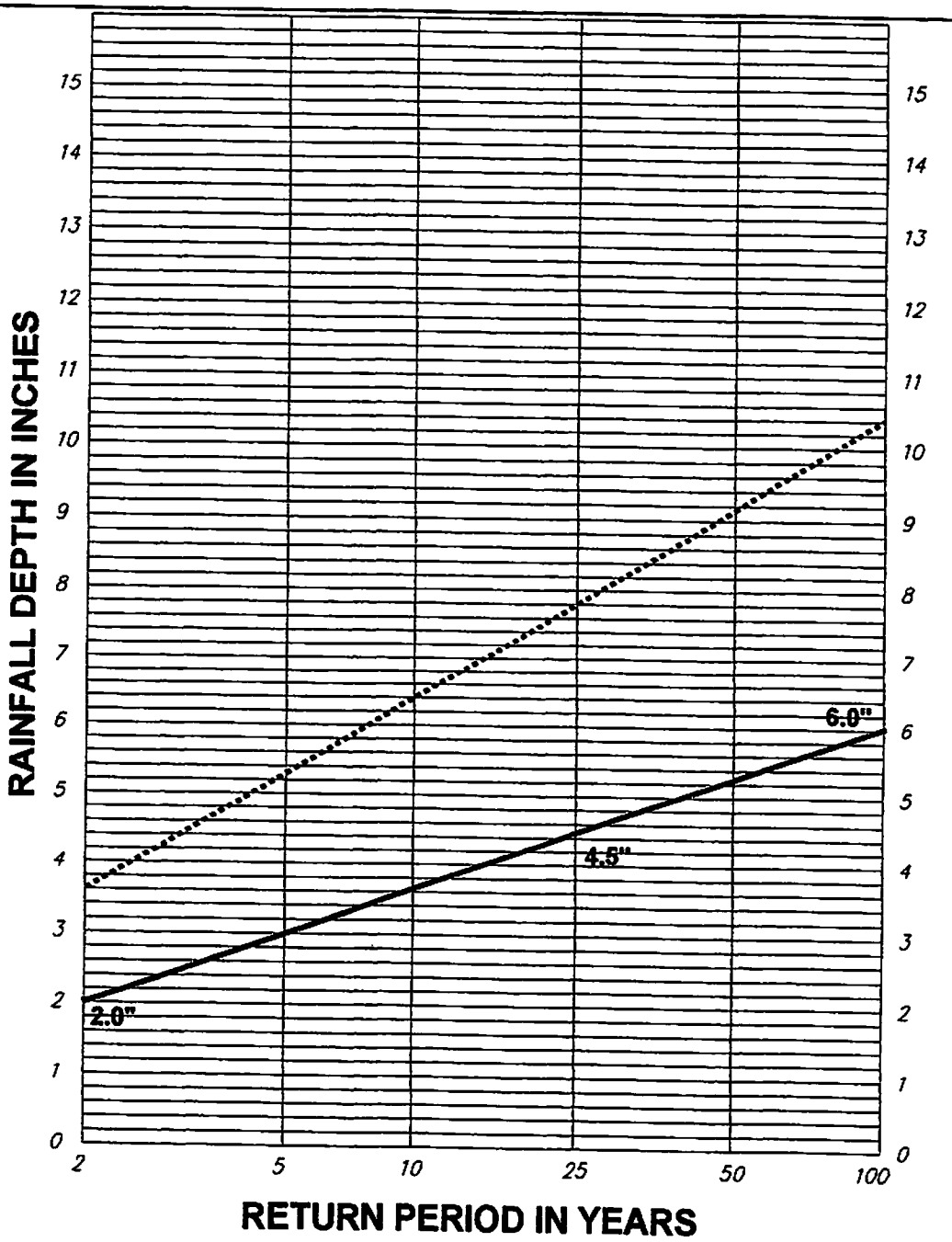


NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for specific duration, then connect points and read value for desired return periond. For example given 2-year 24-hour = 3.5"' and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

Reference: NOAA atlas 2, Volume XI - California, 1973

**RCFC & WCD**

**Hydrology Manual**

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

PLATE E-5.7

# APPENDIX H

100 YEAR FLOOD PLAIN DATA

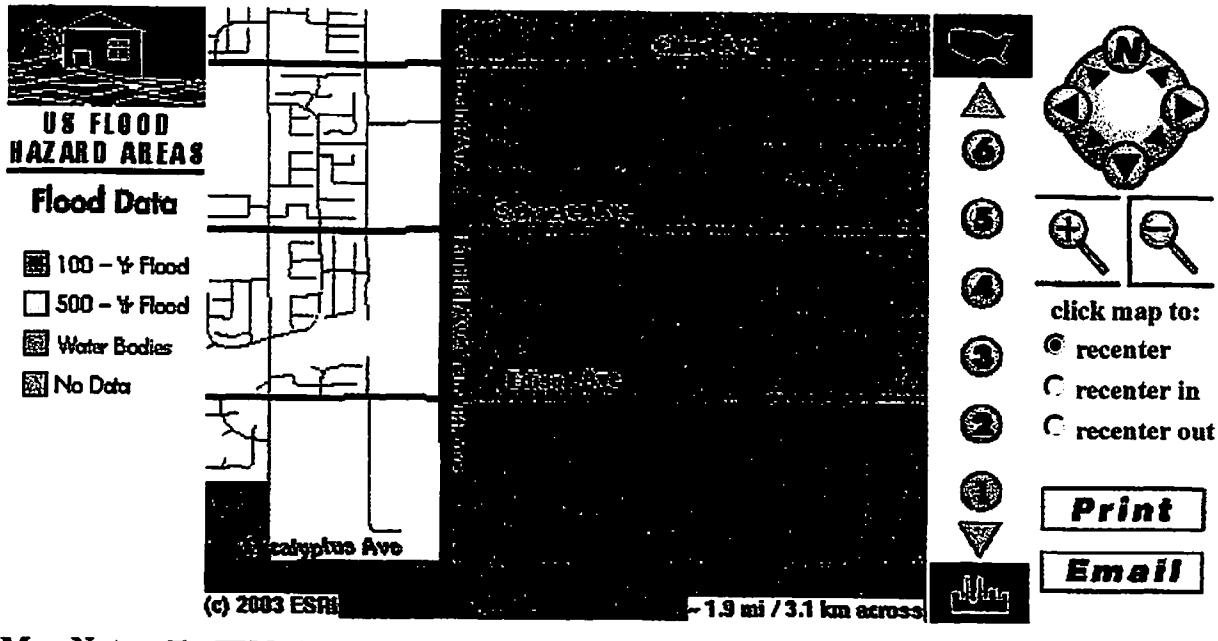


**Map Notes:** The **FEMA Digital Q3 Flood Data** displayed on this Web site is developed by scanning the existing Flood Insurance Rate Map (FIRM) hardcopy and capturing a thematic overlay of flood risks. Digital Q3 Flood Data files contain only certain features from the FIRM hardcopy in effect at the time of scanning and do not replace the existing FIRM hardcopy maps. The Q3 Flood Data is being displayed here with basemap data from the GDT Dynamap/2000 data set. The Q3 Flood Data is currently available for approximately **1,200 counties** across the United States.

**Current Map View:**

Flood Hazard Areas

**Change View**

The maps displayed on this site should be considered an **advisory tool** for general hazard awareness, education, and flood plain management. The flood hazard maps displayed on this site are **not the legal document** to be used when making a single site flood hazard determination. For more information on these maps, please refer to the **Frequently Asked Questions** page.

**Make New Map**

**Return to Home Page**

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Thu May 15 08:24:53 2003

# APPENDIX I

USGS TOPO MAP

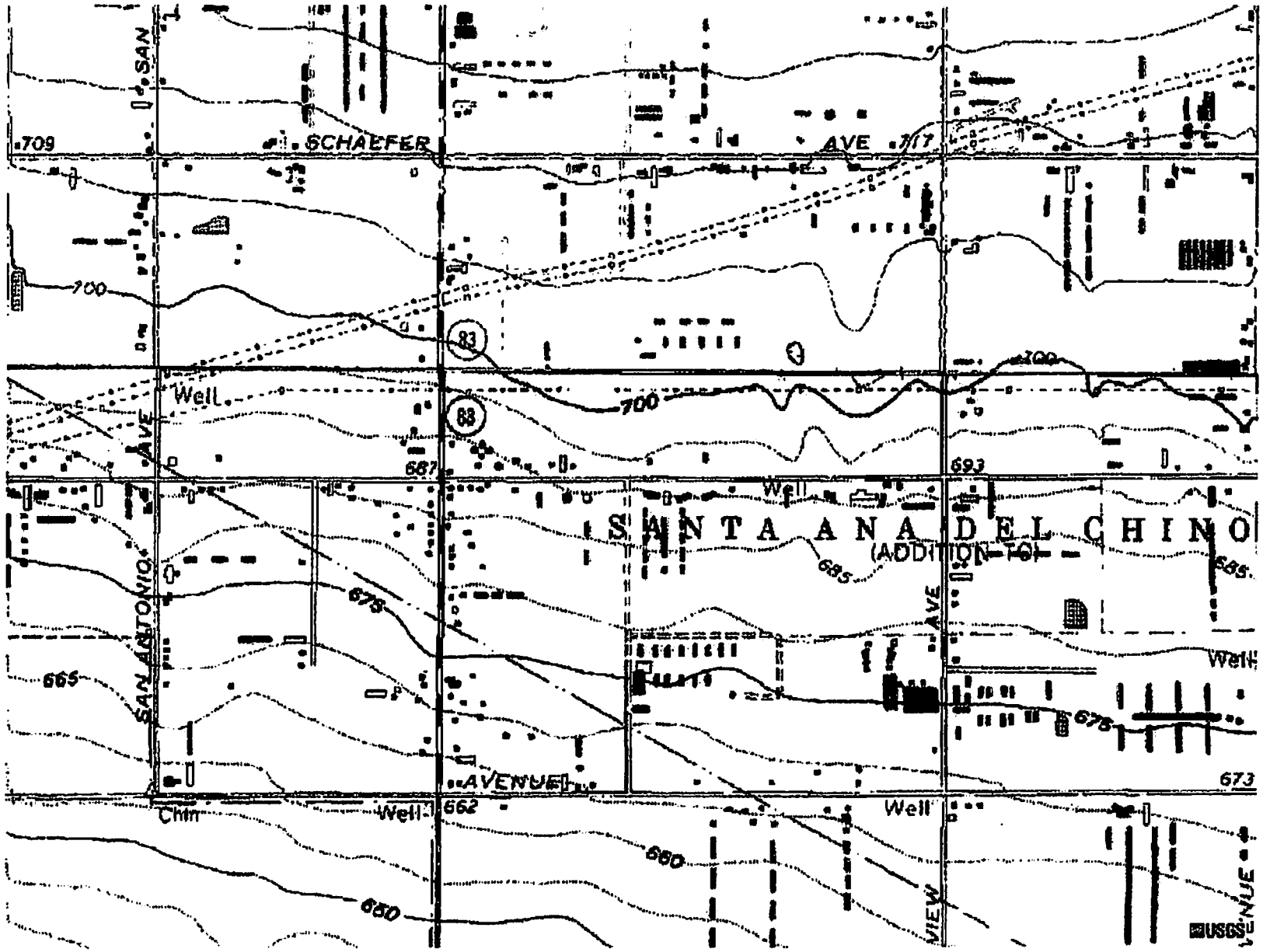
SAN
SCHAEFER
AVE
709
717
700
83
88
Well
AVE
687
693
Well
SANTA ANA DEL CHINO
(ADDITION TO)
685
675
SAN ANTONIO
AVE
665
Well
678
AVENUE
673
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662
Well
660
650
VIEW
VENUE
USGS

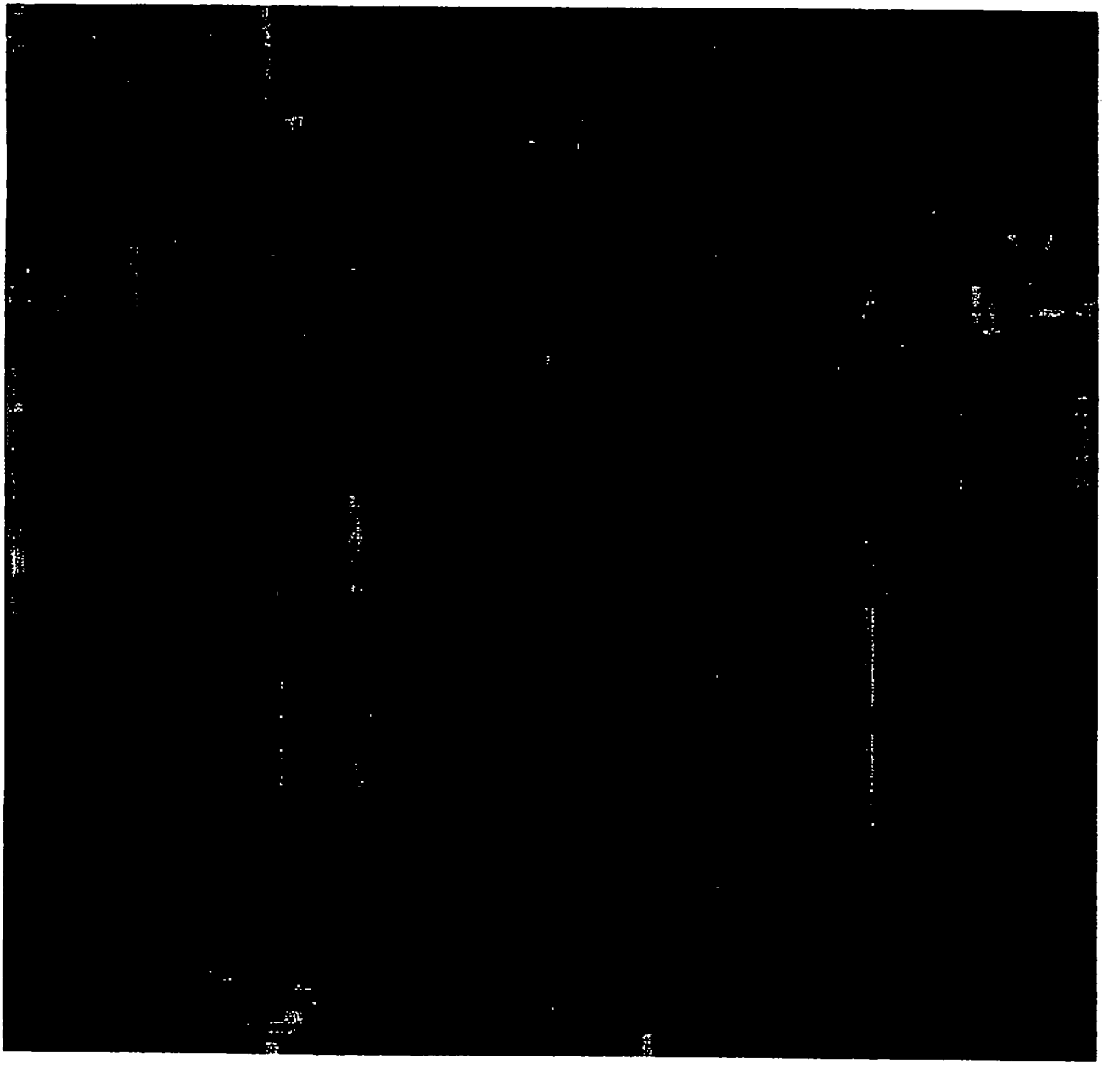

0
300m
900ft
S Bon View Ave
Bon View Ave
Edison Ave
Edison Ave
Edison Ave
Euclid Ave
S Euclid Ave
Sultana Ave
Eucalyptus Ave
Fern Ave
Fern Ave
Cherry Ct
Cherry Ave
Dogwood Ave
Live Oak Ct
Bartlett St
San Antonio Ave
Stone Pine Ct
Ironbark Ave
Schaefer Ave
Homan Ct
Joy Ct
Villa Ave

# APPENDIX J

GUIDELINES FOR ORDER NO. 99-11

# Guidelines for the Development of Engineered Waste Management Plans For Concentrated Animal Feeding Operations

(Dairies and Related Facilities)

California Regional Water Quality Control Board
Santa Ana Region

February 2001

## Introduction

On August 20, 1999, the California Regional Water Quality control Board, Santa Ana Region (Board), adopted Order No. 99-11 (NPDES No. CAG018001), General Waste Discharge Requirements for Concentrated Animal Feeding Operations (Dairies and Related Facilities) in the Santa Ana Region. This order required all operators of dairies and related facilities (i.e., heifer ranches and calf nurseries) authorized to discharge wastes under Order No. 99-11 to develop and implement an engineered waste management plan (EWMP). The primary purpose of an EWMP is to provide a wastewater management system that is designed, constructed, operated and maintained to comply with the wastewater containment requirements in Order No. 99-11. Order No. 99-11 included applicable state and federal regulations that address waste discharges from animal feeding operations.

## Background

The Board began issuing waste discharge requirements to all animal feeding operations in the Region in 1972. These waste discharge requirements stated that each facility had to contain, on the property, all wastewater (i.e., dairy wash water, storm water runoff from manured areas, etc.), including the storm water runoff from a 24-hour, 25-year storm. In an attempt to comply with this requirement, many facilities constructed new ponds, enlarged existing ponds, constructed berms, and implemented other measures. However, these measures were generally implemented in a piecemeal fashion, usually on an as-needed basis, and often did not integrate well with other wastewater containment measures at the facility. It became more and more apparent that many of the wastewater containment improvements that were being made were not very effective. For example, ponds were not sized properly, and therefore, did not have sufficient capacity to contain the entire volume of wastewater generated at the site; berms were sized and constructed improperly, resulting in failures; wastewater pumps, pipelines, etc., were often inoperable and were not replaced when needed; and most wastewater containment structures and equipment were often in a state of disrepair. All of these situations resulted in frequent discharges of wastewater to surface waters, primarily during the winter.

To minimize discharges to surface waters, it became apparent that an overall plan for containing wastewater was necessary. In the late 1980's, Board staff prepared a two-page document that provided guidelines for preparing an EWMP. An EWMP was then generally requested from animal feeding operations that had a history of recurring wastewater discharges. In 1994, the Board adopted Order No. 94-7 (NPDES No. CAG018001), General Waste Discharge Requirements for Concentrated Animal Feeding Operations (CAFOs). Order No. 94-7 required that, in addition to an EWMP being required from CAFOs that had a history of recurring wastewater discharges, EWMPs were to be prepared by anyone initiating a new CAFO at either a new or existing facility. The guidelines for preparing an EWMP were then included as an attachment to Order No.

94-7. Order No. 94-7 expired in March 1999, and the Board adopted Order No. 99-11 in August 1999. To assure that every CAFO had a wastewater management system capable of complying with wastewater containment requirements, Order No. 99-11 required that all CAFO operators develop and fully implement an EWMP. The existing guidelines for preparing an EWMP were included as an attachment to Order No. 99-11. However, the existing EWMP guidelines were outdated, general in nature, and did not contain sufficient criteria to comply with the wastewater containment requirements in Order No. 99-11. Therefore, Order No. 99-11 authorized the Executive Officer to make necessary revisions to the guidelines.

These revised guidelines are longer than the previous guidelines. This is primarily the result of adding explanations and clarification to make EWMPs prepared in accordance with the guidelines as consistent as possible. There are two significant differences between these guidelines and the previous guidelines. First, the new guidelines outline criteria for determining the storage capacity necessary to comply with waste discharge requirements. These criteria will result in the need for significantly more storage capacity than the criteria included in the previous guidelines. However, this does not reflect a change in state or federal regulations. Instead, previous guidelines did not accurately specify criteria for determining the storage capacity necessary to comply with state and federal regulations. Regardless of what was included in previous guidelines, CAFOs have always been, and still are, required to comply with all applicable state and federal regulations. Second, the new guidelines identify several items (such as best management practices) that should be considered in the development and implementation of EWMPs. Many of these items have been included in EWMPs approved by the Executive Officer in the past.

## Purpose

The purpose of an EWMP is to provide a wastewater management system that is designed, constructed, operated and maintained to comply with the wastewater containment requirements in Order No. 99-11. These guidelines do not address the management, application or disposal of manure removed from the corrals. Compliance with waste discharge requirements associated with the discharge of manure removed from corrals is addressed separately. The development and implementation of an EWMP is required by Order No. 99-11. Discharges of wastewater from a CAFO are allowed only if the CAFO operator has constructed and maintained containment structures as required, and if a chronic or catastrophic rainfall event occurs. A chronic rainfall event is a series of wet weather conditions that would total the volume of the 24-hour, 25-year storm event, and would not provide reasonable opportunity for dewatering containment structures prior to the next storm events. A catastrophic storm event includes events such as tornadoes and hurricanes, and any single event that totals the runoff volume of the 24-hour, 25-year storm event. Order No. 99-11 requires that an EWMP be developed in accordance with guidelines established by the Executive Officer. However, these are guidelines, not regulations, and any EWMP that will result in compliance with waste discharge requirements will be acceptable by the Executive Officer. Adhering to these

guidelines, though, will provide consistency for preparing EWMPs, and will increase the likelihood that the EWMP will be acceptable.

## Elements of an EWMP

The EWMP must be prepared by a registered engineer (civil, or other appropriate discipline) or other qualified person (required by Order No. 99-11). The qualified person preparing the EWMP must have the knowledge, technical expertise and experience appropriate to develop an EWMP. This guidance document describes five basic elements that should be addressed in an EWMP. These elements include an introduction, a design, a plot (site) plan, construction specifications, and an operation and management plan. These elements should include a detailed description, as follows:

## I. Introduction

The introduction should describe the existing animal population, the design population for the EWMP, existing wastewater containment facilities, and the operation of those facilities. At a minimum, the Introduction should consist of a brief narrative that addresses the following:

- The facility address, operator name, land owner, and location of the facility with respect to cross streets or other landmarks.
- The name, telephone number and address of the person responsible for implementing the EWMP on an on-going basis (CAFO operator or other designated person)
- The number, telephone number and address of the person(s) to be contacted, if necessary, in the event that the CAFO operator or designated person is not available.
- Current and design animal population (for the expected life of the CAFO)
- The estimated volume of wash water generated at the facility each day (based on gallons per cow per day)
- Total size of the facility (acres)
- The size (acres) of existing ponds, corrals, wastewater disposal areas and wastewater containment areas
- General location and height of berms
- How dairy wastewater is managed and where it is discharged
- Storm water run-on problems (storm water that occurs off-site, but enters the CAFO), including run-on from neighboring facilities, etc.

## II. Design

To comply with Order No. 99-11, containment facilities must be designated to contain all wastewater generated at the facility (i.e., dairy wash water, storm water runoff from manured areas, etc.) and all storm water runoff that comes into contact with manure generated by a 24-hour, 25-year storm. A 24-hour, 25-year storm is a 24-hour storm with

a return frequency of once every 25 years. The design must take into consideration that this storm can and should be expected to occur each year. CAFOs are required to contain the storm water runoff from all lesser storms, if that runoff has come into contact with manure.

If a CAFO does not have existing structures capable of containing the required volume of wastewater, then additional structures must be provided. This may include significantly deepening existing ponds, adding additional ponds, connecting to a sewer system, raising berms to increase the volume of wastewater that can be stored in containment areas, etc. An EWMP may be acceptable if the design has maximized the amount of wastewater that can be contained and the operation and management plan optimizes utilization of the containment capacity provided by the containment structures. **However, acceptance of such a plan will not relieve the CAFO operator of responsibility for any discharges that are not allowed by Order No. 99-11. Wastewater that is discharged off the CAFO property, even after implementing an acceptable EWMP, is still a violation of Order No. 99-11. unless the discharge occurred as a result of a chronic or catastrophic storm event.**

- Historically, containment of wash water and storm water runoff at CAFOs in the Region between the drier months of April through October has not been a problem. However, containing storm water runoff from corrals, wastewater disposal fields, etc., and daily wash water, has been problematic during the five generally wet months of November through March. During these months, evaporation is minimal, and since disposal fields are usually saturated by rainfall, percolation is minimal. Since it is difficult to dispose of daily wash water and accumulated storm water runoff during these months, wastewater facilities should be designed to contain all wastewater generated during this 150-day period, as noted below.

- Containment structures should be designed to contain 150 days of annual storm water runoff <u>and</u> the runoff from a 24-hour, 25-year storm. For the Chino Basin area, average rainfall for the 150 days from November through March is approximately 13 inches, and a 24-hour, 25-year storm generates approximately 4.5 inches of precipitation (based on information from the National Weather Service). For the San Jacinto area, average annual rainfall for the 150 days from November through March is approximately 11 inches, and a 24-hour, 25-year storm is approximately 3.5 inches. These are average values for these areas, and other values can be used for a particular CAFO, if justification is provided.

- Containment structures should be designed to contain 150 days of wash water. This should be based on the maximum number of milking cows for the life of the facility. Otherwise, the EWMP may have to be revised in the future, at such time that the number of milking cows exceeds the number of cows stated in the EWMP. Recent studies have shown that the average daily wash water generated at dairies in the Region is about 70 gal/cow/day (based on two milkings/cow/day). The average daily wash water produced during winter months, however, can exceed 100 gal/cow/day. The average gal/cow/day used during the winter should be used in determining the

volume of storage required for wash water. This volume can vary, depending on specific site practices, but should be about 100 gal/cow/day unless adequate justification is provided for using a smaller number. The installation of a water meter can verify the amount of water used and assist in efforts to conserve water usage, and thereby reduce the amount of water discharged to containment structures. A wash water meter will be required to justify a volume significantly less than 100 gal/cow/day.

- During the winter, evaporation is minimal. Also, ponds tend to seal up over time, and disposal fields are generally saturated during the winter, thereby minimizing percolation. In addition, the amount of wastewater percolated during the winter at a CAFO can vary, depending on the particular wastewater disposal practices implemented at that CAFO. Allowances for loss of wastewater due to percolation and evaporation can be made in determining the amount of storage required for wastewater, as long as reasonable assumptions are made that consider winter conditions and practical CAFO specific wastewater disposal practices.

- The accumulation of solids in ponds and other containment structures decreases the storage capacity available for wastewater. It is estimated that dairy wash water in the Region contains about 10% of the manure generated by a milking cow. Also, solids are present in storm water runoff from corrals, disposal land and other areas. The estimated annual decrease in available storage capacity resulting from the accumulation of these solids should be determined (the volume of manure in wash water can be considered to be 10% of what a milking cow expels).

- Calculations should be provided showing the design capacity of all wastewater containment structures (existing and proposed).

- The total capacity of the containment structures should be at least equal to the volume determined by the following equation: 150 days dairy wash water + 150 days annual storm water runoff + 24-hour, 25-year storm runoff + accumulation of solids + wastewater in containment structures on November 1 – percolation – evaporation.

- A description of all wastewater conveyance equipment and structures (pipelines, surface channels, pumps, etc.), including their design capacities, should be provided.

- CAFOs in operation prior to November 27, 1984 must be designed to protect all manured areas from inundation or washout by overflow from any stream channel during a 20-year peak stream flow (required by Order No. 99-11).

- CAFOs built after November 27, 1984 must be designed to process all manured areas from inundation or washout by overflow from any stream channel during a 100-year peak stream flow (required by Order No. 99-11).

- The use of pumps must be considered for ponds and other containment structures so that wastewater can be pumped from ponds or containment areas to disposal areas, in

order to restore needed capacity in the containments structures. If pumps are not utilized, exceptional justification for not utilizing pumps must be included.

- Storm water containment structures must be protected against inundation from off-site storm water sources, unless such run-on is fully contained (required by Order No. 99-11). If it is not practical to divert all storm water run-on away from a CAFO, a justification should be included that explains why it is not practical to do so. If all storm water run-on from up to a 24-hour, 25-year storm cannot be diverted from containment structures, a description of how the design takes the run-on into consideration should be included.

- The addition of roof structures in areas where manure is present, and diverting the roof runoff off site, should be considered in order to minimize the amount of precipitation that comes into contact with manure.

- Structures should be designed to prevent storm water runoff from non-manured areas (roofs, residence area, paved surfaces, etc.) from entering wastewater containment structures. The use of rain gutters and diversion trenches should be considered. If the CAFO cannot be designed to prevent or minimize the flow of this water onto containment areas, an explanation should be provided that describes how the design accounts for such flows.

- The design for ponds and other wastewater containment areas should allow vehicle access for mosquito abatement personnel to inspect and treat these areas to reduce the risk of mosquito-borne disease and to prevent insect nuisance conditions.

- An emergency spillway must be designed to provide for a controlled release of wastewater, and to maintain the integrity of existing containment structures, in the event that storm events cause the capacity of the containment structures to be exceeded. The use of gateways, valves, or other similar devices for the purpose of manually releasing wastewater, is not acceptable.

- If visual observations, hand-level measurements and information provided by the CAFO operator and others are not sufficient to determine rise and fall dimensions and flow directions for adequately calculating runoff volumes for placing and sizing appropriate containment structures, then current contours must be determined, based on acceptable engineering and surveying practices (it is expected that current contours will be necessary for most CAFOs).

- Structures should be designed to accommodate future increases in animal population.

## III. Plot (Site) Plan

The plot plan should be a standard blue line print, using an appropriate scale, that shows sufficient detail of all containment structures, drainage patterns, and equipment. The plot plan should include:

- The legal description of the property (i.e., parcel numbers), the primary address and any other addresses that may exist at the property, and the location of significant structures on the property (residences, milk barn, hay alleys, etc.).
- The property boundaries, the gross acreage of the property, vicinity map (insert), north arrow, legend and date the plan was prepared.
- The location, elevation contours and dimensions of all areas associated with the generation, storage or management of wastewater and manure (corrals, ponds, access roads around wastewater containment areas, wastewater disposal areas, temporary manure storage areas, cropland, etc.).
- The location of all facilities necessary for containment and management of wastewater (berms, upstream diversion structures, pumps, spillway, distribution lines, etc.) and the dimensions, elevation and cross-sections of all containment structures.
- The drainage patterns (indicated by arrows) for on-site surface drainage courses (swales, ditches, etc.) and any off-site surface drainage that can flow onto, or immediately adjacent to, the facility.

## IV. Construction

The construction plan should describe all construction materials, construction methods (i.e., compaction), criteria and specifications, etc., necessary for proper construction of all containment and conveyance structures (berms, ponds, levees, pipelines, channels, etc.).

- Existing berms that are not sized properly, not adequately compacted, or contain materials (i.e., manure) that are deleterious to the berm's long term stability and effectiveness, must be replaced or improved to a standard that is equivalent to that which would be expected from a new berm constructed in accordance with best engineering practices.
- Actions necessary to restore existing structures to proper conditions and capacities should be clearly described (i.e., clean out existing ponds or containment areas, regarding, repair or replacement of existing berms, etc.).

- Manure shall not be used to construct new containment structures (i.e., berms0, and manure shall not be used to improve or raise existing containment structures (prohibited by Order No. 99-11).

- In accordance with acceptable engineering practices, specifications developed to assure that construction material is applied in lifts of appropriate depth, and rolled and watered to achieve a minimum compaction of 90%, must be included.

## V. Operation and Maintenance

An operation and maintenance plan should be provided to implement effective operation of all containment structures and equipment. During the wet season, wastewater should be managed on a daily basis to maximize the volume of containment capacity available.

- Specific procedures should be included to assure that containment structures have the maximum capacity available just prior to the wet season (November – March).

- Management practices to reduce, to the maximum extent practicable, the volume of dairy wash water generated should be addressed, particularly if the proposed structures are incapable of containing the required volume of wastewater.

- Replacement pumps should be available on-site, or advanced arrangements made for the immediate and reliable delivery of portable pumps.

- Specific procedures for operating standpipes or other conveyance systems used for applying wastewater to land should be provided to efficiently utilize the entire area available for wastewater disposal (i.e., avoid localized over-application that can occur with furrow application, and utilize methods to maximize the spreading of wastewater).

- If all storm water run-on cannot be diverted, the EWMP should contain a description of how storm water run-on will be managed or handled to minimize the impact on wastewater containment structures and to minimize the amount of wastewater that could be discharged from the CAFO.

- Specific measures to minimize the effects of gophers, squirrels or other rodents on the integrity of the containment structures should be identified.

- Removal of solids from containment structures on a scheduled basis should be specified so that the design capacity of the containment structures will be restored prior to each rain season.

- Measures for minimizing the accumulation of stagnant wastewater in low lying areas (corrals, disposal areas, etc.) and preventing potential insect nuisance conditions should be addressed.

- Weekly inspections of ponds, berms, wastewater distribution and application equipment, etc., should be specified to provide assurance that all containment structures are intact and all equipment is in proper operating condition. Daily inspections should be conducted following the first significant rain events at the beginning of the wet season (generally in early Fall), continuing through the cessation of significant rain events (generally in early Spring). Provisions for the immediate repair of any damaged containment structures (i.e., rodent holes, cracks, erosion, etc.) should be provided.

- A description of methods and schedules for maintaining disposal areas in a condition that maximizes the efficient disposal of wastewater in the winter should be provided (i.e., grading, disking, etc.).

- An equipment maintenance schedule should be provided to assure the efficient, consistent and reliable operation of all pumps, sumps, pipelines, etc.

- Weed abatement measures to maintain access to containment structures, maintain capacity of containment structures and to maintain the efficient distribution of wastewater through channels, etc., should be addressed.

- A brief emergency spill plan must be included. The plan must include a list of spare parts (pumps, piping, valves, etc.) that are to be kept on site to maintain adequate wastewater containment facilities, a list of names and phone numbers for contacts for obtaining immediate emergency equipment (pump, piping, valves, heavy equipment, etc.), and a list of names and phone numbers for reporting problems (Board staff, County staff, etc.).

# APPENDIX K

ORDER NO. 99-11

California Regional Water Quality Control Board
Santa Ana Region

Order No. 99-11
NPDES No. CAG018001

# GENERAL WASTE DISCHARGE REQUIREMENTS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (DAIRIES AND RELATED FACILITIES) WITHIN THE SANTA ANA REGION

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter, Regional Board), finds that:

1. On February 17, 1994, the Board adopted Order No. 94-7, General Waste Discharge Requirements For Concentrated Animal Feeding Operations, Including Dairies, Within The Santa Ana Region (NPDES NO. CAG018001).

2. Order No. 94-7 satisfied the criteria cited in 40 CFR 122.28 and, as such, served as a General NPDES Permit. 40 CFR 122.28 pertains to the issuance of general permits to regulate discharges of waste that meet the following criteria:

   a. Waste discharges involving the same or substantially similar types of operations;
   b. Discharge the same types of wastes;
   c. Require the same or similar operating conditions;
   d. Require the same or similar monitoring ; and
   e. Are more appropriately regulated under a general permit rather than individual permits.

3. 40 CFR Part 122.23 defines a concentrated animal feeding operation (CAFO) as any animal feeding operation that has more than 1,000 animal units (dairy cattle are considered 1.4 animal units). Pursuant to the Clean Water Act (CWA), all CAFOs are point sources and are subject to NPDES permitting requirements. Smaller animal feeding operations can also be designated as CAFOs by the permitting agencies after considering certain criteria cited under 40 CFR 122.23 (b)(1). The Regional Board has determined that all dairies, heifer ranches, and calf nurseries in the Region shall be designated as CAFOs.

4. Order No. 94-7 has expedited the preparation of waste discharge requirements and has allowed the Regional Board to better utilize staff resources. To date, approximately 215 CAFOs have been enrolled under Order No. 94-7. Another 72 CAFOs are in the process of obtaining authorization to discharge wastes under that order. Order No. 94-7 expired on March 1, 1999. The dairies currently enrolled under Order No. 94-7, or in the process of enrolling under Order No. 94-7, will want to continue to discharge waste. Therefore, it is necessary to renew the waste discharge requirements contained in Order No. 94-7 to continue this expedited permitting process.

5. Persons discharging, or proposing to discharge, dairy wastes or other similar kinds of wastes in any manner that may affect water quality are hereinafter referred to as "discharger" and are subject to the terms and conditions of this order. Persons discharging, or proposing to discharge, wastes from other types of animal feeding operations must obtain coverage under a separate general permit or individual waste discharge requirements.

6. The Regional Board adopted a revised Water Quality Control Plan (Basin Plan) on March 11, 1994. The Basin Plan became effective on January 24, 1995. The Basin Plan specifies beneficial uses and water quality objectives for surface and ground waters in the Santa Ana Region (Chapters 3 and 4). This order specifies requirements necessary to meet the water quality objectives and to protect the beneficial uses.

7. Revised regulations governing discharges from CAFOs, including dairies, are contained in Division 2, Title 27 of the Combined State Water Resources Control Board/California Integrated Waste Management Board AB 1220 Regulations, which became effective on July 18, 1997. Chapter 7, Subchapter 2 (Article 1) contains requirements for Confined Animal Facilities. Previously, these regulations were specified in Chapter 15, Division 3, Article 6, Title 23 of the California Code of Regulations.

8. Section 402(p) of the CWA as amended by the Water Quality Act of 1987 and the related regulations published by the U.S. EPA on November 16, 1990 (40 CFR Parts 122, 123 and 124), requires an NPDES permit for pollutant discharges from CAFOs. The EPA's Effluent Guidelines and Standards for Feedlots are contained in 40 CFR Part 412 (revised July 1, 1993).

9. On April 17, 1997, the State Water Resources Control Board adopted the General Industrial Storm Water Permit, Order No. 97-03-DWQ, NPDES No. CAS000001. Order No. 97-03-DWQ implements the final regulations (40 CFR 122, 123, and 124) for storm water runoff published on November 16, 1990 by the U.S. EPA in compliance with Section 402(p) of the CWA. This order includes those provisions of the General Industrial Storm Water Permit that pertains to dairies. Once a discharger is authorized under Order No. 99-11, coverage under the State Water Resources Control Board's General Industrial Storm Water Permit (Order No. 97-03-DWQ) will be terminated.

10. Wastes from CAFOs contain high concentrations of salts (total dissolved solids and nitrates). Previous studies conducted by the Board have shown that cow manure produced in the Region contains about 160 pounds of salt per (dry) ton of manure (110 pounds of salt per ton of manure @ 33% moisture). The application of manure or the discharge of process wastewater[1] to land results in the discharge of salts that has adversely impacted, and continues to adversely impact, the quality of groundwater and surface water in the Region.

[1] Process wastewater shall mean any process generated wastewater and any precipitation (rain or snow) which comes into contact with any manure, litter or bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g. milk, eggs).

11. Most of the CAFOs in the Region overlie the Chino Groundwater Basin. The Chino II and III Groundwater Subbasins lack assimilative capacity for additional salt inputs (total dissolved solids and nitrogen). For groundwater subbasins without assimilative capacity, salt inputs that exceed the water quality objectives for these subbasins cannot be allowed (State Water Resources Control Board Order No. 73-4, the Rancho Caballero decision). To meet the Chino Basin groundwater objectives, as well as the groundwater objectives for any other subbasin lacking assimilative capacity, the discharge of manure and other animal wastes, such as process waste water, and their application as fertilizer and irrigation water, must be controlled to prevent further exceedance of water quality objectives. Salt discharges in excess of water quality objectives can only be allowed if the additional salt inputs are offset.

12. The Basin Plan assumed that two desalters would be built in the Chino Basin. The amount of salt to be extracted from the Basin from these desalters was assumed to be adequate to provide sufficient salt removal to offset the present and projected salt loads from ongoing discharges from CAFOs. However, only one desalter is currently being built. This desalter will extract enough salt to offset the amount of salt being added to the basin from process wastewater water discharges. No mitigation measures are currently in place to offset the salt loading from manure application within the Basin. Therefore, the discharge of manure, and its application as fertilizer, must be prohibited.

13. The Board has considered antidegradation pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16 and finds that these discharges are consistent with the State and Federal regulations, as long as appropriate salt offset programs are implemented.

14. In accordance with Water Code Section 13389, the issuance of waste discharge requirements for these discharges is exempt from those provisions of the California Environmental Quality Act contained in Chapter 3 (Commencing with Section 21100), Division 13 of the Public Resources Code.

15. The Regional Board has notified interested agencies and persons of its intent to issue general waste discharge requirements for discharges of wastes CAFOs, and has provided them with an opportunity to submit their views and recommendations.

16. The Regional Board, in a public meeting, heard and considered all comments pertaining to discharges of wastes from CAFOs proposed to be regulated under the general waste discharge requirements.

IT IS HEREBY ORDERED that, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Clean Water Act as amended, and regulations and guidelines adopted thereunder, dischargers, their agents, successors, and assigns, discharging wastes from CAFOs shall comply with the following:

## A. DISCHARGE SPECIFICATIONS:

1. The discharger shall design, construct and maintain containment structures to retain all wastewater within its facility, including all process generated wastewater[2] and all precipitation on, and drainage through, manured areas resulting from storms up to and including a 24-hour, 25-year storm.

2. The discharger shall develop and fully implement an Engineered Waste Management Plan (EMWP) acceptable to the Executive Officer. The EMWP shall be developed by a registered professional engineer, or other qualified individual, in accordance with the guidelines specified in Attachment "B" of this order. The Executive Officer is hereby authorized to make necessary revisions to the guidelines for the preparation of an EWMP outlined in Attachment "B".

3. The discharge to any surface water bodies, or tributary thereof, is prohibited unless a chronic[3] or catastrophic[4] rainfall causes overflow from a storage facility designed, constructed, maintained and operated to contain all process generated wastewater plus the runoff from a 24-hour, 25-year storm.

4. Retention ponds and manured areas at CAFOs in operation on November 27, 1984, shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Facilities existing before November 27, 1984 that are protected against 100-year peak stream flows must continue to provide such protection. New facilities (built after November 27, 1984) shall be protected from 100-year peak stream flows.

5. Disposal of manure to land is prohibited, unless allowed by separate waste discharge requirements issued by the Board.

6. The use of manure as a fertilizer in any area that may affect a groundwater subbasin lacking assimilative capacity, including the Chino Groundwater Basin, is prohibited unless a plan, acceptable to the Executive Officer, is implemented which mitigates the effects of that use on the underlying groundwater subbasin.

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[2] Process generated wastewater shall mean water directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems; washing, cleaning of flushing pens, barns, manure pits or other feedlot facilities; direct contact swimming, washing or spray cooling of animals; and dust control.

[3] Chronic rainfall means a series of wet weather conditions which would not provide opportunity for dewatering and which total the volume of the 25 year, 24 hour storm event.

[4] Catastrophic rainfall means any single event which would total the volume of the 25 year, 24 hour storm event; this could include tornadoes, hurricanes or other catastrophic conditions which could cause overflow due to winds or mechanical damage.

7. Manure applied to cultivated cropland outside of any area that may affect a groundwater subbasin lacking assimilative capacity, including the Chino Groundwater Basin, shall not exceed agronomic rates and shall be incorporated into soil soon after application or appropriate containment (based upon the specific crop grown) controls must be provided. For any application of manure to cropland above 12 dry tons per acre per year (17.5 tons/year @ 33% moisture), an explanation of the type of crop and the number of times it is harvested per year shall also be included in the annual report.

8. Manure removed from the corrals shall be removed from the facility within 180 days. Any manure remaining at the facility after 180 days of being removed from the corrals is considered to be disposal of manure and is prohibited in accordance with Discharge Specification A.5. A manifest of the manure hauled away shall be prepared and submitted with the annual report in accordance with Monitoring and Reporting Program No. 99-11. (The discharger shall be responsible for active management of legal disposal of manure from the property over the six month period following removal of the manure from corrals. This means that legal disposal must be coordinated with periods of rainfall such that manure can be removed from the facility within 180 days of being scraped from corrals.)

9. On two designated "clean days" per calendar year, facilities subject to this order shall be free of all stockpiled manure that has been removed from corrals. These "clean days" shall be selected by each discharger, beginning in 2000. The two "clean days" shall be at least four months apart. Each "clean day" shall be identified and reported to the Board office at least five working days in advance of the selected date.

10. All surface drainage from outside of the facility shall be diverted away from any manured areas unless such drainage is fully contained.

## B. PROVISIONS:

1. Neither the treatment nor the discharge of wastes shall create, or threaten to create, a nuisance or pollution as defined by Section 13050 of the California Water Code.

2. This order shall serve as a general National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Clean Water Act or amendments thereto. The general permit shall become effective 10 days after the date of its adoption provided the Regional Administrator of the Environmental Protection Agency has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

3. This order expires on August 1, 2004. However, it shall continue in force and effect until a new general permit is issued. All dischargers authorized to discharge under the expired permit may continue to discharge waste in accordance with that permit until a new permit is issued.

4. Upon receipt of an application to discharge wastes under this order, the Executive Officer shall authorize the proposed discharge by transmitting a "Discharge Authorization Letter" to the discharger. The discharge authorization letter may be terminated or revised by the Executive Officer at any time.

5. Upon issuance of a discharge authorization letter from the Executive Officer to discharge wastes under this order, the discharger's authorization to discharge waste under the State Water Resources Control Board's General Industrial Storm Water Permit (Order No. 97-03-DWQ) is hereby terminated.

6. All discharges from the facility must comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to storm drain systems or other courses under their jurisdiction.

7. Storm flows in excess of a 24-hour, 25-year storm event may be discharged to surface water bodies in accordance with the requirements specified in U.S. Environmental Protection Agency's "Effluent Guidelines and Standards for Feedlot's, 40 CFR Part 412". Additionally, storm flows resulting from chronic or catastrophic events may also be discharged to surface water bodies in accordance with the U.S. Environmental Protection Agency's effluent guidelines referenced above.

8. The discharger shall comply with Monitoring and Reporting Program No. 99-11.

9. The discharge of wastes to property not owned or controlled by the discharger, except as authorized by this order, is prohibited.

10. The discharger shall comply with all Federal, State, County and local laws and regulations pertaining to the discharge of wastes from the facility.

11. Following a storm event, the discharger shall restore the wastewater holding capacity of retention ponds in a timely manner.

12. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from liabilities under Federal, State, or local laws, nor guarantee the discharger a capacity right in the receiving waters.

13. This order does not convey any property rights of any sort, or any exclusive privilege.

14. An authorization to discharge wastes under this order is not transferable to any person without written authorization from the Executive Officer.

15. The discharger shall comply with all requirements of this order and all terms, conditions, and limitations specified in the discharge authorization letter issued by the Executive Officer.

16. The discharger shall take all reasonable steps to minimize or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment.

17. Any instance of noncompliance with this order constitutes a violation of the Clean Water Act (CWA), its regulations, and the California Water Code, and is grounds for enforcement action, and/or termination of the authorization to discharge.

18. The provisions of this order are severable, and if any provision of this order, or the application of any provisions of this order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this order shall not be affected thereby.

19. It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this order.

20. Compliance determination with the terms of this order shall be based on the following:

    a. Periodic inspections by Regional Board staff;
    b. Evaluation of the annual report of animal waste and storm water discharge submitted according to the attached monitoring and reporting program; and
    c. Any other information deemed necessary by the Executive Officer.

21. The Regional Board, USEPA, and other authorized representatives shall be allowed:

    a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this general permit;
    b. Access to copy any records that are kept under the conditions of this general permit;
    c. To inspect any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and
    d. To photograph, sample, and monitor for the purpose of assuring compliance with this general permit, or as otherwise authorized by the CWA.

## C. PERMIT REOPENING, REVISION, REVOCATION, AND RE-ISSUANCE:

1. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal CWA, or amendments thereto, the Board will revise and modify this order in accordance with such standards.

2. This order may be reopened to address any changes in State or Federal plans, policies or regulations that would affect the quality requirements for the discharges.

## D. PENALTIES:

1. The CWA provides that any person who violates a provision implementing sections 301, 302, 306, 307, or 308 of the CWA is subject to a civil penalty not to exceed $11,000 per day of such violation. Any person who willfully or negligently violates provisions implementing these sections of the CWA is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

2. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $11,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $11,000 per violation, or by imprisonment for not more than six months per violation, or by both.

4. The California Water Code provides that any person who violates a waste discharge requirement or a provision of the California Water Code is subject to civil penalties of up to $5,000 per day, $10,000 per day, or $25,000 per day of violation, or when the violation involves the discharge of pollutants, is subject to civil penalties of up to $10 per gallon per day, or $20 per gallon per day of violation; or some combination thereof, depending on the violation, or upon the combination of violations.

## E. REQUIRED REPORTS AND NOTICES:

1. Reporting Provisions:

   a. All applications, annual reports, or information submitted to the Regional Board shall be signed and certified in accordance with 40 CFR 122.22.

   b. Any discharger authorized to discharge waste under this order shall furnish, within a reasonable time, any information the Regional Board or EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating their authorization or this general permit. The discharger shall also furnish to the Regional Board, upon request, copies of records required to be kept by this order.

c. Except for data determined to be confidential under Section 308 of the CWA, all reports prepared in accordance with the terms of this general permit shall be available for public inspection at the offices of the Regional Water Quality Control Board and the Regional Administrator of USEPA. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act and Section 13387 of the California Water Code.

2. The discharger shall notify the Regional Board by telephone within 24 hours of any unauthorized discharge of waste from the facility. This notification shall be followed by a written report including the following:

   a. The approximate date and time of the discharge;
   b. The volume and duration of the discharge;
   c. The cause of the discharge; and
   d. A time schedule and a plan to implement necessary corrective actions to prevent the recurrence of such discharges.

3. The discharger shall report promptly in writing to the Regional Board of any changes or proposed changes in:

   a. The control, ownership, operation or location of the facility;
   b. The character, location, volume or disposal methods of waste discharges; and
   c. The size of the animal population, if it increases beyond the design capacity of the facility specified in the EWMP.

4. The discharger shall give advance notice to the Regional Board of any planned changes in the permitted facility or activity that may result in noncompliance with this general permit.

## F. APPLICATION REQUIREMENTS:

1. Dischargers previously authorized to discharge wastes under Order No. 94-7, dischargers currently discharging wastes under individual waste discharge requirements, and dischargers who have submitted a notice of intent to discharge wastes under Order No. 94-7 are automatically enrolled under this Order, unless they file an application to be covered under an individual permit. Once the Executive Officer issues a discharge authorization letter, the individual waste discharge requirements are hereby rescinded.

2. Dischargers not previously authorized to discharge waste under Order No. 94-7 are required to submit the following within 60 days of the effective date of this Order for existing discharges and at least 60 days before the start of any new discharge:

a. A completed Notice of Intent Form (see attachment "A") with the appropriate filing fee;
b. An Engineered Waste Management Plan for the facility, acceptable to the Executive Officer (see Attachment "B");
c. If an acceptable EWMP has not been developed, the discharger must submit the name of the engineer, or other qualified individual, who will develop the EWMP and a proposed time schedule for its development; and
d. Any other information deemed necessary by the Executive Officer.

If the proposed discharge meets the requirements of this order, the Executive Officer will provide the discharger with a written authorization to discharge waste in accordance with these waste discharge requirements.

3. The following types of facilities are generally not required to obtain authorization under this order. Such facilities must not discharge waste which may affect water quality, or cause a nuisance or pollution as defined in Section 13050 of the California Water Code.

a. Dairies where the animal population is less than 20 (dry or milking cows).
b. Heifer or calf ranches where the herd size is less than 50.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on August 20, 1999.

G J Thibeault

Gerard J. Thibeault
Executive Officer

Attachment "A" NOI

# REQUIREMENTS FOR AN ENGINEERED WASTE MANAGEMENT PLAN

**The Engineered Waste Management Plan must be prepared by a registered professional engineer in the State of California or another qualified individual.**

## A. SITE PLAN:

Site plan shall include:

1. Address and/or legal description of the property.

2. Name, address, and telephone number of the owner and operator of the property.

3. Total gross acreage of the property, showing property boundaries and all existing and proposed facilities including buildings, storage areas, berms/levees, holding ponds, pumping facilities, culverts, drainage easements, disposal areas, croplands (whether farmed by the owner/operator or another party), etc. The site plan must include the overall dimensions, contours, a vicinity map, north arrow, and the date the plan was prepared. The plan shall be drawn on a standard blue print format using an appropriate scale that shows sufficient details of all facilities.

4. Containment facilities shall be designed to retain, on the property, all process generated wastewater and storm water runoff due to precipitation and drainage through manured areas which results from a 24-hour, 25-year storm event. Facilities in operation on November 27, 1984 shall be designed for protection of all manured areas from inundation or washout by overflow from any stream channel during 20-year peak stream flows. All manured areas for new facilities (built after November 27, 1984) shall be protected from inundation resulting from a 100-year peak stream flow. The site plan shall show all facilities necessary for containment and management of on-site storm water runoff as well as the interception and conveyance of any off-site storm water runoff through the property.

5. The site plan shall show the size, elevation, and location of all facilities proposed for containment of process generated wastewater and storm water runoff on the property (berms/levees, holding ponds, upstream diversion structures, etc.). Cross section details of these facilities shall be presented.

6. A description of existing and proposed disposal areas or cropland, designated to receive operational water.

## B. DESIGN CALCULATIONS:

Design calculations shall include:

1. Present and proposed animal population (numbers of each: milk cows, dry cows, calves, heifers, etc.) and the volume of wash water generated.

2. Amount of storm water runoff resulting from a 24-hour, 25-year storm event.

3. Total amount of wastewater (wash water and storm water) to be contained on the property.

4. Dimensions and capacity of the holding ponds.

5. Percolation rates, if used.

## C. CONSTRUCTION SPECIFICATIONS:

Construction specifications shall include the construction materials and method of compaction utilized to build berms/levees and other containment facilities.

## D. OPERATION AND MANAGEMENT PLAN:

Operations and maintenance plan shall include:

1. A proposed holding pond management plan (to provide maximum pond capacity prior to winter storms; periodic dredging, etc.).

2. A proposed wastewater distribution plan (periodic rotation of wastewater to disposal areas or croplands).

3. A proposed maintenance plan for berms/levees and other containment facilities, including a proposed rodent control plan (periodic inspections to monitor for holes/cracks or breaks, etc.)

California Regional Water Quality Control Board
Santa Ana Region

Monitoring and Reporting Program No. 99-11
for
Concentrated Animal Feeding Operations (Dairies and Related Facilities)
Santa Ana Region

## A. Monitoring

1. The discharger(s) shall inspect the waste holding and disposal areas and note any discharges off the property that is under the control of the discharger. Inspections will be made daily when wastewater is being applied to cropland and weekly during other periods. The results of all inspections will be recorded and submitted with the required reports.

2. During each significant storm event[5], the discharger(s) shall make visual inspections of all storm water containment structures.

3. The discharger(s) shall record the approximate time of each storm-related discharge that results in off-property discharges of storm water commingled with wastewater or manure, and its approximate duration.

4. The discharger(s) shall record each manure-hauling event on a manure tracking manifest form.

## B. Reporting

1. By January 15 of each year, an annual report of animal waste discharge and storm water discharge shall be submitted.

2. The annual report shall be submitted on forms provided by Regional Board staff and shall also include copies of all manure tracking manifests for the reporting period and copies of the inspection logs required to be maintained under A.1. and A.4. above.

3. The discharger shall notify the Regional Board by telephone within 24 hours of any unauthorized discharge of wastes. This notification shall be followed by a written report which shall be submitted to the Regional Board within two weeks of the discharge . The written report shall contain:

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[5] A significant storm event is defined as a storm event which results in continuous discharge of storm water for a minimum of one hour, or intermittent discharge of storm water for a minimum of three hours in a 12-hour period.

a. The approximate date and time of the discharge;

b. The flow rate and duration of the discharge;

c. The specific type and source of the waste discharges (e.g., overflow from holding pond, rainfall runoff from manure storage areas, etc.); and

d. A time schedule and a plan to implement necessary corrective actions to prevent the recurrence of the discharge.

All reports shall be signed by a responsible officer or duly authorized representative of the discharger(s) and shall be submitted under penalty of perjury.

Ordered by
Gerard J. Thibeault
Executive Officer

August 20 , 1999

California Regional Water Quality Control Board
Santa Ana Region

FACT SHEET

# GENERAL WASTE DISCHARGE REQUIREMENTS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (DAIRIES AND RELATED FACILITIES) WITHIN THE SANTA ANA REGION, ORDER NO. 99-11, NPDES NO. CAG018001

## I. Need for General Waste Discharge Requirements

There are approximately 302 animal feeding operations (AFOs), including dairies, heifer ranches and calf nurseries in the Santa Ana Region. These AFOs contain about 370,000 animals [213,000 lactating (milking) cows, 37,000 dry (pregnant) cows, 56,000 heifers (12-18 month old cows), and 60,000 calves (less than 12 month old cows)]. Two hundred and seventy nine of these facilities (320,000 animals) are located in the Chino Basin, while 23 of the facilities (50,000 animals) are located in the San Jacinto Basin. The wastes generated at these facilities include manure, wash water[1] and storm water runoff from manured areas. About 950,000 tons of manure (at 33% moisture) were produced in the corrals by these facilities in 1998. This is equivalent to about 4,000,000 cubic yards of manure (at 33% moisture). About 15 million gallons of washwater, which contains about 10% of the manure produced by milking cows, is discharged to the ground each day. Wastes produced at AFOs contain high levels of bacteria, biochemical oxygen demand, ammonia, nitrate, phosphorus, and other salts.

Wastes in rainfall runoff from AFOs in the Chino Basin affect Chino Creek, Mill Creek and Reach 3 of the Santa Ana River, which are 303(d) listed impacted water bodies. Wastes from AFOs that are discharged to the Santa Ana River also affect the quality of groundwater in Orange County, since the Orange County Water District captures and percolates a significant amount of the flow of the Santa Ana River to recharge the Santa Ana Forebay Groundwater Subbasin. The Chino Basin is considered to have the highest concentration of dairy animals in the world, with its 279 facilities and 320,000 animals located within an area of less than 50 square miles (30,000 acres). The application of manure to the ground in the Chino Basin has resulted in significant groundwater pollution, specifically total dissolved solids (TDS) and nitrate. Affected groundwater in the Chino Basin also impacts the quality of the Santa Ana River because the Santa Ana River becomes a gaining steam in the Prado Basin where groundwater from the Chino Basin contributes to the surface flow of the Santa Ana River.

Wastes in surface runoff from AFOs in the San Jacinto Basin affect the San Jacinto River, Canyon Lake and Lake Elsinore. Phosphorus from AFOs is considered to be the primary cause of algae blooms in Lake Elsinore, the largest natural freshwater lake in Southern California. These algae blooms deplete oxygen in the lake, creating fish kills and other conditions which affect the economic development and aesthetics of the area. Proper management of wastes from AFOs is essential to protect the surface and groundwater resources of the Region.

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[1] Water used to wash cows prior to milking, milking equipment and the milk barn.

Beginning in 1972, and continuing through 1994, the Board's regulatory approach was to issue individual waste discharge requirements to each AFO. Changes in the location, size, number of animals, or operator of these facilities were frequent and necessitated rescinding existing waste discharge requirements and issuing new requirements. The time demands to draft and rescind individual waste discharge requirements far exceeded the staff resources available to do so.

Criteria cited in 40 CFR 122.28 state that general permits may be issued for facilities 1) involving the same or substantially similar types of operations; 2) discharging the same types of wastes; 3) having the same or similar operating conditions; 4) requiring the same or similar monitoring; and 5) that are more appropriately regulated under a general permit rather than individual permits. The types of wastes and appropriate waste discharge requirements for dairies and related facilities are similar. Given this, the AFOs in the Region can be adequately and appropriately regulated by coverage under the terms of a general waste discharge permit.

On February 17, 1994, the Board adopted Order No. 94-7, General Waste Discharge Requirements For Concentrated Animal Feeding Operations, Including Dairies, Within The Santa Ana Region (NPDES NO. CAG018001). Order No. 94-7 has allowed the Board to better utilize staff resources. Currently, approximately 215 AFOs have been enrolled under Order No. 94-7. The remaining AFOs are either covered under individual waste discharge requirements issued prior to 1994, have submitted a Notice of Intent (NOI) to be covered under Order No. 94-7, or have not yet submitted a NOI. AFOs that have submitted a NOI and have not yet been granted coverage under Order No. 94-7 and AFOs that are still covered under individual waste discharge requirements, have not been granted coverage under Order No. 94-7 because they have not yet completed Engineered Waste Management Plans (EWMPs). Order No. 94-7 expired on March 1, 1999. Therefore, it is necessary to renew the waste discharge requirements contained in Order No. 94-7.

Although Order No. 94-7 regulated the discharge of waste from all AFOs (including non-dairy related facilities), the proposed order only addresses the discharge of wastes from dairies and related facilities, such as calf nurseries and heifer ranches. Over 95% of the dischargers enrolled, or waiting to be enrolled, under Order 94-7 are dairies and related facilities. Many of the requirements contained in Order No. 94-7, and this proposed order, are not appropriate for most other types of AFOs. Therefore, persons discharging, or proposing to discharge, wastes from other types of AFOs must obtain coverage under individual waste discharge requirements or another general permit, if one is adopted.

Currently, the larger AFOs are required to get coverage under the State Water Resources Control Board (State Board) General Industrial Storm Water Permit (Order No. 91-13-DWQ) for storm water runoff from their facilities. However, the proposed order consolidates all requirements for AFOs, including those for storm water runoff, into a single permit. Once coverage is granted under this order, other waste discharge requirements issued by this Regional Board and coverage under the State's General Permit will be terminated.

The Federal Clean Water Act (CWA) states that all concentrated animal feeding operations (CAFOs) are point sources and are subject to NPDES permitting requirements. The CWA defines a CAFO as any AFO that has more than 1,000 animal units (i.e., dairy cattle are considered 1.4 animal units). About 70% of the AFOs in the Region have over 1,000 animal units, and are, therefore, considered CAFOs under the CWA. However, the CWA states that smaller facilities can be designated as CAFOs by the permitting authority (i.e., Regional Board) after considering certain criteria. These criteria include, in part, the location of the AFO relative to surface waters, the slope, rainfall and other factors that increase the likelihood or frequency of discharges, and the impact of the aggregate amount of waste from many small operations in a watershed that exceed that of lager operations. Board staff has determined that all dairies, heifer ranches and calf nurseries in the Region meet one or more of these criteria, and, therefore, should be designated as CAFOs under the CWA. Tentative Order No. 99-11 designates all dairies, heifer ranches and calf nurseries in the Region as CAFOs, and makes them subject to NPDES requirements. Therefore, the acronym "CAFO" will be used to describe all facilities addressed by Tentative Order No. 99-11.

## II. Basis for Discharge Limitations

### Development and Implementation of Engineered Waste Management Plans

In compliance with the CWA and the California Code of Regulations, Tentative Order No. 99-11 prohibits discharges to any surface water bodies, or tributary thereof, unless rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 25-year, 24-hour rainfall event. (Title 27, Chapter 7, Subchapter 2, Article 1, Section 22562(a), California Code of Regulations and 40 CFR Part 412). Therefore, process waste water in overflows resulting from rainfall events that are chronic or catastrophic, or are in excess of a 24-hour, 25-year rainfall event, may be discharged to surface water bodies in accordance with requirements specified in this order. To insure that compliance with these requirements is achieved, all CAFOs are required to develop and implement an Engineered Waste Management Plan (EWMP). The guidelines for the preparation of an EWMP are included in Attachment "B" of the proposed order. Attachment "B" is intended to be revised by the Executive Officer in the near future. As with expired Order No. 94-7, Tentative Order No. 99-11 authorizes the Executive Officer to make necessary revisions to "Attachment B".

### Prohibition on the Application of Manure to Land in the Chino Basin

The Regional Board has conducted extensive studies on TDS and nitrate using computer models to determine acceptable salt loading rates to groundwater from various land uses, including dairies and other animal confinement facilities. These studies are the basis of the TDS and nitrogen management plan specified in the Water Quality Control Plan (Basin Plan) for the Region. In accordance with the TDS/nitrogen management plan, since 1972, waste discharge requirements adopted by the Board for CAFOs limited the amount of manure disposal on disposal acreage at

CAFOs to 3 (dry) tons (4.38 tons @ 33% moisture) per acre per year to address potential groundwater impacts. The resultant salt load is roughly equivalent to that permitted by the plan for other types of land use when the affected receiving waters have salt assimilative capacity. Dairy manure contains much more salt per unit of nitrogen than other types of fertilizers. The Board's 1990 Dairy Report, "Dairies and Their Relationship to Water Quality Impacts in the Chino Basin", showed that the use of manure as a fertilizer results in two to four times more salt reaching groundwater (up to 10 times more non-nitrate salts) than the use of non-manure commercial fertilizers. For this reason, the use of manure to meet the nutrient needs of crops results in excessive application of salts that are not utilized by plants and which can, therefore, migrate to groundwater. Order No. 94-7 limited manure application to cropland to agronomic rates [up to 12 (dry) tons (17.5 tons @ 33% moisture) per acre per year]. Limiting the amount of manure applied to cropland to agronomic rates was an attempt to minimize the amount of salt that would reach groundwater from the use of manure on cropland, without hindering the effective use of manure as a fertilizer.

Ninety percent of the CAFOs in the Region are located in the Chino Basin, which has severe TDS and nitrate groundwater quality problems. As noted in the Board's Basin Plan, the Chino II and III Groundwater Subbasins lack assimilative capacity for these constituents. For groundwater subbasins without assimilative capacity, additional salt inputs at rates above Basin Plan objectives cannot be allowed (State Water Resources Control Board Order No. 73-4, the Rancho Caballero decision). To meet the Chino Basin groundwater objectives, the discharge of manure and other animal wastes, such as dairy wash water, and their application as fertilizer, cannot be legally permitted unless this salt load is offset. The Basin Plan contains a dairy regulatory strategy that was developed in the Board's 1990 Dairy Report. One element of that strategy addresses waste discharge requirements for manure and wash water disposal and application of wastes to cropland. That element specifies that ongoing manure and wash water disposal or application to cropland in the Chino Basin must be prohibited unless suitable salt offset programs are implemented.

In 1994, the Board was informed that two desalters would be built in the Chino Basin. The Board was also informed that a significant amount of manure would be exported from the Chino Basin by the proposed Chino Basin Co-Composting Facility. It was assumed that after the Chino Basin Co-Composting Facility began operation and began exporting a significant amount of manure, the amount of salt to be extracted from the Chino Basin by the two desalters would be adequate to provide sufficient salt removal to offset the present and projected salt loads from ongoing dairy discharges. Therefore, the Board adopted Order No. 94-7, allowing manure and wash water discharges to continue, on the assumption that adequate salt offsets would be implemented. However, the desalters were never built (although one is now under construction) and the Co-Composting Facility, built in 1995, has never exported the significant amount of manure that had been projected. Therefore, sufficient offsets were not implemented, and manure and wash water discharges, and the use of manure on cropland, have been continuing without adequate salt offsets, in violation of State law.

Board staff estimates that over 13 million tons of manure have been applied in the Chino Basin since the mid-1950's, resulting in over 1.4 million tons of salt that have reached, or will reach,

groundwater. The application of about 400,000 tons of manure (@ 33% moisture) per year to disposal land, cropland and ongoing stockpiles in the Chino Basin is continuing. Board staff estimates that the current rate of application of manure and wash water to land in the Chino Basin is resulting in about 34,000 tons of salt that will reach groundwater each year. About 30,000 tons per year is from the application of manure, and about 4,200 tons per year is from the discharge of wash water. A desalter is currently being built in the Chino Basin. The extraction wells that will supply water for the desalter are expected to remove about 11,500 tons of salt per year from the Chino Basin. Kaiser Steel will be credited with an offset of 4,000 tons of this salt each year for a period of 25 years, in accordance with a previous settlement agreement with the Board. The Board has previously indicated that it would accept the remainder of the salt that will be removed from the extraction wells as an offset for continuing discharges from CAFOs in the Chino Basin. However, that amounts to an offset of only 7,500 tons of salt per year, compared to a current CAFO salt loading to groundwater of about 34,000 tons per year. In addition to the 4,200 tons of salt that reaches groundwater each year from wash water discharges, salt also is discharged to groundwater as a result of the percolation of rainfall runoff from corrals and drainage from manure stockpiles. The amount of salt that reaches groundwater each year from the percolation of rainfall runoff from corrals and percolation of drainage from manure stockpiles has not yet been adequately determined. However, staff believes that it may account for the remaining 3,800 tons of salt offset provided by the desalter, leaving no, or very little, salt offset available for continued manure application in the Chino Basin. No other mitigation measures are currently in place, and none are expected to be in place immediately, to offset the salt loading from ongoing manure application in the Chino Basin. Therefore, the discharge of manure and its application as fertilizer in the Chino II and Chino III Subbasins must be prohibited. The remainder of the subbasins in the Chino Basin are of excellent quality and are tributary to the Chino II and Chino III Subbasins. Also, the addition of salt to those subbasins by the application of manure was not considered when the assimilative capacity for those subbasins was determined. Therefore, Tentative Order No. 99-11 prohibits the discharge of manure and its application as fertilizer throughout the entire Chino Basin (The accompanying cease and desist order allows manure to continue to be applied to cultivated croplands within the Chino Basin at agronomic rates as long as significant progress is being made towards the construction and operation of a second desalter within the Chino Basin). Tentative Order No. 99-11 does not prohibit the on-site discharge of wash water, rainfall runoff from corrals, or drainage from manure stockpiles, since the salt loadings from these discharges appear to be offset by the salt that will be removed by the desalter facility.

Removal of Manure from the Facility

Tentative Order No. 99-11 requires that manure be hauled from each facility within 180 days after being removed from the corrals. Any manure remaining at the facility after 180 days of being removed from the corrals is considered to be disposal of manure and is prohibited by Tentative Order No. 99-11. Draft Order No. 99-11, which was distributed for comments in March and April 1999, proposed requiring the removal of manure from the facility within 90 days after removal of the manure from the corrals. Several comments were received in writing and orally at Board Workshops, stating reasons why this time frame was unreasonable. Board staff also solicited

comments from farm advisors with the University of California Cooperative Extension. It was determined that it is beneficial to "cure" manure for 90 to 180 days prior to composting or for application to cropland, and that the nutrient value of the manure is not significantly affected when manure is stored for less than 180 days. During the winter, 90 days would not allow sufficient time for the manure to dry adequately prior to hauling. Providing 180 days of storage will allow the moisture content of the manure to be sufficiently reduced, making it lighter per unit of volume, and easier and less expensive to haul. Some commercial fertilizer facilities in the Chino Basin prefer receiving manure that has been aged for at least 150 days. Also, CAFOs generally remove manure from their corrals twice a year. Allowing up to 180 days (6 months) storage will result in manure being removed from the facility prior to the next corral cleaning, and will still achieve the goal of preventing the long term accumulation of manure at CAFOs. Board staff believes that allowing for 180 days storage is reasonable, and that there would be no significant difference in water quality impacts from storing manure at the facility for 180 days instead of 90 days.

Change in Language Pertaining to Containment of Storm Water Runoff

Order No. 94-7 and Draft Order No. 99-11 included the following Discharge Specification: "The discharge to any surface water bodies, or tributary thereof, is prohibited unless a chronic, catastrophic or cumulative rainfall causes overflow from a storage facility designed, constructed, maintained and operated to contain all process generated wastewater plus the runoff from a 24-hour, 25-year storm." These Orders defined a chronic, catastrophic or cumulative rainfall as rainfall occurring over a 7-day period or less which is equivalent to that from a 24-hour, 25-year storm event. This language is slightly different than similar language included in the CWA that does not refer to "cumulative" rainfall, and does not contain a definition that refers to rainfall "occurring over a 7-day period." The specification included in Order No. 94-7 and Draft Order No. 99-11 is, overall, more stringent than the language in the CWA, and was developed to provide a more objective basis for determining compliance with the rainfall containment requirement and to be consistent with the Board's EWMP Guidelines. However, the USEPA, and others, have noted that there could be instances during certain storm events of less than 7 days when the specification included in Order No. 94-7 and Draft Order No. 99-11 can be less restrictive than the language included in the CWA. They have requested that the language proposed in Draft Order No. 99-11 be changed to be consistent with the language in the CWA, since NPDES permits cannot contain requirements that can be less restrictive than the CWA. Therefore, the term "cumulative" and the reference to rainfall "occurring over a 7-day period" has been removed from Tentative Order No. 99-11 to make the rainfall containment requirement consistent with the CWA.

Consistency with USDA/USEPA "Unified National Strategy for Animal Feeding Operations"

In March 1999, the United States Department of Agriculture (USDA) and the USEPA finalized their unified national strategy for AFOs. Among other items, the national strategy recommended that general permits require the development and implementation of Comprehensive Nutrient Management Plans (CNMPs). In general, development and implementation of CNMPs is intended to bring each CAFO into compliance with the requirements of the CWA and to minimize the

impacts to groundwater and surface water by the implementation of best management practices. The national strategy describes many best management practices that could be included in CNMPs for individual CAFOs. The best management practices included in each CNMP for each CAFO would include specific best management practices for that CAFO, depending on the specific situations that exist at that particular CAFO. In general, the CNMP would assure that appropriate wastewater facilities were developed, constructed and maintained to comply with the requirements of the CWA, and that the use and application of waste water and manure (i.e., nutrient management) was managed to minimize impacts to groundwater and surface water. Tentative Order No. 99-11 does not require the development and implementation of CNMPs, as described and recommended in the national strategy. This is because the requirements included in Tentative Order No. 99-11 are equivalent to, or more stringent than, what would be required in CNMPs. Also, many of the BMPs recommended to be included in CNMPs are not relevant to the specific, isolated conditions that exist in the Chino Basin. The requirements in Tentative Order No. 99-11 for wastewater and rainfall are equivalent to what the national strategy requires. General BMPs that can be implemented to comply with the wastewater and rainfall containment requirements will be further addressed in the Board's EWMP Guidelines when they are revised in the near future. Specific BMPs that will be implemented at each CAFO to comply with the wastewater and rainfall containment requirements will be addressed in each CAFO's specific EWMP. The prohibition on the application of manure in the Chino Basin is obviously a more stringent requirement than the BMPs for manure application and management that the national strategy recommends to be included in CNMPs, since application of manure is not permitted. The limitation on the application of manure to agronomic rates, not to exceed 12 (dry) tons (17.5 tons @ 33% moisture) per acre per year, in groundwater basins outside the Chino Basin where assimilative capacity exists and application of manure is permitted, is equivalent to the nutrient management guidelines included in the national strategy. Specific BMPs addressing application of manure will be included in each CAFOs specific EWMP.

Prohibition on Covering New Discharges in the Chino Basin Under this Order

The 1998 California 303(d) List and TMDL Priority Schedule includes several surface water bodies as impaired due to CAFOs, including Chino Creek, Mill Creek (Prado Area), and Reach 3 of the Santa Ana River for nutrients, pathogens, salinity/TDS/chlorides, and suspended solids. The CWA states that NPDES permits cannot be issued to a new source (discharger) if the discharge will cause or contribute to the violation of water quality standards, unless certain specified criteria are met, including the development of TMDLs. In the absence of a current TMDL, USEPA has recommended that this general permit be limited to current facilities, and that any new sources (i.e., construction of any new facilities) be processed through an application for an individual NPDES permit. Therefore, Tentative Order No. 99-11 prohibits new sources (i.e., new facilities) from being covered under this general permit. Since the most recent new construction of a CAFO facility in the Chino Basin was approximately 20 years ago, this prohibition is not expected to be a significant issue.

Inability of Many CAFOs to Immediately Comply with Several Requirements Included in this Order

Many CAFOs will not be able to immediately comply with several of the requirements contained in Tentative Order No. 99-11. These requirements include the prohibition on the application of manure in the Chino Basin, implementation of EWMPs and containment of rainfall from a 24-hour, 25-year storm. The Board will consider adoption of a Cease and Desist Order No. 99-65 with a time schedule for compliance with these requirements.

## III. Coverage Under the General NPDES Permit

### A. Dischargers Currently Regulated Under Order No. 94-7 or Under Individual Waste Discharge Requirements, and Dischargers that have Submitted NOIs

These dischargers will be automatically enrolled under the proposed order, once it is adopted. Dischargers who have not yet submitted an acceptable EWMP (see Attachment "B" of the order) are required to do so.

### B. Dischargers Not Currently Regulated Under Order No. 94-7 or Under Individual Waste Discharge Requirements, and Dischargers that have not Submitted NOIs:

At least 60 days prior to initiating a discharge at an existing facility, the discharger shall submit a Notice of Intent (NOI) (see Attachment "A") with the appropriate filing fee (currently, the filing fee is $2,000.00 for each facility) and an acceptable EWMP[2].

## IV. Discharge Authorization Letter

Upon adoption of this order, the Executive Officer shall issue discharge authorization letters to dischargers currently enrolled under Order No. 94-7, discharging waste under individual waste discharge requirements or who have submitted an NOI to be covered under a general permit.

Upon receipt of a complete application for initiation of a discharge at an existing facility, the Executive Officer will review the application to determine eligibility for discharge under this order. If the Executive Officer determines that the discharger is eligible to discharge wastes under this general order, the Executive Officer may authorize the proposed discharge. Otherwise, the Executive Officer may require the discharger to obtain individual waste discharge requirements.

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[2] New operators/owners of existing facilities for which an EWMP has been approved are not required to submit an additional EWMP.

## V. Antidegradation Analysis

The Regional Board conducted extensive TDS and nitrate studies using computer models to determine acceptable salt loading rates to groundwater from various land uses, including dairies and other concentrated animal feeding operations. These studies indicate that if the requirements specified in the proposed general permit are met, water quality of the Region is not expected to degrade as a result of discharges authorized under this general permit. The Regional Board, in establishing the requirements in the tentative order, has taken into consideration the requirements of the State and Federal "antidegradation policies" and has determined that the discharges are in conformance with the antidegradation policies.

## VI. Written Comments

All written comments regarding the proposed general order should be submitted to: Robert Holub, Regional Water Quality Control Board, 3737 Main Street, Suite 500, Riverside, CA 92501.

## VII. Information and Copying

Persons wishing further information may write to the address given below (see IX, below) or call the Regional Board at (909) 782-4130. Copies of the proposed waste discharge requirements, and other documents (other than those which the Executive Officer maintains as confidential) are available at the Regional Board office for inspection and copying by appointment scheduled between the hours of 10:00 a.m. and 4:00 p.m., Monday through Thursday (excluding holidays).

## VIII. Register of Interested Persons

Any person interested in a general permit, or in a particular application or group of applications, may leave his name, address, and phone number as part of the file for an application. Copies of tentative waste discharge requirements will be mailed to all interested parties.

## IX. Workshops and Public Hearing

The Regional Board conducted public workshops on April 9, 1999, May 21, 1999, and June 25, 1999, to solicit comments on the draft general waste discharge requirements that were distributed in March and April 1999. Oral comments were received during these workshops, and written comments were submitted by several parties. These comments were considered by staff and incorporated into Tentative Order No. 99-11, as appropriate.

The Regional Board will hold a public hearing and consider adopting Tentative Order No. 99-11 during a public meeting on August 20, 1999, beginning at 9:00 a.m. The meeting will be held at the City Council Chambers of Loma Linda, 25541 Barton Road, Loma Linda.

Further information regarding the conduct and nature of workshops and pubic hearings concerning waste discharge requirements may be obtained by writing or visiting the Santa Ana Regional Board office, 3737 Main Street, Suite 500, Riverside, 92501 or by calling Robert Holub of Regional Board Staff at (909) 782-3298.

California Regional Water Quality Control Board
Santa Ana Region

August 20, 1999

ITEM:

SUBJECT: General Waste Discharge Requirements For Concentrated Animal Feeding Operations (Dairies And Related Facilities) Within The Santa Ana Region, Order No. 99-11, NPDES No. CAG018001

DISCUSSION:

See attached Fact Sheet

RECOMMENDATION:

Adopt Order No. 99-11, as presented.

Comments were solicited from the following agencies and/or persons:

U.S. EPA, Washington, Office of Wastewater Enforcement and Compliance - Michael B. Cook
U.S. EPA, San Francisco – Alexis Straus
U.S. EPA, Permit Issuance Section - Terry Oda (W-5-1)
U.S. EPA, San Francisco – Dan Meer
State Water Resources Control Board, Office of the Chief Counsel - Ted Cobb
State Water Resources Control Board, DWQ – Jim Kessel, Jack Hodges, Cheryl Closson
State Department of Water Resources - Glendale
State Department of Health Services - San Bernardino/Santa Ana/San Diego
State Department of Fish and Game - Fred Worthley
Regional Water Quality Control Board (1) - Lee Michlin
Regional Water Quality Control Board (2) - Loretta Barsamian
Regional Water Quality Control Board (3) - Roger Briggs
Regional Water Quality Control Board (4) - Dennis Dickerson
Regional Water Quality Control Board (5) - Gary Carlton
Regional Water Quality Control Board (6) - Harold J. Singer
Regional Water Quality Control Board (7) - Philip Gruenberg
Regional Water Quality Control Board (9) - John Robertus
San Bernardino County Board of Supervisors
San Bernardino County Department of Environmental Health Services - Pam Bennett
San Bernardino County Transportation/Flood Control District - Naresh Varma
San Bernardino County LEA
Riverside County Board of Supervisors
Riverside County Department of Environmental Health Services

Riverside County Flood Control and Water Conservation District - Jason Christie
Riverside County LEA
City of Chino
City of Ontario
Milk Producers Council - Robert Feenstra
California Milk Producers Association – John Godino
Santa Ana Watershed Project Authority - Joseph Grindstaff
Inland Empire Utilities Agency – Doug Drury
Orange County Water District - Bill Mills, Nira Yamachika
U.C. Extension, San Bernardino - Abraham Wubishet
Inland Empire West Resource Conservation District - Jeff Wilson
National Resource Conservation Service - Jim Earsom
City of Lake Elsinore – Dick Watenpaugh, Pat Kilroy
Eastern Valley Municipal Water District
Western United Dairymen - Gary Conover, John Borges
Chino Basin Watermaster - Tracy Stewart
Daily Bulletin - Bob Page
Orange County Register
Press Enterprise - Leslie Bergman
Northwest Mosquito and Vector Control District
Santa Ana River Watershed Group - Lindel Marsh
Orange County Sanitation District - Blake Anderson
Water Advisory Committee of Orange County – H. E. Hartge
Los Alisos Water District – Kenneth Petersen
Municipal Water District of Orange County – Stanley E. Sprague
El Toro Water District – Ronald Kennedy
Mesa Consolidated Water District – Fred Bockmiller
Irvine Ranch Water District – Paul D. Jones II
Metropolitan Water District – Bob Huntley
Yorba Linda Water District – Arthur C. Korn
City of Anaheim, Public Utilities Department – Edward K. Aghjayan
Dairy Mailing List

D

Rec'd 1/7/04

# ENGINEERED WASTE MANAGEMENT PLAN

Accepted 8-22-05

Prepared For:

SNS DAIRY
7325 Edison Avenue
Chino, CA 91710
(909) 732-8165
(909) 627-9432

NOLTE
BEYOND ENGINEERING

JOB NO.IEB0103
December 2003

This Engineered Waste Management Plan was prepared under the direction and supervision of Paul Hacunda, Professional Engineer.

Paul J. Hacunda, P.E. No. 41627

REGISTERED PROFESSIONAL ENGINEER
PAUL J. HACUNDA
No. 41627
Exp. 12/31/07
CIVIL
STATE OF CALIFORNIA

For additional questions and comments, please contact:


Paul Hacunda
Associate

Gary Koontz
Project Manager

NOLTE ASSOCIATES, INC.
255 East Rincon Street, Suite 110
Corona, CA 92879
Tel: (909) 739-5700
Fax: (909) 739-7510

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**ENGINEERED WASTE MANAGEMENT PLAN**
**for**
**SNS DAIRY**
**7325 Edison Avenue**
**Chino, CA 91710**
**(909) 732-8165**

## I. INTRODUCTION

This plan describes the operational setting of SNS Dairy and recommended procedures of the operation and management of the dairy wastewater collection, retention, and disposal system at the:

SNS Dairy

| | |
|---|---|
| Owner/Operator: | Sam Souza |
| Location: | 7325 Edison Avenue, Chino,California |
| Mailing Address: | same |

| | | | |
|---|---|---|---|
| EWMP Responsible Party: | Primary: | Sam Souza | (909) 732-8165 |
| | Secondary: | Sam Souza Jr. | (909) 203-5905 |

The dairy is situated on the south side of Edison Avenue. The west boundary of the dairy is adjacent to the Sultana Avenue right-of-way. The east boundary is adjacent to the Campus Avenue right-of-way.

The gross area of the dairy is approximately 36.55 acres. The dairy operations occupy approximately 33.41 acres of the total acres and include the following uses:

- Corrals,
- Hay barns,
- Commodity barn,
- Milk barn, and
- Wastewater lagoons

The current typical animal population is:

- 850 milk cows, and
- 150 dry cows

This onsite stock count equates to 1400 animal units. SNS Dairy has not plans for expansion at this time. However, the operator does intend to abandon milking operations in the near future and use the facility for raising his heifers. The EWMP is designed for a milking herd to provide the option of leasing out the facility to a dairy operator if he chooses.

At the time this report was prepared, this dairy could not comply with the RWQCB's 2001 Guidelines for the Development of EWMPs. The quantities reported are the result of the proposed improvements described herein under Section II, Recommendations.

Portions of SNS Dairy that require containment of runoff include approximately 12.73 acres of corrals, 1.49 acres of concrete feed alleys, 3.15 acres of dirt areas, and 6.97 acres of fields and pastures. The wastewater lagoon and evaporation basins occupy 8.74 acres and have a combined storage capacity of 10,301,007 gallons (31.61 acre-ft). SNS Dairy generates approximately 24,861 gallons of wash water per day (See Appendix A, page 1).

SNS Dairy has a very efficient and effective way of managing its wash water and storm water. Wash water from the milk barn gravity flows to a sump located just east of the milk barn. From the sump the wash water continues by gravity flow through a 4 inch PVC line to a series of check valves located along the northerly portion of Field #2. Water can be dispersed via the check valves to various portions of Field #2 to evaporate and percolate. Any wash water or storm runoff from Field #2 is collected in a series of evaporation basins located to the south.

Storm runoff from Corral #1 flows south, then east to commingle with runoff from Corrals #2 through #5 and continue south via a swale located along the west boundary of the corrals. Just south of Corral #5, a berm directs the runoff to the east and ultimately into Basin #1. Storm runoff from Corrals #6 through #9 flows east to the west boundary of Field #1, then south to Basin #1. Storm runoff from Corral #10 flows south to Field #1 and ultimately to Basin #1. Corrals #11 through #13 drain south to Field #2 and ultimately into Evaporation Basins #1 through #5.

Corral #14 receives some runoff from the dirt area located to the north of the corral. There is a potential for runoff exiting the corral along the south fence line to flow southeast and offsite. Any runoff that exits the facility along the east fence line will be contained within a small swale located between the east fence line for SNS Dairy and the Feed Alley for the adjacent facility to the east. The runoff will then be channeled, within the swale, to the south along the Campus Avenue right-of-way. This report includes a recommendation that Corral #14 be abandoned, the manure removed and a two foot berm constructed along the west fence line between Corral #13 and #14. By implementing this recommendation, runoff from the dirt area and Corral #14 will remain uncontaminated with manure and, therefore, can flow offsite along the natural drainage course within the Campus Avenue right-of-way.

SNS Dairy has adequate protection against on-site storm water leaving the property. In general, storm runoff drains from north to south to either Basin #1 or Evaporation Basins #1 through #5. The west boundary is protected by a berm along the west part of the Sultana Avenue right-of-way. Potential runoff along the south boundary is contained by the west to east extension of the west berm. Runoff is directed in an easterly direction into Basin #1. Runoff along the east boundary, south of the dirt area and Corral #14, is contained within Evaporation Basin #5.

SNS Dairy also has excellent protection against offsite entering the property. The northern property line is protected from run-on by a series of dirt and asphalt berms depicted on the Plot Plan. The storm runoff from Edison Avenue is directed west and away from the dairy. The remaining boundaries of the dairy are protected by the berms and Basin #1, as discussed above and depicted on the Plot Plan.

SNS Dairy was built prior to November 27, 1984. Therefore, they are not required to protect their manured areas from the 100-year peak stream flow. However, they are required to protect all manured areas from the 20-year peak stream flow. Studies have not been done to calculate the flood elevations of a 20-year peak stream flow. In order to protect the dairy from, and prepare for, a 20-year peak flow, it must maintain regular maintenance programs as described herein. All onsite flows and the required volumes for the 25-year, 24-hour storm must be contained (See Appendix H, 100 Year Flood Plain Data).

## II. DESIGN

SNS Dairy was originally contracted to comply with Order No. 99-11. Since that time, guidelines for achieving compliance with Order No. 99-11 have been issued (Guidelines for the Development of Engineered Waste Management Plans for Concentrated Animal Feeding Operations, February 5, 2001). This Engineered Waste Management Plan (EWMP) was prepared under the recommendations of the new guidelines.

Order No. 99-11 required the containment of the daily production of wastewater and storm water runoff from a 24-hour, 25-year storm. The new guidelines to Order No. 99-11 require the containment of:

- 150 days of the daily production of wastewater,
- A 24-hour, 25-year storm,
- 150 days of winter precipitation, and
- The 150-day accumulation of 10% of manure solids that could end up in the lagoons.

Although evaporation and percolation can be accounted for, the new guidelines require a large change in containment from Order No. 99-11.

In order to accommodate the new guidelines, this report contains two sets of calculations. The first set of calculations determines the amount of capacity required for 150 days storage. The second set of calculations performs a month-by-month water balance analysis of the amount of wastewater generated and eliminated. This second set of calculations was developed for those dairies that do not meet the requirements of the new guidelines. This second set of calculations optimizes the amount of storage required by including percolation and evaporation on a month by month basis.

The Engineered Wastewater Management Plan (EWMP) developed for SNS Dairy in December 2003 determined that the dairy has appreciable wastewater storage. SNS Dairy meets all of the requirements of the new guidelines. In Table 1, wastewater volumes and the capacity of the settling basin & lagoon are summarized.

| Table 1<br>Capacity Summary | | |
|---|---|---|
| Total Days Required | 150 | days |
| Total Milkhouse and Parlor Water Rate | 3,045 | gal per day |
| Total Wash Pen Rate | 21,816 | gal per day |
| Total Milkhouse and Wash Pen Rate | 24,861 | gal per day |
| Total Required Storm Water Volume | 15.44 | acre-ft |
| Total Manure Volume | 0.66 | acre-ft |
| Total Required Containment Facility Volume | 27.54 | acre-ft |
| Total Available Volume | 31.61 | acre-ft |
| ADDITIONAL VOLUME REQUIRED | 0 | acre-ft |
| | | |
| Total Annual Washwater and Storm Water Accumulation | 59.07 | acre-ft |
| Total Annual Evaporation and Percolation Capability | 134.57 | acre-ft |
| | | |
| Total Winter (Nov.-Dec.-Jan.-Feb.-Mar.) Washwater and Storm Water Accumulation (Inflow) | 35.46 | acre-ft |
| Total Winter (Nov.-Dec.-Jan.-Feb.-Mar.) Evaporation and Percolation Capability (Outflow) | 9.72 | acre-ft |

The data presented in this report was generated in the spreadsheets labeled "Worksheet for Determining Containment Facility Volume" (Appendix A). The first page[1] details the current animal population and the daily wash water generated on the dairy. All numbers for milk house and wash pen water rates were generated from Rain Bird and Weather Tech Sprinkler Volume Ratings for single and double nozzles. An average of 5.05 Gallons per minute was used for single nozzles and 7.1 gallons per minute was used for double nozzles. These numbers were confirmed by watching the total run time of the wash pen sprinklers per cow pen and matched with research from the University of California Cooperative Extension Program for Dairies (see Appendix C).

The second page[1] shows the equivalent gallons per cow per day. This calculation was generated in response to the EWMP guidelines adopted by the Regional Board. The guidelines recommend that as much as 100 gal/cow/day should be used to generate

[1] Appendix A, "Worksheet for Determining Containment Facility Volume".

wastewater during winter months. The calculation on the second page[1] shows a more accurate estimate of the volume of water used per cow per day on SNS Dairy.

Page two[1] also shows the total storm water accumulation generated on the dairy. Evaporation was considered, based on data from the California Department of Water Resources. Manure was also considered in the total volume calculations. The Total Required Containment Facility Volume is shown on the bottom of the second page[1].

The Total Available Volume is shown on page three[1] for SNS Dairy. The Additional Volume Required was found by subtracting the Total Required Volume from the Current Capacity. In the case of SNS Dairy, no additional volume is required.

Also included on page three[1] is a calculation showing the total depth needed in the basins to contain the 24-hr, 25-yr storm. This calculation was developed to show how much depth should be retained at the top of the basins to ensure that the 24-hr, 25-yr storm can be fully contained. This calculation also shows the maximum fill depth of the basins before pumping must be initiated. The calculation assumes that all storm water flows by gravity to the basins and is contained before it is pumped to application fields. In the case of SNS Dairy, 3.00 feet must be maintained at the top of the Basins #1 and 0.60 feet maintained at the top of Evaporation Basins #1-5 to ensure capacity of the 24-hr, 25-yr storm.

Shown below are two examples of wastewater lagoons. Figure 1 shows an optimum dairy lagoon that is able to contain all of the required wastewater and runoff volumes. Figure 2 shows a more common situation where two lagoons are used to split the total wastewater and runoff volumes. There should always be enough room in one lagoon to hold the 24-hr, 25-yr storm. By leaving enough room for the 24-hr, 25-yr storm, it eliminates dependency on the pump and eliminates potential spills due to pump failure. The calculation on the bottom of page three[1] shows exactly how much depth is needed at the top of the lagoon to ensure containment of the 24-hr, 25-yr storm.

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[1] Appendix A, "Worksheet for Determining Containment Facility Volume"

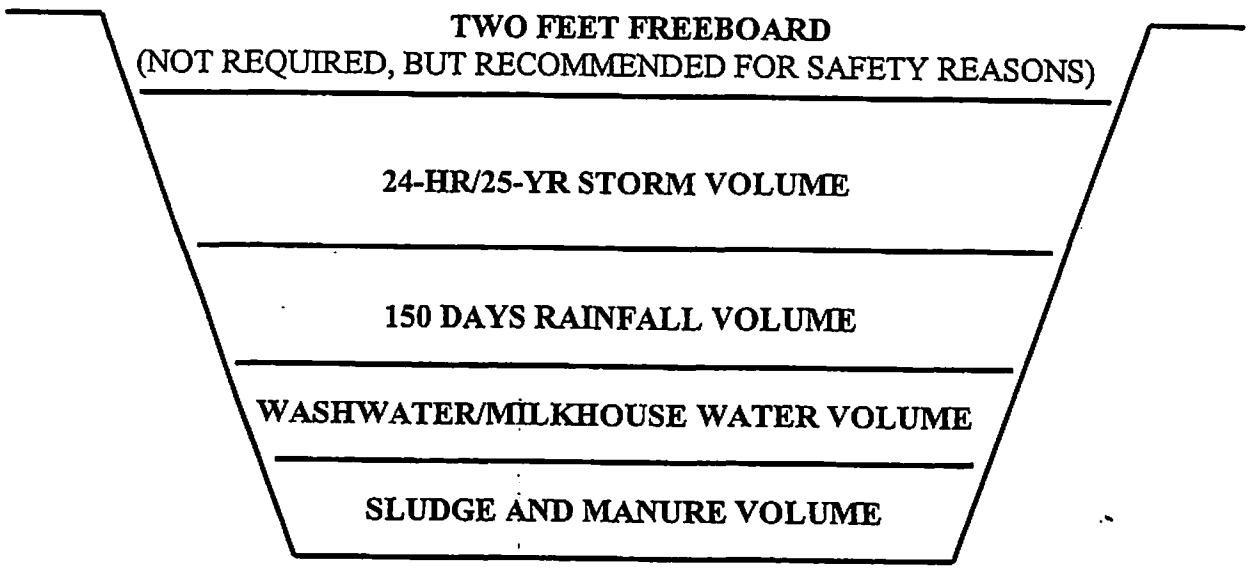


**Figure 1.** Cross section of optimum dairy lagoon.

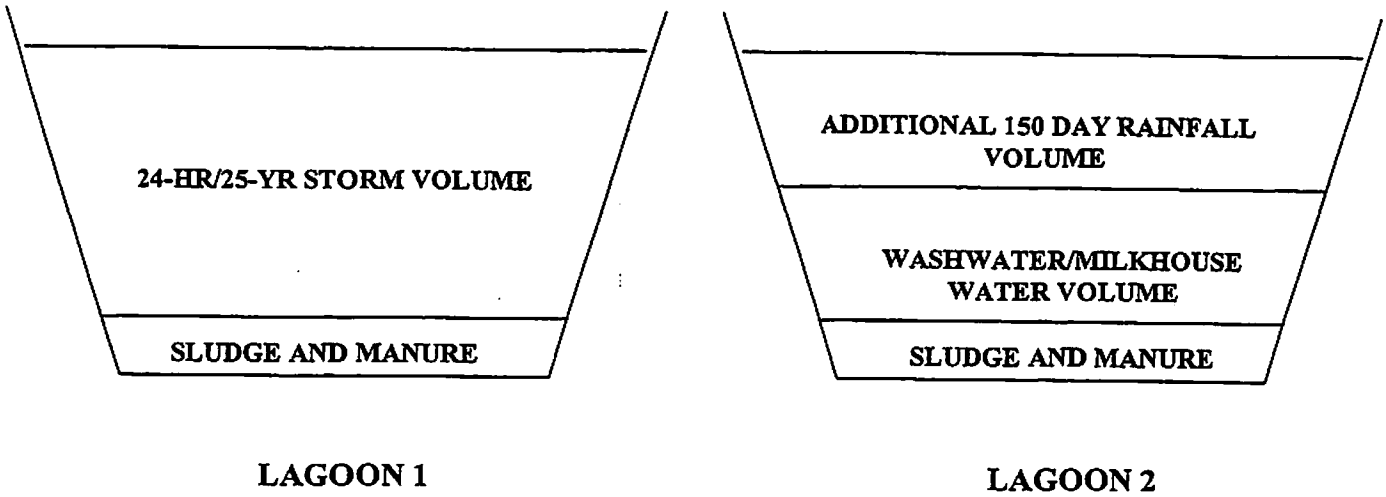


**Figure 2.** Cross sections of typical dairy lagoons with split volumes.

Appendix B contains the Inflow-Outflow computations designed to optimize the amount of storage required. This spreadsheet models the month-by-month totals of operations water, precipitation, 24-hour, 25-year storm data, evaporation and percolation. Although the 24-hour - 25-year storm could occur at any time, it was assumed to occur during the month of

January. Percolation is not included for November through March. All data is referenced in Appendices D-G. As can be seen in the spreadsheets, SNS Dairy has 19,245,907 million gallons of total inflow (Column [15]), and 43,846,695 gallons of total outflow (Column [27]).

Column [28] compares the total inflow with the total outflow on a month-by-month basis. The calculation subtracts the total outflow from the total inflow to give a clear estimate of which months have more inflow than outflow. If there is more inflow than outflow, additional storage is required. Since all factors including evaporation and percolation are included, this calculation gives an accurate estimate of how much storage is needed per month. The total capacity needed on the dairy based on all the months that have more inflow than outflow is then shown at the bottom of the calculation sheet. In the case of SNS Dairy, there are 5 months (November through March) where there is more inflow than outflow. There is a total of 8,386,434 gallons that need to be contained over the year. This number when compared with the total available capacity on the dairy shows if the lagoons need to be expanded or not. Since the SNS Dairy has 10,301,007 gallons of capacity, there is no need to expand the lagoons.

Following the spreadsheets are two charts showing the results of the Inflow-Outflow Computation, titled "Inflow-Outflow Comparison Chart" and "3D Inflow-Outflow Comparison Chart." The 3D Inflow-Outflow Comparison Chart is simply a 3D version of the Inflow-Outflow Comparison Chart. The dark blue line on the chart depicts the total operation water generated in gallons per month. The light blue line shows the total precipitation over the site in gallons per month. The yellow line shows the combination of operation water and precipitation water. The light red line shows the Total Inflow for the dairy including the operations water, precipitation, and the 24-hour, 25-year storm. The large jump in the light blue line denotes the 24-hour, 25-year storm. The purple line shows the evaporation from the fields and lagoons per month. The orange line shows the percolation from the fields per month. The large drop in the line denotes the lack of percolation in the winter months. The green line shows the Total Outflow from the dairy, including evaporation and percolation, per month.

This chart is an excellent reference because it shows the total amount of storage time that would be needed to properly manage the wastewater and storm water. In the case of SNS Dairy, there is more total inflow than total outflow in the months of November through March. This shows that the dairy technically needs 150 days of storage to properly manage the wastewater and storm runoff. In every other month there is more potential evaporation and percolation than there is inflow.

The SNS Dairy meets the requirements of the guidelines to Order No. 99-11 for 150 days storage. The following recommendations should be performed to meet the other requirements of the guidelines to Order No. 99-11.

**Recommendations**

1. Remove all animals from Corral #14. Clean the manure from the corral and construct a berm along the west fence line per Section I-I on the Plot Plan. Continue the berm south of the Corral to divert runoff from Corral #14 and run-on from the adjacent dairy away from Field #2. This portion of the berm should be constructed per Section L-L on the Plot Plan.

2. Construct a spillway near the southeast corner of Basin #1 per Detail 1 of the Plat Plan. The spillway shall be constructed of a material such as concrete, asphalt, or rip rap and shall include aprons designed to control slope erosion.

## III. PLOT (SITE) PLAN

Please see Plot Plan at the end of this report. (Plate 1)

## IV. COMPACTION

For construction and/or replacement of berms, the following procedures should be followed:

A. Over excavate the soil to 1'-2' below original ground before building berms.

B. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Backfill and fill materials should be completely free from manure.

C. Uniformly moisten sub-grade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

    1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
    2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

D. The excavation shall be backfilled and compacted to a relative compaction of no less than 90 percent. A Soils Engineer will need to be hired to ensure 90 percent compaction.

## V. OPERATION AND MAINTENANCE

The basic maintenance objectives are to ensure the reliable storage and disposal of accumulated wastewater and waste solids. To achieve this, there are several tasks that must be accomplished on a routine basis:

- Disposal of accumulated wastewater
- Measurement of accumulated waste solids
- Removal and disposal of accumulated waste solids
- Repair and maintenance of dikes and berms
- Maintenance of site grading
- Weed Abatement
- Record keeping

### Accumulated Wastewater Disposal

It is important that the water level in the wastewater holding ponds be properly maintained so that the ponds can provide the required storage capacity during wet weather periods. The California Regional Water Quality Control Board - Santa Ana Region (CRWQCB) has developed specific standards for the handling and storage of wastewater and storm water collected from the dairy operations. This portion of the Engineered Waste Management Plan describes the recommended maintenance procedures for the wastewater holding ponds to ensure compliance with CRWQCB standards.

In order to meet the requirements of the CRWQCB, the following general guidelines should be followed in disposing of wastewater in the ponds:

- Empty ponds just prior to the start of the wet weather season (November 1st) to ensure maximum capacity for the winter months. If stagnant water remains at the bottom of the ponds below the reach of the pumps, portable pumps should be used to remove all wastewater before the start of the wet season.
- Take advantage of dry weather periods during the annual wet weather period to dispose of accumulated wastewater. Fields must be bermed to prevent overflow from disposal areas onto adjacent properties.
- Start to empty ponds at end of wet weather season (March 31st) to maximize percolation and to create additional capacity in the lagoons.

General Equipment Maintenance. Pumps, pipelines and all pertinent equipment used in the handling of wastewater must be routinely checked and serviced to ensure proper operation:

- Check all wastewater distribution and application equipment weekly to ensure proper operation condition.
- Check and service motors and pumps three times a year. Portable replacement pumps should be available in case of a pump failure. If portable pumps are not available on-site, a rental company phone number should be posted with high visibility for all

employees. Rental company phone numbers are also listed on the last page of this report.

- Check transmission pipes for proper condition.
- Take inventory of spare parts and check sources of emergency repair.
- Disc percolation areas (fields) to about 18 inches to assure maximum percolation during wet seasons. Disking of the disposal area should occur as early in the year as possible, as soon as the fields are dry enough for the procedure to be effective. All of the disposal area should be disked at least once each year.

Dry Weather Disposal. Following the annual wet weather months, wastewater accumulated in the ponds should be disposed of in a timely manner in preparation of the coming wet weather months. The following guidelines should be followed for wastewater disposal during dry weather conditions:

- Apply wastewater to each of the evaporation/percolation disposal areas (fields) on a rotational basis.
- Wastewater should be applied to fields in a manner so that all wastewater will percolate and evaporate. Wastewater should be applied to all parts of the field to improve percolation and evaporation and to prevent stagnant wastewater.
- Observe the wastewater levels in the disposal areas on a daily basis and apply additional wastewater as the drying and percolation rates permit.
- Avoid having the fields completely flooded for extended periods of time. The best disposal rates will occur if the fields are flooded 4 to 6 inches and then allowed to evaporate and percolate. Fields can only be flooded to 4 to 6 inches if proper berms exist around the boundaries of the field. If stagnant wastewater develops, a portable pump or other measures should be used to help spread the water and prevent insect breeding conditions.

Wet Weather Disposal. During the wet weather months, there may be weeks of dry weather available to dispose of accumulated wastewater. Take advantage of every opportunity to reduce the wastewater levels in the holding basins/lagoons so that in the event of a large storm the chances of overflow and inadvertent runoff are reduced. The following guidelines should be followed for wastewater disposal during wet weather months:

- Apply wastewater to each of the disposal areas on a rotational basis.
- Apply wastewater in a manner so that all wastewater will percolate and evaporate. Fields should be watered so that all parts of the field receive wastewater. This will help percolation and evaporation and will help prevent stagnant wastewater.
- Observe the wastewater levels in the disposal areas on a daily basis. Apply additional wastewater only if the previously applied wastewater has evaporated or percolated and if a large storm is not eminent.
- Do not flood the fields and leave standing water for a long period of time unless it has so been designated.

## Accumulated Solids Removal and Disposal

Solids contained in the dairy-generated wastewater and in the storm water will naturally settle and accumulate in the bottom of the holding basins/lagoons. The settled solids will reduce the holding capacity of the ponds. To maintain holding pond storage capacity, solids must be routinely checked and periodically removed. The frequency of solids removal will depend on how quickly solids accumulate in the ponds.

Solids Removal. Remove accumulated solids 1st by agitation and pumping, 2nd by dredging, and 3rd by draining and scraping. If dredging is used, ensure that dredging runoff and excess wastewater taken from the ponds is contained and returned to the ponds. Lagoon solids should be removed *every summer* to ensure full capacity in the lagoons before the start of the next winter season.

Solids Disposal. Solids removed from the ponds can be applied to application areas on-site or must be hauled off-site to farm ground for land application. Solids from lagoon applied to application areas should be tilled and mixed into the native soils shortly after application.

## Levee, Berm and Dike Maintenance

The integrity of pond berms, levees, and dikes must be maintained. Follow these guidelines to ensure proper maintenance of the levees and berms:

- Check pond dikes, levees, and berms a minimum of two times per year for erosion and settlement, and repair as necessary (one inspection to occur just prior to the rainy season).
- Check pond dikes, levees, and berms a minimum of two times per year for rodent damage, and repair as necessary (one inspection to occur just prior to the rainy season).
- If immediate repairs must be made, compacted soil should be used to fill all cracks and holes until further repair can be performed.
- Apply suitable rodent control measures for widespread or frequent rodent damage. These may include Anti-Coagulant Bait, Trapping or Fumigation. Pest Control Specialists should be contacted before using any of these methods.

## Site Grading Maintenance

Site grading must be maintained to ensure proper drainage patterns across the dairy. The goal is to minimize the amount of water contaminated with manure and flowing into the holding ponds and to prevent contaminated wastewater from running off-site. The following guidelines should be followed to maintain site grading:

- Ensure that all wastewater generated by the daily dairy operations flows to the wastewater holding ponds. Re-grade as needed.
- Clean and repair buried drain lines as needed.

- Ensure that rainfall collected from cow holding pens, feed storage areas, and other manured areas flows to the holding ponds or containment areas. Re-grade as needed.
- Check the condition of containment walls and berms surrounding the cow confined areas, and repair as necessary.
- Ensure that storm water from off-site areas is diverted away from holding pens and other manured areas.
- Ensure that storm water from other off-site areas does not drain into the holding ponds.

**Weed Abatement**

Weed abatement measures such as pesticides and clearing and grubbing should be used to control weeds in fields, lagoons, wastewater transport channels, and wastewater access paths. Clearing manure out of lagoons once a year and discing fields at a minimum of once a year will help ensure weed abatement.

**Maintenance and Operations Records**

Keep records of all maintenance activities for future reference.

| Maintenance Activity | | Frequency |
|---|---|---|
| Holding Basin/Lagoon Levels | Pond Depth in Feet | Weekly |
| Holding Basin/Lagoon General Inspection | Berm and Lagoon Wall Stability | Weekly |
| Wastewater distribution/ Application Equipment | Pump/Pipe/Ditch Inspection | Weekly |
| Rainfall Totals | Days of Rain & Inches of Rainfall | Daily/Monthly |
| Solids Level | Solids Depth in Feet | Annually |
| Wastewater Application | Wastewater Depth in Inches | Daily |
| Wastewater Application | Days Applied & Approximate Volume | Weekly |
| Lagoon Solids Removal/Disposal | Days Removed & Volume Removed | Annually |
| Corral Solids Removal/Disposal | Days Removed & Volume Removed | Semi-Annually |
| Dikes and Berms Maintenance | Damage Found & Date Repairs Made | Semi-Annually |
| Site Grading Maintenance | Improvements Made & Date | Annually |
| Equipment Maintenance | Service and Repair Records & Dates | Semi-Annually |

- Daily inspections should be made upon all ponds, berms and wastewater distribution and application equipment following the first significant rain event of each Winter season. These daily inspections should continue until large rain events cease in the Spring.

- Should an unauthorized discharge be made from the facility, the dairy operator should follow the guidelines described in Monitoring and Reporting Program No. 99-11. (See back pages of Order No. 99-11.) Emergency phone numbers are located on the next page of this report.

**Emergency Spill Plan**

In the case of an emergency spill on the dairy, these directions should be followed.

First, the Regional Water Quality Control Board should be contacted if a spill occurs. This requirement is based on Order 99-11.
At least one of these people should be contacted in the case of a spill.

Regional Water Quality Control Board
Steve Mayville (909) 782-4130
Chief of the Dairy Units

Should a pump or piece of equipment break down, these numbers should be used to pursue emergency temporary equipment.

Vandenberg Manufacturing Company, Inc.
(909)-597-3412

Below is a list of spare parts that could be used in the case of an emergency spill.

There are no spare parts on-site.

## VII. GLOSSARY

| | | |
|---|---|---|
| **AFO** | - - | Animal Feeding Operation |
| **BMP** | - - | Best Management Practices |
| **Board** | - - | See CRWQCB, SAR |
| **CAFO** | - - | Concentrated Animal Feeding Operation |
| **Catastrophic Rainfall:** | | Any single event which would total the volume of the 25 year, 24 hour storm event; this could include tornadoes, hurricanes or other catastrophic conditions which could cause overflow due to winds or mechanical damage. |
| **CFR** | - - | Code of Federal Regulations |
| **Chronic Rain fall:** | - | A series of wet weather conditions which would not provide opportunity for dewatering and which total the volume of the 25 year, 24 hour storm event. |
| **CNMP** | - - | Comprehensive Nutrient Management Plan |
| **CRWQCB** | - - | California Regional Water Quality Control Board |
| **CWA** | - - | Clean Water Act |
| **Discharger** | - - | Persons discharging, or proposing to discharge, dairy wastes or other similar kinds of wastes from an existing dairy or related facility in any manner that may affect water quality. |
| **EWMP** | - - | Engineered Waste Management Plan |
| **NPDES** | - - | National Pollutant Discharge Elimination System |
| **Process Wastewater:** | | Water directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems |
| **Regional Board:** | - | See CRWQCB, SAR |
| **Run-on** | - - | Storm water that occurs off-site, but enters the CAFO |
| **SAR** | - - | Santa Ana Region |
| **SWRCB** | - - | State Water Resources Control Board |
| **TDS** | - - | Total Dissolved Solids |
| **TMDL** | - - | Total Maximum Daily Load |
| **USDA** | - - | United States Department of Agriculture |
| **USEPA** | - - | United States Environmental Protection Agency |
| **Washwater** | - - | Water used to wash cows prior to milking, milk equipment & milk barn |

# APPENDIX A

## WORKSHEET FOR DETERMINING CONTAINMENT FACILITY VOLUME

NOLTE
BEYOND ENGINEERING

WORKSHEET FOR DETERMINING
CONTAINMENT FACILITY VOLUME

NAME OF FACILITY: SNS Dairy

NAME OF OPERATOR: Sam Souza
7325 Edison Avenue
Chino, CA 91710

DATE: 12/03/03
PHONE: (909) 627-9432

**TOTAL ACRES OF PROPERTY** 36.55
**DAIRY SITE (Manured Areas)** 33.41 Acres

**TOTAL DAYS STORAGE:** 150

## ANIMAL UNITS

| | Milk Cows | Dry Cows | Bred Heifers | Heifers 1 yr/breed | Calves 3 m to 1yr | Baby Calves |
|---|---|---|---|---|---|---|
| Number (N) | 850 | 150 | 0 | 0 | 0 | 0 |
| Weights (lbs) | 1,400 | 1,400 | 1,100 | 775 | 450 | 150 |
| Pounds (lbs.x N) | 1,190,000 | 210,000 | 0 | 0 | 0 | 0 |
| Units ((N x lbs.)/1000) | 1,190.0 | 210.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | TOTAL ANIMAL UNIT | 1400.0 |

## MILKHOUSE AND PARLOR WATER RATE

| | Gal Per Milking | # Milkings Per Day | # Cows | Totals (Gal Per Day) |
|---|---|---|---|---|
| Bulk Tank Wash Volume [1] | 35 | 2 | | 70 |
| Pipeline Wash Volume [1] | 250 | 2 | | 500 |
| Milkhouse Parlor Floor Wash [1] | 250 | 2 | | 500 |
| Cow Prep (hose wash per cow) [1] | 0.25 | 2 | 850 | 425 |
| Miscellaneous Equipment (buckets etc.) [1] | 250 | 2 | | 500 |
| Miscellaneous Wash (wash/drip pen hose etc.) [1] | 525 | 2 | | 1050 |
| TOTAL DAILY MILK HOUSE AND PARLOR WATER USE | | | | 3,045 |

## WASH PEN/HOLDING PEN WATER RATE

| | | # Strings | Totals (Gal Per Day) |
|---|---|---|---|
| Number of Holding Pen Sprinklers | 54 | | |
| Duration of Sprinkler Wash Cycle (minutes) | 5 | | |
| Number of Wash Cycles (cow pens) | 8 | | |
| Sprinkler Flow Rate (gallons per minute) [1] | 5.05 | | |
| TOTAL WASH PEN WATER USE | 10,908 | 2 | 21,816 |

## WASHWATER VOLUME

| | | |
|---|---|---|
| Milkhouse and Wash Pen (gal per day) | | 24,861 |
| Required days for Containment Facility to hold | | 150 |
| TOTAL WASHWATER VOLUME | Gallons | 3,729,150 |
| | Cu. Ft. | 498,549 |

| EQUIVALENT GALLONS PER COW PER DAY | Gal Per Day | # Cows | # Cows |
|---|---|---|---|
| | 24,861 | 850 | 29.25 Gal/Cow/Day |

[1] University of California Cooperative Extension - Dairy Management Series, Planning and designing dairy waste storage

## WHOLE DAIRY: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 64,725 | 100% | 64,725 |
| Roofed Surface Area Draining Into Lagoon | 14,000 | 100% | 14,000 |
| Surface Area Of The Lagoon | 380,900 | 100% | 380,900 |
| Corral Surface Area Draining Into Lagoon | 554,525 | 50% | 277,263 |
| Pasture Area Draining Into Lagoon | 303,575 | 15% | 45,536 |
| Any Other Dirt Surface Area Draining Into Lagoon | 137,400 | 30% | 41,220 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 1,455,125 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | 33.41 | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **823,644** |

| REQUIRED STORM WATER AND RAINFALL RATES (WHOLE DAIRY) | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| TOTAL STORMWATER RUNOFF VOLUME | | |
|---|---|---|
| | **Gallons** | **7,582,986** |
| | **Cu Ft.** | **1,013,768** |
| | **Acre-Ft.** | **23.27** |

**EVAPORATION CALCULATION FOR WINTER MONTHS**

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 70,684 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| E. Basin 1-5 | 680 | 445 | 0 | 5.00 | 0.00 | - | - | 302,600 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| **Total Lagoon Area #1, #2 & #3** | | | | | | | | **373,284** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

| | | | | |
|---|---|---|---|---|
| *This data is provided by the State of California,* | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPORATION | | | |
|---|---|---|---|
| Area of coverage: 57% | Gallons | 2,553,341 |
| | Cu Ft. | 341,356 |
| | Acre-Ft. | 7.84 |

| NET REQUIRED STORM WATER STORAGE VOLUME | | |
|---|---|---|
| | Gallons | 5,029,645 |
| | Cu Ft. | 672,412 |
| | Acre-Ft. | 15.44 |

| WASHWATER AND STORM WATER TOTAL VOLUME | | |
|---|---|---|
| (Wash Water and Storm Water) | Gallons | 8,758,795 |
| | Cu Ft. | 1,170,962 |

## MANURE CONSIDERATION

(daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet)

| | | | |
|---|---|---|---|
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 1,400.00 | | |
| Total Volume: | 1,918.00 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 191.80 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 28,770 |
| | | Acre-Ft. | 0.66 |

| Total Required Containment Facility Volume | | |
|---|---|---|
| | Gallons | 8,973,994 |
| | Cu Ft. | 1,199,732 |
| | Acre-Ft. | 27.54 |

## AREA #1: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 64,725 | 100% | 64,725 |
| Roofed Surface Area Draining Into Lagoon | 14,000 | 100% | 14,000 |
| Surface Area Of The Lagoon | 78,300 | 100% | 78,300 |
| Corral Surface Area Draining Into Lagoon | 428,125 | 50% | 214,063 |
| Pasture Area Draining Into Lagoon | 156,625 | 15% | 23,494 |
| Any Other Dirt Surface Area Draining Into Lagoon | 71,550 | 30% | 21,465 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 813,325 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | **18.67** | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **416,046** |

| REQUIRED STORM WATER AND RAINFALL RATES (Area 1) | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| TOTAL STORMWATER RUNOFF VOLUME | | |
|---|---|---|
| | **Gallons** | **3,830,385** |
| | **Cu Ft.** | **512,084** |
| | **Acre-Ft.** | **11.76** |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| | Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 70,684 |
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 |
| **Total Lagoon Area #1** | | | | | | | | | **70,684** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** **150.00** =Storgae Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| | | | |
|---|---|---|---|
| TOTAL WINTER MONTHS EVAPOARTION | | Gallons | 424,117 |
| Area of coverage: | 50% | Cu Ft. | 56,700 |
| | | Acre-Ft. | 1.30 |

| | | |
|---|---|---|
| NET REQUIRED STORM WATER STORAGE VOLUME | Gallons | 3,406,268 |
| | Cu Ft. | 455,383 |
| | Acre-Ft. | 10.45 |

| | | | |
|---|---|---|---|
| **WASHWATER AND STORM WATER TOTAL VOLUME** | | | |
| (Wash Water and Storm Water) | 0% | **Gallons** | **3,406,268** |
| | | **Cu Ft.** | **455,383** |

| | | | |
|---|---|---|---|
| **MANURE CONSIDERATION** | | | |
| (daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet) | | | |
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 782.51 | (Percentage) | 55.89% |
| Total Volume: | 1,072.04 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 107.20 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 16,081 |
| | | Acre-Ft. | 0.37 |

| | | |
|---|---|---|
| **Total Required Containment Facility Volume** | **Gallons** | **3,526,551** |
| | **Cu Ft.** | **471,464** |
| | **Acre-Ft.** | **10.82** |

## AREA #2: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 0 | 100% | 0 |
| Roofed Surface Area Draining Into Lagoon | 0 | 100% | 0 |
| Surface Area Of The Lagoon | 302,600 | 100% | 302,600 |
| Corral Surface Area Draining Into Lagoon | 126,400 | 50% | 63,200 |
| Pasture Area Draining Into Lagoon | 146,950 | 15% | 22,043 |
| Any Other Dirt Surface Area Draining Into Lagoon | 65,850 | 30% | 19,755 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 641,800 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | **14.73** | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **407,598** |

## REQUIRED STORM WATER AND RAINFALL RATES (Area #2)

| | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| | | |
|---|---|---|
| **TOTAL STORMWATER AND RUNOFF VOLUME** | **Gallons** | **3,752,601** |
| | **Cu Ft.** | **501,685** |
| | **Acre-Ft.** | **11.52** |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| E. Basin 1-5 | 680 | 445 | 445 | 5.0 | 0.0 | - | - | 302,600 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| **Total Lagoon Area #2** | | | | | | | | **302,600** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPOARTION | | | |
|---|---|---|---|
| Area of coverage: 60% | Gallons | 2,178,787 |
| | Cu Ft. | 291,282 |
| | Acre-Ft. | 6.69 |

| NET REQUIRED STORM WATER STORAGE VOLUME | | |
|---|---|---|
| | Gallons | 1,573,814 |
| | Cu Ft. | 210,403 |
| | Acre-Ft. | 4.83 |

| WASHWATER AND STORM WATER TOTAL VOLUME | | |
|---|---|---|
| (Wash Water and Storm Water) % Wash Water : 100% | Gallons | 5,302,964 |
| | Cu Ft. | 708,952 |

| MANURE CONSIDERATION | | | | |
|---|---|---|---|---|
| (daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet) | | | | |
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | | |
| Total Units | 617.49 | (Percentage) | | 44.11% |
| Total Volume: | 845.96 | (Cubic ft Per Day) | | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | | 84.60 |
| Storage Period (days) | | | | 150 |
| TOTAL MANURE VOLUME | | | Cu Ft. | 12,689 |
| | | | Acre-Ft. | 0.29 |

| Total Required Containment Facility Volume | | |
|---|---|---|
| | Gallons | 5,397,880 |
| | Cu Ft. | 721,642 |
| | Acre-Ft. | 16.57 |

## AREA #3: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 0 | 100% | 0 |
| Roofed Surface Area Draining Into Lagoon | 0 | 100% | 0 |
| Surface Area Of The Lagoon | 0 | 100% | 0 |
| Corral Surface Area Draining Into Lagooh | 0 | 50% | 0 |
| Pasture Area Draining Into Lagoon | 0 | 15% | 0 |
| Any Other Dirt Surface Area Draining Into Lagoon | 0 | 30% | 0 |
| TOTAL SQUARE FEET OF DAIRY OPERATIONS | 0 | (MANURED AREAS) | |
| TOTAL ACREAGE OF DAIRY OPERATIONS | 0.00 | (MANURED AREAS) | |
| TOTAL SQUARE FEET OF SURFACE RUNOFF | | | 0 |

## REQUIRED STORM WATER AND RAINFALL RATES (Area #3)

| | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | TOTAL INCHES | 14.77 |

| | | |
|---|---|---|
| TOTAL STORMWATER AND RUNOFF VOLUME | Gallons | 0 |
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| Total Lagoon Area #3 | | | | | | | | 0 |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPOARTION | | Gallons | 0 |
|---|---|---|---|
| Area of coverage: | 50% | Cu Ft. | 0 |
| | | Acre-Ft. | 0.00 |

| NET REQUIRED STORM WATER STORAGE VOLUME | Gallons | 0 |
|---|---|---|
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

## WASHWATER AND STORM WATER TOTAL VOLUME

| (Wash Water and Storm Water) | % Wash Water : 0% | Gallons | 0 |
|---|---|---|---|
| | | Cu Ft. | 0 |

## MANURE CONSIDERATION

(daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet)

| | | | |
|---|---|---|---|
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 0.00 | (Percentage) | 0.00% |
| Total Volume: | 0.00 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 0.00 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 0 |
| | | Acre-Ft. | 0.00 |

| Total Required Containment Facility Volume | Gallons | 0 |
|---|---|---|
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

TOTAL AVAILABLE VOLUME (Cu.ft.)

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. | Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 78,300 | 620,640 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| E. Basin 1-5 | 680 | 445 | 445 | 5 | 0 | - | - | 302,600 | 756,500 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 | 0 |
| | | | | | | | Total: | 380,900 | 1,377,140 |

## WHOLE DAIRY

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **10,301,007** |
| | | **Cu Ft.** | **1,377,140** |
| | | **Acre-Ft.** | **31.61** |
| **Additional Volume Required** | -1,327,013 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-1

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **4,642,387** |
| | | **Cu Ft.** | **620,640** |
| | | **Acre-Ft.** | **14.25** |
| **Additional Volume Required** | -1,115,836 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-2

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **5,658,620** |
| | | **Cu Ft.** | **756,500** |
| | | **Acre-Ft.** | **17.37** |
| **Additional Volume Required** | -260,740 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-3

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |
| **Additional Volume Required** | 0 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## DEPTH IN STORAGE AREA-1 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 228,748 |
| | Total Area #1 | 78,300 |
| **Total Depth Needed at Top of Lagoon to Hold 24 HR, 25 Year Storm** | | 3.00 |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

## DEPTH IN STORAGE AREA-2 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 180,506 |
| | Total Area #2 | 302,600 |
| **Total Depth Needed at Top of Basin to Hold 24 HR, 25 Year Storm** | | 0.60 |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

## DEPTH IN STORAGE AREA-3 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 0 |
| | Total Area #3 | 0 |
| **Total Depth Needed at Top of Basin to Hold 24 HR, 25 Year Storm** | | #DIV/0! |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

# APPENDIX B

## INFLOW-OUTFLOW COMPUTATION

**Annual Totals Worksheet (Per Month)**

| Month | [1] Operations Water | [2] | [3] Precipitation | [4] | [5] Drainage Per Month | [6] | [7] | [8] Total Inflow | [9] 25 Year Storm | [10] | [11] Drainage Per Month | [12] | [13] | [14] Manure Inflow | [15] Total Inflow |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | [4] x [5] | [5] x 7.48 | [2] + [7] | | | | [10] x [11] | [12] x 7.48 | | [8] + [13] + [14] |
| | Volume | | | | Area | Volume | | Volume | | | Area | Volume | | Volume | Volume |
| | Gal per day | Gal per Month[A] | Inches | Feet | Square feet | Cubic feet | Gal per Month | Gal per Month | Inches | Feet | Square feet | Cubic feet | Gal per Month | Gallons per Month | Gallons per Month |
| August | 24,661 | 770,891 | 0.20 | 0.02 | 823,844 | 13,727 | 102,661 | 673,372 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 918,412 |
| September | 24,861 | 745,830 | 0.39 | 0.03 | 823,644 | 26,788 | 200,228 | 946,058 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 989,098 |
| October | 24,861 | 770,691 | 0.37 | 0.03 | 823,844 | 25,396 | 189,960 | 960,651 | 0.0 | 0.00 | 823,844 | 0 | 0 | 44,475 | 1,005,125 |
| November | 24,861 | 745,830 | 1.54 | 0.13 | 823,844 | 105,701 | 790,843 | 1,536,473 | 0.0 | 0.00 | 823,844 | 0 | 0 | 43,040 | 1,579,513 |
| December | 24,861 | 770,891 | 1.85 | 0.15 | 823,844 | 128,978 | 949,799 | 1,720,490 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 1,764,964 |
| January | 24,861 | 770,891 | 2.35 | 0.20 | 823,644 | 181,297 | 1,206,501 | 1,977,192 | 4.5 | 0.38 | 823,644 | 308,858 | 2,310,321 | 44,475 | 4,331,987 |
| February | 24,861 | 696,108 | 2.64 | 0.22 | 623,644 | 181,202 | 1,355,388 | 2,051,496 | 0.0 | 0.00 | 823,644 | 0 | 0 | 40,171 | 2,091,667 |
| March | 24,861 | 770,891 | 1.89 | 0.16 | 823,644 | 129,724 | 970,335 | 1,741,028 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 1,785,500 |
| April | 24,861 | 745,830 | 0.83 | 0.07 | 823,644 | 56,969 | 426,126 | 1,171,956 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 1,214,996 |
| May | 24,861 | 770,891 | 0.21 | 0.02 | 823,644 | 14,414 | 107,615 | 878,506 | 0.0 | 0.00 | 623,644 | 0 | 0 | 44,475 | 922,981 |
| June | 24,861 | 745,830 | 0.04 | 0.00 | 823,644 | 2,745 | 20,536 | 788,366 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 809,406 |
| July | 24,661 | 770,891 | 0.03 | 0.00 | 823,644 | 13,727 | 102,681 | 848,511 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 917,847 |
| | | | | | | | | | | | | | Total | | 19,245,907 [B] |
| | | | | | | | | | | | | | | *Annual Total* | *59.07 [B] Acre-Ft.* |
| | | | | | | | | | | | | | | *Winter Months Total* | *35.46 [F] Acre-Ft.* |

| Month | [15] Evaporation (Inches) | [17] | [18] Area (sq ft.) | [19] | [20] Total Evaporation | [21] | [22] | [23] Percolation Application | [24] | [25] Percolation Field Area[C] | [25] | [27] Total Outflow | [28] Total Balance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | [18] + [19] | [17] x [20] | [21] x 7.48 | | | | [23] x [25] | [21] + [24] | [15] - [27] |
| | | | | | Area | Volume | | Rate Per Day | Rate Per Month | Rate | | Rate | Volume |
| | Inches[E] | Feet | Field[D] | Lagoon | Square feet | Cubic Feet | Gal per Month | Gallon / feet$^2$ x Day | Gallon / feet$^2$ x Days | Square feet | Gal per Month | Gallons per Month | Gallons per Month |
| August | 10.00 | 0.83 | 146,950 | 380,900 | 527,850 | 439,874 | 3,290,258 | 0.7 | 21.7 | 146,950 | 3,188,815 | 8,479,073 | -5,562,682 |
| September | 7.91 | 0.88 | 148,950 | 380,900 | 527,850 | 348,089 | 2,603,708 | 0.7 | 21 | 145,950 | 3,085,950 | 5,689,658 | -4,700,561 |
| October | 5.87 | 0.47 | 148,950 | 380,900 | 527,850 | 249,377 | 1,865,343 | 0.7 | 21.7 | 146,950 | 3,186,815 | 5,054,158 | -4,049,033 |
| November | 2.11 | 0.18 | 148,950 | 380,900 | 527,850 | 92,851 | 693,027 | 0 | 0 | 146,950 | 0 | 693,027 | 888,486 |
| December | 1.69 | 0.14 | 148,950 | 380,900 | 527,850 | 74,487 | 557,012 | 0 | 0 | 146,950 | 0 | 557,012 | 1,207,952 |
| January | 1.71 | 0.14 | 146,950 | 380,900 | 527,850 | 75,333 | 563,489 | 0 | 0 | 146,950 | 0 | 563,489 | 3,768,498 |
| February | 1.75 | 0.15 | 148,950 | 380,900 | 527,850 | 77,065 | 576,443 | 0 | 0 | 148,950 | 0 | 578,443 | 1,515,224 |
| March | 2.38 | 0.20 | 148,950 | 380,900 | 527,850 | 103,907 | 777,228 | 0 | 0 | 146,950 | 0 | 777,226 | 1,008,274 |
| April | 8.14 | 0.61 | 146,950 | 380,900 | 527,850 | 270,159 | 2,020,789 | 0.7 | 21 | 146,950 | 3,085,950 | 5,106,739 | -3,891,743 |
| May | 7.68 | 0.64 | 148,950 | 380,900 | 527,850 | 337,899 | 2,525,988 | 0.7 | 21.7 | 146,950 | 3,188,815 | 5,714,801 | -4,791,820 |
| June | 8.62 | 0.72 | 148,950 | 380,900 | 527,850 | 379,282 | 2,838,878 | 0.7 | 21 | 146,950 | 3,085,950 | 5,922,828 | -5,113,420 |
| July | 10.71 | 0.89 | 146,950 | 380,900 | 527,850 | 471,048 | 3,523,426 | 0.7 | 21.7 | 146,950 | 3,188,815 | 8,712,241 | -5,795,829 |
| | | | | | | | | | | | Total | 43,846,895 [B] | -25,518,835 |
| | | | | | | | | | | | | *Annual Total* | *134.57 [B] Acre-Ft.* |
| | | | | | | | | | | | | *Winter Months Total* | *9.72 [F] Acre-Ft.* |

[A] Calculation includes actual number of days in each month
[B] Annual totals are calculated January through December
[C] Assumes no percolation during winter months (Nov.-Mar.)
[D] Assumes field is barred for winter disposal. Null values are inserted if field cannot be used for winter disposal.
[E] Evaporation inches reduced 50% during winter months (Nov.-Mar.)
[F] Winter months totals are calculated November through March

| | | |
|---|---|---|
| TOTAL CAPACITY NEEDED ON DAIRY | 8,388,434 | Gallons |
| | 1,121,161 | Cubic Feet |
| | 25.74 | Acre-Ft. |

| | | |
|---|---|---|
| TOTAL AVAILABLE CAPACITY | 10,301,007 | Gallons |
| | 31.61 | Acre-Ft. |

## Inflow - Outflow Comparison Chart

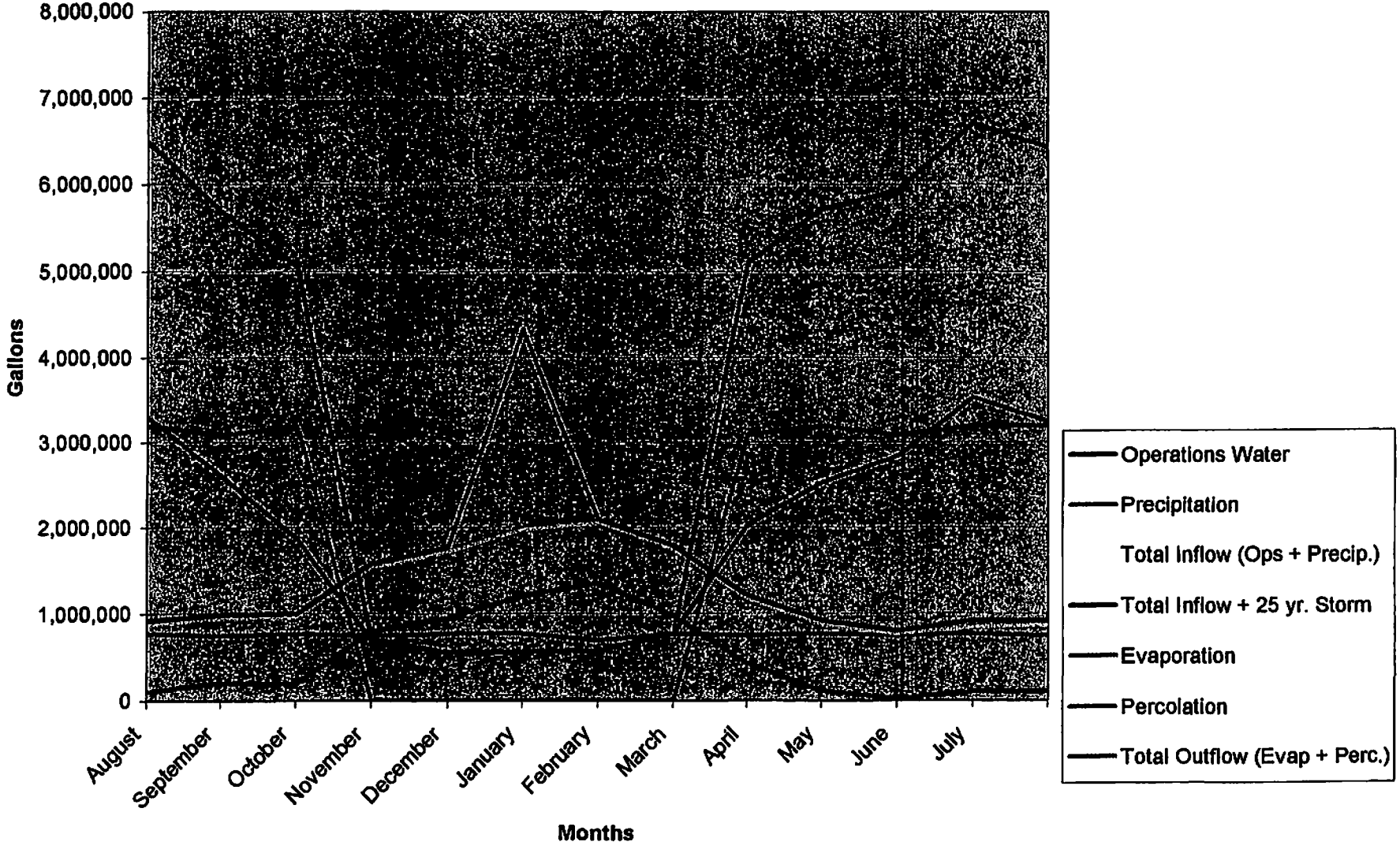

**Evaporation-vs-Percipitation Comparison Chart**

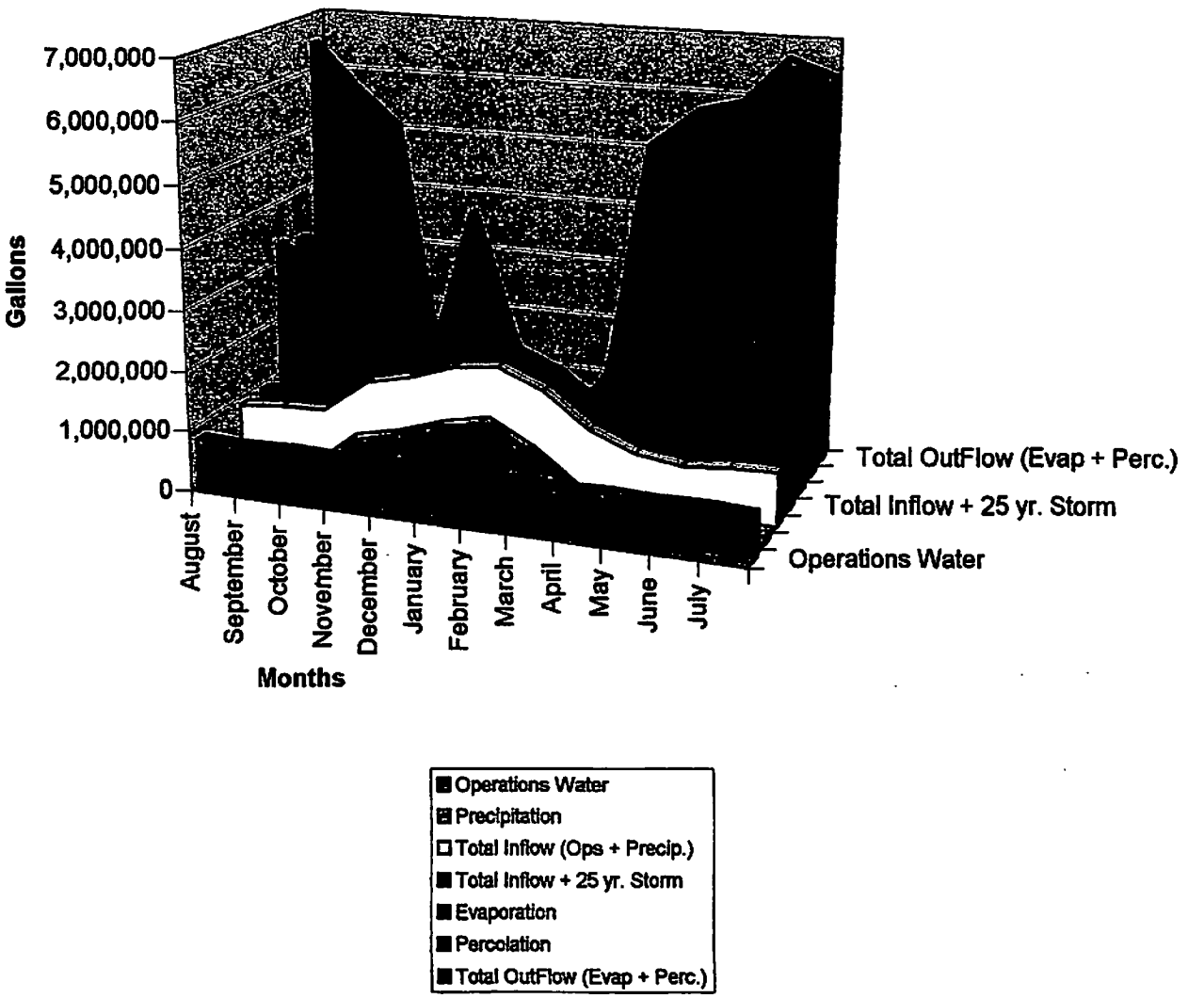

# APPENDIX C

## MILKHOUSE AND WASH PEN VOLUME ESTIMATION DATA

*University of California*
*Cooperative Extension*

# *Dairy Manure Management Series*

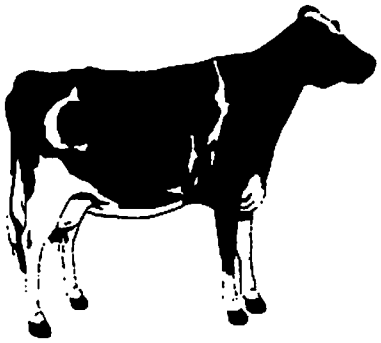

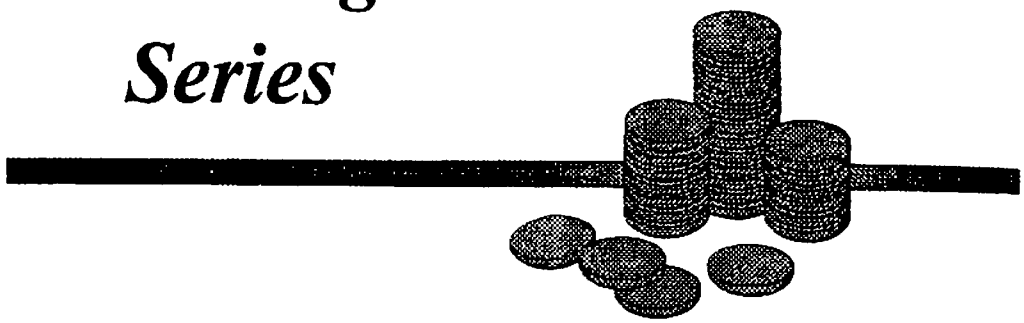

## PLANING AND DESIGNING DAIRY WASTE STORAGE FACILITIES

**Alison Van Eenennaam[1]**

A dairy waste management system must be planned, designed and managed to:

- Prevent water pollution
- Control odors
- Eliminate breeding places for insects
- Provide a convenient and efficient operation for the dairy owner/operator
- Require minimal investment, maintenance and operational costs
- Meet legal requirements.

Proper management of manure and waste water ensures further benefits in providing a healthy atmosphere for the animals. A facility that is clean, dry and free of manure provides a less desirable environment for disease organisms to thrive.

The purposes of this document are to:

- detail the factors to consider in designing a waste management storage facility;
- outline the major factors to be considered when designing dairy waste holding ponds; and
- provide an example of how to size a dairy manure holding pond.

[1]University of California Cooperative Extension Postdoctoral Associate.

## TABLES

**Table 1.** Waste produced daily by a 1,000 pound dairy cow and where it is deposited (2).

| Area | Percent | Cubic Feet |
|---|---|---|
| Housing area | 40 | .548 |
| Feeding area | 45 | .617 |
| Holding pen | 10 | .137 |
| Milk parlor | 5 | .068 |
| Total cubic feet/1,000 lb cow | | 1.370 |

**Table 2.** Volume of milkhouse and parlor water (2, and D. Johnson, NRCS, pers. comm.).

| Washing operation | Water Volume |
|---|---|
| Bulk Tank | |
| Automatic, 3 cycle wash | 60 to 110 gal/wash |
| Manual wash | 30 to 50 gal/wash |
| Pipeline | |
| In parlor (volume is higher for long flat barns) | 75 to 150 gal/wash |
| Milkhouse and parlor floors | 300 to 700 gal/wash |
| Pail milkers | 30 to 40 gal/wash |
| Miscellaneous equipment | 30 gal/day |
| Cow preparation wash | |
| Automatic | 1 to 4.5 gal/wash/cow |
| Manual | .25 to .5 gal/wash/cow |
| Holding pen (sprinklers) | 5 gal/min/head (dependent upon nozzle size & pressure) |

# APPENDIX D

RAINFALL DATA

# CORONA , CALIFORNIA (042031)

## 1961-1990 Monthly Climate Summary

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 67.40 | 69.40 | 71.10 | 75.20 | 79.40 | 85.10 | 91.80 | 92.10 | 88.70 | 82.30 | 70.80 | 67.40 | 78.60 |
| Average Max. Temperature (F) | 40.60 | 41.70 | 43.00 | 45.70 | 50.40 | 54.60 | 58.50 | 59.90 | 56.90 | 50.90 | 42.90 | 39.80 | 48.90 |
| Average Total Precipitation (in.) | 2.35 | 2.64 | 1.89 | 0.83 | 0.21 | 0.04 | 0.03 | 0.20 | 0.39 | 0.37 | 1.54 | 1.85 | 12.32 |

Unofficial values based on averages/sums of smoothed daily data. Information is computed from available daily data during the 1961-1990 period. Smoothing, missing data and observation-time changes may cause these 1961-1990 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made for missing data or time of observation. Check **NCDC normals** table for official data.

---

*Western Regional Climate Center,* wrcc@dri.edu

*Total Rainfall Winter Months:*

| November | | December | | January | | Febuary | | March | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1.54* | + | *1.85* | + | *2.35* | + | *2.64* | + | *1.89* | = | *10.27* | inches |

# CORONA, CALIFORNIA

## 1961 - 1990 Temperature and Precipitation

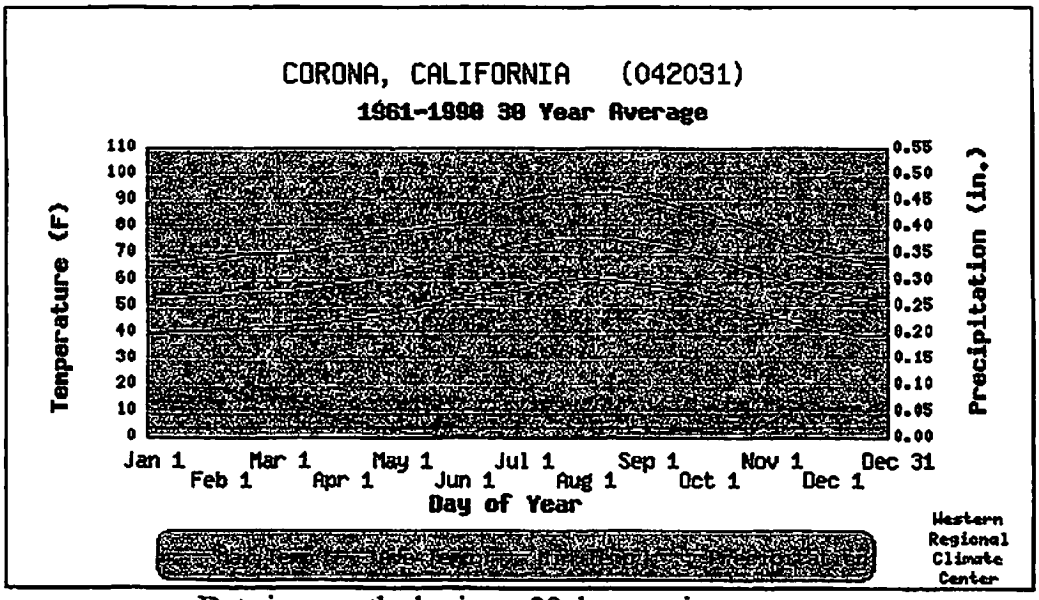


Data is smoothed using a 29 day running average.

■ - Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1961 and 1990.
■ - Ave. Temp. is the average of all daily average temperatures recorded for the day of the year the years 1961 and 1990.
■ - Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1961 and 1990.
■ - Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1961 and 1990.

# APPENDIX E

EVAPORATION DATA

State of California
The Resources Agency

Department of
Water Resources

save water
DWR

# Evaporation from Water Surfaces in California

Bulletin 73-79
November 1979

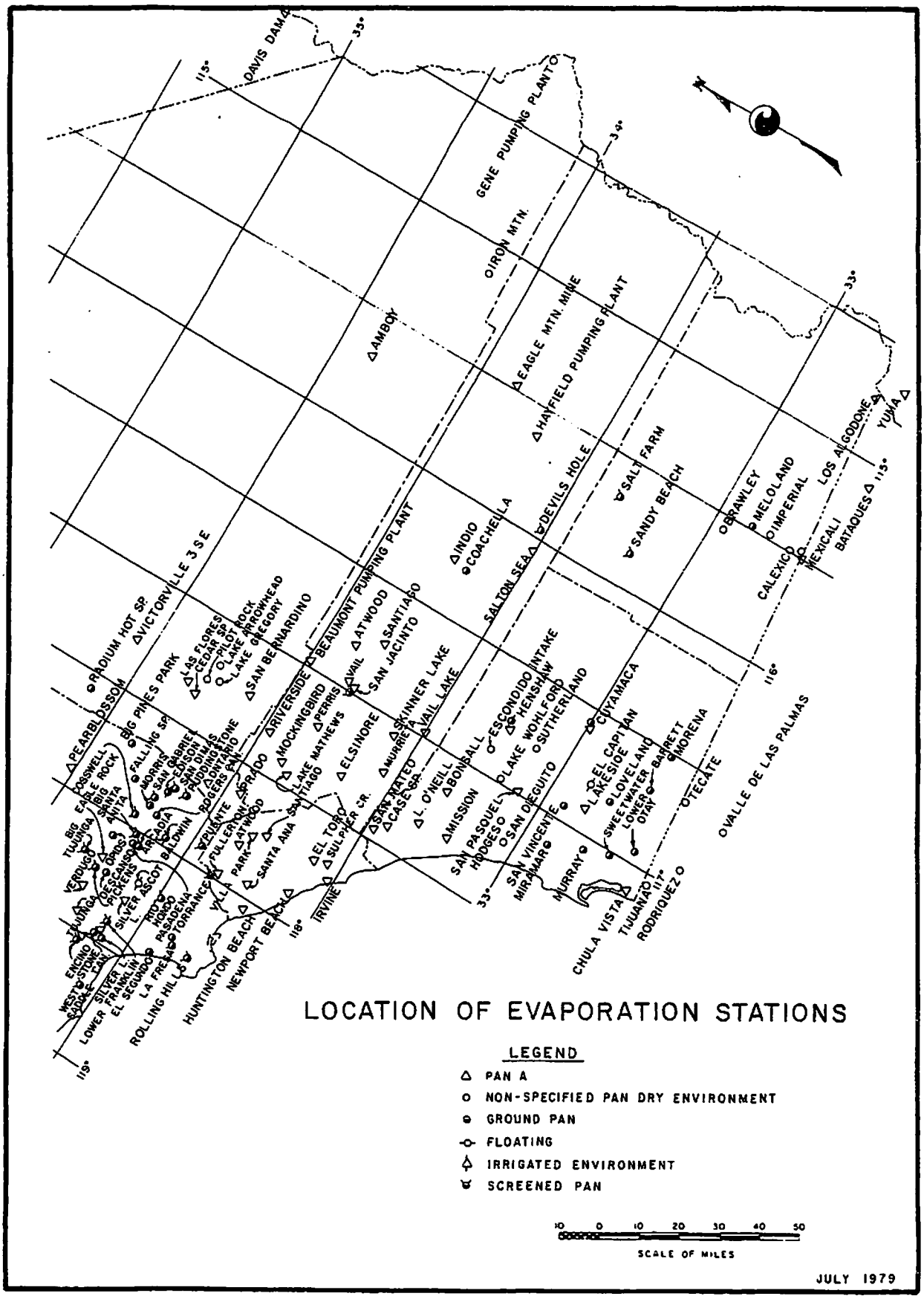
LOCATION OF EVAPORATION STATIONS
LEGEND
PAN A
NON-SPECIFIED PAN DRY ENVIRONMENT
GROUND PAN
FLOATING
IRRIGATED ENVIRONMENT
SCREENED PAN
10 0 10 20 30 40 50
SCALE OF MILES
JULY 1979
DAVIS DAM
GENE PUMPING PLANT
IRON MTN.
AMBOY
EAGLE MTN. MINE
HAYFIELD PUMPING PLANT
SALT FARM
SANDY BEACH
DEVILS HOLE
INDIO
COACHELLA
SALTON SEA
BEAUMONT PUMPING PLANT
VICTORVILLE 3 SE
RADIUM HOT SP.
PEARBLOSSOM
BIG PINES PARK
LAS FLORES
CEDAR SP.
PILOT ROCK
LAKE ARROWHEAD
LAKE GREGORY
SAN BERNARDINO
RIVERSIDE
PERRIS
AVAIL
ATWOOD
SANTIAGO
SAN JACINTO
SKINNER LAKE
AVAIL LAKE
ESCONDIDO INTAKE
HENSHAW
LAKE WOHLFORD
SUTHERLAND
CUYAMACA
EL CAPITAN
LAKESIDE
LOVELAND
SWEETWATER
LOWER OTAY
BARRETT
MORENA
OTECATE
VALLE DE LAS PALMAS
BRAWLEY
MELOLAND
IMPERIAL
CALEXICO
MEXICALI
LOS ALGODONES
YUMA
BATAQUES
MOSSWELL
EAGLE ROCK
BIG TUJUNGA
SANTA ANITA
FALLING SP.
MORRIS
SAN GABRIEL
EDISON
SAN DIMAS
FLUDDINGTONE
ONTARIO
ROGERS PAN
PRADO
MOCKINGBIRD
LAKE MATHEWS
SANTIAGO
ELSINORE
MURRIETA
VERDUGO
GRIDS
PICKENS
ARCADIA
BALDWIN
PUENTE
FULLERTON
ATWOOD
PARK
SANTA ANA
EL TORO
SULPHUR CR.
SAN MATEO
CASESA
L. O'NEILL
BONSALL
MISSION
SAN PASQUEL
HODGES
SAN DIEGUITO
SAN VINCENTE
MIRAMAR
MURRAY
CHULA VISTA
TIJUANA
RODRIQUEZ
ENCINO
WESTSTONE
SADDLE PAK
SILVER LAKE
LOWER FRANKLIN
EL SEGUNDO
SILVER
L. ASCOT
PICO
HOOD
PASADENA
TORRANCE
LA FREE
ROLLING HILLS
HUNTINGTON BEACH
NEWPORT BEACH
IRVINE
33°
34°
115°
116°
117°
118°

EVAPORATION MEASUREMENT REPORT
UNIT OF MEASURE = MILLIMETRES



| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 705010 | POMONA (NEAR)-AGR EXPT ST | 857 | 01S 09W 27 S | 34 03 | 117 49 | LAX | 907 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | 1903 | | | | | | | | | | | 230 | 238 | 160 |
| | 1904 | 1729 | 168 | 108 | 64 | 71 | 65 | 94 | 127 | 165 | 208 | 237 | 238 | 184 |
| | 1905 | 1597 | 136 | 103 | 75 | 49 | 42 | 95 | 104 | 152 | 196 | 227 | 229 | 189 |
| | 1906 | | 134 | 103 | 75 | | | | | | | | | |
| G | MEAN | 1552 | 146 | 105 | 71 | 60 | 54 | 95 | 116 | 159 | 202 | 231 | 235 | 178 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 705011 | POMONA SPRR | 876 | 01S 08W 29 S | 34 03 17 | 117 45 02 | LAX | 410 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1933 | | | | | | | | | | | 306 | 272 | 183 |
| | 1934 | | 157 | 170 | 73 | 118 | 84 | 178 | 200 | 259 | | 314 | 282 | 251 |
| A | MEAN | 2043 | 157 | 170 | 73 | 118 | 84 | 178 | 200 | 259 | | 310 | 277 | 217 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 712301 | PRADO DAM | 565 | 03S 07W 20 P S | 33 53 30 | 117 38 03 | RIV | 415 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1930 | | | | | | | | | | | 279 | 250 | |
| | 1931 | | | 128 | 97 | 102 | 62 | 146 | 154 | 197 | 232 | 293 | 250 | 194 |
| | 1932 | 1914 | 137 | 90 | 64 | 107 | 94 | 131 | 153 | 208 | 232 | 253 | 266 | 179 |
| | 1933 | 1942 | 152 | 137 | 70 | 30 | 112 | 134 | 138 | 191 | 229 | 270 | 241 | 188 |
| | 1934 | 1346 | 130 | 113 | 57 | 100 | 69 | 124 | 161 | 232 | 182 | 257 | 225 | 196 |
| | 1935 | 1630 | 119 | 65 | 52 | 52 | 69 | 90 | 118 | 170 | 216 | 266 | 227 | 186 |
| | 1936 | 1916 | 139 | 86 | 85 | 82 | 78 | 115 | 132 | 197 | 258 | 285 | 256 | 203 |
| | 1937 | 1737 | 130 | 105 | 69 | 41 | 58 | 93 | 148 | 171 | 231 | 256 | 230 | 205 |
| | 1938 | | 139 | 70 | 77 | | | | | | 45 | 255 | 235 | 197 |
| | 1939 | 1789 | 137 | 151 | 90 | 68 | 87 | 91 | 138 | 179 | 217 | 241 | 221 | 169 |
| | 1940 | 1533 | 135 | 70 | 57 | 41 | 70 | 114 | 105 | 174 | 165 | 215 | 204 | 163 |
| | 1941 | 1771 | 114 | 99 | 54 | 66 | 61 | 114 | 135 | 225 | 225 | 281 | 221 | 176 |
| | 1942 | 2245 | 148 | 136 | 72 | 117 | 109 | 177 | 131 | 269 | 243 | 315 | 308 | 220 |
| | 1943 | 2297 | 178 | 148 | 104 | 146 | 130 | 110 | 148 | 242 | 262 | 307 | 288 | 234 |
| | 1944 | 2105 | 166 | 166 | 107 | 114 | 81 | 182 | 178 | 211 | 236 | 272 | 229 | 163 |
| | 1945 | 2034 | 148 | 91 | 88 | 49 | 87 | 133 | 192 | 219 | 218 | 296 | 278 | 235 |
| | 1946 | 2073 | 116 | 117 | 81 | 113 | 125 | 80 | 200 | 168 | 275 | 319 | 301 | 178 |
| | 1947 | 2081 | 154 | 94 | 60 | 100 | 77 | 129 | 195 | 204 | 245 | 312 | 284 | 227 |
| | 1948 | 2167 | 146 | 120 | 98 | 144 | 106 | 114 | 179 | 210 | 223 | 288 | 290 | 249 |
| | 1949 | 2095 | 141 | 188 | 93 | 93 | 65 | 90 | 178 | 191 | 258 | 280 | 288 | 230 |
| | 1950 | 2017 | 167 | 136 | 83 | 68 | 51 | 139 | 164 | 197 | 248 | 302 | 272 | 190 |
| | 1951 | 2139 | 188 | 138 | 69 | 93 | 86 | 191 | 151 | 179 | 228 | 311 | 283 | 222 |
| | 1952 | 2080 | 201 | 118 | 81 | 67 | 115 | 123 | 136 | 230 | 229 | 294 | 275 | 211 |
| | 1953 | 2081 | 135 | 88 | 76 | 106 | 134 | 155 | 154 | 233 | 241 | 304 | 253 | 202 |
| | 1954 | 1978 | 140 | 84 | 167 | 67 | 122 | 97 | 130 | 186 | 203 | 262 | 220 | 200 |
| | 1955 | 1924 | 149 | 104 | 92 | 63 | 94 | 137 | 186 | 165 | 198 | 255 | 260 | 221 |
| | 1956 | 1829 | 116 | 88 | 42 | 55 | 89 | 142 | 179 | 181 | 227 | 260 | 226 | 224 |
| | 1957 | 2057 | 155 | 158 | 128 | 66 | 65 | 78 | 148 | 190 | 255 | 306 | 292 | 216 |
| | 1958 | 1950 | 119 | 92 | 94 | 103 | 64 | 49 | 182 | 202 | 275 | 276 | 253 | 241 |
| | 1959 | 2089 | 160 | 123 | 118 | 78 | 68 | 168 | 172 | 195 | 238 | 304 | 268 | 197 |
| | 1960 | 2270 | 169 | 181 | 120 | 53 | 100 | 125 | 185 | 218 | 242 | 325 | 288 | 264 |
| | 1961 | 2273 | 169 | 63 | 124 | 147 | 133 | 146 | 196 | 225 | 254 | 311 | 300 | 205 |
| | 1962 | 1589 | 138 | 95 | 98 | 118 | 33 | 73 | 134 | 145 | 172 | 220 | 221 | 142 |
| | 1963 | 1558 | 91 | 69 | 67 | 81 | 79 | 97 | 102 | 162 | 190 | 235 | 220 | 165 |
| | 1964 | 1672 | 102 | 82 | 99 | 111 | 141 | 112 | 146 | 166 | 181 | 185 | 192 | 155 |
| | 1965 | 1614 | 123 | 108 | 83 | 71 | 106 | 72 | 157 | 159 | 190 | 171 | 222 | 152 |
| | 1966 | 1811 | 144 | 46 | 60 | 76 | 85 | 124 | 163 | 173 | 215 | 267 | 249 | 209 |
| | 1967 | 2045 | 196 | 73 | 136 | 107 | 121 | 130 | 125 | 209 | 201 | 271 | 274 | 202 |
| | 1968 | 1850 | 177 | 68 | 101 | 88 | 65 | 118 | 166 | 191 | 202 | 203 | 248 | 223 |
| | 1969 | | 117 | 89 | 51 | 75 | | | | 138 | 156 | | | |
| A | MEAN | 1930 | 144 | 107 | 86 | 87 | 89 | 120 | 156 | 195 | 219 | 272 | 254 | 201 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 747300 | RIVERSIDE CITRUS EXP | 1015 | 02S 04W 30 K S | 33 58 00 | 117 20 05 | RIV | 900 | D |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1925 | | | | | 90 | 67 | 127 | 134 | 166 | 213 | 269 | 242 | 182 |
| | 1926 | 1773 | 58 | 128 | 75 | 112 | 97 | 123 | 116 | 200 | 189 | 230 | 237 | 178 |
| | 1927 | 1609 | 150 | 65 | 48 | 30 | 24 | 105 | 102 | 193 | 193 | 253 | 262 | 184 |
| | 1928 | 1756 | 143 | 96 | 50 | 65 | 114 | 99 | 171 | 146 | 193 | 242 | 240 | 197 |
| | 1929 | 1656 | 119 | 82 | 72 | 61 | 60 | 105 | 117 | 175 | 219 | 256 | 253 | 137 |
| | 1930 | 1665 | 140 | 139 | 91 | 45 | 56 | 99 | 138 | 148 | 195 | 241 | 216 | 157 |
| | 1931 | 1806 | 126 | 106 | 75 | 72 | 124 | 145 | 149 | 178 | 191 | 248 | 237 | 155 |
| | 1932 | | 109 | 68 | 46 | | | 133 | 149 | 155 | 155 | 227 | 220 | 147 |
| | 1933 | 1546 | 100 | 101 | 54 | 60 | 91 | 122 | 97 | 160 | 191 | 227 | 202 | 141 |
| | 1934 | 1763 | 115 | 129 | 45 | 99 | 64 | 120 | 188 | 215 | 170 | 232 | 217 | 169 |
| | 1935 | 1508 | 110 | 67 | 55 | 51 | 64 | 85 | 118 | 164 | 203 | 225 | 203 | 163 |
| | 1936 | 1603 | 120 | 75 | 61 | 60 | 65 | 106 | 137 | 188 | 208 | 210 | 207 | 166 |
| | 1937 | 1499 | 112 | 85 | 41 | 35 | 52 | 100 | 152 | 145 | 195 | 195 | 209 | 178 |
| | 1938 | 1584 | 127 | 59 | 67 | 76 | 62 | 92 | 139 | 176 | 182 | 219 | 209 | 176 |
| | 1939 | 1630 | 115 | 99 | 65 | 59 | 81 | 94 | 144 | 173 | 212 | 228 | 214 | 146 |
| | 1940 | 1765 | 149 | 71 | 69 | 68 | 101 | 120 | 166 | 198 | 189 | 241 | 216 | 177 |
| | 1941 | 1529 | 153 | 108 | 52 | 39 | 44 | 96 | 156 | 165 | 181 | 236 | 164 | 135 |
| | 1942 | 1671 | 134 | 75 | 82 | 64 | 77 | 129 | 114 | 193 | 183 | 251 | 215 | 154 |
| | 1943 | 1591 | 113 | 81 | 59 | 74 | 76 | 82 | 117 | 187 | 198 | 217 | 212 | 175 |
| | 1944 | 1548 | 111 | 94 | 51 | 56 | 62 | 134 | 132 | 158 | 168 | 203 | 226 | 153 |
| | 1945 | 1503 | 106 | 64 | 55 | 55 | 67 | 94 | 144 | 171 | 165 | 218 | 196 | 168 |
| | 1946 | 1575 | 107 | 81 | 47 | 91 | 71 | 105 | 137 | 135 | 211 | 205 | 215 | 170 |

# APPENDIX F

PERCOLATION DATA

NOLTE

## SOILS SURVEY

**Percolation Data:**

| *Soil Series* [1] | *Type* [1] | *USDA Texture* [1] | *Depth from Surface* | *Soils Table* [1] | *Soils Survey Map* [1] |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | | |
| 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | | |

**Table 13-9** [2]

| Recommended rates of wastewater application for Trench and Bed Bottom Areas [a] | | |
|---|---|---|
| Soil Texture | Percolation rate, min/in | *Application rate, gal / ft² x d* [b,c] |
| Gravel, coarse sand | <1 | Not Suitable [d] |
| Coarse to medium sand | 1-5 | 1.20 |
| Fine sand, loamy sand | 5-15 | 0.80 |
| Sand loam, loam | 16-30 | 0.60 |
| Loam, porous silt loam | 31-60 | 0.45 |
| Silty clay loam, clay loam [a,f] | 61-120 | 0.20 |
| Clays, colloidal clays | >120 | Not Suitable [g] |

Use Application Rate of 0.7 to Fit B/Re( Classification"

[a] From U.S. EPA (1980).

[b] Rates based on septic tank effluent from a domestic waste source. A factor of safety may be desirable for wastewater's of significantly different strength or character.

[c] May be suitable for sidewall infiltration rates.

[d] Soils with percolation rates less than 1 min/in may be suitable for septic tank effluent if a 2ft layer of loamy sand or other soil is placed above or in place of the native topsoil.

[e] These soils are suitable if they are without significant amounts of expandable clays.

[f] Soil easily damaged during construction.

[g] Alternative pretreatment may be needed and alternative disposal (wetlands or evaporation systems) may be required.

Bibliography:


1 Refer to Pecolation Appendix

2 Crites & Tchobanoglous, "Small and Decentralized Wastewater Management Systems", McGraw-Hill, Boston, 1998

SOIL SURVEY OF

# San Bernardino County Southwestern Part, California

United States Department of Agriculture
Soil Conservation Service
in cooperation with
University of California
Agricultural Experiment Station

TABLE 4.—*Estimated soil properties*

[Absence of information indicates that a determination was not made or that it would not be applicable. The symbol > means made up of two or more kinds of soil. The soils in such mapping units have different properties and limitations and for this reason

| Soil series and map symbols | Depth to bedrock or hardpan | Depth from surface of typical profile | (Typical profile) USDA texture | Classification | | Coarse fraction greater than 3 inches | Percentage less than 3 in. passing sieve— | |
|---|---|---|---|---|---|---|---|---|
| | | | | Unified | AASHTO | | No. 4 (4.7 mm) | No. 10 (2.0 mm) |
| | *Feet* | *Inches* | | | | | | |
| Alo: AaF | 2–3 | 0–36 | Clay | CH, CL | A–7 | | 100 | 100 |
| | | 36 | Shale and sandstone. | | | | | |
| Chino: Cb | >5 | 0–16 | Silt loam | ML, CL-ML | A–4 | | 100 | 100 |
| | | 16–60 | Silty clay loam | CL | A–6 | | 100 | 100 |
| Chualar: CkA, CkC, CkD | >5 | 0–36 | Clay loam | CL | A–6 | | 100 | 100 |
| | | 36–60 | Loam | CL, CL-ML | A–4 | | 100 | 100 |
| *Cieneba: CnD, Cp, Cr. For properties of Friant soils in Cp, refer to Friant series. | 1–1½ | 0–14 | Sandy loam | SM | A–2 | 0–10 | 90–100 | 90–100 |
| | | 14 | Weathered granitic rock. | | | | | |
| Crafton: Cs2 | 1½–3 | 0–26 | Sandy loam | SM | A–2 | 0–15 | 80–100 | 75–100 |
| | | 26 | Weathered micaceous schist. | | | | | |
| Delhi: Db | >5 | 0–18 | Fine sand | SM | A–2 | | 100 | 95–100 |
| | | 18–60 | Sand | SP-SM or SW-SM | A–3 | | 100 | 90–100 |
| Fontana: FoE, FoF | 2–3 | 0–28 | Clay loam, some shale fragments. | CL | A–6 | 0–10 | 85–100 | 70–95 |
| | | 28 | Weathered fractured shale. | | | | | |
| Friant: Fr | 1–1½ | 0–14 | Fine sandy loam | SM | A–4 | | 95–100 | 80–95 |
| | | 14 | Hard mica schist. | | | | | |
| Garretson: GaC | >5 | 0–7 | Very fine sandy loam | ML | A–4 | | 100 | 100 |
| | | 7–28 | Loam | CL-ML, CL | A–4 | | 100 | 100 |
| | | 28–34 | Fine sandy loam | SM | A–4 | | 95–100 | 90–100 |
| | | 34–42 | Gravelly sandy loam | SM | A–2 | | 65–90 | 65–80 |
| | | 42–60 | Loam | CL-ML, CL | A–4 | | 100 | 100 |
| Gaviota: Go | 1–1½ | 0–15 | Fine sandy loam | SM | A–4 | 0–5 | 95–100 | 80–95 |
| | | 15 | Hard sandstone. | | | | | |
| Grangeville: | | | | | | | | |
| Gr | >5 | 0–60 | Fine sandy loam | SM | A–4 | | 100 | 100 |
| Gs | | 0–60 | Fine sandy loam | SM | A–4 | | 100 | 100 |
| Greenfield: | | | | | | | | |
| GtC, GtD | >5 | 0–16 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| | | 16–50 | Fine sandy loam | SM | A–4 | | 95–100 | 85–100 |
| | | 50–60 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| GuD | >5 | 0–16 | Cobbly sandy loam | SM | A–2 | 25–40 | 90–100 | 85–95 |
| | | 16–50 | Fine sandy loam | SM | A–4 | | 95–100 | 85–100 |
| | | 50–60 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| Hanford: HaC, HaD, HbA | >5 | 0–60 | Sandy loam | SM | A–2 | | 100 | 90–100 |
| Hilmar: Hr | >5 | 0–23 | Loamy fine sand and loamy sand. | SM | A–2 | | | 95–100 |
| | | 23–60 | Stratified loam.[2] | CL-ML, CL | A–4 | | 100 | 100 |
| Merrill: Me | 2–3½ | 0–25 | Silt loam | CL-ML or ML | A–4 | | 100 | 95–100 |
| | | 25–43 | Loam that is 25 to 50 percent extremely hard lime nodules. | GM | A–4 or A–2 | 0–5 | 40–70 | 35–65 |
| | | 43–60 | Loam | CL-ML or CL | A–4 | | 100 | 95–100 |
| Metz: MgC | >5 | 0–19 | Coarse sandy loam | SM | A–2 | | 95–100 | 90–100 |
| | | 19–60 | Gravelly sand and loamy coarse sand. | SM | A–1 | | 70–80 | 55–75 |
| Monserate: MoC | 2½–3 | 0–10 | Sandy loam | SM | A–2, A–4 | | 100 | 100 |
| | | 10–30 | Clay loam | CL | A–6 | | 100 | 100 |
| | | 30–45 | Indurated hardpan | | | | | |
| | | 45–60 | Coarse sandy loam | SM | A–2 | | 95–100 | 90–100 |

## Hilmar Series

The Hilmar series consists of somewhat poorly drained, nearly level soils on alluvial valley floors and fans. These soils formed in wind-laid coarse-textured material underlain by medium-textured granitic alluvium. Slopes are 0 to 2 percent. Elevation is 600 to 900 feet. Vegetation is annual grasses and forbs. The average annual precipitation is 12 to 16 inches, the mean annual air temperature is 62° to 65° F, and the frost-free season is 230 to 280 days.

In a representative profile, the surface layer is grayish-brown loamy fine sand about 13 inches thick. The underlying material, to a depth of 23 inches, is light yellowish-brown and grayish-brown loamy sand. Below this, to a depth of 60 inches, it is light brownish-gray mottled loam stratified with thin lenses of sandy loam and loamy sand. Hilmar soils are moderately alkaline throughout the profile and are slightly calcareous in the upper 23 inches and strongly calcareous below.

In these soils the surface layer and the upper part of the underlying material that formed in coarse-textured material are rapidly permeable. The lower part of the underlying material that formed in medium-textured material is slowly permeable. Available water capacity is about 7 to 9 inches. Roots penetrate to a depth of 60 inches or more. Originally the soils were somewhat poorly drained, but the drainage has been altered by lowering the ground water table through pumping.

These soils are used mainly for such irrigated crops as grapes, alfalfa, pasture plants, and small grains.

Representative profile of Hilmar loamy fine sand, about 100 feet south of Edison Road and about 200 feet west of Cucamonga Creek, SE¼NW¼NW¼ sec. 22, T. 2 S., R. 7 W; San Bernardino base line and meridian:

Ap—0 to 13 inches, grayish-brown (2.5Y 5/2) loamy fine sand, very dark grayish brown (2.5Y 3/2) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; many very fine and fine roots; slightly effervescent; moderately alkaline; gradual, smooth boundary.

C1—13 to 16 inches, light yellowish-brown (2.5Y 6/4) loamy sand, light olive brown (2.5Y 5/4) when moist; few, fine, distinct, brownish-yellow (10YR 6/6) mottles, yellowish brown (10YR 5/6) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline; gradual, smooth boundary.

C2—16 to 23 inches, grayish-brown (2.5Y 5/2) loamy sand, light brownish gray (2.5Y 6/2) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline; abrupt, smooth boundary.

IIC3—23 to 60 inches, light brownish-gray (2.5Y 6/2) loam stratified with thin lenses of sandy loam and loamy sand, grayish brown (2.5Y 5/2) when moist; common, medium, distinct, brownish-yellow (10YR 6/6) mottles, yellowish brown (10YR 5/6) when moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; strongly effervescent; moderately alkaline.

The A horizon is grayish brown, dark grayish brown, or brown loamy fine sand or loamy sand. The soil material is dominantly single grained but has weak, very fine to fine, subangular blocky structure in small areas, and in some places it is massive. The soil material is slightly effervescent but is strongly effervescent in a few spots. The A horizon ranges from 8 to 14 inches in thickness but is 13 inches thick in most places.

The C horizon is generally light yellowish brown to grayish brown, but in a few places it is light brownish gray. Yellowish-brown, brownish-yellow, or dark yellowish-brown mottles are common. They range from few to common in abundance, fine to medium in size, and faint to distinct in contrast. The C horizon is loamy sand or loamy fine sand. The soil material is typically single grained, but in some places it is massive. Lime content varies from slight to strong. Thickness is about 10 inches but ranges from 8 to 12 inches.

The IIC horizon is light brownish gray, grayish brown, or light gray. Brownish-yellow or yellowish-brown mottles range from common to many in abundance, fine to medium in size, and distinct to prominent in contrast. The IIC horizon is generally loam that has thin lenses of sandy loam, coarse sandy loam, or loamy sand, but in a few places, it is clay loam or silt loam stratified with thin lenses of coarse-textured material. The IIC horizon is typically massive, but in some places it has weak, moderate, subangular blocky structure. Reaction ranges from mildly alkaline to strongly alkaline.

**Hilmar loamy fine sand (Hr).**—This nearly level soil is on valley floors and alluvial fans. Included with it in mapping are areas of Delhi fine sand that make up about 10 percent of each area. Also included are patches of Tujunga loamy sand, 0 to 5 percent slopes, and small areas where slopes are 2 or 3 percent.

Runoff is slow, and the hazard of water erosion is slight. If the soils are left without a protective cover of vegetation, the hazard of soil blowing is high.

The Hilmar soil is used chiefly for irrigated alfalfa, grapes, small grains, and pasture plants. Capability unit IIe-4 irrigated.

## Merrill Series

The Merrill series consists of somewhat poorly drained, nearly level soils that formed on alluvial fans in medium-textured granitic alluvium. Slopes are 0 to 2 percent, elevation is 500 to 700 feet. Vegetation is mainly annual grasses and forbs, but perennial grasses grow in some areas. The average annual precipitation is 12 to 16 inches, the mean annual air temperature is 62° to 65° F, and the frost-free season is 230 to 280 days.

In a representative profile, the surface layer is gray silt loam about 25 inches thick. The underlying material, to a depth of 43 inches, is light-gray loam that is weakly cemented and contains many extremely hard silica-lime cemented nodules. Below this the underlying material is light brownish-gray loam that extends to a depth of 60 inches or more. Merrill soils are strongly calcareous and moderately alkaline throughout their profile.

These soils are slowly permeable. Their available water capacity is 4 to 7 inches. Roots can penetrate to a depth of 25 to 40 inches. Drainage has been altered on these soils by pumping ground water for irrigation.

These soils are used for such irrigated crops as pasture plants, alfalfa, small grains, and some truck crops.

Representative profile of Merrill silt loam, about 300 feet northwest of Eucalyptus and Central Avenue;

SHEET NO. 11

SAN BERNARDINO COUNTY, SOUTHWESTERN PART, CALIFORNIA

(PRADO DAM)

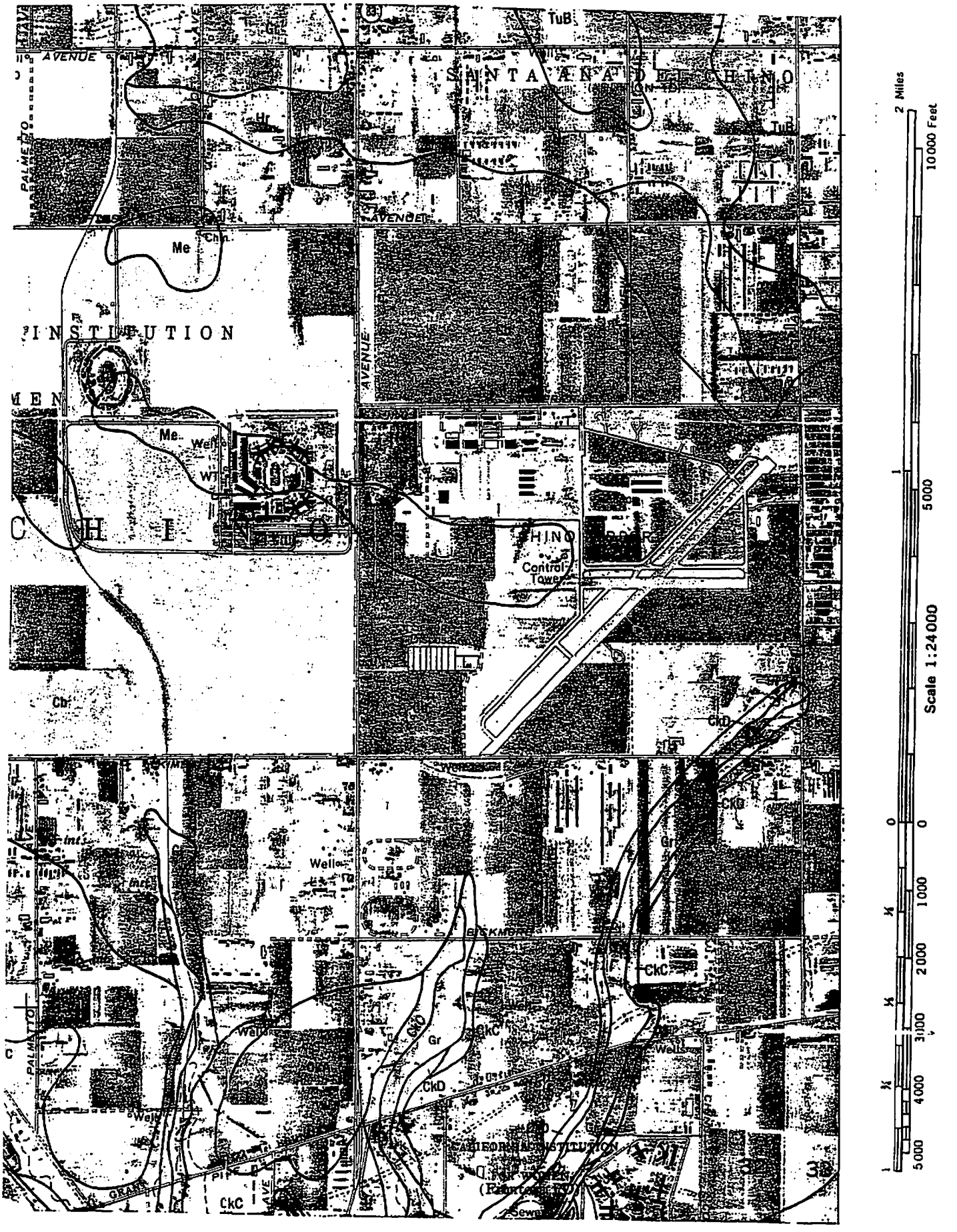


U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

# APPENDIX G

24 HOUR – 25 YEAR STORM DATA

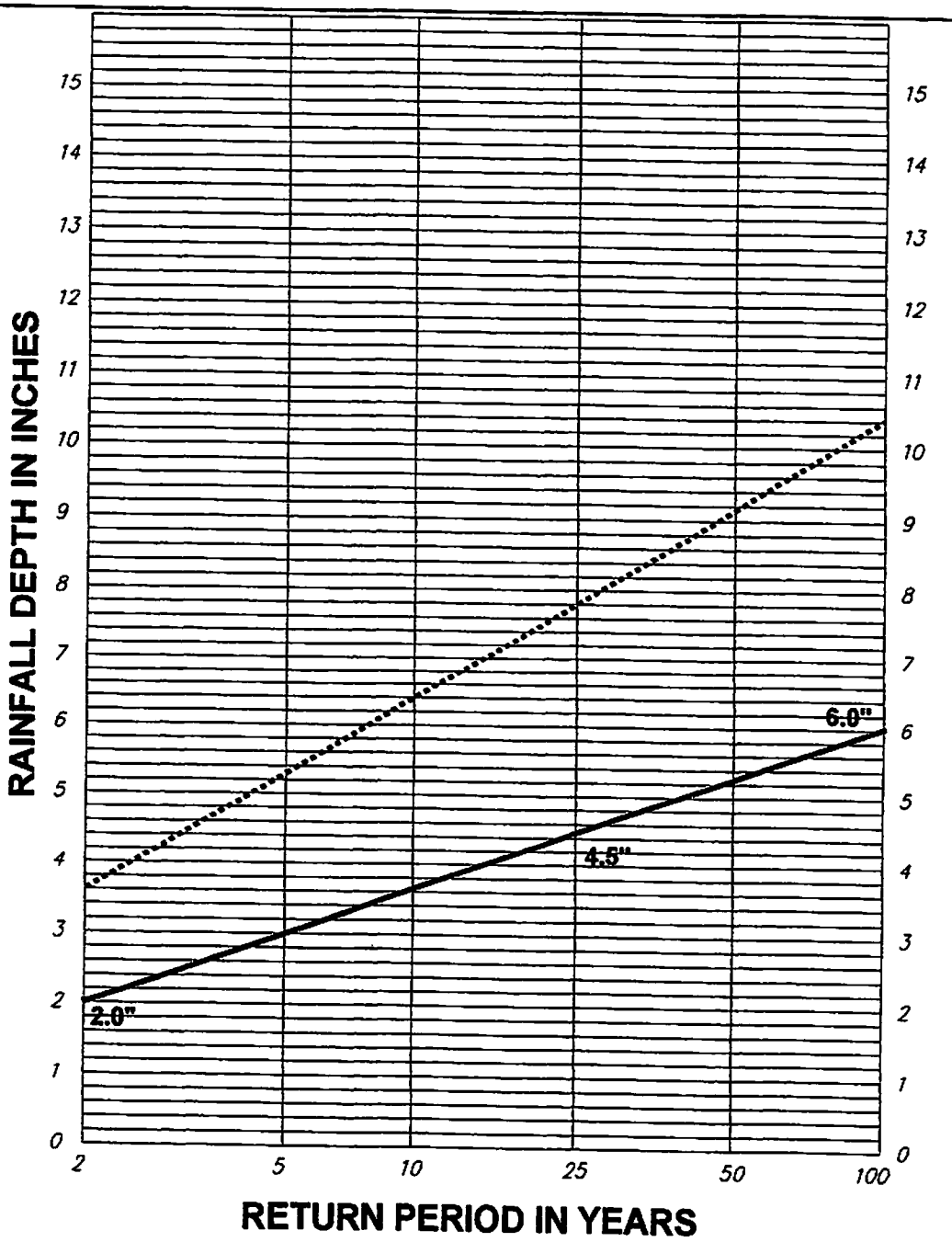


NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for specific duration, then connect points and read value for desired return periond. For example given 2-year 24-hour = 3.5"' and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

Reference: NOAA atlas 2, Volume XI - California, 1973

**RCFC & WCD**

**Hydrology Manual**

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

PLATE E-5.7

# APPENDIX H

100 YEAR FLOOD PLAIN DATA

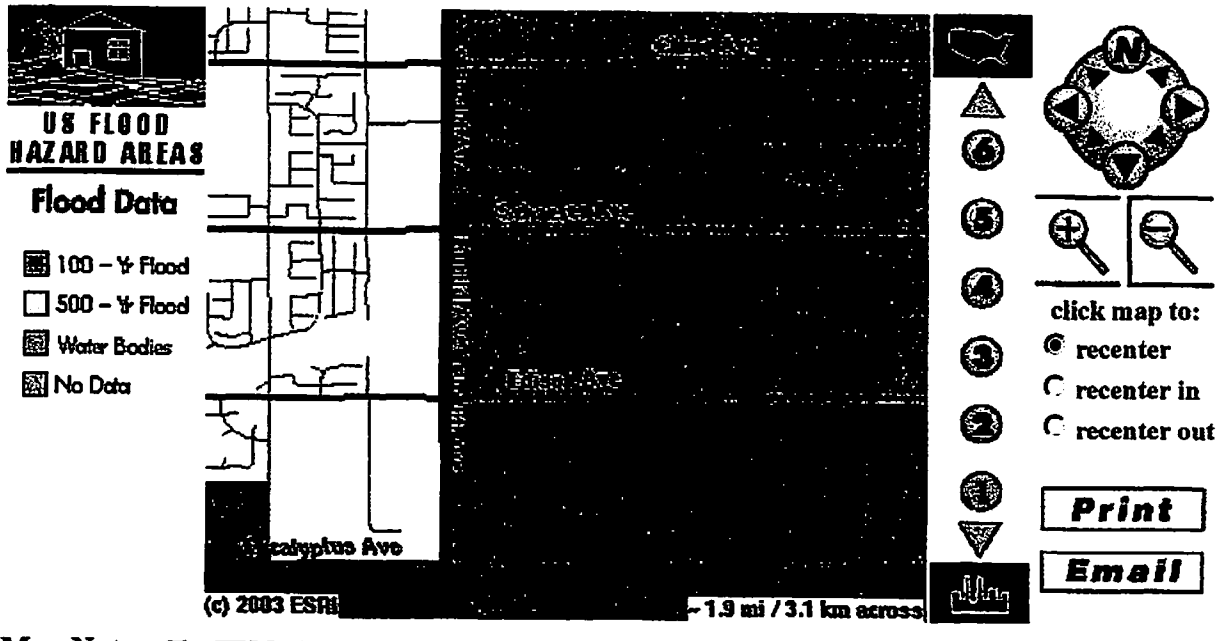


**Map Notes:** The **FEMA Digital Q3 Flood Data** displayed on this Web site is developed by scanning the existing Flood Insurance Rate Map (FIRM) hardcopy and capturing a thematic overlay of flood risks. Digital Q3 Flood Data files contain only certain features from the FIRM hardcopy in effect at the time of scanning and do not replace the existing FIRM hardcopy maps. The Q3 Flood Data is being displayed here with basemap data from the GDT Dynamap/2000 data set. The Q3 Flood Data is currently available for approximately **1,200 counties** across the United States.

**Current Map View:**

Flood Hazard Areas

**Change View**

The maps displayed on this site should be considered an **advisory tool** for general hazard awareness, education, and flood plain management. The flood hazard maps displayed on this site are **not the legal document** to be used when making a single site flood hazard determination. For more information on these maps, please refer to the **Frequently Asked Questions** page.

**Make New Map**

**Return to Home Page**

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Thu May 15 08:24:53 2003

# APPENDIX I

USGS TOPO MAP

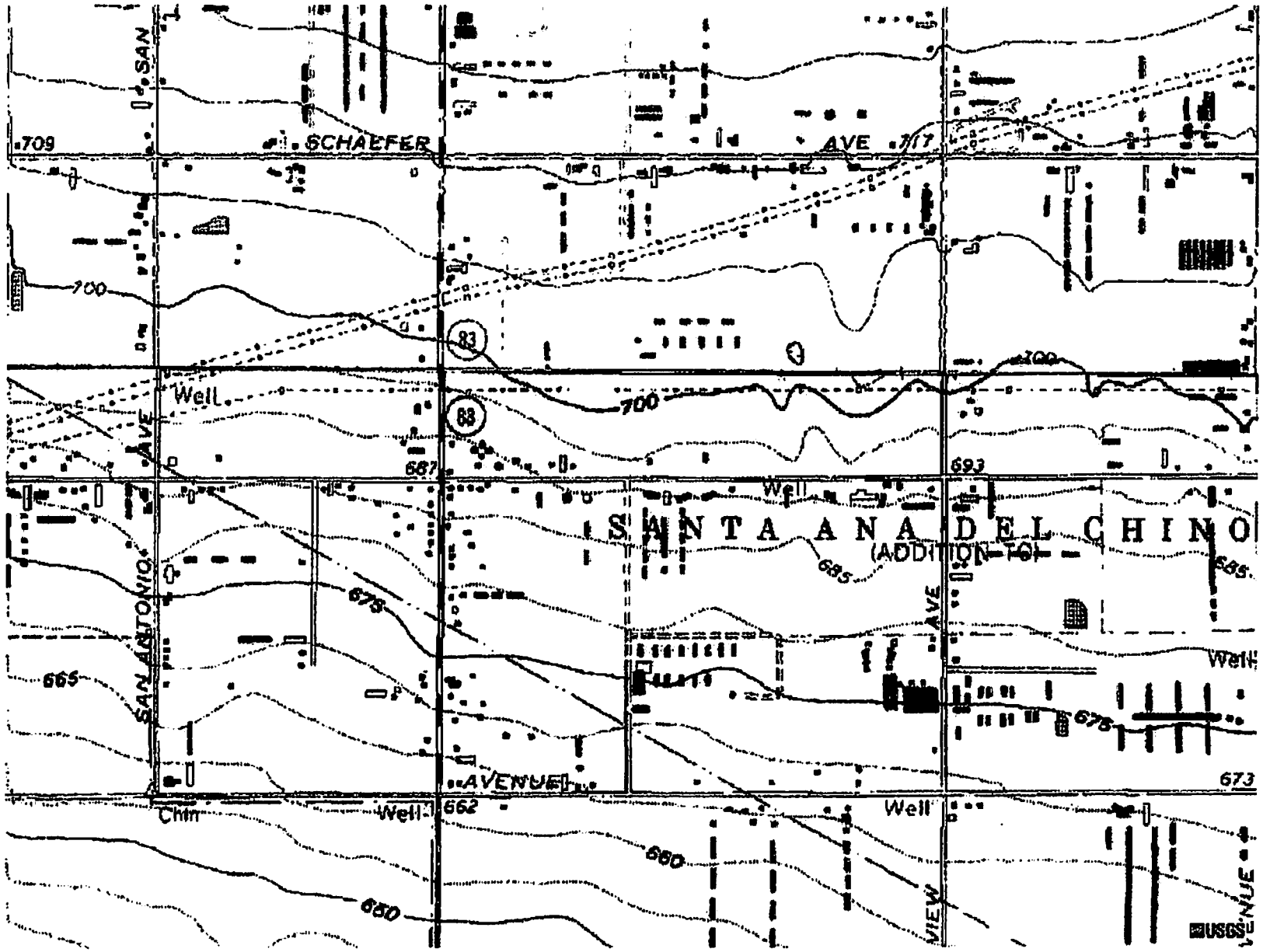
SAN
SCHAEFER
AVE
709
717
700
83
88
Well
AVE
687
693
Well
SANTA ANA DEL CHINO
(ADDITION TO)
685
675
SAN ANTONIO
AVE
665
Well
678
AVENUE
673
Chin
Well
662
Well
660
650
VIEW
VENUE
USGS

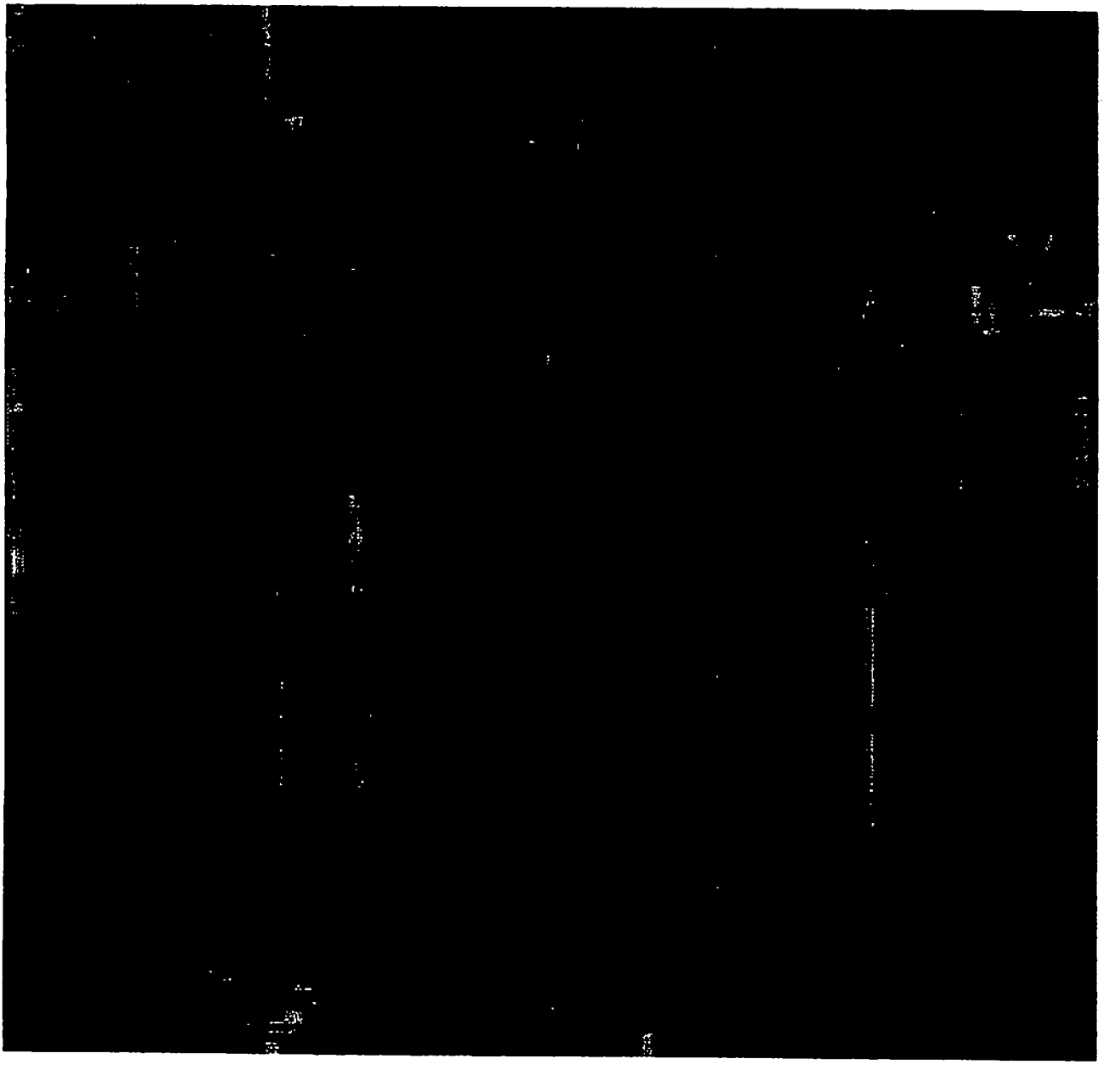

0
300m
900ft
S Bon View Ave
Bon View Ave
Edison Ave
Edison Ave
Edison Ave
Euclid Ave
S Euclid Ave
Sultana Ave
Eucalyptus Ave
Fern Ave
Fern Ave
Cherry Ct
Cherry Ave
Dogwood Ave
Live Oak Ct
Bartlett St
San Antonio Ave
Stone Pine Ct
Ironbark Ave
Schaefer Ave
Homan Ct
Joy Ct
Villa Ave

# APPENDIX J

GUIDELINES FOR ORDER NO. 99-11

# Guidelines for the Development of Engineered Waste Management Plans For Concentrated Animal Feeding Operations

(Dairies and Related Facilities)

California Regional Water Quality Control Board
Santa Ana Region

February 2001

## Introduction

On August 20, 1999, the California Regional Water Quality control Board, Santa Ana Region (Board), adopted Order No. 99-11 (NPDES No. CAG018001), General Waste Discharge Requirements for Concentrated Animal Feeding Operations (Dairies and Related Facilities) in the Santa Ana Region. This order required all operators of dairies and related facilities (i.e., heifer ranches and calf nurseries) authorized to discharge wastes under Order No. 99-11 to develop and implement an engineered waste management plan (EWMP). The primary purpose of an EWMP is to provide a wastewater management system that is designed, constructed, operated and maintained to comply with the wastewater containment requirements in Order No. 99-11. Order No. 99-11 included applicable state and federal regulations that address waste discharges from animal feeding operations.

## Background

The Board began issuing waste discharge requirements to all animal feeding operations in the Region in 1972. These waste discharge requirements stated that each facility had to contain, on the property, all wastewater (i.e., dairy wash water, storm water runoff from manured areas, etc.), including the storm water runoff from a 24-hour, 25-year storm. In an attempt to comply with this requirement, many facilities constructed new ponds, enlarged existing ponds, constructed berms, and implemented other measures. However, these measures were generally implemented in a piecemeal fashion, usually on an as-needed basis, and often did not integrate well with other wastewater containment measures at the facility. It became more and more apparent that many of the wastewater containment improvements that were being made were not very effective. For example, ponds were not sized properly, and therefore, did not have sufficient capacity to contain the entire volume of wastewater generated at the site; berms were sized and constructed improperly, resulting in failures; wastewater pumps, pipelines, etc., were often inoperable and were not replaced when needed; and most wastewater containment structures and equipment were often in a state of disrepair. All of these situations resulted in frequent discharges of wastewater to surface waters, primarily during the winter.

To minimize discharges to surface waters, it became apparent that an overall plan for containing wastewater was necessary. In the late 1980's, Board staff prepared a two-page document that provided guidelines for preparing an EWMP. An EWMP was then generally requested from animal feeding operations that had a history of recurring wastewater discharges. In 1994, the Board adopted Order No. 94-7 (NPDES No. CAG018001), General Waste Discharge Requirements for Concentrated Animal Feeding Operations (CAFOs). Order No. 94-7 required that, in addition to an EWMP being required from CAFOs that had a history of recurring wastewater discharges, EWMPs were to be prepared by anyone initiating a new CAFO at either a new or existing facility. The guidelines for preparing an EWMP were then included as an attachment to Order No.

94-7. Order No. 94-7 expired in March 1999, and the Board adopted Order No. 99-11 in August 1999. To assure that every CAFO had a wastewater management system capable of complying with wastewater containment requirements, Order No. 99-11 required that all CAFO operators develop and fully implement an EWMP. The existing guidelines for preparing an EWMP were included as an attachment to Order No. 99-11. However, the existing EWMP guidelines were outdated, general in nature, and did not contain sufficient criteria to comply with the wastewater containment requirements in Order No. 99-11. Therefore, Order No. 99-11 authorized the Executive Officer to make necessary revisions to the guidelines.

These revised guidelines are longer than the previous guidelines. This is primarily the result of adding explanations and clarification to make EWMPs prepared in accordance with the guidelines as consistent as possible. There are two significant differences between these guidelines and the previous guidelines. First, the new guidelines outline criteria for determining the storage capacity necessary to comply with waste discharge requirements. These criteria will result in the need for significantly more storage capacity than the criteria included in the previous guidelines. However, this does not reflect a change in state or federal regulations. Instead, previous guidelines did not accurately specify criteria for determining the storage capacity necessary to comply with state and federal regulations. Regardless of what was included in previous guidelines, CAFOs have always been, and still are, required to comply with all applicable state and federal regulations. Second, the new guidelines identify several items (such as best management practices) that should be considered in the development and implementation of EWMPs. Many of these items have been included in EWMPs approved by the Executive Officer in the past.

## Purpose

The purpose of an EWMP is to provide a wastewater management system that is designed, constructed, operated and maintained to comply with the wastewater containment requirements in Order No. 99-11. These guidelines do not address the management, application or disposal of manure removed from the corrals. Compliance with waste discharge requirements associated with the discharge of manure removed from corrals is addressed separately. The development and implementation of an EWMP is required by Order No. 99-11. Discharges of wastewater from a CAFO are allowed only if the CAFO operator has constructed and maintained containment structures as required, and if a chronic or catastrophic rainfall event occurs. A chronic rainfall event is a series of wet weather conditions that would total the volume of the 24-hour, 25-year storm event, and would not provide reasonable opportunity for dewatering containment structures prior to the next storm events. A catastrophic storm event includes events such as tornadoes and hurricanes, and any single event that totals the runoff volume of the 24-hour, 25-year storm event. Order No. 99-11 requires that an EWMP be developed in accordance with guidelines established by the Executive Officer. However, these are guidelines, not regulations, and any EWMP that will result in compliance with waste discharge requirements will be acceptable by the Executive Officer. Adhering to these

guidelines, though, will provide consistency for preparing EWMPs, and will increase the likelihood that the EWMP will be acceptable.

## Elements of an EWMP

The EWMP must be prepared by a registered engineer (civil, or other appropriate discipline) or other qualified person (required by Order No. 99-11). The qualified person preparing the EWMP must have the knowledge, technical expertise and experience appropriate to develop an EWMP. This guidance document describes five basic elements that should be addressed in an EWMP. These elements include an introduction, a design, a plot (site) plan, construction specifications, and an operation and management plan. These elements should include a detailed description, as follows:

## I. Introduction

The introduction should describe the existing animal population, the design population for the EWMP, existing wastewater containment facilities, and the operation of those facilities. At a minimum, the Introduction should consist of a brief narrative that addresses the following:

- The facility address, operator name, land owner, and location of the facility with respect to cross streets or other landmarks.
- The name, telephone number and address of the person responsible for implementing the EWMP on an on-going basis (CAFO operator or other designated person)
- The number, telephone number and address of the person(s) to be contacted, if necessary, in the event that the CAFO operator or designated person is not available.
- Current and design animal population (for the expected life of the CAFO)
- The estimated volume of wash water generated at the facility each day (based on gallons per cow per day)
- Total size of the facility (acres)
- The size (acres) of existing ponds, corrals, wastewater disposal areas and wastewater containment areas
- General location and height of berms
- How dairy wastewater is managed and where it is discharged
- Storm water run-on problems (storm water that occurs off-site, but enters the CAFO), including run-on from neighboring facilities, etc.

## II. Design

To comply with Order No. 99-11, containment facilities must be designated to contain all wastewater generated at the facility (i.e., dairy wash water, storm water runoff from manured areas, etc.) and all storm water runoff that comes into contact with manure generated by a 24-hour, 25-year storm. A 24-hour, 25-year storm is a 24-hour storm with

a return frequency of once every 25 years. The design must take into consideration that this storm can and should be expected to occur each year. CAFOs are required to contain the storm water runoff from all lesser storms, if that runoff has come into contact with manure.

If a CAFO does not have existing structures capable of containing the required volume of wastewater, then additional structures must be provided. This may include significantly deepening existing ponds, adding additional ponds, connecting to a sewer system, raising berms to increase the volume of wastewater that can be stored in containment areas, etc. An EWMP may be acceptable if the design has maximized the amount of wastewater that can be contained and the operation and management plan optimizes utilization of the containment capacity provided by the containment structures. **However, acceptance of such a plan will not relieve the CAFO operator of responsibility for any discharges that are not allowed by Order No. 99-11. Wastewater that is discharged off the CAFO property, even after implementing an acceptable EWMP, is still a violation of Order No. 99-11. unless the discharge occurred as a result of a chronic or catastrophic storm event.**

- Historically, containment of wash water and storm water runoff at CAFOs in the Region between the drier months of April through October has not been a problem. However, containing storm water runoff from corrals, wastewater disposal fields, etc., and daily wash water, has been problematic during the five generally wet months of November through March. During these months, evaporation is minimal, and since disposal fields are usually saturated by rainfall, percolation is minimal. Since it is difficult to dispose of daily wash water and accumulated storm water runoff during these months, wastewater facilities should be designed to contain all wastewater generated during this 150-day period, as noted below.

- Containment structures should be designed to contain 150 days of annual storm water runoff <u>and</u> the runoff from a 24-hour, 25-year storm. For the Chino Basin area, average rainfall for the 150 days from November through March is approximately 13 inches, and a 24-hour, 25-year storm generates approximately 4.5 inches of precipitation (based on information from the National Weather Service). For the San Jacinto area, average annual rainfall for the 150 days from November through March is approximately 11 inches, and a 24-hour, 25-year storm is approximately 3.5 inches. These are average values for these areas, and other values can be used for a particular CAFO, if justification is provided.

- Containment structures should be designed to contain 150 days of wash water. This should be based on the maximum number of milking cows for the life of the facility. Otherwise, the EWMP may have to be revised in the future, at such time that the number of milking cows exceeds the number of cows stated in the EWMP. Recent studies have shown that the average daily wash water generated at dairies in the Region is about 70 gal/cow/day (based on two milkings/cow/day). The average daily wash water produced during winter months, however, can exceed 100 gal/cow/day. The average gal/cow/day used during the winter should be used in determining the

volume of storage required for wash water. This volume can vary, depending on specific site practices, but should be about 100 gal/cow/day unless adequate justification is provided for using a smaller number. The installation of a water meter can verify the amount of water used and assist in efforts to conserve water usage, and thereby reduce the amount of water discharged to containment structures. A wash water meter will be required to justify a volume significantly less than 100 gal/cow/day.

- During the winter, evaporation is minimal. Also, ponds tend to seal up over time, and disposal fields are generally saturated during the winter, thereby minimizing percolation. In addition, the amount of wastewater percolated during the winter at a CAFO can vary, depending on the particular wastewater disposal practices implemented at that CAFO. Allowances for loss of wastewater due to percolation and evaporation can be made in determining the amount of storage required for wastewater, as long as reasonable assumptions are made that consider winter conditions and practical CAFO specific wastewater disposal practices.

- The accumulation of solids in ponds and other containment structures decreases the storage capacity available for wastewater. It is estimated that dairy wash water in the Region contains about 10% of the manure generated by a milking cow. Also, solids are present in storm water runoff from corrals, disposal land and other areas. The estimated annual decrease in available storage capacity resulting from the accumulation of these solids should be determined (the volume of manure in wash water can be considered to be 10% of what a milking cow expels).

- Calculations should be provided showing the design capacity of all wastewater containment structures (existing and proposed).

- The total capacity of the containment structures should be at least equal to the volume determined by the following equation: 150 days dairy wash water + 150 days annual storm water runoff + 24-hour, 25-year storm runoff + accumulation of solids + wastewater in containment structures on November 1 – percolation – evaporation.

- A description of all wastewater conveyance equipment and structures (pipelines, surface channels, pumps, etc.), including their design capacities, should be provided.

- CAFOs in operation prior to November 27, 1984 must be designed to protect all manured areas from inundation or washout by overflow from any stream channel during a 20-year peak stream flow (required by Order No. 99-11).

- CAFOs built after November 27, 1984 must be designed to process all manured areas from inundation or washout by overflow from any stream channel during a 100-year peak stream flow (required by Order No. 99-11).

- The use of pumps must be considered for ponds and other containment structures so that wastewater can be pumped from ponds or containment areas to disposal areas, in

order to restore needed capacity in the containments structures. If pumps are not utilized, exceptional justification for not utilizing pumps must be included.

- Storm water containment structures must be protected against inundation from off-site storm water sources, unless such run-on is fully contained (required by Order No. 99-11). If it is not practical to divert all storm water run-on away from a CAFO, a justification should be included that explains why it is not practical to do so. If all storm water run-on from up to a 24-hour, 25-year storm cannot be diverted from containment structures, a description of how the design takes the run-on into consideration should be included.

- The addition of roof structures in areas where manure is present, and diverting the roof runoff off site, should be considered in order to minimize the amount of precipitation that comes into contact with manure.

- Structures should be designed to prevent storm water runoff from non-manured areas (roofs, residence area, paved surfaces, etc.) from entering wastewater containment structures. The use of rain gutters and diversion trenches should be considered. If the CAFO cannot be designed to prevent or minimize the flow of this water onto containment areas, an explanation should be provided that describes how the design accounts for such flows.

- The design for ponds and other wastewater containment areas should allow vehicle access for mosquito abatement personnel to inspect and treat these areas to reduce the risk of mosquito-borne disease and to prevent insect nuisance conditions.

- An emergency spillway must be designed to provide for a controlled release of wastewater, and to maintain the integrity of existing containment structures, in the event that storm events cause the capacity of the containment structures to be exceeded. The use of gateways, valves, or other similar devices for the purpose of manually releasing wastewater, is not acceptable.

- If visual observations, hand-level measurements and information provided by the CAFO operator and others are not sufficient to determine rise and fall dimensions and flow directions for adequately calculating runoff volumes for placing and sizing appropriate containment structures, then current contours must be determined, based on acceptable engineering and surveying practices (it is expected that current contours will be necessary for most CAFOs).

- Structures should be designed to accommodate future increases in animal population.

## III. Plot (Site) Plan

The plot plan should be a standard blue line print, using an appropriate scale, that shows sufficient detail of all containment structures, drainage patterns, and equipment. The plot plan should include:

- The legal description of the property (i.e., parcel numbers), the primary address and any other addresses that may exist at the property, and the location of significant structures on the property (residences, milk barn, hay alleys, etc.).
- The property boundaries, the gross acreage of the property, vicinity map (insert), north arrow, legend and date the plan was prepared.
- The location, elevation contours and dimensions of all areas associated with the generation, storage or management of wastewater and manure (corrals, ponds, access roads around wastewater containment areas, wastewater disposal areas, temporary manure storage areas, cropland, etc.).
- The location of all facilities necessary for containment and management of wastewater (berms, upstream diversion structures, pumps, spillway, distribution lines, etc.) and the dimensions, elevation and cross-sections of all containment structures.
- The drainage patterns (indicated by arrows) for on-site surface drainage courses (swales, ditches, etc.) and any off-site surface drainage that can flow onto, or immediately adjacent to, the facility.

## IV. Construction

The construction plan should describe all construction materials, construction methods (i.e., compaction), criteria and specifications, etc., necessary for proper construction of all containment and conveyance structures (berms, ponds, levees, pipelines, channels, etc.).

- Existing berms that are not sized properly, not adequately compacted, or contain materials (i.e., manure) that are deleterious to the berm's long term stability and effectiveness, must be replaced or improved to a standard that is equivalent to that which would be expected from a new berm constructed in accordance with best engineering practices.
- Actions necessary to restore existing structures to proper conditions and capacities should be clearly described (i.e., clean out existing ponds or containment areas, regarding, repair or replacement of existing berms, etc.).

- Manure shall not be used to construct new containment structures (i.e., berms0, and manure shall not be used to improve or raise existing containment structures (prohibited by Order No. 99-11).

- In accordance with acceptable engineering practices, specifications developed to assure that construction material is applied in lifts of appropriate depth, and rolled and watered to achieve a minimum compaction of 90%, must be included.

## V. Operation and Maintenance

An operation and maintenance plan should be provided to implement effective operation of all containment structures and equipment. During the wet season, wastewater should be managed on a daily basis to maximize the volume of containment capacity available.

- Specific procedures should be included to assure that containment structures have the maximum capacity available just prior to the wet season (November – March).

- Management practices to reduce, to the maximum extent practicable, the volume of dairy wash water generated should be addressed, particularly if the proposed structures are incapable of containing the required volume of wastewater.

- Replacement pumps should be available on-site, or advanced arrangements made for the immediate and reliable delivery of portable pumps.

- Specific procedures for operating standpipes or other conveyance systems used for applying wastewater to land should be provided to efficiently utilize the entire area available for wastewater disposal (i.e., avoid localized over-application that can occur with furrow application, and utilize methods to maximize the spreading of wastewater).

- If all storm water run-on cannot be diverted, the EWMP should contain a description of how storm water run-on will be managed or handled to minimize the impact on wastewater containment structures and to minimize the amount of wastewater that could be discharged from the CAFO.

- Specific measures to minimize the effects of gophers, squirrels or other rodents on the integrity of the containment structures should be identified.

- Removal of solids from containment structures on a scheduled basis should be specified so that the design capacity of the containment structures will be restored prior to each rain season.

- Measures for minimizing the accumulation of stagnant wastewater in low lying areas (corrals, disposal areas, etc.) and preventing potential insect nuisance conditions should be addressed.

- Weekly inspections of ponds, berms, wastewater distribution and application equipment, etc., should be specified to provide assurance that all containment structures are intact and all equipment is in proper operating condition. Daily inspections should be conducted following the first significant rain events at the beginning of the wet season (generally in early Fall), continuing through the cessation of significant rain events (generally in early Spring). Provisions for the immediate repair of any damaged containment structures (i.e., rodent holes, cracks, erosion, etc.) should be provided.

- A description of methods and schedules for maintaining disposal areas in a condition that maximizes the efficient disposal of wastewater in the winter should be provided (i.e., grading, disking, etc.).

- An equipment maintenance schedule should be provided to assure the efficient, consistent and reliable operation of all pumps, sumps, pipelines, etc.

- Weed abatement measures to maintain access to containment structures, maintain capacity of containment structures and to maintain the efficient distribution of wastewater through channels, etc., should be addressed.

- A brief emergency spill plan must be included. The plan must include a list of spare parts (pumps, piping, valves, etc.) that are to be kept on site to maintain adequate wastewater containment facilities, a list of names and phone numbers for contacts for obtaining immediate emergency equipment (pump, piping, valves, heavy equipment, etc.), and a list of names and phone numbers for reporting problems (Board staff, County staff, etc.).

# APPENDIX K

ORDER NO. 99-11

California Regional Water Quality Control Board
Santa Ana Region

Order No. 99-11
NPDES No. CAG018001

# GENERAL WASTE DISCHARGE REQUIREMENTS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (DAIRIES AND RELATED FACILITIES) WITHIN THE SANTA ANA REGION

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter, Regional Board), finds that:

1. On February 17, 1994, the Board adopted Order No. 94-7, General Waste Discharge Requirements For Concentrated Animal Feeding Operations, Including Dairies, Within The Santa Ana Region (NPDES NO. CAG018001).

2. Order No. 94-7 satisfied the criteria cited in 40 CFR 122.28 and, as such, served as a General NPDES Permit. 40 CFR 122.28 pertains to the issuance of general permits to regulate discharges of waste that meet the following criteria:

   a. Waste discharges involving the same or substantially similar types of operations;
   b. Discharge the same types of wastes;
   c. Require the same or similar operating conditions;
   d. Require the same or similar monitoring ; and
   e. Are more appropriately regulated under a general permit rather than individual permits.

3. 40 CFR Part 122.23 defines a concentrated animal feeding operation (CAFO) as any animal feeding operation that has more than 1,000 animal units (dairy cattle are considered 1.4 animal units). Pursuant to the Clean Water Act (CWA), all CAFOs are point sources and are subject to NPDES permitting requirements. Smaller animal feeding operations can also be designated as CAFOs by the permitting agencies after considering certain criteria cited under 40 CFR 122.23 (b)(1). The Regional Board has determined that all dairies, heifer ranches, and calf nurseries in the Region shall be designated as CAFOs.

4. Order No. 94-7 has expedited the preparation of waste discharge requirements and has allowed the Regional Board to better utilize staff resources. To date, approximately 215 CAFOs have been enrolled under Order No. 94-7. Another 72 CAFOs are in the process of obtaining authorization to discharge wastes under that order. Order No. 94-7 expired on March 1, 1999. The dairies currently enrolled under Order No. 94-7, or in the process of enrolling under Order No. 94-7, will want to continue to discharge waste. Therefore, it is necessary to renew the waste discharge requirements contained in Order No. 94-7 to continue this expedited permitting process.

5. Persons discharging, or proposing to discharge, dairy wastes or other similar kinds of wastes in any manner that may affect water quality are hereinafter referred to as "discharger" and are subject to the terms and conditions of this order. Persons discharging, or proposing to discharge, wastes from other types of animal feeding operations must obtain coverage under a separate general permit or individual waste discharge requirements.

6. The Regional Board adopted a revised Water Quality Control Plan (Basin Plan) on March 11, 1994. The Basin Plan became effective on January 24, 1995. The Basin Plan specifies beneficial uses and water quality objectives for surface and ground waters in the Santa Ana Region (Chapters 3 and 4). This order specifies requirements necessary to meet the water quality objectives and to protect the beneficial uses.

7. Revised regulations governing discharges from CAFOs, including dairies, are contained in Division 2, Title 27 of the Combined State Water Resources Control Board/California Integrated Waste Management Board AB 1220 Regulations, which became effective on July 18, 1997. Chapter 7, Subchapter 2 (Article 1) contains requirements for Confined Animal Facilities. Previously, these regulations were specified in Chapter 15, Division 3, Article 6, Title 23 of the California Code of Regulations.

8. Section 402(p) of the CWA as amended by the Water Quality Act of 1987 and the related regulations published by the U.S. EPA on November 16, 1990 (40 CFR Parts 122, 123 and 124), requires an NPDES permit for pollutant discharges from CAFOs. The EPA's Effluent Guidelines and Standards for Feedlots are contained in 40 CFR Part 412 (revised July 1, 1993).

9. On April 17, 1997, the State Water Resources Control Board adopted the General Industrial Storm Water Permit, Order No. 97-03-DWQ, NPDES No. CAS000001. Order No. 97-03-DWQ implements the final regulations (40 CFR 122, 123, and 124) for storm water runoff published on November 16, 1990 by the U.S. EPA in compliance with Section 402(p) of the CWA. This order includes those provisions of the General Industrial Storm Water Permit that pertains to dairies. Once a discharger is authorized under Order No. 99-11, coverage under the State Water Resources Control Board's General Industrial Storm Water Permit (Order No. 97-03-DWQ) will be terminated.

10. Wastes from CAFOs contain high concentrations of salts (total dissolved solids and nitrates). Previous studies conducted by the Board have shown that cow manure produced in the Region contains about 160 pounds of salt per (dry) ton of manure (110 pounds of salt per ton of manure @ 33% moisture). The application of manure or the discharge of process wastewater[1] to land results in the discharge of salts that has adversely impacted, and continues to adversely impact, the quality of groundwater and surface water in the Region.

[1] Process wastewater shall mean any process generated wastewater and any precipitation (rain or snow) which comes into contact with any manure, litter or bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g. milk, eggs).

11. Most of the CAFOs in the Region overlie the Chino Groundwater Basin. The Chino II and III Groundwater Subbasins lack assimilative capacity for additional salt inputs (total dissolved solids and nitrogen). For groundwater subbasins without assimilative capacity, salt inputs that exceed the water quality objectives for these subbasins cannot be allowed (State Water Resources Control Board Order No. 73-4, the Rancho Caballero decision). To meet the Chino Basin groundwater objectives, as well as the groundwater objectives for any other subbasin lacking assimilative capacity, the discharge of manure and other animal wastes, such as process waste water, and their application as fertilizer and irrigation water, must be controlled to prevent further exceedance of water quality objectives. Salt discharges in excess of water quality objectives can only be allowed if the additional salt inputs are offset.

12. The Basin Plan assumed that two desalters would be built in the Chino Basin. The amount of salt to be extracted from the Basin from these desalters was assumed to be adequate to provide sufficient salt removal to offset the present and projected salt loads from ongoing discharges from CAFOs. However, only one desalter is currently being built. This desalter will extract enough salt to offset the amount of salt being added to the basin from process wastewater water discharges. No mitigation measures are currently in place to offset the salt loading from manure application within the Basin. Therefore, the discharge of manure, and its application as fertilizer, must be prohibited.

13. The Board has considered antidegradation pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16 and finds that these discharges are consistent with the State and Federal regulations, as long as appropriate salt offset programs are implemented.

14. In accordance with Water Code Section 13389, the issuance of waste discharge requirements for these discharges is exempt from those provisions of the California Environmental Quality Act contained in Chapter 3 (Commencing with Section 21100), Division 13 of the Public Resources Code.

15. The Regional Board has notified interested agencies and persons of its intent to issue general waste discharge requirements for discharges of wastes CAFOs, and has provided them with an opportunity to submit their views and recommendations.

16. The Regional Board, in a public meeting, heard and considered all comments pertaining to discharges of wastes from CAFOs proposed to be regulated under the general waste discharge requirements.

IT IS HEREBY ORDERED that, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Clean Water Act as amended, and regulations and guidelines adopted thereunder, dischargers, their agents, successors, and assigns, discharging wastes from CAFOs shall comply with the following:

## A. DISCHARGE SPECIFICATIONS:

1. The discharger shall design, construct and maintain containment structures to retain all wastewater within its facility, including all process generated wastewater[2] and all precipitation on, and drainage through, manured areas resulting from storms up to and including a 24-hour, 25-year storm.

2. The discharger shall develop and fully implement an Engineered Waste Management Plan (EMWP) acceptable to the Executive Officer. The EMWP shall be developed by a registered professional engineer, or other qualified individual, in accordance with the guidelines specified in Attachment "B" of this order. The Executive Officer is hereby authorized to make necessary revisions to the guidelines for the preparation of an EWMP outlined in Attachment "B".

3. The discharge to any surface water bodies, or tributary thereof, is prohibited unless a chronic[3] or catastrophic[4] rainfall causes overflow from a storage facility designed, constructed, maintained and operated to contain all process generated wastewater plus the runoff from a 24-hour, 25-year storm.

4. Retention ponds and manured areas at CAFOs in operation on November 27, 1984, shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Facilities existing before November 27, 1984 that are protected against 100-year peak stream flows must continue to provide such protection. New facilities (built after November 27, 1984) shall be protected from 100-year peak stream flows.

5. Disposal of manure to land is prohibited, unless allowed by separate waste discharge requirements issued by the Board.

6. The use of manure as a fertilizer in any area that may affect a groundwater subbasin lacking assimilative capacity, including the Chino Groundwater Basin, is prohibited unless a plan, acceptable to the Executive Officer, is implemented which mitigates the effects of that use on the underlying groundwater subbasin.

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[2] Process generated wastewater shall mean water directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems; washing, cleaning of flushing pens, barns, manure pits or other feedlot facilities; direct contact swimming, washing or spray cooling of animals; and dust control.

[3] Chronic rainfall means a series of wet weather conditions which would not provide opportunity for dewatering and which total the volume of the 25 year, 24 hour storm event.

[4] Catastrophic rainfall means any single event which would total the volume of the 25 year, 24 hour storm event; this could include tornadoes, hurricanes or other catastrophic conditions which could cause overflow due to winds or mechanical damage.

7. Manure applied to cultivated cropland outside of any area that may affect a groundwater subbasin lacking assimilative capacity, including the Chino Groundwater Basin, shall not exceed agronomic rates and shall be incorporated into soil soon after application or appropriate containment (based upon the specific crop grown) controls must be provided. For any application of manure to cropland above 12 dry tons per acre per year (17.5 tons/year @ 33% moisture), an explanation of the type of crop and the number of times it is harvested per year shall also be included in the annual report.

8. Manure removed from the corrals shall be removed from the facility within 180 days. Any manure remaining at the facility after 180 days of being removed from the corrals is considered to be disposal of manure and is prohibited in accordance with Discharge Specification A.5. A manifest of the manure hauled away shall be prepared and submitted with the annual report in accordance with Monitoring and Reporting Program No. 99-11. (The discharger shall be responsible for active management of legal disposal of manure from the property over the six month period following removal of the manure from corrals. This means that legal disposal must be coordinated with periods of rainfall such that manure can be removed from the facility within 180 days of being scraped from corrals.)

9. On two designated "clean days" per calendar year, facilities subject to this order shall be free of all stockpiled manure that has been removed from corrals. These "clean days" shall be selected by each discharger, beginning in 2000. The two "clean days" shall be at least four months apart. Each "clean day" shall be identified and reported to the Board office at least five working days in advance of the selected date.

10. All surface drainage from outside of the facility shall be diverted away from any manured areas unless such drainage is fully contained.

## B. PROVISIONS:

1. Neither the treatment nor the discharge of wastes shall create, or threaten to create, a nuisance or pollution as defined by Section 13050 of the California Water Code.

2. This order shall serve as a general National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Clean Water Act or amendments thereto. The general permit shall become effective 10 days after the date of its adoption provided the Regional Administrator of the Environmental Protection Agency has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

3. This order expires on August 1, 2004. However, it shall continue in force and effect until a new general permit is issued. All dischargers authorized to discharge under the expired permit may continue to discharge waste in accordance with that permit until a new permit is issued.

4. Upon receipt of an application to discharge wastes under this order, the Executive Officer shall authorize the proposed discharge by transmitting a "Discharge Authorization Letter" to the discharger. The discharge authorization letter may be terminated or revised by the Executive Officer at any time.

5. Upon issuance of a discharge authorization letter from the Executive Officer to discharge wastes under this order, the discharger's authorization to discharge waste under the State Water Resources Control Board's General Industrial Storm Water Permit (Order No. 97-03-DWQ) is hereby terminated.

6. All discharges from the facility must comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to storm drain systems or other courses under their jurisdiction.

7. Storm flows in excess of a 24-hour, 25-year storm event may be discharged to surface water bodies in accordance with the requirements specified in U.S. Environmental Protection Agency's "Effluent Guidelines and Standards for Feedlot's, 40 CFR Part 412". Additionally, storm flows resulting from chronic or catastrophic events may also be discharged to surface water bodies in accordance with the U.S. Environmental Protection Agency's effluent guidelines referenced above.

8. The discharger shall comply with Monitoring and Reporting Program No. 99-11.

9. The discharge of wastes to property not owned or controlled by the discharger, except as authorized by this order, is prohibited.

10. The discharger shall comply with all Federal, State, County and local laws and regulations pertaining to the discharge of wastes from the facility.

11. Following a storm event, the discharger shall restore the wastewater holding capacity of retention ponds in a timely manner.

12. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from liabilities under Federal, State, or local laws, nor guarantee the discharger a capacity right in the receiving waters.

13. This order does not convey any property rights of any sort, or any exclusive privilege.

14. An authorization to discharge wastes under this order is not transferable to any person without written authorization from the Executive Officer.

15. The discharger shall comply with all requirements of this order and all terms, conditions, and limitations specified in the discharge authorization letter issued by the Executive Officer.

16. The discharger shall take all reasonable steps to minimize or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment.

17. Any instance of noncompliance with this order constitutes a violation of the Clean Water Act (CWA), its regulations, and the California Water Code, and is grounds for enforcement action, and/or termination of the authorization to discharge.

18. The provisions of this order are severable, and if any provision of this order, or the application of any provisions of this order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this order shall not be affected thereby.

19. It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this order.

20. Compliance determination with the terms of this order shall be based on the following:

    a. Periodic inspections by Regional Board staff;
    b. Evaluation of the annual report of animal waste and storm water discharge submitted according to the attached monitoring and reporting program; and
    c. Any other information deemed necessary by the Executive Officer.

21. The Regional Board, USEPA, and other authorized representatives shall be allowed:

    a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this general permit;
    b. Access to copy any records that are kept under the conditions of this general permit;
    c. To inspect any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and
    d. To photograph, sample, and monitor for the purpose of assuring compliance with this general permit, or as otherwise authorized by the CWA.

## C. PERMIT REOPENING, REVISION, REVOCATION, AND RE-ISSUANCE:

1. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal CWA, or amendments thereto, the Board will revise and modify this order in accordance with such standards.

2. This order may be reopened to address any changes in State or Federal plans, policies or regulations that would affect the quality requirements for the discharges.

## D. PENALTIES:

1. The CWA provides that any person who violates a provision implementing sections 301, 302, 306, 307, or 308 of the CWA is subject to a civil penalty not to exceed $11,000 per day of such violation. Any person who willfully or negligently violates provisions implementing these sections of the CWA is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

2. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $11,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $11,000 per violation, or by imprisonment for not more than six months per violation, or by both.

4. The California Water Code provides that any person who violates a waste discharge requirement or a provision of the California Water Code is subject to civil penalties of up to $5,000 per day, $10,000 per day, or $25,000 per day of violation, or when the violation involves the discharge of pollutants, is subject to civil penalties of up to $10 per gallon per day, or $20 per gallon per day of violation; or some combination thereof, depending on the violation, or upon the combination of violations.

## E. REQUIRED REPORTS AND NOTICES:

1. Reporting Provisions:

   a. All applications, annual reports, or information submitted to the Regional Board shall be signed and certified in accordance with 40 CFR 122.22.

   b. Any discharger authorized to discharge waste under this order shall furnish, within a reasonable time, any information the Regional Board or EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating their authorization or this general permit. The discharger shall also furnish to the Regional Board, upon request, copies of records required to be kept by this order.

c. Except for data determined to be confidential under Section 308 of the CWA, all reports prepared in accordance with the terms of this general permit shall be available for public inspection at the offices of the Regional Water Quality Control Board and the Regional Administrator of USEPA. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act and Section 13387 of the California Water Code.

2. The discharger shall notify the Regional Board by telephone within 24 hours of any unauthorized discharge of waste from the facility. This notification shall be followed by a written report including the following:

   a. The approximate date and time of the discharge;
   b. The volume and duration of the discharge;
   c. The cause of the discharge; and
   d. A time schedule and a plan to implement necessary corrective actions to prevent the recurrence of such discharges.

3. The discharger shall report promptly in writing to the Regional Board of any changes or proposed changes in:

   a. The control, ownership, operation or location of the facility;
   b. The character, location, volume or disposal methods of waste discharges; and
   c. The size of the animal population, if it increases beyond the design capacity of the facility specified in the EWMP.

4. The discharger shall give advance notice to the Regional Board of any planned changes in the permitted facility or activity that may result in noncompliance with this general permit.

## F. APPLICATION REQUIREMENTS:

1. Dischargers previously authorized to discharge wastes under Order No. 94-7, dischargers currently discharging wastes under individual waste discharge requirements, and dischargers who have submitted a notice of intent to discharge wastes under Order No. 94-7 are automatically enrolled under this Order, unless they file an application to be covered under an individual permit. Once the Executive Officer issues a discharge authorization letter, the individual waste discharge requirements are hereby rescinded.

2. Dischargers not previously authorized to discharge waste under Order No. 94-7 are required to submit the following within 60 days of the effective date of this Order for existing discharges and at least 60 days before the start of any new discharge:

a. A completed Notice of Intent Form (see attachment "A") with the appropriate filing fee;
b. An Engineered Waste Management Plan for the facility, acceptable to the Executive Officer (see Attachment "B");
c. If an acceptable EWMP has not been developed, the discharger must submit the name of the engineer, or other qualified individual, who will develop the EWMP and a proposed time schedule for its development; and
d. Any other information deemed necessary by the Executive Officer.

If the proposed discharge meets the requirements of this order, the Executive Officer will provide the discharger with a written authorization to discharge waste in accordance with these waste discharge requirements.

3. The following types of facilities are generally not required to obtain authorization under this order. Such facilities must not discharge waste which may affect water quality, or cause a nuisance or pollution as defined in Section 13050 of the California Water Code.

a. Dairies where the animal population is less than 20 (dry or milking cows).
b. Heifer or calf ranches where the herd size is less than 50.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on August 20, 1999.

G J Thibeault

Gerard J. Thibeault
Executive Officer

Attachment "A" NOI

# REQUIREMENTS FOR AN ENGINEERED WASTE MANAGEMENT PLAN

**The Engineered Waste Management Plan must be prepared by a registered professional engineer in the State of California or another qualified individual.**

## A. SITE PLAN:

Site plan shall include:

1. Address and/or legal description of the property.

2. Name, address, and telephone number of the owner and operator of the property.

3. Total gross acreage of the property, showing property boundaries and all existing and proposed facilities including buildings, storage areas, berms/levees, holding ponds, pumping facilities, culverts, drainage easements, disposal areas, croplands (whether farmed by the owner/operator or another party), etc. The site plan must include the overall dimensions, contours, a vicinity map, north arrow, and the date the plan was prepared. The plan shall be drawn on a standard blue print format using an appropriate scale that shows sufficient details of all facilities.

4. Containment facilities shall be designed to retain, on the property, all process generated wastewater and storm water runoff due to precipitation and drainage through manured areas which results from a 24-hour, 25-year storm event. Facilities in operation on November 27, 1984 shall be designed for protection of all manured areas from inundation or washout by overflow from any stream channel during 20-year peak stream flows. All manured areas for new facilities (built after November 27, 1984) shall be protected from inundation resulting from a 100-year peak stream flow. The site plan shall show all facilities necessary for containment and management of on-site storm water runoff as well as the interception and conveyance of any off-site storm water runoff through the property.

5. The site plan shall show the size, elevation, and location of all facilities proposed for containment of process generated wastewater and storm water runoff on the property (berms/levees, holding ponds, upstream diversion structures, etc.). Cross section details of these facilities shall be presented.

6. A description of existing and proposed disposal areas or cropland, designated to receive operational water.

## B. DESIGN CALCULATIONS:

Design calculations shall include:

1. Present and proposed animal population (numbers of each: milk cows, dry cows, calves, heifers, etc.) and the volume of wash water generated.

2. Amount of storm water runoff resulting from a 24-hour, 25-year storm event.

3. Total amount of wastewater (wash water and storm water) to be contained on the property.

4. Dimensions and capacity of the holding ponds.

5. Percolation rates, if used.

## C. CONSTRUCTION SPECIFICATIONS:

Construction specifications shall include the construction materials and method of compaction utilized to build berms/levees and other containment facilities.

## D. OPERATION AND MANAGEMENT PLAN:

Operations and maintenance plan shall include:

1. A proposed holding pond management plan (to provide maximum pond capacity prior to winter storms; periodic dredging, etc.).

2. A proposed wastewater distribution plan (periodic rotation of wastewater to disposal areas or croplands).

3. A proposed maintenance plan for berms/levees and other containment facilities, including a proposed rodent control plan (periodic inspections to monitor for holes/cracks or breaks, etc.)

California Regional Water Quality Control Board
Santa Ana Region

Monitoring and Reporting Program No. 99-11
for
Concentrated Animal Feeding Operations (Dairies and Related Facilities)
Santa Ana Region

## A. Monitoring

1. The discharger(s) shall inspect the waste holding and disposal areas and note any discharges off the property that is under the control of the discharger. Inspections will be made daily when wastewater is being applied to cropland and weekly during other periods. The results of all inspections will be recorded and submitted with the required reports.

2. During each significant storm event[5], the discharger(s) shall make visual inspections of all storm water containment structures.

3. The discharger(s) shall record the approximate time of each storm-related discharge that results in off-property discharges of storm water commingled with wastewater or manure, and its approximate duration.

4. The discharger(s) shall record each manure-hauling event on a manure tracking manifest form.

## B. Reporting

1. By January 15 of each year, an annual report of animal waste discharge and storm water discharge shall be submitted.

2. The annual report shall be submitted on forms provided by Regional Board staff and shall also include copies of all manure tracking manifests for the reporting period and copies of the inspection logs required to be maintained under A.1. and A.4. above.

3. The discharger shall notify the Regional Board by telephone within 24 hours of any unauthorized discharge of wastes. This notification shall be followed by a written report which shall be submitted to the Regional Board within two weeks of the discharge . The written report shall contain:

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[5] A significant storm event is defined as a storm event which results in continuous discharge of storm water for a minimum of one hour, or intermittent discharge of storm water for a minimum of three hours in a 12-hour period.

a. The approximate date and time of the discharge;

b. The flow rate and duration of the discharge;

c. The specific type and source of the waste discharges (e.g., overflow from holding pond, rainfall runoff from manure storage areas, etc.); and

d. A time schedule and a plan to implement necessary corrective actions to prevent the recurrence of the discharge.

All reports shall be signed by a responsible officer or duly authorized representative of the discharger(s) and shall be submitted under penalty of perjury.

Ordered by
Gerard J. Thibeault
Executive Officer

August 20 , 1999

California Regional Water Quality Control Board
Santa Ana Region

FACT SHEET

# GENERAL WASTE DISCHARGE REQUIREMENTS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (DAIRIES AND RELATED FACILITIES) WITHIN THE SANTA ANA REGION, ORDER NO. 99-11, NPDES NO. CAG018001

## I. Need for General Waste Discharge Requirements

There are approximately 302 animal feeding operations (AFOs), including dairies, heifer ranches and calf nurseries in the Santa Ana Region. These AFOs contain about 370,000 animals [213,000 lactating (milking) cows, 37,000 dry (pregnant) cows, 56,000 heifers (12-18 month old cows), and 60,000 calves (less than 12 month old cows)]. Two hundred and seventy nine of these facilities (320,000 animals) are located in the Chino Basin, while 23 of the facilities (50,000 animals) are located in the San Jacinto Basin. The wastes generated at these facilities include manure, wash water[1] and storm water runoff from manured areas. About 950,000 tons of manure (at 33% moisture) were produced in the corrals by these facilities in 1998. This is equivalent to about 4,000,000 cubic yards of manure (at 33% moisture). About 15 million gallons of washwater, which contains about 10% of the manure produced by milking cows, is discharged to the ground each day. Wastes produced at AFOs contain high levels of bacteria, biochemical oxygen demand, ammonia, nitrate, phosphorus, and other salts.

Wastes in rainfall runoff from AFOs in the Chino Basin affect Chino Creek, Mill Creek and Reach 3 of the Santa Ana River, which are 303(d) listed impacted water bodies. Wastes from AFOs that are discharged to the Santa Ana River also affect the quality of groundwater in Orange County, since the Orange County Water District captures and percolates a significant amount of the flow of the Santa Ana River to recharge the Santa Ana Forebay Groundwater Subbasin. The Chino Basin is considered to have the highest concentration of dairy animals in the world, with its 279 facilities and 320,000 animals located within an area of less than 50 square miles (30,000 acres). The application of manure to the ground in the Chino Basin has resulted in significant groundwater pollution, specifically total dissolved solids (TDS) and nitrate. Affected groundwater in the Chino Basin also impacts the quality of the Santa Ana River because the Santa Ana River becomes a gaining steam in the Prado Basin where groundwater from the Chino Basin contributes to the surface flow of the Santa Ana River.

Wastes in surface runoff from AFOs in the San Jacinto Basin affect the San Jacinto River, Canyon Lake and Lake Elsinore. Phosphorus from AFOs is considered to be the primary cause of algae blooms in Lake Elsinore, the largest natural freshwater lake in Southern California. These algae blooms deplete oxygen in the lake, creating fish kills and other conditions which affect the economic development and aesthetics of the area. Proper management of wastes from AFOs is essential to protect the surface and groundwater resources of the Region.

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[1] Water used to wash cows prior to milking, milking equipment and the milk barn.

Beginning in 1972, and continuing through 1994, the Board's regulatory approach was to issue individual waste discharge requirements to each AFO. Changes in the location, size, number of animals, or operator of these facilities were frequent and necessitated rescinding existing waste discharge requirements and issuing new requirements. The time demands to draft and rescind individual waste discharge requirements far exceeded the staff resources available to do so.

Criteria cited in 40 CFR 122.28 state that general permits may be issued for facilities 1) involving the same or substantially similar types of operations; 2) discharging the same types of wastes; 3) having the same or similar operating conditions; 4) requiring the same or similar monitoring; and 5) that are more appropriately regulated under a general permit rather than individual permits. The types of wastes and appropriate waste discharge requirements for dairies and related facilities are similar. Given this, the AFOs in the Region can be adequately and appropriately regulated by coverage under the terms of a general waste discharge permit.

On February 17, 1994, the Board adopted Order No. 94-7, General Waste Discharge Requirements For Concentrated Animal Feeding Operations, Including Dairies, Within The Santa Ana Region (NPDES NO. CAG018001). Order No. 94-7 has allowed the Board to better utilize staff resources. Currently, approximately 215 AFOs have been enrolled under Order No. 94-7. The remaining AFOs are either covered under individual waste discharge requirements issued prior to 1994, have submitted a Notice of Intent (NOI) to be covered under Order No. 94-7, or have not yet submitted a NOI. AFOs that have submitted a NOI and have not yet been granted coverage under Order No. 94-7 and AFOs that are still covered under individual waste discharge requirements, have not been granted coverage under Order No. 94-7 because they have not yet completed Engineered Waste Management Plans (EWMPs). Order No. 94-7 expired on March 1, 1999. Therefore, it is necessary to renew the waste discharge requirements contained in Order No. 94-7.

Although Order No. 94-7 regulated the discharge of waste from all AFOs (including non-dairy related facilities), the proposed order only addresses the discharge of wastes from dairies and related facilities, such as calf nurseries and heifer ranches. Over 95% of the dischargers enrolled, or waiting to be enrolled, under Order 94-7 are dairies and related facilities. Many of the requirements contained in Order No. 94-7, and this proposed order, are not appropriate for most other types of AFOs. Therefore, persons discharging, or proposing to discharge, wastes from other types of AFOs must obtain coverage under individual waste discharge requirements or another general permit, if one is adopted.

Currently, the larger AFOs are required to get coverage under the State Water Resources Control Board (State Board) General Industrial Storm Water Permit (Order No. 91-13-DWQ) for storm water runoff from their facilities. However, the proposed order consolidates all requirements for AFOs, including those for storm water runoff, into a single permit. Once coverage is granted under this order, other waste discharge requirements issued by this Regional Board and coverage under the State's General Permit will be terminated.

The Federal Clean Water Act (CWA) states that all concentrated animal feeding operations (CAFOs) are point sources and are subject to NPDES permitting requirements. The CWA defines a CAFO as any AFO that has more than 1,000 animal units (i.e., dairy cattle are considered 1.4 animal units). About 70% of the AFOs in the Region have over 1,000 animal units, and are, therefore, considered CAFOs under the CWA. However, the CWA states that smaller facilities can be designated as CAFOs by the permitting authority (i.e., Regional Board) after considering certain criteria. These criteria include, in part, the location of the AFO relative to surface waters, the slope, rainfall and other factors that increase the likelihood or frequency of discharges, and the impact of the aggregate amount of waste from many small operations in a watershed that exceed that of lager operations. Board staff has determined that all dairies, heifer ranches and calf nurseries in the Region meet one or more of these criteria, and, therefore, should be designated as CAFOs under the CWA. Tentative Order No. 99-11 designates all dairies, heifer ranches and calf nurseries in the Region as CAFOs, and makes them subject to NPDES requirements. Therefore, the acronym "CAFO" will be used to describe all facilities addressed by Tentative Order No. 99-11.

## II. Basis for Discharge Limitations

### Development and Implementation of Engineered Waste Management Plans

In compliance with the CWA and the California Code of Regulations, Tentative Order No. 99-11 prohibits discharges to any surface water bodies, or tributary thereof, unless rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 25-year, 24-hour rainfall event. (Title 27, Chapter 7, Subchapter 2, Article 1, Section 22562(a), California Code of Regulations and 40 CFR Part 412). Therefore, process waste water in overflows resulting from rainfall events that are chronic or catastrophic, or are in excess of a 24-hour, 25-year rainfall event, may be discharged to surface water bodies in accordance with requirements specified in this order. To insure that compliance with these requirements is achieved, all CAFOs are required to develop and implement an Engineered Waste Management Plan (EWMP). The guidelines for the preparation of an EWMP are included in Attachment "B" of the proposed order. Attachment "B" is intended to be revised by the Executive Officer in the near future. As with expired Order No. 94-7, Tentative Order No. 99-11 authorizes the Executive Officer to make necessary revisions to "Attachment B".

### Prohibition on the Application of Manure to Land in the Chino Basin

The Regional Board has conducted extensive studies on TDS and nitrate using computer models to determine acceptable salt loading rates to groundwater from various land uses, including dairies and other animal confinement facilities. These studies are the basis of the TDS and nitrogen management plan specified in the Water Quality Control Plan (Basin Plan) for the Region. In accordance with the TDS/nitrogen management plan, since 1972, waste discharge requirements adopted by the Board for CAFOs limited the amount of manure disposal on disposal acreage at

CAFOs to 3 (dry) tons (4.38 tons @ 33% moisture) per acre per year to address potential groundwater impacts. The resultant salt load is roughly equivalent to that permitted by the plan for other types of land use when the affected receiving waters have salt assimilative capacity. Dairy manure contains much more salt per unit of nitrogen than other types of fertilizers. The Board's 1990 Dairy Report, "Dairies and Their Relationship to Water Quality Impacts in the Chino Basin", showed that the use of manure as a fertilizer results in two to four times more salt reaching groundwater (up to 10 times more non-nitrate salts) than the use of non-manure commercial fertilizers. For this reason, the use of manure to meet the nutrient needs of crops results in excessive application of salts that are not utilized by plants and which can, therefore, migrate to groundwater. Order No. 94-7 limited manure application to cropland to agronomic rates [up to 12 (dry) tons (17.5 tons @ 33% moisture) per acre per year]. Limiting the amount of manure applied to cropland to agronomic rates was an attempt to minimize the amount of salt that would reach groundwater from the use of manure on cropland, without hindering the effective use of manure as a fertilizer.

Ninety percent of the CAFOs in the Region are located in the Chino Basin, which has severe TDS and nitrate groundwater quality problems. As noted in the Board's Basin Plan, the Chino II and III Groundwater Subbasins lack assimilative capacity for these constituents. For groundwater subbasins without assimilative capacity, additional salt inputs at rates above Basin Plan objectives cannot be allowed (State Water Resources Control Board Order No. 73-4, the Rancho Caballero decision). To meet the Chino Basin groundwater objectives, the discharge of manure and other animal wastes, such as dairy wash water, and their application as fertilizer, cannot be legally permitted unless this salt load is offset. The Basin Plan contains a dairy regulatory strategy that was developed in the Board's 1990 Dairy Report. One element of that strategy addresses waste discharge requirements for manure and wash water disposal and application of wastes to cropland. That element specifies that ongoing manure and wash water disposal or application to cropland in the Chino Basin must be prohibited unless suitable salt offset programs are implemented.

In 1994, the Board was informed that two desalters would be built in the Chino Basin. The Board was also informed that a significant amount of manure would be exported from the Chino Basin by the proposed Chino Basin Co-Composting Facility. It was assumed that after the Chino Basin Co-Composting Facility began operation and began exporting a significant amount of manure, the amount of salt to be extracted from the Chino Basin by the two desalters would be adequate to provide sufficient salt removal to offset the present and projected salt loads from ongoing dairy discharges. Therefore, the Board adopted Order No. 94-7, allowing manure and wash water discharges to continue, on the assumption that adequate salt offsets would be implemented. However, the desalters were never built (although one is now under construction) and the Co-Composting Facility, built in 1995, has never exported the significant amount of manure that had been projected. Therefore, sufficient offsets were not implemented, and manure and wash water discharges, and the use of manure on cropland, have been continuing without adequate salt offsets, in violation of State law.

Board staff estimates that over 13 million tons of manure have been applied in the Chino Basin since the mid-1950's, resulting in over 1.4 million tons of salt that have reached, or will reach,

groundwater. The application of about 400,000 tons of manure (@ 33% moisture) per year to disposal land, cropland and ongoing stockpiles in the Chino Basin is continuing. Board staff estimates that the current rate of application of manure and wash water to land in the Chino Basin is resulting in about 34,000 tons of salt that will reach groundwater each year. About 30,000 tons per year is from the application of manure, and about 4,200 tons per year is from the discharge of wash water. A desalter is currently being built in the Chino Basin. The extraction wells that will supply water for the desalter are expected to remove about 11,500 tons of salt per year from the Chino Basin. Kaiser Steel will be credited with an offset of 4,000 tons of this salt each year for a period of 25 years, in accordance with a previous settlement agreement with the Board. The Board has previously indicated that it would accept the remainder of the salt that will be removed from the extraction wells as an offset for continuing discharges from CAFOs in the Chino Basin. However, that amounts to an offset of only 7,500 tons of salt per year, compared to a current CAFO salt loading to groundwater of about 34,000 tons per year. In addition to the 4,200 tons of salt that reaches groundwater each year from wash water discharges, salt also is discharged to groundwater as a result of the percolation of rainfall runoff from corrals and drainage from manure stockpiles. The amount of salt that reaches groundwater each year from the percolation of rainfall runoff from corrals and percolation of drainage from manure stockpiles has not yet been adequately determined. However, staff believes that it may account for the remaining 3,800 tons of salt offset provided by the desalter, leaving no, or very little, salt offset available for continued manure application in the Chino Basin. No other mitigation measures are currently in place, and none are expected to be in place immediately, to offset the salt loading from ongoing manure application in the Chino Basin. Therefore, the discharge of manure and its application as fertilizer in the Chino II and Chino III Subbasins must be prohibited. The remainder of the subbasins in the Chino Basin are of excellent quality and are tributary to the Chino II and Chino III Subbasins. Also, the addition of salt to those subbasins by the application of manure was not considered when the assimilative capacity for those subbasins was determined. Therefore, Tentative Order No. 99-11 prohibits the discharge of manure and its application as fertilizer throughout the entire Chino Basin (The accompanying cease and desist order allows manure to continue to be applied to cultivated croplands within the Chino Basin at agronomic rates as long as significant progress is being made towards the construction and operation of a second desalter within the Chino Basin). Tentative Order No. 99-11 does not prohibit the on-site discharge of wash water, rainfall runoff from corrals, or drainage from manure stockpiles, since the salt loadings from these discharges appear to be offset by the salt that will be removed by the desalter facility.

Removal of Manure from the Facility

Tentative Order No. 99-11 requires that manure be hauled from each facility within 180 days after being removed from the corrals. Any manure remaining at the facility after 180 days of being removed from the corrals is considered to be disposal of manure and is prohibited by Tentative Order No. 99-11. Draft Order No. 99-11, which was distributed for comments in March and April 1999, proposed requiring the removal of manure from the facility within 90 days after removal of the manure from the corrals. Several comments were received in writing and orally at Board Workshops, stating reasons why this time frame was unreasonable. Board staff also solicited

comments from farm advisors with the University of California Cooperative Extension. It was determined that it is beneficial to "cure" manure for 90 to 180 days prior to composting or for application to cropland, and that the nutrient value of the manure is not significantly affected when manure is stored for less than 180 days. During the winter, 90 days would not allow sufficient time for the manure to dry adequately prior to hauling. Providing 180 days of storage will allow the moisture content of the manure to be sufficiently reduced, making it lighter per unit of volume, and easier and less expensive to haul. Some commercial fertilizer facilities in the Chino Basin prefer receiving manure that has been aged for at least 150 days. Also, CAFOs generally remove manure from their corrals twice a year. Allowing up to 180 days (6 months) storage will result in manure being removed from the facility prior to the next corral cleaning, and will still achieve the goal of preventing the long term accumulation of manure at CAFOs. Board staff believes that allowing for 180 days storage is reasonable, and that there would be no significant difference in water quality impacts from storing manure at the facility for 180 days instead of 90 days.

Change in Language Pertaining to Containment of Storm Water Runoff

Order No. 94-7 and Draft Order No. 99-11 included the following Discharge Specification: "The discharge to any surface water bodies, or tributary thereof, is prohibited unless a chronic, catastrophic or cumulative rainfall causes overflow from a storage facility designed, constructed, maintained and operated to contain all process generated wastewater plus the runoff from a 24-hour, 25-year storm." These Orders defined a chronic, catastrophic or cumulative rainfall as rainfall occurring over a 7-day period or less which is equivalent to that from a 24-hour, 25-year storm event. This language is slightly different than similar language included in the CWA that does not refer to "cumulative" rainfall, and does not contain a definition that refers to rainfall "occurring over a 7-day period." The specification included in Order No. 94-7 and Draft Order No. 99-11 is, overall, more stringent than the language in the CWA, and was developed to provide a more objective basis for determining compliance with the rainfall containment requirement and to be consistent with the Board's EWMP Guidelines. However, the USEPA, and others, have noted that there could be instances during certain storm events of less than 7 days when the specification included in Order No. 94-7 and Draft Order No. 99-11 can be less restrictive than the language included in the CWA. They have requested that the language proposed in Draft Order No. 99-11 be changed to be consistent with the language in the CWA, since NPDES permits cannot contain requirements that can be less restrictive than the CWA. Therefore, the term "cumulative" and the reference to rainfall "occurring over a 7-day period" has been removed from Tentative Order No. 99-11 to make the rainfall containment requirement consistent with the CWA.

Consistency with USDA/USEPA "Unified National Strategy for Animal Feeding Operations"

In March 1999, the United States Department of Agriculture (USDA) and the USEPA finalized their unified national strategy for AFOs. Among other items, the national strategy recommended that general permits require the development and implementation of Comprehensive Nutrient Management Plans (CNMPs). In general, development and implementation of CNMPs is intended to bring each CAFO into compliance with the requirements of the CWA and to minimize the

impacts to groundwater and surface water by the implementation of best management practices. The national strategy describes many best management practices that could be included in CNMPs for individual CAFOs. The best management practices included in each CNMP for each CAFO would include specific best management practices for that CAFO, depending on the specific situations that exist at that particular CAFO. In general, the CNMP would assure that appropriate wastewater facilities were developed, constructed and maintained to comply with the requirements of the CWA, and that the use and application of waste water and manure (i.e., nutrient management) was managed to minimize impacts to groundwater and surface water. Tentative Order No. 99-11 does not require the development and implementation of CNMPs, as described and recommended in the national strategy. This is because the requirements included in Tentative Order No. 99-11 are equivalent to, or more stringent than, what would be required in CNMPs. Also, many of the BMPs recommended to be included in CNMPs are not relevant to the specific, isolated conditions that exist in the Chino Basin. The requirements in Tentative Order No. 99-11 for wastewater and rainfall are equivalent to what the national strategy requires. General BMPs that can be implemented to comply with the wastewater and rainfall containment requirements will be further addressed in the Board's EWMP Guidelines when they are revised in the near future. Specific BMPs that will be implemented at each CAFO to comply with the wastewater and rainfall containment requirements will be addressed in each CAFO's specific EWMP. The prohibition on the application of manure in the Chino Basin is obviously a more stringent requirement than the BMPs for manure application and management that the national strategy recommends to be included in CNMPs, since application of manure is not permitted. The limitation on the application of manure to agronomic rates, not to exceed 12 (dry) tons (17.5 tons @ 33% moisture) per acre per year, in groundwater basins outside the Chino Basin where assimilative capacity exists and application of manure is permitted, is equivalent to the nutrient management guidelines included in the national strategy. Specific BMPs addressing application of manure will be included in each CAFOs specific EWMP.

Prohibition on Covering New Discharges in the Chino Basin Under this Order

The 1998 California 303(d) List and TMDL Priority Schedule includes several surface water bodies as impaired due to CAFOs, including Chino Creek, Mill Creek (Prado Area), and Reach 3 of the Santa Ana River for nutrients, pathogens, salinity/TDS/chlorides, and suspended solids. The CWA states that NPDES permits cannot be issued to a new source (discharger) if the discharge will cause or contribute to the violation of water quality standards, unless certain specified criteria are met, including the development of TMDLs. In the absence of a current TMDL, USEPA has recommended that this general permit be limited to current facilities, and that any new sources (i.e., construction of any new facilities) be processed through an application for an individual NPDES permit. Therefore, Tentative Order No. 99-11 prohibits new sources (i.e., new facilities) from being covered under this general permit. Since the most recent new construction of a CAFO facility in the Chino Basin was approximately 20 years ago, this prohibition is not expected to be a significant issue.

Inability of Many CAFOs to Immediately Comply with Several Requirements Included in this Order

Many CAFOs will not be able to immediately comply with several of the requirements contained in Tentative Order No. 99-11. These requirements include the prohibition on the application of manure in the Chino Basin, implementation of EWMPs and containment of rainfall from a 24-hour, 25-year storm. The Board will consider adoption of a Cease and Desist Order No. 99-65 with a time schedule for compliance with these requirements.

## III. Coverage Under the General NPDES Permit

### A. Dischargers Currently Regulated Under Order No. 94-7 or Under Individual Waste Discharge Requirements, and Dischargers that have Submitted NOIs

These dischargers will be automatically enrolled under the proposed order, once it is adopted. Dischargers who have not yet submitted an acceptable EWMP (see Attachment "B" of the order) are required to do so.

### B. Dischargers Not Currently Regulated Under Order No. 94-7 or Under Individual Waste Discharge Requirements, and Dischargers that have not Submitted NOIs:

At least 60 days prior to initiating a discharge at an existing facility, the discharger shall submit a Notice of Intent (NOI) (see Attachment "A") with the appropriate filing fee (currently, the filing fee is $2,000.00 for each facility) and an acceptable EWMP[2].

## IV. Discharge Authorization Letter

Upon adoption of this order, the Executive Officer shall issue discharge authorization letters to dischargers currently enrolled under Order No. 94-7, discharging waste under individual waste discharge requirements or who have submitted an NOI to be covered under a general permit.

Upon receipt of a complete application for initiation of a discharge at an existing facility, the Executive Officer will review the application to determine eligibility for discharge under this order. If the Executive Officer determines that the discharger is eligible to discharge wastes under this general order, the Executive Officer may authorize the proposed discharge. Otherwise, the Executive Officer may require the discharger to obtain individual waste discharge requirements.

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[2] New operators/owners of existing facilities for which an EWMP has been approved are not required to submit an additional EWMP.

## V. Antidegradation Analysis

The Regional Board conducted extensive TDS and nitrate studies using computer models to determine acceptable salt loading rates to groundwater from various land uses, including dairies and other concentrated animal feeding operations. These studies indicate that if the requirements specified in the proposed general permit are met, water quality of the Region is not expected to degrade as a result of discharges authorized under this general permit. The Regional Board, in establishing the requirements in the tentative order, has taken into consideration the requirements of the State and Federal "antidegradation policies" and has determined that the discharges are in conformance with the antidegradation policies.

## VI. Written Comments

All written comments regarding the proposed general order should be submitted to: Robert Holub, Regional Water Quality Control Board, 3737 Main Street, Suite 500, Riverside, CA 92501.

## VII. Information and Copying

Persons wishing further information may write to the address given below (see IX, below) or call the Regional Board at (909) 782-4130. Copies of the proposed waste discharge requirements, and other documents (other than those which the Executive Officer maintains as confidential) are available at the Regional Board office for inspection and copying by appointment scheduled between the hours of 10:00 a.m. and 4:00 p.m., Monday through Thursday (excluding holidays).

## VIII. Register of Interested Persons

Any person interested in a general permit, or in a particular application or group of applications, may leave his name, address, and phone number as part of the file for an application. Copies of tentative waste discharge requirements will be mailed to all interested parties.

## IX. Workshops and Public Hearing

The Regional Board conducted public workshops on April 9, 1999, May 21, 1999, and June 25, 1999, to solicit comments on the draft general waste discharge requirements that were distributed in March and April 1999. Oral comments were received during these workshops, and written comments were submitted by several parties. These comments were considered by staff and incorporated into Tentative Order No. 99-11, as appropriate.

The Regional Board will hold a public hearing and consider adopting Tentative Order No. 99-11 during a public meeting on August 20, 1999, beginning at 9:00 a.m. The meeting will be held at the City Council Chambers of Loma Linda, 25541 Barton Road, Loma Linda.

Further information regarding the conduct and nature of workshops and pubic hearings concerning waste discharge requirements may be obtained by writing or visiting the Santa Ana Regional Board office, 3737 Main Street, Suite 500, Riverside, 92501 or by calling Robert Holub of Regional Board Staff at (909) 782-3298.

California Regional Water Quality Control Board
Santa Ana Region

August 20, 1999

ITEM:

SUBJECT: General Waste Discharge Requirements For Concentrated Animal Feeding Operations (Dairies And Related Facilities) Within The Santa Ana Region, Order No. 99-11, NPDES No. CAG018001

DISCUSSION:

See attached Fact Sheet

RECOMMENDATION:

Adopt Order No. 99-11, as presented.

Comments were solicited from the following agencies and/or persons:

U.S. EPA, Washington, Office of Wastewater Enforcement and Compliance - Michael B. Cook
U.S. EPA, San Francisco – Alexis Straus
U.S. EPA, Permit Issuance Section - Terry Oda (W-5-1)
U.S. EPA, San Francisco – Dan Meer
State Water Resources Control Board, Office of the Chief Counsel - Ted Cobb
State Water Resources Control Board, DWQ – Jim Kessel, Jack Hodges, Cheryl Closson
State Department of Water Resources - Glendale
State Department of Health Services - San Bernardino/Santa Ana/San Diego
State Department of Fish and Game - Fred Worthley
Regional Water Quality Control Board (1) - Lee Michlin
Regional Water Quality Control Board (2) - Loretta Barsamian
Regional Water Quality Control Board (3) - Roger Briggs
Regional Water Quality Control Board (4) - Dennis Dickerson
Regional Water Quality Control Board (5) - Gary Carlton
Regional Water Quality Control Board (6) - Harold J. Singer
Regional Water Quality Control Board (7) - Philip Gruenberg
Regional Water Quality Control Board (9) - John Robertus
San Bernardino County Board of Supervisors
San Bernardino County Department of Environmental Health Services - Pam Bennett
San Bernardino County Transportation/Flood Control District - Naresh Varma
San Bernardino County LEA
Riverside County Board of Supervisors
Riverside County Department of Environmental Health Services

Riverside County Flood Control and Water Conservation District - Jason Christie
Riverside County LEA
City of Chino
City of Ontario
Milk Producers Council - Robert Feenstra
California Milk Producers Association – John Godino
Santa Ana Watershed Project Authority - Joseph Grindstaff
Inland Empire Utilities Agency – Doug Drury
Orange County Water District - Bill Mills, Nira Yamachika
U.C. Extension, San Bernardino - Abraham Wubishet
Inland Empire West Resource Conservation District - Jeff Wilson
National Resource Conservation Service - Jim Earsom
City of Lake Elsinore – Dick Watenpaugh, Pat Kilroy
Eastern Valley Municipal Water District
Western United Dairymen - Gary Conover, John Borges
Chino Basin Watermaster - Tracy Stewart
Daily Bulletin - Bob Page
Orange County Register
Press Enterprise - Leslie Bergman
Northwest Mosquito and Vector Control District
Santa Ana River Watershed Group - Lindel Marsh
Orange County Sanitation District - Blake Anderson
Water Advisory Committee of Orange County – H. E. Hartge
Los Alisos Water District – Kenneth Petersen
Municipal Water District of Orange County – Stanley E. Sprague
El Toro Water District – Ronald Kennedy
Mesa Consolidated Water District – Fred Bockmiller
Irvine Ranch Water District – Paul D. Jones II
Metropolitan Water District – Bob Huntley
Yorba Linda Water District – Arthur C. Korn
City of Anaheim, Public Utilities Department – Edward K. Aghjayan
Dairy Mailing List

Search Locations

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Popular Cities

San Francisco, CA
56 °F Mostly Cloudy(/weather/us/ca/san-francisco/37.78,-122.42)

Manhattan, NY
65 °F Light Rain (/weather/us/ny/manhattan/40.

34.05 °N, 117.61 °W

# Ontario, CA Weather History

65° ONTARIO INTERNATIONAL AIRPORT STATION (/DASHBOARD/PWS/KCAONTAR23?CM_VEN=LOCALWX_PWSDASH) | CHANGE

HISTORY (/HISTORY/DAILY/US/CA/ONTARIO/KONT)

- TODAY (/WEATHER/US/CA/ONTARIO/KONT)
- HOURLY (/HOURLY/US/CA/ONTARIO/KONT)
- 10-DAY (/FORECAST/US/CA/ONTARIO/KONT)
- CALENDAR (/CALENDAR/US/CA/ONTARIO/KONT)
- HISTORY (/HISTORY/DAILY/US/CA/ONTARIO/KONT)
- WUNDERMAP (/WUNDERMAP?LAT=34.049&LON=-117.607)

Daily (/history/daily/us/ca/ontario/KONT/date/2010-12-21) Weekly (/history/weekly/us/ca/ontario/KONT/date/2010-12-21) Monthly (/history/monthly/us/ca/ontario/KONT/date/2010-12)

December 21 2010 View

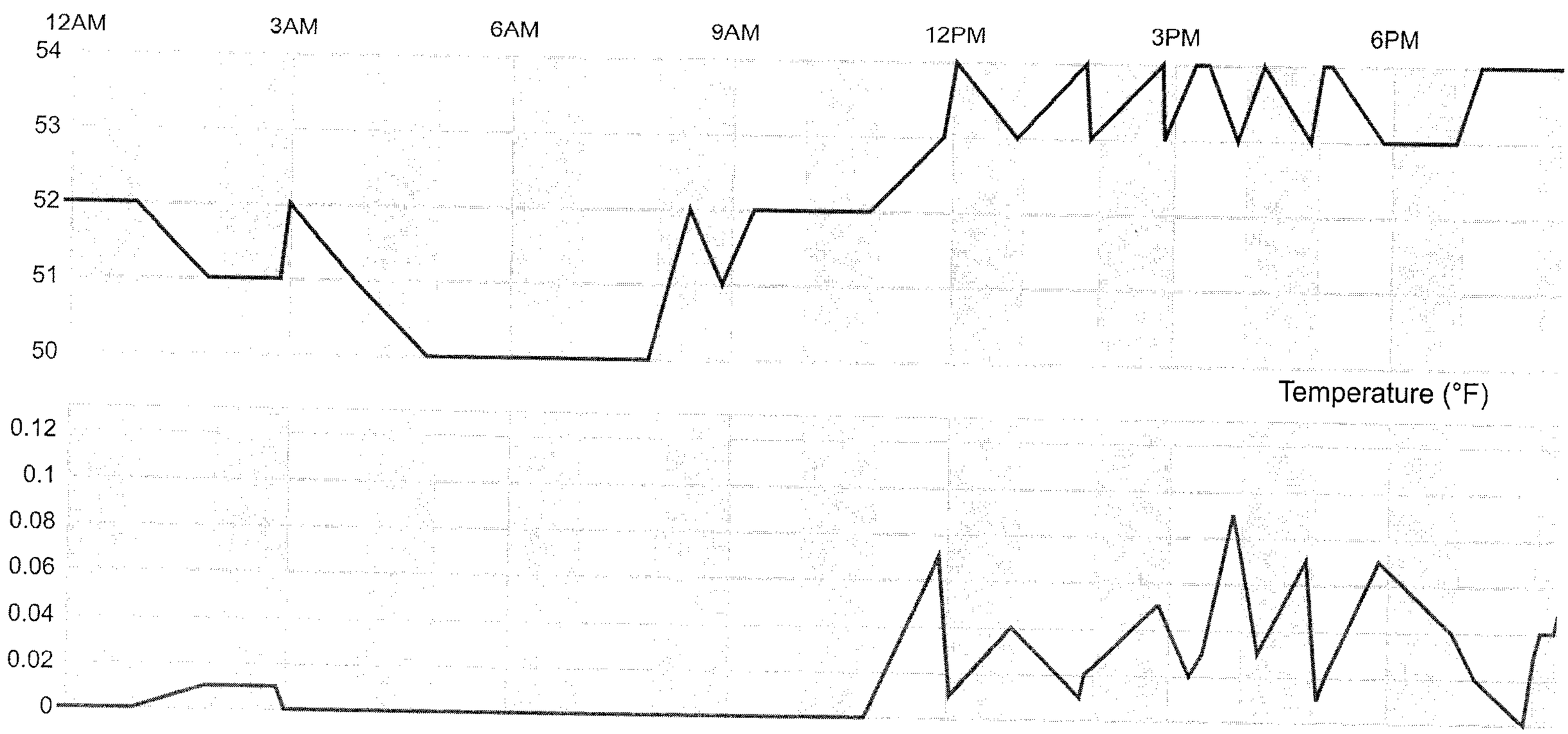

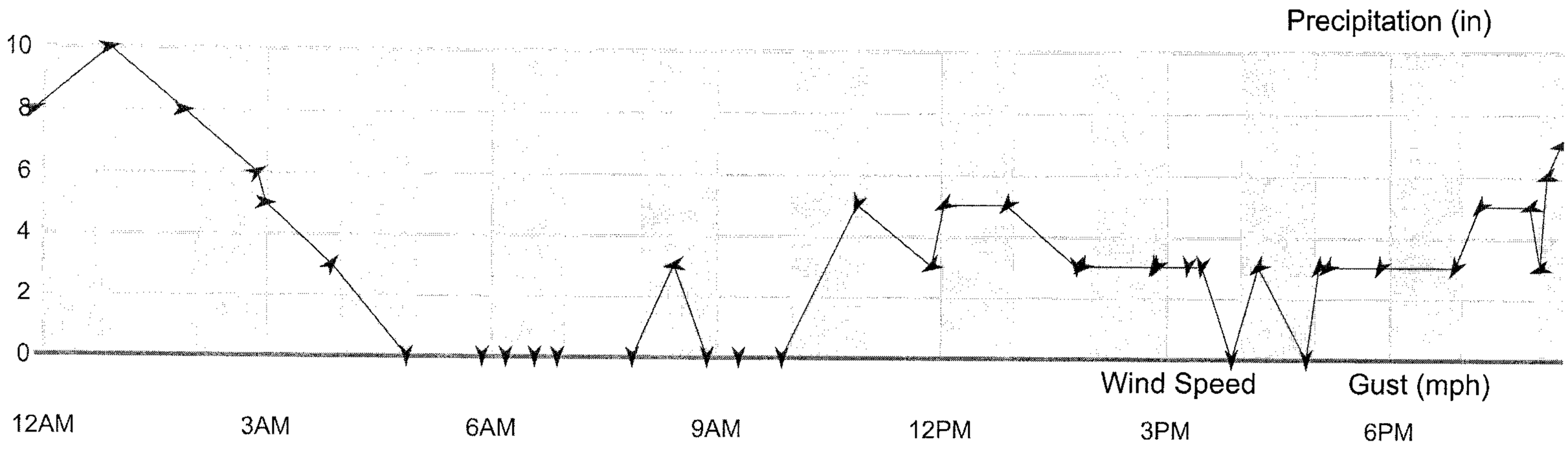


# Summary

| **Temperature (°F)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| High Temp | 54 | 68 | 81 |
| Low Temp | 50 | 44 | 28 |
| Day Average Temp | 52.68 | 56 | - |

| **Precipitation (in)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Precipitation (past 24 hours from 08:53:00) | 0.00 | 0.06 | - |

| **Dew Point (°F)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Dew Point | 51.07 | - | - |
| High | 54 | - | - |
| Low | 48 | - | - |
| Average | 51.07 | - | - |

| **Wind (mph)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Max Wind Speed | 10 | - | - |
| Visibility | 9 | - | - |

| **Sea Level Pressure (in)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Sea Level Pressure | 28.93 | - | - |

| **Astronomy** | Day Length | Rise | Set |
|---|---|---|---|

| Temperature (°F) | Actual | Historic Avg. | Record |
|---|---|---|---|
| Actual Time | 9h 52m | 6:53 AM | 4:46 PM |
| Civil Twilight | | 6:25 AM | 5:14 PM |
| Nautical Twilight | | 5:54 AM | 5:45 PM |
| Astronomical Twilight | | 5:23 AM | 6:15 PM |
| Moon: waning gibbous | | 5:24 PM | 7:12 AM |

# Daily Observations

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Prec |
|---|---|---|---|---|---|---|---|---|
| 11:53 PM | 52 °F | 52 °F | 100 % | WSW | 8 mph | 0 mph | 28.85 in | 0.0 i |
| 12:53 AM | 52 °F | 51 °F | 97 % | W | 10 mph | 0 mph | 28.84 in | 0.0 i |
| 1:53 AM | 51 °F | 50 °F | 96 % | W | 8 mph | 0 mph | 28.84 in | 0.0 i |
| 2:53 AM | 51 °F | 50 °F | 96 % | WSW | 6 mph | 0 mph | 28.86 in | 0.0 i |
| 3:00 AM | 52 °F | 50 °F | 94 % | W | 5 mph | 0 mph | 28.87 in | 0.0 i |
| 3:53 AM | 51 °F | 50 °F | 96 % | SW | 3 mph | 0 mph | 28.85 in | 0.0 i |
| 4:53 AM | 50 °F | 49 °F | 96 % | CALM | 0 mph | 0 mph | 28.86 in | 0.0 i |
| 5:53 AM | 50 °F | 49 °F | 96 % | CALM | 0 mph | 0 mph | 28.87 in | 0.0 i |
| 6:12 AM | 50 °F | 48 °F | 94 % | CALM | 0 mph | 0 mph | 28.88 in | 0.0 i |
| 6:35 AM | 50 °F | 48 °F | 94 % | CALM | 0 mph | 0 mph | 28.88 in | 0.0 i |
| 6:53 AM | 50 °F | 49 °F | 96 % | CALM | 0 mph | 0 mph | 28.89 in | 0.0 i |
| 7:53 AM | 50 °F | 49 °F | 96 % | CALM | 0 mph | 0 mph | 28.90 in | 0.0 i |
| 8:26 AM | 52 °F | 50 °F | 94 % | E | 3 mph | 0 mph | 28.91 in | 0.0 i |
| 8:53 AM | 51 °F | 50 °F | 96 % | CALM | 0 mph | 0 mph | 28.92 in | 0.0 i |
| 9:18 AM | 52 °F | 50 °F | 94 % | CALM | 0 mph | 0 mph | 28.92 in | 0.0 i |
| 9:53 AM | 52 °F | 50 °F | 93 % | CALM | 0 mph | 0 mph | 28.93 in | 0.0 i |
| 10:53 AM | 52 °F | 50 °F | 93 % | NNE | 5 mph | 0 mph | 28.93 in | 0.0 i |
| 11:53 AM | 53 °F | 50 °F | 89 % | ENE | 3 mph | 0 mph | 28.91 in | 0.1 i |
| 12:03 PM | 54 °F | 50 °F | 88 % | ENE | 5 mph | 0 mph | 28.90 in | 0.0 i |
| 12:53 PM | 53 °F | 50 °F | 89 % | NE | 5 mph | 0 mph | 28.89 in | 0.0 i |
| 1:49 PM | 54 °F | 52 °F | 94 % | VAR | 3 mph | 0 mph | 28.88 in | 0.0 i |

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Prec |
|---|---|---|---|---|---|---|---|---|
| 1:53 PM | 53 °F | 51 °F | 93 % | NE | 3 mph | 0 mph | 28.89 in | 0.0 i |
| 2:51 PM | 54 °F | 52 °F | 94 % | NNE | 3 mph | 0 mph | 28.88 in | 0.1 i |
| 2:53 PM | 53 °F | 52 °F | 96 % | NNE | 3 mph | 0 mph | 28.87 in | 0.1 i |
| 3:18 PM | 54 °F | 52 °F | 94 % | N | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 3:29 PM | 54 °F | 52 °F | 94 % | N | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 3:53 PM | 53 °F | 52 °F | 96 % | CALM | 0 mph | 0 mph | 28.89 in | 0.1 i |
| 4:14 PM | 54 °F | 52 °F | 94 % | NE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 4:53 PM | 53 °F | 52 °F | 96 % | CALM | 0 mph | 0 mph | 28.88 in | 0.1 i |
| 5:03 PM | 54 °F | 52 °F | 94 % | NE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 5:10 PM | 54 °F | 52 °F | 94 % | NE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 5:53 PM | 53 °F | 52 °F | 96 % | NNE | 3 mph | 0 mph | 28.88 in | 0.1 i |
| 6:53 PM | 53 °F | 52 °F | 96 % | NNE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 7:13 PM | 54 °F | 52 °F | 94 % | NE | 5 mph | 0 mph | 28.88 in | 0.0 i |
| 7:53 PM | 54 °F | 52 °F | 94 % | ENE | 5 mph | 0 mph | 28.88 in | 0.0 i |
| 8:01 PM | 54 °F | 52 °F | 94 % | ENE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 8:06 PM | 54 °F | 52 °F | 94 % | ENE | 6 mph | 0 mph | 28.88 in | 0.0 i |
| 8:17 PM | 54 °F | 52 °F | 94 % | E | 7 mph | 0 mph | 28.88 in | 0.0 i |
| 8:30 PM | 54 °F | 52 °F | 94 % | ENE | 7 mph | 0 mph | 28.88 in | 0.1 i |
| 8:42 PM | 54 °F | 54 °F | 100 % | ENE | 5 mph | 0 mph | 28.88 in | 0.1 i |
| 8:49 PM | 54 °F | 52 °F | 94 % | ENE | 7 mph | 0 mph | 28.88 in | 0.1 i |
| 8:53 PM | 53 °F | 53 °F | 100 % | ENE | 5 mph | 0 mph | 28.88 in | 0.1 i |
| 9:53 PM | 53 °F | 52 °F | 96 % | E | 8 mph | 0 mph | 28.85 in | 0.0 i |
| 10:53 PM | 54 °F | 52 °F | 93 % | NE | 5 mph | 0 mph | 28.82 in | 0.0 i |
| 11:34 PM | 54 °F | 54 °F | 100 % | ENE | 3 mph | 0 mph | 28.82 in | 0.1 i |

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34.05 °N, 117.61 °W

# Ontario, CA Weather History

65° ONTARIO INTERNATIONAL AIRPORT STATION (/DASHBOARD/PWS/KCAONTAR23?CM_VEN=LOCALWX_PWSDASH) | CHANGE

HISTORY (/HISTORY/DAILY/US/CA/ONTARIO/KONT)

- TODAY (/WEATHER/US/CA/ONTARIO/KONT)
- HOURLY (/HOURLY/US/CA/ONTARIO/KONT)
- 10-DAY (/FORECAST/US/CA/ONTARIO/KONT)
- CALENDAR (/CALENDAR/US/CA/ONTARIO/KONT)
- HISTORY (/HISTORY/DAILY/US/CA/ONTARIO/KONT)
- WUNDERMAP (/WUNDERMAP?LAT=34.049&LON=-117.607)

Daily Weekly Monthly

(/history/daily/us/ca/ontario/KONT/date/2010-12-22) (/history/weekly/us/ca/ontario/KONT/date/2010-12-22) (/history/monthly/us/ca/ontario/KONT/date/2010-12)

December 22 2010 View

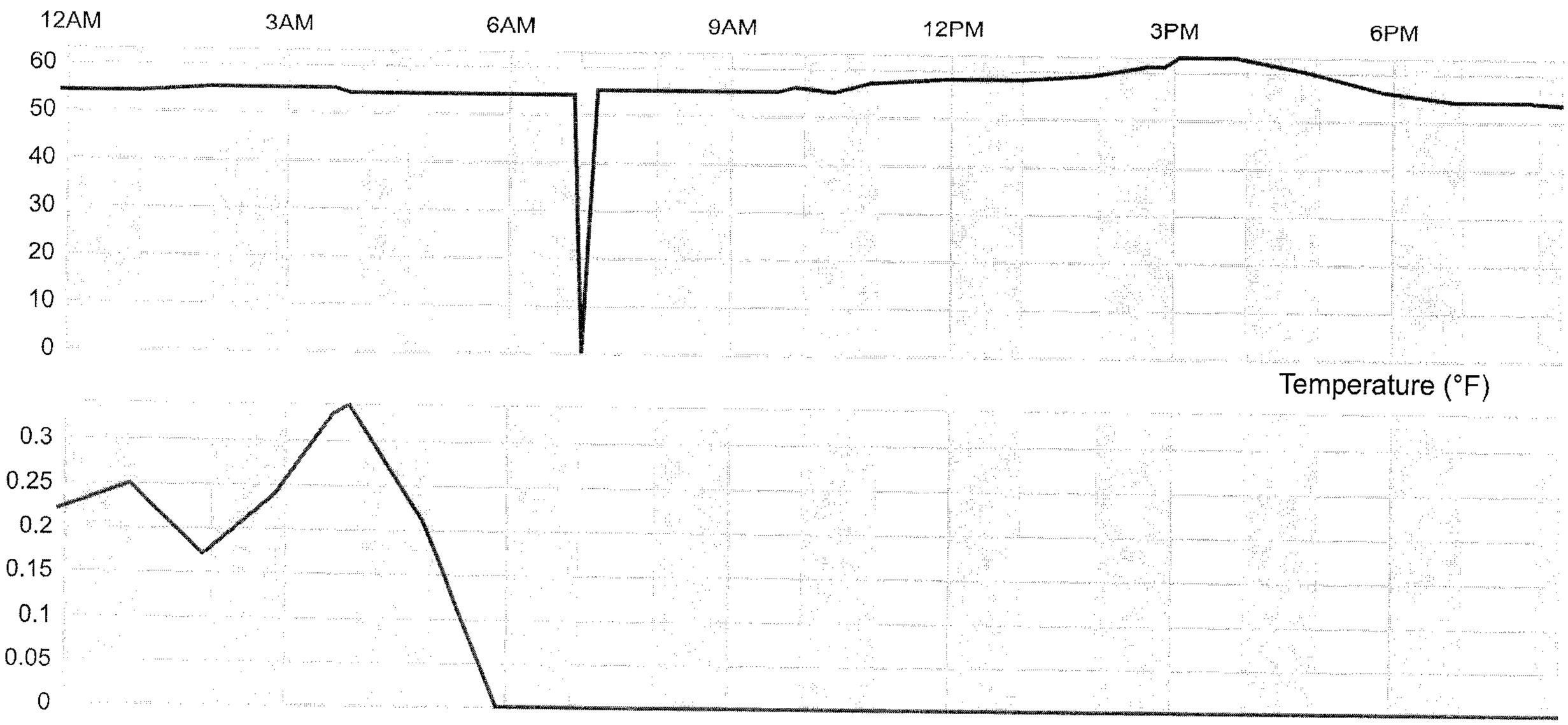

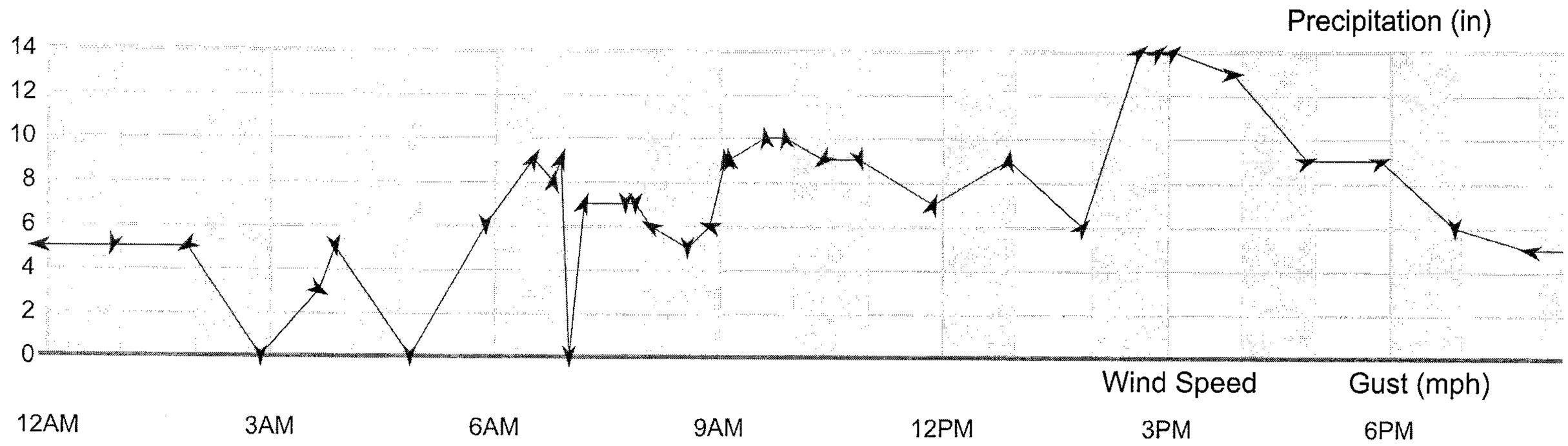


# Summary

| **Temperature (°F)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| High Temp | 63 | 68 | 81 |
| Low Temp | 0 | 44 | 30 |
| Day Average Temp | 54.43 | 56 | - |

| **Precipitation (in)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Precipitation (past 24 hours from 08:53:00) | 0.00 | 0.06 | - |

| **Dew Point (°F)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Dew Point | 51.73 | - | - |
| High | 55 | - | - |
| Low | 0 | - | - |
| Average | 51.73 | - | - |

| **Wind (mph)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Max Wind Speed | 14 | - | - |
| Visibility | 10 | - | - |

| **Sea Level Pressure (in)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Sea Level Pressure | 28.98 | - | - |

| **Astronomy** | Day Length | Rise | Set |
|---|---|---|---|

| Temperature (°F) | Actual | Historic Avg. | Record |
|---|---|---|---|
| Actual Time | 9h 52m | 6:53 AM | 4:46 PM |
| Civil Twilight | | 6:26 AM | 5:14 PM |
| Nautical Twilight | | 5:54 AM | 5:45 PM |
| Astronomical Twilight | | 5:24 AM | 6:16 PM |
| Moon: waning gibbous | | 6:31 PM | 8:01 AM |

# Daily Observations

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Prec |
|---|---|---|---|---|---|---|---|---|
| 11:53 PM | 54 °F | 53 °F | 97 % | E | 5 mph | 0 mph | 28.82 in | 0.2 i |
| 12:53 AM | 54 °F | 54 °F | 100 % | NNE | 5 mph | 0 mph | 28.79 in | 0.3 i |
| 1:53 AM | 55 °F | 54 °F | 96 % | ENE | 5 mph | 0 mph | 28.78 in | 0.2 i |
| 2:53 AM | 55 °F | 54 °F | 96 % | CALM | 0 mph | 0 mph | 28.77 in | 0.2 i |
| 3:40 AM | 55 °F | 54 °F | 94 % | WNW | 3 mph | 0 mph | 28.75 in | 0.3 i |
| 3:53 AM | 54 °F | 53 °F | 97 % | N | 5 mph | 0 mph | 28.74 in | 0.3 i |
| 4:53 AM | 54 °F | 53 °F | 97 % | CALM | 0 mph | 0 mph | 28.75 in | 0.2 i |
| 5:53 AM | 54 °F | 54 °F | 100 % | VAR | 6 mph | 0 mph | 28.74 in | 0.0 i |
| 6:31 AM | 54 °F | 54 °F | 100 % | SSW | 9 mph | 0 mph | 28.77 in | 0.0 i |
| 6:47 AM | 54 °F | 54 °F | 100 % | S | 8 mph | 0 mph | 28.76 in | 0.0 i |
| 6:53 AM | 54 °F | 54 °F | 99 % | SSW | 9 mph | 0 mph | 28.75 in | 0.0 i |
| 7:00 AM | 0 °F | 0 °F | 0 % | | 0 mph | 0 mph | 28.75 in | 0.0 i |
| 7:12 AM | 55 °F | 54 °F | 94 % | SSW | 7 mph | 0 mph | 28.76 in | 0.0 i |
| 7:45 AM | 55 °F | 54 °F | 94 % | VAR | 7 mph | 0 mph | 28.77 in | 0.0 i |
| 7:53 AM | 55 °F | 54 °F | 99 % | VAR | 7 mph | 0 mph | 28.77 in | 0.0 i |
| 8:05 AM | 55 °F | 55 °F | 100 % | ESE | 6 mph | 0 mph | 28.78 in | 0.0 i |
| 8:35 AM | 55 °F | 55 °F | 100 % | VAR | 5 mph | 0 mph | 28.78 in | 0.0 i |
| 8:53 AM | 55 °F | 55 °F | 99 % | ESE | 6 mph | 0 mph | 28.78 in | 0.0 i |
| 9:05 AM | 55 °F | 55 °F | 100 % | S | 9 mph | 0 mph | 28.79 in | 0.0 i |
| 9:08 AM | 55 °F | 55 °F | 100 % | S | 9 mph | 0 mph | 28.79 in | 0.0 i |
| 9:37 AM | 55 °F | 55 °F | 100 % | S | 10 mph | 0 mph | 28.81 in | 0.0 i |

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Prec |
|---|---|---|---|---|---|---|---|---|
| 9:53 AM | 56 °F | 55 °F | 97 % | S | 10 mph | 0 mph | 28.81 in | 0.0 i |
| 10:24 AM | 55 °F | 55 °F | 100 % | NE | 9 mph | 0 mph | 28.80 in | 0.0 i |
| 10:53 AM | 57 °F | 55 °F | 95 % | NNW | 9 mph | 0 mph | 28.78 in | 0.0 i |
| 11:53 AM | 58 °F | 54 °F | 89 % | SSW | 7 mph | 0 mph | 28.78 in | 0.0 i |
| 12:53 PM | 58 °F | 53 °F | 83 % | S | 9 mph | 0 mph | 28.76 in | 0.0 i |
| 1:53 PM | 59 °F | 52 °F | 79 % | SW | 6 mph | 0 mph | 28.75 in | 0.0 i |
| 2:38 PM | 61 °F | 52 °F | 72 % | SW | 14 mph | 0 mph | 28.76 in | 0.0 i |
| 2:53 PM | 61 °F | 51 °F | 71 % | SW | 14 mph | 0 mph | 28.76 in | 0.0 i |
| 3:05 PM | 63 °F | 52 °F | 68 % | SW | 14 mph | 0 mph | 28.79 in | 0.0 i |
| 3:53 PM | 63 °F | 51 °F | 64 % | W | 13 mph | 0 mph | 28.81 in | 0.0 i |
| 4:53 PM | 60 °F | 54 °F | 80 % | WSW | 9 mph | 0 mph | 28.85 in | 0.0 i |
| 5:53 PM | 56 °F | 48 °F | 74 % | WSW | 9 mph | 0 mph | 28.87 in | 0.0 i |
| 6:53 PM | 54 °F | 49 °F | 81 % | VAR | 6 mph | 0 mph | 28.89 in | 0.0 i |
| 7:53 PM | 54 °F | 49 °F | 82 % | E | 5 mph | 0 mph | 28.93 in | 0.0 i |
| 8:53 PM | 53 °F | 48 °F | 82 % | E | 5 mph | 0 mph | 28.94 in | 0.0 i |
| 9:53 PM | 54 °F | 53 °F | 94 % | CALM | 0 mph | 0 mph | 28.96 in | 0.0 i |
| 10:53 PM | 54 °F | 53 °F | 95 % | CALM | 0 mph | 0 mph | 28.98 in | 0.0 i |


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(https://searchtopics.net/index.php?rgid=246489&gclid=GiBeOmrTPuRMmIDEdQT3O4cP_fAViJZvj8B9ecboZ6t3qyCIrVQo5KvY_-aC1d9A)

# RECYCLED WOOD PRODUCTS -IV GREEN WASTE COMPOSTING NONA REPORT

## 1.0 INTRODUCTION

The Recycled Wood Products IV (RWP) is a green waste (Tier I) composting facility in the city of Ontario, operated by Mr. Chris Kiralla. This property is leased from Golden Ontario Holdings by Mr. Bob Feenstra. The property is located at 7325 Edison Avenue in Ontario. The total size of the property is 36.5 acres, A total of 10.5 acres of the site is used for the active green waste composting operation. Two other small side businesses consisting of fruit waste recycling, and wood chips & manure bagging are also in operating at this site. The APN numbers for the entire site is 1053-391-01. Prior to the composting operation, the facility was a dairy site. The corrals, and the pond were cleaned of any manure residue prior to start of the composting operation.

**Facility Data**

The following data has been obtained from the client by Sierra's Engineering staff.

| | |
|---|---|
| Property Owner: | Mr. Gary Dou, Golden Ontario Holdings |
| Address | 14240 Sapphire Hill Lane<br>Chino Hills, CA 91709 |
| Contact No. | (562)921-9974 |
| Property Lease Holder: | Mr. Bob Feenstra<br>Residual Recovery Group<br>P.O. Box 17482<br>Anaheim Hills, CA 92817 |
| Contact No: | (909)597-3222 |
| Email Address: | bobfeenstra@gmail.com |
| Facility Operator: | Mr. Chris Kiralla<br>RWP Ontario IV<br>1313 E. Philips Rd.<br>Pomona, CA 91766 |
| Email Address | chris@rwpmulch.com |
| Contact No. | (909)868-6882 |
| Facility Location: | RWP Ontario IV<br>7325 Edison Avenue<br>Ontario, CA 91762 |

| | | | |
|---|---|---|---|
| Acreage: | Composting Area ( green waste receiving, 2 acres, active curing 6 Acres, finished products & storage, 2.5 Acres) | 10.50 | acres |
| | SMC Fruit Waste Processing Area | 3.0 | acres |
| | Gro Well Wood Chips & Manure Bagging | 10.0 | acres |
| | Buildings, Road ways, lawns, Display Area | 10.05 | acres |
| | Containment Pond, Drainage path & Berms. | 3.0 | acres |
| Total | | 36.55 | acres |

About 5 acres of the property consist of buildings, barns, offices and landscaped area facing Edison Avenue. The stormwater runoff from this area drains toward Edison Avenue on the north side of the property.

The property is listed in the Assessor Map Book No. 682 , Section 17, Township 2S, Range 7W, the property and the surrounding area land use is agricultural. The total size of the green waste composting area is about 10.5 acres. The land use within 1 mile radius of the facility is primarily agricultural, with some mixed residential. The facility receives city water, but, the onsite irrigation well is the main source of water for the composting operation ( see the site plan for the ground water well location). The nearest surface water body to the site is Cucamonga Creek at about 1.5 miles distance from the composting operation.

The new operations at the site consist of discarded fruits & vegetable recovery for animal feed, wood chips & manure bagging & the green waste composting operations.

## 2. FRUITS & VEGETABLES RECOVERY OPERATION

The fruits and vegetables are received in packaged and un packaged containers. Approximately 60% of the material (fruits, vegetables and a little bit of breads) received is clean (no packaging). The other 40% has some sort of packaging that is de-packaged at the site.

The material (discarded fruits and vegetables) arrive in cardboard totes and is unloaded from the trucks. The total number of trucks unloaded is four (4) per day. The maximum amount of fruits and vegetable received and processed per day is 75 tons, or about 62 cubic yards. Once unloaded, the totes are tipped into one of the two cement pits depending if the material is clean or not. The tipped clean material is scraped from a pit with a front loader and loaded directly into a trailer. The tipped material that has packaging is scrapped from a pit and loaded into a de-packager. Once de-packaged, the clean material is conveyed into a cement lined bunker; then scraped and loaded into a trailer. Once the trailer is full with clean material, it is hauled down the street to feed cattle that are either owned by the Ontario Agricultural Commodities (OAC) or by one of the partnering cattle producers. This whole process from unloading the material to delivering clean feed to the cattle takes only a couple of hours.

Recently, part of the operation has become mechanized by utilizing a press on a small portion of the clean material. The pressed juice from the material is pumped into a tanker and once full,

delivered by the tanker to Vivotien ( a local business) as feed for them to mix in and feed to their larvae. The solids left over from the press are used as cattle feed.

The packaging left over from the de-packager is conveyed to a separate cement lined bunker where it is scraped and loaded into an on-site roll-off container that is owned by the City of Ontario and picked up every day, 6 days a week.

## 2.1 Wood Chips & Manure Bagging Operation

The Gro Well wood chips & bagging operation consist of receiving by trucks dry manure and wood chips. The materials are piled on the south west side of the facility, and then delivered by fork lift into the stationary hopper, where it is dropped on a reclining conveyor belt and moved to the automated bagging units. The wood chips or dry manure is transferred from the inclined conveyor belt into 30 lbs bags attached on the automated bagging chain line. The bags are filled and sealed by the automated system and dropped on the pallets on the ground. Each bag filling duration is about 15 seconds. The processing rate is about 200 bags per hour, and the facility operates one shift per day. The pallets containing about 20 bags are then picked up by the forklift and delivered to a temporary station for loading into the trucks and delivery to the customer. The entire bagging system is in a covered area, and the bagging unit is equipped by dust control unit for collection of any dust generated during the bags filling operation.

The facility has a stock pile of dry manure on the south west side of the property. The stock piled manure is being continually used for the manure bagging operation, During the spring season there is a greater demand for dry manure for landscaping and gardening purposes. The manure stock pile has been reduced in size by more than 50% since last year. The measured size of the manure stock pile last year was 200'W. X 240'L. X 12' H. which equals to 576,000 CF, or 21,333 CY. The recently measured stock pile dimensions is 140' W. X 150' L. X 12 H. which is equivalent to 252,000 CF or 9,333 CY of manure. This indicates that the size and amount of the manure stockpile has been reduced by 56% in one year. Based on the current rate of production the manure stock pile will be used up & finished in less than one year from now. The bagging operation for dry manure and wood chips peaks during late winter, & spring seasons.

The facility operators conduct routine daily maintenance at the site, remove any dirt piles, or bagged materials that may block the drainage pathway.

## 2.2 Green Waste Composting Operation

The materials used in the green waste composting operation consist of untreated wood pallets, salvaged wood from warehouses, plus cut out section of trees and branches from landscaping operations. The operator has no use for blending of manure as feed. Green materials is the primary materials used in the composting process, however, a small amount of agricultural, paper ( maximum of 500 cu yard/day agricultural, and 20 cubic

yard/day vegetative food material may be used in feedstock or final products as variation when requested. The total amount of vegetative food material added to the compost will be less than 5000 cubic yards per year. There will not be also any use of the additive non-vegetative food material in the feed or final product The received green waste material is mixed and shredded into a pile. The piles are kept in long rows separated at a minimum of 25 feet intervals. The windrow piles are wetted by water spray from the water trucks moving in between the rows. Backhoes turn the piles on a going basis to distribute the moisture evenly within the mixed materials. The moistened piles are kept onsite for a period of 60 days in the curing area. The total duration for receipt, mixing, curing, storage, and delivery of the compost material is less than 90 days. The pile's moisture content and temperature is checked in the curing area on daily basis to prevent overheating, and excess moisture content building up. Once the cured material temperature is stabilized between 125 to 130 F, it is transferred to the final staging area for final screening, pick up, and delivery. The facility may keep onsite a maximum of 1,000 cubic yards of manure to amend the final product. The final product is placed in the trucks for delivery to landscaping, and gardening material suppliers and distributors in Southern California. Based on the operational history, there is no wastewater generation or runoff from the green waste curing process. The estimated size of the active composting area is 6 acres, the curing area is about 3 acres. The final material staging area is around 1.5 acres. The residual material is screened out of the compost blends with a trammel screener. A very small percentage of the material is collected as residuals. The collected residuals in placed into trash bins, stored at a designated secure area, and hauled out within a few days to the landfill. The composting operation area is not in the flood zone, and there is no creek or waterway within the 1-1/2 miles radius of this operation.

## MATERIAL PROCESS FLOW CHART

**Green Waste Receiving Area > Initial Screening & Separation>Grinding & Screening>Mixing & Curing> Final Staging Area & Residual Removal> Final Material Storage >Loading & Delivery By Trucks to Farms**

## 3. WASTEWATER MANAGEMENT SYSTEM

There is one groundwater well on-site at a **greater distance than 100 feet** from the composting area, that is used for pumping and transfer of water to the water spray tanker trucks. Each tanker truck can hold up to 2,000 gallons of water. During the dry weather condition, the tanker truck turnover rate is about 20 times per day. In the mild weather, the turnover rate could fluctuate between 10 to 12 trucks per day. The tank truck sprays water into the windrow piles at a consistent rate. An attendant is onsite during the entire moistening process to assure that there is no over spraying or runoff from the spraying,

and the water content within the piles is distributed evenly. As observed during the site inspection, no water is collected in the detention pond on non-rainy days or on rainy days with low precipitation. This indicates that there is no wastewater runoff from the composting process. The water collected in the pond is associated with occasional stormwater runoff during the wet season. No water is stored in the pond primarily throughout the year, except on rainy occasions, which generally lasts for a few days. Also, the perimeter area around the composting operation is bermed and protected from run-on. Since no composting wastewater is collected and stored in the pond, no water sampling will be conducted.

### 3.1 Stormwater Run-off/Run on

The site is bordered on the north by Edison Avenue, and on the south, east, and west by adjacent dairy, and pasture land areas. There is no potential of stormwater runoff or run-on from the property boundary areas. According to the Riverside County Flood Control, the average annual precipitation in the Chino/Ontario area is about 13 inches. The maximum historical rainfall recorded at Ontario Air Port for 24 Hr storm event in December 2010 is 2.8 inches. The maximum recorded monthly and annual rainfall are respectively 3.2 and 15 inches.

As shown in the site plan, the property is sloped to the south, and the stormwater runoff from the green waste compost production & side operations drains to the big pond situated on the south side of the composting facility via the compacted and sloped drainage pathways in between the piles. The stormwater run-off from the composting area drainage pathway is led to several surface inlets of 4 to 5 feet in width along the bermed-up length of the detention pond ( see the site plan). Stormwater runoff from the nonproduction area flows toward the southwest side of the pond. To allow a greater a greater stormwater runoff containment capacity the depth of the pond will increased from 8 feet to 12 feet. A data search of the Ontario International Weather Air Port Station indicates that highest amount of 24 rainfall occurred on December 21 to December 22 (see the attachment). The rainfall started at 11:53 AM on December 21, 2010 and stopped at 5:53 AM on December 22, 2010. The total rainfall during this period was 2.8 inches.

### 3.2 Stormwater Containment Volume

The retention pond containment volume exceeds the total volume required for the maximum 24-hr historic rainfall. The pond's average depth has been increased from 8 feet to 12 feet (see the attached site plan). The total containment volume for the pond at the site is as follows:

**Pond's Containment Capacity**

| Pond No. 1 | Area (Sq. Ft.) | Average Depth (Ft.) | Volume (Cuft.) |
|---|---|---|---|
| **780' x 86'x12' (Avg)** | **64,740** (sloped sides) | **12** | **776,880** |

**Total Area = 64,740 Sq. ft** **Total Containment Volume = 776,880 Cu. ft**

Total area of stormwater runoff leading into the containment pond = 31.5 Acres
1 acre-ft = 325,829 Gallons, = 43,560 cu. ft
Runoff from maximum-24hour storm = 2.8 inch /12 inch x 31.5 acre-ft = 7.35 acre-ft
= 320,166 cu. ft
Suspended Solids Volume = 50 cu. ft
= 320,216 cu. ft
Total Containment Volume Required = 320,216 Cu. Ft, 7.36 acre-ft
Total Containment Volume Available = 776,880 Cu. Ft. 17.83 acre-ft

As shown by the above data, the containment pond capacity well exceeds the stormwater runoff volume generated from maximum historic rainfall in the Ontario/Chino area, without taking into account the additional losses in evaporation.

## 4.0 REFERENCES


**1.0** Composting facility site inspection, February 28, 2020.

**2.0** California Water Quality Control Boards Technical Guidelines, August 4, 2015.

**3.0** Riverside County Flood Control Hydrology Manual, April 1978.

**4.0** DWR, Groundwater Wells Profile.

**5.0** Updated information on materials storage, and operation status at the site, furnished by Nathan De Boom, April 14, 2021.

**6.0** Historic rainfall data, Ontario International Air Port, Ontario, CA, December 2010.


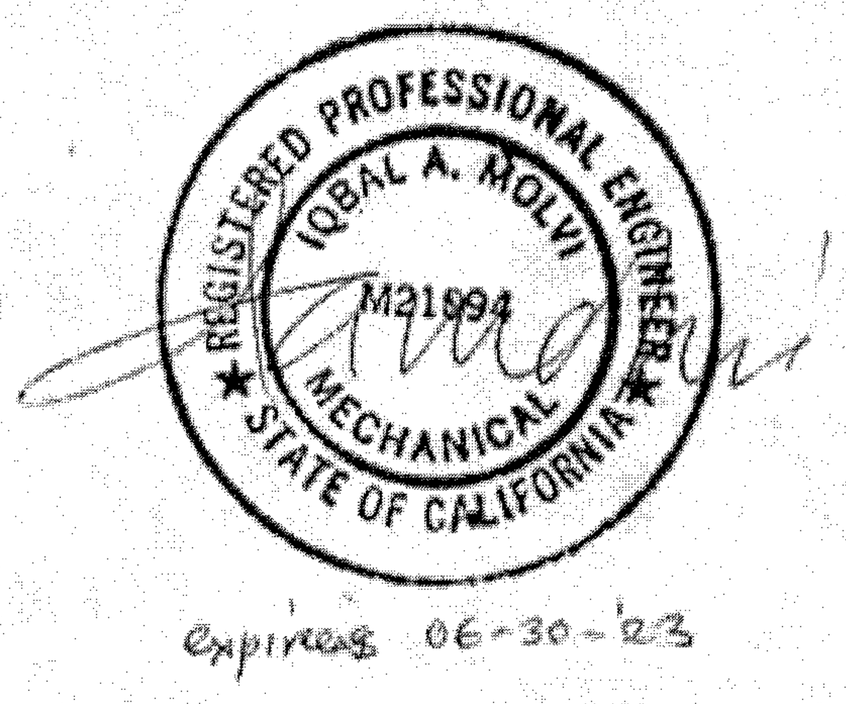


The data confirms that the containment volume exceeds the Stormwater runoff.

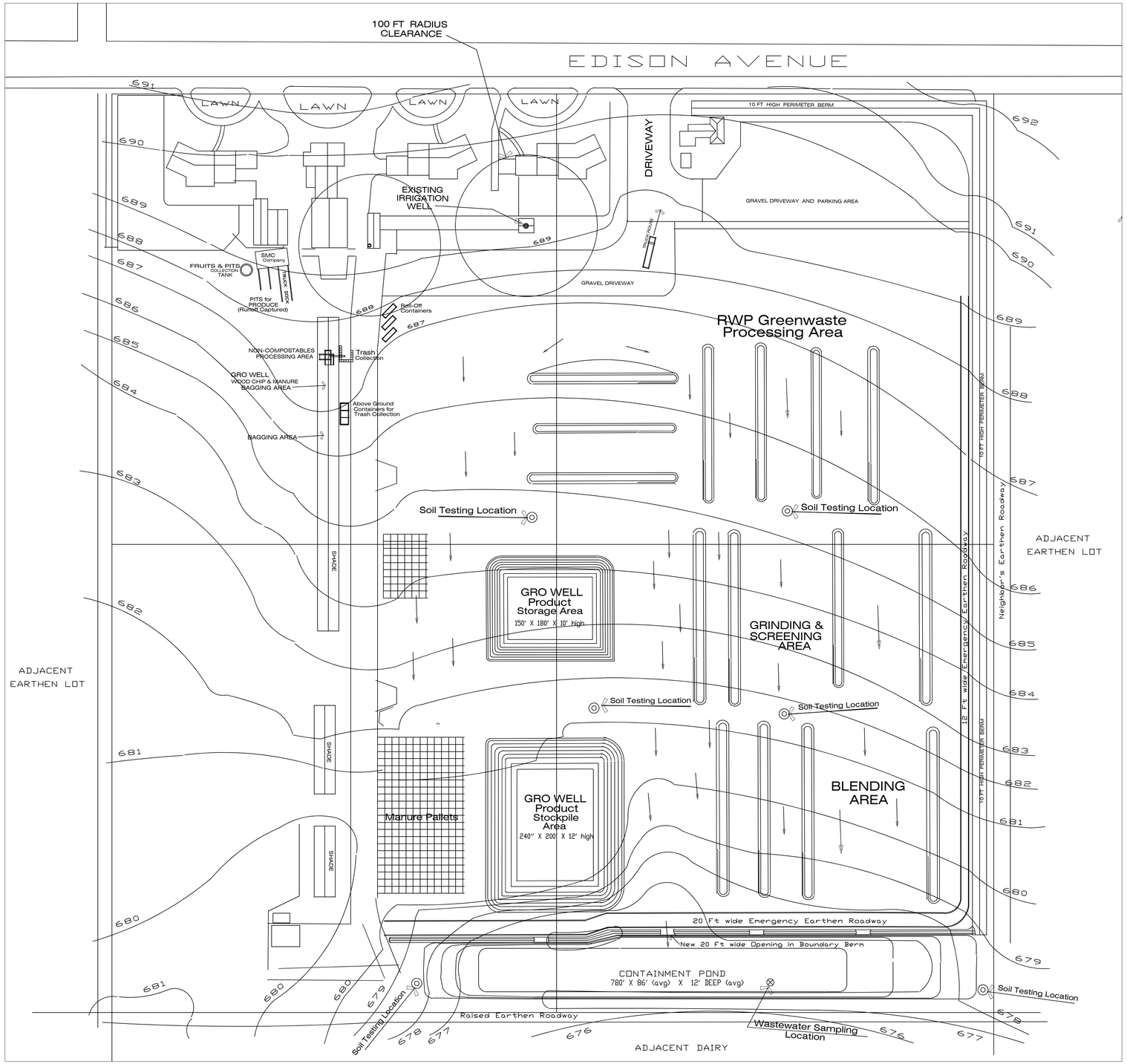


# SITE PLAN

Scale : 1"=75'

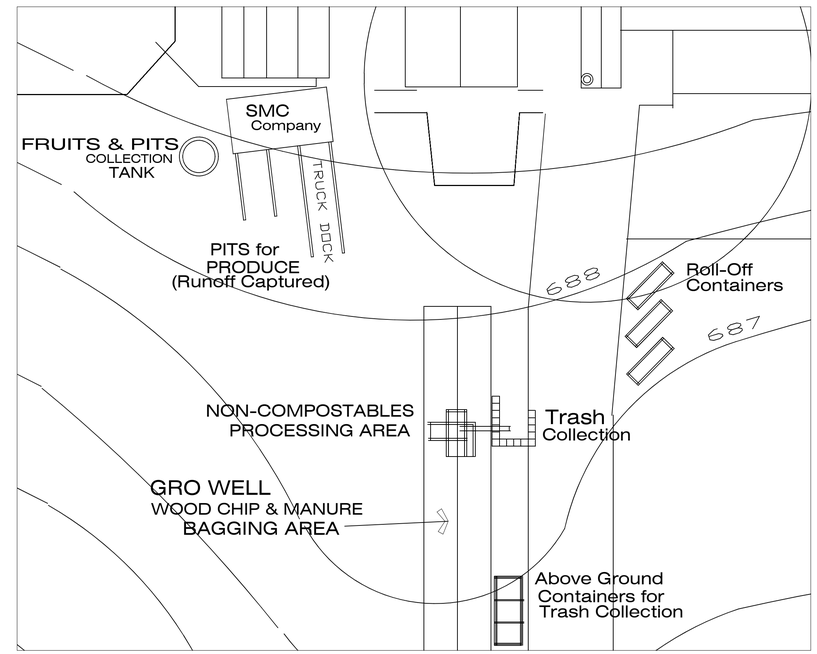


# NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

## GRADING NOTES

1 ALL DIKES AND BERMS SHALL BE CONSTRUCTED OF MINERAL EARTH FREE OF VEGETATION AND DELETERIOUS MATERIAL.

2 NO ROCKS OR COBBLES GREATER THAN 6 INCHES IN DIAMETER SHALL BE PLACED IN ANY FILL.

3 ALL AREAS TO RECIEVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.

4 ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES, WHEELED ROLLED AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

## KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILLWAY

DIGALERT

DIAL TOLL FREE 1-800-227-2600 AT LEAST TWO DAYS BEFORE YOU DIG

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SITE CONDITION RESPONSIBILITY:

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDASNCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 210
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APPVD | DATE |
|---|---|---|---|---|
| 2 | np | Pond depth increase | | 9/29/22 |
| 1 | np | Wastewater sampling location, fruits & pits collection tank | | 8/26/22 |

# SITE PLAN
## RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. 1053 - 391 - 01

DATE: 5-20-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2020
SHEET 1 OF 1

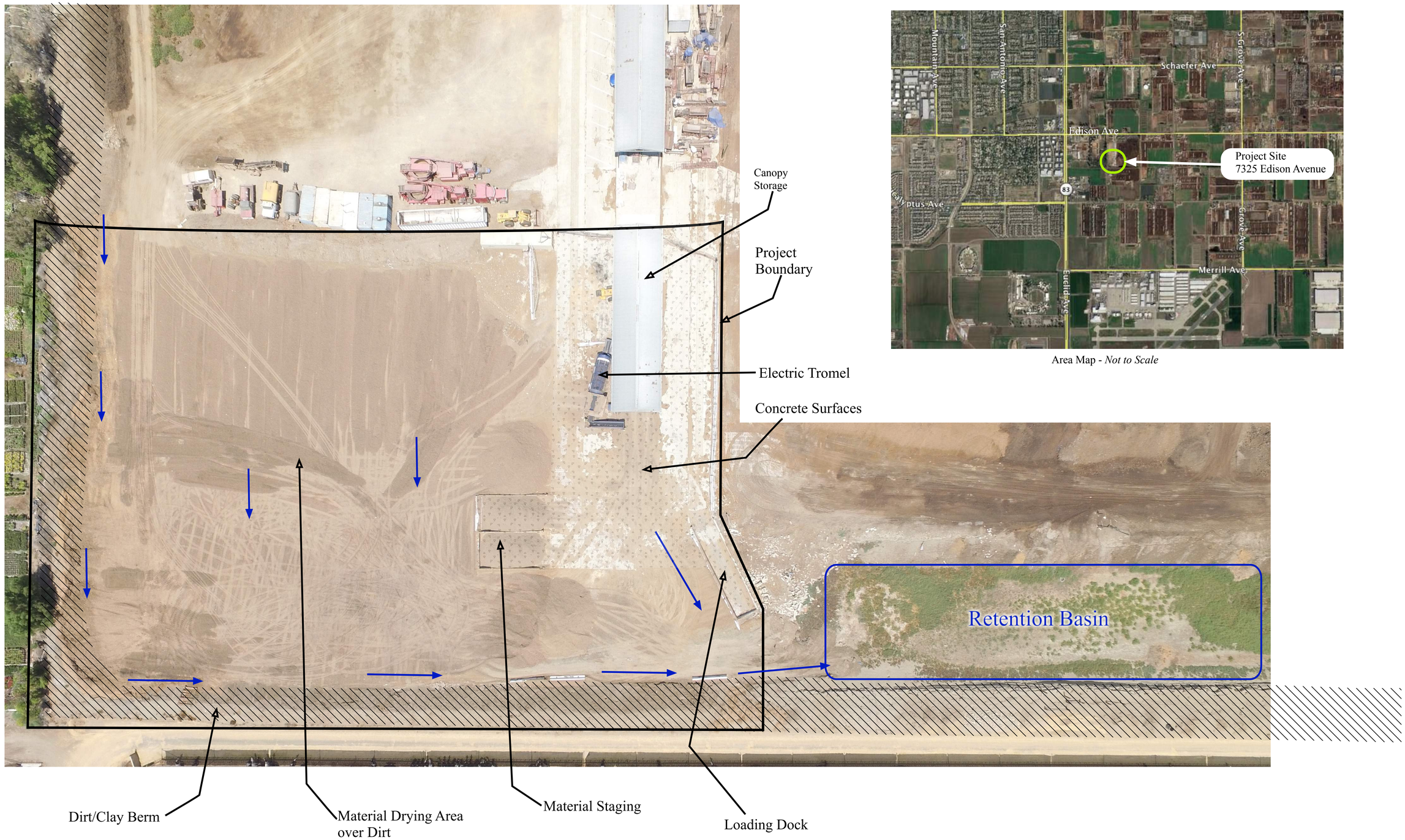





Area Map - *Not to Scale*

*Prepared by:*

Environmental & Chemical Consulting, Inc.

Material Recovery Solutions, Inc.
Water Quality Management Plan
7325 Edison Avenue
Ontario, CA 91762
760-623-6909

APN:
1053-391-01

Water Flow

Approvals:

Revision

| No | Description | Date |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

*Drawn by:*
Wade Riddering

CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL
CPESC
WADE RIDDERING
No. 8136

August 5, 2016

Water Quality Management Plan

Sheet Number:

**Figure 1**

N

Scale 1" = 23'

23 ft

(Sheet = 36" x 24")

# Handler Profile



Search for an ID Number

## CAL000319397 - JORRITSMA & ANEMA DAIRY

Status: INACTIVE

Esri Community Maps Contributors, County of Riverside, County of San Bernardino, California State Parks, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTe… Powered by Esri

### ID Number Profile

| | |
|---|---|
| ID Number: | CAL000319397 |
| Facility Name: | JORRITSMA & ANEMA DAIRY |
| ID Number Status: | INACTIVE (expired: 6/30/2013) |
| ID Type: | PERMANENT |
| ID Category: | STATE |
| Entity Types: | GENERATOR |
| Issued Date: | 5/8/2007 |
| Last Updated: | 3/26/2014 |

### Facility Address

8061 EDISON AVE
ONTARIO, CA 91762
SAN BERNARDINO County
(33.997818, -117.610259)

### Mailing Address

8061 EDISON AVE
ONTARIO, CA 91762

### Owner

**JAMES JORRITSMA & GREG ANEMA**
8061 EDISON AVE
ONTARIO, CA 91762
(909) 597-1317

### Requestor

,

## Contact

**GREG ANEMA**
8061 EDISON AVE
ONTARIO, CA 91762
(951) 741-6184

## CalEnviroScreen 4.0 Results

**Census Tract:** 6071001903 (Population: 13753)

The results for each indicator range from 0-100 and represent the percentile ranking of census tract 6071001903 relative to other census tracts.

| | |
|---|---|
| **Overall Percentiles** | |
| CalEnviroScreen: | 72 |
| Pollution Burden: | 99 |
| Population Characteristics: | 37 |
| **Environmental Effects** | |
| Cleanup Sites: | 80 |
| Groundwater Threats: | 98 |
| Hazardous Waste: | 87 |
| Solid Waste: | 99 |

## NAICS Codes

| | |
|---|---|
| 11212 | Dairy Cattle and Milk Production |

## Annual ID Number Verification History

| Year | Status | Method | VQ Number (eVQ) | Completion Date | Signed By |
|---|---|---|---|---|---|
| 2012 | COMPLETE | PAPER | | 10/17/2012 | |
| 2011 | COMPLETE | PAPER | | 9/21/2011 | |
| 2010 | COMPLETE | PAPER | | 11/2/2010 | |
| 2009 | COMPLETE | PAPER | | 10/6/2009 | |
| 2008 | COMPLETE | PAPER | | 4/15/2009 | |

Page Size: 10 1 to 5 of 5 Page 1 of 1

## Manifests

No Manifest Data for this ID Number.

## Waste Code Matrix

Copyright © 2025 State of California

STATE WATER RESOURCES CONTROL BOARD
ORDER WQ 2015-0121-DWQ
GENERAL WASTE DISCHARGE REQUIREMENTS FOR COMPOSTING OPERATIONS

## ATTACHMENT C – NOTICE OF INTENT

Received JUN 2021 CRWQCB Santa Ana Region 8

### DISCHARGER INFORMATION

| | | | | |
|---|---|---|---|---|
| Owner Name: Residuals Recovery Group INC./Bob Feenstra | | | | |
| Street Address: P.O. Box 17482 | | | | |
| City/Locale: Anaheim Hills | County: Orange | State: CA | Zip: 92817 | Telephone Number: (909) 591-6387 |
| Facsimile Number: (909) 597-3226 | | Email Address: bobfeenstra@gmail.com | | |
| Owner Type (check one): | □ Individual | ☒ Corporation | □ Partnership | □ Other: |

| | | | | |
|---|---|---|---|---|
| Operator Name (if different than above): Chris Kiralla | | | | |
| Mailing Address: 1313 E. Philips Rd. | | | | |
| City/Locale: Pomona | County: LA | State: CA | Zip: 91766 | Telephone Number: (909) 868-6882 |
| Facsimile Number: (909) 868-0595 | | Email Address: chris@rwpmulch.com | | |

### 1. COMPOSTING OPERATION INFORMATION

| | | | | |
|---|---|---|---|---|
| Compost Facility Name: RWP ontario IV | | | | |
| Street Address: 7325 Edison Avenue | | | | |
| City/Locale: Ontario | County: San Bernardino | State: CA | Zip: 91762 | Telephone Number: (909) 868-6882 |

| | |
|---|---|
| Type (check one):<br>☒ Existing Composting Operation<br>□ New Composting Operation | Facility Acreage (acres): 36.5<br>Total Facility Capacity (cubic yards): 12,500<br>Average Weekly Throughput (cubic yards per week): 12,500 |

| | |
|---|---|
| Assessor Parcel Number(s): 1053-391-01 | Regional Water Board Office: Santa Ana Region |
| Latitude 33.9966 Longitude 117.64.34 | Regional Water Board Address: 3737 Main Street, Riverside, CA 92501 |

### 2. REASONS FOR FILING

| | | |
|---|---|---|
| □ New Discharge | ☒ Existing Discharge | □ Expansion or Change in Operations |
| ☒ Changes in Ownership/Operator | □ Other: | |

### 3. STORM WATER PERMIT

Is there an Industrial Storm Water Permit for this facility? □ Yes □ No If yes, WDID Number:_____
Related to storm water, have you received a "No Exposure Certification", "Notice of Termination", or "Notice of Exemption" for this facility? ☒ Yes □ No If yes, please provide a copy. NONA Exemption is being applied for.

The Notice of Intent for coverage under the Industrial Storm Water Permit may be obtained over the internet at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/industrial.shtml

## 4. OTHER PERMITS

| | |
|---|---|
| Has another agency issued permits or other entitlements (e.g., solid waste facility permit, notification permit, conditional use permit, building permits, air permits) for the unit? ☒ Yes ☐ No | |
| For each permit or entitlement, list the type, issuing agency, and date of issuance: Conditional Use Permit, City of Ontario PCUP 19-020, 12,9,2019. LEA Notification 36-AA-0483 10/1/2019 | |

## 5. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

| | |
|---|---|
| Has a CEQA determination been made by an agency? ☒ Yes ☐ No | Name of Agency: City of ontario |
| Type and Date of Determination: Negative Dec 12/9/19 | State Clearinghouse Number: |

## 6. PROCESS

| Allowable Materials (check all that apply, and specify the quantity onsite at any time): | | | |
|---|---|---|---|
| ☒ agricultural material | cu. yds.: 500 | ☐ anaerobic digestate | cu. yds.: |
| ☐ biosolids (Class A, B, or EQ) | cu. yds.: | ☐ food material (non-vegetative) | cu. yds.: |
| ☒ green material | cu. yds.: 10,000 | ☐ manure | cu. yds.: |
| ☐ paper material | cu. yds.: | ☒ vegetative food material | cu. yds.: 20 |
| ☐ residentially co-collected food and green material | cu. yds.: | | |
| Current Processing Capacity (cubic yards): 12,500 | | | |
| Months during which compostable materials will be on-site: Throughout the Year | | | |
| Additives/Amendments and maximum dry weight percentage used (list): 280. CY of manure | | | |

## 7. SITE CONDITIONS

| | |
|---|---|
| Anticipated highest groundwater elevation (feet mean sea level): | >150' |
| Average ground surface material percolation rate (minutes per inch) or attach results of percolation testing: | |
| Annual average precipitation (inches per year): | 13 inches |
| Distance to nearest water supply well (feet): | >100 feet |
| Closest surface water and distance (name, feet): | Cucamonga Creek >5500 feet |

## 8. DESIGN SPECIFICATION TIERS (check one)

| | | |
|---|---|---|
| ☒ Tier I | ☐ Tier II | ☐ Tier II (monitoring) |
| If the box for Tier II (monitoring) has been marked, provide the proposed Groundwater Protection Monitoring Plan with Technical Report. | | |

## 9. TECHNICAL REPORT

Provide a complete technical report with all the information required in Attachment D of this General Order.

## 10. FILING FEE

Pursuant to California Water Code section 13260 et seq., Dischargers enrolled under this General Order are required to pay an annual fee, as determined by the State Water Resources Control Board. The filing fee accompanying this NOI is the first year's annual fee. The annual fee is based on the threat to water quality and complexity of the discharge in accordance with California Code of Regulations, title 23, section 2200. Dischargers enrolled under this General Order will be assigned a threat to water quality and complexity rating as described in the General Order and will be assessed the corresponding fee, plus any applicable surcharges. The NOI is to be accompanied by a check, made out to the State Water Resources Control Board for the payment of the filing fee.

## 11. CERTIFICATION

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

| | |
|---|---|
| Bob Feenstra | 6/7/21 |
| Signature (Owner or Authorized Representative) | Date |
| Bob Feenstra | Authorized Rep |
| Print Name | Title |
| 951 313-1818 | Bobfeenstra@gmail.com |
| Telephone Number | Email |

**AG CONCEPTS, INC**
PO BOX 17482
ANAHEIM CA 92817-7482

5494

11-35/1210 CA
91093

DATE 4/20/2021

PAY TO THE ORDER OF State Water Resources Board $ 2848 00

two thousand eight hundred forty eight DOLLARS

Photo Safe Deposit® Details on back

**BANK OF AMERICA**

ACH R/T 121000358

FOR Compost Permit.

[redacted]

Inspection ID: 48689269 Date Printed: 08/16/2022

# FACILITIES INSPECTION REPORT

| | | |
|---|---|---|
| Region/Office: 8 | Status: Performed | Reg. Measure ID: 448758 |
| Program Type: LNDISPOTH | WDID: 8 363012001 | Order Number: 2015-0121-DWQ |
| Scheduled Insp. Date: | Actual Insp. Date: 08/02/2022 | |

**Discharger Information**

| | | | |
|---|---|---|---|
| Party ID: 556646 | Discharger Organization Name: Recycled Wood Products | | |
| Address: 1313 East Phillips Boulevard | | City, State, Zip: Pomona, CA 91766 | |
| Discharger Contact Person: | Chris Kiralla | Discharger Contact Phone: | Multiple Phone Numbers |
| Discharger Contact Email Address: chris@rwpmulch.com | | | |

**Facility Information**

| | | | |
|---|---|---|---|
| Place ID 240263 | Facility Name: Residuals Recovery Group, Inc | | |
| Address: 7325 Edison Avenue | | City, State, Zip: Ontario, CA 91762-7241 | |
| County: San Bernardino | Latitude: 33.99572 | Longitude: -117.64335 | Method: |

**Lead Inspector Information**

Lead Inspector Party ID: 138121 Lead Inspector Name: Joanne Lee

Inspector Type: ☒ State ☐ State Contractor ☐ EPA Contractor ☐ EPA (Regional) ☐ EPA and State (EPA Lead) ☐ EPA and State (State Lead)

# INSPECTION TYPE

Inspection Type: Prerequirement inspection

# VIOLATIONS

Were Violations noted during this inspection? ☐ Yes ☒ No

| Violation ID | Violation Type | Occurrence Date | Rank | Description |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## INSPECTION SUMMARY (REQUIRED) (500 character limit)

An pre-requirement inspection performed at Recycled Wood Products (RWP), Ontario IV and others at this location to verify information submitted in the permit application by RWP for coverage under the Composting General Order and to gather site information for application approval. Santa Ana Water Board staff (Joanne Lee and Cindy Li) met with San Bernardino County Dept. of Environmental Health, Local Enforcement Agency (LEA) staff (Griselda Reisinger) for this inspection.

## GENERAL NOTES (OPTIONAL) (2000 character limit)

In 2016, Residual Recovery Group leased and operated a manure composting facility at this location. In 2020, RRG ceased operations and the property was sub-leased to multiple operators with multiple operations at the site.

Santa Ana Water Board staff joined LEA staff for a joint facility inspection. There are four different operations observed during inspection: Recycled Wood Products greenwaste composting operations, Gro-Well dairy manure stockpiling/bagging operations, Salvadore Coco fruit and vegetable waste processing operations, and Residual Recovery Group (RRG) one-time chicken manure composting operations. Bob Feenstra of RRG/AG Concepts, Inc. is the master lease holder and representative of the landowner. RRG sub-leases the property to RWP, Gro-Well , and Salvadore Coco for their operations.

All surface runoff from the site drains to the detention pond, installed by the former dairy at this location. A rusty steel drum was found on the east (west-facing) slope of the pond. RRG planned to remove the former empty cattle feed drum from the pond and reuse it offsite.

Santa Ana Water Board staff recommended that RWP composting operations be covered under the Composting General Order and begin water quality monitoring of the pond water and for the need to implement any further groundwater protection measures.

| For Internal Use (Optional) | | | | | |
|---|---|---|---|---|---|
| Reviewed By: | (1) | | (2) | (3) | |
| CIWQS Entry Date: | | Regional Board File Number: | | CIWQS Inspection ID: | |

Recycled Wood Products, Ontario IV Composting Facility, 7325 Edison Avenue, Ontario,  August 2, 2022 Pre-requirement Facility Inspection, 9:30-11:15am (sunny and hot)

Looking southwest at the detention pond located south at the site (see attached site plan). Some water was observed in the pond. Surface runoff from all operations at the site discharges to the pond.

Looking south at the pond.

Looking southeast at the pond.

Looking southeast at an empty steel drum sitting on the west-facing slope of the pond. Residual Recovery Group (RRG), the master lease holder of the site property and landowner's representative, was later contacted to remove the drum from the pond. RRG stated that the empty drum was an old dairy feed (molasses) tank that was moved out back when the site was converted from a dairy to composting operations. RRG planned to remove the empty drum for offsite use.

Earthen berm located north of the pond for drainage control and runoff diversion to pond.

Looking northwest at Gro-Well manure stockpiling, bagging and storage operations (by Elvia Medina) at the site.

Looking northeast at RWP greenwaste composting operations.

RWP composting operations at the site.

Looking north at the site entrance.

RWP composting operations.

Looking west at an area north of the pond, south of Gro-Well operations at the site.

RWP windrow compost piles.

RWP windrow compost piles.

A pile of residual waste generated from screening incoming greenwaste at RWP.

Salvadore CoCo's fruit and vegetable waste processing facility, located at the northwest portion of the site, is one of the operations currently onsite. Fruit and vegetable scraps are pressed to produce juice for processing at the City's digester and solid scrap is used as cattle feed.

Looking southwest at the chicken manure composting operations by Residual Recovery Group (RRG) in an area north of Gro-Well's operations. Sheridan Griepsma and Bob Feenstra of RRG explained that this was a one-time composting event to take and compost

about 400 cubic yards of manure from a local chicken producer that is going out of business.

Looking southeast at the manure windrow compost piles. There were several windrow piles.

Looking south at the manure windrow piles. Gro-Well's manure stockpile is in the background.

Looking southwest at the manure windrow piles.

One of the manure piles measured a temperature of 126.4ºF, below 131ºF (the active composting temperature).

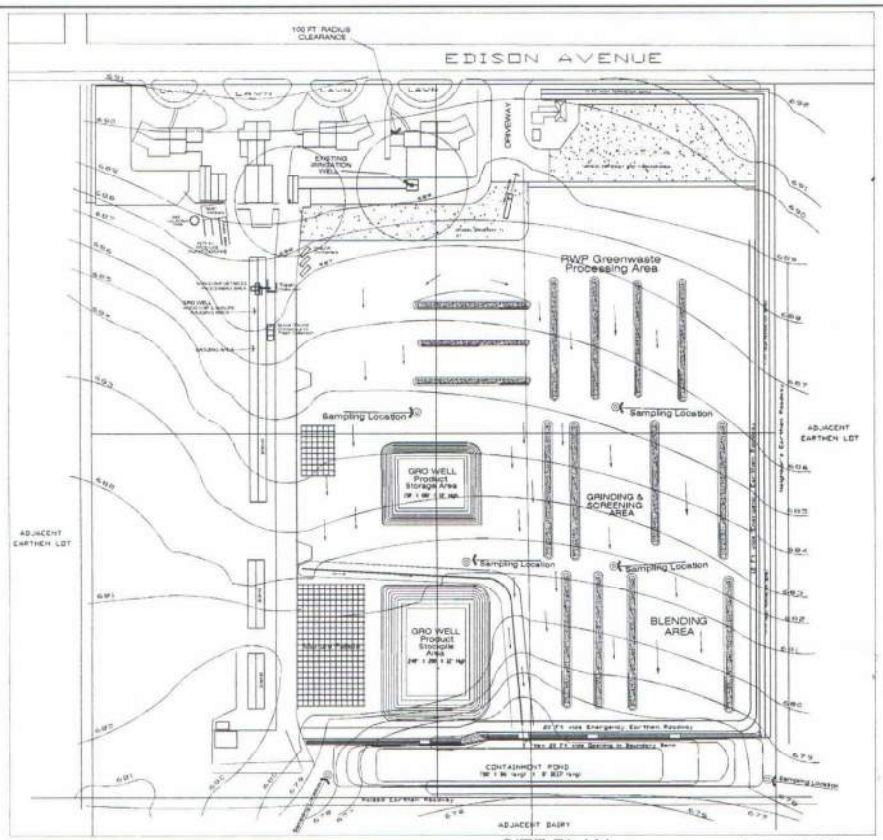


SITE PLAN Scale : 1"=75'

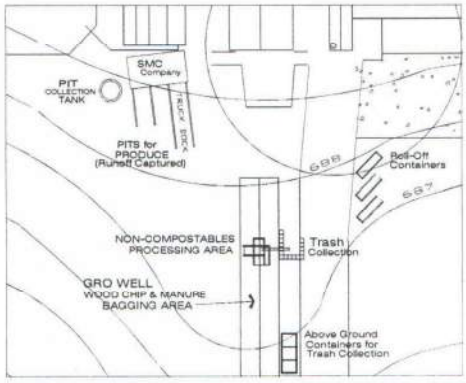


NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

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3. ALL AREAS TO RECEIVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.
4. ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES. WHEELED ROLLER AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILL WALL

DIGALERT

SITE CONDITION RESPONSIBILITY:

CONTRACTOR CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICE, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES

(1750) SIERRA CIRCLE, STE. 210
RIVERSIDE, CA 92506
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APP'D | DATE |
|---|---|---|---|---|

SITE PLAN
RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. (APN - 3N - 8)

DATE: 2-26-2020
SCALE: 1"=75'
PROJECT NUMBER: 4-19-2020
SHEET 1 OF 1

# TECHNICAL REPORT

PREPARED FOR

# RECYCLED WOOD PRODUCTS-IV

IN ONTARIO

BY

SIERRA ENGINEERING SERVICES

September 2023

TABLE OF CONTENTS

1. INTRODUCTION ---------- Pg 1

2. SITE OPERATIONS ----------Pg2
   2.1 Wood Chips & Manure Bagging ---------- Pg 3
   2.2 Green Waste Composting----------Pg 4
   2.3 Fruits & Vegetables Recovery Operation----------Pg 5
3. SITE GEOLOGY ----------Pg 6
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# RECYCLED WOOD PRODUCTS -IV GREEN WASTE COMPOSTING TECHNICAL REPORT

## 1.0 INTRODUCTION

This Technical Report has been submitted for review and approval by the Santa Ana Region Water Quality Control Board. The Recycled Wood Products IV (RWP) is a green waste (Tier I) composting facility in the city of Ontario, operated by Mr. Chris Kiralla. This property is leased from Golden Ontario Holdings by Mr. Bob Feenstra. Under the adopted order No. WQ2020-0012DWQ, the California Regional Water Quality Control Board, the composting facilities are to submit and implement a Technical Report. The property is located at 7325 Edison Avenue in Ontario. The total size of the property is 36.5 acres, A total of 10.5 acres of the site is used for the active green waste composting operation. Two other small side businesses consisting of fruit waste recycling, and wood chips & manure bagging are also operating at this site. The APN numbers for the entire site is 1053-391-01. The property was used as a Tier II manure composting facility prior to starting of the green waste composting operation. The manure composting operation ceased on October 17, 2019. Prior to the composting operation, the facility was a dairy site. The corrals and the pond were cleaned of any manure residue prior to the start of the composting operation.

**Facility Data**

The following data has been obtained from RWP-IV by the Sierra's Engineering staff.

| | |
|---|---|
| Property Owner: | Mr. Gary Dou, Golden Ontario Holdings |
| Address | 14240 Sapphire Hill Lane<br>Chino Hills, CA 91709 |
| Contact No. | (562)921-9974 |
| Property Lease Holder: | Mr. Bob Feenstra<br>Residual Recovery Group<br>P.O. Box 17482<br>Anaheim Hills, CA 92817 |
| Contact No: | (909)597-3222 |
| Email Address: | bobfeenstra@gmail.com |
| Facility Operator:<br>&<br>Mailing Address | Mr. Chris Kiralla<br>RWP Ontario IV<br>1313 E. Philips Rd.<br>Pomona, CA 91766 |
| Email Address | chris@rwpmulch.com |

| | |
|---|---|
| Contact No. | (909)868-6882 |
| Compost Facility | RWP Ontario IV |
| Contact | Nathan De Boom<br>7325 Edison Avenue,<br>Ontario, CA 91762<br>Tel : (951)452-1148 |

**Non-Composting Operations Onsite:**

Gro Well Brands, Inc.
Operating Manager: Elvia Medina
Contact Number: (909) 310-2124
Email Address: emedina@gro-well.com
Mailing Address: 7325 Edison Avenue
Ontario, CA 91762

SMC Company
Director of Operations: Salvadore Coco
Contact Number: (951)788-6042
Email Address: sal@smczerowaste.com
Mailing Address: P. O. Box 79200
Corona, CA 92877

| | | | |
|---|---|---|---|
| Acreage: | Composting Area ( green waste receiving, 2 acres, active curing 6 Acres, finished products & storage, 2.5 Acres) | 10.50 | acres |
| | SMC Fruit Waste Processing Area | 3.0 | acres |
| | Gro Well Wood Chips & Manure Bagging | 10.0 | acres |
| | Buildings, Road ways, lawns, Display Area | 10.05 | acres |
| | Containment Pond, Drainage path & Berms. | 3.0 | acres |
| Total | | 36.55 | acres |

The area of the buildings, houses, roadways, and lawn areas draining toward Edison Avenue is 4.4 acres.

The property is listed in the Assessor Map Book No. 682, Section 17, Township 2S, Range 7W, the property, and the surrounding area land use is agricultural. The total size of the green waste composting area is about 10.5 acres. The land use within a one mile radius of the facility is primarily agricultural, with some mixed residential. The facility receives city water, but, the onsite irrigation well is the main source of water for the composting operation (see the site plan for the groundwater well location). The nearest surface water body to the site is Cucamonga Creek about 1.5 miles distance from the composting operation.

The new non-composting operations at the site consist of discarded fruits and vegetable recovery for animalfeed, wood chips and manure bagging, and green waste composting operations.

## 2. SITE OPERATIONS

### 2.1 Wood Chips & Manure Bagging Operation

The Gro Well wood chips and bagging operation consists of receiving trucks of dry manure and wood chips. The materials are piled on the southwest side of the facility and then delivered by forklift into the stationary hopper, where it is dropped on a reclining conveyor belt and moved to the automated bagging units. The wood chips or dry manure are transferred from the inclined conveyor belt into the bags attached to the automated bagging chain line. The bags are filled and sealed by the automated system and dropped

on the pallets on the ground. **Each bag filling duration is about 15 seconds. The maximum processing rate is about 200 bags per hour, and the facility operates one shift per day. Each bag of wood chips weighs 30 lbs, and each bag of manure weighs 50 lbs. The average number of wood chip & dry manure bags processed on daily basis is 150. The estimated annual amount of wood chips and dry manure processed are respectively 2700 & 4500 tons/yr. The estimated amount of wood chips that is stored onsite will be limited to about four weeks' supply, around 250 tons.** The pallets containing about 20 bags are then picked up by the forklift and delivered to a temporary station for loading into the trucks and delivery to the customer. The entire bagging system is in a covered area, and the bagging unit is equipped with a dust control unit for the collection of any dust generated during the bag-filling operation.

The facility has a stockpile of dry manure on the southwest side of the property. The stockpiled manure is being continually used for the manure bagging operation, During the spring season, there is a greater demand for dry manure for landscaping and gardening purposes. The manure stockpile has been reduced in size by more than 50% since the start of the operation. The measured size of the manure stockpile at the start of operation was about 200' W. X 240'L. X 12' H. which equals to 576,000 CF, or 21,333 CY. The recently measured stockpile dimensions is 140' W. X 150' L. X 12 H. which is equivalent to 252,000 CF or 9,333 CY of manure. This indicates that the size and amount of the manure stockpile were reduced by 56% in about two years. The recent events caused a slow down in manure bagging operation, but the stockpile continues to be reduced & possibly finished in less than two years. The bagging operation for dry manure and wood chips peaks during late winter, & spring seasons. **Currently The Gro well facility has two more years of the lease remaining, with an option to extend the lease for an additional two years. Once the current manure stockpile is depleted, Gro well will import dry manure for their bagging operation, but no more than 5,000 CY of dry manure will be stored at the site at any one time.**

The facility operators conduct routine daily maintenance at the site and remove any dirt piles or bagged materials that may block the drainage pathway.

## 2.2 Green Waste Composting Operation

The materials used in the green waste composting operation consist of untreated wood pallets, salvaged wood from warehouses, and cut-out sections of trees and branches from landscaping operations. The operator has no use for blending manure as feedstock but a very small amount of manure may be added as an additive on occasion per customer demand. The maximum amount of manure that may be added on an annual basis will be less than 980 Cubic yards.

Green materials is the primary materials used in the composting process, however, a small amount of agricultural/green materials ( maximum of 500 cu yard/day) and 20 cubic yard /day vegetative food material may be used in feed stock or final products as variation when requested. The total amount of vegetative food material added to the compost will be less than 5,000 cubic yards per year. There will not be any use of the additive non-vegetative food material in the feed or final product The received green waste material is mixed and shredded into a pile. The piles are kept in long rows separated at a minimum of 25 feet intervals. The windrow piles are wetted by water spray from the water trucks moving in between the rows. Backhoes turn the piles on an ongoing basis to distribute the moisture evenly within the mixed materials. The moistened piles are kept onsite for a period of **60 days in the active composting and curing area**. The total duration for receipt, mixing, curing, storage, and delivery of the compost material is less than 90 days. The pile's moisture content and temperature are checked in the curing area on a daily basis to prevent overheating and excess moisture content build-up. Once the cured material temperature is stabilized between 125 to 130 F, it is transferred to the final staging area for final screening, pickup, and delivery. The facility may keep onsite a maximum of 1,000 cubic yards of manure to amend the final product. The final product is placed in the trucks for delivery to landscaping, and gardening material suppliers and distributors in Southern California. Based on the operational history, there is no waste water generationor runoff from the green waste curing process. The estimated size of the active composting area is 6 acres, the curing area is about 3 acres. The final material staging area is around 1.5 acres. The residual material is screened out of the compost blends with a trammel screener. A very small percentage of the material is collected as residuals . The collected residuals in placed into trash bins, stored at a designated secure area, and hauled out within a few days to landfill. The composting operation area is not in the floodzone, and there is no creek or water way within the 1-1/2 miles radius of this operation.

## 2.3 Fruits & Vegetables Recovery Operation

Fruits and vegetables are received in packaged and unpackaged containers. Approximately 60% of the materials ( fruits, vegetables, and few pieces of bread) that are received, are unpackaged clean materials picked from local supermarkets and grocery stores. The other 40% has some sort of packaging that is removed at the site. The materials (discarded fruits and vegetables) arrive in totes and are unloaded from the trucks. A total of four (4) trucks of materials are received per day. The maximum amount of fruits and vegetables received and processed per day is 75 tons, or 62 cubic yards. Once unloaded, the totes are tipped into one of the two cement pits depending if the material is clean or not. The tipped clean material is scraped from a pit with a front loader, and loaded directly into the trailer. The tipped material that has packaging is scrapped from a pit and loaded into a de-packager. Once de-packaged, the clean material is conveyed into a cement-lined bunker; then scraped and loaded into a trailer. Once the trailer is full of clean material, it is hauled down the street to feed cattle that are either owned by the Ontario Agricultural Commodities (OAC) or by one of the partnering cattle producers. This whole process from unloading the material to delivering from clean feed to the cattle takes only couple of hours.

Recently, part of the operation has become mechanized by utilizing a press on a small portion of the

clean material. The pressed juice from the material is pumped into a tanker and once full, it is delivered by the tanker to Vivotien ( a local business) as feed for them to mix in and fed to their larvae. The solids left over from the press are used as cattle feed. The packaging left over from the de-packer is conveyed to a separate cement lined bunker, where it is scraped and loaded into an onsite roll off container that is owned by the City of Ontario, and picked up 6 days a week.

**MATERIAL PROCESS FLOW CHART**

**Green Waste Receiving Area> Initial Screening & Separation>Grinding & Screening>Mixing, Active Composting & Curing> Final Staging Area & Residual Removal> FinalMaterial Storage >Loading & Delivery By Trucks to Farms**

## 3. SITE GEOLOGY

The geology and hydrogeology of the site and adjacent areas (unless otherwise specified) are taken from:

*"2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement"*, Prepared for Chino Basin Watermaster by Wildermuth Environmental, Inc. October 2015

The subject site is located within the Chino Basin. The Chino Basin consists of about 235 square miles of the Upper Santa Ana river watershed . The basin is bounded by the Cucamonga Basin and the San Gabriel Mountains to the north; the Rialto-Colton Basin to the northeast; the chain of Jurupa, Pedley, and La Sierra Hills to the southeast; the Temescal Basin to the south; the Chino and Puente Hills to the southwest; and the San Jose Hills and the Pomona and Claremont Basins to the northwest (Figure 1-1). The location of the subject site is shown on **Figure 1-1.**

## 3.1 Geologic Setting

The general geology of the Chino Basin is shown on **Figure 2-1.** Although the entire Basin is immediately underlain by Quaternary Alluvium, **Figure 2.1** shows (within shaded borders) the nature of the rock units that underlie the water-bearing sediments of the Quaternary Alluvium. The Chino Basin was formed as a result of tectonic activity along major fault zones during the Quaternary Period. It is part of a large, broad, alluvial-filled plain located between the San Gabriel Mountains to the north (Transverse Ranges) and the elevated Perris block to the south (Peninsular Ranges), which is sometimes referred to as the Chino Plain. The Santa Ana River is the main tributary draining the area.

A number of major faults are at least partly responsible for the uplift of the surrounding mountains and the depression of the Chino Basin. These faults are the Cucamonga Fault Zone, the Rialto-Colton Fault, the Red Hill Fault, the San Jose Fault, and the Chino Fault **(Figure 1-1).** The bottom of the basin, the effective base of the freshwater aquifer, consists of impermeable sedimentary and igneous bedrock formations. These formations are exposed at the surface in the surrounding mountains and hills. Sediments were eroded and washed out from the surrounding mountains and filled the Chino Basin to form its groundwater reservoirs. These sediments are greater than 1,000 feet thick in the deepest portions of the Basin.

The major faults form groundwater barriers and form some of the external boundaries of the Basin by influencing the magnitude and direction of groundwater flow.

## 3.2 Stratigraphy

### 3.2.1 Consolidated Bedrock

The consolidated bedrock formations of the Chino Basin area include the basement complex; consolidated marine sedimentary and volcanic strata; and more recent semi-

consolidated continental sedimentary deposits. Reference **to Figure 2-1** shows the surface outcrops of the consolidated bedrock formations that surround the Chino Basin.

#### 3.2.1.1 Basement Complex

The basement complex consists of deformed and re-crystallized metamorphic rocks that have been intruded by masses of granitic and related igneous rocks. These rocks were subsequently uplifted and exposed by erosion. They have been the major source of detritus to the younger sedimentary formations, particularly the younger water-bearing sediments of the Chino Basin.

#### 3.2.1.2 Undifferentiated Pre-Pliocene Formations

Well-stratified marine sandstones, conglomerates, shales, and interlayered lava flows (late Cretaceous to Miocene) overlie the basement complex and crop out along the western margin of the Chino Basin. This sequence reaches a total stratigraphic thickness of 24,000 feet in the Puente Hills, and is down-warped more than 8,000 feet below sea-level in the Prado Dam area.

#### 3.2.1.3 Plio-Pleistocene Formations

A thick series of semi-consolidated clays, sands, and gravels of marine and non-marine origin overly the older consolidated bedrock formations. These sediments have been named the Fernando Group. The upper portion of the Fernando Group is more permeable than the lower portion and thus represents a gradual transition from non-water-bearing consolidated rocks to water-bearing sediments.

## 4. WATER-BEARINGING SEDIMENTS

An intense episode of faulting, occurring in the Pleistocene, depressed the Chino Basin area and uplifted the surrounding mountains and hills. Detritus eroded from the mountains were transported and deposited in the Chino Basin on top of the bedrock formations. they were deposited as interbedded, discontinuous layers of gravel, sand, silt, and clay to form water-bearing sediments. These water-bearing sediments are differentiated into Older Alluvium of Pleistocene Age and Younger Alluvium of Holocene Age.

### 4.1 Older Alluvium

The Older Alluvium varies in thickness from about 200 feet near the southwestern end of the Chino Basin to over 1,000 feet southwest of Fontana. The pumping capacities of wells completed in the Older Alluvium generally range between 500 and 1,500 gallons per minute (gpm). Capacities exceeding 1,000 gpm are common, and some modern production wells test-pumped at over 4,000 gpm. In the southern part of the Basin where the water-bearing sediments tend to be more clay-rich, the wells generally yield less than 1,000 gpm.

### 4.2 Younger Alluvium

The streambeds, washes, and other areas of recent sedimentation are occupied by the Younger Alluvium. The You8nger Alluvium varies in thickness from over 100 feet near the mountains to just a few feet south of Interstate 10 and generally covers most of the north half of the Basin. The Younger Alluvium is not saturated and, thus , does not yield water directly to wells.

### 4.3 Effective Base of the Freshwater Aquifer

**Figure 2-2** shows the Water master's interpretation of the effective base of the freshwater aquifer in the Chino Basin.

#### 4.3.1 Eastern Chino Basin

The subject site does not lie within the Eastern Chino Basin, so that portion of the Chino Basin (east of Archibald Avenue) will not be discussed here.

#### 4.3.2 Western Chino Basin

On the west side of the Chino Basin (west of Archibald Avenue) and in the Temescal Basin, the determination of the bottom of the aquifer is not straightforward. Some boreholes to 1,400 feet bgs did not penetrate the basement complex, but terminated in highly-weathered and consolidated sediments that may be formations of the sedimentary bedrock formations. There is evidence to suggest that that the upper portions of the sedimentary bedrock formations have a useful porosity and permeability, and that these formations contribute water to deep production wells.

**Figure 2-2** shows deep wells in the western portion of the Chino Basin with screens deeper than 1,000 feet bgs. All of the well boreholes penetrated a similar sequence of sediments that include sands, gravels, silts, and clays.

## 5. SITE HYDROGEOLOGY

### 5.1 Groundwater Flow

The physical nature of the Chino Basin as a groundwater reservoir is described with regard to Basin boundaries, recharge, groundwater flow, internal barriers to groundwater flow, and discharge. **Figure 2-1** shows the physical boundaries of the Basin, primarily composed of faults and surrounding mountains and hills.

The predominant source of recharge to the Basin groundwater reservoirs is the percolation of direct precipitation and returns of applied water.

In general, groundwater flow mimics surface drainage patterns: from the forebay areas of high elevation in the north and east flanking San Gabriel and Jurupa Mountains, towards areas of discharge near the Santa Ana River within Prado Basin. The directions of groundwater flow within the Basin are shown by the groundwater contours depicted on **Exhibit 18,** taken from Chino Basin Watermaster Engineering Report-State of the Basin 2012. The direction of groundwater flow at any location is perpendicular to the groundwater contour line. In the area of the subject site, the direction of groundwater flow is directly south.

There is only one documented barrier to groundwater flow within the aquifer systems of the Chino Basin. This barrier exists only within the deep aquifer system of the western Chino Basin. The location of this barrier is shown in **Figure 2-2** just to the west of the subject site) and is named the Riley Barrier.

Groundwater moves generally in alluvium south of the mountains and west from adjacent basins through the Chino Basin; it rises to the surface along the Santa Ana River between Riverside narrows and the Prado Dam. Subsurface flow past Prado Dam has been stopped by means of a sheet-steel wall driven to the base of the water-bearing sediments (Geological Survey Water-Supply Paper 1999-G, 1972)

### 5.2 Aquifer Systems

The saturated sediments within the Chino Basin comprise one groundwater reservoir, but the reservoir can be subdivided into distinct aquifer systems based on the physical and hydraulic characteristics of the aquifer-system sediments and the contained groundwater. These aquifer systems include Layer 1 (shallow), Layer 2 (intermediate), and Layer 3 (deep). The sediments that comprise the shallow aquifer system (Layer 1) are almost fully saturated in the southern portion of the Chino Basin. Depth to groundwater increases to the north to provide a thick vadose zone for percolating groundwater in the forebay regions of the Chino Basin. The sediments within the deep aquifer system are always fully saturated. The shallow aquifer system is generally characterized by unconfined to semi-confined groundwater conditions, high permeability within its sand and gravel units and high concentrations of dissolved solids and nitrate (especially in the southern portions of the Basin). The deep aquifer system is generally characterized by confined groundwater conditions, lower permeability within its sand and gravel units, and lower concentrations of dissolved solids and nitrate. There is generally a downward hydraulic gradient.

The distinction between the aquifer systems is most pronounced within the west-southwest portions of the Chino Basin. This is likely because of the relative abundance of fine-grained sediments in the southwest (multiple layers of clays and silts). Groundwater flowing from high-elevation forebay areas to the north and east become confined beneath these fine-grained sediments in the west-southwest, and these sediments effectively isolate the shallow aquifer system from the deep aquifer system(s). The three-dimensional extent of these fine-grained sedimentary units and their effectiveness as confining layers is shown by the fact that the subject site is located in an area of historical

flowing artesian conditions, which indicates the existence of confining layers in this area. The presence of these fine-grained sedimentary units is verified by the driller's log of a water well located at 7330 Edison Avenue, directly across Edison Avenue, to the north of the site. The driller's log is contained in the DWR Water Well Drillers Report No. 105755, for State Well Number 2S/7W-17E 1. This well is 357 feet deep, with clay strata at the following intervals:

31-54 feet
115-131 feet
150-168 feet
212-225 feet
227-278 feet
280-285 feet
323-357 feet

Standing water was in the well casing at a depth of 135 feet following 35 hours of well testing. The yield was 750 gallons per minute with 23 feet of drawdown. The date of the Well Drillers Report was May 31, 1976. Reference to Exhibit 18 indicates that, in the Spring of 2012, the depth to groundwater at the site was approximately 133 feet, very similar.

The presence of confining layers beneath the site is an indication that any contaminants produced at the subject site will not likely penetrate below layer 1 and will remain in the Shallow Aquifer.

Layer 1 consists of the upper 150-950 feet of sediments and is generally representative of the shallow aquifer system. Layer 1 sediments are typically coarse (sand and gravel layers) and, where saturated, transmit large quantities of groundwater to wells due to high hydraulic conductivities. On the west side of the Chino Basin, Layer 1 sediments are composed of a greater fraction of finer-grained sediments (silt and clay layers), especially in the uppermost 100 feet. Layer 1 water quality is generally poor in the southern portion of the Basin with relatively high concentrations of TDS and nitrate. **Figure 2-6c** displays the profile view of cross-section J-J' (**Figure 2-5** shows the map view of the hydro Stratigraphic cross sections), which is aligned southwest-northeast and illustrates the thickening of layer 1 in the northeastern direction at the expense of layer 2. The thickening of Layer 1 is supported by the observation that the silt and clay layers, which are typical of Layer 2 sediments in the southwestern Chino Basin, become thinner and less abundant in the eastern and northeastern portion of the Basin. Layers 2 and 3 will not be discussed in detail due to the fact that the site is underlain by extensive clay strata and any contaminants that may leak from the site will not likely penetrate below Layer 1.

### 5.3 Hydraulic Conductivity

The vertical hydraulic conductivity of Layer 1 in the area of the subject site ranges from 5.4 x $10^{-7}$ to 2.5 x $10^{-3}$ cm/sec **(Figure 2-13a).** The hydraulic conductivity of the soil layer immediately beneath the site was determined by conducting soil percolation

tests following the procedure specified by County and local agencies. As shown on the site plan four locations within the composting working pads, and drainage pads area were designated for soil and hydraulic conductivity tests in accordance with the Technical guidelines. Two additional soil testing locations were designated along the perimeter of the detention pond.

**The soil percolation tests were conducted at a greater depth of 2 feet below the working pads, and below the bottom of the detention pond, at the designated locations shown on the site map on December 9th and 10th 2021. A copy of the soil percolation test results is attached in the Appendices.**

## 6. WASTEWATER MANAGEMENT SYSTEM

There is one groundwater well on site at a **greater distance than 100 feet** from the composting area, that is used for pumping and transfer of water to the water spray tanker trucks. Each tanker truck can hold up to 2,000 gallons of water. During the dry weather condition, the tanker truck turnover rate is about 20 times per day. In the mild weather, the turnover rate could fluctuate between 10 to 12 trucks per day. The tank truck sprays water into the wind row piles at a consistent rate. An attendant is onsite during the entire moistening process to assure that there is no over spraying or runoff from the spraying, and the water content within the piles is distributed evenly. As observed during the site inspection, no water is collected in the detention pond in non-rainy days or on rainy days with low precipitation. No water is stored in the pond primarily through-out the year, except on rainy occasions and during the wet season, which generally lasts for few days or few weeks depending on the duration or intensity of the rainy event. **Quarterly wastewater samples will be collected, when adequate amount of water is in the pond for collection of representative samples. A wastewater sample was collected during the last wet season and analyzed for the parameters listed in the Tech Report Guidelines for the Tier I composting facility. Copy of the test results is attached in the appendices.** It needs to be noted that the perimeter area around the composting operation is bermed and protected from run-on.

### 6.1 Storm water Run-off/Run on

The site is bordered on the north by Edison Avenue, and on the south, east and west by adjacent dairy, and pasture land area. There are no potential of stormwater runoff or run on from the property boundary areas. According to the Riverside County Flood Control, the average annual precipitation in the Chino/Ontario area is about 13 inches. The rain fall during the 25 yr, 24 hr storm event is around 4.2 inches. The nearest weather station at the Chino Airport indicate a maximum annual rainfall is about 15 inches. A review of the published data shows a mean annual evaporation rate in the Chino area of 75 inches. As shown in the site plan, the property is sloped to the south, and the stormwater runoff from the green waste compost production & side operations drains to the big pond situated on the south side of the composting facility via the compacted and sloped drainage pathways in between the piles. The stormwater runoff from the composting area drainage pathway is led to several surface inlets of 4 to 5 feet in width along the bermed-up length of the detention pond (see the site plan). Stormwater runoff from the non

production area flows toward the southwest side of the pond.

### 6.2 Stormwater Containment Volume

The proposed retention pond containment volume exceeds the total volume required for the annual rainfall and 25 yr, 24 hr storm. The containment volumes for the proposed ponds at the site are as follows:

**Pond's Containment Capacity**

| **Pond No.1** | **Area (Sq. Ft.)** | **Average Depth (Ft.)** | **Volume (Cuft.)** |
|---|---|---|---|
| **780' x 86'x12' (Avg)** | **64740** (sloped sides) | **12** | **776,880** |

**Total Area= 64740 Sq. ft** **Total Existing Volume= 776,880 Cu. ft**

Runoff from 25-year-24-hour storm 399,700 cu. ft., 9.17 acre-ft
Runoff from 150-day annual rainfall 382,602 cu. ft., 8.78 *acre-ft.*
Suspended Solids Volume = 50 cu. ft.
Total Containment Volume Required 743,526 Cu. Ft, 17.95 acre-ft

Runoff from the 25-year, 24-hour storm was calculated as shown in Appendix I. The 25-year, 24-hour rainfall was calculated according to plate E-5.7 in the *Riverside County Hydrology Manual.* (Riverside County was used because it provides an expanded chart). Rainfall was converted to runoff using Figure C-5, with roofed areas assigned a watershed curve number (CN) of 100, paved areas a CN of 97, and unpaved areas a CN of 90.

The containment pond capacity exceeds the 24 hr-25year storm and 150 days annual rainfall without taking into account the additional losses in evaporation.

The RWP-IV green waste composting operation is a Tier I facility. There is no process wastewater discharge or stormwater runoff from this operation off-site at the facility. The facility has obtained a NONA permit from the Regional Water Board for containing the entire stormwater runoff during a 25-year, 24-hour storm.

## 7. SITE DESIGN INFORMATION

The composting facility is designed and built to minimize soil erosion and dust formation, by having paved, and gravel roadways for materials delivery and movement. The roadways are built around the composting area, to make easy access to the windrow piles. All working surfaces are properly graded and compacted to prevent ponding and ease the surface water flow from storm events. Areas used for receiving, processing, and delivery of composting materials are designed, constructed, and maintained to control and manage stormwater run-on, and runoff.

The current size of the containment pond is 780' L. X 86' W. X 8' H. However, the containment pond will be enlarged within the next few weeks ( by November 30, 2022) by increasing the average depth of the pond from 8 feet to 12 feet. The overall dimensions of the pond will be 780' L. X 86' W. X 12' H. The composting area working pads, and drainage pathways are graded and compacted at greater than 90 %. compaction. The compacted area meets the design criteria set for the hydraulic, and soil percolation rate limits set by the State's Water Board. Hydraulic tests were conducted at the working pads, and the pond area to demonstrate compliance ( see the test results in the appendices section). The proposed pond has extra holding capacity to capture 24 hr, 25 yr storm, and annual rainfall from the composting and non-composting operations at the site.

## 8. EROSION CONTROL PLAN

The prevalent slope per onsite observation ( **no survey data is available**) is toward the southeast, where, the large containment pond is situated. The site is graded properly to prevent the settling of stormwater and soil erosion associated with loose soil and water accumulation. The composting facility and the side operations are inspected by the operators on a regular basis and prior to the start of the wet season. The production area is scraped on an annual basis and cleared from any residue that may have been accumulated during the composting process. Working surfaces are monitored after each storm event, and areas with an uneven grade, or loosened soil are compacted and re-graded. To prevent ponding and ease the stormwater flow to the containment area, all weeds, dead vegetation, and debris that may be encountered in the water flow path is cleared. Mosquito and Vector control measures are strictly enforced, and operators are trained to conduct a weekly inspection, to ensure the integrity of the structure, that there are no holes in the bermed-up areas, and soil erosion does not occur due to the presence of gophers, rabbits, rats, etc.. Additional compaction and reshaping of the bermed areas will be done if any breakdown or soil erosion is encountered.

## 9. OPERATIONS & MONITORING

To comply with the **Water Quality Board Order WQ-2015-0121-DWQ, as amended by order WQ-2020-0012-DWQ,** the facility operators are trained to conduct maintenance

and monitoring of the composting operations periodically. The operators conduct quarterly inspections of the working surfaces, berms, drainage path,

and facility perimeter. The composting facility operator also follows a strict procedure in odor control, and the site is cleaned and the residuals are placed in trash bins and hauled out onweekly basis. The composting facility has an in-house odor control program and a trained staff that conduct routine inspection and maintenance to prevent the growth of vegetation and the formation of algae in the drainage pathways and the pond area.

The facility operators are also trained in utilizing erosion control Best Management Practices (BMP). A thorough inspection of the facility is conducted on annual basis, prior to the start of the wet season to assure that no residues remain on the ground, through scraping and cleaning of the material production area, and working surfaces. Any area with loose or eroded soil will be resurfaced, compacted, and re-graded. The containment pond structure, embankments, berms, and surface drainage areas will be inspected for signs of surface failure, such as cracking or spilling. Any visible sign of surface deterioration will be logged, and taken care of within 24 hrs. Additional measures are taken during the dry season, by preventing soil erosion and dust formation, by slightly wetting and compacting the working surfaces if needed. Receiving and delivery trucks' tires are also inspected and cleaned from dust and debris.

During the rainy event, the piled material will be checked and turned over on an as-needed basis, to prevent wastewater or leachate formation. The operators will inspect the entire facility one day after each major storm event, and log in their observations. Stormwater runoff resulting in the formation of ponding will be collected and cleared within 24 hrs. If any damages are encountered, it will be repaired, and the surface will be graded, and compacted within 10 days of the storm event. The encountered damages and repairs conducted along with visible pictures will be included in the annual report submitted to the Regional Water Board The detention pond will be monitored after each storm event to determine the depth and level of the water collected. The pond will be equipped with a scaled stick for measuring the collected water in the deepest area. During the last few years of composting at the site, the operators have observed that the water collected duringthe rainy days is due to stormwater runoff. Generally few days after the rainfall the pond is dried, and no water is collected until the next rainfall. **A quarterly sampling of stormwater runoff and wastewater that is stored in the detention pond will be conducted, provided that adequate volume is collected for representative sampling.** On January 10, 2022, representative samples of the water in the pond were collected and analyzed for the parameters listed in the Technical Guideline for Tier I composting operations. The test report (see Appendix VI) showed a low concentration of the tested parameters. E Coliform will be added to the list of parameters that are to be analyzed.

Additional measures will be taken to maintain the containment pond integrity and holding capacity. The pond will be cleaned of any vegetation, dead algae, and debris. A mosquito, and vector control plan in accordance with the San Bernardino County Department of Public Health has been implemented onsite. The working surface area is cleaned from any trash, and residues on a regular basis, and maintained free of odor. All trash are collected in covered trash bins and hauled out of the facility on a weekly. Surface drainage and the pathway to the containment pond are also inspected on a weekly basis to ensure it is free of debris and sediments to ease the conveyance of water runoff. During heavy rainfall, if any of the piles can no longer absorb the precipitation, will be coveredwith a tarp to prevent material runoff, soil erosion, or the formation of a slurry.

## 10. CLOSURE PLAN

Due to the type of composting operation, and size of the production and location, as well a routine maintenance monitoring program, the chances of soil or groundwater contamination has been minimized. However, the operator, 90 days prior to vacating the site, or ceasing the operation, will submit a detailed closure plan to the Santa Ana Regional Water Quality Control Board (RWQCB) specifying the site condition, and methods used for inspection, cleaning and disposal of residues, or any potentially contaminated area. Per obtaining the plan approval, the closure activities will be conducted. The RWQCB, and local enforcement agency will be notified in writing at the conclusion of the closure activities.

## 11. COMPLIANCE SHEDULE

To show compliance with the State's Water Board requirement, **RWP-IV** conducted soil percolation tests in accordance with the Technical Guidelines per the site map designated locations of the composting area working pads and the detention pond on December 9th & 10th 2021 ( Appendix VII). The test result showed the water percolation rate well below allowable limits in Table I of the Technical Guidelines. One of the locations chosen for testing failed due to the build-up of silt and sediments. The containment pond enlargement shall be completed by November 30th 2022.

## 12. REFERENCES


**1.0** Composting facility site inspection, February 28, 2020.

**2.0** California Water Quality Control Boards Technical Guidelines, August 4, 2015.

**3.0** Riverside County Flood Control Hydrology Manual, April 1978.

**4.0** Chino Basin 2013 Groundwater Model Update, by Wildermuth Environmental, October 2015

**5.0** DWR, Groundwater Wells Profile.

**6.0** Updated information on materials storage, and operation status at the site, furnished by Nathan De Boom, April 14. 2021.

**7.0** Soil Test Report, RWP-4, Chino, March 2022

**8.** Pond Water Test Report, RWP-IV, Chino, December 2021

# Appendix I:

# Storm water Runoff Storage Pond Evaluation

## Storm & Wastewater Storage Pond Capacity Evaluation

**Dairy Farm**: Recycled Wood Products #4 **Location** Ontario, CA
**Prepared By**: Saeed Ahdout **Date**: 9/26/2022 **Checked By**: FB.

***Runoff Volume Computations***

Average 150 days Rainfall 13 inches 25-year, 24-hour Rainfall: 4.5 inches

**Roofed Area Runoff** (CN= 100) ( 13 + 4.5 ) x 22,260/12 = 32,463

| 150 days Rainfall (inches) | 25-yr, 24-hr Rainfall (inches) | Roof Area (sq. ft) | Runoff Volume (cu. ft.) |
|---|---|---|---|

Paved Area Runoff **(CN= 97)** ( 13 + 4.2 ) **x** 25,000 /12 = 35,833

| 150 days Rainfall (inches) | 25-yr, 24-hr Rainfall (inches) | Area (sq. ft) | Runoff Volume (cu. ft.) |
|---|---|---|---|

Annual Runoff % _____

**Earthen Area Runoff** (CN= 90) ( 2.6 + 3.4) x 31 x 3,630 = 675,180

| 150 days Rainfall (inches) | 25-yr, 24-hr Rainfall (inches) | Area (acres) | Runoff Volume (cu. ft.) |
|---|---|---|---|

Annual Runoff % 20

**Design Runoff Volume = 743,476**

***Storage Volume Computations***

***Design Runoff Volume*** (cu. ft.): **743,476**
(from calculation above)
**Solids Weight** (tons): 1.0
(Multiply tons/year by 50 cu. ft/ton.): 50
***Other Solids Volume*** (cu. ft.): _____

***Process Wastewater Volume*** (cu. ft.): 0
(Divide gallons/year by 7.5 cu. ft.)
***Total Volume Required*** (cu. ft.): **743,526**

***Approximate Design Dimensions*** Depth 12 Width 86 Length 780
(select dimensions from Table 8c that result in a pond volume equal or greater than the design volume)

**Existing Containment Volume**: **776,880**
(cu.ft.)

**The existing pond containment capacity, exceed the proposed containment volume.**

# Appendix II:

## GENERAL Geology & Hydrology Maps

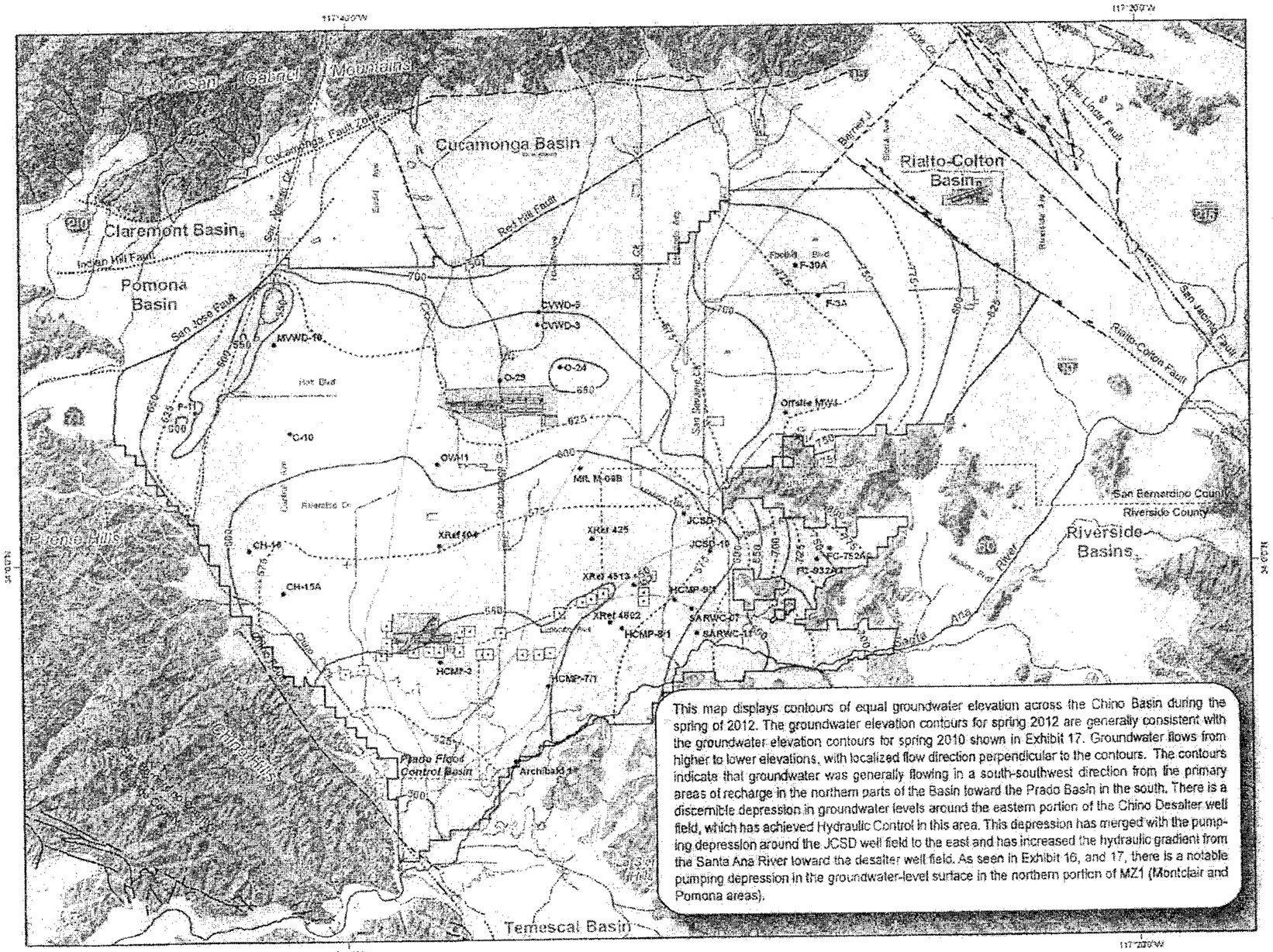


This map displays contours of equal groundwater elevation across the Chino Basin during the spring of 2012. The groundwater elevation contours for spring 2012 are generally consistent with the groundwater elevation contours for spring 2010 shown in Exhibit 17. Groundwater flows from higher to lower elevations, with localized flow direction perpendicular to the contours. The contours indicate that groundwater was generally flowing in a south-southwest direction from the primary areas of recharge in the northern parts of the Basin toward the Prado Basin in the south. There is a discernible depression in groundwater levels around the eastern portion of the Chino Desalter well field, which has achieved Hydraulic Control in this area. This depression has merged with the pumping depression around the JCSD well field to the east and has increased the hydraulic gradient from the Santa Ana River toward the desalter well field. As seen in Exhibit 16, and 17, there is a notable pumping depression in the groundwater-level surface in the northern portion of MZ1 (Montclair and Pomona areas).

Groundwater Elevation Contours (feet above mean sea-level)

Boundry of Contoured Area (contours are not shown outside of this boundary due to lack of water level data)

Well With a Water-Level Time History Plotted on Exhibits 24 through 28.

OSMP Management Zones

Chino Desalter Wells

Streams & Flood Control Channels

Flood Control & Conservation Basins

**Geology**

*Water-Bearing Sediments*

Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain

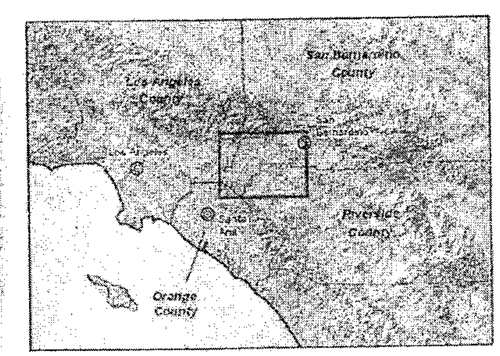


Produced by:

WILDERMUTH ENVIRONMENTAL

23692 Birtcher Drive
Lake Forest, CA 92630
949-420-5010
www.wildermuthenvironmental.com

Author: TCR
Date: 20121130
File: Exhibit_18.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 KM

2012 State of the Basin
*Groundwater Levels*

**Groundwater Elevation Contours in Spring 2012**

*Shallow Aquifer System*

**Exhibit 18**

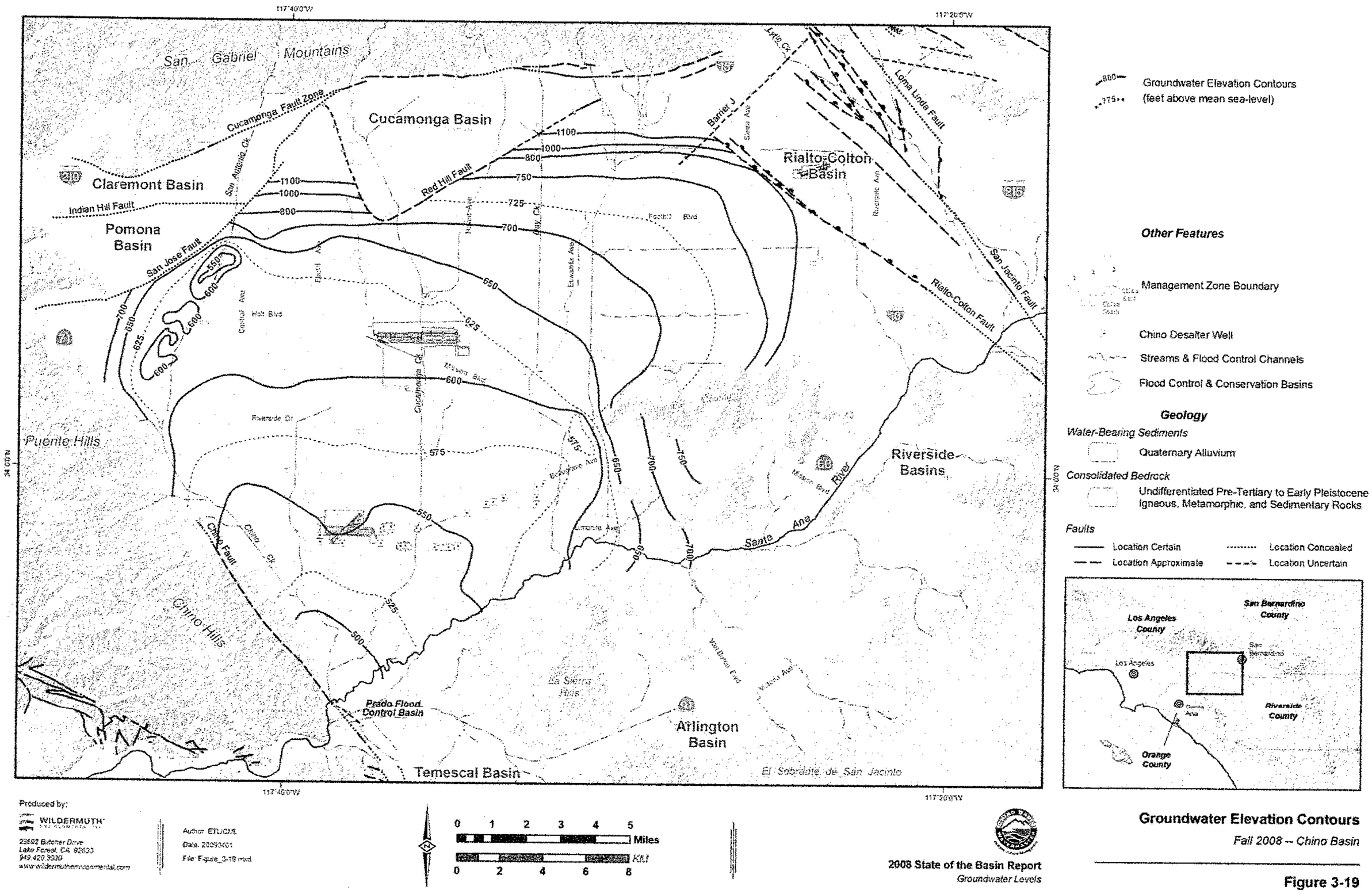


Produced by:
WILDERMUTH ENVIRONMENTAL
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

Author: ETL/CMR
Date: 20090401
File: Figure_3-19.mxd

2008 State of the Basin Report
*Groundwater Levels*

**Groundwater Elevation Contours**
*Fall 2008 -- Chino Basin*

**Figure 3-19**

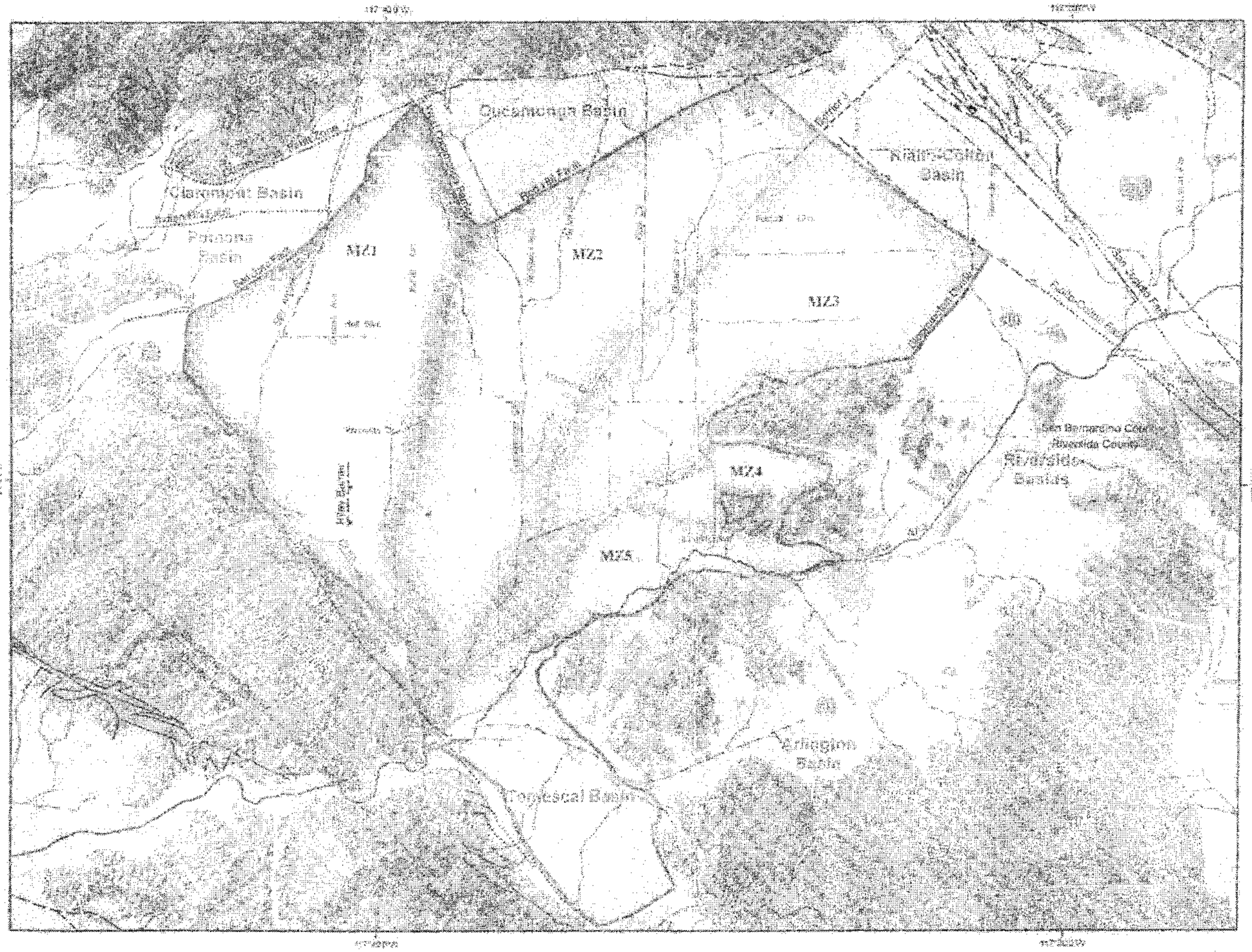


**Geologic Map and Boundaries of the Chino Basin**

**Figure 2-1**

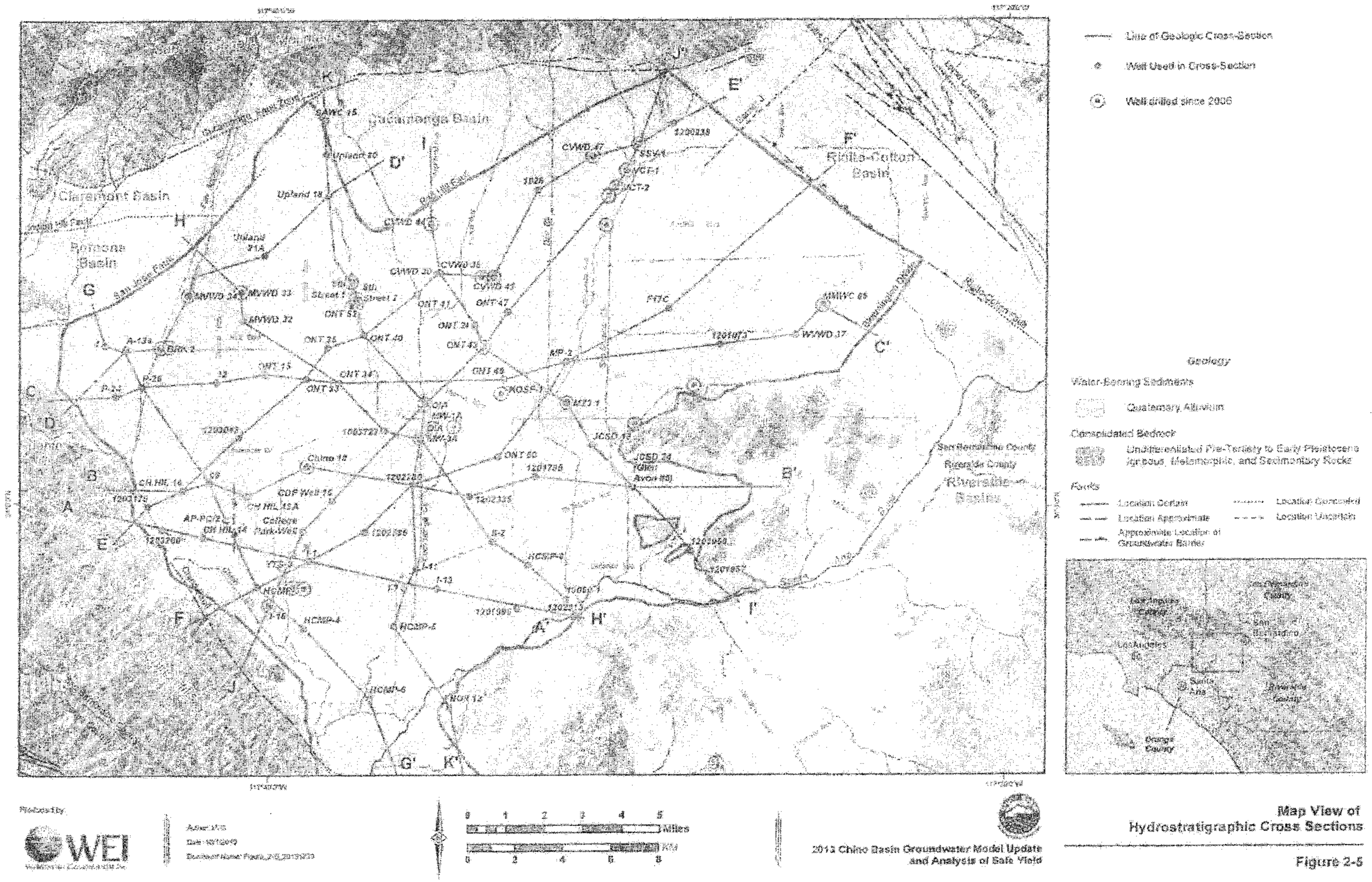


Prepared by:

WEI

2013 Chino Basin Groundwater Model Update and Analysis of Safe Yield

**Map View of Hydrostratigraphic Cross Sections**

Figure 2-5

# Appendix III:

# GROUNWATER WELL PROFILE

ORIGINAL
File with DWR

APR 30 1977

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

# WATER WELL DRILLERS REPORT

*Do Not Fill In*

№ 107275

State Well No.
Other Well No. 02S/07W17E

(1) OWNER:
Name [redacted]
Address

(2) LOCATION OF WELL:
County San Bernardino Owner's number, if any
Township, Range, and Section
Distance from cities, roads, railroads, etc. 500' East of Walker and 250' South of Schaeffer

(3) TYPE OF WORK (*check*):
New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐
*If destruction, describe material and procedure in Item 11.*

(4) PROPOSED USE (*check*):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) EQUIPMENT:
Rotary ☒
Cable ☐
Other ☐

(6) CASING INSTALLED:
STEEL: SINGLE ☒ DOUBLE ☐ OTHER:

| From ft. | To ft. | Diam. | Gage or Wall | Diameter of Bore | From ft. | To ft. |
|---|---|---|---|---|---|---|
| 0 | 450 | 16 | 1/4 | 26" | 0 | 454 |

If gravel packed

Size of shoe or well ring: Bull Nose Size of gravel: 3/8" Pea
Describe joint: Butt Weld

(7) PERFORATIONS OR SCREEN:
Type of perforation or name of screen: Vertical Mill Slot

| From ft. | To ft. | Perf. per row | Rows per ft. | Size in. x in. |
|---|---|---|---|---|
| 280 | 450 | 16 | 4 | 2½ X 1/8 |

(8) CONSTRUCTION:
Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth 50 ft.
Were any strata sealed against pollution? Yes ☐ No ☒ If yes, note depth of strata
From ft. to ft.
From ft. to ft.
Method of sealing 30" Conductor Cemented In 36" Hole

(9) WATER LEVELS:
Depth at which water was first found, if known ft.
Standing level before perforating, if known ft.
Standing level after perforating and developing 149 ft.

(10) WELL TESTS:
Was pump test made? Yes ☒ No ☐ If yes, by whom? McCalla Bros.
2000 gal./min. with 88 ft. drawdown after 37 hrs.
Temperature of water Was a chemical analysis made? Yes ☐ No ☒
Was electric log made of well? Yes ☐ No ☒ If yes, attach copy

(11) WELL LOG:
Total depth 454 ft. Depth of completed well 450 ft.
Formation: *Describe by color, character, size of material, and structure*

| From ft. | To ft. | Formation |
|---|---|---|
| 0 | 50 | Conductor |
| 50 | 98 | Sand and Gravel |
| 98 | 136 | Clay and Streaks of Gravel |
| 136 | 161 | Gravel |
| 161 | 164 | Fine and Coarse Sand |
| 164 | 168 | Clay |
| 168 | 170 | Sand and Gravel |
| 170 | 175 | Clay |
| 175 | 190 | Sand, Gravel and Clay Streaks |
| 190 | 204 | Sand and Gravel |
| 204 | 206 | Clay |
| 206 | 212 | Sand, Gravel and Clay Streaks |
| 212 | 230 | Clay |
| 230 | 240 | Sand and Gravel |
| 240 | 249 | Clay |
| 249 | 255 | Sand and Gravel |
| 255 | 265 | Clay |
| 265 | 270 | Sand and Gravel |
| 270 | 284 | Clay |
| 284 | 296 | Sand and Gravel |
| 296 | 300 | Clay |
| 300 | 361 | Sand, Gravel and Boulders |
| 361 | 381 | Clay |
| 381 | 406 | Sand and Gravel |
| 406 | 410 | Clay |
| 410 | 415 | Sand and Gravel |
| 415 | 426 | Clay |
| 426 | 450 | Sand and Gravel |
| 450 | 454 | Clay |

elev 720

850 GPM @ 190' Pump Level
1200 GPM @ 202' Pump Level
1700 GPM @ 224' Pump Level
2000 GPM @ 237' Pump Level

CONFIDENTIAL - NOT FOR PUBLIC RELEASE

Work started 6-30-76 19 Completed 10-18-76

WELL DRILLER'S STATEMENT:
*This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.*

NAME McCalla Bros.
(Person, firm, or corporation) (*Typed or printed*)
Address 3819 West First Street
Santa Ana, CA 92703
[SIGNED] (*Well Driller*)
License No. 196824 Dated April 26, 1977, 19

SKETCH LOCATION OF WELL ON REVERSE SIDE

DWR 188 (REV. 9-68)

47150-260 9-72 30M YKIP Ⓣr OBP

# Appendix IV:

# FEMA Flood Zone Map

SITE

## NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations** shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11 North. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

**Base map** information shown on this FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency. This imagery was flown in 2005 and was produced with a 1-meter ground sample distance.

This map may reflect more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

**WARNING:** This map contains levees, dikes, or other structures that have been provisionally accredited and mapped as providing protection from the 1-percent-annual-chance flood. To maintain accreditation, the levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10 by August 8, 2009. Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.

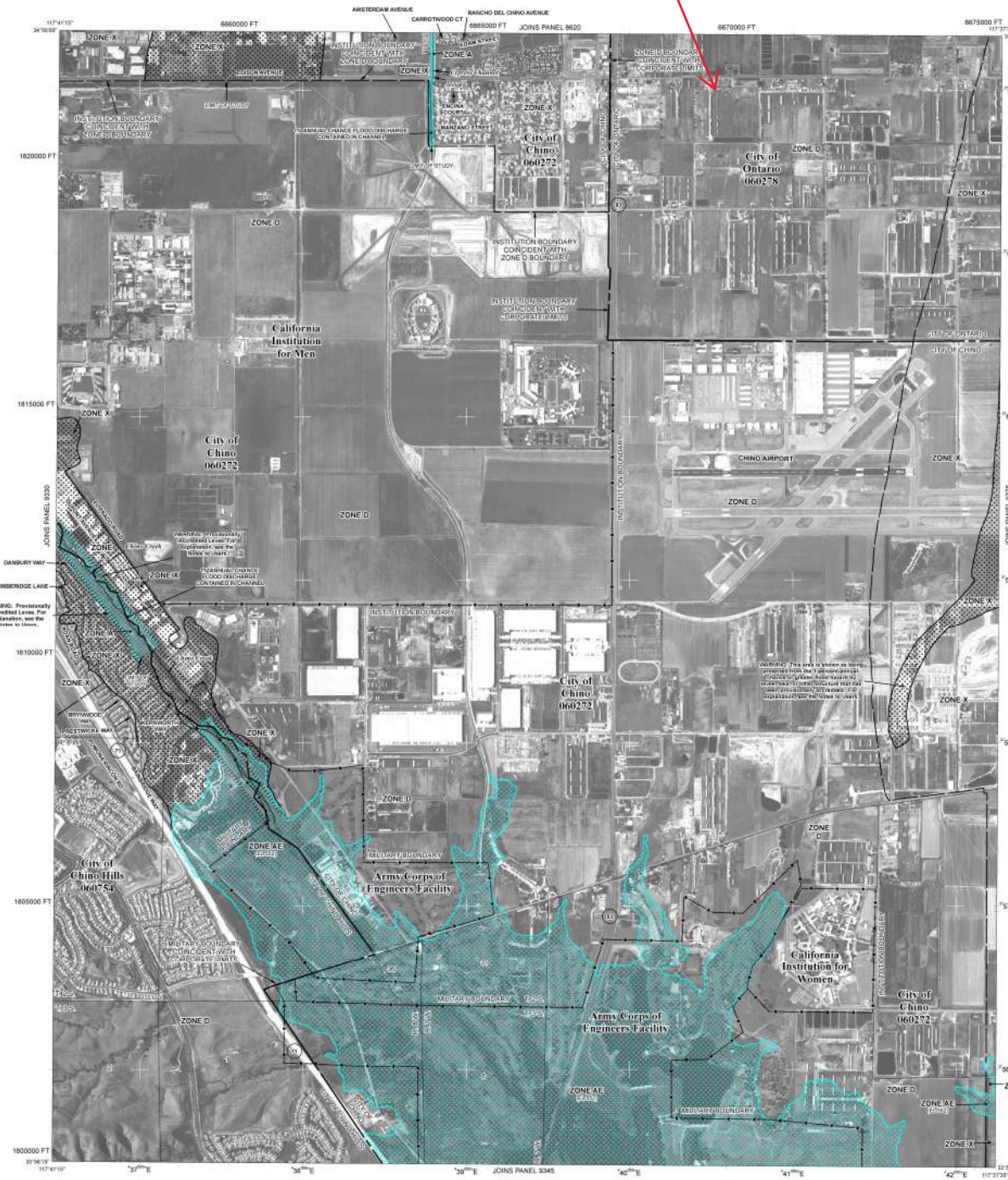


## LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

| | |
|---|---|
| ZONE A | No Base Flood Elevations determined. |
| ZONE AE | Base Flood Elevations determined. |
| ZONE AH | Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined. |
| ZONE AO | Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined. |
| ZONE AR | Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood. |
| ZONE A99 | Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined. |
| ZONE V | Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined. |
| ZONE VE | Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined. |

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

~~~ 513 ~~~ Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

\* Referenced to the North American Vertical Datum of 1988

(A)———(A) Cross section line

(B)- - - - - -(B) Transect line

87°07'45", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

4276000 FT N 1000-meter Universal Transverse Mercator grid values, zone 11N

600000 FT 5000-foot grid ticks: California State Plane coordinate system, zone V (FIPSZONE 0405), Lambert Conformal Conic projection

DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)

•M1.5 River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
March 18, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 28, 2008 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 9335H

# FIRM

FLOOD INSURANCE RATE MAP

**SAN BERNARDINO COUNTY, CALIFORNIA**
AND INCORPORATED AREAS
**PANEL 9335 OF 9400**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CHINO HILLS, CITY OF | 060754 | 9335 | H |
| CHINO, CITY OF | 060272 | 9335 | H |
| ONTARIO, CITY OF | 060278 | 9335 | H |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**06071C9335H**

**MAP REVISED**
**AUGUST 28, 2008**

Federal Emergency Management Agency
~~~

# Appendix V:

# Site Plan

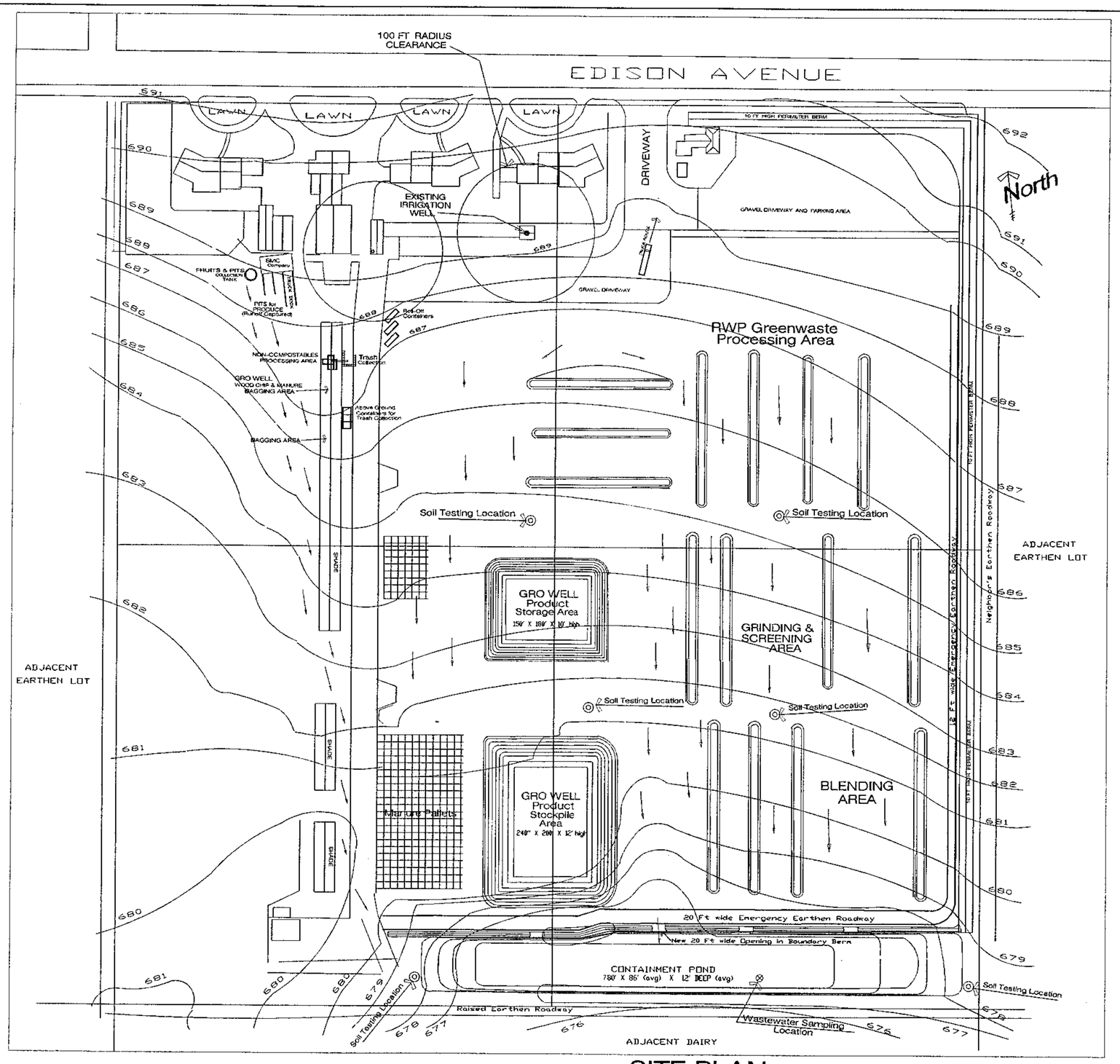


## SITE PLAN

Scale : 1"=75'

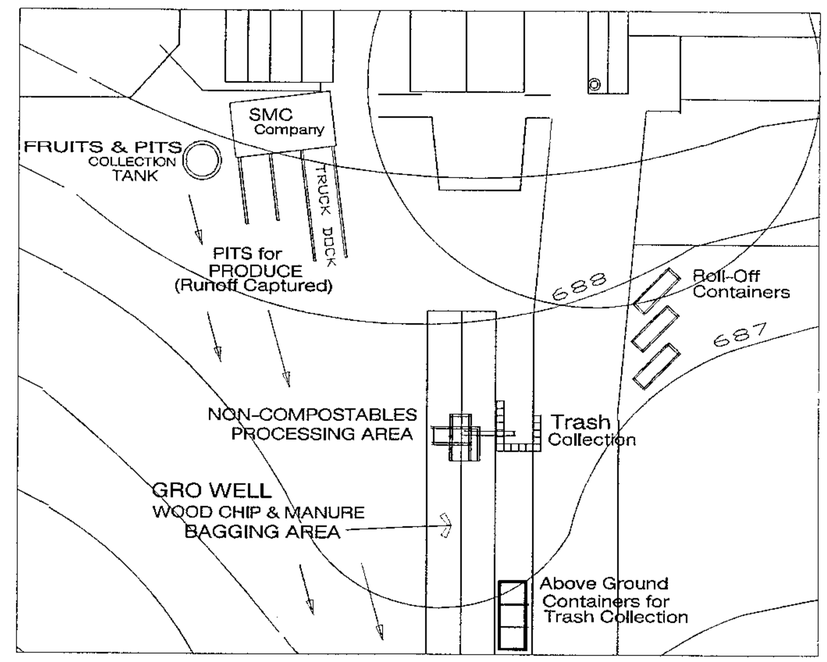


## NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

### GRADING NOTES

1. ALL DIKES AND BERMS SHALL BE CONSTRUCTED OF MINERAL EARTH FREE OF VEGETATION AND DELETERIOUS MATERIAL.
2. NO ROCKS OR COBBLES GREATER THAN 6 INCHES IN DIAMETER SHALL BE PLACED IN ANY FILL.
3. ALL AREAS TO RECIEVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.
4. ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES, WHEELED ROLLED AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

### KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILLWAY

DIGALERT

CALL TOLL FREE 1-800-227-2600 AT LEAST TWO DAYS BEFORE YOU DIG.

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SITE CONDITION RESPONSIBILITY:

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDASNCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 210
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APPVD | DATE |
|---|---|---|---|---|
| 3 | np | SMC flow lines and N arrow | | 9/12/23 |
| 2 | np | Pond depth increase | | 9/29/22 |
| 1 | np | Wastewater sampling location, fruits & pits collection tank | | 8/26/22 |

# SITE PLAN
## RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. 1053 - 391 - 01

DATE: 5-20-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2020
SHEET 1 OF 1

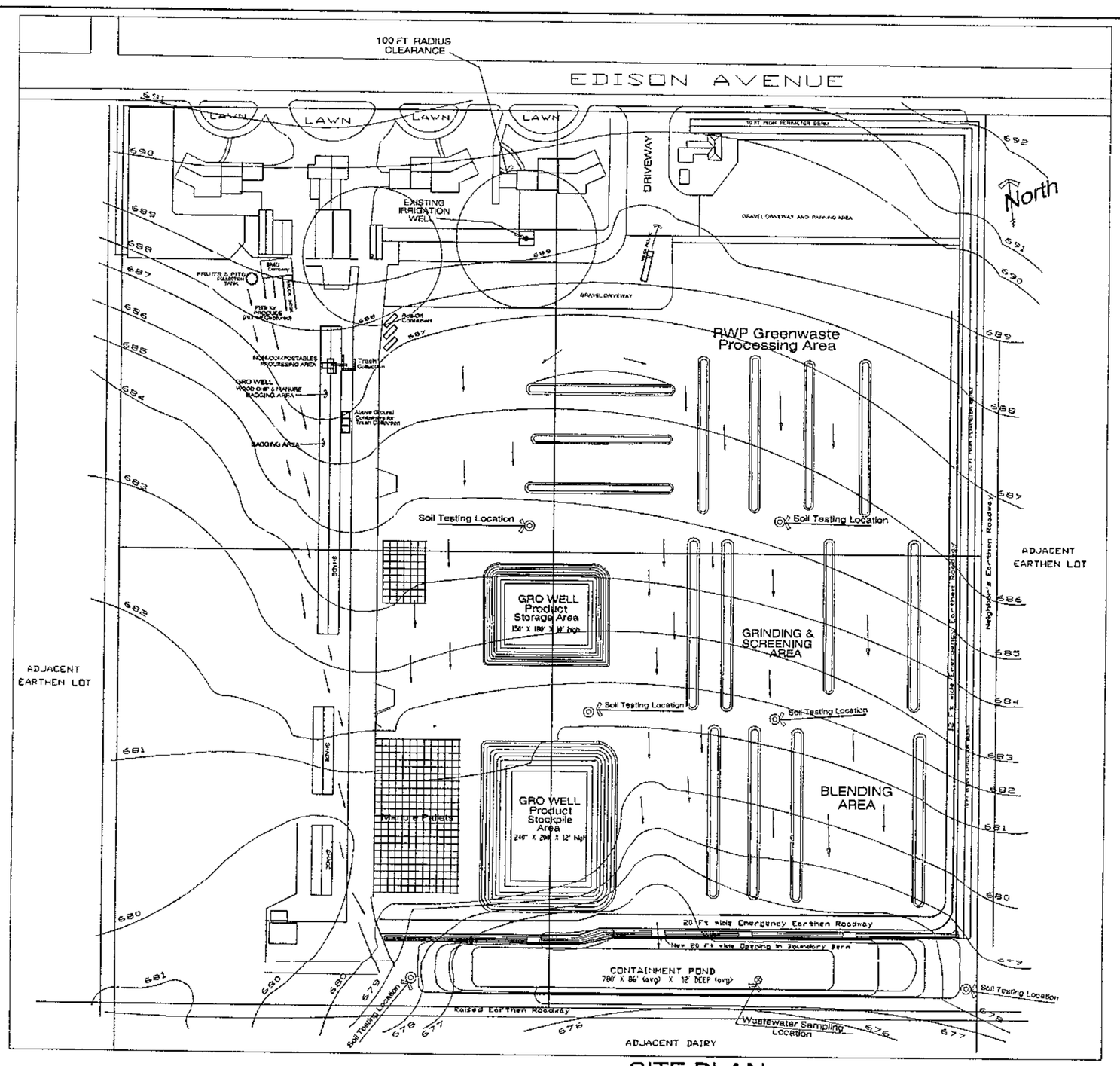


SITE PLAN

Scale : 1"=75'

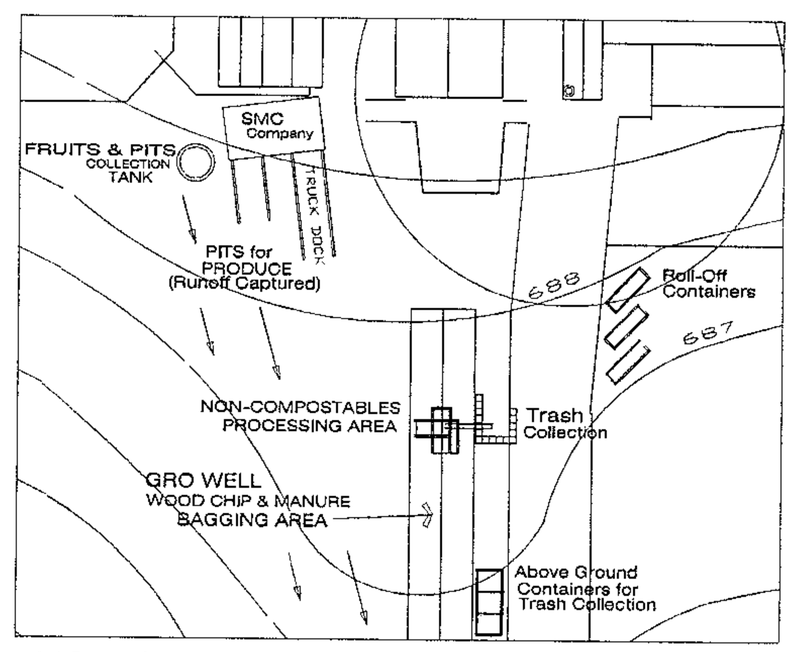


NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

GRADING NOTES

1 ALL DIKES AND BERMS SHALL BE CONSTRUCTED OF MINERAL EARTH FREE OF VEGETATION AND DELETERIOUS MATERIAL.
2 NO ROCKS OR COBBLES GREATER THAN 6 INCHES IN DIAMETER SHALL BE PLACED IN ANY FILL.
3 ALL AREAS TO RECIEVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.
4 ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES. WHEELED ROLLED AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILLWAY

DIGALERT

CALL TOLL FREE 1-800-227-2600 AT LEAST TWO DAYS BEFORE YOU DIG

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SITE CONDITION RESPONSIBILITY:

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 210
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APPVD | DATE |
|---|---|---|---|---|
| 3 | np | SMC Flow lines and N arrow | | 9/12/23 |
| 2 | np | Pond depth increase | | 9/29/22 |
| 1 | np | Wastewater sampling location, fruits & pits collection tank | | 8/26/22 |

SITE PLAN
RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. 1053 - 391 - 01

DATE: 5-20-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2020
SHEET 1 OF 1

# Appendix VI

# Pond Water Test Report

Waypoint ANALYTICAL

# Chain of Custody

23-034-0000
07327
02-03-2023
10:12:21

Residuals Recovery Group Inc/Aq Concepts
7325 Edison Storm Water Pond

| | | | |
|---|---|---|---|
| Company Name: Residuals Recovery | Account Number: 7327 | Phone Number | Analysis Requeste (Note special detection limits / r |
| Project/Site: 7325 Edison Stormwater Pond | State Project Location: CA | PO Number | |
| Type of Event (Routine Sampling Events Only): ☐ Single ☐ Daily ☐ Weekly ☐ Monthly ☐ Quarterly ☐ Semi-Annual ☐ Annually ☐ Bi-Monthly | | FID Number | |
| | | Project Number | |
| Project Manager/Contact: Nathan deBoom | RUSH ☐ (Surcharges may apply) | Matrix: 1) Wastewater 4) Sludge 2) Aqueous 5) Oil/Solvent 3) Soil/Sediment 6) Other | |
| E-mail Address: all | Ice ☐ | | |

SPL Quote No.

Which Regulations Apply?
☐ NPDES ☐ Risk Based Limits
☐ Wastewater ☐ TRRP 13
☐ RCRA ☐ LA RECAP
☐ UST ☐ USACE
Other ☐

| # of Containers | Sample ID/Number | Depth | Sample Date & Time | Matrix | Grab/Comp | TDS 50665 | Nitrite as N 50450 | | | | | | | | Comments | Lab ID Number (for internal use only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Edison Pond | 1' | 2/8/2023 9:00AM | | | X | X | | | | | | | | | 057807 |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
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| | | | |
|---|---|---|---|
| Sampled By: Nathan deBoom | Method of Shipment | Blank/Cooler Temp | Remarks |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished By (sign) | Date | Time | Received By (sign) | Date | Time |
| Relinquished By (sign) | Date | Time | Received By Lab (print/sign) | Date | Time |

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

## Sample Summary Table

**Report Number:** **22-010-0010**

**Client Project Description:** **7325 Edison Pond**

| Lab No | Client Sample ID | Matrix | Date Collected | Date Received | Method | Lab ID |
|---|---|---|---|---|---|---|
| 98137 | 7325 Edison Pond | Aqueous | 01/10/2022 14:33 | 01/10/2022 | 2540C-2011 | |
| 98137 | 7325 Edison Pond | Aqueous | 01/10/2022 14:33 | 01/10/2022 | EPA-300.0 | |

: A&L Analytical Laboratories, Inc., Memphis, TN

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

07327
Residuals Recovery Group Inc/Ag Concepts
7325 Edison Ave

Ontario , CA 91762

Project Information : 7325 Edison Pond

Report Number : **22-010-0010**

***REPORT OF ANALYSIS***

Report Date : 01/14/2022
Received : 01/10/2022

Lab No : **98137**
Sample ID : **7325 Edison Pond**

Matrix: **Aqueous**
Sampled: **1/10/2022 14:33**

**Analytical Method:** 2540C-2011

| Test | Results | Units | MQL | DF | Date / Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | **2240** | mg/L | 89.2 | 1 | 01/12/22 17:09 | CJR | L594400 |

**Analytical Method:** EPA-300.0 **Prep Batch(es):** **L594456** 01/13/22 09:16
**Prep Method:** EPA-300.0 (PREP)

| Test | Results | Units | MQL | DF | Date / Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Nitrite (NO2-N) | <10.0 H | mg/L | 10.0 | 100 | 01/13/22 18:49 | JCA | L594506 |
| Nitrate (NO3-N) | <10.0 H | mg/L | 10.0 | 100 | 01/13/22 18:49 | JCA | L594506 |
| Nitrate+Nitrite-N | <10.0 H | mg/L | 10.0 | 100 | 01/13/22 18:49 | | L594506 |

**Qualifiers/ Definitions**

DF Dilution Factor
MQL Method Quantitation Limit
H Beyond holding time

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

## *SOLUBLE FERTILIZER IN WATER*

| Send To: | Project : | Report No : | **22-010-0012** |
|---|---|---|---|
| Residuals Recovery Group Inc/Ag Concepts | 7325 Edison Pond | Cust No : | 07327 |
| 7325 Edison Ave | | Date Printed : | 1/12/2022 |
| Ontario , CA 91762 | | Date Received : | 1/10/2022 |
| | | Page : | Page 1 of 1 |

| Tests | | UOM | 98139 |
|---|---|---|---|
| Ammonium Nitrogen | NH4-N | ppm | 7 |
| Electrical Conductivity | ECw | dS/m | 2.63 |
| Hydrogen Ion Activity | pH | s.u | 7.5 |
| Nitrate Nitrogen | NO3-N | ppm | 0 |
| Total Nitrogen | TN | ppm | 70 |

| Lab No. | Sample ID |
|---|---|
| # 98139 | 7325 Edison Pond |

All analyses above performed on filtered sample.

# Appendix VII

# Soil Percolation Test Report

AM/PAC

1-800-564-7372
(951) 354-6500
FAX 354-8600

# PERCOLATION INVESTIGATION FOR A COMPOSTING OPERATION

**PROJECT NUMBER:** 21-14993

**DATE:** MARCH 14, 2022

**JOB SITE LOCATION:**

RECYCLED WOOD PRODUCTS, COMPOST FACILITY, TIER 1, AT:
7325 EDISON AVENUE ONTARIO, CA. 91762
APN: 1053-391-01-0000 & 1053-521-01 & 02-0000

**PREPARED FOR:**

AG CONCEPTS, INC.
ATT: MR. NATHAN DE BOOM (951) 452-1148
7325 EDISON AVENUE ONTARIO, CA. 91762
VIA E-MAIL: n8deboom@gmail.com

THIS REPORT IS NOT TRANSFERABLE WITHOUT THE WRITTEN AUTHORIZATION FROM AM/PAC AND ASSOCIATES, INC.

3 1422

GEORGE E. HAWES, VICE PRESIDENT
RCE [illegible]79 STATE OF CALIFORNIA
LIC. EXP [illegible]9/30/23

DATE

DAVID [illegible]GER, PRESIDENT
AM/PAC [illegible]OCIATES, INC.

this official s[illegible] is in [illegible]
otherwise a copy

REGISTERED PROFESSIONAL ENGINEER
GEORGE E. HAWES
No. C034779
STATE OF CALIFORNIA

AM/PAC AND ASSOCIATES, INC.
2900 Adams St., Suite C-35 • Riverside, CA 92504

**PROJECT NUMBER:** 17-13272 **DATE:** NOVEMBER 10, 2017

**1.1 CLIENT REQUESTING REPORT:**

AG CONCEPTS, INC.
ATT: MR. NATHAN DE BOOM (951) 452-1148
7325 EDISON AVENUE ONTARIO, CA. 91762
VIA E-MAIL: n8deboom@gmail.com

**1.2 JOB SITE LOCATION:**

RECYCLED WOOD PRODUCTS, COMPOST FACILITY, TIER 1, AT:
7325 EDISON AVENUE ONTARIO, CA. 91762
APN: 1053-391-01-0000 & 1053-521-01 & 02-0000

ASSESSORS, VICINITY MAPS AND THE SITE PLAN ARE FOUND IN THE APPENDIX OF THIS REPORT

**1.3 PROPOSED DEVELOPMENT:**

THIS IS AN EXISTING RECYCLED WOOD COMPOSTING PLANT. THE DESIGN CIVIL ENGINEER AND THE FACILITY MANAGER HAVE REQUESTED A PERCOLATION/INFILTRATION INVESTIGATION TO COMPLY WITH THE "STATE WATER RESOURCES CONTROL BOARD, ORDER WQ 2015-0121-DWQ".

**PURPOSE AND SCOPE OF THIS REPORT:**

THIS TEST AND INVESTIGATION WAS PERFORMED TO DETERMINE THE PERCOLATION RATE AT 6 PREDETERMINED LOCATIONS ON THE PROPERTY. THE DATA IS TO BE UTILIZED BY THE DESIGN CIVIL.

**1.4 PROPERTY DESCRIPTION:**

THIS PARCEL IS A TOTAL OF 55.28 ACRES, 3 SEPARATELY DEEDED PARCELS, RECTANGULAR IN SHAPE, FRONTING EDISON AVENUE ALONG THE NORTHERLY LOT LINE AND SULTANA AVENUE ALONG THE WESTERLY LOT LINE OF THE PROPERTY. NO ROCK OUTCROPPINGS, TREES, SEASONAL DRAINAGE COURSES OR DETRIMENTAL FEATURES WERE NOTED ON THE PROPERTY.

GROUNDCOVER OF THE PROPERTY CONSISTS OF COMPOSTED WOOD AND BARE SOIL. TOPOGRAPHY IS NOTED AS FALLING FROM THE NORTHERLY PROPERTY LINE DOWN TO THE SOUTHERLY PROPERTY LINE APPROXIMATELY 13 FEET OVERALL. NO NEIGHBOR WELLS WERE NOTED WITHIN 100' OF THIS PARCEL. THIS PARCEL IS EASILY FOUND. PLEASE SEE THE VICINITY MAP, ASSESSORS PARCEL MAP AND GOOGLE EARTH AERIAL ATTACHED.

**2. EQUIPMENT USED:**

PER THE COUNTY OF SAN BERNARDINO, DEPARTMENT OF ENVIRONMENTAL HEALTH'S REQUIREMENTS: ALL EXCAVATIONS WERE MADE USING AM/PAC'S TRUCK MOUNTED MOBILE DRILL B-34, CONTINUOUS FLIGHT AUGER, DRILL RIG. AN 8" DIAMETER AUGER WAS USED TO EXCAVATE THE PERCOLATION TEST HOLES AND THE EXPLORATORY BORING.
ALSO UTILIZED DURING TESTING WAS A SOLINST WATER LEVEL METER, PERFORATED PIPE SLEEVES TO DEPTH AND A 300 GALLON WATER TANK.

**3.1 LOCATION OF EXPLORATORY BORINGS AND TRENCHES:**

THE CLIENT HAS PROVIDED THIS OFFICE WITH A SITE PLAN IN AN ENGINEERS SCALE. THIS OFFICE HAS UTILIZED THE PLAN FOR USE AS A TEST LOCATION PLOT PLAN.

**3.2 SOIL CHARACTERISTICS:**

THE SOILS IN THIS GEOGRAPHICAL AREA OF THE COUNTY AS WELL AS THE SOILS EXCAVATED ON THIS PROJECT, ARE BEST DESCRIBED, AS FAVORABLE. THE SOIL IS SANDY WITH NO CLAYS OR SILTS. THERE IS NO VISUAL EVIDENCE OF SHALLOW GROUNDWATER, BEDROCK, IMPERVIOUS MATERIALS, ETC. TESTS AND BORINGS PERFORMED AGREE WITH THE VISUAL EVIDENCE. THE NATURAL/FINISHED SLOPE OF THE AREA IS LESS THAN 5%.

**3.3.1 BORING/TRENCHING LOG:**

| | | |
|---|---|---|
| 0-5' | S/M | TANNISH BROWN SANDS, SILTY-FINE GRAINED SANDS, SLIGHT AMOUNTS OF SUB-ANGULAR GRAVELS AND COBBLES 1" TO THE LARGEST DIMENSION, LOOSE AND MOIST. |
| 5-10' | S/M | MEDIUM BROWN, SILTY-FINE TO MEDIUM GRAINED SANDS, FIRM AND DRY. |
| 10-15' | S/W | MEDIUM BROWN, FINE GRAINED SANDS, DENSE AND DRY. |

## GROUNDWATER INFORMATION

GROUNDWATER AT THE TIME OF BORING: NONE
GROUNDWATER AT THE 24 HR. RECHECK: NONE
MONITORING WELL INSTALLED? YES

**3.3.4 MINIMUM NUMBER OF TESTS:**

TESTING WAS PERFORMED PER THE STATE OF CALIFORNIA, WATER RESOURCES CONTROL BOARD, ORDER WQ 2015-0121-DWQ, GENERAL WASTE DISCHARGE REQUIREMENTS FOR COMPOSTING OPERATIONS, DATED AUGUST 4, 2015. NOTED WAS ATTACHMENT A (PAGE A-6) "PERCOLATION TEST". THE REQUIREMENT IS NOTED AS FOUR PERCOLATION TEST HOLES A MINIMUM OF 24 INCHES DEEP THROUGHOUT THE OPERATIONS PAD AREA
(SEE TESTS 1-6)

ALSO, TWO PERCOLATION TEST HOLES OUTSIDE OF THE PERIMETER OF THE DETENTION POND NEAREST THE DEEPEST CORNER (SEE TEST 1 AND 2) THESE HOLES MUST BE DRILLED 24" DEEPER THAN THE BOTTOM OF THE DETENTION POND.

PERCOLATION TESTING HAS BEEN CONDUCTED IN THE MANNER SET FORTH BY THE COUNTY OF SAN BERNARDINO DEPARTMENT OF ENVIRONMENTAL HEALTH, LAND USE DIVISION AS SET FORTH IS THE PUBLICATION, "PERCOLATION TESTING AND REPORT WRITING FOR ON-SITE WASTE-WATER TREATMENT SYSTEMS, "SEPTEMBER 2019. AS NOTED ON THE COVER PAGE OF THIS REPORT, THIS TESTING AND REPORT HAS BEEN PERFORMED UNDER THE DIRECTION OF GEORGE HAWES P.E, CALIFORNIA REGISTRATION NUMBER C034779, LIC. EXP. 9-30-23.

### 3.4.1 PERCOLATION TEST PROCEDURE FOR LEACH LINES:

ALL PERCOLATION TEST SITE HOLES WERE EXCAVATED USING THE DRILL RIG. ALL LOOSE MATERIAL WAS REMOVED FROM THE HOLE USING THE POST HOLE DIGGER. ALL TESTS WERE PERFORMED AT LEVELS REQUESTED BY THE DESIGN CIVIL. SIERRA ENGINEERING SERVICES. AN 6 INCH DIAMETER PERFORATED PIPE SLEEVE, WITH A SOLID CAP BOTTOM, ¼" DIAMETER HOLES DRILLED IN THE CAP BOTTOM TO ALLOW WATER TO ESCAPE TO THE SIDEWALL OF THE TEST HOLE, WAS INSERTED INTO EACH OF THE TEST HOLES. THE CAP AT THE BOTTOM ELIMINATES THE NEED FOR PEA GRAVEL AND PREVENTS SCOURING OF THE BOTTOM OF THE TEST HOLE DURING FILLINGS. THE DEPTH OF EACH TEST HOLE IS NOTED ON THE "FIELD DATA SHEET" ATTACHED.

THE TEST HOLES WERE FILLED WITH 10 INCHES OF CLEAR WATER AS MEASURED ABOVE THE PIPE CAP BOTTOM. AS NOTED ON THE "FIELD TEST DATA" SHEET, 10 INCHES OF CLEAR WATER DID NOT SEEP OR PERCOLATE AWAY IN LESS THAN 10 MINUTES TIME, TWICE IN CONSECUTIVE READINGS. THE NATURAL SOIL IS NOTED TO BE OF SILTY-FINE GRAINED AND CLAYEY MATERIAL. THEREFORE, PRESOAKING WAS THEN CONDUCTED. TESTING WAS PERFORMED AFTER AN OVERNIGHT PRESOAK.

EACH TEST HOLE WAS THEN FILLED WITH 8 INCHES OF CLEAR WATER AS MEASURED FROM THE BOTTOM OF THE HOLE. AS NOTED ON THE "FIELD DATA SHEET" ATTACHED, THE TESTS WERE RUN AT INTERVALS OF 30 MINUTES OVER A 6 HOUR CYCLE. REFILLING EACH TEST HOLE AFTER EACH READING. ALL MEASUREMENTS WERE TAKEN TO THE NEAREST 1/10$^{TH}$ OF AN INCH.

EXPLORATORY BORING AND PERCOLATION TESTING WERE PERFORMED ON DECEMBER 9 THROUGH DECEMBER 10, 2021. ALL TEST SITES ARE MARKED WITH LATH AND FLAGGING.

### 4. DISCUSSION OF RESULTS:

AS SHOWN IN THE TEST RESULTS, THE SOILS TESTED ARE NOTED TO BE UNIFORM IN CLASSIFICATION, GRADATION AND THE DEMONSTRATED ABILITY TO ABSORB WATER DURING TESTING. NO RESTRICTIVE SOIL LAYERS WERE ENCOUNTERED TO THE DEPTHS TESTED. NO TESTS WERE NOTED AS FAILING. THERE IS NO INDICATION OF ANY POSSIBLE SOURCE OF ERROR OR VARIABILITY OF THE RESULTS AS SHOWN. ALTHOUGH BIOTURBATION WAS OBSERVED AND NOTED, NO EVIDENCE OF ANY GOPHER HOLES WAS PRESENT AT ANY EXCAVATED TEST SITE.

### 5 HISTORIC HIGH GROUNDWATER DATA:

THE CALIFORNIA DEPT. OF WATER RESOURCES SOUTHERN DISTRICT DATA SHOWS WELL LEVELS AT 250 TO 300 FEET BELOW GRADE FOR THIS AREA. NO GROUNDWATER WAS ENCOUNTERED IN AM/PAC'S EXPLORATORY BORE TO A DEPTH OF 15'.

### 6. PERCOLATION TEST RESULTS: (SEE DATA SHEETS ATTACHED)

| | | |
|---|---|---|
| P-1 - 30:00 MPI | P-2 - FAILED MPI | P-3 - 25:00 MPI |
| P-4 - 25:00 MPI | P-5 – 30:00 MPI | P-6 -30:00 MPI |

## APPENDIX

A-1 FIELD TEST DATA SHEETS

A-2 ASSESSOR'S MAP

A-3 VICINITY MAPS

A-4 SITE PLAN PREPARED BY SIERRA ENGINEERING SERVICES

- CONTINUOUS FLIGHT AUGER RIG WITH 8 INCH BORE USED.
- ALL FILLS RETURNED TO ZERO ON INDICATORS

Project No. 21-14993
Date 3-14-21

# Field Percolation Test Data

Compost Facility

**TEST 1** — DEPTH 60"

SOIL TYPE: (SC)(SM)

| Time | Fill | In. Drp |
|---|---|---|
| 30 | 0 | 2.7 |
| 1 | | 2.4 |
| 30 | | 2.0 |
| 2 | | 1.7 |
| 30 | | 1.5 |
| 3 | | 1.5 |
| 30 | | 1.4 |
| 4 | | 1.2 |
| 30 | | 1.1 |
| 5 | | 1.1 |
| 30 | | 1.0 |
| 6 hr | | 1.0 |

DESIGN RATE: 30:00 MIN/IN

— $Ft^2$/100 Gallons/Day

**TEST 2** — DEPTH 60"

SOIL TYPE: (SC)

| Time | Fill | In. Drp |
|---|---|---|
| 30 | 0 | |
| 1 | | |
| 30 | | |
| 2 | | |
| 30 | | |
| 3 | | |
| 30 | | |
| 4 | | |
| 30 | | |
| 5 | | FAILED |
| 30 | | 1.1 |
| 6 hr | | 1.1 |

DESIGN RATE: FAILED MIN/INCH

— $Ft^2$/100 Gallons/Day

**TEST 3** — DEPTH 60"

SOIL TYPE: (SM)

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | 2.8 |
| 1 | | 2.5 |
| 30 | | 2.2 |
| 2 | | 2.0 |
| 30 | | 1.8 |
| 3 | | 1.6 |
| 30 | | 1.6 |
| 4 | | 1.6 |
| 30 | | 1.4 |
| 5 | | 1.3 |
| 30 | | 1.2 |
| 6 hr | | 1.2 |

DESIGN RATE: 25:00 MIN/IN

MINIMUM AREA REQUIRED

— $Ft^2$/100 Gallons/Day

**TEST 4** — DEPTH 60"

SOIL TYPE: (SM)

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | 2.9 |
| 1 | | 2.6 |
| 30 | | 2.4 |
| 2 | | 2.1 |
| 30 | | 1.9 |
| 3 | | 1.9 |
| 30 | | 1.6 |
| 4 | | 1.5 |
| 30 | | 1.5 |
| 5 | | 1.3 |
| 30 | | 1.2 |
| 6 hr | | 1.2 |

DESIGN RATE: 25:00 MIN/INCH

MINIMUM AREA REQUIRED

— $Ft^2$/100 Gallons/Day

DESIGN RATE

— MIN/INCH

MINIMUM AREA REQUIRED

— $Ft^2$/100 Gallons/Day

- CONTINUOUS FLIGHT AUGER RIG WITH 8 INCH BORE USED.
- ALL FILLS RETURNED TO ZERO ON INDICATORS

Project No 21-14993
Date 3-14-21

# Field Percolation Test Data

TEST: 5
DEPTH: 60"
SOIL TYPE: (SM)
DESIGN RATE: 30:00 MIN/IN

| Time | Fill | In. Drp |
|---|---|---|
| 30 | 0 | 2.3 |
| 1 | | 2.1 |
| 30 | | 1.8 |
| 2 | | 1.8 |
| 30 | | 1.5 |
| 3 | | 1.5 |
| 30 | | 1.3 |
| 4 | | 1.2 |
| 30 | | 1.2 |
| 5 | | 1.1 |
| 30 | | 1.0 |
| 6 hr | | 1.0 |

— $Ft^2$/100 Gallons/Day

TEST: 6
DEPTH: 60"
SOIL TYPE: (SM)
DESIGN RATE: 30:00 MIN/INCH

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | 2.4 |
| 1 | | 2.1 |
| 30 | | 1.8 |
| 2 | | 1.8 |
| 30 | | 1.6 |
| 3 | | 1.5 |
| 30 | | 1.5 |
| 4 | | 1.3 |
| 30 | | 1.3 |
| 5 | | 1.1 |
| 30 | | 1.0 |
| 6 hr | | 1.0 |

— $Ft^2$/100 Gallons/Day

TEST
DEPTH
SOIL TYPE
DESIGN RATE MIN/IN

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | |
| 1 | | |
| 30 | | |
| 2 | | |
| 30 | | |
| 3 | | |
| 30 | | |
| 4 | | |
| 30 | | |
| 5 | | |
| 30 | | |
| 6 hr | | |

MINIMUM AREA REQUIRED
$Ft^2$/100 Gallons/Day

TEST
DEPTH
SOIL TYPE
DESIGN RATE MIN/INCH

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | |
| 1 | | |
| 30 | | |
| 2 | | |
| 30 | | |
| 3 | | |
| 30 | | |
| 4 | | |
| 30 | | |
| 5 | | |
| 30 | | |
| 6 hr | | |

MINIMUM AREA REQUIRED
$Ft^2$/100 Gallons/Day

DESIGN RATE
— MIN/INCH

MINIMUM AREA REQUIRED
— $Ft^2$/100 Gallons/Day

THIS MAP IS FOR THE PURPOSE OF AD VALOREM TAXATION ONLY

Ptn. Rancho Santa Ana Del Chino, M.B. 6/15

City of Ontario
Tax Rate Area
4074

1053 - 39

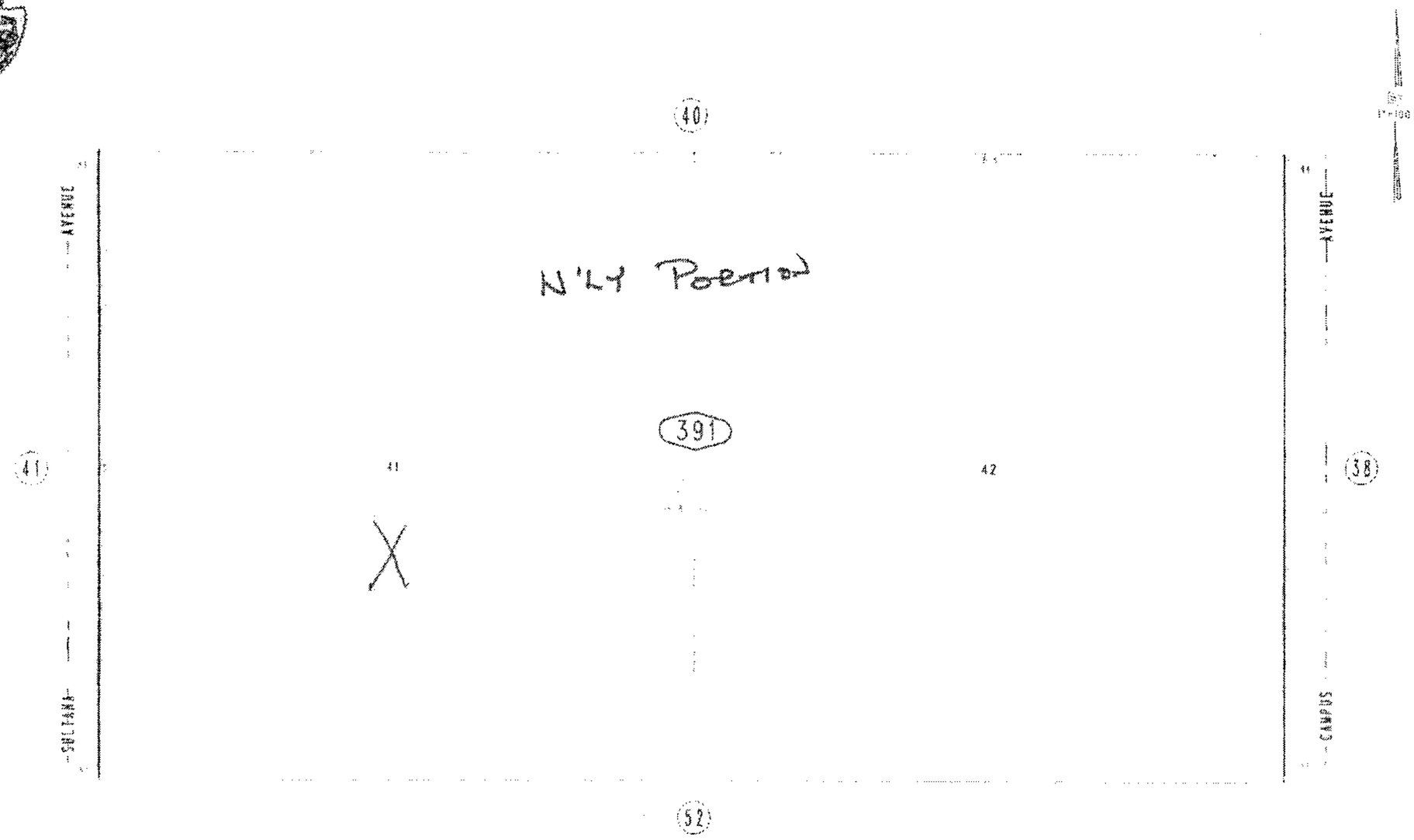


November 2004

Ptn. S.W.1/4, Sec.39
T.2S.,R.7W., S.B.B.&M.

Assessor's Map
Book 1053 Page 39
San Bernardino County

THIS MAP IS FOR THE PURPOSE OF AD VALOREM TAXATION ONLY

Ptn. Rancho Santa Ana Del Chino, M.B. 6/15

City of Ontario
Tax Rate Area
4074

1053 - 52

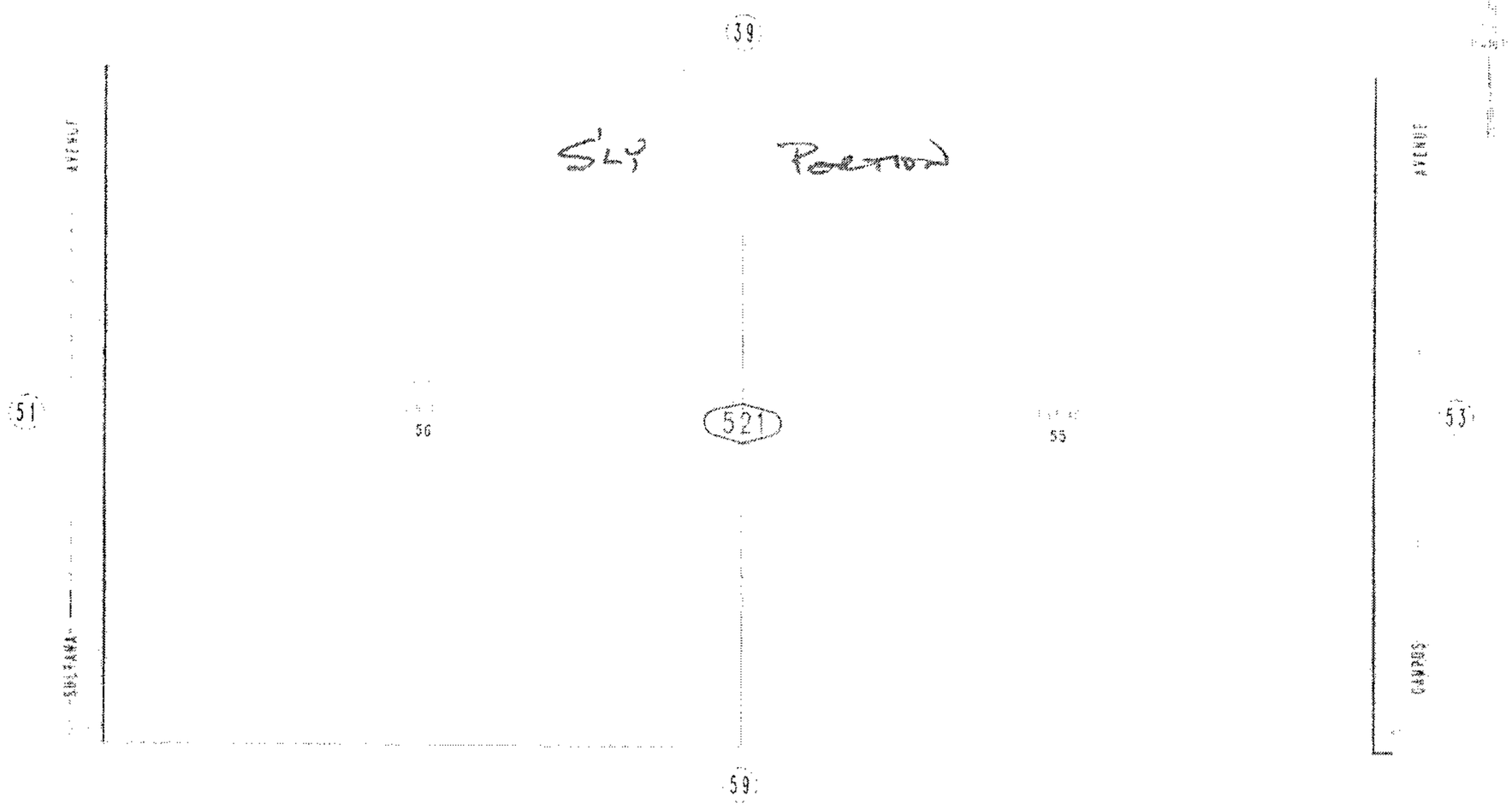


November 2004

Ptn. S.W.1/4, Sec.17
T.2S.,R.7W., S.B.B.&M.

Assessor's Map
Book 1053 Page 52
San Bernardino County

Perk Test #1

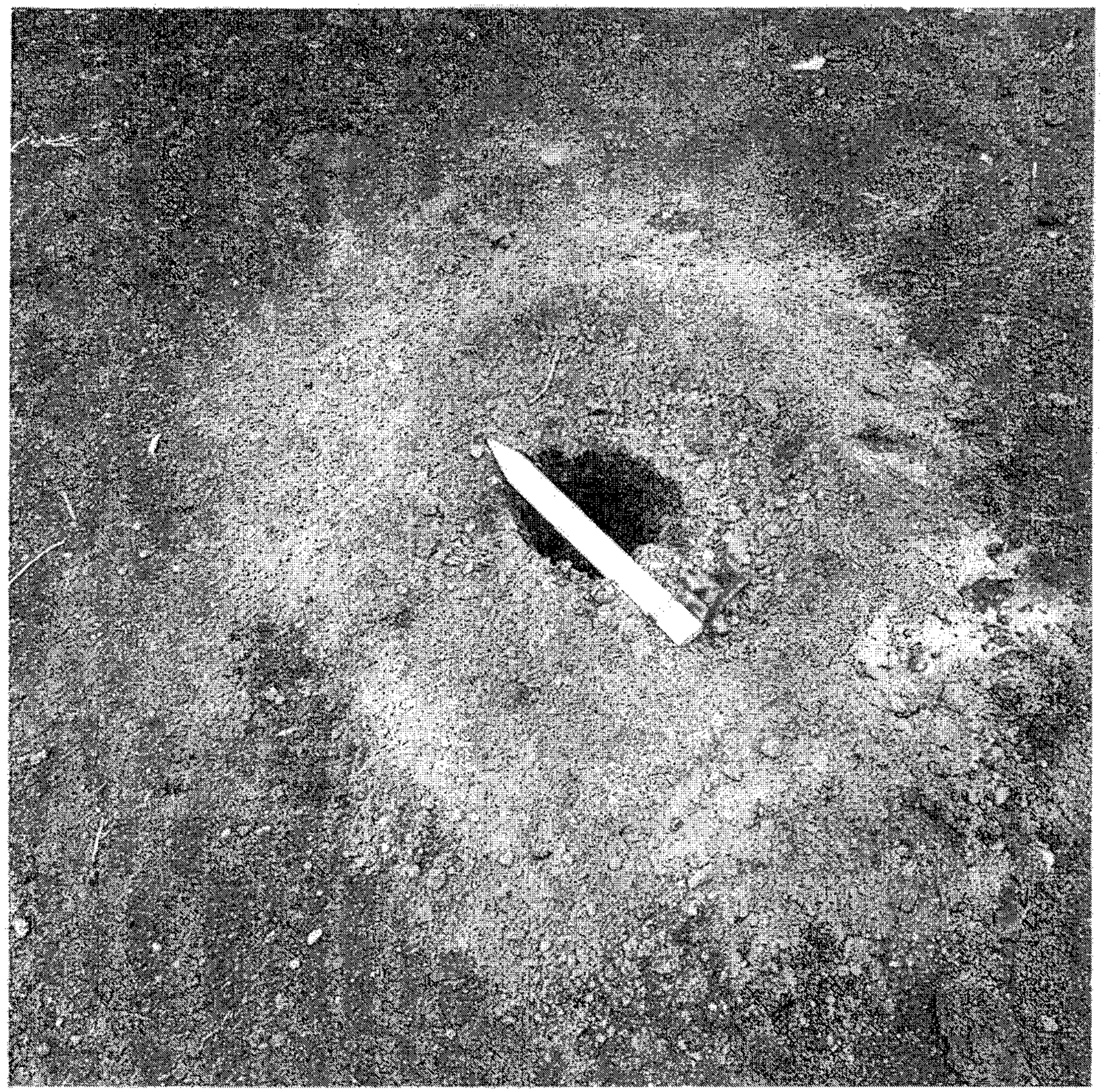

Peak Test #2

Peek Test #3

Peek Test #5

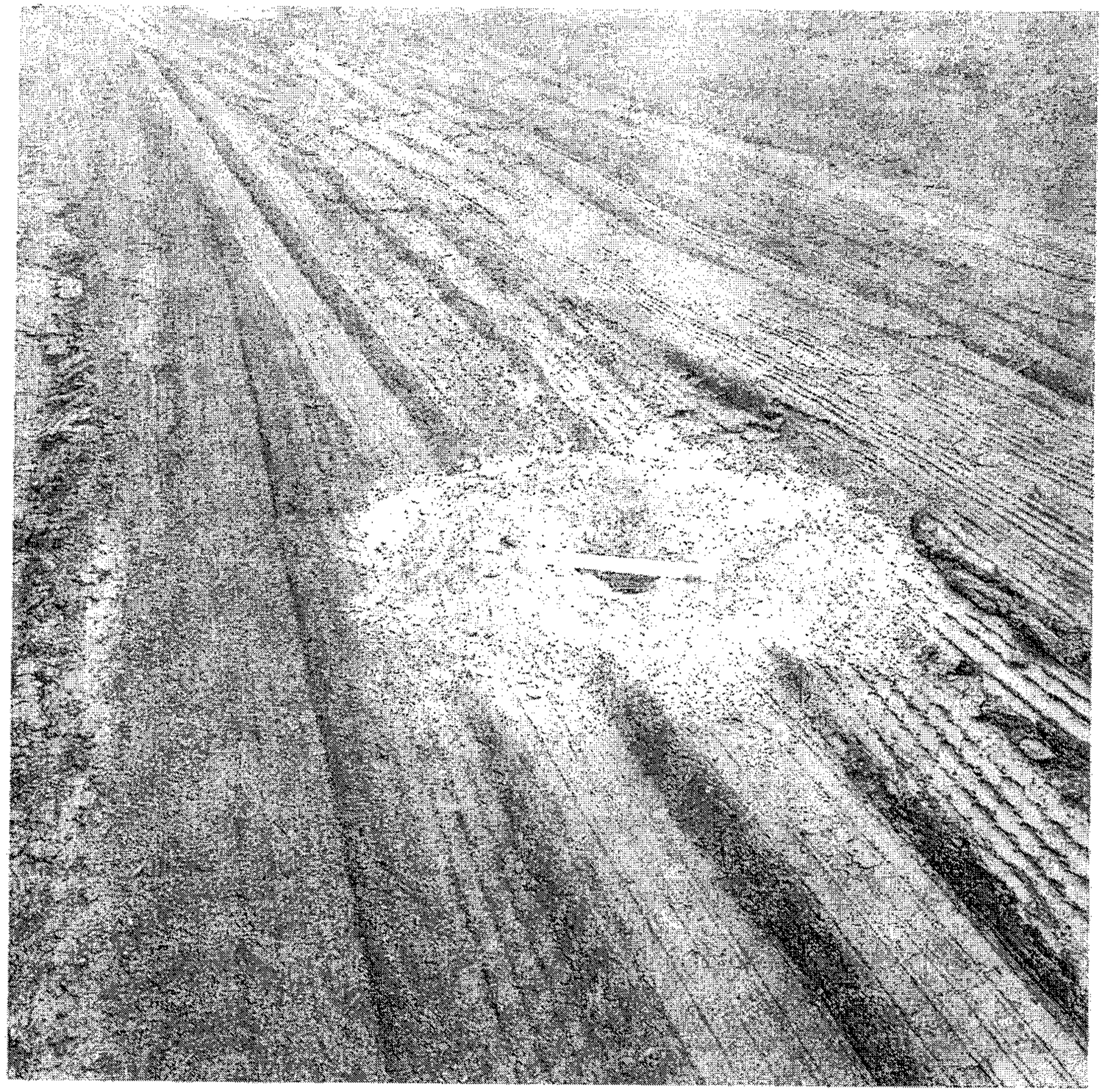

Peck Test # 6

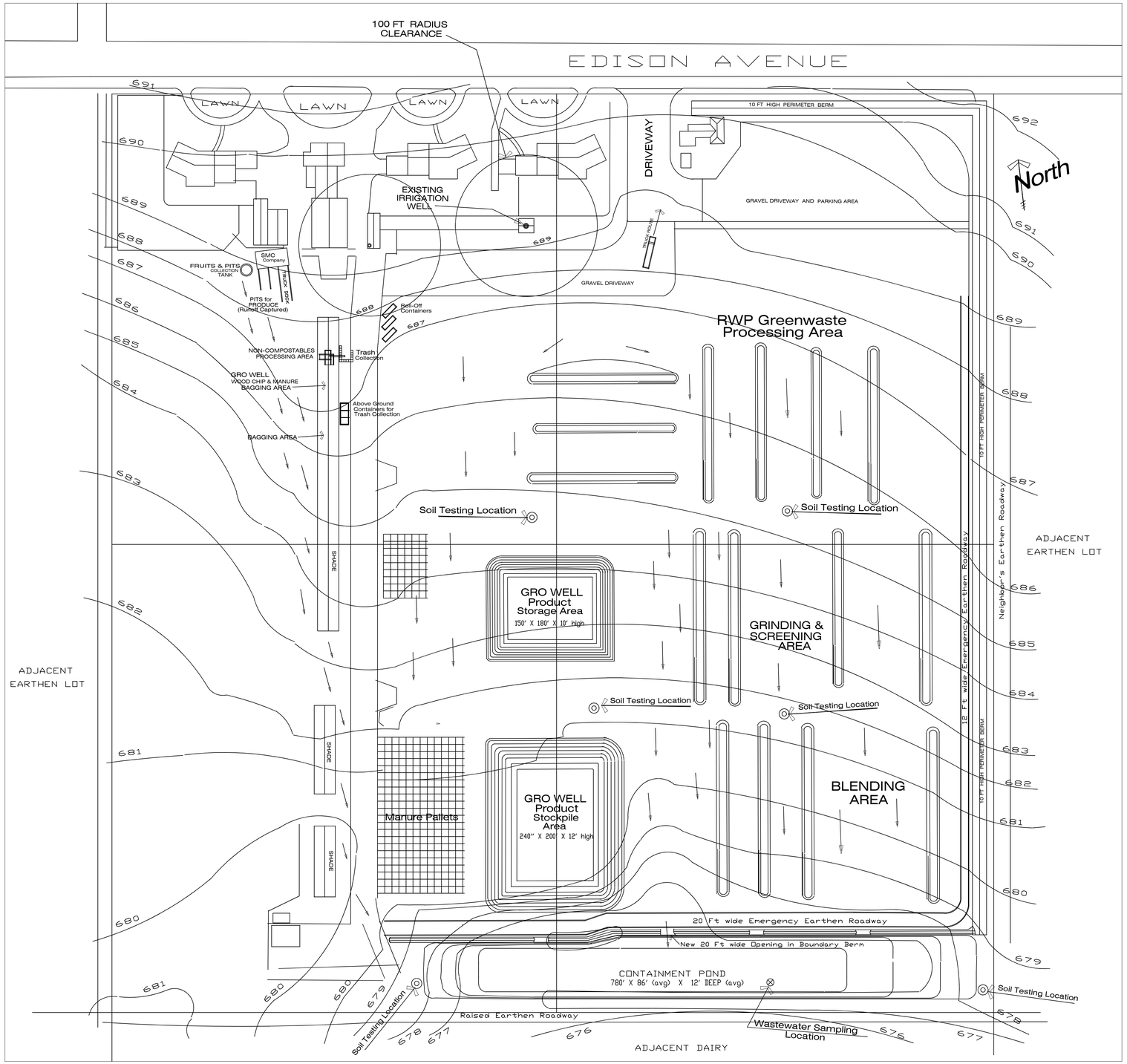


# SITE PLAN

Scale : 1"=75'

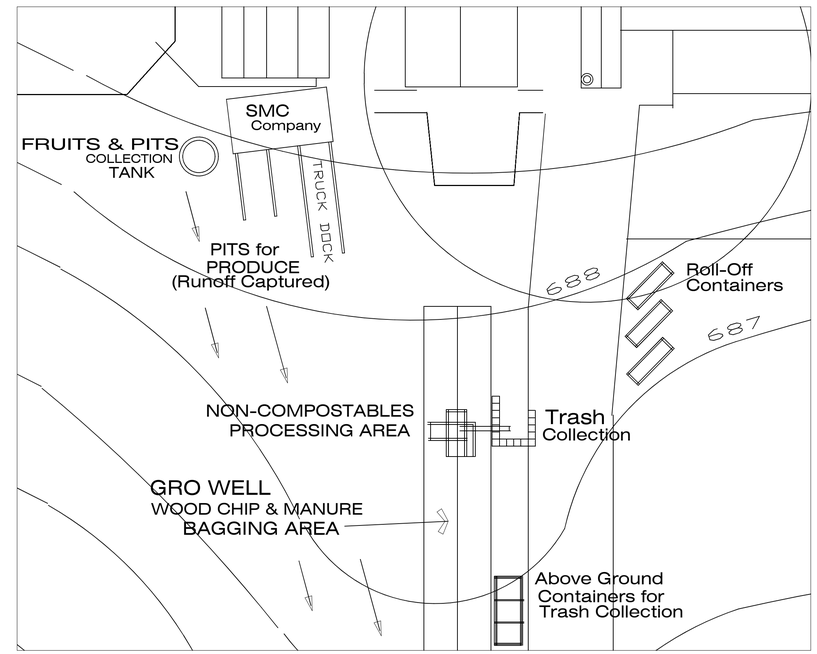


# NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

## GRADING NOTES

1 ALL DIKES AND BERMS SHALL BE CONSTRUCTED OF MINERAL EARTH FREE OF VEGETATION AND DELETERIOUS MATERIAL.

2 NO ROCKS OR COBBLES GREATER THAN 6 INCHES IN DIAMETER SHALL BE PLACED IN ANY FILL.

3 ALL AREAS TO RECIEVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.

4 ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES, WHEELED ROLLED AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

## KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILLWAY

DIGALERT

DIAL TOLL FREE 1-800-227-2600 AT LEAST TWO DAYS BEFORE YOU DIG

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SITE CONDITION RESPONSIBILITY:

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDASNCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 210
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APPVD | DATE |
|---|---|---|---|---|
| 3 | np | SMC flow lines and N arrow | | 9/12/23 |
| 2 | np | Pond depth increase | | 9/29/22 |
| 1 | np | Wastewater sampling location, fruits & pits collection tank | | 8/26/22 |

# SITE PLAN
## RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. 1053 - 391 - 01

DATE: 5-20-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2020
SHEET 1 OF 1

# Santa Ana Regional Water Quality Control Board

November 28, 2023

Mr. Chris Kiralla
Owner/Operator
Recycled Wood Products
(chris@rwpmulch.com)
1313 East Philips Road
Pomona, CA 91766

**NOTICE OF APPLICABILITY FOR COVERAGE UNDER WATER QUALITY ORDER WQ 2020-0012-DWQ, STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS – RECYCLED WOOD PRODUCTS ONTARIO IV, 7325 EDISON AVENUE, ONTARIO, SAN BERNARDINO COUNTY**
**GEOTRACKER ID: T10000020070**

Dear Mr. Kiralla:

You have submitted a Report of Waste Discharge application to obtain coverage under Water Quality (WQ) Order WQ 2015-0121-DWQ, as amended by Order WQ 2020-0012-DWQ, General Waste Discharge Requirements for Commercial Composting Operations (Composting General Order) for Recycled Wood Products Ontario IV (the Facility), located at the above-referenced address.

A copy of the Composting General Order is accessible at:
https://www.waterboards.ca.gov/water_issues/programs/compost/

The application, formally received on June 16, 2020, consists of a Notice of Intent (NOI) and a Technical Report. A filing fee of $2,848 was received on June 11, 2021, with the corrected fee of $3,326 received in full on July 2, 2022. The NOI and Technical Report were subsequently updated and submitted in April 2021, October 2021, June 2022, August 2022, September 2022, October 2022, December 2022, September 2023, and October 2023 to address comments from Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) staff. Based on our review of the updated NOI and Technical Report, we considered the application complete on October 9, 2023. A summary of the Facility description, composting operations and system design, run-on and runoff drainage control system, and monitoring and reporting plan is provided in Table 1. The Facility site plan that you provided in your application is enclosed with this letter as Figure 1.

Based on the information provided, Santa Ana Water Board staff has determined that the Facility meets the conditions for coverage under the Composting General Order,

and it is hereby authorized for coverage as a Tier 1 facility (Site-specific Composting General Order WQ 2020-0012-DWQ-R8018). You will be assessed an annual fee with the discharge rating of 3C until your facility coverage under the Composting General Order is officially terminated.

This letter constitutes the Notice of Applicability (NOA), authorizing the coverage of the Facility under the Composting General Order, which incorporates the NOI and Technical Report. The NOA is contingent upon continual compliance with the Composting General Order.

To ensure compliance with the Composting General Order, it is essential that you and your operators are familiar with the contents of the Composting General Order and the Technical Report. Any non-compliance with the Composting General Order constitutes a violation of the California Water Code and is grounds for enforcement action and/or termination of enrollment under the Composting General Order.

In accordance with Notification Requirements of the Composting General Order, please notify Santa Ana Water Board staff in writing or by email for:

- Any proposed change in materials (feedstock materials, additives, amendments), facility design, and composting operations identified in the NOI and Technical Report;
- Any change in facility ownership or transfer; and
- Any proposed termination of facility operations or termination of coverage under the General Order. A Site Closure Plan must be submitted at least 90 days prior to terminating composting operations for approval by the Executive Officer of the Santa Ana Water Board.

All monitoring and technical reports must be submitted by uploading them to the State Water Resources Control Board's GeoTracker database in searchable Portable Document Format (PDF) under a site-specific global identification number (Global ID). In addition, analytical data must be uploaded to the GeoTracker database in Electronic Deliverable Format (EDF). Guidance for the Electronic Submittal of Information (ESI) to GeoTracker database for composting operations is provided at:
ESI Beginner's Guide - Responsible Party (ca.gov)

**Your first Annual Monitoring and Maintenance Report, for the January 1-December 31, 2023 monitoring period, is due April 1, 2024.** Please use the following site reference information for uploading documents to GeoTracker or for submitting a written notification:

| | |
|---|---|
| **Attention:** | Joanne Lee (Joanne.Lee@waterboards.ca.gov)<br>Land Disposal & DoD Program Section<br>California Regional Water Quality Control Board<br>Santa Ana Region (8)<br>3737 Main Street, Suite 500<br>Riverside, CA 92501<br>Phone: (951) 782-4130<br>Fax: (951) 781-6288 |
| **Facility Name:** | Recycled Wood Products Ontario IV |
| **Facility Address:** | 7325 Edison Avenue, Ontario, CA 91762 |
| **Site-specific Composting General Order No.:** | Order WQ 2020-0012-DWQ-R8018 |
| **Waste Discharge ID (WDID):** | 8 363012001 |
| **CIWQS Place ID:** | 240263 |
| **GeoTracker Global ID:** | T10000020070 |

If you have any questions regarding this letter, please contact Joanne Lee of our Land Disposal & DoD Program Section at (951) 782-3291, or by email at Joanne.Lee@wateraboards.ca.gov, or Cindy Li, Supervisor of our Land Disposal & DoD Program Section at (951) 782-4906, or by email at Cindy.Li@waterboards.ca.gov.

Sincerely,

Jayne Joy
Digitally signed by Jayne Joy
Date: 2023.11.28 09:53:50
-08'00'

Jayne Joy, P.E.
Executive Officer
Santa Ana Regional Water Quality Control Board

Enclosures: Table 1
Figure 1 (Facility site plan from application)

cc: Ember Christensen (Ember.Christensen@waterboards.ca.gov), DWQ, SWRCB
Brianna St. Pierre (Brianna.St.Pierre@waterboards.ca.gov), DWQ, SWRCB
Theodore Tasiopoulos (Theodore.Tasiopoulos@CalRecycle.ca.gov), CalRecycle
Kimberly Tra (kimberly.tra@dph.sbcounty.gov), San Bernardino County Department of Environmental Health, LEA
Rodney Tolosa (Rodney.Tolosa@dph.sbcounty.gov), San Bernardino County Department of Environmental Health, LEA
Bob Feenstra (bobfeenstra@gmail.com), Residual Recovery Group
Saeed Ahdout (sierraeng6@gmail.com), Sierra Engineering

## Table 1

| Composting Facility Information | Description |
|---|---|
| Facility Name | Recycled Wood Products Ontario IV |
| Facility Address | 7325 Edison Avenue, Ontario, CA 91762 |
| Facility Operator | Chris Kiralla |
| Facility Landowner | Mr. Gary Dou, Golden Ontario Holdings |
| Facility Size (acreage) | 10.5 acres of the 36.6-acre site |
| Facility Accessor Parcel No. | APN 1053-391-01 |
| Facility Capacity | Up to 12,500 cubic yards |
| Feedstock Materials | Vegetative agricultural materials, green materials, and vegetative food materials |
| Additives/Amendments | Manure |
| Facility Type | Tier 1 Facility |
| GPS Coordinates | 33.9966 latitude and 117.6434 longitude |
| Water Supply (domestic/Industrial) | Onsite irrigation well |
| **Affected Water Bodies** | |
| Groundwater Management Zone | Chino-North |
| Depth to Groundwater | Approximately 133 feet below ground surface |
| Groundwater Flow Direction | South |
| Distance to Nearest Water Supply Well | The nearest water supply well is over 100 feet from the site |
| Distance to Nearest Surface Water Bodies | Cucamonga Creek (over 5,500 feet east of the site) |
| **Facility Operations/Design Information** | |
| Composting Method | Turned Windrow Pile Method |
| Composting Pad/Working Surfaces Design | Compacted pad |
| Runoff Drainage Control System Design | Earthen drainage ditches and berms; all working surfaces are graded and compacted to drain to a 17.8-acre-foot detention basin. |
| Run-on Drainage Control System Design | The facility is bordered by Edison Ave to the north, and dairy and pastureland to the south, east and west. Run-on drainage to the facility is not anticipated. |
| Compliance Schedule | Onsite soil percolation tests were conducted in December 2021. The detention pond was enlarged to adequately contain surface runoff from the site in November 2022. |
| **Monitoring** | |
| Facility Inspection & Maintenance | Comply with Section A.1, Attachment B (Monitoring and Reporting Program), Order WQ 2020-0012-DWQ |
| Detention Pond Monitoring | Comply with Sections A.2 and A.5, Attachment B, Order WQ 2020-0012-DWQ |
| Groundwater Monitoring (if applicable) | Not applicable |
| **Reporting/Notifications** | |
| Annual Monitoring and Maintenance Report | Comply with Section B.1, Attachment B, Order WQ 2020-0012-DWQ |
| Notification of Violations/Non-compliances | Comply with Sections B.2 and B.3, Attachment B, Order WQ 2020-0012-DWQ |
| Record-keeping | Comply with Section C, Attachment B, Order WQ 2020-0012-DWQ |
| Revised NOI | To be submitted at least 90 days prior to any proposed changes to the approved NOI [Page 37 of Order WQ 2020-0012-DWQ] |
| Change in Ownership | To submit a written notice, at least 30 days in advance of any transfer of the General Order's responsibility and coverage from the current owner to a new owner [Page 37 of Order WQ 2020-0012-DWQ] |
| Site Closure Plan | To be submitted at least 90 days prior to discontinuing composting operations [Page 34 of Order WQ 2020-0012-DWQ] |
| Notice of Termination | Comply with Attachment E, Order WQ 2020-0012-DWQ |

**Figure 1**

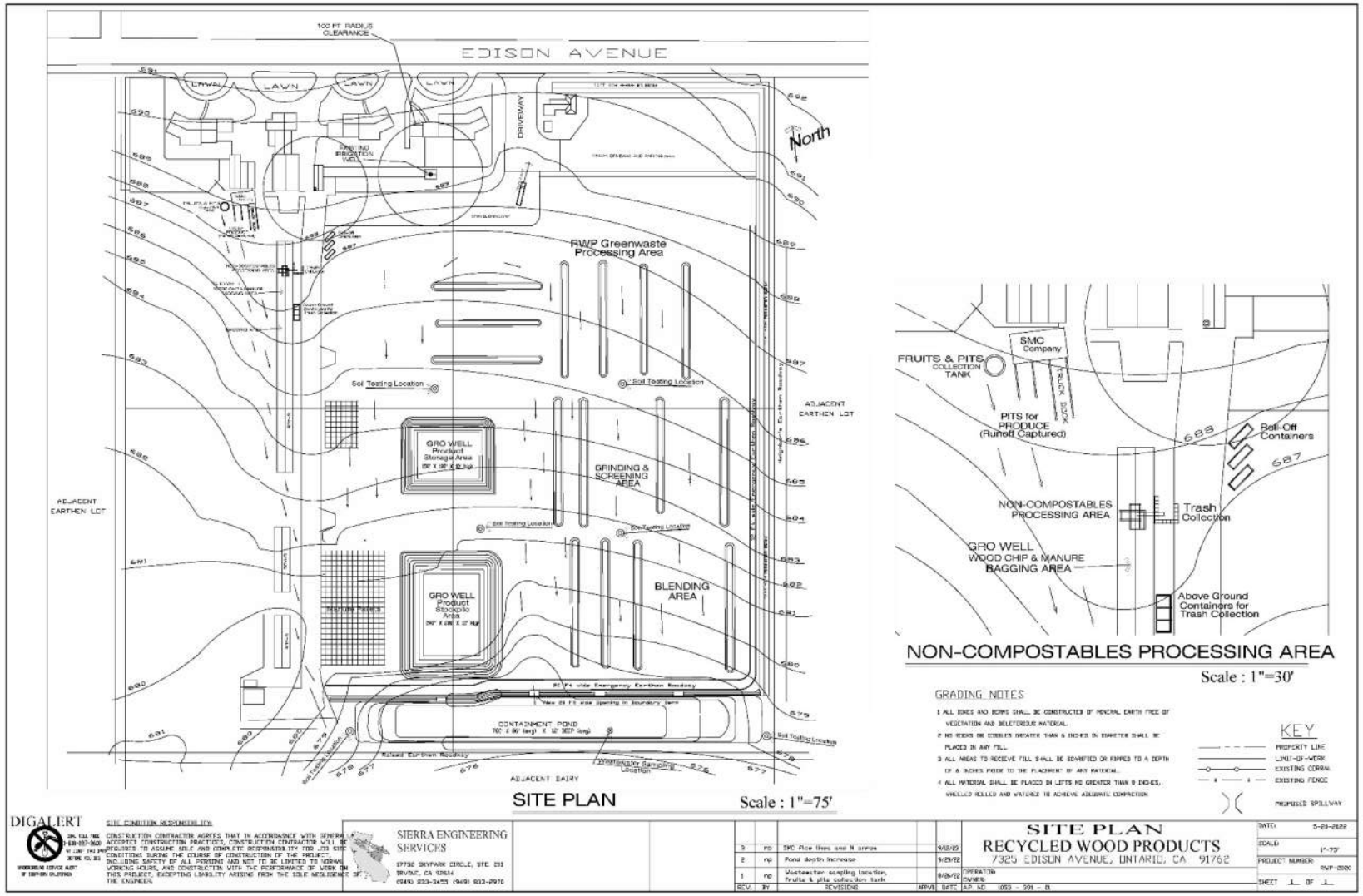
EDISON AVENUE
100 FT RADIUS CLEARANCE
LAWN
DRIVEWAY
North
RWP Greenwaste Processing Area
Soil Testing Location
GRO WELL Product Stockpile Area
GRINDING & SCREENING AREA
BLENDING AREA
GRO WELL Product Stockpile Area
CONTAINMENT POND
ADJACENT EARTHEN LOT
ADJACENT DAIRY
SITE PLAN
Scale : 1"=75'
FRUITS & PITS COLLECTION TANK
SMC Company
TRUCK DOCK
PITS for PRODUCE (Runoff Captured)
Roll-Off Containers
NON-COMPOSTABLES PROCESSING AREA
Trash Collection
GRO WELL WOOD CHIP & MANURE BAGGING AREA
Above Ground Containers for Trash Collection
NON-COMPOSTABLES PROCESSING AREA
Scale : 1"=30'
GRADING NOTES
KEY
PROPERTY LINE
LIMIT-OF-WORK
EXISTING CORRAL
EXISTING FENCE
PROPOSED SPILLWAY
DIGALERT
SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 230
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970
SITE PLAN
RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762
DATE: 5-23-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2000
SHEET 1 OF 1
3 rd SMC flow lines and N arrow 9/12/23
2 rd Pond depth increase 9/29/22
1 rd Wastewater sampling location, fruits & pits collection tank 8/26/22
REV. BY REVISIONS APPVD DATE
APP. NO 1053 - 291 - 21

FIELD NARRATIVE DOCUMENTATION SHEET
HAZARDOUS MATERIALS DIVISION
ENVIRONMENTAL ASSESSMENT/LAND USE
SAN BERNARDINO COUNTY

Mello & Sousa / SNS Dairy — Sam Sousa
COMPANY NAME — PERSON CONTACTED

7325 Edison Chino CA
ADDRESS — TELEPHONE NO.

**********
DISCUSSION:

Site inspection made at above address. Sam Sousa owner and operator said tanks (2) were removed in 1992. 500 gallon and 1000 gallon.

He showed me the tanks that were removed.

File has already been removed off alpha list. Stays closed and send to closed file room.

Craig A. Fraker — 1-28-94
INSPECTOR/SURVEYOR — DATE

# HAZARDOUS WASTE GENERATOR PRODUCTION PROCESS FLOW CHART

County of San Bernardino - Department of Environmental Health Services

| List of all Raw Materials Used | Production Process/Final Product (short narrative) | Hazardous Wastes | Amount |
|---|---|---|---|
| 1. JOE MELLO Dairy 8:00AM | SAM SOUSA - OWNER of SNS Dairy next door | | |
| 2. back by Monday | | | |
| 3. 1 above grnd tank Diesal | about 5PM. | | |
| NO UGST. | 9:00 AM on 12/20 | | |
| 5. { tanks | } | | |
| 6. {Removed 1 - 1½ years ago} according to Mrs Mello / | | How do we handle those removals? | |
| 7. Ag tanks are suppose to meet all removal requirements. | | | |
| 8. Owners must show proof of Removal ie. Receipts for | | | |
| 9. removal fees, bills from lab or for dry ie, pictures etc. | | | |
| 10. | | | |
| 11. | 1992 | | |
| . | | | |
| 13. SNS Dairy, Sam Sousa, 2 tanks, 500 gallon, 1000 gallon | | | |
| 14. | | | |
| 15. | | | |
| 16. | | | |

Facility Name: _____ Inspector: _____

Situs Address: _____ Date: _____

2/86

## AGRICULTURAL HAZARDOUS MATERIALS INVENTORY

BUSINESS NAME Mello + Sousa

EMERGENCY CONTACT Joe Mello 714-597-2414

ADDRESS 7325 Edison

EMERGENCY PHONE # 714-597-3537

CITY Chino

STATE Cal ZIP 91710

PHONE NUMBER 714-597-2414

| MATERIAL | MAXIMUM QUANTITY | USED HOW | STORED AT |
|---|---|---|---|
| Fertilizer. | 1954 tons a year | Hauled away 4 times a year. | |
| Chlorine | 6 gal a month | pipeline rinse | milkhouse |
| Acid | 200 gal a year | pipeline washup | milkhouse |

[ ] I HAVE NO HAZARDOUS MATERIALS IN REPORTABLE QUANTITIES HELD FOR MORE THAN 30 DAYS.

[✓] I HAVE AN UNDERGROUND TANK. TANK SIZE (2) 550 - 1000

[✓] I CERTIFY THAT A "HAZARDOUS MATERIALS STORAGE AREA" SIGN HAS BEEN POSTED AS REQUIRED.

THE ABOVE INFORMATION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

NAME Mello & Sousa DATE Nov 5, 1987

SIGNATURE _____

**PLEASE SUBMIT IN TRIPLICATE**
AGRICULTURAL COMMISSIONER
777 E. RIALTO AVENUE
SAN BERNARDINO, CA. 92415

ENVIRONMENTAL HEALTH SERVICES

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

385 North Arrowhead Avenue • San Bernardino, CA 92415-0160 • (714) 387-4646

PAUL F. RYAN, R.S., MPPA
Director

9. **INVENTORY OF HAZARDOUS MATERIALS ON SITE (INDICATE UNITS USED).**

A. HAZARDOUS MATERIALS

1. Chemical Name pipeline Acid
CAS # (if known) ____
Composition ____
Hazard Code/s (See Page 9) ____/____/____/____
Common Name ____
Solid ____ Liquid ✓ Gas ____ Mix ____ Pure ____
Maximum amount at one time on site 30 gal
Average daily amount on site ____
Number of days on site/year All year
Container type PlASTIC Barrel
Storage Pressure ____ Storage Temp (°F) ____

2. Chemical Name chlorine
CAS # (if known) ____
Composition ____
Hazard Code/s (See Page 9) ____/____/____/____
Common Name ____
Solid ____ Liquid ✓ Gas ____ Mix ____ Pure ____
Maximum amount at one time on site 30 gal
Average daily amount on site ____
Number of days on site/year All year
Container type PlASTIC Barrel
Storage Pressure ____ Storage Temp (°F) ____

3. Chemical Name Diesel
CAS # (if known) ____
Composition ____
Hazard Code/s (See Page 9) ____/____/____/____
Common Name ____
Solid ____ Liquid ✓ Gas ____ Mix ____ Pure ____
Maximum amount at one time on site 200 gal
Average daily amount on site ____
Number of days on site/year ____
Container type Steel TANK.
Storage Pressure ____ Storage Temp ( F) ____

4. Chemical Name ____
CAS # (if known) ____
Composition ____
Hazard Code/s (See Page 9) ____
Common Name ____
Solid ____ Liquid ____ Gas ____ Mix ____ Pure ____
Maximum amount at one time on site ____
Average daily amount on site ____
Number of days on site/year ____
Container type ____
Storage Pressure ____ Storage Temp ( F) ____

MAKE ADDITIONAL COPIES OF INVENTORY FORM AS NEEDED FOR EVERY CHEMICAL.

9. **INVENTORY OF WASTE CATEGORY WITH COMPOSITION OF EVERY HAZARDOUS WASTE HANDLED (INDICATE UNITS USED)**

B. HAZARDOUS WASTE

1. Name_____
Waste Category No. (See back of manifest)_____
Hazard Code/s (See Page 9) _____/_____/_____/_____/_____
Common Name_____
Solid_____ Liquid_____ Gas_____ Mix_____ Pure____
Maximum amount at one time on site_____
Average daily amount on site_____
Waste generated/month_____
Number of days on site/year_____
Container type_____

2. Name_____
Waste Category No. (See back of manifest)_____
Hazard Code/s (See Page 9)_____/_____/_____/_____/_____
Common Name_____
Solid_____ Liquid_____ Gas_____ Mix_____ Pure____
Maximum amount at one time on site_____
Average daily amount on site_____
Waste generated/month_____
Number of days on site/year_____
Container type_____

3. Name_____
Waste Category No. (See back of manifest)_____
Hazard Code/s (See Page 9)_____/_____/_____/_____
Common Name_____
Solid_____ Liquid_____ Gas_____ Mix_____ Pure____
Maximum amount at one time on site_____
Average daily amount on site_____
Waste generated/month_____
Numbers of days on site/year_____
Container type_____

4. Name_____
Waste Category No. (See back of manifest)_____
Hazard Code/s (See Page 9)_____/_____/_____/_____
Common Name_____
Solid_____ Liquid_____ Gas_____ Mix_____ Pure____
Maximum amount at one time on site_____
Average daily amount on site_____
Waste generated/month_____
Numbers of days on site/year_____
Container type_____

MAKE ADDITIONAL COPIES OF INVENTORY FORM AS NEEDED FOR EVERY CHEMICAL.

# ENVIRONMENTAL HEALTH SERVICES

☒ 385 North Arrowhead Avenue • San Bernardino, CA 92415-0160 • (714) 387-4646
☐ 320 East "D" Street • Ontario, CA 91764 • (714) 391-7570
☐ 15505 Civic Drive • Victorville, CA 92392 • (619) 243-8141
☐

PLEASE REPLY TO ADDRESS CHECKED

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

PAUL F. RYAN, R.S., MPPA
Director

Also serving the cities of:

| | |
|---|---|
| Adelanto | Montclair |
| Barstow | Needles |
| Big Bear Lake | Ontario |
| Chino | Rancho Cucamonga |
| Colton | Redlands |
| Fontana | Rialto |
| Grand Terrace | San Bernardino |
| Hesperia | Twentynine Palm. |
| Highland | Upland |
| Loma Linda | Victorville |


**LABORATORY BUSINESS PLAN FORM**

Labs which handle hazardous materials **must** complete this form.

I. Joe Mello Dairy
Name
13832 MOUNTAIN APN
Address
CHINO CAL 91710 Parcel No.

II. _____
Telephone number of laboratory

III. _____
Type of Laboratory (activity/description)
Analytical_____ University/College_____
Clinical_____ Dental_____
Research_____ Other Dairy

IV. Two (2) Emergency Contacts for Laboratory:

Name_____ phone_____
Title
Name_____ phone_____
Title

V. _____
Emergency Notification (* Mandatory in case of release of hazardous material)
911 or list other local emergency agency if 911 is not available

* (800) 852-7550 Office of Emergency Services
* (800) 33-TOXIC San Bernardino Co. Department of Environmental Health Services
(800) 424-8802 National Response Center
_____Other (ie. Main office, insurance company, etc.)
_____

VI. Briefly explain lab employee emergency notification and evacuation procedures.

**LABORATORY BUSINESS PLAN FORM (Continued)**

VII. Briefly explain the lab employee Hazard Communication Program (OSHA) or training program (Ed. Code) currently implemented or proposed.

VIII. Briefly explain emergency procedures developed for laboratory personnel in case of emergency (list emergency coordinator and other emergency personnel.

IX. Briefly explain preventive measures currently implemented or proposed for the laboratory (to prevent or minimize the potential for accidents).

X. List emergency equipment in laboratory (include fire extinguishers, eyewash stations, breathing apparatus, emergency kits, etc.).

XI. Provide Maps - See page 9 of this document.

Check all chemicals located at the laboratory and give the maximum amount on hand of that substance. Substances that are not listed on this inventory page must be included on the laboratories Business Plan form and submitted with a Material Safety Data Sheet.

## LABORATORY INVENTORY

| PLEASE CHECK | CHEMICAL NAME | MAXIMUM AMOUNT ON HAND (INCLUDING UNITS) |
|---|---|---|
| | Acetic Acid | |
| | Acetone | |
| | Acetonitrile | |
| ✓ | Acetylene (compressed gas) | 500 lbs |
| | Acrylamide | |
| | Aluminum Ammonium Sulfate | |
| | Aluminum Chloride | |
| | Aluminum Granular | |
| | Aluminum Oxide | |
| | Aluminum Potassium Sulfate | |
| | Aluminum Sodium Sulfate | |
| | Aluminum Sulfate | |
| | * Ammonia | |
| | Ammonium Carbonate | |
| | Ammonium Chloride | |
| | Ammonium Hydroxide | |
| | Ammonium Nibrate | |
| | Ammonium Persulfate | |
| | Ammonium Phosphate | |
| | Ammonium Sulfate | |
| | Ammonium Sulfide | |
| | Ammonium Tartrate | |
| | Ammonium Thiocyanate | |
| | Amyl Acetate | |
| | Amyl Alcohol | |
| | Antimony | |
| | Antimony Trichloride | |
| | Barium Hydroxide | |
| | Barium Chloride | |
| | Barium Nitrate | |
| | Barium Oxide | |
| | Barium Sulfate | |
| | * Benzene | |
| | Benzoic Acid | |
| | Boric Acid | |
| | Bromine Water | |
| | Bromophenol Blue | |
| | Bromothymol Blue | |

**LABORATORY BUSINESS PLAN FORM (Continued)**

Hazardous Material Inventory- See attached inventory. Any hazardous materials that are handled by your business which does not appear on the specific inventory page, LIST those substances here. Indicate the quantity (maximum at any one time), the CAS number and submit a Material Safety Data Sheet for those substances.

| Chemical | CAS # | Maximum on Site (Include Units) |
|---|---|---|

Send forms in triplicate to San Bernardino County Department of
Environmental Health Services
Hazardous Materials Management
385 N. Arrowhead Ave.
San Bernardino, CA 92415-0160

Questions??? Call (714)387-3044
Are there any exemptions?

*COMPLETE THIS FORM AND ATTACH TO EACH COPY OF THE BUSINESS PLAN

BUSINESS NAME: Joe Mello Dairy

ADDRESS: 13832 MOUNTAIN

CONTACT PERSON: Joe Mello

PHONE #: 714-597-2414

I declare, under penalty of perjury, that the information provided herein is true and correct to the best of my knowledge.

Joe Mello
Signature

1-26-89
Date

Business Plan Prepared By: _____

_____

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 1002400 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: 0000000000 ***

ESTAB NBR: 88015443 BILL FLAG: O LOC: 53 PARCEL NBR: PROBLEM PGM: STATUS: ESTAB DATE: 022388 INACTIVE DATE: 000000

*** CONTROL NUMBER: 1002401 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: 8802240047 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8802240047 | 226008 | | 03/31/88 | | 00 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 1002401 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: 8802240047 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 000 | | | | | |

*** CONTROL NUMBER: 1002499 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: A ***

*** CONTROL NUMBER: 1002499 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: E ***

*** CONTROL NUMBER: 1002499 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: O ***

ESTAB: MELLO & SOUSA
7325 0/0 EDISON
00000
CHINO CA 91710-0000
(714) 597-2414

APPL: MELLO & SOUSA
7325 0/0 EDISON
00000
CHINO CA 91710-0000
(714) 597-2414

OWNR: MELLO & SOUSA
7325 0/0 EDISON
00000
CHINO CA 91710-0000
(714) 597-2414

.ERGENCY MANAGEMENT PROGRA
AUTOMATED PERMIT BILLING SYSTEM
DATA INPUT SHEET

ACTION CODE: I EST. # _____ PERMIT # _____

**ESTABLISHMENT INFO: (00)**

BILL TO: LOCATION: # 53 EST. DATE: _____

**ADDRESSING INFORMATION (99):**

E

NAME: Mello & Sousa

ST #: 7325 FRAC: ____ DIR: ____ ST NAME: Edison

ST. DESIG. _____ APT/SP _____ CITY Chino

STATE CA ZIP 91710 PH #: ( 714 ) 597 - 2414

A

NAME: Same

ST #: _____ FRAC: ____ DIR: ____ ST NAME: _____

ST. DESIG. _____ APT/SP _____ CITY _____

STATE _____ ZIP _____ PH #: ( ) _____ - _____

O

NAME: Same

ST #: _____ FRAC: ____ DIR: ____ ST NAME: _____

ST. DESIG. _____ APT/SP _____ CITY _____

STATE _____ ZIP _____ PH #: ( ) _____ - _____

**PERMIT INFORMATION (01):**

CATEGORY # 226006 226007 (226008)

EXP. DATE: _____ SANITARIAN DIST/AREA: _____ SANITARIAN DIST.EMP #: 00

RENEWAL CODE: (N) MFR # _____

**PROGRAM INFORMATION:**

# OF EMPLOYEES: N/A # OF CHEMICALS: N/A

FEB 23 1988

DATE ENTERED: _____ CONTROL #: 10024

SUBMITTED BY (INITIAL): R.P. ENTERED BY (INITIAL) TR

**COMMENTS/REMARKS:** Needs to be invoiced the AG Haz Materials Handlers fee and entered into the data BASE

| | | | | |
|---|---|---|---|---|
| 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | CHINO |

*EMAILED GRM TO PULL FILE 1/3/24 CR

7325 EDISON AVE / 1053-391-01 SFR 3

7371 EDISON AVE / “ “

7397 EDISON AVE / “ “

7587 EDISON AVE / 1053-371-01 DAIRY

7697 EDISON AVE / N/A

14306 BON VIEW AVE / N/A

14316 BON VIEW AVE / N/A

14330 BON VIEW AVE / N/A

14451 BON VIEW AVE / N/A

14366 BON VIEW AVE / N/A

7556 EUCALYPTUS AVE / 1053-581-03 GRAZING

7634 EUCALYPTUS AVE / N/A

| | | | | | |
|---|---|---|---|---|---|
| ✓ 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | | CHINO |
| ✓ FA0000648 | SNS DAIRY | 02 | 7371 EDISON AVE | | ONTARIO |
| ✓ FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | | ONTARIO |
| ✓ FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | | ONTARIO |
| ✓ 90020263 | QUALITY BUILT FIBERGLASS | 14316 | BON VIEW | | CHINO |
| ✓ FA0000393 | COSTA VIEW FARM | 02 | 14451 BON VIEW | | ONTARIO |

*EMAILED GRM TO SCAN FILES 2/13/24 CR

AG - info updated/closed

CREATE EXPANDED + BOLDING

# HAZARDOUS MATERIAL FIELD SERVICE
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A ONTARIO

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000554

NAME: ~~SOUSA, SERAFIN, ET AL~~ Sam Sousa

ADDRESS 1: ~~7397~~ EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91761

COUNTRY:

PHONE: (909) 627-9432

EXT:

FAX:

ALT PHONE:

EXT:

DRIVER LICENSE:

TAX ID:

LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Sam Sousa

DBA: ~~SOUSA, SERAFIN, ET AL~~ SNS Dairy

ADDRESS1: 7397 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710~~ 91761

COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000648

NAME: ~~AG-~~SNS DAIRY

ADDRESS 1: 7371 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-1710~~ 91761

CITY CODE: ~~CHINO~~ Ontario

SIC CODE:

BUSINESS CODE: 02

BUSINESS TYPE: 03

CENSUS: N/A

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: ~~05~~ 03

PHONE: (909) 627-9432

EXT:

FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG-~~SNS DAIRY

CARE OF:

ADDRESS 1: 7371 EDISON AVE

ADDRESS 2:

CITY: CHINO

STATE: CA

ZIP CODE: 91710-1710

COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000649

RESPONSIBLE PARTY: Sam Sousa

CARE OF: SNS Dairy

ADDRESS 1: 7371 Edison

ADDRESS 2:

CITY: Ontario

STATE:

ZIP CODE:

COUNTRY:

PHONE: (909) 627-9432

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 04/05/2007

ALT PHONE:

EXT:

TAX ID:

ANNIVERSARY DATE: 04/30/1997

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT000893 | ACTIVE | 4210 | /01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009820 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008934 | ACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009821 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 0 NUMBER OF UST'S ENTERED 0 MFR #

DATE SUBMITTED: 4-19-07 DATE ENTERED: MAY 03 2007 FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY: Jose Cisneros

COMMENTS/REMARKS:

Per inspection: No longer milk producer, no hazardous materials or hazardous wastes onsite.

Remove "Ag" prefix from name and update city to Ontario.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000648 Facility Name: SNS Dairy Inspection Date: April 17, 2007

Site Address: 7371 Edison Phone #: (909) 627-9432

City: Ontario Zip Code: 91761 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Sam Sousa Title: Owner # Emp: 0

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | |
| 107. Contingency Plan established | CCR 66265.51(a) | | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR | | | |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | X | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | |
| 202. Business Plan established | CHSC 25503.5 | | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | |
| 230. Business Plan implemented | CHSC 25503.5 | | | |

**INSPECTION NARRATIVE**

An inspection was conducted to verify operating status of this dairy.

Facility raises cattle only, no milk production occurs. No hazardous materials or hazardous wastes were observed at time of inspection.

Correct the following violation:

(117) Contaminated containers not managed properly - CCR 66261.7

Empty containers larger than 5 gallons are required to be labeled as empty along with the date on which the container became empty.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] Sign Name — Leslie Alaviside Print Name

Received By: [signature] Sign Name — Sam Sousa Print Name

Title: Owner

Report Date: April 17, 2007

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620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org

# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 17, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0006648 | SVS Dairy | 7371 Edison, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Sam Sousa | TITLE Owner |

Observed several empty 55-gallon drums in the milking parlor and around feed dispenser.

To correct this violation: Submit a copy of the receipt documenting removal of empty containers.

Submit receipt within 30 days (along with Certificate of Compliance for Sousa Dairy across the street).

If you have any questions, please call (909) 386-8401.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) Leslie Haviside (Print Name)

Received By: [signature] (Sign Name) Sam Sousa (Print Name)

Title: Owner

Report Date: April 17, 2007

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

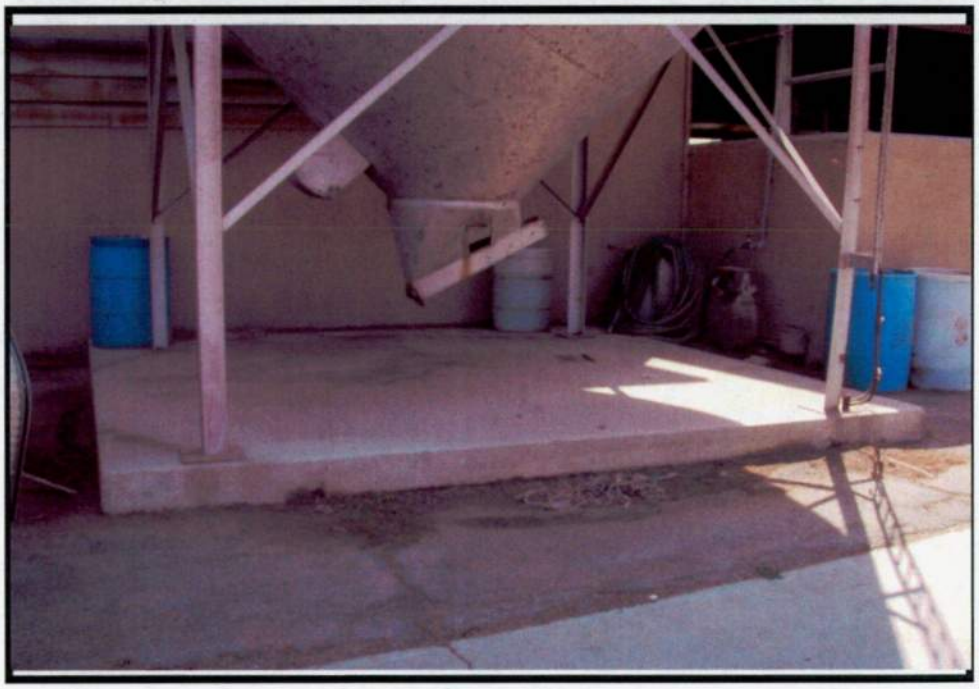

Facility/Case Name: **SNS Dairy**

Facility ID #: **FA0000648**

Address: **7371 Edison Avenue, Ontario**

1) Description: **Sign at front of property**

2) Description: **Empty 55-gallon drums**

Date Taken: **April 17, 2007**

Taken By: **Leslie Heaviside**

Signature: Li Hei

Revised 10/12/2000

WALCO

NTARIO DIVISION
06 East Cedar Street
Ontario, CA 91761
(909) 947-4957

# DRUM RETURNS

№ 3331

Customer Name: SAM SOUSA Customer No.: Date: 5/21/07

| QTY | CODE | DESCRIPTION | SIZE |
|---|---|---|---|
| 6 | | TEAT DIP | 55 |
| | | ACID | 30 |
| | | CHLORINE | 30 |

Driver: WALT Customer Signature: Sam Sousa Approved:

| | | | | | |
|---|---|---|---|---|---|
| ✓ 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | | CHINO |
| ✓ FA0000648 | SNS DAIRY | 02 | 7371 EDISON AVE | | ONTARIO |
| ✓ FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | | ONTARIO |
| ✓ FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | | ONTARIO |
| ✓ 90020263 | QUALITY BUILT FIBERGLASS | 14316 | BON VIEW | | CHINO |
| ✓ FA0000393 | COSTA VIEW FARM | 02 | 14451 BON VIEW | | ONTARIO |

*EMAILED GRM TO SCAN FILES 2/13/24 CR

# TiVa DAIRY (CERSID: 10052128)

**Facility Information Certified Feb 15, 2024**

Certified on 2/15/2024 2:13:50 PM by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

- Business Activities
- Business Owner/Operator Identification

**Hazardous Materials Inventory Certified Feb 15, 2024**

Certified on 2/15/2024 2:13:50 PM by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

- Hazardous Material Inventory (5)
- Site Map (Official Use Only)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 4366KB)

**Emergency Response and Training Plans Certified Feb 15, 2024**

Certified on 2/15/2024 2:13:50 PM by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

- Emergency Response/Contingency Plan
  - *Emergency Response/Contingency Plan* (Adobe PDF, 390KB)
- Employee Training Plan
  - Provided In Submital Element: Emergency Response and Training Plans
- Locally-Required Documentation
  - Provided In Submital Element: Emergency Response and Training Plans

## Site Identification

**TiVa DAIRY**
7587 EDISON AVE
ONTARIO, CA 91762
County
San Bernardino

CERS ID
**10052128**
EPA ID Number

## Submittal Status

Certified on 2/15/2024 by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

## Hazardous Materials

| | |
|---|---|
| Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | Yes |

## Underground Storage Tank(s) (UST)

| | |
|---|---|
| Does your facility own or operate underground storage tanks? | No |

## Hazardous Waste

| | |
|---|---|
| Is your facility a Hazardous Waste Generator? | No |
| Does your facility treat hazardous waste on-site? | No |
| Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | No |
| Does your facility consolidate hazardous waste generated at a remote site? | No |
| Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site? | No |
| Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month greater than 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | No |
| Is your facility a Household Hazardous Waste (HHW) Collection site? | No |

## Excluded and/or Exempted Materials

| | |
|---|---|
| Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)? | No |

## Aboveground Petroleum Storage

| | |
|---|---|
| Does your facility own or operate aboveground petroleum storage tanks or containers AND:<br>* have a total aboveground petroleum storage capacity of 1,320 gallons or more, OR<br>* have one or more petroleum tanks in an underground area? | No |

## Regulated Substances

| | |
|---|---|
| Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)? | No |

## Additional Information

No additional comments provided.

## Facility/Site

**TiVa DAIRY**
7587 EDISON AVE
ONTARIO, CA 91762

CERS ID
**10052128**

## Submittal Status

Certified on 2/15/2024 by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

## Identification

Dickie Vander Meulen

| Operator Phone | Business Phone | Business Fax |
|---|---|---|
| (951) 202-8787 | (951) 202-8787 | |

| Beginning Date | Ending Date | |
|---|---|---|
| Dun & Bradstreet | SIC Code | Primary NAICS |

## Facility/Site Mailing Address

14382 Bethany Ave
Chino, CA 91710

## Primary Emergency Contact

Dickie Vander Meulen
Title
Partner- Operator

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (951) 202-8787 | (951) 202-8787 | |

## Owner

DICKIE VANDERMEULEN
(951) 202-8787
14382 Bethany Ave
Chino, CA 91710

## Secondary Emergency Contact

Harold Tillema
Title
Partner

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 226-1160 | (909) 226-1160 | |

## Billing Contact

DICKIE VANDERMEULEN
(951) 202-8787 tivadairy@gmail.com
14382 Bethany Ave
Chino, CA 91710

## Environmental Contact

Dickie Vander Meulen
(951) 202-8787 tivadairy@gmail.com
14382 Bethany Ave
Chino, CA 91710

| Name of Signer | Signer Title | Document Preparer |
|---|---|---|
| dickie vandermeulen | Partner | dickie vandermeulen |

Additional Information

## Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

### Property Owner

Phone

Mailing Address

,

Assessor Parcel Number (APN)

Number of Employees
6

Facility ID
FA0011003

# Hazardous Materials And Wastes Inventory Matrix Report

CERS Business/Org. **TIVA DAIRY**
Facility Name **TiVa DAIRY**
7587 EDISON AVE, ONTARIO 91762

Chemical Location
**chemical storage room in milk barn**

CERS ID **10052128**
Facility ID **FA0011003**
Status **Submitted** on 2/15/2024 2:13 PM

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 8 - Corrosives (Liquids and Solids)<br><br>Corrosive, Oxidizing, Class 2 | **Sodium Hypochlorite**<br>CAS No<br>7681-52-9 | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **55**<br>Storage Container<br>Plastic/Non-metalic Drum<br><br>Days on Site: 365 | **55** | 55<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | | | | |
| Corrosive | **sodium hydroxide**<br>CAS No<br>61789-31-9 | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **55**<br>Storage Container<br>Plastic/Non-metalic Drum<br><br>Days on Site: 365 | **55** | 55<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Health Acute Toxicity<br>- Health Serious Eye Damage Eye Irritation | | | | |
| Corrosive | **insecticide**<br>CAS No | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **55**<br>Storage Container<br>Plastic/Non-metalic Drum<br><br>Days on Site: 365 | **55** | 55<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Health Acute Toxicity<br>- Health Skin Corrosion Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **TIVA DAIRY** | Chemical Location | CERS ID **10052128** |
| Facility Name | **TiVa DAIRY** | **Chemical storage room in milk house** | Facility ID **FA0011003** |
| | 7587 EDISON AVE, ONTARIO 91762 | | Status **Submitted** on 2/15/2024 2:13 PM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Corrosive | **Iodine solution**<br>CAS No | **Gallons**<br>State: Liquid<br>Type: Mixture | **300**<br>Storage Container: Tote Bin<br>Days on Site: 365 | **300** | 300<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Acute Toxicity<br>- Health Serious Eye Damage Eye Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

CERS Business/Org. **TIVA DAIRY**
Facility Name **TiVa DAIRY**
7587 EDISON AVE, ONTARIO 91762

Chemical Location
**side of barn**

CERS ID **10052128**
Facility ID **FA0011003**
Status **Submitted** on 2/15/2024 2:13 PM

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 3 - Flammable and Combustible Liquids<br><br>Combustible Liquid, Class II | **Diesel Fuel No. 2**<br>CAS No<br>68476-34-6 | **Gallons**<br>State<br>Liquid<br>Type<br>Pure | **500**<br>Storage Container<br>Aboveground Tank<br><br>Days on Site: 365 | **500** | 500<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Physical Flammable<br>- Health Carcinogenicity<br>- Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Respiratory Skin Sensitization<br>- Health Specific Target Organ Toxicity<br>- Health Aspiration Hazard | | | | |

CALIFORNIA ENVIRONMENTAL REPORTING SYSTEM (CERS)

# CONSOLIDATED EMERGENCY RESPONSE / CONTINGENCY PLAN

*Prior to completing this Plan, please refer to the INSTRUCTIONS FOR COMPLETING A CONSOLIDATED CONTINGENCY PLAN*

## A. FACILITY IDENTIFICATION AND OPERATIONS OVERVIEW

| | | | |
|---|---|---|---|
| FACILITY ID # FA0000672 | A1. | CERS ID # 10034845 A2. | DATE OF PLAN PREPARATION/REVISION (MM/DD/YYYY) 04/29/2019 A3. |

BUSINESS NAME *(Same as Facility Name or DBA - Doing Business As)*
TiVa Dairy A4.

BUSINESS SITE ADDRESS
7587 Edison Avenue A5.

| | | |
|---|---|---|
| BUSINESS SITE CITY Ontario A6. | CA | ZIP CODE 91710-0000 A7. |

| | |
|---|---|
| TYPE OF BUSINESS (e.g., Painting Contractor) dairy farm A8. | INCIDENTAL OPERATIONS (e.g., Fleet Maintenance) none A9. |

THIS PLAN COVERS CHEMICAL SPILLS, FIRES, AND EARTHQUAKES INVOLVING (Check all that apply): A10.

- [x] 1. HAZARDOUS MATERIALS; [ ] 2. HAZARDOUS WASTES

## B. INTERNAL RESPONSE

INTERNAL FACILITY EMERGENCY RESPONSE WILL OCCUR BY (Check all that apply): B1.

- [x] 1. CALLING PUBLIC EMERGENCY RESPONDERS (e.g., 9-1-1)
- [ ] 2. CALLING HAZARDOUS WASTE CONTRACTOR
- [ ] 3. ACTIVATING IN-HOUSE EMERGENCY RESPONSE TEAM

## C. EMERGENCY COMMUNICATIONS, PHONE NUMBERS AND NOTIFICATIONS

In the event of an emergency involving hazardous materials and/or hazardous waste, all facilities must IMMEDIATELY:

1. Notify facility personnel and evacuate if necessary in accordance with the Emergency Action Plan (Title 8 California Code of Regulations §3220);
2. Notify local emergency responders by calling 9-1-1;
3. Notify the local Unified Program Agency (UPA) at the phone number below; and
4. Notify the State Warning Center at (800) 852-7550.

Facilities that generate, treat, store or dispose of hazardous waste have additional responsibilities to notify and coordinate with other response agencies. Whenever there is an imminent or actual emergency situation such as an explosion, fire, or release, the Emergency Coordinator must follow the appropriate requirements for the category of facility and type of release involved:

1. Title 22 California Code of Regulations §66265.56. Emergency Procedures for generators of 1,000 kilograms or more of hazardous waste in any calendar month.
2. Title 22 California Code of Regulations §66265.196. Response to Leaks or Spills and Disposition of Leaking or Unfit-for-Use Tank Systems.
3. Title 40 Code of Federal Regulations §302.6. Notification requirements for a release of a hazardous substance equal to or greater than the reportable quantity.
4. Title 22 California Code of Regulations §66262.34(d)(2) and Title 40 Code of Federal Regulations §262.34(d)(5)(ii) for generators of less than 1000 kilograms of hazardous waste in any calendar month.

Following notification and before facility operations are resumed in areas of the facility affected by the incident, the Emergency Coordinator shall notify the local UPA and the local fire department's hazardous materials program, if necessary, that the facility is in compliance with requirements to:

1. Provide for proper storage and disposal of recovered waste, contaminated soil or surface water, or any other material that results from an explosion, fire, or release at the facility; and
2. Ensure that no material that is incompatible with the released material is transferred, stored, or disposed of in areas of the facility affected by the incident until cleanup procedures are completed.

| EMERGENCY RESPONSE PHONE NUMBERS: | | |
|---|---|---|
| AMBULANCE, FIRE, POLICE AND CHP | | 9-1-1 |
| CALIFORNIA STATE WARNING CENTER (CSWC)/CAL OES | | (800) 852-7550 |
| NATIONAL RESPONSE CENTER (NRC) | | (800) 424-8802 |
| POISON CONTROL CENTER | | (800) 222-1222 |
| LOCAL UNIFIED PROGRAM AGENCY (UPA) | | (909) 386-8425 C1. |
| OTHER (Specify): | C2. | C3. |
| NEAREST MEDICAL FACILITY / HOSPITAL NAME: | Kaiser Permanente 2295 S. Vineyard, Ontario CA C4. | (909) 724-5000 C5. |

| AGENCY NOTIFICATION PHONE NUMBERS: | | |
|---|---|---|
| CALIFORNIA DEPT. OF TOXIC SUBSTANCES CONTROL (DTSC) | | (916) 255-3545 |
| REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) | | (951) 782-4130 C6. |
| U.S. ENVIRONMENTAL PROTECTION AGENCY (US EPA) | | (800) 300-2193 |
| CALIFORNIA DEPT. OF FISH AND WILDLIFE (CDFW) | | (916) 358-2900 |
| U.S. COAST GUARD (USCG) | | (202) 267-2180 |
| CAL OSHA | | (916) 263-2800 |
| CAL FIRE OFFICE OF THE STATE FIRE MARSHAL (OSFM) | | (916) 323-7390 |
| OTHER (Specify): | C7. | C8. |
| OTHER (Specify): | C9. | C10. |

INTERNAL FACILITY EMERGENCY COMMUNICATIONS OR ALARM NOTIFICATION WILL OCCUR BY (Check all that apply): C11.

- [x] 1. VERBAL WARNINGS;
- [ ] 2. PUBLIC ADDRESS OR INTERCOM SYSTEM;
- [x] 3. TELEPHONE;
- [ ] 4. PAGERS;
- [ ] 5. ALARM SYSTEM;
- [ ] 6. PORTABLE RADIO

NOTIFICATIONS TO NEIGHBORING FACILITIES THAT MAY BE AFFECTED BY AN OFF-SITE RELEASE WILL OCCUR BY (Check all that apply): C12.

- [x] 1. VERBAL WARNINGS;
- [ ] 2. PUBLIC ADDRESS OR INTERCOM SYSTEM;
- [x] 3. TELEPHONE;
- [ ] 4. PAGERS;
- [ ] 5. ALARM SYSTEM;
- [ ] 6. PORTABLE RADIO

EMERGENCY COORDINATOR CONTACT INFORMATION: Dickie Vander Meulen C13.

PRIMARY EMERGENCY COORDINATOR NAME: Dickie Vander Meulen PHONE NO.: (951) 202-8787 PHONE NO.: (951) 202-8787

ALTERNATE EMERGENCY COORDINATOR NAME: Harold Tillema PHONE NO.: (909) 226-1160 PHONE NO.: (909) 226-1160

[ ] Check if additional Emergency Coordinator contact and address information is available onsite or by calling PHONE NO.:

Note: If more than one alternate emergency coordinator is designated, attach a list in order of responsibility.

## D. EMERGENCY CONTAINMENT AND CLEANUP PROCEDURES

Check the applicable boxes to indicate your facility's procedures for containing spills and preventing and mitigating releases, fires and/or explosions.

D1.

- [x] 1. MONITOR FOR LEAKS, RUPTURES, PRESSURE BUILD-UP, ETC.;
- [x] 2. PROVIDE STRUCTURAL PHYSICAL BARRIERS (e.g., Portable spill containment walls, built-in berms);
- [x] 3. PROVIDE ABSORBENT PHYSICAL BARRIERS (e.g., Pads, spill pigs, spill pillows);
- [x] 4. COVER OR BLOCK FLOOR AND/OR STORM DRAINS;
- [ ] 5. LINED TRENCH DRAINS AND/OR SUMPS;
- [ ] 6. AUTOMATIC FIRE SUPPRESSION SYSTEM;
- [x] 7. ELIMINATE SOURCES OF IGNITION FOR FLAMMABLE HAZARDS;
- [x] 8. STOP PROCESSES AND/OR OPERATIONS;
- [ ] 9. AUTOMATIC / ELECTRONIC EQUIPMENT SHUT-OFF SYSTEM;
- [x] 10. SHUT OFF WATER, GAS, ELECTRICAL UTILITIES;
- [x] 11. CALL 9-1-1 FOR PUBLIC EMERGENCY RESPONDER ASSISTANCE AND/OR MEDICAL AID;
- [x] 12. NOTIFY AND EVACUATE PERSONS IN ALL THREATENED AND/OR IMPACTED AREAS;
- [x] 13. ACCOUNT FOR EVACUATED PERSONS IMMEDIATELY AFTER EVACUATION;
- [ ] 14. PROVIDE PROTECTIVE EQUIPMENT FOR ON-SITE EMERGENCY RESPONSE TEAM;
- [x] 15. REMOVE CONTAINERS AND/OR ISOLATE AREAS;
- [ ] 16. HIRE LICENSED HAZARDOUS WASTE CONTRACTOR;
- [x] 17. USE ABSORBENT MATERIAL FOR SPILL CONTAINMENT;
- [ ] 18. VACUUM SUCTION USING APPROPRIATE VACUUM (e.g., Intrinsically safe) FOR SPILL CONTROL AND/OR CLEANUP;
- [ ] 19. DECONTAMINATE PERSONNEL AND EQUIPMENT WITHIN DESIGNATED AREA AND DISPOSE OF WASTEWATER AS HAZARDOUS WASTE;
- [ ] 20. PROVIDE SAFE TEMPORARY STORAGE OF HAZARDOUS WASTE GENERATED DURING EMERGENCY ACTIONS;
- [ ] 21. OTHER (Specify):

D2.

## E. FACILITY EVACUATION

THE FOLLOWING ALARM SIGNAL(S) WILL BE USED TO BEGIN EVACUATION OF THE FACILITY (Check all that apply): E1.

- [ ] 1. BELLS;
- [ ] 2. HORNS/SIRENS;
- [x] 3. VERBAL (i.e., Shouting);
- [x] 4. OTHER (Specify): personal cellular telephones

E2.

THE FOLLOWING LOCATION(S) WILL BE USED FOR AN EMERGENCY ASSEMBLY AREA(S) (e.g., Parking lot, street corner): E3.

grass area adjacent to Edison Avenue, north side of milk barn

Note: The Emergency Coordinator must account for all onsite employees and visitors after evacuation.

EVACUATION ROUTE S AND ALTERNATE EVACUATION ROUTES ARE DESCRIBED AS FOLLOWS: E4.

- [ ] 1. WRITTEN PROCEDURES DESCRIBING ROUTES, EXITS, AND ASSEMBLY AREAS;
- [x] 2. EVACUATION MAP(S) DEPICTING ROUTES, EXITS, AND ASSEMBLY AREAS;
- [ ] 3. OTHER (Specify):

E5.

Note: Evacuation procedures and/or maps should be posted in visible facility locations and must be included in the Contingency Plan.

## F. ARRANGEMENTS FOR EMERGENCY SERVICES

ADVANCE ARRANGEMENTS FOR LOCAL EMERGENCY SERVICES (Check one of the following): F1.

- [x] 1. HAVE BEEN DETERMINED NOT NECESSARY;
- [ ] 2. THE FOLLOWING ARRANGEMENTS HAVE BEEN MADE (Specify):

F2.

Note: Advance arrangements with local fire and police departments, hospitals, state and local emergency response teams, and/or emergency services contractors should be made for your facility, if necessary. Large Quantity Generators must describe arrangements in the Contingency Plan.

## G. EMERGENCY EQUIPMENT

**Check the applicable boxes to list emergency response equipment available at the facility, identify the location(s) where the equipment is kept, and indicate the equipment's capability, if applicable.**

| TYPE | EQUIPMENT AVAILABLE G1. | LOCATION G2. | CAPABILITY G3. |
|---|---|---|---|
| *EXAMPLE* | ☒ *CHEMICAL PROTECTIVE GLOVES* | *SPILL RESPONSE KIT* | *SINGLE USE, OIL RESISTANT ONLY* |
| **Safety and First Aid** | 1. ☒ CHEMICAL PROTECTIVE SUITS, APRONS, AND/OR VESTS | Chemical room | apron |
| | 2. ☐ CHEMICAL PROTECTIVE GLOVES | | |
| | 3. ☒ CHEMICAL PROTECTIVE BOOTS | employees all wear rubber boots | |
| | 4. ☐ SAFETY GLASSES, GOGGLES, AND FACE SHIELDS | | |
| | 5. ☐ HARD HATS | | |
| | 6. ☐ AIR-PURIFYING RESPIRATORS | | |
| | 7. ☐ SELF-CONTAINED BREATHING APPARATUS (SCBA) | | |
| | 8. ☒ FIRST AID KITS | office | |
| | 9. ☐ PLUMBED EYEWASH FOUNTAIN AND/OR SHOWER | | |
| | 10. ☐ PORTABLE EYEWASH KITS AND/OR STATION | | |
| | 11. ■ OTHER | drop hoses in milking area fresh water | |
| **Fire Fighting** | 12. ☒ PORTABLE FIRE EXTINGUISHERS | office | |
| | 13. ☐ FIXED FIRE SUPPRESSION SYSTEMS AND/ OR SPRINKLERS | | |
| | 14. ☐ FIRE ALARM BOXES | | |
| | 15. ☐ OTHER | | |
| **Spill Control and Clean-Up** | 16. ☐ ALL-IN-ONE SPILL KIT | | |
| | 17. ☒ ABSORBENT MATERIAL | feed storage area- soil | |
| | 18. ☐ CONTAINER FOR USED ABSORBENT | | |
| | 19. ☒ BERM AND/OR DIKING EQUIPMENT | front end loader- feed storage area | |
| | 20. ☐ BROOM | | |
| | 21. ■ SHOVEL | feed storage area | |
| | 22. ☐ VACUUM | | |
| | 23. ☐ EXHAUST HOOD | | |
| | 24. ☐ SUMP AND/OR HOLDING TANK | | |
| | 25. ☐ CHEMICAL NEUTRALIZERS | | |
| | 26. ☐ GAS CYLINDER LEAK REPAIR KIT | | |
| | 27. ☐ SPILL OVERPACK DRUMS | | |
| | 28. ☐ OTHER | | |
| **Communications and Alarm Systems** | 29. ☒ TELEPHONES (e.g., Cellular) | all employees have personal cell phone | |
| | 30. ☐ INTERCOM AND/OR PA SYSTEM | | |
| | 31. ☐ PORTABLE RADIOS | | |
| | 32. ☐ AUTOMATIC ALARM CHEMICAL MONITORING EQUIPMENT | | |
| **Other** | 33. ☐ OTHER | | |
| | 34. ☐ OTHER | | |

## H. EARTHQUAKE VULNERABILITY

Identify areas of the facility that are vulnerable to hazardous materials releases due to seismic motion. These areas require immediate isolation and inspection.

| VULNERABLE AREAS (Check all that apply): H1. | LOCATIONS (e.g., Shop, outdoor shed, lab): H2. |
|---|---|
| ☒ 1. HAZARDOUS MATERIALS AND/OR WASTE STORAGE AREAS | chemical room |
| ☐ 2. PROCESS LINES AND PIPING | |
| ☐ 3. LABORATORY | |
| ☐ 4. WASTE TREATMENT AREA | |

Identify mechanical systems vulnerable to releases / spills due to earthquake-related motion. These systems require immediate isolation and inspection.

| VULNERABLE SYSTEMS AND/OR EQUIPMENT (Check all that apply): H3. | LOCATIONS: H4. |
|---|---|
| ☒ 1. SHELVES, CABINETS AND/OR RACKS | chemical room |
| ☒ 2. TANKS AND SHUT-OFF VALVES | |
| ☐ 3. PORTABLE GAS CYLINDERS | |
| ☒ 4. EMERGENCY SHUT-OFF AND/OR UTILITY VALVES | machine room |
| ☐ 5. SPRINKLER SYSTEMS | |
| ☐ 6. STATIONARY PRESSURIZED CONTAINERS (e.g., Propane tank) | |

## I. EMPLOYEE TRAINING

Employee training is required for all employees and/or contractors handling hazardous materials and/or hazardous wastes during normal and/or emergency operations. Most facilities will need to submit a separate Training Plan. However, your CUPA may accept this section as the Training Plan for some small facilities. Employee training plans may include the following content:

- Applicable laws and regulations;
- Emergency response plans and procedures;
- Safety Data Sheets;
- Hazard communication related to health and safety;
- Methods for safe handling of hazardous substances;
- Hazards of materials and processes (e.g., fire, explosion, asphyxiation);
- Hazard mitigation, prevention and abatement procedures;
- Coordination of emergency response actions;
- Notification procedures for local emergency responders, CUPA, Cal OES, and onsite personnel;
- Communication and alarm systems;
- Personal protective equipment;
- Use and maintenance of emergency response equipment and supplies (e.g. Fire extinguishers, respirators, spill control materials);
- Decontamination procedures;
- Evacuation procedures and evacuation staging locations;
- Identification of facility areas, equipment, and systems vulnerable to earthquakes and other natural disasters.
- OTHER (Specify):

Check the applicable boxes below to indicate how the employee training program is administered.

☐ 1. FORMAL CLASSROOM ☐ 2. VIDEOS ☐ 3. SAFETY MEETINGS ☐ 4. STUDY GUIDES / MANUALS I1.

☒ 5. OTHER (Specify): tailgate meetings as needed I2.

☐ 6. NOT APPLICABLE SINCE FACILITY HAS NO EMPLOYEES

☐ 7. CHECK IF A SEPARATE EMPLOYEE TRAINING PLAN IS USED AND UPLOADED TO CERS AS A PDF DOCUMENT I3.

☐ 8. CHECK IF EMPLOYEE TRAINING IS COVERED BY THE ABOVE REFERENCED CONTENT AND OTHER DOCUMENTS ONSITE I4.

**EMPLOYEE TRAINING FREQUENCY AND RECORDKEEPING TRAINING MUST BE:**

- Provided initially for new employees as soon as possible following the date of hire. New employees should not work in an unsupervised position that involves hazardous materials handling and/or hazardous waste management without proper training;
- Provided within six months from the date of hire for new employees at a large quantity generator;
- Ongoing and provided at least annually;
- Amended prior to a change in process or work assignment;
- Given upon modification to the Emergency Response/Contingency Plan.

**Large Quantity Generator Training:** Large quantity generators (1,000 kg or more) must retain written plan and documentation of employee training which includes:

- A written description of the type and amount of both initial and ongoing training that will be given to persons filling each job position having responsibility for hazardous waste management and/or emergency response.
- The name, job title and job description for each position at the facility related to hazardous waste management.
- Current employee training records must be retained until closure of the facility and former employee training records must be retained for at least three years after termination of employment.

**Small Quantity Generator Training:** Small quantity generators (less than 1,000 kg) must include basic hazardous waste management and emergency response procedures but a written employee training plan and training records are not required. In order to show that the facility has met the small quantity generator employee training requirement, an employee training plan and training records may be made available.

**Hazardous Materials Business Plan Training**: Businesses must provide initial and annual employee training that includes the content referenced above. The training may be based on the job position and training records must be made available for a period of at least three years.

## J. LIST OF ATTACHMENTS

Check one of the following:

☒ 1. NO ATTACHMENTS ARE REQUIRED; or J1.

☐ 2. THE FOLLOWING DOCUMENTS ARE ATTACHED: J2.

CALIFORNIA ENVIRONMENTAL REPORTING SYSTEM (CERS)

# CONSOLIDATED EMERGENCY RESPONSE / CONTINGENCY PLAN

*Prior to completing this Plan, please refer to the INSTRUCTIONS FOR COMPLETING A CONSOLIDATED CONTINGENCY PLAN*

## A. FACILITY IDENTIFICATION AND OPERATIONS OVERVIEW

| FACILITY ID # | A1. | CERS ID # A2. | DATE OF PLAN PREPARATION/REVISION (MM/DD/YYYY) A3. |
|---|---|---|---|
| FA | | 10052128 | 07/02/2019 |

BUSINESS NAME *(Same as Facility Name or DBA - Doing Business As)* A4.
TiVa Dairy

BUSINESS SITE ADDRESS A5.
7587 Edison Avenue

| BUSINESS SITE CITY A6. | | ZIP CODE A7. |
|---|---|---|
| Ontario | CA | 91710-0000 |

| TYPE OF BUSINESS (e.g., Painting Contractor) A8. | INCIDENTAL OPERATIONS (e.g., Fleet Maintenance) A9. |
|---|---|
| dairy farm | none |

THIS PLAN COVERS CHEMICAL SPILLS, FIRES, AND EARTHQUAKES INVOLVING (Check all that apply): A10.

- [x] 1. HAZARDOUS MATERIALS;
- [ ] 2. HAZARDOUS WASTES

## B. INTERNAL RESPONSE

INTERNAL FACILITY EMERGENCY RESPONSE WILL OCCUR BY (Check all that apply): B1.

- [x] 1. CALLING PUBLIC EMERGENCY RESPONDERS (e.g., 9-1-1)
- [ ] 2. CALLING HAZARDOUS WASTE CONTRACTOR
- [ ] 3. ACTIVATING IN-HOUSE EMERGENCY RESPONSE TEAM

## C. EMERGENCY COMMUNICATIONS, PHONE NUMBERS AND NOTIFICATIONS

In the event of an emergency involving hazardous materials and/or hazardous waste, all facilities must IMMEDIATELY:
1. Notify facility personnel and evacuate if necessary in accordance with the Emergency Action Plan (Title 8 California Code of Regulations §3220);
2. Notify local emergency responders by calling 9-1-1;
3. Notify the local Unified Program Agency (UPA) at the phone number below; and
4. Notify the State Warning Center at (800) 852-7550.

Facilities that generate, treat, store or dispose of hazardous waste have additional responsibilities to notify and coordinate with other response agencies. Whenever there is an imminent or actual emergency situation such as an explosion, fire, or release, the Emergency Coordinator must follow the appropriate requirements for the category of facility and type of release involved:
1. Title 22 California Code of Regulations §66265.56. Emergency Procedures for generators of 1,000 kilograms or more of hazardous waste in any calendar month.
2. Title 22 California Code of Regulations §66265.196. Response to Leaks or Spills and Disposition of Leaking or Unfit-for-Use Tank Systems.
3. Title 40 Code of Federal Regulations §302.6. Notification requirements for a release of a hazardous substance equal to or greater than the reportable quantity.
4. Title 22 California Code of Regulations §66262.34(d)(2) and Title 40 Code of Federal Regulations §262.34(d)(5)(ii) for generators of less than 1000 kilograms of hazardous waste in any calendar month.

Following notification and before facility operations are resumed in areas of the facility affected by the incident, the Emergency Coordinator shall notify the local UPA and the local fire department's hazardous materials program, if necessary, that the facility is in compliance with requirements to:
1. Provide for proper storage and disposal of recovered waste, contaminated soil or surface water, or any other material that results from an explosion, fire, or release at the facility; and
2. Ensure that no material that is incompatible with the released material is transferred, stored, or disposed of in areas of the facility affected by the incident until cleanup procedures are completed.

| EMERGENCY RESPONSE PHONE NUMBERS: | | |
|---|---|---|
| | AMBULANCE, FIRE, POLICE AND CHP | 9-1-1 |
| | CALIFORNIA STATE WARNING CENTER (CSWC)/CAL OES | (800) 852-7550 |
| | NATIONAL RESPONSE CENTER (NRC) | (800) 424-8802 |
| | POISON CONTROL CENTER | (800) 222-1222 |
| | LOCAL UNIFIED PROGRAM AGENCY (UPA) | (909) 386-8425 C1. |
| | OTHER (Specify): C2. | C3. |
| NEAREST MEDICAL FACILITY / HOSPITAL NAME: | Kaiser Permanente 2295 S. Vineyard, Ontario CA C4. | (909) 724-5000 C5. |

| AGENCY NOTIFICATION PHONE NUMBERS: | | |
|---|---|---|
| | CALIFORNIA DEPT. OF TOXIC SUBSTANCES CONTROL (DTSC) | (916) 255-3545 |
| | REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) | (951) 782-4130 C6. |
| | U.S. ENVIRONMENTAL PROTECTION AGENCY (US EPA) | (800) 300-2193 |
| | CALIFORNIA DEPT. OF FISH AND WILDLIFE (CDFW) | (916) 358-2900 |
| | U.S. COAST GUARD (USCG) | (202) 267-2180 |
| | CAL OSHA | (916) 263-2800 |
| | CAL FIRE OFFICE OF THE STATE FIRE MARSHAL (OSFM) | (916) 323-7390 |
| | OTHER (Specify): C7. | C8. |
| | OTHER (Specify): C9. | C10. |

INTERNAL FACILITY EMERGENCY COMMUNICATIONS OR ALARM NOTIFICATION WILL OCCUR BY (Check all that apply): C11.

- [x] 1. VERBAL WARNINGS;
- [ ] 2. PUBLIC ADDRESS OR INTERCOM SYSTEM;
- [x] 3. TELEPHONE;
- [ ] 4. PAGERS;
- [ ] 5. ALARM SYSTEM;
- [ ] 6. PORTABLE RADIO

NOTIFICATIONS TO NEIGHBORING FACILITIES THAT MAY BE AFFECTED BY AN OFF-SITE RELEASE WILL OCCUR BY (Check all that apply): C12.

- [x] 1. VERBAL WARNINGS;
- [ ] 2. PUBLIC ADDRESS OR INTERCOM SYSTEM;
- [x] 3. TELEPHONE;
- [ ] 4. PAGERS;
- [ ] 5. ALARM SYSTEM;
- [ ] 6. PORTABLE RADIO

EMERGENCY COORDINATOR CONTACT INFORMATION: Dickie Vander Meulen C13.

PRIMARY EMERGENCY COORDINATOR NAME: Dickie Vander Meulen PHONE NO.: (951) 202-8787 PHONE NO.: (951) 202-8787

ALTERNATE EMERGENCY COORDINATOR NAME: Harold Tillema PHONE NO.: (909) 226-1160 PHONE NO.: (909) 226-1160

- [ ] Check if additional Emergency Coordinator contact and address information is available onsite or by calling PHONE NO.:

Note: If more than one alternate emergency coordinator is designated, attach a list in order of responsibility.

## D. EMERGENCY CONTAINMENT AND CLEANUP PROCEDURES

Check the applicable boxes to indicate your facility's procedures for containing spills and preventing and mitigating releases, fires and/or explosions.

D1.

- [x] 1. MONITOR FOR LEAKS, RUPTURES, PRESSURE BUILD-UP, ETC.;
- [x] 2. PROVIDE STRUCTURAL PHYSICAL BARRIERS (e.g., Portable spill containment walls, built-in berms);
- [x] 3. PROVIDE ABSORBENT PHYSICAL BARRIERS (e.g., Pads, spill pigs, spill pillows);
- [x] 4. COVER OR BLOCK FLOOR AND/OR STORM DRAINS;
- [ ] 5. LINED TRENCH DRAINS AND/OR SUMPS;
- [ ] 6. AUTOMATIC FIRE SUPPRESSION SYSTEM;
- [x] 7. ELIMINATE SOURCES OF IGNITION FOR FLAMMABLE HAZARDS;
- [x] 8. STOP PROCESSES AND/OR OPERATIONS;
- [ ] 9. AUTOMATIC / ELECTRONIC EQUIPMENT SHUT-OFF SYSTEM;
- [x] 10. SHUT OFF WATER, GAS, ELECTRICAL UTILITIES;
- [x] 11. CALL 9-1-1 FOR PUBLIC EMERGENCY RESPONDER ASSISTANCE AND/OR MEDICAL AID;
- [x] 12. NOTIFY AND EVACUATE PERSONS IN ALL THREATENED AND/OR IMPACTED AREAS;
- [x] 13. ACCOUNT FOR EVACUATED PERSONS IMMEDIATELY AFTER EVACUATION;
- [ ] 14. PROVIDE PROTECTIVE EQUIPMENT FOR ON-SITE EMERGENCY RESPONSE TEAM;
- [x] 15. REMOVE CONTAINERS AND/OR ISOLATE AREAS;
- [ ] 16. HIRE LICENSED HAZARDOUS WASTE CONTRACTOR;
- [x] 17. USE ABSORBENT MATERIAL FOR SPILL CONTAINMENT;
- [ ] 18. VACUUM SUCTION USING APPROPRIATE VACUUM (e.g., Intrinsically safe) FOR SPILL CONTROL AND/OR CLEANUP;
- [ ] 19. DECONTAMINATE PERSONNEL AND EQUIPMENT WITHIN DESIGNATED AREA AND DISPOSE OF WASTEWATER AS HAZARDOUS WASTE;
- [ ] 20. PROVIDE SAFE TEMPORARY STORAGE OF HAZARDOUS WASTE GENERATED DURING EMERGENCY ACTIONS;
- [ ] 21. OTHER (Specify): D2.

## E. FACILITY EVACUATION

THE FOLLOWING ALARM SIGNAL(S) WILL BE USED TO BEGIN EVACUATION OF THE FACILITY (Check all that apply): E1.

E2.

- [ ] 1. BELLS;
- [ ] 2. HORNS/SIRENS;
- [x] 3. VERBAL (i.e., Shouting);
- [x] 4. OTHER (Specify): personal cellular telephones

THE FOLLOWING LOCATION(S) WILL BE USED FOR AN EMERGENCY ASSEMBLY AREA(S) (e.g., Parking lot, street corner): E3.

grass area adjacent to Edison Avenue, north side of milk barn

Note: The Emergency Coordinator must account for all onsite employees and visitors after evacuation.

EVACUATION ROUTE S AND ALTERNATE EVACUATION ROUTES ARE DESCRIBED AS FOLLOWS: E4.

- [ ] 1. WRITTEN PROCEDURES DESCRIBING ROUTES, EXITS, AND ASSEMBLY AREAS;
- [x] 2. EVACUATION MAP(S) DEPICTING ROUTES, EXITS, AND ASSEMBLY AREAS;
- [ ] 3. OTHER (Specify): E5.

Note: Evacuation procedures and/or maps should be posted in visible facility locations and must be included in the Contingency Plan.

## F. ARRANGEMENTS FOR EMERGENCY SERVICES

ADVANCE ARRANGEMENTS FOR LOCAL EMERGENCY SERVICES (Check one of the following): F1.

- [x] 1. HAVE BEEN DETERMINED NOT NECESSARY;
- [ ] 2. THE FOLLOWING ARRANGEMENTS HAVE BEEN MADE (Specify): F2.

Note: Advance arrangements with local fire and police departments, hospitals, state and local emergency response teams, and/or emergency services contractors should be made for your facility, if necessary. Large Quantity Generators must describe arrangements in the Contingency Plan.

## G. EMERGENCY EQUIPMENT

**Check the applicable boxes to list emergency response equipment available at the facility, identify the location(s) where the equipment is kept, and indicate the equipment's capability, if applicable.**

| TYPE | EQUIPMENT AVAILABLE G1. | LOCATION G2. | CAPABILITY G3. |
|---|---|---|---|
| *EXAMPLE* | ☒ *CHEMICAL PROTECTIVE GLOVES* | *SPILL RESPONSE KIT* | *SINGLE USE, OIL RESISTANT ONLY* |
| **Safety and First Aid** | 1. ☒ CHEMICAL PROTECTIVE SUITS, APRONS, AND/OR VESTS | Chemical room | apron |
| | 2. ☐ CHEMICAL PROTECTIVE GLOVES | | |
| | 3. ☒ CHEMICAL PROTECTIVE BOOTS | employees all wear rubber boots | |
| | 4. ☐ SAFETY GLASSES, GOGGLES, AND FACE SHIELDS | | |
| | 5. ☐ HARD HATS | | |
| | 6. ☐ AIR-PURIFYING RESPIRATORS | | |
| | 7. ☐ SELF-CONTAINED BREATHING APPARATUS (SCBA) | | |
| | 8. ☒ FIRST AID KITS | office | |
| | 9. ☐ PLUMBED EYEWASH FOUNTAIN AND/OR SHOWER | | |
| | 10. ☐ PORTABLE EYEWASH KITS AND/OR STATION | | |
| | 11. ☒ OTHER | drop hoses in milking area fresh water | |
| **Fire Fighting** | 12. ☒ PORTABLE FIRE EXTINGUISHERS | office | |
| | 13. ☐ FIXED FIRE SUPPRESSION SYSTEMS AND/ OR SPRINKLERS | | |
| | 14. ☐ FIRE ALARM BOXES | | |
| | 15. ☐ OTHER | | |
| **Spill Control and Clean-Up** | 16. ☐ ALL-IN-ONE SPILL KIT | | |
| | 17. ☒ ABSORBENT MATERIAL | feed storage area- soil | |
| | 18. ☐ CONTAINER FOR USED ABSORBENT | | |
| | 19. ☒ BERM AND/OR DIKING EQUIPMENT | front end loader- feed storage area | |
| | 20. ☐ BROOM | | |
| | 21. ☒ SHOVEL | feed storage area | |
| | 22. ☐ VACUUM | | |
| | 23. ☐ EXHAUST HOOD | | |
| | 24. ☐ SUMP AND/OR HOLDING TANK | | |
| | 25. ☐ CHEMICAL NEUTRALIZERS | | |
| | 26. ☐ GAS CYLINDER LEAK REPAIR KIT | | |
| | 27. ☐ SPILL OVERPACK DRUMS | | |
| | 28. ☐ OTHER | | |
| **Communi-cations and Alarm Systems** | 29. ☒ TELEPHONES (e.g., Cellular) | all employees have personal cell phone | |
| | 30. ☐ INTERCOM AND/OR PA SYSTEM | | |
| | 31. ☐ PORTABLE RADIOS | | |
| | 32. ☐ AUTOMATIC ALARM CHEMICAL MONITORING EQUIPMENT | | |
| **Other** | 33. ☐ OTHER | | |
| | 34. ☐ OTHER | | |

## H. EARTHQUAKE VULNERABILITY

Identify areas of the facility that are vulnerable to hazardous materials releases due to seismic motion. These areas require immediate isolation and inspection.

| VULNERABLE AREAS (Check all that apply): H1. | LOCATIONS (e.g., Shop, outdoor shed, lab): H2. |
|---|---|
| ☒ 1. HAZARDOUS MATERIALS AND/OR WASTE STORAGE AREAS | chemical room |
| ☐ 2. PROCESS LINES AND PIPING | |
| ☐ 3. LABORATORY | |
| ☐ 4. WASTE TREATMENT AREA | |

Identify mechanical systems vulnerable to releases / spills due to earthquake-related motion. These systems require immediate isolation and inspection.

| VULNERABLE SYSTEMS AND/OR EQUIPMENT (Check all that apply): H3. | LOCATIONS: H4. |
|---|---|
| ☒ 1. SHELVES, CABINETS AND/OR RACKS | chemical room |
| ☒ 2. TANKS AND SHUT-OFF VALVES | |
| ☐ 3. PORTABLE GAS CYLINDERS | |
| ☒ 4. EMERGENCY SHUT-OFF AND/OR UTILITY VALVES | machine room |
| ☐ 5. SPRINKLER SYSTEMS | |
| ☐ 6. STATIONARY PRESSURIZED CONTAINERS (e.g., Propane tank) | |

## I. EMPLOYEE TRAINING

Employee training is required for all employees and/or contractors handling hazardous materials and/or hazardous wastes during normal and/or emergency operations. Most facilities will need to submit a separate Training Plan. However, your CUPA may accept this section as the Training Plan for some small facilities.
Employee training plans may include the following content:

- Applicable laws and regulations;
- Emergency response plans and procedures;
- Safety Data Sheets;
- Hazard communication related to health and safety;
- Methods for safe handling of hazardous substances;
- Hazards of materials and processes (e.g., fire, explosion, asphyxiation);
- Hazard mitigation, prevention and abatement procedures;
- Coordination of emergency response actions;
- Notification procedures for local emergency responders, CUPA, Cal OES, and onsite personnel;
- Communication and alarm systems;
- Personal protective equipment;
- Use and maintenance of emergency response equipment and supplies (e.g. Fire extinguishers, respirators, spill control materials);
- Decontamination procedures;
- Evacuation procedures and evacuation staging locations;
- Identification of facility areas, equipment, and systems vulnerable to earthquakes and other natural disasters.
- OTHER (Specify):

Check the applicable boxes below to indicate how the employee training program is administered.

☐ 1. FORMAL CLASSROOM ☐ 2. VIDEOS ☐ 3. SAFETY MEETINGS ☐ 4. STUDY GUIDES / MANUALS I1.
☒ 5. OTHER (Specify): tailgate meetings as needed I2.
☐ 6. NOT APPLICABLE SINCE FACILITY HAS NO EMPLOYEES
☐ 7. CHECK IF A SEPARATE EMPLOYEE TRAINING PLAN IS USED AND UPLOADED TO CERS AS A PDF DOCUMENT I3.
☐ 8. CHECK IF EMPLOYEE TRAINING IS COVERED BY THE ABOVE REFERENCED CONTENT AND OTHER DOCUMENTS ONSITE I4.

**EMPLOYEE TRAINING FREQUENCY AND RECORDKEEPING TRAINING MUST BE:**

- Provided initially for new employees as soon as possible following the date of hire. New employees should not work in an unsupervised position that involves hazardous materials handling and/or hazardous waste management without proper training;
- Provided within six months from the date of hire for new employees at a large quantity generator;
- Ongoing and provided at least annually;
- Amended prior to a change in process or work assignment;
- Given upon modification to the Emergency Response/Contingency Plan.

**Large Quantity Generator Training:** Large quantity generators (1,000 kg or more) must retain written plan and documentation of employee training which includes:

- A written description of the type and amount of both initial and ongoing training that will be given to persons filling each job position having responsibility for hazardous waste management and/or emergency response.
- The name, job title and job description for each position at the facility related to hazardous waste management.
- Current employee training records must be retained until closure of the facility and former employee training records must be retained for at least three years after termination of employment.

**Small Quantity Generator Training:** Small quantity generators (less than 1,000 kg) must include basic hazardous waste management and emergency response procedures but a written employee training plan and training records are not required. In order to show that the facility has met the small quantity generator employee training requirement, an employee training plan and training records may be made available.

**Hazardous Materials Business Plan Training**: Businesses must provide initial and annual employee training that includes the content referenced above. The training may be based on the job position and training records must be made available for a period of at least three years.

## J. LIST OF ATTACHMENTS

Check one of the following: J1.
☒ 1. NO ATTACHMENTS ARE REQUIRED; or
☐ 2. THE FOLLOWING DOCUMENTS ARE ATTACHED: J2.

AG-003

# HAZ )OUS MATERIAL FIELD SERVI
# COMPUTER DATABASE UPDATE AUTHORIZATION

RCD SDD FIRE FISCAL
07 JUN 15 PM 1:57

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000579

NAME: TWIN PALMS DAIRY

ADDRESS 1: 7587 EDISON AV

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91762

COUNTRY:

PHONE:

EXT:

FAX:

ALT PHONE: 714-597-2176

EXT:

DRIVER LICENSE:

TAX ID:

LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF:

DBA: TWIN PALMS DAIRY

ADDRESS1: 7587 EDISON AV

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710~~ 91762

COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000673

NAME: AG-TWIN PALM DAIRY

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-0000~~ 91762

CITY CODE: ~~CHINO~~ Ontario

SIC CODE:

BUSINESS CODE:

BUSINESS TYPE: D3

CENSUS:

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: ~~05~~ 03

PHONE: 714-597-2176

EXT:

FIRE JURISDICTION: CHINO VALLEY FIRE

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: AG-TWIN PALM DAIRY

CARE OF:

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-0000~~ 91762

COUNTRY:

EMAIL:

RCD SDD FIRE FISCAL
07 JUN 15 PM 12: 3

## A- A/R INFORMATION

ACCOUNT ID: AR0000674

RESPONSIBLE PARTY:

CARE OF:

ADDRESS 1:

ADDRESS 2:

CITY:

STATE:

ZIP CODE:

COUNTRY:

PHONE:

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 05/04/2007

ALT PHONE:

EXT:

EXEMPT FROM BILLING: YES

TAX ID:

ANNIVERSARY DATE:

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | N/A<br>PERMIT NUMBER | PERMIT STATUS | N/A<br>ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| GHP OR UST ID | CURRENT STATUS(BILLING) | NA<br>GHP FOR UST(PH) | NA<br>CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ADD NEW P.E. | 0202<br>NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. _____ NUMBER OF USTS 0 MFR # _____

ENTERED

DATE SUBMITTED: 5-11-07 DATE ENTERED: JUN 14 2007 FISCAL DATE: _____

SUBMITTED BY: Leslie Heavisides ENTERED BY: Jose Casteros

**COMMENTS/REMARKS:**

per inspection: Huizenga Dairy is now operating at this location.

Assign 0202 PE

A/O - new facility

# HAZA OUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

RCD SDD FIRE FISCAL

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE:

07 JUN 15 PM 1:57

## O- OWNER INFORMATION

OWNER ID: new 9237

NAME: Paul Huizenga

ADDRESS 1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: (909) 597-4695 EXT: FAX: (909) 597-7164

ALT PHONE: (909) 241-3694 EXT: DRIVER LICENSE:

TAX ID: 33-0834181 OWNER SWITCH DATE: LAST UPDATED:

### OWNER MAILING ADDRESS

CARE OF: Paul Huizenga DBA: Huizenga Dairy

ADDRESS1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY: FA 11003

## F- FACILITY INFORMATION

FACILITY ID: new

NAME: Huizenga Dairy

ADDRESS 1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 CITY CODE: Ontario

SIC CODE: BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: N/A SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 3

PHONE: (909) 597-4695 EXT: FIRE JURISDICTION: Ontario

ALT PHONE: EXT: FAX: LAST UPDATED:

### FACILITY MAILING ADDRESS

BUSINESS NAME: Huizenga Dairy

CARE OF: Paul Huizenga

ADDRESS 1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

EMAIL:

RCD SDD FIRE FISCAL 07 JUN 15 PM 12: 38

## A- A/R INFORMATION

ACCOUNT ID: new

RESPONSIBLE PARTY: Paul Huizenga

CARE OF: Huizenga Dairy

ADDRESS 1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: (909) 597-4695 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED:

ALT PHONE: EXT: TAX ID:

ANNIVERSARY DATE: TOTAL DUE: ACCOUNT STATUS:

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | N/A<br>PERMIT NUMBER. | PERMIT STATUS | N/A<br>ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| GHP OR UST ID | CURRENT STATUS(BILLING) | NA<br>GHP FOR UST(PH) | NA<br>CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ADD NEW P.E. | 4221<br>NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 8 NUMBER OF USTS 0 MFR #

ENTERED
JUN 14 2007

DATE SUBMITTED: 5-11-07 DATE ENTERED: FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

Per inspection: facility name & owner change. Huizenga Dairy has taken over at previous location of FA 673.

Assign handler only PE.

Demand bill.

Overall Site with 1 Fac. Unit

## General Information

Location: 0007587 EDISON AV
Community: Chino

Map:
Grid:

Haz:1 Type: 1
F/U: 1 AOV: 0.0

| Contact Name | Title | Business Phone | 24-Hour Phone |
|---|---|---|---|
| ERNEST DE GROOT | DAIRY FARMER | (909) 597-2176 x<br>(~~714~~) 597-2176 x | (909) 597-2176<br>( ) - |

Summary

## Hazmat Inventory List in Quantity Order

### All Materials at Site

| F/U | Material Name | --Hazards-- | | Max Qty | Unit | MCP |
|---|---|---|---|---|---|---|
| F/U: 02 - Fixed Containers at Site | | | | | | |
| | TEAT DIP | | | 0 | | Unrated |
| | DIESEL FUEL | F | IH | 800 | GAL | Low |
| | GASOLINE | F | IH DH | 500 | GAL | Moderate |
| | MOTOR OIL | F | IH | 200 | GAL | Minimal |
| | SANITIZER - BOVADINE | | IH | 22 | GAL | Unrated |
| | SANITIZER - RIDSTONE ACID | | IH | 16 | GAL | Unrated |
| | SANITIZER - G-P CHLOR | | IH | 4 | GAL | Unrated |
| | DETERGENT | | IH DH | 4 | GAL | High |

## AGRICULTURAL HAZARDOUS MATERIALS INVENTORY

BUSINESS NAME _____ EMERGENCY CONTACT ERNEST DE GROOT

ADDRESS Twin Palms Dairy 7587 Edison Ave. EMERGENCY PHONE # 714-597-2176

CITY Chino, Calif. 91710

STATE _____ ZIP _____

PHONE NUMBER _____

| MATERIAL | MAXIMUM QUANTITY | USED HOW | STORED AT |
|---|---|---|---|
| RIDSTONE ACID | 16 gal | SANITIZER | 7587 EDISON AVE |
| G-P CHLOR | 4 gal. | " | " |
| BOVADINE | 22 gal | " | " |
| TEAT DIP | | | " |
| DYNE | 4 gal | DETERGENT | " |
| DETERGENT | | | |
| ENGINE OIL | 200 gal | | " |
| DIESEL FUEL | 800 gal | | " |
| | | | |
| | | | |
| | | | |

[ ] I HAVE NO HAZARDOUS MATERIALS IN REPORTABLE QUANTITIES HELD FOR MORE THAN 30 DAYS.

[X] I HAVE AN UNDERGROUND TANK. TANK SIZE ~~500 gal gas~~ PUMP, PAINTED, RED

[X] I CERTIFY THAT A "HAZARDOUS MATERIALS STORAGE AREA" SIGN HAS BEEN POSTED AS REQUIRED. AS SOON AS THE SIGNS ARE AVAILABLE. FARM BUREAU HAS THEM ON ORDER

THE ABOVE INFORMATION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

NAME ERNEST DE GROOT DATE 11-9-87

SIGNATURE Ernest DeGroot

**PLEASE SUBMIT IN TRIPLICATE**
AGRICULTURAL COMMISSIONER
777 E. RIALTO AVENUE
SAN BERNARDINO, CA. 92415

# ENVIRONMENTAL HEALTH SERVICES

☒ 385 North Arrowhead Avenue • San Bernardino, CA 92415-0160 • (714) 387-4646
☐ 320 East "D" Street • Ontario, CA 91764 • (714) 391-7570
☐ 15505 Civic Drive • Victorville, CA 92392 • (619) 243-8141
☐

PLEASE REPLY TO ADDRESS CHECKED

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

PAUL F. RYAN, R.S., MPPA
Director

**TO ALL AGRICULTURAL BUSINESSES**

As you may recall, last year you returned to the San Bernardino County Agricultural Commissioner, an inventory form requesting information about your hazardous materials at your facility. Many of you have recently received another request for similar information (Business Plan) from the Department of Environmental Health Services.

A complete Business Plan does not need to be submitted. If your inventory of hazardous materials has not changed since you reported last year, please fill in the form below and send to:

**Ag. Commissioner**
**777 East Rialto Avenue**
**San Bernardino, CA 92415-0720**
**Attention: John Gardner**

If your inventory of hazardous materials has changed, please send in duplicate a statement to the above address explaining the changes (added or deleted substances) and include the name of the hazardous material, maximum quantity on hand and how it is stored (i.e., underground tank, bags, drum, etc.).

This will satisfy the state mandated disclosure requirement for agricultural businesses pursuant to Chp. 6.95 of the Health & Safety Code. Please refer questions to (714) 387-2120.

Thank you for your cooperation.

---

**BUSINESS NAME** Ernest Twin Palms Dairy

**BUSINESS ADDRESS** 7587 Edison Ave.
Chino, Calif. 91710

**PHONE NUMBER** 714. 5972176

The inventory of hazardous materials at the above address has not changed since reported on the 1987-88 Inventory Form requested by the County Ag. Commissioner and the Department of Environmental Health Services.

Authorized Signature: Ernest De Groot

Title: Dairy Farmer

MSDS

TRACKING SHEET FOR BUSINESS PLANS

Facility Name: Ag - Twin Palms Dairy

Facility site address: 7587 Edison Ave.

City: Chino, CA 91710

Fire Agency:

Trade Secrets: _____ Y _____ N

| | | Sent to FD | Sent to PD |
|---|---|---|---|
| _____ (# of copies) | | | |
| Business Plan Received | 11/10/87 | __/__/__ | __/__/__ |
| Result of Review(s) | | | |
| Deficiency | | __/__/__ | |
| Conditional Approval | | __/__/__ | |
| Approval | | __/__/__ | |

| | | Sent to FD | Sent to PD |
|---|---|---|---|
| Revised Plan(s) Received | 2/14/89 | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ | __/__/__ |

Other

| Date | Action/documentation (update, new plan, etc.) |
|---|---|
| 2/01/94 | Entered in MSDS / Printout |
| __/__/__ | |
| __/__/__ | |
| __/__/__ | |
| __/__/__ | |
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| __/__/__ | |
| __/__/__ | |

# ENVIRONMENTAL HEALTH SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO, CALIFORNIA

THIS PERMIT EXPIRES:
03/31/91

'IN PALMS DAIRY
.587 EDISON AV
CHINO, CA 91710
EST - 88015451 PERMIT - 8802240055

# PERMIT

## NON-TRANSFERABLE

This permit may be suspended or revoked by the health officer for cause. This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force by the United States Government, the State of California and the County of San Bernardino pertaining to the above mentioned business. Penalty fees are assessed on permits renewed 30 days after expiration date indicated above, or for failure to obtain new permit in case of transfer of ownership.

TYPE OF PERMIT - AGRICULTURAL HAZARDOUS MATERIAL HANDLER

FEE PAID $50.00

TWIN PALMS DAIRY
DBA: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

Richard S. Roberts
Director
ENVIRONMENTAL HEALTH SERVICES

04-1804-631 REV. 3/85

PERMIT DOES NOT IMPLY APPROVAL

POST IN A
CONSPICUOUS PLACE

# ENVIRONMENTAL HEALTH SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO, CALIFORNIA

THIS PERMIT EXPIRES:
03/31/90

WIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710
EST - 88015451 PERMIT - 8802240055

# PERMIT

## NON-TRANSFERABLE

This permit may be suspended or revoked by the health officer for cause. This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force by the United States Government, the State of California and the County of San Bernardino pertaining to the above mentioned business. Penalty fees are assessed on permits renewed 30 days after expiration date indicated above, or for failure to obtain new permit in case of transfer of ownership.

TYPE OF PERMIT - AGRICULTURAL HAZARDOUS MATERIAL HANDLER

FEE PAID $50.00

TWIN PALMS DAIRY
DBA TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

04-1804-631 REV. 3/85

PERMIT DOES NOT IMPLY APPROVAL

POST IN A
CONSPICUOUS PLACE

Director
ENVIRONMENTAL HEALTH SERVICES

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 1003500 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: 0000000000 ***

ESTAB NBR: 88015451 BILL FLAG: O LOC: 53 PARCEL NBR: PROBLEM PGM: STATUS: ESTAB DATE: 022388 INACTIVE DATE: 000000

*** CONTROL NUMBER: 1003501 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: 8802240055 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN DISTRICT AREA | EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8802240055 | 226008 | | 03/31/88 | | 00 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 1003501 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: 8802240055 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 000 | | | | | |

*** CONTROL NUMBER: 1003599 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: A ***

*** CONTROL NUMBER: 1003599 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: E ***

*** CONTROL NUMBER: 1003599 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: O ***

| ESTAB: | APPL: | OWNR: |
|---|---|---|
| TWIN PALMS DAIRY | TWIN PALMS DAIRY | TWIN PALMS DAIRY |
| 7587 0/0 EDISON AV | 7587 0/0 EDISON AV | 7587 0/0 EDISON AV |
| 00000 | 00000 | 00000 |
| CHINO CA 91710-0000 | CHINO CA 91710-0000 | CHINO CA 91710-0000 |
| (714) 597-2176 | (714) 597-2176 | (714) 597-2176 |

ERGENCY MANAGEMENT PROGRA
AL OMATED PERMIT BILLING SYSTEM
DATA INPUT SHEET

ACTION CODE: I EST. # _____ PERMIT # _____

ESTABLISHMENT INFO: (00)

BILL TO: LOCATION: # 53 EST. DATE: _____

ADDRESSING INFORMATION (99):

E

NAME: Twin Palms Dairy

ST #: 7587 FRAC: ____ DIR: ____ ST NAME: Edison Ave.

ST. DESIG. _____ APT/SP _____ CITY Chino

STATE CA. ZIP 91710 PH #: ( 714 ) 597 - 2176

A

NAME: Same

ST #: _____ FRAC: ____ DIR: ____ ST NAME: _____

ST. DESIG. _____ APT/SP _____ CITY _____

STATE _____ ZIP _____ PH #: ( ) _____ - _____

O

NAME: Same

ST #: _____ FRAC: ____ DIR: ____ ST NAME: _____

ST. DESIG. _____ APT/SP _____ CITY _____

STATE _____ ZIP _____ PH #: ( ) _____ - _____

PERMIT INFORMATION (01):

CATEGORY # 226006 226007 226008

EXP. DATE: _____ SANITARIAN DIST/AREA: _____ SANITARIAN DIST.EMP #: 00

RENEWAL CODE: N MFR # _____

PROGRAM INFORMATION:

# OF EMPLOYEES: N/A # OF CHEMICALS: N/A

DATE ENTERED: _____ CONTROL #: 10035 FEB 23 1988

SUBMITTED BY (INITIAL): R.P. ENTERED BY (INITIAL) K

COMMENTS/REMARKS: Needs to be invoiced the HAZ Materials Handles fee and entered into the data Base

MONTHLY

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
I N V O I C E

PAGE 1
BILL DATE 02/26/90
HEALTH PERMIT EXPIRATION DATE 03/31/90

*** REMIT COPY ***

ESTABLISHMENT NBR 88015451

TWIN PALMS DAIRY
DBA: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 880[illegible]055 | 226014 | PREVIOUS BALANCE | | 0.00 |
| | | AGRICULTURAL HAZARDOUS MATERIAL HANDLER | 101 | 50.00 |
| | | PERMIT TOTAL | | 50.00 |
| | | TOTAL DUE | | 50.00 |

MAR 15 1990

PAID
Amt $50-
Date 3-15-90
By vam
#1549

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS
WASTE GENERATORS -- 387-3080
UNDERGROUND STORAGE
TANK PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3044
MOBILEHOME PARK PERMITS -- 387-6515
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-6515
HOME OCCUPATION PERMITS -- 387-6512
TEMPORARY OFFICES/SIGNS -- 387-6512
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4666
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-6512

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

MONTHLY

# RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

LEGAL OWNER INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

< > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

IS THIS A TRANSFER? _____

IF YES: FORMER ESTABLISHMENT NAME _____
FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

| OFFICE USE ONLY |
|---|
| EST NBR 88015451 |
| PERMIT NBR 8802240055 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226014 |
| EXPIR DATE 03/31/90 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 0000 |
| MFR NBR |
| APN |
| PERMIT FEE $50- |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D $50- |

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

SIGNED Ernest DeHoot DATED 3-12-90 TITLE Dairy Farmer

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
I N V O I C E

PAGE 1
BILL DATE 02/24/89
HEALTH PERMIT EXPIRATION DATE 03/31/89

*** REMIT COPY ***

ESTABLISHMENT NBR 88015451

TWIN PALMS DAIRY
DBA: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 88 )055 | 226014 | PREVIOUS BALANCE | | 0.00 |
| | | AGRICULTURAL HAZARDOUS MATERIAL HANDLER | 101 | 50.00 |
| | | PERMIT TOTAL | | 50.00 |
| | | TOTAL DUE | | 50.00 |

MAR 06 1989

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

PAID
Amt 50.00
Date 3-3-89
By RD

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS
WASTE GENERATORS -- 387-3080
UNDERGROUND STORAGE
TANK PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3044
MOBILEHOME PARK PERMITS -- 387-4670
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-4670
HOME OCCUPATION PERMITS -- 387-4678
TEMPORARY OFFICES/SIGNS -- 387-4678
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4655
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-4678

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

<X> CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

LEGAL OWNER INFO TWIN PALMS DAIRY
(7) 597-2176 7587 EDISON AV
CHINO, CA 91710

IS THIS A TRANSFER? _____

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

NUMBER OF EMPLOYEES: 00000

| OFFICE USE ONLY |
|---|
| EST NBR 88015451 |
| PERMIT NBR 8802240055 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226014 |
| EXPIR DATE 03/31/89 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 0000 |
| MFR NBR |
| APN |
| PERMIT FEE 50.00 |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D 50.00 |

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

SIGNED Ernest DeGroot DATED 3-1-89 TITLE Dairy Farmer

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

# CUPA

San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

## UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Huizenga Dairy (previously Twin Palms Dairy) Date: May 9, 2007
Street Address: 7589 Edison Ave Facility No. FA0000673
City: Ontario Zip Code: 91762 Program Record No. —
Facility Contact: Paul Huizenga Facility Phone No. (909) 597-4695 Number of Tanks: —

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 302. UST permit fees paid and current | CHSC 25287(a) | | | ✓ |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | ✓ |
| 308. Failure to report change of ownership within 30 days | CHSC 25284(c) | | | ✓ |
| 306. Owner/Operator agreement available | CHSC 25284(a)(3) | | | ✓ |
| 307. Certificate of Financial Responsibility submitted | CHSC 25292.2(a) | | | ✓ |
| 330. Leak Detection/Monitoring and Response Plan | CCR 2632, 2634 or 2641(h) | | | ✓ |
| 304. UST monitoring/maintenance records available for 3 years | CHSC 25284(c) | | | ✓ |
| 312. Designated Operator Statement submitted | CCR 2715(a) | | | ✓ |
| 313. Monthly inspections completed by Designated Operator | CCR 2715(c) | | | ✓ |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | ✓ |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | ✓ |
| 311. Business Plan submitted/updated | CHSC 25505 | | | ✓ |
| **MONITORING OF UST SYSTEMS** | | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | ✓ |
| 331. Monitoring system(s) certified annually | CCR 2638 or 2641(j) | | | ✓ |
| 334. Audible/visual alarms operational | CCR 2632(c)(2)(B) and 2636(f)(1) | | | ✓ |
| 314. Certification sticker/tag affixed to monitoring equipment | CCR 2638(f) | | | ✓ |
| 318. Sensors placed at low point of UST system(s) | CCR 2630(d) or 2641(a) | | | ✓ |
| 319. Leak detection equipment tampered with or disabled | CHSC 25299(f)(2) | | | ✓ |
| 323. Containment sump(s) free of debris/liquid | CCR 2590.21(c)(3) | | | ✓ |
| 324. Line leak detector(s) installed and functioning properly | CCR 2636(f)(2) or 2641(f) | | | ✓ |
| 333. Overspill containment installed/tested annually | CHSC 25284.2 | | | ✓ |
| 327. Overfill protection device installed/operational | CCR 2635(b)(2) | | | ✓ |
| 328. Secondary containment components tested | CCR 2637(a) | | | ✓ |
| 329. UST system design, construction, and monitoring | CCR 2630 or 2640 | | | ✓ |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | ✓ |
| 341. Failure to report unauthorized release | CHSC 25299(d)(1) | | | ✓ |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | ✓ |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | ✓ |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | ✓ |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | ✓ |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | ✓ |
| **UNIFORM FIRE CODE REQUIREMENTS** | | | | |
| 335. Emergency fuel shut-off device operational | UFC 5201.5.3 | | | ✓ |
| 336. Impact valve(s) installed at dispenser(s) | UFC 5202.5.3.2 | | | ✓ |
| 337. Fire extinguisher(s) present and charged | UFC 5201.9 | | | ✓ |
| 338. Address clearly visible from street | UFC 901.4.4 | | | ✓ |
| **OTHER REQUIREMENTS** | | | | |
| Significant Operational Compliance – Prevention | 40 CFR Part 280 | | | ✓ |
| Significant Operational Compliance – Detection | 40 CFR Part 280 | | | ✓ |
| Significant Operational Compliance – Both | 40 CFR Part 280 | | | ✓ |

**NARRATIVE / CORRECTIONS**

A file review was conducted in conjuction with inspection of May 9, 2007.

This site previously had (1) 500 gallon UST. Tank was removed prior to Mr. Huizenga taking over property. Sampling was conducted in 2001 and a closure letter was issued on 2-13-01.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: Leslie Heaviside Received by: [signature] Title: Owner

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
*Fire Chief*
County Fire Warden


February 13, 2001

ERNEST DE GROOT
7587 EDISON AVE
CHINO, CA 91710

**SUBJECT: SOIL SAMPLING IN AREA OF FORMER UNDERGROUND STORAGE TANK AT 7587 EDISON, CHINO**

The Department has received the sample results and/or closure report submitted by George Bryant Construction, dated January 30, 2001. After review of the reports prepared by you or your agent, it has been determined that the extent of contamination or lack thereof would indicate that no further investigation is warranted at this time.

**It is important to note** that this can not be construed as a release of liability for the site or declaration that the site is free from contamination. Should further projects or environmental investigations reveal additional contaminants on site you will be responsible and held liable for the investigation and remedial actions.

If you have any questions, please call (909) 387-3082.

**CHRISTINE PARSONS**
**Hazardous Materials Field Services**

CP/lld

cc: George Bryant Construction

CUPA
San Bernardino County Fire Departmen
HAZARDOUS MATE S DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 N. Arrowhead Ave., 2nd floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323

## UNDERGROUND STORAGE TANK REMOVAL INSPECTION FORM

DATE: 1/11/01 TIME: 2:10 pm LOG # 042000-05

FACILITY NAME: Paul Huizengea
LOCATION: 7587 Edison Avenue, Chino
CONTRACTOR: George Bryant

INSPECTORS PRESENT HAZMAT C. Parsons FIRE
AQMD OTHER

| | QUANTITY | HAULER | DESTINATION |
|---|---|---|---|
| TRIPLE RINSATE | N/A | N/A | N/A |
| TANKS | " | " | " |

DEGASSING CONTRACTOR "

MANIFEST # N/A SCAQMD REFERENCE # N/A DRY ICE USED (25 # / 1000 g) N/A

NOTES:

Facility is a farm that previously had a 500 gallon diesel tank onsite. Tank was classified as a farm tank and was removed approximately 5-10 years before by property owner (Ernest De Groot). Paul Huizengea (leasee) does not know what happened to the UST once it was removed.

Hours: 1

Page ___/___

| TANK # | SIZE | MATERIAL HELD | UL # | APPEARANCE (RUSTY, HOLED, SOUND, ETC.) |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

FACILITY MAP:

[redacted]

| | SAMPLE # | DATE/ TIME | DESCRIPTION (soil / odor) | LOCATION | DEPTH | EPA TEST # 'S |
|---|---|---|---|---|---|---|
| 1) | 1 | 1/11/01 | | | 10 ft. | 8020, 8015, MTBE |
| 2) | | | | | | |
| 3) | | | | | | |
| 4) | | | | | | |
| 5) | | | | | | |
| 6) | | | | | | |
| 7) | | | | | | |
| 8) | | | | | | |
| 9) | | | | | | |
| 10) | | | | | | |

SAMPLES TAKEN BY George Bryant LABORATORY Del Mar Analytical

CONTAINER _____ LABELS _____ SPLITS _____ HEADSPACE _____ SEALS _____

REFRIGERATED _____ CHAIN OF CUSTODY _____ OTHER _____

REQUIRED EPA TESTS:
Gasoline: 8020 (BTEX) or 8021B , 8015 (TRPH - modified for gas) & MTBE
Diesel: 8020 (BTEX) or 8021B , 8015 (TRPH - modified for diesel) & MTBE
Solvents/HVO's: 8010 or 8021B
Waste Oil: 418.1 (with 8010 or 8021B if solvents are suspect) & CAM 17 for metals
Metals: 7030 (Cd), 7190 (Cr), 7950 (Zn), 7420 or 6010 (Pb), 7080 (As), 8080 (PCB), 9010 (CN's) OR CAM 17
Pesticides: 8080 (organo-Cl's), 8140 (N & P containing)

USTs ≥1000 gal. require a minimum of 2 samples. One from the fill end and one from the turbine end. Also, a sample from the dispenser should be taken. Samples should be taken from at least 2' below native soil (not fill). If discoloration is noted in sidewalls, take samples there. And sample stockpiles if contamination is suspect. For piping, samples should be taken ± every 20' & at major connections.

**Note: Methods 8020 and 8010 were deleted in SW846 -III and combined as 8021B. Also, 8260B may be used in place of 8021B for more accurate analyses when sampling for potential legal actions.**

Revised 11/18/99

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153
(909) 387-3080 • Fax (909) 387-4323

PETER R. HILLS
Fire Chief
County Fire Warden

## AGRICULTURAL UNDERGROUND STORAGE TANK (UST) CERTIFICATE OF COMPLIANCE

**Please Return Certification within 30 days to Inspector** C. Payne

Name of UST/Property Owner Ernest De Groot

Establishment Name Twin Palms Dairy

Establishment Address 7587 Edison Ave, Chino

Establishment Number 8801545 1

Number of UST's (if known) _____

I certify that:
*(Check appropriate box(s), if you check more than one box in the section below, please write an explanation below)*

☐ AUSTs containing motor vehicle fuels (gasoline, diesel, or heating oil) on my property have a capacity less than or equal to 1100 gallons and is **currently in use.**

☐ AUSTs with a capacity greater than 1100 gallons or any size UST containing materials or waste other than motor vehicle fuels located on my property **have been upgraded** to meet December 22, 1998 standards.

☒ The AUST(s) on my property were **previously removed.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ The AUST(s) on my property are **no longer in use.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ AUSTs with a capacity greater than 1100 gallons or **any size** UST containing materials or waste on my property **have not been upgraded** to December 22, 1998 standards. (Contact San Bernardino County Fire Department Hazardous Materials Division for upgrade or closure requirements).

Signature: Paul A. Huizenga — Date: 9-5-2000

Print Name: PAUL A. HUIZENGA — Title: OWNER - PAUL HUIZENGA DAIRY

Additional Information/Explanation:

500 GAL. TANK WAS REMOVED BY ERNEST DE GROOT 5-10 YRS. AGO. I AM RENTING THE DAIRY FACILITY FROM ERNEST DE GROOT.

RECEIVED
SEP 07 2000
COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS

WILLIAM H. RANDOLPH
County Administrative Officer

Board of Supervisors
KATHY A. DAVIS ..... First District
JON D. MIKELS ..... Second District
DENNIS HANSBERGER ..... Third District
FRED AGUIAR ..... Fourth District
JERRY EAVES ..... Fifth District

FD011TP
EH037

FDS Permit Billing System
Establishment Summary

11/30/00
08:56:13

Estab . . 88015451

Established: 02/23/1988
Status . . : DB
Location . : 53
Parcel . . :
Inactive . :
Federal id :

AG-TWIN PALM DAIRY
7587 EDISON AVE
CHINO, CA 91710 (714) 597-2176

Bill to: O Attn:
Contact: Drvr lic: Exp: State:

Applicant: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710 (714) 597-2176
Owner: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710 (714) 597-2176

Comment:

F1=Help F3=Exit F5=Refresh
F13=EstbUpd F14=AddrUpd F17=PrmtInq F21=Srch F23=Print

Linda has tank file

FDPMTCU 011 - This is the first page of data

Estab . . 88015451 AG-TWIN PALM DAIRY

| Sel | Permit | Catgy | Expire Date | MFR | Sani | Balance | Stat | Size |
|---|---|---|---|---|---|---|---|---|
| | 8802240055 | 226014 | 03/31/1991 | 111087 | 0500 | .00 | | 0 |
| | Last bill: 02/26/1990 | | Last delq: | | | Delq cnt: 0 | | |
| | 9008130054 | 222800 | 09/30/1990 | | 0500 | .00 | | 1 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |
| | 9008130055 | 222801 | 09/30/1990 | | 0500 | .00 | | 1 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |
| | 9709091468 | 227001 | 03/31/1991 | | 0500 | .00 | | 0 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |

F1=Help F3=Exit F5=Refresh F7=Bkwd F8=Fwd
F15=PrmtUpd F19=ItemInq F20=FiscInq F21=Srch F22=Smry F23=Print

**George Bryant Construction Inc.**
9333 Golden St.
Alta Loma, CA 91737-2821
**(909) 944-3517**
**(909) 948-2876 Fax**

General Engineering - Lic# 718466
General Contracting - Lic# 718466
Hazardous Certificate # A3666
Asbestos Certificate # A5559
DOSH Certificate # 361
Demo, C21

To LOP M. Ward

January 30, 2001

Attention: Christine Parsons
San Bernardino County Fire Department
385 N. Arrowhead Ave., Second Floor
San Bernardino, CA 92415-0153

Re: Site Closure Letter
7587 Edison
Chino, CA 91710

Dear Ms. Parsons:

Enclosed please find the analytical results from the samples taken in your presence, on January 11, 2001, at the above referenced project. As you can see from the test results, all samples were non-detect or below acceptable levels. No further action is required at this site.

Please forward you Site Closure Letter for this project at your earliest convenience.

Sincerely,

M. S. Bryant

M. S. Bryant
George Bryant Construction, Inc.

Enclosures
Cc: Paul Huizenga

01 JAN 32 AM 10:51
COUNTY FIRE
HAZARDOUS MATERIALS

Del Mar Analytical

2852 Alton / /ine, CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
7277 Hayvenhurst, Suite B-12, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-9596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851

# LABORATORY REPORT

Prepared For: George Bryant Construction
9333 Golden Street
Alta Loma, CA 91737

Attention: Ron Franklin
Project: Paul Huizenga
930

Sampled: 01/11/01
Received: 01/11/01
Reported: 01/19/01

*This laboratory report is confidential and is intended for the sole use of Del Mar Analytical and its client. This entire report was reviewed and approved for release.*

CA ELAP Certificate #1169
AZ DHS License #AZ0062

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

*The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.*

Del Mar Analytical

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| | | |
|---|---|---|
| George Bryant Construction | Client Project ID: Paul Huizenga | |
| 9333 Golden Street | 930 | Sampled:01/11/01 |
| Alta Loma, CA 91737 | Report Number: CKA0092 | Received:01/11/01 |
| Attention: Ron Franklin | | |

# VOLATILE FUEL HYDROCARBONS/BTEX/MTBE (EPA 5030B/8015B/8021B)

| Analyte | Method | Batch | Reporting Limit | Sample Result | Dilution Factor | Date Extracted | Date Analyzed | Data Qualifiers |
|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | mg/kg | | | | |
| **Sample ID: CKA0092-01 (#1 10' B/S - Soil)** | | | | | | | | |
| Volatile Fuel Hydrocarbons | EPA 8015B/8021 | C1A1602 | 1.0 | ND | 1 | 1/16/01 | 1/16/01 | QG |
| Benzene | EPA 8015B/8021 | C1A1602 | 0.0050 | ND | 1 | 1/16/01 | 1/16/01 | |
| Toluene | EPA 8015B/8021 | C1A1602 | 0.0050 | ND | 1 | 1/16/01 | 1/16/01 | |
| Ethylbenzene | EPA 8015B/8021 | C1A1602 | 0.0050 | ND | 1 | 1/16/01 | 1/16/01 | |
| Xylenes, Total | EPA 8015B/8021 | C1A1602 | 0.015 | ND | 1 | 1/16/01 | 1/16/01 | |
| Methyl-tert-butyl Ether (MTBE) | EPA 8015B/8021 | C1A1602 | 0.035 | ND | 1 | 1/16/01 | 1/16/01 | |
| *Surrogate: 4-BFB (PID) (60-145%)* | | | | *115 %* | | | | |
| *Surrogate: aaa-TFT (FID) (50-135%)* | | | | *79.3 %* | | | | |

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

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| | | |
|---|---|---|
| George Bryant Construction<br>9333 Golden Street<br>Alta Loma, CA 91737<br>Attention: Ron Franklin | Client Project ID: Paul Huizenga<br>930<br>Report Number: CKA0092 | Sampled:01/11/01<br>Received:01/11/01 |

## METHOD BLANK/QC DATA

## VOLATILE FUEL HYDROCARBONS/BTEX/MTBE (EPA 5030B/8015B/8021B)

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Data Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch: C1A1602 Extracted: 01/16/01** | | | | | | | | | | |
| **Blank Analyzed: 01/16/01 (C1A1602-BLK1)** | | | | | | | | | | |
| Volatile Fuel Hydrocarbons | ND | 1.0 | mg/kg | | | | | | | *QG* |
| Benzene | ND | 0.0050 | mg/kg | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg | | | | | | | |
| Xylenes, Total | ND | 0.015 | mg/kg | | | | | | | |
| Methyl-tert-butyl Ether (MTBE) | ND | 0.035 | mg/kg | | | | | | | |
| *Surrogate: 4-BFB (PID)* | *0.105* | | *mg/kg* | *0.100* | | *105* | *60-145* | | | |
| *Surrogate: aaa-TFT (FID)* | *0.0801* | | *mg/kg* | *0.100* | | *80.1* | *50-135* | | | |
| **LCS Analyzed: 01/16/01 (C1A1602-BS1)** | | | | | | | | | | |
| Volatile Fuel Hydrocarbons | 1.22 | 1.0 | mg/kg | 1.10 | | 111 | 75-140 | | | *QG* |
| Benzene | 0.110 | 0.0050 | mg/kg | 0.100 | | 110 | 80-125 | | | |
| Toluene | 0.113 | 0.0050 | mg/kg | 0.100 | | 113 | 85-115 | | | |
| Ethylbenzene | 0.109 | 0.0050 | mg/kg | 0.100 | | 109 | 80-115 | | | |
| Xylenes, Total | 0.323 | 0.015 | mg/kg | 0.300 | | 108 | 80-115 | | | |
| Methyl-tert-butyl Ether (MTBE) | 1.87 | 0.035 | mg/kg | 1.50 | | 125 | 60-135 | | | |
| *Surrogate: 4-BFB (PID)* | *0.120* | | *mg/kg* | *0.100* | | *120* | *60-145* | | | |
| *Surrogate: aaa-TFT (FID)* | *0.0839* | | *mg/kg* | *0.100* | | *83.9* | *50-135* | | | |
| **Matrix Spike Analyzed: 01/16/01 (C1A1602-MS1)** | | | | | **Source: CKA0062-01** | | | | | |
| Volatile Fuel Hydrocarbons | 1.18 | 1.0 | mg/kg | 1.10 | ND | 107 | 45-160 | | | *QG* |
| Benzene | 0.109 | 0.0050 | mg/kg | 0.100 | ND | 109 | 75-140 | | | |
| Toluene | 0.112 | 0.0050 | mg/kg | 0.100 | ND | 111 | 80-115 | | | |
| Ethylbenzene | 0.107 | 0.0050 | mg/kg | 0.100 | ND | 107 | 65-135 | | | |
| Xylenes, Total | 0.317 | 0.015 | mg/kg | 0.300 | ND | 106 | 75-120 | | | |
| Methyl-tert-butyl Ether (MTBE) | 1.92 | 0.035 | mg/kg | 1.50 | ND | 128 | 45-155 | | | |
| *Surrogate: 4-BFB (PID)* | *0.119* | | *mg/kg* | *0.100* | | *119* | *60-145* | | | |
| *Surrogate: aaa-TFT (FID)* | *0.0856* | | *mg/kg* | *0.100* | | *85.6* | *50-135* | | | |

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

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Del Mar Analytical

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| | | |
|---|---|---|
| George Bryant Construction<br>9333 Golden Street<br>Alta Loma, CA 91737<br>Attention: Ron Franklin | Client Project ID: Paul Huizenga<br>930<br>Report Number: CKA0092 | Sampled:01/11/01<br>Received:01/11/01 |

## METHOD BLANK/QC DATA

## VOLATILE FUEL HYDROCARBONS/BTEX/MTBE (EPA 5030B/8015B/8021B)

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Data Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch: C1A1602 Extracted: 01/16/01** | | | | | | | | | | |
| **Matrix Spike Dup Analyzed: 01/16/01 (C1A1602-MSD1)** | | | | | **Source: CKA0062-01** | | | | | |
| Volatile Fuel Hydrocarbons | 1.14 | 1.0 | mg/kg | 1.10 | ND | 104 | 45-160 | 3.45 | 25 | *QG* |
| Benzene | 0.102 | 0.0050 | mg/kg | 0.100 | ND | 102 | 75-140 | 6.64 | 25 | |
| Toluene | 0.112 | 0.0050 | mg/kg | 0.100 | ND | 111 | 80-115 | 0 | 25 | |
| Ethylbenzene | 0.106 | 0.0050 | mg/kg | 0.100 | ND | 106 | 65-135 | 0.939 | 25 | |
| Xylenes, Total | 0.312 | 0.015 | mg/kg | 0.300 | ND | 104 | 75-120 | 1.59 | 25 | |
| Methyl-tert-butyl Ether (MTBE) | 1.85 | 0.035 | mg/kg | 1.50 | ND | 123 | 45-155 | 3.71 | 20 | |
| *Surrogate: 4-BFB (PID)* | *0.119* | | *mg/kg* | *0.100* | | *119* | *60-145* | | | |
| *Surrogate: aaa-TFT (FID)* | *0.0824* | | *mg/kg* | *0.100* | | *82.4* | *50-135* | | | |

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851

| | | |
|---|---|---|
| George Bryant Construction | Client Project ID: Paul Huizenga | |
| 9333 Golden Street | 930 | Sampled:01/11/01 |
| Alta Loma, CA 91737 | Report Number: CKA0092 | Received:01/11/01 |
| Attention: Ron Franklin | | |

# DATA QUALIFIERS AND DEFINITIONS

**QG** Carbon ranges C6-C12 quantitated against a gasoline standard.

**ND** Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

**NR** Not reported.

**RPD** Relative Percent Difference

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843
2465 W 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (619) 505-9596 FAX (619) 505-9689

19079

# CHAIN OF CUSTODY FORM

Page 1 of 1

Client Name/Address: George Beynnt Const 9333 Galeton St Alta Loma CA 91737

Project/PO Number: JOB #930 Paul Huizenga

Project Manager: Rod Frankland

Phone Number: 909 944 3517

Sampler: Rod Frankland

Fax Number: 909 948 2876

| Sample Description | Sample Matrix | Container Type | # of Cont. | Sampling Date/Time | Preservatives | 8015 GRS | 8020 GRS | MTBE | | | | | | | Special Instructions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #1 10' B/S | Soil | Glass | 1 | 1/11/01 2:15pm | | X | X | X | | | | | | | |

| Relinquished By: | Date /Time: | Received by: | Date /Time: |
|---|---|---|---|
| Rod Frankland | 1/11/01 3:10pm | [illegible] | 1/16/01 15:10 |
| Relinquished By: | Date /Time: | Received by: | Date /Time: |
| | | | |
| Relinquished By: | Date /Time: | Received in Lab by: | Date /Time: |
| | | [illegible] | 1/16/01 15:10 |

Turnaround Time: (Check)
same day ____ 72 hours ____
24 hours ____ 5 days ____
48 hours ____ normal X

Sample Integrity: (Check)
intact ____ on ice X

Note: By relinquishing samples to Del Mar Analytical, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden


December 22, 2000

ERNEST DE GROOT
7587 EDISON AVE
CHINO, CA 91710

**SUBJECT: EXPIRATION OF UNDERGROUND STORAGE TANK REMOVAL SAMPLING PERMIT FOR 7697 EDISON AVE, CHINO**

On April 20, 2000 a permit to conduct underground storage tank sampling was issued. This letter is a reminder to inform you that your permit for underground storage tank sampling located at 7697 Edison Avenue, Chino will expire on January 20, 2001.

If the underground storage tank sampling has not been conducted on or before the expiration date, you will be required to pay an additional permit fee.

Please feel free to contact me at (909) 387-3082, to schedule any necessary appointments needed to finalize this underground storage tank sampling permit application.

Thank you for your cooperation in this matter.

Linda Lara-Davis

**LINDA LARA-DAVIS, CLERK III**
**Hazardous Materials Field Services**

# COUNTY FIRE DEPARTMENT

Christine

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
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PETER R. HILLS
Fire Chief
County Fire Warden


## AGRICULTURAL UNDERGROUND STORAGE TANK STATEMENT OF DUE DILIGENCE

***(Fill out all of the information below. Incomplete statements will be considered invalid)***

Name of Property Owner ERNEST DE GROOT

Establishment Name PAUL HUIZENGA DAIRY

Establishment Address 7697 EDISON AVE.

Phone Number (909) 597-4695

Establishment Number _____

Number of underground storage tanks 0

***I certify under penalty of law that farm tanks reportedly located on my property have:***

☒ ***been removed without San Bernardino County oversight.***

☐ ***never existed to the best of my knowledge. I have performed research and find no record of their existence.***

I understand that should I receive information to the contrary, I will supply that information to the San Bernardino County Fire Fire Department, Hazmat Division within thirty days.

Paul A. Huizenga
***Signature***

Dec. 2, 2000
***Date***

PAUL A. HUIZENGA
***Print Name***

OWNER
***Title***

[redacted]
***Social Security/Federal ID#***

[redacted]
***Driver's License/ ID #***

FA0000673
UST File
3rd Page from letter


WILLIAM H. RANDOLPH
County Administrative Officer

KATHY
JON D.

of Supervisors
DENNIS HANSBERGER ..... Third District
FRED AGUIAR ..... Fourth District
..... Fifth District

# COUNTY FIRE DEPARTMENT

Christine

COUNTY OF SAN BERNARDINO

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PETER R. HILLS
Fire Chief
County Fire Warden


## AGRICULTURAL UNDERGROUND STORAGE TANK
## STATEMENT OF DUE DILIGENCE

***(Fill out all of the information below. Incomplete statements will be considered invalid)***

Name of Property Owner ERNEST DE GROOT

Establishment Name PAUL HUIZENGA DAIRY

Establishment Address 7697 EDISON AVE.

Phone Number (909) 597-4695

Establishment Number _____

Number of underground storage tanks 0

***I certify under penalty of law that farm tanks reportedly located on my property have:***

☒ ***been removed without San Bernardino County oversight.***

☐ ***never existed to the best of my knowledge. I have performed research and find no record of their existence.***

I understand that should I receive information to the contrary, I will supply that information to the San Bernardino County Fire Fire Department, Hazmat Division within thirty days.

| | |
|---|---|
| [signature] | Dec. 2, 2000 |
| ***Signature*** | ***Date*** |
| PAUL A. HUIZENGA | OWNER |
| ***Print Name*** | ***Title*** |
| / | |
| ***Social Security/Federal ID#*** | ***Driver's License/ ID #*** |


WILLIAM F. RANDOLPH
County Administrative Officer

Board of Supervisors
KATHY A. DAVIS . . . . . First District
JON D. MIKELS . . . . Second District
JERRY EAVES . . . . . Fifth District
DENNIS HANSBERGER . . Third District
FRED AGUIAR . . . . Fourth District

PAUL HUIZENGA DAIRY
7697 EDISON AVE.
CHINO CA 91710

COUNTY FIRE
HAZARDOUS MATERIALS

00 DEC -5 PM 2:45

INDUSTRY CA 917
PM
2000

HAPPY HOLIDAYS from the U.S. Postal Service!

33 USA

SAN BERNARDINO COUNTY FIRE DEPT.
HAZMAT DIVISION
385 NORTH ARROWHEAD AVE., 2ND FLOOR
SAN BERNARDINO, CA 92415-0153

92415+0153

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San Bernardino County Fire Departmei.
HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 N. Arrowhead Ave, 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323

# UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Twin Palms Dairy Date: 02-17-00

Street Address: 7587 Edison Avenue Est. No: 88015451

City: Chino Zip Code: 91710 Number of Tanks: 1

Facility Contact: Facility Phone No. Number of Employees:

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 301. UST permits obtained | CHSC 25284(a) | | | |
| 302. UST permit fees paid and current | CHSC 25287(a) | | | |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | |
| 304. UST monitoring/maintenance records available for 3 years | CCR 2712(b) | | | |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | |
| 306. Owner-operator agreement available | CHSC 25284(a)(3)(A) | | | |
| 307. Certification of Financial Responsibility submitted | CHSC 25292.2(a) | | | |
| 308. Failure to report change of ownership within 30 days | CCR 2712(d) | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | |
| 311. Business Plan submitted/updated | CHSC 25505 | | | |
| **MONITORING OF EXISTING UST SYSTEM (Pre 1984)** | | | | |
| **Monitoring in General -** | | | | |
| 315. Leak Detection/Monitoring and Response Plan available | CCR 2641 | | | |
| 316. Annual UST precision tests conducted | CHSC 25292(b) | | | |
| 317. Monitoring devices maintained annually | CCR 2641(j) | | | |
| **Piping -** | | | | |
| 320. Pressurized piping tested annually | CHSC 25292(e) | | | |
| 321. In-line leak detector installed on pressurized piping | CHSC 25292(e) | | | |
| 322. Suction piping tested every 3 years | CCR 2643(d) | | | |
| **Inventory Reconciliation for Single Wall USTs -** | | | | |
| 325. Monthly inventory reconciliation performed and available (ATG) | CCR 2646(c) | | | |
| 326. Dispenser meters calibrated annually | CCR 2646(l) | | | |
| **MONITORING OF NEW UST SYSTEMS (1984 to Present)** | | | | |
| 330. Leak Detection/Monitoring and Response Plan available | CCR 2632 | | | |
| 331. Monitoring systems certified annually | CCR 2630(d) | | | |
| 332. Pressurized piping maintained/tested | CCR 2636(f) | | | |
| 333. Overfill/spill protection installed | CHSC 25291(c) | | | |
| 334. Visual/audible alarms operational | CCR 2632(c)(2) | | | |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | |
| 341. Failure to report/record unauthorized release | CCR 2650 | | | |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | |

**NARRATIVE / CORRECTIONS**

A recent review of your file indicates that this facility has 1 underground storage tank onsite. The size of the UST was indicated to be 500 gallons. Please contact this office immediately regarding changes to UST status. This may include removal, no longer in use, and/or upgrading of the underground storage tank system to meet December 22, 1998 UST standards.

4/7/00 10am Spoke to Paul Huizenga re: this dairy. The property owner is his father-in-law, he (Paul) is leasing property. I sent an appl. packet for removal. Tank was removed 5-10 years ago.

χ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspector: CHRISTINE PARSONS

Received by: Title:

Revised 11/18/99

**CUPA**

**an Bernardino County Fire Departmen.**

**HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION**

**385 N. Arrowhead Ave, 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323**

## UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Twin Palms Dairy. Date: 2/17/00

Street Address: 7587 Edison Est. No: 88015451

City: Chino, CA Zip Code: 91710 Number of Tanks: 1

Facility Contact: Facility Phone No. Number of Employees:

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N | NARRATIVE / CORRECTIONS |
|---|---|---|---|---|---|
| 301. UST permits obtained | CHSC 25284(a) | | | | |
| 302. UST permit fees paid and current | CHSC 25287(a) | | | | |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | | One UST @ 500 gallons |
| 304. UST monitoring/maintenance records available for 3 years | CCR 2712(b) | | | | holds gasoline. |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | | |
| 306. Owner-operator agreement available | CHSC 25284(a)(3)(A) | | | | |
| 307. Certification of Financial Responsibility submitted | CHSC 25292.2(a) | | | | |
| 308. Failure to report change of ownership within 30 days | CCR 2712(d) | | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | | The only owner listed |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | | for this site is |
| 311. Business Plan submitted/updated | CHSC 25505 | | | | |
| **MONITORING OF EXISTING UST SYSTEM (Pre 1984)** | | | | | |
| **Monitoring in General -** | | | | | Twin Palms Dairy. |
| 315. Leak Detection/Monitoring and Response Plan available | CCR 2641 | | | | |
| 316. Annual UST precision tests conducted | CHSC 25292(b) | | | | |
| 317. Monitoring devices maintained annually | CCR 2641(j) | | | | |
| **Piping -** | | | | | |
| 320. Pressurized piping tested annually | CHSC 25292(e) | | | | There is no evidence |
| 321. In-line leak detector installed on pressurized piping | CHSC 25292(e) | | | | |
| 322. Suction piping tested every 3 years | CCR 2643(d) | | | | of removal. |
| **Inventory Reconciliation for Single Wall USTs -** | | | | | |
| 325. Monthly inventory reconciliation performed and available | CCR | | | | |
| 326. Dispenser meters calibrated annually | CCR 2646(l) | | | | |
| **MONITORING OF NEW UST SYSTEMS (1984 to Present)** | | | | | |
| 330. Leak Detection/Monitoring and Response Plan available | CCR 2632 | | | | |
| 331. Monitoring systems certified annually | CCR 2630(d) | | | | |
| 332. Pressurized piping maintained/tested | CCR 2636(f) | | | | |
| 333. Overfill/spill protection installed | CHSC 25291(c) | | | | |
| 334. Visual/audible alarms operational | CCR 2632(c)(2) | | | | |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | | |
| 340. UST system operated to prevent unauthorized | CHSC 25292.1(a) | | | | |
| 341. Failure to report/record unauthorized release | CCR 2650 | | | | |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | | |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | | |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | | |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | | |

x NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN _____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspector: Christine Parsons Received by: _____ Title: _____

**HAZARDOUS MATERIALS FIELD SERVICES**
**COMPUTER DATA BASE UPDATE AUTHORIZATION**

**CHANGE** [ ]

**INACTIVATE FACILITY** [X] **INACTIVATE PERMIT(S)** [X]

**BILL TO:** E A O **LOC/DIST NO:** _____ **EST NO:** 88015451
(Circle one)
**(Former Est. Name (if applicable)** _____

**E – Establishment Information**
**Name:** AG-Twin Palm Dairy
**Street No:** 7587 **Fraction:** _____ **Direction:** _____
**Street Name:** Edison Ave **Apt/Ste/Unit No:** _____
**City:** Chino **State:** CA **Zip Code:** 91710
**Attn:** **Telephone:** ( )

01 FEB 14 PM 4:18 RCD. SDC FIRE FISCAL

**A – Applicant Information**
**Name:** _____
**Street No:** _____ **Fraction:** _____ **Direction:** _____
**Street Name:** _____ **Apt/Ste/Unit No:** _____
**City:** _____ **State:** _____ **Zip Code:** _____
**Attn:** **Telephone:** ( )

**O – Owner Information**
**Name:** _____
**Street No:** _____ **Fraction:** _____ **Direction:** _____
**Street Name:** _____ **Apt/Ste/Unit No:** _____
**City:** _____ **State:** _____ **Zip Code:** _____
**Attn:** **Telephone:** ( )

**Program Information:** **MFR Number** _____
**Number of Employees:** _____ **Number of UST's:** _____
**Federal Tax I.D.Number/Social Security Number:**

**Permit Information: (Circle those that apply)**
**Change/Inactivate/Z.O.B./Add:** 226014 **Permit No:** 88022400 55
**Change/Inactivate/Z.O.B./Add:** 222800 **Permit No:** 9008130054
**Change/Inactivate/Z.O.B./Add:** 222801 **Permit No:** 9008130055
**Change/Inactivate/Z.O.B./Add:** 227001 **Permit No:** 9709091468
**Change/Inactivate/Z.O.B./Add:** _____ **Permit No:** _____
**Change/Inactivate/Z.O.B./Add:** _____ **Permit No:** _____

**Date Submitted:** 2/13/01 **Date Entered:** 2/21/01
**Submitted By:** L. Sara Davis **Entered By:** Tina Thomas

**Comments/Remarks:** Ag-Sampling conducted on 1/11/00
Closure letter sent 2/13/01. Tank removed w/out permit.

S BERNARDINO COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS DIVISION – FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVE., 2ND FLOOR, SAN BERNARDINO, CA 92415-0153
(909) 387-3082 • FAX (909) 387-4323

# APPLICATION FOR REMOVAL OF UNDERGROUND STORAGE TANK

$ 450.00 First Tank

$ _____ Each Additional Tank

Number of Tanks this Application 1

## JOB LOCATION

PAUL HUIZENGA DAIRY - PAUL HUIZENGA 909-597-5124

Facility Name | Contact Person | Phone No.

7697 EDISON AVE CHINO 91710

Situs Address | City | Zip Code

Water/Sewer Agency | Fire

## PROPERTY OWNER

ERNEST DEGROOT 909 597-2176

Name | Phone No.

7587 EDISON AVE CHINO 91710

Mailing Address | City | Zip Code

PAUL HUIZENGA 909 597-4695

Owner's Representative | Phone No.

## TANK CONTENTS

TANK WAS REMOVED 5-10 YEARS AGO.

## CONTRACTOR

Company Name | Contact Person | Phone No.

Mailing Address | City | Zip Code

Workman's Comp Insurance Carrier | Policy No.

State Contractor's License No. | Types of Licenses | Expiration Date

NOTE: The State of California has determined that tanks used for the storage of any hazardous or flammable substance shall be considered hazardous even if all contents have been removed.

All storage tanks shall be hauled as hazardous waste, accompanied by a state hazardous waste manifest, and taken to a licensed treatment, storage and disposal facility (TSDF); or if the tanks are triple rinsed on site and the rinsate manifested and hauled to a licensed TSDF, the tank may be handled as nonhazardous.

For information on licensed TSDFs that can accept nonrinsed tanks, contact the State of California Department of Health Services, Toxic Substance Control at (800) 258-6942.

PAUL A. HUIZENGA — Print Name Clearly

909 597-5124, 909 597-4695 — Phone

Signature

4-19-00 — Date

## OFFICE USE ONLY

Under Permit: [X] No [ ] Yes 99- Establishment Number

Number of Tanks: [ ]

Fees Current: [ ] No _____ Delinquent Amount

[ ] Yes _____ Expiration Date

$450.00 Permit Fee Paid THIS Application

1490982 / Receipt Number

1129 Check Number

4-20-00 Date Paid

Julie Caldera Taken by

002000-05 Log Number

63169 Job Card Number

03-19991-670 Rev. 5/98

**POST THIS CARD AT JOB SITE**

SAN BERNARDINO COUNTY FIRE DEPARTMENT/CUPA
HAZARDOUS MATERIALS DIVISION
FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVENUE, SECOND FLOOR
SAN BERNARDINO, CA 92415-0153

LOG # 042000-05 JOB CARD № 6369

INSTALL _____ REMOVE 1

**CONSTRUCTION AND/OR REMOVAL OF UNDERGROUND STORAGE FACILITY**

Site Name Ag-Paul Huizenga Dairy
Address 10017 Edison Ave, Chino
Contractor
Address/Phone

| | INSPECTION RECORD | APPROVED | DATE |
|---|---|---|---|
| FIRST INSPECTION | Excavation Clean, Approved Slope | | |
| | Bedding | | |
| | Holiday/Soap Test, Tanks Set X | | |
| | Manufacturer's UL # | | |
| | | | |
| | Additional Requirements | | |
| | | | |
| | **DO NOT BACKFILL UNTIL ABOVE APPROVED** | | |
| SECOND INSPECTION | Tank Air Test 5 PSI/30 Minutes | | |
| | Vent/Vapor Lines | | |
| | Products Lines 75 PSI/30 Minutes | | |
| | Product Line Containment | | |
| | Metal Piping Wrapped | | |
| | Sumps, Dispenser Pans Water Test | | |
| | | | |
| THIRD INSPECTION | Approved Fill Boxes | | |
| | Concrete or AC Paving 12" Beyond | | |
| | Leak Detectors/Monitors | | |
| | Lockable Fluid-Tight Access for Monitoring | | |
| | Precision Test Results | | |
| | Dispenser Containment | | |
| | Emergency Shut-off | | |
| | Additional Requirements | | |
| | | | |
| REQUIRED PRIOR TO OPERATING | Business Plan | | |
| | | | |
| | Monitoring Plan | | |
| | | | |
| | Financial Responsibility | | |

**FINAL APPROVAL AND CURRENT OPERATING PERMITS MUST BE OBTAINED PRIOR TO PLACING THESE TANKS INTO SERVICE ($5,000.00 FINE FOR NONCOMPLIANCE)**

| | | | |
|---|---|---|---|
| TANK REMOVAL INSPECTION | Tank(s) Removed X _____ | | |
| | Required Samples: 8020, 8015, MTBE, 418.1 | | |
| | Lead (pb) 7421 or ICP 6010, Metals EPA PP13 | | |
| | Additional Test Requirements | | |
| | | | |
| | **Removals Cannot be Finaled Until a Signed Copy of the Sample Results Have Been Received and Approved by this Department.** | | |
| | Final — Approved for Backfill | | |

Remarks:

FAILURE TO PROTECT AND MAINTAIN THIS CARD MAY RESULT IN JOB DELAY.
PRESERVE THIS RECORD OF INSPECTIONS.

**FOR INSPECTION CALL 48 HOURS IN ADVANCE AT (909) 387- 3082**

**THIS PERMIT EXPIRES DECEMBER 22, 1998**

☐ PETROLEUM ☐ WASTE OIL ☐ OTHER

*DISTRIBUTION: White — County Fire Department*
*Green — Contractor/Owner*

14-16867-670 Rev. 4/98

7325 EDISON AVE / 1053-391-01 SFR 3

7371 EDISON AVE / “ “

7397 EDISON AVE / “ “

7587 EDISON AVE / 1053-371-01 DAIRY

7697 EDISON AVE / N/A

14306 BON VIEW AVE / N/A

14316 BON VIEW AVE / N/A

14330 BON VIEW AVE / N/A

14451 BON VIEW AVE / N/A

14366 BON VIEW AVE / N/A

7556 EUCALYPTUS AVE / 1053-581-03 GRAZING

7634 EUCALYPTUS AVE / N/A

| | | | | | |
|---|---|---|---|---|---|
| ✓ 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | | CHINO |
| ✓ FA0000648 | SNS DAIRY | 02 | 7371 EDISON AVE | | ONTARIO |
| ✓ FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | | ONTARIO |
| ✓ FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | | ONTARIO |
| ✓ 90020263 | QUALITY BUILT FIBERGLASS | 14316 | BON VIEW | | CHINO |
| ✓ FA0000393 | COSTA VIEW FARM | 02 | 14451 BON VIEW | | ONTARIO |

*EMAILED GRM TO SCAN FILES 2/13/24 CR

For purposes of a Phase I Environmental Site Assessment, I would like to review all records in your possession, regarding but not limited to, underground storage tank, haz mat and remediation records for the following parcels. The parcels are contiguous and located south of Edison Avenue, and between Walker Avenue and Campus Avenue. I have included a parcel map for your reference.

APNs and Addresses:

0216-322-10, 14350 Walker Avenue
0216-322-03
0216-322-04 8335 EDISON AVE
0216-321-08, 8311 Edison Avenue
0216-321-03 8185 EDISON AVE
1053-331-04 8061 EDISON AVE
1053-341-02
1053-341-01
1053-361-02
1053-351-02
1053-361-01 7721 EDISON AVE
1053-351-01 14213 BON VIEW AVE
1053-371-01 7587 EDISON AVE
1053-371-02
1053-331-01
1053-331-02
1053-331-03
1053-361-03 7891 EDISON AVE

Thank you for your time,

Laurie Cattaneo

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
| | | | |
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| | | | |
| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

**CUPA**

**San Bernardino County Fire Department • Hazardous Materials Section**

**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

**CUPA COMPLIANCE INSPECTION REPORT**

| | |
|---|---|
| NAME: **TIVA DAIRY** | FACILITY ID: **FA0011003** |
| ADDRESS: **7587 EDISON AVE** | CERS ID: **10052128** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **1/18/2023** |

**Consent granted by:**

☒ **Photograph** ☒ **Inspect** **Name:** Dickie Vandermeulen **Title:** Owner

An inspection was conducted on 01/18/2023 to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Dickie Vandermeulen, Owner was the escort during the inspection.

Tiva Diary is a farm that raises cattle for milk production. The facility handles hazardous materials in the form of teat dip, multi chlor bleach solution, and diesel fuel. No hazardous waste is generated or stored on site. Per Mr. Vandermeulen the farm equipment is serviced by Ross Avery and all hazardous waste is managed by the servicer. Aramark provides the facility with a rag service.

The inventory observed during the inspection was consistent with that reported to the California Environmental Reporting System on 03/16/2022.

Document Review:

- CUPA program permits are current, expiration date 05/31/2023.
- This facility is a handler only and does not have EPA ID#.
- The Hazardous Materials Business Plan was previously submitted to the California Environmental Reporting System, or CERS, on 03/16/2022.

No violations were observed on this date.

Please contact Erick Tilus at (909) 386-8401 or by e-mail at etilus@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 1/18/23 10:30:56AM<br>LTR:1/18/2023 10:30:11AM |
|---|---|---|
| ERICK TILUS | Dickie Vandermeulen | Owner |
| INSPECTOR NAME | NAME<br>INSPECTION DATE: 01/18/2023 | TITLE<br>REPORT DATE: 1/18/23 10:35 am |

**This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

7018 1830 0001 5890 5583

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- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

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Total Postag

$

Alex
5-14-19

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*Sent To*

**TIVA DAIRY**

*Street and Ap*

**14761 CARPENTER AVE.**

*City, State, Zi*

**ONTARIO, CA 91762**

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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- Electronic verification of delivery or attempted delivery.
- A record of delivery (including the recipient's signature) that is retained by the Postal Service™ for a specified period.

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  - Restricted delivery service, which provides delivery to the addressee specified by name, or to the addressee's authorized agent.
  - Adult signature service, which requires the signee to be at least 21 years of age (not available at retail).
  - Adult signature restricted delivery service, which requires the signee to be at least 21 years of age and provides delivery to the addressee specified by name, or to the addressee's authorized agent (not available at retail).
- To ensure that your Certified Mail receipt is accepted as legal proof of mailing, it should bear a USPS postmark. If you would like a postmark on this Certified Mail receipt, please present your Certified Mail item at a Post Office™ for postmarking. If you don't need a postmark on this Certified Mail receipt, detach the barcoded portion of this label, affix it to the mailpiece, apply appropriate postage, and deposit the mailpiece.

**IMPORTANT: Save this receipt for your records.**

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

***COMPLETE THIS SECTION ON DELIV***

A. Signature

X

B. Received by *(Printed Name)* C.

1. Ar

different from item 1? ☐ Y
ery address below: ☐ No

**TIVA DAIRY**
**14761 CARPENTER AVE.**
**ONTARIO, CA 91762**

RECEIVED
MAY 21 2019
SBCFIRE - HAZMAT

9590 9402 4087 8092 5468 14

2. Article Number *(Transfer from service label)*

7018 1830 0001 5890 5583

3. Service Type
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- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
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- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☑ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

USPS TRACKING#:

9590 9402 4087 8092 5468 14

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**SAN BERNARDINO COUNTY**
**FIRE DEPARTMENT**
**ATTN: ALEXANDRA RODRIGUEZ**
**620 S. 'E' STREET**
**SAN BERNARDINO, CA 92415-0153**

CUPA

# CUPA COMPLIANCE INSPECTION REPORT

San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153
(909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

| | | | |
|---|---|---|---|
| FACILITY NAME: | Tiva Dairy | FACILITY ID: | FA0011003 |
| ADDRESS | 758 | CERS ID: | 10052128 |
| CITY: | Ont | INSPECTION DATE: | 5-1-2019 |

E: 91762

14761 CARPENTER Ave. Ontario, CA 91762

Consent Granted Title: Owner
Inspect y Vandermeulen

An inspection was c th applicable Hazardous Materials and Hazardous Waste laws and regulations. Dic cess and provided an escort throughout the inspection

This facility is a dair nga Dairy ceased operations in June 2018. Tiva Dairy is the new tenant. Hazardous I Hazardous Waste is generated on site. The operator, Dickey Vandermeulen, stor ncluded the Teat Dip did not contain any Hazardous Properties.

**INVENTORY:**

(3) 500 – Tanks of Diesel Fuel; (2) Tanks in service, (1) Tank out of service.

**DOCUMENTATION REVIEW:**

Hazardous Materials Handler Permit is current; Expires 11/30/2019.
The Business Plan elements were last submitted into the California Environmental Reporting System (CERS) on 08/15/2017.
CERS Identification Number – 10052128.
-Diesel Fuel is delivered by Mathisen Oil Company

Submit the completed Certificate of Compliance (CofC) with required documentation, to this office within 30 days of this inspection.

If you have any questions, feel free to contact me at 909-386-8401 or **asrodriguez@sbcfire.org**. If you have any questions regarding CERS, please call the **CERS helpline at 909-386-8432.**

14761
CARPENTER Ave.
Ontario, CA 91762

7587 Edison
Ontario

**CUPA**

**COMPLIANCE INSPECTION REPORT**

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153**
**(909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FACILITY NAME: | **Tiva Dairy** | | | | | FACILITY ID: | **FA0011003** |
| ADDRESS | **7587 Edison Ave.** | | | | | CERS ID: | **10052128** |
| CITY: | **Ontrio** | STATE: | **CA** | ZIP CODE: | **91762** | INSPECTION DATE: | 5-1-2019 |

Consent Granted by: ☒ Photograph ☒ Inspect

Name: **Dickey Vandermeulen** Title: **Owner**

An inspection was conducted on May 1, 2019 to determine compliance with applicable Hazardous Materials and Hazardous Waste laws and regulations. Dickey Vandermeulen, Facility Owner, granted facility access and provided an escort throughout the inspection

This facility is a dairy milking operation. Per owner, Paul Huizenga, Huzienga Dairy ceased operations in June 2018. Tiva Dairy is the new tenant. Hazardous Materials stored on site is used for vehicle fueling. No Hazardous Waste is generated on site. The operator, Dickey Vandermeulen, stores and uses Teat Dip. Upon further research it was concluded the Teat Dip did not contain any Hazardous Properties.

**INVENTORY:**

(3) 500 – Tanks of Diesel Fuel; (2) Tanks in service, (1) Tank out of service.

**DOCUMENTATION REVIEW:**

-Hazardous Materials Handler Permit is current; Expires 11/30/2019.
-The Business Plan elements were last submitted into the California Environmental Reporting System (CERS) on 08/15/2017. CERS Identification Number – 10052128.
-Diesel Fuel is delivered by Mathisen Oil Company

Submit the completed Certificate of Compliance (CofC) with required documentation, to this office within 30 days of this inspection.

If you have any questions, feel free to contact me at 909-386-8401 or **asrodriguez@sbcfire.org.** If you have any questions regarding CERS, please call the **CERS helpline at 909-386-8432.**

San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153
(909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

***Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health and Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).***

**200 – HMRRP (HAZARDOUS MATERIALS HANDLER) VIOLATIONS**

| VIOLATION CODE | DESCRIPTION | SECTION | V | C | N |
|---|---|---|---|---|---|
| H201 | **Hazardous Material Handler Permit Current** | SBCC 23.0602(a) | ☐ | ☑ | ☐ |
| H202 | **Hazardous Materials Business Plan Established and Implemented** | CHSC 25507 | ☐ | ☑ | ☐ |
| H203 | **Hazardous Materials Business Plan Submittal**<br>**Violation Text:** Failure to complete and electronically submit a business plan when storing/ handling a hazardous material at or above reportable quantities.<br><br>**Observation**: Failure to submit Business plan via the California Environmental Reporting System (CERS). CERS Identification Number- 10052128.<br><br>**Corrective action**: Call the CERS help line on the number provided on the beginning of this report to acquire log in information. Once information is acquired, log into CERS, and submit all required elements. | CHSC 25505, 25508(a)(1) | ☐ | ☑ | ☐ |
| H204 | **Immediately Report Any Release or Threatened Release of a Hazardous Material** | CHSC 25510(a) | ☐ | ☑ | ☐ |
| H205 | **Facility Access for Inspection Granted** | CHSC 25511 | ☐ | ☑ | ☐ |
| H206 | **Business Plan Annual Review/Certification** | CHSC 25508(a)(1), 25508.2 | ☑ | ☐ | ☐ |
| H209 | **Business Plan Update Within 30 Days of Change**<br><br>**Violation Text:** Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material.<br>Any handling of a previously disclosed hazardous materials at or above reportable quantities.<br>A change of business address, business ownership, or business name.<br>A substantial change in the handler's operations that requires modification to any portion of the business plan.<br><br>**OBSERVATION:** Facility underwent a change of ownership, and has not been reported via CERS. Facility also needs to report current inventory.<br><br>**CORRECTIVE ACTION:** Using CERS update owner information and inventory information. | CHSC 25508.1(a)-(f) | ☑ | ☐ | ☐ |
| H215 | **Training Documentation** | CHSC 25505(a)(4) | ☐ | ☑ | ☐ |

**DDITIONAL HMRRP (HAZARDOUS MATERIALS HANDLER) VIOLATIONS**

| VIOLATION CODE | DESCRIPTION | SECTION | V | C | N |
|---|---|---|---|---|---|
| H210 | **Business Activities Page and/or Business Owner/Operator Identification Page** | CHSC 25508(a)(1) | ☐ | ☑ | ☐ |
| H211 | **Hazardous Materials Inventory** | CHSC 25505, 25506, 25508 | ☐ | ☑ | ☐ |
| H212 | **Site Map** | CHSC 25505(a)(2), 25508(a)(1) | ☐ | ☑ | ☐ |
| H213 | **Emergency Response Plan** | CHSC 25505(a)(3), 25508(a)(1) | ☐ | ☑ | ☐ |
| H214 | **Training Program Not Included And/or is Not Adequate** | CHSC 25505(a)(4), 25508(a)(1); 19 CCR 4 2658, 2659 | ☐ | ☑ | ☐ |

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| VIOLATION CODE | DESCRIPTION | SECTION | V | C | N |
|---|---|---|---|---|---|
| H216 | Business Plan Readily Available | CHSC 25505(c) | ☐ | ☑ | ☐ |
| H220 | Property Owner Notification | CHSC 25505.1 | ☐ | ☐ | ☑ |
| H221 | Property Owner Business Plan | CHSC 25505.1 | ☐ | ☐ | ☑ |
| H222 | Agricultural Handler Emergency Response Plan | CHSC 25508(a)(1), 25507.1 | ☐ | ☐ | ☑ |
| H223 | Agricultural Handler Training Program | CHSC 25508(a)(1), 25507.1 | ☐ | ☐ | ☑ |
| H224 | Remote Unstaffed Facility | CHSC 25505, 25506, 25507.2, 25508 | ☐ | ☐ | ☑ |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | CHSC 25507.1(a)(2); 19 CCR 4 2670, 2671 | ☐ | ☐ | ☑ |

| Inspected by | Received By | | Report Date |
|---|---|---|---|
| | CERTIFIED MAIL | | 5/13/2019 |
| Alexandra Rodriguez | Dickey Vandermeulen | Owner | |
| NAME | NAME | TITLE | |

This report shall serve as a notice to comply for minor violations and notice of violation for all other violations.
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIMEPERIOD NOTED ABOVE.**

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# CERTIFICATE OF COMPLIANCE

**Return certification to inspector** Asrodriguez@sbcfire.org **within 30 days of inspection unless otherwise specified.**

RESPONDENT: **Dickey Vandermeulen**
VIOLATION(S) CITED ON: **5/1/2019**

| | | | |
|---|---|---|---|
| FACILITY NAME: | **Tiva Dairy** | FACILITY ID: | **FA0011003** |
| SITE ADDRESS: | **7587 Edison Ave.** | | |
| CITY: | **Ontario** STATE: **CA** ZIP CODE: **91762** | CERS ID: | **10052128** |

## SUMMARY OF VIOLATIONS

**IMPORTANT** – Attach all requested documentation when returning this certification.

**Corrective action**: Call the CERS help line on the number provided on the beginning of this report to acquire log in information. Once information is acquired, log into CERS, and submit all required elements.

**CORRECTIVE ACTION:** Using CERS update owner information and inventory information.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

| | |
|---|---|
| SIGNATURE | DATE |
| PRINT NAME | TITLE |

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## PRELIMINARY FIELD INSPECTION REPORT

Page 1 of 1

INSPECTION DATE: 5-1-2019

| FACILITY ID: | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| TA0011003 | Tiva Dairy | Chino |
| Consent Granted by: ☒ Inspect ☐ Photograph | NAME: Dickey Vanderulle | TITLE: Owner |

**The following is a preliminary list of violations observed at the time of inspection. The final report may list additional violations. Violations must be corrected within 30 days of inspection unless otherwise specified below.**

An inspection was conducted on 5-1-2019 to determine Compliance with applicable hazardous materials and hazardous waste regulations.

Inventory:
(3) 55-gallon Diesel Fuel tanks

Contact Alexandra Rodriguez at (909) 386-8401 OR ARodriguez@SBCFire.org with any Questions Regarding this Report.
A Final Report will be provided within 60 days.

Inspected By: Alexandra Rodriguez (Sign Name) Received By: Dickie Vander Meulen (Sign Name) Title: Owner

Print Name: Dickie Vander Meulen Report Date: 5-1-19

Rev. 04/2018

DISTRIBUTION: White – CUPA File Yellow – Facility Pink – CUPA Inspector

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## PRELIMINARY FIELD INSPECTION REPORT

Page 1 of 1

| INSPECTION DATE: 5-1-2019 | | |
|---|---|---|
| FACILITY ID: FA0011003 | FACILITY NAME: Tiva Dairy | FACILITY LOCATION: Chino |
| Consent Granted by: ☐ Inspect ☐ Photograph | NAME: Dickey Vanderville | TITLE: Owner |

**The following is a preliminary list of violations observed at the time of inspection. The final report may list additional violations. Violations must be corrected within 30 days of inspection unless otherwise specified below.**

An inspection was conducted on 5-1-2019 to determine compliance with applicable hazardous materials and hazardous waste regulations.

Inventory:
(5) 55-gallon Diesel Fuel tanks

Contact Alexandra Rodriguez at (909) 386-8401 OR Arodriguez@SBCFire.org with any questions regarding this Report.
A Final Report will be provided within 65 days.

Inspected By: Alexandra Rodriguez (Sign Name) Received By: Dickie Vander Meulen (Sign Name) Title: Owner

Print Name: Dickie Vander Meulen (Print Name) Report Date: 5-1-19

# SAN BE 'ARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Mark A. Hartwig**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


June 20, 2016

HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**ATTN: PAUL HUIZENGA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0011003-HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

Mr. Huizenga,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on April 22, 2016:

- Owner/Operator shall electronically update the information submitted to the statewide information management system if operations require modification to any portion of the plan or there is a substantial change in the handler's operations.
- At least once every 12 months, the owner/owner shall review and certify that the information in the statewide information management system has been verified and is complete, accurate and up to date.
- Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**


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**CUPA COMPLIANCE INSPECTION REPORT**

NAME: **HUIZENGA DAIRY** FACILITY ID: **FA0011003**

ADDRESS: **7587 EDISON AVE** CERS ID:**10052128**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** INSPECTION DATE: **4/22/2016**

Inspector was given permission to: [X] photograph [X] inspect

**Inspection Narrative (v020000)**

An inspection was conducted to determine compliance with hazardous waste generator and hazardous material handler laws and regulations. Consent to conduct the inspection and take photographs was given by Paul Huizenga, the Owner.

This facility is a dairy milking operation. Hazardous materials are stored on site for vehicle fueling and the milking operation. No hazardous waste is generated by the facility.

HAZARDOUS MATERIALS INVENTORY:
(3) 500-gallon tanks of diesel fuel.
(2) 275-gallon and (1) 55-gallon containers of teat dip.
(1) 55-gallon drum of formaldehyde 37%.
(1) 400-pound container of alkaline pipe cleaner.

DOCUMENTATION REVIEW:
-Heavy equipment is serviced by Kent Avery.
-Indoor equipment is serviced by Southern California Dairy Equipment. SoCal Dairy also provides chemicals used in the milking process and removes the empty drums.
-Diesel fuel is delivered by Western Refining.
-The Business Plan elements were last submitted into CERS on 3/19/2013. CERS ID 10052128.
-The permits are current; expiration date of 11/30/2016.

Submit a signed Certificate of Compliance with required documentation to this office within 30 days.

If you have any questions, feel free to contact me at 909-658-5912 or bwade@sbcfire.org. If you have any questions regarding CERS, please call the CERS helpline at 909-386-8432.

**The following lines marked in the V column are violations that must be corrected. Marked items in the N column require additional information to determine compliance.**

| VIOLATION CODE | DESCRIPTION | SECTION | V | N |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| 0201 | Failure to obtain a CUPA Hazardous Matanals Handler parmit. | 23.0602(a) | | |
| 0202 | Failura to astablish a Businass Plan. | CAL. HEALTH & SAFETY CODE 25507 | | |
| 0203 | Failure to submit a Business Plan. | CAL. HEALTH & SAFETY CODE 25508 | X | |
| Violation: | Owner/Operator shall submit tha hazardous matanals inventory, amargency contacts, site plan and certification that the axisting plan is currant and up to data. | | | |
| Correction: | Using the California Environmental Reporting System (CERS), alactronically submit the Business Plan to the statewida information management system. | | | |
| Observation: | This facility has not submitted a Sita Map or tha amergency response/training plans section into CERS. | | | |
| | Comply by date: **5/22/2016** | | | |
| 0204 | Failura to immadiataly raport any relaase or threatanad release of a hazardous material. | CAL. HEALTH & SAFETY CODE 25510 | | |
| 0205 | Failure to allow a hazardous materials handler inspection. | CAL. HEALTH & SAFETY CODE 25511 | | |
| 0206 | Failure to update the Businass Plan | CAL. HEALTH & SAFETY CODE 25508.2 | X | |
| Violation: | At least once avary 12 months, tha owner/owner shall review and certify that the information in tha statewida information management systam has baen varifiad and is complate, accurata and up to data. | | | |
| Correction: | Using tha California Environmental Raporting Systam (CERS), alactronically updata tha information submittad to the statewida information management systam. | | | |
| Obsarvation: | Tha last Business Plan update submittad by this facility is dated 3/19/2013. | | | |
| | Comply by data: **5/22/2016** | | | |

| | | | |
|---|---|---|---|
| 0209 | Failure to submit an amendment to the inventory form within 30 days of change. | CAL. HEALTH & SAFETY CODE 25508.1 | X |
| Violation: | Owner/Operator shall electronically update the information submitted to the statewide information management system if operations require modification to any portion of the plan or there is a substantial change in the handler's operations. | | |
| Correction: | Using the California Environmental Reporting System (CERS), electronically update the information submitted to the statewide information management system. | | |
| Observation: | Hazardous materials were observed on site during the inspection that are listed in CERS in lesser quantities. Also, a secondary emergency contact must be provided to the facility information. Comply by date: **5/22/2016** | | |
| 1231 | Failure to submit a corrected Business Plan within 30 days after notification of deficiencies. | CAL. HEALTH & SAFETY CODE 25508 | |
| 1232 | Failure to submit a Business Plan revision within 30 days of a substantial change in operation. | CAL. HEALTH & SAFETY CODE 25508.1 | |

| | | |
|---|---|---|
| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 4/22/16 2:53:51PM<br>LTR:4/22/2016 2:45:18PM |
| BRIAN WADE | Paul Huizenga | Owner |
| NAME | NAME<br>INSPECTION DATE: 04/22/2016 | TITLE<br>PRINTED ON: 4/22/16 2:58 pm |

X **NOTICE OF VIOLATION: THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN THE SPECIFIED TIMEFRAME. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION.**

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# CERTIFICATE OF COMPLIANCE

**Return Certification within 30 Days of Receipt to Inspector BRIAN WADE**

RESPONDENT: Paul Huizenga

VIOLATION(S) CITED ON: 4/22/2016 CERTIFICATE OF COMPLIANCE DATE: 4/22/2016

| | |
|---|---|
| NAME: **HUIZENGA DAIRY** | FACILITY ID: **FA0011003** |
| ADDRESS: **7587 EDISON AVE** | CERS ID:**10052128** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | |

**Attach the following documentation when returning the Certificate of Compliance:**

| | |
|---|---|
| 0209 | Using the Calfornia Environmental Reporting System (CERS), electronically update the information submitted to the statewide information management system.Hazardous materials were observed on site during the inspection that are listed in CERS in lesser quantities. Also, a secondary emergency contact must be provided to the facility information. |
| 0206 | Using the California Environmental Reporting System (CERS), electronically update the information submitted to the statewide information management system.The last Business Plan update submitted by this facility is dated 3/19/2013. |
| 0203 | Using the California Environmental Reporting System (CERS), electronically submit the Business Plan to the statewide information management system.This facility has not submitted a Site Map or the emergency response/training plans section into CERS. |

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Huizenga Dairy** Facility ID #: **11003**

Address: **7587 Edison Avenue Ontario, CA 91762**

1) Description: **View of the facility from Edison facing South.**

2) Description: **(3) 500-gallon AST's of diesel fuel stored on the South side of the milking barn.**

Date Taken: **4/22/2016**

Taken By: **Brian Wade** Signature: Brian Wade

Revised 02/27/03

# PHOTO NARRATIVE



PHOTO 3

PHOTO 4

Facility/Case Name: **Huizenga Dairy** Facility ID #: **11003**

Address: **7587 Edison Avenue Ontario, CA 91762**

1) Description: **(2) 275-gallon and (1) 55-gallon containers of teat dip stored in a room on the South side of the milking barn.**

2) Description: **(2) 55-gallon drums of formaldehyde 37% stored near the milking area exit on the East side of the building.**

Date Taken: **4/22/2016**

Taken By: **Brian Wade** Signature: Brian Wade

Revised 02/27/03

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# ACCESS REQUEST to FACILITY RECORD IN CERS - SINGLE FACILITY*

For more information, see: http://www.sbcfire.org/hazmat/efile.aspx or call CERS help line (909) 386-8432

The purpose of the ACCESS REQUST is to ensure that only individuals designated by the facility owner/operator are authorized by the CUPA to access facility records and to create, edit, and submit electronic data on the owner's behalf to the statewide system, known as the California Environmental Reporting System (CERS). The initial business user authorized by the CUPA to have access to a facility on CERS is designated as a lead business user. Lead business users have the ability to add additional lead or standard business users, approve or reject other access requests, or delete other users for any facility for which they are listed as a lead user.

**AUTHORIZED LEAD BUSINESS USER**

| Name | Title |
|---|---|
| Luke Huizenga | Manager |
| **Email Address** | **Contact Phone** |
| Lukrishuiz@verizon.net | (951)205-5871 |

| OWNER NAME | OWNER EMAIL ADDRESS |
|---|---|
| Paul Huizenga | pdhuizenga@yahoo.com |

| OWNER MAILING ADDRESS | CITY | STATE | ZIP CODE | OWNER PHONE |
|---|---|---|---|---|
| 7587 Edison Ave. | Ontario | CA | 91762 | (909)597-5124 |

**Fill out the following information for the facility**

| FACILITY ID *(e.g., FA0123456)* | FACILITY NAME *(e.g., CUPA AUTO)* | SITE ADDRESS *(e.g., 123 N. MAIN ST.)* | CITY *(e.g., ANYTOWN)* |
|---|---|---|---|
| FA0011003 | Huizenga Dairy | 7587 Edison Ave. | Ontario |

✓ **I authorize the person and email address listed above to be a lead business user for the listed facility. This includes the ability to create, edit, and submit compliance data for the listed facility. I understand that as a lead business user this person may approve additional lead business users or standard business users, grant or reject facility access requests, and delete users from the facility listed on this authorization form.**

***Certification – I certify that I am the owner/operator or legal representative of the facility listed on this form. I understand that compliance documents prepared or submitted electronically are held to the same standard as their former paper equivalents.***

| SIGNATURE OF OWNER/OPERATOR OR LEGALLY DESIGNATED REPRESENTATIVE | DATE | NAME OF DOCUMENT PREPARER |
|---|---|---|
| [signature] | 3-19-13 | Luke Huizenga |
| **NAME OF SIGNER (print)** | **TITLE OF SIGNER** | |
| PAUL A. HUIZENGA | OWNER | |

*Each facility record that is entered into CERS is assigned to a business/organization. Multiple facilities that have the same owner/operator and that will have the same users managing the facility record in CERS can be grouped together into a single "umbrella" business/organization. If you own or operate multiple facilities and if the same users will be managing all of the facilities in CERS, you may want them to be grouped into a single business/organization. For more information please contact the San Bernardino CERS help line at (909) 386-8432.

Return completed form by Mail: San Bernardino County Fire Department, Hazardous Materials Division, 620 South E Street, San Bernardino, CA 92415-0153 or Fax: (909) 386-8460 or Email: Efile@sbcfire.org

OFFICE USE Notes: Initiated

Form Revised 11/14/12 Completed by: [signature] Date: 3-19-13

OFFICE USE ONLY: DATE STAMP

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0011003 Facility Name: Huizenga Dairy Inspection Date: 2/19/13

Site Address: 7587 Edison Ave. Phone #:

City: Ontario Zip Code: 91761 EPA ID #: Not req'd

Consent Granted by:

☒ Inspect ☐ Photograph Name: Paul Huizenga Title: Owner # Emp:

Refer to Title 19 and Title 22 of the California Codes of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | |
| 107. Contingency Plan established | CCR 66265.51(a) | | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | X | |
| 202. Business Plan established | CHSC 25503.5 | X | | |
| 203. Business Plan submitted/updated | CHSC 25505 | X | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | X | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |

**INSPECTION NARRATIVE**

An inspection was conducted to determine compliance with hazardous materials laws and regulations. I met with Paul Huizenga for the inspection.

This dairy uses chemicals for cleaning and disinfecting cows in the milking process.

They have three 500 gallon diesel fuel tanks, two 200-300lb drums of Pride chlorinated caustic detergent, and one 55 gallon drum of formaldehyde.

See next page

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] Sign Name — Duane Pianalto Print Name

Received By: [signature] Sign Name — PAUL HUIZENGA Print Name

Title:

Report Date: 2/19/13

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: 2/19/13

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0011003 | Huizenga Dairy | 7587 Edison Ave., Ontario |
| Consent Granted by: ☒ Inspect ☐ Photograph | NAME Paul Huizenga | TITLE Owner |

Violations to be corrected within 30 days:
202. Failure to establish a Business Plan.
203. Failure to submit the Business Plan
The Business Plan is required to be established and submitted annually. There is currently no Business Plan on file.
Compliance Requirement: using the California Environmental Reporting System (CERS) submit the Business Plan within 30 days from today. Submit a signed Certificate of Compliance to this office upon completion of the Business Plan.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) Duane Pianetto (Print Name)
Received By: [signature] (Sign Name) PAUL HUIZENGA (Print Name)
Title:
Report Date: 2/19/13

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden


February 05, 2008

HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**ATTN: PAUL HUIZENGA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0011003-HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

MR. HUIZENGA,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 09, 2007:

- Failure to establish a Business Plan

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

Handler

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

December 17, 2007

PAUL HUIZENGA
7587 EDISON AV
CHINO, CA 91710-9171

**ATTN: PAUL HUIZENGA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0011003-HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

MR. HUIZENGA,

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**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

COUNTY FIRE DEPARTMENT

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December 17, 2007

PAUL HUIZENGA
7587 EDISON AV
CHINO, CA 91710-9171

**ATTN: PAUL HUIZENGA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0011003-HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

MR. HUIZENGA,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 09, 2007:

- Failure to establish a Business Plan

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

County of San Bernardino
**OFFICE OF THE FIRE MARSHAL**
**Hazardous Materials Division**
620 South "E" Street
San Bernardino, CA 92415-0153

Recycled

*Return Service Requested*

RECEIVED
DEC 27 2007
S.B. CO. FIRE DEPT.

REPORTED FIRST CLASS

SAN BERNARDINO DEC 19'07 CA

00.36 :
H METER 711319

NIXIE 917 9C 1 70 12/20/07
RETURN TO SENDER
NO SUCH NUMBER
UNABLE TO FORWARD
BC: 924150153 *1009-01542-20-09

9171 [illegible] 0153

# HUIZENGA DAIRY

7587 EDISON AVE.
ONTARIO, CA 91762

OFFICE (909) 597-4695
MOBILE (909) 241-3694
FAX (909) 597-7164

California DAIRIES inc.

FA 11003

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: New Facility Name: Huizenga Dairy Inspection Date: May 9, 2007

Site Address: 7587 Edison Ave Phone #: (909) 597-4695

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by: ☒ Inspect ☒ Photograph Name: Paul Huizenga Title: Owner # Emp: 8 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires handler permit

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31)

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (2) 30-gal drum chlorinated powder soap
(2) 20-gal Dyne detergent germicide
(3) 500-gal AST's Diesel (1) 55 gal drum oil
(7) 55-gal drums formaldehyde (used in foot bath)

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2))

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) NA - does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) NA

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) NA

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) NA

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) NA

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) NA

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) NA

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) NA

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) NA

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) NA

**Compliance Requirement**: Submit copies of waste disposal records for the past

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) NA

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy milk production. Equipment is serviced by Kent Avery Repair, Inc.

Inspected By: [signature] (Sign Name) Leslie Heavside (Print Name)

Received By: [signature] (Sign Name) PAUL A. HUIZENGA (Print Name) Title: Owner

Report Date: May 9, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Paul Huizenga Dairy** Facility ID #: **NEW**

Address: **7587 Edison Avenue, Ontario**

1) Description: **Sign at front of dairy**

2) Description: **(1) 30-gallon drum of chlorinated powder soap**

Date Taken: **May 9, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

PHOTO 4

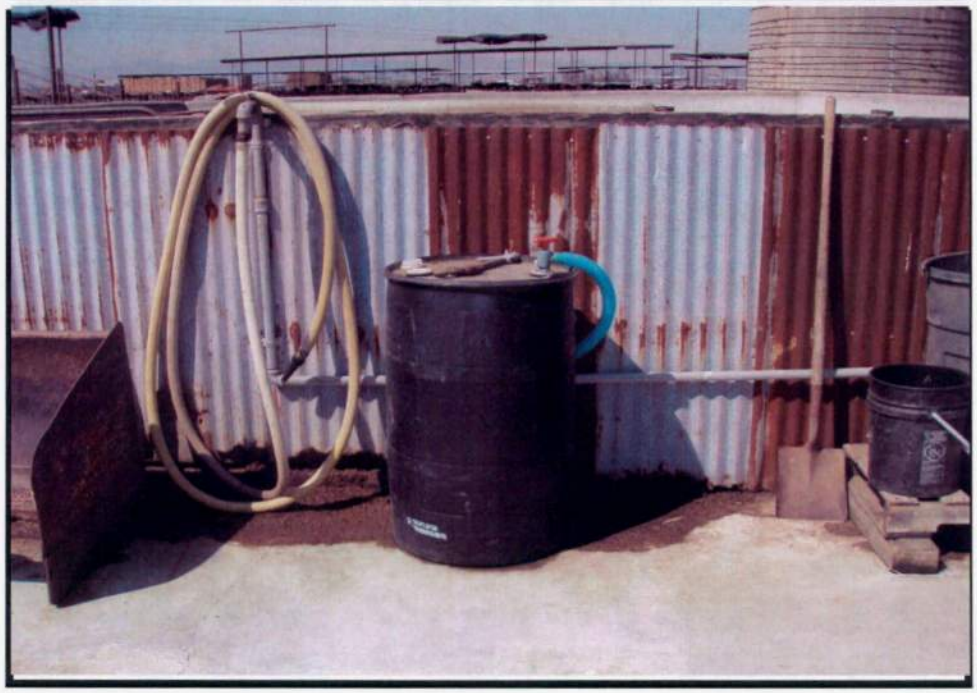

Facility/Case Name: **Paul Huizenga Dairy** Facility ID #: **NEW**

Address: **7587 Edison Avenue, Ontario**

3) Description: **(3) 500-gallon AST's of Diesel**

4) Description: **(1) 55-gallon drum of formaldehyde (used in foot bath)**

Date Taken: **May 9, 2007**

Taken By: **Leslie Heaviside** Signature: Lidei

Revised 10/12/2000

TRACKING SHEET FOR BUSINESS PLANS

*Establishment #*

*Facility Name:*

*Facility Site Address:*

*City:*

*Fire Agency:*

| _____(# of copies) | | Sent to FD |
|---|---|---|
| Business Plans Received | ___/___/___ | ___/___/___ |
| Results of Review(s) | | |
| Deficiency | | ___/___/___ |
| Conditional Approval | | ___/___/___ |
| Approval | | ___/___/___ |
| | | Sent to FD |
| Revised Plans Received | ___/___/___ | ___/___/___ |
| | ___/___/___ | ___/___/___ |

| Other Date | Action/Documentation (update, new plan, etc.) | Staff hours |
|---|---|---|
| ___/___/___ | | |
| ___/___/___ | | |
| ___/___/___ | | |
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| ___/___/___ | | |

California Environmental Reporting System: Regulator

Donna Juday's Account Sign Out Tools Reports Help

Submittals Facilities Businesses Regulators Compliance Responders Reports

# Business Owner/Operator Identification: TiVa DAIRY

Home » Submittal Search » Submittal: 1/30/2020 (10052128) » Facility Information: Business Owner/Operator Identification (Accepted)

**Submittal Element History**

Submitted for CERS ID 10052128 on 1/30/2020 11:56AM by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)
Submittal was ***Accepted*** on 2/4/2020 by *Rose Marie Bruhn* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Rose Marie Bruhn at rbruhn@sbcfire.org or (909) 386-8401.

Return to Submittal

**Site Address**

TiVa DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**Identification**

Dickie Vander Meulen

Operator Phone: (951) 202-8787
Business Phone: (951) 202-8787
Business Fax: () -

Beginning Date: -
Ending Date: -

Dun & Bradstreet: -
SIC Code: -
Primary NAICS: -

**Facility/Site Mailing Address**

14382 Bethany Ave
Chino, CA 91710

**Owner**

DICKIE VANDERMEULEN
Phone
(951) 202-8787
Mailing Address
14382 Bethany Ave
Chino, CA 91710

**Billing Contact**

DICKIE VANDERMEULEN
Phone
(951) 202-8787
tivadairy@gmail.com
Mailing Address
14382 Bethany Ave
Chino, CA 91710

**Primary Emergency Contact**

Dickie Vander Meulen
Title
Partner- Operator
Business Phone: (951) 202-8787
24-Hour Phone: (951) 202-8787
Pager Number: -

**Secondary Emergency Contact**

Harold Tillema
Title
Partner
Business Phone: (909) 226-1160
24-Hour Phone: (909) 226-1160
Pager Number: -

**Environmental Contact**

Dickie Vander Meulen
(951) 202-8787
tivadairy@gmail.com
Mailing Address
14382 Bethany Ave
Chino, CA 91710

Name of Signer: dickie vandermeulen
Title of Signer: Partner
Name of Document Preparer: dickie vandermeulen
Additional Information: -

**Locally-collected Fields**

Some or all of the following fields may be required by your local regulator(s).

**Property Owner**

[No Name Provided]
Phone
() -
Mailing Address
-
, - - -

Assessor Parcel Number (APN): -
Number of Employees: 6
Facility ID Number (Regulator-provided): FA0011003

**Created By:** Betsy Hunter-Binns on 1/30/2020 11:56 AM
**Last Updated By:** Betsy Hunter-Binns on 1/30/2020 11:56 AM

Return to Submittal

Version 3.05.0004 | Enhancements | CERS Central

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CERS Technical Support: Request Technical Assistance

CERS Help Settings Notifications

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

0010675

- [ ] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [x] Other Change of Ownership (see attachment)
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [x] Demand Bill

### OWNER INFORMATION
OWNER ID: OW0009237 OW0009163

NAME: PAUL HUIZENGA

ADDRESS: 7587 EDISON AV ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91710-9171 COUNTRY: US

PHONE: 909-597-4695 EXT: FYI LAST UPDATED: 06/13/2018

### FACILITY INFORMATION
FACILITY ID: FA0011003

BUSINESS NAME: HUIZENGA DAIRY CERS ID:10052128

SITE ADDRESS: 7587 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 FAX: 909-597-5110

BUSINESS PHONE: 909-597-4695 EXT:

BUSINESS OPERATOR NAME: Paul Huizenga Dairy

OPERATOR PHONE: 909-597-5124 EXT: FYI LAST UPDATED: 06/14/2018

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: 7587 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

### BILLING CONTACT
ACCOUNT ID: AR0012473 AR0023220

BILLING CONTACT NAME: PAUL HUIZENGA

ADDRESS 1: 7587 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: US

PHONE: 909-597-4695 EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: Luke Huizenga PHONE: 909-597-5110 EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL): PHUIZE5111@AOL.COM

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: INDIVIDUAL * BUSINESS TYPE: FARM

* SUPERVISORIAL DISTRICT: 004 * INSPECTION DISTRICT: 03 * FIRE JURISDICTION: ONTARIO FIRE

FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 11/30/2007 FYI LAST BILLING: 10/16/2018

FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 0.00

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Motor Vehicle Fuel, 02-Fuel Distributor, 03-Farm, 04-Processor, 05-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| Date Initials | Date Initials | Date Initials | Date Initials |

JUN 06 2019

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0029980 | INACTIVE | 4029-APSA FARM/CONSTRUCTION C | 12/01/2015 | 11/30/2016 |
| | | | GHP OR UST ID: PR0038862 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0018968 | ACTIVE | 4241-HAZARDOUS MATERIALS 1-3 C | 12/01/2018 | 11/30/2019 |
| | | | GHP OR UST ID: PR0017868 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 5/16/2019 SUBMITTED BY: Alexandra Rodriguez

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

C Mz data exchanged on 05/16/2019-yr

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection conducted on 05/01/2019, Huizenga Dairy ceased operations in late 2018, and Tiva Dairy took over operations. Hazardous Materials pertaining to the previous owner are no longer at this location with the exception of (3) 500-gallon Diesel Tanks. Tiva Dairy will now be responsible for permit payment.

- -Keep same FA and assign new owner ID
- -Change anniversary date
- -No changes in permits or operations

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

Demand bill IN0139323

Due 7-31-19

AZ 6-17-19

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

FOR INFO ONLY

- [ ] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [x] Other Change of ownership
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID:

NAME: Dickie Vandermeulen

ADDRESS: 14382 Bethany Ave. ADDRESS 2: 14761 Carpenter Ave., Ontario, Ca 91762

CITY: Chino STATE: CA ZIP CODE: 91710 COUNTRY: US

PHONE: 951-202-8787 EXT: FYI LAST UPDATED:

### FACILITY INFORMATION — FACILITY ID: FA0011003

BUSINESS NAME: Tiva Dairy CERS ID: 10052128

SITE ADDRESS: 7587 Edison Ave. ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 FAX:

BUSINESS PHONE: 951-202-8787 EXT:

BUSINESS OPERATOR NAME: Tiva Dairy

OPERATOR PHONE: 951-202-8787 EXT: FYI LAST UPDATED:

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: 14382 Bethany Ave. ADDRESS 2:

CITY: Chino STATE: CA ZIP CODE: 91710 COUNTRY: US

### BILLING CONTACT — ACCOUNT ID:

BILLING CONTACT NAME: Same As Above

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

PHONE: EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: Same As Above PHONE: EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL): TIVADAIRY@GMAIL.COM

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: * BUSINESS TYPE:

* SUPERVISORIAL DISTRICT: * INSPECTION DISTRICT: * FIRE JURISDICTION:

ACCOUNT STATUS: ANNIVERSARY DATE: FYI LAST BILLING:

EXEMPT FROM BILLING: TOTAL DUE:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Motor Vehicle Fuel, 02-Fuel Distributor, 03-Farm, 04-Processor, 05-Other

### FOR OFFICE USE ONLY:

| | Date | Initials |
|---|---|---|
| [ ] EC Entry Complete | | |
| [ ] QC Complete | | |
| [ ] [ ] Fiscal Entry Complete (N/A) | | |
| [ ] [ ] Referral to Team CERS (N/A) | | |

# N BERNARDINO COUNTY CUP/
## FACILITY INFORMATION

0010675

☐ Update/Assign PEs ☐ Referral to Team CERS ☐ Closure ☐ Invoice Reversal ☐ Demand Bill
☐ Update Non-CERS Fields ☐ 0202 ☐ Other ☐ 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0009237**

NAME: **PAUL HUIZENGA** Dickey vander meulen

ADDRESS: ~~7587 EDISON AV~~ 14382 Bethany st. ADDRESS 2:

CITY: **CHINO** STATE: **CA** ZIP CODE: **91710-9171** COUNTRY: **US**

PHONE: **909-597-4695** EXT: FYI LAST UPDATED: **06/13/2018**

**FACILITY INFORMATION** — **FACILITY ID: FA0011003**

BUSINESS NAME: ~~HUIZENGA DAIRY~~ tivadairy@gmail CERS ID: **10052128**

SITE ADDRESS: **7587 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** FAX: **909-597-5110**

BUSINESS PHONE: **909-597-4695** EXT:

BUSINESS OPERATOR NAME: **Paul Huizenga Dairy**

OPERATOR PHONE: **909-597-5124** EXT: FYI LAST UPDATED: **06/14/2018**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **7587 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

**BILLING CONTACT** — **ACCOUNT ID: AR0012473**

BILLING CONTACT NAME: **PAUL HUIZENGA**

ADDRESS 1: **7587 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **US**

PHONE: **909-597-4695** EXT: EMAIL:

**ENVIRONMENTAL CONTACT**

NAME: **Luke Huizenga** PHONE: **909-597-5110** EXT:

EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL): **PHUIZE5111@AOL.COM**

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: **INDIVIDUAL** * BUSINESS TYPE: **FARM**

* SUPERVISORIAL DISTRICT: **004** * INSPECTION DISTRICT: **03** * FIRE JURISDICTION: **ONTARIO FIRE**

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **11/30/2007** FYI LAST BILLING: **10/16/2018**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

| | | | |
|---|---|---|---|
| ☐ EC Entry Complete | ☐ QC Complete | N/A ☐ ☐ Fiscal Entry Complete | N/A ☐ ☐ Referral to Team CERS |
| Date Initials | Date Initials | Date Initials | Date Initials |

# AN BERNARDINO COUNTY CUP
## FACILITY INFORMATION

☒ Update/Assign PEs ☐ Referral to Team CERS ☐ Closure ☐ Invoice Reversal ☐ Demand Bill
☒ Update Non-CERS Fields ☐ 0202 ☐ Other ☐ 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0009237**

NAME: **PAUL HUIZENGA**
ADDRESS: **7587 EDISON AV** ADDRESS 2:
CITY: **CHINO** STATE: **CA** ZIP CODE: **91710-9171** COUNTRY: **USA**
PHONE: **909-597-4695** EXT: FYI LAST UPDATED: **08/06/2015**

**FACILITY INFORMATION** — **FACILITY ID: FA0011003**

BUSINESS NAME: **HUIZENGA DAIRY** CERS ID: **10052128**
SITE ADDRESS: **7587 EDISON AVE** ADDRESS 2:
CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** FAX:
BUSINESS PHONE: **909-597-4695** EXT:
BUSINESS OPERATOR NAME: **PAUL HUIZENGA**
OPERATOR PHONE: EXT: FYI LAST UPDATED: **12/23/2015**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **7587 EDISON AVE** ADDRESS 2:
CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

**BILLING CONTACT** — **ACCOUNT ID: AR0012473**

BILLING CONTACT NAME: **PAUL HUIZENGA**
ADDRESS 1: **7587 EDISON AVE** ADDRESS 2:
CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**
PHONE: **909-597-4695** EXT: EMAIL:

**ENVIRONMENTAL CONTACT**

NAME: PHONE: EXT:
EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL): phuize5111@aol.com
LOCAL FACILITY PHONE (OPTIONAL): EXT:
CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: **INDIVIDUAL** BUSINESS TYPE: **FARM**
SUPERVISORIAL DISTRICT: **004** INSPECTION DISTRICT: **03** FIRE JURISDICTION: **ONTARIO FIRE**
FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **11/30/2007** FYI LAST BILLING: **10/15/2015**
FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=** 01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

ENTERED APR 28 2016

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ☐ | Entry Complete | ☐ | QC Complete | N/A ☐ | ☐ Fiscal Entry Complete | N/A ☐ | ☐ Referral to Team CERS | | |
| Date | Initials | Date | Initials | Date | Initials | Date | Initials | Date | Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE | PT0029980 | ACTIVE | 4029-APSA FARM/CONSTRUCTI | 12/01/2015 | 11/30/2016 |
| | | | GHP OR UST ID: PR0038862 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0018968 | ACTIVE | 4241-HAZARDOUS MATERIALS | 12/01/2015 | 11/30/2016 |
| | | | GHP OR UST ID: PR0017868 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☒ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

5011

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S **0**

DATE SUBMITTED: 4-26-16 SUBMITTED BY: Brian Wade

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

This facility is a dairy which stores less than 2,500 gallons of petroleum on site and is thus not subject to APSA regulations. Inactivate APSA PE 4029. Update Admin PE to 5011.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

Info update

# HAZA OUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: F

## O- OWNER INFORMATION

OWNER ID: OW0009237

NAME: PAUL HUIZENGA

ADDRESS 1: 7587 EDISON AV

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

COUNTRY: USA

PHONE: 909-597-4695

EXT:

FAX:

ALT PHONE: 909-241-3694

EXT:

DRIVER LICENSE:

TAX ID: 33-0834181

LAST UPDATED:

### OWNER MAILING ADDRESS

CARE OF: PAUL HUIZENGA

DBA: HUIZENGA DAIRY

ADDRESS1: 7587 EDISON AV

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91762

COUNTRY: USA

## F- FACILITY INFORMATION

FACILITY ID: FA0011003

NAME: HUIZENGA DAIRY

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

CITY CODE: ONTARIO

SIC CODE:

BUSINESS CODE: INDIVIDUAL

BUSINESS TYPE: FARM

CENSUS:

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: 03

PHONE: 909-597-4695

EXT:

FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 06/14/2007

### FACILITY MAILING ADDRESS

BUSINESS NAME: HUIZENGA DAIRY

CARE OF: PAUL HUIZENGA

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

COUNTRY: USA

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0012473

RESPONSIBLE PARTY: PAUL HUIZENGA

CARE OF: HUIZENGA DAIRY

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

COUNTRY: USA

PHONE: 909-597-4695

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 01/04/2008

ALT PHONE:

EXT:

EXEMPT FROM BILLING: NO

TAX ID:

ANNIVERSARY DATE: 07/31/2007

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| UPDATE/CLOSE/Z.O.B. | PT001896 | ACTIVE | 4221 | ./01/2007 | 07/31/2008 |
|---|---|---|---|---|---|
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |

| PR0017868 | ACTIVE, BILLABLE | NA | NA | |
|---|---|---|---|---|
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. _____ NUMBER OF ACTIVE UST'S 0 MFR # _____

DATE SUBMITTED: 2-5-08 DATE ENTERED: 1/8/08 FISCAL DATE: _____

SUBMITTED BY: Leslie Heaviside ENTERED BY: CW

**COMMENTS/REMARKS:**

per Envision review: owner mailing address incorrect. Update city & zip.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:2 AR:0.00

**HUIZENGA DAIRY**
**PAUL HUIZENGA**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**This Unified Permit is hereby issued to:**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2014** **Expiration Date: 11/30/2015**

**CUPA Facility Type: 5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0029980 | 4029 APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT | PR0038862 |
| PT0018968 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0017868 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   Note: The UST ID Number is listed on the front of the permit for each UST

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Fire Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part2, Chapter 1,Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4 Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:3 AR:0.00

**ATTN :** **PAUL HUIZENGA**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**This Unified Permit is hereby issued to:**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2013** **Expiration Date: 11/30/2014**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0029980 | 4029 APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT | PR0038862 |
| PT0018968 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0017868 |
| PT0029981 | 5012 CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2 | PR0038863 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4, Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

**ATTN :** **PAUL HUIZENGA**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**This Unified Permit is hereby issued to:**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2012** **Expiration Date: 11/30/2013**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

As a condition of the permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2011** **Expiration Date: 11/30/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Mark A. Hartwig, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 8/1/2010** **Expiration Date: 7/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Danny R. Wurl

**Danny R. Wurl, Fire Chief**

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.

**Effective Date: 8/1/2009** **Expiration Date: 7/31/2010**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.

**Effective Date: 8/1/2008** **Expiration Date: 7/31/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.

Effective Date: 8/1/2007 Expiration Date: 7/31/2008

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

12-20962-638 Rev. 9/06

7325 EDISON AVE / 1053-391-01 SFR 3

7371 EDISON AVE / “ “

7397 EDISON AVE / “ “

7587 EDISON AVE / 1053-371-01 DAIRY

7697 EDISON AVE / N/A

14306 BON VIEW AVE / N/A

14316 BON VIEW AVE / N/A

14330 BON VIEW AVE / N/A

14451 BON VIEW AVE / N/A

14366 BON VIEW AVE / N/A

7556 EUCALYPTUS AVE / 1053-581-03 GRAZING

7634 EUCALYPTUS AVE / N/A

| | | | | | |
|---|---|---|---|---|---|
| ✓ 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | | CHINO |
| ✓ FA0000648 | SNS DAIRY | 02 | 7371 EDISON AVE | | ONTARIO |
| ✓ FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | | ONTARIO |
| ✓ FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | | ONTARIO |
| ✓ 90020263 | QUALITY BUILT FIBERGLASS | 14316 | BON VIEW | | CHINO |
| ✓ FA0000393 | COSTA VIEW FARM | 02 | 14451 BON VIEW | | ONTARIO |

*EMAILED GRM TO SCAN FILES 2/13/24 CR

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

Fiscal

# HA RDOUS MATERIAL FIELD SER ES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

Quick Submit-Correct minor information without full verification. Grace request Inactivate PEs NON/NON

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A CURRENT INVOICE MAILING CODE: A

## O- OWNER INFORMATION — OWNER ID: OW0000369

Legal Owner

*NAME: BOOTSMA, GARRET

*ADDRESS 1: 7721 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *COUNTRY: USA

*PHONE: EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 08/27/2007

TAX ID: DRIVER LICENSE:

### OWNER MAILING ADDRESS

Same as Owner

CARE OF: DBA: BOOTSMA, GARRET

ADDRESS1: 7721 EDISONAVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

## F- FACILITY INFORMATION — FACILITY ID: FA0000454

*NAME: G BOOTSMA & SON'S

*ADDRESS 1: 7721 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

CENSUS: MILITARY SCHOOL MEDICAL *BUSINESS CODE: *BUSINESS TYPE:

SIC CODE: *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03

*PHONE: EXT: FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE: EXT: FAX: FYI LAST UPDATED: 01/18/2008

### FACILITY MAILING ADDRESS

Same as Facility

Same as Owner Mailing Address

BUSINESS NAME: G BOOTSMA & SON'S

CARE OF: GARRET BOOTSMA

ADDRESS 1: 7721 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION — ACCOUNT ID: AR0000456

Same as Owner Mailing Address Same as Facility Mailing Address

RESPONSIBLE PARTY: GARRET BOOTSMA

CARE OF: G BOOTSMA & SON'S

ADDRESS 1: 7721 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

PHONE: 909-597-6121 EXT: TAX ID: DRIVER LICENSE:

ALT PHONE: EXT: FYI EXEMPT FROM BILLING: NO FYI LAST UPDATED: 04/06/2009

ALT PHONE: EXT: FYI TOTAL DUE: 843.00

FYI ANNIVERSARY DATE: 04/30/1997 FYI ACCOUNT STATUS: ACTIVE ACCOUNT

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to **complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☒ ZERO OUT BALANCE | PT000895 | ACTIVE | 4221 | 5/01/2008 | 04/30/2009 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009818 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ☐ UPDATE<br>☒ INACTIVATE<br>☒ ZERO OUT BALANCE | PT0008932 | ACTIVE | 4420 | 05/01/2008 | 04/30/2009 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009819 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E. 0202

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP.: 2 NUMBER OF ACTIVE UST'S 0 MFR #

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? Yes (No)

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? Yes (No)

*DATE SUBMITTED: 4-16-09 DATE ENTERED: 4/21/09 FISCAL ENTRY DATE/ INITIAL: 4-30-09 BL

*SUBMITTED BY: Leslie Heaviside ENTERED BY: P Wilson ***Demand bill for updated PEs**: Yes (No)

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection: facility handles hazardous materials in quantities below 55 gallons & does not generate waste. Inactivate PE's and reverse invoice IN 53475.
assign 0202

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

*IN0053475843.00*

Please make your check payable to:
**San Bernardino County Fire Department**
Send to:
**157 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 387-9603**

**Facility Address**
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91761

| Invoice ID | Facility ID |
|---|---|
| IN0053475 | FA0000454 |

# INVOICE
## HAZARDOUS MATERIALS
## CUPA PERMITS

**Invoice Date** 3/17/09

**Total Account Balance** $ 843.00

**Total Due for Invoice** $ 843.00

**Total Paid**

TO : GARRET BOOTSMA
7721 EDISON AVE
ONTARIO, CA 91762

ATTN : G BOOTSMA & SON'S

☐ Change of Billing Address (see back)

Upon receipt of full payment of the balance due as shown on this invoice, you will receive your new annual permit with an effective date of: 5/1/2009 to 4/30/2010

PLEASE RETURN TOP PORTION WITH PAYMENT

| Program/ Element | Qty | Description | Permit Exp Date | | Amount |
|---|---|---|---|---|---|
| 4221 | 1 | HAZMAT HANDLER 0-10 EMPLOYEES | 4/30/10 | $ | 408.00 |
| 4420 | 1 | SPECIAL GENERATOR(B) | 4/30/10 | $ | 411.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | 4/30/10 | $ | 24.00 |
| | | | Total Due for This Invoice: | $ | 843.00 |

WE NO LONGER NEED A HAZARDOUS MATERIAL PERMIT
PLEASE UPDATE YOUR RECORDS.
THANK YOU,
951-218-3502

**ALL FEES ARE NOW DUE**
**PLEASE SUBMIT FULL PAYMENT BEFORE 4/30/2009**
**TO AVOID A 35% DELINQUENT FEE**
**THANK YOU.**

| 1-30 Days | 31-60 Days | 61-90 Days | 91-120 Days | 121+ Plus | Total Account Bal |
|---|---|---|---|---|---|
| $ 843.00 | $ 0.00 | $ 0.00 | $ 0.00 | $ 0.00 | $ 843.00 |

*IN0053475843.00*

**Permits are not transferable, you must contact this office for new permits.**
**If you have any questions regarding this bill, please call San Bernardino County Fire Department at (909) 387-9603.**

STREET NUMBER

STREET NAME

STE OR UNIT No

CITY NAME

STATE

ZIP CODE

ATTENTION

RCD SDD PRE FISCAL
09 APR 22 PM 3:22

**Hazardous Materials Division**

**Fee Change Authorization Form**

☐ RUSH -NEED BY _____ ☑ PRIORITY-NEED BY 4/10/09 ☐ FYI-PLEASE REVIEW ☐ OTHER _____

**FACILITY INFORMATION**

COMPLETED

NAME: G BOOTSMA & SON'S FACILITY ID: FA0000454

ADDRESS: 7721 EDISON AVE

CITY: ONTARIO STATE: CA ZIP CODE: 91761

PHONE: EXT: FAX:

ALT PHONE: EXT: LOCATION(INSPECTOR DISTRICT): 03

CONTACT PERSON: CITY CODE: ONTARIO DISTRICT(SUPERVISORIAL DISTRICT): 004

ANNIVERSARY DATE: 4/30/1997 12:00:00AM ACCOUNT STATUS: ACTIVE ACCOUNT

NUMBER OF EMP. NUMBER OF UST'S 0 MFR #

**ACTION REQUIRED**

☑ REQUEST VERIFICATION ☑ REQUEST FACILITY INSPECTION

☑ INACTIVATE / CLOSED ACCOUNT / O.O.B. ☑ REQUEST TO REVERSE OUTSTANDING INVOICE

COMMENTS: per fa NO HazMat on site

(See Attached)

REQUESTED BY: APPROVED BY: Rebekah Matteson

**PERMIT INFORMATION**

PROGRAM ELEMENT

PROGRAM ELEMENT

PROGRAM ELEMENT

PROGRAM ELEMENT

PROGRAM ELEMENT

RECEIVED 3/27/09

DATE SUBMITTED: 3/27/09 SUBMITTED BY: REBEKAH MATTESON

ADDITIONAL COMMENTS: Permits no longer required. Lexie Heaviside

4/1/09 SW → ch NS

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:0 AR:0.00

G BOOTSMA & SON'S
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0000454 for a period not to exceed one year from effective date.

Effective Date: 5/1/2009 Expiration Date: 4/30/2010

| Permit Number | Program-Element | Related ID |
|---|---|---|
| PT0008931 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009818 |
| PT0008932 | 4420 SPECIAL GENERATOR(B) | PR0009819 |

SAN BERNARDINO COUNTY
FIRE DEPT

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

G BOOTSMA & SON'S
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0000454 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2008** **Expiration Date: 4/30/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008931 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009818 |
| PT0008932 | 4420 SPECIAL GENERATOR(B) | PR0009819 |

Printed on 4/18/2008
Reconstructed by MIS on 8/12/2008

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Daniel R. Munsey
Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal/Deputy Fire Warden


October 14, 2021

21092805 Ontario-Chino RAL Ardent Env..

**ARDENT ENVIRONMENTAL GROUP, INC.**
**1876 CAPITAL STREET, SUITE 103**
**CORONA, CA 92880**

**ATTENTION:** **KASIA ANDERSON**

**SUBJECT:** **CERTIFIED RECORD SEARCH FINDINGS**
**7721, 7891, AND 8061 EDISON AVENUE; 14400 GROVE AVENUE; 14213, 14283, 14297, 14333, 14343, 14450, AND 14451 BON VIEW AVENUE, ONTARIO (CHINO), CALIFORNIA**

This is to confirm that the San Bernardino County Hazardous Materials Division has identified records that may pertain to the subject site, as described in your request for records search.

The file(s) shown below have been retrieved for review. If you wish to view the original documents, please e-mail this office at hazmatrecords@sbcfire.org or call the number at the end of this letter to arrange an appointment.

**ACTIVE PERMIT FACILITIES:** (Regulatory files for facilities with annual operating permits to maintain underground storage tanks, handle hazardous materials, and/or generate hazardous waste. Files include permits, inspections, reports, test results, correspondence, and related materials. Files will also include any underground tank removal/construction activity records and site remediation/contamination records for facilities still in operation).

| | |
|---|---|
| Gordon Hay Inc. Dairy #3<br>14213 S. Bon View Ave.<br>Ontario | FA0014875 ~ CERS ID. 10444234<br>Hazardous Materials 4-10 Chemicals Special Handler Permit<br>(Last CERS Submission: 05/08/2019) |
| GH Dairy #4<br>8061 Edison Ave.<br>Ontario | FA0017949 ~ CERS ID. 10741726<br>Hazardous Materials 4-10 Chemicals Handler Permit<br>(Last CERS Submission: 11/4/2019) |

**INACTIVE PERMIT AND/OR NON-PERMIT FACILITIES:** (Inactive regulatory files for formerly permitted facilities that maintained underground storage tanks, stored hazardous materials, and/or generated hazardous waste and/or facilities with underground storage tanks removed and/or materials and waste removed. Files will also include any underground tank removal/construction activity records and site remediation/contamination records for facilities no longer operating underground tanks).

| | |
|---|---|
| H & R Dairy<br>14213 Bon View Ave.<br>Ontario | FA0010971 ~ CERS ID. 10052083<br>Hazmat Handler Permit |


BOARD OF DIRECTORS

| Col. Paul Cook (Ret.) | Janice Rutherford | Dawn Rowe | Curt Hagman | Joe Baca Jr. | Leonard X. Hernandez |
|---|---|---|---|---|---|
| First District | Second District | Vice Chair, Third District | Chairman, Fourth District | Fifth District | Chief Executive Officer |

| | |
|---|---|
| Costa Dimas<br>14213 Bon View Ave.<br>Ontario (Chino) | FA0000395<br>Inactive – No Permits needed. |
| Costa View Farm<br>14451 Bon View<br>Chino (now considered Ontario) | FA0000393 ~ Est. # 87013958<br>Hazardous Material Handler – UST Only Permit<br>Underground Storage Tank (AG) |
| G Bootsma & Son's<br>7721 Edison Ave.<br>Ontario | FA0000454<br>Hazmat Handler Permit<br>Special Generator Permit |
| Jorritsma Dairy<br>8061 Edison Ave.<br>Ontario | FA0000522<br>Hazmat Handler Permit<br>Special Generator Permit |
| Joe Ferreira Jr. Dairy<br>14400 Grove Ave.<br>Chino (now known as Ontario) | FA0000515 ~ Est. # 88015348<br>Agricultural Hazard Material Handler Permit<br>Underground Storage Tanks (2) - AG |

**PERMITS TO REMOVE/INSTALL/MODIFY UNDERGROUND STORAGE TANKS:**

| | |
|---|---|
| Costa View Farm – AG<br>14451 Bon View<br>Chino | Issued 10/27/1998<br>Removal (1) – Removed on 10/28/1998<br>Log # 102798-01 ~ Job Card # 5687 |

- Removal of Underground Storage Tank Letter Closure letter/no further action letter dated 05/05/2000 is located in UST portion of facility file.

| | |
|---|---|
| Joe C. Ferreira Jr. Dairy<br>14400 S. Grove Ave.<br>Chino | Issued 06/10/2004<br>Removal (2) ~ Removed in December 1994<br>Log # 061004-01 ~ Job Card # 7557 |

**HAZARDOUS MATERIAL INCIDENT AND/OR COMPLAINT RESPONSE ACTIVITY:** (other records of spill notifications and/or complaints not listed below may also exist in facility permit files).

| | |
|---|---|
| Joe Ferreira Jr. Dairy<br>14400 Grove Ave.<br>Chino (now known as Ontario) | CO0001007<br>04/15/2004<br>Consultant (Leighton and Associates) had contacted Petra to remove contaminated soil at site. 2 USTS were removed in the past. Became Site Assessment (see below). |

**SITE REMEDIATION:** (Underground Storage Tank Clean-Up under Local Oversight Program or Voluntary Hazardous Waste Clean-Up activity under Local Jurisdiction) (documents may be included in regular active or inactive permit files listed above).

| | |
|---|---|
| Joe Ferreira Jr. Dairy<br>14400 Grove Ave.<br>Chino (now known as Ontario) | RO0001227<br>No soil samples were taken when USTs were removed. Phase I and Phase II Site Assessment reports prepared by Leighton Consulting dated 05/17/2004 are in file. Also |

# CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA 454 Facility Name: Bootsma & Sons Dairy Inspection Date: April 14, 2009
Site Address: 7721 Edison Avenue Phone #: 909-597-6121
City: Ontario Zip Code: 91761 EPA ID #: Not applicable
Consent Granted by:
☒ Inspect ☒ Photograph Name: Jim Bootsma Title: Owner # Emp: 2

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | ✓ |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | ✓ |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | ✓ |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | ✓ |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | ✓ |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | ✓ |
| 107. Contingency Plan established | CCR 66265.51(a) | | | ✓ |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | ✓ |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | ✓ |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | ✓ |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | ✓ |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | ✓ |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | ✓ |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | ✓ |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | ✓ |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | ✓ |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | ✓ |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | ✓ |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | ✓ |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | ✓ |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | ✓ |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | ✓ |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | ✓ |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | ✓ |
| 129. Biennial Report prepared | CCR 66262.41 | | | ✓ |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | ✓ |
| 131. Training documentation complete & available | CCR 66265.16 | | | ✓ |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | ✓ |
| 135. Used oil managed properly | CHSC 25250.4 | | | ✓ |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | ✓ |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | ✓ |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | ✓ |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | ✓ |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | ✓ |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | ✓ |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | ✓ |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | ✓ |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | ✓ |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | ✓ |
| 202. Business Plan established | CHSC 25503.5 | | | ✓ |
| 203. Business Plan submitted/updated | CHSC 25505 | | | ✓ |
| 204. Hazardous Materials release reported | CHSC 25507 | | | ✓ |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | ✓ |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | ✓ |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | ✓ |
| 230. Business Plan implemented | CHSC 25503.5 | | | ✓ |

**INSPECTION NARRATIVE**

An inspection was conducted to verify permit applicability as facility contacted Fiscal Division stating that hazardous materials are no longer present. Jim Bootsma escorted me along the inspection.

Hazardous Materials observed:
(1) 30-gallon drum containing Sodium Hypochlorite
(1) 30-gallon drum containing acid cleaner
(1) 30-gallon drum containing CIP cleaner
Diesel AST previously onsite has been removed (now purchased offsite as needed)
Kent Avery services equipment & removes waste. *Permits will be inactivated *

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Heuvisde (Print Name)
Received By: [signature] (Sign Name) GARRET BOOTSMA (Print Name)
Title: Owner
Report Date: April 14, 2009

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

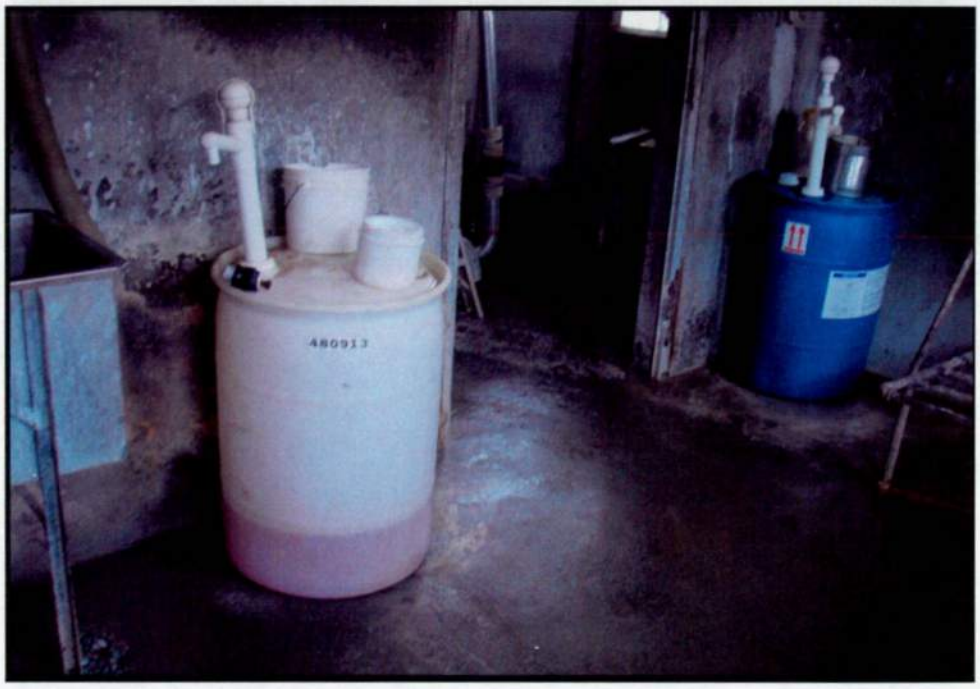


Facility/Case Name: **Bootsma & Sons Dairy** Facility ID #: **FA0000454**

Address: **7721 Edison Avenue, Ontario**

1) Description: **Previous storage location of Diesel AST**

2) Description: **(L to R): (1) 30-gallon drum containing acid cleaner; (1) 30-gallon drum containing Sodium Hypochlorite**

Date Taken: **April 14, 2009**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

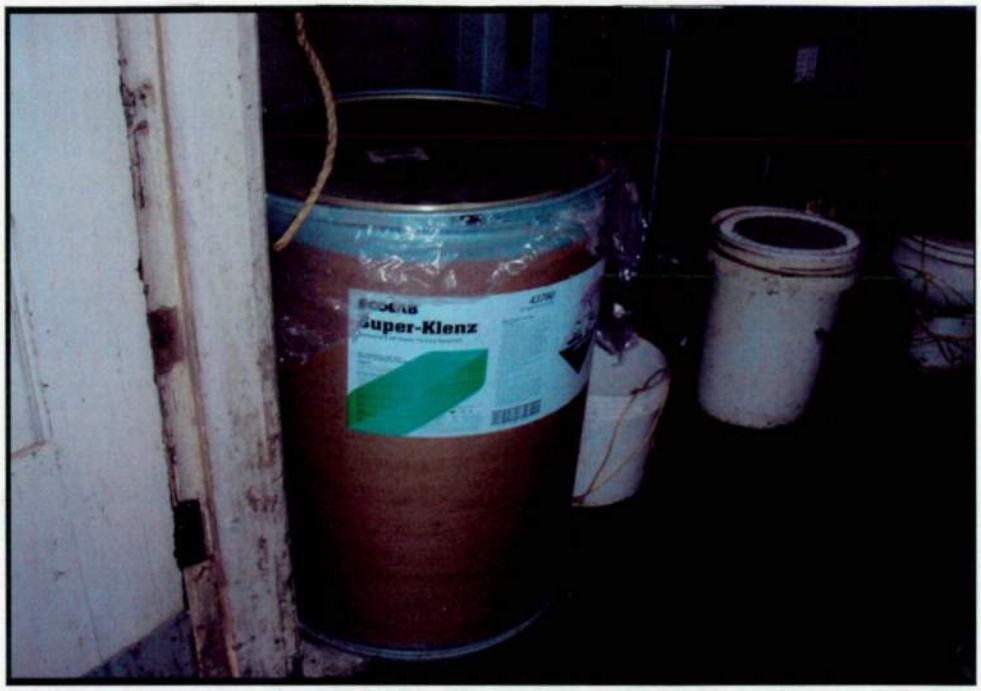


PHOTO 4

Facility/Case Name: **Bootsma & Sons Dairy** Facility ID #: **FA0000454**

Address: **7721 Edison Avenue, Ontario**

3) Description: **(1) 30-gallon drum containing CIP cleaner**

4) Description:

Date Taken: **April 14, 2009**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0004454 Facility Name: Garret Bootsma & Sons Inspection Date: April 17, 2007

Site Address: 7721 Edison Phone #:

City: Ontario Zip Code: 91761 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Gary Bootsma Title: Owner # Emp:

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | X | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | |
| 107. Contingency Plan established | CCR 66265.51(a) | | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR | | | |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | X | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | |
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| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | |
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| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | X | | |
| 202. Business Plan established | CHSC 25503.5 | X | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | X | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |
| 230. Business Plan implemented | CHSC 25503.5 | | | X |

**INSPECTION NARRATIVE**

An inspection was conducted to verify operating status and determine compliance with all applicable hazardous materials and hazardous waste laws and regulations.

Facility is a dairy (milk production)

Hazardous Materials Inventory

(1) 30 gallon drum Acid cleaner

(1) 55 gallon drum Dairy Du (Sodium Hypochlorite)

(2) 55 gallon drums teat dip.

(1) 150 gallon AST Diesel

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Hearnsberger (Print Name)

Received By: [signature] (Sign Name) GARRET BOOTSMA (Print Name)

Title:

Report Date: April 17, 2007

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org**

# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 17, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| A0000454 | Garret Bootsma & Sons | 7721 Edison, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Gary Bootsma | TITLE Owner |

No hazardous waste was observed at the time of inspection. Ken Avery provides repair service on equipment.

Correct the following violations:

(201) Hazardous material handler permit not current - CC 23.0602(b)(3)
Facilities that handle hazardous materials in quantities of 55 gallons or greater require a permit with this department.

To correct this violation: Submit payment upon receipt of invoice.

(202) Business Plan not established - CHSC 25503.5
Facilities that handle permittable quantities of hazardous materials must establish a Business Plan.

To correct this violation: Complete and submit the Business Emergency/Contingency Plan, original and 1 copy. Additionally, keep a copy onsite. Forms provided at time of inspection.

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Heavisides (Print Name)

Received By: [signature] (Sign Name) GARRET BOOTSMA (Print Name)

Title:

Report Date: April 17, 2007

**CUPA**

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 17, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000454 | Garret Bootsma & Sons | 7721 Edison, Ontario |
| Consent Granted by: ☑ Inspect ☑ Photograph | NAME Gary Bootsma | TITLE Owner |

(117) Contaminated containers not managed properly - CCR 66261.7 Empty containers larger than 5 gallons must be labeled as "empty" and the date on which they became empty. Observed several 55-gallon drums that were empty and not labeled properly (in & behind milking parlor and garage area). Empty containers must be removed 1 year from the date they became empty.

To correct this violation: Submit a statement indicating the drums are labeled properly or a copy of the receipt documenting disposal.

Submit requested documentation along with signed Certificate of Compliance within 30 days.

If you have questions, please call (909) 386-8401.

☑ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Heaviside (Print Name)

Received By: [signature] (Sign Name) GARRET BOOTSMA (Print Name)

Title:

Report Date: April 17, 2007

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

Page ____ of ____

**Return Certification within** 30 **Days of Receipt to Inspector** Leslie Hawkins

*In the Matter of Respondent:* _____

*Violation(s) cited on:* _____ *FA #::* _____

*Facility Name:* _____

*Site Address:* _____

*Certificate of Compliance Date:* _____

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| *Signature* | *Date* |
| *Printed or Typed Name* | *Title* |
| *Social Security/Federal ID Number* | *Drivers License/ID Number* |

*Attach the following documentation when returning the Certificate of Compliance:*

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

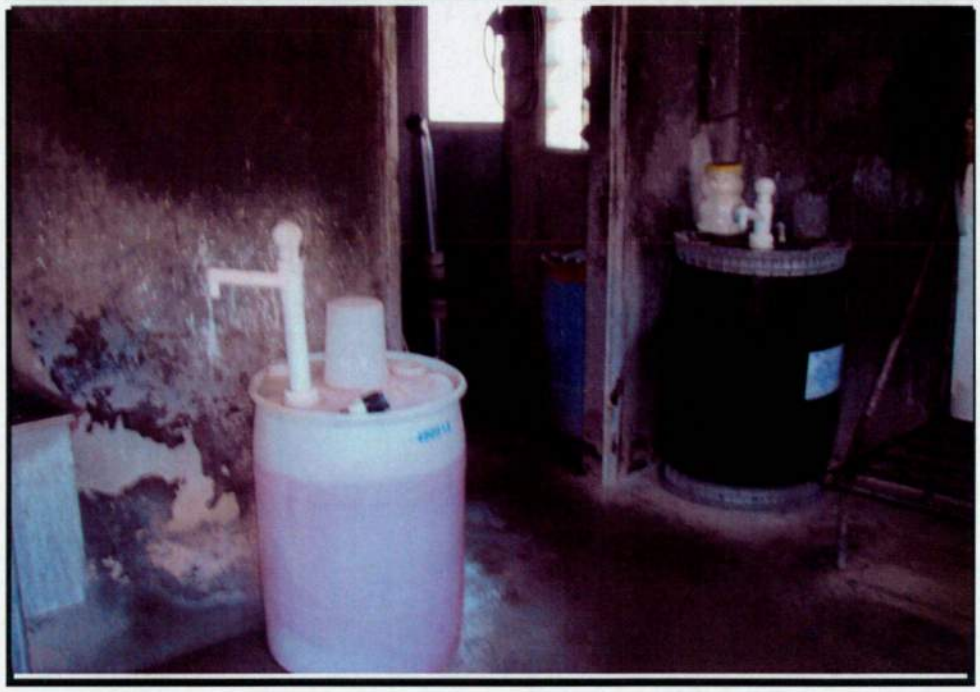

Facility/Case Name: **G. Bootsma & Sons** Facility ID #: **FA0000454**

Address: **7721 Edison Avenue, Ontario**

1) Description: **Sign at front of dairy**

2) Description: **(L to R): (1) 30-gallon drum of Acid; (1) 55-gallon drum of Sodium Hypochlorite**

Date Taken: **April 17, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

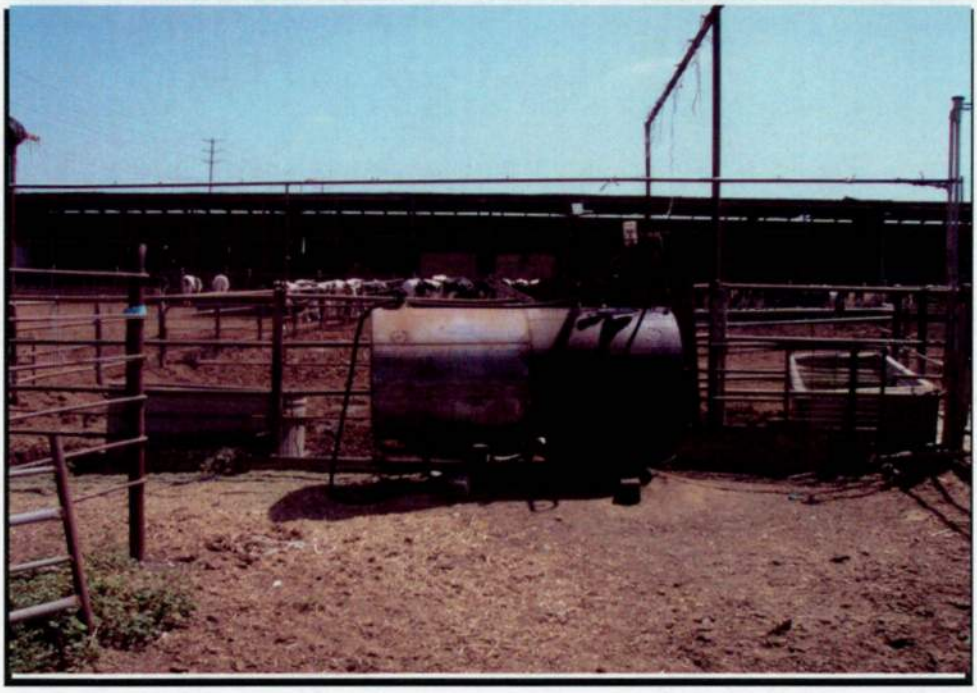

Facility/Case Name: **G. Bootsma & Sons** Facility ID #: **FA0000454**

Address: **7721 Edison Avenue, Ontario**

3) Description: **(L to R): (2) 55-gallon drums of teat dip; (3) empty 55-gallon drums**

4) Description: **150-gallon AST Diesel**

Date Taken: **April 17, 2007**

Taken By: **Leslie Heaviside** Signature: Li Hei

Revised 10/12/2000

Handler

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

December 17, 2007

G BOOTSMA & SON'S
7721 EDISON AVE
CHINO, CA 91761

**ATTN: GARETT BOOTSMA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000454-G BOOTSMA & SON'S**
**7721 EDISON AVE**
**ONTARIO, CA 91761**

MR. BOOTSMA,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on April 17, 2007:

- Failure to obtain CUPA Hazardous Material Handler Permits
- Failure to establish a Business Plan
- Unlawful management of contaminated containers

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

TRACKING SHEET FOR BUSINESS PLANS

_____

Establishment #

Facility Name:

Facility site address:

City:

Fire Agency:

| | | |
|---|---|---|
| _____ (# of copies) | | Sent to FD |
| Business Plan Received | ___/___/___ | ___/___/___ |
| Result of Review(s) | | |
| Deficiency | | ___/___/___ |
| Conditional Approval | | ___/___/___ |
| Approval | | ___/___/___ |
| | | Sent to FD |
| Revised Plan(s) Received | ___/___/___ | ___/___/___ |
| | ___/___/___ | ___/___/___ |

Other

| Date | Action/documentation (update, new plan, etc.) | Staff Hours |
|---|---|---|
| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |
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| ___/___/___ | _____ | _____ |
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| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |

| | | | | |
|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

7721 Edison Ave/1053-361-01-0000/Dairy

7891 Edison Ave/1053-361-03-0000/SFR

8061 Edison Ave/1053-331-04-0000/Dairy

14400 South Grove Ave/1053-551-01-0000/Dairy

14213 Bon View Ave

14283 Bon View Ave

14297 Bon View Ave

14333 Bon View Ave

14450 Bon View Ave

14451 Bon View Ave

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| | | | |
| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# GH Dairy #4 (CERSID: 10741726)

**Facility Information Accepted May 9, 2024**

Submitted on 5/8/2024 5:13:23 AM by *Patricia Mohr* of GH DAIRY (ONTARIO, CA)
Submittal was ***Accepted*** on 5/9/2024 12:07:25 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Business Activities
- Business Owner/Operator Identification

**Hazardous Materials Inventory Accepted May 9, 2024**

Submitted on 5/8/2024 5:13:23 AM by *Patricia Mohr* of GH DAIRY (ONTARIO, CA)
Submittal was ***Accepted*** on 5/9/2024 12:07:17 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Hazardous Material Inventory (9)
- Site Map (Official Use Only)
  - *Annotated Site Map (Official Use Only)* (Web graphic, 41KB)
  - *Annotated Site Legend (Official Use Only)* (MS Word, 14KB)

## Site Identification

**GH Dairy #4**
8061 Edison Ave
Ontario, CA 91762
County
San Bernardino

CERS ID
**10741726**
EPA ID Number

## Submittal Status

Submitted on 5/8/2024 by *Patricia Mohr* of GH DAIRY (ONTARIO, CA)
Submittal was ***Accepted***; Processed on 5/9/2024 by *Erick Tilus* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

## Hazardous Materials

| | |
|---|---|
| Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | **Yes** |

## Underground Storage Tank(s) (UST)

| | |
|---|---|
| Does your facility own or operate underground storage tanks? | **No** |

## Hazardous Waste

| | |
|---|---|
| Is your facility a Hazardous Waste Generator? | **No** |
| Does your facility treat hazardous waste on-site? | **No** |
| Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | **No** |
| Does your facility consolidate hazardous waste generated at a remote site? | **No** |
| Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site? | **No** |
| Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month greater than 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | **No** |
| Is your facility a Household Hazardous Waste (HHW) Collection site? | **No** |

## Excluded and/or Exempted Materials

| | |
|---|---|
| Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)? | **No** |

## Aboveground Petroleum Storage

| | |
|---|---|
| Does your facility own or operate aboveground petroleum storage tanks or containers AND:<br>* have a total aboveground petroleum storage capacity of 1,320 gallons or more, OR<br>* have one or more petroleum tanks in an underground area? | **No** |

## Regulated Substances

| | |
|---|---|
| Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)? | **No** |

## Additional Information

7 Employees

## Facility/Site

**GH Dairy #4**
8061 Edison Ave
Ontario, CA 91762

CERS ID
**10741726**

## Submittal Status

Submitted on 5/8/2024 by *Patricia Mohr* of GH DAIRY (ONTARIO, CA)
Submittal was ***Accepted***; Processed on 5/9/2024 by *Erick Tilus* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

## Identification

GH Dairy

| Operator Phone | Business Phone | Business Fax | Beginning Date | Ending Date | |
|---|---|---|---|---|---|
| (909) 606-6455 | (909) 606-6455 | (909) 606-1640 | | | |
| **Dun & Bradstreet** | | | **SIC Code** | | **Primary NAICS** |
| | | | 0241 | | |

## Facility/Site Mailing Address

7280 Eucalyptus Ave
Ontario, CA 91762

## Primary Emergency Contact

GH Dairy
Title
Owner

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 606-6455 | (951) 218-1994 | |

## Owner

Gerben Hettinga
(909) 606-6455
7280 Eucalyptus Ave
Ontario, CA 91762

## Secondary Emergency Contact

Patricia Mohr
Title
Controller

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 606-6455 | (714) 296-6146 | |

## Billing Contact

GH Dairy
(909) 606-6455 patricia@ghdairy.net
7280 Eucalyptus Ave
Ontario, CA 91762

## Environmental Contact

Patricia L Mohr
(909) 606-6455 patricia@ghdairy.net
14651 S Grove Ave
Ontario, CA 91762

| Name of Signer | Signer Title | Document Preparer |
|---|---|---|
| Patricia Mohr | Controller | Patricia Mohr |

Additional Information

## Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

### Property Owner

GH Dairy
Phone
(909) 606-6455
Mailing Address
7280 Eucalyptus Ave
Ontario, CA 91762

Assessor Parcel Number (APN)

Number of Employees
7

Facility ID
FA0017949

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **GH DAIRY** | Chemical Location | CERS ID **10741726** |
| Facility Name | **GH Dairy #4**<br>8061 Edison Ave, Ontario 91762 | **Between milk cows and chemical room** | Facility ID **FA0017949**<br>Status **Submitted** on 5/8/2024 5:13 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 8 - Corrosives (Liquids and Solids)<br><br>Corrosive, Oxidizing, Class 2 | **Coresan 12.5**<br>CAS No<br>7681-52-9<br>Map: 1 | **Gallons**<br>State<br>Liquid<br>Type<br>Pure | **165**<br>Storage Container<br>Plastic/Non-metalic Drum<br><br>Days on Site: 365 | **55** | 55<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Physical Corrosive To Metal<br>- Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation<br>- Health Specific Target Organ Toxicity | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **GH DAIRY** | Chemical Location | CERS ID **10741726** |
| Facility Name | **GH Dairy #4**<br>8061 Edison Ave, Ontario 91762 | **Between milking barn and Milk Cows** | Facility ID **FA0017949**<br>Status **Submitted** on 5/8/2024 5:13 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities: Max. Daily | Quantities: Largest Cont. | Quantities: Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only): Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 9 - Misc. Hazardous Materials<br><br>Toxic | **Copper Sulfate 40-90%**<br>CAS No<br>7758-98-7<br>Map: 2 | **Pounds**<br>State<br>Solid<br>Type<br>Pure | **2000**<br>Storage Container<br>Bag<br><br>Days on Site: 365 | **50** | 2000<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | Copper Sulfate | 100% | | 7758-98-7 |

# Hazardous Materials And Wastes Inventory Matrix Report

CERS Business/Org. **GH DAIRY**
Facility Name **GH Dairy #4**
8061 Edison Ave, Ontario 91762

Chemical Location
**Chemical Room**

CERS ID **10741726**
Facility ID **FA0017949**
Status **Submitted** on 5/8/2024 5:13 AM

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 3 - Flammable and Combustible Liquids<br>Flammable Liquid, Class I-A, Corrosive | **Dyne**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **30**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **15** | 15<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Carcinogenicity<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation<br>- Health Specific Target Organ Toxicity | Hydriodic Acid<br>Isopropyl Alcohol<br>Iodine<br>Phosporic Acid | 10%<br>30%<br>10%<br>50% | | 10034-85-2<br>67-63-0<br>7553-56-2<br>7664-38-2 |
| DOT: 8 - Corrosives (Liquids and Solids)<br>Corrosive | **Aspen Clean Max**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **110**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | Sodium Hydroxide<br>Sodium Hypochlorite | 10%<br>5% | | 1310-73-2<br>7681-52-9 |
| DOT: 8 - Corrosives (Liquids and Solids)<br>Corrosive | **Mandate**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **110**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | Waste Code | - Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Respiratory Skin Sensitization<br>- Health Serious Eye Damage Eye Irritation | Phosphoric Acid<br>Citric Acid<br>Secondary Alkaensulphonates<br>Octanoic acid<br>Decanoic acid | 24%<br>20%<br>10%<br>6%<br>2% | ✓ | 7664-38-2<br>77-92-9<br>5324-84-5<br>124-07-2<br>334-48-5 |
| | **Oxy-Gard M Sanitizing Teat Dip**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **165**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Serious Eye Damage Eye Irritation | Glycerin<br>Lactic Acid<br>Dodecylbenzene Sulfonic Acid | 5%<br>5%<br>1% | | 56-81-5<br>50-21-5<br>27176-87-0 |
| DOT: 8 - Corrosives (Liquids and Solids)<br>Corrosive | **HD PL-10 Acid**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **110**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | Nitric Acid<br>Phosphoric Acid<br>Sulfuric Acid | 10%<br>10%<br>5% | ✓<br><br>✓ | 7697-37-2<br>7664-38-2<br>7664-93-9 |
| | **I-DEAL (NIL NPE)**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **165**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Serious Eye Damage Eye Irritation | Poly(oxy-1,2-ethanediyl), .alpha.-isotridecyl- .omega.-hydroxy-<br>Propylene glycol<br>Glycerin<br>Oxirane, methyl-, polymer with oxirane<br>Iodine | 5%<br>5%<br>5%<br>5%<br>1% | | 9043-30-5<br>57-55-6<br>56-81-5<br>9003-11-6<br>7553-56-2 |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **GH DAIRY** | Chemical Location | CERS ID **10741726** |
| Facility Name | **GH Dairy #4** | **Chemical Room** | Facility ID **FA0017949** |
| | 8061 Edison Ave, Ontario 91762 | | Status **Submitted** on 5/8/2024 5:13 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Exit II** | **Gallons** | **110** | **55** | 55 | 0 | - Health<br>Respiratory Skin Sensitization<br>- Health Specific Target Organ Toxicity | Permethrin | 1% | | 52645-53-1 |
| | | | | | | | | Piperonyl Butoxide Techinical | 1% | | 51-03-06 |
| | CAS No | State | Storage Container | | Pressue | Waste Code | | | | | |
| | | Liquid | Steel Drum | | Ambient | | | | | | |
| | Map: 3 | Type | | | Temperature | | | | | | |
| | | Mixture | Days on Site: 365 | | Ambient | | | | | | |

completed

## CERS Readiness Survey

Please return this survey to us by one of the following methods by October 31, 2012

Mail: Office of the Fire Marshal
620 South E Street
San Bernardino CA 92415-0153

Fax: (909) 386-8460

Scan & email: Efile@sbcfire.org

*Facility ID# (if known): FA0010956, FA0000522
Facility Name: 14389 Sultana, 8061 Edison Ave
Facility Address: Ontario CA 91761, Ontario, CA 91761

Please read the following descriptions and mark the answer(s) in the section that most closely describes your situation:

☐ I will put off electronic filing as long as possible. Since any Business Plan received on or after November 1st fulfills the requirement for the following March 1st deadline, I will submit a paper copy between November 1 and December 31, 2012, and not worry about tackling electronic filing until it is time to either meet the March 1, 2014, deadline or my Business Plan requires an update, whichever comes first.

☐ I have the situation covered. I don't anticipate needing any help beyond a possible call or two to the San Bernardino CUPA CERS Help Line at (909) 386-8432. (Be aware that there are almost 7,000 facilities in San Bernardino County with the same March 1st deadline, so those who wait until the last minute to file may find it really hard to get through to a live person by phone. The earlier the better!)

☐ A little assistance would be appreciated. I would feel more comfortable entering my facility information into CERS in a workshop setting, where there is someone there to explain the process and who would be immediately available to offer assistance as needed.
Best time for me to attend a workshop: (check more than one if applicable)
- ☐ Workdays (Mon-Fri) between 8 am & 5 pm
- ☐ Workdays in the evening (after 5 pm)
- ☐ Weekends (Saturday or Sunday)
- ☐ I would appreciate assistance in Spanish

☐ Help! I don't have a computer and/or don't know how to use one. I will definitely need help entering my facility's information.
- ☐ I would be able to make an appointment and travel to the San Bernardino Office of the Fire Marshal in order to receive one-on-one help
- ☐ I am unable to travel to San Bernardino and would need someone to travel to my location
- ☐ I would appreciate assistance in Spanish

☒ None of the above describes my situation. Below is a brief description:

We are closeing Down our Businesses on or around Nov. 1st 2012

Name: Greg Arema Assigned to Greg.

The best way to contact me:
☐ U.S Mail ☐ Email: _____ ☐ Phone: 951-741-6184

*If you report for more than one facility, fill out just one survey and note the total number of facilities that you report for.

| Facility ID | Name | Site Address | City | Account Stat | Status | |
|---|---|---|---|---|---|---|
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 | INACTIVE ACCOUNT | |

Inac.

AG-PE/info update

# HAZ. OUS MATERIAL FIELD SERVI S
# COMPUTER DATABASE UPDATE AUTHORIZATION

RCD. SDD FIRE FISCAL
07 MAY 10 PM 3:45

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000434

NAME: JORRITSMA, JAMES / Arema, Greg

ADDRESS 1: 8061 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91761

COUNTRY:

PHONE: 951-741-6184

EXT:

FAX:

ALT PHONE:

EXT:

DRIVER LICENSE:

TAX ID:

LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Jorritsma, James / Arema, Greg

DBA: ~~JORRITSMA, JAMES~~ Jorritsma Dairy

ADDRESS1: 8061 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: 91710

COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000522

NAME: ~~AG~~-JORRITSMA DAIRY

ADDRESS 1: 8061 EDISON AVE

ADDRESS 2: 91761

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-1710~~

CITY CODE: ~~CHINO~~ Ontario

SIC CODE:

BUSINESS CODE: 02

BUSINESS TYPE: 03

CENSUS: NA

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: ~~05~~ 03

PHONE: 951-741-6184

EXT:

FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-JORRITSMA DAIRY

CARE OF:

ADDRESS 1: 8061 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-1710~~ 91761

COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000524

RESPONSIBLE PARTY: Jorritsma, James / Arema, Greg

CARE OF: Jorritsma Dairy

ADDRESS 1: 8061 Edison Ave

ADDRESS 2:

CITY: Ontario

STATE:

ZIP CODE:

COUNTRY:

PHONE: 951-741-6184

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 04/05/2007

ALT PHONE:

EXT:

TAX ID:

ANNIVERSARY DATE: 04/30/1997

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT00089 | ACTIVE | 4210 | 5/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009814 | ACTIVE, BILLABLE | NA | NA | | 4221 |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008928 | ACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009815 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 6 NUMBER OF UST'S 0 MFR #

ENTERED MAY 09 2007

DATE SUBMITTED: 4-27-07 DATE ENTERED: FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

per inspection: Dairy is in operation. Update handler permit to handler only.

Remove "Ag" prefix from name. Change city to Ontario & update owner, FA & AR info.

Demand bill.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:0 AR:0.00

**ATTN :** GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

**This Unified Permit is hereby issued to:**
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2012** **Expiration Date: 11/30/2013**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |
| PT0008928 | 4420 SPECIAL GENERATOR | PR0009815 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

As a condition of the permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

ATTN : GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2011** **Expiration Date: 11/30/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |
| PT0008928 | 4420 SPECIAL GENERATOR | PR0009815 |

Mark A. Hartwig, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

ATTN : GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.**

**Effective Date: 8/1/2010** **Expiration Date: 7/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008928 | 4420 SPECIAL GENERATOR(B) | PR0009815 |
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |

Danny R. Wurl

Danny R. Wurl, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:3 AR:0.00

ATTN : GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.

**Effective Date: 8/1/2009** **Expiration Date: 7/31/2010**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008928 | 4420 SPECIAL GENERATOR(B) | PR0009815 |
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.

**Effective Date: 8/1/1997** **Expiration Date: 7/31/1998**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |
| PT0008928 | 4420 SPECIAL GENERATOR(B) | PR0009815 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

Page 1 of 1

**Return Certification within** 30 **Days of Receipt to Inspector** Leslie Heaviside

*In the Matter of Respondent:* Jorritsma Dairy

*Violation(s) cited on:* April 19, 2007 *FA #::* FA0000522

*Facility Name:* Jorritsma Dairy

*Site Address:* 8061 Edison Ave / Ontario

*Certificate of Compliance Date:* April 19, 2007

RECEIVED
JUN 01 2007
S.B. CO. FIRE DEPT.

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| Signature | 5-29-07<br>Date |
| Greg Anema<br>Printed or Typed Name | partner<br>Title |
| Social Security/Federal ID Number | Drivers License/ID Number |

*Attach the following documentation when returning the Certificate of Compliance:*

- Statement indicating an EPA ID number has been obtained. ~~CE~~ HA52
- Statement indicating all containers are labeled and closed.
- Business Emergency/Contingency Plan original and 1 copy.
- Copies of receipts documenting removal of empty containers and used oil. None removed in 3 years.

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620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

Page 1 of 1

**Return Certification within** 30 **Days of Receipt to Inspector** Leslie Heaviside

*In the Matter of Respondent:* Jorritsma Dairy

*Violation(s) cited on:* April 19, 2007 *FA #::* FA0000522

*Facility Name:* Jorritsma Dairy

*Site Address:* 8061 Edison Ave/Ontario

*Certificate of Compliance Date:* April 19, 2007

RECEIVED
JUN 01 2007
S.B. CO. FIRE DEPT.

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Greg Anema
*Signature*

5-29-07
*Date*

Greg Anema
*Printed or Typed Name*

partner
*Title*

[redacted]
*Social Security/Federal ID Number*

[redacted]
*Drivers License/ID Number*

*Attach the following documentation when returning the Certificate of Comp*

- Statements indicating an EPA ID number [illegible] CA 52380
- Statements indicating all containers are la[illegible]
- Business Emergency/contingency plan ordi[illegible]
- Copies of receipts documenting removal of [illegible]rs and used oil. None removed in 3 years.

FA0000522
Jorritsma Dairy
Generator File
1st page

5/25/07

#1

All labels closed and labeled properly.

#10

# CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000522 Facility Name: Joostsma Dairy Inspection Date: April 19, 2007
Site Address: 8061 Edison Ave Phone #: (951) 741-6184
City: Ontario Zip Code: 91762 EPA ID #: not established
Consent Granted by:
☒ Inspect ☒ Photograph Name: Greg Arema ~~Joostsma~~ Title: Partner # Emp: 6

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | X | | |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | X | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | X | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | X | | |
| 107. Contingency Plan established | CCR 66265.51(a) | X | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR | X | | |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | X | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | X | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | X | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | X | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | X | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | X | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | X | | |
| 202. Business Plan established | CHSC 25503.5 | X | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | X | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |
| 230. Business Plan implemented | CHSC 25503.5 | | | X |

**INSPECTION NARRATIVE**

An ispection was conducted to determine compliance with all applicable hazardous materials and hazardous waste laws and regulations. Facility is a dairy (milk production).

Hazardous Materials Inventory
(1) 55 gal drum teat dip
(2) 55 gal powder Chlorinated Soap
(2) 30 gal Acid
(1) 30 gal Sodium Hypochlorite
(1) 250 gal ~~tote~~ teat dip
(6) 50 lbs bags Zinc Sulfate
(1) 55 gal Hydrochloric Acid
(1) 55 gal Oxene

**NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: Leslie Henriscko (Sign Name) Leslie Henriscko (Print Name)
Received By: Greg Arema (Sign Name) Greg Arema (Print Name)
Title: Partner
Report Date: April 19, 2007

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 19, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000522 | Joritsma Dairy | 8061 Edison Ave, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Greg Arema | TITLE Partner |

Note: The above items (HCl and Oxene) are mixed together to make Chlorine Dioxide. These are automatically ~~pumped~~ injected into the water tank to kill bacteria in water troughs for cattle.
(2) AST's Diesel (1-500 gal; 1-100 gal).

Hazardous waste inventory
(2) 30 gal used oil & (3) 5-gal used oil (open)
Mr. Joritsma indicated that the waste from this waste is consolidated at other location (FA 694). To date used oil has not been removed.

Note: Evaporation ponds onsite provide water for irrigation of fields.

Correct the following violations:
(10) Hazardous waste generator permit not current - CC 23.0602(b)(1)
(201) Hazardous material handler permit not current - CC 23.0602(b)(3)
Facilities that generate any amounts of hazardous waste and handle hazardous materials in quantities of 55 gallons or greater are required to have permits with this department.

To correct this violation: Submit payment upon receipt of invoice.

(104) EPA ID number not obtained - CCR 66262.12(a)
Facilities that generate hazardous waste must obtain an EPA ID number to track removal of hazardous waste.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) Leslie Hawisher (Print Name)
Received By: [signature] (Sign Name) Greg Arema (Print Name)
Title: Partner
Report Date: April 19, 2007

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org**

# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 19, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000522 | Joritsma Dairy | 8061 Edison Ave, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Greg Arema | TITLE Partner |

To correct this violation: Submit a statement indicating that an EPA ID number has been obtained.

(106) Facility not operated/maintained to prevent release - CCR 66265.31
(116) Hazardous waste containers not closed - CCR 66265.173 (a)
Having open containers of hazardous waste is not operating facility to prevent a release. Containers should be closed unless adding to or removing waste. (3) open 5-gallon containers of used oil observed.

To correct these violations: Submit a statement indicating all containers are closed.

(110) Tank/container not labeled/marked "Hazardous Waste" - CCR 66262.34 (a)(3)
(119) Hazardous waste not managed lawfully - CHSC 25154
Containers of hazardous waste must be labeled properly (see Compliance Made Easy handbook for guidance). Not labeling containers properly is unlawful management of hazardous waste. (2) drums of used oil not labeled.

To correct these violations: Submit a statement indicating all containers are labeled properly.

(107) Contingency Plan not established - CCR 66265.51(a)
(202) Business Plan not established - CHSC 25503.5
A Business Emergency/Contingency Plan has not been established.

**NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Heaviside (Print Name)
Received By: [signature] (Sign Name) Greg Arema (Print Name)
Title: Partner
Report Date: April 19, 2007

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 19, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000522 | Jorritsma Dairy | 8061 Edison Ave, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Greg Arema | TITLE Partner |

To correct these violations: Complete and submit a Business Emergency/Contingency Plan, original and 1 copy. Additionally, keep a copy onsite.

(117) Contaminated containers not managed properly - CCR 66261.7
Empty containers must be labeled as "empty" with date they become empty and removed within 1 year. Observed several empty containers that were not labeled properly.

To correct this violation: Submit a statement indicating the containers are labeled properly or copy of receipt documenting removal.

(137) Consolidated manifesting records not available - CHSC 25160.2(b)(3)
Receipts documenting removal of used oil shall be maintained for at least 3 years. To date waste has not been removed.

To correct this violation: Submit a copy of the receipt documenting removal of used oil.

If you have any questions, call (909) 386-8401.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) Leslie Heaviside (Print Name)
Received By: [signature] (Sign Name) Greg Arema (Print Name)
Title: Partner
Report Date: April 19, 2007

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# CERTIFICATE OF COMPLIANCE

Page 1 of 1

**Return Certification within** 30 **Days of Receipt to Inspector** [illegible]

*In the Matter of Respondent:* [illegible]

*Violation(s) cited on:* [illegible] *FA #::* [illegible]

*Facility Name:* [illegible]

*Site Address:* [illegible]

*Certificate of Compliance Date:* [illegible]

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| *Signature* | *Date* |
| *Printed or Typed Name* | *Title* |
| *Social Security/Federal ID Number* | *Drivers License/ID Number* |

*Attach the following documentation when returning the Certificate of Compliance:*

| |
|---|
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

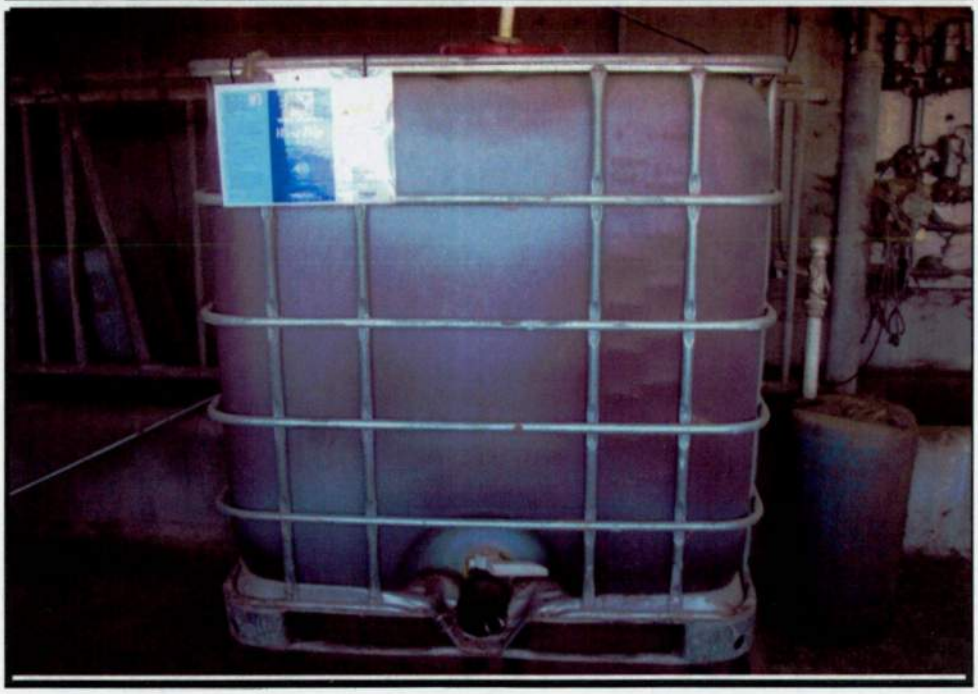

Facility/Case Name: **Jorritsma Dairy** Facility ID #: **FA0000522**

Address: **8061 Edison Avenue, Ontario**

1) Description: **Front of milking parlor**

2) Description: **(1) 250-gallon tote of teat dip**

Date Taken: **April 19, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

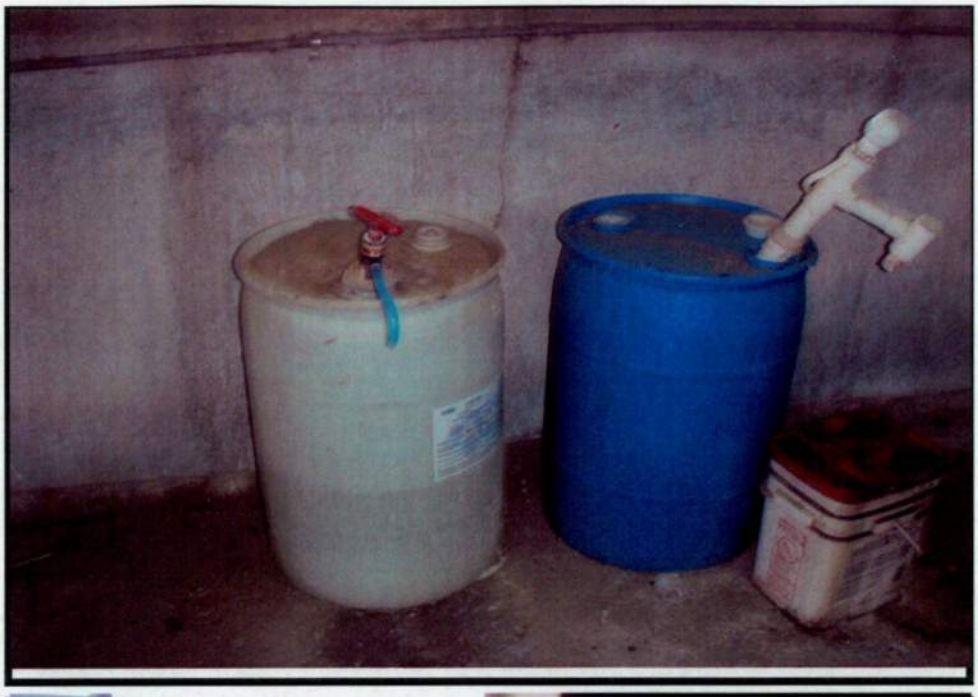

PHOTO 4

Facility/Case Name: **Jorritsma Dairy** Facility ID #: **FA0000522**

Address: **8061 Edison Avenue, Ontario**

3) Description: **(L to R) (1) 30-gallon drum of Sodium Hypochlorite; (1) 30-gallon drum acid**

4) Description: **(L to R) (1) 30-gallon drum of Acid; (2) 55-gallon drums of Chlorinated soap**

Date Taken: **April 19, 2007**

Taken By: **Leslie Heaviside** Signature: Li Hei

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 5

PHOTO 6

Facility/Case Name: **Jorritsma Dairy** Facility ID #: **FA0000522**

Address: **8061 Edison Avenue, Ontario**

5) Description: **Approximately (6) 50-pound bags of Zinc Sulfate**

6) Description: **(L to R): (1) 55-gallon drum of Vitamins A, D & E; (1) 55-gallon drum of Hydrochloric Acid; (1) 55-gallon drum of Oxene; empty 55-gallon drum**

Date Taken: **April 19, 2007**

Taken By: **Leslie Heaviside** Signature: Li Hei

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 7

PHOTO 8

Facility/Case Name: **Jorritsma Dairy** Facility ID #: **FA0000522**

Address: **8061 Edison Avenue, Ontario**

7) Description: **500-gallon AST of Diesel**

8) Description: **(2) 30-gallon drums and (3) 5-gallon containers of used oil**

Date Taken: **April 19, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

HAZARDOUS MATERIALS FIELD SERVICES
COMPUTER DATA BASE UPDATE AUTHORIZATION

Change ☑

Inactivate Permit/Facility ☐
(circle one)

Bill To: E A O Location/District No: _____ Est No: 97044515
(cirle one)
Former Est. Name: (if applicable): _____

Name: AG-JOORITSMA DAIRY
Street No.: 8061 Fraction: ___ Direction:
Street Name: EDISON Apt/Sp No.: _____
City: CHINO State: ____ Zip Code: _____
Telephone No.: ( ) _____

Name: _____
Street No.: _____ Fraction: ___ Direction: _____
Street Name: _____ Apt/Sp No.: _____
City: _____ State: ____ Zip Code: _____
Telephone No.: ( ) _____

Name: _____
Street No.: _____ Fraction: ___ Direction: _____
Street Name: _____ Apt/Sp No.: _____
City: _____ State: ____ Zip Code: _____
Telephone No.: ( ) _____

**Program Information:**

Number of Employees: _____ Number of UGST's: _____
Federal Tax I.D. Number/Social Security Number: _____

**Permit Information:** (Circle those that apply)

Change/Inactivate/Add 226 Permit No.: _____
Change/Inactivate/Add 228 Permit No.: _____
Change/Inactivate/Add _____ Permit No.: _____
Change/Inactivate/Add _____ Permit No.: _____

Date Submitted: 2/24/98 Date Entered: _____
Submitted By: MJW Entered By: None showing

Comments/Remarks: AG EXEMPT — ~~ZERO BALANCE~~ & REMOVE DEL. COUNT

## San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## BUSINESS OWNER/OPERATOR IDENTIFICATION

### I. IDENTIFICATION

| | | | |
|---|---|---|---|
| FACILITY ID# F A 0 0 0 0 5 2 2 (1) | BEGINNING DATE (100) | ENDING DATE (101) | |
| BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) (3): Jorritsma + Anema Dairy | BUSINESS PHONE (102): 951-741-6184 | | |
| BUSINESS SITE ADDRESS (103): 8061 Edison Avenue | BUSINESS FAX (102a) | | |
| BUSINESS SITE CITY (104): Ontario | CA | ZIP CODE (105): 91762 | COUNTY (108): San Bernardino |
| DUN & BRADSTREET (106) | PRIMARY SIC (107): 0241 | PRIMARY NAICS (107): 112120 | |
| BUSINESS MAILING ADDRESS (108a): 8061 Edison Avenue | | | |
| BUSINESS MAILING CITY (108b): Ontario | STATE (108c): CA | ZIP CODE (108d): 91762 | |
| BUSINESS OPERATOR NAME (109): Greg Anema | BUSINESS OPERATOR PHONE (110): 951-741-6184 | | |

### II. BUSINESS OWNER

| | | | |
|---|---|---|---|
| OWNER NAME (111): Dick Jorritsma / Greg Anema | OWNER PHONE (112): 909-597-1317/951-817-1859 | | |
| OWNER MAILING ADDRESS (113): 8061 Edison Avenue | | | |
| OWNER MAILING CITY (114): Ontario | STATE (115): CA | ZIP CODE (116): 91762 | |

### III. ENVIRONMENTAL CONTACT

| | | | |
|---|---|---|---|
| CONTACT NAME (117): Same as above | CONTACT PHONE (118) | | |
| CONTACT MAILING ADDRESS (119) | CONTACT EMAIL (119a): alinegreg@verizon.net | | |
| CONTACT MAILING CITY (120) | STATE (121) | ZIP CODE (122) | |

### IV. EMERGENCY CONTACTS

| -PRIMARY- | -SECONDARY- |
|---|---|
| NAME (123): Dick Jorritsma | NAME (128): Greg Anema |
| TITLE (124): Partner | TITLE (129): Partner |
| BUSINESS PHONE (125): 951-817-1859 | BUSINESS PHONE (130): 951-741-6184 |
| 24-HOUR PHONE (126): 951-817-1859 | 24-HOUR PHONE (131): 909-597-1317 |
| PAGER # (127) | PAGER # (132) |

ADDITIONAL LOCALLY COLLECTED INFORMATION: (133)

**Number of Employees:** 6 **Number of Underground Storage Tanks:** Ø

| | | |
|---|---|---|
| SIGNATURE OF OWNER/OPERATOR OR DESIGNATED REPRESENTATIVE | DATE (134) | NAME OF DOCUMENT PREPARER (135): Steven Goodwin |
| NAME OF SIGNER (print) (136): Greg Anema | TITLE OF SIGNER (137): Partner | |

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

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| BUSINESS SITE CITY (104): Ontario | CA | ZIP CODE (105): 91762 | COUNTY (108): San Bernardino |
| DUN & BRADSTREET (106) | PRIMARY SIC (107): 0241 | PRIMARY NAICS (107): 112120 | |
| BUSINESS MAILING ADDRESS (108a): 8061 Edison Avenue | | | |
| BUSINESS MAILING CITY (108b): Ontario | STATE (108c): CA | ZIP CODE (108d): 91762 | |
| BUSINESS OPERATOR NAME (109): Greg Anema | BUSINESS OPERATOR PHONE (110): 951-741-6184 | | |

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| | | |
|---|---|---|
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| OWNER MAILING ADDRESS (113): 8061 Edison Avenue | | |
| OWNER MAILING CITY (114): Ontario | STATE (115): CA | ZIP CODE (116): 91762 |

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| CONTACT MAILING CITY (120) | STATE (121) | ZIP CODE (122) |

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|---|---|
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| TITLE (124): Partner | TITLE (129): Partner |
| BUSINESS PHONE (125): 951-817-1859 | BUSINESS PHONE (130): 951-741-6184 |
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| PAGER # (127) | PAGER # (132) |

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| NAME OF SIGNER (print) (136): Greg Anema | TITLE OF SIGNER (137): Partner | |

## San Bernardino County Fire Department • Hazardous Materials Division

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# INVENTORY SUMMARY FORM

### I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 2 2 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA) Sorritsma + Arema Dairy

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Chlorine | 2 | 30 | gallons |
| 2 | Chlorinated Alkaline Detergent | 1 | 400 | lbs |
| 3 | Diesel, low sulfur | 1 | 500 | gallon |
| 4 | Fly Bait, QuickStrike | 1 | 5 | gallon |
| 5 | IodoZyme Liquid | 1 | 250 | gallon |
| 6 | Oil, Used | 2 | 30 | gallon |
| 7 | Power pHos 330 | 1 | 50 | gallon |
| 8 | Zinc Sulfate 7-Hydrate | 20 | 50 | lbs |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the Business Plan inventory on this page. Place this summary in front of the inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

### III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached Inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) | DATE |
|---|---|---|
| [signature] | Greg Arema | 8-3-11 |

# San Bernardino County Fire Department • Hazardous Materials Division

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## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE | Page ___ of ___

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As): Jorritsma & Anema Dairy (3)

FACILITY ID #: F A 0 0 0 0 5 2 2 (1) | MAP#: 1 (203) | GRID#: D5 (204)

### II. CHEMICAL INFORMATION

CHEMICAL NAME (205): Sodium Hypochlorite

TRADE SECRET (206): ☐ Yes ☒ No — If Subject to EPCRA, refer to Instructions

COMMON NAME (207): Chlorine Bleach

EHS* (208): ☐ Yes ☒ No

CAS# (209): 7681-52-9

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) (211): ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE (212): ☐ Yes ☒ No | CURIES (213):

PHYSICAL STATE (Check one item only) (214): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER (215): 30 gal

FED HAZARD CATEGORIES (Check all that apply) (216): ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE DAILY AMOUNT (217) | MAXIMUM DAILY AMOUNT (218) | ANNUAL WASTE AMOUNT (219) | STATE WASTE CODE (220) |
|---|---|---|---|
| 30 gal | 50 gal | | |

UNITS* (Check one item only) (221): ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 (222)

STORAGE CONTAINER (223):
☐ a. ABOVE GROUND TANK ☒ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE (224): ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE (225): ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 12.5 (226) | Sodium Hypochlorite (227) | ☐ Yes ☒ No (228) | 7681-52-9 (229) |
| 2 | 1.0 (230) | Sodium Hydroxide (231) | ☐ Yes ☒ No (232) | 1310-73-2 (233) |
| 3 | 10 (234) | Sodium Chloride (235) | ☐ Yes ☒ No (236) | 7647-14-5 (237) |
| 4 | Balance (238) | Water (239) | ☐ Yes ☒ No (240) | 7732-18-5 (241) |
| 5 | (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION (246)

If EPCRA, Please Sign Here

# EMERGENCY RESPONSE PLANS & PROCEDURES – AGENCY NOTIFICATION

3 BUSINESS NAME (Same as FACILITY NAME or DBA) Jorritsma + Anema Dairy

## POST BY TELEPHONE

**Agency Notification**: **If a situation is an emergency, call 911 first.** Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding Federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency (* Indicates mandatory notification) | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | **911** |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | **(800) 33-TOXIC** or **(909) 386-8425** |
| *Note: (800) 33-TOXIC does not work nationwide; non-local callers must use (909) 386-8425 to report **any** release or threatened release.* | |
| 3. *Cal E·M·A (Formerly known as OES) | **(800) 852-7550** or **(916) 845-8911** |
| 4. National Response Center | **(800) 424-8802** |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company name
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date:

# EMERGENCY RESPONSE PLANS AND PROCEDURES

BUSINESS NAME (Same as FACILITY NAME or DBA)
Jorritsma + Arena Dairy

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- ☒ New employee training
- ☒ Annual training & periodic refresher courses
- ☒ Familiarization with the Emergency Response Plans and Procedures of this Business Plan
- ☒ Spill control equipment
- ☐ Monitoring system
- ☒ Personal Protective Equipment
- ☒ On the job training (Described below)
- ☐ Other:

**EMERGENCY PROCEDURES:** Describe duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√ Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- ☒ Identify potential hazards and determine whether a release has occurred
- ☒ Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely
- ☒ Coordinate the notification and evacuation of employees, customers, and other visitors from the facility
- ☒ Make required agency notifications and request needed assistance
- ☒ Assist responding agencies by providing access to the facility and information about the facility
- ☐ Other:

9: 7-30-11

# MATERIAL SAFETY DATA SHEET

## L A CHEMCHLOR

## SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Los Angeles Chemical Company
4545 Ardine Street
South Gate, CA 90280
1-323-562-9500

**Product Name:** Sodium Hypochlorite Solution (10-16%)
**Synonyms:** Sodium Hypochlorite Solution -Trade % (11 – 19), Bleach, Javel Water, Clorox, Bacticide
**Major, Update:** 05/01/00 **Product Use:** Bleach, disinfectant **CAS#:** 7681-52-9

### Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL
**1-800-424-9300.**

## SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

| Hazardous Ingredient(s) | % (w/w) | ACGIH AIHA | CAS NO. |
|---|---|---|---|
| Sodium Hypochlorite | 10 - 16 | 0.5 ppm (STEL) 2 mg/m$^3$ (as chlorine) | 7681-52-9 |

## SECTION 3 – HAZARD IDENTIFICATION

**********

**Emergency Overview:** CORROSIVE! Contact with acid liberates toxic chlorine gas. Causes burns to skin, eyes, respiratory tract and mucous membranes. Harmful or fatal if swallowed. May cause sensitization by skin contact. Toxic to aquatic organisms. Read the entire MSDS for a more thorough evaluation of the hazards.

**********

**Potential Health Effects:**

**Inhalation:** Mist can irritate the nose and throat. If mixed with acids, hypochlorite solutions release large amounts of chlorine gas. This gas can cause severe irritation of the nose and throat. Exposure to high levels of chlorine gas may result in severe lung damage.
**Skin Contact:** Sodium hypochlorite mist and solutions can cause skin irritation. In severe cases, chemical burns may result.

**Eye Contact:** Can cause severe burns and corneal damage, which may result in permanent blindness.

**Ingestion:** Hypochlorite solutions release hypochlorous acid on contact with gastric juices, and ingestion causes irritation and corrosion of mucous membranes, pain, vomiting, and oedema of the pharynx and larynx; reduced blood pressure, delirium and coma may occur.

**Subchronic Effects:** SKIN: Prolonged or repeated skin contact with solutions containing as little as 4-6% sodium hypochlorite can cause allergic contact dermatitis. Symptoms include chronic, itchy eczema. Sensitized people can react to very dilute (0.04-0.06% NaOCl) solutions that touch their skin

**Existing Medical Conditions Possibly Aggravated By Exposure :** Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of vapors or mists may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

**Carcinogenicity:** Sodium hypochlorite is not classified as carcinogenic by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as carcinogens by OSHA (Occupational Safety and Health Administration), and not listed as carcinogens by NTP (National Toxicology Program).

## SECTION 4 – FIRST AID MEASURES

**General:** If you feel unwell seek medical advice (show the label where possible).

**Inhalation:** Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse AND no breathing. Obtain medical attention IMMEDIATELY.

**Skin Contact:** Immediately flush skin with running water for at least 15 - 20 minutes. Under running water remove contaminated clothing, jewelry, and shoes. If irritation persists, repeat flushing. For burns, obtain medical attention. Discard heavily contaminated clothing and shoes in a manner, which limits further exposure. Otherwise, wash clothing separately before reuse.

**Eye Contact:** Immediately flush eyes with running water for a minimum of 15 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

**Ingestion:** DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

**Note to Physicians:** Symptomatic. Treatment and supportive therapy as indicated. Do NOT give acidic antidotes such as juice, soft drink, vinegar, etc. This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed. Following exposure the patient should be kept under medical review for at least 48 hours as delayed pneumonitis may occur. Pulmonary edema is likely and may be delayed. Steroid therapy, if given early, may be effective in preventing or alleviating edema.

## SECTION 5 – FIRE FIGHTING MEASURES

| | |
|---|---|
| **Flash Point** | Not applicable. Not combustible |
| **Flammable Limits (Lower)** | Not applicable |
| **Flammable Limits (Upper)** | Not applicable |
| **Auto Ignition Temperature** | Not applicable |
| **Combustion and Thermal Decomposition Products** | Chlorine, sodium oxide, oxygen |
| **Rate of Burning** | Not applicable |
| **Explosive Power** | Not applicable |
| **Sensitivity to Mechanical Impact** | Not applicable |

**Fire and Explosion Hazards:** Sodium hypochlorite is a strong chemical oxidant, but solutions do not support combustion. Reaction with nitrogen compounds, chloroorganic compounds, or easily oxidizable compounds (reducing agents) may be explosive. This material is non-flammable but is decomposed by heat and light, causing a pressure build-up, which could result in an explosion. When heated, it may

release chlorine gas. Vigorous reaction with oxidizable or organic materials may result in fire. See Section 10.

**Extinguishing Media :** For large fires use an all purpose type AFFF alcohol foam resistant medium expansion according to foam manufacturer's recommended techniques. The foam supplier should be consulted for recommendations regarding foam types and delivery rates for specific applications. Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog.

**Special Information:** Water may be used to cool containers of Hypochlorite solution exposed to heat from a fire. This should be done from a safe distance since containers may rupture.
Firefighters should wear protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode. Move containers from fire area if you can do it without risk. Dike fire control water for later disposal; do not scatter the material. Fire involving tanks or trailer loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Do not get water inside containers. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from the ends of tanks.

**Evacuation:** If tank or tank truck involved in a fire, ISOLATE and consider evacuation of one-half (1/2) mile radius.

**Fire Fighting Protective Equipment:** Full protective clothing, including a self-contained breathing apparatus, must be worn in a fire involving this material. Toxic gas and vapors are produced upon decomposition.

**NOTE:** Also see "Section 10 - Stability and Reactivity"

## SECTION 6 – ACCIDENTAL RELEASE MEASURES

**Spills, Leaks, or Releases:**
- Restrict access to area until completion of clean up. Ensure trained personnel conduct clean up.
- Remove all ignition sources (no smoking, flares, sparks or flames). All equipment should be grounded and non-sparking. Ventilate area.
- Wear adequate personal protective equipment. Do not touch spilled material.
- Stop leak if possible without personal risk.

Small spills: Cover with DRY earth, sand or other non-combustible material. Use clean non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal. Rinse area with water.
Large spills: Prevent entry into sewers and confined areas. Dike with inert material (sand, earth, etc.). Contact fire and emergency services and supplier for advice. Collect product for recovery or disposal by pumping it into polyethylene containers. Consider in-situ neutralization and disposal. Ensure adequate decontamination of tools and equipment following clean up. Collect contaminated soil and water, and absorbent for proper disposal. Comply with Federal, Provincial/State and local regulations on reporting releases.

**Deactivation For Small Spills:** Hypochlorite can be broken down by covering it with a reducing agent such as sodium sulfite or sodium thiosulfate.

**Deactivating Chemicals:** Use sodium sulfite or diluted hydrogen peroxide to reduce the material. Ensure there is no chlorine residue before neutralizing with a weak solution of hydrochloric or sulfuric acid.

**Waste Disposal Methods:** Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste with normal garbage or to sewer systems.

Note - Clean-up material may be a RCRA Hazardous Waste on disposal.
- Spills are subject to CERCLA reporting requirements: RQ = 100 lbs.
-

## SECTION 7 – HANDLING AND STORAGE

**Precautions:** Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Wear appropriate Personal Protection Equipment. People working with this chemical should be properly trained regarding its hazards and its safe use.

**Handling Procedures and Equipment:** Avoid generating mist. Use smallest possible amounts in designated areas with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues. Use corrosion-resistant transfer equipment when dispensing.

**Storage Requirements:** Store in a cool, dry, well-ventilated area, out of direct sunlight. Store containers at 15 – 29 °C (59-84 °F). Do not store above 30 °C (86°F) or below freezing point. Keep containers tightly closed when not in use and when empty. Protect from damage. Vent caps should be checked with full personal protection. Store away from incompatible materials such as reducing materials, strong acids, nitrogen compounds, copper, nickel and cobalt. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. This product has a shelf life of up to six months at 60°F or lower.

Outdoor storage tanks should be suitably diked or otherwise provided with an adequate means of secondary containment. Appropriate secondary containment measures should be taken to prevent spills or leaks from indoor storage tanks and tank-truck unloading stations from entering sewers or other channels that discharge directly to a water body or a municipal sewage system.

## SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

### PREVENTIVE MEASURES

**Recommendations listed in this section indicate the type of equipment, which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.**

**Engineering Controls:** Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact. Smoking should be prohibited in areas in which sodium hypochlorite solution is stored or handled.

### PERSONAL PROTECTIVE EQUIPMENT

**Eye Protection:** Wear splash resistant chemical goggles and full-face shield. Maintain eye wash fountain and quick-drench facilities in work area.
**Skin Protection:** Wear impervious protective clothing, including boots, gloves, lab coat, apron, rain jacket, pants or coveralls, as appropriate, to prevent skin contact.
RECOMMENDED (resistance to breakthrough longer than 8 hours): butyl rubber, natural rubber, neoprene, nitrile rubber, polyethylene, Viton(TM), Saranex(TM), Responder(TM).

Recommendations are valid for permeation rates reaching 0.1 ug/cm2/min or 1 mg/m2/min and over. Resistance of specific materials can vary from product to product. Breakthrough times are obtained under conditions of continuous contact, generally at room temperature. Evaluate resistance under conditions of use and maintain clothing carefully.

**Respiratory Protection:** A NIOSH/MSHA approved air-purifying respirator equipped with acid mist cartridges for concentrations up to 10 times the TLV. Use a supplied air respirator if concentrations are higher or unknown.

### EXPOSURE GUIDELINES

**PRODUCT:**
**Sodium hypochlorite:** Workplace environmental exposure level guides (WEELS) /American Industrial Hygiene Association (AIHA) / 1996 short-term time weighted average ; 2 mg/m$^3$: 15 minute

**Chlorine:**

| | | | |
|---|---|---|---|
| ACGIH TWA | 0.5 ppm as $Cl_2$ | ACGIH STEL | 1 ppm as $Cl_2$ |
| OSHA PEL | 0.5 ppm as $Cl_2$ | OSHA STEL | 1 ppm as $Cl_2$ |
| NIOSH IDLH | 10 ppm as $Cl_2$ | NIOSH (15 min. ceiling) 0.5 ppm | |

## SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Alternate Name(s)** | Hypochlorous acid , Clorox, Javelle water |
| **Chemical Name** | Sodium hypochlorite |
| **Chemical Family** | Hypochlorous acid salt |
| **Molecular Formula** | Na-O-Cl |
| **Molecular Weight** | 74.4 |
| **Appearance** | Green to yellow, watery liquid |
| **Odor** | Pungent chlorine-like odor |
| **pH** | 11-13 |
| **Vapor Pressure (mm Hg at 21 °C(69.8°F)** | 12 mmHg |
| **Vapor Density (Air = 1)** | No data |
| **Boiling Point** | Decomposes above 40 °C (104 ° F) |
| **Freezing Point** | 7.5°F (-13.6°C) |
| **Solubility (Water)** | Completely |
| **Specific Gravity** | About 1.198 (12.5%w/w solution) @ 20°C (68 ° F) |
| **Evaporation Rate** | Not available |
| **% Volatile by Volume** | Not available |

## SECTION 10 – STABILITY AND REACTIVITY

**Chemical Stability:** Stable at room temperature.

**Hazardous Decomposition Products:** Thermal decomposition: Chlorine, sodium oxide, oxygen, oxides of chlorine, sodium chlorate, and hydrogen.

**Conditions to Avoid:** Keep away from high heat, and sunlight or ultra-violet light. Do not store above 30°C (86°F). Do not allow solutions to evaporate dry. Keep away from incompatibles.

**Incompatibility with other Substances:** May react violently with strong acids producing chlorine gas, which is toxic. Other incompatibles include organic material, cellulose, oxidizable materials, ammonia, urea, ammonium salts, ethyleneimine, cyanides, nitrogen compounds, alcohols, metals, and metal oxides. Reacts with metals to produce flammable hydrogen gas. Metal and metal oxide catalysts decompose hypochlorites, evolving oxygen and often causing explosions. May react explosively with nitrogen containing compounds or form chloroamines, which are explosive. Alkaline hypochlorite solutions may react explosively with some chloroorganic compounds.

**Corrosivity to Metals:** Solutions can be corrosive to many metals.

**Hazardous Polymerization:** Will not occur.

## SECTION 11 – TOXICOLOGICAL INFORMATION

### TOXICOLOGICAL DATA:

**Toxicological Data:** Sodium Hypochlorite: Irritation Data: 10 mg eyes-rabbit moderate

Toxicity Data: 1 gm/kg oral-woman TDLo (Lowest published toxic dose);
45 mg/kg intravenous-man TDLo; LD50 oral rat- 8910 mg/kg

Sodium hydroxide: Irritation data: 500 mg/24 hour(s) skin-rabbit severe; 400 µg eyes-rabbit mild; 1 percent eyes-rabbit severe;
Toxicity data: 1350 mg/kg skin-rabbit $LD_{50}$; 104-340 mg/kg oral-rat $LD_{50}$

**Mutagenicity:** Sodium hypochlorite caused mutations in several short-term studies using bacteria and cultured mammalian cells. The significance of these tests is unclear. It was not mutagenic in tests (chromosome aberration and micronucleus) on live animals.

**Reproductive Effects:** No data available

**Teratogenicity and Fetotoxicity:** No data available

**Synergistic Materials:** None known

## SECTION 12 – ECOLOGICAL INFORMATION

**Ecotoxicological Information:** Fish Toxicity: LC50 (48 hr) rainbow trout 0.07 mg/ l.
LC50 (96 hr) fathead minnow 5.9 mg/l.
Invertebrate and Microbial Toxicity: LOEC Oncorhynchus kisutch 0.02 mg/ l.

**Persistence and Degradation:** No data available.

## SECTION 13 – DISPOSAL CONSIDERATIONS

Review federal, state and local government requirements prior to disposal.

Do not dispose of waste with normal garbage, or to sewer systems.

Whatever cannot be saved for recovery or recycling, including containers should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options.

**RCRA:** Test waste material for corrosivity, D002, prior to disposal.

## SECTION 14 – TRANSPORT INFORMATION

| | TDG | DOT |
|---|---|---|
| **Shipping Name** | Hypochlorite solutions- *with more than 5 percent but less than 16 percent available chlorine* | Hypochlorite solutions- *with more than 5 percent but less than 16 percent available chlorine* |
| **Hazard Class/Division** | 8: Corrosive<br>9.2 | 8: Corrosive |
| **Identification No.**<br>**Packing Group:** | UN1791<br>III | UN1791<br>III |

**IATA/ICAO Class:** 8

**Transportation Emergency Telephone Number:** 1-800-424-9300

## SECTION 15 – REGULATORY INFORMATION

**OSHA Classification:** Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

**SARA Regulations sections 313 and 40 CFR 372:** N

**SARA Hazard Categories, SARA SECTIONS 311/312 (40CFR370.21):**
ACUTE: Y
CHRONIC: N
FIRE: N
REACTIVE: N
SUDDEN RELEASE: N
OSHA PROCESS SAFETY (29CFR1910.119): N

**CERCLA SECTION 103 (40CFR302.4):** Y
**Reportable Quantity (RQ) under CERCLA:** 100 lb. (45.4 kg)

**TSCA Inventory Status:** Y

**Other Regulations/Legislation which apply to this product:**

**Right-to-Know/Disclosure Lists: Illinois, Massachusetts, New Jersey, Pennsylvania,**

California Proposition 65: N

This product does not contain nor is it manufactured with ozone depleting substances.

## Canadian Classification

**This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (Material Safety Data Sheet) contains all the information required by the CPR.**

**Controlled Products Regulations (WHMIS) Classification:** D2B: Toxic E: Corrosive

**CEPA / Canadian Domestic Substances List (DSL): Y**

**WHMIS Ingredient Disclosure List: Meets criteria for disclosure at 1% or greater.**

**EINECS Number: 231-668-3**

## SECTION 16 – OTHER INFORMATION

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate Los Angeles Chemical Company makes no representation as to its accuracy or sufficiency. Conditions of use are beyond Los Angeles Chemical Company's control and therefore users are responsible to verify this data under their own operating conditions to determine whether this product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

**National Fire Protection Association (NFPA) Rating**
**Hazardous Materials Identification System (HMIS) Rating**

| | NFPA | HMIS |
|---|---|---|
| HEALTH | 2 | 2 |
| FIRE | 0 | 0 |
| REACTIVITY | 1 | 1 |

4= Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum
W =Water Reactive

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE | Page ___ of ___

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Jorritsma + Arema Dairy

FACILITY ID # F A 0 0 0 0 5 2 2 1 | MAP# 203: 1 | GRID# 204: E5

### II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sodium Hydroxide

TRADE SECRET ☐ Yes ☒ No 206 — If Subject to EPCRA, refer to instructions

COMMON NAME 207: Vortex

EHS* ☐ Yes ☒ No 208

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 215: 400 lbs

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217 | MAXIMUM DAILY AMOUNT 218 | ANNUAL WASTE AMOUNT 219 | STATE WASTE CODE 220

UNITS* (Check one item only) ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS 221

* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER 223:
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☒ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 4-5 (226) | Sodium dichloro-S-triazinetrione (227) | ☐ Yes ☐ No (228) | 51580-86-0 (229) |
| 2 | 15-16 (230) | Sodium Hydroxide (231) | ☐ Yes ☐ No (232) | 1310-73-2 (233) |
| 3 | (234) | (235) | ☐ Yes ☐ No (236) | (237) |
| 4 | (238) | (239) | ☐ Yes ☐ No (240) | (241) |
| 5 | (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

MANUFACTURED FOR:

DairyPro
150 S. Bolingbrook Dr., #357
Bolingbrook, IL 60440
Business Phone: 708-378-3906

FOR CHEMICAL EMERGENCY - spill, leak, fire, accident -
24 hours a day, 7 days a week:

Call 1-800-228-5635; Extension 149

# Material Safety Data Sheet

## Section 1 - General Information

**Product Name:** VORTEX

**DOT Hazard Class:** Corrosive, 8

**Chemical Name:** Mixture

**Chemical Family:** Powdered Caustic Cleaner, Chlorinated

(NE = None Established; NA = Not Available; NDF = No Data Found)

## Section 2 - Hazardous Ingredients

| Ingredients/CAS Number | Wt/Wt Percent | ACGIH TLV PPM | ACGIH TLV mg/M$^3$ | STEL | Vapor Pressure mm HG. 20°C |
|---|---|---|---|---|---|
| Sodium dichloro-s-triazinetrione, dihydrate/51580-86-0 | 4-5 | NE | NE | NE | NE |
| Sodium Hydroxide/1310-73-2 | 15-16 | NDF | 2 ceiling | NDF | 42 @ 1000°C |

## Section 3 - Physical Data

**Boiling Point:** Not applicable

**Specific Gravity ($H_2O$ = 1):** Not applicable

**Vapor Pressure (mm Hg.):** Not applicable

**Percent Volatile by Weight (%):** NDF

**pH:** > 12 (1% solution) typical

**Evaporation Rate (____ = 1):** Not applicable

**Solubility in Water:** Complete at use dilutions

**Viscosity @ 25°C:** Not applicable

**Appearance and Odor:** Free flowing white powder with a mild surfactant/chlorine odor.

## Section 4 - Health Hazard Data

**Threshold Limit Value:** None established.

**Note:** **This product does not contain any known carcinogens.**

**Effects of Overexposure:** Causes severe burns to eyes and skin. Harmful if swallowed.

**FOR ASSISTANCE WITH MEDICAL EMERGENCY,**
**CALL: 1-800-228-5635, Ext. 149 (24 HRS./DAY; 7 DAYS/WEEK)**

**Emergency First Aid:**

EXTERNAL: Flush with large volumes of water for at least 15 minutes. If irritation persists, seek medical attention.

EYES: Flush with large volumes of water for at least 15 minutes. Seek medical attention immediately.

INTERNAL: If swallowed, DO NOT INDUCE VOMITING. Rinse mouth, then give small amount/glass of water. Seek medical attention immediately. Never give anything by mouth to an unconscious person.

SEE OTHER SIDE

## Section 5 - Fire and Explosion Hazard Data

**Flash Point (test method):** Not applicable

**Flammable Limits:** Not applicable

**Extinguishing Media:** Use media appropriate for surrounding material.

**Special Fire Fighting Procedures:** Where there is potential for exposure, wear impervious clothing and Self-Contained Breathing Apparatus (SCBA).

**Unusual Fire & Explosion Hazards:** Excessive heat may liberate chlorine gas.

## Section 6 - Reactivity Data

**Stability:** ☒ Stable ☐ Unstable

**Hazardous Polymerization:** ☐ may occur ☒ will not occur

**Incompatibility:** Strong mineral acids and organic materials. Aluminum, zinc, tin, galvanized iron, or other soft metals.

**Hazardous Decomposition Products:** Chlorine gas.

## Section 7 - Spill or Leak Procedures

**Spill Response:** Shovel and sweep up spilled material. Place in labeled containers to await disposal. Flush spill area with water.

**Waste Disposal Method:** Observe all local, state, & federal regulations.

**We make no guarantee or warranty of any kind that the use or disposal of this product is in compliance with all federal, state or local laws. It is the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable statutes.**

## Section 8 - Special Protection Information

**Eye Protection:** Safety glasses, goggles or face shield if exposure is anticipated.

**Respiratory Protection:** NIOSH/MSHA approved respirator for dust if exposure is anticipated.

**Skin Protection:** As appropriate to avoid skin contact with powder.

**Other Protection:** N/A

**Ventilation Recommended:** General or local exhaust where dust may be generated.

## Section 9 - Special Precautions

**Hygienic Practices in Handling & Storage:** Avoid contact with eyes and skin. Avoid breathing dust (See Section 8.)

**Other Precautions:** KEEP OUT OF REACH OF CHILDREN.

**Date prepared:** APR. 17, 1995 **Prepared by:** Richard I. Engstrom R. I. Engstrom

The information contained herein is based on data available to us and is believed to be correct. Since this information may have been obtained in part from independent laboratories or other sources not under our direct supervision, no representation is made that the information is accurate, reliable, complete or representative and Buyer may rely thereon only at Buyer's risk. We make no guarantee that the health and safety precautions we have suggested will be adequate for all individuals and/or situations involving its handling and use. No warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Vendor assumes no responsibility for injury to vendee or third person proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in this data sheet.

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

Page 1 of 1

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Jorritsma + Anema Dairy

FACILITY ID # F A 0 0 0 0 5 2 2 1 | MAP# 203: 1 | GRID# 204: E3

### II. CHEMICAL INFORMATION

CHEMICAL NAME 206: Dinotefuran

TRADE SECRET ☐ Yes ☒ No 208 — If Subject to EPCRA, refer to instructions

COMMON NAME 207: QuikStrike Fly Scatter Bait

EHS* ☐ Yes ☐ No 208

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 215

FED HAZARD CATEGORIES (Check all that apply) ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 216

AVERAGE DAILY AMOUNT 217 | MAXIMUM DAILY AMOUNT 218 | ANNUAL WASTE AMOUNT 219 | STATE WASTE CODE 220

UNITS* (Check one item only) ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS 221
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER
☐ a. ABOVE GROUND TANK ☒ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON 223

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 0.5 226 | Dinotefuran 227 | ☐ Yes ☐ No 228 | 165252-70-0 229 |
| 2 | 0.04 230 | Guanidine 231 | ☐ Yes ☐ No 232 | 27519-02-4 233 |
| 3 | Balance 234 | Other ingredients 235 | ☐ Yes ☐ No 236 | 237 |
| 4 | 238 | 239 | ☐ Yes ☐ No 240 | 241 |
| 5 | 242 | 243 | ☐ Yes ☐ No 244 | 245 |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☐ MATERIAL ☐ WASTE | Page ___ of ___

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3

| FACILITY ID # | F | A | | | | | | | | 1 | MAP# 203 | GRID# 204 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

### II. CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME 205 | TRADE SECRET ☐ Yes ☐ No 206<br>If Subject to EPCRA, refer to instructions |
| COMMON NAME 207 | EHS* ☐ Yes ☐ No 208 |
| CAS# 209 | *If EHS is "Yes", all amounts below must be in lbs. |

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211 | RADIOACTIVE ☐ Yes ☐ No 212 | CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☐ b. LIQUID ☐ c. GAS 214 | LARGEST CONTAINER 215

FED HAZARD CATEGORIES (Check all that apply) ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 216

| AVERAGE DAILY AMOUNT 217 | MAXIMUM DAILY AMOUNT 218 | ANNUAL WASTE AMOUNT 219 | STATE WASTE CODE 220 |
|---|---|---|---|
| | | | |

UNITS* (Check one item only) ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221 | DAYS ON SITE: 365 222

* If EHS, amount must be in pounds.

STORAGE CONTAINER
☐ a. ABOVE GROUND TANK ☐ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON 223

STORAGE PRESSURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

| %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|
| 1 226 | 227 | ☐ Yes ☐ No 228 | 229 |
| 2 230 | 231 | ☐ Yes ☐ No 232 | 233 |
| 3 234 | 235 | ☐ Yes ☐ No 236 | 237 |
| 4 238 | 239 | ☐ Yes ☐ No 240 | 241 |
| 5 242 | 243 | ☐ Yes ☐ No 244 | 245 |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

# MATERIAL SAFETY DATA SHEET
## Starbar QuikStrike Fly Scatter Bait

**Manufacturer:** Wellmark International

**Address:** 1501 East Woodfield Road, Suite 200-West Schaumburg, IL 60173

**Emergency Phone:** 800-347-8272

**Transportation Emergency Phone:** CHEMTREC: 1-800-424-9300

## 1. CHEMICAL PRODUCT INFORMATION

**Product Name:** Starbar QuikStrike Fly Scatter Bait

**Chemical Name/Synonym:** Dinotefuran; Guanidine, N-methyl-N'-nitro-N''-[(tetrahydro-3-furanyl)methyl]

**Chemical Family:** Neonicotinoid

**Formula:** C7 $H_{14}$ N4 O3

**EPA Registration No.:** 73049-450-2724

**RF Number:** 2061

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

| Component (chemical, common name) | CAS Number | Weight | Tolerance |
|---|---|---|---|
| Dinotefuran; Guanidine, N-methyl-N'-nitro-N''-[(tetrahydro-3-furanyl)methyl] | 165252-70-0 | 0.50% | |
| (Z)-9-Tricosene | 27519-02-4 | 0.04% | |
| Other ingredients (non-hazardous) | | 99.46% | |

## 3. HAZARD INFORMATION

**PRECAUTIONARY STATEMENT**
**CAUTION**
**KEEP OUT OF REACH OF CHILDREN**
**HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION**
**AVOID CONTACT WITH SKIN, EYES OR CLOTHING**

**PRIMARY ROUTE OF ENTRY** Dermal/Eye: Yes Oral: Yes Inhalation: No

**ACUTE TOXICITY**

**Oral:** No specific hazard identified.

**Dermal:** No specific hazard identified.

**Inhalation:** No specific hazard identified.

### OTHER TOXICOLOGICAL INFORMATION

**Skin Irritation:** May cause brief and/or minor irritation.

**Eye Irritation:** May cause minimal irritation.

**Sensitizer:** Not a skin sensitizer.

## 4. FIRST AID MEASURES

**Eye:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**Skin:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

**Ingestion:** Call a poison control center or doctor for treatment advice. Do not induce vomiting unless told to do so by the poison control center or doctor. Have person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person.

**Note to Physician:** There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

## 5. FIRE FIGHTING MEASURES

**NFPA Rating:** **Health:** 1 **Fire:** 1 **Reactivity:** 0

**Flammability Class:** Solid.

**Flash Point:** N/A.

**Explosive Limits (% of Volume):** N/A.

**Extinguishing Media:** Water fog, carbon dioxide, foam, dry chemical.

**Special Protective Equipment:** Fire fighters should wear full protective clothing including self-contained breathing apparatus.

**Fire Fighting Procedures:** Products of combustion from fires involving this material may be toxic. Avoid breathing smoke and mists. Minimize the amount of water used for fire fighting. Do not allow fire fighting water to escape into waterways or sewers.

**Combustion Products:** Incomplete combustion can produce carbon monoxide. Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen.

**Unusual Fire/Explosion Hazards:** None known.

## 6. ACCIDENTAL RELEASE MEASURES

**Steps to be taken:** Do not allow spilled material to enter waterways or sewers.

**Absorbents:** None needed due to product form. Scoop up material and dispose of all wastes according to applicable regulations.

**Incompatibles:** None known.

## 7. HANDLING AND STORAGE

**Handling:** Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if bait gets inside. Wash thoroughly and put on clean clothing. Do not use, pour, spill or store near heat or open flame.

**Storage:** Store in a cool, well-ventilated place away from sources of heat and direct sunlight. Keep container tightly closed. Keep only in original container. Do not contaminate water, food or feed by storage or disposal.

## 8. EXPOSURE CONTROL / PERSONAL MEASURES

**Exposure Limits:** None.

**Ventilation:** Use in a well ventilated area.

**Personal Protective Equipment:** Avoid contact with skin, eyes or clothing. Handlers and applicators should wear appropriate protective equipment including, at a minimum, long pants, long-sleeved shirt and shoes plus socks and chemical resistant gloves.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance and Odor:** Solid blue granules.

**Boiling Point:** Not applicable.

**Melting Point:** Not available.

**Vapor Pressure (mm Hg):** Not available.

**Vapor Density (Air = 1):** Not available.

**Specific Gravity:** 0.94.

**Bulk Density:** 59 lbs / cubic foot.

**Solubility:** Soluble in water.

**Evaporation Rate:** Not available.

**pH:** 6.15.

## 10. STABILITY AND REACTIVITY

**Stability:** Stable.

**Reactivity:** Not reactive.

**Incompatibility w/ Other Materials:** Reactive metals and strong oxidizers.

**Decomposition Products:** Oxides of nitrogen, carbon monoxide, carbon dioxide.

**Hazardous Polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

**ACUTE TOXICITY**

| | |
|---|---|
| Acute oral toxicity (rat): | LD50 >5000 mg/kg |
| Acute dermal toxicity: | LD50 >5050 mg/kg |
| Acute inhalation toxicity: | LC50 >4090 mg/m$^3$ |
| Skin irritation: | Slightly irritating |
| Eye irritation: | Mildly irritating |
| Dermal Sensitization: | Not a sensitizer |

**SUBCHRONIC/CHRONIC TOXICITY [Specific to Active Ingredient(s)]**

**Dinotefuran technical** was tested in 13-week dietary toxicity studies in rats, mice and dogs. In the rat study, a NOEL of 500 ppm was established, based on reduced body weight gain in females and adrenal cortical vacuolation in males and a NOAEL of 5,000 ppm based on marked growth retardation at 25,000 ppm (adrenal cortical vacuolation not adverse). A NOEL of 25,000 ppm was established in the mouse study based on reduced body weight gain at 50,000 ppm. In the dog 13-week dietary study, a NOEL of 8,000 ppm was established based on reduced body weight gain. No target organs were identified in subchronic inhalation or dermal toxicity studies in rats.

**Dinotefuran technical** was tested in lifetime studies with rats and mice and a one-year study with dogs. In common with the subchronic studies in these species, no specific target organs could be identified. In the 78-week mouse study a NOAEL of 2500 ppm was established, based on decreased weight gain and a decrease in circulating platelet counts. In the 104-week rat study a NOAEL of 2000 ppm was established, based on a decrease in weight gain in females. There were no treatment-related effects in rats or mice on survival or the nature and incidence of neoplastic and adverse non-neoplastic histomorphological findings in either species at any dose level. In the 52-week dog study, a NOAEL of 16000 ppm was established based on decreased weight gain in both sexes and decreased food consumption in females.

This product is not listed as a carcinogen by the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), the Occupational Safety and Health Administration (OSHA) or ACGIH.

**DEVELOPMENTAL/REPRODUCTIVE TOXICITY** **[Specific to Active Ingredient(s)]**
**Dinotefuran technical** was tested in a two-generation rat reproduction study at doses of 0, 300, 1000, 3000 and 10000 ppm. The NOAEL for systemic toxicity in parental animals was 3000 ppm based on decreased body weight gain and food consumption and decreased spleen and thyroid weights at the highest dose level evaluated (10000 ppm). The NOAEL for reproductive effects was 10000 ppm. The NOAEL for effects on the offspring was 3000 ppm based on reduced preweaning weight gain at 10000 ppm.

In a developmental toxicity study of Dinotefuran technical in rats, the maternal NOAEL was 300 mg/kg/day based on reduced weight gain, food consumption and water intake at 1000 mg/kg/day. Dinotefuran technical did not produce developmental effects in rats at doses up to 1000 mg/kg/day (the highest does tested). In a study with rabbits, the maternal NOAEL was 52 mg/kg/day based on reduced weight gain, food consumption and water intake and clinical signs noted at 300 mg/kg/day and pathology findings in the liver and stomach at 125 mg/kg/day and higher. The developmental NOEL was 300 mg/kg/day.

**NEUROTOXICITY** **[Specific to Active Ingredient(s)]**
**Dinotefuran** did not produce any functional or histomorphological evidence of neurotoxicity in acute (gavage) and 13-week (dietary) neurotoxicity studies in rats. The NOEL for neurotoxicity in the acute study was 1,500 mg/kg, the highest dose level administered. The NOEL for neurotoxicity in the 13-week dietary study was 50,000 ppm. The NOEL for all effects in this study was 5,000 ppm based on reduced body weight gain and food consumption.

**MUTAGENICITY** **[Specific to Active Ingredient(s)]**
**Dinotefuran technical** was negative in the following *in vitro* assays: Ames Assay, mouse lymphoma (L5178Y), mammalian cytogenetics (CHL/IU) or DNA Repair. Dinotefuran technical was negative in the following *in vivo* assays: mouse micronucleus. Overall, Dinotefuran technical does not present a genetic hazard.

## 12 ECOLOGICAL INFORMATION

**ACUTE AND LONG-TERM TOXICITY TO FISH AND INVERTEBRATES:**
Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or public waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

ECOLOGICAL TOXICITY [Specific to Active Ingredient(s)]
**Dinotefuran Technical** is practically non-toxic to moderately toxic to avian species. Test results include:

Oral $LD_{50}$ quail: greater than 2000 mg/kg;
Dietary $LC_{50}$ Mallard duck: greater than 997.9 ppm;
Dietary $LC_{50}$ quail: greater than 1301 ppm;
Reproduction quail: NOEL = 5000 ppm;
Reproduction Mallard duck: NOEL = 2000 ppm.

**Dinotefuran Technical** is practically nontoxic to fish and practically nontoxic to highly toxic to aquatic invertebrate species. Test results include:

$LC_{50}$ (96 hr) Bluegill Sunfish: greater than 100 mg/l;
$LC_{50}$ (96 hr) Rainbow Trout: greater than 100 mg/l;
$LC_{50}$ (96 hr) Common Carp: greater than 100 mg/l;
$LC_{50}$ (96 hr) Sheepshead Minnow: greater than 109 mg/l;
NOEC (early life stage) Rainbow Trout: greater than 10 mg/l;
$EC_{50}$ (48 hr) Daphnia magna: greater than 1000 mg/l;
NOEC (lifecycle) Daphnia magna: greater than 10 mg/l;
$LC_{50}$ (96 hr) Mysid Shrimp: 0.79 mg/l;
$EC_{50}$ (96 hr) Oyster Shell Deposition: greater than 141 mg/l.

**OTHER ENVIRONMENTAL INFORMATION:**
**Dinotefuran Technical** is highly toxic to bees. The acute oral and contact $LD_{50}$ in bees were 0.056 µg/bee and 0.022 ug/bee, respectively.

## 13. DISPOSAL CONSIDERATIONS

Dispose of product and used containers in accordance with applicable Federal, State and local regulations. Do not contaminate water, food or feed by disposal. End users must dispose of any unused product as per the label recommendations.

## 14. TRANSPORT INFORMATION

**DOT49CFR Description:** Not Regulated.

**Freight Classification:** Insecticides NOI NMFC 102120 CL. 60.

## 15. REGULATORY INFORMATION

**CERCLA (Superfund):** Not regulated.

**RCRA:** Not regulated.

**SARA 311/312 HAZARD CATEGORIES**

**Immediate Health:** Yes.

**Delayed Health:** Yes.

**Fire:** No.

**Sudden Pressure:** No.

**Reactivity:** No.

*The information presented herein, while not guaranteed, was prepared by technically knowledgeable personnel and to the best of our knowledge is true and accurate. It is not intended to be all inclusive and the manner and conditions of use and handling may involve other or additional considerations.*

27-11-016

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE | Page ___ of ___

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As): Jorritsma + Ameno Dairy (3)

FACILITY ID #: F A 0 0 0 0 5 2 2 (1) | MAP#: 1 (203) | GRID#: D5 (204)

### II. CHEMICAL INFORMATION

CHEMICAL NAME: Iodozyme (205) | TRADE SECRET ☐ Yes ☒ No (206) — If Subject to EPCRA, refer to instructions

COMMON NAME (207) | EHS* ☐ Yes ☐ No (208)

CAS# (209) | *If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE (211) | RADIOACTIVE ☐ Yes ☒ No (212) | CURIES (213)

PHYSICAL STATE (Check one item only): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS (214) | LARGEST CONTAINER: 250 gallons (215)

FED HAZARD CATEGORIES (Check all that apply): ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH (216)

| AVERAGE DAILY AMOUNT (217) | MAXIMUM DAILY AMOUNT (218) | ANNUAL WASTE AMOUNT (219) | STATE WASTE CODE (220) |
|---|---|---|---|
| | | | |

UNITS* (Check one item only): ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (221) — * If EHS, amount must be in pounds. | DAYS ON SITE: 365 (222)

STORAGE CONTAINER:
☐ a. ABOVE GROUND TANK ☒ a. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON (223)

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT (224)

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC (225)

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 1-5 (226) | Iodine (227) | ☐ Yes ☐ No (228) | 7553-56-2 (229) |
| 2 | (230) | (231) | ☐ Yes ☐ No (232) | (233) |
| 3 | (234) | (235) | ☐ Yes ☐ No (236) | (237) |
| 4 | (238) | (239) | ☐ Yes ☐ No (240) | (241) |
| 5 | (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION (246)

If EPCRA, Please Sign Here

WESTAGRO®

# Iodozyme Liquid — Material Safety Data Sheet

**Preparation Date** 26-Nov-2007
**Revision Number:** 0
**Revision Date**

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Description:** Iodozyme Liquid
**Item#:** 0145

**Supplier**
DeLaval Manufacturing
11100 N. Congress Ave.
Kansas City, MO 64153

Tel: 816-891-7700, 8am – 5pm M-F

**Emergency Telephone Number** Chemtrec 1-800-424-9300

## 2. HAZARDS IDENTIFICATION

**Emergency Overview**
May cause eye irritation

**Potential Health Effects**

**Principle Routes of Exposure** Eye contact
Ingestion

**Major effects of exposure**
**Eyes** Contact with eyes may cause irritation.
**Ingestion** Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea .

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS-No | Weight % | OSHA PEL |
|---|---|---|---|
| Iodine | 7553-56-2 | 1 - 5 | Ceiling: 0.1 ppm<br>Ceiling: 1 mg/m$^3$ |

## 4. FIRST AID MEASURES

**Eye contact**
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes
- If eye irritation persists, get medical advice/attention

**Ingestion** • Call a physician or Poison Control Centre immediately

## 5. FIRE-FIGHTING MEASURES

**Fire Hazard** The product is not flammable.

**Suitable Extinguishing Media** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

**Protective Equipment and Precautions for Firefighters** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**NFPA**

| Health | Flammability | Instability |
|---|---|---|
| 1 | 0 | 0 |

**NFPA Special Hazard** none

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions** Avoid contact with eyes.

**Environmental Precautions** Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

**Methods for cleaning up** Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal.

## 7. HANDLING AND STORAGE

**Handling** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with eyes.

**Storage** Keep containers tightly closed in a dry, cool and well-ventilated place. Do not freeze. Freezing will affect the physical condition but will not damage the material. Thaw and mix before using.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| Component | ACGIH TLV | OSHA PEL |
|---|---|---|
| Iodine | Ceiling: 0.1 ppm | Ceiling: 0.1 ppm<br>Ceiling: 1 mg/m$^3$ |

**Engineering Controls** Ensure adequate ventilation, especially in confined areas.

**Eye/face Protection** Safety glasses with side-shields

**General Hygiene Considerations**
Handle in accordance with good industrial hygiene and safety practice.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance** | Brown |
| **Form** | liquid |
| **Specific Gravity** | 1.23 |
| **Density** | 10.3 lb/gal |
| **Water Solubility** | soluble |
| **pH** | 3 - 4 |
| **Freezing point** | <10°F |

## 10. STABILITY AND REACTIVITY

**Chemical Stability** Stable under normal conditions.

**Incompatible Materials** strong oxidizing agents, strong acids, strong bases

## 11. TOXICOLOGICAL INFORMATION

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|
| Iodine | 14000 mg/Kg | | 137 ppm |

**Chronic Toxicity**

**Carcinogenicity** Contains no ingredient listed as a carcinogen

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

| Component | Freshwater Algae | Freshwater Fish | Microtox | Water Flea |
|---|---|---|---|---|
| Iodine | | LC50 (96 h) 0.53 mg/L | | LC50 (48 h) 0.16 mg/L |

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Method** Dispose of in accordance with local regulations.

**Contaminated Packaging** Empty containers should be taken for local recycling, recovery or waste disposal.

## 14. TRANSPORT INFORMATION

Not regulated

## 15. REGULATORY INFORMATION

| Component | TSCA | DSL | NDSL | EINECS | ELINCS | ENCS | CHINA | KECL | PICCS | AICS |
|---|---|---|---|---|---|---|---|---|---|---|
| Iodine | Present | X | - | 231-442-4 | - | - | X | 97-3-0138 | X | X |

**USA**

**Federal Regulations**

**TSCA** Complies

**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**State Right-to-Know**

| Component | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|---|---|---|---|---|
| Iodine | X | X | X | | X |

## 16. OTHER INFORMATION

**Preparation Date** 26-Nov-2007

**Revision Date**

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

Page 1 of 1

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As): Jorritsma + Arena Dairy (3)

FACILITY ID #: F A 0 0 0 0 0 5 2 2 (1) | MAP#: 1 (203) | GRID#: E5 (204)

### II. CHEMICAL INFORMATION

CHEMICAL NAME (205)

TRADE SECRET ☐ Yes ☒ No (206) — If Subject to EPCRA, refer to instructions

COMMON NAME (207): Power pHOS 330

EHS* ☐ Yes ☐ No (208)

CAS# (209)

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE (211)

RADIOACTIVE ☐ Yes ☒ No (212) | CURIES (213)

PHYSICAL STATE (Check one item only): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS (214)

LARGEST CONTAINER: 50 gallon (215)

FED HAZARD CATEGORIES (Check all that apply): ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH (216)

| AVERAGE DAILY AMOUNT (217) | MAXIMUM DAILY AMOUNT (218) | ANNUAL WASTE AMOUNT (219) | STATE WASTE CODE (220) |
|---|---|---|---|
| | | | |

UNITS* (Check one item only): ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (221)
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 (222)

STORAGE CONTAINER (223):
☐ a. ABOVE GROUND TANK ☒ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT (224)

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC (225)

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 75 (226) | Phosphoric Acid (227) | ☐ Yes ☐ No (228) | 7664-38-2 (229) |
| 2 | >93 (230) | Sulfuric Acid (231) | ☐ Yes ☐ No (232) | 7664-93-9 (233) |
| 3 | (234) | (235) | ☐ Yes ☐ No (236) | (237) |
| 4 | (238) | (239) | ☐ Yes ☐ No (240) | (241) |
| 5 | (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION (246)

If EPCRA, Please Sign Here

MANUFACTURED FOR:

DAIRY*PRO*
160 S. Bolingbrook Dr., #357
Bolingbrook, IL 60440
Business Phone: 630-378-3906

FOR CHEMICAL EMERGENCY, Spill, Leak, Fire, or Accident
24 hours/day, 7 days/week
CALL 1-800-228-5635 Extension 149

# Material Safety Data Sheet

## Section 1 - General Information

**Product Name:** POWER pHOS 330

**DOT Hazard Class:** Corrosive, 8

**Chemical Name:** Mixture

**Chemical Family:** Liquid Acid Cleaner

(NE – None Established; NA – Not Available; NDF – No Data Found)

## Section 2 - Hazardous Ingredients

| Ingredients/CAS Number | Wt/Wt Percent | ACGIH TLV PPM | ACGIH TLV mg/M$^3$ | STEL | Vapor Pressure mm HG. 20°C |
|---|---|---|---|---|---|
| Phosphoric acid (75%) /7664-38-2 | 11-12 | NDF | 1 | NDF | 5.7 |
| Sulfuric acid (>93%) /7664-93-9 | 9-10 | NDF | 1 | NDF | <0.3 |

## Section 3 - Physical Data

**Boiling Point:** NE

**Specific Gravity ($H_2O$ = 1):** 1.11 typical @ 25°C.

**Vapor Pressure (mm Hg.):** NE

**Percent Volatile by Weight (%):** NE

**pH:** 2.4 (1% solution) typical

**Evaporation Rate (____ = 1):** NE

**Solubility in Water:** Complete

**Viscosity @ 25°C:** 5 cps (Brookfield) typical

**Appearance and Odor:** Clear, red liquid with mild acid odor.

## Section 4 - Health Hazard Data

**Threshold Limit Value:** None established.

**Note:** This product does not contain any known carcinogens.

**Effects of Overexposure:** Causes severe burns to eyes and skin. Harmful if swallowed.

**FOR ASSISTANCE WITH MEDICAL EMERGENCY,**
**CALL: 1-800-228-5635, Ext. 149 (24 HRS./DAY; 7 DAYS/WEEK)**

**Emergency First Aid:**

SKIN: Flush with large volumes of cold water for at least 15 minutes. If irritation persists, seek medical attention.

EYES: Flush with large volumes of cold water for at least 15 minutes. Seek medical attention immediately.

INTERNAL: If swallowed, DO NOT INDUCE VOMITING. Rinse mouth, then give small amount/glass of water. Seek medical attention immediately. Never give anything by mouth to an unconscious person.

SEE OTHER SIDE

## Section 5 - Fire and Explosion Hazard Data

**Flash Point (test method):** Not applicable

**Flammable Limits:** Not applicable

**Extinguishing Media:** Use media appropriate for surrounding material.

**Special Fire Fighting Procedures:** Where there is potential for exposure, wear impervious clothing and Self-Contained Breathing Apparatus (SCBA).

**Unusual Fire & Explosion Hazards:** Keep away from strong alkaline materials and chlorinated materials.

## Section 6 - Reactivity Data

**Stability:** ☒ Stable ☐ Unstable

**Hazardous Polymerization:** ☐ may occur ☒ will not occur

**Incompatibility:** Strong alkaline materials and chlorinated products.

**Hazardous Decomposition Products:** N/A

## Section 7 - Spill or Leak Procedures

**Spill Response:**

Small Spills: Vacuum or mop up, then flush spill area with water.

Large Spills: Dike and contain spill with inert material (sand, earth, etc.). Transfer the liquid & solid separately to containers for recovery or disposal.

**Waste Disposal Method:** Observe all local, state, & federal regulations.

**e make no guarantee or warranty of any kind that the use or disposal of this product is in compliance with all federal, state or local laws. It is the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable statutes.**

## Section 8 - Special Protection Information

**Eye Protection:** Safety glasses, goggles or face shield if exposure is anticipated.

**Respiratory Protection:** NIOSH/MSHA approved respirator when mist or vapors/fumes are generated by product use.

**Skin Protection:** Appropriate chemical resistant gloves and body splash protection if exposure is anticipated.

**Other Protection:** N/A

**Ventilation Recommended:** General or local exhaust

## Section 9 - Special Precautions

**Hygienic Practices in Handling & Storage:** Avoid contact with eyes and skin (See Section 8).

**Other Precautions:** KEEP OUT OF REACH OF CHILDREN.

**Date prepared:** JAN. 6, 1997 **Prepared by:** Richard J. Engstrom

The information contained herein is based on data available to us and is believed to be correct. Since this information may have been obtained in part from independent laboratories or other sources not under our direct supervision, no representation is made that the information is accurate, reliable, complete or representative and Buyer may rely thereon only at Buyer's risk. We make no guarantee that the health and safety precautions we have suggested will be adequate for all individuals and/or situations involving its handling and use. No warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Vendor assumes no responsibility for injury to vendee or third person proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in this data sheet.

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

*☒ MATERIAL ☐ WASTE

Page 1 of 1

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As): Jorritsma & Arema Dairy (3)

FACILITY ID #: F A 0 0 0 0 5 2 2 (1) | MAP#: 1 (203) | GRID#: D5 (204)

### II. CHEMICAL INFORMATION

CHEMICAL NAME: Zinc Sulfate 7-Hydrate (205)

TRADE SECRET ☐ Yes ☒ No (206) — If Subject to EPCRA, refer to instructions

COMMON NAME (207)

EHS* ☐ Yes ☐ No (208)

CAS#: 7446-20-0 (209)

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE (211)

RADIOACTIVE ☐ Yes ☒ No (212) | CURIES (213)

PHYSICAL STATE (Check one item only): ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS (214) | LARGEST CONTAINER (215)

FED HAZARD CATEGORIES (Check all that apply): ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH (216)

AVERAGE DAILY AMOUNT (217) | MAXIMUM DAILY AMOUNT (218) | ANNUAL WASTE AMOUNT (219) | STATE WASTE CODE (220)

UNITS* (Check one item only): ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (221) — * If EHS, amount must be in pounds.

DAYS ON SITE: 365 (222)

STORAGE CONTAINER (223):
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☒ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE (224): ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE (225): ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|
| 1 (226) | Zinc Sulfate 7-Hydrate (227) | ☐ Yes ☐ No (228) | 7446-20-0 (229) |
| 2 (230) | (231) | ☐ Yes ☐ No (232) | (233) |
| 3 (234) | (235) | ☐ Yes ☐ No (236) | (237) |
| 4 (238) | (239) | ☐ Yes ☐ No (240) | (241) |
| 5 (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION (246)

If EPCRA, Please Sign Here

# Safety data for zinc sulfate 7-hydrate

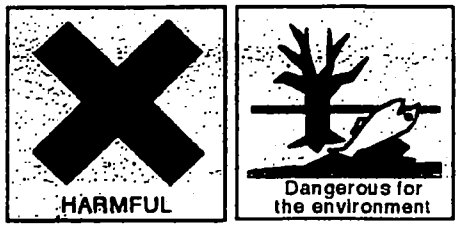


Click here for data on zinc sulfate in student-friendly format, from the HSci project

Glossary

Information on this web page is provided to help you to work safely, but it is intended to be an [illegible] not a replacement for a full [illegible]

## General

Synonyms: zinc sulfate heptahydrate, white vitriol, zinc sulphate 7-hydrate, zinc sulphate heptahydrate
Molecular formula: $ZnSO_4\ 7H_2O$
CAS No: 7446-20-0
EC No: 231-793-3

## Physical data

Appearance: colourless to white crystalline solid
Melting point:
Boiling point:
Vapour density:
Vapour pressure:
Specific gravity: 1.957
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: high

## Stability

Stable. Incompatible with strong oxidizing agents. Hygroscopic - protect from

moisture.

## Toxicology

Harmful if swallowed. Severe eye irritant; may cause serious eye damage.

**Toxicity data**
(The meaning of any abbreviations which appear in this section is given here.)
UNR-MAN LDLO 221 mg $kg^{-1}$
ORL-RAT LD50 1260 mg $kg^{-1}$
ORL-MUS LD50 2200 mg $kg^{-1}$
IPR-RAT LD50 200 mg $kg^{-1}$

**Risk Phrases**
(The meaning of any risk phrases which appear in this section is given here.)
R22 R41 R50 R53.

## Environmental information

Very toxic to aquatic organisms - may cause long-term damage in the environment.

## Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 3077. Hazard class 9. Packing group III.

## Personal protection

Safety glasses, adequate ventilation.

**Safety phrases**
(The meaning of any safety phrases which appear in this section is given here.)
S22 S26 S39 S46 S60 S61.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

This information was last updated on October 21, 2006. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 2 2 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma + Anema Dairy

FACILITY ADDRESS: 8061 Edison Ave

CITY: Ontario

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Used oil | 2 | 30 | gallon |
| 2 | teat dip | 2 | 250 | gallon |
| 3 | powder chlorinated soap | 2 | 55 | gallon |
| 4 | acid | 2 | 30 | gallon |
| 5 | sodium hypochlorite | 2 | 30 | gallon |
| 6 | teat dip | 1 | 55 | gallon |
| 7 | zinc sulfate | 20 | 50 | gallon |
| 8 | Hydrochloric acid | 1 | 55 | gallon |
| 9 | oxine | 1 | 55 | gallon |
| 10 | Diesel | 1 | 500 | gallon |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER *(print)* | DATE |
|---|---|---|
| [signature] | Greg Anema | 2-19-08 |

Inventory Summary Page 1 of 1

BP of 8-17-11 replaces this plan

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

### I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED AUG 17 2011 S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 0 0 5 2 2

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma & Arema Dairy

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8061 Edison Avenue | Ontario | 91762 |

### II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire Business Emergency/Contingency Plan whether new or revised)*

Submission Checklist ☒

- ☒ Business Activities Form
- ☒ Business Owner/Operator Identification Form
- ☒ Supplemental Emergency Contact Page
- ☒ Emergency Response Plans and Procedures
- ☒ Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number
- ☒ One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☒ Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I
- ☒ Facility map (using grid form provided) consisting of all required features including the location of each inventoried item
- ☒ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- X Area map - photocopied city map with location of site indicated
- ☒ Owner/Operator has signed and dated the plan and all required individual pages of the plan
- ☒ Submit the original and 1 copy to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction
- ☒ ***Retain one copy of the business emergency/contingency plan at the facility.***

### III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☒ Please incorporate the following into my Business Emergency/Contingency Plan

- ☐ New Business Owner/Operator Identification Form
- ☒ New Inventory Forms and new Inventory Summary Form (and maps, if affected)
- ☐ New Supplemental Emergency Contact Page

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

### IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER |
|---|---|---|
| | | Steven Goodwin |
| **NAME OF SIGNER** *(print)* | **TITLE OF SIGNER** *(print)* | |
| Greg Arema | Partner | |

ENTERED OCT 26 2011

ENTERED OCT 26 2011

FD SENT AUG 25 2011

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## BUSINESS ACTIVITIES

### I. FACILITY IDENTIFICATION

| | |
|---|---|
| FACILITY ID # F A 0 0 0 0 5 2 2 2 (1) | EPA ID # (Hazardous Waste Only) CAL 000319397 (2) |
| BUSINESS NAME (Same as Facility Name of DBA-Doing Business As) Jorritsma + Arema Dairy (3) | |
| BUSINESS SITE ADDRESS 8061 Edison Avenue (103) | |
| BUSINESS SITE CITY Ontario (104) | CA — ZIP CODE 91762 (105) |

### II. ACTIVITIES DECLARATION

| Does your facility... | If Yes, please complete these pages of the UPCF*.... | |
|---|---|---|
| A. HAZARDOUS MATERIALS<br>Have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | ☒ YES ☐ NO 4 | HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION |
| B. REGULATED SUBSTANCES<br>Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO 4a | Coordinate with your local agency responsible for CalARP. |
| C. UNDERGROUND STORAGE TANKS (USTs)<br>Own or operate underground storage tanks? | ☐ YES ☒ NO 5 | UST FACILITY<br>UST TANK |
| D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)<br>Own or operate ASTs above these thresholds:<br>Store greater than 1,320 gallons of petroleum products (new or used) in aboveground tanks or containers. | ☐ YES ☒ NO 8 | NO FORM REQUIRED TO CUPAs |
| E. HAZARDOUS WASTE | | |
| Generate hazardous waste? | ☒ YES ☐ NO 9 | EPA ID NUMBER – provide at the top of this page |
| Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC 25143.2)? | ☐ YES ☒ NO 10 | RECYCLABLE MATERIALS REPORT (one per recycler) |
| Treat hazardous waste on-site? | ☐ YES ☒ NO 11 | ON-SITE HAZARDOUS WASTE TREATMENT – FACILITY<br>ON-SITE HAZARDOUS WASTE TREATMENT – UNIT |
| Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO 12 | CERTIFICATION OF FINANCIAL ASSURANCE |
| Consolidate hazardous waste generated at a remote site? | ☐ YES ☒ NO 13 | REMOTE WASTE / CONSOLIDATION SITE ANNUAL NOTIFICATION |
| Need to report the closure/removal of a tank that was classified as containing hazardous waste and cleaned on-site? | ☐ YES ☒ NO 14 | HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of Federal RCRA hazardous waste; or generate in any single calendar month, or accumulate at any time 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acutely hazardous waste. | ☐ YES ☒ NO 14a | Obtain Federal EPA ID Number, file Biennial Report (EPA Form 8700-13A/B), and satisfy requirements for RCRA Large Quantity Generator. |
| Household Hazardous Waste (HHW) Collection site? | ☐ YES ☒ NO 14b | See CUPA for required forms. |
| F. LOCAL REQUIREMENTS | | |

*Unified Program Consolidated Forms

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 2 2 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Jomitsma + Anema Dairy

FACILITY ADDRESS 103: 8061 Edison Ave

CITY 104: Ontario

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | used oil | 2 | 30 gal. | gallon |
| 2 | teat dip | 1 | 250gal. | gallon |
| 3 | powder chlorinated soap | 2 | 55 | gallon |
| 4 | acid | 2 | 30 | gallon |
| 5 | sodium hypochlorite | 2 | 30 | gallon |
| 6 | teat dip | 1 | 55 | gallon |
| 7 | Zinc Sulfate | 20 | 50 | lbs |
| 8 | Hydrochloric acid | 1 | 55 | gallon |
| 9 | oxine | 1 | 55 | gallon |
| 10 | Diesel | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

SIGNATURE OF OWNER/OPERATOR: [signature]

NAME OF SIGNER (*print*) 136: Greg Anema

DATE 134: 5-23-07

Inventory Summary Page 1 of 1

BP of 2-21-08 replaces this plan. BW

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages, otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**
**www.sbcfire.org**

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept. Use Only – Log In/Date Stamp
RECEIVED
FEB 21 2008
S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 0 0 5 2 2

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma + Anema Dairy

BUSINESS SITE ADDRESS: 8061 Edison Ave | CITY: Ontario | ZIPCODE: 91762

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ — *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☐ * Business Activities Form
- ☐ * Business Owner/Operator Identification Form
- ☐ * Locally Collected Inventory Information Form
- ☐ * Supplemental Emergency Contact Page
- ☐ Emergency Response Plans and Procedures
- ☐ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☐ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☐ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☐ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☐ Area map - photocopied city map with location of site indicated
- ☐ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit the original and 1 copy to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

- ☒ Please incorporate the following into my business emergency/contingency plan.
  - ☒ New Business Owner/Operator Identification Form
  - ☒ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
  - ☐ New Supplemental Emergency Contact Page.
- ☐ Other: _____

Brief explanation of changes: _____

- ☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:
  - The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
  - There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
  - No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
  - This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER |
|---|---|---|
| [signature] | 2-19-08 | Aline Anema |

| NAME OF SIGNER (*print*) | TITLE OF SIGNER (*print*) |
|---|---|
| Greg Anema | partner |

ENTERED
APR 28 2008

FD SENT
FEB 21 2008

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 6 0 5 2 2 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma + Anema Dairy

EPA ID # (Hazardous Waste Only): CAL000319397

BUSINESS ADDRESS: 8061 Edison Ave

CITY: Ontario

ZIP CODE: 91762

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☒ YES ☐ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

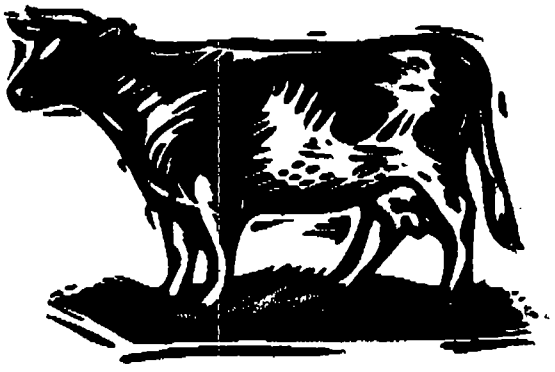

***Jorritsma & Anema Dairy***
***Sultana Dairy***
Greg Anema
8061 Edison Ave
Ontario, CA 91762
(909) 597-1317
Fax: (909) 597-4458
Cell (951) 741-6184

Feb. 12, 2008

Hazardous Materials Division

Dear Leslie Heaviside,

Could you please send a copy of the Business plan for both dairies to:
8061 Edison Ave
Ontario, CA 91762

Thank-you, you are a great help.

Aline Anema

Aline Anema
(909)597-1317

Owner: Greg Anema
(951)741-6184

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

PAT A. DENNEN
Fire Chief
County Fire Warden


January 3, 2008

Greg Anema
8061 Edison Avenue
Ontario, CA 91762

**SUBJECT: NOTICE OF BUSINESS PLAN REVIEW & UPDATE REQUIREMENTS**

**FACILITY: JORRITSMA DAIRY – 8061 EDISON AVENUE, ONTARIO**
**SULTANA DAIRY – 14389 SULTANA, ONTARIO**

The business emergency/contingency plan previously submitted for the above establishments have been reviewed and forwarded to your local fire department.

The next required deadline for you to annually update your business plan is March 1, 2008. You may need to do an interim update if your inventory information (including basic business information and emergency contacts) changes.

Whatever the reason for your next update, please use the enclosed forms. Based on our review of your previous submission, please be sure to address the following business plan elements/concerns in your next update:

**Jorritsma**

- Cover sheet: Submit a signed cover sheet.
- Business Owner/Operator Identification page: The Environmental Contact field was left blank. The environmental contact is intended to be the individual at the facility who will handle all environmental correspondence and will respond to enforcement activity (typically the individual who runs the day-to-day operations). Submit a revised Business Owner/Operator Identification page including the appropriate environmental contact.
- Inventory Summary an individual chemical description forms: The Maximum Quantity is intended to be listed in gallons not the number of containers. Additionally, the Maximum Quantity listed on the summary should be the same as the Maximum Amount listed on the individual description form. Submit a revised Summary and individual forms.

**Sultana**

- Business Owner/Operator Identification page: The Environmental Contact field was left blank. The environmental contact is intended to be the individual at the facility who will handle all environmental correspondence and will respond to enforcement activity (typically the individual who runs the day-to-day operations). Submit a revised Business Owner/Operator Identification page including the appropriate environmental contact.
- Inventory Summary an individual chemical description forms: The Maximum Quantity is intended to be listed in gallons not the number of containers. Additionally, the Maximum Quantity listed on the summary should be the same as the Maximum Amount listed on the individual description form. Used oil was omitted from the Inventory. Submit a revised Summary and individual forms.

Please submit 2 copies of your next update, **due no later than March 1, 2008.**

An electronic version of the Business Emergency/Contingency Plan Forms and Guidelines is available at our website www.sbcfire.org. Click on the HAZMAT bar located on the left side of the page. Then click on Forms & Guidelines in the title bar. Finally, click on the Business Plan title, this will link you to all forms associated with the Business Plan Program. Should you have any further questions, comments, or concerns, please feel free to contact me at (909) 386-8401 or lheaviside@sbcfire.org.

**LESLIE HEAVISIDE, REHS**
**Hazardous Materials Division, Field Services Section**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460
www.sbcfire.org

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED
JUN 01 2007
S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 0 0 5 2 2

BUSINESS NAME (Same as FACILITY NAME or DBA) 3
Jorritsma + Anema Dairy

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8061 Edison Ave | Ontario | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ — *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☒ * Business Activities Form
- ☒ * Business Owner/Operator Identification Form
- ☒ * Supplemental Emergency Contact Page
- ☒ Emergency Response Plans and Procedures
- ☒ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☒ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☒ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☒ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☒ Area map - photocopied city map with location of site indicated
- ☒ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.
- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:
- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER | 135 |
|---|---|---|---|
| [signature] | 5-19-07 | | |

| NAME OF SIGNER *(print)* | TITLE OF SIGNER *(print)* |
|---|---|
| Greg Anema | Partner |

ENTERED
JUL 26 2007

FD SENT
JUL 03 2007

## BUSINESS E .GENCY/CONTINGENCY PLAN COVER SH INSTRUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
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# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 2 2 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma + Arema Dairy

EPA ID # (Hazardous Waste Only): CAL000319397

BUSINESS ADDRESS: 8061 Edison Ave

CITY: Ontario

ZIP CODE: 91762

## II. ACTIVITIES DECLARATION

| Does your facility... | | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☒ YES ☐ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page Instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California Identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

# Business Emergency/Contingency Plan Receipt

Mail to: JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

Site Address: JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

Service Request ID: SR0013922
Facility ID: FA0000522

The Business Emergency/Contingency Plan was received on June 01, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.
2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.
3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.
4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.
5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.
2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.
3. Change of business address, business ownership, or business name.
4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

**TRACKING SHEET FOR BUSINESS PLANS**

*Establishment #* FA 522

*Facility Name:* Sorritsma Dairy

*Facility Site Address:* 8061 Edison Ave

*City:* Ontario

*Fire Agency:* Ontario

2 (# of copies)

| | | Sent to FD |
|---|---|---|
| **Business Plans Received** | 06/01/07 | 07/03/07 |
| **Results of Review(s)** | | |
| **Deficiency** | | __/__/__ |
| **Conditional Approval** | | __/__/__ |
| **Approval** | | __/__/__ |
| | | **Sent to FD** |
| **Revised Plans Received** | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

**Other**

| **Date** | **Action/Documentation (update, new plan, etc.)** | **Staff hours** |
|---|---|---|
| 01/03/08 | BP - review letter sent LA | |
| 02/12/08 | BP - rec'd request for copy LA | |
| 02/12/08 | BP - copy mailed LA | |
| 2/21/08 | BP - Complete Submitted | BW |
| 8/17/11 | BP - Complete Submitted | BW |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

| | | | | |
|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

7721 Edison Ave/1053-361-01-0000/Dairy

7891 Edison Ave/1053-361-03-0000/SFR

8061 Edison Ave/1053-331-04-0000/Dairy

14400 South Grove Ave/1053-551-01-0000/Dairy

14213 Bon View Ave

14283 Bon View Ave

14297 Bon View Ave

14333 Bon View Ave

14450 Bon View Ave

14451 Bon View Ave

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

RBC - cb

[X] Update/Assign PEs [ ] Referral to Team CERS [ ] Closure [ ] Invoice Reversal [ ] Demand Bill
[X] Update Non-CERS Fields [ ] 0202 [ ] Other [ ] 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0009182**

NAME: **Gerben Hettinga**
ADDRESS: **14651 S Grove Ave** ADDRESS 2:
CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** COUNTRY: **US**
PHONE: **909-606-6455** EXT: FYI LAST UPDATED: **05/31/2018**

**FACILITY INFORMATION** — **FACILITY ID: FA0017949**

BUSINESS NAME: **GH Dairy #4** CERS ID: **10741726**
SITE ADDRESS: **8061 Edison Ave** ADDRESS 2:
CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** FAX: **909-606-6455**
BUSINESS PHONE: **909-606-6455** EXT:
BUSINESS OPERATOR NAME: **GH Dairy**
OPERATOR PHONE: **909-606-6455** EXT: FYI LAST UPDATED: **05/31/2018**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **14651 S Grove Ave** ADDRESS 2:
CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** COUNTRY: **US**

**BILLING CONTACT** — **ACCOUNT ID: AR0022849**

BILLING CONTACT NAME: **Patricia L Mohr**
ADDRESS 1: **14651 S Grove Ave** ADDRESS 2:
CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** COUNTRY: **US**
PHONE: **909-606-6455** EXT: EMAIL: **ghd123@earthlink.net**

**ENVIRONMENTAL CONTACT**

NAME: **Patricia L Mohr** PHONE: **909-606-6455** EXT:
EMAIL: **ghd123@earthlink.net**

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL):
LOCAL FACILITY PHONE (OPTIONAL): EXT:
CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: 02 BUSINESS TYPE: 03
SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: 18 - Ontario Fire
FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: ~~06/30/2018~~ 08/31/18 FYI LAST BILLING:
FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code**= 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type**=01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| 06/18/18 CB (Date Initials) | Date Initials | Date Initials | Date Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

NO CUPA ADMIN PE HAS BEEN ADDED

| | | | | | |
|---|---|---|---|---|---|
| [X] UPDATE<br>[ ] INACTIVATE<br>[ ] ZERO OUT BALANCE | PT0038752 | FEE EXEMPT | 4200-HAZMAT HANDLER GENERAL A | 07/01/2018 | 06/30/2019 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| | | | PR0050304 | TIVE, EXEMPT FROM BILLI | 4243 |
| | | | GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. |

ADD NEW P.E.

| | | | | | |
|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

[X] UPDATE
[ ] INACTIVATE
[ ] ZERO OUT BALANCE

5012
*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 6/12/18 SUBMITTED BY: Kristen Riegel Ward

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per CERS inventory submitted on 5/24/18, please assign the following:
Update PE 4200 to PE 4243 Active, Billable - facility reported 7 hazardous materials exceeding reporting threshold. No hazardous wastes generated.

Add CUPA Annual Administrative PE 5112 - facility handles 7 hazardous materials exceeding reporting threshold.

Update Business Code, Business Type, Supervisor District, Inspector, District, Fire Department.

Permit categories will be verified during facility inspection.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

[ ] 5050 scanned and emailed to Fiscal Date Initials

[ ] 5054 scanned and emailed to Fiscal Date Initials

# AN BERNARDINO COUNTY CUP
## FACILITY INFORMATION

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0009182

NAME: Gerben Hettinga

ADDRESS: 14651 S Grove Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY: US

PHONE: 909-606-6455 EXT: FYI LAST UPDATED: 05/31/2018

### FACILITY INFORMATION — FACILITY ID: FA0017949

BUSINESS NAME: GH Dairy #4 CERS ID: 10741726

SITE ADDRESS: 8061 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 FAX: 909-606-6455

BUSINESS PHONE: 909-606-6455 EXT:

BUSINESS OPERATOR NAME: GH Dairy

OPERATOR PHONE: 909-606-6455 EXT: FYI LAST UPDATED: 06/18/2018

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: 14651 S Grove Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY: US

### BILLING CONTACT — ACCOUNT ID: AR0022849

BILLING CONTACT NAME: Patricia L Mohr

ADDRESS 1: 14651 S Grove Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY: US

PHONE: 909-606-6455 EXT: EMAIL: ghd123@earthlink.net

### ENVIRONMENTAL CONTACT

NAME: Patricia L Mohr PHONE: 909-606-6455 EXT:

EMAIL: ghd123@earthlink.net

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: INDIVIDUAL BUSINESS TYPE: FARM

SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: ONTARIO FIRE

FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 08/31/2018 FYI LAST BILLING:

FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 0.00

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| Date: JUN 27 2018 Initials: CB | Date: Initials: | Date: Initials: | Date: Initials: |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

NO CUPA ADMIN PE HAS BEEN ADDED

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0038752 | ACTIVE | 4243-HAZARDOUS MATERIALS | 09/01/2018 | 08/31/2019 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| | | | PR0050304 | ACTIVE, BILLABLE | |
| | | | GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. |

| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

☐ UPDATE
☐ INACTIVATE
☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 6/27/18 SUBMITTED BY: Bezdek

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

per Blue book comment PE 5112 added. 6/18/18
• add PE 5012 - Remove PE 5112. 5112 - Incorrect PE

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

**SAN BERNARDIN COUNTY FIRE PROTECTION DIST T**

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Section**
**sbcfire.org**

**Daniel R. Munsey**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal/Deputy Fire Warden

October 07, 2022

GH Dairy #4
14651 S Grove Ave
Ontario, CA 91762

**ATTN: PATRICIA MOHR**

**SUBJECT: NOTICE OF POTENTIAL ENFORCEMENT ACTION**

**FACILITY: FA0017949-GH Dairy #4**
**8061 Edison Ave**
**Ontario, CA 91762**

Ms. Mohr,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 06, 2022:

- Failure to electronically update business plan within 30 days of any one of the following events:

1) A 100 percent or more increase in the quantity of a previously disclosed material.
2) Any handling of a previously undisclosed hazardous materials at or above reportable quantities.
3) A change of business address, business ownership, or business name.
4) A substantial change in the handler's operations that requires modification to any portion of the business plan.

**NOTICE OF POTENTIAL ENFORCEMENT ACTION:**
Failure to correct violations listed in this report and submit a signed and completed certificate of compliance may subject the facility to administrative enforcement action with penalties, and/or referral to the District Attorney's Office for Civil or Criminal Prosecution.

If you have any questions, please contact me at BWADE@SBCFIRE.ORG or call (909) 386-8401.

**BRIAN WADE, REHS**
**Hazardous Materials Section**

BOARD OF DIRECTORS

| Col. Paul Cook (Ret.) | Janice Rutherford | Dawn Rowe | Curt Hagman | Joe Baca Jr. | Leonard X. Hernandez |
|---|---|---|---|---|---|
| First District | Second District | Vice Chair, Third District | Chairman, Fourth District | Fifth District | Chief Executive Officer |

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

**CUPA COMPLIANCE INSPECTION REPORT**

| | |
|---|---|
| NAME: **GH Dairy #4** | FACILITY ID: **FA0017949** |
| ADDRESS: **8061 Edison Ave** | CERS ID: **10741726** |
| CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **5/6/2022** |

**Consent granted by:**

[X] **Photograph** [X] **Inspect** **Name:** Isidro Perez **Title:** Supervisor

An inspection was conducted on May 6, 2022 to determine compliance with applicable hazardous waste and hazardous material laws and regulations. Isidro Perez, Supervisor, provided escort throughout the inspection.

This facility is a dairy cow milking operation which maintains hazardous materials on site for use in milking barn cleaning and sanitation. Sodium hypochlorite is maintained on site for well water disinfection. Hazardous wastes are not being routinely generated on site.

HAZARDOUS MATERIALS INVENTORY:
The hazardous materials observed on site during the inspection appeared to be consistent with the inventory submitted in the California Environmental Reporting System (CERS) on 11/4/2019, CERS ID 10741726, except for the following:
(1) 55-gallon drum of Mandate
(2) 55-galllon drums of Clean Max
(3) 55-gallon drums of Oxy Gard M
back up generator with a diesel fuel belly tank

DOCUMENTATION REVIEW:
-Dairy equipment and the back up generator are serviced by SDS.
-Chemicals are supplied by Animal Health. Empty drums are removed by the supplier.
-CUPA permits are current; expiration date of 8/31/2022.
-Zoetis provides regular chemical safety training; the trainings are held twice per year.

Submit a signed Certificate of Compliance with required documentation to this office within 30 days.

If you have any questions, feel free to contact me at 909-658-5912 or bwade@sbcfire.org. If you have any questions regarding CERS, please contact the CERS helpline at 909-386-8432 or efile@sbcfire.org.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | Hazardous Materials Business Plan Submittal | CHSC | 25505, 25508(a)(1) | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | | Multiple | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508.2 | |
| H209 | **Business Plan Update Within 30 days of Change** | CHSC | 25508.1(a)-(f) | X |
| Violation: | Failure to electronically update business plan within 30 days of any one of the following events:<br>A 100 percent or more increase in the quantity of a previously disclosed material.<br>Any handling of a previously undisclosed hazardous materials at or above reportable quantities.<br>A change of business address, business ownership, or business name.<br>A substantial change in the handler's operations that requires modification to any portion of the business plan. | | | |
| MINOR | OBSERVATION: Hazardous materials were observed on site during the inspection that are not listed in the most current CERS inventory.<br><br>CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated in CERS. | | | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | | Multiple | |
| H211 | Hazardous Materials Inventory | CHSC | Multiple | |
| H212 | Site Map | CHSC | Multiple | |

| | | | | |
|---|---|---|---|---|
| H213 | Emergency Response Plan | | Multiple | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Not Provided and/or Documented | CHSC | 25505(a)(4) | |
| H216 | Hazardous Materials Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,255 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 5/6/22 2:30:56PM |
|---|---|---|
| Brian Wade | Isidro Perez | LTR:5/6/2022 2:30:43PM |
| BRIAN WADE | Isidro Perez | Supervisor |
| INSPECTOR NAME | NAME<br>INSPECTION DATE: 05/06/2022 | TITLE<br>REPORT DATE: 5/6/22 2:36 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector BRIAN WADE within 30 days of inspection unless otherwise specified.**

RESPONDENT: Patricia Mohr

VIOLATION(S) CITED ON: 5/6/2022

FACILITY NAME: **GH Dairy #4** FACILITY ID: **FA0017949**

SITE ADDRESS: **8061 Edison Ave** CERS ID: **10741726**

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H209 CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated in CERS.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: GH Dairy #4 Facility ID #: 17949

Address: 8061 Edison Avenue Ontario, CA 91762

1) Description: View of the facility from Edison Avenue facing South.

2) Description: Storage area for milking barn cleaning and sanitizing chemicals located on the West side of the barn.

Date Taken: **5/6/2022**

Taken By: **Brian Wade** Signature: _____

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

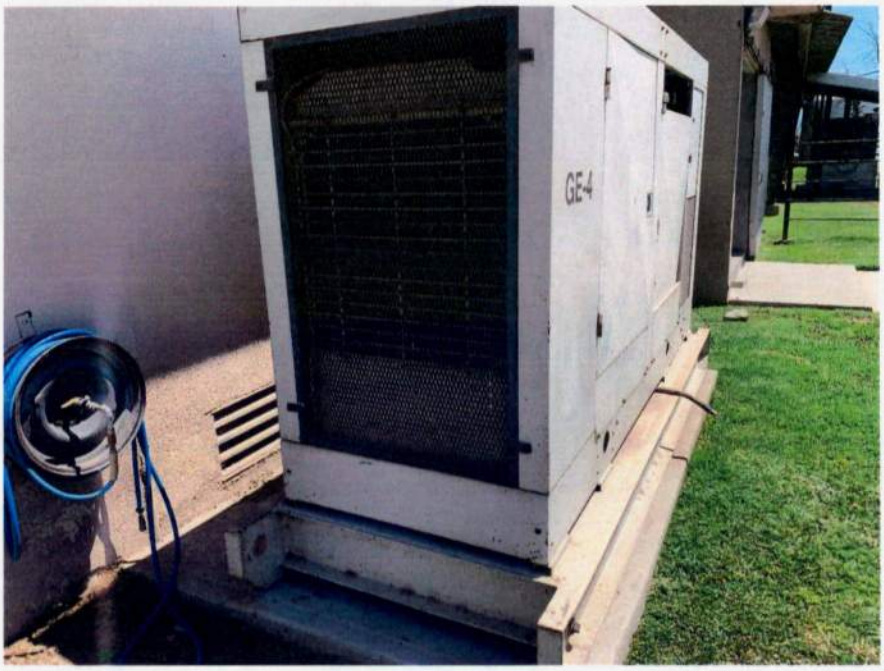


**PHOTO 4**

| | | | |
|---|---|---|---|
| Facility/Case Name: | GH Dairy #4 | Facility ID #: | 17949 |
| Address: | 8061 Edison Avenue Ontario, CA 91762 | | |
| 3) Description: | A back up generator with a diesel fuel belly tank of unknown quantity located outside on the West side of the milking barn. | | |
| 4) Description: | No Photo | | |

Date Taken: **5/6/2022**

Taken By: **Brian Wade** Signature: Brian Wade

Rev 06/29/2018

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Don Trapp
Interim Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal

October 22, 2019

GH DAIRY (GERBEN HETTINGA)
14651 S Grove Ave
Ontario, CA 91762

**ATTN: PATRICIA MOHR**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0017949-GH Dairy #4**
**8061 Edison Ave**
**Ontario, CA 91762**

Ms. Mohr,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on July 09, 2019:

- Failure to electronically update business plan within 30 days of any one of the following events:
  A 100 percent or more increase in the quantity of a previously disclosed material.
  Any handling of a previously undisclosed hazardous materials at or above reportable quantities.
  A change of business address, business ownership, or business name.
  A substantial change in the handler's operations that requires modification to any portion of the business plan.
- Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**

BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
|---|---|---|---|---|---|
| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

CUPA

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**CUPA COMPLIANCE INSPECTION REPORT**

| | |
|---|---|
| NAME: **GH Dairy #4** | FACILITY ID: **FA0017949** |
| ADDRESS: **8061 Edison Ave** | CERS ID: **10741726** |
| CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **7/9/2019** |

**Consent granted by:**

[X] **Photograph** [X] **Inspect** **Name:** Isidro Perez **Title:** Supervisor

An inspection was conducted on July 9, 2019 to determine compliance with hazardous waste and hazardous material laws and regulations. Isidro Perez, Supervisor, and Eric Perez, Part Time Worker, provided escort throughout the inspection.

This facility is a dairy operation which maintains hazardous materials on site for use in milking barn cleaning and sanitation. Sodium hypochlorite is used on site for well water disinfection. Hazardous wastes are not routinely generated on site.

HAZARDOUS MATERIALS INVENTORY:
The hazardous materials observed on site during the inspection appeared to be consistent with the inventory submitted in the California Environmental Reporting System (CERS) on 5/24/2018, CERS ID 10741726, except for the following:
(2) 55-gallon drums of Iodine Teat Dip
(2) 55-gallon drums of sodium hypochlorite
(2) 55-gallon drums of Oxy Gard M
Back up generator with a diesel belly tank of unknown maximum capacity

DOCUMENTATION REVIEW:
-Equipment and trucks are serviced by mechanics from GH Dairy 1. Any materials used and wastes generated are consolidated back at that location for disposal.
-The back up generator is serviced by WICO.
-Chemicals are delivered by Animal Health International. This company also removes the empty 55-gallon drums.
-The permits are current; expiration date of 8/31/2019.
-Zoetis provides regular chemical safety training and covers additional safety topics.

Submit a signed Certificate of Compliance with required documentation to this office within 30 days.

If you have any questions, feel free to contact me at 909-658-5912 or bwade@sbcfire.org. If you have any questions regarding CERS, please contact the CERS helpline at 909-386-8432 or efile@sbcfire.org.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | Hazardous Materials Business Plan Submittal | CHSC | 25505, 25508(a)(1) | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | CHSC | 25510(a) | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | **Business Plan Annual Review/Certification** | CHSC | 25508(a)(1), 25508.2 | X |
| Violation: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. | | | |
| MINOR | OBSERVATION: The last Business Plan update submitted by this facility is dated 5/24/2018.<br><br>CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS. | | | |

| | | | | |
|---|---|---|---|---|
| H209 | **Business Plan Update Within 30 days of change** | CHSC | 25508.1(a)-(f) | X |
| Violation:<br><br><br><br><br>MINOR | Failure to electronically update business plan within 30 days of any one of the following events:<br>A 100 percent or more increase in the quantity of a previously disclosed material.<br>Any handling of a previously undisclosed hazardous materials at or above reportable quantities.<br>A change of business address, business ownership, or business name.<br>A substantial change in the handler's operations that requires modification to any portion of the business plan.<br><br>OBSERVATION: Hazardous materials were observed on site during the inspection that are not listed in the most current CERS inventory or are listed in lesser quantities. Also, the emergency response plan submitted in CERS does not list the correct emergency contact number for the local CUPA. Revise the contact number to list either 909-386-8425 or 800-33-TOXIC and resubmit the plan.<br><br>CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS. | | | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | CHSC | 25508(a)(1) | |
| H211 | Hazardous Materials Inventory | CHSC | 25505, 25506, 25508 | |
| H212 | Site Map | CHSC | 25505(a)(2), 25508(a)(1) | |
| H213 | Emergency Response Plan | CHSC | 25505(a)(3), 25508(a)(1) | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Documentation | CHSC | 25505(a)(4) | |
| H216 | Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,255 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 7/9/19 2:22:41PM<br>LTR:7/9/2019 2:07:39PM |
|---|---|---|
| BRIAN WADE | Isidro Perez | Supervisor |
| INSPECTOR NAME | NAME<br>INSPECTION DATE: 07/09/2019 | TITLE<br>REPORT DATE: 7/9/19 2:24 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector BRIAN WADE within 30 days of inspection unless otherwise specified.**

RESPONDENT: Patricia Mohr

VIOLATION(S) CITED ON: 7/9/2019

FACILITY NAME: **GH Dairy #4** FACILITY ID: **FA0017949**

SITE ADDRESS: **8061 Edison Ave** CERS ID: **10741726**

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H209 CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS.

H206 CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: GH Dairy #4 Facility ID #: 17949

Address: 8061 Edison Avenue Ontario, CA 91762

1) Description: View of the facility from Edison facing South.

2) Description: (1) 55-gallon drum of sodium hypochlorite, (1) 55-gallon drum of HD PL-10 Acid Plus, (2) 55-gallon drums of iodine teat dip, and (1) 55-gallon drum of Liquid HD-325 stored in the milking barn.

Date Taken: **7/9/2019**

Taken By: **Brian Wade** Signature: Brian Wade

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

| | | | |
|---|---|---|---|
| Facility/Case Name: | GH Dairy #4 | Facility ID #: | 17949 |
| Address: | 8061 Edison Avenue Ontario, CA 91762 | | |
| 3) Description: | (1) 55-gallon drum of Exit fly killer and (2) 55-gallon drums of Oxy Gard M stored in the milking barn. | | |
| 4) Description: | (19) 50-pound bags of copper sulfate stored in the milking barn. | | |

Date Taken: **7/9/2019**

Taken By: **Brian Wade** Signature: Brian Wade

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 5**

**PHOTO 6**

Facility/Case Name: GH Dairy #4 Facility ID #: 17949

Address: 8061 Edison Avenue Ontario, CA 91762

5) Description: A back up generator with a diesel fuel belly tank located outside of the milking barn.

6) Description: (1) 55-gallon drum of sodium hypochlorite located to the West of the milking barn at a well used for water disinfection.

Date Taken: **7/9/2019**

Taken By: **Brian Wade** Signature: Brian Wade

Rev 06/29/2018

| | | | | |
|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

JACK & ELANE ALEWYN
9031 EUCALYPTUS AVE.
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JACK ALEWYN DAIRY
8185 EDISON BLVD
ONTARIO, CA 91761

Permit is issued to Facility: FA0000508 for a period not to exceed one year from effective date.

Effective Date: 12/1/2007 Expiration Date: 11/30/2008

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003498 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004040 |

SAN BERNARDINO COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO 1853

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ALEWYN DAIRY #3
9031 EUCALYPTUS AVE.
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JACK ALEWYN DAIRY
8185 EDISON BLVD
ONTARIO, CA 91761

Permit is issued to Facility: FA0000508 for a period not to exceed one year from effective date.

Effective Date: 12/1/2006 Expiration Date: 11/30/2007

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003498 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004040 |

SAN BERNARDINO COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO 1853

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

12-20962-638 Rev. 9/06

OOB

# HAZARDOUS MATERIAL FIELD SERVICES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

File

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000275

Legal Owner

Closure

*NAME: JACK & ELANE ALEWYN

*ADDRESS 1: 9031 EUCALYPTUS AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *COUNTRY: USA

*PHONE: 909-721-4551 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 06/10/2010

**OWNER MAILING ADDRESS** ☐ Same as Owner

CARE OF: DBA: JACK & ELANE ALEWYN

ADDRESS1: 9031 EUCALYPTUS AVE. ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

### F- FACILITY INFORMATION — FACILITY ID: FA0000508

*NAME: JACK ALEWYN DAIRY CERS ID:

*ADDRESS 1: 8185 EDISON BLVD ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

*PHONE: 909-721-4551 EXT: ALT PHONE: EXT: FAX: 909-923-0714

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: INDIVIDUAL *BUSINESS TYPE: FARM FYI LAST UPDATED: 01/02/2013

**FACILITY MAILING ADDRESS** ☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: JACK ALEWYN DAIRY

CARE OF: JACK ALEWYN

ADDRESS 1: 8185 EDISON BLVD ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

*EMAIL:

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION — ACCOUNT ID: AR0000510

RESPONSIBLE PARTY: JACK ALEWYN ☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

CARE OF: JACK ALEWYN DAIRY

ADDRESS 1: 8185 EDISON ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

PHONE: 909-721-4551 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 10/15/2007

FYI ANNIVERSARY DATE: 11/30/2001 FYI ACCOUNT STATUS: ~~ACTIVE ACCOUNT~~ Inactive FYI TOTAL DUE: 0.00

ENVIRONMENTAL CONTACT NAME: JACK ALEWYN EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0003498<br>PERMIT NUMBER. | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-.<br>ORIGINAL P.E. | 12/01/2007<br>EFFECTIVE DATE | 11/30/2008<br>EXPIRATION DATE |
| | | | PR0004040<br>GHP OR UST ID | INACTIVE, NON-BILLAB<br>CURRENT STATUS(BILLING) | UPDATED P.E. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? (Yes) No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? (Yes) No

ENTERED

*DATE SUBMITTED: 1-10-13 DATE ENTERED: JAN 11 2013 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: K. Alfelor ENTERED BY: J. Guerra ***Demand bill for updated PEs**: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Closure inspection conducted on 1-9-13. Facility is no longer in business. No containers of hazardous materials and/or hazardous waste observed. Inactivate all operating permits.

– K. Alfelor

1-10-13

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to **complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0508 Facility Name: Jack Alewyn Dairy #1 Inspection Date: January 9, 2013

Site Address: 8185 Edison Blvd. Phone #: 909-721-4551

City: Ontario 91762 91761 EPA ID #:

Consent Granted by:

☒ Inspect ☒ Photograph Name: Title: # Emp: 0

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | X |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(a) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | X |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | X |
| 206. Regulated Substances registration filed | CHSC 25533 | | | X |
| 207. SPCC Plan prepared | CHSC 25270.4.5 | | | X |

**INSPECTION NARRATIVE**

**A closure inspection was conducted on 01/09/13 to determine compliance with applicable hazardous materials/ hazardous waste laws and regulations.**

**Jack Alewyn Dairy #1 is no longer in business. There were no containers of hazardous materials and hazardous waste observed onsite.**

**All operating permits will be inactivated immediately.**

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: Kris Alfelor (Sign Name) Received By: (Sign Name) Title:

Kristian Alfelor (Print Name) (Print Name) Report Date: January 10, 2013

KB

Form Revised 1/16/2007

Inactivate

# HAZAF US MATERIAL FIELD SERVICE
# COMPUTER DATABASE UPDATE AUTHORIZATION

**COMPLETED**

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

**OWNER ID: OW0000275**

NAME: **JACK & ELANE ALEWYN**

ADDRESS 1: **9031 EUCALYPTUS AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** COUNTRY: **USA**

PHONE: **909-721-4551** EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: **07/27/2007**

### OWNER MAILING ADDRESS

CARE OF: DBA: **JACK & ELANE ALEWYN**

ADDRESS1: **9031 EUCALYPTUS AVE.** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** COUNTRY: **USA**

## F- FACILITY INFORMATION

**FACILITY ID: FA0000508**

NAME: **JACK ALEWYN DAIRY**

ADDRESS 1: **8185 EDISON BLVD** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** CITY CODE: **ONTARIO**

SIC CODE: BUSINESS CODE: **INDIVIDUAL** BUSINESS TYPE: **FARM**

CENSUS: SUPERVISORIAL DISTRICT: **004** INSPECTION DISTRICT: **03**

PHONE: **909-721-4551** EXT: FIRE JURISDICTION: **ONTARIO FIRE**

ALT PHONE: EXT: FAX: **909-923-0714** LAST UPDATED: **07/26/2007**

### FACILITY MAILING ADDRESS

BUSINESS NAME: **JACK ALEWYN DAIRY**

CARE OF: **JACK ALEWYN**

ADDRESS 1: **8185 EDISON BLVD** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** COUNTRY: **USA**

EMAIL:

## A- A/R INFORMATION

**ACCOUNT ID: AR0000510**

RESPONSIBLE PARTY: **JACK ALEWYN**

CARE OF: **JACK ALEWYN DAIRY**

ADDRESS 1: **8185 EDISON** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** COUNTRY: **USA**

PHONE: **909-721-4551** EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: **12/06/2007**

ALT PHONE: EXT: EXEMPT FROM BILLING: **NO** TAX ID:

ANNIVERSARY DATE: **11/30/2001** TOTAL DUE: **0.00** ACCOUNT STATUS: **ACTIVE ACCOUNT**

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| UPDATE/CLOSE/Z.O.B. | PT0003498 | ACTIVE | 4221 | I/2007 | 11/30/2008 |
|---|---|---|---|---|---|
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |

| PR0004040 | ACTIVE, BILLABLE | NA | NA | |
|---|---|---|---|---|
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. _____ NUMBER OF UST'S 0 MFR # _____

DATE SUBMITTED: 1-3-08 DATE ENTERED: 1/7/08 FISCAL DATE: _____

SUBMITTED BY: Leslie Heavisides ENTERED BY: CW

**COMMENTS/REMARKS:**

Per fire and BP: facility has below permittable quantities of haz mat.
Inactivate PE 4221.

AG - PE update

# HAZ OUS MATERIAL FIELD SERVI
# COMP TER DATABASE UPDATE AUTHORIZATION

(2)

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000275

NAME: ~~ALEWYN, JAKE J~~ Alewyn, Jack

ADDRESS 1: ~~14631 GROVE AV~~ 9031 Eucalyptus ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-9171~~ 91761 COUNTRY:

PHONE: (909) 721-4551 EXT: FAX:

ALT PHONE: 000-000-0000 EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Jack Alewyn DBA: ~~ALEWYN, JAKE J~~ Jack Alewyn Dairy

ADDRESS1: ~~14631 GROVE AV~~ 9031 Eucalyptus ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91761 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000508

NAME: ~~AG~~-JACK ALEWYN DAIRY

ADDRESS 1: 8185 EDISON BLVD ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-0000~~ 91761 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 03

PHONE: ~~000-000-0000~~ (909) 721 EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: 4551 EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-JACK ALEWYN DAIRY

CARE OF:

ADDRESS 1: 8185 EDISON BLVD ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91710-0000 COUNTRY:

EMAIL:

RCD SDD FIRE FISCAL
07 MAY 22 PM 12

## A- A/R INFORMATION

ACCOUNT ID: AR0000510

RESPONSIBLE PARTY: Jack Alewyn

CARE OF: Jack Alewyn Dairy

ADDRESS 1: 8185 Edison ADDRESS 2:

CITY: Ontario STATE: ZIP CODE: COUNTRY:

PHONE: (909) 721-4551 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 05/04/2007

ALT PHONE: EXT: EXEMPT FROM BILLING: YES TAX ID:

ANNIVERSARY DATE: 11/30/2001 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT00034! | ACTIVE | 4230 | !/01/2000 | 11/30/2001 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0004040 | ACTIVE, BILLABLE | NA | NA | | 4221 |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 3 NUMBER OF UST'S 0 MFR #

ENTERED

DATE SUBMITTED: 5-8-07 DATE ENTERED: MAY 14 2007 FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

Per inspection: Son, Jack Alcwyn, owns dairy. Update owner info.
Also update FA info (city change).

Assign PE 4221.
Demand bill.

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**

**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**

# BUSINESS OWNER / OPERATOR IDENTIFICATION

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 5 0 8 | | (This number is on your CUPA permit.) |
| EFFECTIVE DATE 100<br>May 1,2007 | ENDING DATE 101<br>3-1-08 | | |
| BUSINESS NAME (Same as FACILITY NAME or DBA)<br>Alewyn Dairy #1 | | BUSINESS PHONE<br>909/923-0714 | |
| BUSINESS SITE ADDRESS 103<br>8185 Edison Ave | | | |
| CITY 104<br>Ontario | COUNTY 108<br>SAN BERNARDINO | STATE<br>CA | ZIP CODE 105<br>91762 |
| D&B NUMBER | PRIMARY SIC/NAICS CODE 107<br>0241 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE<br>Milk Producer | |
| BUSINESS OPERATOR NAME 109<br>Jack & Elane Alewyn | | BUSINESS OPERATOR PHONE 110<br>909/923-0714 | |

## II. BUSINESS OWNER

| | | | |
|---|---|---|---|
| OWNER NAME 111<br>Jack & Elane Alewyn | | OWNER PHONE 112<br>909/923-0714 | |
| OWNER MAILING ADDRESS 113<br>9031 Eucalyptus Ave. | | | |
| CITY 114<br>Ontario | | STATE 115<br>CA | ZIP CODE 116<br>91762 |

## III. ENVIRONMENTAL CONTACT

| | | | |
|---|---|---|---|
| CONTACT NAME<br>Jack or Elane Alewyn | | CONTACT PHONE 118<br>909/923-0714 home 909/721-4550 cell 909/721-4551 | |
| CONTACT MAILING ADDRESS 119<br>9031 Eucalyptus Ave | | | |
| CITY 120<br>Ontario | | STATE 121<br>CA | ZIP CODE 122<br>91762 |

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123<br>Jack Alewyn | NAME 128<br>Elane Alewyn |
| TITLE 124<br>Owner | TITLE 129<br>Owner |
| BUSINESS PHONE 125<br>909/923-0714 | BUSINESS PHONE<br>909/923-0714 |
| HOME PHONE **(NOT CONFIDENTIAL - SEE NOTE BELOW)**<br>Same as above | HOME PHONE **(NOT CONFIDENTIAL - SEE NOTE BELOW)**<br>Same as above |
| OTHER 24-HOUR PHONE **(NOT CONFIDENTIAL – SEE NOTE BELOW)** | 24-HOUR PHONE **(NOT CONFIDENTIAL – SEE NOTE BELOW)** 131 |
| PAGER/CELL # 127<br>909/721-4551 | PAGER /CELL # 132<br>909/721-4550 |

***HOME** PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. **IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK.** ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

| | | |
|---|---|---|
| SIGNATURE OF OWNER/OPERATOR<br>Elane Alewyn | NAME OF SIGNER *(print)* 136<br>Elane Alewyn | DATE 134<br>5/1/07 |

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620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 0 8 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA) 3
Alewyn Dairy #1

FACILITY ADDRESS: 8185 Edison Ave
CITY: Ontario 91762 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

| BUSINESS MAILING ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 9031 Eucalyptus Ave. | Ontario | CA | 91762 |

| BUSINESS FAX NUMBER | BUSINESS E-MAIL |
|---|---|
| 909/923-0714 | |

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

| Total # of Employees per shift | SHIFT 1 | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION |
|---|---|---|---|---|
| 3 | 3 | 3 | | 24 |

| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | TOTAL # EMPLOYEES | TAXPAYER ID NUMBER |
|---|---|---|
| | 15 | 95-3247370 |

ASSESSORS PARCEL NUMBER (S): Unknown , leased
CROSS STREET: S/E corner Grove - Edison

BUSINESS DESCRIPTION: Milk Producer

Number of Underground Storage Tanks located at this facility: none

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☐ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 5-1-07

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| BUSINESS NAME (Same as FACILITY NAME or DBA) | | |
|---|---|---|
| Alewyn Dairy | | |
| FACILITY ADDRESS 103 | CITY 104 | |
| 8185 Edison Ave. | Ontario, CA 91762 | |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification**: **If a situation is an emergency, call 911 first.** Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | **911** |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | **(800) 33-TOXIC** or **(909) 386-8425** |
| 3. *State of California, Governor's Office of Emergency Services | **(800) 852-7550** or **(916) 845-8911** |
| 4. National Response Center | **(800) 424-8802** |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Alewyn Dairy | |
| FACILITY ADDRESS 103 | CITY 104<br>Ontario, CA 91762 |

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:

For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

**In case of emergency, all employees are directed to leave milking parlor thru open breezeways and go to grassy area in front circle Of milking barn. (Entire facility is in open air.)**

**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√ Check those items that apply and write additional information in the space provided).

- [x] Reduction of containers on site if not used or needed.
- [x] Containers are properly labeled and closed when not in use.
- [ ] Compressed gas cylinders are properly secured.
- [ ] Use of monitoring system. Type: _____
- [x] Other: Suppliers are contacted to remove empty containers in a timely fashion. (containers have empty container deposits.)

Date: 5/1/07

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Alewyn Dairy #1 | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8185 Edison Ave | Ontario, CA 91762 |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- [x] New employee training.
- [ ] Annual training & periodic refresher courses.
- [x] Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- [ ] Spill control equipment
- [ ] Monitoring system
- [ ] Personal Protective Equipment
- [x] On the job training. Describe below.
- [x] Other: weekly supply check by employee
  monthly supply check by suppliers

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√ Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- [x] Identify potential hazards and determine whether a release has occurred.
- [x] Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- [x] Coordinate the notification and evacuation of employees and customers from the facility.
- [x] Make required agency notifications and request needed assistance.
- [x] Assist responding agencies by providing access to the facility and information about the facility.
- [ ] Other:

BUSINESS NAME (Same as FACILITY NAME or DBA)
Alewyn Dairy

| FACILITY ADDRESS 103 | CITY 104 |
|---|---|
| | Ontario, CA 91762 |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√ Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | 1 ea hand held | Yearly |
| ☒ First aid kit(s) | 1 ea | replaced as needed |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☐ Personal Protective Equipment | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√ Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste  Floor Drains, open air storage
- ☐ Process vessels
- ☐ Aboveground storage tanks
- ☐ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☐ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√ Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler none
- ☐ Emergency response team
- ☐ Local Hospitals **Inland Industrial Medical, location posted in work area. Treatment plan in place for injuries**
- ☐ Other:
- ☐ No arrangements or agreements at this time

Date: 5/1/07

CUPA
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 0 8 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA)
Alewyn Dairy #1

FACILITY ADDRESS 103
8185 Edison Ave.

CITY 104
Ontario, CA 91762

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| | No qualifying hazardous materials | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER *(print)* 136 | DATE 134 |
|---|---|---|
| Elane Alewyn | Elane Alewyn | 5/1/07 |

Inventory Summary Page ____ of ____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

***One page per item. Indicate if material OR waste (Do not combine material and waste on one form)***

**MAKE COPIES OF THIS FORM AS NEEDED.**

***ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.***

**ITEM NUMBER** _____

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 5 0 8 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME<br>Alewyn Dairy | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS<br>8185 Edison Ave Ont 91762 | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME<br>no qualifying chemicals | TRADE SECRET ☐ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME | EHS* ☐ YES ☐ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)* ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☐ | CURIES

PHYSICAL STATE *(Check one item only)* ☐ a. SOLID ☐ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER:

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| | | | |

UNITS* *(Check one item only)* ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE **365**

STORAGE CONTAINER *(Check all that apply)*

| | | | | |
|---|---|---|---|---|
| ☐ a. ABOVEGROUND TANK | ☐ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. | | ☐ YES ☐ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

| | |
|---|---|
| NOTES *(Trade names/synonyms or other information relevant to the substances listed)* | ***If EPCRA, Owner/Operator please sign this page*** |

Date: _____

Fax Coversheet:
To:

San Bernardino County
Fire Dept
January 3, 2008

Attn: Leslie
909/386-8460

From:

Alewyn Dairy #1

Site Address:
8185 Edison Ave.
Ontario

Memo:

The Dairy # 1 on Edison Ave. stores no qualifying chemicals over 55 gallons. The only chemical in bulk storage is Iodine Dip and that is less than 1%.

Thank you so much for your help. Please call me if you have any questions.

Elane Alewyn

Elane Alewyn
Alewyn Dairy
909/923-0714 fax and phone

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**
**www.sbcfire.org**

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp
RECEIVED
JUN 11 2007
S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 0 0 5 0 8

BUSINESS NAME (Same as FACILITY NAME or DBA) 3
Alewyn Dairy #1

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8185 Edison Ave | Ontario | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ — ***Items with an ' * ' are considered "Inventory" under State disclosure laws***

- ☒ * Business Activities Form
- ☒ * Business Owner/Operator Identification Form
- ☒ * Supplemental Emergency Contact Page
- ☒ Emergency Response Plans and Procedures
- ☒ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☒ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☒ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☒ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☒ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☒ Area map - photocopied city map with location of site indicated
- ☒ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☒ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☒ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.
- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER 135 |
|---|---|---|
| Elane Alewyn | 5-1-07 | Elane Alewyn |

| NAME OF SIGNER *(print)* | TITLE OF SIGNER *(print)* |
|---|---|
| Elane Alewyn | owner |

ENTERED
JUL 26 2007

FD SENT
JUL 03 2007

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 0 8 [redacted]

| BUSINESS NAME (Same as FACILITY NAME or DBA) | EPA ID # (Hazardous Waste Only) |
|---|---|
| Alewyn Dairy #1 | |

| BUSINESS ADDRESS | CITY | ZIP CODE |
|---|---|---|
| 9031 Eucalyptus Ave. | Ontario | 91762 |

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731)<br>* CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank)<br>* HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page<br>* BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY<br>* ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

# Business Emergency/Contingency Plan Receipt

Mail to: JACK & ELANE ALEWYN
9031 EUCALYPTUS AVE.
ONTARIO, CA 91761

Site Address: JACK ALEWYN DAIRY
8185 EDISON BLVD
ONTARIO, CA 91761

Service Request ID: SR0013911
Facility ID: FA0000508

The Business Emergency/Contingency Plan was received on June 11, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.

2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.

3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.

4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.

5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.

2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.

3. Change of business address, business ownership, or business name.

4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0005508 Facility Name: Jack Henryn Dairy Inspection Date: April 23, 2007

Site Address: 8185 Edison Phone #: (909) 724-4551

City: Ontario Zip Code: 91761 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: John Hernandez Title: Manager # Emp: 3 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☒ 101. 201 Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires hazardous materials permit

**Compliance requirements Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (4) 55 gal drums Thalore tank dip
(1) 30 gal Chlorinated Soap
(1) 30 gal drum Acid
- no hazardous waste observed

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) NA

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) NA

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) NA

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) NA

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) NA

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) NA

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) NA

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) NA

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) NA

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) NA

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) NA

**Compliance Requirement**: Submit copies of waste disposal records for the past NA

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) NA

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy-milk production. Equipment is serviced by Kent Aery.

Inspected By: [signature] Sign Name — Leslie Heaviside Print Name

Received By: [signature] Sign Name — Jack Henryn Print Name

Title: Owner

Report Date: April 23, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date



* see attached supplemental *

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org**

# SUPPLEMENTAL INSPECTION REPORT

Page 1 of 1

INSPECTION DATE: April 23, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0003508 | Jack Alewyn Dairy | 8185 Edison, Ontario |
| Consent Granted by: ☑ Inspect ☑ Photograph | NAME John Hernandez | TITLE Manager |

Jack Alewyn stated that the Indure teat dip is only 0.5% Iodine. However, the MSDS provided showed that the concentration of Iodine is 2.5 - 3.0%. Mr. Alewyn called the supplier to verify that the product is diluted to 0.5%. If an MSDS can be provided documenting that the only hazardous constituent in this product is 0.5% Iodine, a permit will not be required for this facility.
This facility will only be exempt from permitting as long as there is less than 55 gallons of hazardous materials and no hazardous waste is generated.

☑ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Hernandez (Print Name)

Received By: [signature] (Sign Name) Jack Alewyn (Print Name)

Title: Owner

Report Date: April 23, 2007

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

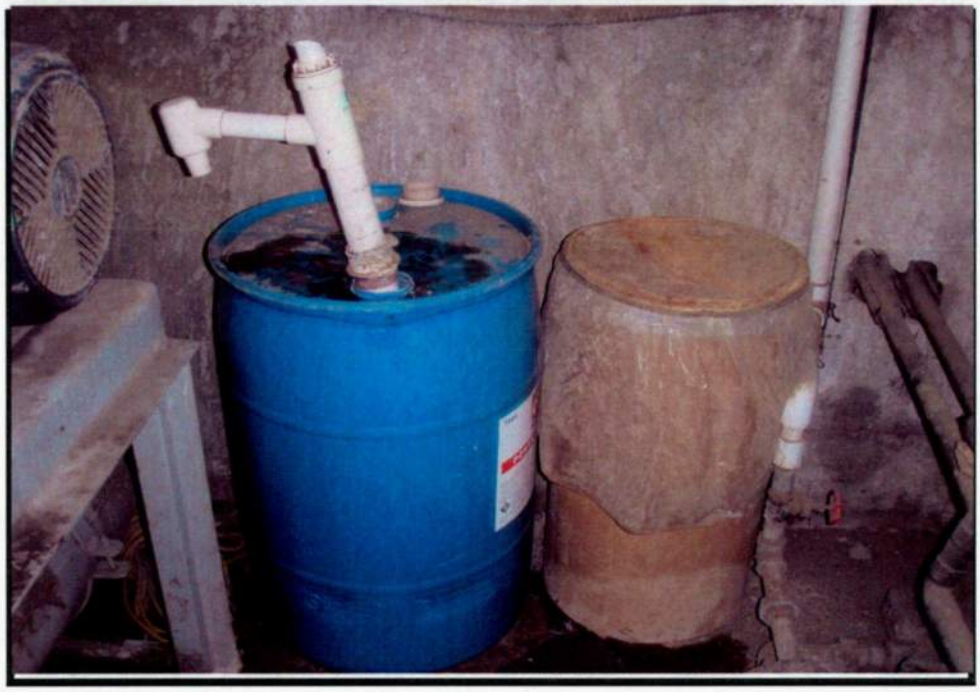

Facility/Case Name: **Jack Alewyn Dairy** Facility ID #: **FA0000508**

Address: **8185 Edison Avenue, Ontario**

1) Description: **(2) 55-gallon drums of teat dip**

2) Description: **(L to R): (1) 30-gallon drum of Power Plus acid cleaner; (1) 20-gallon container of chlorinated soap**

Date Taken: **April 23, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

TRACKING SHEET FOR BUSINESS PLANS

*Establishment #* FA 508

*Facility Name:* Jack Alewyn (Alewyn #1) Dairy

*Facility Site Address:* 8185 Edison

*City:* Ontario

*Fire Agency:* Ontario

2 (# of copies)

| | | Sent to FD |
|---|---|---|
| **Business Plans Received** | 06/11/07 | 07/03/07 |
| **Results of Review(s)** | | |
| **Deficiency** | | __/__/__ |
| **Conditional Approval** | | __/__/__ |
| **Approval** | | __/__/__ |

| | | Sent to FD |
|---|---|---|
| **Revised Plans Received** | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

| Other Date | Action/Documentation (update, new plan, etc.) | Staff hours |
|---|---|---|
| 01/03/08 | BP - rec'd fax indicating haz mat below 55 gals | 1h |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

HA[illegible]RDOUS MATERIALS FIELD SE[illegible]ICES
COMPUTER DATA BASE UPDATE AUTHORIZATION

CHANGE ☑

INACTIVATE PERMIT(S) ☒ INACTIVATE FACILITY ☐

BILL TO: E A O LOC/DIST NO: 53 EST NO: 87014228
(Circle one)
(Former Est. Name (if applicable)

**E – Establishment Information**
Name: AG-Jack Alewyn Dairy
Street No: 8185 Fraction: Direction:
Street Name: Edison Apt/Ste/Unit No:
City: Chino State: CA Zip Code: 91710
Attn: Telephone: ( )

**A – Applicant Information**
Name:
Street No: Fraction: Direction:
Street Name: Apt/Ste/Unit No:
City: State: Zip Code:
Attn: Telephone: ( )

**O – Owner Information**
Name:
Street No: Fraction: Direction:
Street Name: Apt/Ste/Unit No:
City: State: Zip Code:
Attn: Telephone: ( )

Program Information: MFR Number
Number of Employees: Number of UST's:
Federal Tax I.D.Number/Social Security Number:

Permit Information: (Circle those that apply)
Change/Inactivate/Add: 226000 Permit No: 8707300006
Change/Inactivate/Add: 222800 Permit No: 8808230004
Change/Inactivate/Add: 222801 Permit No: 8808230005
Change/Inactivate/Add: 227001 Permit No: 9709091180
Change/Inactivate/Add: 226014 Permit No:

Date Submitted: 9/26/01 Date Entered: 10/2/01
Submitted By: C Parsons. Entered By: L. Lara-Davis

Comments/Remarks:
Pls change permit catagories

222800 & 222801 inactivate all permits

70100 AUG 22 KV 8/19

**COMPUTER DATA BASE UPDATE AUTHORIZATION**

**ACTION REQUESTED (Circle One) est name

**Add** **Change** **Inactivate** **Delete**

**ESTABLISHMENT INFORMATION:

Jack Alewyn Dairy
(Name)

8185 Redlands Chino
(Number/Street) (City)

*PERMIT CATEGORY 222800 & 222801 - add

CHANGE PERMIT CATEGORY FROM _____ TO _____

LEGAL OWNER INFORMATION:

(Name)

(Mailing Address) (City) (Zip)

THIS IS A **NEW** ESTABLISHMENT: _____

THIS IS A **TRANSFER**: _____

Former Establishment Name: _____

PERMIT SECTION SHOULD SEND NEW APPLICATION: _____

NEW APPLICATION HAS BEEN GIVEN TO NEW OWNER: _____

ESTABLISHMENT **NAME CHANGE ONLY** (no change in ownership):

(Old Name)

* AG - Jack Alewyn Dairy
(New Name)

OK

MARK DESIRED BOX(ES):

| Make Change To | Date | Initial |
|---|---|---|
| EH PERMIT BILLING SYSTEM | | |
| SWEEPS | | |
| ESTABLISHMENT FILE | | |

**EHS PERMIT BILLING SYSTEM: 87014228
(Establishment Number)

(Permit Number - Mandatory except for new establishment)

*SWEEPS MFR NUMBER _____ *DIST/SANI NUMBER _____

CHANGE DIST/SANI FROM _____ TO _____

**PROGRAM _____ LOCATION _____

**PROGRAM SPECIFIC INFORMATION**

**FOOD:** Seating Capacity _____

Square Footage _____

**RECREATIONAL BATHING:** # of Pools _____

**MILK AND DAIRY:** Gallons _____

**HAZARDOUS MATERIALS:** # of Tanks 1

# of Employees _____

**HOUSING:** # of Units _____

**VECTOR:** # of Birds _____

**WASTE:** Daily Tons _____

Cubic Yards _____

**WATER:** # of Connections _____

License Number/Expiration Date 9/30/87

License Class 1 _____ 2 _____

*** = Mandatory for Food Program Only**
**** = Mandatory for ALL Programs**

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 7010001 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8808230004 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8808230004 | 222800 | I | 09/30/87 | | 00 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 7010001 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8808230004 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

*** CONTROL NUMBER: 7010002 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8808230005 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8808230005 | 222801 | I | 09/30/87 | | 00 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 7010002 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8808230005 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

Not On County Billing System

STATE: CA 36 SAN BERNARDINO #36
999 COUNTY AT LARGE
001 ENVIRONMENTAL HEALTH SERVICES

STATE SITE ID 00040260
LOCAL SITE ID [redacted]

NOTES

FACILITY ID#: 40260 # OF TANKS AT SITE 1 EPA ID:

FACILITY NAME: JACK ALEWYN DAIRY C/O:

ADDRESS: 8185 EDISON NAME TYPE: UNKNOWN

CITY: CHINO STATE: CA ZIP: 91710 PHONE: (714) 597-2081 EXT

TYPE OF BUSINESS: FARM INDIAN RESERVATION:

NEAREST CROSS STREET:GROVE

SITE INFORMATION (FORM A)
**********
**********
**********

| EMERGENCY CONTACT PERSON (PRIMARY) | | EMERGENCY CONTACT PERSON (SECONDARY) | |
|---|---|---|---|
| NAME | PHONE | NAME | PHONE |
| DAY:JAKE ALEWYN | (714) 597-2081 EXT | | ( ) - EXT |
| IGHT:ALEWYN, JACK | (714) 597-4114 EXT | | ( ) - EXT |

[redacted]

NOT ON ARBS

ROP OWNER NAME: JAKE J. ALEWYN C/O:

DDRESS: 14361 GROVE AVE NAME TYPE: UNKNOWN

ITY: CHINO STATE: CA ZIP: 91710 PHONE: ( ) - EXT

TANK OWNER NAME: JACK ALEWYN DAIRY C/O:

ADDRESS: 8185 EDISON NAME TYPE: UNKNOWN

CITY: CHINO STATE: CA ZIP: 91710 PHONE: ( ) - EXT

LEGAL/BILL NAME: JACK ALEWYN DAIRY C/O:

ADDRESS: 8185 EDISON NAME TYPE: UNKNOWN

CITY: CHINO STATE: CA ZIP: 91710 PHONE: ( ) - EXT

PERMIT #: APPRV'D DATE: - - EXP. DATE: - -

LOCATION: 99 #99 COUNTY AT LARGE CENSUS TRACT#:

DIV: SUP:01 DIST:01 BUSINESS PLAN FILED: N DATE FILED: - -

CHECK #: PERMIT AMT: $.00 SURCHARGE AMT: $.00

FEE CODE: RECEIPT #: REC'D BY:

STATE: CA 36 SAN BERNARDINO #36
999 COUNTY AT LARGE
001 ENVIRONMENTAL HEALTH SERVICES

STATE SITE ID 00040260
LOCAL SITE ID

NOTES

TANK INFORMATION (FORM 8)

FACILITY ID#: 40260 NAME: JACK ALEWYN DAIRY STATE-TANK-ID: 00040260-001

TANK NUMBER: 1 LOCAL-TANK-ID: -

TANK DESCRIPTION

A. OWNERS TANK ID#: 1 B. MANUFACTURED BY:

C. DATE INSTALLED: - - D. CAPACITY IN GALLONS: 250

TANK CONTENTS

A. TANK USE: 1 MOTOR VEHICLE FUEL B. STORAGE: 1 PRODUCT

C. VEHICLE FUEL: 3 DIESEL D. NAME: DIESEL, KEROSENE CAS#: 8008-20-6

TANK CONSTRUCTION

A. SYSTEM TYPE: 95 UNKNOWN B. MATERIAL: 95 UNKNOWN

C. INTERIOR LINING: 95 UNKNOWN IS METHANOL COMPATIBLE?:

D. CORROSION PROTECTION: 95 UNKNOWN

PIPING INFORMATION

| A. PIPING SYSTEM | B. CONSTRUCTION | C. MATERIAL |
|---|---|---|
| A/G 95 UNKNOWN | 95 UNKNOWN | 95 UNKNOWN |
| U/G 1 SUCTION | 95 UNKNOWN | 95 UNKNOWN |

LEAK DETECTION SYSTEM

PRIMARY: 91 NONE SECONDARY: 91 NONE

CLOSED TANK INFO

ESTIMATED LAST USE: - - QUANTITY REMAINING: INERT FILLED:

PERMIT #: APPRV'D DATE: - - EXP. DATE: - -

LOCATION: 99 #99 COUNTY AT LARGE CENSUS TRACT#:

DIV: SUP:01 DIST:01 BUSINESS PLAN FILED: N DATE FILED: - -

CHECK #: PERMIT AMT: $.00 SURCHARGE AMT: $.00

FEE CODE: RECEIPT #: REC'D BY:

AG

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
I N V O I C E

PAGE 1
BILL DATE 08/09/88
HEALTH PERMIT EXPIRATION DATE 09/30/87

*** REMIT COPY ***

ESTABLISHMENT NBR 87014228

ALEWYN, JAKE J
DBA: JACK ALEWYN DAIRY
14631 GROVE AV
CHINO, CA 91710

AUG 17 1988
AG

JACK ALEWYN DAIRY
~~8185 REDLANDS BLVD~~ 8185 EDISON
CHINO, CA 91710

INACT. PERMIT
AUG 17 1988

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 87073[illegible]006 | 226000 | HAZARDOUS MATERIAL HANDLER, UNDERGROUND TANK ONLY | 101 | 40.00 |
| | | PERMIT TOTAL | | 40.00 |
| | | TOTAL DUE | | 40.00 |

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE

REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA. 92415-0160

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK DAIRY ESTABLISHMENTS -- 387-4608
HAZ[illegible]S OR INFECTIOUS
WA[illegible] GENERATORS -- 387-3080
UNDERGROUND STORAGE
TANK PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3044

MOBILEHOME PARK PERMITS -- 387-4670
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-4670
HOME OCCUPATION PERMITS -- 387-4678
TEMPORARY OFFICES/SIGNS -- 387-4678
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4655
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-4678

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO JACK ALEWYN DAIRY
8185 ~~REDLANDS BLVD~~ 8185 EDISON
CHINO, CA 91710

< ✓ > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO ALEWYN, JAKE J
14631 GROVE AV
CHINO, CA 91710

LEGAL OWNER INFO ALEWYN, JAKE J
14631 GROVE AV
CHINO, CA 91710

IS THIS A TRANSFER? _____

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ✓ LEGAL OWNER ___APPLICANT

| OFFICE USE ONLY |
|---|
| EST NBR 87014228 |
| PERMIT NBR 8707300006 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226000 |
| EXPIR DATE 09/30/87 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 2200 |
| MFR NBR |
| APN |
| PERMIT FEE _____ |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D _____ |

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

SIGNED Mrs. Jake Alewyn DATED 8-15-85 TITLE Owner (Wife)

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
INVOICE

PAGE 1
BILL DATE 08/29/87
HEALTH PERMIT EXPIRATION DATE 09/30/87

*** REMIT COPY ***

ESTABLISHMENT NBR 87014228

ALEWYN, JAKE J
DBA: JACK ALEWYN DAIRY
14631 GROVE AV
CHINO, CA 91710

JACK ALEWYN DAIRY
8185 ~~ROLLINGS~~ EDISON BLVD
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 8707300004 | 222800 | PREVIOUS BALANCE | | 0.00 |
| | | UNDERGROUND STORAGE TANKS | 101 | 112.00 |
| | | PERMIT TOTAL | | 112.00 |
| 8707300005 | 222801 | PREVIOUS BALANCE | | 0.00 |
| | | UNDERGROUND STORAGE TANK STATE FEE | 101 | 0.00 |
| | | STATE FEE | 105 | 56.00 |
| | | PERMIT TOTAL | | 56.00 |
| 8707300006 | 226000 | PREVIOUS BALANCE | | 0.00 |
| | | HAZARDOUS MATERIAL HANDLER, UNDERGROUND TANK ONLY | 101 | 40.00 |
| | | PERMIT TOTAL | | 40.00 |
| | | TOTAL DUE | | 208.00 |

9-10-89
This is an agricultural business. The tank is used for diesel for our tractors only. Should your office need we will send you a copy of this form. We were already called regarding this with the same information.
Thank you
Mr. Jake Alewyn

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS
WASTE GENERATORS -- 387-4629
UNDERGROUND STORAGE
TANK PERMITS -- 387-4629
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3080

MOBILEHOME PARK PERMITS -- 387-4670
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-4670
HOME OCCUPATION PERMITS -- 387-4670
TEMPORARY OFFICES/SIGNS -- 387-4670
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4655
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO JACK ALEWYN DAIRY

8185 REDLANDS BLVD

CHINO, CA 91710

< > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO ALEWYN, JAKE J

14631 GROVE AV

CHINO, CA 91710

LEGAL OWNER INFO ALEWYN, JAKE J

14631 GROVE AV

CHINO, CA 91710

IS THIS A TRANSFER? _____

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

NUMBER OF UNDERGROUND STORAGE TANKS: 001

| EMERGENCY CONTACT: | POSITION: | WORK PHONE: | 24-HR PHONE: |
|---|---|---|---|
| _ _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

| OFFICE USE ONLY |
|---|
| EST NBR 87014228 |
| PERMIT NBR 8707300004 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 222800 |
| EXPIR DATE 09/30/87 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 2200 |
| MFR NBR |
| APN |
| PERMIT FEE _____ |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D _____ |

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

SIGNED _____ DATED _____ TITLE _____

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RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

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| OFFICE USE ONLY |
|---|
| EST NBR 87014228 |
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SIGNED _____ DATED _____ TITLE _____

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

TO JAKE ALEWYN
14631 GROVE AVE.
CHINO CA. 91710

FROM

SUBJECT CHECK # 8764 - $40.00

DATE 8/17/88

**MESSAGE** DUE TO CONFLICTING OPINIONS REGARDING AGRICULTURAL HAZARDOUS MATERIAL HANDLER STATUS, WE ARE NOT COLLECTING THIS fee AT THIS TIME. YOU WILL BE NOTIFIED SHOULD THIS PROGRAM BE IMPLEMENTED IN THE FUTURE.

SIGNED BILLING CLERK

**REPLY**

SIGNED

DATE / /

REDIFORM 4S 472

SEND PARTS 1 AND 3 INTACT - PART 3 WILL BE RETURNED WITH REPLY.

POLY PAK (50 SETS) 4P472

DETACH AND FILE FOR FOLLOW-UP

HAZARDOUS WASTE & TOXICS CONTROL SECTION
APBS DATA INPUT

FACE SHEET

ACTION CODE: I  Esta. # _____  Permit # _____

ESTABLISHMENT INFO (00)

Bill to: 0  Location # 53  Esta. Date _____

ADDRESSING INFO (99):

E
NAME: Jack Alewyn Dairy
ST. # 8185  FRAC: _____  DIR: _____  ST. NAME: Bedlands Blvd.
ST. DESIG. _____  APT/SP _____
CITY Chino  STATE Ca.  ZIP 91710  PH (___) ___ - _____

A
NAME: Jake J. Alewyn
ST. # 14631  FRAC: _____  DIR: _____  ST. NAME: Grove Ave.
ST. DESIG. _____  APT/SP _____
CITY Chino  STATE Ca.  ZIP 91710  PH (___) ___ - _____

O
NAME: _____
ST. # _____  FRAC: _____  DIR: _____  ST. NAME: _____
ST. DESIG. _____  APT/SP _____
CITY _____  STATE _____  ZIP _____  PH (___) ___ - _____

PERMIT INFO (01):

Category: 222800 "801 + 226000  Exp. Date 9/30/87  San Dist Area: 22  San Dist. Emp: 00

Renewal Code: ~~R~~ NEW  MFR#: _____

PROGRAM INFO:

# Tank 1

Date Entered : JUL 30 1987

Control # 10001

By (Initial): TK

COMMENTS/REMARKS:

File

E

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 1000100 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 0000000000 ***

ESTAB NBR: 87014228 BILL FLAG: 0 LOC: 53 PARCEL NBR: PROBLEM PGM: STATUS: ESTAB DATE: 073087 INACTIVE DATE: 000000

*** CONTROL NUMBER: 1000101 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300004 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8707300004 | 222800 | | 09/30/87 | | 22 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | |

*** CONTROL NUMBER: 1000101 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300004 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

*** CONTROL NUMBER: 1000102 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300005 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8707300005 | 222801 | | 09/30/87 | | 22 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | |

*** CONTROL NUMBER: 1000102 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300005 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

*** CONTROL NUMBER: 1000103 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300006 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8707300006 | 226000 | | 09/30/87 | | 22 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | |

*** CONTROL NUMBER: 1000103 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300006 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

*** CONTROL NUMBER: 1000199 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: A ***

*** CONTROL NUMBER: 1000199 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: E ***

*** CONTROL NUMBER: 1000199 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: O ***

ESTAB: JACK ALEWYN DAIRY APPL: ALEWYN, JAKE J OWNR: ALEWYN, JAKE J
8185 0/0 REDLANDS BLVD 14631 0/0 GROVE AV 14631 0/0 GROVE AV
00000 00000 00000

CHINO
(000) 000-0000

CA 91710-0000

CHINO
(000) 000-0000

CA 91710-0000

CHINO
(000) 000-0000

CA 91710-0000

# CUPA

San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

## UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Jack Alewyn Dairy
Date: April 23, 2007
Street Address: 8185 Edison
Facility No. FA0000508
City: Ontario
Zip Code: 91761
Program Record No. —
Facility Contact: Jack Alewyn
Facility Phone No. (909) 721-4551
Number of Tanks: —

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 302. UST permit fees paid and current | CHSC 25287(a) | | | ✓ |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | ✓ |
| 308. Failure to report change of ownership within 30 days | CHSC 25284(c) | | | ✓ |
| 306. Owner/Operator agreement available | CHSC 25284(a)(3) | | | ✓ |
| 307. Certificate of Financial Responsibility submitted | CHSC 25292.2(a) | | | ✓ |
| 330. Leak Detection/Monitoring and Response Plan | CCR 2632, 2634 or 2641(h) | | | ✓ |
| 304. UST monitoring/maintenance records available for 3 years | CHSC 25284(c) | | | ✓ |
| 312. Designated Operator Statement submitted | CCR 2715(a) | | | ✓ |
| 313. Monthly inspections completed by Designated Operator | CCR 2715(c) | | | ✓ |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | ✓ |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | ✓ |
| 311. Business Plan submitted/updated | CHSC 25505 | | | ✓ |
| **MONITORING OF UST SYSTEMS** | | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | ✓ |
| 331. Monitoring system(s) certified annually | CCR 2638 or 2641(j) | | | ✓ |
| 334. Audible/visual alarms operational | CCR 2632(c)(2)(B) and 2636(f)(1) | | | ✓ |
| 314. Certification sticker/tag affixed to monitoring equipment | CCR 2638(f) | | | ✓ |
| 318. Sensors placed at low point of UST system(s) | CCR 2630(d) or 2641(a) | | | ✓ |
| 319. Leak detection equipment tampered with or disabled | CHSC 25299(f)(2) | | | ✓ |
| 323. Containment sump(s) free of debris/liquid | CCR 2590.21(c)(3) | | | ✓ |
| 324. Line leak detector(s) installed and functioning properly | CCR 2636(f)(2) or 2641(f) | | | ✓ |
| 333. Overspill containment installed/tested annually | CHSC 25284.2 | | | ✓ |
| 327. Overfill protection device installed/operational | CCR 2635(b)(2) | | | ✓ |
| 328. Secondary containment components tested | CCR 2637(a) | | | ✓ |
| 329. UST system design, construction, and monitoring | CCR 2630 or 2640 | | | ✓ |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | ✓ |
| 341. Failure to report unauthorized release | CHSC 25299(d)(1) | | | ✓ |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | ✓ |
| 343. Unlawful closure of USTs | CHSC 25298(c) | ✓ | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | ✓ |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | ✓ |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | ✓ |
| **UNIFORM FIRE CODE REQUIREMENTS** | | | | |
| 335. Emergency fuel shut-off device operational | UFC 5201.5.3 | | | ✓ |
| 336. Impact valve(s) installed at dispenser(s) | UFC 5202.5.3.2 | | | ✓ |
| 337. Fire extinguisher(s) present and charged | UFC 5201.9 | | | ✓ |
| 338. Address clearly visible from street | UFC 901.4.4 | | | ✓ |
| **OTHER REQUIREMENTS** | | | | |
| Significant Operational Compliance – Prevention | 40 CFR Part 280 | | | ✓ |
| Significant Operational Compliance – Detection | 40 CFR Part 280 | | | ✓ |
| Significant Operational Compliance – Both | 40 CFR Part 280 | | | ✓ |

**NARRATIVE / CORRECTIONS**

An inspection was conducted to verify proper removal of the UST located at this facility. This departments records indicate a 250 gallon UST was previously or still is located at this site. Evidence of removal and sampling was not provided to this department.

Correct the following violation:
(343) Unlawful closure of UST's - CHSC 25298(c): In order to properly close the UST evidence of removal and sampling must be provided.

Note: Mr. Alewyn stated he bought the property in 1978 and did not believe there was ever a UST on site.

If you have any questions, please call (909) 386-8401.

☑ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: Leslie Heavilside
Received by: Jack Alewyn
Title: Owner

CP

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden

## AGRICULTURAL UNDERGROUND STORAGE TANK (UST) CERTIFICATE OF COMPLIANCE

**Please Return Certification within 30 days to Inspector_____.**

Name of UST/Property Owner Jake Alewyn.

Establishment Name Alewyn Dairy.

Establishment Address 8185 Edison Ave Chino.

Establishment Number _____.

Number of UST's (if known) 0.

I certify that:
*(Check appropriate box(s), if you check more than one box in the section below, please write an explanation below)*

☐ AUSTs containing motor vehicle fuels (gasoline, diesel, or heating oil) on my property have a capacity less than or equal to 1100 gallons and is **currently in use.**

☐ AUSTs with a capacity greater than 1100 gallons or any size UST containing materials or waste other than motor vehicle fuels located on my property **have been upgraded** to meet December 22, 1998 standards.

☒ The AUST(s) on my property were **previously removed.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ The AUST(s) on my property are **no longer in use.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ AUSTs with a capacity greater than 1100 gallons or **any size** UST containing materials or waste on my property **have not been upgraded** to December 22, 1998 standards. (Contact San Bernardino County Fire Department Hazardous Materials Division for upgrade or closure requirements).

Elaine Alewyn
Signature

_____
Date

Elaine Alewyn
Print Name

owner / spouse
Title

Additional Information/Explanation:

fire dept offical came to check off for closure requirements.

WILLIAM H. RANDOLPH
County Administrative Officer

Board of Supervisors
KATHY A. DAVIS ..... First District
JON D. MIKELS ..... Second District
JERRY EAVES ..... Fifth District
DENNIS HANSBERGER ..... Third District
FRED AGUIAR ..... Fourth District

ALEWYN DAIRY
9031 EUCALYPTUS AVE
CHINO, CA 91710
909 / 923-0714

COUNTY FIRE
HAZARDOUS MATERIALS
00 MAY 18 PM 3:16

INDUSTRY CA 917 4
PM
16 MAY
2000

County F.D.
Hazardous Mat. Div.
385 N. Arrowhead Ave #2nd Floor
San Bernardino CA 92415-0153

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
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**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden


May 10, 2000

JACK ALEWYN TRUST
14361 GROVE AVENUE
CHINO, CA 91710

**SUBJECT: AGRICULTURAL UNDERGROUND STORAGE TANKS**

San Bernardino County Fire Department recently mailed information to all owners of agricultural underground storage tank(s) (AUST). The purpose of this follow up letter and the attached AUST certificate of compliance is to obtain current information regarding the status of existing AUSTs. In 1984, State Law exempted AUSTs from regulation if they contained motor vehicle fuels (gas, diesel, and heating oil). In 1987, State Law was amended to exempt AUST's 1100 gallons in capacity or less. AUSTs larger than 1100 or any size AUST containing waste or materials other than motor vehicle fuels are not exempt and are required to meet all current UST regulations.

Your cooperation and assistance is appreciated. Please complete the attached AUST certificate of compliance and return it within 30 days to:

COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS DIVISION
FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVE, 2ND FLOOR
SAN BERNARDINO, CA 92415-0153

If you have any questions or if you need further assistance, please contact your local inspector at (909) 387-3082.

**B. DOUGLAS SNYDER, CUPA PROGRAM MANAGER**
**Hazardous Materials Field Services**

BDS/jc

Attachment

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden


## AGRICULTURAL UNDERGROUND STORAGE TANK (UST) CERTIFICATE OF COMPLIANCE

**Please Return Certification within 30 days to Inspector_____.**

Name of UST/Property Owner_____.

Establishment Name_____.

Establishment Address_____.

Establishment Number_____.

Number of UST's (if known)_____.

I certify that:
*(Check appropriate box(s), if you check more than one box in the section below, please write an explanation below)*

☐ ASTUSTs containing motor vehicle fuels (gasoline, diesel, or heating oil) on my property have a capacity less than or equal to 1100 gallons and is **currently in use.**

☐ AUSTs with a capacity greater than 1100 gallons or any size UST containing materials or waste other than motor vehicle fuels located on my property **have been upgraded** to meet December 22, 1998 standards.

☐ The AUST(s) on my property were **previously removed.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ The AUST(s) on my property are **no longer in use.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ AUSTs with a capacity greater than 1100 gallons or any size UST containing materials or waste on my property **have not been upgraded** to December 22, 1998 standards. (Contact San Bernardino County Fire Department Hazardous Materials Division for upgrade or closure requirements).

_____ _____
Signature Date

_____ _____
Print Name Title

Additional Information/Explanation:

_____

_____

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X

**S ER:**

- ete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- A h this form to the front of the mailpiece, or on the back if space does not
- "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

JACK ALEWYN TRUST
14361 GROVE AVE
CHINO CA 91710

4a. Article Number
2 384 255 572

4b. Service Type

☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
3/9/00

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X J. Alewyn

PS Form 3811, December 1994 102595-98-B-0229 Domestic Return Receipt

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

UNITED STATES POSTAL SERVICE

INDUSTRY CA 91716
09 MAR

First-Class Mail
Postage & F Paid
USPS
Permit No. G-10

• Print your name, address, and ZIP Code in this box •

COUNTY FIRE
HAZARDOUS MATERIALS
00 MAR 11 AM 2:26

County of San Bernardino
COUNTY FIRE DEPARTMENT
Hazardous Materials Division
385 N. Arrowhead Ave., 2nd Floor
San Bernardino, CA 92415-0153

HMFS- Christine Parsons

CUPA

**San Bernardino County Fire Department**

HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION

385 N. Arrowhead Ave, 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323

# UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Jack Alewyn Dairy Date: 02-17-00

Street Address: 8185 Edison Avenue Est. No: 87014228

City: Chino Zip Code: 91710 Number of Tanks: 1

Facility Contact: Facility Phone No. Number of Employees:

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 301. UST permits obtained | CHSC 25284(a) | | | |
| 302. UST permit fees paid and current | CHSC 25287(a) | | | |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | |
| 304. UST monitoring/maintenance records available for 3 years | CCR 2712(b) | | | |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | |
| 306. Owner-operator agreement available | CHSC 25284(a)(3)(A) | | | |
| 307. Certification of Financial Responsibility submitted | CHSC 25292.2(a) | | | |
| 308. Failure to report change of ownership within 30 days | CCR 2712(d) | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | |
| 311. Business Plan submitted/updated | CHSC 25505 | | | |
| **MONITORING OF EXISTING UST SYSTEM (Pre 1984)** | | | | |
| **Monitoring in General -** | | | | |
| 315. Leak Detection/Monitoring and Response Plan available | CCR 2641 | | | |
| 316. Annual UST precision tests conducted | CHSC 25292(b) | | | |
| 317. Monitoring devices maintained annually | CCR 2641(j) | | | |
| **Piping -** | | | | |
| 320. Pressurized piping tested annually | CHSC 25292(e) | | | |
| 321. In-line leak detector installed on pressurized piping | CHSC 25292(e) | | | |
| 322. Suction piping tested every 3 years | CCR 2643(d) | | | |
| **Inventory Reconciliation for Single Wall USTs -** | | | | |
| 325. Monthly inventory reconciliation performed and available (ATG) | CCR 2646(c) | | | |
| 326. Dispenser meters calibrated annually | CCR 2646(l) | | | |
| **MONITORING OF NEW UST SYSTEMS (1984 to Present)** | | | | |
| 330. Leak Detection/Monitoring and Response Plan available | CCR 2632 | | | |
| 331. Monitoring systems certified annually | CCR 2630(d) | | | |
| 332. Pressurized piping maintained/tested | CCR 2636(f) | | | |
| 333. Overfill/spill protection installed | CHSC 25291(c) | | | |
| 334. Visual/audible alarms operational | CCR 2632(c)(2) | | | |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | |
| 341. Failure to report/record unauthorized release | CCR 2650 | | | |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | ✓ | | |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | |

**NARRATIVE / CORRECTIONS**

A recent review of your file indicates that this facility has 1- 250 gallon underground storage tank onsite. Please contact this office immediately to inform us in any change to the current status of the UST. This includes: removal, no longer in use, and upgrading the UST systems to meet December 22, 1998 UST standards.

χ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: CHRISTINE PARSONS

Received by: Title:

Revised 11/18/99

Overall Site with 1 Fac. Unit

## General Information

Location: 8185 EDISON BLVD Map: Haz:1 Type: 1
Community: Chino Grid: F/U: 1 AOV: 0.0

| Contact Name | Title | Business Phone | 24-Hour Phone |
|---|---|---|---|
| JAKE ALEWYN | | (909) 597-2081 x | ( ) - |
| MRS JAKE ALEWYN | | (909) 597-2081 x | ( ) - |

Summary

## Hazmat Inventory List in MCP Order

### All Materials at Site

| F/U | Material Name | --Hazards-- | | Max Qty | Unit | MCP |
|---|---|---|---|---|---|---|
| F/U: 02 - Fixed Containers at Site | | | | | | |
| | DIESEL | F | IH DH | 250 | GAL | Moderate |

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

DE HOOG, MARTIN L
8311 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000410 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2013** **Expiration Date: 5/31/2014**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018959 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017852 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

As a condition of the permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
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**Effective Date: 6/1/2012** **Expiration Date: 5/31/2013**

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| PT0018959 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017852 |

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

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ONTARIO, CA 91762

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8311 EDISON AVE
ONTARIO, CA 91762

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**Effective Date: 6/1/2010** **Expiration Date: 5/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018959 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017852 |

Pat A. Dennen, Fire Chief/Fire Warden

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

DE HOOG, MARTIN L
8311 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000410 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2009** **Expiration Date: 5/31/2010**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018959 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017852 |

Pat A. Dennen, Fire Chief/Fire Warden

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# HA RDOUS MATERIAL FIELD SERV ES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000328

Closure

Legal Owner

*NAME: DE HOOG, MARTIN L

*ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY:

*PHONE: 909-947-3559 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 06/10/2010

#### OWNER MAILING ADDRESS

☐ Same as Owner

CARE OF: DBA: MARTIN DEHOOG DAIRY

ADDRESS1: 8311 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

### F- FACILITY INFORMATION — FACILITY ID: FA0000410

*NAME: MARTIN DEHOOG DAIRY CERS ID: 10034638

*ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *CITY CODE: ONTARIO

*PHONE: 909-947-3559 EXT: ALT PHONE: EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.: 6

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FYI LAST UPDATED: 02/19/2013

#### FACILITY MAILING ADDRESS

☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: MARTIN DEHOOG DAIRY

CARE OF: MARTIN DEHOOG

ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

*EMAIL: LIZDEHOOG@MSN.COM

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION — ACCOUNT ID: AR0000412

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY: MARTIN DEHOOG

CARE OF: MARTIN DEHOOG DAIRY

ADDRESS 1: 8311 EDISON ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-3559 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 04/17/2013

FYI ANNIVERSARY DATE: 05/31/2007 FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI TOTAL DUE: 0.00

ENVIRONMENTAL CONTACT NAME: MARTIN DEHOOG EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE TH/ PPLY)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0018959<br>PERMIT NUMBER | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-1U<br>ORIGINAL P.E. | 06/01/2013<br>EFFECTIVE DATE | 05/31/2014<br>EXPIRATION DATE |
| | | | PR0017852<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? (Yes) No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? Yes (No)

ENTERED

*DATE SUBMITTED: 1-13-14 DATE ENTERED: JAN 13 2014 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Brian Wade ENTERED BY: ***Demand bill for updated PEs**: Yes (No)

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

JG

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection of 1-8-14, this facility has ceased operation. All cows + equipment have been sold or transferred and all hazardous materials have been removed. Inactivate PE 4221.

**OPEN VIOLATIONS:**

FA0000410

INSPECTION DATE: **2/14/13** VIOLATION ID: **IV0079320** COMPLY BY: **03/17/2013**

INSPECTOR: **BRIAN WADE** COMPLIED ON:

**VIOLATION:** 4202034200-Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

QC ENTERED

JAN 28 2014

Lara

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

File

# HAZARDOUS MATERIAL FIELD SERVICES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

☑ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A  Update  CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000328

Legal Owner

*NAME: DE HOOG, MARTIN L

*ADDRESS 1: 8311 EDISON AVE  ADDRESS 2:

*CITY: ONTARIO  *STATE: CA  *ZIP CODE: 91762  *COUNTRY:

*PHONE: 909-947-3559  EXT:  FAX:

ALT PHONE:  EXT:  FYI LAST UPDATED: 06/10/2010

**OWNER MAILING ADDRESS** ☐ Same as Owner

CARE OF:  DBA: MARTIN DEHOOG DAIRY

ADDRESS1: 8311 EDISON AVE  ADDRESS 2:

CITY: ONTARIO  STATE: CA  ZIP CODE: 91762  COUNTRY:

### F- FACILITY INFORMATION — FACILITY ID: FA0000410

*NAME: MARTIN DEHOOG DAIRY  CERS ID: 10034638

*ADDRESS 1: 8311 EDISON AVE  ADDRESS 2:

*CITY: ONTARIO  *STATE: CA  *ZIP CODE: 91762  *CITY CODE: ONTARIO

*PHONE: 909-947-3559  EXT:  ALT PHONE:  EXT:  FAX:

CENSUS: MILITARY SCHOOL MEDICAL  *SUPERVISORIAL DISTRICT: 004  *INSPECTION DISTRICT: 03  NUMBER OF EMP.: 6

FIRE JURISDICTION: ONTARIO FIRE  SIC CODE:

*BUSINESS CODE:  *BUSINESS TYPE:  FYI LAST UPDATED: 04/18/2011

**FACILITY MAILING ADDRESS** ☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: MARTIN DEHOOG DAIRY

CARE OF: MARTIN DEHOOG

ADDRESS 1: 8311 EDISON AVE  ADDRESS 2:

CITY: ONTARIO  STATE: CA  ZIP CODE: 91762  COUNTRY:

*EMAIL: lizdehoog@msn.com

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION — ACCOUNT ID: AR0000412

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY: MARTIN DEHOOG

CARE OF: MARTIN DEHOOG DAIRY

ADDRESS 1: 8311 EDISON  ADDRESS 2:

CITY: ONTARIO  STATE: CA  ZIP CODE: 91762  COUNTRY:

PHONE: 909-947-3559  EXT:  ALT PHONE:  EXT:

ALT PHONE 2:  EXT:  FYI EXEMPT FROM BILLING: NO  FYI Last Billing: 04/17/2012

FYI ANNIVERSARY DATE: 05/31/2007  FYI ACCOUNT STATUS: ACTIVE ACCOUNT  FYI TOTAL DUE: 0.00

ENVIRONMENTAL CONTACT NAME: MARTIN DEHOOG  EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0018959<br>PERMIT NUMBER | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-[redacted]<br>ORIGINAL P.E. | | 06/01/2012<br>EFFECTIVE DATE | 05/31/2013<br>EXPIRATION DATE |
| | | | | PR0017852<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | UPDATED P.E. |
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes No

*Should this facility be inactivated upon verification that there is no balance due? Yes No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes No

*Does this 5050 have attached documents? Yes No

*DATE SUBMITTED: 2-15-13 DATE ENTERED: ENTERED FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Brian Wade ENTERED BY: FEB 19 2013 ***Demand bill for updated PEs**: Yes No

BY:

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

# H. RDOUS MATERIAL FIELD SER CES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

COMPLETED

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000328

Legal Owner

*NAME: DE HOOG, MARTIN L

*ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY:

*PHONE: 909-947-3559 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 06/11/2007

TAX ID: DRIVER LICENSE:

#### OWNER MAILING ADDRESS

☐ Same as Owner

CARE OF: DBA: MARTIN DEHOOG DAIRY

ADDRESS1: 8311 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

### F- FACILITY INFORMATION — FACILITY ID: FA0000410

*NAME: MARTIN DEHOOG DAIRY

*ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *CITY CODE: ONTARIO

CENSUS: MILITARY SCHOOL MEDICAL *BUSINESS CODE: *BUSINESS TYPE:

SIC CODE: *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03

*PHONE: 909-947-3559 EXT: FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE: EXT: FAX: FYI LAST UPDATED: 07/15/2008

#### FACILITY MAILING ADDRESS

☐ Same as Facility

☐ Same as Owner Mailing Address

BUSINESS NAME: MARTIN DEHOOG DAIRY

CARE OF: MARTIN DEHOOG

ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

EMAIL:

### A- A/R INFORMATION — ACCOUNT ID: AR0000412

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY: MARTIN DEHOOG

CARE OF: MARTIN DEHOOG DAIRY

ADDRESS 1: 8311 EDISON ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-3559 EXT: TAX ID: DRIVER LICENSE:

ALT PHONE: EXT: FYI EXEMPT FROM BILLING: NO FYI LAST UPDATED: 03/05/2009

ALT PHONE: EXT: FYI TOTAL DUE: 0.00

FYI ANNIVERSARY DATE: 5/31/07 ← ADD FYI ACCOUNT STATUS: ACTIVE ACCOUNT

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency

**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

☐ UPDATE
☐ INACTIVATE
☐ ZERO OUT BALANCE

| PT0018 | ACTIVE | 4221 | 6/01/2007 | 05/31/2008 |
|---|---|---|---|---|
| PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |

| PR0017852 | ACTIVE, BILLABLE | NA | NA | |
|---|---|---|---|---|
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP.: _____ NUMBER OF ACTIVE UST'S 0 MFR # _____

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes **No**

*Should this facility be inactivated upon verification that there is no balance due? Yes **No**

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes **No**

*Does this 5050 have attached documents? Yes **No**

*DATE SUBMITTED: 3/16/09 DATE ENTERED: 3/17/09 FISCAL ENTRY DATE/ INITIAL: _____

*SUBMITTED BY: EKing ENTERED BY: LLD ***Demand bill for updated PEs: Yes** No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered in Envision.

EXPL: ACTIVE PE 4221 added to an "ACTIVE" facility with no programs, which was imported as inac in '02 therefore never had an anniv. date

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Add ANNIV DATE 5/31/07 and demand bill for 08/09 PERMITS.

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

AG - PE & info update

# HAZA[redacted]OUS MATERIAL FIELD SERVIC[redacted]
# COMPUTER DATABASE UPDATE AUTHORIZATION

PROD. SDD

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

07 JUN 24 ONTARIO

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000328

NAME: DE HOOG, MARTIN L

ADDRESS 1: 8311 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-9171~~ 91762 COUNTRY:

PHONE: (909) 947-3559 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Martin De Hoog Dairy DBA: DE HOOG, MARTIN L

ADDRESS1: 8311 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91762 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000410

NAME: ~~AG-DE HOOG, MARTIN L~~ Martin De Hoog Dairy

ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91762 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: 0241 BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: N/A SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 03

PHONE: (909) 947-3559 EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG-DE HOOG, MARTIN L~~ Martin De Hoog Dairy

CARE OF: Martin De Hoog

ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000412

RESPONSIBLE PARTY: Martin De Hoog

CARE OF: Martin De Hoog Dairy

ADDRESS 1: 8311 Edison ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: (909) 947-3559 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 04/05/2007

ALT PHONE: EXT: TAX ID:

ANNIVERSARY DATE: TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | N/A | | N/A | | 5/31/07 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| | | NA | | NA | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E. 4221

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 6 NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 6-4-07 DATE ENTERED: 6/11/07 FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY:

LLD

COMMENTS/REMARKS:

Per inspection: Assign handler only permits.
Update owner, FA & AIR info
Remove "Hg" prefix from name.

Demand bill.

TRACKING SHEET FOR BUSINESS PLANS

_____
Establishment #

Facility Name:

Facility site address:

City:

Fire Agency:

| | | Sent to FD |
|---|---|---|
| _____ (# of copies) | | |
| Business Plan Received | 1/10/08 | __/__/__ |
| Result of Review(s) | | |
| Deficiency | | __/__/__ |
| Conditional Approval | | __/__/__ |
| Approval | | __/__/__ |

| | | Sent to FD |
|---|---|---|
| Revised Plan(s) Received | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

Other

| Date | Action/documentation (update, new plan, etc.) | Staff Hours |
|---|---|---|
| 1/14/08 | BP-requested inv forms LH | |
| 04/15/08 | BP-corrections rec'd LH | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**

**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**

# BUSINESS OWNER / OPERATOR IDENTIFICATION

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 | | (This number is on your CUPA permit.) |
| EFFECTIVE DATE 100 | ENDING DATE 101 | | |
| BUSINESS NAME (Same as FACILITY NAME or DBA) | De Hoog Family Trust | BUSINESS PHONE | (909) 947-3559 |
| BUSINESS SITE ADDRESS 103 | 8311 Edison Ave. | | |
| CITY 104 | Ontario | COUNTY 108: SAN BERNARDINO | STATE: CA; ZIP CODE 105: 91762 |
| D&B NUMBER | — | PRIMARY SIC/NAICS CODE 107: 0241 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: Dairy |
| BUSINESS OPERATOR NAME 109 | MARTIN L. De Hoog | BUSINESS OPERATOR PHONE 110 | (909) 947-3559 |

## II. BUSINESS OWNER

| | | | |
|---|---|---|---|
| OWNER NAME 111 | MARTIN L. De Hoog | OWNER PHONE 112 | (909) 947-3559 |
| OWNER MAILING ADDRESS 113 | 8311 Edison Ave | | |
| CITY 114 | Ontario | STATE 115: CA | ZIP CODE 116: 91762 |

## III. ENVIRONMENTAL CONTACT

| | | | |
|---|---|---|---|
| CONTACT NAME | Martin L. De Hoog | CONTACT PHONE 118 | (909) 947-3559 |
| CONTACT MAILING ADDRESS 119 | 8311 Edison Ave. | | |
| CITY 120 | Ontario | STATE 121: CA | ZIP CODE 122: 91762 |

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | | - SECONDARY - | |
|---|---|---|---|
| NAME 123 | MARTIN L. De Hoog | NAME 128 | Marty De Hoog |
| TITLE 124 | Owner | TITLE 129 | Son |
| BUSINESS PHONE 125 | (909) 947-3559 | ~~BUSINESS~~ Home PHONE | (909) 597-7757 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126 | | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131 | |
| PAGER/CELL # 127 | | PAGER /CELL # 132 | (909) 917-8084 |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| Martin De Hoog | MARTIN DE Hoog | 1/8/08 |

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# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 4 1 0 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): De Hoog Family Trust (Dairy) — 3

FACILITY ADDRESS: 8311 Edison Ave — CITY: Ontario — 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

| BUSINESS MAILING ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 8311 Edison Ave | Ontario | CA | 91762 |

| BUSINESS FAX NUMBER | BUSINESS E-MAIL |
|---|---|
| 909-947-3559 | |

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

| Total # of Employees per shift | SHIFT 1 | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION |
|---|---|---|---|---|
| | 2 | 2 | 1 | |

| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | TOTAL # EMPLOYEES | TAXPAYER ID NUMBER |
|---|---|---|
| | 6 | |

ASSESSORS PARCEL NUMBER (S): — CROSS STREET:

BUSINESS DESCRIPTION: Dairy

Number of Underground Storage Tanks located at this facility: 0

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☐ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 1/08/08

**CUPA**

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| De'Hoog Family Trust (Dairy) | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8311 Edison Ave. | Ontario |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification**: **If a situation is an emergency, call 911 first**. Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | 911 |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | (800) 33-TOXIC or (909) 386-8425 |
| 3. *State of California, Governor's Office of Emergency Services | (800) 852-7550 or (916) 845-8911 |
| 4. National Response Center | (800) 424-8802 |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" *means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into* the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date: 1/08/08

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| DeHoog Family Trust (Martin DeHoog Dairy) | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8311 Edison Ave. | Ontario |

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:

For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

In Case of an Emergency We will notify all Employee's present and have them meet us by our mailBox by Edison Ave. between our house + Barn.

**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√Check those items that apply and write additional information in the space provided).

- [x] Reduction of containers on site if not used or needed.
- [x] Containers are properly labeled and closed when not in use.
- [ ] Compressed gas cylinders are properly secured.
- [ ] Use of monitoring system. Type: _____
- [ ] Other:

Date: 1/08/08

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| De Hoog Family Trust / Martin De Hoog Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8311 Edison Ave | Ontario |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- ☐ New employee training.
- ☐ Annual training & periodic refresher courses.
- ☐ Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- ☐ Spill control equipment
- ☐ Monitoring system
- ☐ Personal Protective Equipment
- ☒ On the job training. Describe below.
- ☐ Other:

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- ☒ Identify potential hazards and determine whether a release has occurred.
- ☒ Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- ☒ Coordinate the notification and evacuation of employees and customers from the facility.
- ☒ Make required agency notifications and request needed assistance.
- ☒ Assist responding agencies by providing access to the facility and information about the facility.
- ☐ Other:

Date: 1/08/08

BUSINESS NAME (Same as FACILITY NAME or DBA): DeHoog Family Trust (Martin DeHoog Dairy)

FACILITY ADDRESS 103: 8311 Edison Ave

CITY 104: Ontario

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | 1 - ABC | Annually |
| ☒ First aid kit(s) | 1 - General | As needed |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☒ Personal Protective Equipment | Nitrile gloves | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste
- ☒ Process vessels
- ☒ Aboveground storage tanks
- ☐ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☒ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler
- ☐ Emergency response team
- ☐ Local Hospitals
- ☐ Other:
- ☒ No arrangements or agreements at this time

Date: 1/08/08

## HELPFUL HINTS FOR COMPLETING THE INVENTORY SECTION

**Congratulations! You have completed the first half of the plan. The following pages require review of the hazardous materials and hazardous wastes at your facility to determine which items require disclosure.**

**Here are some helpful hints to assist you in filling out the hazardous materials inventory section:**

1) This CUPA offers an example business plan that is available on our website or by mail. If you are unfamiliar with the business plan requirement, we recommend that you look at the example before you get started so you can see how inventory summary, chemical description pages, and maps work together.

2) Before you start filling out forms, determine how many items require disclosure and make the appropriate number of copies of the Inventory Summary form and the Chemical Description form. Note the following criteria when determining which items require disclosure in the inventory section: hazardous materials with a maximum quantity of greater than 55 gallons, 500 pounds, or 200 cubic feet; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives.

3) Assign a unique item number to each inventoried item (e.g. 1,2,3, etc.) This same item number is used on the Inventory Summary, on the individual Chemical Description form, and to show the storage location(s) on the facility map.

4) Each inventoried item requires a Chemical Description page that gives additional details about each chemical. Material Safety Data Sheets (MSDSs) and container labels are the main sources of chemical information. Wastes do not have MSDSs, but waste analysis, profiles, or manifests may have useful information.

5) Review Appendix I to determine which inventoried items require submission of a Material Safety Data Sheet (MSDS). If the substance is not listed in Appendix I, attach the MSDS for that chemical to the corresponding individual Chemical Description page. Anytime you update or refile the Chemical Description Page, make sure to attach the current MSDS. If you do not have a MSDS for a material, you can get one from your chemical vendor and you need them for compliance with the OSHA Hazard Communication Standard. Hazardous wastes do not have MSDSs.

6) Materials and wastes of the same chemical (e.g. lubricating oil and used oil) require separate Chemical Description pages.

7) Since the Chemical Description Page requires location information, you will have to complete the facility map(s) before you can finalize the Chemical Description pages.

8) The Maximum Quantity should reflect the maximum amount that could ever be onsite at any one time. The maximum listed on the Inventory Summary and the maximum listed on the individual Chemical Description form should be the same.

9) Typically, liquids are disclosed in gallons, solids in pounds and compressed gases in cubic feet. If you have questions regarding the correct unit type for an item, contact this department for assistance.

10) Signatures: The Inventory Summary form requires the Owner/Operator signature. Additionally, EPCRA filers are required to sign all individual Chemical Description forms.

Note: If you have a large warehouse, trade secrets, or other unique situation, please call our office before you fill out chemical description pages. We can help you develop an inventory that will meet the requirements and accommodate a unique situation.

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 4 1 0 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA)
De Hoog Family Trust (Martin DeHoog Dairy)

FACILITY ADDRESS 103: 8311 Edison Ave

CITY 104: Ontario

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Diesel | 1,500 | 1,000 | Gal |
| 2 | Teat dip | 110 | 55 | Gal |
| 3 | Teat dip sanitizer | 55 | 55 | Gal |
| 4 | Gasoline | 80 | 40 | Gal |
| 5 | Powder chlorinated cleaner | 60 | 30 | Gal |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each Individual attached Inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| Martin DeHoog | MARTIN DeHoog | |

Inventory Summary Page ____ of ____

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages, otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER 1

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: De Hoog Family Trust (Martin De Hoog Dairy) | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Diesel | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES

PHYSICAL STATE (Check one item only): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 1,000

FED HAZARD CATEGORIES: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 750 | 1,500 | | |

UNITS* (Check one item only): ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE: 365

STORAGE CONTAINER (Check all that apply):
☒ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 100 | Diesel | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets

NOTES (*Trade names/synonyms or other information relevant to the substances listed*)

*If EPCRA, Owner/Operator please sign this page*

Martin De Hoog

Date: 1/08/08

## Hazardous Materials Inventory Form – Chemical Description Form

For each item listed on the Inventory Summary Form, complete a separate Chemical Description Form. Attach a Material Safety Data Sheet (MSDS) to corresponding Chemical Description Form, unless the material is not listed in Appendix I.

**Purpose:** The Hazardous Materials Inventory Form – Chemical Description Form is a more detailed inventory form which provides additional chemical information that can be used by the Local Fire Jurisdiction, as well as the CUPA.

**Chemical Description Form:** For each hazardous material or hazardous waste listed on the Inventory Summary Form, a separate Chemical Description Form must be completed. Do not combine materials and wastes on one form. For example, if your facility stores or uses new oil exceeding 55 gallons, and also generates waste oil waste, two separate Chemical Description Forms must be completed. *One form will be completed for the new oil; one form will be completed for the waste oil.* At the top of the form, check one of the two boxes (Material or Waste). Do not check both boxes.

**Item Number:** Use the same item number assigned on the Inventory Summary Form to list inventoried items.

**Chemical Location Information:** This section is used to identify the storage location of the specific hazardous material. Provide the Grid Coordinate(s) from the facility map to identify the storage location of each chemical. The Hazardous Materials Inventory Form – Chemical Description Form is provided to public requestors; however, maps showing storage locations are not. Do not include confidential storage location information on this page.

**Chemical Information:**

- Chemical Name – provide the name of the chemical being inventoried. The Chemical Name can be found on the Material Safety Data Sheet (MSDS), container, or your purchase invoice. For example, petroleum hydrocarbon is the chemical name for gasoline.
- Common Name – provide the common name of the chemical being inventoried. For example, gasoline is the common name for petroleum hydrocarbon.
- CAS # - Chemical Abstract Service number. Provide the CAS number for the chemical being inventoried. The CAS number can be obtained from the MSDS.
- Trade Secret - check the "NO" box. If your facility has a trade secret, contact this CUPA for specific filing instructions.
- EHS – Extremely Hazardous Substance. Check the "YES" box if the chemical being inventoried is listed in Appendix B. Remember, if the "YES" box is checked, the chemical amount must be listed using pounds, regardless if the EHS is a liquid, solid, or gas. If the chemical being inventoried is not in Appendix B, then check the "NO" box
- Hazardous Material Type – check only one box to indicate if the chemical being inventoried is a pure chemical, a mixture or a waste.
- Radioactive – check the "YES" box if the chemical being inventoried is radioactive. In the next box, provide the Curies. Check the "NO" box if the chemical being inventoried is not radioactive.
- Physical State – check only one box to indicate the physical state of the chemical.
- Size of Largest Container – Enter the total capacity of the largest container in which the material is stored. . If hazardous materials are stored in various containers, use the largest container size to complete this section.
- Federal Hazard Categories – check all categories that describe the physical and health hazards associated with the hazardous material. PHYSICAL HAZARDS - **Fire**: Flammable Liquids and Solids, Combustible Liquids, Pyrophorics, Oxidizers; **Reactive**: Unstable Reactive, Organic Peroxides, Water Reactive, Radioactive; **Pressure Release**: Explosives, Compressed Gases, Blasting Agents; HEALTH HAZARDS - **Acute Health (Immediate)**: Highly Toxic, Toxic, Irritants, Sensitizers, Corrosives, other hazardous chemicals with an adverse effect with short term exposure; **Chronic Health (Delayed)**: Carcinogens, other hazardous chemicals with an adverse effect with long term exposure.
- Average Amount – this is the average amount of the chemical being stored at your facility on a given day.
- Maximum Amount – this is the maximum amount of each hazardous material or mixture containing a hazardous material that is on site at any one time over the course of the year. This number represents a not to exceed quantity.
- Annual Waste Amount – this is the annual amount of waste generated during the year.
- State Waste Code – this 3-digit number identifies the type of hazardous waste that is generated. The number can be found on the Hazardous Waste Manifest or in Appendix F – Common Waste Codes.
- Units – check the appropriate box to describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Remember, Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.
- Storage Container – check all boxes that describe what type of container(s) are used to store the chemical.
- Storage Pressure – check the one box that describes the pressure that the chemical is stored at.
- Storage Temperature – check the one box that describes the temperature that the chemical is stored at.
- % WT - enter the percent by weight of the chemical components. If a range of percentages is available, report the highest percentage in that range.
- Composition – list all components of the chemical. If the chemical is a mixture list the hazardous components first, followed by the non-hazardous components.
- EHS - check "Yes" if the component is considered an Extremely Hazardous Substance or "No" if it is not.
- CAS# - Chemical Abstract Service number. Provide the CAS number for the chemical being inventoried. The CAS number can be obtained from the MSDS.
- Notes – this field can be used to provide additional information about the chemical. This CUPA does not require the fire code hazard class. If your local fire agency specifically requests this information, provide the fire code hazard class in this section.

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# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

**ITEM NUMBER** 2

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: De Hoop family Trust | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☐ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Teat dip | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)* ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE — RADIOACTIVE? Yes ☐ No ☒ — CURIES

PHYSICAL STATE *(Check one item only)* ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST — SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 55 | 110 | | |

UNITS* *(Check one item only)* ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: — DAYS ON SITE **365**

STORAGE CONTAINER *(Check all that apply)*

| | | | | |
|---|---|---|---|---|
| ☐ a. ABOVEGROUND TANK | ☒ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 1.75% | Iodine | ☐ YES ☐ NO | |
| 2. | INERT - omega-hydroxy poly (oxyethylene) alpha (P-Nonyl Phenyl) | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

*If EPCRA, Owner/Operator please sign this page*

Date: _____

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# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER 3

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: Dettoog Family Trust | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Teat dip sanitizer | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE — RADIOACTIVE? Yes ☐ No ☒ — CURIES

PHYSICAL STATE *(Check one item only)*: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST — SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES 2: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 25 | 55 | | |

UNITS* *(Check one item only)*: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: — DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:
☐ a. ABOVEGROUND TANK ☒ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 5.00% | nonylphenoxpolyethoxyethanol | ☐ YES ☐ NO | |
| 2. 10.00% | INERT GLYORIN | ☐ YES ☐ NO | |
| 3. 85% | other Inerts Buffering Agent + surfactants | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

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# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER 4

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: Dettoro Family Trust | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Gasoline | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES

PHYSICAL STATE (Check one item only): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 40

FED HAZARD CATEGORIES: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 40 | 80 | | |

UNITS* (Check one item only): ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE: 365

STORAGE CONTAINER (Check all that apply):
☐ a. ABOVEGROUND TANK ☐ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☒ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 100 | Gasoline | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

*If EPCRA, Owner/Operator please sign this page*

Date: _____

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# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER 5

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: Dethoss Family Trust | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Powder chlorinated soap | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES

PHYSICAL STATE *(Check one item only)*: ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 30

FED HAZARD CATEGORIES: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 30 | 60 | | |

UNITS* *(Check one item only)*: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:

| | | | | |
|---|---|---|---|---|
| ☐ a. ABOVEGROUND TANK | ☒ e. PLASTIC/NONMETALLIC DRUM | ☒ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. | Chlorine | ☐ YES ☐ NO | |
| 2. | Caustic chemicals + Protect equipment from pitting | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

**CUPA**

**San Bernardino County Fire Department • Hazardous Materials Division**

**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 410 Facility Name: Martin DeHoog Dairy Inspection Date: January 8, 2014

Site Address: 8311 Edison Avenue Phone #: 909-947-3559

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by:

☒ Inspect ☐ Photograph Name: Martin DeHoog Title: Owner # Emp: 0

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | |
| 107. Contingency Plan established | CCR 66265.51(a) | | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | |

**INSPECTION NARRATIVE**

An inspection was conducted to verify removal of hazardous materials. Consent to inspect was given by Martin DeHoog, Owner. This facility has ceased operation. Cows and equipment have either been sold off or shipped to Nebraska. All hazardous materials have been removed. The permit will be inactivated.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: Brian Wade (Sign Name) Brian Wade (Print Name)

Received By: Martin De Hoog (Sign Name) MARTIN DE HOOG (Print Name)

Title: Owner

Report Date: January 8, 2014

**SAN BERNARDINO COUNTY**
**FIRE DEPARTMENT**

**COUNTY OF SAN BERNARDINO**

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

**MARK A. HARTWIG**
**Fire Chief**

August 20, 2013

MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

**ATTN: MARTIN DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000410-MARTIN DEHOOG DAIRY**
**8311 EDISON AVE**
**ONTARIO, CA 91762**

Mr. DeHoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on February 14, 2013:

- Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**

Board of Supervisors
GREGORY C. DEVEREAUX
Chief Executive Officer
ROBERT A. LOVINGOOD ..... First District
JANICE RUTHERFORD..... Second District
JOSIE GONZALES ..... Fifth District
JAMES RAMOS.....Third District
GARY C. OVITT..... Fourth District

Using CERS at http://cers.calepa.ca.gov, submit the elements of the Basin's Plan.

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 410 Facility Name: Martin DeHoog Dairy Inspection Date: February 14, 2013

Site Address: 6311 Edison Avenue Phone #: 909-947-3559

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by: ☑ Inspect ☐ Photograph Name: Martin DeHoog Title: Owner # Emp: 6 Packet left on site? Yes/(No)

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permit is current
**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste
**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31)
**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☐ 202. A Business Plan has not been established. (CHSC 25503.5)

☒ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: 1 ~~1,000~~ gal + 1 ~~500~~ gal AST's diesel
2 x 55 gal teat dip,
2 x 40 gal tanks gasoline
1 x 55-gal teat barrier dip
1 x 55 gal sanitizer

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Basic safety training
**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3))

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2))
**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34)
**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171)

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b))

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a))
**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

Equipment serviced by outside mechanic.

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste
**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a))

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3))
**Compliance Requirement**: Submit copies of waste disposal records for the past

☐ 138. Unlawful management of used oil filters. (CCR 66266.130)
**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspected By: Brian Wade (Sign Name) Received By: Martin DeHoog (Sign Name) Title: Owner

Brian Wade (Print Name) Print Name Report Date: February 14, 2013

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

CUPA

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**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**
**www.sbcfire.org**

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED JAN 10 2008 S.B. CO. FIRE DEPT.

| FACILITY ID # | F | A | 0 | 0 | 0 | 0 | 4 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|

BUSINESS NAME (Same as FACILITY NAME or DBA): De Hoog Family Trust (Martin De Hoog Dairy

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8311 Edison | Ontario | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ — *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☒ * Business Activities Form
- ☒ * Business Owner/Operator Identification Form
- ☐ * Supplemental Emergency Contact Page
- ☐ Emergency Response Plans and Procedures
- ☐ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☐ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☐ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☐ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☐ Area map - photocopied city map with location of site indicated
- ☐ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.
- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. **(EPCRA requires complete annual submission)**

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER | 135 |
|---|---|---|---|
| Martin De Hoog | 1/8/08 | | |
| NAME OF SIGNER *(print)* | TITLE OF SIGNER *(print)* | | |
| MARTIN DE HOOG | Operator | | |

## BUSINES[illegible]RGENCY/CONTINGENCY PLAN COVER S[illegible] INSTRUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

CUPA
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# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 4 1 0 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA): De HOOG Family Trust

EPA ID # (Hazardous Waste Only):

BUSINESS ADDRESS: 8311 Edison Ave.

CITY: Ontario

ZIP CODE: 91762

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☒ YES ☐ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page Instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California Identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

Handler

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

December 17, 2007

MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

**ATTN: MARTIN DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000410-MARTIN DEHOOG DAIRY**
**8311 EDISON AVE**
**ONTARIO, CA 91762**

MR. DEHOOG,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 29, 2007:

- Failure to establish a Business Plan

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

Generator

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

December 17, 2007

SAM SOUSA
7397 EDISON AVE
ONTARIO, CA 91761

**ATTN: SAM SOUSA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000648-SNS DAIRY**
**7371 EDISON AVE**
**ONTARIO, CA 91761**

MR. SOUSA,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on April 12, 2007:

- Unlawful management of contaminated containers

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0004412 Facility Name: Martin De Hoog Dairy Inspection Date: May 29, 2007

Site Address: 8311 Edison Phone #: (909) 947-3559

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Martin De Hoog Title: Owner # Emp: 6 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires handler permit only

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

**INVENTORY:** (2) AST's Diesel - (1) 1,000 gal & (1) 500-gal (1) 55 gal teat dip sanitizer (2) 55-gal aluminum tank dip (2) 40 gal tanks in back up generator (2) 30 gal drums powder chlorinated cleaner

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement**: Submit training documentation as required.

## Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) Does not generate waste

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) " " "

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) " " "

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) " " "

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

RECEIVED JAN 10 2008 S.B. CO. FIRE DEPT.

## Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) " " "

**Compliance Requirement**: Submit copies of waste disposal records for the past " " "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Equipment serviced by tent heavy repair

Inspected By: [signature] (Sign Name) Received By: Martin De Hoog (Sign Name) Title: Owner

Leslie Heaviside (Print Name) MARTIN DE HOOG (Print Name) Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Martin De Hoog (Name) 1/08/08 (Date)

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

PAT A. DENNEN
Fire Chief
County Fire Warden


## Business Emergency/Contingency Plan Receipt

Mail to: DE HOOG, MARTIN L
8311 EDISON AVE
ONTARIO, CA 91762

Site Address: MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

Service Request ID: SR0015002
Facility ID: FA0000410

The Business Emergency/Contingency Plan was received on January 10, 2008 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.
2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.
3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.
4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.
5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.
2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.
3. Change of business address, business ownership, or business name.
4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000410 Facility Name: Martin DeHoog Dairy Inspection Date: May 29, 2007

Site Address: 8311 Edison Phone #: (909) 947-3559

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Martin DeHoog Title: Owner # Emp: 6 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

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☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (2) AST's Diesel -(1) 1-000 gal & (1) 500-gal (1) 55 gal foot dip sanitizer (2) 55-gal drum tank dip (2) 40 gal tanks in back up generator (2) 30 gal drums powder chlorinated cleaner

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

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☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters.

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Equipment serviced by Kent Avery Repair, Inc

Inspected By: [signature] (Sign Name) Leslie Heavilside (Print Name)

Received By: Martin DeHoog (Sign Name) MARTIN DE HOOG (Print Name) Title: Owner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

# PHOTO NARRATIVE



PHOTO 1

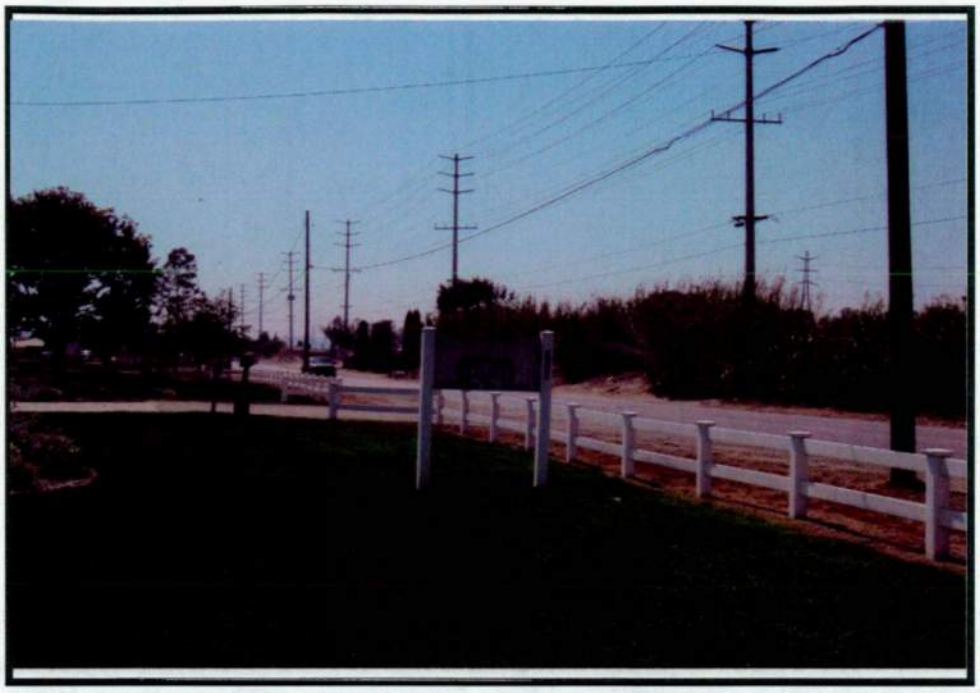

PHOTO 2

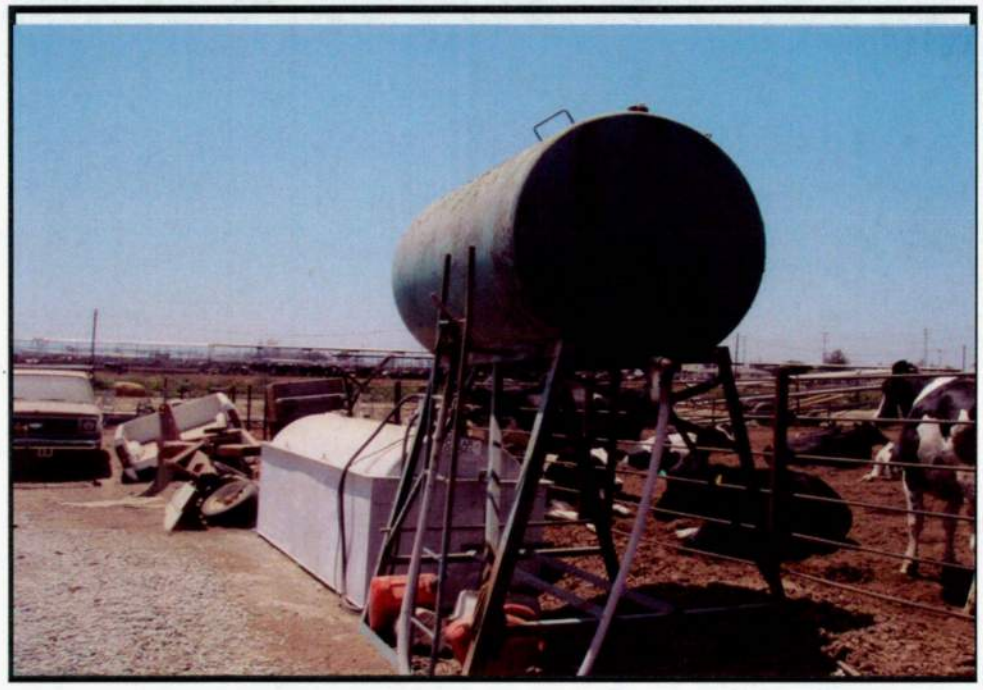

Facility/Case Name: **Martin DeHoog Dairy** Facility ID #: **FA0000410**

Address: **8311 Edison, Ontario**

1) Description: **Sign at front of dairy**

2) Description: **(L to R): (1) 1,000-gallon AST and (1) 500-gallon AST Diesel fuel**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

PHOTO 4

Facility/Case Name: **Martin DeHoog Dairy** Facility ID #: **FA0000410**

Address: **8311 Edison, Ontario**

3) Description: **(1) 30-gallon and (2) 5-gallon containers of powder chlorinated soap**

4) Description: **Back-up generator containing (2) 40-gallon tanks of Diesel fuel**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

05120104 Ontario Ral GeoKinetics

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PETER R. HILLS
Fire Chief
County Fire Warden

December 19, 2005

GeoKinetics
77 Bunsen
Irvine CA 92618

ATTENTION: Jennifer Wedner

**SUBJECT: REQUEST FOR RECORDS INFORMATION**

**RE: 8381 Edison**
**Ontario, California**

This is to confirm that the San Bernardino County Hazardous Materials Division has located records that may pertain to the subject site, as described in your request for records search.

The file(s) listed below are available for your review. Please e-mail this office at eking@sbcfire.org or call the number at the end of this letter to arrange an appointment.

**ACTIVE PERMITS:**
*(Regulatory files for facilities with annual operating permits to maintain underground storage tanks, storage hazardous materials, and/or generate hazardous waste. Files include permits, inspections, reports, test results, correspondence, and related materials. Files will also include any underground tank removal/construction activity records and site remediation/contamination records for facilities still in operation).*

No record of active permits/files

**INACTIVE PERMITS:**
*(Inactive regulatory files for formerly permitted facilities which maintained underground storage tanks, stored hazardous materials, and/or generated hazardous waste and/or facilities with underground storage tanks removed and/or materials and waste removed. Files will also include any underground tank removal/construction activity records and site remediation/contamination records for facilities no longer operating underground tanks).*

| | |
|---|---|
| AG-Martin L. DeHoog Dairy<br>8311 Edison<br>Chino | FA0000410 (AG-Exempt)<br>Hazardous Material Handler Permit<br>Underground Storage Tank Permit |

**PERMITS TO REMOVE/INSTALL/MODIFY UNDERGROUND STORAGE TANKS:**

| | |
|---|---|
| AG-DeHoog, Martin L.<br>8311 Edison<br>Chino | Issued 10/27/98<br>Remove 1 |

**HAZ MAT INCIDENT RESPONSE TEAM ACTIVITY:**

No record of haz mat incident response

**SITE REMEDIATION:**
*(Underground Storage Tank Clean-Up under Local Oversight Program or Hazardous Waste Clean-Up Activity under Local Jurisdiction) (documents may be included in regular active or inactive permit files listed above).*

No record of site remediation/clean-up action

Records searched include permit database systems for facilities with permits as hazardous waste generators, hazardous materials handlers, and/or underground storage tanks, including inactive and/or out of business records; logs of permits issued for the removal and/or installation of underground storage tanks; records and databases pertaining to illicit dumping and releases; records of non-permitted facilities; sites undergoing remediation for contaminated soil and/or groundwater; and incidents responded to by the hazardous materials emergency response team

Please e-mail me at eking@sbcfire.org or contact me at the number below for a review appointment or for further clarification.*

**ELIZABETH A. KING**
**Environmental Specialist II**
OFM/Hazardous Materials Division
(909) 386-8468 (909) 386-8460 fax
eking@sbcfire.org

*We will copy up to thirty (30) pre-selected pages from a file at a charge $0.25 per page copied. (Be prepared to make this payment at the time of service). If the copies selected exceed thirty (30) pages or if you want a copy of the entire file and it exceeds thirty (30) pages, we will refer you to a private copy service. If you prefer to bring a portable copier on site, you may do so. Please let us know your plans in advance so that accommodations can be made.

The file is about 30 pgs. or less. Please advise if you would like copies sent with an invoice for copying charges.

CUPA
San Bernardino County e Department • Hazardous Materials Divisi Public Records Section
620 South 'E' Street, San Bernardino, CA 92415-0153
(909) 386-8401 • FAX (909) 386-8460 • eking@sbcfire.org

# REQUEST FOR RECORDS RESEARCH

W/K 48

| For Office Use Only | |
|---|---|
| Reference No.: | 05120104 |
| Amount Paid: | 71.00 |
| Receipt No.: | 26497 |
| Date: | 12-15-05 |

**If this request is being faxed or e-mailed, please check the box below and indicate the amount to be mailed separately with the original form:**

☒ This request is being faxed or e-mailed. The original form will be mailed on 12/2/2005 along with a check or money order made payable to San Bernardino County Fire Department for the amount of: $ 71.00

| SITE INFORMATION | | |
|---|---|---|
| Facility Name / Owner Name | Site Address | City/Community |
| Brookfield – DeHoog | 8381 Edison Ave. | Ontario, California 91761 |

**SPECIFIC RECORDS REQUESTED**

| Record Type | Dates | Record Type | Dates |
|---|---|---|---|
| ☒ **ALL RECORDS** | | | |
| ☐ Active Permit Records | To | ☐ Risk Management Plan (RMP)/ CalARP | To |
| ☐ Inactive/Closed Permit Records | To | ☐ Hazardous Materials Handler Business Plan | To |
| ☐ Hazardous Waste Generator | To | ☐ Underground Storage Tank Removal Records | To |
| ☐ Hazardous Materials Handler | To | ☐ Site Remediation | To |
| ☐ Underground Storage Tank | To | ☐ Hazmat Incident/Emergency Response | To |
| ☐ Aboveground Storage Tank | To | ☐ | To |

*Records are searched by site location. If no site address exists, please provide other identifying location information, such as an Assessor's Parcel Number, address range (125-135 E. Main St.), street corner (NW Corner Main St. & Elm Ave.), legal description (Township, Range, Section), and/or a map.*

**NOTE: To obtain records information for sites within the City of Victorville, contact the Victorville City Fire Department at (760) 955-5229.**

**REQUESTOR INFORMATION**

| NAME | TITLE (*If individual, leave blank*) | COMPANY (*If individual, leave blank*) | |
|---|---|---|---|
| Jennifer Wedner | Project Coordinator | GeoKinetics | |
| **MAILING ADDRESS** | **CITY** | **STATE** | **ZIP CODE** |
| 77 Bunsen | Irvine | CA | 92618 |
| **TELEPHONE** | **FAX** | **EMAIL ADDRESS** | |
| 949/502.5353 | 949/502.5354 | Jennifer@appliedgeokinetics.com | |

**PURPOSE OF REQUEST**

| | |
|---|---|
| ☒ 1. Phase I site assessment or due diligence **AT THE SITE** | ☐ 7. Owner or operator of the above facility or property |
| ☐ 2. Environmental consultant or engineer involved with remediation **AT THE SITE** | ☐ 8. General interest/Community awareness |
| ☐ 3. Phase I site assessment or due diligence **NEARBY** | ☐ 9. Potential buyer |
| ☐ 4. Environmental consultant or engineer involved with remediation **NEARBY** | ☐ 10. Real Estate Agent, Lender, Appraiser |
| ☐ 5. Proposed School Site | ☐ 11. Legal reasons |
| ☐ 6. Proposed Drinking Water Well | ☐ 12. Other: |

- ***PAYMENT OF $71.00 MUST BE SUBMITTED WITH THIS REQUEST. A SEPARATE REQUEST MUST BE MADE FOR EACH SITE.***
- ***This form can be faxed or e-mailed. However, the original form must be mailed or delivered in person with the appropriate payment. Your faxed or e-mailed request will be logged at the time it is received (any request received after 5:00 PM will be logged in on the following business morning). Check the box in the upper left corner of this form to indicate that you have sent the original form with the fee by separate mail. PLEASE NOTE THAT THE SEARCH WILL NOT BEGIN UNTIL PAYMENT IS RECEIVED.***
- ***A rate of $71.00 per hour will be charged for any extended research.***
- ***If no records exist, you will be notified in writing. If records are identified, you will be notified in writing or by phone once they are located and retrieved, generally within two to three weeks, with a description of records that exist for the site and files that are available for review. Upon receipt of records availability, an appointment can be scheduled for your review of available files.***
- ***We will copy up to a maximum of 30 pages at the time records are examined at a rate of 25 cents per page. If more copies are required, you may bring a personal copier or arrange for a private copy service.***

**REQUESTOR'S SIGNATURE**

***I have read and understand the above record search procedures.***

| SIGNATURE OF REQUESTOR | DATE |
|---|---|
| | 12/1/2005 |

Overall Site with 1 Fac. Unit

## General Information

Location: 0008381 EDISON AV Map: Haz:1 Type: 1
Community: Chino Grid: F/U: 1 AOV: 0.0

| Contact Name | Title | Business Phone | 24-Hour Phone |
|---|---|---|---|
| MICHAEL DE HOOG | OWNER | (000) 000-0000 x | ( ) - |
| | | (000) 000-0000 x | ( ) - |

Summary

## Hazmat Inventory List in MCP Order

### All Materials at Site

| F/U | Material Name | --Hazards-- | Max Qty | Unit | MCP |
|---|---|---|---|---|---|
| F/U: 02 - Fixed Containers at Site | | | | | |
| | DIESEL | F IH DH | 280 | GAL | Moderate |

## AGRICULTURAL HAZARDOUS MATERIALS INVENTORY

BUSINESS NAME MICHAEL DE HOOG DAIRY

ADDRESS 8381 EDISON AVE. CHINO, CA 91710

CITY

STATE ZIP

PHONE NUMBER

EMERGENCY CONTACT MICHAEL DE HOOG DAIRY

EMERGENCY PHONE # 8381 EDISON AVE. CHINO, CA 91710

| MATERIAL | MAXIMUM QUANTITY | USED HOW | STORED AT |
|---|---|---|---|
| | | | |

[X] I HAVE NO HAZARDOUS MATERIALS IN REPORTABLE QUANTITIES HELD FOR MORE THAN 30 DAYS.

[X] I HAVE AN UNDERGROUND TANK. TANK SIZE 280 gallons

[ ] I CERTIFY THAT A "HAZARDOUS MATERIALS STORAGE AREA" SIGN HAS BEEN POSTED AS REQUIRED.

THE ABOVE INFORMATION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

NAME

DATE 10-30-87

SIGNATURE Michael R. De Hoog

**PLEASE SUBMIT IN TRIPLICATE**

AGRICULTURAL COMMISSIONER
777 E. RIALTO AVENUE
SAN BERNARDINO, CA. 92415

FD011TP DS Permit Billing System 12/06/00
SD005A Establishment Summary 09:27:07

Estab . . 97042497

Established: 03/26/1997
Status . . : DB
Location . : 53
Parcel . . :
Inactive . :
Federal id :

AG-DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Bill to: O Attn:
Contact: Drvr lic: Exp: State:

Applicant: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710
Owner: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Comment: DAIRY- 1 UST REMOVED 11/12/98 - MIKE WARD

F1=Help F3=Exit F5=Refresh
F13=EstbUpd F14=AddrUpd F17=PrmtInq F21=Srch F23=Print

FD011TP DS Permit Billing System 12/06/00
SD005A Establishment Summary 09:32:19

Estab . . 97042497

Established: 03/26/1997
Status . . : IN
Location . : 53
Parcel . . :
Inactive . : 12/06/2000
Federal id :

AG-DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Bill to: O Attn:
Contact: Drvr lic: Exp: State:

Applicant: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710
Owner: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Comment: FACILITY NO LONGER IN BUS-PER WAYNE WILLIAMS-SURVEY 11/27/00

F1=Help F3=Exit F5=Refresh
F13=EstbUpd F14=AddrUpd F17=PrmtInq F21=Srch F23=Print

RECEIVED
NOV 3 0 2000
BY:

# HAZARDOUS MATERIALS FIELD SERVICES
# COMPUTER DATA BASE UPDATE AUTHORIZATION

CHANGE ☐

INACTIVATE FACILITY ☒ INACTIVATE PERMIT(S) ☒

BILL TO: E A O LOC/DIST NO: _____ EST NO: 97042497
(Circle one)
(Former Est. Name (if applicable)

**E – Establishment Information**
Name: AG - DE Hoog, Martin L.
Street No: 8311 Fraction: _____ Direction: _____
Street Name: EDISON Ave. Apt/Ste/Unit No: _____
City: Ontario State: CA Zip Code: 91710
Attn: Telephone: ( )

**A – Applicant Information**
Name: _____
Street No: _____ Fraction: _____ Direction: _____
Street Name: _____ Apt/Ste/Unit No: _____
City: _____ State: _____ Zip Code: _____
Attn: Telephone: ( )

**O – Owner Information**
Name: _____
Street No: _____ Fraction: _____ Direction: _____
Street Name: _____ Apt/Ste/Unit No: _____
City: _____ State: _____ Zip Code: _____
Attn: Telephone: ( )

Program Information: MFR Number _____
Number of Employees: _____ Number of UST's: _____
Federal Tax I.D.Number/Social Security Number:

Permit Information: (Circle those that apply)
Change/Inactivate/Add: 2260003 Permit No: 97032662322
Change/Inactivate/Add: 229707 Permit No: 97032662323
Change/Inactivate/Add: 227001 Permit No: 97009101316
Change/Inactivate/Add: _____ Permit No: _____
Change/Inactivate/Add: _____ Permit No: _____

Date Submitted: 11-27-00 Date Entered: 12/6/00
Submitted By: W. Williams Entered By: Dina Thomas

Comments/Remarks:
Facility no longer in business – per survey
Please inactivate all permits

llm

**HAZARDOUS MATERIALS FIELD SERVICES**
**COMPUTER DATA BASE UPDATE AUTHORIZATION**

**CHANGE [ ]**

(Circle one) **INACTIVATE PERMIT/FACILITY [ ✓ ]**

**BILL TO: E A O** **LOC/DIST NO:** _____ **EST NO:** 97042497

**(Former Est. Name (if applicable)**

**E – Establishment Information**
**Name:** Ag- De Hoog, Martin L
**Street No:** 8311 **Fraction:** _____ **Direction:** _____
**Street Name:** Edison Ave **Apt/Ste/Unit No:** _____
**City:** Chino **State:** CA **Zip Code:** 91710
**Attn:** _____ **Telephone: (** **)**

**A – Applicant Information**
**Name:** _____
**Street No:** _____ **Fraction:** _____ **Direction:** _____
**Street Name:** _____ **Apt/Ste/Unit No:** _____
**City:** _____ **State:** _____ **Zip Code:** _____
**Attn:** _____ **Telephone: (** **)**

**O – Owner Information**
**Name:** _____
**Street No:** _____ **Fraction:** _____ **Direction:** _____
**Street Name:** _____ **Apt/Ste/Unit No:** _____
**City:** _____ **State:** _____ **Zip Code:** _____
**Attn:** _____ **Telephone: (** **)**

**Program Information:**
**Number of Employees:** _____ **Number of UGST's:** _____

**Federal Tax I.D.Number/Social Security Number:** _____

**Permit Information: (Circle those that apply)**
**Change/Inactivate/Add:** 222800 **Permit No:** 9901128652 = IN
**Change/Inactivate/Add:** 222800A **Permit No:** _____
**Change/Inactivate/Add:** _____ **Permit No:** _____
**Change/Inactivate/Add:** _____ **Permit No:** _____
**Change/Inactivate/Add:** _____ **Permit No:** _____

Date Submitted: 1/6/99 Date Entered: JAN 1 2 1999
Sumitted By: Larita Entered By: ab van

**Comments/Remarks:** 1 Ag tank removed 11/12/98 (Mike Ward)

**POST THIS CARD AT JOB SITE**

SAN BERNARDINO COUNTY FIRE DEPARTMENT/CUPA
HAZARDOUS MATERIALS DIVISION
FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVENUE, SECOND FLOOR
SAN BERNARDINO, CA 92415-0153

LOG # 102798-05 **JOB CARD №** 5691

INSTALL | REMOVE X

## CONSTRUCTION AND/OR REMOVAL OF UNDERGROUND STORAGE FACILITY

Site Name Martin Dehoog Dairy
Address 8311 Edison Ave, Chino
Contractor A&J Environmental 947-3559
Address/Phone 4752-C Felspar #104, Riverside

| | INSPECTION RECORD | APPROVED | DATE |
|---|---|---|---|
| FIRST INSPECTION | Excavation Clean, Approved Slope | | |
| | Bedding | | |
| | Holiday/Soap Test, Tanks Set X | | |
| | Manufacturer's UL # | | |
| | | | |
| | Additional Requirements | | |
| | | | |
| | **DO NOT BACKFILL UNTIL ABOVE APPROVED** | | |
| SECOND INSPECTION | Tank Air Test 5 PSI/30 Minutes | | |
| | Vent/Vapor Lines | | |
| | Products Lines 75 PSI/30 Minutes | | |
| | Product Line Containment | | |
| | Metal Piping Wrapped | | |
| | Sumps, Dispenser Pans Water Test | | |
| | | | |
| THIRD INSPECTION | Approved Fill Boxes | | |
| | Concrete or AC Paving 12" Beyond | | |
| | Leak Detectors/Monitors | | |
| | Lockable Fluid-Tight Access for Monitoring | | |
| | Precision Test Results | | |
| | Dispenser Containment | | |
| | Emergency Shut-off | | |
| | Additional Requirements | | |
| | | | |
| REQUIRED PRIOR TO OPERATING | Business Plan | | |
| | | | |
| | Monitoring Plan | | |
| | | | |
| | Financial Responsibility | | |

**FINAL APPROVAL AND CURRENT OPERATING PERMITS MUST BE OBTAINED PRIOR TO PLACING THESE TANKS INTO SERVICE ($5,000.00 FINE FOR NONCOMPLIANCE)**

| | | | |
|---|---|---|---|
| TANK REMOVAL INSPECTION | Tank(s) Removed X | MN | 11/12/98 |
| | Required Samples: 8020, 8015, MTBE, 418.1 | | |
| | Lead (pb) 7421 or ICP 6010, Metals EPA PP13 | | |
| | Additional Test Requirements | | |
| | | | |
| | **Removals Cannot be Finaled Until a Signed Copy of the Sample Results Have Been Received and Approved by this Department.** | | |
| | Final — Approved for Backfill | MN | 12/2/98 |

Remarks:

FAILURE TO PROTECT AND MAINTAIN THIS CARD MAY RESULT IN JOB DELAY.
PRESERVE THIS RECORD OF INSPECTIONS.

**FOR INSPECTION CALL 48 HOURS IN ADVANCE AT (909) 387- 3082**

**THIS PERMIT EXPIRES DECEMBER 22, 1998**

[1] PETROLEUM [ ] WASTE OIL [ ] OTHER

*DISTRIBUTION:* *White — County Fire Department*
*Green — Contractor/Owner*

14-16867-670 Rev. 4/98

SAN BERNARDINO COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS DIVISION – FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVE., 2ND FLOOR, SAN BERNARDINO, CA 92415-0153
(909) 387-3082 • FAX (909) 387-4323

# APPLICATION FOR REMOVAL OF UNDERGROUND STORAGE TANK

$ 450.00 First Tank

$ _____ Each Additional Tank

Number of Tanks this Application 1

## JOB LOCATION

Facility Name: Martin De Hoog Dairy
Contact Person: Martin De Hoog
Phone No.: 909) 947-3559
Situs Address: 8311 Edison Ave
City: Chino
Zip Code: 91710
Water/Sewer Agency:
Fire: Chino Fire

## PROPERTY OWNER

Name: Martin De Hoog
Phone No.: 909) 947-3559
Mailing Address: 8311 Edison Ave
City: Chino
Zip Code: 91710
Owner's Representative: Asa Cosby
Phone No.: 909) 681-0708

## TANK CONTENTS

Tank # 1 - Motor vehicle Fuel

## CONTRACTOR

Company Name: A&J Environmental
Contact Person: Asa Cosby
Phone No.: 909) 681-0708
Mailing Address: 4752-C Felspar #104
City: Riverside
Zip Code: 92509
Workman's Comp Insurance Carrier:
Policy No.:
State Contractor's License No.: 653381
Types of Licenses: General-A Haz Cert.
Expiration Date:

NOTE: The State of California has determined that tanks used for the storage of any hazardous or flammable substance shall be considered hazardous even if all contents have been removed.

All storage tanks shall be hauled as hazardous waste, accompanied by a state hazardous waste manifest, and taken to a licensed treatment, storage and disposal facility (TSDF); or if the tanks are triple rinsed on site and the rinsate manifested and hauled to a licensed TSDF, the tank may be handled as nonhazardous.

For information on licensed TSDFs that can accept nonrinsed tanks, contact the State of California Department of Health Services, Toxic Substance Control at (800) 258-6942.

Print Name Clearly: Rudy Gil
Phone: 909) 681-0708
Signature: Rudy Gil
Date: 10/27/98

## OFFICE USE ONLY

Under Permit: ☐ No ☑ Yes
Establishment Number: 970D497
Number of Tanks: 0
Fees Current: ☐ No
Delinquent Amount: AG-Tank
☐ Yes
Expiration Date:

Permit Fee Paid THIS Application: $450.00
Receipt Number: 1488399
Check Number: 7814
Date Paid: 10/27/98
Taken by: Larita
Log Number: 102798-05
Job Card Number: 56091

03-19991-670 Rev. 5/98

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

# UNDERGROUND STORAGE TANK PERMIT APPLICATION - FORM A

COMPLETE THIS FORM FOR EACH FACILITY/SITE

MARK ONLY ONE ITEM
- [ ] 1 NEW PERMIT
- [ ] 2 INTERIM PERMIT
- [ ] 3 RENEWAL PERMIT
- [ ] 4 AMENDED PERMIT
- [ ] 5 CHANGE OF INFORMATION
- [ ] 6 TEMPORARY SITE CLOSURE
- [x] 7 PERMANENTLY CLOSED SITE

## I. FACILITY/SITE INFORMATION & ADDRESS - (MUST BE COMPLETED)

| | | | |
|---|---|---|---|
| DBA OR FACILITY NAME: Martin De Hoog Dairy | | NAME OF OPERATOR: Martin De Hoog | |
| ADDRESS: 6311 Edison Ave | | NEAREST CROSS STREET: Grove Ave | PARCEL # (OPTIONAL) |
| CITY NAME: Chino | STATE: CA | ZIP CODE: 91710 | SITE PHONE # WITH AREA CODE: 909) 947-3559 |

✓ BOX TO INDICATE: [ ] CORPORATION [x] INDIVIDUAL [ ] PARTNERSHIP [ ] LOCAL-AGENCY DISTRICTS * [ ] COUNTY-AGENCY * [ ] STATE-AGENCY * [ ] FEDERAL-AGENCY *

* If owner of UST is a public agency, complete the following: name of Supervisor of division, section, or office which operates the UST _____

| | | | |
|---|---|---|---|
| TYPE OF BUSINESS: [ ] 1 GAS STATION [ ] 2 DISTRIBUTOR [x] 3 FARM [ ] 4 PROCESSOR [ ] 5 OTHER | [ ] ✓ IF INDIAN RESERVATION OR TRUST LANDS | # OF TANKS AT SITE: 1 | E. P. A. I. D. # (optional) |

| EMERGENCY CONTACT PERSON (PRIMARY) | | EMERGENCY CONTACT PERSON (SECONDARY) - optional | |
|---|---|---|---|
| DAYS: NAME (LAST, FIRST): De Hoog, Martin | PHONE # WITH AREA CODE: 909) 947-3559 | DAYS: NAME (LAST, FIRST) | PHONE # WITH AREA CODE |
| NIGHTS: NAME (LAST, FIRST): De Hoog, Martin | PHONE # WITH AREA CODE: 909) 947-3559 | NIGHTS: NAME (LAST, FIRST) | PHONE # WITH AREA CODE |

## II. PROPERTY OWNER INFORMATION - (MUST BE COMPLETED)

| | | | |
|---|---|---|---|
| NAME: Martin De Hoog Dairy | CARE OF ADDRESS INFORMATION | | |
| MAILING OR STREET ADDRESS: 6311 Edison Ave | ✓ box to indicate: [x] INDIVIDUAL [ ] LOCAL-AGENCY [ ] STATE-AGENCY [ ] CORPORATION [ ] PARTNERSHIP [ ] COUNTY-AGENCY [ ] FEDERAL-AGENCY | | |
| CITY NAME: Chino | STATE: CA | ZIP CODE: 91710 | PHONE # WITH AREA CODE: 909) 947-3559 |

## III. TANK OWNER INFORMATION - (MUST BE COMPLETED)

| | | | |
|---|---|---|---|
| NAME OF OWNER: Martin De Hoog Dairy | CARE OF ADDRESS INFORMATION | | |
| MAILING OR STREET ADDRESS: 6311 Edison Ave | ✓ box to indicate: [x] INDIVIDUAL [ ] LOCAL-AGENCY [ ] STATE-AGENCY [ ] CORPORATION [ ] PARTNERSHIP [ ] COUNTY-AGENCY [ ] FEDERAL-AGENCY | | |
| CITY NAME: Chino | STATE: CA | ZIP CODE: 91710 | PHONE # WITH AREA CODE: 909) 947-3559 |

## IV. BOARD OF EQUALIZATION UST STORAGE FEE ACCOUNT NUMBER - Call (916) 322-9669 if questions arise.

TY (TK) HQ 4 4 - [ ][ ][ ][ ][ ][ ]

## V. PETROLEUM UST FINANCIAL RESPONSIBILITY - (MUST BE COMPLETED) – IDENTIFY THE METHOD(S) USED

✓ box to indicate
- [ ] 1 SELF-INSURED
- [ ] 5 LETTER OF CREDIT
- [x] 2 GUARANTEE
- [ ] 6 EXEMPTION
- [ ] 3 INSURANCE
- [ ] 99 OTHER _____
- [ ] 4 SURETY BOND

## VI. LEGAL NOTIFICATION AND BILLING ADDRESS

Legal notification and billing will be sent to the tank owner unless box I or II is checked.

CHECK ONE BOX INDICATING WHICH ABOVE ADDRESS SHOULD BE USED FOR LEGAL NOTIFICATIONS AND BILLING: I. [x] II. [ ] III. [ ]

*THIS FORM HAS BEEN COMPLETED UNDER PENALTY OF PERJURY, AND TO THE BEST OF MY KNOWLEDGE, IS TRUE AND CORRECT*

| | | |
|---|---|---|
| OWNER'S NAME (PRINTED & SIGNED): Rudy G.I / Rudy M / Agent for Martin De Hoog Dairy | OWNER'S TITLE | DATE MONTH/DAY/YEAR: 10/27/96 |

## LOCAL AGENCY USE ONLY

| COUNTY # | JURISDICTION # | FACILITY # |
|---|---|---|
| [ ][ ] | [ ][ ][ ] | [ ][ ][ ][ ][ ][ ] |

| LOCATION CODE - *OPTIONAL* | CENSUS TRACT # - *OPTIONAL* | SUPVISOR - DISTRICT CODE - *OPTIONAL* |
|---|---|---|
| | | |

THIS FORM MUST BE ACCOMPANIED BY AT LEAST (1) OR MORE PERMIT APPLICATION - FORM B, UNLESS THIS IS A CHANGE OF SITE INFORMATION ONLY.

OWNER MUST FILE THIS FORM WITH THE LOCAL AGENCY IMPLEMENTING THE UNDERGROUND STORAGE TANK REGULATIONS

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

# UNDERGROUND STORAGE TANK PERMIT APPLICATION - FORM B

COMPLETE A SEPARATE FORM FOR EACH TANK SYSTEM.

MARK ONLY ONE ITEM
- [ ] 1 NEW PERMIT
- [ ] 2 INTERIM PERMIT
- [ ] 3 RENEWAL PERMIT
- [ ] 4 AMENDED PERMIT
- [ ] 5 CHANGE OF INFORMATION
- [ ] 6 TEMPORARY TANK CLOSURE
- [ ] 7 PERMANENTLY CLOSED ON SITE
- [x] 8 TANK REMOVED

DBA OR FACILITY NAME WHERE TANK IS INSTALLED: Martin De Hoog Dairy

## I. TANK DESCRIPTION

COMPLETE ALL ITEMS – SPECIFY IF UNKNOWN

A. OWNER'S TANK I. D. # #1

B. MANUFACTURED BY: UNKNOWN

C. DATE INSTALLED (MO/DAY/YEAR) UNKNOWN

D. TANK CAPACITY IN GALLONS: 500 gal

## II. TANK CONTENTS

IF A-1 IS MARKED, COMPLETE ITEM C.

A.
- [x] 1 MOTOR VEHICLE FUEL
- [ ] 2 PETROLEUM
- [ ] 3 CHEMICAL PRODUCT
- [ ] 4 OIL
- [ ] 80 EMPTY
- [ ] 95 UNKNOWN

B.
- [x] 1 PRODUCT
- [ ] 2 WASTE

C.
- [x] 1a REGULAR UNLEADED
- [ ] 1b PREMIUM UNLEADED
- [ ] 2 LEADED
- [ ] 3 DIESEL
- [ ] 4 GASAHOL
- [ ] 5 JET FUEL
- [ ] 6 AVIATION GAS
- [ ] 7 METHANOL
- [ ] 99 OTHER (DESCRIBE IN ITEM D. BELOW)

D. IF (A.1) IS NOT MARKED, ENTER NAME OF SUBSTANCE STORED

C. A. S. # :

## III. TANK CONSTRUCTION

MARK ONE ITEM ONLY IN BOXES A, B, AND C, AND ALL THAT APPLIES IN BOX D AND E

A. TYPE OF SYSTEM
- [ ] 1 DOUBLE WALL
- [x] 2 SINGLE WALL
- [ ] 3 SINGLE WALL WITH EXTERIOR LINER
- [ ] 4 SECONDARY CONTAINMENT (VAULTED TANK)
- [ ] 95 UNKNOWN
- [ ] 99 OTHER

B. TANK MATERIAL (Primary Tank)
- [x] 1 BARE STEEL
- [ ] 2 STAINLESS STEEL
- [ ] 3 FIBERGLASS
- [ ] 4 STEEL CLAD W/ FIBERGLASS REINFORCED PLASTIC
- [ ] 5 CONCRETE
- [ ] 6 POLYVINYL CHLORIDE
- [ ] 7 ALUMINUM
- [ ] 8 100% METHANOL COMPATIBLE W/FRP
- [ ] 9 BRONZE
- [ ] 10 GALVANIZED STEEL
- [ ] 95 UNKNOWN
- [ ] 99 OTHER

C. INTERIOR LINING
- [ ] 1 RUBBER LINED
- [ ] 2 ALKYD LINING
- [ ] 3 EPOXY LINING
- [ ] 4 PHENOLIC LINING
- [ ] 5 GLASS LINING
- [ ] 6 UNLINED
- [x] 95 UNKNOWN
- [ ] 99 OTHER

IS LINING MATERIAL COMPATIBLE WITH 100% METHANOL ? YES ___ NO ___

D. CORROSION PROTECTION
- [ ] 1 POLYETHYLENE WRAP
- [ ] 2 COATING
- [ ] 3 VINYL WRAP
- [ ] 4 FIBERGLASS REINFORCED PLASTIC
- [ ] 5 CATHODIC PROTECTION
- [x] 91 NONE
- [ ] 95 UNKNOWN
- [ ] 99 OTHER

E. SPILL AND OVERFILL — SPILL CONTAINMENT INSTALLED (YEAR) N/A — OVERFILL PREVENTION EQUIPMENT INSTALLED (YEAR) N/A

## IV. PIPING INFORMATION

CIRCLE A IF ABOVE GROUND OR U IF UNDERGROUND, BOTH IF APPLICABLE

A. SYSTEM TYPE — A (U) 1 SUCTION; A U 2 PRESSURE; A U 3 GRAVITY; A U 99 OTHER

B. CONSTRUCTION — A (U) 1 SINGLE WALL; A U 2 DOUBLE WALL; A U 3 LINED TRENCH; A U 95 UNKNOWN; A U 99 OTHER

C. MATERIAL AND CORROSION PROTECTION
- A (U) 1 BARE STEEL
- A U 2 STAINLESS STEEL
- A U 3 POLYVINYL CHLORIDE (PVC)
- A U 4 FIBERGLASS PIPE
- A U 5 ALUMINUM
- A U 6 CONCRETE
- A U 7 STEEL W/ COATING
- A U 8 100% METHANOL COMPATIBLE W/FRP
- A U 9 GALVANIZED STEEL
- A U 10 CATHODIC PROTECTION
- A U 95 UNKNOWN
- A U 99 OTHER

D. LEAK DETECTION
- [ ] 1 AUTOMATIC LINE LEAK DETECTOR
- [x] 2 LINE TIGHTNESS TESTING
- [ ] 3 INTERSTITIAL MONITORING
- [ ] 99 OTHER

## V. TANK LEAK DETECTION

- [x] 1 VISUAL CHECK
- [ ] 2 INVENTORY RECONCILIATION
- [ ] 3 VADOZE MONITORING
- [ ] 4 AUTOMATIC TANK GAUGING
- [ ] 5 GROUND WATER MONITORING
- [ ] 6 TANK TESTING
- [ ] 7 INTERSTITIAL MONITORING
- [ ] 91 NONE
- [ ] 95 UNKNOWN
- [ ] 99 OTHER

## VI. TANK CLOSURE INFORMATION

1. ESTIMATED DATE LAST USED (MO/DAY/YR) UNKNOWN
2. ESTIMATED QUANTITY OF SUBSTANCE REMAINING Ø GALLONS
3. WAS TANK FILLED WITH INERT MATERIAL ? YES [ ] NO [x]

*THIS FORM HAS BEEN COMPLETED UNDER PENALTY OF PERJURY, AND TO THE BEST OF MY KNOWLEDGE, IS TRUE AND CORRECT*

APPLICANT'S NAME (PRINTED & SIGNATURE) Rudy Gil / Rudy MO / Agent for Martin De Hoog Dairy — DATE 10/27/92

## LOCAL AGENCY USE ONLY

THE STATE I.D. NUMBER IS COMPOSED OF THE FOUR NUMBERS BELOW

| STATE I.D.# | COUNTY # | JURISDICTION # | FACILITY # | TANK # |
|---|---|---|---|---|
| | | | | |

| PERMIT NUMBER | PERMIT APPROVED BY/DATE | PERMIT EXPIRATION DATE |
|---|---|---|
| | | |

THIS FORM MUST BE ACCOMPANIED BY A PERMIT APPLICATION - FORM A, UNLESS A CURRENT FORM A HAS BEEN FILED.
FILE THIS FORM WITH THE LOCAL AGENCY IMPLEMENTING THE UNDERGROUND STORAGE TANK REGULATIONS

# ENVIRONMENTAL HEALTH SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO, CALIFORNIA

THIS PERMIT EXPIRES:
05/30/91

MICHAEL DEHOOG DAIRY
8381 EDISON AV
CHINO, CA 91710
EST - 88015860 PERMIT - 8804250023

# PERMIT

## NON-TRANSFERABLE

This permit may be suspended or revoked by the health officer for cause. This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force by the United States Government, the State of California and the County of San Bernardino pertaining to the above mentioned business. Penalty fees are assessed on permits renewed 30 days after expiration date indicated above, or for failure to obtain new permit in case of transfer of ownership.

TYPE OF PERMIT - AGRICULTURAL HAZARDOUS MATERIAL HANDLER

FEE PAID $50.00

MICHAEL DEHOOG DAIRY
DBA: MICHAEL DEHOOG DAIRY
8381 EDISON AV
CHINO, CA 91710

04-1804-631 REV. 3/85

PERMIT DOES NOT IMPLY APPROVAL

POST IN A
CONSPICUOUS PLACE

Director
ENVIRONMENTAL HEALTH SERVICES

Changes A MAY 18 90

MONTHLY

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
INVOICE

PAGE 1
BILL DATE 04/30/90
HEALTH PERMIT EXPIRATION DATE 05/30/90

*** REMIT COPY ***

ESTABLISHMENT NBR 88015860

MICHAEL DEHOAG DAIRY
DBA: MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 880[illegible]23 | 226014 | PREVIOUS BALANCE | | 0.00 |
| | | AGRICULTURAL HAZARDOUS MATERIAL HANDLER | 101 | 50.00 |
| | | PERMIT TOTAL | | 50.00 |
| | | TOTAL DUE | | 50.00 |

MAY 18 1990

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

PAID
Amt $50
Date 5/18
By Pat
# 4743

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS WASTE GENERATORS -- 387-3080
UND[illegible]OUND STORAGE T[illegible] PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER PERMITS -- 387-3044
MOBILEHOME PARK PERMITS -- 387-6515
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-6515
HOME OCCUPATION PERMITS -- 387-6512
TEMPORARY OFFICES/SIGNS -- 387-6512
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4666
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-6512

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

MONTHLY

# RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO MICHAEL DE~~HOAG~~ Hoog DAIRY
8381 EDISON AV
CHINO, CA 91710

< > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO MICHAEL DE~~HOAG~~ Hoog DAIRY
8381 EDISON AV
CHINO, CA 91710

LEGAL OWNER INFO MICHAEL ~~DEHOAG~~ De Hoog DAIRY
8381 EDISON AV
CHINO, CA 91710

IS THIS A TRANSFER? no

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

| OFFICE USE ONLY |
|---|
| EST NBR 88015860 |
| PERMIT NBR 8804250023 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226014 |
| EXPIR DATE 05/30/90 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 2200 |
| MFR NBR |
| APN |
| PERMIT FEE _____ |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D 150 |

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

SIGNED Michael De Hoog DATED 5/15/90 TITLE Owner

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

# ENVIRONMENTAL HEALTH SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO, CALIFORNIA

THIS PERMIT EXPIRES:
05/30/90

MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710
EST - 88015860 PERMIT - 8804250023

# PERMIT

## NON-TRANSFERABLE

This permit may be suspended or revoked by the health officer for cause. This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force by the United States Government, the State of California and the County of San Bernardino pertaining to the above mentioned business. Penalty fees are assessed on permits renewed 30 days after expiration date indicated above, or for failure to obtain new permit in case of transfer of ownership.

TYPE OF PERMIT - AGRICULTURAL HAZARDOUS MATERIAL HANDLER

FEE PAID $50.00

MICHAEL DEHOAG DAIRY
DBA MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

04-1804-631 REV. 3/85

PERMIT DOES NOT IMPLY APPROVAL

POST IN A
CONSPICUOUS PLACE

Director
ENVIRONMENTAL HEALTH SERVICES

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
I N V O I C E

PAGE 1
BILL DATE 04/24/89
HEALTH PERMIT EXPIRATION DATE 05/30/89

*** REMIT COPY ***

ESTABLISHMENT NBR 88015860

MICHAEL DEHOAG DAIRY
DBA: MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 8804250023 | 226014 | PREVIOUS BALANCE | | 0.00 |
| | | AGRICULTURAL HAZARDOUS MATERIAL HANDLER | 101 | 50.00 |
| | | PERMIT TOTAL | | 50.00 |
| | | TOTAL DUE | | 50.00 |

MAY 05 1989

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

PAID
Amt 50.00
Date 5-5-89
By PD

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS
WASTE GENERATORS -- 387-3080
UNDERGROUND STORAGE
TANK PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3044
MOBILEHOME PARK PERMITS -- 387-4670
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-4670
HOME OCCUPATION PERMITS -- 387-4678
TEMPORARY OFFICES/SIGNS -- 387-4678
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4655
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-4678

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

< > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

LEGAL OWNER INFO MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

IS THIS A TRANSFER? NO

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: X ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

NUMBER OF EMPLOYEES: 00000

| OFFICE USE ONLY |
|---|
| EST NBR 88015860 |
| PERMIT NBR 8804250023 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226014 |
| EXPIR DATE 05/30/89 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 2200 |
| MFR NBR |
| APN |
| PERMIT FEE 50- |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D 50- |

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

SIGNED Michael DeHoog DATED 5-4-89 TITLE owner

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 7001100 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: 0000000000 ***

ESTAB NBR: 88015860 BILL FLAG: O LOC: 53 PARCEL NBR: PROBLEM PGM: STATUS: ESTAB DATE: 042588 INACTIVE DATE: 000000

*** CONTROL NUMBER: 7001101 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: 8804250023 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8804250023 | 226008 | | 05/30/88 | | 22 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 7001101 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: 8804250023 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 000 | | | | | |

*** CONTROL NUMBER: 7001199 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: A ***

*** CONTROL NUMBER: 7001199 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: E ***

*** CONTROL NUMBER: 7001199 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: O ***

| ESTAB: | APPL: | OWNR: |
|---|---|---|
| MICHAEL DEHOAG DAIRY | MICHAEL DEHOAG DAIRY | MICHAEL DEHOAG DAIRY |
| 8381 O/O EDISON AV | 8381 O/O EDISON AV | 8381 O/O EDISON AV |
| 00000 | 00000 | 00000 |
| CHINO CA 91710-0000 | CHINO CA 91710-0000 | CHINO CA 91710-0000 |
| (000) 000-0000 | (000) 000-0000 | (000) 000-0000 |

**EMERGENCY MANAGEMENT PROGRAM**
**AUTOMATED PERMIT BILLING SYSTEM**
**DATA INPUT SHEET**

ACTION CODE: I EST. # _____ PERMIT # _____

**ESTABLISHMENT INFO: (00)**

BILL TO: LOCATION: # 153 EST. DATE: _____

**ADDRESSING INFORMATION (99):**

E

NAME: MICHAEL DEHOIT DAIRY

ST #: 8381 FRAC: ____ DIR: ____ ST NAME: EDISON

ST. DESIG. AVE APT/SP ____ CITY CHINO

STATE CA ZIP 91710 PH #: ( ) ____ - ____

A

NAME: Same

ST #: ____ FRAC: ____ DIR: ____ ST NAME: ____

ST. DESIG. ____ APT/SP ____ CITY ____

STATE ____ ZIP ____ PH #: ( ) ____ - ____

O

NAME: Same

ST #: ____ FRAC: ____ DIR: ____ ST NAME: ____

ST. DESIG. ____ APT/SP ____ CITY ____

STATE ____ ZIP ____ PH #: ( ) ____ - ____

**PERMIT INFORMATION (01):**

CATEGORY # 226006 226007 226008

EXP. DATE: _____ SANITARIAN DIST/AREA: _____ SANITARIAN DIST.EMP #: 00

RENEWAL CODE: N MFR # _____

**PROGRAM INFORMATION:**

# OF EMPLOYEES: N/A # OF CHEMICALS: _____

DATE ENTERED: _____ CONTROL #: 70011

SUBMITTED BY (INITIAL): LG ENTERED BY (INITIAL) APR 25 1988

**COMMENTS/REMARKS:**

# CUPA

San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

## UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Martin De Hoog — Date: May 29, 2007
Street Address: 8311 Edison — Facility No. FA0000410
City: Ontario — Zip Code: 91762 — Program Record No. N/A
Facility Contact: Martin De Hoog — Facility Phone No. (909) 947-3559 — Number of Tanks: 0

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 302. UST permit fees paid and current | CHSC 25287(a) | | | |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | |
| 308. Failure to report change of ownership within 30 days | CHSC 25284(c) | | | |
| 306. Owner/Operator agreement available | CHSC 25284(a)(3) | | | |
| 307. Certificate of Financial Responsibility submitted | CHSC 25292.2(a) | | | |
| 330. Leak Detection/Monitoring and Response Plan | CCR 2632, 2634 or 2641(h) | | | |
| 304. UST monitoring/maintenance records available for 3 years | CHSC 25284(c) | | | |
| 312. Designated Operator Statement submitted | CCR 2715(a) | | | |
| 313. Monthly inspections completed by Designated Operator | CCR 2715(c) | | | |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | |
| 311. Business Plan submitted/updated | CHSC 25505 | | | |
| **MONITORING OF UST SYSTEMS** | | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | |
| 331. Monitoring system(s) certified annually | CCR 2638 or 2641(j) | | | |
| 334. Audible/visual alarms operational | CCR 2632(c)(2)(B) and 2636(f)(1) | | | |
| 314. Certification sticker/tag affixed to monitoring equipment | CCR 2638(f) | | | |
| 318. Sensors placed at low point of UST system(s) | CCR 2630(d) or 2641(a) | | | |
| 319. Leak detection equipment tampered with or disabled | CHSC 25299(f)(2) | | | |
| 323. Containment sump(s) free of debris/liquid | CCR 2590.21(c)(3) | | | |
| 324. Line leak detector(s) installed and functioning properly | CCR 2636(f)(2) or 2641(f) | | | |
| 333. Overspill containment installed/tested annually | CHSC 25284.2 | | | |
| 327. Overfill protection device installed/operational | CCR 2635(b)(2) | | | |
| 328. Secondary containment components tested | CCR 2637(a) | | | |
| 329. UST system design, construction, and monitoring | CCR 2630 or 2640 | | | |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | |
| 341. Failure to report unauthorized release | CHSC 25299(d)(1) | | | |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | |
| **UNIFORM FIRE CODE REQUIREMENTS** | | | | |
| 335. Emergency fuel shut-off device operational | UFC 5201.5.3 | | | |
| 336. Impact valve(s) installed at dispenser(s) | UFC 5202.5.3.2 | | | |
| 337. Fire extinguisher(s) present and charged | UFC 5201.9 | | | |
| 338. Address clearly visible from street | UFC 901.4.4 | | | |
| **OTHER REQUIREMENTS** | | | | |
| Significant Operational Compliance – Prevention | 40 CFR Part 280 | | | |
| Significant Operational Compliance – Detection | 40 CFR Part 280 | | | |
| Significant Operational Compliance – Both | 40 CFR Part 280 | | | |

**NARRATIVE / CORRECTIONS**

A file review was conducted in conjunction with hazardous material handler and hazardous waste generator inspection.
One 500-gallon gasoline UST was removed on 11-12-98. Sampling was conducted on the date of removal. A closure letter was issued on 1-6-99.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: Lester Hearnside — Received by: Martin De Hoog — Title: Owner

**CUPA**
**San Bernardino County Fire Department**
**HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION**
**385 N. Arrowhead Ave, 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323**

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

Facility Name: AG - Martin L. De Hoog Date: 11-21-00
Street Address: 8311 EDISON AVE. Est. No: 97042497
City: CHINO Zip Code: 91710 EPA ID No:
Facility Contact: MARTIN DeHoog Phone No. Number of Employees:

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N | |
|---|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 33.0732 | | | | • |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | | • |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | | • |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | | • |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | | • |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | | • |
| 107. Contingency Plan established | CCR 66265.51(a) | | | | • |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | | • |
| **STORAGE AND LABELING REQUIREMENTS** | | | | | |
| 110. Hazardous Waste containers labeled | CCR 66262.34(f)(3) | | | | |
| 111. Hazardous Waste container label complete | CCR 66262.34(f)(3) | | | | |
| 112. Accumulation start date on labels | CCR 66262.34(f)(2) | | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | | • |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | | • |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | | • |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | | • |
| 120. Aboveground Tank storage area inspected daily | CCR 66265.195 | | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | | • |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | | • |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | | • |
| 132. SB 14 completed and available | CCR 67100.3 | | | | |
| **MANAGEMENT OF USED OIL AND BATTERIES** | | | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | | |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | | |
| 137. Used oil receipts complete & available | CHSC 25250.8(b) | | | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | | |
| 139. Used batteries managed lawfully | CCR 66266.81 | | | | |
| **DISPOSAL AND TRANSPORTATION** | | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | | |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | | • |
| 147. Transportation of Hazardous Waste w/o registration | CHSC 25163 | | | | • |
| 148. Hazardous Waste hauled by registered transporter | CHSC 25163 | | | | • |
| 149. Haz. Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | | • |

| RELEASE AND RESPONSE/BUSINESS PLANS | | V | C | N | |
|---|---|---|---|---|---|
| 201. Hazardous Material handler permit current | CC 33.022 | | | | |
| 202. Business Plan established | CHSC 25503.5 | | | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | | |
| 205. Facility access for inspection granted - HM Only | CHSC 25508 | | | | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | | |
| 207. SPCC Plan completed | CHSC 25270.5(c) | | | | |

**INSPECTION NARRATIVE**

No HAZARDOUS MATERIALS / WASTES on site. The UST was removed 11-12-98.

Permits will be INACTIVATED.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN _____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: _____ Received by: _____ Title: _____

EH011TP EHS Permit Bi g System 10/24/00
EH002 Establishment Summary 09:00:35

Estab . . 97042497

Established: 03/26/1997
Status . . : DB
Location . : 53
Parcel . . :
Inactive . :
Federal id :

AG-DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Bill to: O Attn:
Contact: Drvr lic: Exp: State:

Applicant: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710
Owner: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Comment: DAIRY- 1 UST REMOVED 11/12/98 - MIKE WARD

F1=Help F3=Exit F5=Refresh
F13=EstbUpd F14=AddrUpd F17=PrmtInq F21=Srch F23=Print

Wayne,
The UST here was removed, would you please verify for me whether they still need these other permits?
Thank you
Linda

Estab . . 97042497 AG-DE HOOG, MARTIN L

| Sel | Permit | Catgy | Expire Date | MFR | Sani | Balance | Stat | Size |
|---|---|---|---|---|---|---|---|---|
| | 9703262322 | 226008 | 04/30/1997 | | 0500 | .00 | | 0 |
| | Last bill: 03/29/1997 | | Last delq: | | | Delq cnt: 0 | | |
| | 9703262323 | 228707 | 04/30/1997 | | 0500 | .00 | | 0 |
| | Last bill: 03/29/1997 | | Last delq: | | | Delq cnt: 0 | | |
| | 9709101316 | 227001 | 04/30/1997 | | 0500 | .00 | | 0 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |
| | 9901128652 | 222800 | 07/31/1998 | | 0500 | .00 | I | 1 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |

F1=Help F3=Exit F5=Refresh F7=Bkwd F8=Fwd
F15=PrmtUpd F19=ItemInq F20=FiscInq F21=Srch F22=Smry F23=Print

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden


JANUARY 6, 1999

MARTIN DE HOG
8311 EDISON AVE
CHINO, CA 91710

**SUBJECT: UNDERGROUND STORAGE TANK REMOVAL AT 8311 EDISON AVE, CHINO**

The Department has received the sample results and/or closure report submitted by Enviro-Chem, Inc dated 11/23/98. After review of the reports prepared by you or your agent, it has been determined that the extent of contamination or lack thereof would indicate that no further investigation is warranted at this time.

**It is important to note** that this can not be construed as a release of liability for the site or declaration that the site is free from contamination. Should further projects or environmental investigations reveal additional contaminants site you will be responsible and held liable for the investigation and remedial actions. If you have any questions, please call (909) 387-3082.

Mike Ward

**MIKE WARD, E.S. II**
**Hazardous Materials Division**

MW/ll

Cc: A & J Environmental

C10 SCD

San Bernardino County Fire Department
HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 N. Arrowhead Ave., 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323

# UNDERGROUND STORAGE TANK REMOVAL INSPECTION FORM

DATE: 12 NOV 98 TIME: 1300 LOG # _____

FACILITY NAME: Hogg Dairy
LOCATION: 8311 Edison, Chino
CONTRACTOR: A&J

INSPECTORS PRESENT — HAZMAT: Ward FIRE: Jensen
AQMD: _____ OTHER: _____

| | QUANTITY | HAULER | DESTINATION |
|---|---|---|---|
| TRIPLE RINSATE | 100g | JSE ENV. | Ind. Waste Svcs. |
| TANKS | 1 | " | AMR |

DEGASSING CONTRACTOR _____

MANIFEST # 99119670 SCAQMD REFERENCE # _____ DRY ICE USED (10-15 # / 1000 g) 10#

NOTES:

Hours: _____

Page ___/___

| TANK # | SIZE | MATERIAL HELD | UL # | APPEARANCE (RUSTY, HOLED, SOUND, ETC.) |
|---|---|---|---|---|
| 1 | 500 | Gasoline | | Sound |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

ACILITY MAP:

[redacted]

| SAMPLE # | DATE/ TIME | DESCRIPTION (soil / odor) | LOCATION | DEPTH | EPA TEST # 'S |
|---|---|---|---|---|---|
| TANK-1-C | | SILT / NONE | | 9' | 8015 / 8020 + MTBE |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| )) | | | | | |

AMPLES TAKEN BY Asa Cosby - A&J LABORATORY _____

ONTAINER GLASS LABELS x SPLITS N/A HEADSPACE ϕ SEALS N/A

EFRIGERATED x CHAIN OF CUSTODY x OTHER _____

EQUIRED EPA TESTS:
asoline: 8020 (BTEX) or 8021B , 8015 (TRPH - modified for gas) & MTBE
iesel: 8020 (BTEX) or 8021B , 8015 (TRPH - modified for diesel) & MTBE
olvents/HVO's: 8010 or 8021B
aste Oil: 418.1 (with 8010 or 8021B if solvents are suspect) & CAM 17 for metals
etals: 7030 (Cd), 7190 (Cr), 7950 (Zn), 7420 or 6010 (Pb), 7080 (As), 8080 (PCB), 9010 (CN's)
esticides: 8080 (organo-Cl's), 8140 (N & P containing)

NOTE:
USTs ≥1000 g require a minimum of 2 samples. One from the fill end and one from the turbine end. Also, a sample from the dispenser should be taken. Samples should be taken from at least 2' below native soil (not fill). If discoloration is noted in sidewalls, take samples there. And sample stockpiles if contamination is suspect. For piping, samples should be taken ± every 20' & at major connections.

**ote: Methods 8020 and 8010 were deleted i 346 -III and combined as 8021B. Also, 82( ay be used in place of 8021B for ore accurate analyses when sampling for pot...al legal actions.**

Environmental

RECEIVED
DEC - 2 1998
COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS

November 30, 1998

Mr. Mike Curtis
San Bernardino Fire Department
Hazardous Materials Division
385 N. Arrowhead Ave. 2ND Floor
San Bernardino, Ca. 92415-0153

Subject: Site Closure: Martin Dehoog Dairy, 8311 Edison Avenue, Chino, CA.

Mr. Curtis,

A & J Environmental has prepared and is pleased to submit the following Closure Report with supporting documentation regarding the removal of one underground storage tank from the above referenced address.

## BACKGROUND

The site is located on a generally flat area consisting mostly of dairy farms. On November 12, 1998 one (1) underground storage tank was removed from the site. The tank had the capacity of 500 gallons and reportedly once contained gasoline. The tank was triple rinsed prior to the removal. Approximately 100 gallons of rinsate waste was generated during the tank cleaning and subsequently shipped to Industrial Service Oil Co., Inc (Manifest # 98119670 attached). The tank was removed using a backhoe and loaded onto a truck and transported to American Metal Recycling Inc.in Ontario for destruction (Ticket # 50215 attached). The tank removal procedures were witnessed by Inspector Curtis Armstrong of the San Bernardino County Fire Department, Hazardous Materials Division.

OK To Close
mfa 12/2/98

(Continued)

## SAMPLE COLLECTION PROCEDURES

Following the removal of the tank, a backhoe was used to obtain one (1) soil sample from underneath the center of the tank and identified as Tank # 1 Center. The sample was collected from near the teeth of the backhoe bucket and compacted into a glass jar. The jar was completely filled without any head space prior to sealing with a Teflon-lined threaded cap. The sample was placed into a chilled container and transported for analysis to Enviro-Chem, INC. (ECI), a State Certified Laboratory.

## FINDINGS

The sample collected was analyzed for EPA 8015-m, 8020 and MTBE. Sample Tank # 1 Center indicate non-detectable limits of Hydrocarbons. (ECI Laboratory Report and Chain of Custody attached).

## CONCLUSIONS

Based upon the above findings, we are asking that the San Bernardino County Fire Department, Hazardous Materials Division, to grant closure and require no further action at this site.

## LIMITATIONS

Our professional services were performed using that degree of care and skill ordinarily exercised by environmental consultants practicing in this or similar localities. The findings were mainly based upon analytical results provided by an independent laboratory. Interpretations of the subsurface conditions at the site for the purpose of this investigation are made from a limited number of available data points (i.e. soil samples) and subsurface conditions may vary away from these data points. No other warranty, expressed or implied, is made as to the professional recommendations contained in this report.

Thank you for taking time from your schedule to review this report. Please do not hesitate to contact us if you have any questions or comments regarding this matter. Our office number is (909) 681-0708

Sincerely

Asa Cosby, REA-03892

**POST THIS CARD AT JOB SITE**

SAN BERNARDINO COUNTY FIRE DEPARTMENT/CUPA
HAZARDOUS MATERIALS DIVISION
FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVENUE, SECOND FLOOR
SAN BERNARDINO, CA 92415-0153

LOG # 102798-05 JOB CARD № 5691

INSTALL ____ REMOVE 1

## CONSTRUCTION AND/OR REMOVAL OF UNDERGROUND STORAGE FACILITY

Site Name Martin Dehoog Dairy
Address 8311 Edison Ave, Chino
Contractor AJ Environmental 947-3559
Address/Phone 4752-C Felspar #101, Riverside

| | INSPECTION RECORD | APPROVED | DATE |
|---|---|---|---|
| FIRST INSPECTION | Excavation Clean, Approved Slope | | |
| | Bedding | | |
| | Holiday/Soap Test, Tanks Set X | | |
| | Manufacturer's UL # | | |
| | | | |
| | Additional Requirements | | |
| | | | |
| | DO NOT BACKFILL UNTIL ABOVE APPROVED | | |
| SECOND INSPECTION | Tank Air Test 5 PSI/30 Minutes | | |
| | Vent/Vapor Lines | | |
| | Products Lines 75 PSI/30 Minutes | | |
| | Product Line Containment | | |
| | Metal Piping Wrapped | | |
| | Sumps, Dispenser Pans Water Test | | |
| | | | |
| THIRD INSPECTION | Approved Fill Boxes | | |
| | Concrete or AC Paving 12" Beyond | | |
| | Leak Detectors/Monitors | | |
| | Lockable Fluid-Tight Access for Monitoring | | |
| | Precision Test Results | | |
| | Dispenser Containment | | |
| | Emergency Shut-off | | |
| | Additional Requirements | | |
| | | | |
| REQUIRED PRIOR TO OPERATING | Business Plan | | |
| | | | |
| | Monitoring Plan | | |
| | | | |
| | Financial Responsibility | | |

**FINAL APPROVAL AND CURRENT OPERATING PERMITS MUST BE OBTAINED PRIOR TO PLACING THESE TANKS INTO SERVICE ($5,000.00 FINE FOR NONCOMPLIANCE)**

| | | | |
|---|---|---|---|
| TANK REMOVAL INSPECTION | Tank(s) Removed X | | |
| | Required Samples: 8020, 8015, MTBE, 418.1 | 3 | 11/12/98 |
| | Lead (pb) 7421 or ICP 6010, Metals EPA PP13 | | 3 |
| | Additional Test Requirements | | |
| | | | |
| | **Removals Cannot be Finaled Until a Signed Copy of the Sample Results Have Been Received and Approved by this Department.** | | |
| | Final — Approved for Backfill | | |

Remarks:

FAILURE TO PROTECT AND MAINTAIN THIS CARD MAY RESULT IN JOB DELAY.
PRESERVE THIS RECORD OF INSPECTIONS.

**FOR INSPECTION CALL 48 HOURS IN ADVANCE AT (909) 387- 3082**

**THIS PERMIT EXPIRES DECEMBER 22, 1998**

[1] PETROLEUM [ ] WASTE OIL [ ] OTHER

14-16867-670 Rev. 4/98

*DISTRIBUTION: White — County Fire Department*
*Green — Contractor/Owner*

Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-99)
Please print or type. Form designed for use on elite (12-pitch) typewriter.

**See Instructions on back of page 6.**

Department of Toxic Substances Control
Sacramento, California

98119670

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

# UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No: CAC001416616 | Manifest Document No.: 119167 10
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

A. State Manifest Document Number: 98119670

3. Generator's Name and Mailing Address: MARTEN DE HONG (NW) 8311 EDISON, AVE. CHINO, CA 91710

B. State Generator's ID:

4. Generator's Phone: (909) 947-3559

5. Transporter 1 Company Name: JOE ENVIRONMENTAL SERVICES
6. US EPA ID Number: CAL000018778 57

C. State Transporter's ID:

D. Transporter's Phone: (909) 984-5886

7. Transporter 2 Company Name:
8. US EPA ID Number:

E. State Transporter's ID:

F. Transporter's Phone:

9. Designated Facility Name and Site Address: INDUSTRIAL SERVICE OIL CO INC. 1700 S. SOTO ST. LOS ANGELES, CA 90023
10. US EPA ID Number: CAD099452791

G. State Facility's ID: CAD099452791

H. Facility's Phone: (562) 598-5577

| 11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number) | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt/Vol | I. Waste Number |
|---|---|---|---|---|---|
| a. PETROLEUM OIL - WATER NON-RCRA. HAZARDOUS WASTE LIQUID | 0001 | TT | 00110 | G | State 222 / EPA/Other N/A |
| b. | | | | | State / EPA/Other |
| c. | | | | | State / EPA/Other |
| d. | | | | | State / EPA/Other |

J. Additional Descriptions for Materials Listed Above: 11.A. Petroleum Hydrocarbons + Water

K. Handling Codes for Wastes Listed Above: a. 01 b. c. d.

15. Special Handling Instructions and Additional Information: GLOVES - NO OPEN FLAME

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: Agent For Ace Cusy | Signature: Ace Cusy | Month 1 1 | Day 1 2 | Year 9 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Carlos Mayorga | Signature: [illegible] | Month 1 1 | Day 1 2 | Year 9 8

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: | Signature: | Month | Day | Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: Carlos Reyna | Signature: [illegible] | Month 1 1 | Day 1 3 | Year 9 8

**DO NOT WRITE BELOW THIS LINE.**

DTSC 8022A (4/97)
EPA 8700-22

Green: TRANSPORTER RETAINS

**AMERICAN FUEL TANK METAL RECYCLING, INC.**

2202 S. MILLIKEN AVE. • ONTARIO, CA 91761
(909) 988-8000

№ 50215

# TANK DISPOSAL FORM

Date: 11/12/98.
Job#
P.O.#

CONTRACTOR: A & D Environmental
ADDRESS:
JOB SITE: Marten De Hoog
ADDRESS: 5311 Edison ave. Chino. Ca
DESTINATION: A.M.R. 2202 S. MILLIKEN AVE., ONTARIO, CA 91761

| DATE | TIME | PROJECTED TANKS | ORDERED BY: | LIC. NO. |
|---|---|---|---|---|
| | | | | |

SPECIAL INSTRUCTIONS: _____

TIME IN:
TIME OUT:

| ✔ | Services Rendered | Cost |
|---|---|---|
| ____ | Disposal Fee | |
| ____ | Extensive Loading Time | |
| ____ | Disposal Fee with Permit | |
| ____ | Fiberglass Tank Disposal Fee Per Tank | |
| ____ | Fiberglass Delivered | |
| ____ | Bobtail Disposal | |
| ____ | Cancellation Fee | |

**TOTAL CHARGES** $

All fees incurred are per load unless specified. Terms are net 30 days from date of invoice. Contractor's signature represents acceptance of terms for payment, and confirms that tank removal complies with State laws.

CONTRACTOR'S SIGNATURE

**TANKS RECEIVED**

| QTY | GALLONS | TYPE F* | TYPE S* | NET TONS | TOTAL |
|---|---|---|---|---|---|
| | 280 | ☐ | ☐ | .14 | |
| 1 | 500 | ☐ | ☑ | .21 | |
| | 550 | ☐ | ☐ | .24 | |
| | 1000 - 12 ft. | ☐ | ☐ | .44 | |
| | 1000 - 6 ft. | ☐ | ☐ | .61 | |
| | 1500 | ☐ | ☐ | .87 | |
| | 2000 | ☐ | ☐ | .97 | |
| | 2500 | ☐ | ☐ | 1.14 | |
| | 3000 | ☐ | ☐ | 1.32 | |
| | 4000 | ☐ | ☐ | 1.64 | |
| | 5000 | ☐ | ☐ | 2.42 | |
| | 6000 | ☐ | ☐ | 2.84 | |
| | 7500 | ☐ | ☐ | 3.26 | |
| | 8000 | ☐ | ☐ | 3.44 | |
| | 9000 | ☐ | ☐ | 3.82 | |
| | 10000 | ☐ | ☐ | 4.33 | |
| | 12000 | ☐ | ☐ | 4.93 | |

NO. OF TANKS: 1 TOTAL: ____ NET TONS: ____

*F - FIBERGLASS *S - STEEL 105

**CERTIFICATE OF TANK DISPOSAL / DESTRUCTION**

THIS IS TO CERTIFY THE RECEIPT AND ACCEPTANCE OF THE TANK(S) AS SPECIFIED ABOVE. ALL MATERIALS SPECIFIED HAVE BEEN COMPLETELY DESTROYED FOR SCRAP PUROSES ONLY.

Louise Doz
AUTHORIZED REP.

11/12/98
DATE

Enviro - Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

# LABORATORY REPORT

CUSTOMER: A & J ENVIRONMENTAL SERVICES
4752 C FELSPAR STREET, #104, RIVERSIDE, CA 92509
TEL(909)681-0708 FAX(909)681-8991

PROJECT: **Martin DeHoog Dairy**

MATRIX: SOIL
SAMPLING DATE: 11/12/98
REPORT TO: MR. ASA COSBY

DATE SAMPLES REC'D: 11/12/98
DATE ANALYZED: 11/13-15/98
DATE REPORTED: 11/23/98

---

SAMPLE I.D.: **Tank #1 Center**
LAB I.D.: 981112-17

---

| PARAMETER | SAMPLE RESULT, MG/KG | D.L.(X1) | EPA METHOD |
|---|---|---|---|
| TPH/GASOLINE RANGE (C4-C10) | ND | 0.1 | 5030/8015M |
| BENZENE | ND | 0.005 | 5030/8020A |
| TOLUENE | ND | 0.005 | 5030/8020A |
| ETHYLBENZENE | ND | 0.005 | 5030/8020A |
| TOTAL XYLENES | ND | 0.010 | 5030/8020A |
| MTBE | ND | 0.025 | 5030/8020A |

---

COMMENTS
MG/KG = PPM
D.L. = DETECTION LIMIT
ND = BELOW THE DETECTION LIMIT OR NON-DETECTED
TPH = TOTAL PETROLEUM HYDROCARBONS
MTBE = METHYL tert-BUTYL ETHER

---

DATA REVIEWED AND APPROVED BY: [signature]
CAL-DHS ELAP CERTIFICATE No.: 1555

**ENVIRO-CHEM, INC. LABORATORIES**
1214 E. Lexington Ave.
Pomona, CA 91766
(909) 590-5905 • Fax: (909) 590-5907

# CHAIN of CUSTODY RECORD

Lab Project # _____

CA-DHS ELAP CERTIFICATE # 1555

DATE: 11-12-98
PAGE: 1 of 1

REPORT TO: A+J Environmental
STREET: 4752-C Felspar #104
CITY: Riverside STATE: CA ZIP: 92509
TEL: (909) 681-0708 FAX: (909) 681-8991

PROJECT NAME: Martin DeHoog Dairy
PROJECT CONTACT: Ash Cosby
SAMPLER(S) SIGNATURE:

TURN AROUND TIME DESIRED
☐ Same Day ☐ 24 Hour ☐ 48 Hour
☐ 72 Hour ☑ 1 Week ☐ Standard (2 Weeks)
☐ Others:
Confirmed
By:

SHIPPING INFORMATION: ICE Chest

AFTER ANALYSES, SAMPLES ARE TO BE: ☐ DISPOSED OF ☐ STORED (30 days) ☐ RETURNED TO CLIENT ☐ OTHER:

| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE: | TIME: |
|---|---|---|---|
| Ash Cosby | Curtis Neals | 11/12/98 | 13:30 |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE: | TIME: |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE: | TIME: |

| SAMPLE I.D. | LAB I.D. | SAMPLING DATE/TIME | MATRIX | Nº of Containers | ANALYSIS REQUESTED | COMMENTS | Sample Stored Location |
|---|---|---|---|---|---|---|---|
| Tank #1 Center | 981112-17 | 11-12-98 1:28 | Soil | 1 | EPA 8015 gas, 8020 MTBE | | R1 |
| Dropped #1 | | | Soil | 1 | " " " " " | | |
| Stock Pile | | | Soil | 1 | " " " " " | | |
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DISTRIBUTION: WHITE WITH REPORT • YELLOW TO COURIER

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# Legend Dairy Farms (CERSID: 10034761)

**Facility Information Accepted Apr 23, 2024**

Submitted on 3/26/2024 10:15:27 AM by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted*** on 4/23/2024 3:39:11 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Business Activities
- Business Owner/Operator Identification

**Hazardous Materials Inventory Accepted Apr 23, 2024**

Submitted on 3/26/2024 10:15:27 AM by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted*** on 4/23/2024 3:39:20 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Hazardous Material Inventory (6)
- Site Map (Official Use Only)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 262KB)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 262KB)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 694KB)

**Emergency Response and Training Plans Accepted Apr 23, 2024**

Submitted on 3/26/2024 10:15:27 AM by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted*** on 4/23/2024 3:39:29 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Emergency Response/Contingency Plan
  - *Emergency Response/Contingency Plan* (Web graphic, 1429KB)
  - *Emergency Response/Contingency Plan* (Web graphic, 867KB)
  - *Emergency Response/Contingency Plan* (Web graphic, 792KB)
  - *Emergency Response/Contingency Plan* (Web graphic, 617KB)
  - *Emergency Response/Contingency Plan* (Web graphic, 814KB)
- Employee Training Plan
  - Provided In Submital Element: Emergency Response and Training Plans

## Site Identification

**Legend Dairy Farms**
8381 EDISON AVE
ONTARIO, CA 91762
County
San Bernardino

CERS ID
**10034761**
EPA ID Number

## Submittal Status

Submitted on 3/26/2024 by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted***; Processed on 4/23/2024 by *Erick Tilus* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

## Hazardous Materials

| | |
|---|---|
| Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | **Yes** |

## Underground Storage Tank(s) (UST)

| | |
|---|---|
| Does your facility own or operate underground storage tanks? | **No** |

## Hazardous Waste

| | |
|---|---|
| Is your facility a Hazardous Waste Generator? | **No** |
| Does your facility treat hazardous waste on-site? | **No** |
| Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | **No** |
| Does your facility consolidate hazardous waste generated at a remote site? | **No** |
| Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site? | **No** |
| Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month greater than 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | **No** |
| Is your facility a Household Hazardous Waste (HHW) Collection site? | **No** |

## Excluded and/or Exempted Materials

| | |
|---|---|
| Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)? | **No** |

## Aboveground Petroleum Storage

| | |
|---|---|
| Does your facility own or operate aboveground petroleum storage tanks or containers AND:<br>* have a total aboveground petroleum storage capacity of 1,320 gallons or more, OR<br>* have one or more petroleum tanks in an underground area? | **No** |

## Regulated Substances

| | |
|---|---|
| Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)? | **No** |

## Additional Information

No additional comments provided.

## Facility/Site

**Legend Dairy Farms**
8381 EDISON AVE
ONTARIO, CA 91762

CERS ID
**10034761**

## Submittal Status

Submitted on 3/26/2024 by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted***; Processed on 4/23/2024 by *Erick Tilus* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

## Identification

Ronald C. Pietersma

| Operator Phone | Business Phone | Business Fax |
|---|---|---|
| (909) 225-7672 | (909) 627-2100 | (909) 627-5150 |

| Beginning Date | Ending Date | |
|---|---|---|
| Dun & Bradstreet | SIC Code | Primary NAICS |

## Facility/Site Mailing Address

PO Box 2500
Chino, CA 91708

## Primary Emergency Contact

Ronald C. Pietersma
Title
Owner

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 627-2100 | (909) 225-7672 | |

## Owner

Ronald C. Pietersma
(909) 225-7672
PO Box 2500
Chino, CA 91708

## Secondary Emergency Contact

Lupe Mora
Title
Herdsman

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| | (951) 454-5068 | |

## Billing Contact

Ronald C. Pietersma
(909) 225-7672 rcpietersma@aol.com
PO Box 2500
Chino, CA 91708

## Environmental Contact

Ronald C. Pietersma
(909) 225-7672 rcpietersma@aol.com
PO Box 2500
Chino, CA 91708

| Name of Signer | Signer Title | Document Preparer |
|---|---|---|
| Ronald C. Pietersma | Owner | Tina C. Reyes |

Additional Information

## Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

### Property Owner

Ronald C. Pietersma
Phone
(909) 225-7672
Mailing Address
PO Box 2500
Chino, CA 91708

Assessor Parcel Number (APN)

Number of Employees

Facility ID
FA0000565

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms**<br>8381 EDISON AVE, ONTARIO 91762 | **1** | Facility ID **FA0000565**<br>Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Velocity-Two (CIP Soap Detergent)**<br>CAS No<br>7681-52-9 | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **110**<br>Storage Container<br>Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | Pressue<br>Temperature | Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | | | |
|---|---|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | | CERS ID | **10034761** |
| Facility Name | **Legend Dairy Farms** | **2** | | Facility ID | **FA0000565** |
| | 8381 EDISON AVE, ONTARIO 91762 | | | Status | **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Acid Cleaner EC** | **Gallons** | **110** | **55** | | | - Health Carcinogenicity<br>- Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation<br>- Health Specific Target Organ Toxicity | | | | |
| | CAS No | State: Liquid<br>Type: Mixture | Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | | Pressue<br>Temperature | Waste Code | | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms**<br>8381 EDISON AVE, ONTARIO 91762 | **3** | Facility ID **FA0000565**<br>Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **T-Chlor - Chlorine Bleach**<br>CAS No | **Gallons**<br>State: Liquid<br>Type | **110**<br>Storage Container: Plastic/Non-metalic Drum | **55** | Pressue<br>Temperature | Waste Code | - Physical Corrosive To Metal<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms**<br>8381 EDISON AVE, ONTARIO 91762 | **4** | Facility ID **FA0000565**<br>Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TCB 5000 NPF - Post-Dip for Udders**<br>CAS No | **Gallons**<br>State: Liquid<br>Type: Mixture | **110**<br>Storage Container: Plastic/Non-metalic Drum | **55** | Pressue<br>Temperature | Waste Code | - Health Acute Toxicity<br>- Health Reproductive Toxicity | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms** | **5** | Facility ID **FA0000565** |
| | 8381 EDISON AVE, ONTARIO 91762 | | Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **LuxSan V**<br>CAS No | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **110**<br>Storage Container<br>Plastic/Non-metalic Drum | | Pressue<br>Temperature | Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms** | **6** | Facility ID **FA0000565** |
| | 8381 EDISON AVE, ONTARIO 91762 | | Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Aspen QM Pre-dip spray** | **Gallons** | **110** | | | | - Health Serious Eye Damage Eye Irritation | | | | |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue | Waste Code | | | | | |
| | | Type: Mixture | | | Temperature | | | | | | |

OWNER TRANSFER

0011262

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

☐ Update/Assign PEs ☐ Referral to Team CERS ☐ Closure ☐ Invoice Reversal ☐ Demand Bill
☐ Update Non-CERS Fields ☐ 0202 ☒ Other Ownership Change ☐ 5054 Attached

### OWNER INFORMATION — OWNER ID: ~~OW0000474~~ OW0009196

NAME: ~~MICHAEL DEHOOG DAIRY~~ Ron C. Pietersma
ADDRESS: ~~8381 EDISON AV~~ 12474 Central Ave — ADDRESS 2:
CITY: ~~ONTARIO~~ Chino — STATE: CA — ZIP CODE: ~~91762~~ 91710 — COUNTRY: US
PHONE: ~~909-947-0944~~ 909-627-2100 — EXT: CELL: 909-225-7672 — FYI LAST UPDATED: ~~09/20/2017~~ 11/01/2022

### FACILITY INFORMATION — FACILITY ID: FA0000565

BUSINESS NAME: ~~MICHAEL DEHOOG DAIRY~~ Legend Dairy Farms — CERS ID: 10034761
SITE ADDRESS: 8381 EDISON AVE — ADDRESS 2:
CITY: ONTARIO — STATE: CA — ZIP CODE: 91762 — FAX: ~~909-948-7074~~
BUSINESS PHONE: ~~909-947-0944~~ 909-627-2100 — EXT:
BUSINESS OPERATOR NAME: ~~Joe DeHoog~~ Lupe Mora
OPERATOR PHONE: ~~909-948-7074~~ 951-454-5068 — EXT: — FYI LAST UPDATED: ~~09/20/2017~~

NEW OWNER HAS NOT SUBMITTED ON CERS YET

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: ~~8381 EDISON AVE~~ P.O. Box 2500 — ADDRESS 2:
CITY: ~~ONTARIO~~ Chino — STATE: CA — ZIP CODE: ~~91762~~ 91708 — COUNTRY:

### BILLING CONTACT — ACCOUNT ID: AR0000566 AR0025965

BILLING CONTACT NAME: ~~JOE DEHOOG~~ Tina
ADDRESS 1: ~~8381 EDISON AV~~ 12474 Central Ave — ADDRESS 2:
CITY: ONTARIO Chino — STATE: CA — ZIP CODE: 91762 91710 — COUNTRY: US
PHONE: ~~909-947-0944~~ 909-627-2100 — EXT: — EMAIL: RCPietersma@aol.com

UPDATED

### ENVIRONMENTAL CONTACT

NAME: ~~Joe DeHoog~~ Ron C. Pietersma — PHONE: ~~909-948-7074~~ 909-225-7672 EXT:
EMAIL: RCPietersma@aol.com

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL): RCPietersma@aol.com
LOCAL FACILITY PHONE (OPTIONAL): 909-627-2100 — EXT:

UPDATED

CENSUS: MILITARY SCHOOL MEDICAL — * BUSINESS CODE: 02 - Individual — * BUSINESS TYPE: 6 - Other
* SUPERVISORIAL DISTRICT: 004 — * INSPECTION DISTRICT: 03 — * FIRE JURISDICTION: ONTARIO FIRE
FYI ACCOUNT STATUS: ACTIVE ACCOUNT — FYI ANNIVERSARY DATE: 05/31/1991 — FYI LAST BILLING: 04/14/2022
FYI EXEMPT FROM BILLING: NO — FYI TOTAL DUE: 0.00

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**1-Motor Vehicle Fuel, 2-Fuel Distributor, 3-Farm, 4-Processor, 6-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| ☒ EC Entry Complete | ☐ QC Complete | N/A ☐ ☐ Fiscal Entry Complete | N/A ☐ ☐ Referral to Team CERS |
| Date: 11/1/22 Initials: LS | Date: Initials: | Date: Initials: | Date: Initials: |

PEs SET TO 1/1/22 - 12/31/22

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0032862 | INACTIVE | 4029-APSA FARM/CONSTRUCTION C | 06/01/2016 | 05/31/2017 |
| | | | GHP OR UST ID: PR0041752 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0003791 | ACTIVE | 4243-HAZARDOUS MATERIALS 4-10 ( | 06/01/2022 | 05/31/2023 |
| | | | GHP OR UST ID: PR0004397 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☒ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

5012

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 11/01/2022 SUBMITTED BY: Erick Tilus

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Michael Dehoog Dairy has ceased operations at this facility. The new owner of this facility is Ron C. Pietersma, DBA Legend Dairy Farms.

"Legend Dairy Farms" operates the facilities located at 8311, 8381, and 8485 Edison Ave, Ontario, CA, 91762. These properties are contiguous.

Billing is current, please bill at regular billing cycle.

COMMENT ADDED

Thank you,

ET.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

# SAN BERNARDINO COUNTY CUP
## FACILITY INFORMATION

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0000474

NAME: MICHAEL DEHOOG DAIRY

ADDRESS: 8381 EDISON AV ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-0944 EXT: FYI LAST UPDATED: 08/06/2015

### FACILITY INFORMATION — FACILITY ID: FA0000565

BUSINESS NAME: MICHAEL DEHOOG DAIRY CERS ID: 10034761

SITE ADDRESS: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762-0000 FAX:

BUSINESS PHONE: 909-947-0944 EXT:

BUSINESS OPERATOR NAME: JOE DEHOOG

OPERATOR PHONE: EXT: FYI LAST UPDATED: 09/19/2014

### FACILITY MAILING ADDRESS

MAILING ADDRESS: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

### BILLING CONTACT — ACCOUNT ID: AR0000566

BILLING CONTACT NAME: MICHAEL DEHOOG

ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-0944 EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: JOE DEHOOG PHONE: EXT:

EMAIL: GOTMILKFOR6@JUNO.COM

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: BUSINESS TYPE:

SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: ONTARIO FIRE

FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 05/31/1991 FYI LAST BILLING: 04/14/2016

FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 0.00

**Business Code**= 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type**= 01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

### FOR OFFICE USE ONLY:

ENTERED AUG 31 2016

- [ ] EC Entry Complete
- [ ] QC Complete
- [ ] N/A Fiscal Entry Complete
- [ ] N/A Referral to Team CERS

| Date | Initials | Date | Initials | Date | Initials | Date | Initials |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE | PT0032862 | ACTIVE | 4029-APSA FARM/CONSTRUCTI | 06/01/2016 | 05/31/2017 |
| | | | GHP OR UST ID: PR0041752 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☒ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0003791 | ACTIVE | 4241-HAZARDOUS MATERIALS | 06/01/2016 | 05/31/2017 |
| | | | GHP OR UST ID: PR0004397 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E.: 4243 |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S **0**

DATE SUBMITTED: 8-29-16 SUBMITTED BY: Brian Wade

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection of 8-26-16, this facility does not store greater than 2,500 gallons of petroleum on site. Inactivate APSA PE 4029. Update handler PE to 4243.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials ☐ 5054 scanned and emailed to Fiscal Date Initials

**OPEN VIOLATIONS**

FA0000565

INSPECTION DATE: **1/30/13** VIOLATION ID: **IV0079031** COMPLY BY: **03/02/2013**

INSPECTOR: **JERRY WONG** COMPLIED ON:

**VIOLATION:** 4202034200-Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

File

# HA' 'DOUS MATERIAL FIELD SERV' 'S
## COMPUTER L.. ABASE UPDATE AUTHORIZAT. . (5050 Form)

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000474

Update

Legal Owner

*NAME: MICHAEL DEHOOG DAIRY

*ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY:

*PHONE: 909-947-0944 EXT: FAX:

ALT PHONE: 000-000-0000 EXT: FYI LAST UPDATED: 10/21/2010

**OWNER MAILING ADDRESS** ☐ Same as Owner

CARE OF: JOE DEHOOG DBA: MICHAEL DEHOOG DAIRY

ADDRESS1: 8381 EDISON AV ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

### F- FACILITY INFORMATION — FACILITY ID: FA0000565

*NAME: MICHAEL DEHOOG DAIRY CERS ID: 10034761

*ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762-0000 *CITY CODE: ONTARIO

*PHONE: 909-947-0944 EXT: ALT PHONE: EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FYI LAST UPDATED: 04/18/2011

**FACILITY MAILING ADDRESS** ☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: MICHAEL DEHOOG DAIRY

CARE OF: JOE DEHOOG

ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

*EMAIL:

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION — ACCOUNT ID: AR0000566

RESPONSIBLE PARTY: MICHAEL DEHOOG ☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

CARE OF: MICHAEL DEHOOG DAIRY

ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-0944 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 04/17/2012

FYI ANNIVERSARY DATE: 05/31/1991 FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI TOTAL DUE: 0.00

ENVIRONMENTAL CONTACT NAME: Joe DeHoog EMAIL: GoTmilkFor6@Juno.com

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0003791<br>PERMIT NUMBER. | TIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-1( | 06/01/2012<br>EFFECTIVE DATE | 05/31/2013<br>EXPIRATION DATE | |
| | | | PR0004397<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | UPDATED P.E. | |
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S **0**

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes No

*Should this facility be inactivated upon verification that there is no balance due? Yes No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes No

*Does this 5050 have attached documents? Yes No

ENTERED

*DATE SUBMITTED: 1-31-2013 DATE ENTERED: JAN 31 2013 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Jay Ubas ENTERED BY: J. Guerra ***Demand bill for updated PEs**: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Update Env. Contact Email Address, thanks

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to **complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

AG - info & PE update

# HAZ. OUS MATERIAL FIELD SERVI
# COMPUTER DATABASE UPDATE AUTHORIZATION

CREATE EXPANDO + SOLDERS
INACTIVE 2000 DTSC
CA001466264

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

ROD. ST
ONTARIO
07 JU

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000474

NAME: MICHAEL DEHOOG DAIRY

ADDRESS 1: 8381 EDISON AV ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-9171~~ 91762 COUNTRY:

PHONE: (909) 947-0944 EXT: FAX:

ALT PHONE: 000-000-0000 EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Joe DeHoog DBA: MICHAEL DEHOOG DAIRY

ADDRESS1: 8381 EDISON AV ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91762 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000565

NAME: ~~AG~~-MICHAEL DEHOOG DAIRY

ADDRESS 1: ~~8311~~ EDISON AVE 8381 ADDRESS 2: 91762

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-0000~~ CITY CODE: ~~CHINO~~ Ontario

SIC CODE: 0241 BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 03

PHONE: ~~000-000-0000~~ (909) 947-0944 EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-MICHAEL DEHOOG DAIRY

CARE OF: Joe DeHoog

ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-0000~~ 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000566

RESPONSIBLE PARTY: Michael DeHoog

CARE OF: Michael DeHoog Dairy

ADDRESS 1: 8381 Edison Ave ADDRESS 2:

CITY: Ontario STATE: ZIP CODE: COUNTRY:

PHONE: (909) 947-0944 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 04/05/2007

ALT PHONE: EXT: TAX ID:

ANNIVERSARY DATE: 05/31/1991 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

| UPDATE/CLOSE/Z.O.B. | PT00037 | ACTIVE | 4230 | 5/01/1990 | 05/31/1991 |
|---|---|---|---|---|---|
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |

| PR0004397 | ACTIVE, BILLABLE | NA | NA | 4221 |
|---|---|---|---|---|
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 9 NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 6-4-07 DATE ENTERED: FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY:

COMMENTS/REMARKS:

Per inspection: Update handler permit.
Update owner, fa & A/R info.
Remove "Ag" prefix from name.

Demand bill.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:2 AR:0.00

MICHAEL DEHOOG
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2015** **Expiration Date: 5/31/2016**

**CUPA Facility Type: 5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0032862 | 4029 APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT | PR0041752 |
| PT0003791 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0004397 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   Note: The UST ID Number is listed on the front of the permit for each UST

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Fire Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part2, Chapter 1,Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4 Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:3 AR:0.00

MICHAEL DEHOOG DAIRY
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2014** **Expiration Date: 5/31/2015**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0032862 | 4029 APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT | PR0041752 |
| PT0003791 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0004397 |
| PT0032863 | 5012 CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2 | PR0041753 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

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a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4, Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

ATTN : JOE DEHOOG
MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2013** **Expiration Date: 5/31/2014**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

As a condition of the permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

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e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

ATTN : JOE DEHOOG
MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2012** **Expiration Date: 5/31/2013**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

Mark A. Hartwig, Fire Chief

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
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ONTARIO, CA 91762

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8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2011** **Expiration Date: 5/31/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

Mark A. Hartwig, Fire Chief

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

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MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2010** **Expiration Date: 5/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

Pat A. Dennen, Fire Chief/Fire Warden

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# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

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MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.

Effective Date: 6/1/2009 Expiration Date: 5/31/2010

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

SAN BERNARDINO COUNTY
COUNTY OF SAN BERNARDINO 1853
FIRE DEPT

Pat A. Dennen, Fire Chief/Fire Warden

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# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : JOE DEHOOG
MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2008** **Expiration Date: 5/31/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

Printed on 5/2/2008
Reconstructed by MIS on 8/12/2008

Pat A. Dennen, Fire Chief/Fire Warden

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CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ERICK TILUS within 30 days of inspection unless otherwise specified.**

RESPONDENT: Lupe Mora

VIOLATION(S) CITED ON: 10/28/2022

FACILITY NAME: **LEGEND DAIRY FARMS** FACILITY ID: **FA0000565**

SITE ADDRESS: **8381 EDISON AVE** CERS ID: **10034761**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H211 CORRECTIVE ACTION: Ensure a complete and accurate Hazardous Materials Business Plan is submitted to CERS. Sign and return the Certificate of Compliance to the inspector within 30 days of the inspection indicating the Hazardous Materials Inventory is complete and accurate.

I certify under penalty of law that:

- o Respondent has corrected violations specified in the above-entitled action.
- o I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- o Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- o I am authorized to file this certification on behalf of the Respondent.
- o I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE

11-17-22
DATE

Ronald C. Pietersma
PRINT NAME

OWNER: LEGEND DAIRY FARMS
TITLE

CUPA
San Berna ɔ County Fire Department • Hazardous Ma s Section
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CUPA COMPLIANCE INSPECTION REPORT

| | |
|---|---|
| NAME: **LEGEND DAIRY FARMS** | FACILITY ID: **FA0000565** |
| ADDRESS: **8381 EDISON AVE** | CERS ID: **10034761** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **10/28/2022** |

**Consent granted by:**

☒ **Photograph** ☒ **Inspect** **Name:** Lupe Mora **Title:** Lead Farmer

An inspection was conducted on 10/28/2022 to determine compliance with applicable hazardous materials laws and regulations. Lupe Mora, Lead Farmer, was the escort during the inspection.

Legend Dairy Farms is a livestock farm specializing in milk collection. Legend Dairy Farms has taken over operation of (3) contiguous properties. The facilities located at 8311 Edison, 8381 Edison, and 8485 Edison Ave, Ontario, CA, 91762 are all currently being operated by Legend Dairy Farms. The facility handles hazardous materials over threshold in the form of Iodine teat dip, TCB 5000 NPF teat dip, T-Chlor 12.5 solution, Acid Cleaner EC, and Velocity Two Chlorinated cleaner.

The following inventory was observed during the inspection:

(4) 55-gallon drums of TCB 5000 NPF teat dip
(4) 55-gallon drums of T-chlor 12.5 Solution
(3) Acid Cleaner EC
(2) Velocity Two Chlorinated Cleaner
(2) Soft Dine-10 Iodine teat dip

Document Review:

- CUPA program permit is current. Expiration Date:
- This facility is a handler only and is not required to maintain an active EPA ID#.
- The Hazardous Materials Business Plan was previously submitted to the California Environmental Reporting System 02/09/2022.

Complete and submit the Certificate of Compliance (CofC) provided along with all requested documentation, to the attention of Erick Tilus within 30 days of inspection.

Please contact Erick Tilus at (909) 386-8401 or by e-mail at etilus@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | - | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | Hazardous Materials Business Plan Submittal | CHSC | 25505, 25508(a)(1) | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | | Multiple | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508.2 | |
| H209 | Business Plan Update Within 30 days of Change | CHSC | 25508.1(a)-(f) | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | | Multiple | |

| | | | | |
|---|---|---|---|---|
| H211 | **Hazardous Materials Inventory** | CHSC | Multiple | X |
| ılation: | Failure to electronically submit comp nd accurate hazardous material inventory informati all reportable hazardous materials on site at or above reportable quantit. 55 gallons for liquids, 500 pounds for solids, or 20 ic feet for compressed gases. CHSC 6.95 25506, 25505(a)(1), 25508(a)(1), 25508(a)(3) | | | |
| MINOR | OBSERVATION: At the time of the inspection, the inventory observed on site was not consistent with that reported to CERS.<br><br>CORRECTIVE ACTION: Ensure a complete and accurate Hazardous Materials Business Plan is submitted to CERS. Sign and return the Certificate of Compliance to the inspector within 30 days of the inspection indicating the Hazardous Materials Inventory is complete and accurate. | | | |
| H212 | Site Map | CHSC | Multiple | |
| H213 | Emergency Response Plan | | Multiple | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Not Provided and/or Documented | CHSC | 25505(a)(4) | |
| H216 | Hazardous Materials Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,25 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: LTR: |
|---|---|---|
| ERICK TILUS<br>INSPECTOR NAME | NAME<br>INSPECTION DATE: 10/28/2022 | TITLE<br>REPORT DATE: 11/1/22 3:31 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations. THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
San Bernai ) County Fire Department • Hazardous Mat .s Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ERICK TILUS within 30 days of inspection unless otherwise specified.**

RESPONDENT: Lupe Mora

VIOLATION(S) CITED ON: 10/28/2022

FACILITY NAME: **LEGEND DAIRY FARMS** FACILITY ID: **FA0000565**

SITE ADDRESS: **8381 EDISON AVE** CERS ID: **10034761**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H211 CORRECTIVE ACTION: Ensure a complete and accurate Hazardous Materials Business Plan is submitted to CERS. Sign and return the Certificate of Compliance to the inspector within 30 days of the inspection indicating the Hazardous Materials Inventory is complete and accurate.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

TRACKING SHEET FOR BUSINESS PLANS

Establishment # FA0000565

Facility Name: Michael DeHoog

Facility site address: 8381 Edison

City: Ontario

Fire Agency: Ontario

1 (# of copies)

| | | Sent to FD |
|---|---|---|
| Business Plan Received | 07/19/07 | __/__/__ |
| Result of Review(s) | | |
| Deficiency | | 11/30/07 |
| Conditional Approval | | __/__/__ |
| Approval | | __/__/__ |
| | | Sent to FD |
| Revised Plan(s) Received | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

Other

| Date | Action/documentation (update, new plan, etc.) | Staff Hours |
|---|---|---|
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
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| __/__/__ | | |
| __/__/__ | | |

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# BUSINESS OWNER / OPERATOR IDENTIFICATION

| | | |
|---|---|---|
| FACILITY ID # | F A | (This number is on your CUPA permit.) |
| EFFECTIVE DATE 100 | ENDING DATE 101 | |
| BUSINESS NAME (Same as FACILITY NAME or DBA): Michael Deltoog Dairy | | BUSINESS PHONE: 909 947-0944 |
| BUSINESS SITE ADDRESS 103: 8381 Edison Ave | | |
| CITY 104: Ontario | COUNTY 108: SAN BERNARDINO | STATE: CA / ZIP CODE 105: 91762 |
| D&B NUMBER | PRIMARY SIC/NAICS CODE 107 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: Dairy - milk Production |
| BUSINESS OPERATOR NAME 109: Joe Deltoog / Michael Deltoog | | BUSINESS OPERATOR PHONE 110: 909 947-0944 |

## II. BUSINESS OWNER

| | |
|---|---|
| OWNER NAME 111: Michael Deltoog | OWNER PHONE 112: 909 947-4712 |
| OWNER MAILING ADDRESS 113: 8381 Edison Ave | |
| CITY 114: Ontario | STATE 115: CA / ZIP CODE 116: 91762 |

## III. ENVIRONMENTAL CONTACT

| | |
|---|---|
| CONTACT NAME: Joe Deltoog | CONTACT PHONE 118: 909 947-0944 |
| CONTACT MAILING ADDRESS 119: 8381 Edison Ave | |
| CITY 120: Ontario | STATE 121: CA / ZIP CODE 122: 91762 |

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123: Joe Deltoog | NAME 128: Michael Deltoog |
| TITLE 124: Partner | TITLE 129: Partner |
| BUSINESS PHONE 125: 909 947-0944 | BUSINESS PHONE: 909 947-0944 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126 | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131 |
| PAGER/CELL # 127 | PAGER /CELL # 132 |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

| | | |
|---|---|---|
| SIGNATURE OF OWNER/OPERATOR: Joe Deltoog | NAME OF SIGNER (*print*) 136: Joe Deltoog | DATE 134: 6-18-07 |

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**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A [redacted] (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Michael Deltoog Dairy 3

FACILITY ADDRESS: 8381 Edison Ave

CITY: Ontario 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

BUSINESS MAILING ADDRESS: 8381 Edison Ave

CITY: Ontario

STATE: CA

ZIP CODE: 91762

BUSINESS FAX NUMBER: 909 947-0944

BUSINESS E-MAIL:

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

Total # of Employees per shift: SHIFT 1 Day: 7; SHIFT 2 night: 3; SHIFT 3:

HOURS OF OPERATION: 6 To 5 am + pm

Total # of employees at this facility (as reported on your most recent tax withholding forms.): TOTAL # EMPLOYEES: ~~8~~ 9 [redacted]

TAXPAYER ID NUMBER: 87-

ASSESSORS PARCEL NUMBER (S):

CROSS STREET: Edison + Walker

BUSINESS DESCRIPTION: Dairy Farm

Number of Underground Storage Tanks located at this facility: 0 [redacted]

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☐ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 6-18-07

**CUPA**

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| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Michael DeHoog Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8381 Edison Ave | Ontario |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification:** **If a situation is an emergency, call 911 first.** Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | **911** |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | **(800) 33-TOXIC** or **(909) 386-8425** |
| 3. *State of California, Governor's Office of Emergency Services | **(800) 852-7550** or **(916) 845-8911** |
| 4. National Response Center | **(800) 424-8802** |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date: 6-18-07

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**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Michael De Hoog Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8381 Edison Ave | ONTARIO |

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:

For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√Check those items that apply and write additional information in the space provided).

- [x] Reduction of containers on site if not used or needed.
- [x] Containers are properly labeled and closed when not in use.
- [ ] Compressed gas cylinders are properly secured.
- [ ] Use of monitoring system. Type: _____
- [ ] Other:

Date: 6-18-07

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Michael Deffood Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8381 Edison Ave | Ontario |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- ☐ New employee training.
- ☐ Annual training & periodic refresher courses.
- ☐ Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- ☐ Spill control equipment
- ☐ Monitoring system
- ☐ Personal Protective Equipment
- ☒ On the job training. Describe below.
- ☐ Other:

All employee's are given Instructions on how to use cleaning Solutions.

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- ☒ Identify potential hazards and determine whether a release has occurred.
- ☒ Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- ☒ Coordinate the notification and evacuation of employees and customers from the facility.
- ☒ Make required agency notifications and request needed assistance.
- ☒ Assist responding agencies by providing access to the facility and information about the facility.
- ☐ Other:

Date: 6-18-07

BUSINESS NAME (Same as FACILITY NAME or DBA): Michael Deltoog Dairy

FACILITY ADDRESS 103: 8381 Edison Ave

CITY 104: Ontario

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | | Annually |
| ☒ First aid kit(s) | 1-General | As needed |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☐ Personal Protective Equipment | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste
- ☐ Process vessels
- ☒ Aboveground storage tanks
- ☐ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☒ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler
- ☐ Emergency response team
- ☐ Local Hospitals
- ☐ Other:
- ☒ No arrangements or agreements at this time

Date: 6-18-07

## HELPFUL HINTS FOR COMPLETING THE INVENTORY SECTION

**Congratulations! You have completed the first half of the plan. The following pages require review of the hazardous materials and hazardous wastes at your facility to determine which items require disclosure.**

**Here are some helpful hints to assist you in filling out the hazardous materials inventory section:**

1) This CUPA offers an example business plan that is available on our website or by mail. If you are unfamiliar with the business plan requirement, we recommend that you look at the example before you get started so you can see how inventory summary, chemical description pages, and maps work together.

2) Before you start filling out forms, determine how many items require disclosure and make the appropriate number of copies of the Inventory Summary form and the Chemical Description form. Note the following criteria when determining which items require disclosure in the inventory section: hazardous materials with a maximum quantity of greater than 55 gallons, 500 pounds, or 200 cubic feet; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives.

3) Assign a unique item number to each inventoried item (e.g. 1,2,3, etc.) This same item number is used on the Inventory Summary, on the individual Chemical Description form, and to show the storage location(s) on the facility map.

4) Each inventoried item requires a Chemical Description page that gives additional details about each chemical. Material Safety Data Sheets (MSDSs) and container labels are the main sources of chemical information. Wastes do not have MSDSs, but waste analysis, profiles, or manifests may have useful information.

5) Review Appendix I to determine which inventoried items require submission of a Material Safety Data Sheet (MSDS). If the substance is not listed in Appendix I, attach the MSDS for that chemical to the corresponding individual Chemical Description page. Anytime you update or refile the Chemical Description Page, make sure to attach the current MSDS. If you do not have a MSDS for a material, you can get one from your chemical vendor and you need them for compliance with the OSHA Hazard Communication Standard. Hazardous wastes do not have MSDSs.

6) Materials and wastes of the same chemical (e.g. lubricating oil and used oil) require separate Chemical Description pages.

7) Since the Chemical Description Page requires location information, you will have to complete the facility map(s) before you can finalize the Chemical Description pages.

8) The Maximum Quantity should reflect the maximum amount that could ever be onsite at any one time. The maximum listed on the Inventory Summary and the maximum listed on the individual Chemical Description form should be the same.

9) Typically, liquids are disclosed in gallons, solids in pounds and compressed gases in cubic feet. If you have questions regarding the correct unit type for an item, contact this department for assistance.

10) Signatures: The Inventory Summary form requires the Owner/Operator signature. Additionally, EPCRA filers are required to sign all individual Chemical Description forms.

Note: If you have a large warehouse, trade secrets, or other unique situation, please call our office before you fill out chemical description pages. We can help you develop an inventory that will meet the requirements and accommodate a unique situation.

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# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Michael DeHoog DAIRY

FACILITY ADDRESS 103: 8381 Edison AVE

CITY 104: ONTARIO

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Teat dip | 375 | 55 | gall |
| 2 | Diesel | 1,075 | 500 | gall |
| 3 | Hydro Clean 400 | 60 | 30 | gall |
| 4 | Acid cleaner | 60 | 30 | gall |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| Joe DeHoog | Joe DeHoog | 6-18-07 |

Inventory Summary Page ____ of ____

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages, otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

## KEY TO BUSINESS EMERGENCY/CONTINGENCY PLAN MAP SYMBOLS

— N — REFERENCE TO NORTH

INCLUDE ALL ADJACENT STREETS BY NAME

DRIVEWAY/GATE

DOORS

ERE — EMERGENCY RESPONSE EQUIPMENT

EVACUATION ROUTE

E/S — EVACUATION/STAGING AREA

FENCE/BARRIERS

FA — FIRE ALARM

FIRST AID

F — FIRE HOSE

F — FIRE EXTINGUISHER

FIRE HYDRANT

FLOOR DRAIN

MSDS BEP — MATERIAL SAFETY DATA SHEETS & BUSINESS EMERGENCY PLAN

RAILROAD TRACKS

S — SEWER

STORM DRAIN

**UTILITY CONNECTIONS/SHUTOFFS**

E — ELECTRIC METER

E — ELECTRIC SHUTOFF

G — GAS METER

G — GAS SHUTOFF

P — PUMP SHUTOFF

W — WATER MAIN LINE GATE VALVE

**STORAGE TANKS**

ABOVE GROUND TANK

UNDERGROUND TANK

HAZARDOUS WASTE TREATMENT FACILITIES MUST LOCATE TREATMENT UNIT (S) ON MAP.

ADDITIONAL SYMBOLS:

| Symbol | Description | Symbol | Description |
|---|---|---|---|
| 1 | Test Pip | | |
| 2 | Diesel fuel | | |
| 3 | Hydro clean | | |
| 4 | Acid cleaner | | |
| | | | |
| | | | |
| | | | |

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## SECTION IV: BUSINESS EMERGENCY CONTINGENCY PLAN MAPS

**Submit three (3) maps:**

- ❑ **Area Map** - location of facility in relation to community
- ❑ **Site Map** - overview of facility and its immediate surroundings
- ❑ **Facility Map(s)** - floor plan of facility, locations of hazardous materials, emergency equipment, building details.

**AREA MAP** - Provide a map showing entire area around the facility and property. The purpose of the area map is to identify primary and alternate routes to the facility and to see where in a community the facility is located. Be sure to identify location of the facility on map. (e.g. Thomas Brother's Guide map page or equivalent may be used). There is no form provided for the area map, since it is a copy of an existing map noting the location of the facility. *Area map **must** be to a legible scale on an 8 1/2 x 11" sheet of paper.*

**NOTE:** The following Sections require that you prepare a map of your facility and site location. A blank grid map has been provided for this purpose. You **must** use a grid system and use the map symbols provided. If you add additional symbol items on the map, provide an explanation of those symbols on the legend sheet area.

If your facility is very large and you cannot adequately fit the required items on the map forms provided, you may submit a series of maps. For example, enlarge a quadrant area on a main grid map and submit detail maps for a grid group. If you have difficulty with map preparation, contact this office for further assistance. The facility and the site map may be combined into one map **only if** you can provide all the required items in a legible scale on the sheets provided. These maps provide vital emergency information to emergency responders, and therefore it is important that you take the time to make them readable and accurate.

**SITE MAP** - The site map is an aerial overview of your facility. Complete this map on the sheet provided to a legible scale. The purpose of the site map is to provide the geographic context of the buildings, access points, and surrounding properties and streets around a facility. Below is a list of items that **must** be included on the drawing:

- ❑ Scale of map (i.e., 1" = 100 ft.)
- ❑ Site orientation (north, south, etc.)
- ❑ The names of all roads on all sides of the facility
- ❑ The location of your facility
- ❑ Property lines
- ❑ Types of surrounding facilities and/or uses of adjacent property
- ❑ Exit/entry routes (i.e., gates, driveways, etc.)
- ❑ Schools, hospitals, extended care facilities within 1000 feet of your facility.
- ❑ Fences or barriers on the site
- ❑ Location of any rail transportation sites (i.e., railroad tracks or spurs)

**FACILITY MAP** - The facility map is a drawing of the **FLOOR PLAN** of your establishment. Complete this map on the sheet provided to a legible scale. The purpose of the facility map is to locate inventoried hazardous materials (by item number), emergency equipment, and facility features that must be considered in responding to a fire or potential release of hazardous materials. Below is a list of items that **must** be included on the drawing:

- ❑ Scale of map (i.e., 1" = 100 ft.)
- ❑ Site orientation (north, south, etc.)
- ❑ Identify each hazardous material handling, use, or storage area using the item # assigned on the Inventory Summary. If the materials are too numerous to indicate on the map grid area, then provide a sequential letter (i.e., A, B, etc.) on the map where the items are located and list item # in the **"Notes"** area provided (i.e., A= #1,2,3,4,7, 9, 10, etc.).
- ❑ Identify location of emergency response equipment such as fire suppression equipment, protective clothing, etc.
- ❑ Identify any hazardous waste treatment units
- ❑ Identify exits, evacuation routes, doors, and wall separations
- ❑ Identify interior and exterior electrical, gas, water and any other emergency shut-off valves.
- ❑ Identify emergency alarm locations, and first aid equipment locations
- ❑ Identify location of material safety data sheets and business emergency plan
- ❑ Identify location of all floor drains
- ❑ Identify location of sewer and storm drains on or around facility site
- ❑ Identify location of parking and loading areas
- ❑ Identify location of evacuation staging areas
- ❑ Identify location of above and below ground storage tanks. Identify contents by inventory item # and indicate amount stored in tank (i.e., 10 pounds, 500 gallons.)

Use the symbols on the following key to locate features on the site and facility maps. If you add additional symbol items on the map, provide an explanation of those symbols on the legend sheet area.

U.S. Postal Service

# CERTIFIED MAIL® RECEIPT

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FA565

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- ☐ Return Receipt (electronic) $ _____
- ☐ Certified Mail Restricted Delivery $ _____
- ☐ Adult Signature Required $ _____
- ☐ Adult Signature Restricted Delivery $ _____

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11-4-22

Postmark
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City

LEGEND DAIRY FARMS
P.O. BOX 2500
CHINO, CA 91708

7020 1290 0001 2837 8921

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

- A receipt (this portion of the Certified Mail label).
- [illegible] 'nue identifier for your mailpiece.
  [illegible] nic verification of delivery or attempted [illegible] .y.
- A record of delivery (including the recipient's [illegible] signature) that is retained by the Postal Service™ for a specified period.

*Important Reminders:*

- You may purchase Certified Mail service with First-Class Mail®, First-Class Package Service®, or Priority Mail® service.
- Certified Mail service is *not* available for international mail.
- Insurance coverage is *not* available for purchase with Certified Mail service. However, the purchase of Certified Mail service does not change the insurance coverage automatically included with certain Priority Mail items.
- For an additional fee, and with a proper endorsement on the mailpiece, you may request the following services:
  - Return receipt service, which provides a record of delivery (including the recipient's signature). You can request a hardcopy return receipt or an electronic version. For a hardcopy return receipt, complete PS Form 3811, *Domestic Return Receipt*; attach PS Form 3811 to your mailpiece; for an electronic return receipt, see a retail associate for assistance. To [illegible] a duplicate return receipt for no additi[illegible] present this USPS®-postmarked Certifie[illegible] receipt to the retail associate.
  - Restricted delivery service, which provides delivery to the addressee specified by name, or to the addressee's authorized agent.
  - Adult signature service, which requires the signee to be at least 21 years of age (not available at retail).
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**IMPORTANT: Save this receipt for your records.**

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SAN BERNARDINO COUNTY FIRE DIST
ATTN: ERICK TILUS
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SAN BERNARDINO, CA 92415-0153

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SBCFIRE - HAZMAT

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

LEGEND DAIRY FARMS
P.O. BOX 2500
CHINO, CA 91708

9590 9402 7339 2028 5834 62

2. Article Number *(Transfer from service label)*

7020 1290 0001 2837 8921

*COMPLETE THIS SECTION ON DELIVERY*

A. Signature

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☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

11/10/2022

D. Is delivery address different from item 1? ☐ Yes
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PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

CUPA
San Bernai County Fire Department • Hazardous Mat s Section
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (9 386-8460 • www.sbcfire.org

# CUPA COMPLIANCE INSPECTION REPORT

NAME: **LEGEND DAIRY FARMS** FACILITY ID: **FA0000565**

ADDRESS: **8381 EDISON AVE** CERS ID: **10034761**

CITY: **ONTARIO** STATE **CA** ZIP CODE: **91762** INSPECTION DATE: **10/28/2022**

**Consent granted by:**

☒ **Photograph** ☒ **Inspect** **Name:** Lupe Mora **Title:** Lead Farmer

An inspection was conducted on 10/28/2022 to determine compliance with applicable hazardous materials laws and regulations. Lupe Mora, Lead Farmer, was the escort during the inspection.

Legend Dairy Farms is a livestock fa en over operation of (3) contiguous properties. The facilities l tario, CA, 91762 are all currently being operated by Legend D old in the form of Iodine teat dip, TCB 5000 NPF teat dip, T-Ch cleaner.

The following inventory was observed

(4) 55-gallon drums of TCB 5000 NPF
(4) 55-gallon drums of T-chlor 12.5 Sc
(3) Acid Cleaner EC
(2) Velocity Two Chlorinated Cleaner
(2) Soft Dine-10 Iodine teat dip

LEGEND DAIRY FARMS
MAILING ADDRESS:
P.O. BOX 2500
CHINO, CA, 91708

Document Review:

- CUPA program permit is current.
- This facility is a handler only and
- The Hazardous Materials Busin ental Reporting System 02/09/2022.

Complete and submit the Certificate tation, to the attention of Erick Tilus within 30 days of inspectio

Please contact Erick Tilus at (909) 38 rding this report.

If you have any questions regarding

**Refer to Title 19 and Title 22 of the C of the California Health Safety Code (CHSC), and Division 3 ing lines marked in the V column are violations that must be**

| VIOLATION CODE | DESCRIPTION | | | V |
|---|---|---|---|---|
| 42 | H | | - | |
| H201 | Hazardous Material Handler Perm | | 602(a) | |
| H202 | Hazardous Materials Business Pl | | 07 | |
| H203 | Hazardous Materials Business Pl | | 05, 25508(a)(1) | |
| H204 | Immediately Report Any Release Material | | ltiple | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508.2 | |
| H209 | Business Plan Update Within 30 days of Change | CHSC | 25508.1(a)-(f) | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | | Multiple | |

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Don Trapp**
Interim Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


November 25, 2019

MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

**ATTN: CORY DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000565-MICHAEL DEHOOG DAIRY**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

Mr. Dehoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on October 11, 2019:

- Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
- Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.
- Failure to electronically update business plan within 30 days of any one of the following events:
  A 100 percent or more increase in the quantity of a previously disclosed material.
  Any handling of a previously undisclosed hazardous materials at or above reportable quantities.
  A change of business address, business ownership, or business name.
  A substantial change in the handler's operations that requires modification to any portion of the business plan.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation <u>immediately</u> may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at AVILLANUEVA@SBCFIRE.ORG.

**ANA VILLANUEVA**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

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# SAN BERNARDINO COUNTY FIRE DISTRICT

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**Hazardous Materials Division**
**sbcfire.org**

**Don Trapp**
Interim Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


October 28, 2019

MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762
**ATTN: JOE DEHOOG**

**SUBJECT: COMPLIANCE DEADLINE REMINDER NOTICE**

**FACILITY: FA0000565-MICHAEL DEHOOG DAIRY**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

Mr. DeHoog,

A post-inspection compliance review indicates that the following violations cited at the time of inspection on **October 11, 2019**, remain outstanding.

- Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
- Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.
- Failure to electronically update business plan within 30 days of any one of the following events:
  A 100 percent or more increase in the quantity of a previously disclosed material.
  Any handling of a previously undisclosed hazardous materials at or above reportable quantities.
  A change of business address, business ownership, or business name.
  A substantial change in the handler's operations that requires modification to any portion of the business plan.

If all compliance documentation ' ecently been submitted, please disregar s notice

**IMPORTANT:** All compliance documentation requested on the inspection report must be received by this Division within **30 days from the date of the violation** or as otherwise indicated in the inspection report. This CUPA (Certified Unified Program Agency) is required by the State of California to gain compliance from all facilities subject to hazardous materials and hazardous waste laws and regulations **Complying within 30 days of violation or as indicated in the inspection report, is the most efficient and the least inconvenient way for a facility to resolve outstanding violations.** If formal enforcement is necessary to gain compliance after 30 days, the facility will be **subject to substantial civil fines, costs and other penalties** pursuant to California Health and Safety Code (CHSC) 25404.1.1 & 25187.8.

If I can be of assistance in helping you correct the violations stated above or if you have any other questions, please don't hesitate to contact me at AVILLANUEVA@SBCFIRE.ORG or (909) 386-8401.

**ANA VILLANUEVA**
**Hazardous Materials Specialist**
**Hazardous Materials Division**

BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
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CUPA
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620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CUPA COMPLIANCE INSPECTION REPORT

NAME: MICHAEL DEHOOG DAIRY | FACILITY ID: FA0000565
ADDRESS: 8381 EDISON AVE | CERS ID: 10034761
CITY: ONTARIO STATE: CA ZIP CODE: 91762 | INSPECTION DATE: 10/11/2019

**Consent granted by:**
[X] **Photograph** [X] **Inspect** **Name:** Cory Dehoog **Title:** Ranch Hand

An inspection was conducted on 10/11/2019 to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Cory Dehoog, Ranch Hand, was the escort during the inspection. Also present during the inspection was Brian Wade, Hazardous Materials Specialist with San Bernardino County Fire.

The facility is a dairy cow milking operation. The hazardous materials stored on site are used for vehicle and equipment fueling and for cleaning and sanitizing the milking operation. This facility does not routinely generate hazardous waste.

Inventory:

-back up generator with approximately 200 gallons of diesel fuel
-(4) 55 gallon drums of Soft Dine 10 sanitizing teat dip
-(1) 55 gallon drum of sodium hypochlorite
-(2) 30 gallon drums of Hydroclean chlorinated cleaner
-(2) 30 gallon drum of acid cleaner
-(2) 1,000 gallon tanks of diesel fuel

Document Review:

- CUPA permits were valid during the time of the inspection and expire 5/31/2020.
- The Hazardous Materials Business Plan was last updated via California Environmental Reporting System (CERS) on 8/26/2017. CERS I.D. number: 10034761.
- All equipment and vehicles were serviced by Ross Avery.
- Chemicals were supplied by The Chem Guys and Vetex.
- Empty drums were picked up during the time of new deliveries.
- Diesel fuel was supplied by Merit Oil.

Complete and submit the Certificate of Compliance (CofC) provided along with all requested documentation, to the attention of Ana Villanueva within 30 days of inspection.

Please contact Ana Villanueva at (909)386-8401 or by email at avillanueva@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| 42 | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | Hazardous Materials Business Plan Submittal | CHSC | 25505, 25508(e)(1) | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | CHSC | 25510(e) | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | **Business Plan Annual Review/Certification** | CHSC | 25508(e)(1), 25508.2 | X |
| Violation: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. | | | |
| MINOR | OBSERVATION: The last business plan update submitted by this facility via CERS was dated 8/26/2017. | | | |
| | CORRECTIVE ACTION: Submit a signed statement that the business plan has been updated via CERS. Your CERS ID number is 10034761. | | | |

| | | | | |
|---|---|---|---|---|
| H209 | **Business Plan Update Within 30 da Change** | CHSC | 25508.1(a)-(f) | X |
| Violation: | Failure to electronically update business plan within 30 days of any one of the following events:<br>A 100 percent or more increase in the quantity of a previously disclosed material.<br>Any handling of a previously undisclosed hazardous materials at or above reportable quantities.<br>A change of business address, business ownership, or business name.<br>A substantial change in the handler's operations that requires modification to any portion of the business plan. | | | |
| MINOR | OBSERVATION: At the time of the inspection, hazardous materials were observed on site that were not listed on the current CERS inventory or were listed in lesser quantities.<br><br>CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated via CERS. | | | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | CHSC | 25508(a)(1) | |
| H211 | Hazardous Materials Inventory | CHSC | 25505, 25506, 25508 | |
| H212 | Site Map | CHSC | 25505(a)(2), 25508(a)(1) | |
| H213 | **Emergency Response Plan** | CHSC | 25505(a)(3), 25508(a)(1) | X |
| Violation: | Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material. | | | |
| MINOR | OBSERVATION: This facility has not submitted a complete emergency response plan to CERS. Stored at facility is not a valid option for the training plan.<br><br>CORRECTIVE ACTION: Submit a signed statement that a complete emergency response plan and training plan have been submitted to CERS. | | | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Documentation | CHSC | 25505(a)(4) | |
| H216 | Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,255 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 10/11/19 12:05:55PM<br>LTR:10/11/2019 12:01:06PM |
|---|---|---|
| ANA VILLANUEVA | CORY DEHOOG | RANCH HAND |
| INSPECTOR NAME | NAME | TITLE |
| | INSPECTION DATE: 10/11/2019 | REPORT DATE: 10/11/19 1:53 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
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# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ANA VILLANUEVA within 30 days of inspection unless otherwise specified.**

RESPONDENT: Cory Dehoog

VIOLATION(S) CITED ON: 10/11/2019

FACILITY NAME: **MICHAEL DEHOOG DAIRY** FACILITY ID: **FA0000565**

SITE ADDRESS: **8381 EDISON AVE** CERS ID: **10034761**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H206 CORRECTIVE ACTION: Submit a signed statement that the business plan has been updated via CERS. Your CERS ID number is 10034761.

H213 CORRECTIVE ACTION: Submit a signed statement that a complete emergency response plan and training plan have been submitted to CERS.

H209 CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated via CERS.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

| | |
|---|---|
| Facility/ Case Name: Michael Dehoog Dairy | Facility ID #: FA0000565 |
| Address:8381 Edison Ave., Ontario, CA 91762 | |
| *1) Description:* Front of the facility from Edison facing south. | |
| *2) Description:* Backup generator with approximately 200 gallons of diesel fuel located on the north side of the property. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature: Ana Villanueva

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

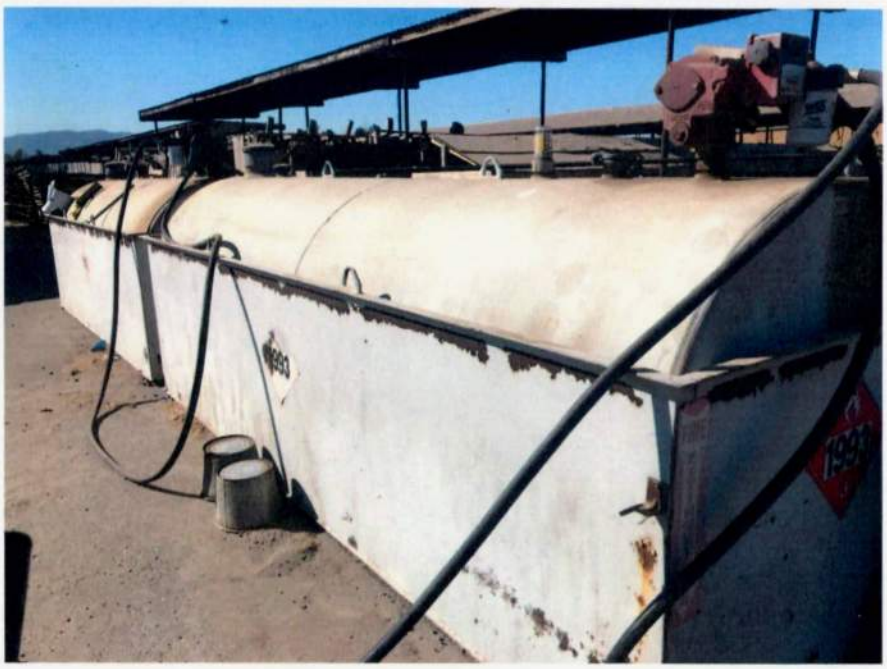

| Facility/ Case Name: Michael Dehoog Dairy | Facility ID #: FA0000565 |
|---|---|
| Address:8381 Edison Ave., Ontario, CA 91762 | |
| *3) Description:* (1) 55 gallon drum of used oil and (1) empty 55 gallon drum located on the south of the property. These drums are managed by a third party company operating on site. | |
| *4) Description:* (2) 1,000 gallon tanks of diesel fuel on the east side of the property. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature:

# PHOTO NARRATIVE



**PHOTO 5**

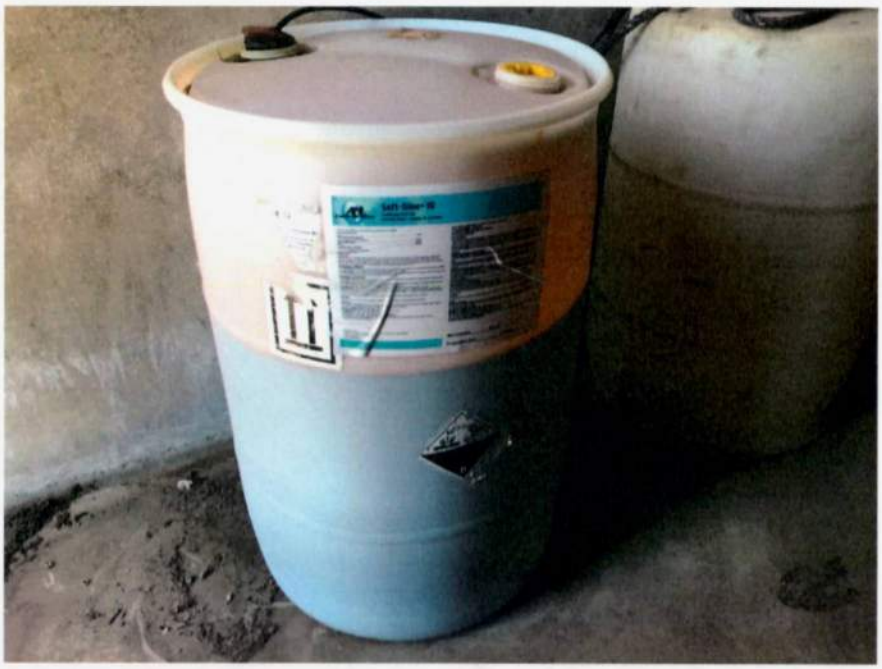

**PHOTO 6**

| Facility/ Case Name: Michael Dehoog Dairy | Facility ID #: FA0000565 |
|---|---|
| Address:8381 Edison Ave., Ontario, CA 91762 | |
| *5) Description:* (1) 55 gallon drum of Soft Dine 10 sanitizing teat dip located in the milking barn. | |
| *6) Description:* (1) empty 55 gallon drum and (1) 55 gallon drum of sodium hypochlorite located in the milking barn. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature: _____

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 7**

**PHOTO 8**

| | |
|---|---|
| Facility/ Case Name: Michael Dehoog Dairy | Facility ID #: FA0000565 |
| Address:8381 Edison Ave., Ontario, CA 91762 | |
| *7) Description:* (1) empty 30 gallon drum and (2) 30 gallon drums of Hydroclean chlorinated cleaner located in the milking barn. | |
| *8) Description:* (2) 30 gallon drums of acid cleaner located in the milking barn. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature:

Rev 06/29/2018

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Mark A. Hartwig
Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal


**July 28, 2017**

**MICHAEL DEHOOG**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

# NOTICE OF VIOLATION

| | | | |
|---|---|---|---|
| **CUPA Facility ID:** | FA0000565 | **CERS ID:** | 10034761 |
| **Facility Name:** | MICHAEL DEHOOG DAIRY | **Business Owner:** | MICHAEL DEHOOG DAIRY |
| **Business Address:** | 8381 EDISON AVE<br>ONTARIO, CA 917620000 | | |

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials and hazardous waste using the **California Environmental Reporting System (CERS)** annually. Your facility was also provided reasonable notice of this requirement from this agency in subsequent emails and/or inspections since that date.

**VIOLATION:** Failure to electronically submit / update business plan information annually using the statewide information management system, also known as CERS - California Health & Safety Code §25508(a)(1)(A) or 25508.2

**OBSERVATION:** As of the date of this letter, one or more of the following elements have not been submitted / updated in CERS:

- FACILITY INFORMATION
- HAZARDOUS MATERIALS INVENTORY
- EMERGENCY RESPONSE AND TRAINING PLANS

**REQUIREMENT:** Immediately submit / update business plan information using the instructions for accessing CERS and submitting business plan information that can be found on our website at http://www.sbcfire.org/ofm/Hazmat/ElectronicReporting-CERS.aspx

**COMPLY BY:** **August 25, 2017**

**NOTE: In accordance with Section 25515 of the California Health and Safety Code, a business that knowingly violates this article after reasonable notice of the violation is liable for an administrative penalty of up to five thousand dollars ($5,000) for each day in which the violation occurs. Failure to submit in CERS by the "Comply By" date noted above may subject your facility to this penalty. This will be your final notice- before administrative action takes place.**

**ADDITIONAL NOTE:** There may be other violations that are still open from the last inspection conducted at your facility. Please refer to the last inspection report that you received from this agency to verify compliance with all open violations, or contact this office to speak with the district inspector about complying with those violations.

Should you have any questions regarding this Notice of Violation, please contact Greg Zeigler at (909) 386-8430. For assistance with your CERS submittal, please contact the CERS Helpline at (909) 386-8432.

*Greg Zeigler, R.E.H.S.*
**Hazardous Materials Specialist IV**
**Hazardous Materials Enforcement Section**

Attachments: Workshop Announcement, Site Plan Instructions, Emergency Response & Training Plan


BOARD OF SUPERVISORS

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MICHAEL DEHOOG
8381 EDISON AVE
ONTARIO, CA 91762

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  - Restricted delivery service, which provides delivery to the addressee specified by name, or to the addressee's authorized agent.
  - Adult signature service, which requires the signee to be at least 21 years of age (not available at retail).
  - Adult signature restricted delivery service, which requires the signee to be at least 21 years of age and provides delivery to the addressee specified by name, or to the addressee's authorized agent (not available at retail).
- To ensure that your Certified Mail receipt is accepted as legal proof of mailing, it should bear a USPS postmark. If you would like a postmark on this Certified Mail receipt, please present your Certified Mail item at a Post Office™ for postmarking. If you don't need a postmark on this Certified Mail receipt, detach the barcoded portion of this label, affix it to the mailpiece, apply appropriate postage, and deposit the mailpiece.

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**SAN BERNARDINO COUNTY**
**FIRE DEPARTMENT**
**ATTN: PRISCILLA REYES**
**620 S. 'E' STREET**
**SAN BERNARDINO, CA 92415**

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
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**MICHAEL DEHOOG**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

9590 9402 2526 6306 8237 37

2. Article Number *(Transfer from service label)*

7016 0750 0000 3078 6163

***COMPLETE THIS SECTION ON DELIVERY***

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)* Janna Van Den Bosch

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

ONTARIO CA 91761
AUG 3 2017
USPS

3. Service Type

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PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

**SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT**

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Mark A. Hartwig
Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal

**July 28, 2017**

**MICHAEL DEHOOG**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

# NOTICE OF VIOLATION

| | | | |
|---|---|---|---|
| **CUPA Facility ID:** | FA0000565 | **CERS ID:** | 10034761 |
| **Facility Name:** | MICHAEL DEHOOG DAIRY | **Business Owner:** | MICHAEL DEHOOG DAIRY |
| **Business Address:** | 8381 EDISON AVE<br>ONTARIO, CA 917620000 | | |

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials and hazardous waste using the **California Environmental Reporting System (CERS)** annually. Your facility was also provided reasonable notice of this requirement from this agency in subsequent emails and/or inspections since that date.

**VIOLATION:** Failure to electronically submit / update business plan information annually using the statewide information management system, also known as CERS - California Health & Safety Code §25508(a)(1)(A) or 25508.2

**OBSERVATION:** As of the date of this letter, one or more of the following elements have not been submitted / updated in CERS:

- FACILITY INFORMATION
- HAZARDOUS MATERIALS INVENTORY
- EMERGENCY RESPONSE AND TRAINING PLANS

**REQUIREMENT:** Immediately submit / update business plan information using the instructions for accessing CERS and submitting business plan information that can be found on our website at http://www.sbcfire.org/ofm/Hazmat/ElectronicReporting-CERS.aspx

**COMPLY BY:** **August 25, 2017**

**NOTE: In accordance with Section 25515 of the California Health and Safety Code, a business that knowingly violates this article after reasonable notice of the violation is liable for an administrative penalty of up to five thousand dollars ($5,000) for each day in which the violation occurs. Failure to submit in CERS by the "Comply By" date noted above may subject your facility to this penalty. This will be your final notice- before administrative action takes place.**

**ADDITIONAL NOTE:** There may be other violations that are still open from the last inspection conducted at your facility. Please refer to the last inspection report that you received from this agency to verify compliance with all open violations, or contact this office to speak with the district inspector about complying with those violations.

Should you have any questions regarding this Notice of Violation, please contact Greg Zeigler at (909) 386-8430. For assistance with your CERS submittal, please contact the CERS Helpline at (909) 386-8432.

*Greg Zeigler, R.E.H.S.*
**Hazardous Materials Specialist IV**
**Hazardous Materials Enforcement Section**

Attachments: Workshop Announcement, Site Plan Instructions, Emergency Response & Training Plan

BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | James Ramos | Curt Hagman | Josie Gonzales | Dena Smith |
|---|---|---|---|---|---|
| Chairman, First District | Second District | Third District | Vice Chairman, Fourth District | Fifth District | Interim Chief Executive Officer |

San Bernardino County CUPA
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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 565 Facility Name: Michael DeHoog Dairy Inspection Date: August 26, 2016

Site Address: 8381 Edison Avenue Phone #: 909-947-0944

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by:

☒ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner

*Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)*

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permits are current; expire 5/31/17

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) No spills or releases were observed

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a)) (2) 1,000-gal ASTs diesel fuel, (4) 55-gal drums iodine teat dip, (2) 55-gal drums iodine teat dip, (2) 30-gal drums and cleaner, (3) 30-gal drums Hydroclean 400

☐ 202. A Business Plan has not been established. (CHSC 25507) ☒ 206. Business Plan not updated w/in 12 months (CHSC 25508.2) 7/9/2007

☒ 203. A Business Plan has not been submitted. (CHSC 25508) CERS ID 10034761

**Compliance Requirement**: Using the California Environmental Reporting System (CERS), submit Business Plan information into the statewide information management system.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety training provided

**Compliance Requirement**: Submit training documentation as required.

## Container Storage and Labeling Requirements:

Chemicals delivered by SDS and Terco.

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

## Waste Management:

Heavy equipment serviced by Rent Avery. Diesel by Merit Oil.

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A

**Compliance Requirement**: Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspector: Brian Wade (Sign Name) Received By: Joe DeHoog (Sign Name) Title: PARTNER

Brian Wade (Print Name) Joe DeHoog (Print Name) Report Date: August 26, 2016

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name: Joe DeHoog Date: 11-15-16

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Mark A. Hartwig**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


October 29, 2016

MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762

**ATTN: JOE DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000565-MICHAEL DEHOOG DAIRY**
**8381 EDISON AVE**
**ONTARIO, CA 91762-0000**

Mr. DeHoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on August 26, 2016:

- At least once every 12 months, the owner/owner shall review and certify that the information in the statewide information management system has been verified and is complete, accurate and up to date.
- Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

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| Vice Chair, First District | Second District | Chair, Third District | Fourth District | Fifth District | Chief Executive Officer |

San Bernardino County CUPA

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 565 Facility Name: Michael DeHoog Dairy Inspection Date: August 26, 2016

Site Address: 8381 Edison Avenue Phone #: 909-947-0944

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by:

☒ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner

*Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)*

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permits are current; expire 5/31/17

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) No spills or releases were observed

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a)) (2) 1,000-gal ASTs diesel fuel, (4) 55-gal drums iodine teat dip, (2) 55-gal drums iodine teat dip, (2) 30-gal drums acid cleaner, (3) 30-gal drums hydroclean 400

☐ 202. A Business Plan has not been established. (CHSC 25507) ☒ 206. Business Plan not updated w/in 12 months (CHSC 25508.2) 7/9/2007

☒ 203. A Business Plan has not been submitted. (CHSC 25508) CERS ID 10034761

**Compliance Requirement**: Using the California Environmental Reporting System (CERS), submit Business Plan information into the statewide information management system.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety training provided

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements: Chemicals delivered by SDS and Terco.

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management: Heavy equipment serviced by Kent Avery. Diesel by Merit Oil.

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A

**Compliance Requirement**: Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspector: Brian Wade (Sign Name) Received By: Joe DeHoog (Sign Name) Title: PARTNER

Brian Wade (Print Name) Joe DeHoog (Print Name) Report Date: August 26, 2016

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** _____ Name _____ Date

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **565**

Address: **8381 Edison Avenue Ontario, CA 91762**

1) Description: **View of the facility from Edison facing South.**

2) Description: **(2) 1,000-gallon AST's of diesel fuel stored on the Eastern side of the property.**

Date Taken: **8/26/2016**

Taken By: **Brian Wade**

Signature: Brian Wade

Revised 02/27/03

# PHOTO NARRATIVE



PHOTO 3

PHOTO 4

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **565**

Address: **8381 Edison Avenue Ontario, CA 91762**

1) Description: **(2) 30-gallon drums of acid cleaner in the chemical storage room of the milking barn.**

2) Description: **(3) 30-gallon drums of Hydroclean 400 stored in the chemical storage room of the milking barn.**

Date Taken: **8/26/2016**

Taken By: **Brian Wade** Signature: Brian Wade

Revised 02/27/03

# PHOTO NARRATIVE



**PHOTO 5**

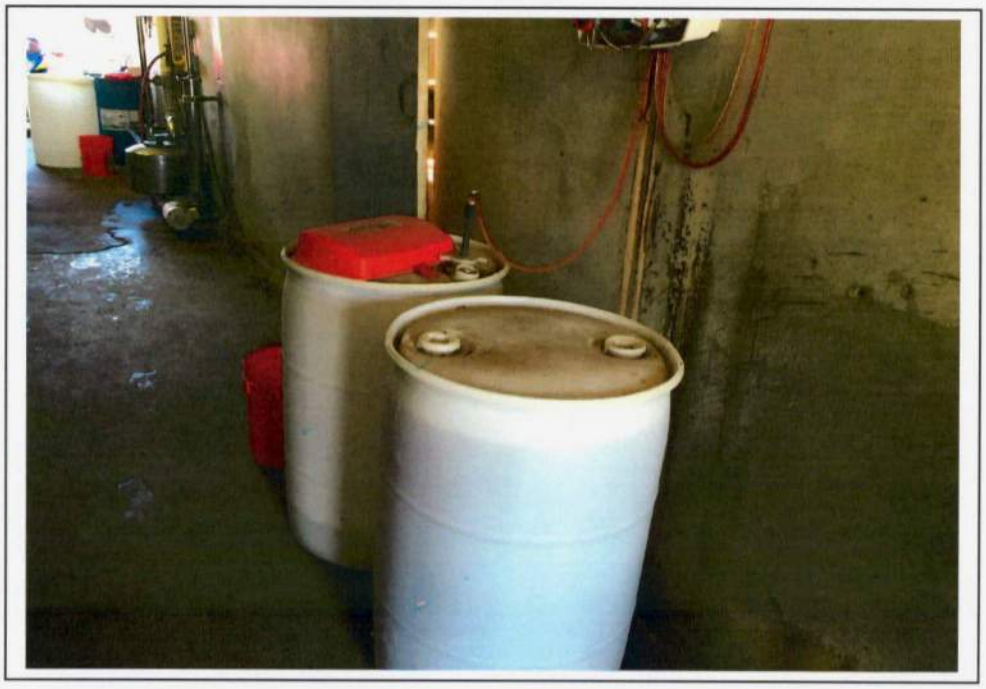

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **565**

Address: **8381 Edison Avenue Ontario, CA 91762**

1) Description: **(2) 55-gallon drums of non-iodine teat dip stored in the milking barn. In the rear of the photo are 55-gallon drums of iodine teat dip.**

Date Taken: **8/26/2016**

Taken By: **Brian Wade** Signature: Brian Wade

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153
(909) 386-8401 • FAX (909) 386-8460 • www.sbcfire.org

# ACCESS REQUEST to FACILITY RECORD IN CERS - SINGLE FACILITY*

For more information, see: http://www.sbcfire.org/hazmat/efile.aspx or call CERS help line (909) 386-8432

The purpose of the ACCESS REQUST is to ensure that only individuals designated by the facility owner/operator are authorized by the CUPA to access facility records and to create, edit, and submit electronic data on the owner's behalf to the statewide system, known as the California Environmental Reporting System (CERS). The initial business user authorized by the CUPA to have access to a facility on CERS is designated as a lead business user. Lead business users have the ability to add additional lead or standard business users, approve or reject other access requests, or delete other users for any facility for which they are listed as a lead user.

**AUTHORIZED LEAD BUSINESS USER**

| Name | Title |
|---|---|
| Joe DeHoog | Owner |
| **Email Address** | **Contact Phone** |
| 90TmilkFor6@Juno.com | 909 815-7074 |

| OWNER NAME | OWNER EMAIL ADDRESS |
|---|---|
| Joe DeHoog | Same |

| OWNER MAILING ADDRESS | CITY | STATE | ZIP CODE | OWNER PHONE |
|---|---|---|---|---|
| 8381 Edison Ave | ONTARIO | CA | 91762 | 909 947-0944 |

**Fill out the following information for the facility**

| FACILITY ID *(e.g., FA0123456)* | FACILITY NAME *(e.g., CUPA AUTO)* | SITE ADDRESS *(e.g., 123 N. MAIN ST.)* | CITY *(e.g., ANYTOWN)* |
|---|---|---|---|
| 565 + 668 | Michael DeHoog Dairy<br>Three D Dairy | 8381 Edison Ave<br>8485 Edison Ave | ONTARIO |

☑ **I authorize the person and email address listed above to be a lead business user for the listed facility. This includes the ability to create, edit, and submit compliance data for the listed facility. I understand that as a lead business user this person may approve additional lead business users or standard business users, grant or reject facility access requests, and delete users from the facility listed on this authorization form.**

**Certification – I certify that I am the owner/operator or legal representative of the facility listed on this form. I understand that compliance documents prepared or submitted electronically are held to the same standard as their former paper equivalents.**

| SIGNATURE OF OWNER/OPERATOR OR LEGALLY DESIGNATED REPRESENTATIVE | DATE | NAME OF DOCUMENT PREPARER |
|---|---|---|
| Joe DeHoog | 3-10-13 | |
| **NAME OF SIGNER (print)** | **TITLE OF SIGNER** | |
| Joe DeHoog | Owner | |

*Each facility record that is entered into CERS is assigned to a business/organization. Multiple facilities that have the same owner/operator and that will have the same users managing the facility record in CERS can be grouped together into a single "umbrella" business/organization. If you own or operate multiple facilities and if the same users will be managing all of the facilities in CERS, you may want them to be grouped into a single business/organization. For more information please contact the San Bernardino CERS help line at (909) 386-8432.

Return completed form by Mail: San Bernardino County Fire Department, Hazardous Materials Division, 620 South E Street, San Bernardino, CA 92415-0153 or Fax: (909) 386-8460 or Email: Efile@sbcfire.org

OFFICE USE Notes: invitation 3-18-13

Form Revised 11/14/12 Completed by: [illegible] Date: 3-18-13

OFFICE USE ONLY: DATE STAMP

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 565 Facility Name: Michael DeHoog Dairy Inspection Date: 1-30-2013

Site Address: 8381 Edison Phone #: (909) 947-0944

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:

☑ Inspect ☑ Photograph Name: Joe DeHoog Title: Owner # Emp: 4 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED** 5/31/2013

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Haz Mat Handler

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) N/A

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) Okay

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☐ 202. A Business Plan has not been established. (CHSC 25503.5)

☑ 203. A Business Plan has not been submitted / updated. (CHSC 25505) Last Submission 1/18/07

INVENTORY: 5% Iodine - Tit Dip 4X55 gal
Diesel - 2X1000 gallon Tanks

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety Meetings

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements: No Hazardous Waste Generated

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) N/A

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Discussed Universal Waste Mgmt

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) Kent Avery Diesel Mechanics - Service Equipment

**Compliance Requirement**: Submit copies of waste disposal records for the past

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - Milk Production

Inspected By: Jerry Wong (Sign Name) Received By: Joe DeHoog (Sign Name) Title: Owner

Jerry Wong (Print Name) Joe DeHoog (Print Name) Report Date: 1/30/2013

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: 1/30/2013

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| 565 | Michael DeHoog Dairy | 8381 Edison, Ontario |
| Consent Granted by: ☑ Inspect ☑ Photograph | NAME Joe DeHoog | TITLE Owner |

#203 - Failure to Update the Business Plan (CHSC Section 25505) Business Plans are to be updated annually. The current Business Plan on file has not been updated since 6/18/2007

Compliance Requirement - Using the California Environmental Reporting System (CERS) Please submit the elements of the Business Plan within 30 days of receipt of this Inspection. The Website is http://cers.calepa.ca.gov/

If you have any questions regarding CERS Please call the Help Line at (909) 386-8432

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: Jerry Wong (Sign Name) Jerry Wong (Print Name)

Received By: [signature] (Sign Name) Joe DeHoog (Print Name)

Title: Owner

Report Date: 1/30/2013

# PHOTO NARRATIVE



PHOTO 1

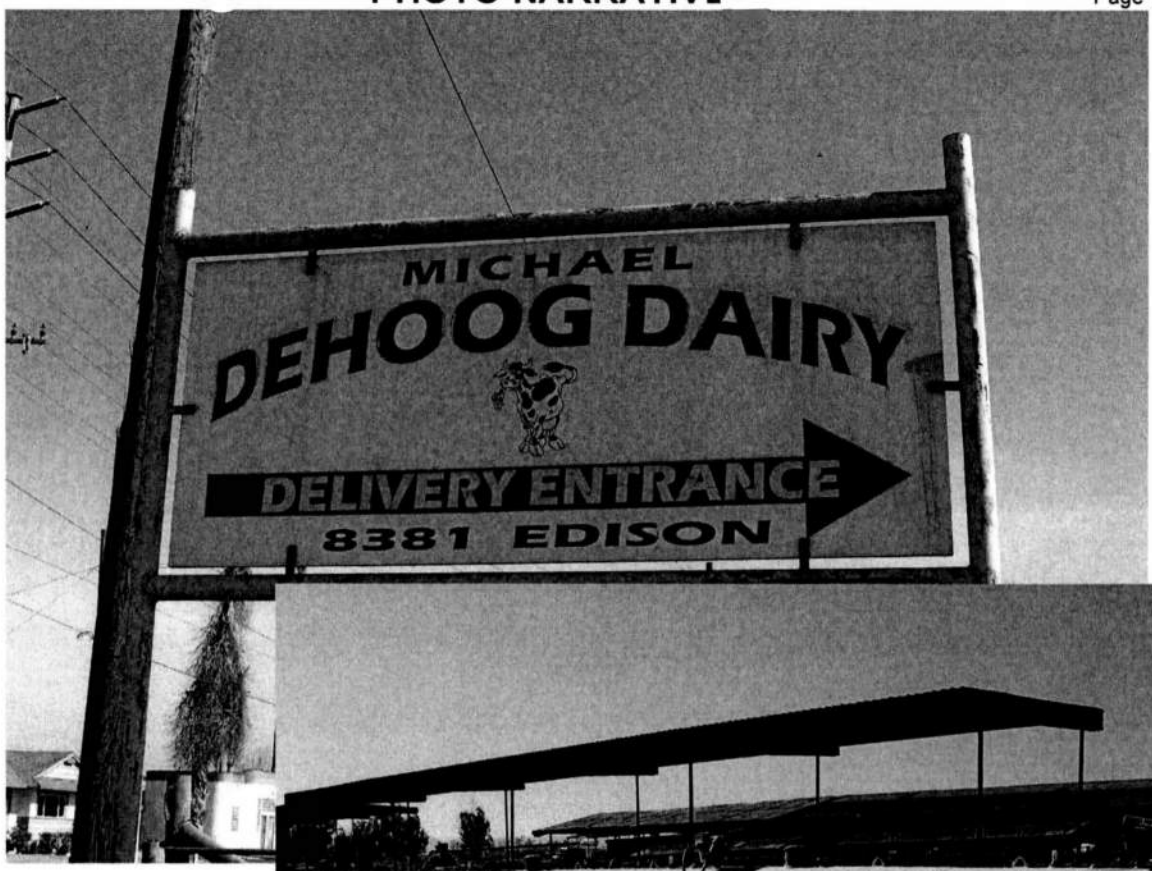


PHOTO 2

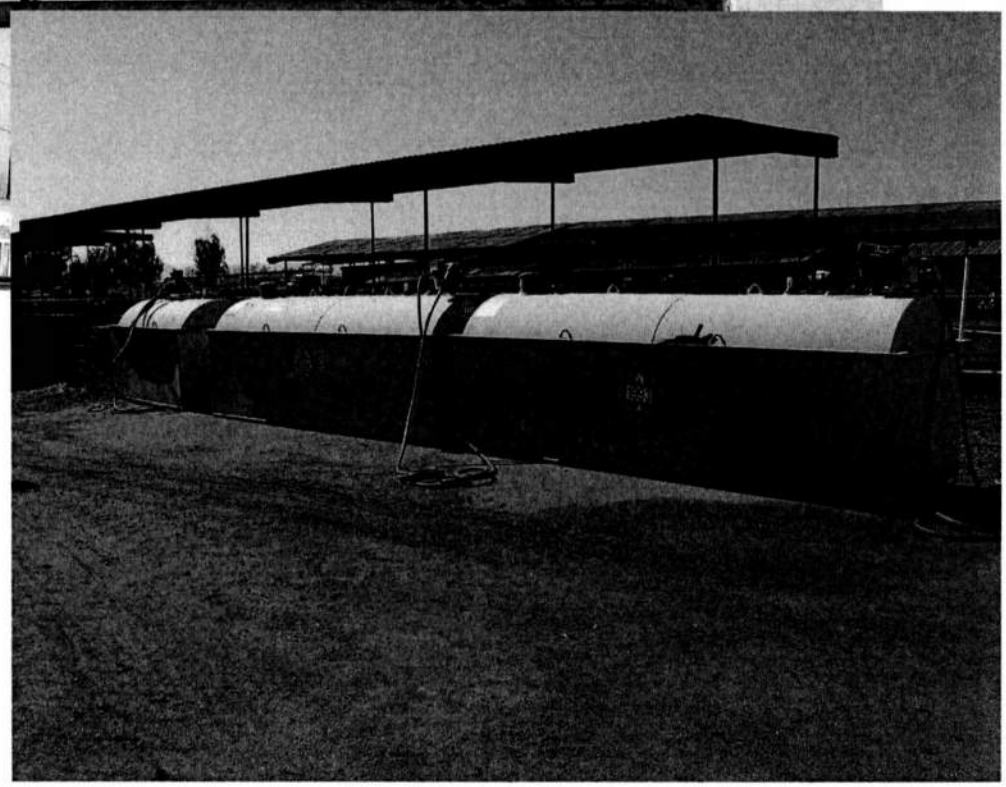

| | | |
|---|---|---|
| Facility/Case Name: | **MICHAEL DEHOOG DAIRY** | Facility ID 0000565 |
| Address: | **8381 Edison Avenue, Ontario, California, 91762** | |
| 1) Description: | **The facility is an agricultural business that produces milk. The owners of the facility are father and son.** | |
| 2) Description: | The facility is currently storing diesel fuel in two 1000 gallon tanks. The 500 gallon tank on the left is empty. | |
| Date Taken: | January 30, 2013 | |
| Taken By: | **Jerry Wong** | Signature: |

Revised 10/12/2000

PHOTO 1

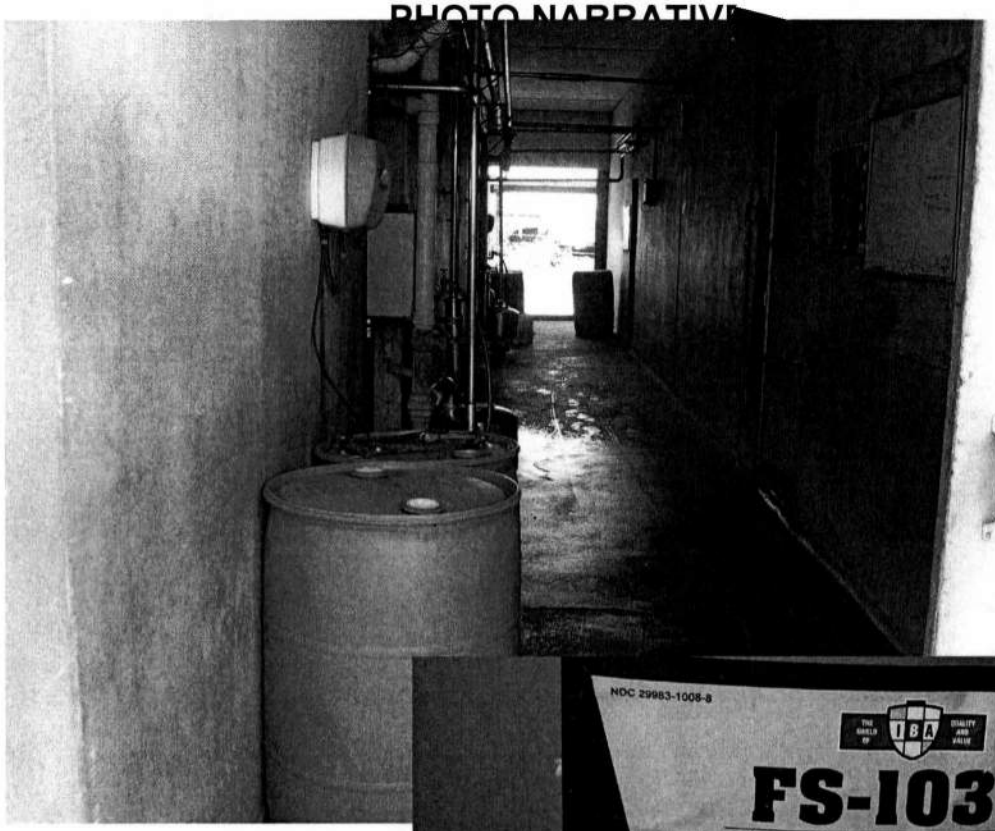

PHOTO 2

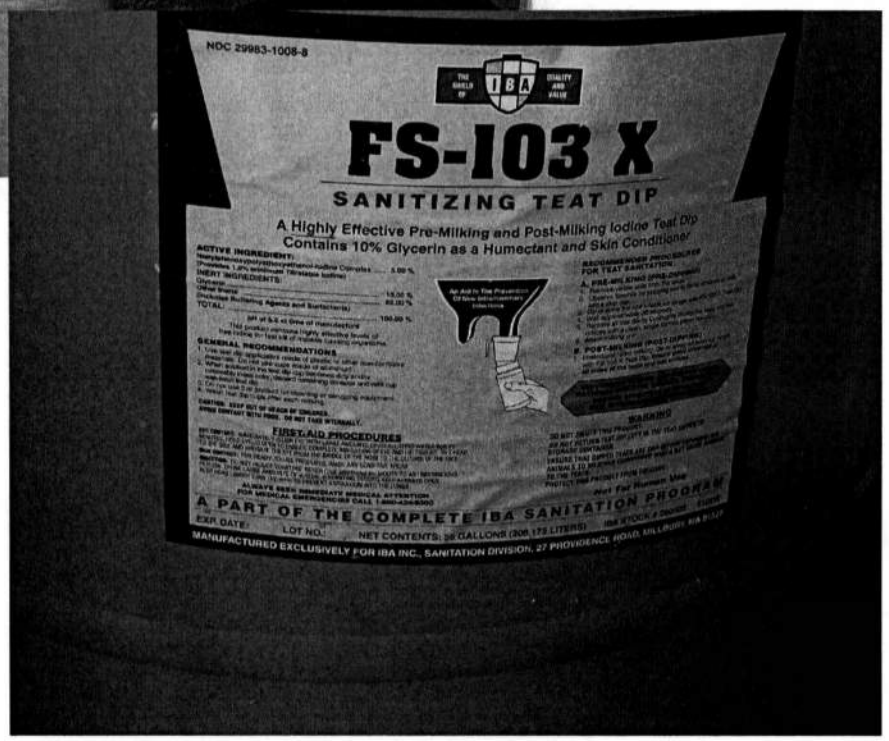


| | | |
|---|---|---|
| Facility/Case Name: | **MICHAEL DEHOOG DAIRY** | Facility ID 0000565 |
| Address: | **8381 Edison Avenue, Ontario, California, 91762** | |
| 1) Description: | **The facility stores drums of cleaning chemicals and sanitizing agents in the milk barn.** | |
| 2) Description: | The facility is currently storing four 55 gallon drums of this 5% iodine solution in the milk barn. | |
| Date Taken: | January 30, 2013 | |
| Taken By: | **Jerry Wong** | Signature: |

Revised 10/12/2000

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

PAT A. DENNEN
Fire Chief
County Fire Warden


November 30, 2007

Michael DeHoog Dairy
8381 Edison Avenue
Ontario, CA 91762

**ATTENTION: JOE DEHOOG**

**SUBJECT: NOTICE OF BUSINESS PLAN DEFICIENCIES**

**FACILITY: 8381 EDISON AVENUE, ONTARIO**

The Business Emergency/Contingency Plan submitted to the Hazardous Materials Division have been determined to be deficient. California Health & Safety Code, Chapter 6.95, § 25505 (a)(2) states, "*If, after review, the administering agency determines that the handler's Business Plan is deficient in any way, the administering agency shall notify the handler of those deficiencies. The handler shall submit a corrected Business Plan within 30 days from the date of the notice.*"

***This letter constitutes formal notice of business plan deficiencies. Please submit 2 copies of the information requested below with a copy of this letter for final review within 30 days from the above date.***

**The following are the items requiring correction:**

Locally Collected Inventory Information page

- Taxpayer ID Number: Provide the Taxpayer or Federal ID Number.

Emergency Response Plans and Procedures page 1 (page 5)

- Evacuation/Notification: Provide a description of how employees, customers and visitors at this facility will be notified of an emergency, e.g. loudspeaker, hand held radios, etc. Also, indicate where the emergency staging area is located. Submit a revised Emergency Response Plans and Procedures page 1 (page 5).

Inventory

- All items listed on the Inventory Summary are required to have an included individual chemical description forms. No individual chemical description forms were submitted. Enclosed find partially completed individual forms (I was unable to complete all of the form due to lack of information).

Submit completed individual chemical description forms for all items.


MARK H. UFFER
County Administrative Officer

NORMAN A. KANOLD
Assistant County Administrator
Public and Support
Services Group

Board of Supervisors
BRAD MITZELFELT ..... First District
PAUL BIANE ..... Second District
DENNIS HANSBERGER ..... Third District
GARY C. OVITT ..... Fourth District
JOSIE GONZALES ..... Fifth District

**Failure to correct the outstanding deficiencies could result in further enforcement actions and additional fees. If the response to this deficiency letter does not result in correction of the deficiencies, a records review fee of $123/hr will be assessed to recover those costs associated with additional file review.**

*CA Health and Safety Code, Chapter 6.95, § 25505 (a)(3) states, "If a handler fails, after reasonable notice, to submit a business plan in compliance with this article, the administering agency shall immediately take appropriate action to enforce this article, including the imposition of civil and criminal penalties as specified in this article." Penalties for business plan violations can range from $2000-$5000/day.*

An electronic version of the Business Emergency/Contingency Plan Forms and Guidelines is available at our website www.sbcfire.org. Click on the HAZMAT bar located on the left side of the page. Then click on Forms & Guidelines in the title bar. Finally, click on the Business Plan title, this will link you to all forms associated with the Business Plan Program. Should you have any further questions, comments, or concerns, please feel free to contact me at (909) 386-8401 or lheaviside@sbcfire.org.

**LESLIE HEAVISIDE, REHS**
**Hazardous Materials Division, Field Services Section**
Enclosures: Business Emergency/Contingency Plan Guidelines and Forms
Example Business Emergency/Contingency Plan

# Business Emergency/Contingency Plan Receipt

Mail to: MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

Site Address: MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

Service Request ID: SR0013881
Facility ID: FA0000565

The Business Emergency/Contingency Plan was received on July 19, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.

2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.

3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.

4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.

5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.

2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.

3. Change of business address, business ownership, or business name.

4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**

**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**

**www.sbcfire.org**

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED
JUL 19 2007
S.B. CO. FIRE DEPT.

FACILITY ID # F A

BUSINESS NAME (Same as FACILITY NAME or DBA) 3

Michael DeHoog DAIRY

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8381 Edison Ave | ONTARIO | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☐ * Business Activities Form
- ☐ * Business Owner/Operator Identification Form
- ☐ * Supplemental Emergency Contact Page
- ☐ Emergency Response Plans and Procedures
- ☐ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☐ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☐ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☐ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☐ Area map - photocopied city map with location of site indicated
- ☐ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.

- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER 135 |
|---|---|---|
| Joe DeHoog | 6-18-07 | Joe DeHoog |

| NAME OF SIGNER (*print*) | TITLE OF SIGNER (*print*) |
|---|---|
| Joe De Hoog | PARTNER |

## BUSINESS RGENCY/CONTINGENCY PLAN COVER S. .T INSTRUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of Initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

| FACILITY ID # | F | A | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

| BUSINESS NAME (Same as FACILITY NAME or DBA) | EPA ID # (Hazardous Waste Only) |
|---|---|
| Michael DeHoog Dairy | NA |

| BUSINESS ADDRESS | CITY | ZIP CODE |
|---|---|---|
| 8381 Edison Ave | ONTARIO | 91762 |

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page Instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California Identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FH0000505 Facility Name: Michael DeHoog Dairy Inspection Date: May 29, 2007

Site Address: 8381 Edison Phone #: 909 947-1914

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:

☑ Inspect ☑ Photograph Name: Joe DeHoog Title: Partner # Emp: 9 Packet left on site? (Yes/No)

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☑ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires handler permit only

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☑ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

**INVENTORY:** 1) 55-gal drums tool oil (100% Textline) 2) 500-gal AST, 4111 ~ 75 gal AST diesel & back up generator 3) 30-gal liquid laundry cleaner 4) 30-gal acid pipe cleaner

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement**: Submit training documentation as required.

## Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) "

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) "

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

RECEIVED JUL 19 2007 S.B. CO. FIRE DEPT.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) "

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) "

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

## Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) Does not generate waste

**Compliance Requirement**: Submit copies of waste disposal records for the past "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Equipment serviced by Lost Hills Repair Inc.

Inspected By: [signature] (Sign Name) Leslie Hawkside (Print Name)

Received By: [signature] (Sign Name) Joe DeHoog (Print Name)

Title: Partner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** [signature] (Name) 6-30-07 (Date)

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000565 Facility Name: Michael DeHoog Dairy Inspection Date: May 29, 2007

Site Address: 8381 Edison Phone #: (909) 947-1944

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by: ☑ Inspect ☑ Photograph Name: Joe DeHoog Title: Partner # Emp: 9 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☒ 101. (201) Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires handler permit only

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking.

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (5) 55-gal drums teat dip (10% Iodine)
(2) 500-gal AST's (1) ~ 75 gal AST diesel & back up generator
(2) 30-gal liquid chlorinated cleaner
(2) 30-gal acid pipe cleaner

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement**: Submit training documentation as required.

## Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) " " " " "

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) " " " "

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) " " " " "

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) " " " "

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

## Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) Does not generate waste

**Compliance Requirement**: Submit copies of waste disposal records for the past " " " "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Equipment serviced by Kent Avery Repair, Inc.

Inspected By: [signature] Sign Name — Leslie Heaviside Print Name

Received By: [signature] Sign Name — Joe DeHoog Print Name

Title: Partner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **FA0000565**

Address: **8311 Edison Avenue, Ontario**

1) Description: **Front of milking parlor**

2) Description: **Back-up generator containing approximately 75 gallons Diesel fuel**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

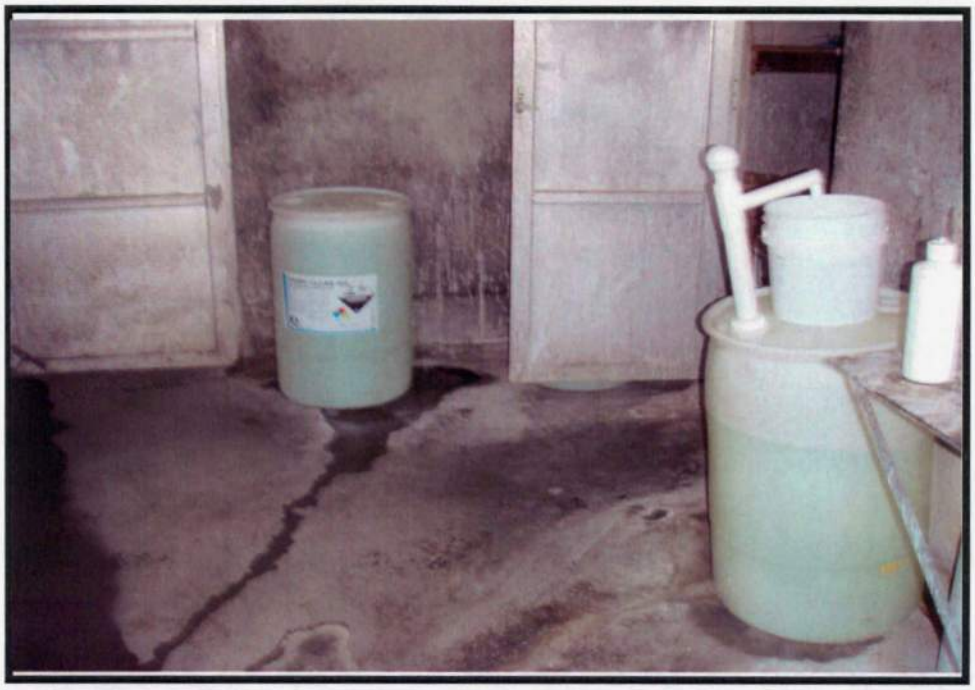

PHOTO 4

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **FA0000565**

Address: **8311 Edison Avenue, Ontario**

3) Description: **(2) 30-gallon drums of HydroClean 400 (potassium hydroxide & sodium hypochlorite)**

4) Description: **(2) 500-gallon AST's Diesel fuel**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

THREE D DAIRY
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2015** **Expiration Date: 4/30/2016**

**CUPA Facility Type: 5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0009608 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   Note: The UST ID Number is listed on the front of the permit for each UST

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Fire Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part2, Chapter 1,Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4 Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:2 AR:0.00

JOE DEHOOG
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2014** **Expiration Date: 4/30/2015**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0009608 |
| PT0031936 | 5011 CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | PR0040824 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4, Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2013** **Expiration Date: 4/30/2014**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

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a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bemardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
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f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2012** **Expiration Date: 4/30/2013**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2011** **Expiration Date: 4/30/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

Daniel A. Odom, Interim Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
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# PERMIT CONDITIONS

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a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

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g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2010** **Expiration Date: 4/30/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

DEHOOG,MICHAEL
14350 WALKER AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0010668 for a period not to exceed one year from effective date.

Effective Date: 5/1/2009 Expiration Date: 4/30/2010

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

SAN BERNARDINO COUNTY
COUNTY OF SAN BERNARDINO
1853
FIRE DEPT

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

DEHOOG,MICHAEL
14350 WALKER AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.

**Effective Date: 5/1/2008** **Expiration Date: 4/30/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

Printed on 5/2/2008
Reconstructed by MIS on 8/12/2008

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

CLOSURE

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

0011267
0015320

- [ ] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [x] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0000574

NAME: **DEHOOG,MICHAEL**

ADDRESS: **8381 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

PHONE: EXT: FYI LAST UPDATED: **06/10/2010**

### FACILITY INFORMATION — FACILITY ID: FA0000668

BUSINESS NAME: **THREE D DAIRY** CERS ID:**10034842**

INACTIVATED

SITE ADDRESS: **8485 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** FAX:

BUSINESS PHONE: **909-947-0944** EXT:

BUSINESS OPERATOR NAME: **JOE DEHOOG**

OPERATOR PHONE: EXT: FYI LAST UPDATED: **11/18/2016**

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: **8485 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

### BILLING CONTACT — ACCOUNT ID: AR0000669

BILLING CONTACT NAME: **JOE DEHOOG**

ADDRESS 1: **8485 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

PHONE: **909-947-0944** EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: PHONE: EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL): **GOTMILKFOR6@JUNO.COM**

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: * BUSINESS TYPE:

* SUPERVISORIAL DISTRICT: **004** * INSPECTION DISTRICT: **03** * FIRE JURISDICTION: **ONTARIO FIRE**

INACTIVATED

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **04/30/1997** FYI LAST BILLING: **03/15/2022**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**1-Motor Vehicle Fuel, 2-Fuel Distributor, 3-Farm, 4-Processor, 6-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [x] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| 11/1/22 LS | | | |
| Date Initials | Date Initials | Date Initials | Date Initials |

ALL PES INACTIVATED

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE | PT0008721 | ACTIVE | 4241-HAZARDOUS MATERIALS 1-3 C | 05/01/2022 | 04/30/2023 |
| | | | GHP OR UST ID: PR0009608 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE | PT0008722 | INACTIVE | 4420-SPECIAL GENERATOR | 05/01/1996 | 04/30/1997 |
| | | | GHP OR UST ID: PR0009609 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 11/01/2022 SUBMITTED BY: Erick Tilus

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Three D Dairy has ceased operations at this location. This facility is contiguous with (2) other farms operated by Ron C. Pietersma, OW0009196, effective 10/15/2022.

Please inactivate all permits for this FA.

Thanks,

ET

COMMENT ADDED

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

# SAN BERNARDINO COUNTY CUP
## FACILITY INFORMATION

☐ Update/Assign PEs ☐ Referral to Team CERS ☐ Closure ☐ Invoice Reversal ☐ Demand Bill
☑ Update Non-CERS Fields ☐ 0202 ☐ Other ☐ 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0000574**

NAME: DEHOOG,MICHAEL
ADDRESS: 8381 EDISON AVE ADDRESS 2:
CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA
PHONE: EXT: FYI LAST UPDATED: 06/10/2010

**FACILITY INFORMATION** — **FACILITY ID: FA0000668**

BUSINESS NAME: THREE D DAIRY CERS ID: 10034842
SITE ADDRESS: 8485 EDISON AVE ADDRESS 2:
CITY: ONTARIO STATE: CA ZIP CODE: 91762 FAX:
BUSINESS PHONE: 909-947-0944 EXT:
BUSINESS OPERATOR NAME: JOE DEHOOG
OPERATOR PHONE: EXT: FYI LAST UPDATED: 07/06/2015

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: 8485 EDISON AVE ADDRESS 2:
CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

**BILLING CONTACT** — **ACCOUNT ID: AR0000669**

BILLING CONTACT NAME: JOE DEHOOG
ADDRESS 1: 8485 EDISON AVE ADDRESS 2:
CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA
PHONE: 909-947-0944 EXT: EMAIL:

**ENVIRONMENTAL CONTACT**

NAME: PHONE: EXT:
EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL): gotmilkfor6@yahoo.com
LOCAL FACILITY PHONE (OPTIONAL): EXT:
CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: BUSINESS TYPE:
SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: ONTARIO FIRE
FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 04/30/1997 FYI LAST BILLING: 03/16/2016
FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 0.00

Business Code: 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
Business Type: 01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

ENTERED AUG 31 2016

| | | | |
|---|---|---|---|
| ☐ EC Entry Complete | ☐ QC Complete | N/A ☐ ☐ Fiscal Entry Complete | N/A ☐ ☐ Referral to Team CERS |
| Date Initials | Date Initials | Date Initials | Date Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0008721 | ACTIVE | 4241-HAZARDOUS MATERIALS | 05/01/2016 | 04/30/2017 |
| | | | GHP OR UST ID: PR0009608 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0008722 | INACTIVE | 4420-SPECIAL GENERATOR | 05/01/1996 | 04/30/1997 |
| | | | GHP OR UST ID: PR0009609 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLAB | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

☐ UPDATE
☐ INACTIVATE
☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 7/29/16 SUBMITTED BY: Brian Wade

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

## SAN BERNARDIN OUNTY FIRE -HAZARDOUS MAT ALS DIVISION

### Request to Reverse Delinquent Penalty Fees

Requester: RUTH CLARK

Date: 5/20/2015 7:29:19AM

Facility ID: FA0000668
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

| Invoice ID | Total Account Balance | Total Due for Invoice |
|---|---|---|
| IN0103679 | $ 0.00 | $ 0.00 |
| **Invoice Date** | **Delinquent Penalties** | **Total Paid** |
| 3/17/15 | $ 108.85 | $ 419.85 |

Explanation: IN0103679 HAD DELINQUENT FEES ADDED IN ERROR. BILLING ADDRESS UPDATED IN CERS ON 3/25/13, BUT HAD NOT YET BEEN UPDATED IN ENVISION. PLEASE REVERSE $108.85 AND ISSUE THE CUSTOMER A REFUND. PLEASE SEE ATTACHED.

HazMat Supervisor — Date 5/27/15

Deputy Fire Marshal — Date 5/20/15

| Program/ Element | Qty | Description | | Amount |
|---|---|---|---|---|
| 4241 | 1 | HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | $ | 183.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | $ | 35.00 |
| 5011 | 1 | CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | $ | 93.00 |
| 9990 | 3 | DELINQUENT PENALTY FEE | $ | 108.85 |
| 9999 | 6 | PAYMENT RECEIVED - THANK YOU | $ | -419.85 |
| | | Total Due for This Invoice: | $ | 0.00 |

☐ Waive 9805 Administrative Fee

**Fiscal Section**

Fiscal Services Supervisor — Date 6-1-15

Michael Sadsad

OFM Administrative Supervisor — Date 5/20/15

COMPLETED

# SAN BERNARDINO COUNTY FIRE -HAZARDOUS MATERIALS DIVISION

## Request to Reverse Delinquent Penalty Fees

Requester: RUTH CLARK

Date: 5/20/2015 7:29:19AM

Facility ID: FA0000668
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

| Invoice ID | Total Account Balance | Total Due for Invoice |
|---|---|---|
| IN0103679 | $ 0.00 | $ 0.00 |
| **Invoice Date** | **Delinquent Penalties** | **Total Paid** |
| 3/17/15 | $ 108.85 | $ 419.85 |

Explanation: IN0103679 HAD DELINQUENT FEES ADDED IN ERROR. BILLING ADDRESS UPDATED IN CERS ON 3/25/13, BUT HAD NOT YET BEEN UPDATED IN ENVISION. PLEASE REVERSE $108.85 AND ISSUE THE CUSTOMER A REFUND. PLEASE SEE ATTACHED.

Kristi Wal 5/27/15
HazMat Supervisor Date

5/20/15
Deputy Fire Marshal Date

| Program/ Element | Qty | Description | | Amount |
|---|---|---|---|---|
| 4241 | 1 | HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | $ | 183.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | $ | 35.00 |
| 5011 | 1 | CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | $ | 93.00 |
| 9990 | 3 | DELINQUENT PENALTY FEE | $ | 108.85 |
| 9999 | 6 | PAYMENT RECEIVED - THANK YOU | $ | -419.85 |
| | | Total Due for This Invoice: | **$** | **0.00** |

☐ Waive 9805 Administrative Fee

**Fiscal Section**

Fiscal Services Supervisor Date

5/20/15
OFM Administrative Supervisor Date

Please make your check payable to:
**San Bernardino County Fire Protection District**
Send to:
**157 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 386-8483**

**PAST DUE**
**HAZARDOUS MATERIALS**
**CUPA PERMITS**

Nice! mail to the wrong Address and Then Penalize me. (Only in Govt.)

**TO : THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

**ATTN : THREE D DAIRY**

☒ **Change of Billing Address (see back)**

**Facility Address**
**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

| CERS ID | Facility ID | Invoice ID |
|---|---|---|
| 10034842 | FA0000668 | IN0103679 |

**Invoice Date**
3/17/15

*IN0103679419.85*

**Total Account Balance**
$ 419.85

**Total Due for Invoice**
$ 419.85

**Total Paid**
419.85

**Upon receipt of full payment of the total account balance due as shown on this Invoice, you will receive your new annual permit with an effective date of:**
**5/1/2015 to 4/30/2016**

California Environmental Reporting System: Regulator

Ruth Clark's Account Sign Out Tools Reports Help

Submittals Facilities Businesses Regulators Compliance Responders Reports

# Business Owner/Operator Identification: THREE D DAIRY

Home » Submittal Search » Submittal: 3/25/2013 (10034842) » Facility Information: Business Owner/Operator Identification (Submitted)

**Submittal Element History**

Submitted for CERS ID 10034842 on 3/25/2013 1:16PM by Joe DeHoog of THREE D DAIRY (ONTARIO, CA)

Return to Submittal

**Site Address**

THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Identification**

Joe DeHoog

**Operator Phone** **Business Phone** **Business Fax**
(909) 815-7174 (909) 947-0944 () -

**Beginning Date** **Ending Date**

**Dun & Bradstreet** **SIC Code** **Primary NAICS**
- - -

**Facility/Site Mailing Address**

8485 EDISON AVE
ONTARIO, CA 91762

**Owner**

DEHOOG,MICHAEL

**Phone**
(909) 947-0944

**Mailing Address**
9909
Ontario, CA 91762

**Billing Contact**

Joe DeHoog

**Phone**
(909) 815-7074
-

**Mailing Address**
8381 EDISON AVE
ONTARIO, CA 91762

**Primary Emergency Contact**

Joe DeHoog

**Title**
Partner

**Business Phone** **24-Hour Phone** **Pager Number**
(909) 947-0944 (909) 815-7074 -

**Secondary Emergency Contact**

[No Name Provided]

**Title**
-

**Business Phone** **24-Hour Phone** **Pager Number**
() - () - -

**Environmental Contact**

Joe DeHoog
(909) 815-7074
-

**Mailing Address**
8381 Edison Ave
Ontario, CA 91762

**Title of Signer** [No Name Provided]
- **Name of Document Preparer**
-

**Additional Information**
-

**Locally-collected Fields**

Some or all of the following fields may be required by your local regulator(s).

**Property Owner**

[No Name Provided]

**Phone**
() -

**Mailing Address**
-
, - - -

**Assessor Parcel Number (APN)**
-

**Number of Employees**
-

**Facility ID Number (Regulator-provided)**
FA0000668

**Created By:** System Administrator on 11/27/2012 1:19 PM
**Last Updated By:** Joe DeHoog on 3/25/2013 1:16 PM

Return to Submittal

Version 2.23.0002 | Enhancements | CERS Central

Diagnostics | Conditions of Use | Privacy Policy | Contact | Help

California Environmental Reporting System: Business | © 2015 California Environmental Protection Agency
CERS Technical Support: Request Technical Assistance

CERS Help Settings Notifications

Please make your check payable to:
**San Bernardino County Fire Protection District**
Send to:
**[redacted]7 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 386-8483**

**Facility Address**

**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

| CERS ID | Facility ID | Invoice ID |
|---|---|---|
| 10034842 | FA0000668 | IN0103679 |

**Invoice Date**
3/17/15

*IN0103679419.85*

**Total Account Balance**
$ 419.85

**Total Due for Invoice**
$ 419.85

**Total Paid**
419.85

# PAST DUE

**HAZARDOUS MATERIALS**
**CUPA PERMITS**

SAN BERNARDINO COUNTY CUPA CERTIFIED PROGRAM AGENCY

- Nice! Mail to the wrong Address and Then Penalize me (Only in Gov't.)

**TO : THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

**ATTN : THREE D DAIRY**

☒ **Change of Billing Address (see back)**

**Upon receipt of full payment of the total account balance due as shown on this invoice, you will receive your new annual permit with an effective date of:**
**5/1/2015 to 4/30/2016**

Add update

| STREET NUMBER | STREET NAME | STE OR UNIT No |
|---|---|---|
| 8381 | EDISON AVE | |

| CITY NAME | STATE | ZIP CODE |
|---|---|---|
| ONTARIO | CA | 91762 |

ATTENTION

GREENIE REQUEST

FISCAL

# HAZ DOUS MATERIAL FIELD SERV S
## COMPUTER DA ABASE UPDATE AUTHORIZATI (5050 Form)

☐ Quick Submit-Correct minor information without full verification. MAILING ADDRESS

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000574

Legal Owner

*NAME: DEHOOG,MICHAEL

*ADDRESS 1: 8381 EDISON AVE

ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY:

*PHONE: EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 02/08/2008

TAX ID: DRIVER LICENSE:

### OWNER MAILING ADDRESS

☒ Same as Owner

CARE OF: DBA: DEHOOG,MICHAEL

ADDRESS1: 14350 WALKER AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000668

*NAME: THREE D DAIRY

*ADDRESS 1: 8485 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *CITY CODE: ONTARIO

CENSUS: MILITARY SCHOOL MEDICAL *BUSINESS CODE: *BUSINESS TYPE:

SIC CODE: *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03

*PHONE: 909-947-0944 EXT: FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE: EXT: FAX: FYI LAST UPDATED: 07/23/2007

### FACILITY MAILING ADDRESS

☐ Same as Facility

☐ Same as Owner Mailing Address

BUSINESS NAME: THREE D DAIRY

CARE OF: JOE DEHOOG

ADDRESS 1: 8485 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000669

☒ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY:

CARE OF:

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

PHONE: EXT: TAX ID: DRIVER LICENSE:

ALT PHONE: EXT: FYI EXEMPT FROM BILLING: NO FYI LAST UPDATED: 04/21/2009

ALT PHONE: EXT: FYI TOTAL DUE: 0.00

FYI ANNIVERSARY DATE: 04/30/1997 FYI ACCOUNT STATUS: ACTIVE ACCOUNT

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency

**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE* ☑ INACTIVATE ☐ ZERO OUT BALANCE | PT0008721 | ACTIVE | 4221 | 01/2009 | 04/30/2010 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009608 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0008722 | INACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009609 | INACTIVE, NON-BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP.: _____ NUMBER OF ACTIVE UST'S 0 MFR # _____

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? Yes (No)

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? (Yes) No 5051

*DATE SUBMITTED: _____ DATE ENTERED: 5/4/09 FISCAL ENTRY DATE/ INITIAL: 5/13/09 M

*SUBMITTED BY: _____ ENTERED BY: PWilson ***Demand bill for updated PEs**: Yes (No)

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Update owner mailing address to:

8381 Edison Ave
Ontario, CA 91762

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

Please make your check payable to:
**San Bernardino County Fire Department**
Send to:
**157 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 387-9603**

# INVOICE

**HAZARDOUS MATERIALS**
**CUPA PERMITS**

**TO : DEHOOG,MICHAEL**
~~14350 WALKER AVE~~ 8381 Edison Ave
**ONTARIO, CA 91762**

**ATTN :**

☒ **Change of Billing Address (see back)**

*IN0053488432.00*

**Facility Address**

**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

| Invoice ID | Facility ID |
|---|---|
| IN0053488 | FA0000668 |

**Invoice Date**
3/17/09

**Total Account Balance**
$ 432.00

**Total Due for Invoice**
$ 432.00

**Total Paid**
432.00

8381 Edison Ave

STREET NUMBER | STREET NAME | STE OR UNIT No

ONTARIO | CA | 91762

CITY NAME | STATE | ZIP CODE

ATTENTION

Upon receipt of full payment of the balance due as shown on this invoice, you will receive your new annual permit with an effective date of:

5/1/2009 to 4/30/2010

**Hazardous Materials Division**

**Fee Change Authorization Form**

☐ RUSH -NEED BY _____ ☑ PRIORITY-NEED BY 5-8-09 ☐ FYI-PLEASE REVIEW ☐ OTHER _____

**FACILITY INFORMATION**

NAME: **THREE D DAIRY** FACILITY ID: **FA0000668**

ADDRESS: **8485 EDISON AVE**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

PHONE: **909-947-0944** EXT: _____ FAX: _____

ALT PHONE: _____ EXT: _____ LOCATION(INSPECTOR DISTRICT): **03**

CONTACT PERSON: _____ CITY CODE: **ONTARIO** DISTRICT(SUPERVISORIAL DISTRICT): **004**

ANNIVERSARY DATE: **4/30/1997 12:00:00AM** ACCOUNT STATUS: **ACTIVE ACCOUNT**

NUMBER OF EMP. _____ NUMBER OF UST'S **0** MFR # _____

**ACTION REQUIRED**

☑ REQUEST VERIFICATION ☐ REQUEST FACILITY INSPECTION

☐ INACTIVATE / CLOSED ACCOUNT / O.O.B. ☐ REQUEST TO REVERSE OUTSTANDING INVOICE

COMMENTS: Mailing address change

REQUESTED BY: _____ APPROVED BY: Rebekah Matteson

**PERMIT INFORMATION**

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

RECEIVED 5/14/09

DATE SUBMITTED: 4-24-09 SUBMITTED BY: REBEKAH MATTESON

ADDITIONAL COMMENTS: 5/14/09- Per request from facility update owner address to:
8381 Edison Ave
Ontario, CA
91762

Owner info update

# HAZA OUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000574

NAME: DEHOOG,MICHAEL

ADDRESS 1: 14350 WALKER AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91762

COUNTRY:

PHONE:

EXT:

FAX:

ALT PHONE:

EXT:

DRIVER LICENSE:

TAX ID:

LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF:

DBA: DEHOOG,MICHAEL

ADDRESS1: 14350 WALKER AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91762

COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000668

NAME: THREE D DAIRY

ADDRESS 1: 8485 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

CITY CODE: ONTARIO

SIC CODE:

BUSINESS CODE:

BUSINESS TYPE:

CENSUS:

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: 03

PHONE: 909-947-0944

EXT:

FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 07/23/2007

### FACILITY MAILING ADDRESS

BUSINESS NAME: THREE D DAIRY

CARE OF: JOE DEHOOG

ADDRESS 1: 8485 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000669

RESPONSIBLE PARTY:

CARE OF:

ADDRESS 1:

ADDRESS 2:

CITY:

STATE:

ZIP CODE:

COUNTRY:

PHONE:

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 01/04/2008

ALT PHONE:

EXT:

EXEMPT FROM BILLING: NO

TAX ID:

ANNIVERSARY DATE: 04/30/1997

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT000872 | ACTIVE | 4221 | /01/2007 | 04/30/2008 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009608 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT0008722 | INACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009609 | INACTIVE, NON-BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. _____ NUMBER OF ACTIVE UST'S 0 MFR # _____

DATE SUBMITTED: 2-5-08 DATE ENTERED: 2/8/08 FISCAL DATE: _____

SUBMITTED BY: Leslie Heaviside ENTERED BY: CW

**COMMENTS/REMARKS:**

Per Envision review: Owner city & zip code incorrect.

AG - per 4 info update

CREATE EXPAND DO
REV

# HAZ/ OUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

ADD OLD FIRE MODEL

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

07 JUN 24 PM 12:19

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000574

NAME: DEHOOG,MICHAEL

ADDRESS 1: ~~14350 WALKER AVE~~ 8485 Edison ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-9171~~ 91762 COUNTRY:

PHONE: (909) 947-0944 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Joe DeHoog DBA: DEHOOG,MICHAEL

ADDRESS1: ~~14350 WALKER AVE~~ 8485 Edison ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91762 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000668

NAME: ~~AG~~-THREE D DAIRY

ADDRESS 1: 8485 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91762 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: 0241 BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: NA SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 03

PHONE: (909) 947-0944 EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-THREE D DAIRY

CARE OF: Joe DeHoog

ADDRESS 1: 8485 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000669

RESPONSIBLE PARTY: Michael DeHoog

CARE OF: Three D Dairy

ADDRESS 1: 8485 Edison ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: (909) 947-0944 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 04/05/2007

ALT PHONE: EXT: TAX ID:

ANNIVERSARY DATE: 04/30/1997 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFO TION (CIRCLE THOSE THAT APPLY)

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT00087: PERMIT NUMBER. | ACTIVE PERMIT STATUS | 4210 ORIGINAL P.E. | 5/01/1996 EFFECTIVE DATE | 04/30/1997 EXPIRATION DATE |
| PR0009608 GHP OR UST ID | ACTIVE, BILLABLE CURRENT STATUS(BILLING) | NA GHP FOR UST(PH) | NA CURRENT STATUS FOR UST(PH) | | 4221 UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008722 PERMIT NUMBER. | ACTIVE PERMIT STATUS | 4420 ORIGINAL P.E. | 05/01/1996 EFFECTIVE DATE | 04/30/1997 EXPIRATION DATE |
| PR0009609 GHP OR UST ID | ACTIVE, BILLABLE CURRENT STATUS(BILLING) | NA GHP FOR UST(PH) | NA CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 6 NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 6-4-07 DATE ENTERED: 6/12/07 FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY:

MD

COMMENTS/REMARKS:

per inspection: Update handler permit (not special handler). Facility no longer generates waste, inactivate PE 4420.

Remove "Ag" prefix from name.

Update owner, FA & AIR info.

Demand bill.

TRACKING SHEET FOR BUSINESS PLANS

*Establishishment #* FA 6668

*Facility Name:* Three D Dairy

*Facility Site Address:* 8485 Edison

*City:* Ontario

*Fire Agency:* Ontario

| | | Sent to FD |
|---|---|---|
| 1 (# of copies) | | |
| **Business Plans Received** | 07/19/07 | __/__/__ |
| **Results of Review(s)** | | |
| **Deficiency** | | 11/30/07 |
| **Conditional Approval** | | __/__/__ |
| **Approval** | | __/__/__ |

| | | Sent to FD |
|---|---|---|
| **Revised Plans Received** | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

| Other Date | Action/Documentation (update, new plan, etc.) | Staff hours |
|---|---|---|
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

HAZARDOUS MATERIALS FIELD SERVICES
COMPUTER DATA BASE UPDATE AUTHORIZATION

Change ☒

Inactivate Permit/Facility ☐
(circle one)

Bill To: E A O Location/District No: _____ Est No: 97042498
(cirle one)
Former Est. Name: (if applicable): _____

Name: AG-THREED DAIRY
Street No.: 8435 Fraction: ___ Direction:
Street Name: EDISON Apt/Sp No.: _____
City: CHINO State: ____ Zip Code: _____
Telephone No.: ( ) _____

Name: _____
Street No.: _____ Fraction: ___ Direction: _____
Street Name: _____ Apt/Sp No.: _____
City: _____ State: ____ Zip Code: _____
Telephone No.: ( ) _____

Name: _____
Street No.: _____ Fraction: ___ Direction: _____
Street Name: _____ Apt/Sp No.: _____
City: _____ State: ____ Zip Code: _____
Telephone No.: ( ) _____

**Program Information:**

Number of Employees: _____ Number of UGST's: _____
Federal Tax I.D. Number/Social Security Number: _____

**Permit Information:** (Circle those that apply)

Change/Inactivate/Add 226 Permit No.: _____
Change/Inactivate/Add 228 Permit No.: _____
Change/Inactivate/Add _____ Permit No.: _____
Change/Inactivate/Add _____ Permit No.: _____

Date Submitted: 2/24/98 Date Entered: _____
Submitted By: MJW Entered By: None showing

Comments/Remarks: AG EXEMPT — ~~[illegible]~~ & REMOVE DEL. COUNT

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# BUSINESS OWNER / OPERATOR IDENTIFICATION

FACILITY ID # F A (This number is on your CUPA permit.)

EFFECTIVE DATE 100 | ENDING DATE 101

BUSINESS NAME (Same as FACILITY NAME or DBA): Three D Dairy | BUSINESS PHONE:

BUSINESS SITE ADDRESS 103: 8485 Edison Ave

CITY 104: Ontario | COUNTY 108: SAN BERNARDINO | STATE: CA | ZIP CODE 105: 91762

D&B NUMBER: | PRIMARY SIC/NAICS CODE 107: | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: Dairy – Milk Production

BUSINESS OPERATOR NAME 109: Joe Deltoog | BUSINESS OPERATOR PHONE 110: 909 923-7839

## II. BUSINESS OWNER

OWNER NAME 111: Michael Deltoog | OWNER PHONE 112: 909 947-4712

OWNER MAILING ADDRESS 113: 8381 Edison Ave

CITY 114: Ontario | STATE 115: CA | ZIP CODE 116: 91762

## III. ENVIRONMENTAL CONTACT

CONTACT NAME: Joe Deltoog | CONTACT PHONE 118: 909 947-0944

CONTACT MAILING ADDRESS 119: 8381 Edison Ave

CITY 120: Ontario | STATE 121: CA | ZIP CODE 122: 91762

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123: Joe Deltoog | NAME 128: Michael Deltoog |
| TITLE 124: Partner | TITLE 129: Partner |
| BUSINESS PHONE 125: 909 947-0944 | BUSINESS PHONE: 909 947-0944 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW): | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW): |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126: | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131: |
| PAGER/CELL # 127: | PAGER /CELL # 132: |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

SIGNATURE OF OWNER/OPERATOR: Joe Deltoog | NAME OF SIGNER (*print*) 136: Joe Deltoog | DATE 134: 6-18-07

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**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Three D Dairy 3

FACILITY ADDRESS: 8485 Edison Ave

CITY: Ontario 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

BUSINESS MAILING ADDRESS: 8381 Edison Ave

CITY: Ontario

STATE: CA

ZIP CODE: 91762

BUSINESS FAX NUMBER: 909 947-0944

BUSINESS E-MAIL:

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

| Total # of Employees per shift | SHIFT 1 DAY | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION AM+PM |
|---|---|---|---|---|
| | 3 | 2 | | 6:00 TO 5:00 |
| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | TOTAL # EMPLOYEES 6 | | | TAXPAYER ID NUMBER 87- |

ASSESSORS PARCEL NUMBER (S):

CROSS STREET: Edison + Walker

BUSINESS DESCRIPTION: Dairy Farm

Number of Underground Storage Tanks located at this facility: 0

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☐ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 6-18-07

**CUPA**
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**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Three D Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8485 Edison Ave | Ontario |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification:** **If a situation is an emergency, call 911 first.** Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | 911 |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | (800) 33-TOXIC or (909) 386-8425 |
| 3. *State of California, Governor's Office of Emergency Services | (800) 852-7550 or (916) 845-8911 |
| 4. National Response Center | (800) 424-8802 |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date: 6-18-07

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Three O DAIRY | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8485 Edison Ave | ONTARIO |

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:

For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√Check those items that apply and write additional information in the space provided).

- ☒ Reduction of containers on site if not used or needed.
- ☒ Containers are properly labeled and closed when not in use.
- ☐ Compressed gas cylinders are properly secured.
- ☐ Use of monitoring system. Type: _____
- ☐ Other:

Date: 6-18-07

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| THREE D DAIRY | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8485 Edison Ave | ONTARIO |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- ☐ New employee training.
- ☐ Annual training & periodic refresher courses.
- ☐ Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- ☐ Spill control equipment
- ☐ Monitoring system
- ☐ Personal Protective Equipment
- ☒ On the job training. Describe below.
- ☐ Other:

All employees are given Instructions on how to use cleaning solutions.

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- ☒ Identify potential hazards and determine whether a release has occurred.
- ☒ Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- ☒ Coordinate the notification and evacuation of employees and customers from the facility.
- ☒ Make required agency notifications and request needed assistance.
- ☒ Assist responding agencies by providing access to the facility and information about the facility.
- ☐ Other:

Date: 6-18-07

BUSINESS NAME (Same as FACILITY NAME or DBA): Three D Dairy

FACILITY ADDRESS 103: 8485 Edison Ave

CITY 104: Ontario

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√ Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | | Annually |
| ☒ First aid kit(s) | 1 - General | As needed |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☐ Personal Protective Equipment | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√ Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste
- ☐ Process vessels
- ☒ Aboveground storage tanks
- ☐ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☒ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√ Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler
- ☐ Emergency response team
- ☐ Local Hospitals
- ☐ Other:
- ☒ No arrangements or agreements at this time

Date: 6-18-07

## HELPFUL HINTS FOR COMPLETING THE INVENTORY SECTION

**Congratulations! You have completed the first half of the plan. The following pages require review of the hazardous materials and hazardous wastes at your facility to determine which items require disclosure.**

**Here are some helpful hints to assist you in filling out the hazardous materials inventory section:**

1) This CUPA offers an example business plan that is available on our website or by mail. If you are unfamiliar with the business plan requirement, we recommend that you look at the example before you get started so you can see how inventory summary, chemical description pages, and maps work together.

2) Before you start filling out forms, determine how many items require disclosure and make the appropriate number of copies of the Inventory Summary form and the Chemical Description form. Note the following criteria when determining which items require disclosure in the inventory section: hazardous materials with a maximum quantity of greater than 55 gallons, 500 pounds, or 200 cubic feet; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives.

3) Assign a unique item number to each inventoried item (e.g. 1,2,3, etc.) This same item number is used on the Inventory Summary, on the individual Chemical Description form, and to show the storage location(s) on the facility map.

4) Each inventoried item requires a Chemical Description page that gives additional details about each chemical. Material Safety Data Sheets (MSDSs) and container labels are the main sources of chemical information. Wastes do not have MSDSs, but waste analysis, profiles, or manifests may have useful information.

5) Review Appendix I to determine which inventoried items require submission of a Material Safety Data Sheet (MSDS). If the substance is not listed in Appendix I, attach the MSDS for that chemical to the corresponding individual Chemical Description page. Anytime you update or refile the Chemical Description Page, make sure to attach the current MSDS. If you do not have a MSDS for a material, you can get one from your chemical vendor and you need them for compliance with the OSHA Hazard Communication Standard. Hazardous wastes do not have MSDSs.

6) Materials and wastes of the same chemical (e.g. lubricating oil and used oil) require separate Chemical Description pages.

7) Since the Chemical Description Page requires location information, you will have to complete the facility map(s) before you can finalize the Chemical Description pages.

8) The Maximum Quantity should reflect the maximum amount that could ever be onsite at any one time. The maximum listed on the Inventory Summary and the maximum listed on the individual Chemical Description form should be the same.

9) Typically, liquids are disclosed in gallons, solids in pounds and compressed gases in cubic feet. If you have questions regarding the correct unit type for an item, contact this department for assistance.

10) Signatures: The Inventory Summary form requires the Owner/Operator signature. Additionally, EPCRA filers are required to sign all individual Chemical Description forms.

Note: If you have a large warehouse, trade secrets, or other unique situation, please call our office before you fill out chemical description pages. We can help you develop an inventory that will meet the requirements and accommodate a unique situation.

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA)
Three D Dairy

FACILITY ADDRESS 103
8485 Edison Ave

CITY 104
Ontario

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Teat Dip | 165 | 55 | Gal |
| ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ |
| 2 | Hydro clean 400 | 60 | 30 | Gal |
| 3 | Acid cleaner | 60 | 30 | Gal |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| Joe DeHoog | Joe DeHoog | 6-18-07 |

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages, otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Daniel R. Munsey**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal/Deputy Fire Warden


**February 3, 2020**

**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

# NOTICE OF VIOLATION

| | | | |
|---|---|---|---|
| **CUPA Facility ID:** | FA0000668 | **CERS ID:** | 10034842 |
| **Facility Name:** | THREE D DAIRY | **Business Owner:** | MICHAEL DEHOOG |
| **Business Address:** | 8485 EDISON AVE<br>ONTARIO, CA 91762 | **Certified Mail:** | 7019 1120 0000 7119 0904 |

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials and hazardous waste using the **California Environmental Reporting System (CERS)** annually by March 1st. Your facility was also provided reasonable notice of this requirement from this agency in subsequent emails and/or inspections since that date.

**VIOLATION:** Failure to electronically submit / update business plan information annually using the statewide information management system, also known as CERS - California Health & Safety Code §25508(a)(1)(A) or 25508.2

**OBSERVATION:** As of the date of this letter, one or more of the following elements have not been submitted / updated in CERS:

- FACILITY INFORMATION
- HAZARDOUS MATERIALS INVENTORY
- EMERGENCY RESPONSE AND TRAINING PLANS

**REQUIREMENT:** Immediately submit / update business plan information using the instructions for accessing CERS and submitting business plan information that can be found on our website at http://www.sbcfire.org/ofm/Hazmat/ElectronicReporting-CERS.aspx

**COMPLY BY:** **Immediately**

**NOTE: In accordance with Section 25515 of the California Health and Safety Code, a business that knowingly violates this article after reasonable notice of the violation is liable for an administrative penalty of up to five thousand dollars ($5,000) for each day in which the violation occurs. Failure to submit in CERS immediately may subject your facility to this penalty. This will be your final notice-before administrative action takes place.**

**ADDITIONAL NOTE:** There may be other violations that are still open from the last inspection conducted at your facility. Please refer to the last inspection report that you received from this agency to verify compliance with all open violations, or contact this office to speak with the district inspector about complying with those violations.

Should you have any questions regarding this Notice of Violation, please contact Greg Zeigler at (909) 386-8423. For assistance with your CERS submittal, please contact the CERS Helpline at (909) 386-8432.

*Greg Zeigler, R.E.H.S.*
**Hazardous Materials Specialist IV, Enforcement Section**


BOARD OF DIRECTORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
|---|---|---|---|---|---|
| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Don Trapp**
Interim Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


November 25, 2019

THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**ATTN: CORY DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000668-THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

Mr. Dehoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on October 11, 2019:

- Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at AVILLANUEVA@SBCFIRE.ORG.

**ANA VILLANUEVA**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
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| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

# SAN BERNA DINO COUNTY FIRE DIS ICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Don Trapp**
Interim Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


October 28, 2019

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762
**ATTN: JOE DEHOOG**

**SUBJECT: COMPLIANCE DEADLINE REMINDER NOTICE**

**FACILITY: FA0000668-THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

Mr. DeHoog,

A post-inspection compliance review indicates that the following violations cited at the time of inspection on **October 11, 2019**, remain outstanding.

- Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.

If all compliance documentation has recently been submitted, please disregard this notice.

**IMPORTANT:** All compliance documentation requested on the inspection report must be received by this Division within **30 days from the date of the violation** or as otherwise indicated in the inspection report. This CUPA (Certified Unified Program Agency) is required by the State of California to gain compliance from all facilities subject to hazardous materials and hazardous waste laws and regulations. **Complying within 30 days of violation or as indicated in the inspection report, is the most efficient and the least inconvenient way for a facility to resolve outstanding violations.** If formal enforcement is necessary to gain compliance after 30 days, the facility will be **subject to substantial civil fines, costs and other penalties** pursuant to California Health and Safety Code (CHSC) 25404.1.1 & 25187.8.

If I can be of assistance in helping you correct the violations stated above or if you have any other questions, please don't hesitate to contact me at AVILLANUEVA@SBCFIRE.ORG or (909) 386-8401.

**ANA VILLANUEVA**
**Hazardous Materials Specialist**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
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CUPA

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CUPA COMPLIANCE INSPECTION REPORT

| | |
|---|---|
| NAME: THREE D DAIRY | FACILITY ID: FA0000668 |
| ADDRESS: 8485 EDISON AVE | CERS ID: 10034842 |
| CITY: ONTARIO STATE: CA ZIP CODE: 91762 | INSPECTION DATE: 10/11/2019 |

**Consent granted by:**

[X] **Photograph** [X] **Inspect** **Name:** Cory Dehoog **Title:** Ranch Hand

An inspection was conducted on 10/11/2019 to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Cory Dehoog, Ranch Hand, was the escort during the inspection. Also present during the inspection was Brian Wade Hazardous Materials Specialist with San Bernardino County Fire.

The facility is a dairy cow milking operation. The hazardous materials stored on site are used for vehicle and equipment fueling and for cleaning and sanitizing the milking operation. This facility does not routinely generate hazardous waste.

Inventory:

-back up generator with approximately 100 gallons of diesel fuel
-(1) 275 gallon tote of Soft Dine 10 sanitizing teat dip
-(2) 55 gallon drums of Pre Prep Gold 55
-(2) 55 gallon drum of sodium hypochlorite
-(1) 30 gallon drums of Hydroclean chlorinated cleaner
-(1) 30 gallon drum of acid cleaner
-(1) 251 cubic feet cylinder of oxygen

Document Review:

- CUPA permits were valid during the time of the inspection and expire 4/30/2020.
- California Environmental Reporting System (CERS) I.D. number: 10034842.
- All equipment and vehicles were serviced by Ross Avery.
- Chemicals were supplied by The Chem Guys and Vetex.
- Empty drums were picked up during the time of new deliveries.
- Diesel fuel was supplied by Merit Oil.

Complete and submit the Certificate of Compliance (CofC) provided along with all requested documentation, to the attention of Ana Villanueva within 30 days of inspection.

Please contact Ana Villanueva at (909)386-8401 or by email at avillanueva@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

***Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.***

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| 42 | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | **Hazardous Materials Business Plan Submittal** | CHSC | 25505, 25508(a)(1) | X |
| Violation: | Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities. | | | |
| MINOR | OBSERVATION: This facility has not submitted a complete business plan via CERS. | | | |
| | CORRECTIVE ACTION: Submit a signed statement that the business plan has been submitted via CERS. Your CERS ID number is10034842. | | | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | CHSC | 25510(a) | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508(a)(1), 25508.2 | |

| | | | | |
|---|---|---|---|---|
| H209 | Business Plan Update Within 30 day[illegible] change | CHSC | 25508.1(a)-(f) | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | CHSC | 25508(a)(1) | |
| H211 | Hazardous Materials Inventory | CHSC | 25505, 25506, 25508 | |
| H212 | Site Map | CHSC | 25505(a)(2), 25508(a)(1) | |
| H213 | Emergency Response Plan | CHSC | 25505(a)(3), 25508(a)(1) | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Documentation | CHSC | 25505(a)(4) | |
| H216 | Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,255 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 10/11/19 12:10:44PM<br>LTR:10/11/2019 12:01:25PM |
|---|---|---|
| ANA VILLANUEVA | CORY DEHOOG | RANCH HAND |
| INSPECTOR NAME | NAME<br>INSPECTION DATE: 10/11/2019 | TITLE<br>REPORT DATE: 10/11/19 1:55 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

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# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ANA VILLANUEVA within 30 days of inspection unless otherwise specified.**

RESPONDENT: Cory Dehoog

VIOLATION(S) CITED ON: 10/11/2019

FACILITY NAME: **THREE D DAIRY** FACILITY ID: **FA0000668**

SITE ADDRESS: **8485 EDISON AVE** CERS ID: **10034842**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H203 CORRECTIVE ACTION: Submit a signed statement that the business plan has been submitted via CERS. Your CERS ID number is10034842.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



PHOTO 1

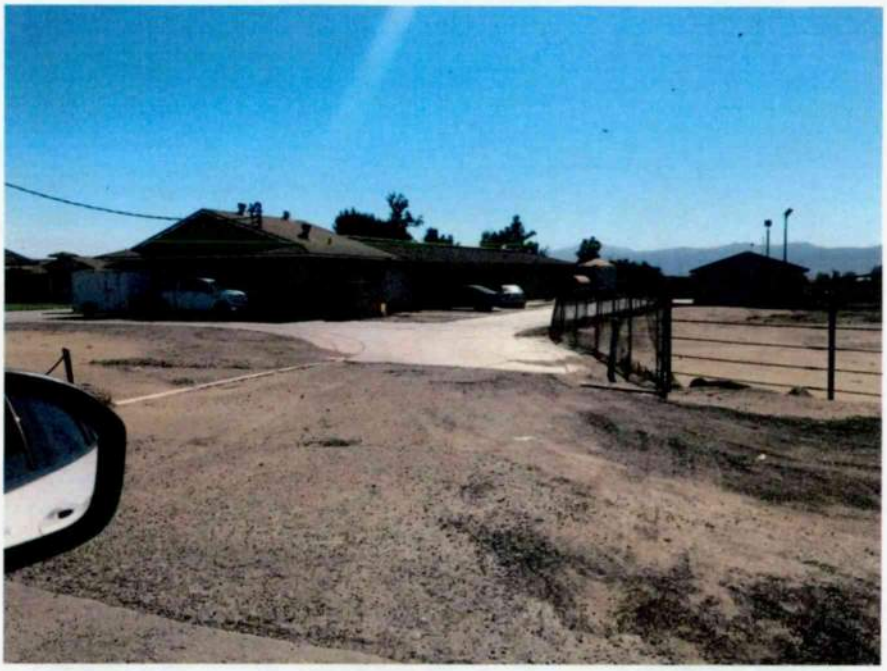

PHOTO 2

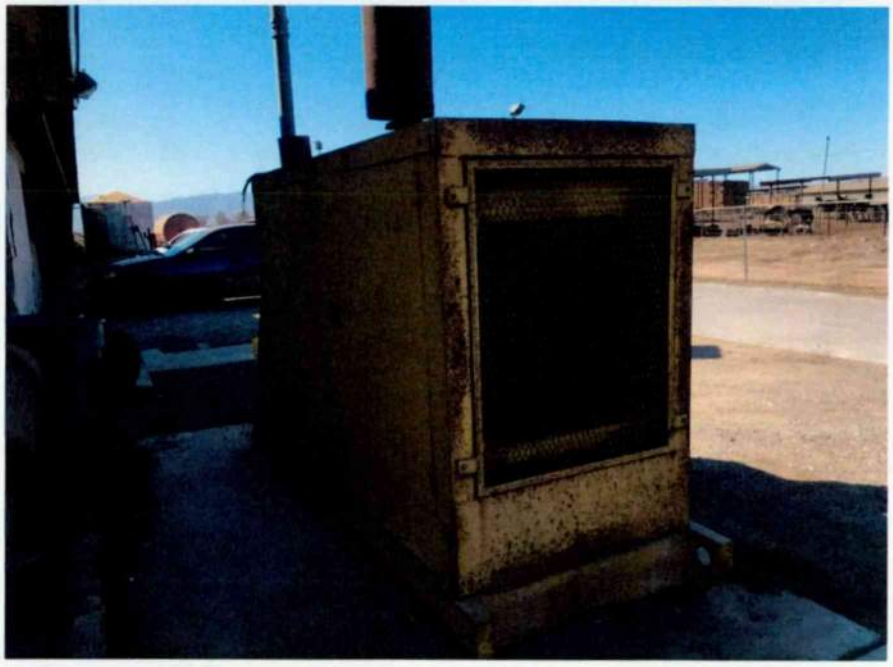

| Facility/ Case Name: Three D Dairy | Facility ID #: FA0000668 |
|---|---|
| Address: 8485 Edison Ave., Ontario, CA 91762 | |
| *1) Description:* Front of the facility from Edison Ave facing south. | |
| *2) Description:* Backup generator with approximately 100 gallons of diesel fuel located on the north side of the property. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature:

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

| Facility/ Case Name: Three D Dairy | Facility ID #: FA0000668 |
|---|---|
| Address: 8485 Edison Ave., Ontario, CA 91762 | |
| *3) Description:* (1) 275 gallon tote of Soft Dine 10 sanitizing teat dip, (2) 30 gallon drums of Pre Prep Gold 55 lactic acid, (2) empty 5 gallon containers, and (1) empty pail located in the milking barn. | |
| *4) Description:* (2) 55 gallon drums of sodium hypochlorite and (1) empty Folgers container located in the milking barn. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature:

# PHOTO NARRATIVE



PHOTO 5

PHOTO 6

| | |
|---|---|
| Facility/ Case Name: Three D Dairy | Facility ID #: FA0000668 |
| Address: 8485 Edison Ave., Ontario, CA 91762 | |
| *5) Description:* (1) 251 cubic feet cylinder of oxygen located on a maintenance truck. | |
| *6) Description:* (1) 30 gallon drum of acid cleaner and (1) 30 gallon drum of Hydroclean chlorinated cleaner located in the milking barn. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature: Ana Villanueva

RECEIVED
NOV 22 2016
S.B. CO. FIRE DEPT.

San Bernardino County CUPA
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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 668 Facility Name: Three D Dairy Inspection Date: August 26, 2016
Site Address: 4485 Edison Avenue Phone #: 909-947-0944
City: Ontario Zip Code: 91762 EPA ID #: None
Consent Granted by:
☐ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner

*Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)*

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permits are current; 4/30/2017
**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste
**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) No spills or releases were observed
**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a)) (3) 55-gal drums non-iodine teat, (2) 30-gal drums acid cleaner, (2) 55-gal drums bleach, (1) 30 gal drum Hydroclean 400

☐ 202. A Business Plan has not been established. (CHSC 25507) ☒ 206. Business Plan not updated w/in 12 months (CHSC 25508.2)
7-14-07

☒ 203. A Business Plan has not been submitted. (CHSC 25508) CERS ID 10034842
**Compliance Requirement**: Using the California Environmental Reporting System (CERS), submit Business Plan information into the statewide information management system.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety training provided
**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements:

Heavy equipment serviced by Kent Avery

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A
**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A
**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A
**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

Chemicals delivered by SDS & The Chem Guys. Diesel by Merit Oil

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste
**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A
**Compliance Requirement**: Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A
**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspector: Brian Wade (Sign Name) Received By: Joe DeHoog (Sign Name) Title: PARTNER
Brian Wade (Print Name) Joe DeHoog (Print Name) Report Date: August 26, 2016

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Joe DeHoog (Name) 11-15-16 (Date)

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Mark A. Hartwig**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


October 29, 2016

THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**ATTN: JOE DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000668-THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

Mr. DeHoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on August 26, 2016:

- Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.
- At least once every 12 months, the owner/owner shall review and certify that the information in the statewide information management system has been verified and is complete, accurate and up to date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

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|---|---|---|---|---|---|
| Vice Chair, First District | Second District | Chair, Third District | Fourth District | Fifth District | Chief Executive Officer |

San Bernardino County CUPA

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 668 Facility Name: Three D Dairy Inspection Date: August 26, 2016

Site Address: 4485 Edison Avenue Phone #: 909-947-0944

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by:

☒ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner

*Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)*

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permits are current; 4/30/2017

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) No spills or releases were observed

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a)) (3) 55-gal drums non-iodine teat, (2) 30-gal drums acid cleaner, (2) 55-gal drums bleach, (1) 30 gal drum Hydroclean 400

☐ 202. A Business Plan has not been established. (CHSC 25507) 7-19-07

☒ 206. Business Plan not updated w/in 12 months (CHSC 25508.2)

☒ 203. A Business Plan has not been submitted. (CHSC 25508) CERS ID 10034842

**Compliance Requirement** : Using the California Environmental Reporting System (CERS), submit Business Plan information into the statewide information management system.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety training provided

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements: Heavy equipment serviced by Kent Avery

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed .

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management: Chemicals delivered by SDS & The Chem Guys. Diesel by Merit Oil

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A

**Compliance Requirement**: Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspector: Brian Wade (Sign Name) Received By: [signature] (Sign Name) Title: PARTNER

Brian Wade (Print Name) Joe DeHoog (Print Name) Report Date: August 26, 2016

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** _____ Name _____ Date

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Three D Dairy** Facility ID #: **668**

Address: **8485 Edison Avenue Ontario, CA 91762**

1) Description: **View of the facility from Edison facing South.**

2) Description: **(2) 55-gallon drums of non-iodine teat dip stored in the milking barn.**

Date Taken: **8/26/2016**

Taken By: **Brian Wade**

Signature: Brian Wade

Revised 02/27/03

# PHOTO NARRATIVE



**PHOTO 3**

| | | | |
|---|---|---|---|
| Facility/Case Name: | **Three D Dairy** | Facility ID #: | **668** |
| Address: | **8485 Edison Avenue Ontario, CA 91762** | | |
| 1) Description: | **Two 30-gallon drums of acid cleaner, (2) 55-gallon drums of bleach, and (1) 30-gallon drum of Hydroclean 400 stored in the milking barn.** | | |
| Date Taken: | **8/26/2016** | | |
| Taken By: | **Brian Wade** | Signature: | Brian Wade |

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 668 Facility Name: THREE "D" DAIRY Inspection Date: 2/13/13

Site Address: 8485 EDISON AVE Phone #: 909-947-0944

City: ONTARIO Zip Code: 91762 EPA ID #: N/A

Consent Granted by: ☑ Inspect ☑ Photograph Name: MICHAEL DEHOOG Title: OWNER # Emp: Packet left on site? ~~Yes/No~~

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) ACTIVE
**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) N/A
**Compliance Requirement:** Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) NO SPILLS OBSERVED
**Compliance Requirement:** Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☐ 202. A Business Plan has not been established. (CHSC 25503.5)

INVENTORY: CONSISTENT WITH BP DISCLOSURE

☑ 203. A Business Plan has not been submitted/updated. (CHSC 25505)
↳ SEE SUPPLEMENTAL
**Compliance Requirement:** Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) N/A
**Compliance Requirement:** Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) HAZ WASTE NOT
☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) MANAGED ON SITE.
☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2))
**Compliance Requirement:** Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A
**Compliance Requirement:** Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A
**Compliance Requirement:** Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) N/A
**Compliance Requirement:** Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A
**Compliance Requirement:** Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A
**Compliance Requirement:** Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** FACILITY IS A DAIRY 1 OF 2

Inspected By: [signature] Sign Name Received By: [signature] Sign Name Title: X

MICHAEL ANANDA Print Name MICHAEL DE HOOG Print Name Report Date: 2/13/13

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org

# SUPPLEMENTAL INSPECTION REPORT

Page 2 of 2

INSPECTION DATE: 2/13/13

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| 668 | THREE D DAIRY | 8485 EDISON AVE ONTARIO 91762 |
| Consent Granted by: ☑ Inspect ☑ Photograph | NAME<br>MICHAEL DEHOOG | TITLE<br>OWNER |

#203 ANNUAL UPDATE TO BUSINESS PLAN REQUIRE, CHSC 25505
BUSINESS PLANS (BP) ARE REQUIRED TO BE UPDATED ANNUALLY,
CURRENT BP HAS NOT BEEN UPDATE SINCE 7/19/07
COMPLIANCE REQUIREMENT! USE CALIFORNIA ENVIRONMENTAL
REPORTING SYSTEM (CERS) TO SUBMIT THE ELEMENTS
OF THE BUSINESS PLAN W/IN 30 DAYS
WEBSITE! http://cers.calepa.ca.gov/

☑ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) MICHAEL ARANDA (Print Name)

Received By: [signature] (Sign Name) MICHAEL DE HOOG (Print Name)

Title:

Report Date: 2/13/13

# PHOTO NARRATIVE



PHOTO 1

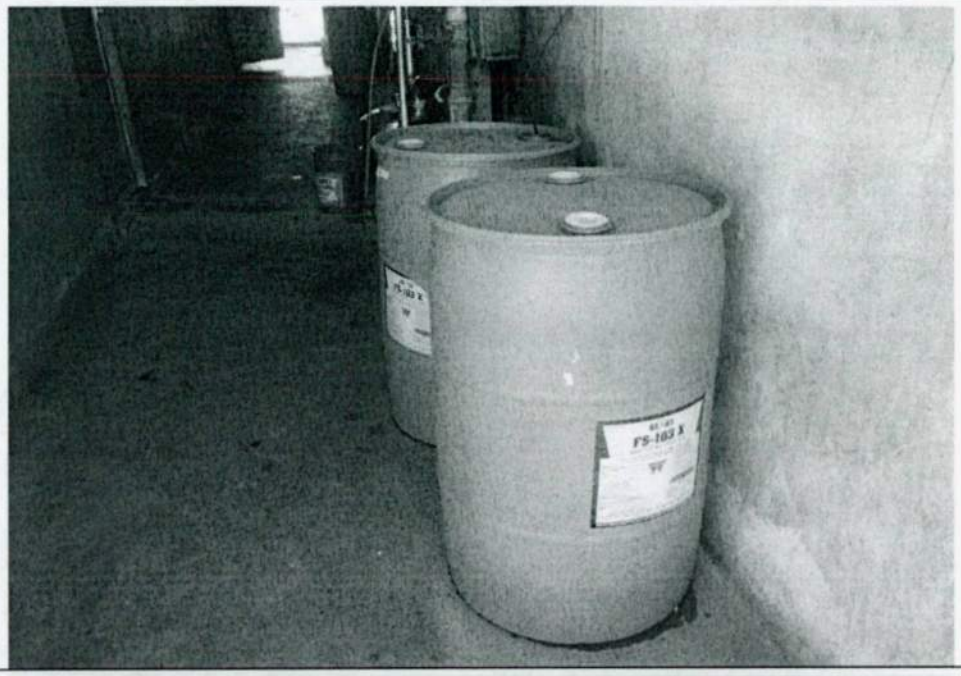

PHOTO 2

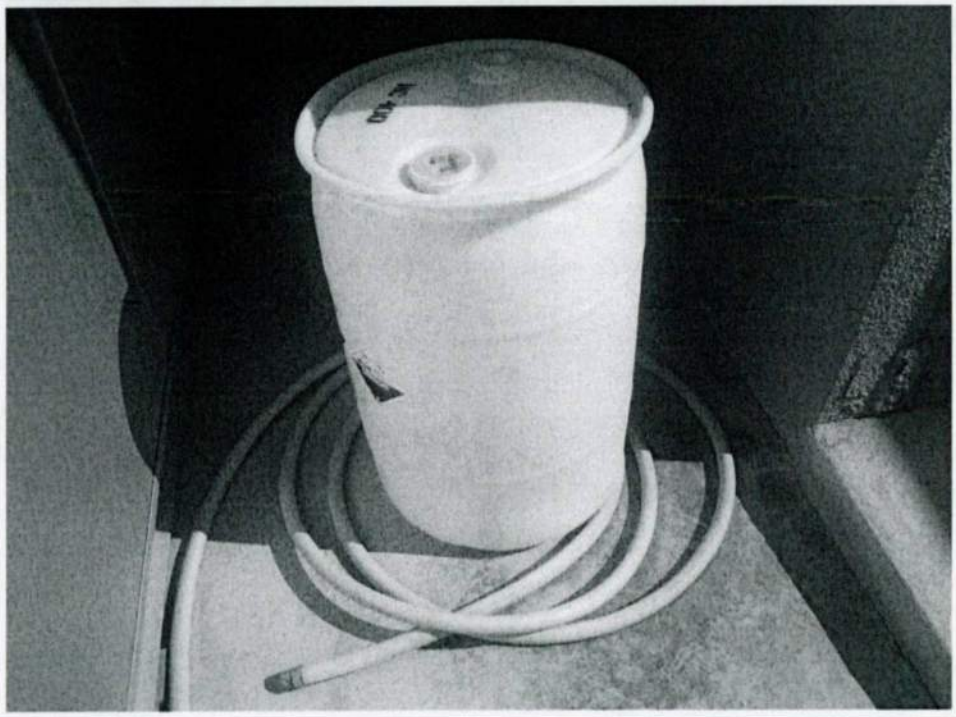

| | | |
|---|---|---|
| Facility/Case Name: | THREE D DAIRY | Facility ID#: 0000668 |
| Address: 8485 EDISON AVE, ONTARIO 91762 | | |
| Description #1: (2) 55 gallon drums of teat dip. | | |
| Description #2: (1) 30 gallon drum of acid cleaning solution. | | |
| Date Taken: February 13, 2013 | Taken By: Michael Aranda | |

Signature: _____

Revised 02/27/03

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

PAT A. DENNEN
Fire Chief
County Fire Warden


November 30, 2007

Three D Dairy
8485 Edison Avenue
Ontario, CA 91762

**ATTENTION: JOE DEHOOG**

**SUBJECT: NOTICE OF BUSINESS PLAN DEFICIENCIES**

**FACILITY: 8485 EDISON AVENUE, ONTARIO**

The Business Emergency/Contingency Plan submitted to the Hazardous Materials Division have been determined to be deficient. California Health & Safety Code, Chapter 6.95, § 25505 (a)(2) states, "*If, after review, the administering agency determines that the handler's Business Plan is deficient in any way, the administering agency shall notify the handler of those deficiencies. The handler shall submit a corrected Business Plan within 30 days from the date of the notice.*"

***This letter constitutes formal notice of business plan deficiencies. Please submit 2 copies of the information requested below with a copy of this letter for final review within 30 days from the above date.***

**The following are the items requiring correction:**

Locally Collected Inventory Information page

- Taxpayer ID Number: Provide the Taxpayer or Federal ID Number.

Emergency Response Plans and Procedures page 1 (page 5)

- Evacuation/Notification: Provide a description of how employees, customers and visitors at this facility will be notified of an emergency, e.g. loudspeaker, hand held radios, etc. Also, indicate where the emergency staging area is located. Submit a revised Emergency Response Plans and Procedures page 1 (page 5).

Inventory

- All items listed on the Inventory Summary are required to have an included individual chemical description forms. No individual chemical description forms were submitted. Enclosed find partially completed individual forms (I was unable to complete all of the form due to lack of information).

Submit completed individual chemical description forms for all items.


MARK H. UFFER
County Administrative Officer

NORMAN A. KANOLD
Assistant County Administrator
Public and Support
Services Group

Board of Supervisors
BRAD MITZELFELT ..... First District
PAUL BIANE ..... Second District
DENNIS HANSBERGER ..... Third District
GARY C. OVITT ..... Fourth District
JOSIE GONZALES ..... Fifth District

**Failure to correct the outstanding deficiencies could result in further enforcement actions and additional fees. If the response to this deficiency letter does not result in correction of the deficiencies, a records review fee of $123/hr will be assessed to recover those costs associated with additional file review.**

*CA Health and Safety Code, Chapter 6.95, § 25505 (a)(3) states, "If a handler fails, after reasonable notice, to submit a business plan in compliance with this article, the administering agency shall immediately take appropriate action to enforce this article, including the imposition of civil and criminal penalties as specified in this article." Penalties for business plan violations can range from $2000-$5000/day.*

An electronic version of the Business Emergency/Contingency Plan Forms and Guidelines is available at our website www.sbcfire.org. Click on the HAZMAT bar located on the left side of the page. Then click on Forms & Guidelines in the title bar. Finally, click on the Business Plan title, this will link you to all forms associated with the Business Plan Program. Should you have any further questions, comments, or concerns, please feel free to contact me at (909) 386-8401 or lheaviside@sbcfire.org.

**LESLIE HEAVISIDE, REHS**
**Hazardous Materials Division, Field Services Section**
Enclosures: Business Emergency/Contingency Plan Guidelines and Forms
Example Business Emergency/Contingency Plan

# Business Emergency/Contingency Plan Receipt

Mail to: DEHOOG,MICHAEL
14350 WALKER AVE
CHINO, CA 91710-9171

Site Address: THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

Service Request ID: SR0013880
Facility ID: FA0000668

The Business Emergency/Contingency Plan was received on July 19, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.

2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.

3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.

4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.

5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.

2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.

3. Change of business address, business ownership, or business name.

4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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www.sbcfire.org

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED

JUL 19 2007

S.B. CO. FIRE DEPT.

FACILITY ID # F A

BUSINESS NAME (Same as FACILITY NAME or DBA) 3

Three D DAIRY

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8485 Edison Ave | ONTARIO | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ *Items with an '*' are considered "Inventory" under State disclosure laws*

- ☐ * Business Activities Form
- ☐ * Business Owner/Operator Identification Form
- ☐ * Supplemental Emergency Contact Page
- ☐ Emergency Response Plans and Procedures
- ☐ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☐ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☐ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☐ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☐ Area map - photocopied city map with location of site indicated
- ☐ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.

- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is <u>not</u> being made to meet annual inventory submission requirements of EPCRA. **(EPCRA requires complete annual submission)**

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER 135 |
|---|---|---|
| Joe DeHoog | 6-18-07 | Joe DeHoog |

| NAME OF SIGNER (*print*) | TITLE OF SIGNER (*print*) |
|---|---|
| Joe DeHoog | Partner |

## BUSINESS E GENCY/CONTINGENCY PLAN COVER SH INSTRUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

| FACILITY ID # | F | A | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

| BUSINESS NAME (Same as FACILITY NAME or DBA) | EPA ID # (Hazardous Waste Only) |
|---|---|
| | |

| BUSINESS ADDRESS | CITY | ZIP CODE |
|---|---|---|
| | | |

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731)<br>* CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank)<br>* HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page<br>* BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY<br>* ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0002668 Facility Name: Three D Dairy Inspection Date: May 29, 2007

Site Address: 8485 Edison Phone #: (909) 947-3944

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by: ☐ Inspect ☐ Photograph Name: Joe DeHaan Title: Partner # Emp: 6 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires material handler permit (ML)

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

**INVENTORY:** (1) 55 gal hot Diesel tank - generator 3/55-gal drums feed dip (1) 55-gal sanitizing tank 2) 30-gal drums concentrated liquid cleaner 2) 30-gal drums acid cleaner (1) 55-gal drum sodium

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement**: Submit training documentation as required.

RECEIVED JUL 19 2007 S.B. CO. FIRE DEPT.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) Does not generate waste

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) Does not generate waste

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) Does not generate waste

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) Does not generate waste

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) " " "

**Compliance Requirement**: Submit copies of waste disposal records for the past " " " "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Kent Dairy Repair Inc. services equipment.

Inspected By: [signature] (Sign Name) Leslie Hamilton (Print Name)

Received By: Joe DeHaan (Sign Name) Joe DeHaan (Print Name)

Title: Partner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Joe DeHaan (Name) 6-30-07 (Date)



Note: Diesel fuel from 8381 address is stored with this location

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0001668 Facility Name: Three D Dairy Inspection Date: May 29, 2007

Site Address: 8485 Edison Phone #: (909) 947-2944

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner # Emp: 6 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires material handler permit only.

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste.

**Compliance Requirement:** Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking.

**Compliance Requirement:** Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (1) ~ 50 gal AST Diesel back-up generator. (3) 55-gal drums tank dip (1) 55-gal sanitizing tank dip (2) 30-gal drums chlorinated liquid cleaner (2) 30-gal drums acid cleaner (1) 55-gal drum sodium hypochl

**Compliance Requirement:** Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement:** Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) Does not generate waste

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) Does not generate waste

**Compliance Requirement:** Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement:** Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) Does not generate waste

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) Does not generate waste

**Compliance Requirement:** Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement:** Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) " " "

**Compliance Requirement:** Submit copies of waste disposal records for the past " " " "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters.

**Compliance Requirement:** Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Kent dairy repair, tires services equipments

Inspected By: [signature] Sign Name Leslie Henrikse Print Name

Received By: [signature] Sign Name Joe DeHoog Print Name

Title: Partner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

Form Revised 1/16/2007 15-21060-638 Rev. 2/07 DISTRIBUTION: White – CUPA File Yellow – Facility returns to CUPA Pink – Facility

Note: Diesel fuel from 8381 address is shared with this location.

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Three D Dairy** Facility ID #: **FA0000668**

Address: **8485 Edison, Ontario**

1) Description: **Back-up generator containing approximately 50-gallons of Diesel Fuel**

2) Description: **(3) 55-gallon drums of teat dip**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: Li Hei

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

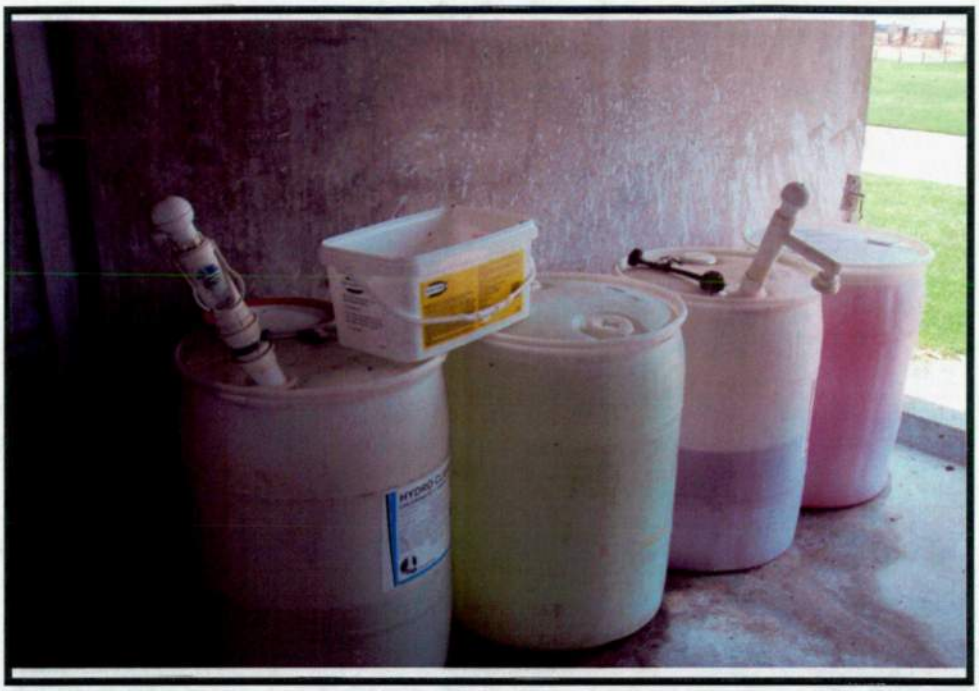

PHOTO 4

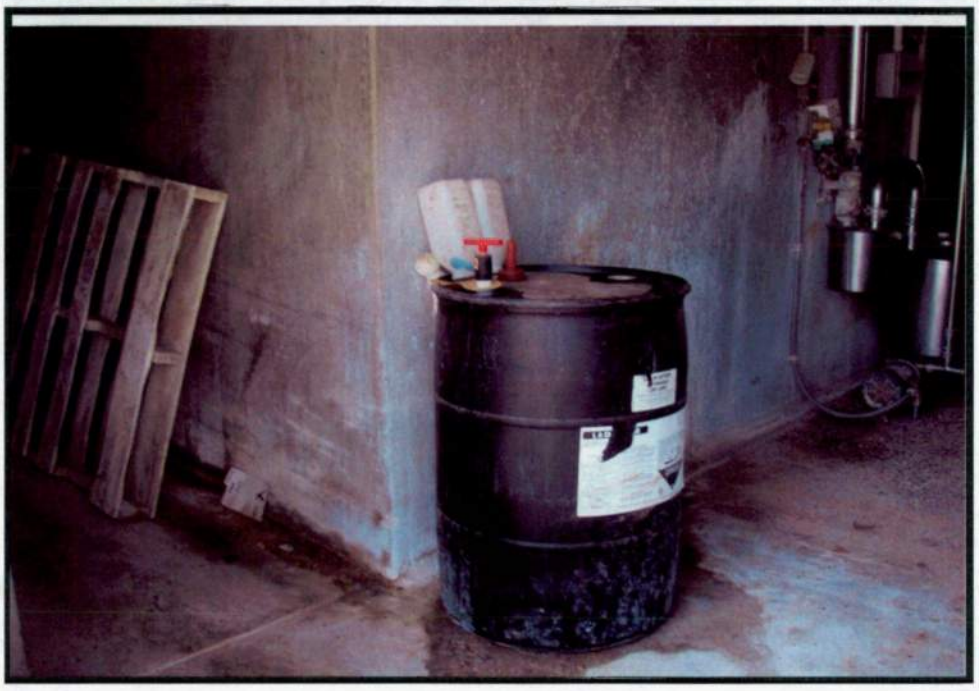

Facility/Case Name: **Three D Dairy** Facility ID #: **FA0000668**

Address: **8485 Edison, Ontario**

3) Description: **(2) 30-gallon drums of hydro clean 400 (potassium hydroxide & sodium hydroxide)**

4) Description: **(1) 55-gallon drum of sodium hypochlorite**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: Le He

Revised 10/12/2000

S

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

THREE D DAIRY
MICHAEL DEHOOG
8485 EDISON AVE
ONTARIO, CA 91762

RECEIVED
FEB 26 2020
SBCFIRE - HAZMAT

9590 9402 4889 9032 8171 17

2. Article Number *(Transfer from service label)*

7019 2280 0001 8674 2560

***COMPLETE THIS SECTION ON DELIVERY***

A. Signature

X NOEL M

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

FEB 22 2020

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

USPS TRACKING #

9590 9402 4889 9032 8171 17

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

**United States Postal Service**

• Sender: Please print your name, address, and ZIP+4® in this box•

COUNTY OF SAN BERNARDINO
OFFICE OF THE FIRE MARSHAL
620 SOUTH "E" STREET
SAN BERNARDINO, CA 92415

SAN BERNA. INO COUNTY FIRE PROTECT. .N DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Daniel R. Munsey
Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal/Deputy Fire Warden

February 20, 2020

**THREE D DAIRY**
**ATTN: MICHAEL DEHOOG**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

RECEIVED
FEB 20 2020
SBCFIRE - HAZMAT

**CERTIFIED MAIL NO: 7019 2280 0001 8674 2560**

## ADMINISTRATIVE ENFORCEMENT ORDER WITH PENALTIES

**YOU ARE IN VIOLATION**

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials using the California Environmental Reporting System (CERS) annually, per California Health & Safety Code (CHSC) Section 25508. On October 11, 2019, the San Bernardino County Fire Hazardous Materials Division (HMD) conducted a routine inspection and issued a Notice of Violation, notifying the facility operator of the legal requirement to annually submit Business Plan information electronically using the California Environmental Reporting System (CERS) by November 11, 2019. On February 3, 2020, another Notice of Violation letter was sent to your facility, listing the violation and requiring compliance upon receipt.

**As of the date of this notice, this violation has not been corrected.**

Due to the above violation, CHSC Section 25404.1 authorizes HMD to pursue **immediate enforcement action**, including the imposition of a monetary penalty.

**ENFORCEMENT ORDER AND PENALTIES**

For the above noted violation, CHSC Section 25515 establishes a maximum penalty of **$5,000.00 for each day** in which the violation occurred. This letter serves to inform you that HMD is offering a settlement through the attached Consent Order Agreement. If settlement cannot be reached, HMD intends to issue a **Formal Enforcement Order** against above noted facility, which will impose a penalty of **$5,000.00 or more.** The Enforcement Order will be issued **within 20 days of receipt of this notice UNLESS you complete all of steps 1 through 4 on the following page:**

BOARD OF DIRECTORS

Robert A. Lovingood, First District | Janice Rutherford, Second District | Dawn Rowe, Third District | Curt Hagman, Chairman, Fourth District | Josie Gonzales, Vice Chair, Fifth District | Gary McBride, Chief Executive Officer

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

THREE D DAIRY
Attn: MICHAEL DEHOOG
8485 EDISON AVE
ONTARIO, CA 91762

9590 9402 4889 9032 8174 83

2. Article Number *(Transfer from service label)*

7019 1120 0000 7119 0904

***COMPLETE THIS SECTION ON DELIVERY***

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

(over $500)

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

USPS TRACKING #

9590 9402 4889 9032 8174 83

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

**United States Postal Service**

• Sender: Please print your name, address, and ZIP+4® in this box•

COUNTY OF SAN BERNARDINO
OFFICE OF THE FIRE MARSHAL
620 SOUTH "E" STREET
SAN BERNARDINO, CA 92415

RECEIVED
FEB 12 2024
SBCFIRE - Hi...

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Daniel R. Munsey**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal/Deputy Fire Warden


RECEIVED
FEB 03 2020
SBCFIRE - HAZMAT

ENTERED 2/3

**February 3, 2020**

**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

# NOTICE OF VIOLATION

| | | | |
|---|---|---|---|
| **CUPA Facility ID:** | FA0000668 | **CERS ID:** | 10034842 |
| **Facility Name:** | THREE D DAIRY | **Business Owner:** | MICHAEL DEHOOG |
| **Business Address:** | 8485 EDISON AVE<br>ONTARIO, CA 91762 | **Certified Mail:** | 7019 1120 0000 7119 0904 |

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials and hazardous waste using the **California Environmental Reporting System (CERS)** annually by March 1st. Your facility was also provided reasonable notice of this requirement from this agency in subsequent emails and/or inspections since that date.

**VIOLATION:** Failure to electronically submit / update business plan information annually using the statewide information management system, also known as CERS - California Health & Safety Code §25508(a)(1)(A) or 25508.2

**OBSERVATION:** As of the date of this letter, one or more of the following elements have not been submitted / updated in CERS:

- FACILITY INFORMATION
- HAZARDOUS MATERIALS INVENTORY
- EMERGENCY RESPONSE AND TRAINING PLANS

**REQUIREMENT:** Immediately submit / update business plan information using the instructions for accessing CERS and submitting business plan information that can be found on our website at http://www.sbcfire.org/ofm/Hazmat/ElectronicReporting-CERS.aspx

**COMPLY BY:** **Immediately**

**NOTE: In accordance with Section 25515 of the California Health and Safety Code, a business that knowingly violates this article after reasonable notice of the violation is liable for an administrative penalty of up to five thousand dollars ($5,000) for each day in which the violation occurs. Failure to submit in CERS immediately may subject your facility to this penalty. This will be your final notice-before administrative action takes place.**

**ADDITIONAL NOTE:** There may be other violations that are still open from the last inspection conducted at your facility. Please refer to the last inspection report that you received from this agency to verify compliance with all open violations, or contact this office to speak with the district inspector about complying with those violations.

Should you have any questions regarding this Notice of Violation, please contact Greg Zeigler at (909) 386-8423. For assistance with your CERS submittal, please contact the CERS Helpline at (909) 386-8432.

*Greg Zeigler, R.E.H.S.*
**Hazardous Materials Specialist IV, Enforcement Section**


BOARD OF DIRECTORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
|---|---|---|---|---|---|
| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

7019 2280 0001 8674 2560

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**OFFICIAL USE**

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Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postmark Here

Postage
$

Total Postag
$

Sent To
THREE D DAIRY
MICHAEL DEHOOG
8485 EDISON AVE
ONTARIO, CA 91762

Street and A

City, State, Zip+4

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Daniel R. Munsey**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal/Deputy Fire Warden


February 20, 2020

**THREE D DAIRY**
**ATTN: MICHAEL DEHOOG**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

**CERTIFIED MAIL NO: 7019 2280 0001 8674 2560**

## ADMINISTRATIVE ENFORCEMENT ORDER WITH PENALTIES

---

**YOU ARE IN VIOLATION**

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials using the California Environmental Reporting System (CERS) annually, per California Health & Safety Code (CHSC) Section 25508. On October 11, 2019, the San Bernardino County Fire Hazardous Materials Division (HMD) conducted a routine inspection and issued a Notice of Violation, notifying the facility operator of the legal requirement to annually submit Business Plan information electronically using the California Environmental Reporting System (CERS) by November 11, 2019. On February 3, 2020, another Notice of Violation letter was sent to your facility, listing the violation and requiring compliance upon receipt.

**As of the date of this notice, this violation has not been corrected.**

Due to the above violation, CHSC Section 25404.1 authorizes HMD to pursue **immediate enforcement action**, including the imposition of a monetary penalty.

---

**ENFORCEMENT ORDER AND PENALTIES**

For the above noted violation, CHSC Section 25515 establishes a maximum penalty of **$5,000.00 for each day** in which the violation occurred. This letter serves to inform you that HMD is offering a settlement through the attached Consent Order Agreement. If settlement cannot be reached, HMD intends to issue a **Formal Enforcement Order** against above noted facility, which will impose a penalty of **$5,000.00 or more.** The Enforcement Order will be issued **within 20 days of receipt of this notice <u>UNLESS</u> you complete all of steps 1 through 4 on the following page:**


BOARD OF DIRECTORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
|---|---|---|---|---|---|
| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

## YOU MUST COMPLETE ALL OF THE FOLLOWING FOUR STEPS:

1. **Immediately submit** the Business Plan information into the CERS system: You are encouraged to contact this office at (909) 386-8432 for assistance with completing the CERS submittal. **The CERS submittal must be completed within 20 days of receipt of this letter** (verified by certified mail).
2. **Sign** the enclosed **Consent Order** (Attachment 1); review and sign the enclosed Consent Order.
3. **Pay** the penalty in the amount of **$500.00:** through this Consent Order settlement, HMD has chosen to accept a penalty in an amount less than the maximum amount ($5,000/day). Payable by check, cashier's check, or money order. Payment shall be made payable to "San Bernardino County Fire Department" and shall identify the Respondent, the HM Case No. and the Case File No. as shown in the heading of this Consent Order. Payment shall be mailed or delivered to 620 South "E" Street, San Bernardino, CA 92415-0153.
4. **Return** the signed Consent Order and penalty payment to HMD within 20 days of receipt.

Completing **all** of the above requirements **within 20 days of receipt** will resolve the violation and penalties cited in this letter.

Should you choose not to accept the above noted settlement agreement or fail to complete all of the above noted steps, a Formal Enforcement Order may be issued against you, imposing a penalty in an amount of $5,000.00 or more. Compliance with the CERS Business Plan submittal will still be required. HMD has the option of referring this case to the District Attorney's Office for enforcement as well.

Should you have questions concerning this notice, please contact Greg Zeigler at (909) 386-8423.

Greg Beach

**Greg Beach, Supervising Hazardous Materials Specialist**
**Hazardous Materials Division**
**Office of the Fire Marshal**
**San Bernardino County Fire Department**

Attachments: Consent Order (Attachment 1)

# Southwest Dairy Inc. (CERSID: 10444234)

**Facility Information Certified Feb 19, 2024**

Certified on 2/19/2024 2:35:05 PM by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

- Business Activities
- Business Owner/Operator Identification

**Hazardous Materials Inventory Certified Feb 19, 2024**

Certified on 2/19/2024 2:35:05 PM by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

- Hazardous Material Inventory (4)
- Site Map (Official Use Only)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 4417KB)

**Emergency Response and Training Plans Certified Feb 19, 2024**

Certified on 2/19/2024 2:35:05 PM by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

- Emergency Response/Contingency Plan
  - *Emergency Response/Contingency Plan* (Adobe PDF, 664KB)
- Employee Training Plan
  - Provided In Submital Element: Emergency Response and Training Plans

## Site Identification

**Southwest Dairy Inc.**
14213 Bon View Ave
Ontario, CA 91762

County
San Bernardino

CERS ID
**10444234**

EPA ID Number

## Submittal Status

Certified on 2/19/2024 by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

## Hazardous Materials

| | |
|---|---|
| Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | Yes |

## Underground Storage Tank(s) (UST)

| | |
|---|---|
| Does your facility own or operate underground storage tanks? | No |

## Hazardous Waste

| | |
|---|---|
| Is your facility a Hazardous Waste Generator? | No |
| Does your facility treat hazardous waste on-site? | No |
| Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | No |
| Does your facility consolidate hazardous waste generated at a remote site? | No |
| Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site? | No |
| Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month greater than 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | No |
| Is your facility a Household Hazardous Waste (HHW) Collection site? | No |

## Excluded and/or Exempted Materials

| | |
|---|---|
| Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)? | No |

## Aboveground Petroleum Storage

| | |
|---|---|
| Does your facility own or operate aboveground petroleum storage tanks or containers AND:<br>* have a total aboveground petroleum storage capacity of 1,320 gallons or more, OR<br>* have one or more petroleum tanks in an underground area? | No |

## Regulated Substances

| | |
|---|---|
| Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)? | No |

## Additional Information

No additional comments provided.

## Facility/Site

**Southwest Dairy Inc.**
14213 Bon View Ave
Ontario, CA 91762

CERS ID
**10444234**

## Submittal Status

Certified on 2/19/2024 by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

## Identification

Daric Ameye

| Operator Phone | Business Phone | Business Fax |
|---|---|---|
| (909) 754-4642 | (909) 754-4642 | |

| Beginning Date | Ending Date | |
|---|---|---|
| | | |
| **Dun & Bradstreet** | **SIC Code** | **Primary NAICS** |

## Facility/Site Mailing Address

14213 Bon View Ave
Ontario, CA 91762

## Primary Emergency Contact

Daric Ameye
Title
Owner/Operator

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 754-4642 | (909) 754-4642 | |

## Owner

Daric Ameye
(909) 754-4642
14213 Bon View Ave
Ontario, CA 91762

## Secondary Emergency Contact

Bryn Ameye
Title
Owner/Operator

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (760) 594-6078 | (760) 594-6078 | |

## Billing Contact

Daric Ameye
(760) 594-6078 southwestdairyinc@gmail.com
14213 Bon View Ave
Ontario, CA 91762

## Environmental Contact

Daric Ameye
(99) 754-4642 southwestdairyinc@gmail.com
14213 Bon View Ave
Ontario, CA 91762

| Name of Signer | Signer Title | Document Preparer |
|---|---|---|
| Daric Ameye | Owner/Operator | Daric Ameye |

Additional Information

## Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

### Property Owner

Phone

Mailing Address
southwestdairyinc@gmail.com
Ontario, CA 91762

Assessor Parcel Number (APN)

Number of Employees
2

Facility ID
FA0014875

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | | | |
|---|---|---|---|---|---|
| CERS Business/Org. | **Southwest Dairy Inc.** | Chemical Location | | CERS ID | **10444234** |
| Facility Name | **Southwest Dairy Inc.**<br>14213 Bon View Ave, Ontario 91762 | **South side of Milking Barn** | | Facility ID | **FA0014875** |
| | | | | Status | **Submitted** on 2/19/2024 2:35 PM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TCB 5000 Teat Dip** | **Gallons** | **500** | | | | | 2-bromo-2-nitro-1,3-propanediol | 0% | | 000052-51-7 |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue | Waste Code | | | | | |
| | | Type: Mixture | Days on Site: 365 | | Temperature | | | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **Southwest Dairy Inc.** | Chemical Location | CERS ID **10444234** |
| Facility Name | **Southwest Dairy Inc.**<br>14213 Bon View Ave, Ontario 91762 | **Wash House of Milking Barn** | Facility ID **FA0014875**<br>Status **Submitted** on 2/19/2024 2:35 PM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities: Max. Daily | Quantities: Largest Cont. | Quantities: Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only): Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Acid Cleaner EC** | **Gallons** | **110** | | | | - Health Acute Toxicity | Phosphoric Acid | 10% | | 7664-38-2 |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue: Ambient | Waste Code | | Nitric Acid | 10% | | 7697-37-2 |
| | | Type: Mixture | Days on Site: 365 | | Temperature: Ambient | | | Sulfuric Acid | 10% | | 7664-93-9 |
| | **LA Chemchlor** | **Gallons** | **110** | | | | - Health Acute Toxicity | Sodium Hypochlorite | 13% | | 7681-52-9 |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue: Ambient | Waste Code | | Sodium Hydroxide | 2% | | 1310-73-2 |
| | | Type: Mixture | Days on Site: 365 | | Temperature: Ambient | | | | | | |
| | **Velocity Two Detergent** | **Gallons** | **110** | | | | - Health Acute Toxicity | Sodium Hydroxide | 30% | | 1310-73-2 |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue: Ambient | Waste Code | | | | | |
| | | Type: Mixture | Days on Site: 365 | | Temperature: Ambient | | | | | | |

&$/,)251,$ (19,5210(17$/ 5(3257,1*SYSTEM (CERS)

# CONSOLIDATED EMERGENCY RESPONSE / CONTINGENCY PLAN

*Prior to completing this Plan, please refer to the INSTRUCTIONS FOR COMPLETING A CONSOLIDATED CONTINGENCY PLAN*

## A. FACILITY IDENTIFICATION AND OPERATIONS OVERVIEW

FACILITY ID # F A 0 0 1 4 8 7 5 A1.

CERS ID # 1044234 A2.

DATE OF PLAN PREPARATION/REVISION (MM/DD/YYYY) 06/30/2022 A3.

BUSINESS NAME *(Same as Facility Name or DBA - Doing Business As)* A4.
Southwest Dairy Inc

BUSINESS SITE ADDRESS A5.
14213 Bon View Ave

BUSINESS SITE CITY A6.
Ontario

CA

ZIP CODE A7.
91762

TYPE OF BUSINESS (e.g., Painting Contractor) A8.
Dairy Farm

INCIDENTAL OPERATIONS (e.g., Fleet Maintenance) A9.

THIS PLAN COVERS CHEMICAL SPILLS, FIRES, AND EARTHQUAKES INVOLVING (Check all that apply): A10.

☒ 1. HAZARDOUS MATERIALS; ☐ 2. HAZARDOUS WASTES

## B. INTERNAL RESPONSE

INTERNAL FACILITY EMERGENCY RESPONSE WILL OCCUR BY (Check all that apply): B1.

☒ 1. CALLING PUBLIC EMERGENCY RESPONDERS (e.g., 9-1-1)
☐ 2. CALLING HAZARDOUS WASTE CONTRACTOR
☐ 3. ACTIVATING IN-HOUSE EMERGENCY RESPONSE TEAM

## C. EMERGENCY COMMUNICATIONS, PHONE NUMBERS AND NOTIFICATIONS

In the event of an emergency involving hazardous materials and/or hazardous waste, all facilities must IMMEDIATELY:
1. Notify facility personnel and evacuate if necessary in accordance with the Emergency Action Plan (Title 8 California Code of Regulations §3220);
2. Notify local emergency responders by calling 9-1-1;
3. Notify the local Unified Program Agency (UPA) at the phone number below; and
4. Notify the State Warning Center at (800) 852-7550.

Facilities that generate, treat, store or dispose of hazardous waste have additional responsibilities to notify and coordinate with other response agencies. Whenever there is an imminent or actual emergency situation such as an explosion, fire, or release, the Emergency Coordinator must follow the appropriate requirements for the category of facility and type of release involved:
1. Title 22 California Code of Regulations §66265.56. Emergency Procedures for generators of 1,000 kilograms or more of hazardous waste in any calendar month.
2. Title 22 California Code of Regulations §66265.196. Response to Leaks or Spills and Disposition of Leaking or Unfit-for-Use Tank Systems.
3. Title 40 Code of Federal Regulations §302.6. Notification requirements for a release of a hazardous substance equal to or greater than the reportable quantity.
4. Title 22 California Code of Regulations §66262.34(d)(2) and Title 40 Code of Federal Regulations §262.34(d)(5)(ii) for generators of less than 1000 kilograms of hazardous waste in any calendar month.

Following notification and before facility operations are resumed in areas of the facility affected by the incident, the Emergency Coordinator shall notify the local UPA and the local fire department's hazardous materials program, if necessary, that the facility is in compliance with requirements to:
1. Provide for proper storage and disposal of recovered waste, contaminated soil or surface water, or any other material that results from an explosion, fire, or release at the facility; and
2. Ensure that no material that is incompatible with the released material is transferred, stored, or disposed of in areas of the facility affected by the incident until cleanup procedures are completed.

EMERGENCY RESPONSE PHONE NUMBERS:

| | |
|---|---|
| AMBULANCE, FIRE, POLICE AND CHP | 9-1-1 |
| CALIFORNIA STATE WARNING CENTER (CSWC)/CAL OES | (800) 852-7550 |
| NATIONAL RESPONSE CENTER (NRC) | (800) 424-8802 |
| POISON CONTROL CENTER | (800) 222-1222 |
| LOCAL UNIFIED PROGRAM AGENCY (UPA) | (909) 386-8425 C1. |
| OTHER (Specify): C2. | C3. |
| NEAREST MEDICAL FACILITY / HOSPITAL NAME: C4. | C5. |

AGENCY NOTIFICATION PHONE NUMBERS:

| | |
|---|---|
| CALIFORNIA DEPT. OF TOXIC SUBSTANCES CONTROL (DTSC) | (916) 255-3545 |
| REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) | (951) 782-4130 C6. |
| U.S. ENVIRONMENTAL PROTECTION AGENCY (US EPA) | (800) 300-2193 |
| CALIFORNIA DEPT. OF FISH AND WILDLIFE (CDFW) | (916) 358-2900 |
| U.S. COAST GUARD (USCG) | (202) 267-2180 |
| CAL OSHA | (916) 263-2800 |
| CAL FIRE OFFICE OF THE STATE FIRE MARSHAL (OSFM) | (916) 323-7390 |
| OTHER (Specify): C7. | C8. |
| OTHER (Specify): C9. | C10. |

INTERNAL FACILITY EMERGENCY COMMUNICATIONS OR ALARM NOTIFICATION WILL OCCUR BY (Check all that apply): C11.

☒ 1. VERBAL WARNINGS; ☐ 2. PUBLIC ADDRESS OR INTERCOM SYSTEM; ☒ 3. TELEPHONE;
☐ 4. PAGERS; ☐ 5. ALARM SYSTEM; ☐ 6. PORTABLE RADIO

NOTIFICATIONS TO NEIGHBORING FACILITIES THAT MAY BE AFFECTED BY AN OFF-SITE RELEASE WILL OCCUR BY (Check all that apply): C12.

☒ 1. VERBAL WARNINGS; ☐ 2. PUBLIC ADDRESS OR INTERCOM SYSTEM; ☒ 3. TELEPHONE;
☐ 4. PAGERS; ☐ 5. ALARM SYSTEM; ☐ 6. PORTABLE RADIO

EMERGENCY COORDINATOR CONTACT INFORMATION: C13.

PRIMARY EMERGENCY COORDINATOR NAME: Daric Ameye PHONE NO.:(909) 754-4642 PHONE NO.:

ALTERNATE EMERGENCY COORDINATOR NAME: Bryn Ameye PHONE NO.:(760) 594-6078 PHONE NO.:

☐ Check if additional Emergency Coordinator contact and address information is available onsite or by calling PHONE NO.:

Note: If more than one alternate emergency coordinator is designated, attach a list in order of responsibility.

## D. EMERGENCY CONTAINMENT AND CLEANUP PROCEDURES

Check the applicable boxes to indicate your facility's procedures for containing spills and preventing and mitigating releases, fires and/or explosions.

D1.

☒ 1. MONITOR FOR LEAKS, RUPTURES, PRESSURE BUILD-UP, ETC.;
☐ 2. PROVIDE STRUCTURAL PHYSICAL BARRIERS (e.g., Portable spill containment walls, built-in berms);
☐ 3. PROVIDE ABSORBENT PHYSICAL BARRIERS (e.g., Pads, spill pigs, spill pillows);
☐ 4. COVER OR BLOCK FLOOR AND/OR STORM DRAINS;
☒ 5. LINED TRENCH DRAINS AND/OR SUMPS;
☐ 6. AUTOMATIC FIRE SUPPRESSION SYSTEM;
☐ 7. ELIMINATE SOURCES OF IGNITION FOR FLAMMABLE HAZARDS;
☐ 8. STOP PROCESSES AND/OR OPERATIONS;
☐ 9. AUTOMATIC / ELECTRONIC EQUIPMENT SHUT-OFF SYSTEM;
☐ 10. SHUT OFF WATER, GAS, ELECTRICAL UTILITIES;
☐ 11. CALL 9-1-1 FOR PUBLIC EMERGENCY RESPONDER ASSISTANCE AND/OR MEDICAL AID;
☐ 12. NOTIFY AND EVACUATE PERSONS IN ALL THREATENED AND/OR IMPACTED AREAS;
☐ 13. ACCOUNT FOR EVACUATED PERSONS IMMEDIATELY AFTER EVACUATION;
☐ 14. PROVIDE PROTECTIVE EQUIPMENT FOR ON-SITE EMERGENCY RESPONSE TEAM;
☐ 15. REMOVE CONTAINERS AND/OR ISOLATE AREAS;
☐ 16. HIRE LICENSED HAZARDOUS WASTE CONTRACTOR;
☐ 17. USE ABSORBENT MATERIAL FOR SPILL CONTAINMENT;
☐ 18. VACUUM SUCTION USING APPROPRIATE VACUUM (e.g., Intrinsically safe) FOR SPILL CONTROL AND/OR CLEANUP;
☐ 19. DECONTAMINATE PERSONNEL AND EQUIPMENT WITHIN DESIGNATED AREA AND DISPOSE OF WASTEWATER AS HAZARDOUS WASTE;
☐ 20. PROVIDE SAFE TEMPORARY STORAGE OF HAZARDOUS WASTE GENERATED DURING EMERGENCY ACTIONS;
☐ 21. OTHER (Specify): D2.

## E. FACILITY EVACUATION

THE FOLLOWING ALARM SIGNAL(S) WILL BE USED TO BEGIN EVACUATION OF THE FACILITY (Check all that apply): E1.

☐ 1. BELLS; E2.
☐ 2. HORNS/SIRENS;
☒ 3. VERBAL (i.e., Shouting);
☐ 4. OTHER (Specify):

THE FOLLOWING LOCATION(S) WILL BE USED FOR AN EMERGENCY ASSEMBLY AREA(S) (e.g., Parking lot, street corner): E3.

Note: The Emergency Coordinator must account for all onsite employees and visitors after evacuation.

EVACUATION ROUTE S AND ALTERNATE EVACUATION ROUTES ARE DESCRIBED AS FOLLOWS: E4.

☐ 1. WRITTEN PROCEDURES DESCRIBING ROUTES, EXITS, AND ASSEMBLY AREAS;
☒ 2. EVACUATION MAP(S) DEPICTING ROUTES, EXITS, AND ASSEMBLY AREAS;
☐ 3. OTHER (Specify): E5.

Note: Evacuation procedures and/or maps should be posted in visible facility locations and must be included in the Contingency Plan.

## F. ARRANGEMENTS FOR EMERGENCY SERVICES

ADVANCE ARRANGEMENTS FOR LOCAL EMERGENCY SERVICES (Check one of the following): F1.

☒ 1. HAVE BEEN DETERMINED NOT NECESSARY;
☐ 2. THE FOLLOWING ARRANGEMENTS HAVE BEEN MADE (Specify): F2.

Note: Advance arrangements with local fire and police departments, hospitals, state and local emergency response teams, and/or emergency services contractors should be made for your facility, if necessary. Large Quantity Generators must describe arrangements in the Contingency Plan.

## G. EMERGENCY EQUIPMENT

**Check the applicable boxes to list emergency response equipment available at the facility, identify the location(s) where the equipment is kept, and indicate the equipment's capability, if applicable.**

| TYPE | EQUIPMENT AVAILABLE G1. | LOCATION G2. | CAPABILITY G3. |
|---|---|---|---|
| *EXAMPLE* | ☒ *CHEMICAL PROTECTIVE GLOVES* | *SPILL RESPONSE KIT* | *SINGLE USE, OIL RESISTANT ONLY* |
| **Safety and First Aid** | 1. ☐ CHEMICAL PROTECTIVE SUITS, APRONS, AND/OR VESTS | | |
| | 2. ☐ CHEMICAL PROTECTIVE GLOVES | | |
| | 3. ☐ CHEMICAL PROTECTIVE BOOTS | | |
| | 4. ☐ SAFETY GLASSES, GOGGLES, AND FACE SHIELDS | | |
| | 5. ☐ HARD HATS | | |
| | 6. ☐ AIR-PURIFYING RESPIRATORS | | |
| | 7. ☐ SELF-CONTAINED BREATHING APPARATUS (SCBA) | | |
| | 8. ☒ FIRST AID KITS | Barn | |
| | 9. ☒ PLUMBED EYEWASH FOUNTAIN AND/OR SHOWER | Barn | |
| | 10. ☐ PORTABLE EYEWASH KITS AND/OR STATION | | |
| | 11. ☐ OTHER | | |
| **Fire Fighting** | 12. ☒ PORTABLE FIRE EXTINGUISHERS | Barn | |
| | 13. ☐ FIXED FIRE SUPPRESSION SYSTEMS AND/ OR SPRINKLERS | | |
| | 14. ☐ FIRE ALARM BOXES | | |
| | 15. ☒ OTHER | Barn Hoses | |
| **Spill Control and Clean-Up** | 16. ☐ ALL-IN-ONE SPILL KIT | | |
| | 17. ☐ ABSORBENT MATERIAL | | |
| | 18. ☐ CONTAINER FOR USED ABSORBENT | | |
| | 19. ☐ BERM AND/OR DIKING EQUIPMENT | | |
| | 20. ☐ BROOM | | |
| | 21. ☐ SHOVEL | | |
| | 22. ☐ VACUUM | | |
| | 23. ☐ EXHAUST HOOD | | |
| | 24. ☐ SUMP AND/OR HOLDING TANK | | |
| | 25. ☐ CHEMICAL NEUTRALIZERS | | |
| | 26. ☐ GAS CYLINDER LEAK REPAIR KIT | | |
| | 27. ☐ SPILL OVERPACK DRUMS | | |
| | 28. ☐ OTHER | | |
| **Communi-cations and Alarm Systems** | 29. ☒ TELEPHONES (e.g., Cellular) | Cells in barn | |
| | 30. ☐ INTERCOM AND/OR PA SYSTEM | | |
| | 31. ☐ PORTABLE RADIOS | | |
| | 32. ☐ AUTOMATIC ALARM CHEMICAL MONITORING EQUIPMENT | | |
| **Other** | 33. ☐ OTHER | | |
| | 34. ☐ OTHER | | |

## H. EARTHQUAKE VULNERABILITY

Identify areas of the facility that are vulnerable to hazardous materials releases due to seismic motion. These areas require immediate isolation and inspection.

| VULNERABLE AREAS (Check all that apply): H1. | LOCATIONS (e.g., Shop, outdoor shed, lab): H2. |
|---|---|
| ☐ 1. HAZARDOUS MATERIALS AND/OR WASTE STORAGE AREAS | |
| ☐ 2. PROCESS LINES AND PIPING | |
| ☐ 3. LABORATORY | |
| ☐ 4. WASTE TREATMENT AREA | |

Identify mechanical systems vulnerable to releases / spills due to earthquake-related motion. These systems require immediate isolation and inspection.

| VULNERABLE SYSTEMS AND/OR EQUIPMENT (Check all that apply): H3. | LOCATIONS: H4. |
|---|---|
| ☐ 1. SHELVES, CABINETS AND/OR RACKS | |
| ☐ 2. TANKS AND SHUT-OFF VALVES | |
| ☐ 3. PORTABLE GAS CYLINDERS | |
| ☐ 4. EMERGENCY SHUT-OFF AND/OR UTILITY VALVES | |
| ☐ 5. SPRINKLER SYSTEMS | |
| ☐ 6. STATIONARY PRESSURIZED CONTAINERS (e.g., Propane tank) | |

## I. EMPLOYEE TRAINING

Employee training is required for all employees and/or contractors handling hazardous materials and/or hazardous wastes during normal and/or emergency operations. Most facilities will need to submit a separate Training Plan. However, your CUPA may accept this section as the Training Plan for some small facilities.
Employee training plans may include the following content:

- Applicable laws and regulations;
- Emergency response plans and procedures;
- Safety Data Sheets;
- Hazard communication related to health and safety;
- Methods for safe handling of hazardous substances;
- Hazards of materials and processes (e.g., fire, explosion, asphyxiation);
- Hazard mitigation, prevention and abatement procedures;
- Coordination of emergency response actions;
- Notification procedures for local emergency responders, CUPA, Cal OES, and onsite personnel;
- Communication and alarm systems;
- Personal protective equipment;
- Use and maintenance of emergency response equipment and supplies (e.g. Fire extinguishers, respirators, spill control materials);
- Decontamination procedures;
- Evacuation procedures and evacuation staging locations;
- Identification of facility areas, equipment, and systems vulnerable to earthquakes and other natural disasters.
- OTHER (Specify):

Check the applicable boxes below to indicate how the employee training program is administered.

☐ 1. FORMAL CLASSROOM ☐ 2. VIDEOS ☒ 3. SAFETY MEETINGS ☐ 4. STUDY GUIDES / MANUALS I1.
☐ 5. OTHER (Specify): _____ I2.
☐ 6. NOT APPLICABLE SINCE FACILITY HAS NO EMPLOYEES
☐ 7. CHECK IF A SEPARATE EMPLOYEE TRAINING PLAN IS USED AND UPLOADED TO CERS AS A PDF DOCUMENT I3.
☐ 8. CHECK IF EMPLOYEE TRAINING IS COVERED BY THE ABOVE REFERENCED CONTENT AND OTHER DOCUMENTS ONSITE I4.

**EMPLOYEE TRAINING FREQUENCY AND RECORDKEEPING TRAINING MUST BE:**

- Provided initially for new employees as soon as possible following the date of hire. New employees should not work in an unsupervised position that involves hazardous materials handling and/or hazardous waste management without proper training;
- Provided within six months from the date of hire for new employees at a large quantity generator;
- Ongoing and provided at least annually;
- Amended prior to a change in process or work assignment;
- Given upon modification to the Emergency Response/Contingency Plan.

**Large Quantity Generator Training:** Large quantity generators (1,000 kg or more) must retain written plan and documentation of employee training which includes:

- A written description of the type and amount of both initial and ongoing training that will be given to persons filling each job position having responsibility for hazardous waste management and/or emergency response.
- The name, job title and job description for each position at the facility related to hazardous waste management.
- Current employee training records must be retained until closure of the facility and former employee training records must be retained for at least three years after termination of employment.

**Small Quantity Generator Training:** Small quantity generators (less than 1,000 kg) must include basic hazardous waste management and emergency response procedures but a written employee training plan and training records are not required. In order to show that the facility has met the small quantity generator employee training requirement, an employee training plan and training records may be made available.

**Hazardous Materials Business Plan Training**: Businesses must provide initial and annual employee training that includes the content referenced above. The training may be based on the job position and training records must be made available for a period of at least three years.

## J. LIST OF ATTACHMENTS

Check one of the following: J1.
☒ 1. NO ATTACHMENTS ARE REQUIRED; or
☐ 2. THE FOLLOWING DOCUMENTS ARE ATTACHED: J2.

# HAZ DOUS MATERIAL FIELD SERVI S
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000314

NAME: COSTA, DIMAS

ADDRESS 1: 14451 BON VIEW AVE ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91710-9171 COUNTRY:

PHONE: EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: DBA: COSTA, DIMAS

ADDRESS1: 14451 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91761 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000395

NAME: ~~AG~~-COSTA, DIMAS

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~9-1710~~ 91761 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: BUSINESS CODE: 1 BUSINESS TYPE: 3

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 3

PHONE: EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-COSTA, DIMAS

CARE OF:

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91761 COUNTRY:

EMAIL:

ROCKBID FIRE FISCAL
MAY 22 PM 4:13

## A- A/R INFORMATION

ACCOUNT ID: AR0000397

RESPONSIBLE PARTY:

CARE OF:

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

PHONE: EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 05/04/2007

ALT PHONE: EXT: EXEMPT FROM BILLING: YES TAX ID:

ANNIVERSARY DATE: 04/30/1997 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE TH[illegible]PPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT000892[illegible] | ACTIVE | 4210 | [illegible]/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009816 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008930 | ACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009817 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E. 0202 inactive

NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E.

NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E.

NUMBER OF EMP. N/A NUMBER OF UST'S 0 MFR #

ENTERED

DATE SUBMITTED: 3-May-2007 DATE ENTERED: FISCAL DATE:

MAY 18 2007

SUBMITTED BY: Shane Bach ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

Please update the following information
- owner information
- Facility information
- Remove Ag listing
- ~~Cle~~
- ~~R~~ Close P.E. 4210 and P.E. ~~4~~ 4420
- Add P.E. 0202 inactive

*note H and R dairy now occupies this Address

Thank you

Shane

| | | | | |
|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

**SAN BERNARDINO COU' 'Y**
**FIRE DEPARTMENT**

COUNTY OF SAN BERNARDINO

**ADMINISTRATIVE HEADQUARTERS**
**157 West Fifth Street, Second Floor • San Bernardino, CA 92415-0451**
**(909) 387-5974 • Fax (909) 387-5542**

**MARK A. HARTWIG**
Fire Chief

# FINAL NOTICE

H & R DAIRY
14441 GROVE AVE
ONTARIO, CA 91762

H + R Dairy
14213 Bon View
Ontario

December 12, 2012

File closed out.
Business closed.

ATTN: RON MEIRSMA

RE: Invoice # IN0086049

Facility: FA0010971-H & R DAIRY

Dear Sir or Madam:

Your account has been referred to our Collections Section with a request to set a date to be heard in **Small Claims Court**.

On December 05, 2012 a past due invoice was mailed to your facility for Hazardous Materials Permit Fees in the amount of **$598.05** to be paid no later than December 12, 2012. As of the date of this letter, we have not received a payment. Notices advising you of your unpaid account balance have received no response. Therefore, a **$64.00** administrative fee has been added to your past due amount.

Payment of these fees is required as a condition to operate your facility in accordance with San Bernardino County Ordinance No. 3846, Section 23.0605. **Without a valid permit, operation of your facility may be subject to closure. All owners are responsible for current and past due fees.**

At this time, San Bernardino County Fire considers legal action to be necessary. If you would like to settle out of court, please submit full payment before **December 17, 2012**. If full payment is not received by **December 17, 2012**, additional collection and court fees will be added to your current balance.

*IN0086049662.05*

Sincerely,
Hazardous Materials Collections Officer
San Bernardino County Fire Department

Detach here and return this portion with payment

MAKE CHECK PAYABLE TO: San Bernardino County Fire Department

Facility ID: FA0010971

Facility Name: H & R DAIRY

Invoice #: IN0086049

Balance Due: $662.05

*IN0086049662.05*

Rpt#9123

Board of Supervisors
GREGORY C. DEVEREAUX, Chief Executive Officer
ROBERT A. LOVINGOOD ..... First District
JANICE RUTHERFORD ..... Second District
JOSIE GONZALES ..... Fifth District
JAMES RAMOS ..... Third District
GARY C. OVITT ..... Fourth District

Please make your check payable to:
**San Bernardino County Fire Protection District**
Send to:
**157 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 386-8483**

**Facility Address**
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

| Facility ID | Invoice ID |
|---|---|
| FA0010971 | IN0086049 |

**Invoice Date**
10/17/12

*IN0086049598.05*

**Total Account Balance**
$ 598.05

**Total Due for Invoice**
$ 598.05

**Total Paid**

SAN BERNARDINO COUNTY FIRE DEPARTMENT
PAST DUE
HAZARDOUS MATERIALS
CUPA PERMITS
SAN BERNARDINO
1853

TO : H & R DAIRY
14441 GROVE AVE
ONTARIO, CA 91762

ATTN : RON MEIRSMA

☐ **Change of Billing Address (see back)**

**Upon receipt of full payment of the balance due as shown on this invoice, you will receive your new annual permit with an effective date of:**
**12/1/2012 to 11/30/2013**

**PLEASE RETURN TOP PORTION WITH PAYMENT**

| Program/ Element | Qty | Description | Permit Exp Date | | Amount |
|---|---|---|---|---|---|
| 4221 | 1 | HAZMAT HANDLER 0-10 EMPLOYEES | 11/30/12 | $ | 408.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | 11/30/12 | $ | 35.00 |
| 9990 | 2 | DELINQUENT PENALTY FEE | 11/30/12 | $ | 155.05 |
| | | | Total Due for This Invoice: | $ | 598.05 |

**ALL FEES ARE NOW DUE**
**PLEASE SUBMIT FULL PAYMENT BEFORE 12/12/2012**

| 1-30 Days | 31-60 Days | 61-90 Days | 91-120 Days | 121+ Plus | Total Account Bal |
|---|---|---|---|---|---|
| $ 155.05 | $ 443.00 | $ 0.00 | $ 0.00 | $ 0.00 | $ 598.05 |

**Permits are not transferable, you must contact this office for new permits.**
***If you have any questions regarding this bill, please call San Bernardino County Fire Protection District at (909) 386-8483.***

*IN0086049598.05*

**ALL FEES ARE NOW PAST DUE. FAILURE TO PAY WITHIN 7 DAYS WILL RESULT IN THIS ACCOUNT BEING FORWARDED TO COLLECTIONS FOR LEGAL ACTION.**

# H ARDOUS MATERIAL FIELD SEF CES

## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

Fiscal CPC/5051

FILE

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION

OWNER ID: OW0009212

Legal Owner

*NAME: RON MIERSMA

*ADDRESS 1: ~~14451 BON VIEW AVE~~ 14441 ~~Bon~~ Grove Ave ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: ~~91761~~ 91762 *COUNTRY: USA

*PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 11/02/2011

#### OWNER MAILING ADDRESS

☐ Same as Owner

CARE OF: ROM MIERSMA DBA: H & R DAIRY

ADDRESS1: 14451 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

### F- FACILITY INFORMATION

FACILITY ID: FA0010971

*NAME: H & R DAIRY CERS ID: 10052083

*ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

*PHONE: 909-376-3379 EXT: ALT PHONE: 909-376-3373 EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FARM FYI LAST UPDATED: 04/18/2011

#### FACILITY MAILING ADDRESS

☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: H & R DAIRY

CARE OF: RON MIERSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

*EMAIL:

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION

ACCOUNT ID: AR0012409

RESPONSIBLE PARTY: H & R DAIRY

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

CARE OF: RON MEIRSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

PHONE: 909-376-3379 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 10/17/2012

FYI ANNIVERSARY DATE: 11/30/2007 FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI TOTAL DUE: 443.00

ENVIRONMENTAL CONTACT NAME: RON MIERSMA EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency

**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE T[illegible] APPLY)**

| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0018909<br>PERMIT NUMBER. | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-[illegible]<br>ORIGINAL P.E. | 12/01/2011<br>EFFECTIVE DATE | 11/30/2012<br>EXPIRATION DATE |
|---|---|---|---|---|---|
| | | | PR0017775<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | UPDATED P.E. |

| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|---|
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0.

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes No

*Should this facility be inactivated upon verification that there is no balance due? Yes No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes No

*Does this 5050 have attached documents? Yes No

ENTERED

*DATE SUBMITTED: 11/7/12 DATE ENTERED: NOV 10 2012 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Other ENTERED BY: ***Demand bill for updated PEs**: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Facility is still in operation, no change to permit billing

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

# CUPA

San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0010971 Facility Name: H and R Dairy Inspection Date: 11/07/12

Site Address: 14213 Bon View Ave Phone #:

City: Ontario Zip Code: 91761 EPA ID #:

Consent Granted by:

☐ Inspect ☐ Photograph Name: Title: # Emp:

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). *The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).*

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | X |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(a) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | X |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | X |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |
| 230. Business Plan implemented | CHSC 25503.5 | | | X |

**INSPECTION NARRATIVE**

**Closure inspection verified that facility is still in operation. Continue with billing for IN0086049**

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: Sign Name Received By: Sign Name Title:

Brian Otter Print Name Print Name Report Date: 11/07/12

Form Revised 1/16/2007

**Hazardous Materials Division**

**Fee Change Authorization Form**

☒ RUSH -NEED BY 11/19/12 ☐ PRIORITY-NEED BY _____ ☐ FYI-PLEASE REVIEW ☐ OTHER _____

## FACILITY INFORMATION

NAME: **H & R DAIRY** FACILITY ID: **FA0010971**

ADDRESS: **14213 BON VIEW AVE**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761**

PHONE: **909-376-3379** EXT: _____ FAX: _____

ALT PHONE: **909-376-3373** EXT: _____ LOCATION(INSPECTOR DISTRICT): **03**

CONTACT PERSON: _____ CITY CODE: **ONTARIO** DISTRICT(SUPERVISORIAL DISTRICT): **004**

ANNIVERSARY DATE: **11/30/2007** ACCOUNT STATUS: **ACTIVE ACCOUNT**

NUMBER OF EMP. _____ NUMBER OF UST'S **0** MFR # _____

## ACTION REQUIRED

☒ REQUEST VERIFICATION ☒ REQUEST FACILITY INSPECTION

☒ INACTIVATE / CLOSED ACCOUNT / O.O.B. ☒ REQUEST TO REVERSE OUTSTANDING INVOICE

COMMENTS: RECEIVED RETURNED MAIL FROM FACILITY ADDRESS. FORWARDING ADDRESS TO MEIRSMA AT 14441 GROVE AVE. ONTARIO, CA 91762-7922.PLEASE SET FOR INSPECTION TO VERIFY POSSIBLE OOB. THANK YOU!

REQUESTED BY: Donna Judah APPROVED BY: [signature] 11/6/12

## PERMIT INFORMATION

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

RECEIVED
NOV 07 2012
BEN

1N0080049

DATE SUBMITTED: _____ SUBMITTED BY: _____

ADDITIONAL COMMENTS: 11/7/12 Greg Z

EnvisionConnect

File Tools Help

Tuesday, December 18, 2012

Back Forward Home Refresh

Activities

EnvisionConnect

Common Tasks

Cancel workflow

Customize the List

Add or remove report heedings

Add or remove report groups

Sort results

Manage advanced report features

# Add a comment

Change View

Matches: 12

View: All Comments Related to this Facility, Sorted by Entered Date (Increasing)

| Comm... | Record ID | ... | Entered... |
|---|---|---|---|
| May 18... | FA00109... | | 5/18/2007 |
| INV D... | IN0036207 | | 5/29/2007 |
| Decem... | FA00109... | | 12/28/2007 |
| On 6-1... | IN0047563 | ... | 6/18/2008 |
| ON MA... | FA00109... | ... | 6/10/2011 |
| RECEI... | IN0086049 | | 10/30/2012 |
| PREPA... | IN0086049 | | 11/6/2012 |
| 5051: ... | FA00109... | | 11/10/2012 |
| SENT ... | IN0086049 | | 11/16/2012 |
| 5051 ... | FA00109... | | 12/4/2012 |
| ADMIN... | IN0086049 | | 12/13/2012 |
| 5054/... | FA00109... | | 12/17/2012 |

TEXT

5054/CLOSURE/INACTIVATE PERMITS: PER DISCUSSION WITH OWNER, CATTLE SOLD TO NEW DAIRY OPERATING AT THIS LOCATION SINCE 4/1/12. REVERSE INVOICE IN0086049. (LESLIE HEAVISIDE)

REVERSE INVOICE IN0086049 AND DELINQUENT CHARGES ASSOCIATED WITH INVOICE-5054 SUBMITTED.

Monday, December 17, 2012 10:30 AM - PRISCILLA LOPEZ

OOB

#15

AR

Add a Comment

Cancel

Save and Continue

Workflow: Add an Invoice

Connected | User: J0995 | Database: HazMat | Server: EnvisionSQL\SQL2005

Inbox - Micr...

envisionCon...

Untitled - DY...

4:40 PM

12/18/2012

County of San Bernardino
**FIRE PROTECTION DISTRICT**
**FISCAL DIVISION**
**Hazmat Permit Billing**
157 West 5th Street, 2nd Floor
San Bernardino, CA 92415-0451

Recycled

Hasler
018H13502254
ZIP 92415

US POSTAGE
$00.40
10/18/2012

RETURN SVC REQUESTED

PRSRT FIRST-CLASS MAIL

12 OCT 25 PM 1:06

10-19-2012

Hi Priscilla,

FA 0010971

Please update to:

↓ Thanks! Donna

917 NBE 1 412I 06 10/22/12
RETURN TO SENDER
MTERSMA
14441 GROVE AVE
ONTARIO CA 91762-7922
RETURN TO SENDER

SBCO FIRE DEPT
2012 OCT 25

IL*LRMB 91762
92415@0451

closure

Fiscal

# HAZ DOUS MATERIAL FIELD SERVI S
## COMPUTER D BASE UPDATE AUTHORIZATI (5050 Form)

5054/5051

Quick Submit-Correct minor information without full verification.

4201

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: A

## O- OWNER INFORMATION

OWNER ID: OW0009212

Legal Owner

*NAME: RON MIERSMA

*ADDRESS 1: 14441 GROVE AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY: USA

*PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 11/10/2012

### OWNER MAILING ADDRESS

Same as Owner

CARE OF: ROM MIERSMA DBA: H & R DAIRY

ADDRESS1: 14441 GROVE AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

## F- FACILITY INFORMATION

FACILITY ID: FA0010971

*NAME: H & R DAIRY CERS ID: 10052083

*ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

*PHONE: 909-376-3379 EXT: ALT PHONE: 909-376-3373 EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FARM FYI LAST UPDATED: 04/18/2011

### FACILITY MAILING ADDRESS

Same as Owner Mailing Address Same as Facility

BUSINESS NAME: H & R DAIRY

CARE OF: RON MIERSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

*EMAIL:

NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

## A- A/R INFORMATION

ACCOUNT ID: AR0012409

Same as Owner Mailing Address Same as Facility Mailing Address

RESPONSIBLE PARTY: H & R DAIRY

CARE OF: RON MEIRSMA

ADDRESS 1: 14441 GROVE AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

PHONE: 909-376-3379 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 10/17/2012

Inactive

FYI ANNIVERSARY DATE: 11/30/2007 FYI ACCOUNT STATUS: ~~ACTIVE ACCOUNT~~ FYI TOTAL DUE: 598.05

ENVIRONMENTAL CONTACT NAME: RON MIERSMA EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☒ ZERO OUT BALANCE | PT0018909<br>PERMIT NUMBER. | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER U<br>ORIGINAL P.E. | EI<br>12/01/2011<br>EFFECTIVE DATE | | 11/30/2012<br>EXPIRATION DATE |
| | | | PR0017775<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | | UPDATED P.E. |
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? (Yes) No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? (Yes) No

*DATE SUBMITTED: 12-12-12 DATE ENTERED: ENTERED DEC 17 2012 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Leslie Heaviside ENTERED BY: *Demand bill for updated PEs: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

Reverse IN0086049 + delinq. charges.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

per discussion with owner: cattle sold to new dairy operating at this location since 4-1-12. Reverse invoice IN0086049.

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

# SAN BERNARDINO COUNTY FIRE -HAZARDOUS MATERIALS DIVISION

## Request to Reverse Delinquent Penalty Fee

Requester: LESLIE HEAVISIDE

Date: 12/14/2012 8:22:24AM

Facility ID: FA0010971
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

| Invoice ID | Total Account Balance | Total Due for Invoice |
|---|---|---|
| IN0086049 | $ 662.05 | $ 662.05 |
| **Invoice Date** | **Delinquent Penalties** | **Total Paid** |
| 10/17/12 | $ 155.05 | $ 0.00 |

X Categories were in dispute. Account on hold pending inspection.

Explanation: CATTLE WERE SOLD IN MARCH AND A NEW DAIRY BEGAN OPERATING AT THIS LOCATION IN APRIL. COPY OF BILL OF SALE ATTACHED.

C Beal 12/17/12
HazMat Supervisor Date

12/19/12
Deputy Fire Marshal Date

| Program/ Element | Qty | Description | | Amount |
|---|---|---|---|---|
| 4221 | 1 | HAZMAT HANDLER 0-10 EMPLOYEES | $ | 408.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | $ | 35.00 |
| 9805 | 1 | ADMINISTRATIVE FEE(COLLECTIONS) | $ | 64.00 |
| 9990 | 2 | DELINQUENT PENALTY FEE | $ | 155.05 |
| | | Total Due for This Invoice: | **$** | **662.05** |

☐ Waive 9805 Administrative Fee

**Fiscal Section**

12/17/12

Fiscal Services Supervisor Date

OFM Administrative Supervisor Date

Correction

RECEIVED
DEC 17 2012

COMPLETED

# BILL OF SALE

*KNOW ALL MEN BY THESE PRESENTS:* That DOROTHY MIERSMA, TRUSTEE, RON MIERSMA, TRUSTEE, DENISE MIERSMA, TRUSTEE, DBA H & R DAIRY, hereinafter designated as the Seller(s), for good and valuable consideration in and with lawful money of the United States of America, to them in hand paid by CRAIG GORDON, DBA GORDON HAY, INC., hereinafter designated as the Purchaser(s), the receipt whereof is hereby acknowledged, do by these presents grant, bargain, sell, and convey unto the Purchaser(s), executors, administrators, and assigns; the following described Personal Property;

~~468~~ head consisting of mature Holstein dairy cattle of various ages and descriptions.

*TO HAVE AND TO HOLD,* the same to the said Purchaser(s) their Executors, administrators and assigns forever. And the said Seller(s) do convey for their heirs, executors and administrators covenant and agree to and with the said Purchaser(s), their executors, administrators and assigns, to warrant and defend the title to the said property, goods and chattels hereby conveyed, against the just and lawful claims and demands of all persons whomsoever.

*WITNESS* our hands and seals this 30th day of March, 2012.

DOROTHY MIERSMA, TRUSTEE
RON MIERSMA, TRUSTEE
DENISE MIERSMA, TRUSTEE
DBA H & R DAIRY

Dorothy Miersma Trustee
Dorothy Miersma, Trustee

Ron Miersma Trustee
Ron Miersma, Trustee

Denise Miersma Trustee
Denise Miersma, Trustee

APPROVED AS TO FORM AND CONTENT

CRAIG GORDON, DBA GORDON HAY, INC.

Craig Gordon

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0010971 Facility Name: H & R Dairy Inspection Date: 12/12/12

Site Address: 14213 S. Bon View Ave. Phone #: 909-376-3379

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:

☐ Inspect ☐ Photograph Name: _____ Title: _____ # Emp: _____

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | X |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(a) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | X |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | X |
| 206. Regulated Substances registration filed | CHSC 25533 | | | X |
| 207. SPCC Plan prepared | CHSC 25270.4.5 | | | X |

**INSPECTION NARRATIVE**

An inspection was conducted to verify this business is no longer in operation at this location. Per copy of bill of sale, cattle were sold to another company that began operating a new dairy at this location on 4/1/12.

Business vacated this location prior to permit expiration; therefore, invoice IN0086049 for 2012/13 permits is not applicable. Invoice will be reversed and hazardous material handler permit will be inactivated.

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: _____ (Sign Name) Received By: USPS (Sign Name) Title: _____

Leslie Heaviside _____ Report Date: December 12, 2012

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Gordon Hay Inc. Dairy #3** Facility ID #: **NEW**

Address: **14213 S. Bon View Ave., Ontario**

1) Description: **Signage located at front of dairy**

2) Description: **(L to R) (2) 55-gallon drums containing CIP cleaner, (1) 55-gallon drum containing sodium hypochlorite, (2) 55-gallon drums containing acid cleaner**

Date Taken: **December 12, 2012**

Taken By: **Leslie Heavlside** Signature: _____

# PHOTO NARRATIVE



PHOTO 3

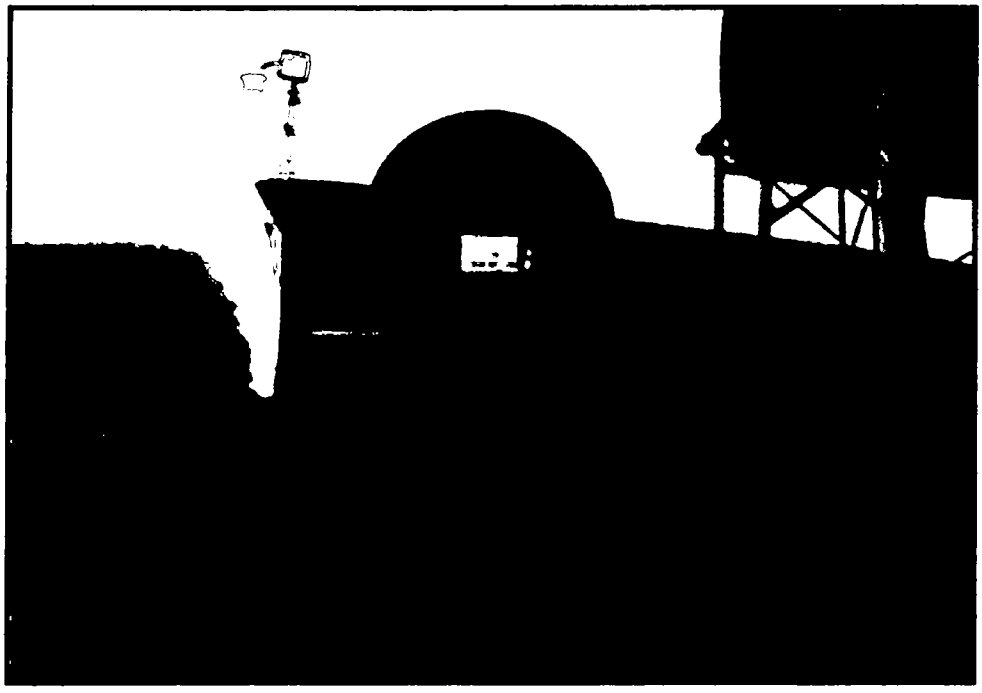

PHOTO 4

Facility/Case Name: **Gordon Hay Inc. Dairy #3** Facility ID #: **NEW**

Address: **14213 S. Bon View Ave., Ontario**

3) Description: **500-gallon AST containing Diesel fuel**

4) Description: **No photo**

Date Taken: **December 12, 2012**

Taken By: **Leslie Heaviside** Signature: _____

# HAZARDOUS MATERIAL FIELD SERVICES
## COMPUTER DATABASE UPDATE AUTHORIZAT. (5050 Form)

Fiscal 5054/5051

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A 4221

CURRENT INVOICE MAILING CODE: A

## O- OWNER INFORMATION — OWNER ID: OW0009212

Legal Owner

*NAME: RON MIERSMA

COMPLETED

*ADDRESS 1: 14441 GROVE AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY: USA

*PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 11/10/2012

### OWNER MAILING ADDRESS

☐ Same as Owner

CARE OF: ROM MIERSMA DBA: H & R DAIRY

ADDRESS1: 14441 GROVE AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

## F- FACILITY INFORMATION — FACILITY ID: FA0010971

*NAME: H & R DAIRY CERS ID: 10052083

*ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

*PHONE: 909-376-3379 EXT: ALT PHONE: 909-376-3373 EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FARM FYI LAST UPDATED: 04/18/2011

### FACILITY MAILING ADDRESS

☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: H & R DAIRY

CARE OF: RON MIERSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

*EMAIL:

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

## A- A/R INFORMATION — ACCOUNT ID: AR0012409

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY: H & R DAIRY

CARE OF: RON MEIRSMA

ADDRESS 1: 14441 GROVE AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

PHONE: 909-376-3379 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 10/17/2012

FYI ANNIVERSARY DATE: 11/30/2007 FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI TOTAL DUE: 598.05

ENVIRONMENTAL CONTACT NAME: RON MIERSMA EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☒ ZERO OUT BALANCE | PT0018909 | ACTIVE | 4221-HAZMAT HANDLER 0- | 12/01/2011 | 11/30/2012 |

| GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. |
|---|---|---|
| PR0017775 | ACTIVE, BILLABLE | |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? (Yes) No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? (Yes) No

*DATE SUBMITTED: 12-12-12 DATE ENTERED: ENTERED DEC 17 2012 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Leslie Heaviside ENTERED BY: *Demand bill for updated PEs: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

Reverse IN0086049 + delinq. charges.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

per discussion with owner: cattle sold to new dairy operating at this location since 4-1-12. Reverse invoice IN0086049.

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

Owner address update

# HAZARDOUS MATERIAL FIELD SERVICE
# COMPUTER DATABASE UPDATE AUTHORIZATION

COMPLETED

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: F

## O- OWNER INFORMATION

OWNER ID: OW0009212

NAME: RON MIERSMA

ADDRESS 1: ~~14213 BON VIEW AVE~~ 14451 Bon View Ave ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED:

### OWNER MAILING ADDRESS

CARE OF: ROM MIERSMA DBA: H & R DAIRY

ADDRESS1: ~~14213 BON VIEW AVE~~ 14451 Bon View Ave ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

## F- FACILITY INFORMATION

FACILITY ID: FA0010971

NAME: H & R DAIRY

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 CITY CODE: ONTARIO

SIC CODE: BUSINESS CODE: BUSINESS TYPE: FARM

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03

PHONE: 909-376-3379 EXT: FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE: 909-376-3373 EXT: FAX: LAST UPDATED: 12/18/2007

### FACILITY MAILING ADDRESS

BUSINESS NAME: H & R DAIRY

CARE OF: RON MIERSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0012409

RESPONSIBLE PARTY: H & R DAIRY

CARE OF: RON MEIRSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

PHONE: 909-376-3379 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 12/06/2007

ALT PHONE: EXT: EXEMPT FROM BILLING: NO TAX ID:

ANNIVERSARY DATE: 07/31/2007 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT0018909 | ACTIVE | 4221 | ,1/2007 | 07/31/2008 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0017775 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 12/27/07 DATE ENTERED: 12/28/07 FISCAL DATE:

SUBMITTED BY: Leslie Heavisile ENTERED BY: CW

**COMMENTS/REMARKS:**

Per BP: update owner address.

# HAZ DOUS MATERIAL FIELD SERVI S
# COMPUTER DATABASE UPDATE AUTHORIZATION

New Facility

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE:

## O- OWNER INFORMATION

OWNER ID: New 9212

NAME: Ron Miersma

ADDRESS 1: 14213 Bon View Ave. ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 COUNTRY:

PHONE: (909)376-3373 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED:

### OWNER MAILING ADDRESS

CARE OF: Ron Miersma DBA: H&R Dairy

ADDRESS1: 14213 Bon View Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: New 10971

NAME: H&R Dairy

ADDRESS 1: 14213 Bon View Ave. ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 CITY CODE: Ontario

SIC CODE: BUSINESS CODE: 2 BUSINESS TYPE: 3

CENSUS: SUPERVISORIAL DISTRICT: 4 INSPECTION DISTRICT: 3

PHONE: (909)376-3379 EXT: FIRE JURISDICTION: Ontario Fire

ALT PHONE: EXT: FAX: LAST UPDATED:

RCD SDD FIRE FISCAL
MAY 22 PM 4: 13

### FACILITY MAILING ADDRESS

BUSINESS NAME: H&R Dairy

CARE OF: Ron Miersma

ADDRESS 1: 14213 Bon View Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: New

RESPONSIBLE PARTY: H&R Dairy

CARE OF: Ron Miersma

ADDRESS 1: 14213 Bon View Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 COUNTRY:

PHONE: (909)376-3379 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED:

ALT PHONE: EXT: EXEMPT FROM BILLING: TAX ID:

ANNIVERSARY DATE: TOTAL DUE: ACCOUNT STATUS:

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | N/A<br>PERMIT NUMBER. | PERMIT STATUS | N/A<br>ORIGINAL P.E. | EFFECTIVE DATE | 7/31/07<br>EXPIRATION DATE |
| GHP OR UST ID | CURRENT STATUS(BILLING) | NA<br>GHP FOR UST(PH) | NA<br>CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ADD NEW P.E. | 4221<br>NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 5 NUMBER OF UST'S 0 MFR #

ENTERED

DATE SUBMITTED: 8-May-2006 DATE ENTERED: MAY 18 2007 FISCAL DATE:

SUBMITTED BY: Shane Barlas ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

Please update everything
- New Facility
  note* "Costa, Di Mas" was the previous Facility at this address. (FA0000395)
- New P.E. 4221

Thanks
Shane Barlas

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

ATTN : ROM MIERSMA
RON MIERSMA
14451 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2011** **Expiration Date: 11/30/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Mark A. Hartwig, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

ATTN : RON MIERSMA
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.**

**Effective Date: 8/1/2010** **Expiration Date: 7/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Danny R. Wurl

Danny R. Wurl, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

ATTN : RON MIERSMA
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.**

**Effective Date: 8/1/2009** **Expiration Date: 7/31/2010**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : RON MIERSMA
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.

**Effective Date: 8/1/2008** **Expiration Date: 7/31/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : RON MIERSMA
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.

Effective Date: 8/1/2007 Expiration Date: 7/31/2008

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

12-20962-638 Rev. 9/06

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# BUSINESS OWNER / OPERATOR IDENTIFICATION

FACILITY ID # F A 0 0 1 0 9 7 1 (This number is on your CUPA permit.)

EFFECTIVE DATE 100 | ENDING DATE 101

BUSINESS NAME (Same as FACILITY NAME or DBA): H & R DAIRY

BUSINESS PHONE: 909-606-2996

BUSINESS SITE ADDRESS 103: 14213 BON VIEW AVE

CITY 104: ONTARIO, CA | COUNTY 108: SAN BERNARDINO | STATE: CA | ZIP CODE 105: 91762

D&B NUMBER | PRIMARY SIC/NAICS CODE 107 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: DAIRY FARM

BUSINESS OPERATOR NAME 109: RON MIERSMA | BUSINESS OPERATOR PHONE 110: 909-606-2996

## II. BUSINESS OWNER

OWNER NAME 111: RON MIERSMA | OWNER PHONE 112: 909-606-2996

OWNER MAILING ADDRESS 113: 14451 BON VIEW AVE

CITY 114: ONTARIO | STATE 115: CA | ZIP CODE 116: 91762

## III. ENVIRONMENTAL CONTACT

CONTACT NAME: RON MIERSMA | CONTACT PHONE 118: 909-356-3333

CONTACT MAILING ADDRESS 119: 14451 BON VIEW AVE

CITY 120: ONTARIO | STATE 121: CA | ZIP CODE 122: 91762

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123: RON MIERSMA | NAME 128: CARLOS GONZALEZ |
| TITLE 124: OWNER | TITLE 129: FOREMAN |
| BUSINESS PHONE 125: 909-356-3333 | BUSINESS PHONE: ~~909~~-732-8397 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126 | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131 |
| PAGER/CELL # 127: 909-356-3333 | PAGER /CELL # 132: 909-732-8397 |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

SIGNATURE OF OWNER/OPERATOR: [signature] | NAME OF SIGNER (*print*) 136: RON MIERSMA | DATE 134: 10/24/03

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 1 0 9 7 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): H & R DAIRY 3

FACILITY ADDRESS: 14213 BON VIEW AVE

CITY: ONTARIO 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

| BUSINESS MAILING ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 14451 BON VIEW AVE | ONTARIO | CA | 91762 |

| BUSINESS FAX NUMBER | BUSINESS E-MAIL |
|---|---|
| | |

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

| | SHIFT 1 | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION |
|---|---|---|---|---|
| Total # of Employees per shift | 4 | 2 | | 9-5, 9-5 |

| | TOTAL # EMPLOYEES | TAXPAYER ID NUMBER |
|---|---|---|
| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | 7 | |

| ASSESSORS PARCEL NUMBER (S) | CROSS STREET |
|---|---|
| | |

BUSINESS DESCRIPTION

Number of Underground Storage Tanks located at this facility

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☒ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 10/24/07

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# BUSINESS OWNER / OPERATOR IDENTIFICATION

[redacted]

FACILITY ID # F A 0 0 1 0 9 7 1 (This number is on your CUPA permit.)

EFFECTIVE DATE 100 | ENDING DATE 101 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA): H&R DAIRY

BUSINESS PHONE: 909-606-2996

BUSINESS SITE ADDRESS 103: 14213 BON VIEW AVE

CITY 104: ONTARIO, CA | COUNTY 108: SAN BERNARDINO | STATE: CA | ZIP CODE 105: 91762

D&B NUMBER | PRIMARY SIC/NAICS CODE 107 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: DAIRY FARM

BUSINESS OPERATOR NAME 109: RON MIERSMA | BUSINESS OPERATOR PHONE 110: 909-606-2996

## II. BUSINESS OWNER

OWNER NAME 111: RON MIERSMA | OWNER PHONE 112: 909-606-2996

OWNER MAILING ADDRESS 113: 14451 BON VIEW AVE

CITY 114: ONTARIO | STATE 115: CA | ZIP CODE 116: 91762

## III. ENVIRONMENTAL CONTACT

CONTACT NAME: RON MIERSMA | CONTACT PHONE 118: 909-356-3333

CONTACT MAILING ADDRESS 119: 14451 BON VIEW AVE

CITY 120: ONTARIO | STATE 121: CA | ZIP CODE 122: 91762

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123: RON MIERSMA | NAME 128: CARLOS GONZALEZ |
| TITLE 124: OWNER | TITLE 129: FOREMAN |
| BUSINESS PHONE 125: 909-356-3333 | BUSINESS PHONE: ~~909~~-732-8397 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126 | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131 |
| PAGER/CELL # 127: 909-356-3333 | PAGER /CELL # 132: 909-732-8397 |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

SIGNATURE OF OWNER/OPERATOR: [signature] | NAME OF SIGNER (print) 136: RON MIERSMA | DATE 134: 10/24/03

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# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 1 0 9 7 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): H&R DAIRY 3

FACILITY ADDRESS: 14213 BON VIEW AVE

CITY: ONTARIO 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

| BUSINESS MAILING ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 14451 BON VIEW AVE | ONTARIO | CA | 91762 |

| BUSINESS FAX NUMBER | BUSINESS E-MAIL |
|---|---|
| | |

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|---|---|---|---|---|
| Total # of Employees per shift | 4 | 2 | | 9-5, 9-5 |

| | TOTAL # EMPLOYEES | TAXPAYER ID NUMBER |
|---|---|---|
| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | 7 | |

| ASSESSORS PARCEL NUMBER (S) | CROSS STREET |
|---|---|
| | |

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4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

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Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 10/24/03

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| H & R DAIRY | |
| FACILITY ADDRESS 103 | CITY 104 |
| 14213 BONVIEW AVE | ONTARIO |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification:** **If a situation is an emergency, call 911 first**. Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | 911 |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | (800) 33-TOXIC or (909) 386-8425 |
| 3. *State of California, Governor's Office of Emergency Services | (800) 852-7550 or (916) 845-8911 |
| 4. National Response Center | (800) 424-8802 |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date: 10/25/07

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

BUSINESS NAME (Same as FACILITY NAME or DBA)
HYR DAIRY

FACILITY ADDRESS 103: 14213 BONVIEW AVE
CITY 104: ONTARIO

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:
For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

UPON AN EMERGENCY, ALL EMPLOYEES ARE TO MEET AT THE PARKING LOT SOUTH OF THE MILK BARN & IN FRONT OF MY OFFICE. ALL NEED TO KNOW PEOPLE WILL BE CALLED IMMEDIATELY.

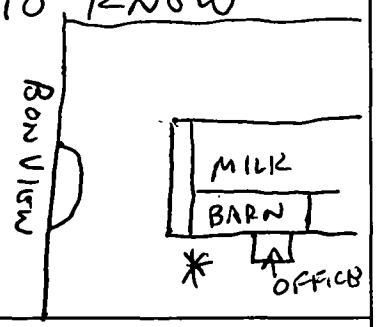


**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√Check those items that apply and write additional information in the space provided).

- [x] Reduction of containers on site if not used or needed.
- [x] Containers are properly labeled and closed when not in use.
- [ ] Compressed gas cylinders are properly secured.
- [ ] Use of monitoring system. Type: _____
- [ ] Other:

Date: 10/25/07

BUSINESS NAME (Same as FACILITY NAME or DBA)
H+R DAIRY

| FACILITY ADDRESS 103 | CITY 104 |
|---|---|
| 14213 BON VIEW AVE | ONTARIO |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- [x] New employee training.
- [x] Annual training & periodic refresher courses.
- [x] Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- [x] Spill control equipment
- [ ] Monitoring system
- [x] Personal Protective Equipment
- [x] On the job training. Describe below.
- [ ] Other:

PUT EACH EMPLOYEE THROUGH AN ANNUAL TRAINING & REFRESHER COURSE. MAKE SURE THEY KNOW HOW TO USE SPILL EQUIPMENT & PROTECTIVE EQUIPMENT

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- [x] Identify potential hazards and determine whether a release has occurred.
- [x] Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- [x] Coordinate the notification and evacuation of employees and customers from the facility.
- [x] Make required agency notifications and request needed assistance.
- [x] Assist responding agencies by providing access to the facility and information about the facility.
- [ ] Other:

Date: 10/25/07

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**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

BUSINESS NAME (Same as FACILITY NAME or DBA): A&R DAIRY

FACILITY ADDRESS (103): 14213 BON VIEW AVE

CITY (104): ONTARIO

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | 2 | |
| ☒ First aid kit(s) | 2 | |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☒ Personal Protective Equipment | 2 | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste
- ☐ Process vessels
- ☒ Aboveground storage tanks
- ☒ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☐ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler
- ☐ Emergency response team
- ☐ Local Hospitals
- ☐ Other:
- ☒ No arrangements or agreements at this time

Date: 10/25/07

## HELPFUL HINTS FOR COMPLETING THE INVENTORY SECTION

**Congratulations! You have completed the first half of the plan. The following pages require review of the hazardous materials and hazardous wastes at your facility to determine which items require disclosure.**

**Here are some helpful hints to assist you in filling out the hazardous materials inventory section:**

1) This CUPA offers an example business plan that is available on our website or by mail. If you are unfamiliar with the business plan requirement, we recommend that you look at the example before you get started so you can see how inventory summary, chemical description pages, and maps work together.

2) Before you start filling out forms, determine how many items require disclosure and make the appropriate number of copies of the Inventory Summary form and the Chemical Description form. Note the following criteria when determining which items require disclosure in the inventory section: hazardous materials with a maximum quantity of greater than 55 gallons, 500 pounds, or 200 cubic feet; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives.

3) Assign a unique item number to each inventoried item (e.g. 1,2,3, etc.) This same item number is used on the Inventory Summary, on the individual Chemical Description form, and to show the storage location(s) on the facility map.

4) Each inventoried item requires a Chemical Description page that gives additional details about each chemical. Material Safety Data Sheets (MSDSs) and container labels are the main sources of chemical information. Wastes do not have MSDSs, but waste analysis, profiles, or manifests may have useful information.

5) Review Appendix I to determine which inventoried items require submission of a Material Safety Data Sheet (MSDS). If the substance is not listed in Appendix I, attach the MSDS for that chemical to the corresponding individual Chemical Description page. Anytime you update or refile the Chemical Description Page, make sure to attach the current MSDS. If you do not have a MSDS for a material, you can get one from your chemical vendor and you need them for compliance with the OSHA Hazard Communication Standard. Hazardous wastes do not have MSDSs.

6) Materials and wastes of the same chemical (e.g. lubricating oil and used oil) require separate Chemical Description pages..

7) Since the Chemical Description Page requires location information, you will have to complete the facility map(s) before you can finalize the Chemical Description pages.

8) The Maximum Quantity should reflect the maximum amount that could ever be onsite at any one time. The maximum listed on the Inventory Summary and the maximum listed on the individual Chemical Description form should be the same.

9) Typically, liquids are disclosed in gallons, solids in pounds and compressed gases in cubic feet. If you have questions regarding the correct unit type for an item, contact this department for assistance.

10) Signatures: The Inventory Summary form requires the Owner/Operator signature. Additionally, EPCRA filers are required to sign all individual Chemical Description forms.

Note: If you have a large warehouse, trade secrets, or other unique situation, please call our office before you fill out chemical description pages. We can help you develop an inventory that will meet the requirements and accommodate a unique situation.

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 1 0 9 7 1 — 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): H&R DAIRY

FACILITY ADDRESS 103: 14213 BONVIEW AVE

CITY 104: ONTARIO

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | FUEL TANK - DIESEL | 500 | 500 | GAL. |
| 2 | CHLORINE BARRELS - LIQUID | 110 | 55 | GAL |
| 3 | ACID DETERGENT | 110 | 55 | GAL |
| 4 | CHLORINE - POWDER | 800 | 400 | lbs |
| 5 | FUEL TANK - DIESEL | 55 | 55 | GAL |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| [signature] | RON MIERSMA | 10/23/03 |

Inventory Summary Page ____ of ____

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages; otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

***ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.***

**ITEM NUMBER ____1____**

| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION |
|---|---|---|
| BUSINESS NAME: H & R Dairy | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 14213 Bon View Ave. | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME: Diesel | TRADE SECRET ☒ NO — Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Diesel | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B) *If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)* ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE — RADIOACTIVE? Yes ☐ No ☒ — CURIES N/A

PHYSICAL STATE *(Check one item only)* ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST — SIZE OF LARGEST CONTAINER: 500

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 500 | 500 | | |

UNITS* *(Check one item only)* ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: — DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*
☒ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER _____

STORAGE PRESSURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 100 | Diesel | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER ____2____

| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION |
|---|---|---|
| BUSINESS NAME: H & R Dairy | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 14213 Bon View Ave. | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME: Chlorine | TRADE SECRET ☒ NO — Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Sodium Hypochlorite | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B) *If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE? Yes ☐ No ☒ CURIES N/A

PHYSICAL STATE *(Check one item only)*: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST

SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 55 | 110 | | |

UNITS* *(Check one item only)*: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER:

DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:

| | | | | |
|---|---|---|---|---|
| ☒ a. ABOVEGROUND TANK | ☐ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 12.5 | Sodium Hypochlorite | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER ____3____

| | | |
|---|---|---|
| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION |
| BUSINESS NAME: H & R Dairy | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 14213 Bon View Ave. | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME: Acid Detergent | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Acid Detergent | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES N/A

PHYSICAL STATE *(Check one item only)*: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 55 | 110 | | |

UNITS* *(Check one item only)*: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:
☒ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER _____

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. | Acid Detergent | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

**ITEM NUMBER ____4____**

| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION |
|---|---|---|
| BUSINESS NAME: H & R Dairy | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 14213 Bon View Ave. | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME: Chlorine Powder | TRADE SECRET ☒ NO — Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Chlorine Powder | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B) *If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE? Yes ☐ No ☒ CURIES N/A

PHYSICAL STATE *(Check one item only)*: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST

SIZE OF LARGEST CONTAINER: 400

FED HAZARD CATEGORIES: ☐ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 400 | 800 | | |

UNITS* *(Check one item only)*: ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS ☐ E. OTHER:

DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:

| | | | | |
|---|---|---|---|---|
| ☒ a. ABOVEGROUND TANK | ☐ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. | Chlorine Powder | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER ___4___

| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION | |
|---|---|---|---|
| BUSINESS NAME<br>H & R Dairy | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS<br>14213 Bon View Ave. | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME<br>Diesel | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME<br>Diesel | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)* ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES N/A

PHYSICAL STATE *(Check one item only)* ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 55 | 55 | | |

UNITS* *(Check one item only)* ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE 365

STORAGE CONTAINER *(Check all that apply)*

| | | | | |
|---|---|---|---|---|
| ☐ a. ABOVEGROUND TANK | ☐ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☒ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 100 | Diesel | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0010971 Facility Name: H & R Dairy Inspection Date: 12/12/12

Site Address: 14213 S. Bon View Ave. Phone #: 909-376-3379

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:

☐ Inspect ☐ Photograph Name: ---------- Title: ---------- # Emp: ----

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | X |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(e) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(e) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(e)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | X |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | X |
| 206. Regulated Substances registration filed | CHSC 25533 | | | X |
| 207. SPCC Plan prepared | CHSC 25270.4.5 | | | X |

**INSPECTION NARRATIVE**

An inspection was conducted to verify this business is no longer in operation at this location. Per copy of bill of sale, cattle were sold to another company that began operating a new dairy at this location on 4/1/12.

Business vacated this location prior to permit expiration; therefore, invoice IN0086049 for 2012/13 permits is not applicable. Invoice will be reversed and hazardous material handler permit will be inactivated.

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] Sign Name — Leslie Heaviside

Received By: USPS Sign Name — ----------

Title: ----------

Report Date: December 12, 2012

# BILL OF SALE

*KNOW ALL MEN BY THESE PRESENTS:* That DOROTHY MIERSMA, TRUSTEE, RON MIERSMA, TRUSTEE, DENISE MIERSMA, TRUSTEE, DBA H & R DAIRY, hereinafter designated as the Seller(s), for good and valuable consideration in and with lawful money of the United States of America, to them in hand paid by CRAIG GORDON, DBA GORDON HAY, INC., hereinafter designated as the Purchaser(s), the receipt whereof is hereby acknowledged, do by these presents grant, bargain, sell, and convey unto the Purchaser(s), executors, administrators, and assigns; the following described Personal Property;

58 head consisting of mature Holstein dairy cattle of various ages and descriptions.

*TO HAVE AND TO HOLD*, the same to the said Purchaser(s) their Executors, administrators and assigns forever. And the said Seller(s) do convey for their heirs, executors and administrators covenant and agree to and with the said Purchaser(s), their executors, administrators and assigns, to warrant and defend the title to the said property, goods and chattels hereby conveyed, against the just and lawful claims and demands of all persons whomsoever.

*WITNESS* our hands and seals this 7th day of March, 2012.

DOROTHY MIERSMA, TRUSTEE
RON MIERSMA, TRUSTEE
DENISE MIERSMA, TRUSTEE
DBA H & R DAIRY

Dorothy Miersma Trustee
Dorothy Miersma, Trustee

Ron Mi Trustee
Ron Miersma, Trustee

Denise Miersma Trustee
Denise Miersma, Trustee

APPROVED AS TO FORM AND CONTENT

CRAIG GORDON, DBA GORDON HAY, INC.

Craig Gordon

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden


October 17, 2007

RON MIERSMA
14213 BON VIEW AVE
ONTARIO, CA 91761

**ATTN: RON MIERSMA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0010971-H & R DAIRY**
**14213 BON VIEW AVE**
**ONTARIO, CA 91761**

Mr. Miersma,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 02, 2007:

- Failure to establish a Business Plan
- Failure to submit/update a Business Plan
- Failure to train facility personnel in hazardous waste management procedures

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at SBARBAO@SBCFIRE.ORG.

**SHANE BARBAO**
**Hazardous Materials Division, Field Services Section**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460
www.sbcfire.org

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

[redacted]

For Dept Use Only – Log In/Date Stamp

RECEIVED
OCT 10 2007
S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 1 0 9 7 1 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA) 3
H & R DAIRY

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 14213 BON VIEW AVE | ONTARIO | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☒ * Business Activities Form
- ☒ * Business Owner/Operator Identification Form
- ☒ * Supplemental Emergency Contact Page
- ☒ Emergency Response Plans and Procedures
- ☒ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☒ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☒ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☒ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☒ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☒ Area map - photocopied city map with location of site indicated
- ☒ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☒ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☒ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.

- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER 135 |
|---|---|---|
| Ron Miersma | 10/24/07 | |
| **NAME OF SIGNER (*print*)** | **TITLE OF SIGNER (*print*)** | |
| RON MIERSMA | OWNER | |

ENTERED DEC 18 2007

FD SENT DEC 12 2007

## BUSINESS EMEI .CY/CONTINGENCY PLAN COVER SHEET :RUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

**CUPA**
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**620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

**FACILITY ID #** F A 0 0 1 0 9 7 1 [redacted]

**BUSINESS NAME** (Same as FACILITY NAME or DBA): H&R DAIRY

**EPA ID # (Hazardous Waste Only):**

**BUSINESS ADDRESS:** 14213 BON VIEW AVE

**CITY:** ONTARIO

**ZIP CODE:** 91762

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page Instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California Identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

# Business Emergency/Contingency Plan Receipt

Mail to: H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

Site Address: H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

Service Request ID: SR0014813
Facility ID: FA0010971

The Business Emergency/Contingency Plan was received on October 10, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.
2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.
3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.
4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.
5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.
2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.
3. Change of business address, business ownership, or business name.
4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

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# CERTIFICATE OF COMPLIANCE

Page 1 of 1

**Return Certification within** 30 **Days of Receipt to Inspector** Shane Barbao

*In the Matter of Respondent:* Ron ~~Miersma~~ Miersma

*Violation(s) cited on:* 3-May-2007 *FA #::* FA0010971

*Facility Name:* H and R Dairy

*Site Address:* 14213 Bon View

*Certificate of Compliance Date:* 3-May-2007

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| *Signature* | 11/8/07 *Date* |
| RON MIERSMA *Printed or Typed Name* | Owner *Title* |
| *Social Security/Federal ID Number* | *Drivers License/ID Number* |

*Attach the following documentation when returning the Certificate of Compliance:*

(1) Submit documentation showing that an employee safety program had taken place.
(2) Pay invoice for the hazardous materials handler permit. Invoice will be mailed to facility.
(3) Submit original and one copy of the business emergency/contingency plan. Keep one copy on site.

**CUPA**

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000395 Facility Name: H and R Dairy Inspection Date: 3-May-2007

Site Address: 14213 Bon View Phone #: 909-376-3373

City: Ontario Zip Code: 91710 EPA ID #: N/A

Consent Granted by:

☒ Inspect ☒ Photograph Name: Ron ~~Miersna~~ Miersma Title: Owner # Emp: 5

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | X | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(a) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | X | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | X | | |
| 202. Business Plan established | CHSC 25503.5 | X | | |
| 203. Business Plan submitted/updated | CHSC 25505 | X | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | X | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |
| 230. Business Plan implemented | CHSC 25503.5 | | | X |

**INSPECTION NARRATIVE**

Unannounced inspection conducted at H and R Dairy on 3-May-2007. Purpose of inspection was to determine compliance with hazardous materials and waste laws. Ron Miersma accompanied me on the inspection.

Facility is a dairy. ~~that~~ Facility stores hazardous materials as a result of plant (dairy) sanitization ~~and~~ and vehicle fueling (diesel).

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: Shane Barbao (Sign Name) Received By: (Sign Name) Title: Owner

Shane Barbao (Print Name) Ron Miersma (Print Name) Report Date: 3-May-2007

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: 3-May-2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000395 | H and R dairy | 14213 Bon View |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Ron Miersma | TITLE Owner |

Hazardous materials inventory
(2) 400 pound drums of caustic cleaner
(1) 55 gallon drum of acid cleaner.
(2) 30 gallon drums of sodium hypochlorite, 12.5%
(2) 55 gallon drums of sodium hypochlorite, 12.5%
(7) 50 pound bags of copper sulfate.
(1) 500 gallon (AST) aboveground storage tank of diesel
Unknown amount of R-409(A) refrigerant gas in the cooling system. (the chiller)

Hazardous waste inventory
no hazardous waste was observed

Documentation
Vehicle maintenance performed by Kent Avery.
Permits not current.
Packet left on site
Universal waste

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: Shane Barbar (Sign Name) Received By: Ron Mie (Sign Name) Title: Owner
Shane Barbar (Print Name) Ron Miersma (Print Name) Report Date: 3-May-2007

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: 3-May-2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000390S | H and R Dairy | 14213 Bon View |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Ron Miersma | TITLE Owner |

Correct the following violations within 30 days:
201- Hazardous material handler permit not current. CC23.0602
Violation: Your facility does not have a hazardous material handler permit.
Compliance Requirement: (Hazardous material handler permit) invoice will be mailed to facility. Pay invoice.

202- Business plan not established. CHSC 25503.5
203- Business plan not submitted. CHSC 25505
Violation: Your facility did not submit a business plan.
Compliance Requirement: Submit original and one copy of the business emergency / contingency plan to the address above. Keep one copy on site.

131- Training documentation not completed. CCR 66265.16
Violation: Your facility did not provide any type of safety training.
Compliance Requirement: Provide safety training to your employees. Submit a copy of your safety plan and ~~a copy the~~ documentation showing that the safety training took place.

Submit signed Certificate of Compliance along with requested documentation within 30 days to 620 S. "E" St., San Bernardino, CA 92415
Any questions, please call (909) 386-8445.

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: Shane Barba (Sign Name) — Shane Barbar (Print Name)
Received By: [signature] (Sign Name) — Ron Miersma (Print Name)
Title: Owner
Report Date: 3-May-2007

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# CERTIFICATE OF COMPLIANCE



**Return Certification within** 30 **Days of Receipt to Inspector** Shane Barbao

*In the Matter of Respondent:* Ron ~~Miersna~~ Miersma

*Violation(s) cited on:* 3-May-2007 *FA #::* FA0000395

*Facility Name:* H and R Dairy

*Site Address:* 14213 Bon View

*Certificate of Compliance Date:* 3-May-2007

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| *Signature* | *Date* |
| *Printed or Typed Name* | *Title* |
| *Social Security/Federal ID Number* | *Drivers License/ID Number* |

*Attach the following documentation when returning the Certificate of Compliance:*

(1) Submit documentation showing that an employee safety program had taken place.
(2) Pay invoice for the hazardous materials handler permit. Invoice will be mailed to facility.
(3) Submit original and one copy of the business emergency/contingency plan. Keep one copy on site.

# PHOTO NARRATIVE



**PHOTO 1**

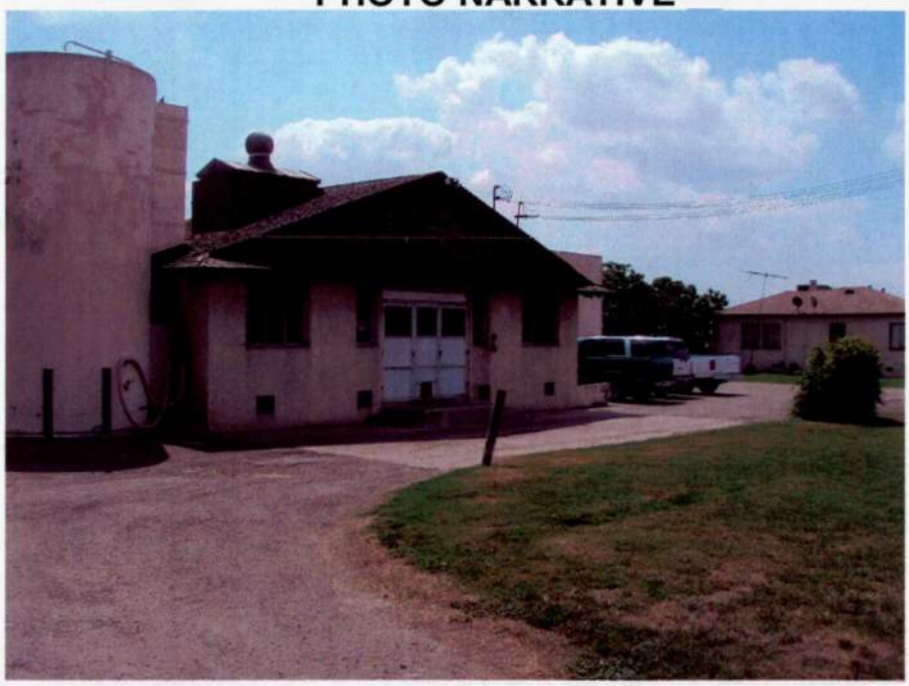

**PHOTO 2**

Facility/Case Name: **H&R Dairy** Facility ID #: **FA0000395**

Address: **14213 Bon View Ontario, CA 91710**

1) Description: **The front entrance to H&R Dairy.**

2) Description: **(2) Four hundred pound (plastic lined, cardboard) drums of chlorinate caustic. Area located at the west end of the facility.**

Date Taken: **03-May-2007**

Taken By: **Shane Barbao** Signature: Shane Barbao

Revised 10/12/2000

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

| | | | |
|---|---|---|---|
| Facility/Case Name: | **H&R Dairy** | Facility ID #: | **FA0000395** |
| Address: | **14213 Bon View Ontario, CA 91710** | | |
| 3) Description: | **Inventory from left to right. (2) four hundred pound (plastic lined, card board) drums of chlorinated caustic, (1) 55-gallon (white poly) drum of acid cleaner, and (2) 30-gallon (white poly) drums of sodium hypochlorite, 12.5%. Area located at the east end of the facility.** | | |
| 4) Description: | **(2) 55-gallon (black poly) drums of sodium hypochlorite, 12.5%. Area at the north end of the facility's yard.** | | |
| Date Taken: | **03-May-2007** | | |
| Taken By: | **Shane Barbao** | Signature: | Shane Barb |

Revised 10/12/2000

# PHOTO NARRATIVE



**PHOTO 5**

**PHOTO 6**

| | | | |
|---|---|---|---|
| Facility/Case Name: | **H&R Dairy** | Facility ID #: | **FA0000395** |
| Address: | **14213 Bon View Ontario, CA 91710** | | |
| 5) Description: | **(1) 500-gallon (red metal AST) tank of diesel. Area located at the northeast end of the facility.** | | |
| 6) Description: | **(7) 50-pound (white plastic bags) of copper sulfate. Area located at the south west end of the facility.** | | |
| Date Taken: | **03-May-2007** | | |
| Taken By: | **Shane Barbao** | Signature: | Shane Barbao |

Revised 10/12/2000

# HAZA DUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000314

NAME: ~~COSTA, DIMAS~~ ~~H and R Dairy~~ Ron Miersma

ADDRESS 1: ~~14451 BON VIEW AVE~~ 14213 Bon View Ave ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: 91710-9171 COUNTRY:

PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Ron Miersma DBA: ~~COSTA, DIMAS~~ H and R Dairy

ADDRESS1: 14451 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: 91710 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000395

NAME: ~~AG COSTA, DIMAS~~ H and R Dairy

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ ~~Chino~~ Ontario STATE: CA ZIP CODE: 91710-1710 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: BUSINESS CODE: 2 BUSINESS TYPE: 3

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 3

PHONE: EXT: FIRE JURISDICTION: CHINO VALLEY FIRE

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG COSTA, DIMAS~~ H and R Dairy

CARE OF: Ron Miersma

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91710-1710 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000397

RESPONSIBLE PARTY: Ron Miersma

CARE OF: H and R Dairy

ADDRESS 1: 14213 Bon View Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91710 COUNTRY:

PHONE: 909-376-3379 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 04/05/2007

ALT PHONE: EXT: EXEMPT FROM BILLING: YES TAX ID:

ANNIVERSARY DATE: 04/30/1997 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT0008[illegible] | ACTIVE | 4210 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009816 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008930 | ACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009817 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E. 4221

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NUMBER OF EMP. 5 NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 3-May-2007 DATE ENTERED: FISCAL DATE:

SUBMITTED BY: Shane Barb ENTERED BY:

COMMENTS/REMARKS:

Please update the following information
- Owner Information
- Facility information
- A/R Information
- Close P.E. 4210 and 4425
- ADD P.E 4221
- Remove Ag listing
- Business owner change
- Business name change

Thanks Shane

TRACKING SHEET FOR BUSINESS PLANS

*Establishment #*

*Facility Name:*

*Facility Site Address:*

*City:*

*Fire Agency:*

| | | |
|---|---|---|
| 2 (# of copies) | | Sent to FD |
| **Business Plans Received** | 10/10/07 | 12/12/07 |
| **Results of Review(s)** | | |
| **Deficiency** | | __/__/__ |
| **Conditional Approval** | | __/__/__ |
| **Approval** | | __/__/__ |
| | | **Sent to FD** |
| **Revised Plans Received** | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

| Other Date | Action/Documentation (update, new plan, etc.) | Staff hours |
|---|---|---|
| 12/14/12 | BP - processed. LH | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

0009003

Facility Name Change

☐ Update/Assign PEs ☐ Referral to Team CERS ☑ Closure ☐ Invoice Reversal ☐ Demand Bill
☐ Update Non-CERS Fields ☐ 0202 ☑ Other Facility Name Change ☐ 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0012146**

NAME: **GORDON, CRAIG**

ADDRESS: **16395 EUCLID Ave** ADDRESS 2:

CITY: **CHINO** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: FYI LAST UPDATED: **05/18/2017**

**FACILITY INFORMATION** — **FACILITY ID: FA0014875**

BUSINESS NAME: ~~GORDON HAY INC DAIRY #0~~ Southwest Dairy CERS ID: **10444234**

SITE ADDRESS: **14213 S BON VIEW AVE** ADDRESS 2:

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** FAX: **909-393-4408**

BUSINESS PHONE: **909-393-4408** EXT:

BUSINESS OPERATOR NAME: ~~Craig Gordon~~ Daric Ameye

OPERATOR PHONE: ~~909-393-0006~~ 909-754-4642 EXT: FYI LAST UPDATED: **06/04/2019**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **16395 S. Euclid Avenue** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **USA**

**BILLING CONTACT** — **ACCOUNT ID: AR0018064**

BILLING CONTACT NAME: ~~Craig Gordon~~ Daric Ameye

ADDRESS 1: ~~16395 Euclid Ave~~ 14213 S. Bon View ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: ~~909-393-4408~~ 909-754-4642 EXT: EMAIL: ~~Craig Gordon~~ southwestdairy@gmail.com

**ENVIRONMENTAL CONTACT**

NAME: **Craig Gordon** PHONE: **909-393-4408** EXT:

EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: **INDIVIDUAL** * BUSINESS TYPE:

* SUPERVISORIAL DISTRICT: **004** * INSPECTION DISTRICT: **03** * FIRE JURISDICTION: **ONTARIO FIRE**

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **01/31/2013** FYI LAST BILLING: **12/16/2021**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**1-Motor Vehicle Fuel, 2-Fuel Distributor, 3-Farm, 4-Processor, 6-Other

**FOR OFFICE USE ONLY:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☒ EC Entry Complete | | ☐ QC Complete | | ☐ N/A ☐ Fiscal Entry Complete | | ☐ N/A ☐ Referral to Team CERS | |
| 5/12/22 | KR | | | | | | |
| Date | Initials | Date | Initials | Date | Initials | Date | Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

**5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2**

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0025907 | ACTIVE | 4243-HAZARDOUS MATERIALS 4-10 ( | 02/01/2022 | 01/31/2023 |
| | | | GHP OR UST ID: PR0034614 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0039413 | INACTIVE | 4400-HAZWASTE GENERAL ACTIVIT' | 02/01/2019 | 01/31/2020 |
| | | | GHP OR UST ID: PR0051505 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 05/04/22 SUBMITTED BY: Erick Tilus

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection from 5/4/22, Southwest Dairy is leasing the facility from Craig Gordon. Gordon Hay Inc #3 is still the owner, but Daric Ameye operates Southwest dairy from this location.

- Maintain existing billing dates and anniversary.
- No changes in permits or operation.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

000900

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [x] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0012146

NAME: **GORDON, CRAIG**

ADDRESS: **16395 EUCLID Ave** ADDRESS 2:

CITY: **CHINO** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: FYI LAST UPDATED: **05/18/2017**

### FACILITY INFORMATION — FACILITY ID: FA0014875

BUSINESS NAME: **GORDON HAY INC DAIRY #3** CERS ID: **10444234**

SITE ADDRESS: **14213 S Bon View AVE** ADDRESS 2:

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** FAX: **909-393-4408**

BUSINESS PHONE: **909-393-4408** EXT:

BUSINESS OPERATOR NAME: **Craig Gordon**

OPERATOR PHONE: **909-228-9026** EXT: FYI LAST UPDATED: **03/04/2019**

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: **16395 S. Euclid Avenue** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **USA**

### BILLING CONTACT — ACCOUNT ID: AR0018064

BILLING CONTACT NAME: **Craig Gordon**

ADDRESS 1: **16395 Euclid Ave** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: **Craig Gordon** PHONE: **909-393-4408** EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: **INDIVIDUAL** BUSINESS TYPE:

SUPERVISORIAL DISTRICT: **004** INSPECTION DISTRICT: **03** FIRE JURISDICTION: **ONTARIO FIRE**

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **01/31/2013** FYI LAST BILLING: **12/17/2018**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| MAR 28 2019 CB | | | |
| Date / Initials | Date / Initials | Date / Initials | Date / Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| | | | 5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | | |
| ☒ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0025907<br>PERMIT NUMBER | ACTIVE<br>PERMIT STATUS | 4241-HAZARDOUS MATERIALS 1-3 C<br>ORIGINAL P.E. | 02/01/2019<br>EFFECTIVE DATE | 01/31/2020<br>EXPIRATION DATE |
| | | | PR0034614<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | 4243<br>UPDATED P.E. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | ☒ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | 5012<br>*NEW CUPA Admin P.E. |

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 3/28/2019 SUBMITTED BY: Matthew Valenzuela

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection on 3/25/19 this facility handles 4-10 chemicals above the reportable threshold.

-Update handler PE from 4241 to 4243
-Update admin PE from 5011 to 5012
-Demand bill for difference in permits.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

IN0135780
Reverse Lines 1 + 2. Updated PE's added.
Will demand.

☐ 5050 scanned and emailed to Fiscal 4/4/19 (AZ) Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

Demand billed IN0135780
Due 6.1.19
4.16.19 (AZ)

# INTEROFFICE MEMO

**DATE:** 4/4/2019 **PHONE:** 909-387-5961

**FROM:** **Lisa Goodson**
Collections Officer, Fiscal Services Division **MAIL CODE:** 0451

**TO:** **Christine Tenorio, Fiscal Services and Collections Supervisor**

**SUBJECT: Request to APPROVE/DENY financial adjustments**

The facility listed below was incorrectly billed and/or penalized due to the following reason/s:

**FA0014875 - IN0135780 – GORDON HAY INC DAIRY #3**

- ☐ Incorrect permits billed prior to update to facility permit records based on inspection.
- ☐ Facility moved to another location within the County of San Bernardino prior to permit expiration.
- ☐ There was an address error in the system.
- ☐ Admin fee assessed after payment for permit fees and delinquent fees remitted.
- ☐ Business ceased operations prior to permit billing and/or permit requirement.
- ☐ Ownership change occurred prior to permit renewal.
- ☐ Other:

Completed

Christine Tenorio

Chief Trapp

CAO Analyst Approval

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

000900

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [x] Demand Bill

**OWNER INFORMATION** — **OWNER ID: OW0012146**

NAME: **GORDON, CRAIG**

ADDRESS: **16395 EUCLID Ave** ADDRESS 2:

CITY: **CHINO** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: FYI LAST UPDATED: **05/18/2017**

**FACILITY INFORMATION** — **FACILITY ID: FA0014875**

BUSINESS NAME: **GORDON HAY INC DAIRY #3** CERS ID: **10444234**

SITE ADDRESS: **14213 S Bon View AVE** ADDRESS 2:

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** FAX: **909-393-4408**

BUSINESS PHONE: **909-393-4408** EXT:

BUSINESS OPERATOR NAME: **Craig Gordon**

OPERATOR PHONE: **909-228-9026** EXT: FYI LAST UPDATED: **03/04/2019**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **16395 S. Euclid Avenue** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **USA**

**BILLING CONTACT** — **ACCOUNT ID: AR0018064**

BILLING CONTACT NAME: **Craig Gordon**

ADDRESS 1: **16395 Euclid Ave** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: EMAIL:

**ENVIRONMENTAL CONTACT**

NAME: **Craig Gordon** PHONE: **909-393-4408** EXT:

EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL): Completed

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: **INDIVIDUAL** BUSINESS TYPE:

SUPERVISORIAL DISTRICT: **004** INSPECTION DISTRICT: **03** FIRE JURISDICTION: **ONTARIO FIRE**

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **01/31/2013** FYI LAST BILLING: **12/17/2018**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code**= 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type**=01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| [ ] EC Entry Complete | | [ ] QC Complete | | N/A [ ] [ ] Fiscal Entry Complete | | N/A [ ] [ ] Referral to Team CERS | |
| Date | Initials | Date | Initials | Date | Initials | Date | Initials |

MAR 28 2019 CB

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| | | | 5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | | |
| [X] UPDATE<br>[ ] INACTIVATE<br>[ ] ZERO OUT BALANCE | PT0025907<br>PERMIT NUMBER | ACTIVE<br>PERMIT STATUS | 4241-HAZARDOUS MATERIALS 1-3 C<br>ORIGINAL P.E. | 02/01/2019<br>EFFECTIVE DATE | 01/31/2020<br>EXPIRATION DATE |
| | | | PR0034614<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | 4243<br>UPDATED P.E. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | [X] UPDATE<br>[ ] INACTIVATE<br>[ ] ZERO OUT BALANCE |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | 5012<br>*NEW CUPA Admin P.E. |

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 3/28/2019 SUBMITTED BY: Matthew Valenzuela

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection on 3/25/19 this facility handles 4-10 chemicals above the reportable threshold.

-Update handler PE from 4241 to 4243
-Update admin PE from 5011 to 5012
-Demand bill for difference in permits.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

IN0135780
Reverse Lines 1 + 2. Updated PE's added.
Will demand.

[ ] 5050 scanned and emailed to Fiscal 4/4/19 (AL) Date Initials

[ ] 5054 scanned and emailed to Fiscal Completed Date Initials

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0012146

NAME: GORDON, CRAIG

ADDRESS: 16395 EUCLID Ave ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91708 COUNTRY: US

PHONE: 909-393-4408 EXT: FYI LAST UPDATED: 05/18/2017

### FACILITY INFORMATION — FACILITY ID: FA0014875

BUSINESS NAME: GORDON HAY INC DAIRY #3 CERS ID: 10444234

SITE ADDRESS: 14213 S Bon View AVE ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 FAX: 909-393-4408

BUSINESS PHONE: 909-393-4408 EXT:

BUSINESS OPERATOR NAME: Craig Gordon

OPERATOR PHONE: 909-228-9026 EXT: FYI LAST UPDATED: 03/04/2019

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: 16395 S. Euclid Avenue ADDRESS 2:

CITY: Chino STATE: CA ZIP CODE: 91708 COUNTRY: USA

### BILLING CONTACT — ACCOUNT ID: AR0018064

BILLING CONTACT NAME: Craig Gordon

ADDRESS 1: 16395 Euclid Ave ADDRESS 2:

CITY: Chino STATE: CA ZIP CODE: 91708 COUNTRY: US

PHONE: 909-393-4408 EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: Craig Gordon PHONE: 909-393-4408 EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: INDIVIDUAL BUSINESS TYPE:

SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: ONTARIO FIRE

FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 01/31/2013 FYI LAST BILLING: 12/17/2018

FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 253.00

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| APR 16 2019 CB | | | |
| Date / Initials | Date / Initials | Date / Initials | Date / Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

**5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0025907 | ACTIVE | 4243-HAZARDOUS MATERIALS 4-10 ( | 02/01/2019 | 01/31/2020 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| | | | PR0034614 | ACTIVE, BILLABLE | |
| | | | GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADD NEW P.E. | 4400 | | | | | | ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | |
| | | | | | | | |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | *NEW CUPA Admin P.E. |

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 4/12/2019 SUBMITTED BY: Matthew Valenzuela

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection on 3/25/2019, hazardous waste violations must be added on to this facility.

Please add new nonbillable hazardous waste PE 4400.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal _____ Date _____ Initials

☐ 5054 scanned and emailed to Fiscal _____ Date _____ Initials

NEW

File RBL

# F ARDOUS MATERIAL FIELD SE CES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) (O) F A Add PE 4221 CURRENT INVOICE MAILING CODE

**O- OWNER INFORMATION** — **OWNER ID:** new

Legal Owner 0012146

*NAME: Craig Gordon

*ADDRESS 1: 16395 Euclid ADDRESS 2:

*CITY: Chino *STATE: CA *ZIP CODE: 91708 *COUNTRY: USA

*PHONE: 909-228-9026 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED:

**OWNER MAILING ADDRESS** ☒ Same as Owner

CARE OF: DBA:

ADDRESS1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

**F- FACILITY INFORMATION** — **FACILITY ID:** new #14875

*NAME: Gordon Hay Inc. Dairy #3

*ADDRESS 1: 14213 S. Bon View Ave. ADDRESS 2:

*CITY: Ontario *STATE: CA *ZIP CODE: 91762 *CITY CODE: Ontario

*PHONE: none EXT: ALT PHONE: EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.: 4

FIRE JURISDICTION: Ontario SIC CODE:

*BUSINESS CODE: 02 *BUSINESS TYPE: 06 FYI LAST UPDATED:

**FACILITY MAILING ADDRESS** ☒ Same as Facility ☐ Same as Owner Mailing Address

BUSINESS NAME:

CARE OF:

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

*EMAIL: ☒ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name)

**A- A/R INFORMATION** — **ACCOUNT ID:** new

RESPONSIBLE PARTY: ☒ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

CARE OF: 0018064

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

PHONE: EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: EXEMPT FROM BILLING: FYI LAST UPDATED:

ANNIVERSARY DATE: 1/31/2013 ACCOUNT STATUS: TOTAL DUE:

**Business Code**= 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type**=01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to **complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

ERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

☐ UPDATE
☐ INACTIVATE
☐ ZERO OUT BALANCE

| N/A | | N/A | | | |
|---|---|---|---|---|---|
| PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE | |
| NA | NA | | | | |
| GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. | |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| 4221 | | | | | | |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| PR0034616 | | | | | | |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

s this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)
Should this facility be inactivated upon verification that there is no balance due? Yes (No)
s this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)
Does this 5050 have attached documents? Yes (No)

ENTERED

DATE SUBMITTED: 12-12-12 DATE ENTERED: DEC 14 2012 FISCAL ENTRY DATE/ INITIAL:
SUBMITTED BY: Leslie Heaviside ENTERED BY: JGuerra ***Demand bill for updated PEs**: (Yes) No

**PECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

RBC

**OMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection: new dairy operating at this location (previously FA10971 H&R Dairy). Assign primarily handler PE.

**e fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to **complete all ids** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

Craig Gordon
GORDON HAY INC DAIRY #3
14213 Bon View Ave
CHINO, CA 91762

This Unified Permit is hereby issued to:
GORDON HAY INC DAIRY #3
14213 S BON VIEW AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0014875 for a period not to exceed one year from effective date.**

**Effective Date: 2/1/2015** **Expiration Date: 1/31/2016**

**CUPA Facility Type: 5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0025907 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0034614 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mike Horton, Fire Marshal

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   Note: The UST ID Number is listed on the front of the permit for each UST

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Fire Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part2, Chapter 1,Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4 Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:2 AR:0.00

**GORDON HAY INC DAIRY #3**
**16395 EUCLID AVE**
**CHINO, CA 91708**

**This Unified Permit is hereby issued to:**
**GORDON HAY INC DAIRY #3**
**14213 S BON VIEW AVE**
**ONTARIO, CA 91762**

**Permit is issued to Facility: FA0014875 for a period not to exceed one year from effective date.**

**Effective Date: 2/1/2014** **Expiration Date: 1/31/2015**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0025907 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0034614 |
| PT0031387 | 5011 CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | PR0040273 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

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   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

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e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4, Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

CUPA
San Berna. , County Fire Department • Hazardous Ma ; Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (9 386-8460 • www.sbcfire.org

# CUPA COMPLIANCE INSPECTION REPORT

| | | |
|---|---|---|
| NAME: **SOUTHWEST DAIRY** | | FACILITY ID: **FA0014875** |
| ADDRESS: **14213 S BON VIEW AVE** | | CERS ID: **10444234** |
| CITY: **ONTARIO** | STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **5/4/2022** |

**Consent granted by:**

☒ **Photograph** ☒ **Inspect** **Name:** Daric Ameye **Title:** Operator

An inspection was conducted on 05/04/2022 to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Daric Amaye, Operator, was the escort during the inspection. Also present during the inspection was Ana Villanueva, Hazardous Materials Specialist with San Bernardino County Fire.

Southwest Dairy is a farm that produces milk. Throughout the production process, the facility handles specialized chemicals such as teat dip, velocity two detergent, acid cleaner EC, and chemclor.
Inventory:

The inventory observed at the facility during the inspection was consistent with that submitted via the California Environmental Reporting System (CERS) on 05/08/2019. CERS ID # 10444234

Document Review:

- CUPA program permits are current; expiration date of 01/31/23
- EPA ID # CAC003121794 was inactive at the time of the inspection. However, the facility is a handler only.
- The Hazardous Materials Business Plan was last updated via the CERS on 05/08/2019.

Complete and submit the Certificate of Compliance (CofC) provided along with all requested documentation, to the attention of Erick Tilus within 30 days of inspection.

Please contact Erick Tilus at (909) 386-8401 or by e-mail at etilus@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | - | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | **Hazardous Materials Business Plan Submittal** | CHSC | 25505, 25508(a)(1) | X |
| Violation: | Failure to complete and electronically submit initially, annually or triennially, a business plan when storing/handling a hazardous material at or above reportable quantities. | | | |
| MINOR | OBSERVATION: Observed the hazardous materials business plan to not be electronically submitted or certified annually. | | | |
| | CORRECTIVE ACTION: Ensure to electronically submit a hazardous materials business plan annually. | | | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | | Multiple | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508.2 | |
| H209 | Business Plan Update Within 30 days of Change | CHSC | 25508.1(a)-(f) | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | | Multiple | |
| H211 | Hazardous Materials Inventory | CHSC | Multiple | |
| H212 | Site Map | CHSC | Multiple | |
| H213 | Emergency Response Plan | | Multiple | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Not Provided and/or Documented | CHSC | 25505(a)(4) | |
| H216 | Hazardous Materials Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |

| | | | | |
|---|---|---|---|---|
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Resp Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,25 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **44** | **HAZARDOUS WASTE GENERATOR** | | - | |
| W101 | Hazardous Waste Generator CUPA Permit | SBCC | 23.0602 | |
| W102 | Facility Access for Inspection | CHSC | 25185 | |
| W103 | HWG: Hazardous Waste Determination | CCR | 66262.11 | |
| W104 | HWG: Identification Number | CCR | 66262.12 | |
| W108 | HWG: Recyclable Materials | CHSC | 25143.2, 25143.9 | |
| W110 | HWG: Hazardous Waste Labeling Standards | CCR | 66262.34(f) | |
| W111 | HWG: Hazardous Waste Tank Label | CCR | 66262.34(f) | |
| W117 | HWG: Empty Containers >5 Gallons | CCR | 66261.7 | |
| W121 | HWG: Quarantine Order | CHSC | 25187.6 | |
| W122 | HWG: Reusable Soiled Textile Materials | CHSC | 25144.6(b) | |
| W124 | HWG: Remote Consolidation Notification | CHSC | 25110.10(d) | |
| W125 | HWG: Preparation of the Hazardous Waste Manifest | CCR | 66262.20 | |
| W126 | HWG: Hazardous Waste Manifest Completeness | CCR | 66262.23(a) | |
| W127 | HWG: Hazardous Waste Manifest Not Sent to DTSC | | Multiple | |
| W128 | HWG: Hazardous Waste Disposal Documentation | CCR | 66262.40(a) | |
| W130 | HWG: Maintaining Records of Test Result for Three Years | CCR | 66262.40(c) | |
| W134 | HWG: Used Oil Certification Form | CHSC | Multiple | |
| W136 | HWG: Contamination of Used Oil | CHSC | 25250.7(a) | |
| W137 | HWG: Consolidated Manifest | CHSC | 25160.2 | |
| W138 | HWG: Used Oil Filter and Fuel Filter Handling Requirements | CCR | Multiple | |
| W139 | HWG: Lead Battery Disposal Documentation | CCR | 66266.81(a)(4)(B) | |
| W140 | HWG: Management of Spent Vehicle Lead-Acid Batteries | CCR | 66266.81(a)(1) | |
| W141 | HWG: Management of 11 or More Spent Vehicle Lead-Acid Batteries | CCR | 66266.81(a)(3) | |
| W142 | HWG: Damaged Lead Battery Handling | CCR | 66266.81(b) | |
| W145 | HWG: Improper Disposal of Hazardous Waste | CHSC | 25189.5(a) | |
| W148 | HWG: Hazardous Waste Not Transported by Registered Hauler | CHSC | 25163(a) | |
| W152 | HWG: Excluded Recyclable Materials Report | CHSC | 25143.10 | |
| W155 | HWG: Satellite Accumulation | CCR | 66262.34(e) | |
| W156 | HWG: Laboratory Accumulation Areas | CHSC | 25200.3.1(b) | |
| W157 | HWG: Laboratory Waste Treatment | CHSC | 25200.3.1 (c) | |
| W158 | HWG: Program Data Electronic Report | | Multiple | |
| W159 | HWG: Facility Information Reporting | SBCC | 23.0602,23.0712 | |
| W190 | HWG: Land Disposal Restriction | CCR | Multiple | |
| W206 | SQG: Facility Maintained to Prevent Fire/Explosion/Release | CCR | 66262.34(d)(2) | |
| W207 | SQG: Emergency Plan | CCR | 66262.34(d)(2) | |
| W213 | SQG: Time Exceeded for Hazardous Waste Conditional Accumulation (180 Days) | | Multiple | |
| W214 | SQG: Container in Poor Condition or Damaged | CCR | 66262.34(d)(2) | |
| W216 | SQG: Open Hazardous Waste Containers | CCR | 66262.34(d)(2) | |
| W218 | Generator of < 100 kg/mth: Accumulation Time Exceeded (180/270, or 90 Days for Acutely/Extremely) | | Multiple | |
| W227 | SQG: Hazardous Waste Manifest Exception Reporting | | Multiple | |
| W231 | SQG: Employee Training | CCR | 66262.34(d)(2) | |
| W238 | SQG: Weekly Hazardous Waste Storage Area Inspection | CCR | 66262.34(d)(2) | |
| W245 | SQG: Hazardous Waste Container Incompatible with Material Stored | CCR | 66262.34(d)(2) | |
| W249 | SQG: Aisle Space | CCR | 66262.34(d)(2) | |
| W268 | SQG: Incompatible Waste Storage | CCR | 66262.34(d)(2) | |
| W269 | SQG: Hazardous Waste Tank Spill Control/Overfill | CCR | 66262.34(d)(2) | |
| W270 | SQG: Daily Tank, Monitoring, and Discharge Inspection | CCR | 66262.34(d)(2) | |
| W271 | SQG: Weekly Hazardous Waste Tank Construction and System Fixture Inspection | CCR | 66262.34(d)(2) | |
| W272 | SQG: Hazardous Waste Facility Closure | CCR | 66262.34(d)(2) | |
| W273 | SQG: Tank 2ft Freeboard | CCR | 66262.34(d)(2) | |
| W280 | SQG: Emergency Coordinator | CCR | 66262.34(d)(2) | |
| W281 | SQG: Facility Emergency Equipment | CCR | 66262.34(d)(2) | |
| W282 | SQG: Emergency Equipment Maintenance | CCR | 66262.34(d)(2) | |

| | | | | |
|---|---|---|---|---|
| W306 | LQG: Facility Maintained To Prevent Fire/Explosion/Release | CCR | 66262.34(a)(4), 66265.31 | |
| W307 | LQG: Contingency Plan | CCR | 66262.34(a)(4), 66265.51 | |
| W308 | LQG: Contingency Plan Copies | CCR | 66262.34(a)(4), 66265.53 | |
| W309 | LQG: Contingency Plan Emergency Action Plan | CCR | 66262.34(a)(4), 66265.5: | |
| W313 | LQG: Hazardous Waste Accumulation Time Exceeded | | Multiple | |
| W314 | LQG: Container in Poor Condition or Damaged | CCR | 66262.34(a)(1), 66265.17 | |
| W316 | LQG: Open Hazardous Waste Container | CCR | 66262.34(a)(1), 66265.17 | |
| W318 | LQG: Weekly Hazardous Waste Storage Areas Inspection | CCR | 66262.34(a)(1), 66265.17 | |
| W320 | LQG: Hazardous Waste Tank Inspections | CCR | 66262.34(a)(1), 66265.19 | |
| W321 | LQG: Hazardous Waste Tank Cathodic Inspection | CCR | 66262.34(a)(1), 66265.19 | |
| W324 | LQG: Hazardous Waste Tank Equipment Replacement | CCR | 66265.192(m) | |
| W325 | LQG: Hazardous Waste Tank Release | CCR | 66265.196 | |
| W326 | LQG: Tank Closure Requirements and Documentation | CCR | Multiple | |
| W331 | LQG: Employee Hazardous Waste Training | CCR | 66262.34(a)(4), 66265.16 | |
| W332 | LQG: Source Reduction Evaluation Review and Plan | CCR | 67100.7, 67100.8 | |
| W333 | LQG: Summary Progress Report | CCR | 67100.9 | |
| W334 | LQG: Source Reduction Implementation | CCR | 67100.5 | |
| W345 | LQG: Hazardous Waste Container Incompatible with Material Stored | CCR | 66262.34(a)(1), 66265.17 | |
| W349 | LQG: Aisle Space | CCR | 66262.34(a)(4), 66265.35 | |
| W350 | LQG: New Hazardous Waste Tank System P.E. Certification | CCR | Multiple | |
| W351 | LQG: Reassessment for Hazardous Waste Tank System P.E. Certification | CCR | 66265.192(h) | |
| W352 | LQG: New Tank Assessment Standards | CCR | 66265.192(k) | |
| W353 | LQG: Hazardous Waste Tank Standards | CCR | 66262.34(a)(1), 66265.19 | |
| W354 | LQG: Secondary Containment | CCR | 66262.34(a)(1), 66265.19 | |
| W368 | LQG: Incompatible Waste Storage | CCR | Multiple | |
| W369 | LQG: Air Emissions for Waste in Containers | CCR | Multiple | |
| W371 | LQG: Air Emissions for Wastes in Tanks | CCR | 66262.34(a)(1), 66265.20 | |
| W378 | LQG: Hazardous Waste Manifest Exception Reporting | | Multiple | |
| W380 | LQG: Emergency Coordinator | CCR | 66262.34(a)(4), 66265.55 | |
| W381 | LQG: Facility Emergency Equipment | CCR | 66262.34(a)(4), 66265.32 | |
| W382 | LQG: Emergency Equipment Maintenance | CCR | 66262.34(a)(4), 66265.33 | |
| W501 | Certified Appliance Recycler: Certification | CHSC | 25211.4 | |
| W502 | Certified Appliance Recycler: Certification | CHSC | 25211.2, 25211.3 | |
| W503 | Certified Appliance Recycler: Materials that Require Special Handling (MRSH) properly managed | CHSC | 25212 | |
| W504 | Certified Appliance Recycler: Proper Removal of Materials that Require Special Handling (MRSH) | CHSC | 25211.3, 25212(a) | |
| W901 | Universal Waste Handler: Permit | SBCC | 23.0602 | |
| W902 | Universal Waste Handler: Labeling Requirements | CCR | 66273.34 | |
| W903 | Universal Waste Handler: Accumulation Time | CCR | 66273.35 | |
| W904 | Universal Waste Handler: Employee Training | CCR | 66273.36 | |
| W907 | Universal Waste: Accumulation of Aerosol Cans | CHSC | 25201.16(f) | |
| W908 | Universal Waste: Handling of Aerosol Cans | CHSC | 25201.16(e) | |
| W911 | Universal Waste Handler: Department Notification | CCR | 66273.32(c),(e) | |
| W912 | Universal Waste Handler: Annual Report | CCR | 66273.32(d),(f) | |
| W913 | Universal Waste Handler: Release | CCR | 66273.33.5; 66273.33.6 | |
| W914 | Universal Waste Handler: USEPA Notification | CCR | 66273.32(a) | |
| W915 | Universal Waste Handler: Exporting Notification | CCR | 66273.40(a)(2)- (4) | |
| W920 | Universal Waste Handler: Illegal Disposal | CCR | 66273.31(a) | |
| W923 | Large Quantity Universal Waste Handler DTSC ID Number | CCR | 66273.32(b) | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: LTR: |
|---|---|---|
| ERICK TILUS | | |
| INSPECTOR NAME | NAME | TITLE |
| | INSPECTION DATE: 05/04/2022 | REPORT DATE: 5/13/22 12:31 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations. THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
San Berna. , County Fire Department • Hazardous Ma ; Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (, , 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ERICK TILUS within 30 days of inspection unless otherwise specified.**

RESPONDENT: Daric Ameye

VIOLATION(S) CITED ON: 5/4/2022

FACILITY NAME: **SOUTHWEST DAIRY** FACILITY ID: **FA0014875**

SITE ADDRESS: **14213 S BON VIEW AVE** CERS ID: **10444234**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H203 CORRECTIVE ACTION: Ensure to electronically submit a hazardous materials business plan annually.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

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## PRELIMINARY FIELD INSPECTION REPORT

Page 1 of 1

| | | |
|---|---|---|
| | | INSPECTION DATE: 5/4/22 |
| FACILITY ID: FA0014875 | FACILITY NAME: SOUTHWEST DAIRY | FACILITY LOCATION: 14213 S. BON VIEW, ONTARIO, CA |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME: DARIC AMEYE | TITLE: OWNER/OPERATOR |

**The following is a preliminary list of violations observed at the time of inspection. The final report may list additional violations. Violations must be corrected within 30 days of inspection unless otherwise specified below.**

AN INSPECTION WAS CONDUCTED 5/4/22 TO DETERMINE COMPLIANCE WITH ~~HAZ~~ APPLICABLE HAZARDOUS MATERIALS AND HAZARDOUS WASTE LAWS AND REGULATIONS.

THE FINAL REPORT WILL BE PROVIDED WITHIN 65 DAYS OF THE INSPECTION.

* CORRECT THE FOLLOWING VIOLATIONS WITHIN 30 DAYS:
- H203: FAILURE TO ELECTRONICALLY SUBMIT A HAZARDOUS MATERIALS BUSINESS PLAN CHSC 25505, 25508(a)(1).

CONTACT ERICK TILLIS @ ETILLIS@SBCFIRE.ORG OR 909-386-8401 WITH ANY QUESTIONS REGARDING THIS INSPECTION.

Inspected By: CTillis (Sign Name) — ERICK TILLIS (Print Name)

Received By: (Sign Name) — DARIC AMEYE (Print Name)

Title: OPERATOR

Report Date: 05/04/22

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: Southwest Dairy

Facility ID #: FA0014875

Address: 14213 S. Bon View Ave, Ontario, CA 91761

*1) Description:* The front of the facility.

*2) Description:* (1) 55-gallon drum of T-Chlor 12.5 sodium hypochlorite solution.

Date Taken: **5/4/2022**

Taken By: **Erick Tilus**

Signature: E Tilus.

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

Facility/Case Name: Southwest Dairy Facility ID #: FA0014875

Address: 14213 S. Bon View Ave, Ontario, CA 91761

*3) Description:* (1) 55-gallon drum of Velocity Two chlorinated alkaline circulation cleaner.

*4) Description:* (1) 55-gallon drum of Acid Cleaner EC.

Date Taken: **5/4/2022**

Taken By: **Erick Tilus** Signature: E Tilus.

RECEIVED
Apr mv
~~MAR~~ 09 2019
SBCFIRE - HAZMAT

# CUPA
## CUPA COMPLIANCE INSPECTION REPORT

San Bernardino County Fire Department • Hazardous Materials Division
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| | | | |
|---|---|---|---|
| FACILITY NAME: | Gordon Hay Inc. | FACILIY ID: | FA 0014875 |
| FACILITY ADDRESS: | 14213 S Bon View Ave | CERS ID: | 1044442541 CERS Desk 909-386-8432 |
| ☐ INSPECTION ☐ PHOTOGRAPHS CONSENT GRANTED BY: | NAME: Bryan Vander Dussen | TITLE: | Manager |

*This inspection was conducted to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Refer to Title 19 and 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health and Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). (V) Violation, (C) – Compliant, (N) Not applicable or not addressed. ALL violations must be corrected within 30-days unless otherwise specified.*

| CODE | VIOLATION INFORMATION & CLASSIFICATION | | V | C | N | NARRATIVE |
|---|---|---|---|---|---|---|
| H201 | Hazardous Materials Handler Permit | SBCC 23.0602(a) | | X | | H211: |
| H202 | Business Plan Established and Implemented | CHSC 25507 | | X | | OBSERVATION: Observed one and four |
| H203 | Business Plan Submittal | CHSC 25505, 25508(a)(1) | | X | | 330 gallon tanks & 330 gallons each |
| H206 | Business Plan Annual Review and Certification | CHSC 25508(a)(1), 25506.2 | | X | | CORRECTIVE ACTION: Update inventory |
| H209 | Business Plan Update within 30-days of Change | CHSC 25508.1(a)-(f) | | X | | CERS by adding 330 gallons of one time use |
| H210 | Business Activities/Owner/Operator ID Page | CHSC 25508(a)(1) | | X | | and 330 gallons of post-use dip. Submit |
| H211 | Hazardous Materials Inventory | CHSC 25505, 25506, 25508 | X | | | signed document stating inventory is updated |
| H212 | Site Map | CHSC 25505(a)(2), 25508(a)(1) | | X | | within |
| H213 | Emergency Response Plan | CHSC 25505(a)(3), 25508(a)(1) | | X | | OBSERVATION: Observed (1) 55 gallon |
| H214 | Training Program | CCR 2655, 2656, CHSC 25505(a)(4), 25508(a)(1) | | X | | drum of used oil. |
| H215 | Training Documentation | CHSC 25505(a)(4) | | X | | CORRECTIVE ACTION: Obtain hazardous |
| W101 | Hazardous Waste Generator Permit | SBCC 23.0602 | X | | | waste generator permit. |
| W103 | Hazardous Waste Determination | CCR 66262.11 | | | X | |
| W104 | EPA ID Number | CCR 66262.12 | | | X | W213 |
| W110 | Hazardous Waste Labeling Standards | CCR 66262.34(f) | | | X | OBSERVATION: Observed (1) unlabeled 55 |
| W122 | Reusable Soiled Textile Materials | CHSC 25144.6(b) | | | X | gallon drum of used oil and (1) unlabeled |
| W128 | Hazardous Waste Disposal Documentation | CCR 66262.40(a) | | | X | 55 gallon drum of unknown waste. |
| W137 | Consolidated Manifest Standards | CHSC 25100.2 | | | | CORRECTIVE ACTION: Have waste |
| W138 | Used Oil and Fuel Filter Management | CCR 66266.130, CHSC 25250.22 | | | X | hauled off by certified waste and |
| W139 | Lead Battery Disposal Documentation | CCR 66266.81(a)(9)(B) | | | X | submit a copy of waste manifest |
| W145 | Improper Disposal of Hazardous Waste | CHSC 25189.5(a), 25201(a) | | | X | along with signed statement ~~[illegible]~~ mv |
| W159 | Facility Information Reporting | SBCC 23.0602, 23.0712 | | | X | stating that the waste has been |
| W206 | Facility Maintained to Prevent Release/Fire/Explosion | CCR 66262.34(d)(2) | | | X | removed. |
| W207 | Emergency Plan | CCR 66262.34(d)(2) | | | X | |
| W213 | Hazardous Waste Accumulation | CCR 66262.34(d), CHSC 25123.3(h)(1) | X | | | Personal Review: |
| W214 | Condition of Hazardous Waste Containers | CCR 66262.34(d)(2) | | | X | Equipment is serviced by Ross Avery. |
| W216 | Open Hazardous Waste Containers | CCR 66262.34(d)(2) | | | X | Uniforms serviced by Aramark. |
| W218 | EHS Waste Accumulation | CCR 66262.34(b)(1), CHSC 25123.3(h)(1)(c), 25123.3(u) | | | X | Business plan last submitted on 3/1/19 |
| W231 | Employee Training | CCR 66262.34(d)(2) | | | X | Hazardous safety training is being |
| W238 | Hazardous Waste Storage Area Weekly Inspection | CCR 66262.34(d)(2) | | | X | conducted. |
| | | | | | | Chemicals are supplied by |
| | | | | | | SO Cal Dairy Equipment. |

| Description of Facility: | Hazmat Inventory: |
|---|---|
| Facility is a dairy farm. Hazardous materials are stored and used as disinfectants and cleaners during milking process. | Consistent with CERS submitted 3/1/19, with exception of 55 gallon drum of used oil and (1) 55 gallon drum of unknown. |

*For assistance regarding this report, please contact the inspector below @ 909-386-8401 or email* MVallenzuela *@sbcfire.org.*

THIS REPORT SHALL SERVE AS A "NOTICE TO COMPLY" FOR MINOR VIOLATIONS AND A "NOTICE OF VIOLATION" FOR CLASS I & II VIOLATIONS. ALL VIOLATIONS MUST BE CORRECTED WITHIN 30-DAYS OF INSPECTION UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN FORMAL ENFORCEMENT LEGAL ACTION. WITHIN 30-DAYS, SIGN THE CERTIFICATION BELOW AND RETURN A COPY TO THE INSPECTOR ONCE ALL VIOLATIONS HAVE BEEN CORRECTED.

| CERTIFICATE OF COMPLIANCE: | Inspected by: | Received by: | |
|---|---|---|---|
| I certify under penalty of law that ALL violations have been corrected. I am authorized to file this certification on behalf of the Respondent and I am aware of the possibility of penalties, fines and imprisonment for false statements or knowing violations. | Inspector Signature: | Operator Signature: | Title: |
| Sign: Date: | Inspector Name (Print): MaVallenzuela | Operator Name (Print): Bryan Vander Dussen | Inspection Date: |
| Print: Title: | | | |

1/3/2019 GM

**GORDON HAY, INC.**
**16395 SO. EUCLID AVE**
**CHINO, CA 91708**
**909-393-448**

RECEIVED
MAR 09 2019
SBCFIRE - HAZMAT

April 1, 2019

San Bernardino County
Fire District
620 South E Street
San Bernardino, CA 92415

To Whom It May Concern

In regards to the CUPA Compliance Inspections Report for Facility # FA0014875 and CERS ID # 10444234
For the location of Gordon Hay Inc. 14213 S Bonview Ave Ontario, CA 91761

Attached you will find copies papers showing that the violations have been corrected.
1: removal of the 55 gallon used Oil
2: Facility map with the Teat Dip Storage Correction
3: 2 barrels had rain water in them no hazardous material and have been removed

If you should have any more concerns please contact Bryan @ 909-816-2709

Thank you

Debbie Gasper

Debbie Gasper
Gordon Hay, Inc.

Kent Avery Repair, Inc
2752 Scarborough Pl
Riverside, CA 92503

# Invoice

| Date | Invoice # |
|---|---|
| 3/30/2019 | 22574 |

| Bill To |
|---|
| Gordon Hay<br>16395 S Euclid Ave<br>Chino, CA 91708 |

| Due Date |
|---|
| 4/13/2019 |

| Project | |
|---|---|

| Description | Qty | Amount |
|---|---|---|
| Outside Service Provider, Ross Avery & Associates Inc., Service Date: 3/29/2019<br>Removed used engine oil from black 55 gallon open top drum at Dairy #3 on Bon View Ave, as per Brian Vanderham | | 369.00 |
| Oil Disposal Fee | 117 | 88.92 |

*This invoice is subject to Terms of Service. A percentage is donated to non-profit organizations.*

| | |
|---|---|
| Subtotal | $457.92 |
| Sales Tax (3.25%) | $0.00 |
| **Balance Due** | $457.92 |

**CUPA**
**CUPA COMPLIANCE INSPECTION REPORT**
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**620 South "E" Street, San Bernardino, CA 92415-0153**
**(909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

| | | | |
|---|---|---|---|
| **FACILITY NAME:** | Gordon Hay Inc. | **FACILIY ID:** | FA 0014825 |
| **FACILITY ADDRESS:** | 14213 S Bon View Ave. | **CERS ID:** | 10444234 CERS Desk 909-386-8432 |
| ☒ INSPECTION ☒ PHOTOGRAPHS **CONSENT GRANTED BY:** | **NAME:** Bryan Vander Dussen | **TITLE:** | Manager |

***This inspection was conducted to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Refer to Title 19 and 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health and Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). (V) Violation, (C) – Compliant, (N) Not applicable or not addressed. ALL violations must be corrected within 30-days unless otherwise specified.***

| CODE | VIOLATION INFORMATION & CLASSIFICATION | | V | C | N | NARRATIVE |
|---|---|---|---|---|---|---|
| H201 | Hazardous Materials Handler Permit | SBCC 23.0602(a) | | X | | H211: |
| H202 | Business Plan Established and Implemented | CHSC 25507 | | X | | OBSERVATION: Observed pre and post |
| H203 | Business Plan Submittal | CHSC 25505, 25508(a)(1) | | X | | test dip tanks at 330 gallons each. |
| H206 | Business Plan Annual Review and Certification | CHSC 255508(a)(1), 25508.2 | | X | | CORRECTIVE ACTION: Update inventory via |
| H209 | Business Plan Update within 30-days of Change | CHSC 25508.1(a)-(f) | | X | | CERS by adding 330 gallons of pre test dip |
| H210 | Business Activities/Owner/Operator ID Page | CHSC 25508(a)(1) | | X | | and 330 gallons of post test dip. Submit |
| H211 | Hazardous Materials Inventory | CHSC 25505, 25506, 25508 | X | | | signed document stating inventory is updated. |
| H212 | Site Map | CHSC 25505(a)(2), 25508(a)(1) | | X | | W101 |
| H213 | Emergency Response Plan | CHSC 25505(a)(3), 25508(a)(1) | | X | | OBSERVATION: Observed (1) 55 gallon |
| H214 | Training Program | CCR 2658, 2659, CHSC 25505(a)(4), 25508(a)(1) | | X | | drum of used oil. |
| H215 | Training Documentation | CHSC 25505(a)(4) | | X | | CORRECTIVE ACTION: Obtain hazardous |
| W101 | Hazardous Waste Generator Permit | SBCC 23.0602 | X | | | waste generator permit. |
| W103 | Hazardous Waste Determination | CCR 66262.11 | | | X | |
| W104 | EPA ID Number | CCR 66262.12 | | | X | W213 |
| W110 | Hazardous Waste Labeling Standards | CCR 66262.34(f) | | | X | OBSERVATION: Observed (1) unlabeled 55 |
| W122 | Reusable Soiled Textile Materials | CHSC 25144.6(b) | | | X | gallon drum of used oil and (1) unlabeled |
| W128 | Hazardous Waste Disposal Documentation | CCR 66262.40(a) | | | X | 55 gallon drum of unknown waste. |
| W137 | Consolidated Manifest Standards | CHSC 25160.2 | | | X | CORRECTIVE ACTION: Have waste |
| W138 | Used Oil and Fuel Filter Management | CCR 66266.130, CHSC 25250.22 | | | X | hauled off by certified hauler and |
| W139 | Lead Battery Disposal Documentation | CCR 66266.81(a)(4)(B) | | | X | submit a copy of waste man. for |
| W145 | Improper Disposal of Hazardous Waste | CHSC 25189.5(a), 25201(a) | | | X | along with signed statement ~~that~~ mu |
| W159 | Facility Information Reporting | SBCC 23.0602, 23.0712 | | | X | stating that the waste has been |
| W206 | Facility Maintained to Prevent Release/Fire/Explosion | CCR 66262.34(d)(2) | | | X | removed. |
| W207 | Emergency Plan | CCR 66262.34(d)(2) | | | X | |
| W213 | Hazardous Waste Accumulation | CCR 66262.34(d), CHSC 25123.3(h)(1) | X | | | Document Review: |
| W214 | Condition of Hazardous Waste Containers | CCR 66262.34(d)(2) | | | X | Equipment is serviced by Ross Avery. |
| W216 | Open Hazardous Waste Containers | CCR 66262.34(d)(2) | | | X | Uniforms serviced by Aramark. |
| W218 | EHS Waste Accumulation | CCR 66262.34(b)(1), CHSC 25123.3(h)(1)(c), 25123.3(c) | | | X | Business plan last submitted on 3/1/19 |
| W231 | Employee Training | CCR 66262.34(d)(2) | | | X | Hazardous safety training is being |
| W238 | Hazardous Waste Storage Area Weekly Inspection | CCR 66262.34(d)(2) | | | X | conducted. |
| | | | | | | Chemicals are supplied by |
| | | | | | | So Cal Dairy Equipment. |

**Description of Facility:** Facility is a dairy farm. Hazardous materials are stored and used ~~and~~ as disinfectants and cleaners during milking process.

**Hazmat Inventory:** Consistent with CERS submittal 3/1/19, with exception of 55 gallon drum of used oil and (1) 55 gallon drum of unknown.

***For assistance regarding this report, please contact the inspector below @ 909-386-8401 or email MbVallenzuela @sbcfire.org.***

**THIS REPORT SHALL SERVE AS A "NOTICE TO COMPLY" FOR MINOR VIOLATIONS AND A "NOTICE OF VIOLATION" FOR CLASS I & II VIOLATIONS. ALL VIOLATIONS MUST BE CORRECTED WITHIN 30-DAYS OF INSPECTION UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN FORMAL ENFORCEMENT LEGAL ACTION. WITHIN 30-DAYS, SIGN THE CERTIFICATION BELOW AND RETURN A COPY TO THE INSPECTOR ONCE ALL VIOLATIONS HAVE BEEN CORRECTED.**

| CERTIFICATE OF COMPLIANCE: | Inspected by: | Received by: | |
|---|---|---|---|
| I certify under penalty of law that ALL violations have been corrected. I am authorized to file this certification on behalf of the Respondent and I am aware of the possibility of penalties, fines and imprisonment for false statements or knowing violations. | Inspector Signature: | Operator Signature: | Title: |
| Sign: Date: | Inspector Name (Print): Matt Vallenzuela | Operator Name (Print): Bryan Vander Dussen | Inspection Date: |
| Print: Title: | | | |

1/3/2019 GM

## Violations and Compliance Inform[illegible]

| | | |
|---|---|---|
| **H201** | *Failure to obtain and maintain a current CUPA Hazardous Materials Handler permit.* | *Comply by paying all applicable permit fees upon receipt of invoice and submitting all necessary information.* |
| **H202** | *Failure to adequately establish and implement a Business Plan when storing/handling a hazardous material at or above reportable quantities.* | *Comply by establishing and implementing the Business Plan.* |
| **H203** | *Failure to complete and electronically submit a Business Plan when storing/handling a hazardous material at or above reportable quantities.* | *Comply by submitting an accurate and complete Business Plan via the* ***California Environmental Reporting System (CERS).*** |
| **H206** | *Failure to annually review and electronically certify that the Business Plan is complete and accurate on or before the due date.* | *Comply by reviewing and certifying the Business Plan annually.* |
| **H209** | *Failure to electronically update Business Plan within 30 days of: a 100% or more increase in a reported quantity, any handling of a previously undisclosed, reportable hazardous materials, a change of business address, business ownership, or business name, a substantial change in the handler's operations that requires modification of the business plan.* | *Comply by submitting the updated Business Plan information via CERS.* |
| **H210** | *Failure to accurately complete and electronically submit the Business Activities Page and/or Business Owner Operator Identification Page.* | *Comply by submitting the Business Activities Page and/or Business Owner/Operator Identification Page as required.* |
| **H211** | *Failure to accurately complete and electronically submit hazardous materials inventory information for all reportable hazardous materials on site at or above reportable quantities.* | *Comply by submitting an accurate and complete hazardous materials inventory via CERS.* |
| **H212** | *Failure to accurately complete and electronically submit a site map with all required content.* | *Comply by submitting an accurate and complete site map via CERS.* |
| **H213** | *Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.* | *Comply by submitting a complete emergency response plan via CERS.* |
| **H214** | *Failure to establish and electronically submit an adequate training program and safety procedures in the event of a release or threatened release of a hazardous material.* | *Comply by submitting a complete training program via CERS.* |
| **H215** | *Failure to provide initial and annual training to all employees in safety procedures in the event of a release or threatened release of a hazardous material and/or failure to document and maintain training records for a minimum of three years.* | *Comply by submitting a signed statement indicating that initial and annual training is conducted and training records are maintained for at least three years.* |
| **W101** | *Failure to obtain and maintain a CUPA Hazardous Waste generator permit.* | *Comply by paying all applicable permit fees upon receipt of invoice and submitting all necessary information.* |
| **W103** | *Failure to make hazardous waste determination.* | *Comply by submitting a signed statement indicating the waste is non-hazardous based upon generator knowledge, laboratory analysis documentation, or manage the waste as hazardous waste and submit disposal records.* |
| **W104** | *Failure to obtain an EPA ID Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.* | *Comply by submitting form 1358 to DTSC.* |
| **W110** | *Failure to properly label hazardous waste containers with: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and accumulation start date.* | *Comply by labeling containers properly and submitting the signed Certificate of Compliance (CofC).* |
| **W122** | *Failure to properly manage reusable soiled textile materials prior to being sent for laundering.* | *Comply by properly managing reusable textile materials and submitting the signed CofC.* |
| **W128** | *Failure to keep disposal records for three years.* | *Comply by retaining hazardous waste disposal records and submitting the signed CofC.* |
| **W137** | *Failure to comply with consolidated manifesting procedures and retain records for three years.* | *Comply by following the consolidated manifesting requirements and submitting the signed CofC.* |
| **W138** | *Failure to properly manage used oil or fuel filters.* | *Comply by proper management of used oil filters, and by submitting the signed CofC.* |
| **W139** | *Failure to retain for at least 3 years a legible copy of each manifest or bill of lading which identifies spent lead-acid storage batteries shipped to a person who stores the batteries or who uses, reuses, recycles or reclaims the batteries or their components.* | *Comply by retaining records for 3 years and by submitting the signed CofC.* |
| **W145** | *Failure to dispose of hazardous waste at an authorized facility.* | *Comply by submitting a signed statement indicating that hazardous waste will be disposed of through a licensed facility.* |
| **W159** | *Failure to provide names, addresses and phone numbers of the business and owner; name and 24-hr phone number of the emergency contact; site address where hazardous waste is generated or produced, if different from the facility address; list of each type of hazardous waste generated; prepare a Contingency Plan.* | *Comply by meeting all stated requirements by submitting the information via CERS.* |
| **W206** | *Failure to maintain and operate the facility to minimize the possibility of a fire, explosion, or any release of hazardous waste substances to air, soil, or surface water which could threaten human health or the environment.* | *Comply by ensuring the above requirements are met and by submitting the CofC.* |
| **W207** | *Failure to post the following information next to the telephone: name and telephone number of the emergency coordinator; location of fire extinguishers and spill control material, and, if present, fire alarm; the telephone number of the fire department, unless the facility has a direct alarm.* | *Comply by meeting the requirements stated above and by submitting the CofC.* |
| **W213** | *Failure to manage hazardous waste within 180 days (or as otherwise required).* | *Comply by disposing of hazardous waste within the accumulation time limit, by submitting records and the CofC.* |
| **W214** | *Failure to accumulate hazardous waste in a container that is in good condition.* | *Comply by using a container that is in good condition and by submitting the CofC.* |
| **W216** | *Failure to keep closed a hazardous waste container unless it is in use.* | *Comply by closing the containers and by submitting the CofC.* |
| **W218** | *Failure to manage acute/extremely hazardous waste within 90 days after accumulating 1 kilogram.* | *Comply by managing the waste as required and by submitting disposal records and the CofC.* |
| **W231** | *Failure to train all employees on waste handling and emergency procedures. Comply by training employees and by submitting the CofC.* | |
| **W238** | *Failure to inspect hazardous waste storage areas at least weekly.* | *Comply by conducting weekly inspections and by submitting the CofC along with any other documentation requested by the inspector.* |

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: Gordon Hay Inc #3 Facility ID #: FA0014875

Address: 14213 S Bon View Ave Ontario, CA 91762

*1) Description:* Front of facility as seen from Bon View Ave. facing east.

*2) Description:* (1) 55-gallon drum of used oil located in storage shed on north side of facility.

Date Taken: **3/25/2019**

Taken By: **Matthew Valenzuela** Signature:

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

Facility/Case Name: Gordon Hay Inc #3 Facility ID #: FA0014875

Address: 14213 S Bon View Ave Ontario, CA 91762

*3) Description:* (2) 55-gallon drums of acid cleaner located in hazardous materials storage area.

*4) Description:* (1) 55 -gallon drum of LA Chemclor and (1) 55-gallon Velocity Two Detergent located in hazardous materials storage area.

Date Taken: **3/25/2019**

Taken By: **Matthew Valenzuela** Signature: Ma Valenzuela

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 5**

**PHOTO 6**

Facility/Case Name: Gordon Hay Inc #3 Facility ID #: FA0014875

Address: 14213 S Bon View Ave Ontario, CA 91762

*5) Description:* (1) 275-gallon tank of post teat dip located outside of building on the south side.

*6) Description:* (1) 275-gallon tank of pre teat dip located outside of building on the south side.

Date Taken: **3/25/2019**

Taken By: **Matthew Valenzuela** Signature:

Rev 06/29/2018

CUPA

San Be. ..dino County Fire Department • Hazardous Materials ..ision

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

**CUPA COMPLIANCE INSPECTION REPORT**

| | |
|---|---|
| NAME: **GORDON HAY INC DAIRY #3** | FACILITY ID: **FA0014875** |
| ADDRESS: **14213 S BON VIEW AVE** | CERS ID:**10444234** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **12/9/2015** |

Inspector was given permission to: ☐ photograph ☒ inspect

**Inspection Narrative (v020000)**

An inspection was conducted to determine compliance with hazardous waste generator and hazardous material handler laws and regulations. Consent to conduct the inspection and photograph the facility was given by Mario Hernandez, employee of the dairy.

The facility is a dairy. The facility stores hazardous materials as a result of dairy operations, using disinfectants and cleaners in the process of milking cows.

HAZARDOUS MATERIALS INVENTORY: Two 55 gallon drums of Acid Cleaner EC, three 55 gallon drums of Velocity Two detergent, three 55 gallon drums of LA Chemclor, one 500 gallon tank of Teat Dip, and one 500 gallon tank of diesel fuel.

DOCUMENTATION REVIEW: The Business Plan was last submitted on 4/30/14 to the CERS website. The EPA ID# is not required as no hazardous waste is generated at this facility.

Submit a signed Certificate of Compliance with required documentation to this office within 30 days.

If you have any questions, feel free to contact me at 909-754-0453 or dpianalto@sbcfire.org. If you have any questions regarding CERS, please call the CERS helpline at 909-386-8432.

**The following lines marked in the V column are violations that must be corrected. Marked items in the N column require additional information to determine compliance.**

| VIOLATION CODE | DESCRIPTION | SECTION | V | N |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| 0201 | Failure to obtain a CUPA Hazardous Materials Handler permit. | 23.0602(a) | | |
| 0202 | Failure to establish a Business Plan. | CAL. HEALTH & SAFETY CODE 25507 | | |
| 0203 | Failure to submit a Business Plan. | CAL. HEALTH & SAFETY CODE 25508 | X | |
| Violation: | Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date. | | | |
| Correction: | Using the California Environmental Reporting System (CERS), electronically submit the Business Plan to the statewide information management system. | | | |
| Observation: | The business plan was last submitted on 4/30/15 to the CERS website. Update and submit the plan within 30 days to meet annual submission requirements. Comply by date: **1/9/2016** | | | |
| 0204 | Failure to immediately report any release or threatened release of a hazardous material. | CAL. HEALTH & SAFETY CODE 25510 | | |
| 0205 | Failure to allow a hazardous materials handler inspection. | CAL. HEALTH & SAFETY CODE 25511 | | |
| 0206 | Failure to update the Business Plan | CAL. HEALTH & SAFETY CODE 25508.2 | | |
| 0209 | Failure to submit an amendment to the inventory form within 30 days of change. | CAL. HEALTH & SAFETY CODE 25508.1 | | |
| 1231 | Failure to submit a corrected Business Plan within 30 days after notification of deficiencies. | CAL. HEALTH & SAFETY CODE 25508 | | |
| 1232 | Failure to submit a Business Plan revision within 30 days of a substantial change in operation. | CAL. HEALTH & SAFETY CODE 25508.1 | | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: LTR: |
|---|---|---|
| DWANE PIANALTO | | |
| NAME | INSPECTION DATE: 12/09/2015 NAME | PRINTED ON: 12/10/15 4:32 pm TITLE |

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN THE SPECIFIED TIMEFRAME. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION.**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return Certification within 31 Days of Reciept to Inspector DWANE PIANALTO**

RESPONDENT: Mario Hernandez

VIOLATION(S) CITED ON: 12/9/2015 CERTIFICATE OF COMPLIANCE DATE: 12/9/2015

| | |
|---|---|
| NAME: **GORDON HAY INC DAIRY #3** | FACILITY ID: **FA0014875** |
| ADDRESS: **14213 S BON VIEW AVE** | CERS ID:**10444234** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | |

**Attach the following documentation when returning the Certificate of Compliance:**

0203 Using the California Environmental Reporting System (CERS), electronically submit the Business Plan to the statewide information management system.The business plan was last submitted on 4/30/15 to the CERS website. Update and submit the plan within 30 days to meet annual submission requirements.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

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# ACCESS REQUEST to FACILITY RECORD IN CERS - SINGLE FACILITY*

For more information, see: http://www.sbcfire.org/hazmat/efile.aspx or call CERS help line (909) 386-8432

The purpose of the ACCESS REQUST is to ensure that only individuals designated by the facility owner/operator are authorized by the CUPA to access facility records and to create, edit, and submit electronic data on the owner's behalf to the statewide system, known as the California Environmental Reporting System (CERS). The initial business user authorized by the CUPA to have access to a facility on CERS is designated as a lead business user. Lead business users have the ability to add additional lead or standard business users, approve or reject other access requests, or delete other users for any facility for which they are listed as a lead user.

**AUTHORIZED LEAD BUSINESS USER**

| | |
|---|---|
| Name: Craig Gordon | Title: President |
| Email Address: Haydebi@aol.com | Contact Phone: 909-393-4408 |

| | | | | |
|---|---|---|---|---|
| OWNER NAME: Craig Gordon | OWNER EMAIL ADDRESS: Haydebi@aol.com | | | |
| OWNER MAILING ADDRESS: 16395 S. Euclid Ave | CITY: Chino | STATE: CA | ZIP CODE: 91708 | OWNER PHONE: 909-393-4408 |

**Fill out the following information for the facility**

| FACILITY ID *(e.g., FA0123456)* | FACILITY NAME *(e.g., CUPA AUTO)* | SITE ADDRESS *(e.g., 123 N. MAIN ST.)* | CITY *(e.g., ANYTOWN)* |
|---|---|---|---|
| FA0014875 | Gordon Hay Inc Dairy #3 | 14213. S. Con View Ave | Ontario |

☒ **I authorize the person and email address listed above to be a lead business user for the listed facility. This includes the ability to create, edit, and submit compliance data for the listed facility. I understand that as a lead business user this person may approve additional lead business users or standard business users, grant or reject facility access requests, and delete users from the facility listed on this authorization form.**

**Certification – I certify that I am the owner/operator or legal representative of the facility listed on this form. I understand that compliance documents prepared or submitted electronically are held to the same standard as their former paper equivalents.**

| | | |
|---|---|---|
| SIGNATURE OF OWNER/OPERATOR OR LEGALLY DESIGNATED REPRESENTATIVE | DATE: 3-31-14 | NAME OF DOCUMENT PREPARER: Craig Gordon |
| NAME OF SIGNER (print): Craig Gordon | TITLE OF SIGNER: President / owner | |

*Each facility record that is entered into CERS is assigned to a business/organization. Multiple facilities that have the same owner/operator and that will have the same users managing the facility record in CERS can be grouped together into a single "umbrella" business/organization. If you own or operate multiple facilities and if the same users will be managing all of the facilities in CERS, you may want them to be grouped into a single business/organization. For more information please contact the San Bernardino CERS help line at (909) 386-8432.

Return completed form by Mail: San Bernardino County Fire Department, Hazardous Materials Division, 620 South E Street, San Bernardino, CA 92415-0153 or Fax: (909) 386-8460 or Email: Efile@sbcfire.org

RECEIVED
APR 04 2014
S.B. CO. FIRE DEPT.

OFFICE USE Notes:

Form Revised 11/14/12 Completed by: [signature] Date: 04/04/14.

OFFICE USE ONLY: DATE STAMP

7011 2970 0004 2051 3851

# U.S. Postal Service™
# CERTIFIED MAIL™ RECEIPT
*(Domestic Mail Only; No Insurance Coverage Provided)*

For delivery information visit our website at www.usps.com®

OFFICIAL USE

12/13/12

| | |
|---|---|
| Postage | $ |
| Certified Fee | |
| Return Receipt Fee (Endorsement Required) | |
| Restricted Delivery Fee (Endorsement Required) | |

Postmark Here

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Craig Gordon
16395 Euclid
Chino, CA 90208

Str
or
Cit

PS Form 3800, August 2006

See Reverse for Instructions

## Certified Mail Provides:

- A mailing receipt
- A unique identifier for your mailpiece
- A record of delivery kept by the Postal Service for two years

***Important Reminders:***

- Certified Mail may ONLY be combined with First-Class Mail® or Priority Mail®.
- Certified Mail is *not* available for any class of international mail.
- NO INSURANCE COVERAGE IS PROVIDED with Certified Mail. For valuables, please consider Insured or Registered Mail.
- For an additional fee, a *Return Receipt* may be requested to provide proof of delivery. To obtain Return Receipt service, please complete and attach a Return Receipt (PS Form 3811) to the article and add applicable postage to cover the fee. Endorse mailpiece "Return Receipt Requested". To receive a fee waiver for a duplicate return receipt, a USPS® postmark on your Certified Mail receipt is required.
- For an additional fee, delivery may be restricted to the addressee or addressee's authorized agent. Advise the clerk or mark the mailpiece with the endorsement *"Restricted Delivery"*.
- If a postmark on the Certified Mail receipt is desired, please present the article at the post office for postmarking. If a postmark on the Certified Mail receipt is not needed, detach and affix label with postage and mail.

**IMPORTANT: Save this receipt and present it when making an inquiry.**

PS Form 3800, August 2006 *(Reverse)* PSN 7530-02-000-9047

# Track & Confirm

**You entered: 70112970000420513851**

**Status: Delivered**
**Your item was delivered at 11:13 am on December 15, 2012 in CHINO, CA 91710. Additional information for this item is stored in files offline.**

**You may request that the additional information be retrieved from the archives, and that we send you an e-mail when this retrieval is complete. Requests to retrieve additional information are generally processed momentarily.**

I would like to receive notification on this request

Restore

## Find Another Item

What's your label (or receipt) number?

Find



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CUPA
San Bern... ...no County Fire Department • Hazardous ... ...erials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

'A #: NEW Facility Name: Gordon Hay Inc. Dairy #3 Inspection Date: 12/12/12

Site Address: 14213 S. Bon View Ave. Phone #:

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:
☒ Inspect ☒ Photograph Name: Carlos Gonzalez Title: Employee # Emp: 4 Packet left on site? ☒ Yes ☐ No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials ... erials handler permit needed
**Compliance requirement: Submit fees w**

☐ 104. EPA ID Number not obtained for waste g
**Compliance Requirement**: Obtain perma ... it your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or
**Compliance Requirement**: Facility must ... on certification below denotes compliance.

☐ 107. A Contingency Plan has not been establi

☒ 202. A Business Plan has not been establishe

☒ 203. A Business Plan has not been ☒ submi
**Compliance Requirement**: Submit the c ... lan to this Division. NOTE: You must keep a current co ... ailable at all times.

☐ 131. Training documentation not complete or
**Compliance Requirement**: Submit train

Pls mail, to: certified
Craig Gordon
16395 Euclid
Chino, CA 90708

## Container Storage and Labeling Requ

☐ 110. Hazardous waste containers are not lab ... ste

☐ 111. Hazardous waste label is incomplete. (C

☐ 112. Accumulation start date is missing from ... waste
**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All ... lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste
**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) Does not generate waste

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) Does not generate waste
**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

## Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste
**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) Does not generate waste
**Compliance Requirement**: Submit copies of waste disposal records for the past ----------

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate
**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. New dairy operating at previous location of H&R Dairy.

Inspected By: [signature] Sign Name Received By: Carlos Gonzalez Sign Name Title: Employee

Leslie Heaviside Print Name Carlos Gonzalez Print Name Report Date: 12/12/12

**Sign and submit the a copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** _____ Name _____ Date

*Form Revised 6/2/2011*

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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: NEW 14875 Facility Name: Gordon Hay Inc. Dairy #3 Inspection Date: 12/12/12

Site Address: 14213 S. Bon View Ave. Phone #:

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by: ☒ Inspect ☒ Photograph Name: Carlos Gonzalez Title: Employee # Emp: 4 Packet left on site? ☒ Yes ☐ No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED

## General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Hazardous Materials handler permit needed
Compliance requirement: Submit fees within 30 days of billing.

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste
Compliance Requirement: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) Containers closed
Compliance Requirement: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☒ 203. A Business Plan has not been ☒ submitted / ☐ updated. (CHSC 25505)
Compliance Requirement: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training.
Compliance Requirement: Submit training documentation as required.

## Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) Does not generate waste

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) Does not generate waste
Compliance Requirement: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste
Compliance Requirement: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

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Compliance Requirement: Submit copies of waste disposal records for the past ----------

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate
Compliance Requirement: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. New dairy operating at previous location of H&R Dairy.

Inspected By: [signature] Sign Name Received By: Carlos Gonzalez Sign Name Title: Employee

Leslie Heaviside Print Name Carlos Gonzalez Print Name Report Date: 12/12/12

Sign and submit the a copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

*Form Revised 6/2/2011*

**CUPA**

**San Bernardino County Fire Department • Hazardous Materials Division**

**HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT**

| | | | | | |
|---|---|---|---|---|---|
| FA #: | NEW | Facility Name: | Gordon Hay Inc. Dairy #3 | Inspection Date: | 12/12/12 |
| Site Address: | 14213 S. Bon View Ave. | | | Phone #: | |
| City: | Ontario | Zip Code: | 91762 | EPA ID #: | N/A |

Hazardous Materials inventory:
(1) 55-gallon drum of teat dip
(1) 55-gallon drum of sodium hypochlorite
(2) 55-gallon drums of CIP cleaner
(2)) 55-gallon drums of acid cleaner
(2) 55-gallon drums of sodium hypochlorite used for chlorination of water onsite
(1) 500-gallon AST Diesel fuel
<55-gallons of new oil for equipment

No hazardous waste was observed at time of inspection. Gonzalez was unsure of whether equipment is serviced or repaired onsite. Verify that a mobile maintenance service is used to be exempt from hazardous waste generator requirements.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: **Gordon Hay Inc. Dairy #3** Facility ID #: **NEW**

Address: **14213 S. Bon View Ave., Ontario**

1) Description: **Signage located at front of dairy**

2) Description: **(L to R) (2) 55-gallon drums containing CIP cleaner, (1) 55-gallon drum containing sodium hypochlorite, (2) 55-gallon drums containing acid cleaner**

Date Taken: **December 12, 2012**

Taken By: **Leslie Heaviside** Signature: _____

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

| | | | |
|---|---|---|---|
| Facility/Case Name: | **Gordon Hay Inc. Dairy #3** | Facility ID #: | **NEW** |
| Address: | **14213 S. Bon View Ave., Ontario** | | |
| 3) Description: | **500-gallon AST containing Diesel fuel** | | |
| 4) Description: | **No photo** | | |
| Date Taken: | **December 12, 2012** | | |
| Taken By: | **Leslie Heaviside** | Signature: | |

## *TRACKING SHEET FOR BUSINESS PLANS*

***OFM - HAZMAT***

FACILITY LABEL

GORDON HAY INC DAIRY #3
14213 S BON VIEW AVE
ONTARIO FA0014875

rpt# 5066

DATE FILE CREATED 12-19-12

| OTHER DATE | ACTION/DOCUMENTATION (UPDATE, NEW PLAN, ETC) |
|---|---|
| ___/___/___ | |
| ___/___/___ | |
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|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

Martin Dehoog Dairy

#279526 8/27/71 (34)

#5097 28 2

**SAN BERNARDINO COUNTY AIR POLLUTION CONTROL DISTRICT**

172 West Third Street, San Bernardino, California, 92401, Telephone 889-0111, Ext. 548, 549

# APPLICATION FOR AUTHORITY TO CONSTRUCT AND PERMIT TO OPERATE RULE 65 GASOLINE TANKS

add

**APPLICATION INSTRUCTIONS**

A. Use this form for gasoline tanks which are filled from tank truck or trailer. Gasoline is defined as any petroleum distillate with a Reid vapor pressure of 4 pounds or more.

B. File form in duplicate properly signed, for each group of 5 tanks or less, at same location.

C. Pay $10.00 filing fee for each tank listed, or

D. For transfer of ownership of any tank which has a valid permit at the time of the transfer, pay only a $10.00 filing fee for each tank.

E. Make checks payable to Air Pollution Control District.

INCOMPLETE APPLICATIONS NOT ACCEPTABLE

1. PERMIT NO.: A2407

1A. PERMIT TO BE ISSUED TO: Martin De Hoog Dairy (BUSINESS LICENSE NAME OF ORGANIZATION THAT IS TO RECEIVE PERMIT)

1B. ATT: Mr. Martin De Hoog

2A. MAILING ADDRESS: 8311 E. Edison Chino CA (NUMBER STREET CITY OR COMMUNITY STATE)

2B. ZIP CODE: 91710

3. LOC. NO.: 001

3A. ADDRESS OF TANK(S) LOCATION: 8311 East Edison, CHino (NUMBER STREET CITY OR COMMUNITY)

3B. STATION NUMBER: —

4. PERMIT APPLICATION REASON:
- New construction ☐ 1
- Tank replaced ☐ 2
- Tank added ☐ 3
- Ownership change ☐ 4
- Existing 1-1-71 ☑ 5

5. ESTIMATED DATE TANK PLACED IN SERVICE:

6. DATE OF OWNERSHIP CHANGE:

7. TYPE OF ORGANIZATION:
- Corporation ☐ 1
- Partnership ☐ 2
- Lessee or individual owner ☑ 3
- Gov't. agency ☐ 4

8. GENERAL NATURE OF BUSINESS:
- Retail service station ☐ 1
- Garage ☐ 2
- Bulk plant ☐ 3
- Consumer account ☑ 4

9. TANK INFORMATION - ENTER COMPLETE INFORMATION FOR EACH TANK:

| | A Tank Designation | B Tank Capacity (Gallons) | Inside dimension C Diameter (Inches) | D Length (Inches) | E*** Product Stored | Check fill type F Offset * | G Sub-Merged ** | Check tank type H Under-Ground | I Above Ground | J Port-able | Check control K Drop (Ft-In) | L Lift (Ft-In) | M Control Approved |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 500 | | | 2 | | | U | ✓ | | | NA | NA |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |

**APCD USE ONLY**

| 15. PERMIT NUMBER | 16. FEE |
|---|---|
| 01 | 15 |

10. SIGNATURE OF RESPONSIBLE MEMBER OF ORGANIZATION: Cornelius De Hoog

11. OFFICIAL TITLE OF SIGNER: Ranchhand

12. TYPED OR PRINTED NAME OF SIGNER: CORNELIUS DE HOOG

13. DATE: 8-16-71

14. PHONE NUMBER: 983-6849

FINAL APPROVAL OF ACTION

BRANCH SUPERVISOR

DATE

VALIDATION

*Offset Fill - Fill line between tank truck fill connection and underground tank has an abrupt mechanical bend.

**Submerged Fill - Fill pipe discharge opening submerged in tank at liquid level of 6 inches, or, for tank loaded from side, entirely submerged at liquid level of 18 inches.

NOTE: All gasoline tanks of 250 or more gallons capacity installed after Jan. 1, 1971, must be equipped with submerged fill.

***Code - 1 - Regular; 2 - Ethyl; 3 - Premium; 4 - No lead regular; 5 - Low lead regular; 6 - No lead premium; 7 - Low lead premium.

CONTRACTOR'S NAME:

Telephone:

APCD FORM # 04-11248-013

60000

# SCAQMD Facility Equipment List Report



Facility: 26950 MARTIN L. DE HOOG
Status: Active
MR: 1316 SIC: 0 Team: I
Last Inspection: 06/19/2020 On Hold: Suspended: TS: TS-09 Non-inspection: Potential Inactivations (From Quarter: 0100 - inspect in 2nd quarter, every year
Contact: UNKNOWN UNKNOWN (714) 9473559 RECLAIM: N TITLE V: N AIRS ID:
Assignment: 1844617
Location Address: 8311 EDISON AVE, CHINO 91710-9242 Sector:EB
Inspector: KP06 KEVIN PEROZO
Mailing Address: 8311 EDISON AVE, CHINO 91710-9242 Sector:EB
Inspection Date: 06/19/2020
Instruction:
Disposition: Non source, company operating, no permits required

| Application No. | Permit No. | Permit Issue Date | Permit Status | Equipment Category | | BCAT/CCAT Description | Application Date | Application Status |
|---|---|---|---|---|---|---|---|---|
| 908744 | 908744 | | INACTIVE | 248915 | BCAT | SERV STAT STORAGE & DISPENSING GASOLINE | 01/01/1900 | PERMIT TO OPERATE GRANTED |
| 908744 | 908744 | | INACTIVE | 70 | CCAT | CONTROL ETO STERILIZATION HOSPITAL | 01/01/1900 | PERMIT TO OPERATE GRANTED |

Inspector: _____ Date: _____ Reviewed By: _____ Date: _____

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, CA 91765

# PERMIT TO OPERATE


Permit No.
F87591
A/N 445901

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301.f) is not received by the expiration date, contact the District.

ID 145099

Legal Owner
or Operator: THREE D DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-7318

**Equipment Location:** 8485 EDISON AVE, ONTARIO, CA 91762-7242

**Equipment Description :**

CONFINED ANIMAL FEED OPERATION CONSISTING OF:

1. MILK COWS, DRY COWS, HEIFERS, AND CALVES
2. MILKING PARLOR
3. SCRAPE TYPE MANURE HANDLING SYSTEM
4. OPEN CORRALS WITH IN-CORRAL MOUNDS
5. TWO STORAGE PONDS
6. FEED STORAGE/COMMODITY BARNS
7. MIXER FEED WAGON/LONG HAY

**Conditions :**

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
3. THE MAXIMUM NUMBER OF MILKING COWS, DRY COWS, HEIFERS, AND CALVES AT THIS FACILITY SHALL NOT EXCEED 1170 ANIMALS IN ANY ONE DAY.
4. THE MAXIMUM NUMBER OF MILK-PRODUCING COWS AT THIS FACILITY SHALL NOT EXCEED 820 IN ANY ONE DAY.
5. THIS FACILITY IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

**FILE COPY**

RULE 1127 EMISSION REDUCTION FROM LIVESTOCK WASTE
RULE 1186 PM10 EMISSIONS FROM PAVED AND UNPAVED ROADS AND LIVESTOCK OPERATIONS

6. THE OPERATOR SHALL USE BEST MANAGEMENT PRACTICES AT ALL TIMES, IN ACCORDANCE WITH RULE 1127. FACILITY MAY BE EXEMPTED FROM ONE CORRAL CLEARING PER YEAR IF ALL THE REQUIREMENTS OF RULE 1127(J)(3) ARE MET. NOTIFICATION TO THE DISTRICT SHALL BE MADE BY CALLING 1 800 CUT SMOG.

7. MANURE DISPOSED OF WITHIN THE JURISDICTION OF THE DISTRICT SHALL ONLY BE REMOVED OR CONTRACTED TO BE REMOVED FROM THIS DAIRY TO:

   A. AN APPROVED MANURE PROCESSING OPERATION; OR

   B. AGRICULTURAL LAND WITHIN THE DISTRICT APPROVED BY LOCAL ORDINANCE AND/OR REGIONAL WATER QUALITY BOARD FOR THE SPREADIING OF MANURE; OR

   C. A COMBINATION OF DESTINATIONS IN A AND B.

8. THE OPERATOR SHALL MAINTAIN COPIES OF ALL MANURE MANIFESTS, TIPPING FEE INVOICES, MANURE MOISTURE TEST RECORDS, CORRAL CLEARING RECORDS, AND STOCKPILE REMOVAL RECORDS.

9. THE OPERATOR SHALL SUBMIT A WRITTEN ANNUAL REPORT BY JANUARY 15TH OF EACH YEAR AFTER JANUARY 1, 2007 PER THE REQUIREMENTS OF RULE 1127. THE REPORT SHALL BE SENT TO: SCAQMD, COMPLIANCE DIVISION, PO BOX 4941, DIAMOND BAR , CA 91765-0941.

10. THE OPERATOR SHALL:

   A. CEASE ALL HAY GRINDING ACTIVITIES BETWEEN 2-5 PM EACH DAY IF VISIBLE EMISSIONS EXTEND MORE THAN 50 FEET FROM A HAY GRINDING SOURCE, AND

   B. TREAT ALL UNPAVED ACCESS CONNECTIONS AND UNPAVED FEED LANE ACCESS AREAS WITH EITHER PAVEMENT, GRAVEL (MAINTAINED TO A DEPTH OF FOUR (4) INCHES), OR ASPHALTIC ROADBASE.

11. THE OPERATOR SHALL MAINTAIN RECORDS, IN A MANNER APPROVED BY THE DISTRICT, TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 3, 4, 7, AND 8. ALL RECORDS SHALL BE RETAINED AT THE FACILITY FOR AT LEAST THREE YEARS AND BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

**NOTICE**

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR COPY SHALL BE POSTED ON OR WITHIN 8 METERS OF THE EQUIPMENT.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT CANNOT BE CONSIDERED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF OTHER GOVERNMENT AGENCIES.

EXECUTIVE OFFICER

Dorris M. Bailey

By Dorris M.Bailey/CW02
2/11/2007

**FILE COPY**

# SCAQMD Facility Equipment List Report



Facility: 88197 SOUTHERN CALIFORNIA EDISON CO
Status: Active
MR:
SIC: 3833
Team: I
Last Inspection: 06/19/2020
On Hold:
Suspended:
TS: TS-12 Industrial Sources - Out of Business and Cha
Quarter: none - do not inspect
Contact: FRANK MELONE (818) 3029775
RECLAIM: N
TITLE V: N
AIRS ID:
Assignment: 1844616
Location Address: 8381 E EDISON AVE, CHINO 91710 Sector:EB
Inspector: KP06 KEVIN PEROZO
Mailing Address: P O BOX 800, ROSEMEAD 91770 Sector:CG
Inspection Date: 06/19/2020
Instruction:
Disposition: Out of Business

| Application No. | Permit No. | Permit Issue Date | Permit Status | Equipment Category | BCAT/CCAT Description | Application Date | Application Status |
|---|---|---|---|---|---|---|---|
| 256001 | | | | 040901 BCAT | I C E (50-500 HP) N-EM STAT DIESEL | 09/04/1991 | BANKING/ PLAN GRANTED, NON BILLABLE |

Inspector: _____ Date: _____ Reviewed By: _____ Date: _____

South Coast Air Quality Management District
P. O. Box 4944
Diamond Bar, CA 91765
(909) 396-2000

761.20

# APPLICATION FOR PERMIT TO CONSTRUCT AND PERMIT TO OPERATE
# FORM 400 - A

**Non-Title V Facilities:** This form must be accompanied by one or more 400-E-xx series form(s). Complete this side of form only.
**Title V Facilities:** Complete both sides of this form. Include additional forms as necessary.

| NC/NOV NUMBER: | |
|---|---|
| INSPECTOR | SECTOR |
| ISSUE DATE | |

## Section I - Company Information

LEGAL NAME OF OPERATOR: Michael De Hoog
☒ IRS OR ☐ S. S. NUMBER: 330124064

PERMIT TO BE ISSUED TO (SEE INSTRUCTIONS):

BUSINESS MAILING ADDRESS: 8381 Edison Ave Ontario CA 91762

PERMIT MAILING ADDRESS, IF DIFFERENT FROM BUSINESS MAILING ADDRESS:

TYPE OF ORGANIZATION
☐ Corporation ☐ Limited Partnership ☐ Government Entity
☒ Individual ☐ General Partnership ☐ Other (Fill in):

ARE YOU A SMALL BUSINESS? (SEE INSTRUCTIONS) ☒ Yes ☐ No

AVERAGE ANNUAL GROSS RECEIPTS $ 2,200,000
NUMBER OF EMPLOYEES 7

IS YOUR BUSINESS 51 % OR MORE WOMAN/MINORITY OWNED? ☐ Yes ☒ No

**THIS SECTION IS REQUIRED FOR ALL APPLICATIONS FOR NEW CONSTRUCTION OR MAJOR MODIFICATIONS.**

ARE ALL MAJOR SOURCES UNDER SAME OWNERSHIP IN CALIFORNIA IN COMPLIANCE WITH FEDERAL, STATE, AND LOCAL AIR POLLUTION CONTROL RULES? ☒ Yes ☐ No

ARE YOU THE OWNER OF THE EQUIPMENT UNDER THIS APPLICATION? ☒ Yes ☐ No ☐ IRS OR ☐ S. S. NUMBER OF OWNER

IF NO, ENTER THE LEGAL NAME OF OWNER

## Section II - Facility Information

EQUIPMENT ADDRESS/LOCATION: 8485 Edison Ave (NUMBER/STREET)
Ontario (CITY OR COMMUNITY) CA, 91762 (ZIP CODE)

FACILITY NAME: Three D Dairy
FACILITY ID NUMBER: 145099 7-12-05

PRINT NAME OF CONTACT PERSON: Joe DeHoog
TITLE OF CONTACT PERSON: Manager

TYPE OF BUSINESS AT THIS FACILITY: Dairy
PRIMARY SIC CODE FOR THIS FACILITY: 0241
NUMBER OF EMPLOYEES AT THIS FACILITY: 7

CONTACT PERSON'S TELEPHONE NUMBER: (909) 947-0944
CONTACT PERSON'S FAX NUMBER: (909) 947-0944
CONTACT PERSON'S E-MAIL ADDRESS: Gotmilkfor6@Juno.com

## Section III - Application Type

DESCRIPTION OF EQUIPMENT: DAIRY

PREVIOUS PERMIT #(S):

APPLICATION FOR (SEE INSTRUCTIONS):
☐ NEW CONSTRUCTION ☐ MODIFICATION ☐ CHANGE OF LOCATION
☒ EXISTING EQUIPMENT WITHOUT PERMIT ☐ CHANGE OF PERMITTEE ☐ CHANGE OF PERMIT CONDITION
☐ EXISTING EQUIPMENT WITH EXPIRED PERMIT

ARE YOU SUBMITTING MULTIPLE APPLICATIONS FOR EQUIPMENT IDENTICAL TO THAT DESCRIBED ABOVE? ☐ Yes ☐ No

☐ **APPLICATION FOR NON-TITLE V EQUIPMENT PERMIT. CHECK THE SUPPLEMENTAL SERIES 400-E-xx FORM(S) SUBMITTED WITH THIS 400-A FORM:**

| | | | |
|---|---|---|---|
| ____ 400-E-1 | • PARTICULATE MATTER ($PM_{10}$) CONTROL EQUIPMENT | ✓ 400-E-13 | • INTERNAL COMBUSTION EQUIPMENT |
| ____ 400-E-2 | • VOLATILE ORGANIC COMPOUND (VOC) CONTROL EQUIPMENT | ____ 400-E-14 | • OPEN PROCESS TANK |
| ____ 400-E-3 | • SCRUBBER | ____ 400-E-14a | • OPEN PROCESS TANK; PROCESS LINE |
| ____ 400-E-4 | • ABRASIVE BLASTING EQUIPMENT | ____ 400-E-15 | • PRINTING EQUIPMENT |
| ____ 400-E-6 | • DEGREASER | ____ 400-E-16 | • SOLID MATERIALS STORAGE EQUIPMENT |
| ____ 400-E-7 | • DRY CLEANING EQUIPMENT | ____ 400-E-17 | • SPRAY BOOTH/OPEN SPRAY |
| ____ 400-E-8 | • ETHYLENE OXIDE STERILIZER | ____ 400-E-17a | • POWDER SPRAY BOOTH |
| ____ 400-E-9 | • EXTERNAL COMBUSTION EQUIPMENT | ____ 400-E-18 | • STORAGE TANK (LIQUID & GASEOUS MAT'L) |
| ____ 400-E-10 | • FOOD BROILER/FRYER | ____ 400-E-19 | • WAVE SOLDER MACHINE |
| ____ 400-E-11 | • FUEL DISPENSING AND STORAGE EQUIPMENT | ____ 400-E-20 | • ASBESTOS REMOVAL EQUIPMENT |
| ____ 400-E-12 | • GAS TURBINE | ____ NONE | • ADDITIONAL INFORMATION SUBMITTED AS REQUESTED ON FORM 400-E-GI |

☐ **APPLICATION FOR TITLE V FACILITY PERMIT. PROVIDE INFORMATION REQUESTED ON REVERSE SIDE OF THIS FORM.**

**I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT.**
SIGNATURE OF RESPONSIBLE OFFICIAL OF FIRM: Joe DeHoog
TITLE OF RESPONSIBLE OFFICIAL OF FIRM:

TYPE OR PRINT NAME OF RESPONSIBLE OFFICIAL OF FIRM: Joe DeHoog
RESPONSIBLE OFFICIAL'S TELEPHONE NUMBER: (909) 947-0944
DATE SIGNED: 6/25/05

**I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT.**
SIGNATURE OF PREPARER, IF PREPARED BY PERSON OTHER THAN RESPONSIBLE OFFICIAL OF FIRM:
TITLE OF PREPARER:

TYPE OR PRINT NAME OF PREPARER, IF PREPARED BY PERSON OTHER THAN RESPONSIBLE OFFICIAL OF FIRM:
PREPARER'S TELEPHONE NUMBER: ( ) -
DATE SIGNED: / /

***TITLE V FACILITIES ONLY: COMPLETE OTHER SIDE***

| AQMD USE ONLY | APPLICATION/TRACKING # 446901 | PROJECT # | TYPE B C D | EQUIPMENT CATEGORY CODE: ___ ___ ___ ___ / ___ ___ | FEE SCHEDULE: $ | VALIDATION 7-6-05 |
|---|---|---|---|---|---|---|
| ENG. A R DATE | ENG. A R DATE | CLASS I III IV | ASSIGNMENT UNIT ENGINEER | ENF. SECT. | CHECK/MONEY ORDER # 7632 | AMOUNT $ 388.60 |

FORM 400-A, Rev. 10/97

116771

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, CA 91765

# PERMIT TO OPERATE


Permit No.
F87591
A/N 445901

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301.f) is not received by the expiration date, contact the District.

ID 145099

Legal Owner
or Operator: THREE D DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-7318

**Equipment Location:** 8485 EDISON AVE, ONTARIO, CA 91762-7242

**Equipment Description :**

CONFINED ANIMAL FEED OPERATION CONSISTING OF:

1. MILK COWS, DRY COWS, HEIFERS, AND CALVES
2. MILKING PARLOR
3. SCRAPE TYPE MANURE HANDLING SYSTEM
4. OPEN CORRALS WITH IN-CORRAL MOUNDS
5. TWO STORAGE PONDS
6. FEED STORAGE/COMMODITY BARNS
7. MIXER FEED WAGON/LONG HAY

**Conditions :**

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.

3. THE MAXIMUM NUMBER OF MILKING COWS, DRY COWS, HEIFERS, AND CALVES AT THIS FACILITY SHALL NOT EXCEED 1170 ANIMALS IN ANY ONE DAY.

4. THE MAXIMUM NUMBER OF MILK-PRODUCING COWS AT THIS FACILITY SHALL NOT EXCEED 820 IN ANY ONE DAY.

5. THIS FACILITY IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

FILE COPY
South Coast Air Quality Management District
Certified Copy

RULE 1127 EMISSION REDUCTION FROM LIVESTOCK WASTE
RULE 1186 PM10 EMISSIONS FROM PAVED AND UNPAVED ROADS AND LIVESTOCK OPERATIONS

6. THE OPERATOR SHALL USE BEST MANAGEMENT PRACTICES AT ALL TIMES, IN ACCORDANCE WITH RULE 1127. FACILITY MAY BE EXEMPTED FROM ONE CORRAL CLEARING PER YEAR IF ALL THE REQUIREMENTS OF RULE 1127(J)(3) ARE MET. NOTIFICATION TO THE DISTRICT SHALL BE MADE BY CALLING 1 800 CUT SMOG.

7. MANURE DISPOSED OF WITHIN THE JURISDICTION OF THE DISTRICT SHALL ONLY BE REMOVED OR CONTRACTED TO BE REMOVED FROM THIS DAIRY TO:

   A. AN APPROVED MANURE PROCESSING OPERATION; OR

   B. AGRICULTURAL LAND WITHIN THE DISTRICT APPROVED BY LOCAL ORDINANCE AND/OR REGIONAL WATER QUALITY BOARD FOR THE SPREADIING OF MANURE; OR

   C. A COMBINATION OF DESTINATIONS IN A AND B.

8. THE OPERATOR SHALL MAINTAIN COPIES OF ALL MANURE MANIFESTS, TIPPING FEE INVOICES, MANURE MOISTURE TEST RECORDS, CORRAL CLEARING RECORDS, AND STOCKPILE REMOVAL RECORDS.

9. THE OPERATOR SHALL SUBMIT A WRITTEN ANNUAL REPORT BY JANUARY 15TH OF EACH YEAR AFTER JANUARY 1, 2007 PER THE REQUIREMENTS OF RULE 1127. THE REPORT SHALL BE SENT TO: SCAQMD, COMPLIANCE DIVISION, PO BOX 4941, DIAMOND BAR , CA 91765-0941.

10. THE OPERATOR SHALL:

    A. CEASE ALL HAY GRINDING ACTIVITIES BETWEEN 2-5 PM EACH DAY IF VISIBLE EMISSIONS EXTEND MORE THAN 50 FEET FROM A HAY GRINDING SOURCE, AND

    B. TREAT ALL UNPAVED ACCESS CONNECTIONS AND UNPAVED FEED LANE ACCESS AREAS WITH EITHER PAVEMENT, GRAVEL (MAINTAINED TO A DEPTH OF FOUR (4) INCHES), OR ASPHALTIC ROADBASE.

11. THE OPERATOR SHALL MAINTAIN RECORDS, IN A MANNER APPROVED BY THE DISTRICT, TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 3, 4, 7, AND 8. ALL RECORDS SHALL BE RETAINED AT THE FACILITY FOR AT LEAST THREE YEARS AND BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

**FILE COPY**
**South Coast Air Quality Management District**
**Certified Copy**

**NOTICE**

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR COPY SHALL BE POSTED ON OR WITHIN 8 METERS OF THE EQUIPMENT.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT CANNOT BE CONSIDERED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF OTHER GOVERNMENT AGENCIES.

EXECUTIVE OFFICER

Dorris M Bailey

By Dorris M.Bailey/CW02
2/11/2007

**FILE COPY**
**South Coast Air Quality Management District**
**Certified Copy**

# SCAQMD Facility Equipment List Report



Facility: 145099 THREE D DAIRY
Status: Active
MR: SIC: 241 Team: I
Last Inspection: 06/28/2017 On Hold: N Suspended: N TS: TS-11 Industrial: Sector-based Inspections
Quarter: 0020 - inspect in 3rd quarter, every two years
Contact: JOE DEHOOG (909) 9470944 RECLAIM: N TITLE V: N AIRS ID:
Assignment: 1436252
Location Address: 8485 EDISON AVE, ONTARIO 91762-7242 Sector:EE
Inspector: MR01 MANUEL REGALA
Mailing Address: 8381 EDISON AVE, ONTARIO 91762-7318 Sector:EE
Inspection Date: 06/12/2014
Instruction:
Disposition: Operating in Compliance at time of inspection

| Application No. | Permit No. | Permit Issue Date | Permit Status | Equipment Category | BCAT/CCAT Description | Application Date | Application Status |
|---|---|---|---|---|---|---|---|
| 445901 | F87591 | 02/11/2007 | INACT_NR | 021000 BCAT | AGOPS DAIRY | 07/06/2005 | PERMIT TO OPERATE GRANTED |

Inspector: _____ Date: _____ Reviewed By: _____ Date: _____

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178

# PERMIT TO OPERATE


Permit No.
G55848
A/N 609889

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301(d)) is not received by the expiration date, contact the District.

ID 189218

**Legal Owner or Operator:**

TIVA DAIRY
14382 BETHANY AVE
CHINO, CA 91710

**Equipment Location:** 7587 EDISON AVE, ONTARIO, CA 91762

**Equipment Description :**

CONFINED ANIMAL FEED OPERATION CONSISTING OF:

1. MILK COWS, DRY COWS, HEIFERS, AND CALVES
2. MILKING PARLOR
3. SCRAPE TYPE MANURE HANDLING SYSTEM
4. OPEN CORRALS WITH IN-CORRAL MOUNDS
5. MANURE STOCK PILES
6. ONE (1) STORAGE PONDS
7. FEED STORAGE COMMODITY BARNS
8. MIXER FEED WAGON/LONG HAY

**Conditions :**

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.

3. THE MAXIMUM NUMBER OF MILKING COWS, DRY COWS, HEIFERS, AND CALVES AT THIS FACILITY SHALL NOT EXCEED 2200 ANIMALS IN ANY ONE DAY.

4. THE MAXIMUM NUMBER OF MILK-PRODUCING COWS AT THIS FACILITY SHALL NOT EXCEED 999 IN ANY ONE DAY.

FILE COPY
South Coast Air Quality Management District
Certified Copy

5. THIS FACILITY IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

   RULE 1127 EMISSION REDUCTION FROM LIVESTOCK WASTE
   RULE 1186 PM10 EMISSIONS FROM PAVED AND UNPAVED ROADS AND LIVESTOCK OPERATIONS

6. THE OPERATOR SHALL USE BEST MANAGEMENT PRACTICES AT ALL TIMES, IN ACCORDANCE WITH RULE 1127. FACILITY MAY BE EXEMPTED FROM ONE CORRAL CLEARING PER YEAR IF ALL THE REQUIREMENTS OF RULE 1127(J)(3) ARE MET. NOTIFICATION TO THE DISTRICT SHALL BE MADE BY CALLING 1-800-CUT-SMOG.

7. MANURE DISPOSED OF WITHIN THE JURISDICTION OF THE DISTRICT SHALL ONLY BE REMOVED OR CONTRACTED TO BE REMOVED FROM THIS DAIRY TO:

   A. AN APPROVED MANURE PROCESSING OPERATION; OR

   B. AGRICULTURAL LAND WITHIN THE DISTRICT APPROVED BY LOCAL ORDINANCE AND/OR REGIONAL WATER QUALITY BOARD FOR THE SPREADIING OF MANURE; OR

   C. A COMBINATION OF DESTINATIONS IN A AND B.

8. THE OPERATOR SHALL MAINTAIN COPIES OF ALL MANURE MANIFESTS, TIPPING FEE INVOICES, MANURE MOISTURE TEST RECORDS, CORRAL CLEARING RECORDS, AND STOCKPILE REMOVAL RECORDS.

9. THE OPERATOR SHALL SUBMIT A WRITTEN ANNUAL REPORT BY JANUARY 15TH OF EACH YEAR AFTER JANUARY 1, 2007 PER THE REQUIREMENTS OF RULE 1127. THE REPORT SHALL BE SENT TO: SCAQMD, COMPLIANCE DIVISION, PO BOX 4941, DIAMOND BAR , CA 91765-0941.

10. THE OPERATOR SHALL:

    A. CEASE ALL HAY GRINDING ACTIVITIES BETWEEN 2-5 PM EACH DAY IF VISIBLE EMISSIONS EXTEND MORE THAN 50 FEET FROM A HAY GRINDING SOURCE, AND

    B. TREAT ALL UNPAVED ACCESS CONNECTIONS AND UNPAVED FEED LANE ACCESS AREAS WITH EITHER PAVEMENT, GRAVEL (MAINTAINED TO A DEPTH OF FOUR (4) INCHES), OR ASPHALTIC ROADBASE.

11. THE OPERATOR SHALL MAINTAIN RECORDS, IN A MANNER APPROVED BY THE DISTRICT, TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 3, 4, 7, AND 8. ALL RECORDS SHALL BE RETAINED AT THE FACILITY FOR AT LEAST THREE YEARS AND BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

FILE COPY
**South Coast Air Quality Management District**
**Certified Copy**

## NOTICE

In accordance with Rule 206, this Permit to Operate or copy shall be posted on or within 8 meters of the equipment.

This permit does not authorize the emission of air contaminants in excess of those allowed by Division 26 of the Health and Safety Code of the State of California or the applicable Rules and Regulations of the South Coast Air Quality Management District (SCAQMD). This permit cannot be considered as permission to violate existing laws, ordinances, regulations or statutes of other government agencies.

Executive Officer

BY LAKI TISOPULOS, PhD/JA08
1/24/2019

FILE COPY
**South Coast Air Quality Management District**
**Certified Copy**

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178

# PERMIT TO OPERATE


Permit No.
G56695
A/N 595834

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301(d)) is not received by the expiration date, contact the District.

ID 185096

**Legal Owner or Operator:** GH DAIRY #4
14651 GROVE AVE
ONTARIO, CA 91762-7704

**Equipment Location:** 8061 EDISON AVE, ONTARIO, CA 91762-7297

**Equipment Description :**

Confined Animal Facility (CAF), Dairy Operation, Consisting of:

1. Milk cows, dry cows and heifers
2. Milking parlor
3. Scrape type manure handling system
4. Open Corrals with in-corral mounds
5. One (1) Storage pond

**Conditions :**

1. Operation of this equipment shall be conducted in accordance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.
2. This equipment shall be properly maintained and kept in good operating condition at all times.
3. This facility shall only house a maximum of 800 milk cows, 200 dry cows, and 450 heifers (15-24 months), for a total head count of not to exceed 1450 cows on any one day.
4. The maximum number of milking cows at this facility shall not exceed 800 in any one day.
5. The operator shall maintain records that specify the monthly average number of animals maintained at this facility.
6. The operator shall submit an annual report to the executive officer in writing by January 15th of each year which shall include:
   A. The information required in condition no. 9,
   B. Animal population for the previous calendar year, broken out by number of milk cows, dry cows, and heifers (15-24 months),

FILE COPY
South Coast Air Quality Management District
Certified Copy

C. Amount of manure removed from the dairy in the previous calendar year broken out by the following destinations:

I. Agricultural lands within the jurisdiction of the south coast air quality management district;
II. Manure processing operation(s) within the jurisdiction of the south coast air quality management district, including the amount of manure that went to each manure processing operation; and/or
III. A location out of the jurisdiction of south coast air quality management district.

The report shall be sent to: SCAQMD, Compliance Division, PO Box 4941, Diamond Bar, CA 91765-0941.

7. This facility is subject to the applicable requirements of Rules 1127 and 1186.

8. The operator shall use best management practices at all times in accordance with Rule 1127 which shall include:

A. Clear corrals such that an even surface of compacted manure remains on top of the soil, and do not scrape down to soil level,
B. Indentify and eliminate water leaks from troughs and piping,
C. Pave feedlanes at least eight (8) feet on the corral side of the feedlane fence,
D. Clear any accumulated manure in excess of three (3) inches in height in each corral at least four (4) times per year with at least sixty (60) days between clearings,
E. Remove all on-dairy stockpiles within three (3) months of last corral clearing day and no more than three (3) months after date that previous stockpiles were last completely cleared.

9. Manure disposed of within the jurisdiction of the District shall only be removed or contracted to be removed from this dairy to:

A. An approved manure processing operation, or
B. Agricultural land within the district approved by local ordinance, and/or regional water quality board for the spreading of manure, or
C. Combination of destinations described in A and B.

10. No later than 30 days after operations begin the operator shall submit a Rule 1127 notification to the executive officer in writing which shall include:

A. Dairy farm operator's name,
B. Name of contact person,
C. Farm name,
D. Farm street address,
E. Mailing address, and
F. Telephone number for the contact person.

The notification shall be sent to: SCAQMD, Compliance Division, PO Box 4941, Diamond Bar, CA 91765-0941.

11. The operator shall:

FILE COPY
South Coast Air Quality Management District
Certified Copy

A. Cease all hay grinding activities between 2 p.m. and 5 p.m. if visible emissions extend more than 50 feet from a hay grinding source,

B. Treat unpaved access connections and unpaved feed lane access areas with either pavement, gravel (maintained to a depth of 4 inches), or asphaltic road-base.

12. The operator shall maintain records, in a manner approved by the District, to demonstrate compliance Rules 1127 and 1186. The records shall include:

A. Monthly average number of animals maintained at the facility,

B. Each clearing of accumulated manure as required by permit condition no. 7 D,

C. Each removal of on-dairy stockpiles as required by permit condition no. 7 E, including date(s) of removal, hauler (if applicable) and manure destination,

D. Manure manifests, tipping fee invoices, and manure moisture test records.

The records shall be retained at the facility for at least three years and be made available to district personnel upon request.

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South Coast Air Quality Management District
Certified Copy

## NOTICE

In accordance with Rule 206, this Permit to Operate or copy shall be posted on or within 8 meters of the equipment.

This permit does not authorize the emission of air contaminants in excess of those allowed by Division 26 of the Health and Safety Code of the State of California or the applicable Rules and Regulations of the South Coast Air Quality Management District (SCAQMD). This permit cannot be considered as permission to violate existing laws, ordinances, regulations or statutes of other government agencies.

Executive Officer

BY LAKI TISOPULOS, PhD/CW02
3/30/2019

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South Coast Air Quality Management District
Certified Copy

# APPENDIX F

Third Party Vendor Database Report

**Ontario Ranch II**
8061 Edison Avenue
Ontario, CA 91762

Inquiry Number: 7910061.1s
February 27, 2025

# The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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## GEOCHECK ADDENDUM

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527 - 21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E2247 - 16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E1528 - 22) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

**TARGET PROPERTY INFORMATION**

**ADDRESS**

8061 EDISON AVENUE
ONTARIO, CA 91762

**COORDINATES**

| | |
|---|---|
| Latitude (North): | 33.9965990 - 33˚ 59' 47.75'' |
| Longitude (West): | 117.6313600 - 117˚ 37' 52.89'' |
| Universal Tranverse Mercator: | Zone 11 |
| UTM X (Meters): | 441691.2 |
| UTM Y (Meters): | 3761764.0 |
| Elevation: | 691 ft. above sea level |

**USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY**

| | |
|---|---|
| Target Property Map: | 50006194 PRADO DAM, CA |
| Version Date: | 2022 |
| Northeast Map: | 50005338 GUASTI, CA |
| Version Date: | 2021 |
| Southeast Map: | 50005749 CORONA NORTH, CA |
| Version Date: | 2022 |
| Northwest Map: | 50005381 ONTARIO, CA |
| Version Date: | 2021 |

**AERIAL PHOTOGRAPHY IN THIS REPORT**

| | |
|---|---|
| Portions of Photo from: | 20200424, 20200423 |
| Source: | USDA |

## MAPPED SITES SUMMARY

Target Property Address:
8061 EDISON AVENUE
ONTARIO, CA 91762

Click on Map ID to see full detail.

| MAP ID | SITE NAME | ADDRESS | DATABASE ACRONYMS | RELATIVE ELEVATION | DIST (ft. & mi.) DIRECTION |
|---|---|---|---|---|---|
| A1 | JORRITSMA & ANEMA DA | 8061 EDISON AVE | EMI, ENF, HWTS, San Bern. Co. Permit, CIWQS, CERS | | TP |
| A2 | JORRITSMA AND ANEMA | 8061 EDISON AVENUE | FINDS, ECHO | | TP |
| A3 | JORRITSMA DAIRY | 8061 EDISON AVE | WDS | | TP |
| A4 | GH DAIRY #4 | 8061 EDISON | ECHO | | TP |
| A5 | GH DAIRY #4 | 8061 EDISON | CERS | | TP |
| A6 | GH DAIRY #4 | 8061 EDISON | FINDS | | TP |
| B7 | THREE D DAIRY - HEIF | 8311 EDISON | FINDS | Higher | 1 ft. |
| B8 | LEGEND DAIRY FARMS - | 8311 EDISON AVENUE | ENF, San Bern. Co. Permit, CIWQS | Higher | 1 ft. |
| C9 | LEGEND DAIRY FARMS - | 8185 EDISON | ECHO | Higher | 1 ft. |
| B10 | LEGEND DAIRY FARMS - | 8311 EDISON | ECHO | Higher | 1 ft. |
| C11 | AG-JACK ALEWYN DAIRY | 8185 EDISON AVE | UST | Higher | 1 ft. |
| C12 | GORDON DAIRY #7 | 8185 EDISON | FINDS | Higher | 1 ft. |
| B13 | LEGEND DAIRY FARMS | 8311 EDISON | CERS | Higher | 1 ft. |
| C14 | LEGEND DAIRY FARMS - | 8185 EDISON AVENUE | ENF, CIWQS | Higher | 1 ft. |
| C15 | SOUTHWEST DAIRY INC | 8185 EDISON | CERS | Higher | 1 ft. |
| C16 | GORDON DAIRY #7 | 8185 EDISON | ECHO | Higher | 1 ft. |
| C17 | JACK ALEWYN DAIRY | 8185 EDISON BLVD | ENF, San Bern. Co. Permit | Higher | 1 ft. |
| D18 | GORDON DAIRY #3 | 14213 BON VIEW AVENU | ENF, San Bern. Co. Permit, CIWQS, CERS | Lower | 1 ft. |
| D19 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | San Bern. Co. Permit | Lower | 1 ft. |
| D20 | H & R DAIRY - BON VI | 14213 BON VIEW AVE | WDS | Lower | 1 ft. |
| D21 | GORDON DAIRY #3 | 14213 BON VIEW | CERS | Lower | 1 ft. |
| D22 | H & R DAIRY | 14213 BON VIEW AVENU | FINDS, ECHO | Lower | 1 ft. |
| D23 | GORDON DAIRY #3 | 14213 BON VIEW | FINDS | Lower | 1 ft. |
| D24 | GORDON DAIRY #3 | 14213 BON VIEW | ECHO | Lower | 1 ft. |
| D25 | GORDON HAY INC DAIRY | 14213 BON VIEW AVE | FINDS | Lower | 1 ft. |
| 26 | G H DAIRY #4B | 7721 EDISON AVENUE | ENF, San Bern. Co. Permit, CIWQS | Higher | 9, 0.002, WNW |
| 27 | LEGEND DAIRY FARMS - | 8381 EDISON AVENUE | AST, ENF, San Bern. Co. Permit, CIWQS, CERS | Higher | 10, 0.002, East |
| E28 | AG-TWIN PALM DAIRY | 7587 EDISON AVE | UST | Higher | 39, 0.007, West |
| E29 | TIVA DAIRY | 7587 EDISON AVE | EMI, San Bern. Co. Permit, CERS | Higher | 39, 0.007, West |
| E30 | PAUL HUIZENGA DAIRY | 7587 EDISON AVE | AST, EMI, ENF, CIWQS, CERS | Higher | 39, 0.007, West |
| C31 | JACK ALEWYN DAIRY | 8185 EDISON | SWEEPS UST, CA FID UST | Higher | 47, 0.009, ENE |
| 32 | THREE D DAIRY | 8485 EDISON AVE | HIST UST, WDS | Higher | 60, 0.011, East |
| F33 | LONGGO TRANS | 7960 EDISON AVE | RCRA NonGen / NLR, E MANIFEST | Higher | 94, 0.018, NNE |
| F34 | WESTLEY CARDOZA | 7990 EDISON AVE | RCRA NonGen / NLR | Higher | 95, 0.018, NE |
| 35 | VICTORS FARMS | 8040 EDISON AVE | RCRA NonGen / NLR | Higher | 95, 0.018, NE |
| G36 | AGROMIN OC ONTARIO G | 8292 EDISON AVE | RCRA NonGen / NLR | Higher | 102, 0.019, East |
| G37 | AGROMIN OC ONTARIO G | 8292 EDISON AVE | CERS HAZ WASTE, HAZNET | Higher | 102, 0.019, East |
| G38 | AGROMIN ONTARIO | 8292 EDISON AVE | RCRA NonGen / NLR, E MANIFEST | Higher | 102, 0.019, East |
| G39 | AGROMIN OC ONTARIO G | 8292 EDISON AVENUE | SWF/LF, CERS HAZ WASTE, NPDES, San Bern. Co.... | Higher | 102, 0.019, East |

## MAPPED SITES SUMMARY

Target Property Address:
8061 EDISON AVENUE
ONTARIO, CA 91762

Click on Map ID to see full detail.

| MAP ID | SITE NAME | ADDRESS | DATABASE ACRONYMS | RELATIVE ELEVATION | DIST (ft. & mi.) DIRECTION |
|---|---|---|---|---|---|
| G40 | AGROMIN OC ONTARIO G | 8292 EDISON AVE | HWTS, San Bern. Co. Permit | Higher | 102, 0.019, East |
| B41 | BREAKTHRU TRANSPORTS | 8270 EDISON AVE | RCRA NonGen / NLR | Higher | 113, 0.021, ENE |
| F42 | LONGGO TRANS | 7914 EDISON AVE | RCRA NonGen / NLR | Higher | 114, 0.022, North |
| 43 | ALEWYN DAIRY #3 | 14361 GROVE | ENF, San Bern. Co. Permit, CIWQS | Lower | 332, 0.063, SE |
| 44 | MAJESTIC FARMS #1 | 14333 WALKER | ENF, San Bern. Co. Permit, CIWQS | Lower | 345, 0.065, ESE |
| H45 | RLE DAIRY | 14049 GROVE AVE | San Bern. Co. Permit | Higher | 386, 0.073, NE |
| H46 | BROWN'S FAMILY DAIRY | 14016 S GROVE AVE | San Bern. Co. Permit | Higher | 569, 0.108, NE |
| I47 | JOE FERREIRA JR DAIR | 14400 S GROVE AVE | San Bern. Co. Permit | Lower | 634, 0.120, SSE |
| I48 | WHITEGOLD VENTURES L | 14400 GROVE AVE | RCRA NonGen / NLR, E MANIFEST | Lower | 634, 0.120, SSE |
| J49 | SAM SOUSA DAIRY | 7330 EDISON AVE | CERS HAZ WASTE, EMI, ENF, HWTS, San Bern. Co.... | Higher | 673, 0.127, West |
| J50 | KENT AVERY REPAIR IN | 7330 EDISON AVE | RCRA NonGen / NLR | Higher | 673, 0.127, West |
| J51 | MATERIAL RECOVERY SO | 7325 EDISON AVE | SWF/LF, LDS, NPDES, CERS | Higher | 682, 0.129, West |
| J52 | RESIDUALS RECOVERY G | 7325 EDISON RD. | SWF/LF | Higher | 682, 0.129, West |
| J53 | SNS DAIRY | 7371 EDISON AVE | San Bern. Co. Permit | Higher | 686, 0.130, West |
| K54 | PARK INDUSTRIES | 14306 BON VIEW AVE | RCRA NonGen / NLR | Lower | 810, 0.153, SW |
| K55 | GORDON HAY, INC | 14451 BON VIEW AVE | RCRA NonGen / NLR | Lower | 819, 0.155, SW |
| K56 | AG-COSTA VIEW FARM | 14451 BON VIEW | SWEEPS UST, CA FID UST, CERS | Lower | 819, 0.155, SW |
| K57 | GORDON HAY, INC | 14451 BON VIEW AVE | HIST UST, HWTS | Lower | 819, 0.155, SW |
| 58 | O & M DAIRY | 14474 GROVE AVE | San Bern. Co. Permit | Lower | 976, 0.185, SSE |
| L59 | GORZEMAN DAIRY #2 | 13948 WALKER | San Bern. Co. Permit | Higher | 1030, 0.195, ENE |
| K60 | DIMAS COSTA | 14451 BON VIEW | HIST UST, HWTS, HAZNET | Lower | 1065, 0.202, SW |
| L61 | GORZEMAN FAMILY DAIR | 13975 WALKER | San Bern. Co. Permit | Higher | 1104, 0.209, ENE |
| L62 | WE INC | 13955 WALKER AVE | RCRA NonGen / NLR | Higher | 1215, 0.230, ENE |
| 63 | WRECK AGE DEMOLITION | 13908 GROVE AVE | RCRA NonGen / NLR | Higher | 1265, 0.240, NNE |
| 64 | RECYCLED WOOD PRODUC | 13905 WALKER AVENUE | SWF/LF, NPDES, CIWQS | Higher | 1492, 0.283, ENE |
| 65 | PRIVATE RESIDENCE | PRIVATE RESIDENCE | LUST, Cortese | Lower | 1509, 0.286, SSE |
| 66 | REDWOOD PRODUCTS OF | 13814 S GROVE AVE | SWF/LF, CERS HAZ WASTE, CERS TANKS, LDS, EMI,... | Higher | 1691, 0.320, NNE |
| 67 | COMPOSTING PLANTONTA | 8605 SCHAEFER AVE | WMUDS/SWAT, WDS | Higher | 2531, 0.479, ENE |
| 68 | CAL-AERO FIELD / ACA | | ENVIROSTOR | Lower | 4685, 0.887, SSW |

# EXECUTIVE SUMMARY

**TARGET PROPERTY SEARCH RESULTS**

The target property was identified in the following records. For more information on this property see page 9 of the attached EDR Radius Map report:

| Site | Database(s) | EPA ID |
|---|---|---|
| JORRITSMA & ANEMA DA<br>8061 EDISON AVE<br>ONTARIO, CA 91762 | EMI<br>Facility Id: 145031<br><br>ENF<br>Status: Historical<br>Status: Historical<br>Facility Id: 234045<br><br>HWTS<br>San Bern. Co. Permit<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0017949<br>Facility Id: FA0000522<br><br>CIWQS<br>CERS | N/A |
| JORRITSMA AND ANEMA<br>8061 EDISON AVENUE<br>ONTARIO, CA 91761 | FINDS<br>Registry ID:: 110037259515<br>Registry ID:: 110071787266<br><br>ECHO<br>Registry ID: 110037259515 | N/A |
| JORRITSMA DAIRY<br>8061 EDISON AVE<br>CHINO, CA 91710 | WDS<br>Facility Status: A<br>Facility Id: 8 365551001 | N/A |
| GH DAIRY #4<br>8061 EDISON<br>ONTARIO, CA 91762 | ECHO<br>Registry ID: 110066693894 | N/A |
| GH DAIRY #4<br>8061 EDISON<br>ONTARIO, CA 91762 | CERS | N/A |
| GH DAIRY #4<br>8061 EDISON<br>ONTARIO, CA 91762 | FINDS<br>Registry ID:: 110066693894 | N/A |

# EXECUTIVE SUMMARY

**DATABASES WITH NO MAPPED SITES**

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

**STANDARD ENVIRONMENTAL RECORDS**

***Lists of Federal NPL (Superfund) sites***

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

***Lists of Federal Delisted NPL sites***

Delisted NPL ..... National Priority List Deletions

***Lists of Federal sites subject to CERCLA removals and CERCLA orders***

FEDERAL FACILITY ..... Federal Facility Site Information listing
SEMS ..... Superfund Enterprise Management System

***Lists of Federal CERCLA sites with NFRAP***

SEMS-ARCHIVE ..... Superfund Enterprise Management System Archive

***Lists of Federal RCRA facilities undergoing Corrective Action***

CORRACTS ..... Corrective Action Report

***Lists of Federal RCRA TSD facilities***

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

***Lists of Federal RCRA generators***

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-SQG ..... RCRA - Small Quantity Generators
RCRA-VSQG ..... RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

***Federal institutional controls / engineering controls registries***

LUCIS ..... Land Use Control Information System
US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROLS ..... Institutional Controls Sites List

***Federal ERNS list***

ERNS ..... Emergency Response Notification System

***Lists of state- and tribal (Superfund) equivalent sites***

RESPONSE ..... State Response Sites

# EXECUTIVE SUMMARY

***Lists of state and tribal leaking storage tanks***

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land
CPS-SLIC ---------- Statewide SLIC Cases

***Lists of state and tribal registered storage tanks***

FEMA UST ---------- Underground Storage Tank Listing
INDIAN UST ---------- Underground Storage Tanks on Indian Land

***Lists of state and tribal voluntary cleanup sites***

INDIAN VCP ---------- Voluntary Cleanup Priority Listing
VCP ---------- Voluntary Cleanup Program Properties

***Lists of state and tribal brownfield sites***

BROWNFIELDS ---------- Considered Brownfieds Sites Listing

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS ---------- A Listing of Brownfields Sites

***Local Lists of Landfill / Solid Waste Disposal Sites***

SWRCY ---------- Recycler Database
HAULERS ---------- Registered Waste Tire Haulers Listing
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory
IHS OPEN DUMPS ---------- Open Dumps on Indian Land

***Local Lists of Hazardous waste / Contaminated Sites***

US HIST CDL ---------- Delisted National Clandestine Laboratory Register
HIST Cal-Sites ---------- Historical Calsites Database
SCH ---------- School Property Evaluation Program
CDL ---------- Clandestine Drug Labs
Toxic Pits ---------- Toxic Pits Cleanup Act Sites
US CDL ---------- National Clandestine Laboratory Register

***Local Lists of Registered Storage Tanks***

CERS TANKS ---------- California Environmental Reporting System (CERS) Tanks

***Local Land Records***

LIENS ---------- Environmental Liens Listing
LIENS 2 ---------- CERCLA Lien Information
DEED ---------- Deed Restriction Listing

***Records of Emergency Release Reports***

HMIRS ---------- Hazardous Materials Information Reporting System

| | |
|---|---|
| CHMIRS | California Hazardous Material Incident Report System |
| LDS | Land Disposal Sites Listing |
| MCS | Military Cleanup Sites Listing |
| SPILLS 90 | SPILLS 90 data from FirstSearch |

***Other Ascertainable Records***

| | |
|---|---|
| FUDS | Formerly Used Defense Sites |
| DOD | Department of Defense Sites |
| SCRD DRYCLEANERS | State Coalition for Remediation of Drycleaners Listing |
| US FIN ASSUR | Financial Assurance Information |
| EPA WATCH LIST | EPA WATCH LIST |
| 2020 COR ACTION | 2020 Corrective Action Program List |
| TSCA | Toxic Substances Control Act |
| TRIS | Toxic Chemical Release Inventory System |
| SSTS | Section 7 Tracking Systems |
| ROD | Records Of Decision |
| RMP | Risk Management Plans |
| RAATS | RCRA Administrative Action Tracking System |
| PRP | Potentially Responsible Parties |
| PADS | PCB Activity Database System |
| ICIS | Integrated Compliance Information System |
| FTTS | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) |
| MLTS | Material Licensing Tracking System |
| COAL ASH DOE | Steam-Electric Plant Operation Data |
| COAL ASH EPA | Coal Combustion Residues Surface Impoundments List |
| PCB TRANSFORMER | PCB Transformer Registration Database |
| RADINFO | Radiation Information Database |
| HIST FTTS | FIFRA/TSCA Tracking System Administrative Case Listing |
| DOT OPS | Incident and Accident Data |
| CONSENT | Superfund (CERCLA) Consent Decrees |
| INDIAN RESERV | Indian Reservations |
| FUSRAP | Formerly Utilized Sites Remedial Action Program |
| UMTRA | Uranium Mill Tailings Sites |
| LEAD SMELTERS | Lead Smelter Sites |
| US AIRS | Aerometric Information Retrieval System Facility Subsystem |
| US MINES | Mines Master Index File |
| ABANDONED MINES | Abandoned Mines |
| MINES MRDS | Mineral Resources Data System |
| UXO | Unexploded Ordnance Sites |
| DOCKET HWC | Hazardous Waste Compliance Docket Listing |
| FUELS PROGRAM | EPA Fuels Program Registered Listing |
| PFAS NPL | Superfund Sites with PFAS Detections Information |
| PFAS FEDERAL SITES | Federal Sites PFAS Information |
| PFAS TSCA | PFAS Manufacture and Imports Information |
| PFAS TRIS | List of PFAS Added to the TRI |
| PFAS RCRA MANIFEST | PFAS Transfers Identified In the RCRA Database Listing |
| PFAS ATSDR | PFAS Contamination Site Location Listing |
| PFAS WQP | Ambient Environmental Sampling for PFAS |
| PFAS PROJECT | NORTHEASTERN UNIVERSITY PFAS PROJECT |
| PFAS NPDES | Clean Water Act Discharge Monitoring Information |
| PFAS ECHO | Facilities in Industries that May Be Handling PFAS Listing |
| PFAS ECHO FIRE TRAIN | Facilities in Industries that May Be Handling PFAS Listing |
| PFAS PT 139 AIRPORT | All Certified Part 139 Airports PFAS Information Listing |

# EXECUTIVE SUMMARY

| | |
|---|---|
| AQUEOUS FOAM NRC | Aqueous Foam Related Incidents Listing |
| BIOSOLIDS | ICIS-NPDES Biosolids Facility Data |
| UST FINDER | UST Finder Database |
| UST FINDER RELEASE | UST Finder Releases Database |
| PFAS | PFAS Investigation Site Location Listing |
| AQUEOUS FOAM | Former Fire Training Facility Assessments Listing |
| CA BOND EXP. PLAN | Bond Expenditure Plan |
| CHROME PLATING | Chrome Plating Facilities Listing |
| CUPA Listings | CUPA Resources List |
| DRYCLEANERS | Cleaner Facilities |
| Financial Assurance | Financial Assurance Information Listing |
| ICE | Inspection, Compliance and Enforcement |
| HIST CORTESE | Hazardous Waste & Substance Site List |
| HWP | EnviroStor Permitted Facilities Listing |
| HWT | Registered Hazardous Waste Transporter Database |
| HAZNET | Facility and Manifest Data |
| MINES | Mines Site Location Listing |
| MWMP | Medical Waste Management Program Listing |
| NPDES | NPDES Permits Listing |
| PEST LIC | Pesticide Regulation Licenses Listing |
| PROC | Certified Processors Database |
| Notify 65 | Proposition 65 Records |
| HAZMAT | Hazardous Material Facilities |
| UIC | UIC Listing |
| UIC GEO | UIC GEO (GEOTRACKER) |
| WASTEWATER PITS | Oil Wastewater Pits Listing |
| WIP | Well Investigation Program Case List |
| MILITARY PRIV SITES | MILITARY PRIV SITES (GEOTRACKER) |
| PROJECT | PROJECT (GEOTRACKER) |
| WDR | Waste Discharge Requirements Listing |
| NON-CASE INFO | NON-CASE INFO (GEOTRACKER) |
| OTHER OIL GAS | OTHER OIL & GAS (GEOTRACKER) |
| PROD WATER PONDS | PROD WATER PONDS (GEOTRACKER) |
| SAMPLING POINT | SAMPLING POINT (GEOTRACKER) |
| WELL STIM PROJ | Well Stimulation Project (GEOTRACKER) |

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

| | |
|---|---|
| EDR MGP | EDR Proprietary Manufactured Gas Plants |
| EDR Hist Auto | EDR Exclusive Historical Auto Stations |
| EDR Hist Cleaner | EDR Exclusive Historical Cleaners |

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

| | |
|---|---|
| RGA LF | Recovered Government Archive Solid Waste Facilities List |
| RGA LUST | Recovered Government Archive Leaking Underground Storage Tank |

**SURROUNDING SITES: SEARCH RESULTS**

Surrounding sites were identified in the following databases.

# EXECUTIVE SUMMARY

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

**STANDARD ENVIRONMENTAL RECORDS**

***Lists of state- and tribal hazardous waste facilities***

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 10/21/2024 has revealed that there is 1 ENVIROSTOR site within approximately 1 mile of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| CAL-AERO FIELD / ACA<br>Facility Id: 80000986<br>Status: Inactive - Needs Evaluation | | SSW 1/2 - 1 (0.887 mi.) | 68 | 236 |

***Lists of state and tribal landfills and solid waste disposal facilities***

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Integrated Waste Management Board's Solid Waste Information System (SWIS) database.

A review of the SWF/LF list, as provided by EDR, has revealed that there are 5 SWF/LF sites within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***AGROMIN OC ONTARIO G***<br>Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024<br>Facility ID: 36-AA-0505<br>Facility ID: 36-AA-0509<br>Operational Status: Active<br>Regulation Status: Notification | ***8292 EDISON AVENUE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G39*** | ***137*** |
| ***MATERIAL RECOVERY SO***<br>Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024 | ***7325 EDISON AVE*** | ***W 1/8 - 1/4 (0.129 mi.)*** | ***J51*** | ***191*** |

Facility ID: 36-AA-0496
Operational Status: Closed
Regulation Status: Notification

| | | | | |
|---|---|---|---|---|
| RESIDUALS RECOVERY G | 7325 EDISON RD. | W 1/8 - 1/4 (0.129 mi.) | J52 | 194 |

Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024
Facility ID: 36-AA-0483
Operational Status: Active
Regulation Status: Notification

| | | | | |
|---|---|---|---|---|
| ***RECYCLED WOOD PRODUC*** | ***13905 WALKER AVENUE*** | ***ENE 1/4 - 1/2 (0.283 mi.)*** | ***64*** | ***218*** |

Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024
Facility ID: 36-AA-0477
Operational Status: Active
Regulation Status: Notification

| | | | | |
|---|---|---|---|---|
| ***REDWOOD PRODUCTS OF*** | ***13814 S GROVE AVE*** | ***NNE 1/4 - 1/2 (0.320 mi.)*** | ***66*** | ***224*** |

Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024
Facility ID: 36-AA-0507
Operational Status: Active
Regulation Status: Notification

### *Lists of state and tribal leaking storage tanks*

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there is 1 LUST site within approximately 0.5 miles of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***PRIVATE RESIDENCE*** | ***PRIVATE RESIDENCE*** | ***SSE 1/4 - 1/2 (0.286 mi.)*** | ***65*** | ***221*** |

Database: LUST, Date of Government Version: 02/24/2025
Status: Completed - Case Closed
Global Id: T0607175289

### *Lists of state and tribal registered storage tanks*

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, has revealed that there are 2 UST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| AG-JACK ALEWYN DAIRY | 8185 EDISON AVE | 0 - 1/8 (0.000 mi.) | C11 | 36 |

Database: UST, Date of Government Version: 11/26/2024
Facility Id: 87014228

| | | | | |
|---|---|---|---|---|
| AG-TWIN PALM DAIRY | 7587 EDISON AVE | W 0 - 1/8 (0.007 mi.) | E28 | 97 |

Database: UST, Date of Government Version: 11/26/2024

# EXECUTIVE SUMMARY

Facility Id: 88015451

AST: A listing of aboveground storage tank petroleum storage tank locations.

A review of the AST list, as provided by EDR, has revealed that there are 2 AST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LEGEND DAIRY FARMS -*** | ***8381 EDISON AVENUE*** | ***E 0 - 1/8 (0.002 mi.)*** | ***27*** | ***75*** |
| Database: AST, Date of Government Version: 07/06/2016 | | | | |
| ***PAUL HUIZENGA DAIRY*** | ***7587 EDISON AVE*** | ***W 0 - 1/8 (0.007 mi.)*** | ***E30*** | ***104*** |
| Database: AST, Date of Government Version: 07/06/2016 | | | | |

## ADDITIONAL ENVIRONMENTAL RECORDS

### *Local Lists of Landfill / Solid Waste Disposal Sites*

WMUDS/SWAT: The Waste Management Unit Database System is used for program tracking and inventory of waste management units. The source is the State Water Resources Control Board.

A review of the WMUDS/SWAT list, as provided by EDR, and dated 04/01/2000 has revealed that there is 1 WMUDS/SWAT site within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***COMPOSTING PLANTONTA*** | ***8605 SCHAEFER AVE*** | ***ENE 1/4 - 1/2 (0.479 mi.)*** | ***67*** | ***234*** |

### *Local Lists of Hazardous waste / Contaminated Sites*

CERS HAZ WASTE: List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

A review of the CERS HAZ WASTE list, as provided by EDR, and dated 10/15/2024 has revealed that there are 3 CERS HAZ WASTE sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***AGROMIN OC ONTARIO G*** | ***8292 EDISON AVE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G37*** | ***130*** |
| ***AGROMIN OC ONTARIO G*** | ***8292 EDISON AVENUE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G39*** | ***137*** |
| ***SAM SOUSA DAIRY*** | ***7330 EDISON AVE*** | ***W 1/8 - 1/4 (0.127 mi.)*** | ***J49*** | ***173*** |

# EXECUTIVE SUMMARY

***Local Lists of Registered Storage Tanks***

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 2 SWEEPS UST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***JACK ALEWYN DAIRY***<br>Status: A<br>Tank Status: A<br>Comp Number: 40260 | ***8185 EDISON*** | ***ENE 0 - 1/8 (0.009 mi.)*** | ***C31*** | ***117*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***AG-COSTA VIEW FARM***<br>Status: A<br>Tank Status: A<br>Comp Number: 44727 | ***14451 BON VIEW*** | ***SW 1/8 - 1/4 (0.155 mi.)*** | ***K56*** | ***202*** |

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 3 HIST UST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***THREE D DAIRY*** | ***8485 EDISON AVE*** | ***E 0 - 1/8 (0.011 mi.)*** | ***32*** | ***118*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON HAY, INC***<br>Facility Id: 00000044727 | ***14451 BON VIEW AVE*** | ***SW 1/8 - 1/4 (0.155 mi.)*** | ***K57*** | ***208*** |
| ***DIMAS COSTA*** | ***14451 BON VIEW*** | ***SW 1/8 - 1/4 (0.202 mi.)*** | ***K60*** | ***211*** |

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there are 2 CA FID UST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***JACK ALEWYN DAIRY***<br>Facility Id: 36008971<br>Status: A | ***8185 EDISON*** | ***ENE 0 - 1/8 (0.009 mi.)*** | ***C31*** | ***117*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***AG-COSTA VIEW FARM*** | ***14451 BON VIEW*** | ***SW 1/8 - 1/4 (0.155 mi.)*** | ***K56*** | ***202*** |

# EXECUTIVE SUMMARY

Facility Id: 36009015
Status: A

***Other Ascertainable Records***

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 09/16/2024 has revealed that there are 13 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LONGGO TRANS***<br>EPA ID:: CAC003256171 | ***7960 EDISON AVE*** | ***NNE 0 - 1/8 (0.018 mi.)*** | ***F33*** | ***119*** |
| WESTLEY CARDOZA<br>EPA ID:: CAR000217141 | 7990 EDISON AVE | NE 0 - 1/8 (0.018 mi.) | F34 | 124 |
| VICTORS FARMS<br>EPA ID:: CAC003252196 | 8040 EDISON AVE | NE 0 - 1/8 (0.018 mi.) | 35 | 126 |
| AGROMIN OC ONTARIO G<br>EPA ID:: CAL000469601 | 8292 EDISON AVE | E 0 - 1/8 (0.019 mi.) | G36 | 128 |
| ***AGROMIN ONTARIO***<br>EPA ID:: CAL000457796 | ***8292 EDISON AVE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G38*** | ***133*** |
| BREAKTHRU TRANSPORTS<br>EPA ID:: CAC003088689 | 8270 EDISON AVE | ENE 0 - 1/8 (0.021 mi.) | B41 | 155 |
| LONGGO TRANS<br>EPA ID:: CAC003278161 | 7914 EDISON AVE | N 0 - 1/8 (0.022 mi.) | F42 | 157 |
| KENT AVERY REPAIR IN<br>EPA ID:: CAL000471801 | 7330 EDISON AVE | W 1/8 - 1/4 (0.127 mi.) | J50 | 189 |
| WE INC<br>EPA ID:: CAC003118028 | 13955 WALKER AVE | ENE 1/8 - 1/4 (0.230 mi.) | L62 | 213 |
| WRECK AGE DEMOLITION<br>EPA ID:: CAL000381231 | 13908 GROVE AVE | NNE 1/8 - 1/4 (0.240 mi.) | 63 | 215 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***WHITEGOLD VENTURES L***<br>EPA ID:: CAC002974181 | ***14400 GROVE AVE*** | ***SSE 0 - 1/8 (0.120 mi.)*** | ***I48*** | ***169*** |
| PARK INDUSTRIES<br>EPA ID:: CAC003238066 | 14306 BON VIEW AVE | SW 1/8 - 1/4 (0.153 mi.) | K54 | 198 |
| GORDON HAY, INC<br>EPA ID:: CAC003121794 | 14451 BON VIEW AVE | SW 1/8 - 1/4 (0.155 mi.) | K55 | 200 |

# EXECUTIVE SUMMARY

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 11/11/2024 has revealed that there are 5 FINDS sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| THREE D DAIRY - HEIF<br>Registry ID:: 110071370993<br>Registry ID:: 110066342513 | 8311 EDISON | 0 - 1/8 (0.000 mi.) | B7 | 30 |
| GORDON DAIRY #7<br>Registry ID:: 110071369294<br>Registry ID:: 110064884086 | 8185 EDISON | 0 - 1/8 (0.000 mi.) | C12 | 37 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***H & R DAIRY***<br>Registry ID:: 110044231836 | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D22*** | ***70*** |
| GORDON DAIRY #3<br>Registry ID:: 110066423604 | 14213 BON VIEW | 0 - 1/8 (0.000 mi.) | D23 | 71 |
| GORDON HAY INC DAIRY<br>Registry ID:: 110066348713 | 14213 BON VIEW AVE | 0 - 1/8 (0.000 mi.) | D25 | 71 |

ECHO: ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

A review of the ECHO list, as provided by EDR, and dated 12/21/2024 has revealed that there are 5 ECHO sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| LEGEND DAIRY FARMS -<br>Registry ID: 110071369294 | 8185 EDISON | 0 - 1/8 (0.000 mi.) | C9 | 36 |
| LEGEND DAIRY FARMS -<br>Registry ID: 110071370993 | 8311 EDISON | 0 - 1/8 (0.000 mi.) | B10 | 36 |
| GORDON DAIRY #7<br>Registry ID: 110064884086 | 8185 EDISON | 0 - 1/8 (0.000 mi.) | C16 | 52 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***H & R DAIRY***<br>Registry ID: 110044231836 | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D22*** | ***70*** |
| GORDON DAIRY #3<br>Registry ID: 110066423604 | 14213 BON VIEW | 0 - 1/8 (0.000 mi.) | D24 | 71 |

# EXECUTIVE SUMMARY

E MANIFEST: EPA established a national system for tracking hazardous waste shipments electronically. This system, known as ?e-Manifest,? will modernize the nation?s cradle-to-grave hazardous waste tracking process while saving valuable time, resources, and dollars for industry and states.

A review of the E MANIFEST list, as provided by EDR, and dated 09/16/2024 has revealed that there are 3 E MANIFEST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LONGGO TRANS*** | ***7960 EDISON AVE*** | ***NNE 0 - 1/8 (0.018 mi.)*** | ***F33*** | ***119*** |
| ***AGROMIN ONTARIO*** | ***8292 EDISON AVE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G38*** | ***133*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***WHITEGOLD VENTURES L*** | ***14400 GROVE AVE*** | ***SSE 0 - 1/8 (0.120 mi.)*** | ***I48*** | ***169*** |

Cortese: The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

A review of the Cortese list, as provided by EDR, and dated 09/16/2024 has revealed that there is 1 Cortese site within approximately 0.5 miles of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***PRIVATE RESIDENCE*** | ***PRIVATE RESIDENCE*** | ***SSE 1/4 - 1/2 (0.286 mi.)*** | ***65*** | ***221*** |
| Cleanup Status: COMPLETED - CASE CLOSED | | | | |

ENF: A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

A review of the ENF list, as provided by EDR, and dated 10/15/2024 has revealed that there are 4 ENF sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LEGEND DAIRY FARMS -***<br>Status: Historical<br>Facility Id: 239652 | ***8311 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***B8*** | ***30*** |
| ***LEGEND DAIRY FARMS -***<br>Status: Historical<br>Status: Historical<br>Facility Id: 204958 | ***8185 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***C14*** | ***43*** |
| ***JACK ALEWYN DAIRY***<br>Status: Historical<br>Status: Historical<br>Facility Id: 204958 | ***8185 EDISON BLVD*** | ***0 - 1/8 (0.000 mi.)*** | ***C17*** | ***52*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON DAIRY #3***<br>Status: Historical<br>Status: Historical<br>Facility Id: 229393 | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D18*** | ***54*** |

# EXECUTIVE SUMMARY

San Bern. Co. Permit: San Bernardino County Fire Department Hazardous Materials Division.

A review of the San Bern. Co. Permit list, as provided by EDR, and dated 08/13/2024 has revealed that there are 19 San Bern. Co. Permit sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LEGEND DAIRY FARMS -***<br>Facility Status: INACTIVE<br>Facility Id: FA0000410 | ***8311 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***B8*** | ***30*** |
| ***JACK ALEWYN DAIRY***<br>Facility Status: INACTIVE<br>Facility Id: FA0000508 | ***8185 EDISON BLVD*** | ***0 - 1/8 (0.000 mi.)*** | ***C17*** | ***52*** |
| ***G H DAIRY #4B***<br>Facility Status: INACTIVE<br>Facility Id: FA0000454 | ***7721 EDISON AVENUE*** | ***WNW 0 - 1/8 (0.002 mi.)*** | ***26*** | ***72*** |
| ***LEGEND DAIRY FARMS -***<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0000565 | ***8381 EDISON AVENUE*** | ***E 0 - 1/8 (0.002 mi.)*** | ***27*** | ***75*** |
| ***TIVA DAIRY***<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0011003 | ***7587 EDISON AVE*** | ***W 0 - 1/8 (0.007 mi.)*** | ***E29*** | ***98*** |
| ***AGROMIN OC ONTARIO G***<br>Facility Status: ACTIVE<br>Facility Id: FA0018707 | ***8292 EDISON AVENUE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G39*** | ***137*** |
| ***AGROMIN OC ONTARIO G***<br>Facility Status: ACTIVE<br>Facility Id: FA0019159 | ***8292 EDISON AVE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G40*** | ***154*** |
| RLE DAIRY<br>Facility Status: INACTIVE<br>Facility Id: FA0000626 | 14049 GROVE AVE | NE 0 - 1/8 (0.073 mi.) | H45 | 168 |
| BROWN'S FAMILY DAIRY<br>Facility Status: INACTIVE<br>Facility Id: FA0000370 | 14016 S GROVE AVE | NE 0 - 1/8 (0.108 mi.) | H46 | 168 |
| ***SAM SOUSA DAIRY***<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0000634<br>Facility Id: FA0019415 | ***7330 EDISON AVE*** | ***W 1/8 - 1/4 (0.127 mi.)*** | ***J49*** | ***173*** |
| SNS DAIRY<br>Facility Status: INACTIVE<br>Facility Id: FA0000648 | 7371 EDISON AVE | W 1/8 - 1/4 (0.130 mi.) | J53 | 197 |
| GORZEMAN DAIRY #2<br>Facility Status: INACTIVE<br>Facility Id: FA0011060 | 13948 WALKER | ENE 1/8 - 1/4 (0.195 mi.) | L59 | 210 |
| GORZEMAN FAMILY DAIR<br>Facility Status: INACTIVE<br>Facility Id: FA0011061 | 13975 WALKER | ENE 1/8 - 1/4 (0.209 mi.) | L61 | 213 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON DAIRY #3*** | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D18*** | ***54*** |

| | | | | |
|---|---|---|---|---|
| Facility Status: INACTIVE<br>Facility Id: FA0010971<br>Facility Id: FA0000395 | | | | |
| SOUTHWEST DAIRY<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0014875 | 14213 S BON VIEW AVE | 0 - 1/8 (0.000 mi.) | D19 | 64 |
| ***ALEWYN DAIRY #3***<br>Facility Status: INACTIVE<br>Facility Id: FA0000511 | ***14361 GROVE*** | ***SE 0 - 1/8 (0.063 mi.)*** | ***43*** | ***160*** |
| ***MAJESTIC FARMS #1***<br>Facility Status: INACTIVE<br>Facility Id: FA0011051 | ***14333 WALKER*** | ***ESE 0 - 1/8 (0.065 mi.)*** | ***44*** | ***163*** |
| JOE FERREIRA JR DAIR<br>Facility Status: INACTIVE<br>Facility Id: FA0000515 | 14400 S GROVE AVE | SSE 0 - 1/8 (0.120 mi.) | I47 | 169 |
| O & M DAIRY<br>Facility Status: INACTIVE<br>Facility Id: FA0010952<br>Facility Id: FA0000566 | 14474 GROVE AVE | SSE 1/8 - 1/4 (0.185 mi.) | 58 | 210 |

WDS: California Water Resources Control Board - Waste Discharge System.

A review of the WDS list, as provided by EDR, and dated 06/19/2007 has revealed that there is 1 WDS site within approximately 0.001 miles of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| H & R DAIRY - BON VI<br>Facility Status: A<br>Facility Id: 8 365857001 | 14213 BON VIEW AVE | 0 - 1/8 (0.000 mi.) | D20 | 65 |

CIWQS: The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

A review of the CIWQS list, as provided by EDR, and dated 11/20/2024 has revealed that there are 3 CIWQS sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LEGEND DAIRY FARMS -*** | ***8311 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***B8*** | ***30*** |
| ***LEGEND DAIRY FARMS -*** | ***8185 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***C14*** | ***43*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON DAIRY #3*** | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D18*** | ***54*** |

# EXECUTIVE SUMMARY

CERS: The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

A review of the CERS list, as provided by EDR, and dated 10/15/2024 has revealed that there are 4 CERS sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| LEGEND DAIRY FARMS | 8311 EDISON | 0 - 1/8 (0.000 mi.) | B13 | 38 |
| SOUTHWEST DAIRY INC | 8185 EDISON | 0 - 1/8 (0.000 mi.) | C15 | 47 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON DAIRY #3*** | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D18*** | ***54*** |
| GORDON DAIRY #3 | 14213 BON VIEW | 0 - 1/8 (0.000 mi.) | D21 | 66 |

# EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 13 records.

| Site Name | Database(s) |
|---|---|
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| SO CAL GAS/ONTARIO MGP | EDR MGP |
| ONTARIO RANCH HOLSTEINS #1 | ECHO |

# OVERVIEW MAP - 7910061.1S

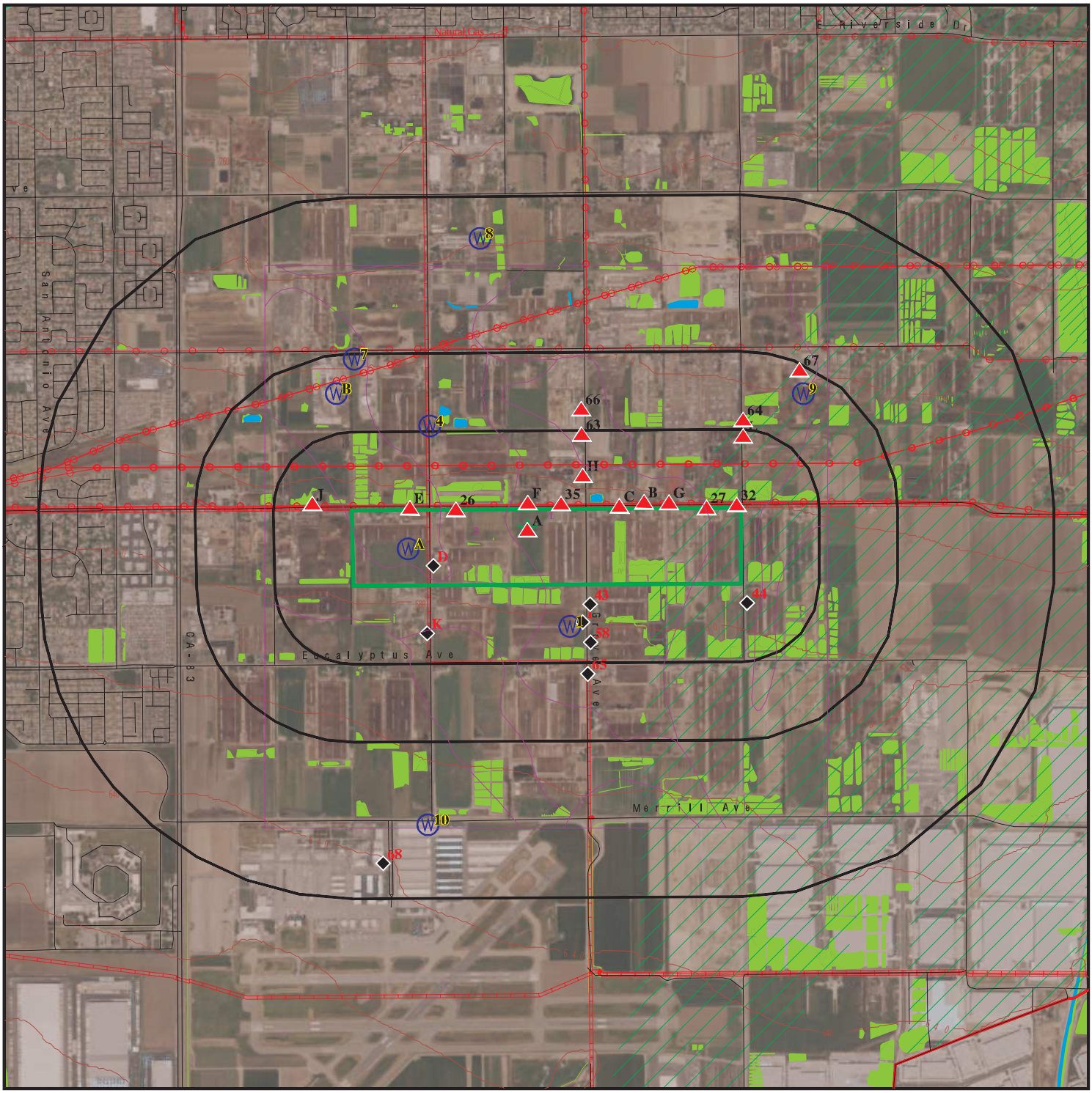


Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

County Boundary

Power transmission lines

Pipelines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Ontario Ranch II | CLIENT: Roux Associates |
| ADDRESS: 8061 Edison Avenue<br>Ontario CA 91762 | CONTACT: Ashley Whitaker |
| LAT/LONG: 33.996599 / 117.63136 | INQUIRY #: 7910061.1s |
| | DATE: February 27, 2025 2:35 pm |

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# DETAIL MAP - 7910061.1S

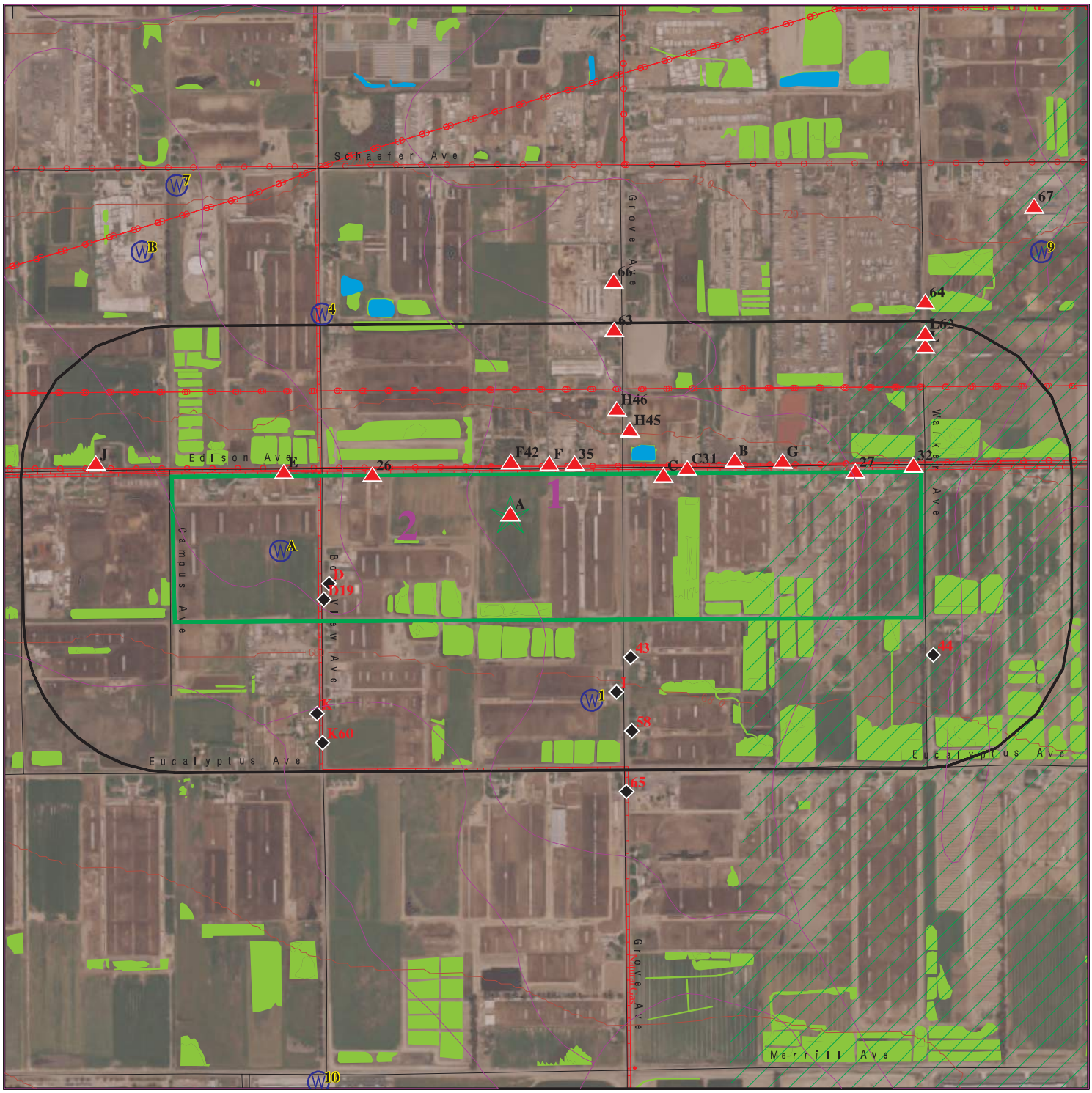


Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA

Power transmission lines

Pipelines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Ontario Ranch II | CLIENT: Roux Associates |
| ADDRESS: 8061 Edison Avenue<br>Ontario CA 91762 | CONTACT: Ashley Whitaker<br>INQUIRY #: 7910061.1s |
| LAT/LONG: 33.996599 / 117.63136 | DATE: February 27, 2025 2:35 pm |

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# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| **STANDARD ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Lists of Federal NPL (Superfund) sites*** | | | | | | | | |
| NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| Proposed NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| NPL LIENS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Lists of Federal Delisted NPL sites*** | | | | | | | | |
| Delisted NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Lists of Federal sites subject to CERCLA removals and CERCLA orders*** | | | | | | | | |
| FEDERAL FACILITY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| SEMS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of Federal CERCLA sites with NFRAP*** | | | | | | | | |
| SEMS-ARCHIVE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of Federal RCRA facilities undergoing Corrective Action*** | | | | | | | | |
| CORRACTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Lists of Federal RCRA TSD facilities*** | | | | | | | | |
| RCRA-TSDF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of Federal RCRA generators*** | | | | | | | | |
| RCRA-LQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-SQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-VSQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Federal institutional controls / engineering controls registries*** | | | | | | | | |
| LUCIS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US INST CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal ERNS list*** | | | | | | | | |
| ERNS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ***Lists of state- and tribal (Superfund) equivalent sites*** | | | | | | | | |
| RESPONSE | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Lists of state- and tribal hazardous waste facilities*** | | | | | | | | |
| ENVIROSTOR | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| ***Lists of state and tribal landfills and solid waste disposal facilities*** | | | | | | | | |
| SWF/LF | 0.500 | | 1 | 2 | 2 | NR | NR | 5 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| ***Lists of state and tribal leaking storage tanks*** | | | | | | | | |
| LUST | 0.500 | | 0 | 0 | 1 | NR | NR | 1 |
| INDIAN LUST | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| CPS-SLIC | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of state and tribal registered storage tanks*** | | | | | | | | |
| FEMA UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| UST | 0.250 | | 2 | 0 | NR | NR | NR | 2 |
| AST | 0.250 | | 2 | 0 | NR | NR | NR | 2 |
| INDIAN UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Lists of state and tribal voluntary cleanup sites*** | | | | | | | | |
| INDIAN VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of state and tribal brownfield sites*** | | | | | | | | |
| BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| **ADDITIONAL ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Local Brownfield lists*** | | | | | | | | |
| US BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Landfill / Solid Waste Disposal Sites*** | | | | | | | | |
| WMUDS/SWAT | 0.500 | | 0 | 0 | 1 | NR | NR | 1 |
| SWRCY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| HAULERS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| INDIAN ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| DEBRIS REGION 9 | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| IHS OPEN DUMPS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Hazardous waste / Contaminated Sites*** | | | | | | | | |
| US HIST CDL | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| HIST Cal-Sites | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCH | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| CDL | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| CERS HAZ WASTE | 0.250 | | 2 | 1 | NR | NR | NR | 3 |
| Toxic Pits | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| US CDL | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ***Local Lists of Registered Storage Tanks*** | | | | | | | | |
| SWEEPS UST | 0.250 | | 1 | 1 | NR | NR | NR | 2 |
| HIST UST | 0.250 | | 1 | 2 | NR | NR | NR | 3 |
| CA FID UST | 0.250 | | 1 | 1 | NR | NR | NR | 2 |
| CERS TANKS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Local Land Records*** | | | | | | | | |
| LIENS | 0.001 | | 0 | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| LIENS 2 | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| DEED | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Records of Emergency Release Reports*** | | | | | | | | |
| HMIRS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| CHMIRS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| LDS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| MCS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| SPILLS 90 | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ***Other Ascertainable Records*** | | | | | | | | |
| RCRA NonGen / NLR | 0.250 | | 8 | 5 | NR | NR | NR | 13 |
| FUDS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| DOD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCRD DRYCLEANERS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US FIN ASSUR | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| EPA WATCH LIST | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| 2020 COR ACTION | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| TSCA | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| TRIS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| SSTS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ROD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| RMP | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| RAATS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| PRP | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| PADS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ICIS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| FTTS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| MLTS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| COAL ASH DOE | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| COAL ASH EPA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| PCB TRANSFORMER | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| RADINFO | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| HIST FTTS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| DOT OPS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| CONSENT | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| INDIAN RESERV | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUSRAP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| UMTRA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| LEAD SMELTERS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| US AIRS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| US MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ABANDONED MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| MINES MRDS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| FINDS | 0.001 | 2 | 5 | NR | NR | NR | NR | 7 |
| UXO | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ECHO | 0.001 | 2 | 5 | NR | NR | NR | NR | 7 |
| DOCKET HWC | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| FUELS PROGRAM | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS NPL | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS FEDERAL SITES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| PFAS TSCA | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS TRIS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS RCRA MANIFEST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS ATSDR | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS WQP | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS PROJECT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS NPDES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS ECHO | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS ECHO FIRE TRAIN | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS PT 139 AIRPORT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AQUEOUS FOAM NRC | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| BIOSOLIDS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| UST FINDER | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| UST FINDER RELEASE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| E MANIFEST | 0.250 | | 3 | 0 | NR | NR | NR | 3 |
| PFAS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AQUEOUS FOAM | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| CA BOND EXP. PLAN | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| CHROME PLATING | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| Cortese | 0.500 | | 0 | 0 | 1 | NR | NR | 1 |
| CUPA Listings | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| DRYCLEANERS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| EMI | 0.001 | 1 | 0 | NR | NR | NR | NR | 1 |
| ENF | 0.001 | 1 | 4 | NR | NR | NR | NR | 5 |
| Financial Assurance | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ICE | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| HIST CORTESE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| HWP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HWT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| HWTS | 0.001 | 1 | 0 | NR | NR | NR | NR | 1 |
| HAZNET | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| MWMP | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| NPDES | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| San Bern. Co. Permit | 0.250 | 1 | 14 | 5 | NR | NR | NR | 20 |
| PEST LIC | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| PROC | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| Notify 65 | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HAZMAT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| UIC | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| UIC GEO | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| WASTEWATER PITS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| WDS | 0.001 | 1 | 1 | NR | NR | NR | NR | 2 |
| WIP | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| MILITARY PRIV SITES | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| PROJECT | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| WDR | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| CIWQS | 0.001 | 1 | 3 | NR | NR | NR | NR | 4 |
| CERS | 0.001 | 2 | 4 | NR | NR | NR | NR | 6 |
| NON-CASE INFO | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| OTHER OIL GAS | 0.001 | | 0 | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| PROD WATER PONDS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| SAMPLING POINT | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| WELL STIM PROJ | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| **EDR HIGH RISK HISTORICAL RECORDS** | | | | | | | | |
| ***EDR Exclusive Records*** | | | | | | | | |
| EDR MGP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| EDR Hist Auto | 0.125 | | 0 | NR | NR | NR | NR | 0 |
| EDR Hist Cleaner | 0.125 | | 0 | NR | NR | NR | NR | 0 |
| **EDR RECOVERED GOVERNMENT ARCHIVES** | | | | | | | | |
| ***Exclusive Recovered Govt. Archives*** | | | | | | | | |
| RGA LF | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| RGA LUST | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| - Totals -- | | 12 | 57 | 17 | 5 | 1 | 0 | 92 |

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

| | | | |
|---|---|---|---|
| **A1** | **JORRITSMA & ANEMA DAIRY** | **EMI** | **S104761926** |
| **Target** | **8061 EDISON AVE** | **ENF** | **N/A** |
| **Property** | **ONTARIO, CA 91762** | **HWTS** | |
| | | **San Bern. Co. Permit** | |
| | **Site 1 of 6 in cluster A** | **CIWQS** | |
| | | **CERS** | |

**Actual:**
**691 ft.**

EMI:

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2006 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.962210134554823933 |
| Reactive Organic Gases Tons/Yr: | 2.768 |
| Carbon Monoxide Emissions Tons/Yr: | .001 |
| NOX - Oxides of Nitrogen Tons/Yr: | .002 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.232 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .6028176 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2007 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.962210134554823933 |
| Reactive Organic Gases Tons/Yr: | 2.768 |
| Carbon Monoxide Emissions Tons/Yr: | .001 |
| NOX - Oxides of Nitrogen Tons/Yr: | .002 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.232 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .6028176 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2008 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.635843114801030632 |
| Reactive Organic Gases Tons/Yr: | 2.54 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.28 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .626304 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2009 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 4.9957056971084999 |
| Reactive Organic Gases Tons/Yr: | 3.4900000000000002 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.1899999999999999 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.58226699999999998 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2010 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 6.8744632121385596 |
| Reactive Organic Gases Tons/Yr: | 4.8025000000000002 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.2103999999999999 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.59224871999999995 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2011 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 6.8744632121 |
| Reactive Organic Gases Tons/Yr: | 4.8025 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.2104 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.59224872 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2012 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 4.8525622674 |
| Reactive Organic Gases Tons/Yr: | 3.39 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 0.8544 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.41805792 |

ENF:

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 234045 |
| Agency Name: | Jorritsma, James |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997681 |
| Place Longitude: | -117.629148 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365551001 |
| Reg Measure Id: | 211692 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/10/2013 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 01/09/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 351564 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 04/23/2008 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 04/23/2008 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Communication |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 234045 |
| Agency Name: | Jorritsma, James |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997681 |
| Place Longitude: | -117.629148 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365551001 |
| Reg Measure Id: | 211692 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/10/2013 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 01/09/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 222535 |
| Region: | 8 |
| Order / Resolution Number: | R8-1997-0044 |
| Enforcement Action Type: | Admin Civil Liability |
| Effective Date: | 05/19/1997 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | 6/4/1997 |
| Termination Date: | Not reported |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Enforcement - 8 365551001 |
| Description: | 13385-DISCHARGE OF WASTEWATER OFF PROPERTY. $6,750 SUSPENDED PROVIDED EMWP SUBMITTED & IMPLEMENTED BY 11/1/97. |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | 6/4/1997 |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 750 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 750 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 750 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 750 |

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 234045 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997681 |
| Place Longitude: | -117.629148 |
| SIC Code 1: | 241 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 12/24/2013 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 347601 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 05/14/2008 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 05/14/2008 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm..(05/14/2008) |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

HWTS:

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAL000319397 |
| Inactive Date: | 06/30/2013 |
| Create Date: | 05/08/2007 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 8061 EDISON AVE |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | ONTARIO, CA 917620000 |
| Owner Name: | JAMES JORRITSMA & GREG ANEMA |
| Owner Address: | 8061 EDISON AVE |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | ONTARIO, CA 917620000 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | GREG ANEMA |
| Contact Address: | 8061 EDISON AVE |
| Contact Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 917620000 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | PERMANENT |
| Category: | STATE |
| Latitude: | 33.997818 |
| Longitude: | -117.610259 |

NAICS:

| | |
|---|---|
| EPA ID: | CAL000319397 |
| Create Date: | 2007-05-08 14:05:53.117 |
| NAICS Code: | 11212 |
| NAICS Description: | Dairy Cattle and Milk Production |
| Issued EPA ID Date: | 2007-05-08 14:05:53.08700 |
| Inactive Date: | 2013-06-30 00:00:00 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Facility Name: | JORRITSMA & ANEMA DAIRY |
| Facility Address: | 8061 EDISON AVE |
| Facility Address 2: | Not reported |
| Facility City: | ONTARIO |
| Facility County: | Not reported |
| Facility State: | CA |
| Facility Zip: | 91762 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0017949 |
| Owner: | GH DAIRY (GERBEN HETTINGA) |
| Permit Number: | PT0038752 |
| Permit Category: | HAZARDOUS MATERIALS 4-10 CHEMICALS |
| Facility Status: | ACTIVE |
| Expiration Date: | 08/31/2024 |

| | |
|---|---|
| Name: | JORRITSMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000522 |
| Owner: | JORRITSMA, JAMES |
| Permit Number: | PT0008928 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2013 |

| | |
|---|---|
| Name: | JORRITSMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000522 |
| Owner: | JORRITSMA, JAMES |
| Permit Number: | PT0008927 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2013 |

CIWQS:

| | |
|---|---|
| Name: | Gh Dairy #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Hettinga, Gerben |
| Agency Address: | 6939 Schaefer Avenue Suite D Box 301, Chino, CA 91710 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| WDID: | 8 365998001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/24/2013 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997681 |
| Longitude: | -117.629148 |

| | |
|---|---|
| Name: | Gh Dairy #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Jorritsma, James |
| Agency Address: | 1115 Big Pine Lane, Norco, CA 92860 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | NPDES Permit |
| Order Number: | 82-133 |
| WDID: | 8 365551001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | 05/14/1982 |
| Effective Date: | 05/14/1982 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 05/10/1997 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997681 |
| Longitude: | -117.629148 |

CERS:

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 438861 |
| CERS ID: | 10741726 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 438861 |
| Site Name: | GH Dairy #4 |
| Violation Date: | 07-09-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to annually review and electronically certify that the |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| | business plan is complete and accurate on or before the annual due date. |
| Violation Notes: | Returned to compliance on 11/04/2019. OBSERVATION: The last Business Plan update submitted by this facility is dated 5/24/2018. CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |
| | |
| Site ID: | 438861 |
| Site Name: | GH Dairy #4 |
| Violation Date: | 07-09-2019 |
| Citation: | HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan. |
| Violation Notes: | Returned to compliance on 11/04/2019. OBSERVATION: Hazardous materials were observed on site during the inspection that are not listed in the most current CERS inventory or are listed in lesser quantities. Also, the emergency response plan submitted in CERS does not list the correct emergency contact number for the local CUPA. Revise the contact number to list either 909-386-8425 or 800-33-TOXIC and resubmit the plan. CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |
| | |
| Site ID: | 438861 |
| Site Name: | GH Dairy #4 |
| Violation Date: | 05-06-2022 |
| Citation: | HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan. |
| Violation Notes: | OBSERVATION: Hazardous materials were observed on site during the inspection that are not listed in the most current CERS inventory. CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated in CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 07-09-2019 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | ROUTINE HANDLER INSPECTION-GH DAIRY 4 |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HMRRP |
| Eval Source: | CERS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 05-06-2022 |
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | Not reported |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HMRRP |
| Eval Source: | CERS, |

Coordinates:

| | |
|---|---|
| Site ID: | 438861 |
| Facility Name: | GH Dairy #4 |
| Env Int Type Code: | HMBP |
| Program ID: | 10741726 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Center of a facility or station., |
| Latitude: | 33.996700 |
| Longitude: | -117.629260 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Patricia Mohr |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | Patricia L Mohr |
| Entity Title: | Not reported |
| Affiliation Address: | 14651 S Grove Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | GH Dairy |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | GERBEN HETTINGA |
| Entity Title: | Not reported |
| Affiliation Address: | 14651 S Grove Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | (909) 606-6455, |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Patricia Mohr |
| Entity Title: | Controller |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 14651 S Grove Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | GH Dairy |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (909) 606-6455, |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762-7297 |
| Site ID: | 475022 |
| CERS ID: | 110037259515 |
| CERS Description: | US EPA Air Emission Inventory System (EIS) |

**A2 Target Property** | **JORRITSMA AND ANEMA DAIRY**
**8061 EDISON AVENUE**
**ONTARIO, CA 91761** | **FINDS** | **1011908263**
**ECHO** | **N/A**

**Site 2 of 6 in cluster A**

**Actual: 691 ft.**

FINDS:
Registry ID: 110037259515

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
THE EMISSION INVENTORY SYSTEM (EIS) MAINTAINS AN INVENTORY OF LARGE STATIONARY SOURCES AND VOLUNTARILY-REPORTED SMALLER SOURCES OF AIR POINT POLLUTANT EMITTERS. IT CONTAINS INFORMATION ABOUT FACILITY SITES AND THEIR PHYSICAL LOCATION, EMISSIONS UNITS, EMISSIONS PROCESSES, RELEASE POINTS, CONTROL APPROACHES, AND REGULATIONS. FACILITY INVENTORY DATA ARE KEPT SEPARATE FROM THE EMISSIONS DATA AND HAVE STABLE IDENTIFIERS TO IMPROVE CONTINUITY FROM YEAR TO YEAR AND TO HELP IDENTIFY DUPLICATE OR MISSING FACILITIES
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.
Registry ID: 110071787266

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1011908263
Registry ID: 110037259515

DFR URL:
Name: JORRITSMA & ANEMA DAIRY
Address: 8061 EDISON AVENUE
City,State,Zip: ONTARIO, CA 91762

---

**A3 Target Property** | **JORRITSMA DAIRY**
**8061 EDISON AVE**
**CHINO, CA 91710** | **WDS** | **S102006119**
**N/A**

**Site 3 of 6 in cluster A**

**Actual: 691 ft.**

WDS:
Name: JORRITSMA DAIRY
Address: 8061 EDISON AVE
City: CHINO
Facility ID: Santa Ana River 365551001
Facility Type: Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this

**JORRITSMA DAIRY (Continued)** **S102006119**

| | |
|---|---|
| | category. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | CAG018001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board |
| Subregion: | 8 |
| Facility Telephone: | Not reported |
| Facility Contact: | JAMES JORRITSMA |
| Agency Name: | JORRITSMA JAMES |
| Agency Address: | 1115 BIG PINE LANE |
| Agency City,St,Zip: | NORCO 92860 |
| Agency Contact: | JAMES JORRITSMA |
| Agency Telephone: | Not reported |
| Agency Type: | Private |
| SIC Code: | 241 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Primary Waste: | STORMS |
| Waste Type2: | N |
| Waste2: | Stormwater Runoff |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Secondary Waste: | Solid Wastes |
| Secondary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | No reclamation requirements associated with this facility. |
| POTW: | The facility is not a POTW. |
| Treat To Water: | Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance from a waste treatment facility. |
| Complexity: | Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds. |

**A4 Target Property** | **GH DAIRY #4** | **ECHO** | **1025935107**
**8061 EDISON** | **N/A**
**ONTARIO, CA 91762**

**Site 4 of 6 in cluster A**

**Actual: 691 ft.**

ECHO:

| | |
|---|---|
| Envid: | 1025935107 |
| Registry ID: | 110066693894 |
| DFR URL: | |
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |

---

**A5 Target Property** | **GH DAIRY #4** | **CERS** | **S123509543**
**8061 EDISON** | **N/A**
**ONTARIO, CA 91762**

**Site 5 of 6 in cluster A**

**Actual: 691 ft.**

CERS:

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 33147 |
| CERS ID: | 234045 |
| CERS Description: | Animal Wastewater Discharge |

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 01-07-2014 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 01-25-2018 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |
| Eval General Type: | Complaint Inspection |
| Eval Date: | 03-11-1993 |
| Violations Found: | No |
| Eval Type: | Complaint Inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 06-08-2004 |
| Violations Found: | No |

**GH DAIRY #4 (Continued)** **S123509543**

Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-18-2007
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-26-2014
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-07-1999
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-03-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-15-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards

**GH DAIRY #4 (Continued)** **S123509543**

Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-17-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-06-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-23-2002
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-26-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-12-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-02-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

**GH DAIRY #4 (Continued)** **S123509543**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-09-2013
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-03-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-06-1998
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-30-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-23-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-08-1987
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-21-1992
Violations Found: No

**GH DAIRY #4 (Continued)** **S123509543**

Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-21-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-03-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 33147
Site Name: GH Dairy #4
Site Address: 8061 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 04-23-2008
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Site ID: 33147
Site Name: GH Dairy #4
Site Address: 8061 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 05-14-2008
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Site ID: 33147
Site Name: GH Dairy #4
Site Address: 8061 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 05-19-1997

**GH DAIRY #4 (Continued)** **S123509543**

Enf Action Type: Administrative Enforcement with Penality
Enf Action Description: Administrative Enforcement with Civil Liability (Penality)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Affiliation:
Affiliation Type Desc: Owner and Operator
Entity Name: Hettinga, Gerben
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

---

**A6 Target Property** **GH DAIRY #4** **FINDS** **1023371521**
**8061 EDISON** **N/A**
**ONTARIO, CA 91762**

**Site 6 of 6 in cluster A**

**Actual: 691 ft.**

FINDS:
Registry ID: 110066693894

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different systems managed within CalEPA. The five systems are: California Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

**B7** **THREE D DAIRY - HEIFERS** **FINDS** **1023338917**
**8311 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 1 of 5 in cluster B**

**Relative:** **Higher**
**Actual:** **696 ft.**

FINDS:
Registry ID: 110071370993

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.
Registry ID: 110066342513

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different systems managed within CalEPA. The five systems are: California Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

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**B8** **LEGEND DAIRY FARMS - 8311 EDISON** **ENF** **S108536469**
**8311 EDISON AVENUE** **San Bern. Co. Permit** **N/A**
**< 1/8** **ONTARIO, CA 91762** **CIWQS**
**1 ft.**

**Site 2 of 5 in cluster B**

**Relative:** **Higher**
**Actual:** **696 ft.**

ENF:

| | |
|---|---|
| Name: | ONTARIO RANCH HOLSTEINS #3 |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | 8 |
| Facility Id: | 239652 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997735 |
| Place Longitude: | -117.623403 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

| | |
|---|---|
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Not reported |
| Facility Waste Type 2: | Not reported |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | Not reported |
| Program Category1: | Not reported |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | Not reported |
| WDID: | Not reported |
| Reg Measure Id: | Not reported |
| Reg Measure Type: | Not reported |
| Region: | Not reported |
| Order #: | Not reported |
| Npdes# CA#: | Not reported |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Not reported |
| Status Date: | Not reported |
| Effective Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Not reported |
| Individual/General: | Not reported |
| Fee Code: | Not reported |
| Direction/Voice: | Not reported |
| Enforcement Id(EID): | 345334 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 11/13/2007 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 11/13/2007 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

| | |
|---|---|
| Title: | Oral Comm for Martin De Hoog |
| Description: | Oral Communication |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8311 EDISON |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | 8 |
| Facility Id: | 239652 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997735 |
| Place Longitude: | -117.623403 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Not reported |
| Facility Waste Type 2: | Not reported |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | Not reported |
| Reg Measure Type: | Not reported |
| Region: | Not reported |
| Order #: | Not reported |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

| | |
|---|---|
| Npdes# CA#: | Not reported |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Not reported |
| Status Date: | Not reported |
| Effective Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | Not reported |
| Fee Code: | Not reported |
| Direction/Voice: | Not reported |
| Enforcement Id(EID): | 345334 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 2007-11-13 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 2007-11-13 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm for Martin De Hoog |
| Description: | Oral Communication |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | MARTIN DEHOOG DAIRY |
| Address: | 8311 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000410 |
| Owner: | DE HOOG, MARTIN L |
| Permit Number: | PT0018959 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 05/31/2014 |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

CIWQS:

| | |
|---|---|
| Name: | Legend Dairy Farms - 8311 Edison |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | De Hoog, Martin |
| Agency Address: | 8311 Edison Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 77-116 |
| WDID: | 8 365366001 |
| NPDES Number: | Not reported |
| Adoption Date: | 06/10/1977 |
| Effective Date: | 06/10/1977 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 06/06/1992 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997735 |
| Longitude: | -117.623403 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8311 Edison |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Haringa, Rudolph |
| Agency Address: | 14848 Grove Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366030001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 12/01/2016 |
| Termination Date: | 01/04/2024 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997735 |
| Longitude: | -117.623403 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8311 Edison |
| Address: | 8311 EDISON AVENUE |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

| | |
|---|---|
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Ronald Pietersma |
| Agency Address: | Po Box 2500, Chino, CA 91708 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366045001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/11/2024 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997735 |
| Longitude: | -117.623403 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8311 Edison |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Joe De Hoog |
| Agency Address: | 1281 South Almond Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee |
| Order Number: | R8-2013-0001 |
| WDID: | 8 366012001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 12/27/2013 |
| Termination Date: | 01/28/2016 |
| Expiration/Review Date: | 06/01/2018 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997735 |
| Longitude: | -117.623403 |

**C9** **LEGEND DAIRY FARMS - 8185 EDISON** **ECHO** **1027617524**
**8185 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 1 of 8 in cluster C**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

ECHO:

| | |
|---|---|
| Envid: | 1027617524 |
| Registry ID: | 110071369294 |
| DFR URL: | |
| Name: | LEGEND DAIRY FARMS - 8185 EDISON |
| Address: | 8185 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |

---

**B10** **LEGEND DAIRY FARMS - 8311 EDISON** **ECHO** **1027619217**
**8311 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 3 of 5 in cluster B**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

ECHO:

| | |
|---|---|
| Envid: | 1027619217 |
| Registry ID: | 110071370993 |
| DFR URL: | |
| Name: | LEGEND DAIRY FARMS - 8311 EDISON |
| Address: | 8311 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |

---

**C11** **AG-JACK ALEWYN DAIRY** **UST** **U003784997**
**8185 EDISON AVE** **N/A**
**< 1/8** **CHINO, CA 91762**
**1 ft.**

**Site 2 of 8 in cluster C**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

UST:

| | |
|---|---|
| Name: | AG-JACK ALEWYN DAIRY |
| Address: | 8185 EDISON AVE |
| City,State,Zip: | CHINO, CA 91762 |
| Facility ID: | 87014228 |
| Permitting Agency: | SAN BERNARDINO COUNTY |
| CERSID: | Not reported |
| Latitude: | 33.997163 |
| Longitude: | -117.625589 |
| Owner type: | Not reported |
| Facility type: | Not reported |
| Num of inuse ust: | Not reported |
| Num of closed ust: | Not reported |
| Num of oos ust: | Not reported |
| Epa region: | Not reported |
| Tribal lands: | Not reported |
| Tank owner name: | Not reported |
| Tank owner mailing address: | Not reported |
| Tank owner mailing city: | Not reported |
| Tank owner mailing zip: | Not reported |
| Tank owner mailing state: | Not reported |
| Tank operator name: | Not reported |

**AG-JACK ALEWYN DAIRY (Continued)** **U003784997**

| | |
|---|---|
| Tank operator mailing address: | Not reported |
| Tank operator mailing city: | Not reported |
| Tank operator mailing zip: | Not reported |
| Tank operator mailing state: | Not reported |
| Tankidnumber: | Not reported |
| Tank status: | Not reported |
| Tank configuration: | Not reported |
| Tank closure date: | Not reported |
| Tank installation date: | Not reported |
| Tank num of compartments: | Not reported |
| Tank contents: | Not reported |
| Tank capacity gallons: | Not reported |
| Tank type: | Not reported |
| Tank pc construction: | Not reported |
| Tank pwpiping construction: | Not reported |
| Tank piping type: | Not reported |
| Tank piping construction: | Not reported |
| Tank sacrificial anode: | Not reported |
| Tank cp impressed current: | Not reported |
| Tank cp shutoff: | Not reported |
| Tank alarms: | Not reported |
| Tank ball float: | Not reported |
| Tank spill bucket: | Not reported |

---

**C12** **GORDON DAIRY #7** **FINDS** **1023203419**
**8185 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 3 of 8 in cluster C**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

FINDS:
Registry ID: 110071369294

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

Registry ID: 110064884086

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different systems managed within CalEPA. The five systems are: California

**GORDON DAIRY #7 (Continued)** **1023203419**

Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

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**B13** **LEGEND DAIRY FARMS** **CERS** **S123502901**
**8311 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 4 of 5 in cluster B**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

CERS:

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS |
| Address: | 8311 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 162220 |
| CERS ID: | 239652 |
| CERS Description: | Animal Wastewater Discharge |

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 01-08-2001 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 02-16-2011 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 06-21-2012 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 10-31-2019 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |

**LEGEND DAIRY FARMS (Continued)** **S123502901**

Eval Date: 12-01-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-13-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-10-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-10-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-13-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-16-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-19-2013
Violations Found: No
Eval Type: RWQCB Type B compliance inspection

**LEGEND DAIRY FARMS (Continued)** **S123502901**

Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-27-2002
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-14-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-04-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-15-1998
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-20-1987
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-20-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS

**LEGEND DAIRY FARMS (Continued)** **S123502901**

Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-27-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-23-2008
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-30-2018
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-08-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-10-2009
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-13-2007
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection

**LEGEND DAIRY FARMS (Continued)** **S123502901**

Eval Date: 11-22-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 162220
Site Name: Legend Dairy Farms
Site Address: 8311 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 11-13-2007
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Affiliation:
Affiliation Type Desc: Operator
Entity Name: Haringa, Rudolph
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Owner and Operator
Entity Name: Joe De Hoog
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Owner and Operator
Entity Name: Ronald Pietersma
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

**C14** **LEGEND DAIRY FARMS - 8185 EDISON** **ENF** **S130549994**
**8185 EDISON AVENUE** **CIWQS** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 4 of 8 in cluster C**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

ENF:

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8185 EDISON |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 204958 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.99581 |
| Place Longitude: | -117.62694 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Not reported |
| Facility Waste Type 2: | Not reported |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | Not reported |
| Reg Measure Type: | Not reported |
| Region: | Not reported |
| Order #: | Not reported |
| Npdes# CA#: | Not reported |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Not reported |

**LEGEND DAIRY FARMS - 8185 EDISON (Continued)** **S130549994**

| | |
|---|---|
| Status Date: | Not reported |
| Effective Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | Not reported |
| Fee Code: | Not reported |
| Direction/Voice: | Not reported |
| Enforcement Id(EID): | 451378 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Notice of Violation |
| Effective Date: | 2023-02-07 |
| Adoption/Issuance Date: | 02/07/2023 |
| Achieve Date: | Not reported |
| Termination Date: | 2023-03-10 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | NOV 02/07/2023 for Southwest Dairy Inc |
| Description: | Not reported |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8185 EDISON |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 204958 |
| Agency Name: | Alewyn, Jack |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.99581 |
| Place Longitude: | -117.62694 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |

**LEGEND DAIRY FARMS - 8185 EDISON (Continued)** **S130549994**

| | |
|---|---|
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | 8 365533001 |
| Reg Measure Id: | 211688 |
| Reg Measure Type: | Enrollee |
| Region: | Not reported |
| Order #: | R8-2013-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 2013-12-23 00:00:00 |
| Effective Date: | 03/08/1985 |
| Expiration/Review Date: | 2018-06-01 00:00:00 |
| Termination Date: | 12/18/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 343972 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 2008-02-27 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 2008-02-27 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |

**LEGEND DAIRY FARMS - 8185 EDISON (Continued)** **S130549994**

| | |
|---|---|
| Status: | Historical |
| Title: | Oral Comm 02/27/2008 |
| Description: | Oral Communication |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

CIWQS:

| | |
|---|---|
| Name: | Legend Dairy Farms - 8185 Edison |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Southwest Dairy Inc |
| Agency Address: | 8185 Edison Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366043001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 08/31/2021 |
| Termination Date: | 05/13/2022 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99581 |
| Longitude: | -117.62694 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8185 Edison |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Craig Gordon |
| Agency Address: | 2915 Kings River Lane, Ontario, CA 91761 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366007001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |

**LEGEND DAIRY FARMS - 8185 EDISON (Continued)** **S130549994**

| | |
|---|---|
| Effective Date: | 10/07/2013 |
| Termination Date: | 06/01/2021 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99581 |
| Longitude: | -117.62694 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8185 Edison |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Alewyn, Jack |
| Agency Address: | 9031 Eucalyptus Avenue, Ontario, CA 91762-7515 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 85-038 |
| WDID: | 8 365533001 |
| NPDES Number: | Not reported |
| Adoption Date: | 03/08/1985 |
| Effective Date: | 03/08/1985 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/04/2000 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99581 |
| Longitude: | -117.62694 |

---

**C15** **SOUTHWEST DAIRY INC** **CERS** **S127998773**
**8185 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 5 of 8 in cluster C**

**Relative: Higher**

**Actual: 696 ft.**

CERS:

| | |
|---|---|
| Name: | SOUTHWEST DAIRY INC |
| Address: | 8185 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 120257 |
| CERS ID: | 204958 |
| CERS Description: | Animal Wastewater Discharge |

Violations:

| | |
|---|---|
| Site ID: | 120257 |
| Site Name: | Southwest Dairy Inc |
| Violation Date: | 01-16-2023 |
| Citation: | California Water Code |

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

Violation Description: Not reported
Violation Notes: Failure to submit a complete 2022 Annual Report by the 1/15/2023 deadline.
Violation Division: Water Boards
Violation Program: ANIWSTCOWS
Violation Source: CIWQS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-16-2011
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-27-1997
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-28-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-07-2020
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-14-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-23-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-28-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-23-2008
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Initial Site Inspection
Eval Date: 12-09-2014
Violations Found: No
Eval Type: Prerequirement inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Initial Site Inspection
Eval Date: 01-13-2016
Violations Found: No
Eval Type: Prerequirement inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-26-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-08-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-21-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-17-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-26-2018
Violations Found: No
Eval Type: AGT SPCC inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-04-1988
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-14-1998
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-21-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

Eval Date: 11-03-2009
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-08-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-13-2007
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 120257
Site Name: Southwest Dairy Inc
Site Address: 8185 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 02-07-2023
Enf Action Type: Notice of Violation (Water)
Enf Action Description: Notice of Violation Letter (Informal)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Site ID: 120257
Site Name: Southwest Dairy Inc
Site Address: 8185 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 02-27-2008
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Affiliation:
Affiliation Type Desc: Operator
Entity Name: Craig Gordon

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

| | |
|---|---|
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Land Owner |
| Entity Name: | Alewyn, Jack |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Operator |
| Entity Name: | Southwest Dairy Inc |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**C16** **GORDON DAIRY #7** **ECHO** **1025487484**
**8185 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 6 of 8 in cluster C**

**Relative:** **Higher**
**Actual:** **696 ft.**

ECHO:

| | |
|---|---|
| Envid: | 1025487484 |
| Registry ID: | 110064884086 |
| | |
| DFR URL: | |
| Name: | GORDON DAIRY #7 |
| Address: | 8185 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |

---

**C17** **JACK ALEWYN DAIRY** **ENF** **S104761888**
**8185 EDISON BLVD** **San Bern. Co. Permit** **N/A**
**< 1/8** **ONTARIO, CA 91761**
**1 ft.**

**Site 7 of 8 in cluster C**

**Relative:** **Higher**
**Actual:** **696 ft.**

ENF:

| | |
|---|---|
| Name: | GORDON DAIRY #7 |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 204958 |

**JACK ALEWYN DAIRY (Continued)** **S104761888**

| | |
|---|---|
| Agency Name: | Alewyn, Jack |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.99581 |
| Place Longitude: | -117.62694 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365533001 |
| Reg Measure Id: | 211688 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 12/23/2013 |
| Effective Date: | 03/08/1985 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 12/18/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |

**JACK ALEWYN DAIRY (Continued)** **S104761888**

| | |
|---|---|
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 343972 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 02/27/2008 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 02/27/2008 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm 02/27/2008 |
| Description: | Oral Communication |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | JACK ALEWYN DAIRY |
| Address: | 8185 EDISON BLVD |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000508 |
| Owner: | JACK & ELANE ALEWYN |
| Permit Number: | PT0003498 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2008 |

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**D18** **GORDON DAIRY #3** **ENF** **S108536445**
**14213 BON VIEW AVENUE** **San Bern. Co. Permit** **N/A**
**< 1/8** **ONTARIO, CA 91762** **CIWQS**
**1 ft.** **CERS**

**Site 1 of 8 in cluster D**

**Relative:**
**Lower**

**Actual:**
**684 ft.**

ENF:

| | |
|---|---|
| Name: | GORDON DAIRY #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 229393 |
| Agency Name: | Miersma, Ronald |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| # Of Agencies: | 1 |
| Place Latitude: | 33.99491 |
| Place Longitude: | -117.63565 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365857001 |
| Reg Measure Id: | 211818 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 2000 |
| Status: | Historical |
| Status Date: | 01/18/2013 |
| Effective Date: | 11/01/2000 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 01/17/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 383854 |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Third Party Action |
| Effective Date: | 09/26/2011 |
| Adoption/Issuance Date: | 09/26/2011 |
| Achieve Date: | Not reported |
| Termination Date: | 12/31/2011 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Administrative Order Issued by EPA on 09/26/2011 for Miersma, Ronald |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | 12/31/2011 |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | GORDON DAIRY #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 229393 |
| Agency Name: | Miersma, Ronald |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.99491 |
| Place Longitude: | -117.63565 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365857001 |
| Reg Measure Id: | 211818 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 2000 |
| Status: | Historical |
| Status Date: | 01/18/2013 |
| Effective Date: | 11/01/2000 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 01/17/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 344954 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 02/06/2008 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 02/06/2008 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Communication - 2/6/2008 |
| Description: | Oral Communication |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

**GORDON DAIRY #3 (Continued)** **S108536445**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | H & R DAIRY |
| Address: | 14213 BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0010971 |
| Owner: | RON MIERSMA |
| Permit Number: | PT0018909 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2012 |

| | |
|---|---|
| Name: | COSTA, DIMAS |
| Address: | 14213 BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000395 |
| Owner: | COSTA, DIMAS |
| Permit Number: | PT0008929 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | COSTA, DIMAS |
| Address: | 14213 BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000395 |
| Owner: | COSTA, DIMAS |
| Permit Number: | PT0008930 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

CIWQS:

| | |
|---|---|
| Name: | Gordon Dairy #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Craig Gordon |
| Agency Address: | 2915 Kings River Lane, Ontario, CA 91761 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366001001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/31/2013 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99491 |
| Longitude: | -117.63565 |

| | |
|---|---|
| Name: | Gordon Dairy #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Costa, Dimas |
| Agency Address: | 14451 Bon View Avenue, Chino, CA 91710 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | NPDES Permit |
| Order Number: | 90-046 |
| WDID: | 8 365692001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | 04/13/1990 |
| Effective Date: | 04/13/1990 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 04/09/2005 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99491 |
| Longitude: | -117.63565 |

| | |
|---|---|
| Name: | Gordon Dairy #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Rocha, Joe |
| Agency Address: | 514 West Philadelphia Street, Ontario, CA 91762-6443 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 90-04601 |
| WDID: | 8 365433001 |
| NPDES Number: | Not reported |
| Adoption Date: | 04/13/1990 |
| Effective Date: | 04/13/1990 |
| Termination Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Design Flow: | 0.0001 |
| Major/Minor: | Not reported |
| Complexity: | C |
| TTWQ: | 3 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Latitude: | 33.99491 |
| Longitude: | -117.63565 |

| | |
|---|---|
| Name: | Gordon Dairy #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Miersma, Ronald |
| Agency Address: | 14451 Bon View Avenue, Ontario, CA 91762-7978 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee |
| Order Number: | R8-2007-0001 |
| WDID: | 8 365857001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 11/01/2000 |
| Termination Date: | 01/17/2013 |
| Expiration/Review Date: | 09/06/2012 |
| Design Flow: | 0 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99491 |
| Longitude: | -117.63565 |

CERS:

| | |
|---|---|
| Name: | SOUTHWEST DAIRY INC. |
| Address: | 14213 BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 33989 |
| CERS ID: | 10444234 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 03-25-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 04/09/2019. OBSERVATION: Observed Pre and Post teat dip tanks at 330 gallons each that were not listed on the hazardous materials inventory via CERS. CORRECTIVE ACTION: Update the inventory via CERS by adding (1) 330-gallon tank of pre teat dip and (1) 330-gallon tank of post teat dip. Submit a signed document stating that the inventory has been updated. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 03-25-2019 |
| Citation: | Un-Specified |
| Violation Description: | Hazardous Waste Generator Program - Administration/Documentation - General Local Ordinance |
| Violation Notes: | Returned to compliance on 04/09/2019. OBSERVATION: Observed (1) 55-gallon drum of used oil. CORRECTIVE ACTION: Obtain hazardous waste generator permit. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HW |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 03-25-2019 |
| Citation: | HSC 6.5 25123.3(h)(1) - California Health and Safety Code, Chapter 6.5, Section(s) 25123.3(h)(1) |
| Violation Description: | Failure to send hazardous waste offsite for treatment, storage, or disposal within 180 days (or 270 days if waste is transported over 200 miles) for a generator who generates less than 1000 kilogram per month if all of the following conditions are met: (1) The quantity of hazardous waste accumulated onsite never exceeds 6,000 kilograms. (2) The generator complies with the requirements of 40 Code of Federal Regulations section 262.34(d), (e) and (f). (3) The generator does not hold acutely hazardous waste or extremely hazardous waste in an amount greater than one kilogram for more than 90 days. |
| Violation Notes: | Returned to compliance on 04/09/2019. OBSERVATION: Observed (1) unlabeled 55-gallon drum of used oil and (1) 55-gallon drum of unknown waste. CORRECTIVE ACTION: Have waste hauled off site by a certified hauler and submit a copy of waste manifest along with a signed statement stating that the waste has been removed. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HW |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 05-04-2022 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 06/30/2022. OBSERVATION: Observed the hazardous materials business plan to not be electronically submitted or certified annually. CORRECTIVE ACTION: Ensure to electronically submit a hazardous materials business plan annually. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 12-09-2015 |
| Citation: | HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d) |

**GORDON DAIRY #3 (Continued)** **S108536445**

Violation Description: Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 11/22/2016. The business plan was last submitted on 4/30/15 to the CERS website. Update and submit the plan within 30 days to meet annual submission requirements.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-25-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-04-2022
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-09-2015
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Routine inspection
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-25-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Enforcement Action:
Site ID: 33989
Site Name: Southwest Dairy Inc.
Site Address: 14213 BON VIEW AVE
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 12-09-2015
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Enf Action Notes: | Not reported |
| Enf Action Division: | San Bernardino County Fire Department |
| Enf Action Program: | HMRRP |
| Enf Action Source: | CERS, |

Coordinates:

| | |
|---|---|
| Site ID: | 33989 |
| Facility Name: | Southwest Dairy Inc. |
| Env Int Type Code: | HMBP |
| Program ID: | 10444234 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Center of a facility or station., |
| Latitude: | 33.994910 |
| Longitude: | -117.635640 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 14213 Bon View Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Daric Ameye |
| Entity Title: | Owner/Operator |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | Daric Ameye |
| Entity Title: | Not reported |
| Affiliation Address: | 14213 Bon View Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | (909) 754-4642, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Daric Ameye |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (909) 754-4642, |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Daric Ameye |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | Southwest Dairy Inc. |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

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**D19** **SOUTHWEST DAIRY** **San Bern. Co. Permit** **S112833937**
**14213 S BON VIEW AVE** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 2 of 8 in cluster D**

**Relative:**
**Lower**

**Actual:**
**683 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | SOUTHWEST DAIRY |
| Address: | 14213 S BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0014875 |
| Owner: | GORDON, CRAIG |
| Permit Number: | PT0025907 |
| Permit Category: | HAZARDOUS MATERIALS 4-10 CHEMICALS |
| Facility Status: | ACTIVE |
| Expiration Date: | 01/31/2025 |

| | |
|---|---|
| Name: | SOUTHWEST DAIRY |
| Address: | 14213 S BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0014875 |
| Owner: | GORDON, CRAIG |
| Permit Number: | PT0039413 |
| Permit Category: | HAZWASTE GENERAL ACTIVITY (NB) |
| Facility Status: | INACTIVE |

**SOUTHWEST DAIRY (Continued)** **S112833937**

Expiration Date: 01/31/2020

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**D20** **H & R DAIRY - BON VIEW** **WDS** **S105257098**
**14213 BON VIEW AVE** **N/A**
**< 1/8** **CHINO, CA 0**
**1 ft.**

**Site 3 of 8 in cluster D**

**Relative:** **Lower**
**Actual:** **683 ft.**

WDS:

| | |
|---|---|
| Name: | H & R DAIRY - BON VIEW |
| Address: | 14213 BON VIEW AVE |
| City: | CHINO |
| Facility ID: | Santa Ana River 365857001 |
| Facility Type: | Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this category. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | CAG018001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board |
| Subregion: | 8 |
| Facility Telephone: | 9096062996 |
| Facility Contact: | RON MIERSMA |
| Agency Name: | MIERSMA RONALD |
| Agency Address: | 6828 ARCHIBALD |
| Agency City,St,Zip: | CORONA 91720 |
| Agency Contact: | RONALD MIERSMA |
| Agency Telephone: | 9096062996 |
| Agency Type: | Private |
| SIC Code: | 241 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Primary Waste: | STORMS |
| Waste Type2: | D |
| Waste2: | Stormwater Runoff |
| Primary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Secondary Waste: | Solid Wastes |
| Secondary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | No reclamation requirements associated with this facility. |
| POTW: | The facility is not a POTW. |
| Treat To Water: | Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance |

**H & R DAIRY - BON VIEW (Continued)** **S105257098**

from a waste treatment facility.

Complexity: Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

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**D21** **GORDON DAIRY #3** **CERS** **S123499836**
**14213 BON VIEW** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 4 of 8 in cluster D**

**Relative: Lower**
**Actual: 684 ft.**

CERS:

| | |
|---|---|
| Name: | GORDON DAIRY #3 |
| Address: | 14213 BON VIEW |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 120256 |
| CERS ID: | 229393 |
| CERS Description: | Animal Wastewater Discharge |

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Followup Inspection |
| Eval Date: | 02-07-2012 |
| Violations Found: | No |
| Eval Type: | Follow-up inspection (enforcement) |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 02-23-1988 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 08-03-2016 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 10-10-2007 |
| Violations Found: | Yes |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

**GORDON DAIRY #3 (Continued)** **S123499836**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-03-2009
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-13-1998
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-22-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-29-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-12-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-09-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-23-2010
Violations Found: No

**GORDON DAIRY #3 (Continued)** **S123499836**

Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-26-2014
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-16-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-26-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-20-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-17-2011
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-23-2018
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards

**GORDON DAIRY #3 (Continued)** **S123499836**

Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-02-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-17-1991
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 120256
Site Name: Gordon Dairy #3
Site Address: 14213 BON VIEW
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 02-06-2008
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Site ID: 120256
Site Name: Gordon Dairy #3
Site Address: 14213 BON VIEW
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 09-26-2011
Enf Action Type: Third Party Action
Enf Action Description: Third Party Action
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Affiliation:
Affiliation Type Desc: Owner and Operator
Entity Name: Craig Gordon
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported

**GORDON DAIRY #3 (Continued)** **S123499836**

Affiliation Zip: Not reported
Affiliation Phone: ,

---

**D22** **H & R DAIRY** **FINDS** **1014869496**
**14213 BON VIEW AVENUE** **ECHO** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 5 of 8 in cluster D**

**Relative:**
**Lower**

**Actual:**
**684 ft.**

FINDS:
Registry ID: 110044231836

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The Integrated Compliance Information System (ICIS) provides a database that, when complete, will contain integrated enforcement and compliance information across most of EPA's programs. The vision for ICIS is to replace EPA's independent databases that contain enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions and a subset of the Permit Compliance System (PCS), which supports the National Pollutant Discharge Elimination System (NPDES). This information is maintained in ICIS by EPA in the Regional offices and it at Headquarters. A future release of ICIS will completely replace PCS and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities that support compliance and enforcement programs, including incident tracking, compliance assistance, and compliance monitoring.
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1014869496
Registry ID: 110044231836

DFR URL:
Name: H & R DAIRY
Address: 14213 BON VIEW AVENUE
City,State,Zip: ONTARIO, CA 91762

**D23** **GORDON DAIRY #3** **FINDS** **1023346381**
**14213 BON VIEW** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 6 of 8 in cluster D**

**Relative:** FINDS:
**Lower** Registry ID: 110066423604

**Actual:**
**684 ft.** Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different systems managed within CalEPA. The five systems are: California Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

---

**D24** **GORDON DAIRY #3** **ECHO** **1025898597**
**14213 BON VIEW** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 7 of 8 in cluster D**

**Relative:** ECHO:
**Lower** Envid: 1025898597
Registry ID: 110066423604

**Actual:**
**684 ft.**

DFR URL:
Name: GORDON DAIRY #3
Address: 14213 BON VIEW
City,State,Zip: ONTARIO, CA 91762

---

**D25** **GORDON HAY INC DAIRY #3** **FINDS** **1023339497**
**14213 BON VIEW AVE** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 8 of 8 in cluster D**

**Relative:** FINDS:
**Lower** Registry ID: 110066348713

**Actual:**
**684 ft.** Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different

**GORDON HAY INC DAIRY #3 (Continued)** **1023339497**

systems managed within CalEPA. The five systems are: California Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

---

**26**
**WNW**
**< 1/8**
**0.002 mi.**
**9 ft.**

**G H DAIRY #4B**
**7721 EDISON AVENUE**
**ONTARIO, CA 91762**

**ENF** **S104761802**
**San Bern. Co. Permit** **N/A**
**CIWQS**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

ENF:

| | |
|---|---|
| Name: | G H DAIRY #4B |
| Address: | 7721 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | 8 |
| Facility Id: | 226776 |
| Agency Name: | Bootsma, Garret |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997675 |
| Place Longitude: | -117.63613 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | 112112 |
| NAICS Desc 1: | Cattle Feedlots |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365290001 |
| Reg Measure Id: | 211627 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |

**G H DAIRY #4B (Continued)** **S104761802**

| | |
|---|---|
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 09/09/2016 |
| Effective Date: | 09/09/1999 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 08/23/2016 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 343844 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 02/26/2008 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 09/08/2009 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral comm - 2/26/2008 |
| Description: | Oral communication |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | G BOOTSMA & SON'S |
| Address: | 7721 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000454 |
| Owner: | BOOTSMA, GARRET |
| Permit Number: | PT0008932 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/2010 |

**G H DAIRY #4B (Continued)** **S104761802**

| | |
|---|---|
| Name: | G BOOTSMA & SON'S |
| Address: | 7721 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000454 |
| Owner: | BOOTSMA, GARRET |
| Permit Number: | PT0008931 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/2010 |

CIWQS:

| | |
|---|---|
| Name: | G H Dairy #4b |
| Address: | 7721 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Hettinga, Gerben |
| Agency Address: | 14651 South Grove Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTGRZ |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2013-0001 |
| WDID: | 8 366028001 |
| NPDES Number: | Not reported |
| Adoption Date: | Not reported |
| Effective Date: | 10/06/2016 |
| Termination Date: | 08/23/2019 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997675 |
| Longitude: | -117.63613 |

| | |
|---|---|
| Name: | G H Dairy #4b |
| Address: | 7721 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Bootsma, Garret |
| Agency Address: | 7721 Edison Avenue, Chino, CA 91710 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS, WDR |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee |
| Order Number: | R8-2013-0001 |
| WDID: | 8 365290001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 09/09/1999 |
| Termination Date: | 08/23/2016 |
| Expiration/Review Date: | 06/01/2018 |

**G H DAIRY #4B (Continued)** **S104761802**

| | |
|---|---|
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997675 |
| Longitude: | -117.63613 |

---

**27**
**East**
**< 1/8**
**0.002 mi.**
**10 ft.**

**LEGEND DAIRY FARMS - 8381 EDISON**
**8381 EDISON AVENUE**
**ONTARIO, CA 91762**

**AST** **S108536473**
**ENF** **N/A**
**San Bern. Co. Permit**
**CIWQS**
**CERS**

**Relative:**
**Higher**

**Actual:**
**698 ft.**

AST:

| | |
|---|---|
| Name: | MICHAEL DEHOOG DAIRY |
| Address: | 8381 EDISON AVE |
| City/Zip: | ONTARIO,91762 |
| Certified Unified Program Agencies: | Not reported |
| Owner: | MICHAEL DEHOOG DAIRY |
| Total Gallons: | Not reported |
| CERSID: | 10034761 |
| Facility ID: | FA0000565 |
| Business Name: | MICHAEL DEHOOG DAIRY |
| Phone: | (909) 947-0944 |
| Fax: | (909) 947-0944 |
| Mailing Address: | 8381 EDISON AVE |
| Mailing Address City: | ONTARIO |
| Mailing Address State: | CA |
| Mailing Address Zip Code: | 91762 |
| Operator Name: | Joe DeHoog |
| Operator Phone: | (909) 815-7074 |
| Owner Phone: | (909) 947-0944 |
| Owner Mail Address: | 8381 EDISON AV |
| Owner State: | CA |
| Owner Zip Code: | 91762 |
| Owner Country: | United States |
| Property Owner Name: | Not reported |
| Property Owner Phone: | Not reported |
| Property Owner Mailing Address: | Not reported |
| Property Owner City: | Not reported |
| Property Owner Stat : | Not reported |
| Property Owner Zip Code: | Not reported |
| Property Owner Country: | Not reported |
| EPAID: | Not reported |

ENF:

| | |
|---|---|
| Name: | MICHAEL DE HOOG DAIRY |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 12/24/2013 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Enforcement Id(EID): | 347354 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 09/10/1982 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 09/10/1982 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm... |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8381 EDISON |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | De Hoog, Michael |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | 8 365379001 |
| Reg Measure Id: | 211660 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | Not reported |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 1 |
| Status: | Historical |
| Status Date: | 2024-01-08 00:00:00 |
| Effective Date: | 09/10/1982 |
| Expiration/Review Date: | 2024-03-15 00:00:00 |
| Termination Date: | 01/04/2024 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | 2019-07-15 00:00:00 |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 15 - WDRs pending rescission |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 223705 |
| Region: | Not reported |
| Order / Resolution Number: | 90-065 |
| Enforcement Action Type: | Admin Civil Liability |
| Effective Date: | 1990-04-09 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 1990-04-16 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | ACLC 90-065 for Michael De Hoog |
| Description: | 13385 - ENTIRE ASSESSMENT SUSPENDED PROVIDED THAT WASTE MANAGEMENT PLAN IS IMPLEMENTED BY 10/10/90. |
| Program: | Not reported |
| Latest Milestone Completion Date: | 1990-04-16 00:00:00 |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | 10000 |
| Initial Assessed Amount: | 10000 |
| Liability $ Amount: | Not reported |
| Project $ Amount: | 10000 |
| Liability $ Paid: | Not reported |
| Project $ Completed: | 10000 |
| Total $ Paid/Completed Amount: | 10000 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8381 EDISON |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | De Hoog, Michael |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | 8 365379001 |
| Reg Measure Id: | 211660 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | Not reported |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 1 |
| Status: | Historical |
| Status Date: | 2024-01-08 00:00:00 |
| Effective Date: | 09/10/1982 |
| Expiration/Review Date: | 2024-03-15 00:00:00 |
| Termination Date: | 01/04/2024 |
| WDR Review - Amend: | Not reported |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| WDR Review - Revise/Renew: | 2019-07-15 00:00:00 |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 15 - WDRs pending rescission |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391900 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 2012-08-09 |
| Adoption/Issuance Date: | 08/09/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 2012-08-09 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/09/2012 for De Hoog, Michael |
| Description: | Not reported |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

| | |
|---|---|
| Name: | MICHAEL DE HOOG DAIRY |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | De Hoog, Michael |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365379001 |
| Reg Measure Id: | 211660 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | 8 |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 1 |
| Status: | Active |
| Status Date: | 07/16/2019 |
| Effective Date: | 09/10/1982 |
| Expiration/Review Date: | 03/15/2024 |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391900 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/09/2012 |
| Adoption/Issuance Date: | 08/09/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/09/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/09/2012 for De Hoog, Michael |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | MICHAEL DE HOOG DAIRY |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | De Hoog, Michael |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365379001 |
| Reg Measure Id: | 211660 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | 8 |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 1 |
| Status: | Active |
| Status Date: | 07/16/2019 |
| Effective Date: | 09/10/1982 |
| Expiration/Review Date: | 03/15/2024 |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 223705 |
| Region: | 8 |
| Order / Resolution Number: | 90-065 |
| Enforcement Action Type: | Admin Civil Liability |
| Effective Date: | 04/09/1990 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 04/16/1990 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | ACLC 90-065 for Michael De Hoog |
| Description: | 13385 - ENTIRE ASSESSMENT SUSPENDED PROVIDED THAT WASTE MANAGEMENT PLAN IS IMPLEMENTED BY 10/10/90. |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | 4/16/1990 |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 10000 |
| Initial Assessed Amount: | 10000 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 10000 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 10000 |
| Total $ Paid/Completed Amount: | 10000 |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8381 EDISON |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | Not reported |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 2013-12-24 00:00:00 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 2012-09-06 00:00:00 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 347354 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 1982-09-10 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 1982-09-10 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm... |
| Description: | Not reported |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS |
| Address: | 8381 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000565 |
| Owner: | Ronald C. Pietersma |
| Permit Number: | PT0003791 |
| Permit Category: | HAZARDOUS MATERIALS 4-10 CHEMICALS |
| Facility Status: | ACTIVE |
| Expiration Date: | 12/31/2024 |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS |
| Address: | 8381 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000565 |
| Owner: | Ronald C. Pietersma |
| Permit Number: | PT0032862 |
| Permit Category: | APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT |
| Facility Status: | INACTIVE |
| Expiration Date: | 12/31/2022 |

CIWQS:

| | |
|---|---|
| Name: | Legend Dairy Farms - 8381 Edison |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | De Hoog, Michael |
| Agency Address: | 8381 Edison. Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 82-239 |
| WDID: | 8 365379001 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| NPDES Number: | Not reported |
| Adoption Date: | 09/10/1982 |
| Effective Date: | 09/10/1982 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 09/06/1997 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997391 |
| Longitude: | -117.622865 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8381 Edison |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Ronald Pietersma |
| Agency Address: | Po Box 2500, Chino, CA 91708 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366047001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/11/2024 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997391 |
| Longitude: | -117.622865 |

| | |
|---|---|
| Name: | Michael De Hoog Dairy |
| Address: | 8381 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Michael DeHoog Dairy |
| Agency Address: | 8381 Edison Ave, Chino, CA 91710 |
| Place/Project Type: | Industrial |
| SIC/NAICS: | Not reported |
| Region: | 8 |
| Program: | INDSTW |
| Regulatory Measure Status: | Terminated |
| Regulatory Measure Type: | Storm water industrial |
| Order Number: | 2014-0057-DWQ |
| WDID: | 8 36I006432 |
| NPDES Number: | CAS000001 |
| Adoption Date: | Not reported |
| Effective Date: | 04/24/1992 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Termination Date: | 03/14/2000 |
| Expiration/Review Date: | Not reported |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99775 |
| Longitude: | -117.62196 |

CERS:

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS |
| Address: | 8381 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 134851 |
| CERS ID: | 10034761 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 10-11-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material. |
| Violation Notes: | Returned to compliance on 08/10/2020. OBSERVATION: This facility has not submitted a complete emergency response plan to CERS. Stored at facility is not a valid option for the training plan. CORRECTIVE ACTION: Submit a signed statement that a complete emergency response plan and training plan have been submitted to CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 10-11-2019 |
| Citation: | HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan. |
| Violation Notes: | Returned to compliance on 07/17/2020. OBSERVATION: At the time of the inspection, hazardous materials were observed on site that were not listed on the current CERS inventory or were listed in lesser quantities. CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated via CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 08-26-2016 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. |
| Violation Notes: | Returned to compliance on 08/10/2020. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 07-28-2017 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 08/10/2020. NON INSPECTION RELATED VIOLATION |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 10-11-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. |
| Violation Notes: | Returned to compliance on 08/10/2020. OBSERVATION: The last business plan update submitted by this facility via CERS was dated 8/26/2017. CORRECTIVE ACTION: Submit a signed statement that the business plan has been updated via CERS. Your CERS ID number is 10034761. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 10-28-2022 |
| Citation: | HSC 6.95 25508(a)(3) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(3) |
| Violation Description: | Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 11/17/2022. OBSERVATION: At the time of the inspection, the inventory observed on site was not consistent with that reported to CERS. CORRECTIVE ACTION: Ensure a complete and accurate Hazardous Materials Business Plan is submitted to CERS. Sign and return the Certificate of Compliance to the inspector within 30 days of the inspection indicating the Hazardous Materials Inventory is complete and accurate. |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 134851
Site Name: Legend Dairy Farms
Violation Date: 08-26-2016
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 08/10/2020.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-11-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 07-28-2017
Violations Found: Yes
Eval Type: Other, not routine, done by local agency
Eval Notes: CERS ENFORCEMENT PROJECT
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 07-28-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-26-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-MICHAEL DEHOOG DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-28-2022
Violations Found: Yes

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 07-28-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: CERS Enforcement Project Enter Violation
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-26-2016
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: ROUTINE APSA INSPECTION-MICHAEL DEHOOG DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Enforcement Action:
Site ID: 134851
Site Name: Legend Dairy Farms
Site Address: 8381 EDISON AVE
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 08-26-2016
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Bernardino County Fire Department
Enf Action Program: HMRRP
Enf Action Source: CERS,

Coordinates:
Site ID: 134851
Facility Name: Legend Dairy Farms
Env Int Type Code: HMBP
Program ID: 10034761
Coord Name: Not reported
Ref Point Type Desc: Unknown,
Latitude: 33.991390
Longitude: -117.622559

Affiliation:
Affiliation Type Desc: Operator
Entity Name: RONALD C. PIETERSMA
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (909) 225-7672, |
| | |
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |
| | |
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Tina C. Reyes |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | PO Box 2500 |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91708 |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Ronald C. Pietersma |
| Entity Title: | Owner |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | RONALD C. PIETERSMA |
| Entity Title: | Not reported |
| Affiliation Address: | PO Box 2500 |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91708 |
| Affiliation Phone: | (909) 225-7672, |
| | |
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | LEGEND DAIRY FARMS |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Environmental Contact
Entity Name: RONALD C. PIETERSMA
Entity Title: Not reported
Affiliation Address: PO Box 2500
Affiliation City: Chino
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 91708
Affiliation Phone: ,

Affiliation Type Desc: Property Owner
Entity Name: Ronald C. Pietersma
Entity Title: Not reported
Affiliation Address: PO Box 2500
Affiliation City: Chino
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 91708
Affiliation Phone: (909) 225-7672,

Name: LEGEND DAIRY FARMS
Address: 8381 EDISON
City,State,Zip: ONTARIO, CA 91762
Site ID: 134850
CERS ID: 240561
CERS Description: Animal Wastewater Discharge

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-10-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-20-1990
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-09-2012
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-05-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-07-2011
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-05-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-1997
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-27-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-31-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-31-2019
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-03-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-16-2011
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-29-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-23-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-12-2014
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Other/Unknown
Eval Date: 08-22-2000
Violations Found: No

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval Type: Miscellaneous Inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-30-2018
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-18-2003
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-19-1997
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-22-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-26-2007
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-10-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-10-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-03-1987
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-26-2007
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-01-2009
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-18-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 134850
Site Name: Legend Dairy Farms
Site Address: 8381 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 04-09-1990
Enf Action Type: Administrative Enforcement with Penality
Enf Action Description: Administrative Enforcement with Civil Liability (Penality)

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Enf Action Notes: | Not reported |
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |

| | |
|---|---|
| Site ID: | 134850 |
| Site Name: | Legend Dairy Farms |
| Site Address: | 8381 EDISON |
| Site City: | ONTARIO |
| Site Zip: | 91762 |
| Enf Action Date: | 08-09-2012 |
| Enf Action Type: | Oral Communication |
| Enf Action Description: | Oral Communication |
| Enf Action Notes: | Not reported |
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |

| | |
|---|---|
| Site ID: | 134850 |
| Site Name: | Legend Dairy Farms |
| Site Address: | 8381 EDISON |
| Site City: | ONTARIO |
| Site Zip: | 91762 |
| Enf Action Date: | 09-10-1982 |
| Enf Action Type: | Oral Communication |
| Enf Action Description: | Oral Communication |
| Enf Action Notes: | Not reported |
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Ronald Pietersma |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**E28** **AG-TWIN PALM DAIRY** **UST** **U003785069**
**West** **7587 EDISON AVE** **N/A**
**< 1/8** **CHINO, CA 91762**
**0.007 mi.**
**39 ft.** **Site 1 of 3 in cluster E**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

UST:

| | |
|---|---|
| Name: | AG-TWIN PALM DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | CHINO, CA 91762 |
| Facility ID: | 88015451 |
| Permitting Agency: | SAN BERNARDINO COUNTY |
| CERSID: | Not reported |
| Latitude: | 33.997087 |

**AG-TWIN PALM DAIRY (Continued)** **U003785069**

| | |
|---|---|
| Longitude: | -117.637638 |
| Owner type: | Not reported |
| Facility type: | Not reported |
| Num of inuse ust: | Not reported |
| Num of closed ust: | Not reported |
| Num of oos ust: | Not reported |
| Epa region: | Not reported |
| Tribal lands: | Not reported |
| Tank owner name: | Not reported |
| Tank owner mailing address: | Not reported |
| Tank owner mailing city: | Not reported |
| Tank owner mailing zip: | Not reported |
| Tank owner mailing state: | Not reported |
| Tank operator name: | Not reported |
| Tank operator mailing address: | Not reported |
| Tank operator mailing city: | Not reported |
| Tank operator mailing zip: | Not reported |
| Tank operator mailing state: | Not reported |
| Tankidnumber: | Not reported |
| Tank status: | Not reported |
| Tank configuration: | Not reported |
| Tank closure date: | Not reported |
| Tank installation date: | Not reported |
| Tank num of compartments: | Not reported |
| Tank contents: | Not reported |
| Tank capacity gallons: | Not reported |
| Tank type: | Not reported |
| Tank pc construction: | Not reported |
| Tank pwpiping construction: | Not reported |
| Tank piping type: | Not reported |
| Tank piping construction: | Not reported |
| Tank sacrificial anode: | Not reported |
| Tank cp impressed current: | Not reported |
| Tank cp shutoff: | Not reported |
| Tank alarms: | Not reported |
| Tank ball float: | Not reported |
| Tank spill bucket: | Not reported |

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**E29**
**West**
**< 1/8**
**0.007 mi.**
**39 ft.**

**TIVA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**Site 2 of 3 in cluster E**

**EMI** **S124441617**
**San Bern. Co. Permit** **N/A**
**CERS**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

EMI:

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2019 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 189218 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 49.13675 |

**TIVA DAIRY (Continued)** **S124441617**

| | |
|---|---|
| Reactive Organic Gases Tons/Yr: | 3.93094 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.78 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.857604 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2020 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 189218 |
| Air District Name: | SC |
| SIC Code: | 2419 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 49.125 |
| Reactive Organic Gases Tons/Yr: | 3.93 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.77 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.852786 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2021 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 189218 |
| Air District Name: | SC |
| SIC Code: | 2419 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 49.13671875 |
| Reactive Organic Gases Tons/Yr: | 3.9309375 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.78 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.857604 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2022 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 189218 |
| Air District Name: | SC |
| SIC Code: | 2419 |
| Air District Name: | SOUTH COAST AQMD |

**TIVA DAIRY (Continued)** **S124441617**

Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 49
Reactive Organic Gases Tons/Yr: 3.92
Carbon Monoxide Emissions Tons/Yr: Not reported
NOX - Oxides of Nitrogen Tons/Yr: Not reported
SOX - Oxides of Sulphur Tons/Yr: Not reported
Particulate Matter Tons/Yr: 1.77
Part. Matter 10 Micrometers and Smllr Tons/Yr:0.852786

San Bern. Co. Permit:
Name: TIVA DAIRY
Address: 7587 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0011003
Owner: DICKIE VANDERMEULEN
Permit Number: PT0018968
Permit Category: HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL
Facility Status: ACTIVE
Expiration Date: 05/31/2025

Name: TIVA DAIRY
Address: 7587 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0011003
Owner: DICKIE VANDERMEULEN
Permit Number: PT0029980
Permit Category: APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT
Facility Status: INACTIVE
Expiration Date: 05/31/2020

CERS:
Name: TIVA DAIRY
Address: 7587 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Site ID: 549491
CERS ID: 10052128
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 549491
Site Name: TiVa DAIRY
Violation Date: 04-22-2016
Citation: HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d)
Violation Description: Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 05/01/2019. This facility has not submitted a Site Map or the emergency response/training plans section into CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 549491

**TIVA DAIRY (Continued)** **S124441617**

Site Name: TiVa DAIRY
Violation Date: 04-22-2016
Citation: HSC 6.95 25508.1(a)-(e) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(e)
Violation Description: Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name.
Violation Notes: Returned to compliance on 05/01/2019. Hazardous materials were observed on site during the inspection that are listed in CERS in lesser quantities. Also, a secondary emergency contact must be provided to the facility information.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 549491
Site Name: TiVa DAIRY
Violation Date: 04-22-2016
Citation: HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2
Violation Description: Failure to annually review and electronically certify that the business plan is complete, accurate, and up-to-date.
Violation Notes: Returned to compliance on 05/01/2019. The last Business Plan update submitted by this facility is dated 3/19/2013.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 549491
Site Name: TiVa DAIRY
Violation Date: 05-01-2019
Citation: HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f)
Violation Description: Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan.
Violation Notes: Returned to compliance on 07/02/2019. OBSERVATION: Facility underwent a change of ownership, and has not been reported via CERS. Facility also needs to report current inventory. CORRECTIVE ACTION: Using CERS update owner information and inventory information.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 549491
Site Name: TiVa DAIRY
Violation Date: 05-01-2019
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a business plan when

**TIVA DAIRY (Continued)** **S124441617**

storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 07/02/2019. Observation: Failure to submit Business plan via the California Environmental Reporting System (CERS). CERS Identification Number- 10052128. Corrective action: Call the CERS help line on the number provided on the beginning of this report to acquire log in information. Once information is acquired, log into CERS, and submit all required elements.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-22-2016
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: ROUTINE APSA INSPECTION-HUIZENGA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-18-2023
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-22-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-HUIZENGA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-01-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Enforcement Action:
Site ID: 549491
Site Name: TiVa DAIRY
Site Address: 7587 EDISON AVE
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 04-22-2016

**TIVA DAIRY (Continued)** **S124441617**

| | |
|---|---|
| Enf Action Type: | Notice of Violation (Unified Program) |
| Enf Action Description: | Notice of Violation Issued by the Inspector at the Time of Inspection |
| Enf Action Notes: | Not reported |
| Enf Action Division: | San Bernardino County Fire Department |
| Enf Action Program: | HMRRP |
| Enf Action Source: | CERS, |

Coordinates:

| | |
|---|---|
| Site ID: | 549491 |
| Facility Name: | TiVa DAIRY |
| Env Int Type Code: | HMBP |
| Program ID: | 10052128 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Unknown, |
| Latitude: | 33.995739 |
| Longitude: | -117.638985 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | dickie vandermeulen |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | Dickie Vander Meulen |
| Entity Title: | Not reported |
| Affiliation Address: | 14382 Bethany Ave |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91710 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | dickie vandermeulen |
| Entity Title: | Partner |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Dickie Vander Meulen |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |

**TIVA DAIRY (Continued)** **S124441617**

| | |
|---|---|
| Affiliation Phone: | (951) 202-8787, |
| | |
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 14382 Bethany Ave |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91710 |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | DICKIE VANDERMEULEN |
| Entity Title: | Not reported |
| Affiliation Address: | 14382 Bethany Ave |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91710 |
| Affiliation Phone: | (951) 202-8787, |
| | |
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | TIVA DAIRY |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

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**E30** **PAUL HUIZENGA DAIRY** **AST** **S108536452**
**West** **7587 EDISON AVE** **EMI** **N/A**
**< 1/8** **ONTARIO, CA 91762** **ENF**
**0.007 mi.** **CIWQS**
**39 ft.** **Site 3 of 3 in cluster E** **CERS**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

AST:

| | |
|---|---|
| Name: | HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City/Zip: | ONTARIO,91762 |
| Certified Unified Program Agencies: | Not reported |
| Owner: | PAUL HUIZENGA |
| Total Gallons: | Not reported |
| CERSID: | 10052128 |
| Facility ID: | FA0011003 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Business Name: | HUIZENGA DAIRY |
| Phone: | (909) 597-4695 |
| Fax: | Not reported |
| Mailing Address: | 7587 EDISON AVE |
| Mailing Address City: | ONTARIO |
| Mailing Address State: | CA |
| Mailing Address Zip Code: | 91762 |
| Operator Name: | Paul Huizenga Dairy |
| Operator Phone: | (909) 597-5124 |
| Owner Phone: | (909) 597-4695 |
| Owner Mail Address: | 7587 EDISON AV |
| Owner State: | CA |
| Owner Zip Code: | Not reported |
| Owner Country: | United States |
| Property Owner Name: | Not reported |
| Property Owner Phone: | Not reported |
| Property Owner Mailing Address: | Not reported |
| Property Owner City: | Not reported |
| Property Owner Stat : | Not reported |
| Property Owner Zip Code: | Not reported |
| Property Owner Country: | Not reported |
| EPAID: | Not reported |

EMI:

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2006 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 5.300601202404809619 |
| Reactive Organic Gases Tons/Yr: | 3.703 |
| Carbon Monoxide Emissions Tons/Yr: | .001 |
| NOX - Oxides of Nitrogen Tons/Yr: | .005 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.872 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .9159696 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2007 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 5.300601202404809619 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Reactive Organic Gases Tons/Yr: | 3.703 |
| Carbon Monoxide Emissions Tons/Yr: | .001 |
| NOX - Oxides of Nitrogen Tons/Yr: | .005 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.872 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .9159696 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2008 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 5.410821643286573146 |
| Reactive Organic Gases Tons/Yr: | 3.78 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.94 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .949242 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2009 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.8892069853993707 |
| Reactive Organic Gases Tons/Yr: | 6.21 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.77 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.86606099999999997 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2010 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.9450329229888297 |
| Reactive Organic Gases Tons/Yr: | 6.2489999999999997 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.792 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.87682559999999998 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2011 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.906384197 |
| Reactive Organic Gases Tons/Yr: | 6.222 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.778 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.8699754 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2012 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 7.9594904094 |
| Reactive Organic Gases Tons/Yr: | 5.5605 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.428 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.6987204 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2013 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 7.762808879 |
| Reactive Organic Gases Tons/Yr: | 5.5605 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.428 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.6987204 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2014 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 54.216125 |
| Reactive Organic Gases Tons/Yr: | 4.33729 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 2.047 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.9862446 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2015 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 49.35055736 |
| Reactive Organic Gases Tons/Yr: | 4.17849986 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.8334 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.88333212 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2016 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 44.375 |
| Reactive Organic Gases Tons/Yr: | 3.55 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.65 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.79497 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2017 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 45 |
| Reactive Organic Gases Tons/Yr: | 3.6 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.68 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.809424 |

ENF:

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 247791 |
| Agency Name: | Huizenga, Paul |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Individual |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997653 |
| Place Longitude: | -117.639275 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365368001 |
| Reg Measure Id: | 211655 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/08/2019 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 01/07/2019 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391924 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/08/2012 |
| Adoption/Issuance Date: | 08/08/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/08/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Title: | Oral Com 08/08/2012 for Huizenga, Paul |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 247791 |
| Agency Name: | Huizenga, Paul |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Individual |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997653 |
| Place Longitude: | -117.639275 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365368001 |
| Reg Measure Id: | 211655 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/08/2019 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 01/07/2019 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391901 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/08/2012 |
| Adoption/Issuance Date: | 08/08/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/08/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/08/2012 for Huizenga, Paul |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 247791 |
| Agency Name: | Huizenga, Paul |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Individual |
| # Of Agencies: | 1 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Place Latitude: | 33.997653 |
| Place Longitude: | -117.639275 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365368001 |
| Reg Measure Id: | 211655 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/08/2019 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 01/07/2019 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 387729 |
| Region: | 8 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/08/2012 |
| Adoption/Issuance Date: | 08/08/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/08/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/08/2012 for Huizenga, Paul |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 247791 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997653 |
| Place Longitude: | -117.639275 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 12/24/2013 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 347339 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 05/14/1982 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 05/14/1982 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral comm.. |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

CIWQS:

| | |
|---|---|
| Name: | Tiva Dairy |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Dickie Vander Meulen |
| Agency Address: | 14382 Bethany Avenue, Chino, CA 91710 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366036001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 03/04/2019 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997653 |
| Longitude: | -117.639275 |

| | |
|---|---|
| Name: | Tiva Dairy |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Huizenga, Paul |
| Agency Address: | 7587 Edison Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 82-134 |
| WDID: | 8 365368001 |
| NPDES Number: | Not reported |
| Adoption Date: | 05/14/1982 |
| Effective Date: | 05/14/1982 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 05/10/1997 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997653 |
| Longitude: | -117.639275 |

CERS:

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

Site ID: 486428
CERS ID: 110041406047
CERS Description: US EPA Air Emission Inventory System (EIS)

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**C31 ENE < 1/8 0.009 mi. 47 ft.** | **JACK ALEWYN DAIRY 8185 EDISON CHINO, CA 91710** | **SWEEPS UST CA FID UST** | **S101618788 N/A**

**Site 8 of 8 in cluster C**

**Relative: Higher**

**Actual: 696 ft.**

SWEEPS UST:

| | |
|---|---|
| Name: | JACK ALEWYN DAIRY |
| Address: | 8185 EDISON |
| City: | CHINO |
| Status: | Active |
| Comp Number: | 40260 |
| Number: | 9 |
| Board Of Equalization: | Not reported |
| Referral Date: | 08-27-91 |
| Action Date: | 08-27-91 |
| Created Date: | 02-29-88 |
| Owner Tank Id: | 1 |
| SWRCB Tank Id: | 36-000-040260-000001 |
| Tank Status: | A |
| Capacity: | 250 |
| Active Date: | 07-01-85 |
| Tank Use: | M.V. FUEL |
| STG: | P |
| Content: | DIESEL |
| Number Of Tanks: | 1 |

CA FID UST:

| | |
|---|---|
| Facility ID: | 36008971 |
| Regulated By: | UTNKA |
| Regulated ID: | 00040260 |
| Cortese Code: | Not reported |
| SIC Code: | Not reported |
| Facility Phone: | 7145972081 |
| Mail To: | Not reported |
| Mailing Address: | 8185 EDISON |
| Mailing Address 2: | Not reported |
| Mailing City,St,Zip: | CHINO 91710 |
| Contact: | Not reported |
| Contact Phone: | Not reported |
| DUNs Number: | Not reported |
| NPDES Number: | Not reported |
| EPA ID: | Not reported |
| Comments: | Not reported |
| Status: | Active |

**32 East < 1/8 0.011 mi. 60 ft.** | **THREE D DAIRY 8485 EDISON AVE CHINO, CA 91710** | **HIST UST WDS** | **S104156088 N/A**

**Relative: Higher**

**Actual: 700 ft.**

HIST UST:

| | |
|---|---|
| Name: | JACK ALEWYN DAIRY |
| Address: | 8485 EDISON |
| City,State,Zip: | CHINO, CA 91710 |
| File Number: | 0002a03c |
| URL: | |
| Region: | Not reported |
| Facility ID: | Not reported |
| Facility Type: | Not reported |
| Other Type: | Not reported |
| Contact Name: | Not reported |
| Telephone: | Not reported |
| Owner Name: | Not reported |
| Owner Address: | Not reported |
| Owner City,St,Zip: | Not reported |
| Total Tanks: | Not reported |
| Tank Num: | Not reported |
| Container Num: | Not reported |
| Year Installed: | Not reported |
| Tank Capacity: | Not reported |
| Tank Used for: | Not reported |
| Type of Fuel: | Not reported |
| Container Construction Thickness: | Not reported |
| Leak Detection: | Not reported |

Click here for Geo Tracker PDF:

WDS:

| | |
|---|---|
| Name: | THREE D DAIRY |
| Address: | 8485 EDISON AVE |
| City: | CHINO |
| Facility ID: | Santa Ana River 365749001 |
| Facility Type: | Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this category. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | CAG018001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board |
| Subregion: | 8 |
| Facility Telephone: | Not reported |
| Facility Contact: | JOE DE HOOG |
| Agency Name: | DE HOOG JOE & MICHAEL |
| Agency Address: | 14350 WALKER AVENUE |
| Agency City,St,Zip: | CHINO 91710 |
| Agency Contact: | JOE DE HOOG |
| Agency Telephone: | Not reported |
| Agency Type: | Private |

**THREE D DAIRY (Continued)** **S104156088**

| | |
|---|---|
| SIC Code: | 241 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Primary Waste: | STORMS |
| Waste Type2: | N |
| Waste2: | Stormwater Runoff |
| Primary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Secondary Waste: | Solid Wastes |
| Secondary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | No reclamation requirements associated with this facility. |
| POTW: | The facility is not a POTW. |
| Treat To Water: | Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance from a waste treatment facility. |
| Complexity: | Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds. |

---

**F33** **LONGGO TRANS** **RCRA NonGen / NLR** **1028894796**
**NNE** **7960 EDISON AVE** **E MANIFEST** **CAC003256171**
**< 1/8** **ONTARIO, CA 91762**
**0.018 mi.**
**94 ft.** **Site 1 of 3 in cluster F**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

RCRA Listings:

| | |
|---|---|
| Date Form Received by Agency: | 20231012 |
| Handler Name: | Longgo Trans |
| Handler Address: | 7960 Edison Ave |
| Handler City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAC003256171 |
| Contact Name: | CONNIE GAO |
| Contact Address: | 7960 EDISON AVE |
| Contact City,State,Zip: | ONTRAIO, CA 91762 |
| Contact Telephone: | 909-628-7868 |
| Contact Fax: | Not reported |
| Contact Email: | LONGGOTRANSAR@GMAIL.COM |
| Contact Title: | Not reported |
| EPA Region: | 09 |
| Land Type: | Not reported |
| Federal Waste Generator Description: | Not a generator, verified |
| Non-Notifier: | Not reported |

**LONGGO TRANS (Continued)** **1028894796**

| | | |
|---|---|---|
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | PO BOX 1578 |
| Mailing City,State,Zip: | | CHINO, CA 91708 |
| Owner Name: | Connie Gao | |
| Owner Type: | | Other |
| Operator Name: | Connie Gao | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20231012 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: CONNIE GAO | |
| Legal Status: | Other |

**LONGGO TRANS (Continued)** **1028894796**

| | |
|---|---|
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 7960 EDISON AVE |
| Owner/Operator City,State,Zip: | ONTRAIO, CA 91710 |
| Owner/Operator Telephone: | 626-758-8088 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: CONNIE GAO | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 7960 EDISON AVE |
| Owner/Operator City,State,Zip: | ONTRAIO, CA 91762 |
| Owner/Operator Telephone: | 909-628-7868 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20231012 |
| Handler Name: LONGGO TRANS | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 48411 |
| NAICS Description: | General Freight Trucking, Local |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

E MANIFEST:

| | |
|---|---|
| Manifest Tracking Number: | 007258294GBF |
| Last Updated Date: | 20231101 |
| Shipped Date: | 20231013 |
| Received Date: | 20231016 |
| Manifest Status: | Signed |
| Submission Type: | DataImage5Copy |
| Origin Type: | Service |
| Generator EPA ID: | CAC003256171 |

**LONGGO TRANS (Continued)** **1028894796**

| | |
|---|---|
| Generator Name: | Longgo Trans |
| Generator Location Street Number: | Not reported |
| Generator Location Street 1: | 7960 EDISON AVE |
| Generator Location Street 2: | Not reported |
| Generator Location City: | ONTARIO |
| Generator Location State: | CA |
| Generator Location Zip: | 91762 |
| Generator Mail Street Number: | Not reported |
| Generator Mail Street 1: | PO BOX 1578 |
| Generator Mail Street 2: | Not reported |
| Generator Mail City: | CHINO |
| Generator Mail Zip: | 91708 |
| Generator Mail State: | CA |
| Generator Contact Company Name: | Not reported |
| Designated Facility EPA ID: | CAT080013352 |
| Designated Facility Name: | World Oil Recycling |
| Designated Facility Mail Street Number: | 2000 |
| Designated Facility Mail Street 1: | CA90222 CA037US 2000 |
| Designated Facility Mail Street 2: | N. ALAMEDA STREET |
| Designated Facility Mail City: | COMPTON |
| Designated Facility Mail Zip: | 90222 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | 2000 |
| Designated Facility Location Street 1: | N. ALAMEDA STREET |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | COMPTON |
| Designated Facility Location Zip: | 90222-0000 |
| Designated Facility Location State: | CA |
| Designated Facility Contact Company Name: | Not reported |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

| | |
|---|---|
| Manifest Tracking Number: | 007258316GBF |
| Last Updated Date: | 20231106 |
| Shipped Date: | 20231020 |
| Received Date: | 20231026 |
| Manifest Status: | Signed |
| Submission Type: | DataImage5Copy |
| Origin Type: | Web |
| Generator EPA ID: | CAC003256171 |
| Generator Name: | Longgo Trans |
| Generator Location Street Number: | Not reported |
| Generator Location Street 1: | 7960 EDISON AVE |
| Generator Location Street 2: | Not reported |
| Generator Location City: | ONTARIO |
| Generator Location State: | CA |
| Generator Location Zip: | 91762 |
| Generator Mail Street Number: | Not reported |
| Generator Mail Street 1: | PO BOX 1578 |
| Generator Mail Street 2: | Not reported |
| Generator Mail City: | CHINO |
| Generator Mail Zip: | 91708 |
| Generator Mail State: | CA |
| Generator Contact Company Name: | Not reported |
| Designated Facility EPA ID: | AZR000520304 |
| Designated Facility Name: | Aa Sydcol Llc |
| Designated Facility Mail Street Number: | Not reported |

**LONGGO TRANS (Continued)** **1028894796**

| | |
|---|---|
| Designated Facility Mail Street 1: | Not reported |
| Designated Facility Mail Street 2: | 3155 GOLDEN WILLOW CT |
| Designated Facility Mail City: | YORBA LINDA |
| Designated Facility Mail Zip: | 92886-1303 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | Not reported |
| Designated Facility Location Street 1: | 2264 E 13TH ST |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | YUMA |
| Designated Facility Location Zip: | 85365-1858 |
| Designated Facility Location State: | AZ |
| Designated Facility Contact Company Name: | Not reported |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

Transporter:

| | |
|---|---|
| Manifest Tracking Number: | 007258316GBF |
| Transporter Line Number: | 1 |
| Transporter EPA ID: | CAR000293316 |
| Transporter Name: | Swift Oil & Vacuum Inc |

| | |
|---|---|
| Manifest Tracking Number: | 007258316GBF |
| Transporter Line Number: | 2 |
| Transporter EPA ID: | CAD980585293 |
| Transporter Name: | Industrial Waste Utilization Inc |

Waste Line:

| | |
|---|---|
| Manifest Tracking Number: | 007258316GBF |
| Waste Line Number: | 1 |
| U.S. DOT Hazardous Indicator: | N |
| U.S. DOT ID Number: | Not reported |
| U.S. DOT Description: | Not reported |
| Non-Hazardous Waste Description: | NON-RCRA HAZARDOUS WASTE SOLID (PAPER FILTERS & OIL) |
| Number of Containers: | 1 |
| Container Type Code: | DM |
| Container Type Description: | Metal drums, barrels, kegs |
| Waste Quantity: | 200 |
| Quantity Unit of Measure Code: | P |
| Quantity Unit of Measure Description: | Pounds |
| Waste Quantity, in Tons: | 0.1 |
| Acute Waste Quantity, in Tons: | 0 |
| Non-Acute Waste Quantity, in Tons: | 0.1 |
| Waste Quantity, in Kilograms: | 90.703 |
| Acute Waste Quantity, in Kilograms: | 0 |
| Non-Acute Waste Quantity, in Kilorgrams: | 90.703 |
| Management Method Code: | H141 |
| Management Method Description: | STORAGE, BULKING AND/OR TRANSFER OFF SITE |
| Waste Residue Indicator: | N |
| Quantity Discrepancy Indicator: | N |
| Waste Type Discrepancy Indicator: | N |
| Waste Density: | Not reported |
| Waste Density Unit of Measure Code: | Not reported |
| Waste Density Unit of Measure Description: | Not reported |
| Form Code: | Not reported |
| Form Code Description: | Not reported |
| Source Code: | Not reported |

**LONGGO TRANS (Continued)** **1028894796**

| | |
|---|---|
| Source Code Description: | Not reported |
| Waste Minimization Code: | Not reported |
| Waste Minimization Code Description: | Not reported |
| Consent Number: | Not reported |
| EPA Waste Indicator: | N |

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**F34 NE < 1/8 0.018 mi. 95 ft.** **WESTLEY CARDOZA** **RCRA NonGen / NLR** **1014465273**
**7990 EDISON AVE** **CAR000217141**
**ONTARIO, CA 91762**

**Site 2 of 3 in cluster F**

**Relative: Higher**

**Actual: 694 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20110314 |
| Handler Name: | | Westley Cardoza |
| Handler Address: | | 7990 Edison Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAR000217141 |
| Contact Name: | | WESTLEY N CARDOZA |
| Contact Address: | | PO BOX 6790 |
| Contact City,State,Zip: | | NORCO, CA 92860 |
| Contact Telephone: | | 909-772-7318 |
| Contact Fax: | | Not reported |
| Contact Email: | | CARDOZADEVILLE@YAHOO.COM |
| Contact Title: | | OWNER WWC TRANSPORT |
| EPA Region: | | 09 |
| Land Type: | | Private |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Handler Activities |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | PO BOX 6790 |
| Mailing City,State,Zip: | | NORCO, CA 92860 |
| Owner Name: | Westley Cardoza | |
| Owner Type: | | Private |
| Operator Name: | Westley Cardoza | |
| Operator Type: | | Private |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | Yes |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |

**WESTLEY CARDOZA (Continued)** **1014465273**

| | |
|---|---|
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20110314 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: WESTLEY CARDOZA | |
| Legal Status: | Private |
| Date Became Current: | 20060701 |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | PO BOX 6790 |
| Owner/Operator City,State,Zip: | NORCO, CA 92860 |
| Owner/Operator Telephone: | 509-772-7318 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |
| | |
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: WESTLEY CARDOZA | |
| Legal Status: | Private |
| Date Became Current: | 20060801 |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | Not reported |
| Owner/Operator City,State,Zip: | Not reported |
| Owner/Operator Telephone: | Not reported |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20110314 |
| Handler Name: WESTLEY CARDOZA | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |

**WESTLEY CARDOZA (Continued)** **1014465273**

| | |
|---|---|
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | Not reported |
| Electronic Manifest Broker: | Not reported |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 48411 |
| NAICS Description: | General Freight Trucking, Local |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

---

**35**
**NE**
**< 1/8**
**0.018 mi.**
**95 ft.**

**VICTORS FARMS**
**8040 EDISON AVE**
**ONTARIO, CA 91762**

**RCRA NonGen / NLR** **1028891097**
**CAC003252196**

**Relative:**
**Higher**

**Actual:**
**695 ft.**

RCRA Listings:

| | |
|---|---|
| Date Form Received by Agency: | 20230918 |
| Handler Name: | Victors Farms |
| Handler Address: | 8040 Edison Ave |
| Handler City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAC003252196 |
| Contact Name: | VICTOR FARMS |
| Contact Address: | 8040 EDISON AVE |
| Contact City,State,Zip: | ONTARIO, CA 91762 |
| Contact Telephone: | 951-218-6289 |
| Contact Fax: | Not reported |
| Contact Email: | MILLS.KEVIN@CLEANHARBORS.COM |
| Contact Title: | Not reported |
| EPA Region: | 09 |
| Land Type: | Not reported |
| Federal Waste Generator Description: | Not a generator, verified |
| Non-Notifier: | Not reported |
| Biennial Report Cycle: | Not reported |
| Accessibility: | Not reported |
| Active Site Indicator: | Not reported |
| State District Owner: | Not reported |
| State District: | Not reported |
| Mailing Address: | 8040 EDISON AVE |
| Mailing City,State,Zip: | ONTARIO, CA 91762 |
| Owner Name: | Victor Farms |
| Owner Type: | Other |
| Operator Name: | Victor Farms |
| Operator Type: | Other |
| Short-Term Generator Activity: | No |
| Importer Activity: | No |
| Mixed Waste Generator: | No |
| Transporter Activity: | No |

**VICTORS FARMS (Continued)** **1028891097**

| | |
|---|---|
| Transfer Facility Activity: | No |
| Recycler Activity with Storage: | No |
| Small Quantity On-Site Burner Exemption: | No |
| Smelting Melting and Refining Furnace Exemption: | No |
| Underground Injection Control: | No |
| Off-Site Waste Receipt: | No |
| Universal Waste Indicator: | No |
| Universal Waste Destination Facility: | No |
| Federal Universal Waste: | No |
| Active Site State-Reg Handler: | --- |
| Federal Facility Indicator: | Not reported |
| Hazardous Secondary Material Indicator: | N |
| Sub-Part K Indicator: | Not reported |
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20230918 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: VICTOR FARMS | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 8040 EDISON AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-218-6289 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: VICTOR FARMS | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 8040 EDISON AVE |

**VICTORS FARMS (Continued)** **1028891097**

Owner/Operator City,State,Zip: ONTARIO, CA 91762
Owner/Operator Telephone: 951-218-6289
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20230918
Handler Name: VICTORS FARMS
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 811430
NAICS Description: Footwear And Leather Goods Repair

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

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**G36** **AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPER** **RCRA NonGen / NLR** **1027217754**
**East** **8292 EDISON AVE** **CAL000469601**
**< 1/8** **ONTARIO, CA 91762**
**0.019 mi.**
**102 ft.** **Site 1 of 5 in cluster G**

**Relative:**
**Higher**

**Actual:**
**699 ft.**

RCRA Listings:
Date Form Received by Agency: 20220330
Handler Name: Agromin Oc Ontario Green Materials Composting Operation
Handler Address: 8292 Edison Ave
Handler City,State,Zip: ONTARIO, CA 91762
EPA ID: CAL000469601
Contact Name: MIKE ZWERNER
Contact Address: 201 KINETIC DR
Contact City,State,Zip: OXNARD, CA 93030
Contact Telephone: 805-807-0677
Contact Fax: 805-485-9222
Contact Email: Not reported
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **1027217754**

| | | |
|---|---|---|
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 201 KINETIC DR |
| Mailing City,State,Zip: | | OXNARD, CA 93030 |
| Owner Name: | Agromin Oc Llc | |
| Owner Type: | | Other |
| Operator Name: | Mike Zwerner | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20220411 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: MIKE ZWERNER | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **1027217754**

Owner/Operator Address: 201 KINETIC DR
Owner/Operator City,State,Zip: OXNARD, CA 93030
Owner/Operator Telephone: 805-807-0677
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: AGROMIN OC LLC
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 17121 NICHOLS LN
Owner/Operator City,State,Zip: HUNTINGTON BEACH, CA 92647
Owner/Operator Telephone: 805-485-9200
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20220330
Handler Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 325314
NAICS Description: Fertilizer (Mixing Only) Manufacturing

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

---

**G37** **AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPER** **CERS HAZ WASTE** **S128624015**
**East** **8292 EDISON AVE** **HAZNET** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**0.019 mi.**
**102 ft.** **Site 2 of 5 in cluster G**

**Relative:**
**Higher**
**Actual:**
**699 ft.**

CERS HAZ WASTE:
Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Address: 8292 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Site ID: 611660
CERS ID: 10896175

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **S128624015**

CERS Description: Hazardous Waste Generator

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: San Bernardino County Fire
Entity Title: Not reported
Affiliation Address: 620 South E Street
Affiliation City: San Bernardino
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92415-0153
Affiliation Phone: (909) 386-8401,

Affiliation Type Desc: Environmental Contact
Entity Name: DAVE GREEN
Entity Title: Not reported
Affiliation Address: 201 Kinetic Drive
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93030
Affiliation Phone: ,

Affiliation Type Desc: Legal Owner
Entity Name: Agromin OC, LLC.
Entity Title: Not reported
Affiliation Address: 201 Kinetic Drive
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 93030
Affiliation Phone: (805) 485-9200,

Affiliation Type Desc: Parent Corporation
Entity Name: Agromin OC
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **S128624015**

| | |
|---|---|
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Dave Green |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Dave Green |
| Entity Title: | COO |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Operator |
| Entity Name: | Agromin OC, LLC. |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (805) 485-9200, |
| | |
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 201 Kinetic Drive |
| Affiliation City: | Oxnard |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 93030 |
| Affiliation Phone: | , |

HAZNET:

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91762 |
| Contact: | DAVE GREEN |
| Telephone: | 8054859200 |
| Mailing Name: | Not reported |
| Mailing Address: | 201 KINETIC DR |
| | |
| Year: | 2023 |

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **S128624015**

| | |
|---|---|
| Gepaid: | CAL000469601 |
| TSD EPA ID: | Not reported |
| CA Waste Code: | - |
| Disposal Method: | - |
| Tons: | Not reported |

---

**G38**
**East**
**< 1/8**
**0.019 mi.**
**102 ft.**

**AGROMIN ONTARIO**
**8292 EDISON AVE**
**ONTARIO, CA 91762**

**RCRA NonGen / NLR** **1026492994**
**E MANIFEST** **CAL000457796**

**Site 3 of 5 in cluster G**

**Relative:**
**Higher**

**Actual:**
**699 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20201027 |
| Handler Name: | | Agromin Ontario |
| Handler Address: | | 8292 Edison Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAL000457796 |
| Contact Name: | | GERMAN CERVANTES |
| Contact Address: | | 201 KINETIC DR |
| Contact City,State,Zip: | | OXNARD, CA 93030 |
| Contact Telephone: | | 805-207-7956 |
| Contact Fax: | | 806-485-9222 |
| Contact Email: | | GERMAN@AGROMIN.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 201 KINETIC DR |
| Mailing City,State,Zip: | | OXNARD, CA 93030 |
| Owner Name: | Bill Camarillo | |
| Owner Type: | | Other |
| Operator Name: | German Cervantes | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |

**AGROMIN ONTARIO (Continued)** **1026492994**

| | |
|---|---|
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20201106 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: GERMAN CERVANTES | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 201 KINETIC DR |
| Owner/Operator City,State,Zip: | OXNARD, CA 93030 |
| Owner/Operator Telephone: | 805-207-7956 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: BILL CAMARILLO | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 201 KINETIC DR |
| Owner/Operator City,State,Zip: | OXNARD, CA 93030 |
| Owner/Operator Telephone: | 805-485-9200 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20201027 |
| Handler Name: AGROMIN ONTARIO | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |

**AGROMIN ONTARIO (Continued)** **1026492994**

| | |
|---|---|
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | Not reported |
| Electronic Manifest Broker: | Not reported |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 325314 |
| NAICS Description: | Fertilizer (Mixing Only) Manufacturing |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

E MANIFEST:

| | |
|---|---|
| Manifest Tracking Number: | 030085021WAS |
| Last Updated Date: | 20231213 |
| Shipped Date: | 20231207 |
| Received Date: | 20231208 |
| Manifest Status: | Signed |
| Submission Type: | DataImage5Copy |
| Origin Type: | Web |
| Generator EPA ID: | CAL000457796 |
| Generator Name: | Agromin Ontario |
| Generator Location Street Number: | Not reported |
| Generator Location Street 1: | 8292 EDISON AVE |
| Generator Location Street 2: | Not reported |
| Generator Location City: | ONTARIO |
| Generator Location State: | CA |
| Generator Location Zip: | 91762 |
| Generator Mail Street Number: | Not reported |
| Generator Mail Street 1: | 201 KINETIC DR |
| Generator Mail Street 2: | Not reported |
| Generator Mail City: | OXNARD |
| Generator Mail Zip: | 93030 |
| Generator Mail State: | CA |
| Generator Contact Company Name: | Not reported |
| Designated Facility EPA ID: | CAL000330453 |
| Designated Facility Name: | Agritec Int Dba Cleantech Environmental |
| Designated Facility Mail Street Number: | 5820 |
| Designated Facility Mail Street 1: | Not reported |
| Designated Facility Mail Street 2: | MARTIN ROAD |
| Designated Facility Mail City: | IRWINDALE |
| Designated Facility Mail Zip: | 91706 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | 5820 |
| Designated Facility Location Street 1: | MARTIN ROAD |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | IRWINDALE |
| Designated Facility Location Zip: | 91706 |

**AGROMIN ONTARIO (Continued)** **1026492994**

| | |
|---|---|
| Designated Facility Location State: | CA |
| Designated Facility Contact Company Name: | Not reported |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

| | |
|---|---|
| Manifest Tracking Number: | 030047108WAS |
| Last Updated Date: | 20220303 |
| Shipped Date: | 20220225 |
| Received Date: | 20220228 |
| Manifest Status: | Signed |
| Submission Type: | DataImage5Copy |
| Origin Type: | Web |
| Generator EPA ID: | CAL000457796 |
| Generator Name: | Agromin Ontario |
| Generator Location Street Number: | Not reported |
| Generator Location Street 1: | 8292 EDISON AVE |
| Generator Location Street 2: | Not reported |
| Generator Location City: | ONTARIO |
| Generator Location State: | CA |
| Generator Location Zip: | 91762 |
| Generator Mail Street Number: | Not reported |
| Generator Mail Street 1: | 201 KINETIC DR |
| Generator Mail Street 2: | Not reported |
| Generator Mail City: | OXNARD |
| Generator Mail Zip: | 93030 |
| Generator Mail State: | CA |
| Generator Contact Company Name: | Not reported |
| Designated Facility EPA ID: | CAL000330453 |
| Designated Facility Name: | Agritec Int Dba Cleantech Environmental |
| Designated Facility Mail Street Number: | 5820 |
| Designated Facility Mail Street 1: | Not reported |
| Designated Facility Mail Street 2: | MARTIN ROAD |
| Designated Facility Mail City: | IRWINDALE |
| Designated Facility Mail Zip: | 91706 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | 5820 |
| Designated Facility Location Street 1: | MARTIN ROAD |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | IRWINDALE |
| Designated Facility Location Zip: | 91706 |
| Designated Facility Location State: | CA |
| Designated Facility Contact Company Name: | Not reported |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

State Waste:

| | |
|---|---|
| Manifest Tracking Number: | 030047108WAS |
| Waste Line Number: | 1 |
| State Waste Code Owner: | CA |
| State Waste Code: | 352 |
| State Waste: | Other organic solids |

Transporter:

| | |
|---|---|
| Manifest Tracking Number: | 030047108WAS |
| Transporter Line Number: | 1 |
| Transporter EPA ID: | CAR000330019 |

**AGROMIN ONTARIO (Continued)** **1026492994**

Transporter Name: Cleantech Environmental, Inc

Waste Line:

| | |
|---|---|
| Manifest Tracking Number: | 030047108WAS |
| Waste Line Number: | 1 |
| U.S. DOT Hazardous Indicator: | N |
| U.S. DOT ID Number: | Not reported |
| U.S. DOT Description: | Not reported |
| Non-Hazardous Waste Description: | NON-RCRA HAZARDOUS WASTE SOLID (OILY SOLID WASTE/USED METAL OIL FILTERS) |
| Number of Containers: | 1 |
| Container Type Code: | DM |
| Container Type Description: | Metal drums, barrels, kegs |
| Waste Quantity: | 200 |
| Quantity Unit of Measure Code: | P |
| Quantity Unit of Measure Description: | Pounds |
| Waste Quantity, in Tons: | 0.1 |
| Acute Waste Quantity, in Tons: | 0 |
| Non-Acute Waste Quantity, in Tons: | 0.1 |
| Waste Quantity, in Kilograms: | 90.703 |
| Acute Waste Quantity, in Kilograms: | 0 |
| Non-Acute Waste Quantity, in Kilorgrams: | 90.703 |
| Management Method Code: | H010 |
| Management Method Description: | METALS RECOVERY |
| Waste Residue Indicator: | N |
| Quantity Discrepancy Indicator: | N |
| Waste Type Discrepancy Indicator: | N |
| Waste Density: | Not reported |
| Waste Density Unit of Measure Code: | Not reported |
| Waste Density Unit of Measure Description: | Not reported |
| Form Code: | Not reported |
| Form Code Description: | Not reported |
| Source Code: | Not reported |
| Source Code Description: | Not reported |
| Waste Minimization Code: | Not reported |
| Waste Minimization Code Description: | Not reported |
| Consent Number: | Not reported |
| EPA Waste Indicator: | N |

---

**G39** **AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERA** **SWF/LF** **S126142007**
**East** **8292 EDISON AVENUE** **CERS HAZ WASTE** **N/A**
**< 1/8** **ONTARIO, CA 91762** **NPDES**
**0.019 mi.** **San Bern. Co. Permit**
**102 ft.** **Site 4 of 5 in cluster G** **CIWQS**
**CERS**

**Relative:**
**Higher**

**Actual:**
**699 ft.**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | AGROMIN ONTARIO GREEN MATERIAL COMPOST OPERATION |
| Address: | 8292 EDISON AVE. |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | STATE |
| Facility ID: | 36-AA-0505 |
| SWIS Number: | 36-AA-0505 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Activity: | Chipping and Grinding Facility/Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Facility |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | 10/21/2021 |
| Cease Operation Type: | Actual |
| Inspection Frequency: | Quarterly |
| Throughput: | 200 |
| Throughput Units: | Tons per day |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 63000 |
| Capacity Units: | Tons per year |
| Total Acreage: | 5 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 8292 Edison Ave. |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91762 |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Activity: | Green Material Composting Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 12500 |
| Throughput Units: | Cubic Yards |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 300000 |
| Capacity Units: | Cubic Yards per year |
| Total Acreage: | 5 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 8292 Edison Ave. |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91762 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Site Regulatory Status: | Notification |
| Latitude: | 33.99791 |
| Longitude: | -117.62399 |
| Is Archived: | No |
| Operator: | Agromin |
| Started On: | Not reported |
| Contact Name: | Bill Camarillo |
| Contact Title: | Not reported |
| Contact Email: | bill@agromin.com |
| Contact Phone: | (805) 485-9200 |
| Street Address: | 201 Kinetic Dr. |
| Operator City: | Oxnard |
| Operator State: | CA |
| Operator Zip: | 93030 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Owner: | Ag Concepts |
| Owner Address: | 7325 Edison Ave. |
| Owner City: | Ontario |
| Owner State: | CA |
| Owner Zip: | 91762 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.99791 |
| Longitude: | -117.62399 |
| Is Archived: | No |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (805) 485-9200 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Activity: | Chipping and Grinding Facility/Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Inactive |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Facility |

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Activity: | Green Material Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OP |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | STATE |
| Facility ID: | 36-AA-0509 |
| SWIS Number: | 36-AA-0509 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Activity: | Green Material Composting Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 300000 |
| Throughput Units: | Cubic Yards per year |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 12500 |
| Capacity Units: | Cubic Yards |
| Total Acreage: | 5 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 8292 Edison Ave |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91762 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.99775 |
| Longitude: | -117.627 |
| Is Archived: | No |
| Operator: | Agromin OC |
| Started On: | 2/15/2022 |
| Contact Name: | Bill Camarillo |
| Contact Title: | Not reported |
| Contact Email: | bcamarillo@agromin.com |
| Contact Phone: | (805) 485-9200 |
| Street Address: | 201 Kinetic |
| Operator City: | Oxnard |
| Operator State: | CA |
| Operator Zip: | 93030 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Owner: | Ag Concepts |
| Owner Address: | 7325 Edison Ave. |
| Owner City: | Ontario |
| Owner State: | CA |
| Owner Zip: | 91762 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Site Regulatory Status: | Notification |
| Latitude: | 33.99775 |
| Longitude: | -117.627 |
| Is Archived: | No |
| Started On: | 2/15/2022 |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (805) 485-9200 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Activity: | Green Material Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Activity: | Green Material Composting Operation |
| Waste Type: | Wood Waste |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

CERS HAZ WASTE:

| | |
|---|---|
| Name: | AGROMIN - ONTARIO |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 569130 |
| CERS ID: | 10854592 |
| CERS Description: | Hazardous Waste Generator |

NPDES:

| | |
|---|---|
| Name: | AGROMIN GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 8 36I029489 |
| Regulatory Measure Type: | Industrial |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | Active |
| Status Date: | 11/15/2021 |
| Operator Name: | Agromin Ontario Chip and Grind Operation |
| Operator Address: | 201 Kinetic Drive |
| Operator City: | Oxnard |
| Operator State: | California |
| Operator Zip: | 93030 |

| | |
|---|---|
| Name: | AGROMIN GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Active |
| NPDES Number: | CAS000001 |
| Region: | 8 |
| Agency Number: | 0 |
| Regulatory Measure ID: | 536832 |
| Place ID: | Not reported |
| Order Number: | 97-03-DWQ |
| WDID: | 8 36I029489 |
| Regulatory Measure Type: | Enrollee |
| Program Type: | Industrial |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | 11/15/2021 |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | 201 Kinetic Drive |
| Discharge Name: | Agromin Ontario Chip and Grind Operation |
| Discharge City: | Oxnard |
| Discharge State: | California |
| Discharge Zip: | 93030 |
| Status: | Not reported |
| Status Date: | Not reported |
| Operator Name: | Not reported |
| Operator Address: | Not reported |
| Operator City: | Not reported |
| Operator State: | Not reported |
| Operator Zip: | Not reported |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVENUE |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 8 36I029779 |
| Regulatory Measure Type: | Industrial |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | Active |
| Status Date: | 05/27/2022 |
| Operator Name: | Agromin OC LLC |
| Operator Address: | 201 Kinetic Drive |
| Operator City: | Oxnard |
| Operator State: | California |
| Operator Zip: | 93030 |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Active |
| NPDES Number: | CAS000001 |
| Region: | 8 |
| Agency Number: | 0 |
| Regulatory Measure ID: | 547490 |
| Place ID: | Not reported |
| Order Number: | 97-03-DWQ |
| WDID: | 8 36I029779 |
| Regulatory Measure Type: | Enrollee |
| Program Type: | Industrial |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | 05/27/2022 |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | 201 Kinetic Drive |
| Discharge Name: | Agromin OC LLC |
| Discharge City: | Oxnard |
| Discharge State: | California |
| Discharge Zip: | 93030 |
| Status: | Not reported |
| Status Date: | Not reported |
| Operator Name: | Not reported |
| Operator Address: | Not reported |
| Operator City: | Not reported |
| Operator State: | Not reported |
| Operator Zip: | Not reported |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | AGROMIN - ONTARIO |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0018707 |
| Owner: | Agromin OC, LLC. |
| Permit Number: | PT0040408 |
| Permit Category: | HAZARDOUS MATERIALS 4-10 CHEMICALS |
| Facility Status: | ACTIVE |
| Expiration Date: | 01/31/2025 |

| | |
|---|---|
| Name: | AGROMIN - ONTARIO |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0018707 |
| Owner: | Agromin OC, LLC. |
| Permit Number: | PT0040409 |
| Permit Category: | SMALL QUANTITY GENERATOR |
| Facility Status: | ACTIVE |
| Expiration Date: | 01/31/2025 |

CIWQS:

| | |
|---|---|
| Name: | Agromin Oc Ontario Green Material Composting Operation |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Agromin OC LLC |
| Agency Address: | 201 Kinetic Drive, Oxnard, CA 93030 |
| Place/Project Type: | Industrial - Fertilizers, Mixing Only |
| SIC/NAICS: | 2875 |
| Region: | 8 |
| Program: | INDSTW |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Storm water industrial |
| Order Number: | 2014-0057-DWQ |
| WDID: | 8 36I029779 |
| NPDES Number: | CAS000001 |
| Adoption Date: | Not reported |
| Effective Date: | 05/27/2022 |
| Termination Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99793 |
| Longitude: | -117.62393 |

| | |
|---|---|
| Name: | Agromin Oc Ontario Green Materials Composting Operation |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Agromin OC, LLC |
| Agency Address: | 201 Kinetic Drive, Oxnard, CA 93030 |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Place/Project Type: | Composting Facility |
| SIC/NAICS: | 2875 |
| Region: | 8 |
| Program: | LNDISPOTH |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - WDR |
| Order Number: | 2015-0121-DWQ |
| WDID: | 8 363011001 |
| NPDES Number: | Not reported |
| Adoption Date: | Not reported |
| Effective Date: | 02/25/2022 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 08/03/2030 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | C |
| TTWQ: | 3 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99793 |
| Longitude: | -117.62393 |

| | |
|---|---|
| Name: | Agromin Green Material Composting Operation |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Agromin Ontario Chip and Grind Operation |
| Agency Address: | 201 Kinetic Drive, Oxnard, CA 93030 |
| Place/Project Type: | Industrial - Fertilizers, Mixing Only |
| SIC/NAICS: | 2875 |
| Region: | 8 |
| Program: | INDSTW |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Storm water industrial |
| Order Number: | 2014-0057-DWQ |
| WDID: | 8 36I029489 |
| NPDES Number: | CAS000001 |
| Adoption Date: | Not reported |
| Effective Date: | 11/15/2021 |
| Termination Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99792 |
| Longitude: | -117.62396 |

| | |
|---|---|
| Name: | Agromin-Ontario Green Materials Composting Operation |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Agromin-Burrtec LLC |
| Agency Address: | 201 Kinetic Drive, Oxnard, CA 93030 |
| Place/Project Type: | Composting Facility |
| SIC/NAICS: | 2875 |
| Region: | 8 |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Program: | LNDISPOTH |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - WDR |
| Order Number: | 2015-0121-DWQ |
| WDID: | 8 363010001 |
| NPDES Number: | Not reported |
| Adoption Date: | Not reported |
| Effective Date: | 02/25/2022 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 08/03/2030 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | C |
| TTWQ: | 3 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 34.000442 |
| Longitude: | -117.625308 |

CERS:

| | |
|---|---|
| Name: | AGROMIN ONTARIO GREEN MATERIALS COMPOSTING OPERATIONS |
| Address: | 8292 EDISON AVE. |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 869681 |
| CERS ID: | T10000017417 |
| CERS Description: | Land Disposal Site |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Regional Board Caseworker |
| Entity Name: | JOANNE LEE - SANTA ANA RWQCB (REGION 8) |
| Entity Title: | Not reported |
| Affiliation Address: | 3737 MAIN STREET, SUITE 500 |
| Affiliation City: | RIVERSIDE |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | AGROMIN - ONTARIO |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 569130 |
| CERS ID: | 10854592 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 569130 |
| Site Name: | Agromin - Ontario |
| Violation Date: | 08-19-2021 |
| Citation: | 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f) |
| Violation Description: | Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date. |
| Violation Notes: | Returned to compliance on 09/07/2021. OBSERVATION: Two 55 gallon drums |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

of used oil lacked hazardous waste labeling. Labels were provided during the inspection. CORRECTIVE ACTION: Properly label all hazardous waste containers and submit photographs demonstrating the used oil drums been properly labeled.

Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 569130
Site Name: Agromin - Ontario
Violation Date: 08-19-2021
Citation: HSC 6.95 25508(a)(3) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(3)
Violation Description: Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes: Returned to compliance on 08/24/2021. OBSERVATION: The CERS inventory submitted on 1/21/2021 needs to be updated to include the 240 gallon tank of clear diesel. CORRECTIVE ACTION: Submit an updated hazardous materials inventory in CERS to include the 240 gallon clear diesel tank.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 569130
Site Name: Agromin - Ontario
Violation Date: 08-19-2021
Citation: 40 CFR 1 265.172 - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 265.172
Violation Description: Failure to accumulate or store hazardous waste in container made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored.
Violation Notes: Returned to compliance on 09/07/2021. OBSERVATION: The facility did not have a container for the storage of oily absorbent waste. CORRECTIVE ACTION: Submit a signed statement indicating a properly labeled drum has been obtained for the storage of oily absorbent.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 569130
Site Name: Agromin - Ontario
Violation Date: 08-19-2021
Citation: HSC 6.5 25250.22 - California Health and Safety Code, Chapter 6.5, Section(s) 25250.22
Violation Description: Failure to properly manage used oil and/or fuel filters in accordance with the requirements.
Violation Notes: Returned to compliance on 09/07/2021. OBSERVATION: The facility did not have storage containers for the used oil filters. Obtain properly labeled steel drums for the storage of used oil filters. CORRECTIVE ACTION: Submit photographs demonstrating that the used oil and fuel filters are being properly managed.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 08-19-2021 |
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | Not reported |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HW |
| Eval Source: | CERS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 08-19-2021 |
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | Not reported |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HMRRP |
| Eval Source: | CERS, |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | California Wood Recycling |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (805) 485-9200, |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | DAVE GREEN |
| Entity Title: | Not reported |
| Affiliation Address: | 201 Kinetic Dr |
| Affiliation City: | Oxnard |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 93030 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | California Wood Recycling |
| Entity Title: | Not reported |
| Affiliation Address: | 201 Kinetic Dr |
| Affiliation City: | Oxnard |
| Affiliation State: | CA |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

Affiliation Country: United States
Affiliation Zip: 93030
Affiliation Phone: (805) 485-9200,

Affiliation Type Desc: Parent Corporation
Entity Name: CALIFORNIA WOOD RECYCLING; dba AGROMIN HORTICULTURAL PRODUCTS
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Document Preparer
Entity Name: Dave Green
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 201 Kinetic Dr
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93030
Affiliation Phone: ,

Affiliation Type Desc: Identification Signer
Entity Name: Dave Green
Entity Title: COO
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Address: 8292 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Site ID: 611660
CERS ID: 10896175
CERS Description: Chemical Storage Facilities

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Affiliation:

Affiliation Type Desc: CUPA District
Entity Name: San Bernardino County Fire
Entity Title: Not reported
Affiliation Address: 620 South E Street
Affiliation City: San Bernardino
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92415-0153
Affiliation Phone: (909) 386-8401,

Affiliation Type Desc: Environmental Contact
Entity Name: DAVE GREEN
Entity Title: Not reported
Affiliation Address: 201 Kinetic Drive
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93030
Affiliation Phone: ,

Affiliation Type Desc: Legal Owner
Entity Name: Agromin OC, LLC.
Entity Title: Not reported
Affiliation Address: 201 Kinetic Drive
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 93030
Affiliation Phone: (805) 485-9200,

Affiliation Type Desc: Parent Corporation
Entity Name: Agromin OC
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Document Preparer
Entity Name: Dave Green
Entity Title: Not reported

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Dave Green |
| Entity Title: | COO |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Agromin OC, LLC. |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (805) 485-9200, |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 201 Kinetic Drive |
| Affiliation City: | Oxnard |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 93030 |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 619024 |
| CERS ID: | 902733 |
| CERS Description: | Industrial Facility Storm Water |

| | |
|---|---|
| Name: | AGROMIN GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 596629 |
| CERS ID: | 894520 |
| CERS Description: | Industrial Facility Storm Water |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Owner/Operator |
| Entity Name: | Agromin Ontario Chip and Grind Operation |
| Entity Title: | Operator |
| Affiliation Address: | 201 Kinetic Drive |
| Affiliation City: | Oxnard |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 93030 |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATIONS |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 896008 |
| CERS ID: | T10000018575 |
| CERS Description: | Land Disposal Site |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Regional Board Caseworker |
| Entity Name: | JOANNE LEE - SANTA ANA RWQCB (REGION 8) |
| Entity Title: | Not reported |
| Affiliation Address: | 3737 MAIN STREET, SUITE 500 |
| Affiliation City: | RIVERSIDE |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**G40** **AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPER** **HWTS** **S128386036**
**East** **8292 EDISON AVE** **San Bern. Co. Permit** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**0.019 mi.**
**102 ft.** **Site 5 of 5 in cluster G**

**Relative:**
**Higher**

**Actual:**
**699 ft.**

HWTS:

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAL000469601 |
| Inactive Date: | Not reported |
| Create Date: | 03/30/2022 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 201 KINETIC DR |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | OXNARD, CA 93030 |
| Owner Name: | AGROMIN OC LLC |
| Owner Address: | 17121 NICHOLS LN |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | HUNTINGTON BEACH, CA 92647 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | MIKE ZWERNER |
| Contact Address: | 201 KINETIC DR |
| Contact Address 2: | Not reported |
| City,State,Zip: | OXNARD, CA 93030 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Active |
| Facility Type: | PERMANENT |

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **S128386036**

Category: STATE
Latitude: 33.99776525
Longitude: -117.6239478

San Bern. Co. Permit:
Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Address: 8292 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0019159
Owner: Agromin OC, LLC.
Permit Number: PT0041232
Permit Category: HAZARDOUS MATERIALS 4-10 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 05/31/2025

Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Address: 8292 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0019159
Owner: Agromin OC, LLC.
Permit Number: PT0041233
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: ACTIVE
Expiration Date: 05/31/2025

---

**B41** **BREAKTHRU TRANSPORTS** **RCRA NonGen / NLR** **1026482636**
**ENE** **8270 EDISON AVE** **CAC003088689**
**< 1/8** **ONTARIO, CA 91761**
**0.021 mi.**
**113 ft.** **Site 5 of 5 in cluster B**

**Relative:**
**Higher**

**Actual:**
**698 ft.**

RCRA Listings:
Date Form Received by Agency: 20201015
Handler Name: Breakthru Transports
Handler Address: 8270 Edison Ave
Handler City,State,Zip: ONTARIO, CA 91761
EPA ID: CAC003088689
Contact Name: JORGE VAZQUEZ
Contact Address: 9165 JADEITE AVE
Contact City,State,Zip: RANCHO CUCAMONGA, CA 91730
Contact Telephone: 909-565-7955
Contact Fax: 909-987-0462
Contact Email: BREAKTHRUTRANS@YAHOO.COM
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: Not reported
State District: Not reported
Mailing Address: 9165 JADEITE AVE
Mailing City,State,Zip: RANCHO CUCAMONGA, CA 91730

**BREAKTHRU TRANSPORTS (Continued)** **1026482636**

| | | |
|---|---|---|
| Owner Name: | Jorge Vazquez | |
| Owner Type: | | Other |
| Operator Name: | Jorge Vazquez | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20201026 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: JORGE VAZQUEZ | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 9165 JADEITE AVE |
| Owner/Operator City,State,Zip: | RANCHO CUCAMONGA, CA 91730 |
| Owner/Operator Telephone: | 909-565-7955 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |

**BREAKTHRU TRANSPORTS (Continued)** **1026482636**

Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: JORGE VAZQUEZ
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 9165 JADEITE AVE
Owner/Operator City,State,Zip: RANCHO CUCAMONGA, CA 91730
Owner/Operator Telephone: 909-565-7955
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20201015
Handler Name: BREAKTHRU TRANSPORTS
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 484210
NAICS Description: Used Household And Office Goods Moving

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

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**F42** **LONGGO TRANS** **RCRA NonGen / NLR** **1031050904**
**North** **7914 EDISON AVE** **CAC003278161**
**< 1/8** **ONTARIO, CA 91762**
**0.022 mi.**
**114 ft.** **Site 3 of 3 in cluster F**

**Relative:**
**Higher**

**Actual:**
**695 ft.**

RCRA Listings:
Date Form Received by Agency: 20240315
Handler Name: Longgo Trans
Handler Address: 7914 Edison Ave
Handler City,State,Zip: ONTARIO, CA 91762
EPA ID: CAC003278161
Contact Name: CONNIE GAO
Contact Address: 7914 EDISON AVE
Contact City,State,Zip: ONTARIO, CA 91762
Contact Telephone: 909-628-7868
Contact Fax: Not reported

**LONGGO TRANS (Continued)** **1031050904**

| | | |
|---|---|---|
| Contact Email: | | LONGGOTRANSAR@GMAIL.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 7914 EDISON AVE |
| Mailing City,State,Zip: | | ONTARIO, CA 91762 |
| Owner Name: | Connie Gao | |
| Owner Type: | | Other |
| Operator Name: | Connie Gao | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20240316 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

**LONGGO TRANS (Continued)** **1031050904**

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: CONNIE GAO | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 7914 EDISON AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 909-628-7868 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: CONNIE GAO | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 5772 TERRITORY LN |
| Owner/Operator City,State,Zip: | EASTVALE, CA 91710 |
| Owner/Operator Telephone: | 626-758-8088 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20240315 |
| Handler Name: LONGGO TRANS | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 541360 |
| NAICS Description: | Geophysical Surveying And Mapping Services |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

**43 SE < 1/8 0.063 mi. 332 ft.** | **ALEWYN DAIRY #3**
**14361 GROVE**
**ONTARIO, CA 91762** | **ENF**
**San Bern. Co. Permit**
**CIWQS** | **S104761898**
**N/A**

**Relative: Lower**

**Actual: 682 ft.**

ENF:

| | |
|---|---|
| Name: | GORDON DAIRY #6 |
| Address: | 14361 GROVE AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 204960 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.992964 |
| Place Longitude: | -117.628072 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |

**ALEWYN DAIRY #3 (Continued)** **S104761898**

| | |
|---|---|
| Status Date: | 12/24/2013 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 347119 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 10/08/1982 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 10/08/1982 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Commun.. |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | ALEWYN DAIRY #3 |
| Address: | 14361 GROVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000511 |
| Owner: | JACK & ELANE ALEWYN |
| Permit Number: | PT0003754 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/2013 |

CIWQS:

| | |
|---|---|
| Name: | Gordon Dairy #6 |
| Address: | 14361 GROVE AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Craig Gordon |
| Agency Address: | 2915 Kings River Lane, Ontario, CA 91761 |

**ALEWYN DAIRY #3 (Continued)** **S104761898**

| | |
|---|---|
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366006001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 06/13/2013 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.992964 |
| Longitude: | -117.628072 |

| | |
|---|---|
| Name: | Gordon Dairy #6 |
| Address: | 14361 GROVE AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Alewyn, Jack |
| Agency Address: | 9031 Eucalyptus Avenue, Ontario, CA 91762-7515 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS, NPDESWW |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 82-260 |
| WDID: | 8 365311001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | 10/08/1982 |
| Effective Date: | 10/08/1982 |
| Termination Date: | 10/04/1997 |
| Expiration/Review Date: | 10/04/1997 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.992964 |
| Longitude: | -117.628072 |

**44 ESE < 1/8 0.065 mi. 345 ft.** | **MAJESTIC FARMS #1**
**14333 WALKER**
**ONTARIO, CA 91762** | **ENF**
**San Bern. Co. Permit**
**CIWQS** | **S108724299**
**N/A**

**Relative: Lower**

**Actual: 683 ft.**

ENF:

| | |
|---|---|
| Name: | ONTARIO RANCH HOLSTEINS #2 |
| Address: | 14333 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 239249 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.993203 |
| Place Longitude: | -117.618212 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Not reported |
| Facility Waste Type 2: | Not reported |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | Not reported |
| Reg Measure Type: | Not reported |
| Region: | Not reported |
| Order #: | Not reported |
| Npdes# CA#: | Not reported |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Not reported |

**MAJESTIC FARMS #1 (Continued)** **S108724299**

| | |
|---|---|
| Status Date: | Not reported |
| Effective Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | Not reported |
| Fee Code: | Not reported |
| Direction/Voice: | Not reported |
| Enforcement Id(EID): | 391902 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 2012-08-09 |
| Adoption/Issuance Date: | 08/09/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 2012-08-09 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/09/2012 for Struikmans, Henry |
| Description: | Not reported |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

| | |
|---|---|
| Name: | STRUIKMANS & SON DAIRY 2 |
| Address: | 14333 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 239249 |
| Agency Name: | Struikmans, Henry |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.993203 |
| Place Longitude: | -117.618212 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |

**MAJESTIC FARMS #1 (Continued)** **S108724299**

| | |
|---|---|
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365236002 |
| Reg Measure Id: | 211615 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | 8 |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Active |
| Status Date: | 07/11/2019 |
| Effective Date: | 06/09/1978 |
| Expiration/Review Date: | 03/15/2024 |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391902 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/09/2012 |
| Adoption/Issuance Date: | 08/09/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/09/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |

**MAJESTIC FARMS #1 (Continued)** **S108724299**

| | |
|---|---|
| Status: | Historical |
| Title: | Oral Com 08/09/2012 for Struikmans, Henry |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | MAJESTIC FARMS #1 |
| Address: | 14333 WALKER |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0011051 |
| Owner: | STRUIKMAN, NICHOLAS |
| Permit Number: | PT0019049 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 07/31/2009 |

CIWQS:

| | |
|---|---|
| Name: | Ontario Ranch Holsteins #2 |
| Address: | 14333 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Rudolph Haringa |
| Agency Address: | P.O. Box 7219, Norco, CA 92860 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366053001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/11/2024 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.993203 |
| Longitude: | -117.618212 |

| | |
|---|---|
| Name: | Ontario Ranch Holsteins #2 |
| Address: | 14333 WALKER AVENUE |

**MAJESTIC FARMS #1 (Continued)** **S108724299**

| | |
|---|---|
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Joe De Hoog |
| Agency Address: | 1281 South Almond Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366038001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 02/06/2020 |
| Termination Date: | 02/06/2024 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.993203 |
| Longitude: | -117.618212 |

| | |
|---|---|
| Name: | Ontario Ranch Holsteins #2 |
| Address: | 14333 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Struikmans, Henry |
| Agency Address: | 14333 Walker Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | NPDES Permit |
| Order Number: | 88-141 |
| WDID: | 8 365236002 |
| NPDES Number: | CAG018001 |
| Adoption Date: | 12/09/1988 |
| Effective Date: | 12/09/1988 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 12/06/2003 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.993203 |
| Longitude: | -117.618212 |

**H45 NE < 1/8 0.073 mi. 386 ft.** | **RLE DAIRY**
**14049 GROVE AVE**
**ONTARIO, CA 91761**
**Site 1 of 2 in cluster H** | **San Bern. Co. Permit** | **S104762090**
**N/A**

**Relative: Higher**
**Actual: 700 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | RLE DAIRY |
| Address: | 14049 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000626 |
| Owner: | ESPARZA, RUBEN L |
| Permit Number: | PT0008717 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | RLE DAIRY |
| Address: | 14049 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000626 |
| Owner: | ESPARZA, RUBEN L |
| Permit Number: | PT0008718 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

---

**H46 NE < 1/8 0.108 mi. 569 ft.** | **BROWN'S FAMILY DAIRY**
**14016 S GROVE AVE**
**ONTARIO, CA 91710**
**Site 2 of 2 in cluster H** | **San Bern. Co. Permit** | **S104761656**
**N/A**

**Relative: Higher**
**Actual: 703 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | BROWN'S FAMILY DAIRY |
| Address: | 14016 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91710 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000370 |
| Owner: | BROWN, RONALD |
| Permit Number: | PT0008922 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | BROWN'S FAMILY DAIRY |
| Address: | 14016 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91710 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000370 |
| Owner: | BROWN, RONALD |
| Permit Number: | PT0008923 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

**I47 SSE < 1/8 0.120 mi. 634 ft.** | **JOE FERREIRA JR DAIRY**
**14400 S GROVE AVE**
**ONTARIO, CA 91762**
**Site 1 of 2 in cluster I** | **San Bern. Co. Permit** | **S106910656**
**N/A**

**Relative: Lower**
**Actual: 679 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | JOE FERREIRA JR DAIRY |
| Address: | 14400 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000515 |
| Owner: | JOE & LEONTINA FERREIRA TRUST |
| Permit Number: | PT0003666 |
| Permit Category: | HAZMAT HANDLER - AGRICULTURAL(FE) |
| Facility Status: | INACTIVE |
| Expiration Date: | 02/28/1991 |

---

**I48 SSE < 1/8 0.120 mi. 634 ft.** | **WHITEGOLD VENTURES LP**
**14400 GROVE AVE**
**ONTARIO, CA 91762**
**Site 2 of 2 in cluster I** | **RCRA NonGen / NLR**
**E MANIFEST** | **1024754364**
**CAC002974181**

**Relative: Lower**
**Actual: 679 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20180803 |
| Handler Name: | | Whitegold Ventures Lp |
| Handler Address: | | 14400 Grove Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAC002974181 |
| Contact Name: | | LEONTINA FERREIRA |
| Contact Address: | | 14400 GROVE AVE |
| Contact City,State,Zip: | | ONTARIO, CA 91762 |
| Contact Telephone: | | 951-733-5948 |
| Contact Fax: | | Not reported |
| Contact Email: | | FAVILA@BURNS-ENVIRO.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Handler Activities |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 14400 GROVE AVE |
| Mailing City,State,Zip: | | ONTARIO, CA 91762 |
| Owner Name: | Whitegold Ventures Lp | |
| Owner Type: | | Other |
| Operator Name: | Leontina Ferreira | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |

**WHITEGOLD VENTURES LP (Continued)** **1024754364**

| | |
|---|---|
| Underground Injection Control: | No |
| Off-Site Waste Receipt: | No |
| Universal Waste Indicator: | Yes |
| Universal Waste Destination Facility: | Yes |
| Federal Universal Waste: | No |
| Active Site State-Reg Handler: | --- |
| Federal Facility Indicator: | Not reported |
| Hazardous Secondary Material Indicator: | N |
| Sub-Part K Indicator: | Not reported |
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20180831 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: WHITEGOLD VENTURES LP | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 14400 GROVE AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-733-5948 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: LEONTINA FERREIRA | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 14400 GROVE AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-733-5948 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |

**WHITEGOLD VENTURES LP (Continued)** **1024754364**

Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20180803
Handler Name: WHITEGOLD VENTURES LP
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: All Other Waste Management Services

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

E MANIFEST:
Manifest Tracking Number: 003699389GBF
Last Updated Date: 20180926
Shipped Date: 20180805
Received Date: 20180808
Manifest Status: Signed
Submission Type: DataImage5Copy
Origin Type: Service
Generator EPA ID: CAC002974181
Generator Name: Whitegold Ventures Sp
Generator Location Street Number: Not reported
Generator Location Street 1: 14400 GROVE AVE
Generator Location Street 2: Not reported
Generator Location City: ONTARIO
Generator Location State: CA
Generator Location Zip: 91762
Generator Mail Street Number: Not reported
Generator Mail Street 1: 14400 GROVE AVE
Generator Mail Street 2: Not reported
Generator Mail City: ONTARIO
Generator Mail Zip: 91762
Generator Mail State: CA
Generator Contact Company Name: Not reported
Designated Facility EPA ID: CAD009007626
Designated Facility Name: Not reported
Designated Facility Mail Street Number: Not reported
Designated Facility Mail Street 1: Not reported
Designated Facility Mail Street 2: 1211 W. GLADSTONE STREET

**WHITEGOLD VENTURES LP (Continued)** **1024754364**

| | |
|---|---|
| Designated Facility Mail City: | AZUSA |
| Designated Facility Mail Zip: | 91702 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | Not reported |
| Designated Facility Location Street 1: | 1211 W. GLADSTONE STREET |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | AZUSA |
| Designated Facility Location Zip: | 91702 |
| Designated Facility Location State: | CA |
| Designated Facility Contact Company Name: | AZUSA LAND RECLAMATION CO INC |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

State Waste:

| | |
|---|---|
| Manifest Tracking Number: | 003699389GBF |
| Waste Line Number: | 1 |
| State Waste Code Owner: | CA |
| State Waste Code: | 151 |
| State Waste: | Asbestos-containing waste |

Transporter:

| | |
|---|---|
| Manifest Tracking Number: | 003699389GBF |
| Transporter Line Number: | 1 |
| Transporter EPA ID: | CAL000395969 |
| Transporter Name: | Burns Environmental Services |

| | |
|---|---|
| Manifest Tracking Number: | 003699389GBF |
| Transporter Line Number: | 2 |
| Transporter EPA ID: | CAR000181891 |
| Transporter Name: | Usa Waste Of Ca Inc Dba Bdc Special Wast |

Waste Line:

| | |
|---|---|
| Manifest Tracking Number: | 003699389GBF |
| Waste Line Number: | 1 |
| U.S. DOT Hazardous Indicator: | Y |
| U.S. DOT ID Number: | NA2212 |
| U.S. DOT Description: | Na2212, Waste Asbestos, 9, Iii, Rq |
| Non-Hazardous Waste Description: | Not reported |
| Number of Containers: | 40 |
| Container Type Code: | BA |
| Container Type Description: | Burlap, cloth, paper, or plastic bags |
| Waste Quantity: | 4 |
| Quantity Unit of Measure Code: | Y |
| Quantity Unit of Measure Description: | Cubic Yards |
| Waste Quantity, in Tons: | 3.36 |
| Acute Waste Quantity, in Tons: | 0 |
| Non-Acute Waste Quantity, in Tons: | 3.36 |
| Waste Quantity, in Kilograms: | 3047.6208 |
| Acute Waste Quantity, in Kilograms: | 0 |
| Non-Acute Waste Quantity, in Kilorgrams: | 3047.6208 |
| Management Method Code: | H132 |
| Management Method Description: | LANDFILL (WITH PRIOR TREATMENT AND/OR STABILIZATION) |
| Waste Residue Indicator: | N |
| Quantity Discrepancy Indicator: | N |
| Waste Type Discrepancy Indicator: | N |
| Waste Density: | Not reported |

**WHITEGOLD VENTURES LP (Continued)** **1024754364**

| | |
|---|---|
| Waste Density Unit of Measure Code: | Not reported |
| Waste Density Unit of Measure Description: | Not reported |
| Form Code: | Not reported |
| Form Code Description: | Not reported |
| Source Code: | Not reported |
| Source Code Description: | Not reported |
| Waste Minimization Code: | Not reported |
| Waste Minimization Code Description: | Not reported |
| Consent Number: | Not reported |
| EPA Waste Indicator: | Y |

---

**J49**
**West**
**1/8-1/4**
**0.127 mi.**
**673 ft.**

**Relative:**
**Higher**

**Actual:**
**695 ft.**

**SAM SOUSA DAIRY**
**7330 EDISON AVE**
**ONTARIO, CA 91762**

**Site 1 of 5 in cluster J**

**CERS HAZ WASTE** **S104762106**
**EMI** **N/A**
**ENF**
**HWTS**
**San Bern. Co. Permit**
**CIWQS**
**CERS**

CERS HAZ WASTE:

| | |
|---|---|
| Name: | KENT AVERY REPAIR INC. |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 614282 |
| CERS ID: | 10902508 |
| CERS Description: | Hazardous Waste Generator |

EMI:

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2006 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145210 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.794732321786430002 |
| Reactive Organic Gases Tons/Yr: | 6.144 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.709 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .8362137 |

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2007 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145210 |
| Air District Name: | SC |
| SIC Code: | 241 |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.794732321786430002 |
| Reactive Organic Gases Tons/Yr: | 6.144 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.709 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .8362137 |

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2008 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145210 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.879186945319209848 |
| Reactive Organic Gases Tons/Yr: | 2.71 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.36 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .665448 |

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2009 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145210 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.2350415115946101 |
| Reactive Organic Gases Tons/Yr: | 2.2599999999999998 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 0.67000000000000004 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.32783099999999998 |

ENF:

| | |
|---|---|
| Name: | OK CATTLE LLC |
| Address: | 7330 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 255143 |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Agency Name: | Sam Sousa |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997581 |
| Place Longitude: | -117.646761 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365766001 |
| Reg Measure Id: | 211751 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | 8 |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 2000 |
| Status: | Active |
| Status Date: | 07/08/2019 |
| Effective Date: | 08/08/2001 |
| Expiration/Review Date: | 03/15/2024 |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391917 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 04/09/2013 |
| Adoption/Issuance Date: | 04/09/2013 |
| Achieve Date: | Not reported |
| Termination Date: | 04/09/2013 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 04/09/2013 for Sousa, Sam |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

HWTS:

| | |
|---|---|
| Name: | KENT AVERY REPAIR INC |
| Address: | 7330 EDISON AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAL000471801 |
| Inactive Date: | 06/30/2023 |
| Create Date: | 07/07/2022 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 2892 JAMES ST |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | CORONA, CA 92881 |
| Owner Name: | KENT AVERY REPAIR INC |
| Owner Address: | 2752 SCARBOROUGH PL |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | RIVERSIDE, CA 92503 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | KENT AVERY |
| Contact Address: | 2892 JAMES ST |
| Contact Address 2: | Not reported |
| City,State,Zip: | CORONA, CA 92881 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | Permanent |
| Category: | State |
| Latitude: | 33.997662310000003 |

**SAM SOUSA DAIRY (Continued)** **S104762106**

Longitude: -117.64345179999999

San Bern. Co. Permit:

Name: SAM SOUSA DAIRY
Address: 7330 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0000634
Owner: SOUSA, SAM
Permit Number: PT0008924
Permit Category: HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL
Facility Status: ACTIVE
Expiration Date: 04/30/2025

Name: KENT AVERY REPAIR INC
Address: 7330 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0019415
Owner: MULTI-CORP RESOURCES, INC
Permit Number: PT0041546
Permit Category: HAZARDOUS MATERIALS 1-3 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 03/31/2025

Name: KENT AVERY REPAIR INC
Address: 7330 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0019415
Owner: MULTI-CORP RESOURCES, INC
Permit Number: PT0041547
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: ACTIVE
Expiration Date: 03/31/2025

Name: SAM SOUSA DAIRY
Address: 7330 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0000634
Owner: SOUSA, SAM
Permit Number: PT0008925
Permit Category: HAZWASTE GENERAL ACTIVITY (NB)
Facility Status: INACTIVE
Expiration Date: 04/30/2007

CIWQS:

Name: Ok Cattle Llc
Address: 7330 EDISON AVENUE
City,State,Zip: ONTARIO, CA 91762
Agency: Sam Sousa
Agency Address: 7330 Edison Avenue, Ontario, CA 91762
Place/Project Type: Animal Feeding Facility
SIC/NAICS: 241
Region: 8

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 365766001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 08/08/2001 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | 0 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997581 |
| Longitude: | -117.646761 |

CERS:

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 64237 |
| CERS ID: | 110041519684 |
| CERS Description: | US EPA Air Emission Inventory System (EIS) |

Violations:

| | |
|---|---|
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508.1(a)-(e) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(e) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. |
| Violation Notes: | Returned to compliance on 07/25/2017. Hazardous materials were observed on site during the inspection that are not listed in the most current Business Plan inventory. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2 |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete, accurate, and up-to-date. |
| Violation Notes: | Returned to compliance on 07/25/2017. The last Business Plan update submitted by this facility is dated 1/10/2008. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |

**SAM SOUSA DAIRY (Continued)** **S104762106**

Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY
Violation Date: 04-24-2016
Citation: 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f)
Violation Description: Failure to properly label hazardous waste accumulation containers with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date.
Violation Notes: Returned to compliance on 07/09/2019. Failure to label hazardous waste containers (CCR 66262.34(f)(3)) Any tank or container holding a hazardous waste must be properly labeled. Proper labeling includes the following information: the words Hazardous Waste, generator name and address, hazardous properties of the waste, composition & physical state of the waste, and the accumulation start date. Observed two 55-gallon drums of used oil missing hazardous waste labels. Compliance requirement: -Submit a signed statement that all containers of used oil have been removed and that no hazardous wastes will be stored on site.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY
Violation Date: 04-27-2016
Citation: HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d)
Violation Description: Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 07/25/2017. This facility has not submitted the Business Plan elements into CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY
Violation Date: 07-09-2019
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
Violation Notes: Returned to compliance on 08/08/2019. OBSERVATION: The last Business Plan update submitted by this facility is dated 2/21/2018. CORRECTIVE ACTION: Submit a signed statement that the Business Plan elements have been updated in CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY

**SAM SOUSA DAIRY (Continued)** **S104762106**

Violation Date: 06-03-2022
Citation: HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f)
Violation Description: Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan.
Violation Notes: OBSERVATION: A 55-gallon drum of motor oil was observed on site during the inspection that is not listed in the current CERS inventory. Also, ensure that the federal hazard categories are completed for each material listed in the inventory. CORRECTIVE ACTION: Submit a signed statement that the inventory has been revised in CERS to include the 55-gallon drum of motor oil and completed federal hazard categories.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-03-2022
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-SAM SOUZA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-09-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-SAM SOUSA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

**SAM SOUSA DAIRY (Continued)** **S104762106**

Coordinates:

| | |
|---|---|
| Site ID: | 64237 |
| Facility Name: | SAM SOUSA DAIRY |
| Env Int Type Code: | FRS-AIR |
| Program ID: | 110041519684 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Unknown, |
| Latitude: | 33.997600 |
| Longitude: | -117.643360 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | SAM SOUSA DAIRY |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE. |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | SAM SOUSA |
| Entity Title: | OWNER |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | Sousa, Sam |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | (909) 627-9342, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (951) 203-5905, |

| | |
|---|---|
| Name: | KENT AVERY REPAIR INC. |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 614282 |
| CERS ID: | 10902508 |
| CERS Description: | Chemical Storage Facilities |

Coordinates:

| | |
|---|---|
| Site ID: | 614282 |
| Facility Name: | Kent Avery Repair Inc. |
| Env Int Type Code: | HMBP |
| Program ID: | 10902508 |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Coord Name: | Not reported |
| Ref Point Type Desc: | Center of a facility or station., |
| Latitude: | 33.997990 |
| Longitude: | -117.644850 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Kent Avery |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 2892 James St |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92881 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Kent Avery |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | KENT AVERY REPAIR INC |
| Entity Title: | Not reported |
| Affiliation Address: | 2892 James St |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 92881 |
| Affiliation Phone: | (909) 229-2084, |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Entity Name: | KENT AVERY |
| Entity Title: | Not reported |
| Affiliation Address: | 2892 James St |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92881 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Ross Avery |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (951) 202-0001, |

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | Multi-Corp Resources, Inc. |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 64237 |
| CERS ID: | 10034818 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508.1(a)-(e) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(e) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. |
| Violation Notes: | Returned to compliance on 07/25/2017. Hazardous materials were observed on site during the inspection that are not listed in the most current Business Plan inventory. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2 |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete, accurate, and up-to-date. |
| Violation Notes: | Returned to compliance on 07/25/2017. The last Business Plan update submitted by this facility is dated 1/10/2008. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |
| | |
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-24-2016 |
| Citation: | 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f) |
| Violation Description: | Failure to properly label hazardous waste accumulation containers with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date. |
| Violation Notes: | Returned to compliance on 07/09/2019. Failure to label hazardous waste containers (CCR 66262.34(f)(3)) Any tank or container holding a hazardous waste must be properly labeled. Proper labeling includes the following information: the words Hazardous Waste, generator name and address, hazardous properties of the waste, composition & physical state of the waste, and the accumulation start date. Observed two 55-gallon drums of used oil missing hazardous waste labels. Compliance requirement: -Submit a signed statement that all containers of used oil have been removed and that no hazardous wastes will be stored on site. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HW |
| Violation Source: | CERS, |
| | |
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d) |
| Violation Description: | Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 07/25/2017. This facility has not submitted the Business Plan elements into CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |
| | |
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 07-09-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. |
| Violation Notes: | Returned to compliance on 08/08/2019. OBSERVATION: The last Business |

**SAM SOUSA DAIRY (Continued)** **S104762106**

Plan update submitted by this facility is dated 2/21/2018. CORRECTIVE ACTION: Submit a signed statement that the Business Plan elements have been updated in CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY
Violation Date: 06-03-2022
Citation: HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f)
Violation Description: Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan.
Violation Notes: OBSERVATION: A 55-gallon drum of motor oil was observed on site during the inspection that is not listed in the current CERS inventory. Also, ensure that the federal hazard categories are completed for each material listed in the inventory. CORRECTIVE ACTION: Submit a signed statement that the inventory has been revised in CERS to include the 55-gallon drum of motor oil and completed federal hazard categories.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-03-2022
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-SAM SOUZA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 07-09-2019 |
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | ROUTINE HANDLER INSPECTION-SAM SOUSA DAIRY |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HMRRP |
| Eval Source: | CERS, |

Coordinates:

| | |
|---|---|
| Site ID: | 64237 |
| Facility Name: | SAM SOUSA DAIRY |
| Env Int Type Code: | FRS-AIR |
| Program ID: | 110041519684 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Unknown, |
| Latitude: | 33.997600 |
| Longitude: | -117.643360 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | SAM SOUSA DAIRY |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE. |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | SAM SOUSA |
| Entity Title: | OWNER |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | Sousa, Sam |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | (909) 627-9342, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (951) 203-5905, |

**J50 West 1/8-1/4 0.127 mi. 673 ft.** | **KENT AVERY REPAIR INC**
**7330 EDISON AVE**
**ONTARIO, CA 91762**

**Site 2 of 5 in cluster J** | **RCRA NonGen / NLR** | **1027467473**
**CAL000471801**

**Relative: Higher**

**Actual: 695 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20220707 |
| Handler Name: | | Kent Avery Repair Inc |
| Handler Address: | | 7330 Edison Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAL000471801 |
| Contact Name: | | KENT AVERY |
| Contact Address: | | 2892 JAMES ST |
| Contact City,State,Zip: | | CORONA, CA 92881 |
| Contact Telephone: | | 909-229-2084 |
| Contact Fax: | | Not reported |
| Contact Email: | | KENTAVERYREPAIR@YAHOO.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 2892 JAMES ST |
| Mailing City,State,Zip: | | CORONA, CA 92881 |
| Owner Name: | Kent Avery Repair Inc | |
| Owner Type: | | Other |
| Operator Name: | Kent Avery | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |

**KENT AVERY REPAIR INC (Continued)** **1027467473**

| | |
|---|---|
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20220718 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: KENT AVERY REPAIR INC | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 2752 SCARBOROUGH PL |
| Owner/Operator City,State,Zip: | RIVERSIDE, CA 92503 |
| Owner/Operator Telephone: | 909-229-2084 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: KENT AVERY | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 2892 JAMES ST |
| Owner/Operator City,State,Zip: | CORONA, CA 92881 |
| Owner/Operator Telephone: | 909-229-2084 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20220707 |
| Handler Name: KENT AVERY REPAIR INC | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

**KENT AVERY REPAIR INC (Continued)** **1027467473**

List of NAICS Codes and Descriptions:
NAICS Code: 811490
NAICS Description: Other Personal And Household Goods Repair And Maintenance

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

---

**J51 West 1/8-1/4 0.129 mi. 682 ft.** | **MATERIAL RECOVERY SOLUTIONS INC**
**7325 EDISON AVE**
**ONTARIO, CA 91762**
**Site 3 of 5 in cluster J** | **SWF/LF LDS NPDES CERS** | **S119777635 N/A**

**Relative: Higher**
**Actual: 694 ft.**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | ONTARIO AGRICULTURAL COMMODITIES/REGREEN |
| Address: | 7325 EDISON AVE. |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | STATE |
| Facility ID: | 36-AA-0496 |
| SWIS Number: | 36-AA-0496 |
| Point of Contact: | Megan Emslander |
| Is Archived: | Yes |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Closed |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0496 |
| Site Name: | Ontario Agricultural Commodities/Regreen |
| Site Operational Status: | Closed |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.99685 |
| Longitude: | -117.6444 |
| Is Archived: | Yes |
| Operator: | Ontario Agricultural Commodities |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |

**MATERIAL RECOVERY SOLUTIONS INC (Continued)** **S119777635**

| | |
|---|---|
| Contact Phone: | (951) 788-6042 |
| Street Address: | PO Box 79200 |
| Operator City: | Corona |
| Operator State: | CA |
| Operator Zip: | 92877 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0496 |
| Owner: | Golden Ontario Holdings |
| Owner Address: | Gary Dou 14240 Sapphire Hill Lane |
| Owner City: | Chino Hills |
| Owner State: | CA |
| Owner Zip: | 91709 |
| Site Name: | Ontario Agricultural Commodities/Regreen |
| Site Operational Status: | Closed |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.99685 |
| Longitude: | -117.6444 |
| Is Archived: | Yes |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (951) 788-6042 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0496 |
| Site Name: | Ontario Agricultural Commodities/Regreen |
| Activity: | Research Composting Operation |
| Waste Type: | Food Wastes |
| Site Is Archived: | Yes |
| Site Operational Status: | Closed |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | Yes |
| Activity Operational Status: | Closed |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0496 |
| Site Name: | Ontario Agricultural Commodities/Regreen |
| Activity: | Research Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | Yes |
| Site Operational Status: | Closed |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | Yes |
| Activity Operational Status: | Closed |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

**MATERIAL RECOVERY SOLUTIONS INC (Continued)** **S119777635**

LDS:

| | |
|---|---|
| Name: | RECYCLED WOOD PRODUCTS (RWP), ONTARIO 4 (IV) |
| Address: | 7325 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Global Id: | T10000020070 |
| Latitude: | 33.99707 |
| Longitude: | -117.6444 |
| Case Type: | Land Disposal Site |
| Status: | Open - Operating |
| Status Date: | 08/17/2022 |
| Lead Agency: | SANTA ANA RWQCB (REGION 8) |
| Caseworker: | JPL |
| Local Agency: | Not reported |
| RB Case Number: | 8 363012001 |
| LOC Case Number: | Not reported |
| File Location: | Not reported |
| Potential Media Affect: | Not reported |
| EDR Link ID: | T10000020070 |
| Potential Contaminants of Concern: | Not reported |
| EPA Region: | 9 |
| Coordinate Source: | Not reported |
| Quantity Released Gallons: | Not reported |
| Begin Date: | 06/11/2021 |
| Leak Reported Date: | Not reported |
| How Discovered: | Not reported |
| How Discovered Description: | Not reported |
| Discharge Source: | Not reported |
| Discharge Cause: | Not reported |
| Stop Method: | Not reported |
| Stop Description: | Not reported |
| No Further Action Date: | Not reported |
| CA Water Watershed Name: | Santa Ana River - Middle Santa Ana River - Chino (Split) (801.21) |
| Dwr Groundwater Subbasin Name: | Upper Santa Ana Valley - Chino (8-002.01) |
| Disadvantaged Community: | Not reported |
| CA Enviroscreen 3 Score: | 71-75% |
| CA Enviroscreen 4 Score: | 70-75% |
| Military DOD Site: | No |
| Facility Project Subtype: | Compost Facility |
| RWQCB Region: | SANTA ANA RWQCB (REGION 8) |
| Claim Number: | Not reported |
| Claim Status: | Not reported |
| Site History: | Not reported |

Click here to access the California GeoTracker records for this facility:

NPDES:

| | |
|---|---|
| Name: | MATERIAL RECOVERY SOLUTIONS INC |
| Address: | 7325 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |

**MATERIAL RECOVERY SOLUTIONS INC (Continued)** **S119777635**

| | |
|---|---|
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 8 36NNA000183 |
| Regulatory Measure Type: | Industrial |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | No Action Required |
| Status Date: | 07/08/2019 |
| Operator Name: | Material Recovery Solutions Inc |
| Operator Address: | 7325 Edison Ave |
| Operator City: | Ontario |
| Operator State: | California |
| Operator Zip: | 91762 |

CERS:

| | |
|---|---|
| Name: | RECYCLED WOOD PRODUCTS (RWP), ONTARIO 4 (IV) |
| Address: | 7325 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 849250 |
| CERS ID: | T10000020070 |
| CERS Description: | Land Disposal Site |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Regional Board Caseworker |
| Entity Name: | JOANNE LEE - SANTA ANA RWQCB (REGION 8) |
| Entity Title: | Not reported |
| Affiliation Address: | 3737 MAIN STREET, SUITE 500 |
| Affiliation City: | RIVERSIDE |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**J52** **RESIDUALS RECOVERY GROUP, INC.** **SWF/LF** **S117347578**
**West** **7325 EDISON RD.** **N/A**
**1/8-1/4** **ONTARIO, CA 91762**
**0.129 mi.**
**682 ft.** **Site 4 of 5 in cluster J**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | RESIDUALS RECOVERY GROUP, INC. |
| Address: | 7325 EDISON RD. |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | STATE |
| Facility ID: | 36-AA-0483 |
| SWIS Number: | 36-AA-0483 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |

**RESIDUALS RECOVERY GROUP, INC. (Continued)** **S117347578**

| | |
|---|---|
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Activity: | Agricultural Material Composting Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 350 |
| Throughput Units: | Tons per day |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 70000 |
| Capacity Units: | Tons per year |
| Total Acreage: | 20 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 7325 Edison Rd. |
| City: | Ontario |
| State: | CA |

**RESIDUALS RECOVERY GROUP, INC. (Continued)** **S117347578**

| | |
|---|---|
| ZIP Code: | 91762 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.9966 |
| Longitude: | -117.6434 |
| Is Archived: | No |
| Operator: | Residuals Recovery Group, Inc. |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (909) 902-0408 |
| Street Address: | Allen Shelby P.O. Box 17482 |
| Operator City: | Anahiem Hills |
| Operator State: | CA |
| Operator Zip: | 92817 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Owner: | Golden Ontario Hills |
| Owner Address: | Gary Dou 14240 Sapphire Hill Ln. |
| Owner City: | Chino Hills |
| Owner State: | CA |
| Owner Zip: | 91709 |
| Site Name: | Residuals Recovery Group, Inc. |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.9966 |
| Longitude: | -117.6434 |
| Is Archived: | No |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (909) 591-6389 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Activity: | Agricultural Material Composting Operation |
| Waste Type: | Agricultural |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |

**RESIDUALS RECOVERY GROUP, INC. (Continued)** **S117347578**

| | |
|---|---|
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Activity: | Agricultural Material Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Activity: | Agricultural Material Composting Operation |
| Waste Type: | Manure |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

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**J53** **SNS DAIRY** **San Bern. Co. Permit** **S104762133**
**West** **7371 EDISON AVE** **N/A**
**1/8-1/4** **ONTARIO, CA 91761**
**0.130 mi.**
**686 ft.** **Site 5 of 5 in cluster J**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | SNS DAIRY |
| Address: | 7371 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000648 |
| Owner: | SAM SOUSA |
| Permit Number: | PT0008933 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | SNS DAIRY |
| Address: | 7371 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |

**SNS DAIRY (Continued)** **S104762133**

Region: SAN BERNARDINO
Facility ID: FA0000648
Owner: SAM SOUSA
Permit Number: PT0008934
Permit Category: SPECIAL GENERATOR
Facility Status: INACTIVE
Expiration Date: 04/30/1997

---

**K54** **PARK INDUSTRIES** **RCRA NonGen / NLR** **1027695274**
**SW** **14306 BON VIEW AVE** **CAC003238066**
**1/8-1/4** **ONTARIO, CA 91762**
**0.153 mi.**
**810 ft.** **Site 1 of 5 in cluster K**

**Relative:**
**Lower**

**Actual:**
**675 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20230619 |
| Handler Name: | | Park Industries |
| Handler Address: | | 14306 Bon View Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAC003238066 |
| Contact Name: | | LUIS ARBURUA |
| Contact Address: | | 14306 BON VIEW AVE |
| Contact City,State,Zip: | | ONTARIO, CA 91762 |
| Contact Telephone: | | 951-905-8155 |
| Contact Fax: | | Not reported |
| Contact Email: | | DAISY@ENVIROPROSCA.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 14306 BON VIEW AVE |
| Mailing City,State,Zip: | | ONTARIO, CA 91762 |
| Owner Name: | Park Industries | |
| Owner Type: | | Other |
| Operator Name: | Luis Arburua | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |

**PARK INDUSTRIES (Continued)** **1027695274**

| | |
|---|---|
| Sub-Part K Indicator: | Not reported |
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20230619 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: LUIS ARBURUA | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 14306 BON VIEW AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-905-8155 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: PARK INDUSTRIES | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 14306 BON VIEW AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-905-8155 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20230619 |
| Handler Name: PARK INDUSTRIES | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |

**PARK INDUSTRIES (Continued)** **1027695274**

| | |
|---|---|
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 56299 |
| NAICS Description: | All Other Waste Management Services |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

---

**K55** **GORDON HAY, INC** **RCRA NonGen / NLR** **1026809423**
**SW** **14451 BON VIEW AVE** **CAC003121794**
**1/8-1/4** **ONTARIO, CA 91710**
**0.155 mi.**
**819 ft.** **Site 2 of 5 in cluster K**

**Relative:**
**Lower**

**Actual:**
**676 ft.**

RCRA Listings:

| | |
|---|---|
| Date Form Received by Agency: | 20210527 |
| Handler Name: | Gordon Hay, Inc |
| Handler Address: | 14451 Bon View Ave |
| Handler City,State,Zip: | ONTARIO, CA 91710 |
| EPA ID: | CAC003121794 |
| Contact Name: | DEBBIE GASPER |
| Contact Address: | 16395 S EUCLID AVE |
| Contact City,State,Zip: | CHINO, CA 91708 |
| Contact Telephone: | 909-393-4408 |
| Contact Fax: | Not reported |
| Contact Email: | HAYDEBI@AOL.COM |
| Contact Title: | Not reported |
| EPA Region: | 09 |
| Land Type: | Not reported |
| Federal Waste Generator Description: | Not a generator, verified |
| Non-Notifier: | Not reported |
| Biennial Report Cycle: | Not reported |
| Accessibility: | Not reported |
| Active Site Indicator: | Not reported |
| State District Owner: | Not reported |
| State District: | Not reported |
| Mailing Address: | 16395 S EUCLID AVE |
| Mailing City,State,Zip: | CHINO, CA 91708 |
| Owner Name: | Craig Gordon |
| Owner Type: | Other |
| Operator Name: | Debbie Gasper |
| Operator Type: | Other |
| Short-Term Generator Activity: | No |
| Importer Activity: | No |

**GORDON HAY, INC (Continued)** **1026809423**

| | |
|---|---|
| Mixed Waste Generator: | No |
| Transporter Activity: | No |
| Transfer Facility Activity: | No |
| Recycler Activity with Storage: | No |
| Small Quantity On-Site Burner Exemption: | No |
| Smelting Melting and Refining Furnace Exemption: | No |
| Underground Injection Control: | No |
| Off-Site Waste Receipt: | No |
| Universal Waste Indicator: | No |
| Universal Waste Destination Facility: | No |
| Federal Universal Waste: | No |
| Active Site State-Reg Handler: | --- |
| Federal Facility Indicator: | Not reported |
| Hazardous Secondary Material Indicator: | N |
| Sub-Part K Indicator: | Not reported |
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20210601 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: DEBBIE GASPER | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 16395 S EUCLID AVE |
| Owner/Operator City,State,Zip: | CHINO, CA 91708 |
| Owner/Operator Telephone: | 909-393-4408 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: CRAIG GORDON | |
| Legal Status: | Other |
| Date Became Current: | Not reported |

**GORDON HAY, INC (Continued)** **1026809423**

| | |
|---|---|
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 16395 S EUCLID AVE |
| Owner/Operator City,State,Zip: | CHINO, CA 91708 |
| Owner/Operator Telephone: | 909-393-4408 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20210527 |
| Handler Name: | GORDON HAY, INC |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 11212 |
| NAICS Description: | Dairy Cattle And Milk Production |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

---

**K56** **AG-COSTA VIEW FARM** **SWEEPS UST** **S101591786**
**SW** **14451 BON VIEW** **CA FID UST** **N/A**
**1/8-1/4** **CHINO, CA 91710** **CERS**
**0.155 mi.**
**819 ft.** **Site 3 of 5 in cluster K**

**Relative:**
**Lower**

**Actual:**
**676 ft.**

SWEEPS UST:

| | |
|---|---|
| Name: | AG-COSTA VIEW FARM |
| Address: | 14451 BON VIEW |
| City: | CHINO |
| Status: | Active |
| Comp Number: | 44727 |
| Number: | 9 |
| Board Of Equalization: | Not reported |
| Referral Date: | 08-27-91 |
| Action Date: | 08-27-91 |
| Created Date: | 02-29-88 |
| Owner Tank Id: | 1 |
| SWRCB Tank Id: | 36-000-044727-000001 |
| Tank Status: | A |
| Capacity: | 550 |
| Active Date: | 07-01-85 |
| Tank Use: | M.V. FUEL |

**AG-COSTA VIEW FARM (Continued)** **S101591786**

STG: P
Content: LEADED
Number Of Tanks: 1

CA FID UST:
Facility ID: 36009015
Regulated By: UTNKA
Regulated ID: 00044727
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 7145972360
Mail To: Not reported
Mailing Address: 14451 BON VIEW
Mailing Address 2: Not reported
Mailing City,St,Zip: CHINO 91710
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

CERS:
Name: GORDON DAIRY #4
Address: 14451 BON VIEW
City,State,Zip: ONTARIO, CA 91710
Site ID: 33986
CERS ID: 241364
CERS Description: Animal Wastewater Discharge

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-19-2011
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-08-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-13-2007
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS

**AG-COSTA VIEW FARM (Continued)** **S101591786**

Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-17-1991
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-03-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-03-2009
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-21-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-22-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2003
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Followup Inspection

**AG-COSTA VIEW FARM (Continued)** **S101591786**

Eval Date: 03-30-1990
Violations Found: No
Eval Type: Follow-up inspection (enforcement)
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-22-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-29-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-12-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-05-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-07-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-12-2013
Violations Found: No
Eval Type: RWQCB Type B compliance inspection

**AG-COSTA VIEW FARM (Continued)** **S101591786**

Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-17-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-17-2011
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-19-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-09-2013
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-21-1988
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-16-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS

**AG-COSTA VIEW FARM (Continued)** **S101591786**

Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-13-2014
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-08-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Other/Unknown
Eval Date: 10-20-2011
Violations Found: Yes
Eval Type: Miscellaneous Inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-03-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-27-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 33986
Site Name: Gordon Dairy #4
Site Address: 14451 BON VIEW
Site City: ONTARIO
Site Zip: 91710
Enf Action Date: 09-26-2011
Enf Action Type: Third Party Action
Enf Action Description: Third Party Action
Enf Action Notes: Not reported

**AG-COSTA VIEW FARM (Continued)** **S101591786**

| | |
|---|---|
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |
| | |
| Site ID: | 33986 |
| Site Name: | Gordon Dairy #4 |
| Site Address: | 14451 BON VIEW |
| Site City: | ONTARIO |
| Site Zip: | 91710 |
| Enf Action Date: | 11-29-2004 |
| Enf Action Type: | Oral Communication |
| Enf Action Description: | Oral Communication |
| Enf Action Notes: | Not reported |
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Craig Gordon |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**K57** **GORDON HAY, INC** **HIST UST** **U001568961**
**SW** **14451 BON VIEW AVE** **HWTS** **N/A**
**1/8-1/4** **ONTARIO, CA 91710**
**0.155 mi.**
**819 ft.** **Site 4 of 5 in cluster K**

**Relative:**
**Lower**

**Actual:**
**676 ft.**

HIST UST:

| | |
|---|---|
| Name: | SAME AS ABOVE |
| Address: | 14451 BON VIEW AVE |
| City,State,Zip: | CHINO, CA 91710 |
| File Number: | Not reported |
| URL: | Not reported |
| Region: | STATE |
| Facility ID: | 00000044727 |
| Facility Type: | Other |
| Other Type: | DAIRY |
| Contact Name: | Not reported |
| Telephone: | 7145972360 |
| Owner Name: | DIMAS COSTA |
| Owner Address: | 14451 BON VIEW |
| Owner City,St,Zip: | CHINO, CA 91710 |
| Total Tanks: | 0001 |
| | |
| Tank Num: | 001 |
| Container Num: | 1 |
| Year Installed: | 1970 |
| Tank Capacity: | 00000550 |
| Tank Used for: | PRODUCT |

**GORDON HAY, INC (Continued)** **U001568961**

| | |
|---|---|
| Type of Fuel: | REGULAR |
| Container Construction Thickness: | Not reported |
| Leak Detection: | Visual, Stock Inventor, None |

HWTS:

| | |
|---|---|
| Name: | GORDON HAY, INC |
| Address: | 14451 BON VIEW AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91710 |
| EPA ID: | CAC003121794 |
| Inactive Date: | 08/26/2021 |
| Create Date: | 05/27/2021 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 16395 S EUCLID AVE |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | CHINO, CA 91708 |
| Owner Name: | CRAIG GORDON |
| Owner Address: | 16395 S EUCLID AVE |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | CHINO, CA 91708 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | DEBBIE GASPER |
| Contact Address: | 16395 S EUCLID AVE |
| Contact Address 2: | Not reported |
| City,State,Zip: | CHINO, CA 91708 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | TEMPORARY |
| Category: | STATE |
| Latitude: | 33.99175598 |
| Longitude: | -117.63640702 |

NAICS:

| | |
|---|---|
| EPA ID: | CAC003121794 |
| Create Date: | 2021-05-27 09:19:20.870 |
| NAICS Code: | 11212 |
| NAICS Description: | Dairy Cattle and Milk Production |
| Issued EPA ID Date: | 2021-05-27 09:19:20.88300 |
| Inactive Date: | Not reported |
| Facility Name: | GORDON HAY, INC |
| Facility Address: | 14451 BON VIEW AVE |
| Facility Address 2: | Not reported |
| Facility City: | ONTARIO |
| Facility County: | Not reported |
| Facility State: | CA |
| Facility Zip: | 91710 |

**58 SSE 1/8-1/4 0.185 mi. 976 ft.** | **O & M DAIRY**
**14474 GROVE AVE**
**ONTARIO, CA 91762** | **San Bern. Co. Permit** | **S108536478**
**N/A**

**Relative: Lower**
**Actual: 676 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | O & M DAIRY |
| Address: | 14474 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0010952 |
| Owner: | TRAVIS MOUW |
| Permit Number: | PT0018888 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 07/31/2010 |

| | |
|---|---|
| Name: | MIERSMA #1 |
| Address: | 14474 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000566 |
| Owner: | MIERSMA HARRY |
| Permit Number: | PT0008719 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | MIERSMA #1 |
| Address: | 14474 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000566 |
| Owner: | MIERSMA HARRY |
| Permit Number: | PT0008720 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

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**L59 ENE 1/8-1/4 0.195 mi. 1030 ft.** | **GORZEMAN DAIRY #2**
**13948 WALKER**
**ONTARIO, CA 91762**
**Site 1 of 3 in cluster L** | **San Bern. Co. Permit** | **S108724305**
**N/A**

**Relative: Higher**
**Actual: 709 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | GORZEMAN DAIRY #2 |
| Address: | 13948 WALKER |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0011060 |
| Owner: | GORZEMAN GLENN |
| Permit Number: | PT0019075 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2010 |

**K60 SW 1/8-1/4 0.202 mi. 1065 ft.** | **DIMAS COSTA 14451 BON VIEW CHINO, CA 91710** | **HIST UST HWTS HAZNET** | **S112886421 N/A**

**Site 5 of 5 in cluster K**

**Relative: Lower**

**Actual: 673 ft.**

HIST UST:

| | |
|---|---|
| Name: | DIMAS COSTA |
| Address: | 14451 BON VIEW |
| City,State,Zip: | CHINO, CA 91710 |
| File Number: | 00029dae |
| URL: | |
| Region: | Not reported |
| Facility ID: | Not reported |
| Facility Type: | Not reported |
| Other Type: | Not reported |
| Contact Name: | Not reported |
| Telephone: | Not reported |
| Owner Name: | Not reported |
| Owner Address: | Not reported |
| Owner City,St,Zip: | Not reported |
| Total Tanks: | Not reported |
| Tank Num: | Not reported |
| Container Num: | Not reported |
| Year Installed: | Not reported |
| Tank Capacity: | Not reported |
| Tank Used for: | Not reported |
| Type of Fuel: | Not reported |
| Container Construction Thickness: | Not reported |
| Leak Detection: | Not reported |

Click here for Geo Tracker PDF:

HWTS:

| | |
|---|---|
| Name: | COSTA VIEW FARMS |
| Address: | 14451 BON VIEW |
| Address 2: | Not reported |
| City,State,Zip: | CHINO, CA 91710 |
| EPA ID: | CAC001380480 |
| Inactive Date: | 10/25/2000 |
| Create Date: | 10/27/1998 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 14451 BON VIEW |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | CHINO, CA 917100000 |
| Owner Name: | DIMAS COSTA |
| Owner Address: | 14451 BON VIEW |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | CHINO, CA 917100000 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | DIMAS COSTA-OWNER |
| Contact Address: | 14451 BON VIEW |
| Contact Address 2: | Not reported |
| City,State,Zip: | CHINO, CA 917100000 |
| Contact Phone: | Not reported |

**DIMAS COSTA (Continued)** **S112886421**

| | |
|---|---|
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | TEMPORARY |
| Category: | STATE |
| Latitude: | 33.991074 |
| Longitude: | -117.636779 |

HAZNET:

| | |
|---|---|
| Name: | COSTA VIEW FARMS |
| Address: | 14451 BON VIEW |
| Address 2: | Not reported |
| City,State,Zip: | CHINO, CA 917100000 |
| Contact: | DIMAS COSTA-OWNER |
| Telephone: | 9095972360 |
| Mailing Name: | Not reported |
| Mailing Address: | 14451 BON VIEW |
| Year: | 1998 |
| Gepaid: | CAC001380480 |
| TSD EPA ID: | CAD028409019 |
| CA Waste Code: | 221 - Waste oil and mixed oil |
| Disposal Method: | T01 - Treatment, Tank |
| Tons: | 0.57 |

Additional Information:

| | |
|---|---|
| Year: | 1998 |
| Gen EPA ID: | CAC001380480 |
| Shipment Date: | 19981028 |
| Creation Date: | 12/10/1998 0:00:00 |
| Receipt Date: | 19981028 |
| Manifest ID: | 96692674 |
| Trans EPA ID: | CAR000018168 |
| Trans Name: | Not reported |
| Trans 2 EPA ID: | Not reported |
| Trans 2 Name: | Not reported |
| TSDF EPA ID: | CAD028409019 |
| Trans Name: | Not reported |
| TSDF Alt EPA ID: | Not reported |
| TSDF Alt Name: | Not reported |
| Waste Code Description: | 221 - Waste oil and mixed oil |
| RCRA Code: | Not reported |
| Meth Code: | T01 - Treatment, Tank |
| Quantity Tons: | 0.57 |
| Waste Quantity: | 150 |
| Quantity Unit: | G |
| Additional Code 1: | Not reported |
| Additional Code 2: | Not reported |
| Additional Code 3: | Not reported |
| Additional Code 4: | Not reported |
| Additional Code 5: | Not reported |

**L61 ENE 1/8-1/4 0.209 mi. 1104 ft.** | **GORZEMAN FAMILY DAIRY**
**13975 WALKER**
**ONTARIO, CA 91762**
**Site 2 of 3 in cluster L** | **San Bern. Co. Permit** | **S108724306**
**N/A**

**Relative: Higher**
**Actual: 710 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | GORZEMAN FAMILY DAIRY |
| Address: | 13975 WALKER |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0011061 |
| Owner: | GORZEMAN, GLENN |
| Permit Number: | PT0019076 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2010 |

| | |
|---|---|
| Name: | GORZEMAN FAMILY DAIRY |
| Address: | 13975 WALKER |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0011061 |
| Owner: | GORZEMAN, GLENN |
| Permit Number: | PT0019077 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2010 |

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**L62 ENE 1/8-1/4 0.230 mi. 1215 ft.** | **WE INC**
**13955 WALKER AVE**
**ONTARIO, CA 91762**
**Site 3 of 3 in cluster L** | **RCRA NonGen / NLR** | **1026805839**
**CAC003118028**

**Relative: Higher**
**Actual: 711 ft.**

RCRA Listings:

| | |
|---|---|
| Date Form Received by Agency: | 20210504 |
| Handler Name: | We Inc |
| Handler Address: | 13955 Walker Ave |
| Handler City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAC003118028 |
| Contact Name: | JO MARIE WESTSTEYN |
| Contact Address: | PO BOX 849 |
| Contact City,State,Zip: | NORCO, CA 92860 |
| Contact Telephone: | 951-377-7090 |
| Contact Fax: | Not reported |
| Contact Email: | WE-INC@HOTMAIL.COM |
| Contact Title: | Not reported |
| EPA Region: | 09 |
| Land Type: | Not reported |
| Federal Waste Generator Description: | Not a generator, verified |
| Non-Notifier: | Not reported |
| Biennial Report Cycle: | Not reported |
| Accessibility: | Not reported |
| Active Site Indicator: | Not reported |
| State District Owner: | Not reported |
| State District: | Not reported |
| Mailing Address: | PO BOX 849 |
| Mailing City,State,Zip: | NORCO, CA 92860 |
| Owner Name: | Jo Marie Weststeyn |

**WE INC (Continued)** **1026805839**

| | | |
|---|---|---|
| Owner Type: | | Other |
| Operator Name: | Jo Marie Weststeyn | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20210514 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: JO MARIE WESTSTEYN | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | PO BOX 849 |
| Owner/Operator City,State,Zip: | NORCO, CA 92860 |
| Owner/Operator Telephone: | 951-377-7090 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

**WE INC (Continued)** **1026805839**

Owner/Operator Indicator: Operator
Owner/Operator Name: JO MARIE WESTSTEYN
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 849
Owner/Operator City,State,Zip: NORCO, CA 92860
Owner/Operator Telephone: 951-377-7090
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20210504
Handler Name: WE INC
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 112990
NAICS Description: All Other Animal Production

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

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**63 NNE 1/8-1/4 0.240 mi. 1265 ft.** | **WRECK AGE DEMOLITION INC** | **RCRA NonGen / NLR** | **1024836825**
**13908 GROVE AVE** | **CAL000381231**
**ONTARIO, CA 91762**

**Relative: Higher**
**Actual: 710 ft.**

RCRA Listings:
Date Form Received by Agency: 20121224
Handler Name: Wreck Age Demolition Inc
Handler Address: 13908 Grove Ave
Handler City,State,Zip: ONTARIO, CA 91762
EPA ID: CAL000381231
Contact Name: ISMAEL RODRIGUEZ
Contact Address: 3965 COAST OAK CIR
Contact City,State,Zip: CHINO HILLS, CA 91709
Contact Telephone: 909-393-6937
Contact Fax: 909-393-6945
Contact Email: NORMA.RODRIGUEZ@WRECKAGEDEMO.COM
Contact Title: Not reported

**WRECK AGE DEMOLITION INC (Continued)** **1024836825**

| | | |
|---|---|---|
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Handler Activities |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 3965 COAST OAK CIR |
| Mailing City,State,Zip: | | CHINO HILLS, CA 91709-4941 |
| Owner Name: | Ismael Rodriguez Hernandez | |
| Owner Type: | | Other |
| Operator Name: | Ismael Rodriguez | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | Yes |
| Universal Waste Destination Facility: | | Yes |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20180906 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

**WRECK AGE DEMOLITION INC (Continued)** **1024836825**

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: | ISMAEL RODRIGUEZ HERNANDEZ |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 3965 COAST OAK CIR |
| Owner/Operator City,State,Zip: | CHINO HILLS, CA 91709-4941 |
| Owner/Operator Telephone: | 909-393-6937 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: | ISMAEL RODRIGUEZ |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 3965 COAST OAK CIR |
| Owner/Operator City,State,Zip: | CHINO HILLS, CA 91709 |
| Owner/Operator Telephone: | 909-393-6937 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20121224 |
| Handler Name: | WRECK AGE DEMOLITION INC |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | Not reported |
| Electronic Manifest Broker: | Not reported |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 811111 |
| NAICS Description: | General Automotive Repair |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

**64 ENE 1/4-1/2 0.283 mi. 1492 ft.**

**RECYCLED WOOD PRODUCTS**
**13905 WALKER AVENUE**
**ONTARIO, CA 91761**

**SWF/LF NPDES CIWQS**

**S116497304 N/A**

**Relative: Higher**

**Actual: 714 ft.**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | RWP RECYCLED WOOD PRODUCTS ONTARIO 2 |
| Address: | 13905 WALKER AVE. |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | STATE |
| Facility ID: | 36-AA-0477 |
| SWIS Number: | 36-AA-0477 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Activity: | Green Material Composting Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 12500 |
| Throughput Units: | Cubic Yards per Day |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 50000 |
| Capacity Units: | Tons per year |
| Total Acreage: | 1 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |

**RECYCLED WOOD PRODUCTS (Continued)** **S116497304**

| | |
|---|---|
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 13905 Walker Ave. |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91761 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 34.00322 |
| Longitude: | -117.61928 |
| Is Archived: | No |
| Operator: | Recycled Wood Products |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | chris@rwpmulch.com |
| Contact Phone: | (909) 868-6882 |
| Street Address: | Chris Kiralla 1313 E. Phillips Blvd. |
| Operator City: | Pomona |
| Operator State: | CA |
| Operator Zip: | 91766 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Owner: | Cecilia Da Costa Family |
| Owner Address: | Jaoquim Da Costa 8551 Schaefer Ave. |
| Owner City: | Ontario |
| Owner State: | CA |
| Owner Zip: | 91761 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 34.00322 |
| Longitude: | -117.61928 |
| Is Archived: | No |
| Started On: | Not reported |
| Contact Name: | Not reported |

**RECYCLED WOOD PRODUCTS (Continued)** **S116497304**

| | |
|---|---|
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (909) 923-0058 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Activity: | Green Material Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Activity: | Green Material Composting Operation |
| Waste Type: | Manure |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

NPDES:

| | |
|---|---|
| Name: | RECYCLED WOOD PRODUCTS |
| Address: | 13905 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 8 36IN603695 |
| Regulatory Measure Type: | Industrial |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |

**RECYCLED WOOD PRODUCTS (Continued)** **S116497304**

| | |
|---|---|
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | NOI Required |
| Status Date: | 05/03/2017 |
| Operator Name: | Recycled Wood Products |
| Operator Address: | 1313 East Phillips Boulevard |
| Operator City: | Pomona |
| Operator State: | California |
| Operator Zip: | 91766 |

CIWQS:

| | |
|---|---|
| Name: | Recycled Wood Products Ontario 2 |
| Address: | 13905 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Agency: | Recycled Wood Products |
| Agency Address: | 1313 East Phillips Boulevard, Pomona, CA 91766 |
| Place/Project Type: | Composting Facility |
| SIC/NAICS: | Not reported |
| Region: | 8 |
| Program: | LNDISPOTH |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - WDR |
| Order Number: | 2015-0121-DWQ |
| WDID: | 8 362979001 |
| NPDES Number: | Not reported |
| Adoption Date: | Not reported |
| Effective Date: | 05/09/2018 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 08/03/2030 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | C |
| TTWQ: | 3 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 34.00464 |
| Longitude: | -117.61945 |

---

**65** **PRIVATE RESIDENCE** **LUST** **S110655056**
**SSE** **PRIVATE RESIDENCE** **Cortese** **N/A**
**1/4-1/2** **CHINO, CA**
**0.286 mi.**
**1509 ft.**

**Relative:**
**Lower**

**Actual:**
**673 ft.**

LUST:

| | |
|---|---|
| Name: | PRIVATE RESIDENCE |
| Address: | PRIVATE RESIDENCE |
| City,State,Zip: | CHINO, CA |
| Lead Agency: | SANTA ANA RWQCB (REGION 8) |
| Case Type: | LUST Cleanup Site |

Geo Track:

| | |
|---|---|
| Global Id: | T0607175289 |
| Latitude: | 33.9899 |
| Longitude: | -117.628 |
| Status: | Completed - Case Closed |

**PRIVATE RESIDENCE (Continued)** **S110655056**

| | |
|---|---|
| Status Date: | 10/18/2006 |
| Case Worker: | Not reported |
| RB Case Number: | 083604041T |
| Local Agency: | SAN BERNARDINO COUNTY |
| File Location: | Not reported |
| Local Case Number: | Not reported |
| Potential Media Affect: | Soil |
| Potential Contaminants of Concern: | Diesel, Gasoline |
| EPA Region: | 9 |
| Coordinate Source: | Not reported |
| Quantity Released Gallons: | Not reported |
| Begin Date: | 01/13/2004 |
| Leak Reported Date: | 09/02/2005 |
| How Discovered: | Property Sale/Transaction |
| How Discovered Description: | Not reported |
| Discharge Source: | Other |
| Discharge Cause: | Unknown |
| Stop Method: | Close and Remove Tank |
| Stop Description: | Not reported |
| No Further Action Date: | 10/18/2006 |
| CA Water Watershed Name: | Santa Ana River - Middle Santa Ana River - Chino (Split) (801.21) |
| Dwr Groundwater Subbasin Name: | Upper Santa Ana Valley - Chino (8-002.01) |
| Disadvantaged Community: | Not reported |
| CA Enviroscreen 3 Score: | 76-80% |
| CA Enviroscreen 4 Score: | 70-75% |
| Military DOD Site: | No |
| Facility Project Subtype: | Not reported |
| RWQCB Region: | SANTA ANA RWQCB (REGION 8) |
| Claim Number: | Not reported |
| Claim Status: | Not reported |
| Site History: | Not reported |

LUST:

| | |
|---|---|
| Global Id: | T0607175289 |
| Contact Type: | Local Agency Caseworker |
| Contact Name: | CATHERINE RICHARDS |
| Organization Name: | SAN BERNARDINO COUNTY |
| Address: | 620 SOUTH E STREET |
| City: | SAN BERNARDINO |
| Email: | crichards@sbcfire.org |
| Phone Number: | 9093868419 |

LUST:

| | |
|---|---|
| Global Id: | T0607175289 |
| Action Type: | REMEDIATION |
| Date: | 04/27/2004 |
| Action: | Excavation |
| | |
| Global Id: | T0607175289 |
| Action Type: | ENFORCEMENT |
| Date: | 09/02/2005 |
| Action: | Meeting |
| | |
| Global Id: | T0607175289 |
| Action Type: | Other |
| Date: | 01/13/2004 |
| Action: | Leak Began |

**PRIVATE RESIDENCE (Continued)** **S110655056**

Global Id: T0607175289
Action Type: ENFORCEMENT
Date: 10/18/2006
Action: Closure/No Further Action Letter

Global Id: T0607175289
Action Type: Other
Date: 09/02/2005
Action: Leak Reported

Global Id: T0607175289
Action Type: RESPONSE
Date: 02/03/2006
Action: Soil and Water Investigation Report

Global Id: T0607175289
Action Type: Other
Date: 01/13/2004
Action: Leak Stopped

Global Id: T0607175289
Action Type: Other
Date: 01/13/2004
Action: Leak Discovery

LUST:
Global Id: T0607175289
Status: Open - Case Begin Date
Status Date: 01/13/2004

Global Id: T0607175289
Status: Open - Site Assessment
Status Date: 09/02/2005

Global Id: T0607175289
Status: Open - Verification Monitoring
Status Date: 09/02/2005

Global Id: T0607175289
Status: Open - Site Assessment
Status Date: 12/05/2005

Global Id: T0607175289
Status: Completed - Case Closed
Status Date: 10/18/2006

CORTESE:
Name: PRIVATE RESIDENCE
Address: PRIVATE RESIDENCE
City,State,Zip: CHINO, CA
Region: CORTESE
Envirostor Id: Not reported
Global ID: T0607175289
Site/Facility Type: LUST CLEANUP SITE
Cleanup Status: COMPLETED - CASE CLOSED

**PRIVATE RESIDENCE (Continued)** **S110655056**

| | |
|---|---|
| Status Date: | Not reported |
| Site Code: | Not reported |
| Latitude: | Not reported |
| Longitude: | Not reported |
| Owner: | Not reported |
| Enf Type: | Not reported |
| Swat R: | Not reported |
| Flag: | active |
| Order No: | Not reported |
| Waste Discharge System No: | Not reported |
| Effective Date: | Not reported |
| Region 2: | Not reported |
| WID Id: | Not reported |
| Solid Waste Id No: | Not reported |
| Waste Management Uit Name: | Not reported |
| File Name: | Active Open |

---

**66**
**NNE**
**1/4-1/2**
**0.320 mi.**
**1691 ft.**

**Relative:**
**Higher**

**Actual:**
**713 ft.**

**REDWOOD PRODUCTS OF CHINO INC**
**13814 S GROVE AVE**
**ONTARIO, CA 91761**

**SWF/LF** **S126397034**
**CERS HAZ WASTE** **N/A**
**CERS TANKS**
**LDS**
**EMI**
**HWTS**
**San Bern. Co. Permit**
**CERS**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S. GROVE AVE. |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | STATE |
| Facility ID: | 36-AA-0507 |
| SWIS Number: | 36-AA-0507 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Site Name: | Redwood Products |
| Activity: | Small Volume CDI Debris Processing Operation |
| Activity Is Archived: | No |
| Category: | Transfer/Processing |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 90 |
| Throughput Units: | Tons per day |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 195 |
| Capacity Units: | Tons |
| Total Acreage: | 10 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 13814 S. Grove Ave. |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91761 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Site Name: | Redwood Products |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 34.00223 |
| Longitude: | -117.62927 |
| Is Archived: | No |
| Operator: | Redwood Products of Chino, Inc. |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | marcie@redwoodchino.com |
| Contact Phone: | (909) 923-5656 |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Street Address: | Jaime Carlos P.O. Box 2662 |
| Operator City: | Corona |
| Operator State: | CA |
| Operator Zip: | 92878 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Owner: | Jaime Carlos |
| Owner Address: | P.O. Box 2662 |
| Owner City: | Corona |
| Owner State: | CA |
| Owner Zip: | 92878 |
| Site Name: | Redwood Products |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 34.00223 |
| Longitude: | -117.62927 |
| Is Archived: | No |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | marcie@redwoodchino.com |
| Contact Phone: | (909) 923-5656 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Site Name: | Redwood Products |
| Activity: | Small Volume CDI Debris Processing Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Transfer/Processing |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Site Name: | Redwood Products |
| Activity: | Small Volume CDI Debris Processing Operation |
| Waste Type: | Wood Waste |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Transfer/Processing |
| Activity Classification: | Solid Waste Operation |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

CERS HAZ WASTE:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Site ID: | 572620 |
| CERS ID: | 10864990 |
| CERS Description: | Hazardous Waste Generator |

CERS TANKS:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Site ID: | 572620 |
| CERS ID: | 10864990 |
| CERS Description: | Aboveground Petroleum Storage |

LDS:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S. GROVE AVE. |
| City,State,Zip: | ONTARIO, CA 91761 |
| Global Id: | T10000017416 |
| Latitude: | 34.00219 |
| Longitude: | -117.6292 |
| Case Type: | Land Disposal Site |
| Status: | Open - Operating |
| Status Date: | 10/13/2021 |
| Lead Agency: | Not reported |
| Caseworker: | Not reported |
| Local Agency: | Not reported |
| RB Case Number: | Not reported |
| LOC Case Number: | Not reported |
| File Location: | Not reported |
| Potential Media Affect: | Not reported |
| EDR Link ID: | T10000017416 |
| Potential Contaminants of Concern: | Not reported |
| EPA Region: | 9 |
| Coordinate Source: | Not reported |
| Quantity Released Gallons: | Not reported |
| Begin Date: | 08/17/2021 |
| Leak Reported Date: | Not reported |
| How Discovered: | Not reported |
| How Discovered Description: | Not reported |
| Discharge Source: | Not reported |
| Discharge Cause: | Not reported |
| Stop Method: | Not reported |
| Stop Description: | Not reported |
| No Further Action Date: | Not reported |
| CA Water Watershed Name: | Not reported |
| Dwr Groundwater Subbasin Name: | Not reported |
| Disadvantaged Community: | Not reported |
| CA Enviroscreen 3 Score: | 71-75% |
| CA Enviroscreen 4 Score: | 70-75% |
| Military DOD Site: | No |
| Facility Project Subtype: | Compost Facility |
| RWQCB Region: | SANTA ANA RWQCB (REGION 8) |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Claim Number: | Not reported |
| Claim Status: | Not reported |
| Site History: | Not reported |

Click here to access the California GeoTracker records for this facility:

EMI:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS OF CHINO, INC |
| Address: | 13814 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Year: | 2022 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 193678 |
| Air District Name: | SC |
| SIC Code: | 5031 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | .3414911781445645987478 65 |
| Reactive Organic Gases Tons/Yr: | 0.3 |
| Carbon Monoxide Emissions Tons/Yr: | 0.82 |
| NOX - Oxides of Nitrogen Tons/Yr: | 3.82 |
| SOX - Oxides of Sulphur Tons/Yr: | 0.001713 |
| Particulate Matter Tons/Yr: | 0.25 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.2485 |

HWTS:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS OF CHINO INC |
| Address: | 13814 S GROVE AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91761 |
| EPA ID: | CAL000457349 |
| Inactive Date: | 06/30/2021 |
| Create Date: | 10/06/2020 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | PO BOX 2662 |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | CORONA, CA 92878 |
| Owner Name: | JAIME CARLOS |
| Owner Address: | 13814 S GROVE AVE |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | ONTARIO, CA 91761 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | ANDREW LOPEZ |
| Contact Address: | 13814 S GROVE AVE |
| Contact Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91761 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | PERMANENT |
| Category: | STATE |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

Latitude: 34.00172001
Longitude: -117.62886297

NAICS:
EPA ID: CAL000457349
Create Date: 2020-10-06 18:56:20.737
NAICS Code: 541614
NAICS Description: Process, Physical Distribution, and Logistics Consulting Services
Issued EPA ID Date: 2020-10-06 18:56:20.72700
Inactive Date: Not reported
Facility Name: REDWOOD PRODUCTS OF CHINO INC
Facility Address: 13814 S GROVE AVE
Facility Address 2: Not reported
Facility City: ONTARIO
Facility County: Not reported
Facility State: CA
Facility Zip: 91761

San Bern. Co. Permit:
Name: REDWOOD PRODUCTS
Address: 13814 S GROVE AVE
City,State,Zip: ONTARIO, CA 91761
Region: SAN BERNARDINO
Facility ID: FA0018759
Owner: Carlos, Jaime
Permit Number: PT0040533
Permit Category: HAZARDOUS MATERIALS 4-10 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 04/30/2025

Name: REDWOOD PRODUCTS
Address: 13814 S GROVE AVE
City,State,Zip: ONTARIO, CA 91761
Region: SAN BERNARDINO
Facility ID: FA0018759
Owner: Carlos, Jaime
Permit Number: PT0040534
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: ACTIVE
Expiration Date: 04/30/2025

Name: REDWOOD PRODUCTS
Address: 13814 S GROVE AVE
City,State,Zip: ONTARIO, CA 91761
Region: SAN BERNARDINO
Facility ID: FA0018759
Owner: Carlos, Jaime
Permit Number: PT0040532
Permit Category: APSA 1,320-10,000 GAL FAC CAPACITY
Facility Status: ACTIVE
Expiration Date: 04/30/2025

CERS:
Name: REDWOOD PRODUCTS
Address: 13814 S. GROVE AVE.
City,State,Zip: ONTARIO, CA 91761

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Site ID: | 898211 |
| CERS ID: | T10000017416 |
| CERS Description: | Land Disposal Site |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Regional Board Caseworker |
| Entity Name: | JOANNE LEE - SANTA ANA RWQCB (REGION 8) |
| Entity Title: | Not reported |
| Affiliation Address: | 3737 MAIN STREET, SUITE 500 |
| Affiliation City: | RIVERSIDE |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Site ID: | 572620 |
| CERS ID: | 10864990 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 572620 |
| Site Name: | Redwood Products |
| Violation Date: | 09-28-2021 |
| Citation: | HSC 6.67 25270.4.5(a) - California Health and Safety Code, Chapter 6.67, Section(s) 25270.4.5(a) |
| Violation Description: | Failure to prepare a Spill Prevention, Control, and Countermeasures (SPCC) Plan. |
| Violation Notes: | Returned to compliance on 11/01/2021. OBSERVATION: This facility stores over 1,320 gallons of petroleum based products on site. At the time of the inspection, facility had not prepared an SPCC Plan. CORRECTIVE ACTION: Prepare and implement an SPCC Plan. Submit a signed statement indicating that an SPCC plan has been prepared. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | APSA |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 572620 |
| Site Name: | Redwood Products |
| Violation Date: | 09-28-2021 |
| Citation: | 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f) |
| Violation Description: | Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date. |
| Violation Notes: | Returned to compliance on 11/01/2021. OBSERVATION: The used oil tote was found to be missing a hazardous waste label. CORRECTIVE ACTION: Properly label all hazardous waste containers and submit a photograph demonstrating that the container listed above has been properly labeled. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HW |
| Violation Source: | CERS, |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

Site ID: 572620
Site Name: Redwood Products
Violation Date: 09-28-2021
Citation: HSC 6.95 25508(a)(3) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(3)
Violation Description: Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes: Returned to compliance on 11/01/2021. OBSERVATION: The hazardous materials inventory in CERS was found to be incomplete. There is also a hazard class error for the the inventory currently listed in CERS. CORRECTIVE ACTION: Submit an updated inventory to include the mobil fuel tank, the waste filters drum, waste absorbent drum, the drums and totes of dye, the parts washer and to update the maximum quantities of the diesel fuel and waste oil. Also update the inventory to correct the hazard class error.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 572620
Site Name: Redwood Products
Violation Date: 09-28-2021
Citation: 40 CFR 1 265.31 - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 265.31
Violation Description: Failure to maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.
Violation Notes: Returned to compliance on 11/01/2021. OBSERVATION: Used oil spills were observed on and around the used oil tote. CORRECTIVE ACTION: Properly clean up the waste oil spill residues and manage spent absorbent and contaminated soil as a hazardous waste. Submit photos to this division demonstrating the spill has been properly removed and managed.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 572620
Site Name: Redwood Products
Violation Date: 09-28-2021
Citation: HSC 6.95 25508(a)(3) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(3)
Violation Description: Failure to report program data electronically.
Violation Notes: Returned to compliance on 11/01/2021. OBSERVATION: Update the business activities page to add a secondary contact and to remove the recycling of hazardous waste activity. CORRECTIVE ACTION: Update Business Activities Page and/or Business Owner/Operator Identification Page in CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

Eval Date: 09-28-2021
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-28-2021
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-28-2021
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Affiliation:
Affiliation Type Desc: Environmental Contact
Entity Name: Andrew Lopez
Entity Title: Not reported
Affiliation Address: PO Box 2662
Affiliation City: Corona
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92878
Affiliation Phone: ,

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: PO Box 2662
Affiliation City: Corona
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92878
Affiliation Phone: ,

Affiliation Type Desc: Document Preparer
Entity Name: Andrew Lopez
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Andrew Lopez |
| Entity Title: | Manager |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | Jaime Carlos |
| Entity Title: | Not reported |
| Affiliation Address: | PO Box 2662 |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 92878 |
| Affiliation Phone: | (909) 923-5656, |

| | |
|---|---|
| Affiliation Type Desc: | Property Owner |
| Entity Name: | Jaime Carlos |
| Entity Title: | Not reported |
| Affiliation Address: | PO Box 2662 |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 92878 |
| Affiliation Phone: | (909) 923-5656, |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Redwood Products |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (909) 923-5656, |

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | Redwood Products of chino Inc |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

Affiliation Zip: Not reported
Affiliation Phone: ,

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**67 ENE 1/4-1/2 0.479 mi. 2531 ft.** | **COMPOSTING PLANTONTARIO**
**8605 SCHAEFER AVE**
**ONTARIO, CA 91761** | **WMUDS/SWAT WDS** | **S104384492 N/A**

**Relative: Higher**
**Actual: 722 ft.**

WMUDS/SWAT:

| | |
|---|---|
| Edit Date: | Not reported |
| Complexity: | Not reported |
| Primary Waste: | SLDWST |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Secondary Waste: | Not reported |
| Secondary Waste Type: | Not reported |
| Base Meridian: | Not reported |
| NPID: | Not reported |
| Tonnage: | 0 |
| Regional Board ID: | Not reported |
| Municipal Solid Waste: | False |
| Superorder: | False |
| Open To Public: | False |
| Waste List: | False |
| Agency Type: | Private |
| Agency Name: | KELLOGG SUPPLY, INC. |
| Agency Department: | Not reported |
| Agency Address: | 350 W. SEPULVEDA BLVD. |
| Agency City,St,Zip: | CARSON CA 90745 |
| Agency Contact: | DEL PERRY |
| Agency Telephone: | 3108302206 |
| Land Owner Name: | Not reported |
| Land Owner Address: | Not reported |
| Land Owner City,St,Zip: | Not reported |
| Land Owner Contact: | Not reported |
| Land Owner Phone: | Not reported |
| Region: | 8 |
| Facility Type: | Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this category. |
| Facility Description: | Not reported |
| Facility Telephone: | Not reported |
| SWAT Facility Name: | Not reported |
| Primary SIC: | 2875 |
| Secondary SIC: | Not reported |
| Comments: | Not reported |
| Last Facility Editors: | Not reported |
| Waste Discharge System: | True |
| Solid Waste Assessment Test Program: | False |
| Toxic Pits Cleanup Act Program: | False |

**COMPOSTING PLANTONTARIO (Continued)** **S104384492**

| | |
|---|---|
| Resource Conservation Recovery Act: | False |
| Department of Defence: | False |
| Solid Waste Assessment Test Program: | Not reported |
| Threat to Water Quality: | Not reported |
| Sub Chapter 15: | True |
| Regional Board Project Officer: | Not reported |
| Number of WMUDS at Facility: | 0 |
| Section Range: | Not reported |
| RCRA Facility: | No |
| Waste Discharge Requirements: | H |
| Self-Monitoring Rept. Frequency: | Quarterly Submittal |
| Waste Discharge System ID: | 8 362319001 |
| Solid Waste Information ID: | Not reported |

WDS:

| | |
|---|---|
| Name: | COMPOSTING PLANTONTARIO |
| Address: | 8605 SCHAEFER AVE |
| City: | ONTARIO |
| Facility ID: | Santa Ana River 362319001 |
| Facility Type: | Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this category. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | Not reported |
| Subregion: | 8 |
| Facility Telephone: | Not reported |
| Facility Contact: | DEL PERRY |
| Agency Name: | KELLOGG SUPPLY INC. |
| Agency Address: | 350 W. SEPULVEDA BLVD. |
| Agency City,St,Zip: | CARSON 90745 |
| Agency Contact: | DEL PERRY |
| Agency Telephone: | Not reported |
| Agency Type: | Private |
| SIC Code: | 2875 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Primary Waste: | SLDWST |
| Waste Type2: | Not reported |
| Waste2: | Solid Wastes |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Secondary Waste: | Not reported |
| Secondary Waste Type: | Not reported |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | No reclamation requirements associated with this facility. |

**COMPOSTING PLANTONTARIO (Continued)** **S104384492**

| | |
|---|---|
| POTW: | The facility is not a POTW. |
| Treat To Water: | Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality. |
| Complexity: | Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds. |

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**68 SSW 1/2-1 0.887 mi. 4685 ft.** **CAL-AERO FIELD / ACADEMY** **ENVIROSTOR** **S107735994 N/A**

**CHINO, CA**

**Relative: Lower**

**Actual: 638 ft.**

ENVIROSTOR:

| | |
|---|---|
| Name: | CAL-AERO FIELD / ACADEMY |
| Address: | Not reported |
| City,State,Zip: | CHINO, CA |
| Facility ID: | 80000986 |
| Status: | Inactive - Needs Evaluation |
| Status Date: | 07/01/2005 |
| Site Code: | Not reported |
| Site Type: | Military Evaluation |
| Site Type Detailed: | FUDS |
| Acres: | 0 |
| NPL: | NO |
| Regulatory Agencies: | SMBRP |
| Lead Agency: | SMBRP |
| Program Manager: | Not reported |
| Supervisor: | Eileen Mananian |
| Division Branch: | Cleanup Cypress |
| Assembly: | 53 |
| Senate: | 22 |
| Special Program: | Not reported |
| Restricted Use: | NO |
| Site Mgmt Req: | NONE SPECIFIED |
| Funding: | DERA |
| Latitude: | 33.98111 |
| Longitude: | -117.6394 |
| APN: | NONE SPECIFIED |
| Past Use: | NONE SPECIFIED |
| Potential COC: | NONE SPECIFIED |
| Confirmed COC: | NONE SPECIFIED |
| Potential Description: | NONE SPECIFIED |
| Alias Name: | CA99799FA37100 |
| Alias Type: | Federal Facility ID |
| Alias Name: | J09CA7342 & J0CA7341 |
| Alias Type: | INPR |
| Alias Name: | 80000986 |
| Alias Type: | Envirostor ID Number |

Completed Info:

**CAL-AERO FIELD / ACADEMY (Continued)** **S107735994**

| | |
|---|---|
| Completed Area Name: | PROJECT WIDE |
| Completed Sub Area Name: | Not reported |
| Completed Document Type: | Inventory Project Report (INPR) |
| Completed Date: | 05/28/1999 |
| Comments: | Not reported |

| | |
|---|---|
| Completed Area Name: | PROJECT WIDE |
| Completed Sub Area Name: | Not reported |
| Completed Document Type: | Inventory Project Report (INPR) |
| Completed Date: | 05/28/1999 |
| Comments: | Not reported |

| | |
|---|---|
| Future Area Name: | Not reported |
| Future Sub Area Name: | Not reported |
| Future Document Type: | Not reported |
| Future Due Date: | Not reported |
| Schedule Area Name: | Not reported |
| Schedule Sub Area Name: | Not reported |
| Schedule Document Type: | Not reported |
| Schedule Due Date: | Not reported |
| Schedule Revised Date: | Not reported |

Count: 13 records.

ORPHAN SUMMARY

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|---|---|---|---|---|---|
| CHINO | S125845654 | | 3992 CITRUS GROVE | 91710 | CDL |
| CHINO | S107538626 | | GROVE AVE (15700 BLOCK) | 91710 | CDL |
| CHINO | S107539847 | | ON GROVE AVENUE (SOUTH OF PINE | 91710 | CDL |
| CHINO | S107537626 | | AT SOUTH END OF FERN AVE (CROS | 91710 | CDL |
| ONTARIO | S107538075 | | CLEAVELAND RD, S OF EDISON | 91761 | CDL |
| ONTARIO | S107538083 | | CLEVELAND ST, SOUTH OF EDISON | | CDL |
| ONTARIO | S107538082 | | CLEVELAND ST (SOUTH OF EDISON) | 91761 | CDL |
| ONTARIO | S107539773 | | ON CLEVELAND, 100 YARDS SO OF | 91761 | CDL |
| ONTARIO | 1009508586 | SO CAL GAS/ONTARIO MGP | CORNER OF CAMPUS, MARTLAND, MO | 91761 | EDR MGP |
| ONTARIO | S107538422 | | EDISON, 1/2 MI W OF ARCHIBALD | | CDL |
| ONTARIO | S107538468 | | EUCALYPTUS W OF BON VIEW | 91761 | CDL |
| ONTARIO | 1025945930 | ONTARIO RANCH HOLSTEINS #1 | 14848 GROVE | 91762 | ECHO |
| ONTARIO | S107541120 | | WALKER ST, SOUTH OF EDISON | 91761 | CDL |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

## STANDARD ENVIRONMENTAL RECORDS

***Lists of Federal NPL (Superfund) sites***

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: N/A
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: N/A
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

***Lists of Federal Delisted NPL sites***

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: N/A
Last EDR Contact: 02/04/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

***Lists of Federal sites subject to CERCLA removals and CERCLA orders***

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 12/18/2024
Date Made Active in Reports: 12/20/2024
Number of Days to Update: 2

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 12/18/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Quarterly

***Lists of Federal CERCLA sites with NFRAP***

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Quarterly

***Lists of Federal RCRA facilities undergoing Corrective Action***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

***Lists of Federal RCRA TSD facilities***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

***Lists of Federal RCRA generators***

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

***Federal institutional controls / engineering controls registries***

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 11/11/2024
Date Data Arrived at EDR: 11/25/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 85

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/15/2024
Date Made Active in Reports: 02/11/2025
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/18/2025
Next Scheduled EDR Contact: 12/02/2024
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/15/2024
Date Made Active in Reports: 02/11/2025
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/18/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

***Federal ERNS list***

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/03/2024
Date Data Arrived at EDR: 12/11/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 69

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

***Lists of state- and tribal (Superfund) equivalent sites***

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

***Lists of state- and tribal hazardous waste facilities***

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

***Lists of state and tribal landfills and solid waste disposal facilities***

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/06/2024
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 86

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/04/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Quarterly

***Lists of state and tribal leaking storage tanks***

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/11/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

***Lists of state and tribal registered storage tanks***

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 08/12/2024
Date Data Arrived at EDR: 10/30/2024
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 76

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 11/26/2024
Date Data Arrived at EDR: 11/26/2024
Date Made Active in Reports: 02/20/2025
Number of Days to Update: 86

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 11/26/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Semi-Annually

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 11/25/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 01/07/2025
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/11/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 07/29/2024
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

***Lists of state and tribal voluntary cleanup sites***

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

***Lists of state and tribal brownfield sites***

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/02/2024
Number of Days to Update: 76

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/09/2024
Date Data Arrived at EDR: 09/11/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/12/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Semi-Annually

***Local Lists of Landfill / Solid Waste Disposal Sites***

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 11/13/2024
Date Data Arrived at EDR: 11/15/2024
Date Made Active in Reports: 12/12/2024
Number of Days to Update: 27

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 02/07/2024
Date Data Arrived at EDR: 11/13/2024
Date Made Active in Reports: 11/19/2024
Number of Days to Update: 6

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 12/09/2024
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

***Local Lists of Hazardous waste / Contaminated Sites***

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 05/20/2024
Date Data Arrived at EDR: 08/19/2024
Date Made Active in Reports: 10/09/2024
Number of Days to Update: 51

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 03/21/2024
Date Made Active in Reports: 06/12/2024
Number of Days to Update: 83

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CERS HAZ WASTE: California Environmental Reporting System Hazardous Waste

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 05/20/2024
Date Data Arrived at EDR: 08/19/2024
Date Made Active in Reports: 10/09/2024
Number of Days to Update: 51

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Quarterly

***Local Lists of Registered Storage Tanks***

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 07/29/2024
Date Data Arrived at EDR: 07/30/2024
Date Made Active in Reports: 10/17/2024
Number of Days to Update: 79

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Local Land Records***

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 11/26/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Semi-Annually

***Records of Emergency Release Reports***

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/14/2024
Date Data Arrived at EDR: 06/17/2024
Date Made Active in Reports: 06/24/2024
Number of Days to Update: 7

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 08/01/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Other Ascertainable Records***

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 10/01/2024
Date Data Arrived at EDR: 11/12/2024
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 70

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/11/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021
Date Data Arrived at EDR: 07/13/2021
Date Made Active in Reports: 03/09/2022
Number of Days to Update: 239

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/07/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 12/30/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/20/2024
Number of Days to Update: 94

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA Watch List

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 01/27/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: No Update Planned

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/14/2022
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 283

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/12/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 02/11/2025
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 7

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/11/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 90

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 10/24/2024
Date Data Arrived at EDR: 11/01/2024
Date Made Active in Reports: 11/19/2024
Number of Days to Update: 18

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 03/10/2025
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

| | |
|---|---|
| Date of Government Version: 10/01/2024 | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 10/23/2024 | Telephone: 202-564-8600 |
| Date Made Active in Reports: 01/14/2025 | Last EDR Contact: 01/09/2025 |
| Number of Days to Update: 83 | Next Scheduled EDR Contact: 04/28/2025 |
| | Data Release Frequency: Varies |

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

| | |
|---|---|
| Date of Government Version: 04/17/1995 | Source: EPA |
| Date Data Arrived at EDR: 07/03/1995 | Telephone: 202-564-4104 |
| Date Made Active in Reports: 08/07/1995 | Last EDR Contact: 06/02/2008 |
| Number of Days to Update: 35 | Next Scheduled EDR Contact: 09/01/2008 |
| | Data Release Frequency: No Update Planned |

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

| | |
|---|---|
| Date of Government Version: 09/19/2023 | Source: EPA |
| Date Data Arrived at EDR: 10/03/2023 | Telephone: 202-564-6023 |
| Date Made Active in Reports: 10/19/2023 | Last EDR Contact: 02/03/2025 |
| Number of Days to Update: 16 | Next Scheduled EDR Contact: 05/12/2025 |
| | Data Release Frequency: Quarterly |

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

| | |
|---|---|
| Date of Government Version: 07/01/2024 | Source: EPA |
| Date Data Arrived at EDR: 10/02/2024 | Telephone: 202-566-0500 |
| Date Made Active in Reports: 01/10/2025 | Last EDR Contact: 01/02/2025 |
| Number of Days to Update: 100 | Next Scheduled EDR Contact: 04/14/2025 |
| | Data Release Frequency: Annually |

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

| | |
|---|---|
| Date of Government Version: 11/18/2016 | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 11/23/2016 | Telephone: 202-564-2501 |
| Date Made Active in Reports: 02/10/2017 | Last EDR Contact: 12/23/2024 |
| Number of Days to Update: 79 | Next Scheduled EDR Contact: 04/14/2025 |
| | Data Release Frequency: Quarterly |

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 10/12/2024
Date Data Arrived at EDR: 10/17/2024
Date Made Active in Reports: 11/19/2024
Number of Days to Update: 33

Source: Nuclear Regulatory Commission
Telephone: 301-415-0717
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 90

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 12/17/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 10/04/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 51

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2024
Date Data Arrived at EDR: 10/09/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 93

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/30/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 12/12/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 12/30/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/03/2023
Date Data Arrived at EDR: 03/03/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 98

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 05/08/2024
Date Data Arrived at EDR: 08/14/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 14

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/01/2024
Date Data Arrived at EDR: 11/18/2024
Date Made Active in Reports: 02/11/2025
Number of Days to Update: 85

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/18/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data
Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 10/01/2024
Date Data Arrived at EDR: 10/02/2024
Date Made Active in Reports: 10/09/2024
Number of Days to Update: 7

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/02/2024
Date Data Arrived at EDR: 08/20/2024
Date Made Active in Reports: 10/09/2024
Number of Days to Update: 50

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines
An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/10/2024
Date Data Arrived at EDR: 12/11/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 69

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 02/26/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Quarterly

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 06/04/2024
Date Data Arrived at EDR: 11/22/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 88

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/11/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 90

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/21/2021
Date Made Active in Reports: 08/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 09/06/2023
Date Data Arrived at EDR: 09/13/2023
Date Made Active in Reports: 12/11/2023
Number of Days to Update: 89

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/06/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 12/21/2024
Date Data Arrived at EDR: 12/27/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 12/27/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 11/08/2024
Date Data Arrived at EDR: 11/08/2024
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 67

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/13/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 703-603-8895
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS TRIS: List of PFAS Added to the TRI

Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-566-0250
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020
Date Data Arrived at EDR: 03/17/2021
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 601

Source: Department of Health & Human Services
Telephone: 202-741-5770
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

Date of Government Version: 12/13/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits. Caveats and Limitations: Less than half of states have required PFAS monitoring for at least one of their permittees and fewer states have established PFAS effluent limits for permittees. New rulemakings have been initiated that may increase the number of facilities monitoring for PFAS in the future.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 01/02/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS PROJECT: NORTHEASTERN UNIVERSITY PFAS PROJECT

The PFAS Contamination Site Tracker records qualitative and quantitative data from each site in a chart, specifically examining discovery, contamination levels, government response, litigation, health impacts, media coverage, and community characteristics. All data presented in the chart were extracted from government websites, such as state health departments or the Environmental Protection Agency, and news articles.

Date of Government Version: 05/19/2023
Date Data Arrived at EDR: 04/05/2024
Date Made Active in Reports: 06/06/2024
Number of Days to Update: 62

Source: Social Science Environmental Health Research Institute
Telephone: N/A
Last EDR Contact: 12/05/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS ECHO FIRE TRAIN: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facilitys name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS PT 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration?s document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-267-2675
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PCS ENF: Enforcement data

No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 12/16/2016
Date Data Arrived at EDR: 01/06/2017
Date Made Active in Reports: 03/10/2017
Number of Days to Update: 63

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: No Update Planned

BIOSOLIDS: ICIS-NPDES Biosolids Facility Data

The data reflects compliance information about facilities in the biosolids program.

Date of Government Version: 10/13/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 10/23/2024
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 202-564-4700
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

UST FINDER: UST Finder Database

EPA developed UST Finder, a web map application containing a comprehensive, state-sourced national map of underground storage tank (UST) and leaking UST (LUST) data. It provides the attributes and locations of active and closed USTs, UST facilities, and LUST sites from states and from Tribal lands and US territories . UST Finder contains information about proximity of UST facilities and LUST sites to: surface and groundwater public drinking water protection areas; estimated number of private domestic wells and number of people living nearby; and flooding and wildfires.

Date of Government Version: 06/08/2023
Date Data Arrived at EDR: 10/04/2023
Date Made Active in Reports: 01/18/2024
Number of Days to Update: 106

Source: Environmental Protection Agency
Telephone: 202-564-0394
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

UST FINDER RELEASE: UST Finder Releases Database

US EPA's UST Finder data is a national composite of leaking underground storage tanks. This data contains information about, and locations of, leaking underground storage tanks. Data was collected from state sources and standardized into a national profile by EPA's Office of Underground Storage Tanks, Office of Research and Development, and the Association of State and Territorial Solid Waste Management Officials.

Date of Government Version: 06/08/2023
Date Data Arrived at EDR: 10/31/2023
Date Made Active in Reports: 01/18/2024
Number of Days to Update: 79

Source: Environmental Protecton Agency
Telephone: 202-564-0394
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Semi-Annually

E MANIFEST: Hazardous Waste Electronic Manifest System

EPA established a national system for tracking hazardous waste shipments electronically. This system, known as ?e-Manifest,? will modernize the nation?s cradle-to-grave hazardous waste tracking process while saving valuable time, resources, and dollars for industry and states.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/20/2024
Number of Days to Update: 94

Source: Environmental Protection Agency
Telephone: 833-501-6826
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS sites included in the Envirostor and GeoTracker databases. Locations of potential sources of per - and polyfluoroalkyl substances (PFAS). This does not mean that PFAS has been produced, used, or discharged at these sites.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

AQUEOUS FOAM: Former Fire Training Facility Assessments Listing

Airports shown on this list are those believed to use Aqueous Film Forming Foam (AFFF), and certified by the Federal Aviation Administration (FAA) under Title 14, Code of Federal Regulations (CFR), Part 139 (14 CFR Part 139). This list was created by SWRCB using information available from the FAA. Location points shown are from the latitude and longitude listed on the FAA airport master record.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 916-341-5455
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CHROME PLATING: Chrome Plating Facilities Listing

This listing represents chrome plating facilities the California State Water Resources Control Board staff identified as possibly being a source of Per- and polyfluoroalkyl substance (PFAS) contamination. Sites and locations were identified by staff with the Division of Water Quality in the California State Water Board. Data was collected from the CA Air Resources Board 2013 and 2018 - Cr VI emission survey, CA Emission Inventory, CA HAZ Waste discharge database and by reviewing storm water permits. Former chrome plating sites are also included that are open site investigation or remediation cases with the Regional Water Quality Control Boards and the Department of Toxic Substances Control.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 916-341-5455
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/02/2024
Number of Days to Update: 76

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

CUPA LIV-PLE: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 09/19/2024
Date Data Arrived at EDR: 11/05/2024
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 87

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

DRYCLEAN MOJAVE: Mojave Desert Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mojave Desert Air Quality Management District.

Date of Government Version: 08/21/2024
Date Data Arrived at EDR: 08/22/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 75

Source: Mojave Desert Air Quality Management District
Telephone: 760-245-1661
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN N SIERRA: Northern Sierra Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sierra Air Quality Management District,

Date of Government Version: 08/22/2024
Date Data Arrived at EDR: 08/22/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 75

Source: Northern Sierra Air Quality Management District
Telephone: 530-274-9350
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN MONTERY BAY: Monterey Bay Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Monterey Bay Air Quality Management District.

Date of Government Version: 09/09/2024
Date Data Arrived at EDR: 09/11/2024
Date Made Active in Reports: 11/26/2024
Number of Days to Update: 76

Source: Monterey Bay Air Quality Management District
Telephone: 831-647-9411
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN AMADOR: Amador Air District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Amador Air Quality Management District

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 77

Source: Amador Air Quality Management District
Telephone: 209-257-0112
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN VENTURA: Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Ventura County Air Pollution Control District.

Date of Government Version: 08/26/2024
Date Data Arrived at EDR: 08/28/2024
Date Made Active in Reports: 11/14/2024
Number of Days to Update: 78

Source: Ventura County Air Pollution Control District
Telephone: 805-645-1421
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN EAST KERN: Eastern Kern Air Pollution Control District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Eastern Kern Air Pollution Control District.

Date of Government Version: 08/21/2024
Date Data Arrived at EDR: 08/22/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 75

Source: Eastern Kern Air Pollution Control District
Telephone: 661-862-9684
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN JOAQUIN: San Joaquin Valley Air Pollution Control District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Joaquin Valley Air Pollution Control District.

Date of Government Version: 08/22/2024
Date Data Arrived at EDR: 08/22/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 75

Source: San Joaquin Valley Air Pollution Control District
Telephone: 559-230-6001
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN GLENN: Glenn County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Glenn County Air Pollution Control District.

Date of Government Version: 08/26/2024
Date Data Arrived at EDR: 08/28/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 77

Source: Glenn County Air Pollution Control District
Telephone: 530-934-6500
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN BUTTE: Butte County Air Quality Management DistrictDrycleaner Facility Listing
Butte County Air Quality Management DistrictDrycleaner Facility Listing.

Date of Government Version: 09/10/2024
Date Data Arrived at EDR: 09/11/2024
Date Made Active in Reports: 11/25/2024
Number of Days to Update: 75

Source: Butte County Air Quality Management District
Telephone: 530-332-9400
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN FEATHER RVR: Feather River Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Feather River Air Quality Management District.

Date of Government Version: 03/08/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 06/05/2023
Number of Days to Update: 88

Source: Feather River Air Quality Management District
Telephone: 530-634-7659
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 05/29/2024
Date Data Arrived at EDR: 11/07/2024
Date Made Active in Reports: 11/22/2024
Number of Days to Update: 15

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

DRYCLEAN N SONOMA: Norther Sonoma County County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sonoma County Air Pollution Control District.,

Date of Government Version: 08/23/2024
Date Data Arrived at EDR: 08/26/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 71

Source: Santa Barbara County Air Pollution Control District
Telephone: 707-433-5911
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN GRANT: Grant Recipients List
Assembly Bill 998 (AB 998) established the Non-Toxic Dry Cleaning Incentive Program to provide financial assistance to the dry cleaning industry to switch from systems using perchloroethylene (Perc), an identified toxic air contaminant and potential human carcinogen, to non-toxic and non-smog forming alternatives.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 01/26/2024
Date Made Active in Reports: 04/16/2024
Number of Days to Update: 81

Source: California Air Resources Board
Telephone: 916-323-0006
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

DRYCLEAN YOLO-SOLANO: Yolo-Solano Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Yolo-Solano Air Quality Management District.

Date of Government Version: 08/21/2024
Date Data Arrived at EDR: 08/26/2024
Date Made Active in Reports: 11/06/2024
Number of Days to Update: 72

Source: Yolo-Solano Air Quality Management District
Telephone: 530-757-3650
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN LAKE: Lake County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Lake County Air Quality Management District,

Date of Government Version: 02/15/2024
Date Data Arrived at EDR: 02/16/2024
Date Made Active in Reports: 05/02/2024
Number of Days to Update: 76

Source: Lake County Air Quality Management District
Telephone: 707-263-7000
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN DIEGO: San Diego County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Diego County Air Pollution Control District.

Date of Government Version: 08/21/2024
Date Data Arrived at EDR: 08/28/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 77

Source: San Diego County Air Pollution Control District
Telephone: 858-586-2616
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN MENDOCINO: Mendocino County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mendocino County Air Quality Management District.

Date of Government Version: 08/26/2024
Date Data Arrived at EDR: 09/03/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 71

Source: Mendocino County Air Quality Management District
Telephone: 707-463-4354
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SACRAMENTO: Sacramento Metropolitan Air Quality Management DistrictDrycleaner Facility Listing
A listing of drycleaner facility locations, for the Sacramento Metropolitan Air Quality Management District.

Date of Government Version: 09/03/2024
Date Data Arrived at EDR: 09/05/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 69

Source: Sacramento Metropolitan Air Quality Management District
Telephone: 916-874-3958
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN IMPERIAL: Imperial County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Imperial County Air Pollution Control District

Date of Government Version: 10/02/2024
Date Data Arrived at EDR: 10/03/2024
Date Made Active in Reports: 12/20/2024
Number of Days to Update: 78

Source: Imperial County Air Pollution Control District
Telephone: 442-265-1800
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN LUIS OB: San Luis Obispo County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Luis Obispo County Air Pollution Control District.

Date of Government Version: 01/03/2024
Date Data Arrived at EDR: 01/04/2024
Date Made Active in Reports: 03/20/2024
Number of Days to Update: 76

Source: San Luis Obispo County Air Pollution Control District
Telephone: 805-781-5756
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN PLACER: Placer County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Placer County Air Quality Management District.

Date of Government Version: 05/15/2023
Date Data Arrived at EDR: 05/17/2023
Date Made Active in Reports: 08/14/2023
Number of Days to Update: 89

Source: Placer County Air Quality Management District
Telephone: 530-745-2335
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN BAY AREA: Bay Area Air Quality Management District Drycleaner Facility Listing
Bay Area Air Quality Management District Drycleaner Facility Listing.

Date of Government Version: 02/20/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1432

Source: Bay Area Air Quality Management District
Telephone: 415-516-1916
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN CALAVERAS: Calaveras County Environmental Management Agency Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Calaveras County Environmental Management Agency.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1412

Source: Calaveras County Environmental Management Agency
Telephone: 209-754-6399
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN N COAST: North Coast Unified Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the North Coast Unified Air Quality Management District.

Date of Government Version: 11/30/2016
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473

Source: North Coast Unified Air Quality Management District
Telephone: 707-443-3093
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SANTA BARB: Santa Barbara County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Santa Barbara County Air Pollution Control District.

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Santa Barbara County Air Pollution Control District
Telephone: 805-961-8867
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN TEHAMA: Tehama County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Tehama County Air Pollution Control District.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1468

Source: Tehama County Air Pollution Control District
Telephone: 530-527-3717
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 11/14/2024
Date Data Arrived at EDR: 11/15/2024
Date Made Active in Reports: 02/05/2025
Number of Days to Update: 82

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/28/2024
Date Data Arrived at EDR: 09/05/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 69

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Annually

DRYCLEAN SHASTA: Shasta County Air Quality Management District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Shasta County Air Quality Management District.

Date of Government Version: 08/29/2024
Date Data Arrived at EDR: 09/05/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 69

Source: Shasta County Air Quality Management District
Telephone: 530-225-5674
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 06/11/2024
Date Made Active in Reports: 09/03/2024
Number of Days to Update: 84

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/12/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

FIN ASSURANCE 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 10/09/2024
Date Data Arrived at EDR: 10/10/2024
Date Made Active in Reports: 12/30/2024
Number of Days to Update: 81

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

FIN ASSURANCE 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/06/2024
Date Data Arrived at EDR: 11/08/2024
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 84

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

ICE: Inspection, Compliance and Enforcement
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 11/08/2024
Date Data Arrived at EDR: 11/08/2024
Date Made Active in Reports: 02/03/2025
Number of Days to Update: 87

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 02/11/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/08/2024
Date Data Arrived at EDR: 11/08/2024
Date Made Active in Reports: 02/03/2025
Number of Days to Update: 87

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/11/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 09/30/2024
Date Data Arrived at EDR: 10/01/2024
Date Made Active in Reports: 12/13/2024
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 12/27/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Quarterly

HWTS: Hazardous Waste Tracking System

DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 07/19/2024
Date Data Arrived at EDR: 07/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 29

Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 01/02/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 07/02/2024
Date Made Active in Reports: 09/25/2024
Number of Days to Update: 85

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Annually

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 10/07/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/05/2024
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 87

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/04/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 09/05/2024
Date Data Arrived at EDR: 09/06/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 68

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 01/26/2021
Number of Days to Update: 82

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Annually

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/25/2025
Number of Days to Update: 84

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 07/01/2021
Date Made Active in Reports: 09/29/2021
Number of Days to Update: 90

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 01/02/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/25/2025
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/12/2025
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**COUNTY RECORDS**

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 12/26/2023
Date Data Arrived at EDR: 12/26/2023
Date Made Active in Reports: 03/19/2024
Number of Days to Update: 84

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 04/27/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 77

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 09/25/2024
Date Data Arrived at EDR: 09/26/2024
Date Made Active in Reports: 12/12/2024
Number of Days to Update: 77

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/23/2024
Date Made Active in Reports: 01/13/2025
Number of Days to Update: 82

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 02/05/2024
Date Data Arrived at EDR: 02/08/2024
Date Made Active in Reports: 04/26/2024
Number of Days to Update: 78

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/08/2022
Date Data Arrived at EDR: 08/09/2022
Date Made Active in Reports: 09/01/2022
Number of Days to Update: 23

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 06/28/2021
Date Data Arrived at EDR: 12/21/2021
Date Made Active in Reports: 03/03/2022
Number of Days to Update: 72

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 12/19/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/12/2021
Date Data Arrived at EDR: 08/12/2021
Date Made Active in Reports: 11/08/2021
Number of Days to Update: 88

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 10/09/2024
Date Data Arrived at EDR: 10/11/2024
Date Made Active in Reports: 12/30/2024
Number of Days to Update: 80

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 01/27/2025
Date Data Arrived at EDR: 01/29/2025
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 2

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 01/27/2025
Date Data Arrived at EDR: 01/29/2025
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 2

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 12/03/2020
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/14/2021
Number of Days to Update: 78

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 10/31/2024
Date Data Arrived at EDR: 11/01/2024
Date Made Active in Reports: 01/17/2025
Number of Days to Update: 77

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 09/26/2024
Date Data Arrived at EDR: 10/01/2024
Date Made Active in Reports: 12/12/2024
Number of Days to Update: 72

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/04/2024
Date Data Arrived at EDR: 10/04/2024
Date Made Active in Reports: 12/23/2024
Number of Days to Update: 80

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/07/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 10/03/2024
Date Made Active in Reports: 12/17/2024
Number of Days to Update: 75

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills
This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 07/09/2024
Date Made Active in Reports: 09/27/2024
Number of Days to Update: 80

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory
A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 09/01/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/02/2024
Number of Days to Update: 76

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory
A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 09/01/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/02/2024
Number of Days to Update: 76

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation LA County List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 05/21/2024
Date Data Arrived at EDR: 07/16/2024
Date Made Active in Reports: 10/07/2024
Number of Days to Update: 83

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/17/2024
Date Made Active in Reports: 01/07/2025
Number of Days to Update: 82

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Semi-Annually

MENDOCINO COUNTY:

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/22/2021
Date Data Arrived at EDR: 11/18/2021
Date Made Active in Reports: 11/22/2021
Number of Days to Update: 4

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 10/08/2024
Date Data Arrived at EDR: 10/09/2024
Date Made Active in Reports: 10/31/2024
Number of Days to Update: 22

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 01/10/2025
Date Data Arrived at EDR: 01/14/2025
Date Made Active in Reports: 02/20/2025
Number of Days to Update: 37

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 01/27/2025
Date Data Arrived at EDR: 01/27/2025
Date Made Active in Reports: 02/03/2025
Number of Days to Update: 7

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups Orange County
Petroleum and non-petroleum spills.

Date of Government Version: 10/31/2024
Date Data Arrived at EDR: 10/31/2024
Date Made Active in Reports: 01/24/2025
Number of Days to Update: 85

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/27/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 10/31/2024
Date Data Arrived at EDR: 10/31/2024
Date Made Active in Reports: 01/24/2025
Number of Days to Update: 85

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/27/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 08/06/2024
Date Data Arrived at EDR: 08/08/2024
Date Made Active in Reports: 10/29/2024
Number of Days to Update: 82

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/27/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 11/19/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 06/11/2024
Date Data Arrived at EDR: 06/12/2024
Date Made Active in Reports: 06/27/2024
Number of Days to Update: 15

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 12/05/2024
Date Data Arrived at EDR: 12/05/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 26

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/21/2022
Date Made Active in Reports: 03/16/2023
Number of Days to Update: 85

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/09/2022
Date Made Active in Reports: 03/01/2023
Number of Days to Update: 82

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 10/25/2024
Date Data Arrived at EDR: 10/29/2024
Date Made Active in Reports: 01/17/2025
Number of Days to Update: 80

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 08/13/2024
Date Data Arrived at EDR: 08/14/2024
Date Made Active in Reports: 08/20/2024
Number of Days to Update: 6

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 01/28/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/01/2023
Date Data Arrived at EDR: 01/31/2024
Date Made Active in Reports: 04/17/2024
Number of Days to Update: 77

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/22/2021
Date Data Arrived at EDR: 10/19/2021
Date Made Active in Reports: 01/13/2022
Number of Days to Update: 86

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing
Cupa facilities

Date of Government Version: 10/28/2024
Date Data Arrived at EDR: 10/30/2024
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 83

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 10/28/2024
Date Data Arrived at EDR: 10/30/2024
Date Made Active in Reports: 01/24/2025
Number of Days to Update: 86

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

SAN FRANCISO COUNTY:

SAN FRANCISCO MAHER: Maher Ordinance Property Listing
a listing of properties that fall within a Maher Ordinance, for all of San Francisco

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 01/06/2025
Number of Days to Update: 82

Source: San Francisco Planning
Telephone: 628-652-7483
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/12/2024
Date Data Arrived at EDR: 11/13/2024
Date Made Active in Reports: 02/06/2025
Number of Days to Update: 85

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/05/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 02/26/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 11/18/2024
Date Data Arrived at EDR: 11/19/2024
Date Made Active in Reports: 02/12/2025
Number of Days to Update: 85

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: No Update Planned

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

SITE MIT SANTA CRUZ: Site Mitigation Santa Cruz County List
Sites may become contaminated with toxic chemicals through illegal dumping or disposal, from leaking underground storage tanks, or through industrial or commercial activities.The goal of the site mitigation program is to protect the public health and the environment while facilitating completion of contaminated site clean-up projects in a timely manner.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 06/23/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 20

Source: Santa Cruz Environmental Health Services
Telephone: 831-454-2761
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/15/2021
Date Data Arrived at EDR: 09/16/2021
Date Made Active in Reports: 12/09/2021
Number of Days to Update: 84

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 07/02/2021
Date Data Arrived at EDR: 07/06/2021
Date Made Active in Reports: 07/14/2021
Number of Days to Update: 8

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 06/30/2021
Date Data Arrived at EDR: 06/30/2021
Date Made Active in Reports: 09/24/2021
Number of Days to Update: 86

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 02/08/2022
Date Data Arrived at EDR: 02/10/2022
Date Made Active in Reports: 05/04/2022
Number of Days to Update: 83

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 11/05/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 08/27/2024
Date Data Arrived at EDR: 08/28/2024
Date Made Active in Reports: 11/12/2024
Number of Days to Update: 76

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 10/09/2024
Date Data Arrived at EDR: 10/11/2024
Date Made Active in Reports: 12/30/2024
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 10/07/2022
Date Data Arrived at EDR: 10/07/2022
Date Made Active in Reports: 12/21/2022
Number of Days to Update: 75

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 07/02/2024
Date Data Arrived at EDR: 07/17/2024
Date Made Active in Reports: 07/23/2024
Number of Days to Update: 6

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/13/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 07/02/2024
Date Data Arrived at EDR: 07/18/2024
Date Made Active in Reports: 07/23/2024
Number of Days to Update: 5

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 01/13/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/27/2024
Date Data Arrived at EDR: 09/04/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 70

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/05/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 09/18/2024
Date Data Arrived at EDR: 09/25/2024
Date Made Active in Reports: 12/13/2024
Number of Days to Update: 79

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 10/17/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

**OTHER DATABASE(S)**

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/05/2024
Date Made Active in Reports: 01/27/2025
Number of Days to Update: 83

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/04/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 11/30/2023
Date Made Active in Reports: 12/01/2023
Number of Days to Update: 1

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/06/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/18/2022
Number of Days to Update: 80

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 02/26/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

**STREET AND ADDRESS INFORMATION**

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# GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

**TARGET PROPERTY ADDRESS**

ONTARIO RANCH II
8061 EDISON AVENUE
ONTARIO, CA 91762

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 33.996599 - 33˚ 59’ 47.76’’ |
| Longitude (West): | 117.63136 - 117˚ 37’ 52.90’’ |
| Universal Tranverse Mercator: | Zone 11 |
| UTM X (Meters): | 441691.2 |
| UTM Y (Meters): | 3761764.0 |
| Elevation: | 691 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 50006194 PRADO DAM, CA |
| Version Date: | 2022 |
| Northeast Map: | 50005338 GUASTI, CA |
| Version Date: | 2021 |
| Southeast Map: | 50005749 CORONA NORTH, CA |
| Version Date: | 2022 |
| Northwest Map: | 50005381 ONTARIO, CA |
| Version Date: | 2021 |

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

**TOPOGRAPHIC INFORMATION**

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General South

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**

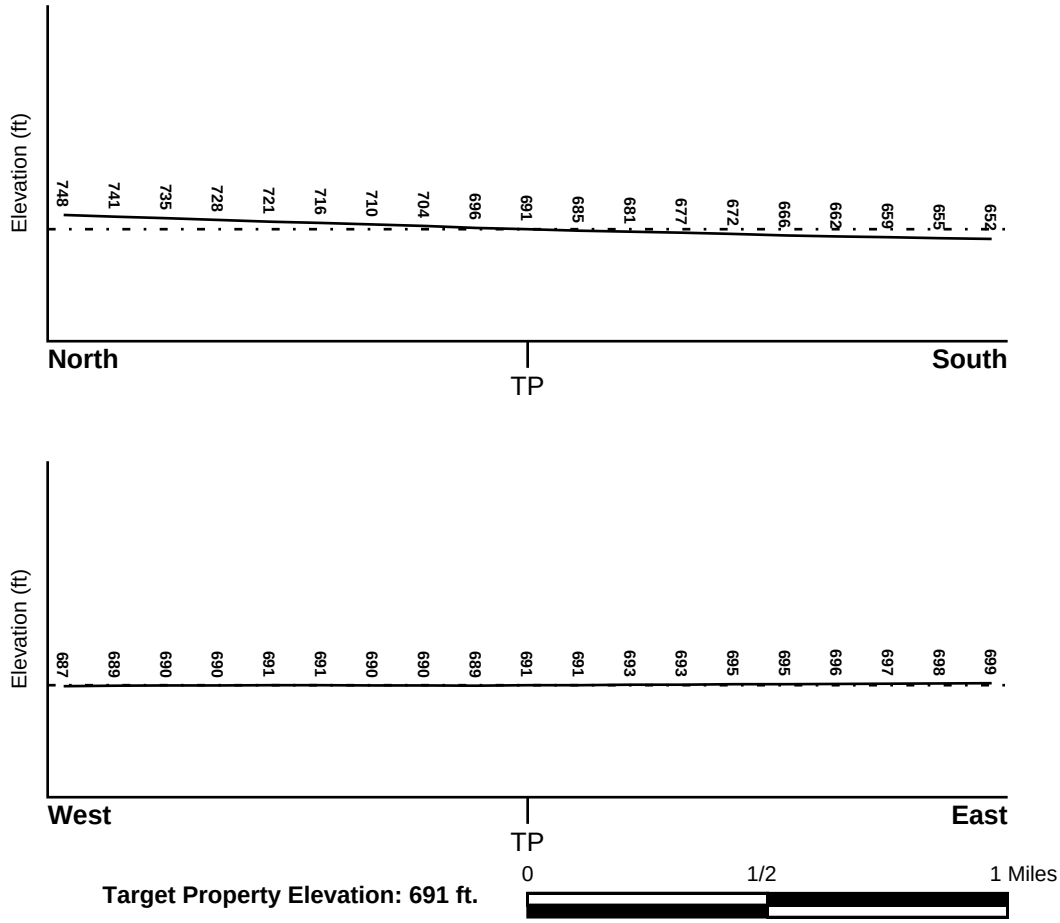


**Target Property Elevation: 691 ft.**

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**HYDROLOGIC INFORMATION**

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

**FEMA FLOOD ZONE**

| Flood Plain Panel at Target Property | FEMA Source Type |
|---|---|
| 06071C9335H | FEMA FIRM Flood data |

| Additional Panels in search area: | FEMA Source Type |
|---|---|
| 06037C1750F | FEMA FIRM Flood data |
| 06071C8620H | FEMA FIRM Flood data |
| 06071C8638H | FEMA FIRM Flood data |
| 06071C9375H | FEMA FIRM Flood data |

**NATIONAL WETLAND INVENTORY**

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| PRADO DAM | YES - refer to the Overview Map and Detail Map |

**HYDROGEOLOGIC INFORMATION**

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

***Site-Specific Hydrogeological Data*:***

| | |
|---|---|
| Search Radius: | 1.25 miles |
| Status: | Not found |

**AQUIFLOW®**

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

**GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

| | |
|---|---|
| Era: | Cenozoic |
| System: | Quaternary |
| Series: | Quaternary |
| Code: | Q *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 7910061.1s

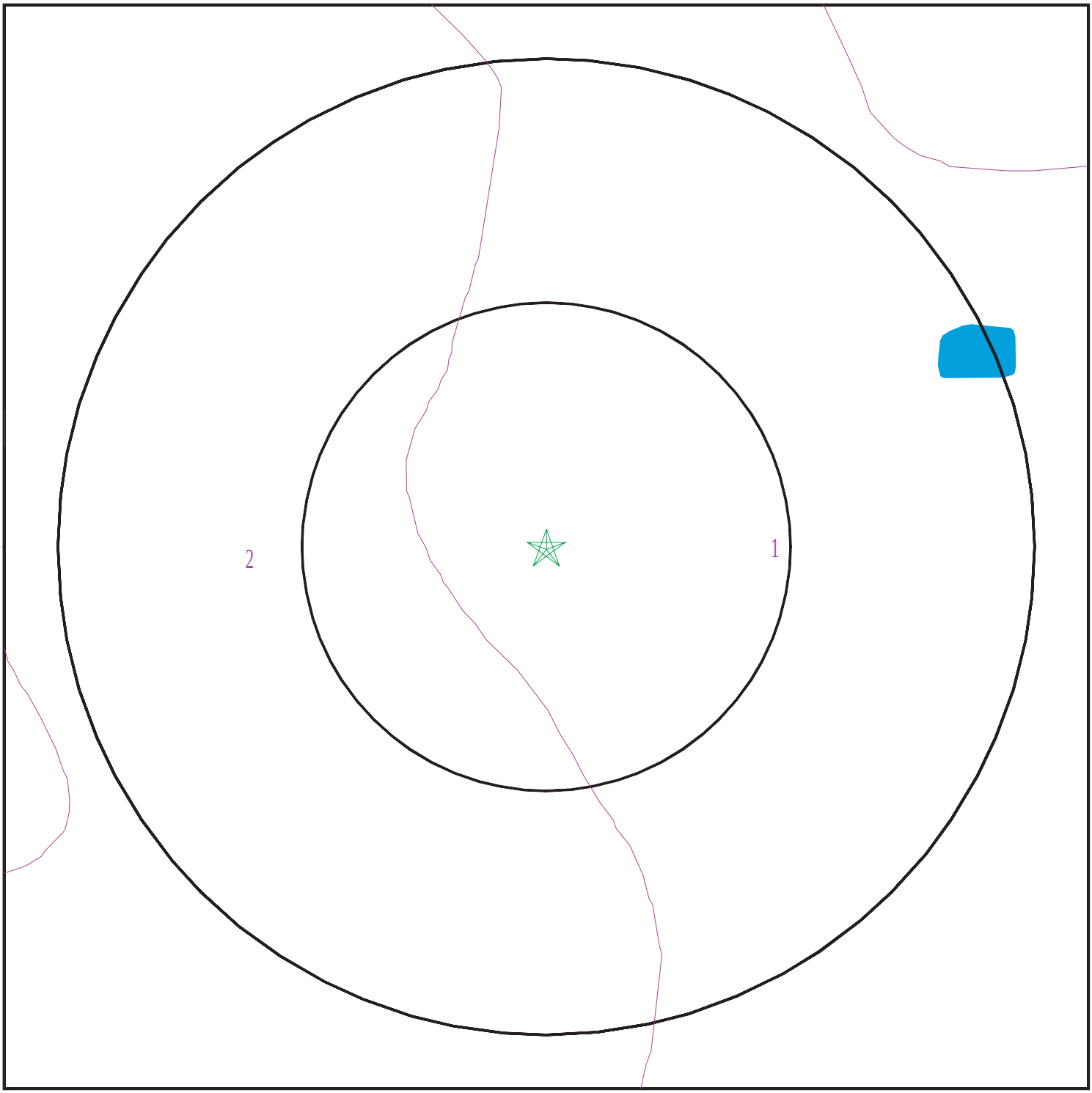


Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

| | | | |
|---|---|---|---|
| SITE NAME: | Ontario Ranch II | CLIENT: | Roux Associates |
| ADDRESS: | 8061 Edison Avenue<br>Ontario CA 91762 | CONTACT: | Ashley Whitaker |
| | | INQUIRY #: | 7910061.1s |
| LAT/LONG: | 33.996599 / 117.63136 | DATE: | February 27, 2025 2:36 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY**

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

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**Soil Map ID: 1**

Soil Component Name: TUJUNGA

Soil Surface Texture: gravelly loamy sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 18 inches | gravelly loamy sand | Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand. | COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 141<br>Min: 42 | Max: 7.8<br>Min: 6.1 |
| 2 | 18 inches | 59 inches | loamy sand | Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand. | COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 141<br>Min: 42 | Max: 7.8<br>Min: 6.1 |

**Soil Map ID: 2**

Soil Component Name: HILMAR

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 22 inches | loamy fine sand | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt. | Max: 1.4 Min: 0.42 | Max: 8.4 Min: 7.9 |
| 2 | 22 inches | 59 inches | stratified loamy sand to loam | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt. | Max: 1.4 Min: 0.42 | Max: 8.4 Min: 7.9 |

**LOCAL / REGIONAL WATER AGENCY RECORDS**

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## WELL SEARCH DISTANCE INFORMATION

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | Nearest PWS within 1 mile |
| State Database | 1.000 |

## FEDERAL USGS WELL INFORMATION

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

## FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No PWS System Found | | |

Note: PWS System location is not always the same as well location.

## STATE DATABASE WELL INFORMATION

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| 1 | CADWR0000031378 | 1/4 - 1/2 Mile SSE |
| A2 | CADWR0000009816 | 1/4 - 1/2 Mile West |
| A3 | CADWR0000004960 | 1/4 - 1/2 Mile West |
| 4 | CADDW2000005418 | 1/4 - 1/2 Mile NW |
| B5 | CADWR0000011113 | 1/2 - 1 Mile NW |
| B6 | CADWR0000009886 | 1/2 - 1 Mile NW |
| 7 | CADWR9000006371 | 1/2 - 1 Mile NW |
| 8 | CADWR0000020619 | 1/2 - 1 Mile North |
| 9 | CADWR0000007518 | 1/2 - 1 Mile ENE |
| 10 | CAEDF0000129348 | 1/2 - 1 Mile SSW |

# PHYSICAL SETTING SOURCE MAP - 7910061.1s

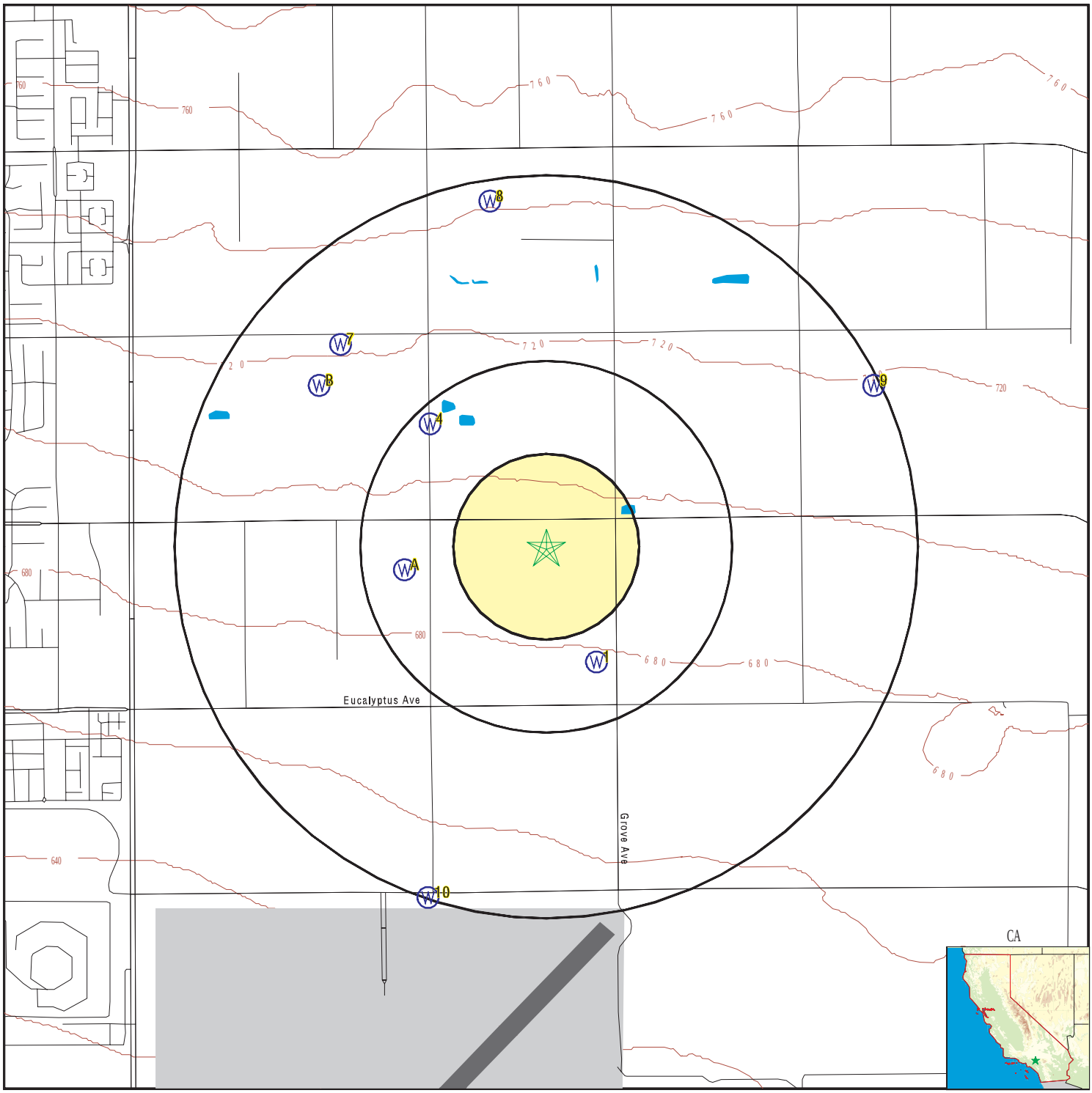


County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Airports
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location
HD Closest Hydrogeological Data
Oil, gas or related wells

N

| | | | |
|---|---|---|---|
| SITE NAME: | Ontario Ranch II | CLIENT: | Roux Associates |
| ADDRESS: | 8061 Edison Avenue<br>Ontario CA 91762 | CONTACT: | Ashley Whitaker |
| | | INQUIRY #: | 7910061.1s |
| LAT/LONG: | 33.996599 / 117.63136 | DATE: | February 27, 2025 2:36 pm |

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| Map ID<br>Direction<br>Distance<br>Elevation | Database | EDR ID Number |
|---|---|---|
| **1**<br>**SSE**<br>**1/4 - 1/2 Mile**<br>**Lower** | **CA WELLS** | **CADWR0000031378** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17R001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17R001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17R001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **A2**<br>**West**<br>**1/4 - 1/2 Mile**<br>**Lower** | **CA WELLS** | **CADWR0000009816** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17L001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17L001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17L001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **A3**<br>**West**<br>**1/4 - 1/2 Mile**<br>**Lower** | **CA WELLS** | **CADWR0000004960** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17L002S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17L002S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17L002S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **4**<br>**NW**<br>**1/4 - 1/2 Mile**<br>**Higher** | **CA WELLS** | **CADDW2000005418** |

**GAMA:**

| | | | |
|---|---|---|---|
| Well ID: | CA3610012_019_019 | Well Type: | MUNICIPAL |
| Source: | DDW | Other Names: | 3610012-019 |
| GAMA Pfas testing: | Not Reported | | |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=CA3610012_019_019&store_num= | | |
| GeoTracker Data: | Not Reported | | |

| Map ID<br>Direction<br>Distance<br>Elevation | Database | EDR ID Number |
|---|---|---|
| **B5**<br>**NW**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR0000011113** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17D001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17D001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17D001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **B6**<br>**NW**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR0000009886** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17D002S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17D002S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17D002S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **7**<br>**NW**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR9000006371** |

| | | | |
|---|---|---|---|
| State Well #: | Not Reported | Station ID: | 48086 |
| Well Name: | CHINO-1208672 | Basin Name: | Chino |
| Well Use: | Observation | Well Type: | Single Well |
| Well Depth: | 565 | Well Completion Rpt #: | e042290 |

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| | | |
|---|---|---|
| **8**<br>**North**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR0000020619** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W08K001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W08K001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W08K001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

| Map ID<br>Direction<br>Distance<br>Elevation | Database | EDR ID Number |
|---|---|---|
| **9**<br>**ENE**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR0000007518** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W16B001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W16B001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W16B001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **10**<br>**SSW**<br>**1/2 - 1 Mile**<br>**Lower** | **CA WELLS** | **CAEDF0000129348** |

| | | | |
|---|---|---|---|
| Well ID: | SL208634049-CAMW2 | Well Type: | MONITORING |
| Source: | EDF | Other Name: | CAMW2 |
| GAMA PFAS Testing: | Not Reported | | |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=SL208634049&assigned_name=CAMW2&store_num= | | |
| GeoTracker Data: | https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=SL208634049&assigned_name=CAMW2 | | |

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

State Database: CA Radon

Radon Test Results

| Zipcode | Num Tests | > 4 pCi/L |
|---|---|---|
| 91762 | 19 | 0 |

Federal EPA Radon Zone for SAN BERNARDINO County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

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Federal Area Radon Information for Zip Code: 91762

Number of sites tested: 1

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 0.300 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | Not Reported | Not Reported | Not Reported | Not Reported |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

## HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

## HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

## OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

Geothermal Wells Listing
Department of Conservation
Telephone: 916-445-9686
Geothermal well means a well constructed to extract or return water to the ground after it has been used for heating or cooling purposes. Geothermal wells in California (except for wells on federal leases which are administered by the Bureau of Land Management) are permitted, drilled, operated, and permanently sealed and closed (plugged and abandoned) under requirements and procedures administered by the Geothermal Section of the Department of Conservations Geologic Energy Management Division (CalGEM, formerly DOGGR).

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

**STREET AND ADDRESS INFORMATION**

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# APPENDIX G

Resumes

ROUX

# PROFESSIONAL PROFILE

## Mauricio H. Escobar, PG

### Vice President | Principal Geologist


**CONTACT INFORMATION**

Main: (310) 879-4900
Direct: (310) 879-4920
Email: mescobar@rouxinc.com
Website: www.rouxinc.com

5150 East Pacific Coast Highway
Suite 450
Long Beach, CA 90804


**EDUCATION**

Bachelor of Arts, Earth Science, 1995, University of California, Berkeley

OSHA 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Certified

Research Assistant to UC Berkeley Ph.D. Candidate Dawnika L. Blatter and Professor Ian S. E. Carmichael in Study of Continental Crustal Deformation from Subduction of the Cocos Plate in Western Mexico and Study of Upper Mantle Petrology in Central Mexico, January to April 1996

**PROFESSIONAL LICENSES**

Professional Geologist, State of California, No. 07506

**EXPERIENCE SUMMARY**

21 years of consulting experience: Principal Geologist with Roux Associates (2011 to Present); Senior Manager, Manager, and Senior Associate with ENVIRON International Corporation (2004 to 2011); Project Geologist with URS Corporation (2001 to 2004); Geologist with Hart Crowser (1998 to 2001).

**TECHNICAL SPECIALTIES**

Professional Geologist with over twenty years of experience designing, managing, and implementing environmental soil and groundwater investigations and remediation strategies for public and private clients. Experience as in-house consultant assisting with management of a $25MM yearly remediation portfolio for a Fortune 100 Company. Practice developing and implementing high-level strategies that consider legal and regulatory issues, communications and government relations, as well as technical challenges and costs. Significant assignments representing clients during Working Group meetings for Superfund sites and participation in technical committee meetings. Expertise in design and field implementation of in-situ chemical oxidation (ISCO) in hard rock and porous media-flow aquifers.

Substantial experience evaluating and remediating industrial, commercial and residential sites impacted with numerous contaminants in multiple media, including crude oil, fuels, volatile organic compounds, chromium VI, 1,4-dioxane, and PCBs. Extensive experience managing implementation of remediation programs that utilize and consider multiple technologies including soil vapor extraction, dual phase extraction, traditional pump and treat, in-well stripping, air sparging, chemical oxidation and reduction, thermal treatment, and natural attenuation. Experience managing large-scale remedial excavations involving the use of heavy earth moving equipment. Significant field experience using numerous drilling, soil sampling, groundwater sampling, and soil vapor sampling techniques.

**CONTINUING EDUCATION**

- Compounds of Emerging Concern in Groundwater, California Groundwater Resources Association, Concord, California, February 2012
- The Remediation Course, Princeton Groundwater, Las Vegas, Nevada, April 2010
- Vapor Intrusion Pathway: A Practical Guideline, Interstate Technology and Regulatory Council (ITRC) in conjunction with the California Department of Toxic Substances (DTSC) and California Water Boards, Long Beach, California, June 2009
- The Groundwater Pollution and Hydrology Course, Princeton Groundwater, Orlando, Florida, February 2007
- Hydrogeologic Analysis of Fractured Bedrock Systems, Midwest GeoSciences Group, University of Nevada Las Vegas and Nevada Test Site at Yucca Mountain, March 2006

**REPRESENTATIVE PROJECTS**

- **PRP Representation of Fortune 100 Company, Omega Chemical Superfund Site, Whittier, California.** Provide ongoing technical consulting to a Fortune 100 Company and major PRP at the Omega Chemical Superfund Site in Whittier, California. Active participant of the Omega PRP Group (OPOG) Technical Committee. Attend all pertinent technical meetings and provide Client with technical and strategic input that protects their best interests. Maintain constant interaction with the legal and finance teams as necessary to ensure the technical and legal strategies are in agreement and that adequate funding is reserved well in advance of regulatory commitments and OPOG cash calls. Pertinent technical issues include soil gas and vapor intrusion, and a regional groundwater plume. Regulatory oversight is provided by USEPA Region IX.

- **PRP Representation of Fortune 100 Company, BKK Corporation Class I Landfill Organized Group, West Covina, California.** Provide ongoing technical consulting to a Fortune 100 Company at the former BKK Corporation Class I Landfill site in West Covina, California. Participant in the BKK Technical Committee and attendant of pertinent technical meetings. Maintain constant communication with the Client's legal and finance teams and responsible for informing Client on the direction the Organized Group is headed. Responsible for identifying financial commitments made as part of technical decisions. Trusted with voicing opinions, concerns, and/or offering direction to the Group (if and when necessary), to ensure the Organized Group's direction is consistent with the Client's strategy. Pertinent technical issues include upgrades to the landfill infrastructure and groundwater remedial investigations in and around the landfill prism. Regulatory oversight is provided by the Department of Toxic Substances Control.
- **Portfolio Project Control - Fortune 100 Company, Torrance, California.** Three years of experience working as a full-time in-house consultant for a Fortune 100 Company assisting with management of all aspects of a complex multi-site portfolio. General role included communication with alliance partners, vendors, corporate finance, attorneys, public relations/communications, and procurement to track and facilitate progress of 9 major projects ($400,000 to $1 MM/year) and 3 mega projects ($3MM to $10MM+/year) that were unique in nature and complexity. Portfolio included former chemical sites, landfills, aerospace facilities, and other heavy use industrial facilities that were undergoing State and RCRA closure, as well as sites under CERCLA Superfund actions with PRP commitments. Charged with helping to develop, evaluate, and refine remedial strategies and lifecycle costs for sites that utilized various cleanup technologies such as application of oxidants and reducing agents, thermal oxidation, groundwater pump and treat, dual-phase and 2-PHASE™ extraction, soil vapor extraction, air sparging, and in-well air stripping. Major role included verifying adequate funding and maintaining documentation consistent with Sarbanes Oxley.
- **Strategy Expert Consulting - Fortune 100 Company, Los Angeles, California.** Ongoing third-party technical and strategic support to a Fortune 100 company for a major project involving former bulk storage and distribution facilities converted to open public space and residential uses. Site is undergoing remedial investigations and remedial alternatives evaluations under heavy regulatory and public scrutiny. Charged with providing opinions and recommendations as to the direction the current consultant and the regulatory agencies want to take the project and evaluating the conceptual site model and long term technical strategy. Active participant on technical team calls and ongoing direct communications with internal legal team.
- **Shipyard Decommissioning - Subsurface Assessment, Remedial Investigation, Demolition and Closure, Campbell Shipyard - Marco, Port of San Diego, California.** Lead geologist in the preparation of a comprehensive subsurface study of the former Campbell Shipyard property at the Port of San Diego, California. Over 200 borings were necessary to delineate the extent of impacted soils. Relevant environmental issues included a former coal works gasification plant immediately adjacent to the Site, a 2 to 4-foot thick lens of polynuclear aromatic hydrocarbon (PAH) laden sediment present throughout the Site below the water table, a former on-site diesel and kerosene tank farm, and numerous leaking fuel USTs. Responsibilities also included management of shipyard abandonment activities, such as abatement of asbestos and lead-based paint containing materials, demolition of on-site structures, crushing of asphalt and concrete into Class II base, and a comprehensive geophysical survey to locate all on-site utilities and buried structures. The work was performed under the regulatory oversight of the San Diego Regional Water Quality Control Board and the San Diego Unified Port District. Total cost of the work was approximately $1.3MM, implemented over a 15-month period.
- **Neutral Third-Party Oversight of Remediation Work, ITT Corporation and Home Depot, Glendale, California.** Provided third party oversight for a site undergoing major remediation of VOCs and chromium VI in soils and groundwater. The site was a former electronics manufacturing facility redeveloped as a major box retailer in Glendale, California. Services were provided on behalf of the former facility owners/operators and the current property owners, both of whom had differing interests and views on the remedial work being performed. Viewed all fieldwork and construction of remediation systems and attended quarterly meetings with consultants, attorneys, and clients to gauge progress, discuss ongoing work, and evaluate projected schedules for completion of remediation. Technical challenges to remediation included dewatering of 20-foot thick perched zone impacted with VOC contamination, despite a leaking slurry wall originally designed to prevent onsite migration from upgradient sources.
- **ISCO Demonstration Plan Using Permanganate, Wyle Laboratories, Riverside County, California.** Designed, managed, and implemented an ISCO Demonstration Plan using sodium permanganate injection at a former industrial manufacturing facility in Southern California. Main goals of the application were to demonstrate effective oxidation of trichloroethene (TCE) in alluvium and fractured granitic bedrock, evaluate potential mobilization of naturally occurring reduced metals, and evaluate the potential application of ISCO

at other areas of the Site, including off-site beneath residential homes. Twelve thousand gallons of 10% permanganate solution were delivered to the subsurface through 47 multi-depth permanent injection probes over a 22-day field event. TCE concentrations were reduced from a maximum of 30,000 microgram per liter (µg/L) to non-detect at the source area. Significantly, elevated hexavalent chromium [Cr(VI)] concentrations were observed in the area of injection and immediately downgradient. Following field observations, a Bench Scale Assessment (BSA) was conducted to evaluate potential significant sources of Cr(VI), evaluate the capacity of the aquifer to naturally attenuate Cr(VI), and provide data sufficient to estimate distance and time Cr(VI) would revert to its trivalent form. BSA and field data showed that principal source of Cr(VI) was from the raw product, with secondary contribution from chromium in the native rock, and deterioration of stainless steel well screens. Natural attenuation of Cr(VI) to background concentrations was estimated at 2 to 3 years post injection. Monitoring of the Demonstration Plan area for the 2+ years has proved those predictions accurate and a Remedial Action Plan (RAP) recommending full-scale on- and off-site treatment of TCE with permanganate was submitted to the California Department of Toxic Substances Control (DTSC). Total cost of the work was more than $1.0 million.

- **Remedial Excavation and ISCO Used to Facilitate Property Transfer, Sanmina, Inc., Irvine, California.** Managed and implemented an aggressive remedial strategy for a former electronics manufacturing facility in Southern California. The site had TCE concentrations in groundwater suggestive of dense non-aqueous phase liquid (DNAPL) and required expedited soil and groundwater remediation, in lieu of ongoing 2-PHASE™ and dual-phase extraction (DPE) efforts, to accommodate its divesture and redevelopment. Groundwater was generally encountered at 15 feet below ground surface (bgs) and contained TCE concentrations in the source area as high as 77,000 µg/L. The project was successfully completed by installing a 90-well dewatering system, excavating 13,000 cubic yards (cy) of soils, and removing 3,200 cy of TCE impacted soil along the axis of a residual TCE DNAPL mass; total depth of the excavation was 32 feet bgs. ISCO using sodium and potassium permanganate was used to remediate residual TCE-impacted soil and groundwater outside the area of excavation. Following implementation of the aggressive remedial strategy, TCE concentrations in groundwater were reduced by one to three orders of magnitude, suggesting the DNAPL had been removed and/or destroyed. The Orange County Health Care Agency (OCHCA) provided soils closure and the Santa Ana Regional Water Quality Control Board provided groundwater closure for the site 16 months after completion of remediation. The site was sold and redeveloped. Total cost of excavation and ISCO application was approximately $1.4 million.

- **Assessment, Remediation and Closure of Former Industrial Facility for Residential Re-development, Former Boeing Plant, Los Angeles, California.** Managed the assessment, remediation, and closure of a former asphalt batch plant and defense contractor facility on behalf of a residential developer. The work was performed simultaneously with planning and entitlement of the property, under the oversight of the County of Los Angeles Fire Department, Hazardous Materials Division. Unique challenges included the discovery of 15+ feet of buried asphalt debris and soils with elevated arsenic and chromium concentrations requiring off-site disposal. Developed site-specific cleanup thresholds for VOCs and heavy metals by preparing a limited human health risk assessment and incorporating Risk Based Screening Levels (RBSLs) developed by the San Francisco Regional Water Quality Control Board. The entire project was implemented in 15 months from initial assessment to site closure at a cost of $250,000.

- **Hydrocarbon Release Characterization and Remedial Investigation, Kinder Morgan Energy Partners, La Habra, California.** Designed, managed, and implemented a subsurface investigation with the primary focus of characterizing lateral and vertical distribution of hydrocarbon impacts to the groundwater and unsaturated zone. The release was related to a pipeline booster station flange rupture dating to the early 1980s. Fractured siltstone bedrock presented unique subsurface conditions and as a result, special consideration was given to drilling techniques and boring/well installations. The project involved 12 months of fieldwork for the installation of soil vapor probes, backhoe trenches, soil borings, and monitoring wells. Discovery of up to 15-feet of light non-aqueous phase liquids (LNAPL) resulted in amendments to the original work scope to provide for LNAPL removal and assessment of pneumatic and hydraulic properties of the soil/rock. A high vacuum DPE test was performed at selected wells to evaluate the feasibility of this technology for the removal of hydrocarbons. All work was conducted under the oversight of the Los Angeles Regional Water Quality Control Board in consideration of future residential development. Work was performed over a 2-year period at an approximate cost of $1.0 million.

- **Resource Conservation and Recovery Act (RCRA) Facility Investigation Work Plan for Bunker C Tank Farm Redevelopment, Long Beach, California.** Managed the preparation of a RCRA Facility Investigation Work Plan for a former power plant tank farm facility in Long Beach, California. The site was being planned for redevelopment with a retail box store and restaurant uses. The RFI Work Plan was prepared as part of a Corrective Action Consent Agreement between the

Client and the DTSC. The purpose of the RFI was to determine the nature and extent of releases at the site and to gather all the necessary data to support completion and implementation of a Corrective Measures Study (CMS).

- **Remedial Investigation of Former Transformer Washing Facility, General Electric and City of Los Angeles Redevelopment Agency, Los Angeles, California.** Prepared, managed, and implemented a Remedial Investigation Work Plan for a former transformer washing facility under the oversight of the DTSC. The field investigation was intended to evaluate and delineate the nature and extent of residual VOC, PCB, and dioxin impacts at the Site, to support decisions regarding the need for, and extent of, future removal or remedial actions. The field program showed that shallow soils at the site were significantly impacted with PCBs and deep soils and groundwater were significantly impacted with TCE and tetrachloroethene (PCE). ISCO Demonstration Plan Using Permanganate, Riverside County, California.
- **Remedial Investigation and Remedial Action Plan for Former Small Arms Firing Range, City of Huntington Beach Community Development Office, Huntington Beach, California.** Managed the preparation of a Remedial Investigation and RAP for the City of Huntington Beach in their effort to assess the extent of contamination and remedial options for a former public and police firing range. The project was performed under the oversight of the OCHCA. Relevant issues included soil berms and coal-tar treated wood posts impregnated with lead-shot, shallow landfill conditions (<5-feet), lack of a landfill cap, heavy hydrocarbon contamination, and landfill gas issues. The RAP included remedial options, costing, and an outline for implementation. Special consideration was given to the fact that the City intended to use the property for future Central Park recreational uses. The project was awarded on technical merit following a public bidding process that required the submittal of a formal proposal and interviews with City officials. Total cost of the project was $150,000, implemented over a 2-year period.

**PRESENTATIONS***

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*Assessment of Microbial Community Composition Throughout In Situ Chemical Oxidation of Trichloroethylene with Permanganate*, Bram Sercu and Patricia Holden, UCSB, Santa Barbara, CA; Antony D. G. Jones and Carol L. Serlin, ENVIRON, Irvine, CA; Mauricio H. Escobar, ENVIRON, Los Angeles, CA. The 19th Annual AEHS Meeting and West Coast Conference on Soils, Sediments, & Water, San Diego, California, March 2009

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# APPENDIX H

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# APPENDIX F

## CEQA GUIDELINES SECTION 15183 CONSISTENCY ANALYSIS

# CENTERPARK SPECIFIC PLAN PROJECT

## CEQA GUIDELINES SECTION 15183 ANALYSIS (PSP24-002)


| | |
|---|---|
| **Lead Agency** | **City of Ontario**<br>Rafael Torres<br>Assistant Planner<br>303 East B Street<br>Ontario, CA 91764<br>(909) 395-2979<br>rtorres@ontarioca.gov |
| **Project Applicant** | **Ontario Ranch Venture, LLC**<br>(Ontario Ranch I & II)<br>C/O Sares Regis Group<br>3501 Jamboree Road, Suite 3000<br>Newport Beach, CA 92660<br>C/O RCCD Inc. Attn: Jason Lee<br>8101 E. Kaiser Blvd., Suite 140<br>Anaheim Hills, CA 92808 |
| **CEQA Consultant** | **Kimley-Horn and Associates, Inc.**<br>3801 University Ave, Suite 300<br>Riverside, California 92501 |



| | |
|---|---|
| **Date** | **December 2025** |

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# 1. INTRODUCTION

Ontario Ranch Venture, LLC the applicant, is proposing a residential and mixed-use retail/office development on 29 parcels covering approximately 257.34 acres in the City of Ontario (City), San Bernardino County (County), California. For parcels within the Project site not owned by Ontario Ranch Venture, LLC, described in more detail below, the City will serve as the applicant. The development would include up to 250,919 square feet of commercial retail/office uses, up to 4,293 residential units across low, low-medium, and mixed-use residential uses, 67.26 acres of open space parkland/non-recreation uses and associated on-site and off-site infrastructure improvements. The Project site is currently occupied by agricultural uses, including the raising of livestock and dairy farming activities and the majority of the site exists as fallow or cultivated fields. According to the City of Ontario's guiding framework, The Ontario Plan (TOP), the Project site is currently designated as Mixed-Use, Medium Density Residential, and Open Space.

This report provides an analysis of the CenterPark Specific Plan Project (Project), with respect to the Project's consistency with The Ontario Plan 2050 Supplemental Environmental Impact Report (TOP 2050 Supplemental EIR) and the site-specific environmental impacts or cumulative impacts that may result from the Project implementation.

# 2. PROJECT SUMMARY

## 2.1 Project Location

The Project site is in the southwestern portion of the City, immediately east of the City of Chino in the County. The Project site is bounded to the north by a Southern California Edison (SCE) easement located approximately 330 feet north of Edison Avenue, Eucalyptus Avenue to the south, Campus Avenue to the west, Walker Avenue to the east, and bisected by Edison Avenue. Regional access to the Project site is provided by Euclid Avenue approximately 0.8 miles west, which connects to State Route 60 (SR-60) and Interstate 10 (I-10) to the north. Interstate 15 (I-15) is approximately 4.0 miles to the east and State Route 71 (SR-71) is approximately 3.5 miles to the southwest. SR-71 connects the Project to State Route 91 (SR-91) in Riverside County. See **Figure 3-1: Regional Location Map**, **Figure 3-2: Local Vicinity Map** and **Figure 3-3: Project Boundary**. The Project Assessor Parcel Numbers (APNs) for the site are 1053-301-01, -02; 1053-311-01, -02; 1053-321-01, -02, -03; 1053 331 01, 02, -03, -04; 1053-341-01, -02; 1053-351-01, -02; 1053-361-01, -02, -03; 1053-371-01, -02; 0216-311-01, -02, -09; 0216-321-03, -08; 0216-322-03, -04, -10 and depicted in **Figure 3-4: Project Assessor Parcel Numbers**.

The approximately 257.34-acre Project site currently comprises existing agricultural uses, including the raising of livestock, field crop farming, dairy farming activities, and rural residences scattered throughout the area. Additionally, the Project site consists of a relatively flat land elevation, as Project site elevations range from approximately 700 feet above mean sea level (amsl) in the northeast portion of the site to approximately 680 feet above amsl in the southwest portion of the site.

The existing uses in the vicinity of the Project site include:

- North of Edison Avenue: Nursery/Field Crops, Dairy Operations and Rural Residential
- South toward Eucalyptus Avenue: Dairy Operations and Rural Residential
- East of Campus Avenue: Field Crops, Dairy Operations and Rural Residential
- West of Walker Avenue: Field Crops, Dairy Operations and Rural Residential

## 2.2 Existing Site Conditions, Land Use, and Zoning

The approximately 257.34-acre Project site currently comprises existing agricultural uses, including the raising of livestock, field crop farming, dairy farming activities, and rural residences scattered throughout the area. Rural residential housing, farm buildings and other ancillary facilities occupy those areas not in active agricultural production. The natural vegetation and soil conditions that once occurred throughout the Project area have been significantly altered through agricultural uses, leaving little or no native vegetation.

There are several dairy farm related buildings and structures within the Project site that are considered potential historic resources by the City of Ontario. Dairy farm related buildings and structures over 45 years or older have been identified, documented, and evaluated for national, state, and local historical significance as part of the environmental review for the Project.

Properties with buildings and/or structures that have been surveyed and determined to meet local and state designation criteria, will be considered for adaptive reuse, relocation or other mitigation measures

as required by the City of Ontario Historic Preservation Commission; refer to **Section 4.5** for more information.

Existing uses surrounding the Project site are similar to those on the site, consisting of ongoing crop farming, dairy operations, a nursery, and rural residences. See **Figure 3-5: Surrounding Land Uses**.

The existing land use designations for the Project site are consistent with TOP 2050's existing land designations; see **Figure 3-6: Existing Land Use and Zoning**. The City's TOP 2050 and zoning maps designate the Project site for Medium-Density and Mixed-Use Residential, Mixed-Use Retail and Office, Open Space Recreation (Parkland), and Open Space Non-Recreation development.

## 2.3 Proposed Project

*"Project" as defined by the State CEQA Guidelines, means:*

> *"…the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and that is any of the following: (1)…enactment and amendment of zoning ordinances, and the adoption and amendment of local General Plans or elements thereof pursuant to Government Code Section 65100-65700. (State CEQA Guidelines Section 15378[a]))."*

### 2.3.1 Description of the Project

The Project consists of a Specific Plan to allow for a residential and mixed-used retail/office development on 29 parcels covering approximately 257.34 acres in the City. The development would include up to 250,919 square feet of commercial retail/office uses, up to 4,293 residential units across low, low-medium, and mixed-use residential uses, 67.26 acres of open space parkland/non-recreation uses, and associated on-site and off-site infrastructure improvements, as described further below. The Project site is comprised of two "Ownership Areas" (representing different ownership conditions) with 22 planning areas. Refer to **Table 1: Project Buildout by Ownership Area**.

Ownership Area 1 of the Project includes Planning Areas (PAs) 5 and 7 through 18, which would allow for the development of up to 3,095 residential dwelling units and 55.98 acres of parkland use. This consistency analysis conservatively evaluates the maximum development potential for Ownership Areas 1 and 2 as permitted in the proposed Specific Plan. Note that the applicant intends to process a Development Plan and Tentative Parcel Map for Ownership Area 1 following processing of the CenterPark Specific Plan.

This CEQA Guidelines Section 15183 Consistency Analysis also evaluates, at a "programmatic" level, potential future development of Ownership Area 2, comprised of PAs 1 through 4, 6, and 19 through 22; refer to **Figure 3-7: Project Area Ownership**. The Project Applicant for Ownership Area 1 does not own the parcels within Ownership Area 2 (PAs 1 through 4, 6, and 19 through 22) and does not have access to Ownership Area 2 at this time. Therefore, Ownership Area 2 is being evaluated at the programmatic level, consistent with CEQA Guidelines Section 15168 (Program EIR). Planning areas within Ownership Area 2 do not have specific development proposals at this time and therefore, these planning areas would be developed at an unknown, later date following Ownership Area 1. Combined, the Ownership Areas 1 and 2 of the Project would allow up to 250,919 square feet of retail/office mixed uses in addition to up to

4,293 residential units, and 67.26 acres of open space parkland and non-recreational uses, as shown in **Table 2: Maximum Project Buildout**, below.

However, for construction modeling and phasing purposes, the planning areas would begin construction preparations at different stages. Construction Phase 1, comprising PAs 6, 12, 13, 17, 18, and 22, would develop 256 single-family DUs, 768 multi-family DUs, 19.64 acres of recreational open space, and 3.38 acres of non-recreational open space. Additionally, Construction Phase 2, comprising Planning Areas 1 through 5, 7 through 11, 14 through 16, and 19 through 21, would develop 546 single-family DUs, 2,723 multi-family DUs, 250,920 SF of commercial space, 36.34 acres of recreational open space, and 7.9 acres of non-recreational open space.

### 2.3.2 Land Use Plan

The Project consists of 22 planning areas accommodating a variety of land use including residential, commercial/mixed-use, retail, office, parks and open space, and community facility components, and other similar uses that are compatible with the Project site's location and surrounding existing and proposed land uses. The CenterPark Specific Plan Land Use Plan implements the vision of TOP 2050 by providing a designed natural open space framework, interacting with mixed retail and office centers which anchor traditional residential neighborhoods. The Land Use Plan identifies the location of the land use designations for the Project site. The Project zoning mirrors TOP 2050 land use designations and is identified along the 22 planning areas (see **Figure 3-8: Land Use Plan**).

**Table 1: Project Buildout by Ownership Area**

| Planning Area | Land Use | TOP 2050 Acreage | Maximum Density Per TOP 2050 EIR | Maximum Units | Maximum Retail | Maximum Office |
|---|---|---|---|---|---|---|
| **Ownership Area 1** | | | | | | |
| 5 | MIXED-USE RESIDENTIAL | 5.19 AC | 35.0 DU/AC | 182 DU | | |
| 5 | MIXED-USE RETAIL | 1.48 AC | | | 19,367 SF | |
| 5 | MIXED-USE OFFICE | 0.74 AC | | | | 22,595 SF |
| 7 | MDR (11.1 - 25.0 DU/AC) | 23.67 AC | 22.0 DU/AC | 521 DU | | |
| 8 | MDR (11.1 - 25.0 DU/AC) | 24.20 AC | 22.0 DU/AC | 532 DU | | |
| 9 | MDR (11.1 - 25.0 DU/AC) | 12.18 AC | 22.0 DU/AC | 268 DU | | |
| 10 | MIXED-USE RESIDENTIAL | 9.87 AC | 35.0 DU/AC | 345 DU | | |
| 10 | MIXED-USE RETAIL | 2.82 AC | | | 36,852 SF | |
| 10 | MIXED-USE OFFICE | 1.41 AC | | | | 42,994 SF |
| 11 | MIXED-USE RESIDENTIAL | 10.97 AC | 35.0 DU/AC | 384 DU | | |
| 11 | MIXED-USE RETAIL | 3.13 AC | | | 40,955 SF | |
| 11 | MIXED-USE OFFICE | 1.57 AC | | | | 47,781 SF |
| 12 | MDR (11.1 - 25.0 DU/AC) | 15.46 AC | 22.0 DU/AC | 340 DU | | |
| 13 | MDR (11.1 - 25.0 DU/AC) | 23.75 AC | 22.0 DU/AC | 523 DU | | |
| 14 | OS-R (PARKLAND) | 13.33 AC | | | | |
| 15 | OS-R (PARKLAND) | 13.11 AC | | | | |
| 16 | OS-R (PARKLAND) | 9.90 AC | | | | |
| 17 | OS-R (PARKLAND) | 6.20 AC | | | | |
| 18 | OS-R (PARKLAND) | 13.44 AC | | | | |
| **Ownership Area 1 Total** | | **192.42 AC** | **19.5 DU/AC** | **3,095 DU** | **97,174 SF** | **113,370 SF** |
| **Ownership Area 2 Future Development Areas** | | | | | | |
| 1 | MDR (11.1 - 25.0 DU/AC) | 15.91 AC | 22.0 DU/AC | 350 DU | | |
| 2 | MDR (11.1 - 25.0 DU/AC) | 15.57 AC | 22.0 DU/AC | 343 DU | | |
| 3 | MDR (11.1 - 25.0 DU/AC) | 7.70 AC | 22.0 DU/AC | 169 DU | | |
| 4 | MIXED-USE RESIDENTIAL | 4.99 AC | 35.0 DU/AC | 175 DU | | |
| 4 | MIXED-USE RETAIL | 1.43 AC | | | 18,635 SF | |
| 4 | MIXED-USE OFFICE | 0.71 AC | | | | 21,741 SF |
| 6 | MDR (11.1 - 25.0 DU/AC) | 7.33 AC | 22.0 DU/AC | 161 DU | | |
| 19 | OS-NR (NON-RECREATION) | 2.26 AC | | | | |
| 20 | OS-NR (NON-RECREATION) | 2.68 AC | | | | |
| 21 | OS-NR (NON-RECREATION) | 2.96 AC | | | | |
| 22 | OS-NR (NON-RECREATION) | 3.38 AC | | | | |
| **Ownership Area 2 Total** | | **64.92 AC** | **15.6 DU/AC** | **1,198 DU** | **18,635 SF** | **21,741 SF** |
| **Project Total** | | **257.34 AC** | **16.7 DU/AC** | **4,293 DU** | **115,809 SF** | **135,110 SF** |

Notes:
1. The numbers were rounded to present a conservative estimate.
2. The EIR will evaluate the total maximum allowable development in the Project Specific Plan.
3. Ownership Area 2 uses are being evaluated at programmatic level only; no specific development applications have been submitted; no specific development dates are known.
4. RETAIL in Mixed-Use areas = 20% of Mixed-Use acreage x 0.30 FAR; OFFICE in Mixed-Use areas = 10% of Mixed-Use acreage x 0.70 FAR

## Mixed-Use

The mixed-use development is comprised of 10 percent office with a maximum floor area ratio (FAR) of 0.70; 20 percent retail with a maximum FAR of 0.30; and 70 percent residential with a maximum density of 35 dwelling units per acre (du/ac). TOP 2050 allows up to 135,110 square feet of office development, 115,809 square feet of retail development, and a maximum of 1,086 mixed-use dwelling units.

Mixed-use development is allowed in Planning Areas 4, 5, 10 and 11. These mixed-use planning areas will allow for development of neighborhood retail uses at a maximum 0.30 FAR and office uses at a maximum 0.70 FAR, intended to meet the needs of the surrounding community. The maximum number of allowed units within the Mixed-Use portion of the CenterPark Specific Plan is 1,086 units and 3,207 units within the residential planning areas for a total maximum of 4,293 units that includes a maximum height of up to five (5) stories.

The maximum allowable retail development is 115,809 square feet and the maximum office development is 135,110 square feet, and the maximum residential development is 1,086 units within the CenterPark Specific Plan Mixed-Use planning areas. Mixed-use planning areas would allow for up to 70 percent of the area to be developed as higher density residential uses with a maximum density of 35 du/ac.

## Residential

The residential development encompasses a variety of residential housing types. Maximum allowable units allowed within the Project area are not to exceed 4,293 units and would include a maximum height of up to five stories. The blending of residential densities within each planning area are not exceeded in the mixed-use land use designation.

The residential uses will complement the office and retail development uses that create a variety of living choices within the western area of Ontario Ranch.

Medium- Density Residential developments are allowed in PAs 1, 2, 3, 6, 7, 8, 9, 12 and 13. The residential densities for each Planning Area shall not exceed the maximum density allowed within the Mixed-Use designation.

The following housing types are allowed within the Project area:

- Conventional Single-Family Dwelling (SFD) – Two Story. This housing type includes conventional single-family neighborhoods, traditional single-family and cluster SFD neighborhoods, including condominium developments, with one- and two-story buildings.
- Small Lot/Cluster SFD – Two and-Three Story. This housing type includes conventional single-family neighborhoods, traditional single-family and cluster SFD neighborhoods, including condominium developments, with buildings up to three stories tall.
- Attached Single-Family Attached (SFA) – Two Story. This housing type includes duplexes/paired homes, triplexes, townhomes/rowtowns and stacked flats, including condominium and apartment developments, with buildings up to two stories tall.
- Attached SFA – Three Story. This housing type includes duplexes/paired homes, triplexes, townhomes/rowtowns and stacked flats, including condominium and apartment developments, with buildings up to three stories tall.

- Attached SFA/Multi-Family – Three to Five Stories. This housing type includes attached homes, including condominium and apartment developments, with buildings three stories or greater tall with a maximum of five story buildings.

## Parks, Trails, and Open Space

The CenterPark Specific Plan open space concept is oriented around a large public regional park comprised of 55.98 acres and includes a system of private parks distributed throughout the residential neighborhoods. Each private park will have a minimum of 0.25 acres of open space that would include a variety of facilities and amenities for future residents.

Enhanced neighborhood edges would include pedestrian walkways that provide connectivity to and from the Project area and to the street, separated public sidewalks, private pedestrian walkways and pathways to be developed within the community that connect all residential neighborhoods to the Grand Park and several private parks.

The private parks of CenterPark will be designed in accordance with TOP 2050. Actual required park acreage would be determined at the time of tentative tract map approval. An overall Conceptual Open Space Plan and Program will be developed and reviewed concurrently with each subdivision map of the planning areas. These plans would include the location and size of the proposed parks within its designated Planning Area with its amenity features within the area to be mapped as well as an amenity program listing the proposed facilities of private amenities within the remainder of the Project area.

Additionally, a portion of the Project site is located within the Mixed Use - Great Park (MU-Great Park) land use designation. The southern portion of the Project site is also within the Great Park Corridor. The Great Park area is intended to be highly walkable with pedestrian-oriented site design and road network and transit stops with public amenities. Sites within the Great Park Corridor are currently zoned SP (Specific Plan) with an AG (Agriculture) Overlay zoning district and (AH) Affordable Housing overlay zoning district. The (AH) Affordable Housing Overlay zoning district is designed to increase housing opportunities in compliance with the City's Housing Element and State Housing Element law. This overlay applies to specific sites identified in the City's Housing Element, including areas south of Riverside Drive, along East Holt Boulevard between Cucamonga Creek Channel and Corona Avenue, and MU-6 designated areas at the northeast corner of West Holt Boulevard and Mountain Avenue. Affordable housing projects within this overlay are classified into two tiers: Tier 1, with at least 20 percent of units designated as affordable, and Tier 2, with at least 25 percent of units designated as affordable, both ensuring affordability for a minimum of 30 years. Development within the AH Overlay must meet a minimum density of 20 dwelling units per acre and adhere to the standards of the base zoning district, other overlay zones, and the Development Code. Tier 1 projects can develop under the SP zoning or MDR-25 requirements for Medium Density Residential, and under the SP zoning or a comparable tool for Mixed Use, while Tier 2 projects follow the same but allow for a higher density of 25 to 30 dwelling units per acre for MDR.

Property owners and developers have expressed interest in redeveloping within the Project site. as existing agricultural operations are not expected to limit development potential. The areas within the Project site will have TOP 2050 designations of Medium-Density Residential (MDR) and Mixed-Use (MU). Medium-Density Residential (MDR) will allow a range of 20-30 du/ac for projects with at least 25 percent of units affordable to lower incomes, and a range of 11.1-25 du/ac for all other projects. Two different

MU areas are proposed in this opportunity area, Mixed-Use Eucalyptus/Chino Airport (MU-EU) allowing 20-45 du/ac and Mixed-Use Great Park, allowing 20-65 du/ac. With TOP 2050 and zoning changes, all sites identified support densities necessary to facilitate lower- and moderate-income housing development.[1]

TOP 2050 designates the surrounding area in Ontario Ranch for Mixed-Use, Recreational Open Space, Low, Low-Medium, and Medium Density Residential development.

The existing zoning designation for the Project site and surrounding area is Specific Plan (SP) Zoning District with an Agricultural (AG) Overlay. The zoning Districts and designations of the CenterPark Specific Plan require approval by the City for the development of the Project. The Specific Plan will be the zoning for the Project site, consistent with TOP 2050.

Recreational Open Space uses are planned within PAs 14, 15, 16, 17 and 18, along the southern Project boundary. There are 55.98 acres designated for Recreational Open Space (OS-R). This area has been designated to be part of the City of Ontario Grand Park. There are 11.28 acres designated for Open Space Non-Recreation (OS-NR) on the northern portion of the Project site, adjacent to the SCE easement. The OS-NR areas are designated for non-recreational uses. While no buildings are proposed within this district, it is suitable for uses such as landscape plant nurseries, recreational vehicle and truck/trailer storage and other uses allowed by the City zoning.

The land use types proposed by the Project are summarized below in **Table 2: Maximum Project Buildout**. **Table 2** provides the maximum development intensity, addressing full buildout per the CenterPark Specific Plan (allowable gross building area and maximum residential development for each planning area based on the allowable floor area ratio or residential density respectively). Development standards, such as setback requirements, parking, open space, minimum landscaping, infrastructure, and site design, may reduce the maximum gross square footage or density.

This CEQA Guidelines Section 15183 Consistency Analysis evaluates the total maximum allowable development in the CenterPark Specific Plan, which is 250,919 square feet of mixed-use commercial office/retail, up to 4,293 residential units, 67.26 acres of open space uses, and associated on-site and off-site infrastructure improvements. Additional on-site improvements would include landscaping, utility infrastructure, and internal roadways. Off-site improvements may include various street improvements, storm drain infrastructure, sewer infrastructure, potable water infrastructure, recycled water infrastructure, and underground electric utility infrastructure.

[1] City of Ontario. 2022. *The Ontario Plan 2050, Housing Element*, page H-282. https://www.ontarioca.gov/about-ontario-ontario-plan-policy-plan/housing (accessed August 2024).

**Table 2: Maximum Project Buildout**

| Planning Area | Land Use | TOP 2050 Acreage | Maximum Density Per TOP 2050 EIR | Maximum Units | Maximum Retail | Maximum Office |
|---|---|---|---|---|---|---|
| 1 | MDR (11.1 - 25.0 DU/AC) | 15.91 AC | 22.0 DU/AC | 350 DU | | |
| 2 | MDR (11.1 - 25.0 DU/AC) | 15.57 AC | 22.0 DU/AC | 343 DU | | |
| 3 | MDR (11.1 - 25.0 DU/AC) | 7.70 AC | 22.0 DU/AC | 169 DU | | |
| 4 | MIXED-USE RESIDENTIAL | 4.99 AC | 35.0 DU/AC | 175 DU | | |
| 4 | MIXED-USE RETAIL | 1.43 AC | | | 18,635 SF | |
| 4 | MIXED-USE OFFICE | 0.71 AC | | | | 21,741 SF |
| 5 | MIXED-USE RESIDENTIAL | 5.19 AC | 35.0 DU/AC | 182 DU | | |
| 5 | MIXED-USE RETAIL | 1.48 AC | | | 19,367 SF | |
| 5 | MIXED-USE OFFICE | 0.74 AC | | | | 22,595 SF |
| 6 | MDR (11.1 - 25.0 DU/AC) | 7.33 AC | 22.0 DU/AC | 161 DU | | |
| 7 | MDR (11.1 - 25.0 DU/AC) | 23.67 AC | 22.0 DU/AC | 521 DU | | |
| 8 | MDR (11.1 - 25.0 DU/AC) | 24.20 AC | 22.0 DU/AC | 532 DU | | |
| 9 | MDR (11.1 - 25.0 DU/AC) | 12.18 AC | 22.0 DU/AC | 268 DU | | |
| 10 | MIXED-USE RESIDENTIAL | 9.87 AC | 35.0 DU/AC | 345 DU | | |
| 10 | MIXED-USE RETAIL | 2.82 AC | | | 36,852 SF | |
| 10 | MIXED-USE OFFICE | 1.41 AC | | | | 42,994 SF |
| 11 | MIXED-USE RESIDENTIAL | 10.97 AC | 35.0 DU/AC | 384 DU | | |
| 11 | MIXED-USE RETAIL | 3.13 AC | | | 40,955 SF | |
| 11 | MIXED-USE OFFICE | 1.57 AC | | | | 47,781 SF |
| 12 | MDR (11.1 - 25.0 DU/AC) | 15.46 AC | 22.0 DU/AC | 340 DU | | |
| 13 | MDR (11.1 - 25.0 DU/AC) | 23.75 AC | 22.0 DU/AC | 523 DU | | |
| **Residential Total** | | **176.79 AC** | **24.3 DU/AC** | **4,293 DU** | | |
| **Retail Total** | | **8.86 AC** | | | **115,809 SF** | |
| **Office Total** | | **4.43 AC** | | | | **135,110 SF** |
| 14 | OS-R (PARKLAND) | 13.33 AC | | | | |
| 15 | OS-R (PARKLAND) | 13.11 AC | | | | |
| 16 | OS-R (PARKLAND) | 9.90 AC | | | | |
| 17 | OS-R (PARKLAND) | 6.20 AC | | | | |
| 18 | OS-R (PARKLAND) | 13.44 AC | | | | |
| 19 | OS-NR (NON-RECREATION) | 2.26 AC | | | | |
| 20 | OS-NR (NON-RECREATION) | 2.68 AC | | | | |
| 21 | OS-NR (NON-RECREATION) | 2.96 AC | | | | |
| 22 | OS-NR (NON-RECREATION) | 3.38 AC | | | | |
| **Open Space Total** | | **67.26** | | | | |
| **Project Total** | | **257.34 AC** | **16.7 DU/AC** | **4,293 DU** | **115,809 SF** | **135,110 SF** |

Notes:
1. The numbers were rounded to present a conservative estimate.
2. This analysis evaluates the total maximum allowable development in the CenterPark Specific Plan.
3. Ownership Area 2 uses are being evaluated at a programmatic level only; no specific development applications have been submitted; no specific development dates are known.
4. RETAIL in Mixed-Use areas = 20% of Mixed-Use acreage x 0.30 FAR; OFFICE in Mixed-Use areas = 10% of Mixed-Use acreage x 0.70 FAR

### 2.3.3 Circulation Plan

The Circulation Plan facilitates movement of vehicles, pedestrians and cyclists around and within the Project site, and provides access to the neighborhood commercial and residential planning areas, consistent with the City of Ontario Roadway Classification System (**Figure 3-9: City of Ontario Road Classification System**). For additional information on vehicle and truck circulation, trip distribution, and truck routing, see **Section 4.17, Transportation**.

The Project site includes three City arterial roadways, which provide access to and from the Project site. Edison Avenue/ Ontario Ranch Road bisects the Project site in an east/west direction, Grove Avenue bisects the Project site in a north/south direction, and Campus Avenue borders the Project site on the west, running in a north/south direction; refer to **Figure 3-10: Conceptual Circulation Plan**. The Project site also includes two City collector roadways. Bon View Avenue traverses the site in a north/south direction and Walker Avenue borders the Project site on the east, running in a north/south direction. Phasing and construction of the improvements shall be implemented as required by the City Engineer and pursuant to the mitigation measures identified in the TOP 2050 Supplemental EIR and the conditions of approval adopted with the approval of tentative maps for the Project. Locations and construction of bus turnouts may be required within the Project site to the satisfaction of the City of Ontario and Omnitrans requirements.

#### Pedestrian Circulation

Off-street pedestrian circulation would be provided throughout the Project site through a paved sidewalk system that interconnects with the right-of-way and separated from vehicular travel lanes by landscaped parkways. The pedestrian system would provide connectivity between residential neighborhoods and to all private parks within the Project area. The Project would provide connectivity with off-site areas via City master planned multipurpose trails/bikeways located along the neighborhood edges of the Project site. Additionally, the Specific Plan would allow for additional internal trails and paseos that provide pedestrian accessibility between neighborhoods, community parks and amenities, and to the regional park in the center of the Project area.

#### Trails and Bike Paths

Multipurpose trails would be provided along the south side of Edison Avenue/Ontario Ranch Road and along the eastern side of Grove Avenue and Campus Avenue for the Project site. See **Figure 3-11: Conceptual Pedestrian and Regional Trail Circulation Plan** and **Figure 3-12: Internal Pedestrian Circulation Plan**.

A Class II Bicycle Lane is proposed by TOP 2050 on the west side of Walker Avenue. Class II bicycle lanes are defined as dedicated (striped) lanes along streets, with no parking allowed in the bicycle lane. This bicycle lane provides linkages to the City's bicycle path system.

#### Parks

Parks would be provided throughout the Project site, see **Figure 3-13: Conceptual Landscape Plan**. The City has established a parkland standard of five (5) acres of parkland (public and private) per 1,000

residents, with a minimum of two (2) acres of developed private park space per 1,000 residents. The Project would fulfill this requirement through the establishment of private parks within the proposed residential developments or by satisfying the in-lieu park development impact fee if approved by the City. As mentioned above, parks provided on-site would be consistent with TOP 2050; refer to **Section 4.16, Recreation** for more information related to parks and recreation.

### Transit

Transit options provide an alternative mode of transportation for motorists and a primary mode for the transit-dependent. The City is coordinating with regional transit agencies to implement Bus Rapid Transit (BRT) service to target destinations and along corridors. The Omnitrans BRT Corridor is planned to be implemented along Edison Avenue/Ontario Ranch Road as a part of future development. The BRT Corridor is expected to provide convenient and accessible public transportation for future residents and visitors of the Project site; and hence the potential for residents and visitors to have a reduced need for private transportation requirements. In anticipation of the future implementation of the high-speed public transport route, developments which exceed the minimum density of 20 DU/Acre, located within 330 feet of the BRT corridor along Edison Avenue/Ontario Ranch Road may be allowed to have reduced parking requirements.

## 2.3.4 Water Master Plan

Potable water would be provided by the City. The City's Water Master Plan identifies new water facilities to serve the Ontario Ranch area, which would need to be constructed prior to or concurrent with onsite water improvements. Construction of the on-site and off-site Master Plan water service improvements shall be the responsibility of the developer and is required prior to issuance of certificates of occupancy for any residential dwelling unit within the Project site.

The off-site improvements include the construction of the 30-inch Master Planned line in Grove Avenue from Eucalyptus Avenue to Chino Avenue, and the 30-inch main in Grove Avenue from Edison Avenue/Ontario Ranch Road to Chino Avenue continuing along Campus Avenue from Chino Avenue to Francis Street, proceeding east in Francis Street to Bon View Avenue, continuing north in Bon View Avenue to the City owned reservoir site. To provide a looped water system for the Project site, the master planned 24-inch main shall be constructed in Eucalyptus Avenue from the existing 925 pressure zone (PZ) line in Carpenter Avenue to the Walker Avenue and Eucalyptus Avenue intersection. As a part of the Backbone Infrastructure, the master planned 925 PZ reservoir shall be constructed on the City-owned reservoir site as directed by the City. Well supply and any drinking water treatment necessary for the 925 PZ shall be constructed to supply the 925 PZ reservoir. The off-site potable water line locations are shown on **Figure 3-14: Conceptual Potable Water Master Plan.**

Master planned potable water main lines serving the development, as identified in the approved Specific Plan, shall be constructed prior to issuance of building permits. All private agricultural wells located within the Project site would be decommissioned per the County of San Bernardino Health Department Standards prior to issuance of construction permit for any construction activity. A copy of the County Health Department Permit shall be provided to Engineering and the Ontario Municipal Utilities Company prior to issuance of grading permits.

The Project would construct new potable water lines to provide a looped system for the Project site. A 12-inch master planned water line will be installed in Edison Avenue/Ontario Ranch Road and Campus Avenue and Walker Avenue; along with a 30-inch master planned water line in Grove Avenue; and a 24-inch master planned water line in Edison Avenue/Ontario Ranch Road between Walker Avenue and Grove Avenue. The proposed on-site water system sizing is subject to the hydraulic criteria in the City's Water and Sewer Design Guidelines. The conceptual potable water system is illustrated on **Figure 3-15: Conceptual Potable Water System.**

### Master Planned Recycled Water System

Recycled water for this Project will be supplied by the Inland Empire Utilities Agency's (IEUA) existing recycled water infrastructure as presented in the City's Recycled Water Master Plan. The master planned 930 feet PZ 30-inch recycled water system exists in Bon View Avenue and Eucalyptus Avenue and Edison Avenue/Ontario Ranch Road and shall service the Project.

The Project would provide all recycled water lines required to serve the Project. The off-site improvements include the construction of the 930 feet PZ master planned recycled water system consisting of an 8-inch main in Grove Avenue from Edison Avenue/Ontario Ranch Road to Eucalyptus Avenue, an 8-inch main in Walker Avenue from Edison Avenue/Ontario Ranch Road to Eucalyptus Avenue, a 12-inch main in Edison Avenue/Ontario Ranch Road from Campus Avenue to Bon View Avenue, and a 12-inch main in Eucalyptus Avenue from Bon View Avenue to Walker Avenue. The off-site recycled water line locations are shown on **Figure 3-16: Conceptual Recycled Water Master Plan**.

Within the Project site, 8-inch recycled water mains are proposed to serve the site. The Project would comply with City Ordinance 2689 and make use of recycled water for all approved uses, including but not limited to the irrigation of parks, street parkway landscaping, recreational trails, private pocket parks and any other HOA-maintained common areas. The developer shall prepare and secure approval of an Engineering Report from the City of Ontario and State Department of Drinking Water prior to the use of recycled water. Sizing of the on-site system is subject to the hydraulic criteria in the City's Water and Sewer Design Guidelines. The conceptual recycled water system is illustrated on **Figure 3-17: Conceptual Recycled Water System**.

## 2.3.5 Sewer Master Plan

Sewer service for the Project would be provided by the City of Ontario. Off-site sewer improvements to serve the Specific Plan area would be implemented according to the most current version of the City's Sewer Master Plan. The City's Sewer Master Plan identifies sewer service to be provided by the Grove Trunk Sewer beginning at the intersection of Edison Avenue/Ontario Ranch Road and Bon View Avenue, aligning south to connect to the Western Trunk Sewer line at the intersection of Bon View Avenue and Merrill Avenue, continuing west in Merrill Avenue, then south in Euclid Avenue to connect with the IEUA Kimball Interceptor. In addition to the main sewer service for the Project, a 16-inch sewer main is to be constructed in Campus Avenue between Edison Avenue/Ontario Ranch Road and Eucalyptus Avenue, an 18-inch sewer main is to be constructed in Grove Avenue between Edison Avenue/Ontario Ranch Road and Eucalyptus Avenue, and an 18-inch sewer main is to be constructed as part of half-width street improvements in Walker Avenue between Edison Avenue/Ontario Ranch Road and Eucalyptus Avenue.

Within the Project site, a series of 8-inch sewer mains are proposed to serve the mixed use and residential developments. Construction of the on-site and off-site Master Plan sewer improvements shall be the responsibility of the developer and is required prior to issuance of building permits for the Project. The proposed on-site public sewer system sizing is subject to the hydraulic criteria in the City's Water and Sewer Design Guidelines. Master planned sewer main lines as identified in the adopted Sewer Master Plan, shall be constructed prior to issuance building permits. The conceptual sewer improvements are illustrated on **Figure 3-18: Conceptual Sewer Master Plan**, and on **Figure 3-19: Conceptual Sewer System.**

### 2.3.6 Drainage

For the eastern portion of the proposed development, the Project would construct the 108-inch master planned storm drain line in Grove Avenue from the intersection of Grove Avenue and Edison Avenue/Ontario Ranch Road to Eucalyptus Avenue and a 108-inch storm drain in Walker Avenue from the intersection of Walker Avenue and Edison Avenue/Ontario Ranch Road south to Eucalyptus Avenue.

For the western portion of the development, the Project would construct the 60-inch master planned storm drain line in Campus Avenue from the intersection of Edison Avenue/Ontario Ranch Road and Campus Avenue to Eucalyptus Avenue. From the intersection of Eucalyptus Avenue and Walker Avenue, the Project would construct an 8-foot by 13-foot reinforced box culvert-type storm drain continuing east in Eucalyptus Avenue to Baker Avenue and a 96-inch storm drain in Bon View Avenue from the intersection of Bon View Avenue and Edison Avenue/Ontario Ranch Road south to Eucalyptus Avenue.

The City's Storm Drain Master Plan identifies storm drain improvements to serve the Project site. Completion of these Master Plan improvements will provide permanent storm drain service to the Project. That portion of the Master Plan storm drain system that lies within the Project site will be constructed as part of the development of the Project. The size and location would be based on the Approved Master Plan of Drainage. The City of Ontario Master Plan storm drain improvements are illustrated on **Figure 3-20: Conceptual Drainage Master Plan**. On-site storm drains would be sized and constructed to convey the on-site flows to the proposed Master Plan system. The size and location of proposed on-site storm drains may change based on final design. Interim detention basins are not proposed and are not allowed by the City. The developer is required to construct the ultimate storm drain improvements as identified on the Master Plan of Drainage. The Master Plan of Drainage for the Project is illustrated in **Figure 3-21: Conceptual Storm Drain Improvements**.

#### National Pollutant Discharge Elimination System (NPDES) Compliance

The grading and drainage of the Specific Plan area may be designed to retain and infiltrate the Design Capture Volumes (DCV). These DCV may be directed to underground storage/infiltration chambers beneath parklets and paseos for infiltration into the ground where site soils do not provide adequate infiltration or other means to control drainage.

Low Impact Development (LID) Site Design Best Management Practices (BMPs) would be implemented in accordance with the selection criteria and other requirements outlined in the San Bernardino County NPDES Storm Water Program's current Water Quality Management Plan (WQMP) as well as the City of

Ontario's Water Quality Management Plan requirements. Appropriate pre-treatment BMPs, such as baffle boxes, filters or surface forebays, etc. can be installed upstream of underground storage/infiltration chambers to collect sediments and minimize deposition of sediments in the infiltration zone.

The objective of the WQMP for the Project is to minimize the detrimental effects of urbanization on the beneficial uses of receiving waters, which includes effects caused by increased pollutants and changes in hydrology. These effects shall be minimized through the implementation of on-site and off-site LID Site Design BMPs that provide appropriate treatment of the DCV.

In addition, Non-Structural and Structural Source Control BMPs, shall also be implemented and documented in the Project's approved WQMP(s) to reduce pollutant generation and transport from the Project site. Prior to the issuance of grading or construction permits for any tract map or area that disturbs one acre or more of land, within the Project site, Erosion/Sediment Control Plans and Storm Water Pollution Prevention Plans (SWPPP) shall be prepared. The SWPPP shall be prepared to comply with California State Water Resources Control Board's (SWRCB) current "General Permit to Discharge Storm Water Associated with Construction Activity" and current "Area Wide Urban Storm Water Runoff" (Regional NPDES) Permits. The SWPPP shall identify and detail all appropriate BMPs to be implemented or installed during construction of the Project. In addition to the preparation of a construction SWPPP, any tract map or project that disturbs one acre or more of land area shall be required to obtain coverage under the State Water Board's General Permit to Discharge Storm Water Associated with Construction Activity and show evidence of permit coverage to the City of Ontario, prior to the issuance of any grading or construction permits. All Priority Land Use (PLU) areas within the Specific Plan Area shall comply with the statewide Trash Provisions adopted by the SWRCB and trash requirements in the most current San Bernardino County Area-Wide Municipal Separate Storm Sewer Systems (MS4) Permit.

### 2.3.7 Dry Utilities Plan

#### Fiber Optics

The proposed backbone street fiber optics (conduits, tracer wire, handholes and fiber) would be placed underground within a duct and structure system to be installed by the developer in a joint trench, as illustrated in **Figure 3-22: Fiber Optic Master Plan**. In-tract fiber and conduit shall be installed per the In-Tract Fiber Optic Design Guidelines. Maintenance of the installed system will be the responsibility of the City/Special District. Development of the project requires the installation of all fiber optic infrastructure and peripheral equipment necessary to service the Project as a stand-alone development.

#### Natural Gas

The Southern California Gas Company will provide natural gas to the project site and install gas mains to the Project site as necessary.

#### Electricity

SCE currently provides electrical service in the area. All new lines and all existing lines within the Project site less than 34.5 kilovolts, shall be placed underground by the developer according to City of Ontario requirements and in accordance with the City of Ontario undergrounding ordinance.

### 2.3.8 Public Services

#### Fire

The City of Ontario would provide fire protection services to the Project site. The Ontario Fire Department (OFD) currently has 10 permanent stations, which are staffed with eight four-man paramedic engine companies and two four-man truck companies.[2] The closest operational fire station, Station 9, is located at 2661 East Grand Park, approximately three miles east of the Project site. Additionally, OFD maintains a mutual-aid agreement with the Operation Area and State of California and receives first alarm automatic aid from other, neighboring fire departments, including the Chino Valley Fire Department District, the Ontario Airport Fire Department, and the San Bernardino County Fire Department, among others; refer to **Section 4.15: Public Services** for more information on fire protection services available to the Project site.

#### Police

The City of Ontario would provide police services to the Project site. The closest police station is located approximately three miles northeast of the Project site at 2500 South Archibald Avenue, just south of SR-60. This station is also the City of Ontario Police Department headquarters.

#### Schools

The Chino Valley Unified School District would serve the school age needs of grades K through 12 for the Project. The nearest Chino Valley Unified School District elementary school location, within the vicinity of the Project site, is Dickey Elementary School, located at 2840 Parco Avenue in Ontario. The nearest Chino Valley Unified School District middle school location is Woodcrest Junior High School, located at 2725 South Campus in Ontario. The nearest Chino Valley Unified School District high school location is Chino High School, located at 5472 Park Place, in the City of Chino. The Project would be subject to school impact fees, as required by the state; refer to **Section 4.15** for more information.

#### Solid Waste

The Project would comply with the City of Ontario's latest "Solid Waste Department Refuse and Recycling Planning Manual." City crews, through the Ontario Municipal Utilities Company, would provide solid waste collection and disposal service for the Project. The Project would participate in City sponsored recycle programs and diversion of special wastes such as tires and construction materials. Provisions for solid waste and recycling for the Project are as follows:

- Residential – For curbside automated container service, developer shall comply with Municipal Code Section 6-3.308.9(a) and (d), Residential Receptacles, Placement.
- Recycling Requirements – The developer shall comply with Municipal Code Article 6 Recycling Requirements for Special Business Activity, Section 6-3.601 Business Recycling Plan and Section 6-602 Construction and Demolition Recycling Plan.
- Site Improvement Plans shall follow the City of Ontario refuse collection standards.

[2] City of Ontario. 2025. *Fire Stations.* https://www.ontarioca.gov/government/fire (accessed February 2024).

- Community trash enclosures ("dumpsters") may be utilized, dependent upon housing product types/orientation.

### 2.3.9 Grading Concept

The Project site generally slopes to the south at approximately 0.8 percent to 2.0 percent. The grading activities for the Project would generally consist of clearing and grubbing, demolition of existing structures and moving surface soils to construct building pads and streets. Where slope conditions are present, the Project lot line shall be located at the top of a slope. Dwelling units and structures adjacent to the sloped areas should be sited to:

- Use the natural ridge as a backdrop for structures;
- Use landscape plant materials as a backdrop; and
- Use structures to maximize concealment of cut slope. If retaining walls are required, the following criteria shall be used:
    - Exposed walls and fences facing roadways shall be no greater than 3 ft. retaining in height (9 ft. total wall), except as necessary for acoustical purposes as identified by the EIR or as required as a condition of approval.
    - Where retaining walls or fences face roadways, they shall be built of decorative materials consistent with the wall theme of the neighborhood.

The Conceptual Grading Plan, as illustrated in **Figure 3-23: Conceptual Grading Plan**, provides a balance of cut/fills for the Project. Grading plans for each tract within the Project shall be reviewed and approved by the City of Ontario Building, Planning and Engineering Departments prior to the issuance of grading permits.

All grading plans and activities associated with the Project would conform to the City's grading ordinance and dust and erosion control requirements. All landscape areas adjacent to streets, including medians, parkways and neighborhood edges, in the Project site, shall be finish graded, at a minimum of 1-inch to 2-inches below top-of-curb or sidewalk finish surface, for conservation of irrigation water and increased retention of rainwater runoff. To the maximum extent practicable, all landscaped areas within the Project would be graded as swales and designed to accept runoff water from impervious surfaces.

### 2.3.10 Development Standards and Design Guidelines

Upon adoption of the CenterPark Specific Plan, the development standards and procedures established in Section 6 of the Specific Plan would become the governing zoning standards for any new construction, additions, or remodel improvements within the Project site. The Specific Plan outlines the allowable uses and development standards of building heights, setbacks, parking, coverage, landscape, signage, and other development standards within the Project area. The Design Guidelines of the Project provide conceptual themes of site planning, architecture, and landscape design within the Project site as referenced in Section 7 of the Specific Plan.

### 2.3.11 Sustainable Design Strategies

The Specific Plan includes sustainable design strategies that integrate principles of environmental stewardship into the design and construction process. Additionally, the Project is designed to be consistent with TOP policies for sustainable communities. Appropriate strategies will be determined for each project within the Project site. Sustainable goals for the Project include, but are not limited to:

1. Encourage walking and other non-vehicular modes of travel.
2. Provide pedestrian connectivity throughout the Project.
3. Provide shaded outdoor areas in forms of trees and/or structures.
4. Encourage the use of architectural elements designed to reduce interior heat gain.
5. Encourage the use of recycled, recyclable, and environmentally friendly building materials.
6. Require the use of low energy glass, low water plumbing features, and energy efficient appliances.
7. Encourage the use of drought tolerant landscaping and water efficient irrigation methods.

Neighborhood site planning, architecture and building design as well as landscape treatment and maintenance within the Project should consider these sustainable goals and further the implementation of sustainable design within the Project site.

## 2.4 Discretionary Actions

This CEQA Section 15183 Analysis examines the environmental effects of the following required Project approvals associated with the Project. It is the intent of this CEQA Section 15183 analysis to evaluate the environmental effects of the Project, thereby enabling the City, other responsible agencies, and interested parties to make informed decisions with respect to the requested entitlements.

**CenterPark Specific Plan (PSP24-002)**

The CenterPark Specific Plan provides regulations for development of the Project site by establishing permitted land uses, development standards, infrastructure requirements, and implementation requirements. Implementation of the proposed CenterPark Specific Plan would achieve the intent of TOP 2050 for the Project site.

### Anticipated Approvals

The anticipated approvals required for this Project are listed in **Table 3: Anticipated Permits and Approvals Required**, below:

**Table 3: Anticipated Permits and Approvals Required**

| Lead Agency | Action |
|---|---|
| City of Ontario City Council | Certification of the Consistency Analysis<br>Certification of Focused EIR<br>Adoption of the Mitigation Monitoring and Reporting Program<br>Adoption of the CenterPark Specific Plan (PSP24-002) |

| | |
|---|---|
| City of Ontario | Certificate of Appropriateness for demolition of a historic resource |
| **Responsible Agencies** | **Action** |
| San Bernardino County | Well removal permit from County Health Department (if required) |
| Caltrans | Encroachment permit (if required) |
| Santa Ana Regional Water Quality Control Board | Issuance of a National Pollutant Discharge Elimination System (NPDES) Permit |
| Federal Aviation Administration | Obstruction evaluation |
| South Coast Air Quality Management District | Issuance of Air Quality permits for construction |

### *Future Agreements, Permits and Approvals*

Development proposed within the Project site, inclusive of both Ownership Areas 1 and 2, shall be subject to Development Plan review pursuant to Section 4.02.025 of the Ontario Development Code. The review is intended to ensure compliance with the provisions of the CenterPark Specific Plan (PSP24-002), protect the integrity and character of the physical composition of the City, and encourage high-quality development. The following future agreements, permits and approvals are anticipated, concurrent with or following City approval of the Specific Plan.

#### *Tentative Parcel Map (PMTT25-001, PMTT25-002)*

Concurrently with submitting the Development Plan for Ownership Area 1, the Applicant has submitted Tentative Tract Maps (TPM) PMTT25-001 and PMTT25-002, for the Project.

#### *Development Agreement (PDA25-001)*

Approval of the CenterPark Specific Plan will be followed by an application for approval of a development agreement to encourage investment in and commitment to comprehensive planning as envisioned by the City, which seeks to maximize efficient utilization of resources at the least economic cost to the public. A statutory development agreement, pursuant to California Government Code Sections 65869.5 et seq., shall be required as part of the approval of the Project Specific Plan. The development agreement shall include, but not be limited to, methods for financing acquisition and construction of infrastructure, acquisition and development of adequate levels of parkland and schools, as well as the provision of adequate housing opportunities for various segments of the community consistent with the City's regional housing needs assessments. The development agreement must be fully approved prior to or concurrent with the approval of any Tentative Tract Map and Development Plan submitted within the CenterPark Specific Plan area.

### *Potential Future Discretionary Approvals*

#### *Subdivision Maps*

A tentative tract map(s) shall be submitted for approval by the City indicating the approximate location of lot lines, streets, common areas, and proposed grading. Following approval a tentative tract map(s), a

final map(s) will be prepared for acceptance by the City. The final map(s) becomes a legal document that is recorded and defines legal parcels and lots that can be sold for development. Subdivision maps and lot changes shall be reviewed and approved pursuant to the Ontario Development Code and other applicable City codes and regulations, California Government Code Section 66410 (Subdivision Map Act), as well as the provisions of the CenterPark Specific Plan.

### *Development Plan Review*

All development proposals for the planning areas within the CenterPark Specific Plan are subject to the Development Plan Review (DPR) process, pursuant to the City's Development Code.

### *Conditional Use Permit*

A Conditional Use Permit (CUP) is required for uses specified as "conditionally permitted" in the CenterPark Specific Plan. CUP applications shall be processed pursuant to Section 4.02.015 of the City Development Code.

### *Certificate of Appropriateness*

A Certificate of Appropriateness (COA) is required for minor alterations, restoration, rehabilitation, and demolition of historic resources listed in the local register. Additionally, a Certificate of Appropriateness shall not be issued for the demolition of a historic resource, either in whole or in part, until such time that a demolition permit application and a replacement structure has been approved by the City, and appropriate permits have been issued for its construction.

# 3. CEQA COMPLIANCE

California Public Resources Code section 21083.3 and California Environmental Quality Act (CEQA) Guidelines Section 15183 provide an exemption from additional environmental review for projects that are consistent with the development density established by existing zoning, community plan or general plan policies for which an Environmental Impact Report (EIR) was certified, except as might be necessary to examine whether there are project-specific significant effects which are peculiar to the project or its site. Section 15183 specifies that examination of environmental effects shall be limited to those effects that: (1) Are peculiar to the project or the parcel on which the project would be located, and were not analyzed as significant effects in a prior EIR on the zoning action, general plan, or community plan, with which the project is consistent, (2) Are potentially significant off-site impacts and cumulative impacts which were not discussed in the prior EIR prepared for the general plan, community plan or zoning action, or (3) Are previously identified significant effects which, as a result of substantial new information which was not known at the time the EIR was certified, are determined to have a more severe adverse impact than discussed in the prior EIR. Section 15183(c) further specifies that if an impact is not peculiar to the parcel or to the proposed project, has been addressed as a significant effect in the prior EIR, or can be substantially mitigated by the imposition of uniformly applied development policies or standards, then an additional EIR need not be prepared for that project solely on the basis of that impact.

## 3.1 Previous Environmental Analysis of the Project

### 3.1.1 City of Ontario, The Ontario Plan 2050 Final Supplemental EIR

Available at https://www.ontarioca.gov/OntarioPlan.

A CEQA Guidelines Section 15183 exemption requires a project to be consistent with the development density established by either existing zoning, community plan or general plan policies for which an EIR was certified.

The Ontario Plan (TOP), the City's guiding framework, was originally adopted on January 27, 2010, and amended in 2022 to TOP 2050, approved August 16, 2022. TOP 2050 included updates to the Ontario Policy Plan (General Plan), as well as the City's Housing Element.

The City encompasses approximately 50 square miles and is located in the southwestern portion of San Bernardino County. The purpose of TOP 2050 is to provide guidance for the City's long-term development. TOP 2050, as well as the included Policy Plan, include goals and policies that provide the framework for the City's vision.

A CEQA Guidelines Section 15183 exemption requires a project be consistent with the development density established by either existing zoning, community plan or general plan policies for which an EIR was certified. TOP 2050 designates the Project site land use for medium-density and mixed-use residential, mixed-use retail and office, and open space development. The Project would include the development of residential buildings and associated site improvements, which is consistent with the current TOP 2050 land use designation for the Project site.[3]

[3] City of Ontario. 2023. *The Ontario Plan 2050 Land Use Map*. https://content.ontarioca.gov/sites/default/files/2024-12/TOPLUP_Map%2824x36%2910_6_20240905_0.pdf (accessed February 2025).

TOP 2050 relies on the findings of the original TOP and incorporates its certified EIR by reference in the TOP 2050 Supplemental EIR. The following summarizes the findings of TOP 2050 Supplemental EIR associated with the adoption and long-term implementation of TOP 2050.

TOP 2050 Supplemental EIR and Environmental Evaluation found the following environmental effects to be less than significant:

- Aesthetics: all thresholds.
- Agriculture and Forestry Resources: all thresholds.
- Biological Resources: all thresholds.
- Energy: all thresholds
- Greenhouse Gas Emissions: all thresholds.
- Hazards and Hazardous Materials: all thresholds.
- Hydrology and Water Quality: all thresholds.
- Land Use and Planning: Physically divide an established community.
- Mineral Resources: all thresholds.
- Population and Housing: all thresholds.
- Public Services and Recreation: all thresholds.
- Utilities and Service Systems: all thresholds.
- Wildfire: all thresholds.

TOP 2050 Supplemental EIR found the following environmental effects to be less than significant with mitigation incorporated:

- Cultural Resources: Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.
- Cultural Resources: Disturb any human remains, including those interred outside of formal cemeteries.
- Geology and Soils: all thresholds.
- Tribal Cultural Resources: all thresholds.

TOP 2050 Supplemental EIR found the following to be significant unavoidable impacts:

- Air Quality: all thresholds.
- Cultural Resources: Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5.
- Noise: all thresholds.
- Transportation: all thresholds.

For further information, TOP 2050 is available at: https://www.ontarioca.gov/OntarioPlan.

### 3.1.2 City of Ontario General Plan 2021-2029 Housing Element

State law requires the preparation of a Housing Element as part of a jurisdiction's General Plan (*Government Code Section* 65302(c)). It is the primary planning guide for local jurisdictions to identify and prioritize the housing needs of the City and determine ways to best meet these needs while balancing community objectives and resources. As a part of the mandate, a jurisdiction must demonstrate in the Housing Element that the land inventory is adequate to accommodate that jurisdiction's share of the region's projected growth. The City's Housing Element includes goals and policies to meet the housing needs of the community. The Housing Element identifies the City's Regional Housing Needs Assessment (RHNA) target for the 2021 to 2029 cycle at 20,854 units which is inclusive of Extremely/Very Low Income, Low Income, Moderate Income, and Above Moderate-Income housing. The Project would create an additional 4,293 units of housing within the City, which would be completed prior to and after 2029. As such, implementation of the Project would aid the City in reaching its 2029 RHNA goal.

## 3.2 Summary of Findings

The Project is consistent with the analysis performed for the TOP 2050 Supplemental EIR. Further, the TOP 2050 Supplemental EIR adequately anticipated and described the impacts of the Project as well as identified applicable mitigation measures necessary to reduce Project specific impacts. The Project implements these mitigation measures, with the exception of Project impacts to historic resources, which has been identified as "peculiar" and remains, despite the implementation of mitigation measures, significant and unavoidable.

Specifically, this evaluation concludes that the Project requires additional environmental review because Tier II historical resources were identified within the Project site and, impacts Tier II historical resources were not explicitly analyzed within the TOP 2050 Supplemental EIR. Additionally, peculiar biological resources may occur within portions of the Project site for which a site reconnaissance survey was not conducted, due to site-access restrictions related to current ownership conditions. Pending a site reconnaissance survey, the extent of impacts within these areas, discussed in more detail below, is not known. Therefore, while the Project is consistent with the development density and use characteristics established by TOP 2050, as analyzed by the TOP 2050 Supplemental EIR (SCH # 2021070364, certified August 2022), and all required findings, a Focused EIR will be required for the biological resources and historic resources impacts of the Project that were not addressed in the TOP 2050 Supplemental EIR.

In accordance with CEQA Guidelines Section 15183, with the exception of certain biological resources and Tier II historical resources as described above, the Project qualifies for an exemption because the following findings can be made:

1. **The Project is consistent with the development density established by existing zoning, community plan or general plan policies for which an EIR was certified**. The Project would develop the site with mixed-use land uses, medium density residential, and open space land uses, which is consistent with the uses analyzed in the TOP 2050 Supplemental EIR and allowed by TOP 2050 land use designations.
2. **There are no Project specific effects which are peculiar to the Project or its site, and which the TOP 2050 Supplemental EIR failed to analyze as significant effects, with the exception of certain**

**biological resources that require mitigation and historic resources, as discussed in Section 4.4: Biological Resources and Section 4.5: Cultural Resources.** The Project is similar to other properties in the area, including its land use designation and zoning. The property does not support any peculiar environmental features, and the Project would not result in any peculiar effects with the exception of biological resources and historic resources, as discussed in **Section 4.4** and **Section 4.5**. In addition, as explained further in the CEQA Streamlining Checklist below, Project impacts (except for impacts to biological resources and Tier II historic resources) were adequately analyzed by the TOP 2050 Supplemental EIR.

3. **There are no potentially significant off-site and/or cumulative impacts which the TOP 2050 Supplemental EIR failed to evaluate, with the exception of certain biological resources that require mitigation and historic resources, as discussed in Section 4.4: Biological Resources and Section 4.5: Cultural Resources.** The Project is consistent with the land use characteristics of the development considered by the TOP 2050 Supplemental EIR and would represent a small part of the growth that was forecasted for build-out of TOP 2050. The TOP 2050 Supplemental EIR considered the incremental impacts of the Project, and as explained further in the CEQA Streamlining Checklist, below, no new Project-specific impacts are anticipated. Therefore, the Project would not result in any potentially significant cumulative impacts which were not previously evaluated in the TOP 2050 Supplemental EIR.
4. **There is no substantial new information which results in more severe impacts than anticipated by the TOP 2050 Supplemental EIR**. As documented in the CEQA Streamlining Checklist below, no new information has been identified which would result in a determination that the Project would have a more severe impact than anticipated by the TOP 2050 Supplemental EIR (except for impacts to biological resources, the extent of which cannot be known at this time).
5. **The Project will undertake feasible mitigation measures specified in the TOP 2050 Supplemental EIR**. As explained in the CEQA Streamlining Checklist below, the Project will undertake all applicable mitigation measures specified in the TOP 2050 Supplemental EIR and subsequently adopted by the City. These TOP 2050 Supplemental EIR mitigation measures will be undertaken through Project design, compliance with regulations and ordinances, the Project's conditions of approval, and City permit processing.

## 3.3 Thresholds Not Qualifying for the CEQA 15183 Exemption

The TOP 2050 Supplemental EIR noted that impacts to Tier I and Tier II resources would be unlikely and, as such, did not include a finding or associated mitigation measures specific to these tiers. The TOP 2050 Supplemental EIR did not explicitly analyze impacts to Tier II resources and instead deferred to the City's process for identifying and mitigating impacts and analyzing the impact of any proposed demolition of Tier II resources. This evaluation concludes that the Project requires additional environmental review because Tier II resources were identified within the Project site and, impacts Tier II historical resources, including that of demolition, were not explicitly analyzed within the TOP 2050 Supplemental EIR. Despite the incorporation of a substantial range of recommended mitigation (**Mitigation Measures [MM] CUL-1** through **CUL-9**), City staff have determined that the proposed mitigation and compliance with the City's Historic Preservation Ordinance (Article 26 of the City's Development Code) do not "substantially mitigate" this new impact and, therefore, pursuant to CEQA Guidelines Section 15183, this individual threshold pertaining to historic resources is not adequately addressed in the TOP 2050 Supplemental EIR.

Additionally, for areas not owned by the Project applicant, Ontario Ranch Venture, LLC, for which the City serves as the applicant, a biological site reconnaissance survey and focused biological surveys could not be conducted. Therefore, the extent of biological impacts within these areas is not fully known and mitigation is required to ensure that there would be lessened impacts to biological resources. Despite the incorporation of a substantial range of recommended mitigation (**MM BIO-1** through **BIO-6**), City staff have determined that compliance with the City's habitat mitigation fee program do not "substantially mitigate" this new impact and, therefore, pursuant to CEQA Guidelines Section 15183, these thresholds pertaining to biological resources are not adequately addressed in the TOP 2050 Supplemental EIR.

Therefore, the Project is inconsistent with the findings of the TOP 2050 Supplemental EIR in this regard. Consequently, a Focused EIR will be required for those Project impacts that were not adequately addressed in the TOP 2050 Supplemental EIR.

| | |
|---|---|
| Signature | Date |
| Printed Name | Title |

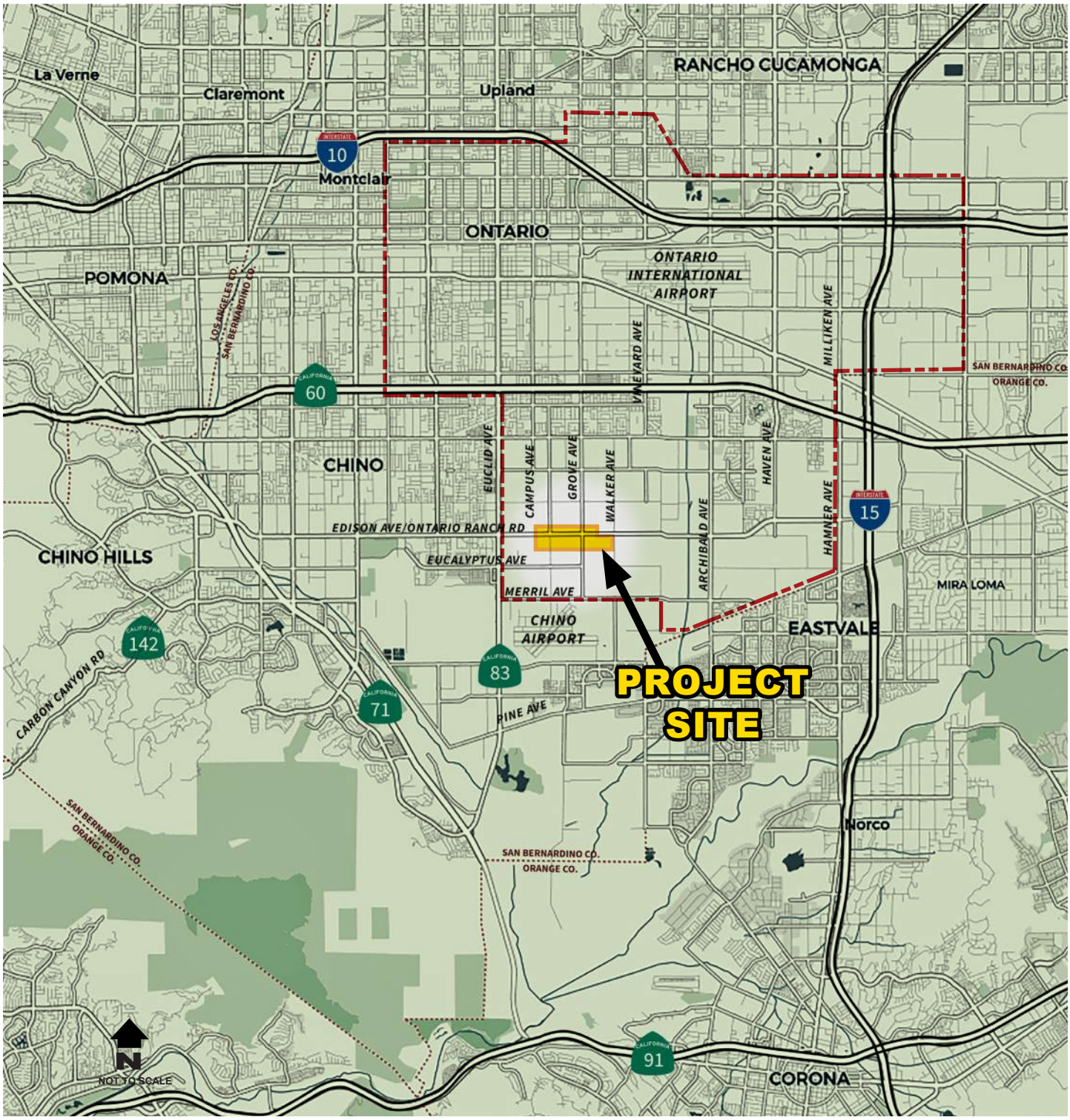


*Source: CenterPark Specific Plan Exhibit 1-1 Regional Location Map, 2025.*

**Figure 3-1:** Regional Location Map
*CenterPark Specific Plan, City of Ontario*

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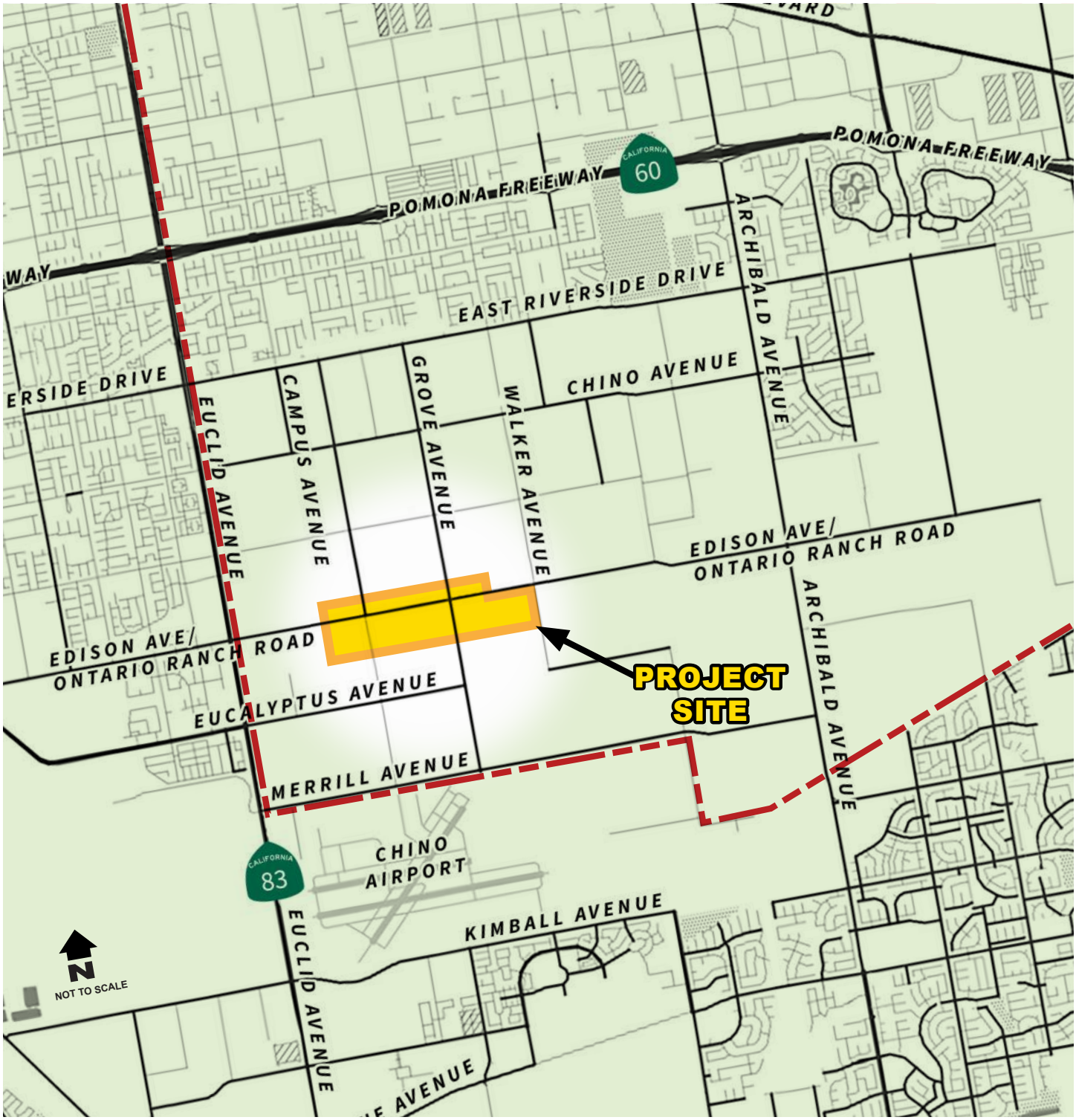


*Source: CenterPark Specific Plan Exhibit 1-2 Vicinity Map, 2025.*

**Figure 3-2:** Local Vicinity Map
*CenterPark Specific Plan, City of Ontario*

Not to scale

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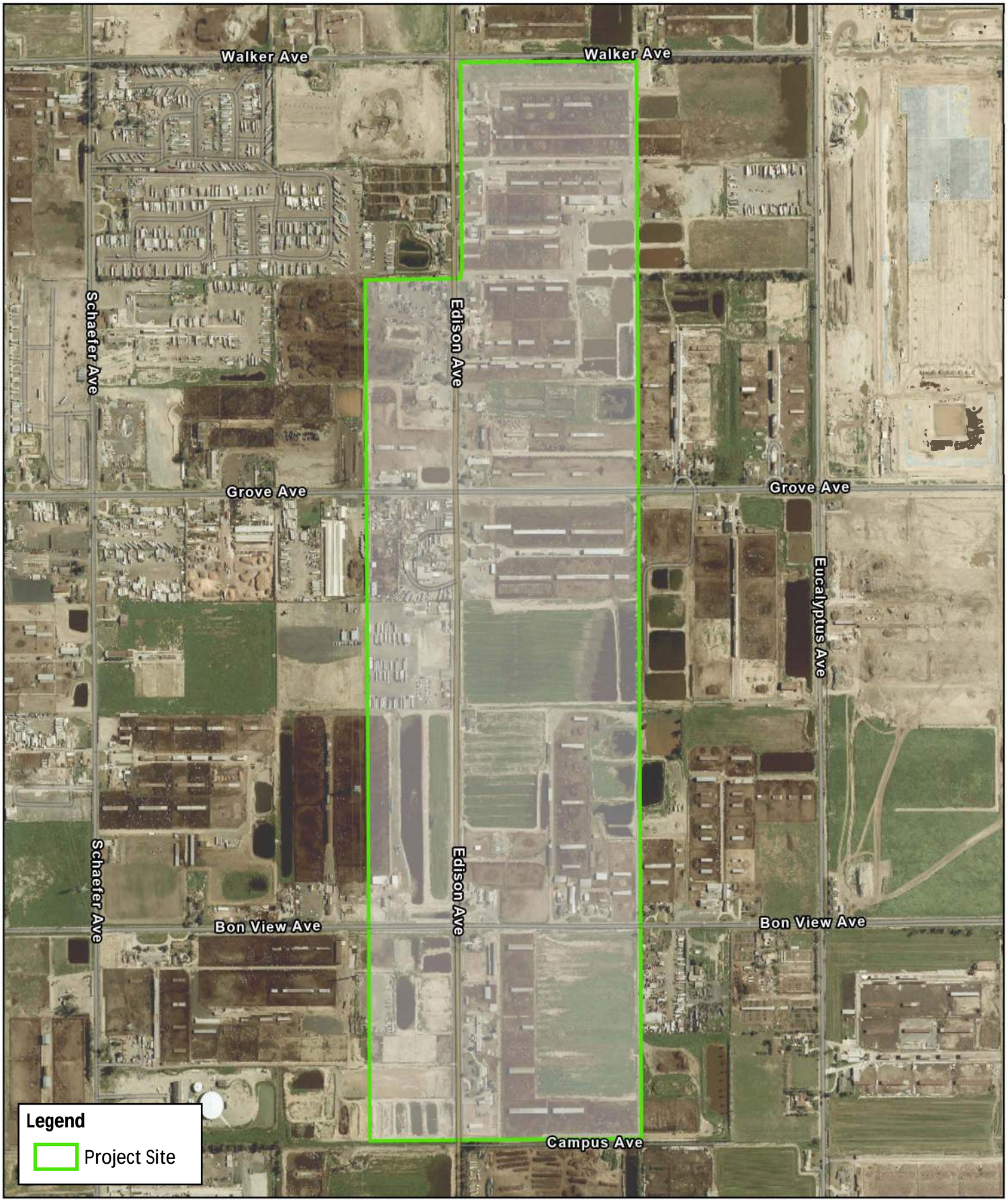


*Source: ESRI, 2024.*

**Figure 3-3:** Project Boundary
*CenterPark Specific Plan, City of Ontario*

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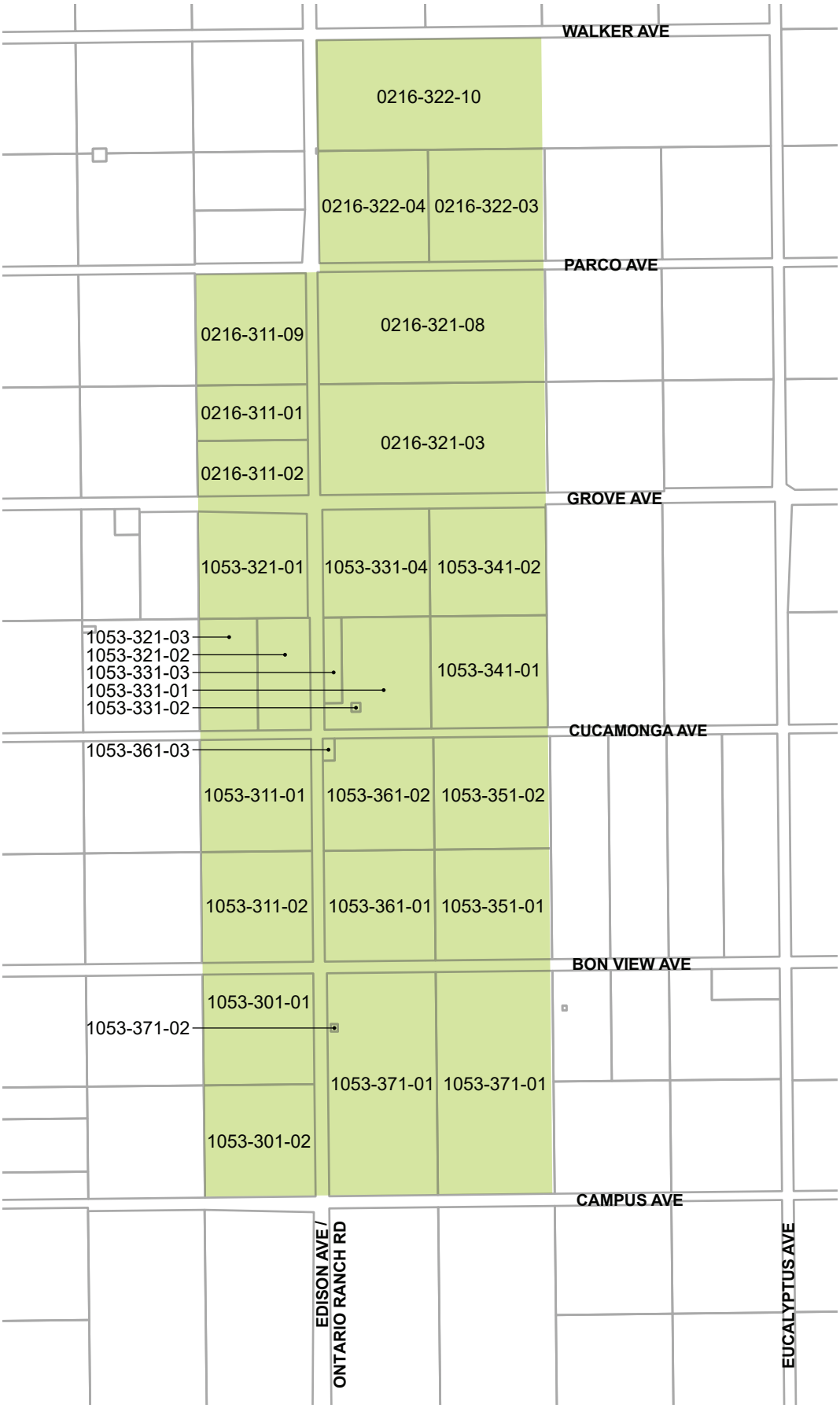


*Source: CenterPark Specific Plan Exhibit 3-1 Assessor's Parcel Numbers, 2025.*

**Figure 3-4:** Project Assessor Parcel Numbers
*CenterPark Specific Plan, City of Ontario*

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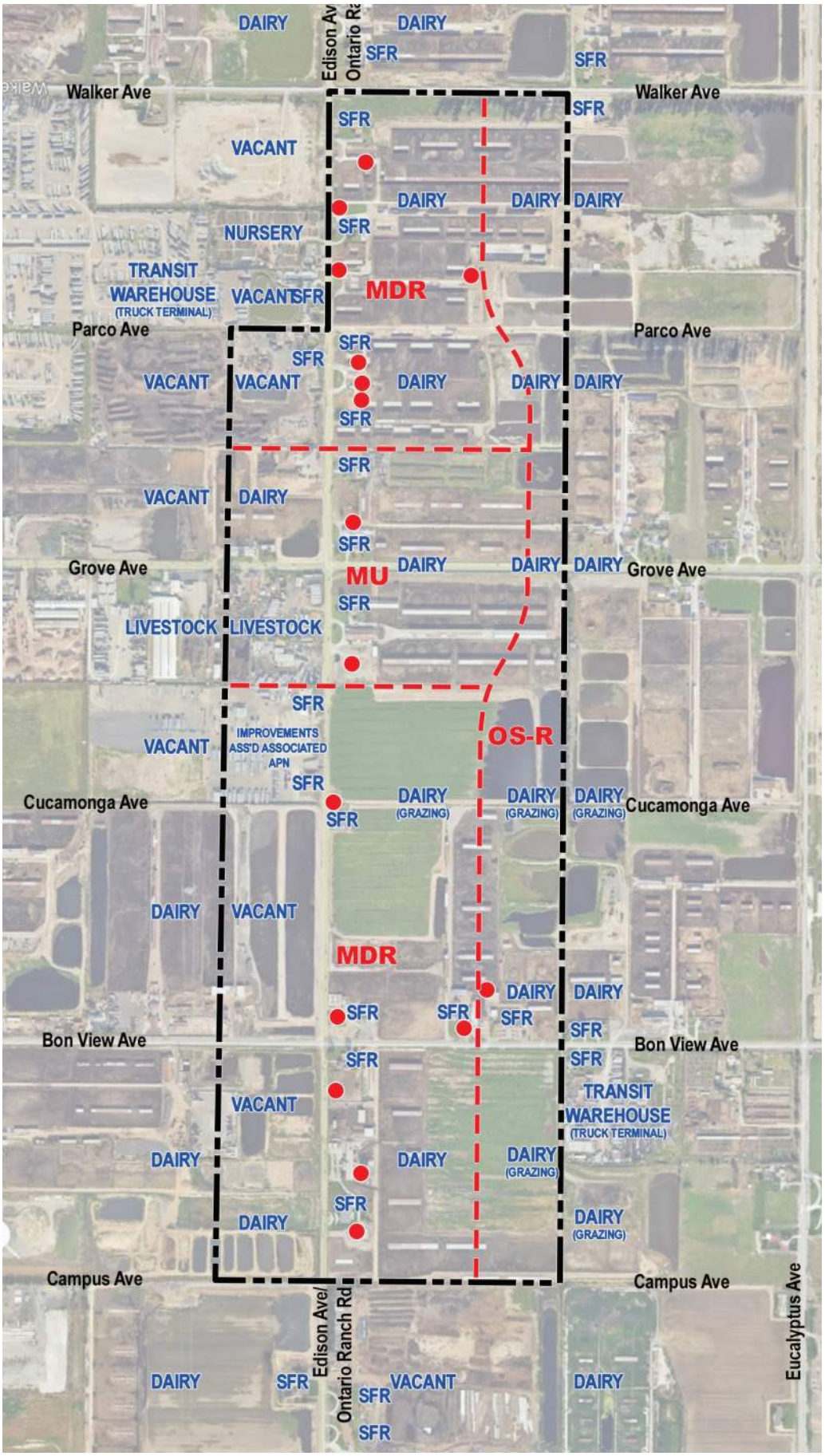


LEGEND

- EXISTING TOP LAND USE BOUNDARIES
- EXISTING WELLS

*Source: CenterPark Specific Plan Exhibit 3-3 Existing and Surrounding Land Uses, 2025.*

**Figure 3-5:** Surrounding Land Uses
*Center Park Specific Plan, City of Ontario*

Not to scale

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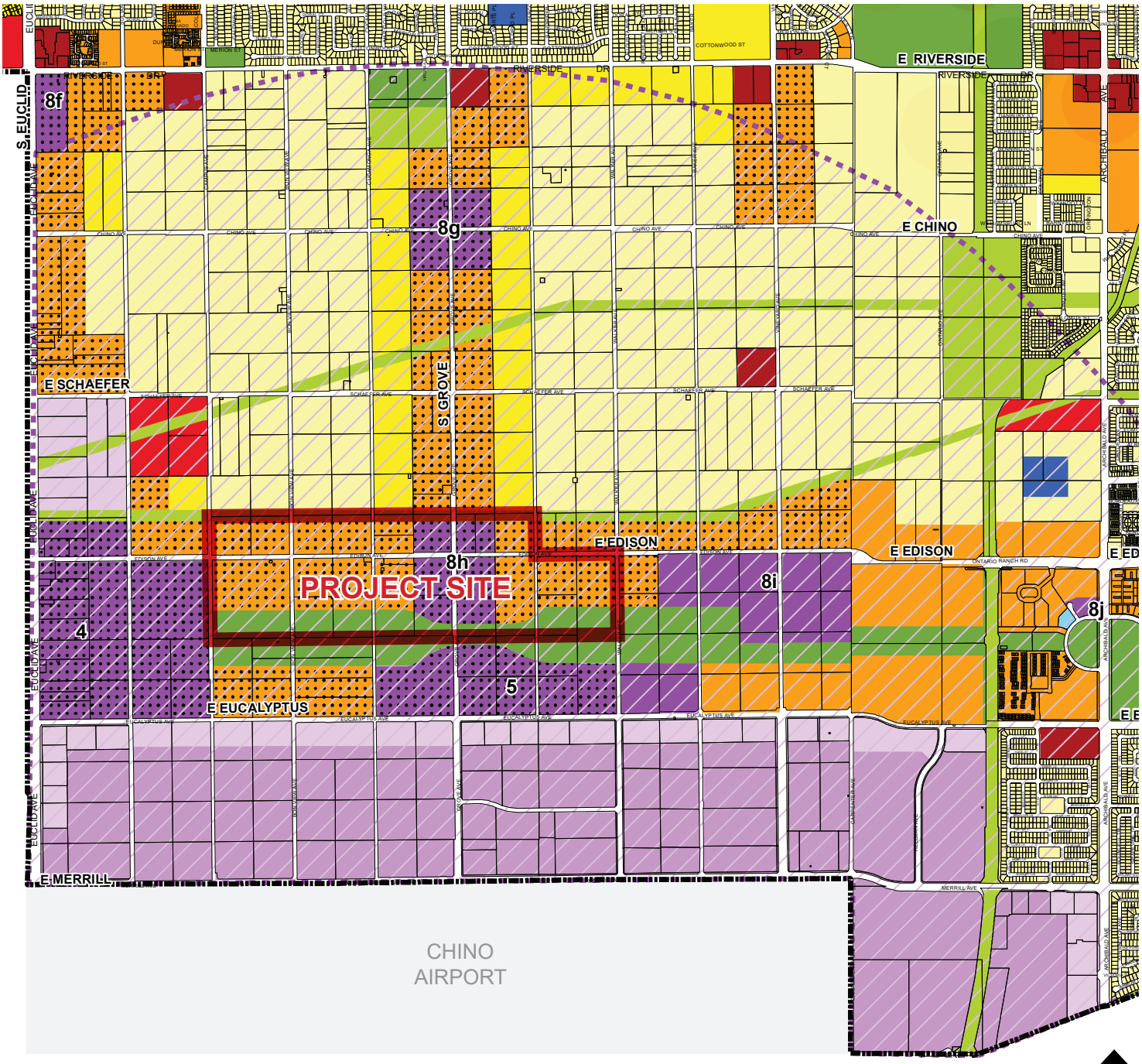


**LEGEND**

**Residential**
- Rural (0 - 2 du/ac)
- Low Density (2.1 - 5 du / ac)
- Low-Medium Density (5.1 - 11 du / ac)
- Medium Density (11.1 - 25 du / ac)
- High Density (25.1 - 45 du / ac)

**Mixed Use**
- Mixed Use

**Retail/Service**
- Neighborhood Commercial (0.4 FAR)
- General Commercial (0.4 FAR)
- Office Commercial (0.75 FAR)
- Hospitality (1.0 FAR)

**Employment**
- Business Park (0.6 FAR)
- Industrial (0.55 FAR)

**Other**
- Open Space - Non-Recreation
- Open Space - Parkland
- Open Space - Water
- Public Facility
- Public School
- Airport
- Rail
- Landfill

**Overlays**
- Business Park
- Industrial
- Landfill Impact Area
- AH - Affordable Housing
- Chino AIA - Chino Airport Influence Area

*Source: CenterPark Specific Plan Exhibit 2-1, Chino Airport Influence Area, 2025.*

**Figure 3-6:** Land Use and Zoning
*CenterPark Specific Plan, City of Ontario*

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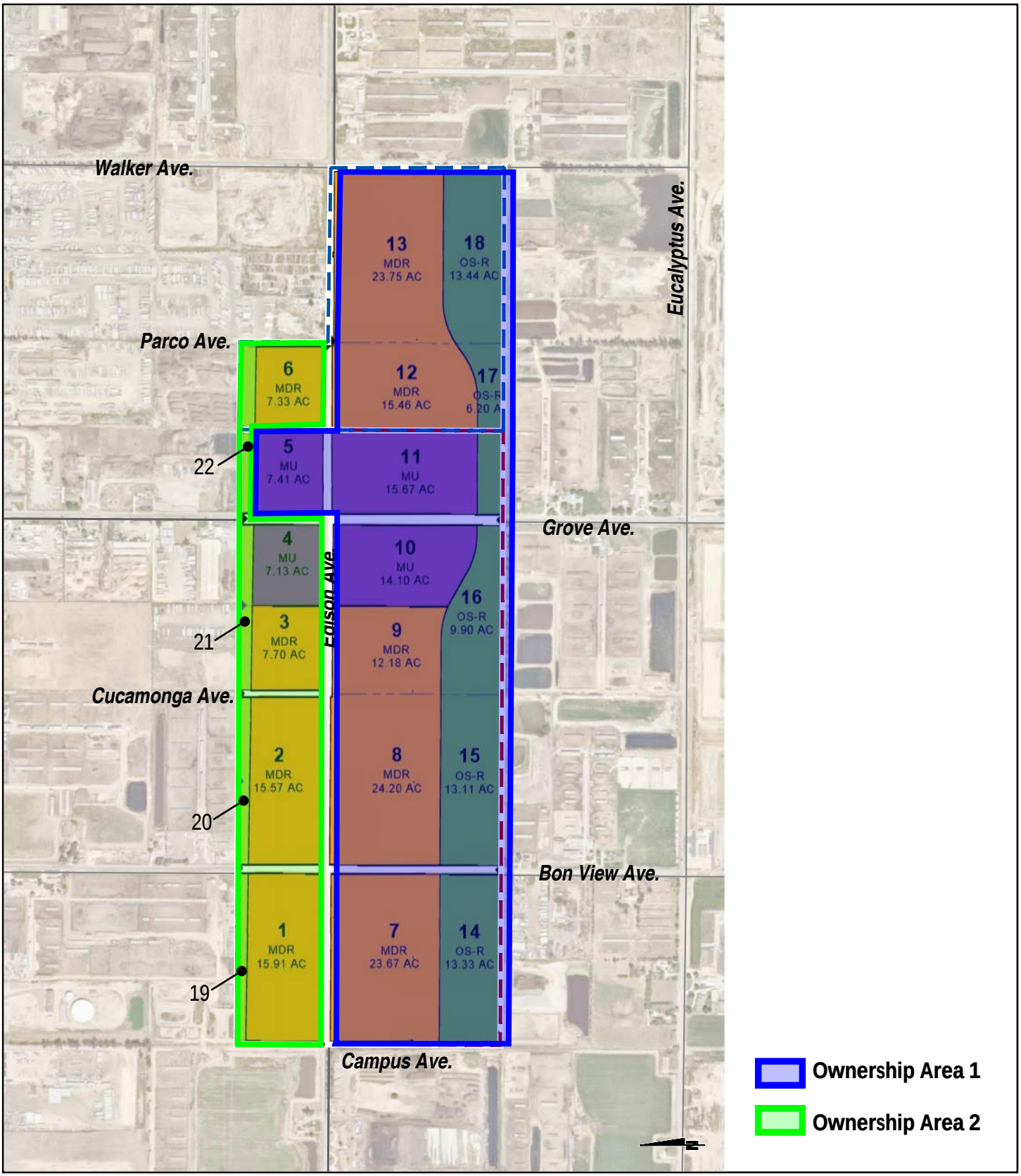


*Source: CenterPark Specific Plan Traffic Analysis, Exhibit 1-2 Preliminary Land Use Plan and Phasing Plan, 2025.*

**Figure 3-7:** Project Area Ownership
*CenterPark Specific Plan*

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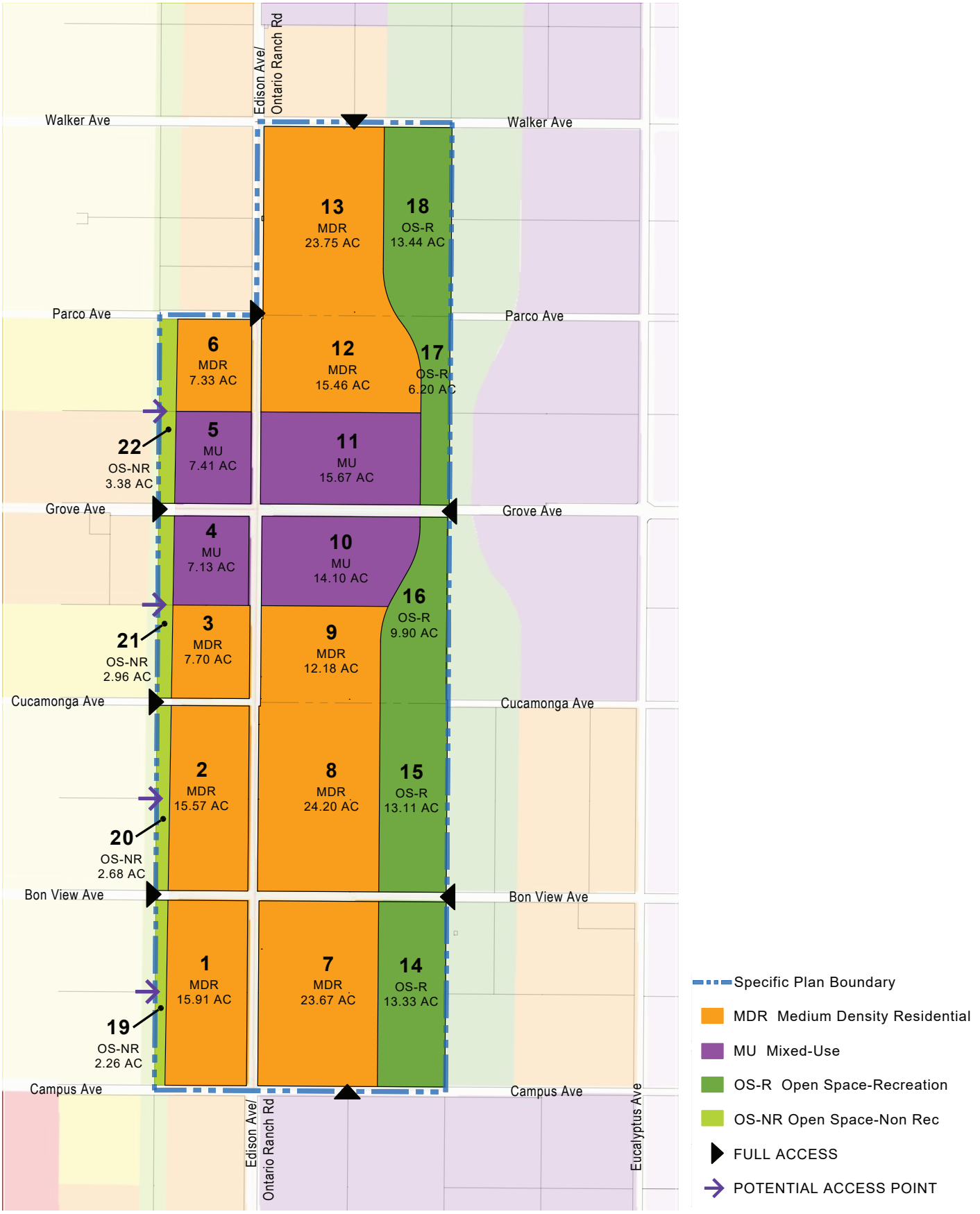


*Source: CenterPark Specific Plan Exhibit 1-3 Land Use Plan, 2025.*

**Figure 3-8:** Land Use Plan
*CenterPark Specific Plan, City of Ontario*

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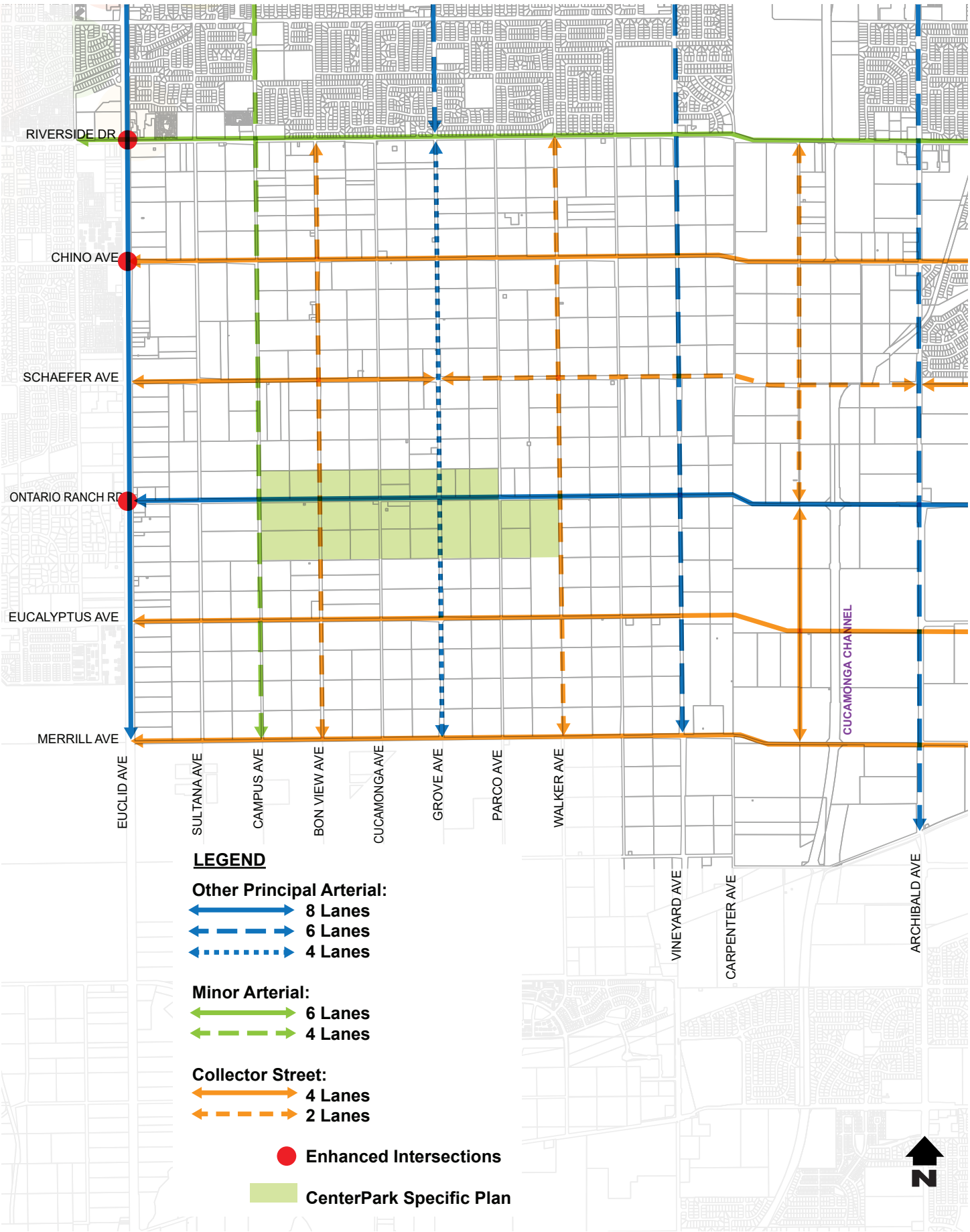


*Source: CenterPark Specific Plan Exhibit 5-1 City of Ontario Road Classification System, 2025.*

**Figure 3-9:** City of Ontario Road Classification System
*CenterPark Specific Plan, City of Ontario*

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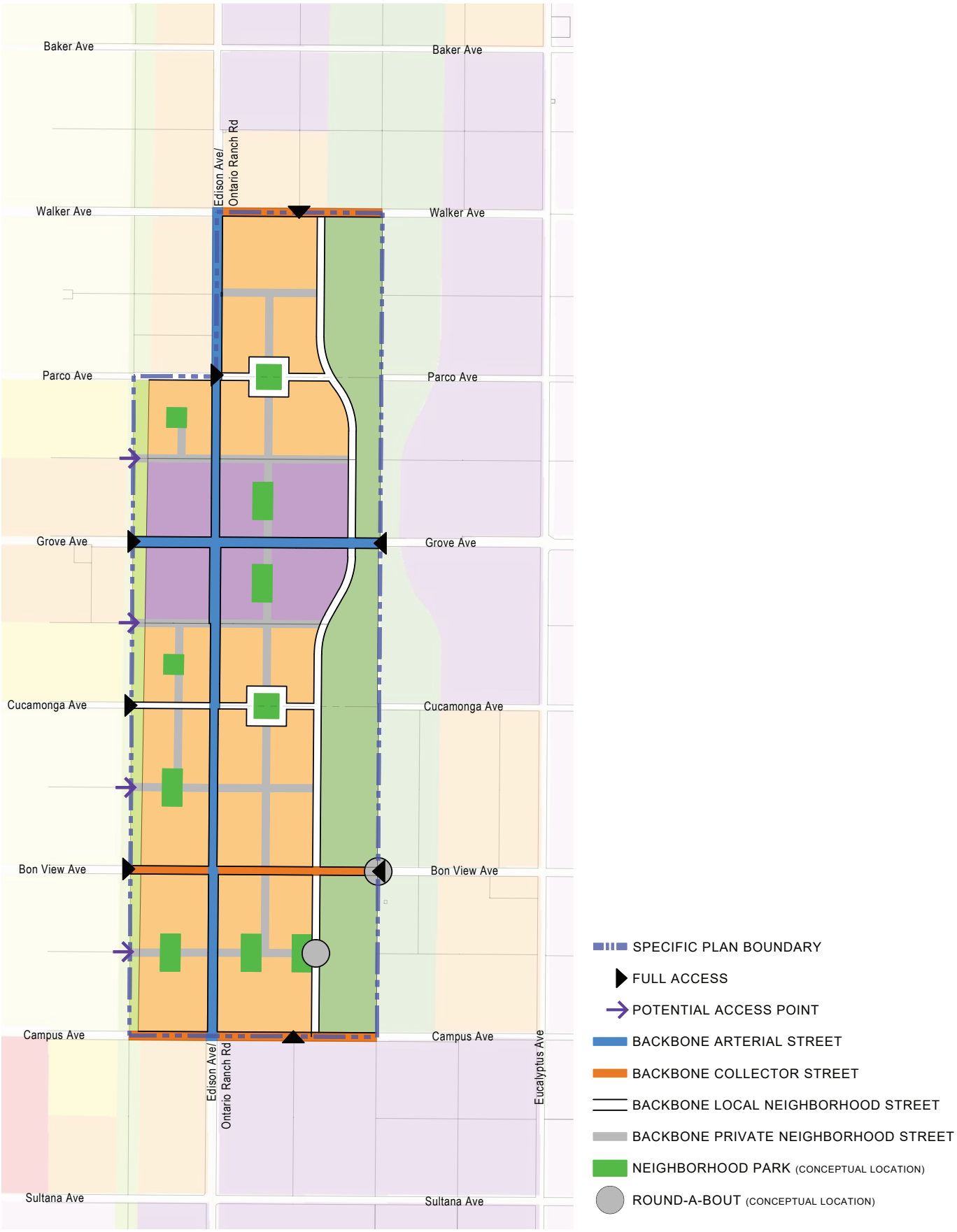


*Source: CenterPark Specific Plan Exhibit 5-2 Conceptual Circulation Plan, 2025.*

**Figure 3-10:** Conceptual Circulation Plan

*CenterPark Specific Plan, City of Ontario*

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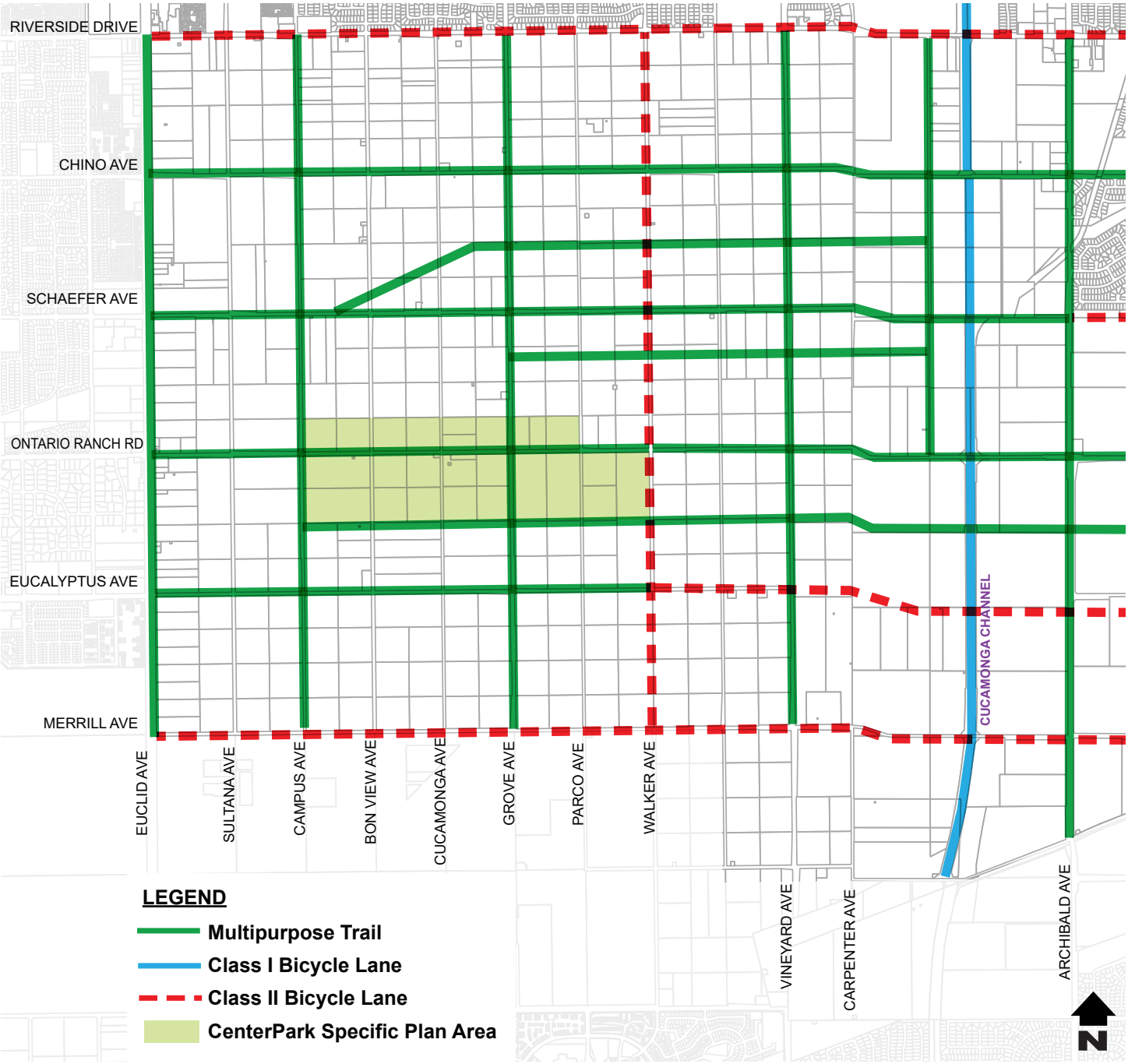


*Source: CenterPark Specific Plan Exhibit 5-12 Conceptual Pedestrian and Regional Trail Circulation Plan, 2025.*

**Figure 3-11:** Conceptual Pedestrian and Regional Trail Circulation Plan
*CenterPark Specific Plan, City of Ontario*

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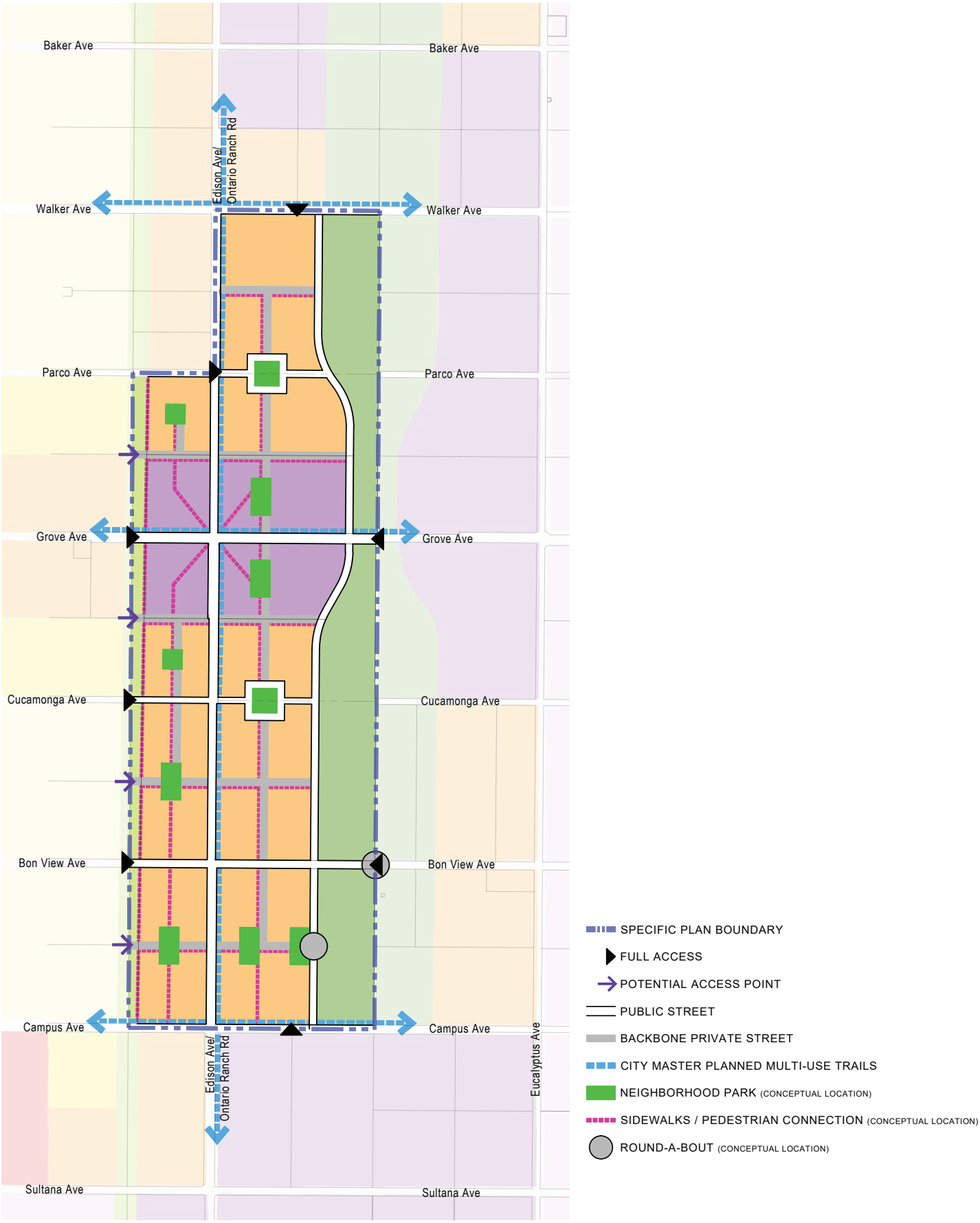


*Source: CenterPark Specific Plan Exhibit 5-13 Internal Pedestrian Circulation Plan, 2025.*

**Figure 3-12:** Internal Pedestrian Circulation Plan

*CenterPark Specific Plan, City of Ontario*

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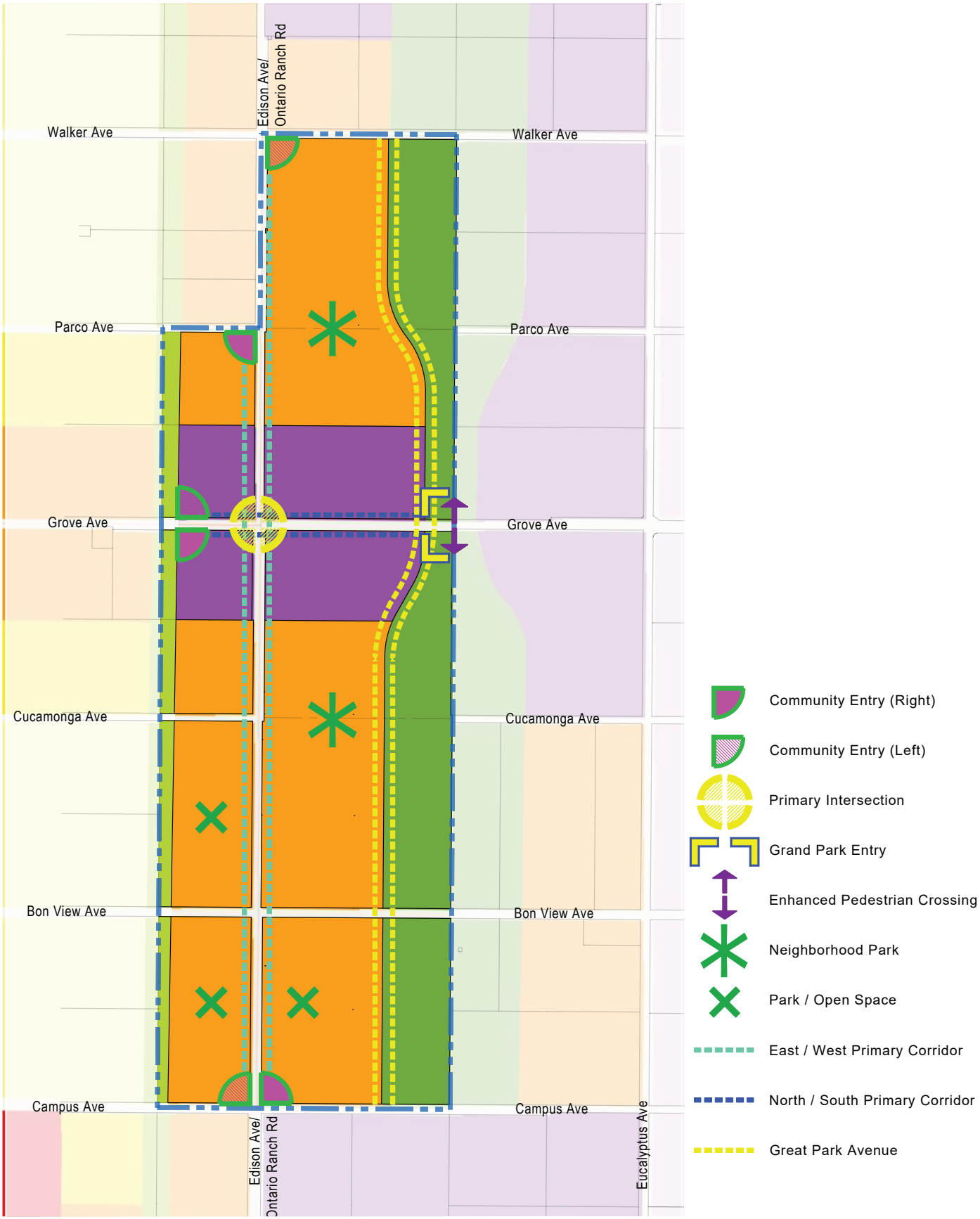


*Source: CenterPark Specific Plan Exhibit 7-10 Landscape Framework Plan, 2025.*

**Figure 3-13:** Conceptual Landscape Plan

*CenterPark Specific Plan, City of Ontario*

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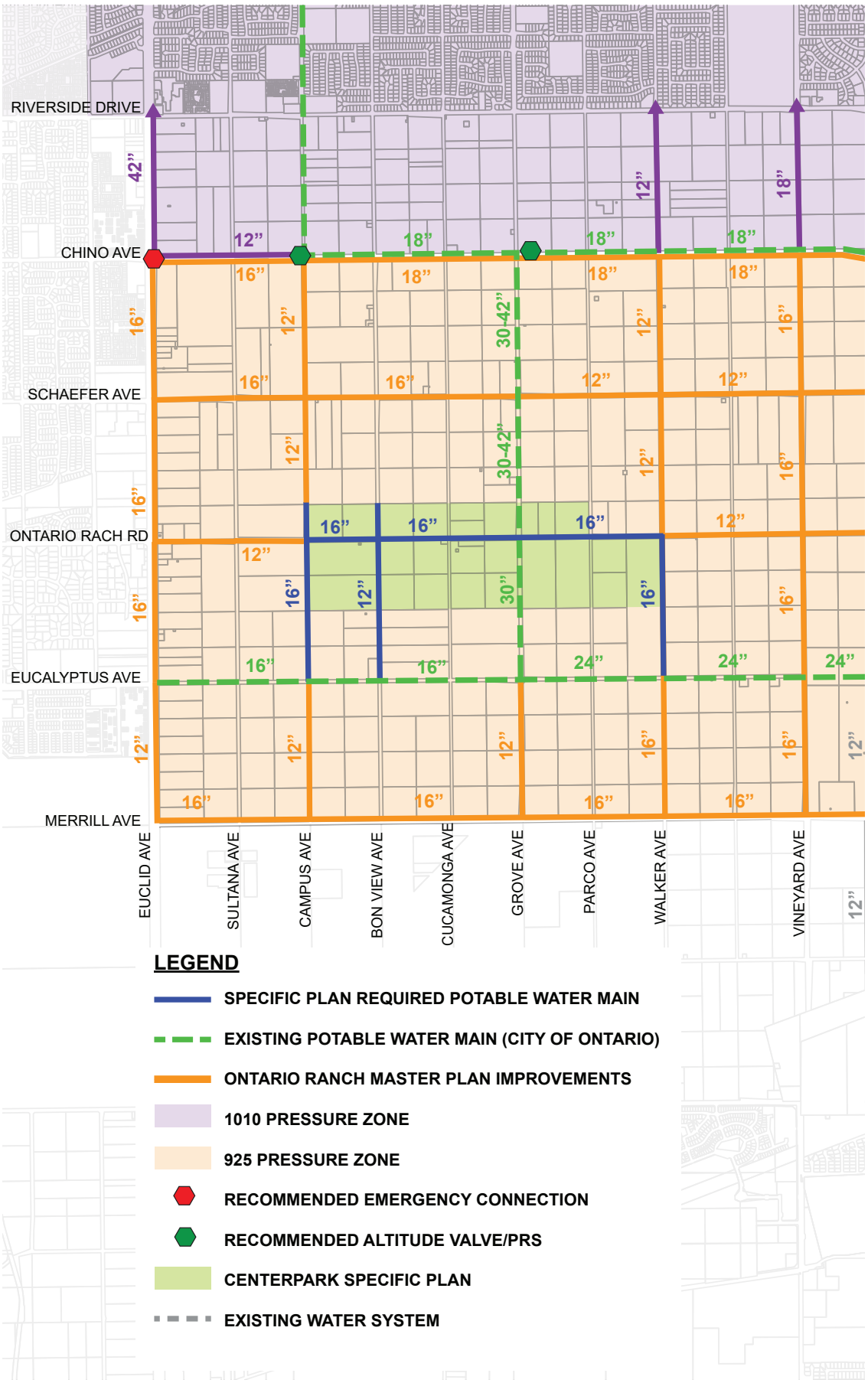


*Source: CenterPark Specific Plan Exhibit 5-14 Conceptual Potable Water Master Plan, 2025.*

**Figure 3-14:** Conceptual Potable Water Master Plan

*CenterPark Specific Plan, City of Ontario*

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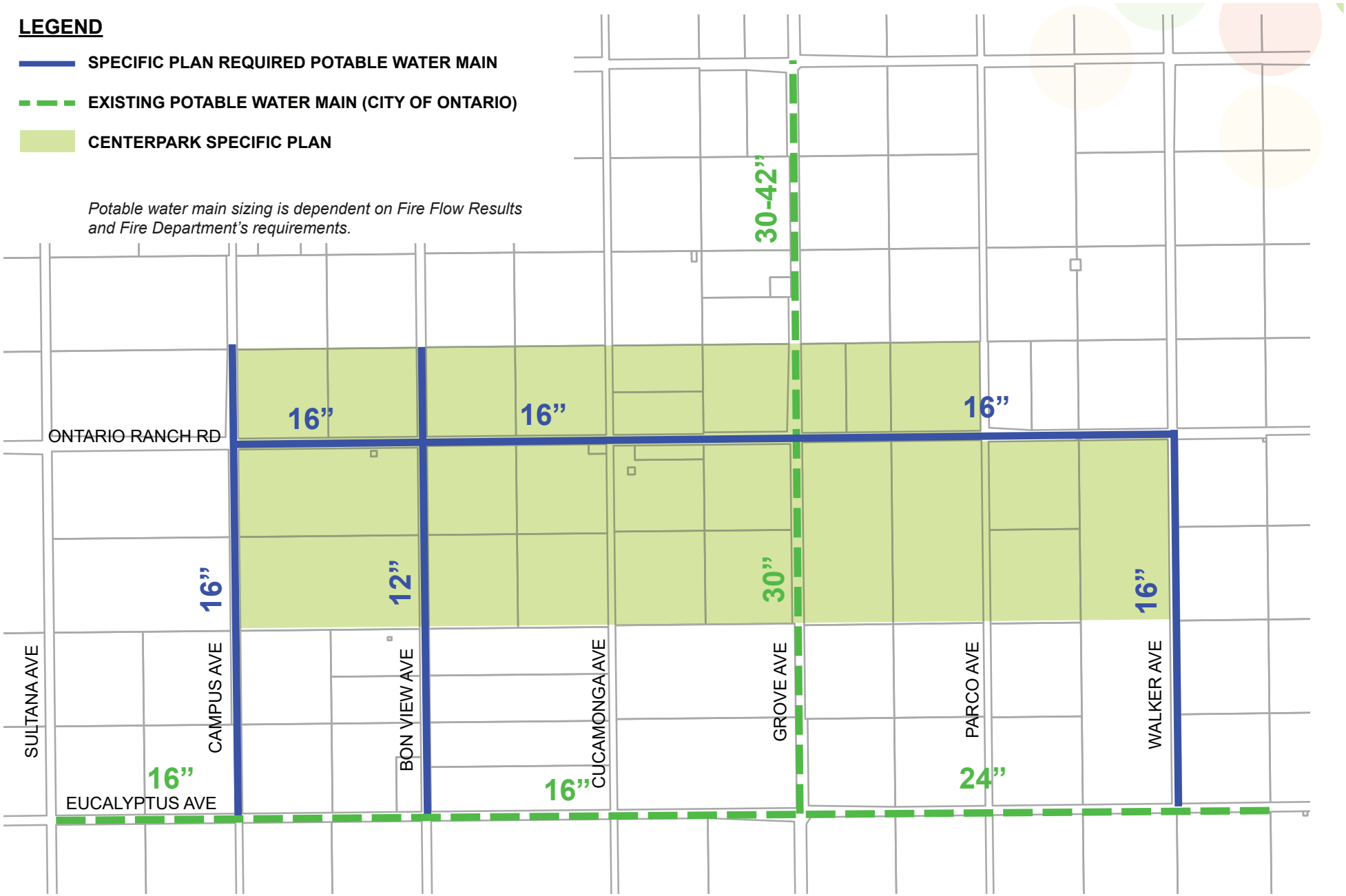


*Source: CenterPark Specific Plan Exhibit 5-15 Conceptual Potable Water System, 2025.*

**Figure 3-15:** Conceptual Potable Water System
*CenterPark Specific Plan, City of Ontario*

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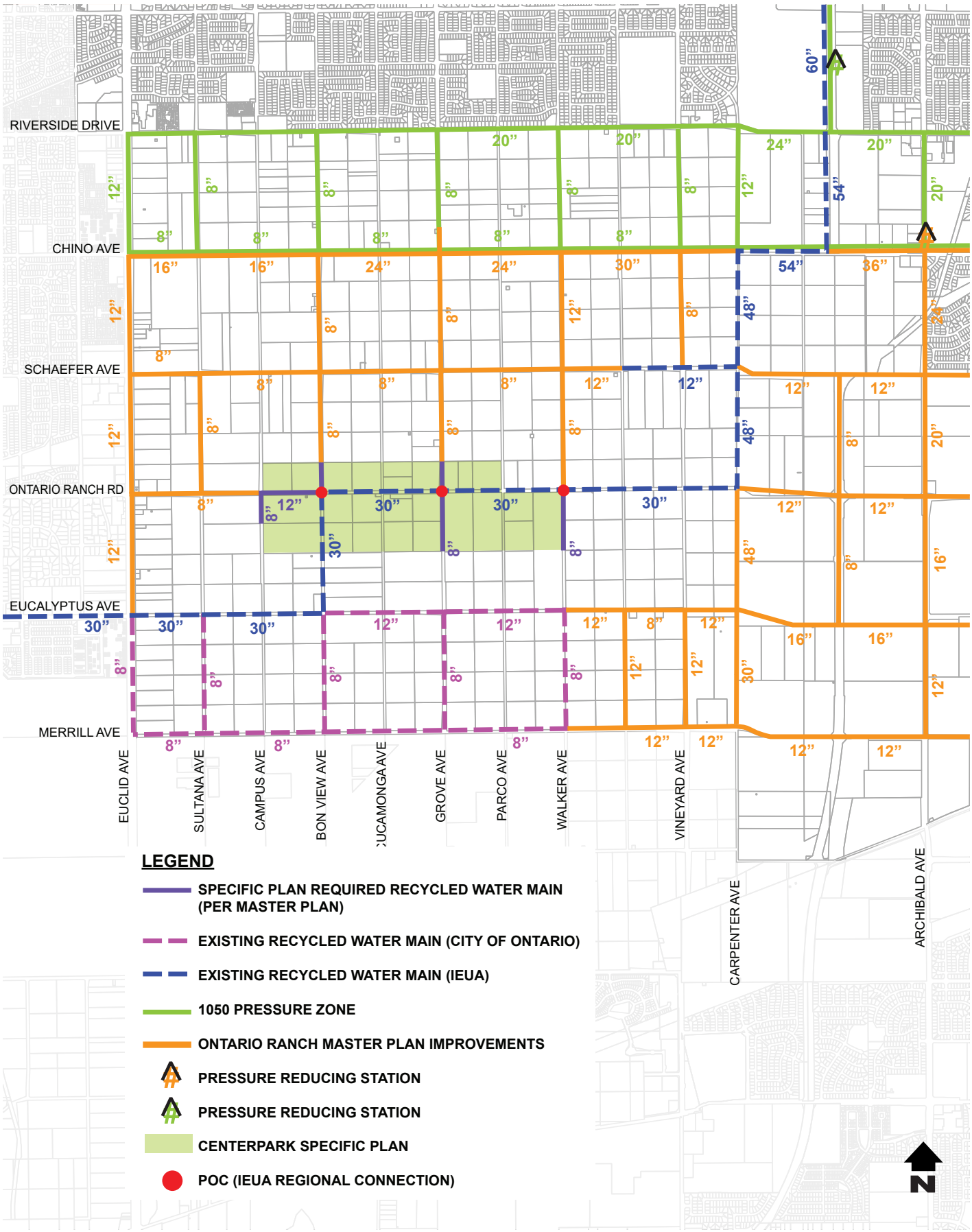


*Source: CenterPark Specific Plan Exhibit 5-16 Conceptual Recycled Water Master Plan, 2025.*

**Figure 3-16:** Conceptual Recycled Water Master Plan

*CenterPark Specific Plan, City of Ontario*

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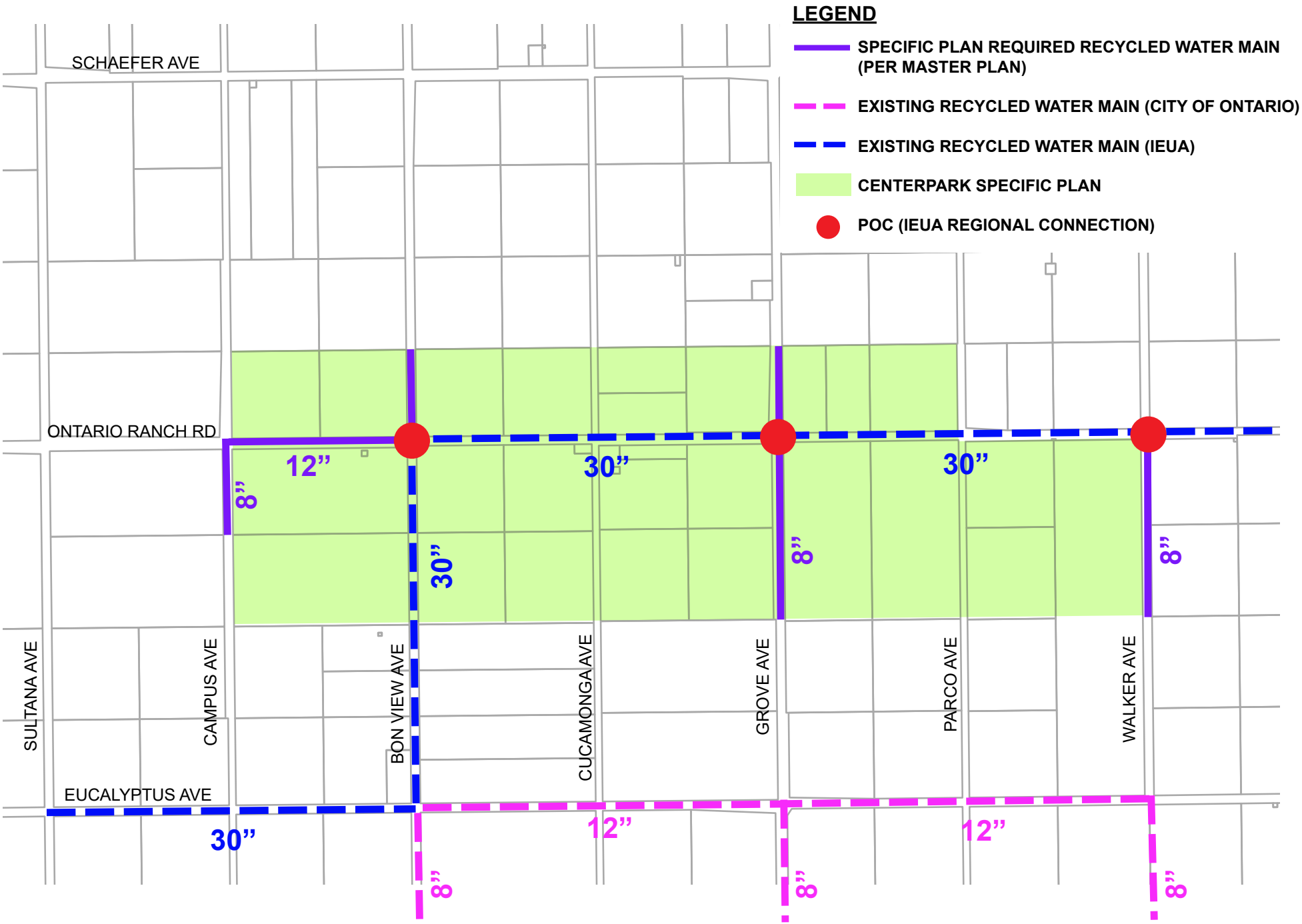


*Source: CenterPark Specific Plan Exhibit 5-17 Conceptual Recycled Water System, 2025.*

**Figure 3-16:** Conceptual Recycled Water System
*CenterPark Specific Plan, City of Ontario*

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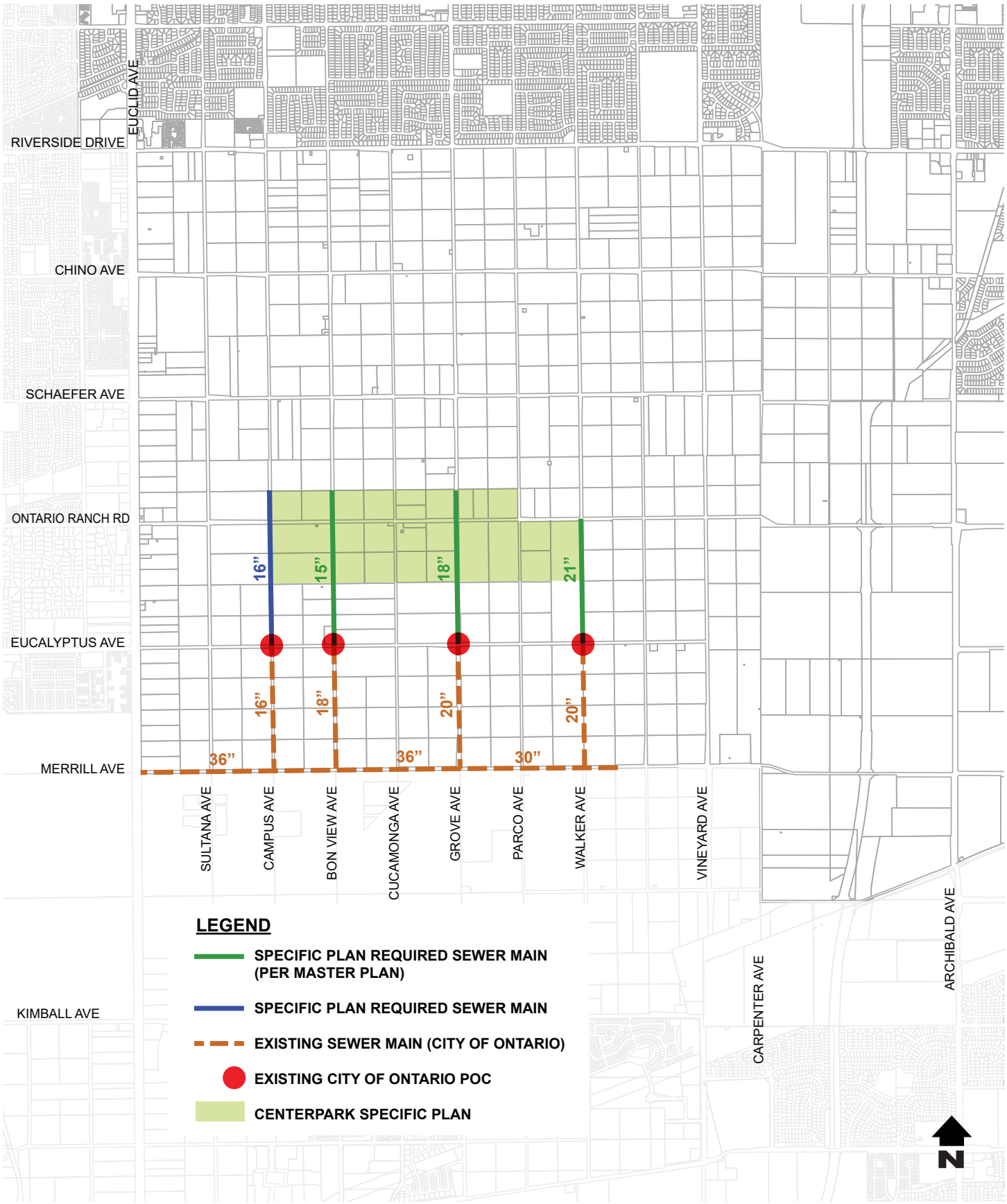


*Source: CenterPark Specific Plan Exhibit 5-18 Conceptual Sewer Master Plan, 2025.*

**Figure 3-18:** Conceptual Sewer Master Plan

*CenterPark Specific Plan, City of Ontario*

Not to scale

Kimley»Horn

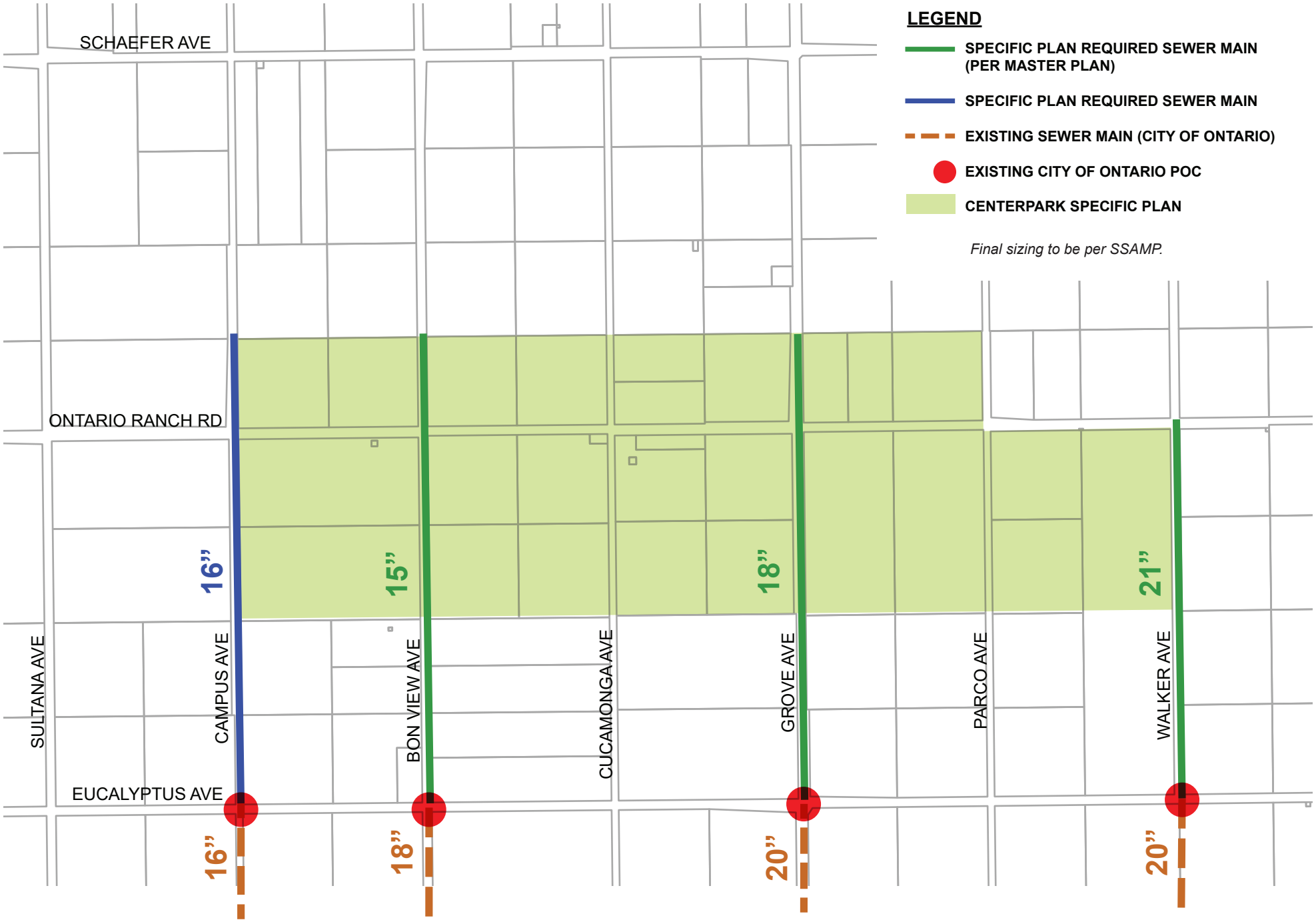


*Source: CenterPark Specific Plan Exhibit 5-19 Conceptual Sewer System, 2025.*

**Figure 3-19:** Conceptual Sewer System
*CenterPark Specific Plan, City of Ontario*

Not to scale

Kimley»Horn

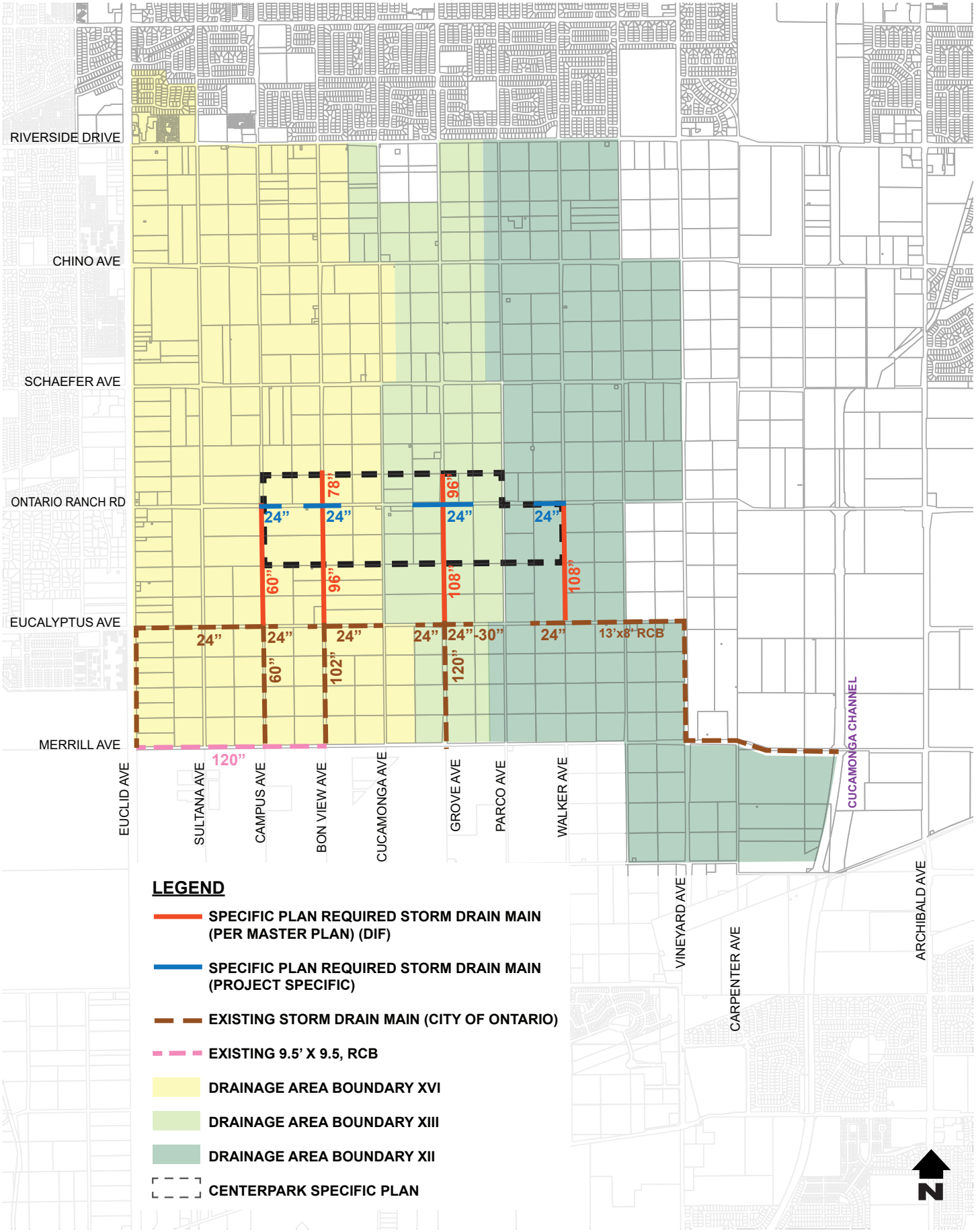


*Source: CenterPark Specific Plan Exhibit 5-20 Conceptual Drainage Master Plan, 2025.*

**Figure 3-20:** Conceptual Drainage Master Plan

*CenterPark Specific Plan, City of Ontario*

Not to scale

Kimley»Horn

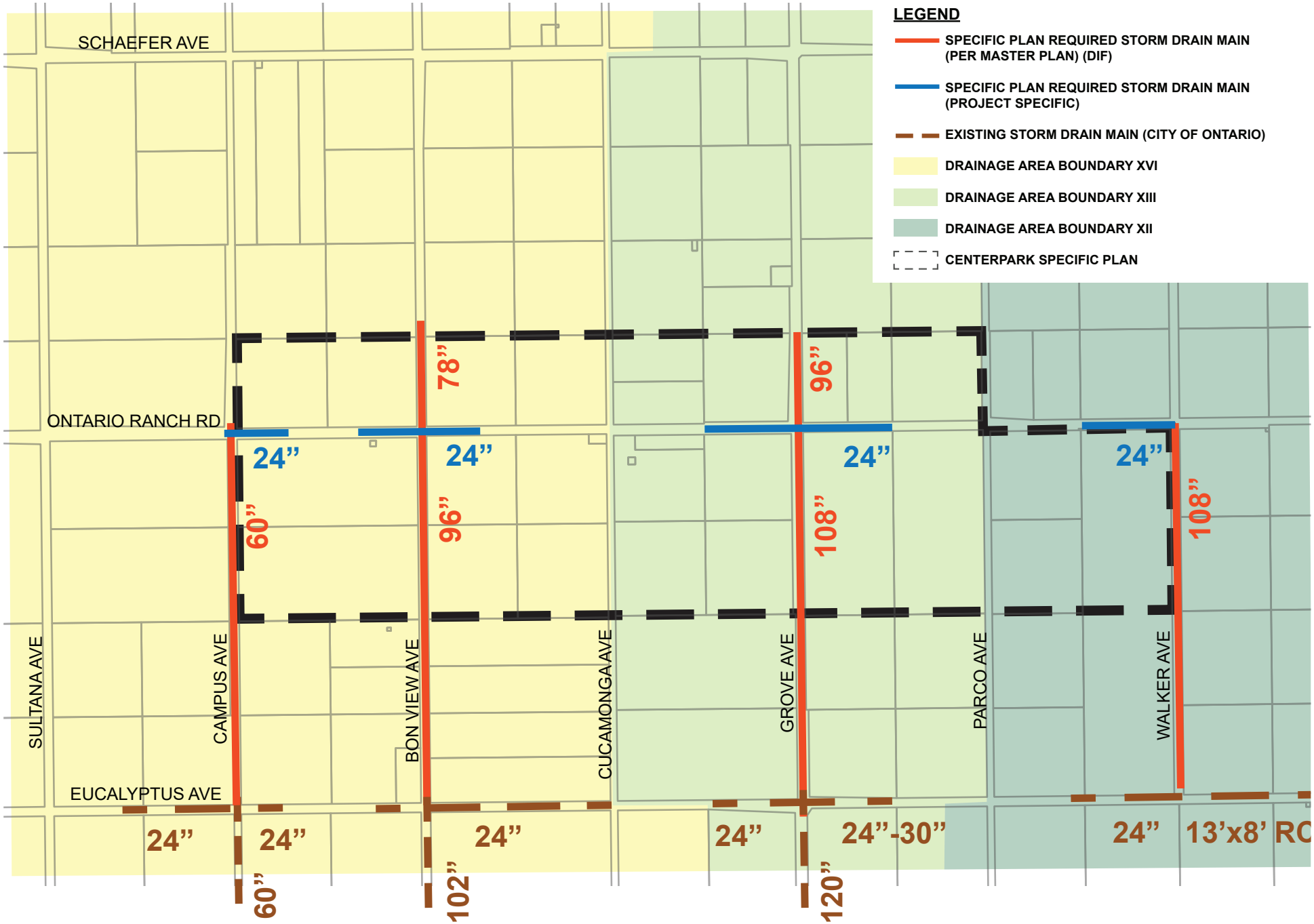


*Source: CenterPark Specific Plan Exhibit 5-21 Conceptual Storm Drain Improvements, 2025.*

**Figure 3-21:** Conceptual Storm Drain Improvements
*CenterPark Specific Plan, City of Ontario*

Not to scale

Kimley»Horn

*Source: CenterPark Specific Plan Exhibit 5-23 Fiber Optic Master Plan, 2025.*

**Figure 3-22:** Fiber Optic Master Plan

*CenterPark Specific Plan, City of Ontario*

Not to scale

Kimley»Horn

*Source: CenterPark Specific Plan Exhibit 5-23 Fiber Optic Master Plan, 2025.*

**Figure 3-22:** Fiber Optic Master Plan

*CenterPark Specific Plan, City of Ontario*

Not to scale

Kimley»Horn

# 4. ENVIRONMENTAL EVALUATION

This checklist provides an analysis of potential environmental impacts resulting from the Project. Following the format of CEQA Guidelines Appendix G, environmental effects are evaluated to determine if the Project would result in a potentially significant impact triggering additional review under Guidelines Section 15183.

- Items checked "Peculiar Project Impact" are impacts peculiar to the Project that were not analyzed in prior EIR and cannot be substantially mitigated by the imposition of uniformly applied development policies or standards. If the Project has a peculiar impact, but those impacts were either addressed in the prior EIR or can be "substantially mitigated" through application of uniformly applied development policies or standards, then this box is not checked, and no further EIR is required. (State CEQA Guidelines Section 15183(b)(1)(f)).
- Items checked "Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR" indicates the Project could result in a significant offsite or cumulative impact that was not discussed in the Prior EIR. Such an off-site or cumulative Project impact is not significant (the box is not checked) if it can be substantially mitigated by the imposition of uniformly applied development policies or standards. (State CEQA Guidelines Section 15183(b)(3),(c),(f)).
- Items checked "Substantially More Severe Impact Based on Substantial New Information" indicates that there is new information that indicates a Project impact is substantially more severe than discussed in the prior EIR. Such an impact is not significant (the box is not checked) if it can be substantially mitigated by the imposition of uniformly applied development policies or standards. (State CEQA Guidelines Section 15183(b)(4)(c)(f)).
- Items checked "No New Impact" indicates that potential impacts from the Project have been adequately analyzed in the prior EIR.

A project does not qualify for a Section 15183 exemption if it is determined that it would result in: 1) a peculiar impact that was not identified as a significant impact under the TOP 2050 Supplemental EIR; 2) a more severe impact due to new information; or 3) a potentially significant off-site impact or cumulative impact not discussed in the TOP 2050 Supplemental EIR.

A summary of staff's analysis of each potential environmental effect is provided below the checklist for each subject area. **Appendix A** contains a list of TOP 2050 Supplemental EIR mitigation measures.

This section provides evidence to substantiate the conclusions in the environmental checklist. The section briefly summarizes the conclusions of the TOP 2050 Supplemental EIR and then discusses whether or not the proposed Project is consistent with the findings contained in the TOP 2050 Supplemental EIR, or if further analysis is required pursuant to CEQA. Mitigation measures referenced herein are from the TOP 2050 Supplemental EIR.

## 4.1 Aesthetics

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Except as provided in Public Resources Code Section 21099, would the project:** | | | | |
| **Criterion 1:** Have a substantial adverse effect on a scenic vista? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Substantially damage scenic resources, including, but not limited to trees, and rock outcroppings and historic buildings within a scenic highway? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings. If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** Create a new source of substantial light and glare which would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts associated with development resulting from implementation of TOP 2050 would be less than significant with respect to aesthetics.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project have a substantial adverse effect on a scenic vista?

A scenic vista can be defined as a viewpoint that provides expansive views of a highly valued landscape for the public's benefit. From the viewshed point of view, looking north from Edison Avenue/Ontario Ranch Road, are the foothills of the San Gabriel and San Bernardino Mountains. The Project site is surrounded by areas with varying agricultural and residential densities of previously developed land containing dairy farms; multiple commercial and residential buildings; and an airport.

Scenic vistas include the San Gabriel Mountains and the San Bernardino National Forest, which are located approximately 11.6 miles north from the Project site. Construction of Ownership Area 1 would result in alterations to the existing views of the scenic vistas from along Edison Avenue/Ontario Ranch Road from Campus Avenue to Walker Avenue to the east. Visual changes would include alterations in the appearance of the foreground to viewers looking across the site toward the San Gabriel Mountains. Views of the San

Gabriel Mountains are already partially obstructed by intervening agricultural development and existing powerlines. While construction activities on Ownership Area 1 would modify foreground views as observed by some viewers, considering the existing disturbed nature of the site, developed nature of surrounding areas, and the currently partially obscured, views from existing off-site development, the changes the construction activities would represent are not substantial. Additionally, because most views are already obscured, limited, and short-in duration, the views as seen by the majority of viewers (i.e., from existing public viewpoints along Edison Avenue and adjacent properties to the north) would not be significantly adversely affected. Therefore, while construction of Ownership Area 1 would change the existing views toward the scenic views, impacts associated with adversely affecting a scenic vista would be less than significant.

Upon completion of construction on the Ownership Area 1, the buildings would be a new permanent visual element in the environment. Ownership Area 1 would be developed within an existing urban footprint, with setbacks from the existing Edison Avenue/Ontario Ranch Road that are reflective of planned road widening (Specific Plan Section 6, Development Regulations).[4] The new structures and operations associated with the Project would change the foreground views of the San Gabriel Mountains as observed from viewers looking north, across the site. However, development of Ownership Area 1 would occur within a developed area of the City, where views are already partially obstructed by existing development, powerlines, utility poles, etc. Additionally, the TOP 2050 Supplemental EIR determined that development within the low-lying areas of the City would not have the potential to alter scenic views provided by the backdrop of the San Gabriel Mountains as the peaks rise to 7,000 feet above mean sea level. As discussed in **Section 2, Project Summary**, the Project site consists of a relatively flat land elevation and Project site elevations range from approximately 700 feet amsl in the northeast portion of the site to approximately 680 feet amsl in the southwest portion of the site. The CenterPark Specific Plan also includes design guidelines addressing architecture, landscaping, and lighting (Specific Plan Section 7, Design Guidelines). Pursuant to the CenterPark Specific Plan design guidelines and development standards, the major north-south streets would be designed to frame the views of the San Gabriel Mountains through the addition of landscaping and enhanced framing utilizing trees. Additionally, pursuant to the Project's Specific Plan, Project development would not exceed the City's maximum building height allowed for the residential portions of 58 feet, and mixed-use district, 55 feet, and would be setback, allowing for unobstructed scenic views (Specific Plan Section 6, Development Regulations). Additionally, implementation of TOP 2050 policies and adherence to the Ontario Municipal Code (OMC), would ensure that the development of Ownership Area 1 does not substantially degrade scenic vistas in the City. For example, the Project would comply with TOP 2050 Policy CD-1.5, which would ensure that major north-south streets would be designed and redeveloped to feature views of the San Gabriel Mountains. Therefore, while the structures and associated operations within Ownership Area 1 would change the existing views looking toward the mountains, impacts associated with adversely affecting a scenic vista would be less than significant. There is no peculiar impact and no mitigation is required.

[4] TOP 2050's Mobility Element designates Edison Avenue/Ontario Ranch Road as an "8-Lane Other Principal Arterial" (160 ft right-of-way). Currently, Edison Avenue, which transects the Project site in an east-west direction, is a two-lane roadway. Therefore, compared to existing conditions, public views from Edison Avenue/Ontario Ranch Road would be expanded.

**Criterion 2:** Would the project substantially damage scenic resources, including, but not limited to trees, and rock outcroppings and historic buildings within a scenic highway?

There are no officially designated state scenic highways within the City.[5] As stated above, Euclid Avenue (SR-83) is approximately 0.6 mile west of the Project site, which connects to SR-60 and I-10 to the north, I-15 approximately 4 miles to the east of the Project site, SR-60, approximately 2 miles to the north, and SR-71, approximately 4.2 miles to the east. SR-71 connects the Project to SR-91 in Riverside County. These segments have not been designated as scenic highways by Caltrans.[6] The nearest designated state scenic highway to the Project site is a segment of SR-91, located approximately 15 miles southwest of the Project site between the junction of State Route 55 and the east city limits of Anaheim. Therefore, no scenic resources such as trees, rock outcroppings and historical buildings are known to exist on the Project site adjacent to a state scenic highway. There is no peculiar impact and no mitigation is required.

**Criterion 3:** In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings. If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

The existing visual character of Ownership Area 1 is defined primarily by agricultural uses and related structures. The site is designated as Medium Density Residential, Mixed-Use, Open Space – Recreation, and Open Space – Non-Recreation, in the City's TOP 2050 Land Use Map.[7] The Project site is located in an urbanized area and is subject to the City's TOP 2050 and Development Code governing scenic quality. The City's TOP 2050 Community Design Element establishes multiple policies that protect scenic resources and promote high quality, visually compatible development, that the Project must adhere to and that are reflected in the Specific Plan. For example, Policy CD-2.1, encourages "all development projects to convey visual interest and character through building volume, massing, and height to provide context-appropriate scale and proportion; a true architectural style which is carried out in plan, section, and elevation through all aspects of the building and site design and appropriate for its setting; and exterior building materials that are articulated, high quality, durable, and appropriate for the architectural style." Lastly, Policy CD 2-9 encourages "durable, sustainable, and drought-tolerant landscaping materials and designs that enhance the aesthetics of structures, create and define public and private spaces, and provide shade and environmental benefits." As stated in the Project's Specific Plan Section 7, Community Design Guidelines, "architectural design should provide for high-quality neighborhoods"; "building design should be sensitive to climatic conditions and context"; and "architectural design should incorporate materials and techniques that are cost-effective." To this end, the Project's Specific Plan includes design guidelines that conform architectural and landscape considerations (e.g., building materials, massing, height, style, setbacks, building orientation, and landscape requirements) to TOP 2050.

The City's TOP 2050 measures governing scenic quality, including those noted above, ensure protection of scenic resources and promote visually compatible and appealing development. These policies are implemented through Development Code Chapter 6.0, Development and Subdivision Regulations, et al.

[5] California Department of Transportation. 2022. *Scenic Highways Map*. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways (accessed February 2025).
[6] Ibid.
[7] City of Ontario. 2022. *TOP 2050, Figure LU-01, Official Land Use Plan*. https://content.ontarioca.gov/sites/default/files/2024-12/TOPLUP_Map%2824x36%2910_6_20240905_0.pdf (accessed February 2025).

The City would ensure that the Project, as implemented, contains Development Regulations and Design Guidelines that would conform to provisions of the City's TOP 2050 and Development Code. Specifically, all subsequent development within the Project site would also be required to comply with the Specific Plan Development Regulations and Design Guidelines addressing visual and scenic qualities (Specific Plan Section 7, Design Guidelines). Conformance with TOP 2050, Development Code, and CenterPark Specific Plan would minimize the potential for the Project to substantially degrade the existing visual character or quality of public views of the site and its surroundings. There is no peculiar impact and no mitigation is required.

**Criterion 4:** Would the project create a new source of substantial light and glare which would adversely affect day or nighttime views in the area?

Spill light occurs when lighting fixtures such as streetlights, parking lot lighting, exterior building lighting, and landscape lighting are not properly aimed or shielded to direct light to the desired location and light escapes and partially illuminates a surrounding location.

Glare is the result of improperly aimed or blocked lighting sources that are visible against a dark background such as the night sky. Glare may also refer to the sensation experienced looking into an excessively bright light source that causes a reduction in the ability to see or causes discomfort. Glare generally does not result in illumination of off-site locations but results in a visible source of light viewable from a distance. Glare could also occur from building materials of the new structures, including glass and other reflective materials.

The Project site is currently comprised of existing agricultural uses, including the raising of livestock, field crop farming, dairy farming activities, and rural residences scattered throughout the area. Existing uses surrounding the Project site are similar to those on the site. Sources of light and glare exist minimally in the Project's immediate vicinity. Existing lighting sources include outdoor lighting and lighting emitted from the indoors from adjacent developments, and vehicle headlights from adjacent and surrounding roadways. The urbanizing nature of the Project area would lead to a high baseline of light and glare from surrounding development and vehicle lights traveling at night. Construction of Ownership Area 1 would be limited to daytime hours, and nighttime lighting may be utilized for security purposes, consistent with the OMC Section 5-29.09. However, all lighting and light fixtures, including parking lot lighting, security lighting and decorative lighting, may be indirect or diffused, or, if not, shall be shielded or directed away from nearby sensitive receptors. Therefore, no short-term impacts associated with light and glare would occur. These lights would be used to improve visibility and safety on the site and would be directed to maximize site visibility and minimize glare to sensitive receptors. Lighting would also be properly screened to avoid further impact to nearby receptors. Additionally, the Project's Specific Plan includes design guidelines and standards for lighting of on-site areas (Specific Plan Section 7, Design Guidelines). The Project requires lighting fixtures to be selected and located to confine the area of illumination to within the site boundaries, including lighting for parking areas, pedestrian walkways, graphics and signage, architectural and landscape features, and any additional exterior areas. This would reduce the potential for spill light. All subsequent development within the Project site would be required to conform with the Project Development Regulations and Design Guidelines addressing light, glare, and overspill from the CenterPark Specific Plan.

In accordance with OMC Sections 4-11.08, 4-11.09, and 6.03.050 (A), all parking facilities developed shall be provided with nighttime security lighting and designed to confine emitted light to the parking areas. This lighting may cause slight glare to the surrounding residences and vehicles passing along the bordering roadways. The maximum permitted height of luminaires within a parking lot shall not exceed a height of 14 feet when there is no cutoff involved. If a ninety degree or greater cutoff is enacted, the maximum height shall not exceed that of 24 feet. Anything less than ninety degrees of cutoff, the maximum height of luminaire shall be 30 feet.

Consistent with the City's Development Code, all lighting used on the Project site is required to be directed and/or shielded to prevent the light from adversely affecting adjacent properties, and no structures or features that create adverse glare effects are permitted. Thus, all exterior lighting would be shielded/hooded to prevent light trespass onto nearby properties. Additionally, the Project would use a variety of non-reflective building materials, and although some new reflective improvements (i.e., windows and building front treatments) would be introduced to the site, the Project would not be a source of glare in the area. Therefore, long-term impacts associated with light, and glare would be less than significant. There is no peculiar impact and no mitigation is required.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the new permanent visual element in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. According to the TOP 2050 Supplemental EIR, development under TOP 2050 would alter the visual appearance of the Ontario Ranch from rural agriculture to low and low-medium density residential land uses and office/industrial mixed uses. However, the scale and design of the City would not deter views of the San Gabriel Mountains, which are the dominant scenic resource in the City of Ontario. Regulations such as the City's Municipal Code and policies as part of the TOP 2050 would ensure that increased development would not impact scenic vistas. Additionally, the TOP 2050 Supplemental EIR determined that development within the low-lying areas of the City would not have the potential to alter scenic views provided by the backdrop of the San Gabriel Mountains as the peaks rise to 7,000 feet above mean sea level. As discussed in **Section 2, Project Summary**, the Project site consists of a relatively flat land elevation and Project site elevations range from approximately 700 feet amsl in the northeast portion of the site to approximately 680 feet amsl in the southwest portion of the site. Therefore, while the structures and operations associated with Ownership Area 2 would alter the existing visual characteristics of the site, impacts affecting a scenic vista would be less than significant. Furthermore, the proposed CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050. There is no peculiar impact and no mitigation is required.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy CD-2.1:** **Quality Building Design and Architecture.** We encourage all development projects to convey visual interest and character through:

1. Building volume, massing, and height to provide context-appropriate scale and proportion;
2. A true architectural style which is carried out in plan, section, and elevation through all aspects of the building and site design and appropriate for its setting; and
3. Exterior building materials that are articulated, high quality, durable, and appropriate for the architectural style.

**Policy CD-2.2:** **Neighborhood Design.** We create distinct residential neighborhoods that promote a sense of community and identity by emphasizing access, connectivity, livability, and social interaction through such elements as:

1. A pattern of smaller, walkable blocks that promote activity, safety, and access to nearby amenities and services;
2. Varied parcel sizes and lot configurations to accommodate a diversity of housing types;
3. Traffic calming measures to slow traffic and promote walkability while maintaining acceptable traffic flows and emergency evacuation access;
4. Floor plans that encourage views onto the street and de-emphasize the visual and physical dominance of garages (introducing the front porch as the "outdoor living room"), as appropriate; and
5. Landscaped parkways, with sidewalks separated from the curb and designed to maximize safety, comfort, and aesthetics for all users.

**Policy CD-2.9:** **Landscape Design.** We encourage durable, sustainable, and drought-tolerant landscaping materials and designs that enhance the aesthetics of structures, create and define public and private spaces, and provide shade and environmental benefits.

**Policy CD-3.1:** **Unique Identity.** We promote development that heightens the unique character and identity of each Place Type by requiring compatible land uses and land planning, site design, and building design that promotes an active public realm.

**Policy CD-3.2:** **Comfortable, Human-Scale Public Realm.** We require that public spaces, including streets, parks, and plazas on both public and private property be designed to maximize safety, comfort and aesthetics and connect to the citywide pedestrian, vehicular, and bicycle networks.

**Policy CD-3.5:** **Active Frontages.** We create lively pedestrian streetscapes by requiring primary building, business, and residential entrances, outdoor dining, and storefronts be located on ground floors adjacent to sidewalks or public spaces and designed to maximize safety, comfort, aesthetics, and the intended functionality (as defined by the Place Type).

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

## Conclusion

With regards to the issue area of Aesthetics, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.2 Agriculture and Forestry Resources

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards*) | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:** | | | | |
| **Criterion 1:** Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** Result in the loss of forestland or conversion of forestland to non-forest use? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 5:** Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forestland to non-forest use? | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts associated with development resulting from implementation of TOP 2050 would be less than significant with respect to agriculture and forestry resources.

## Project Specific-Impacts

### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use?

In accordance with the CenterPark Specific Plan's Allowable Land Uses, commercial crop production and farming would be conditionally allowed within the Specific Plan Zoning District as temporary and interim agricultural uses. Additionally, community gardens, urban farms, and related uses would be conditionally allowed within the Medium Density Residential and Mixed-Use land use areas.

The Project site, including Ownership Area 1, has historically been used for agricultural purposes, primarily dairy operations, and field crops. According to the California Department of Conservation (DOC) approximately 20 acres of the Project site are identified as Prime Farmland, approximately 22.7 acres are identified as Farmland of Statewide Importance, approximately 5.9 acres are identified as Unique Farmland, approximately 3.1 acres are identified as grazing land, and the remaining acreage of the Project site is identified as Other Land.[8] The Project would convert the entirety of the Project site, including Ownership Area 1, from agriculture to non-agricultural urban uses. However, consistent with the TOP 2050 Supplemental EIR, which identified a less than significant impact concerning the conversion of farmland to a non-agricultural use, the Project is currently designated for non-agricultural uses (i.e., Medium-Density and Mixed-Use Residential, Mixed-Use Retail and Office, Open Space Recreation [Parkland], and Open Space Non-Recreation development). As such, implementation of the Project would not result in new impacts not identified in TOP 2050.

As identified in TOP 2050 Supplemental EIR, build out of TOP 2050would result in conversion of all agricultural-designated land to urban uses; remaining agricultural uses would be retained within 200 acres of the Southern California Agricultural Land Foundation preserves. The City determined that the mitigation proposed and considered would not prevent significant impacts from occurring, and impacts would be significant and unavoidable; however, TOP 2050 has planned for urbanization within the Ontario Ranch area. The City adopted a Statement of Overriding Considerations in 2022 for significant and unavoidable impacts to agricultural lands with full buildout of the TOP 2050 Policy Plan, which allows the decision-making body of the City to approve a project despite one or more unmitigated significant environmental impacts identified in the TOP 2050 Supplemental EIR. Therefore, consistent with Findings made at the time of certification of the City's TOP 2050 Supplemental EIR, this impact is not peculiar and remains significant and unavoidable.

**Criterion 3:** Would the project conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? *and*

[8] California Department of Conservation. 2022. *California Important Farmland Finder*. https://maps.conservation.ca.gov/DLRP/CIFF/ (accessed February 2025).

**Criterion 4:** Would the project result in the loss of forestland or conversion of forestland to non-forest use?

As determined by the TOP 2050 Supplemental EIR, the City does not contain any forestland or timberland. Implementation of TOP 2050 would not conflict with existing zoning for forestland or timberland as there are no sites zoned for timberland production within the City. Therefore, there would be no peculiar impacts related to implementation of the Project, including development on Ownership Area 1.

**Criterion 2:** Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

According to the City's Zoning Map, Ownership Area 1 is identified as Specific Plan with Agricultural Overlay (SP-AG) Overlay Zone (Right to Farm Ordinance).[9] It also contains an operational dairy farm and other structures, and equipment associated with agricultural use. Construction of this Project, including Ownership Area 1, would remove the agricultural land, converting it to Business Park and Mixed-Use uses. When the City annexed all of the land within the Ontario Ranch area, including the CenterPark Specific Plan area, it was zoned Specific Plan, with an Agricultural Overlay Zoning District (Section F of Division 5.01 of the Ontario Development Code). The Overlay Zoning provides for agricultural uses within the City on an interim basis, until such time that urban development consistent with TOP 2050 occurs. The operation of the on-site dairy and row crops and the urban development that is proposed by the CenterPark Specific Plan are consistent with this ordinance. The CenterPark Specific Plan would not conflict with the Agricultural Overlay Zoning, and impacts related to a conflict with the overlay would not occur. With Project approval, the Project's existing SP-AG overlay zone would be removed as part of Project approval, consistent with TOP 2050 goals to transition agricultural areas to urban development. Lastly, according to records from the City, there are no active Williamson Act Contracts within the Project site. Therefore, impacts of the Project regarding conflict with existing zoning for agricultural use or a Williamson Act contract would be less than significant and are not peculiar.

### Specific Plan – Ownership Area 2, Future Development Areas

According to the City's Zoning Map, Ownership Area 2 is identified as Specific Plan with Agricultural Overlay (SP-AG) Overlay Zone (Right to Farm Ordinance).[10] It also contains an operational dairy farm and other structures, and equipment associated with agricultural use. Construction of this Project would remove the agricultural land, converting it to Business Park and Mixed-Use uses. When the City annexed all of the land within the Ontario Ranch area, including the CenterPark Specific Plan area, it was zoned Specific Plan, with an Agricultural Overlay Zoning District (Section F of Division 5.01 of the Ontario Development Code). The Overlay Zoning provides for agricultural uses within the City on an interim basis, until such time that urban development consistent with TOP 2050 occurs. The operation of the on-site dairy and row crops and the urban development that is proposed by the CenterPark Specific Plan are consistent with this ordinance. The CenterPark Specific Plan would not conflict with the Agricultural Overlay Zoning, and impacts related to a conflict with the overlay would not occur and are not peculiar. With Project approval, the Project's existing SP-AG overlay zone would be removed as part of Project

[9] City of Ontario. 2022. *Zoning Map*. https://content.ontarioca.gov/government/community-development/planning/zoning-map (accessed February 2025).
[10] Ibid.

approval, consistent with TOP 2050 goals to transition agricultural areas to urban development. Lastly, according to records from the City, there are no active Williamson Act Contracts within Ownership Area 2. Therefore, impacts regarding conflict with existing zoning for agricultural use or a Williamson Act contract are not peculiar and would be less than significant.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Goal ER-5:** Protected high value habitat and farming and mineral resource extraction activities that are compatible with adjacent development.

**Policy ER-5.3:** Right to Farm. We support the right of existing farms to continue their operations within the Ontario Ranch.

**Policy ER-5.4:** Transition of Farms. We protect both existing farms and sensitive uses around them as agricultural areas transition to urban uses.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None are applicable to the Project.

### Conclusion

With regards to the issue area of Agriculture and Forestry Resources, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.3 Air Quality

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:** | | | | |
| **Criterion 1:** Conflict with or obstruct implementation of the applicable air quality plan. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Expose sensitive receptors to substantial pollutant concentrations. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Air Quality Assessment prepared by Kimley-Horn and Associates, Inc., dated May 2025, which is included in **Appendix B1**. The Air Quality Assessment analyzed the Project's air quality impacts as well as the consistency of the Project's impacts with the findings of the TOP 2050 Supplemental EIR. As discussed in the **Appendix B1** Air Quality Assessment, Project construction and operational-related emissions would exceed the applicable South Coast Air Quality Management District (SCAQMD) thresholds and would not be consistent with SCAQMD's AQMPs. However, the Project would not expose sensitive receptors to substantial pollutant concentrations, create a CO hot spot, or generate concentrations of diesel particulate matter (DPM) that would result in carcinogenic, chronic, or acute health risk effects. Additionally, as shown in the Air Quality Assessment, the Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR, which identified significant and unavoidable impacts related to air quality. As a result, the Project would not result in any new or more severe impacts than previously analyzed in the TOP 2050 Supplemental EIR.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts associated with air quality resulting from implementation of TOP 2050 would be significant and unavoidable regarding air quality.

## Project Specific-Impacts

### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project conflict with or obstruct implementation of the applicable air quality plan?

While individual projects accommodated under TOP 2050 may not exceed the SCAQMD regional significance thresholds, the scale and extent of construction activities associated with buildout of TOP 2050 would exceed the relevant SCAQMD construction thresholds for criteria pollutants. Therefore, the TOP 2050 Supplemental EIR concluded that construction related air quality impacts of developments approved under TOP 2050 would result in a significant impact. As discussed in **Appendix B1**, Ownership Area 1 construction emissions would exceed the SCAQMD threshold for ROG[11] emissions (construction-generated ROG emissions are primarily from architectural coatings). TOP 2050 Supplemental EIR MM 3-1 requires that the Applicant use super-compliant ROG paints for architectural coatings, which have a ROG content lower than the regulatory limits required by SCAQMD Rule 1113. Additionally, Ownership Area 1 construction would be subject to SCAQMD Rule 402, Rule 403, Rule 1113, TOP 2050 Supplemental EIR **MM 3-1**, and Laws, ordinances, and regulations (LOR) AQ-1 through LOR AQ-2. LOR AQ-1 requires owners to retrofit their existing heavy-duty tractor and trailer fleet with U.S. EPA SmartWay certified vehicles. LOR AQ-2 establishes GHG and fuel efficiency standards for medium and heavy-duty vehicle engines. With mitigation and LORs incorporated, construction-period ROG emissions would still exceed the SCAQMD threshold. As concluded in the TOP 2050 Supplemental EIR, impacts would be significant and unavoidable. Therefore, Project construction impacts would be consistent with the findings of the TOP 2050 Supplemental EIR. See **Appendix B1** for more information regarding the construction assumptions used in this analysis.

The Project would be developed in two Construction phases. As Phase 1 is occupied and Phase 2 developed, there is the potential overlap of construction and operational emissions. The **Appendix B1** Air Quality Assessment analyzes the potential overlapping of operational activities with ongoing construction activities which have been compared to SCAQMD daily operational thresholds.

As discussed in the **Appendix B1** Air Quality Assessment, the Project operational emissions would exceed the SCAQMD threshold for ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions. The Project operational-generated ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions are primarily from mobile sources. Phase 1 operations would be subject to TOP 2050 Supplemental EIR **MM 3-2** and **MM AQ-1**, TOP 2050 Policy ER-3.5, and LOR AQ-3 through AQ-4. TOP 2050 Supplemental EIR **MM 3-2** requires new developments to include access to alternative modes of transportation, such as transit stops, bike paths, and pedestrian paths. TOP 2050 Supplemental EIR MM 3-2 would reduce mobile emissions to the maximum extent feasible, as motor vehicle emissions are controlled by State and federal standards and neither the Applicant nor the City has control over these standards. TOP 2050 Supplemental EIR **MM AQ-1** requires new developments to provide bicycle parking, changing/shower, and supportive electric charging station facilities, preferential parking for fuel-efficient and carpool vehicles, and Energy Star certified appliances. TOP 2050 Policy ER-3.5 requires Phase 2 occupants to purchase and use vehicles that comply with the Advanced Clean Cars II and

[11] Volatile Organic Compounds (VOCs or Reactive Organic Gases [ROG]) are hydrocarbons/organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including ROGs and VOCs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation).

Advanced Clean Trucks. LOR AQ-3 requires new buildings to meet the current Energy Code and the California Green Building Standards Code (CALGreen Code). LOR AQ-4 requires new non-residential buildings to provide bicycle parking according to the CALGreen Code or City ordinance. Project operational-generated ROG emissions would also be emitted from consumer products. For analytical purposes, consumer products include cleaning supplies, aerosols, cosmetics, toiletries, and fertilizer. As such, the Project operational-generated ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions cannot be reduced below the SCAQMD threshold. As concluded in the TOP 2050 Supplemental EIR, impacts would not be peculiar and would remain significant and unavoidable.

**Criterion 2:** Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?

According to the TOP 2050 Supplemental EIR, long-term operational emissions were also determined to exceed SCAQMD operational thresholds for criteria pollutants and cumulatively contribute to the nonattainment designations in the South Coast Air Basin for $O_3$ and particulate matter ($PM_{10}$ and $PM_{2.5}$) under the National Ambient Air Quality Standard (NAAQS) and California Ambient Air Quality Standard (CAAQS). Buildout of TOP 2050 was determined to result in VOC emissions which are a precursor to $O_3$. As a result, the TOP 2050 Supplemental EIR determined that TOP 2050 would result in a significant and unavoidable impact because of operational emissions. As discussed in **Section 2.2, Existing Site Conditions, Land Use, and Zoning**, the Project's land use plan is consistent with the land uses designated for TOP 2050. As discussed in the **Appendix B1** Air Quality Assessment, construction of the Project may result in potentially significant impacts, exceeding ambient air quality standards and conflicting with the SCAQMD 2022 Air Quality Management Plan (AQMP), which is consistent with the findings of the TOP 2050 Supplemental EIR. According to the Air Quality Assessment, Project construction emissions would exceed SCAQMD thresholds for ROG emissions, for which the South Coast Air Basin is in attainment. The Project construction-generated ROG emissions are primarily from architectural coatings. TOP 2050 Supplemental EIR MM 3-1 requires the Project Applicant to use super-compliant ROG paints for architectural coatings, which have a ROG content lower than the regulatory limits required by SCAQMD Rule 1113. As such, the Project construction-generated ROG emissions cannot be reduced below the SCAQMD threshold. As concluded in the TOP 2050 Supplemental EIR, impacts would be significant and unavoidable. As a result, the Project's operational emissions would be consistent with the findings of the TOP 2050 Supplemental EIR.

**Criterion 3:** Would the project expose sensitive receptors to substantial pollutant concentrations?

The TOP 2050 Supplemental EIR also determined that development and operation of industrial and warehouse uses approved under TOP 2050 could generate new sources of localized criteria air pollutants and toxic air contaminants (TAC)[12] resulting in a significant and unavoidable impact. Additionally, construction would be subject to and would comply with pertinent California regulations (e.g., California Code of Regulations, Title 13, Sections 2485 and 2449), the effect of which would be to reduce DPM and criteria pollutant emissions from in-use off-road diesel-fueled vehicles and limit the idling of heavy-duty

[12] TACs may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes more than 200 compounds, including particulate emissions from diesel-fueled engines (e.g., diesel particulate matter (DPM) from heavy-duty and light-duty trucks); refer to **Appendix B1** for further information.

construction equipment to no more than five minutes. These regulations would further reduce nearby sensitive receptors' exposure to the Project's temporary and variable DPM emissions. Given the temporary and intermittent nature of construction activities likely to occur within specific locations in the Project site (i.e., construction is not likely to occur in any one location for an extended time), the dose of DPM of any one receptor is exposed to would be limited. Therefore, considering the relatively short duration of DPM-emitting construction activity at any one location, and the highly dispersive properties of DPM, sensitive receptors would not be exposed to substantial concentrations of construction-related TAC emissions.

Additionally, TACs are commonly emitted from a variety of sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. As the Project would only include residential, mixed-use, and recreational uses, the generation of pollutants typically associated with industrial and warehouse uses is not a concern and the exposure of sensitive receptors to substantial pollutant concentrations would be less than significant. There is no peculiar impact and no mitigation is required.

**Criterion 4:** Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

In addition, consistent with the TOP 2050 Supplemental EIR, the Project would also not result in new or a substantial increase in other emissions, including odors, which would adversely affect a substantial number of people. According to the **Appendix B1** Air Quality Assessment, the SCAQMD CEQA Air Quality Handbook identifies certain land uses as potentially significant odor sources. These land uses include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding. The Project would not include these types of uses. Additionally, the Project would comply with all applicable SCAQMD rules including Rule 402, which prevents discharging nuisance odors. As such, the Project's operational-related odors are not expected to affect a considerable number of people. Impacts would be less than significant. Additionally, according to the **Appendix B1** Air Quality Assessment, Project construction and operational-related odors would be temporary and are not expected to affect a substantial number of people. Therefore, the Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. There is no peculiar impact and no mitigation is required.

### Specific Plan – Ownership Area 2, Future Development Areas

**Criterion 1:** Would the project conflict with or obstruct implementation of the applicable air quality plan?

The **Appendix B1** Air Quality Assessment analyzed the Project's conflicts with an applicable air quality plan, including Ownership Areas 1 and 2, as well as the consistency of the Project's impacts with the findings of the TOP 2050 Supplemental EIR. Ownership Area 2 construction would be subject to SCAQMD Rule 402, Rule 403, Rule 1113, and TOP 2050 Supplemental EIR MM 3-1. As discussed in the **Appendix B1** Air Quality Assessment, the worst-case overlap of Ownership Area 1 operational and Ownership Area 2 construction emissions would exceed the SCAQMD threshold for ROG emissions. As discussed above, the construction-generated ROG emissions of the Project, which includes Ownership Area 2, are primarily from architectural coatings. TOP 2050 Supplemental EIR MM 3-1 requires that the Applicant use super-compliant ROG paints for architectural coatings, which have a ROG content lower than the regulatory

limits required by SCAQMD Rule 1113. As described above, the combined ROG emissions cannot be reduced below the SCAQMD threshold. As concluded in the TOP 2050 Supplemental EIR impacts would be significant and unavoidable and not peculiar compared to the TOP 2050 Supplemental EIR would result from the Project.

**Criterion 2:** Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard?

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the air quality impacts in the environment when PAs 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed in the **Appendix B1** Air Quality Assessment, Ownership Area 2 construction emissions would exceed the SCAQMD threshold for ROG emissions, similar to those for Ownership Area 1, discussed above. The Ownership Area 2 construction-generated ROG emissions are primarily from architectural coatings. TOP 2050 Supplemental EIR MM 3-1 requires the Applicant to use super-compliant ROG paints for architectural coatings, which have a ROG content lower than the regulatory limits required by SCAQMD Rule 1113. As such, Ownership Area 2 construction-generated ROG emissions cannot be reduced below the SCAQMD threshold Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050.

Additionally, as discussed in **Appendix B1**, Ownership Area 2 operational emissions would exceed the SCAQMD threshold for ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions. The Ownership Area 2 operational-generated ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions are primarily from mobile sources and consumer products. TOP 2050 Supplemental EIR MM 3-2 would reduce mobile emissions to the maximum extent feasible, as motor vehicle emissions are controlled by State and federal standards and neither the Applicant nor the City has control over these standards. Despite the application of TOP 2050 Supplemental EIR mitigation measures, Ownership Area 2 operational-generated ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions cannot be reduced below the SCAQMD threshold. As concluded in the TOP 2050 Supplemental EIR, impacts would be significant and unavoidable, and no peculiar compared to the TOP 2050 Supplemental EIR would result from the Project. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

**Criterion 3:** Would the project expose sensitive receptors to substantial pollutant concentrations?

According to the **Appendix B1** Air Quality Assessment, the Project's localized emissions, inclusive of both Ownership Areas 1 and 2, would not exceed the applicable standards. Therefore, Project implementation would not expose sensitive receptors to substantial pollutant concentrations, create a CO hot spot, or generate concentrations of DPM that would result in carcinogenic, chronic, or acute health risk effects. Impacts would be less than significant in this regard. The Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. As a result, the Project would not result in any new or peculiar impacts than previously analyzed in the TOP 2050 Supplemental EIR.

**Criterion 4:** Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

As discussed above, Project construction and operational-related odors would be temporary and are not expected to affect a substantial number of people. Impacts would be less than significant, and no mitigation is required. The Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. As a result, the Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. There is no peculiar impact and no additional mitigation, beyond those identified in the TOP 2050 Supplemental EIR, is required.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy LU-2.9:** **Methane Gas Sites.** We require sensitive land uses and new uses on former dairy farms or other methane-producing sites to be designed to minimize health risks.

**Policy ER-4.2:** **Sensitive Land Uses.** We prohibit the future siting of sensitive land uses within the distances defined by the California Air Resources Board for specific source categories without sufficient mitigation.

**Policy ER-4.4:** **Indoor Air Quality.** We will comply with State Green Building Codes relative to indoor air quality. We seek funding to improve indoor air quality for households with poor indoor air quality, with priority for lower income households in environmental justice areas.

### Laws, Ordinances, and Regulations:

LORs are existing requirements that are based on local, State, or federal regulations or laws that are frequently required independent of CEQA review. Typical standard conditions and requirements include compliance with the provisions of the Building Code, SCAQMD Rules, etc. The City may impose additional conditions during the approval process, as appropriate. Because LORs are neither project-specific nor a result of development of the Project, they are not considered to be either project design features or mitigation measures.

**LOR AQ-1:** Heavy duty tractors and trailers (i.e., trucks that are 53-foot or longer) must use U.S. EPA SmartWay certified tractors and trailers or retrofit their existing fleet with SmartWay verified technologies in accordance with the California Air Resources Board (CARB) Heavy-Duty (Tractor-Trailer) GHG Regulation. Owners are responsible for replacing or retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. Sleeper cab tractors model year 2011 and later must be SmartWay certified. All other tractors must use SmartWay verified low rolling resistance tires. Trailers must have low rolling resistance tires and aerodynamic devices.

**LOR AQ-2:** The medium-duty and heavy-duty vehicle engines are required to comply with the U.S. EPA's GHG and fuel efficiency standards. The federal and California Phase 1 standards took effect with model year 2014 tractors, vocational vehicles, and heavy-duty pick-up trucks and vans and the engines powering such vehicles (the Phase 1 standards exclude trailers). The federal Phase 2 standards cover model years 2018 2027 for certain trailers and model years 2021 2027 for semi-trucks and large pick-up trucks, vans and all types and sizes of buses and work trucks. California is aligned with the federal Phase 2 standards

in structure, timing, and stringency, but with some minor California differences. The California Phase 2 regulations became effective April 1, 2019.

**LOR AQ-3:** New buildings are required to achieve the current Energy Code (Title 24, Part 6) and CALGreen Code. The 2022 Energy Code became effective January 1, 2023. The Energy Code and CALGreen are updated triennially with a goal to achieve zero net energy for residential buildings and non-residential buildings in the future.

**LOR AQ-4:** New buildings are required to adhere to the CALGreen requirement to provide bicycle parking for new non-residential buildings, or meet local bicycle parking ordinances, whichever is stricter (CALGreen Section 5.106.4.1, 14.106.4.1, and Section 5.106.4.1.2).

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

**MM 3-1:** Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project construction-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with South Coast Air Quality Management District (South Coast AQMD) methodology for assessing air quality impacts. If construction-related criteria air pollutants are determined to have the potential to exceed the South Coast AQMD–adopted thresholds of significance, The City of Ontario Building Department shall require feasible mitigation measures to reduce air quality emissions. Potential measures shall be incorporated as conditions of approval for a project and may include:

- Require fugitive dust control measures that exceed South Coast Air Quality Management District's Rule 403, such as:
    - Requiring use of nontoxic soil stabilizers to reduce wind erosion.
    - Applying water every four hours to active soil disturbing activities.
    - Tarping and/or maintaining a minimum of 24 inches of freeboard on trucks hauling dirt, sand, soil, or other loose materials.
- Using construction equipment rated by the United States Environmental Protection Agency as having Tier 4 interim or higher exhaust emission limits.
- Ensuring construction equipment is properly serviced and maintained to the manufacturer's standards.
- Limiting nonessential idling of construction equipment to no more than five consecutive minutes.
- Using Super-Compliant VOC paints for coating of architectural surfaces whenever possible. A list of Super-Compliant architectural coating manufacturers can be found

on the South Coast Air Quality Management District's website at: http://www.aqmd.gov/prdas/brochures/Super-Compliant_AIM.pdf.

These identified measures shall be incorporated into all appropriate construction documents (e.g., construction management plans) submitted to the City and shall be verified by the City's Planning Department.

**MM 3-2:** The City of Ontario shall evaluate new development proposals within the City and require all developments to include access or linkages to alternative modes of transportation, such as transit stops, bike paths, and/or pedestrian paths (e.g., sidewalks).

**MM AQ-1:** Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project operation-phase-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with SCAQMD methodology in assessing air quality impacts. If operation-related air pollutants are determined to have the potential to exceed the SCAQMD–adopted thresholds of significance, the City of Ontario Planning Department shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities. The identified measures shall be included as part of the conditions of approval. Possible mitigation measures to reduce long-term emissions could include, but are not limited to the following:

- For site-specific development that requires refrigerated vehicles, the construction documents shall demonstrate an adequate number of electrical service connections at loading docks for plug-in of the anticipated number of refrigerated trailers to reduce idling time and emissions.
- Applicants for manufacturing and light industrial uses shall consider energy storage and combined heat and power in appropriate applications to optimize renewable energy generation systems and avoid peak energy use.
- Site-specific developments with truck delivery and loading areas and truck parking spaces shall include signage as a reminder to limit idling of vehicles while parked for loading/unloading in accordance with California Air Resources Board Rule 2845 (13 CCR Chapter 10 sec. 2485).
- Provide changing/shower facilities as specified in Section A5.106.4.3 of CALGreen (Nonresidential Voluntary Measures).
- Provide bicycle parking facilities per Section A4.106.9 of CALGreen (Residential Voluntary Measures).
- Provide preferential parking spaces for low-emitting, fuel-efficient, and carpool/van vehicles per Section A5.106.5.1 of CALGreen (Nonresidential Voluntary Measures).

- Provide facilities to support electric charging stations per Section A5.106.5.3 and Section A5.106.8.2 of CALGreen (Nonresidential Voluntary Measures; Residential Voluntary Measures).
- Applicant-provided appliances shall be Energy Star–certified appliances or appliances of equivalent energy efficiency (e.g., dishwashers, refrigerators, clothes washers, and dryers). Installation of Energy Star– certified or equivalent appliances shall be verified by the City during plan check.

### Conclusion

With regards to the issue area of Air Quality, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. Feasible mitigation measures contained within the TOP 2050 Supplemental EIR (MM-3-1, MM 3-2, and MM AQ-1), would be applied to the Project.

## 4.4 Biological Resources

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service. | ☒ | ☐ | ☐ | ☐ |
| **Criterion 2:** Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service. | ☒ | ☐ | ☐ | ☐ |
| **Criterion 3:** Have a substantial adverse effect on State or Federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. | ☒ | ☐ | ☐ | ☐ |
| **Criterion 4:** Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites. | ☒ | ☐ | ☐ | ☐ |
| **Criterion 5:** Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. | ☒ | ☐ | ☐ | ☐ |
| **Criterion 6:** Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Biological Resources Technical Report prepared by Cadre Environmental dated October 2024, which is included as **Appendix C1** of this consistency analysis. Additionally, this section summarizes the Delhi Sands Flower-Loving Fly Habitat Suitability Assessment (Habitat Suitability Assessment) prepared by ELMT Consulting, Inc. dated August 2024, which is included as **Appendix C2**.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts associated with development resulting from implementation of TOP 2050 would be less than significant with respect to sensitive species, riparian or sensitive habitats, jurisdictional waters, wildlife movement, and the Delhi Sands Flower-Loving Fly *(Rhaphiomidas terminatus abdominalis)* and any other biological resources.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?

A substantial adverse effect to special-status species would occur if the Project would:

1) Reduce the population size or reduce the area of occupied habitat of a rare, threatened, or endangered species; or
2) Reduce the population size or reduce the area of occupied habitat of a locally uncommon species.

A substantial adverse effect on a special-status wildlife species occurs if the Project would:

1) Increase predation of a species, leading to population reduction;
2) Reduce habitat availability sufficiently to affect potential reproduction; or
3) Reduce habitat availability sufficiently to constrain the distribution of a species and not allow for natural changes in distributional patterns over time.

As previously mentioned, the Biological Resources Technical Report analyzed the entirety of the Project site. The Biological Resources Technical Report includes a thorough literature review, results of the site reconnaissance survey, and biological resources recommendations for the Project; refer to **Appendix C2**. Currently, the Applicant does not control the Ownership Area 2 parcels. Therefore, a site reconnaissance survey was not completed for Ownership Area 2, and the 63.27-acre Ownership Area 2 is analyzed programmatically based on aerial photographs and assessments from the parcel boundaries. TOP 2050 includes policies to ensure that special-status species and habitat are protected through compliance with state and federal regulations (e.g., Policies ER-5.1 and ER-5.2, provided below). As discussed in the TOP 2050 Supplemental EIR, if potential habitat were found on-site, focused surveys for those sensitive species potentially present would be required.

#### *Sensitive Plants*

As concluded in the **Appendix C1** Biological Resources Technical Report, review of the CNDDB, TOP 2050, and existing conditions within and adjacent to the Project site identified a total of 13 sensitive plant species have the potential to occur within the vicinity of the Project site. However, the **Appendix C1** Biological Resources Technical Report concluded that no suitable habitat for sensitive plant species,

including those listed as federal or state threatened/endangered, was documented within the Project site. Additionally, no sensitive special status plant species were documented or expected to occur within the Project site.

### *Sensitive Wildlife*

As concluded in **Appendix C1**, review of the CNDDB, TOP 2050, and existing conditions within and adjacent to the Project site identified a total of 50 sensitive invertebrate and wildlife species have the potential of occurring within the vicinity of the Project site. The Project site does not occur within or adjacent to a USFWS designated critical habitat for any federally listed threatened or endangered species. However, out of the 50 identified sensitive wildlife, the heavily disturbed active dairy and agricultural facilities were determined to provide low to high likelihood of occurrence (foraging, breeding and roosting habitat) for the following sensitive or locally monitored species shown in **Table 4: Sensitive Wildlife Potentially Occurring On-site**.

**Table 4: Sensitive Wildlife Potentially Occurring On-site**

| | |
|---|---|
| • Cooper's hawk (*Accipiter cooperii*), SSC | • California horned lark (*Eremophila alpestris actia*), CWL |
| • Sharp-shinned hawk (*Accipiter striatus*), CWL | • Merlin (*Falco columbarius*), CWL |
| • Golden eagle (*Aquila chrysaetos*), CWL, SFP | • Prairie falcon (*Falco mexicanus*), CWL |
| • Great egret (*Ardea alba*), Nesting Colony | • Loggerhead shrike (*Lanius ludovicianus*), SSC |
| • Great blue heron (*Ardea herodias*), Nesting Colony | • California gull (*Larus californicus*), CWL |
| • Burrowing owl (*Athene cunicularia),* SSC | • Long-billed curlew (*Numenius americanus*), CWL |
| • Ferruginous hawk (*Buteo regalis*), CWL | • Double-crested cormorant (*Nannopterum auritum*), CWL |
| • Swainson's hawk (*Buteo swainsoni*), ST | • White-faced ibis (*Plegadis chihi*), CWL |
| • Northern harrier (*Circus cyaneus*), SSC | • Pallid bat (*Antrozous pallidus*), SSC |
| • Snowy Egret (*Egretta thula*), Nesting Colony | • Townsend's big-eared bat (*Corynorhinus townsendii*), SSC |
| • White-tailed kite (*Elanus leucurus*), SFP | • Western yellow bat (*Lasiurus xanthinus*), SSC |
| *Source: Cadre Environmental. 2024. Biological Resources Technical Report. p. 36 (**Appendix C1**)* | |

### *Delhi Sands Flower-loving Fly*

The federally endangered Delhi Sands Flower-Loving Fly is not expected to occur onsite based on the historic and ongoing impacts to the Project site respective of active dairy and agricultural use. However, approximately 19 acres of the north-northeastern region of the Project site is mapped as Delhi soils. As determined by the Habitat Suitability Assessment, Delhi soils are located within Ownership Area 1 and Ownership Area 2, PAs 6, 13, 18, and 22; refer to **Appendix C2**.

The City requires that the Project Applicant pay towards the City of Ontario Biological Resources Habitat Mitigation Fee program to cover potential environmental impacts to the Delhi Sands Flower-loving Fly (DSFLF), burrowing owl, raptor foraging, loss of open space, and agricultural lands. The City has approved a Memorandum of Agreement with Inland Empire Resource Conservation District to administer the Greater Prado Basin Habitat Conservation Program and associated Ontario Ranch Habitat Mitigation Fees. Pursuant to recommended mitigation measure **MM BIO-1** and the City's Habitat Mitigation Fee program, the Applicant would pay a habitat mitigation fee which would include payment of $4,320 per net acre for proposed residential, commercial, hotel and restaurant, office, and industrial development. These paid mitigation fees would then be collected by the City and be deposited into a trust fund to use for the acquisition, restoration, rehabilitation, and maintenance of lands deemed to have long-term conservation value.

As discussed above, a habitat assessment for the DSFLF was prepared and concluded that the Project site no longer supports clean Delhi Sand soils and is rated as unsuitable habitat (**Appendix C2**, p. 12). Therefore, impacts to the DSFLF associated with development of Ownership Area 1 would not be peculiar and would be less than significant.

### *Nesting Birds*

Within Ownership Area 1, suitable foraging and/or nesting habitat for the Cooper's hawk (SSC), sharp-shinned hawk (CWL), golden eagle (CWL, SFP), great egret (Nesting Colony), great blue heron (Nesting Colony), Burrowing owl (SSC), ferruginous hawk (CWL), Swainson's hawk (ST), snowy egret (Nesting colony), white-tailed kite (SFP), California horned lark (CWL), merlin (CWL), prairie falcon (CWL), loggerhead shrike (SSC), California gull (CWL), long-billed curlew (CWL), and double crested cormorant (CWL) was observed within the agricultural fields and the artificially created unvegetated dairy effluent retention ponds. Additionally, suitable habitat for breeding was documented within the Project site for Cooper's hawk (SSC) and California horned lark (CWL). As discussed above, the Project would be subject to the City's Habitat Mitigation Fee program to cover potential environmental impacts related to the DSFLF, burrowing owl, raptor foraging, loss of open space, and agricultural lands. Additionally, **MM BIO-2** would require a qualified biologist to conduct a nesting bird survey(s) to be reviewed by the City to reduce impacts to nesting birds to less than significant levels. Therefore, implementation of **MM BIO-2** would be required to reduce potential impacts to these species to less than significant levels.

### *Bats*

Many North American bat species tend to congregate at preferred roosting sites or at isolated water sources, several field methods are available to identify species and broad habitat associations (e.g., tree cavities, exfoliating bark, bark fissures, crevices, cliff faces, and/or dense foliage). Suitable foraging and/or roosting habitat were documented for the pallid bat (SSC), Townsend's big-eared bat (SSC), and the western yellow bat (SSC) within Ownership Area 1. Potential impacts to foraging habitat for these species would be mitigated to a level of less than significant level with implementation of recommended mitigation measure **MM BIO-3**. **MM BIO-3** would require a qualified biologist to determine whether potential roosting sites for bats may be affected through exit counts and acoustic surveys that would be performed prior to ground disturbance activities. If the results of the bat survey find a total of one single

roosting individual of a special status bat species or 25 or more individuals of a non-special status bat species with potential to be present in Ownership Area 1 (i.e., western Mastiff bat, big free-tailed bat, or pallid bat), a Bat Management Plan shall be developed to ensure mortality to bats does not occur. The plan would be reviewed and approved by the CDFW. Therefore, impacts related to bat species would be less than significant with incorporation of **MM BIO-3**.

### *Burrowing Owl*

BUOW is a CDFW Species of Special Concern. The BUOW uses predominantly open land, including grassland, agriculture, playa, sparse coastal sage scrub, and desert scrub habitats. The BUOW (low-occurrence potential) often occur in less than optimal and/or disturbed conditions. Suitable burrows larger than 4 inches in diameter and foraging habitat for the BUOW were documented within and adjacent to the east of Ownership Area 1. However, despite the fact that the site has been exposed to long-standing disturbances, suitable BUOW habitat, including burrows larger than 4-inches in diameter, was observed within the fallow fields on Ownership Area 1. Although there is suitable BUOW habitat, potential impacts to refugia, nesting, and foraging habitat for this species would be mitigated to a level of less than significant following implementation of **MM BIO-4**, which would ensure BUOW surveys are completed prior to construction. **MM BIO-4** would implement focused and preconstruction surveys to ensure potential impacts to refugia, nesting, and foraging habitat for the BUOW would be reduced to less than significant levels. Upon arrival at the survey area and prior to initiating the walking surveys, the biologist would use binoculars and/or spotting scope to scan suitable habitat. A total of four surveys would be conducted with at least one site visit between February 15$^{th}$ and April 15$^{th}$, and a minimum of three surveys at least three weeks apart between April 15$^{th}$ and July 15$^{th}$. Furthermore, one site visit would occur after June 15$^{th}$.

While this species is not protected by state or federal endangered species acts, BUOW (and other native avian species) are protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game Code (CFGC) Sections 3503, 3503.5, and 3800 which prohibits take, possession, or destruction of birds, their nests, or eggs (in particular raptor species such as BUOW). If it were later determined that active nests of BUOW (or other native species) would be lost as a result of Project site-preparation, it could result in significant adverse impacts and would be in conflict with these regulations. Specific BUOW survey and mitigation guidelines were developed and described in the 2012 CDFW Staff Report on Burrowing Owl Mitigation in order to reduce project-related impacts to BUOW (**MM BIO-4**). If Project site-preparation activities occur within potential BUOW habitat, a pre-construction BUOW / Initial Take Avoidance Survey conducted no less than 14 days prior to initiating ground disturbance activities, using the recommended methods described in the 2012 Staff Report, is required by CDFW to determine if active nests of species protected by the MBTA code. If it is determined BUOW are present in the construction zone, then the subsequently appropriate measures may be applied to reduce potential adverse project-related impacts. Therefore, implementation of **MM BIO-4** would be required to reduce impacts to less than significant.

The Biological Resources Assessment (**Appendix C1**) and the Habitat Suitability Assessment (**Appendix C2**) have determined that the Project site is incapable of supporting special status wildlife species as degradation of habitat quality, agricultural/ grazing land uses, and development have removed the potential for the Project site to support special status species. While not required to make a finding of less

than significant impacts, the City will impose its standard Habitat Mitigation Fee. Additionally, focused and preconstruction surveys would be implemented to verify the absence of special status species, as described above.

**Criterion 2:** Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?

disturbed, active dairy, and agricultural facilities. Within Ownership Area 1, a total of 194.05 acres of vegetation communities would be directly impacted as a result of Project implementation as summarized in **Table 5: Ownership Area 1 Vegetation Community Impacts**. However, no riparian, sensitive, or undisturbed native/natural habitats were documented during the biological assessment. In addition, no riparian scrub, forest, or woodland habitat was observed within the artificially created dairy effluent retention ponds located within Ownership Area 1. Furthermore, the adherence to the City's Biological Resources habitat mitigation fee consistent with **MM BIO-1**, described previously, would be required to reduce potential impacts to BUOW, raptor foraging, loss of open space, and agricultural lands to a less than significant level.

**Table 5: Ownership Area 1 Vegetation Community Impacts**

| Vegetation Community | Ownership Area 1 (Acres) |
|---|---|
| Active Dairy | 133.55 |
| Active Agriculture | 45.92 |
| Disturbed | 1.11 |
| Developed | 13.19 |
| Ornamental (Eucalyptus) | 0.28 |
| **Total** | **194.05** |
| Source: Cadre Environmental. 2024. *Biological Technical Report,* page 42. (**Appendix C1**) | |

**Criterion 3:** Would the project have a substantial adverse effect on State or Federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

A Jurisdictional Resources Assessment was conducted as part of the Project's Biological Resources Technical Report to assess the presence/absence of United States Army Corps of Engineers (USACE), CDFW, and Regional Water Quality Control Board (RWQCB) jurisdictional resources. Non-wetland waters of the United States were assessed based on the limits of the ordinary high water mark (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in vegetation and soil characteristics. The assessment utilized the methodology for routine wetland determination according to the methods outlined in the USACE Wetland Delineation Manual (Environmental Laboratory 1987) and the Arid West Wetland Delineation Supplement and updated regulatory guidance letters.[13] Wetlands are identified by the presence of three characteristics: hydrophytic vegetation, wetland hydrology, and hydric soils. If any of these criteria were met, one or more transects were run to determine the extent of the

[13] Ibid. p. 5.

wetland. Specifically, the presence of wetland hydrology was evaluated throughout the Project site by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil pits, where applicable. In addition, indicators of wetland or riverine hydrology were recorded, including water marks, drift lines, rack, debris, and sediment deposits, as warranted. Any indicators of hydric soils, such as redoximorphic features, buried organic matter, organic streaking, reduced soil conditions, gleyed or low-chroma soils, or sulfidic odor were also recorded.[14]

As concluded in the **Appendix C1** Biological Resources Technical Report, no wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project site. The artificially created unvegetated dairy effluent retention ponds are isolated, located in uplands, and currently rotated in use resulting in a wet (inundated) and dry phase. All of the active retention ponds are devoid of wetland vegetation including but not limited to riparian scrub, forest or woodland habitat. Therefore, the Project would not result in peculiar impacts as no impacts associated with development of the Ownership Area 1 are anticipated.

**Criterion 4:** Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites?

Ownership Area 1 is heavily disturbed with active dairy and agricultural uses and is surrounded by development including high traffic roads, commercial/residential development, active dairy/agricultural facilities, and therefore, it is highly unlikely that Ownership Area 1 occupies an important location relative to regional wildlife movement. As such, Project implementation would not have any substantial effect on local or regional wildlife movement. Ownership Area 1 is separated from regional wildlife movement corridors associated with the Prado Dam Flood Control Basin and Santa Ana River. Therefore, Ownership Area 1 does not function as a wildlife movement corridor.

Furthermore, although vegetation, including trees and shrubs would provide nesting habitat for raptors and migratory birds protected under the CFGC Codes are present within Ownership Area 1, development of Ownership Area 1 would comply with CFGC Code Section 3503 and implementation of **MM BIO-2** would require a qualified biologist to conduct a nesting bird and raptor survey(s) no more than three days prior to initiation of grading. Furthermore, construction activities outside of the nesting season (between September 1st and January 31st) would not require any preconstruction nesting bird survey(s).

Ownership Area 1 does not represent a wildlife movement corridor or route between open space habitats. Additionally, Ownership Area 1 is separated from regional wildlife movement corridors associated with the Prado Damn Flood Control Basin and Santa Ana River. Therefore, Ownership Area 1 does not function as a wildlife movement corridor. With implementation of **MM BIO-2**, development of Ownership Area 1 would not impede any native resident or migratory fish or wildlife species and would not be located in a migratory wildlife corridor. Therefore, with mitigation incorporated, impacts would be reduced to a less than significant level.

[14] Ibid. p. 5.

**Criterion 5:** Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

A Heritage Tree is one that is designated for preservation as a tree of historic or cultural significance, or a tree of importance to the community. As noted above, the majority of the site is occupied by agricultural operations, associated access roads and agricultural residential uses. Several blue gum (*Eucalyptus globulus*) and red gum (*Eucalyptus camaldulensis*) are located in the east/southeastern portions of the Project site, although these trees do not meet the City's Heritage Tree policy criteria. Prior to any site clearing or grading, a tree inventory would be prepared to ensure compliance with Ontario MC Section 6.05.020, Tree Preservation Policy and Protection Measures. Pursuant to Ontario MC Section 6.05.020, a tree inventory will be required and prepared by a City approved certified arborist or qualified horticulturalist, to determine the presence/absence of Heritage Trees including assessment of health, structure, condition, and expected life span of all affected specimens. Property proposed for development on which a Heritage Tree exists would require the submittal of a Tree Inventory and Preservation Plan prepared by a licensed landscape architect, horticulturalist, certified arborist, or other related professional. **MM BIO-6** would ensure healthy Heritage Trees that are approved for removal would be replaced with new trees with a total trunk diameter equal to the trees removed, or as deemed appropriate by the Approving Authority. With implementation of **MM BIO-6**, impacts would be reduced to less than significant levels.

**Criterion 6:** Would the project conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or State habitat conservation plan?

The Project is not located within or adjacent to a Conservation Program Area. Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Furthermore, the Project zoning mirrors the existing TOP 2050 land use designations for the Project site and is therefore consistent with TOP 2050. Ownership Area 2 future development is not located within or adjacent to a Conservation Program Area. Therefore, implementation of the Project would not result in a conflict with the provisions of an adopted habitat conservation plan and no impact would occur. Therefore, no mitigation is required or proposed.

## Specific Plan – Ownership Area 2, Future Development Areas

A total of 63.27-acres of the Project site (including Phase portions of Ownership Areas 1 and 2) were analyzed programmatically due to inaccessibility and based on aerial photographs and assessments from the parcel boundaries. Therefore, a site-specific habitat assessment was not performed for Ownership Area 2. Pursuant to recommended mitigation measures **MM BIO-5**, upon commencement of a project-level CEQA review for the Ownership Area 2, a focused biological resources assessment and site reconnaissance survey would be conducted. Should a subsequent biological assessment of Ownership Area 2 determine that there is potential habitat for sensitive species, focused protocol surveys are required. During development of the Ownership Area 2, existing vegetation and habitat would be removed by grading, excavation, and other construction activities. In the absence of focused biological surveys, impacts within the Ownership Area 2 are not fully known and could be potentially significant. At the time of the project-level CEQA analysis and associated biological resources assessment of the

Ownership Area 2, unforeseen site conditions could be discovered that warrant a finding of potentially significant impact. Additionally, development in this area would be subject to the requirements of the California Endangered Species Act and the Federal Endangered Species Act, including U.S. Fish and Wildlife Service and CDFW requirements regarding critical habitat, as well as mitigation fees paid by projects in Ontario Ranch. However, implementation of applicable requirements for biological resources including the payment of habitat mitigation fees would not be sufficient to bring impacts within Ownership Area 2 to a level of less than significant. Therefore, additional mitigation is required beyond those identified in the TOP 2050 Supplemental EIR.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy ER5-1:** **Habitat Conservation Areas.** We support the protection of biological resources through the establishment, restoration, and conservation of high-quality habitat areas.

**Policy ER5-2:** **Entitlement and Permitting Process.** We comply with state and federal regulations regarding protected species.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Recommended Mitigation Measures

As discussed above, City staff have determined that compliance with the City's habitat mitigation fee program do not "substantially mitigate" the Project's impacts to biological resources and, therefore, pursuant to CEQA Guidelines Section 15183, these thresholds pertaining to biological resources are not adequately addressed in the TOP 2050 Supplemental EIR. The following mitigation measures are recommended in inclusion in the Focused EIR:

**MM BIO-1** **City of Ontario Biological Resources Habitat Mitigation Fee.** The City of Ontario has established a habitat mitigation fee to cover potential environmental impacts to the burrowing owl, DSFLF, raptor foraging, loss of open space, and agricultural lands. Development impact fees for new development in Ontario Ranch were adopted on June 23rd, 2003, by the City Council. The Ontario Ranch development impact fees include a habitat mitigation fee of $4,320 per net acre for proposed residential, commercial, hotel and restaurant, office, and industrial development. Mitigation fees have been collected by the City of Ontario and have been deposited into a trust fund to be used for the acquisition, restoration, rehabilitation, and maintenance of lands deemed to have long-term conservation value.

**MM BIO-2** **Nesting Bird and Raptor Preconstruction Survey.** Regulatory requirement for potential direct/indirect impacts to nesting common and sensitive bird and raptor species will require compliance with the California Fish and Game Code (CFGC) Section 3503. Construction outside the nesting season (between September 1st and January 31st) do not require pre-removal nesting bird surveys. If construction is proposed during nesting season (February 1st and August 31st), a qualified biologist will conduct a nesting bird survey(s) no more than three (3) days prior to initiation of grading to document the

presence or absence of nesting birds within or directly adjacent (200 ft -500 ft for raptors) to the Project site.

The survey(s) will focus on identifying any raptors and/or bird nests that are directly or indirectly affected by construction activities. If active nests are documented, the qualified biologist will prepare and implement specific measures to prevent abandonment of the active nest. At a minimum, grading in the vicinity of a nest will be postponed until the young birds have fledged. The perimeter of the nest setback zone will be fenced or adequately demarcated with stakes and flagging at 20-foot intervals, and construction personnel and activities will be restricted from the area. The biologist shall establish a no-disturbance buffer around each active nest. The buffer area will be determined by the biologist based on the species present, surrounding habitat, and type of construction activities proposed in the area. The survey report will be submitted by the qualified biologist to the City of Ontario for review and approval prior to initiation of grading in the nest-setback zone.

Additionally, the qualified biologist will serve as a construction monitor during those periods when construction activities occur near active nest areas to ensure that no inadvertent impacts on these nests occur. A final monitoring report of the findings, prepared by a qualified biologist, will be submitted to the City of Ontario documenting compliance with the CFGC. Any nest permanently vacated for the season would not warrant protection pursuant to the CFGC.

**MM BIO-3** **Pre-construction Focused Bat Survey.** Prior to implementation of Project activities, a qualified biologist shall be retained to determine whether potential roosting sites for bats may be affected. For large ornamental trees suitable for bat roosting/nursery, exit counts and acoustic surveys shall be performed prior to initial ground disturbance, vegetation or structure removal to determine whether the Project site and a 300-foot buffer supports a nursery or roost, and by which species. This work will occur between late -spring and late summer and/or in the fall (generally mid-March through late October).

If the results of the bat survey find a total of a single roosting individual of a special status bat species or 25 or more individuals of a non-special status bat species with potential to be present in the Project site (i.e., western Mastiff bat, big free-tailed bat, or pallid bat), a Bat Management Plan shall be developed to ensure mortality to bats does not occur. For each location confirmed to be occupied by bats, the plan will provide details both in text and graphically where exclusion devises/and or staged tree removal will need to occur, the timing for exclusion work and the timeline and methodology needed to exclude the bats. The plan will need to be reviewed and approved by CDFW prior to disturbance of the roost(s).

**MM BIO-4** **Focused and Preconstruction Burrowing Owl Surveys.** Focused surveys for burrowing owl will be conducted in accordance with the March 7, 2022, CDFW staff report on Burrowing Owl Mitigation. Specifically, a total of four (4) surveys will be conducted: 1) at least one site visit between February 15$^{th}$ and April 15$^{th}$, and 2) a minimum of three (3) surveys, at least three weeks apart, between April 15$^{th}$ and July 15$^{th}$, with at least one visit

after June 15th. A report of the findings prepared by a qualified biologist shall be submitted to the City of Ontario prior to any permit or approval for ground disturbing activities.

A 14-day burrowing owl preconstruction survey will also be conducted immediately prior to the initiation of ground-disturbing construction to ensure protection for this species. The survey will be conducted in compliance with CDFW guidelines (CDFW 2012). A report of the findings prepared by a qualified biologist shall be submitted to the City of Ontario prior to any permit or approval for ground disturbing activities.

If burrowing owls are detected on-site during the focused surveys or 14-day preconstruction survey efforts, during the breeding season (February 1st to August 31st) then construction activities shall be limited to beyond 300 feet of the active burrows until a qualified biologist has confirmed that nesting efforts are complete or not initiated. In addition to monitoring breeding activity, if construction is proposed to be initiated during the breeding season or active relocation is proposed, a burrowing owl relocation plan will be developed and approved by the City of Ontario, CDFW and USFWS.

**MM BIO-5** **Programmatic Assessment Area CEQA Analysis.** The Programmatic Assessment Area located within Ownership Area 2, including APN's 0216-311-09, 1053-301-01 and -02; 1053-311-01 and -02, and 1053-321-01, -02, and -03, was not evaluated for biological resources as part of this analysis. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in the un-surveyed portion of the Project site prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction.

**MM BIO-6** **Tree Inventory.** Prior to implementation of Project site clearing or grading, a certified arborist or qualified horticulturalist shall provide a tree inventory to ensure compliance with Ontario MC Section 6.05.020, Tree Preservation Policy and Protection Measures in order to determine the presence/absence of Heritage Trees. Healthy Heritage Trees that are approved for removal shall be replaced with new trees with a total trunk diameter equal to the tree(s) removed, or as deemed appropriate by the Approving Authority based on lot size and available planting space. Replacement trees are to be in addition to the quantity of trees required for landscaping. The Approving Authority is responsible for reviewing the landscape plan and approving appropriate species for tree replacement (The Ontario Plan 2050).

## Conclusion

With regards to the issue area of Biological Resources, the following findings can be made:

1. New peculiar impacts to the Project or its site have been identified and additional environmental review is required.

2. There are potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. Substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.5 Cultural Resources

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5. | ☒ | ☐ | ☐ | ☐ |
| **Criterion 2:** Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Disturb any human remains, including those interred outside of formal cemeteries. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Cultural Resources Assessment, prepared by Kimley-Horn and Associates, Inc. (Kimley-Horn; February 2025), which is included as **Appendix D**.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined impacts to Tier III historical resources may be potentially significant prior to mitigation, and that those impacts may remain significant and unavoidable even after implementation of mitigation measures. Refer to the **Appendix D,** Cultural Resources Assessment, for a discussion of the City's Historic Resources Tiering System, per Article 26 of the City's Development Code. To mitigate potential impacts to Tier III resources within the City, the TOP 2050 Supplemental EIR adopted the previously applicable TOP 2050 Supplemental EIR mitigation measures, as noted in Table ES-2 of the TOP 2050 Supplemental EIR and identified as **Mitigation Measure (MM) 5-1** and **5-2** (see below). The TOP 2050 Supplemental EIR also stated that impacts to Tier I and Tier II resources would be unlikely and, as such, did not include a finding or recommend mitigation measures with regard to potential impacts to Tier I and Tier II resources.

The TOP 2050 Supplemental EIR also determined that future grading and construction activities of undeveloped areas or redevelopment that requires more intensive soil excavation than in the past could potentially cause the disturbance of archeological resources and could potentially unearth previously unrecorded resources. TOP 2050 Supplemental EIR adopted **MM 5-2** to mitigate potential impacts to archaeological resources within the City (see below). Additionally, the TOP 2050 Supplemental EIR determined that a less than significant impact would occur on human remains.

## Project Specific-Impacts

### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?

The Cultural Resources Assessment (**Appendix D**) prepared for the Project identified 12 historic resources associated with early-to-mid 20th century dairy farming. The Cultural Resources Assessment concluded that five of the 12 identified cultural resources are eligible for listing on the California Register of Historical Resources (CRHR) and meet the definition of a historic resource under CEQA. Additionally, one of these historical resources, located at 8185 Edison Avenue, was determined in 2014 to be a Tier II property by the City. While the City maintains authority to assign an appropriate Tier to each resource, the Cultural Resources Assessment included analysis and recommendations related to the potential Tier of the remaining historic resources within the Project area. As a result of the analysis, it was concluded that the other four historic resources meet the definition of both Tier II and III resources and would likely be assigned as Tier II resources.

The TOP 2050 Supplemental EIR determined impacts to Tier III historical resources may be potentially significant prior to mitigation and impacts may remain significant and unavoidable even after implementation of mitigation measures. The TOP 2050 Supplemental EIR also stated that impacts to Tier I and Tier II resources would be unlikely and, as such, did not include a finding or recommend mitigation measures specific to these tiers. The TOP 2050 Supplemental EIR also noted that the City would utilize its tiering system to analyze and review all historical resources and then apply mitigation measures to reduce impacts. As there is a possibility that historical resources assigned Tier II or III status by the City may be substantially impacted as a result of the Project, the Project may result in a substantial adverse change in the significance of a historical resource as defined in 15064.5.

As mentioned above, the TOP 2050 Supplemental EIR found potential impacts to Tier II resources to be less than significant. As such, any potentially significant Project impacts to Tier II resources were not analyzed by the TOP 2050 Supplemental EIR. Therefore, in this regard, the Project would be inconsistent with the analysis of the TOP 2050 Supplemental EIR in regards to historical resources and the Project would result in new Project-specific effects that are peculiar to the Project and for which TOP 2050 Supplemental EIR failed to analyze as significant effects.

Furthermore, as previously discussed, the TOP 2050 Supplemental EIR determined impacts on Tier III historical resources may be potentially significant prior to mitigation, and impacts may remain significant and unavoidable after adoption of mitigation measures. Potential impacts to historical resources would be reduced following implementation of TOP 2050 Supplemental EIR **MM 5-1** and recommended mitigation measures **MM CUL-1** through **MM CUL-8**.

**Criterion 2:** Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?

Additionally, based on an analysis of records and a survey of Ownership Area 1, no archaeological sites were discovered within Ownership Area 1. Although no archaeological resources were identified during

survey, the potential exists for subsurface deposits within Ownership Area 1. As previously discussed, the TOP 2050 Supplemental EIR determined impacts on archaeological sites may be significant, though would be reduced to a level less than significance through implementation of mitigation measures. Potential impacts to archaeological resources would be mitigated to a level less than significant following implementation of TOP 2050 Supplemental EIR **MM 5-2**. Therefore, the Project, concerning Ownership Area 1, would be consistent with the analysis of the TOP 2050 Supplemental EIR as it relates to archaeological resources and the Project would not result in peculiar impacts, or a substantial increase in magnitude of impacts compared to the TOP 2050 Supplemental EIR.

**Criterion 3:** Would the project disturb any human remains, including those interred outside of formal cemeteries?

Lastly, the TOP 2050 Supplemental EIR notes that compliance with existing law would ensure that significant impacts to human remains would not occur. As the Project includes grading within Ownership Area 1, the possibility of accidentally encountering human remains exists. Potential impacts to human remains would be mitigated to a level less than significance following implementation of TOP 2050 Supplemental EIR **MM 5-2** and compliance with California State Health and Safety Code Section 7050.5, which states that excavation shall stop and no furth disturbance shall occur within 100 feet of the discovery until the County Coroner has made a determination of origin and disposition of the remains pursuant to Public Resources Code Section 5097.98. As such, the Project is consistent with the analysis of the TOP 2050 Supplemental EIR relating to the disturbance of human remains.

### Specific Plan – Ownership Area 2, Future Development Areas

Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the cultural resource impacts in the environment when PAs 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. Additionally, according to the **Appendix D** Cultural Resources Assessment, no Tier II historic resources are identified within Ownership Area 2. The CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Furthermore, as previously discussed, the TOP 2050 Supplemental EIR determined impacts on Tier III historical resources may be potentially significant prior to mitigation, and impacts may remain significant and unavoidable after adoption of mitigation measures. Potential impacts to historical resources would be reduced following implementation of TOP 2050 Supplemental EIR **MM 5-1** and recommended mitigation measures **MM CUL-1** through **MM CUL-8**.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy CD-4.1:** **Cultural Resource Management.** We update and maintain an inventory of historic sites and buildings, professional collections, artifacts, manuscripts, photographs, documents, maps, and other archives.

**Policy CD-4.2:** **Collaboration with Property Owners and Developers.** We educate and collaborate with property owners and developers to implement strategies and best practices that preserve the character of our historic buildings, streetscapes, and unique neighborhoods.

**Policy CD-4.3:** **Collaboration with Outside Agencies.** We pursue opportunities to team with other agencies, local organizations, and nonprofits in order to preserve and promote Ontario's heritage.

**Policy CD-4.4:** **Incentives.** We use the Mills Act and other federal, state, regional and local programs to assist property owners with the preservation of select properties and structures.

**Policy CD-4.5:** **Adaptive Reuse.** We actively promote and support the adaptive reuse of historic sites and buildings to preserve and maintain their viability.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

**MM 5-1:** Historic or potentially historic resources in the City shall be evaluated for historic significance through the City's tier system prior to the issuance of plan or development approvals in the Focus Areas. Pursuant to City's Development Code (Chapter 4, Permits, Actions, and Decisions, and Chapter 7, Historic Preservation), mitigation measures for all Tier III Historic Resources shall include the following:

a) Each historic resource shall be fully documented and cataloged pursuant to Historic American Building Survey/Historic American Engineering Record (HABS/HAER) standards, to provide a record of the resource, including, but not limited to: [i] the preparation of site plans, floor plans, exterior and interior elevations, and detail drawings of character defining features (such as moldings, stairs, etc.); and [ii] photographs of the resource, including the exterior, interior, and interior and exterior character defining features (such as moldings, light fixtures, trim patterns, etc.).

b) A mitigation fee established pursuant to Section 7.01.030 (Historic Preservation Mitigation Fee) shall be paid to the City prior to the issuance of a demolition permit for Tier III historic resources. Fees for Tier I and II historic resources shall be determined during the Environmental Impact Report process. The fees established for Tier III will be used as a reference point for establishing fees for Tier I and II historic resources.

c) A Certificate of Appropriateness shall not be issued for the demolition of an historic resource, either in whole or in part, until such time that a demolition permit application and a replacement structure has been approved by the City, and appropriate permits have been issued for its construction, unless: [i] a waiver is granted pursuant to Subsection H (Replacement Structure Waiver for Historic Resources Located within Industrial Zoning Districts) of Section 4.02.050; [ii] a deferral of the replacement structure requirement is granted pursuant to Subsection G (Replacement Structure Deferral) of Section 4.02.050; or [iii] demolition is required pursuant to Section 7.01.050 (Unsafe or Dangerous Conditions) of this Development Code.

d) In an effort to preserve features and artifacts from historic resources, a determination whether items within or on the resource should be salvaged must be made by the Planning Department and may include the local historical society prior to the issuance of the demolition permit. The applicant shall be responsible for the removal, relocation, storage, and donation of such items selected for salvaging. The applicant

shall provide an inventory of salvaged items to the Planning Department, and shall include a list of each item name, description, and dimension (as necessary), and the location of each item on a floor plan.

**MM 5-2:** In areas of documented or inferred archaeological and/or paleontological resource presence, City staff shall require applicants for development permits to provide studies to document the presence/absence of such resources. On properties where resources are identified, such studies shall provide a detailed mitigation plan, including a monitoring program and recovery and/or in situ preservation plan, based on the recommendations of a qualified cultural preservation expert. The mitigation plan shall include the following requirements:

a) Archaeologists and/or paleontologist shall be retained for the project and will be on call during grading and other significant ground-disturbing activities.

b) Should any cultural resources be discovered, no further grading shall occur in the area of the discovery until the Planning Director or designee is satisfied that adequate provisions are in place to protect these resources.

c) Unanticipated discoveries shall be evaluated for significance by a San Bernardino County Certified Professional Archaeologist/Paleontologist. If significance criteria are met, then the project shall be required to perform data recovery, professional identification, radiocarbon dates, and other special studies; submit materials to a museum for permanent curation; and provide a comprehensive final report including catalog with museum numbers.

### Recommended Mitigation Measures

As discussed above, City staff have determined that the proposed mitigation and compliance with the City's Historic Preservation Ordinance (Article 26 of the City's Development Code) do not "substantially mitigate" this new impact and, therefore, pursuant to CEQA Guidelines Section 15183, this individual threshold pertaining to historic resources is not adequately addressed in the TOP 2050 Supplemental EIR. Consequently, a Focused EIR will be required for those Project impacts that were not adequately addressed in the TOP 2050 Supplemental EIR. The following mitigation measures are recommended for inclusion in the Focused EIR:

**MM CUL-1** The applicant shall obtain a building permit prior to any demolition, relocation, or alteration of any significant historic resource.

**MM CUL-2** Prior to issuance of a building permit for demolition of any significant historical resources and within 120 days of project approval, a Historic American Buildings Survey (HABS) or an Historic American Engineering Record (HAER) documentation in accord with the City's HABS/HAER Checklist Level 2, including but not limited to as built drawings with site plan, floor plan, exterior elevations, and details for any identified significant/character defining feature, historical narrative, and photographs of the three (3) historical resources subject properties, shall be submitted to the Planning Department for review, approval, and

subsequent release to the Ovitt Family Community Library, Model Colony History Room. Digital files and 2 printed copies are required (one archival and one non-archival).

**MM CUL-3** Prior to issuance of a grading or demolition building permit for the property addressed to 8185 Edison Avenue, a relocation plan for the Streamline Moderne Milk Parlor, a local Tier II Historic Resource, shall be submitted to the City. The plan shall identify the receiver site in the Grand Park Phase 1 development or alternate suitable location, as well as a relocation schedule and any protective measures to ensure minimal impact to the resource during relocation efforts. The Applicant shall be responsible for the relocation to the receiver site and securing the building to its foundation. Issuance of a Certificate of Appropriateness by the Historic Preservation Subcommittee (or Historic Preservation Commission) shall be required for the relocation plan.

**MM CUL-4** Prior to issuance of a building permit for demolition or grading, every effort shall be made to relocate the historic resources, except for the Streamline Moderne Milk Parlor, a local Tier II Historic Resource addressed to 8185 Edison Avenue. The structures shall be offered at no cost for those who can relocate the structures off-site. Advertisements notifying the public of the opportunity to relocate the structures shall be placed for a minimum of 30 days: on-site with temporary signage, in at least 3 local publications (newspapers, magazines, local organization newsletters), and on local bulletin boards (realtor's offices, local business). A social media campaign, posted on the developer's website or on a local non-profit heritage site, including a dedicated web page with the structures' information (description, square footage, photographs) and contact information should be incorporated into the relocation advertisement.

**MM CUL-5** A mitigation fee pursuant to Section 7.01.030 of the Ontario Development Code shall be paid to the Planning Department prior to issuance of building permit for grading the site or for demolition of any of the identified significant historical resources for which relocation was determined by the City to be infeasible. Mitigation fee is equal to 30% of the price per square foot construction cost as established in the most current International Code Council Building Valuation Data. The fee amount will be provided by the Planning Department at the time of payment. Funds will be deposited into the City's Historic Preservation Trust Fund.

**MM CUL-6** Prior to issuance of a building permit of any of the three (3) significant historical resources identified in the Focused EIR and within 120 days of project approval, a determination shall be made by the Planning Department whether items within or on the historic properties should be salvaged. The applicant shall be responsible for the removal, relocation, storage, and donation of such items selected for salvaging. An inventory of salvaged items shall be provided by the applicant and shall include a list of each item name, description, and dimension (as necessary), and the location of each item on a floor plan to the Planning Department prior to the issuance of building permit.

**MM CUL-7** Should the Streamline Moderne Milk Parlor, a local Tier II Historic Resource, addressed to 8185 Edison Avenue be proposed for demolition, and prior to issuance of a building permit for demolition of the resource issuance of a Certificate of Appropriateness and

approval of a Demolition application by the Historic Preservation Commission or Historic Preservation Subcommittee pursuant to the Ontario Development Code, Section 4.02.050, shall be required. A Certificate of Appropriateness shall not be issued for the demolition of the resource, either in whole or in part, until such time that a demolition permit application and a replacement structure has been approved by the City, and appropriate permits have been issued for its construction.

**MM CUL-8** Prior to issuance of a Certificate of Final Occupancy for the first building constructed within the Project site, enhancements to the Ontario Dairy Industry microdocumentary that features the operations of a functioning dairy located within the Ontario Ranch area focusing on the dairy history, themes, site, buildings, and stories gathered from new and archived oral interviews, dairy context and recent dairy surveys, shall be made. The Applicant will be responsible for producing additional field work to gather drone video footage of new development on former dairy lands, conduct a minimum of 2 oral interviews of city representatives, and make certain edits to incorporate the new material. Final deliverables include: 1) full length microdocumentary (approx. 30 minutes); 2) transcriptions of the 4 stakeholder interviews; and 3) separate videos of the 4 stakeholder interviews and will be submitted to the Planning Department for review and acceptance.

### Conclusion

With regards to the issue area of Cultural Resources, the following findings can be made:

1. New peculiar impacts to the Project or its site have been identified and additional environmental review is required.
2. There are potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. Substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. Feasible mitigation measures contained within the TOP 2050 Supplemental EIR (MM 5-1 and MM 5-2), would be applied to the Project.

## 4.6 Energy

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Conflict with or obstruct a State or local plan for renewable energy or energy efficiency. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Energy Assessment prepared by Kimley-Horn and Associates, Inc., dated May 2025, which is included in **Appendix B2**. The Energy Assessment summarizes the consistency of the Project's impacts with the findings of the TOP 2050 Supplemental EIR. As discussed in the **Appendix B2** Energy Assessment, the Project would not result in or contribute to a cumulative impact to the wasteful, unnecessary, or inefficient use of energy. Furthermore, the Project would not conflict with or obstruct applicable renewable energy or energy efficiency plans. As shown in the Energy Assessment, the Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. As a result, the Project would not result in any new or more severe impacts than previously analyzed in the TOP 2050 Supplemental EIR.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that development resulting from the buildout of TOP 2050 would result in less than significant impacts with respect to energy.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

As determined by the TOP 2050 Supplemental EIR, regulatory compliance (e.g., Building Energy Efficiency Standards, CALGreen, Renewable Portfolio Standards [RPS], and Corporate Average Fuel Economy [CAFE] standards) would increase building energy efficiency and vehicle fuel efficiency and reduce building energy demand and transportation-related fuel usage. Additionally, the Project is consistent with land uses proposed for TOP 2050 and would adhere to TOP 2050 policies related to land use and transportation planning and design, energy efficiency, public and active transit, and renewable energy generation, which

would contribute to minimizing building and transportation-related energy demands overall and demands on nonrenewable sources of energy.

The State's electricity grid is also transitioning to renewable energy under California's Renewable Portfolio Standard (RPS) Program. Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. In general, California has RPS requirements of 33 percent renewable energy by 2020 (SB X1-2), 40 percent by 2024 (SB 350), 50 percent by 2026 (SB 100), 60 percent by 2030 (SB 100), and 100 percent by 2045 (SB 100). SB 100 also establishes RPS requirements for publicly owned utilities that consist of 44 percent renewable energy by 2024, 52 percent by 2027, and 60 percent by 2030. The statewide RPS requirements do not directly apply to individual development projects, but to utilities and energy providers such as SCE, whose compliance with RPS requirements would contribute to the State of California objective of transitioning to renewable energy. The end uses accommodated under the Project would comply with the current and future iterations of the Building Energy Efficiency Standards and CALGreen. Therefore, the development of the Project within Ownership Area 1 would not result in peculiar impacts, or a substantial increase in magnitude of impacts compared to the TOP 2050 Supplemental EIR.

**Criterion 2:** Would the project conflict with or obstruct a State or local plan for renewable energy or energy efficiency?

According to the **Appendix B2** Energy Assessment, the Project's operational energy consumption, inclusive of Ownership Area 1, would constitute less than two percent of the corresponding energy consumption projections within the County. Therefore, Project operations would not substantially affect existing energy or fuel supplies or resources. In addition, the Project would comply with energy and fuel efficiency laws and regulations and would not result in the inefficient, wasteful, and unnecessary consumption of energy. As stated in the **Appendix B2** Energy Assessment, the Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. Additionally, as the Project is consistent with the land uses in TOP 2050, energy impacts associated with Project would be consistent with those identified in the TOP 2050 Supplemental EIR. Implementation of proposed policies under TOP 2050 and energy efficient strategies identified in the Community Climate Action Plan (CCAP) in conjunction with regulatory requirements would ensure that energy demand associated with the Project would not be inefficient, wasteful, or unnecessary and consistent with the CCAP. The Project would be consistent with the applicable energy efficient measures outlined in Title 24, Title 20, CCAP, and TOP 2050. Therefore, the Project would not result in peculiar impacts, or a substantial increase in magnitude of impacts compared to the TOP 2050 Supplemental EIR.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the energy usage impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. While the structures and operations associated with Ownership Area 2 land uses (i.e., medium-density residential, mixed-use residential, and mixed-use office and retail uses) would increase energy usage impacts of the site, impacts affecting energy would be less than significant as the Project would be subject to compliance with all federal, state, and

local requirements for energy efficiency. State regulations, including the Low Carbon Fuel Standard, Pavley Clean Car Standards, and Low Emission Vehicle Program would serve to reduce the transportation fuel demand of future development projects. As discussed above, the Project would be subject to applicable Title 24 and CALGreen requirements, which includes energy efficiency standards to minimize the wasteful and inefficient use of energy. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy LU-1.4:** **Multi-modal Mobility.** We require development and urban design, where appropriate, that reduces reliance on the automobile and capitalizes on active transportation, transit, electric vehicles, and multi-modal transportation opportunities.

**Policy ER-3.1:** **Conservation Strategy.** We require conservation as the first strategy to be employed to meet applicable energy-saving standards.

**Policy ER-3.2:** **Green Development – Communities.** We encourage the use of the LEED Neighborhood Development rating system, or similar mechanism, to guide the planning and development of all new communities.

**Policy ER-3.3:** **Building and Site Design.** We require new construction to incorporate energy efficient building and site design strategies, which could include appropriate solar orientation, maximum use of natural daylight, passive solar, and natural ventilation.

**Policy ER-3.5:** **Fuel Efficient and Alternative Energy Vehicles and Equipment.** We require purchase and use vehicles and equipment that are fuel efficient and meet or surpass state emissions requirements and/or use renewable sources of energy.

**Policy ER-3.6:** **Generation – Renewable Sources.** We promote the use of renewable energy sources (e.g., solar, wind, biomass) in public and private sector development.

**Policy M-1.4:** **Complete Streets.** We work to provide a complete, balanced, context-aware, multimodal transportation network that meets the needs of all users of streets, roads, and highways, including motorists, pedestrians, bicyclists, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation. We prioritize implementation of complete streets improvements in environmental justice areas to facilitate opportunities for residents to use active transportation systems.

**Policy M-2.1:** **Active Transportation.** We maintain our Multipurpose Trails & Bikeway Corridor Active Transportation Master Plan to create a comprehensive system of on- and off-street bikeways that and pedestrian facilities that are safe, comfortable, accessible, and connect residential areas, businesses, schools, parks, and other key destination points.

**Policy M-2.3:** **Pedestrian Walkways.** We require streets to include sidewalks and visible crosswalks at major intersections where necessary to promote safe and comfortable mobility between residential areas, businesses, schools, parks, recreation areas, and other key destination points.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Energy, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.7 Geology and Soils

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:<br>a. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map issued by the State Geologist for the area or based on other substantial evidence of a known fault.<br>b. Strong seismic ground shaking.<br>c. Seismic-related ground failure, including liquefaction.<br>d. Landslides. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Result in substantial soil erosion or the loss of topsoil. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** Be located on expansive soils, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 5:** Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 6:** Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Preliminary Geotechnical Investigation and Organic Soil/Manure Evaluation Report (Geotechnical Investigation), prepared by Converse Consultants in September 2024, which is included as **Appendix E**.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that the impacts associated with development resulting from implementation of TOP 2050 would result in a less than significant impacts with respect to geology and soils, and a less than significant impact with mitigation incorporated for paleontological resources.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

a. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map issued by the State Geologist for the area or based on other substantial evidence of a known fault.

b. Strong seismic ground shaking.

c. Seismic-related ground failure, including liquefaction.

d. Landslides.

According to the TOP 2050 Supplemental EIR, the City is not within any Alquist-Priolo Earthquake Fault Zone; however, the nearest Alquist-Priolo Fault Zone to the Project site is the Prado Dam Fault, located approximately 3.9 miles southwest of the Project site.[15] It has been determined by the TOP 2050 Supplemental EIR that seismic risk is not considered greater than that of surrounding areas. Project construction would comply with TOP 2050 **Policy S-1.1**, ensuring all new habitable structures be designed in accordance with the most recent California Building Code (CBC) adopted by the City, including provisions regarding lateral forces and grading. Adherence to CBC regulations would ensure seismic stability and damage from potential ground shaking be reduced to less than significant levels.

Liquefaction occurs when loose, saturated, generally fine sands and silts are subjected to strong ground shaking. According to the TOP 2050 Supplemental EIR, based on groundwater levels throughout the City, there is no potential for liquefaction to occur. Additionally, the Project's Geotechnical Investigation found that due to deep historic groundwater elevations, the potential for liquefaction onsite (including effects of liquefaction, such as lateral spreading), is unlikely to occur at the Project site, inclusive of Ownership Area 1.[16] The Project site is flat and contains no topographic features, making Ownership Area 1 unlikely to be affected by landslides.

Subsidence occurs as in-place soil (e.g., natural ground) is moisture-conditioned and densified to receive fill, such as in processing an overexcavation bottom. Subsidence is in addition to shrinkage due to recompaction of fill soil. Subsidence (overexcavation bottom processing) is estimated at approximately 0.2 to 0.25 feet. According to TOP 2050 Figure S-02, Subsidence Zones, the Project site, inclusive of

[15] California Geological Survey. 2025. *Earthquake Zones of Required Investigation*. https://maps.conservation.ca.gov/cgs/informationwarehouse/eqzapp/. (accessed February 2025).
[16] Converse Consultants. 2024. *Preliminary Geotechnical Investigation & Organic Soil/Manure Evaluation Report*.(**Appendix E**)

Ownership Area 1, is located within a subsidence zone due to groundwater pumping.[17] However, the TOP 2050 Supplemental EIR concluded that compliance with the CBC and review of grading plans for individual projects by the City Engineer would ensure no significant impacts would occur.

Therefore, impacts would be less than significant and Project implementation within Ownership Area 1 would not result in peculiar impacts, or a substantial increase in magnitude of impacts compared to the TOP 2050 Supplemental EIR.

**Criterion 2:** Would the project result in substantial soil erosion or the loss of topsoil?

Ownership Area 1 consists of 192.42 acres of mostly agricultural land uses. During construction, the Project site would feature exposed soils, which would be susceptible to erosion; however, a SWPPP and associated BMPs would be implemented in compliance with the City Construction General Permit to reduce potential disturbances. Consistent with the determination of the TOP 2050 Supplemental EIR, impacts associated with soil erosion would be less than significant. Therefore, Project implementation within Ownership Area 1 would not result in peculiar impacts, or a substantial increase in magnitude of impacts compared to the TOP 2050 Supplemental EIR.

**Criterion 3:** Would the project be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

Refer to the **Criterion 1** discussion above.

**Criterion 4:** Would the project be located on expansive soils, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

According to the Project's Geotechnical Investigation, collapse potential is low, and Expansion Index testing indicated near-surface soil are considered to have a very low expansion potential. Therefore, Project implementation within Ownership Area 1 would not result in peculiar impacts, or a substantial increase in magnitude of impacts compared to the TOP 2050 Supplemental EIR.

**Criterion 5:** Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

The Project would not include the use of septic tanks or any other alternative wastewater disposal system. As such, a less than significant impact would occur. Therefore, Project implementation within Ownership Area 1 would not result in peculiar impacts, or a substantial increase in magnitude of impacts compared to the TOP 2050 Supplemental EIR.

**Criterion 6:** Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Lastly, paleontological resources are recognized as nonrenewable; and therefore, receive protection under the California Public Resources Code (Section 21083.2) and CEQA. Review and protection of

[17] City of Ontario. 2022. TOP 2050. *Figure S-02, Subsidence Zones*. https://content.ontarioca.gov/sites/default/files/2024-12/Figure%20S-02%20Subsidence%20Zones%20%281%29.pdf (accessed February 2025).

paleontological resources are also afforded by CEQA for individual development projects that would be accommodated by TOP 2050, subject to discretionary actions that are implemented in accordance with the land use plan of TOP 2050. Compared to the TOP 2050 Supplemental EIR, the Project would have similar impacts because development within Ownership Area 1 would result in an increase in land use intensity rather than development of new, previously undeveloped areas of the City that would require substantial landform modification. However, the potential to uncover undiscovered archeological and paleontological resources is moderate to high. Therefore, similar to TOP 2050 Supplemental EIR, paleontological resources impact of the Project would require implementation of TOP 2050 Supplemental EIR **MM 5-2**, to ensure impacts on paleontological resources are reduced to less than significant.

These findings are consistent with the TOP 2050 Supplemental EIR. The Project would not require changes to the findings in the TOP 2050 Supplemental EIR. As such, Project impacts within Ownership Area 1 are not peculiar and would be less than significant with mitigation incorporated (**MM 5-2**).

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the geology and soil impacts in the environment when PAs 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed above, Project impacts concerning geology and soil would be less than significant. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, the Ownership Area 2 impacts are not peculiar no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Goal S-1** **Minimized risk of injury, loss of life, property damage, and economic and social disruption caused by earthquake-induced and other geologic hazards.**

**Policy S-1.1** **Implementation of Regulations and Standards.** We require that all new habitable structures be designed in accordance with the most recent California Building Code adopted by the City, including provisions regarding lateral forces and grading.

**Policy S-1.2** **Entitlement and Permitting Process.** We follow state guidelines and the California Building Code to determine when development proposals must conduct geotechnical and geological investigations.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

**MM 5-2** In areas of documented or inferred archaeological and/or paleontological resource presence, City staff shall require applicants for development permits to provide studies to document the presence/absence of such resources. On properties where resources are identified, such studies shall provide a detailed mitigation plan, including a monitoring program and recovery and/or in situ preservation plan, based on the recommendations of a qualified cultural preservation expert. The mitigation plan shall include the following requirements:

a. Archaeologists and/or paleontologist shall be retained for the project and will be on call during grading and other significant ground-disturbing activities.

b. Should any cultural resources be discovered; no further grading shall occur in the area of the discovery until the Planning Director or designee is satisfied that adequate provisions are in place to protect these resources.

c. Unanticipated discoveries shall be evaluated for significance by a San Bernardino County Certified Professional Archaeologist/Paleontologist. If significance criteria are met, then the project shall be required to perform data recovery, professional identification, radiocarbon dates, and other special studies; submit materials to a museum for permanent curation; and provide a comprehensive final report including a catalog with museum numbers.

### Conclusion

With regards to the issue area of Geology and Soils, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. Feasible mitigation measures contained within the TOP 2050 Supplemental EIR (MM 5-2), would be applied to the Project.

## 4.8 Greenhouse Gas Emissions

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing the emissions of greenhouse gases. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Greenhouse Gas (GHG) Emissions Assessment prepared by Kimley-Horn and Associates, Inc., dated May 2025, which is included in **Appendix B3**. The GHG Emissions Assessment summarizes the consistency of the Project's impacts with the findings of the TOP 2050 Supplemental EIR. The Project would demonstrate consistency with the CCAP by achieving a minimum score of 100 points from the Screening Tables. Therefore, the Project construction and operational-related GHG emissions would not exceed the applicable thresholds. Furthermore, the Project would be consistent with the applicable GHG-reducing plans and policies. As discussed in the **Appendix B3** GHG Emissions Assessment, the Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. As a result, the Project would not result in any new or more severe impacts than previously analyzed in the TOP 2050 Supplemental EIR.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that development resulting from the buildout of TOP 2050 would result in less than significant impacts with respect to energy and GHG emissions.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The City's CCAP was developed to reduce GHG emissions from nine sectors: building energy, renewable energy, wastewater treatment, solid waste management, on-road transportation, off-road equipment, agriculture, water, and miscellaneous.

Since adopting the CCAP, the City has implemented its GHG reduction measures in new development projects through the development review process. This process involves documentation of GHG reduction measures incorporated into the design and construction of development projects using "screening tables" that assign point values for each measure that correspond to the minimum emission reduction expected

from that measure. Projects are required to achieve a minimum of 100 points on the applicable screening table based on the measures selected.

TOP 2050, which includes the CCAP, identifies GHG emissions policies and reductions targets for the City of Ontario that would ensure consistency with the State GHG reduction goals and substantial progress toward the State's carbon neutrality goals. As a result, projects consistent with the CCAP are also consistent with the California Air Resources Board (CARB) Scoping Plan and other applicable GHG reduction plans. With the implementation of CCAP, TOP 2050 would result in an 80 percent decrease in GHG emissions in the City by 2050 from existing conditions.

Therefore, the TOP 2050 Supplemental EIR determined that buildout of TOP 2050 would not result in substantial increases in GHG emissions. In compliance with the CCAP, the Project, inclusive of Ownership Area 1, would be required to achieve a minimum 100 points on the Multi-Family Residential Development 2030 screening table, resulting in less than significant GHG emissions, consistent with the finding of the TOP 2050 Supplemental EIR.

**Criterion 2:** Would the project conflict with an applicable plan, policy, or regulation adopted for the purposes of reducing the emissions of greenhouse gases?

Ownership Area 1 of the Project is subject to TOP 2050 Supplemental EIR **MM 3-2** and **MM AQ-1**, and TOP 2050 Policy ER-3.5. The **Appendix B3** GHG Emissions Assessment shows that Ownership Area 1 operations would generate approximately 16,071 $MTCO_2e$ per year. It should be noted that 82 percent of GHG emissions are associated with non-construction-related mobile sources. Vehicle fuel efficiency and emissions are regulated by federal and State standards and neither the Applicant nor the City has control over these standards. Since Ownership Area 1 would exceed the project size thresholds, Ownership Area 1 would be required to incorporate project design features to achieve a minimum score of 100 points on the applicable Screening Tables. As stated above, projects that achieve a minimum score of 100 points are considered less than significant. At the time of this analysis, Ownership Area 1 is in the design phase where project design features needed to achieve consistency with the Screening Tables are being considered and implemented. Since the majority of emissions are from mobile sources, neither the Applicant nor the City have regulatory authority to control tailpipe emissions. Consistent with the Development Plan Review and CCAP, the Project, including buildout within Ownership Area 1, must incorporate project design features to achieve a minimum score of 100 points on the Screening Tables. An example of how the Project could achieve a minimum of 100 Screening Table Points is provided in **Table 6: Example of GHG Performance Standards for Multi-Family Development.** As stated in the CCAP, projects that achieve a minimum score of 100 points are considered less than significant. The Applicant must complete and submit a final set of screening tables showing the achievement of the required 100 points prior to issuance of the building permit. The Project's impacts within respect to Ownership Area 1 are within the limit of impacts identified in the TOP 2050 Supplemental EIR. As a result, the Project would not result in any peculiar or more severe impacts than previously analyzed in the TOP 2050 Supplemental EIR.

**Table 6: Example of GHG Performance Standards for Multi-Family Development**

| Reduction Measure | Description | Feature | Points |
|---|---|---|---|
| Measure 1: Building Electrification | Replacement of gas appliance with efficient electric appliance | Electric Water Heater<br>Electric Stove<br>Electric Dryer | 6<br>8<br>5<br>1 |
| | | *Total for measure* | **20** |
| Measure 4: Transit Oriented Communities | New development is located in a transit-oriented community | Development site is located within ½ mile radius of one or more of the following: a Bus Rapid Transit (BRT) stop, bus transit center, light rail station, the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods, and/or High Quality Transit Corridor defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours. | 10 |
| | | *Total for measure* | **10** |
| Measure 6: Vehicle Electrification | Installation of EV charging stations for resident vehicle parking space | Installation of Level 2 EV or higher charging stations at a rate of 5-10% of required vehicle parking spaces. | 10 |
| | | *Total for measure* | **10** |
| Measure 7: Active Transportation | Installation or improvement of bicycle facilities | Bicycle parking facilities with 1:1 ratio of bicycle parking to guest vehicle parking space. | 3 |
| | Installation or improvement of pedestrian facilities | Two or three pedestrian infrastructure improvements to street design on private streets, including, but not limited to curb extensions, raised crosswalks, speed humps/bumps, street tree plantings in parkways or street medians, and elevated pavement markings. | 3 |
| | | *Total for measure* | **6** |
| Measure 10: Waste Diversion | Design and plan multi-family housing developments to include onsite areas for municipal compost/green waste and recycling bins/containers | Site design allocates sufficient space for storage and collection of green waste, organic waste, and recyclables. | 33 |
| | | *Total for measure* | ***33*** |
| Measure 11: Water Conservation | Implement indoor water efficiency measures | Implement water efficient showerheads and faucets.<br><br>Install on-demand water circulators on all showers/baths | 1<br><br>2 |
| | Incorporate outdoor water efficiency measures | Design and plan outdoor landscapes planted with drought-tolerant, low maintenance plants with a 1) drip irrigation system or 2) sprinkler irrigation system with a weather-based irrigation controller. | 4 |
| | | *Total for measure* | **7** |

| Reduction Measure | Description | Feature | Points |
|---|---|---|---|
| Additional Measures | AR-1: Meet CalGreen | CalGreen Tier 2 Compliance | 10 |
| | AR-2: Generate energy from on-site solar PV | Solar PV that generates 30%-49% of residential energy needs on multifamily residential buildings that are 4 stories in height or taller. | 5 |
| | | *Total for measure* | **15** |
| | | **TOTAL POINTS** | **101** |

Source: City of Ontario. 2023. Ontario Community Climate Action Plan: Greenhouse Gas Emissions Screening Tables, Table 3, page 10. https://content.ontarioca.gov/sites/default/files/2025-01/Ontario-CCAP_Screening-Tables-AUGUST%202023%20Rev.01%20.pdf. (Accessed October 2025).

## Specific Plan – Ownership Area 2, Future Development Areas

Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the greenhouse gas emission impacts in the environment when PAs 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1, above. Since Ownership Area 2 would exceed the project size thresholds outlined in the **Appendix B3** GHG Emissions Assessment, developments within Ownership Area 2 would be required to incorporate project design features to achieve a minimum score of 100 points on the applicable Screening Tables. As stated above, projects that achieve a minimum score of 100 points are considered less than significant. At the time of this analysis, Ownership Area 2 is in the design phase and there are no specific development proposals at this time where project design features needed to achieve consistency with the Screening Tables are being considered and implemented. The Applicant must complete and submit a final set of screening tables showing the achievement of the required 100 points prior to issuance of the building permit. Ownership Area 2 would have a less than significant impact with implementation of TOP 2050 Supplemental EIR **MM 3-2** and **MM AQ-1** and compliance with the CCAP. Impacts would be less than significant, and no mitigation is required.

As discussed above, Project impacts concerning GHG emissions would be less than significant. Ownership Area 2 of the Project is subject to TOP 2050 Supplemental EIR **MM 3-2** and **MM AQ 1**, and TOP 2050 Policy ER-3.5. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy ER-3.1:** **Conservation Strategy.** We require conservation as the first strategy to be employed to meet applicable energy-saving standards.

**Policy ER-3.2:** **Green Development – Communities.** We encourage the use of the LEED Neighborhood Development rating system, or similar mechanism, to guide the planning and development of all new communities.

**Policy ER-3.3:** **Building and Site Design.** We require new construction to incorporate energy efficient building and site design strategies, which could include appropriate solar orientation, maximum use of natural daylight, passive solar, and natural ventilation.

**Policy ER-3.4:** **Green Development – Public Buildings.** We require all new and substantially renovated City buildings in excess of 10,000 square feet achieve a LEED Silver Certification standard, as determined by the U.S. Green Building Council.

**Policy ER-3.5:** **Fuel Efficient and Alternative Energy Vehicles and Equipment.** We require purchase and use vehicles and equipment that are fuel efficient and meet or surpass state emissions requirements and/or use renewable sources of energy.

**Policy ER-3.6:** **Generation – Renewable Sources.** We promote the use of renewable energy sources (e.g., solar, wind, biomass) in public and private sector development.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

**MM 3-2:** The City of Ontario shall evaluate new development proposals within the City and require all developments to include access or linkages to alternative modes of transportation, such as transit stops, bike paths, and/or pedestrian paths (e.g., sidewalks).

**MM AQ-1:** Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project operation-phase-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with the South Coast Air Quality Management District (SCAQMD) methodology in assessing air quality impacts. If operation-related air pollutants are determined to have the potential to exceed the SCAQMD–adopted thresholds of significance, the City of Ontario Planning Department shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities. The identified measures shall be included as part of the conditions of approval. Possible mitigation measures to reduce long-term emissions could include, but are not limited to the following:

- For site-specific development that requires refrigerated vehicles, the construction documents shall demonstrate an adequate number of electrical service connections at loading docks for plug-in of the anticipated number of refrigerated trailers to reduce idling time and emissions.
- Applicants for manufacturing and light industrial uses shall consider energy storage and combined heat and power in appropriate applications to optimize renewable energy generation systems and avoid peak energy use.
- Site-specific developments with truck delivery and loading areas and truck parking spaces shall include signage as a reminder to limit idling of vehicles while parked for loading/unloading in accordance with California Air Resources Board Rule 2845 (13 CCR Chapter 10 sec. 2485).
- Provide changing/shower facilities as specified in Section A5.106.4.3 of CALGreen (Nonresidential Voluntary Measures).

- Provide bicycle parking facilities per Section A4.106.9 of CALGreen (Residential Voluntary Measures).
- Provide preferential parking spaces for low-emitting, fuel-efficient, and carpool/van vehicles per Section A5.106.5.1 of CALGreen (Nonresidential Voluntary Measures).
- Provide facilities to support electric charging stations per Section A5.106.5.3 and Section A5.106.8.2 of CALGreen (Nonresidential Voluntary Measures; Residential Voluntary Measures).
- Applicant-provided appliances shall be Energy Star–certified appliances or appliances of equivalent energy efficiency (e.g., dishwashers, refrigerators, clothes washers, and dryers). Installation of Energy Star– certified or equivalent appliances shall be verified by the City during plan check.

### Conclusion

With regards to the issue area of Greenhouse Gas Emissions, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.9 Hazards and Hazardous Materials

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2**: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3**: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 5:** Result in a safety hazard or excessive noise for people residing or working in the project area for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 6:** Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 7:** Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Phase I Environmental Site Assessment Report (Phase I ESA) prepared by Roux Associates, Inc. (Roux), dated March 2025, which is included as **Appendix F**. The findings of the Phase I ESA are discussed in greater detail, below.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts associated with development resulting from implementation of TOP 2050 would be less than significant regarding hazards and hazardous materials.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

#### *Phase I Environmental Site Assessment*

A Phase I ESA was completed in March 2025 for the Ownership Area 1 development area; see the **Appendix F** Phase I Environmental Site Assessment Report. The Ownership Area 2 is being evaluated only at a programmatic level based on available information from TOP 2050, and there are no specific development proposals at this time. The Applicant does not own the parcels within the Ownership Area 2 area, which consists of Planning Areas 1 through 5, 7 through 11, and 14 through 16, and does not have access to the Ownership Area 2 at this time. At the time of Ownership Area 2 development, it will undergo its own site-specific CEQA analysis. The Project site and its adjoining properties were cross-referenced with the following environmental databases: Hazardous Substance Storage Container Database (HIST UST), Statewide Environmental Evaluation and Planning System (SWEEPS UST), Facility Inventory Database (CA FID UST), Waste Discharge System (WDS), California Environmental Reporting System (CERS), California Environmental Reporting System (CERS HAZ WASTE), Hazardous Waste Tracking System (HWTS), Facility Index System/Facility Registry System (FINDS), California Integrated Water Quality System (CIWQS), Water Board Enforcement Action Listings (ENF), and San Bernardino County Permit; refer to **Appendix F** for more information.

From at least 1938 to 1953, the Project site was used for agricultural purposes (row crops and orchards) with a few residential dwellings. By the mid-1950s, the Project site became increasingly used for dairy farm purposes with some residences. Currently, the Project site is used for dairy farming and residential purposes. According to observations and interviews during Phase I ESA reconnaissance, which took place on January 22 and January 31, 2025, the Project site contains multiple active agricultural (6) and residential (1) water wells, as well as one idle water well; refer to **Appendix F** for more information. Additionally, Roux observed evidence of staining, unusual odors, petroleum sheens, or distressed vegetation at the Project site during the Phase 1 ESA reconnaissance. In general, Roux observed surficial staining in the milk barns and feed silos areas associated with the dairy farm operations. According to the staff, the staining observed in the milk barn and feed silos areas are a result of acid wash (a concentrated, non-foaming, tri-blend detergent) and molasses (liquid cattle feed), respectively. Roux also observed small areas of surficial staining along the area surrounding diesel above-ground storage tanks (ASTs) within the Project site. Moderate to heavy oil staining was noted on and within the vicinity of the diesel ASTs located within Planning Area 13. This area of Planning Area 13 appeared to be concrete/asphalt paved, although the hardscape appeared to be damaged and/or broken. During the January 2025 site reconnaissance, the surficial staining observed on the different properties located within the Project site appeared to be limited in scale and are not anticipated to present a threat to human health or the environment. The staining observed is considered to be de minimis in nature. Wastewater ponds associated with dairy farm operations were observed on multiple properties within the Project site. These ponds represent permitted features, and no chemical uses were noted to be associated with these features. Additionally, the Phase I

ESA identified the following Recognized Environmental Conditions (RECs) in connection with the Project site:

- REC 1: Based on the historical use of the Project site for agricultural purposes from at least the 1930s through 1950s, it is likely that pesticides were used. In 2005, soil sampling at the eastern portion of the Project site (referred to as the "Swager Property") was conducted to further investigate the potential presence of pesticides. No detectable to low concentrations of organochlorine pesticides were reported in the sample collected and all but one were below regulatory screening levels. The sample that exceeded residential screening levels was collected from the central portion of the Swager Property and contained slightly elevated dieldrin; refer to **Appendix F** for more information.
- REC 2: The Phase I ESA evaluated conditions within the adjoining property, located immediately to the south of Planning Area 14, referred to as the "Hindelang Property"; refer to **Figure 3-8**. Historical records for the south adjoining Hindelang Property indicate that manufacturing of fiberglass camper shells from at least 1986 through 1992 included the use and storage of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-trichloroethane (1,1,1-TCA) and hydrocarbon solvents, rubber adhesive, etc. Previous environmental reports noted poor housekeeping practices and automobile repair operations at the Hindelang Property. Based on the documented use of chlorinated solvents (1,1,1-TCA), poor general housekeeping, and noted automobile repair operations, the south adjoining Hindelang Property represents a potential vapor encroachment concern and a REC; refer to **Appendix F** for more information.

**Criterion 1:** Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? *and*

**Criterion 2:** Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Project development within Ownership Area 1 would include the development of residential and mixed-use buildings and associated site improvements, which is consistent with the current TOP 2050 land use designation for Ownership Area 1. Operations within Ownership Area 1 could involve the transport and use of materials associated with routine maintenance of the property, such as janitorial supplies for cleaning purposes and/or herbicides and pesticides for landscaping. Additionally, the storage, use, handling, and disposal of any hazardous materials (such as paints and solvents) that might be stored on Ownership Area 1 during construction are addressed by federal, state, and local laws, regulations and programs that govern the use, transport and/or disposal of hazardous materials. Impacts would be less than significant in this regard.

Additionally, prior to the redevelopment of dairy farms, the City of Ontario Building Department requires that an investigation be performed to evaluate the possible build-up of methane gas in shallow soils and to determine the level of methane gas mitigation required. The Project, inclusive of Ownership Area 1, would comply with TOP 2050 Policy S-6.6, Remediation of Methane, which requires that development assess and mitigate the presence of methane, per regulatory standards and guidelines. Proper removal and disposal of manure-laden shallow soil in accordance with local regulatory guidance may also be

required prior to the redevelopment of Ownership Area 1. Therefore, with compliance with existing federal, state, and local regulations, the Project's impacts with respect to Ownership Area 1would be within the limit of impacts identified in the TOP 2050 Supplemental EIR. There is no peculiar impact and no mitigation is required.

**Criterion 3:** Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Additionally, the Project's new land uses within Ownership Area 1 would not emit hazardous emissions or handle hazardous materials, substances or waste within one-quarter mile of a school site. Levi H. Dickey Elementary School is located approximately 1.5 miles north of Ownership Area 1; however, hazardous materials other than supplies used for operational maintenance within Ownership Area 1 are not expected to be on site. Compliance with local, state and federal laws and regulations would reduce the risk of hazardous material incidents to a less than significant impact. Therefore, implementation of the Project within Ownership Area 1 would not create a significant hazard to the public or to the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment; and the Project would not create a significant hazard to existing or proposed school sites. Therefore, the Project's impacts with respect to Ownership Area 1 are within the limit of impacts identified in the TOP 2050 Supplemental EIR. There is no peculiar impact and no mitigation is required.

**Criterion 4:** Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment?

California Government Code Section 65962.5 combines several regulatory lists of sites that pose a hazard related to hazardous materials and substances. These lists are the California Department of Toxic Substances Control (DTSC) EnviroStor database; the SWRCB Geotracker database; the SWRCB list of sites identified with waste constituents above hazardous waste levels outside the waste management unit; and the SWRCB's list of "active" sites with a cease-and-desist order or been issued a cleanup or abatement order. Based on a review of these databases, the Project site, including Ownership Area 1, does not include any sites identified on a hazardous site list, compiled pursuant to California Government Code Section 65962.5, that would create a significant hazard to the public or the environment.[18] Therefore, the Project's impacts with respect to Ownership Area 1 are within the limit of impacts identified in the TOP 2050 Supplemental EIR. There is no peculiar impact and no mitigation is required.

**Criterion 5:** Would the project result in a safety hazard or excessive noise for people residing or working in the project area for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport?

The Project site and Ownership Area 1 are located approximately 0.75 mile north of Chino Airport and within the Chino Airport land use compatibility area.[19] TOP 2050 planning area is within the Chino Airport

[18] California Department of Toxic Substances Control (DTSC). 2024. *Envirostor.* https://www.envirostor.dtsc.ca.gov/public/map/?global_id=60003205, (accessed January 2025).

[19] Riverside County Airport Land Use Commission. 2008. *Chino Airport ALUCP*. https://rcaluc.org/sites/g/files/aldnop421/files/2023-06/Chino.pdf (accessed February 2025).

land use compatibility area (ALUCP). The new land uses within Ownership Area 1 would be consistent with residential land uses within the airport influence area as it would not expose individuals to excessive safety hazards. Therefore, the Project's impacts with respect to Ownership Area 1 are within the limit of impacts identified in the TOP 2050 Supplemental EIR. There is no peculiar impact and no mitigation is required.

**Criterion 6:** Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

As determined in the TOP 2050 Supplemental EIR, none of the proposed land uses within TOP 2050 would interfere with or impair the implementation of an adopted emergency response or evacuation plan. The OFD reviews development applications to ensure that adequate emergency accessibility is provided based on local and state guidance. Project buildout within Ownership Area 1 would not result in new impacts or a substantial increase in the magnitude of impacts than what was previously analyzed within the TOP 2050 Supplemental EIR. Additionally, Project construction within Ownership Area 1 would not require the partial or temporary closure of adjacent roadways, such as Edison Avenue, identified as an evacuation route for the City, and the Project site, including Ownership Area 1, does not contain any emergency services that would be impacted.[20] Therefore, the Project impact with respect to Ownership Area 1 regarding emergency response would be less than significant. As a result, the Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. There is no peculiar impact and no mitigation is required.

**Criterion 7:** Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

With regard to wildfire risk and the exposure of people/structures to risks associated with wildfire, TOP 2050 Supplemental EIR found that the City is outside of the State Responsibility Area (SRA), and CAL FIRE determined that the City contains no areas subject to very high wildfire risk. The City, however, recognizes that even though fuel loading is light in Ontario and fire risk comes primarily from urban fires, not wildfires, there is some risk related to wildfires. Overall, with adherence to building practices and resources such as the Local Hazard Mitigation Plan (LHMP), California Fire Code (CFC), and CAL FIRE's Strategic Fire Plan, among others, development associated with TOP 2050 and the Project would not exacerbate risk or result in post-wildfire hazards (i.e., landslides, mudflows, flooding, etc.). In addition, TOP 2050 and the Project, inclusive of Ownership Area 1, would adhere to the policies below in **Section 4.20** to prevent wildfire hazards. As with TOP 2050, Project impacts within Ownership Area 1 would be less than significant with respect to wildfire and no mitigation is necessary. Project implementation within Ownership Area 1 would be consistent with the findings of the TOP 2050 Supplemental EIR.

No peculiar impacts nor a substantial increase in the severity of a previously identified significant impact would occur and impacts from hazards and hazardous materials would remain less than significant.

[20] City of Ontario. 2022. *The Ontario Plan* 2050. Figure S-10, Evacuation Routes. https://content.ontarioca.gov/sites/default/files/2024-12/Figure%20S-10%20Evacuation%20Sites.pdf (accessed February 2025).

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the hazards and hazardous material impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. While the structures and operations associated with Ownership Area 2 have the potential to increase hazards and hazardous material impacts of the site, impacts affecting hazards and hazardous materials would be less than significant. As discussed above, Ownership Area 2 would not emit hazardous emissions or involve hazardous or acutely hazardous materials, substances, or waste. However, it would involve the transport and use of materials associated with routine maintenance of the property, such as janitorial supplies for cleaning purposes and/or herbicides and pesticides for landscaping. The storage, use, handling, and disposal of any hazardous materials (such as paints and solvents) that might be stored on Ownership Area 2 during construction are addressed by federal, state, and local laws, regulations and programs that govern the use, transport and/or disposal of hazardous materials. Additionally, Ownership Area 2 would comply with TOP 2050 Policy S-6.6, Remediation of Methane, which requires that development assess and mitigate the presence of methane, per regulatory standards and guidelines.

Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. As determined by the TOP 2050 Supplemental EIR, current federal and state regulations, City ordinances, and TOP 2050 policies would regulate the handling of hazardous substances to reduce potential releases; exposure; and risks of transporting, storing, treating, and disposing of hazardous materials and wastes. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Goal S-6** **Reduced potential for hazardous materials exposure and contamination.**

**Policy S-6.1** **Disclosure and Notification.** We enforce disclosure laws that require all users, producers, and transporters of hazardous materials and wastes to clearly identify the materials that they store, use, or transport.

**Policy S-6.2** **Response to Hazardous Materials Releases.** We respond to hazardous materials incidents and coordinate these services with other jurisdictions.

**Policy S-6.4** **Safe Storage and Maintenance Practices.** We require that the users of hazardous materials be adequately prepared to prevent and mitigate hazardous materials releases.

**Policy S-6.5** **Location of Hazardous Material Facilities.** We regulate facilities that will be involved in the production, use, storage, or disposal of hazardous materials, pursuant to federal, state, county, and local regulations, so that impacts to the environment and sensitive land uses are mitigated. We prohibit new hazardous waste facilities in close proximity to sensitive land uses and environmental justice areas.

**Policy S-6.9** **Remediation of Methane.** We require development to assess and mitigate the presence of methane, per regulatory standards and guidelines.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Hazards and Hazardous Materials, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.10 Hydrology and Water Quality

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:<br>a. Result in substantial erosion or siltation on- or off-site.<br>b. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.<br>c. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.<br>d. Impede or redirect flood flows. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 5:** Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Hydrology Report prepared by JLC Engineering & Consulting, Inc., in May 2025, and the Water Quality Management Plan prepared by City of Ontario Engineering Department in September 2024, which are included as **Appendix G.**

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that development resulting from buildout of TOP 2050 would result in less than significant impacts with respect to hydrology and water quality.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

As determined by the TOP 2050 Supplemental EIR, construction activities have the potential to result in significant water quality impacts. Water quality impacts could occur during the earthwork and construction phase, when the potential for erosion, siltation, and sedimentation would be the greatest. Construction within Ownership Area 1 has the potential to produce typical pollutants, such as heavy metals, pesticides and herbicides, and chemicals related to construction and cleaning, waste materials, including wash water, paints, wood, paper, concrete, food container, sanitary wastes, fuel, and lubricants. Impacts to storm water quality could occur from construction and associated earth moving, and increased pollutant loadings. Similar to TOP 2050 Supplemental EIR, the Project, inclusive of Ownership Area 1, would comply with applicable federal, state, and local water quality controls. Construction activities would disturb more than one acre and therefore would be required to comply with the water quality standards and waste discharge requirements of the NPDES. The Construction General Permit requires implementation of a SWPPP which would include project construction features designed to prevent erosion and protect the quality of storm water runoff (i.e., BMPs). A SWPPP would be prepared during the City's plan review process, prior to issuance of a grading permit. Water quality standards and waste discharge are addressed using the BMPs incorporated in the SWPPP. Compliance with the SWPPP, including the BMPs associated with the Project, would reduce, minimize, treat or even avoid storm water pollution associated with the construction within Ownership Area 1. Implementation of BMPs identified in the SWPPP would eliminate or minimize pollution of downstream receiving waters. Similar to the buildout of TOP 2050, Project implementation within Ownership Area 1 would not result in significant impacts to water quality.

TOP 2050 includes Policies ER-1.6 and ER-1.7 which direct the City to reduce pollutants in the City's stormwater system. The Project would comply with TOP 2050 policies listed below, ensuring compliance with applicable federal, state, and local water quality controls. A Preliminary WQMP has been prepared on behalf of the Project, which establishes BMPs specific to the Project to treat, reduce, or avoid the contamination of downstream waters from waterborne pollutants during operation. Examples of BMPs in the Preliminary WQMP include, among others:

- Minimizing non-stormwater site runoff through efficient irrigation system design and controllers;
- Providing solid roofs over all trash enclosures; and
- Gravity separator devices for pretreatment of sediment, trash/litter, or oil and grease.[21]

[21] National Core, Ontario Housing Authority. 2024. Preliminary Water Quality Management Plan (PWQMP).

**Criterion 2:** Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The TOP 2050 Supplemental EIR identified less than significant impacts to groundwater and groundwater supplies. Similar to TOP 2050, the Project, inclusive of Ownership Area 1, would implement TOP 2050 **Policy ER-1.6**. TOP 2050 **Policy ER-1.6** encourages use of LID strategies to intercept runoff, slow the discharge rate, increase infiltration, and ultimately reduce discharge volumes to traditional storm drain systems. Potential low impact development (LID) strategies that could be implemented by development in the City include bioretention, dry wells, filter strips, grassed swales, infiltration trenches, inlet pollution removal devices, permeable pavement, permeable pavers, rain barrels and cisterns, soil amendments, tree box filters, vegetated buffers, and vegetated roofs. With the implementation of City policies that promote LID and infiltration for new development projects, the potential for the Project to substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Project may impede sustainable groundwater management of the basin is considered less than significant. Additionally, the City's groundwater supplies are from the Chino Groundwater Basin, which is adjudicated and managed by the Chino Basin Watermaster. As stated within the TOP 2050, adherence to the State Construction General Permit, implementation of the SWPPP, and adherence to the City's Erosion and Sediment Control Plan requirements, would ensure that surface and groundwater quality are not adversely impacted during construction. The Project would be required to comply with the Santa Ana River Basin Plan and to control pollutants in discharges of stormwater from postconstruction activities under NPDES Permit No. CAS618036 through preparation of a WQMP identifying BMPs for prevention of stormwater pollution during the post-construction phase, including site-design, source-control, and/or treatment BMPs. A Preliminary WQMP, included as **Appendix G2** of this consistency analysis, has been prepared for the Project in compliance with the Santa Ana Regional Water Quality Control Board requirements, which includes Low Impact Development (LID) features and BMPs to ensure proper water management practices within Ownership Area 1. Therefore, similar to the TOP 2050 Supplemental EIR, Project implementation within Ownership Area 1 would not obstruct or conflict with any groundwater management plan, and impacts would be less than significant.

**Criterion 3:** Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

a. Result in substantial erosion or siltation on- or off-site;

b. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

c. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

d. Impede or redirect flood flows? *and*

**Criterion 4:** Would the project, in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

## Runoff/Flooding

Ownership Area 1 currently features agricultural and residential development and is heavily disturbed. Elevations on-site range from approximately 700 feet amsl in the northeast portion of the site to approximately 680 feet amsl in the southwest portion of the site. The Ownership Area 1 slopes from the northwest to the southeast. The Project site, including Ownership Area 1, does not receive upstream runoff from surrounding areas.

On-site stormwater drainage facilities shall be provided to capture and infiltrate a 2-year, 1 hour storm event, consistent with the San Bernardino County Stormwater Program's WQMP requirements for new development projects. Stormwater capture and infiltration facilities may include the utilization of vegetated swales, depressed landscaped basins, pervious concrete pavement or underground stormwater detention/retention/infiltration vaults. All building roof and paved area runoff shall be directed into depressed landscaped swales, trenches, or basins, within the development, to comply with the requirement to capture and infiltrate the 2-year, 1-hour storm event runoff. As such, similar to buildout of TOP 2050, Project implementation within Ownership Area 1 would not result in significant impacts regarding runoff or flooding.

**Criterion 5:** Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

According to the TOP 2050 Supplemental EIR, projects approved under TOP 2050 would be required to comply with the Santa Ana River Basin Plan and to control pollutants in discharges of stormwater from postconstruction activities under NPDES Permit No. CAS618036 through preparation of a WQMP identifying BMPs for prevention of stormwater pollution during the post-construction phase, including site-design, source-control, and/or treatment BMPs. As discussed above the Project would adhere to all applicable State, and local regulatory framework which would ensure that surface and groundwater quality are not adversely impacted during construction. In addition, implementation of the LID and BMP measures at the site, would ensure that water quality is not impacted during the operational phase of the Project. As a result, Project implementation within Ownership Area 1 would not obstruct or conflict with the implementation of the Santa Ana River Basin Water Quality Control Plan. Additionally, existing on-site groundwater wells would be abandoned per the California Department of Water Resources (DWR) Standards and would require a permit from the San Bernardino Department of Environmental Health Services and completion of a DWR 188 Well Completion Form.

Development within the Project site, inclusive of Ownership Area 1, would be connected to the City's public water supply and there would be no on-site wells for use of groundwater. The City manages both the potable and non-potable supplies to ensure withdrawals from the Chino Groundwater Basin do not exceed the safe yield for the Basin, as per the Chino Basin Watermaster's Optimum Basin Management Program. The Chino Basin is listed as "very low" priority pursuant to the Sustainable Groundwater Management Act, and therefore is not operating under a Groundwater Sustainability Plan (GSP) pursuant to the Sustainable Groundwater Management Act. Therefore, consistent with the TOP 2050 Supplemental EIR, Project impacts within Ownership Area 1 would be less than significant with adherence to State and local regulations, including TOP 2050 (includes Policies ER-1.6 and ER-1.7), the City's Erosion and Sediment

Control Plan requirements, the Santa Ana River Basin Water Quality Control Plan, and NPDES Permit No. CAS618036. No peculiar impacts would occur.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the hydrology and water quality impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed above, Project impacts concerning hydrology and water quality would be less than significant. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy ER-1.4:** **Supply-Demand Balance:** We require that available water supply and demands be balanced.

**Policy ER-1.6:** **Urban Run-off Quantity:** We encourage the use of low impact development strategies to intercept run-off, slow the discharge rate, increase infiltration and ultimately reduce discharge volumes to traditional storm drain systems.

**Policy ER-1.7:** **Urban Run-off Quality:** We require the control and management of urban run-off, consistent with Regional Water Quality Control Board regulations.

**Policy S-2.1:** **Entitlement and Permitting Process:** We follow State guidelines and building code to determine when development proposals require hydrological studies prepared by a State-certified engineer to assess the impact that the new development will have on the flooding potential of existing development down-gradient.

**Policy S-2.5:** **Stormwater Management:** We maintain the storm drain system to convey a 100-year storm, when feasible, and encourage environmental site design practices to minimize flooding and increase groundwater recharge, including natural drainage, green infrastructure, and permeable ground surfaces.

**Policy S-2.6:** **Use of Flood Control Facilities:** We encourage joint use of flood control facilities as open space or other types of recreational facilities.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Hydrology and Water Quality, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.

3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.11 Land Use and Planning

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Physically divide an established community. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that development resulting from implementation of TOP 2050 would have less than significant impacts with respect to land use and planning.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project physically divide an established community?

The Project applicant proposes development that would include up to 115,809 square feet of commercial retail uses, up to 4,293 residential units, and 135,110 square feet of office uses, as described further below. Due to current land ownership, only Ownership Area 1 is proposed at a project-level entitlement. Ownership Area 1 is expected to start construction in 2025, with an anticipated opening year in 2029.

Projects that are typically considered to have the potential to divide an established community include the construction of new freeways, highways, roads, or other uses that physically separate an existing or established neighborhood. Additionally, the Project site, including Ownership Area 1, is developed with existing buildings and structures used for agricultural purposes and does not include an established community.

Project development within Ownership Area 1 would not include improvements which would substantially alter existing roadways and transportation corridors in a manner that would cause the removal or separation of existing adjacent communities from important resources and neighboring units. Roadway improvements associated with the Project would also increase transportation efficiency within the Project site and adjacent roadways without degrading the existing neighborhoods. Therefore, Project implementation within Ownership Area 1 would not physically divide an established community and there would be no impact.

**Criterion 2:** Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The City is currently developing a Compatibility Plan for Chino Airport (Compatibility Plan) that relies upon the California Airport Land Use Planning Handbook (State of California Department of Transportation, Division of Aeronautics) October 2011 (Handbook). As provided for in the Handbook "alternative process," the City functions as the Designated Agency in formulating airport land use compatibility plans for City properties. The Compatibility Plan is based on the Handbook Generic Safety Zones for General Aviation Airports. The Project site is within the Chino Airport ALUCP and is within Zone E, which is within Safety Zone III.[22] Proposed development under the CenterPark Specific Plan is permitted within this zone; however, a departmental review from the lead agency is required prior to development to verify residential compatibility within the Chino Airport Land Use Plan area.

Final site plans and development plans within the Project site would be subject to and required to comply with applicable standards and requirements of the Compatibility Plan as adopted by the City. Please refer also to related discussions presented in **Section 4.9, Hazards and Hazardous Materials**.

The Project site is within the ONT ALUCP. However, it is not within a safety zone, a noise impact zone, or an airspace protection zone of the ONT. Therefore, a less than significant impact would occur.

Project implementation would be consistent with TOP 2050. The Project would not conflict with applicable land use plans, policies, or regulations, including TOP 2050 and other regional plans. The Project is consistent with the underlying land use designation that have been included in local and regional planning efforts. Therefore, the Project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The Project would cause neither a new impact, nor an increase in the severity of an impact previously disclosed. No further analysis is required.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the land use and planning impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed above, Project impacts concerning land use and planning would be less than significant. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

[22] San Bernardino County Land Use Services. 1991. *Chino Airport Land Use Compatibility Plan.* https://www.sbcounty.gov/Uploads/lus/Airports/Chino.pdf. (accessed February 2025).

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Goal LU-1** A community that has a spectrum of housing types and price ranges that match the jobs in the City and that make it possible for people to live and work in Ontario and maintain a quality of life.

**Policy LU-1.1** **Strategic Growth.** We concentrate growth in strategic locations that help create place and identity, maximize available and planned infrastructure, foster the development of transit, and support the expansion of the active and multimodal transportation networks throughout the City.

**Policy LU-1.3** **Adequate Capacity**. We require adequate infrastructure and services for all development.

**Policy LU-1.4** **Multimodal Mobility**. We require development and urban design, where appropriate, that reduces reliance on the automobile and capitalizes on active transportation, transit, electric vehicles, and multimodal transportation opportunities.

**Policy LU-1.6** **Complete Community**. We incorporate a variety of land uses and building types in our land use planning efforts that result in a complete community where residents at all stages of life, employers, workers, and visitors have a wide spectrum of choices of where they can live, work, shop and recreate within Ontario.

**Goal LU-4** **Development that provides short-term value only when the opportunity to achieve our Vision can be preserved.**

**Policy LU-4.2** **Interim Development**. We allow development in urban, mixed use, and transit-oriented Place Types that is not immediately reflective of our ultimate Vision for the Place Type, provided it can be modified or replaced when circumstances are right to support development aligned with the Place Type Vision. We will not allow development that impedes, precludes, or compromises our ability to achieve our Vision.

**Policy LU-4.4** **Shared Infrastructure**. We encourage and facilitate the use of shared infrastructure (including shared or managed parking) in urban, mixed use, and transit-oriented Place Types.

**Goal LU-5** **Integrated airport systems and facilities that minimize negative impacts to the community and maximize economic benefits.**

**Policy LU-5.7** **ALUCP Consistency with Land Use Regulations**. We comply with state law that requires general plans, specific plans, and all new development to be consistent with the policies and criteria set forth within an Airport Land Use Compatibility Plan for any public-use airport.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

## Conclusion

With regards to the issue area of Land Use and Planning, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR are required.

## 4.12 Mineral Resources

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards*) | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan? | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that development resulting from implementation of TOP 2050 would result in less than significant impacts with respect to mineral resources.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? *and*

**Criterion 2:** Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

According to Figure 5.12-1 of the TOP 2050 Supplemental EIR, the Project, including Ownership Area 1, is located within Mineral Resource Zone-3 (MRZ-3), which is indicative of areas of undetermined mineral resource significance.[23] Development in an MRZ-3 area would not result in significant impacts because mineral resources of statewide or local importance are not identified on the California Geological Survey's P-C maps. There are two areas in Ontario that are designated MRZ-2, where significant mineral resources are known or are likely. These areas are located in the northwest and east-central portions of the City. Aggregate resource sectors D-2, D-3, and D-5 are located in the east-central portion of the City. Sectors D-3 and D-5 have been completely developed, as have portions of D-2. The areas of the City that are designated MRZ-2 but are outside of sectors are developed with urban uses and would continue to be designated for urban uses by TOP 2050. Areas designated MRZ-2 outside of the sectors are not available for extraction of mineral resources, and TOP 2050 would not result in changes to the existing conditions of these areas. Therefore, TOP 2050 and Project implementation within Ownership Area 1 would not

[23] City of Ontario. 2022. *The Ontario Plan 2050 Final SEIR*. Pages 5.12-2 and –3. https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf (accessed February 2025).

result in the loss of availability of a known mineral resource in Ontario and impacts to mineral resources would be less than significant.[24]

As such, the Project with respect to Ownership Area 1 would have a less than significant impact regarding mineral resources and no mitigation is needed as determined by the TOP 2050 Supplemental EIR. No peculiar impacts would occur.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the mineral resource impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As described above, because the entirety of the Project site is located within MRZ-3, future development within Ownership Area 2 would result in less than significant impacts to mineral resources. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy ER-5.5:** **Mining Operations.** We prohibit future mining operations where the resource extraction activities are incompatible with existing or proposed adjacent land uses.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Mineral Resources, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR, would be required.

[24] City of Ontario. 2022. The Ontario Plan 2050 Final SEIR. Page 5.12-6. https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf (accessed February 2025).

## 4.13 Noise

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project result in:** | | | | |
| **Criterion 1:** Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Generation of excessive groundborne vibration or groundborne noise levels. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Acoustical Assessment prepared by Kimley-Horn and Associates, Inc. (Kimley-Horn), dated May 2025, which is included as **Appendix H**. The **Appendix H** Acoustical Assessment summarizes the consistency of the Project's impacts, inclusive of both Ownership Areas 1 and 2, with the findings of the TOP 2050 Supplemental EIR. The Project-generated construction noise, stationary source noise, on-site mobile noise, construction vibration, and operational vibration would not exceed the applicable. However, the Project-generated mobile noise would exceed the applicable noise standards and be cumulatively significant. As shown in **Appendix H**, the Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. As a result, the Project would not result in any new or more severe impacts than previously analyzed in the TOP 2050 Supplemental EIR.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts resulting from the implementation of the TOP 2050 would be significant and unavoidable regarding noise and vibration.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

The TOP 2050 Supplemental EIR indicates that, upon buildout of TOP 2050, ground-level receivers adjacent plan implementation projects could experience temporary noise level increases from construction activities resulting in a potentially significant impact. However, with implementation of **MM 12-4**, construction noise, including stationary noise sources and traffic noise would not exceed the City's significance thresholds . As shown in the **Appendix H** Acoustical Assessment, the Project's construction noise impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. Ownership Area 1 on-site construction noise levels would not exceed accepted significance thresholds for construction noise.[25] Additionally, off-site construction traffic associated with Ownership Area 1 would not exceed Federal Transit Administration residential significance thresholds for construction activities. Additionally, delivery and haul trucks associated with Ownership Area 1 construction would be subject to the TOP 2050 Supplemental EIR **MM 12-4**, which limits, to the extent feasible, construction traffic to approved haul routes established by the City's Engineering Department. Impacts would be less than significant, and no mitigation is required. Similarly, Ownership Area 1 operational impacts would not exceed the City's daytime noise standard[26], and impacts would be less than significant. As discussed previously, the Project is consistent with the land uses designated in TOP 2050, and as a result, noise levels generated by the Project would be consistent with the findings of the Supplemental EIR. No peculiar impact would occur.

**Criterion 2:** Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Similar to noise levels, the TOP 2050 Supplemental EIR also found that vibrations generated during construction would also result in a significant impact to vibration-sensitive receptors while long-term operations associated with the buildout of TOP 2050 would not generate significant vibration impacts. To minimize vibration impacts, **MM 12-2** would be implemented to preserve integrity of sensitive receptors regarding vibration. As shown in the **Appendix H** Acoustical Assessment, the Project's vibration impacts are less than significant and within the limit of impacts identified in the TOP 2050 Supplemental EIR. Since the Project is consistent with land uses approved in the TOP 2050, vibration impacts with respect to Ownership Area 1 would be consistent with the TOP 2050 Supplemental EIR.

**Criterion 3:** For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in exposure of people residing or working in the project area to excessive noise levels?

The TOP 2050 Supplemental EIR also determined that airport noise would result in potentially significant impacts to sensitive receptors. The TOP 2050 Supplemental EIR found that based on data from the Airport Land Use Compatibility Plan, residents and other sensitive receptors located within the airport noise contours would be exposed to excessive noise levels from airport operations, resulting in a significant and unavoidable impact. TOP 2050 Supplemental EIR **MM 12-1** would require that, for certain projects within the Ontario International Airport influence area, the project applicant retain an acoustical engineer to conduct an acoustic analysis and identify, where appropriate, site design features and/or required

[25] The City does not have a quantitative noise threshold for construction. Therefore, the Federal Transit Administrations (FTA's) construction noise threshold is conservatively used for the **Appendix H** Acoustical Assessment.
[26] Pursuant to City MC Section 5-29.04, the exterior daytime noise standard for single-family residential uses is 65 dBA (A-weighted decibels).

building acoustical improvements to ensure compliance with the City's Noise Compatibility Criteria and the California State Building Code and California Noise Insulation Standards (Titles 24 and 21 of the California Code of Regulations).

As the Project site is located outside of the Chino Airport and Ontario International Airport noise contours, Project implementation would not expose residents or workers to excessive airport noise levels. The Project's impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. As a result, the Project would not result in any new or more severe impacts than previously analyzed in the TOP 2050 Supplemental EIR. As shown in the **Appendix H** Acoustical Assessment, the Project's noise impacts are within the limit of impacts identified in the TOP 2050 Supplemental EIR. As a result, Project implementation within Ownership Area 1 would not result in any peculiar or more severe impacts than previously analyzed in the TOP 2050 Supplemental EIR.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the noise impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As shown in the Appendix H Acoustical Assessment, the Project's construction and operational noise impacts would be less than significant and no mitigation is required. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy S4-1:** **Noise Mitigation.** Utilize the City's Noise Ordinance, building codes and subdivision and development codes to mitigate noise impacts.

**Policy S4-2:** **Coordination with Transportation Authorities.** Collaborate with airport owners, FAA, Caltrans, SANBAG, SCAG, neighboring jurisdictions, and other transportation providers in the preparation and maintenance of, and updates to transportation related plans to minimize noise impacts and provide appropriate mitigation measures.

**Policy S4-4:** **Truck Traffic.** Manage truck traffic to minimize noise impacts on sensitive land uses.

**Policy S4-5:** **Roadway Design.** Design streets and highways to minimize noise impact.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

**MM 12-1:** Prior to the issuance of building permits for any project that involves a noise-sensitive use within the 65 dBA CNEL of the Ontario International Airport, the project property owner/developers shall retain an acoustical engineer to conduct an acoustic analysis and identify, where appropriate, site design features and/or required building acoustical improvements (e.g., sound transmission class rated windows, doors, and attic baffling), to ensure compliance with the City's Noise Compatibility Criteria and the California State

Building Code and California Noise Insulation Standards (Titles 24 and 21 of the California Code of Regulations).

**MM 12-2:** Prior to issuance of a building permit, individual projects that involve vibration-intensive construction activities, such as pile drivers, jack hammers, and vibratory rollers near sensitive receptors shall be evaluated for potential vibration impacts. For construction within 135 feet of fragile structures, such as historical resources, within 100 feet of nonengineered timber and masonry buildings (e.g., most residential buildings), or within 75 feet of engineered concrete and masonry (no plaster); or a vibratory roller within 25 feet of any structure, the project applicant shall prepare a noise and vibration analysis to assess and mitigate potential noise and vibration impacts related to these activities. This noise and vibration analysis shall be conducted by a qualified and experienced acoustical consultant or engineer. The vibration levels shall not exceed Federal Transit Administration (FTA) architectural damage thresholds (e.g., 0.12 inches per second [in/sec] peak particle velocity [PPV] for fragile or historical resources, 0.2 in/sec PPV for nonengineered timber and masonry buildings, and 0.3 in/sec PPV for engineered concrete and masonry). If vibration levels would exceed this threshold, alternative uses shall be used, such as drilling piles as opposed to pile driving and static rollers as opposed to vibratory rollers. If necessary, construction vibration monitoring shall be conducted to ensure vibration thresholds are not exceeded.

**MM 12-4:** Construction activities associated with new development that occurs near sensitive receptors shall be evaluated for potential noise impacts. Construction contractors shall implement the following measures for construction activities in the City of Ontario. Construction plans submitted to the City shall identify these measures on demolition, grading, and construction plans. The City of Ontario Planning and Building Departments shall verify that grading, demolition, and/or construction plans submitted include these notations prior to issuance of demolition, grading, and/or building permits.

- Construction activity is limited to the hours between 7:00 am and 6:00 pm Monday through Friday and 9:00 am to 6:00 pm Saturdays and Sundays, as prescribed in Municipal Code Section 5-29.09.
- During the entire active construction period, equipment and trucks used for project construction shall use the best-available noise control techniques wherever feasible (e.g., improved mufflers, equipment re-design, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds).
- Impact tools (e.g., jack hammers and hoe rams) shall be hydraulically or electrically powered wherever possible. Where the use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used along with external noise jackets on the tools.
- Stationary equipment such as generators and air compressors shall be located as far as feasible from nearby noise-sensitive uses.
- Stockpiling shall be located as far as feasible from nearby noise-sensitive receptors.

- Construction traffic shall be limited, to the extent feasible, to approved haul routes established by the City's Engineering Department.
- At least 10 days prior to the start of construction activities, a sign shall be posted at the entrance(s) to the job site, clearly visible to the public, that includes permitted construction days and hours as well as the telephone numbers of the City's and contractor's authorized representatives that are assigned to respond in the event of a noise or vibration complaint. If the authorized contractor's representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City.
- Signs shall be posted at the job site entrance(s), within the on-site construction zones, and along queueing lanes (if any) to reinforce the prohibition of unnecessary engine idling. All other equipment shall be turned off if not in use for more than 5 minutes.
- During the entire active construction period and to the extent feasible, the use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only. The construction manager shall use smart back-up alarms, which automatically adjust the alarm level based on the background noise level or switch off back-up alarms and replace with human spotters in compliance with all safety requirements and laws.
- Erect temporary noise barriers (at least as high as the exhaust of equipment and breaking line-of-sight between noise sources and sensitive receptors), as necessary and feasible, to maintain construction noise levels at or below the performance standard of 80 dBA $L_{eq}$. Barriers shall be constructed with a solid material that has a density of at least 1.5 pounds per square foot with no gaps from the ground to the top of the barrier and may be lined on the construction side with an acoustical blanket, curtain, or equivalent absorptive material.

### Conclusion

With regards to the issue area of Noise, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. Feasible mitigation measures contained within the TOP 2050 Supplemental EIR (MMs 12-1, 12-2, and 12-4) would be applied to the Project.

## 4.14 Population and Housing

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts associated with development resulting from implementation of TOP 2050 would be less than significant with respect to population and housing.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Ownership Area 1 of the Project would include the addition of up to 3,095 residential units within the Project site. This could directly contribute to population growth in the area. Utilizing the Department of Finance (DOF) factor of 3.29 persons per household and, conservatively assuming that every resident of the Ownership Area 1 future development areas would be a new resident of the City, these residential uses would potentially result in a population increase in the City of up to 10,183 residents.

Conservative estimate growth predictions of 10,183 residents would be well within the SCAG growth projections assumed for the City and the SCAG region, specifically, 65,200 by 2050 in the City and 448,000 by 2050 in the County (see **Table 6**). The addition of 3,095 housing units would also aid the City in reaching the RHNA requirement of an additional 20,854 housing units by 2029. Therefore, the Project would not result in substantial unplanned population growth, and impacts would be less than significant.

**Criterion 2:** Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

Though the Project site is primarily use for agricultural land uses, there are currently single-family residences within Ownership Area 1 that would be displaced upon Project implementation. However, due to the low number of residences that would be displaced compared to the larger housing stock in the region (i.e., the Project as a whole would result in a net increase of approximately 4,273 housing units, conservatively assuming that approximately 20 residences currently exist on-site), the Project would not displace a substantial number of people or houses and would not necessitate the construction of replacement housing elsewhere. Ownership Area 1 of the Project would construct 3,095 housing units within the City, contributing to the City reaching its RHNA goal of 20,854 additional housing units by 2029. As such, displacement would not be substantial or require the construction of replacement housing elsewhere as the Project would construct adequate housing and aid the City in reaching its RHNA goal. As such, implementation of TOP 2050 would have a less than significant impact regarding displacement of housing as determined by the TOP 2050 Supplemental EIR.

This impact determination is consistent with the certified TOP 2050 Supplemental EIR. The Project would cause neither a new impact, nor an increase in the severity of an impact previously disclosed. No further analysis is required.

**Table 7: SCAG Projections – City of Ontario and San Bernardino County**

| | 2019 | 2050 | Projected Change 2019-2050 | Percent Change 2019-2050 |
|---|---|---|---|---|
| **San Bernardino County Forecast** | | | | |
| Population | 2,175,000 | 2,623,000 | 448,000 | 21% |
| Housing | 657,000 | 953,000 | 296,000 | 45% |
| Employment | 860,000 | 1,145,000 | 285,000 | 33% |
| **City of Ontario Forecast** | | | | |
| Population | 174,800 | 240,000 | 65,200 | 37% |
| Housing | 50,500 | 90,500 | 45,000 | 79% |
| Employment | 122,000 | 187,700 | 65,000 | 54% |

Source: SCAG. 2024. *RTP/SCS 2024-2050 – Connect SoCal, Demographics and Growth Forecast*. https://scag.ca.gov/sites/main/files/file-attachments/23-2987-connect-socal-2024-final-complete-040424.pdf?1714175547 . (accessed February 2025).

## Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the population and housing impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed above, Project impacts concerning population and housing would be less than significant. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Goal H-1:** **Stable neighborhoods of quality housing, ample community services and public facilities, well-maintained infrastructure, and public safety that foster a positive sense of identity.**

**Policy H-1.2** **Neighborhood Conditions.** We direct efforts to improve the long-term sustainability of neighborhoods through comprehensive planning, provision of neighborhood amenities, rehabilitation and maintenance of housing, and community building efforts.

**Policy H-1.3** **Community Amenities.** We shall provide adequate public services, infrastructure, open space, parking and traffic management, pedestrian, bicycle, and equestrian routes and public safety for neighborhoods consistent with City master plans and neighborhood plans.

**Policy H-1.4** **Historical Preservation**. We support the preservation and enhancement of residential structures, properties, street designs, lot configurations, and other reminders of Ontario's past that are considered to be local historical or cultural resources.

**Goal H-2:** **Diversity of types of quality housing that are affordable to a range of household income levels, accommodate changing demographics, and support and reinforce the economic sustainability of Ontario.**

**Policy H-2.1** **Corridor Housing.** We revitalize transportation corridors by encouraging the production of higher density residential and mixed-uses that are architecturally, functionally, and aesthetically suited to corridors.

**Policy H-2.4** **Ontario Ranch.** We support a premier lifestyle community in the Ontario Ranch, distinguished by diverse housing, highest design quality, and cohesive and highly amenitized neighborhoods.

**Policy H-2.5** **Housing Design.** We require architectural excellence through adherence to City design guidelines, thoughtful site planning, environmentally sustainable practices, and other best practices.

**Goal H-5:** **A full range of housing types and community services that meet the special housing needs for all individuals and families in Ontario, regardless of income level, age, or other status.**

**Policy H-5.2** **Family Housing.** We support the development of larger rental apartments that are appropriate for families with children, including, as feasible, the provision of services, recreation, and other amenities.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

## Conclusion

With regards to the issue area of Population and Housing, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.

   No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.15 Public Services

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Except as provided in Public Resources Code Section 21099, would the project:** | | | | |
| **Would the project:** | | | | |
| **Criterion 1:** Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Fire protection? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Police protection? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Schools? | ☐ | ☐ | ☐ | ☒ |

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Criterion 4:** Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Parks? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 5:** Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Other public facilities? | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts pertaining to public services would be less than significant.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Fire protection?

Fire protection services within the City are provided by the OFD. It was anticipated in the TOP 2050 Supplemental EIR that the development of land uses proposed within TOP 2050 planning area would likely result in an increase in demand for fire protection services, and that additional fire protection facilities would be required to meet the increase in demand. Specifically, the OFD's recommendation is that three additional fire stations would be needed in the Ontario Ranch to meet projected needs while maintaining response times and meeting National Fire Protection Association (NFPA) recommendations for levels of

service.[27] The TOP 2050 Supplemental EIR added that future projects, including the Project in its totality (Ownership Areas 1 and 2), would be reviewed by the City and the OFD on an individual basis and would be required to comply with requirements in effect at the time building permits are issued, including the payment of development impact fees that contribute to funding for additional staffing, facilities, and equipment. According to the TOP 2050 Supplemental EIR, sufficient revenue would be available for necessary service improvements to provide for adequate fire facilities, equipment, and personnel upon buildout of the TOP 2050. Consistent with TOP 2050, impacts from implementing the Project would be less than significant and no mitigation is necessary.

**Criterion 2:** Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Police protection?

Law enforcement services within the City are provided by the Ontario Police Department (OPD). The OPD also participates in mutual aid agreements with the San Bernardino County Sheriff and various jurisdictions surrounding Ontario to help participating jurisdictions when resources are inadequate to meet current service demands at a particular time. The TOP 2050 Supplemental EIR has determined that the OPD will incrementally require additional staffing as the City population increases. The police services required to cover the new development and population growth for Ontario would be assessed and acquired appropriately based on the needs of the City. The TOP 2050 Supplemental EIR found that it is possible that buildout of TOP 2050 would require additional facilities to support the OPD, the construction of which could result in potential environmental impacts. It stated that such facilities would have to complete applicable environmental review under CEQA at that time. Further the TOP 2050 Supplemental EIR found that future projects, such as the Project (both Ownership Areas 1 and 2), would also be reviewed by the City of Ontario on an individual basis and required to comply with regulations in effect at the time building permits are issued. As with TOP 2050, the need for additional structures and personnel would be financed through the City's development impact fee program, and the impacts of TOP 2050 and Project on police services would be less than significant.

**Criterion 3:** Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Schools?

The City is served by five school districts: Chaffey Joint Union High School District (CJUHSD); Ontario-Montclair Elementary School District (OMESD); Cucamonga Elementary School District (CESD); Mountain View Elementary School District (MVESD); and Chino Valley Unified School District (CVUSD). CJUHSD, CVUSD, and MVESD indicated they have capacity to accommodate TOP 2050. It is possible OMESD would need additional facilities by horizon year of TOP 2050. CESD could similarly be impacted by increased student population. Project implementation, inclusive of Ownership Areas 1 and 2, may result in a minimal

[27] City of Ontario. 2022. *TOP Final SEIR*. Page 5.15-3. https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf (accessed February 2025).

increase in demand for school services. Residential development in Ontario under TOP 2050, including the Project, would require payments to corresponding school districts, which would go towards the construction of new facilities when and if they are needed. School districts determine their own development impact fees, often dependent on student generation rates for that district. These payments accommodate the need for new facilities based on the increase in student population in each district. Developers would be required to pay the impact fees levied by each school district, set within the limits of Senate Bill (SB) 50. This funding program has been found by the Legislature to constitute "full and complete mitigation of the impacts" on the provision of adequate school facilities (Government Code Section 65995[h]).[28] The payment of impact fees in compliance with SB 50 would reduce the impacts to an acceptable level. Impacts would be less than significant, and the Project would be consistent with the TOP 2050 Supplemental EIR.

**Criterion 4:** Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Parks?

Refer to **Section 4.16: Recreation** for a discussion on parks.

**Criterion 5:** Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services: Other public facilities?

The City of Ontario has two library facilities within its library system: the Ovitt Family Community Library at 215 East C Street, and the Lewis Family Branch at 3850 East Riverside Drive. The Ontario library system is a member of the Inland Library System, which includes 19 independent libraries and other resources in San Bernardino, Riverside, and Inyo counties. This allows Ontario library members to use the interlibrary loan between the participating libraries. Buildout of TOP 2050 and the Project would result in an increase in demand for library services in the City of Ontario based on an increase in population. Future projects, including the Project, would be reviewed by the City of Ontario on an individual basis and would be required to comply with requirements in effect at the time building permits are issued (i.e., payment of development impact fees). Since adequate services would be provided and payment of development impact fees would offset the costs associated with library services, impacts on library services would be less than significant.[29]

## Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the public service

[28] City of Ontario. 2022. *TOP Final SEIR*. Page 5.15-14. https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf (accessed February 2025).

[29] City of Ontario. 2022. *TOP Final SEIR*. Page 5.15-17. https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf (accessed February 2025).

impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed above, Project impacts concerning public services would be less than significant. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy S-3.1:** **Prevention Services.** We proactively mitigate or reduce the negative effects of fire, hazardous materials release, and structural collapse by implementing the regularly adopted California Fire Code and California Building Code.

**Policy S-3.8:** **Fire Prevention through Environmental Design.** We require new development to incorporate fire prevention consideration in the design of streetscapes, sites, open spaces and buildings.

**Policy S-7.4:** **Crime Prevention through Environmental Design (CPTED).** We require new development to incorporate CPTED in the design of streetscapes, sites, open spaces, and buildings.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Public Services, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.16 Recreation

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Criterion 1:** Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts with regard to recreation would be less than significant.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

At the time of the TOP 2050 Supplemental EIR, the City provided approximately 2.7 acres of parkland[30] per 1,000 residents within the City and has a goal of providing five acres per 1,000 residents (see **Policy PR-1.5**). TOP 2050 addresses the need for recreation and parkland to preserve natural assets and environmentally sensitive lands. The Parks and Recreation Element contains relevant policies and programs to acquire additional parkland; integrate new park and recreation facilities with existing and future trails, bikeways, and easements; and conduct regular reviews and updates of the City's parks and trails plans to keep pace with demographic trends and recreational needs of Ontario's residents. TOP 2050 **Policy PR-1.14** requires that new multi-family residential developments of five or more units provide recreational facilities or open space, in addition to paying adopted impact fees. The policies and regulations are intended to meet the TOP 2050's standard parkland acreage ratio.[31]

The Project would include the development of 3,095 dwelling units within Ownership Area 1. As such, Project implementation would result in a minimal increase in demand for parks and recreational facilities

[30] (481 existing acres x 1,000)/179,597 people = 2.7.
[31] City of Ontario. 2022. *TOP 2050 Final SEIR*. Page 5.16-13. https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf (accessed February 2025).

within the City. The Project, including Ownership Area 1, would provide recreational amenities for its residents. Consistent with TOP 2050, Ownership Area 1 would include neighborhood parks and open space, as well as access and entryway improvements for the Ontario Grand Park, along Great Park Avenue and the existing Grove Avenue; refer to **Figure 3-13: Conceptual Landscape Plan**. Impacts associated with development of the Project, including its recreational amenities, are evaluated throughout this document. The Project would be consistent with the findings of the TOP 2050 Supplemental EIR and have a less than significant impact.

**Criterion 2:** Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The City maintains 32 parks, seven community centers, and three dog parks. The Project (both Ownership Areas 1 and 2) includes a residential component that could generate population growth and increase use of the nearby public parks or facilities. Multiple parks are located near the Project site. The nearest parks to the Project are Centennial Park, which is a City park, and two City of Chino parks: Constellation Park and Cypress Trails Park. These parks are approximately 1.4 miles north, less than one mile southwest and 1.2 miles west of the Project site, respectively. The MU zoning district accommodates a wide variety of retail commercial, office and high-density residential development in conformance with TOP 2050. It is anticipated that the Mixed-Use development will be comprised of 10 percent Office, 20 percent Commercial/Retail, and 70 percent Residential. According to the CenterPark Specific Plan, public parks, community centers, and similar facilities are permitted by right within both the BP and MU zoning districts. Additionally, publicly owned or accessible open space/parks and trails are permitted within the OS-NR zoning district. The Project is required, by TOP 2050 Policy PR-1.4, to provide parks or open space for new multi-family residential developments, in addition to the payment of applicable Development Impact Fees (DIFs).

Under TOP 2050, the City strives to provide five acres of parkland per 1,000 residents, and a minimum of two acres of developed private park space per 1,000 residents in addition to the three acres per 1,000 persons standard. The Project would be in compliance with the land use and zoning designations identified in TOP 2050 and the Project Applicant would pay general DIFs that contribute to funding for parks. Additionally, the Project would directly construct approximately 55.98 acres of parkland/ non-recreation open space within Ownership Area 1. Construction of approximately 3,095 dwelling units during Ownership Area 1 would have the potential to result in 10,183 residents as discussed in **Section 4.14: Population and Housing.** Under the assumption of an additional 10,183 residents and 55.98 acres of parkland within Ownership Area 1, there would be 5.5 acres of parkland per 1,000 residents, consistent with the City's goal of five acres of parkland per 1,000 residents (TOP 2050 Policy PR-1.5). As a result, development of park facilities would keep pace with the anticipated increase in population from buildout of TOP 2050. Furthermore, all future park development would undergo individual CEQA evaluation, which is anticipated to account for any future impacts, and impacts would be less than significant.

Overall, the Project would not result in adverse physical impacts associated with the provision of or need for new or physically altered park facilities and will not adversely affect service ratios or other performance objectives. In addition, the Project would comply with all applicable federal, state, and local regulations and payment of DIFs. Therefore, impacts related to parks would be less than significant.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the recreation impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed above, Project impacts concerning recreation would be less than significant. That is, the Project would provide for 11.28 acres of open-space parkland and non-recreational uses within Ownership Area 2 (2.9 acres per 1,000 residents) consistent with TOP 2050 Policy PR-1.6. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Goal PR-1** A system of safe and accessible parks that meets the needs of the community.

**Policy PR-1.4** **Multi-family Residential Developments**. We require that new multi-family residential developments of five or more units provide recreational facilities or open space, in addition to paying adopted impact fees.

**Policy PR-1.5** **Acreage Standard.** We strive to provide 5 acres or parkland (public and private) per 1,000 residents.

**Policy PR-1.6** **Private Parks.** We expect development to provide a minimum of 2 acres of developed private park space per 1,000 residents.

**Policy PR-1.14:** **Multi-family Residential Developments.** We require that new multi-family residential developments of five or more units provide recreational facilities or open space, in addition to paying adopted impact fees.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Recreation, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.17 Transportation

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b). | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** Result in inadequate emergency access. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Traffic Analysis and Vehicle Miles Traveled Analysis prepared by Urban Crossroads, Inc. (Urban Crossroads), dated March 2025 and November 2024 respectively, which are included as **Appendix I.** The Traffic Analysis includes a Level of Service (LOS) analysis. Please note that this additional information is provided for information purposes only, as vehicle delay is no longer considered a significant impact under CEQA pursuant to SB 743. Specifically, Public Resources Code (PRC) Section 21099(b)(2) states that: "Upon certification of the guidelines by the Secretary of the Natural Resources Agency pursuant to this section, automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment pursuant to this division, except in locations specifically identified in the guidelines, if any." (emphasis added). As summarized below, with respect to consistency with TOP 2050 level of service policies, with recommended improvements the Project's effects on operational LOS would be consistent with applicable local agency policies. Refer to **Appendix I** for a complete discussion of analysis methodology and findings.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that development resulting from buildout of TOP 2050 would result in less than significant impacts for conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities, and inadequate emergency access; result in a less than significant impact with mitigation incorporated for hazards due to a geometric design feature; and result in a significant and unavoidable impact for conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b).

As determined by the TOP 2050 Supplemental EIR, buildout of TOP 2050 would be inconsistent with CEQA Section 15064.3 as Vehicle Miles Traveled (VMT) would exceed the City average for VMT per service population. TOP 2050 would comply with TOP 2050 goals surrounding VMT reduction; however, as TOP 2050 does not adequately plan for increased VMT or alternative transportation methods, it would result in a significant and unavoidable impact.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?

Project implementation within Ownership Area 1 would not conflict with the 2020-2045 SCAG RTP/ SCS as determined by the TOP 2050 Supplemental EIR, and transportation infrastructure would comply with City engineering standards to ensure safety and compatibility with existing infrastructure. More specifically, the Project's circulation network across both Ownership Areas would be designed consistently with the existing transportation system by adhering to the transportation guidelines set in the TOP 2050. The Project would comply with the City's DIF program which would require a payment of fees to ensure that the Project's impact would not significantly impact the regional circulation and/or arterial expansions planned by the City and County (i.e., Congestion Management Program). The payment of fees pursuant to the DIF program would also help the City keep pace with improvements associated with the projected population increase or other identified roadway deficiencies. As such, Project buildout within Ownership Area 1 would not increase hazards due to a design feature and impacts would be less than significant.

**Criterion 2:** Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

Consistent with CEQA Guidelines Section 15064.3, the Project prepared a VMT Analysis (**Appendix I2**), which analyzes Project related VMT based on the San Bernardino County Transportation Analysis Model (SBTAM). The City and SBTAM model determined a significant impact regarding VMT would occur if the Project VMT per service population exceeds the Citywide average VMT per service population under General Plan buildout conditions or if the Project caused total daily VMT per service population within the City to be higher than the no project scenario under cumulative conditions. The VMT Analysis determined that the cumulative effect on VMT with buildout of the Project would not exceed the City impact threshold of 27.6 VMT per service population, as Project generated VMT would be approximately 16.0 VMT per service population. As such, the Project-generated VMT was estimated under baseline and buildout conditions and was found to be below the City's impact threshold. Therefore, a less than significant impact would occur regarding inconsistency with CEQA Guidelines Section 15064.3, and no mitigation is necessary.

**Criterion 3:** Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

The City has adopted roadway classification standards in TOP 2050 Policy M-1.1, provided below that include roadway design standards as part of TOP 2050, precluding the construction of any unsafe features. Because the Project land uses are consistent with TOP 2050, development of Ownership Area 1 was

accounted for in the environmental documentation for TOP 2050 (i.e., the TOP 2050 Supplemental EIR). Additionally, Project uses within Ownership Area 1 are within the maximum allowable FARs and densities in TOP 2050 Supplemental EIR. Therefore, the FAR and density of Ownership Area 1 are within the land use and zoning assumptions in TOP 2050 Supplemental EIR. Additionally, a Traffic Analysis was prepared that identifies intersection improvement recommendations, which are necessary to maintain LOS standards consistent with the TOP 2050 Supplemental EIR. This Traffic Analysis is included as **Appendix I1**. The Traffic Analysis evaluated traffic impacts on roadway segments and road queuing for existing conditions (year 2024), existing conditions plus the Project, opening year conditions (year 2034), and horizon year impacts (year 2050). Under existing conditions, one roadway segment, Euclid Avenue (SR-83) to Pine Avenue, operates at a deficient LOS E during PM peak hours, which is considered an unacceptable level of service. The Traffic Analysis identifies on-site circulation recommendations that would comply with the circulation recommendations found in TOP 2050. The City has created its own local DIF program to impose and collect fees from new residential, commercial, and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the TOP 2050 Circulation Element. Recommended circulation improvements, consistent with the City's Roadway Classification Plan, and payment of fair share contribution fees would be conditioned by the City and would achieve City transportation policy standards. As such, these roadways would incorporate bicycle and pedestrian facilities consistent with policies described in the TOP 2050 Supplemental EIR, thereby supporting the City's goals for a multimodal transportation network. As impacts are cumulative with surrounding Projects in the City, payment of development impact fees effective January 2023 and fair share contributions would bring impacts to a less than significant impact.

**Criterion 4:** Would the project result in inadequate emergency access?

Implementation of the Project, inclusive of Ownership Area 1, would comply with all adopted emergency response plans, evacuation plans, and maintain adequate emergency access through construction and operation associated with buildout of TOP 2050. All future roadway and access improvements would comply with City engineering and fire department standards to maintain adequate circulation and access throughout the City. Therefore, Project implementation within Ownership Area 1 would have a less than significant impact regarding result in inadequate emergency access.

Additionally, Project construction within Ownership Area 1 would not require the partial or temporary closure of adjacent roadways, such as Edison Avenue, identified as an evacuation route for the City, and the Project site does not contain any emergency services that would be impacted.[32] Additionally, a review of emergency access is included as part of the City's Design Review process. Further, the Ontario Fire Department would review future development applications to ensure that adequate emergency accessibility is provided based on local and state guidance. As a result, the Project would not create new significant impacts than those analyzed and identified in the TOP 2050 Supplemental EIR. Based on the development assumptions for Ownership Area 1 under the TOP 2050 Supplemental EIR, Project implementation within Ownership Area 1 would be consistent with the anticipated land uses for Ownership Area 1 and would not generate unanticipated impacts. As such, impacts would not differ from

[32] City of Ontario. 2022. *The Ontario Plan 2050. Figure S-10, Evacuation Routes*. https://content.ontarioca.gov/sites/default/files/2024-12/Figure%20S-10%20Evacuation%20Sites.pdf. (accessed February 2025).

those identified in TOP 2050 Supplemental EIR and the Project with respect to Ownership Area 1 would result in a less than significant impact.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the transportation impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed above, Project impacts affecting transportation would be less than significant. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy M-1.2:** **Mitigation of Impacts.** We require development to mitigate its traffic impacts.

**Policy M-1.5:** **Level of Service.** Maintain a peak hour Level of Service (LOS) E or better at all intersections. Maintain Level of Service D or better on arterial streets in the City. Develop and maintain a list of locations where LOS E or LOS F are considered acceptable and would be exempt from this level of service policy. Considerations for LOS exemption include being restricted by environmental constraints, lacking available right-of-way, deterring an increase in VMT, or degrading other modes of travel (such as bicycle or pedestrian infrastructure).

**Policy M-1.6:** **Reduce Vehicle Miles Traveled.** We will strive to reduce VMT through a combination of land use, transportation projects, travel demand management strategies, and other trip reduction measures in coordination with development projects and public capital improvement projects.

**Policy M-2.1:** **Active Transportation.** We maintain our Active Transportation Master Plan to create a comprehensive system of on- and off-street bikeways and pedestrian facilities that are safe, comfortable, and accessible and connect residential areas, businesses, schools, parks, and other key destination points.

**Policy M-2.2:** **Bicycle System.** We provide off-street multipurpose trails and Class II bikeways as our preferred paths of travel and use the Class III for connectivity in constrained circumstances. When truck routes and bicycle facilities share a right-of-way, we prefer Class I or Class IV bicycle facilities. We require new development to include bicycle facilities, such as bicycle parking and secure storage areas.

**Policy M-2.3:** **Pedestrian Walkways.** We require streets to include sidewalks and visible crosswalks at major intersections where necessary to promote safe and comfortable mobility between residential areas, businesses, schools, parks, recreation areas, and other key destination points.

**Policy M-2.4:** **Network Opportunities.** We use public rights-of-way and easements such as, utility easements, levees, drainage corridors, road rights-of-way, medians, and other potential options to maintain and expand our bicycle and pedestrian network. In urban, mixed-use,

and transit-oriented Place Types, we encourage the use of underutilized public and private spaces to expand our public realm and improve pedestrian and bicycle connectivity.

**Policy M-3.2:** **Alternative Transit Facilities at New Development.** We require new development adjacent to an existing or planned transit stop to contribute to the creation of transit facilities, such as bus shelters, transit bays and turnouts, and bicycle facilities, such as secure storage areas.

**Policy M-3.3:** **Transit-Oriented Development.** We may provide additional development-related incentives to those inherent in the Land Use Plan for projects that promote transit use and reduce vehicle miles traveled.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Transportation, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR, would be required.

## 4.18 Tribal Cultural Resources

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Except as provided in Public Resources Code Section 21099, would the project:** | | | | |
| **Criterion 1:** Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:<br>a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC Section 5020.1(k), or<br>b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that development resulting from implementation of TOP 2050 would result in less than significant impacts with mitigation incorporated regarding tribal cultural resources (TCRs).

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1 and Ownership Area 2 Future Development Areas

**Criterion 1:** Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC Section 5020.1(k), or

b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

TOP 2050, in consultation with local Native American Tribes, identifies potential areas of significance for TCRs. The Agua Caliente Band of Cahuilla Indians and Quechan Tribe of the Fort Yuma Reservation responded that the City is not within the tribe's traditional use area. The Gabrieleño Band of Mission Indians–Kizh Nation concurred with TOP 2050, and the San Manuel Band of Mission Indian stated that TOP 2050 may impact projects in Serrano ancestral territory and therefore is of interest to the tribe. Additionally, as the Project includes the adoption of a Specific Plan, SB 18 would apply. Therefore, the City has initiated government-to-government tribal consultation, pursuant to SB 18.

In accordance with SB 18, the City sent Tribal consultation letters to the Native American Tribes. The Gabrieleño Band of Mission Indians–Kizh Nation responded and has requested mitigation measures, in conformance with the mitigation requirements set forth in the TOP 2050 Supplemental EIR, be applied to the Project; refer to **MMs TCR-3** through **5**. lt. Additionally, the Morongo Band of Mission Indians responded and requested additional project-specific materials, including the Cultural Resources Assessment. Upon receipt of these materials from the City on September 14, 2025, representatives of the Morongo band of Mission Indians had no further comments on the Project and tribal consultation was concluded. No other responses have been received.

Future development as a result of the implementation of TOP 2050, including the Project, could include grading in portions of the City with sensitivity to TCRs. Grading and construction activities in undeveloped areas or redevelopment that require deeper soil excavation than in the past could potentially disturb TCRs. Therefore, future development could potentially unearth previously unknown/unrecorded TCRs. **MM TCR-2** would reduce potential impacts associated with TCRs inadvertent discoveries to a level that is less than significant by both TOP 2050 and the Project. Therefore, no significant unavoidable adverse impacts relating to TCRs remain. Project findings are consistent with those of TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy CD4-1:** **Cultural Resource Management.** We update and maintain an inventory of historic sites and buildings, professional collections, artifacts, manuscripts, photographs, documents, maps, and other archives.

**Policy CD-4.2:** **Collaboration with Property Owners and Developers.** We educate and collaborate with property owners and developers to implement strategies and best practices that preserve the character of our historic buildings, streetscapes, and unique neighborhoods.

**Policy CD-4.3:** **Collaboration with Outside Agencies.** We pursue opportunities to team with other agencies, local organizations, and nonprofits in order to preserve and promote Ontario's heritage.

**Policy CD-4.6:** **Promotion of Public Involvement in Preservation.** We engage in programs to publicize and promote the City's and the public's involvement in preservation efforts.

**Policy CD-4.7:** **Public Outreach.** We provide opportunities for our residents to research and learn about the history of Ontario through the Planning Department, the Ontario Museum of History and Art, and the Robert E. Ellingwood Model Colony History Room.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

**MM 5-3** Upon receipt of an application for a proposed project subject to CEQA and is within the City's jurisdiction, the City's representative shall consult with the relevant tribe(s)' representative(s) to determine if the proposed project is within a culturally sensitive area to the tribe. If sufficient evidence is provided to reasonably ascertain that the site is within a [tribal] culturally sensitive area, an archaeologist shall prepare a cultural resources assessment. The findings of the cultural resources assessment shall be incorporated into the CEQA documentation. A copy of the report shall be forwarded to the tribe(s). If mitigation is recommended in the CEQA document, the procedure described in Mitigation Measure 5-4 shall be followed.

**MM 5-4** Prior to the issuance of grading permits for a proposed project for which the CEQA document defines cultural resource mitigation for potential tribal resources, the project applicant shall contact the designated tribe(s) to notify them of the grading, excavation, and monitoring program. The applicant shall coordinate with the City of Ontario and the tribal representative(s) to develop mitigation measures that address the designation, responsibilities, and participation of tribal monitors during grading, excavation, and ground-disturbing activities; scheduling; terms of compensation; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site. The City of Ontario shall be the final arbiter of the conditions for projects within the City's jurisdiction.

**MM TCR-1** **Tribal Cultural Resources Monitoring.** The project archaeologist, in consultation with interested tribes, the developer, and the City of Ontario, shall develop an archaeological monitoring plan (AMP) to address the details, timing, and responsibility of archaeological and cultural activities that will occur on the project site. Details in the AMP shall include:

1. Project-related ground disturbance (including, but not limited to, brush clearing, grading, trenching, etc.) and development scheduling;
2. The development of a rotating or simultaneous schedule in coordination with the developer and the project archeologist for designated Native American Tribal Monitors from the consulting tribes during grading, excavation and ground disturbing activities on the site: including the scheduling, safety requirements, duties, scope of work, and Native American Tribal Monitors' authority to stop and redirect grading activities in coordination with all project archaeologists (if the tribes cannot come to an agreement on the rotating or simultaneous schedule of tribal monitoring, the Native American Heritage Commission shall designate the schedule for the onsite Native American Tribal Monitor for the proposed project);
3. The protocols and stipulations that the developer, City, Tribes, and project archaeologist will follow in the event of inadvertent cultural resources discoveries,

including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation.

At least 30 days prior to application for a grading permit and before any brush clearance, grading, excavation, and/or ground disturbing activities on the site, the developer shall retain a tribal cultural monitor to monitor all ground-disturbing activities in an effort to identify any unknown archaeological resources.

Pursuant to the AMP, a tribal monitor from the consulting tribe shall be present during the initial grading activities. If tribal resources are found during grubbing activities, the tribal monitoring shall be present during site grading activities.

**MM TCR-2** **Treatment and Disposition of Cultural Resources.** In the event that Native American cultural resources are inadvertently discovered during the course of any ground-disturbing activities, including but not limited to brush clearance, grading, trenching, etc., for the proposed project, the following procedures will be carried out for treatment and disposition of the discoveries:

1. Temporary Curation and Storage: During the course of construction, all discovered resources shall be temporarily curated in a secure location on-site or at the offices of the project archaeologist. The removal of any artifacts from the project site will need to be thoroughly inventoried with tribal monitor oversight of the process;
2. Treatment and Final Disposition: The landowner(s) shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts and nonhuman remains as part of the required mitigation for impacts to cultural resources. The applicant shall relinquish the artifacts through one or more of the following methods and provide the City of Ontario with evidence of same:
    a. Accommodate the process for on-site reburial of the discovered items with the consulting Native American tribes or bands. This shall include measures and provisions to protect the future reburial area from any future impacts. Reburial shall not occur until all cataloging, basic analysis, other analyses as recommended by the project archaeologist and approved by consulting tribes, and basic recordation have been completed; all documentation should be at a level of standard professional practice to allow the writing of a report of professional quality;
    b. A curation agreement with an appropriate qualified repository in San Bernardino County that meets federal standards per 36 CFR Part 79, and therefore the resource would be professionally curated and made available to other archaeologists/researchers for further study. The collections and associated records shall be transferred, including title, to an appropriate curation facility in San Bernardino County, to be accompanied by payment of the fees necessary for permanent curation;
    c. For purposes of conflict resolution, if more than one Native American tribe or band is involved with the project and cannot come to an agreement as to the

disposition of cultural materials, materials shall be curated at the San Bernardino County Museum by default; and

d. At the completion of grading, excavation, and ground-disturbing activities on the site, a Phase IV Monitoring Report shall be submitted to the City documenting monitoring activities conducted by the project archaeologist and Native Tribal Monitors within 60 days of completion of grading. This report shall document the impacts to the known resources on the property; describe how each mitigation measure was fulfilled; document the type of cultural resources recovered and the disposition of such resources; provide evidence of the required cultural sensitivity training for the construction staff held during the required pre-grade meeting; and, in a confidential appendix, include the daily/weekly monitoring notes from the archaeologist. All reports produced will be submitted to the City, County Museum, and consulting tribes.

In compliance with state law, the following measures, requested for inclusion by the Consulting Tribes (described above), are intended to implement the policies and mitigation requirements set forth in the TOP 2050 Supplemental EIR:

**MM TCR-3** Retain a Native American Monitor Prior to Commencement of Ground-Disturbing Activities

a. The project applicant/lead agency shall retain a Native American Monitor from or approved by the Gabrieleño Band of Mission Indians – Kizh Nation. The monitor shall be retained prior to the commencement of any "ground-disturbing activity" for the subject project at all project locations (i.e., both on-site and any off-site locations that are included in the project description/definition and/or required in connection with the project, such as public improvement work). "Ground-disturbing activity" shall include, but is not limited to, demolition, pavement removal, potholing, auguring, grubbing, tree removal, boring, grading, excavation, drilling, and trenching.

b. A copy of the executed monitoring agreement shall be submitted to the lead agency prior to the earlier of the commencement of any ground-disturbing activity, or the issuance of any permit necessary to commence a ground-disturbing activity.

c. The monitor will complete daily monitoring logs that will provide descriptions of the relevant ground-disturbing activities, the type of construction activities performed, locations of ground-disturbing activities, soil types, cultural-related materials, and any other facts, conditions, materials, or discoveries of significance to the Tribe. Monitor logs will identify and describe any discovered TCRs, including but not limited to, Native American cultural and historical artifacts, remains, places of significance, etc., (collectively, tribal cultural resources, or "TCR"), as well as any discovered Native American (ancestral) human remains and burial goods. Copies of monitor logs will be provided to the project applicant/lead agency upon written request to the Tribe.

d. On-site tribal monitoring shall conclude upon the latter of the following (1) written confirmation to the Kizh from a designated point of contact for the project

applicant/lead agency that all ground-disturbing activities and phases that may involve ground-disturbing activities on the project site or in connection with the project are complete; or (2) a determination and written notification by the Kizh to the project applicant/lead agency that no future, planned construction activity and/or development/construction phase at the project site possesses the potential to impact Kizh TCRs.

MM TCR-4 Unanticipated Discovery of Tribal Cultural Resource Objects (Non-Funerary/Non-Ceremonial)

a. Upon discovery of any TCRs, all construction activities in the immediate vicinity of the discovery shall cease (i.e., not less than the surrounding 50 feet) and shall not resume until the discovered TCR has been fully assessed by the Kizh monitor and/or Kizh archaeologist. The Kizh will recover and retain all discovered TCRs in the form and/or manner the Tribe deems appropriate, in the Tribe's sole discretion, and for any purpose the Tribe deems appropriate, including for educational, cultural and/or historic purposes.

**MM TCR-5:** Unanticipated Discovery of Human Remains and Associated Funerary or Ceremonial Objects.

a. Native American human remains are defined in PRC 5097.98 (d)(1) as an inhumation or cremation, and in any state of decomposition or skeletal completeness. Funerary objects, called associated grave goods in Public Resources Code Section 5097.98, are also to be treated according to this statute.

b. If Native American human remains and/or grave goods are discovered or recognized on the project site, then Public Resource Code 5097.9 as well as Health and Safety Code Section 7050.5 shall be followed.

c. Human remains and grave/burial goods shall be treated alike per California Public Resources Code section 5097.98(d)(1) and (2).

d. Preservation in place (i.e., avoidance) is the preferred manner of treatment for discovered human remains and/or burial goods.

e. Any discovery of human remains/burial goods shall be kept confidential to prevent further disturbance.

## Conclusion

With regards to the issue area of TCRs, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.

4. Feasible mitigation measures contained within or consistent with the TOP 2050 Supplemental EIR (MMs 5-3, 5-4, TCR-1, and TCR-2), would be applied to the Project.

## 4.19 Utilities and Service Systems

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Would the project:** | | | | |
| **Criterion 1:** Require or result in the relocation or construction of new or expanded water or wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Result in a determination by the wastewater treatment provider which serves, or may serve, the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 5:** Comply with Federal, State, and local management and reduction statutes and regulations related to solid waste. | ☐ | ☐ | ☐ | ☒ |

This section summarizes the Water Supply Assessment prepared by Albert A. Webb Associates (Webb; December 2024), which is included as **Appendix J**.

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts resulting from buildout of TOP 2050 would be less than significant with respect to utilities and service systems.

## Project Specific-Impacts

### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project require or result in the relocation or construction of new or expanded water or wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The City, and thus the Project site inclusive of both Ownership Areas 1 and 2, are within the service area for SCE and SoCalGas. Developments accommodated under the TOP 2050, such as the Project, would be required to comply with the current and future updates to the Building Energy Efficiency Standards and CALGreen, which would contribute to reducing the electricity and natural gas demands in the City.

The Project would include connections to existing facilities on-site. Ownership Area 1 would include development of 3,095 residential units on currently partially developed and disturbed land. Project implementation would result in an increase in demand for water, sewer, trash, and energy services. The Project would be consistent with the existing land use designation of the Project site. As such, the proposed development was anticipated upon approval of the TOP 2050 Supplemental EIR, and it is anticipated that the Project would be adequately served by existing providers. The Project would be consistent with the findings of the TOP 2050 Supplemental EIR.

The TOP 2050 Supplemental EIR found that potential future development as part of TOP 2050, including, as discussed here, from the Project, and the change in land uses could result in an increase in impervious surfaces, could result in an increase in stormwater runoff, higher peak discharges to drainage channels, and the potential to cause nuisance flooding in areas without adequate drainage facilities. All projects in the City are required to install stormwater treatment measures to ensure that post-project runoff does not exceed pre-project runoff for the two-year, 24-hour storm event. This would also minimize the potential for increases in peak runoff from the Project. Per the TOP 2050 Supplemental EIR, TOP 2050 **Policies ER-1.6, ER-1.7, S-2.2,** and **S-2.5** direct the City to incorporate strategies to capture, slow and treat runoff and reduce the downgradient potential for flooding. Compliance with these policies will ultimately reduce discharge volumes to the storm drain system. **Policy S-2.1** requires hydrological studies prepared by a State-certified engineer when development is located in a 100-year or 500-year floodplain to assess the impact that new development will have on the flooding potential of existing downgradient developments. Also, **LU-1.3** requires adequate infrastructure and services for all development and **Policy LU-4.3** requires that the necessary infrastructure and services be in place prior to or concurrent with new development.[33] Consistent with TOP 2050, the Project would also adhere to the aforementioned TOP 2050 policies. Future development under TOP 2050, including the Project, would be required to comply with the City's storm drain policies and MS4 permit, and prepare hydrology reports, drainage plans, and WQMPs. These requirements would minimize the amount of stormwater runoff from potential future development.

[33] Ibid. Page 5.19-43.

**Criterion 2:** Would the project have insufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?

The City would provide water service to the TOP 2050 plan area and the Project, inclusive of Ownership Area 1. Total water demand associated with TOP 2050 would be 78,128-acre feet per year (afy). Adherence to TOP 2050 policies **LU-1.3** and **LU-4.3** would ensure that the infrastructure and services for all development are adequate and that the necessary infrastructure and services are in place prior to or concurrent with development. The goal of **Policy ER-1.1** is to increase local water supplies to reduce dependence on imported water. **Policy ER-1.2** states the water supply and quality should match the appropriate use and **Policy ER-1.3** requires conservative strategies that reduce water usage. **Policy ER-1.4** requires that water supply and demands be balanced, and **Policy ER-1.5** relates to water quality protection, pollution prevention, and existing contamination and remediation. **Policy S-3.7** requires monitoring the water supply system to ensure that there are adequate supplies for firefighting needs. Consistent with TOP 2050, the Project would also adhere to the aforementioned TOP 2050 policies related to water supply. That is, the Project's water supply system has been designed to be consistent with the City's Water Master Plan. In addition, State requirements and City policies and code requirements would result in enhanced water efficiency and conservation. Applying these measures to the TOP 2050 water demand estimates would result in total water demand below the projections in the IEUA's 2020 Urban Water Management Plan (UWMP) for year 2045. Therefore, there would be sufficient water supplies to meet the demand for TOP 2050 buildout and the Project within Ownership Area 1.[34] Project impacts with respect to Ownership Area 1 would be less than significant and no peculiar impact would occur.

**Criterion 3:** Would the project result in a determination by the wastewater treatment provider which serves, or may serve, the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

The TOP 2050 Supplemental EIR found that the City's wastewater collection system is adequate to convey the additional 2.55 million gallons per day (mgd) that would occur with implementation of TOP 2050. Sewer infrastructure would be able to accommodate sewer flows associated with TOP 2050. This CIP would serve to benefit development in the area, including the Project. Wastewater treatment services would be provided by IEUA which has two facilities in the City: Recycling Plant (RP)-1 and RP-5. 2040 future capacity of these two facilities is projected at 74 mgd. The wastewater flow rate for TOP 2050 buildout, inclusive of the Project, is 37.1 mgd. The additional flow associated with TOP 2050 would not exceed IEUA wastewater treatment capacity. Even with future increases in population and wastewater flows in the service area, IEUA could continue to provide wastewater treatment to all its customers.[35] Therefore, impacts for Ownership Area 1 would be less than significant and no peculiar impact would occur.

[34] Ibid. Page 5.19-30 through –31.
[35] City of Ontario. 2022. TOP 2050 Supplemental EIR. Page 5.19-11 https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf (accessed February 2025).

**Criterion 4:** Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? *and*

**Criterion 5:** Would the project comply with Federal, State, and local management and reduction statutes and regulations related to solid waste?

Buildout under TOP 2050 would generate an additional 87,248 tons/year of solid waste from residents, but this would be offset by a reduction of 42,044 tons/year due to a decrease in the number of employees. This would result in a net increase in solid waste generation at buildout of 45,204 tons/year. This equates to approximately 151 tons/day (assuming 300 disposal days/year). The combined excess capacity of the Badlands Sanitary Landfill and the El Sobrante Landfill is 7,046 tons/day. Therefore, these landfills can the additional 151 tons/day from TOP 2050, which is about 2 percent of the landfills' excess capacity, and both landfills have closure dates beyond the year 2050.[36] As the Project solid waste generation falls within that estimated for buildout of TOP 2050, the excess capacity of the landfills can accommodate the waste generated by Project land uses within Ownership Area 1. TOP 2050 and the Project would also adhere to Assembly Bill 341, which requires recycling for mixed-use land uses. Finally, TOP 2050 and the Project, inclusive of Ownership Area 1, would adhere to **Policies ER-2.1, ER-2.2,** and **ER-2.3** which describe waste diversion requirements, hazardous and electronic waste disposal, and purchasing of products made from recycled materials that would ensure that the City has a cost-effective integrated waste management system that meets or exceeds state and federal recycling and waste diversion mandates. Therefore, impacts within Ownership Area 1 would be less than significant and no peculiar impact would occur.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the utilities and service system impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. While the structures and operations associated with Ownership Area 2 would increase utility and service system impacts of the site, impacts affecting utility and service systems would be less than significant, as described above. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

## The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy ER-1.1:** **Local Water Supply**. We increase local water supplies to reduce our dependence on imported water. New and redevelopment projects are aligned with our available water supply and/or to enhance our available water supply.

**Policy ER-1.2:** **Matching Supply to Use**. We match water supply and quality to the appropriate use.

[36] Ibid. Page 5.19-53.

**Policy ER-1.3:** **Conservation and Sustainable Water Supply**. We work with regional water providers and users to conserve water and ensure sustainable local water supplies as more frequent droughts reduce long term local and regional water availability.

**Policy ER-1.4:** **Supply-Demand Balance**. We require that available water supply and demands be balanced.

**Policy ER-1.5:** **Water Resources Management.** Environmental justice areas are prioritized as we coordinate with local agencies to protect water quality, prevent pollution, address existing contamination, and remediate contaminated surface water and groundwater.

**Policy ER-1-6:** **Urban Runoff Quantity.** We encourage the use of low impact development strategies, including green infrastructure, to intercept runoff, slow the discharge rate, increase infiltration and ultimately reduce discharge volumes to traditional storm drain systems.

**Policy ER-1.8:** **Wastewater Management**. We require the management of wastewater discharge and collection consistent with waste discharge requirements adopted by the Regional Water Quality Control Board.

**Policy ER-2-1:** **Waste Diversion.** We shall meet or exceed AB 939 requirements.

**Policy ER-2-2:** **Hazardous and Electronic Wastes.** We prohibit the disposal of hazardous and electronic waste into the municipal waste stream pursuant to state law.

**Policy ER-2-3:** **Purchase Products Made from Recycled Materials.** We purchase recycled-content products where it is cost-effective.

**Policy S-2-1:** **Entitlement and Permitting Process.** We require hydrological studies prepared by a State-certified engineer when new development is located in a 100-year or 500-year floodplain to assess the impact that the new development will have on the flooding potential of existing development down-gradient.

**Policy S-2-2:** **Floodplain Mapping:** We require any new development partially or entirely in 100-year flood zones to provide detailed floodplain mapping for 100- and 200-year storm events as part of the development approval process.

**Policy S-2-5:** **Stormwater Management.** We maintain the storm drain system to convey a 100-year storm, when feasible, and encourage environmental site design practices to minimize flooding and increase groundwater recharge, including natural drainage, green infrastructure, and permeable ground surfaces.

**Policy S-2-7:** **Collaboration Between Agencies.** Collaborate with the San Bernardino County Flood Control District and other state and federal agencies to maintain flood-control infrastructure to minimize flood damage.

**Policy S-3.7:** **Water Supply and System Redundancy.** We monitor our water system to manage and ensure adequate firefighting water supplies.

**Policy LU-1.3:** **Adequate Capacity**. We require adequate infrastructure and services for all development.

**Policy LU-4.3:** **Infrastructure Timing**. We require that the necessary infrastructure and services be in place prior to or concurrently with development.

**Policy LU-4.4:** **Shared Infrastructure**. We encourage and facilitate the use of shared infrastructure (including shared or managed parking) in urban, mixed use, and transit-oriented Place Types.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Utilities and Service Systems, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.
4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR, would be required.

# 4.20 Wildfire

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:** | | | | |
| **Criterion 1:** Substantially impair an adopted emergency response plan or emergency evacuation plan. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 2:** Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the Environment. | ☐ | ☐ | ☐ | ☒ |
| **Criterion 4:** Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. | ☐ | ☐ | ☐ | ☒ |

### Summary of Impacts Identified in The Ontario Plan 2050 Supplemental EIR

The TOP 2050 Supplemental EIR determined that impacts resulting from buildout of TOP 2050 would be less than significant with respect to wildfire.

### Project Specific-Impacts

#### Specific Plan – Ownership Area 1

**Criterion 1:** Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

Refer to **Section 4.9, Hazards and Hazardous Materials** and **Section 4.17, Transportation** for further discussion relating to emergency access and evacuation plans. The Project impact regarding emergency response would be less than significant. As a result, the Project's impacts for Ownership Area 1 are within the limit of impacts identified in the TOP 2050 Supplemental EIR. There is no peculiar impact and no mitigation is required.

**Criterion 2:** Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

With regard to wildfire risk and the exposure of people/structures to risks associated with wildfire, TOP 2050 Supplemental EIR found that the City is outside of the State Responsibility Area (SRA), and CAL FIRE determined that the City contains no areas subject to very high wildfire risk. Because the Project land uses are consistent with TOP 2050, development of Ownership Area 1 was accounted for in the environmental documentation for TOP 2050 (i.e., the TOP 2050 Supplemental EIR). There is no peculiar impact and no mitigation is required.

**Criterion 3:** Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the Environment?

Per TOP 2050 Supplemental EIR, substantial improvements in transportation infrastructure are planned to accommodate the increase in population in the City should an emergency occur. The City has adopted roadway classification standards in **Policy M-1.1** (see below) that include roadway design standards as part of TOP 2050, precluding the construction of any unsafe features. Furthermore, emergency access would be considered during the City's Design Review process, and the Ontario Fire Department reviews development applications to ensure the provision of adequate emergency access based on local and state guidance. The Project, too, would be consistent with **Policy M 1.1**. That is, the Project would undergo the City's Design Review process and review by the OFD to ensure compliance with federal, state, and local design and safety standards. Additionally, the Project's Specific Plan has been designed consistent with the City's Master Plan of Streets and Highways.

The City's 2023 Local Hazard Mitigation Plan (LHMP) identified a mitigation action to continue to reduce fire hazards in the City.[37] Said action, through code enforcement, is to enforce the weed abatement program to reduce fuels available to burn. Therefore, the Project, inclusive of Ownership Area 1, would comply with LHMP Mitigation Action 6.02 for the reduction of fire hazards in the City (Ontario MC Section 5-22.02). Both TOP 2050 and the Project would be consistent with this action and the LHMP. No peculiar impacts would occur.

**Criterion 4:** Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Overall, with adherence to building practices and resources such as the LHMP, California Fire Code, and CAL FIRE's Strategic Fire Plan, among others, development associated with TOP 2050 and the Project would not exacerbate risk or result in post-wildfire hazards (i.e., landslides, mudflows, flooding, etc.). In addition, as required in the TOP 2050, the Project would adhere to the policies below to prevent wildfire hazards. As with TOP 2050, Project impacts with respect to Ownership Area 1 would be less than significant with respect to wildfire and no mitigation is necessary. Project buildout within Ownership

[37] City of Ontario. 2023. *Local Hazard Mitigation Plan*. Page 145. https://www.ontarioca.gov/residents/health-safety/emergency-preparedness/local-hazard-mitigation-plan (accessed February 2025).

Area 1 would be consistent with the findings of the TOP 2050 Supplemental EIR. No peculiar impacts would occur.

### Specific Plan – Ownership Area 2, Future Development Areas

The Ownership Area 2 is being evaluated only at a programmatic level, and there are no specific development proposals at this time. Development of Ownership Area 2 would add to the wildfire impacts in the environment when Planning Areas 1 through 5, 7 through 11, and 14 through 16 are completed – similar to the discussion of Ownership Area 1 above. As discussed above, Project impacts regarding wildfire would be less than significant. Furthermore, the CenterPark Specific Plan land use designations within Ownership Area 2 are the same land use designations as contained in TOP 2050. Accordingly, no mitigation is required other than compliance with applicable plans, policies and programs, including the proposed Specific Plan and TOP 2050.

### The Ontario Plan 2050 Supplemental EIR Applicable Policies:

**Policy M-1.1:** **Roadway Design and Maintenance.** We require our roadways to: 1) Comply with federal, state, and local design and safety standards; 2) Meet the needs of multiple transportation modes and users; 3) Handle the capacity envisioned in the City of Ontario Master Plan of Streets and Highways; 4) Be maintained in accordance with best practices; 5) Be compatible with the streetscape and surrounding land uses; and 6) Promote the efficient flow of all modes of traffic through the implementation of intelligent transportation systems and travel demand management strategies.

**Policy S-3.8:** **Fire Prevention through Environmental Design.** We require new development to incorporate fire prevention considerations in the design of streetscapes, sites, open spaces, and buildings.

**Policy CD-2.8:** **Safe Design.** We incorporate defensible space design into new and existing developments to ensure the maximum safe travel and visibility on pathways, corridors, and open space and at building entrances and parking areas by avoiding physically and visually isolated spaces, maintaining visibility and accessibility, and using lighting.

### The Ontario Plan 2050 Supplemental EIR Applicable Mitigation Measures:

None.

### Conclusion

With regards to the issue area of Wildfire, the following findings can be made:

1. No peculiar impacts to the Project or its site have been identified.
2. There are no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR.
3. No substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR.

4. No feasible mitigation measures contained within the TOP 2050 Supplemental EIR would be required.

## 4.21 Mandatory Findings of Significance

| Environmental Impact Issues | Peculiar Project Impact (*not analyzed in prior EIR and not substantially mitigated by the imposition of uniformly applied development policies or standards)* | Potentially Significant Offsite or Cumulative Impact not Discussed in Prior EIR | Substantially More Severe Impact based on Substantial New Information | No New Impact |
|---|---|---|---|---|
| **Except as provided in Public Resources Code Section 21099, would the project:** | | | | |
| **Criterion 1:** Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. | ☒ | ☐ | ☐ | ☐ |
| **Criterion 2:** Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.). | ☐ | ☐ | ☐ | ☒ |
| **Criterion 3:** Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☐ | ☐ | ☒ |

A finding of significance is determined if a project "has the potential to substantially degrade the quality of the environment." In practice, this is the same standard as a significant effect on the environment, which is defined in CEQA Guidelines Section 15382 as "a substantial or potentially adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."

TOP 2050 relies on the findings of the original TOP 2050 and incorporates its certified EIR by reference in the TOP 2050 Supplemental EIR. TOP 2050 designated the Project site land use as Mixed Use, Medium Density Residential, and Open Space, subject to PUD at City's discretion. The Project would include the development of residential buildings and associated site improvements, which is consistent with the current TOP 2050 land use designation for the Project site.

The TOP 2050 Supplemental EIR in its entirety addresses and discloses all known potential environmental effects associated with the development of TOP 2050 including direct, indirect, and cumulative impacts in the following resource areas:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems
- Wildfire

A summary of all potential environmental impacts, level of significance and mitigation measures is provided in **Section 4: Environmental Evaluation**.

**Criterion 1:** Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Endemic and endangered animals within California and the Project's potential effect on those species are fully discussed in **Section 4.4: Biological Resources**. The section found that implementation of the Project would result in peculiar impacts to biological resources compared to the TOP 2050 Supplemental EIR. Potential impacts to biological resources would be reduced following implementation of recommended Mitigation Measures **MM BIO-1** through **MM BIO-6**. However, impacts to biological resources within Ownership Area 2 are unable to be reduced to a less than significant level, lacking adequate analysis of these resources by the TOP 2050 Supplemental EIR. Therefore, the Project would be inconsistent with the analysis of the TOP 2050 Supplemental EIR in regard to historical resources and the Project would result in new Project-specific effects that are peculiar to the Project and for which the TOP 2050 Supplemental EIR failed to analyze as significant effects.

**Section 4.5: Cultural Resources** of the TOP 2050 Supplemental EIR analyzed the potential historic and prehistoric resource impacts that could occur due to the implementation of TOP 2050 and determined that impacts associated TOP 2050 could potentially significantly impact historical resources categorized under the Development Code as Tier III with implementation of TOP 2050 Land Use Plan. The TOP 2050 Supplemental EIR also determined that future grading and construction activities of undeveloped areas or redevelopment that requires more intensive soil excavation than in the past could potentially cause the disturbance of archeological resources and could potentially unearth previously unrecorded

resources. Potential impacts to historical resources would be reduced following implementation of TOP 2050 Supplemental EIR **MM 5-1** and recommended Mitigation Measures **MM CUL-1** through **MM CUL-7**. However, impacts to Tier II historical resources are unable to be reduced to a less than significant level, lacking adequate analysis of these resources by the TOP 2050 Supplemental EIR. Therefore, the Project would be inconsistent with the analysis of the TOP 2050 Supplemental EIR in regard to historical resources and the Project would result in new Project-specific effects that are peculiar to the Project and for which the Top 2050 Supplemental EIR failed to analyze as significant effects.

Finally, the TOP 2050 Supplemental EIR determined that a less than significant would occur on human remains. As a result of research and field efforts conducted for the Project, no archaeological or historic built environment resources were identified within the Project site. Furthermore, the Project site maintains a low potential for intact buried archaeological resources due to the extent of previous development. However, although no impacts to archaeological or human remains are anticipated to occur from development of the Project site, it is recommended that the Project conditions include language related to inadvertent discoveries in the rare case that such a discovery occurs during Project implementation.

**Section 4.18: Tribal Cultural Resources** of the TOP 2050 Supplemental EIR analyzed the potential prehistoric resource impacts that could occur due to the implementation of TOP 2050 and determined that future grading and construction activities of undeveloped areas or redevelopment that requires more intensive soil excavation than in the past could potentially cause the disturbance of archeological resources and could potentially unearth previously unrecorded resources. **MM TCR-2** would reduce potential impacts associated with TCRs inadvertent discoveries to a level that is less than significant by both TOP 2050 and the Project. Therefore, no significant unavoidable adverse impacts relating to TCRs remain. Project findings are consistent with those of TOP 2050.

Ownership Area 1 of the Project site would contain 3,095 residential units and be consistent with TOP 2050 land use designations. The Project site has been previously disturbed. Utility and infrastructure improvements are present within and adjacent to the Project site. The Project would connect to existing utility infrastructure in adjacent roadways to allow for the use of resources such as electricity and water, and potentially natural gas. The environmental impacts associated with the facility improvements associated with the proposed Project have been analyzed in **Section 4.1, Aesthetics** through **Section 4.20, Wildfire**, above. Impacts identified in these sections included no peculiar impacts to the Project or its site; no potentially significant off-site and/or cumulative impacts which were not discussed by the TOP 2050 Supplemental EIR; and no substantial new information has been identified which results in an impact which is more severe than anticipated by the TOP 2050 Supplemental EIR. These impacts were not associated with the construction or operation of new or expanded facilities that may be required for the Project. Further, the Project would not require the expansion of utility facilities such as water treatment plants or landfills. Adequate capacity was concluded for each of those facilities.

**Criterion 2:** Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.).

CEQA Guidelines Section 15065(a)(3) defines "cumulatively considerable" to mean that "the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." Cumulative impacts are addressed for each of the environmental topics listed above in the TOP 2050 Supplemental EIR (https://www.ontarioca.gov/government/community-development/planning/ontario-plan#environmental-impact-report).

**Criterion 3:** Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

As required by CEQA Guidelines Section 15065(a)(4), "A lead agency shall find that a project may have a significant effect on the environment and thereby require an EIR to be prepared for the project where there is substantial evidence, in light of the whole record, that any of the following conditions may occur: the environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly." Under this standard, a change to the physical environment that might otherwise be minor must be treated as significant if people would be significantly affected. This standard relates to adverse changes to the environment of human beings generally, and not to effects on particular individuals. While changes to the environment that could directly or indirectly affect human beings would be possible in all of the CEQA issue areas previously listed, those that could directly affect human beings include aesthetics, air quality, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, land use and planning, public services and utilities, transportation, water resources, wildfire hazards, and climate change, all of which are addressed in **Sections 4.1** through **4.20**; refer to Table of Contents for specific section numbers. The Project has the potential to create impacts that could cause adverse effects on human beings. The majority of these effects are created during the construction phase of the Project and would be temporary in nature and would mostly occur over the relatively short-term construction phase. Direct impacts to humans during the construction phase as well as effects associated with operation of the Project site would be less than significant or would be mitigated to less than significant levels. Mitigation measures from TOP 2050 Supplemental EIR used for the potential impacts of the Project are detailed in **Sections 4.1** through **4.20** of this memorandum.

# 5. CONSULTATION AND PREPARATION

## Lead Agency

### City of Ontario

303 East B Street
Ontario, CA 91764

*Contact:* *Rafael Torres, Assistant Planner*

## Project Applicant

### Ontario Ranch Venture, LLC

C/O Sares Regis Group

3501 Jamboree Road, Suite 3000
Newport Beach, CA 92660

## Consultant Team

### Kimley-Horn and Associates, Inc.

3801 University Avenue, Suite 300
Riverside, CA 92501

*Contacts:* *Kevin Thomas - Project Director*
*Sabrina Wallace – Project Manager*
*Cameron Bauer – Assistant Project Manager*
*Meghan D. Karadimos – QA/QC*
*Alex Pohlman – Technical Expert (Air Quality, Energy, Greenhouse Gas Emissions, Noise)*
*Jessica Mauck – Technical Expert (Cultural Resources)*
*Samuel Perkins – Environmental Analyst*
*Amanda McCallum – Document Production Specialist*

## Technical Team

### **Albert A. Webb Associates**

*(Water Supply Assessment and Written Verification of Sufficient Water Supply)*

3788 McCray Street
Riverside, CA 92506

*Contact:* *Autumn DeWoody, Senior Environmental Analyst*
*Sam I. Gershon, RCE, Senior Vice President*

**Cadre Environmental**

*(Biological Resources Technical Report)*

701 Palomar Airport Road, Suite 300
Carlsbad, CA 92011

*Contact:* *Ruben Ramirez*

**City of Ontario Engineering Department**

*(Preliminary Water Quality Management Plan)*

303 E B Street,

Ontario, CA 91764

**Converse Consultant**

*(Preliminary Geotechnical Investigation & Organic Soil/Manure Evaluation Report)*

2021 Rancho Drive, Suite 1
Redlands, CA 92373

*Contact:* *Hashmi S.E. Quazi, PhD, GE, PE, Principal Engineer*

**ELMT Consulting, Inc.**

*(Delhi Sands Flower-Loving Fly Habitat Suitability Assessment)*

3501 Jamboree Road, Suite 3000
Newport Beach, CA 92620

*Contact:* *Patrick Russel*

**JLC Engineering & Consulting, Inc.**

*(Preliminary Hydrology Report)*

41660 Ivy Street, Suite A
Murrieta, CA 92562

*Contact:* *Joseph L. Castaneda, RCE 59825*

**Roux Associates, Inc.**

*(Phase I Environmental Site Assessment)*

5150 E. Pacific Coast Highway, Suite 450
Long Beach, CA 90804
(310) 879-4900

*Contacts:* *Mauricio Escobar, Principal Geologist/Vice President*
*Kasia Anderson, Project Geologist*

**Urban Crossroads, Inc.**

*(Traffic Analysis)*

*(Vehicle Miles Traveled Analysis)*

20341 SW Birch Street, Suite 230
Newport Beach, CA 92660
(949) 660-1994

*Contacts:* *Charlene So, PE, Principal*
*Jared Brawner*
*Aric Evatt, PTP*

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# APPENDIX A

## TOP 2050 SUPPLEMENTAL EIR MITIGATION MEASURES

July 2022| Mitigation Monitoring and Reporting Program
State Clearinghouse No. 2021070364

# The Ontario Plan 2050

for City of Ontario

*Prepared for:*

**City of Ontario**
Contact: Thomas Grahn, Senior Planner
303 East "B" Street
Ontario, California 91764
909.395.2036

*Prepared by:*

**PlaceWorks**
Contact: Nicole Vermilion, Principal
3 MacArthur Place, Suite 1100
Santa Ana, California 92707
714.966.9220
info@placeworks.com
www.placeworks.com

PLACEWORKS

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# 1. Introduction

## 1.1 PURPOSE OF MITIGATION MONITORING AND REPORTING PROGRAM

This Mitigation Monitoring and Reporting Program (MMRP) has been developed to provide a vehicle by which to monitor mitigation measures and conditions of approval outlined in the Draft Supplemental Environmental Impact Report (Draft SEIR), State Clearinghouse No. 2021070364 for The Ontario Plan 2050 (TOP 2050 or Proposed Project). The MMRP has been prepared in conformance with Section 21081.6 of the Public Resources Code and City of Ontario Monitoring Requirements. Section 21081.6 states:

> (a) When making findings required by paragraph (1) of subdivision (a) of Section 21081 or when adopting a mitigated negative declaration pursuant to paragraph (2) of subdivision (c) of Section 21080, the following requirements shall apply:
>
> (1) The public agency shall adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment. The reporting or monitoring program shall be designed to ensure compliance during project implementation. For those changes which have been required or incorporated into the project at the request of a responsible agency or a public agency having jurisdiction by law over natural resources affected by the project, that agency shall, if so requested by the lead or responsible agency, prepare and submit a proposed reporting or monitoring program.
>
> (2) The lead agency shall specify the location and custodian of the documents or other material which constitute the record of proceedings upon which its decision is based.

## 1.2 PROJECT LOCATION

The City of Ontario is in the southwestern portion of San Bernardino County and is surrounded by the cities of Chino and Montclair and unincorporated San Bernardino County to the west; the cities of Upland and Rancho Cucamonga to the north; the City of Fontana and unincorporated San Bernardino County to the east; and the cities of Eastvale and Jurupa Valley to the south. The City is in the central part of the Upper Santa Ana River Valley, bounded by the San Gabriel Mountains to the north; the Chino Hills, Puente Hills, and San Jose Hills to the west; the Santa Ana River to the south; and Lytle Creek Wash on the east.

The City comprises approximately 50 square miles (32,022 acres), including the 8,200-acre Ontario Ranch in the southern part of the City—formerly known as the New Model Colony and formerly the City's sphere of influence. The northern, more urbanized part of the City is known as the Original Model Colony in reference to the City's founding as a model colony for cities in terms of layout and infrastructure. Generally, the City is bounded by Benson Avenue and Euclid Avenue on the west; Interstate 10 (I-10), 8th Street, and 4th Street on

the north; Etiwanda Avenue and Hammer Avenue on the east; and Merrill Avenue and the San Bernardino County/Riverside County boundary on the south. Regional circulation to and through the City is provided by I-10 and State Route (SR) 60, east to west, and by I-15 and SR-83 (Euclid Avenue), north to south. The City is also home to the Ontario International Airport and proximate to Chino Airport.

## 1.3 PROJECT DESCRIPTION

The Proposed Project, The Ontario Plan (TOP) 2050, is an update to The Ontario Plan (TOP or Approved Project) to guide the City's development and conservation for the next 30 years through 2050. The Proposed Project is a focused effort, with particular emphasis on technical refinements to the Policy Plan to comply with state housing mandates; conform with new state laws related to community health, environmental justice, climate adaptation, resiliency, and mobility; bring long-term growth and fiscal projections into alignment with current economic conditions; and advance the Tracking and Feedback system and Implementation Plan.

TOP is the City's policy and implementation framework that guides the long-term growth and improvement of the Ontario community through six interrelated components of city governance:

A **Vision** that provides a sense of purpose and mission for city governance and sets the tone for the other components of TOP. The Vision's central theme is a sustained, community-wide prosperity that continuously adds value and yields benefits.

A **Governance Manual** that establishes a set of goals and policies to promote consistent City leadership based on the principles of regional leadership, transparency, long-term value, accountability, and inclusivity.

A **Policy Plan** that serves as the City's legally required general plan and that states long-term goals, principles, and policies to achieve Ontario's Vision through nine elements: land use, housing, mobility, safety, environmental resources, parks and recreation, community economics, community design, and social resources.

A list of **City Council Priorities** that shape the City's ongoing annual budgeting process, with a focus on a variety of short- and long-term goals and objectives.

An **Implementation Plan** that identifies the actions needed to carry out TOP's policies. This includes initiatives by the City such as establishing consistent land use zoning and creating objective development and design standards, as well as decisions on public and private development projects and City activity programs.

A **Tracking and Feedback** system that charts the City's progress toward achieving the Policy Plan goals, providing data and analysis that enables decision makers to make strategic course corrections in response to changing circumstances and monitor ongoing operational effectiveness.

TOP 2050 is an update to TOP to guide the City's development and conservation for the next 30 years through 2050. The Proposed Project is a focused effort, with particular emphasis on technical refinements to the Policy Plan to comply with state housing mandates; conform with new state laws related to community health, environmental justice, climate adaption, resiliency, and mobility; bring long-term growth and fiscal projections into alignment with current economic conditions; and advance the Tracking and Feedback system and Implementation Plan. TOP 2050 fulfills the mandatory Regional Housing Needs Assessment (RHNA)

obligation. TOP 2050 brings long-term growth and fiscal projections into alignment with current economic conditions as well as property owner and stakeholder requests, all in support of the vision for Ontario.

Table 1, *Comparison of Approved TOP to TOP 2050*, provides a statistical summary of the buildout potential of TOP 2050 compared to existing conditions and to the buildout potential under the currently approved TOP. As shown in this table, TOP 2050 would increase population, dwelling units, and nonresidential buildings but would result in a small decrease in employment. The decrease in employment at buildout is largely because of automation in the industrial sector, with large warehousing and logistics buildings expected to create fewer new jobs through 2050 than a similarly sized industrial building was expected to create when the current TOP was adopted in 2010.

**Table 1 Comparison of Approved TOP to TOP 2050**

| Scenario | Units | Population | Nonresidential Square Feet | Employment |
|---|---|---|---|---|
| Existing 2021 Conditions[1] | 52,466 | 179,597 | 156,065,382 | 131,999 |
| Approved TOP | 104,163 | 357,957 | 260,399,271 | 313,067 |
| Proposed TOP | 129,562 | 410,492 | 261,491,779 | 296,002 |
| **Net Difference (Proposed TOP -Approved TOP)** | **25,399** | **52,535** | **1,092,508** | **-17,065** |

Note:
[1] See Chapter 4, *Environmental Setting*, for a summary of existing conditions.

## 1.4 ENVIRONMENTAL IMPACTS

### 1.4.1 Impacts Considered No Impact or Less Than Significant

The EIR identified various thresholds from the CEQA Guidelines among a number of environmental categories that would not be significantly impacts by the proposed project in Chapter 5, *Environmental Analysis*, and Chapter 8, *Impacts Found Not to Be Significant*, and therefore, did not require mitigation. Impacts to the following environmental resources were found to be less than significant or no impact:

- Aesthetics
- Agriculture and Forestry Resources
- Biological Resources
- Energy
- Greenhouse Gas Emissions
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems
- Wildlife

### 1.4.2 Potentially Significant Adverse Impacts That Can Be Mitigated, Avoided, or Substantially Lessened

The EIR concluded that the proposed project could result in one or more potentially significant impacts in the following topic areas:

- Cultural Resources (Archeological Resources)
- Geology and Soils (Paleontological Resources)
- Tribal Cultural Resources

However, the EIR also found that these impacts would be reduced, avoided, or substantially lessened through the implementation of mitigation measures, which are listed in Table 2, *Mitigation Monitoring Requirements*.

### 1.4.3 Unavoidable Significant Adverse Impacts

The following impact would remain significant and unavoidable after implementation of required mitigation, as identified in the EIR:

- Air Quality (AQMP Consistency, Regional Construction Emissions, Regional Operation Emissions, and Cumulative Health Risk)
- Cultural Resources (Historic Resources)
- Noise (Construction Noise, Construction Vibration, and Airport Land Use Compatibility)
- Transportation (Vehicle Miles Traveled)

# 2. Mitigation Monitoring Requirements

## 2.1 CATEGORIZED MITIGATION MEASURES/MATRIX

Project-specific mitigation measures (MM) have been categorized in matrix format, as shown in Table 2, *Mitigation Monitoring Requirements*. The matrix identifies the environmental factor, specific mitigation measures, schedule, and responsible monitor. The mitigation matrix will serve as the basis for scheduling the implementation of, and compliance with, all mitigation measures.

# 2. Mitigation Monitoring Requirements

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# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| **AESTHETICS** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **AGRICULTURAL AND FORESTRY RESOURCES** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **AIR QUALITY** | | | | | |
| MM 3-1 | Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project construction-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with South Coast Air Quality Management District (South Coast AQMD) methodology for assessing air quality impacts. If construction-related criteria air pollutants are determined to have the potential to exceed the South Coast AQMD–adopted thresholds of significance, the City of Ontario Building Department shall require feasible mitigation measures to reduce air quality emissions. Potential measures shall be incorporated as conditions of approval for a project and may include:<br>• Require fugitive dust control measures that exceed South Coast Air Quality Management District's Rule 403, such as:<br>– Requiring use of nontoxic soil stabilizers to reduce wind erosion.<br>– Applying water every four hours to active soil disturbing activities.<br>– Tarping and/or maintaining a minimum of 24 inches of freeboard on trucks hauling dirt, sand, soil, or other loose materials.<br>• Using construction equipment rated by the United States Environmental Protection Agency as having Tier 4 interim or higher exhaust emission limits.<br>• Ensuring construction equipment is properly serviced and maintained to the manufacturer's standards. | City of Ontario Planning Department in coordination with Landowner/Project Applicant | Prior to individual project approvals and during construction activities | City of Ontario Planning/Building Department | |

# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | • Limiting nonessential idling of construction equipment to no more than five consecutive minutes.<br>• Using Super-Compliant VOC paints for coating of architectural surfaces whenever possible. A list of Super-Compliant architectural coating manufactures can be found on the South Coast Air Quality Management District's website at: http://www.aqmd.gov/prdas/brochures/Super-Compliant_AIM.pdf.<br>These identified measures shall be incorporated into all appropriate construction documents (e.g., construction management plans) submitted to the City and shall be verified by the City's Planning Department. | | | | |
| MM 3-2 | The City of Ontario shall evaluate new development proposals within the City and require all developments to include access or linkages to alternative modes of transportation, such as transit stops, bike paths, and/or pedestrian paths (e.g. sidewalks). | City of Ontario Planning/Engineering Departments in coordination with the Landowner/Project Applicant | Prior to individual project approvals | City of Ontario Planning Department | |
| AQ-1 | Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project operation-phase-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with South Coast Air Quality Management District (South Coast AQMD) methodology in assessing air quality impacts. If operation-related air pollutants are determined to have the potential to exceed the South Coast AQMD–adopted thresholds of significance, the City of Ontario Planning Department shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities. The identified measures shall be included as part of the conditions of approval. Possible | City of Ontario Planning Department in coordination with the Landowner/Project Applicant | Prior to individual project approvals | City of Ontario Planning Department | |

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | mitigation measures to reduce long-term emissions could include, but are not limited to the following:<br>• For site-specific development that requires refrigerated vehicles, the construction documents shall demonstrate an adequate number of electrical service connections at loading docks for plug-in of the anticipated number of refrigerated trailers to reduce idling time and emissions.<br>• Applicants for manufacturing and light industrial uses shall consider energy storage and combined heat and power in appropriate applications to optimize renewable energy generation systems and avoid peak energy use.<br>• Site-specific developments with truck delivery and loading areas and truck parking spaces shall include signage as a reminder to limit idling of vehicles while parked for loading/unloading in accordance with California Air Resources Board Rule 2845 (13 CCR Chapter 10 sec. 2485).<br>• Provide changing/shower facilities as specified in Section A5.106.4.3 of CALGreen (Nonresidential Voluntary Measures).<br>• Provide bicycle parking facilities per Section A4.106.9 of CALGreen (Residential Voluntary Measures).<br>• Provide preferential parking spaces for low-emitting, fuel-efficient, and carpool/van vehicles per Section A5.106.5.1 of CALGreen (Nonresidential Voluntary Measures).<br>• Provide facilities to support electric charging stations per Section A5.106.5.3 and Section A5.106.8.2 of CALGreen (Nonresidential Voluntary Measures; Residential Voluntary Measures).<br>• Applicant-provided appliances shall be Energy Star–certified appliances or appliances of equivalent energy efficiency (e.g., dishwashers, refrigerators, clothes washers, and dryers). Installation of Energy Star–certified or equivalent appliances shall be verified by the City during plan check. | | | | |
| **BIOLOGICAL RESOURCES** | | | | | |
| No Mitigation Measures are applicable. | | | | | |

# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| **CULTURAL AND PALEONTOLOGICAL RESOURCES** | | | | | |
| MM 5-1 | Historic or potentially historic resources in the City shall be evaluated for historic significance through the City's tier system prior to the issuance of plan or development approval. Pursuant to City's Development Code (Chapter 4, Permit, Actions, and Decisions, and Chapter 7, Historic Preservation), mitigation measures for all Tier III Historic Resources shall include the following:<br>a) Each historic resource shall be fully documented and cataloged pursuant to Historic American Building Survey/Historic American Engineering Record (HABS/HAER) standards, to provide a record of the resource, including, but not limited to: [i] the preparation of site plans, floor plans, exterior and interior elevations, and detail drawings of character defining features (such as moldings, stairs, etc.); and [ii] photographs of the resource, including the exterior, interior, and interior and exterior character defining features (such as moldings, light fixtures, trim patterns, etc.).<br>b) A mitigation fee established pursuant to Section 7.01.030 (Historic Preservation Mitigation Fee) shall be paid to the City prior to the issuance of a demolition permit for Tier III historic resources. Fees for Tier I and II historic resources shall be determined during the Environmental Impact Report process. The fees established for Tier III will be used as a reference point for establishing fees for Tier I and II historic resources.<br>c) A Certificate of Appropriateness shall not be issued for the demolition of an historic resource, either in whole or in part, until such time that a demolition permit application and a replacement structure has been approved by the City, and appropriate permits have been issued for its construction, unless: [i] a waiver is granted pursuant to Subsection H (Replacement Structure Waiver for Historic Resources Located within Industrial Zoning Districts) of Section 4.02.050; [ii] a deferral of the replacement structure requirement is granted pursuant to Subsection G (Replacement Structure Deferral) of Section 4.02.050; or [iii] demolition is required | City of Ontario Planning Department | Prior to individual project approvals | City of Ontario Planning Department | |

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | pursuant to Section 7.01.050 (Unsafe or Dangerous Conditions) of this Development Code.<br>d) In an effort to preserve features and artifacts from historic resources, a determination whether items within or on the resource should be salvaged must be made by the Planning Department and may include the local historical society prior to the issuance of the demolition permit. The applicant shall be responsible for the removal, relocation, storage, and donation of such items selected for salvaging. The applicant shall provide an inventory of salvaged items to the Planning Department, and shall include a list of each item name, description, and dimension (as necessary), and the location of each item on a floor plan. | | | | |
| MM 5-2 | In areas of documented or inferred from evident archaeological and/or paleontological resource presence, City staff shall require applicants for development permits to provide studies to document the presence/absence of such resources. On properties where resources are identified, such studies shall provide a detailed mitigation plan, including a monitoring program and recovery and/or in situ preservation plan, based on the recommendations of a qualified cultural preservation expert. The mitigation plan shall include the following requirements:<br>a) Archaeologists and/or paleontologist shall be retained for the project and will be on call during grading and other significant ground-disturbing activities.<br>b) Should any cultural resources be discovered, no further grading shall occur in the area of the discovery until the Planning Director or designee is satisfied that adequate provisions are in place to protect these resources.<br>c) Unanticipated discoveries shall be evaluated for significance by a San Bernardino County Certified Professional Archaeologist/Paleontologist. If significance criteria are met, then the project shall be required to perform data recovery, professional identification, radiocarbon dates, and other special studies; submit materials to a museum for permanent curation; | City of Ontario Planning Department in coordination with Landowner/Project Applicant | Prior to individual project approvals and during ground disturbing activities | City of Ontario Planning Department | |

# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | and provide a comprehensive final report including catalog with museum numbers. | | | | |
| **ENERGY** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **GEOLOGY AND SOILS** | | | | | |
| See MM 5-2 | | | | | |
| **GREENHOUSE GAS EMISSIONS** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **HAZARDS AND HAZARDOUS MATERIALS** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **HYDROLOGY AND WATER QUALITY** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **LAND USE AND PLANNING** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **MINERAL RESOURCES** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **NOISE** | | | | | |
| MM 12-1 | Prior to the issuance of building permits for any project that involves a noise-sensitive use within the 65 dBA CNEL contour of the Ontario International Airport, the project property owner/developers shall retain an acoustical engineer to conduct an acoustic analysis and identify, where appropriate, site design and/or required building acoustical improvements (e.g., sound transmission class rated windows, doors, and attic baffling), to ensure compliance with the City's Noise Compatibility Criteria and the California State Building Code and California Noise Insulation Standards (Titles 24 and 21 of the California Code of Regulations). | City of Ontario Planning/Building Department in coordination with Landowner/Project Applicant | Prior to individual project approvals | City of Ontario Planning/Building Department | |

# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| MM 12-2 | Prior to issuance of a building permit, individual projects that involve vibration-intensive construction activities, such as pile drivers, jack hammers, and vibratory rollers occurring near sensitive receptors shall be evaluated for potential vibration impacts. For construction within 135 feet of fragile structures, such as historical resources, within 100 feet of nonengineered timber and masonry buildings (e.g., most residential buildings), or within 75 feet of engineered concrete and masonry (no plaster); or a vibratory roller within 25 feet of any structure, the project applicant shall prepare a noise and vibration analysis to assess and mitigate potential noise and vibration impacts related to these activities. This noise and vibration analysis shall be conducted by a qualified and experienced acoustical consultant or engineer. The vibration levels shall not exceed Federal Transit Administration (FTA) architectural damage thresholds (e.g., 0.12 inches per second [in/sec] peak particle velocity [PPV] for fragile or historical resources, 0.2 in/sec PPV for nonengineered timber and masonry buildings, and 0.3 in/sec PPV for engineered concrete and masonry). If vibration levels would exceed this threshold, alternative uses shall be used, such as drilling piles as opposed to pile driving and static rollers as opposed to vibratory rollers. If necessary, construction vibration monitoring shall be conducted to ensure vibration thresholds are not exceeded. | City of Ontario Planning/Building Department in coordination with Landowner/Project Applicant's construction contractor | Prior to and during construction | City of Ontario Building Department | |
| MM 12-4 | Construction activities associated with new development that occurs near sensitive receptors shall be evaluated for potential noise impacts. Construction contractors shall implement the following measures for construction activities in the City of Ontario. Construction plans submitted to the City shall identify these measures on demolition, grading, and construction plans. The City of Ontario Planning and Building Departments shall verify that grading, demolition, and/or construction plans submitted include these notations prior to issuance of demolition, grading, and/or building permits.<br>• Construction activity is limited to the hours between 7:00 am and 6:00 pm Monday through Friday and 9:00 am to 6:00 pm | City of Ontario Planning/Building Department in coordination with Landowner/Project Applicant's construction contractor | During construction | City of Ontario Building Department | |

# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | Saturdays and Sundays, as prescribed in Municipal Code Section 5-29.09.<br>• During the entire active construction period, equipment and trucks used for project construction shall use the best-available noise control techniques wherever feasible (e.g., improved mufflers, equipment re-design, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds).<br>• Impact tools (e.g., jack hammers and hoe rams) shall be hydraulically or electrically powered wherever possible. Where the use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used along with external noise jackets on the tools.<br>• Stationary equipment such as generators and air compressors shall be located as far as feasible from nearby noise-sensitive uses.<br>• Stockpiling shall be located as far as feasible from nearby noise-sensitive receptors.<br>• Construction traffic shall be limited, to the extent feasible, to approved haul routes established by the City's Engineering Department.<br>• At least 10 days prior to the start of construction activities, a sign shall be posted at the entrance(s) to the job site, clearly visible to the public, that includes permitted construction days and hours as well as the telephone numbers of the City's and contractor's authorized representatives that are assigned to respond in the event of a noise or vibration complaint. If the authorized contractor's representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City.<br>• Signs shall be posted at the job site entrance(s), within the on-site construction zones, and along queueing lanes (if any) to reinforce the prohibition of unnecessary engine idling. All other equipment shall be turned off if not in use for more than 5 minutes. | | | | |

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | • During the entire active construction period and to the extent feasible, the use of noise-producing signals, including horns, whistles, alarms, and bells, shall be for safety warning purposes only. The construction manager shall use smart back-up alarms, which automatically adjust the alarm level based on the background noise level or switch off back-up alarms and replace with human spotters in compliance with all safety requirements and laws.<br>• Erect temporary noise barriers (at least as high as the exhaust of equipment and breaking line-of-sight between noise sources and sensitive receptors), as necessary and feasible, to maintain construction noise levels at or below the performance standard of 80 dBA $L_{eq}$. Barriers shall be constructed with a solid material that has a density of at least 1.5 pounds per square foot with no gaps from the ground to the top of the barrier and may be lined on the construction side with an acoustical blanket, curtain, or equivalent absorptive material. | | | | |
| **POPULATION AND HOUSING** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **PUBLIC SERVICES** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **RECREATION** | | | | | |
| No Mitigation Measures are applicable. | | | | | |
| **TRANSPORTATION** | | | | | |
| T-1 | Prior to approval of discretionary projects subject to VMT reduction analysis, applicants shall demonstrate compliance with the City's VMT Guidelines for CEQA assessment of VMT impacts. For projects with VMT per Service Population exceeding the County's significance threshold, a mitigation plan shall be developed and implemented. Mitigation should consist of Transportation Demand Management (TDM) measures analyzed under a VMT-reduction methodology consistent with the California Air Pollution Control Officers Association's (CAPCOA) *Final Handbook for Analyzing* | City of Ontario Planning/Engineering Departments in coordination with Landowner/Project Applicant | Prior to individual project approvals | City of Ontario Planning Department | |

# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | *Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity* (2021) and approved by the City of Ontario (if applicable). Examples of measures include but are not limited to:<br>• Pedestrian Network Improvements: constructing new sidewalks and/or improving damaged or substandard sidewalks that connect to a larger pedestrian network.<br>• Construct or Improve Bike Facilities: constructing new or enhancing a single existing Class I, II or IV bike facility that connects to a larger bike network.<br>• Construct or Improve Bike Boulevards: implementing a Class III bike boulevard on a local or collector street that is one travel lane in each direction, has a design speed of 25 mph or less and a design volume of 5,000 ADT or less.<br>• Expand Bikeway Networks: constructing a network of interconnected new Class I, II, or IV bike facilities.<br>• Provide End of Trip Bicycle Facilities: constructing facilities that support cyclists such as bike parking, lockers, and showers.<br>• Implement Transit-Supportive Roadway Treatments: funding infrastructure improvements such as traffic signal modifications and roadway signing and striping that are dedicated to improving transit travel times and reliability.<br>• Transit Passes: proving discounted or free transit fare to a specific geographic area, population group, or to the general public.<br>• Vanpool Program: providing groups of 5 to 15 people with direct shuttle service between their workplace and residence.<br>• Carshare Program (conventional or EV): providing access to a shared fleet of on-demand vehicles for short-term use/rental. Best practice is to discount carshare membership and provide priority parking for carshare vehicles to encourage use of the service.<br>• Bikeshare Program (conventional or EV): providing access to a shared fleet of on-demand bicycles for short-term use/rental. | | | | |

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | Best practice is to discount bikeshare membership and dedicate bikeshare parking to encourage use of the service.<br>• Rideshare Program: providing access to and encouraging the use of a ridesharing platform or service. This could be an app, website, or other service that provides ride-matching coordination services.<br>• Community-Based Travel Planning (CBTP): CBTP is a residential based approach to outreach, performed by trained advisors, that provides households within a targeted geographic area with customized information, incentives, and support to encourage the use of transportation alternatives in place of single occupancy vehicles.<br>• Commute Trip Reduction (CTR) Program: CTR programs can be mandatory or voluntary, and involve providing information, coordination, services, infrastructure, and/or incentives for alternative modes such as ridesharing, vanpool, transit passes, and cycling. | | | | |
| **TRIBAL CULTURAL RESOURCES** | | | | | |
| MM 5-3 | Upon receipt of an application for a proposed project subject to CEQA and within the City's jurisdiction, the City's representative shall consult with the relevant tribe(s)' representative(s) to determine if the proposed project is within a culturally sensitive area to the tribe. If sufficient evidence is provided to reasonably ascertain that the site is within a [tribal] culturally sensitive area, an archaeologist shall prepare then a cultural resources assessment. The findings of the cultural resources assessment shall be incorporated into the CEQA documentation. A copy of the report shall be forwarded to the tribe(s). If mitigation is recommended in the CEQA document, the procedure described in Mitigation Measure 5-4 shall be followed. | City of Ontario Planning Department | Prior to individual project approvals | City of Ontario Planning Department | |
| MM 5-4 | Prior to the issuance of grading permits for a proposed project for which the CEQA document defines cultural resource mitigation for potential tribal resources, the project applicant shall contact the designated tribe(s) to notify them of the grading, excavation, and | City of Ontario Planning Department in coordination with | Prior to issuance of grading permit(s) | City of Ontario Planning Department | |

# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | monitoring program. The applicant shall coordinate with the City of Ontario and the tribal representative(s) to develop mitigation measures that address the designation, responsibilities, and participation of tribal monitors during grading, excavation, and ground-disturbing activities; scheduling; terms of compensation; and treatment and final disposition of any cultural resources, sacred sites, and human remains discovered on the site. The City of Ontario shall be the final arbiter of the conditions for projects within the City's jurisdiction. | Landowner/Project Applicant | | | |
| TRC-1 | Tribal Cultural Resources Monitoring. The project archaeologist, in consultation with interested tribes, the developer, and the City of Ontario, shall develop an archaeological monitoring plan (AMP) to address the details, timing, and responsibility of archaeological and cultural activities that will occur on the project site. Details in the AMP shall include:<br>1. Project-related ground disturbance (including, but not limited to, brush clearing, grading, trenching, etc.) and development scheduling;<br>2. The development of a rotating or simultaneous schedule in coordination with the developer and the project archeologist for designated Native American Tribal Monitors from the consulting tribes during grading, excavation and ground disturbing activities on the site: including the scheduling, safety requirements, duties, scope of work, and Native American Tribal Monitors' authority to stop and redirect grading activities in coordination with all project archaeologists (if the tribes cannot come to an agreement on the rotating or simultaneous schedule of tribal monitoring, the Native American Heritage Commission shall designate the schedule for the onsite Native American Tribal Monitor for the proposed project);<br>3. The protocols and stipulations that the developer, City, Tribes, and project archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation. | City of Ontario Planning Department in coordination with Landowner/Project Applicant's archeologist and interested tribes | Prior to and during construction | City of Ontario Planning Department | |

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | At least 30 days prior to application for a grading permit and before any brush clearance, grading, excavation, and/or ground disturbing activities on the site, the developer shall retain a tribal cultural monitor to monitor all ground-disturbing activities in an effort to identify any unknown archaeological resources.<br>Pursuant to the AMP, a tribal monitor from the consulting tribe shall be present during the initial grading activities. If tribal resources are found during grubbing activities, the tribal monitoring shall be present during site grading activities. | | | | |
| TRC-2 | Treatment and Disposition of Cultural Resources**.** In the event that Native American cultural resources are inadvertently discovered during the course of any ground-disturbing activities, including but not limited to brush clearance, grading, trenching, etc., for the proposed project, the following procedures will be carried out for treatment and disposition of the discoveries:<br>1. Temporary Curation and Storage: During the course of construction, all discovered resources shall be temporarily curated in a secure location on-site or at the offices of the project archaeologist. The removal of any artifacts from the project site will need to be thoroughly inventoried with tribal monitor oversight of the process;<br>2. Treatment and Final Disposition: The landowner(s) shall relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts and nonhuman remains as part of the required mitigation for impacts to cultural resources. The applicant shall relinquish the artifacts through one or more of the following methods and provide the City of Ontario with evidence of same:<br>a. Accommodate the process for on-site reburial of the discovered items with the consulting Native American tribes or bands. This shall include measures and provisions to protect the future reburial area from any future impacts. Reburial shall not occur until all cataloging, basic analysis, other analyses as recommended by the project archaeologist and approved by consulting tribes, and basic recordation have been completed; | City of Ontario Planning Department in coordination with Landowner/Project Applicant's archeologist and interested tribes | During construction | City of Ontario Planning Department | |

# 2. Mitigation Monitoring Requirements

**Table 2 Mitigation Monitoring Requirements**

| | Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|---|
| | all documentation should be at a level of standard professional practice to allow the writing of a report of professional quality;<br>b. A curation agreement with an appropriate qualified repository in San Bernardino County that meets federal standards per 36 CFR Part 79, and therefore the resource would be professionally curated and made available to other archaeologists/researchers for further study. The collections and associated records shall be transferred, including title, to an appropriate curation facility in San Bernardino County, to be accompanied by payment of the fees necessary for permanent curation;<br>c. For purposes of conflict resolution, if more than one Native American tribe or band is involved with the project and cannot come to an agreement as to the disposition of cultural materials, materials shall be curated at the San Bernardino County Museum by default;<br>d. At the completion of grading, excavation, and ground-disturbing activities on the site, a Phase IV Monitoring Report shall be submitted to the City documenting monitoring activities conducted by the project archaeologist and Native Tribal Monitors within 60 days of completion of grading. This report shall document the impacts to the known resources on the property; describe how each mitigation measure was fulfilled; document the type of cultural resources recovered and the disposition of such resources; provide evidence of the required cultural sensitivity training for the construction staff held during the required pregrade meeting; and, in a confidential appendix, include the daily/weekly monitoring notes from the archaeologist. All reports produced will be submitted to the City, County Museum, and consulting tribes. | | | | |

**Table 2 Mitigation Monitoring Requirements**

| Mitigation Measure | Responsibility for Implementation | Timing | Responsibility for Monitoring | Monitor (Signature Required) (Date of Compliance) |
|---|---|---|---|---|
| **UTILITIES AND SERVICE SYSTEMS** | | | | |
| No Mitigation Measures are applicable. | | | | |
| **WILDFIRE** | | | | |
| No Mitigation Measures are applicable. | | | | |

Note: MM indicates existing mitigation measures from the Approved Project, while others (AQ, T, and TRC) indicate new mitigation measures included as part of the Proposed Project.

# 2. Mitigation Monitoring Requirements

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# 3. Report Preparation

## 3.1 LIST OF PREPARERS

### City of Ontario

Rudy Zeledon, Planning Director
Kimberly Ruddins, AICP, Sustainability Program Manager
Thomas Grahn, Senior Planner

### PlaceWorks

Nicole Vermilion, Principal
Vivian Kha, Project Planner

# 3. Report Preparation

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# APPENDIX B1

## AIR QUALITY ASSESSMENT

# Air Quality Assessment

# Center Park Specific Plan Project

**Prepared for:**

City of Ontario
Rafael Torres
Assistant Planner
303 East N Street
Ontario, California 91764
909.395.297

**Prepared by:**

Kimley-Horn and Associates, Inc.
1100 W. Town and Country Road, Suite 700
Orange, California 92868
714.939.1030

May 2025

Kimley»Horn

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Appendix A: Air Quality Data

**LIST OF ABBREVIATED TERMS**

| | |
|---|---|
| AH | Affordable Housing |
| AG | Agriculture |
| AQMP | Air Quality Management Plan |
| AAQS | Ambient air quality standard |
| APN | Assessor Parcel Number |
| ADT | Average daily traffic |
| BRT | Bus Rapid Transit |
| CARB | California Air Resources Board |
| CAAQS | California Ambient Air Quality Standards |
| CCAA | California Clean Air Act |
| CalEEMod | California Emissions Estimator Model |
| CEC | California Energy Commission |
| CalGreen | California Green Building Standards Code |
| CO | Carbon monoxide |
| CNO | Chino Airport |
| $PM_{10}$ | Coarse particulate matter |
| DPM | Diesel particulate matter |
| DU | Dwelling unit |
| EMFAC | EMission FACtor |
| FCAA | Federal Clean Air Act |
| $PM_{2.5}$ | Fine particulate matter |
| GHG | Greenhouse gas |
| I-10 | Interstate 10 |
| I-15 | Interstate 15 |
| LOR | Laws, ordinances and regulations |
| LOS | Level of service |
| MDR | Medium Density Residential |
| MM | Mitigation Measure |
| MU – Great Park | Mixed-Use – Great Park |
| NAAQS | National Ambient Air Quality Standards |
| $NO_X$ | Nitrogen oxide |
| OEHHA | Office of Environmental Health Hazard Assessment |
| OS – NR | Open Space – Non-Recreation |
| OS – R | Open Space – Recreation |
| $O_3$ | Ozone |
| ppm | Parts per million |
| PA | Planning Area |
| ROG | Reactive organic gases |
| RTP/SCS | Regional Transportation Plan/Sustainable Communities Strategy |
| SRA | Source receptor area |
| SCAB | South Coast Air Basin |
| SCAQMD | South Coast Air Quality Management District |
| SCAG | Southern California Association of Governments |

| | |
|---|---|
| SCE | Southern California Edison |
| SP | Specific Plan |
| SF | Square feet |
| SIP | State Implementation Plan |
| SR-60 | State Route 60 |
| SR-91 | State Route 91 |
| $SO_2$ | Sulfur dioxide |
| TACs | Toxic air contaminants |
| U.S. EPA | United States Environmental Protection Agency |
| VOC | Volatile organic compound |

# 1.0 INTRODUCTION

This report documents the results of an Air Quality Assessment completed for the Center Park Specific Plan (Project). The purpose of this Air Quality Assessment is to identify the potential construction and operations emissions associated with the Project and determine the level of impact the Project would have on the environment. A comparative analysis has been undertaken to determine whether the Project would result in any new or substantially more severe significant environmental impacts as compared to the conclusions discussed in The Ontario Plan (TOP) 2050, certified Final Supplemental Environmental Impact Report (FSEIR), pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning). Applicable mitigation measures from the FSEIR have been incorporated into this analysis.

## 1.1 Project Location

The Project site is comprised of 29 parcels totaling 257.34 acres within Ontario Ranch, City of Ontario (City), San Bernardino County (County), California; see **Figure 1: Regional Location Map.** The Assessor Parcel Numbers (APNs) comprising the Project site are 1053-301-01, -02; 1053-311-01, -02; 1053-321-01, -02, -03; 1053 331 01, 02, -03, -04; 1053-341-01, -02; 1053-351-01, -02; 1053-361-01, -02, -03; 1053-371-01, -02; 0216-311-01, -02, -09; 0216-321-03, -08; 0216-322-03, -04, -10; see **Figure 2: Project Site Assessor Parcel Numbers**. The Project site is bounded by a Southern California Edison (SCE) Easement to the north, Walker Avenue to the east, Eucalyptus Avenue to the south, and Campus Avenue to the west; see **Figure 3: Local Vicinity Map**. Land uses surrounding the Project site include a nursery, crop farms, rural residential uses, and dairy farm operations.

Regional access to the Project site is provided by State Route 60 (SR-60) located approximately 2.1 miles to the north, Interstate 15 (I-15) located approximately 4.0 miles to the east, State Route 71 (SR-71), which connects to State Route 91 (SR-91) to the south, located approximately 3.5 miles to the southwest, and Euclid Avenue, which connects SR-71, SR-60, and Interstate 10 (I-10) to the north, located approximately 0.8 mile to the west.

TOP 2050 designates the Project site land use as Medium Density Residential (MDR), Mixed-Use – Great Park (MU – Great Park), Open Space – Recreation (OS – R), and Open Space – Non-Recreation (OS – NR); see **Figure 4: Existing Land Use and Zoning**. The MDR designation permits single-family and multi-family residential uses. The MU – Great Park designation permits commercial, office, and multi-family residential uses. The OS – R designation permits recreational uses. The OS – NR designation permits utility easements and drainage channels and prohibits building development. TOP 2050 zones the Project site as Specific Plan (SP) with an Agriculture (AG) and Chino Airport (CNO) Overlay zoning overlay. The AG overlay requires a transition buffer area between the existing agricultural uses and the proposed urban uses. In addition, the Project site areas designated MDR or MU – Great Park have an Affordable Housing (AH) zoning overlay to increase affordable housing opportunities in compliance with the City's Housing Element and State Housing Element law.

## 1.2 Project Description

The proposed SP would implement the TOP 2050 vision, establish development standards and procedures, become the governing zoning standards for the Project site, permit a maximum of 802 single-family dwelling units (DUs), 3,491 multi-family DUs, 250,920 square feet (SF) of commercial

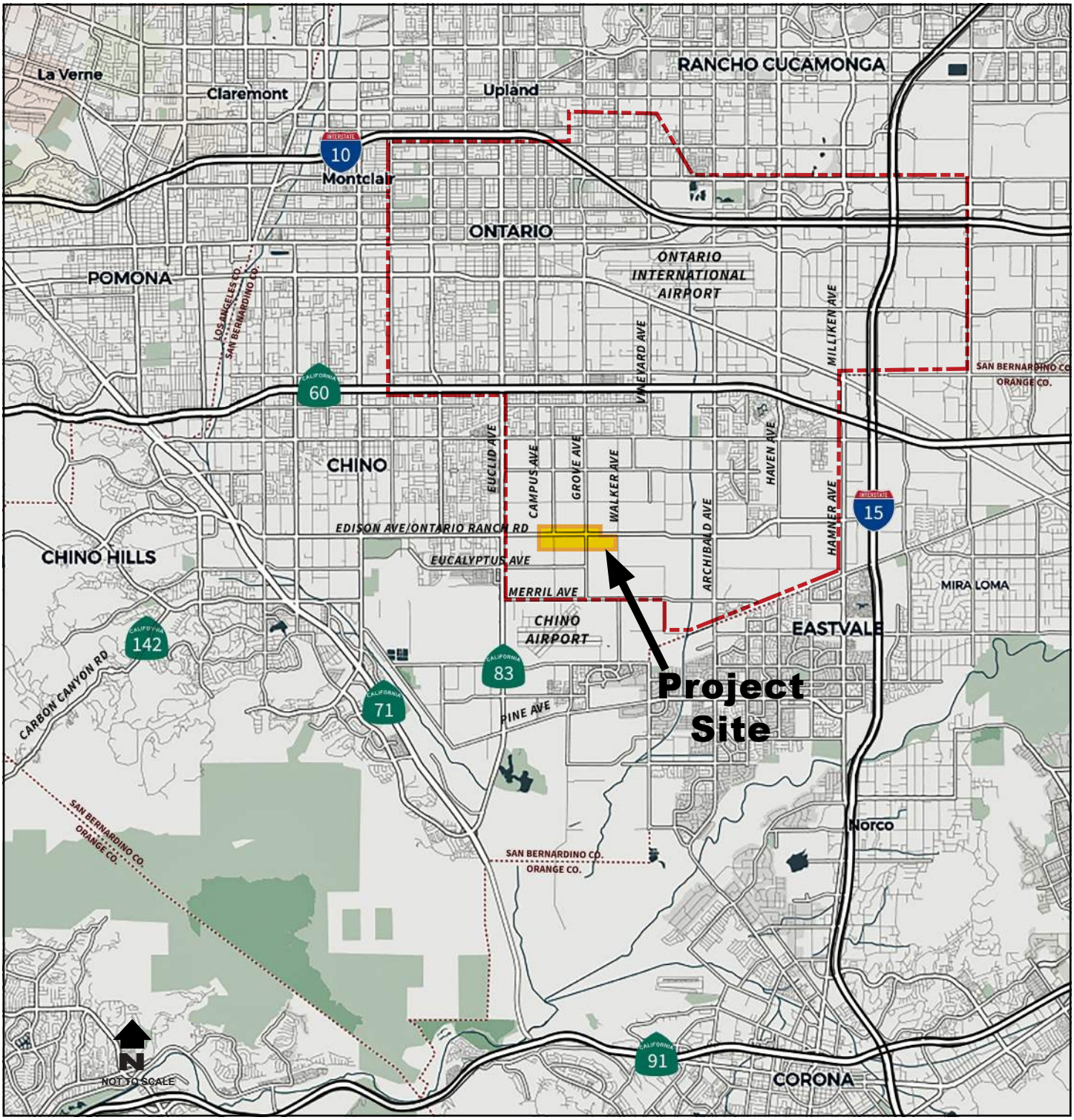


*Source: CenterPark Specific Plan Exhibit 1-1 Regional Location Map, 2024.*

**Figure 1:** Regional Location Map
*Center Park Specific Plan Project*

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Kimley»Horn

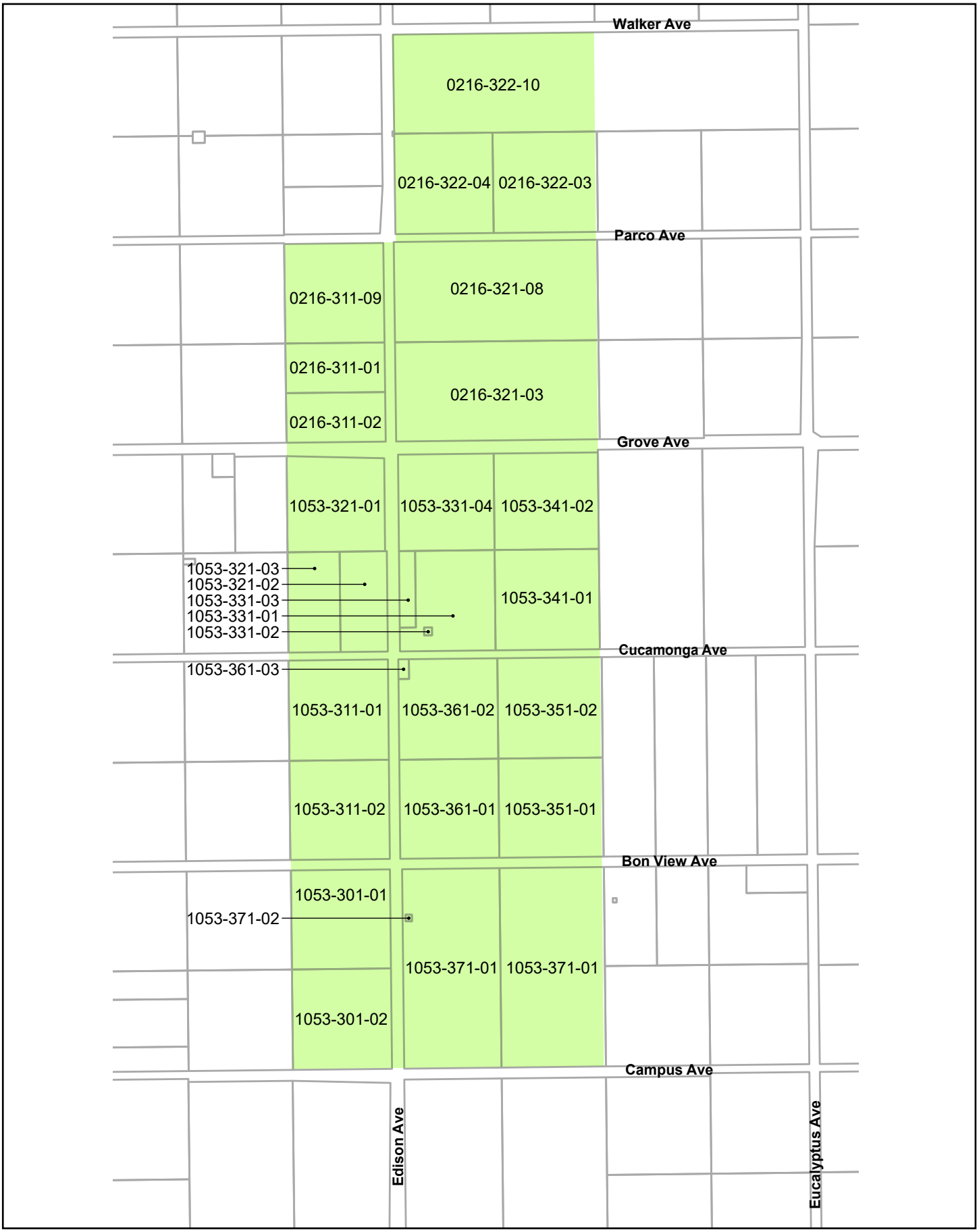


*Source: CenterPark Specific Plan Exhibit 3-1 Assessor's Parcel Numbers, 2024.*

**Figure 2:** Project Site Assessor Parcel Numbers
*Center Park Specific Plan Project*

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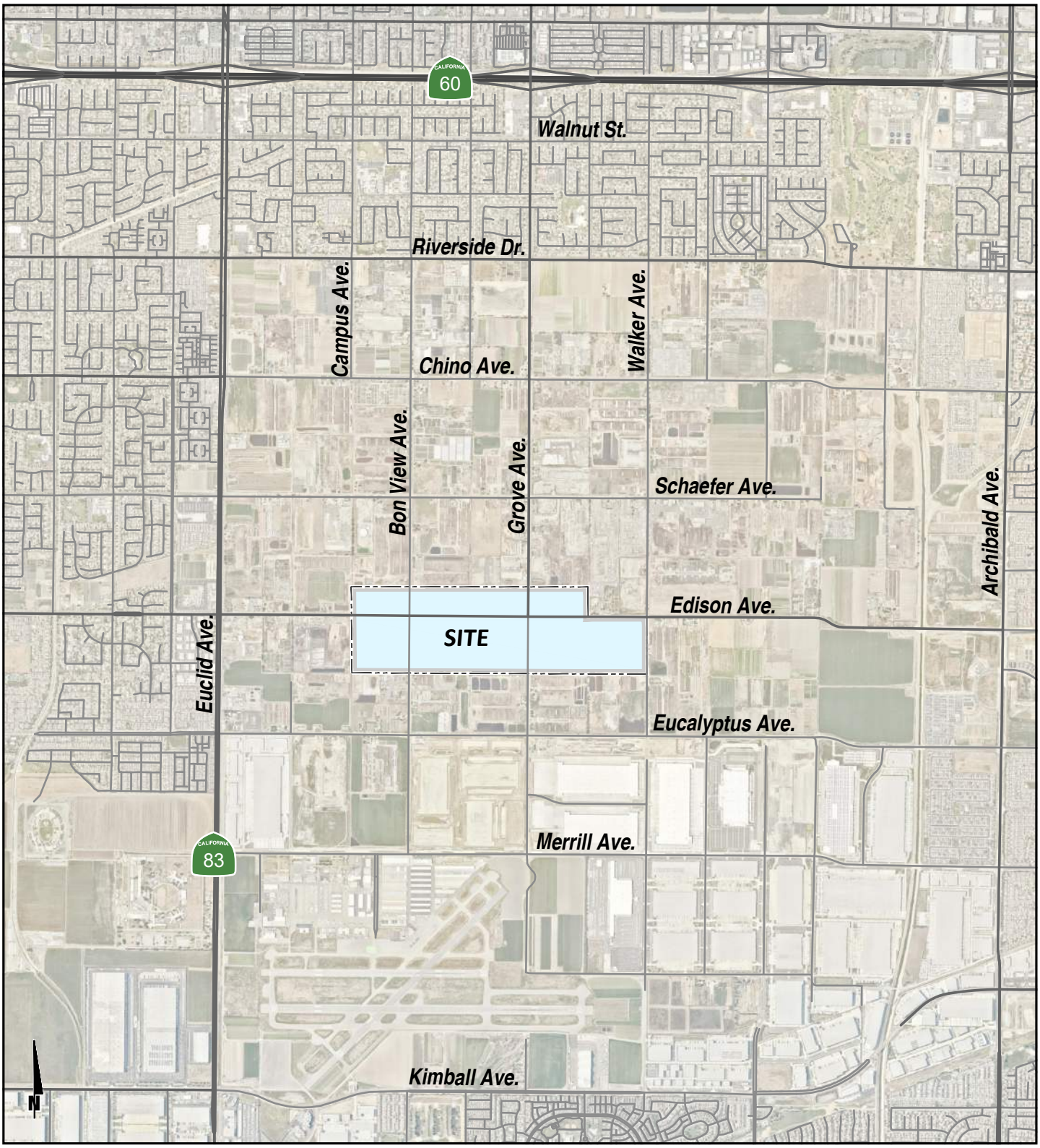


*Source: Center Park Specific Plan Traffic Analysis, Exhibit 1-1 Location Map, 2025.*

**Figure 3:** Local Vicinity Map
*Center Park Specific Plan Project*

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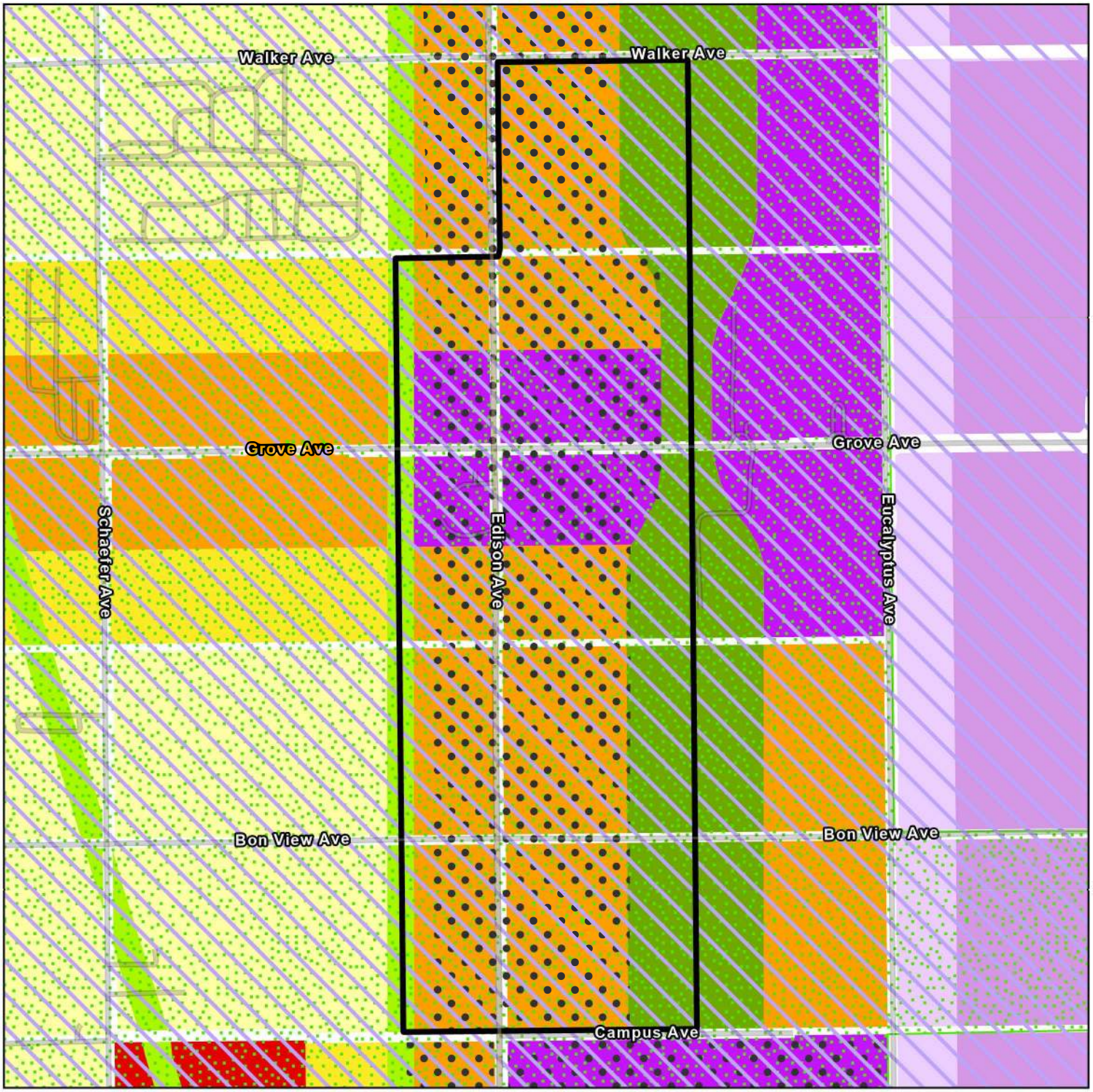


Project Site

**TOP 2050 Land Use Designations**

- RR Rural Residential
- LDR Low Density Residential
- LMDR Low Medium Density Residential
- MDR Medium Density Residential
- HDR High Density Residential
- MU Mixed Use
- NC Neighborhood Commercial
- GC General Commercial
- OC Office Commercial
- HOS Hospitality
- BP Business Park
- IND Industrial
- OS-NR Open Space - Non-Rec
- OS-R Open Space - Recreation
- OS-W Open Space - Water
- PF Public Facility
- PS Public School
- ARPT Airport
- LF Landfill
- Rail

**Zoning Overlay**

- CNO (Chino Airport) Overlay
- AH Affordable Housing
- AG Agricultural

*Source: City of Ontario The Ontario Plan 2050, 2024.*

**Figure 4:** Existing Land Use and Zoning
*Center Park Specific Plan Project*

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space, 55.98 acres of recreational open space, and 11.28 acres of non-recreational open space. The Project site is currently developed by ruderal vegetation, rural residences, and agricultural uses such as livestock raising, field crop farming, and dairy farm operations. The Project would remove all on-site uses and improvements to implement the proposed Project.

The proposed SP would divide the Project site into 22 planning areas (PAs); see **Figure 5: Land Use Plan**. The Project site land use designations would remain consistent with TOP 2050. The proposed SP would serve as the Project site zoning designation, consistent with TOP 2050. The Project would be classified as a Tier 2 affordable housing project, which designates at least 25 percent of the DUs as affordable housing. The Project would be developed in two phases; see **Figure 6: Project Phasing Plan**. Phase I would be developed by the private Applicant. Phase II would be dedicated to the City and would be developed at an unknown, later date following Phase I. This analysis conservatively evaluates the maximum Project development potential, with Phase II being evaluated at the programmatic level.

Phase I

Phase I would develop 256 single-family DUs, 768 multi-family DUs, 19.64 acres of recreational open space, and 3.38 acres of non-recreational open space within PAs 6, 12, 13, 17, 18, and 22; see **Table 1: Maximum Phase I Buildout**. The recreational open space would be designated as part of the City's Grand Park, a planned regional park within the Ontario Ranch area. The developer would construct the recreational open space in accordance with the City's Recreation and Parks Master Plan. The Applicant would submit a Development Plan and Tentative Parcel Map for the Phase I Project site following Project approval. Phase I is anticipated to begin construction as early as 2025 and be operational as early as 2029. For purposes of this analysis, it is conservatively assumed that Phase I would be operational as soon as construction is completed in 2027. This is a worst-case assumption as Phase I occupancy would be dependent on market conditions and permit approvals.

**Table 1: Maximum Phase I Buildout**

| Planning Area | Land Use | TOP 2050 Acreage (AC) | Maximum Residential Density (DU/AC)[1] | Maximum Residential (DU) |
|---|---|---|---|---|
| 6 | MDR | 7.33 | -- | 161 |
| 12 | MDR | 15.46 | 22.0 | 340 |
| 13 | MDR | 23.75 | 22.0 | 523 |
| 17 | OS – R | 6.20 | -- | -- |
| 18 | OS – R | 13.44 | -- | -- |
| 22 | OS – NR | 3.38 | -- | -- |
| | **Phase I Total** | **69.56** | **--** | **1,024** |

AC = acres; DU/AC = dwelling units/ acre; DU = dwelling unit; SF = square feet; MDR = Medium Density Residential; OS – R = Open Space – Recreation; and OS – NR = Open Space – Non-Recreation
1. Maximum residential density per The Ontario Plan 2050, Final Supplemental Environmental Impact Report.

Phase II

Phase II would develop 546 single-family DUs, 2,723 multi-family DUs, 250,920 SF of commercial space, 36.34 acres of recreational open space, and 7.9 acres of non-recreational open space within PAs 1 through 5, 7 through 11, 14 through 16, and 19 through 2; see **Table 2: Maximum Phase II Buildout**. The recreational open space would be designated as part of the City's Grand Park, a planned regional park within the Ontario Ranch area. The developer would construct the recreational

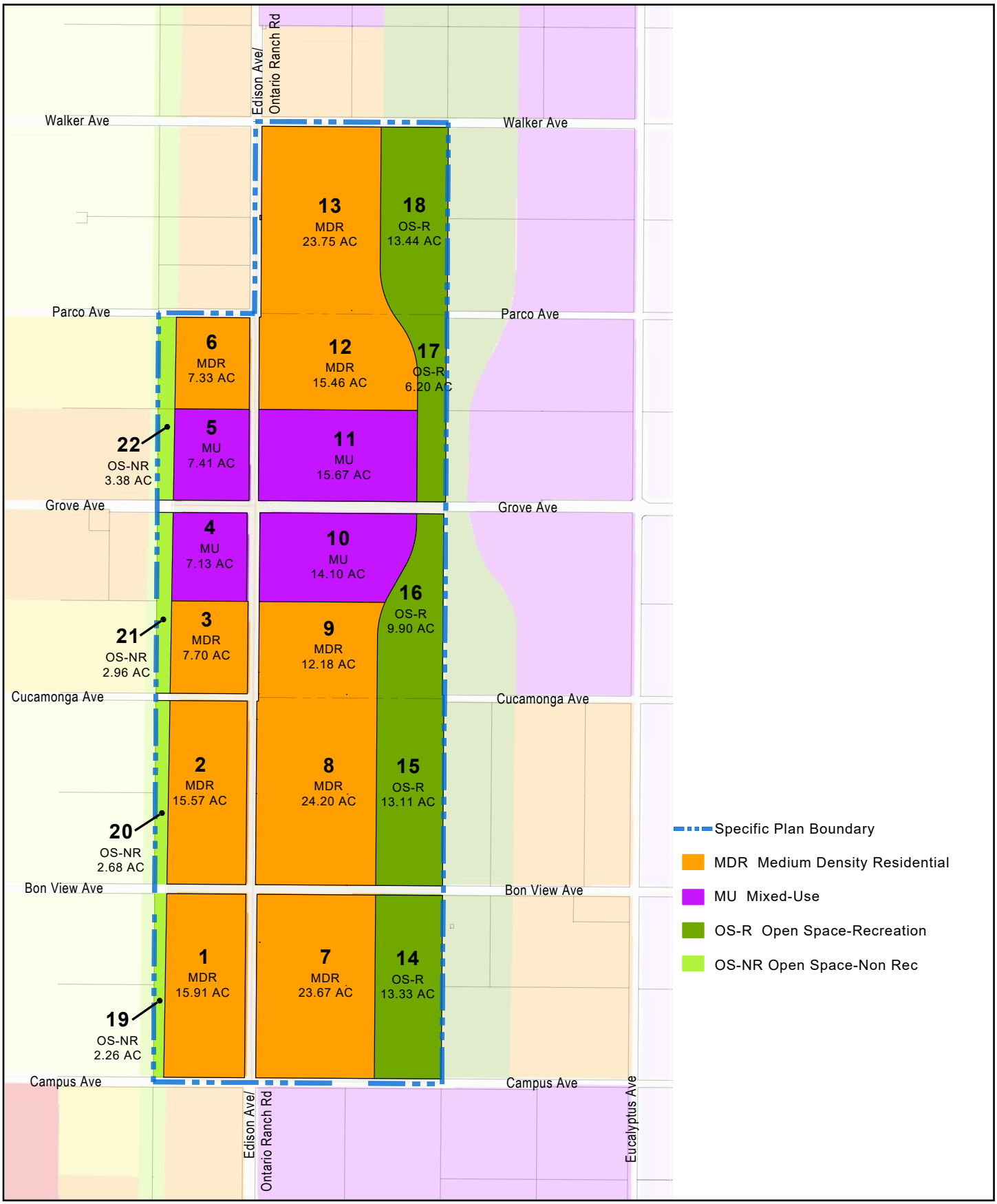


*Source: CenterPark Specific Plan Exhibit 1-3 Land Use Plan, 2024.*

**Figure 5:** Land Use Plan
*Center Park Specific Plan*

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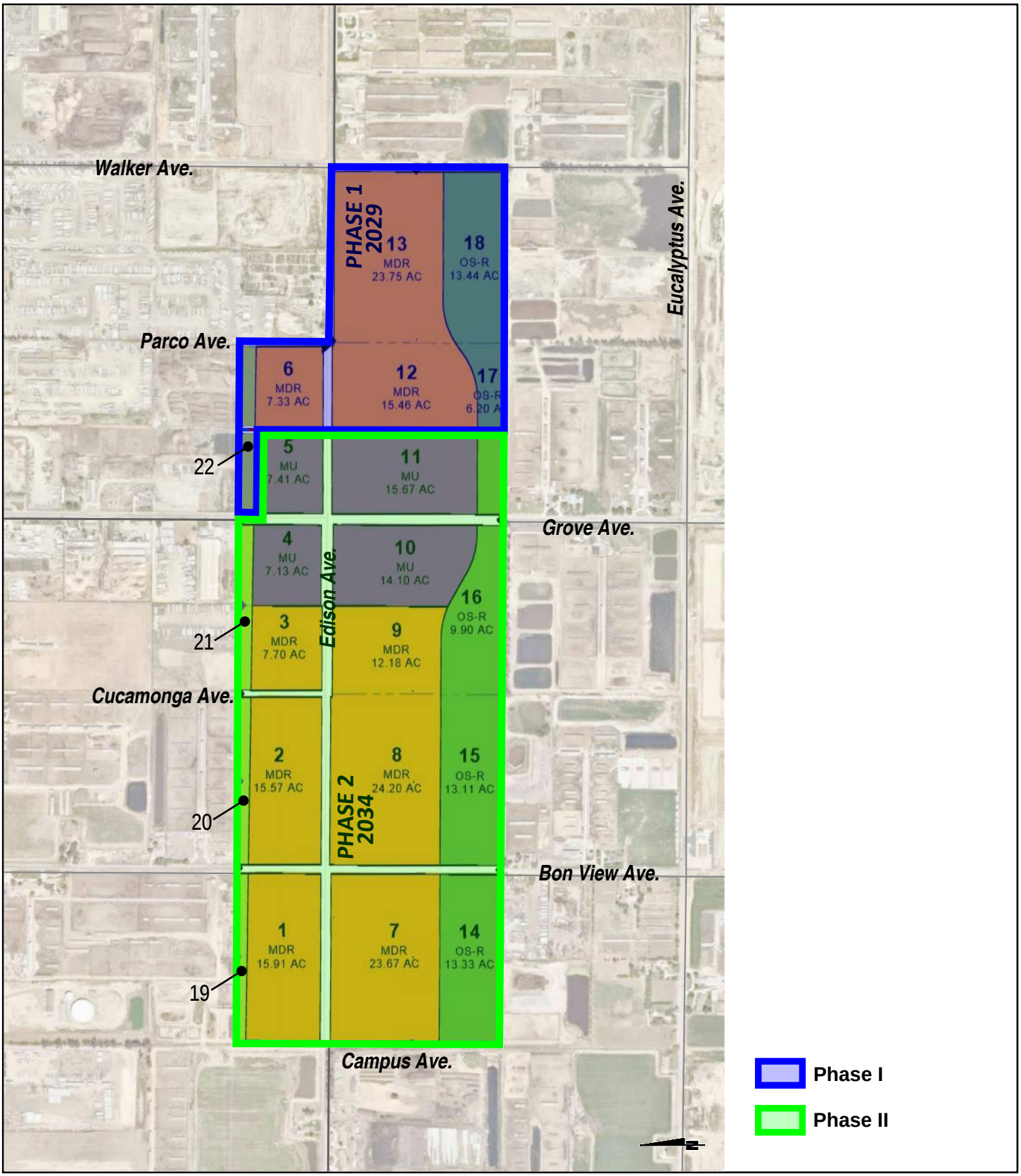


*Source: CenterPark Specific Plan Traffic Analysis, Exhibit 1-2 Preliminary Land Use Plan and Phasing Plan, 2025.*

**Figure 6:** Project Phasing Plan
*Center Park Specific Plan*

Not to scale

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open space in accordance with the City's Recreation and Parks Master Plan. For construction phasing purposes, Phase II is anticipated to begin construction as early as 2026 and be operational as early as 2034. It is conservatively assumed that Phase II would be operational as soon as construction is completed in 2030. This is a worst-case assumption as Phase II construction and occupancy would be dependent on market conditions and permit approvals.

**Table 2: Maximum Phase II Buildout**

| Planning Area | Land Use | TOP 2050 Acreage (AC) | Maximum Residential Density (DU/AC)[1] | Maximum Residential (DU) | Maximum Retail (SF) | Maximum Office (SF) |
|---|---|---|---|---|---|---|
| 1 | MDR | 15.91 | 22.0 | 350 | -- | -- |
| 2 | MDR | 15.57 | 22.0 | 343 | -- | -- |
| 3 | MDR | 7.70 | 22.0 | 169 | -- | -- |
| 4 | MU – Residential | 4.99 | 35.0 | 175 | -- | -- |
| 4 | MU – Retail | 1.43 | -- | -- | 18,635 | -- |
| 4 | MU – Office | 0.71 | -- | -- | -- | 21,741 |
| 5 | MU – Residential | 5.19 | 35.0 | 182 | -- | -- |
| 5 | MU – Retail | 1.48 | -- | -- | 19,367 | -- |
| 5 | MU – Office | 0.74 | -- | -- | -- | 22,595 |
| 7 | MDR | 23.67 | 22.0 | 521 | -- | -- |
| 8 | MDR | 24.20 | 22.0 | 532 | -- | -- |
| 9 | MDR | 12.18 | 22.0 | 268 | -- | -- |
| 10 | MU - Residential | 9.87 | 35.0 | 345 | -- | -- |
| 10 | MU – Retail | 2.82 | -- | -- | 36,852 | -- |
| 10 | MU – Office | 1.41 | -- | -- | -- | 42,994 |
| 11 | MU – Residential | 10.97 | 35.0 | 384 | -- | -- |
| 11 | MU – Retail | 3.13 | -- | -- | 40,955 | -- |
| 11 | MU – Office | 1.57 | -- | -- | -- | 47,781 |
| 14 | OS – R | 13.33 | -- | -- | -- | -- |
| 15 | OS – R | 13.11 | -- | -- | -- | -- |
| 16 | OS – R | 9.90 | -- | -- | -- | -- |
| 19 | OS – NR | 2.26 | -- | -- | -- | -- |
| 20 | OS – NR | 2.68 | -- | -- | -- | -- |
| 21 | OS – NR | 2.96 | -- | -- | -- | -- |
| | **Phase II Total** | **187.79** | **--** | **3,269** | **115,809** | **135,111** |

AC = acres; DU/AC = dwelling units/ acre; DU = dwelling unit; SF = square feet; MDR = Medium Density Residential; MU = Mixed-Use; OS – R = Open Space – Recreation; OS – NR = Open Space – Non-Recreation
1. Maximum residential density per The Ontario Plan 2050, Final Supplemental Environmental Impact Report.

Circulation

The Project would include a Circulation Plan to facilitate the movement of vehicles, pedestrians, and cyclists within the Project area. Local access to the Project site would be provided via Campus Avenue, Bon View Avenue, Cucamonga Avenue, Grove Avenue, Parco Avenue, Walker Avenue, and Edison Avenue/Ontario Ranch Road. Pedestrian circulation would be provided throughout the Project area via a paved sidewalk system that would interconnect with the roadway right-of-way. TOP 2050 proposed Class II bicycle lanes transversing in a north/south direction along the west side of Walker Avenue. The City's Recreation and Parks Master Plan proposed Class I bicycle lanes transversing in an east/west direction along the Project site's southern property line. The Project would be connected to off-site areas through the City's master planned multipurpose trails/bikeways located along the neighborhood edges of the Project site. An Omnitrans Bus Rapid

Transit (BRT) Corridor is proposed along Edison Avenue/Ontario Ranch Road as a part of future development.

On-site and Off-site Improvements

Roadway and utility infrastructure improvements (i.e., storm drains, sewer, potable water, recycled water, fiber optics, and underground electricity) would be constructed prior to the issuance of building occupancy permits. The developer would construct the improvements in accordance with the City's Master Plans, City's Ordinances, and proposed Specific Plan provisions or with the City Engineer's approval. Phasing and construction of the improvements would be determined by the City Engineer and Project requirements.

The Project would include landscaping along roadway frontages and between the pedestrian sidewalk and roadway. Landscaping would be developed in accordance with the City's development code and proposed Specific Plan provisions. Landscape and Construction Irrigation Documentation Plans would be submitted to the City prior to the issuance of building permits. The Project would comply with City Ordinance 2689, which requires the use of recycled water for all approved uses, including but not limited to landscape irrigation.

# 2.0 ENVIRONMENTAL SETTING

## 2.1 Climate and Meteorology

The California Air Resources Board (CARB) divides the State into 15 air basins that share similar meteorological and topographical features.[1] The Project is located within the South Coast Air Basin (SCAB), which includes the non-desert portions of Los Angeles, Riverside, and San Bernardino counties, as well as all of Orange County. The SCAB is on a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean on the southwest and high mountains forming the remainder of the perimeter.[2] Air quality in this area is determined by such natural factors as topography, meteorology, and climate, in addition to the presence of existing air pollution sources and ambient conditions. These factors along with applicable regulations are discussed below.

The SCAB is part of a semi-permanent high-pressure zone in the eastern Pacific. As a result, the climate is mild and tempered by cool sea breezes. This usually mild weather pattern is occasionally interrupted by periods of extreme heat, winter storms, and Santa Ana winds. The annual average temperature throughout the 6,645-square-mile SCAB ranges from low 60 to high 80 degrees Fahrenheit with little variance. With more oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas.

Contrasting the steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all annual rainfall occurs between the months of November and April. Summer rainfall is reduced to widely scattered thundershowers near the coast, with slightly heavier activity in the east and over the mountains.

Although the SCAB has a semiarid climate, the air closer to the Earth's surface is typically moist because of the presence of a shallow marine layer. Except for occasional periods when dry, continental air is brought into the SCAB by offshore winds, the "ocean effect" is dominant. Periods of heavy fog are frequent and low clouds known as high fog are characteristic climatic features, especially along the coast. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the SCAB.

Wind patterns across the SCAB are characterized by westerly or southwesterly onshore winds during the day and easterly or northeasterly breezes at night. Wind speed is typically higher during the dry summer months than during the rainy winter. Between periods of wind, air stagnation may occur in both the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During winter and fall, surface high-pressure systems over the SCAB, combined with other meteorological conditions, result in very strong, downslope Santa Ana winds. These winds normally continue for a few days before predominant meteorological conditions are reestablished.[3]

The mountain ranges to the east affect the diffusion of pollutants by inhibiting the eastward transport of pollutants. Air quality in the SCAB generally ranges from fair to poor and is similar to air quality in

[1] South Coast Air Quality Management District, *2022 Air Quality Management Plan*, December 2022, https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-management-plan/final-2022-aqmp/final-2022aqmp.pdf?sfv rsn= 16, accessed December 2024.

[2] South Coast Air Quality Management District, *CEQA Air Quality Handbook*, 1993

[3] California Air Resources Board, *Almanac Resources,* https://ww2.arb.ca.gov/resources/documents/almanac-resources, accessed December 2024.

most of coastal Southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions.

In addition to the characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, two distinct types of temperature inversions control the vertical depth through which air pollutants are mixed. These inversions are the marine inversion and the radiation inversion. The height of the base of the inversion at any given time is called the "mixing height."[4] The combination of winds and inversions is a critical determinant leading to highly degraded air quality for the SCAB in the summer and generally good air quality in the winter.

## 2.2 Air Pollutants of Concern

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by State and federal laws. These regulated air pollutants are known as "criteria air pollutants" and are categorized into primary and secondary pollutants. Primary air pollutants are emitted directly from sources. Carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxide ($NO_X$), sulfur dioxide ($SO_2$), coarse particulate matter ($PM_{10}$), fine particulate matter ($PM_{2.5}$), and lead are primary air pollutants. Of these, CO, $NO_X$, $SO_2$, $PM_{10}$, and $PM_{2.5}$ are criteria pollutants.[5] ROG and $NO_X$ are criteria pollutant precursors and form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere.[6] For example, the criteria pollutant ozone ($O_3$) is formed by a chemical reaction between ROG and $NO_X$ in the presence of sunlight. $O_3$ and nitrogen dioxide ($NO_2$) are the principal secondary pollutants. Sources and health effects commonly associated with criteria pollutants are summarized in **Table 3: Air Contaminants and Associated Public Health Concerns**.

**Table 3: Air Contaminants and Associated Public Health Concerns**

| Pollutant | Major Man-Made Sources | Human Health Effects |
|---|---|---|
| Particulate Matter ($PM_{10}$ and $PM_{2.5}$) | Power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles and others. | Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; asthma; chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility. |
| Ozone ($O_3$) | Formed by a chemical reaction between reactive organic gases/volatile organic compounds (ROG or VOC)[1] and nitrogen oxides ($NO_X$) in the presence of sunlight. Motor vehicle exhaust industrial emissions, gasoline storage and transport, solvents, paints and landfills. | Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. |
| Sulfur Dioxide ($SO_2$) | A colorless gas formed when fuel containing sulfur is burned and when gasoline is extracted from oil. Examples are petroleum refineries, cement manufacturing, metal | Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron and |

[4] South Coast Air Quality Management District, *Final 2016 Air Quality Management Plan,* March 2017, https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/ final2016aqmp.pdf, accessed December 2024.
[5] U.S. Environmental Protection Agency, *Criteria Air Pollutants*, https://www.epa.gov/criteria-air-pollutants, accessed December 2024.
[6] Ibid.

| Table 3: Air Contaminants and Associated Public Health Concerns | | |
|---|---|---|
| **Pollutant** | **Major Man-Made Sources** | **Human Health Effects** |
| | processing facilities, locomotives, and ships. | steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain. |
| Carbon Monoxide (CO) | An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust. | Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death. |
| Nitrogen Dioxide ($NO_2$) | A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include motor vehicles, electric utilities, and other sources that burn fuel. | Respiratory irritant; aggravates lung and heart problems. Precursor to $O_3$. Contributes to global warming and nutrient overloading which deteriorates water quality. Causes brown discoloration of the atmosphere. |
| Lead (Pb) | Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been motor vehicles (such as cars and trucks) and industrial sources. Due to the phase out of leaded gasoline, metals processing is the major source of lead emissions to the air today. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers. | Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation, and behavioral disorders. Even at low doses, lead exposure is associated with damage to the nervous systems of fetuses and young children, resulting in learning deficits and lowered IQ. |

1. Volatile Organic Compounds (VOCs or Reactive Organic Gases [ROG]) are hydrocarbons/organic gases that are formed solely of hydrogen and carbon. There are several subsets of organic gases including ROGs and VOCs. Both ROGs and VOCs are emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. The major sources of hydrocarbons are combustion engine exhaust, oil refineries, and oil-fueled power plants; other common sources are petroleum fuels, solvents, dry cleaning solutions, and paint (via evaporation).

Source: U.S. Environmental Protection Agency, *Criteria Air Pollutants*, https://www.epa.gov/criteria-air-pollutants, accessed December 2024.

### Toxic Air Contaminants

Toxic air contaminants (TACs) are airborne substances that can cause short-term (acute) or long-term (i.e. chronic, carcinogenic or cancer causing) adverse human health effects (i.e. injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes more than 200 compounds, including particulate emissions from diesel-fueled engines.[7]

CARB has identified diesel particulate matter (DPM) as a toxic air contaminant. DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particles (such as DPM) and gases produced

[7] California Air Resources Board, *Common Air Pollutants*, 2024, https://ww2.arb.ca.gov/resources/common-air-pollutants, accessed December 2024.

when an engine burns diesel fuel. DPM includes the particle-phase constituents in diesel exhaust. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine. Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. DPM poses the greatest health risk among the TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Due to their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.[8]

### Ambient Air Quality

CARB monitors ambient air quality at approximately 250 air monitoring stations across the State. These stations usually measure pollutant concentrations ten feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. Existing levels of ambient air quality, historical trends, and projections near the Project are documented by measurements made by the South Coast Air Quality Management District (SCAQMD), the air pollution regulatory agency in the SCAB that maintains air quality monitoring stations that process ambient air quality measurements.

Pollutants of concern in the SCAB include $O_3$, $PM_{10}$, and $PM_{2.5}$ because these pollutants are currently in nonattainment. The air monitoring station nearest the Project site that monitors ambient concentrations of $O_3$, $PM_{10}$, and $PM_{2.5}$ is the Upland Monitoring Station (located approximately 7.2 miles to the north). Local air quality data from 2021 to 2023 are provided in **Table 4: Ambient Air Quality Data**, which lists the monitored maximum concentrations and number of exceedances of the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS).

**Table 4: Ambient Air Quality Data**

| Criteria Pollutant[1] | 2021 | 2022 | 2023 |
|---|---|---|---|
| **Ozone ($O_3$)** | | | |
| 1-hour Maximum Concentration (ppm) | 0.124 | 0.155 | 0.067 |
| 8-hour Maximum Concentration (ppm) | 0.100 | 0.100 | 0.060 |
| *Number of Days Standard Exceeded* | | | |
| NAAQS 8-hour (>0.070 ppm) | 78 | 67 | 0 |
| CAAQS 1-hour (>0.09 ppm) | 42 | 45 | 0 |
| **Carbon Monoxide (CO)** | | | |
| 1-hour Maximum Concentration (ppm) | 1.31 | 1.11 | 1.02 |
| *Number of Days Standard Exceeded* | | | |
| NAAQS 1-hour (>35 ppm) | 0 | 0 | 0 |
| CAAQS 1-hour (>20 ppm) | 0 | 0 | 0 |
| **Nitrogen Dioxide ($NO_2$)** | | | |
| 1-hour Maximum Concentration (ppm) | 0.065 | 0.053 | 0.040 |
| *Number of Days Standard Exceeded* | | | |
| NAAQS 1-hour (>100 ppm) | 0 | 0 | 0 |
| CAAQS 1-hour (>0.18 ppm) | 0 | 0 | 0 |
| **Particulate Matter Less Than 10 Microns ($PM_{10}$)** | | | |

[8] California Air Resources Board, *Overview: Diesel Exhaust & Health*, https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health, accessed December 2024.

| **Table 4: Ambient Air Quality Data** | | | |
|---|---|---|---|
| **Criteria Pollutant[1]** | **2021** | **2022** | **2023** |
| National 24-hour Maximum Concentration | 124.3 | 144.9 | 32.9 |
| State 24-hour Maximum Concentration | — | — | — |
| State Annual Average Concentration (CAAQS=20 µg/m$^3$) | — | — | — |
| *Number of Days Standard Exceeded* | | | |
| NAAQS 24-hour (>150 µg/m$^3$) | 0 | 0 | — |
| CAAQS 24-hour (>50 µg/m$^3$) | — | — | — |
| **Particulate Matter Less Than 2.5 Microns ($PM_{2.5}$)** | | | |
| National 24-hour Maximum Concentration | — | — | — |
| State 24-hour Maximum Concentration | 83.8 | 66.2 | 18.7 |
| *Number of Days Standard Exceeded* | | | |
| NAAQS 24-hour (>35 µg/m$^3$) | — | — | — |

NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; ppm = parts per million; µg/m$^3$ = micrograms per cubic meter; – = not measured
1. Measurements were taken at the Upland Monitoring Station at 1350 San Bernardino Road, Upland, CA 91786 (CARB# 36175).

Source: All pollutant measurements are from the CARB Aerometric Data Analysis and Management system database (https://www.arb.ca.gov/adam) except for CO, which were retrieved from the CARB Air Quality and Meteorological Information System (https://www.arb.ca.gov/aqmis2/aqdselect.php).

## 2.3 Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than the general population. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive receptors nearest the Project site are listed in **Table 5: Sensitive Receptors** and shown in **Figure 7: Sensitive Receptor Locations**.

| **Table 5: Sensitive Receptors** | | |
|---|---|---|
| **Receptor Description** | **Distance and Direction from the Project** | |
| | **Phase I[1]** | **Phase II[2]** |
| 1- Residential Uses | 36 feet to the north | 710 feet to the east |
| 2- Residential Uses | 3,172 feet to the southwest | 53 feet to the south |
| 3- On-site Residential Uses[3] | 55 feet to the west | N/A |
| 4- Future Phase I Residential Uses[4] | N/A | 55 feet to the east |
| 5- Residential Uses | 348 feet to the southeast | 1,815 feet to the southeast |
| 6- Residential Uses | 172 feet to the east | 2,134 feet to the east |
| 7- Residential Uses | 590 feet to the northwest | 223 feet to the north |
| 8- Residential Uses | 590 feet to the southwest | 357 feet to the south |
| 9- Residential Uses | 5,070 feet to the west | 460 feet to the west |
| 10- Residential Uses | 3,220 feet to the northwest | 574 feet to the north |
| 11- Residential Uses | 1,207 feet to the northeast | 1,837 feet to the northeast |

N/A = not applicable
1. Distance measured from the Phase I Project site property line to the nearest sensitive receptor property line.
2. Distance measured from the Phase II Project site property line to the nearest sensitive receptor property line.
3. The City would demolish the existing sensitive receptor structures within the Phase II Project site at a future date after construction of Phase I has begun; therefore, the existing sensitive receptors would be exposed to the construction noise associated with the proposed Phase I development.
4. The proposed Phase I Project would develop residential uses that would be exposed to the construction noise associated with the future Phase II development by the City.

Source: Google Earth, 2025.

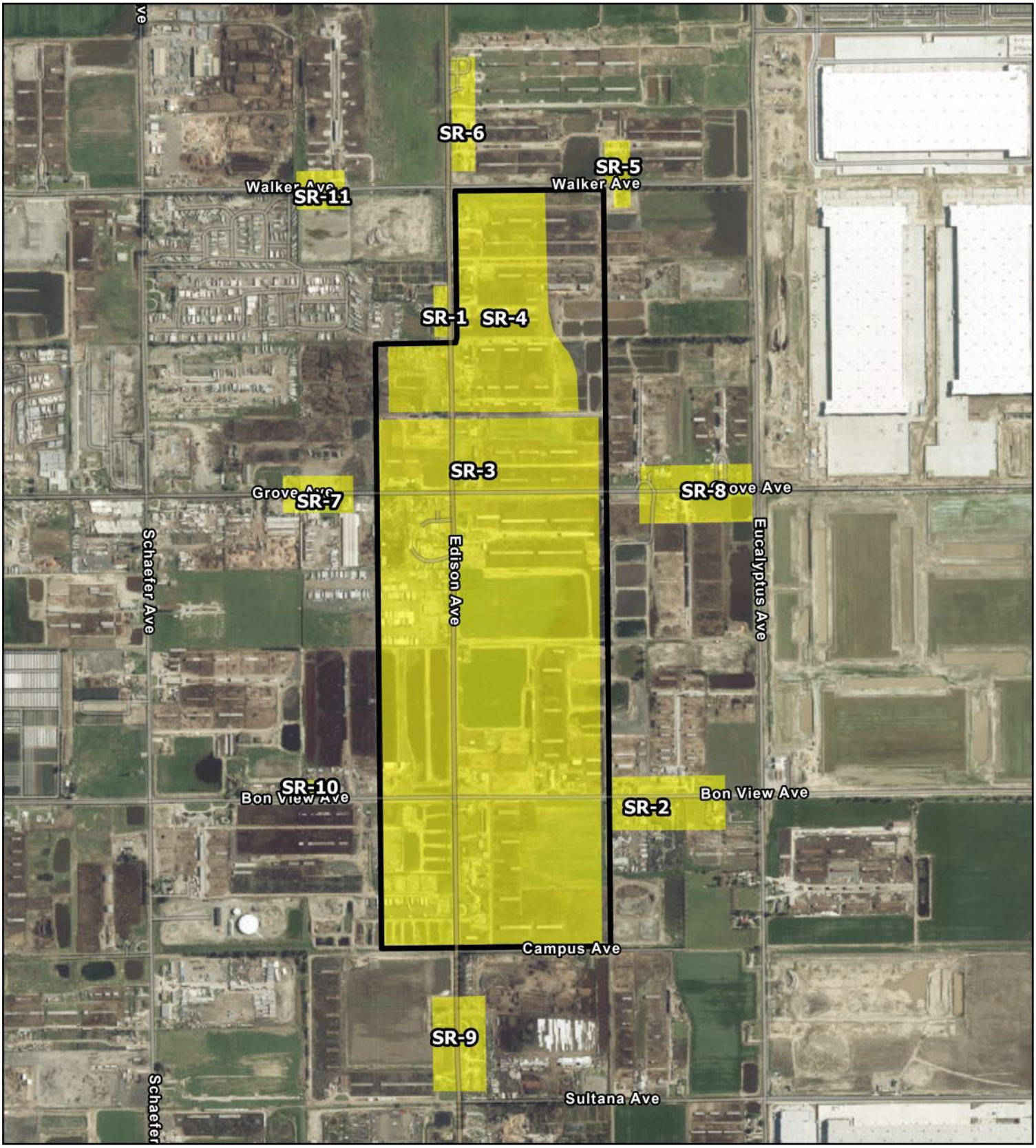


Project Site

Sensitive Receptor Locations

*Source: Kimley-Horn and Associates, Inc. 2025; ESRI World Imagery, 2025.*

**Figure 7: Sensitive Receptor Locations**

*Center Park Specific Plan Project*

Not to scale

Kimley»Horn

# 3.0 REGULATORY SETTING

## 3.1 Federal

### Federal Clean Air Act

Air quality is federally protected by the Federal Clean Air Act (FCAA; 42 U.S.C. §§ 7401 et seq.) and its amendments. Under the FCAA, the United States Environmental Protection Agency (U.S. EPA) developed the primary and secondary NAAQS for the criteria air pollutants including $O_3$, $NO_2$, CO, $SO_2$, $PM_{10}$, $PM_{2.5}$, and lead. Proposed projects in or near nonattainment areas could be subject to more stringent air-permitting requirements. The FCAA requires each state to prepare a State Implementation Plan (SIP) to demonstrate how it will attain the NAAQS within the federally imposed deadlines.

The U.S. EPA can withhold certain transportation funds from states that fail to comply with the planning requirements of the FCAA. If a state fails to correct these planning deficiencies within two years of Federal notification, the U.S. EPA is required to develop a federal implementation plan for the identified nonattainment area or areas. The provisions of 40 Code of Federal Regulations Parts 51 and 93 apply in all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan. The U.S. EPA has designated enforcement of air pollution control regulations to the individual states. The applicable federal standards are summarized in **Table 6: State and Federal Ambient Air Quality Standards**.

**Table 6: State and Federal Ambient Air Quality Standards**

| Pollutant | Averaging Time | State Standards[1,2] | Federal Standards[3,4,5] |
|---|---|---|---|
| Ozone ($O_3$)[6] | 1 Hour | 0.09 ppm (180 µg/m$^3$) | NA |
| | 8 Hour | 0.070 ppm (137 µg/m$^3$) | 0.070 ppm (137 µg/m$^3$) |
| Respirable Particulate Matter ($PM_{10}$)[7] | 24-Hour | 50 µg/m$^3$ | 150 µg/m$^3$ |
| | Annual Arithmetic Mean | 20 µg/m$^3$ | NA |
| Fine Particulate Matter ($PM_{2.5}$)[7] | 24-Hour | NA | 35 µg/m$^3$ |
| | Annual Arithmetic Mean | 12 µg/m$^3$ | 9.0 µg/m$^3$ |
| Carbon Monoxide (CO) | 1 Hour | 20 ppm (23 mg/m$^3$) | 35 ppm (40 mg/m$^3$) |
| | 8 Hour | 9.0 ppm (10 mg/m$^3$) | 9.0 ppm (10 mg/m$^3$) |
| Nitrogen Dioxide ($NO_2$)[8] | 1 Hour | 0.18 ppm (339 µg/m$^3$) | 100 ppb (188 µg/m$^3$) |
| | Annual Arithmetic Mean | 0.030 ppm (57 µg/m$^3$) | 0.053 ppm (100 µg/m$^3$) |
| Sulfur Dioxide ($SO_2$)[9] | 1 Hour | 0.25 ppm (655 µg/m$^3$) | 75 ppb (196 µg/m$^3$) |
| | 24 Hour | 0.04 ppm (105 µg/m$^3$) | 0.14 ppm (365 µg/m$^3$) |
| | Annual Arithmetic Mean | NA | 0.03 ppm (80 µg/m$^3$) |
| Lead (Pb)[10,11] | 30-Day Average | 1.5 µg/m$^3$ | NA |
| | Calendar Quarter | NA | 1.5 µg/m$^3$ |
| | Rolling 3-Month Average | NA | 0.15 µg/m$^3$ |
| Visibility Reducing Particles[12] | 8 hours | See Note 11 | NA |
| Sulfates ($SO_4^{-2}$) | 24 Hour | 25 µg/m$^3$ | NA |
| Hydrogen Sulfide ($H_2S$) | 1 Hour | 0.03 ppm (42 µg/m$^3$) | NA |
| Vinyl Chloride ($C_2H_3Cl$)[10] | 24 Hour | 0.01 ppm (26 µg/m$^3$) | NA |

ppm = parts per million; ppb = parts per billion; µg/m$^3$ = micrograms per cubic meter; mg/m$^3$ = milligrams per cubic meter; NA = no information available

ppm = parts per million; µg/m$^3$ = micrograms per cubic meter; mg/m$^3$ = milligrams per cubic meter.

Notes:

[1] California standards for $O_3$, carbon monoxide (except Lake Tahoe), sulfur dioxide (1-hour and 24-hour), nitrogen dioxide, suspended particulate matter ($PM_{10}$, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

**Table 6: State and Federal Ambient Air Quality Standards**

[2] National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For $PM_{10}$, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m$^3$ is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

[3] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25° C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25° C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[4] Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

[5] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[6] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[7] On February 7, 2024, the national annual $PM_{2.5}$ primary standard was lowered from 12.0 µg/m$^3$ to 9.0 µg/m$^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m$^3$, as was the annual secondary standard of 15.0 µg/m$^3$. The existing 24-hour $PM_{10}$ standards (primary and secondary) of 150 µg/m$^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[8] To attain the 1-hour national standard, the 3-year average of the annual 98$^{th}$ percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[9] On June 2, 2010, a new 1-hour $SO_2$ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99$^{th}$ percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 $SO_2$ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

[10] The ARB has identified lead and vinyl chloride as "toxic air contaminants" with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[11] The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m$^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Source: South Coast Air Quality Management District, Table of *Air Quality Standards*, July 2024, https://ww2.arb.ca.gov/sites/default/files/2024-08/AAQS%20Table_ADA_FINAL_07222024.pdf, accessed February 2025.

## 3.2 State of California

### California Air Resources Board

CARB administers the air quality policy in California. The CAAQS were established in 1969 pursuant to the Mulford-Carrell Act. These standards, included in **Table 6** with the NAAQS, are generally more stringent and apply to more pollutants than the NAAQS. In addition to the criteria pollutants, CAAQS have been established for visibility reducing particulates, hydrogen sulfide, and sulfates.[9]

The California Clean Air Act (CCAA) was approved in 1988 and requires that each local air district prepare and maintain an Air Quality Management Plan (AQMP) to achieve compliance with the CAAQS. These AQMPs also serve as the basis for the preparation of the SIP for meeting the federal clean air standards for the State.[10] Like the U.S. EPA, CARB also designates areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a state standard for the pollutant was violated at least once during the previous

[9] California Air Resources Board, *California Ambient Air Quality Standards*, https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards, accessed December 2024.

[10] South Coast Air Quality Management District, *Final 2016 Air Quality Management Plan*, March 2017, https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, accessed December 2024.

three calendar years. Exceedances that are affected by highly irregular or infrequent events such as wildfires, volcanoes, etc. are not considered violations of a state standard, and are not used as a basis for designating areas as nonattainment. The applicable State standards are summarized in **Table 6.**

**Title 24 Energy Efficiency Standard and California Building Standards**

The Building Energy Efficiency Standards (Energy Code) was adopted in 1976 by the California Energy Commission (CEC) and has been updated throughout the years. The most recent update to the Energy Code occurred in 2022. The Energy Code requires newly constructed buildings to contain water and energy-efficient measures. The CEC anticipates that the 2022 Energy Code will provide $1.5 billion in consumer benefits and reduce greenhouse gas (GHG) emissions by 10 million metric tons. The Project would be required to comply with the applicable standards in place at the time plan check submittals are made.[11]

CCR, Title 24, Part 11: California Green Building Standards Code (CalGreen) is a comprehensive and uniform voluntary regulatory code for all residential, commercial, and school buildings that went in effect on August 1, 2009, and is administered by the California Building Standards Commission. CalGreen is updated on a regular basis, with the most recent approved update consisting of the 2022 California Green Building Code Standards that became effective on January 1, 2023.

## 3.3 Regional

**South Coast Air Quality Management District**

The SCAQMD is the air pollution control agency for Orange County and the urban portions of Los Angeles, Riverside, and San Bernardino Counties. The agency's primary responsibility is ensuring that the NAAQS and CAAQS are attained and maintained in the SCAB. The SCAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, and many other activities. All projects are subject to SCAQMD rules and regulations in effect at the time of construction.

The SCAQMD is also the lead agency in charge of developing each AQMP, with input from the Southern California Association of Governments (SCAG) and CARB. The AQMP is a comprehensive plan that includes control strategies to reduce emissions from stationary and area sources, as well as for on-road and off-road mobile sources. SCAG has the primary responsibility for providing future growth projections and the development and implementation of transportation control measures. CARB, in coordination with federal agencies, has jurisdiction over mobile sources.

The 2016 AQMP was adopted by the SCAQMD Governing Board on March 3, 2017.[12] The purpose of

[11] California Energy Commission, *2022 Building Energy Efficiency Standards for Residential and Nonresidential Buildings: For the 2022 Building Energy Efficiency Standards Title 24, Part 6, and Associated Administrative Regulations in Part 1,* https://www.energy.ca.gov/publications/2022/2022-building-energy-efficiency-standards-residential-and-nonresidential, accessed April 2025.

[12] South Coast Air Quality Management District, *Final 2016 Air Quality Management Plan*, March 2017, https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15, accessed December 2024.

the 2016 AQMP is to set forth a comprehensive and integrated program that would lead the SCAB into compliance with those NAAQS for which the basin is in nonattainment (i.e., the federal 24-hour $PM_{2.5}$ air quality standard), and to provide an update to the SCAQMD's commitments towards meeting the federal 8-hour $O_3$ standards. The 2016 AQMP incorporated the latest scientific and technological information and planning assumptions, including the *2016-2040 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS) and updated emission inventory methodologies for various source categories.[13]

On October 1, 2015, the U.S. EPA strengthened the NAAQS for ground-level $O_3$. The 2022 AQMP, adopted by the SCAQMD Governing Board on December 2, 2022, was developed to address the strengthened requirements for meeting the 2015 ground-level 8-hour $O_3$ standard.[14] The 2022 AQMP builds upon measures already in place from previous AQMPs. It also includes a variety of additional strategies such as regulation, accelerated deployment of available cleaner technologies (e.g., zero emissions technologies, when cost-effective and feasible, and low $NO_X$ technologies in other applications), best management practices, co-benefits from existing programs (e.g., climate and energy efficiency), incentives, and other FCAA measures to achieve the 2015 8-hour ozone standard. Like earlier AQMPs, the 2022 AQMP incorporates the latest scientific and technological information and planning assumptions, including the *2020-2045* RTP/SCS and updated emission inventory methodologies for various source categories.[15]

The SCAQMD has published the CEQA Air Quality Handbook (approved by the SCAQMD Governing Board in 1993 and augmented with guidance for Local Significance Thresholds [LST] in 2008).[16] The SCAQMD guidance helps local government agencies and consultants to develop environmental documents required by California Environmental Quality Act (CEQA) and suggests thresholds of significance for criteria pollutants for both construction and operation (see discussion of thresholds below). With the help of SCAQMD's CEQA Air Quality Handbook and associated guidance, local land use planners and consultants are able to analyze and document how proposed and existing projects affect air quality in order to meet the requirements of the CEQA review process. The SCAQMD periodically provides supplemental guidance and updates to the handbook on their website.

The State and federal attainment status designations for the SCAB are summarized in **Table 7: South Coast Air Basin Attainment Status**. The SCAB is currently designated as a nonattainment area with respect to the State $O_3$, $PM_{10}$, and $PM_{2.5}$ standards, as well as the national 8-hour $O_3$ and $PM_{2.5}$ standards. The SCAB is designated as attainment or unclassified for the remaining state and federal standards.

[13] Southern California Association of Governments, *The 2016-2040 Regional Transportation Plan/Sustainable Communities Strategy*, April 2016, https://scag.ca.gov/sites/main/files/file-attachments/f2016rtpscs.pdf?1606005557, accessed September 2024

[14] South Coast Air Quality Management District, *2022 Air Quality Management Plan*, December 2022, https://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2022-air-quality-managementplan/final-2022-aqmp/final-2022-aqmp.pdf?sfvrsn=16, accessed December 2024

[15] Southern California Association of Governments, *Connect SoCal (2020-2045 Regional Transportation Plan/Sustainable Communities Strategy)*, September 2020, https://scag.ca.gov/read-plan-adopted-final-connect-socal-2020, accessed December 2024

[16] South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, Revised 2008, https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/localized-significance-thresholds, accessed December 2024

**Table 7: South Coast Air Basin Attainment Status**

| Pollutant | State | Federal |
|---|---|---|
| Ozone ($O_3$) (1 Hour Standard) | Non-Attainment | Non-Attainment (Extreme) |
| Ozone ($O_3$) (8 Hour Standard) | Non-Attainment | Non-Attainment (Extreme) |
| Particulate Matter ($PM_{2.5}$) (24 Hour Standard) | – | Non-Attainment (Serious) |
| Particulate Matter ($PM_{2.5}$) (Annual Standard) | Non-Attainment | Non-Attainment (Moderate) |
| Particulate Matter ($PM_{10}$) (24 Hour Standard) | Non-Attainment | Attainment (Maintenance) |
| Particulate Matter ($PM_{10}$) (Annual Standard) | Non-Attainment | – |
| Carbon Monoxide (CO) (1 Hour Standard) | Attainment | Attainment (Maintenance) |
| Carbon Monoxide (CO) (8 Hour Standard) | Attainment | Attainment (Maintenance) |
| Nitrogen Dioxide ($NO_2$) (1 Hour Standard) | Attainment | Unclassifiable/Attainment |
| Nitrogen Dioxide ($NO_2$) (Annual Standard) | Attainment | Attainment (Maintenance) |
| Sulfur Dioxide ($SO_2$) (1 Hour Standard) | Attainment | Unclassifiable/Attainment |
| Sulfur Dioxide ($SO_2$) (24 Hour Standard) | Attainment | – |
| Lead (Pb) (30 Day Standard) | – | Unclassifiable/Attainment |
| Lead (Pb) (3 Month Standard) | Attainment | Nonattainment (Partial)[1] |
| Sulfates ($SO_{4-2}$) (24 Hour Standard) | Attainment | – |
| Hydrogen Sulfide ($H_2S$) (1 Hour Standard) | Unclassified | – |

Source: South Coast Air Quality Management District, *Air Quality Management Plan*, 2022; United States Environmental Protection Agency, *Nonattainment Areas for Criteria Pollutants (Green Book)*, 2024.

The following is a list of SCAQMD rules with which construction activities associated with the Project must comply:

- **Rule 401 (Visible Emissions)** – A person shall not discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any 1 hour that is dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.
- **Rule 402 (Nuisance)** – This rule prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. This rule does not apply to odors emanating from agricultural operations necessary for the growing or crops or the raising of fowl or animals.
- **Rule 403 (Fugitive Dust)** - This rule requires fugitive dust sources to implement best available control measures for all sources, and all forms of visible particulate matter are

prohibited from crossing any property line. This rule is intended to reduce PM10 emissions from any transportation, handling, construction, or storage activity that has the potential to generate fugitive dust. $PM_{10}$ suppression techniques are summarized below.

a) Portions of a construction site to remain inactive longer than a period of three months will be seeded and watered until grass cover is grown or otherwise stabilized.

b) All on-site roads are paved as soon as feasible, watered regularly, or chemically stabilized.

c) All material transported off-site will be either sufficiently watered or securely covered to prevent excessive amounts of dust.

d) The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized at all times.

e) Where vehicles leave a construction site and enter adjacent public streets, the streets will be swept daily or washed down following the work day to remove soil from pavement.

- **Rule 431.2 (Sulfur Content of Liquid Fuels)** - This rule limits the sulfur content in diesel and other liquid fuels for the purpose of both reducing the formation of sulfur oxides and particulates during combustion and to enable the use of add-on control devices for diesel fueled internal combustion engines.
- **Rule 445 (Wood Burning)** – This rule prohibits permanently installed wood-burning devices into any new development. A wood-burning device means any fireplace, wood burning heater, or pellet-fueled wood heater, or any similarly enclosed, permanently installed, indoor or outdoor device burning any solid fuel for aesthetic or space-heating purposes, which has a heat input of less than one million British thermal units per hour.
- **Rule 1113 (Architectural Coatings)** – This rule requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce ROG emissions from the use of these coatings, primarily by placing limits on the ROG content of various coating categories.

**Southern California Association of Governments**

The SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino and Imperial counties, and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. Under federal law, SCAG is designated as a Metropolitan Planning Organization and under State law as a Regional Transportation Planning Agency and a Council of Governments. With respect to air quality planning, SCAG has prepared the Regional Comprehensive Plan and Guide for the region, which includes Growth Management and Regional Mobility chapters that form the basis for the land use and transportation control portions of the 2022 AQMP.

## 3.4 Local

**City of Ontario General Plan**

The City of Ontario General Plan (TOP 2050) is a policy plan that guides the City's long-term development. TOP 2050 establishes goals and policies within the Environmental Resources Element, Land Use Element, and Safety Element to protect residents, workers, and visitors from worsening local pollutant emissions. The following goals and policies are applicable to the Project.

Environmental Resources Element

**Goal ER-3** **Cost-effective and reliable energy system sustained through a combination of low impact buildings, site and neighborhood energy conservation, and diverse sources of energy generation that collectively helps to minimize the region's carbon footprint.**

**Policy ER-3.5** **Fuel-Efficient and Alternative Energy Vehicles and Equipment.** We require purchase and use vehicles and equipment that are fuel efficient and meet or surpass state emissions requirements and/or use renewable sources of energy.

**Goal ER-4** **Improved indoor and outdoor air quality and reduced locally generated pollutant emissions.**

**Policy ER-4.1** **Land Use.** We reduce GHG and other local pollutant emissions through compact, mixed use, and transit-oriented development and development that improves the regional jobs-housing balance.

**Policy ER-4.4** **Indoor Air Quality.** We will comply with State Green Building Codes relative to indoor air quality. We seek funding to improve indoor air quality for households with poor indoor air quality, with priority for lower income households in environmental justice areas.

**Policy ER-4.5** **Transportation.** We promote mass transit and non-motorized mobility options (walking, biking) to reduce air pollutant emissions.

**Policy ER-4.6** **Particulate Matter.** We support efforts to reduce particulate matter to meet State and Federal Clean Air Standards.

**Policy ER-4.7** **Other Agency Collaboration.** We collaborate with other agencies within the South Coast Air Basin to improve regional air quality at the emission source, with a particular focus on sources that affect environmental justice areas in Ontario.

**Policy ER-4.8** **Tree Planting.** We protect healthy trees within the City and plant new trees to increase carbon sequestration and help the regional/local air quality. We expand the tree canopy in environmental justice areas to enhance air quality and reduce the "heat island" effect.

Land Use Element

**Goal LU-2** **Compatibility between a wide range of uses and resultant urban patterns and forms.**

**Policy LU-2.2** **Buffers.** We require new uses to provide mitigation or buffers between existing uses where potential adverse impacts could occur. Additional mitigation is required when new uses could negatively impact environmental justice areas.

**Policy LU-2.4** **Regulation of Nuisances**. We regulate the location, concentration, and operation of potential nuisances

**Policy LU-2.8** **Transitional Areas**. We require development in transitional areas to protect the quality of life of current residents.

Safety Element

**Goal S-9** **Incorporate energy efficient practices and renewable energy systems to improve air quality, comfort, and energy reliability during temporary power outages.**

# 4.0 SIGNIFICANCE CRITERIA AND METHODOLOGY

## 4.1 Air Quality Thresholds

**State CEQA Guidelines Appendix G**

According to the State CEQA Guidelines Appendix G, a project would normally have a significant effect on the environment if the project would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in nonattainment under an applicable state or federal ambient air quality standard.
- Expose sensitive receptors to substantial pollutant concentrations.
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

**South Coast Air Quality Management District**

Mass Emissions Thresholds

The significance criteria established by SCAQMD may be relied upon to make the above determinations. According to the CEQA Appendix G, an air quality impact is considered significant if the Project would violate any ambient air quality standard (AAQS), contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations. The SCAQMD has established thresholds of significance for criteria pollutant and precursor emissions during construction and operational activities of land use development projects, as shown in **Table 8: South Coast Air Quality Management District Emissions Thresholds**.

**Table 8: South Coast Air Quality Management District Emissions Thresholds**

| Criteria Pollutants and Precursors | Daily Emissions (pounds per day) | |
|---|---|---|
| | Construction-Related | Operational-Related |
| Volatile Organic Compounds (VOCs)[1] | 75 | 55 |
| Nitrogen Oxides ($NO_X$) | 100 | 55 |
| Carbon Monoxide (CO) | 550 | 550 |
| Sulfur Oxides ($SO_X$) | 150 | 150 |
| Coarse Particulates ($PM_{10}$) | 150 | 150 |
| Fine Particulates ($PM_{2.5}$) | 55 | 55 |

1. VOCs and reactive organic gases (ROGs) are subsets of organic gases emitted from the incomplete combustion of hydrocarbons or other carbon-based fuels. Although they represent slightly different subsets of organic gases, they are used interchangeably for the purposes of this analysis.

Source: South Coast Air Quality Management District, *CEQA Air Quality Significance Thresholds,* March 2023.

Localized Carbon Monoxide

In addition to the daily thresholds listed above, development associated with the Project would also be subject to the AAQS. These are addressed through an analysis of localized CO impacts known as the CO "hot spots" analysis. An analysis of CO "hot spots" determines whether the change in the level of service (LOS) of an intersection as a result of Project activities would have the potential to result in exceedances of the CAAQS or NAAQS. It has long been recognized that one of the greatest

contributors of CO to outdoor air is cars.[17] Vehicle emissions standards have become increasingly stringent in the last 20 years. Currently, the CO standard in California is a maximum of 3.4 grams per mile for passenger cars (requirements for certain vehicles are more stringent).[18] With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations have steadily declined.[19, 20]

Accordingly, with steadily decreasing CO emissions from vehicles, even very busy intersections do not result in exceedances of the CO standard. An analysis prepared for CO attainment in the SCAB by the SCAQMD is useful for current evaluations of the potential for CO exceedances. CO attainment was thoroughly analyzed as part of the SCAQMD's 2003 AQMP.[21] Considering the region's unique meteorological conditions and the increasingly stringent CO emissions standards, CO modeling was performed as part of air quality management plans. The SCAB was re-designated as attainment (as reported in **Table 5**, above) in 2007 and CO is no longer addressed in the SCAQMD's AQMP.

The 2003 AQMP is the most recent AQMP that addressed CO concentrations. As part of the 2003 AQMP CO Modeling Attainment Demonstration, an analysis was performed utilizing dispersion modeling.[22] The Wilshire Boulevard and Veteran Avenue intersection, one of the most congested intersections in Southern California with an average daily traffic (ADT) volume of approximately 100,000 vehicles per day, was modeled for CO concentrations. This modeling effort identified a CO concentration high of 4.6 parts per million (ppm), which is well below the 35-ppm federal standard.

The Bay Area Air Quality Management District addressed CO concentrations in its most recent CEQA Guidelines. Based on the improvement in mobile-source CO emissions, the CEQA Guidelines established a project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact. [23]

For purposes of this analysis, a significant impact regarding CO hotspots may occur if an intersection exceeds 24,000 vehicles per hour.

<u>Localized Significance Thresholds</u>

In addition to the CO hot spot analysis, the SCAQMD developed LSTs for emissions of $NO_2$, CO, $PM_{10}$, and $PM_{2.5}$ generated at new development sites (off-site mobile source emissions are not included in the LST analysis). LSTs represent the maximum emissions that can be generated at a project site without expecting to cause or substantially contributing to an exceedance of the most stringent

[17] U.S. Environmental Protection Agency, *Basic Information about Carbon Monoxide (CO) Outdoor Air Pollution,* 2024, https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-airpollution#:~:text=The%20greatest%20sources%20of%20CO,can%20affect %20air%20quality%20indoors, accessed December 2024

[18] California Code of Regulations Section 1961, *Exhaust Emission Standards and Test Procedures – 2004 through 2019 Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles*, 2022, https://ww2.arb.ca.gov/sites/default/files/2023-02/cleancomplete_lev_ghg_regs_11_2022.pdf, accessed December 2024.

[19] South Coast Air Quality Management District, *Carbon Monoxide Redesignation Request and Maintenance Plan*, February 2005, https://ww2.arb.ca.gov/sites/default/files/classic/planning/sip/sccosip05/sccosip_redesig_mplan.pdf, accessed December 2024.

[20] U.S. Environmental Protection Agency, *Carbon Monoxide Trends*, 2024, https://www.epa.gov/air-trends/carbon-monoxide-trends, accessed December 2024.

[21] South Coast Air Quality Management District, *Air Quality Management Plan, Appendix V, Modeling and Attainment Demonstrations*, August 2003, https://www.aqmd.gov/home/air-quality/air-quality-management-plans/air-quality-mgt-plan/2003-aqmp, accessed December 2024.

[22] Ibid.

[23] Bay Area Air Quality Management District, 2022 CEQA Guidelines, https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/ceqa-guidelines-chapter-4-screening_final-pdf.pdf?la=en, accessed April 2025.

NAAQS or CAAQS. LSTs are based on the ambient concentrations of that pollutant within the Project source receptor area (SRA), as demarcated by the SCAQMD, and the distance to the nearest sensitive receptor. LST analysis for construction is required for all projects that disturb 5 acres or less on a single day. The Project site is located within SCAQMD SRA 33 (Southwest San Bernardino Valley). LST are provided for source-receptor distances of 25, 50, 100, 200, and 500 meters. LSTs for 1-acre, 2-acre, and 5-acre projects in SRA 33 at 25 meters of the Project site are provided in **Table 9: Local Significance Thresholds for Construction/Operations**.

**Table 9: Local Significance Thresholds for Construction/Operations**

| Project Size | Daily Construction/Operations Emissions (pounds per day) | | | |
|---|---|---|---|---|
| | Nitrogen Oxide ($NO_x$) | Carbon Monoxide (CO) | Coarse Particulates ($PM_{10}$) | Fine Particulates ($PM_{2.5}$) |
| 1 Acre | 118/118 | 863/863 | 5/2 | 4/1 |
| 2 Acres | 170/170 | 1,232/1,232 | 6/2 | 5/2 |
| 5 Acres | 270/270 | 2,193/2,193 | 16/4 | 9/2 |

Source: South Coast Air Quality Management District, *Localized Significance Threshold Methodology,* July 2008.

The sensitive receptors nearest the Phase I Project area are residential uses (Sensitive Receptor 1) located approximately 36 feet (11 meters) to the north and nearest the Phase II Project area are residential uses (Sensitive Receptor 2) located approximately 53 feet (16 meters) to the south. As the LSTs at 25 feet is the closest receptor distance provided by SCAQMD, the LSTs at 25 meters applies to sensitive receptors located closer than 25 meters from the Project site.[24] LSTs associated with all acreage categories at 25 meters are provided in **Table 9** for informational purposes and shows that the LSTs increase as acreages increase. It should be noted that LSTs are screening thresholds and are therefore conservative. The construction LST acreage is determined based daily acreage disturbed. The operational LST acreage is based on the total area of the Project site.

## 4.2 Methodology

This air quality impact analysis considers construction and operational impacts associated with the Project. Where criteria air pollutant quantification was required, emissions were modeled using the CARB approved California Emissions Estimator Model (CalEEMod) version 2022.1. CalEEMod is a Statewide land use emissions computer model designed to quantify potential criteria pollutant emissions for land use development projects based on typical construction requirements. Air quality impacts were assessed according to methodologies recommended by CARB and the SCAQMD.

Construction equipment, trucks, worker vehicles, and ground-disturbing activities associated with Project construction would generate emissions of criteria air pollutants and precursors. Although Project construction would be dependent on market conditions, daily regional construction emissions are estimated by assuming construction occurs at the earliest feasible date (i.e., a conservative estimate of construction activities) and applying off-road, fugitive dust, and on-road emissions factors in CalEEMod. It is assumed that Phase I construction would occur from late-2025 to mid-2027. At this stage of the planning process, the Phase II construction timeline is not yet available. As such, reasonable assumptions have been made as a conservative measure. It is assumed that Phase II construction would occur from late-2026 to early-2030 and would overlap

[24] South Coast Air Quality Management District, *Localized Significance Threshold Methodology*, July 2008, https://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf, accessed April 2025.

with Phase I construction.

Project operations would result in emissions from mobile sources (Project generated vehicle trips), area sources (architectural coatings, landscaping equipment, and consumer products), energy sources (electricity and natural gas usage), and vehicles idling in the drive-thru lanes. Project-generated operational emissions would be predominantly associated with motor vehicle use. The emissions associated with the mobile, area, and energy sources were quantified in CalEEMod based on land use activity data. The Project vehicle trip generation was obtained from the Traffic Analysis.[25] The emissions generated by vehicles idling in drive-thru lanes were estimated using CARB's EMission FACtor (EMFAC) projected emissions rates in San Bernardino County, the miles traveled on-site, and the vehicle trip generation from the Traffic Analysis.[26] Project occupancy would be dependent on market conditions and permit approvals. As such, it is conservatively assumed Phase I and Phase II would be operational as soon as construction is completed. In addition, operational emissions associated with the maximum potential buildout are conservatively calculated based on an operational year of 2030.

As discussed above, the SCAQMD provides significance thresholds for emissions associated with project construction and operations. The Project's construction and operational emissions are compared to the daily criteria pollutant emissions significance thresholds in order to determine the significance of a Project's impact on regional air quality.

The localized effects from the Project's on-site construction and operational emissions were evaluated in accordance with the SCAQMD's LST methodology, which uses on-site mass emissions rate look-up tables and Project-specific modeling. LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable NAAQS or CAAQS and are developed based on the ambient concentrations of that pollutant for each source receptor area and distance to the nearest sensitive receptor.

[25] Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.
[26] Ibid.

# 5.0 POTENTIAL IMPACTS AND MITIGATION

## Threshold 5.1 Would the Project conflict with or obstruct implementation of the applicable air quality plan?

As part of its enforcement responsibilities, the U.S. EPA requires each state with nonattainment areas to prepare and submit a SIP that demonstrates the means to attain the NAAQS. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under State law, the CCAA requires an air quality attainment plan to be prepared for areas designated as nonattainment regarding the NAAQS and CAAQS. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

The Project site is located within SCAB, which is under the jurisdiction of the SCAQMD. The SCAQMD is required, pursuant to the FCAA, to reduce emissions of criteria pollutants for which the SCAB is in nonattainment. To reduce such emissions, the SCAQMD drafted the 2016 AQMP and 2022 AQMP (AQMPs).[27] The AQMPs establish a program of rules and regulations directed at reducing air pollutant emissions and achieving NAAQS and CAAQS. The AQMPs are a regional and multi-agency effort including the SCAQMD, the CARB, the SCAG, and the U.S. EPA. The AQMPs pollutant control strategies are based on the latest scientific and technical information and planning assumptions, including SCAG's RTP/SCS, updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts. SCAG's latest growth forecasts were defined in consultation with local governments and with reference to local general plans. The Project is subject to the SCAQMD's AQMPs.

The criteria for determining consistency with the AQMPs are defined by the following indicators:

- **Consistency Criterion No. 1**: The Project will not result in an increase in the frequency or severity of existing air quality violations, or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMPs.
- **Consistency Criterion No. 2**: The Project will not exceed the assumptions in the AQMPs or increments based on the years of the Project build-out phase.

According to the SCAQMD's *CEQA Air Quality Handbook*, the purpose of the consistency finding is to determine if a project is inconsistent with the assumptions and objectives of the regional air quality plans, and thus if it would interfere with the region's ability to comply with the NAAQS and CAAQS.[28]

[27] The 2016 AQMP was adopted in March 2017 and was developed to address attainment of multiple $O_3$ and $PM_{2.5}$ standards. The 2022 AQMP was adopted in December 2022 and was developed to address attainment of the 2015 8-hour $O_3$ federal standard.
[28] South Coast Air Quality Management District, *CEQA Air Quality Handbook*, 1993.

### Phase I (Proposed Development), Phase II (Future Development, Project Buildout (Phase I + Phase II)

**Criterion No. 1**

Consistency Criterion No. 1 refers to exceedances of the NAAQS and CAAQS. As shown in Threshold 2 below, the construction and operational-generated emissions associated with Project (Phase I and Phase II) implementation would exceed the applicable SCAQMD emission thresholds. Mitigation measures from the FSEIR were incorporated to reduce emissions to the greatest extent feasible. However, the construction and operational-generated emissions would remain above the SCAQMD emissions thresholds. Therefore, the Project would potentially contribute to an existing air quality violation and is consistent with the first criterion.

**Criterion No.2**

Consistency Criterion No. 2 refers to exceedances of the AQMP emission assumptions based on SCAG's latest growth forecasts. The AQMP contains air pollutant reduction strategies based on SCAG's latest growth forecasts, and SCAG's growth forecasts were defined in consultation with local governments and with reference to local general plans.

Growth forecasts prepared by SCAG and contained in the 2024-2050 RTP/SCS indicate that the number of households within the City will increase from 50,500 in 2019 to 95,500 in 2050, an increase of 45,000 households.[29] The Project would develop a maximum of 4,293 DUs, which represents 8.5 percent of the anticipated increase for the City by 2050. The Project site land use designation would be consistent with TOP 2050 and the AQMP. Therefore, the housing growth attributed to the Project would be accounted for within the local and regional population projections under the 2024-2050 RTP/SCS. As such, the Project would be consistent with the AQMP regarding population and housing assumptions.

The Project operational emissions would exceed the applicable SCAQMD emission thresholds. The Project is subject to FSEIR mitigation, which would reduce operational emissions; however, operational emissions would remain significant and would potentially contribute to the nonattainment designations in the SCAB. As such, the Project would be inconsistent with the AQMP regarding emission projections. As concluded in the FSEIR, impacts would be significant and unavoidable.

**FSEIR Mitigation Measures:** Refer to MM 3-2 and MM AQ-1 under Threshold 2 below.

**Mitigation Measures:** No additional mitigation is required.

**Level of Significance:** Significant and unavoidable.

### Conclusion

The criteria pollutant emissions impacts associated with the Project would be significant and unavoidable. The Project's impacts are within the limit of significant and unavoidable impacts

[29] Southern California Association of Governments, Connect SoCal (2024–2050 RTP/SCS), Demographics and Growth Forecast adopted April 4, 2024, https://www.scag.ca.gov/sites/default/files/2024-05/23-2987-tr-demographics-growth-forecast-final-040424.pdf, accessed April 2025.

identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

### Threshold 5.2 Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable state or federal ambient air quality standard?

Construction associated with the Project would generate short-term emissions of criteria air pollutants. The criteria pollutants of primary concern within the SCAB include ozone-precursor pollutants (i.e., ROG and $NO_X$), $PM_{10}$, and $PM_{2.5}$, as these pollutants are in nonattainment. Construction-generated emissions of these criteria pollutants would be short-term and of temporary duration, lasting only as long as construction activities occur, but would be considered a significant air quality impact if the volume of pollutants generated were to exceed the SCAQMD's thresholds of significance.

Construction activities would result in the temporary generation of criteria pollutant emissions from site grading, road paving, motor vehicle exhaust associated with construction equipment and worker trips, and the movement of construction equipment, especially on unpaved surfaces. Emissions of airborne particulate matter are largely generated by motor vehicle exhaust and ground disturbance; the volume of airborne particulate matter is largely dependent on the amount of ground disturbance associated with site preparation activities, as well as weather conditions and the appropriate application of water.

Project operations would generate emissions from mobile sources (Project generated vehicle trips), area sources (architectural coatings, consumer products, and landscape equipment), and energy sources (electricity and natural gas usage), and vehicles idling in the drive-thru lanes. The primary sources of operational criteria pollutants are from motor vehicle use and area sources.

## Phase I – Proposed Development

### Construction Emissions

Phase I construction is estimated to occur over 1 year and 6 months. Phase I construction would include demolition, site preparation, grading, infrastructure improvements, paving, and architectural coatings. Construction-generated emissions associated with Phase I were calculated using CalEEMod, which is designed to model emissions for land use development projects based on typical construction requirements. It is conservatively assumed that all anticipated construction equipment for each construction phase would operate simultaneously.

Fugitive dust emissions may have a temporary impact on local air quality and may be a nuisance to those living and working in the Phase I Project area. Phase I would be required to comply with SCAQMD rules and regulations, including SCAQMD Rule 402 (Nuisance), Rule 403 (Fugitive Dust), and Rule 1113 (Architectural Coatings). SCAQMD Rule 402 prohibits the discharge of air contaminants or other material that cause a nuisance. SCAQMD Rule 403 requires fugitive dust control measures. SCAQMD Rule 1113 provides specifications on painting practices and regulates the ROG content of paint. Phase I would additionally comply with CARB's anti-idling regulations, which prohibits heavy-duty diesel vehicle idling for more than five minutes.

Phase I construction would be subject to FSEIR Mitigation Measure (MM) 3-1, which requires compliance with SCAQMD Rule 403, the use of Tier 4 interim or higher exhaust emission limits, super-compliant ROG paint for architectural coatings, and prohibits idling of construction equipment for more than five minutes. The following measures from SCAQMD Rule 403 and FSEIR MM 3-1 were accounted for in emissions estimation:

- Exposed areas would be watered three times per day during earthmoving activities, twice per day during demolition, and twice per day for on unpaved roads and vehicle speeds would be limited to 25 miles per hour on unpaved roads.
- Heavy-duty diesel vehicle idling would be limited to five minutes or less.
- Construction equipment would meet the Tier 4 Final engine standards.
- Paints used for architectural coatings would have a ROG content less than ten g/L.

Phase I construction would also comply with laws, ordinances and regulations (LOR) AQ-1 through AQ-2. LOR AQ-1 requires owners to retrofit their existing heavy-duty tractor and trailer fleet with U.S. EPA SmartWay certified vehicles. LOR AQ-2 establishes GHG and fuel efficiency standards for medium- and heavy-duty vehicle engines. See **Appendix A: Air Quality Data** for more information regarding the construction assumptions used in this analysis.

The emissions associated with Phase I construction are reported in **Table 10: Phase I Construction Emissions**.

**Table 10: Phase I Construction Emissions**

| Construction Year | Maximum Daily Emissions (pounds per day)[1,2] | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
| 2025 | 1.03 | 9.36 | 49.53 | 0.09 | 7.52 | 3.24 |
| 2026 | 5.99 | 18.78 | 103.75 | 0.15 | 18.99 | 4.71 |
| 2027 | 122.14 | 17.92 | 98.58 | 0.10 | 18.99 | 4.71 |
| SCAQMD Threshold | 75 | 100 | 550 | 150 | 150 | 55 |
| **SCAQMD Threshold Exceeded?** | **Yes** | **No** | **No** | **No** | **No** | **No** |

ROG = Reactive Organic Gases; $NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $SO_2$ = Sulfur Dioxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. SCAQMD Rule 403 Fugitive Dust was applied. Rule 403 reduction/credits include the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; water all haul roads twice daily. Reductions percentages from the SCAQMD CEQA Handbook (Tables XI-A through XI-E) were applied.
2. Worst-case seasonal daily maximum emissions are reported.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

As shown in **Table 10**, the Phase I construction emissions would exceed the SCAQMD threshold for ROG emissions. The Phase I construction-generated ROG emissions are primarily from architectural coatings. FSEIR MM 3-1 requires the Applicant to use super-compliant ROG paints for architectural coatings, which have a ROG content lower than the regulatory limits required by SCAQMD Rule 1113. As such, the Phase I construction-generated ROG emissions cannot be reduced below the SCAQMD threshold. As concluded in the FSEIR, Project impacts would be significant and unavoidable.

### Operational Emissions

Phase I operations would be subject to FSEIR MM 3-2 and MM AQ-1, TOP 2050 Policy ER-3.5, and LOR AQ-3 through AQ-4. FSEIR MM 3-2 requires new developments to include access to alternative modes of transportation, such as transit stops, bike paths, and pedestrian paths. FSEIR MM AQ-1

requires new developments to provide bicycle parking, changing/shower, and supportive electric charging station facilities, preferential parking for fuel efficient and carpool vehicles, and Energy Star certified appliances. TOP 2050 Policy ER-3.5 requires Phase I occupants to purchase and use vehicles that comply with the Advanced Clean Cars II and Advanced Clean Trucks. LOR AQ-3 requires new buildings to meet the current Energy Code and CALGreen Code. LOR AQ-4 requires new non-residential buildings to provide bicycle parking according to the CALGreen Code or City ordinance. The following measures from FSEIR MM AQ-1 were accounted for in emissions estimation:

- Non-residential buildings would provide changing/shower facilities, electric vehicle charging infrastructure, and preferential parking for fuel efficient and carpool vehicles.
- Residential buildings would include bicycle parking facilities and Energy Star certified appliances.

The emissions associated with Phase I operations are summarized in **Table 11: Phase I Operational Emissions**.

**Table 11: Phase I Operational Emissions**

| Source | Maximum Daily Emissions (pounds per day)[1] | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
| Mobile | 31.48 | 33.73 | 309.01 | 0.81 | 72.35 | 18.73 |
| Area | 52.47 | 0.55 | 58.14 | <0.01 | 0.03 | 0.02 |
| Energy | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | 0.42 |
| Total Emissions[2] | 84.26 | 39.53 | 369.38 | 0.84 | 72.80 | 19.18 |
| SCAQMD Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| **SCAQMD Threshold Exceeded?** | **Yes** | **No** | **No** | **No** | **No** | **No** |

ROG = Reactive Organic Gases; $NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $SO_2$ = Sulfur Dioxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less
1. Worst-case seasonal daily maximum emissions are reported.
2. Totals may not add up due to rounding.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

The operational emissions sources are described in detail below:

- **Mobile Sources.** Mobile sources emissions would be generated from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, $NO_X$, $PM_{10}$, and $PM_{2.5}$ are all pollutants of regional concern. $NO_X$ and ROG react with sunlight to form $O_3$, known as photochemical smog. Additionally, wind currents readily transport $PM_{10}$ and $PM_{2.5}$. However, CO tends to be a localized pollutant, dispersing rapidly at the source.

  Phase I-generated vehicle emissions are based on the trip generation estimates and have been incorporated into CalEEMod, as recommended by the SCAQMD. Phase I would generate 8,270 total daily vehicle trips.[30]

- **Area Sources**. Area source emissions would be generated due to architectural coatings, consumer products, and landscape equipment.

[30] Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

- **Energy Source.** Energy source emissions would be generated due to electrical and natural gas usage associated with Phase I operations. Primary energy uses include space heating and cooling, water heating, ventilation, lighting, appliances, and electronics. However, electrical usage does not emit criteria pollutants and the residential uses would not include natural gas hearths.

As shown in **Table 11**, the Phase I operational emissions would exceed the SCAQMD threshold for ROG emissions. The Phase I operational ROG emissions are primarily from mobile sources and consumer products. Implementation of FSEIR MM 3-2 would reduce mobile emissions to the maximum extent feasible, as motor vehicle emissions are controlled by State and federal standards and neither the Applicant nor the City has control over these standards. For analytical purposes, consumer products include cleaning supplies, aerosols, cosmetics, toiletries, and fertilizer.[31] Phase I could require limitations on the use of ROG emitting products through lease or property agreements. However, this mitigation is not feasible as it would be difficult to enforce. As such, the Phase I operational ROG emissions cannot be reduced below the SCAQMD threshold. As concluded in the FSEIR, Project impacts would be significant and unavoidable.

## Phase II – Future Development

### Construction Emissions

Phase II construction is conservatively assumed to occur over 3 years and 4 months. Phase II construction would include demolition, site preparation, grading, infrastructure improvements, paving, and architectural coatings. Construction-generated emissions associated with Phase II were calculated using CalEEMod, which is designed to model emissions for land use development projects based on typical construction requirements. It is conservatively assumed that all anticipated construction equipment for each construction phase would operate simultaneously.

Fugitive dust emissions may have a temporary impact on local air quality and may be a nuisance to those living and working in the Phase II Project area. Phase I would be required to comply with SCAQMD rules and regulations, including SCAQMD Rule 402 (Nuisance), Rule 403 (Fugitive Dust), and Rule 1113 (Architectural Coatings). SCAQMD Rule 402 prohibits the discharge of air contaminants or other material that cause a nuisance. SCAQMD Rule 403 requires fugitive dust control measures. SCAQMD Rule 1113 provides specifications on painting practices and regulates the ROG content of paint. Phase I would additionally comply with CARB's anti-idling regulations, which prohibits heavy-duty diesel vehicle idling for more than five minutes.

Phase II construction would be subject to FSEIR MM 3-1, which requires compliance with SCAQMD Rule 403, the use of Tier 4 interim or higher exhaust emission limits, super-compliant ROG paint for architectural coatings, and prohibits idling of construction equipment for more than five minutes. The following measures from SCAQMD Rule 403 and FSEIR MM 3-1 were accounted for in emissions estimation:

- Exposed areas would be watered three times per day during earthmoving activities, twice per day during demolition, and twice per day for on unpaved roads and vehicle speeds would be limited to 25 miles per hour on unpaved roads.

[31] California Air Pollution Control Officers Association, *California Emissions Estimator Model User's Guide*, 2022.

- Heavy-duty diesel vehicle idling would be limited to five minutes or less.
- Construction equipment would meet the Tier 4 final engine standards.
- Paints used for architectural coatings would have a ROG content less than ten g/L.

Phase II construction would also comply with LOR AQ-1 through AQ-2. LOR 1 requires owners to retrofit their existing heavy-duty tractor and trailer fleet with U.S. EPA SmartWay certified vehicles. LOR 2 establishes GHG and fuel efficiency standards for medium and heavy-duty vehicle engines. See **Appendix A** for more information regarding the construction assumptions used in this analysis.

The emissions associated with Phase II construction are reported in **Table 12: Phase II Construction Emissions**.

**Table 12: Phase II Construction Emissions**

| Construction Year | Maximum Daily Emissions (pounds per day)[1] | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
| 2026 | 1.05 | 12.14 | 50.95 | 0.11 | 10.10 | 3.73 |
| 2027 | 10.55 | 29.02 | 208.66 | 0.17 | 35.72 | 9.18 |
| 2028 | 18.19 | 47.80 | 263.66 | 0.24 | 66.10 | 16.00 |
| 2029 | 8.99 | 24.24 | 151.19 | 0.13 | 33.07 | 8.04 |
| 2030 | 370.37 | 20.83 | 112.42 | 0.11 | 32.85 | 7.96 |
| SCAQMD Threshold | 75 | 100 | 550 | 150 | 150 | 55 |
| **SCAQMD Threshold Exceeded?** | **Yes** | **No** | **No** | **No** | **No** | **No** |

ROG = Reactive Organic Gases; $NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $SO_2$ = Sulfur Dioxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. SCAQMD Rule 403 Fugitive Dust was applied. Rule 403 reduction/credits include the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; water all haul roads twice daily. Reductions percentages from the SCAQMD CEQA Handbook (Tables XI-A through XI-E) were applied.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

As shown in **Table 12**, the Phase II construction emissions would exceed the SCAQMD threshold for ROG emissions. The Phase II construction-generated ROG emissions are primarily from architectural coatings. FSEIR MM 3-1 requires the Applicant to use super-compliant ROG paints for architectural coatings, which have a ROG content lower than the regulatory limits required by SCAQMD Rule 1113. As such, Phase II construction-generated ROG emissions cannot be reduced below the SCAQMD threshold. As concluded in the FSEIR, Project impacts would be significant and unavoidable.

### Operational Emissions

Phase II operations would be subject to FSEIR MM 3-2 and MM AQ-1, TOP 2050 Policy ER-3.5, and LOR AQ-3 through AQ-4. FSEIR MM 3-2 requires new developments to include access to alternative modes of transportation, such as transit stops, bike paths, and pedestrian paths. FSEIR MM AQ-1 requires new developments to provide bicycle parking, changing/shower, and supportive electric charging station facilities, preferential parking for fuel efficient and carpool vehicles, and Energy Star certified appliances. TOP 2050 Policy ER-3.5 requires Phase II occupants to purchase and use vehicles that comply with the Advanced Clean Cars II and Advanced Clean Trucks. LOR AQ-3 requires new buildings to meet the current Energy Code and CALGreen Code. LOR AQ-4 requires new non-residential buildings to provide bicycle parking according to the CALGreen Code or City ordinance. The following measures from FSEIR MM AQ-1 were accounted for in emissions estimation:

- Non-residential buildings would provide changing/shower facilities, electric vehicle charging infrastructure, and preferential parking for fuel efficient and carpool vehicles.
- Residential buildings would include bicycle parking facilities and Energy Star certified appliances.

The emissions associated with Phase II operations are summarized in **Table 13: Phase II Operational Emissions**.

**Table 13: Phase II Operational Emissions**

| Source | Maximum Daily Emissions (pounds per day)[1] | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
| Mobile | 121.24 | 133.37 | 1,299.39 | 3.69 | 351.10 | 90.64 |
| Area | 156.00 | 1.82 | 197.01 | 0.01 | 0.10 | 0.08 |
| Energy | 1.11 | 19.19 | 9.59 | 0.12 | 1.54 | 1.54 |
| Drive-thru Lanes | <0.01 | <0.01 | 0.04 | <0.01 | <0.01 | <0.01 |
| Total Emissions[2] | 278.36 | 154.39 | 1,506.03 | 3.82 | 352.74 | 92.25 |
| SCAQMD Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| **SCAQMD Threshold Exceeded?** | **Yes** | **Yes** | **Yes** | **No** | **Yes** | **Yes** |

ROG = Reactive Organic Gases; $NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $SO_2$ = Sulfur Dioxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less
1. Worst-case seasonal daily maximum emissions are reported.
2. Totals may not add up due to rounding.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

The operational emissions sources are described in detail below:

- **Mobile Sources.** Mobile sources emissions would be generated from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, $NO_X$, $PM_{10}$, and $PM_{2.5}$ are all pollutants of regional concern. $NO_X$ and ROG react with sunlight to form $O_3$, known as photochemical smog. Additionally, wind currents readily transport $PM_{10}$ and $PM_{2.5}$. However, CO tends to be a localized pollutant, dispersing rapidly at the source.

  Phase II-generated vehicle emissions are based on the trip generation estimates and have been incorporated into CalEEMod, as recommended by the SCAQMD. Phase II would generate 36,446 total daily vehicle trips.[32]

- **Area Sources**. Area source emissions would be generated due to architectural coatings, consumer products, and landscape equipment.

- **Energy Source.** Energy source emissions would be generated due to electrical and natural gas usage associated with Phase II operations. Primary energy uses include space heating and cooling, water heating, ventilation, lighting, appliances, and electronics. However, electrical usage does not emit criteria pollutants and the residential uses would not include nature gas hearths.

- **Drive-thru Lanes.** Drive-thru lanes emissions would be generated from motor vehicles, including tailpipe and evaporative emissions, idling in the drive-thru lanes. The drive-thru were calculated with projected EMFAC emission rates in San Bernardino County, the miles

[32] Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

traveled on-site within the MU – Great Park land use (PAs 4, 5, 10, and 11), and the trip generation from the Traffic Analysis.[33] It is conservatively assumed the potential maximum miles traveled on-site within a PA designated as MU – Great Park would be 0.20 miles.[34] Conservatively assuming that 70 percent of drive thru restaurant trips would utilize drive-thru lanes, Phase II would generate 5,022 total daily drive-thru trips.

As shown in **Table 13**, the Phase II operational emissions would exceed the SCAQMD threshold for ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions. The Phase II operational-generated ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions are primarily from mobile sources and consumer products. FSEIR MM 3-2 would reduce mobile emissions to the maximum extent feasible, as motor vehicle emissions are controlled by State and federal standards and neither the Applicant nor the City has control over these standards. Phase II operational-generated ROG emissions would also be emitted from consumer products. For analytical purposes, consumer products include cleaning supplies, aerosols, cosmetics, toiletries, and fertilizer.[35] Phase II could require limitations on the use of ROG emitting products through lease or property agreements. However, this mitigation is not feasible as it would be difficult to enforce. As such, Phase II operational-generated ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions cannot be reduced below the SCAQMD threshold. As concluded in the FSEIR, impacts would be significant and unavoidable.

## Project Buildout (Phase I + Phase II)

### Construction Emissions

As it is speculative to assume the Phase II construction timeline, it is conservatively assumed that Phase I construction would overlap with Phase II construction. As stated above, Project construction would be subject to SCAQMD Rule 402, Rule 403, and Rule 1113, FSEIR MM 3-1, and LOR AQ-1 through AQ-2.

The emissions associated with Phase I and Phase II construction are reported in **Table 14: Project Construction Emissions**.

**Table 14: Project Construction Emissions**

| Construction Year | Maximum Daily Emissions (pounds per day)[1] | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
| 2025 | 1.03 | 9.36 | 49.53 | 0.09 | 7.52 | 3.24 |
| 2026 | 7.04 | 30.92 | 154.70 | 0.26 | 29.09 | 8.45 |
| 2027 | 132.69 | 46.94 | 307.24 | 0.27 | 54.70 | 13.90 |
| 2028 | 18.19 | 47.80 | 263.66 | 0.24 | 66.10 | 16.00 |
| 2029 | 8.99 | 24.24 | 151.19 | 0.13 | 33.07 | 8.04 |
| 2030 | 370.37 | 20.83 | 112.42 | 0.11 | 32.85 | 7.96 |
| SCAQMD Threshold | 75 | 100 | 550 | 150 | 150 | 55 |
| **SCAQMD Threshold Exceeded?** | **Yes** | **No** | **No** | **No** | **No** | **No** |

ROG = Reactive Organic Gases; $NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $SO_2$ = Sulfur Dioxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. SCAQMD Rule 403 Fugitive Dust was applied. Rule 403 reduction/credits include the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; water all haul roads twice daily. Reductions percentages from the SCAQMD CEQA Handbook (Tables XI-A through XI-E) were applied.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

[33] Ibid.
[34] The distance was measured on Google Earth, 2025.
[35] California Air Pollution Control Officers Association, *California Emissions Estimator Model User's Guide*, 2022.

As shown in **Table 14**, the Project construction emissions would exceed the SCAQMD threshold for ROG emissions. The Project construction-generated ROG emissions are primarily from architectural coatings. FSEIR MM 3-1 requires the Applicant to use super-compliant ROG paints for architectural coatings, which have a ROG content lower than the regulatory limits required by SCAQMD Rule 1113. As such, the Project construction-generated ROG emissions cannot be reduced below the SCAQMD threshold. As concluded in the FSEIR, impacts would be significant and unavoidable.

**Phase I Operations + Phase II Construction**

The Project would be developed in two phases. As Phase I is occupied and Phase II developed, there is the potential overlap of construction and operational emissions. Neither the SCAQMD's *CEQA Air Quality Handbook, Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*, or *Air Quality Significance Thresholds* imply or explicitly recommend combining emissions from distinct construction and operational activities into a single lump sum emissions total. Rather, each of these documents discusses potential sources, mitigation measures, and thresholds of significance for construction and operational emissions separately. Nonetheless, the potential overlapping of operational activities with ongoing construction activities have been compared to SCAQMD daily operational thresholds.

**Table 15: Potential Phase I Operational and Phase II Construction Emissions Overlap** presents the estimated maximum daily emissions from the worst-case overlap of the Phase I operational emissions and Phase II construction emissions. As stated above, Phase I operations would be subject to FSEIR MM 3-2 and MM AQ-1, TOP 2050 Policy ER-3.5, and LOR AQ-3 through AQ-4. Phase II construction would be subject to SCAQMD Rule 402, Rule 403, Rule 1113, FSEIR MM 3-1, and LOR AQ-1 through LOR AQ-2.

**Table 15: Potential Phase I Operational and Phase II Construction Emissions Overlap**

| Source | Maximum Daily Emissions (pounds per day)[1,2] | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
| **Overlap 1** | | | | | | |
| Phase I Operations | 84.27 | 39.54 | 369.45 | 0.84 | 72.82 | 19.18 |
| Phase II Demolition | 0.36 | 4.51 | 18.17 | 0.03 | 3.32 | 0.56 |
| Phase II Site Preparation | 0.50 | 2.59 | 28.31 | 0.05 | 5.21 | 2.73 |
| Phase II Grading | 0.64 | 4.43 | 35.35 | 0.06 | 2.52 | 1.07 |
| Total Emissions[3] | 85.77 | 51.06 | 451.28 | 0.98 | 83.87 | 23.54 |
| SCAQMD Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| **SCAQMD Threshold Exceeded?** | **Yes** | **No** | **No** | **No** | **No** | **No** |
| **Overlap 6** | | | | | | |
| Phase I Operations | 84.27 | 39.54 | 369.45 | 0.84 | 72.82 | 19.18 |
| Phase II Architectural Coating | 367.69 | 0.65 | 0.96 | <0.01 | <0.01 | <0.01 |
| Total Emissions[3] | 451.96 | 40.19 | 370.42 | 0.84 | 72.82 | 19.19 |
| SCAQMD Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| **SCAQMD Threshold Exceeded?** | **Yes** | **No** | **No** | **No** | **No** | **No** |

ROG = Reactive Organic Gases; $NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $SO_2$ = Sulfur Dioxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. Worst-case seasonal daily maximum emissions are reported.
2. Includes the worst-case overlap between the Phase I operational emissions and the Phase II construction emissions.
3. Totals may not add up due to rounding.

As shown in **Table 15**, the worst-case overlap of Phase I operational and Phase II construction emissions would exceed the SCAQMD threshold for ROG emissions. The Phase II construction-generated ROG emissions are primarily from architectural coatings. FSEIR MM 3-1 requires the

Applicant to use super-compliant ROG paints for architectural coatings, which have a ROG content lower than the regulatory limits required by SCAQMD Rule 1113. As such, the combined ROG emissions cannot be reduced below the SCAQMD threshold. As concluded in the FSEIR impacts would be significant and unavoidable.

### Operational Emissions

The Project would include all emission sources from Phase I and Phase II when the entire Project is built and operational. As stated above, Project operations would be subject to FSEIR MM 3-2 and MM AQ-1, TOP 2050 Policy ER-3.5, and LOR AQ-3 through AQ-4. The emissions associated with the Project operations are summarized in **Table 16: Project Operational Emissions**.

**Table 16: Project Operational Emissions**

| Source | Maximum Daily Emissions (pounds per day)[1] | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
| Mobile | 147.57 | 159.41 | 1,548.27 | 4.38 | 416.48 | 107.52 |
| Area | 208.40 | 2.37 | 255.30 | 0.01 | 0.13 | 0.10 |
| Energy | 1.42 | 24.44 | 11.82 | 0.15 | 1.96 | 1.96 |
| Drive-thru Lanes | <0.01 | <0.01 | 0.04 | <0.01 | <0.01 | <0.01 |
| Total Emissions[2] | 357.39 | 186.23 | 1,815.44 | 4.54 | 418.57 | 109.58 |
| SCAQMD Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| **SCAQMD Threshold Exceeded?** | **Yes** | **Yes** | **Yes** | **No** | **Yes** | **Yes** |

ROG = Reactive Organic Gases; $NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $SO_2$ = Sulfur Dioxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. Worst-case seasonal daily maximum emissions are reported.
2. Totals may not add up due to rounding.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

The operational emissions sources are described in detail below:

- **Mobile Sources.** Mobile sources emissions would be generated from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, $NO_X$, $PM_{10}$, and $PM_{2.5}$ are all pollutants of regional concern. $NO_X$ and ROG react with sunlight to form $O_3$, known as photochemical smog. Additionally, wind currents readily transport $PM_{10}$ and $PM_{2.5}$. However, CO tends to be a localized pollutant, dispersing rapidly at the source.

  Project-generated vehicle emissions are based on the trip generation estimates and have been incorporated into CalEEMod, as recommended by the SCAQMD. The Project would generate 44,716 total daily vehicle trips.[36]

- **Area Sources**. Area source emissions would be generated due to architectural coatings, consumer products, and landscape equipment.

- **Energy Source.** Energy source emissions would be generated due to electrical and natural gas usage associated with Project operations. Primary energy uses include space heating and cooling, water heating, ventilation, lighting, appliances, and electronics. However, electrical usage does not emit criteria pollutants and residential uses would not include nature gas hearths.

[36] Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

- **Drive-thru Lanes.** Drive-thru lanes emissions would be generated from motor vehicles, including tailpipe and evaporative emissions, idling in the drive-thru lanes. The drive-thru were calculated with projected EMFAC emission rates in San Bernardino County, the miles traveled on-site within the MU – Great Park land use (PAs 4, 5, 10, and 11), and the trip generation from the Traffic Analysis.[37] It is conservatively assumed the potential maximum miles traveled on-site within a PA designated as MU – Great Park would be 0.20 miles.[38] Conservatively assuming that 70 percent of drive thru restaurant trips would utilize drive-thru lanes, the Project would generate 5,022 total daily drive-thru trips.

As shown in **Table 16**, the Project operational emissions would exceed the SCAQMD threshold for ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions. The Project operational-generated ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions are primarily from mobile sources. FSEIR MM 3-2 would reduce mobile emissions to the maximum extent feasible, as motor vehicle emissions are controlled by State and federal standards and neither the Applicant nor the City has control over these standards. Project operational-generated ROG emissions would also be emitted from consumer products. For analytical purposes, consumer products include cleaning supplies, aerosols, cosmetics, toiletries, and fertilizer.[39] The Project could require limitations on the use of ROG emitting products through lease or property agreements. However, this mitigation is not feasible as it would be difficult to enforce. As such, the Project operational-generated ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions cannot be reduced below the SCAQMD threshold. As concluded in the FSEIR, impacts would be significant and unavoidable.

## Cumulative Impacts

The nature of air emissions is largely a cumulative impact. As a result, no single project is sufficient in size to, by itself, result in nonattainment of AAQS. Instead, individual project emissions contribute to existing cumulatively significant adverse air quality impacts. The SCAQMD developed the construction and operational thresholds of significance based on the level above which individual project emissions would result in a cumulatively considerable contribution to SCAB's existing air quality conditions. In addition, Appendix D of the SCAQMD White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution (2003) notes that projects that result in emissions that do not exceed the project-specific SCAQMD regional thresholds of significance are considered to result in a less than significant impact on a cumulative basis unless there is other pertinent information to the contrary.[40] Therefore, a project whose emissions would exceed SCAQMD thresholds would also make a cumulatively considerable contribution to a significant cumulative impact and, conversely, a project whose emissions would be below SCAQMD thresholds would not make a cumulatively considerable contribution to a significant cumulative impact.

### Cumulative Construction Impacts

The SCAB is designated nonattainment for $O_3$, $PM_{10}$, and $PM_{2.5}$ under the State standards and nonattainment for $O_3$ and $PM_{2.5}$ under the federal standards. As discussed above, a project that is estimated to result in emissions that do not exceed SCAQMD thresholds, the project's contribution

[37] Ibid.
[38] The distance was measured on Google Earth, 2025.
[39] California Air Pollution Control Officers Association, *California Emissions Estimator Model User's Guide*, 2022.
[40] South Coast Air Quality Management District, *White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution*, August 2003, https://www.aqmd.gov/docs/default-source/Agendas/Environmental-Justice/cumulative-impacts-working-group/cumulative-impacts-white-paper.pdf, accessed December 2024

to the cumulative impact on air quality in the SCAB would not be considered to be cumulatively considerable.[41] As shown above, the Project construction-related emissions would exceed the SCAQMD significance thresholds for ROG emissions. Therefore, the Project would potentially generate a cumulatively considerable contribution to air pollutant emissions during construction.

The SCAQMD has developed strategies to reduce criteria pollutant emissions as outlined in the AQMP pursuant to the FCAA mandates. The analysis assumed fugitive dust controls would be used during construction, including frequent water applications. SCAQMD rules, mandates, and compliance with adopted AQMP emissions control measures would be imposed on construction projects throughout SCAB, which would include the related projects. Project compliance with SCAQMD rules and regulations would further minimize the Project construction-related emissions. However, as concluded above, the Project construction-related impacts would be significant and unavoidable. Therefore, Project-related construction emissions, in combination with those from other, related projects in the area, would potentially substantially deteriorate the local air quality. As concluded in the FSEIR, cumulative impacts would be significant and unavoidable.

**Cumulative Operational Impacts**

As discussed above, projects that would result in operational emissions that do not individually exceed SCAQMD regional thresholds of significance are not considered to make a cumulatively considerable contribution to a significant cumulative impact on air quality in the SCAB. As discussed above, and as concluded in the FSEIR, operational emissions would exceed the SCAQMD thresholds for ROG, $NO_x$, CO, $PM_{10}$, and $PM_{2.5}$ emissions. Therefore, Project operational emissions would potentially result in a cumulatively considerable contribution to significant cumulative air quality impacts. As concluded in the FSEIR, cumulative impacts would be significant and unavoidable.

## Conclusion

The Project construction and operational-generated emissions would exceed the applicable SCAQMD thresholds and result in a cumulatively considerable contribution to the $O_3$, $NO_2$, $PM_{10}$, and $PM_{2.5}$ nonattainment designations within the SCAB. Impacts would be significant and unavoidable. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

## Laws, Ordinances, and Regulations

LORs are existing requirements that are based on local, State, or federal regulations or laws that are frequently required independent of CEQA review. Typical standard conditions and requirements include compliance with the provisions of the Building Code, SCAQMD Rules, etc. The City may impose additional conditions during the approval process, as appropriate. Because LORs are neither project-specific nor a result of development of the Project, they are not considered to be either project design features or mitigation measures.

**LOR AQ-1** Heavy duty tractors and trailers (i.e., trucks that are 53-foot or longer) must use U.S. EPA SmartWay certified tractors and trailers or retrofit their existing fleet with SmartWay verified technologies in accordance with CARB's Heavy-Duty (Tractor-Trailer) GHG Regulation. Owners are responsible for replacing or

[41] Ibid.

retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. Sleeper cab tractors model year 2011 and later must be SmartWay certified. All other tractors must use SmartWay verified low rolling resistance tires. Trailers must have low rolling resistance tires and aerodynamic devices.

**LOR AQ-2** The medium-duty and heavy-duty vehicle engines are required to comply with the U.S. EPA's GHG and fuel efficiency standards. The federal and California Phase 1 standards took effect with model year 2014 tractors, vocational vehicles, and heavy-duty pick-up trucks and vans and the engines powering such vehicles (the Phase 1 standards exclude trailers). The federal Phase 2 standards cover model years 2018-2027 for certain trailers and model years 2021-2027 for semi-trucks and large pick-up trucks, vans and all types and sizes of buses and work trucks. California is aligned with the federal Phase 2 standards in structure, timing, and stringency, but with some minor California differences. The California Phase 2 regulations became effective April 1, 2019.

**LOR AQ-3** New buildings are required to achieve the current Energy Code (Title 24, Part 6) and CALGreen Code. The 2022 Energy Code became effective January 1, 2023. The Energy Code and CALGreen are updated triennially with a goal to achieve zero net energy for residential buildings and non-residential buildings in the future.

**LOR AQ-4** New buildings are required to adhere to the CALGreen requirement to provide bicycle parking for new non-residential buildings, or meet local bicycle parking ordinances, whichever is stricter (CALGreen Section 5.106.4.1, 14.106.4.1, and Section 5.106.4.1.2).

### FSEIR Mitigation Measures

The FSEIR analyzed emission impacts associated with land development throughout the City and implemented the following mitigation measures, which are applicable to the Project.

**3-1** Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project construction-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with South Coast Air Quality Management District (South Coast AQMD) methodology for assessing air quality impacts. If construction-related criteria air pollutants are determined to have the potential to exceed the South Coast AQMD–adopted thresholds of significance, City of Ontario Building Department shall require feasible mitigation measures to reduce air quality emissions. Potential measures shall be incorporated as conditions of approval for a project and may include:

- Require fugitive dust control measures that SCAQMD Rule 403, such as:

  - Requiring use of nontoxic soil stabilizers to reduce wind erosion.
  - Applying water every four hours to active soil disturbing activities.
  - Tarping and/or maintaining a minimum of 24 inches of freeboard on trucks hauling dirt, sand, soil, or other loose materials.
- Using construction equipment rated by the United States Environmental Protection Agency as having Tier 4 interim or higher exhaust emission limits.
- Ensuring construction equipment is properly serviced and maintained to the manufacturer's standards.
- Limiting nonessential idling of construction equipment to no more than five consecutive minutes.
- Using Super-Compliant VOC paints for coating of architectural surfaces whenever possible.

**3-2** The City of Ontario shall evaluate new development proposals within the City and require all developments to include access or linkages to alternative modes of transportation, such as transit stops, bike paths, and/or pedestrian paths (e.g., sidewalks).

**AQ-1** Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project operation-phase-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with SCAQMD methodology in assessing air quality impacts. If operation-related air pollutants are determined to have the potential to exceed the SCAQMD–adopted thresholds of significance, the City of Ontario Planning Department shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities. The identified measures shall be included as part of the conditions of approval. Possible mitigation measures to reduce long-term emissions could include, but are not limited to the following:

- For site-specific development that requires refrigerated vehicles, the construction documents shall demonstrate an adequate number of electrical service connections at loading docks for plug-in of the anticipated number of refrigerated trailers to reduce idling time and emissions.
- Applicants for manufacturing and light industrial uses shall consider energy storage and combined heat and power in appropriate applications to optimize renewable energy generation systems and avoid peak energy use.
- Site-specific developments with truck delivery and loading areas and truck parking spaces shall include signage as a reminder to limit idling of vehicles while parked for loading/unloading in accordance with California Air Resources Board Rule 2845 (13 CCR Chapter 10 sec. 2485).
- Provide changing/shower facilities as specified in Section A5.106.4.3 of

CALGreen (Nonresidential Voluntary Measures).

- Provide bicycle parking facilities per Section A4.106.9 of CALGreen (Residential Voluntary Measures).
- Provide preferential parking spaces for low-emitting, fuel-efficient, and carpool/van vehicles per Section A5.106.5.1 of CALGreen (Nonresidential Voluntary Measures).
- Provide facilities to support electric charging stations per Section A5.106.5.3 and Section A5.106.8.2 of CALGreen (Nonresidential Voluntary Measures; Residential Voluntary Measures).
- Applicant-provided appliances shall be Energy Star–certified appliances or appliances of equivalent energy efficiency (e.g., dishwashers, refrigerators, clothes washers, and dryers). Installation of Energy Star– certified or equivalent appliances shall be verified by the City during plan check.

**Mitigation Measures:** No additional mitigation is required.

**Level of Significance:** Significant and unavoidable impact.

### Threshold 5.3 Would the Project expose sensitive receptors to substantial pollutant concentrations?

To identify impacts to sensitive receptors, the SCAQMD recommends addressing LSTs for construction. LSTs were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the *Final Localized Significance Threshold Methodology* (dated June 2003 [revised 2008]) for guidance. The LST methodology assists lead agencies in analyzing localized impacts associated with Project-specific emissions.

The appropriate SRA for the LSTs is SRA 33 (Southwest San Bernardino Valley), since this area includes the Project site. LSTs only take into consideration emissions of $NO_X$, CO, $PM_{10}$, and $PM_{2.5}$.[42] CalEEMod calculates construction emissions based on the number of equipment hours and the maximum daily soil disturbance activity possible for each piece of equipment. Based on CalEEMod modeling, construction of Phase I and Phase II would use the same number of and types of equipment, therefore **Table 17: Equipment-Specific Grading Rates** was used to determine the maximum daily disturbed acreage for the LST analysis.[43]

**Table 17: Equipment-Specific Grading Rates**

| Construction Phase | Equipment Type | Equipment Quantity | Acres Graded per 8-Hour Day | Operating Hours per Day | Acres Graded per Day |
|---|---|---|---|---|---|
| Grading | Tractor/Backhoe | 2 | 0.5 | 8 | 1 |
| | Dozer | 1 | 0.5 | 8 | 0.5 |

[42] South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, Revised 2008, http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/localized-significance-thresholds, accessed December 2024

[43] South Coast Air Quality Management District, *Sample Construction Scenarios for Projects Less than Five Acres in Size*, February 2005, https://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-sample-construction-scenario-report.pdf?sfvrsn=2, accessed December 2024

| Table 17: Equipment-Specific Grading Rates | | | | | |
|---|---|---|---|---|---|
| **Construction Phase** | **Equipment Type** | **Equipment Quantity** | **Acres Graded per 8-Hour Day** | **Operating Hours per Day** | **Acres Graded per Day** |
| | Grader | 1 | 0.5 | 8 | 0.5 |
| | Scraper | 2 | 1 | 8 | 2 |
| | | | | **Total Acres Graded per Day** | 4 |
| Source: CalEEMod version 2022.1. Refer to **Appendix A** for the modeling outputs. | | | | | |

Based on the daily equipment modeled in CalEEMod and **Table 17**, Phase I and Phase II construction is anticipated to disturb approximately 4-acres in a single day. As the Final Localized Significance Threshold Methodology provides thresholds for projects disturbing 1-, 2-, and 5-acres in size and the thresholds increase with size of the project site, the LSTs for a 4-acre threshold were interpolated and utilized for the construction analysis. LSTs are provided for distances to sensitive receptors of 25, 50, 100, 200, and 500 meters. SCAQMD's LST guidance recommends using the LSTs at 25 meters for sensitive receptors located 25 meters (82 feet) or less from the project site.[44]

The SCAQMD's methodology states that "off-site mobile emissions from the project should not be included in the emissions compared to LSTs."[45] Therefore, for purposes of the construction analysis, only the emissions included in the CalEEMod "on-site" emissions outputs were considered.

According to the SCAQMD localized significance threshold methodology, operational LSTs only apply to on-site stationary sources.[46]

## Phase I – Proposed Development

### Localized Construction Significance

The sensitive receptor nearest the Phase I Project site are the residential uses located approximately 36 feet (11 meters) to the north. Therefore, the LSTs for 4-acres at 25 meters in SRA 33 were used for the construction analysis.

**Table 18: Localized Significance of Phase I Construction Emissions** presents the localized emissions during each individual and overlapping construction phase for Phase I. As stated above, Phase I construction would be subject to SCAQMD Rule 402, Rule 403, Rule 1113, FSEIR MM 3-1, and LOR AQ-1 through LOR AQ-2.

| Table 18: Localized Significance of Phase I Construction Emissions | | | | |
|---|---|---|---|---|
| **Construction Activity** | **Maximum Daily Emissions (pounds per day)[1,2]** | | | |
| | **$NO_X$** | **CO** | **$PM_{10}$** | **$PM_{2.5}$** |
| Demolition (2025) | 4.51 | 18.17 | 1.41 | 0.27 |
| Demolition (2026) | 4.51 | 18.17 | 1.41 | 0.27 |
| Site Preparation (2025) | 2.59 | 28.31 | 5.21 | 2.73 |
| Site Preparation (2026) | 2.59 | 28.31 | 5.21 | 2.73 |
| Grading (2026) | 4.43 | 35.35 | 2.52 | 1.07 |
| Building Construction (2026) | 2.82 | 14.82 | 0.07 | 0.07 |
| Building Construction (2027) | 2.82 | 14.82 | 0.07 | 0.07 |

[44] Ibid
[45] South Coast Air Quality Management District, *Final Localized Significance Threshold Methodology*, Revised 2008, http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/localized-significance-thresholds, accessed December 2024
[46] Ibid.

| Table 18: Localized Significance of Phase I Construction Emissions | | | | |
|---|---|---|---|---|
| **Construction Activity** | **Maximum Daily Emissions (pounds per day)[1,2]** | | | |
| | **$NO_X$** | **CO** | **$PM_{10}$** | **$PM_{2.5}$** |
| Infrastructure Improvements (2026) | 2.82 | 14.82 | 0.07 | 0.07 |
| Infrastructure Improvements (2027) | 2.82 | 14.82 | 0.07 | 0.07 |
| Paving (2027) | 1.93 | 10.60 | 0.03 | 0.03 |
| Architectural Coating (2027) | 0.65 | 0.96 | <0.01 | <0.01 |
| Demolition + Site Preparation (2025) | 7.09 | 46.48 | 6.62 | 2.99 |
| Demolition + Site Preparation (2026) | 7.09 | 46.48 | 6.62 | 2.99 |
| Demolition + Site Preparation + Grading (2026) | 11.52 | 81.83 | 9.14 | 4.07 |
| Site Preparation + Grading (2026) | 7.02 | 63.66 | 7.73 | 3.80 |
| Building Construction + Infrastructure Improvements (2026) | 5.64 | 29.65 | 0.15 | 0.14 |
| Building Construction + Infrastructure Improvements (2027) | 5.63 | 29.65 | 0.15 | 0.14 |
| Building Construction + Paving (2027) | 4.75 | 25.42 | 0.10 | 0.10 |
| Maximum Daily Emissions | 11.52 | 81.83 | 9.14 | 4.07 |
| SCAQMD LST (adjusted for 4 acres at 25 meters) | 237 | 1,873 | 13 | 8 |
| **Exceeds SCAQMD Threshold?** | **No** | **No** | **No** | **No** |

$NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. Worst-case seasonal maximum daily emissions are reported.
2. SCAQMD Rule 403 Fugitive Dust was applied. Rule 403 reduction/credits include the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; water all haul roads twice daily. Reductions percentages from the SCAQMD CEQA Handbook (Tables XI-A through XI-E) were applied.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

**Table 18** shows that the construction emissions of these pollutants on the peak day of construction would not exceed the LSTs. Phase I construction would not be expected to create substantial concentrations of pollutants at the sensitive receptors nearest the Phase I Project area. Impacts would be less than significant, and no mitigation is required.

### Localized Operational Significance

Although the Phase I Project site is 69.57 acres, the 5-acre LSTs were conservatively used because the LSTs increase with the size of the project size. This operational analysis uses the LSTs for 5-acres at 25 feet within SRA 33. The on-site operational emissions associated with Phase I are reported in **Table 19: Localized Significance of Phase I Operational Emissions**. On-site Phase I operations would be subject to MM AQ-1and LOR AQ-4.

| Table 19: Localized Significance of Phase I Operational Emissions | | | | |
|---|---|---|---|---|
| **Activity** | **Maximum Daily Emissions (pounds per day)[1]** | | | |
| | **$NO_X$** | **CO** | **$PM_{10}$** | **$PM_{2.5}$** |
| On-site Emissions[2] | 6.48 | 66.55 | 1.90 | 0.82 |
| SCAQMD LST (5.0-acres at 25 meters) | 270 | 2,193 | 4 | 2 |
| **Exceeds SCAQMD Threshold?** | No | No | No | No |

$NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. Worst-case seasonal maximum daily emissions are reported.
2. On-site emissions consist of area sources, energy sources, and on-site mobile sources (approximately 2 percent of regional emissions based on percentage of Phase I Project Area width compared to regional trip length)

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

**Table 19** shows the operational emissions of these pollutants would not exceed the LSTs. Phase I operations would not be expected to create substantial concentrations of pollutants at the sensitive receptors nearest the Phase I Project site. Impacts would be less than significant, and no mitigation is required.

## Phase II – Future Development

### Localized Construction Significance

The sensitive receptor nearest the Phase II Project site are the residential uses located approximately 53 feet (16 meters) to the south. Therefore, the LSTs for 4-acres at 25 meters in SRA 33 were used for the construction analysis.

**Table 20: Localized Significance of Phase II Construction Emissions** presents the localized emissions during each individual and overlapping construction phase for Phase II. As stated above, Phase II construction would be subject to SCAQMD Rule 402, Rule 403, Rule 1113, FSEIR MM 3-1, and LOR AQ-1 through LOR AQ-2.

**Table 20: Localized Significance of Phase II Construction Emissions**

| Construction Activity | Maximum Daily Emissions (pounds per day)[1,2] | | | |
|---|---|---|---|---|
| | $NO_X$ | CO | $PM_{10}$ | $PM_{2.5}$ |
| Demolition (2026) | 4.51 | 18.17 | 3.32 | 0.56 |
| Demolition (2027) | 4.51 | 18.17 | 3.32 | 0.56 |
| Site Preparation (2026) | 2.59 | 28.31 | 5.21 | 2.73 |
| Site Preparation (2027) | 2.59 | 28.31 | 5.21 | 2.73 |
| Grading (2027) | 4.43 | 35.35 | 2.52 | 1.07 |
| Building Construction (2028) | 2.81 | 14.82 | 0.07 | 0.07 |
| Building Construction (2029) | 2.81 | 14.82 | 0.07 | 0.07 |
| Building Construction (2030) | 2.81 | 14.82 | 0.07 | 0.07 |
| Infrastructure Improvements (2027) | 2.82 | 14.82 | 0.07 | 0.07 |
| Infrastructure Improvements (2028) | 2.81 | 14.82 | 0.07 | 0.07 |
| Paving (2028) | 1.93 | 10.60 | 0.03 | 0.03 |
| Paving (2029) | 1.93 | 10.60 | 0.03 | 0.03 |
| Architectural Coating (2030) | 0.65 | 0.96 | >0.01 | >0.01 |
| Demolition + Site Preparation (2026) | 7.09 | 46.48 | 8.53 | 3.28 |
| Demolition + Site Preparation (2027) | 7.09 | 46.48 | 8.53 | 3.28 |
| Demolition + Site Preparation + Grading (2027) | 11.52 | 81.83 | 11.05 | 4.36 |
| Site Preparation + Grading (2027) | 7.02 | 63.66 | 7.73 | 3.80 |
| Grading + Infrastructure Improvements (2027) | 5.41 | 43.13 | 5.28 | 2.80 |
| Infrastructure Improvements + Paving (2028) | 4.75 | 25.42 | 0.10 | 0.10 |
| Infrastructure Improvements + Paving + Building Construction (2028) | 7.56 | 40.24 | 0.18 | 0.17 |
| Paving + Building Construction (2028) | 4.75 | 25.42 | 0.10 | 0.10 |
| Paving + Building Construction (2029) | 4.74 | 25.42 | 0.10 | 0.10 |
| Maximum Daily Emissions | 11.52 | 81.83 | 11.05 | 4.36 |
| SCAQMD LST (adjusted for 4 acres at 25 meters) | 237 | 1,873 | 13 | 8 |
| **Exceeds SCAQMD Threshold?** | **No** | **No** | **No** | **No** |

$NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. Worst-case seasonal maximum daily emissions are reported.
2. SCAQMD Rule 403 Fugitive Dust was applied. Rule 403 reduction/credits include the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; water all haul roads twice daily. Reductions percentages from the SCAQMD CEQA Handbook (Tables XI-A through XI-E) were applied.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

**Table 20** shows that the that the peak day of construction would not exceed the LSTs. Phase II construction would not be expected to create substantial concentrations of pollutants at the sensitive receptors nearest the Phase II Project area. Impacts would be less than significant, and no mitigation is required.

### Localized Operational Significance

Although the Phase II Project site is 187.79 acres, the 5-acre LSTs were conservatively used because the LSTs increase with the size of the project site. This operational analysis uses the LSTs for 5-acres at 25 feet within SRA 33. The on-site operational emissions associated with Phase II are reported in **Table 21: Localized Significance of Phase II Operational Emissions**. On-site Phase II operations would be subject to MM AQ-1and LOR AQ-4.

**Table 21: Localized Significance of Phase II Operational Emissions**

| Activity | Maximum Daily Emissions (pounds per day)[1] | | | |
|---|---|---|---|---|
| | $NO_X$ | CO | $PM_{10}$ | $PM_{2.5}$ |
| On-site Emissions[2] | 26.35 | 258.57 | 15.68 | 5.24 |
| SCAQMD LST (5.0-acres at 25 meters) | 270 | 2,193 | 4 | 2 |
| **Exceeds SCAQMD Threshold?** | **No** | **No** | **Yes** | **Yes** |

$NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. Worst-case seasonal maximum daily emissions are reported.
2. On-site emissions consist of area sources, energy sources, and on-site mobile sources (approximately 4 percent of regional emissions based on percentage of Phase II Project Area width compared to regional trip length) which would include drive-thru lane emissions.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

As shown above, Phase II operational emissions generated on-site would exceed the thresholds for $PM_{10}$ and $PM_{2.5}$. Therefore, $PM_{10}$ and $PM_{2.5}$ dispersion modeling has been conducted to determine if Project Phase II operations would result in significant $PM_{10}$ and $PM_{2.5}$ concentrations at nearby sensitive receptors in accordance with SCAQMD LST methodology. Localized $PM_{10}$ and $PM_{2.5}$ construction emissions were estimated using the U.S. EPA AERMOD dispersion model to determine the worst-case $PM_{10}$ and $PM_{2.5}$ concentrations. AERMOD is a steady-state, multiple-source, Gaussian dispersion model designed for use with emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources. AERMOD requires hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. **Table 22: Phase II – Operational Dispersion Modeling** shows on-site operational $PM_{10}$ and $PM_{2.5}$ emissions would not exceeded the SCAQMD's 24-hour average $PM_{10}$ or $PM_{2.5}$ operational standards.[47] Therefore, Phase II would result in a less than significant localized operational impact.

**Table 22: Phase II – Operational Dispersion Modeling**

| Emissions Source | $PM_{10}$ (24-hour) (µg/m$^3$) | $PM_{2.5}$ (24-hour) (µg/m$^3$) |
|---|---|---|
| Phase I On-site Emissions | 2.4 | 0.6 |
| Threshold[1] | 2.5 | 2.5 |
| Exceeds Threshold? | No | No |

1. The $PM_{10}$ and $PM_{2.5}$ thresholds are from South Coast Air Quality Management District, *Air Quality Significance Thresholds*, April 2019. The thresholds are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

Source: CalEEMod version 2022.1. Refer to Appendix A for the model outputs.

## Project Buildout (Phase I + Phase II)

### Localized Construction Significance

As it is speculative to assume the Phase II construction timeline, it is conservatively assumed that Phase I construction would overlap with Phase II construction. The sensitive receptor nearest ground

[47] South Coast Air Quality Management District, *Air Quality Significance Thresholds*, April 2019.

disturbing activities within the Phase II Project area are the residential uses located approximately 53 feet (16 meters) to the south. Therefore, the LSTs for 4-acres at 25 meters in SRA 33 were used for the construction analysis.

**Table 23: Localized Significance of Phase I and Phase II Construction Emissions Overlap** presents the localized emissions during each overlapping Phase I and Phase II construction phase.

**Table 23: Localized Significance of Phase I and Phase II Construction Emissions Overlap**

| Construction Activity | Maximum Daily Emissions (pounds per day)[1,2] | | | |
|---|---|---|---|---|
| | $NO_X$ | CO | $PM_{10}$ | $PM_{2.5}$ |
| Phase I Building Construction + Phase II Demolition + Site Preparation (2026) | 10.15 | 47.82 | 3.47 | 0.70 |
| Phase I Building Construction + Infrastructure Improvements + Phase II Demolition + Site Preparation (2026) | 12.74 | 76.13 | 8.68 | 3.43 |
| Phase I Building Construction + Infrastructure Improvements + Phase II Demolition + Site Preparation (2027) | 12.73 | 76.13 | 8.68 | 3.43 |
| Phase I Building Construction + Paving + Phase II Demolition + Site Preparation (2027) | 11.85 | 71.90 | 8.64 | 3.38 |
| Phase I Building Construction + Phase II Demolition + Site Preparation (2027) | 9.91 | 61.30 | 8.61 | 3.36 |
| Phase I Building Construction + Phase II Demolition + Site Preparation + Grading (2027) | 14.34 | 96.65 | 11.13 | 4.43 |
| Phase I Architectural Coating + Phase II Demolition + Site Preparation + Grading (2027) | 12.17 | 82.79 | 11.05 | 4.36 |
| Maximum Daily Emissions | 14.34 | 96.65 | 11.13 | 4.43 |
| SCAQMD LST (adjusted for 4 acres at 25 meters) | 237 | 1,873 | 13 | 8 |
| **Exceeds SCAQMD Threshold?** | **No** | **No** | **No** | **No** |

$NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. Worst-case seasonal maximum daily emissions are reported.
2. SCAQMD Rule 403 Fugitive Dust was applied. Rule 403 reduction/credits include the following: properly maintain mobile and other construction equipment; replace ground cover in disturbed areas quickly; water exposed surfaces three times daily; water all haul roads twice daily. Reductions percentages from the SCAQMD CEQA Handbook (Tables XI-A through XI-E) were applied.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

**Table 23** shows that the peak day of construction would not exceed the LSTs. The overlap of Phase I and Phase II construction would not be expected to create substantial concentrations of pollutants at the sensitive receptors nearest the Project area. Impacts would be less than significant, and no mitigation is required.

### Localized Operational Significance

As shown in **Table 19, Table 21,** and **Table 22**, emissions for Phase I and Phase II operations do not individually exceed operational LSTs.

**Table 24: Localized Significance of Buildout Operational Emissions**

| Activity | Maximum Daily Emissions (pounds per day)[1] | | | |
|---|---|---|---|---|
| | $NO_X$ | CO | $PM_{10}$ | $PM_{2.5}$ |
| On-site Emissions[2] | 34.78 | 344.58 | 22.91 | 7.43 |
| SCAQMD LST (5.0-acres at 25 meters) | 270 | 2,193 | 4 | 2 |
| **Exceeds SCAQMD Threshold?** | **No** | **No** | **Yes** | **Yes** |

$NO_X$ = Nitrogen Oxides; CO = Carbon Monoxide; $PM_{10}$ = Particulate Matter 10 microns in diameter or less; $PM_{2.5}$ = Particulate Matter 2.5 microns in diameter or less

1. Worst-case seasonal maximum daily emissions are reported.
2. On-site emissions consist of area sources, energy sources, and drive-thru lane emissions.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

As shown above, Project Buildout operational emissions generated on-site would exceed the thresholds for $PM_{10}$ and $PM_{2.5}$. Therefore, $PM_{10}$ and $PM_{2.5}$ dispersion modeling has been conducted to determine if Project Buildout operations would result in significant $PM_{10}$ and $PM_{2.5}$ concentrations at nearby sensitive receptors in accordance with SCAQMD LST methodology. Localized $PM_{10}$ and $PM_{2.5}$ construction emissions were estimated using the U.S. EPA AERMOD dispersion model to determine the worst-case $PM_{10}$ and $PM_{2.5}$ concentrations. AERMOD is a steady-state, multiple-source, Gaussian dispersion model designed for use with emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources. AERMOD requires hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. **Table 25: Buildout – Operational Dispersion Modeling** shows on-site operational $PM_{10}$ and $PM_{2.5}$ emissions would not exceeded the SCAQMD's 24-hour average $PM_{10}$ or $PM_{2.5}$ operational standards.[48] Therefore, Project Buildout would result in a less than significant localized operational impact.

**Table 25: Buildout – Operational Dispersion Modeling**

| Emissions Source | $PM_{10}$ (24-hour) (µg/m$^3$) | $PM_{2.5}$ (24-hour) (µg/m$^3$) |
|---|---|---|
| Buildout On-site Emissions | 2.4 | 0.7 |
| Threshold[1] | 2.5 | 2.5 |
| Exceeds Threshold? | No | No |

1. The $PM_{10}$ and $PM_{2.5}$ thresholds are from South Coast Air Quality Management District, *Air Quality Significance Thresholds*, April 2019. The thresholds are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

Source: CalEEMod version 2022.1. Refer to Appendix A for the model outputs.

**Construction Diesel Particulate Matter**

Project construction would result in the generation of DPM emissions from the use of required off-road diesel equipment. The amount of DPM emissions to which sensitive receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine the health risk to such receptors from DPM exposure (i.e., potential exposure to TAC emission levels that exceed applicable standards). Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer.

Construction is temporary, and would be transient throughout the site (i.e., move from location to location). The use of diesel-powered construction equipment would also be temporary and episodic; the duration of exposure would be short and exhaust from construction equipment dissipates rapidly. Therefore, construction would not generate emissions in a fixed location for extended periods of time, which would limit the exposure of any proximate individual sensitive receptor to TACs.

Current models and methodologies for conducting health risk assessments are associated with longer-term exposure periods of 9, 30, and 70 years, which do not correlate well with the temporary and highly variable nature of construction activities.[49] The California Office of Environmental Health Hazard Assessment (OEHHA) has not identified short-term health effects from DPM due to the uncertainty in assessing cancer risk from short-term exposures.[50] In addition, SCAQMD guidance

[48] South Coast Air Quality Management District, *Air Quality Significance Thresholds*, April 2019.
[49] Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments,* February 2015, https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf, accessed December 2024
[50] Ibid.

on the analysis of cancer risks from mobile source diesel emissions does include recommendations on the analysis of short-term construction activities.[51]

Additionally, construction would be subject to and would comply with pertinent California regulations (e.g., California Code of Regulations, Title 13, Sections 2485 and 2449), the effect of which would be to reduce diesel PM and criteria pollutant emissions from in-use off-road diesel-fueled vehicles and limit the idling of heavy-duty construction equipment to no more than five minutes. These regulations would further reduce nearby sensitive receptors' exposure to the Project's temporary and variable DPM emissions. Given the temporary and intermittent nature of construction activities likely to occur within specific locations in the Project site (i.e., construction is not likely to occur in any one location for an extended time), the dose of DPM of any one receptor is exposed to would be limited.

Therefore, relying on the expert guidance of the SCAQMD, and considering the relatively short duration of DPM-emitting construction activity at any one location, and the highly dispersive properties of DPM, sensitive receptors would not be exposed to substantial concentrations of construction-related TAC emissions. Impacts would be less than significant, and no mitigation is required.

**Operational Diesel Particulate Matter**

The Project does not include a land use that has the potential to significantly impact nearby sensitive receptors during operations as the Project would not generate trips by heavy-duty diesel trucks, which emit DPM. Impacts would be less than significant, and no mitigation is required.

**Carbon Monoxide Hot Spots**

As discussed above, projects that would not produce traffic volumes resulting in more than 100,000 daily vehicles along project area roadway segments would not require preparation of a detailed CO hot spot analysis. The Project would not produce the volume of traffic required to generate a CO hot spot in the context of SCAQMD's 2003 CO hot-spot analysis. Project buildout would generate 44,716 total daily vehicle trips within the Project area and a maximum peak hour volume of 2,700 vehicles at Grove Avenue and Edison Avenue.[52] Phase I and Phase II implementation would generate less trips than the Project buildout. The Project's maximum peak hour volume of 2,700 vehicles would not exceed the Bay Area Air Quality Management District's most stringent screening criteria of 24,000 vehicles per hour. Impacts would be less than significant, and no mitigation is required.

## Conclusion

The Project's localized emissions would not exceed the applicable standards. Therefore, Project implementation would not expose sensitive receptors to substantial pollutant concentrations, create a CO hot spot, or generate concentrations of DPM that would result in carcinogenic, chronic, or acute health risk effects. Impacts would be less than significant in this regard. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would

[51] South Coast Air Quality Management District, *Health Risk Assessment Guidance for Analyzing Cancer Risks from Mobile Source Diesel Idling Emissions for CEQA Air Quality Analysis*, August 2002, https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook/mobile-source-toxics-analysis, accessed December 2024

[52] Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

not result in any new or more severe impacts than previously analyzed in the FSEIR.

**FSEIR Mitigation Measures:** Refer to TOP FSEIR MM 3-1, MM 3-2, and MM AQ-1 under Threshold 2 above.

**Mitigation Measures:** No additional mitigation is required.

**Level of Significance:** Less than significant impact.

### Threshold 5.4 Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

### Phase I (Proposed Development), Phase II (Future Development, Project Buildout (Phase I + Phase II)

#### Construction

Project construction activities would generate odors from equipment diesel exhaust, architectural coatings containing volatile organic compounds, and paving activities. The Project would be required to comply with SCAQMD Rule 402: Nuisance, which states:

> *"A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property."*

Additionally, standard construction requirements and Project compliance with established regulations (Code of Federal Regulations [CFR], Part 1926 – *Safety and Health Regulations for Construction,* Subpart H – *Materials Handling, Storage Use and Disposal, et al*.) addressing construction materials storage, use, and disposal would further minimize construction-related odor impacts on sensitive receptors. Therefore, construction-related odors are not expected to affect a substantial number of people, would be temporary, lasting only as long as construction activities occur, and would disperse rapidly. Impacts would be less than significant, and no mitigation is required.

#### Operational

The SCAQMD *CEQA Air Quality Handbook* identifies certain land uses as potentially significant odor sources. These land uses include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding. The Project would not include these types of uses. The Project would comply with all applicable SCAQMD rules including Rule 402, which prevents discharging nuisance odors. As such, the Project's operational-related odors are not expected to affect a considerable number of people. Impacts would be less than significant, and no mitigation is required.

#### Conclusion

Project construction and operational-related odors would be temporary and are not expected to affect a substantial number of people. Impacts would be less than significant, and no mitigation is

required. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

**Mitigation Measures:** No mitigation is required.

**Level of Significance:** Less than significant impact.

## Conclusion

**Table 26: Project Consistency with the FSEIR** summarizes the consistency of the Project's impacts with the findings of the FSEIR. Project construction and operational-related emissions would exceed the applicable SCAQMD thresholds and would not be consistent with SCAQMD's AQMPs. However, the Project would not expose sensitive receptors to substantial pollutant concentrations, create a CO hot spot, or generate concentrations of DPM that would result in carcinogenic, chronic, or acute health risk effects. As shown in **Table 26**, the Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

**Table 26: Project Consistency with the FSEIR**

| Impact | FSEIR Findings | Project Findings |
|---|---|---|
| Air Quality Plan Consistency | Significant and Unavoidable | Significant and Unavoidable |
| Air Quality Standard Violation | Significant and Unavoidable | Significant and Unavoidable |
| Cumulative Considerable Net Increase of Criteria Pollutants | Significant and Unavoidable | Significant and Unavoidable |
| Expose Sensitive Receptors to Substantial Pollutant Concentrations | -- | Less than Significant |
| Expose Sensitive Receptors to Substantial Toxic Air Contaminants | Significant and Unavoidable | Less than Significant |
| Expose Sensitive Receptors to Carbon Monoxide Hotspots | Less than Significant | Less than Significant |
| Objectionable Odors | Less than Significant | Less than Significant |

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# Appendix A

## Air Quality Data

# Center Park Specific Plan
## CalEEMod Assumptions

# Phase I

Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 6 | 7.32 | Single Family Detached | 40 | DU | 22 | 1.82 |
| | | Multifamily (Low-Rise) Residential | 121 | DU | 22 | 5.50 |
| 12 | 15.45 | Single Family Detached | 85 | DU | 22 | 3.86 |
| | | Multifamily (Low-Rise) Residential | 255 | DU | 22 | 11.59 |
| 13 | 23.77 | Single Family Detached | 131 | DU | 22 | 5.95 |
| | | Multifamily (Low-Rise) Residential | 392 | DU | 22 | 17.82 |
| 17 | 6.20 | Public Park | 6.20 | AC | -- | -- |
| 18 | 13.44 | Active Park | 13.44 | AC | -- | -- |
| 22 | 3.38 | Non-Recreational Park | 3.38 | AC | -- | -- |

PA = planning area, AC = acres; DU = dwelling unit
1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 22, which was taken from TOP 2025.
3. The building lot size was calculated using the following equation: building lot size = dwelling units * (dwelling units/acre).

Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 256 | DU | 506,880 | -- | 11.64 |
| Apartments (Low-Rise)[1] | 768 | DU | 152,0640 | -- | 34.91 |
| City Park[2,3] | 19.64 | AC | -- | 855,518.40 | 19.64 |
| Other Non-Asphalt Surfaces[2,4] | 3.38 | AC | -- | 147,232.80 | 3.38 |

DU = dwelling unit; AC = acres; SF = square feet
1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The city park and other non-asphalt surfaces was assumed to be fully landscaped with “special landscaping” because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
3. The public park and active park were modeled as city park.
4. The non-recreational park was modeled as non-asphalt surfaces.

# Construction

## Schedule

| Construction Phase | Start Date | End Date | Workdays |
|---|---|---|---|
| Demolition | 12/1/2025 | 6/1/2026 | 131 |
| Site Preparation | 12/15/2025 | 6/15/2026 | 131 |
| Grading | 4/1/2026 | 12/1/2026 | 175 |
| Infrastructure Improvements | 8/1/2026 | 2/1/2027 | 131 |
| Building Construction | 12/2/2026 | 5/2/2027 | 108 |
| Paving | 2/2/2027 | 3/2/2027 | 21 |
| Architectural Coating | 5/3/2027 | 5/31/2027 | 21 |

## Construction Phase Overlap

| Construction Phase | Start Date | End Date |
|---|---|---|
| Demolition + Site Preparation | 12/15/2025 | 3/31/2026 |
| Demolition + Site Preparation + Grading | 4/1/2026 | 6/1/2026 |
| Site Preparation + Grading | 6/2/2026 | 6/15/2026 |
| Grading + Infrastructure Improvements | 8/1/2026 | 12/1/2026 |
| Infrastructure Improvements + Building Construction | 12/2/2026 | 2/1/2027 |
| Building Construction + Paving | 2/2/2027 | 3/2/2027 |

## Equipment

| Construction Phase | Equipment | Number per Day | Hours per Day |
|---|---|---|---|
| Demolition | Rubber Tired Dozers | 2 | 8 |
| | Excavators | 3 | 8 |
| | Concrete/Industrial Saws | 1 | 8 |
| Site Preparation | Rubber Tired Dozers | 3 | 8 |
| | Tractors/Loaders/Backhoes | 4 | 8 |
| Grading | Graders | 1 | 8 |
| | Excavators | 2 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| | Scrapers | 2 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| Infrastructure Improvements | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Building Construction | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Paving | Pavers | 2 | 8 |
| | Paving Equipment | 2 | 8 |
| | Rollers | 2 | 8 |
| Architectural Coating | Air Compressors | 1 | 6 |

## Worker, Vendor, and Haul Trips

| Trip Type | # One-Way Trips/Day | Trip Length (miles) |
|---|---|---|
| **Demolition** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 24.32 | 20 |
| On-Site Truck | -- | -- |
| **Site Preparation** | | |
| Worker | 17.5 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Grading** | | |
| Worker | 20 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Infrastructure Improvements** | | |
| Worker | 645.12 | 18.5 |
| Vendor | 109.47 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Building Construction** | | |
| Worker | 645.12 | 18.5 |
| Vendor | 109.47 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Paving** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Architectural Coating** | | |
| Worker | 258.05 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |

## Demolition

| Construction Phase | Amount (tons) |
|---|---|
| Demolition | 12,744 |

## Notes

Construction would include (per SCAQMD Rule 403 and FSEIR MM 3-1)

- watering exposed areas 3 times per day during earthmoving activities (site preparation and grading)
- watering demolished areas 2 times per day during demolition
- watering unpaved roads 2 times per day and limit vehicle speeds on unpaved roads to 25 mph throughout construction

# Operations

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 256 | DU | 9.4375000 | 2,416 |
| Apartments Low Rise | 768 | DU | 6.739583333 | 5,176 |
| City Park | 19.64 | AC | 34.52138493 | 678 |
| Other Non-Asphalt Surfaces | 3.38 | AC | 0 | 0 |
| | | | **Total** | **8,270** |
| DU = dwelling unit; AC = acres | | | | |
| Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025. | | | | |

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.43607679 | 4.945488532 | 7.468766689 |
| Apartments Low Rise | 18.43607679 | 4.945488532 | 7.468766689 |
| City Park | 18.43607679 | 6.967184162 | 11.74551353 |
| Other Non-Asphalt Surfaces | 18.43607679 | 6.967184162 | 11.74551353 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 41.4893616 | 6.3829787 | 52.1276596 |
| Apartments Low Rise | 100 | 0 | 0 | 41.4893616 | 6.3829787 | 52.1276596 |
| City Park | 100 | 0 | 0 | 79.5918367 | 10.2040816 | 10.2040816 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 79.5918367 | 10.2040816 | 10.2040816 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| Apartments (Low-Rise) | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| City Park | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| Other Non-Asphalt Surfaces | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |

Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 174.4 | 81.6 |
| Apartments Low Rise | 523.2 | 244.8 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments.<br>The Project would not include natural gas fireplaces.<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces. | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Construction** | | |
| C-2* | Limit Heavy-Duty Diesel Vehicle Idling | Construction equipment idling would be limited to 5 minutes per FSEIR MM 3-1 |
| C-5 | Use Advanced Engine Tiers | Construction equipment would have Tier 4 Final engines per FSEIR MM 3-1 |
| C-13 | Use Low-VOC Paints for Construction | Architectural coatings would have a VOC content <10 g/L per FSEIR MM 3-1 |
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

# Phase II

Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 1 | 15.91 | Single Family Detached | 88 | DU | 22 | 4.00 |
| | | Multifamily (Low-Rise) Residential | 262 | DU | 22 | 11.91 |
| 2 | 15.59 | Single Family Detached | 86 | DU | 22 | 3.91 |
| | | Multifamily (Low-Rise) Residential | 257 | DU | 22 | 11.68 |
| 3 | 7.68 | Single Family Detached | 42 | DU | 22 | 1.91 |
| | | Multifamily (Low-Rise) Residential | 127 | DU | 22 | 5.77 |
| 4 | 5.00 | Multifamily (Low-Rise) Residential | 175 | DU | 35 | 5.00 |
| | 1.43 | Retail | 18,635 | SF | -- | 0.43 |
| | 0.71 | General Office | 21,741 | SF | -- | 0.50 |
| 5 | 5.19 | Multifamily (Low-Rise) Residential | 182 | DU | 35 | 5.20 |
| | 1.48 | Retail | 19,367 | SF | -- | 0.44 |
| | 0.74 | General Office | 22,595 | SF | -- | 0.52 |
| 7 | 23.68 | Single Family Detached | 130 | DU | 22 | 5.91 |
| | | Multifamily (Low-Rise) Residential | 391 | DU | 22 | 17.77 |
| 8 | 24.18 | Single Family Detached | 133 | DU | 22 | 6.05 |
| | | Multifamily (Low-Rise) Residential | 399 | DU | 22 | 18.14 |
| 9 | 12.18 | Single Family Detached | 67 | DU | 22 | 3.05 |
| | | Multifamily (Low-Rise) Residential | 201 | DU | 22 | 9.14 |
| 10 | 9.86 | Multifamily (Low-Rise) Residential | 345 | DU | 35 | 9.86 |
| | 2.82 | Retail | 36,852 | SF | -- | 0.85 |
| | 1.41 | General Office | 42,994 | SF | -- | 0.99 |
| 11 | 10.97 | Multifamily (Low-Rise) Residential | 384 | DU | 35 | 10.97 |
| | 3.13 | Retail | 40,955 | SF | -- | 0.94 |
| | 1.57 | General Office | 47,781 | SF | -- | 1.10 |
| 14 | 13.33 | Active Park | 13.33 | AC | -- | -- |
| 15 | 13.11 | Active Park | 13.11 | AC | -- | -- |
| 16 | 9.90 | Public Park | 9.90 | AC | -- | -- |
| 19 | 2.26 | Non-Recreational Park | 2.26 | AC | -- | -- |
| 20 | 2.68 | Non-Recreational Park | 2.68 | AC | -- | -- |
| 21 | 2.96 | Non-Recreational Park | 2.96 | AC | -- | -- |

PA = planning area; AC = acres; DU = dwelling unit; SF = square feet

1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 19 through 21, which were taken from TOP 2025.
3. The residential building lot size was calculated using the following equation: building lot size = dwelling units *(dwelling units/acre). The retail and general office building lot size was assumed to be equal to the land use size in acres.

## Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 546 | DU | 1,081,080 | -- | 24.82 |
| Apartments Low Rise[1] | 2,723 | DU | 4,592,864 | -- | 105.44 |
| Strip Mall[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant w/o Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant with Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| General Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| Medical Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| City Park[6,7] | 36.34 | AC | -- | 158,2970.4 | 36.34 |
| Other Non-Asphalt Surfaces[6,8] | 7.90 | AC | -- | 344,124 | 7.9 |
| Parking Lot[9] | 6.954 | AC | -- | -- | 6.954 |

DU = dwelling unit; KSF = thousand square feet; AC = acres; SF = square feet

1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The retail size was evenly divided between the strip mall, fast food restaurant w/o drive thru, and fast food restaurant with drive thru land uses.
3. Per the proposed Specific Plan, the retail and office land uses would include landscaping equal to 10% of the building square footage.
4. The lot size included the building size and landscaping in acres.
5. The general office size was evenly divided between the general office building and medical office building land uses.
6. The city park and other non-asphalt surfaces was assumed to be fully landscaped with "special landscaping" because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
7. The public park and active park were modeled as city park.
8. The non-recreational park was modeled as non-asphalt surfaces.
9. Assumed the retail and office lot acreage not occupied by buildings or landscaping would be dedicated to parking lots. The lot size in acres was calculated using the following equation: lot size = total lot size – building size – landscaping.

# Construction

## Schedule

| Construction Phase | Start Date | End Date | Workdays |
|---|---|---|---|
| Demolition | 12/2/2026 | 6/2/2027 | 131 |
| Site Preparation | 12/15/2026 | 6/15/2027 | 131 |
| Grading | 4/1/2027 | 12/1/2027 | 175 |
| Infrastructure Improvements | 8/1/2027 | 12/1/2028 | 350 |
| Building Construction | 10/1/2028 | 3/1/2030 | 370 |
| Paving | 8/1/2028 | 2/1/2029 | 133 |
| Architectural Coating | 3/2/2030 | 3/30/2030 | 20 |

## Construction Phase Overlap

| Construction Phase | Start Date | End Date |
|---|---|---|
| Demolition + Site Preparation | 12/15/2026 | 3/31/2027 |
| Demolition + Site Preparation + Grading | 4/1/2027 | 6/2/2027 |
| Site Preparation + Grading | 6/3/2027 | 6/15/2027 |
| Grading + Infrastructure Improvements | 8/1/2027 | 12/1/2027 |
| Infrastructure Improvements + Paving | 8/1/2028 | 9/30/2028 |
| Infrastructure Improvements + Paving + Building Construction | 10/1/2028 | 12/1/2028 |
| Building Construction + Paving | 12/2/2028 | 2/1/2029 |

## Equipment

| Construction Phase | Equipment | Number per Day | Hours per Day |
|---|---|---|---|
| Demolition | Rubber Tired Dozers | 2 | 8 |
| | Excavators | 3 | 8 |
| | Concrete/Industrial Saws | 1 | 8 |
| Site Preparation | Rubber Tired Dozers | 3 | 8 |
| | Tractors/Loaders/Backhoes | 4 | 8 |
| Grading | Graders | 1 | 8 |
| | Excavators | 2 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| | Scrapers | 2 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| Infrastructure Improvements | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Building Construction | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Paving | Pavers | 2 | 8 |
| | Paving Equipment | 2 | 8 |
| | Rollers | 2 | 8 |
| Architectural Coating | Air Compressors | 1 | 6 |

## Worker, Vendor, and Haul Trips

| Trip Type | # One-Way Trips/Day | Trip Length (miles) |
|---|---|---|
| **Demolition** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 58.8015 | 20 |
| On-Site Truck | -- | -- |
| **Site Preparation** | | |
| Worker | 17.5 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Grading** | | |
| Worker | 20 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Infrastructure Improvements** | | |
| Worker | 2245.1353 | 18.5 |
| Vendor | 390.5820 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Building Construction** | | |
| Worker | 2245.1353 | 18.5 |
| Vendor | 390.5820 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Paving** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Architectural Coating** | | |
| Worker | 898.0541 | 18.5 |
| Vendor | 0 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |

## Demolition

| Construction Phase | Amount (tons) |
|---|---|
| Demolition | 30,810 |

## Notes

Construction would include (per SCAQMD Rule 403 and FSEIR MM 3-1)

- watering exposed areas 3 times per day during earthmoving activities (site preparation and grading)
- watering demolished areas 2 times per day during demolition
- watering unpaved roads 2 times per day and limit vehicle speeds on unpaved roads to 25 mph throughout construction

# Operations

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 546 | DU | 6.285047956 | 3,432 |
| Apartments Low Rise | 2723 | DU | 5.388308416 | 14,672 |
| Strip Mall | 38.603 | KSF | 15.38740512 | 594 |
| Fast Food Restaurant w/o Drive Thru | 38.603 | KSF | 179.0910682 | 6,913 |
| Fast Food Restaurant with Drive Thru | 38.603 | KSF | 185.84689 | 7,174 |
| General Office Building | 67.556 | KSF | 7.972483979 | 539 |
| Medical Office Building | 67.556 | KSF | 26.48781562 | 1789 |
| City Park | 36.34 | AC | 36.65382499 | 1,332 |
| Other Non-Asphalt Surfaces | 7.9 | AC | 0 | 0 |
| Parking Lot | 6.954 | AC | 0 | 0 |
| | | | **Total** | **36,446** |
| DU = dwelling unit; KSF = thousand square feet; AC = acres | | | | |
| Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025. | | | | |

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.81393411 | 20.96433004 | 6.45145941 |
| Apartments Low Rise | 18.81393411 | 20.96433004 | 6.45145941 |
| Strip Mall | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant w/o Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant with Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| General Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| Medical Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| City Park | 18.81393411 | 6.477110207 | 6.883326689 |
| Other Non-Asphalt Surfaces | 18.81393411 | 6.477110207 | 6.883326689 |
| Parking Lot | 18.81393411 | 6.477110207 | 6.883326689 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Apartments Low Rise | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Strip Mall | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant w/o Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant with Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| General Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| Medical Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| City Park | 100 | 0 | 0 | 80 | 8 | 12 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 80 | 8 | 12 |
| Parking Lot | 100 | 0 | 0 | 80 | 8 | 12 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Apartments Low Rise | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Strip Mall | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant w/o Drive Thru | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant with Drive Thru | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| General Office Building | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Medical Office Building | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| City Park | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Other Non-Asphalt Surfaces | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Parking Lot | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

## Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 371.96 | 174.04 |
| Apartments Low Rise | 1,855.04 | 867.96 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments<br>The Project would not include natural gas fireplaces<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Construction** | | |
| C-2* | Limit Heavy-Duty Diesel Vehicle Idling | Construction equipment idling would be limited to 5 minutes per FSEIR MM 3-1 |
| C-5 | Use Advanced Engine Tiers | Construction equipment would have Tier 4 Final engines per FSEIR MM 3-1 |
| C-13 | Use Low-VOC Paints for Construction | Architectural coatings would have a VOC content <10 g/L per FSEIR MM 3-1 |
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

# Project Buildout (Phase I + Phase II)

## Construction Phase Overlap between Phase I and Phase II

| Construction Phase | Start Date | End Date |
|---|---|---|
| Phase I Building Construction + Infrastructure Improvements<br>+ Phase II Demolition | 12/2/2026 | 12/14/2026 |
| Phase I Building Construction + Infrastructure Improvements<br>+ Phase II Demolition + Site Preparation | 12/15/2026 | 2/1/2027 |
| Phase I Building Construction + Paving<br>Phase II Demolition + Site Preparation | 2/2/2027 | 3/2/2027 |
| Phase I Building Construction<br>Phase II Demolition + Site Preparation | 3/3/2027 | 3/31/2027 |
| Phase I Building Construction +<br>Phase II Demolition + Site Preparation + Grading | 4/1/2027 | 5/2/2027 |
| Phase I Architectural Coatings +<br>Phase II Demolition + Site Preparation + Grading | 5/3/2027 | 5/31/2027 |
| See Phase I and Phase II above for the construction schedule, planning areas, and modeled land uses. | | |

# Operations

## Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 1 | 15.91 | Single Family Detached | 88 | DU | 22 | 4.00 |
| | | Multifamily (Low-Rise) Residential | 262 | DU | 22 | 11.91 |
| 2 | 15.59 | Single Family Detached | 86 | DU | 22 | 3.91 |
| | | Multifamily (Low-Rise) Residential | 257 | DU | 22 | 11.68 |
| 3 | 7.68 | Single Family Detached | 42 | DU | 22 | 1.91 |
| | | Multifamily (Low-Rise) Residential | 127 | DU | 22 | 5.77 |
| 4 | 5.00 | Multifamily (Low-Rise) Residential | 175 | DU | 35 | 5.00 |
| | 1.43 | Retail | 18,635 | SF | -- | 0.43 |
| | 0.71 | General Office | 21,741 | SF | -- | 0.50 |
| 5 | 5.19 | Multifamily (Low-Rise) Residential | 182 | DU | 35 | 5.20 |
| | 1.48 | Retail | 19,367 | SF | -- | 0.44 |
| | 0.74 | General Office | 22,595 | SF | -- | 0.52 |
| 6 | 7.32 | Single Family Detached | 40 | DU | 22 | 1.82 |
| | | Multifamily (Low-Rise) Residential | 121 | DU | 22 | 5.50 |
| 7 | 23.68 | Single Family Detached | 130 | DU | 22 | 5.91 |
| | | Multifamily (Low-Rise) Residential | 391 | DU | 22 | 17.77 |
| 8 | 24.18 | Single Family Detached | 133 | DU | 22 | 6.05 |
| | | Multifamily (Low-Rise) Residential | 399 | DU | 22 | 18.14 |
| 9 | 12.18 | Single Family Detached | 67 | DU | 22 | 3.05 |
| | | Multifamily (Low-Rise) Residential | 201 | DU | 22 | 9.14 |
| 10 | 9.86 | Multifamily (Low-Rise) Residential | 345 | DU | 35 | 9.86 |
| | 2.82 | Retail | 36,852 | SF | -- | 0.85 |
| | 1.41 | General Office | 42,994 | SF | -- | 0.99 |
| 11 | 10.97 | Multifamily (Low-Rise) Residential | 384 | DU | 35 | 10.97 |
| | 3.13 | Retail | 40,955 | SF | -- | 0.94 |
| | 1.57 | General Office | 47,781 | SF | -- | 1.10 |
| 12 | 15.45 | Single Family Detached | 85 | DU | 22 | 3.86 |
| | | Multifamily (Low-Rise) Residential | 255 | DU | 22 | 11.59 |
| 13 | 23.77 | Single Family Detached | 131 | DU | 22 | 5.95 |
| | | Multifamily (Low-Rise) Residential | 392 | DU | 22 | 17.82 |
| 14 | 13.33 | Active Park | 13.33 | AC | -- | -- |
| 15 | 13.11 | Active Park | 13.11 | AC | -- | -- |
| 16 | 9.90 | Public Park | 9.90 | AC | -- | -- |
| 17 | 6.20 | Public Park | 6.20 | AC | -- | -- |
| 18 | 13.44 | Active Park | 13.44 | AC | -- | -- |
| 19 | 2.26 | Non-Recreational Park | 2.26 | AC | -- | -- |
| 20 | 2.68 | Non-Recreational Park | 2.68 | AC | -- | -- |
| 21 | 2.96 | Non-Recreational Park | 2.96 | AC | -- | -- |
| 22 | 3.38 | Non-Recreational Park | 3.38 | AC | -- | -- |

PA = planning area; AC = acres; DU = dwelling unit; SF = square feet

1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 19 through 22, which were taken from TOP 2025.
3. The residential building lot size was calculated using the following equation: building lot size = dwelling units * (dwelling units/acre). The retail and general office building lot size was assumed to be equal to the land use size in acres.

## Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 802 | DU | 1,587,960 | -- | 36.45 |
| Apartments Low Rise[1] | 3,491 | DU | 6,113,504.5 | -- | 140.35 |
| Strip Mall[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant w/o Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant with Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| General Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| Medical Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| City Park[6,7] | 55.98 | AC | -- | 2,438,488.8 | 36.34 |
| Other Non-Asphalt Surfaces[6,8] | 11.28 | AC | -- | 491,356.8 | 7.9 |
| Parking Lot[9] | 6.954 | AC | -- | -- | 6.954 |

DU = dwelling unit; KSF = thousand square feet; AC = acres; SF = square feet

1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The retail size was evenly divided between the strip mall, fast food restaurant w/o drive thru, and fast food restaurant with drive thru land uses.
3. Per the proposed Specific Plan, the retail and office land uses would include landscaping equal to 10% of the building square footage.
4. The lot size included the building size and landscaping in acres.
5. The general office size was evenly divided between the general office building and medical office building land uses.
6. The city park and other non-asphalt surfaces was assumed to be fully landscaped with "special landscaping" because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
7. The public park and active park were modeled as city park.
8. The non-recreational park was modeled as non-asphalt surfaces.
9. Assumed the retail and office lot acreage not occupied by buildings or landscaping would be dedicated to parking lots. The lot size in acres was calculated using the following equation: lot size = total lot size – building size – landscaping.

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 802 | DU | 7.291317 | 5,848 |
| Apartments Low Rise | 3,491 | DU | 5.685581 | 19,848 |
| Strip Mall | 38.603 | KSF | 15.387405 | 594 |
| Fast Food Restaurant w/o Drive Thru | 38.603 | KSF | 179.091068 | 6,913 |
| Fast Food Restaurant with Drive Thru | 38.603 | KSF | 185.846890 | 7,174 |
| General Office Building | 67.556 | KSF | 7.972543 | 539 |
| Medical Office Building | 67.556 | KSF | 26.488012 | 1789 |
| City Park | 55.98 | AC | 35.905681 | 2010 |
| Other Non-Asphalt Surfaces | 11.28 | AC | 0.000000 | 0 |
| Parking Lot | 6.954 | AC | 0 | 0 |
| | | | **Total** | **44,716** |

DU = dwelling unit; KSF = thousand square feet; AC = acres

Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.81393411 | 20.96433004 | 6.45145941 |
| Apartments Low Rise | 18.81393411 | 20.96433004 | 6.45145941 |
| Strip Mall | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant w/o Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant with Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| General Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| Medical Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| City Park | 18.81393411 | 6.477110207 | 6.883326689 |
| Other Non-Asphalt Surfaces | 18.81393411 | 6.477110207 | 6.883326689 |
| Parking Lot | 18.81393411 | 6.477110207 | 6.883326689 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Apartments Low Rise | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Strip Mall | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant w/o Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant with Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| General Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| Medical Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| City Park | 100 | 0 | 0 | 80 | 8 | 12 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 80 | 8 | 12 |
| Parking Lot | 100 | 0 | 0 | 80 | 8 | 12 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Apartments Low Rise | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Strip Mall | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant w/o Drive Thru | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant with Drive Thru | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| General Office Building | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Medical Office Building | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| City Park | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Other Non-Asphalt Surfaces | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Parking Lot | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 546.36 | 256.64 |
| Apartments Low Rise | 2,378.24 | 1,112.76 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments<br>The Project would not include natural gas fireplaces<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

**Construction Regional Emissions**

| Phase I | ROG | NOx | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| 2025 | 1.03 | 9.36 | 49.53 | 0.09 | 7.52 | 3.24 |
| 2026 | 5.99 | 18.78 | 103.75 | 0.15 | 18.99 | 4.71 |
| 2027 | 122.14 | 17.92 | 98.58 | 0.10 | 18.99 | 4.71 |
| Maximum Daily Emissions | 122.14 | 18.78 | 103.75 | 0.15 | 18.99 | 4.71 |
| SCAQMD Regional Threshold | 75.00 | 100.00 | 550.00 | 150.00 | 150.00 | 55.00 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

| Phase II | ROG | NOx | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| 2026 | 1.05 | 12.14 | 50.95 | 0.11 | 10.10 | 3.73 |
| 2027 | 10.55 | 29.02 | 208.66 | 0.17 | 35.72 | 9.18 |
| 2028 | 18.19 | 47.80 | 263.66 | 0.24 | 66.10 | 16.00 |
| 2029 | 8.99 | 24.24 | 151.19 | 0.13 | 33.07 | 8.04 |
| 2030 | 370.37 | 20.83 | 112.42 | 0.11 | 32.85 | 7.96 |
| Maximum Daily Emissions | 370.37 | 47.80 | 263.66 | 0.24 | 66.10 | 16.00 |
| SCAQMD Regional Threshold | 75.00 | 100.00 | 550.00 | 150.00 | 150.00 | 55.00 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

| Phase I + Phase II | ROG | NOx | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| 2025 | 1.03 | 9.36 | 49.53 | 0.09 | 7.52 | 3.24 |
| 2026 | 7.04 | 30.92 | 154.70 | 0.26 | 29.09 | 8.45 |
| 2027 | 132.69 | 46.94 | 307.24 | 0.27 | 54.70 | 13.90 |
| 2028 | 18.19 | 47.80 | 263.66 | 0.24 | 66.10 | 16.00 |
| 2029 | 8.99 | 24.24 | 151.19 | 0.13 | 33.07 | 8.04 |
| 2030 | 370.37 | 20.83 | 112.42 | 0.11 | 32.85 | 7.96 |
| Maximum Daily Emissions | 370.37 | 47.80 | 307.24 | 0.27 | 66.10 | 16.00 |
| SCAQMD Regional Threshold | 75.00 | 100.00 | 550.00 | 150.00 | 150.00 | 55.00 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

## Localized Construction Emissions

| Phase I | NOx | CO | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|
| **Individual Phases** | | | | |
| Demolition (2025) | 4.51 | 18.17 | 1.41 | 0.27 |
| Demolition (2026) | 4.51 | 18.17 | 1.41 | 0.27 |
| Site Prep (2025) | 2.59 | 28.31 | 5.21 | 2.73 |
| Site Prep (2026) | 2.59 | 28.31 | 5.21 | 2.73 |
| Grading (2026) | 4.43 | 35.35 | 2.52 | 1.07 |
| Building Construction (2026) | 2.82 | 14.82 | 0.07 | 0.07 |
| Building Construction (2027) | 2.82 | 14.82 | 0.07 | 0.07 |
| Infrastructure Improvements (2026) | 2.82 | 14.82 | 0.07 | 0.07 |
| Infrastructure Improvements (2027) | 2.82 | 14.82 | 0.07 | 0.07 |
| Paving (2027) | 1.93 | 10.60 | 0.03 | 0.03 |
| Architectural Coating (2027) | 0.65 | 0.96 | 0.00 | 0.00 |
| **Overlapping Phases** | | | | |
| Demolition + Site Preparation (2025) | 7.09 | 46.48 | 6.62 | 2.99 |
| Demolition + Site Preparation (2026) | 7.09 | 46.48 | 6.62 | 2.99 |
| Demolition + Site Preparation + Grading (2026) | 11.52 | 81.83 | 9.14 | 4.07 |
| Site Preparation + Grading (2026) | 7.02 | 63.66 | 7.73 | 3.80 |
| Building Construction + Infrastructure Improvements (2026) | 5.64 | 29.65 | 0.15 | 0.14 |
| Building Construction + Infrastructure Improvements (2027) | 5.63 | 29.65 | 0.15 | 0.14 |
| Building Construction + Paving (2027) | 4.75 | 25.42 | 0.10 | 0.10 |
| **Maximum Emissions** | **11.52** | **81.83** | **9.14** | **4.07** |
| **SCAQMD LST Threshold (adjusted for 4 acres @ 25 meters)** | **237** | **1873** | **13** | **8** |
| **Exceeds Threshold?** | **No** | **No** | **No** | **No** |

| Phase II | NOx | CO | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|
| **Individual Phases** | | | | |
| Demolition (2026) | 4.51 | 18.17 | 3.32 | 0.56 |
| Demolition (2027) | 4.51 | 18.17 | 3.32 | 0.56 |
| Site Preparation (2026) | 2.59 | 28.31 | 5.21 | 2.73 |
| Site Preparation (2027) | 2.59 | 28.31 | 5.21 | 2.73 |
| Grading (2027) | 4.43 | 35.35 | 2.52 | 1.07 |
| Building Construction (2028) | 2.81 | 14.82 | 0.07 | 0.07 |
| Building Construction (2029) | 2.81 | 14.82 | 0.07 | 0.07 |
| Building Construction (2030) | 2.81 | 14.82 | 0.07 | 0.07 |
| Infrastructure Improvements (2027) | 2.82 | 14.82 | 0.07 | 0.07 |
| Infrastructure Improvements (2028) | 2.81 | 14.82 | 0.07 | 0.07 |
| Paving (2028) | 1.93 | 10.60 | 0.03 | 0.03 |
| Paving (2029) | 1.93 | 10.60 | 0.03 | 0.03 |
| Architectural Coating (2030) | 0.65 | 0.96 | 0.00 | 0.00 |
| **Overlapping Phases** | | | | |
| Demolition + Site Preparation (2026) | 7.09 | 46.48 | 8.53 | 3.28 |
| Demolition + Site Preparation (2027) | 7.09 | 46.48 | 8.53 | 3.28 |
| Demolition + Site Preparation + Grading (2027) | 11.52 | 81.83 | 11.05 | 4.36 |
| Site Preparation + Grading (2027) | 7.02 | 63.66 | 7.73 | 3.80 |
| Grading + Infrastructure Improvements (2027) | 5.41 | 43.13 | 5.28 | 2.80 |
| Infrastructure Improvements + Paving (2028) | 4.75 | 25.42 | 0.10 | 0.10 |
| Infrastructure Improvements + Paving + Building Construction (2028) | 7.56 | 40.24 | 0.18 | 0.17 |
| Paving + Building Construction (2028) | 4.75 | 25.42 | 0.10 | 0.10 |
| Paving + Building Construction (2029) | 4.74 | 25.42 | 0.10 | 0.10 |
| **Maximum Emissions** | **11.52** | **81.83** | **11.05** | **4.36** |
| **SCAQMD LST Threshold (adjusted for 4 acres @ 25 meters)** | **237** | **1873** | **13** | **8** |
| **Exceeds Threshold?** | **No** | **No** | **No** | **No** |

| Phase I + Phase II Overlap | NOx | CO | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|
| Phase I Building Construction + Phase II Demolition + Site Preparation (2026) | 10.15 | 47.82 | 3.47 | 0.70 |
| Phase I Building Construction + Infrastructure Improvements + Phase II Demolition + Site Preparation (2026) | 12.74 | 76.13 | 8.68 | 3.43 |
| Phase I Building Construction + Infrastructure Improvements + Phase II Demolition + Site Preparation (2027) | 12.73 | 76.13 | 8.68 | 3.43 |
| Phase I Building Construction + Paving + Phase II Demolition + Site Preparation (2027) | 11.85 | 71.90 | 8.64 | 3.38 |
| Phase I Building Construction + Phase II Demolition + Site Preparation (2027) | 9.91 | 61.30 | 8.61 | 3.36 |
| Phase I Building Construction + Phase II Demolition + Site Preparation + Grading (2027) | 14.34 | 96.65 | 11.13 | 4.43 |
| Phase I Architectural Coating + Phase II Demolition + Site Preparation + Grading (2027) | 12.17 | 82.79 | 11.05 | 4.36 |
| **Maximum Emissions** | **14.34** | **96.65** | **11.13** | **4.43** |
| **SCAQMD LST Threshold (adjusted for 4 acres @ 25 meters)** | **237** | **1873** | **13** | **8** |
| **Exceeds Threshold?** | **No** | **No** | **No** | **No** |

## Operational Regional Emissions

| Phase I | ROG | NOx | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| Mobile | 31.48 | 33.73 | 309.01 | 0.81 | 72.35 | 18.73 |
| Area | 52.47 | 0.55 | 58.14 | 0.00 | 0.03 | 0.02 |
| Energy | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | 0.42 |
| Total Emissions | 84.26 | 39.53 | 369.38 | 0.84 | 72.80 | 19.18 |
| SCAQMD Regional Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

| Phase II | ROG | NOx | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| Mobile | 121.24 | 133.37 | 1299.39 | 3.69 | 351.10 | 90.64 |
| Area | 156.00 | 1.82 | 197.01 | 0.01 | 0.10 | 0.08 |
| Energy | 1.11 | 19.19 | 9.59 | 0.12 | 1.54 | 1.54 |
| Drive-thru | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 |
| Total Emissions | 278.36 | 154.39 | 1506.03 | 3.82 | 352.74 | 92.25 |
| SCAQMD Regional Threshold | 55.00 | 55.00 | 550.00 | 150.00 | 150.00 | 55.00 |
| Exceeds Threshold? | Yes | Yes | Yes | No | Yes | Yes |

| Buildout (Phase I + Phase II) | ROG | NOx | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| Mobile | 147.57 | 159.41 | 1548.27 | 4.38 | 416.48 | 107.52 |
| Area | 208.40 | 2.37 | 255.30 | 0.01 | 0.13 | 0.10 |
| Energy | 1.42 | 24.44 | 11.82 | 0.15 | 1.96 | 1.96 |
| Drive-thru | 0.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 |
| Total Emissions | 357.39 | 186.23 | 1815.44 | 4.54 | 418.57 | 109.58 |
| SCAQMD Regional Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| Exceeds Threshold? | Yes | Yes | Yes | No | Yes | Yes |

**Phase I Operations + Phase II Construction Emissions Overlap**

| **Overlap 1** | **ROG** | **NOx** | **CO** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** |
|---|---|---|---|---|---|---|
| Phase I Operations | 84.26 | 39.53 | 369.38 | 0.84 | 72.80 | 19.18 |
| Phase II Demolition (2027) | 0.36 | 4.51 | 18.17 | 0.03 | 3.32 | 0.56 |
| Phase II Site Preparation (2027) | 0.50 | 2.59 | 28.31 | 0.05 | 5.21 | 2.73 |
| Phase II Grading (2027) | 0.64 | 4.43 | 35.35 | 0.06 | 2.52 | 1.07 |
| Total Emissions | 85.76 | 51.06 | 451.21 | 0.98 | 83.85 | 23.54 |
| SCAQMD Regional Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

| **Overlap 2** | **ROG** | **NOx** | **CO** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** |
|---|---|---|---|---|---|---|
| **Phase I Operations** | 84.26 | 39.53 | 369.38 | 0.84 | 72.80 | 19.18 |
| Phase II Grading (2027) | 0.64 | 4.43 | 35.35 | 0.06 | 2.52 | 1.07 |
| Phase II Infrastructure Improvements (2027) | 0.33 | 2.82 | 14.82 | 0.02 | 0.07 | 0.07 |
| Total Emissions | 85.23 | 46.78 | 419.55 | 0.93 | 75.39 | 20.32 |
| SCAQMD Regional Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

| **Overlap 3** | **ROG** | **NOx** | **CO** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** |
|---|---|---|---|---|---|---|
| Phase I Operations | 84.26 | 39.53 | 369.38 | 0.84 | 72.80 | 19.18 |
| Phase II Infrastructure Improvements (2028) | 0.33 | 2.81 | 14.82 | 0.02 | 0.07 | 0.07 |
| Phase II Paving (2028) | 0.30 | 1.93 | 10.60 | 0.01 | 0.03 | 0.03 |
| Phase II Building Construction (2028) | 0.33 | 2.81 | 14.82 | 0.02 | 0.07 | 0.07 |
| Total Emissions | 85.21 | 47.10 | 409.63 | 0.90 | 72.98 | 19.35 |
| SCAQMD Regional Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

| **Overlap 4** | **ROG** | **NOx** | **CO** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** |
|---|---|---|---|---|---|---|
| Phase I Operations | 84.26 | 39.53 | 369.38 | 0.84 | 72.80 | 19.18 |
| Phase II Paving (2029) | 0.30 | 1.93 | 10.60 | 0.01 | 0.03 | 0.03 |
| Phase II Building Construction (2029) | 0.33 | 2.81 | 14.82 | 0.02 | 0.07 | 0.07 |
| Total Emissions | 84.89 | 44.28 | 394.80 | 0.88 | 72.90 | 19.28 |
| SCAQMD Regional Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| **Exceeds Threshold?** | Yes | No | No | No | No | No |

| **Overlap 5** | **ROG** | **NOx** | **CO** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** |
|---|---|---|---|---|---|---|
| Phase I Operations | 84.26 | 39.53 | 369.38 | 0.84 | 72.80 | 19.18 |
| Phase II Building Construction (2030) | 0.33 | 2.81 | 14.82 | 0.02 | 0.07 | 0.07 |
| Total Emissions | 84.59 | 42.35 | 384.20 | 0.86 | 72.87 | 19.25 |
| SCAQMD Regional Threshold | 55 | 55 | 550 | 150 | 150 | 55 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

| **Overlap 6** | **ROG** | **NOx** | **CO** | **$SO_2$** | **$PM_{10}$** | **$PM_{2.5}$** |
|---|---|---|---|---|---|---|
| Phase I Operations | 84.26 | 39.53 | 369.38 | 0.84 | 72.80 | 19.18 |
| Phase II Architectural Coating (2030) | 367.69 | 0.65 | 0.96 | 0.00 | 0.00 | 0.00 |
| Total Emissions | 451.95 | 40.18 | 370.34 | 0.84 | 72.80 | 19.18 |
| SCAQMD Regional Threshold | 55.00 | 55.00 | 550.00 | 150.00 | 150.00 | 55.00 |
| Exceeds Threshold? | Yes | No | No | No | No | No |

Drive-Through On-site Emissions

| | |
|---|---|
| Total Trips/Day[1] | 7,174 |
| Drive-Through Trips | 5,022 |
| Minutes/Trip | 5 |
| Distance (mi/trip)[2] | 0.2 |

| | ROG | $NO_X$ | CO | $SO_2$ | $PM_{10}$ | $PM_{2.5}$ |
|---|---|---|---|---|---|---|
| EMFAC Emissions Rate (g/mi) | 0.0125 | 0.0137 | 0.2435 | 0.0011 | 0.0023 | 0.0008 |
| Pounds/Day | 0.00231 | 0.00253 | 0.04 | 0.00 | 0.0004 | 0.0001 |

NOTES:

1. total trips per day from Urban Crossroads, *Center Park Specfic Plan Traffic Analysis,* 2025
2. PAs 4, 5, 10, and 11 are designated as MU - Great Park land use and would include restaurants w/ drive-thru lanes the potential maximum drive-thru lane measured across PA 11 from Google Earth, 2025.
3. EMFAC2021 (v1.0.0) Emission Rates, San Bernardino (MD) Sub-Area, Year 2030, Annual.

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: Sub-Area
Region: San Bernardino (MD)
Calendar Year: 2030
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

| | ROG | NOx | CO | SOx | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| EMFAC Emissions Rate (g | 0.012540143 | 0.013691122 | 0.243508723 | 0.001086364 | 0.002265962 | 0.000793087 | 109.9223071 | 0.002912712 | 0.001502499 |

| Region | Calendar Year | Vehicle Category | Model Year | Speed | Fuel | Total VMT | CVMT | EVMT | ROG_RUNEX | NOx_RUNEX | CO_RUNEX | SOx_RUNEX | PM10_RUNEX | PM2.5_RUNEX | CO2_RUNEX | CH4_RUNEX | N2O_RUNEX | TOG_RUNEX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| San Bernardino (MD) | 2030 | LDA | Aggregate | 5 | Gasoline | 3915.495943 | 3915.495943 | 0 | 0.039277545 | 0.053745033 | 1.245661046 | 0.006071957 | 0.005954562 | 0.002084097 | 614.1963808 | 0.01140915 | 0.007220653 | 0.057313701 |
| San Bernardino (MD) | 2030 | LDA | Aggregate | 5 | Diesel | 5.816026442 | 5.816026442 | 0 | 0.233153742 | 0.185222503 | 4.645922104 | 0.005305266 | 0.006122135 | 0.002142747 | 559.8924775 | 0.010829546 | 0.088211288 | 0.265430034 |
| San Bernardino (MD) | 2030 | LDA | Aggregate | 5 | Electricity | 30835.76206 | 0 | 30835.76206 | 0 | 0 | 0 | 0 | 0.001329156 | 0.000465205 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | LDA | Aggregate | 5 | Plug-in Hybrid | 4109.611964 | 73.87671591 | 4035.735248 | 0.000482534 | 0.000469094 | 0.040639009 | 0.000151215 | 0.001330616 | 0.000465716 | 15.29588549 | 0.000151864 | 8.44919E-05 | 0.000704112 |
| San Bernardino (MD) | 2030 | LDT1 | Aggregate | 5 | Gasoline | 287.2992717 | 287.2992717 | 0 | 0.146332154 | 0.199405211 | 2.645395342 | 0.007347597 | 0.008523843 | 0.002983345 | 743.231163 | 0.03393778 | 0.015421796 | 0.213527535 |
| San Bernardino (MD) | 2030 | LDT1 | Aggregate | 5 | Diesel | 0.002820831 | 0.002820831 | 0 | 0.592560129 | 0.409303603 | 3.61420863 | 0.008683089 | 0.008458939 | 0.002960629 | 916.3718166 | 0.027523285 | 0.144374753 | 0.67459031 |
| San Bernardino (MD) | 2030 | LDT1 | Aggregate | 5 | Electricity | 248.3305489 | 0 | 248.3305489 | 0 | 0 | 0 | 0 | 0.001326324 | 0.000464213 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | LDT1 | Aggregate | 5 | Plug-in Hybrid | 64.25680427 | 1.015129558 | 63.24167471 | 0.000424056 | 0.000412245 | 0.035875847 | 0.000133087 | 0.001326138 | 0.000464148 | 13.46209759 | 0.000133556 | 7.43553E-05 | 0.000618781 |
| San Bernardino (MD) | 2030 | LDT2 | Aggregate | 5 | Gasoline | 1952.78956 | 1952.78956 | 0 | 0.053226165 | 0.085799407 | 1.449997479 | 0.007319839 | 0.008202678 | 0.002870937 | 740.4234213 | 0.014730145 | 0.008839566 | 0.077667495 |
| San Bernardino (MD) | 2030 | LDT2 | Aggregate | 5 | Diesel | 7.144075189 | 7.144075189 | 0 | 0.264345404 | 0.156950946 | 2.690102885 | 0.006548436 | 0.008147726 | 0.002851704 | 691.0907535 | 0.012278339 | 0.10888163 | 0.300939668 |
| San Bernardino (MD) | 2030 | LDT2 | Aggregate | 5 | Electricity | 2408.878796 | 0 | 2408.878796 | 0 | 0 | 0 | 0 | 0.001327109 | 0.000464488 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | LDT2 | Aggregate | 5 | Plug-in Hybrid | 901.5605528 | 15.01538332 | 886.5451695 | 0.000447056 | 0.000434605 | 0.037726772 | 0.00014019 | 0.001328602 | 0.000465011 | 14.18059398 | 0.000140299 | 7.78505E-05 | 0.000652344 |
| San Bernardino (MD) | 2030 | LHDT1 | Aggregate | 5 | Gasoline | 23.31692094 | 23.31692094 | 0 | 0.08654334 | 0.181435413 | 2.02593115 | 0.01439763 | 0.078000022 | 0.027300008 | 1456.362905 | 0.018968053 | 0.010424339 | 0.126283839 |
| San Bernardino (MD) | 2030 | LHDT1 | Aggregate | 5 | Diesel | 12.62605226 | 12.62605226 | 0 | 0.356079181 | 1.847486561 | 1.17611733 | 0.010987489 | 0.078000022 | 0.027300008 | 1159.567236 | 0.016539197 | 0.18269029 | 0.405372473 |
| San Bernardino (MD) | 2030 | LHDT1 | Aggregate | 5 | Electricity | 3.000874152 | 0 | 3.000874152 | 0 | 0 | 0 | 0 | 0.039000011 | 0.013650004 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | MCY | Aggregate | 5 | Gasoline | 30.64331434 | 30.64331434 | 0 | 6.337982441 | 0.878491722 | 27.07711462 | 0.004583571 | 0.012000003 | 0.004200001 | 463.6417568 | 1.017212003 | 0.064162555 | 7.765901828 |
| San Bernardino (MD) | 2030 | MDV | Aggregate | 5 | Gasoline | 1251.724221 | 1251.724221 | 0 | 0.084112754 | 0.139354421 | 1.788353884 | 0.009131768 | 0.008483233 | 0.002969132 | 923.7054006 | 0.021357446 | 0.011866456 | 0.122737134 |
| San Bernardino (MD) | 2030 | MDV | Aggregate | 5 | Diesel | 18.11237387 | 18.11237387 | 0 | 0.193685632 | 0.148925829 | 4.202219576 | 0.008698701 | 0.008719741 | 0.003051909 | 918.0194472 | 0.008996327 | 0.144634338 | 0.220498215 |
| San Bernardino (MD) | 2030 | MDV | Aggregate | 5 | Electricity | 2425.290164 | 0 | 2425.290164 | 0 | 0 | 0 | 0 | 0.00132809 | 0.000464832 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | MDV | Aggregate | 5 | Plug-in Hybrid | 557.5071295 | 9.429934019 | 548.0771954 | 0.000454024 | 0.000441378 | 0.038309785 | 0.000142369 | 0.001329674 | 0.000465386 | 14.40099818 | 0.000142082 | 7.86292E-05 | 0.000662511 |

| Vehicle Category | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| LDA | 153.7910675 | 210.4384604 | 4877.380773 | 23.77472114 | 23.31506471 | 8.160272648 | 2404883.437 | 44.67248174 | 28.2724386 | 224.4115646 |
| LDA | 1.356028328 | 1.077258976 | 27.02080581 | 0.030855566 | 0.0356065 | 0.012462275 | 3256.349454 | 0.062984924 | 0.513039183 | 1.543748097 |
| LDA | 0 | 0 | 0 | 0 | 40.985539 | 14.34493865 | 0 | 0 | 0 | 0 |
| LDA | 1.983025445 | 1.927792815 | 167.0105567 | 0.621436619 | 5.468315539 | 1.913910439 | 62860.154 | 0.624103349 | 0.347228904 | 2.893626074 |
| LDT1 | 42.04112116 | 57.28897192 | 760.0201553 | 2.110959185 | 2.448893816 | 0.857112835 | 213529.7719 | 9.750299341 | 4.430670837 | 61.3463053 |
| LDT1 | 0.001671512 | 0.001154576 | 0.01019507 | 2.44935E-05 | 2.38612E-05 | 8.35143E-06 | 2.584929633 | 7.76385E-05 | 0.000407257 | 0.001902905 |
| LDT1 | 0 | 0 | 0 | 0 | 0.329366748 | 0.115278362 | 0 | 0 | 0 | 0 |
| LDT1 | 0.027248474 | 0.02648953 | 2.305267307 | 0.008551716 | 0.085213394 | 0.029824688 | 865.0313697 | 0.008581859 | 0.004777832 | 0.039760909 |
| LDT2 | 103.9394994 | 167.5481866 | 2831.539939 | 14.29410582 | 16.01810304 | 5.606336063 | 1445891.127 | 28.7648737 | 17.26181145 | 151.6682736 |
| LDT2 | 1.888503442 | 1.121269356 | 19.21829728 | 0.04678252 | 0.058207969 | 0.020372789 | 4937.204306 | 0.087717375 | 0.777858549 | 2.149935612 |
| LDT2 | 0 | 0 | 0 | 0 | 3.196844914 | 1.11889572 | 0 | 0 | 0 | 0 |
| LDT2 | 0.403048333 | 0.391822345 | 34.01296974 | 0.126389421 | 1.197815012 | 0.419235254 | 12784.66415 | 0.126488323 | 0.070186919 | 0.588127181 |
| LHDT1 | 2.017924219 | 4.230515186 | 47.23847645 | 0.3357084 | 1.818720354 | 0.636552124 | 33957.8987 | 0.4422766 | 0.243063498 | 2.944550284 |
| LHDT1 | 4.495874345 | 23.32646188 | 14.84971888 | 0.138728609 | 0.984832359 | 0.344691326 | 14640.75653 | 0.20882477 | 2.306657153 | 5.118254036 |
| LHDT1 | 0 | 0 | 0 | 0 | 0.117034125 | 0.040961944 | 0 | 0 | 0 | 0 |
| MCY | 194.2167883 | 26.91989798 | 829.7325348 | 0.140455801 | 0.367719878 | 0.128701957 | 14207.5201 | 31.17074717 | 1.966153337 | 237.9729709 |
| MDV | 105.285972 | 174.4333036 | 2238.525873 | 11.43045555 | 10.61866858 | 3.716534003 | 1156224.423 | 26.73363205 | 14.85353053 | 153.6330432 |
| MDV | 3.508106578 | 2.697400288 | 76.11217204 | 0.157554121 | 0.157935207 | 0.055277322 | 16627.51145 | 0.162944845 | 2.6196712 | 3.993746104 |
| MDV | 0 | 0 | 0 | 0 | 3.221004377 | 1.127351532 | 0 | 0 | 0 | 0 |
| MDV | 0.253121689 | 0.246071564 | 21.35797806 | 0.07937147 | 0.741302927 | 0.259456024 | 8028.659156 | 0.079211524 | 0.043836331 | 0.369354574 |

# Center Park Specific Plan- Phase I Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan- Phase I |
| Construction Start Date | 12/1/2025 |
| Operational Year | 2027 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99350362244249, -117.62396749625904 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5260 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 256 | Dwelling Unit | 11.6 | 506,880 | 0.00 | — | 847 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 768 | Dwelling Unit | 34.9 | 1,520,640 | 0.00 | — | 2,542 | — |
| City Park | 19.6 | Acre | 19.6 | 0.00 | 855,518 | 855,518 | — | — |
| Other Non-Asphalt Surfaces | 3.38 | Acre | 3.38 | 0.00 | 147,233 | 147,233 | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Construction | C-2* | Limit Heavy-Duty Diesel Vehicle Idling |
| Construction | C-5 | Use Advanced Engine Tiers |
| Construction | C-13 | Use Low-VOC Paints for Construction |
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 608 | 607 | 79.2 | 90.4 | 0.15 | 3.23 | 12.0 | 13.6 | 2.97 | 4.07 | 7.04 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| Mit. | 122 | 122 | 13.7 | 100 | 0.15 | 0.31 | 12.0 | 12.3 | 0.31 | 4.07 | 4.37 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| % Reduced | 80% | 80% | 83% | -11% | — | 90% | — | 10% | 90% | — | 38% | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 9.06 | 7.47 | 56.1 | 100 | 0.11 | 2.30 | 18.7 | 19.6 | 2.12 | 4.47 | 5.27 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| Mit. | 7.20 | 5.99 | 18.8 | 104 | 0.11 | 0.25 | 18.7 | 19.0 | 0.25 | 4.47 | 4.71 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| % Reduced | 21% | 20% | 67% | -4% | — | 89% | — | 3% | 88% | — | 10% | — | — | — | — | — | — | — |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 36.3 | 36.1 | 35.4 | 48.3 | 0.08 | 1.35 | 6.91 | 8.26 | 1.25 | 2.26 | 3.50 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| Mit. | 8.09 | 7.91 | 8.47 | 52.2 | 0.08 | 0.16 | 6.91 | 7.07 | 0.16 | 2.26 | 2.42 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| % Reduced | 78% | 78% | 76% | -8% | — | 88% | — | 14% | 87% | — | 31% | — | — | — | — | — | — | — |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 6.63 | 6.58 | 6.45 | 8.81 | 0.01 | 0.25 | 1.26 | 1.51 | 0.23 | 0.41 | 0.64 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| Mit. | 1.48 | 1.44 | 1.55 | 9.53 | 0.01 | 0.03 | 1.26 | 1.29 | 0.03 | 0.41 | 0.44 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| % Reduced | 78% | 78% | 76% | -8% | — | 88% | — | 14% | 87% | — | 31% | — | — | — | — | — | — | — |

## 2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 4.51 | 3.91 | 13.7 | 100 | 0.15 | 0.31 | 12.0 | 12.3 | 0.31 | 4.07 | 4.37 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| 2027 | 122 | 122 | 8.50 | 59.9 | 0.05 | 0.12 | 9.37 | 9.49 | 0.12 | 2.24 | 2.36 | — | 14,381 | 14,381 | 0.43 | 0.81 | 35.2 | 14,669 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2025 | 1.23 | 1.03 | 9.36 | 49.5 | 0.09 | 0.18 | 7.34 | 7.52 | 0.18 | 3.05 | 3.24 | — | 10,823 | 10,823 | 0.55 | 0.36 | 0.14 | 10,944 |
| 2026 | 7.20 | 5.99 | 18.8 | 104 | 0.11 | 0.25 | 18.7 | 19.0 | 0.25 | 4.47 | 4.71 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| 2027 | 6.91 | 5.76 | 17.9 | 98.6 | 0.10 | 0.25 | 18.7 | 19.0 | 0.24 | 4.47 | 4.71 | — | 27,322 | 27,322 | 0.89 | 1.62 | 1.83 | 27,830 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 0.06 | 0.05 | 0.50 | 2.21 | < 0.005 | 0.01 | 0.30 | 0.31 | 0.01 | 0.11 | 0.12 | — | 506 | 506 | 0.03 | 0.02 | 0.13 | 512 |
| 2026 | 2.02 | 1.74 | 8.47 | 52.2 | 0.08 | 0.16 | 6.91 | 7.07 | 0.16 | 2.26 | 2.42 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| 2027 | 8.09 | 7.91 | 3.00 | 16.8 | 0.02 | 0.04 | 2.99 | 3.03 | 0.04 | 0.71 | 0.75 | — | 4,443 | 4,443 | 0.14 | 0.25 | 4.88 | 4,527 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 0.01 | 0.01 | 0.09 | 0.40 | < 0.005 | < 0.005 | 0.05 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 83.7 | 83.7 | < 0.005 | < 0.005 | 0.02 | 84.8 |
| 2026 | 0.37 | 0.32 | 1.55 | 9.53 | 0.01 | 0.03 | 1.26 | 1.29 | 0.03 | 0.41 | 0.44 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| 2027 | 1.48 | 1.44 | 0.55 | 3.07 | < 0.005 | 0.01 | 0.55 | 0.55 | 0.01 | 0.13 | 0.14 | — | 736 | 736 | 0.02 | 0.04 | 0.81 | 749 |

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 102,332 | 102,854 | 57.2 | 3.93 | 272 | 105,728 |
| Mit. | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 101,949 | 102,471 | 57.2 | 3.93 | 272 | 105,343 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 97,007 | 97,529 | 57.3 | 4.04 | 21.2 | 100,189 |
| Mit. | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 96,625 | 97,147 | 57.3 | 4.04 | 21.2 | 99,806 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 94,171 | 94,693 | 57.1 | 4.05 | 126 | 97,453 |
| Mit. | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 93,790 | 94,312 | 57.1 | 4.04 | 126 | 97,069 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 13.0 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,591 | 15,678 | 9.46 | 0.67 | 20.8 | 16,134 |
| Mit. | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 12.9 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,528 | 15,614 | 9.45 | 0.67 | 20.8 | 16,071 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 35.1 | 31.5 | 31.4 | 309 | 0.81 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 82,685 | 82,685 | 3.47 | 3.62 | 257 | 84,107 |
| Area | 52.8 | 52.5 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | 0.00 | 4,176 | 4,176 | 0.26 | 0.03 | — | 4,192 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 101,949 | 102,471 | 57.2 | 3.93 | 272 | 105,343 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 33.1 | 29.4 | 33.7 | 256 | 0.75 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 77,516 | 77,516 | 3.58 | 3.74 | 6.67 | 78,726 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | 47.4 | 47.4 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 96,625 | 97,147 | 57.3 | 4.04 | 21.2 | 99,806 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 32.8 | 29.2 | 34.3 | 266 | 0.76 | 0.53 | 71.0 | 71.5 | 0.49 | 18.0 | 18.5 | — | 78,319 | 78,319 | 3.58 | 3.77 | 111 | 79,642 |
| Area | 51.1 | 50.9 | 0.38 | 39.8 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 382 | 382 | 0.02 | < 0.005 | — | 383 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 93,790 | 94,312 | 57.1 | 4.04 | 126 | 97,069 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 5.99 | 5.33 | 6.26 | 48.5 | 0.14 | 0.10 | 12.9 | 13.0 | 0.09 | 3.29 | 3.38 | — | 12,967 | 12,967 | 0.59 | 0.62 | 18.4 | 13,186 |
| Area | 9.32 | 9.28 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | 0.00 | 63.2 | 63.2 | < 0.005 | < 0.005 | — | 63.4 |
| Energy | 0.11 | 0.06 | 0.96 | 0.41 | 0.01 | 0.08 | — | 0.08 | 0.08 | — | 0.08 | — | 2,382 | 2,382 | 0.18 | 0.01 | — | 2,390 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 13.5 | 116 | 129 | 1.40 | 0.03 | — | 174 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 72.9 | 0.00 | 72.9 | 7.28 | 0.00 | — | 255 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.40 | 2.40 |
| Total | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 12.9 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,528 | 15,614 | 9.45 | 0.67 | 20.8 | 16,071 |

# 3. Construction Emissions Details

## 3.2. Demolition (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,425 | 3,425 | 0.14 | 0.03 | — | 3,437 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.27 | 1.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 208 | 208 | 0.01 | < 0.005 | — | 208 |
| Demolition | — | — | — | — | — | — | 0.08 | 0.08 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.05 | 0.20 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 34.4 | 34.4 | < 0.005 | < 0.005 | — | 34.5 |
| Demolition | — | — | — | — | — | — | 0.01 | 0.01 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.88 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 194 | 194 | 0.01 | 0.01 | 0.02 | 196 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.21 | 0.03 | 2.11 | 1.14 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,682 | 1,682 | 0.18 | 0.28 | 0.09 | 1,769 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.9 | 11.9 | < 0.005 | < 0.005 | 0.02 | 12.1 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.13 | 0.07 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 102 | 102 | 0.01 | 0.02 | 0.09 | 107 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.97 | 1.97 | < 0.005 | < 0.005 | < 0.005 | 2.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | < 0.005 | 0.02 | 0.01 | < 0.005 | < 0.005 | < 0.005 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 16.9 | 16.9 | < 0.005 | < 0.005 | 0.02 | 17.8 |

## 3.4. Demolition (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.11 | 0.11 | 1.34 | 5.41 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 1,019 | 1,019 | 0.04 | 0.01 | — | 1,023 |
| Demolition | — | — | — | — | — | — | 0.40 | 0.40 | — | 0.06 | 0.06 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.24 | 0.99 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 169 | 169 | 0.01 | < 0.005 | — | 169 |
| Demolition | — | — | — | — | — | — | 0.07 | 0.07 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.07 | 0.06 | 0.06 | 1.08 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 207 | 207 | 0.01 | 0.01 | 0.71 | 210 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.20 | 0.03 | 1.95 | 1.11 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,651 | 1,651 | 0.17 | 0.26 | 3.36 | 1,737 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.82 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 190 | 190 | < 0.005 | 0.01 | 0.02 | 192 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.20 | 0.02 | 2.03 | 1.12 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,652 | 1,652 | 0.17 | 0.26 | 0.09 | 1,735 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.26 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 57.3 | 57.3 | < 0.005 | < 0.005 | 0.09 | 58.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.06 | 0.01 | 0.61 | 0.33 | < 0.005 | 0.01 | 0.13 | 0.14 | 0.01 | 0.04 | 0.04 | — | 491 | 491 | 0.05 | 0.08 | 0.43 | 516 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.48 | 9.48 | < 0.005 | < 0.005 | 0.02 | 9.61 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.11 | 0.06 | < 0.005 | < 0.005 | 0.02 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 81.3 | 81.3 | 0.01 | 0.01 | 0.07 | 85.5 |

## 3.6. Site Preparation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipm | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,295 | 5,295 | 0.21 | 0.04 | — | 5,314 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.09 | 0.94 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 176 | 176 | 0.01 | < 0.005 | — | 177 |
| Dust From Material Movement | — | — | — | — | — | — | 0.17 | 0.17 | — | 0.09 | 0.09 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 29.2 | 29.2 | < 0.005 | < 0.005 | — | 29.3 |
| Dust From Material Movement | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.08 | 0.08 | 1.03 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 226 | 226 | 0.01 | 0.01 | 0.02 | 229 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.63 | 7.63 | < 0.005 | < 0.005 | 0.01 | 7.74 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.26 | 1.26 | < 0.005 | < 0.005 | < 0.005 | 1.28 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.8. Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 0.84 | 9.20 | 0.02 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,721 | 1,721 | 0.07 | 0.01 | — | 1,727 |
| Dust From Material Movement | — | — | — | — | — | — | 1.66 | 1.66 | — | 0.85 | 0.85 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.03 | 0.03 | 0.15 | 1.68 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 285 | 285 | 0.01 | < 0.005 | — | 286 |
| Dust From Material Movement | — | — | — | — | — | — | 0.30 | 0.30 | — | 0.16 | 0.16 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.08 | 0.07 | 1.26 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 242 | 242 | 0.01 | 0.01 | 0.83 | 245 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.08 | 0.95 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 222 | 222 | < 0.005 | 0.01 | 0.02 | 224 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.02 | 0.03 | 0.33 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | 0.02 | 0.02 | — | 73.0 | 73.0 | < 0.005 | < 0.005 | 0.12 | 74.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | 0.02 | 12.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.10. Grading (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,599 | 6,599 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,599 | 6,599 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.31 | 0.31 | 2.12 | 16.9 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,164 | 3,164 | 0.13 | 0.03 | — | 3,175 |
| Dust From Material Movement | — | — | — | — | — | — | 1.15 | 1.15 | — | 0.46 | 0.46 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.06 | 0.39 | 3.09 | 0.01 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 524 | 524 | 0.02 | < 0.005 | — | 526 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | — | 0.21 | 0.21 | — | 0.08 | 0.08 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.10 | 0.09 | 0.08 | 1.44 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 276 | 276 | 0.01 | 0.01 | 0.94 | 280 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.09 | 1.09 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 253 | 253 | < 0.005 | 0.01 | 0.02 | 256 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.04 | 0.04 | 0.05 | 0.55 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 123 | 123 | < 0.005 | < 0.005 | 0.20 | 125 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.10 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | — | 20.4 | 20.4 | < 0.005 | < 0.005 | 0.03 | 20.7 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.12. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.17 | 0.87 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 141 | 141 | 0.01 | < 0.005 | — | 141 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.03 | 0.16 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 23.3 | 23.3 | < 0.005 | < 0.005 | — | 23.4 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 2.92 | 2.60 | 2.84 | 35.1 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,166 | 8,166 | 0.13 | 0.32 | 0.79 | 8,265 |
| Vendor | 0.33 | 0.06 | 3.73 | 1.97 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,322 | 3,322 | 0.24 | 0.51 | 0.23 | 3,481 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.15 | 0.18 | 2.17 | 0.00 | 0.00 | 0.49 | 0.49 | 0.00 | 0.11 | 0.11 | — | 486 | 486 | 0.01 | 0.02 | 0.77 | 493 |
| Vendor | 0.02 | < 0.005 | 0.22 | 0.12 | < 0.005 | < 0.005 | 0.05 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 195 | 195 | 0.01 | 0.03 | 0.22 | 205 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.40 | 0.00 | 0.00 | 0.09 | 0.09 | 0.00 | 0.02 | 0.02 | — | 80.5 | 80.5 | < 0.005 | < 0.005 | 0.13 | 81.6 |
| Vendor | < 0.005 | < 0.005 | 0.04 | 0.02 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 32.3 | 32.3 | < 0.005 | < 0.005 | 0.04 | 33.9 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.14. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.08 | 0.08 | 0.67 | 3.54 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 572 | 572 | 0.02 | < 0.005 | — | 574 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.01 | 0.12 | 0.65 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 94.8 | 94.8 | < 0.005 | < 0.005 | — | 95.1 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.97 | 2.66 | 2.25 | 43.2 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,726 | 8,726 | 0.10 | 0.31 | 27.4 | 8,847 |
| Vendor | 0.30 | 0.07 | 3.43 | 1.87 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,258 | 3,258 | 0.23 | 0.49 | 7.81 | 3,417 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.81 | 2.49 | 2.55 | 32.6 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,004 | 8,004 | 0.11 | 0.31 | 0.71 | 8,098 |
| Vendor | 0.30 | 0.06 | 3.60 | 1.89 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,260 | 3,260 | 0.23 | 0.49 | 0.20 | 3,411 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.67 | 0.60 | 0.67 | 8.15 | 0.00 | 0.00 | 1.99 | 1.99 | 0.00 | 0.47 | 0.47 | — | 1,938 | 1,938 | 0.03 | 0.07 | 2.83 | 1,963 |
| Vendor | 0.07 | 0.02 | 0.86 | 0.45 | 0.01 | 0.01 | 0.22 | 0.23 | 0.01 | 0.06 | 0.07 | — | 778 | 778 | 0.06 | 0.12 | 0.80 | 815 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.12 | 0.11 | 0.12 | 1.49 | 0.00 | 0.00 | 0.36 | 0.36 | 0.00 | 0.09 | 0.09 | — | 321 | 321 | < 0.005 | 0.01 | 0.47 | 325 |
| Vendor | 0.01 | < 0.005 | 0.16 | 0.08 | < 0.005 | < 0.005 | 0.04 | 0.04 | < 0.005 | 0.01 | 0.01 | — | 129 | 129 | 0.01 | 0.02 | 0.13 | 135 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.16. Infrastructure Improvements (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.10 | 0.84 | 4.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 718 | 718 | 0.03 | 0.01 | — | 720 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.15 | 0.81 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 119 | 119 | < 0.005 | < 0.005 | — | 119 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 3.09 | 2.79 | 2.55 | 46.5 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,904 | 8,904 | 0.38 | 0.31 | 30.5 | 9,035 |
| Vendor | 0.33 | 0.07 | 3.59 | 1.95 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,320 | 3,320 | 0.24 | 0.51 | 8.76 | 3,488 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.92 | 2.60 | 2.84 | 35.1 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,166 | 8,166 | 0.13 | 0.32 | 0.79 | 8,265 |
| Vendor | 0.33 | 0.06 | 3.73 | 1.97 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,322 | 3,322 | 0.24 | 0.51 | 0.23 | 3,481 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.88 | 0.78 | 0.93 | 11.1 | 0.00 | 0.00 | 2.49 | 2.49 | 0.00 | 0.58 | 0.58 | — | 2,479 | 2,479 | 0.04 | 0.10 | 3.94 | 2,513 |
| Vendor | 0.10 | 0.02 | 1.13 | 0.59 | 0.01 | 0.01 | 0.28 | 0.29 | 0.01 | 0.08 | 0.09 | — | 994 | 994 | 0.07 | 0.15 | 1.13 | 1,043 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.16 | 0.14 | 0.17 | 2.02 | 0.00 | 0.00 | 0.46 | 0.46 | 0.00 | 0.11 | 0.11 | — | 410 | 410 | 0.01 | 0.02 | 0.65 | 416 |
| Vendor | 0.02 | < 0.005 | 0.21 | 0.11 | < 0.005 | < 0.005 | 0.05 | 0.05 | < 0.005 | 0.01 | 0.02 | — | 165 | 165 | 0.01 | 0.03 | 0.19 | 173 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.18. Infrastructure Improvements (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.18 | 0.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 150 | 150 | 0.01 | < 0.005 | — | 151 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.03 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 24.9 | 24.9 | < 0.005 | < 0.005 | — | 24.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.81 | 2.49 | 2.55 | 32.6 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,004 | 8,004 | 0.11 | 0.31 | 0.71 | 8,098 |
| Vendor | 0.30 | 0.06 | 3.60 | 1.89 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,260 | 3,260 | 0.23 | 0.49 | 0.20 | 3,411 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.18 | 0.16 | 0.18 | 2.14 | 0.00 | 0.00 | 0.52 | 0.52 | 0.00 | 0.12 | 0.12 | — | 508 | 508 | 0.01 | 0.02 | 0.74 | 515 |
| Vendor | 0.02 | < 0.005 | 0.23 | 0.12 | < 0.005 | < 0.005 | 0.06 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 204 | 204 | 0.01 | 0.03 | 0.21 | 214 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.39 | 0.00 | 0.00 | 0.10 | 0.10 | 0.00 | 0.02 | 0.02 | — | 84.1 | 84.1 | < 0.005 | < 0.005 | 0.12 | 85.2 |
| Vendor | < 0.005 | < 0.005 | 0.04 | 0.02 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 33.8 | 33.8 | < 0.005 | 0.01 | 0.03 | 35.4 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.20. Paving (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.11 | 0.61 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 86.9 | 86.9 | < 0.005 | < 0.005 | — | 87.2 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.11 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 14.4 | 14.4 | < 0.005 | < 0.005 | — | 14.4 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.06 | 0.76 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 186 | 186 | < 0.005 | 0.01 | 0.02 | 188 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 10.9 | 10.9 | < 0.005 | < 0.005 | 0.02 | 11.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.80 | 1.80 | < 0.005 | < 0.005 | < 0.005 | 1.82 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.22. Architectural Coating (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.65 | 0.96 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 121 | 121 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.04 | 0.06 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 7.68 | 7.68 | < 0.005 | < 0.005 | — | 7.71 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architect Coatings | 6.96 | 6.96 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.27 | 1.27 | < 0.005 | < 0.005 | — | 1.28 |
| Architectural Coatings | 1.27 | 1.27 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.19 | 1.06 | 0.90 | 17.3 | 0.00 | 0.00 | 3.37 | 3.37 | 0.00 | 0.79 | 0.79 | — | 3,490 | 3,490 | 0.04 | 0.12 | 11.0 | 3,539 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.06 | 0.79 | 0.00 | 0.00 | 0.19 | 0.19 | 0.00 | 0.04 | 0.04 | — | 187 | 187 | < 0.005 | 0.01 | 0.27 | 189 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.14 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.01 | 0.01 | — | 30.9 | 30.9 | < 0.005 | < 0.005 | 0.05 | 31.3 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 10.2 | 9.13 | 8.95 | 87.8 | 0.23 | 0.15 | 20.3 | 20.5 | 0.14 | 5.16 | 5.30 | — | 23,411 | 23,411 | 0.99 | 1.03 | 72.7 | 23,816 |
| Apartments Low Rise | 21.8 | 19.6 | 19.2 | 188 | 0.49 | 0.32 | 43.5 | 43.9 | 0.30 | 11.1 | 11.4 | — | 50,156 | 50,156 | 2.13 | 2.21 | 156 | 51,022 |
| City Park | 3.16 | 2.78 | 3.28 | 33.0 | 0.09 | 0.06 | 7.96 | 8.02 | 0.05 | 2.02 | 2.07 | — | 9,117 | 9,117 | 0.35 | 0.38 | 28.5 | 9,269 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 35.1 | 31.5 | 31.4 | 309 | 0.81 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 82,685 | 82,685 | 3.47 | 3.62 | 257 | 84,107 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 9.57 | 8.54 | 9.61 | 72.9 | 0.21 | 0.15 | 20.3 | 20.5 | 0.14 | 5.16 | 5.30 | — | 21,949 | 21,949 | 1.02 | 1.06 | 1.89 | 22,293 |
| Apartments Low Rise | 20.5 | 18.3 | 20.6 | 156 | 0.46 | 0.32 | 43.5 | 43.9 | 0.30 | 11.1 | 11.4 | — | 47,023 | 47,023 | 2.19 | 2.28 | 4.04 | 47,761 |
| City Park | 2.99 | 2.61 | 3.52 | 26.9 | 0.08 | 0.06 | 7.96 | 8.02 | 0.05 | 2.02 | 2.07 | — | 8,544 | 8,544 | 0.36 | 0.40 | 0.74 | 8,672 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 33.1 | 29.4 | 33.7 | 256 | 0.75 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 77,516 | 77,516 | 3.58 | 3.74 | 6.67 | 78,726 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 1.73 | 1.55 | 1.78 | 13.8 | 0.04 | 0.03 | 3.66 | 3.69 | 0.03 | 0.93 | 0.96 | — | 3,672 | 3,672 | 0.17 | 0.18 | 5.20 | 3,734 |
| Apartments Low Rise | 3.72 | 3.31 | 3.82 | 29.6 | 0.08 | 0.06 | 7.85 | 7.91 | 0.05 | 1.99 | 2.05 | — | 7,866 | 7,866 | 0.36 | 0.38 | 11.1 | 7,999 |
| City Park | 0.54 | 0.47 | 0.66 | 5.10 | 0.02 | 0.01 | 1.43 | 1.45 | 0.01 | 0.36 | 0.37 | — | 1,429 | 1,429 | 0.06 | 0.07 | 2.04 | 1,453 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 5.99 | 5.33 | 6.26 | 48.5 | 0.14 | 0.10 | 12.9 | 13.0 | 0.09 | 3.29 | 3.38 | — | 12,967 | 12,967 | 0.59 | 0.62 | 18.4 | 13,186 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 2,743 | 2,743 | 0.17 | 0.02 | — | 2,753 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 4,979 | 4,979 | 0.31 | 0.04 | — | 4,997 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 7,721 | 7,721 | 0.48 | 0.06 | — | 7,750 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 2,743 | 2,743 | 0.17 | 0.02 | — | 2,753 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 4,979 | 4,979 | 0.31 | 0.04 | — | 4,997 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 7,721 | 7,721 | 0.48 | 0.06 | — | 7,750 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 454 | 454 | 0.03 | < 0.005 | — | 456 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 824 | 824 | 0.05 | 0.01 | — | 827 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 1,278 | 1,278 | 0.08 | 0.01 | — | 1,283 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.24 | 0.12 | 2.02 | 0.86 | 0.01 | 0.16 | — | 0.16 | 0.16 | — | 0.16 | — | 2,567 | 2,567 | 0.23 | < 0.005 | — | 2,574 |
| Apartments Low Rise | 0.38 | 0.19 | 3.23 | 1.37 | 0.02 | 0.26 | — | 0.26 | 0.26 | — | 0.26 | — | 4,100 | 4,100 | 0.36 | 0.01 | — | 4,111 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 6,667 | 6,667 | 0.59 | 0.01 | — | 6,685 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.24 | 0.12 | 2.02 | 0.86 | 0.01 | 0.16 | — | 0.16 | 0.16 | — | 0.16 | — | 2,567 | 2,567 | 0.23 | < 0.005 | — | 2,574 |
| Apartments Low Rise | 0.38 | 0.19 | 3.23 | 1.37 | 0.02 | 0.26 | — | 0.26 | 0.26 | — | 0.26 | — | 4,100 | 4,100 | 0.36 | 0.01 | — | 4,111 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 6,667 | 6,667 | 0.59 | 0.01 | — | 6,685 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.04 | 0.02 | 0.37 | 0.16 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 425 | 425 | 0.04 | < 0.005 | — | 426 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartment Low Rise | 0.07 | 0.03 | 0.59 | 0.25 | < 0.005 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 679 | 679 | 0.06 | < 0.005 | — | 681 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.11 | 0.06 | 0.96 | 0.41 | 0.01 | 0.08 | — | 0.08 | 0.08 | — | 0.08 | — | 1,104 | 1,104 | 0.10 | < 0.005 | — | 1,107 |

## 4.3. Area Emissions by Source

### 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Consumer Products | 43.9 | 43.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 3.49 | 3.49 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 5.38 | 5.10 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | — | 155 | 155 | 0.01 | < 0.005 | — | 156 |
| Total | 52.8 | 52.5 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | 0.00 | 4,176 | 4,176 | 0.26 | 0.03 | — | 4,192 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Consumer Products | 43.9 | 43.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 3.49 | 3.49 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 47.4 | 47.4 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 45.6 | 45.6 | < 0.005 | < 0.005 | — | 45.8 |
| Consumer Products | 8.01 | 8.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 0.64 | 0.64 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 0.67 | 0.64 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 17.6 | 17.6 | < 0.005 | < 0.005 | — | 17.7 |
| Total | 9.32 | 9.28 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | 0.00 | 63.2 | 63.2 | < 0.005 | < 0.005 | — | 63.4 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 20.4 | 106 | 126 | 2.10 | 0.05 | — | 194 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 61.3 | 318 | 379 | 6.31 | 0.15 | — | 582 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 236 | 236 | 0.01 | < 0.005 | — | 237 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 40.6 | 40.6 | < 0.005 | < 0.005 | — | 40.8 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 20.4 | 106 | 126 | 2.10 | 0.05 | — | 194 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 61.3 | 318 | 379 | 6.31 | 0.15 | — | 582 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 236 | 236 | 0.01 | < 0.005 | — | 237 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 40.6 | 40.6 | < 0.005 | < 0.005 | — | 40.8 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 3.39 | 17.5 | 20.9 | 0.35 | 0.01 | — | 32.1 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 10.2 | 52.6 | 62.7 | 1.04 | 0.03 | — | 96.3 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 39.1 | 39.1 | < 0.005 | < 0.005 | — | 39.2 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 6.73 | 6.73 | < 0.005 | < 0.005 | — | 6.75 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 13.5 | 116 | 129 | 1.40 | 0.03 | — | 174 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 133 | 0.00 | 133 | 13.3 | 0.00 | — | 466 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 306 | 0.00 | 306 | 30.6 | 0.00 | — | 1,071 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 0.00 | 0.91 | 0.09 | 0.00 | — | 3.18 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 133 | 0.00 | 133 | 13.3 | 0.00 | — | 466 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 306 | 0.00 | 306 | 30.6 | 0.00 | — | 1,071 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 0.00 | 0.91 | 0.09 | 0.00 | — | 3.18 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 22.1 | 0.00 | 22.1 | 2.21 | 0.00 | — | 77.2 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 50.7 | 0.00 | 50.7 | 5.06 | 0.00 | — | 177 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.15 | 0.00 | 0.15 | 0.02 | 0.00 | — | 0.53 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 72.9 | 0.00 | 72.9 | 7.28 | 0.00 | — | 255 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.63 | 3.63 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 10.9 | 10.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.63 | 3.63 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 10.9 | 10.9 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.60 | 0.60 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.80 | 1.80 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.40 | 2.40 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remove | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Demolition | Demolition | 12/1/2025 | 6/1/2026 | 5.00 | 131 | — |
| Site Preparation | Site Preparation | 12/15/2025 | 6/15/2026 | 5.00 | 131 | — |
| Grading | Grading | 4/1/2026 | 12/1/2026 | 5.00 | 175 | — |
| Building Construction | Building Construction | 12/2/2026 | 5/2/2027 | 5.00 | 108 | — |
| Infrastructure Improvements | Building Construction | 8/1/2026 | 2/1/2027 | 5.00 | 131 | — |
| Paving | Paving | 2/2/2027 | 3/2/2027 | 5.00 | 21.0 | — |
| Architectural Coating | Architectural Coating | 5/3/2027 | 5/31/2027 | 5.00 | 21.0 | — |

## 5.2. Off-Road Equipment

### 5.2.2. Mitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Demolition | Rubber Tired Dozers | Diesel | Tier 4 Final | 2.00 | 8.00 | 367 | 0.40 |
| Demolition | Excavators | Diesel | Tier 4 Final | 3.00 | 8.00 | 36.0 | 0.38 |
| Demolition | Concrete/Industrial Saws | Diesel | Tier 4 Final | 1.00 | 8.00 | 33.0 | 0.73 |
| Site Preparation | Rubber Tired Dozers | Diesel | Tier 4 Final | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Graders | Diesel | Tier 4 Final | 1.00 | 8.00 | 148 | 0.41 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Grading | Excavators | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Grading | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 2.00 | 8.00 | 84.0 | 0.37 |
| Grading | Scrapers | Diesel | Tier 4 Final | 2.00 | 8.00 | 423 | 0.48 |
| Grading | Rubber Tired Dozers | Diesel | Tier 4 Final | 1.00 | 8.00 | 367 | 0.40 |
| Building Construction | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Building Construction | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Infrastructure Improvements | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Infrastructure Improvements | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Infrastructure Improvements | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Infrastructure Improvements | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Infrastructure Improvements | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Paving | Pavers | Diesel | Tier 4 Final | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Tier 4 Final | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Tier 4 Final | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.2. Mitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Demolition | — | — | — | — |

| | | | | |
|---|---|---|---|---|
| Demolition | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Demolition | Vendor | — | 10.2 | HHDT,MHDT |
| Demolition | Hauling | 24.3 | 20.0 | HHDT |
| Demolition | Onsite truck | — | — | HHDT |
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 18.5 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 10.2 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 20.0 | 18.5 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 10.2 | HHDT,MHDT |
| Grading | Hauling | 0.00 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 645 | 18.5 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 109 | 10.2 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 10.2 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 258 | 18.5 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 10.2 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |

| | | | | |
|---|---|---|---|---|
| Architectural Coating | Onsite truck | — | — | HHDT |
| Infrastructure Improvements | — | — | — | — |
| Infrastructure Improvements | Worker | 645 | 18.5 | LDA,LDT1,LDT2 |
| Infrastructure Improvements | Vendor | 109 | 10.2 | HHDT,MHDT |
| Infrastructure Improvements | Hauling | 0.00 | 20.0 | HHDT |
| Infrastructure Improvements | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

| Control Strategies Applied | PM10 Reduction | PM2.5 Reduction |
|---|---|---|
| Water unpaved roads twice daily | 55% | 55% |
| Limit vehicle speeds on unpaved roads to 25 mph | 44% | 44% |

## 5.5. Architectural Coatings

| Phase Name | Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|---|
| Architectural Coating | 4,105,728 | 1,368,576 | 0.00 | 0.00 | 8,834 |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (cy) | Material Exported (cy) | Acres Graded (acres) | Material Demolished (Ton of Debris) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Demolition | 0.00 | 0.00 | 0.00 | 12,744 | — |
| Site Preparation | — | — | 197 | 0.00 | — |
| Grading | — | — | 525 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 6.20 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 3 | 74% | 74% |
| Water Demolished Area | 2 | 36% | 36% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Single Family Housing | 2.82 | 0% |
| Apartments Low Rise | — | 0% |
| City Park | 0.00 | 0% |
| Other Non-Asphalt Surfaces | 3.38 | 0% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2025 | 0.00 | 532 | 0.03 | < 0.005 |
| 2026 | 0.00 | 532 | 0.03 | < 0.005 |
| 2027 | 0.00 | 532 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 2,416 | 2,416 | 2,416 | 881,840 | 28,649 | 28,649 | 28,649 | 10,456,835 |
| Apartments Low Rise | 5,176 | 5,176 | 5,176 | 1,889,240 | 61,377 | 61,377 | 61,377 | 22,402,558 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| City Park | 677 | 677 | 677 | 246,933 | 11,219 | 11,219 | 11,219 | 4,094,910 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 174 |
| No Fireplaces | 82 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 523 |
| No Fireplaces | 245 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |

| | |
|---|---|
| Pellet Wood Stoves | 0 |

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 4105728 | 1,368,576 | 0.00 | 0.00 | 8,834 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 1,881,731 | 532 | 0.0330 | 0.0040 | 8,010,167 |
| Apartments Low Rise | 3,415,883 | 532 | 0.0330 | 0.0040 | 12,792,237 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Single Family Housing | 10,670,381 | 0.00 |
| Apartments Low Rise | 32,011,142 | 0.00 |

| | | |
|---|---|---|
| City Park | 0.00 | 30,530,835 |
| Other Non-Asphalt Surfaces | 0.00 | 5,254,288 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 247 | — |
| Apartments Low Rise | 568 | — |
| City Park | 1.69 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

#### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

#### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 19.8 | annual days of extreme heat |
| Extreme Precipitation | 3.10 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 6.78 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |

| | |
|---|---|
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |

| | |
|---|---|
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |

| | |
|---|---|
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|
| Land Use | per center park specific plan provisions and traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Construction: Construction Phases | per construction questionnaire from client |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD 445 (Wood Burning) prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

# Center Park Specific Plan - Phase II Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan - Phase II |
| Construction Start Date | 12/2/2026 |
| Operational Year | 2030 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99545776525716, -117.63174085978615 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5259 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 546 | Dwelling Unit | 24.8 | 1,081,080 | 0.00 | — | 1,807 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 2,723 | Dwelling Unit | 105 | 4,592,865 | 0.00 | — | 9,013 | — |
| Strip Mall | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant w/o Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant with Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| General Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| Medical Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| City Park | 36.3 | Acre | 36.3 | 0.00 | 1,582,970 | 1,582,970 | — | — |
| Other Non-Asphalt Surfaces | 7.90 | Acre | 7.90 | 0.00 | 344,124 | 344,124 | — | — |
| Parking Lot | 6.95 | Acre | 6.95 | 0.00 | 0.00 | — | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Construction | C-2* | Limit Heavy-Duty Diesel Vehicle Idling |
| Construction | C-5 | Use Advanced Engine Tiers |
| Construction | C-13 | Use Low-VOC Paints for Construction |
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 16.2 | 13.6 | 78.2 | 199 | 0.17 | 3.06 | 35.3 | 36.9 | 2.82 | 8.81 | 10.3 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| Mit. | 12.5 | 10.5 | 27.4 | 209 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| % Reduced | 23% | 22% | 65% | -5% | — | 88% | — | 3% | 87% | — | 10% | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 1,904 | 1,904 | 64.7 | 259 | 0.24 | 2.14 | 65.6 | 66.8 | 1.97 | 15.6 | 16.6 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| Mit. | 371 | 370 | 47.8 | 264 | 0.24 | 0.53 | 65.6 | 66.1 | 0.37 | 15.6 | 16.0 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| % Reduced | 81% | 81% | 26% | -2% | — | 75% | — | 1% | 81% | — | 4% | — | — | — | — | — | — | — |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 105 | 105 | 38.4 | 113 | 0.10 | 1.29 | 27.1 | 27.6 | 1.19 | 6.47 | 6.84 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| Mit. | 21.4 | 21.1 | 20.5 | 114 | 0.10 | 0.22 | 27.1 | 27.3 | 0.20 | 6.47 | 6.61 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| % Reduced | 80% | 80% | 47% | -2% | — | 83% | — | 1% | 83% | — | 3% | — | — | — | — | — | — | — |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 19.3 | 19.2 | 7.01 | 20.5 | 0.02 | 0.24 | 4.95 | 5.03 | 0.22 | 1.18 | 1.25 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| Mit. | 3.90 | 3.86 | 3.75 | 20.9 | 0.02 | 0.04 | 4.95 | 4.99 | 0.04 | 1.18 | 1.21 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| % Reduced | 80% | 80% | 47% | -2% | — | 83% | — | 1% | 83% | — | 3% | — | — | — | — | — | — | — |

## 2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2027 | 12.5 | 10.5 | 27.4 | 209 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| 2028 | 10.8 | 9.79 | 24.3 | 172 | 0.13 | 0.28 | 32.9 | 33.2 | 0.19 | 7.85 | 8.04 | — | 45,254 | 45,254 | 1.24 | 2.84 | 111 | 46,243 |
| 2029 | 9.89 | 8.99 | 20.8 | 151 | 0.11 | 0.16 | 32.7 | 32.8 | 0.16 | 7.80 | 7.96 | — | 42,706 | 42,706 | 1.12 | 2.73 | 98.2 | 43,647 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 1.49 | 1.05 | 12.1 | 50.9 | 0.11 | 0.21 | 9.89 | 10.1 | 0.21 | 3.52 | 3.73 | — | 13,129 | 13,129 | 0.76 | 0.73 | 0.25 | 13,365 |
| 2027 | 11.9 | 9.93 | 29.0 | 171 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 48,731 | 48,731 | 1.59 | 2.88 | 3.22 | 49,633 |
| 2028 | 20.3 | 18.2 | 47.8 | 264 | 0.24 | 0.53 | 65.6 | 66.1 | 0.35 | 15.6 | 16.0 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| 2029 | 9.78 | 7.90 | 24.2 | 130 | 0.13 | 0.19 | 32.9 | 33.1 | 0.19 | 7.85 | 8.04 | — | 41,995 | 41,995 | 1.23 | 2.75 | 2.55 | 42,848 |
| 2030 | 371 | 370 | 20.8 | 112 | 0.11 | 0.16 | 32.7 | 32.8 | 0.16 | 7.80 | 7.96 | — | 39,526 | 39,526 | 1.07 | 2.73 | 2.26 | 40,370 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.07 | 0.05 | 0.65 | 2.25 | 0.01 | 0.01 | 0.44 | 0.45 | 0.01 | 0.14 | 0.15 | — | 631 | 631 | 0.04 | 0.04 | 0.24 | 644 |
| 2027 | 4.17 | 3.45 | 13.4 | 75.4 | 0.10 | 0.20 | 14.0 | 14.2 | 0.20 | 3.91 | 4.11 | — | 19,987 | 19,987 | 0.76 | 1.09 | 17.3 | 20,349 |
| 2028 | 8.38 | 7.54 | 20.5 | 114 | 0.10 | 0.22 | 27.1 | 27.3 | 0.14 | 6.47 | 6.61 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| 2029 | 6.72 | 5.43 | 16.1 | 89.7 | 0.08 | 0.12 | 23.1 | 23.2 | 0.12 | 5.51 | 5.62 | — | 29,160 | 29,160 | 0.84 | 1.95 | 30.3 | 29,794 |
| 2030 | 21.4 | 21.1 | 2.63 | 15.9 | 0.01 | 0.02 | 4.43 | 4.45 | 0.02 | 1.05 | 1.07 | — | 5,277 | 5,277 | 0.13 | 0.34 | 5.05 | 5,388 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.01 | 0.01 | 0.12 | 0.41 | < 0.005 | < 0.005 | 0.08 | 0.08 | < 0.005 | 0.03 | 0.03 | — | 104 | 104 | 0.01 | 0.01 | 0.04 | 107 |
| 2027 | 0.76 | 0.63 | 2.45 | 13.8 | 0.02 | 0.04 | 2.56 | 2.60 | 0.04 | 0.71 | 0.75 | — | 3,309 | 3,309 | 0.13 | 0.18 | 2.86 | 3,369 |
| 2028 | 1.53 | 1.38 | 3.75 | 20.9 | 0.02 | 0.04 | 4.95 | 4.99 | 0.03 | 1.18 | 1.21 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| 2029 | 1.23 | 0.99 | 2.93 | 16.4 | 0.01 | 0.02 | 4.21 | 4.23 | 0.02 | 1.00 | 1.03 | — | 4,828 | 4,828 | 0.14 | 0.32 | 5.02 | 4,933 |
| 2030 | 3.90 | 3.86 | 0.48 | 2.90 | < 0.005 | < 0.005 | 0.81 | 0.81 | < 0.005 | 0.19 | 0.20 | — | 874 | 874 | 0.02 | 0.06 | 0.84 | 892 |

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 296 | 278 | 145 | 1,508 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.7 | 92.4 | 2,650 | 452,002 | 454,652 | 285 | 17.3 | 1,028 | 467,980 |
| Mit. | 296 | 278 | 145 | 1,506 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.6 | 92.3 | 2,650 | 450,333 | 452,983 | 285 | 17.3 | 1,027 | 466,298 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 270 | 254 | 153 | 1,082 | 3.58 | 3.72 | 349 | 353 | 3.58 | 88.7 | 92.3 | 2,650 | 427,769 | 430,419 | 286 | 17.8 | 186 | 443,057 |
| Mit. | 270 | 254 | 153 | 1,080 | 3.57 | 3.71 | 349 | 353 | 3.58 | 88.6 | 92.2 | 2,650 | 426,132 | 428,782 | 285 | 17.8 | 186 | 441,409 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 282 | 265 | 156 | 1,258 | 3.62 | 3.79 | 345 | 349 | 3.64 | 87.7 | 91.3 | 2,650 | 419,861 | 422,511 | 285 | 17.9 | 537 | 435,494 |
| Mit. | 282 | 265 | 156 | 1,256 | 3.62 | 3.79 | 345 | 349 | 3.63 | 87.5 | 91.2 | 2,650 | 418,220 | 420,870 | 285 | 17.8 | 536 | 433,840 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 51.4 | 48.3 | 28.5 | 230 | 0.66 | 0.69 | 63.0 | 63.7 | 0.66 | 16.0 | 16.7 | 439 | 69,513 | 69,952 | 47.2 | 2.96 | 88.9 | 72,101 |
| Mit. | 51.4 | 48.3 | 28.5 | 229 | 0.66 | 0.69 | 62.9 | 63.6 | 0.66 | 16.0 | 16.6 | 439 | 69,241 | 69,680 | 47.1 | 2.95 | 88.8 | 71,827 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 136 | 121 | 124 | 1,299 | 3.69 | 2.18 | 349 | 351 | 2.04 | 88.6 | 90.6 | — | 378,689 | 378,689 | 14.3 | 16.1 | 864 | 384,694 |
| Area | 157 | 156 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | 0.00 | 13,376 | 13,376 | 0.82 | 0.10 | — | 13,426 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 296 | 278 | 145 | 1,506 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.6 | 92.3 | 2,650 | 450,333 | 452,983 | 285 | 17.3 | 1,027 | 466,298 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 129 | 114 | 133 | 1,071 | 3.45 | 2.18 | 349 | 351 | 2.05 | 88.6 | 90.6 | — | 355,028 | 355,028 | 14.7 | 16.5 | 22.4 | 360,348 |
| Area | 138 | 138 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 270 | 254 | 153 | 1,080 | 3.57 | 3.71 | 349 | 353 | 3.58 | 88.6 | 92.2 | 2,650 | 426,132 | 428,782 | 285 | 17.8 | 186 | 441,409 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 128 | 113 | 136 | 1,112 | 3.49 | 2.18 | 345 | 347 | 2.04 | 87.5 | 89.6 | — | 358,701 | 358,701 | 14.7 | 16.7 | 373 | 364,408 |
| Area | 151 | 150 | 1.25 | 135 | 0.01 | 0.07 | — | 0.07 | 0.05 | — | 0.05 | 0.00 | 1,249 | 1,249 | 0.07 | 0.01 | — | 1,254 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 282 | 265 | 156 | 1,256 | 3.62 | 3.79 | 345 | 349 | 3.63 | 87.5 | 91.2 | 2,650 | 418,220 | 420,870 | 285 | 17.8 | 536 | 433,840 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 23.4 | 20.7 | 24.7 | 203 | 0.64 | 0.40 | 62.9 | 63.3 | 0.37 | 16.0 | 16.4 | — | 59,387 | 59,387 | 2.43 | 2.76 | 61.7 | 60,332 |
| Area | 27.6 | 27.4 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | 0.00 | 207 | 207 | 0.01 | < 0.005 | — | 208 |
| Energy | 0.41 | 0.20 | 3.50 | 1.75 | 0.02 | 0.28 | — | 0.28 | 0.28 | — | 0.28 | — | 9,258 | 9,258 | 0.68 | 0.05 | — | 9,289 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 58.1 | 389 | 447 | 5.98 | 0.14 | — | 640 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 381 | 0.00 | 381 | 38.0 | 0.00 | — | 1,332 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 27.1 | 27.1 |
| Total | 51.4 | 48.3 | 28.5 | 229 | 0.66 | 0.69 | 62.9 | 63.6 | 0.66 | 16.0 | 16.6 | 439 | 69,241 | 69,680 | 47.1 | 2.95 | 88.8 | 71,827 |

# 3. Construction Emissions Details

## 3.2. Demolition (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.26 | 1.07 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 201 | 201 | 0.01 | < 0.005 | — | 202 |
| Demolition | — | — | — | — | — | — | 0.19 | 0.19 | — | 0.03 | 0.03 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.05 | 0.19 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 33.3 | 33.3 | < 0.005 | < 0.005 | — | 33.4 |
| Demolition | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.82 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 190 | 190 | < 0.005 | 0.01 | 0.02 | 192 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.49 | 0.06 | 4.90 | 2.70 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,994 | 3,994 | 0.40 | 0.64 | 0.21 | 4,194 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.3 | 11.3 | < 0.005 | < 0.005 | 0.02 | 11.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.03 | < 0.005 | 0.29 | 0.16 | < 0.005 | < 0.005 | 0.06 | 0.07 | < 0.005 | 0.02 | 0.02 | — | 234 | 234 | 0.02 | 0.04 | 0.21 | 246 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.87 | 1.87 | < 0.005 | < 0.005 | < 0.005 | 1.90 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.05 | 0.03 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 38.8 | 38.8 | < 0.005 | 0.01 | 0.03 | 40.8 |

## 3.4. Demolition (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,439 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,439 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road | 0.11 | 0.11 | 1.35 | 5.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 1,026 | 1,026 | 0.04 | 0.01 | — | 1,030 |
| Demolition | — | — | — | — | — | — | 0.98 | 0.98 | — | 0.15 | 0.15 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.25 | 0.99 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 170 | 170 | 0.01 | < 0.005 | — | 170 |
| Demolition | — | — | — | — | — | — | 0.18 | 0.18 | — | 0.03 | 0.03 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.05 | 1.01 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 203 | 203 | < 0.005 | 0.01 | 0.64 | 206 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.46 | 0.06 | 4.54 | 2.58 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,911 | 3,911 | 0.40 | 0.64 | 7.45 | 4,119 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.06 | 0.76 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 186 | 186 | < 0.005 | 0.01 | 0.02 | 188 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.46 | 0.06 | 4.74 | 2.59 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,912 | 3,912 | 0.40 | 0.64 | 0.19 | 4,113 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.24 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 56.5 | 56.5 | < 0.005 | < 0.005 | 0.08 | 57.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.14 | 0.02 | 1.43 | 0.77 | 0.01 | 0.02 | 0.32 | 0.34 | 0.02 | 0.09 | 0.10 | — | 1,171 | 1,171 | 0.12 | 0.19 | 0.96 | 1,232 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.35 | 9.35 | < 0.005 | < 0.005 | 0.01 | 9.48 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.03 | < 0.005 | 0.26 | 0.14 | < 0.005 | < 0.005 | 0.06 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 194 | 194 | 0.02 | 0.03 | 0.16 | 204 |

## 3.6. Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.09 | 0.94 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 176 | 176 | 0.01 | < 0.005 | — | 177 |
| Dust From Material Movement | — | — | — | — | — | — | 0.17 | 0.17 | — | 0.09 | 0.09 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 29.2 | 29.2 | < 0.005 | < 0.005 | — | 29.3 |
| Dust From Material Movement | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.08 | 0.95 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 222 | 222 | < 0.005 | 0.01 | 0.02 | 224 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.47 | 7.47 | < 0.005 | < 0.005 | 0.01 | 7.57 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.24 | 1.24 | < 0.005 | < 0.005 | < 0.005 | 1.25 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.8. Site Preparation (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 0.84 | 9.20 | 0.02 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,721 | 1,721 | 0.07 | 0.01 | — | 1,727 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | — | 1.66 | 1.66 | — | 0.85 | 0.85 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.03 | 0.03 | 0.15 | 1.68 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 285 | 285 | 0.01 | < 0.005 | — | 286 |
| Dust From Material Movement | — | — | — | — | — | — | 0.30 | 0.30 | — | 0.16 | 0.16 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.06 | 1.17 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 237 | 237 | < 0.005 | 0.01 | 0.74 | 240 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.07 | 0.88 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 217 | 217 | < 0.005 | 0.01 | 0.02 | 220 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.30 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | 0.02 | 0.02 | — | 71.5 | 71.5 | < 0.005 | < 0.005 | 0.10 | 72.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.8 | 11.8 | < 0.005 | < 0.005 | 0.02 | 12.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.10. Grading (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,598 | 6,598 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,598 | 6,598 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.31 | 0.31 | 2.12 | 16.9 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,163 | 3,163 | 0.13 | 0.03 | — | 3,174 |
| Dust From Material Movement | — | — | — | — | — | — | 1.15 | 1.15 | — | 0.46 | 0.46 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.06 | 0.39 | 3.09 | 0.01 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 524 | 524 | 0.02 | < 0.005 | — | 526 |
| Dust From Material Movement | — | — | — | — | — | — | 0.21 | 0.21 | — | 0.08 | 0.08 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.07 | 1.34 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 271 | 271 | < 0.005 | 0.01 | 0.85 | 274 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.08 | 1.01 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 248 | 248 | < 0.005 | 0.01 | 0.02 | 251 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.04 | 0.04 | 0.04 | 0.51 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 121 | 121 | < 0.005 | < 0.005 | 0.18 | 122 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.09 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | — | 20.0 | 20.0 | < 0.005 | < 0.005 | 0.03 | 20.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.12. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipm | 0.06 | 0.06 | 0.51 | 2.67 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 432 | 432 | 0.02 | < 0.005 | — | 433 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.09 | 0.49 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 71.5 | 71.5 | < 0.005 | < 0.005 | — | 71.7 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.36 | 7.85 | 105 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,329 | 27,329 | 0.40 | 1.06 | 2.23 | 27,659 |
| Vendor | 1.06 | 0.23 | 12.2 | 6.55 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,366 | 11,366 | 0.73 | 1.74 | 0.64 | 11,903 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.52 | 1.50 | 1.58 | 20.0 | 0.00 | 0.00 | 5.22 | 5.22 | 0.00 | 1.22 | 1.22 | — | 4,989 | 4,989 | 0.07 | 0.19 | 6.67 | 5,055 |
| Vendor | 0.19 | 0.04 | 2.20 | 1.17 | 0.02 | 0.03 | 0.60 | 0.63 | 0.02 | 0.16 | 0.18 | — | 2,046 | 2,046 | 0.13 | 0.31 | 1.92 | 2,144 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.28 | 0.27 | 0.29 | 3.65 | 0.00 | 0.00 | 0.95 | 0.95 | 0.00 | 0.22 | 0.22 | — | 826 | 826 | 0.01 | 0.03 | 1.10 | 837 |
| Vendor | 0.03 | 0.01 | 0.40 | 0.21 | < 0.005 | 0.01 | 0.11 | 0.11 | < 0.005 | 0.03 | 0.03 | — | 339 | 339 | 0.02 | 0.05 | 0.32 | 355 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.14. Building Construction (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.25 | 0.23 | 2.01 | 10.6 | 0.02 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 1,712 | 1,712 | 0.07 | 0.01 | — | 1,718 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.05 | 0.04 | 0.37 | 1.93 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 283 | 283 | 0.01 | < 0.005 | — | 284 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.41 | 6.78 | 130 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 29,248 | 29,248 | 0.30 | 1.06 | 76.5 | 29,649 |
| Vendor | 0.98 | 0.24 | 11.2 | 6.16 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 11,061 | 11,061 | 0.73 | 1.65 | 21.7 | 11,593 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.12 | 7.00 | 7.80 | 98.1 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 26,840 | 26,840 | 0.35 | 1.06 | 1.98 | 27,167 |
| Vendor | 0.96 | 0.23 | 11.7 | 6.25 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 11,068 | 11,068 | 0.73 | 1.65 | 0.56 | 11,579 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 5.76 | 5.00 | 5.57 | 74.0 | 0.00 | 0.00 | 20.7 | 20.7 | 0.00 | 4.85 | 4.85 | — | 19,439 | 19,439 | 0.25 | 0.76 | 23.6 | 19,696 |
| Vendor | 0.69 | 0.17 | 8.38 | 4.44 | 0.06 | 0.06 | 2.36 | 2.43 | 0.06 | 0.65 | 0.72 | — | 7,903 | 7,903 | 0.52 | 1.18 | 6.71 | 8,274 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.05 | 0.91 | 1.02 | 13.5 | 0.00 | 0.00 | 3.78 | 3.78 | 0.00 | 0.89 | 0.89 | — | 3,218 | 3,218 | 0.04 | 0.13 | 3.90 | 3,261 |
| Vendor | 0.13 | 0.03 | 1.53 | 0.81 | 0.01 | 0.01 | 0.43 | 0.44 | 0.01 | 0.12 | 0.13 | — | 1,308 | 1,308 | 0.09 | 0.20 | 1.11 | 1,370 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.16. Building Construction (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.04 | 0.04 | 0.33 | 1.74 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 281 | 281 | 0.01 | < 0.005 | — | 282 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.06 | 0.32 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 46.6 | 46.6 | < 0.005 | < 0.005 | — | 46.8 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 7.77 | 6.71 | 6.78 | 91.5 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 26,384 | 26,384 | 0.35 | 1.06 | 1.77 | 26,712 |
| Vendor | 0.86 | 0.22 | 11.2 | 6.06 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 10,745 | 10,745 | 0.63 | 1.65 | 0.49 | 11,253 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.91 | 0.78 | 0.80 | 11.3 | 0.00 | 0.00 | 3.40 | 3.40 | 0.00 | 0.80 | 0.80 | — | 3,141 | 3,141 | 0.04 | 0.12 | 3.44 | 3,183 |
| Vendor | 0.10 | 0.03 | 1.32 | 0.71 | 0.01 | 0.01 | 0.39 | 0.40 | 0.01 | 0.11 | 0.12 | — | 1,261 | 1,261 | 0.07 | 0.19 | 0.96 | 1,322 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.14 | 0.15 | 2.06 | 0.00 | 0.00 | 0.62 | 0.62 | 0.00 | 0.15 | 0.15 | — | 520 | 520 | 0.01 | 0.02 | 0.57 | 527 |
| Vendor | 0.02 | < 0.005 | 0.24 | 0.13 | < 0.005 | < 0.005 | 0.07 | 0.07 | < 0.005 | 0.02 | 0.02 | — | 209 | 209 | 0.01 | 0.03 | 0.16 | 219 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.18. Infrastructure Improvements (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.10 | 0.84 | 4.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 718 | 718 | 0.03 | 0.01 | — | 720 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.15 | 0.81 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 119 | 119 | < 0.005 | < 0.005 | — | 119 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 10.3 | 9.26 | 7.85 | 150 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 30,366 | 30,366 | 0.35 | 1.06 | 95.5 | 30,788 |
| Vendor | 1.08 | 0.24 | 12.2 | 6.65 | 0.09 | 0.18 | 3.34 | 3.52 | 0.18 | 0.92 | 1.10 | — | 11,626 | 11,626 | 0.83 | 1.74 | 27.9 | 12,192 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 9.78 | 8.66 | 8.86 | 113 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,854 | 27,854 | 0.40 | 1.06 | 2.47 | 28,184 |
| Vendor | 1.06 | 0.23 | 12.8 | 6.75 | 0.09 | 0.18 | 3.34 | 3.52 | 0.18 | 0.92 | 1.10 | — | 11,633 | 11,633 | 0.83 | 1.74 | 0.72 | 12,172 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.94 | 2.61 | 2.93 | 35.6 | 0.00 | 0.00 | 8.68 | 8.68 | 0.00 | 2.03 | 2.03 | — | 8,457 | 8,457 | 0.12 | 0.32 | 12.3 | 8,567 |
| Vendor | 0.32 | 0.07 | 3.84 | 2.01 | 0.03 | 0.05 | 0.99 | 1.04 | 0.05 | 0.27 | 0.33 | — | 3,482 | 3,482 | 0.25 | 0.52 | 3.60 | 3,647 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.54 | 0.48 | 0.53 | 6.49 | 0.00 | 0.00 | 1.58 | 1.58 | 0.00 | 0.37 | 0.37 | — | 1,400 | 1,400 | 0.02 | 0.05 | 2.04 | 1,418 |
| Vendor | 0.06 | 0.01 | 0.70 | 0.37 | < 0.005 | 0.01 | 0.18 | 0.19 | 0.01 | 0.05 | 0.06 | — | 576 | 576 | 0.04 | 0.09 | 0.60 | 604 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.20. Infrastructure Improvements (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.23 | 0.22 | 1.85 | 9.75 | 0.02 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 1,576 | 1,576 | 0.06 | 0.01 | — | 1,582 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.04 | 0.04 | 0.34 | 1.78 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 261 | 261 | 0.01 | < 0.005 | — | 262 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 9.01 | 8.86 | 7.75 | 139 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 29,788 | 29,788 | 0.35 | 1.06 | 85.6 | 30,199 |
| Vendor | 1.07 | 0.24 | 11.7 | 6.44 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,359 | 11,359 | 0.73 | 1.74 | 24.7 | 11,920 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.36 | 7.85 | 105 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,329 | 27,329 | 0.40 | 1.06 | 2.23 | 27,659 |
| Vendor | 1.06 | 0.23 | 12.2 | 6.55 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,366 | 11,366 | 0.73 | 1.74 | 0.64 | 11,903 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 5.57 | 5.47 | 5.76 | 73.1 | 0.00 | 0.00 | 19.1 | 19.1 | 0.00 | 4.46 | 4.46 | — | 18,222 | 18,222 | 0.26 | 0.70 | 24.4 | 18,461 |
| Vendor | 0.70 | 0.15 | 8.05 | 4.27 | 0.06 | 0.12 | 2.17 | 2.29 | 0.06 | 0.60 | 0.66 | — | 7,471 | 7,471 | 0.48 | 1.14 | 7.01 | 7,830 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.02 | 1.00 | 1.05 | 13.3 | 0.00 | 0.00 | 3.48 | 3.48 | 0.00 | 0.81 | 0.81 | — | 3,017 | 3,017 | 0.04 | 0.12 | 4.03 | 3,056 |
| Vendor | 0.13 | 0.03 | 1.47 | 0.78 | 0.01 | 0.02 | 0.40 | 0.42 | 0.01 | 0.11 | 0.12 | — | 1,237 | 1,237 | 0.08 | 0.19 | 1.16 | 1,296 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.22. Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.05 | 0.05 | 0.58 | 3.17 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 452 | 452 | 0.02 | < 0.005 | — | 454 |
| Paving | 0.04 | 0.04 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.01 | 0.01 | 0.11 | 0.58 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 74.9 | 74.9 | < 0.005 | < 0.005 | — | 75.2 |
| Paving | 0.01 | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.05 | 0.93 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 199 | 199 | < 0.005 | 0.01 | 0.57 | 202 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.05 | 0.70 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 183 | 183 | < 0.005 | 0.01 | 0.01 | 185 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.22 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 55.4 | 55.4 | < 0.005 | < 0.005 | 0.07 | 56.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.18 | 9.18 | < 0.005 | < 0.005 | 0.01 | 9.30 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.24. Paving (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.12 | 0.66 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 94.6 | 94.6 | < 0.005 | < 0.005 | — | 94.9 |
| Paving | 0.01 | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.12 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 15.7 | 15.7 | < 0.005 | < 0.005 | — | 15.7 |
| Paving | < 0.005 | < 0.005 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.05 | 0.05 | 0.66 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 179 | 179 | < 0.005 | 0.01 | 0.01 | 182 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.4 | 11.4 | < 0.005 | < 0.005 | 0.01 | 11.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.89 | 1.89 | < 0.005 | < 0.005 | < 0.005 | 1.91 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.26. Architectural Coating (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.02 | 0.02 | 0.65 | 0.96 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 368 | 368 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.04 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 7.32 | 7.32 | < 0.005 | < 0.005 | — | 7.34 |
| Architectural Coatings | 20.1 | 20.1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.21 | 1.21 | < 0.005 | < 0.005 | — | 1.22 |
| Architectural Coatings | 3.68 | 3.68 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 3.11 | 2.68 | 2.71 | 36.6 | 0.00 | 0.00 | 11.7 | 11.7 | 0.00 | 2.75 | 2.75 | — | 10,554 | 10,554 | 0.14 | 0.43 | 0.71 | 10,685 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.15 | 0.15 | 2.11 | 0.00 | 0.00 | 0.64 | 0.64 | 0.00 | 0.15 | 0.15 | — | 586 | 586 | 0.01 | 0.02 | 0.64 | 594 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.38 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 97.1 | 97.1 | < 0.005 | < 0.005 | 0.11 | 98.4 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 12.0 | 10.8 | 9.76 | 99.6 | 0.27 | 0.16 | 25.8 | 26.0 | 0.15 | 6.55 | 6.71 | — | 28,143 | 28,143 | 1.15 | 1.24 | 63.9 | 28,604 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 51.3 | 46.3 | 41.7 | 426 | 1.17 | 0.70 | 110 | 111 | 0.66 | 28.0 | 28.7 | — | 120,328 | 120,328 | 4.91 | 5.28 | 273 | 122,298 |
| Strip Mall | 2.36 | 2.08 | 2.35 | 25.1 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 7,456 | 7,456 | 0.27 | 0.31 | 17.1 | 7,571 |
| Fast Food Restaurant w/o Drive Thru | 27.5 | 24.2 | 27.4 | 292 | 0.85 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 86,775 | 86,775 | 3.11 | 3.59 | 198 | 88,122 |
| Fast Food Restaurant with Drive Thru | 28.6 | 25.1 | 28.4 | 303 | 0.88 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 90,049 | 90,049 | 3.22 | 3.73 | 206 | 91,447 |
| General Office Building | 2.14 | 1.88 | 2.14 | 22.7 | 0.07 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,760 | 6,760 | 0.24 | 0.28 | 15.5 | 6,865 |
| Medical Office Building | 7.12 | 6.25 | 7.09 | 75.5 | 0.22 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 22,460 | 22,460 | 0.80 | 0.93 | 51.4 | 22,809 |
| City Park | 5.30 | 4.66 | 5.28 | 56.2 | 0.16 | 0.10 | 15.5 | 15.5 | 0.09 | 3.92 | 4.01 | — | 16,719 | 16,719 | 0.60 | 0.69 | 38.2 | 16,978 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 136 | 121 | 124 | 1,299 | 3.69 | 2.18 | 349 | 351 | 2.04 | 88.6 | 90.6 | — | 378,689 | 378,689 | 14.3 | 16.1 | 864 | 384,694 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 11.3 | 10.2 | 10.5 | 83.2 | 0.26 | 0.16 | 25.8 | 26.0 | 0.15 | 6.55 | 6.71 | — | 26,394 | 26,394 | 1.19 | 1.27 | 1.66 | 26,805 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 48.5 | 43.5 | 44.8 | 356 | 1.10 | 0.70 | 110 | 111 | 0.66 | 28.0 | 28.7 | — | 112,852 | 112,852 | 5.07 | 5.44 | 7.08 | 114,608 |
| Strip Mall | 2.25 | 1.96 | 2.53 | 20.5 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 6,988 | 6,988 | 0.27 | 0.32 | 0.44 | 7,090 |
| Fast Food Restaurant w/o Drive Thru | 26.2 | 22.8 | 29.5 | 238 | 0.79 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 81,334 | 81,334 | 3.17 | 3.70 | 5.15 | 82,522 |
| Fast Food Restaurant with Drive Thru | 27.2 | 23.7 | 30.6 | 247 | 0.82 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 84,402 | 84,402 | 3.29 | 3.84 | 5.34 | 85,635 |
| General Office Building | 2.04 | 1.78 | 2.29 | 18.5 | 0.06 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,336 | 6,336 | 0.25 | 0.29 | 0.40 | 6,429 |
| Medical Office Building | 6.77 | 5.91 | 7.62 | 61.6 | 0.20 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 21,052 | 21,052 | 0.82 | 0.96 | 1.33 | 21,359 |
| City Park | 5.04 | 4.40 | 5.67 | 45.9 | 0.15 | 0.10 | 15.5 | 15.5 | 0.09 | 3.92 | 4.01 | — | 15,670 | 15,670 | 0.61 | 0.71 | 0.99 | 15,899 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 129 | 114 | 133 | 1,071 | 3.45 | 2.18 | 349 | 351 | 2.05 | 88.6 | 90.6 | — | 355,028 | 355,028 | 14.7 | 16.5 | 22.4 | 360,348 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 2.05 | 1.84 | 1.94 | 15.7 | 0.05 | 0.03 | 4.65 | 4.68 | 0.03 | 1.18 | 1.21 | — | 4,415 | 4,415 | 0.20 | 0.21 | 4.57 | 4,488 |
| Apartments Low Rise | 8.78 | 7.87 | 8.29 | 67.3 | 0.20 | 0.13 | 19.9 | 20.0 | 0.12 | 5.05 | 5.17 | — | 18,876 | 18,876 | 0.84 | 0.91 | 19.5 | 19,187 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | 0.41 | 0.36 | 0.47 | 3.88 | 0.01 | 0.01 | 1.24 | 1.25 | 0.01 | 0.32 | 0.32 | — | 1,169 | 1,169 | 0.05 | 0.05 | 1.22 | 1,187 |
| Fast Food Restaurant w/o Drive Thru | 4.74 | 4.13 | 5.47 | 45.2 | 0.15 | 0.09 | 14.5 | 14.6 | 0.08 | 3.67 | 3.76 | — | 13,606 | 13,606 | 0.53 | 0.62 | 14.2 | 13,817 |
| Fast Food Restaurant with Drive Thru | 4.92 | 4.29 | 5.67 | 46.9 | 0.15 | 0.09 | 15.0 | 15.1 | 0.09 | 3.81 | 3.90 | — | 14,119 | 14,119 | 0.54 | 0.64 | 14.7 | 14,338 |
| General Office Building | 0.37 | 0.32 | 0.43 | 3.52 | 0.01 | 0.01 | 1.13 | 1.13 | 0.01 | 0.29 | 0.29 | — | 1,060 | 1,060 | 0.04 | 0.05 | 1.11 | 1,076 |
| Medical Office Building | 1.23 | 1.07 | 1.42 | 11.7 | 0.04 | 0.02 | 3.74 | 3.77 | 0.02 | 0.95 | 0.97 | — | 3,522 | 3,522 | 0.14 | 0.16 | 3.67 | 3,576 |
| City Park | 0.91 | 0.80 | 1.05 | 8.70 | 0.03 | 0.02 | 2.79 | 2.80 | 0.02 | 0.71 | 0.72 | — | 2,621 | 2,621 | 0.10 | 0.12 | 2.73 | 2,662 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 23.4 | 20.7 | 24.7 | 203 | 0.64 | 0.40 | 62.9 | 63.3 | 0.37 | 16.0 | 16.4 | — | 59,387 | 59,387 | 2.43 | 2.76 | 61.7 | 60,332 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 5,849 | 5,849 | 0.36 | 0.04 | — | 5,872 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 17,652 | 17,652 | 1.09 | 0.13 | — | 17,719 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 31,818 | 31,818 | 1.97 | 0.24 | — | 31,939 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 5,849 | 5,849 | 0.36 | 0.04 | — | 5,872 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 17,652 | 17,652 | 1.09 | 0.13 | — | 17,719 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 31,818 | 31,818 | 1.97 | 0.24 | — | 31,939 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 968 | 968 | 0.06 | 0.01 | — | 972 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 2,922 | 2,922 | 0.18 | 0.02 | — | 2,934 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 90.6 | 90.6 | 0.01 | < 0.005 | — | 91.0 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 64.0 | 64.0 | < 0.005 | < 0.005 | — | 64.3 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 5,268 | 5,268 | 0.33 | 0.04 | — | 5,288 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.50 | 0.25 | 4.31 | 1.84 | 0.03 | 0.35 | — | 0.35 | 0.35 | — | 0.35 | — | 5,475 | 5,475 | 0.48 | 0.01 | — | 5,490 |
| Apartments Low Rise | 1.34 | 0.67 | 11.5 | 4.87 | 0.07 | 0.93 | — | 0.93 | 0.93 | — | 0.93 | — | 14,536 | 14,536 | 1.29 | 0.03 | — | 14,576 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 24,100 | 24,100 | 2.13 | 0.05 | — | 24,167 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.50 | 0.25 | 4.31 | 1.84 | 0.03 | 0.35 | — | 0.35 | 0.35 | — | 0.35 | — | 5,475 | 5,475 | 0.48 | 0.01 | — | 5,490 |
| Apartments Low Rise | 1.34 | 0.67 | 11.5 | 4.87 | 0.07 | 0.93 | — | 0.93 | 0.93 | — | 0.93 | — | 14,536 | 14,536 | 1.29 | 0.03 | — | 14,576 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 24,100 | 24,100 | 2.13 | 0.05 | — | 24,167 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 0.09 | 0.05 | 0.79 | 0.33 | 0.01 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 906 | 906 | 0.08 | < 0.005 | — | 909 |
| Apartments Low Rise | 0.24 | 0.12 | 2.09 | 0.89 | 0.01 | 0.17 | — | 0.17 | 0.17 | — | 0.17 | — | 2,407 | 2,407 | 0.21 | < 0.005 | — | 2,413 |
| Strip Mall | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | — | 12.1 |
| Fast Food Restaurant w/o Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| Fast Food Restaurant with Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| General Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| Medical Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.41 | 0.20 | 3.50 | 1.75 | 0.02 | 0.28 | — | 0.28 | 0.28 | — | 0.28 | — | 3,990 | 3,990 | 0.35 | 0.01 | — | 4,001 |

## 4.3. Area Emissions by Source

## 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Consumer Products | 128 | 128 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 10.4 | 10.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 18.9 | 17.8 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | — | 541 | 541 | 0.02 | < 0.005 | — | 543 |
| Total | 157 | 156 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | 0.00 | 13,376 | 13,376 | 0.82 | 0.10 | — | 13,426 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Consumer Products | 128 | 128 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 10.4 | 10.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 138 | 138 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 146 | 146 | 0.01 | < 0.005 | — | 146 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Consum Products | 23.3 | 23.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 1.90 | 1.90 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 2.36 | 2.23 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 61.3 | 61.3 | < 0.005 | < 0.005 | — | 61.5 |
| Total | 27.6 | 27.4 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | 0.00 | 207 | 207 | 0.01 | < 0.005 | — | 208 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 43.6 | 226 | 269 | 4.49 | 0.11 | — | 414 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 217 | 1,126 | 1,344 | 22.4 | 0.54 | — | 2,063 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 437 | 437 | 0.03 | < 0.005 | — | 439 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 95.0 | 95.0 | 0.01 | < 0.005 | — | 95.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 43.6 | 226 | 269 | 4.49 | 0.11 | — | 414 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 217 | 1,126 | 1,344 | 22.4 | 0.54 | — | 2,063 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 437 | 437 | 0.03 | < 0.005 | — | 439 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 95.0 | 95.0 | 0.01 | < 0.005 | — | 95.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 7.22 | 37.4 | 44.6 | 0.74 | 0.02 | — | 68.5 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 36.0 | 186 | 222 | 3.70 | 0.09 | — | 342 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 4.78 | 5.68 | 0.09 | < 0.005 | — | 8.69 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 3.81 | 19.9 | 23.7 | 0.39 | 0.01 | — | 36.3 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 2.69 | 14.1 | 16.8 | 0.28 | 0.01 | — | 25.7 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 72.3 | 72.3 | < 0.005 | < 0.005 | — | 72.6 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 15.7 | 15.7 | < 0.005 | < 0.005 | — | 15.8 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 58.1 | 389 | 447 | 5.98 | 0.14 | — | 640 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 284 | 0.00 | 284 | 28.4 | 0.00 | — | 995 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,085 | 0.00 | 1,085 | 108 | 0.00 | — | 3,797 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 1.68 | 0.00 | 1.68 | 0.17 | 0.00 | — | 5.89 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 284 | 0.00 | 284 | 28.4 | 0.00 | — | 995 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,085 | 0.00 | 1,085 | 108 | 0.00 | — | 3,797 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 1.68 | 0.00 | 1.68 | 0.17 | 0.00 | — | 5.89 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 47.1 | 0.00 | 47.1 | 4.71 | 0.00 | — | 165 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 180 | 0.00 | 180 | 18.0 | 0.00 | — | 629 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 3.62 | 0.00 | 3.62 | 0.36 | 0.00 | — | 12.7 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 5.61 | 0.00 | 5.61 | 0.56 | 0.00 | — | 19.6 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 65.1 | 0.00 | 65.1 | 6.51 | 0.00 | — | 228 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.28 | 0.00 | 0.28 | 0.03 | 0.00 | — | 0.98 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 381 | 0.00 | 381 | 38.0 | 0.00 | — | 1,332 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.74 | 7.74 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 32.9 | 32.9 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.74 | 7.74 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 32.9 | 32.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.28 | 1.28 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.45 | 5.45 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.04 | 0.04 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.03 | 0.03 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.29 | 0.29 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 27.1 | 27.1 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

### 4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Demolition | Demolition | 12/2/2026 | 6/2/2027 | 5.00 | 131 | — |

| | | | | | | |
|---|---|---|---|---|---|---|
| Site Preparation | Site Preparation | 12/15/2026 | 6/15/2027 | 5.00 | 131 | — |
| Grading | Grading | 4/1/2027 | 12/1/2027 | 5.00 | 175 | — |
| Building Construction | Building Construction | 10/1/2028 | 3/1/2030 | 5.00 | 370 | — |
| Infrastructure Improvements | Building Construction | 8/1/2027 | 12/1/2028 | 5.00 | 350 | — |
| Paving | Paving | 8/1/2028 | 2/1/2029 | 5.00 | 133 | — |
| Architectural Coating | Architectural Coating | 3/2/2030 | 3/30/2030 | 5.00 | 20.0 | — |

## 5.2. Off-Road Equipment

### 5.2.2. Mitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Demolition | Rubber Tired Dozers | Diesel | Tier 4 Final | 2.00 | 8.00 | 367 | 0.40 |
| Demolition | Excavators | Diesel | Tier 4 Final | 3.00 | 8.00 | 36.0 | 0.38 |
| Demolition | Concrete/Industrial Saws | Diesel | Tier 4 Final | 1.00 | 8.00 | 33.0 | 0.73 |
| Site Preparation | Rubber Tired Dozers | Diesel | Tier 4 Final | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Graders | Diesel | Tier 4 Final | 1.00 | 8.00 | 148 | 0.41 |
| Grading | Excavators | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Grading | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 2.00 | 8.00 | 84.0 | 0.37 |
| Grading | Scrapers | Diesel | Tier 4 Final | 2.00 | 8.00 | 423 | 0.48 |
| Grading | Rubber Tired Dozers | Diesel | Tier 4 Final | 1.00 | 8.00 | 367 | 0.40 |
| Building Construction | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Building Construction | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Infrastructure Improvements | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Infrastructure Improvements | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Infrastructure Improvements | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Infrastructure Improvements | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Infrastructure Improvements | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Paving | Pavers | Diesel | Tier 4 Final | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Tier 4 Final | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Tier 4 Final | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.2. Mitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Demolition | — | — | — | — |
| Demolition | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Demolition | Vendor | — | 10.2 | HHDT,MHDT |
| Demolition | Hauling | 58.8 | 20.0 | HHDT |
| Demolition | Onsite truck | — | — | HHDT |
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 18.5 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 10.2 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |

| | | | | |
|---|---|---|---|---|
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 20.0 | 18.5 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 10.2 | HHDT,MHDT |
| Grading | Hauling | 0.00 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 2,245 | 18.5 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 391 | 10.2 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 10.2 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 898 | 18.5 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 10.2 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |
| Architectural Coating | Onsite truck | — | — | HHDT |
| Infrastructure Improvements | — | — | — | — |
| Infrastructure Improvements | Worker | 2,245 | 18.5 | LDA,LDT1,LDT2 |
| Infrastructure Improvements | Vendor | 391 | 10.2 | HHDT,MHDT |
| Infrastructure Improvements | Hauling | 0.00 | 20.0 | HHDT |
| Infrastructure Improvements | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

| Control Strategies Applied | PM10 Reduction | PM2.5 Reduction |
|---|---|---|
| Water unpaved roads twice daily | 55% | 55% |
| Limit vehicle speeds on unpaved roads to 25 mph | 44% | 44% |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (cy) | Material Exported (cy) | Acres Graded (acres) | Material Demolished (Ton of Debris) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Demolition | 0.00 | 0.00 | 0.00 | 30,810 | — |
| Site Preparation | — | — | 197 | 0.00 | — |
| Grading | — | — | 525 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 20.9 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 3 | 74% | 74% |
| Water Demolished Area | 2 | 36% | 36% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Single Family Housing | 6.02 | 0% |
| Apartments Low Rise | — | 0% |
| Strip Mall | 0.00 | 0% |
| Fast Food Restaurant w/o Drive Thru | 0.00 | 0% |
| Fast Food Restaurant with Drive Thru | 0.00 | 0% |

| | | |
|---|---|---|
| General Office Building | 0.00 | 0% |
| Medical Office Building | 0.00 | 0% |
| City Park | 0.00 | 0% |
| Other Non-Asphalt Surfaces | 7.90 | 0% |
| Parking Lot | 6.95 | 100% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2026 | 0.00 | 532 | 0.03 | < 0.005 |
| 2027 | 0.00 | 532 | 0.03 | < 0.005 |
| 2028 | 0.00 | 532 | 0.03 | < 0.005 |
| 2029 | 0.00 | 532 | 0.03 | < 0.005 |
| 2030 | 0.00 | 532 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 3,432 | 3,432 | 3,432 | 1,252,547 | 36,394 | 36,394 | 36,394 | 13,283,984 |
| Apartments Low Rise | 14,672 | 14,672 | 14,672 | 5,355,413 | 155,609 | 155,609 | 155,609 | 56,797,233 |
| Strip Mall | 593 | 593 | 593 | 216,323 | 9,717 | 9,717 | 9,717 | 3,546,684 |
| Fast Food Restaurant w/o Drive Thru | 6,898 | 6,898 | 6,898 | 2,517,742 | 113,094 | 113,094 | 113,094 | 41,279,181 |
| Fast Food Restaurant with Drive Thru | 7,158 | 7,158 | 7,158 | 2,612,719 | 117,360 | 117,360 | 117,360 | 42,836,349 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| General Office Building | 537 | 537 | 537 | 196,143 | 8,811 | 8,811 | 8,811 | 3,215,834 |
| Medical Office Building | 1,785 | 1,785 | 1,785 | 651,668 | 29,272 | 29,272 | 29,272 | 10,684,302 |
| City Park | 1,329 | 1,329 | 1,329 | 485,088 | 21,790 | 21,790 | 21,790 | 7,953,171 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 372 |
| No Fireplaces | 174 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 1855 |

| | |
|---|---|
| No Fireplaces | 868 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 11489737.756275 | 3,829,913 | 376,382 | 125,461 | 38,822 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 4,013,379 | 532 | 0.0330 | 0.0040 | 17,084,185 |
| Apartments Low Rise | 12,111,261 | 532 | 0.0330 | 0.0040 | 45,355,810 |
| Strip Mall | 375,543 | 532 | 0.0330 | 0.0040 | 227,584 |
| Fast Food Restaurant w/o Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| Fast Food Restaurant with Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| General Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |

| | | | | | |
|---|---|---|---|---|---|
| Medical Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Parking Lot | 265,355 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Single Family Housing | 22,757,922 | 0.00 |
| Apartments Low Rise | 113,497,840 | 0.00 |
| Strip Mall | 2,859,422 | 61,993 |
| Fast Food Restaurant w/o Drive Thru | 11,717,312 | 61,993 |
| Fast Food Restaurant with Drive Thru | 11,717,312 | 61,993 |
| General Office Building | 12,006,981 | 108,488 |
| Medical Office Building | 8,476,963 | 108,488 |
| City Park | 0.00 | 56,491,371 |
| Other Non-Asphalt Surfaces | 0.00 | 12,280,733 |
| Parking Lot | 0.00 | 0.00 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 528 | — |
| Apartments Low Rise | 2,014 | — |
| Strip Mall | 40.5 | — |
| Fast Food Restaurant w/o Drive Thru | 445 | — |

| | | |
|---|---|---|
| Fast Food Restaurant with Drive Thru | 445 | — |
| General Office Building | 62.8 | — |
| Medical Office Building | 730 | — |
| City Park | 3.13 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |
| Parking Lot | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Strip Mall | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Strip Mall | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |
| Strip Mall | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant w/o Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant w/o Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant with Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant with Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant with Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| General Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.02 | 0.60 | 0.00 | 1.00 |
| General Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Medical Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.45 | 0.60 | 0.00 | 1.00 |
| Medical Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 17.8 | annual days of extreme heat |
| Extreme Precipitation | 3.00 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 9.13 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |

| | |
|---|---|
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |

| | |
|---|---|
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |

| | |
|---|---|
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |

| | |
|---|---|
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|

| | |
|---|---|
| Land Use | per center park specific plan provisions and traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Construction: Construction Phases | per construction questionnaire from client |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD Rule 445 (Wood Burning) - prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

# Center Park Specific Plan - Buildout Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan - Buildout |
| Operational Year | 2030 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99497622020672, -117.6290606636939 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5259 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 802 | Dwelling Unit | 36.5 | 1,587,960 | 0.00 | — | 2,655 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 3,491 | Dwelling Unit | 140 | 6,113,505 | 0.00 | — | 11,555 | — |
| Strip Mall | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant w/o Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant with Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| General Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| Medical Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| City Park | 56.0 | Acre | 56.0 | 0.00 | 2,438,489 | 2,438,489 | — | — |
| Other Non-Asphalt Surfaces | 11.3 | Acre | 11.3 | 0.00 | 491,357 | 491,357 | — | — |
| Parking Lot | 6.95 | Acre | 6.95 | 0.00 | 0.00 | — | — | — |

### 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

### 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 378 | 358 | 175 | 1,817 | 4.55 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 542,346 | 545,518 | 342 | 20.7 | 1,204 | 561,449 |
| Mit. | 378 | 357 | 175 | 1,815 | 4.54 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 540,295 | 543,467 | 342 | 20.7 | 1,202 | 559,383 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 346 | 326 | 184 | 1,292 | 4.26 | 4.55 | 414 | 419 | 4.39 | 105 | 110 | 3,172 | 513,554 | 516,727 | 342 | 21.3 | 205 | 531,841 |
| Mit. | 345 | 326 | 184 | 1,290 | 4.25 | 4.55 | 414 | 418 | 4.39 | 105 | 109 | 3,172 | 511,537 | 514,709 | 342 | 21.3 | 205 | 529,811 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 361 | 341 | 188 | 1,515 | 4.31 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 502,691 | 505,864 | 341 | 21.3 | 621 | 521,381 |
| Mit. | 361 | 340 | 188 | 1,514 | 4.30 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 500,669 | 503,841 | 341 | 21.3 | 620 | 519,344 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 65.9 | 62.2 | 34.4 | 277 | 0.79 | 0.85 | 74.7 | 75.6 | 0.81 | 19.0 | 19.8 | 525 | 83,226 | 83,752 | 56.5 | 3.53 | 103 | 86,321 |
| Mit. | 65.8 | 62.1 | 34.3 | 276 | 0.79 | 0.85 | 74.6 | 75.5 | 0.81 | 19.0 | 19.8 | 525 | 82,891 | 83,417 | 56.5 | 3.53 | 103 | 85,983 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 165 | 148 | 148 | 1,548 | 4.38 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 449,461 | 449,461 | 17.1 | 19.1 | 1,024 | 456,617 |
| Area | 210 | 208 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | 0.00 | 17,551 | 17,551 | 1.07 | 0.13 | — | 17,618 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 378 | 357 | 175 | 1,815 | 4.54 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 540,295 | 543,467 | 342 | 20.7 | 1,202 | 559,383 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 157 | 139 | 159 | 1,278 | 4.10 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 421,399 | 421,399 | 17.6 | 19.7 | 26.6 | 427,743 |
| Area | 186 | 186 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 345 | 326 | 184 | 1,290 | 4.25 | 4.55 | 414 | 418 | 4.39 | 105 | 109 | 3,172 | 511,537 | 514,709 | 342 | 21.3 | 205 | 529,811 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 156 | 138 | 162 | 1,327 | 4.14 | 2.59 | 409 | 411 | 2.43 | 104 | 106 | — | 425,755 | 425,755 | 17.6 | 19.9 | 442 | 432,559 |
| Area | 202 | 201 | 1.62 | 175 | 0.01 | 0.09 | — | 0.09 | 0.07 | — | 0.07 | 0.00 | 1,631 | 1,631 | 0.09 | 0.01 | — | 1,637 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 361 | 340 | 188 | 1,514 | 4.30 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 500,669 | 503,841 | 341 | 21.3 | 620 | 519,344 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mobile | 28.4 | 25.2 | 29.6 | 242 | 0.76 | 0.47 | 74.6 | 75.1 | 0.44 | 19.0 | 19.4 | — | 70,489 | 70,489 | 2.92 | 3.29 | 73.2 | 71,615 |
| Area | 36.9 | 36.7 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 270 | 270 | 0.02 | < 0.005 | — | 271 |
| Energy | 0.52 | 0.26 | 4.46 | 2.16 | 0.03 | 0.36 | — | 0.36 | 0.36 | — | 0.36 | — | 11,640 | 11,640 | 0.86 | 0.06 | — | 11,679 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 71.6 | 493 | 564 | 7.37 | 0.18 | — | 802 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 454 | 0.00 | 454 | 45.3 | 0.00 | — | 1,587 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 29.5 | 29.5 |
| Total | 65.8 | 62.1 | 34.3 | 276 | 0.79 | 0.85 | 74.6 | 75.5 | 0.81 | 19.0 | 19.8 | 525 | 82,891 | 83,417 | 56.5 | 3.53 | 103 | 85,983 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 20.4 | 18.5 | 16.6 | 170 | 0.47 | 0.28 | 44.0 | 44.3 | 0.26 | 11.2 | 11.4 | — | 47,956 | 47,956 | 1.96 | 2.11 | 109 | 48,741 |
| Apartments Low Rise | 69.3 | 62.6 | 56.4 | 576 | 1.58 | 0.95 | 149 | 150 | 0.89 | 37.9 | 38.8 | — | 162,776 | 162,776 | 6.64 | 7.15 | 369 | 165,441 |
| Strip Mall | 2.36 | 2.08 | 2.35 | 25.1 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 7,456 | 7,456 | 0.27 | 0.31 | 17.1 | 7,571 |
| Fast Food Restaurant w/o Drive Thru | 27.5 | 24.2 | 27.4 | 292 | 0.85 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 86,775 | 86,775 | 3.11 | 3.59 | 198 | 88,122 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 28.6 | 25.1 | 28.4 | 303 | 0.88 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 90,049 | 90,049 | 3.22 | 3.73 | 206 | 91,447 |
| General Office Building | 2.14 | 1.88 | 2.14 | 22.7 | 0.07 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,760 | 6,760 | 0.24 | 0.28 | 15.5 | 6,865 |
| Medical Office Building | 7.12 | 6.25 | 7.09 | 75.5 | 0.22 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 22,460 | 22,460 | 0.80 | 0.93 | 51.4 | 22,809 |
| City Park | 8.00 | 7.03 | 7.97 | 84.8 | 0.25 | 0.14 | 23.3 | 23.5 | 0.14 | 5.92 | 6.06 | — | 25,229 | 25,229 | 0.90 | 1.05 | 57.7 | 25,621 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 165 | 148 | 148 | 1,548 | 4.38 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 449,461 | 449,461 | 17.1 | 19.1 | 1,024 | 456,617 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 19.3 | 17.4 | 17.8 | 142 | 0.44 | 0.28 | 44.0 | 44.3 | 0.26 | 11.2 | 11.4 | — | 44,977 | 44,977 | 2.02 | 2.17 | 2.82 | 45,677 |
| Apartments Low Rise | 65.6 | 58.9 | 60.5 | 481 | 1.48 | 0.95 | 149 | 150 | 0.89 | 37.9 | 38.8 | — | 152,663 | 152,663 | 6.86 | 7.36 | 9.58 | 155,039 |
| Strip Mall | 2.25 | 1.96 | 2.53 | 20.5 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 6,988 | 6,988 | 0.27 | 0.32 | 0.44 | 7,090 |
| Fast Food Restaurant w/o Drive Thru | 26.2 | 22.8 | 29.5 | 238 | 0.79 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 81,334 | 81,334 | 3.17 | 3.70 | 5.15 | 82,522 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 27.2 | 23.7 | 30.6 | 247 | 0.82 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 84,402 | 84,402 | 3.29 | 3.84 | 5.34 | 85,635 |
| General Office Building | 2.04 | 1.78 | 2.29 | 18.5 | 0.06 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,336 | 6,336 | 0.25 | 0.29 | 0.40 | 6,429 |
| Medical Office Building | 6.77 | 5.91 | 7.62 | 61.6 | 0.20 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 21,052 | 21,052 | 0.82 | 0.96 | 1.33 | 21,359 |
| City Park | 7.61 | 6.64 | 8.56 | 69.2 | 0.23 | 0.14 | 23.3 | 23.5 | 0.14 | 5.92 | 6.06 | — | 23,647 | 23,647 | 0.92 | 1.08 | 1.50 | 23,992 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 157 | 139 | 159 | 1,278 | 4.10 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 421,399 | 421,399 | 17.6 | 19.7 | 26.6 | 427,743 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 3.50 | 3.14 | 3.30 | 26.8 | 0.08 | 0.05 | 7.93 | 7.98 | 0.05 | 2.01 | 2.06 | — | 7,523 | 7,523 | 0.33 | 0.36 | 7.78 | 7,647 |
| Apartments Low Rise | 11.9 | 10.6 | 11.2 | 91.1 | 0.27 | 0.17 | 26.9 | 27.1 | 0.16 | 6.84 | 7.00 | — | 25,535 | 25,535 | 1.14 | 1.23 | 26.4 | 25,956 |
| Strip Mall | 0.41 | 0.36 | 0.47 | 3.88 | 0.01 | 0.01 | 1.24 | 1.25 | 0.01 | 0.32 | 0.32 | — | 1,169 | 1,169 | 0.05 | 0.05 | 1.22 | 1,187 |
| Fast Food Restaurant w/o Drive Thru | 4.74 | 4.13 | 5.47 | 45.2 | 0.15 | 0.09 | 14.5 | 14.6 | 0.08 | 3.67 | 3.76 | — | 13,606 | 13,606 | 0.53 | 0.62 | 14.2 | 13,817 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 4.92 | 4.29 | 5.67 | 46.9 | 0.15 | 0.09 | 15.0 | 15.1 | 0.09 | 3.81 | 3.90 | — | 14,119 | 14,119 | 0.54 | 0.64 | 14.7 | 14,338 |
| General Office Building | 0.37 | 0.32 | 0.43 | 3.52 | 0.01 | 0.01 | 1.13 | 1.13 | 0.01 | 0.29 | 0.29 | — | 1,060 | 1,060 | 0.04 | 0.05 | 1.11 | 1,076 |
| Medical Office Building | 1.23 | 1.07 | 1.42 | 11.7 | 0.04 | 0.02 | 3.74 | 3.77 | 0.02 | 0.95 | 0.97 | — | 3,522 | 3,522 | 0.14 | 0.16 | 3.67 | 3,576 |
| City Park | 1.38 | 1.20 | 1.59 | 13.1 | 0.04 | 0.03 | 4.20 | 4.23 | 0.02 | 1.07 | 1.09 | — | 3,956 | 3,956 | 0.15 | 0.18 | 4.13 | 4,017 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 28.4 | 25.2 | 29.6 | 242 | 0.76 | 0.47 | 74.6 | 75.1 | 0.44 | 19.0 | 19.4 | — | 70,489 | 70,489 | 2.92 | 3.29 | 73.2 | 71,615 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 8,592 | 8,592 | 0.53 | 0.06 | — | 8,625 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 22,631 | 22,631 | 1.40 | 0.17 | — | 22,716 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 39,539 | 39,539 | 2.45 | 0.30 | — | 39,689 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 8,592 | 8,592 | 0.53 | 0.06 | — | 8,625 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 22,631 | 22,631 | 1.40 | 0.17 | — | 22,716 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 39,539 | 39,539 | 2.45 | 0.30 | — | 39,689 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 1,423 | 1,423 | 0.09 | 0.01 | — | 1,428 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 3,747 | 3,747 | 0.23 | 0.03 | — | 3,761 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 90.6 | 90.6 | 0.01 | < 0.005 | — | 91.0 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 64.0 | 64.0 | < 0.005 | < 0.005 | — | 64.3 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 6,546 | 6,546 | 0.41 | 0.05 | — | 6,571 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.74 | 0.37 | 6.34 | 2.70 | 0.04 | 0.51 | — | 0.51 | 0.51 | — | 0.51 | — | 8,042 | 8,042 | 0.71 | 0.02 | — | 8,065 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartme Low Rise | 1.72 | 0.86 | 14.7 | 6.25 | 0.09 | 1.19 | — | 1.19 | 1.19 | — | 1.19 | — | 18,636 | 18,636 | 1.65 | 0.04 | — | 18,687 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 30,767 | 30,767 | 2.72 | 0.06 | — | 30,852 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.74 | 0.37 | 6.34 | 2.70 | 0.04 | 0.51 | — | 0.51 | 0.51 | — | 0.51 | — | 8,042 | 8,042 | 0.71 | 0.02 | — | 8,065 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 1.72 | 0.86 | 14.7 | 6.25 | 0.09 | 1.19 | — | 1.19 | 1.19 | — | 1.19 | — | 18,636 | 18,636 | 1.65 | 0.04 | — | 18,687 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 30,767 | 30,767 | 2.72 | 0.06 | — | 30,852 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.14 | 0.07 | 1.16 | 0.49 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,332 | 1,332 | 0.12 | < 0.005 | — | 1,335 |
| Apartments Low Rise | 0.31 | 0.16 | 2.68 | 1.14 | 0.02 | 0.22 | — | 0.22 | 0.22 | — | 0.22 | — | 3,085 | 3,085 | 0.27 | 0.01 | — | 3,094 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | — | 12.1 |
| Fast Food Restaurant w/o Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| Fast Food Restaurant with Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| General Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| Medical Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.52 | 0.26 | 4.46 | 2.16 | 0.03 | 0.36 | — | 0.36 | 0.36 | — | 0.36 | — | 5,094 | 5,094 | 0.45 | 0.01 | — | 5,108 |

## 4.3. Area Emissions by Source

### 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Consumer Products | 172 | 172 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 13.9 | 13.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 24.2 | 22.9 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | — | 696 | 696 | 0.03 | 0.01 | — | 699 |
| Total | 210 | 208 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | 0.00 | 17,551 | 17,551 | 1.07 | 0.13 | — | 17,618 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Consumer Products | 172 | 172 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 13.9 | 13.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 186 | 186 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 191 | 191 | 0.01 | < 0.005 | — | 192 |
| Consumer Products | 31.3 | 31.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 2.54 | 2.54 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Landsca Equipment | 3.03 | 2.86 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 78.9 | 78.9 | < 0.005 | < 0.005 | — | 79.2 |
| Total | 36.9 | 36.7 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 270 | 270 | 0.02 | < 0.005 | — | 271 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 64.1 | 332 | 396 | 6.59 | 0.16 | — | 608 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 279 | 1,444 | 1,723 | 28.7 | 0.69 | — | 2,645 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 673 | 673 | 0.04 | 0.01 | — | 676 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 61.0 | 61.0 | < 0.005 | < 0.005 | — | 61.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 64.1 | 332 | 396 | 6.59 | 0.16 | — | 608 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 279 | 1,444 | 1,723 | 28.7 | 0.69 | — | 2,645 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 673 | 673 | 0.04 | 0.01 | — | 676 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 61.0 | 61.0 | < 0.005 | < 0.005 | — | 61.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 10.6 | 54.9 | 65.5 | 1.09 | 0.03 | — | 101 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 46.2 | 239 | 285 | 4.75 | 0.11 | — | 438 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 4.78 | 5.68 | 0.09 | < 0.005 | — | 8.69 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 3.81 | 19.9 | 23.7 | 0.39 | 0.01 | — | 36.3 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 2.69 | 14.1 | 16.8 | 0.28 | 0.01 | — | 25.7 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 111 | 111 | 0.01 | < 0.005 | — | 112 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 10.1 | 10.1 | < 0.005 | < 0.005 | — | 10.1 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 71.6 | 493 | 564 | 7.37 | 0.18 | — | 802 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 418 | 0.00 | 418 | 41.8 | 0.00 | — | 1,462 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,391 | 0.00 | 1,391 | 139 | 0.00 | — | 4,867 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 2.59 | 0.00 | 2.59 | 0.26 | 0.00 | — | 9.08 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 418 | 0.00 | 418 | 41.8 | 0.00 | — | 1,462 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,391 | 0.00 | 1,391 | 139 | 0.00 | — | 4,867 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 2.59 | 0.00 | 2.59 | 0.26 | 0.00 | — | 9.08 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.91 | 0.00 | — | 242 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 230 | 0.00 | 230 | 23.0 | 0.00 | — | 806 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 3.62 | 0.00 | 3.62 | 0.36 | 0.00 | — | 12.7 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 5.61 | 0.00 | 5.61 | 0.56 | 0.00 | — | 19.6 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 65.1 | 0.00 | 65.1 | 6.51 | 0.00 | — | 228 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.43 | 0.00 | 0.43 | 0.04 | 0.00 | — | 1.50 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 454 | 0.00 | 454 | 45.3 | 0.00 | — | 1,587 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 11.4 | 11.4 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 43.8 | 43.8 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 11.4 | 11.4 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 43.8 | 43.8 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.88 | 1.88 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.25 | 7.25 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.04 | 0.04 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.03 | 0.03 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.29 | 0.29 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 29.5 | 29.5 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 5,848 | 5,848 | 5,848 | 2,134,387 | 62,018 | 62,018 | 62,018 | 22,636,404 |
| Apartments Low Rise | 19,848 | 19,848 | 19,848 | 7,244,653 | 210,503 | 210,503 | 210,503 | 76,833,708 |
| Strip Mall | 593 | 593 | 593 | 216,323 | 9,717 | 9,717 | 9,717 | 3,546,684 |
| Fast Food Restaurant w/o Drive Thru | 6,898 | 6,898 | 6,898 | 2,517,742 | 113,094 | 113,094 | 113,094 | 41,279,181 |
| Fast Food Restaurant with Drive Thru | 7,158 | 7,158 | 7,158 | 2,612,719 | 117,360 | 117,360 | 117,360 | 42,836,349 |
| General Office Building | 537 | 537 | 537 | 196,145 | 8,811 | 8,811 | 8,811 | 3,215,858 |
| Medical Office Building | 1,785 | 1,785 | 1,785 | 651,673 | 29,272 | 29,272 | 29,272 | 10,684,381 |
| City Park | 2,005 | 2,005 | 2,005 | 732,002 | 32,881 | 32,881 | 32,881 | 12,001,407 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

## 5.10.1. Hearths

### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 546 |
| No Fireplaces | 256 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 2378 |
| No Fireplaces | 1113 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |

## 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 15595465.756275 | 5,198,489 | 376,382 | 125,461 | 47,656 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 5,895,110 | 532 | 0.0330 | 0.0040 | 25,094,352 |
| Apartments Low Rise | 15,527,143 | 532 | 0.0330 | 0.0040 | 58,148,047 |
| Strip Mall | 375,543 | 532 | 0.0330 | 0.0040 | 227,584 |
| Fast Food Restaurant w/o Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| Fast Food Restaurant with Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| General Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| Medical Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Parking Lot | 265,355 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|

| | | |
|---|---|---|
| Single Family Housing | 33,428,302 | 0.00 |
| Apartments Low Rise | 145,508,982 | 0.00 |
| Strip Mall | 2,859,422 | 61,993 |
| Fast Food Restaurant w/o Drive Thru | 11,717,312 | 61,993 |
| Fast Food Restaurant with Drive Thru | 11,717,312 | 61,993 |
| General Office Building | 12,006,981 | 108,488 |
| Medical Office Building | 8,476,963 | 108,488 |
| City Park | 0.00 | 87,022,206 |
| Other Non-Asphalt Surfaces | 0.00 | 7,890,759 |
| Parking Lot | 0.00 | 0.00 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 775 | — |
| Apartments Low Rise | 2,581 | — |
| Strip Mall | 40.5 | — |
| Fast Food Restaurant w/o Drive Thru | 445 | — |
| Fast Food Restaurant with Drive Thru | 445 | — |
| General Office Building | 62.8 | — |
| Medical Office Building | 730 | — |
| City Park | 4.81 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |
| Parking Lot | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

## 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Strip Mall | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Strip Mall | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |
| Strip Mall | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant w/o Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant w/o Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant w/o Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant with Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant with Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant with Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| General Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.02 | 0.60 | 0.00 | 1.00 |
| General Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Medical Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.45 | 0.60 | 0.00 | 1.00 |
| Medical Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

#### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

#### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

#### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 17.8 | annual days of extreme heat |
| Extreme Precipitation | 3.00 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 9.13 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |

| | | | | |
|---|---|---|---|---|
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |

| | |
|---|---|
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |

| | |
|---|---|
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |

| | |
|---|---|
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|
| Land Use | per center park specific plan provisions and  traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD Rule 445 (Wood Burning) - prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

Unmitigated

| Pollutant | Averaging Time | Maximum Modeled Concentration | Background Concentration ($\mu g/m^3$)[1] | Total Ground Level Concentration ($\mu g/m^3$) | Threshold ($\mu g/m^3$)[2] | Threshold Exceeded?[3] |
|---|---|---|---|---|---|---|
| **Operations Phase I** | | | | | | |
| $PM_{10}$[1] | 24-hour | 0.5 | -- | 0.5 | 2.5 | No |
| $PM_{2.5}$[1] | 24-hour | 0.3 | -- | 0.3 | 2.5 | No |
| **Operations Phase II** | | | | | | |
| $PM_{10}$[1] | 24-hour | 2.4 | -- | 2.4 | 2.5 | No |
| $PM_{2.5}$[1] | 24-hour | 0.6 | -- | 0.6 | 2.5 | No |
| **Operations Buildout** | | | | | | |
| $PM_{10}$[1] | 24-hour | 2.4 | -- | 2.4 | 2.5 | No |
| $PM_{2.5}$[1] | 24-hour | 0.7 | -- | 0.7 | 2.5 | No |

[1] The thresholds for $PM_{10}$ and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

Phase I Unmitigated

| On Site Emissions | | PM10E (lbs/day) | PM10D (lbs/day) | PM10T (lbs/day) |
|---|---|---|---|---|
| Mobile | | 0.01 | 1.44 | 1.45 |
| Area | | 0.03 | - | 0.03 |
| Energy | | 0.42 | - | 0.42 |
| **Total lbs/day** | | **0.46** | **1.44** | 1.90 |
| | g/s | 0.00 | 0.01 | |

** Assumed that onsite mobile emissions, consists of 2% of total mobile emissions - accounting for onsite travel*

Phase II Unmitigated

| On Site Emissions | | PM10E (lbs/day) | PM10D (lbs/day) | PM10T (lbs/day) |
|---|---|---|---|---|
| Mobile | | 0.09 | 13.95 | 14.04 |
| Area | | 0.10 | - | 0.10 |
| Energy | | 1.54 | - | 1.54 |
| **Total lbs/day** | | **1.73** | **13.95** | 15.68 |
| | g/s | 0.01 | 0.07 | |

** Assumed that onsite mobile emissions, consists of 4% of total mobile emissions - accounting for onsite travel and drive-thru trips*

Buildout Unmitigated

| On Site Emissions | | PM10E (lbs/day) | PM10D (lbs/day) | PM10T (lbs/day) |
|---|---|---|---|---|
| Mobile | | 0.10 | 15.39 | 15.49 |
| Area | | 0.13 | 0.00 | 0.13 |
| Energy | | 1.96 | 0.00 | 1.96 |
| **Total lbs/day** | | **2.19** | **15.39** | 17.58 |
| | g/s | 0.01 | 0.08 | |

**Conversions:**

| | | |
|---|---|---|
| Const Hrs | 8 | per day |
| 1 hour = | 3600 | seconds |
| 1 pound = | 453.5924 | grams |
| 1 day = | 86400 | seconds |
| 1 pound = | 453.5924 | grams |
| 1 meter = | 0.000621 | miles |
| 1 ton = | 907184.7 | grams |
| 1 year = | 3.15E+07 | seconds |

Phase I Unmitigated

| On Site Emissions | | PM2.5E (lbs/day) | PM2.5D (lbs/day) | PM2.5T (lbs/day) |
|---|---|---|---|---|
| Mobile | | 0.02 | 0.91 | 0.94 |
| Area | | 0.02 | - | 0.02 |
| Energy | | 0.42 | - | 0.42 |
| **Total lbs/day** | | **0.47** | **0.91** | 1.38 |
| | g/s | 0.00 | 0.00 | |

** Assumed that onsite mobile emissions, consists of 2% of total mobile emissions - accounting for onsite travel*

Phase II Unmitigated

| On Site Emissions | | PM2.5E (lbs/day) | PM2.5D (lbs/day) | PM2.5T (lbs/day) |
|---|---|---|---|---|
| Mobile | | 0.08 | 3.54 | 3.62 |
| Area | | 0.08 | - | 0.08 |
| Energy | | 1.54 | - | 1.54 |
| **Total lbs/day** | | **1.69** | **3.54** | 5.23 |
| | g/s | 0.01 | 0.02 | |

** Assumed that onsite mobile emissions, consists of 4% of total mobile emissions - accounting for onsite travel and drive-thru trips*

Buildout Unmitigated

| On Site Emissions | | PM2.5E (lbs/day) | PM2.5D (lbs/day) | PM2.5T (lbs/day) |
|---|---|---|---|---|
| Mobile | | 0.11 | 4.45 | 4.56 |
| Area | | 0.10 | 0.00 | 0.10 |
| Energy | | 1.96 | 0.00 | 1.96 |
| **Total lbs/day** | | **2.16** | **4.45** | 6.62 |
| | g/s | 0.01 | 0.02 | |

**Conversions:**

| | | |
|---|---|---|
| Const Hrs | 8 | per day |
| 1 hour = | 3600 | seconds |
| 1 pound = | 453.5924 | grams |
| 1 day = | 86400 | seconds |
| 1 pound = | 453.5924 | grams |
| 1 meter = | 0.000621 | miles |
| 1 ton = | 907184.7 | grams |
| 1 year = | 3.15E+07 | seconds |

| Unmitigated Operations: | P1 Exhaust | P1 Dust | P2 Exhaust | P2 Dust |
|---|---|---|---|---|
| Rate (g/s): | 2.43E-03 | 7.56E-03 | 9.06E-03 | 7.32E-02 |

PM10
24-HR Concentration [µg/m^3] at 1 g/s

| # | | X | Y | P1 Exhaust | P1 Dust | P2 Exhaust | P2 Dust | X, Y | P1 Exhaust | P1 Dust | P2 Exhaust | P2 Dust | Total P1 | Total P2 | otal Buildout |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | RES_V | 440400.61 | 3761994.75 | 0.96085 | 2.63216 | 3.98138 | 7.09797 | 440400.61, 3761994.75 | 0.00233185 | 0.0199 | 0.03608 | 0.519829 | 0.022231 | 0.555908 | 0.578139 |
| 2 | RES_V | 440450.61 | 3761994.75 | 1.00558 | 2.71573 | 4.45494 | 7.92518 | 440450.61, 3761994.75 | 0.0024404 | 0.02053 | 0.04037 | 0.580411 | 0.022971 | 0.620781 | 0.643752 |
| 3 | RES_V | 440500.61 | 3761994.75 | 1.05358 | 2.80283 | 5.03164 | 8.90724 | 440500.61, 3761994.75 | 0.00255689 | 0.02119 | 0.0456 | 0.652333 | 0.023746 | 0.69793 | 0.721675 |
| 4 | RES_V | 440550.61 | 3761994.75 | 1.10524 | 2.89347 | 5.71756 | 10.09854 | 440550.61, 3761994.75 | 0.00268226 | 0.02187 | 0.05181 | 0.739579 | 0.024557 | 0.791392 | 0.815948 |
| 5 | RES_V | 440600.61 | 3761994.75 | 1.16086 | 2.98821 | 6.59196 | 11.58399 | 440600.61, 3761994.75 | 0.00281724 | 0.02259 | 0.05974 | 0.848368 | 0.025408 | 0.908104 | 0.933512 |
| 6 | RES_V | 440650.61 | 3761994.75 | 1.22085 | 3.08718 | 7.73381 | 13.49133 | 440650.61, 3761994.75 | 0.00296283 | 0.02334 | 0.07008 | 0.988055 | 0.026302 | 1.058138 | 1.08444 |
| 7 | RES_V | 440400.61 | 3762044.75 | 1.00894 | 2.62924 | 4.12483 | 7.06788 | 440400.61, 3762044.75 | 0.00244856 | 0.01988 | 0.03738 | 0.517625 | 0.022325 | 0.555004 | 0.577329 |
| 8 | RES_V | 440450.61 | 3762044.75 | 1.0562 | 2.70626 | 4.57615 | 7.85598 | 440450.61, 3762044.75 | 0.00256325 | 0.02046 | 0.04147 | 0.575343 | 0.023022 | 0.616812 | 0.639834 |
| 9 | RES_V | 440500.61 | 3762044.75 | 1.10689 | 2.78628 | 5.13705 | 8.79701 | 440500.61, 3762044.75 | 0.00268627 | 0.02106 | 0.04655 | 0.64426 | 0.02375 | 0.690812 | 0.714562 |
| 10 | RES_V | 440550.61 | 3762044.75 | 1.16136 | 2.86927 | 5.80826 | 9.93939 | 440550.61, 3762044.75 | 0.00281846 | 0.02169 | 0.05263 | 0.727924 | 0.02451 | 0.780558 | 0.805068 |
| 11 | RES_V | 440600.61 | 3762044.75 | 1.21998 | 2.95546 | 6.65426 | 11.36357 | 440600.61, 3762044.75 | 0.00296072 | 0.02234 | 0.0603 | 0.832226 | 0.025304 | 0.892526 | 0.91783 |
| 12 | RES_V | 440650.61 | 3762044.75 | 1.28318 | 3.04494 | 7.76702 | 13.21679 | 440650.61, 3762044.75 | 0.0031141 | 0.02302 | 0.07038 | 0.967948 | 0.026133 | 1.038333 | 1.064466 |
| 13 | RES_V | 440400.61 | 3762094.75 | 1.06742 | 2.54614 | 4.29174 | 6.92812 | 440400.61, 3762094.75 | 0.00259048 | 0.01925 | 0.03889 | 0.50739 | 0.021839 | 0.546281 | 0.56812 |
| 14 | RES_V | 440450.61 | 3762094.75 | 1.11007 | 2.61279 | 4.69794 | 7.6571 | 440450.61, 3762094.75 | 0.00269398 | 0.01975 | 0.04257 | 0.560777 | 0.022446 | 0.60335 | 0.625796 |
| 15 | RES_V | 440500.61 | 3762094.75 | 1.16512 | 2.68162 | 5.21719 | 8.53086 | 440500.61, 3762094.75 | 0.00282758 | 0.02027 | 0.04728 | 0.624768 | 0.0231 | 0.672046 | 0.695147 |
| 16 | RES_V | 440550.61 | 3762094.75 | 1.22227 | 2.75268 | 5.84765 | 9.59598 | 440550.61, 3762094.75 | 0.00296628 | 0.02081 | 0.05299 | 0.702774 | 0.023776 | 0.755765 | 0.779541 |
| 17 | RES_V | 440600.61 | 3762094.75 | 1.28157 | 2.82604 | 6.61624 | 10.9317 | 440600.61, 3762094.75 | 0.00311019 | 0.02136 | 0.05996 | 0.800597 | 0.024475 | 0.860553 | 0.885028 |
| 18 | RES_V | 440650.61 | 3762094.75 | 1.36234 | 2.902 | 7.7501 | 12.68839 | 440650.61, 3762094.75 | 0.00330621 | 0.02194 | 0.07023 | 0.92925 | 0.025245 | 0.999481 | 1.024726 |
| 19 | RES_V | 440400.61 | 3762144.75 | 1.16806 | 2.39005 | 4.38495 | 6.72597 | 440400.61, 3762144.75 | 0.00283472 | 0.01807 | 0.03974 | 0.492585 | 0.020903 | 0.532321 | 0.553224 |
| 20 | RES_V | 440450.61 | 3762144.75 | 1.19526 | 2.4464 | 4.73531 | 7.37791 | 440450.61, 3762144.75 | 0.00290073 | 0.01849 | 0.04291 | 0.540331 | 0.021395 | 0.583242 | 0.604637 |
| 21 | RES_V | 440500.61 | 3762144.75 | 1.26184 | 2.5243 | 5.23452 | 8.15231 | 440500.61, 3762144.75 | 0.00306231 | 0.01908 | 0.04743 | 0.597045 | 0.022146 | 0.64448 | 0.666625 |
| 22 | RES_V | 440550.61 | 3762144.75 | 1.30441 | 2.60495 | 5.77402 | 9.10257 | 440550.61, 3762144.75 | 0.00316562 | 0.01969 | 0.05232 | 0.666638 | 0.022859 | 0.718962 | 0.741821 |
| 23 | RES_V | 440600.61 | 3762144.75 | 1.3767 | 2.68852 | 6.52753 | 10.30419 | 440600.61, 3762144.75 | 0.00334106 | 0.02032 | 0.05915 | 0.75464 | 0.023666 | 0.813793 | 0.837459 |
| 24 | RES_V | 440650.61 | 3762144.75 | 1.45973 | 2.77563 | 7.53204 | 11.90953 | 440650.61, 3762144.75 | 0.00354256 | 0.02098 | 0.06825 | 0.87221 | 0.024526 | 0.940465 | 0.964991 |
| 25 | RES_S | 441145.13 | 3761319.94 | 2.12553 | 4.56931 | 4.55485 | 10.53125 | 441145.13, 3761319.94 | 0.00515836 | 0.03454 | 0.04128 | 0.771269 | 0.039702 | 0.812545 | 0.852247 |
| 26 | RES_S | 441195.13 | 3761319.94 | 2.26455 | 4.84498 | 4.67159 | 10.47632 | 441195.13, 3761319.94 | 0.00549575 | 0.03663 | 0.04233 | 0.767247 | 0.042123 | 0.80958 | 0.851704 |
| 27 | RES_S | 441245.13 | 3761319.94 | 2.41327 | 5.1299 | 4.77344 | 10.55287 | 441245.13, 3761319.94 | 0.00585667 | 0.03878 | 0.04326 | 0.772853 | 0.044638 | 0.81611 | 0.860748 |
| 28 | RES_S | 441145.13 | 3761369.94 | 2.11737 | 4.66046 | 5.10595 | 11.70923 | 441145.13, 3761369.94 | 0.00513856 | 0.03523 | 0.04627 | 0.85754 | 0.040371 | 0.90381 | 0.944181 |
| 29 | RES_S | 441195.13 | 3761369.94 | 2.26164 | 4.93078 | 5.233 | 11.66853 | 441195.13, 3761369.94 | 0.00548868 | 0.03728 | 0.04742 | 0.85456 | 0.042765 | 0.901981 | 0.944746 |
| 30 | RES_S | 441245.13 | 3761369.94 | 2.41791 | 5.24039 | 5.3417 | 11.71704 | 441245.13, 3761369.94 | 0.00586793 | 0.03962 | 0.04841 | 0.858112 | 0.045485 | 0.906519 | 0.952003 |
| 31 | RES_S | 441145.13 | 3761419.94 | 2.0988 | 4.94046 | 5.78182 | 13.04839 | 441145.13, 3761419.94 | 0.00509349 | 0.03735 | 0.05239 | 0.955615 | 0.042443 | 1.00801 | 1.050453 |
| 32 | RES_S | 441195.13 | 3761419.94 | 2.24746 | 5.10888 | 5.92206 | 13.02727 | 441195.13, 3761419.94 | 0.00545427 | 0.03862 | 0.05367 | 0.954069 | 0.044077 | 1.007734 | 1.051811 |
| 33 | RES_S | 441245.13 | 3761419.94 | 2.41065 | 5.32295 | 6.04218 | 13.05641 | 441245.13, 3761419.94 | 0.00585031 | 0.04024 | 0.05475 | 0.956203 | 0.046091 | 1.010957 | 1.057048 |
| 34 | RES_S | 441145.13 | 3761469.94 | 2.07032 | 5.07287 | 6.63464 | 14.61988 | 441145.13, 3761469.94 | 0.00502438 | 0.03835 | 0.06012 | 1.070706 | 0.043375 | 1.130828 | 1.174203 |
| 35 | RES_S | 441195.13 | 3761469.94 | 2.22112 | 5.30373 | 6.78371 | 14.61171 | 441195.13, 3761469.94 | 0.00539035 | 0.0401 | 0.06147 | 1.070107 | 0.045486 | 1.131581 | 1.177067 |
| 36 | RES_S | 441245.13 | 3761469.94 | 2.39016 | 5.54095 | 6.91734 | 14.63274 | 441245.13, 3761469.94 | 0.00580058 | 0.04189 | 0.06268 | 1.071647 | 0.047689 | 1.134332 | 1.182021 |
| 37 | RES_S | 441145.13 | 3761519.94 | 2.031 | 5.1067 | 7.73761 | 16.53324 | 441145.13, 3761519.94 | 0.00492895 | 0.03861 | 0.07012 | 1.210833 | 0.043535 | 1.280951 | 1.324486 |
| 38 | RES_S | 441195.13 | 3761519.94 | 2.18225 | 5.37911 | 7.89464 | 16.53557 | 441195.13, 3761519.94 | 0.00529602 | 0.04067 | 0.07154 | 1.211004 | 0.045961 | 1.282544 | 1.328506 |
| 39 | RES_S | 441245.13 | 3761519.94 | 2.35176 | 5.66816 | 8.02652 | 16.52249 | 441245.13, 3761519.94 | 0.00570739 | 0.04285 | 0.07274 | 1.210046 | 0.048558 | 1.282782 | 1.331339 |
| 40 | RES_S | 441145.13 | 3761569.94 | 1.98072 | 5.10756 | 9.23454 | 19.02473 | 441145.13, 3761569.94 | 0.00480693 | 0.03861 | 0.08368 | 1.3933 | 0.043419 | 1.476983 | 1.520403 |
| 41 | RES_S | 441195.13 | 3761569.94 | 2.13043 | 5.40416 | 9.39767 | 19.02519 | 441195.13, 3761569.94 | 0.00517026 | 0.04085 | 0.08516 | 1.393334 | 0.046025 | 1.478495 | 1.52452 |
| 42 | RES_S | 441245.13 | 3761569.94 | 2.2983 | 5.72463 | 9.5274 | 18.98993 | 441245.13, 3761569.94 | 0.00557765 | 0.04328 | 0.08634 | 1.390752 | 0.048855 | 1.477089 | 1.525944 |
| 43 | RES_S | 441145.13 | 3761619.94 | 2.02317 | 5.12114 | 11.45832 | 22.70956 | 441145.13, 3761619.94 | 0.00490995 | 0.03872 | 0.10383 | 1.663164 | 0.043625 | 1.766998 | 1.810623 |
| 44 | RES_S | 441195.13 | 3761619.94 | 2.14643 | 5.4327 | 11.63286 | 22.72561 | 441195.13, 3761619.94 | 0.00520909 | 0.04107 | 0.10542 | 1.664339 | 0.04628 | 1.769755 | 1.816035 |
| 45 | RES_S | 441245.13 | 3761619.94 | 2.28264 | 5.77456 | 11.76665 | 22.73139 | 441245.13, 3761619.94 | 0.00553965 | 0.04365 | 0.10663 | 1.664762 | 0.049195 | 1.771391 | 1.820586 |
| 46 | RES_S | 441145.13 | 3761669.94 | 2.06029 | 5.15579 | 14.62927 | 30.69182 | 441145.13, 3761669.94 | 0.00500004 | 0.03898 | 0.13257 | 2.247755 | 0.043977 | 2.380324 | 2.424301 |
| 47 | RES_S | 441195.13 | 3761669.94 | 2.18901 | 5.47547 | 14.80671 | 30.60056 | 441195.13, 3761669.94 | 0.00531242 | 0.04139 | 0.13418 | 2.241071 | 0.046706 | 2.375249 | 2.421955 |
| 48 | RES_S | 441245.13 | 3761669.94 | 2.33204 | 5.82959 | 14.91588 | 30.76232 | 441245.13, 3761669.94 | 0.00565953 | 0.04407 | 0.13517 | 2.252918 | 0.04973 | 2.388085 | 2.437815 |
| 49 | RES_S | 441917 | 3761316.31 | 4.79572 | 15.55362 | 4.46474 | 8.40786 | 441917, 3761316.31 | 0.01163854 | 0.11758 | 0.04046 | 0.61576 | 0.129222 | 0.65622 | 0.785442 |
| 50 | RES_S | 441967 | 3761316.31 | 5.00968 | 16.53726 | 4.27152 | 8.0716 | 441967, 3761316.31 | 0.01215779 | 0.12502 | 0.03871 | 0.591134 | 0.137177 | 0.629842 | 0.76702 |
| 51 | RES_S | 442017 | 3761316.31 | 5.37618 | 17.2036 | 4.05105 | 7.79084 | 442017, 3761316.31 | 0.01304724 | 0.13006 | 0.03671 | 0.570572 | 0.143104 | 0.607283 | 0.750387 |
| 52 | RES_S | 442067 | 3761316.31 | 5.71462 | 17.57519 | 3.80585 | 7.25211 | 442067, 3761316.31 | 0.01386858 | 0.13287 | 0.03449 | 0.531118 | 0.146735 | 0.565606 | 0.712341 |
| 53 | RES_S | 441917 | 3761366.31 | 5.18302 | 15.94721 | 4.94759 | 9.10546 | 441917, 3761366.31 | 0.01257846 | 0.12056 | 0.04483 | 0.66685 | 0.133137 | 0.711685 | 0.844822 |
| 54 | RES_S | 441967 | 3761366.31 | 5.50894 | 17.46981 | 4.73981 | 8.77498 | 441967, 3761366.31 | 0.01336943 | 0.13207 | 0.04295 | 0.642647 | 0.145439 | 0.685599 | 0.831038 |
| 55 | RES_S | 442017 | 3761366.31 | 5.88829 | 18.60484 | 4.48847 | 8.49494 | 442017, 3761366.31 | 0.01429006 | 0.14065 | 0.04067 | 0.622138 | 0.15494 | 0.662812 | 0.817752 |
| 56 | RES_S | 442067 | 3761366.31 | 6.35147 | 19.36681 | 4.20897 | 7.96628 | 442067, 3761366.31 | 0.01541413 | 0.14641 | 0.03814 | 0.583421 | 0.161825 | 0.621562 | 0.783387 |
| 57 | RES_S | 441917 | 3761416.31 | 5.66529 | 15.96021 | 5.53903 | 9.94744 | 441917, 3761416.31 | 0.01374887 | 0.12066 | 0.05019 | 0.728513 | 0.134406 | 0.778708 | 0.913114 |
| 58 | RES_S | 441967 | 3761416.31 | 6.02466 | 18.04936 | 5.30618 | 9.61111 | 441967, 3761416.31 | 0.01462101 | 0.13645 | 0.04808 | 0.703882 | 0.151072 | 0.751966 | 0.903038 |
| 59 | RES_S | 442017 | 3761416.31 | 6.43398 | 19.85769 | 5.02224 | 9.30625 | 442017, 3761416.31 | 0.01561437 | 0.15012 | 0.04551 | 0.681555 | 0.165736 | 0.727066 | 0.892802 |
| 60 | RES_S | 442067 | 3761416.31 | 7.05082 | 21.17175 | 4.69536 | 8.79004 | 442067, 3761416.31 | 0.01711135 | 0.16006 | 0.04255 | 0.64375 | 0.177167 | 0.686299 | 0.863466 |
| 61 | RES_S | 441917 | 3761466.31 | 6.37785 | 16.09163 | 6.2702 | 10.94819 | 441917, 3761466.31 | 0.01547815 | 0.12165 | 0.05682 | 0.801805 | 0.137129 | 0.858625 | 0.995754 |
| 62 | RES_S | 441967 | 3761466.31 | 6.67291 | 18.09874 | 6.01309 | 10.62291 | 441967, 3761466.31 | 0.01619422 | 0.13682 | 0.05449 | 0.777982 | 0.153018 | 0.832473 | 0.985491 |
| 63 | RES_S | 442017 | 3761466.31 | 7.13234 | 20.72909 | 5.69446 | 10.27855 | 442017, 3761466.31 | 0.01730919 | 0.15671 | 0.0516 | 0.752763 | 0.174018 | 0.804366 | 0.978384 |
| 64 | RES_S | 442067 | 3761466.31 | 7.83078 | 22.94826 | 5.31502 | 9.7937 | 442067, 3761466.31 | 0.01900421 | 0.17349 | 0.04816 | 0.717254 | 0.19249 | 0.765419 | 0.957909 |
| 65 | RES_S | 441917 | 3761516.31 | 7.05634 | 15.98458 | 7.21657 | 12.23359 | 441917, 3761516.31 | 0.01712475 | 0.12084 | 0.0654 | 0.895943 | 0.137966 | 0.961339 | 1.099305 |
| 66 | RES_S | 441967 | 3761516.31 | 7.58392 | 18.49355 | 6.93448 | 11.89518 | 441967, 3761516.31 | 0.01840511 | 0.13981 | 0.06284 | 0.871159 | 0.158214 | 0.933999 | 1.092213 |
| 67 | RES_S | 442017 | 3761516.31 | 8.05885 | 21.21751 | 6.5773 | 11.51241 | 442017, 3761516.31 | 0.0195577 | 0.1604 | 0.0596 | 0.843126 | 0.179959 | 0.902729 | 1.082689 |
| 68 | RES_S | 442067 | 3761516.31 | 8.70103 | 24.37926 | 6.13541 | 11.07063 | 442067, 3761516.31 | 0.02111618 | 0.1843 | 0.0556 | 0.810772 | 0.20542 | 0.86637 | 1.071791 |
| 69 | RES_S | 441917 | 3761566.31 | 7.65271 | 15.1668 | 8.53063 | 14.08595 | 441917, 3761566.31 | 0.01857206 | 0.11466 | 0.0773 | 1.031602 | 0.133231 | 1.108907 | 1.242138 |
| 70 | RES_S | 441967 | 3761566.31 | 8.44118 | 18.11612 | 8.21465 | 13.68144 | 441967, 3761566.31 | 0.02048556 | 0.13696 | 0.07444 | 1.001978 | 0.157441 | 1.076418 | 1.23386 |
| 71 | RES_S | 442017 | 3761566.31 | 9.28111 | 21.66745 | 7.80854 | 13.21579 | 442017, 3761566.31 | 0.02252396 | 0.1638 | 0.07076 | 0.967875 | 0.186327 | 1.038636 | 1.224963 |
| 72 | RES_S | 442067 | 3761566.31 | 10.11696 | 25.87976 | 7.28994 | 12.85562 | 442067, 3761566.31 | 0.02455245 | 0.19565 | 0.06606 | 0.941498 | 0.2202 | 1.007559 | 1.227759 |
| 73 | RES_S | 441917 | 3761616.31 | 8.11687 | 15.95909 | 10.55036 | 17.64164 | 441917, 3761616.31 | 0.01969851 | 0.12065 | 0.09561 | 1.292008 | 0.140347 | 1.387615 | 1.527962 |
| 74 | RES_S | 441967 | 3761616.31 | 9.15207 | 18.45147 | 10.19188 | 17.04205 | 441967, 3761616.31 | 0.02221079 | 0.13949 | 0.09236 | 1.248096 | 0.161702 | 1.340455 | 1.502156 |
| 75 | RES_S | 442017 | 3761616.31 | 10.38207 | 21.60138 | 9.71946 | 16.25034 | 442017, 3761616.31 | 0.02519583 | 0.1633 | 0.08808 | 1.190114 | 0.1885 | 1.278192 | 1.466691 |
| 76 | RES_S | 442067 | 3761616.31 | 11.86149 | 26.08448 | 9.09561 | 15.68784 | 442067, 3761616.31 | 0.02878618 | 0.1972 | 0.08242 | 1.148919 | 0.225982 | 1.231343 | 1.457324 |
| 77 | RES_E | 442847.68 | 3761995.12 | 22.99231 | 43.36489 | 3.24566 | 6.34175 | 442847.68, 3761995.12 | 0.05579912 | 0.32783 | 0.02941 | 0.464446 | 0.383632 | 0.493858 | 0.87749 |
| 78 | RES_E | 442897.68 | 3761995.12 | 17.83783 | 34.40642 | 3.13004 | 5.99487 | 442897.68, 3761995.12 | 0.04328992 | 0.26011 | 0.02836 | 0.439042 | 0.303398 | 0.467406 | 0.770804 |
| 79 | RES_E | 442947.68 | 3761995.12 | 14.49049 | 28.86594 | 2.90043 | 5.67509 | 442947.68, 3761995.12 | 0.03516639 | 0.21822 | 0.02628 | 0.415622 | 0.253389 | 0.441906 | 0.695295 |
| 80 | RES_E | 442997.68 | 3761995.12 | 12.18518 | 24.84366 | 2.7353 | 5.37792 | 442997.68, 3761995.12 | 0.02957173 | 0.18781 | 0.02479 | 0.393859 | 0.217387 | 0.418646 | 0.636033 |
| 81 | RES_E | 443047.68 | 3761995.12 | 10.45361 | 21.69874 | 2.61087 | 5.10206 | 443047.68, 3761995.12 | 0.02536945 | 0.16404 | 0.02366 | 0.373656 | 0.189409 | 0.397315 | 0.586725 |
| 82 | RES_E | 443097.68 | 3761995.12 | 9.09535 | 19.12185 | 2.48711 | 4.84617 | 443097.68, 3761995.12 | 0.02207314 | 0.14456 | 0.02254 | 0.354915 | 0.166632 | 0.377453 | 0.544085 |
| 83 | RES_E | 443147.68 | 3761995.12 | 8.0349 | 16.94253 | 2.40682 | 4.60833 | 443147.68, 3761995.12 | 0.01949958 | 0.12808 | 0.02181 | 0.337497 | 0.147583 | 0.359307 | 0.50689 |
| 84 | RES_E | 443197.68 | 3761995.12 | 7.2637 | 15.05543 | 2.32954 | 4.38761 | 443197.68, 3761995.12 | 0.01762798 | 0.11382 | 0.02111 | 0.321332 | 0.131445 | 0.342442 | 0.473888 |
| 85 | RES_E | 442847.68 | 3762045.12 | 22.51157 | 40.38594 | 3.43436 | 6.58567 | 442847.68, 3762045.12 | 0.05463243 | 0.30531 | 0.03112 | 0.48231 | 0.359945 | 0.513432 | 0.873377 |
| 86 | RES_E | 442897.68 | 3762045.12 | 17.34081 | 31.57957 | 3.25304 | 6.23422 | 442897.68, 3762045.12 | 0.04208372 | 0.23874 | 0.02948 | 0.456571 | 0.280821 | 0.48605 | 0.766871 |
| 87 | RES_E | 442947.68 | 3762045.12 | 14.01589 | 26.54246 | 3.07631 | 5.90699 | 442947.68, 3762045.12 | 0.0340146 | 0.20066 | 0.02788 | 0.432606 | 0.234672 | 0.460483 | 0.695156 |
| 88 | RES_E | 442997.68 | 3762045.12 | 11.68828 | 23.06959 | 2.93508 | 5.60124 | 442997.68, 3762045.12 | 0.02836582 | 0.1744 | 0.0266 | 0.410214 | 0.202769 | 0.436811 | 0.63958 |
| 89 | RES_E | 443047.68 | 3762045.12 | 10.03825 | 20.42279 | 2.79162 | 5.3154 | 443047.68, 3762045.12 | 0.02436143 | 0.15439 | 0.0253 | 0.38928 | 0.178755 | 0.414578 | 0.593333 |
| 90 | RES_E | 443097.68 | 3762045.12 | 8.84459 | 18.27467 | 2.67279 | 5.04799 | 443097.68, 3762045.12 | 0.02146458 | 0.13815 | 0.02422 | 0.369696 | 0.159619 | 0.393917 | 0.553535 |
| 91 | RES_E | 443147.68 | 3762045.12 | 7.8766 | 16.45318 | 2.5613 | 4.7977 | 443147.68, 3762045.12 | 0.01911541 | 0.12438 | 0.02321 | 0.351366 | 0.143499 | 0.374576 | 0.518075 |
| 92 | RES_E | 443197.68 | 3762045.12 | 7.11503 | 14.861 | 2.47876 | 4.5635 | 443197.68, 3762045.12 | 0.01726718 | 0.11235 | 0.02246 | 0.334214 | 0.129614 | 0.356676 | 0.486291 |
| 93 | RES_E | 442447.68 | 3762095.12 | 34.23435 | 60.16243 | 6.28878 | 11.35911 | 442447.68, 3762095.12 | 0.08308198 | 0.45482 | 0.05699 | 0.831899 | 0.537902 | 0.888888 | 1.42679 |
| 94 | RES_E | 442497.68 | 3762095.12 | 33.90119 | 56.97081 | 5.74397 | 10.2968 | 442497.68, 3762095.12 | 0.08227345 | 0.43069 | 0.05205 | 0.754099 | 0.512966 | 0.806151 | 1.319116 |
| 95 | RES_E | 442547.68 | 3762095.12 | 30.04869 | 55.43294 | 5.33657 | 9.5017 | 442547.68, 3762095.12 | 0.07292397 | 0.41907 | 0.04836 | 0.695869 | 0.49199 | 0.744229 | 1.236219 |
| 96 | RES_E | 442597.68 | 3762095.12 | 31.06478 | 53.68916 | 5.03223 | 8.90259 | 442597.68, 3762095.12 | 0.07538988 | 0.40588 | 0.0456 | 0.651993 | 0.481273 | 0.697594 | 1.178867 |
| 97 | RES_E | 442647.68 | 3762095.12 | 27.28436 | 52.21682 | 4.57222 | 8.36888 | 442647.68, 3762095.12 | 0.06621533 | 0.39475 | 0.04143 | 0.612906 | 0.460968 | 0.654339 | 1.115307 |
| 98 | RES_E | 442697.68 | 3762095.12 | 27.62452 | 50.24696 | 4.32414 | 7.88234 | 442697.68, 3762095.12 | 0.06704085 | 0.37986 | 0.03919 | 0.577273 | 0.446901 | 0.616458 | 1.06336 |
| 99 | RES_E | 442747.68 | 3762095.12 | 26.67943 | 47.22145 | 4.06309 | 7.43935 | 442747.68, 3762095.12 | 0.06474725 | 0.35699 | 0.03682 | 0.54483 | 0.421735 | 0.58165 | 1.003385 |
| 100 | RES_E | 442797.68 | 3762095.12 | 24.23052 | 45.17286 | 3.80804 | 7.03256 | 442797.68, 3762095.12 | 0.05880408 | 0.3415 | 0.03451 | 0.515038 | 0.400305 | 0.549547 | 0.949852 |
| 101 | RES_E | 442847.68 | 3762095.12 | 21.00994 | 36.33746 | 3.52619 | 6.65788 | 442847.68, 3762095.12 | 0.05098819 | 0.27471 | 0.03195 | 0.487598 | 0.325695 | 0.519552 | 0.845247 |
| 102 | RES_E | 442897.68 | 3762095.12 | 16.82341 | 29.06914 | 3.34995 | 6.30885 | 442897.68, 3762095.12 | 0.04082806 | 0.21976 | 0.03036 | 0.462037 | 0.260587 | 0.492394 | 0.752981 |
| 103 | RES_E | 442947.68 | 3762095.12 | 14.00307 | 24.17062 | 3.18739 | 5.984 | 442947.68, 3762095.12 | 0.03398349 | 0.18273 | 0.02888 | 0.438246 | 0.21671 | 0.46713 | 0.68384 |
| 104 | RES_E | 442997.68 | 3762095.12 | 12.30412 | 20.43822 | 3.10141 | 5.67951 | 442997.68, 3762095.12 | 0.02986038 | 0.15451 | 0.0281 | 0.415946 | 0.184371 | 0.444051 | 0.628422 |
| 105 | RES_E | 443047.68 | 3762095.12 | 10.59292 | 18.52614 | 2.94211 | 5.39551 | 443047.68, 3762095.12 | 0.02570754 | 0.14006 | 0.02666 | 0.395147 | 0.165763 | 0.421808 | 0.587571 |
| 106 | RES_E | 443097.68 | 3762095.12 | 9.20879 | 16.91145 | 2.80312 | 5.12862 | 443097.68, 3762095.12 | 0.02234845 | 0.12785 | 0.0254 | 0.375601 | 0.150197 | 0.401003 | 0.5512 |
| 107 | RES_E | 443147.68 | 3762095.12 | 8.01866 | 15.50287 | 2.67543 | 4.87802 | 443147.68, 3762095.12 | 0.01946017 | 0.1172 | 0.02424 | 0.357248 | 0.13666 | 0.381493 | 0.518153 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 108 | RES_E | 443197.68 | 3762095.12 | 7.29936 | 14.24185 | 2.62412 | 4.64148 | 443197.68, 3762095.12 | 0.01771453 | 0.10767 | 0.02378 | 0.339925 | 0.125381 | 0.363704 | 0.489085 |
| 109 | RES_E | 442447.68 | 3762145.12 | 28.41558 | 33.93297 | 6.11073 | 11.17868 | 442447.68, 3762145.12 | 0.06896064 | 0.25653 | 0.05538 | 0.818685 | 0.32549 | 0.87406 | 1.19955 |
| 110 | RES_E | 442497.68 | 3762145.12 | 24.54389 | 30.58036 | 5.64834 | 10.15192 | 442497.68, 3762145.12 | 0.05956459 | 0.23118 | 0.05118 | 0.743489 | 0.290748 | 0.794674 | 1.085422 |
| 111 | RES_E | 442547.68 | 3762145.12 | 22.53683 | 29.65552 | 5.12438 | 9.29312 | 442547.68, 3762145.12 | 0.05469373 | 0.22419 | 0.04644 | 0.680593 | 0.278886 | 0.72703 | 1.005916 |
| 112 | RES_E | 442597.68 | 3762145.12 | 21.18103 | 29.32199 | 4.92921 | 8.7067 | 442597.68, 3762145.12 | 0.0514034 | 0.22167 | 0.04467 | 0.637646 | 0.273074 | 0.682315 | 0.955388 |
| 113 | RES_E | 442647.68 | 3762145.12 | 20.36711 | 29.11529 | 4.50106 | 8.18628 | 442647.68, 3762145.12 | 0.04942813 | 0.22011 | 0.04079 | 0.599533 | 0.269536 | 0.640321 | 0.909857 |
| 114 | RES_E | 442697.68 | 3762145.12 | 19.83499 | 28.64616 | 4.23809 | 7.71476 | 442697.68, 3762145.12 | 0.04813675 | 0.21656 | 0.03841 | 0.565 | 0.264698 | 0.603406 | 0.868104 |
| 115 | RES_E | 442747.68 | 3762145.12 | 19.0734 | 27.99308 | 4.03433 | 7.28471 | 442747.68, 3762145.12 | 0.04628847 | 0.21162 | 0.03656 | 0.533505 | 0.257913 | 0.570064 | 0.827977 |
| 116 | RES_E | 442797.68 | 3762145.12 | 17.83651 | 27.0762 | 3.80196 | 6.89201 | 442797.68, 3762145.12 | 0.04328672 | 0.20469 | 0.03445 | 0.504745 | 0.247979 | 0.539198 | 0.787178 |
| 117 | RES_E | 442847.68 | 3762145.12 | 16.68897 | 27.27319 | 3.5055 | 6.53227 | 442847.68, 3762145.12 | 0.0405018 | 0.20618 | 0.03177 | 0.478399 | 0.246684 | 0.510166 | 0.756849 |
| 118 | RES_E | 442897.68 | 3762145.12 | 14.99764 | 25.35919 | 3.37101 | 6.19699 | 442897.68, 3762145.12 | 0.03639717 | 0.19171 | 0.03055 | 0.453844 | 0.228109 | 0.484392 | 0.712502 |
| 119 | RES_E | 442947.68 | 3762145.12 | 13.31464 | 22.56564 | 3.23976 | 5.88607 | 442947.68, 3762145.12 | 0.03231277 | 0.17059 | 0.02936 | 0.431074 | 0.202906 | 0.460432 | 0.663339 |
| 120 | RES_E | 442997.68 | 3762145.12 | 11.96624 | 19.84312 | 3.13293 | 5.59602 | 442997.68, 3762145.12 | 0.02904039 | 0.15001 | 0.02839 | 0.409832 | 0.179052 | 0.438222 | 0.617274 |
| 121 | RES_E | 443047.68 | 3762145.12 | 10.57024 | 17.40603 | 2.98704 | 5.32549 | 443047.68, 3762145.12 | 0.02565249 | 0.13159 | 0.02707 | 0.390019 | 0.15724 | 0.417087 | 0.574327 |
| 122 | RES_E | 443097.68 | 3762145.12 | 9.31944 | 15.2658 | 2.84949 | 5.07164 | 443097.68, 3762145.12 | 0.02261698 | 0.11541 | 0.02582 | 0.371428 | 0.138024 | 0.39725 | 0.535274 |
| 123 | RES_E | 443147.68 | 3762145.12 | 8.26272 | 14.20626 | 2.722 | 4.83259 | 443147.68, 3762145.12 | 0.02005247 | 0.1074 | 0.02467 | 0.353921 | 0.12745 | 0.378588 | 0.506038 |
| 124 | RES_E | 443197.68 | 3762145.12 | 7.49835 | 13.30059 | 2.63925 | 4.60667 | 443197.68, 3762145.12 | 0.01819745 | 0.10055 | 0.02392 | 0.337375 | 0.118748 | 0.361292 | 0.48004 |
| 125 | RES_E | 442447.68 | 3762195.12 | 23.39463 | 29.1596 | 6.29053 | 10.72087 | 442447.68, 3762195.12 | 0.0567755 | 0.22044 | 0.057 | 0.785157 | 0.277218 | 0.842161 | 1.119379 |
| 126 | RES_E | 442497.68 | 3762195.12 | 19.33303 | 24.98329 | 5.63753 | 9.79319 | 442497.68, 3762195.12 | 0.04691856 | 0.18887 | 0.05109 | 0.717217 | 0.235789 | 0.768304 | 1.004093 |
| 127 | RES_E | 442547.68 | 3762195.12 | 17.18179 | 23.13625 | 4.94998 | 9.00759 | 442547.68, 3762195.12 | 0.0416978 | 0.17491 | 0.04486 | 0.659682 | 0.216605 | 0.704539 | 0.921144 |
| 128 | RES_E | 442597.68 | 3762195.12 | 16.13685 | 22.22322 | 4.66724 | 8.31536 | 442597.68, 3762195.12 | 0.03916188 | 0.168 | 0.04229 | 0.608986 | 0.207167 | 0.65128 | 0.858447 |
| 129 | RES_E | 442647.68 | 3762195.12 | 15.82719 | 22.3468 | 4.40414 | 7.7065 | 442647.68, 3762195.12 | 0.03841038 | 0.16894 | 0.03991 | 0.564395 | 0.207349 | 0.604305 | 0.811655 |
| 130 | RES_E | 442697.68 | 3762195.12 | 15.47423 | 22.38465 | 4.19084 | 7.2753 | 442697.68, 3762195.12 | 0.03755379 | 0.16923 | 0.03798 | 0.532816 | 0.206779 | 0.570793 | 0.777572 |
| 131 | RES_E | 442747.68 | 3762195.12 | 14.93625 | 21.51768 | 3.99069 | 6.88473 | 442747.68, 3762195.12 | 0.03624819 | 0.16267 | 0.03616 | 0.504212 | 0.198919 | 0.540375 | 0.739295 |
| 132 | RES_E | 442797.68 | 3762195.12 | 14.01771 | 20.67133 | 3.72084 | 6.52977 | 442797.68, 3762195.12 | 0.03401902 | 0.15627 | 0.03372 | 0.478216 | 0.190292 | 0.511934 | 0.702226 |
| 133 | RES_E | 442847.68 | 3762195.12 | 13.11827 | 20.88627 | 3.46791 | 6.20357 | 442847.68, 3762195.12 | 0.03183621 | 0.1579 | 0.03143 | 0.454326 | 0.189734 | 0.485752 | 0.675486 |
| 134 | RES_E | 442897.68 | 3762195.12 | 12.6751 | 20.8286 | 3.34008 | 5.90053 | 442897.68, 3762195.12 | 0.0307607 | 0.15746 | 0.03027 | 0.432133 | 0.188222 | 0.4624 | 0.650623 |
| 135 | RES_E | 442947.68 | 3762195.12 | 12.00192 | 19.8345 | 3.25122 | 5.61943 | 442947.68, 3762195.12 | 0.02912698 | 0.14995 | 0.02946 | 0.411546 | 0.179073 | 0.441009 | 0.620082 |
| 136 | RES_E | 442997.68 | 3762195.12 | 11.26799 | 18.2223 | 3.14752 | 5.35766 | 442997.68, 3762195.12 | 0.02734584 | 0.13776 | 0.02852 | 0.392375 | 0.165104 | 0.420898 | 0.586002 |
| 137 | RES_E | 443047.68 | 3762195.12 | 10.33856 | 16.55557 | 3.02308 | 5.1133 | 443047.68, 3762195.12 | 0.02509024 | 0.12516 | 0.0274 | 0.374479 | 0.150248 | 0.401874 | 0.552122 |
| 138 | RES_E | 443097.68 | 3762195.12 | 9.40363 | 14.88814 | 2.89884 | 4.88398 | 443097.68, 3762195.12 | 0.02282129 | 0.11255 | 0.02627 | 0.357684 | 0.135374 | 0.383954 | 0.519327 |
| 139 | RES_E | 443147.68 | 3762195.12 | 8.4563 | 13.33343 | 2.76432 | 4.66792 | 443147.68, 3762195.12 | 0.02052226 | 0.1008 | 0.02505 | 0.341861 | 0.121321 | 0.366911 | 0.488232 |
| 140 | RES_E | 443197.68 | 3762195.12 | 7.65456 | 12.41227 | 2.65848 | 4.46342 | 443197.68, 3762195.12 | 0.01857655 | 0.09384 | 0.02409 | 0.326884 | 0.112412 | 0.350975 | 0.463387 |
| 141 | RES_E | 442447.68 | 3762245.12 | 19.52445 | 26.23496 | 6.43315 | 10.05814 | 442447.68, 3762245.12 | 0.04738311 | 0.19833 | 0.0583 | 0.736621 | 0.245716 | 0.794918 | 1.040634 |
| 142 | RES_E | 442497.68 | 3762245.12 | 15.83822 | 22.15616 | 5.76496 | 9.29164 | 442497.68, 3762245.12 | 0.03843714 | 0.1675 | 0.05224 | 0.680485 | 0.205935 | 0.732727 | 0.938662 |
| 143 | RES_E | 442547.68 | 3762245.12 | 14.00659 | 19.99242 | 5.10424 | 8.63268 | 442547.68, 3762245.12 | 0.03399204 | 0.15114 | 0.04625 | 0.632225 | 0.185132 | 0.67848 | 0.863612 |
| 144 | RES_E | 442597.68 | 3762245.12 | 13.42532 | 18.64075 | 4.72253 | 8.04336 | 442597.68, 3762245.12 | 0.03258137 | 0.14092 | 0.0428 | 0.589066 | 0.173503 | 0.631861 | 0.805364 |
| 145 | RES_E | 442647.68 | 3762245.12 | 13.00237 | 18.39066 | 4.29232 | 7.51595 | 442647.68, 3762245.12 | 0.03155493 | 0.13903 | 0.0389 | 0.55044 | 0.170586 | 0.589337 | 0.759923 |
| 146 | RES_E | 442697.68 | 3762245.12 | 12.61971 | 18.18837 | 4.0239 | 7.03442 | 442697.68, 3762245.12 | 0.03062627 | 0.1375 | 0.03646 | 0.515175 | 0.168128 | 0.551639 | 0.719767 |
| 147 | RES_E | 442747.68 | 3762245.12 | 12.14637 | 17.23953 | 3.76452 | 6.66351 | 442747.68, 3762245.12 | 0.02947754 | 0.13033 | 0.03411 | 0.488011 | 0.159806 | 0.522125 | 0.681931 |
| 148 | RES_E | 442797.68 | 3762245.12 | 11.65359 | 16.87419 | 3.58495 | 6.36533 | 442797.68, 3762245.12 | 0.02828163 | 0.12757 | 0.03249 | 0.466173 | 0.155848 | 0.49866 | 0.654508 |
| 149 | RES_E | 442847.68 | 3762245.12 | 11.08356 | 17.27495 | 3.43065 | 6.08773 | 442847.68, 3762245.12 | 0.02689825 | 0.1306 | 0.03109 | 0.445843 | 0.157495 | 0.476931 | 0.634426 |
| 150 | RES_E | 442897.68 | 3762245.12 | 10.66429 | 17.23082 | 3.36487 | 5.82708 | 442897.68, 3762245.12 | 0.02588074 | 0.13026 | 0.03049 | 0.426754 | 0.156144 | 0.457246 | 0.613389 |
| 151 | RES_E | 442947.68 | 3762245.12 | 10.44159 | 17.28723 | 3.24285 | 5.58266 | 442947.68, 3762245.12 | 0.02534028 | 0.13069 | 0.02939 | 0.408853 | 0.15603 | 0.43824 | 0.594269 |
| 152 | RES_E | 442997.68 | 3762245.12 | 10.10533 | 16.75677 | 3.13971 | 5.3521 | 442997.68, 3762245.12 | 0.02452422 | 0.12668 | 0.02845 | 0.391968 | 0.151203 | 0.42042 | 0.571623 |
| 153 | RES_E | 443047.68 | 3762245.12 | 9.45975 | 15.67824 | 2.97939 | 5.13446 | 443047.68, 3762245.12 | 0.02295749 | 0.11853 | 0.027 | 0.376029 | 0.141483 | 0.403028 | 0.544511 |
| 154 | RES_E | 443097.68 | 3762245.12 | 8.89243 | 14.26571 | 2.86605 | 4.92794 | 443097.68, 3762245.12 | 0.02158068 | 0.10785 | 0.02597 | 0.360904 | 0.129428 | 0.386876 | 0.516304 |
| 155 | RES_E | 443147.68 | 3762245.12 | 8.15599 | 12.94686 | 2.72786 | 4.73228 | 443147.68, 3762245.12 | 0.01979345 | 0.09788 | 0.02472 | 0.346575 | 0.11767 | 0.371294 | 0.488964 |
| 156 | RES_E | 443197.68 | 3762245.12 | 7.53112 | 11.77192 | 2.63189 | 4.54616 | 443197.68, 3762245.12 | 0.01827698 | 0.08899 | 0.02385 | 0.332944 | 0.107271 | 0.356794 | 0.464065 |
| 157 | RES_E | 442822.81 | 3761611.77 | 14.7822 | 24.88279 | 2.5747 | 5.40779 | 442822.81, 3761611.77 | 0.03587433 | 0.18811 | 0.02333 | 0.396046 | 0.223985 | 0.419378 | 0.643363 |
| 158 | RES_E | 442872.81 | 3761611.77 | 12.22843 | 19.99966 | 2.47134 | 5.21194 | 442872.81, 3761611.77 | 0.02967669 | 0.15119 | 0.0224 | 0.381703 | 0.180872 | 0.404098 | 0.58497 |
| 159 | RES_E | 442922.81 | 3761611.77 | 9.98917 | 17.72968 | 2.37354 | 5.02169 | 442922.81, 3761611.77 | 0.02424232 | 0.13403 | 0.02151 | 0.36777 | 0.158276 | 0.389279 | 0.547555 |
| 160 | RES_E | 442972.81 | 3761611.77 | 8.33808 | 16.20959 | 2.28086 | 4.83715 | 442972.81, 3761611.77 | 0.02023535 | 0.12254 | 0.02067 | 0.354255 | 0.142778 | 0.374924 | 0.517702 |
| 161 | RES_E | 442822.81 | 3761661.77 | 19.24435 | 33.85589 | 2.80784 | 5.60675 | 442822.81, 3761661.77 | 0.04670335 | 0.25595 | 0.02544 | 0.410617 | 0.30265 | 0.436062 | 0.738712 |
| 162 | RES_E | 442872.81 | 3761661.77 | 14.31593 | 25.65993 | 2.67768 | 5.41812 | 442872.81, 3761661.77 | 0.03474276 | 0.19399 | 0.02427 | 0.396803 | 0.228729 | 0.421068 | 0.649797 |
| 163 | RES_E | 442922.81 | 3761661.77 | 11.38706 | 21.49006 | 2.55657 | 5.23988 | 442922.81, 3761661.77 | 0.0276348 | 0.16246 | 0.02317 | 0.383749 | 0.190097 | 0.406917 | 0.597014 |
| 164 | RES_E | 442972.81 | 3761661.77 | 9.605 | 18.63011 | 2.44361 | 5.06989 | 442972.81, 3761661.77 | 0.02330999 | 0.14084 | 0.02214 | 0.3713 | 0.164151 | 0.393444 | 0.557595 |
| 165 | RES_N | 442732.29 | 3762366.08 | 8.78546 | 11.58217 | 3.97817 | 6.27182 | 442732.29, 3762366.08 | 0.02132108 | 0.08756 | 0.03605 | 0.459325 | 0.108881 | 0.495375 | 0.604256 |
| 166 | RES_N | 442782.29 | 3762366.08 | 8.51892 | 11.31834 | 3.72001 | 5.98878 | 442782.29, 3762366.08 | 0.02067423 | 0.08557 | 0.03371 | 0.438596 | 0.106239 | 0.472306 | 0.578546 |
| 167 | RES_N | 442832.29 | 3762366.08 | 8.31828 | 11.61409 | 3.50491 | 5.71226 | 442832.29, 3762366.08 | 0.0201873 | 0.0878 | 0.03176 | 0.418345 | 0.107988 | 0.450106 | 0.558094 |
| 168 | RES_N | 442732.29 | 3762416.08 | 7.89421 | 10.21958 | 4.03505 | 6.17516 | 442732.29, 3762416.08 | 0.01915814 | 0.07726 | 0.03657 | 0.452246 | 0.096417 | 0.488811 | 0.585228 |
| 169 | RES_N | 442782.29 | 3762416.08 | 7.63845 | 9.99688 | 3.78788 | 5.83007 | 442782.29, 3762416.08 | 0.01853745 | 0.07558 | 0.03433 | 0.426973 | 0.094113 | 0.461298 | 0.555411 |
| 170 | RES_N | 442832.29 | 3762416.08 | 7.3875 | 10.25306 | 3.54889 | 5.55119 | 442832.29, 3762416.08 | 0.01792843 | 0.07751 | 0.03216 | 0.406548 | 0.09544 | 0.438708 | 0.534149 |
| 171 | RES_N | 442732.29 | 3762466.08 | 7.04563 | 9.13247 | 4.01623 | 6.09717 | 442732.29, 3762466.08 | 0.01709876 | 0.06904 | 0.03639 | 0.446534 | 0.086139 | 0.482929 | 0.569068 |
| 172 | RES_N | 442782.29 | 3762466.08 | 6.85927 | 8.83536 | 3.79779 | 5.83179 | 442782.29, 3762466.08 | 0.01664649 | 0.06679 | 0.03442 | 0.427099 | 0.083441 | 0.461514 | 0.544955 |
| 173 | RES_N | 442832.29 | 3762466.08 | 6.67577 | 9.12574 | 3.59475 | 5.57321 | 442832.29, 3762466.08 | 0.01620116 | 0.06899 | 0.03258 | 0.408161 | 0.085191 | 0.440737 | 0.525927 |
| 174 | RES_N | 441922.75 | 3762323.77 | 6.6086 | 11.85873 | 10.44886 | 15.29362 | 441922.75, 3762323.77 | 0.01603815 | 0.08965 | 0.09469 | 1.120048 | 0.105689 | 1.214735 | 1.320423 |
| 175 | RES_N | 441972.75 | 3762323.77 | 7.47033 | 13.12291 | 10.39343 | 15.18928 | 441972.75, 3762323.77 | 0.01812945 | 0.09921 | 0.09418 | 1.112406 | 0.117337 | 1.206591 | 1.323928 |
| 176 | RES_N | 442022.75 | 3762323.77 | 8.45985 | 14.59296 | 10.31777 | 15.0177 | 442022.75, 3762323.77 | 0.02053087 | 0.11032 | 0.0935 | 1.09984 | 0.130852 | 1.19334 | 1.324191 |
| 177 | RES_N | 442072.75 | 3762323.77 | 9.56621 | 16.48983 | 10.18583 | 14.75104 | 442072.75, 3762323.77 | 0.02321585 | 0.12466 | 0.0923 | 1.080311 | 0.147877 | 1.172615 | 1.320492 |
| 178 | RES_N | 441922.75 | 3762373.77 | 6.42164 | 10.99314 | 8.72539 | 11.83853 | 441922.75, 3762373.77 | 0.01558442 | 0.08311 | 0.07907 | 0.86701 | 0.098691 | 0.946079 | 1.04477 |
| 179 | RES_N | 441972.75 | 3762373.77 | 6.98057 | 12.28178 | 8.56746 | 11.78932 | 441972.75, 3762373.77 | 0.01694087 | 0.09285 | 0.07764 | 0.863406 | 0.10979 | 0.941044 | 1.050833 |
| 180 | RES_N | 442022.75 | 3762373.77 | 7.61794 | 13.51122 | 8.50801 | 11.66095 | 442022.75, 3762373.77 | 0.01848768 | 0.10214 | 0.0771 | 0.854005 | 0.120631 | 0.931104 | 1.051734 |
| 181 | RES_N | 442072.75 | 3762373.77 | 8.21124 | 14.39986 | 8.29103 | 11.60069 | 442072.75, 3762373.77 | 0.01992753 | 0.10886 | 0.07513 | 0.849591 | 0.128789 | 0.924724 | 1.053513 |
| 182 | RES_N | 441922.75 | 3762423.77 | 6.17313 | 10.7675 | 7.63372 | 9.77183 | 441922.75, 3762423.77 | 0.01498132 | 0.0814 | 0.06918 | 0.715652 | 0.096382 | 0.784829 | 0.881211 |
| 183 | RES_N | 441972.75 | 3762423.77 | 6.35244 | 11.49687 | 7.44831 | 9.90502 | 441972.75, 3762423.77 | 0.01541648 | 0.08691 | 0.0675 | 0.725407 | 0.102331 | 0.792903 | 0.895234 |
| 184 | RES_N | 442022.75 | 3762423.77 | 6.63737 | 11.8281 | 7.35808 | 9.98348 | 442022.75, 3762423.77 | 0.01610797 | 0.08942 | 0.06668 | 0.731153 | 0.105527 | 0.797831 | 0.903358 |
| 185 | RES_N | 442072.75 | 3762423.77 | 7.5078 | 12.03295 | 7.19466 | 9.98103 | 442072.75, 3762423.77 | 0.01822038 | 0.09097 | 0.0652 | 0.730973 | 0.109188 | 0.796171 | 0.905359 |
| 186 | RES_N | 441922.75 | 3762473.77 | 5.61246 | 9.87933 | 6.6886 | 8.52747 | 441922.75, 3762473.77 | 0.01362066 | 0.07469 | 0.06061 | 0.62452 | 0.088307 | 0.685132 | 0.773439 |
| 187 | RES_N | 441972.75 | 3762473.77 | 5.74598 | 9.94245 | 6.61911 | 8.67301 | 441972.75, 3762473.77 | 0.01394469 | 0.07516 | 0.05998 | 0.635179 | 0.089108 | 0.695161 | 0.784269 |
| 188 | RES_N | 442022.75 | 3762473.77 | 6.32834 | 9.87037 | 6.52099 | 8.76714 | 442022.75, 3762473.77 | 0.015358 | 0.07462 | 0.05909 | 0.642073 | 0.089977 | 0.701166 | 0.791142 |
| 189 | RES_N | 442072.75 | 3762473.77 | 7.14315 | 10.91778 | 6.42328 | 8.77031 | 442072.75, 3762473.77 | 0.01733543 | 0.08254 | 0.05821 | 0.642305 | 0.099872 | 0.700512 | 0.800385 |
| 190 | RES_N | 441922.75 | 3762523.77 | 4.99931 | 8.48723 | 5.94606 | 7.50215 | 441922.75, 3762523.77 | 0.01213263 | 0.06416 | 0.05388 | 0.54943 | 0.076295 | 0.603312 | 0.679607 |
| 191 | RES_N | 441972.75 | 3762523.77 | 5.58916 | 8.26689 | 5.91761 | 7.66372 | 441972.75, 3762523.77 | 0.01356411 | 0.0625 | 0.05363 | 0.561262 | 0.076061 | 0.614887 | 0.690948 |
| 192 | RES_N | 442022.75 | 3762523.77 | 6.05732 | 9.26687 | 5.83816 | 7.77161 | 442022.75, 3762523.77 | 0.01470027 | 0.07006 | 0.05291 | 0.569164 | 0.084757 | 0.622069 | 0.706826 |
| 193 | RES_N | 442072.75 | 3762523.77 | 6.50191 | 9.92659 | 5.7685 | 7.78854 | 442072.75, 3762523.77 | 0.01577923 | 0.07504 | 0.05227 | 0.570404 | 0.090823 | 0.622678 | 0.7135 |
| 194 | RES_N | 441922.75 | 3762573.77 | 4.92221 | 7.02147 | 5.3565 | 6.61776 | 441922.75, 3762573.77 | 0.01194552 | 0.05308 | 0.04854 | 0.48466 | 0.065027 | 0.5332 | 0.598227 |
| 195 | RES_N | 441972.75 | 3762573.77 | 5.38879 | 7.98579 | 5.33861 | 6.79639 | 441972.75, 3762573.77 | 0.01307784 | 0.06037 | 0.04838 | 0.497742 | 0.073449 | 0.54612 | 0.61957 |
| 196 | RES_N | 442022.75 | 3762573.77 | 5.75722 | 8.68538 | 5.30059 | 6.91835 | 442022.75, 3762573.77 | 0.01397197 | 0.06566 | 0.04803 | 0.506674 | 0.079632 | 0.554708 | 0.63434 |
| 197 | RES_N | 442072.75 | 3762573.77 | 6.00211 | 8.82216 | 5.23176 | 6.94809 | 442072.75, 3762573.77 | 0.01456628 | 0.06669 | 0.04741 | 0.508852 | 0.081261 | 0.556262 | 0.637523 |
| 198 | RES_N | 441922.75 | 3762623.77 | 4.80056 | 6.95533 | 4.8363 | 5.9844 | 441922.75, 3762623.77 | 0.01165029 | 0.05258 | 0.04383 | 0.438275 | 0.064232 | 0.482101 | 0.546333 |
| 199 | RES_N | 441972.75 | 3762623.77 | 5.17363 | 7.65019 | 4.84946 | 6.06818 | 441972.75, 3762623.77 | 0.01255568 | 0.05783 | 0.04395 | 0.444411 | 0.07039 | 0.488356 | 0.558747 |
| 200 | RES_N | 442022.75 | 3762623.77 | 5.41166 | 7.94842 | 4.82543 | 6.15729 | 442022.75, 3762623.77 | 0.01313334 | 0.06009 | 0.04373 | 0.450937 | 0.073222 | 0.494665 | 0.567887 |
| 201 | RES_N | 442072.75 | 3762623.77 | 5.49936 | 7.74203 | 4.7678 | 6.20027 | 442072.75, 3762623.77 | 0.01334618 | 0.05853 | 0.04321 | 0.454085 | 0.071875 | 0.49729 | 0.569165 |
| 202 | RES_N | 441109.54 | 3762319.57 | 2.5554 | 4.36295 | 10.01249 | 14.58268 | 441109.54, 3762319.57 | 0.0062016 | 0.03298 | 0.09073 | 1.067981 | 0.039185 | 1.158714 | 1.197899 |
| 203 | RES_N | 441159.54 | 3762319.57 | 2.63069 | 4.54901 | 10.1915 | 14.75129 | 441159.54, 3762319.57 | 0.00638432 | 0.03439 | 0.09235 | 1.08033 | 0.040774 | 1.172684 | 1.213459 |
| 204 | RES_N | 441209.54 | 3762319.57 | 2.74879 | 4.73672 | 10.36165 | 14.87392 | 441209.54, 3762319.57 | 0.00667093 | 0.03581 | 0.0939 | 1.08931 | 0.04248 | 1.183207 | 1.225687 |
| 205 | RES_N | 441259.54 | 3762319.57 | 2.95529 | 4.92429 | 10.7036 | 14.93862 | 441259.54, 3762319.57 | 0.00717208 | 0.03723 | 0.097 | 1.094049 | 0.044399 | 1.191044 | 1.235443 |
| 206 | RES_N | 441109.54 | 3762369.57 | 2.58348 | 4.1663 | 7.9946 | 10.9988 | 441109.54, 3762369.57 | 0.00626974 | 0.0315 | 0.07245 | 0.805511 | 0.037766 | 0.877958 | 0.915724 |
| 207 | RES_N | 441159.54 | 3762369.57 | 2.55399 | 4.3067 | 7.96394 | 11.09012 | 441159.54, 3762369.57 | 0.00619818 | 0.03256 | 0.07217 | 0.812199 | 0.038756 | 0.884368 | 0.923124 |
| 208 | RES_N | 441209.54 | 3762369.57 | 2.64709 | 4.44204 | 8.08818 | 11.13951 | 441209.54, 3762369.57 | 0.00642412 | 0.03358 | 0.07329 | 0.815816 | 0.040005 | 0.889111 | 0.929116 |
| 209 | RES_N | 441259.54 | 3762369.57 | 2.81866 | 4.57188 | 8.32627 | 11.15367 | 441259.54, 3762369.57 | 0.00684049 | 0.03456 | 0.07545 | 0.816853 | 0.041403 | 0.892305 | 0.933709 |
| 210 | RES_N | 441109.54 | 3762419.57 | 2.52036 | 3.86571 | 6.73855 | 8.90096 | 441109.54, 3762419.57 | 0.00611656 | 0.02922 | 0.06106 | 0.651873 | 0.035341 | 0.712938 | 0.748278 |
| 211 | RES_N | 441159.54 | 3762419.57 | 2.45009 | 3.9568 | 6.6419 | 8.9446 | 441159.54, 3762419.57 | 0.00594603 | 0.02991 | 0.06019 | 0.655069 | 0.035859 | 0.715258 | 0.751117 |
| 212 | RES_N | 441209.54 | 3762419.57 | 2.48578 | 4.03883 | 6.71264 | 8.95977 | 441209.54, 3762419.57 | 0.00603264 | 0.03053 | 0.06083 | 0.65618 | 0.036566 | 0.71701 | 0.753575 |
| 213 | RES_N | 441259.54 | 3762419.57 | 2.56088 | 4.11231 | 6.75307 | 8.99803 | 441259.54, 3762419.57 | 0.0062149 | 0.03109 | 0.0612 | 0.658982 | 0.037303 | 0.720178 | 0.757482 |
| 214 | RES_N | 441109.54 | 3762469.57 | 2.36163 | 3.65617 | 5.7899 | 7.43788 | 441109.54, 3762469.57 | 0.00573135 | 0.02764 | 0.05247 | 0.544723 | 0.033372 | 0.59719 | 0.630562 |
| 215 | RES_N | 441159.54 | 3762469.57 | 2.30931 | 3.77116 | 5.72251 | 7.43487 | 441159.54, 3762469.57 | 0.00560437 | 0.02851 | 0.05186 | 0.544502 | 0.034114 | 0.596359 | 0.630473 |
| 216 | RES_N | 441209.54 | 3762469.57 | 2.333 | 3.87042 | 5.75502 | 7.469 | 441209.54, 3762469.57 | 0.00566186 | 0.02926 | 0.05215 | 0.547002 | 0.034922 | 0.599153 | 0.634075 |
| 217 | RES_N | 441259.54 | 3762469.57 | 2.53224 | 3.95151 | 5.87772 | 7.57687 | 441259.54, 3762469.57 | 0.00614539 | 0.02987 | 0.05326 | 0.554902 | 0.036018 | 0.608165 | 0.644184 |
| 218 | RES_N | 441109.54 | 3762519.57 | 2.29951 | 3.5411 | 5.11351 | 6.35206 | 441109.54, 3762519.57 | 0.00558059 | 0.02677 | 0.04634 | 0.465201 | 0.032351 | 0.51154 | 0.54389 |
| 219 | RES_N | 441159.54 | 3762519.57 | 2.30066 | 3.59477 | 5.03677 | 6.30173 | 441159.54, 3762519.57 | 0.00558338 | 0.02718 | 0.04564 | 0.461515 | 0.032759 | 0.507158 | 0.539918 |
| 220 | RES_N | 441209.54 | 3762519.57 | 2.40161 | 3.88808 | 5.05761 | 6.35498 | 441209.54, 3762519.57 | 0.00582837 | 0.02939 | 0.04583 | 0.465415 | 0.035222 | 0.511247 | 0.546469 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 221 | RES_N | 441259.54 | 3762519.57 | 2.524 | 4.25806 | 5.10698 | 6.44943 | 441259.54, 3762519.57 | 0.0061254 | 0.03219 | 0.04628 | 0.472332 | 0.038316 | 0.518611 | 0.556927 |
| 222 | RES_N | 441109.54 | 3762569.57 | 2.41384 | 3.54055 | 4.58194 | 5.51201 | 441109.54, 3762569.57 | 0.00585805 | 0.02677 | 0.04152 | 0.403679 | 0.032624 | 0.4452 | 0.477825 |
| 223 | RES_N | 441159.54 | 3762569.57 | 2.38734 | 3.86428 | 4.53721 | 5.42649 | 441159.54, 3762569.57 | 0.00579374 | 0.02921 | 0.04112 | 0.397416 | 0.035007 | 0.438532 | 0.473539 |
| 224 | RES_N | 441209.54 | 3762569.57 | 2.40667 | 4.19201 | 4.50169 | 5.44472 | 441209.54, 3762569.57 | 0.00584065 | 0.03169 | 0.04079 | 0.398751 | 0.037532 | 0.439545 | 0.477077 |
| 225 | RES_N | 441259.54 | 3762569.57 | 2.46526 | 4.51694 | 4.49086 | 5.51569 | 441259.54, 3762569.57 | 0.00598284 | 0.03415 | 0.0407 | 0.403949 | 0.04013 | 0.444645 | 0.484775 |
| 226 | RES_N | 441109.54 | 3762619.57 | 2.43043 | 3.81055 | 4.11851 | 4.85302 | 441109.54, 3762619.57 | 0.00589831 | 0.02881 | 0.03732 | 0.355417 | 0.034706 | 0.392739 | 0.427444 |
| 227 | RES_N | 441159.54 | 3762619.57 | 2.41517 | 4.09561 | 4.09481 | 4.73594 | 441159.54, 3762619.57 | 0.00586128 | 0.03096 | 0.03711 | 0.346843 | 0.036824 | 0.38395 | 0.420773 |
| 228 | RES_N | 441209.54 | 3762619.57 | 2.4193 | 4.37136 | 4.0747 | 4.80415 | 441209.54, 3762619.57 | 0.0058713 | 0.03305 | 0.03692 | 0.351838 | 0.038918 | 0.388763 | 0.427681 |
| 229 | RES_N | 441259.54 | 3762619.57 | 2.55284 | 4.62912 | 4.14014 | 4.92546 | 441259.54, 3762619.57 | 0.00619539 | 0.035 | 0.03752 | 0.360722 | 0.041191 | 0.39824 | 0.439431 |
| 230 | RES_N | 441109.54 | 3762669.57 | 2.38358 | 3.97278 | 3.72764 | 4.3067 | 441109.54, 3762669.57 | 0.00578462 | 0.03003 | 0.03378 | 0.315407 | 0.035818 | 0.349186 | 0.385005 |
| 231 | RES_N | 441159.54 | 3762669.57 | 2.44409 | 4.20116 | 3.74431 | 4.24869 | 441159.54, 3762669.57 | 0.00593146 | 0.03176 | 0.03393 | 0.311158 | 0.037692 | 0.345089 | 0.382781 |
| 232 | RES_N | 441209.54 | 3762669.57 | 2.51797 | 4.40738 | 3.7694 | 4.42234 | 441209.54, 3762669.57 | 0.00611076 | 0.03332 | 0.03416 | 0.323876 | 0.03943 | 0.358034 | 0.397464 |
| 233 | RES_N | 441259.54 | 3762669.57 | 2.59051 | 4.58268 | 3.79282 | 4.55296 | 441259.54, 3762669.57 | 0.00628681 | 0.03464 | 0.03437 | 0.333442 | 0.040931 | 0.367812 | 0.408743 |
| 234 | RES_N | 441109.54 | 3762719.57 | 2.37343 | 4.01212 | 3.43409 | 3.82963 | 441109.54, 3762719.57 | 0.00575998 | 0.03033 | 0.03112 | 0.280468 | 0.036091 | 0.311587 | 0.347678 |
| 235 | RES_N | 441159.54 | 3762719.57 | 2.41235 | 4.17193 | 3.43791 | 3.90162 | 441159.54, 3762719.57 | 0.00585444 | 0.03154 | 0.03115 | 0.28574 | 0.037394 | 0.316894 | 0.354288 |
| 236 | RES_N | 441209.54 | 3762719.57 | 2.46179 | 4.29864 | 3.45006 | 4.07677 | 441209.54, 3762719.57 | 0.00597442 | 0.0325 | 0.03126 | 0.298567 | 0.038472 | 0.329832 | 0.368303 |
| 237 | RES_N | 441259.54 | 3762719.57 | 2.48062 | 4.38484 | 3.45606 | 4.21286 | 441259.54, 3762719.57 | 0.00602012 | 0.03315 | 0.03132 | 0.308534 | 0.039169 | 0.339853 | 0.379022 |
| 238 | RES_N | 441109.54 | 3762769.57 | 2.28273 | 3.94203 | 3.16607 | 3.48035 | 441109.54, 3762769.57 | 0.00553987 | 0.0298 | 0.02869 | 0.254888 | 0.035341 | 0.283579 | 0.31892 |
| 239 | RES_N | 441159.54 | 3762769.57 | 2.30843 | 4.01597 | 3.16721 | 3.5876 | 441159.54, 3762769.57 | 0.00560224 | 0.03036 | 0.0287 | 0.262742 | 0.035962 | 0.291444 | 0.327406 |
| 240 | RES_N | 441209.54 | 3762769.57 | 2.31243 | 4.06237 | 3.16415 | 3.75731 | 441209.54, 3762769.57 | 0.00561194 | 0.03071 | 0.02867 | 0.275171 | 0.036323 | 0.303845 | 0.340168 |
| 241 | RES_N | 441259.54 | 3762769.57 | 2.40659 | 4.1816 | 3.16302 | 3.8951 | 441259.54, 3762769.57 | 0.00584046 | 0.03161 | 0.02866 | 0.285263 | 0.037453 | 0.313926 | 0.351379 |
| 242 | RES_N | 441313.48 | 3762805.42 | 2.59793 | 4.42091 | 2.98316 | 3.78922 | 441313.48, 3762805.42 | 0.00630481 | 0.03342 | 0.02703 | 0.277508 | 0.039726 | 0.304542 | 0.344268 |
| 243 | RES_N | 441363.48 | 3762805.42 | 2.71579 | 4.56769 | 2.97191 | 3.84951 | 441363.48, 3762805.42 | 0.00659084 | 0.03453 | 0.02693 | 0.281924 | 0.041122 | 0.308855 | 0.349977 |
| 244 | RES_N | 441413.48 | 3762805.42 | 2.777 | 4.62324 | 2.95198 | 3.86952 | 441413.48, 3762805.42 | 0.00673939 | 0.03495 | 0.02675 | 0.283389 | 0.04169 | 0.31014 | 0.35183 |
| 245 | RES_N | 441463.48 | 3762805.42 | 2.83866 | 4.61983 | 2.92494 | 3.85222 | 441463.48, 3762805.42 | 0.00688903 | 0.03493 | 0.02651 | 0.282122 | 0.041814 | 0.308628 | 0.350442 |
| 246 | RES_N | 441513.48 | 3762805.42 | 2.90363 | 4.55154 | 2.88766 | 3.79973 | 441513.48, 3762805.42 | 0.0070467 | 0.03441 | 0.02617 | 0.278278 | 0.041456 | 0.304446 | 0.345902 |
| 247 | RES_N | 441563.48 | 3762805.42 | 2.92404 | 4.41162 | 2.8526 | 3.71796 | 441563.48, 3762805.42 | 0.00709624 | 0.03335 | 0.02585 | 0.27229 | 0.040448 | 0.29814 | 0.338587 |
| 248 | RES_N | 441613.48 | 3762805.42 | 2.92117 | 4.24153 | 2.94378 | 3.60593 | 441613.48, 3762805.42 | 0.00708927 | 0.03207 | 0.02668 | 0.264085 | 0.039155 | 0.290761 | 0.329916 |
| 249 | RES_N | 441663.48 | 3762805.42 | 2.87335 | 4.04308 | 3.03503 | 3.53207 | 441663.48, 3762805.42 | 0.00697322 | 0.03057 | 0.0275 | 0.258676 | 0.037538 | 0.286179 | 0.323717 |
| 250 | RES_N | 441713.48 | 3762805.42 | 3.08824 | 4.21587 | 3.12439 | 3.66314 | 441713.48, 3762805.42 | 0.00749473 | 0.03187 | 0.02831 | 0.268275 | 0.039366 | 0.296588 | 0.335954 |
| 251 | RES_N | 441763.48 | 3762805.42 | 3.38513 | 4.72003 | 3.20285 | 3.80526 | 441763.48, 3762805.42 | 0.00821524 | 0.03568 | 0.02902 | 0.278683 | 0.043898 | 0.307707 | 0.351605 |
| 252 | RES_N | 441813.48 | 3762805.42 | 3.66531 | 5.2483 | 3.28292 | 3.9418 | 441813.48, 3762805.42 | 0.00889519 | 0.03968 | 0.02975 | 0.288683 | 0.048572 | 0.318432 | 0.367004 |
| 253 | RES_N | 441313.48 | 3762855.42 | 2.55408 | 4.26793 | 2.74702 | 3.50465 | 441313.48, 3762855.42 | 0.00619839 | 0.03227 | 0.02489 | 0.256668 | 0.038463 | 0.281561 | 0.320024 |
| 254 | RES_N | 441363.48 | 3762855.42 | 2.61916 | 4.29048 | 2.72654 | 3.57158 | 441363.48, 3762855.42 | 0.00635634 | 0.03244 | 0.02471 | 0.261569 | 0.038792 | 0.286277 | 0.325069 |
| 255 | RES_N | 441413.48 | 3762855.42 | 2.65868 | 4.24385 | 2.69959 | 3.60011 | 441413.48, 3762855.42 | 0.00645224 | 0.03208 | 0.02446 | 0.263659 | 0.038535 | 0.288122 | 0.326657 |
| 256 | RES_N | 441463.48 | 3762855.42 | 2.68042 | 4.13829 | 2.66623 | 3.59047 | 441463.48, 3762855.42 | 0.006505 | 0.03128 | 0.02416 | 0.262953 | 0.03779 | 0.287114 | 0.324904 |
| 257 | RES_N | 441513.48 | 3762855.42 | 2.72218 | 3.98745 | 2.62479 | 3.5439 | 441513.48, 3762855.42 | 0.00660635 | 0.03014 | 0.02379 | 0.259542 | 0.036751 | 0.283328 | 0.320079 |
| 258 | RES_N | 441563.48 | 3762855.42 | 2.71736 | 3.80858 | 2.60878 | 3.46336 | 441563.48, 3762855.42 | 0.00659465 | 0.02879 | 0.02364 | 0.253644 | 0.035387 | 0.277284 | 0.312671 |
| 259 | RES_N | 441613.48 | 3762855.42 | 2.659 | 3.7633 | 2.6906 | 3.35293 | 441613.48, 3762855.42 | 0.00645302 | 0.02845 | 0.02438 | 0.245556 | 0.034903 | 0.269938 | 0.304841 |
| 260 | RES_N | 441663.48 | 3762855.42 | 2.80157 | 3.9447 | 2.77203 | 3.22616 | 441663.48, 3762855.42 | 0.00679902 | 0.02982 | 0.02512 | 0.236272 | 0.03662 | 0.261392 | 0.298012 |
| 261 | RES_N | 441713.48 | 3762855.42 | 3.0937 | 4.23981 | 2.85219 | 3.34006 | 441713.48, 3762855.42 | 0.00750798 | 0.03205 | 0.02585 | 0.244614 | 0.03956 | 0.27046 | 0.31002 |
| 262 | RES_N | 441763.48 | 3762855.42 | 3.34241 | 4.72728 | 2.92586 | 3.46467 | 441763.48, 3762855.42 | 0.00811156 | 0.03574 | 0.02651 | 0.25374 | 0.043849 | 0.280254 | 0.324103 |
| 263 | RES_N | 441813.48 | 3762855.42 | 3.5723 | 5.14131 | 3.00319 | 3.58452 | 441813.48, 3762855.42 | 0.00866947 | 0.03887 | 0.02721 | 0.262517 | 0.047537 | 0.289732 | 0.337269 |
| 264 | RES_N | 441313.48 | 3762905.42 | 2.47121 | 3.97761 | 2.53765 | 3.23316 | 441313.48, 3762905.42 | 0.00599728 | 0.03007 | 0.023 | 0.236785 | 0.036068 | 0.259781 | 0.295848 |
| 265 | RES_N | 441363.48 | 3762905.42 | 2.47957 | 3.89666 | 2.51119 | 3.30616 | 441363.48, 3762905.42 | 0.00601757 | 0.02946 | 0.02276 | 0.242131 | 0.035476 | 0.264887 | 0.300363 |
| 266 | RES_N | 441413.48 | 3762905.42 | 2.52291 | 3.77639 | 2.473 | 3.34227 | 441413.48, 3762905.42 | 0.00612275 | 0.02855 | 0.02241 | 0.244775 | 0.034672 | 0.267186 | 0.301857 |
| 267 | RES_N | 441463.48 | 3762905.42 | 2.54196 | 3.6145 | 2.44215 | 3.34174 | 441463.48, 3762905.42 | 0.00616898 | 0.02733 | 0.02213 | 0.244737 | 0.033494 | 0.266867 | 0.300361 |
| 268 | RES_N | 441513.48 | 3762905.42 | 2.5361 | 3.51039 | 2.45317 | 3.30222 | 441513.48, 3762905.42 | 0.00615476 | 0.02654 | 0.02223 | 0.241842 | 0.032693 | 0.264073 | 0.296766 |
| 269 | RES_N | 441563.48 | 3762905.42 | 2.48276 | 3.5772 | 2.43981 | 3.22684 | 441563.48, 3762905.42 | 0.00602531 | 0.02704 | 0.02211 | 0.236322 | 0.033068 | 0.258431 | 0.2915 |
| 270 | RES_N | 441613.48 | 3762905.42 | 2.5287 | 3.6403 | 2.46399 | 3.12647 | 441613.48, 3762905.42 | 0.0061368 | 0.02752 | 0.02233 | 0.228971 | 0.033657 | 0.2513 | 0.284957 |
| 271 | RES_N | 441663.48 | 3762905.42 | 2.8335 | 3.81899 | 2.55085 | 2.98505 | 441663.48, 3762905.42 | 0.00687651 | 0.02887 | 0.02312 | 0.218614 | 0.035748 | 0.24173 | 0.277477 |
| 272 | RES_N | 441713.48 | 3762905.42 | 3.07437 | 4.27266 | 2.62044 | 3.06758 | 441713.48, 3762905.42 | 0.00746107 | 0.0323 | 0.02375 | 0.224658 | 0.039762 | 0.248404 | 0.288166 |
| 273 | RES_N | 441763.48 | 3762905.42 | 3.18165 | 4.62618 | 2.66124 | 3.19201 | 441763.48, 3762905.42 | 0.00772142 | 0.03497 | 0.02412 | 0.233771 | 0.042695 | 0.257887 | 0.300582 |
| 274 | RES_N | 441813.48 | 3762905.42 | 3.41835 | 4.95887 | 2.75184 | 3.28286 | 441813.48, 3762905.42 | 0.00829586 | 0.03749 | 0.02494 | 0.240424 | 0.045784 | 0.265361 | 0.311146 |
| 275 | RES_N | 441313.48 | 3762955.42 | 2.33686 | 3.58593 | 2.35112 | 2.97583 | 441313.48, 3762955.42 | 0.00567123 | 0.02711 | 0.02131 | 0.217939 | 0.03278 | 0.239244 | 0.272025 |
| 276 | RES_N | 441363.48 | 3762955.42 | 2.35177 | 3.45126 | 2.31866 | 3.05232 | 441363.48, 3762955.42 | 0.00570742 | 0.02609 | 0.02101 | 0.223541 | 0.031799 | 0.244552 | 0.276351 |
| 277 | RES_N | 441413.48 | 3762955.42 | 2.38301 | 3.37382 | 2.27769 | 3.09612 | 441413.48, 3762955.42 | 0.00578323 | 0.02551 | 0.02064 | 0.226748 | 0.031289 | 0.247389 | 0.278677 |
| 278 | RES_N | 441463.48 | 3762955.42 | 2.37144 | 3.30267 | 2.3035 | 3.10481 | 441463.48, 3762955.42 | 0.00575515 | 0.02497 | 0.02087 | 0.227385 | 0.030723 | 0.248259 | 0.278982 |
| 279 | RES_N | 441513.48 | 3762955.42 | 2.32062 | 3.37763 | 2.313 | 3.0748 | 441513.48, 3762955.42 | 0.00563182 | 0.02553 | 0.02096 | 0.225187 | 0.031166 | 0.246147 | 0.277313 |
| 280 | RES_N | 441563.48 | 3762955.42 | 2.35682 | 3.53546 | 2.29371 | 3.00914 | 441563.48, 3762955.42 | 0.00571967 | 0.02673 | 0.02079 | 0.220378 | 0.032447 | 0.241164 | 0.273611 |
| 281 | RES_N | 441613.48 | 3762955.42 | 2.59534 | 3.58222 | 2.29456 | 2.91006 | 441613.48, 3762955.42 | 0.00629853 | 0.02708 | 0.02079 | 0.213122 | 0.03338 | 0.233915 | 0.267295 |
| 282 | RES_N | 441663.48 | 3762955.42 | 2.83844 | 3.86919 | 2.36201 | 2.77833 | 441663.48, 3762955.42 | 0.0068885 | 0.02925 | 0.0214 | 0.203475 | 0.036139 | 0.224879 | 0.261018 |
| 283 | RES_N | 441713.48 | 3762955.42 | 3.03145 | 4.24865 | 2.42292 | 2.84133 | 441713.48, 3762955.42 | 0.00735691 | 0.03212 | 0.02196 | 0.208088 | 0.039476 | 0.230045 | 0.269521 |
| 284 | RES_N | 441763.48 | 3762955.42 | 3.16083 | 4.54928 | 2.47791 | 2.93337 | 441763.48, 3762955.42 | 0.00767089 | 0.03439 | 0.02245 | 0.214829 | 0.042063 | 0.237284 | 0.279347 |
| 285 | RES_N | 441813.48 | 3762955.42 | 3.24975 | 4.73471 | 2.53409 | 3.02483 | 441813.48, 3762955.42 | 0.00788669 | 0.03579 | 0.02296 | 0.221527 | 0.04368 | 0.244491 | 0.288172 |
| 286 | RES_S | 440408.22 | 3761498.57 | 0.98286 | 2.7597 | 3.46733 | 7.02462 | 440408.22, 3761498.57 | 0.00238526 | 0.02086 | 0.03142 | 0.514457 | 0.023248 | 0.545878 | 0.569126 |
| 287 | RES_N | 440956.5 | 3762849.59 | 2.00885 | 3.48634 | 2.78673 | 3.24926 | 440956.5, 3762849.59 | 0.0048752 | 0.02636 | 0.02525 | 0.237964 | 0.031231 | 0.263217 | 0.294448 |
| 288 | RES_S | 440559.26 | 3761306.11 | 1.10318 | 3.2158 | 2.91719 | 8.10421 | 440559.26, 3761306.11 | 0.00267726 | 0.02431 | 0.02644 | 0.593522 | 0.026988 | 0.619958 | 0.646946 |
| 289 | RES_S | 440752.05 | 3761305.37 | 1.34241 | 3.59722 | 3.50303 | 9.83074 | 440752.05, 3761305.37 | 0.00325784 | 0.02719 | 0.03174 | 0.719967 | 0.030452 | 0.751711 | 0.782163 |
| 290 | RES_S | 440857.69 | 3761312.76 | 1.50577 | 3.81099 | 3.83256 | 10.4014 | 440857.69, 3761312.76 | 0.00365429 | 0.02881 | 0.03473 | 0.76176 | 0.032465 | 0.79649 | 0.828955 |
| 291 | RES_S | 440969.23 | 3761308.33 | 1.7153 | 3.96514 | 4.00823 | 10.3626 | 440969.23, 3761308.33 | 0.00416279 | 0.02998 | 0.03632 | 0.758918 | 0.034139 | 0.795241 | 0.829379 |
| 292 | RES_S | 440936.73 | 3761237.41 | 1.66668 | 3.8318 | 3.4903 | 9.22534 | 440936.73, 3761237.41 | 0.0040448 | 0.02897 | 0.03163 | 0.67563 | 0.033013 | 0.707258 | 0.740271 |

| Unmitigated Operations: Rate (g/s): | P1 Exhaust | P1 Dust | P2 Exhaust | P2 Dust |
|---|---|---|---|---|
| | 2.47E-03 | 4.79E-03 | 8.90E-03 | 1.86E-02 |

PM2.5
24-HR Concentration [µg/m^3] at 1 g/s

| # | | X | Y | P1 Exhaust | P1 Dust | P2 Exhaust | P2 Dust | X, Y | P1 Exhaust | P1 Dust | P2 Exhaust | P2 Dust | Total P1 | Total P2 | otal Buildou |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | RES_V | 440400.61 | 3761994.75 | 0.82074 | 1.98509 | 3.22758 | 6.34179 | 440400.61, 3761994.75 | 0.00202631 | 0.0095 | 0.02871 | 0.11786 | 0.01153 | 0.146572 | 0.158103 |
| 2 | RES_V | 440450.61 | 3761994.75 | 0.85386 | 2.04663 | 3.62324 | 7.00936 | 440450.61, 3761994.75 | 0.00210808 | 0.0098 | 0.03223 | 0.130267 | 0.011907 | 0.162499 | 0.174405 |
| 3 | RES_V | 440500.61 | 3761994.75 | 0.8892 | 2.11586 | 4.10672 | 7.79438 | 440500.61, 3761994.75 | 0.00219533 | 0.01013 | 0.03653 | 0.144856 | 0.012326 | 0.181389 | 0.193714 |
| 4 | RES_V | 440550.61 | 3761994.75 | 0.92752 | 2.18866 | 4.71617 | 8.7355 | 440550.61, 3761994.75 | 0.00228994 | 0.01048 | 0.04195 | 0.162347 | 0.012769 | 0.204301 | 0.21707 |
| 5 | RES_V | 440600.61 | 3761994.75 | 0.96914 | 2.26569 | 5.49699 | 9.89877 | 440600.61, 3761994.75 | 0.0023927 | 0.01085 | 0.0489 | 0.183966 | 0.01324 | 0.232866 | 0.246106 |
| 6 | RES_V | 440650.61 | 3761994.75 | 1.01381 | 2.34726 | 6.53879 | 11.40699 | 440650.61, 3761994.75 | 0.00250298 | 0.01124 | 0.05817 | 0.211995 | 0.013741 | 0.270163 | 0.283904 |
| 7 | RES_V | 440400.61 | 3762044.75 | 0.82831 | 1.99059 | 3.2062 | 6.06762 | 440400.61, 3762044.75 | 0.002045 | 0.00953 | 0.02852 | 0.112765 | 0.011575 | 0.141287 | 0.152862 |
| 8 | RES_V | 440450.61 | 3762044.75 | 0.86256 | 2.05638 | 3.58514 | 6.70505 | 440450.61, 3762044.75 | 0.00212956 | 0.00985 | 0.03189 | 0.124611 | 0.011975 | 0.156504 | 0.168479 |
| 9 | RES_V | 440500.61 | 3762044.75 | 0.89913 | 2.12761 | 4.05635 | 7.46223 | 440500.61, 3762044.75 | 0.00221985 | 0.01019 | 0.03608 | 0.138683 | 0.012406 | 0.174768 | 0.187174 |
| 10 | RES_V | 440550.61 | 3762044.75 | 0.93822 | 2.20538 | 4.63691 | 8.37047 | 440550.61, 3762044.75 | 0.00231636 | 0.01056 | 0.04125 | 0.155563 | 0.012875 | 0.196812 | 0.209687 |
| 11 | RES_V | 440600.61 | 3762044.75 | 0.9801 | 2.29066 | 5.38356 | 9.49207 | 440600.61, 3762044.75 | 0.00241976 | 0.01097 | 0.04789 | 0.176407 | 0.013387 | 0.224298 | 0.237685 |
| 12 | RES_V | 440650.61 | 3762044.75 | 1.02503 | 2.38066 | 6.40515 | 10.94936 | 440650.61, 3762044.75 | 0.00253068 | 0.0114 | 0.05698 | 0.20349 | 0.013929 | 0.26047 | 0.274398 |
| 13 | RES_V | 440400.61 | 3762094.75 | 0.83959 | 2.01196 | 3.2096 | 5.84058 | 440400.61, 3762094.75 | 0.00207285 | 0.00963 | 0.02855 | 0.108545 | 0.011706 | 0.137097 | 0.148803 |
| 14 | RES_V | 440450.61 | 3762094.75 | 0.87115 | 2.08445 | 3.55087 | 6.36879 | 440450.61, 3762094.75 | 0.00215077 | 0.00998 | 0.03159 | 0.118362 | 0.012131 | 0.14995 | 0.162081 |
| 15 | RES_V | 440500.61 | 3762094.75 | 0.90891 | 2.16049 | 3.98757 | 7.02303 | 440500.61, 3762094.75 | 0.002244 | 0.01034 | 0.03547 | 0.130521 | 0.012588 | 0.165994 | 0.178581 |
| 16 | RES_V | 440550.61 | 3762094.75 | 0.94836 | 2.24015 | 4.52999 | 7.8651 | 440550.61, 3762094.75 | 0.00234139 | 0.01073 | 0.0403 | 0.14617 | 0.013067 | 0.186469 | 0.199535 |
| 17 | RES_V | 440600.61 | 3762094.75 | 0.9897 | 2.32356 | 5.21982 | 8.92715 | 440600.61, 3762094.75 | 0.00244346 | 0.01112 | 0.04643 | 0.165908 | 0.013568 | 0.212343 | 0.225911 |
| 18 | RES_V | 440650.61 | 3762094.75 | 1.04064 | 2.4112 | 6.22071 | 10.35501 | 440650.61, 3762094.75 | 0.00256922 | 0.01154 | 0.05534 | 0.192445 | 0.014113 | 0.247783 | 0.261897 |
| 19 | RES_V | 440400.61 | 3762144.75 | 0.87622 | 2.02073 | 3.23936 | 5.56555 | 440400.61, 3762144.75 | 0.00216329 | 0.00967 | 0.02882 | 0.103434 | 0.011838 | 0.132251 | 0.144089 |
| 20 | RES_V | 440450.61 | 3762144.75 | 0.89759 | 2.10107 | 3.52624 | 6.06526 | 440450.61, 3762144.75 | 0.00221605 | 0.01006 | 0.03137 | 0.112721 | 0.012275 | 0.14409 | 0.156365 |
| 21 | RES_V | 440500.61 | 3762144.75 | 0.94085 | 2.18918 | 3.95788 | 6.65865 | 440500.61, 3762144.75 | 0.00232285 | 0.01048 | 0.03521 | 0.123749 | 0.012804 | 0.158958 | 0.171762 |
| 22 | RES_V | 440550.61 | 3762144.75 | 0.97218 | 2.2813 | 4.43972 | 7.38829 | 440550.61, 3762144.75 | 0.0024002 | 0.01092 | 0.0395 | 0.137309 | 0.013322 | 0.176804 | 0.190127 |
| 23 | RES_V | 440600.61 | 3762144.75 | 1.01923 | 2.37777 | 5.11628 | 8.35023 | 440600.61, 3762144.75 | 0.00251636 | 0.01138 | 0.04551 | 0.155186 | 0.013901 | 0.2007 | 0.214601 |
| 24 | RES_V | 440650.61 | 3762144.75 | 1.07242 | 2.47874 | 6.03669 | 9.65776 | 440650.61, 3762144.75 | 0.00264768 | 0.01187 | 0.0537 | 0.179486 | 0.014515 | 0.233188 | 0.247703 |
| 25 | RES_S | 441145.13 | 3761319.94 | 1.81325 | 4.22394 | 4.19062 | 9.54608 | 441145.13, 3761319.94 | 0.00447671 | 0.02022 | 0.03728 | 0.177411 | 0.0247 | 0.21469 | 0.23939 |
| 26 | RES_S | 441195.13 | 3761319.94 | 1.9213 | 4.35092 | 4.25201 | 9.62123 | 441195.13, 3761319.94 | 0.00474347 | 0.02083 | 0.03783 | 0.178808 | 0.025575 | 0.216633 | 0.242207 |
| 27 | RES_S | 441245.13 | 3761319.94 | 2.03701 | 4.50924 | 4.30603 | 9.65055 | 441245.13, 3761319.94 | 0.00502915 | 0.02159 | 0.03831 | 0.179352 | 0.026618 | 0.217658 | 0.244276 |
| 28 | RES_S | 441145.13 | 3761369.94 | 1.8302 | 4.45949 | 4.67434 | 10.47198 | 441145.13, 3761369.94 | 0.00451856 | 0.02135 | 0.04158 | 0.194618 | 0.025869 | 0.236201 | 0.26207 |
| 29 | RES_S | 441195.13 | 3761369.94 | 1.9407 | 4.62531 | 4.74346 | 10.56234 | 441195.13, 3761369.94 | 0.00479137 | 0.02214 | 0.0422 | 0.196298 | 0.026936 | 0.238495 | 0.265431 |
| 30 | RES_S | 441245.13 | 3761369.94 | 2.0587 | 4.79455 | 4.79687 | 10.60531 | 441245.13, 3761369.94 | 0.0050827 | 0.02296 | 0.04267 | 0.197096 | 0.028038 | 0.239769 | 0.267806 |
| 31 | RES_S | 441145.13 | 3761419.94 | 1.83661 | 4.59161 | 5.26319 | 11.55078 | 441145.13, 3761419.94 | 0.00453438 | 0.02198 | 0.04682 | 0.214668 | 0.026518 | 0.261488 | 0.288006 |
| 32 | RES_S | 441195.13 | 3761419.94 | 1.95413 | 4.80688 | 5.3437 | 11.65596 | 441195.13, 3761419.94 | 0.00482452 | 0.02301 | 0.04754 | 0.216622 | 0.027839 | 0.264159 | 0.291998 |
| 33 | RES_S | 441245.13 | 3761419.94 | 2.08143 | 5.02957 | 5.40757 | 11.71815 | 441245.13, 3761419.94 | 0.00513881 | 0.02408 | 0.0481 | 0.217778 | 0.029219 | 0.265883 | 0.295102 |
| 34 | RES_S | 441145.13 | 3761469.94 | 1.83339 | 4.67315 | 6.00419 | 12.85189 | 441145.13, 3761469.94 | 0.00452643 | 0.02237 | 0.05341 | 0.238848 | 0.0269 | 0.292261 | 0.319161 |
| 35 | RES_S | 441195.13 | 3761469.94 | 1.95604 | 4.88947 | 6.09441 | 12.9607 | 441195.13, 3761469.94 | 0.00482924 | 0.02341 | 0.05421 | 0.240871 | 0.028239 | 0.295085 | 0.323324 |
| 36 | RES_S | 441245.13 | 3761469.94 | 2.09172 | 5.13669 | 6.17274 | 13.05582 | 441245.13, 3761469.94 | 0.00516422 | 0.02459 | 0.05491 | 0.242638 | 0.029757 | 0.29755 | 0.327307 |
| 37 | RES_S | 441145.13 | 3761519.94 | 1.82203 | 4.70253 | 6.96663 | 14.49015 | 441145.13, 3761519.94 | 0.00449838 | 0.02251 | 0.06197 | 0.269295 | 0.027013 | 0.331269 | 0.358282 |
| 38 | RES_S | 441195.13 | 3761519.94 | 1.94669 | 4.93893 | 7.06793 | 14.58919 | 441195.13, 3761519.94 | 0.00480616 | 0.02365 | 0.06288 | 0.271136 | 0.028453 | 0.334011 | 0.362463 |
| 39 | RES_S | 441245.13 | 3761519.94 | 2.08647 | 5.19218 | 7.15596 | 14.68447 | 441245.13, 3761519.94 | 0.00515126 | 0.02486 | 0.06366 | 0.272906 | 0.03001 | 0.336565 | 0.366575 |
| 40 | RES_S | 441145.13 | 3761569.94 | 1.80616 | 4.64454 | 8.28929 | 16.70273 | 441145.13, 3761569.94 | 0.0044592 | 0.02224 | 0.07374 | 0.310415 | 0.026696 | 0.384155 | 0.410851 |
| 41 | RES_S | 441195.13 | 3761569.94 | 1.92948 | 4.89119 | 8.41029 | 16.76281 | 441195.13, 3761569.94 | 0.00476367 | 0.02342 | 0.07482 | 0.311532 | 0.028181 | 0.386348 | 0.41453 |
| 42 | RES_S | 441245.13 | 3761569.94 | 2.06829 | 5.17049 | 8.51503 | 16.85109 | 441245.13, 3761569.94 | 0.00510637 | 0.02476 | 0.07575 | 0.313172 | 0.029861 | 0.388921 | 0.418782 |
| 43 | RES_S | 441145.13 | 3761619.94 | 1.80425 | 4.47716 | 10.32714 | 20.01784 | 441145.13, 3761619.94 | 0.00445449 | 0.02144 | 0.09187 | 0.372025 | 0.02589 | 0.463894 | 0.489784 |
| 44 | RES_S | 441195.13 | 3761619.94 | 1.92404 | 4.74537 | 10.47614 | 20.08903 | 441195.13, 3761619.94 | 0.00475024 | 0.02272 | 0.09319 | 0.373348 | 0.02747 | 0.466542 | 0.494012 |
| 45 | RES_S | 441245.13 | 3761619.94 | 2.05724 | 5.03308 | 10.5922 | 20.20023 | 441245.13, 3761619.94 | 0.00507909 | 0.0241 | 0.09423 | 0.375415 | 0.029176 | 0.469642 | 0.498818 |
| 46 | RES_S | 441145.13 | 3761669.94 | 1.80364 | 4.22253 | 13.57478 | 27.22792 | 441145.13, 3761669.94 | 0.00445298 | 0.02022 | 0.12076 | 0.506022 | 0.024669 | 0.626781 | 0.651451 |
| 47 | RES_S | 441195.13 | 3761669.94 | 1.92522 | 4.49851 | 13.74316 | 27.2336 | 441195.13, 3761669.94 | 0.00475315 | 0.02154 | 0.12226 | 0.506128 | 0.026291 | 0.628385 | 0.654676 |
| 48 | RES_S | 441245.13 | 3761669.94 | 2.06118 | 4.79794 | 13.88945 | 27.48814 | 441245.13, 3761669.94 | 0.00508882 | 0.02297 | 0.12356 | 0.510859 | 0.02806 | 0.634417 | 0.662477 |
| 49 | RES_S | 441917 | 3761316.31 | 4.34155 | 12.3069 | 4.00323 | 7.60478 | 441917, 3761316.31 | 0.01071879 | 0.05892 | 0.03561 | 0.141332 | 0.069641 | 0.176945 | 0.246586 |
| 50 | RES_S | 441967 | 3761316.31 | 4.63905 | 12.79981 | 3.8727 | 7.31932 | 441967, 3761316.31 | 0.01145329 | 0.06128 | 0.03445 | 0.136027 | 0.072736 | 0.170478 | 0.243214 |
| 51 | RES_S | 442017 | 3761316.31 | 4.97927 | 13.2573 | 3.72889 | 6.96068 | 442017, 3761316.31 | 0.01229325 | 0.06347 | 0.03317 | 0.129362 | 0.075766 | 0.162534 | 0.2383 |
| 52 | RES_S | 442067 | 3761316.31 | 5.29343 | 13.6977 | 3.57326 | 6.58531 | 442067, 3761316.31 | 0.01306888 | 0.06558 | 0.03179 | 0.122386 | 0.07865 | 0.154173 | 0.232823 |
| 53 | RES_S | 441917 | 3761366.31 | 4.7389 | 13.13145 | 4.44687 | 8.30668 | 441917, 3761366.31 | 0.0116998 | 0.06287 | 0.03956 | 0.154377 | 0.07457 | 0.193936 | 0.268506 |
| 54 | RES_S | 441967 | 3761366.31 | 5.0503 | 13.96629 | 4.30428 | 8.00397 | 441967, 3761366.31 | 0.01246862 | 0.06687 | 0.03829 | 0.148751 | 0.079336 | 0.187041 | 0.266377 |
| 55 | RES_S | 442017 | 3761366.31 | 5.46674 | 14.6187 | 4.14019 | 7.6357 | 442017, 3761366.31 | 0.01349676 | 0.06999 | 0.03683 | 0.141907 | 0.083487 | 0.178738 | 0.262225 |
| 56 | RES_S | 442067 | 3761366.31 | 5.89483 | 15.29281 | 3.96143 | 7.19697 | 442067, 3761366.31 | 0.01455366 | 0.07322 | 0.03524 | 0.133753 | 0.087772 | 0.168994 | 0.256765 |
| 57 | RES_S | 441917 | 3761416.31 | 5.26651 | 13.75139 | 4.9929 | 9.16738 | 441917, 3761416.31 | 0.01300241 | 0.06584 | 0.04442 | 0.170373 | 0.078841 | 0.214789 | 0.29363 |
| 58 | RES_S | 441967 | 3761416.31 | 5.56109 | 15.00703 | 4.82872 | 8.82734 | 441967, 3761416.31 | 0.0137297 | 0.07185 | 0.04296 | 0.164053 | 0.08558 | 0.207009 | 0.292588 |
| 59 | RES_S | 442017 | 3761416.31 | 5.99832 | 16.06994 | 4.64314 | 8.44651 | 442017, 3761416.31 | 0.01480917 | 0.07694 | 0.0413 | 0.156976 | 0.091748 | 0.19828 | 0.290028 |
| 60 | RES_S | 442067 | 3761416.31 | 6.56694 | 16.98974 | 4.43029 | 7.94972 | 442067, 3761416.31 | 0.01621303 | 0.08134 | 0.03941 | 0.147743 | 0.097556 | 0.187154 | 0.28471 |
| 61 | RES_S | 441917 | 3761466.31 | 5.7971 | 14.009 | 5.67073 | 10.21304 | 441917, 3761466.31 | 0.01431238 | 0.06707 | 0.05045 | 0.189806 | 0.081384 | 0.240252 | 0.321636 |
| 62 | RES_S | 441967 | 3761466.31 | 6.23163 | 15.77245 | 5.48655 | 9.83118 | 441967, 3761466.31 | 0.01538518 | 0.07551 | 0.04881 | 0.182709 | 0.0909 | 0.231517 | 0.322417 |
| 63 | RES_S | 442017 | 3761466.31 | 6.65403 | 17.4307 | 5.27829 | 9.43641 | 442017, 3761466.31 | 0.01642804 | 0.08345 | 0.04695 | 0.175373 | 0.099882 | 0.222328 | 0.322209 |
| 64 | RES_S | 442067 | 3761466.31 | 7.33472 | 18.88085 | 5.02633 | 8.90818 | 442067, 3761466.31 | 0.01810859 | 0.0904 | 0.04471 | 0.165556 | 0.108505 | 0.210269 | 0.318775 |
| 65 | RES_S | 441917 | 3761516.31 | 6.28388 | 13.84833 | 6.54898 | 11.53521 | 441917, 3761516.31 | 0.01551418 | 0.0663 | 0.05826 | 0.214378 | 0.081817 | 0.272637 | 0.354453 |
| 66 | RES_S | 441967 | 3761516.31 | 6.91552 | 16.08424 | 6.3555 | 11.13745 | 441967, 3761516.31 | 0.01707363 | 0.07701 | 0.05654 | 0.206986 | 0.094081 | 0.263524 | 0.357604 |
| 67 | RES_S | 442017 | 3761516.31 | 7.55794 | 18.48157 | 6.11514 | 10.70002 | 442017, 3761516.31 | 0.01865969 | 0.08849 | 0.0544 | 0.198857 | 0.107145 | 0.253256 | 0.360401 |
| 68 | RES_S | 442067 | 3761516.31 | 8.21564 | 20.82636 | 5.81452 | 10.1705 | 442067, 3761516.31 | 0.02028348 | 0.09971 | 0.05173 | 0.189016 | 0.119995 | 0.240741 | 0.360735 |
| 69 | RES_S | 441917 | 3761566.31 | 6.70924 | 13.94978 | 7.78393 | 13.40053 | 441917, 3761566.31 | 0.01656435 | 0.06679 | 0.06924 | 0.249045 | 0.083352 | 0.318289 | 0.401642 |
| 70 | RES_S | 441967 | 3761566.31 | 7.53024 | 16.01822 | 7.56808 | 12.94426 | 441967, 3761566.31 | 0.01859131 | 0.07669 | 0.06732 | 0.240565 | 0.095283 | 0.307889 | 0.403172 |
| 71 | RES_S | 442017 | 3761566.31 | 8.48402 | 18.89562 | 7.28737 | 12.42038 | 442017, 3761566.31 | 0.02094608 | 0.09047 | 0.06483 | 0.230829 | 0.111414 | 0.295656 | 0.40707 |
| 72 | RES_S | 442067 | 3761566.31 | 9.52787 | 22.42356 | 6.92452 | 11.91552 | 442067, 3761566.31 | 0.02352323 | 0.10736 | 0.0616 | 0.221446 | 0.130882 | 0.283046 | 0.413927 |
| 73 | RES_S | 441917 | 3761616.31 | 7.0725 | 14.21325 | 9.77672 | 16.54329 | 441917, 3761616.31 | 0.0174612 | 0.06805 | 0.08697 | 0.307452 | 0.085511 | 0.394424 | 0.479935 |
| 74 | RES_S | 441967 | 3761616.31 | 8.07869 | 16.41945 | 9.48862 | 15.94525 | 441967, 3761616.31 | 0.01994537 | 0.07861 | 0.08441 | 0.296338 | 0.098558 | 0.380747 | 0.479304 |
| 75 | RES_S | 442017 | 3761616.31 | 9.30241 | 19.21419 | 9.12169 | 15.25751 | 442017, 3761616.31 | 0.02296659 | 0.09199 | 0.08115 | 0.283556 | 0.114959 | 0.364701 | 0.47966 |
| 76 | RES_S | 442067 | 3761616.31 | 10.85594 | 23.25295 | 8.67483 | 14.58885 | 442067, 3761616.31 | 0.02680208 | 0.11133 | 0.07717 | 0.271129 | 0.138131 | 0.348299 | 0.486431 |
| 77 | RES_E | 442847.68 | 3761995.12 | 21.08669 | 38.11746 | 2.90031 | 5.59447 | 442847.68, 3761995.12 | 0.05206064 | 0.1825 | 0.0258 | 0.103971 | 0.234557 | 0.129772 | 0.36433 |
| 78 | RES_E | 442897.68 | 3761995.12 | 16.23013 | 29.73692 | 2.77944 | 5.2907 | 442897.68, 3761995.12 | 0.04007034 | 0.14237 | 0.02473 | 0.098326 | 0.182443 | 0.123051 | 0.305495 |
| 79 | RES_E | 442947.68 | 3761995.12 | 13.09688 | 24.70104 | 2.58477 | 5.01464 | 442947.68, 3761995.12 | 0.03233471 | 0.11826 | 0.02299 | 0.093196 | 0.150597 | 0.116189 | 0.266786 |
| 80 | RES_E | 442997.68 | 3761995.12 | 10.9828 | 21.29372 | 2.43819 | 4.76119 | 442997.68, 3761995.12 | 0.02711528 | 0.10195 | 0.02169 | 0.088485 | 0.129064 | 0.110175 | 0.239239 |
| 81 | RES_E | 443047.68 | 3761995.12 | 9.45317 | 18.64975 | 2.32305 | 4.52828 | 443047.68, 3761995.12 | 0.0233388 | 0.08929 | 0.02067 | 0.084157 | 0.112629 | 0.104822 | 0.217451 |
| 82 | RES_E | 443097.68 | 3761995.12 | 8.26947 | 16.49086 | 2.21117 | 4.31391 | 443097.68, 3761995.12 | 0.02041638 | 0.07895 | 0.01967 | 0.080173 | 0.09937 | 0.099843 | 0.199213 |
| 83 | RES_E | 443147.68 | 3761995.12 | 7.35322 | 14.68279 | 2.13275 | 4.11846 | 443147.68, 3761995.12 | 0.01815426 | 0.0703 | 0.01897 | 0.07654 | 0.088452 | 0.095513 | 0.183965 |
| 84 | RES_E | 443197.68 | 3761995.12 | 6.60268 | 13.14097 | 2.05893 | 3.94134 | 443197.68, 3761995.12 | 0.01630127 | 0.06292 | 0.01832 | 0.073249 | 0.079217 | 0.091564 | 0.170781 |
| 85 | RES_E | 442847.68 | 3762045.12 | 20.32743 | 36.80656 | 2.95535 | 5.54557 | 442847.68, 3762045.12 | 0.05018611 | 0.17622 | 0.02629 | 0.103063 | 0.226407 | 0.129353 | 0.35576 |
| 86 | RES_E | 442897.68 | 3762045.12 | 15.66391 | 28.56109 | 2.78961 | 5.24403 | 442897.68, 3762045.12 | 0.03867241 | 0.13674 | 0.02482 | 0.097459 | 0.175416 | 0.122275 | 0.29769 |
| 87 | RES_E | 442947.68 | 3762045.12 | 12.76206 | 23.6285 | 2.63102 | 4.96763 | 442947.68, 3762045.12 | 0.03150807 | 0.11313 | 0.02341 | 0.092322 | 0.144635 | 0.115727 | 0.260362 |
| 88 | RES_E | 442997.68 | 3762045.12 | 10.78249 | 20.25044 | 2.50448 | 4.71376 | 442997.68, 3762045.12 | 0.02662074 | 0.09695 | 0.02228 | 0.087604 | 0.123575 | 0.109883 | 0.233458 |
| 89 | RES_E | 443047.68 | 3762045.12 | 9.27006 | 17.77752 | 2.37987 | 4.48138 | 443047.68, 3762045.12 | 0.02288672 | 0.08511 | 0.02117 | 0.083285 | 0.108001 | 0.104456 | 0.212457 |
| 90 | RES_E | 443097.68 | 3762045.12 | 8.10673 | 15.91531 | 2.27494 | 4.26638 | 443097.68, 3762045.12 | 0.02001459 | 0.0762 | 0.02024 | 0.079289 | 0.096213 | 0.099527 | 0.19574 |
| 91 | RES_E | 443147.68 | 3762045.12 | 7.21139 | 14.35109 | 2.17724 | 4.06694 | 443147.68, 3762045.12 | 0.0178041 | 0.06871 | 0.01937 | 0.075583 | 0.086514 | 0.094951 | 0.181465 |
| 92 | RES_E | 443197.68 | 3762045.12 | 6.53513 | 12.99487 | 2.10585 | 3.8857 | 443197.68, 3762045.12 | 0.01613449 | 0.06222 | 0.01873 | 0.072215 | 0.078351 | 0.090948 | 0.169298 |
| 93 | RES_E | 442447.68 | 3762095.12 | 31.62386 | 52.18052 | 5.81935 | 10.05503 | 442447.68, 3762095.12 | 0.07807571 | 0.24983 | 0.05177 | 0.18687 | 0.327903 | 0.238638 | 0.566541 |
| 94 | RES_E | 442497.68 | 3762095.12 | 31.1704 | 49.91781 | 5.27769 | 9.17016 | 442497.68, 3762095.12 | 0.07695617 | 0.23899 | 0.04695 | 0.170425 | 0.31595 | 0.217374 | 0.533324 |
| 95 | RES_E | 442547.68 | 3762095.12 | 27.51181 | 48.51923 | 4.8642 | 8.40164 | 442547.68, 3762095.12 | 0.06792353 | 0.2323 | 0.04327 | 0.156142 | 0.300221 | 0.199413 | 0.499634 |
| 96 | RES_E | 442597.68 | 3762095.12 | 28.30402 | 47.06693 | 4.56766 | 7.72449 | 442597.68, 3762095.12 | 0.0698794 | 0.22534 | 0.04063 | 0.143557 | 0.295224 | 0.18419 | 0.479414 |
| 97 | RES_E | 442647.68 | 3762095.12 | 25.52186 | 45.8983 | 4.13301 | 7.12661 | 442647.68, 3762095.12 | 0.06301057 | 0.21975 | 0.03677 | 0.132446 | 0.28276 | 0.169212 | 0.451973 |
| 98 | RES_E | 442697.68 | 3762095.12 | 26.14892 | 44.85829 | 3.87977 | 6.5894 | 442697.68, 3762095.12 | 0.06455871 | 0.21477 | 0.03451 | 0.122462 | 0.279329 | 0.156976 | 0.436305 |
| 99 | RES_E | 442747.68 | 3762095.12 | 25.02819 | 43.49542 | 3.59689 | 6.14172 | 442747.68, 3762095.12 | 0.06179175 | 0.20825 | 0.032 | 0.114142 | 0.270037 | 0.146139 | 0.416176 |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | RES_E | 442797.68 | 3762095.12 | 21.50719 | 40.88904 | 3.3165 | 5.78104 | 442797.68, 3762095.12 | 0.0530988 | 0.19577 | 0.0295 | 0.107439 | 0.248865 | 0.136942 | 0.385807 |
| 101 | RES_E | 442847.68 | 3762095.12 | 18.18178 | 32.12724 | 3.01843 | 5.45923 | 442847.68, 3762095.12 | 0.04488874 | 0.15382 | 0.02685 | 0.101458 | 0.198706 | 0.12831 | 0.327015 |
| 102 | RES_E | 442897.68 | 3762095.12 | 14.48683 | 25.91457 | 2.84854 | 5.1704 | 442897.68, 3762095.12 | 0.03576633 | 0.12407 | 0.02534 | 0.09609 | 0.159839 | 0.12143 | 0.281269 |
| 103 | RES_E | 442947.68 | 3762095.12 | 12.08078 | 21.86928 | 2.69223 | 4.90395 | 442947.68, 3762095.12 | 0.02982607 | 0.1047 | 0.02395 | 0.091138 | 0.134531 | 0.115088 | 0.249619 |
| 104 | RES_E | 442997.68 | 3762095.12 | 10.50415 | 19.11196 | 2.62275 | 4.65659 | 442997.68, 3762095.12 | 0.02593355 | 0.0915 | 0.02333 | 0.086541 | 0.117437 | 0.109873 | 0.22731 |
| 105 | RES_E | 443047.68 | 3762095.12 | 9.12779 | 16.8684 | 2.47242 | 4.42814 | 443047.68, 3762095.12 | 0.02253547 | 0.08076 | 0.02199 | 0.082296 | 0.103297 | 0.10429 | 0.207587 |
| 106 | RES_E | 443097.68 | 3762095.12 | 8.08621 | 15.00348 | 2.34788 | 4.22449 | 443097.68, 3762095.12 | 0.01996393 | 0.07183 | 0.02089 | 0.078511 | 0.091797 | 0.099397 | 0.191194 |
| 107 | RES_E | 443147.68 | 3762095.12 | 7.21699 | 13.62249 | 2.23655 | 4.03812 | 443147.68, 3762095.12 | 0.01781793 | 0.06522 | 0.0199 | 0.075047 | 0.083039 | 0.094943 | 0.177982 |
| 108 | RES_E | 443197.68 | 3762095.12 | 6.73739 | 12.45667 | 2.20631 | 3.86233 | 443197.68, 3762095.12 | 0.01663385 | 0.05964 | 0.01963 | 0.07178 | 0.076273 | 0.091407 | 0.16768 |
| 109 | RES_E | 442447.68 | 3762145.12 | 25.85077 | 31.34255 | 5.75082 | 9.90142 | 442447.68, 3762145.12 | 0.06382261 | 0.15006 | 0.05116 | 0.184015 | 0.213883 | 0.235173 | 0.449056 |
| 110 | RES_E | 442497.68 | 3762145.12 | 22.12942 | 28.01715 | 5.27896 | 9.05891 | 442497.68, 3762145.12 | 0.05463502 | 0.13414 | 0.04696 | 0.168357 | 0.188774 | 0.215318 | 0.404092 |
| 111 | RES_E | 442547.68 | 3762145.12 | 20.54331 | 27.09415 | 4.7699 | 8.33032 | 442547.68, 3762145.12 | 0.05071909 | 0.12972 | 0.04243 | 0.154816 | 0.180439 | 0.197249 | 0.377688 |
| 112 | RES_E | 442597.68 | 3762145.12 | 19.55628 | 26.64421 | 4.56114 | 7.69788 | 442597.68, 3762145.12 | 0.04828223 | 0.12757 | 0.04058 | 0.143063 | 0.175848 | 0.183638 | 0.359486 |
| 113 | RES_E | 442647.68 | 3762145.12 | 18.88571 | 26.77451 | 4.15292 | 7.14159 | 442647.68, 3762145.12 | 0.04662667 | 0.12819 | 0.03694 | 0.132724 | 0.174816 | 0.169668 | 0.344484 |
| 114 | RES_E | 442697.68 | 3762145.12 | 18.14008 | 26.89139 | 3.86604 | 6.6393 | 442697.68, 3762145.12 | 0.04478579 | 0.12875 | 0.03439 | 0.123389 | 0.173535 | 0.157781 | 0.331316 |
| 115 | RES_E | 442747.68 | 3762145.12 | 17.29572 | 26.52078 | 3.65434 | 6.1827 | 442747.68, 3762145.12 | 0.04270116 | 0.12697 | 0.03251 | 0.114904 | 0.169676 | 0.147412 | 0.317088 |
| 116 | RES_E | 442797.68 | 3762145.12 | 16.16491 | 25.62753 | 3.40099 | 5.78723 | 442797.68, 3762145.12 | 0.03990932 | 0.1227 | 0.03025 | 0.107554 | 0.162607 | 0.137809 | 0.300416 |
| 117 | RES_E | 442847.68 | 3762145.12 | 14.46608 | 24.69521 | 3.0397 | 5.43883 | 442847.68, 3762145.12 | 0.0357151 | 0.11823 | 0.02704 | 0.101079 | 0.15395 | 0.12812 | 0.282069 |
| 118 | RES_E | 442897.68 | 3762145.12 | 12.74401 | 22.69223 | 2.9208 | 5.12443 | 442897.68, 3762145.12 | 0.03146351 | 0.10864 | 0.02598 | 0.095236 | 0.140108 | 0.121219 | 0.261327 |
| 119 | RES_E | 442947.68 | 3762145.12 | 11.19307 | 20.20442 | 2.79748 | 4.86722 | 442947.68, 3762145.12 | 0.02763442 | 0.09673 | 0.02489 | 0.090456 | 0.124368 | 0.115342 | 0.23971 |
| 120 | RES_E | 442997.68 | 3762145.12 | 9.95296 | 17.82023 | 2.6993 | 4.62886 | 442997.68, 3762145.12 | 0.02457273 | 0.08532 | 0.02401 | 0.086026 | 0.109892 | 0.110038 | 0.21993 |
| 121 | RES_E | 443047.68 | 3762145.12 | 8.73381 | 15.82507 | 2.54838 | 4.41617 | 443047.68, 3762145.12 | 0.02156278 | 0.07577 | 0.02267 | 0.082073 | 0.097329 | 0.104743 | 0.202072 |
| 122 | RES_E | 443097.68 | 3762145.12 | 7.77005 | 14.29888 | 2.40614 | 4.21974 | 443097.68, 3762145.12 | 0.01918337 | 0.06846 | 0.0214 | 0.078423 | 0.087643 | 0.099827 | 0.18747 |
| 123 | RES_E | 443147.68 | 3762145.12 | 6.99533 | 13.06149 | 2.28045 | 4.03622 | 443147.68, 3762145.12 | 0.01727067 | 0.06254 | 0.02029 | 0.075012 | 0.079806 | 0.095298 | 0.175104 |
| 124 | RES_E | 443197.68 | 3762145.12 | 6.51575 | 11.93527 | 2.20686 | 3.86406 | 443197.68, 3762145.12 | 0.01608664 | 0.05714 | 0.01963 | 0.071812 | 0.07323 | 0.091444 | 0.164674 |
| 125 | RES_E | 442447.68 | 3762195.12 | 21.01265 | 26.66827 | 5.71007 | 9.61194 | 442447.68, 3762195.12 | 0.05187784 | 0.12768 | 0.0508 | 0.178635 | 0.179559 | 0.229431 | 0.40899 |
| 126 | RES_E | 442497.68 | 3762195.12 | 17.28833 | 22.39332 | 5.21967 | 8.83297 | 442497.68, 3762195.12 | 0.04268292 | 0.10721 | 0.04643 | 0.164158 | 0.149897 | 0.210591 | 0.360488 |
| 127 | RES_E | 442547.68 | 3762195.12 | 15.66699 | 20.8678 | 4.6663 | 8.16638 | 442547.68, 3762195.12 | 0.03868001 | 0.09991 | 0.04151 | 0.15177 | 0.13859 | 0.19328 | 0.33187 |
| 128 | RES_E | 442597.68 | 3762195.12 | 14.77799 | 20.18652 | 4.45478 | 7.57425 | 442597.68, 3762195.12 | 0.03648517 | 0.09665 | 0.03963 | 0.140765 | 0.133133 | 0.180394 | 0.313527 |
| 129 | RES_E | 442647.68 | 3762195.12 | 14.1228 | 20.21592 | 4.18381 | 7.04851 | 442647.68, 3762195.12 | 0.03486759 | 0.09679 | 0.03722 | 0.130994 | 0.131656 | 0.168213 | 0.299869 |
| 130 | RES_E | 442697.68 | 3762195.12 | 13.54762 | 20.23782 | 3.94031 | 6.57467 | 442697.68, 3762195.12 | 0.03344753 | 0.09689 | 0.03505 | 0.122188 | 0.130341 | 0.157241 | 0.287582 |
| 131 | RES_E | 442747.68 | 3762195.12 | 13.04667 | 19.95712 | 3.71794 | 6.15321 | 442747.68, 3762195.12 | 0.03221074 | 0.09555 | 0.03307 | 0.114355 | 0.12776 | 0.14743 | 0.27519 |
| 132 | RES_E | 442797.68 | 3762195.12 | 12.44721 | 19.41754 | 3.43435 | 5.78857 | 442797.68, 3762195.12 | 0.03073074 | 0.09297 | 0.03055 | 0.107579 | 0.123697 | 0.13813 | 0.261827 |
| 133 | RES_E | 442847.68 | 3762195.12 | 11.68703 | 19.37882 | 3.14021 | 5.45338 | 442847.68, 3762195.12 | 0.02885395 | 0.09278 | 0.02793 | 0.101349 | 0.121635 | 0.129284 | 0.250919 |
| 134 | RES_E | 442897.68 | 3762195.12 | 11.00412 | 18.93388 | 3.00991 | 5.14263 | 442897.68, 3762195.12 | 0.02716792 | 0.09065 | 0.02678 | 0.095574 | 0.117819 | 0.12235 | 0.240168 |
| 135 | RES_E | 442947.68 | 3762195.12 | 10.19716 | 17.93764 | 2.91519 | 4.85551 | 442947.68, 3762195.12 | 0.02517563 | 0.08588 | 0.02593 | 0.090238 | 0.111057 | 0.116171 | 0.227228 |
| 136 | RES_E | 442997.68 | 3762195.12 | 9.47849 | 16.49881 | 2.80661 | 4.59408 | 442997.68, 3762195.12 | 0.02340131 | 0.07899 | 0.02497 | 0.08538 | 0.102393 | 0.110347 | 0.21274 |
| 137 | RES_E | 443047.68 | 3762195.12 | 8.59539 | 15.0093 | 2.67223 | 4.37431 | 443047.68, 3762195.12 | 0.02122104 | 0.07186 | 0.02377 | 0.081295 | 0.093082 | 0.105067 | 0.198149 |
| 138 | RES_E | 443097.68 | 3762195.12 | 7.72945 | 13.50578 | 2.53875 | 4.17129 | 443097.68, 3762195.12 | 0.01908313 | 0.06466 | 0.02258 | 0.077522 | 0.083745 | 0.100106 | 0.183852 |
| 139 | RES_E | 443147.68 | 3762195.12 | 6.93413 | 12.30034 | 2.39488 | 3.98979 | 443147.68, 3762195.12 | 0.01711958 | 0.05889 | 0.0213 | 0.074149 | 0.076011 | 0.095453 | 0.171464 |
| 140 | RES_E | 443197.68 | 3762195.12 | 6.32726 | 11.39751 | 2.28373 | 3.82745 | 443197.68, 3762195.12 | 0.01562128 | 0.05457 | 0.02032 | 0.071132 | 0.07019 | 0.091448 | 0.161637 |
| 141 | RES_E | 442447.68 | 3762245.12 | 17.73809 | 24.06374 | 5.62971 | 9.10077 | 442447.68, 3762245.12 | 0.04379332 | 0.11521 | 0.05008 | 0.169135 | 0.159004 | 0.219216 | 0.37822 |
| 142 | RES_E | 442497.68 | 3762245.12 | 14.36417 | 19.46148 | 5.13602 | 8.37525 | 442497.68, 3762245.12 | 0.0354635 | 0.09318 | 0.04569 | 0.155651 | 0.12864 | 0.201341 | 0.329981 |
| 143 | RES_E | 442547.68 | 3762245.12 | 12.78185 | 17.57363 | 4.62889 | 7.77721 | 442547.68, 3762245.12 | 0.03155693 | 0.08414 | 0.04118 | 0.144537 | 0.115695 | 0.185715 | 0.30141 |
| 144 | RES_E | 442597.68 | 3762245.12 | 11.91209 | 16.70556 | 4.38952 | 7.2595 | 442597.68, 3762245.12 | 0.02940959 | 0.07998 | 0.03905 | 0.134916 | 0.109392 | 0.173964 | 0.283356 |
| 145 | RES_E | 442647.68 | 3762245.12 | 11.33841 | 16.41827 | 4.08403 | 6.79823 | 442647.68, 3762245.12 | 0.02799324 | 0.07861 | 0.03633 | 0.126343 | 0.1066 | 0.162674 | 0.269274 |
| 146 | RES_E | 442697.68 | 3762245.12 | 10.84852 | 16.31012 | 3.81846 | 6.37874 | 442697.68, 3762245.12 | 0.02678376 | 0.07809 | 0.03397 | 0.118547 | 0.104873 | 0.152515 | 0.257388 |
| 147 | RES_E | 442747.68 | 3762245.12 | 10.48513 | 16.01825 | 3.55514 | 6.00874 | 442747.68, 3762245.12 | 0.02588659 | 0.07669 | 0.03163 | 0.111671 | 0.102578 | 0.143297 | 0.245874 |
| 148 | RES_E | 442797.68 | 3762245.12 | 10.15047 | 15.4015 | 3.35958 | 5.67542 | 442797.68, 3762245.12 | 0.02506035 | 0.07374 | 0.02989 | 0.105476 | 0.098799 | 0.135362 | 0.234161 |
| 149 | RES_E | 442847.68 | 3762245.12 | 9.78608 | 15.56784 | 3.18903 | 5.3662 | 442847.68, 3762245.12 | 0.02416072 | 0.07453 | 0.02837 | 0.099729 | 0.098696 | 0.128098 | 0.226794 |
| 150 | RES_E | 442897.68 | 3762245.12 | 9.49253 | 15.73246 | 3.08598 | 5.07795 | 442897.68, 3762245.12 | 0.02343598 | 0.07532 | 0.02745 | 0.094372 | 0.098759 | 0.121825 | 0.220584 |
| 151 | RES_E | 442947.68 | 3762245.12 | 9.12461 | 15.4617 | 2.9481 | 4.81014 | 442947.68, 3762245.12 | 0.02252762 | 0.07403 | 0.02623 | 0.089395 | 0.096554 | 0.115621 | 0.212175 |
| 152 | RES_E | 442997.68 | 3762245.12 | 8.70819 | 14.88151 | 2.82777 | 4.56081 | 442997.68, 3762245.12 | 0.02149953 | 0.07125 | 0.02516 | 0.084761 | 0.092748 | 0.109917 | 0.202665 |
| 153 | RES_E | 443047.68 | 3762245.12 | 8.00247 | 14.01578 | 2.67345 | 4.32898 | 443047.68, 3762245.12 | 0.01975719 | 0.0671 | 0.02378 | 0.080453 | 0.086861 | 0.104235 | 0.191097 |
| 154 | RES_E | 443097.68 | 3762245.12 | 7.43158 | 12.91209 | 2.55493 | 4.11278 | 443097.68, 3762245.12 | 0.01834772 | 0.06182 | 0.02273 | 0.076435 | 0.080168 | 0.099163 | 0.179331 |
| 155 | RES_E | 443147.68 | 3762245.12 | 6.71739 | 11.828 | 2.42428 | 3.92822 | 443147.68, 3762245.12 | 0.01658447 | 0.05663 | 0.02157 | 0.073005 | 0.073214 | 0.094571 | 0.167785 |
| 156 | RES_E | 443197.68 | 3762245.12 | 6.17423 | 10.8043 | 2.32438 | 3.75785 | 443197.68, 3762245.12 | 0.01524347 | 0.05173 | 0.02068 | 0.069838 | 0.066972 | 0.090516 | 0.157488 |
| 157 | RES_E | 442822.81 | 3761611.77 | 13.29022 | 23.0646 | 2.29777 | 4.59397 | 442822.81, 3761611.77 | 0.03281204 | 0.11043 | 0.02044 | 0.085378 | 0.14324 | 0.105818 | 0.249058 |
| 158 | RES_E | 442872.81 | 3761611.77 | 11.08861 | 19.02616 | 2.18713 | 4.38606 | 442872.81, 3761611.77 | 0.02737652 | 0.09109 | 0.01946 | 0.081514 | 0.118469 | 0.10097 | 0.219439 |
| 159 | RES_E | 442922.81 | 3761611.77 | 9.38512 | 16.13149 | 2.08361 | 4.18683 | 442922.81, 3761611.77 | 0.02317079 | 0.07723 | 0.01854 | 0.077811 | 0.100404 | 0.096346 | 0.196751 |
| 160 | RES_E | 442972.81 | 3761611.77 | 8.06348 | 14.03229 | 1.98657 | 4.01942 | 442972.81, 3761611.77 | 0.01990781 | 0.06718 | 0.01767 | 0.0747 | 0.087091 | 0.092372 | 0.179463 |
| 161 | RES_E | 442822.81 | 3761661.77 | 17.66351 | 31.18335 | 2.42724 | 4.84984 | 442822.81, 3761661.77 | 0.0436092 | 0.1493 | 0.02159 | 0.090133 | 0.192907 | 0.111725 | 0.304632 |
| 162 | RES_E | 442872.81 | 3761661.77 | 13.56244 | 23.09517 | 2.29918 | 4.65308 | 442872.81, 3761661.77 | 0.03348412 | 0.11057 | 0.02045 | 0.086476 | 0.144058 | 0.106929 | 0.250987 |
| 163 | RES_E | 442922.81 | 3761661.77 | 10.86954 | 18.61992 | 2.18933 | 4.4769 | 442922.81, 3761661.77 | 0.02683566 | 0.08915 | 0.01948 | 0.083202 | 0.115983 | 0.102678 | 0.218661 |
| 164 | RES_E | 442972.81 | 3761661.77 | 9.12233 | 16.1247 | 2.08854 | 4.30929 | 442972.81, 3761661.77 | 0.02252199 | 0.0772 | 0.01858 | 0.080087 | 0.099723 | 0.098666 | 0.198389 |
| 165 | RES_N | 442732.29 | 3762366.08 | 7.25355 | 10.77881 | 3.60452 | 5.71649 | 442732.29, 3762366.08 | 0.01790819 | 0.05161 | 0.03207 | 0.106239 | 0.069514 | 0.138304 | 0.207819 |
| 166 | RES_N | 442782.29 | 3762366.08 | 7.15608 | 10.30871 | 3.47098 | 5.41704 | 442782.29, 3762366.08 | 0.01766755 | 0.04936 | 0.03088 | 0.100674 | 0.067023 | 0.131551 | 0.198574 |
| 167 | RES_N | 442832.29 | 3762366.08 | 7.3074 | 10.18863 | 3.37531 | 5.12856 | 442832.29, 3762366.08 | 0.01804114 | 0.04878 | 0.03003 | 0.095313 | 0.066822 | 0.125339 | 0.192161 |
| 168 | RES_N | 442732.29 | 3762416.08 | 6.46053 | 9.44393 | 3.52057 | 5.52249 | 442732.29, 3762416.08 | 0.01595031 | 0.04522 | 0.03132 | 0.102634 | 0.061165 | 0.133952 | 0.195118 |
| 169 | RES_N | 442782.29 | 3762416.08 | 6.40718 | 9.00819 | 3.40526 | 5.28555 | 442782.29, 3762416.08 | 0.0158186 | 0.04313 | 0.03029 | 0.09823 | 0.058948 | 0.128523 | 0.18747 |
| 170 | RES_N | 442832.29 | 3762416.08 | 6.40149 | 8.86897 | 3.28034 | 5.05054 | 442832.29, 3762416.08 | 0.01580455 | 0.04246 | 0.02918 | 0.093863 | 0.058267 | 0.123044 | 0.181311 |
| 171 | RES_N | 442732.29 | 3762466.08 | 5.73685 | 8.3015 | 3.37968 | 5.24451 | 442732.29, 3762466.08 | 0.01416363 | 0.03975 | 0.03007 | 0.097468 | 0.053909 | 0.127533 | 0.181442 |
| 172 | RES_N | 442782.29 | 3762466.08 | 5.73788 | 7.98229 | 3.27593 | 5.0509 | 442782.29, 3762466.08 | 0.01416617 | 0.03822 | 0.02914 | 0.093869 | 0.052383 | 0.123012 | 0.175395 |
| 173 | RES_N | 442832.29 | 3762466.08 | 5.83814 | 7.79587 | 3.19696 | 4.88756 | 442832.29, 3762466.08 | 0.0144137 | 0.03732 | 0.02844 | 0.090834 | 0.051738 | 0.119273 | 0.171012 |
| 174 | RES_N | 441922.75 | 3762323.77 | 5.7919 | 9.99288 | 9.45341 | 13.44193 | 441922.75, 3762323.77 | 0.01429954 | 0.04784 | 0.0841 | 0.249814 | 0.062143 | 0.33391 | 0.396053 |
| 175 | RES_N | 441972.75 | 3762323.77 | 6.52004 | 11.11387 | 9.43312 | 13.45631 | 441972.75, 3762323.77 | 0.01609724 | 0.05321 | 0.08392 | 0.250081 | 0.069308 | 0.333997 | 0.403305 |
| 176 | RES_N | 442022.75 | 3762323.77 | 7.44423 | 12.46076 | 9.33511 | 13.41954 | 442022.75, 3762323.77 | 0.01837896 | 0.05966 | 0.08304 | 0.249398 | 0.078038 | 0.332442 | 0.41048 |
| 177 | RES_N | 442072.75 | 3762323.77 | 8.57867 | 14.35966 | 9.14529 | 13.33023 | 442072.75, 3762323.77 | 0.02117976 | 0.06875 | 0.08136 | 0.247738 | 0.08993 | 0.329093 | 0.419023 |
| 178 | RES_N | 441922.75 | 3762373.77 | 5.42726 | 9.57238 | 7.71747 | 10.68133 | 441922.75, 3762373.77 | 0.01339929 | 0.04583 | 0.06865 | 0.198509 | 0.059229 | 0.267163 | 0.326392 |
| 179 | RES_N | 441972.75 | 3762373.77 | 5.9536 | 10.40886 | 7.57778 | 10.72578 | 441972.75, 3762373.77 | 0.01469876 | 0.04984 | 0.06741 | 0.199335 | 0.064534 | 0.266746 | 0.33128 |
| 180 | RES_N | 442022.75 | 3762373.77 | 6.66993 | 11.48987 | 7.57133 | 10.71338 | 442022.75, 3762373.77 | 0.0164673 | 0.05501 | 0.06735 | 0.199105 | 0.071478 | 0.266458 | 0.337936 |
| 181 | RES_N | 442072.75 | 3762373.77 | 7.47445 | 12.68104 | 7.45082 | 10.63269 | 442072.75, 3762373.77 | 0.01845357 | 0.06071 | 0.06628 | 0.197605 | 0.079167 | 0.263887 | 0.343054 |
| 182 | RES_N | 441922.75 | 3762423.77 | 5.24275 | 8.78874 | 6.78254 | 8.98716 | 441922.75, 3762423.77 | 0.01294375 | 0.04208 | 0.06034 | 0.167024 | 0.055022 | 0.22736 | 0.282382 |
| 183 | RES_N | 441972.75 | 3762423.77 | 5.50875 | 9.46246 | 6.53396 | 9.03883 | 441972.75, 3762423.77 | 0.01360048 | 0.0453 | 0.05813 | 0.167984 | 0.058904 | 0.226109 | 0.285013 |
| 184 | RES_N | 442022.75 | 3762423.77 | 6.02216 | 10.11472 | 6.52161 | 9.04426 | 442022.75, 3762423.77 | 0.01486803 | 0.04843 | 0.05802 | 0.168085 | 0.063295 | 0.2261 | 0.289395 |
| 185 | RES_N | 442072.75 | 3762423.77 | 6.51588 | 11.12025 | 6.4476 | 9.02809 | 442072.75, 3762423.77 | 0.01608697 | 0.05324 | 0.05736 | 0.167784 | 0.069328 | 0.225141 | 0.294469 |
| 186 | RES_N | 441922.75 | 3762473.77 | 4.90371 | 8.00987 | 5.85377 | 7.76137 | 441922.75, 3762473.77 | 0.0121067 | 0.03835 | 0.05207 | 0.144243 | 0.050456 | 0.196317 | 0.246773 |
| 187 | RES_N | 441972.75 | 3762473.77 | 5.17046 | 8.49508 | 5.81699 | 7.81461 | 441972.75, 3762473.77 | 0.01276528 | 0.04067 | 0.05175 | 0.145232 | 0.053438 | 0.196979 | 0.250417 |
| 188 | RES_N | 442022.75 | 3762473.77 | 5.41859 | 9.23609 | 5.76137 | 7.87336 | 442022.75, 3762473.77 | 0.01337788 | 0.04422 | 0.05125 | 0.146324 | 0.057598 | 0.197576 | 0.255174 |
| 189 | RES_N | 442072.75 | 3762473.77 | 5.92037 | 9.66704 | 5.7386 | 7.87241 | 442072.75, 3762473.77 | 0.01461672 | 0.04628 | 0.05105 | 0.146306 | 0.0609 | 0.197356 | 0.258256 |
| 190 | RES_N | 441922.75 | 3762523.77 | 4.58914 | 7.28056 | 5.12516 | 6.79328 | 441922.75, 3762523.77 | 0.01133006 | 0.03486 | 0.04559 | 0.126251 | 0.046188 | 0.171844 | 0.218031 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 191 | RES_N | 441972.75 | 3762523.77 | 4.78826 | 7.8433 | 5.14067 | 6.87401 | 441972.75, 3762523.77 | 0.01182167 | 0.03755 | 0.04573 | 0.127751 | 0.049373 | 0.173482 | 0.222855 |
| 192 | RES_N | 442022.75 | 3762523.77 | 4.95589 | 8.25591 | 5.10768 | 6.95024 | 442022.75, 3762523.77 | 0.01223553 | 0.03953 | 0.04544 | 0.129168 | 0.051763 | 0.174605 | 0.226368 |
| 193 | RES_N | 442072.75 | 3762523.77 | 5.35697 | 8.28232 | 5.09255 | 6.96332 | 442072.75, 3762523.77 | 0.01322575 | 0.03965 | 0.0453 | 0.129411 | 0.052879 | 0.174714 | 0.227593 |
| 194 | RES_N | 441922.75 | 3762573.77 | 4.32094 | 6.76221 | 4.528 | 5.99752 | 441922.75, 3762573.77 | 0.01066791 | 0.03238 | 0.04028 | 0.111462 | 0.043044 | 0.151742 | 0.194786 |
| 195 | RES_N | 441972.75 | 3762573.77 | 4.44762 | 7.14537 | 4.55864 | 6.09266 | 441972.75, 3762573.77 | 0.01098067 | 0.03421 | 0.04055 | 0.11323 | 0.045191 | 0.153783 | 0.198974 |
| 196 | RES_N | 442022.75 | 3762573.77 | 4.65838 | 7.28638 | 4.57041 | 6.18227 | 442022.75, 3762573.77 | 0.01150101 | 0.03489 | 0.04066 | 0.114896 | 0.046386 | 0.155553 | 0.20194 |
| 197 | RES_N | 442072.75 | 3762573.77 | 4.93397 | 7.18734 | 4.56616 | 6.20527 | 442072.75, 3762573.77 | 0.01218141 | 0.03441 | 0.04062 | 0.115323 | 0.046593 | 0.155943 | 0.202535 |
| 198 | RES_N | 441922.75 | 3762623.77 | 3.96771 | 6.2484 | 4.05284 | 5.32698 | 441922.75, 3762623.77 | 0.00979582 | 0.02992 | 0.03605 | 0.099 | 0.039712 | 0.135054 | 0.174765 |
| 199 | RES_N | 441972.75 | 3762623.77 | 4.14316 | 6.44221 | 4.07263 | 5.41826 | 441972.75, 3762623.77 | 0.01022899 | 0.03084 | 0.03623 | 0.100697 | 0.041073 | 0.136926 | 0.177999 |
| 200 | RES_N | 442022.75 | 3762623.77 | 4.33629 | 6.43253 | 4.10103 | 5.51631 | 442022.75, 3762623.77 | 0.01070581 | 0.0308 | 0.03648 | 0.102519 | 0.041503 | 0.139001 | 0.180504 |
| 201 | RES_N | 442072.75 | 3762623.77 | 4.52816 | 6.44024 | 4.11295 | 5.54721 | 442072.75, 3762623.77 | 0.01117951 | 0.03083 | 0.03659 | 0.103093 | 0.042014 | 0.139681 | 0.181695 |
| 202 | RES_N | 441109.54 | 3762319.57 | 1.79877 | 3.52746 | 8.91153 | 11.60901 | 441109.54, 3762319.57 | 0.00444096 | 0.01689 | 0.07928 | 0.21575 | 0.02133 | 0.295025 | 0.316355 |
| 203 | RES_N | 441159.54 | 3762319.57 | 1.86031 | 3.66082 | 9.15815 | 11.81362 | 441159.54, 3762319.57 | 0.00459289 | 0.01753 | 0.08147 | 0.219552 | 0.02212 | 0.301022 | 0.323142 |
| 204 | RES_N | 441209.54 | 3762319.57 | 1.95984 | 3.8037 | 9.3095 | 12.07042 | 441209.54, 3762319.57 | 0.00483862 | 0.01821 | 0.08282 | 0.224325 | 0.02305 | 0.307141 | 0.330191 |
| 205 | RES_N | 441259.54 | 3762319.57 | 2.13105 | 3.94741 | 9.33879 | 12.2702 | 441259.54, 3762319.57 | 0.00526132 | 0.0189 | 0.08308 | 0.228038 | 0.024161 | 0.311114 | 0.335275 |
| 206 | RES_N | 441109.54 | 3762369.57 | 1.84611 | 3.39739 | 6.83867 | 8.90249 | 441109.54, 3762369.57 | 0.00455784 | 0.01627 | 0.06084 | 0.16545 | 0.020824 | 0.226286 | 0.247109 |
| 207 | RES_N | 441159.54 | 3762369.57 | 1.84269 | 3.53105 | 6.99903 | 9.0291 | 441159.54, 3762369.57 | 0.00454939 | 0.01691 | 0.06226 | 0.167803 | 0.021455 | 0.230065 | 0.25152 |
| 208 | RES_N | 441209.54 | 3762369.57 | 1.92731 | 3.66383 | 7.11221 | 9.13243 | 441209.54, 3762369.57 | 0.00475831 | 0.01754 | 0.06327 | 0.169723 | 0.0223 | 0.232992 | 0.255292 |
| 209 | RES_N | 441259.54 | 3762369.57 | 2.07833 | 3.79503 | 7.23204 | 9.30325 | 441259.54, 3762369.57 | 0.00513116 | 0.01817 | 0.06434 | 0.172898 | 0.023301 | 0.237233 | 0.260534 |
| 210 | RES_N | 441109.54 | 3762419.57 | 1.84399 | 3.26868 | 5.69328 | 7.30494 | 441109.54, 3762419.57 | 0.0045526 | 0.01565 | 0.05065 | 0.13576 | 0.020202 | 0.186407 | 0.206609 |
| 211 | RES_N | 441159.54 | 3762419.57 | 1.81217 | 3.36523 | 5.75678 | 7.38237 | 441159.54, 3762419.57 | 0.00447404 | 0.01611 | 0.05121 | 0.137199 | 0.020586 | 0.18841 | 0.208996 |
| 212 | RES_N | 441209.54 | 3762419.57 | 1.85681 | 3.457 | 5.85497 | 7.45794 | 441209.54, 3762419.57 | 0.00458425 | 0.01655 | 0.05208 | 0.138603 | 0.021136 | 0.190688 | 0.211824 |
| 213 | RES_N | 441259.54 | 3762419.57 | 1.95528 | 3.58561 | 5.94466 | 7.54052 | 441259.54, 3762419.57 | 0.00482736 | 0.01717 | 0.05288 | 0.140138 | 0.021994 | 0.193021 | 0.215015 |
| 214 | RES_N | 441109.54 | 3762469.57 | 1.7945 | 3.08717 | 4.91483 | 6.20273 | 441109.54, 3762469.57 | 0.00443042 | 0.01478 | 0.04372 | 0.115276 | 0.019211 | 0.158997 | 0.178208 |
| 215 | RES_N | 441159.54 | 3762469.57 | 1.77774 | 3.2177 | 4.9319 | 6.22506 | 441159.54, 3762469.57 | 0.00438904 | 0.01541 | 0.04387 | 0.115691 | 0.019795 | 0.159564 | 0.179359 |
| 216 | RES_N | 441209.54 | 3762469.57 | 1.8386 | 3.36266 | 4.99791 | 6.25421 | 441209.54, 3762469.57 | 0.00453929 | 0.0161 | 0.04446 | 0.116233 | 0.020639 | 0.160693 | 0.181332 |
| 217 | RES_N | 441259.54 | 3762469.57 | 1.98929 | 3.55869 | 5.09462 | 6.2749 | 441259.54, 3762469.57 | 0.00491133 | 0.01704 | 0.04532 | 0.116617 | 0.021949 | 0.161938 | 0.183887 |
| 218 | RES_N | 441109.54 | 3762519.57 | 1.81347 | 3.0502 | 4.35999 | 5.44302 | 441109.54, 3762519.57 | 0.00447725 | 0.0146 | 0.03879 | 0.101157 | 0.019081 | 0.139943 | 0.159023 |
| 219 | RES_N | 441159.54 | 3762519.57 | 1.78526 | 3.2125 | 4.33319 | 5.43088 | 441159.54, 3762519.57 | 0.0044076 | 0.01538 | 0.03855 | 0.100931 | 0.019788 | 0.139479 | 0.159267 |
| 220 | RES_N | 441209.54 | 3762519.57 | 1.87186 | 3.42275 | 4.37182 | 5.41655 | 441209.54, 3762519.57 | 0.00462141 | 0.01639 | 0.03889 | 0.100665 | 0.021009 | 0.139556 | 0.160565 |
| 221 | RES_N | 441259.54 | 3762519.57 | 1.97621 | 3.64705 | 4.42479 | 5.42855 | 441259.54, 3762519.57 | 0.00487904 | 0.01746 | 0.03936 | 0.100888 | 0.02234 | 0.14025 | 0.16259 |
| 222 | RES_N | 441109.54 | 3762569.57 | 1.88708 | 3.09096 | 3.92255 | 4.84516 | 441109.54, 3762569.57 | 0.00465899 | 0.0148 | 0.03489 | 0.090046 | 0.019458 | 0.12494 | 0.144398 |
| 223 | RES_N | 441159.54 | 3762569.57 | 1.84881 | 3.28148 | 3.88979 | 4.80884 | 441159.54, 3762569.57 | 0.0045645 | 0.01571 | 0.0346 | 0.089371 | 0.020275 | 0.123974 | 0.144249 |
| 224 | RES_N | 441209.54 | 3762569.57 | 1.87495 | 3.46835 | 3.887 | 4.78879 | 441209.54, 3762569.57 | 0.00462904 | 0.01661 | 0.03458 | 0.088998 | 0.021235 | 0.123576 | 0.144811 |
| 225 | RES_N | 441259.54 | 3762569.57 | 1.93326 | 3.64877 | 3.88628 | 4.78923 | 441259.54, 3762569.57 | 0.004773 | 0.01747 | 0.03457 | 0.089006 | 0.022242 | 0.123578 | 0.14582 |
| 226 | RES_N | 441109.54 | 3762619.57 | 1.88736 | 3.12656 | 3.53831 | 4.35833 | 441109.54, 3762619.57 | 0.00465968 | 0.01497 | 0.03148 | 0.080998 | 0.019629 | 0.112474 | 0.132103 |
| 227 | RES_N | 441159.54 | 3762619.57 | 1.89651 | 3.27957 | 3.51934 | 4.29705 | 441159.54, 3762619.57 | 0.00468227 | 0.0157 | 0.03131 | 0.079859 | 0.020384 | 0.111167 | 0.131551 |
| 228 | RES_N | 441209.54 | 3762619.57 | 1.91677 | 3.46242 | 3.51179 | 4.29084 | 441209.54, 3762619.57 | 0.00473229 | 0.01658 | 0.03124 | 0.079744 | 0.021309 | 0.110984 | 0.132294 |
| 229 | RES_N | 441259.54 | 3762619.57 | 2.04943 | 3.684 | 3.55669 | 4.29158 | 441259.54, 3762619.57 | 0.00505981 | 0.01764 | 0.03164 | 0.079758 | 0.022698 | 0.111397 | 0.134095 |
| 230 | RES_N | 441109.54 | 3762669.57 | 1.88558 | 3.11549 | 3.20783 | 3.94459 | 441109.54, 3762669.57 | 0.00465528 | 0.01492 | 0.02854 | 0.073309 | 0.019571 | 0.101845 | 0.121417 |
| 231 | RES_N | 441159.54 | 3762669.57 | 1.95813 | 3.30367 | 3.21781 | 3.8882 | 441159.54, 3762669.57 | 0.0048344 | 0.01582 | 0.02863 | 0.072261 | 0.020652 | 0.100886 | 0.121538 |
| 232 | RES_N | 441209.54 | 3762669.57 | 2.04564 | 3.51657 | 3.23361 | 3.89893 | 441209.54, 3762669.57 | 0.00505045 | 0.01684 | 0.02877 | 0.07246 | 0.021887 | 0.101226 | 0.123113 |
| 233 | RES_N | 441259.54 | 3762669.57 | 2.13482 | 3.71832 | 3.24211 | 3.90742 | 441259.54, 3762669.57 | 0.00527063 | 0.0178 | 0.02884 | 0.072618 | 0.023073 | 0.101459 | 0.124532 |
| 234 | RES_N | 441109.54 | 3762719.57 | 1.9293 | 3.16752 | 2.9487 | 3.57787 | 441109.54, 3762719.57 | 0.00476322 | 0.01517 | 0.02623 | 0.066494 | 0.019929 | 0.092725 | 0.112653 |
| 235 | RES_N | 441159.54 | 3762719.57 | 1.98719 | 3.34746 | 2.94903 | 3.54453 | 441159.54, 3762719.57 | 0.00490615 | 0.01603 | 0.02623 | 0.065874 | 0.020933 | 0.092108 | 0.113041 |
| 236 | RES_N | 441209.54 | 3762719.57 | 2.05963 | 3.51868 | 2.95629 | 3.5814 | 441209.54, 3762719.57 | 0.00508499 | 0.01685 | 0.0263 | 0.066559 | 0.021932 | 0.092858 | 0.114789 |
| 237 | RES_N | 441259.54 | 3762719.57 | 2.10504 | 3.6832 | 2.95382 | 3.60431 | 441259.54, 3762719.57 | 0.0051971 | 0.01763 | 0.02628 | 0.066985 | 0.022831 | 0.093262 | 0.116093 |
| 238 | RES_N | 441109.54 | 3762769.57 | 1.93013 | 3.19343 | 2.71118 | 3.26202 | 441109.54, 3762769.57 | 0.00476527 | 0.01529 | 0.02412 | 0.060624 | 0.020055 | 0.084742 | 0.104796 |
| 239 | RES_N | 441159.54 | 3762769.57 | 1.97832 | 3.3358 | 2.7123 | 3.28013 | 441159.54, 3762769.57 | 0.00488425 | 0.01597 | 0.02413 | 0.06096 | 0.020855 | 0.085088 | 0.105944 |
| 240 | RES_N | 441209.54 | 3762769.57 | 2.00389 | 3.46529 | 2.70858 | 3.31681 | 441209.54, 3762769.57 | 0.00494738 | 0.01659 | 0.0241 | 0.061642 | 0.021538 | 0.085737 | 0.107275 |
| 241 | RES_N | 441259.54 | 3762769.57 | 2.03965 | 3.5675 | 2.70123 | 3.33415 | 441259.54, 3762769.57 | 0.00503566 | 0.01708 | 0.02403 | 0.061964 | 0.022116 | 0.085994 | 0.10811 |
| 242 | RES_N | 441313.48 | 3762805.42 | 2.10662 | 3.4533 | 2.55645 | 3.14975 | 441313.48, 3762805.42 | 0.005201 | 0.01653 | 0.02274 | 0.058537 | 0.021735 | 0.081279 | 0.103013 |
| 243 | RES_N | 441363.48 | 3762805.42 | 2.18743 | 3.48315 | 2.55063 | 3.12491 | 441363.48, 3762805.42 | 0.00540052 | 0.01668 | 0.02269 | 0.058075 | 0.022077 | 0.080765 | 0.102842 |
| 244 | RES_N | 441413.48 | 3762805.42 | 2.25168 | 3.53392 | 2.56218 | 3.1082 | 441413.48, 3762805.42 | 0.00555914 | 0.01692 | 0.02279 | 0.057765 | 0.022479 | 0.080558 | 0.103036 |
| 245 | RES_N | 441463.48 | 3762805.42 | 2.33582 | 3.6449 | 2.57949 | 3.09062 | 441463.48, 3762805.42 | 0.00576687 | 0.01745 | 0.02295 | 0.057438 | 0.023218 | 0.080385 | 0.103603 |
| 246 | RES_N | 441513.48 | 3762805.42 | 2.42038 | 3.70968 | 2.58817 | 3.10374 | 441513.48, 3762805.42 | 0.00597564 | 0.01776 | 0.02302 | 0.057682 | 0.023737 | 0.080706 | 0.104443 |
| 247 | RES_N | 441563.48 | 3762805.42 | 2.47814 | 3.69082 | 2.5906 | 3.1214 | 441563.48, 3762805.42 | 0.00611825 | 0.01767 | 0.02305 | 0.05801 | 0.023789 | 0.081056 | 0.104845 |
| 248 | RES_N | 441613.48 | 3762805.42 | 2.53394 | 3.77147 | 2.61943 | 3.14683 | 441613.48, 3762805.42 | 0.00625601 | 0.01806 | 0.0233 | 0.058483 | 0.024313 | 0.081785 | 0.106098 |
| 249 | RES_N | 441663.48 | 3762805.42 | 2.61112 | 3.835 | 2.64909 | 3.17996 | 441663.48, 3762805.42 | 0.00644656 | 0.01836 | 0.02357 | 0.059099 | 0.024808 | 0.082664 | 0.107472 |
| 250 | RES_N | 441713.48 | 3762805.42 | 2.70173 | 4.02052 | 2.68298 | 3.22927 | 441713.48, 3762805.42 | 0.00667026 | 0.01925 | 0.02387 | 0.060015 | 0.02592 | 0.083882 | 0.109802 |
| 251 | RES_N | 441763.48 | 3762805.42 | 2.74501 | 4.20323 | 2.70472 | 3.27711 | 441763.48, 3762805.42 | 0.00677712 | 0.02012 | 0.02406 | 0.060904 | 0.026901 | 0.084965 | 0.111866 |
| 252 | RES_N | 441813.48 | 3762805.42 | 2.84991 | 4.37564 | 2.74474 | 3.346 | 441813.48, 3762805.42 | 0.0070361 | 0.02095 | 0.02442 | 0.062184 | 0.027986 | 0.086601 | 0.114587 |
| 253 | RES_N | 441313.48 | 3762855.42 | 2.05006 | 3.23919 | 2.36084 | 2.91606 | 441313.48, 3762855.42 | 0.00506136 | 0.01551 | 0.021 | 0.054194 | 0.02057 | 0.075196 | 0.095766 |
| 254 | RES_N | 441363.48 | 3762855.42 | 2.11461 | 3.31689 | 2.35045 | 2.88933 | 441363.48, 3762855.42 | 0.00522073 | 0.01588 | 0.02091 | 0.053697 | 0.021101 | 0.074607 | 0.095708 |
| 255 | RES_N | 441413.48 | 3762855.42 | 2.17336 | 3.39376 | 2.35133 | 2.87918 | 441413.48, 3762855.42 | 0.00536578 | 0.01625 | 0.02092 | 0.053509 | 0.021614 | 0.074426 | 0.09604 |
| 256 | RES_N | 441463.48 | 3762855.42 | 2.22869 | 3.41986 | 2.36215 | 2.86028 | 441463.48, 3762855.42 | 0.00550238 | 0.01637 | 0.02101 | 0.053157 | 0.021876 | 0.074171 | 0.096047 |
| 257 | RES_N | 441513.48 | 3762855.42 | 2.29602 | 3.40006 | 2.36595 | 2.87515 | 441513.48, 3762855.42 | 0.00566861 | 0.01628 | 0.02105 | 0.053434 | 0.021947 | 0.074481 | 0.096428 |
| 258 | RES_N | 441563.48 | 3762855.42 | 2.3554 | 3.47814 | 2.37311 | 2.89273 | 441563.48, 3762855.42 | 0.00581521 | 0.01665 | 0.02111 | 0.05376 | 0.022468 | 0.074871 | 0.097339 |
| 259 | RES_N | 441613.48 | 3762855.42 | 2.40164 | 3.51855 | 2.39113 | 2.91449 | 441613.48, 3762855.42 | 0.00592938 | 0.01685 | 0.02127 | 0.054165 | 0.022775 | 0.075436 | 0.098211 |
| 260 | RES_N | 441663.48 | 3762855.42 | 2.47506 | 3.67395 | 2.42233 | 2.92874 | 441663.48, 3762855.42 | 0.00611064 | 0.01759 | 0.02155 | 0.05443 | 0.023701 | 0.075978 | 0.099679 |
| 261 | RES_N | 441713.48 | 3762855.42 | 2.53028 | 3.83291 | 2.45875 | 2.95281 | 441713.48, 3762855.42 | 0.00624697 | 0.01835 | 0.02187 | 0.054877 | 0.024598 | 0.07675 | 0.101348 |
| 262 | RES_N | 441763.48 | 3762855.42 | 2.59932 | 4.01176 | 2.48325 | 3.0023 | 441763.48, 3762855.42 | 0.00641743 | 0.01921 | 0.02209 | 0.055797 | 0.025625 | 0.077887 | 0.103512 |
| 263 | RES_N | 441813.48 | 3762855.42 | 2.69611 | 4.14178 | 2.51788 | 3.06821 | 441813.48, 3762855.42 | 0.00665639 | 0.01983 | 0.0224 | 0.057022 | 0.026486 | 0.07942 | 0.105907 |
| 264 | RES_N | 441313.48 | 3762905.42 | 1.99033 | 3.11464 | 2.18614 | 2.70245 | 441313.48, 3762905.42 | 0.0049139 | 0.01491 | 0.01945 | 0.050224 | 0.019826 | 0.069672 | 0.089498 |
| 265 | RES_N | 441363.48 | 3762905.42 | 2.02135 | 3.15921 | 2.17091 | 2.67536 | 441363.48, 3762905.42 | 0.00499048 | 0.01513 | 0.01931 | 0.049721 | 0.020116 | 0.069033 | 0.089149 |
| 266 | RES_N | 441413.48 | 3762905.42 | 2.08443 | 3.1748 | 2.18086 | 2.66765 | 441413.48, 3762905.42 | 0.00514622 | 0.0152 | 0.0194 | 0.049577 | 0.020346 | 0.068978 | 0.089324 |
| 267 | RES_N | 441463.48 | 3762905.42 | 2.13249 | 3.16009 | 2.18822 | 2.65316 | 441463.48, 3762905.42 | 0.00526488 | 0.01513 | 0.01947 | 0.049308 | 0.020395 | 0.068774 | 0.089169 |
| 268 | RES_N | 441513.48 | 3762905.42 | 2.19499 | 3.22209 | 2.18641 | 2.67206 | 441513.48, 3762905.42 | 0.00541918 | 0.01543 | 0.01945 | 0.049659 | 0.020846 | 0.069109 | 0.089955 |
| 269 | RES_N | 441563.48 | 3762905.42 | 2.24502 | 3.24854 | 2.19094 | 2.69777 | 441563.48, 3762905.42 | 0.0055427 | 0.01555 | 0.01949 | 0.050137 | 0.021096 | 0.069627 | 0.090723 |
| 270 | RES_N | 441613.48 | 3762905.42 | 2.23903 | 3.35518 | 2.18992 | 2.72903 | 441613.48, 3762905.42 | 0.00552791 | 0.01606 | 0.01948 | 0.050718 | 0.021592 | 0.070199 | 0.091791 |
| 271 | RES_N | 441663.48 | 3762905.42 | 2.3486 | 3.53003 | 2.23137 | 2.73759 | 441663.48, 3762905.42 | 0.00579843 | 0.0169 | 0.01985 | 0.050877 | 0.022699 | 0.070727 | 0.093426 |
| 272 | RES_N | 441713.48 | 3762905.42 | 2.41852 | 3.70174 | 2.26178 | 2.74389 | 441713.48, 3762905.42 | 0.00597105 | 0.01772 | 0.02012 | 0.050994 | 0.023694 | 0.071115 | 0.094809 |
| 273 | RES_N | 441763.48 | 3762905.42 | 2.41099 | 3.78835 | 2.26268 | 2.77017 | 441763.48, 3762905.42 | 0.00595246 | 0.01814 | 0.02013 | 0.051483 | 0.02409 | 0.071611 | 0.095701 |
| 274 | RES_N | 441813.48 | 3762905.42 | 2.53891 | 3.86427 | 2.30951 | 2.836 | 441813.48, 3762905.42 | 0.00626828 | 0.0185 | 0.02055 | 0.052706 | 0.024769 | 0.073251 | 0.098021 |
| 275 | RES_N | 441313.48 | 3762955.42 | 1.8968 | 2.9519 | 2.02706 | 2.52783 | 441313.48, 3762955.42 | 0.00468298 | 0.01413 | 0.01803 | 0.046979 | 0.018816 | 0.065011 | 0.083827 |
| 276 | RES_N | 441363.48 | 3762955.42 | 1.92953 | 2.93961 | 2.01818 | 2.50269 | 441363.48, 3762955.42 | 0.00476379 | 0.01407 | 0.01795 | 0.046512 | 0.018838 | 0.064465 | 0.083303 |
| 277 | RES_N | 441413.48 | 3762955.42 | 1.99069 | 2.9608 | 2.02451 | 2.48125 | 441413.48, 3762955.42 | 0.00491479 | 0.01418 | 0.01801 | 0.046113 | 0.01909 | 0.064123 | 0.083213 |
| 278 | RES_N | 441463.48 | 3762955.42 | 2.04065 | 3.0102 | 2.03113 | 2.46806 | 441463.48, 3762955.42 | 0.00503813 | 0.01441 | 0.01807 | 0.045868 | 0.01945 | 0.063937 | 0.083387 |
| 279 | RES_N | 441513.48 | 3762955.42 | 2.08592 | 3.01046 | 2.02777 | 2.49423 | 441513.48, 3762955.42 | 0.0051499 | 0.01441 | 0.01804 | 0.046354 | 0.019563 | 0.064393 | 0.083956 |
| 280 | RES_N | 441563.48 | 3762955.42 | 2.13909 | 3.11394 | 2.04548 | 2.53431 | 441563.48, 3762955.42 | 0.00528117 | 0.01491 | 0.0182 | 0.047099 | 0.02019 | 0.065296 | 0.085486 |
| 281 | RES_N | 441613.48 | 3762955.42 | 2.17601 | 3.27481 | 2.05859 | 2.56035 | 441613.48, 3762955.42 | 0.00537232 | 0.01568 | 0.01831 | 0.047583 | 0.021051 | 0.065896 | 0.086947 |
| 282 | RES_N | 441663.48 | 3762955.42 | 2.26718 | 3.44524 | 2.06936 | 2.57123 | 441663.48, 3762955.42 | 0.00559741 | 0.01649 | 0.01841 | 0.047786 | 0.022092 | 0.066194 | 0.088287 |
| 283 | RES_N | 441713.48 | 3762955.42 | 2.31168 | 3.57602 | 2.08657 | 2.57676 | 441713.48, 3762955.42 | 0.00570727 | 0.01712 | 0.01856 | 0.047888 | 0.022828 | 0.06645 | 0.089278 |
| 284 | RES_N | 441763.48 | 3762955.42 | 2.32577 | 3.61752 | 2.10954 | 2.57656 | 441763.48, 3762955.42 | 0.00574206 | 0.01732 | 0.01877 | 0.047885 | 0.023062 | 0.066651 | 0.089713 |
| 285 | RES_N | 441813.48 | 3762955.42 | 2.4089 | 3.59988 | 2.13226 | 2.62729 | 441813.48, 3762955.42 | 0.0059473 | 0.01724 | 0.01897 | 0.048827 | 0.023183 | 0.067796 | 0.090978 |
| 286 | RES_S | 440408.22 | 3761498.57 | 0.86958 | 2.4054 | 2.92759 | 6.14299 | 440408.22, 3761498.57 | 0.00214689 | 0.01152 | 0.02604 | 0.114166 | 0.013663 | 0.140209 | 0.153872 |
| 287 | RES_N | 440956.5 | 3762849.59 | 1.7098 | 2.79657 | 2.40743 | 3.02869 | 440956.5, 3762849.59 | 0.0042213 | 0.01339 | 0.02142 | 0.056287 | 0.017611 | 0.077703 | 0.095314 |
| 288 | RES_S | 440559.26 | 3761306.11 | 1.00116 | 2.97277 | 2.72129 | 6.85231 | 440559.26, 3761306.11 | 0.00247175 | 0.01423 | 0.02421 | 0.127348 | 0.016705 | 0.151556 | 0.168261 |
| 289 | RES_S | 440752.05 | 3761305.37 | 1.19342 | 3.30755 | 3.25258 | 8.06016 | 440752.05, 3761305.37 | 0.00294642 | 0.01584 | 0.02893 | 0.149796 | 0.018782 | 0.17873 | 0.197512 |
| 290 | RES_S | 440857.69 | 3761312.76 | 1.32955 | 3.53459 | 3.5902 | 8.44514 | 440857.69, 3761312.76 | 0.00328251 | 0.01692 | 0.03194 | 0.15695 | 0.020205 | 0.188888 | 0.209093 |
| 291 | RES_S | 440969.23 | 3761308.33 | 1.49592 | 3.78267 | 3.79971 | 8.76272 | 440969.23, 3761308.33 | 0.00369326 | 0.01811 | 0.0338 | 0.162852 | 0.021804 | 0.196654 | 0.218458 |
| 292 | RES_S | 440936.73 | 3761237.41 | 1.43737 | 3.46187 | 3.28005 | 7.70214 | 440936.73, 3761237.41 | 0.0035487 | 0.01657 | 0.02918 | 0.143142 | 0.020123 | 0.172321 | 0.192444 |

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** AERMOD Input Produced by:
** AERMOD View Ver. 13.0.0
** Lakes Environmental Software Inc.
** Date: 5/7/2025
** File: C:\Lakes\AERMOD View\CenterPark OP LST PM2_5 Phases\CenterPark OP LST PM2_5
Phases.ADI
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**
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** AERMOD Control Pathway
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**
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   MODELOPT DFAULT CONC
   AVERTIME 24 ANNUAL
   URBANOPT 2035210
   POLLUTID PM-2.5
   FLAGPOLE 2.00
   RUNORNOT RUN
   ERRORFIL "CenterPark OP LST PM2_5 Phases.err"
CO FINISHED
**
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** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   440792.704  3762267.472      213.390
** DESCRSRC P2 Fugitive Dust
** ---------------------------------------------------------------------
** Line Source Represented by Adjacent Volume Sources
** LINE VOLUME Source ID = SLINE1
** DESCRSRC P2 Exhaust
** PREFIX
** Length of Side = 32.00
** Configuration = Adjacent
** Emission Rate = 1.0
** Vertical Dimension = 10.00
** SZINIT = 1.40
** Nodes = 36
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   LOCATION L0000004     VOLUME   440920.022 3762248.809 213.06
   LOCATION L0000005     VOLUME   440952.022 3762248.865 213.14
   LOCATION L0000006     VOLUME   440984.022 3762248.920 213.06
   LOCATION L0000007     VOLUME   441016.022 3762248.976 212.87
   LOCATION L0000008     VOLUME   441048.022 3762249.031 212.68
   LOCATION L0000009     VOLUME   441080.022 3762249.086 212.62
   LOCATION L0000010     VOLUME   441112.022 3762249.142 212.63
   LOCATION L0000011     VOLUME   441144.022 3762249.197 212.39
   LOCATION L0000012     VOLUME   441176.022 3762249.252 212.48
   LOCATION L0000013     VOLUME   441208.022 3762249.308 212.83
   LOCATION L0000014     VOLUME   441240.022 3762249.363 213.12
   LOCATION L0000015     VOLUME   441272.022 3762249.418 213.43
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** DESCRSRC P1 Exhaust
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** Configuration = Adjacent
** Emission Rate = 1.0
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** DESCRSRC P1 Fugitive Dust
** Source Parameters **
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SRCGROUP P2Exhaus L0000697 L0000698 L0000699 L0000700 L0000701 L0000702
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SRCGROUP P2Exhaus L0000709 L0000710 L0000711 L0000712 L0000713 L0000714
SRCGROUP P2Exhaus L0000715 L0000716 L0000717 L0000718 L0000719 L0000720
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SRCGROUP P2Exhaus L0000733 L0000734 L0000735 L0000736 L0000737 L0000738
SRCGROUP P2Exhaus L0000739 L0000740 L0000741 L0000742 L0000743 L0000744
SRCGROUP P2Exhaus L0000745 L0000746 L0000747 L0000748 L0000749 L0000750
SRCGROUP P2Exhaus L0000751 L0000752 L0000753 L0000754 L0000755 L0000756
SRCGROUP P2Exhaus L0000757 L0000758 L0000759 L0000760 L0000761 L0000762
SRCGROUP P2Exhaus L0000763 L0000764 L0000765 L0000766 L0000767 L0000768
SRCGROUP P2Exhaus L0000769 L0000770 L0000771 L0000772 L0000773 L0000774
SRCGROUP P2Exhaus L0000775 L0000776 L0000777 L0000778 L0000779 L0000780
SRCGROUP P2Exhaus L0000781 L0000782 L0000783 L0000784 L0000785 L0000786
SRCGROUP P2Exhaus L0000787 L0000788
SRCGROUP P2Fugiti PAREA1
SRCGROUP P1Exhaus L0000789 L0000790 L0000791 L0000792 L0000793 L0000794
SRCGROUP P1Exhaus L0000795 L0000796 L0000797 L0000798 L0000799 L0000800
SRCGROUP P1Exhaus L0000801 L0000802 L0000803 L0000804 L0000805 L0000806
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SRCGROUP P1Exhaus L0000813 L0000814 L0000815 L0000816 L0000817 L0000818
SRCGROUP P1Exhaus L0000819 L0000820 L0000821 L0000822 L0000823 L0000824
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SRCGROUP P1Exhaus L0000843 L0000844 L0000845 L0000846 L0000847 L0000848
SRCGROUP P1Exhaus L0000849 L0000850 L0000851 L0000852 L0000853 L0000854
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   SRCGROUP P1Exhaus L0000873 L0000874 L0000875 L0000876 L0000877 L0000878
   SRCGROUP P1Exhaus L0000879 L0000880 L0000881 L0000882 L0000883 L0000884
   SRCGROUP P1Exhaus L0000885 L0000886 L0000887 L0000888 L0000889 L0000890
   SRCGROUP P1Exhaus L0000891 L0000892 L0000893 L0000894 L0000895 L0000896
   SRCGROUP P1Exhaus L0000897 L0000898 L0000899 L0000900 L0000901 L0000902
   SRCGROUP P1Exhaus L0000903 L0000904 L0000905 L0000906 L0000907 L0000908
   SRCGROUP P1Exhaus L0000909 L0000910 L0000911 L0000912 L0000913 L0000914
   SRCGROUP P1Exhaus L0000915 L0000916 L0000917 L0000918 L0000919 L0000920
   SRCGROUP P1Exhaus L0000921 L0000922 L0000923 L0000924 L0000925 L0000926
   SRCGROUP P1Exhaus L0000927 L0000928 L0000929 L0000930 L0000931 L0000932
   SRCGROUP P1Exhaus L0000933 L0000934 L0000935 L0000936 L0000937 L0000938
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   SRCGROUP P1Exhaus L0000945 L0000946 L0000947 L0000948 L0000949 L0000950
   SRCGROUP P1Exhaus L0000951 L0000952 L0000953 L0000954 L0000955 L0000956
   SRCGROUP P1Exhaus L0000957 L0000958 L0000959 L0000960 L0000961 L0000962
   SRCGROUP P1Exhaus L0000963 L0000964 L0000965 L0000966 L0000967 L0000968
   SRCGROUP P1Exhaus L0000969 L0000970 L0000971 L0000972 L0000973 L0000974
   SRCGROUP P1Exhaus L0000975 L0000976 L0000977 L0000978 L0000979 L0000980
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   SRCGROUP P1Exhaus L0000999 L0001000 L0001001 L0001002 L0001003 L0001004
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   SRCGROUP P1Exhaus L0001011 L0001012 L0001013 L0001014 L0001015 L0001016
   SRCGROUP P1Exhaus L0001017 L0001018 L0001019 L0001020 L0001021 L0001022
   SRCGROUP P1Exhaus L0001023 L0001024 L0001025 L0001026 L0001027 L0001028
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   SRCGROUP P1Exhaus L0001035 L0001036 L0001037 L0001038 L0001039 L0001040
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   SRCGROUP P1Exhaus L0001047 L0001048 L0001049 L0001050 L0001051 L0001052
   SRCGROUP P1Exhaus L0001053 L0001054 L0001055 L0001056 L0001057 L0001058
   SRCGROUP P1Exhaus L0001059 L0001060 L0001061 L0001062 L0001063 L0001064
   SRCGROUP P1Exhaus L0001065 L0001066 L0001067 L0001068 L0001069 L0001070
   SRCGROUP P1Exhaus L0001071 L0001072 L0001073 L0001074 L0001075
   SRCGROUP P1Fugiti PAREA2
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED "CenterPark OP LST PM2_5 Phases.rou"
RE FINISHED
**
****************************************
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** AERMOD Meteorology Pathway
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**
**
ME STARTING
   SURFFILE KCNO_v9.SFC
   PROFFILE KCNO_v9.PFL
   SURFDATA 3179 2012
   UAIRDATA 3190 2012
   PROFBASE 198.0 METERS
ME FINISHED
**
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** AERMOD Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE 1ST 8TH
   RECTABLE 24 1ST 8TH
** Auto-Generated Plotfiles
   PLOTFILE 24 ALL 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1GALL.PLT" 31
   PLOTFILE 24 P2Exhaus 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1G001.PLT" 32
   PLOTFILE 24 P2Fugiti 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1G002.PLT" 33
   PLOTFILE 24 P1Exhaus 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1G003.PLT" 34
   PLOTFILE 24 P1Fugiti 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1G004.PLT" 35
   PLOTFILE 24 ALL 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8GALL.PLT" 36
   PLOTFILE 24 P2Exhaus 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8G001.PLT" 37
   PLOTFILE 24 P2Fugiti 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8G002.PLT" 38
   PLOTFILE 24 P1Exhaus 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8G003.PLT" 39
   PLOTFILE 24 P1Fugiti 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8G004.PLT" 40
   PLOTFILE ANNUAL ALL "CENTERPARK OP LST PM2_5 PHASES.AD\AN00GALL.PLT" 41
   PLOTFILE ANNUAL P2Exhaus "CENTERPARK OP LST PM2_5 PHASES.AD\AN00G001.PLT" 42
   PLOTFILE ANNUAL P2Fugiti "CENTERPARK OP LST PM2_5 PHASES.AD\AN00G002.PLT" 43
   PLOTFILE ANNUAL P1Exhaus "CENTERPARK OP LST PM2_5 PHASES.AD\AN00G003.PLT" 44
   PLOTFILE ANNUAL P1Fugiti "CENTERPARK OP LST PM2_5 PHASES.AD\AN00G004.PLT" 45
   SUMMFILE "CenterPark OP LST PM2_5 Phases.sum"
OU FINISHED
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** Project Parameters
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** PROJCTN  CoordinateSystemUTM
** DESCPTN  UTM: Universal Transverse Mercator
** DATUM    World Geodetic System 1984
** DTMRGN   Global Definition
** UNITS    m
** ZONE     11
** ZONEINX  0
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** AERMOD Input Produced by:
** AERMOD View Ver. 13.0.0
** Lakes Environmental Software Inc.
** Date: 5/7/2025
** File: C:\Lakes\AERMOD View\CenterPark OP LST PM2_5 Phases\CenterPark OP LST PM2_5
Phases.ADI
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**
**
****************************************
** AERMOD Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE Center Park Operational LST - PM2.5
   MODELOPT DFAULT CONC
   AVERTIME 24 ANNUAL
   URBANOPT 2035210
   POLLUTID PM-2.5
   FLAGPOLE 2.00
   RUNORNOT RUN
   ERRORFIL "CenterPark OP LST PM2_5 Phases.err"
CO FINISHED
**
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** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   440792.704  3762267.472      213.390
** DESCRSRC P2 Fugitive Dust
** ---------------------------------------------------------------------
** Line Source Represented by Adjacent Volume Sources
** LINE VOLUME Source ID = SLINE1
** DESCRSRC P2 Exhaust
** PREFIX
** Length of Side = 32.00
** Configuration = Adjacent
** Emission Rate = 1.0
** Vertical Dimension = 10.00
** SZINIT = 1.40
** Nodes = 36
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** 440809.712, 3762215.816, 212.74, 5.00, 14.88
** 440808.022, 3762184.862, 212.52, 5.00, 14.88
** 442172.785, 3762188.761, 213.15, 5.00, 14.88
** 442174.734, 3762154.628, 212.94, 5.00, 14.88
** 440802.099, 3762152.104, 212.23, 5.00, 14.88
** 440801.999, 3762117.800, 212.15, 5.00, 14.88
** 442168.071, 3762124.868, 212.68, 5.00, 14.88
** 442166.892, 3762093.966, 212.47, 5.00, 14.88
** 440803.311, 3762085.348, 211.98, 5.00, 14.88
** 440805.509, 3762053.176, 211.18, 5.00, 14.88
** 442172.377, 3762062.309, 212.25, 5.00, 14.88
** 442172.909, 3762031.347, 211.97, 5.00, 14.88
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** 440807.355, 3761994.960, 210.21, 5.00, 14.88
** 442174.682, 3761994.636, 211.32, 5.00, 14.88
** 442179.006, 3761957.142, 210.96, 5.00, 14.88
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** 442173.453, 3761889.923, 210.46, 5.00, 14.88
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** 442177.759, 3761824.413, 210.08, 5.00, 14.88
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** 442178.010, 3761764.247, 209.46, 5.00, 14.88
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** 442176.320, 3761697.054, 209.08, 5.00, 14.88
** 440803.508, 3761702.331, 207.95, 5.00, 14.88
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   LOCATION L0000002     VOLUME   440856.022 3762248.699 213.05
   LOCATION L0000003     VOLUME   440888.022 3762248.754 213.14
   LOCATION L0000004     VOLUME   440920.022 3762248.809 213.06
   LOCATION L0000005     VOLUME   440952.022 3762248.865 213.14
   LOCATION L0000006     VOLUME   440984.022 3762248.920 213.06
   LOCATION L0000007     VOLUME   441016.022 3762248.976 212.87
   LOCATION L0000008     VOLUME   441048.022 3762249.031 212.68
   LOCATION L0000009     VOLUME   441080.022 3762249.086 212.62
   LOCATION L0000010     VOLUME   441112.022 3762249.142 212.63
   LOCATION L0000011     VOLUME   441144.022 3762249.197 212.39
   LOCATION L0000012     VOLUME   441176.022 3762249.252 212.48
   LOCATION L0000013     VOLUME   441208.022 3762249.308 212.83
   LOCATION L0000014     VOLUME   441240.022 3762249.363 213.12
   LOCATION L0000015     VOLUME   441272.022 3762249.418 213.43
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| LOCATION | L0000016 | VOLUME | 441304.022 | 3762249.474 | 213.54 |
| LOCATION | L0000017 | VOLUME | 441336.021 | 3762249.529 | 213.39 |
| LOCATION | L0000018 | VOLUME | 441368.021 | 3762249.585 | 213.23 |
| LOCATION | L0000019 | VOLUME | 441400.021 | 3762249.640 | 213.17 |
| LOCATION | L0000020 | VOLUME | 441432.021 | 3762249.695 | 213.09 |
| LOCATION | L0000021 | VOLUME | 441464.021 | 3762249.751 | 213.03 |
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| LOCATION | L0000023 | VOLUME | 441528.021 | 3762249.861 | 212.86 |
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| LOCATION | L0000025 | VOLUME | 441592.021 | 3762249.972 | 212.96 |
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| LOCATION | L0000032 | VOLUME | 441816.021 | 3762250.360 | 213.38 |
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| LOCATION | L0000034 | VOLUME | 441880.021 | 3762250.470 | 213.70 |
| LOCATION | L0000035 | VOLUME | 441912.021 | 3762250.526 | 213.83 |
| LOCATION | L0000036 | VOLUME | 441944.021 | 3762250.581 | 214.03 |
| LOCATION | L0000037 | VOLUME | 441976.021 | 3762250.636 | 213.94 |
| LOCATION | L0000038 | VOLUME | 442008.020 | 3762250.692 | 214.11 |
| LOCATION | L0000039 | VOLUME | 442040.020 | 3762250.747 | 214.47 |
| LOCATION | L0000040 | VOLUME | 442072.020 | 3762250.803 | 214.53 |
| LOCATION | L0000041 | VOLUME | 442104.020 | 3762250.858 | 214.56 |
| LOCATION | L0000042 | VOLUME | 442136.020 | 3762250.913 | 214.38 |
| LOCATION | L0000043 | VOLUME | 442168.020 | 3762250.969 | 214.41 |
| LOCATION | L0000044 | VOLUME | 442173.302 | 3762221.520 | 213.63 |
| LOCATION | L0000045 | VOLUME | 442143.578 | 3762219.376 | 213.37 |
| LOCATION | L0000046 | VOLUME | 442111.578 | 3762219.290 | 213.78 |
| LOCATION | L0000047 | VOLUME | 442079.578 | 3762219.205 | 213.82 |
| LOCATION | L0000048 | VOLUME | 442047.578 | 3762219.120 | 213.83 |
| LOCATION | L0000049 | VOLUME | 442015.579 | 3762219.034 | 213.73 |
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| LOCATION | L0000051 | VOLUME | 441951.579 | 3762218.863 | 213.85 |
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| LOCATION | L0000053 | VOLUME | 441887.579 | 3762218.693 | 213.37 |
| LOCATION | L0000054 | VOLUME | 441855.579 | 3762218.607 | 213.17 |
| LOCATION | L0000055 | VOLUME | 441823.579 | 3762218.522 | 212.97 |
| LOCATION | L0000056 | VOLUME | 441791.579 | 3762218.436 | 212.84 |
| LOCATION | L0000057 | VOLUME | 441759.579 | 3762218.351 | 212.73 |
| LOCATION | L0000058 | VOLUME | 441727.580 | 3762218.266 | 212.63 |
| LOCATION | L0000059 | VOLUME | 441695.580 | 3762218.180 | 212.54 |
| LOCATION | L0000060 | VOLUME | 441663.580 | 3762218.095 | 212.58 |
| LOCATION | L0000061 | VOLUME | 441631.580 | 3762218.010 | 212.68 |
| LOCATION | L0000062 | VOLUME | 441599.580 | 3762217.924 | 212.68 |
| LOCATION | L0000063 | VOLUME | 441567.580 | 3762217.839 | 212.64 |
| LOCATION | L0000064 | VOLUME | 441535.580 | 3762217.753 | 212.64 |
| LOCATION | L0000065 | VOLUME | 441503.580 | 3762217.668 | 212.66 |
| LOCATION | L0000066 | VOLUME | 441471.580 | 3762217.583 | 212.70 |

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| LOCATION | L0000067 | VOLUME | 441439.581 | 3762217.497 | 212.74 |
| LOCATION | L0000068 | VOLUME | 441407.581 | 3762217.412 | 212.81 |
| LOCATION | L0000069 | VOLUME | 441375.581 | 3762217.326 | 212.92 |
| LOCATION | L0000070 | VOLUME | 441343.581 | 3762217.241 | 213.12 |
| LOCATION | L0000071 | VOLUME | 441311.581 | 3762217.156 | 213.38 |
| LOCATION | L0000072 | VOLUME | 441279.581 | 3762217.070 | 213.21 |
| LOCATION | L0000073 | VOLUME | 441247.581 | 3762216.985 | 212.83 |
| LOCATION | L0000074 | VOLUME | 441215.581 | 3762216.899 | 212.61 |
| LOCATION | L0000075 | VOLUME | 441183.581 | 3762216.814 | 212.29 |
| LOCATION | L0000076 | VOLUME | 441151.582 | 3762216.729 | 212.26 |
| LOCATION | L0000077 | VOLUME | 441119.582 | 3762216.643 | 212.36 |
| LOCATION | L0000078 | VOLUME | 441087.582 | 3762216.558 | 211.87 |
| LOCATION | L0000079 | VOLUME | 441055.582 | 3762216.472 | 211.27 |
| LOCATION | L0000080 | VOLUME | 441023.582 | 3762216.387 | 211.58 |
| LOCATION | L0000081 | VOLUME | 440991.582 | 3762216.302 | 212.47 |
| LOCATION | L0000082 | VOLUME | 440959.582 | 3762216.216 | 212.74 |
| LOCATION | L0000083 | VOLUME | 440927.582 | 3762216.131 | 212.69 |
| LOCATION | L0000084 | VOLUME | 440895.583 | 3762216.045 | 212.68 |
| LOCATION | L0000085 | VOLUME | 440863.583 | 3762215.960 | 212.73 |
| LOCATION | L0000086 | VOLUME | 440831.583 | 3762215.875 | 212.35 |
| LOCATION | L0000087 | VOLUME | 440809.160 | 3762205.702 | 212.65 |
| LOCATION | L0000088 | VOLUME | 440819.152 | 3762184.894 | 212.27 |
| LOCATION | L0000089 | VOLUME | 440851.152 | 3762184.986 | 212.26 |
| LOCATION | L0000090 | VOLUME | 440883.152 | 3762185.077 | 212.46 |
| LOCATION | L0000091 | VOLUME | 440915.151 | 3762185.169 | 212.30 |
| LOCATION | L0000092 | VOLUME | 440947.151 | 3762185.260 | 212.41 |
| LOCATION | L0000093 | VOLUME | 440979.151 | 3762185.351 | 212.34 |
| LOCATION | L0000094 | VOLUME | 441011.151 | 3762185.443 | 211.15 |
| LOCATION | L0000095 | VOLUME | 441043.151 | 3762185.534 | 210.21 |
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| LOCATION | L0000104 | VOLUME | 441331.150 | 3762186.357 | 212.39 |
| LOCATION | L0000105 | VOLUME | 441363.150 | 3762186.448 | 212.12 |
| LOCATION | L0000106 | VOLUME | 441395.149 | 3762186.540 | 212.03 |
| LOCATION | L0000107 | VOLUME | 441427.149 | 3762186.631 | 212.01 |
| LOCATION | L0000108 | VOLUME | 441459.149 | 3762186.723 | 211.99 |
| LOCATION | L0000109 | VOLUME | 441491.149 | 3762186.814 | 211.96 |
| LOCATION | L0000110 | VOLUME | 441523.149 | 3762186.906 | 211.97 |
| LOCATION | L0000111 | VOLUME | 441555.149 | 3762186.997 | 212.00 |
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| LOCATION | L0000113 | VOLUME | 441619.149 | 3762187.180 | 212.27 |
| LOCATION | L0000114 | VOLUME | 441651.148 | 3762187.271 | 212.15 |
| LOCATION | L0000115 | VOLUME | 441683.148 | 3762187.363 | 212.23 |
| LOCATION | L0000116 | VOLUME | 441715.148 | 3762187.454 | 212.28 |
| LOCATION | L0000117 | VOLUME | 441747.148 | 3762187.545 | 212.51 |

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|---|---|---|---|---|---|
| LOCATION | L0000118 | VOLUME | 441779.148 | 3762187.637 | 212.61 |
| LOCATION | L0000119 | VOLUME | 441811.148 | 3762187.728 | 212.65 |
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| LOCATION | L0000122 | VOLUME | 441907.147 | 3762188.003 | 213.11 |
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| LOCATION | L0000126 | VOLUME | 442035.147 | 3762188.368 | 213.50 |
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** End of LINE VOLUME Source ID = SLINE1
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** LINE VOLUME Source ID = SLINE2
** DESCRSRC P1 Exhaust
** PREFIX
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** Configuration = Adjacent
** Emission Rate = 1.0
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** DESCRSRC P1 Fugitive Dust
** Source Parameters **
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   AREAVERT PAREA1       442193.996 3761681.734 440790.347 3761684.091
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   SRCGROUP P2Exhaus L0000199 L0000200 L0000201 L0000202 L0000203 L0000204
   SRCGROUP P2Exhaus L0000205 L0000206 L0000207 L0000208 L0000209 L0000210
   SRCGROUP P2Exhaus L0000211 L0000212 L0000213 L0000214 L0000215 L0000216
   SRCGROUP P2Exhaus L0000217 L0000218 L0000219 L0000220 L0000221 L0000222
   SRCGROUP P2Exhaus L0000223 L0000224 L0000225 L0000226 L0000227 L0000228
   SRCGROUP P2Exhaus L0000229 L0000230 L0000231 L0000232 L0000233 L0000234
   SRCGROUP P2Exhaus L0000235 L0000236 L0000237 L0000238 L0000239 L0000240
   SRCGROUP P2Exhaus L0000241 L0000242 L0000243 L0000244 L0000245 L0000246
   SRCGROUP P2Exhaus L0000247 L0000248 L0000249 L0000250 L0000251 L0000252
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SRCGROUP P2Exhaus L0000253 L0000254 L0000255 L0000256 L0000257 L0000258
SRCGROUP P2Exhaus L0000259 L0000260 L0000261 L0000262 L0000263 L0000264
SRCGROUP P2Exhaus L0000265 L0000266 L0000267 L0000268 L0000269 L0000270
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SRCGROUP P2Exhaus L0000529 L0000530 L0000531 L0000532 L0000533 L0000534
SRCGROUP P2Exhaus L0000535 L0000536 L0000537 L0000538 L0000539 L0000540
SRCGROUP P2Exhaus L0000541 L0000542 L0000543 L0000544 L0000545 L0000546
SRCGROUP P2Exhaus L0000547 L0000548 L0000549 L0000550 L0000551 L0000552
SRCGROUP P2Exhaus L0000553 L0000554 L0000555 L0000556 L0000557 L0000558
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SRCGROUP P2Exhaus L0000559 L0000560 L0000561 L0000562 L0000563 L0000564
SRCGROUP P2Exhaus L0000565 L0000566 L0000567 L0000568 L0000569 L0000570
SRCGROUP P2Exhaus L0000571 L0000572 L0000573 L0000574 L0000575 L0000576
SRCGROUP P2Exhaus L0000577 L0000578 L0000579 L0000580 L0000581 L0000582
SRCGROUP P2Exhaus L0000583 L0000584 L0000585 L0000586 L0000587 L0000588
SRCGROUP P2Exhaus L0000589 L0000590 L0000591 L0000592 L0000593 L0000594
SRCGROUP P2Exhaus L0000595 L0000596 L0000597 L0000598 L0000599 L0000600
SRCGROUP P2Exhaus L0000601 L0000602 L0000603 L0000604 L0000605 L0000606
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SRCGROUP P2Exhaus L0000619 L0000620 L0000621 L0000622 L0000623 L0000624
SRCGROUP P2Exhaus L0000625 L0000626 L0000627 L0000628 L0000629 L0000630
SRCGROUP P2Exhaus L0000631 L0000632 L0000633 L0000634 L0000635 L0000636
SRCGROUP P2Exhaus L0000637 L0000638 L0000639 L0000640 L0000641 L0000642
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SRCGROUP P2Fugiti PAREA1
SRCGROUP P1Exhaus L0000789 L0000790 L0000791 L0000792 L0000793 L0000794
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SRCGROUP P1Exhaus L0000849 L0000850 L0000851 L0000852 L0000853 L0000854
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   SRCGROUP P1Exhaus L0000969 L0000970 L0000971 L0000972 L0000973 L0000974
   SRCGROUP P1Exhaus L0000975 L0000976 L0000977 L0000978 L0000979 L0000980
   SRCGROUP P1Exhaus L0000981 L0000982 L0000983 L0000984 L0000985 L0000986
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   SRCGROUP P1Exhaus L0000993 L0000994 L0000995 L0000996 L0000997 L0000998
   SRCGROUP P1Exhaus L0000999 L0001000 L0001001 L0001002 L0001003 L0001004
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   SRCGROUP P1Exhaus L0001011 L0001012 L0001013 L0001014 L0001015 L0001016
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   SRCGROUP P1Exhaus L0001047 L0001048 L0001049 L0001050 L0001051 L0001052
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   SRCGROUP P1Exhaus L0001059 L0001060 L0001061 L0001062 L0001063 L0001064
   SRCGROUP P1Exhaus L0001065 L0001066 L0001067 L0001068 L0001069 L0001070
   SRCGROUP P1Exhaus L0001071 L0001072 L0001073 L0001074 L0001075
   SRCGROUP P1Fugiti PAREA2
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED "CenterPark OP LST PM2_5 Phases.rou"
RE FINISHED
**
****************************************
```

```
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE KCNO_v9.SFC
   PROFFILE KCNO_v9.PFL
   SURFDATA 3179 2012
   UAIRDATA 3190 2012
   PROFBASE 198.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE 1ST 8TH
   RECTABLE 24 1ST 8TH
** Auto-Generated Plotfiles
   PLOTFILE 24 ALL 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1GALL.PLT" 31
   PLOTFILE 24 P2Exhaus 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1G001.PLT" 32
   PLOTFILE 24 P2Fugiti 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1G002.PLT" 33
   PLOTFILE 24 P1Exhaus 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1G003.PLT" 34
   PLOTFILE 24 P1Fugiti 1ST "CENTERPARK OP LST PM2_5 PHASES.AD\24H1G004.PLT" 35
   PLOTFILE 24 ALL 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8GALL.PLT" 36
   PLOTFILE 24 P2Exhaus 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8G001.PLT" 37
   PLOTFILE 24 P2Fugiti 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8G002.PLT" 38
   PLOTFILE 24 P1Exhaus 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8G003.PLT" 39
   PLOTFILE 24 P1Fugiti 8TH "CENTERPARK OP LST PM2_5 PHASES.AD\24H8G004.PLT" 40
   PLOTFILE ANNUAL ALL "CENTERPARK OP LST PM2_5 PHASES.AD\AN00GALL.PLT" 41
   PLOTFILE ANNUAL P2Exhaus "CENTERPARK OP LST PM2_5 PHASES.AD\AN00G001.PLT" 42
   PLOTFILE ANNUAL P2Fugiti "CENTERPARK OP LST PM2_5 PHASES.AD\AN00G002.PLT" 43
   PLOTFILE ANNUAL P1Exhaus "CENTERPARK OP LST PM2_5 PHASES.AD\AN00G003.PLT" 44
   PLOTFILE ANNUAL P1Fugiti "CENTERPARK OP LST PM2_5 PHASES.AD\AN00G004.PLT" 45
   SUMMFILE "CenterPark OP LST PM2_5 Phases.sum"
OU FINISHED


  *** Message Summary For AERMOD Model Setup ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            2 Warning Message(s)
 A Total of            0 Informational Message(s)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***
```

```
   ********   WARNING MESSAGES   ********
 ME W186    2509       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used
     0.50
 ME W187    2509       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET


 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************

 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                          ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE   1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                                              ***     MODEL SETUP OPTIONS SUMMARY
 ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - -

 ** Model Options Selected:
      * Model Uses Regulatory DEFAULT Options
      * Model Is Setup For Calculation of Average CONCentration Values.
      * NO GAS DEPOSITION Data Provided.
      * NO PARTICLE DEPOSITION Data Provided.
      * Model Uses NO DRY DEPLETION. DDPLETE  =  F
      * Model Uses NO WET DEPLETION. WETDPLT  =  F
      * Stack-tip Downwash.
      * Model Accounts for ELEVated Terrain Effects.
      * Use Calms Processing Routine.
      * Use Missing Data Processing Routine.
      * No Exponential Decay.
      * Model Uses URBAN Dispersion Algorithm for the SBL for  1077 Source(s),
        for Total of    1 Urban Area(s):
   Urban Population =   2035210.0 ;  Urban Roughness Length =  1.000 m
      * Urban Roughness Length of 1.0 Meter Used.
      * ADJ_U*   - Use ADJ_U* option for SBL in AERMET
      * CCVR_Sub - Meteorological data includes CCVR substitutions
      * TEMP_Sub - Meteorological data includes TEMP substitutions
      * Model Accepts FLAGPOLE Receptor . Heights.
      * The User Specified a Pollutant Type of: PM-2.5

 **Note that special processing requirements apply for the 24-hour PM2.5 NAAQS -
check available guidance.
   Model will process user-specified ranks of high 24-hour values averaged across
the number of years modeled, and
```

the multi-year average of individual ANNUAL values, averaged across the number of years modeled.

```
 **Model Calculates  1 Short Term Average(s) of:  24-HR
     and Calculates ANNUAL Averages

 **This Run Includes:   1077 Source(s);       5 Source Group(s); and     292
Receptor(s)

                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:   1075 VOLUME source(s)
                 and:      2 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 RLINE/RLINEXT source(s)
                 and:      0 OPENPIT source(s)
                 and:      0 BUOYANT LINE source(s) with a total of     0 line(s)
                 and:      0 SWPOINT source(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  16216

 **Output Options Selected:
          Model Outputs Tables of ANNUAL Averages by Receptor
          Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE
Keyword)
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE
Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE
Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and
Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =   198.00 ;  Decay
Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC                                ;
Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      4.5 MB of RAM.

 **Input Runstream File:          aermod.inp

 **Output Print File:             aermod.out
```

```
 **Detailed Error/Message File:   CenterPark OP LST PM2_5 Phases.err

 **File for Summary of Results:   CenterPark OP LST PM2_5 Phases.sum

 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                          ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE   2
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                   *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000001         0   0.12690E-02  440824.0 3762248.6   212.8     5.00    14.88
1.40     YES                    NO
 L0000002         0   0.12690E-02  440856.0 3762248.7   213.1     5.00    14.88
1.40     YES                    NO
 L0000003         0   0.12690E-02  440888.0 3762248.8   213.1     5.00    14.88
1.40     YES                    NO
 L0000004         0   0.12690E-02  440920.0 3762248.8   213.1     5.00    14.88
1.40     YES                    NO
 L0000005         0   0.12690E-02  440952.0 3762248.9   213.1     5.00    14.88
1.40     YES                    NO
 L0000006         0   0.12690E-02  440984.0 3762248.9   213.1     5.00    14.88
1.40     YES                    NO
 L0000007         0   0.12690E-02  441016.0 3762249.0   212.9     5.00    14.88
1.40     YES                    NO
 L0000008         0   0.12690E-02  441048.0 3762249.0   212.7     5.00    14.88
1.40     YES                    NO
 L0000009         0   0.12690E-02  441080.0 3762249.1   212.6     5.00    14.88
1.40     YES                    NO
 L0000010         0   0.12690E-02  441112.0 3762249.1   212.6     5.00    14.88
1.40     YES                    NO
 L0000011         0   0.12690E-02  441144.0 3762249.2   212.4     5.00    14.88
1.40     YES                    NO
 L0000012         0   0.12690E-02  441176.0 3762249.3   212.5     5.00    14.88
1.40     YES                    NO
 L0000013         0   0.12690E-02  441208.0 3762249.3   212.8     5.00    14.88
1.40     YES                    NO
 L0000014         0   0.12690E-02  441240.0 3762249.4   213.1     5.00    14.88
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1.40     YES                    NO
 L0000015         0   0.12690E-02  441272.0 3762249.4   213.4     5.00    14.88
1.40     YES                    NO
 L0000016         0   0.12690E-02  441304.0 3762249.5   213.5     5.00    14.88
1.40     YES                    NO
 L0000017         0   0.12690E-02  441336.0 3762249.5   213.4     5.00    14.88
1.40     YES                    NO
 L0000018         0   0.12690E-02  441368.0 3762249.6   213.2     5.00    14.88
1.40     YES                    NO
 L0000019         0   0.12690E-02  441400.0 3762249.6   213.2     5.00    14.88
1.40     YES                    NO
 L0000020         0   0.12690E-02  441432.0 3762249.7   213.1     5.00    14.88
1.40     YES                    NO
 L0000021         0   0.12690E-02  441464.0 3762249.8   213.0     5.00    14.88
1.40     YES                    NO
 L0000022         0   0.12690E-02  441496.0 3762249.8   213.0     5.00    14.88
1.40     YES                    NO
 L0000023         0   0.12690E-02  441528.0 3762249.9   212.9     5.00    14.88
1.40     YES                    NO
 L0000024         0   0.12690E-02  441560.0 3762249.9   212.8     5.00    14.88
1.40     YES                    NO
 L0000025         0   0.12690E-02  441592.0 3762250.0   213.0     5.00    14.88
1.40     YES                    NO
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1.40     YES                    NO
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1.40     YES                    NO
 L0000028         0   0.12690E-02  441688.0 3762250.1   212.9     5.00    14.88
1.40     YES                    NO
 L0000029         0   0.12690E-02  441720.0 3762250.2   212.9     5.00    14.88
1.40     YES                    NO
 L0000030         0   0.12690E-02  441752.0 3762250.2   212.9     5.00    14.88
1.40     YES                    NO
 L0000031         0   0.12690E-02  441784.0 3762250.3   213.1     5.00    14.88
1.40     YES                    NO
 L0000032         0   0.12690E-02  441816.0 3762250.4   213.4     5.00    14.88
1.40     YES                    NO
 L0000033         0   0.12690E-02  441848.0 3762250.4   213.6     5.00    14.88
1.40     YES                    NO
 L0000034         0   0.12690E-02  441880.0 3762250.5   213.7     5.00    14.88
1.40     YES                    NO
 L0000035         0   0.12690E-02  441912.0 3762250.5   213.8     5.00    14.88
1.40     YES                    NO
 L0000036         0   0.12690E-02  441944.0 3762250.6   214.0     5.00    14.88
1.40     YES                    NO
 L0000037         0   0.12690E-02  441976.0 3762250.6   213.9     5.00    14.88
1.40     YES                    NO
 L0000038         0   0.12690E-02  442008.0 3762250.7   214.1     5.00    14.88
1.40     YES                    NO
 L0000039         0   0.12690E-02  442040.0 3762250.7   214.5     5.00    14.88
1.40     YES                    NO
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 L0000040         0   0.12690E-02  442072.0 3762250.8   214.5     5.00    14.88
1.40     YES                     NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                          ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                   PAGE   3
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                   *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000041         0   0.12690E-02  442104.0 3762250.9   214.6     5.00    14.88
1.40     YES                     NO
 L0000042         0   0.12690E-02  442136.0 3762250.9   214.4     5.00    14.88
1.40     YES                     NO
 L0000043         0   0.12690E-02  442168.0 3762251.0   214.4     5.00    14.88
1.40     YES                     NO
 L0000044         0   0.12690E-02  442173.3 3762221.5   213.6     5.00    14.88
1.40     YES                     NO
 L0000045         0   0.12690E-02  442143.6 3762219.4   213.4     5.00    14.88
1.40     YES                     NO
 L0000046         0   0.12690E-02  442111.6 3762219.3   213.8     5.00    14.88
1.40     YES                     NO
 L0000047         0   0.12690E-02  442079.6 3762219.2   213.8     5.00    14.88
1.40     YES                     NO
 L0000048         0   0.12690E-02  442047.6 3762219.1   213.8     5.00    14.88
1.40     YES                     NO
 L0000049         0   0.12690E-02  442015.6 3762219.0   213.7     5.00    14.88
1.40     YES                     NO
 L0000050         0   0.12690E-02  441983.6 3762218.9   213.7     5.00    14.88
1.40     YES                     NO
 L0000051         0   0.12690E-02  441951.6 3762218.9   213.9     5.00    14.88
1.40     YES                     NO
 L0000052         0   0.12690E-02  441919.6 3762218.8   213.6     5.00    14.88
1.40     YES                     NO
 L0000053         0   0.12690E-02  441887.6 3762218.7   213.4     5.00    14.88
1.40     YES                     NO
 L0000054         0   0.12690E-02  441855.6 3762218.6   213.2     5.00    14.88
1.40     YES                     NO
 L0000055         0   0.12690E-02  441823.6 3762218.5   213.0     5.00    14.88
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1.40     YES                    NO
 L0000056         0   0.12690E-02  441791.6 3762218.4   212.8     5.00    14.88
1.40     YES                    NO
 L0000057         0   0.12690E-02  441759.6 3762218.4   212.7     5.00    14.88
1.40     YES                    NO
 L0000058         0   0.12690E-02  441727.6 3762218.3   212.6     5.00    14.88
1.40     YES                    NO
 L0000059         0   0.12690E-02  441695.6 3762218.2   212.5     5.00    14.88
1.40     YES                    NO
 L0000060         0   0.12690E-02  441663.6 3762218.1   212.6     5.00    14.88
1.40     YES                    NO
 L0000061         0   0.12690E-02  441631.6 3762218.0   212.7     5.00    14.88
1.40     YES                    NO
 L0000062         0   0.12690E-02  441599.6 3762217.9   212.7     5.00    14.88
1.40     YES                    NO
 L0000063         0   0.12690E-02  441567.6 3762217.8   212.6     5.00    14.88
1.40     YES                    NO
 L0000064         0   0.12690E-02  441535.6 3762217.8   212.6     5.00    14.88
1.40     YES                    NO
 L0000065         0   0.12690E-02  441503.6 3762217.7   212.7     5.00    14.88
1.40     YES                    NO
 L0000066         0   0.12690E-02  441471.6 3762217.6   212.7     5.00    14.88
1.40     YES                    NO
 L0000067         0   0.12690E-02  441439.6 3762217.5   212.7     5.00    14.88
1.40     YES                    NO
 L0000068         0   0.12690E-02  441407.6 3762217.4   212.8     5.00    14.88
1.40     YES                    NO
 L0000069         0   0.12690E-02  441375.6 3762217.3   212.9     5.00    14.88
1.40     YES                    NO
 L0000070         0   0.12690E-02  441343.6 3762217.2   213.1     5.00    14.88
1.40     YES                    NO
 L0000071         0   0.12690E-02  441311.6 3762217.2   213.4     5.00    14.88
1.40     YES                    NO
 L0000072         0   0.12690E-02  441279.6 3762217.1   213.2     5.00    14.88
1.40     YES                    NO
 L0000073         0   0.12690E-02  441247.6 3762217.0   212.8     5.00    14.88
1.40     YES                    NO
 L0000074         0   0.12690E-02  441215.6 3762216.9   212.6     5.00    14.88
1.40     YES                    NO
 L0000075         0   0.12690E-02  441183.6 3762216.8   212.3     5.00    14.88
1.40     YES                    NO
 L0000076         0   0.12690E-02  441151.6 3762216.7   212.3     5.00    14.88
1.40     YES                    NO
 L0000077         0   0.12690E-02  441119.6 3762216.6   212.4     5.00    14.88
1.40     YES                    NO
 L0000078         0   0.12690E-02  441087.6 3762216.6   211.9     5.00    14.88
1.40     YES                    NO
 L0000079         0   0.12690E-02  441055.6 3762216.5   211.3     5.00    14.88
1.40     YES                    NO
 L0000080         0   0.12690E-02  441023.6 3762216.4   211.6     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE SCALAR VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0000081 | 0 | 0.12690E-02 | 440991.6 | 3762216.3 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000082 | 0 | 0.12690E-02 | 440959.6 | 3762216.2 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000083 | 0 | 0.12690E-02 | 440927.6 | 3762216.1 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000084 | 0 | 0.12690E-02 | 440895.6 | 3762216.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000085 | 0 | 0.12690E-02 | 440863.6 | 3762216.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000086 | 0 | 0.12690E-02 | 440831.6 | 3762215.9 | 212.4 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000087 | 0 | 0.12690E-02 | 440809.2 | 3762205.7 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000088 | 0 | 0.12690E-02 | 440819.2 | 3762184.9 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000089 | 0 | 0.12690E-02 | 440851.2 | 3762185.0 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000090 | 0 | 0.12690E-02 | 440883.2 | 3762185.1 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000091 | 0 | 0.12690E-02 | 440915.2 | 3762185.2 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000092 | 0 | 0.12690E-02 | 440947.2 | 3762185.3 | 212.4 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000093 | 0 | 0.12690E-02 | 440979.2 | 3762185.4 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000094 | 0 | 0.12690E-02 | 441011.2 | 3762185.4 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000095 | 0 | 0.12690E-02 | 441043.2 | 3762185.5 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000096 | 0 | 0.12690E-02 | 441075.2 | 3762185.6 | 210.8 | 5.00 | 14.88 | | | | |

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1.40     YES                    NO
 L0000097         0   0.12690E-02  441107.2 3762185.7   211.9     5.00    14.88
1.40     YES                    NO
 L0000098         0   0.12690E-02  441139.1 3762185.8   211.8     5.00    14.88
1.40     YES                    NO
 L0000099         0   0.12690E-02  441171.1 3762185.9   211.9     5.00    14.88
1.40     YES                    NO
 L0000100         0   0.12690E-02  441203.1 3762186.0   212.1     5.00    14.88
1.40     YES                    NO
 L0000101         0   0.12690E-02  441235.1 3762186.1   212.3     5.00    14.88
1.40     YES                    NO
 L0000102         0   0.12690E-02  441267.1 3762186.2   212.4     5.00    14.88
1.40     YES                    NO
 L0000103         0   0.12690E-02  441299.1 3762186.3   212.6     5.00    14.88
1.40     YES                    NO
 L0000104         0   0.12690E-02  441331.1 3762186.4   212.4     5.00    14.88
1.40     YES                    NO
 L0000105         0   0.12690E-02  441363.1 3762186.4   212.1     5.00    14.88
1.40     YES                    NO
 L0000106         0   0.12690E-02  441395.1 3762186.5   212.0     5.00    14.88
1.40     YES                    NO
 L0000107         0   0.12690E-02  441427.1 3762186.6   212.0     5.00    14.88
1.40     YES                    NO
 L0000108         0   0.12690E-02  441459.1 3762186.7   212.0     5.00    14.88
1.40     YES                    NO
 L0000109         0   0.12690E-02  441491.1 3762186.8   212.0     5.00    14.88
1.40     YES                    NO
 L0000110         0   0.12690E-02  441523.1 3762186.9   212.0     5.00    14.88
1.40     YES                    NO
 L0000111         0   0.12690E-02  441555.1 3762187.0   212.0     5.00    14.88
1.40     YES                    NO
 L0000112         0   0.12690E-02  441587.1 3762187.1   212.2     5.00    14.88
1.40     YES                    NO
 L0000113         0   0.12690E-02  441619.1 3762187.2   212.3     5.00    14.88
1.40     YES                    NO
 L0000114         0   0.12690E-02  441651.1 3762187.3   212.2     5.00    14.88
1.40     YES                    NO
 L0000115         0   0.12690E-02  441683.1 3762187.4   212.2     5.00    14.88
1.40     YES                    NO
 L0000116         0   0.12690E-02  441715.1 3762187.5   212.3     5.00    14.88
1.40     YES                    NO
 L0000117         0   0.12690E-02  441747.1 3762187.5   212.5     5.00    14.88
1.40     YES                    NO
 L0000118         0   0.12690E-02  441779.1 3762187.6   212.6     5.00    14.88
1.40     YES                    NO
 L0000119         0   0.12690E-02  441811.1 3762187.7   212.7     5.00    14.88
1.40     YES                    NO
 L0000120         0   0.12690E-02  441843.1 3762187.8   212.8     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE BY | EMISSION RATE SCALAR VARY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0000121 | 0 | 0.12690E-02 | 441875.1 | 3762187.9 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000122 | 0 | 0.12690E-02 | 441907.1 | 3762188.0 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000123 | 0 | 0.12690E-02 | 441939.1 | 3762188.1 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000124 | 0 | 0.12690E-02 | 441971.1 | 3762188.2 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000125 | 0 | 0.12690E-02 | 442003.1 | 3762188.3 | 213.4 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000126 | 0 | 0.12690E-02 | 442035.1 | 3762188.4 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000127 | 0 | 0.12690E-02 | 442067.1 | 3762188.5 | 213.4 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000128 | 0 | 0.12690E-02 | 442099.1 | 3762188.6 | 213.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000129 | 0 | 0.12690E-02 | 442131.1 | 3762188.6 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000130 | 0 | 0.12690E-02 | 442163.1 | 3762188.7 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000131 | 0 | 0.12690E-02 | 442174.1 | 3762166.4 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000132 | 0 | 0.12690E-02 | 442154.6 | 3762154.6 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000133 | 0 | 0.12690E-02 | 442122.6 | 3762154.5 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000134 | 0 | 0.12690E-02 | 442090.6 | 3762154.5 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000135 | 0 | 0.12690E-02 | 442058.6 | 3762154.4 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000136 | 0 | 0.12690E-02 | 442026.6 | 3762154.4 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000137 | 0 | 0.12690E-02 | 441994.6 | 3762154.3 | 213.0 | 5.00 | 14.88 | | | | |

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1.40     YES                    NO
 L0000138         0   0.12690E-02  441962.6 3762154.2   213.2     5.00    14.88
1.40     YES                    NO
 L0000139         0   0.12690E-02  441930.6 3762154.2   213.0     5.00    14.88
1.40     YES                    NO
 L0000140         0   0.12690E-02  441898.6 3762154.1   212.8     5.00    14.88
1.40     YES                    NO
 L0000141         0   0.12690E-02  441866.6 3762154.1   212.7     5.00    14.88
1.40     YES                    NO
 L0000142         0   0.12690E-02  441834.6 3762154.0   212.5     5.00    14.88
1.40     YES                    NO
 L0000143         0   0.12690E-02  441802.6 3762153.9   212.4     5.00    14.88
1.40     YES                    NO
 L0000144         0   0.12690E-02  441770.6 3762153.9   212.5     5.00    14.88
1.40     YES                    NO
 L0000145         0   0.12690E-02  441738.6 3762153.8   212.3     5.00    14.88
1.40     YES                    NO
 L0000146         0   0.12690E-02  441706.6 3762153.8   212.1     5.00    14.88
1.40     YES                    NO
 L0000147         0   0.12690E-02  441674.6 3762153.7   211.9     5.00    14.88
1.40     YES                    NO
 L0000148         0   0.12690E-02  441642.6 3762153.6   211.8     5.00    14.88
1.40     YES                    NO
 L0000149         0   0.12690E-02  441610.6 3762153.6   211.9     5.00    14.88
1.40     YES                    NO
 L0000150         0   0.12690E-02  441578.6 3762153.5   211.7     5.00    14.88
1.40     YES                    NO
 L0000151         0   0.12690E-02  441546.6 3762153.5   211.6     5.00    14.88
1.40     YES                    NO
 L0000152         0   0.12690E-02  441514.6 3762153.4   211.6     5.00    14.88
1.40     YES                    NO
 L0000153         0   0.12690E-02  441482.6 3762153.4   211.6     5.00    14.88
1.40     YES                    NO
 L0000154         0   0.12690E-02  441450.6 3762153.3   211.6     5.00    14.88
1.40     YES                    NO
 L0000155         0   0.12690E-02  441418.6 3762153.2   211.6     5.00    14.88
1.40     YES                    NO
 L0000156         0   0.12690E-02  441386.6 3762153.2   211.6     5.00    14.88
1.40     YES                    NO
 L0000157         0   0.12690E-02  441354.6 3762153.1   211.6     5.00    14.88
1.40     YES                    NO
 L0000158         0   0.12690E-02  441322.6 3762153.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000159         0   0.12690E-02  441290.6 3762153.0   211.8     5.00    14.88
1.40     YES                    NO
 L0000160         0   0.12690E-02  441258.6 3762152.9   211.9     5.00    14.88
1.40     YES                    NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                        ***       20:06:41
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE SCALAR VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0000161 | 0 | 0.12690E-02 | 441226.6 | 3762152.9 | 211.7 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000162 | 0 | 0.12690E-02 | 441194.6 | 3762152.8 | 211.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000163 | 0 | 0.12690E-02 | 441162.6 | 3762152.8 | 211.4 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000164 | 0 | 0.12690E-02 | 441130.6 | 3762152.7 | 211.4 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000165 | 0 | 0.12690E-02 | 441098.6 | 3762152.6 | 211.5 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000166 | 0 | 0.12690E-02 | 441066.6 | 3762152.6 | 211.2 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000167 | 0 | 0.12690E-02 | 441034.6 | 3762152.5 | 211.2 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000168 | 0 | 0.12690E-02 | 441002.6 | 3762152.5 | 211.7 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000169 | 0 | 0.12690E-02 | 440970.6 | 3762152.4 | 212.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000170 | 0 | 0.12690E-02 | 440938.6 | 3762152.4 | 212.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000171 | 0 | 0.12690E-02 | 440906.6 | 3762152.3 | 212.0 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000172 | 0 | 0.12690E-02 | 440874.6 | 3762152.2 | 212.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000173 | 0 | 0.12690E-02 | 440842.6 | 3762152.2 | 211.8 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000174 | 0 | 0.12690E-02 | 440810.6 | 3762152.1 | 212.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000175 | 0 | 0.12690E-02 | 440802.0 | 3762128.6 | 212.2 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000176 | 0 | 0.12690E-02 | 440823.2 | 3762117.9 | 211.9 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000177 | 0 | 0.12690E-02 | 440855.2 | 3762118.1 | 211.9 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000178 | 0 | 0.12690E-02 | 440887.2 | 3762118.2 | 212.0 | 5.00 | 14.88 | | | | |

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1.40     YES                    NO
 L0000179         0   0.12690E-02  440919.2 3762118.4   211.9     5.00    14.88
1.40     YES                    NO
 L0000180         0   0.12690E-02  440951.2 3762118.6   211.9     5.00    14.88
1.40     YES                    NO
 L0000181         0   0.12690E-02  440983.2 3762118.7   211.8     5.00    14.88
1.40     YES                    NO
 L0000182         0   0.12690E-02  441015.2 3762118.9   211.5     5.00    14.88
1.40     YES                    NO
 L0000183         0   0.12690E-02  441047.2 3762119.1   211.6     5.00    14.88
1.40     YES                    NO
 L0000184         0   0.12690E-02  441079.2 3762119.2   211.5     5.00    14.88
1.40     YES                    NO
 L0000185         0   0.12690E-02  441111.2 3762119.4   211.1     5.00    14.88
1.40     YES                    NO
 L0000186         0   0.12690E-02  441143.2 3762119.6   211.3     5.00    14.88
1.40     YES                    NO
 L0000187         0   0.12690E-02  441175.2 3762119.7   211.3     5.00    14.88
1.40     YES                    NO
 L0000188         0   0.12690E-02  441207.2 3762119.9   211.2     5.00    14.88
1.40     YES                    NO
 L0000189         0   0.12690E-02  441239.2 3762120.1   211.3     5.00    14.88
1.40     YES                    NO
 L0000190         0   0.12690E-02  441271.2 3762120.2   211.1     5.00    14.88
1.40     YES                    NO
 L0000191         0   0.12690E-02  441303.2 3762120.4   211.1     5.00    14.88
1.40     YES                    NO
 L0000192         0   0.12690E-02  441335.2 3762120.6   211.1     5.00    14.88
1.40     YES                    NO
 L0000193         0   0.12690E-02  441367.2 3762120.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000194         0   0.12690E-02  441399.2 3762120.9   211.2     5.00    14.88
1.40     YES                    NO
 L0000195         0   0.12690E-02  441431.2 3762121.1   211.2     5.00    14.88
1.40     YES                    NO
 L0000196         0   0.12690E-02  441463.2 3762121.2   211.2     5.00    14.88
1.40     YES                    NO
 L0000197         0   0.12690E-02  441495.2 3762121.4   211.2     5.00    14.88
1.40     YES                    NO
 L0000198         0   0.12690E-02  441527.2 3762121.6   211.2     5.00    14.88
1.40     YES                    NO
 L0000199         0   0.12690E-02  441559.2 3762121.7   211.2     5.00    14.88
1.40     YES                    NO
 L0000200         0   0.12690E-02  441591.2 3762121.9   211.5     5.00    14.88
1.40     YES                    NO
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000201         0   0.12690E-02  441623.2 3762122.0   211.5     5.00    14.88
1.40     YES                    NO
 L0000202         0   0.12690E-02  441655.2 3762122.2   211.5     5.00    14.88
1.40     YES                    NO
 L0000203         0   0.12690E-02  441687.2 3762122.4   211.8     5.00    14.88
1.40     YES                    NO
 L0000204         0   0.12690E-02  441719.2 3762122.5   212.1     5.00    14.88
1.40     YES                    NO
 L0000205         0   0.12690E-02  441751.2 3762122.7   212.2     5.00    14.88
1.40     YES                    NO
 L0000206         0   0.12690E-02  441783.2 3762122.9   212.3     5.00    14.88
1.40     YES                    NO
 L0000207         0   0.12690E-02  441815.2 3762123.0   212.3     5.00    14.88
1.40     YES                    NO
 L0000208         0   0.12690E-02  441847.2 3762123.2   212.4     5.00    14.88
1.40     YES                    NO
 L0000209         0   0.12690E-02  441879.2 3762123.4   212.5     5.00    14.88
1.40     YES                    NO
 L0000210         0   0.12690E-02  441911.2 3762123.5   212.7     5.00    14.88
1.40     YES                    NO
 L0000211         0   0.12690E-02  441943.2 3762123.7   212.8     5.00    14.88
1.40     YES                    NO
 L0000212         0   0.12690E-02  441975.2 3762123.9   212.8     5.00    14.88
1.40     YES                    NO
 L0000213         0   0.12690E-02  442007.2 3762124.0   212.5     5.00    14.88
1.40     YES                    NO
 L0000214         0   0.12690E-02  442039.2 3762124.2   212.1     5.00    14.88
1.40     YES                    NO
 L0000215         0   0.12690E-02  442071.2 3762124.4   212.4     5.00    14.88
1.40     YES                    NO
 L0000216         0   0.12690E-02  442103.2 3762124.5   212.8     5.00    14.88
1.40     YES                    NO
 L0000217         0   0.12690E-02  442135.2 3762124.7   212.6     5.00    14.88
1.40     YES                    NO
 L0000218         0   0.12690E-02  442167.2 3762124.9   212.7     5.00    14.88
1.40     YES                    NO
 L0000219         0   0.12690E-02  442166.7 3762094.0   212.5     5.00    14.88
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1.40     YES                    NO
 L0000220         0   0.12690E-02  442134.7 3762093.8   212.4     5.00    14.88
1.40     YES                    NO
 L0000221         0   0.12690E-02  442102.7 3762093.6   212.5     5.00    14.88
1.40     YES                    NO
 L0000222         0   0.12690E-02  442070.7 3762093.4   211.9     5.00    14.88
1.40     YES                    NO
 L0000223         0   0.12690E-02  442038.7 3762093.2   211.6     5.00    14.88
1.40     YES                    NO
 L0000224         0   0.12690E-02  442006.7 3762093.0   212.2     5.00    14.88
1.40     YES                    NO
 L0000225         0   0.12690E-02  441974.7 3762092.8   212.5     5.00    14.88
1.40     YES                    NO
 L0000226         0   0.12690E-02  441942.7 3762092.5   212.5     5.00    14.88
1.40     YES                    NO
 L0000227         0   0.12690E-02  441910.7 3762092.3   212.5     5.00    14.88
1.40     YES                    NO
 L0000228         0   0.12690E-02  441878.7 3762092.1   212.3     5.00    14.88
1.40     YES                    NO
 L0000229         0   0.12690E-02  441846.7 3762091.9   212.2     5.00    14.88
1.40     YES                    NO
 L0000230         0   0.12690E-02  441814.7 3762091.7   212.2     5.00    14.88
1.40     YES                    NO
 L0000231         0   0.12690E-02  441782.7 3762091.5   212.1     5.00    14.88
1.40     YES                    NO
 L0000232         0   0.12690E-02  441750.7 3762091.3   212.0     5.00    14.88
1.40     YES                    NO
 L0000233         0   0.12690E-02  441718.7 3762091.1   211.8     5.00    14.88
1.40     YES                    NO
 L0000234         0   0.12690E-02  441686.7 3762090.9   211.5     5.00    14.88
1.40     YES                    NO
 L0000235         0   0.12690E-02  441654.7 3762090.7   211.3     5.00    14.88
1.40     YES                    NO
 L0000236         0   0.12690E-02  441622.7 3762090.5   211.3     5.00    14.88
1.40     YES                    NO
 L0000237         0   0.12690E-02  441590.7 3762090.3   211.3     5.00    14.88
1.40     YES                    NO
 L0000238         0   0.12690E-02  441558.7 3762090.1   211.1     5.00    14.88
1.40     YES                    NO
 L0000239         0   0.12690E-02  441526.7 3762089.9   211.0     5.00    14.88
1.40     YES                    NO
 L0000240         0   0.12690E-02  441494.7 3762089.7   211.0     5.00    14.88
1.40     YES                    NO
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*
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*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0000241 | 0 | 0.12690E-02 | 441462.7 | 3762089.5 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000242 | 0 | 0.12690E-02 | 441430.7 | 3762089.3 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000243 | 0 | 0.12690E-02 | 441398.7 | 3762089.1 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000244 | 0 | 0.12690E-02 | 441366.7 | 3762088.9 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000245 | 0 | 0.12690E-02 | 441334.7 | 3762088.7 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000246 | 0 | 0.12690E-02 | 441302.7 | 3762088.5 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000247 | 0 | 0.12690E-02 | 441270.7 | 3762088.3 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000248 | 0 | 0.12690E-02 | 441238.7 | 3762088.1 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000249 | 0 | 0.12690E-02 | 441206.7 | 3762087.9 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000250 | 0 | 0.12690E-02 | 441174.7 | 3762087.7 | 211.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000251 | 0 | 0.12690E-02 | 441142.7 | 3762087.5 | 211.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000252 | 0 | 0.12690E-02 | 441110.7 | 3762087.3 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000253 | 0 | 0.12690E-02 | 441078.7 | 3762087.1 | 211.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000254 | 0 | 0.12690E-02 | 441046.7 | 3762086.9 | 211.6 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000255 | 0 | 0.12690E-02 | 441014.7 | 3762086.7 | 211.6 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000256 | 0 | 0.12690E-02 | 440982.7 | 3762086.5 | 211.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000257 | 0 | 0.12690E-02 | 440950.7 | 3762086.3 | 211.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000258 | 0 | 0.12690E-02 | 440918.7 | 3762086.1 | 211.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000259 | 0 | 0.12690E-02 | 440886.7 | 3762085.9 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000260 | 0 | 0.12690E-02 | 440854.7 | 3762085.7 | 211.9 | 5.00 | 14.88 | | | | |

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1.40     YES                    NO
 L0000261         0   0.12690E-02  440822.7 3762085.5   211.9     5.00    14.88
1.40     YES                    NO
 L0000262         0   0.12690E-02  440804.2 3762072.8   211.8     5.00    14.88
1.40     YES                    NO
 L0000263         0   0.12690E-02  440817.9 3762053.3   211.2     5.00    14.88
1.40     YES                    NO
 L0000264         0   0.12690E-02  440849.9 3762053.5   211.4     5.00    14.88
1.40     YES                    NO
 L0000265         0   0.12690E-02  440881.9 3762053.7   211.7     5.00    14.88
1.40     YES                    NO
 L0000266         0   0.12690E-02  440913.9 3762053.9   211.8     5.00    14.88
1.40     YES                    NO
 L0000267         0   0.12690E-02  440945.9 3762054.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000268         0   0.12690E-02  440977.9 3762054.3   211.6     5.00    14.88
1.40     YES                    NO
 L0000269         0   0.12690E-02  441009.9 3762054.5   211.4     5.00    14.88
1.40     YES                    NO
 L0000270         0   0.12690E-02  441041.9 3762054.8   211.2     5.00    14.88
1.40     YES                    NO
 L0000271         0   0.12690E-02  441073.9 3762055.0   211.2     5.00    14.88
1.40     YES                    NO
 L0000272         0   0.12690E-02  441105.9 3762055.2   211.1     5.00    14.88
1.40     YES                    NO
 L0000273         0   0.12690E-02  441137.9 3762055.4   211.0     5.00    14.88
1.40     YES                    NO
 L0000274         0   0.12690E-02  441169.9 3762055.6   211.0     5.00    14.88
1.40     YES                    NO
 L0000275         0   0.12690E-02  441201.9 3762055.8   210.9     5.00    14.88
1.40     YES                    NO
 L0000276         0   0.12690E-02  441233.9 3762056.0   211.0     5.00    14.88
1.40     YES                    NO
 L0000277         0   0.12690E-02  441265.9 3762056.3   211.0     5.00    14.88
1.40     YES                    NO
 L0000278         0   0.12690E-02  441297.9 3762056.5   210.9     5.00    14.88
1.40     YES                    NO
 L0000279         0   0.12690E-02  441329.9 3762056.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000280         0   0.12690E-02  441361.9 3762056.9   211.1     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

```
                NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000281         0   0.12690E-02  441393.9 3762057.1   210.9     5.00    14.88
1.40     YES                     NO
 L0000282         0   0.12690E-02  441425.9 3762057.3   210.9     5.00    14.88
1.40     YES                     NO
 L0000283         0   0.12690E-02  441457.9 3762057.5   210.9     5.00    14.88
1.40     YES                     NO
 L0000284         0   0.12690E-02  441489.9 3762057.7   210.9     5.00    14.88
1.40     YES                     NO
 L0000285         0   0.12690E-02  441521.9 3762058.0   210.9     5.00    14.88
1.40     YES                     NO
 L0000286         0   0.12690E-02  441553.9 3762058.2   211.0     5.00    14.88
1.40     YES                     NO
 L0000287         0   0.12690E-02  441585.9 3762058.4   211.0     5.00    14.88
1.40     YES                     NO
 L0000288         0   0.12690E-02  441617.9 3762058.6   211.1     5.00    14.88
1.40     YES                     NO
 L0000289         0   0.12690E-02  441649.9 3762058.8   211.1     5.00    14.88
1.40     YES                     NO
 L0000290         0   0.12690E-02  441681.9 3762059.0   211.2     5.00    14.88
1.40     YES                     NO
 L0000291         0   0.12690E-02  441713.9 3762059.2   211.4     5.00    14.88
1.40     YES                     NO
 L0000292         0   0.12690E-02  441745.9 3762059.5   211.6     5.00    14.88
1.40     YES                     NO
 L0000293         0   0.12690E-02  441777.8 3762059.7   211.7     5.00    14.88
1.40     YES                     NO
 L0000294         0   0.12690E-02  441809.8 3762059.9   212.0     5.00    14.88
1.40     YES                     NO
 L0000295         0   0.12690E-02  441841.8 3762060.1   212.0     5.00    14.88
1.40     YES                     NO
 L0000296         0   0.12690E-02  441873.8 3762060.3   212.1     5.00    14.88
1.40     YES                     NO
 L0000297         0   0.12690E-02  441905.8 3762060.5   212.2     5.00    14.88
1.40     YES                     NO
 L0000298         0   0.12690E-02  441937.8 3762060.7   212.2     5.00    14.88
1.40     YES                     NO
 L0000299         0   0.12690E-02  441969.8 3762061.0   212.1     5.00    14.88
1.40     YES                     NO
 L0000300         0   0.12690E-02  442001.8 3762061.2   212.0     5.00    14.88
1.40     YES                     NO
 L0000301         0   0.12690E-02  442033.8 3762061.4   212.1     5.00    14.88
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1.40     YES                    NO
 L0000302         0   0.12690E-02  442065.8 3762061.6   212.1     5.00    14.88
1.40     YES                    NO
 L0000303         0   0.12690E-02  442097.8 3762061.8   212.2     5.00    14.88
1.40     YES                    NO
 L0000304         0   0.12690E-02  442129.8 3762062.0   212.2     5.00    14.88
1.40     YES                    NO
 L0000305         0   0.12690E-02  442161.8 3762062.2   212.2     5.00    14.88
1.40     YES                    NO
 L0000306         0   0.12690E-02  442172.7 3762040.8   212.0     5.00    14.88
1.40     YES                    NO
 L0000307         0   0.12690E-02  442150.4 3762031.2   211.8     5.00    14.88
1.40     YES                    NO
 L0000308         0   0.12690E-02  442118.4 3762031.0   211.5     5.00    14.88
1.40     YES                    NO
 L0000309         0   0.12690E-02  442086.4 3762030.8   211.6     5.00    14.88
1.40     YES                    NO
 L0000310         0   0.12690E-02  442054.4 3762030.7   211.8     5.00    14.88
1.40     YES                    NO
 L0000311         0   0.12690E-02  442022.4 3762030.5   211.8     5.00    14.88
1.40     YES                    NO
 L0000312         0   0.12690E-02  441990.4 3762030.3   211.6     5.00    14.88
1.40     YES                    NO
 L0000313         0   0.12690E-02  441958.4 3762030.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000314         0   0.12690E-02  441926.4 3762029.9   211.8     5.00    14.88
1.40     YES                    NO
 L0000315         0   0.12690E-02  441894.4 3762029.7   211.9     5.00    14.88
1.40     YES                    NO
 L0000316         0   0.12690E-02  441862.4 3762029.5   211.8     5.00    14.88
1.40     YES                    NO
 L0000317         0   0.12690E-02  441830.4 3762029.3   211.7     5.00    14.88
1.40     YES                    NO
 L0000318         0   0.12690E-02  441798.4 3762029.2   211.5     5.00    14.88
1.40     YES                    NO
 L0000319         0   0.12690E-02  441766.4 3762029.0   211.3     5.00    14.88
1.40     YES                    NO
 L0000320         0   0.12690E-02  441734.4 3762028.8   211.1     5.00    14.88
1.40     YES                    NO
```



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

NUMBER EMISSION RATE BASE RELEASE INIT.

```
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000321         0   0.12690E-02  441702.4 3762028.6   210.9     5.00    14.88
1.40     YES                     NO
 L0000322         0   0.12690E-02  441670.4 3762028.4   210.8     5.00    14.88
1.40     YES                     NO
 L0000323         0   0.12690E-02  441638.4 3762028.2   210.7     5.00    14.88
1.40     YES                     NO
 L0000324         0   0.12690E-02  441606.4 3762028.0   210.7     5.00    14.88
1.40     YES                     NO
 L0000325         0   0.12690E-02  441574.4 3762027.8   210.6     5.00    14.88
1.40     YES                     NO
 L0000326         0   0.12690E-02  441542.4 3762027.6   210.5     5.00    14.88
1.40     YES                     NO
 L0000327         0   0.12690E-02  441510.4 3762027.5   210.4     5.00    14.88
1.40     YES                     NO
 L0000328         0   0.12690E-02  441478.4 3762027.3   210.4     5.00    14.88
1.40     YES                     NO
 L0000329         0   0.12690E-02  441446.4 3762027.1   210.4     5.00    14.88
1.40     YES                     NO
 L0000330         0   0.12690E-02  441414.4 3762026.9   210.4     5.00    14.88
1.40     YES                     NO
 L0000331         0   0.12690E-02  441382.4 3762026.7   210.6     5.00    14.88
1.40     YES                     NO
 L0000332         0   0.12690E-02  441350.4 3762026.5   210.8     5.00    14.88
1.40     YES                     NO
 L0000333         0   0.12690E-02  441318.4 3762026.3   210.6     5.00    14.88
1.40     YES                     NO
 L0000334         0   0.12690E-02  441286.4 3762026.1   210.4     5.00    14.88
1.40     YES                     NO
 L0000335         0   0.12690E-02  441254.4 3762026.0   210.6     5.00    14.88
1.40     YES                     NO
 L0000336         0   0.12690E-02  441222.4 3762025.8   210.7     5.00    14.88
1.40     YES                     NO
 L0000337         0   0.12690E-02  441190.4 3762025.6   210.5     5.00    14.88
1.40     YES                     NO
 L0000338         0   0.12690E-02  441158.4 3762025.4   210.6     5.00    14.88
1.40     YES                     NO
 L0000339         0   0.12690E-02  441126.4 3762025.2   210.5     5.00    14.88
1.40     YES                     NO
 L0000340         0   0.12690E-02  441094.4 3762025.0   210.6     5.00    14.88
1.40     YES                     NO
 L0000341         0   0.12690E-02  441062.4 3762024.8   210.6     5.00    14.88
1.40     YES                     NO
 L0000342         0   0.12690E-02  441030.4 3762024.6   210.9     5.00    14.88
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1.40     YES                    NO
 L0000343         0   0.12690E-02  440998.4 3762024.5   211.2     5.00    14.88
1.40     YES                    NO
 L0000344         0   0.12690E-02  440966.4 3762024.3   211.3     5.00    14.88
1.40     YES                    NO
 L0000345         0   0.12690E-02  440934.4 3762024.1   211.5     5.00    14.88
1.40     YES                    NO
 L0000346         0   0.12690E-02  440902.4 3762023.9   211.6     5.00    14.88
1.40     YES                    NO
 L0000347         0   0.12690E-02  440870.4 3762023.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000348         0   0.12690E-02  440838.4 3762023.5   210.6     5.00    14.88
1.40     YES                    NO
 L0000349         0   0.12690E-02  440809.0 3762020.6   210.6     5.00    14.88
1.40     YES                    NO
 L0000350         0   0.12690E-02  440813.7 3761995.0   210.2     5.00    14.88
1.40     YES                    NO
 L0000351         0   0.12690E-02  440845.7 3761995.0   210.3     5.00    14.88
1.40     YES                    NO
 L0000352         0   0.12690E-02  440877.7 3761994.9   210.7     5.00    14.88
1.40     YES                    NO
 L0000353         0   0.12690E-02  440909.7 3761994.9   210.9     5.00    14.88
1.40     YES                    NO
 L0000354         0   0.12690E-02  440941.7 3761994.9   210.9     5.00    14.88
1.40     YES                    NO
 L0000355         0   0.12690E-02  440973.7 3761994.9   210.9     5.00    14.88
1.40     YES                    NO
 L0000356         0   0.12690E-02  441005.7 3761994.9   210.8     5.00    14.88
1.40     YES                    NO
 L0000357         0   0.12690E-02  441037.7 3761994.9   210.6     5.00    14.88
1.40     YES                    NO
 L0000358         0   0.12690E-02  441069.7 3761994.9   210.4     5.00    14.88
1.40     YES                    NO
 L0000359         0   0.12690E-02  441101.7 3761994.9   210.3     5.00    14.88
1.40     YES                    NO
 L0000360         0   0.12690E-02  441133.7 3761994.9   210.2     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                  *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
```

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SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000361         0   0.12690E-02  441165.7 3761994.9   210.2     5.00    14.88
1.40     YES                     NO
 L0000362         0   0.12690E-02  441197.7 3761994.9   210.2     5.00    14.88
1.40     YES                     NO
 L0000363         0   0.12690E-02  441229.7 3761994.9   210.4     5.00    14.88
1.40     YES                     NO
 L0000364         0   0.12690E-02  441261.7 3761994.9   210.4     5.00    14.88
1.40     YES                     NO
 L0000365         0   0.12690E-02  441293.7 3761994.8   210.2     5.00    14.88
1.40     YES                     NO
 L0000366         0   0.12690E-02  441325.7 3761994.8   210.3     5.00    14.88
1.40     YES                     NO
 L0000367         0   0.12690E-02  441357.7 3761994.8   210.5     5.00    14.88
1.40     YES                     NO
 L0000368         0   0.12690E-02  441389.7 3761994.8   210.3     5.00    14.88
1.40     YES                     NO
 L0000369         0   0.12690E-02  441421.7 3761994.8   210.2     5.00    14.88
1.40     YES                     NO
 L0000370         0   0.12690E-02  441453.7 3761994.8   210.2     5.00    14.88
1.40     YES                     NO
 L0000371         0   0.12690E-02  441485.7 3761994.8   210.2     5.00    14.88
1.40     YES                     NO
 L0000372         0   0.12690E-02  441517.7 3761994.8   210.2     5.00    14.88
1.40     YES                     NO
 L0000373         0   0.12690E-02  441549.7 3761994.8   210.2     5.00    14.88
1.40     YES                     NO
 L0000374         0   0.12690E-02  441581.7 3761994.8   210.3     5.00    14.88
1.40     YES                     NO
 L0000375         0   0.12690E-02  441613.7 3761994.8   210.3     5.00    14.88
1.40     YES                     NO
 L0000376         0   0.12690E-02  441645.7 3761994.8   210.2     5.00    14.88
1.40     YES                     NO
 L0000377         0   0.12690E-02  441677.7 3761994.8   210.4     5.00    14.88
1.40     YES                     NO
 L0000378         0   0.12690E-02  441709.7 3761994.7   210.5     5.00    14.88
1.40     YES                     NO
 L0000379         0   0.12690E-02  441741.7 3761994.7   210.7     5.00    14.88
1.40     YES                     NO
 L0000380         0   0.12690E-02  441773.7 3761994.7   210.9     5.00    14.88
1.40     YES                     NO
 L0000381         0   0.12690E-02  441805.7 3761994.7   211.1     5.00    14.88
1.40     YES                     NO
 L0000382         0   0.12690E-02  441837.7 3761994.7   211.5     5.00    14.88
1.40     YES                     NO
 L0000383         0   0.12690E-02  441869.7 3761994.7   211.8     5.00    14.88
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1.40     YES                    NO
 L0000384         0   0.12690E-02  441901.7 3761994.7   211.8     5.00    14.88
1.40     YES                    NO
 L0000385         0   0.12690E-02  441933.7 3761994.7   211.5     5.00    14.88
1.40     YES                    NO
 L0000386         0   0.12690E-02  441965.7 3761994.7   211.2     5.00    14.88
1.40     YES                    NO
 L0000387         0   0.12690E-02  441997.7 3761994.7   211.2     5.00    14.88
1.40     YES                    NO
 L0000388         0   0.12690E-02  442029.7 3761994.7   211.6     5.00    14.88
1.40     YES                    NO
 L0000389         0   0.12690E-02  442061.7 3761994.7   211.4     5.00    14.88
1.40     YES                    NO
 L0000390         0   0.12690E-02  442093.7 3761994.7   211.2     5.00    14.88
1.40     YES                    NO
 L0000391         0   0.12690E-02  442125.7 3761994.6   211.1     5.00    14.88
1.40     YES                    NO
 L0000392         0   0.12690E-02  442157.7 3761994.6   211.3     5.00    14.88
1.40     YES                    NO
 L0000393         0   0.12690E-02  442176.4 3761979.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000394         0   0.12690E-02  442169.8 3761957.2   210.8     5.00    14.88
1.40     YES                    NO
 L0000395         0   0.12690E-02  442137.8 3761957.3   210.7     5.00    14.88
1.40     YES                    NO
 L0000396         0   0.12690E-02  442105.8 3761957.4   211.0     5.00    14.88
1.40     YES                    NO
 L0000397         0   0.12690E-02  442073.8 3761957.5   211.1     5.00    14.88
1.40     YES                    NO
 L0000398         0   0.12690E-02  442041.8 3761957.6   211.2     5.00    14.88
1.40     YES                    NO
 L0000399         0   0.12690E-02  442009.8 3761957.7   210.9     5.00    14.88
1.40     YES                    NO
 L0000400         0   0.12690E-02  441977.8 3761957.8   210.7     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X         Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
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(METERS) BY
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1.40     YES                    NO
 L0000425         0   0.12690E-02  441177.8 3761960.2   209.8     5.00    14.88
1.40     YES                    NO
 L0000426         0   0.12690E-02  441145.8 3761960.3   209.9     5.00    14.88
1.40     YES                    NO
 L0000427         0   0.12690E-02  441113.8 3761960.4   209.9     5.00    14.88
1.40     YES                    NO
 L0000428         0   0.12690E-02  441081.8 3761960.5   210.1     5.00    14.88
1.40     YES                    NO
 L0000429         0   0.12690E-02  441049.8 3761960.6   210.2     5.00    14.88
1.40     YES                    NO
 L0000430         0   0.12690E-02  441017.8 3761960.7   210.3     5.00    14.88
1.40     YES                    NO
 L0000431         0   0.12690E-02  440985.8 3761960.8   210.3     5.00    14.88
1.40     YES                    NO
 L0000432         0   0.12690E-02  440953.8 3761960.9   210.3     5.00    14.88
1.40     YES                    NO
 L0000433         0   0.12690E-02  440921.8 3761961.0   210.3     5.00    14.88
1.40     YES                    NO
 L0000434         0   0.12690E-02  440889.8 3761961.1   210.1     5.00    14.88
1.40     YES                    NO
 L0000435         0   0.12690E-02  440857.8 3761961.2   210.1     5.00    14.88
1.40     YES                    NO
 L0000436         0   0.12690E-02  440825.8 3761961.3   209.9     5.00    14.88
1.40     YES                    NO
 L0000437         0   0.12690E-02  440803.9 3761952.1   209.8     5.00    14.88
1.40     YES                    NO
 L0000438         0   0.12690E-02  440813.6 3761927.9   209.5     5.00    14.88
1.40     YES                    NO
 L0000439         0   0.12690E-02  440845.6 3761927.8   209.6     5.00    14.88
1.40     YES                    NO
 L0000440         0   0.12690E-02  440877.6 3761927.7   209.5     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000441         0   0.12690E-02  440909.6 3761927.6   209.7     5.00    14.88
1.40     YES                     NO
 L0000442         0   0.12690E-02  440941.6 3761927.5   209.9     5.00    14.88
1.40     YES                     NO
 L0000443         0   0.12690E-02  440973.6 3761927.5   209.8     5.00    14.88
1.40     YES                     NO
 L0000444         0   0.12690E-02  441005.6 3761927.4   209.8     5.00    14.88
1.40     YES                     NO
 L0000445         0   0.12690E-02  441037.6 3761927.3   209.6     5.00    14.88
1.40     YES                     NO
 L0000446         0   0.12690E-02  441069.6 3761927.2   209.7     5.00    14.88
1.40     YES                     NO
 L0000447         0   0.12690E-02  441101.6 3761927.1   209.6     5.00    14.88
1.40     YES                     NO
 L0000448         0   0.12690E-02  441133.6 3761927.0   209.6     5.00    14.88
1.40     YES                     NO
 L0000449         0   0.12690E-02  441165.6 3761926.9   209.6     5.00    14.88
1.40     YES                     NO
 L0000450         0   0.12690E-02  441197.6 3761926.9   209.5     5.00    14.88
1.40     YES                     NO
 L0000451         0   0.12690E-02  441229.6 3761926.8   209.8     5.00    14.88
1.40     YES                     NO
 L0000452         0   0.12690E-02  441261.6 3761926.7   209.9     5.00    14.88
1.40     YES                     NO
 L0000453         0   0.12690E-02  441293.6 3761926.6   210.0     5.00    14.88
1.40     YES                     NO
 L0000454         0   0.12690E-02  441325.6 3761926.5   209.9     5.00    14.88
1.40     YES                     NO
 L0000455         0   0.12690E-02  441357.6 3761926.4   210.0     5.00    14.88
1.40     YES                     NO
 L0000456         0   0.12690E-02  441389.6 3761926.4   209.9     5.00    14.88
1.40     YES                     NO
 L0000457         0   0.12690E-02  441421.6 3761926.3   209.9     5.00    14.88
1.40     YES                     NO
 L0000458         0   0.12690E-02  441453.6 3761926.2   209.9     5.00    14.88
1.40     YES                     NO
 L0000459         0   0.12690E-02  441485.6 3761926.1   209.9     5.00    14.88
1.40     YES                     NO
 L0000460         0   0.12690E-02  441517.6 3761926.0   209.9     5.00    14.88
1.40     YES                     NO
 L0000461         0   0.12690E-02  441549.6 3761925.9   209.9     5.00    14.88
1.40     YES                     NO
 L0000462         0   0.12690E-02  441581.6 3761925.9   210.0     5.00    14.88
1.40     YES                     NO
 L0000463         0   0.12690E-02  441613.6 3761925.8   209.9     5.00    14.88
1.40     YES                     NO
 L0000464         0   0.12690E-02  441645.6 3761925.7   209.7     5.00    14.88
1.40     YES                     NO
 L0000465         0   0.12690E-02  441677.6 3761925.6   209.9     5.00    14.88
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1.40     YES                    NO
 L0000466         0   0.12690E-02  441709.6 3761925.5   210.0     5.00    14.88
1.40     YES                    NO
 L0000467         0   0.12690E-02  441741.6 3761925.4   210.2     5.00    14.88
1.40     YES                    NO
 L0000468         0   0.12690E-02  441773.6 3761925.4   210.3     5.00    14.88
1.40     YES                    NO
 L0000469         0   0.12690E-02  441805.6 3761925.3   210.5     5.00    14.88
1.40     YES                    NO
 L0000470         0   0.12690E-02  441837.6 3761925.2   211.3     5.00    14.88
1.40     YES                    NO
 L0000471         0   0.12690E-02  441869.6 3761925.1   211.4     5.00    14.88
1.40     YES                    NO
 L0000472         0   0.12690E-02  441901.6 3761925.0   211.3     5.00    14.88
1.40     YES                    NO
 L0000473         0   0.12690E-02  441933.6 3761924.9   211.0     5.00    14.88
1.40     YES                    NO
 L0000474         0   0.12690E-02  441965.6 3761924.9   210.4     5.00    14.88
1.40     YES                    NO
 L0000475         0   0.12690E-02  441997.6 3761924.8   210.4     5.00    14.88
1.40     YES                    NO
 L0000476         0   0.12690E-02  442029.6 3761924.7   210.8     5.00    14.88
1.40     YES                    NO
 L0000477         0   0.12690E-02  442061.6 3761924.6   210.8     5.00    14.88
1.40     YES                    NO
 L0000478         0   0.12690E-02  442093.6 3761924.5   210.8     5.00    14.88
1.40     YES                    NO
 L0000479         0   0.12690E-02  442125.6 3761924.4   210.6     5.00    14.88
1.40     YES                    NO
 L0000480         0   0.12690E-02  442157.6 3761924.4   210.5     5.00    14.88
1.40     YES                    NO
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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|---|---|---|---|---|---|---|---|---|---|
| L0000481 | 0 | 0.12690E-02 | 442176.1 | 3761912.3 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000482 | 0 | 0.12690E-02 | 442164.0 | 3761890.0 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000483 | 0 | 0.12690E-02 | 442132.0 | 3761890.1 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000484 | 0 | 0.12690E-02 | 442100.0 | 3761890.2 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000485 | 0 | 0.12690E-02 | 442068.0 | 3761890.4 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000486 | 0 | 0.12690E-02 | 442036.0 | 3761890.5 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000487 | 0 | 0.12690E-02 | 442004.0 | 3761890.7 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000488 | 0 | 0.12690E-02 | 441972.0 | 3761890.8 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000489 | 0 | 0.12690E-02 | 441940.0 | 3761890.9 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000490 | 0 | 0.12690E-02 | 441908.0 | 3761891.1 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000491 | 0 | 0.12690E-02 | 441876.0 | 3761891.2 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000492 | 0 | 0.12690E-02 | 441844.0 | 3761891.4 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000493 | 0 | 0.12690E-02 | 441812.0 | 3761891.5 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000494 | 0 | 0.12690E-02 | 441780.0 | 3761891.6 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000495 | 0 | 0.12690E-02 | 441748.0 | 3761891.8 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000496 | 0 | 0.12690E-02 | 441716.0 | 3761891.9 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000497 | 0 | 0.12690E-02 | 441684.0 | 3761892.1 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000498 | 0 | 0.12690E-02 | 441652.0 | 3761892.2 | 209.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000499 | 0 | 0.12690E-02 | 441620.0 | 3761892.3 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000500 | 0 | 0.12690E-02 | 441588.0 | 3761892.5 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000501 | 0 | 0.12690E-02 | 441556.0 | 3761892.6 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000502 | 0 | 0.12690E-02 | 441524.0 | 3761892.8 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000503 | 0 | 0.12690E-02 | 441492.0 | 3761892.9 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000504 | 0 | 0.12690E-02 | 441460.0 | 3761893.0 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000505 | 0 | 0.12690E-02 | 441428.0 | 3761893.2 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000506 | 0 | 0.12690E-02 | 441396.0 | 3761893.3 | 209.0 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000507         0   0.12690E-02  441364.0 3761893.5   209.5     5.00    14.88
1.40     YES                    NO
 L0000508         0   0.12690E-02  441332.0 3761893.6   209.7     5.00    14.88
1.40     YES                    NO
 L0000509         0   0.12690E-02  441300.0 3761893.7   209.6     5.00    14.88
1.40     YES                    NO
 L0000510         0   0.12690E-02  441268.0 3761893.9   209.6     5.00    14.88
1.40     YES                    NO
 L0000511         0   0.12690E-02  441236.0 3761894.0   209.4     5.00    14.88
1.40     YES                    NO
 L0000512         0   0.12690E-02  441204.0 3761894.2   209.2     5.00    14.88
1.40     YES                    NO
 L0000513         0   0.12690E-02  441172.0 3761894.3   209.2     5.00    14.88
1.40     YES                    NO
 L0000514         0   0.12690E-02  441140.0 3761894.4   209.3     5.00    14.88
1.40     YES                    NO
 L0000515         0   0.12690E-02  441108.0 3761894.6   209.3     5.00    14.88
1.40     YES                    NO
 L0000516         0   0.12690E-02  441076.0 3761894.7   209.3     5.00    14.88
1.40     YES                    NO
 L0000517         0   0.12690E-02  441044.0 3761894.9   209.3     5.00    14.88
1.40     YES                    NO
 L0000518         0   0.12690E-02  441012.0 3761895.0   209.4     5.00    14.88
1.40     YES                    NO
 L0000519         0   0.12690E-02  440980.0 3761895.1   209.4     5.00    14.88
1.40     YES                    NO
 L0000520         0   0.12690E-02  440948.0 3761895.3   209.4     5.00    14.88
1.40     YES                    NO
```



```
                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000521         0   0.12690E-02  440916.0 3761895.4   209.3     5.00    14.88
1.40     YES                    NO
```

```
 L0000522         0   0.12690E-02  440884.0 3761895.6   209.1     5.00    14.88
1.40     YES                     NO
 L0000523         0   0.12690E-02  440852.0 3761895.7   209.2     5.00    14.88
1.40     YES                     NO
 L0000524         0   0.12690E-02  440820.0 3761895.8   209.1     5.00    14.88
1.40     YES                     NO
 L0000525         0   0.12690E-02  440806.0 3761878.3   209.1     5.00    14.88
1.40     YES                     NO
 L0000526         0   0.12690E-02  440822.2 3761862.1   208.7     5.00    14.88
1.40     YES                     NO
 L0000527         0   0.12690E-02  440854.2 3761862.0   208.7     5.00    14.88
1.40     YES                     NO
 L0000528         0   0.12690E-02  440886.2 3761861.9   208.9     5.00    14.88
1.40     YES                     NO
 L0000529         0   0.12690E-02  440918.2 3761861.8   209.0     5.00    14.88
1.40     YES                     NO
 L0000530         0   0.12690E-02  440950.2 3761861.7   209.0     5.00    14.88
1.40     YES                     NO
 L0000531         0   0.12690E-02  440982.2 3761861.6   209.1     5.00    14.88
1.40     YES                     NO
 L0000532         0   0.12690E-02  441014.2 3761861.5   209.1     5.00    14.88
1.40     YES                     NO
 L0000533         0   0.12690E-02  441046.2 3761861.4   209.0     5.00    14.88
1.40     YES                     NO
 L0000534         0   0.12690E-02  441078.2 3761861.3   209.0     5.00    14.88
1.40     YES                     NO
 L0000535         0   0.12690E-02  441110.2 3761861.2   209.0     5.00    14.88
1.40     YES                     NO
 L0000536         0   0.12690E-02  441142.2 3761861.1   208.9     5.00    14.88
1.40     YES                     NO
 L0000537         0   0.12690E-02  441174.2 3761861.0   208.9     5.00    14.88
1.40     YES                     NO
 L0000538         0   0.12690E-02  441206.2 3761860.9   209.0     5.00    14.88
1.40     YES                     NO
 L0000539         0   0.12690E-02  441238.2 3761860.8   209.0     5.00    14.88
1.40     YES                     NO
 L0000540         0   0.12690E-02  441270.2 3761860.7   209.1     5.00    14.88
1.40     YES                     NO
 L0000541         0   0.12690E-02  441302.2 3761860.6   209.1     5.00    14.88
1.40     YES                     NO
 L0000542         0   0.12690E-02  441334.2 3761860.5   209.1     5.00    14.88
1.40     YES                     NO
 L0000543         0   0.12690E-02  441366.2 3761860.4   208.9     5.00    14.88
1.40     YES                     NO
 L0000544         0   0.12690E-02  441398.2 3761860.3   208.3     5.00    14.88
1.40     YES                     NO
 L0000545         0   0.12690E-02  441430.2 3761860.2   208.4     5.00    14.88
1.40     YES                     NO
 L0000546         0   0.12690E-02  441462.2 3761860.1   208.8     5.00    14.88
1.40     YES                     NO
 L0000547         0   0.12690E-02  441494.2 3761860.0   209.1     5.00    14.88
```

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1.40     YES                    NO
 L0000548         0   0.12690E-02  441526.2 3761859.9   209.1     5.00    14.88
1.40     YES                    NO
 L0000549         0   0.12690E-02  441558.2 3761859.8   209.2     5.00    14.88
1.40     YES                    NO
 L0000550         0   0.12690E-02  441590.2 3761859.7   209.4     5.00    14.88
1.40     YES                    NO
 L0000551         0   0.12690E-02  441622.2 3761859.6   209.2     5.00    14.88
1.40     YES                    NO
 L0000552         0   0.12690E-02  441654.2 3761859.5   209.1     5.00    14.88
1.40     YES                    NO
 L0000553         0   0.12690E-02  441686.2 3761859.4   209.2     5.00    14.88
1.40     YES                    NO
 L0000554         0   0.12690E-02  441718.2 3761859.3   209.2     5.00    14.88
1.40     YES                    NO
 L0000555         0   0.12690E-02  441750.2 3761859.1   209.4     5.00    14.88
1.40     YES                    NO
 L0000556         0   0.12690E-02  441782.2 3761859.0   209.6     5.00    14.88
1.40     YES                    NO
 L0000557         0   0.12690E-02  441814.2 3761858.9   210.0     5.00    14.88
1.40     YES                    NO
 L0000558         0   0.12690E-02  441846.2 3761858.8   210.5     5.00    14.88
1.40     YES                    NO
 L0000559         0   0.12690E-02  441878.2 3761858.7   210.6     5.00    14.88
1.40     YES                    NO
 L0000560         0   0.12690E-02  441910.2 3761858.6   210.6     5.00    14.88
1.40     YES                    NO
```



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                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000561         0   0.12690E-02  441942.2 3761858.5   210.0     5.00    14.88
1.40     YES                    NO
 L0000562         0   0.12690E-02  441974.2 3761858.4   209.7     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000563 | 0 | 0.12690E-02 | 442006.2 | 3761858.3 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000564 | 0 | 0.12690E-02 | 442038.2 | 3761858.2 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000565 | 0 | 0.12690E-02 | 442070.2 | 3761858.1 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000566 | 0 | 0.12690E-02 | 442102.2 | 3761858.0 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000567 | 0 | 0.12690E-02 | 442134.2 | 3761857.9 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000568 | 0 | 0.12690E-02 | 442166.2 | 3761857.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000569 | 0 | 0.12690E-02 | 442178.0 | 3761837.9 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000570 | 0 | 0.12690E-02 | 442159.2 | 3761824.5 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000571 | 0 | 0.12690E-02 | 442127.2 | 3761824.6 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000572 | 0 | 0.12690E-02 | 442095.2 | 3761824.7 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000573 | 0 | 0.12690E-02 | 442063.2 | 3761824.8 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000574 | 0 | 0.12690E-02 | 442031.2 | 3761824.9 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000575 | 0 | 0.12690E-02 | 441999.2 | 3761825.0 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000576 | 0 | 0.12690E-02 | 441967.2 | 3761825.1 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000577 | 0 | 0.12690E-02 | 441935.2 | 3761825.2 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000578 | 0 | 0.12690E-02 | 441903.2 | 3761825.3 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000579 | 0 | 0.12690E-02 | 441871.2 | 3761825.3 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000580 | 0 | 0.12690E-02 | 441839.2 | 3761825.4 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000581 | 0 | 0.12690E-02 | 441807.2 | 3761825.5 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000582 | 0 | 0.12690E-02 | 441775.2 | 3761825.6 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000583 | 0 | 0.12690E-02 | 441743.2 | 3761825.7 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000584 | 0 | 0.12690E-02 | 441711.2 | 3761825.8 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000585 | 0 | 0.12690E-02 | 441679.2 | 3761825.9 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000586 | 0 | 0.12690E-02 | 441647.2 | 3761826.0 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000587 | 0 | 0.12690E-02 | 441615.2 | 3761826.1 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000588 | 0 | 0.12690E-02 | 441583.2 | 3761826.2 | 208.9 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000589         0   0.12690E-02  441551.2 3761826.3   208.8     5.00    14.88
1.40     YES                    NO
 L0000590         0   0.12690E-02  441519.2 3761826.4   209.0     5.00    14.88
1.40     YES                    NO
 L0000591         0   0.12690E-02  441487.2 3761826.5   208.8     5.00    14.88
1.40     YES                    NO
 L0000592         0   0.12690E-02  441455.2 3761826.6   208.7     5.00    14.88
1.40     YES                    NO
 L0000593         0   0.12690E-02  441423.2 3761826.7   208.8     5.00    14.88
1.40     YES                    NO
 L0000594         0   0.12690E-02  441391.2 3761826.8   208.7     5.00    14.88
1.40     YES                    NO
 L0000595         0   0.12690E-02  441359.2 3761826.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000596         0   0.12690E-02  441327.2 3761827.0   208.8     5.00    14.88
1.40     YES                    NO
 L0000597         0   0.12690E-02  441295.2 3761827.1   208.9     5.00    14.88
1.40     YES                    NO
 L0000598         0   0.12690E-02  441263.2 3761827.2   208.8     5.00    14.88
1.40     YES                    NO
 L0000599         0   0.12690E-02  441231.2 3761827.3   208.8     5.00    14.88
1.40     YES                    NO
 L0000600         0   0.12690E-02  441199.2 3761827.4   208.6     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000601         0   0.12690E-02  441167.2 3761827.5   208.8     5.00    14.88
1.40     YES                    NO
 L0000602         0   0.12690E-02  441135.2 3761827.6   208.7     5.00    14.88
1.40     YES                    NO
 L0000603         0   0.12690E-02  441103.2 3761827.7   208.7     5.00    14.88
1.40     YES                    NO
```

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 L0000604         0   0.12690E-02  441071.2 3761827.8   208.7     5.00    14.88
1.40     YES                     NO
 L0000605         0   0.12690E-02  441039.2 3761827.9   208.7     5.00    14.88
1.40     YES                     NO
 L0000606         0   0.12690E-02  441007.2 3761828.0   208.7     5.00    14.88
1.40     YES                     NO
 L0000607         0   0.12690E-02  440975.2 3761828.1   208.7     5.00    14.88
1.40     YES                     NO
 L0000608         0   0.12690E-02  440943.2 3761828.2   208.7     5.00    14.88
1.40     YES                     NO
 L0000609         0   0.12690E-02  440911.2 3761828.3   208.7     5.00    14.88
1.40     YES                     NO
 L0000610         0   0.12690E-02  440879.2 3761828.4   208.6     5.00    14.88
1.40     YES                     NO
 L0000611         0   0.12690E-02  440847.2 3761828.5   208.4     5.00    14.88
1.40     YES                     NO
 L0000612         0   0.12690E-02  440815.3 3761828.6   208.6     5.00    14.88
1.40     YES                     NO
 L0000613         0   0.12690E-02  440805.3 3761807.4   208.6     5.00    14.88
1.40     YES                     NO
 L0000614         0   0.12690E-02  440825.3 3761794.9   208.2     5.00    14.88
1.40     YES                     NO
 L0000615         0   0.12690E-02  440857.3 3761794.9   208.2     5.00    14.88
1.40     YES                     NO
 L0000616         0   0.12690E-02  440889.3 3761794.9   208.3     5.00    14.88
1.40     YES                     NO
 L0000617         0   0.12690E-02  440921.3 3761794.9   208.3     5.00    14.88
1.40     YES                     NO
 L0000618         0   0.12690E-02  440953.3 3761794.9   208.4     5.00    14.88
1.40     YES                     NO
 L0000619         0   0.12690E-02  440985.3 3761794.9   208.4     5.00    14.88
1.40     YES                     NO
 L0000620         0   0.12690E-02  441017.3 3761794.9   208.4     5.00    14.88
1.40     YES                     NO
 L0000621         0   0.12690E-02  441049.3 3761794.9   208.4     5.00    14.88
1.40     YES                     NO
 L0000622         0   0.12690E-02  441081.3 3761794.9   208.5     5.00    14.88
1.40     YES                     NO
 L0000623         0   0.12690E-02  441113.3 3761794.9   208.4     5.00    14.88
1.40     YES                     NO
 L0000624         0   0.12690E-02  441145.3 3761794.9   208.5     5.00    14.88
1.40     YES                     NO
 L0000625         0   0.12690E-02  441177.3 3761794.9   208.5     5.00    14.88
1.40     YES                     NO
 L0000626         0   0.12690E-02  441209.3 3761794.9   208.4     5.00    14.88
1.40     YES                     NO
 L0000627         0   0.12690E-02  441241.3 3761794.9   208.6     5.00    14.88
1.40     YES                     NO
 L0000628         0   0.12690E-02  441273.3 3761794.9   208.6     5.00    14.88
1.40     YES                     NO
 L0000629         0   0.12690E-02  441305.3 3761794.9   208.5     5.00    14.88
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1.40     YES                    NO
 L0000630         0   0.12690E-02  441337.3 3761794.9   208.5     5.00    14.88
1.40     YES                    NO
 L0000631         0   0.12690E-02  441369.3 3761794.9   208.3     5.00    14.88
1.40     YES                    NO
 L0000632         0   0.12690E-02  441401.3 3761794.9   208.4     5.00    14.88
1.40     YES                    NO
 L0000633         0   0.12690E-02  441433.3 3761794.9   208.4     5.00    14.88
1.40     YES                    NO
 L0000634         0   0.12690E-02  441465.3 3761794.9   208.5     5.00    14.88
1.40     YES                    NO
 L0000635         0   0.12690E-02  441497.3 3761794.9   208.6     5.00    14.88
1.40     YES                    NO
 L0000636         0   0.12690E-02  441529.3 3761794.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000637         0   0.12690E-02  441561.3 3761794.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000638         0   0.12690E-02  441593.3 3761794.9   208.8     5.00    14.88
1.40     YES                    NO
 L0000639         0   0.12690E-02  441625.3 3761794.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000640         0   0.12690E-02  441657.3 3761794.9   208.6     5.00    14.88
1.40     YES                    NO
```



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                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000641         0   0.12690E-02  441689.3 3761794.9   208.6     5.00    14.88
1.40     YES                    NO
 L0000642         0   0.12690E-02  441721.3 3761794.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000643         0   0.12690E-02  441753.3 3761794.9   208.8     5.00    14.88
1.40     YES                    NO
 L0000644         0   0.12690E-02  441785.3 3761794.9   209.2     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| L0000645 | 0 | 0.12690E-02 | 441817.3 | 3761794.9 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000646 | 0 | 0.12690E-02 | 441849.3 | 3761794.9 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000647 | 0 | 0.12690E-02 | 441881.3 | 3761794.9 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000648 | 0 | 0.12690E-02 | 441913.3 | 3761794.9 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000649 | 0 | 0.12690E-02 | 441945.3 | 3761794.9 | 209.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000650 | 0 | 0.12690E-02 | 441977.3 | 3761794.9 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000651 | 0 | 0.12690E-02 | 442009.3 | 3761794.9 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000652 | 0 | 0.12690E-02 | 442041.3 | 3761794.9 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000653 | 0 | 0.12690E-02 | 442073.3 | 3761794.9 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000654 | 0 | 0.12690E-02 | 442105.3 | 3761794.8 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000655 | 0 | 0.12690E-02 | 442137.3 | 3761794.8 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000656 | 0 | 0.12690E-02 | 442169.3 | 3761794.8 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000657 | 0 | 0.12690E-02 | 442178.1 | 3761772.1 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000658 | 0 | 0.12690E-02 | 442153.9 | 3761764.2 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000659 | 0 | 0.12690E-02 | 442121.9 | 3761764.1 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000660 | 0 | 0.12690E-02 | 442089.9 | 3761764.1 | 209.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000661 | 0 | 0.12690E-02 | 442057.9 | 3761764.0 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000662 | 0 | 0.12690E-02 | 442025.9 | 3761763.9 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000663 | 0 | 0.12690E-02 | 441993.9 | 3761763.8 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000664 | 0 | 0.12690E-02 | 441961.9 | 3761763.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000665 | 0 | 0.12690E-02 | 441929.9 | 3761763.7 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000666 | 0 | 0.12690E-02 | 441897.9 | 3761763.6 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000667 | 0 | 0.12690E-02 | 441865.9 | 3761763.6 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000668 | 0 | 0.12690E-02 | 441833.9 | 3761763.5 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000669 | 0 | 0.12690E-02 | 441801.9 | 3761763.4 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000670 | 0 | 0.12690E-02 | 441769.9 | 3761763.4 | 208.8 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000671         0   0.12690E-02  441737.9 3761763.3   208.5     5.00    14.88
1.40     YES                    NO
 L0000672         0   0.12690E-02  441705.9 3761763.2   208.5     5.00    14.88
1.40     YES                    NO
 L0000673         0   0.12690E-02  441673.9 3761763.2   208.4     5.00    14.88
1.40     YES                    NO
 L0000674         0   0.12690E-02  441641.9 3761763.1   208.4     5.00    14.88
1.40     YES                    NO
 L0000675         0   0.12690E-02  441609.9 3761763.0   208.6     5.00    14.88
1.40     YES                    NO
 L0000676         0   0.12690E-02  441577.9 3761762.9   208.5     5.00    14.88
1.40     YES                    NO
 L0000677         0   0.12690E-02  441545.9 3761762.9   208.1     5.00    14.88
1.40     YES                    NO
 L0000678         0   0.12690E-02  441513.9 3761762.8   207.8     5.00    14.88
1.40     YES                    NO
 L0000679         0   0.12690E-02  441481.9 3761762.7   208.0     5.00    14.88
1.40     YES                    NO
 L0000680         0   0.12690E-02  441449.9 3761762.7   208.0     5.00    14.88
1.40     YES                    NO
```



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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000681         0   0.12690E-02  441417.9 3761762.6   208.2     5.00    14.88
1.40     YES                    NO
 L0000682         0   0.12690E-02  441385.9 3761762.5   208.0     5.00    14.88
1.40     YES                    NO
 L0000683         0   0.12690E-02  441353.9 3761762.5   208.1     5.00    14.88
1.40     YES                    NO
 L0000684         0   0.12690E-02  441321.9 3761762.4   208.1     5.00    14.88
1.40     YES                    NO
 L0000685         0   0.12690E-02  441289.9 3761762.3   208.2     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000686 | 0 | 0.12690E-02 | 441257.9 | 3761762.3 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000687 | 0 | 0.12690E-02 | 441225.9 | 3761762.2 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000688 | 0 | 0.12690E-02 | 441193.9 | 3761762.1 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000689 | 0 | 0.12690E-02 | 441161.9 | 3761762.0 | 208.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000690 | 0 | 0.12690E-02 | 441129.9 | 3761762.0 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000691 | 0 | 0.12690E-02 | 441097.9 | 3761761.9 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000692 | 0 | 0.12690E-02 | 441065.9 | 3761761.8 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000693 | 0 | 0.12690E-02 | 441033.9 | 3761761.8 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000694 | 0 | 0.12690E-02 | 441001.9 | 3761761.7 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000695 | 0 | 0.12690E-02 | 440969.9 | 3761761.6 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000696 | 0 | 0.12690E-02 | 440937.9 | 3761761.6 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000697 | 0 | 0.12690E-02 | 440905.9 | 3761761.5 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000698 | 0 | 0.12690E-02 | 440873.9 | 3761761.4 | 208.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000699 | 0 | 0.12690E-02 | 440841.9 | 3761761.3 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000700 | 0 | 0.12690E-02 | 440809.9 | 3761761.3 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000701 | 0 | 0.12690E-02 | 440806.4 | 3761735.0 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000702 | 0 | 0.12690E-02 | 440834.1 | 3761730.3 | 207.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000703 | 0 | 0.12690E-02 | 440866.1 | 3761730.3 | 207.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000704 | 0 | 0.12690E-02 | 440898.1 | 3761730.3 | 207.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000705 | 0 | 0.12690E-02 | 440930.1 | 3761730.3 | 207.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000706 | 0 | 0.12690E-02 | 440962.1 | 3761730.3 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000707 | 0 | 0.12690E-02 | 440994.1 | 3761730.3 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000708 | 0 | 0.12690E-02 | 441026.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000709 | 0 | 0.12690E-02 | 441058.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000710 | 0 | 0.12690E-02 | 441090.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000711 | 0 | 0.12690E-02 | 441122.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000712         0   0.12690E-02  441154.1 3761730.4   208.1     5.00    14.88
1.40     YES                    NO
 L0000713         0   0.12690E-02  441186.1 3761730.4   207.9     5.00    14.88
1.40     YES                    NO
 L0000714         0   0.12690E-02  441218.1 3761730.4   207.9     5.00    14.88
1.40     YES                    NO
 L0000715         0   0.12690E-02  441250.1 3761730.4   208.1     5.00    14.88
1.40     YES                    NO
 L0000716         0   0.12690E-02  441282.1 3761730.5   208.2     5.00    14.88
1.40     YES                    NO
 L0000717         0   0.12690E-02  441314.1 3761730.5   208.0     5.00    14.88
1.40     YES                    NO
 L0000718         0   0.12690E-02  441346.1 3761730.5   207.8     5.00    14.88
1.40     YES                    NO
 L0000719         0   0.12690E-02  441378.1 3761730.5   207.4     5.00    14.88
1.40     YES                    NO
 L0000720         0   0.12690E-02  441410.1 3761730.5   207.7     5.00    14.88
1.40     YES                    NO
```



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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000721         0   0.12690E-02  441442.1 3761730.5   207.6     5.00    14.88
1.40     YES                    NO
 L0000722         0   0.12690E-02  441474.1 3761730.5   207.5     5.00    14.88
1.40     YES                    NO
 L0000723         0   0.12690E-02  441506.1 3761730.6   207.1     5.00    14.88
1.40     YES                    NO
 L0000724         0   0.12690E-02  441538.1 3761730.6   207.1     5.00    14.88
1.40     YES                    NO
 L0000725         0   0.12690E-02  441570.1 3761730.6   208.9     5.00    14.88
1.40     YES                    NO
 L0000726         0   0.12690E-02  441602.1 3761730.6   208.7     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| L0000727 | 0 | 0.12690E-02 | 441634.1 | 3761730.6 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000728 | 0 | 0.12690E-02 | 441666.1 | 3761730.6 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000729 | 0 | 0.12690E-02 | 441698.1 | 3761730.6 | 208.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000730 | 0 | 0.12690E-02 | 441730.1 | 3761730.6 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000731 | 0 | 0.12690E-02 | 441762.1 | 3761730.7 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000732 | 0 | 0.12690E-02 | 441794.1 | 3761730.7 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000733 | 0 | 0.12690E-02 | 441826.1 | 3761730.7 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000734 | 0 | 0.12690E-02 | 441858.1 | 3761730.7 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000735 | 0 | 0.12690E-02 | 441890.1 | 3761730.7 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000736 | 0 | 0.12690E-02 | 441922.1 | 3761730.7 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000737 | 0 | 0.12690E-02 | 441954.1 | 3761730.7 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000738 | 0 | 0.12690E-02 | 441986.1 | 3761730.8 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000739 | 0 | 0.12690E-02 | 442018.1 | 3761730.8 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000740 | 0 | 0.12690E-02 | 442050.1 | 3761730.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000741 | 0 | 0.12690E-02 | 442082.1 | 3761730.8 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000742 | 0 | 0.12690E-02 | 442114.1 | 3761730.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000743 | 0 | 0.12690E-02 | 442146.1 | 3761730.8 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000744 | 0 | 0.12690E-02 | 442178.1 | 3761730.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000745 | 0 | 0.12690E-02 | 442176.6 | 3761700.2 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000746 | 0 | 0.12690E-02 | 442147.5 | 3761697.2 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000747 | 0 | 0.12690E-02 | 442115.5 | 3761697.3 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000748 | 0 | 0.12690E-02 | 442083.5 | 3761697.4 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000749 | 0 | 0.12690E-02 | 442051.5 | 3761697.5 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000750 | 0 | 0.12690E-02 | 442019.5 | 3761697.7 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000751 | 0 | 0.12690E-02 | 441987.5 | 3761697.8 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000752 | 0 | 0.12690E-02 | 441955.5 | 3761697.9 | 208.6 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000753         0   0.12690E-02  441923.5 3761698.0   208.7     5.00    14.88
1.40     YES                    NO
 L0000754         0   0.12690E-02  441891.5 3761698.1   208.8     5.00    14.88
1.40     YES                    NO
 L0000755         0   0.12690E-02  441859.5 3761698.3   208.8     5.00    14.88
1.40     YES                    NO
 L0000756         0   0.12690E-02  441827.5 3761698.4   208.7     5.00    14.88
1.40     YES                    NO
 L0000757         0   0.12690E-02  441795.5 3761698.5   208.2     5.00    14.88
1.40     YES                    NO
 L0000758         0   0.12690E-02  441763.5 3761698.6   207.8     5.00    14.88
1.40     YES                    NO
 L0000759         0   0.12690E-02  441731.5 3761698.8   207.7     5.00    14.88
1.40     YES                    NO
 L0000760         0   0.12690E-02  441699.5 3761698.9   207.7     5.00    14.88
1.40     YES                    NO
```



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                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000761         0   0.12690E-02  441667.5 3761699.0   207.7     5.00    14.88
1.40     YES                    NO
 L0000762         0   0.12690E-02  441635.5 3761699.1   207.7     5.00    14.88
1.40     YES                    NO
 L0000763         0   0.12690E-02  441603.5 3761699.3   208.5     5.00    14.88
1.40     YES                    NO
 L0000764         0   0.12690E-02  441571.5 3761699.4   209.6     5.00    14.88
1.40     YES                    NO
 L0000765         0   0.12690E-02  441539.5 3761699.5   206.9     5.00    14.88
1.40     YES                    NO
 L0000766         0   0.12690E-02  441507.5 3761699.6   206.9     5.00    14.88
1.40     YES                    NO
 L0000767         0   0.12690E-02  441475.5 3761699.7   207.5     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000768 | 0 | 0.12690E-02 | 441443.5 | 3761699.9 | 207.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000769 | 0 | 0.12690E-02 | 441411.5 | 3761700.0 | 207.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000770 | 0 | 0.12690E-02 | 441379.5 | 3761700.1 | 207.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000771 | 0 | 0.12690E-02 | 441347.5 | 3761700.2 | 207.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000772 | 0 | 0.12690E-02 | 441315.5 | 3761700.4 | 208.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000773 | 0 | 0.12690E-02 | 441283.5 | 3761700.5 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000774 | 0 | 0.12690E-02 | 441251.5 | 3761700.6 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000775 | 0 | 0.12690E-02 | 441219.5 | 3761700.7 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000776 | 0 | 0.12690E-02 | 441187.5 | 3761700.9 | 207.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000777 | 0 | 0.12690E-02 | 441155.5 | 3761701.0 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000778 | 0 | 0.12690E-02 | 441123.5 | 3761701.1 | 207.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000779 | 0 | 0.12690E-02 | 441091.5 | 3761701.2 | 207.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000780 | 0 | 0.12690E-02 | 441059.5 | 3761701.3 | 207.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000781 | 0 | 0.12690E-02 | 441027.5 | 3761701.5 | 207.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000782 | 0 | 0.12690E-02 | 440995.5 | 3761701.6 | 207.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000783 | 0 | 0.12690E-02 | 440963.5 | 3761701.7 | 207.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000784 | 0 | 0.12690E-02 | 440931.5 | 3761701.8 | 207.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000785 | 0 | 0.12690E-02 | 440899.5 | 3761702.0 | 207.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000786 | 0 | 0.12690E-02 | 440867.5 | 3761702.1 | 207.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000787 | 0 | 0.12690E-02 | 440835.5 | 3761702.2 | 207.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000788 | 0 | 0.12690E-02 | 440803.5 | 3761702.3 | 208.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000789 | 0 | 0.34843E-02 | 442221.2 | 3762270.1 | 214.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000790 | 0 | 0.34843E-02 | 442253.1 | 3762269.9 | 214.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000791 | 0 | 0.34843E-02 | 442285.1 | 3762269.6 | 213.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000792 | 0 | 0.34843E-02 | 442317.1 | 3762269.4 | 213.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000793 | 0 | 0.34843E-02 | 442349.1 | 3762269.2 | 214.1 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000794         0   0.34843E-02  442381.1 3762268.9   214.7     5.00    14.88
1.40     YES                    NO
 L0000795         0   0.34843E-02  442386.0 3762241.8   214.8     5.00    14.88
1.40     YES                    NO
 L0000796         0   0.34843E-02  442360.1 3762236.8   214.2     5.00    14.88
1.40     YES                    NO
 L0000797         0   0.34843E-02  442328.2 3762238.3   213.7     5.00    14.88
1.40     YES                    NO
 L0000798         0   0.34843E-02  442296.2 3762239.7   213.4     5.00    14.88
1.40     YES                    NO
 L0000799         0   0.34843E-02  442264.2 3762241.1   213.6     5.00    14.88
1.40     YES                    NO
 L0000800         0   0.34843E-02  442232.3 3762242.6   214.2     5.00    14.88
1.40     YES                    NO
```



*** VOLUME SOURCE DATA ***

```
               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000801         0   0.34843E-02  442209.1 3762234.8   214.4     5.00    14.88
1.40     YES                    NO
 L0000802         0   0.34843E-02  442210.1 3762203.7   214.0     5.00    14.88
1.40     YES                    NO
 L0000803         0   0.34843E-02  442242.1 3762203.5   213.6     5.00    14.88
1.40     YES                    NO
 L0000804         0   0.34843E-02  442274.1 3762203.2   213.2     5.00    14.88
1.40     YES                    NO
 L0000805         0   0.34843E-02  442306.1 3762203.0   213.1     5.00    14.88
1.40     YES                    NO
 L0000806         0   0.34843E-02  442338.1 3762202.8   213.6     5.00    14.88
1.40     YES                    NO
 L0000807         0   0.34843E-02  442370.1 3762202.5   214.0     5.00    14.88
1.40     YES                    NO
 L0000808         0   0.34843E-02  442386.6 3762186.4   214.3     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000809 | 0 | 0.34843E-02 | 442375.2 | 3762166.5 | 213.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000810 | 0 | 0.34843E-02 | 442343.2 | 3762166.5 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000811 | 0 | 0.34843E-02 | 442311.2 | 3762166.5 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000812 | 0 | 0.34843E-02 | 442279.2 | 3762166.5 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000813 | 0 | 0.34843E-02 | 442247.2 | 3762166.5 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000814 | 0 | 0.34843E-02 | 442215.2 | 3762166.5 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000815 | 0 | 0.34843E-02 | 442206.8 | 3762144.6 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000816 | 0 | 0.34843E-02 | 442227.1 | 3762132.4 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000817 | 0 | 0.34843E-02 | 442259.1 | 3762133.1 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000818 | 0 | 0.34843E-02 | 442291.1 | 3762133.8 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000819 | 0 | 0.34843E-02 | 442323.0 | 3762134.5 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000820 | 0 | 0.34843E-02 | 442355.0 | 3762135.2 | 213.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000821 | 0 | 0.34843E-02 | 442387.0 | 3762135.9 | 213.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000822 | 0 | 0.34843E-02 | 442384.9 | 3762106.6 | 213.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000823 | 0 | 0.34843E-02 | 442352.9 | 3762106.4 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000824 | 0 | 0.34843E-02 | 442320.9 | 3762106.2 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000825 | 0 | 0.34843E-02 | 442288.9 | 3762106.0 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000826 | 0 | 0.34843E-02 | 442256.9 | 3762105.7 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000827 | 0 | 0.34843E-02 | 442224.9 | 3762105.5 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000828 | 0 | 0.34843E-02 | 442200.8 | 3762097.1 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000829 | 0 | 0.34843E-02 | 442210.8 | 3762076.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000830 | 0 | 0.34843E-02 | 442242.8 | 3762075.8 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000831 | 0 | 0.34843E-02 | 442274.8 | 3762075.6 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000832 | 0 | 0.34843E-02 | 442306.8 | 3762075.3 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000833 | 0 | 0.34843E-02 | 442338.8 | 3762075.1 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000834 | 0 | 0.34843E-02 | 442370.8 | 3762074.9 | 213.0 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000835         0   0.34843E-02  442402.8 3762074.7   213.3     5.00    14.88
1.40     YES                    NO
 L0000836         0   0.34843E-02  442434.8 3762074.5   213.6     5.00    14.88
1.40     YES                    NO
 L0000837         0   0.34843E-02  442466.8 3762074.3   213.6     5.00    14.88
1.40     YES                    NO
 L0000838         0   0.34843E-02  442498.8 3762074.0   213.6     5.00    14.88
1.40     YES                    NO
 L0000839         0   0.34843E-02  442530.8 3762073.8   213.7     5.00    14.88
1.40     YES                    NO
 L0000840         0   0.34843E-02  442562.8 3762073.6   213.6     5.00    14.88
1.40     YES                    NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                        ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                   *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
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 L0000841         0   0.34843E-02  442594.8 3762073.4   213.6     5.00    14.88
1.40     YES                    NO
 L0000842         0   0.34843E-02  442626.8 3762073.2   213.6     5.00    14.88
1.40     YES                    NO
 L0000843         0   0.34843E-02  442658.8 3762072.9   213.5     5.00    14.88
1.40     YES                    NO
 L0000844         0   0.34843E-02  442690.8 3762072.7   213.5     5.00    14.88
1.40     YES                    NO
 L0000845         0   0.34843E-02  442722.8 3762072.5   213.4     5.00    14.88
1.40     YES                    NO
 L0000846         0   0.34843E-02  442754.8 3762072.3   213.2     5.00    14.88
1.40     YES                    NO
 L0000847         0   0.34843E-02  442784.9 3762070.3   212.9     5.00    14.88
1.40     YES                    NO
 L0000848         0   0.34843E-02  442780.4 3762041.5   212.5     5.00    14.88
1.40     YES                    NO
 L0000849         0   0.34843E-02  442748.4 3762041.8   212.7     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| L0000850 | 0 | 0.34843E-02 | 442716.4 | 3762042.1 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000851 | 0 | 0.34843E-02 | 442684.4 | 3762042.4 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000852 | 0 | 0.34843E-02 | 442652.4 | 3762042.7 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000853 | 0 | 0.34843E-02 | 442620.4 | 3762043.0 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000854 | 0 | 0.34843E-02 | 442588.4 | 3762043.3 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000855 | 0 | 0.34843E-02 | 442556.5 | 3762043.6 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000856 | 0 | 0.34843E-02 | 442524.5 | 3762043.9 | 213.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000857 | 0 | 0.34843E-02 | 442492.5 | 3762044.2 | 213.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000858 | 0 | 0.34843E-02 | 442460.5 | 3762044.5 | 213.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000859 | 0 | 0.34843E-02 | 442428.5 | 3762044.8 | 213.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000860 | 0 | 0.34843E-02 | 442396.5 | 3762045.1 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000861 | 0 | 0.34843E-02 | 442364.5 | 3762045.4 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000862 | 0 | 0.34843E-02 | 442332.5 | 3762045.7 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000863 | 0 | 0.34843E-02 | 442300.5 | 3762046.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000864 | 0 | 0.34843E-02 | 442268.5 | 3762046.3 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000865 | 0 | 0.34843E-02 | 442236.5 | 3762046.6 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000866 | 0 | 0.34843E-02 | 442207.9 | 3762043.5 | 212.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000867 | 0 | 0.34843E-02 | 442209.1 | 3762011.5 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000868 | 0 | 0.34843E-02 | 442240.6 | 3762010.9 | 212.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000869 | 0 | 0.34843E-02 | 442272.6 | 3762010.9 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000870 | 0 | 0.34843E-02 | 442304.6 | 3762010.9 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000871 | 0 | 0.34843E-02 | 442336.6 | 3762010.9 | 212.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000872 | 0 | 0.34843E-02 | 442368.6 | 3762010.9 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000873 | 0 | 0.34843E-02 | 442400.6 | 3762010.9 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000874 | 0 | 0.34843E-02 | 442432.6 | 3762010.9 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000875 | 0 | 0.34843E-02 | 442464.6 | 3762010.9 | 214.1 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000876         0   0.34843E-02  442496.6 3762010.9   213.7     5.00    14.88
1.40     YES                    NO
 L0000877         0   0.34843E-02  442528.6 3762010.9   212.9     5.00    14.88
1.40     YES                    NO
 L0000878         0   0.34843E-02  442560.6 3762010.9   212.7     5.00    14.88
1.40     YES                    NO
 L0000879         0   0.34843E-02  442592.6 3762010.9   212.6     5.00    14.88
1.40     YES                    NO
 L0000880         0   0.34843E-02  442624.6 3762010.9   212.4     5.00    14.88
1.40     YES                    NO
```



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                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
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 L0000881         0   0.34843E-02  442656.6 3762010.9   212.3     5.00    14.88
1.40     YES                    NO
 L0000882         0   0.34843E-02  442688.6 3762010.9   212.5     5.00    14.88
1.40     YES                    NO
 L0000883         0   0.34843E-02  442720.6 3762010.9   212.5     5.00    14.88
1.40     YES                    NO
 L0000884         0   0.34843E-02  442752.6 3762010.9   212.3     5.00    14.88
1.40     YES                    NO
 L0000885         0   0.34843E-02  442783.5 3762010.0   212.1     5.00    14.88
1.40     YES                    NO
 L0000886         0   0.34843E-02  442780.3 3761978.2   211.8     5.00    14.88
1.40     YES                    NO
 L0000887         0   0.34843E-02  442753.5 3761972.3   211.8     5.00    14.88
1.40     YES                    NO
 L0000888         0   0.34843E-02  442721.5 3761972.3   212.1     5.00    14.88
1.40     YES                    NO
 L0000889         0   0.34843E-02  442689.5 3761972.3   211.9     5.00    14.88
1.40     YES                    NO
 L0000890         0   0.34843E-02  442657.5 3761972.3   211.8     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000891 | 0 | 0.34843E-02 | 442625.5 | 3761972.3 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000892 | 0 | 0.34843E-02 | 442593.5 | 3761972.3 | 212.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000893 | 0 | 0.34843E-02 | 442561.5 | 3761972.3 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000894 | 0 | 0.34843E-02 | 442529.5 | 3761972.3 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000895 | 0 | 0.34843E-02 | 442497.5 | 3761972.3 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000896 | 0 | 0.34843E-02 | 442465.5 | 3761972.3 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000897 | 0 | 0.34843E-02 | 442433.5 | 3761972.3 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000898 | 0 | 0.34843E-02 | 442401.5 | 3761972.3 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000899 | 0 | 0.34843E-02 | 442369.5 | 3761972.3 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000900 | 0 | 0.34843E-02 | 442337.5 | 3761972.3 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000901 | 0 | 0.34843E-02 | 442305.5 | 3761972.3 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000902 | 0 | 0.34843E-02 | 442273.5 | 3761972.3 | 212.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000903 | 0 | 0.34843E-02 | 442241.5 | 3761972.3 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000904 | 0 | 0.34843E-02 | 442209.5 | 3761972.3 | 211.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000905 | 0 | 0.34843E-02 | 442205.4 | 3761942.1 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000906 | 0 | 0.34843E-02 | 442234.1 | 3761939.1 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000907 | 0 | 0.34843E-02 | 442266.1 | 3761939.1 | 211.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000908 | 0 | 0.34843E-02 | 442298.1 | 3761939.1 | 211.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000909 | 0 | 0.34843E-02 | 442330.1 | 3761939.1 | 211.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000910 | 0 | 0.34843E-02 | 442362.1 | 3761939.1 | 212.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000911 | 0 | 0.34843E-02 | 442394.1 | 3761939.1 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000912 | 0 | 0.34843E-02 | 442426.1 | 3761939.1 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000913 | 0 | 0.34843E-02 | 442458.1 | 3761939.1 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000914 | 0 | 0.34843E-02 | 442490.1 | 3761939.1 | 212.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000915 | 0 | 0.34843E-02 | 442522.1 | 3761939.1 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000916 | 0 | 0.34843E-02 | 442554.1 | 3761939.1 | 211.8 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000917         0   0.34843E-02  442586.1 3761939.1   211.9     5.00    14.88
1.40     YES                    NO
 L0000918         0   0.34843E-02  442618.1 3761939.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000919         0   0.34843E-02  442650.1 3761939.1   211.5     5.00    14.88
1.40     YES                    NO
 L0000920         0   0.34843E-02  442682.1 3761939.1   211.3     5.00    14.88
1.40     YES                    NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                   *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
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 L0000921         0   0.34843E-02  442714.1 3761939.1   211.8     5.00    14.88
1.40     YES                    NO
 L0000922         0   0.34843E-02  442746.1 3761939.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000923         0   0.34843E-02  442778.1 3761939.1   211.5     5.00    14.88
1.40     YES                    NO
 L0000924         0   0.34843E-02  442784.2 3761915.4   211.3     5.00    14.88
1.40     YES                    NO
 L0000925         0   0.34843E-02  442758.5 3761908.3   211.2     5.00    14.88
1.40     YES                    NO
 L0000926         0   0.34843E-02  442726.5 3761908.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000927         0   0.34843E-02  442694.5 3761907.9   211.3     5.00    14.88
1.40     YES                    NO
 L0000928         0   0.34843E-02  442662.5 3761907.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000929         0   0.34843E-02  442630.5 3761907.4   211.3     5.00    14.88
1.40     YES                    NO
 L0000930         0   0.34843E-02  442598.5 3761907.2   211.5     5.00    14.88
1.40     YES                    NO
 L0000931         0   0.34843E-02  442566.5 3761907.0   211.5     5.00    14.88
1.40     YES                    NO
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 L0000932         0   0.34843E-02  442534.5 3761906.8   211.1     5.00    14.88
1.40     YES                     NO
 L0000933         0   0.34843E-02  442502.5 3761906.5   211.4     5.00    14.88
1.40     YES                     NO
 L0000934         0   0.34843E-02  442470.5 3761906.3   211.6     5.00    14.88
1.40     YES                     NO
 L0000935         0   0.34843E-02  442438.5 3761906.1   211.4     5.00    14.88
1.40     YES                     NO
 L0000936         0   0.34843E-02  442406.5 3761905.9   211.3     5.00    14.88
1.40     YES                     NO
 L0000937         0   0.34843E-02  442374.5 3761905.7   211.9     5.00    14.88
1.40     YES                     NO
 L0000938         0   0.34843E-02  442342.5 3761905.4   211.3     5.00    14.88
1.40     YES                     NO
 L0000939         0   0.34843E-02  442310.5 3761905.2   210.8     5.00    14.88
1.40     YES                     NO
 L0000940         0   0.34843E-02  442278.5 3761905.0   211.3     5.00    14.88
1.40     YES                     NO
 L0000941         0   0.34843E-02  442246.5 3761904.8   211.6     5.00    14.88
1.40     YES                     NO
 L0000942         0   0.34843E-02  442214.5 3761904.5   211.1     5.00    14.88
1.40     YES                     NO
 L0000943         0   0.34843E-02  442211.8 3761875.3   210.8     5.00    14.88
1.40     YES                     NO
 L0000944         0   0.34843E-02  442238.5 3761870.1   211.2     5.00    14.88
1.40     YES                     NO
 L0000945         0   0.34843E-02  442270.5 3761870.4   211.0     5.00    14.88
1.40     YES                     NO
 L0000946         0   0.34843E-02  442302.5 3761870.6   210.5     5.00    14.88
1.40     YES                     NO
 L0000947         0   0.34843E-02  442334.5 3761870.8   210.7     5.00    14.88
1.40     YES                     NO
 L0000948         0   0.34843E-02  442366.5 3761871.0   211.4     5.00    14.88
1.40     YES                     NO
 L0000949         0   0.34843E-02  442398.5 3761871.2   210.9     5.00    14.88
1.40     YES                     NO
 L0000950         0   0.34843E-02  442430.5 3761871.5   210.5     5.00    14.88
1.40     YES                     NO
 L0000951         0   0.34843E-02  442462.5 3761871.7   210.6     5.00    14.88
1.40     YES                     NO
 L0000952         0   0.34843E-02  442494.5 3761871.9   210.6     5.00    14.88
1.40     YES                     NO
 L0000953         0   0.34843E-02  442526.5 3761872.1   210.4     5.00    14.88
1.40     YES                     NO
 L0000954         0   0.34843E-02  442558.5 3761872.4   210.8     5.00    14.88
1.40     YES                     NO
 L0000955         0   0.34843E-02  442590.5 3761872.6   211.1     5.00    14.88
1.40     YES                     NO
 L0000956         0   0.34843E-02  442622.5 3761872.8   211.1     5.00    14.88
1.40     YES                     NO
 L0000957         0   0.34843E-02  442654.5 3761873.0   210.9     5.00    14.88
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1.40     YES                    NO
 L0000958         0   0.34843E-02  442686.5 3761873.3   210.8     5.00    14.88
1.40     YES                    NO
 L0000959         0   0.34843E-02  442718.5 3761873.5   211.4     5.00    14.88
1.40     YES                    NO
 L0000960         0   0.34843E-02  442750.5 3761873.7   211.0     5.00    14.88
1.40     YES                    NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                          ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                   *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
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 L0000961         0   0.34843E-02  442782.3 3761873.8   210.9     5.00    14.88
1.40     YES                    NO
 L0000962         0   0.34843E-02  442780.7 3761843.3   210.5     5.00    14.88
1.40     YES                    NO
 L0000963         0   0.34843E-02  442748.7 3761843.1   210.7     5.00    14.88
1.40     YES                    NO
 L0000964         0   0.34843E-02  442716.7 3761842.9   211.0     5.00    14.88
1.40     YES                    NO
 L0000965         0   0.34843E-02  442684.7 3761842.7   210.4     5.00    14.88
1.40     YES                    NO
 L0000966         0   0.34843E-02  442652.7 3761842.4   210.6     5.00    14.88
1.40     YES                    NO
 L0000967         0   0.34843E-02  442620.7 3761842.2   210.8     5.00    14.88
1.40     YES                    NO
 L0000968         0   0.34843E-02  442588.7 3761842.0   210.8     5.00    14.88
1.40     YES                    NO
 L0000969         0   0.34843E-02  442556.7 3761841.8   210.5     5.00    14.88
1.40     YES                    NO
 L0000970         0   0.34843E-02  442524.7 3761841.5   210.1     5.00    14.88
1.40     YES                    NO
 L0000971         0   0.34843E-02  442492.7 3761841.3   210.0     5.00    14.88
1.40     YES                    NO
 L0000972         0   0.34843E-02  442460.7 3761841.1   209.9     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| L0000973 | 0 | 0.34843E-02 | 442428.7 | 3761840.9 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000974 | 0 | 0.34843E-02 | 442396.7 | 3761840.7 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000975 | 0 | 0.34843E-02 | 442364.8 | 3761840.4 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000976 | 0 | 0.34843E-02 | 442332.8 | 3761840.2 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000977 | 0 | 0.34843E-02 | 442300.8 | 3761840.0 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000978 | 0 | 0.34843E-02 | 442268.8 | 3761839.8 | 210.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000979 | 0 | 0.34843E-02 | 442236.8 | 3761839.5 | 210.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000980 | 0 | 0.34843E-02 | 442211.8 | 3761832.3 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000981 | 0 | 0.34843E-02 | 442212.3 | 3761800.8 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000982 | 0 | 0.34843E-02 | 442244.3 | 3761801.2 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000983 | 0 | 0.34843E-02 | 442276.3 | 3761801.7 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000984 | 0 | 0.34843E-02 | 442308.3 | 3761802.1 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000985 | 0 | 0.34843E-02 | 442340.3 | 3761802.6 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000986 | 0 | 0.34843E-02 | 442372.3 | 3761803.0 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000987 | 0 | 0.34843E-02 | 442404.3 | 3761803.4 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000988 | 0 | 0.34843E-02 | 442436.3 | 3761803.9 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000989 | 0 | 0.34843E-02 | 442468.3 | 3761804.3 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000990 | 0 | 0.34843E-02 | 442500.3 | 3761804.8 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000991 | 0 | 0.34843E-02 | 442532.3 | 3761805.2 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000992 | 0 | 0.34843E-02 | 442564.2 | 3761805.7 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000993 | 0 | 0.34843E-02 | 442596.2 | 3761806.1 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000994 | 0 | 0.34843E-02 | 442628.2 | 3761806.5 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000995 | 0 | 0.34843E-02 | 442660.2 | 3761807.0 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000996 | 0 | 0.34843E-02 | 442692.2 | 3761807.4 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000997 | 0 | 0.34843E-02 | 442724.2 | 3761807.9 | 210.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000998 | 0 | 0.34843E-02 | 442756.2 | 3761808.3 | 210.3 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000999         0   0.34843E-02  442788.2 3761808.7   210.3     5.00    14.88
1.40     YES                    NO
 L0001000         0   0.34843E-02  442790.3 3761778.8   210.0     5.00    14.88
1.40     YES                    NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                   *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0001001         0   0.34843E-02  442760.3 3761776.7   210.0     5.00    14.88
1.40     YES                    NO
 L0001002         0   0.34843E-02  442728.3 3761776.6   210.6     5.00    14.88
1.40     YES                    NO
 L0001003         0   0.34843E-02  442696.3 3761776.4   210.2     5.00    14.88
1.40     YES                    NO
 L0001004         0   0.34843E-02  442664.3 3761776.3   209.9     5.00    14.88
1.40     YES                    NO
 L0001005         0   0.34843E-02  442632.3 3761776.1   210.2     5.00    14.88
1.40     YES                    NO
 L0001006         0   0.34843E-02  442600.3 3761776.0   210.2     5.00    14.88
1.40     YES                    NO
 L0001007         0   0.34843E-02  442568.3 3761775.8   210.2     5.00    14.88
1.40     YES                    NO
 L0001008         0   0.34843E-02  442536.3 3761775.7   210.2     5.00    14.88
1.40     YES                    NO
 L0001009         0   0.34843E-02  442504.3 3761775.5   210.0     5.00    14.88
1.40     YES                    NO
 L0001010         0   0.34843E-02  442472.3 3761775.4   209.6     5.00    14.88
1.40     YES                    NO
 L0001011         0   0.34843E-02  442440.3 3761775.2   209.6     5.00    14.88
1.40     YES                    NO
 L0001012         0   0.34843E-02  442408.3 3761775.1   209.5     5.00    14.88
1.40     YES                    NO
 L0001013         0   0.34843E-02  442376.3 3761774.9   209.5     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0001014 | 0 | 0.34843E-02 | 442344.3 | 3761774.8 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001015 | 0 | 0.34843E-02 | 442312.3 | 3761774.6 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001016 | 0 | 0.34843E-02 | 442280.3 | 3761774.5 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001017 | 0 | 0.34843E-02 | 442248.3 | 3761774.3 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001018 | 0 | 0.34843E-02 | 442216.3 | 3761774.2 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001019 | 0 | 0.34843E-02 | 442215.8 | 3761742.7 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001020 | 0 | 0.34843E-02 | 442240.7 | 3761735.9 | 209.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001021 | 0 | 0.34843E-02 | 442272.7 | 3761736.3 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001022 | 0 | 0.34843E-02 | 442304.7 | 3761736.7 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001023 | 0 | 0.34843E-02 | 442336.7 | 3761737.0 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001024 | 0 | 0.34843E-02 | 442368.7 | 3761737.4 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001025 | 0 | 0.34843E-02 | 442400.7 | 3761737.8 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001026 | 0 | 0.34843E-02 | 442432.7 | 3761738.1 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001027 | 0 | 0.34843E-02 | 442464.7 | 3761738.5 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001028 | 0 | 0.34843E-02 | 442496.7 | 3761738.9 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001029 | 0 | 0.34843E-02 | 442528.7 | 3761739.3 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001030 | 0 | 0.34843E-02 | 442560.7 | 3761739.6 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001031 | 0 | 0.34843E-02 | 442592.7 | 3761740.0 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001032 | 0 | 0.34843E-02 | 442624.7 | 3761740.4 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001033 | 0 | 0.34843E-02 | 442656.7 | 3761740.7 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001034 | 0 | 0.34843E-02 | 442688.7 | 3761741.1 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001035 | 0 | 0.34843E-02 | 442720.7 | 3761741.5 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001036 | 0 | 0.34843E-02 | 442752.7 | 3761741.8 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001037 | 0 | 0.34843E-02 | 442784.7 | 3761742.2 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001038 | 0 | 0.34843E-02 | 442792.7 | 3761716.0 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0001039 | 0 | 0.34843E-02 | 442763.9 | 3761713.0 | 209.6 | 5.00 | 14.88 | | | |

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1.40     YES                     NO
 L0001040         0   0.34843E-02  442731.9 3761713.0   210.2     5.00    14.88
1.40     YES                     NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                          ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                        ***        20:06:41

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                     *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
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- - - - - - - - - - - - - - - - - - - -

 L0001041         0   0.34843E-02  442699.9 3761713.0   209.9     5.00    14.88
1.40     YES                     NO
 L0001042         0   0.34843E-02  442667.9 3761713.0   209.5     5.00    14.88
1.40     YES                     NO
 L0001043         0   0.34843E-02  442635.9 3761713.0   209.8     5.00    14.88
1.40     YES                     NO
 L0001044         0   0.34843E-02  442603.9 3761713.0   209.9     5.00    14.88
1.40     YES                     NO
 L0001045         0   0.34843E-02  442571.9 3761713.0   210.1     5.00    14.88
1.40     YES                     NO
 L0001046         0   0.34843E-02  442539.9 3761713.0   210.0     5.00    14.88
1.40     YES                     NO
 L0001047         0   0.34843E-02  442507.9 3761713.0   209.9     5.00    14.88
1.40     YES                     NO
 L0001048         0   0.34843E-02  442475.9 3761713.0   209.2     5.00    14.88
1.40     YES                     NO
 L0001049         0   0.34843E-02  442443.9 3761713.0   209.1     5.00    14.88
1.40     YES                     NO
 L0001050         0   0.34843E-02  442411.9 3761713.0   208.9     5.00    14.88
1.40     YES                     NO
 L0001051         0   0.34843E-02  442379.9 3761713.0   209.2     5.00    14.88
1.40     YES                     NO
 L0001052         0   0.34843E-02  442347.9 3761713.0   209.0     5.00    14.88
1.40     YES                     NO
 L0001053         0   0.34843E-02  442315.9 3761713.0   209.1     5.00    14.88
1.40     YES                     NO
 L0001054         0   0.34843E-02  442283.9 3761713.0   208.8     5.00    14.88
1.40     YES                     NO
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 L0001055         0   0.34843E-02  442251.9 3761713.0   208.4     5.00    14.88
1.40     YES                     NO
 L0001056         0   0.34843E-02  442219.9 3761713.0   208.9     5.00    14.88
1.40     YES                     NO
 L0001057         0   0.34843E-02  442202.3 3761696.0   208.8     5.00    14.88
1.40     YES                     NO
 L0001058         0   0.34843E-02  442216.7 3761681.3   208.4     5.00    14.88
1.40     YES                     NO
 L0001059         0   0.34843E-02  442248.7 3761681.7   207.8     5.00    14.88
1.40     YES                     NO
 L0001060         0   0.34843E-02  442280.7 3761682.0   208.3     5.00    14.88
1.40     YES                     NO
 L0001061         0   0.34843E-02  442312.7 3761682.4   208.9     5.00    14.88
1.40     YES                     NO
 L0001062         0   0.34843E-02  442344.7 3761682.8   208.9     5.00    14.88
1.40     YES                     NO
 L0001063         0   0.34843E-02  442376.7 3761683.1   209.1     5.00    14.88
1.40     YES                     NO
 L0001064         0   0.34843E-02  442408.7 3761683.5   208.9     5.00    14.88
1.40     YES                     NO
 L0001065         0   0.34843E-02  442440.7 3761683.8   209.0     5.00    14.88
1.40     YES                     NO
 L0001066         0   0.34843E-02  442472.7 3761684.2   209.0     5.00    14.88
1.40     YES                     NO
 L0001067         0   0.34843E-02  442504.7 3761684.6   209.6     5.00    14.88
1.40     YES                     NO
 L0001068         0   0.34843E-02  442536.7 3761684.9   209.7     5.00    14.88
1.40     YES                     NO
 L0001069         0   0.34843E-02  442568.7 3761685.3   209.7     5.00    14.88
1.40     YES                     NO
 L0001070         0   0.34843E-02  442600.7 3761685.7   209.7     5.00    14.88
1.40     YES                     NO
 L0001071         0   0.34843E-02  442632.7 3761686.0   209.6     5.00    14.88
1.40     YES                     NO
 L0001072         0   0.34843E-02  442664.7 3761686.4   209.3     5.00    14.88
1.40     YES                     NO
 L0001073         0   0.34843E-02  442696.7 3761686.8   209.5     5.00    14.88
1.40     YES                     NO
 L0001074         0   0.34843E-02  442728.7 3761687.1   210.0     5.00    14.88
1.40     YES                     NO
 L0001075         0   0.34843E-02  442760.7 3761687.5   209.5     5.00    14.88
1.40     YES                     NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*
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*** AREAPOLY SOURCE DATA ***

```
               NUMBER EMISSION RATE   LOCATION OF AREA  BASE     RELEASE  NUMBER
 INIT.   URBAN  EMISSION RATE    AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC       X        Y      ELEV.    HEIGHT  OF VERTS.
  SZ     SOURCE  SCALAR VARY
     ID         CATS.   /METER**2)   (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - -

 PAREA1           0   0.12184E-05  440792.7 3762267.5   213.4     0.00       4
  1.00     YES                     NO
 PAREA2           0   0.34973E-05  442194.7 3762277.8   215.2     0.00       6
  1.00     YES                     NO
```



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
|---|---|
| P2EXHAUS | L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , L0000029 , L0000030 , L0000031 , L0000032 , L0000033 , L0000034 , L0000035 , L0000036 , L0000037 , L0000038 , L0000039 , L0000040 , L0000041 , L0000042 , L0000043 , L0000044 , L0000045 , L0000046 , L0000047 , L0000048 , L0000049 , L0000050 , L0000051 , L0000052 , L0000053 , L0000054 , L0000055 , L0000056 , |

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             L0000057    , L0000058    , L0000059    , L0000060    , L0000061    ,
L0000062    , L0000063    , L0000064    ,

             L0000065    , L0000066    , L0000067    , L0000068    , L0000069    ,
L0000070    , L0000071    , L0000072    ,

             L0000073    , L0000074    , L0000075    , L0000076    , L0000077    ,
L0000078    , L0000079    , L0000080    ,

             L0000081    , L0000082    , L0000083    , L0000084    , L0000085    ,
L0000086    , L0000087    , L0000088    ,

             L0000089    , L0000090    , L0000091    , L0000092    , L0000093    ,
L0000094    , L0000095    , L0000096    ,

             L0000097    , L0000098    , L0000099    , L0000100    , L0000101    ,
L0000102    , L0000103    , L0000104    ,

             L0000105    , L0000106    , L0000107    , L0000108    , L0000109    ,
L0000110    , L0000111    , L0000112    ,

             L0000113    , L0000114    , L0000115    , L0000116    , L0000117    ,
L0000118    , L0000119    , L0000120    ,

             L0000121    , L0000122    , L0000123    , L0000124    , L0000125    ,
L0000126    , L0000127    , L0000128    ,

             L0000129    , L0000130    , L0000131    , L0000132    , L0000133    ,
L0000134    , L0000135    , L0000136    ,

             L0000137    , L0000138    , L0000139    , L0000140    , L0000141    ,
L0000142    , L0000143    , L0000144    ,

             L0000145    , L0000146    , L0000147    , L0000148    , L0000149    ,
L0000150    , L0000151    , L0000152    ,

             L0000153    , L0000154    , L0000155    , L0000156    , L0000157    ,
L0000158    , L0000159    , L0000160    ,
```



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
|---|---|

L0000161 , L0000162 , L0000163 , L0000164 , L0000165 ,
L0000166 , L0000167 , L0000168 ,

L0000169 , L0000170 , L0000171 , L0000172 , L0000173 ,
L0000174 , L0000175 , L0000176 ,

L0000177 , L0000178 , L0000179 , L0000180 , L0000181 ,
L0000182 , L0000183 , L0000184 ,

L0000185 , L0000186 , L0000187 , L0000188 , L0000189 ,
L0000190 , L0000191 , L0000192 ,

L0000193 , L0000194 , L0000195 , L0000196 , L0000197 ,
L0000198 , L0000199 , L0000200 ,

L0000201 , L0000202 , L0000203 , L0000204 , L0000205 ,
L0000206 , L0000207 , L0000208 ,

L0000209 , L0000210 , L0000211 , L0000212 , L0000213 ,
L0000214 , L0000215 , L0000216 ,

L0000217 , L0000218 , L0000219 , L0000220 , L0000221 ,
L0000222 , L0000223 , L0000224 ,

L0000225 , L0000226 , L0000227 , L0000228 , L0000229 ,
L0000230 , L0000231 , L0000232 ,

L0000233 , L0000234 , L0000235 , L0000236 , L0000237 ,
L0000238 , L0000239 , L0000240 ,

L0000241 , L0000242 , L0000243 , L0000244 , L0000245 ,
L0000246 , L0000247 , L0000248 ,

L0000249 , L0000250 , L0000251 , L0000252 , L0000253 ,
L0000254 , L0000255 , L0000256 ,

L0000257 , L0000258 , L0000259 , L0000260 , L0000261 ,
L0000262 , L0000263 , L0000264 ,

L0000265 , L0000266 , L0000267 , L0000268 , L0000269 ,
L0000270 , L0000271 , L0000272 ,

L0000273 , L0000274 , L0000275 , L0000276 , L0000277 ,
L0000278 , L0000279 , L0000280 ,

L0000281 , L0000282 , L0000283 , L0000284 , L0000285 ,
L0000286 , L0000287 , L0000288 ,

L0000289 , L0000290 , L0000291 , L0000292 , L0000293 ,

L0000294 , L0000295 , L0000296 ,

L0000297 , L0000298 , L0000299 , L0000300 , L0000301 ,
L0000302 , L0000303 , L0000304 ,

L0000305 , L0000306 , L0000307 , L0000308 , L0000309 ,
L0000310 , L0000311 , L0000312 ,

L0000313 , L0000314 , L0000315 , L0000316 , L0000317 ,
L0000318 , L0000319 , L0000320 ,



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
|---|---|
| | L0000321 , L0000322 , L0000323 , L0000324 , L0000325 , L0000326 , L0000327 , L0000328 , L0000329 , L0000330 , L0000331 , L0000332 , L0000333 , L0000334 , L0000335 , L0000336 , L0000337 , L0000338 , L0000339 , L0000340 , L0000341 , L0000342 , L0000343 , L0000344 , L0000345 , L0000346 , L0000347 , L0000348 , L0000349 , L0000350 , L0000351 , L0000352 , L0000353 , L0000354 , L0000355 , L0000356 , L0000357 , L0000358 , L0000359 , L0000360 , L0000361 , L0000362 , L0000363 , L0000364 , L0000365 , L0000366 , L0000367 , L0000368 , L0000369 , L0000370 , L0000371 , L0000372 , L0000373 , L0000374 , L0000375 , L0000376 , L0000377 , L0000378 , L0000379 , L0000380 , L0000381 , L0000382 , L0000383 , L0000384 , L0000385 , L0000386 , L0000387 , L0000388 , L0000389 , L0000390 , L0000391 , L0000392 , |

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L0000398    , L0000399    , L0000400    ,

             L0000401    , L0000402    , L0000403    , L0000404    , L0000405    ,
L0000406    , L0000407    , L0000408    ,

             L0000409    , L0000410    , L0000411    , L0000412    , L0000413    ,
L0000414    , L0000415    , L0000416    ,

             L0000417    , L0000418    , L0000419    , L0000420    , L0000421    ,
L0000422    , L0000423    , L0000424    ,

             L0000425    , L0000426    , L0000427    , L0000428    , L0000429    ,
L0000430    , L0000431    , L0000432    ,

             L0000433    , L0000434    , L0000435    , L0000436    , L0000437    ,
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L0000446    , L0000447    , L0000448    ,

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L0000462    , L0000463    , L0000464    ,

             L0000465    , L0000466    , L0000467    , L0000468    , L0000469    ,
L0000470    , L0000471    , L0000472    ,

             L0000473    , L0000474    , L0000475    , L0000476    , L0000477    ,
L0000478    , L0000479    , L0000480    ,
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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             L0000481    , L0000482    , L0000483    , L0000484    , L0000485    ,
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L0000630    , L0000631    , L0000632    ,

             L0000633    , L0000634    , L0000635    , L0000636    , L0000637    ,
L0000638    , L0000639    , L0000640    ,
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                            ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE  34
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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             L0000641    , L0000642    , L0000643    , L0000644    , L0000645    ,
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L0000654    , L0000655    , L0000656    ,

             L0000657    , L0000658    , L0000659    , L0000660    , L0000661    ,
L0000662    , L0000663    , L0000664    ,

             L0000665    , L0000666    , L0000667    , L0000668    , L0000669    ,
L0000670    , L0000671    , L0000672    ,

             L0000673    , L0000674    , L0000675    , L0000676    , L0000677    ,
L0000678    , L0000679    , L0000680    ,

             L0000681    , L0000682    , L0000683    , L0000684    , L0000685    ,
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             L0000689    , L0000690    , L0000691    , L0000692    , L0000693    ,
L0000694    , L0000695    , L0000696    ,

             L0000697    , L0000698    , L0000699    , L0000700    , L0000701    ,
L0000702    , L0000703    , L0000704    ,

             L0000705    , L0000706    , L0000707    , L0000708    , L0000709    ,
L0000710    , L0000711    , L0000712    ,

             L0000713    , L0000714    , L0000715    , L0000716    , L0000717    ,
L0000718    , L0000719    , L0000720    ,

             L0000721    , L0000722    , L0000723    , L0000724    , L0000725    ,
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L0000734    , L0000735    , L0000736    ,

             L0000737    , L0000738    , L0000739    , L0000740    , L0000741    ,
L0000742    , L0000743    , L0000744    ,

             L0000745    , L0000746    , L0000747    , L0000748    , L0000749    ,
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L0000758    , L0000759    , L0000760    ,

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L0000766    , L0000767    , L0000768    ,

             L0000769    , L0000770    , L0000771    , L0000772    , L0000773    ,
L0000774    , L0000775    , L0000776    ,

             L0000777    , L0000778    , L0000779    , L0000780    , L0000781    ,
L0000782    , L0000783    , L0000784    ,

             L0000785    , L0000786    , L0000787    , L0000788    ,

  P2FUGITI   PAREA1      ,
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE  35
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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  P1EXHAUS   L0000789    , L0000790    , L0000791    , L0000792    , L0000793    ,
L0000794    , L0000795    , L0000796    ,

             L0000797    , L0000798    , L0000799    , L0000800    , L0000801    ,
L0000802    , L0000803    , L0000804    ,

             L0000805    , L0000806    , L0000807    , L0000808    , L0000809    ,
L0000810    , L0000811    , L0000812    ,

             L0000813    , L0000814    , L0000815    , L0000816    , L0000817    ,
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L0000818 , L0000819 , L0000820 ,

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L0000826 , L0000827 , L0000828 ,

L0000829 , L0000830 , L0000831 , L0000832 , L0000833 ,
L0000834 , L0000835 , L0000836 ,

L0000837 , L0000838 , L0000839 , L0000840 , L0000841 ,
L0000842 , L0000843 , L0000844 ,

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L0000898 , L0000899 , L0000900 ,

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L0000906 , L0000907 , L0000908 ,

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L0000914 , L0000915 , L0000916 ,

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L0000933 , L0000934 , L0000935 , L0000936 , L0000937 ,
L0000938 , L0000939 , L0000940 ,

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L0000946 , L0000947 , L0000948 ,

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
|---|---|
| | L0000949 , L0000950 , L0000951 , L0000952 , L0000953 , L0000954 , L0000955 , L0000956 , |
| | L0000957 , L0000958 , L0000959 , L0000960 , L0000961 , L0000962 , L0000963 , L0000964 , |
| | L0000965 , L0000966 , L0000967 , L0000968 , L0000969 , L0000970 , L0000971 , L0000972 , |
| | L0000973 , L0000974 , L0000975 , L0000976 , L0000977 , L0000978 , L0000979 , L0000980 , |
| | L0000981 , L0000982 , L0000983 , L0000984 , L0000985 , L0000986 , L0000987 , L0000988 , |
| | L0000989 , L0000990 , L0000991 , L0000992 , L0000993 , L0000994 , L0000995 , L0000996 , |
| | L0000997 , L0000998 , L0000999 , L0001000 , L0001001 , L0001002 , L0001003 , L0001004 , |
| | L0001005 , L0001006 , L0001007 , L0001008 , L0001009 , L0001010 , L0001011 , L0001012 , |
| | L0001013 , L0001014 , L0001015 , L0001016 , L0001017 , L0001018 , L0001019 , L0001020 , |
| | L0001021 , L0001022 , L0001023 , L0001024 , L0001025 , L0001026 , L0001027 , L0001028 , |
| | L0001029 , L0001030 , L0001031 , L0001032 , L0001033 , L0001034 , L0001035 , L0001036 , |
| | L0001037 , L0001038 , L0001039 , L0001040 , L0001041 , L0001042 , L0001043 , L0001044 , |
| | L0001045 , L0001046 , L0001047 , L0001048 , L0001049 , L0001050 , L0001051 , L0001052 , |

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             L0001069    , L0001070    , L0001071    , L0001072    , L0001073    ,
L0001074    , L0001075    ,

  P1FUGITI   PAREA2      ,

  ALL        PAREA1      , L0000001    , L0000002    , L0000003    , L0000004    ,
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                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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L0000029    , L0000030    , L0000031    ,

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L0000037    , L0000038    , L0000039    ,

             L0000040    , L0000041    , L0000042    , L0000043    , L0000044    ,
L0000045    , L0000046    , L0000047    ,

             L0000048    , L0000049    , L0000050    , L0000051    , L0000052    ,
L0000053    , L0000054    , L0000055    ,

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L0000173 , L0000174 , L0000175 ,

L0000176 , L0000177 , L0000178 , L0000179 , L0000180 ,
L0000181 , L0000182 , L0000183 ,


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
|---|---|
| | L0000184 , L0000185 , L0000186 , L0000187 , L0000188 , L0000189 , L0000190 , L0000191 , |
| | L0000192 , L0000193 , L0000194 , L0000195 , L0000196 , L0000197 , L0000198 , L0000199 , |
| | L0000200 , L0000201 , L0000202 , L0000203 , L0000204 , L0000205 , L0000206 , L0000207 , |
| | L0000208 , L0000209 , L0000210 , L0000211 , L0000212 , L0000213 , L0000214 , L0000215 , |
| | L0000216 , L0000217 , L0000218 , L0000219 , L0000220 , L0000221 , L0000222 , L0000223 , |
| | L0000224 , L0000225 , L0000226 , L0000227 , L0000228 , L0000229 , L0000230 , L0000231 , |
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                  SOURCE IDs
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L0000661 , L0000662 , L0000663 ,


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
|---|---|
| | L0000664 , L0000665 , L0000666 , L0000667 , L0000668 , L0000669 , L0000670 , L0000671 , |
| | L0000672 , L0000673 , L0000674 , L0000675 , L0000676 , L0000677 , L0000678 , L0000679 , |
| | L0000680 , L0000681 , L0000682 , L0000683 , L0000684 , L0000685 , L0000686 , L0000687 , |
| | L0000688 , L0000689 , L0000690 , L0000691 , L0000692 , L0000693 , L0000694 , L0000695 , |
| | L0000696 , L0000697 , L0000698 , L0000699 , L0000700 , L0000701 , L0000702 , L0000703 , |
| | L0000704 , L0000705 , L0000706 , L0000707 , L0000708 , L0000709 , L0000710 , L0000711 , |
| | L0000712 , L0000713 , L0000714 , L0000715 , L0000716 , L0000717 , L0000718 , L0000719 , |
| | L0000720 , L0000721 , L0000722 , L0000723 , L0000724 , L0000725 , L0000726 , L0000727 , |
| | L0000728 , L0000729 , L0000730 , L0000731 , L0000732 , L0000733 , L0000734 , L0000735 , |

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             L0000736    , L0000737    , L0000738    , L0000739    , L0000740    ,
L0000741    , L0000742    , L0000743    ,

             L0000744    , L0000745    , L0000746    , L0000747    , L0000748    ,
L0000749    , L0000750    , L0000751    ,

             L0000752    , L0000753    , L0000754    , L0000755    , L0000756    ,
L0000757    , L0000758    , L0000759    ,

             L0000760    , L0000761    , L0000762    , L0000763    , L0000764    ,
L0000765    , L0000766    , L0000767    ,

             L0000768    , L0000769    , L0000770    , L0000771    , L0000772    ,
L0000773    , L0000774    , L0000775    ,

             L0000776    , L0000777    , L0000778    , L0000779    , L0000780    ,
L0000781    , L0000782    , L0000783    ,

             L0000784    , L0000785    , L0000786    , L0000787    , L0000788    ,
L0000789    , L0000790    , L0000791    ,

             L0000792    , L0000793    , L0000794    , L0000795    , L0000796    ,
L0000797    , L0000798    , L0000799    ,

             L0000800    , L0000801    , L0000802    , L0000803    , L0000804    ,
L0000805    , L0000806    , L0000807    ,

             L0000808    , L0000809    , L0000810    , L0000811    , L0000812    ,
L0000813    , L0000814    , L0000815    ,

             L0000816    , L0000817    , L0000818    , L0000819    , L0000820    ,
L0000821    , L0000822    , L0000823    ,
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```
*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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             L0000824    , L0000825    , L0000826    , L0000827    , L0000828    ,
L0000829    , L0000830    , L0000831    ,
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L0000832 , L0000833 , L0000834 , L0000835 , L0000836 ,
L0000837 , L0000838 , L0000839 ,

L0000840 , L0000841 , L0000842 , L0000843 , L0000844 ,
L0000845 , L0000846 , L0000847 ,

L0000848 , L0000849 , L0000850 , L0000851 , L0000852 ,
L0000853 , L0000854 , L0000855 ,

L0000856 , L0000857 , L0000858 , L0000859 , L0000860 ,
L0000861 , L0000862 , L0000863 ,

L0000864 , L0000865 , L0000866 , L0000867 , L0000868 ,
L0000869 , L0000870 , L0000871 ,

L0000872 , L0000873 , L0000874 , L0000875 , L0000876 ,
L0000877 , L0000878 , L0000879 ,

L0000880 , L0000881 , L0000882 , L0000883 , L0000884 ,
L0000885 , L0000886 , L0000887 ,

L0000888 , L0000889 , L0000890 , L0000891 , L0000892 ,
L0000893 , L0000894 , L0000895 ,

L0000896 , L0000897 , L0000898 , L0000899 , L0000900 ,
L0000901 , L0000902 , L0000903 ,

L0000904 , L0000905 , L0000906 , L0000907 , L0000908 ,
L0000909 , L0000910 , L0000911 ,

L0000912 , L0000913 , L0000914 , L0000915 , L0000916 ,
L0000917 , L0000918 , L0000919 ,

L0000920 , L0000921 , L0000922 , L0000923 , L0000924 ,
L0000925 , L0000926 , L0000927 ,

L0000928 , L0000929 , L0000930 , L0000931 , L0000932 ,
L0000933 , L0000934 , L0000935 ,

L0000936 , L0000937 , L0000938 , L0000939 , L0000940 ,
L0000941 , L0000942 , L0000943 ,

L0000944 , L0000945 , L0000946 , L0000947 , L0000948 ,
L0000949 , L0000950 , L0000951 ,

L0000952 , L0000953 , L0000954 , L0000955 , L0000956 ,
L0000957 , L0000958 , L0000959 ,

L0000960 , L0000961 , L0000962 , L0000963 , L0000964 ,
L0000965 , L0000966 , L0000967 ,

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             L0000968    , L0000969    , L0000970    , L0000971    , L0000972    ,
L0000973    , L0000974    , L0000975    ,

             L0000976    , L0000977    , L0000978    , L0000979    , L0000980    ,
L0000981    , L0000982    , L0000983    ,
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE  43
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
 -----------                                                ----------


             L0000984    , L0000985    , L0000986    , L0000987    , L0000988    ,
L0000989    , L0000990    , L0000991    ,

             L0000992    , L0000993    , L0000994    , L0000995    , L0000996    ,
L0000997    , L0000998    , L0000999    ,

             L0001000    , L0001001    , L0001002    , L0001003    , L0001004    ,
L0001005    , L0001006    , L0001007    ,

             L0001008    , L0001009    , L0001010    , L0001011    , L0001012    ,
L0001013    , L0001014    , L0001015    ,

             L0001016    , L0001017    , L0001018    , L0001019    , L0001020    ,
L0001021    , L0001022    , L0001023    ,

             L0001024    , L0001025    , L0001026    , L0001027    , L0001028    ,
L0001029    , L0001030    , L0001031    ,

             L0001032    , L0001033    , L0001034    , L0001035    , L0001036    ,
L0001037    , L0001038    , L0001039    ,

             L0001040    , L0001041    , L0001042    , L0001043    , L0001044    ,
L0001045    , L0001046    , L0001047    ,

             L0001048    , L0001049    , L0001050    , L0001051    , L0001052    ,
L0001053    , L0001054    , L0001055    ,

             L0001056    , L0001057    , L0001058    , L0001059    , L0001060    ,
L0001061    , L0001062    , L0001063    ,

             L0001064    , L0001065    , L0001066    , L0001067    , L0001068    ,
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L0001069    , L0001070    , L0001071    ,

             L0001072    , L0001073    , L0001074    , L0001075    , PAREA2      ,
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                          ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                        ***        20:06:41

                                   PAGE  44
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                          *** SOURCE IDs DEFINED AS URBAN SOURCES
***

  URBAN ID   URBAN POP                                     SOURCE IDs
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              2035210.   PAREA1      , L0000001    , L0000002    , L0000003    ,
L0000004    , L0000005    , L0000006    ,
 L0000007    ,

             L0000008    , L0000009    , L0000010    , L0000011    , L0000012    ,
L0000013    , L0000014    , L0000015    ,

             L0000016    , L0000017    , L0000018    , L0000019    , L0000020    ,
L0000021    , L0000022    , L0000023    ,

             L0000024    , L0000025    , L0000026    , L0000027    , L0000028    ,
L0000029    , L0000030    , L0000031    ,

             L0000032    , L0000033    , L0000034    , L0000035    , L0000036    ,
L0000037    , L0000038    , L0000039    ,

             L0000040    , L0000041    , L0000042    , L0000043    , L0000044    ,
L0000045    , L0000046    , L0000047    ,

             L0000048    , L0000049    , L0000050    , L0000051    , L0000052    ,
L0000053    , L0000054    , L0000055    ,

             L0000056    , L0000057    , L0000058    , L0000059    , L0000060    ,
L0000061    , L0000062    , L0000063    ,

             L0000064    , L0000065    , L0000066    , L0000067    , L0000068    ,
L0000069    , L0000070    , L0000071    ,

             L0000072    , L0000073    , L0000074    , L0000075    , L0000076    ,
L0000077    , L0000078    , L0000079    ,

             L0000080    , L0000081    , L0000082    , L0000083    , L0000084    ,
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L0000085 , L0000086 , L0000087 ,

L0000088 , L0000089 , L0000090 , L0000091 , L0000092 ,
L0000093 , L0000094 , L0000095 ,

L0000096 , L0000097 , L0000098 , L0000099 , L0000100 ,
L0000101 , L0000102 , L0000103 ,

L0000104 , L0000105 , L0000106 , L0000107 , L0000108 ,
L0000109 , L0000110 , L0000111 ,

L0000112 , L0000113 , L0000114 , L0000115 , L0000116 ,
L0000117 , L0000118 , L0000119 ,

L0000120 , L0000121 , L0000122 , L0000123 , L0000124 ,
L0000125 , L0000126 , L0000127 ,

L0000128 , L0000129 , L0000130 , L0000131 , L0000132 ,
L0000133 , L0000134 , L0000135 ,

L0000136 , L0000137 , L0000138 , L0000139 , L0000140 ,
L0000141 , L0000142 , L0000143 ,

L0000144 , L0000145 , L0000146 , L0000147 , L0000148 ,
L0000149 , L0000150 , L0000151 ,

L0000152 , L0000153 , L0000154 , L0000155 , L0000156 ,
L0000157 , L0000158 , L0000159 ,


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|

L0000160 , L0000161 , L0000162 , L0000163 , L0000164 ,
L0000165 , L0000166 , L0000167 ,

L0000168 , L0000169 , L0000170 , L0000171 , L0000172 ,
L0000173 , L0000174 , L0000175 ,

L0000176 , L0000177 , L0000178 , L0000179 , L0000180 ,

L0000181 , L0000182 , L0000183 ,

L0000184 , L0000185 , L0000186 , L0000187 , L0000188 ,
L0000189 , L0000190 , L0000191 ,

L0000192 , L0000193 , L0000194 , L0000195 , L0000196 ,
L0000197 , L0000198 , L0000199 ,

L0000200 , L0000201 , L0000202 , L0000203 , L0000204 ,
L0000205 , L0000206 , L0000207 ,

L0000208 , L0000209 , L0000210 , L0000211 , L0000212 ,
L0000213 , L0000214 , L0000215 ,

L0000216 , L0000217 , L0000218 , L0000219 , L0000220 ,
L0000221 , L0000222 , L0000223 ,

L0000224 , L0000225 , L0000226 , L0000227 , L0000228 ,
L0000229 , L0000230 , L0000231 ,

L0000232 , L0000233 , L0000234 , L0000235 , L0000236 ,
L0000237 , L0000238 , L0000239 ,

L0000240 , L0000241 , L0000242 , L0000243 , L0000244 ,
L0000245 , L0000246 , L0000247 ,

L0000248 , L0000249 , L0000250 , L0000251 , L0000252 ,
L0000253 , L0000254 , L0000255 ,

L0000256 , L0000257 , L0000258 , L0000259 , L0000260 ,
L0000261 , L0000262 , L0000263 ,

L0000264 , L0000265 , L0000266 , L0000267 , L0000268 ,
L0000269 , L0000270 , L0000271 ,

L0000272 , L0000273 , L0000274 , L0000275 , L0000276 ,
L0000277 , L0000278 , L0000279 ,

L0000280 , L0000281 , L0000282 , L0000283 , L0000284 ,
L0000285 , L0000286 , L0000287 ,

L0000288 , L0000289 , L0000290 , L0000291 , L0000292 ,
L0000293 , L0000294 , L0000295 ,

L0000296 , L0000297 , L0000298 , L0000299 , L0000300 ,
L0000301 , L0000302 , L0000303 ,

L0000304 , L0000305 , L0000306 , L0000307 , L0000308 ,
L0000309 , L0000310 , L0000311 ,

L0000312 , L0000313 , L0000314 , L0000315 , L0000316 ,

L0000317 , L0000318 , L0000319 ,



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|
| | | L0000320 , L0000321 , L0000322 , L0000323 , L0000324 , L0000325 , L0000326 , L0000327 , |
| | | L0000328 , L0000329 , L0000330 , L0000331 , L0000332 , L0000333 , L0000334 , L0000335 , |
| | | L0000336 , L0000337 , L0000338 , L0000339 , L0000340 , L0000341 , L0000342 , L0000343 , |
| | | L0000344 , L0000345 , L0000346 , L0000347 , L0000348 , L0000349 , L0000350 , L0000351 , |
| | | L0000352 , L0000353 , L0000354 , L0000355 , L0000356 , L0000357 , L0000358 , L0000359 , |
| | | L0000360 , L0000361 , L0000362 , L0000363 , L0000364 , L0000365 , L0000366 , L0000367 , |
| | | L0000368 , L0000369 , L0000370 , L0000371 , L0000372 , L0000373 , L0000374 , L0000375 , |
| | | L0000376 , L0000377 , L0000378 , L0000379 , L0000380 , L0000381 , L0000382 , L0000383 , |
| | | L0000384 , L0000385 , L0000386 , L0000387 , L0000388 , L0000389 , L0000390 , L0000391 , |
| | | L0000392 , L0000393 , L0000394 , L0000395 , L0000396 , L0000397 , L0000398 , L0000399 , |
| | | L0000400 , L0000401 , L0000402 , L0000403 , L0000404 , L0000405 , L0000406 , L0000407 , |
| | | L0000408 , L0000409 , L0000410 , L0000411 , L0000412 , |

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L0000413    , L0000414    , L0000415    ,

             L0000416    , L0000417    , L0000418    , L0000419    , L0000420    ,
L0000421    , L0000422    , L0000423    ,

             L0000424    , L0000425    , L0000426    , L0000427    , L0000428    ,
L0000429    , L0000430    , L0000431    ,

             L0000432    , L0000433    , L0000434    , L0000435    , L0000436    ,
L0000437    , L0000438    , L0000439    ,

             L0000440    , L0000441    , L0000442    , L0000443    , L0000444    ,
L0000445    , L0000446    , L0000447    ,

             L0000448    , L0000449    , L0000450    , L0000451    , L0000452    ,
L0000453    , L0000454    , L0000455    ,

             L0000456    , L0000457    , L0000458    , L0000459    , L0000460    ,
L0000461    , L0000462    , L0000463    ,

             L0000464    , L0000465    , L0000466    , L0000467    , L0000468    ,
L0000469    , L0000470    , L0000471    ,

             L0000472    , L0000473    , L0000474    , L0000475    , L0000476    ,
L0000477    , L0000478    , L0000479    ,
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINED AS URBAN SOURCES
***

  URBAN ID   URBAN POP                                    SOURCE IDs
  --------   ---------                                    ----------


             L0000480    , L0000481    , L0000482    , L0000483    , L0000484    ,
L0000485    , L0000486    , L0000487    ,

             L0000488    , L0000489    , L0000490    , L0000491    , L0000492    ,
L0000493    , L0000494    , L0000495    ,

             L0000496    , L0000497    , L0000498    , L0000499    , L0000500    ,
L0000501    , L0000502    , L0000503    ,

             L0000504    , L0000505    , L0000506    , L0000507    , L0000508    ,
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L0000509 , L0000510 , L0000511 ,

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L0000525 , L0000526 , L0000527 ,

L0000528 , L0000529 , L0000530 , L0000531 , L0000532 ,
L0000533 , L0000534 , L0000535 ,

L0000536 , L0000537 , L0000538 , L0000539 , L0000540 ,
L0000541 , L0000542 , L0000543 ,

L0000544 , L0000545 , L0000546 , L0000547 , L0000548 ,
L0000549 , L0000550 , L0000551 ,

L0000552 , L0000553 , L0000554 , L0000555 , L0000556 ,
L0000557 , L0000558 , L0000559 ,

L0000560 , L0000561 , L0000562 , L0000563 , L0000564 ,
L0000565 , L0000566 , L0000567 ,

L0000568 , L0000569 , L0000570 , L0000571 , L0000572 ,
L0000573 , L0000574 , L0000575 ,

L0000576 , L0000577 , L0000578 , L0000579 , L0000580 ,
L0000581 , L0000582 , L0000583 ,

L0000584 , L0000585 , L0000586 , L0000587 , L0000588 ,
L0000589 , L0000590 , L0000591 ,

L0000592 , L0000593 , L0000594 , L0000595 , L0000596 ,
L0000597 , L0000598 , L0000599 ,

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L0000629 , L0000630 , L0000631 ,

L0000632 , L0000633 , L0000634 , L0000635 , L0000636 ,
L0000637 , L0000638 , L0000639 ,

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|

L0000640 , L0000641 , L0000642 , L0000643 , L0000644 , L0000645 , L0000646 , L0000647 ,

L0000648 , L0000649 , L0000650 , L0000651 , L0000652 , L0000653 , L0000654 , L0000655 ,

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L0000696 , L0000697 , L0000698 , L0000699 , L0000700 , L0000701 , L0000702 , L0000703 ,

L0000704 , L0000705 , L0000706 , L0000707 , L0000708 , L0000709 , L0000710 , L0000711 ,

L0000712 , L0000713 , L0000714 , L0000715 , L0000716 , L0000717 , L0000718 , L0000719 ,

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L0000789 , L0000790 , L0000791 ,

L0000792 , L0000793 , L0000794 , L0000795 , L0000796 ,
L0000797 , L0000798 , L0000799 ,



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|

L0000800 , L0000801 , L0000802 , L0000803 , L0000804 ,
L0000805 , L0000806 , L0000807 ,

L0000808 , L0000809 , L0000810 , L0000811 , L0000812 ,
L0000813 , L0000814 , L0000815 ,

L0000816 , L0000817 , L0000818 , L0000819 , L0000820 ,
L0000821 , L0000822 , L0000823 ,

L0000824 , L0000825 , L0000826 , L0000827 , L0000828 ,
L0000829 , L0000830 , L0000831 ,

L0000832 , L0000833 , L0000834 , L0000835 , L0000836 ,

L0000837 , L0000838 , L0000839 ,

L0000840 , L0000841 , L0000842 , L0000843 , L0000844 ,
L0000845 , L0000846 , L0000847 ,

L0000848 , L0000849 , L0000850 , L0000851 , L0000852 ,
L0000853 , L0000854 , L0000855 ,

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L0000861 , L0000862 , L0000863 ,

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L0000869 , L0000870 , L0000871 ,

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L0000917 , L0000918 , L0000919 ,

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L0000933 , L0000934 , L0000935 ,

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L0000952 , L0000953 , L0000954 , L0000955 , L0000956 ,
L0000957 , L0000958 , L0000959 ,

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|
| | | L0000960 , L0000961 , L0000962 , L0000963 , L0000964 , L0000965 , L0000966 , L0000967 , |
| | | L0000968 , L0000969 , L0000970 , L0000971 , L0000972 , L0000973 , L0000974 , L0000975 , |
| | | L0000976 , L0000977 , L0000978 , L0000979 , L0000980 , L0000981 , L0000982 , L0000983 , |
| | | L0000984 , L0000985 , L0000986 , L0000987 , L0000988 , L0000989 , L0000990 , L0000991 , |
| | | L0000992 , L0000993 , L0000994 , L0000995 , L0000996 , L0000997 , L0000998 , L0000999 , |
| | | L0001000 , L0001001 , L0001002 , L0001003 , L0001004 , L0001005 , L0001006 , L0001007 , |
| | | L0001008 , L0001009 , L0001010 , L0001011 , L0001012 , L0001013 , L0001014 , L0001015 , |
| | | L0001016 , L0001017 , L0001018 , L0001019 , L0001020 , L0001021 , L0001022 , L0001023 , |
| | | L0001024 , L0001025 , L0001026 , L0001027 , L0001028 , L0001029 , L0001030 , L0001031 , |
| | | L0001032 , L0001033 , L0001034 , L0001035 , L0001036 , L0001037 , L0001038 , L0001039 , |
| | | L0001040 , L0001041 , L0001042 , L0001043 , L0001044 , L0001045 , L0001046 , L0001047 , |
| | | L0001048 , L0001049 , L0001050 , L0001051 , L0001052 , L0001053 , L0001054 , L0001055 , |
| | | L0001056 , L0001057 , L0001058 , L0001059 , L0001060 , L0001061 , L0001062 , L0001063 , |
| | | L0001064 , L0001065 , L0001066 , L0001067 , L0001068 , |

L0001069 , L0001070 , L0001071 ,

L0001072 , L0001073 , L0001074 , L0001075 , PAREA2 ,



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

( 440400.6, 3761994.8, 210.3, 210.3, 2.0); ( 440450.6, 3761994.8, 210.5, 210.5, 2.0);
( 440500.6, 3761994.8, 210.7, 210.7, 2.0); ( 440550.6, 3761994.8, 210.4, 210.4, 2.0);
( 440600.6, 3761994.8, 210.4, 210.4, 2.0); ( 440650.6, 3761994.8, 210.6, 210.6, 2.0);
( 440400.6, 3762044.8, 211.1, 211.1, 2.0); ( 440450.6, 3762044.8, 211.0, 211.0, 2.0);
( 440500.6, 3762044.8, 211.1, 211.1, 2.0); ( 440550.6, 3762044.8, 211.1, 211.1, 2.0);
( 440600.6, 3762044.8, 211.1, 211.1, 2.0); ( 440650.6, 3762044.8, 211.1, 211.1, 2.0);
( 440400.6, 3762094.8, 211.9, 211.9, 2.0); ( 440450.6, 3762094.8, 211.8, 211.8, 2.0);
( 440500.6, 3762094.8, 211.8, 211.8, 2.0); ( 440550.6, 3762094.8, 211.8, 211.8, 2.0);
( 440600.6, 3762094.8, 211.6, 211.6, 2.0); ( 440650.6, 3762094.8, 212.0, 212.0, 2.0);
( 440400.6, 3762144.8, 212.7, 212.7, 2.0); ( 440450.6, 3762144.8, 212.4, 212.4, 2.0);
( 440500.6, 3762144.8, 212.6, 212.6, 2.0); ( 440550.6, 3762144.8, 212.2, 212.2, 2.0);
( 440600.6, 3762144.8, 212.3, 212.3, 2.0); ( 440650.6, 3762144.8, 212.6, 212.6, 2.0);
( 441145.1, 3761319.9, 204.5, 204.5, 2.0); ( 441195.1, 3761319.9, 204.6, 204.6, 2.0);
( 441245.1, 3761319.9, 204.7, 204.7, 2.0); ( 441145.1, 3761369.9, 204.9, 204.9, 2.0);
( 441195.1, 3761369.9, 204.9, 204.9, 2.0); ( 441245.1, 3761369.9, 204.9, 204.9, 2.0);
( 441145.1, 3761419.9, 205.2, 205.2, 2.0); ( 441195.1, 3761419.9, 205.3, 205.3, 2.0);
( 441245.1, 3761419.9, 205.6, 205.6, 2.0); ( 441145.1, 3761469.9, 205.7, 205.7, 2.0);
( 441195.1, 3761469.9, 205.7, 205.7, 2.0); ( 441245.1, 3761469.9, 206.6, 206.6, 2.0);

( 441145.1, 3761519.9, 206.2, 206.2, 2.0); ( 441195.1, 3761519.9, 206.2, 206.2, 2.0);
( 441245.1, 3761519.9, 206.7, 206.7, 2.0); ( 441145.1, 3761569.9, 206.7, 206.7, 2.0);
( 441195.1, 3761569.9, 206.5, 206.5, 2.0); ( 441245.1, 3761569.9, 206.6, 206.6, 2.0);
( 441145.1, 3761619.9, 207.0, 207.0, 2.0); ( 441195.1, 3761619.9, 206.9, 206.9, 2.0);
( 441245.1, 3761619.9, 207.2, 207.2, 2.0); ( 441145.1, 3761669.9, 207.7, 207.7, 2.0);
( 441195.1, 3761669.9, 207.4, 207.4, 2.0); ( 441245.1, 3761669.9, 207.8, 207.8, 2.0);
( 441917.0, 3761316.3, 206.2, 206.2, 2.0); ( 441967.0, 3761316.3, 205.9, 205.9, 2.0);
( 442017.0, 3761316.3, 206.0, 206.0, 2.0); ( 442067.0, 3761316.3, 206.3, 206.3, 2.0);
( 441917.0, 3761366.3, 206.6, 206.6, 2.0); ( 441967.0, 3761366.3, 206.7, 206.7, 2.0);
( 442017.0, 3761366.3, 206.5, 206.5, 2.0); ( 442067.0, 3761366.3, 207.2, 207.2, 2.0);
( 441917.0, 3761416.3, 207.7, 207.7, 2.0); ( 441967.0, 3761416.3, 207.3, 207.3, 2.0);
( 442017.0, 3761416.3, 206.9, 206.9, 2.0); ( 442067.0, 3761416.3, 207.1, 207.1, 2.0);
( 441917.0, 3761466.3, 208.1, 208.1, 2.0); ( 441967.0, 3761466.3, 207.6, 207.6, 2.0);
( 442017.0, 3761466.3, 207.2, 207.2, 2.0); ( 442067.0, 3761466.3, 207.3, 207.3, 2.0);
( 441917.0, 3761516.3, 207.5, 207.5, 2.0); ( 441967.0, 3761516.3, 207.7, 207.7, 2.0);
( 442017.0, 3761516.3, 207.5, 207.5, 2.0); ( 442067.0, 3761516.3, 207.8, 207.8, 2.0);
( 441917.0, 3761566.3, 207.3, 207.3, 2.0); ( 441967.0, 3761566.3, 207.7, 207.7, 2.0);
( 442017.0, 3761566.3, 207.8, 207.8, 2.0); ( 442067.0, 3761566.3, 208.5, 208.5, 2.0);
( 441917.0, 3761616.3, 207.4, 207.4, 2.0); ( 441967.0, 3761616.3, 207.9, 207.9, 2.0);
( 442017.0, 3761616.3, 208.1, 208.1, 2.0); ( 442067.0, 3761616.3, 208.4, 208.4, 2.0);
( 442847.7, 3761995.1, 211.9, 211.9, 2.0); ( 442897.7, 3761995.1, 212.3, 212.3, 2.0);
( 442947.7, 3761995.1, 211.9, 211.9, 2.0); ( 442997.7, 3761995.1, 211.8, 211.8, 2.0);
( 443047.7, 3761995.1, 211.9, 211.9, 2.0); ( 443097.7, 3761995.1, 211.9, 211.9, 2.0);
( 443147.7, 3761995.1, 212.2, 212.2, 2.0); ( 443197.7, 3761995.1, 212.5, 212.5, 2.0);
( 442847.7, 3762045.1, 212.5, 212.5, 2.0); ( 442897.7, 3762045.1, 212.5, 212.5, 2.0);
( 442947.7, 3762045.1, 212.4, 212.4, 2.0); ( 442997.7,

3762045.1,  212.6,  212.6,  2.0);
( 443047.7, 3762045.1,  212.6,  212.6,  2.0);  ( 443097.7, 3762045.1,  212.6,  212.6,  2.0);



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

( 443147.7, 3762045.1,  212.8,  212.8,  2.0);  ( 443197.7, 3762045.1,  213.0,  213.0,  2.0);
( 442447.7, 3762095.1,  213.7,  213.7,  2.0);  ( 442497.7, 3762095.1,  213.6,  213.6,  2.0);
( 442547.7, 3762095.1,  213.7,  213.7,  2.0);  ( 442597.7, 3762095.1,  214.0,  214.0,  2.0);
( 442647.7, 3762095.1,  213.6,  213.6,  2.0);  ( 442697.7, 3762095.1,  213.7,  213.7,  2.0);
( 442747.7, 3762095.1,  213.6,  213.6,  2.0);  ( 442797.7, 3762095.1,  213.4,  213.4,  2.0);
( 442847.7, 3762095.1,  213.0,  213.0,  2.0);  ( 442897.7, 3762095.1,  213.0,  213.0,  2.0);
( 442947.7, 3762095.1,  213.0,  213.0,  2.0);  ( 442997.7, 3762095.1,  213.4,  213.4,  2.0);
( 443047.7, 3762095.1,  213.3,  213.3,  2.0);  ( 443097.7, 3762095.1,  213.3,  213.3,  2.0);
( 443147.7, 3762095.1,  213.3,  213.3,  2.0);  ( 443197.7, 3762095.1,  213.8,  213.8,  2.0);
( 442447.7, 3762145.1,  214.1,  214.1,  2.0);  ( 442497.7, 3762145.1,  214.1,  214.1,  2.0);
( 442547.7, 3762145.1,  213.9,  213.9,  2.0);  ( 442597.7, 3762145.1,  214.2,  214.2,  2.0);
( 442647.7, 3762145.1,  214.0,  214.0,  2.0);  ( 442697.7, 3762145.1,  213.9,  213.9,  2.0);
( 442747.7, 3762145.1,  214.0,  214.0,  2.0);  ( 442797.7, 3762145.1,  213.9,  213.9,  2.0);
( 442847.7, 3762145.1,  213.2,  213.2,  2.0);  ( 442897.7, 3762145.1,  213.4,  213.4,  2.0);
( 442947.7, 3762145.1,  213.6,  213.6,  2.0);  ( 442997.7, 3762145.1,  213.9,  213.9,  2.0);
( 443047.7, 3762145.1,  213.8,  213.8,  2.0);  ( 443097.7, 3762145.1,  213.8,  213.8,  2.0);
( 443147.7, 3762145.1,  213.7,  213.7,  2.0);  ( 443197.7, 3762145.1,  214.0,  214.0,  2.0);
( 442447.7, 3762195.1,  214.4,  214.4,  2.0);  ( 442497.7, 3762195.1,  214.4,  214.4,  2.0);

( 442547.7, 3762195.1, 214.0, 214.0, 2.0); ( 442597.7, 3762195.1, 214.4, 214.4, 2.0);
( 442647.7, 3762195.1, 214.5, 214.5, 2.0); ( 442697.7, 3762195.1, 214.5, 214.5, 2.0);
( 442747.7, 3762195.1, 214.6, 214.6, 2.0); ( 442797.7, 3762195.1, 214.2, 214.2, 2.0);
( 442847.7, 3762195.1, 213.8, 213.8, 2.0); ( 442897.7, 3762195.1, 214.0, 214.0, 2.0);
( 442947.7, 3762195.1, 214.3, 214.3, 2.0); ( 442997.7, 3762195.1, 214.5, 214.5, 2.0);
( 443047.7, 3762195.1, 214.6, 214.6, 2.0); ( 443097.7, 3762195.1, 214.6, 214.6, 2.0);
( 443147.7, 3762195.1, 214.4, 214.4, 2.0); ( 443197.7, 3762195.1, 214.5, 214.5, 2.0);
( 442447.7, 3762245.1, 214.8, 214.8, 2.0); ( 442497.7, 3762245.1, 214.7, 214.7, 2.0);
( 442547.7, 3762245.1, 214.3, 214.3, 2.0); ( 442597.7, 3762245.1, 214.7, 214.7, 2.0);
( 442647.7, 3762245.1, 214.7, 214.7, 2.0); ( 442697.7, 3762245.1, 214.6, 214.6, 2.0);
( 442747.7, 3762245.1, 214.5, 214.5, 2.0); ( 442797.7, 3762245.1, 214.4, 214.4, 2.0);
( 442847.7, 3762245.1, 214.4, 214.4, 2.0); ( 442897.7, 3762245.1, 214.7, 214.7, 2.0);
( 442947.7, 3762245.1, 214.8, 214.8, 2.0); ( 442997.7, 3762245.1, 214.9, 214.9, 2.0);
( 443047.7, 3762245.1, 214.8, 214.8, 2.0); ( 443097.7, 3762245.1, 214.8, 214.8, 2.0);
( 443147.7, 3762245.1, 214.7, 214.7, 2.0); ( 443197.7, 3762245.1, 214.8, 214.8, 2.0);
( 442822.8, 3761611.8, 208.4, 208.4, 2.0); ( 442872.8, 3761611.8, 208.7, 208.7, 2.0);
( 442922.8, 3761611.8, 208.8, 208.8, 2.0); ( 442972.8, 3761611.8, 208.5, 208.5, 2.0);
( 442822.8, 3761661.8, 209.0, 209.0, 2.0); ( 442872.8, 3761661.8, 208.9, 208.9, 2.0);
( 442922.8, 3761661.8, 209.0, 209.0, 2.0); ( 442972.8, 3761661.8, 208.9, 208.9, 2.0);
( 442732.3, 3762366.1, 215.6, 215.6, 2.0); ( 442782.3, 3762366.1, 215.8, 215.8, 2.0);
( 442832.3, 3762366.1, 216.3, 216.3, 2.0); ( 442732.3, 3762416.1, 216.0, 216.0, 2.0);
( 442782.3, 3762416.1, 216.2, 216.2, 2.0); ( 442832.3, 3762416.1, 216.4, 216.4, 2.0);
( 442732.3, 3762466.1, 216.3, 216.3, 2.0); ( 442782.3, 3762466.1, 216.6, 216.6, 2.0);
( 442832.3, 3762466.1, 217.0, 217.0, 2.0); ( 441922.8, 3762323.8, 214.0, 214.0, 2.0);
( 441972.8, 3762323.8, 214.4, 214.4, 2.0); ( 442022.8, 3762323.8, 215.0, 215.0, 2.0);
( 442072.8, 3762323.8, 215.2, 215.2, 2.0); ( 441922.8,

3762373.8,  215.2,  215.2,  2.0);
( 441972.8, 3762373.8,  214.9,  214.9,  2.0);  ( 442022.8, 3762373.8,  215.3,  215.3,  2.0);



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

( 442072.8, 3762373.8,  215.4,  215.4,  2.0);  ( 441922.8, 3762423.8,  216.1,  216.1,  2.0);
( 441972.8, 3762423.8,  215.6,  215.6,  2.0);  ( 442022.8, 3762423.8,  215.7,  215.7,  2.0);
( 442072.8, 3762423.8,  215.8,  215.8,  2.0);  ( 441922.8, 3762473.8,  216.2,  216.2,  2.0);
( 441972.8, 3762473.8,  216.1,  216.1,  2.0);  ( 442022.8, 3762473.8,  216.0,  216.0,  2.0);
( 442072.8, 3762473.8,  216.2,  216.2,  2.0);  ( 441922.8, 3762523.8,  216.5,  216.5,  2.0);
( 441972.8, 3762523.8,  216.5,  216.5,  2.0);  ( 442022.8, 3762523.8,  216.3,  216.3,  2.0);
( 442072.8, 3762523.8,  216.5,  216.5,  2.0);  ( 441922.8, 3762573.8,  216.9,  216.9,  2.0);
( 441972.8, 3762573.8,  216.8,  216.8,  2.0);  ( 442022.8, 3762573.8,  216.8,  216.8,  2.0);
( 442072.8, 3762573.8,  216.9,  216.9,  2.0);  ( 441922.8, 3762623.8,  217.2,  217.2,  2.0);
( 441972.8, 3762623.8,  217.3,  217.3,  2.0);  ( 442022.8, 3762623.8,  217.4,  217.4,  2.0);
( 442072.8, 3762623.8,  217.6,  217.6,  2.0);  ( 441109.5, 3762319.6,  214.0,  214.0,  2.0);
( 441159.5, 3762319.6,  213.6,  213.6,  2.0);  ( 441209.5, 3762319.6,  213.6,  213.6,  2.0);
( 441259.5, 3762319.6,  214.3,  214.3,  2.0);  ( 441109.5, 3762369.6,  215.1,  215.1,  2.0);
( 441159.5, 3762369.6,  214.1,  214.1,  2.0);  ( 441209.5, 3762369.6,  214.0,  214.0,  2.0);
( 441259.5, 3762369.6,  214.6,  214.6,  2.0);  ( 441109.5, 3762419.6,  215.8,  215.8,  2.0);
( 441159.5, 3762419.6,  214.6,  214.6,  2.0);  ( 441209.5, 3762419.6,  214.2,  214.2,  2.0);
( 441259.5, 3762419.6,  214.1,  214.1,  2.0);  ( 441109.5, 3762469.6,  215.9,  215.9,  2.0);
( 441159.5, 3762469.6,  215.0,  215.0,  2.0);  ( 441209.5, 3762469.6,  214.6,  214.6,  2.0);

( 441259.5, 3762469.6, 215.0, 215.0, 2.0); ( 441109.5, 3762519.6, 216.4, 216.4, 2.0);
( 441159.5, 3762519.6, 215.4, 215.4, 2.0); ( 441209.5, 3762519.6, 215.1, 215.1, 2.0);
( 441259.5, 3762519.6, 215.0, 215.0, 2.0); ( 441109.5, 3762569.6, 217.2, 217.2, 2.0);
( 441159.5, 3762569.6, 215.9, 215.9, 2.0); ( 441209.5, 3762569.6, 215.4, 215.4, 2.0);
( 441259.5, 3762569.6, 215.0, 215.0, 2.0); ( 441109.5, 3762619.6, 217.2, 217.2, 2.0);
( 441159.5, 3762619.6, 216.2, 216.2, 2.0); ( 441209.5, 3762619.6, 215.8, 215.8, 2.0);
( 441259.5, 3762619.6, 216.0, 216.0, 2.0); ( 441109.5, 3762669.6, 217.1, 217.1, 2.0);
( 441159.5, 3762669.6, 216.7, 216.7, 2.0); ( 441209.5, 3762669.6, 216.7, 216.7, 2.0);
( 441259.5, 3762669.6, 216.7, 216.7, 2.0); ( 441109.5, 3762719.6, 218.0, 218.0, 2.0);
( 441159.5, 3762719.6, 217.5, 217.5, 2.0); ( 441209.5, 3762719.6, 217.4, 217.4, 2.0);
( 441259.5, 3762719.6, 217.1, 217.1, 2.0); ( 441109.5, 3762769.6, 218.4, 218.4, 2.0);
( 441159.5, 3762769.6, 218.0, 218.0, 2.0); ( 441209.5, 3762769.6, 217.5, 217.5, 2.0);
( 441259.5, 3762769.6, 217.3, 217.3, 2.0); ( 441313.5, 3762805.4, 218.1, 218.1, 2.0);
( 441363.5, 3762805.4, 218.4, 218.4, 2.0); ( 441413.5, 3762805.4, 218.3, 218.3, 2.0);
( 441463.5, 3762805.4, 218.4, 218.4, 2.0); ( 441513.5, 3762805.4, 218.8, 218.8, 2.0);
( 441563.5, 3762805.4, 218.4, 218.4, 2.0); ( 441613.5, 3762805.4, 218.2, 218.2, 2.0);
( 441663.5, 3762805.4, 218.5, 218.5, 2.0); ( 441713.5, 3762805.4, 218.9, 218.9, 2.0);
( 441763.5, 3762805.4, 218.6, 218.6, 2.0); ( 441813.5, 3762805.4, 218.9, 218.9, 2.0);
( 441313.5, 3762855.4, 218.7, 218.7, 2.0); ( 441363.5, 3762855.4, 218.8, 218.8, 2.0);
( 441413.5, 3762855.4, 218.9, 218.9, 2.0); ( 441463.5, 3762855.4, 218.9, 218.9, 2.0);
( 441513.5, 3762855.4, 219.1, 219.1, 2.0); ( 441563.5, 3762855.4, 219.2, 219.2, 2.0);
( 441613.5, 3762855.4, 219.0, 219.0, 2.0); ( 441663.5, 3762855.4, 219.1, 219.1, 2.0);
( 441713.5, 3762855.4, 219.4, 219.4, 2.0); ( 441763.5, 3762855.4, 219.2, 219.2, 2.0);
( 441813.5, 3762855.4, 219.8, 219.8, 2.0); ( 441313.5, 3762905.4, 219.3, 219.3, 2.0);
( 441363.5, 3762905.4, 219.1, 219.1, 2.0); ( 441413.5, 3762905.4, 219.7, 219.7, 2.0);
( 441463.5, 3762905.4, 219.7, 219.7, 2.0); ( 441513.5,

3762905.4,  220.0,  220.0,  2.0);
( 441563.5, 3762905.4,  220.1,  220.1,  2.0);  ( 441613.5, 3762905.4,  218.4,  218.4,  2.0);



*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

( 441663.5, 3762905.4,  220.1,  220.1,  2.0);  ( 441713.5, 3762905.4,  220.0,  220.0,  2.0);
( 441763.5, 3762905.4,  218.1,  218.1,  2.0);  ( 441813.5, 3762905.4,  220.0,  220.0,  2.0);
( 441313.5, 3762955.4,  219.7,  219.7,  2.0);  ( 441363.5, 3762955.4,  219.7,  219.7,  2.0);
( 441413.5, 3762955.4,  220.2,  220.2,  2.0);  ( 441463.5, 3762955.4,  220.4,  220.4,  2.0);
( 441513.5, 3762955.4,  220.7,  220.7,  2.0);  ( 441563.5, 3762955.4,  220.6,  220.6,  2.0);
( 441613.5, 3762955.4,  220.5,  220.5,  2.0);  ( 441663.5, 3762955.4,  221.0,  221.0,  2.0);
( 441713.5, 3762955.4,  220.8,  220.8,  2.0);  ( 441763.5, 3762955.4,  220.2,  220.2,  2.0);
( 441813.5, 3762955.4,  220.2,  220.2,  2.0);  ( 440408.2, 3761498.6,  205.4,  205.4,  2.0);
( 440956.5, 3762849.6,  219.2,  219.2,  2.0);  ( 440559.3, 3761306.1,  203.9,  203.9,  2.0);
( 440752.0, 3761305.4,  204.1,  204.1,  2.0);  ( 440857.7, 3761312.8,  204.3,  204.3,  2.0);
( 440969.2, 3761308.3,  204.3,  204.3,  2.0);  ( 440936.7, 3761237.4,  204.1,  204.1,  2.0);



* SOURCE-RECEPTOR COMBINATIONS FOR WHICH CALCULATIONS MAY NOT BE PERFORMED *
LESS THAN 1.0 METER; WITHIN OPENPIT; OR BEYOND 80KM FOR FASTAREA/FASTALL

```
                              SOURCE          - - RECEPTOR LOCATION - -
DISTANCE
                                ID            XR (METERS)   YR (METERS)
(METERS)
                            - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - -

                             L0000774            441245.1     3761669.9
-0.67
                             L0000776            441195.1     3761669.9
-0.15
                             L0000777            441145.1     3761669.9
0.74
                             L0000836            442447.7     3762095.1
-7.65
                             L0000837            442447.7     3762095.1
-3.70
                             L0000838            442497.7     3762095.1
-10.88
                             L0000839            442547.7     3762095.1
-4.80
                             L0000840            442547.7     3762095.1
-5.70
                             L0000841            442597.7     3762095.1
-10.06
                             L0000842            442647.7     3762095.1
-1.68
                             L0000843            442647.7     3762095.1
-7.19
                             L0000844            442697.7     3762095.1
-8.56
                             L0000846            442747.7     3762095.1
-8.08
                             L0000847            442797.7     3762095.1
-4.04
```



```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                                          *** METEOROLOGICAL DAYS SELECTED FOR
PROCESSING ***
                                                                (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
```

```
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: KCNO_v9.SFC
Met Version: 16216
Profile file: KCNO_v9.PFL

Surface format: FREE

Profile format: FREE

Surface station no.: 3179 Upper air station no.: 3190
Name: UNKNOWN Name: UNKNOWN

Year: 2012 Year: 2012

First 24 hours of scalar data

| YR | MO | DY | JDY | HR | H0 | U* | W* | DT/DZ | ZICNV | ZIMCH | M-O LEN | Z0 | BOWEN | ALBEDO | REF WS | WD | HT | REF TA | HT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
- - - - - - - - - - - - - - - - - - -
 12 01 01   1 01   -2.3  0.067 -9.000 -9.000 -999.   41.     11.2  0.09   0.74
1.00    0.73  313.    7.9  279.2    2.0
 12 01 01   1 02   -2.7  0.070 -9.000 -9.000 -999.   44.     11.3  0.09   0.74
1.00    0.80  342.    7.9  280.9    2.0
 12 01 01   1 03   -5.6  0.098 -9.000 -9.000 -999.   73.     14.7  0.09   0.74
1.00    1.20    9.    7.9  281.4    2.0
 12 01 01   1 04   -3.5  0.078 -9.000 -9.000 -999.   52.     11.9  0.09   0.74
1.00    0.94   21.    7.9  282.0    2.0
 12 01 01   1 05   -8.4  0.119 -9.000 -9.000 -999.   99.     18.1  0.09   0.74
1.00    1.45  353.    7.9  279.9    2.0
 12 01 01   1 06   -7.6  0.113 -9.000 -9.000 -999.   91.     17.0  0.09   0.74
1.00    1.38  325.    7.9  277.5    2.0
 12 01 01   1 07   -8.0  0.117 -9.000 -9.000 -999.   96.     17.7  0.09   0.74
1.00    1.42  313.    7.9  281.4    2.0
 12 01 01   1 08   -5.2  0.101 -9.000 -9.000 -999.   77.     17.5  0.09   0.74
0.53    1.23   19.    7.9  280.9    2.0
 12 01 01   1 09   23.2  0.117  0.267  0.012   29.   97.     -6.2  0.09   0.74
0.31    0.96  318.    7.9  287.5    2.0
 12 01 01   1 10   65.2  0.101  0.531  0.014   82.   77.     -1.4  0.09   0.74
0.24    0.63  244.    7.9  291.4    2.0
 12 01 01   1 11   95.5  0.162  0.778  0.008  176.  156.     -4.0  0.09   0.74
0.21    1.23   91.    7.9  296.4    2.0
 12 01 01   1 12  110.8  0.197  1.018  0.005  338.  209.     -6.1  0.09   0.74
0.20    1.60   90.    7.9  299.9    2.0
 12 01 01   1 13  110.5  0.229  1.184  0.005  534.  262.     -9.6  0.09   0.74
0.20    1.98   92.    7.9  302.0    2.0
 12 01 01   1 14   94.6  0.185  1.215  0.005  674.  191.     -5.9  0.09   0.74
0.21    1.50   73.    7.9  303.1    2.0
 12 01 01   1 15   68.6  0.187  1.184  0.005  858.  194.     -8.4  0.09   0.74
0.25    1.59   64.    7.9  303.1    2.0
 12 01 01   1 16   24.9  0.255  0.862  0.005  911.  308.    -58.8  0.09   0.74
0.34    2.61   92.    7.9  300.4    2.0
 12 01 01   1 17  -13.7  0.168 -9.000 -9.000 -999.  168.     31.1  0.09   0.74
0.62    1.98  107.    7.9  295.4    2.0
 12 01 01   1 18  -26.7  0.279 -9.000 -9.000 -999.  354.     85.6  0.09   0.74
1.00    3.22  134.    7.9  291.4    2.0
 12 01 01   1 19   -8.0  0.118 -9.000 -9.000 -999.  120.     18.2  0.09   0.74
1.00    1.43   37.    7.9  290.4    2.0
 12 01 01   1 20   -7.7  0.115 -9.000 -9.000 -999.   94.     17.6  0.09   0.74
1.00    1.40   49.    7.9  287.0    2.0
 12 01 01   1 21   -9.7  0.130 -9.000 -9.000 -999.  113.     20.2  0.09   0.74
1.00    1.57   26.    7.9  288.8    2.0
 12 01 01   1 22   -4.8  0.090 -9.000 -9.000 -999.   65.     13.6  0.09   0.74
1.00    1.11   56.    7.9  284.9    2.0
 12 01 01   1 23  -11.5  0.141 -9.000 -9.000 -999.  127.     21.9  0.09   0.74
1.00    1.69   36.    7.9  282.0    2.0
 12 01 01   1 24  -16.9  0.172 -9.000 -9.000 -999.  171.     32.4  0.09   0.74
1.00    2.03   33.    7.9  279.9    2.0
```

```
 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 12 01 01 01    7.9 1  313.    0.73   279.3   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        20:06:41

                                 PAGE  58
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P2EXHAUS ***
                                 INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                 L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                 L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                 L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                            *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                       ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - -
         440400.61    3761994.75        1.29732                      440450.61
3761994.75        1.46319
         440500.61    3761994.75        1.66803                      440550.61
3761994.75        1.94377
         440600.61    3761994.75        2.30535                      440650.61
3761994.75        2.81086
         440400.61    3762044.75        1.26756                      440450.61
3762044.75        1.42896
         440500.61    3762044.75        1.62777                      440550.61
3762044.75        1.88766
         440600.61    3762044.75        2.23673                      440650.61
3762044.75        2.73121
         440400.61    3762094.75        1.21882                      440450.61
3762094.75        1.37202
         440500.61    3762094.75        1.56015                      440550.61
3762094.75        1.80321
         440600.61    3762094.75        2.14039                      440650.61
```

3762094.75 2.58175
440400.61 3762144.75 1.16606 440450.61
3762144.75 1.31272
440500.61 3762144.75 1.48208 440550.61
3762144.75 1.71492
440600.61 3762144.75 2.00849 440650.61
3762144.75 2.41612
441145.13 3761319.94 1.88148 441195.13
3761319.94 1.92250
441245.13 3761319.94 1.95752 441145.13
3761369.94 2.11998
441195.13 3761369.94 2.16793 441245.13
3761369.94 2.20920
441145.13 3761419.94 2.41725 441195.13
3761419.94 2.47498
441245.13 3761419.94 2.52572 441145.13
3761469.94 2.80193
441195.13 3761469.94 2.87072 441245.13
3761469.94 2.93355
441145.13 3761519.94 3.32045 441195.13
3761519.94 3.40335
441245.13 3761519.94 3.47615 441145.13
3761569.94 4.06739
441195.13 3761569.94 4.16822 441245.13
3761569.94 4.25405
441145.13 3761619.94 5.28030 441195.13
3761619.94 5.40468
441245.13 3761619.94 5.50691 441145.13
3761669.94 7.46002
441195.13 3761669.94 7.59071 441245.13
3761669.94 7.71804
441917.00 3761316.31 1.84936 441967.00
3761316.31 1.79750
442017.00 3761316.31 1.74122 442067.00
3761316.31 1.67978
441917.00 3761366.31 2.09368 441967.00
3761366.31 2.03368
442017.00 3761366.31 1.96502 442067.00
3761366.31 1.89134
441917.00 3761416.31 2.40189 441967.00
3761416.31 2.32931
442017.00 3761416.31 2.24568 442067.00
3761416.31 2.15374
441917.00 3761466.31 2.79832 441967.00
3761466.31 2.71170
442017.00 3761466.31 2.60971 442067.00
3761466.31 2.49435
441917.00 3761516.31 3.33226 441967.00
3761516.31 3.22877
442017.00 3761516.31 3.10372 442067.00
3761516.31 2.95648

```
         441917.00    3761566.31        4.09838                      441967.00
3761566.31        3.97501
         442017.00    3761566.31        3.82050                      442067.00
3761566.31        3.62835
         441917.00    3761616.31        5.32837                      441967.00
3761616.31        5.18105
         442017.00    3761616.31        4.99031                      442067.00
3761616.31        4.74025
         442847.68    3761995.12        1.47642                      442897.68
3761995.12        1.37747
         442947.68    3761995.12        1.27617                      442997.68
3761995.12        1.19119
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        20:06:41

                                 PAGE  59
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P2EXHAUS ***
                                 INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                 L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                 L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                 L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                                 *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                         ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
         443047.68    3761995.12        1.11796                      443097.68
3761995.12        1.05122
         443147.68    3761995.12        0.99458                      443197.68
3761995.12        0.94274
         442847.68    3762045.12        1.49375                      442897.68
3762045.12        1.38696
         442947.68    3762045.12        1.29139                      442997.68
3762045.12        1.20855
         443047.68    3762045.12        1.13302                      443097.68
3762045.12        1.06658
```

443147.68 3762045.12 1.00637 443197.68
3762045.12 0.95389
442447.68 3762095.12 3.25213 442497.68
3762095.12 2.87782
442547.68 3762095.12 2.57649 442597.68
3762095.12 2.32957
442647.68 3762095.12 2.10854 442697.68
3762095.12 1.92830
442747.68 3762095.12 1.76828 442797.68
3762095.12 1.62655
442847.68 3762095.12 1.49711 442897.68
3762095.12 1.39177
442947.68 3762095.12 1.29814 442997.68
3762095.12 1.22138
443047.68 3762095.12 1.14433 443097.68
3762095.12 1.07583
443147.68 3762095.12 1.01403 443197.68
3762095.12 0.96454
442447.68 3762145.12 3.15020 442497.68
3762145.12 2.80204
442547.68 3762145.12 2.50935 442597.68
3762145.12 2.28268
442647.68 3762145.12 2.07214 442697.68
3762145.12 1.89667
442747.68 3762145.12 1.74810 442797.68
3762145.12 1.61305
442847.68 3762145.12 1.48368 442897.68
3762145.12 1.38553
442947.68 3762145.12 1.29692 442997.68
3762145.12 1.21897
443047.68 3762145.12 1.14403 443097.68
3762145.12 1.07615
443147.68 3762145.12 1.01475 443197.68
3762145.12 0.96237
442447.68 3762195.12 3.00485 442497.68
3762195.12 2.68590
442547.68 3762195.12 2.41457 442597.68
3762195.12 2.20532
442647.68 3762195.12 2.01952 442697.68
3762195.12 1.85875
442747.68 3762195.12 1.71785 442797.68
3762195.12 1.58684
442847.68 3762195.12 1.46686 442897.68
3762195.12 1.37186
442947.68 3762195.12 1.28987 442997.68
3762195.12 1.21376
443047.68 3762195.12 1.14220 443097.68
3762195.12 1.07658
443147.68 3762195.12 1.01506 443197.68
3762195.12 0.96096
442447.68 3762245.12 2.81761 442497.68

3762245.12 2.53690
442547.68 3762245.12 2.29833 442597.68
3762245.12 2.10973
442647.68 3762245.12 1.94084 442697.68
3762245.12 1.79319
442747.68 3762245.12 1.65866 442797.68
3762245.12 1.54279
442847.68 3762245.12 1.43996 442897.68
3762245.12 1.35250
442947.68 3762245.12 1.26999 442997.68
3762245.12 1.19615
443047.68 3762245.12 1.12534 443097.68
3762245.12 1.06306
443147.68 3762245.12 1.00440 443197.68
3762245.12 0.95267
442822.81 3761611.77 1.15325 442872.81
3761611.77 1.08572
442922.81 3761611.77 1.02456 442972.81
3761611.77 0.96892



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3761661.77 1.01313
442732.29 3762366.08 1.52978 442782.29
3762366.08 1.44316
442832.29 3762366.08 1.36643 442732.29
3762416.08 1.44758
442782.29 3762416.08 1.37210 442832.29
3762416.08 1.30090
442732.29 3762466.08 1.35841 442782.29
3762466.08 1.29447
442832.29 3762466.08 1.23380 441922.75
3762323.77 5.59065
441972.75 3762323.77 5.46019 442022.75
3762323.77 5.25687
442072.75 3762323.77 5.02755 441922.75
3762373.77 4.07082
441972.75 3762373.77 4.03209 442022.75
3762373.77 3.88807
442072.75 3762373.77 3.74287 441922.75
3762423.77 3.13568
441972.75 3762423.77 3.14297 442022.75
3762423.77 3.06645
442072.75 3762423.77 2.96595 441922.75
3762473.77 2.56342
441972.75 3762473.77 2.54518 442022.75
3762473.77 2.50649
442072.75 3762473.77 2.42407 441922.75
3762523.77 2.13598
441972.75 3762523.77 2.11799 442022.75
3762523.77 2.09752
442072.75 3762523.77 2.03651 441922.75
3762573.77 1.79964
441972.75 3762573.77 1.79434 442022.75
3762573.77 1.76998
442072.75 3762573.77 1.73288 441922.75
3762623.77 1.54842
441972.75 3762623.77 1.53550 442022.75
3762623.77 1.51647
442072.75 3762623.77 1.48923 441109.54
3762319.57 4.84936
441159.54 3762319.57 5.08630 441209.54
3762319.57 5.24786
441259.54 3762319.57 5.22570 441109.54
3762369.57 3.29051
441159.54 3762369.57 3.65271 441209.54
3762369.57 3.79256
441259.54 3762369.57 3.78684 441109.54
3762419.57 2.47034
441159.54 3762419.57 2.77908 441209.54
3762419.57 2.95675
441259.54 3762419.57 3.07718 441109.54
3762469.57 2.01292

441159.54 3762469.57 2.22236 441209.54
3762469.57 2.35758
441259.54 3762469.57 2.39163 441109.54
3762519.57 1.66484
441159.54 3762519.57 1.84060 441209.54
3762519.57 1.93986
441259.54 3762519.57 2.00844 441109.54
3762569.57 1.40570
441159.54 3762569.57 1.52928 441209.54
3762569.57 1.64172
441259.54 3762569.57 1.72836 441109.54
3762619.57 1.23369
441159.54 3762619.57 1.31888 441209.54
3762619.57 1.39272
441259.54 3762619.57 1.41379 441109.54
3762669.57 1.10319
441159.54 3762669.57 1.14502 441209.54
3762669.57 1.17724
441259.54 3762669.57 1.20766 441109.54
3762719.57 0.96664
441159.54 3762719.57 1.00483 441209.54
3762719.57 1.03225
441259.54 3762719.57 1.06408 441109.54
3762769.57 0.86657
441159.54 3762769.57 0.89561 441209.54
3762769.57 0.92631



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 0.95093 | 441313.48 | 3762805.42 | 0.88232 |
| 441363.48 | 3762805.42 | 0.89043 | 441413.48 | 3762805.42 | 0.90686 |
| 441463.48 | 3762805.42 | 0.91728 | 441513.48 | 3762805.42 | 0.92002 |
| 441563.48 | 3762805.42 | 0.93915 | 441613.48 | 3762805.42 | 0.95210 |
| 441663.48 | 3762805.42 | 0.95397 | 441713.48 | 3762805.42 | 0.95270 |
| 441763.48 | 3762805.42 | 0.96365 | 441813.48 | 3762805.42 | 0.96223 |
| 441313.48 | 3762855.42 | 0.79091 | 441363.48 | 3762855.42 | 0.80038 |
| 441413.48 | 3762855.42 | 0.81044 | 441463.48 | 3762855.42 | 0.81993 |
| 441513.48 | 3762855.42 | 0.82502 | 441563.48 | 3762855.42 | 0.83231 |
| 441613.48 | 3762855.42 | 0.84467 | 441663.48 | 3762855.42 | 0.84817 |
| 441713.48 | 3762855.42 | 0.84896 | 441763.48 | 3762855.42 | 0.85633 |
| 441813.48 | 3762855.42 | 0.85057 | 441313.48 | 3762905.42 | 0.71247 |
| 441363.48 | 3762905.42 | 0.72531 | 441413.48 | 3762905.42 | 0.72396 |
| 441463.48 | 3762905.42 | 0.73331 | 441513.48 | 3762905.42 | 0.73583 |
| 441563.48 | 3762905.42 | 0.74051 | 441613.48 | 3762905.42 | 0.77650 |
| 441663.48 | 3762905.42 | 0.75323 | 441713.48 | 3762905.42 | 0.75920 |
| 441763.48 | 3762905.42 | 0.79425 | 441813.48 | 3762905.42 | 0.76710 |
| 441313.48 | 3762955.42 | 0.64899 | 441363.48 | 3762955.42 | 0.65711 |
| 441413.48 | 3762955.42 | 0.65615 | 441463.48 | 3762955.42 | 0.66014 |
| 441513.48 | 3762955.42 | 0.66208 | 441563.48 | 3762955.42 | 0.66961 |
| 441613.48 | 3762955.42 | 0.67688 | 441663.48 | 3762955.42 | 0.67386 |
| 441713.48 | 3762955.42 | 0.68172 | 441763.48 | 3762955.42 | 0.69310 |
| 441813.48 | 3762955.42 | 0.69498 | 440408.22 | 3761498.57 | 1.05768 |
| 440956.50 | 3762849.59 | 0.68397 | 440559.26 | | |

3761306.11 1.06104
440752.05 3761305.37 1.33567 440857.69
3761312.76 1.51241
440969.23 3761308.33 1.64955 440936.73
3761237.41 1.40048



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

441145.13 3761319.94 2.51434 441195.13
3761319.94 2.55589
441245.13 3761319.94 2.58849 441145.13
3761369.94 2.80975
441195.13 3761369.94 2.85756 441245.13
3761369.94 2.89596
441145.13 3761419.94 3.17203 441195.13
3761419.94 3.22961
441245.13 3761419.94 3.27845 441145.13
3761469.94 3.63400
441195.13 3761469.94 3.70207 441245.13
3761469.94 3.76879
441145.13 3761519.94 4.24876 441195.13
3761519.94 4.33070
441245.13 3761519.94 4.40826 441145.13
3761569.94 5.12946
441195.13 3761569.94 5.22693 441245.13
3761569.94 5.31625
441145.13 3761619.94 6.56868 441195.13
3761619.94 6.69431
441245.13 3761619.94 6.81545 441145.13
3761669.94 10.10519
441195.13 3761669.94 10.23751 441245.13
3761669.94 10.43567
441917.00 3761316.31 2.23719 441967.00
3761316.31 2.15063
442017.00 3761316.31 2.05817 442067.00
3761316.31 1.95886
441917.00 3761366.31 2.52824 441967.00
3761366.31 2.43024
442017.00 3761366.31 2.31977 442067.00
3761366.31 2.20360
441917.00 3761416.31 2.90031 441967.00
3761416.31 2.78244
442017.00 3761416.31 2.64958 442067.00
3761416.31 2.50700
441917.00 3761466.31 3.37925 441967.00
3761466.31 3.24041
442017.00 3761466.31 3.08064 442067.00
3761466.31 2.90531
441917.00 3761516.31 4.01749 441967.00
3761516.31 3.86243
442017.00 3761516.31 3.67208 442067.00
3761516.31 3.45341
441917.00 3761566.31 4.93706 441967.00
3761566.31 4.76335
442017.00 3761566.31 4.53939 442067.00
3761566.31 4.27107
441917.00 3761616.31 6.43030 441967.00
3761616.31 6.24776
442017.00 3761616.31 5.98790 442067.00

3761616.31 5.64761
442847.68 3761995.12 1.72874 442897.68
3761995.12 1.60440
442947.68 3761995.12 1.49525 442997.68
3761995.12 1.39790



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

443047.68 3762095.12 1.32498 443097.68
3762095.12 1.24594
443147.68 3762095.12 1.17452 443197.68
3762095.12 1.10938
442447.68 3762145.12 3.61035 442497.68
3762145.12 3.21567
442547.68 3762145.12 2.89278 442597.68
3762145.12 2.61989
442647.68 3762145.12 2.38900 442697.68
3762145.12 2.18929
442747.68 3762145.12 2.01493 442797.68
3762145.12 1.86229
442847.68 3762145.12 1.72809 442897.68
3762145.12 1.60778
442947.68 3762145.12 1.50048 442997.68
3762145.12 1.40423
443047.68 3762145.12 1.31802 443097.68
3762145.12 1.24020
443147.68 3762145.12 1.16970 443197.68
3762145.12 1.10540
442447.68 3762195.12 3.41997 442497.68
3762195.12 3.06389
442547.68 3762195.12 2.77217 442597.68
3762195.12 2.52307
442647.68 3762195.12 2.31034 442697.68
3762195.12 2.12557
442747.68 3762195.12 1.96342 442797.68
3762195.12 1.82074
442847.68 3762195.12 1.69379 442897.68
3762195.12 1.57952
442947.68 3762195.12 1.47694 442997.68
3762195.12 1.38456
443047.68 3762195.12 1.30129 443097.68
3762195.12 1.22584
443147.68 3762195.12 1.15732 443197.68
3762195.12 1.09475
442447.68 3762245.12 3.16527 442497.68
3762245.12 2.86280
442547.68 3762245.12 2.61070 442597.68
3762245.12 2.39240
442647.68 3762245.12 2.20397 442697.68
3762245.12 2.03843
442747.68 3762245.12 1.89201 442797.68
3762245.12 1.76109
442847.68 3762245.12 1.64357 442897.68
3762245.12 1.53745
442947.68 3762245.12 1.44167 442997.68
3762245.12 1.35485
443047.68 3762245.12 1.27603 443097.68
3762245.12 1.20409
443147.68 3762245.12 1.13844 443197.68

3762245.12 1.07820
442822.81 3761611.77 1.25892 442872.81
3761611.77 1.18891
442922.81 3761611.77 1.12521 442972.81
3761611.77 1.06688



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

442072.75 3762423.77 2.52077 441922.75
3762473.77 2.07941
441972.75 3762473.77 2.07820 442022.75
3762473.77 2.07041
442072.75 3762473.77 2.05540 441922.75
3762523.77 1.71665
441972.75 3762523.77 1.72136 442022.75
3762523.77 1.72166
442072.75 3762523.77 1.71574 441922.75
3762573.77 1.44071
441972.75 3762573.77 1.44944 442022.75
3762573.77 1.45382
442072.75 3762573.77 1.45427 441922.75
3762623.77 1.22522
441972.75 3762623.77 1.23514 442022.75
3762623.77 1.24205
442072.75 3762623.77 1.24606 441109.54
3762319.57 3.59227
441159.54 3762319.57 3.79178 441209.54
3762319.57 3.96346
441259.54 3762319.57 4.10285 441109.54
3762369.57 2.35776
441159.54 3762369.57 2.51178 441209.54
3762369.57 2.64660
441259.54 3762369.57 2.76445 441109.54
3762419.57 1.73788
441159.54 3762419.57 1.84993 441209.54
3762419.57 1.95424
441259.54 3762419.57 2.05127 441109.54
3762469.57 1.36849
441159.54 3762469.57 1.44660 441209.54
3762469.57 1.52334
441259.54 3762469.57 1.59624 441109.54
3762519.57 1.12417
441159.54 3762519.57 1.17932 441209.54
3762519.57 1.23474
441259.54 3762519.57 1.29018 441109.54
3762569.57 0.94921
441159.54 3762569.57 0.99040 441209.54
3762569.57 1.03094
441259.54 3762569.57 1.07246 441109.54
3762619.57 0.82070
441159.54 3762619.57 0.85065 441209.54
3762619.57 0.88011
441259.54 3762619.57 0.91017 441109.54
3762669.57 0.72095
441159.54 3762669.57 0.74196 441209.54
3762669.57 0.76357
441259.54 3762669.57 0.78626 441109.54
3762719.57 0.63869
441159.54 3762719.57 0.65501 441209.54

3762719.57 0.67142
441259.54 3762719.57 0.68913 441109.54
3762769.57 0.57210
441159.54 3762769.57 0.58464 441209.54
3762769.57 0.59786



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

```
         441363.48    3762905.42        0.47562                      441413.48
3762905.42        0.48278
         441463.48    3762905.42        0.49134                      441513.48
3762905.42        0.49972
         441563.48    3762905.42        0.50872                      441613.48
3762905.42        0.52105
         441663.48    3762905.42        0.52805                      441713.48
3762905.42        0.53802
         441763.48    3762905.42        0.55103                      441813.48
3762905.42        0.55767
         441313.48    3762955.42        0.42624                      441363.48
3762955.42        0.43248
         441413.48    3762955.42        0.43832                      441463.48
3762955.42        0.44496
         441513.48    3762955.42        0.45176                      441563.48
3762955.42        0.45950
         441613.48    3762955.42        0.46756                      441663.48
3762955.42        0.47478
         441713.48    3762955.42        0.48344                      441763.48
3762955.42        0.49264
         441813.48    3762955.42        0.50079                      440408.22
3761498.57        1.30647
         440956.50    3762849.59        0.46188                      440559.26
3761306.11        1.41361
         440752.05    3761305.37        1.81832                      440857.69
3761312.76        2.06423
         440969.23    3761308.33        2.24174                      440936.73
3761237.41        1.92134
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1EXHAUS ***
                                 INCLUDING SOURCE(S):     L0000789    , L0000790
, L0000791    , L0000792    , L0000793    ,
                 L0000794    , L0000795    , L0000796    , L0000797    , L0000798
, L0000799    , L0000800    , L0000801    ,
                 L0000802    , L0000803    , L0000804    , L0000805    , L0000806
, L0000807    , L0000808    , L0000809    ,
                 L0000810    , L0000811    , L0000812    , L0000813    , L0000814
, L0000815    , L0000816    ,  . . .      ,

                                                 *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM-2.5   IN MICROGRAMS/M**3
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**

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 0.32002 | 440450.61 | 3761994.75 | 0.33330 |
| 440500.61 | 3761994.75 | 0.34749 | 440550.61 | 3761994.75 | 0.36271 |
| 440600.61 | 3761994.75 | 0.37904 | 440650.61 | 3761994.75 | 0.39660 |
| 440400.61 | 3762044.75 | 0.31834 | 440450.61 | 3762044.75 | 0.33149 |
| 440500.61 | 3762044.75 | 0.34555 | 440550.61 | 3762044.75 | 0.36062 |
| 440600.61 | 3762044.75 | 0.37679 | 440650.61 | 3762044.75 | 0.39418 |
| 440400.61 | 3762094.75 | 0.31570 | 440450.61 | 3762094.75 | 0.32910 |
| 440500.61 | 3762094.75 | 0.34287 | 440550.61 | 3762094.75 | 0.35774 |
| 440600.61 | 3762094.75 | 0.37382 | 440650.61 | 3762094.75 | 0.39002 |
| 440400.61 | 3762144.75 | 0.31029 | 440450.61 | 3762144.75 | 0.32441 |
| 440500.61 | 3762144.75 | 0.33740 | 440550.61 | 3762144.75 | 0.35297 |
| 440600.61 | 3762144.75 | 0.36808 | 440650.61 | 3762144.75 | 0.38397 |
| 441145.13 | 3761319.94 | 0.60554 | 441195.13 | 3761319.94 | 0.63992 |
| 441245.13 | 3761319.94 | 0.67727 | 441145.13 | 3761369.94 | 0.61815 |
| 441195.13 | 3761369.94 | 0.65419 | 441245.13 | 3761369.94 | 0.69354 |
| 441145.13 | 3761419.94 | 0.63003 | 441195.13 | 3761419.94 | 0.66782 |
| 441245.13 | 3761419.94 | 0.70937 | 441145.13 | 3761469.94 | 0.64124 |
| 441195.13 | 3761469.94 | 0.68060 | 441245.13 | 3761469.94 | 0.72447 |
| 441145.13 | 3761519.94 | 0.65151 | 441195.13 | 3761519.94 | 0.69237 |
| 441245.13 | 3761519.94 | 0.73780 | 441145.13 | 3761569.94 | 0.66067 |
| 441195.13 | 3761569.94 | 0.70285 | 441245.13 | 3761569.94 | 0.74971 |
| 441145.13 | 3761619.94 | 0.66849 | 441195.13 | 3761619.94 | 0.71203 |
| 441245.13 | 3761619.94 | 0.76049 | 441145.13 | | |

3761669.94 0.67510
441195.13 3761669.94 0.71966 441245.13
3761669.94 0.76945
441917.00 3761316.31 1.67449 441967.00
3761316.31 1.80099
442017.00 3761316.31 1.93599 442067.00
3761316.31 2.07631
441917.00 3761366.31 1.81754 441967.00
3761366.31 1.97363
442017.00 3761366.31 2.14029 442067.00
3761366.31 2.31999
441917.00 3761416.31 1.97551 441967.00
3761416.31 2.16541
442017.00 3761416.31 2.37391 442067.00
3761416.31 2.60257
441917.00 3761466.31 2.14366 441967.00
3761466.31 2.37691
442017.00 3761466.31 2.64101 442067.00
3761466.31 2.93943
441917.00 3761516.31 2.31966 441967.00
3761516.31 2.60714
442017.00 3761516.31 2.94416 442067.00
3761516.31 3.34032
441917.00 3761566.31 2.50187 441967.00
3761566.31 2.85176
442017.00 3761566.31 3.28007 442067.00
3761566.31 3.81251
441917.00 3761616.31 2.68455 441967.00
3761616.31 3.10321
442017.00 3761616.31 3.63788 442067.00
3761616.31 4.34688
442847.68 3761995.12 14.45267 442897.68
3761995.12 10.57714
442947.68 3761995.12 8.33313 442997.68
3761995.12 6.82720



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,

L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 5.73987 | 443097.68 | 3761995.12 | 4.91649 |
| 443147.68 | 3761995.12 | 4.27480 | 443197.68 | 3761995.12 | 3.75995 |
| 442847.68 | 3762045.12 | 13.19335 | 442897.68 | 3762045.12 | 9.71539 |
| 442947.68 | 3762045.12 | 7.74115 | 442997.68 | 3762045.12 | 6.41178 |
| 443047.68 | 3762045.12 | 5.44961 | 443097.68 | 3762045.12 | 4.71141 |
| 443147.68 | 3762045.12 | 4.12772 | 443197.68 | 3762045.12 | 3.65805 |
| 442447.68 | 3762095.12 | 20.32381 | 442497.68 | 3762095.12 | 20.03074 |
| 442547.68 | 3762095.12 | 17.89468 | 442597.68 | 3762095.12 | 18.39305 |
| 442647.68 | 3762095.12 | 16.62953 | 442697.68 | 3762095.12 | 16.96427 |
| 442747.68 | 3762095.12 | 15.81198 | 442797.68 | 3762095.12 | 12.83922 |
| 442847.68 | 3762095.12 | 10.63194 | 442897.68 | 3762095.12 | 8.32649 |
| 442947.68 | 3762095.12 | 6.84652 | 442997.68 | 3762095.12 | 5.78968 |
| 443047.68 | 3762095.12 | 5.01750 | 443097.68 | 3762095.12 | 4.40386 |
| 443147.68 | 3762095.12 | 3.90590 | 443197.68 | 3762095.12 | 3.49964 |
| 442447.68 | 3762145.12 | 16.94456 | 442497.68 | 3762145.12 | 14.22452 |
| 442547.68 | 3762145.12 | 13.01678 | 442597.68 | 3762145.12 | 12.12111 |
| 442647.68 | 3762145.12 | 11.52236 | 442697.68 | 3762145.12 | 10.84854 |
| 442747.68 | 3762145.12 | 9.96147 | 442797.68 | 3762145.12 | 8.88722 |
| 442847.68 | 3762145.12 | 7.82704 | 442897.68 | 3762145.12 | 6.72330 |

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         442947.68    3762145.12        5.82038                       442997.68
3762145.12        5.08818
         443047.68    3762145.12        4.51224                       443097.68
3762145.12        4.02864
         443147.68    3762145.12        3.62193                       443197.68
3762145.12        3.27769
         442447.68    3762195.12       14.12430                       442497.68
3762195.12       11.21413
         442547.68    3762195.12        9.89634                       442597.68
3762195.12        8.92680
         442647.68    3762195.12        8.27116                       442697.68
3762195.12        7.68862
         442747.68    3762195.12        7.10525                       442797.68
3762195.12        6.56483
         442847.68    3762195.12        5.99822                       442897.68
3762195.12        5.39125
         442947.68    3762195.12        4.85323                       442997.68
3762195.12        4.38108
         443047.68    3762195.12        3.97808                       443097.68
3762195.12        3.62287
         443147.68    3762195.12        3.30902                       443197.68
3762195.12        3.03131
         442447.68    3762245.12       11.60933                       442497.68
3762245.12        9.10475
         442547.68    3762245.12        7.92224                       442597.68
3762245.12        7.04917
         442647.68    3762245.12        6.48535                       442697.68
3762245.12        6.01521
         442747.68    3762245.12        5.60842                       442797.68
3762245.12        5.19099
         442847.68    3762245.12        4.79114                       442897.68
3762245.12        4.40243
         442947.68    3762245.12        4.06170                       442997.68
3762245.12        3.75186
         443047.68    3762245.12        3.47758                       443097.68
3762245.12        3.21989
         443147.68    3762245.12        2.98349                       443197.68
3762245.12        2.76667
         442822.81    3761611.77        7.16797                       442872.81
3761611.77        6.02148
         442922.81    3761611.77        5.12504                       442972.81
3761611.77        4.42662
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                        ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE  68
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
```

YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 , L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 , L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 , L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 10.29132 | 442872.81 | 3761661.77 | 7.83306 |
| 442922.81 | 3761661.77 | 6.29140 | 442972.81 | 3761661.77 | 5.23813 |
| 442732.29 | 3762366.08 | 3.47618 | 442782.29 | 3762366.08 | 3.26100 |
| 442832.29 | 3762366.08 | 3.05233 | 442732.29 | 3762416.08 | 2.87066 |
| 442782.29 | 3762416.08 | 2.73327 | 442832.29 | 3762416.08 | 2.59677 |
| 442732.29 | 3762466.08 | 2.40100 | 442782.29 | 3762466.08 | 2.29737 |
| 442832.29 | 3762466.08 | 2.19241 | 441922.75 | 3762323.77 | 2.15989 |
| 441972.75 | 3762323.77 | 2.44664 | 442022.75 | 3762323.77 | 2.79832 |
| 442072.75 | 3762323.77 | 3.29203 | 441922.75 | 3762373.77 | 1.89279 |
| 441972.75 | 3762373.77 | 2.15613 | 442022.75 | 3762373.77 | 2.42600 |
| 442072.75 | 3762373.77 | 2.78051 | 441922.75 | 3762423.77 | 1.63723 |
| 441972.75 | 3762423.77 | 1.88318 | 442022.75 | 3762423.77 | 2.08998 |
| 442072.75 | 3762423.77 | 2.32804 | 441922.75 | 3762473.77 | 1.46660 |
| 441972.75 | 3762473.77 | 1.62077 | 442022.75 | 3762473.77 | 1.79375 |
| 442072.75 | 3762473.77 | 1.91165 | 441922.75 | 3762523.77 | 1.30559 |
| 441972.75 | 3762523.77 | 1.41340 | 442022.75 | | |

3762523.77 1.53642
442072.75 3762523.77 1.62817 441922.75
3762573.77 1.14925
441972.75 3762573.77 1.23278 442022.75
3762573.77 1.31203
442072.75 3762573.77 1.38410 441922.75
3762623.77 1.02660
441972.75 3762623.77 1.08127 442022.75
3762623.77 1.13668
442072.75 3762623.77 1.18593 441109.54
3762319.57 0.56256
441159.54 3762319.57 0.60028 441209.54
3762319.57 0.63768
441259.54 3762319.57 0.66894 441109.54
3762369.57 0.53660
441159.54 3762369.57 0.58062 441209.54
3762369.57 0.61647
441259.54 3762369.57 0.64602 441109.54
3762419.57 0.51447
441159.54 3762419.57 0.55934 441209.54
3762419.57 0.59843
441259.54 3762419.57 0.63642 441109.54
3762469.57 0.49817
441159.54 3762469.57 0.53834 441209.54
3762469.57 0.57517
441259.54 3762469.57 0.60346 441109.54
3762519.57 0.47576
441159.54 3762519.57 0.51937 441209.54
3762519.57 0.55158
441259.54 3762519.57 0.58374 441109.54
3762569.57 0.45050
441159.54 3762569.57 0.49427 441209.54
3762569.57 0.53076
441259.54 3762569.57 0.56519 441109.54
3762619.57 0.43539
441159.54 3762619.57 0.47205 441209.54
3762619.57 0.50554
441259.54 3762619.57 0.52689 441109.54
3762669.57 0.42324
441159.54 3762669.57 0.44624 441209.54
3762669.57 0.46811
441259.54 3762669.57 0.49069 441109.54
3762719.57 0.40192
441159.54 3762719.57 0.42306 441209.54
3762719.57 0.44279
441259.54 3762719.57 0.46630 441109.54
3762769.57 0.38605
441159.54 3762769.57 0.40421 441209.54
3762769.57 0.42491

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 0.44489 | 441313.48 | 3762805.42 | 0.44397 |
| 441363.48 | 3762805.42 | 0.46017 | 441413.48 | 3762805.42 | 0.48041 |
| 441463.48 | 3762805.42 | 0.49966 | 441513.48 | 3762805.42 | 0.51670 |
| 441563.48 | 3762805.42 | 0.54244 | 441613.48 | 3762805.42 | 0.56718 |
| 441663.48 | 3762805.42 | 0.58743 | 441713.48 | 3762805.42 | 0.60665 |
| 441763.48 | 3762805.42 | 0.63524 | 441813.48 | 3762805.42 | 0.65668 |
| 441313.48 | 3762855.42 | 0.42114 | 441363.48 | 3762855.42 | 0.43663 |
| 441413.48 | 3762855.42 | 0.45323 | 441463.48 | 3762855.42 | 0.47056 |
| 441513.48 | 3762855.42 | 0.48678 | 441563.48 | 3762855.42 | 0.50491 |
| 441613.48 | 3762855.42 | 0.52692 | 441663.48 | 3762855.42 | 0.54510 |
| 441713.48 | 3762855.42 | 0.56232 | 441763.48 | 3762855.42 | 0.58499 |
| 441813.48 | 3762855.42 | 0.59874 | 441313.48 | 3762905.42 | 0.39895 |

```
         441363.48    3762905.42        0.41477                       441413.48
3762905.42        0.42530
         441463.48    3762905.42        0.44107                       441513.48
3762905.42        0.45425
         441563.48    3762905.42        0.46903                       441613.48
3762905.42        0.50309
         441663.48    3762905.42        0.50261                       441713.48
3762905.42        0.52046
         441763.48    3762905.42        0.56149                       441813.48
3762905.42        0.55594
         441313.48    3762955.42        0.37935                       441363.48
3762955.42        0.39233
         441413.48    3762955.42        0.40170                       441463.48
3762955.42        0.41369
         441513.48    3762955.42        0.42504                       441563.48
3762955.42        0.43986
         441613.48    3762955.42        0.45527                       441663.48
3762955.42        0.46470
         441713.48    3762955.42        0.48168                       441763.48
3762955.42        0.50239
         441813.48    3762955.42        0.51678                       440408.22
3761498.57        0.31915
         440956.50    3762849.59        0.32255                       440559.26
3761306.11        0.34853
         440752.05    3761305.37        0.41000                       440857.69
3761312.76        0.45219
         440969.23    3761308.33        0.50252                       440936.73
3761237.41        0.47531
```



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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1FUGITI ***
                                 INCLUDING SOURCE(S):     PAREA2      ,

                                            *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         440400.61    3761994.75        0.29546                       440450.61
```

3761994.75 0.30750
440500.61 3761994.75 0.32037 440550.61
3761994.75 0.33410
440600.61 3761994.75 0.34885 440650.61
3761994.75 0.36471
440400.61 3762044.75 0.28871 440450.61
3762044.75 0.30030
440500.61 3762044.75 0.31268 440550.61
3762044.75 0.32591
440600.61 3762044.75 0.34008 440650.61
3762044.75 0.35529
440400.61 3762094.75 0.28161 440450.61
3762094.75 0.29273
440500.61 3762094.75 0.30461 440550.61
3762094.75 0.31729
440600.61 3762094.75 0.33086 440650.61
3762094.75 0.34544
440400.61 3762144.75 0.27426 440450.61
3762144.75 0.28492
440500.61 3762144.75 0.29629 440550.61
3762144.75 0.30841
440600.61 3762144.75 0.32138 440650.61
3762144.75 0.33528
441145.13 3761319.94 0.72352 441195.13
3761319.94 0.77006
441245.13 3761319.94 0.82101 441145.13
3761369.94 0.72647
441195.13 3761369.94 0.77426 441245.13
3761369.94 0.82686
441145.13 3761419.94 0.72752 441195.13
3761419.94 0.77649
441245.13 3761419.94 0.83077 441145.13
3761469.94 0.72717
441195.13 3761469.94 0.77687 441245.13
3761469.94 0.83276
441145.13 3761519.94 0.72546 441195.13
3761519.94 0.77566
441245.13 3761519.94 0.83196 441145.13
3761569.94 0.72241
441195.13 3761569.94 0.77283 441245.13
3761569.94 0.82925
441145.13 3761619.94 0.71778 441195.13
3761619.94 0.76836
441245.13 3761619.94 0.82508 441145.13
3761669.94 0.71161
441195.13 3761669.94 0.76186 441245.13
3761669.94 0.81844
441917.00 3761316.31 2.25817 441967.00
3761316.31 2.44284
442017.00 3761316.31 2.63987 442067.00
3761316.31 2.84390

```
         441917.00    3761366.31        2.42412                      441967.00
3761366.31        2.65030
         442017.00    3761366.31        2.89054                      442067.00
3761366.31        3.15076
         441917.00    3761416.31        2.60129                      441967.00
3761416.31        2.87194
         442017.00    3761416.31        3.16789                      442067.00
3761416.31        3.49307
         441917.00    3761466.31        2.77726                      441967.00
3761466.31        3.10352
         442017.00    3761466.31        3.47196                      442067.00
3761466.31        3.88874
         441917.00    3761516.31        2.94307                      441967.00
3761516.31        3.33787
         442017.00    3761516.31        3.79841                      442067.00
3761516.31        4.33960
         441917.00    3761566.31        3.09852                      441967.00
3761566.31        3.56409
         442017.00    3761566.31        4.13235                      442067.00
3761566.31        4.84330
         441917.00    3761616.31        3.23657                      441967.00
3761616.31        3.77319
         442017.00    3761616.31        4.45421                      442067.00
3761616.31        5.35023
         442847.68    3761995.12       17.40033                      442897.68
3761995.12       12.54420
         442947.68    3761995.12        9.89738                      442997.68
3761995.12        8.15227
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE  71
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - -
         443047.68    3761995.12        6.88645                      443097.68
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3761995.12 5.91677
443147.68 3761995.12 5.14942 443197.68
3761995.12 4.52744
442847.68 3762045.12 15.46718 442897.68
3762045.12 11.27341
442947.68 3762045.12 9.03621 442997.68
3762045.12 7.55239
443047.68 3762045.12 6.46269 443097.68
3762045.12 5.61621
443147.68 3762045.12 4.93526 443197.68
3762045.12 4.37478
442447.68 3762095.12 25.69466 442497.68
3762095.12 23.00128
442547.68 3762095.12 21.45849 442597.68
3762095.12 20.25397
442647.68 3762095.12 19.37934 442697.68
3762095.12 18.29647
442747.68 3762095.12 17.01491 442797.68
3762095.12 14.83613
442847.68 3762095.12 11.46429 442897.68
3762095.12 9.22162
442947.68 3762095.12 7.75398 442997.68
3762095.12 6.67958
443047.68 3762095.12 5.84278 443097.68
3762095.12 5.16497
443147.68 3762095.12 4.60193 443197.68
3762095.12 4.12561
442447.68 3762145.12 15.86423 442497.68
3762145.12 12.40537
442547.68 3762145.12 11.00775 442597.68
3762145.12 10.22979
442647.68 3762145.12 9.70811 442697.68
3762145.12 9.24793
442747.68 3762145.12 8.76774 442797.68
3762145.12 8.24860
442847.68 3762145.12 7.68942 442897.68
3762145.12 7.02261
442947.68 3762145.12 6.32628 442997.68
3762145.12 5.68383
443047.68 3762145.12 5.11888 443097.68
3762145.12 4.62467
443147.68 3762145.12 4.19176 443197.68
3762145.12 3.80998
442447.68 3762195.12 13.29184 442497.68
3762195.12 9.83837
442547.68 3762195.12 8.28231 442597.68
3762195.12 7.41400
442647.68 3762195.12 6.87787 442697.68
3762195.12 6.49484
442747.68 3762195.12 6.18095 442797.68
3762195.12 5.90459

```
         442847.68    3762195.12        5.64543                       442897.68
3762195.12        5.37255
         442947.68    3762195.12        5.06420                       442997.68
3762195.12        4.72742
         443047.68    3762195.12        4.38610                       443097.68
3762195.12        4.05599
         443147.68    3762195.12        3.74596                       443197.68
3762195.12        3.45831
         442447.68    3762245.12       10.67022                       442497.68
3762245.12        7.88403
         442547.68    3762245.12        6.57259                       442597.68
3762245.12        5.80605
         442647.68    3762245.12        5.32501                       442697.68
3762245.12        4.99481
         442747.68    3762245.12        4.75004                       442797.68
3762245.12        4.55342
         442847.68    3762245.12        4.38624                       442897.68
3762245.12        4.23312
         442947.68    3762245.12        4.07714                       442997.68
3762245.12        3.90328
         443047.68    3762245.12        3.71146                       443097.68
3762245.12        3.50745
         443147.68    3762245.12        3.30036                       443197.68
3762245.12        3.09558
         442822.81    3761611.77        7.76518                       442872.81
3761611.77        6.38496
         442922.81    3761611.77        5.39137                       442972.81
3761611.77        4.64296
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        20:06:41

                                 PAGE  72
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1FUGITI ***
                                 INCLUDING SOURCE(S):     PAREA2      ,

                                            *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                       ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         442822.81    3761661.77       11.79492                       442872.81
```

3761661.77 8.58782
442922.81 3761661.77 6.82603 442972.81
3761661.77 5.66322
442732.29 3762366.08 2.81716 442782.29
3762366.08 2.73223
442832.29 3762366.08 2.66056 442732.29
3762416.08 2.27700
442782.29 3762416.08 2.23717 442832.29
3762416.08 2.19934
442732.29 3762466.08 1.84096 442782.29
3762466.08 1.83558
442832.29 3762466.08 1.82428 441922.75
3762323.77 1.45288
441972.75 3762323.77 1.62076 442022.75
3762323.77 1.82779
442072.75 3762323.77 2.09316 441922.75
3762373.77 1.26016
441972.75 3762373.77 1.37858 442022.75
3762373.77 1.51379
442072.75 3762373.77 1.66897 441922.75
3762423.77 1.09542
441972.75 3762423.77 1.17750 442022.75
3762423.77 1.26533
442072.75 3762423.77 1.35880 441922.75
3762473.77 0.95597
441972.75 3762473.77 1.01243 442022.75
3762473.77 1.07116
442072.75 3762473.77 1.13161 441922.75
3762523.77 0.83827
441972.75 3762523.77 0.87832 442022.75
3762523.77 0.91981
442072.75 3762523.77 0.96233 441922.75
3762573.77 0.73986
441972.75 3762573.77 0.76966 442022.75
3762573.77 0.80060
442072.75 3762573.77 0.83260 441922.75
3762623.77 0.65798
441972.75 3762623.77 0.68109 442022.75
3762623.77 0.70540
442072.75 3762623.77 0.73042 441109.54
3762319.57 0.45609
441159.54 3762319.57 0.48090 441209.54
3762319.57 0.50789
441259.54 3762319.57 0.53724 441109.54
3762369.57 0.43669
441159.54 3762369.57 0.45966 441209.54
3762369.57 0.48442
441259.54 3762369.57 0.51121 441109.54
3762419.57 0.41820
441159.54 3762419.57 0.43935 441209.54
3762419.57 0.46205

```
         441259.54    3762419.57        0.48654                       441109.54
3762469.57        0.40058
         441159.54    3762469.57        0.41992                       441209.54
3762469.57        0.44062
         441259.54    3762469.57        0.46272                       441109.54
3762519.57        0.38360
         441159.54    3762519.57        0.40129                       441209.54
3762519.57        0.42006
         441259.54    3762519.57        0.44004                       441109.54
3762569.57        0.36716
         441159.54    3762569.57        0.38328                       441209.54
3762569.57        0.40025
         441259.54    3762569.57        0.41818                       441109.54
3762619.57        0.35132
         441159.54    3762619.57        0.36586                       441209.54
3762619.57        0.38104
         441259.54    3762619.57        0.39689                       441109.54
3762669.57        0.33593
         441159.54    3762669.57        0.34888                       441209.54
3762669.57        0.36234
         441259.54    3762669.57        0.37634                       441109.54
3762719.57        0.32077
         441159.54    3762719.57        0.33233                       441209.54
3762719.57        0.34424
         441259.54    3762719.57        0.35655                       441109.54
3762769.57        0.30608
         441159.54    3762769.57        0.31632                       441209.54
3762769.57        0.32683
```



```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                              *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         441259.54    3762769.57        0.33756                       441313.48
```

3762805.42 0.33495
441363.48 3762805.42 0.34478 441413.48
3762805.42 0.35473
441463.48 3762805.42 0.36457 441513.48
3762805.42 0.37416
441563.48 3762805.42 0.38395 441613.48
3762805.42 0.39358
441663.48 3762805.42 0.40288 441713.48
3762805.42 0.41209
441763.48 3762805.42 0.42207 441813.48
3762805.42 0.43189
441313.48 3762855.42 0.31586 441363.48
3762855.42 0.32422
441413.48 3762855.42 0.33250 441463.48
3762855.42 0.34065
441513.48 3762855.42 0.34855 441563.48
3762855.42 0.35635
441613.48 3762855.42 0.36431 441663.48
3762855.42 0.37206
441713.48 3762855.42 0.37986 441763.48
3762855.42 0.38829
441813.48 3762855.42 0.39648 441313.48
3762905.42 0.29782
441363.48 3762905.42 0.30492 441413.48
3762905.42 0.31162
441463.48 3762905.42 0.31833 441513.48
3762905.42 0.32472
441563.48 3762905.42 0.33110 441613.48
3762905.42 0.33879
441663.48 3762905.42 0.34433 441713.48
3762905.42 0.35130
441763.48 3762905.42 0.36011 441813.48
3762905.42 0.36628
441313.48 3762955.42 0.28085 441363.48
3762955.42 0.28672
441413.48 3762955.42 0.29222 441463.48
3762955.42 0.29765
441513.48 3762955.42 0.30294 441563.48
3762955.42 0.30850
441613.48 3762955.42 0.31424 441663.48
3762955.42 0.31971
441713.48 3762955.42 0.32599 441763.48
3762955.42 0.33287
441813.48 3762955.42 0.33979 440408.22
3761498.57 0.33556
440956.50 3762849.59 0.25903 440559.26
3761306.11 0.39061
440752.05 3761305.37 0.46885 440857.69
3761312.76 0.52210
440969.23 3761308.33 0.58885 440936.73
3761237.41 0.56653

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 ,
L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 3.12186 | 440450.61 | 3761994.75 | 3.47010 |
| 440500.61 | 3761994.75 | 3.90005 | 440550.61 | 3761994.75 | 4.46133 |
| 440600.61 | 3761994.75 | 5.19936 | 440650.61 | 3761994.75 | 6.22800 |
| 440400.61 | 3762044.75 | 3.02463 | 440450.61 | 3762044.75 | 3.35575 |
| 440500.61 | 3762044.75 | 3.76349 | 440550.61 | 3762044.75 | 4.28852 |
| 440600.61 | 3762044.75 | 4.98803 | 440650.61 | 3762044.75 | 5.97343 |
| 440400.61 | 3762094.75 | 2.90184 | 440450.61 | 3762094.75 | 3.21066 |
| 440500.61 | 3762094.75 | 3.58862 | 440550.61 | 3762094.75 | 4.07164 |
| 440600.61 | 3762094.75 | 4.72598 | 440650.61 | 3762094.75 | 5.61314 |
| 440400.61 | 3762144.75 | 2.76819 | 440450.61 | 3762144.75 | 3.05581 |
| 440500.61 | 3762144.75 | 3.39325 | 440550.61 | 3762144.75 | 3.83854 |

440600.61 3762144.75 4.40819 440650.61
3762144.75 5.20359
441145.13 3761319.94 5.72487 441195.13
3761319.94 5.88837
441245.13 3761319.94 6.04429 441145.13
3761369.94 6.27435
441195.13 3761369.94 6.45394 441245.13
3761369.94 6.62555
441145.13 3761419.94 6.94683 441195.13
3761419.94 7.14891
441245.13 3761419.94 7.34431 441145.13
3761469.94 7.80433
441195.13 3761469.94 8.03026 441245.13
3761469.94 8.25958
441145.13 3761519.94 8.94617 441195.13
3761519.94 9.20207
441245.13 3761519.94 9.45416 441145.13
3761569.94 10.57993
441195.13 3761569.94 10.87083 441245.13
3761569.94 11.14925
441145.13 3761619.94 13.23526 441195.13
3761619.94 13.57938
441245.13 3761619.94 13.90793 441145.13
3761669.94 18.95193
441195.13 3761669.94 19.30973 441245.13
3761669.94 19.74161
441917.00 3761316.31 8.01921 441967.00
3761316.31 8.19196
442017.00 3761316.31 8.37525 442067.00
3761316.31 8.55885
441917.00 3761366.31 8.86358 441967.00
3761366.31 9.08785
442017.00 3761366.31 9.31562 442067.00
3761366.31 9.56568
441917.00 3761416.31 9.87899 441967.00
3761416.31 10.14909
442017.00 3761416.31 10.43705 442067.00
3761416.31 10.75639
441917.00 3761466.31 11.09849 441967.00
3761466.31 11.43254
442017.00 3761466.31 11.80332 442067.00
3761466.31 12.22783
441917.00 3761516.31 12.61248 441967.00
3761516.31 13.03622
442017.00 3761516.31 13.51838 442067.00
3761516.31 14.08981
441917.00 3761566.31 14.63583 441967.00
3761566.31 15.15421
442017.00 3761566.31 15.77230 442067.00
3761566.31 16.55523
441917.00 3761616.31 17.67978 441967.00

3761616.31 18.30522
442017.00 3761616.31 19.07031 442067.00
3761616.31 20.08497
442847.68 3761995.12 35.05817 442897.68
3761995.12 26.10320
442947.68 3761995.12 21.00193 442997.68
3761995.12 17.56856



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 ,
L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762095.12 43.65680
442647.68 3762095.12 40.55351 442697.68
3762095.12 39.41430
442747.68 3762095.12 36.63828 442797.68
3762095.12 31.18600
442847.68 3762095.12 25.33808 442897.68
3762095.12 20.56088
442947.68 3762095.12 17.40974 442997.68
3762095.12 15.10336
443047.68 3762095.12 13.32960 443097.68
3762095.12 11.89060
443147.68 3762095.12 10.69637 443197.68
3762095.12 9.69917
442447.68 3762145.12 39.56934 442497.68
3762145.12 32.64760
442547.68 3762145.12 29.42666 442597.68
3762145.12 27.25347
442647.68 3762145.12 25.69161 442697.68
3762145.12 24.18243
442747.68 3762145.12 22.49224 442797.68
3762145.12 20.61117
442847.68 3762145.12 18.72823 442897.68
3762145.12 16.73922
442947.68 3762145.12 14.94406 442997.68
3762145.12 13.39521
443047.68 3762145.12 12.09317 443097.68
3762145.12 10.96966
443147.68 3762145.12 9.99814 443197.68
3762145.12 9.15543
442447.68 3762195.12 33.84096 442497.68
3762195.12 26.80229
442547.68 3762195.12 23.36540 442597.68
3762195.12 21.06919
442647.68 3762195.12 19.47889 442697.68
3762195.12 18.16778
442747.68 3762195.12 16.96746 442797.68
3762195.12 15.87699
442847.68 3762195.12 14.80430 442897.68
3762195.12 13.71518
442947.68 3762195.12 12.68423 442997.68
3762195.12 11.70681
443047.68 3762195.12 10.80766 443097.68
3762195.12 9.98128
443147.68 3762195.12 9.22737 443197.68
3762195.12 8.54534
442447.68 3762245.12 28.26243 442497.68
3762245.12 22.38847
442547.68 3762245.12 19.40387 442597.68
3762245.12 17.35736
442647.68 3762245.12 15.95517 442697.68
3762245.12 14.84164

```
         442747.68    3762245.12       13.90914                      442797.68
3762245.12       13.04828
         442847.68    3762245.12       12.26090                      442897.68
3762245.12       11.52550
         442947.68    3762245.12       10.85051                      442997.68
3762245.12       10.20614
         443047.68    3762245.12        9.59041                      443097.68
3762245.12        8.99449
         443147.68    3762245.12        8.42669                      443197.68
3762245.12        7.89313
         442822.81    3761611.77       17.34531                      442872.81
3761611.77       14.68108
         442922.81    3761611.77       12.66618                      442972.81
3761611.77       11.10538
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE  76
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
         442822.81    3761661.77       24.65203                      442872.81
3761661.77       18.83129
         442922.81    3761661.77       15.38815                      442972.81
3761661.77       13.04555
         442732.29    3762366.08        9.51144                      442782.29
3762366.08        9.02753
         442832.29    3762366.08        8.58019                      442732.29
3762416.08        8.17024
```

| | | | | | |
|---|---|---|---|---|---|
| 442782.29 | 3762416.08 | 7.83653 | 442832.29 | 3762416.08 | 7.51463 |
| 442732.29 | 3762466.08 | 7.06153 | 442782.29 | 3762466.08 | 6.82271 |
| 442832.29 | 3762466.08 | 6.58216 | 441922.75 | 3762323.77 | 13.89107 |
| 441972.75 | 3762323.77 | 14.16522 | 442022.75 | 3762323.77 | 14.44024 |
| 442072.75 | 3762323.77 | 14.86730 | 441922.75 | 3762373.77 | 10.55943 |
| 441972.75 | 3762373.77 | 10.87973 | 442022.75 | 3762373.77 | 11.09758 |
| 442072.75 | 3762373.77 | 11.40582 | 441922.75 | 3762423.77 | 8.44811 |
| 441972.75 | 3762423.77 | 8.77525 | 442022.75 | 3762423.77 | 8.97234 |
| 442072.75 | 3762423.77 | 9.17357 | 441922.75 | 3762473.77 | 7.06540 |
| 441972.75 | 3762473.77 | 7.25658 | 442022.75 | 3762473.77 | 7.44180 |
| 442072.75 | 3762473.77 | 7.52273 | 441922.75 | 3762523.77 | 5.99649 |
| 441972.75 | 3762523.77 | 6.13106 | 442022.75 | 3762523.77 | 6.27540 |
| 442072.75 | 3762523.77 | 6.34276 | 441922.75 | 3762573.77 | 5.12945 |
| 441972.75 | 3762573.77 | 5.24622 | 442022.75 | 3762573.77 | 5.33642 |
| 442072.75 | 3762573.77 | 5.40386 | 441922.75 | 3762623.77 | 4.45823 |
| 441972.75 | 3762623.77 | 4.53299 | 442022.75 | 3762623.77 | 4.60059 |
| 442072.75 | 3762623.77 | 4.65164 | 441109.54 | 3762319.57 | 9.46028 |
| 441159.54 | 3762319.57 | 9.95926 | 441209.54 | 3762319.57 | 10.35689 |
| 441259.54 | 3762319.57 | 10.53474 | 441109.54 | 3762369.57 | 6.62156 |
| 441159.54 | 3762369.57 | 7.20477 | 441209.54 | 3762369.57 | 7.54005 |
| 441259.54 | 3762369.57 | 7.70852 | 441109.54 | 3762419.57 | 5.14089 |
| 441159.54 | 3762419.57 | 5.62769 | 441209.54 | 3762419.57 | 5.97147 |
| 441259.54 | 3762419.57 | 6.25141 | 441109.54 | 3762469.57 | 4.28016 |
| 441159.54 | 3762469.57 | 4.62723 | 441209.54 | 3762469.57 | 4.89671 |
| 441259.54 | 3762469.57 | 5.05405 | 441109.54 | 3762519.57 | 3.64837 |
| 441159.54 | 3762519.57 | 3.94058 | 441209.54 | | |

3762519.57 4.14624
441259.54 3762519.57 4.32240 441109.54
3762569.57 3.17257
441159.54 3762569.57 3.39722 441209.54
3762569.57 3.60367
441259.54 3762569.57 3.78420 441109.54
3762619.57 2.84110
441159.54 3762619.57 3.00745 441209.54
3762619.57 3.15941
441259.54 3762619.57 3.24774 441109.54
3762669.57 2.58332
441159.54 3762669.57 2.68210 441209.54
3762669.57 2.77125
441259.54 3762669.57 2.86094 441109.54
3762719.57 2.32803
441159.54 3762719.57 2.41524 441209.54
3762719.57 2.49070
441259.54 3762719.57 2.57607 441109.54
3762769.57 2.13080
441159.54 3762769.57 2.20078 441209.54
3762769.57 2.27592



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 ,
L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762805.42 2.23704
441363.48 3762805.42 2.28274 441413.48
3762805.42 2.34222
441463.48 3762805.42 2.39466 441513.48
3762805.42 2.43672
441563.48 3762805.42 2.50606 441613.48
3762805.42 2.56777
441663.48 3762805.42 2.61264 441713.48
3762805.42 2.65285
441763.48 3762805.42 2.71665 441813.48
3762805.42 2.75907
441313.48 3762855.42 2.04491 441363.48
3762855.42 2.08758
441413.48 3762855.42 2.13247 441463.48
3762855.42 2.17787
441513.48 3762855.42 2.21762 441563.48
3762855.42 2.26203
441613.48 3762855.42 2.31639 441663.48
3762855.42 2.35722
441713.48 3762855.42 2.39424 441763.48
3762855.42 2.44465
441813.48 3762855.42 2.47111 441313.48
3762905.42 1.87697
441363.48 3762905.42 1.92060 441413.48
3762905.42 1.94367
441463.48 3762905.42 1.98405 441513.48
3762905.42 2.01452
441563.48 3762905.42 2.04936 441613.48
3762905.42 2.13944
441663.48 3762905.42 2.12822 441713.48
3762905.42 2.16898
441763.48 3762905.42 2.26688 441813.48
3762905.42 2.24700
441313.48 3762955.42 1.73543 441363.48
3762955.42 1.76864
441413.48 3762955.42 1.78840 441463.48
3762955.42 1.81644
441513.48 3762955.42 1.84181 441563.48
3762955.42 1.87747
441613.48 3762955.42 1.91395 441663.48
3762955.42 1.93305
441713.48 3762955.42 1.97283 441763.48
3762955.42 2.02100
441813.48 3762955.42 2.05234 440408.22
3761498.57 3.01886
440956.50 3762849.59 1.72743 440559.26
3761306.11 3.21379
440752.05 3761305.37 4.03285 440857.69
3761312.76 4.55094
440969.23 3761308.33 4.98266 440936.73
3761237.41 4.36366

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 3.22758 | 440450.61 | 3761994.75 | 3.62324 |
| 440500.61 | 3761994.75 | 4.10672 | 440550.61 | 3761994.75 | 4.71617 |
| 440600.61 | 3761994.75 | 5.49699 | 440650.61 | 3761994.75 | 6.53879 |
| 440400.61 | 3762044.75 | 3.20620 | 440450.61 | 3762044.75 | 3.58514 |
| 440500.61 | 3762044.75 | 4.05635 | 440550.61 | 3762044.75 | 4.63691 |
| 440600.61 | 3762044.75 | 5.38356 | 440650.61 | 3762044.75 | 6.40515 |
| 440400.61 | 3762094.75 | 3.20960 | 440450.61 | 3762094.75 | 3.55087 |
| 440500.61 | 3762094.75 | 3.98757 | 440550.61 | 3762094.75 | 4.52999 |
| 440600.61 | 3762094.75 | 5.21982 | 440650.61 | 3762094.75 | 6.22071 |
| 440400.61 | 3762144.75 | 3.23936 | 440450.61 | 3762144.75 | 3.52624 |
| 440500.61 | 3762144.75 | 3.95788 | 440550.61 | 3762144.75 | 4.43972 |

| | | | | | |
|---|---|---|---|---|---|
| 440600.61 | 3762144.75 | 5.11628 | 440650.61 | 3762144.75 | 6.03669 |
| 441145.13 | 3761319.94 | 4.19062 | 441195.13 | 3761319.94 | 4.25201 |
| 441245.13 | 3761319.94 | 4.30603 | 441145.13 | 3761369.94 | 4.67434 |
| 441195.13 | 3761369.94 | 4.74346 | 441245.13 | 3761369.94 | 4.79687 |
| 441145.13 | 3761419.94 | 5.26319 | 441195.13 | 3761419.94 | 5.34370 |
| 441245.13 | 3761419.94 | 5.40757 | 441145.13 | 3761469.94 | 6.00419 |
| 441195.13 | 3761469.94 | 6.09441 | 441245.13 | 3761469.94 | 6.17274 |
| 441145.13 | 3761519.94 | 6.96663 | 441195.13 | 3761519.94 | 7.06793 |
| 441245.13 | 3761519.94 | 7.15596 | 441145.13 | 3761569.94 | 8.28929 |
| 441195.13 | 3761569.94 | 8.41029 | 441245.13 | 3761569.94 | 8.51503 |
| 441145.13 | 3761619.94 | 10.32714 | 441195.13 | 3761619.94 | 10.47614 |
| 441245.13 | 3761619.94 | 10.59220 | 441145.13 | 3761669.94 | 13.57478 |
| 441195.13 | 3761669.94 | 13.74316 | 441245.13 | 3761669.94 | 13.88945 |
| 441917.00 | 3761316.31 | 4.00323 | 441967.00 | 3761316.31 | 3.87270 |
| 442017.00 | 3761316.31 | 3.72889 | 442067.00 | 3761316.31 | 3.57326 |
| 441917.00 | 3761366.31 | 4.44687 | 441967.00 | 3761366.31 | 4.30428 |
| 442017.00 | 3761366.31 | 4.14019 | 442067.00 | 3761366.31 | 3.96143 |
| 441917.00 | 3761416.31 | 4.99290 | 441967.00 | 3761416.31 | 4.82872 |
| 442017.00 | 3761416.31 | 4.64314 | 442067.00 | 3761416.31 | 4.43029 |
| 441917.00 | 3761466.31 | 5.67073 | 441967.00 | 3761466.31 | 5.48655 |
| 442017.00 | 3761466.31 | 5.27829 | 442067.00 | 3761466.31 | 5.02633 |
| 441917.00 | 3761516.31 | 6.54898 | 441967.00 | 3761516.31 | 6.35550 |
| 442017.00 | 3761516.31 | 6.11514 | 442067.00 | 3761516.31 | 5.81452 |
| 441917.00 | 3761566.31 | 7.78393 | 441967.00 | 3761566.31 | 7.56808 |
| 442017.00 | 3761566.31 | 7.28737 | 442067.00 | 3761566.31 | 6.92452 |
| 441917.00 | 3761616.31 | 9.77672 | 441967.00 | | |

3761616.31 9.48862
442017.00 3761616.31 9.12169 442067.00
3761616.31 8.67483
442847.68 3761995.12 2.90031 442897.68
3761995.12 2.77944
442947.68 3761995.12 2.58477 442997.68
3761995.12 2.43819



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762095.12 4.56766
442647.68 3762095.12 4.13301 442697.68
3762095.12 3.87977
442747.68 3762095.12 3.59689 442797.68
3762095.12 3.31650
442847.68 3762095.12 3.01843 442897.68
3762095.12 2.84854
442947.68 3762095.12 2.69223 442997.68
3762095.12 2.62275
443047.68 3762095.12 2.47242 443097.68
3762095.12 2.34788
443147.68 3762095.12 2.23655 443197.68
3762095.12 2.20631
442447.68 3762145.12 5.75082 442497.68
3762145.12 5.27896
442547.68 3762145.12 4.76990 442597.68
3762145.12 4.56114
442647.68 3762145.12 4.15292 442697.68
3762145.12 3.86604
442747.68 3762145.12 3.65434 442797.68
3762145.12 3.40099
442847.68 3762145.12 3.03970 442897.68
3762145.12 2.92080
442947.68 3762145.12 2.79748 442997.68
3762145.12 2.69930
443047.68 3762145.12 2.54838 443097.68
3762145.12 2.40614
443147.68 3762145.12 2.28045 443197.68
3762145.12 2.20686
442447.68 3762195.12 5.71007 442497.68
3762195.12 5.21967
442547.68 3762195.12 4.66630 442597.68
3762195.12 4.45478
442647.68 3762195.12 4.18381 442697.68
3762195.12 3.94031
442747.68 3762195.12 3.71794 442797.68
3762195.12 3.43435
442847.68 3762195.12 3.14021 442897.68
3762195.12 3.00991
442947.68 3762195.12 2.91519 442997.68
3762195.12 2.80661
443047.68 3762195.12 2.67223 443097.68
3762195.12 2.53875
443147.68 3762195.12 2.39488 443197.68
3762195.12 2.28373
442447.68 3762245.12 5.62971 442497.68
3762245.12 5.13602
442547.68 3762245.12 4.62889 442597.68
3762245.12 4.38952
442647.68 3762245.12 4.08403 442697.68
3762245.12 3.81846

```
         442747.68    3762245.12        3.55514                      442797.68
3762245.12        3.35958
         442847.68    3762245.12        3.18903                      442897.68
3762245.12        3.08598
         442947.68    3762245.12        2.94810                      442997.68
3762245.12        2.82777
         443047.68    3762245.12        2.67345                      443097.68
3762245.12        2.55493
         443147.68    3762245.12        2.42428                      443197.68
3762245.12        2.32438
         442822.81    3761611.77        2.29777                      442872.81
3761611.77        2.18713
         442922.81    3761611.77        2.08361                      442972.81
3761611.77        1.98657
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE  80
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

            *** THE   1ST-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                  ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                  **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
         442822.81    3761661.77        2.42724                      442872.81
3761661.77        2.29918
         442922.81    3761661.77        2.18933                      442972.81
3761661.77        2.08854
         442732.29    3762366.08        3.60452                      442782.29
3762366.08        3.47098
         442832.29    3762366.08        3.37531                      442732.29
3762416.08        3.52057
```

442782.29 3762416.08 3.40526 442832.29
3762416.08 3.28034
442732.29 3762466.08 3.37968 442782.29
3762466.08 3.27593
442832.29 3762466.08 3.19696 441922.75
3762323.77 9.45341
441972.75 3762323.77 9.43312 442022.75
3762323.77 9.33511
442072.75 3762323.77 9.14529 441922.75
3762373.77 7.71747
441972.75 3762373.77 7.57778 442022.75
3762373.77 7.57133
442072.75 3762373.77 7.45082 441922.75
3762423.77 6.78254
441972.75 3762423.77 6.53396 442022.75
3762423.77 6.52161
442072.75 3762423.77 6.44760 441922.75
3762473.77 5.85377
441972.75 3762473.77 5.81699 442022.75
3762473.77 5.76137
442072.75 3762473.77 5.73860 441922.75
3762523.77 5.12516
441972.75 3762523.77 5.14067 442022.75
3762523.77 5.10768
442072.75 3762523.77 5.09255 441922.75
3762573.77 4.52800
441972.75 3762573.77 4.55864 442022.75
3762573.77 4.57041
442072.75 3762573.77 4.56616 441922.75
3762623.77 4.05284
441972.75 3762623.77 4.07263 442022.75
3762623.77 4.10103
442072.75 3762623.77 4.11295 441109.54
3762319.57 8.91153
441159.54 3762319.57 9.15815 441209.54
3762319.57 9.30950
441259.54 3762319.57 9.33879 441109.54
3762369.57 6.83867
441159.54 3762369.57 6.99903 441209.54
3762369.57 7.11221
441259.54 3762369.57 7.23204 441109.54
3762419.57 5.69328
441159.54 3762419.57 5.75678 441209.54
3762419.57 5.85497
441259.54 3762419.57 5.94466 441109.54
3762469.57 4.91483
441159.54 3762469.57 4.93190 441209.54
3762469.57 4.99791
441259.54 3762469.57 5.09462 441109.54
3762519.57 4.35999
441159.54 3762519.57 4.33319 441209.54

3762519.57 4.37182
441259.54 3762519.57 4.42479 441109.54
3762569.57 3.92255
441159.54 3762569.57 3.88979 441209.54
3762569.57 3.88700
441259.54 3762569.57 3.88628 441109.54
3762619.57 3.53831
441159.54 3762619.57 3.51934 441209.54
3762619.57 3.51179
441259.54 3762619.57 3.55669 441109.54
3762669.57 3.20783
441159.54 3762669.57 3.21781 441209.54
3762669.57 3.23361
441259.54 3762669.57 3.24211 441109.54
3762719.57 2.94870
441159.54 3762719.57 2.94903 441209.54
3762719.57 2.95629
441259.54 3762719.57 2.95382 441109.54
3762769.57 2.71118
441159.54 3762769.57 2.71230 441209.54
3762769.57 2.70858



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762805.42 2.55645
441363.48 3762805.42 2.55063 441413.48
3762805.42 2.56218
441463.48 3762805.42 2.57949 441513.48
3762805.42 2.58817
441563.48 3762805.42 2.59060 441613.48
3762805.42 2.61943
441663.48 3762805.42 2.64909 441713.48
3762805.42 2.68298
441763.48 3762805.42 2.70472 441813.48
3762805.42 2.74474
441313.48 3762855.42 2.36084 441363.48
3762855.42 2.35045
441413.48 3762855.42 2.35133 441463.48
3762855.42 2.36215
441513.48 3762855.42 2.36595 441563.48
3762855.42 2.37311
441613.48 3762855.42 2.39113 441663.48
3762855.42 2.42233
441713.48 3762855.42 2.45875 441763.48
3762855.42 2.48325
441813.48 3762855.42 2.51788 441313.48
3762905.42 2.18614
441363.48 3762905.42 2.17091 441413.48
3762905.42 2.18086
441463.48 3762905.42 2.18822 441513.48
3762905.42 2.18641
441563.48 3762905.42 2.19094 441613.48
3762905.42 2.18992
441663.48 3762905.42 2.23137 441713.48
3762905.42 2.26178
441763.48 3762905.42 2.26268 441813.48
3762905.42 2.30951
441313.48 3762955.42 2.02706 441363.48
3762955.42 2.01818
441413.48 3762955.42 2.02451 441463.48
3762955.42 2.03113
441513.48 3762955.42 2.02777 441563.48
3762955.42 2.04548
441613.48 3762955.42 2.05859 441663.48
3762955.42 2.06936
441713.48 3762955.42 2.08657 441763.48
3762955.42 2.10954
441813.48 3762955.42 2.13226 440408.22
3761498.57 2.92759
440956.50 3762849.59 2.40743 440559.26
3761306.11 2.72129
440752.05 3761305.37 3.25258 440857.69
3761312.76 3.59020
440969.23 3761308.33 3.79971 440936.73
3761237.41 3.28005

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 6.34179 | 440450.61 | 3761994.75 | 7.00936 |
| 440500.61 | 3761994.75 | 7.79438 | 440550.61 | 3761994.75 | 8.73550 |
| 440600.61 | 3761994.75 | 9.89877 | 440650.61 | 3761994.75 | 11.40699 |
| 440400.61 | 3762044.75 | 6.06762 | 440450.61 | 3762044.75 | 6.70505 |
| 440500.61 | 3762044.75 | 7.46223 | 440550.61 | 3762044.75 | 8.37047 |
| 440600.61 | 3762044.75 | 9.49207 | 440650.61 | 3762044.75 | 10.94936 |
| 440400.61 | 3762094.75 | 5.84058 | 440450.61 | 3762094.75 | 6.36879 |
| 440500.61 | 3762094.75 | 7.02303 | 440550.61 | 3762094.75 | 7.86510 |
| 440600.61 | 3762094.75 | 8.92715 | 440650.61 | 3762094.75 | 10.35501 |
| 440400.61 | 3762144.75 | 5.56555 | 440450.61 | 3762144.75 | 6.06526 |
| 440500.61 | 3762144.75 | 6.65865 | 440550.61 | 3762144.75 | 7.38829 |
| 440600.61 | 3762144.75 | 8.35023 | 440650.61 | 3762144.75 | 9.65776 |
| 441145.13 | 3761319.94 | 9.54608 | 441195.13 | 3761319.94 | 9.62123 |
| 441245.13 | 3761319.94 | 9.65055 | 441145.13 | 3761369.94 | 10.47198 |
| 441195.13 | 3761369.94 | 10.56234 | 441245.13 | | |

3761369.94 10.60531
441145.13 3761419.94 11.55078 441195.13
3761419.94 11.65596
441245.13 3761419.94 11.71815 441145.13
3761469.94 12.85189
441195.13 3761469.94 12.96070 441245.13
3761469.94 13.05582
441145.13 3761519.94 14.49015 441195.13
3761519.94 14.58919
441245.13 3761519.94 14.68447 441145.13
3761569.94 16.70273
441195.13 3761569.94 16.76281 441245.13
3761569.94 16.85109
441145.13 3761619.94 20.01784 441195.13
3761619.94 20.08903
441245.13 3761619.94 20.20023 441145.13
3761669.94 27.22792
441195.13 3761669.94 27.23360 441245.13
3761669.94 27.48814
441917.00 3761316.31 7.60478 441967.00
3761316.31 7.31932
442017.00 3761316.31 6.96068 442067.00
3761316.31 6.58531
441917.00 3761366.31 8.30668 441967.00
3761366.31 8.00397
442017.00 3761366.31 7.63570 442067.00
3761366.31 7.19697
441917.00 3761416.31 9.16738 441967.00
3761416.31 8.82734
442017.00 3761416.31 8.44651 442067.00
3761416.31 7.94972
441917.00 3761466.31 10.21304 441967.00
3761466.31 9.83118
442017.00 3761466.31 9.43641 442067.00
3761466.31 8.90818
441917.00 3761516.31 11.53521 441967.00
3761516.31 11.13745
442017.00 3761516.31 10.70002 442067.00
3761516.31 10.17050
441917.00 3761566.31 13.40053 441967.00
3761566.31 12.94426
442017.00 3761566.31 12.42038 442067.00
3761566.31 11.91552
441917.00 3761616.31 16.54329 441967.00
3761616.31 15.94525
442017.00 3761616.31 15.25751 442067.00
3761616.31 14.58885
442847.68 3761995.12 5.59447 442897.68
3761995.12 5.29070
442947.68 3761995.12 5.01464 442997.68
3761995.12 4.76119

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 4.52828 | 443097.68 | 3761995.12 | 4.31391 |
| 443147.68 | 3761995.12 | 4.11846 | 443197.68 | 3761995.12 | 3.94134 |
| 442847.68 | 3762045.12 | 5.54557 | 442897.68 | 3762045.12 | 5.24403 |
| 442947.68 | 3762045.12 | 4.96763 | 442997.68 | 3762045.12 | 4.71376 |
| 443047.68 | 3762045.12 | 4.48138 | 443097.68 | 3762045.12 | 4.26638 |
| 443147.68 | 3762045.12 | 4.06694 | 443197.68 | 3762045.12 | 3.88570 |
| 442447.68 | 3762095.12 | 10.05503 | 442497.68 | 3762095.12 | 9.17016 |
| 442547.68 | 3762095.12 | 8.40164 | 442597.68 | 3762095.12 | 7.72449 |
| 442647.68 | 3762095.12 | 7.12661 | 442697.68 | 3762095.12 | 6.58940 |
| 442747.68 | 3762095.12 | 6.14172 | 442797.68 | 3762095.12 | 5.78104 |
| 442847.68 | 3762095.12 | 5.45923 | 442897.68 | 3762095.12 | 5.17040 |
| 442947.68 | 3762095.12 | 4.90395 | 442997.68 | 3762095.12 | 4.65659 |
| 443047.68 | 3762095.12 | 4.42814 | 443097.68 | 3762095.12 | 4.22449 |
| 443147.68 | 3762095.12 | 4.03812 | 443197.68 | 3762095.12 | 3.86233 |
| 442447.68 | 3762145.12 | 9.90142 | 442497.68 | | |

3762145.12 9.05891
442547.68 3762145.12 8.33032 442597.68
3762145.12 7.69788
442647.68 3762145.12 7.14159 442697.68
3762145.12 6.63930
442747.68 3762145.12 6.18270 442797.68
3762145.12 5.78723
442847.68 3762145.12 5.43883 442897.68
3762145.12 5.12443
442947.68 3762145.12 4.86722 442997.68
3762145.12 4.62886
443047.68 3762145.12 4.41617 443097.68
3762145.12 4.21974
443147.68 3762145.12 4.03622 443197.68
3762145.12 3.86406
442447.68 3762195.12 9.61194 442497.68
3762195.12 8.83297
442547.68 3762195.12 8.16638 442597.68
3762195.12 7.57425
442647.68 3762195.12 7.04851 442697.68
3762195.12 6.57467
442747.68 3762195.12 6.15321 442797.68
3762195.12 5.78857
442847.68 3762195.12 5.45338 442897.68
3762195.12 5.14263
442947.68 3762195.12 4.85551 442997.68
3762195.12 4.59408
443047.68 3762195.12 4.37431 443097.68
3762195.12 4.17129
443147.68 3762195.12 3.98979 443197.68
3762195.12 3.82745
442447.68 3762245.12 9.10077 442497.68
3762245.12 8.37525
442547.68 3762245.12 7.77721 442597.68
3762245.12 7.25950
442647.68 3762245.12 6.79823 442697.68
3762245.12 6.37874
442747.68 3762245.12 6.00874 442797.68
3762245.12 5.67542
442847.68 3762245.12 5.36620 442897.68
3762245.12 5.07795
442947.68 3762245.12 4.81014 442997.68
3762245.12 4.56081
443047.68 3762245.12 4.32898 443097.68
3762245.12 4.11278
443147.68 3762245.12 3.92822 443197.68
3762245.12 3.75785
442822.81 3761611.77 4.59397 442872.81
3761611.77 4.38606
442922.81 3761611.77 4.18683 442972.81
3761611.77 4.01942

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 4.84984 | 442872.81 | 3761661.77 | 4.65308 |
| 442922.81 | 3761661.77 | 4.47690 | 442972.81 | 3761661.77 | 4.30929 |
| 442732.29 | 3762366.08 | 5.71649 | 442782.29 | 3762366.08 | 5.41704 |
| 442832.29 | 3762366.08 | 5.12856 | 442732.29 | 3762416.08 | 5.52249 |
| 442782.29 | 3762416.08 | 5.28555 | 442832.29 | 3762416.08 | 5.05054 |
| 442732.29 | 3762466.08 | 5.24451 | 442782.29 | 3762466.08 | 5.05090 |
| 442832.29 | 3762466.08 | 4.88756 | 441922.75 | 3762323.77 | 13.44193 |
| 441972.75 | 3762323.77 | 13.45631 | 442022.75 | 3762323.77 | 13.41954 |
| 442072.75 | 3762323.77 | 13.33023 | 441922.75 | 3762373.77 | 10.68133 |
| 441972.75 | 3762373.77 | 10.72578 | 442022.75 | 3762373.77 | 10.71338 |
| 442072.75 | 3762373.77 | 10.63269 | 441922.75 | 3762423.77 | 8.98716 |
| 441972.75 | 3762423.77 | 9.03883 | 442022.75 | 3762423.77 | 9.04426 |
| 442072.75 | 3762423.77 | 9.02809 | 441922.75 | 3762473.77 | 7.76137 |
| 441972.75 | 3762473.77 | 7.81461 | 442022.75 | 3762473.77 | 7.87336 |
| 442072.75 | 3762473.77 | 7.87241 | 441922.75 | | |

3762523.77 6.79328
441972.75 3762523.77 6.87401 442022.75
3762523.77 6.95024
442072.75 3762523.77 6.96332 441922.75
3762573.77 5.99752
441972.75 3762573.77 6.09266 442022.75
3762573.77 6.18227
442072.75 3762573.77 6.20527 441922.75
3762623.77 5.32698
441972.75 3762623.77 5.41826 442022.75
3762623.77 5.51631
442072.75 3762623.77 5.54721 441109.54
3762319.57 11.60901
441159.54 3762319.57 11.81362 441209.54
3762319.57 12.07042
441259.54 3762319.57 12.27020 441109.54
3762369.57 8.90249
441159.54 3762369.57 9.02910 441209.54
3762369.57 9.13243
441259.54 3762369.57 9.30325 441109.54
3762419.57 7.30494
441159.54 3762419.57 7.38237 441209.54
3762419.57 7.45794
441259.54 3762419.57 7.54052 441109.54
3762469.57 6.20273
441159.54 3762469.57 6.22506 441209.54
3762469.57 6.25421
441259.54 3762469.57 6.27490 441109.54
3762519.57 5.44302
441159.54 3762519.57 5.43088 441209.54
3762519.57 5.41655
441259.54 3762519.57 5.42855 441109.54
3762569.57 4.84516
441159.54 3762569.57 4.80884 441209.54
3762569.57 4.78879
441259.54 3762569.57 4.78923 441109.54
3762619.57 4.35833
441159.54 3762619.57 4.29705 441209.54
3762619.57 4.29084
441259.54 3762619.57 4.29158 441109.54
3762669.57 3.94459
441159.54 3762669.57 3.88820 441209.54
3762669.57 3.89893
441259.54 3762669.57 3.90742 441109.54
3762719.57 3.57787
441159.54 3762719.57 3.54453 441209.54
3762719.57 3.58140
441259.54 3762719.57 3.60431 441109.54
3762769.57 3.26202
441159.54 3762769.57 3.28013 441209.54
3762769.57 3.31681

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 3.33415 | 441313.48 | 3762805.42 | 3.14975 |
| 441363.48 | 3762805.42 | 3.12491 | 441413.48 | 3762805.42 | 3.10820 |
| 441463.48 | 3762805.42 | 3.09062 | 441513.48 | 3762805.42 | 3.10374 |
| 441563.48 | 3762805.42 | 3.12140 | 441613.48 | 3762805.42 | 3.14683 |
| 441663.48 | 3762805.42 | 3.17996 | 441713.48 | 3762805.42 | 3.22927 |
| 441763.48 | 3762805.42 | 3.27711 | 441813.48 | 3762805.42 | 3.34600 |
| 441313.48 | 3762855.42 | 2.91606 | 441363.48 | 3762855.42 | 2.88933 |
| 441413.48 | 3762855.42 | 2.87918 | 441463.48 | 3762855.42 | 2.86028 |
| 441513.48 | 3762855.42 | 2.87515 | 441563.48 | 3762855.42 | 2.89273 |
| 441613.48 | 3762855.42 | 2.91449 | 441663.48 | 3762855.42 | 2.92874 |
| 441713.48 | 3762855.42 | 2.95281 | 441763.48 | 3762855.42 | 3.00230 |
| 441813.48 | 3762855.42 | 3.06821 | 441313.48 | 3762905.42 | 2.70245 |
| 441363.48 | 3762905.42 | 2.67536 | 441413.48 | 3762905.42 | 2.66765 |
| 441463.48 | 3762905.42 | 2.65316 | 441513.48 | 3762905.42 | 2.67206 |
| 441563.48 | 3762905.42 | 2.69777 | 441613.48 | | |

3762905.42 2.72903
441663.48 3762905.42 2.73759 441713.48
3762905.42 2.74389
441763.48 3762905.42 2.77017 441813.48
3762905.42 2.83600
441313.48 3762955.42 2.52783 441363.48
3762955.42 2.50269
441413.48 3762955.42 2.48125 441463.48
3762955.42 2.46806
441513.48 3762955.42 2.49423 441563.48
3762955.42 2.53431
441613.48 3762955.42 2.56035 441663.48
3762955.42 2.57123
441713.48 3762955.42 2.57676 441763.48
3762955.42 2.57656
441813.48 3762955.42 2.62729 440408.22
3761498.57 6.14299
440956.50 3762849.59 3.02869 440559.26
3761306.11 6.85231
440752.05 3761305.37 8.06016 440857.69
3761312.76 8.44514
440969.23 3761308.33 8.76272 440936.73
3761237.41 7.70214



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

- - - - - - - - - - - - - - - - - - - - - - -

| | | | | | |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 0.82074 | 440450.61 | 3761994.75 | 0.85386 |
| 440500.61 | 3761994.75 | 0.88920 | 440550.61 | 3761994.75 | 0.92752 |
| 440600.61 | 3761994.75 | 0.96914 | 440650.61 | 3761994.75 | 1.01381 |
| 440400.61 | 3762044.75 | 0.82831 | 440450.61 | 3762044.75 | 0.86256 |
| 440500.61 | 3762044.75 | 0.89913 | 440550.61 | 3762044.75 | 0.93822 |
| 440600.61 | 3762044.75 | 0.98010 | 440650.61 | 3762044.75 | 1.02503 |
| 440400.61 | 3762094.75 | 0.83959 | 440450.61 | 3762094.75 | 0.87115 |
| 440500.61 | 3762094.75 | 0.90891 | 440550.61 | 3762094.75 | 0.94836 |
| 440600.61 | 3762094.75 | 0.98970 | 440650.61 | 3762094.75 | 1.04064 |
| 440400.61 | 3762144.75 | 0.87622 | 440450.61 | 3762144.75 | 0.89759 |
| 440500.61 | 3762144.75 | 0.94085 | 440550.61 | 3762144.75 | 0.97218 |
| 440600.61 | 3762144.75 | 1.01923 | 440650.61 | 3762144.75 | 1.07242 |
| 441145.13 | 3761319.94 | 1.81325 | 441195.13 | 3761319.94 | 1.92130 |
| 441245.13 | 3761319.94 | 2.03701 | 441145.13 | 3761369.94 | 1.83020 |
| 441195.13 | 3761369.94 | 1.94070 | 441245.13 | 3761369.94 | 2.05870 |
| 441145.13 | 3761419.94 | 1.83661 | 441195.13 | 3761419.94 | 1.95413 |
| 441245.13 | 3761419.94 | 2.08143 | 441145.13 | 3761469.94 | 1.83339 |
| 441195.13 | 3761469.94 | 1.95604 | 441245.13 | 3761469.94 | 2.09172 |
| 441145.13 | 3761519.94 | 1.82203 | 441195.13 | 3761519.94 | 1.94669 |
| 441245.13 | 3761519.94 | 2.08647 | 441145.13 | 3761569.94 | 1.80616 |
| 441195.13 | 3761569.94 | 1.92948 | 441245.13 | 3761569.94 | 2.06829 |
| 441145.13 | 3761619.94 | 1.80425 | 441195.13 | 3761619.94 | 1.92404 |
| 441245.13 | 3761619.94 | 2.05724 | 441145.13 | 3761669.94 | 1.80364 |
| 441195.13 | 3761669.94 | 1.92522 | 441245.13 | 3761669.94 | 2.06118 |
| 441917.00 | 3761316.31 | 4.34155 | 441967.00 | 3761316.31 | 4.63905 |

```
         442017.00    3761316.31        4.97927                      442067.00
3761316.31        5.29343
         441917.00    3761366.31        4.73890                      441967.00
3761366.31        5.05030
         442017.00    3761366.31        5.46674                      442067.00
3761366.31        5.89483
         441917.00    3761416.31        5.26651                      441967.00
3761416.31        5.56109
         442017.00    3761416.31        5.99832                      442067.00
3761416.31        6.56694
         441917.00    3761466.31        5.79710                      441967.00
3761466.31        6.23163
         442017.00    3761466.31        6.65403                      442067.00
3761466.31        7.33472
         441917.00    3761516.31        6.28388                      441967.00
3761516.31        6.91552
         442017.00    3761516.31        7.55794                      442067.00
3761516.31        8.21564
         441917.00    3761566.31        6.70924                      441967.00
3761566.31        7.53024
         442017.00    3761566.31        8.48402                      442067.00
3761566.31        9.52787
         441917.00    3761616.31        7.07250                      441967.00
3761616.31        8.07869
         442017.00    3761616.31        9.30241                      442067.00
3761616.31       10.85594
         442847.68    3761995.12       21.08669                      442897.68
3761995.12       16.23013
         442947.68    3761995.12       13.09688                      442997.68
3761995.12       10.98280
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE  87
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

            *** THE   1ST-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000789    , L0000790
, L0000791    , L0000792    , L0000793    ,
                L0000794    , L0000795    , L0000796    , L0000797    , L0000798
, L0000799    , L0000800    , L0000801    ,
                L0000802    , L0000803    , L0000804    , L0000805    , L0000806
, L0000807    , L0000808    , L0000809    ,
                L0000810    , L0000811    , L0000812    , L0000813    , L0000814
, L0000815    , L0000816    ,  . . .      ,

                                                  *** DISCRETE CARTESIAN RECEPTOR POINTS
***
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** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 9.45317 | 443097.68 | 3761995.12 | 8.26947 |
| 443147.68 | 3761995.12 | 7.35322 | 443197.68 | 3761995.12 | 6.60268 |
| 442847.68 | 3762045.12 | 20.32743 | 442897.68 | 3762045.12 | 15.66391 |
| 442947.68 | 3762045.12 | 12.76206 | 442997.68 | 3762045.12 | 10.78249 |
| 443047.68 | 3762045.12 | 9.27006 | 443097.68 | 3762045.12 | 8.10673 |
| 443147.68 | 3762045.12 | 7.21139 | 443197.68 | 3762045.12 | 6.53513 |
| 442447.68 | 3762095.12 | 31.62386 | 442497.68 | 3762095.12 | 31.17040 |
| 442547.68 | 3762095.12 | 27.51181 | 442597.68 | 3762095.12 | 28.30402 |
| 442647.68 | 3762095.12 | 25.52186 | 442697.68 | 3762095.12 | 26.14892 |
| 442747.68 | 3762095.12 | 25.02819 | 442797.68 | 3762095.12 | 21.50719 |
| 442847.68 | 3762095.12 | 18.18178 | 442897.68 | 3762095.12 | 14.48683 |
| 442947.68 | 3762095.12 | 12.08078 | 442997.68 | 3762095.12 | 10.50415 |
| 443047.68 | 3762095.12 | 9.12779 | 443097.68 | 3762095.12 | 8.08621 |
| 443147.68 | 3762095.12 | 7.21699 | 443197.68 | 3762095.12 | 6.73739 |
| 442447.68 | 3762145.12 | 25.85077 | 442497.68 | 3762145.12 | 22.12942 |
| 442547.68 | 3762145.12 | 20.54331 | 442597.68 | 3762145.12 | 19.55628 |
| 442647.68 | 3762145.12 | 18.88571 | 442697.68 | 3762145.12 | 18.14008 |
| 442747.68 | 3762145.12 | 17.29572 | 442797.68 | 3762145.12 | 16.16491 |
| 442847.68 | 3762145.12 | 14.46608 | 442897.68 | 3762145.12 | 12.74401 |
| 442947.68 | 3762145.12 | 11.19307 | 442997.68 | 3762145.12 | 9.95296 |
| 443047.68 | 3762145.12 | 8.73381 | 443097.68 | 3762145.12 | 7.77005 |
| 443147.68 | 3762145.12 | 6.99533 | 443197.68 | | |

3762145.12 6.51575
442447.68 3762195.12 21.01265 442497.68
3762195.12 17.28833
442547.68 3762195.12 15.66699 442597.68
3762195.12 14.77799
442647.68 3762195.12 14.12280 442697.68
3762195.12 13.54762
442747.68 3762195.12 13.04667 442797.68
3762195.12 12.44721
442847.68 3762195.12 11.68703 442897.68
3762195.12 11.00412
442947.68 3762195.12 10.19716 442997.68
3762195.12 9.47849
443047.68 3762195.12 8.59539 443097.68
3762195.12 7.72945
443147.68 3762195.12 6.93413 443197.68
3762195.12 6.32726
442447.68 3762245.12 17.73809 442497.68
3762245.12 14.36417
442547.68 3762245.12 12.78185 442597.68
3762245.12 11.91209
442647.68 3762245.12 11.33841 442697.68
3762245.12 10.84852
442747.68 3762245.12 10.48513 442797.68
3762245.12 10.15047
442847.68 3762245.12 9.78608 442897.68
3762245.12 9.49253
442947.68 3762245.12 9.12461 442997.68
3762245.12 8.70819
443047.68 3762245.12 8.00247 443097.68
3762245.12 7.43158
443147.68 3762245.12 6.71739 443197.68
3762245.12 6.17423
442822.81 3761611.77 13.29022 442872.81
3761611.77 11.08861
442922.81 3761611.77 9.38512 442972.81
3761611.77 8.06348



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,

L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 17.66351 | 442872.81 | 3761661.77 | 13.56244 |
| 442922.81 | 3761661.77 | 10.86954 | 442972.81 | 3761661.77 | 9.12233 |
| 442732.29 | 3762366.08 | 7.25355 | 442782.29 | 3762366.08 | 7.15608 |
| 442832.29 | 3762366.08 | 7.30740 | 442732.29 | 3762416.08 | 6.46053 |
| 442782.29 | 3762416.08 | 6.40718 | 442832.29 | 3762416.08 | 6.40149 |
| 442732.29 | 3762466.08 | 5.73685 | 442782.29 | 3762466.08 | 5.73788 |
| 442832.29 | 3762466.08 | 5.83814 | 441922.75 | 3762323.77 | 5.79190 |
| 441972.75 | 3762323.77 | 6.52004 | 442022.75 | 3762323.77 | 7.44423 |
| 442072.75 | 3762323.77 | 8.57867 | 441922.75 | 3762373.77 | 5.42726 |
| 441972.75 | 3762373.77 | 5.95360 | 442022.75 | 3762373.77 | 6.66993 |
| 442072.75 | 3762373.77 | 7.47445 | 441922.75 | 3762423.77 | 5.24275 |
| 441972.75 | 3762423.77 | 5.50875 | 442022.75 | 3762423.77 | 6.02216 |
| 442072.75 | 3762423.77 | 6.51588 | 441922.75 | 3762473.77 | 4.90371 |
| 441972.75 | 3762473.77 | 5.17046 | 442022.75 | 3762473.77 | 5.41859 |
| 442072.75 | 3762473.77 | 5.92037 | 441922.75 | 3762523.77 | 4.58914 |
| 441972.75 | 3762523.77 | 4.78826 | 442022.75 | 3762523.77 | 4.95589 |
| 442072.75 | 3762523.77 | 5.35697 | 441922.75 | 3762573.77 | 4.32094 |
| 441972.75 | 3762573.77 | 4.44762 | 442022.75 | 3762573.77 | 4.65838 |

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         442072.75    3762573.77        4.93397                        441922.75
3762623.77        3.96771
         441972.75    3762623.77        4.14316                        442022.75
3762623.77        4.33629
         442072.75    3762623.77        4.52816                        441109.54
3762319.57        1.79877
         441159.54    3762319.57        1.86031                        441209.54
3762319.57        1.95984
         441259.54    3762319.57        2.13105                        441109.54
3762369.57        1.84611
         441159.54    3762369.57        1.84269                        441209.54
3762369.57        1.92731
         441259.54    3762369.57        2.07833                        441109.54
3762419.57        1.84399
         441159.54    3762419.57        1.81217                        441209.54
3762419.57        1.85681
         441259.54    3762419.57        1.95528                        441109.54
3762469.57        1.79450
         441159.54    3762469.57        1.77774                        441209.54
3762469.57        1.83860
         441259.54    3762469.57        1.98929                        441109.54
3762519.57        1.81347
         441159.54    3762519.57        1.78526                        441209.54
3762519.57        1.87186
         441259.54    3762519.57        1.97621                        441109.54
3762569.57        1.88708
         441159.54    3762569.57        1.84881                        441209.54
3762569.57        1.87495
         441259.54    3762569.57        1.93326                        441109.54
3762619.57        1.88736
         441159.54    3762619.57        1.89651                        441209.54
3762619.57        1.91677
         441259.54    3762619.57        2.04943                        441109.54
3762669.57        1.88558
         441159.54    3762669.57        1.95813                        441209.54
3762669.57        2.04564
         441259.54    3762669.57        2.13482                        441109.54
3762719.57        1.92930
         441159.54    3762719.57        1.98719                        441209.54
3762719.57        2.05963
         441259.54    3762719.57        2.10504                        441109.54
3762769.57        1.93013
         441159.54    3762769.57        1.97832                        441209.54
3762769.57        2.00389
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 2.03965 | 441313.48 | 3762805.42 | 2.10662 |
| 441363.48 | 3762805.42 | 2.18743 | 441413.48 | 3762805.42 | 2.25168 |
| 441463.48 | 3762805.42 | 2.33582 | 441513.48 | 3762805.42 | 2.42038 |
| 441563.48 | 3762805.42 | 2.47814 | 441613.48 | 3762805.42 | 2.53394 |
| 441663.48 | 3762805.42 | 2.61112 | 441713.48 | 3762805.42 | 2.70173 |
| 441763.48 | 3762805.42 | 2.74501 | 441813.48 | 3762805.42 | 2.84991 |
| 441313.48 | 3762855.42 | 2.05006 | 441363.48 | 3762855.42 | 2.11461 |
| 441413.48 | 3762855.42 | 2.17336 | 441463.48 | 3762855.42 | 2.22869 |
| 441513.48 | 3762855.42 | 2.29602 | 441563.48 | 3762855.42 | 2.35540 |
| 441613.48 | 3762855.42 | 2.40164 | 441663.48 | 3762855.42 | 2.47506 |
| 441713.48 | 3762855.42 | 2.53028 | 441763.48 | 3762855.42 | 2.59932 |
| 441813.48 | 3762855.42 | 2.69611 | 441313.48 | 3762905.42 | 1.99033 |
| 441363.48 | 3762905.42 | 2.02135 | 441413.48 | 3762905.42 | 2.08443 |
| 441463.48 | 3762905.42 | 2.13249 | 441513.48 | 3762905.42 | 2.19499 |
| 441563.48 | 3762905.42 | 2.24502 | 441613.48 | | |

3762905.42 2.23903
441663.48 3762905.42 2.34860 441713.48
3762905.42 2.41852
441763.48 3762905.42 2.41099 441813.48
3762905.42 2.53891
441313.48 3762955.42 1.89680 441363.48
3762955.42 1.92953
441413.48 3762955.42 1.99069 441463.48
3762955.42 2.04065
441513.48 3762955.42 2.08592 441563.48
3762955.42 2.13909
441613.48 3762955.42 2.17601 441663.48
3762955.42 2.26718
441713.48 3762955.42 2.31168 441763.48
3762955.42 2.32577
441813.48 3762955.42 2.40890 440408.22
3761498.57 0.86958
440956.50 3762849.59 1.70980 440559.26
3761306.11 1.00116
440752.05 3761305.37 1.19342 440857.69
3761312.76 1.32955
440969.23 3761308.33 1.49592 440936.73
3761237.41 1.43737



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

440400.61 3762044.75 1.99059 440450.61 3762044.75 2.05638
440500.61 3762044.75 2.12761 440550.61 3762044.75 2.20538
440600.61 3762044.75 2.29066 440650.61 3762044.75 2.38066
440400.61 3762094.75 2.01196 440450.61 3762094.75 2.08445
440500.61 3762094.75 2.16049 440550.61 3762094.75 2.24015
440600.61 3762094.75 2.32356 440650.61 3762094.75 2.41120
440400.61 3762144.75 2.02073 440450.61 3762144.75 2.10107
440500.61 3762144.75 2.18918 440550.61 3762144.75 2.28130
440600.61 3762144.75 2.37777 440650.61 3762144.75 2.47874
441145.13 3761319.94 4.22394 441195.13 3761319.94 4.35092
441245.13 3761319.94 4.50924 441145.13 3761369.94 4.45949
441195.13 3761369.94 4.62531 441245.13 3761369.94 4.79455
441145.13 3761419.94 4.59161 441195.13 3761419.94 4.80688
441245.13 3761419.94 5.02957 441145.13 3761469.94 4.67315
441195.13 3761469.94 4.88947 441245.13 3761469.94 5.13669
441145.13 3761519.94 4.70253 441195.13 3761519.94 4.93893
441245.13 3761519.94 5.19218 441145.13 3761569.94 4.64454
441195.13 3761569.94 4.89119 441245.13 3761569.94 5.17049
441145.13 3761619.94 4.47716 441195.13 3761619.94 4.74537
441245.13 3761619.94 5.03308 441145.13 3761669.94 4.22253
441195.13 3761669.94 4.49851 441245.13 3761669.94 4.79794
441917.00 3761316.31 12.30690 441967.00 3761316.31 12.79981
442017.00 3761316.31 13.25730 442067.00 3761316.31 13.69770
441917.00 3761366.31 13.13145 441967.00 3761366.31 13.96629
442017.00 3761366.31 14.61870 442067.00 3761366.31 15.29281
441917.00 3761416.31 13.75139 441967.00

3761416.31 15.00703
442017.00 3761416.31 16.06994 442067.00
3761416.31 16.98974
441917.00 3761466.31 14.00900 441967.00
3761466.31 15.77245
442017.00 3761466.31 17.43070 442067.00
3761466.31 18.88085
441917.00 3761516.31 13.84833 441967.00
3761516.31 16.08424
442017.00 3761516.31 18.48157 442067.00
3761516.31 20.82636
441917.00 3761566.31 13.94978 441967.00
3761566.31 16.01822
442017.00 3761566.31 18.89562 442067.00
3761566.31 22.42356
441917.00 3761616.31 14.21325 441967.00
3761616.31 16.41945
442017.00 3761616.31 19.21419 442067.00
3761616.31 23.25295
442847.68 3761995.12 38.11746 442897.68
3761995.12 29.73692
442947.68 3761995.12 24.70104 442997.68
3761995.12 21.29372



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

| | | | | | |
|---|---|---|---|---|---|
| 442947.68 | 3762045.12 | 23.62850 | 442997.68 | 3762045.12 | 20.25044 |
| 443047.68 | 3762045.12 | 17.77752 | 443097.68 | 3762045.12 | 15.91531 |
| 443147.68 | 3762045.12 | 14.35109 | 443197.68 | 3762045.12 | 12.99487 |
| 442447.68 | 3762095.12 | 52.18052 | 442497.68 | 3762095.12 | 49.91781 |
| 442547.68 | 3762095.12 | 48.51923 | 442597.68 | 3762095.12 | 47.06693 |
| 442647.68 | 3762095.12 | 45.89830 | 442697.68 | 3762095.12 | 44.85829 |
| 442747.68 | 3762095.12 | 43.49542 | 442797.68 | 3762095.12 | 40.88904 |
| 442847.68 | 3762095.12 | 32.12724 | 442897.68 | 3762095.12 | 25.91457 |
| 442947.68 | 3762095.12 | 21.86928 | 442997.68 | 3762095.12 | 19.11196 |
| 443047.68 | 3762095.12 | 16.86840 | 443097.68 | 3762095.12 | 15.00348 |
| 443147.68 | 3762095.12 | 13.62249 | 443197.68 | 3762095.12 | 12.45667 |
| 442447.68 | 3762145.12 | 31.34255 | 442497.68 | 3762145.12 | 28.01715 |
| 442547.68 | 3762145.12 | 27.09415 | 442597.68 | 3762145.12 | 26.64421 |
| 442647.68 | 3762145.12 | 26.77451 | 442697.68 | 3762145.12 | 26.89139 |
| 442747.68 | 3762145.12 | 26.52078 | 442797.68 | 3762145.12 | 25.62753 |
| 442847.68 | 3762145.12 | 24.69521 | 442897.68 | 3762145.12 | 22.69223 |
| 442947.68 | 3762145.12 | 20.20442 | 442997.68 | 3762145.12 | 17.82023 |
| 443047.68 | 3762145.12 | 15.82507 | 443097.68 | 3762145.12 | 14.29888 |
| 443147.68 | 3762145.12 | 13.06149 | 443197.68 | 3762145.12 | 11.93527 |
| 442447.68 | 3762195.12 | 26.66827 | 442497.68 | 3762195.12 | 22.39332 |
| 442547.68 | 3762195.12 | 20.86780 | 442597.68 | 3762195.12 | 20.18652 |
| 442647.68 | 3762195.12 | 20.21592 | 442697.68 | 3762195.12 | 20.23782 |
| 442747.68 | 3762195.12 | 19.95712 | 442797.68 | 3762195.12 | 19.41754 |
| 442847.68 | 3762195.12 | 19.37882 | 442897.68 | 3762195.12 | 18.93388 |
| 442947.68 | 3762195.12 | 17.93764 | 442997.68 | 3762195.12 | 16.49881 |
| 443047.68 | 3762195.12 | 15.00930 | 443097.68 | | |

3762195.12 13.50578
443147.68 3762195.12 12.30034 443197.68
3762195.12 11.39751
442447.68 3762245.12 24.06374 442497.68
3762245.12 19.46148
442547.68 3762245.12 17.57363 442597.68
3762245.12 16.70556
442647.68 3762245.12 16.41827 442697.68
3762245.12 16.31012
442747.68 3762245.12 16.01825 442797.68
3762245.12 15.40150
442847.68 3762245.12 15.56784 442897.68
3762245.12 15.73246
442947.68 3762245.12 15.46170 442997.68
3762245.12 14.88151
443047.68 3762245.12 14.01578 443097.68
3762245.12 12.91209
443147.68 3762245.12 11.82800 443197.68
3762245.12 10.80430
442822.81 3761611.77 23.06460 442872.81
3761611.77 19.02616
442922.81 3761611.77 16.13149 442972.81
3761611.77 14.03229



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

442832.29 3762366.08 10.18863 442732.29
3762416.08 9.44393
442782.29 3762416.08 9.00819 442832.29
3762416.08 8.86897
442732.29 3762466.08 8.30150 442782.29
3762466.08 7.98229
442832.29 3762466.08 7.79587 441922.75
3762323.77 9.99288
441972.75 3762323.77 11.11387 442022.75
3762323.77 12.46076
442072.75 3762323.77 14.35966 441922.75
3762373.77 9.57238
441972.75 3762373.77 10.40886 442022.75
3762373.77 11.48987
442072.75 3762373.77 12.68104 441922.75
3762423.77 8.78874
441972.75 3762423.77 9.46246 442022.75
3762423.77 10.11472
442072.75 3762423.77 11.12025 441922.75
3762473.77 8.00987
441972.75 3762473.77 8.49508 442022.75
3762473.77 9.23609
442072.75 3762473.77 9.66704 441922.75
3762523.77 7.28056
441972.75 3762523.77 7.84330 442022.75
3762523.77 8.25591
442072.75 3762523.77 8.28232 441922.75
3762573.77 6.76221
441972.75 3762573.77 7.14537 442022.75
3762573.77 7.28638
442072.75 3762573.77 7.18734 441922.75
3762623.77 6.24840
441972.75 3762623.77 6.44221 442022.75
3762623.77 6.43253
442072.75 3762623.77 6.44024 441109.54
3762319.57 3.52746
441159.54 3762319.57 3.66082 441209.54
3762319.57 3.80370
441259.54 3762319.57 3.94741 441109.54
3762369.57 3.39739
441159.54 3762369.57 3.53105 441209.54
3762369.57 3.66383
441259.54 3762369.57 3.79503 441109.54
3762419.57 3.26868
441159.54 3762419.57 3.36523 441209.54
3762419.57 3.45700
441259.54 3762419.57 3.58561 441109.54
3762469.57 3.08717
441159.54 3762469.57 3.21770 441209.54
3762469.57 3.36266
441259.54 3762469.57 3.55869 441109.54

3762519.57 3.05020
441159.54 3762519.57 3.21250 441209.54
3762519.57 3.42275
441259.54 3762519.57 3.64705 441109.54
3762569.57 3.09096
441159.54 3762569.57 3.28148 441209.54
3762569.57 3.46835
441259.54 3762569.57 3.64877 441109.54
3762619.57 3.12656
441159.54 3762619.57 3.27957 441209.54
3762619.57 3.46242
441259.54 3762619.57 3.68400 441109.54
3762669.57 3.11549
441159.54 3762669.57 3.30367 441209.54
3762669.57 3.51657
441259.54 3762669.57 3.71832 441109.54
3762719.57 3.16752
441159.54 3762719.57 3.34746 441209.54
3762719.57 3.51868
441259.54 3762719.57 3.68320 441109.54
3762769.57 3.19343
441159.54 3762769.57 3.33580 441209.54
3762769.57 3.46529



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

441563.48 3762805.42 3.69082 441613.48
3762805.42 3.77147
441663.48 3762805.42 3.83500 441713.48
3762805.42 4.02052
441763.48 3762805.42 4.20323 441813.48
3762805.42 4.37564
441313.48 3762855.42 3.23919 441363.48
3762855.42 3.31689
441413.48 3762855.42 3.39376 441463.48
3762855.42 3.41986
441513.48 3762855.42 3.40006 441563.48
3762855.42 3.47814
441613.48 3762855.42 3.51855 441663.48
3762855.42 3.67395
441713.48 3762855.42 3.83291 441763.48
3762855.42 4.01176
441813.48 3762855.42 4.14178 441313.48
3762905.42 3.11464
441363.48 3762905.42 3.15921 441413.48
3762905.42 3.17480
441463.48 3762905.42 3.16009 441513.48
3762905.42 3.22209
441563.48 3762905.42 3.24854 441613.48
3762905.42 3.35518
441663.48 3762905.42 3.53003 441713.48
3762905.42 3.70174
441763.48 3762905.42 3.78835 441813.48
3762905.42 3.86427
441313.48 3762955.42 2.95190 441363.48
3762955.42 2.93961
441413.48 3762955.42 2.96080 441463.48
3762955.42 3.01020
441513.48 3762955.42 3.01046 441563.48
3762955.42 3.11394
441613.48 3762955.42 3.27481 441663.48
3762955.42 3.44524
441713.48 3762955.42 3.57602 441763.48
3762955.42 3.61752
441813.48 3762955.42 3.59988 440408.22
3761498.57 2.40540
440956.50 3762849.59 2.79657 440559.26
3761306.11 2.97277
440752.05 3761305.37 3.30755 440857.69
3761312.76 3.53459
440969.23 3761308.33 3.78267 440936.73
3761237.41 3.46187

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

            *** THE   1ST-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: ALL      ***
                                INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                    **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - -
         440400.61    3761994.75       11.43738                      440450.61
3761994.75       12.55587
         440500.61    3761994.75       13.87961                      440550.61
3761994.75       15.47295
         440600.61    3761994.75       17.45963                      440650.61
3761994.75       20.20931
         440400.61    3762044.75       11.19845                      440450.61
3762044.75       12.26994
         440500.61    3762044.75       13.55295                      440550.61
3762044.75       15.09430
         440600.61    3762044.75       17.06293                      440650.61
3762044.75       19.76041
         440400.61    3762094.75       11.21879                      440450.61
3762094.75       12.17548
         440500.61    3762094.75       13.37720                      440550.61
3762094.75       14.84286
         440600.61    3762094.75       16.66276                      440650.61
3762094.75       19.24944
         440400.61    3762144.75       11.22407                      440450.61
3762144.75       12.07824
         440500.61    3762144.75       13.20037                      440550.61
3762144.75       14.49295
         440600.61    3762144.75       16.20784                      440650.61
3762144.75       18.49143
         441145.13    3761319.94       16.08333                      441195.13
3761319.94       16.50775
         441245.13    3761319.94       16.90931                      441145.13
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3761369.94 17.30426
441195.13 3761369.94 17.72352 441245.13
3761369.94 18.11833
441145.13 3761419.94 18.79791 441195.13
3761419.94 19.21788
441245.13 3761419.94 19.61698 441145.13
3761469.94 20.67580
441195.13 3761469.94 21.08884 441245.13
3761469.94 21.51093
441145.13 3761519.94 23.15850 441195.13
3761519.94 23.60729
441245.13 3761519.94 24.04577 441145.13
3761569.94 26.72189
441195.13 3761569.94 27.16542 441245.13
3761569.94 27.58699
441145.13 3761619.94 32.11590 441195.13
3761619.94 32.57544
441245.13 3761619.94 33.02446 441145.13
3761669.94 42.67234
441195.13 3761669.94 43.06457 441245.13
3761669.94 43.59179
441917.00 3761316.31 23.36719 441967.00
3761316.31 23.85272
442017.00 3761316.31 24.27792 442067.00
3761316.31 24.63407
441917.00 3761366.31 25.23517 441967.00
3761366.31 25.91531
442017.00 3761366.31 26.57655 442067.00
3761366.31 27.19650
441917.00 3761416.31 27.32427 441967.00
3761416.31 28.24588
442017.00 3761416.31 29.10400 442067.00
3761416.31 30.03894
441917.00 3761466.31 29.56184 441967.00
3761466.31 30.82646
442017.00 3761466.31 32.07365 442067.00
3761466.31 33.30986
441917.00 3761516.31 32.11884 441967.00
3761516.31 33.77540
442017.00 3761516.31 35.59367 442067.00
3761516.31 37.46696
441917.00 3761566.31 35.44883 441967.00
3761566.31 37.29548
442017.00 3761566.31 39.61447 442067.00
3761566.31 42.48736
441917.00 3761616.31 40.93323 441967.00
3761616.31 42.74244
442017.00 3761616.31 45.05805 442067.00
3761616.31 48.53044
442847.68 3761995.12 63.49081 442897.68
3761995.12 50.32505

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         442947.68    3761995.12       42.10628                      442997.68
3761995.12       36.51364
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                          ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                   PAGE  95
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

             *** THE   1ST-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: ALL      ***
                                   INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                            ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         443047.68    3761995.12       32.26604                      443097.68
3761995.12       28.85176
         443147.68    3761995.12       26.19050                      443197.68
3761995.12       23.95274
         442847.68    3762045.12       60.54605                      442897.68
3762045.12       47.83496
         442947.68    3762045.12       40.43639                      442997.68
3762045.12       35.49716
         443047.68    3762045.12       31.64894                      443097.68
3762045.12       28.58024
         443147.68    3762045.12       26.00520                      443197.68
3762045.12       23.90180
         442447.68    3762095.12       89.16074                      442497.68
3762095.12       85.24267
         442547.68    3762095.12       80.26016                      442597.68
3762095.12       79.33536
         442647.68    3762095.12       75.27973                      442697.68
3762095.12       74.30013
         442747.68    3762095.12       71.68262                      442797.68
3762095.12       66.08545
```

| | | | | | |
|---|---|---|---|---|---|
| 442847.68 | 3762095.12 | 52.77180 | 442897.68 | 3762095.12 | 43.71249 |
| 442947.68 | 3762095.12 | 37.77362 | 442997.68 | 3762095.12 | 33.64131 |
| 443047.68 | 3762095.12 | 29.98110 | 443097.68 | 3762095.12 | 27.46956 |
| 443147.68 | 3762095.12 | 25.35734 | 443197.68 | 3762095.12 | 23.78347 |
| 442447.68 | 3762145.12 | 64.60442 | 442497.68 | 3762145.12 | 57.14440 |
| 442547.68 | 3762145.12 | 53.93070 | 442597.68 | 3762145.12 | 52.09017 |
| 442647.68 | 3762145.12 | 50.72283 | 442697.68 | 3762145.12 | 49.48189 |
| 442747.68 | 3762145.12 | 48.03619 | 442797.68 | 3762145.12 | 45.95398 |
| 442847.68 | 3762145.12 | 42.75937 | 442897.68 | 3762145.12 | 38.33116 |
| 442947.68 | 3762145.12 | 34.09082 | 442997.68 | 3762145.12 | 31.28746 |
| 443047.68 | 3762145.12 | 28.59577 | 443097.68 | 3762145.12 | 26.09650 |
| 443147.68 | 3762145.12 | 23.91659 | 443197.68 | 3762145.12 | 22.42917 |
| 442447.68 | 3762195.12 | 56.97111 | 442497.68 | 3762195.12 | 47.78525 |
| 442547.68 | 3762195.12 | 43.51313 | 442597.68 | 3762195.12 | 41.42030 |
| 442647.68 | 3762195.12 | 40.21852 | 442697.68 | 3762195.12 | 39.10188 |
| 442747.68 | 3762195.12 | 37.96730 | 442797.68 | 3762195.12 | 36.45936 |
| 442847.68 | 3762195.12 | 35.16514 | 442897.68 | 3762195.12 | 33.68116 |
| 442947.68 | 3762195.12 | 31.36288 | 442997.68 | 3762195.12 | 29.05792 |
| 443047.68 | 3762195.12 | 26.89807 | 443097.68 | 3762195.12 | 24.95868 |
| 443147.68 | 3762195.12 | 23.21001 | 443197.68 | 3762195.12 | 21.62292 |
| 442447.68 | 3762245.12 | 51.36543 | 442497.68 | 3762245.12 | 42.36615 |
| 442547.68 | 3762245.12 | 37.91280 | 442597.68 | 3762245.12 | 35.50348 |
| 442647.68 | 3762245.12 | 33.98030 | 442697.68 | 3762245.12 | 32.77421 |
| 442747.68 | 3762245.12 | 31.64255 | 442797.68 | 3762245.12 | 30.50811 |
| 442847.68 | 3762245.12 | 29.82934 | 442897.68 | 3762245.12 | 29.33453 |
| 442947.68 | 3762245.12 | 28.26068 | 442997.68 | | |

3762245.12 26.72622
443047.68 3762245.12 25.00970 443097.68
3762245.12 23.61476
443147.68 3762245.12 21.89269 443197.68
3762245.12 20.60732
442822.81 3761611.77 39.09793 442872.81
3761611.77 33.27600
442922.81 3761611.77 28.65902 442972.81
3761611.77 25.52923



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 ,
L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762323.77 30.43844
441972.75 3762323.77 31.42431 442022.75
3762323.77 32.54860
442072.75 3762323.77 34.13101 441922.75
3762373.77 25.35511
441972.75 3762373.77 26.01173 442022.75
3762373.77 26.92375
442072.75 3762373.77 28.05038 441922.75
3762423.77 22.12230
441972.75 3762423.77 22.43172 442022.75
3762423.77 23.03959
442072.75 3762423.77 23.57796 441922.75
3762473.77 19.47712
441972.75 3762473.77 19.77898 442022.75
3762473.77 20.00018
442072.75 3762473.77 20.60899 441922.75
3762523.77 17.31554
441972.75 3762523.77 17.50115 442022.75
3762523.77 17.84102
442072.75 3762523.77 18.06955 441922.75
3762573.77 15.53678
441972.75 3762573.77 15.84166 442022.75
3762573.77 16.04341
442072.75 3762573.77 16.03325 441922.75
3762623.77 14.20185
441972.75 3762623.77 14.41250 442022.75
3762623.77 14.46148
442072.75 3762623.77 14.34138 441109.54
3762319.57 22.64113
441159.54 3762319.57 23.15489 441209.54
3762319.57 23.64276
441259.54 3762319.57 24.15947 441109.54
3762369.57 18.09549
441159.54 3762369.57 18.43633 441209.54
3762369.57 18.86016
441259.54 3762369.57 19.40184 441109.54
3762419.57 15.64733
441159.54 3762419.57 15.78653 441209.54
3762419.57 16.12113
441259.54 3762419.57 16.46924 441109.54
3762469.57 13.95206
441159.54 3762469.57 14.08127 441209.54
3762469.57 14.34216
441259.54 3762469.57 14.80336 441109.54
3762519.57 12.91811
441159.54 3762519.57 12.92813 441209.54
3762519.57 13.15293
441259.54 3762519.57 13.44948 441109.54
3762569.57 12.13896
441159.54 3762569.57 12.12216 441209.54
3762569.57 12.18271

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         441259.54    3762569.57       12.31907                      441109.54
3762619.57       11.39866
         441159.54    3762619.57       11.38188                      441209.54
3762619.57       11.41315
         441259.54    3762619.57       11.66125                      441109.54
3762669.57       10.69298
         441159.54    3762669.57       10.75496                      441209.54
3762669.57       10.85467
         441259.54    3762669.57       11.01022                      441109.54
3762719.57       10.14224
         441159.54    3762719.57       10.17996                      441209.54
3762719.57       10.26629
         441259.54    3762719.57       10.32015                      441109.54
3762769.57        9.59863
         441159.54    3762769.57        9.61844                      441209.54
3762769.57        9.61530
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                        ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        20:06:41

                                 PAGE  97
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

             *** THE   1ST-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: ALL      ***
                                 INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                            *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                         ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         441259.54    3762769.57        9.61534                      441313.48
3762805.42        9.20413
         441363.48    3762805.42        9.23115                      441413.48
3762805.42        9.23623
         441463.48    3762805.42        9.29102                      441513.48
3762805.42        9.36068
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441563.48 3762805.42 9.44373 441613.48
3762805.42 9.53934
441663.48 3762805.42 9.67404 441713.48
3762805.42 9.90881
441763.48 3762805.42 10.11910 441813.48
3762805.42 10.30507
441313.48 3762855.42 8.56412 441363.48
3762855.42 8.55563
441413.48 3762855.42 8.57193 441463.48
3762855.42 8.62338
441513.48 3762855.42 8.69369 441563.48
3762855.42 8.77386
441613.48 3762855.42 8.88191 441663.48
3762855.42 9.08940
441713.48 3762855.42 9.32317 441763.48
3762855.42 9.52713
441813.48 3762855.42 9.70213 441313.48
3762905.42 7.98330
441363.48 3762905.42 7.97936 441413.48
3762905.42 8.01524
441463.48 3762905.42 8.05583 441513.48
3762905.42 8.13539
441563.48 3762905.42 8.24829 441613.48
3762905.42 8.42446
441663.48 3762905.42 8.66224 441713.48
3762905.42 8.85579
441763.48 3762905.42 8.95523 441813.48
3762905.42 9.11831
441313.48 3762955.42 7.48405 441363.48
3762955.42 7.49517
441413.48 3762955.42 7.52252 441463.48
3762955.42 7.60468
441513.48 3762955.42 7.70176 441563.48
3762955.42 7.88821
441613.48 3762955.42 8.07441 441663.48
3762955.42 8.26403
441713.48 3762955.42 8.41786 441763.48
3762955.42 8.52052
441813.48 3762955.42 8.56873 440408.22
3761498.57 10.79426
440956.50 3762849.59 8.67877 440559.26
3761306.11 10.93868
440752.05 3761305.37 12.97725 440857.69
3761312.76 13.99350
440969.23 3761308.33 14.56832 440936.73
3761237.41 13.26748

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 2.48867 | 440450.61 | 3761994.75 | 2.80153 |
| 440500.61 | 3761994.75 | 3.15299 | 440550.61 | 3761994.75 | 3.64856 |
| 440600.61 | 3761994.75 | 4.31177 | 440650.61 | 3761994.75 | 5.21899 |
| 440400.61 | 3762044.75 | 2.42188 | 440450.61 | 3762044.75 | 2.70415 |
| 440500.61 | 3762044.75 | 3.06488 | 440550.61 | 3762044.75 | 3.52946 |
| 440600.61 | 3762044.75 | 4.16407 | 440650.61 | 3762044.75 | 5.04510 |
| 440400.61 | 3762094.75 | 2.37954 | 440450.61 | 3762094.75 | 2.66004 |
| 440500.61 | 3762094.75 | 2.99781 | 440550.61 | 3762094.75 | 3.42050 |
| 440600.61 | 3762094.75 | 4.00164 | 440650.61 | 3762094.75 | 4.83078 |
| 440400.61 | 3762144.75 | 2.29393 | 440450.61 | 3762144.75 | 2.54798 |
| 440500.61 | 3762144.75 | 2.87498 | 440550.61 | 3762144.75 | 3.29309 |
| 440600.61 | 3762144.75 | 3.84741 | 440650.61 | 3762144.75 | 4.58655 |
| 441145.13 | 3761319.94 | 3.65093 | 441195.13 | 3761319.94 | 3.70441 |
| 441245.13 | 3761319.94 | 3.75707 | 441145.13 | | |

3761369.94 4.07654
441195.13 3761369.94 4.13476 441245.13
3761369.94 4.19106
441145.13 3761419.94 4.59208 441195.13
3761419.94 4.66997
441245.13 3761419.94 4.74298 441145.13
3761469.94 5.25902
441195.13 3761469.94 5.35620 441245.13
3761469.94 5.44189
441145.13 3761519.94 6.13608 441195.13
3761519.94 6.24650
441245.13 3761519.94 6.33577 441145.13
3761569.94 7.35317
441195.13 3761569.94 7.48684 441245.13
3761569.94 7.59077
441145.13 3761619.94 9.26882 441195.13
3761619.94 9.40010
441245.13 3761619.94 9.51599 441145.13
3761669.94 12.25243
441195.13 3761669.94 12.43031 441245.13
3761669.94 12.55991
441917.00 3761316.31 3.28660 441967.00
3761316.31 3.18245
442017.00 3761316.31 3.06736 442067.00
3761316.31 2.94897
441917.00 3761366.31 3.67092 441967.00
3761366.31 3.55402
442017.00 3761366.31 3.42028 442067.00
3761366.31 3.27171
441917.00 3761416.31 4.15093 441967.00
3761416.31 4.01474
442017.00 3761416.31 3.85454 442067.00
3761416.31 3.66853
441917.00 3761466.31 4.76007 441967.00
3761466.31 4.60141
442017.00 3761466.31 4.41314 442067.00
3761466.31 4.17908
441917.00 3761516.31 5.57462 441967.00
3761516.31 5.37969
442017.00 3761516.31 5.16396 442067.00
3761516.31 4.88120
441917.00 3761566.31 6.75231 441967.00
3761566.31 6.50744
442017.00 3761566.31 6.24682 442067.00
3761566.31 5.90001
441917.00 3761616.31 8.59015 441967.00
3761616.31 8.31939
442017.00 3761616.31 7.97030 442067.00
3761616.31 7.51898
442847.68 3761995.12 2.54242 442897.68
3761995.12 2.43756

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         442947.68    3761995.12        2.24027                      442997.68
3761995.12        2.09828
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                   PAGE  99
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

            *** THE   8TH-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
                                   INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                  **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
         443047.68    3761995.12        1.99022                      443097.68
3761995.12        1.88077
         443147.68    3761995.12        1.81776                      443197.68
3761995.12        1.75751
         442847.68    3762045.12        2.58075                      442897.68
3762045.12        2.42033
         442947.68    3762045.12        2.27273                      442997.68
3762045.12        2.15386
         443047.68    3762045.12        2.04096                      443097.68
3762045.12        1.94671
         443147.68    3762045.12        1.85850                      443197.68
3762045.12        1.79837
         442447.68    3762095.12        5.23484                      442497.68
3762095.12        4.73655
         442547.68    3762095.12        4.33732                      442597.68
3762095.12        4.03411
         442647.68    3762095.12        3.63848                      442697.68
3762095.12        3.39860
         442747.68    3762095.12        3.14128                      442797.68
3762095.12        2.89279
```

| | | | | | |
|---|---|---|---|---|---|
| 442847.68 | 3762095.12 | 2.63452 | 442897.68 | 3762095.12 | 2.47686 |
| 442947.68 | 3762095.12 | 2.33243 | 442997.68 | 3762095.12 | 2.25358 |
| 443047.68 | 3762095.12 | 2.11776 | 443097.68 | 3762095.12 | 2.00588 |
| 443147.68 | 3762095.12 | 1.90390 | 443197.68 | 3762095.12 | 1.88650 |
| 442447.68 | 3762145.12 | 5.11708 | 442497.68 | 3762145.12 | 4.68195 |
| 442547.68 | 3762145.12 | 4.23831 | 442597.68 | 3762145.12 | 3.99139 |
| 442647.68 | 3762145.12 | 3.63796 | 442697.68 | 3762145.12 | 3.36759 |
| 442747.68 | 3762145.12 | 3.15661 | 442797.68 | 3762145.12 | 2.92486 |
| 442847.68 | 3762145.12 | 2.64384 | 442897.68 | 3762145.12 | 2.51792 |
| 442947.68 | 3762145.12 | 2.39610 | 442997.68 | 3762145.12 | 2.29113 |
| 443047.68 | 3762145.12 | 2.16162 | 443097.68 | 3762145.12 | 2.04309 |
| 443147.68 | 3762145.12 | 1.93610 | 443197.68 | 3762145.12 | 1.87482 |
| 442447.68 | 3762195.12 | 4.97948 | 442497.68 | 3762195.12 | 4.56101 |
| 442547.68 | 3762195.12 | 4.09284 | 442597.68 | 3762195.12 | 3.91603 |
| 442647.68 | 3762195.12 | 3.63659 | 442697.68 | 3762195.12 | 3.37688 |
| 442747.68 | 3762195.12 | 3.16727 | 442797.68 | 3762195.12 | 2.92981 |
| 442847.68 | 3762195.12 | 2.67327 | 442897.68 | 3762195.12 | 2.55598 |
| 442947.68 | 3762195.12 | 2.45836 | 442997.68 | 3762195.12 | 2.35151 |
| 443047.68 | 3762195.12 | 2.23157 | 443097.68 | 3762195.12 | 2.11318 |
| 443147.68 | 3762195.12 | 1.99429 | 443197.68 | 3762195.12 | 1.90521 |
| 442447.68 | 3762245.12 | 4.82175 | 442497.68 | 3762245.12 | 4.38583 |
| 442547.68 | 3762245.12 | 3.93891 | 442597.68 | 3762245.12 | 3.74011 |
| 442647.68 | 3762245.12 | 3.51610 | 442697.68 | 3762245.12 | 3.29979 |
| 442747.68 | 3762245.12 | 3.05209 | 442797.68 | 3762245.12 | 2.85452 |
| 442847.68 | 3762245.12 | 2.68772 | 442897.68 | 3762245.12 | 2.57995 |
| 442947.68 | 3762245.12 | 2.45211 | 442997.68 | | |

3762245.12 2.32785
443047.68 3762245.12 2.20853 443097.68
3762245.12 2.11040
443147.68 3762245.12 2.00255 443197.68
3762245.12 1.92229
442822.81 3761611.77 1.89546 442872.81
3761611.77 1.79962
442922.81 3761611.77 1.70569 442972.81
3761611.77 1.61494



*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762323.77 8.19264
441972.75 3762323.77 8.02303 442022.75
3762323.77 7.77967
442072.75 3762323.77 7.51175 441922.75
3762373.77 6.28857
441972.75 3762373.77 6.18994 442022.75
3762373.77 6.04715
442072.75 3762373.77 5.86309 441922.75
3762423.77 5.16408
441972.75 3762423.77 5.04277 442022.75
3762423.77 4.99844
442072.75 3762423.77 4.91972 441922.75
3762473.77 4.36552
441972.75 3762473.77 4.34403 442022.75
3762473.77 4.29498
442072.75 3762473.77 4.23727 441922.75
3762523.77 3.76768
441972.75 3762523.77 3.77893 442022.75
3762523.77 3.72149
442072.75 3762523.77 3.69198 441922.75
3762573.77 3.29786
441972.75 3762573.77 3.31462 442022.75
3762573.77 3.27823
442072.75 3762573.77 3.26572 441922.75
3762623.77 2.93178
441972.75 3762623.77 2.93750 442022.75
3762623.77 2.92430
442072.75 3762623.77 2.93366 441109.54
3762319.57 7.82528
441159.54 3762319.57 8.08686 441209.54
3762319.57 8.27639
441259.54 3762319.57 8.17540 441109.54
3762369.57 5.70915
441159.54 3762369.57 6.06027 441209.54
3762369.57 6.19705
441259.54 3762369.57 6.17253 441109.54
3762419.57 4.53425
441159.54 3762419.57 4.83119 441209.54
3762419.57 4.97113
441259.54 3762419.57 5.08195 441109.54
3762469.57 3.80979
441159.54 3762469.57 4.00988 441209.54
3762469.57 4.11677
441259.54 3762469.57 4.13791 441109.54
3762519.57 3.26399
441159.54 3762519.57 3.41892 441209.54
3762519.57 3.50527
441259.54 3762519.57 3.54908 441109.54
3762569.57 2.85634
441159.54 3762569.57 2.95046 441209.54
3762569.57 3.03945

```
         441259.54    3762569.57        3.10361                      441109.54
3762619.57        2.54252
         441159.54    3762619.57        2.59636                      441209.54
3762619.57        2.65342
         441259.54    3762619.57        2.67041                      441109.54
3762669.57        2.29162
         441159.54    3762669.57        2.31985                      441209.54
3762669.57        2.34820
         441259.54    3762669.57        2.35474                      441109.54
3762719.57        2.06307
         441159.54    3762719.57        2.09596                      441209.54
3762719.57        2.12458
         441259.54    3762719.57        2.11979                      441109.54
3762769.57        1.88385
         441159.54    3762769.57        1.91261                      441209.54
3762769.57        1.92222
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                        ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        20:06:41

                                 PAGE 101
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

             *** THE   8TH-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
                                 INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                            *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                         ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         441259.54    3762769.57        1.92093                      441313.48
3762805.42        1.80224
         441363.48    3762805.42        1.80320                      441413.48
3762805.42        1.82254
         441463.48    3762805.42        1.83651                      441513.48
3762805.42        1.84665
```

441563.48 3762805.42 1.85346 441613.48
3762805.42 1.85951
441663.48 3762805.42 1.86866 441713.48
3762805.42 1.91626
441763.48 3762805.42 1.95662 441813.48
3762805.42 1.96933
441313.48 3762855.42 1.65584 441363.48
3762855.42 1.66018
441413.48 3762855.42 1.67614 441463.48
3762855.42 1.68806
441513.48 3762855.42 1.67234 441563.48
3762855.42 1.69333
441613.48 3762855.42 1.71674 441663.48
3762855.42 1.70926
441713.48 3762855.42 1.73559 441763.48
3762855.42 1.78122
441813.48 3762855.42 1.79399 441313.48
3762905.42 1.52614
441363.48 3762905.42 1.54273 441413.48
3762905.42 1.55375
441463.48 3762905.42 1.55738 441513.48
3762905.42 1.56181
441563.48 3762905.42 1.56483 441613.48
3762905.42 1.58267
441663.48 3762905.42 1.59678 441713.48
3762905.42 1.60504
441763.48 3762905.42 1.60893 441813.48
3762905.42 1.65240
441313.48 3762955.42 1.40352 441363.48
3762955.42 1.42855
441413.48 3762955.42 1.43585 441463.48
3762955.42 1.43976
441513.48 3762955.42 1.44700 441563.48
3762955.42 1.45568
441613.48 3762955.42 1.46998 441663.48
3762955.42 1.48189
441713.48 3762955.42 1.49453 441763.48
3762955.42 1.50911
441813.48 3762955.42 1.51888 440408.22
3761498.57 2.16071
440956.50 3762849.59 1.59125 440559.26
3761306.11 2.17320
440752.05 3761305.37 2.67980 440857.69
3761312.76 2.99874
440969.23 3761308.33 3.25883 440936.73
3761237.41 2.79447

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 4.14834 | 440450.61 | 3761994.75 | 4.52996 |
| 440500.61 | 3761994.75 | 5.03510 | 440550.61 | 3761994.75 | 5.70381 |
| 440600.61 | 3761994.75 | 6.51731 | 440650.61 | 3761994.75 | 7.64617 |
| 440400.61 | 3762044.75 | 4.10113 | 440450.61 | 3762044.75 | 4.49605 |
| 440500.61 | 3762044.75 | 4.92358 | 440550.61 | 3762044.75 | 5.51332 |
| 440600.61 | 3762044.75 | 6.28312 | 440650.61 | 3762044.75 | 7.28921 |
| 440400.61 | 3762094.75 | 3.97216 | 440450.61 | 3762094.75 | 4.35770 |
| 440500.61 | 3762094.75 | 4.82799 | 440550.61 | 3762094.75 | 5.30594 |
| 440600.61 | 3762094.75 | 5.92620 | 440650.61 | 3762094.75 | 6.79636 |
| 440400.61 | 3762144.75 | 3.84540 | 440450.61 | 3762144.75 | 4.19017 |
| 440500.61 | 3762144.75 | 4.59696 | 440550.61 | 3762144.75 | 5.06194 |
| 440600.61 | 3762144.75 | 5.61623 | 440650.61 | 3762144.75 | 6.39942 |
| 441145.13 | 3761319.94 | 7.17087 | 441195.13 | 3761319.94 | 7.23368 |
| 441245.13 | 3761319.94 | 7.27364 | 441145.13 | 3761369.94 | 7.86073 |
| 441195.13 | 3761369.94 | 7.91699 | 441245.13 | 3761369.94 | 7.97251 |
| 441145.13 | 3761419.94 | 8.69418 | 441195.13 | 3761419.94 | 8.74327 |
| 441245.13 | 3761419.94 | 8.79512 | 441145.13 | 3761469.94 | 9.74242 |

441195.13 3761469.94 9.78662 441245.13
3761469.94 9.83500
441145.13 3761519.94 11.05804 441195.13
3761519.94 11.16784
441245.13 3761519.94 11.22041 441145.13
3761569.94 12.84304
441195.13 3761569.94 12.99364 441245.13
3761569.94 13.11251
441145.13 3761619.94 15.60841 441195.13
3761619.94 15.72520
441245.13 3761619.94 15.84289 441145.13
3761669.94 22.03092
441195.13 3761669.94 22.15179 441245.13
3761669.94 22.40150
441917.00 3761316.31 6.01107 441967.00
3761316.31 5.80469
442017.00 3761316.31 5.62791 442067.00
3761316.31 5.43059
441917.00 3761366.31 6.67270 441967.00
3761366.31 6.40042
442017.00 3761366.31 6.16364 442067.00
3761366.31 5.90594
441917.00 3761416.31 7.39931 441967.00
3761416.31 7.12865
442017.00 3761416.31 6.79449 442067.00
3761416.31 6.50328
441917.00 3761466.31 8.33894 441967.00
3761466.31 8.03820
442017.00 3761466.31 7.64711 442067.00
3761466.31 7.28869
441917.00 3761516.31 9.59631 441967.00
3761516.31 9.21455
442017.00 3761516.31 8.76182 442067.00
3761516.31 8.32149
441917.00 3761566.31 11.32173 441967.00
3761566.31 10.89661
442017.00 3761566.31 10.36470 442067.00
3761566.31 9.87895
441917.00 3761616.31 13.97596 441967.00
3761616.31 13.57976
442017.00 3761616.31 13.03574 442067.00
3761616.31 12.36775
442847.68 3761995.12 4.49980 442897.68
3761995.12 4.23051
442947.68 3761995.12 3.98650 442997.68
3761995.12 3.76792

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 3.57114 | 443097.68 | 3761995.12 | 3.39697 |
| 443147.68 | 3761995.12 | 3.24619 | 443197.68 | 3761995.12 | 3.10310 |
| 442847.68 | 3762045.12 | 4.57964 | 442897.68 | 3762045.12 | 4.31336 |
| 442947.68 | 3762045.12 | 4.04905 | 442997.68 | 3762045.12 | 3.81336 |
| 443047.68 | 3762045.12 | 3.60468 | 443097.68 | 3762045.12 | 3.42947 |
| 443147.68 | 3762045.12 | 3.27615 | 443197.68 | 3762045.12 | 3.12875 |
| 442447.68 | 3762095.12 | 8.28218 | 442497.68 | 3762095.12 | 7.60209 |
| 442547.68 | 3762095.12 | 6.92347 | 442597.68 | 3762095.12 | 6.35593 |
| 442647.68 | 3762095.12 | 5.94214 | 442697.68 | 3762095.12 | 5.53451 |
| 442747.68 | 3762095.12 | 5.17984 | 442797.68 | 3762095.12 | 4.85419 |
| 442847.68 | 3762095.12 | 4.57464 | 442897.68 | 3762095.12 | 4.31382 |
| 442947.68 | 3762095.12 | 4.08247 | 442997.68 | 3762095.12 | 3.85846 |
| 443047.68 | 3762095.12 | 3.65810 | 443097.68 | 3762095.12 | 3.46826 |
| 443147.68 | 3762095.12 | 3.30781 | 443197.68 | 3762095.12 | 3.15651 |
| 442447.68 | 3762145.12 | 8.12874 | 442497.68 | 3762145.12 | 7.44953 |
| 442547.68 | 3762145.12 | 6.83135 | 442597.68 | 3762145.12 | 6.30612 |
| 442647.68 | 3762145.12 | 5.86662 | 442697.68 | 3762145.12 | 5.46912 |

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         442747.68    3762145.12        5.11911                       442797.68
3762145.12        4.82368
         442847.68    3762145.12        4.54146                       442897.68
3762145.12        4.28430
         442947.68    3762145.12        4.02576                       442997.68
3762145.12        3.80326
         443047.68    3762145.12        3.61750                       443097.68
3762145.12        3.43999
         443147.68    3762145.12        3.26862                       443197.68
3762145.12        3.12821
         442447.68    3762195.12        8.01325                       442497.68
3762195.12        7.26172
         442547.68    3762195.12        6.67562                       442597.68
3762195.12        6.18541
         442647.68    3762195.12        5.74180                       442697.68
3762195.12        5.34453
         442747.68    3762195.12        4.97920                       442797.68
3762195.12        4.68265
         442847.68    3762195.12        4.43499                       442897.68
3762195.12        4.19605
         442947.68    3762195.12        3.95866                       442997.68
3762195.12        3.74490
         443047.68    3762195.12        3.54486                       443097.68
3762195.12        3.37046
         443147.68    3762195.12        3.21896                       443197.68
3762195.12        3.07649
         442447.68    3762245.12        7.65045                       442497.68
3762245.12        7.00322
         442547.68    3762245.12        6.43324                       442597.68
3762245.12        5.94110
         442647.68    3762245.12        5.54058                       442697.68
3762245.12        5.20678
         442747.68    3762245.12        4.90165                       442797.68
3762245.12        4.62602
         442847.68    3762245.12        4.37647                       442897.68
3762245.12        4.14203
         442947.68    3762245.12        3.92517                       442997.68
3762245.12        3.72778
         443047.68    3762245.12        3.53469                       443097.68
3762245.12        3.35063
         443147.68    3762245.12        3.17440                       443197.68
3762245.12        3.03728
         442822.81    3761611.77        3.56317                       442872.81
3761611.77        3.38109
         442922.81    3761611.77        3.21481                       442972.81
3761611.77        3.05202
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 3.71824 | 442872.81 | 3761661.77 | 3.51185 |
| 442922.81 | 3761661.77 | 3.32958 | 442972.81 | 3761661.77 | 3.18810 |
| 442732.29 | 3762366.08 | 4.41379 | 442782.29 | 3762366.08 | 4.18116 |
| 442832.29 | 3762366.08 | 3.98020 | 442732.29 | 3762416.08 | 4.22746 |
| 442782.29 | 3762416.08 | 4.00901 | 442832.29 | 3762416.08 | 3.80805 |
| 442732.29 | 3762466.08 | 4.10741 | 442782.29 | 3762466.08 | 3.89492 |
| 442832.29 | 3762466.08 | 3.67350 | 441922.75 | 3762323.77 | 10.35685 |
| 441972.75 | 3762323.77 | 10.42102 | 442022.75 | 3762323.77 | 10.47224 |
| 442072.75 | 3762323.77 | 10.47903 | 441922.75 | 3762373.77 | 8.00349 |
| 441972.75 | 3762373.77 | 8.01844 | 442022.75 | 3762373.77 | 8.05408 |
| 442072.75 | 3762373.77 | 8.11813 | 441922.75 | 3762423.77 | 6.60031 |
| 441972.75 | 3762423.77 | 6.63037 | 442022.75 | 3762423.77 | 6.64438 |
| 442072.75 | 3762423.77 | 6.72389 | 441922.75 | 3762473.77 | 5.62243 |
| 441972.75 | 3762473.77 | 5.63202 | 442022.75 | 3762473.77 | 5.62993 |
| 442072.75 | 3762473.77 | 5.68452 | 441922.75 | 3762523.77 | 4.83928 |
| 441972.75 | 3762523.77 | 4.84904 | 442022.75 | 3762523.77 | 4.82793 |
| 442072.75 | 3762523.77 | 4.89167 | 441922.75 | 3762573.77 | 4.26280 |

441972.75 3762573.77 4.24157 442022.75
3762573.77 4.22364
442072.75 3762573.77 4.23008 441922.75
3762623.77 3.72504
441972.75 3762623.77 3.75707 442022.75
3762623.77 3.77610
442072.75 3762623.77 3.76947 441109.54
3762319.57 8.46574
441159.54 3762319.57 8.71534 441209.54
3762319.57 8.91058
441259.54 3762319.57 9.06731 441109.54
3762369.57 6.34445
441159.54 3762369.57 6.46715 441209.54
3762369.57 6.64459
441259.54 3762369.57 6.78236 441109.54
3762419.57 5.13954
441159.54 3762419.57 5.27113 441209.54
3762419.57 5.29231
441259.54 3762419.57 5.43078 441109.54
3762469.57 4.31855
441159.54 3762469.57 4.37955 441209.54
3762469.57 4.48393
441259.54 3762469.57 4.47536 441109.54
3762519.57 3.76869
441159.54 3762519.57 3.81533 441209.54
3762519.57 3.86345
441259.54 3762519.57 3.92864 441109.54
3762569.57 3.30130
441159.54 3762569.57 3.38087 441209.54
3762569.57 3.41402
441259.54 3762569.57 3.44939 441109.54
3762619.57 2.95794
441159.54 3762619.57 3.01010 441209.54
3762619.57 3.04894
441259.54 3762619.57 3.05615 441109.54
3762669.57 2.64554
441159.54 3762669.57 2.68449 441209.54
3762669.57 2.71930
441259.54 3762669.57 2.74901 441109.54
3762719.57 2.42181
441159.54 3762719.57 2.43921 441209.54
3762719.57 2.44976
441259.54 3762719.57 2.48861 441109.54
3762769.57 2.25522
441159.54 3762769.57 2.24800 441209.54
3762769.57 2.25448

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 2.27514 | 441313.48 | 3762805.42 | 2.17287 |
| 441363.48 | 3762805.42 | 2.17871 | 441413.48 | 3762805.42 | 2.18046 |
| 441463.48 | 3762805.42 | 2.21786 | 441513.48 | 3762805.42 | 2.21730 |
| 441563.48 | 3762805.42 | 2.22215 | 441613.48 | 3762805.42 | 2.24228 |
| 441663.48 | 3762805.42 | 2.31304 | 441713.48 | 3762805.42 | 2.33543 |
| 441763.48 | 3762805.42 | 2.33215 | 441813.48 | 3762805.42 | 2.40085 |
| 441313.48 | 3762855.42 | 2.01365 | 441363.48 | 3762855.42 | 2.01266 |
| 441413.48 | 3762855.42 | 2.04254 | 441463.48 | 3762855.42 | 2.04449 |
| 441513.48 | 3762855.42 | 2.04132 | 441563.48 | 3762855.42 | 2.07587 |
| 441613.48 | 3762855.42 | 2.09004 | 441663.48 | 3762855.42 | 2.11950 |
| 441713.48 | 3762855.42 | 2.12091 | 441763.48 | 3762855.42 | 2.12703 |
| 441813.48 | 3762855.42 | 2.16448 | 441313.48 | 3762905.42 | 1.88089 |
| 441363.48 | 3762905.42 | 1.87616 | 441413.48 | 3762905.42 | 1.89301 |
| 441463.48 | 3762905.42 | 1.89507 | 441513.48 | 3762905.42 | 1.90664 |
| 441563.48 | 3762905.42 | 1.92220 | 441613.48 | 3762905.42 | 1.94131 |
| 441663.48 | 3762905.42 | 1.97288 | 441713.48 | 3762905.42 | 1.95806 |
| 441763.48 | 3762905.42 | 1.94781 | 441813.48 | 3762905.42 | 1.98866 |

441313.48 3762955.42 1.75488 441363.48
3762955.42 1.77137
441413.48 3762955.42 1.76231 441463.48
3762955.42 1.76613
441513.48 3762955.42 1.79302 441563.48
3762955.42 1.79745
441613.48 3762955.42 1.78544 441663.48
3762955.42 1.85084
441713.48 3762955.42 1.82187 441763.48
3762955.42 1.81663
441813.48 3762955.42 1.82025 440408.22
3761498.57 4.63071
440956.50 3762849.59 1.99483 440559.26
3761306.11 4.52010
440752.05 3761305.37 5.54331 440857.69
3761312.76 6.14758
440969.23 3761308.33 6.67531 440936.73
3761237.41 5.81059



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

440600.61 3761994.75 0.75738 440650.61
3761994.75 0.79141
440400.61 3762044.75 0.64039 440450.61
3762044.75 0.66588
440500.61 3762044.75 0.69340 440550.61
3762044.75 0.72232
440600.61 3762044.75 0.75327 440650.61
3762044.75 0.78647
440400.61 3762094.75 0.63206 440450.61
3762094.75 0.65656
440500.61 3762094.75 0.68313 440550.61
3762094.75 0.71143
440600.61 3762094.75 0.74151 440650.61
3762094.75 0.77334
440400.61 3762144.75 0.62724 440450.61
3762144.75 0.64777
440500.61 3762144.75 0.67484 440550.61
3762144.75 0.70043
440600.61 3762144.75 0.73084 440650.61
3762144.75 0.76568
441145.13 3761319.94 1.23849 441195.13
3761319.94 1.31529
441245.13 3761319.94 1.39978 441145.13
3761369.94 1.25149
441195.13 3761369.94 1.32605 441245.13
3761369.94 1.41653
441145.13 3761419.94 1.26456 441195.13
3761419.94 1.34478
441245.13 3761419.94 1.43253 441145.13
3761469.94 1.28384
441195.13 3761469.94 1.35766 441245.13
3761469.94 1.44716
441145.13 3761519.94 1.30828 441195.13
3761519.94 1.38316
441245.13 3761519.94 1.47023 441145.13
3761569.94 1.32388
441195.13 3761569.94 1.40908 441245.13
3761569.94 1.50073
441145.13 3761619.94 1.32195 441195.13
3761619.94 1.40760
441245.13 3761619.94 1.50320 441145.13
3761669.94 1.33409
441195.13 3761669.94 1.41644 441245.13
3761669.94 1.51364
441917.00 3761316.31 3.52829 441967.00
3761316.31 3.76167
442017.00 3761316.31 4.04147 442067.00
3761316.31 4.30672
441917.00 3761366.31 3.80105 441967.00
3761366.31 4.11815
442017.00 3761366.31 4.44109 442067.00

3761366.31 4.76972
441917.00 3761416.31 4.11796 441967.00
3761416.31 4.48972
442017.00 3761416.31 4.91915 442067.00
3761416.31 5.34597
441917.00 3761466.31 4.46548 441967.00
3761466.31 4.92265
442017.00 3761466.31 5.42770 442067.00
3761466.31 6.02544
441917.00 3761516.31 4.80382 441967.00
3761516.31 5.37461
442017.00 3761516.31 6.09694 442067.00
3761516.31 6.81471
441917.00 3761566.31 5.12047 441967.00
3761566.31 5.83178
442017.00 3761566.31 6.73428 442067.00
3761566.31 7.79642
441917.00 3761616.31 5.40657 441967.00
3761616.31 6.25918
442017.00 3761616.31 7.36560 442067.00
3761616.31 8.78997
442847.68 3761995.12 18.81069 442897.68
3761995.12 14.44092
442947.68 3761995.12 11.68203 442997.68
3761995.12 9.79591



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M)

Y-COORD (M)  CONC
- - - -

```
         442647.68    3762195.12       11.97893                      442697.68
3762195.12       11.28812
         442747.68    3762195.12       10.57664                      442797.68
3762195.12        9.89982
         442847.68    3762195.12        9.15054                      442897.68
3762195.12        8.63236
         442947.68    3762195.12        8.02385                      442997.68
3762195.12        7.41483
         443047.68    3762195.12        6.76584                      443097.68
3762195.12        6.22052
         443147.68    3762195.12        5.71912                      443197.68
3762195.12        5.30290
         442447.68    3762245.12       15.91208                      442497.68
3762245.12       12.81472
         442547.68    3762245.12       11.28812                      442597.68
3762245.12       10.22485
         442647.68    3762245.12        9.53820                      442697.68
3762245.12        8.98496
         442747.68    3762245.12        8.48889                      442797.68
3762245.12        7.94597
         442847.68    3762245.12        7.57727                      442897.68
3762245.12        7.26622
         442947.68    3762245.12        6.90828                      442997.68
3762245.12        6.52214
         443047.68    3762245.12        6.04817                      443097.68
3762245.12        5.68419
         443147.68    3762245.12        5.27090                      443197.68
3762245.12        4.95323
         442822.81    3761611.77       11.24212                      442872.81
3761611.77        9.29942
         442922.81    3761611.77        7.79587                      442972.81
3761611.77        6.72799
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        20:06:41

                                  PAGE 108
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

             *** THE   8TH-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000789    , L0000790
, L0000791    , L0000792    , L0000793    ,
                L0000794    , L0000795    , L0000796    , L0000797    , L0000798
, L0000799    , L0000800    , L0000801    ,
                L0000802    , L0000803    , L0000804    , L0000805    , L0000806
, L0000807    , L0000808    , L0000809    ,
                L0000810    , L0000811    , L0000812    , L0000813    , L0000814
, L0000815    , L0000816    ,  . . .      ,
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*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 15.07716 | 442872.81 | 3761661.77 | 11.39348 |
| 442922.81 | 3761661.77 | 9.19628 | 442972.81 | 3761661.77 | 7.69296 |
| 442732.29 | 3762366.08 | 5.63767 | 442782.29 | 3762366.08 | 5.48900 |
| 442832.29 | 3762366.08 | 5.53591 | 442732.29 | 3762416.08 | 4.90752 |
| 442782.29 | 3762416.08 | 4.84512 | 442832.29 | 3762416.08 | 4.81525 |
| 442732.29 | 3762466.08 | 4.30618 | 442782.29 | 3762466.08 | 4.26047 |
| 442832.29 | 3762466.08 | 4.31898 | 441922.75 | 3762323.77 | 4.19512 |
| 441972.75 | 3762323.77 | 4.77953 | 442022.75 | 3762323.77 | 5.42319 |
| 442072.75 | 3762323.77 | 6.34258 | 441922.75 | 3762373.77 | 3.84385 |
| 441972.75 | 3762373.77 | 4.27458 | 442022.75 | 3762373.77 | 4.79491 |
| 442072.75 | 3762373.77 | 5.44841 | 441922.75 | 3762423.77 | 3.55716 |
| 441972.75 | 3762423.77 | 3.81710 | 442022.75 | 3762423.77 | 4.20640 |
| 442072.75 | 3762423.77 | 4.63114 | 441922.75 | 3762473.77 | 3.23172 |
| 441972.75 | 3762473.77 | 3.47138 | 442022.75 | 3762473.77 | 3.67996 |
| 442072.75 | 3762473.77 | 3.99483 | 441922.75 | 3762523.77 | 2.92901 |
| 441972.75 | 3762523.77 | 3.09195 | 442022.75 | 3762523.77 | 3.30761 |
| 442072.75 | 3762523.77 | 3.53304 | 441922.75 | 3762573.77 | 2.71406 |
| 441972.75 | 3762573.77 | 2.82547 | 442022.75 | 3762573.77 | 2.97944 |
| 442072.75 | 3762573.77 | 3.15853 | 441922.75 | 3762623.77 | 2.48006 |
| 441972.75 | 3762623.77 | 2.59277 | 442022.75 | 3762623.77 | 2.71894 |
| 442072.75 | 3762623.77 | 2.80115 | 441109.54 | | |

3762319.57 1.19610
441159.54 3762319.57 1.23917 441209.54
3762319.57 1.30128
441259.54 3762319.57 1.40634 441109.54
3762369.57 1.21725
441159.54 3762369.57 1.21294 441209.54
3762369.57 1.27319
441259.54 3762369.57 1.38059 441109.54
3762419.57 1.20034
441159.54 3762419.57 1.21000 441209.54
3762419.57 1.26008
441259.54 3762419.57 1.33347 441109.54
3762469.57 1.17393
441159.54 3762469.57 1.22045 441209.54
3762469.57 1.26089
441259.54 3762469.57 1.34264 441109.54
3762519.57 1.20013
441159.54 3762519.57 1.19745 441209.54
3762519.57 1.24420
441259.54 3762519.57 1.30611 441109.54
3762569.57 1.21898
441159.54 3762569.57 1.19737 441209.54
3762569.57 1.21579
441259.54 3762569.57 1.24989 441109.54
3762619.57 1.20185
441159.54 3762619.57 1.18500 441209.54
3762619.57 1.19501
441259.54 3762619.57 1.26627 441109.54
3762669.57 1.16418
441159.54 3762669.57 1.18751 441209.54
3762669.57 1.22468
441259.54 3762669.57 1.27314 441109.54
3762719.57 1.16554
441159.54 3762719.57 1.18170 441209.54
3762719.57 1.21056
441259.54 3762719.57 1.25326 441109.54
3762769.57 1.13580
441159.54 3762769.57 1.15691 441209.54
3762769.57 1.18048



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,

L0000794 , L0000795 , L0000796 , L0000797 , L0000798
, L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806
, L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814
, L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS
***

** CONC OF PM-2.5 IN MICROGRAMS/M**3
**

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 1.20433 | 441313.48 | 3762805.42 | 1.24642 |
| 441363.48 | 3762805.42 | 1.31894 | 441413.48 | 3762805.42 | 1.38262 |
| 441463.48 | 3762805.42 | 1.42750 | 441513.48 | 3762805.42 | 1.50724 |
| 441563.48 | 3762805.42 | 1.54807 | 441613.48 | 3762805.42 | 1.56320 |
| 441663.48 | 3762805.42 | 1.61236 | 441713.48 | 3762805.42 | 1.64186 |
| 441763.48 | 3762805.42 | 1.67589 | 441813.48 | 3762805.42 | 1.74727 |
| 441313.48 | 3762855.42 | 1.23399 | 441363.48 | 3762855.42 | 1.29504 |
| 441413.48 | 3762855.42 | 1.33003 | 441463.48 | 3762855.42 | 1.39450 |
| 441513.48 | 3762855.42 | 1.43405 | 441563.48 | 3762855.42 | 1.47856 |
| 441613.48 | 3762855.42 | 1.48804 | 441663.48 | 3762855.42 | 1.50531 |
| 441713.48 | 3762855.42 | 1.54630 | 441763.48 | 3762855.42 | 1.58058 |
| 441813.48 | 3762855.42 | 1.65457 | 441313.48 | 3762905.42 | 1.21939 |
| 441363.48 | 3762905.42 | 1.24256 | 441413.48 | 3762905.42 | 1.30545 |
| 441463.48 | 3762905.42 | 1.34994 | 441513.48 | 3762905.42 | 1.38193 |
| 441563.48 | 3762905.42 | 1.40786 | 441613.48 | 3762905.42 | 1.36525 |
| 441663.48 | 3762905.42 | 1.44469 | 441713.48 | 3762905.42 | 1.47084 |
| 441763.48 | 3762905.42 | 1.47232 | 441813.48 | 3762905.42 | 1.54752 |

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         441313.48    3762955.42        1.16976                      441363.48
3762955.42        1.20727
         441413.48    3762955.42        1.26953                      441463.48
3762955.42        1.28136
         441513.48    3762955.42        1.32319                      441563.48
3762955.42        1.30658
         441613.48    3762955.42        1.33618                      441663.48
3762955.42        1.36915
         441713.48    3762955.42        1.39399                      441763.48
3762955.42        1.42387
         441813.48    3762955.42        1.43929                      440408.22
3761498.57        0.64060
         440956.50    3762849.59        0.99709                      440559.26
3761306.11        0.71342
         440752.05    3761305.37        0.83344                      440857.69
3761312.76        0.91498
         440969.23    3761308.33        1.02223                      440936.73
3761237.41        0.97302
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

            *** THE   8TH-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                              *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         440400.61    3761994.75        1.45225                      440450.61
3761994.75        1.50286
         440500.61    3761994.75        1.55113                      440550.61
3761994.75        1.60885
         440600.61    3761994.75        1.66544                      440650.61
3761994.75        1.72510
         440400.61    3762044.75        1.50081                      440450.61
3762044.75        1.54766
         440500.61    3762044.75        1.59662                      440550.61
3762044.75        1.64766
         440600.61    3762044.75        1.70352                      440650.61
```

3762044.75 1.76552
440400.61 3762094.75 1.52902 440450.61
3762094.75 1.57527
440500.61 3762094.75 1.62460 440550.61
3762094.75 1.67371
440600.61 3762094.75 1.72537 440650.61
3762094.75 1.78003
440400.61 3762144.75 1.50918 440450.61
3762144.75 1.55416
440500.61 3762144.75 1.58974 440550.61
3762144.75 1.63107
440600.61 3762144.75 1.66956 440650.61
3762144.75 1.71653
441145.13 3761319.94 3.17159 441195.13
3761319.94 3.33814
441245.13 3761319.94 3.43307 441145.13
3761369.94 3.17441
441195.13 3761369.94 3.33501 441245.13
3761369.94 3.53335
441145.13 3761419.94 3.02475 441195.13
3761419.94 3.25237
441245.13 3761419.94 3.52617 441145.13
3761469.94 3.01570
441195.13 3761469.94 3.18418 441245.13
3761469.94 3.39417
441145.13 3761519.94 2.98902 441195.13
3761519.94 3.17717
441245.13 3761519.94 3.40127 441145.13
3761569.94 2.92225
441195.13 3761569.94 3.12857 441245.13
3761569.94 3.34568
441145.13 3761619.94 2.88404 441195.13
3761619.94 3.08404
441245.13 3761619.94 3.30737 441145.13
3761669.94 2.80342
441195.13 3761669.94 2.99730 441245.13
3761669.94 3.20555
441917.00 3761316.31 7.92401 441967.00
3761316.31 8.39823
442017.00 3761316.31 8.85246 442067.00
3761316.31 9.44258
441917.00 3761366.31 8.33272 441967.00
3761366.31 9.07478
442017.00 3761366.31 9.67608 442067.00
3761366.31 10.17463
441917.00 3761416.31 8.78165 441967.00
3761416.31 9.55646
442017.00 3761416.31 10.40194 442067.00
3761416.31 11.23197
441917.00 3761466.31 9.29720 441967.00
3761466.31 10.18571

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         442017.00    3761466.31       11.14554                      442067.00
3761466.31       12.40496
         441917.00    3761516.31       10.03647                      441967.00
3761516.31       11.08560
         442017.00    3761516.31       12.22233                      442067.00
3761516.31       13.48686
         441917.00    3761566.31       10.60734                      441967.00
3761566.31       11.95743
         442017.00    3761566.31       13.35318                      442067.00
3761566.31       15.29528
         441917.00    3761616.31       10.69206                      441967.00
3761616.31       12.11860
         442017.00    3761616.31       14.30044                      442067.00
3761616.31       16.73349
         442847.68    3761995.12       34.26734                      442897.68
3761995.12       26.01296
         442947.68    3761995.12       21.03783                      442997.68
3761995.12       17.61363
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE 111
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

             *** THE   8TH-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - -
         443047.68    3761995.12       15.20152                      443097.68
3761995.12       13.34218
         443147.68    3761995.12       11.87208                      443197.68
3761995.12       10.64045
         442847.68    3762045.12       32.31539                      442897.68
3762045.12       24.23098
         442947.68    3762045.12       19.92124                      442997.68
3762045.12       16.90669
         443047.68    3762045.12       14.72145                      443097.68
3762045.12       12.90052
         443147.68    3762045.12       11.52037                      443197.68
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3762045.12 10.41799
442447.68 3762095.12 42.70295 442497.68
3762095.12 40.72113
442547.68 3762095.12 39.35565 442597.68
3762095.12 38.27136
442647.68 3762095.12 37.61591 442697.68
3762095.12 36.74341
442747.68 3762095.12 35.69112 442797.68
3762095.12 33.92620
442847.68 3762095.12 26.71920 442897.68
3762095.12 21.35796
442947.68 3762095.12 17.81522 442997.68
3762095.12 15.52775
443047.68 3762095.12 13.74716 443097.68
3762095.12 12.28114
443147.68 3762095.12 11.06845 443197.68
3762095.12 9.99180
442447.68 3762145.12 26.78005 442497.68
3762145.12 22.91319
442547.68 3762145.12 21.67094 442597.68
3762145.12 21.30580
442647.68 3762145.12 20.91831 442697.68
3762145.12 20.80118
442747.68 3762145.12 20.62212 442797.68
3762145.12 20.09681
442847.68 3762145.12 18.92476 442897.68
3762145.12 17.39241
442947.68 3762145.12 15.60492 442997.68
3762145.12 13.87309
443047.68 3762145.12 12.46035 443097.68
3762145.12 11.25518
443147.68 3762145.12 10.36651 443197.68
3762145.12 9.44581
442447.68 3762195.12 23.55988 442497.68
3762195.12 18.54221
442547.68 3762195.12 16.71638 442597.68
3762195.12 15.78481
442647.68 3762195.12 15.65658 442697.68
3762195.12 15.46668
442747.68 3762195.12 15.16543 442797.68
3762195.12 15.05285
442847.68 3762195.12 14.65449 442897.68
3762195.12 13.98919
442947.68 3762195.12 13.06624 442997.68
3762195.12 12.21914
443047.68 3762195.12 11.25248 443097.68
3762195.12 10.42336
443147.68 3762195.12 9.53406 443197.68
3762195.12 8.81026
442447.68 3762245.12 20.50925 442497.68
3762245.12 15.82320

```
         442547.68    3762245.12       13.93215                      442597.68
3762245.12       13.10567
         442647.68    3762245.12       12.62243                      442697.68
3762245.12       12.30948
         442747.68    3762245.12       12.27965                      442797.68
3762245.12       12.07913
         442847.68    3762245.12       11.90003                      442897.68
3762245.12       11.39164
         442947.68    3762245.12       11.05142                      442997.68
3762245.12       10.47470
         443047.68    3762245.12       10.07522                      443097.68
3762245.12        9.43065
         443147.68    3762245.12        8.82136                      443197.68
3762245.12        8.23547
         442822.81    3761611.77       18.27359                      442872.81
3761611.77       14.97836
         442922.81    3761611.77       13.10648                      442972.81
3761611.77       11.68102
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE 112
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

             *** THE   8TH-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - -
         442822.81    3761661.77       24.75264                      442872.81
3761661.77       18.77501
         442922.81    3761661.77       15.70625                      442972.81
3761661.77       13.39995
         442732.29    3762366.08        7.99906                      442782.29
3762366.08        8.01674
         442832.29    3762366.08        7.81324                      442732.29
3762416.08        6.94062
         442782.29    3762416.08        6.96204                      442832.29
3762416.08        6.74988
         442732.29    3762466.08        6.05178                      442782.29
```

3762466.08 6.11499
442832.29 3762466.08 5.91953 441922.75
3762323.77 6.35864
441972.75 3762323.77 6.99718 442022.75
3762323.77 7.79191
442072.75 3762323.77 8.85392 441922.75
3762373.77 5.70453
441972.75 3762373.77 6.33547 442022.75
3762373.77 6.77069
442072.75 3762373.77 7.50301 441922.75
3762423.77 5.21025
441972.75 3762423.77 5.52531 442022.75
3762423.77 6.05194
442072.75 3762423.77 6.43517 441922.75
3762473.77 4.65263
441972.75 3762473.77 5.10383 442022.75
3762473.77 5.24285
442072.75 3762473.77 5.69234 441922.75
3762523.77 4.26888
441972.75 3762523.77 4.48584 442022.75
3762523.77 4.78397
442072.75 3762523.77 4.88860 441922.75
3762573.77 3.98582
441972.75 3762573.77 4.12399 442022.75
3762573.77 4.22829
442072.75 3762573.77 4.40441 441922.75
3762623.77 3.50947
441972.75 3762623.77 3.67734 442022.75
3762623.77 3.92623
442072.75 3762623.77 3.96823 441109.54
3762319.57 2.29217
441159.54 3762319.57 2.37407 441209.54
3762319.57 2.49203
441259.54 3762319.57 2.62892 441109.54
3762369.57 2.22142
441159.54 3762369.57 2.30341 441209.54
3762369.57 2.41222
441259.54 3762369.57 2.51966 441109.54
3762419.57 2.15649
441159.54 3762419.57 2.23964 441209.54
3762419.57 2.29217
441259.54 3762419.57 2.34717 441109.54
3762469.57 2.01715
441159.54 3762469.57 2.08099 441209.54
3762469.57 2.17078
441259.54 3762469.57 2.27655 441109.54
3762519.57 1.95680
441159.54 3762519.57 2.06179 441209.54
3762519.57 2.19404
441259.54 3762519.57 2.28205 441109.54
3762569.57 1.93562

441159.54 3762569.57 2.03712 441209.54
3762569.57 2.10509
441259.54 3762569.57 2.15000 441109.54
3762619.57 1.90457
441159.54 3762619.57 1.95637 441209.54
3762619.57 2.01930
441259.54 3762619.57 2.10606 441109.54
3762669.57 1.81047
441159.54 3762669.57 1.88208 441209.54
3762669.57 1.98201
441259.54 3762669.57 2.04818 441109.54
3762719.57 1.80080
441159.54 3762719.57 1.85072 441209.54
3762719.57 1.90909
441259.54 3762719.57 2.00345 441109.54
3762769.57 1.72538
441159.54 3762769.57 1.79705 441209.54
3762769.57 1.84483



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762805.42 2.49274
441313.48 3762855.42 1.82533 441363.48
3762855.42 1.90311
441413.48 3762855.42 1.98108 441463.48
3762855.42 2.06257
441513.48 3762855.42 2.09867 441563.48
3762855.42 2.18873
441613.48 3762855.42 2.19394 441663.48
3762855.42 2.23060
441713.48 3762855.42 2.28306 441763.48
3762855.42 2.26353
441813.48 3762855.42 2.33110 441313.48
3762905.42 1.79184
441363.48 3762905.42 1.85386 441413.48
3762905.42 1.94462
441463.48 3762905.42 1.94240 441513.48
3762905.42 2.02581
441563.48 3762905.42 2.02556 441613.48
3762905.42 2.04554
441663.48 3762905.42 2.09194 441713.48
3762905.42 2.04702
441763.48 3762905.42 2.16547 441813.48
3762905.42 2.22690
441313.48 3762955.42 1.73870 441363.48
3762955.42 1.81323
441413.48 3762955.42 1.81609 441463.48
3762955.42 1.84630
441513.48 3762955.42 1.87875 441563.48
3762955.42 1.88740
441613.48 3762955.42 1.93119 441663.48
3762955.42 1.90721
441713.48 3762955.42 2.00417 441763.48
3762955.42 2.00676
441813.48 3762955.42 2.14403 440408.22
3761498.57 1.54306
440956.50 3762849.59 1.50941 440559.26
3761306.11 1.80074
440752.05 3761305.37 2.14625 440857.69
3761312.76 2.35012
440969.23 3761308.33 2.63229 440936.73
3761237.41 2.55728


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***

INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 7.96222 | 440450.61 | 3761994.75 | 8.70922 |
| 440500.61 | 3761994.75 | 9.61883 | 440550.61 | 3761994.75 | 10.75346 |
| 440600.61 | 3761994.75 | 12.26085 | 440650.61 | 3761994.75 | 14.26650 |
| 440400.61 | 3762044.75 | 8.03047 | 440450.61 | 3762044.75 | 8.76457 |
| 440500.61 | 3762044.75 | 9.61488 | 440550.61 | 3762044.75 | 10.56999 |
| 440600.61 | 3762044.75 | 11.81843 | 440650.61 | 3762044.75 | 13.73130 |
| 440400.61 | 3762094.75 | 7.91065 | 440450.61 | 3762094.75 | 8.56287 |
| 440500.61 | 3762094.75 | 9.33616 | 440550.61 | 3762094.75 | 10.33028 |
| 440600.61 | 3762094.75 | 11.60735 | 440650.61 | 3762094.75 | 13.11149 |
| 440400.61 | 3762144.75 | 7.70580 | 440450.61 | 3762144.75 | 8.27416 |
| 440500.61 | 3762144.75 | 9.02362 | 440550.61 | 3762144.75 | 9.96230 |
| 440600.61 | 3762144.75 | 11.05738 | 440650.61 | 3762144.75 | 12.50951 |
| 441145.13 | 3761319.94 | 13.13808 | 441195.13 | 3761319.94 | 13.45882 |
| 441245.13 | 3761319.94 | 13.77764 | 441145.13 | 3761369.94 | 14.22455 |
| 441195.13 | 3761369.94 | 14.55308 | 441245.13 | 3761369.94 | 14.87120 |
| 441145.13 | 3761419.94 | 15.56524 | 441195.13 | 3761419.94 | 15.90542 |

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         441245.13    3761419.94       16.22669                       441145.13
3761469.94       17.32554
         441195.13    3761469.94       17.62778                       441245.13
3761469.94       18.01776
         441145.13    3761519.94       19.46093                       441195.13
3761519.94       19.78858
         441245.13    3761519.94       20.12914                       441145.13
3761569.94       22.54935
         441195.13    3761569.94       22.91094                       441245.13
3761569.94       23.25873
         441145.13    3761619.94       27.17445                       441195.13
3761619.94       27.58917
         441245.13    3761619.94       28.01261                       441145.13
3761669.94       36.51085
         441195.13    3761669.94       36.82443                       441245.13
3761669.94       37.31792
         441917.00    3761316.31       17.73403                       441967.00
3761316.31       18.15369
         442017.00    3761316.31       18.60987                       442067.00
3761316.31       19.10349
         441917.00    3761366.31       19.36075                       441967.00
3761366.31       19.78569
         442017.00    3761366.31       20.37308                       442067.00
3761366.31       20.81034
         441917.00    3761416.31       21.21065                       441967.00
3761416.31       21.80844
         442017.00    3761416.31       22.37104                       442067.00
3761416.31       22.99862
         441917.00    3761466.31       23.37127                       441967.00
3761466.31       24.17844
         442017.00    3761466.31       24.92495                       442067.00
3761466.31       25.80323
         441917.00    3761516.31       25.95508                       441967.00
3761516.31       26.88714
         442017.00    3761516.31       28.07338                       442067.00
3761516.31       29.26439
         441917.00    3761566.31       29.22281                       441967.00
3761566.31       30.41523
         442017.00    3761566.31       31.93569                       442067.00
3761566.31       33.99790
         441917.00    3761616.31       34.15052                       441967.00
3761616.31       35.42197
         442017.00    3761616.31       37.10576                       442067.00
3761616.31       39.52451
         442847.68    3761995.12       57.52747                       442897.68
3761995.12       44.95176
         442947.68    3761995.12       37.28061                       442997.68
3761995.12       32.30086
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                          ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 ,
L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 28.55088 | 443097.68 | 3761995.12 | 25.56977 |
| 443147.68 | 3761995.12 | 23.02144 | 443197.68 | 3761995.12 | 20.93366 |
| 442847.68 | 3762045.12 | 55.31751 | 442897.68 | 3762045.12 | 42.98291 |
| 442947.68 | 3762045.12 | 35.94952 | 442997.68 | 3762045.12 | 31.12293 |
| 443047.68 | 3762045.12 | 27.50189 | 443097.68 | 3762045.12 | 24.73700 |
| 443147.68 | 3762045.12 | 22.49627 | 443197.68 | 3762045.12 | 20.60883 |
| 442447.68 | 3762095.12 | 77.49320 | 442497.68 | 3762095.12 | 74.07034 |
| 442547.68 | 3762095.12 | 69.18037 | 442597.68 | 3762095.12 | 68.39175 |
| 442647.68 | 3762095.12 | 64.61955 | 442697.68 | 3762095.12 | 63.40592 |
| 442747.68 | 3762095.12 | 61.18965 | 442797.68 | 3762095.12 | 56.76377 |
| 442847.68 | 3762095.12 | 46.52094 | 442897.68 | 3762095.12 | 38.57103 |
| 442947.68 | 3762095.12 | 33.20245 | 442997.68 | 3762095.12 | 29.43189 |
| 443047.68 | 3762095.12 | 26.14443 | 443097.68 | | |

3762095.12 23.68445
443147.68 3762095.12 21.51595 443197.68
3762095.12 19.86970
442447.68 3762145.12 57.85882 442497.68
3762145.12 49.40461
442547.68 3762145.12 45.81225 442597.68
3762145.12 43.37397
442647.68 3762145.12 41.83239 442697.68
3762145.12 40.62505
442747.68 3762145.12 39.47943 442797.68
3762145.12 37.77191
442847.68 3762145.12 35.20789 442897.68
3762145.12 32.12982
442947.68 3762145.12 29.02475 442997.68
3762145.12 26.66780
443047.68 3762145.12 24.24173 443097.68
3762145.12 22.11884
443147.68 3762145.12 20.38105 443197.68
3762145.12 18.97741
442447.68 3762195.12 51.30257 442497.68
3762195.12 41.92770
442547.68 3762195.12 36.96329 442597.68
3762195.12 34.47265
442647.68 3762195.12 32.83466 442697.68
3762195.12 31.77542
442747.68 3762195.12 30.97757 442797.68
3762195.12 29.57921
442847.68 3762195.12 28.29591 442897.68
3762195.12 26.96229
442947.68 3762195.12 25.44982 442997.68
3762195.12 23.71326
443047.68 3762195.12 22.04767 443097.68
3762195.12 20.55120
443147.68 3762195.12 19.20182 443197.68
3762195.12 17.91337
442447.68 3762245.12 45.72812 442497.68
3762245.12 37.07952
442547.68 3762245.12 32.30127 442597.68
3762245.12 29.44308
442647.68 3762245.12 27.62908 442697.68
3762245.12 26.67321
442747.68 3762245.12 25.80989 442797.68
3762245.12 24.83174
442847.68 3762245.12 24.07873 442897.68
3762245.12 23.28073
442947.68 3762245.12 22.30602 442997.68
3762245.12 21.21547
443047.68 3762245.12 19.94636 443097.68
3762245.12 18.70039
443147.68 3762245.12 17.62323 443197.68
3762245.12 16.70998

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         442822.81    3761611.77       32.03305                      442872.81
3761611.77       27.44664
         442922.81    3761611.77       24.39231                      442972.81
3761611.77       21.93299
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE 116
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

             *** THE   8TH-HIGHEST 24-HR AVERAGE CONCENTRATION    VALUES AVERAGED
OVER   5 YEARS FOR SOURCE GROUP: ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM-2.5   IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         442822.81    3761661.77       43.26318                      442872.81
3761661.77       34.28073
         442922.81    3761661.77       28.83706                      442972.81
3761661.77       25.12777
         442732.29    3762366.08       19.02163                      442782.29
3762366.08       18.57869
         442832.29    3762366.08       18.41555                      442732.29
3762416.08       17.18767
         442782.29    3762416.08       16.94587                      442832.29
3762416.08       16.55186
         442732.29    3762466.08       15.37437                      442782.29
3762466.08       15.21776
         442832.29    3762466.08       15.13021                      441922.75
3762323.77       23.89976
         441972.75    3762323.77       24.50569                      442022.75
3762323.77       25.15394
         442072.75    3762323.77       26.16545                      441922.75
3762373.77       19.29698
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441972.75 3762373.77 19.77624 442022.75
3762373.77 20.24322
442072.75 3762373.77 20.93915 441922.75
3762423.77 16.35284
441972.75 3762423.77 16.62614 442022.75
3762423.77 16.95919
442072.75 3762423.77 17.43329 441922.75
3762473.77 14.16531
441972.75 3762473.77 14.38706 442022.75
3762473.77 14.66539
442072.75 3762473.77 15.03237 441922.75
3762523.77 12.50493
441972.75 3762523.77 12.72913 442022.75
3762523.77 12.95267
442072.75 3762523.77 13.07618 441922.75
3762573.77 11.17366
441972.75 3762573.77 11.35140 442022.75
3762573.77 11.44219
442072.75 3762573.77 11.60863 441922.75
3762623.77 10.02761
441972.75 3762623.77 10.21350 442022.75
3762623.77 10.29140
442072.75 3762623.77 10.30706 441109.54
3762319.57 17.75604
441159.54 3762319.57 18.29467 441209.54
3762319.57 18.69900
441259.54 3762319.57 18.96633 441109.54
3762369.57 13.85901
441159.54 3762369.57 14.35900 441209.54
3762369.57 14.67322
441259.54 3762369.57 14.94699 441109.54
3762419.57 11.72287
441159.54 3762419.57 11.98908 441209.54
3762419.57 12.33591
441259.54 3762419.57 12.58915 441109.54
3762469.57 10.27782
441159.54 3762469.57 10.41545 441209.54
3762469.57 10.63786
441259.54 3762469.57 10.86199 441109.54
3762519.57 9.16551
441159.54 3762519.57 9.27391 441209.54
3762519.57 9.43478
441259.54 3762519.57 9.64739 441109.54
3762569.57 8.31616
441159.54 3762569.57 8.36036 441209.54
3762569.57 8.53449
441259.54 3762569.57 8.70888 441109.54
3762619.57 7.61807
441159.54 3762619.57 7.67540 441209.54
3762619.57 7.73748
441259.54 3762619.57 7.94002 441109.54

3762669.57 6.95292
441159.54 3762669.57 7.05469 441209.54
3762669.57 7.19746
441259.54 3762669.57 7.32138 441109.54
3762719.57 6.47904
441159.54 3762719.57 6.58604 441209.54
3762719.57 6.71170
441259.54 3762719.57 6.79276 441109.54
3762769.57 6.09020
441159.54 3762769.57 6.16731 441209.54
3762769.57 6.23256



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH-HIGHEST 24-HR AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 ,
L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762805.42 6.92286
441313.48 3762855.42 5.71155 441363.48
3762855.42 5.83018
441413.48 3762855.42 5.84266 441463.48
3762855.42 5.83506
441513.48 3762855.42 5.89896 441563.48
3762855.42 6.00691
441613.48 3762855.42 6.12561 441663.48
3762855.42 6.20401
441713.48 3762855.42 6.27859 441763.48
3762855.42 6.35915
441813.48 3762855.42 6.44214 441313.48
3762905.42 5.35950
441363.48 3762905.42 5.34594 441413.48
3762905.42 5.38519
441463.48 3762905.42 5.42511 441513.48
3762905.42 5.59430
441563.48 3762905.42 5.71416 441613.48
3762905.42 5.71049
441663.48 3762905.42 5.78398 441713.48
3762905.42 5.84075
441763.48 3762905.42 5.82551 441813.48
3762905.42 5.92768
441313.48 3762955.42 4.98706 441363.48
3762955.42 4.99069
441413.48 3762955.42 5.03811 441463.48
3762955.42 5.15254
441513.48 3762955.42 5.31901 441563.48
3762955.42 5.30369
441613.48 3762955.42 5.35247 441663.48
3762955.42 5.43230
441713.48 3762955.42 5.43109 441763.48
3762955.42 5.43321
441813.48 3762955.42 5.57743 440408.22
3761498.57 8.11445
440956.50 3762849.59 5.20980 440559.26
3761306.11 8.40106
440752.05 3761305.37 9.87612 440857.69
3761312.76 10.87421
440969.23 3761308.33 11.58049 440936.73
3761237.41 10.38498


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS
AVERAGED OVER 5 YEARS ***

```
                                        ** CONC OF PM-2.5   IN MICROGRAMS/M**3
              **


                        NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV,
ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - -

P2EXHAUS  1ST HIGHEST VALUE IS       7.71804 AT (  441245.13,  3761669.94,   207.75,
  207.75,    2.00)  DC
          2ND HIGHEST VALUE IS       7.59071 AT (  441195.13,  3761669.94,   207.43,
  207.43,    2.00)  DC
          3RD HIGHEST VALUE IS       7.46002 AT (  441145.13,  3761669.94,   207.68,
  207.68,    2.00)  DC
          4TH HIGHEST VALUE IS       5.59065 AT (  441922.75,  3762323.77,   214.01,
  214.01,    2.00)  DC
          5TH HIGHEST VALUE IS       5.50691 AT (  441245.13,  3761619.94,   207.21,
  207.21,    2.00)  DC
          6TH HIGHEST VALUE IS       5.46019 AT (  441972.75,  3762323.77,   214.36,
  214.36,    2.00)  DC
          7TH HIGHEST VALUE IS       5.40468 AT (  441195.13,  3761619.94,   206.94,
  206.94,    2.00)  DC
          8TH HIGHEST VALUE IS       5.32837 AT (  441917.00,  3761616.31,   207.36,
  207.36,    2.00)  DC
          9TH HIGHEST VALUE IS       5.28030 AT (  441145.13,  3761619.94,   207.02,
  207.02,    2.00)  DC
         10TH HIGHEST VALUE IS       5.25687 AT (  442022.75,  3762323.77,   214.97,
  214.97,    2.00)  DC

P2FUGITI  1ST HIGHEST VALUE IS      10.43567 AT (  441245.13,  3761669.94,   207.75,
  207.75,    2.00)  DC
          2ND HIGHEST VALUE IS      10.23751 AT (  441195.13,  3761669.94,   207.43,
  207.43,    2.00)  DC
          3RD HIGHEST VALUE IS      10.10519 AT (  441145.13,  3761669.94,   207.68,
  207.68,    2.00)  DC
          4TH HIGHEST VALUE IS       6.81545 AT (  441245.13,  3761619.94,   207.21,
  207.21,    2.00)  DC
          5TH HIGHEST VALUE IS       6.69431 AT (  441195.13,  3761619.94,   206.94,
  206.94,    2.00)  DC
          6TH HIGHEST VALUE IS       6.56868 AT (  441145.13,  3761619.94,   207.02,
  207.02,    2.00)  DC
          7TH HIGHEST VALUE IS       6.43030 AT (  441917.00,  3761616.31,   207.36,
  207.36,    2.00)  DC
          8TH HIGHEST VALUE IS       6.24776 AT (  441967.00,  3761616.31,   207.90,
  207.90,    2.00)  DC
          9TH HIGHEST VALUE IS       5.98790 AT (  442017.00,  3761616.31,   208.10,
  208.10,    2.00)  DC
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        10TH HIGHEST VALUE IS       5.64761 AT (  442067.00,  3761616.31,   208.44,
  208.44,    2.00)  DC

P1EXHAUS  1ST HIGHEST VALUE IS      20.32381 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
         2ND HIGHEST VALUE IS      20.03074 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
         3RD HIGHEST VALUE IS      18.39305 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
         4TH HIGHEST VALUE IS      17.89468 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
         5TH HIGHEST VALUE IS      16.96427 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
         6TH HIGHEST VALUE IS      16.94456 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
         7TH HIGHEST VALUE IS      16.62953 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
         8TH HIGHEST VALUE IS      15.81198 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
         9TH HIGHEST VALUE IS      14.45267 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
        10TH HIGHEST VALUE IS      14.22452 AT (  442497.68,  3762145.12,   214.09,
  214.09,    2.00)  DC

P1FUGITI  1ST HIGHEST VALUE IS      25.69466 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
         2ND HIGHEST VALUE IS      23.00128 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
         3RD HIGHEST VALUE IS      21.45849 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
         4TH HIGHEST VALUE IS      20.25397 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
         5TH HIGHEST VALUE IS      19.37934 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
         6TH HIGHEST VALUE IS      18.29647 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
         7TH HIGHEST VALUE IS      17.40033 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
         8TH HIGHEST VALUE IS      17.01491 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
         9TH HIGHEST VALUE IS      15.86423 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
        10TH HIGHEST VALUE IS      15.46718 AT (  442847.68,  3762045.12,   212.50,
  212.50,    2.00)  DC
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***       05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***       20:06:41
```



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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*
```

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS
AVERAGED OVER 5 YEARS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3
**

```
                      NETWORK
GROUP ID                     AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV,
ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS      53.00779 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
          2ND HIGHEST VALUE IS      49.22565 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
          3RD HIGHEST VALUE IS      44.89953 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          4TH HIGHEST VALUE IS      43.65680 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
          5TH HIGHEST VALUE IS      40.55351 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
          6TH HIGHEST VALUE IS      39.56934 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
          7TH HIGHEST VALUE IS      39.41430 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          8TH HIGHEST VALUE IS      36.63828 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
          9TH HIGHEST VALUE IS      35.05817 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
         10TH HIGHEST VALUE IS      33.84096 AT (  442447.68,  3762195.12,   214.36,
  214.36,    2.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                        ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST 24-HR RESULTS
AVERAGED OVER 5 YEARS ***

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                                        ** CONC OF PM-2.5   IN MICROGRAMS/M**3
              **


                        NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV,
ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - -

P2EXHAUS  1ST HIGHEST VALUE IS      13.88945 AT (  441245.13,  3761669.94,   207.75,
  207.75,    2.00)  DC
          2ND HIGHEST VALUE IS      13.74316 AT (  441195.13,  3761669.94,   207.43,
  207.43,    2.00)  DC
          3RD HIGHEST VALUE IS      13.57478 AT (  441145.13,  3761669.94,   207.68,
  207.68,    2.00)  DC
          4TH HIGHEST VALUE IS      10.59220 AT (  441245.13,  3761619.94,   207.21,
  207.21,    2.00)  DC
          5TH HIGHEST VALUE IS      10.47614 AT (  441195.13,  3761619.94,   206.94,
  206.94,    2.00)  DC
          6TH HIGHEST VALUE IS      10.32714 AT (  441145.13,  3761619.94,   207.02,
  207.02,    2.00)  DC
          7TH HIGHEST VALUE IS       9.77672 AT (  441917.00,  3761616.31,   207.36,
  207.36,    2.00)  DC
          8TH HIGHEST VALUE IS       9.48862 AT (  441967.00,  3761616.31,   207.90,
  207.90,    2.00)  DC
          9TH HIGHEST VALUE IS       9.45341 AT (  441922.75,  3762323.77,   214.01,
  214.01,    2.00)  DC
         10TH HIGHEST VALUE IS       9.43312 AT (  441972.75,  3762323.77,   214.36,
  214.36,    2.00)  DC

P2FUGITI  1ST HIGHEST VALUE IS      27.48814 AT (  441245.13,  3761669.94,   207.75,
  207.75,    2.00)  DC
          2ND HIGHEST VALUE IS      27.23360 AT (  441195.13,  3761669.94,   207.43,
  207.43,    2.00)  DC
          3RD HIGHEST VALUE IS      27.22792 AT (  441145.13,  3761669.94,   207.68,
  207.68,    2.00)  DC
          4TH HIGHEST VALUE IS      20.20023 AT (  441245.13,  3761619.94,   207.21,
  207.21,    2.00)  DC
          5TH HIGHEST VALUE IS      20.08903 AT (  441195.13,  3761619.94,   206.94,
  206.94,    2.00)  DC
          6TH HIGHEST VALUE IS      20.01784 AT (  441145.13,  3761619.94,   207.02,
  207.02,    2.00)  DC
          7TH HIGHEST VALUE IS      16.85109 AT (  441245.13,  3761569.94,   206.63,
  206.63,    2.00)  DC
          8TH HIGHEST VALUE IS      16.76281 AT (  441195.13,  3761569.94,   206.49,
  206.49,    2.00)  DC
          9TH HIGHEST VALUE IS      16.70273 AT (  441145.13,  3761569.94,   206.70,
  206.70,    2.00)  DC
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        10TH HIGHEST VALUE IS      16.54329 AT (  441917.00,  3761616.31,   207.36,
  207.36,    2.00)  DC

P1EXHAUS  1ST HIGHEST VALUE IS      31.62386 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
         2ND HIGHEST VALUE IS      31.17040 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
         3RD HIGHEST VALUE IS      28.30402 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
         4TH HIGHEST VALUE IS      27.51181 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
         5TH HIGHEST VALUE IS      26.14892 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
         6TH HIGHEST VALUE IS      25.85077 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
         7TH HIGHEST VALUE IS      25.52186 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
         8TH HIGHEST VALUE IS      25.02819 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
         9TH HIGHEST VALUE IS      22.12942 AT (  442497.68,  3762145.12,   214.09,
  214.09,    2.00)  DC
        10TH HIGHEST VALUE IS      21.50719 AT (  442797.68,  3762095.12,   213.43,
  213.43,    2.00)  DC

P1FUGITI  1ST HIGHEST VALUE IS      52.18052 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
         2ND HIGHEST VALUE IS      49.91781 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
         3RD HIGHEST VALUE IS      48.51923 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
         4TH HIGHEST VALUE IS      47.06693 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
         5TH HIGHEST VALUE IS      45.89830 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
         6TH HIGHEST VALUE IS      44.85829 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
         7TH HIGHEST VALUE IS      43.49542 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
         8TH HIGHEST VALUE IS      40.88904 AT (  442797.68,  3762095.12,   213.43,
  213.43,    2.00)  DC
         9TH HIGHEST VALUE IS      38.11746 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
        10TH HIGHEST VALUE IS      36.80656 AT (  442847.68,  3762045.12,   212.50,
  212.50,    2.00)  DC
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***       05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***       20:06:41

                                PAGE 121
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

```
                        NETWORK
GROUP ID                      AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV,
ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS      89.16074 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
          2ND HIGHEST VALUE IS      85.24267 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
          3RD HIGHEST VALUE IS      80.26016 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          4TH HIGHEST VALUE IS      79.33536 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
          5TH HIGHEST VALUE IS      75.27973 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
          6TH HIGHEST VALUE IS      74.30013 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          7TH HIGHEST VALUE IS      71.68262 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
          8TH HIGHEST VALUE IS      66.08545 AT (  442797.68,  3762095.12,   213.43,
  213.43,    2.00)  DC
          9TH HIGHEST VALUE IS      64.60442 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
         10TH HIGHEST VALUE IS      63.49081 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
```



*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST 24-HR RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF PM-2.5 IN MICROGRAMS/M**3 **

```
                         NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV,
ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - -

P2EXHAUS  1ST HIGHEST VALUE IS      12.55991 AT (  441245.13,  3761669.94,   207.75,
  207.75,    2.00)  DC
          2ND HIGHEST VALUE IS      12.43031 AT (  441195.13,  3761669.94,   207.43,
  207.43,    2.00)  DC
          3RD HIGHEST VALUE IS      12.25243 AT (  441145.13,  3761669.94,   207.68,
  207.68,    2.00)  DC
          4TH HIGHEST VALUE IS       9.51599 AT (  441245.13,  3761619.94,   207.21,
  207.21,    2.00)  DC
          5TH HIGHEST VALUE IS       9.40010 AT (  441195.13,  3761619.94,   206.94,
  206.94,    2.00)  DC
          6TH HIGHEST VALUE IS       9.26882 AT (  441145.13,  3761619.94,   207.02,
  207.02,    2.00)  DC
          7TH HIGHEST VALUE IS       8.59015 AT (  441917.00,  3761616.31,   207.36,
  207.36,    2.00)  DC
          8TH HIGHEST VALUE IS       8.31939 AT (  441967.00,  3761616.31,   207.90,
  207.90,    2.00)  DC
          9TH HIGHEST VALUE IS       8.27639 AT (  441209.54,  3762319.57,   213.62,
  213.62,    2.00)  DC
         10TH HIGHEST VALUE IS       8.19264 AT (  441922.75,  3762323.77,   214.01,
  214.01,    2.00)  DC

P2FUGITI  1ST HIGHEST VALUE IS      22.40150 AT (  441245.13,  3761669.94,   207.75,
  207.75,    2.00)  DC
          2ND HIGHEST VALUE IS      22.15179 AT (  441195.13,  3761669.94,   207.43,
  207.43,    2.00)  DC
          3RD HIGHEST VALUE IS      22.03092 AT (  441145.13,  3761669.94,   207.68,
  207.68,    2.00)  DC
          4TH HIGHEST VALUE IS      15.84289 AT (  441245.13,  3761619.94,   207.21,
  207.21,    2.00)  DC
          5TH HIGHEST VALUE IS      15.72520 AT (  441195.13,  3761619.94,   206.94,
  206.94,    2.00)  DC
          6TH HIGHEST VALUE IS      15.60841 AT (  441145.13,  3761619.94,   207.02,
  207.02,    2.00)  DC
          7TH HIGHEST VALUE IS      13.97596 AT (  441917.00,  3761616.31,   207.36,
  207.36,    2.00)  DC
          8TH HIGHEST VALUE IS      13.57976 AT (  441967.00,  3761616.31,   207.90,
  207.90,    2.00)  DC
          9TH HIGHEST VALUE IS      13.11251 AT (  441245.13,  3761569.94,   206.63,
  206.63,    2.00)  DC
         10TH HIGHEST VALUE IS      13.03574 AT (  442017.00,  3761616.31,   208.10,
  208.10,    2.00)  DC

P1EXHAUS  1ST HIGHEST VALUE IS      28.40965 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
          2ND HIGHEST VALUE IS      28.12077 AT (  442497.68,  3762095.12,   213.64,
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```
  213.64,    2.00)  DC
          3RD HIGHEST VALUE IS      25.54845 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
          4TH HIGHEST VALUE IS      24.92665 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          5TH HIGHEST VALUE IS      23.47679 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
          6TH HIGHEST VALUE IS      23.39486 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          7TH HIGHEST VALUE IS      23.07733 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
          8TH HIGHEST VALUE IS      21.66444 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
          9TH HIGHEST VALUE IS      20.03514 AT (  442497.68,  3762145.12,   214.09,
  214.09,    2.00)  DC
         10TH HIGHEST VALUE IS      19.33688 AT (  442447.68,  3762195.12,   214.36,
  214.36,    2.00)  DC

P1FUGITI  1ST HIGHEST VALUE IS      42.70295 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
          2ND HIGHEST VALUE IS      40.72113 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
          3RD HIGHEST VALUE IS      39.35565 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          4TH HIGHEST VALUE IS      38.27136 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
          5TH HIGHEST VALUE IS      37.61591 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
          6TH HIGHEST VALUE IS      36.74341 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          7TH HIGHEST VALUE IS      35.69112 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
          8TH HIGHEST VALUE IS      34.26734 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
          9TH HIGHEST VALUE IS      33.92620 AT (  442797.68,  3762095.12,   213.43,
  213.43,    2.00)  DC
         10TH HIGHEST VALUE IS      32.31539 AT (  442847.68,  3762045.12,   212.50,
  212.50,    2.00)  DC
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                         ***       05/07/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        20:06:41

                                 PAGE 123
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                          *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST 24-HR RESULTS
AVERAGED OVER   5 YEARS ***


                                  ** CONC OF PM-2.5   IN MICROGRAMS/M**3
```

```
                **


                        NETWORK
GROUP ID                       AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV,
ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS      77.49320 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
          2ND HIGHEST VALUE IS      74.07034 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
          3RD HIGHEST VALUE IS      69.18037 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          4TH HIGHEST VALUE IS      68.39175 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
          5TH HIGHEST VALUE IS      64.61955 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
          6TH HIGHEST VALUE IS      63.40592 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          7TH HIGHEST VALUE IS      61.18965 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
          8TH HIGHEST VALUE IS      57.85882 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
          9TH HIGHEST VALUE IS      57.52747 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
         10TH HIGHEST VALUE IS      56.76377 AT (  442797.68,  3762095.12,   213.43,
  213.43,    2.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM2.5
                        ***        05/07/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        20:06:41

                                  PAGE 124
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of           65 Warning Message(s)
 A Total of         1279 Informational Message(s)
```

```
 A Total of        43848 Hours Were Processed

 A Total of          917 Calm Hours Identified

 A Total of          362 Missing Hours Identified (  0.83 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 ME W186    2509       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used
     0.50
 ME W187    2509       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 CN W732     384         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012011624
 CN W732    1632         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012030824
 CN W732    2856         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012042824
 CN W732    2880         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012042924
 CN W732    2904         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012043024
 CN W732    2952         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012050224
 CN W732    3792         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012060624
 CN W732    3816         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012060724
 CN W732    3840         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012060824
 CN W732    3864         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012060924
 CN W732    3888         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012061024
 CN W732    3912         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012061124
 CN W732    3936         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012061224
 CN W732    7296         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012103024
 CN W732    7848         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012112224
 CN W732    8016         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012112924
 CN W732    8784         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012123124
 CN W732    8856         AVER: 24-hr avg, < 18 hours of data, calms policy used.
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2013010324
CN W732 10488 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031224
CN W732 10512 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031324
CN W732 10536 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031424
CN W732 10560 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031524
CN W732 10608 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031724
CN W732 10632 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031824
CN W732 10656 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031924
CN W732 16920 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013120524
CN W732 17544 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013123124
CN W732 17760 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014010924
CN W732 20952 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014052224
CN W732 20976 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014052324
CN W732 21744 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014062424
CN W732 22704 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014080324
CN W732 22728 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014080424
CN W732 22800 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014080724
CN W732 23016 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014081624
CN W732 23040 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014081724
CN W732 23064 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014081824
CN W732 23088 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014081924
CN W732 23112 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014082024
CN W732 23136 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014082124
CN W732 23280 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014082724
CN W732 23304 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014082824
CN W732 23496 AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014090524

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 CN W732   23568         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014090824
 CN W732   23640         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014091124
 CN W732   23688         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014091324
 CN W732   25200         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014111524
 CN W732   26304         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014123124
 CN W732   27216         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015020724
 CN W732   27960         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015031024
 CN W732   28512         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015040224
 CN W732   29424         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015051024
 CN W732   31680         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015081224
 CN W732   34080         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015112024
 CN W732   34464         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015120624
 CN W732   35064         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015123124
 CN W732   36816         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016031324
 CN W732   36840         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016031424
 CN W732   38424         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016051924
 CN W732   40416         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016081024
 CN W732   40512         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016081424
 CN W732   43248         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016120624
 CN W732   43848         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016123124

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

```
**
****************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 13.0.0
** Lakes Environmental Software Inc.
** Date: 5/8/2025
** File: C:\Lakes\AERMOD View\Center Park OP LST PM10\Center Park OP LST PM10.ADI
**
****************************************
**
**
****************************************
** AERMOD Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE Center Park Operational LST - PM10
   MODELOPT DFAULT CONC
   AVERTIME 24 ANNUAL
   URBANOPT 2035210
   POLLUTID PM_10
   FLAGPOLE 2.00
   RUNORNOT RUN
   ERRORFIL "Center Park OP LST PM10.err"
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   440792.704  3762267.472      213.390
** DESCRSRC P2 Fugitive Dust
** ---------------------------------------------------------------------
** Line Source Represented by Adjacent Volume Sources
** LINE VOLUME Source ID = SLINE1
** DESCRSRC P2 Exhaust
** PREFIX
** Length of Side = 32.00
** Configuration = Adjacent
** Emission Rate = 1.0
** Vertical Dimension = 10.00
** SZINIT = 1.40
** Nodes = 36
** 440808.022, 3762248.616, 212.98, 5.00, 14.88
** 442170.428, 3762250.973, 214.52, 5.00, 14.88
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** 442173.504, 3762219.456, 213.60, 5.00, 14.88
** 440809.712, 3762215.816, 212.74, 5.00, 14.88
** 440808.022, 3762184.862, 212.52, 5.00, 14.88
** 442172.785, 3762188.761, 213.15, 5.00, 14.88
** 442174.734, 3762154.628, 212.94, 5.00, 14.88
** 440802.099, 3762152.104, 212.23, 5.00, 14.88
** 440801.999, 3762117.800, 212.15, 5.00, 14.88
** 442168.071, 3762124.868, 212.68, 5.00, 14.88
** 442166.892, 3762093.966, 212.47, 5.00, 14.88
** 440803.311, 3762085.348, 211.98, 5.00, 14.88
** 440805.509, 3762053.176, 211.18, 5.00, 14.88
** 442172.377, 3762062.309, 212.25, 5.00, 14.88
** 442172.909, 3762031.347, 211.97, 5.00, 14.88
** 440809.201, 3762023.349, 210.55, 5.00, 14.88
** 440807.355, 3761994.960, 210.21, 5.00, 14.88
** 442174.682, 3761994.636, 211.32, 5.00, 14.88
** 442179.006, 3761957.142, 210.96, 5.00, 14.88
** 440803.152, 3761961.409, 209.86, 5.00, 14.88
** 440805.890, 3761927.889, 209.51, 5.00, 14.88
** 442177.551, 3761924.311, 210.61, 5.00, 14.88
** 442173.453, 3761889.923, 210.46, 5.00, 14.88
** 440805.613, 3761895.897, 209.25, 5.00, 14.88
** 440806.332, 3761862.179, 208.99, 5.00, 14.88
** 442178.322, 3761857.776, 210.38, 5.00, 14.88
** 442177.759, 3761824.413, 210.08, 5.00, 14.88
** 440804.487, 3761828.608, 208.79, 5.00, 14.88
** 440805.717, 3761794.933, 208.57, 5.00, 14.88
** 442178.522, 3761794.846, 209.89, 5.00, 14.88
** 442178.010, 3761764.247, 209.46, 5.00, 14.88
** 440804.227, 3761761.267, 208.30, 5.00, 14.88
** 440806.844, 3761730.261, 208.09, 5.00, 14.88
** 442179.345, 3761730.832, 209.12, 5.00, 14.88
** 442176.320, 3761697.054, 209.08, 5.00, 14.88
** 440803.508, 3761702.331, 207.95, 5.00, 14.88
** ----------------------------------------------------------------------
   LOCATION L0000001     VOLUME   440824.022 3762248.643 212.84
   LOCATION L0000002     VOLUME   440856.022 3762248.699 213.05
   LOCATION L0000003     VOLUME   440888.022 3762248.754 213.14
   LOCATION L0000004     VOLUME   440920.022 3762248.809 213.06
   LOCATION L0000005     VOLUME   440952.022 3762248.865 213.14
   LOCATION L0000006     VOLUME   440984.022 3762248.920 213.06
   LOCATION L0000007     VOLUME   441016.022 3762248.976 212.87
   LOCATION L0000008     VOLUME   441048.022 3762249.031 212.68
   LOCATION L0000009     VOLUME   441080.022 3762249.086 212.62
   LOCATION L0000010     VOLUME   441112.022 3762249.142 212.63
   LOCATION L0000011     VOLUME   441144.022 3762249.197 212.39
   LOCATION L0000012     VOLUME   441176.022 3762249.252 212.48
   LOCATION L0000013     VOLUME   441208.022 3762249.308 212.83
   LOCATION L0000014     VOLUME   441240.022 3762249.363 213.12
   LOCATION L0000015     VOLUME   441272.022 3762249.418 213.43
   LOCATION L0000016     VOLUME   441304.022 3762249.474 213.54
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| | | | | | |
|---|---|---|---|---|---|
| LOCATION | L0000017 | VOLUME | 441336.021 | 3762249.529 | 213.39 |
| LOCATION | L0000018 | VOLUME | 441368.021 | 3762249.585 | 213.23 |
| LOCATION | L0000019 | VOLUME | 441400.021 | 3762249.640 | 213.17 |
| LOCATION | L0000020 | VOLUME | 441432.021 | 3762249.695 | 213.09 |
| LOCATION | L0000021 | VOLUME | 441464.021 | 3762249.751 | 213.03 |
| LOCATION | L0000022 | VOLUME | 441496.021 | 3762249.806 | 212.96 |
| LOCATION | L0000023 | VOLUME | 441528.021 | 3762249.861 | 212.86 |
| LOCATION | L0000024 | VOLUME | 441560.021 | 3762249.917 | 212.79 |
| LOCATION | L0000025 | VOLUME | 441592.021 | 3762249.972 | 212.96 |
| LOCATION | L0000026 | VOLUME | 441624.021 | 3762250.027 | 213.02 |
| LOCATION | L0000027 | VOLUME | 441656.021 | 3762250.083 | 212.98 |
| LOCATION | L0000028 | VOLUME | 441688.021 | 3762250.138 | 212.92 |
| LOCATION | L0000029 | VOLUME | 441720.021 | 3762250.194 | 212.90 |
| LOCATION | L0000030 | VOLUME | 441752.021 | 3762250.249 | 212.90 |
| LOCATION | L0000031 | VOLUME | 441784.021 | 3762250.304 | 213.09 |
| LOCATION | L0000032 | VOLUME | 441816.021 | 3762250.360 | 213.38 |
| LOCATION | L0000033 | VOLUME | 441848.021 | 3762250.415 | 213.55 |
| LOCATION | L0000034 | VOLUME | 441880.021 | 3762250.470 | 213.70 |
| LOCATION | L0000035 | VOLUME | 441912.021 | 3762250.526 | 213.83 |
| LOCATION | L0000036 | VOLUME | 441944.021 | 3762250.581 | 214.03 |
| LOCATION | L0000037 | VOLUME | 441976.021 | 3762250.636 | 213.94 |
| LOCATION | L0000038 | VOLUME | 442008.020 | 3762250.692 | 214.11 |
| LOCATION | L0000039 | VOLUME | 442040.020 | 3762250.747 | 214.47 |
| LOCATION | L0000040 | VOLUME | 442072.020 | 3762250.803 | 214.53 |
| LOCATION | L0000041 | VOLUME | 442104.020 | 3762250.858 | 214.56 |
| LOCATION | L0000042 | VOLUME | 442136.020 | 3762250.913 | 214.38 |
| LOCATION | L0000043 | VOLUME | 442168.020 | 3762250.969 | 214.41 |
| LOCATION | L0000044 | VOLUME | 442173.302 | 3762221.520 | 213.63 |
| LOCATION | L0000045 | VOLUME | 442143.578 | 3762219.376 | 213.37 |
| LOCATION | L0000046 | VOLUME | 442111.578 | 3762219.290 | 213.78 |
| LOCATION | L0000047 | VOLUME | 442079.578 | 3762219.205 | 213.82 |
| LOCATION | L0000048 | VOLUME | 442047.578 | 3762219.120 | 213.83 |
| LOCATION | L0000049 | VOLUME | 442015.579 | 3762219.034 | 213.73 |
| LOCATION | L0000050 | VOLUME | 441983.579 | 3762218.949 | 213.65 |
| LOCATION | L0000051 | VOLUME | 441951.579 | 3762218.863 | 213.85 |
| LOCATION | L0000052 | VOLUME | 441919.579 | 3762218.778 | 213.55 |
| LOCATION | L0000053 | VOLUME | 441887.579 | 3762218.693 | 213.37 |
| LOCATION | L0000054 | VOLUME | 441855.579 | 3762218.607 | 213.17 |
| LOCATION | L0000055 | VOLUME | 441823.579 | 3762218.522 | 212.97 |
| LOCATION | L0000056 | VOLUME | 441791.579 | 3762218.436 | 212.84 |
| LOCATION | L0000057 | VOLUME | 441759.579 | 3762218.351 | 212.73 |
| LOCATION | L0000058 | VOLUME | 441727.580 | 3762218.266 | 212.63 |
| LOCATION | L0000059 | VOLUME | 441695.580 | 3762218.180 | 212.54 |
| LOCATION | L0000060 | VOLUME | 441663.580 | 3762218.095 | 212.58 |
| LOCATION | L0000061 | VOLUME | 441631.580 | 3762218.010 | 212.68 |
| LOCATION | L0000062 | VOLUME | 441599.580 | 3762217.924 | 212.68 |
| LOCATION | L0000063 | VOLUME | 441567.580 | 3762217.839 | 212.64 |
| LOCATION | L0000064 | VOLUME | 441535.580 | 3762217.753 | 212.64 |
| LOCATION | L0000065 | VOLUME | 441503.580 | 3762217.668 | 212.66 |
| LOCATION | L0000066 | VOLUME | 441471.580 | 3762217.583 | 212.70 |
| LOCATION | L0000067 | VOLUME | 441439.581 | 3762217.497 | 212.74 |

| | | | | | |
|---|---|---|---|---|---|
| LOCATION | L0000068 | VOLUME | 441407.581 | 3762217.412 | 212.81 |
| LOCATION | L0000069 | VOLUME | 441375.581 | 3762217.326 | 212.92 |
| LOCATION | L0000070 | VOLUME | 441343.581 | 3762217.241 | 213.12 |
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** End of LINE VOLUME Source ID = SLINE1
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** LINE VOLUME Source ID = SLINE2
** DESCRSRC P1 Exhaust
** PREFIX
** Length of Side = 32.00
** Configuration = Adjacent
** Emission Rate = 1.0
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** SZINIT = 1.40
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| SRCPARAM | L0001050 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001051 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001052 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001053 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001054 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001055 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001056 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001057 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001058 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001059 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001060 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001061 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001062 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001063 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001064 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001065 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001066 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001067 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001068 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001069 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001070 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001071 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001072 | 0.0034843206 | 5.00 | 14.88 | 1.40 |
| SRCPARAM | L0001073 | 0.0034843206 | 5.00 | 14.88 | 1.40 |

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   SRCPARAM L0001074     0.0034843206      5.00     14.88      1.40
   SRCPARAM L0001075     0.0034843206      5.00     14.88      1.40
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   AREAVERT PAREA2       442401.547 3762092.413 442798.317 3762082.240
   AREAVERT PAREA2       442802.838 3761675.296 442201.466 3761675.296
   URBANSRC ALL
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   SRCGROUP P2Exhaus L0000007 L0000008 L0000009 L0000010 L0000011 L0000012
   SRCGROUP P2Exhaus L0000013 L0000014 L0000015 L0000016 L0000017 L0000018
   SRCGROUP P2Exhaus L0000019 L0000020 L0000021 L0000022 L0000023 L0000024
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   SRCGROUP P2Exhaus L0000031 L0000032 L0000033 L0000034 L0000035 L0000036
   SRCGROUP P2Exhaus L0000037 L0000038 L0000039 L0000040 L0000041 L0000042
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SRCGROUP P2Exhaus L0000559 L0000560 L0000561 L0000562 L0000563 L0000564
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SRCGROUP P2Exhaus L0000577 L0000578 L0000579 L0000580 L0000581 L0000582
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SRCGROUP P2Exhaus L0000787 L0000788
SRCGROUP P2Fugiti PAREA1
SRCGROUP P1Exhaus L0000789 L0000790 L0000791 L0000792 L0000793 L0000794
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SRCGROUP P1Exhaus L0000801 L0000802 L0000803 L0000804 L0000805 L0000806
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SRCGROUP P1Exhaus L0000855 L0000856 L0000857 L0000858 L0000859 L0000860
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   SRCGROUP P1Exhaus L0001035 L0001036 L0001037 L0001038 L0001039 L0001040
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   SRCGROUP P1Exhaus L0001047 L0001048 L0001049 L0001050 L0001051 L0001052
   SRCGROUP P1Exhaus L0001053 L0001054 L0001055 L0001056 L0001057 L0001058
   SRCGROUP P1Exhaus L0001059 L0001060 L0001061 L0001062 L0001063 L0001064
   SRCGROUP P1Exhaus L0001065 L0001066 L0001067 L0001068 L0001069 L0001070
   SRCGROUP P1Exhaus L0001071 L0001072 L0001073 L0001074 L0001075
   SRCGROUP P1Fugiti PAREA2
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED "Center Park OP LST PM10.rou"
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
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**
**
ME STARTING
   SURFFILE KCNO_v9.SFC
   PROFFILE KCNO_v9.PFL
   SURFDATA 3179 2012
   UAIRDATA 3190 2012
   PROFBASE 198.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE 1ST 8TH
   RECTABLE 24 1ST 8TH
** Auto-Generated Plotfiles
   PLOTFILE 24 ALL 1ST "CENTER PARK OP LST PM10.AD\24H1GALL.PLT" 31
   PLOTFILE 24 P2Exhaus 1ST "CENTER PARK OP LST PM10.AD\24H1G001.PLT" 32
   PLOTFILE 24 P2Fugiti 1ST "CENTER PARK OP LST PM10.AD\24H1G002.PLT" 33
   PLOTFILE 24 P1Exhaus 1ST "CENTER PARK OP LST PM10.AD\24H1G003.PLT" 34
   PLOTFILE 24 P1Fugiti 1ST "CENTER PARK OP LST PM10.AD\24H1G004.PLT" 35
   PLOTFILE 24 ALL 8TH "CENTER PARK OP LST PM10.AD\24H8GALL.PLT" 36
   PLOTFILE 24 P2Exhaus 8TH "CENTER PARK OP LST PM10.AD\24H8G001.PLT" 37
   PLOTFILE 24 P2Fugiti 8TH "CENTER PARK OP LST PM10.AD\24H8G002.PLT" 38
   PLOTFILE 24 P1Exhaus 8TH "CENTER PARK OP LST PM10.AD\24H8G003.PLT" 39
   PLOTFILE 24 P1Fugiti 8TH "CENTER PARK OP LST PM10.AD\24H8G004.PLT" 40
   PLOTFILE ANNUAL ALL "CENTER PARK OP LST PM10.AD\AN00GALL.PLT" 41
   PLOTFILE ANNUAL P2Exhaus "CENTER PARK OP LST PM10.AD\AN00G001.PLT" 42
   PLOTFILE ANNUAL P2Fugiti "CENTER PARK OP LST PM10.AD\AN00G002.PLT" 43
   PLOTFILE ANNUAL P1Exhaus "CENTER PARK OP LST PM10.AD\AN00G003.PLT" 44
   PLOTFILE ANNUAL P1Fugiti "CENTER PARK OP LST PM10.AD\AN00G004.PLT" 45
   SUMMFILE "Center Park OP LST PM10.sum"
OU FINISHED
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** Project Parameters
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** PROJCTN  CoordinateSystemUTM
** DESCPTN  UTM: Universal Transverse Mercator
** DATUM    World Geodetic System 1984
** DTMRGN   Global Definition
** UNITS    m
** ZONE     11
** ZONEINX  0
**
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**
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**
** AERMOD Input Produced by:
** AERMOD View Ver. 13.0.0
** Lakes Environmental Software Inc.
** Date: 5/8/2025
** File: C:\Lakes\AERMOD View\Center Park OP LST PM10\Center Park OP LST PM10.ADI
**
****************************************
**
**
****************************************
** AERMOD Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE Center Park Operational LST - PM10
   MODELOPT DFAULT CONC
   AVERTIME 24 ANNUAL
   URBANOPT 2035210
   POLLUTID PM_10
   FLAGPOLE 2.00
   RUNORNOT RUN
   ERRORFIL "Center Park OP LST PM10.err"
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   440792.704  3762267.472      213.390
** DESCRSRC P2 Fugitive Dust
** ---------------------------------------------------------------------
** Line Source Represented by Adjacent Volume Sources
** LINE VOLUME Source ID = SLINE1
** DESCRSRC P2 Exhaust
** PREFIX
** Length of Side = 32.00
** Configuration = Adjacent
** Emission Rate = 1.0
** Vertical Dimension = 10.00
** SZINIT = 1.40
** Nodes = 36
** 440808.022, 3762248.616, 212.98, 5.00, 14.88
** 442170.428, 3762250.973, 214.52, 5.00, 14.88
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** 440809.712, 3762215.816, 212.74, 5.00, 14.88
** 440808.022, 3762184.862, 212.52, 5.00, 14.88
** 442172.785, 3762188.761, 213.15, 5.00, 14.88
** 442174.734, 3762154.628, 212.94, 5.00, 14.88
** 440802.099, 3762152.104, 212.23, 5.00, 14.88
** 440801.999, 3762117.800, 212.15, 5.00, 14.88
** 442168.071, 3762124.868, 212.68, 5.00, 14.88
** 442166.892, 3762093.966, 212.47, 5.00, 14.88
** 440803.311, 3762085.348, 211.98, 5.00, 14.88
** 440805.509, 3762053.176, 211.18, 5.00, 14.88
** 442172.377, 3762062.309, 212.25, 5.00, 14.88
** 442172.909, 3762031.347, 211.97, 5.00, 14.88
** 440809.201, 3762023.349, 210.55, 5.00, 14.88
** 440807.355, 3761994.960, 210.21, 5.00, 14.88
** 442174.682, 3761994.636, 211.32, 5.00, 14.88
** 442179.006, 3761957.142, 210.96, 5.00, 14.88
** 440803.152, 3761961.409, 209.86, 5.00, 14.88
** 440805.890, 3761927.889, 209.51, 5.00, 14.88
** 442177.551, 3761924.311, 210.61, 5.00, 14.88
** 442173.453, 3761889.923, 210.46, 5.00, 14.88
** 440805.613, 3761895.897, 209.25, 5.00, 14.88
** 440806.332, 3761862.179, 208.99, 5.00, 14.88
** 442178.322, 3761857.776, 210.38, 5.00, 14.88
** 442177.759, 3761824.413, 210.08, 5.00, 14.88
** 440804.487, 3761828.608, 208.79, 5.00, 14.88
** 440805.717, 3761794.933, 208.57, 5.00, 14.88
** 442178.522, 3761794.846, 209.89, 5.00, 14.88
** 442178.010, 3761764.247, 209.46, 5.00, 14.88
** 440804.227, 3761761.267, 208.30, 5.00, 14.88
** 440806.844, 3761730.261, 208.09, 5.00, 14.88
** 442179.345, 3761730.832, 209.12, 5.00, 14.88
** 442176.320, 3761697.054, 209.08, 5.00, 14.88
** 440803.508, 3761702.331, 207.95, 5.00, 14.88
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   LOCATION L0000001     VOLUME   440824.022 3762248.643 212.84
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   LOCATION L0000003     VOLUME   440888.022 3762248.754 213.14
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** DESCRSRC P1 Exhaust
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| LOCATION | L0001020 | VOLUME | 442240.741 | 3761735.918 | 209.41 |
| LOCATION | L0001021 | VOLUME | 442272.739 | 3761736.289 | 209.32 |
| LOCATION | L0001022 | VOLUME | 442304.736 | 3761736.659 | 209.30 |
| LOCATION | L0001023 | VOLUME | 442336.734 | 3761737.029 | 209.30 |
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| LOCATION | L0001026 | VOLUME | 442432.728 | 3761738.140 | 209.03 |
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| LOCATION | L0001028 | VOLUME | 442496.724 | 3761738.881 | 209.73 |
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** DESCRSRC P1 Fugitive Dust
** Source Parameters **
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   AREAVERT PAREA1       442193.996 3761681.734 440790.347 3761684.091
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| SRCPARAM | L0001022 | 0.0034843206 | 5.00 | 14.88 | 1.40 |

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   SRCGROUP P1Fugiti PAREA2
   SRCGROUP ALL
SO FINISHED
**
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** AERMOD Receptor Pathway
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RE STARTING
   INCLUDED "Center Park OP LST PM10.rou"
RE FINISHED
**
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** AERMOD Meteorology Pathway
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   PROFFILE KCNO_v9.PFL
   SURFDATA 3179 2012
   UAIRDATA 3190 2012
   PROFBASE 198.0 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
   RECTABLE ALLAVE 1ST 8TH
   RECTABLE 24 1ST 8TH
** Auto-Generated Plotfiles
   PLOTFILE 24 ALL 1ST "CENTER PARK OP LST PM10.AD\24H1GALL.PLT" 31
   PLOTFILE 24 P2Exhaus 1ST "CENTER PARK OP LST PM10.AD\24H1G001.PLT" 32
   PLOTFILE 24 P2Fugiti 1ST "CENTER PARK OP LST PM10.AD\24H1G002.PLT" 33
   PLOTFILE 24 P1Exhaus 1ST "CENTER PARK OP LST PM10.AD\24H1G003.PLT" 34
   PLOTFILE 24 P1Fugiti 1ST "CENTER PARK OP LST PM10.AD\24H1G004.PLT" 35
   PLOTFILE 24 ALL 8TH "CENTER PARK OP LST PM10.AD\24H8GALL.PLT" 36
   PLOTFILE 24 P2Exhaus 8TH "CENTER PARK OP LST PM10.AD\24H8G001.PLT" 37
   PLOTFILE 24 P2Fugiti 8TH "CENTER PARK OP LST PM10.AD\24H8G002.PLT" 38
   PLOTFILE 24 P1Exhaus 8TH "CENTER PARK OP LST PM10.AD\24H8G003.PLT" 39
   PLOTFILE 24 P1Fugiti 8TH "CENTER PARK OP LST PM10.AD\24H8G004.PLT" 40
   PLOTFILE ANNUAL ALL "CENTER PARK OP LST PM10.AD\AN00GALL.PLT" 41
   PLOTFILE ANNUAL P2Exhaus "CENTER PARK OP LST PM10.AD\AN00G001.PLT" 42
   PLOTFILE ANNUAL P2Fugiti "CENTER PARK OP LST PM10.AD\AN00G002.PLT" 43
   PLOTFILE ANNUAL P1Exhaus "CENTER PARK OP LST PM10.AD\AN00G003.PLT" 44
   PLOTFILE ANNUAL P1Fugiti "CENTER PARK OP LST PM10.AD\AN00G004.PLT" 45
   SUMMFILE "Center Park OP LST PM10.sum"
OU FINISHED


  *** Message Summary For AERMOD Model Setup ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            2 Warning Message(s)
 A Total of            0 Informational Message(s)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***
```

```
    ********   WARNING MESSAGES   ********
 ME W186    2509       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used
     0.50
 ME W187    2509       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET


 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************

 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE   1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                                             ***     MODEL SETUP OPTIONS SUMMARY
 ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - -

 ** Model Options Selected:
      * Model Uses Regulatory DEFAULT Options
      * Model Is Setup For Calculation of Average CONCentration Values.
      * NO GAS DEPOSITION Data Provided.
      * NO PARTICLE DEPOSITION Data Provided.
      * Model Uses NO DRY DEPLETION. DDPLETE  =  F
      * Model Uses NO WET DEPLETION. WETDPLT  =  F
      * Stack-tip Downwash.
      * Model Accounts for ELEVated Terrain Effects.
      * Use Calms Processing Routine.
      * Use Missing Data Processing Routine.
      * No Exponential Decay.
      * Model Uses URBAN Dispersion Algorithm for the SBL for  1077 Source(s),
        for Total of    1 Urban Area(s):
   Urban Population =   2035210.0 ;  Urban Roughness Length =  1.000 m
      * Urban Roughness Length of 1.0 Meter Used.
      * ADJ_U*   - Use ADJ_U* option for SBL in AERMET
      * CCVR_Sub - Meteorological data includes CCVR substitutions
      * TEMP_Sub - Meteorological data includes TEMP substitutions
      * Model Accepts FLAGPOLE Receptor . Heights.
      * The User Specified a Pollutant Type of: PM_10

 **Model Calculates  1 Short Term Average(s) of:  24-HR
     and Calculates ANNUAL Averages

 **This Run Includes:   1077 Source(s);       5 Source Group(s); and     292
Receptor(s)
```

```
                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:   1075 VOLUME source(s)
                 and:      2 AREA type source(s)
                 and:      0 LINE source(s)
                 and:      0 RLINE/RLINEXT source(s)
                 and:      0 OPENPIT source(s)
                 and:      0 BUOYANT LINE source(s) with a total of     0 line(s)
                 and:      0 SWPOINT source(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  16216

 **Output Options Selected:
          Model Outputs Tables of ANNUAL Averages by Receptor
          Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE
Keyword)
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE
Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE
Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and
Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =   198.00 ;  Decay
Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC                                ;
Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      4.5 MB of RAM.

 **Input Runstream File:          aermod.inp

 **Output Print File:             aermod.out


 **Detailed Error/Message File:   Center Park OP LST PM10.err

 **File for Summary of Results:   Center Park OP LST PM10.sum

 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46
```

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE SCALAR VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0000001 | 0 | 0.12690E-02 | 440824.0 | 3762248.6 | 212.8 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000002 | 0 | 0.12690E-02 | 440856.0 | 3762248.7 | 213.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000003 | 0 | 0.12690E-02 | 440888.0 | 3762248.8 | 213.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000004 | 0 | 0.12690E-02 | 440920.0 | 3762248.8 | 213.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000005 | 0 | 0.12690E-02 | 440952.0 | 3762248.9 | 213.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000006 | 0 | 0.12690E-02 | 440984.0 | 3762248.9 | 213.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000007 | 0 | 0.12690E-02 | 441016.0 | 3762249.0 | 212.9 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000008 | 0 | 0.12690E-02 | 441048.0 | 3762249.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000009 | 0 | 0.12690E-02 | 441080.0 | 3762249.1 | 212.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000010 | 0 | 0.12690E-02 | 441112.0 | 3762249.1 | 212.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000011 | 0 | 0.12690E-02 | 441144.0 | 3762249.2 | 212.4 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000012 | 0 | 0.12690E-02 | 441176.0 | 3762249.3 | 212.5 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000013 | 0 | 0.12690E-02 | 441208.0 | 3762249.3 | 212.8 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000014 | 0 | 0.12690E-02 | 441240.0 | 3762249.4 | 213.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000015 | 0 | 0.12690E-02 | 441272.0 | 3762249.4 | 213.4 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000016 | 0 | 0.12690E-02 | 441304.0 | 3762249.5 | 213.5 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000017 | 0 | 0.12690E-02 | 441336.0 | 3762249.5 | 213.4 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000018 | 0 | 0.12690E-02 | 441368.0 | 3762249.6 | 213.2 | 5.00 | 14.88 | | | | |

```
1.40     YES                    NO
 L0000019         0   0.12690E-02  441400.0 3762249.6   213.2     5.00    14.88
1.40     YES                    NO
 L0000020         0   0.12690E-02  441432.0 3762249.7   213.1     5.00    14.88
1.40     YES                    NO
 L0000021         0   0.12690E-02  441464.0 3762249.8   213.0     5.00    14.88
1.40     YES                    NO
 L0000022         0   0.12690E-02  441496.0 3762249.8   213.0     5.00    14.88
1.40     YES                    NO
 L0000023         0   0.12690E-02  441528.0 3762249.9   212.9     5.00    14.88
1.40     YES                    NO
 L0000024         0   0.12690E-02  441560.0 3762249.9   212.8     5.00    14.88
1.40     YES                    NO
 L0000025         0   0.12690E-02  441592.0 3762250.0   213.0     5.00    14.88
1.40     YES                    NO
 L0000026         0   0.12690E-02  441624.0 3762250.0   213.0     5.00    14.88
1.40     YES                    NO
 L0000027         0   0.12690E-02  441656.0 3762250.1   213.0     5.00    14.88
1.40     YES                    NO
 L0000028         0   0.12690E-02  441688.0 3762250.1   212.9     5.00    14.88
1.40     YES                    NO
 L0000029         0   0.12690E-02  441720.0 3762250.2   212.9     5.00    14.88
1.40     YES                    NO
 L0000030         0   0.12690E-02  441752.0 3762250.2   212.9     5.00    14.88
1.40     YES                    NO
 L0000031         0   0.12690E-02  441784.0 3762250.3   213.1     5.00    14.88
1.40     YES                    NO
 L0000032         0   0.12690E-02  441816.0 3762250.4   213.4     5.00    14.88
1.40     YES                    NO
 L0000033         0   0.12690E-02  441848.0 3762250.4   213.6     5.00    14.88
1.40     YES                    NO
 L0000034         0   0.12690E-02  441880.0 3762250.5   213.7     5.00    14.88
1.40     YES                    NO
 L0000035         0   0.12690E-02  441912.0 3762250.5   213.8     5.00    14.88
1.40     YES                    NO
 L0000036         0   0.12690E-02  441944.0 3762250.6   214.0     5.00    14.88
1.40     YES                    NO
 L0000037         0   0.12690E-02  441976.0 3762250.6   213.9     5.00    14.88
1.40     YES                    NO
 L0000038         0   0.12690E-02  442008.0 3762250.7   214.1     5.00    14.88
1.40     YES                    NO
 L0000039         0   0.12690E-02  442040.0 3762250.7   214.5     5.00    14.88
1.40     YES                    NO
 L0000040         0   0.12690E-02  442072.0 3762250.8   214.5     5.00    14.88
1.40     YES                    NO
```

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000041         0   0.12690E-02  442104.0 3762250.9   214.6     5.00    14.88
1.40     YES                    NO
 L0000042         0   0.12690E-02  442136.0 3762250.9   214.4     5.00    14.88
1.40     YES                    NO
 L0000043         0   0.12690E-02  442168.0 3762251.0   214.4     5.00    14.88
1.40     YES                    NO
 L0000044         0   0.12690E-02  442173.3 3762221.5   213.6     5.00    14.88
1.40     YES                    NO
 L0000045         0   0.12690E-02  442143.6 3762219.4   213.4     5.00    14.88
1.40     YES                    NO
 L0000046         0   0.12690E-02  442111.6 3762219.3   213.8     5.00    14.88
1.40     YES                    NO
 L0000047         0   0.12690E-02  442079.6 3762219.2   213.8     5.00    14.88
1.40     YES                    NO
 L0000048         0   0.12690E-02  442047.6 3762219.1   213.8     5.00    14.88
1.40     YES                    NO
 L0000049         0   0.12690E-02  442015.6 3762219.0   213.7     5.00    14.88
1.40     YES                    NO
 L0000050         0   0.12690E-02  441983.6 3762218.9   213.7     5.00    14.88
1.40     YES                    NO
 L0000051         0   0.12690E-02  441951.6 3762218.9   213.9     5.00    14.88
1.40     YES                    NO
 L0000052         0   0.12690E-02  441919.6 3762218.8   213.6     5.00    14.88
1.40     YES                    NO
 L0000053         0   0.12690E-02  441887.6 3762218.7   213.4     5.00    14.88
1.40     YES                    NO
 L0000054         0   0.12690E-02  441855.6 3762218.6   213.2     5.00    14.88
1.40     YES                    NO
 L0000055         0   0.12690E-02  441823.6 3762218.5   213.0     5.00    14.88
1.40     YES                    NO
 L0000056         0   0.12690E-02  441791.6 3762218.4   212.8     5.00    14.88
1.40     YES                    NO
 L0000057         0   0.12690E-02  441759.6 3762218.4   212.7     5.00    14.88
1.40     YES                    NO
 L0000058         0   0.12690E-02  441727.6 3762218.3   212.6     5.00    14.88
1.40     YES                    NO
 L0000059         0   0.12690E-02  441695.6 3762218.2   212.5     5.00    14.88
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1.40     YES                    NO
 L0000060         0   0.12690E-02  441663.6 3762218.1   212.6     5.00    14.88
1.40     YES                    NO
 L0000061         0   0.12690E-02  441631.6 3762218.0   212.7     5.00    14.88
1.40     YES                    NO
 L0000062         0   0.12690E-02  441599.6 3762217.9   212.7     5.00    14.88
1.40     YES                    NO
 L0000063         0   0.12690E-02  441567.6 3762217.8   212.6     5.00    14.88
1.40     YES                    NO
 L0000064         0   0.12690E-02  441535.6 3762217.8   212.6     5.00    14.88
1.40     YES                    NO
 L0000065         0   0.12690E-02  441503.6 3762217.7   212.7     5.00    14.88
1.40     YES                    NO
 L0000066         0   0.12690E-02  441471.6 3762217.6   212.7     5.00    14.88
1.40     YES                    NO
 L0000067         0   0.12690E-02  441439.6 3762217.5   212.7     5.00    14.88
1.40     YES                    NO
 L0000068         0   0.12690E-02  441407.6 3762217.4   212.8     5.00    14.88
1.40     YES                    NO
 L0000069         0   0.12690E-02  441375.6 3762217.3   212.9     5.00    14.88
1.40     YES                    NO
 L0000070         0   0.12690E-02  441343.6 3762217.2   213.1     5.00    14.88
1.40     YES                    NO
 L0000071         0   0.12690E-02  441311.6 3762217.2   213.4     5.00    14.88
1.40     YES                    NO
 L0000072         0   0.12690E-02  441279.6 3762217.1   213.2     5.00    14.88
1.40     YES                    NO
 L0000073         0   0.12690E-02  441247.6 3762217.0   212.8     5.00    14.88
1.40     YES                    NO
 L0000074         0   0.12690E-02  441215.6 3762216.9   212.6     5.00    14.88
1.40     YES                    NO
 L0000075         0   0.12690E-02  441183.6 3762216.8   212.3     5.00    14.88
1.40     YES                    NO
 L0000076         0   0.12690E-02  441151.6 3762216.7   212.3     5.00    14.88
1.40     YES                    NO
 L0000077         0   0.12690E-02  441119.6 3762216.6   212.4     5.00    14.88
1.40     YES                    NO
 L0000078         0   0.12690E-02  441087.6 3762216.6   211.9     5.00    14.88
1.40     YES                    NO
 L0000079         0   0.12690E-02  441055.6 3762216.5   211.3     5.00    14.88
1.40     YES                    NO
 L0000080         0   0.12690E-02  441023.6 3762216.4   211.6     5.00    14.88
1.40     YES                    NO
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```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*
```

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0000081 | 0 | 0.12690E-02 | 440991.6 | 3762216.3 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000082 | 0 | 0.12690E-02 | 440959.6 | 3762216.2 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000083 | 0 | 0.12690E-02 | 440927.6 | 3762216.1 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000084 | 0 | 0.12690E-02 | 440895.6 | 3762216.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000085 | 0 | 0.12690E-02 | 440863.6 | 3762216.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000086 | 0 | 0.12690E-02 | 440831.6 | 3762215.9 | 212.4 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000087 | 0 | 0.12690E-02 | 440809.2 | 3762205.7 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000088 | 0 | 0.12690E-02 | 440819.2 | 3762184.9 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000089 | 0 | 0.12690E-02 | 440851.2 | 3762185.0 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000090 | 0 | 0.12690E-02 | 440883.2 | 3762185.1 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000091 | 0 | 0.12690E-02 | 440915.2 | 3762185.2 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000092 | 0 | 0.12690E-02 | 440947.2 | 3762185.3 | 212.4 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000093 | 0 | 0.12690E-02 | 440979.2 | 3762185.4 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000094 | 0 | 0.12690E-02 | 441011.2 | 3762185.4 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000095 | 0 | 0.12690E-02 | 441043.2 | 3762185.5 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000096 | 0 | 0.12690E-02 | 441075.2 | 3762185.6 | 210.8 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000097 | 0 | 0.12690E-02 | 441107.2 | 3762185.7 | 211.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000098 | 0 | 0.12690E-02 | 441139.1 | 3762185.8 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000099 | 0 | 0.12690E-02 | 441171.1 | 3762185.9 | 211.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000100 | 0 | 0.12690E-02 | 441203.1 | 3762186.0 | 212.1 | 5.00 | 14.88 | | | | |

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1.40     YES                    NO
 L0000101         0   0.12690E-02  441235.1 3762186.1   212.3     5.00    14.88
1.40     YES                    NO
 L0000102         0   0.12690E-02  441267.1 3762186.2   212.4     5.00    14.88
1.40     YES                    NO
 L0000103         0   0.12690E-02  441299.1 3762186.3   212.6     5.00    14.88
1.40     YES                    NO
 L0000104         0   0.12690E-02  441331.1 3762186.4   212.4     5.00    14.88
1.40     YES                    NO
 L0000105         0   0.12690E-02  441363.1 3762186.4   212.1     5.00    14.88
1.40     YES                    NO
 L0000106         0   0.12690E-02  441395.1 3762186.5   212.0     5.00    14.88
1.40     YES                    NO
 L0000107         0   0.12690E-02  441427.1 3762186.6   212.0     5.00    14.88
1.40     YES                    NO
 L0000108         0   0.12690E-02  441459.1 3762186.7   212.0     5.00    14.88
1.40     YES                    NO
 L0000109         0   0.12690E-02  441491.1 3762186.8   212.0     5.00    14.88
1.40     YES                    NO
 L0000110         0   0.12690E-02  441523.1 3762186.9   212.0     5.00    14.88
1.40     YES                    NO
 L0000111         0   0.12690E-02  441555.1 3762187.0   212.0     5.00    14.88
1.40     YES                    NO
 L0000112         0   0.12690E-02  441587.1 3762187.1   212.2     5.00    14.88
1.40     YES                    NO
 L0000113         0   0.12690E-02  441619.1 3762187.2   212.3     5.00    14.88
1.40     YES                    NO
 L0000114         0   0.12690E-02  441651.1 3762187.3   212.2     5.00    14.88
1.40     YES                    NO
 L0000115         0   0.12690E-02  441683.1 3762187.4   212.2     5.00    14.88
1.40     YES                    NO
 L0000116         0   0.12690E-02  441715.1 3762187.5   212.3     5.00    14.88
1.40     YES                    NO
 L0000117         0   0.12690E-02  441747.1 3762187.5   212.5     5.00    14.88
1.40     YES                    NO
 L0000118         0   0.12690E-02  441779.1 3762187.6   212.6     5.00    14.88
1.40     YES                    NO
 L0000119         0   0.12690E-02  441811.1 3762187.7   212.7     5.00    14.88
1.40     YES                    NO
 L0000120         0   0.12690E-02  441843.1 3762187.8   212.8     5.00    14.88
1.40     YES                    NO
```



```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***
```

```
                NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000121         0   0.12690E-02  441875.1 3762187.9   213.0     5.00    14.88
1.40     YES                     NO
 L0000122         0   0.12690E-02  441907.1 3762188.0   213.1     5.00    14.88
1.40     YES                     NO
 L0000123         0   0.12690E-02  441939.1 3762188.1   213.5     5.00    14.88
1.40     YES                     NO
 L0000124         0   0.12690E-02  441971.1 3762188.2   213.5     5.00    14.88
1.40     YES                     NO
 L0000125         0   0.12690E-02  442003.1 3762188.3   213.4     5.00    14.88
1.40     YES                     NO
 L0000126         0   0.12690E-02  442035.1 3762188.4   213.5     5.00    14.88
1.40     YES                     NO
 L0000127         0   0.12690E-02  442067.1 3762188.5   213.4     5.00    14.88
1.40     YES                     NO
 L0000128         0   0.12690E-02  442099.1 3762188.6   213.3     5.00    14.88
1.40     YES                     NO
 L0000129         0   0.12690E-02  442131.1 3762188.6   213.0     5.00    14.88
1.40     YES                     NO
 L0000130         0   0.12690E-02  442163.1 3762188.7   213.0     5.00    14.88
1.40     YES                     NO
 L0000131         0   0.12690E-02  442174.1 3762166.4   213.1     5.00    14.88
1.40     YES                     NO
 L0000132         0   0.12690E-02  442154.6 3762154.6   212.7     5.00    14.88
1.40     YES                     NO
 L0000133         0   0.12690E-02  442122.6 3762154.5   212.9     5.00    14.88
1.40     YES                     NO
 L0000134         0   0.12690E-02  442090.6 3762154.5   213.1     5.00    14.88
1.40     YES                     NO
 L0000135         0   0.12690E-02  442058.6 3762154.4   213.1     5.00    14.88
1.40     YES                     NO
 L0000136         0   0.12690E-02  442026.6 3762154.4   213.0     5.00    14.88
1.40     YES                     NO
 L0000137         0   0.12690E-02  441994.6 3762154.3   213.0     5.00    14.88
1.40     YES                     NO
 L0000138         0   0.12690E-02  441962.6 3762154.2   213.2     5.00    14.88
1.40     YES                     NO
 L0000139         0   0.12690E-02  441930.6 3762154.2   213.0     5.00    14.88
1.40     YES                     NO
 L0000140         0   0.12690E-02  441898.6 3762154.1   212.8     5.00    14.88
1.40     YES                     NO
 L0000141         0   0.12690E-02  441866.6 3762154.1   212.7     5.00    14.88
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1.40     YES                    NO
 L0000142         0   0.12690E-02  441834.6 3762154.0   212.5     5.00    14.88
1.40     YES                    NO
 L0000143         0   0.12690E-02  441802.6 3762153.9   212.4     5.00    14.88
1.40     YES                    NO
 L0000144         0   0.12690E-02  441770.6 3762153.9   212.5     5.00    14.88
1.40     YES                    NO
 L0000145         0   0.12690E-02  441738.6 3762153.8   212.3     5.00    14.88
1.40     YES                    NO
 L0000146         0   0.12690E-02  441706.6 3762153.8   212.1     5.00    14.88
1.40     YES                    NO
 L0000147         0   0.12690E-02  441674.6 3762153.7   211.9     5.00    14.88
1.40     YES                    NO
 L0000148         0   0.12690E-02  441642.6 3762153.6   211.8     5.00    14.88
1.40     YES                    NO
 L0000149         0   0.12690E-02  441610.6 3762153.6   211.9     5.00    14.88
1.40     YES                    NO
 L0000150         0   0.12690E-02  441578.6 3762153.5   211.7     5.00    14.88
1.40     YES                    NO
 L0000151         0   0.12690E-02  441546.6 3762153.5   211.6     5.00    14.88
1.40     YES                    NO
 L0000152         0   0.12690E-02  441514.6 3762153.4   211.6     5.00    14.88
1.40     YES                    NO
 L0000153         0   0.12690E-02  441482.6 3762153.4   211.6     5.00    14.88
1.40     YES                    NO
 L0000154         0   0.12690E-02  441450.6 3762153.3   211.6     5.00    14.88
1.40     YES                    NO
 L0000155         0   0.12690E-02  441418.6 3762153.2   211.6     5.00    14.88
1.40     YES                    NO
 L0000156         0   0.12690E-02  441386.6 3762153.2   211.6     5.00    14.88
1.40     YES                    NO
 L0000157         0   0.12690E-02  441354.6 3762153.1   211.6     5.00    14.88
1.40     YES                    NO
 L0000158         0   0.12690E-02  441322.6 3762153.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000159         0   0.12690E-02  441290.6 3762153.0   211.8     5.00    14.88
1.40     YES                    NO
 L0000160         0   0.12690E-02  441258.6 3762152.9   211.9     5.00    14.88
1.40     YES                    NO
```



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

NUMBER EMISSION RATE BASE RELEASE INIT.

```
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000161         0   0.12690E-02  441226.6 3762152.9   211.7     5.00    14.88
1.40     YES                     NO
 L0000162         0   0.12690E-02  441194.6 3762152.8   211.6     5.00    14.88
1.40     YES                     NO
 L0000163         0   0.12690E-02  441162.6 3762152.8   211.4     5.00    14.88
1.40     YES                     NO
 L0000164         0   0.12690E-02  441130.6 3762152.7   211.4     5.00    14.88
1.40     YES                     NO
 L0000165         0   0.12690E-02  441098.6 3762152.6   211.5     5.00    14.88
1.40     YES                     NO
 L0000166         0   0.12690E-02  441066.6 3762152.6   211.2     5.00    14.88
1.40     YES                     NO
 L0000167         0   0.12690E-02  441034.6 3762152.5   211.2     5.00    14.88
1.40     YES                     NO
 L0000168         0   0.12690E-02  441002.6 3762152.5   211.7     5.00    14.88
1.40     YES                     NO
 L0000169         0   0.12690E-02  440970.6 3762152.4   212.1     5.00    14.88
1.40     YES                     NO
 L0000170         0   0.12690E-02  440938.6 3762152.4   212.1     5.00    14.88
1.40     YES                     NO
 L0000171         0   0.12690E-02  440906.6 3762152.3   212.0     5.00    14.88
1.40     YES                     NO
 L0000172         0   0.12690E-02  440874.6 3762152.2   212.1     5.00    14.88
1.40     YES                     NO
 L0000173         0   0.12690E-02  440842.6 3762152.2   211.8     5.00    14.88
1.40     YES                     NO
 L0000174         0   0.12690E-02  440810.6 3762152.1   212.1     5.00    14.88
1.40     YES                     NO
 L0000175         0   0.12690E-02  440802.0 3762128.6   212.2     5.00    14.88
1.40     YES                     NO
 L0000176         0   0.12690E-02  440823.2 3762117.9   211.9     5.00    14.88
1.40     YES                     NO
 L0000177         0   0.12690E-02  440855.2 3762118.1   211.9     5.00    14.88
1.40     YES                     NO
 L0000178         0   0.12690E-02  440887.2 3762118.2   212.0     5.00    14.88
1.40     YES                     NO
 L0000179         0   0.12690E-02  440919.2 3762118.4   211.9     5.00    14.88
1.40     YES                     NO
 L0000180         0   0.12690E-02  440951.2 3762118.6   211.9     5.00    14.88
1.40     YES                     NO
 L0000181         0   0.12690E-02  440983.2 3762118.7   211.8     5.00    14.88
1.40     YES                     NO
 L0000182         0   0.12690E-02  441015.2 3762118.9   211.5     5.00    14.88
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1.40     YES                    NO
 L0000183         0   0.12690E-02  441047.2 3762119.1   211.6     5.00    14.88
1.40     YES                    NO
 L0000184         0   0.12690E-02  441079.2 3762119.2   211.5     5.00    14.88
1.40     YES                    NO
 L0000185         0   0.12690E-02  441111.2 3762119.4   211.1     5.00    14.88
1.40     YES                    NO
 L0000186         0   0.12690E-02  441143.2 3762119.6   211.3     5.00    14.88
1.40     YES                    NO
 L0000187         0   0.12690E-02  441175.2 3762119.7   211.3     5.00    14.88
1.40     YES                    NO
 L0000188         0   0.12690E-02  441207.2 3762119.9   211.2     5.00    14.88
1.40     YES                    NO
 L0000189         0   0.12690E-02  441239.2 3762120.1   211.3     5.00    14.88
1.40     YES                    NO
 L0000190         0   0.12690E-02  441271.2 3762120.2   211.1     5.00    14.88
1.40     YES                    NO
 L0000191         0   0.12690E-02  441303.2 3762120.4   211.1     5.00    14.88
1.40     YES                    NO
 L0000192         0   0.12690E-02  441335.2 3762120.6   211.1     5.00    14.88
1.40     YES                    NO
 L0000193         0   0.12690E-02  441367.2 3762120.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000194         0   0.12690E-02  441399.2 3762120.9   211.2     5.00    14.88
1.40     YES                    NO
 L0000195         0   0.12690E-02  441431.2 3762121.1   211.2     5.00    14.88
1.40     YES                    NO
 L0000196         0   0.12690E-02  441463.2 3762121.2   211.2     5.00    14.88
1.40     YES                    NO
 L0000197         0   0.12690E-02  441495.2 3762121.4   211.2     5.00    14.88
1.40     YES                    NO
 L0000198         0   0.12690E-02  441527.2 3762121.6   211.2     5.00    14.88
1.40     YES                    NO
 L0000199         0   0.12690E-02  441559.2 3762121.7   211.2     5.00    14.88
1.40     YES                    NO
 L0000200         0   0.12690E-02  441591.2 3762121.9   211.5     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

```
               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X         Y      ELEV.   HEIGHT      SY
```

```
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000201         0   0.12690E-02  441623.2 3762122.0   211.5     5.00    14.88
1.40     YES                     NO
 L0000202         0   0.12690E-02  441655.2 3762122.2   211.5     5.00    14.88
1.40     YES                     NO
 L0000203         0   0.12690E-02  441687.2 3762122.4   211.8     5.00    14.88
1.40     YES                     NO
 L0000204         0   0.12690E-02  441719.2 3762122.5   212.1     5.00    14.88
1.40     YES                     NO
 L0000205         0   0.12690E-02  441751.2 3762122.7   212.2     5.00    14.88
1.40     YES                     NO
 L0000206         0   0.12690E-02  441783.2 3762122.9   212.3     5.00    14.88
1.40     YES                     NO
 L0000207         0   0.12690E-02  441815.2 3762123.0   212.3     5.00    14.88
1.40     YES                     NO
 L0000208         0   0.12690E-02  441847.2 3762123.2   212.4     5.00    14.88
1.40     YES                     NO
 L0000209         0   0.12690E-02  441879.2 3762123.4   212.5     5.00    14.88
1.40     YES                     NO
 L0000210         0   0.12690E-02  441911.2 3762123.5   212.7     5.00    14.88
1.40     YES                     NO
 L0000211         0   0.12690E-02  441943.2 3762123.7   212.8     5.00    14.88
1.40     YES                     NO
 L0000212         0   0.12690E-02  441975.2 3762123.9   212.8     5.00    14.88
1.40     YES                     NO
 L0000213         0   0.12690E-02  442007.2 3762124.0   212.5     5.00    14.88
1.40     YES                     NO
 L0000214         0   0.12690E-02  442039.2 3762124.2   212.1     5.00    14.88
1.40     YES                     NO
 L0000215         0   0.12690E-02  442071.2 3762124.4   212.4     5.00    14.88
1.40     YES                     NO
 L0000216         0   0.12690E-02  442103.2 3762124.5   212.8     5.00    14.88
1.40     YES                     NO
 L0000217         0   0.12690E-02  442135.2 3762124.7   212.6     5.00    14.88
1.40     YES                     NO
 L0000218         0   0.12690E-02  442167.2 3762124.9   212.7     5.00    14.88
1.40     YES                     NO
 L0000219         0   0.12690E-02  442166.7 3762094.0   212.5     5.00    14.88
1.40     YES                     NO
 L0000220         0   0.12690E-02  442134.7 3762093.8   212.4     5.00    14.88
1.40     YES                     NO
 L0000221         0   0.12690E-02  442102.7 3762093.6   212.5     5.00    14.88
1.40     YES                     NO
 L0000222         0   0.12690E-02  442070.7 3762093.4   211.9     5.00    14.88
1.40     YES                     NO
 L0000223         0   0.12690E-02  442038.7 3762093.2   211.6     5.00    14.88
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1.40     YES                    NO
 L0000224         0   0.12690E-02  442006.7 3762093.0   212.2     5.00    14.88
1.40     YES                    NO
 L0000225         0   0.12690E-02  441974.7 3762092.8   212.5     5.00    14.88
1.40     YES                    NO
 L0000226         0   0.12690E-02  441942.7 3762092.5   212.5     5.00    14.88
1.40     YES                    NO
 L0000227         0   0.12690E-02  441910.7 3762092.3   212.5     5.00    14.88
1.40     YES                    NO
 L0000228         0   0.12690E-02  441878.7 3762092.1   212.3     5.00    14.88
1.40     YES                    NO
 L0000229         0   0.12690E-02  441846.7 3762091.9   212.2     5.00    14.88
1.40     YES                    NO
 L0000230         0   0.12690E-02  441814.7 3762091.7   212.2     5.00    14.88
1.40     YES                    NO
 L0000231         0   0.12690E-02  441782.7 3762091.5   212.1     5.00    14.88
1.40     YES                    NO
 L0000232         0   0.12690E-02  441750.7 3762091.3   212.0     5.00    14.88
1.40     YES                    NO
 L0000233         0   0.12690E-02  441718.7 3762091.1   211.8     5.00    14.88
1.40     YES                    NO
 L0000234         0   0.12690E-02  441686.7 3762090.9   211.5     5.00    14.88
1.40     YES                    NO
 L0000235         0   0.12690E-02  441654.7 3762090.7   211.3     5.00    14.88
1.40     YES                    NO
 L0000236         0   0.12690E-02  441622.7 3762090.5   211.3     5.00    14.88
1.40     YES                    NO
 L0000237         0   0.12690E-02  441590.7 3762090.3   211.3     5.00    14.88
1.40     YES                    NO
 L0000238         0   0.12690E-02  441558.7 3762090.1   211.1     5.00    14.88
1.40     YES                    NO
 L0000239         0   0.12690E-02  441526.7 3762089.9   211.0     5.00    14.88
1.40     YES                    NO
 L0000240         0   0.12690E-02  441494.7 3762089.7   211.0     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X         Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
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(METERS) BY
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1.40     YES                    NO
 L0000265         0   0.12690E-02  440881.9 3762053.7   211.7     5.00    14.88
1.40     YES                    NO
 L0000266         0   0.12690E-02  440913.9 3762053.9   211.8     5.00    14.88
1.40     YES                    NO
 L0000267         0   0.12690E-02  440945.9 3762054.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000268         0   0.12690E-02  440977.9 3762054.3   211.6     5.00    14.88
1.40     YES                    NO
 L0000269         0   0.12690E-02  441009.9 3762054.5   211.4     5.00    14.88
1.40     YES                    NO
 L0000270         0   0.12690E-02  441041.9 3762054.8   211.2     5.00    14.88
1.40     YES                    NO
 L0000271         0   0.12690E-02  441073.9 3762055.0   211.2     5.00    14.88
1.40     YES                    NO
 L0000272         0   0.12690E-02  441105.9 3762055.2   211.1     5.00    14.88
1.40     YES                    NO
 L0000273         0   0.12690E-02  441137.9 3762055.4   211.0     5.00    14.88
1.40     YES                    NO
 L0000274         0   0.12690E-02  441169.9 3762055.6   211.0     5.00    14.88
1.40     YES                    NO
 L0000275         0   0.12690E-02  441201.9 3762055.8   210.9     5.00    14.88
1.40     YES                    NO
 L0000276         0   0.12690E-02  441233.9 3762056.0   211.0     5.00    14.88
1.40     YES                    NO
 L0000277         0   0.12690E-02  441265.9 3762056.3   211.0     5.00    14.88
1.40     YES                    NO
 L0000278         0   0.12690E-02  441297.9 3762056.5   210.9     5.00    14.88
1.40     YES                    NO
 L0000279         0   0.12690E-02  441329.9 3762056.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000280         0   0.12690E-02  441361.9 3762056.9   211.1     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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 L0000281         0   0.12690E-02  441393.9 3762057.1   210.9     5.00    14.88
1.40     YES                     NO
 L0000282         0   0.12690E-02  441425.9 3762057.3   210.9     5.00    14.88
1.40     YES                     NO
 L0000283         0   0.12690E-02  441457.9 3762057.5   210.9     5.00    14.88
1.40     YES                     NO
 L0000284         0   0.12690E-02  441489.9 3762057.7   210.9     5.00    14.88
1.40     YES                     NO
 L0000285         0   0.12690E-02  441521.9 3762058.0   210.9     5.00    14.88
1.40     YES                     NO
 L0000286         0   0.12690E-02  441553.9 3762058.2   211.0     5.00    14.88
1.40     YES                     NO
 L0000287         0   0.12690E-02  441585.9 3762058.4   211.0     5.00    14.88
1.40     YES                     NO
 L0000288         0   0.12690E-02  441617.9 3762058.6   211.1     5.00    14.88
1.40     YES                     NO
 L0000289         0   0.12690E-02  441649.9 3762058.8   211.1     5.00    14.88
1.40     YES                     NO
 L0000290         0   0.12690E-02  441681.9 3762059.0   211.2     5.00    14.88
1.40     YES                     NO
 L0000291         0   0.12690E-02  441713.9 3762059.2   211.4     5.00    14.88
1.40     YES                     NO
 L0000292         0   0.12690E-02  441745.9 3762059.5   211.6     5.00    14.88
1.40     YES                     NO
 L0000293         0   0.12690E-02  441777.8 3762059.7   211.7     5.00    14.88
1.40     YES                     NO
 L0000294         0   0.12690E-02  441809.8 3762059.9   212.0     5.00    14.88
1.40     YES                     NO
 L0000295         0   0.12690E-02  441841.8 3762060.1   212.0     5.00    14.88
1.40     YES                     NO
 L0000296         0   0.12690E-02  441873.8 3762060.3   212.1     5.00    14.88
1.40     YES                     NO
 L0000297         0   0.12690E-02  441905.8 3762060.5   212.2     5.00    14.88
1.40     YES                     NO
 L0000298         0   0.12690E-02  441937.8 3762060.7   212.2     5.00    14.88
1.40     YES                     NO
 L0000299         0   0.12690E-02  441969.8 3762061.0   212.1     5.00    14.88
1.40     YES                     NO
 L0000300         0   0.12690E-02  442001.8 3762061.2   212.0     5.00    14.88
1.40     YES                     NO
 L0000301         0   0.12690E-02  442033.8 3762061.4   212.1     5.00    14.88
1.40     YES                     NO
 L0000302         0   0.12690E-02  442065.8 3762061.6   212.1     5.00    14.88
1.40     YES                     NO
 L0000303         0   0.12690E-02  442097.8 3762061.8   212.2     5.00    14.88
1.40     YES                     NO
 L0000304         0   0.12690E-02  442129.8 3762062.0   212.2     5.00    14.88
1.40     YES                     NO
 L0000305         0   0.12690E-02  442161.8 3762062.2   212.2     5.00    14.88
```

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1.40     YES                    NO
 L0000306         0   0.12690E-02  442172.7 3762040.8   212.0     5.00    14.88
1.40     YES                    NO
 L0000307         0   0.12690E-02  442150.4 3762031.2   211.8     5.00    14.88
1.40     YES                    NO
 L0000308         0   0.12690E-02  442118.4 3762031.0   211.5     5.00    14.88
1.40     YES                    NO
 L0000309         0   0.12690E-02  442086.4 3762030.8   211.6     5.00    14.88
1.40     YES                    NO
 L0000310         0   0.12690E-02  442054.4 3762030.7   211.8     5.00    14.88
1.40     YES                    NO
 L0000311         0   0.12690E-02  442022.4 3762030.5   211.8     5.00    14.88
1.40     YES                    NO
 L0000312         0   0.12690E-02  441990.4 3762030.3   211.6     5.00    14.88
1.40     YES                    NO
 L0000313         0   0.12690E-02  441958.4 3762030.1   211.7     5.00    14.88
1.40     YES                    NO
 L0000314         0   0.12690E-02  441926.4 3762029.9   211.8     5.00    14.88
1.40     YES                    NO
 L0000315         0   0.12690E-02  441894.4 3762029.7   211.9     5.00    14.88
1.40     YES                    NO
 L0000316         0   0.12690E-02  441862.4 3762029.5   211.8     5.00    14.88
1.40     YES                    NO
 L0000317         0   0.12690E-02  441830.4 3762029.3   211.7     5.00    14.88
1.40     YES                    NO
 L0000318         0   0.12690E-02  441798.4 3762029.2   211.5     5.00    14.88
1.40     YES                    NO
 L0000319         0   0.12690E-02  441766.4 3762029.0   211.3     5.00    14.88
1.40     YES                    NO
 L0000320         0   0.12690E-02  441734.4 3762028.8   211.1     5.00    14.88
1.40     YES                    NO
```



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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000321 | 0 | 0.12690E-02 | 441702.4 | 3762028.6 | 210.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000322 | 0 | 0.12690E-02 | 441670.4 | 3762028.4 | 210.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000323 | 0 | 0.12690E-02 | 441638.4 | 3762028.2 | 210.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000324 | 0 | 0.12690E-02 | 441606.4 | 3762028.0 | 210.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000325 | 0 | 0.12690E-02 | 441574.4 | 3762027.8 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000326 | 0 | 0.12690E-02 | 441542.4 | 3762027.6 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000327 | 0 | 0.12690E-02 | 441510.4 | 3762027.5 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000328 | 0 | 0.12690E-02 | 441478.4 | 3762027.3 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000329 | 0 | 0.12690E-02 | 441446.4 | 3762027.1 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000330 | 0 | 0.12690E-02 | 441414.4 | 3762026.9 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000331 | 0 | 0.12690E-02 | 441382.4 | 3762026.7 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000332 | 0 | 0.12690E-02 | 441350.4 | 3762026.5 | 210.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000333 | 0 | 0.12690E-02 | 441318.4 | 3762026.3 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000334 | 0 | 0.12690E-02 | 441286.4 | 3762026.1 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000335 | 0 | 0.12690E-02 | 441254.4 | 3762026.0 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000336 | 0 | 0.12690E-02 | 441222.4 | 3762025.8 | 210.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000337 | 0 | 0.12690E-02 | 441190.4 | 3762025.6 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000338 | 0 | 0.12690E-02 | 441158.4 | 3762025.4 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000339 | 0 | 0.12690E-02 | 441126.4 | 3762025.2 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000340 | 0 | 0.12690E-02 | 441094.4 | 3762025.0 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000341 | 0 | 0.12690E-02 | 441062.4 | 3762024.8 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000342 | 0 | 0.12690E-02 | 441030.4 | 3762024.6 | 210.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000343 | 0 | 0.12690E-02 | 440998.4 | 3762024.5 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000344 | 0 | 0.12690E-02 | 440966.4 | 3762024.3 | 211.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000345 | 0 | 0.12690E-02 | 440934.4 | 3762024.1 | 211.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000346 | 0 | 0.12690E-02 | 440902.4 | 3762023.9 | 211.6 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000347         0   0.12690E-02  440870.4 3762023.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000348         0   0.12690E-02  440838.4 3762023.5   210.6     5.00    14.88
1.40     YES                    NO
 L0000349         0   0.12690E-02  440809.0 3762020.6   210.6     5.00    14.88
1.40     YES                    NO
 L0000350         0   0.12690E-02  440813.7 3761995.0   210.2     5.00    14.88
1.40     YES                    NO
 L0000351         0   0.12690E-02  440845.7 3761995.0   210.3     5.00    14.88
1.40     YES                    NO
 L0000352         0   0.12690E-02  440877.7 3761994.9   210.7     5.00    14.88
1.40     YES                    NO
 L0000353         0   0.12690E-02  440909.7 3761994.9   210.9     5.00    14.88
1.40     YES                    NO
 L0000354         0   0.12690E-02  440941.7 3761994.9   210.9     5.00    14.88
1.40     YES                    NO
 L0000355         0   0.12690E-02  440973.7 3761994.9   210.9     5.00    14.88
1.40     YES                    NO
 L0000356         0   0.12690E-02  441005.7 3761994.9   210.8     5.00    14.88
1.40     YES                    NO
 L0000357         0   0.12690E-02  441037.7 3761994.9   210.6     5.00    14.88
1.40     YES                    NO
 L0000358         0   0.12690E-02  441069.7 3761994.9   210.4     5.00    14.88
1.40     YES                    NO
 L0000359         0   0.12690E-02  441101.7 3761994.9   210.3     5.00    14.88
1.40     YES                    NO
 L0000360         0   0.12690E-02  441133.7 3761994.9   210.2     5.00    14.88
1.40     YES                    NO
```



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                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000361         0   0.12690E-02  441165.7 3761994.9   210.2     5.00    14.88
1.40     YES                    NO
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000362 | 0 | 0.12690E-02 | 441197.7 | 3761994.9 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000363 | 0 | 0.12690E-02 | 441229.7 | 3761994.9 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000364 | 0 | 0.12690E-02 | 441261.7 | 3761994.9 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000365 | 0 | 0.12690E-02 | 441293.7 | 3761994.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000366 | 0 | 0.12690E-02 | 441325.7 | 3761994.8 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000367 | 0 | 0.12690E-02 | 441357.7 | 3761994.8 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000368 | 0 | 0.12690E-02 | 441389.7 | 3761994.8 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000369 | 0 | 0.12690E-02 | 441421.7 | 3761994.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000370 | 0 | 0.12690E-02 | 441453.7 | 3761994.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000371 | 0 | 0.12690E-02 | 441485.7 | 3761994.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000372 | 0 | 0.12690E-02 | 441517.7 | 3761994.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000373 | 0 | 0.12690E-02 | 441549.7 | 3761994.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000374 | 0 | 0.12690E-02 | 441581.7 | 3761994.8 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000375 | 0 | 0.12690E-02 | 441613.7 | 3761994.8 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000376 | 0 | 0.12690E-02 | 441645.7 | 3761994.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000377 | 0 | 0.12690E-02 | 441677.7 | 3761994.8 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000378 | 0 | 0.12690E-02 | 441709.7 | 3761994.7 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000379 | 0 | 0.12690E-02 | 441741.7 | 3761994.7 | 210.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000380 | 0 | 0.12690E-02 | 441773.7 | 3761994.7 | 210.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000381 | 0 | 0.12690E-02 | 441805.7 | 3761994.7 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000382 | 0 | 0.12690E-02 | 441837.7 | 3761994.7 | 211.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000383 | 0 | 0.12690E-02 | 441869.7 | 3761994.7 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000384 | 0 | 0.12690E-02 | 441901.7 | 3761994.7 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000385 | 0 | 0.12690E-02 | 441933.7 | 3761994.7 | 211.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000386 | 0 | 0.12690E-02 | 441965.7 | 3761994.7 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000387 | 0 | 0.12690E-02 | 441997.7 | 3761994.7 | 211.2 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000388         0   0.12690E-02  442029.7 3761994.7   211.6     5.00    14.88
1.40     YES                    NO
 L0000389         0   0.12690E-02  442061.7 3761994.7   211.4     5.00    14.88
1.40     YES                    NO
 L0000390         0   0.12690E-02  442093.7 3761994.7   211.2     5.00    14.88
1.40     YES                    NO
 L0000391         0   0.12690E-02  442125.7 3761994.6   211.1     5.00    14.88
1.40     YES                    NO
 L0000392         0   0.12690E-02  442157.7 3761994.6   211.3     5.00    14.88
1.40     YES                    NO
 L0000393         0   0.12690E-02  442176.4 3761979.7   211.1     5.00    14.88
1.40     YES                    NO
 L0000394         0   0.12690E-02  442169.8 3761957.2   210.8     5.00    14.88
1.40     YES                    NO
 L0000395         0   0.12690E-02  442137.8 3761957.3   210.7     5.00    14.88
1.40     YES                    NO
 L0000396         0   0.12690E-02  442105.8 3761957.4   211.0     5.00    14.88
1.40     YES                    NO
 L0000397         0   0.12690E-02  442073.8 3761957.5   211.1     5.00    14.88
1.40     YES                    NO
 L0000398         0   0.12690E-02  442041.8 3761957.6   211.2     5.00    14.88
1.40     YES                    NO
 L0000399         0   0.12690E-02  442009.8 3761957.7   210.9     5.00    14.88
1.40     YES                    NO
 L0000400         0   0.12690E-02  441977.8 3761957.8   210.7     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - -

 L0000401         0   0.12690E-02  441945.8 3761957.9   211.0     5.00    14.88
1.40     YES                    NO
 L0000402         0   0.12690E-02  441913.8 3761958.0   211.5     5.00    14.88
1.40     YES                    NO
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000403 | 0 | 0.12690E-02 | 441881.8 | 3761958.1 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000404 | 0 | 0.12690E-02 | 441849.8 | 3761958.2 | 211.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000405 | 0 | 0.12690E-02 | 441817.8 | 3761958.3 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000406 | 0 | 0.12690E-02 | 441785.8 | 3761958.4 | 210.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000407 | 0 | 0.12690E-02 | 441753.8 | 3761958.5 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000408 | 0 | 0.12690E-02 | 441721.8 | 3761958.6 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000409 | 0 | 0.12690E-02 | 441689.8 | 3761958.7 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000410 | 0 | 0.12690E-02 | 441657.8 | 3761958.8 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000411 | 0 | 0.12690E-02 | 441625.8 | 3761958.9 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000412 | 0 | 0.12690E-02 | 441593.8 | 3761959.0 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000413 | 0 | 0.12690E-02 | 441561.8 | 3761959.1 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000414 | 0 | 0.12690E-02 | 441529.8 | 3761959.2 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000415 | 0 | 0.12690E-02 | 441497.8 | 3761959.3 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000416 | 0 | 0.12690E-02 | 441465.8 | 3761959.4 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000417 | 0 | 0.12690E-02 | 441433.8 | 3761959.5 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000418 | 0 | 0.12690E-02 | 441401.8 | 3761959.6 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000419 | 0 | 0.12690E-02 | 441369.8 | 3761959.7 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000420 | 0 | 0.12690E-02 | 441337.8 | 3761959.8 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000421 | 0 | 0.12690E-02 | 441305.8 | 3761959.8 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000422 | 0 | 0.12690E-02 | 441273.8 | 3761959.9 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000423 | 0 | 0.12690E-02 | 441241.8 | 3761960.0 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000424 | 0 | 0.12690E-02 | 441209.8 | 3761960.1 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000425 | 0 | 0.12690E-02 | 441177.8 | 3761960.2 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000426 | 0 | 0.12690E-02 | 441145.8 | 3761960.3 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000427 | 0 | 0.12690E-02 | 441113.8 | 3761960.4 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000428 | 0 | 0.12690E-02 | 441081.8 | 3761960.5 | 210.1 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000429         0   0.12690E-02  441049.8 3761960.6   210.2     5.00    14.88
1.40     YES                    NO
 L0000430         0   0.12690E-02  441017.8 3761960.7   210.3     5.00    14.88
1.40     YES                    NO
 L0000431         0   0.12690E-02  440985.8 3761960.8   210.3     5.00    14.88
1.40     YES                    NO
 L0000432         0   0.12690E-02  440953.8 3761960.9   210.3     5.00    14.88
1.40     YES                    NO
 L0000433         0   0.12690E-02  440921.8 3761961.0   210.3     5.00    14.88
1.40     YES                    NO
 L0000434         0   0.12690E-02  440889.8 3761961.1   210.1     5.00    14.88
1.40     YES                    NO
 L0000435         0   0.12690E-02  440857.8 3761961.2   210.1     5.00    14.88
1.40     YES                    NO
 L0000436         0   0.12690E-02  440825.8 3761961.3   209.9     5.00    14.88
1.40     YES                    NO
 L0000437         0   0.12690E-02  440803.9 3761952.1   209.8     5.00    14.88
1.40     YES                    NO
 L0000438         0   0.12690E-02  440813.6 3761927.9   209.5     5.00    14.88
1.40     YES                    NO
 L0000439         0   0.12690E-02  440845.6 3761927.8   209.6     5.00    14.88
1.40     YES                    NO
 L0000440         0   0.12690E-02  440877.6 3761927.7   209.5     5.00    14.88
1.40     YES                    NO
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000441         0   0.12690E-02  440909.6 3761927.6   209.7     5.00    14.88
1.40     YES                    NO
 L0000442         0   0.12690E-02  440941.6 3761927.5   209.9     5.00    14.88
1.40     YES                    NO
 L0000443         0   0.12690E-02  440973.6 3761927.5   209.8     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| L0000444 | 0 | 0.12690E-02 | 441005.6 | 3761927.4 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000445 | 0 | 0.12690E-02 | 441037.6 | 3761927.3 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000446 | 0 | 0.12690E-02 | 441069.6 | 3761927.2 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000447 | 0 | 0.12690E-02 | 441101.6 | 3761927.1 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000448 | 0 | 0.12690E-02 | 441133.6 | 3761927.0 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000449 | 0 | 0.12690E-02 | 441165.6 | 3761926.9 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000450 | 0 | 0.12690E-02 | 441197.6 | 3761926.9 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000451 | 0 | 0.12690E-02 | 441229.6 | 3761926.8 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000452 | 0 | 0.12690E-02 | 441261.6 | 3761926.7 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000453 | 0 | 0.12690E-02 | 441293.6 | 3761926.6 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000454 | 0 | 0.12690E-02 | 441325.6 | 3761926.5 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000455 | 0 | 0.12690E-02 | 441357.6 | 3761926.4 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000456 | 0 | 0.12690E-02 | 441389.6 | 3761926.4 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000457 | 0 | 0.12690E-02 | 441421.6 | 3761926.3 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000458 | 0 | 0.12690E-02 | 441453.6 | 3761926.2 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000459 | 0 | 0.12690E-02 | 441485.6 | 3761926.1 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000460 | 0 | 0.12690E-02 | 441517.6 | 3761926.0 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000461 | 0 | 0.12690E-02 | 441549.6 | 3761925.9 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000462 | 0 | 0.12690E-02 | 441581.6 | 3761925.9 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000463 | 0 | 0.12690E-02 | 441613.6 | 3761925.8 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000464 | 0 | 0.12690E-02 | 441645.6 | 3761925.7 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000465 | 0 | 0.12690E-02 | 441677.6 | 3761925.6 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000466 | 0 | 0.12690E-02 | 441709.6 | 3761925.5 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000467 | 0 | 0.12690E-02 | 441741.6 | 3761925.4 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000468 | 0 | 0.12690E-02 | 441773.6 | 3761925.4 | 210.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000469 | 0 | 0.12690E-02 | 441805.6 | 3761925.3 | 210.5 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000470         0   0.12690E-02  441837.6 3761925.2   211.3     5.00    14.88
1.40     YES                    NO
 L0000471         0   0.12690E-02  441869.6 3761925.1   211.4     5.00    14.88
1.40     YES                    NO
 L0000472         0   0.12690E-02  441901.6 3761925.0   211.3     5.00    14.88
1.40     YES                    NO
 L0000473         0   0.12690E-02  441933.6 3761924.9   211.0     5.00    14.88
1.40     YES                    NO
 L0000474         0   0.12690E-02  441965.6 3761924.9   210.4     5.00    14.88
1.40     YES                    NO
 L0000475         0   0.12690E-02  441997.6 3761924.8   210.4     5.00    14.88
1.40     YES                    NO
 L0000476         0   0.12690E-02  442029.6 3761924.7   210.8     5.00    14.88
1.40     YES                    NO
 L0000477         0   0.12690E-02  442061.6 3761924.6   210.8     5.00    14.88
1.40     YES                    NO
 L0000478         0   0.12690E-02  442093.6 3761924.5   210.8     5.00    14.88
1.40     YES                    NO
 L0000479         0   0.12690E-02  442125.6 3761924.4   210.6     5.00    14.88
1.40     YES                    NO
 L0000480         0   0.12690E-02  442157.6 3761924.4   210.5     5.00    14.88
1.40     YES                    NO
```



```
                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000481         0   0.12690E-02  442176.1 3761912.3   210.6     5.00    14.88
1.40     YES                    NO
 L0000482         0   0.12690E-02  442164.0 3761890.0   210.4     5.00    14.88
1.40     YES                    NO
 L0000483         0   0.12690E-02  442132.0 3761890.1   210.3     5.00    14.88
1.40     YES                    NO
 L0000484         0   0.12690E-02  442100.0 3761890.2   210.6     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000485 | 0 | 0.12690E-02 | 442068.0 | 3761890.4 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000486 | 0 | 0.12690E-02 | 442036.0 | 3761890.5 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000487 | 0 | 0.12690E-02 | 442004.0 | 3761890.7 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000488 | 0 | 0.12690E-02 | 441972.0 | 3761890.8 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000489 | 0 | 0.12690E-02 | 441940.0 | 3761890.9 | 210.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000490 | 0 | 0.12690E-02 | 441908.0 | 3761891.1 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000491 | 0 | 0.12690E-02 | 441876.0 | 3761891.2 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000492 | 0 | 0.12690E-02 | 441844.0 | 3761891.4 | 211.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000493 | 0 | 0.12690E-02 | 441812.0 | 3761891.5 | 210.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000494 | 0 | 0.12690E-02 | 441780.0 | 3761891.6 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000495 | 0 | 0.12690E-02 | 441748.0 | 3761891.8 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000496 | 0 | 0.12690E-02 | 441716.0 | 3761891.9 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000497 | 0 | 0.12690E-02 | 441684.0 | 3761892.1 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000498 | 0 | 0.12690E-02 | 441652.0 | 3761892.2 | 209.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000499 | 0 | 0.12690E-02 | 441620.0 | 3761892.3 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000500 | 0 | 0.12690E-02 | 441588.0 | 3761892.5 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000501 | 0 | 0.12690E-02 | 441556.0 | 3761892.6 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000502 | 0 | 0.12690E-02 | 441524.0 | 3761892.8 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000503 | 0 | 0.12690E-02 | 441492.0 | 3761892.9 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000504 | 0 | 0.12690E-02 | 441460.0 | 3761893.0 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000505 | 0 | 0.12690E-02 | 441428.0 | 3761893.2 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000506 | 0 | 0.12690E-02 | 441396.0 | 3761893.3 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000507 | 0 | 0.12690E-02 | 441364.0 | 3761893.5 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000508 | 0 | 0.12690E-02 | 441332.0 | 3761893.6 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000509 | 0 | 0.12690E-02 | 441300.0 | 3761893.7 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000510 | 0 | 0.12690E-02 | 441268.0 | 3761893.9 | 209.6 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000511         0   0.12690E-02  441236.0 3761894.0   209.4     5.00    14.88
1.40     YES                    NO
 L0000512         0   0.12690E-02  441204.0 3761894.2   209.2     5.00    14.88
1.40     YES                    NO
 L0000513         0   0.12690E-02  441172.0 3761894.3   209.2     5.00    14.88
1.40     YES                    NO
 L0000514         0   0.12690E-02  441140.0 3761894.4   209.3     5.00    14.88
1.40     YES                    NO
 L0000515         0   0.12690E-02  441108.0 3761894.6   209.3     5.00    14.88
1.40     YES                    NO
 L0000516         0   0.12690E-02  441076.0 3761894.7   209.3     5.00    14.88
1.40     YES                    NO
 L0000517         0   0.12690E-02  441044.0 3761894.9   209.3     5.00    14.88
1.40     YES                    NO
 L0000518         0   0.12690E-02  441012.0 3761895.0   209.4     5.00    14.88
1.40     YES                    NO
 L0000519         0   0.12690E-02  440980.0 3761895.1   209.4     5.00    14.88
1.40     YES                    NO
 L0000520         0   0.12690E-02  440948.0 3761895.3   209.4     5.00    14.88
1.40     YES                    NO
```



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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000521         0   0.12690E-02  440916.0 3761895.4   209.3     5.00    14.88
1.40     YES                    NO
 L0000522         0   0.12690E-02  440884.0 3761895.6   209.1     5.00    14.88
1.40     YES                    NO
 L0000523         0   0.12690E-02  440852.0 3761895.7   209.2     5.00    14.88
1.40     YES                    NO
 L0000524         0   0.12690E-02  440820.0 3761895.8   209.1     5.00    14.88
1.40     YES                    NO
 L0000525         0   0.12690E-02  440806.0 3761878.3   209.1     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000526 | 0 | 0.12690E-02 | 440822.2 | 3761862.1 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000527 | 0 | 0.12690E-02 | 440854.2 | 3761862.0 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000528 | 0 | 0.12690E-02 | 440886.2 | 3761861.9 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000529 | 0 | 0.12690E-02 | 440918.2 | 3761861.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000530 | 0 | 0.12690E-02 | 440950.2 | 3761861.7 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000531 | 0 | 0.12690E-02 | 440982.2 | 3761861.6 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000532 | 0 | 0.12690E-02 | 441014.2 | 3761861.5 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000533 | 0 | 0.12690E-02 | 441046.2 | 3761861.4 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000534 | 0 | 0.12690E-02 | 441078.2 | 3761861.3 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000535 | 0 | 0.12690E-02 | 441110.2 | 3761861.2 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000536 | 0 | 0.12690E-02 | 441142.2 | 3761861.1 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000537 | 0 | 0.12690E-02 | 441174.2 | 3761861.0 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000538 | 0 | 0.12690E-02 | 441206.2 | 3761860.9 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000539 | 0 | 0.12690E-02 | 441238.2 | 3761860.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000540 | 0 | 0.12690E-02 | 441270.2 | 3761860.7 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000541 | 0 | 0.12690E-02 | 441302.2 | 3761860.6 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000542 | 0 | 0.12690E-02 | 441334.2 | 3761860.5 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000543 | 0 | 0.12690E-02 | 441366.2 | 3761860.4 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000544 | 0 | 0.12690E-02 | 441398.2 | 3761860.3 | 208.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000545 | 0 | 0.12690E-02 | 441430.2 | 3761860.2 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000546 | 0 | 0.12690E-02 | 441462.2 | 3761860.1 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000547 | 0 | 0.12690E-02 | 441494.2 | 3761860.0 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000548 | 0 | 0.12690E-02 | 441526.2 | 3761859.9 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000549 | 0 | 0.12690E-02 | 441558.2 | 3761859.8 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000550 | 0 | 0.12690E-02 | 441590.2 | 3761859.7 | 209.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000551 | 0 | 0.12690E-02 | 441622.2 | 3761859.6 | 209.2 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000552         0   0.12690E-02  441654.2 3761859.5   209.1     5.00    14.88
1.40     YES                    NO
 L0000553         0   0.12690E-02  441686.2 3761859.4   209.2     5.00    14.88
1.40     YES                    NO
 L0000554         0   0.12690E-02  441718.2 3761859.3   209.2     5.00    14.88
1.40     YES                    NO
 L0000555         0   0.12690E-02  441750.2 3761859.1   209.4     5.00    14.88
1.40     YES                    NO
 L0000556         0   0.12690E-02  441782.2 3761859.0   209.6     5.00    14.88
1.40     YES                    NO
 L0000557         0   0.12690E-02  441814.2 3761858.9   210.0     5.00    14.88
1.40     YES                    NO
 L0000558         0   0.12690E-02  441846.2 3761858.8   210.5     5.00    14.88
1.40     YES                    NO
 L0000559         0   0.12690E-02  441878.2 3761858.7   210.6     5.00    14.88
1.40     YES                    NO
 L0000560         0   0.12690E-02  441910.2 3761858.6   210.6     5.00    14.88
1.40     YES                    NO
```



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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000561         0   0.12690E-02  441942.2 3761858.5   210.0     5.00    14.88
1.40     YES                    NO
 L0000562         0   0.12690E-02  441974.2 3761858.4   209.7     5.00    14.88
1.40     YES                    NO
 L0000563         0   0.12690E-02  442006.2 3761858.3   209.9     5.00    14.88
1.40     YES                    NO
 L0000564         0   0.12690E-02  442038.2 3761858.2   210.0     5.00    14.88
1.40     YES                    NO
 L0000565         0   0.12690E-02  442070.2 3761858.1   210.2     5.00    14.88
1.40     YES                    NO
 L0000566         0   0.12690E-02  442102.2 3761858.0   210.3     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000567 | 0 | 0.12690E-02 | 442134.2 | 3761857.9 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000568 | 0 | 0.12690E-02 | 442166.2 | 3761857.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000569 | 0 | 0.12690E-02 | 442178.0 | 3761837.9 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000570 | 0 | 0.12690E-02 | 442159.2 | 3761824.5 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000571 | 0 | 0.12690E-02 | 442127.2 | 3761824.6 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000572 | 0 | 0.12690E-02 | 442095.2 | 3761824.7 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000573 | 0 | 0.12690E-02 | 442063.2 | 3761824.8 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000574 | 0 | 0.12690E-02 | 442031.2 | 3761824.9 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000575 | 0 | 0.12690E-02 | 441999.2 | 3761825.0 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000576 | 0 | 0.12690E-02 | 441967.2 | 3761825.1 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000577 | 0 | 0.12690E-02 | 441935.2 | 3761825.2 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000578 | 0 | 0.12690E-02 | 441903.2 | 3761825.3 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000579 | 0 | 0.12690E-02 | 441871.2 | 3761825.3 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000580 | 0 | 0.12690E-02 | 441839.2 | 3761825.4 | 210.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000581 | 0 | 0.12690E-02 | 441807.2 | 3761825.5 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000582 | 0 | 0.12690E-02 | 441775.2 | 3761825.6 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000583 | 0 | 0.12690E-02 | 441743.2 | 3761825.7 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000584 | 0 | 0.12690E-02 | 441711.2 | 3761825.8 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000585 | 0 | 0.12690E-02 | 441679.2 | 3761825.9 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000586 | 0 | 0.12690E-02 | 441647.2 | 3761826.0 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000587 | 0 | 0.12690E-02 | 441615.2 | 3761826.1 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000588 | 0 | 0.12690E-02 | 441583.2 | 3761826.2 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000589 | 0 | 0.12690E-02 | 441551.2 | 3761826.3 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000590 | 0 | 0.12690E-02 | 441519.2 | 3761826.4 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000591 | 0 | 0.12690E-02 | 441487.2 | 3761826.5 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000592 | 0 | 0.12690E-02 | 441455.2 | 3761826.6 | 208.7 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000593         0   0.12690E-02  441423.2 3761826.7   208.8     5.00    14.88
1.40     YES                    NO
 L0000594         0   0.12690E-02  441391.2 3761826.8   208.7     5.00    14.88
1.40     YES                    NO
 L0000595         0   0.12690E-02  441359.2 3761826.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000596         0   0.12690E-02  441327.2 3761827.0   208.8     5.00    14.88
1.40     YES                    NO
 L0000597         0   0.12690E-02  441295.2 3761827.1   208.9     5.00    14.88
1.40     YES                    NO
 L0000598         0   0.12690E-02  441263.2 3761827.2   208.8     5.00    14.88
1.40     YES                    NO
 L0000599         0   0.12690E-02  441231.2 3761827.3   208.8     5.00    14.88
1.40     YES                    NO
 L0000600         0   0.12690E-02  441199.2 3761827.4   208.6     5.00    14.88
1.40     YES                    NO
```



```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000601         0   0.12690E-02  441167.2 3761827.5   208.8     5.00    14.88
1.40     YES                    NO
 L0000602         0   0.12690E-02  441135.2 3761827.6   208.7     5.00    14.88
1.40     YES                    NO
 L0000603         0   0.12690E-02  441103.2 3761827.7   208.7     5.00    14.88
1.40     YES                    NO
 L0000604         0   0.12690E-02  441071.2 3761827.8   208.7     5.00    14.88
1.40     YES                    NO
 L0000605         0   0.12690E-02  441039.2 3761827.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000606         0   0.12690E-02  441007.2 3761828.0   208.7     5.00    14.88
1.40     YES                    NO
 L0000607         0   0.12690E-02  440975.2 3761828.1   208.7     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000608 | 0 | 0.12690E-02 | 440943.2 | 3761828.2 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000609 | 0 | 0.12690E-02 | 440911.2 | 3761828.3 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000610 | 0 | 0.12690E-02 | 440879.2 | 3761828.4 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000611 | 0 | 0.12690E-02 | 440847.2 | 3761828.5 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000612 | 0 | 0.12690E-02 | 440815.3 | 3761828.6 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000613 | 0 | 0.12690E-02 | 440805.3 | 3761807.4 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000614 | 0 | 0.12690E-02 | 440825.3 | 3761794.9 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000615 | 0 | 0.12690E-02 | 440857.3 | 3761794.9 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000616 | 0 | 0.12690E-02 | 440889.3 | 3761794.9 | 208.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000617 | 0 | 0.12690E-02 | 440921.3 | 3761794.9 | 208.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000618 | 0 | 0.12690E-02 | 440953.3 | 3761794.9 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000619 | 0 | 0.12690E-02 | 440985.3 | 3761794.9 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000620 | 0 | 0.12690E-02 | 441017.3 | 3761794.9 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000621 | 0 | 0.12690E-02 | 441049.3 | 3761794.9 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000622 | 0 | 0.12690E-02 | 441081.3 | 3761794.9 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000623 | 0 | 0.12690E-02 | 441113.3 | 3761794.9 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000624 | 0 | 0.12690E-02 | 441145.3 | 3761794.9 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000625 | 0 | 0.12690E-02 | 441177.3 | 3761794.9 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000626 | 0 | 0.12690E-02 | 441209.3 | 3761794.9 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000627 | 0 | 0.12690E-02 | 441241.3 | 3761794.9 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000628 | 0 | 0.12690E-02 | 441273.3 | 3761794.9 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000629 | 0 | 0.12690E-02 | 441305.3 | 3761794.9 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000630 | 0 | 0.12690E-02 | 441337.3 | 3761794.9 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000631 | 0 | 0.12690E-02 | 441369.3 | 3761794.9 | 208.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000632 | 0 | 0.12690E-02 | 441401.3 | 3761794.9 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000633 | 0 | 0.12690E-02 | 441433.3 | 3761794.9 | 208.4 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000634         0   0.12690E-02  441465.3 3761794.9   208.5     5.00    14.88
1.40     YES                    NO
 L0000635         0   0.12690E-02  441497.3 3761794.9   208.6     5.00    14.88
1.40     YES                    NO
 L0000636         0   0.12690E-02  441529.3 3761794.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000637         0   0.12690E-02  441561.3 3761794.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000638         0   0.12690E-02  441593.3 3761794.9   208.8     5.00    14.88
1.40     YES                    NO
 L0000639         0   0.12690E-02  441625.3 3761794.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000640         0   0.12690E-02  441657.3 3761794.9   208.6     5.00    14.88
1.40     YES                    NO
```



*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

*** VOLUME SOURCE DATA ***

```
               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000641         0   0.12690E-02  441689.3 3761794.9   208.6     5.00    14.88
1.40     YES                    NO
 L0000642         0   0.12690E-02  441721.3 3761794.9   208.7     5.00    14.88
1.40     YES                    NO
 L0000643         0   0.12690E-02  441753.3 3761794.9   208.8     5.00    14.88
1.40     YES                    NO
 L0000644         0   0.12690E-02  441785.3 3761794.9   209.2     5.00    14.88
1.40     YES                    NO
 L0000645         0   0.12690E-02  441817.3 3761794.9   209.6     5.00    14.88
1.40     YES                    NO
 L0000646         0   0.12690E-02  441849.3 3761794.9   210.0     5.00    14.88
1.40     YES                    NO
 L0000647         0   0.12690E-02  441881.3 3761794.9   209.8     5.00    14.88
1.40     YES                    NO
 L0000648         0   0.12690E-02  441913.3 3761794.9   209.8     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| L0000649 | 0 | 0.12690E-02 | 441945.3 | 3761794.9 | 209.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000650 | 0 | 0.12690E-02 | 441977.3 | 3761794.9 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000651 | 0 | 0.12690E-02 | 442009.3 | 3761794.9 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000652 | 0 | 0.12690E-02 | 442041.3 | 3761794.9 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000653 | 0 | 0.12690E-02 | 442073.3 | 3761794.9 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000654 | 0 | 0.12690E-02 | 442105.3 | 3761794.8 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000655 | 0 | 0.12690E-02 | 442137.3 | 3761794.8 | 209.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000656 | 0 | 0.12690E-02 | 442169.3 | 3761794.8 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000657 | 0 | 0.12690E-02 | 442178.1 | 3761772.1 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000658 | 0 | 0.12690E-02 | 442153.9 | 3761764.2 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000659 | 0 | 0.12690E-02 | 442121.9 | 3761764.1 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000660 | 0 | 0.12690E-02 | 442089.9 | 3761764.1 | 209.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000661 | 0 | 0.12690E-02 | 442057.9 | 3761764.0 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000662 | 0 | 0.12690E-02 | 442025.9 | 3761763.9 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000663 | 0 | 0.12690E-02 | 441993.9 | 3761763.8 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000664 | 0 | 0.12690E-02 | 441961.9 | 3761763.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000665 | 0 | 0.12690E-02 | 441929.9 | 3761763.7 | 209.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000666 | 0 | 0.12690E-02 | 441897.9 | 3761763.6 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000667 | 0 | 0.12690E-02 | 441865.9 | 3761763.6 | 209.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000668 | 0 | 0.12690E-02 | 441833.9 | 3761763.5 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000669 | 0 | 0.12690E-02 | 441801.9 | 3761763.4 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000670 | 0 | 0.12690E-02 | 441769.9 | 3761763.4 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000671 | 0 | 0.12690E-02 | 441737.9 | 3761763.3 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000672 | 0 | 0.12690E-02 | 441705.9 | 3761763.2 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000673 | 0 | 0.12690E-02 | 441673.9 | 3761763.2 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000674 | 0 | 0.12690E-02 | 441641.9 | 3761763.1 | 208.4 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000675         0   0.12690E-02  441609.9 3761763.0   208.6     5.00    14.88
1.40     YES                    NO
 L0000676         0   0.12690E-02  441577.9 3761762.9   208.5     5.00    14.88
1.40     YES                    NO
 L0000677         0   0.12690E-02  441545.9 3761762.9   208.1     5.00    14.88
1.40     YES                    NO
 L0000678         0   0.12690E-02  441513.9 3761762.8   207.8     5.00    14.88
1.40     YES                    NO
 L0000679         0   0.12690E-02  441481.9 3761762.7   208.0     5.00    14.88
1.40     YES                    NO
 L0000680         0   0.12690E-02  441449.9 3761762.7   208.0     5.00    14.88
1.40     YES                    NO
```



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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000681         0   0.12690E-02  441417.9 3761762.6   208.2     5.00    14.88
1.40     YES                    NO
 L0000682         0   0.12690E-02  441385.9 3761762.5   208.0     5.00    14.88
1.40     YES                    NO
 L0000683         0   0.12690E-02  441353.9 3761762.5   208.1     5.00    14.88
1.40     YES                    NO
 L0000684         0   0.12690E-02  441321.9 3761762.4   208.1     5.00    14.88
1.40     YES                    NO
 L0000685         0   0.12690E-02  441289.9 3761762.3   208.2     5.00    14.88
1.40     YES                    NO
 L0000686         0   0.12690E-02  441257.9 3761762.3   208.2     5.00    14.88
1.40     YES                    NO
 L0000687         0   0.12690E-02  441225.9 3761762.2   208.1     5.00    14.88
1.40     YES                    NO
 L0000688         0   0.12690E-02  441193.9 3761762.1   208.1     5.00    14.88
1.40     YES                    NO
 L0000689         0   0.12690E-02  441161.9 3761762.0   208.3     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| L0000690 | 0 | 0.12690E-02 | 441129.9 | 3761762.0 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000691 | 0 | 0.12690E-02 | 441097.9 | 3761761.9 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000692 | 0 | 0.12690E-02 | 441065.9 | 3761761.8 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000693 | 0 | 0.12690E-02 | 441033.9 | 3761761.8 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000694 | 0 | 0.12690E-02 | 441001.9 | 3761761.7 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000695 | 0 | 0.12690E-02 | 440969.9 | 3761761.6 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000696 | 0 | 0.12690E-02 | 440937.9 | 3761761.6 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000697 | 0 | 0.12690E-02 | 440905.9 | 3761761.5 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000698 | 0 | 0.12690E-02 | 440873.9 | 3761761.4 | 208.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000699 | 0 | 0.12690E-02 | 440841.9 | 3761761.3 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000700 | 0 | 0.12690E-02 | 440809.9 | 3761761.3 | 208.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000701 | 0 | 0.12690E-02 | 440806.4 | 3761735.0 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000702 | 0 | 0.12690E-02 | 440834.1 | 3761730.3 | 207.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000703 | 0 | 0.12690E-02 | 440866.1 | 3761730.3 | 207.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000704 | 0 | 0.12690E-02 | 440898.1 | 3761730.3 | 207.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000705 | 0 | 0.12690E-02 | 440930.1 | 3761730.3 | 207.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000706 | 0 | 0.12690E-02 | 440962.1 | 3761730.3 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000707 | 0 | 0.12690E-02 | 440994.1 | 3761730.3 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000708 | 0 | 0.12690E-02 | 441026.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000709 | 0 | 0.12690E-02 | 441058.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000710 | 0 | 0.12690E-02 | 441090.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000711 | 0 | 0.12690E-02 | 441122.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000712 | 0 | 0.12690E-02 | 441154.1 | 3761730.4 | 208.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000713 | 0 | 0.12690E-02 | 441186.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000714 | 0 | 0.12690E-02 | 441218.1 | 3761730.4 | 207.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000715 | 0 | 0.12690E-02 | 441250.1 | 3761730.4 | 208.1 | 5.00 | 14.88 | | | |

```
1.40     YES                    NO
 L0000716         0   0.12690E-02  441282.1 3761730.5   208.2     5.00    14.88
1.40     YES                    NO
 L0000717         0   0.12690E-02  441314.1 3761730.5   208.0     5.00    14.88
1.40     YES                    NO
 L0000718         0   0.12690E-02  441346.1 3761730.5   207.8     5.00    14.88
1.40     YES                    NO
 L0000719         0   0.12690E-02  441378.1 3761730.5   207.4     5.00    14.88
1.40     YES                    NO
 L0000720         0   0.12690E-02  441410.1 3761730.5   207.7     5.00    14.88
1.40     YES                    NO
```



```
                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000721         0   0.12690E-02  441442.1 3761730.5   207.6     5.00    14.88
1.40     YES                    NO
 L0000722         0   0.12690E-02  441474.1 3761730.5   207.5     5.00    14.88
1.40     YES                    NO
 L0000723         0   0.12690E-02  441506.1 3761730.6   207.1     5.00    14.88
1.40     YES                    NO
 L0000724         0   0.12690E-02  441538.1 3761730.6   207.1     5.00    14.88
1.40     YES                    NO
 L0000725         0   0.12690E-02  441570.1 3761730.6   208.9     5.00    14.88
1.40     YES                    NO
 L0000726         0   0.12690E-02  441602.1 3761730.6   208.7     5.00    14.88
1.40     YES                    NO
 L0000727         0   0.12690E-02  441634.1 3761730.6   208.2     5.00    14.88
1.40     YES                    NO
 L0000728         0   0.12690E-02  441666.1 3761730.6   208.2     5.00    14.88
1.40     YES                    NO
 L0000729         0   0.12690E-02  441698.1 3761730.6   208.3     5.00    14.88
1.40     YES                    NO
 L0000730         0   0.12690E-02  441730.1 3761730.6   208.4     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000731 | 0 | 0.12690E-02 | 441762.1 | 3761730.7 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000732 | 0 | 0.12690E-02 | 441794.1 | 3761730.7 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000733 | 0 | 0.12690E-02 | 441826.1 | 3761730.7 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000734 | 0 | 0.12690E-02 | 441858.1 | 3761730.7 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000735 | 0 | 0.12690E-02 | 441890.1 | 3761730.7 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000736 | 0 | 0.12690E-02 | 441922.1 | 3761730.7 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000737 | 0 | 0.12690E-02 | 441954.1 | 3761730.7 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000738 | 0 | 0.12690E-02 | 441986.1 | 3761730.8 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000739 | 0 | 0.12690E-02 | 442018.1 | 3761730.8 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000740 | 0 | 0.12690E-02 | 442050.1 | 3761730.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000741 | 0 | 0.12690E-02 | 442082.1 | 3761730.8 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000742 | 0 | 0.12690E-02 | 442114.1 | 3761730.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000743 | 0 | 0.12690E-02 | 442146.1 | 3761730.8 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000744 | 0 | 0.12690E-02 | 442178.1 | 3761730.8 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000745 | 0 | 0.12690E-02 | 442176.6 | 3761700.2 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000746 | 0 | 0.12690E-02 | 442147.5 | 3761697.2 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000747 | 0 | 0.12690E-02 | 442115.5 | 3761697.3 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000748 | 0 | 0.12690E-02 | 442083.5 | 3761697.4 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000749 | 0 | 0.12690E-02 | 442051.5 | 3761697.5 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000750 | 0 | 0.12690E-02 | 442019.5 | 3761697.7 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000751 | 0 | 0.12690E-02 | 441987.5 | 3761697.8 | 208.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000752 | 0 | 0.12690E-02 | 441955.5 | 3761697.9 | 208.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000753 | 0 | 0.12690E-02 | 441923.5 | 3761698.0 | 208.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000754 | 0 | 0.12690E-02 | 441891.5 | 3761698.1 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000755 | 0 | 0.12690E-02 | 441859.5 | 3761698.3 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000756 | 0 | 0.12690E-02 | 441827.5 | 3761698.4 | 208.7 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000757         0   0.12690E-02  441795.5 3761698.5   208.2     5.00    14.88
1.40     YES                    NO
 L0000758         0   0.12690E-02  441763.5 3761698.6   207.8     5.00    14.88
1.40     YES                    NO
 L0000759         0   0.12690E-02  441731.5 3761698.8   207.7     5.00    14.88
1.40     YES                    NO
 L0000760         0   0.12690E-02  441699.5 3761698.9   207.7     5.00    14.88
1.40     YES                    NO
```



```
                                                    *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000761         0   0.12690E-02  441667.5 3761699.0   207.7     5.00    14.88
1.40     YES                    NO
 L0000762         0   0.12690E-02  441635.5 3761699.1   207.7     5.00    14.88
1.40     YES                    NO
 L0000763         0   0.12690E-02  441603.5 3761699.3   208.5     5.00    14.88
1.40     YES                    NO
 L0000764         0   0.12690E-02  441571.5 3761699.4   209.6     5.00    14.88
1.40     YES                    NO
 L0000765         0   0.12690E-02  441539.5 3761699.5   206.9     5.00    14.88
1.40     YES                    NO
 L0000766         0   0.12690E-02  441507.5 3761699.6   206.9     5.00    14.88
1.40     YES                    NO
 L0000767         0   0.12690E-02  441475.5 3761699.7   207.5     5.00    14.88
1.40     YES                    NO
 L0000768         0   0.12690E-02  441443.5 3761699.9   207.5     5.00    14.88
1.40     YES                    NO
 L0000769         0   0.12690E-02  441411.5 3761700.0   207.4     5.00    14.88
1.40     YES                    NO
 L0000770         0   0.12690E-02  441379.5 3761700.1   207.1     5.00    14.88
1.40     YES                    NO
 L0000771         0   0.12690E-02  441347.5 3761700.2   207.6     5.00    14.88
1.40     YES                    NO
```

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 L0000772         0   0.12690E-02  441315.5 3761700.4   208.0     5.00    14.88
1.40     YES                     NO
 L0000773         0   0.12690E-02  441283.5 3761700.5   208.1     5.00    14.88
1.40     YES                     NO
 L0000774         0   0.12690E-02  441251.5 3761700.6   208.1     5.00    14.88
1.40     YES                     NO
 L0000775         0   0.12690E-02  441219.5 3761700.7   207.9     5.00    14.88
1.40     YES                     NO
 L0000776         0   0.12690E-02  441187.5 3761700.9   207.7     5.00    14.88
1.40     YES                     NO
 L0000777         0   0.12690E-02  441155.5 3761701.0   207.9     5.00    14.88
1.40     YES                     NO
 L0000778         0   0.12690E-02  441123.5 3761701.1   207.7     5.00    14.88
1.40     YES                     NO
 L0000779         0   0.12690E-02  441091.5 3761701.2   207.8     5.00    14.88
1.40     YES                     NO
 L0000780         0   0.12690E-02  441059.5 3761701.3   207.7     5.00    14.88
1.40     YES                     NO
 L0000781         0   0.12690E-02  441027.5 3761701.5   207.7     5.00    14.88
1.40     YES                     NO
 L0000782         0   0.12690E-02  440995.5 3761701.6   207.6     5.00    14.88
1.40     YES                     NO
 L0000783         0   0.12690E-02  440963.5 3761701.7   207.6     5.00    14.88
1.40     YES                     NO
 L0000784         0   0.12690E-02  440931.5 3761701.8   207.6     5.00    14.88
1.40     YES                     NO
 L0000785         0   0.12690E-02  440899.5 3761702.0   207.6     5.00    14.88
1.40     YES                     NO
 L0000786         0   0.12690E-02  440867.5 3761702.1   207.5     5.00    14.88
1.40     YES                     NO
 L0000787         0   0.12690E-02  440835.5 3761702.2   207.6     5.00    14.88
1.40     YES                     NO
 L0000788         0   0.12690E-02  440803.5 3761702.3   208.0     5.00    14.88
1.40     YES                     NO
 L0000789         0   0.34843E-02  442221.2 3762270.1   214.7     5.00    14.88
1.40     YES                     NO
 L0000790         0   0.34843E-02  442253.1 3762269.9   214.0     5.00    14.88
1.40     YES                     NO
 L0000791         0   0.34843E-02  442285.1 3762269.6   213.7     5.00    14.88
1.40     YES                     NO
 L0000792         0   0.34843E-02  442317.1 3762269.4   213.7     5.00    14.88
1.40     YES                     NO
 L0000793         0   0.34843E-02  442349.1 3762269.2   214.1     5.00    14.88
1.40     YES                     NO
 L0000794         0   0.34843E-02  442381.1 3762268.9   214.7     5.00    14.88
1.40     YES                     NO
 L0000795         0   0.34843E-02  442386.0 3762241.8   214.8     5.00    14.88
1.40     YES                     NO
 L0000796         0   0.34843E-02  442360.1 3762236.8   214.2     5.00    14.88
1.40     YES                     NO
 L0000797         0   0.34843E-02  442328.2 3762238.3   213.7     5.00    14.88
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1.40     YES                    NO
 L0000798         0   0.34843E-02  442296.2 3762239.7   213.4     5.00    14.88
1.40     YES                    NO
 L0000799         0   0.34843E-02  442264.2 3762241.1   213.6     5.00    14.88
1.40     YES                    NO
 L0000800         0   0.34843E-02  442232.3 3762242.6   214.2     5.00    14.88
1.40     YES                    NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                  *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000801         0   0.34843E-02  442209.1 3762234.8   214.4     5.00    14.88
1.40     YES                    NO
 L0000802         0   0.34843E-02  442210.1 3762203.7   214.0     5.00    14.88
1.40     YES                    NO
 L0000803         0   0.34843E-02  442242.1 3762203.5   213.6     5.00    14.88
1.40     YES                    NO
 L0000804         0   0.34843E-02  442274.1 3762203.2   213.2     5.00    14.88
1.40     YES                    NO
 L0000805         0   0.34843E-02  442306.1 3762203.0   213.1     5.00    14.88
1.40     YES                    NO
 L0000806         0   0.34843E-02  442338.1 3762202.8   213.6     5.00    14.88
1.40     YES                    NO
 L0000807         0   0.34843E-02  442370.1 3762202.5   214.0     5.00    14.88
1.40     YES                    NO
 L0000808         0   0.34843E-02  442386.6 3762186.4   214.3     5.00    14.88
1.40     YES                    NO
 L0000809         0   0.34843E-02  442375.2 3762166.5   213.8     5.00    14.88
1.40     YES                    NO
 L0000810         0   0.34843E-02  442343.2 3762166.5   213.5     5.00    14.88
1.40     YES                    NO
 L0000811         0   0.34843E-02  442311.2 3762166.5   213.0     5.00    14.88
1.40     YES                    NO
 L0000812         0   0.34843E-02  442279.2 3762166.5   213.0     5.00    14.88
1.40     YES                    NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000813 | 0 | 0.34843E-02 | 442247.2 | 3762166.5 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000814 | 0 | 0.34843E-02 | 442215.2 | 3762166.5 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000815 | 0 | 0.34843E-02 | 442206.8 | 3762144.6 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000816 | 0 | 0.34843E-02 | 442227.1 | 3762132.4 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000817 | 0 | 0.34843E-02 | 442259.1 | 3762133.1 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000818 | 0 | 0.34843E-02 | 442291.1 | 3762133.8 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000819 | 0 | 0.34843E-02 | 442323.0 | 3762134.5 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000820 | 0 | 0.34843E-02 | 442355.0 | 3762135.2 | 213.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000821 | 0 | 0.34843E-02 | 442387.0 | 3762135.9 | 213.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000822 | 0 | 0.34843E-02 | 442384.9 | 3762106.6 | 213.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000823 | 0 | 0.34843E-02 | 442352.9 | 3762106.4 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000824 | 0 | 0.34843E-02 | 442320.9 | 3762106.2 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000825 | 0 | 0.34843E-02 | 442288.9 | 3762106.0 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000826 | 0 | 0.34843E-02 | 442256.9 | 3762105.7 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000827 | 0 | 0.34843E-02 | 442224.9 | 3762105.5 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000828 | 0 | 0.34843E-02 | 442200.8 | 3762097.1 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000829 | 0 | 0.34843E-02 | 442210.8 | 3762076.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000830 | 0 | 0.34843E-02 | 442242.8 | 3762075.8 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000831 | 0 | 0.34843E-02 | 442274.8 | 3762075.6 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000832 | 0 | 0.34843E-02 | 442306.8 | 3762075.3 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000833 | 0 | 0.34843E-02 | 442338.8 | 3762075.1 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000834 | 0 | 0.34843E-02 | 442370.8 | 3762074.9 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000835 | 0 | 0.34843E-02 | 442402.8 | 3762074.7 | 213.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000836 | 0 | 0.34843E-02 | 442434.8 | 3762074.5 | 213.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000837 | 0 | 0.34843E-02 | 442466.8 | 3762074.3 | 213.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000838 | 0 | 0.34843E-02 | 442498.8 | 3762074.0 | 213.6 | 5.00 | 14.88 | | | |

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1.40     YES                    NO
 L0000839         0   0.34843E-02  442530.8 3762073.8   213.7     5.00    14.88
1.40     YES                    NO
 L0000840         0   0.34843E-02  442562.8 3762073.6   213.6     5.00    14.88
1.40     YES                    NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                        ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE  23
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                   *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000841         0   0.34843E-02  442594.8 3762073.4   213.6     5.00    14.88
1.40     YES                    NO
 L0000842         0   0.34843E-02  442626.8 3762073.2   213.6     5.00    14.88
1.40     YES                    NO
 L0000843         0   0.34843E-02  442658.8 3762072.9   213.5     5.00    14.88
1.40     YES                    NO
 L0000844         0   0.34843E-02  442690.8 3762072.7   213.5     5.00    14.88
1.40     YES                    NO
 L0000845         0   0.34843E-02  442722.8 3762072.5   213.4     5.00    14.88
1.40     YES                    NO
 L0000846         0   0.34843E-02  442754.8 3762072.3   213.2     5.00    14.88
1.40     YES                    NO
 L0000847         0   0.34843E-02  442784.9 3762070.3   212.9     5.00    14.88
1.40     YES                    NO
 L0000848         0   0.34843E-02  442780.4 3762041.5   212.5     5.00    14.88
1.40     YES                    NO
 L0000849         0   0.34843E-02  442748.4 3762041.8   212.7     5.00    14.88
1.40     YES                    NO
 L0000850         0   0.34843E-02  442716.4 3762042.1   212.8     5.00    14.88
1.40     YES                    NO
 L0000851         0   0.34843E-02  442684.4 3762042.4   212.8     5.00    14.88
1.40     YES                    NO
 L0000852         0   0.34843E-02  442652.4 3762042.7   212.8     5.00    14.88
1.40     YES                    NO
 L0000853         0   0.34843E-02  442620.4 3762043.0   212.9     5.00    14.88
1.40     YES                    NO
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000854 | 0 | 0.34843E-02 | 442588.4 | 3762043.3 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000855 | 0 | 0.34843E-02 | 442556.5 | 3762043.6 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000856 | 0 | 0.34843E-02 | 442524.5 | 3762043.9 | 213.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000857 | 0 | 0.34843E-02 | 442492.5 | 3762044.2 | 213.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000858 | 0 | 0.34843E-02 | 442460.5 | 3762044.5 | 213.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000859 | 0 | 0.34843E-02 | 442428.5 | 3762044.8 | 213.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000860 | 0 | 0.34843E-02 | 442396.5 | 3762045.1 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000861 | 0 | 0.34843E-02 | 442364.5 | 3762045.4 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000862 | 0 | 0.34843E-02 | 442332.5 | 3762045.7 | 212.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000863 | 0 | 0.34843E-02 | 442300.5 | 3762046.0 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000864 | 0 | 0.34843E-02 | 442268.5 | 3762046.3 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000865 | 0 | 0.34843E-02 | 442236.5 | 3762046.6 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000866 | 0 | 0.34843E-02 | 442207.9 | 3762043.5 | 212.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000867 | 0 | 0.34843E-02 | 442209.1 | 3762011.5 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000868 | 0 | 0.34843E-02 | 442240.6 | 3762010.9 | 212.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000869 | 0 | 0.34843E-02 | 442272.6 | 3762010.9 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000870 | 0 | 0.34843E-02 | 442304.6 | 3762010.9 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000871 | 0 | 0.34843E-02 | 442336.6 | 3762010.9 | 212.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000872 | 0 | 0.34843E-02 | 442368.6 | 3762010.9 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000873 | 0 | 0.34843E-02 | 442400.6 | 3762010.9 | 213.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000874 | 0 | 0.34843E-02 | 442432.6 | 3762010.9 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000875 | 0 | 0.34843E-02 | 442464.6 | 3762010.9 | 214.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000876 | 0 | 0.34843E-02 | 442496.6 | 3762010.9 | 213.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000877 | 0 | 0.34843E-02 | 442528.6 | 3762010.9 | 212.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000878 | 0 | 0.34843E-02 | 442560.6 | 3762010.9 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000879 | 0 | 0.34843E-02 | 442592.6 | 3762010.9 | 212.6 | 5.00 | 14.88 | | | |

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1.40     YES                     NO
 L0000880         0   0.34843E-02  442624.6 3762010.9   212.4     5.00    14.88
1.40     YES                     NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                        ***        07:43:46

                                   PAGE  24
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                     *** VOLUME SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE    INIT.
INIT.   URBAN  EMISSION RATE   AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT      SY
SZ     SOURCE  SCALAR VARY
     ID         CATS.               (METERS) (METERS) (METERS) (METERS) (METERS)
(METERS)             BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -

 L0000881         0   0.34843E-02  442656.6 3762010.9   212.3     5.00    14.88
1.40     YES                     NO
 L0000882         0   0.34843E-02  442688.6 3762010.9   212.5     5.00    14.88
1.40     YES                     NO
 L0000883         0   0.34843E-02  442720.6 3762010.9   212.5     5.00    14.88
1.40     YES                     NO
 L0000884         0   0.34843E-02  442752.6 3762010.9   212.3     5.00    14.88
1.40     YES                     NO
 L0000885         0   0.34843E-02  442783.5 3762010.0   212.1     5.00    14.88
1.40     YES                     NO
 L0000886         0   0.34843E-02  442780.3 3761978.2   211.8     5.00    14.88
1.40     YES                     NO
 L0000887         0   0.34843E-02  442753.5 3761972.3   211.8     5.00    14.88
1.40     YES                     NO
 L0000888         0   0.34843E-02  442721.5 3761972.3   212.1     5.00    14.88
1.40     YES                     NO
 L0000889         0   0.34843E-02  442689.5 3761972.3   211.9     5.00    14.88
1.40     YES                     NO
 L0000890         0   0.34843E-02  442657.5 3761972.3   211.8     5.00    14.88
1.40     YES                     NO
 L0000891         0   0.34843E-02  442625.5 3761972.3   212.0     5.00    14.88
1.40     YES                     NO
 L0000892         0   0.34843E-02  442593.5 3761972.3   212.2     5.00    14.88
1.40     YES                     NO
 L0000893         0   0.34843E-02  442561.5 3761972.3   212.3     5.00    14.88
1.40     YES                     NO
 L0000894         0   0.34843E-02  442529.5 3761972.3   212.5     5.00    14.88
1.40     YES                     NO
```

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| L0000895 | 0 | 0.34843E-02 | 442497.5 | 3761972.3 | 213.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000896 | 0 | 0.34843E-02 | 442465.5 | 3761972.3 | 213.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000897 | 0 | 0.34843E-02 | 442433.5 | 3761972.3 | 213.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000898 | 0 | 0.34843E-02 | 442401.5 | 3761972.3 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000899 | 0 | 0.34843E-02 | 442369.5 | 3761972.3 | 212.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000900 | 0 | 0.34843E-02 | 442337.5 | 3761972.3 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000901 | 0 | 0.34843E-02 | 442305.5 | 3761972.3 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000902 | 0 | 0.34843E-02 | 442273.5 | 3761972.3 | 212.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000903 | 0 | 0.34843E-02 | 442241.5 | 3761972.3 | 212.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000904 | 0 | 0.34843E-02 | 442209.5 | 3761972.3 | 211.6 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000905 | 0 | 0.34843E-02 | 442205.4 | 3761942.1 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000906 | 0 | 0.34843E-02 | 442234.1 | 3761939.1 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000907 | 0 | 0.34843E-02 | 442266.1 | 3761939.1 | 211.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000908 | 0 | 0.34843E-02 | 442298.1 | 3761939.1 | 211.3 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000909 | 0 | 0.34843E-02 | 442330.1 | 3761939.1 | 211.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000910 | 0 | 0.34843E-02 | 442362.1 | 3761939.1 | 212.1 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000911 | 0 | 0.34843E-02 | 442394.1 | 3761939.1 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000912 | 0 | 0.34843E-02 | 442426.1 | 3761939.1 | 212.0 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000913 | 0 | 0.34843E-02 | 442458.1 | 3761939.1 | 212.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000914 | 0 | 0.34843E-02 | 442490.1 | 3761939.1 | 212.4 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000915 | 0 | 0.34843E-02 | 442522.1 | 3761939.1 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000916 | 0 | 0.34843E-02 | 442554.1 | 3761939.1 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000917 | 0 | 0.34843E-02 | 442586.1 | 3761939.1 | 211.9 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000918 | 0 | 0.34843E-02 | 442618.1 | 3761939.1 | 211.7 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000919 | 0 | 0.34843E-02 | 442650.1 | 3761939.1 | 211.5 | 5.00 | 14.88 | 1.40 | YES | NO |
| L0000920 | 0 | 0.34843E-02 | 442682.1 | 3761939.1 | 211.3 | 5.00 | 14.88 | | | |

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE SCALAR VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0000921 | 0 | 0.34843E-02 | 442714.1 | 3761939.1 | 211.8 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000922 | 0 | 0.34843E-02 | 442746.1 | 3761939.1 | 211.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000923 | 0 | 0.34843E-02 | 442778.1 | 3761939.1 | 211.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000924 | 0 | 0.34843E-02 | 442784.2 | 3761915.4 | 211.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000925 | 0 | 0.34843E-02 | 442758.5 | 3761908.3 | 211.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000926 | 0 | 0.34843E-02 | 442726.5 | 3761908.1 | 211.7 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000927 | 0 | 0.34843E-02 | 442694.5 | 3761907.9 | 211.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000928 | 0 | 0.34843E-02 | 442662.5 | 3761907.7 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000929 | 0 | 0.34843E-02 | 442630.5 | 3761907.4 | 211.3 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000930 | 0 | 0.34843E-02 | 442598.5 | 3761907.2 | 211.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000931 | 0 | 0.34843E-02 | 442566.5 | 3761907.0 | 211.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000932 | 0 | 0.34843E-02 | 442534.5 | 3761906.8 | 211.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000933 | 0 | 0.34843E-02 | 442502.5 | 3761906.5 | 211.4 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000934 | 0 | 0.34843E-02 | 442470.5 | 3761906.3 | 211.6 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0000935 | 0 | 0.34843E-02 | 442438.5 | 3761906.1 | 211.4 | 5.00 | 14.88 | 1.40 | YES | NO | |

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 L0000936         0   0.34843E-02  442406.5 3761905.9   211.3     5.00    14.88
1.40     YES                     NO
 L0000937         0   0.34843E-02  442374.5 3761905.7   211.9     5.00    14.88
1.40     YES                     NO
 L0000938         0   0.34843E-02  442342.5 3761905.4   211.3     5.00    14.88
1.40     YES                     NO
 L0000939         0   0.34843E-02  442310.5 3761905.2   210.8     5.00    14.88
1.40     YES                     NO
 L0000940         0   0.34843E-02  442278.5 3761905.0   211.3     5.00    14.88
1.40     YES                     NO
 L0000941         0   0.34843E-02  442246.5 3761904.8   211.6     5.00    14.88
1.40     YES                     NO
 L0000942         0   0.34843E-02  442214.5 3761904.5   211.1     5.00    14.88
1.40     YES                     NO
 L0000943         0   0.34843E-02  442211.8 3761875.3   210.8     5.00    14.88
1.40     YES                     NO
 L0000944         0   0.34843E-02  442238.5 3761870.1   211.2     5.00    14.88
1.40     YES                     NO
 L0000945         0   0.34843E-02  442270.5 3761870.4   211.0     5.00    14.88
1.40     YES                     NO
 L0000946         0   0.34843E-02  442302.5 3761870.6   210.5     5.00    14.88
1.40     YES                     NO
 L0000947         0   0.34843E-02  442334.5 3761870.8   210.7     5.00    14.88
1.40     YES                     NO
 L0000948         0   0.34843E-02  442366.5 3761871.0   211.4     5.00    14.88
1.40     YES                     NO
 L0000949         0   0.34843E-02  442398.5 3761871.2   210.9     5.00    14.88
1.40     YES                     NO
 L0000950         0   0.34843E-02  442430.5 3761871.5   210.5     5.00    14.88
1.40     YES                     NO
 L0000951         0   0.34843E-02  442462.5 3761871.7   210.6     5.00    14.88
1.40     YES                     NO
 L0000952         0   0.34843E-02  442494.5 3761871.9   210.6     5.00    14.88
1.40     YES                     NO
 L0000953         0   0.34843E-02  442526.5 3761872.1   210.4     5.00    14.88
1.40     YES                     NO
 L0000954         0   0.34843E-02  442558.5 3761872.4   210.8     5.00    14.88
1.40     YES                     NO
 L0000955         0   0.34843E-02  442590.5 3761872.6   211.1     5.00    14.88
1.40     YES                     NO
 L0000956         0   0.34843E-02  442622.5 3761872.8   211.1     5.00    14.88
1.40     YES                     NO
 L0000957         0   0.34843E-02  442654.5 3761873.0   210.9     5.00    14.88
1.40     YES                     NO
 L0000958         0   0.34843E-02  442686.5 3761873.3   210.8     5.00    14.88
1.40     YES                     NO
 L0000959         0   0.34843E-02  442718.5 3761873.5   211.4     5.00    14.88
1.40     YES                     NO
 L0000960         0   0.34843E-02  442750.5 3761873.7   211.0     5.00    14.88
1.40     YES                     NO
```

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE SCALAR VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0000961 | 0 | 0.34843E-02 | 442782.3 | 3761873.8 | 210.9 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000962 | 0 | 0.34843E-02 | 442780.7 | 3761843.3 | 210.5 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000963 | 0 | 0.34843E-02 | 442748.7 | 3761843.1 | 210.7 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000964 | 0 | 0.34843E-02 | 442716.7 | 3761842.9 | 211.0 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000965 | 0 | 0.34843E-02 | 442684.7 | 3761842.7 | 210.4 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000966 | 0 | 0.34843E-02 | 442652.7 | 3761842.4 | 210.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000967 | 0 | 0.34843E-02 | 442620.7 | 3761842.2 | 210.8 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000968 | 0 | 0.34843E-02 | 442588.7 | 3761842.0 | 210.8 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000969 | 0 | 0.34843E-02 | 442556.7 | 3761841.8 | 210.5 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000970 | 0 | 0.34843E-02 | 442524.7 | 3761841.5 | 210.1 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000971 | 0 | 0.34843E-02 | 442492.7 | 3761841.3 | 210.0 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000972 | 0 | 0.34843E-02 | 442460.7 | 3761841.1 | 209.9 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000973 | 0 | 0.34843E-02 | 442428.7 | 3761840.9 | 209.9 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000974 | 0 | 0.34843E-02 | 442396.7 | 3761840.7 | 210.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000975 | 0 | 0.34843E-02 | 442364.8 | 3761840.4 | 211.0 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0000976 | 0 | 0.34843E-02 | 442332.8 | 3761840.2 | 210.3 | 5.00 | 14.88 | 1.40 | YES | | NO |

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 L0000977         0   0.34843E-02  442300.8 3761840.0   210.2     5.00    14.88
1.40     YES                     NO
 L0000978         0   0.34843E-02  442268.8 3761839.8   210.8     5.00    14.88
1.40     YES                     NO
 L0000979         0   0.34843E-02  442236.8 3761839.5   210.9     5.00    14.88
1.40     YES                     NO
 L0000980         0   0.34843E-02  442211.8 3761832.3   210.5     5.00    14.88
1.40     YES                     NO
 L0000981         0   0.34843E-02  442212.3 3761800.8   210.0     5.00    14.88
1.40     YES                     NO
 L0000982         0   0.34843E-02  442244.3 3761801.2   210.3     5.00    14.88
1.40     YES                     NO
 L0000983         0   0.34843E-02  442276.3 3761801.7   210.1     5.00    14.88
1.40     YES                     NO
 L0000984         0   0.34843E-02  442308.3 3761802.1   209.8     5.00    14.88
1.40     YES                     NO
 L0000985         0   0.34843E-02  442340.3 3761802.6   209.9     5.00    14.88
1.40     YES                     NO
 L0000986         0   0.34843E-02  442372.3 3761803.0   210.1     5.00    14.88
1.40     YES                     NO
 L0000987         0   0.34843E-02  442404.3 3761803.4   210.0     5.00    14.88
1.40     YES                     NO
 L0000988         0   0.34843E-02  442436.3 3761803.9   209.8     5.00    14.88
1.40     YES                     NO
 L0000989         0   0.34843E-02  442468.3 3761804.3   209.8     5.00    14.88
1.40     YES                     NO
 L0000990         0   0.34843E-02  442500.3 3761804.8   210.0     5.00    14.88
1.40     YES                     NO
 L0000991         0   0.34843E-02  442532.3 3761805.2   210.2     5.00    14.88
1.40     YES                     NO
 L0000992         0   0.34843E-02  442564.2 3761805.7   210.3     5.00    14.88
1.40     YES                     NO
 L0000993         0   0.34843E-02  442596.2 3761806.1   210.4     5.00    14.88
1.40     YES                     NO
 L0000994         0   0.34843E-02  442628.2 3761806.5   210.5     5.00    14.88
1.40     YES                     NO
 L0000995         0   0.34843E-02  442660.2 3761807.0   210.2     5.00    14.88
1.40     YES                     NO
 L0000996         0   0.34843E-02  442692.2 3761807.4   210.4     5.00    14.88
1.40     YES                     NO
 L0000997         0   0.34843E-02  442724.2 3761807.9   210.8     5.00    14.88
1.40     YES                     NO
 L0000998         0   0.34843E-02  442756.2 3761808.3   210.3     5.00    14.88
1.40     YES                     NO
 L0000999         0   0.34843E-02  442788.2 3761808.7   210.3     5.00    14.88
1.40     YES                     NO
 L0001000         0   0.34843E-02  442790.3 3761778.8   210.0     5.00    14.88
1.40     YES                     NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                             ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE SCALAR VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0001001 | 0 | 0.34843E-02 | 442760.3 | 3761776.7 | 210.0 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001002 | 0 | 0.34843E-02 | 442728.3 | 3761776.6 | 210.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001003 | 0 | 0.34843E-02 | 442696.3 | 3761776.4 | 210.2 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001004 | 0 | 0.34843E-02 | 442664.3 | 3761776.3 | 209.9 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001005 | 0 | 0.34843E-02 | 442632.3 | 3761776.1 | 210.2 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001006 | 0 | 0.34843E-02 | 442600.3 | 3761776.0 | 210.2 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001007 | 0 | 0.34843E-02 | 442568.3 | 3761775.8 | 210.2 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001008 | 0 | 0.34843E-02 | 442536.3 | 3761775.7 | 210.2 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001009 | 0 | 0.34843E-02 | 442504.3 | 3761775.5 | 210.0 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001010 | 0 | 0.34843E-02 | 442472.3 | 3761775.4 | 209.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001011 | 0 | 0.34843E-02 | 442440.3 | 3761775.2 | 209.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001012 | 0 | 0.34843E-02 | 442408.3 | 3761775.1 | 209.5 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001013 | 0 | 0.34843E-02 | 442376.3 | 3761774.9 | 209.5 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001014 | 0 | 0.34843E-02 | 442344.3 | 3761774.8 | 209.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001015 | 0 | 0.34843E-02 | 442312.3 | 3761774.6 | 209.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001016 | 0 | 0.34843E-02 | 442280.3 | 3761774.5 | 209.6 | 5.00 | 14.88 | 1.40 | YES | | NO |
| L0001017 | 0 | 0.34843E-02 | 442248.3 | 3761774.3 | 209.7 | 5.00 | 14.88 | 1.40 | YES | | NO |

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 L0001018         0   0.34843E-02  442216.3 3761774.2   209.7     5.00    14.88
1.40     YES                     NO
 L0001019         0   0.34843E-02  442215.8 3761742.7   209.6     5.00    14.88
1.40     YES                     NO
 L0001020         0   0.34843E-02  442240.7 3761735.9   209.4     5.00    14.88
1.40     YES                     NO
 L0001021         0   0.34843E-02  442272.7 3761736.3   209.3     5.00    14.88
1.40     YES                     NO
 L0001022         0   0.34843E-02  442304.7 3761736.7   209.3     5.00    14.88
1.40     YES                     NO
 L0001023         0   0.34843E-02  442336.7 3761737.0   209.3     5.00    14.88
1.40     YES                     NO
 L0001024         0   0.34843E-02  442368.7 3761737.4   209.1     5.00    14.88
1.40     YES                     NO
 L0001025         0   0.34843E-02  442400.7 3761737.8   209.2     5.00    14.88
1.40     YES                     NO
 L0001026         0   0.34843E-02  442432.7 3761738.1   209.0     5.00    14.88
1.40     YES                     NO
 L0001027         0   0.34843E-02  442464.7 3761738.5   209.2     5.00    14.88
1.40     YES                     NO
 L0001028         0   0.34843E-02  442496.7 3761738.9   209.7     5.00    14.88
1.40     YES                     NO
 L0001029         0   0.34843E-02  442528.7 3761739.3   210.2     5.00    14.88
1.40     YES                     NO
 L0001030         0   0.34843E-02  442560.7 3761739.6   210.2     5.00    14.88
1.40     YES                     NO
 L0001031         0   0.34843E-02  442592.7 3761740.0   210.1     5.00    14.88
1.40     YES                     NO
 L0001032         0   0.34843E-02  442624.7 3761740.4   210.0     5.00    14.88
1.40     YES                     NO
 L0001033         0   0.34843E-02  442656.7 3761740.7   209.8     5.00    14.88
1.40     YES                     NO
 L0001034         0   0.34843E-02  442688.7 3761741.1   209.8     5.00    14.88
1.40     YES                     NO
 L0001035         0   0.34843E-02  442720.7 3761741.5   210.3     5.00    14.88
1.40     YES                     NO
 L0001036         0   0.34843E-02  442752.7 3761741.8   209.8     5.00    14.88
1.40     YES                     NO
 L0001037         0   0.34843E-02  442784.7 3761742.2   209.7     5.00    14.88
1.40     YES                     NO
 L0001038         0   0.34843E-02  442792.7 3761716.0   209.6     5.00    14.88
1.40     YES                     NO
 L0001039         0   0.34843E-02  442763.9 3761713.0   209.6     5.00    14.88
1.40     YES                     NO
 L0001040         0   0.34843E-02  442731.9 3761713.0   210.2     5.00    14.88
1.40     YES                     NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                         ***        07:43:46
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** VOLUME SOURCE DATA ***

| SOURCE ID | NUMBER PART. CATS. | EMISSION RATE (GRAMS/SEC) | X (METERS) | Y (METERS) | BASE ELEV. (METERS) | RELEASE HEIGHT (METERS) | INIT. SY (METERS) | INIT. SZ (METERS) | URBAN SOURCE | EMISSION RATE VARY BY | AIRCRAFT |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L0001041 | 0 | 0.34843E-02 | 442699.9 | 3761713.0 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001042 | 0 | 0.34843E-02 | 442667.9 | 3761713.0 | 209.5 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001043 | 0 | 0.34843E-02 | 442635.9 | 3761713.0 | 209.8 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001044 | 0 | 0.34843E-02 | 442603.9 | 3761713.0 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001045 | 0 | 0.34843E-02 | 442571.9 | 3761713.0 | 210.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001046 | 0 | 0.34843E-02 | 442539.9 | 3761713.0 | 210.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001047 | 0 | 0.34843E-02 | 442507.9 | 3761713.0 | 209.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001048 | 0 | 0.34843E-02 | 442475.9 | 3761713.0 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001049 | 0 | 0.34843E-02 | 442443.9 | 3761713.0 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001050 | 0 | 0.34843E-02 | 442411.9 | 3761713.0 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001051 | 0 | 0.34843E-02 | 442379.9 | 3761713.0 | 209.2 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001052 | 0 | 0.34843E-02 | 442347.9 | 3761713.0 | 209.0 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001053 | 0 | 0.34843E-02 | 442315.9 | 3761713.0 | 209.1 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001054 | 0 | 0.34843E-02 | 442283.9 | 3761713.0 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001055 | 0 | 0.34843E-02 | 442251.9 | 3761713.0 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001056 | 0 | 0.34843E-02 | 442219.9 | 3761713.0 | 208.9 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001057 | 0 | 0.34843E-02 | 442202.3 | 3761696.0 | 208.8 | 5.00 | 14.88 | 1.40 | YES | NO | |
| L0001058 | 0 | 0.34843E-02 | 442216.7 | 3761681.3 | 208.4 | 5.00 | 14.88 | 1.40 | YES | NO | |

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 L0001059         0   0.34843E-02  442248.7 3761681.7   207.8     5.00    14.88
1.40     YES                     NO
 L0001060         0   0.34843E-02  442280.7 3761682.0   208.3     5.00    14.88
1.40     YES                     NO
 L0001061         0   0.34843E-02  442312.7 3761682.4   208.9     5.00    14.88
1.40     YES                     NO
 L0001062         0   0.34843E-02  442344.7 3761682.8   208.9     5.00    14.88
1.40     YES                     NO
 L0001063         0   0.34843E-02  442376.7 3761683.1   209.1     5.00    14.88
1.40     YES                     NO
 L0001064         0   0.34843E-02  442408.7 3761683.5   208.9     5.00    14.88
1.40     YES                     NO
 L0001065         0   0.34843E-02  442440.7 3761683.8   209.0     5.00    14.88
1.40     YES                     NO
 L0001066         0   0.34843E-02  442472.7 3761684.2   209.0     5.00    14.88
1.40     YES                     NO
 L0001067         0   0.34843E-02  442504.7 3761684.6   209.6     5.00    14.88
1.40     YES                     NO
 L0001068         0   0.34843E-02  442536.7 3761684.9   209.7     5.00    14.88
1.40     YES                     NO
 L0001069         0   0.34843E-02  442568.7 3761685.3   209.7     5.00    14.88
1.40     YES                     NO
 L0001070         0   0.34843E-02  442600.7 3761685.7   209.7     5.00    14.88
1.40     YES                     NO
 L0001071         0   0.34843E-02  442632.7 3761686.0   209.6     5.00    14.88
1.40     YES                     NO
 L0001072         0   0.34843E-02  442664.7 3761686.4   209.3     5.00    14.88
1.40     YES                     NO
 L0001073         0   0.34843E-02  442696.7 3761686.8   209.5     5.00    14.88
1.40     YES                     NO
 L0001074         0   0.34843E-02  442728.7 3761687.1   210.0     5.00    14.88
1.40     YES                     NO
 L0001075         0   0.34843E-02  442760.7 3761687.5   209.5     5.00    14.88
1.40     YES                     NO
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                                *** AREAPOLY SOURCE DATA ***

               NUMBER EMISSION RATE   LOCATION OF AREA  BASE     RELEASE  NUMBER
 INIT.   URBAN  EMISSION RATE    AIRCRAFT
   SOURCE       PART.  (GRAMS/SEC       X        Y      ELEV.    HEIGHT  OF VERTS.
  SZ     SOURCE  SCALAR VARY
     ID         CATS.   /METER**2)   (METERS) (METERS) (METERS) (METERS)
(METERS)              BY
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             L0000081    , L0000082    , L0000083    , L0000084    , L0000085    ,
L0000086    , L0000087    , L0000088    ,

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L0000094    , L0000095    , L0000096    ,

             L0000097    , L0000098    , L0000099    , L0000100    , L0000101    ,
L0000102    , L0000103    , L0000104    ,

             L0000105    , L0000106    , L0000107    , L0000108    , L0000109    ,
L0000110    , L0000111    , L0000112    ,

             L0000113    , L0000114    , L0000115    , L0000116    , L0000117    ,
L0000118    , L0000119    , L0000120    ,

             L0000121    , L0000122    , L0000123    , L0000124    , L0000125    ,
L0000126    , L0000127    , L0000128    ,

             L0000129    , L0000130    , L0000131    , L0000132    , L0000133    ,
L0000134    , L0000135    , L0000136    ,

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L0000142    , L0000143    , L0000144    ,

             L0000145    , L0000146    , L0000147    , L0000148    , L0000149    ,
L0000150    , L0000151    , L0000152    ,

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L0000158    , L0000159    , L0000160    ,
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                                                *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                   SOURCE IDs
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L0000166    , L0000167    , L0000168    ,

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L0000174    , L0000175    , L0000176    ,
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L0000206 , L0000207 , L0000208 ,

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L0000294 , L0000295 , L0000296 ,

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L0000310 , L0000311 , L0000312 ,

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             L0000313    , L0000314    , L0000315    , L0000316    , L0000317    ,
L0000318    , L0000319    , L0000320    ,
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
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 *** AERMET - VERSION  16216 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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             L0000321    , L0000322    , L0000323    , L0000324    , L0000325    ,
L0000326    , L0000327    , L0000328    ,

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L0000334    , L0000335    , L0000336    ,

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L0000390    , L0000391    , L0000392    ,

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L0000398    , L0000399    , L0000400    ,

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L0000478    , L0000479    , L0000480    ,
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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             L0000481    , L0000482    , L0000483    , L0000484    , L0000485    ,
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L0000510    , L0000511    , L0000512    ,
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L0000622    , L0000623    , L0000624    ,

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L0000638    , L0000639    , L0000640    ,
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                             ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
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| | L0000641 , L0000642 , L0000643 , L0000644 , L0000645 , L0000646 , L0000647 , L0000648 , |
| | L0000649 , L0000650 , L0000651 , L0000652 , L0000653 , L0000654 , L0000655 , L0000656 , |
| | L0000657 , L0000658 , L0000659 , L0000660 , L0000661 , L0000662 , L0000663 , L0000664 , |
| | L0000665 , L0000666 , L0000667 , L0000668 , L0000669 , L0000670 , L0000671 , L0000672 , |
| | L0000673 , L0000674 , L0000675 , L0000676 , L0000677 , L0000678 , L0000679 , L0000680 , |
| | L0000681 , L0000682 , L0000683 , L0000684 , L0000685 , L0000686 , L0000687 , L0000688 , |
| | L0000689 , L0000690 , L0000691 , L0000692 , L0000693 , L0000694 , L0000695 , L0000696 , |
| | L0000697 , L0000698 , L0000699 , L0000700 , L0000701 , L0000702 , L0000703 , L0000704 , |
| | L0000705 , L0000706 , L0000707 , L0000708 , L0000709 , L0000710 , L0000711 , L0000712 , |
| | L0000713 , L0000714 , L0000715 , L0000716 , L0000717 , L0000718 , L0000719 , L0000720 , |
| | L0000721 , L0000722 , L0000723 , L0000724 , L0000725 , L0000726 , L0000727 , L0000728 , |
| | L0000729 , L0000730 , L0000731 , L0000732 , L0000733 , L0000734 , L0000735 , L0000736 , |
| | L0000737 , L0000738 , L0000739 , L0000740 , L0000741 , L0000742 , L0000743 , L0000744 , |

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             L0000785    , L0000786    , L0000787    , L0000788    ,

  P2FUGITI   PAREA1      ,
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
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 *** AERMET - VERSION  16216 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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L0000802    , L0000803    , L0000804    ,

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L0000818    , L0000819    , L0000820    ,

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L0000826    , L0000827    , L0000828    ,

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L0000834    , L0000835    , L0000836    ,
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L0000866    , L0000867    , L0000868    ,

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L0000946    , L0000947    , L0000948    ,
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINING SOURCE GROUPS ***
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| SRCGROUP ID | SOURCE IDs |
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| | L0000965 , L0000966 , L0000967 , L0000968 , L0000969 , L0000970 , L0000971 , L0000972 , |
| | L0000973 , L0000974 , L0000975 , L0000976 , L0000977 , L0000978 , L0000979 , L0000980 , |
| | L0000981 , L0000982 , L0000983 , L0000984 , L0000985 , L0000986 , L0000987 , L0000988 , |
| | L0000989 , L0000990 , L0000991 , L0000992 , L0000993 , L0000994 , L0000995 , L0000996 , |
| | L0000997 , L0000998 , L0000999 , L0001000 , L0001001 , L0001002 , L0001003 , L0001004 , |
| | L0001005 , L0001006 , L0001007 , L0001008 , L0001009 , L0001010 , L0001011 , L0001012 , |
| | L0001013 , L0001014 , L0001015 , L0001016 , L0001017 , L0001018 , L0001019 , L0001020 , |
| | L0001021 , L0001022 , L0001023 , L0001024 , L0001025 , L0001026 , L0001027 , L0001028 , |
| | L0001029 , L0001030 , L0001031 , L0001032 , L0001033 , L0001034 , L0001035 , L0001036 , |
| | L0001037 , L0001038 , L0001039 , L0001040 , L0001041 , L0001042 , L0001043 , L0001044 , |
| | L0001045 , L0001046 , L0001047 , L0001048 , L0001049 , L0001050 , L0001051 , L0001052 , |
| | L0001053 , L0001054 , L0001055 , L0001056 , L0001057 , L0001058 , L0001059 , L0001060 , |
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             L0000016    , L0000017    , L0000018    , L0000019    , L0000020    ,
L0000021    , L0000022    , L0000023    ,
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                          *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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             L0000024    , L0000025    , L0000026    , L0000027    , L0000028    ,
L0000029    , L0000030    , L0000031    ,

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             L0000040    , L0000041    , L0000042    , L0000043    , L0000044    ,
L0000045    , L0000046    , L0000047    ,

             L0000048    , L0000049    , L0000050    , L0000051    , L0000052    ,
L0000053    , L0000054    , L0000055    ,

             L0000056    , L0000057    , L0000058    , L0000059    , L0000060    ,
L0000061    , L0000062    , L0000063    ,

             L0000064    , L0000065    , L0000066    , L0000067    , L0000068    ,
L0000069    , L0000070    , L0000071    ,

             L0000072    , L0000073    , L0000074    , L0000075    , L0000076    ,
L0000077    , L0000078    , L0000079    ,

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L0000085    , L0000086    , L0000087    ,
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L0000101    , L0000102    , L0000103    ,

             L0000104    , L0000105    , L0000106    , L0000107    , L0000108    ,
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             L0000112    , L0000113    , L0000114    , L0000115    , L0000116    ,
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L0000165    , L0000166    , L0000167    ,

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             L0000176    , L0000177    , L0000178    , L0000179    , L0000180    ,
L0000181    , L0000182    , L0000183    ,
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
|---|---|

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             L0000184    , L0000185    , L0000186    , L0000187    , L0000188    ,
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L0000189 , L0000190 , L0000191 ,

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L0000336 , L0000337 , L0000338 , L0000339 , L0000340 ,
L0000341 , L0000342 , L0000343 ,



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
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| | L0000368 , L0000369 , L0000370 , L0000371 , L0000372 , L0000373 , L0000374 , L0000375 , |
| | L0000376 , L0000377 , L0000378 , L0000379 , L0000380 , L0000381 , L0000382 , L0000383 , |
| | L0000384 , L0000385 , L0000386 , L0000387 , L0000388 , L0000389 , L0000390 , L0000391 , |
| | L0000392 , L0000393 , L0000394 , L0000395 , L0000396 , L0000397 , L0000398 , L0000399 , |
| | L0000400 , L0000401 , L0000402 , L0000403 , L0000404 , L0000405 , L0000406 , L0000407 , |
| | L0000408 , L0000409 , L0000410 , L0000411 , L0000412 , L0000413 , L0000414 , L0000415 , |
| | L0000416 , L0000417 , L0000418 , L0000419 , L0000420 , L0000421 , L0000422 , L0000423 , |

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L0000477    , L0000478    , L0000479    ,

             L0000480    , L0000481    , L0000482    , L0000483    , L0000484    ,
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                                                *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                   SOURCE IDs
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L0000645 , L0000646 , L0000647 ,

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L0000653 , L0000654 , L0000655 ,

L0000656 , L0000657 , L0000658 , L0000659 , L0000660 ,
L0000661 , L0000662 , L0000663 ,



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
|---|---|
| | L0000664 , L0000665 , L0000666 , L0000667 , L0000668 , L0000669 , L0000670 , L0000671 , |
| | L0000672 , L0000673 , L0000674 , L0000675 , L0000676 , L0000677 , L0000678 , L0000679 , |
| | L0000680 , L0000681 , L0000682 , L0000683 , L0000684 , L0000685 , L0000686 , L0000687 , |
| | L0000688 , L0000689 , L0000690 , L0000691 , L0000692 , L0000693 , L0000694 , L0000695 , |
| | L0000696 , L0000697 , L0000698 , L0000699 , L0000700 , L0000701 , L0000702 , L0000703 , |
| | L0000704 , L0000705 , L0000706 , L0000707 , L0000708 , L0000709 , L0000710 , L0000711 , |
| | L0000712 , L0000713 , L0000714 , L0000715 , L0000716 , L0000717 , L0000718 , L0000719 , |
| | L0000720 , L0000721 , L0000722 , L0000723 , L0000724 , L0000725 , L0000726 , L0000727 , |
| | L0000728 , L0000729 , L0000730 , L0000731 , L0000732 , L0000733 , L0000734 , L0000735 , |
| | L0000736 , L0000737 , L0000738 , L0000739 , L0000740 , L0000741 , L0000742 , L0000743 , |
| | L0000744 , L0000745 , L0000746 , L0000747 , L0000748 , L0000749 , L0000750 , L0000751 , |
| | L0000752 , L0000753 , L0000754 , L0000755 , L0000756 , |

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             L0000768    , L0000769    , L0000770    , L0000771    , L0000772    ,
L0000773    , L0000774    , L0000775    ,

             L0000776    , L0000777    , L0000778    , L0000779    , L0000780    ,
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L0000789    , L0000790    , L0000791    ,

             L0000792    , L0000793    , L0000794    , L0000795    , L0000796    ,
L0000797    , L0000798    , L0000799    ,

             L0000800    , L0000801    , L0000802    , L0000803    , L0000804    ,
L0000805    , L0000806    , L0000807    ,

             L0000808    , L0000809    , L0000810    , L0000811    , L0000812    ,
L0000813    , L0000814    , L0000815    ,

             L0000816    , L0000817    , L0000818    , L0000819    , L0000820    ,
L0000821    , L0000822    , L0000823    ,
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINING SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
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             L0000824    , L0000825    , L0000826    , L0000827    , L0000828    ,
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             L0000832    , L0000833    , L0000834    , L0000835    , L0000836    ,
L0000837    , L0000838    , L0000839    ,

             L0000840    , L0000841    , L0000842    , L0000843    , L0000844    ,
L0000845    , L0000846    , L0000847    ,

             L0000848    , L0000849    , L0000850    , L0000851    , L0000852    ,
L0000853    , L0000854    , L0000855    ,
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L0000877    , L0000878    , L0000879    ,

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L0000885    , L0000886    , L0000887    ,

             L0000888    , L0000889    , L0000890    , L0000891    , L0000892    ,
L0000893    , L0000894    , L0000895    ,

             L0000896    , L0000897    , L0000898    , L0000899    , L0000900    ,
L0000901    , L0000902    , L0000903    ,

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L0000909    , L0000910    , L0000911    ,

             L0000912    , L0000913    , L0000914    , L0000915    , L0000916    ,
L0000917    , L0000918    , L0000919    ,

             L0000920    , L0000921    , L0000922    , L0000923    , L0000924    ,
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L0000933    , L0000934    , L0000935    ,

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L0000941    , L0000942    , L0000943    ,

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L0000957    , L0000958    , L0000959    ,

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L0000965    , L0000966    , L0000967    ,

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L0000973    , L0000974    , L0000975    ,

             L0000976    , L0000977    , L0000978    , L0000979    , L0000980    ,
L0000981    , L0000982    , L0000983    ,
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                             ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
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*** SOURCE IDs DEFINING SOURCE GROUPS ***

| SRCGROUP ID | SOURCE IDs |
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| | L0000984 , L0000985 , L0000986 , L0000987 , L0000988 , L0000989 , L0000990 , L0000991 , |
| | L0000992 , L0000993 , L0000994 , L0000995 , L0000996 , L0000997 , L0000998 , L0000999 , |
| | L0001000 , L0001001 , L0001002 , L0001003 , L0001004 , L0001005 , L0001006 , L0001007 , |
| | L0001008 , L0001009 , L0001010 , L0001011 , L0001012 , L0001013 , L0001014 , L0001015 , |
| | L0001016 , L0001017 , L0001018 , L0001019 , L0001020 , L0001021 , L0001022 , L0001023 , |
| | L0001024 , L0001025 , L0001026 , L0001027 , L0001028 , L0001029 , L0001030 , L0001031 , |
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| | L0001056 , L0001057 , L0001058 , L0001059 , L0001060 , L0001061 , L0001062 , L0001063 , |
| | L0001064 , L0001065 , L0001066 , L0001067 , L0001068 , L0001069 , L0001070 , L0001071 , |
| | L0001072 , L0001073 , L0001074 , L0001075 , PAREA2 , |

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|
| PAREA1 | 2035210. | L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , |
| | | L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , |
| | | L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , |
| | | L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , L0000029 , L0000030 , L0000031 , |
| | | L0000032 , L0000033 , L0000034 , L0000035 , L0000036 , L0000037 , L0000038 , L0000039 , |
| | | L0000040 , L0000041 , L0000042 , L0000043 , L0000044 , L0000045 , L0000046 , L0000047 , |
| | | L0000048 , L0000049 , L0000050 , L0000051 , L0000052 , L0000053 , L0000054 , L0000055 , |
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| | | L0000064 , L0000065 , L0000066 , L0000067 , L0000068 , L0000069 , L0000070 , L0000071 , |
| | | L0000072 , L0000073 , L0000074 , L0000075 , L0000076 , L0000077 , L0000078 , L0000079 , |
| | | L0000080 , L0000081 , L0000082 , L0000083 , L0000084 , L0000085 , L0000086 , L0000087 , |
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L0000149 , L0000150 , L0000151 ,

L0000152 , L0000153 , L0000154 , L0000155 , L0000156 ,
L0000157 , L0000158 , L0000159 ,


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|

L0000160 , L0000161 , L0000162 , L0000163 , L0000164 ,
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L0000181 , L0000182 , L0000183 ,

L0000184 , L0000185 , L0000186 , L0000187 , L0000188 ,
L0000189 , L0000190 , L0000191 ,

L0000192 , L0000193 , L0000194 , L0000195 , L0000196 ,
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|
| | | L0000320 , L0000321 , L0000322 , L0000323 , L0000324 , L0000325 , L0000326 , L0000327 , |
| | | L0000328 , L0000329 , L0000330 , L0000331 , L0000332 , L0000333 , L0000334 , L0000335 , |
| | | L0000336 , L0000337 , L0000338 , L0000339 , L0000340 , L0000341 , L0000342 , L0000343 , |
| | | L0000344 , L0000345 , L0000346 , L0000347 , L0000348 , L0000349 , L0000350 , L0000351 , |
| | | L0000352 , L0000353 , L0000354 , L0000355 , L0000356 , L0000357 , L0000358 , L0000359 , |
| | | L0000360 , L0000361 , L0000362 , L0000363 , L0000364 , L0000365 , L0000366 , L0000367 , |
| | | L0000368 , L0000369 , L0000370 , L0000371 , L0000372 , L0000373 , L0000374 , L0000375 , |
| | | L0000376 , L0000377 , L0000378 , L0000379 , L0000380 , L0000381 , L0000382 , L0000383 , |
| | | L0000384 , L0000385 , L0000386 , L0000387 , L0000388 , L0000389 , L0000390 , L0000391 , |
| | | L0000392 , L0000393 , L0000394 , L0000395 , L0000396 , L0000397 , L0000398 , L0000399 , |
| | | L0000400 , L0000401 , L0000402 , L0000403 , L0000404 , L0000405 , L0000406 , L0000407 , |
| | | L0000408 , L0000409 , L0000410 , L0000411 , L0000412 , L0000413 , L0000414 , L0000415 , |
| | | L0000416 , L0000417 , L0000418 , L0000419 , L0000420 , L0000421 , L0000422 , L0000423 , |
| | | L0000424 , L0000425 , L0000426 , L0000427 , L0000428 , L0000429 , L0000430 , L0000431 , |

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L0000453    , L0000454    , L0000455    ,

             L0000456    , L0000457    , L0000458    , L0000459    , L0000460    ,
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             L0000464    , L0000465    , L0000466    , L0000467    , L0000468    ,
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             L0000472    , L0000473    , L0000474    , L0000475    , L0000476    ,
L0000477    , L0000478    , L0000479    ,
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
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 *** AERMET - VERSION  16216 ***   ***
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                                 PAGE  47
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINED AS URBAN SOURCES
***

  URBAN ID   URBAN POP                                     SOURCE IDs
  --------   ---------                                     ----------


             L0000480    , L0000481    , L0000482    , L0000483    , L0000484    ,
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L0000493    , L0000494    , L0000495    ,

             L0000496    , L0000497    , L0000498    , L0000499    , L0000500    ,
L0000501    , L0000502    , L0000503    ,

             L0000504    , L0000505    , L0000506    , L0000507    , L0000508    ,
L0000509    , L0000510    , L0000511    ,

             L0000512    , L0000513    , L0000514    , L0000515    , L0000516    ,
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             L0000520    , L0000521    , L0000522    , L0000523    , L0000524    ,
L0000525    , L0000526    , L0000527    ,
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L0000573 , L0000574 , L0000575 ,

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L0000629 , L0000630 , L0000631 ,

L0000632 , L0000633 , L0000634 , L0000635 , L0000636 ,
L0000637 , L0000638 , L0000639 ,


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES

***

| URBAN ID | URBAN POP | SOURCE IDs |
|---|---|---|
| | | L0000640 , L0000641 , L0000642 , L0000643 , L0000644 , L0000645 , L0000646 , L0000647 , |
| | | L0000648 , L0000649 , L0000650 , L0000651 , L0000652 , L0000653 , L0000654 , L0000655 , |
| | | L0000656 , L0000657 , L0000658 , L0000659 , L0000660 , L0000661 , L0000662 , L0000663 , |
| | | L0000664 , L0000665 , L0000666 , L0000667 , L0000668 , L0000669 , L0000670 , L0000671 , |
| | | L0000672 , L0000673 , L0000674 , L0000675 , L0000676 , L0000677 , L0000678 , L0000679 , |
| | | L0000680 , L0000681 , L0000682 , L0000683 , L0000684 , L0000685 , L0000686 , L0000687 , |
| | | L0000688 , L0000689 , L0000690 , L0000691 , L0000692 , L0000693 , L0000694 , L0000695 , |
| | | L0000696 , L0000697 , L0000698 , L0000699 , L0000700 , L0000701 , L0000702 , L0000703 , |
| | | L0000704 , L0000705 , L0000706 , L0000707 , L0000708 , L0000709 , L0000710 , L0000711 , |
| | | L0000712 , L0000713 , L0000714 , L0000715 , L0000716 , L0000717 , L0000718 , L0000719 , |
| | | L0000720 , L0000721 , L0000722 , L0000723 , L0000724 , L0000725 , L0000726 , L0000727 , |
| | | L0000728 , L0000729 , L0000730 , L0000731 , L0000732 , L0000733 , L0000734 , L0000735 , |
| | | L0000736 , L0000737 , L0000738 , L0000739 , L0000740 , L0000741 , L0000742 , L0000743 , |
| | | L0000744 , L0000745 , L0000746 , L0000747 , L0000748 , L0000749 , L0000750 , L0000751 , |
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             L0000792    , L0000793    , L0000794    , L0000795    , L0000796    ,
L0000797    , L0000798    , L0000799    ,
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*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*


                                        *** SOURCE IDs DEFINED AS URBAN SOURCES
***

  URBAN ID   URBAN POP                                    SOURCE IDs
  --------   ---------                                    ----------


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L0000813    , L0000814    , L0000815    ,

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L0000821    , L0000822    , L0000823    ,

             L0000824    , L0000825    , L0000826    , L0000827    , L0000828    ,
L0000829    , L0000830    , L0000831    ,

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L0000837    , L0000838    , L0000839    ,

             L0000840    , L0000841    , L0000842    , L0000843    , L0000844    ,
L0000845    , L0000846    , L0000847    ,

             L0000848    , L0000849    , L0000850    , L0000851    , L0000852    ,
L0000853    , L0000854    , L0000855    ,
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L0000944 , L0000945 , L0000946 , L0000947 , L0000948 ,
L0000949 , L0000950 , L0000951 ,

L0000952 , L0000953 , L0000954 , L0000955 , L0000956 ,
L0000957 , L0000958 , L0000959 ,


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** SOURCE IDs DEFINED AS URBAN SOURCES ***

URBAN ID URBAN POP SOURCE IDs

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  --------   ---------                                   ----------


             L0000960    , L0000961    , L0000962    , L0000963    , L0000964    ,
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L0000973    , L0000974    , L0000975    ,

             L0000976    , L0000977    , L0000978    , L0000979    , L0000980    ,
L0000981    , L0000982    , L0000983    ,

             L0000984    , L0000985    , L0000986    , L0000987    , L0000988    ,
L0000989    , L0000990    , L0000991    ,

             L0000992    , L0000993    , L0000994    , L0000995    , L0000996    ,
L0000997    , L0000998    , L0000999    ,

             L0001000    , L0001001    , L0001002    , L0001003    , L0001004    ,
L0001005    , L0001006    , L0001007    ,

             L0001008    , L0001009    , L0001010    , L0001011    , L0001012    ,
L0001013    , L0001014    , L0001015    ,

             L0001016    , L0001017    , L0001018    , L0001019    , L0001020    ,
L0001021    , L0001022    , L0001023    ,

             L0001024    , L0001025    , L0001026    , L0001027    , L0001028    ,
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L0001061    , L0001062    , L0001063    ,

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L0001069    , L0001070    , L0001071    ,

             L0001072    , L0001073    , L0001074    , L0001075    , PAREA2      ,
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

( 440400.6, 3761994.8, 210.3, 210.3, 2.0); ( 440450.6, 3761994.8, 210.5, 210.5, 2.0);
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( 440500.6, 3762044.8, 211.1, 211.1, 2.0); ( 440550.6, 3762044.8, 211.1, 211.1, 2.0);
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( 440500.6, 3762144.8, 212.6, 212.6, 2.0); ( 440550.6, 3762144.8, 212.2, 212.2, 2.0);
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( 441245.1, 3761319.9, 204.7, 204.7, 2.0); ( 441145.1, 3761369.9, 204.9, 204.9, 2.0);
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( 441245.1, 3761519.9, 206.7, 206.7, 2.0); ( 441145.1, 3761569.9, 206.7, 206.7, 2.0);
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     ( 442017.0, 3761316.3,     206.0,     206.0,       2.0);         ( 442067.0,
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     ( 441917.0, 3761366.3,     206.6,     206.6,       2.0);         ( 441967.0,
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     ( 442017.0, 3761366.3,     206.5,     206.5,       2.0);         ( 442067.0,
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     ( 442017.0, 3761416.3,     206.9,     206.9,       2.0);         ( 442067.0,
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     ( 442017.0, 3761466.3,     207.2,     207.2,       2.0);         ( 442067.0,
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     ( 441917.0, 3761516.3,     207.5,     207.5,       2.0);         ( 441967.0,
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     ( 442017.0, 3761516.3,     207.5,     207.5,       2.0);         ( 442067.0,
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     ( 442017.0, 3761616.3,     208.1,     208.1,       2.0);         ( 442067.0,
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     ( 442947.7, 3761995.1,     211.9,     211.9,       2.0);         ( 442997.7,
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 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                        ***        07:43:46
```

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

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```

( 442947.7, 3762195.1, 214.3, 214.3, 2.0); ( 442997.7, 3762195.1, 214.5, 214.5, 2.0);
( 443047.7, 3762195.1, 214.6, 214.6, 2.0); ( 443097.7, 3762195.1, 214.6, 214.6, 2.0);
( 443147.7, 3762195.1, 214.4, 214.4, 2.0); ( 443197.7, 3762195.1, 214.5, 214.5, 2.0);
( 442447.7, 3762245.1, 214.8, 214.8, 2.0); ( 442497.7, 3762245.1, 214.7, 214.7, 2.0);
( 442547.7, 3762245.1, 214.3, 214.3, 2.0); ( 442597.7, 3762245.1, 214.7, 214.7, 2.0);
( 442647.7, 3762245.1, 214.7, 214.7, 2.0); ( 442697.7, 3762245.1, 214.6, 214.6, 2.0);
( 442747.7, 3762245.1, 214.5, 214.5, 2.0); ( 442797.7, 3762245.1, 214.4, 214.4, 2.0);
( 442847.7, 3762245.1, 214.4, 214.4, 2.0); ( 442897.7, 3762245.1, 214.7, 214.7, 2.0);
( 442947.7, 3762245.1, 214.8, 214.8, 2.0); ( 442997.7, 3762245.1, 214.9, 214.9, 2.0);
( 443047.7, 3762245.1, 214.8, 214.8, 2.0); ( 443097.7, 3762245.1, 214.8, 214.8, 2.0);
( 443147.7, 3762245.1, 214.7, 214.7, 2.0); ( 443197.7, 3762245.1, 214.8, 214.8, 2.0);
( 442822.8, 3761611.8, 208.4, 208.4, 2.0); ( 442872.8, 3761611.8, 208.7, 208.7, 2.0);
( 442922.8, 3761611.8, 208.8, 208.8, 2.0); ( 442972.8, 3761611.8, 208.5, 208.5, 2.0);
( 442822.8, 3761661.8, 209.0, 209.0, 2.0); ( 442872.8, 3761661.8, 208.9, 208.9, 2.0);
( 442922.8, 3761661.8, 209.0, 209.0, 2.0); ( 442972.8, 3761661.8, 208.9, 208.9, 2.0);
( 442732.3, 3762366.1, 215.6, 215.6, 2.0); ( 442782.3, 3762366.1, 215.8, 215.8, 2.0);
( 442832.3, 3762366.1, 216.3, 216.3, 2.0); ( 442732.3, 3762416.1, 216.0, 216.0, 2.0);
( 442782.3, 3762416.1, 216.2, 216.2, 2.0); ( 442832.3, 3762416.1, 216.4, 216.4, 2.0);
( 442732.3, 3762466.1, 216.3, 216.3, 2.0); ( 442782.3, 3762466.1, 216.6, 216.6, 2.0);
( 442832.3, 3762466.1, 217.0, 217.0, 2.0); ( 441922.8, 3762323.8, 214.0, 214.0, 2.0);
( 441972.8, 3762323.8, 214.4, 214.4, 2.0); ( 442022.8, 3762323.8, 215.0, 215.0, 2.0);
( 442072.8, 3762323.8, 215.2, 215.2, 2.0); ( 441922.8, 3762373.8, 215.2, 215.2, 2.0);
( 441972.8, 3762373.8, 214.9, 214.9, 2.0); ( 442022.8, 3762373.8, 215.3, 215.3, 2.0);

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

```
     ( 442072.8, 3762373.8,     215.4,     215.4,       2.0);         ( 441922.8,
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     ( 441972.8, 3762423.8,     215.6,     215.6,       2.0);         ( 442022.8,
3762423.8,     215.7,     215.7,       2.0);
     ( 442072.8, 3762423.8,     215.8,     215.8,       2.0);         ( 441922.8,
3762473.8,     216.2,     216.2,       2.0);
     ( 441972.8, 3762473.8,     216.1,     216.1,       2.0);         ( 442022.8,
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     ( 442072.8, 3762473.8,     216.2,     216.2,       2.0);         ( 441922.8,
3762523.8,     216.5,     216.5,       2.0);
     ( 441972.8, 3762523.8,     216.5,     216.5,       2.0);         ( 442022.8,
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     ( 442072.8, 3762523.8,     216.5,     216.5,       2.0);         ( 441922.8,
3762573.8,     216.9,     216.9,       2.0);
     ( 441972.8, 3762573.8,     216.8,     216.8,       2.0);         ( 442022.8,
3762573.8,     216.8,     216.8,       2.0);
     ( 442072.8, 3762573.8,     216.9,     216.9,       2.0);         ( 441922.8,
3762623.8,     217.2,     217.2,       2.0);
     ( 441972.8, 3762623.8,     217.3,     217.3,       2.0);         ( 442022.8,
3762623.8,     217.4,     217.4,       2.0);
     ( 442072.8, 3762623.8,     217.6,     217.6,       2.0);         ( 441109.5,
3762319.6,     214.0,     214.0,       2.0);
     ( 441159.5, 3762319.6,     213.6,     213.6,       2.0);         ( 441209.5,
3762319.6,     213.6,     213.6,       2.0);
     ( 441259.5, 3762319.6,     214.3,     214.3,       2.0);         ( 441109.5,
3762369.6,     215.1,     215.1,       2.0);
     ( 441159.5, 3762369.6,     214.1,     214.1,       2.0);         ( 441209.5,
3762369.6,     214.0,     214.0,       2.0);
     ( 441259.5, 3762369.6,     214.6,     214.6,       2.0);         ( 441109.5,
3762419.6,     215.8,     215.8,       2.0);
     ( 441159.5, 3762419.6,     214.6,     214.6,       2.0);         ( 441209.5,
3762419.6,     214.2,     214.2,       2.0);
     ( 441259.5, 3762419.6,     214.1,     214.1,       2.0);         ( 441109.5,
3762469.6,     215.9,     215.9,       2.0);
     ( 441159.5, 3762469.6,     215.0,     215.0,       2.0);         ( 441209.5,
3762469.6,     214.6,     214.6,       2.0);
     ( 441259.5, 3762469.6,     215.0,     215.0,       2.0);         ( 441109.5,
3762519.6,     216.4,     216.4,       2.0);
     ( 441159.5, 3762519.6,     215.4,     215.4,       2.0);         ( 441209.5,
3762519.6,     215.1,     215.1,       2.0);
     ( 441259.5, 3762519.6,     215.0,     215.0,       2.0);         ( 441109.5,
3762569.6,     217.2,     217.2,       2.0);
     ( 441159.5, 3762569.6,     215.9,     215.9,       2.0);         ( 441209.5,
3762569.6,     215.4,     215.4,       2.0);
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( 441159.5, 3762619.6, 216.2, 216.2, 2.0); ( 441209.5, 3762619.6, 215.8, 215.8, 2.0);
( 441259.5, 3762619.6, 216.0, 216.0, 2.0); ( 441109.5, 3762669.6, 217.1, 217.1, 2.0);
( 441159.5, 3762669.6, 216.7, 216.7, 2.0); ( 441209.5, 3762669.6, 216.7, 216.7, 2.0);
( 441259.5, 3762669.6, 216.7, 216.7, 2.0); ( 441109.5, 3762719.6, 218.0, 218.0, 2.0);
( 441159.5, 3762719.6, 217.5, 217.5, 2.0); ( 441209.5, 3762719.6, 217.4, 217.4, 2.0);
( 441259.5, 3762719.6, 217.1, 217.1, 2.0); ( 441109.5, 3762769.6, 218.4, 218.4, 2.0);
( 441159.5, 3762769.6, 218.0, 218.0, 2.0); ( 441209.5, 3762769.6, 217.5, 217.5, 2.0);
( 441259.5, 3762769.6, 217.3, 217.3, 2.0); ( 441313.5, 3762805.4, 218.1, 218.1, 2.0);
( 441363.5, 3762805.4, 218.4, 218.4, 2.0); ( 441413.5, 3762805.4, 218.3, 218.3, 2.0);
( 441463.5, 3762805.4, 218.4, 218.4, 2.0); ( 441513.5, 3762805.4, 218.8, 218.8, 2.0);
( 441563.5, 3762805.4, 218.4, 218.4, 2.0); ( 441613.5, 3762805.4, 218.2, 218.2, 2.0);
( 441663.5, 3762805.4, 218.5, 218.5, 2.0); ( 441713.5, 3762805.4, 218.9, 218.9, 2.0);
( 441763.5, 3762805.4, 218.6, 218.6, 2.0); ( 441813.5, 3762805.4, 218.9, 218.9, 2.0);
( 441313.5, 3762855.4, 218.7, 218.7, 2.0); ( 441363.5, 3762855.4, 218.8, 218.8, 2.0);
( 441413.5, 3762855.4, 218.9, 218.9, 2.0); ( 441463.5, 3762855.4, 218.9, 218.9, 2.0);
( 441513.5, 3762855.4, 219.1, 219.1, 2.0); ( 441563.5, 3762855.4, 219.2, 219.2, 2.0);
( 441613.5, 3762855.4, 219.0, 219.0, 2.0); ( 441663.5, 3762855.4, 219.1, 219.1, 2.0);
( 441713.5, 3762855.4, 219.4, 219.4, 2.0); ( 441763.5, 3762855.4, 219.2, 219.2, 2.0);
( 441813.5, 3762855.4, 219.8, 219.8, 2.0); ( 441313.5, 3762905.4, 219.3, 219.3, 2.0);
( 441363.5, 3762905.4, 219.1, 219.1, 2.0); ( 441413.5, 3762905.4, 219.7, 219.7, 2.0);
( 441463.5, 3762905.4, 219.7, 219.7, 2.0); ( 441513.5, 3762905.4, 220.0, 220.0, 2.0);
( 441563.5, 3762905.4, 220.1, 220.1, 2.0); ( 441613.5, 3762905.4, 218.4, 218.4, 2.0);

*** DISCRETE CARTESIAN RECEPTORS ***
(X-COORD, Y-COORD, ZELEV, ZHILL, ZFLAG)
(METERS)

( 441663.5, 3762905.4, 220.1, 220.1, 2.0); ( 441713.5, 3762905.4, 220.0, 220.0, 2.0);
( 441763.5, 3762905.4, 218.1, 218.1, 2.0); ( 441813.5, 3762905.4, 220.0, 220.0, 2.0);
( 441313.5, 3762955.4, 219.7, 219.7, 2.0); ( 441363.5, 3762955.4, 219.7, 219.7, 2.0);
( 441413.5, 3762955.4, 220.2, 220.2, 2.0); ( 441463.5, 3762955.4, 220.4, 220.4, 2.0);
( 441513.5, 3762955.4, 220.7, 220.7, 2.0); ( 441563.5, 3762955.4, 220.6, 220.6, 2.0);
( 441613.5, 3762955.4, 220.5, 220.5, 2.0); ( 441663.5, 3762955.4, 221.0, 221.0, 2.0);
( 441713.5, 3762955.4, 220.8, 220.8, 2.0); ( 441763.5, 3762955.4, 220.2, 220.2, 2.0);
( 441813.5, 3762955.4, 220.2, 220.2, 2.0); ( 440408.2, 3761498.6, 205.4, 205.4, 2.0);
( 440956.5, 3762849.6, 219.2, 219.2, 2.0); ( 440559.3, 3761306.1, 203.9, 203.9, 2.0);
( 440752.0, 3761305.4, 204.1, 204.1, 2.0); ( 440857.7, 3761312.8, 204.3, 204.3, 2.0);
( 440969.2, 3761308.3, 204.3, 204.3, 2.0); ( 440936.7, 3761237.4, 204.1, 204.1, 2.0);



* SOURCE-RECEPTOR COMBINATIONS FOR WHICH CALCULATIONS MAY NOT BE PERFORMED *
LESS THAN 1.0 METER; WITHIN OPENPIT; OR BEYOND 80KM FOR FASTAREA/FASTALL

| SOURCE ID | - - RECEPTOR LOCATION - - XR (METERS) | YR (METERS) | DISTANCE (METERS) |
|---|---|---|---|
| L0000774 | 441245.1 | 3761669.9 | |

```
-0.67
                              L0000776            441195.1     3761669.9
-0.15
                              L0000777            441145.1     3761669.9
0.74
                              L0000836            442447.7     3762095.1
-7.65
                              L0000837            442447.7     3762095.1
-3.70
                              L0000838            442497.7     3762095.1
-10.88
                              L0000839            442547.7     3762095.1
-4.80
                              L0000840            442547.7     3762095.1
-5.70
                              L0000841            442597.7     3762095.1
-10.06
                              L0000842            442647.7     3762095.1
-1.68
                              L0000843            442647.7     3762095.1
-7.19
                              L0000844            442697.7     3762095.1
-8.56
                              L0000846            442747.7     3762095.1
-8.08
                              L0000847            442797.7     3762095.1
-4.04
```



```
*** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                                          *** METEOROLOGICAL DAYS SELECTED FOR
PROCESSING ***
                                                                (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
```

```
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1
1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON
WHAT IS INCLUDED IN THE DATA FILE.



                                    *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED
CATEGORIES ***
                                                                (METERS/SEC)

                                                   1.54,   3.09,   5.14,   8.23,
10.80,
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                    PAGE  57
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                                      *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL
DATA ***

   Surface file:   KCNO_v9.SFC
                 Met Version:  16216
   Profile file:   KCNO_v9.PFL

   Surface format: FREE

   Profile format: FREE

   Surface station no.:     3179                  Upper air station no.:     3190
                  Name: UNKNOWN                                     Name: UNKNOWN

                  Year:   2012                                      Year:   2012

 First 24 hours of scalar data
 YR MO DY JDY HR     H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN    Z0  BOWEN
ALBEDO  REF WS   WD     HT  REF TA     HT
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - -
 12 01 01   1 01   -2.3  0.067 -9.000 -9.000 -999.   41.     11.2  0.09   0.74
1.00    0.73  313.    7.9  279.2    2.0
 12 01 01   1 02   -2.7  0.070 -9.000 -9.000 -999.   44.     11.3  0.09   0.74
1.00    0.80  342.    7.9  280.9    2.0
 12 01 01   1 03   -5.6  0.098 -9.000 -9.000 -999.   73.     14.7  0.09   0.74
1.00    1.20    9.    7.9  281.4    2.0
 12 01 01   1 04   -3.5  0.078 -9.000 -9.000 -999.   52.     11.9  0.09   0.74
```

```
1.00    0.94   21.    7.9  282.0    2.0
 12 01 01   1 05   -8.4  0.119 -9.000 -9.000 -999.   99.     18.1  0.09   0.74
1.00    1.45  353.    7.9  279.9    2.0
 12 01 01   1 06   -7.6  0.113 -9.000 -9.000 -999.   91.     17.0  0.09   0.74
1.00    1.38  325.    7.9  277.5    2.0
 12 01 01   1 07   -8.0  0.117 -9.000 -9.000 -999.   96.     17.7  0.09   0.74
1.00    1.42  313.    7.9  281.4    2.0
 12 01 01   1 08   -5.2  0.101 -9.000 -9.000 -999.   77.     17.5  0.09   0.74
0.53    1.23   19.    7.9  280.9    2.0
 12 01 01   1 09   23.2  0.117  0.267  0.012   29.   97.     -6.2  0.09   0.74
0.31    0.96  318.    7.9  287.5    2.0
 12 01 01   1 10   65.2  0.101  0.531  0.014   82.   77.     -1.4  0.09   0.74
0.24    0.63  244.    7.9  291.4    2.0
 12 01 01   1 11   95.5  0.162  0.778  0.008  176.  156.     -4.0  0.09   0.74
0.21    1.23   91.    7.9  296.4    2.0
 12 01 01   1 12  110.8  0.197  1.018  0.005  338.  209.     -6.1  0.09   0.74
0.20    1.60   90.    7.9  299.9    2.0
 12 01 01   1 13  110.5  0.229  1.184  0.005  534.  262.     -9.6  0.09   0.74
0.20    1.98   92.    7.9  302.0    2.0
 12 01 01   1 14   94.6  0.185  1.215  0.005  674.  191.     -5.9  0.09   0.74
0.21    1.50   73.    7.9  303.1    2.0
 12 01 01   1 15   68.6  0.187  1.184  0.005  858.  194.     -8.4  0.09   0.74
0.25    1.59   64.    7.9  303.1    2.0
 12 01 01   1 16   24.9  0.255  0.862  0.005  911.  308.    -58.8  0.09   0.74
0.34    2.61   92.    7.9  300.4    2.0
 12 01 01   1 17  -13.7  0.168 -9.000 -9.000 -999.  168.     31.1  0.09   0.74
0.62    1.98  107.    7.9  295.4    2.0
 12 01 01   1 18  -26.7  0.279 -9.000 -9.000 -999.  354.     85.6  0.09   0.74
1.00    3.22  134.    7.9  291.4    2.0
 12 01 01   1 19   -8.0  0.118 -9.000 -9.000 -999.  120.     18.2  0.09   0.74
1.00    1.43   37.    7.9  290.4    2.0
 12 01 01   1 20   -7.7  0.115 -9.000 -9.000 -999.   94.     17.6  0.09   0.74
1.00    1.40   49.    7.9  287.0    2.0
 12 01 01   1 21   -9.7  0.130 -9.000 -9.000 -999.  113.     20.2  0.09   0.74
1.00    1.57   26.    7.9  288.8    2.0
 12 01 01   1 22   -4.8  0.090 -9.000 -9.000 -999.   65.     13.6  0.09   0.74
1.00    1.11   56.    7.9  284.9    2.0
 12 01 01   1 23  -11.5  0.141 -9.000 -9.000 -999.  127.     21.9  0.09   0.74
1.00    1.69   36.    7.9  282.0    2.0
 12 01 01   1 24  -16.9  0.172 -9.000 -9.000 -999.  171.     32.4  0.09   0.74
1.00    2.03   33.    7.9  279.9    2.0


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 12 01 01 01    7.9 1  313.    0.73   279.3   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                             ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 1.29732 | 440450.61 | 3761994.75 | 1.46319 |
| 440500.61 | 3761994.75 | 1.66803 | 440550.61 | 3761994.75 | 1.94377 |
| 440600.61 | 3761994.75 | 2.30535 | 440650.61 | 3761994.75 | 2.81086 |
| 440400.61 | 3762044.75 | 1.26756 | 440450.61 | 3762044.75 | 1.42896 |
| 440500.61 | 3762044.75 | 1.62777 | 440550.61 | 3762044.75 | 1.88766 |
| 440600.61 | 3762044.75 | 2.23673 | 440650.61 | 3762044.75 | 2.73121 |
| 440400.61 | 3762094.75 | 1.21882 | 440450.61 | 3762094.75 | 1.37202 |
| 440500.61 | 3762094.75 | 1.56015 | 440550.61 | 3762094.75 | 1.80321 |
| 440600.61 | 3762094.75 | 2.14039 | 440650.61 | 3762094.75 | 2.58175 |
| 440400.61 | 3762144.75 | 1.16606 | 440450.61 | 3762144.75 | 1.31272 |
| 440500.61 | 3762144.75 | 1.48208 | 440550.61 | 3762144.75 | 1.71492 |
| 440600.61 | 3762144.75 | 2.00849 | 440650.61 | 3762144.75 | 2.41612 |
| 441145.13 | 3761319.94 | 1.88148 | 441195.13 | | |

3761319.94 1.92250
441245.13 3761319.94 1.95752 441145.13
3761369.94 2.11998
441195.13 3761369.94 2.16793 441245.13
3761369.94 2.20920
441145.13 3761419.94 2.41725 441195.13
3761419.94 2.47498
441245.13 3761419.94 2.52572 441145.13
3761469.94 2.80193
441195.13 3761469.94 2.87072 441245.13
3761469.94 2.93355
441145.13 3761519.94 3.32045 441195.13
3761519.94 3.40335
441245.13 3761519.94 3.47615 441145.13
3761569.94 4.06739
441195.13 3761569.94 4.16822 441245.13
3761569.94 4.25405
441145.13 3761619.94 5.28030 441195.13
3761619.94 5.40468
441245.13 3761619.94 5.50691 441145.13
3761669.94 7.46002
441195.13 3761669.94 7.59071 441245.13
3761669.94 7.71804
441917.00 3761316.31 1.84936 441967.00
3761316.31 1.79750
442017.00 3761316.31 1.74122 442067.00
3761316.31 1.67978
441917.00 3761366.31 2.09368 441967.00
3761366.31 2.03368
442017.00 3761366.31 1.96502 442067.00
3761366.31 1.89134
441917.00 3761416.31 2.40189 441967.00
3761416.31 2.32931
442017.00 3761416.31 2.24568 442067.00
3761416.31 2.15374
441917.00 3761466.31 2.79832 441967.00
3761466.31 2.71170
442017.00 3761466.31 2.60971 442067.00
3761466.31 2.49435
441917.00 3761516.31 3.33226 441967.00
3761516.31 3.22877
442017.00 3761516.31 3.10372 442067.00
3761516.31 2.95648
441917.00 3761566.31 4.09838 441967.00
3761566.31 3.97501
442017.00 3761566.31 3.82050 442067.00
3761566.31 3.62835
441917.00 3761616.31 5.32837 441967.00
3761616.31 5.18105
442017.00 3761616.31 4.99031 442067.00
3761616.31 4.74025

```
         442847.68    3761995.12        1.47642                      442897.68
3761995.12        1.37747
         442947.68    3761995.12        1.27617                      442997.68
3761995.12        1.19119
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE  59
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P2EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
         443047.68    3761995.12        1.11796                      443097.68
3761995.12        1.05122
         443147.68    3761995.12        0.99458                      443197.68
3761995.12        0.94274
         442847.68    3762045.12        1.49375                      442897.68
3762045.12        1.38696
         442947.68    3762045.12        1.29139                      442997.68
3762045.12        1.20855
         443047.68    3762045.12        1.13302                      443097.68
3762045.12        1.06658
         443147.68    3762045.12        1.00637                      443197.68
3762045.12        0.95389
         442447.68    3762095.12        3.25213                      442497.68
3762095.12        2.87782
         442547.68    3762095.12        2.57649                      442597.68
3762095.12        2.32957
         442647.68    3762095.12        2.10854                      442697.68
3762095.12        1.92830
```

| | | | | | |
|---|---|---|---|---|---|
| 442747.68 | 3762095.12 | 1.76828 | 442797.68 | 3762095.12 | 1.62655 |
| 442847.68 | 3762095.12 | 1.49711 | 442897.68 | 3762095.12 | 1.39177 |
| 442947.68 | 3762095.12 | 1.29814 | 442997.68 | 3762095.12 | 1.22138 |
| 443047.68 | 3762095.12 | 1.14433 | 443097.68 | 3762095.12 | 1.07583 |
| 443147.68 | 3762095.12 | 1.01403 | 443197.68 | 3762095.12 | 0.96454 |
| 442447.68 | 3762145.12 | 3.15020 | 442497.68 | 3762145.12 | 2.80204 |
| 442547.68 | 3762145.12 | 2.50935 | 442597.68 | 3762145.12 | 2.28268 |
| 442647.68 | 3762145.12 | 2.07214 | 442697.68 | 3762145.12 | 1.89667 |
| 442747.68 | 3762145.12 | 1.74810 | 442797.68 | 3762145.12 | 1.61305 |
| 442847.68 | 3762145.12 | 1.48368 | 442897.68 | 3762145.12 | 1.38553 |
| 442947.68 | 3762145.12 | 1.29692 | 442997.68 | 3762145.12 | 1.21897 |
| 443047.68 | 3762145.12 | 1.14403 | 443097.68 | 3762145.12 | 1.07615 |
| 443147.68 | 3762145.12 | 1.01475 | 443197.68 | 3762145.12 | 0.96237 |
| 442447.68 | 3762195.12 | 3.00485 | 442497.68 | 3762195.12 | 2.68590 |
| 442547.68 | 3762195.12 | 2.41457 | 442597.68 | 3762195.12 | 2.20532 |
| 442647.68 | 3762195.12 | 2.01952 | 442697.68 | 3762195.12 | 1.85875 |
| 442747.68 | 3762195.12 | 1.71785 | 442797.68 | 3762195.12 | 1.58684 |
| 442847.68 | 3762195.12 | 1.46686 | 442897.68 | 3762195.12 | 1.37186 |
| 442947.68 | 3762195.12 | 1.28987 | 442997.68 | 3762195.12 | 1.21376 |
| 443047.68 | 3762195.12 | 1.14220 | 443097.68 | 3762195.12 | 1.07658 |
| 443147.68 | 3762195.12 | 1.01506 | 443197.68 | 3762195.12 | 0.96096 |
| 442447.68 | 3762245.12 | 2.81761 | 442497.68 | 3762245.12 | 2.53690 |
| 442547.68 | 3762245.12 | 2.29833 | 442597.68 | 3762245.12 | 2.10973 |
| 442647.68 | 3762245.12 | 1.94084 | 442697.68 | 3762245.12 | 1.79319 |
| 442747.68 | 3762245.12 | 1.65866 | 442797.68 | 3762245.12 | 1.54279 |
| 442847.68 | 3762245.12 | 1.43996 | 442897.68 | | |

3762245.12 1.35250
442947.68 3762245.12 1.26999 442997.68
3762245.12 1.19615
443047.68 3762245.12 1.12534 443097.68
3762245.12 1.06306
443147.68 3762245.12 1.00440 443197.68
3762245.12 0.95267
442822.81 3761611.77 1.15325 442872.81
3761611.77 1.08572
442922.81 3761611.77 1.02456 442972.81
3761611.77 0.96892



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762466.08 1.29447
442832.29 3762466.08 1.23380 441922.75
3762323.77 5.59065
441972.75 3762323.77 5.46019 442022.75
3762323.77 5.25687
442072.75 3762323.77 5.02755 441922.75
3762373.77 4.07082
441972.75 3762373.77 4.03209 442022.75
3762373.77 3.88807
442072.75 3762373.77 3.74287 441922.75
3762423.77 3.13568
441972.75 3762423.77 3.14297 442022.75
3762423.77 3.06645
442072.75 3762423.77 2.96595 441922.75
3762473.77 2.56342
441972.75 3762473.77 2.54518 442022.75
3762473.77 2.50649
442072.75 3762473.77 2.42407 441922.75
3762523.77 2.13598
441972.75 3762523.77 2.11799 442022.75
3762523.77 2.09752
442072.75 3762523.77 2.03651 441922.75
3762573.77 1.79964
441972.75 3762573.77 1.79434 442022.75
3762573.77 1.76998
442072.75 3762573.77 1.73288 441922.75
3762623.77 1.54842
441972.75 3762623.77 1.53550 442022.75
3762623.77 1.51647
442072.75 3762623.77 1.48923 441109.54
3762319.57 4.84936
441159.54 3762319.57 5.08630 441209.54
3762319.57 5.24786
441259.54 3762319.57 5.22570 441109.54
3762369.57 3.29051
441159.54 3762369.57 3.65271 441209.54
3762369.57 3.79256
441259.54 3762369.57 3.78684 441109.54
3762419.57 2.47034
441159.54 3762419.57 2.77908 441209.54
3762419.57 2.95675
441259.54 3762419.57 3.07718 441109.54
3762469.57 2.01292
441159.54 3762469.57 2.22236 441209.54
3762469.57 2.35758
441259.54 3762469.57 2.39163 441109.54
3762519.57 1.66484
441159.54 3762519.57 1.84060 441209.54
3762519.57 1.93986
441259.54 3762519.57 2.00844 441109.54
3762569.57 1.40570

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         441159.54    3762569.57        1.52928                      441209.54
3762569.57        1.64172
         441259.54    3762569.57        1.72836                      441109.54
3762619.57        1.23369
         441159.54    3762619.57        1.31888                      441209.54
3762619.57        1.39272
         441259.54    3762619.57        1.41379                      441109.54
3762669.57        1.10319
         441159.54    3762669.57        1.14502                      441209.54
3762669.57        1.17724
         441259.54    3762669.57        1.20766                      441109.54
3762719.57        0.96664
         441159.54    3762719.57        1.00483                      441209.54
3762719.57        1.03225
         441259.54    3762719.57        1.06408                      441109.54
3762769.57        0.86657
         441159.54    3762769.57        0.89561                      441209.54
3762769.57        0.92631
*** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE  61
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P2EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                 L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                 L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                 L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
         441259.54    3762769.57        0.95093                      441313.48
3762805.42        0.88232
         441363.48    3762805.42        0.89043                      441413.48
3762805.42        0.90686
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441463.48 3762805.42 0.91728 441513.48
3762805.42 0.92002
441563.48 3762805.42 0.93915 441613.48
3762805.42 0.95210
441663.48 3762805.42 0.95397 441713.48
3762805.42 0.95270
441763.48 3762805.42 0.96365 441813.48
3762805.42 0.96223
441313.48 3762855.42 0.79091 441363.48
3762855.42 0.80038
441413.48 3762855.42 0.81044 441463.48
3762855.42 0.81993
441513.48 3762855.42 0.82502 441563.48
3762855.42 0.83231
441613.48 3762855.42 0.84467 441663.48
3762855.42 0.84817
441713.48 3762855.42 0.84896 441763.48
3762855.42 0.85633
441813.48 3762855.42 0.85057 441313.48
3762905.42 0.71247
441363.48 3762905.42 0.72531 441413.48
3762905.42 0.72396
441463.48 3762905.42 0.73331 441513.48
3762905.42 0.73583
441563.48 3762905.42 0.74051 441613.48
3762905.42 0.77650
441663.48 3762905.42 0.75323 441713.48
3762905.42 0.75920
441763.48 3762905.42 0.79425 441813.48
3762905.42 0.76710
441313.48 3762955.42 0.64899 441363.48
3762955.42 0.65711
441413.48 3762955.42 0.65615 441463.48
3762955.42 0.66014
441513.48 3762955.42 0.66208 441563.48
3762955.42 0.66961
441613.48 3762955.42 0.67688 441663.48
3762955.42 0.67386
441713.48 3762955.42 0.68172 441763.48
3762955.42 0.69310
441813.48 3762955.42 0.69498 440408.22
3761498.57 1.05768
440956.50 3762849.59 0.68397 440559.26
3761306.11 1.06104
440752.05 3761305.37 1.33567 440857.69
3761312.76 1.51241
440969.23 3761308.33 1.64955 440936.73
3761237.41 1.40048

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 1.20905 | 440450.61 | 3761994.75 | 1.36611 |
| 440500.61 | 3761994.75 | 1.56416 | 440550.61 | 3761994.75 | 1.82074 |
| 440600.61 | 3761994.75 | 2.16612 | 440650.61 | 3761994.75 | 2.65583 |
| 440400.61 | 3762044.75 | 1.15002 | 440450.61 | 3762044.75 | 1.29500 |
| 440500.61 | 3762044.75 | 1.47750 | 440550.61 | 3762044.75 | 1.71434 |
| 440600.61 | 3762044.75 | 2.03443 | 440650.61 | 3762044.75 | 2.49276 |
| 440400.61 | 3762094.75 | 1.08571 | 440450.61 | 3762094.75 | 1.21681 |
| 440500.61 | 3762094.75 | 1.38098 | 440550.61 | 3762094.75 | 1.59340 |
| 440600.61 | 3762094.75 | 1.88092 | 440650.61 | 3762094.75 | 2.29593 |
| 440400.61 | 3762144.75 | 1.01758 | 440450.61 | 3762144.75 | 1.13375 |
| 440500.61 | 3762144.75 | 1.27748 | 440550.61 | 3762144.75 | 1.46225 |
| 440600.61 | 3762144.75 | 1.71024 | 440650.61 | 3762144.75 | 2.06821 |
| 441145.13 | 3761319.94 | 2.51434 | 441195.13 | 3761319.94 | 2.55589 |
| 441245.13 | 3761319.94 | 2.58849 | 441145.13 | 3761369.94 | 2.80975 |
| 441195.13 | 3761369.94 | 2.85756 | 441245.13 | 3761369.94 | 2.89596 |
| 441145.13 | 3761419.94 | 3.17203 | 441195.13 | 3761419.94 | 3.22961 |

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         441245.13    3761419.94        3.27845                       441145.13
3761469.94        3.63400
         441195.13    3761469.94        3.70207                       441245.13
3761469.94        3.76879
         441145.13    3761519.94        4.24876                       441195.13
3761519.94        4.33070
         441245.13    3761519.94        4.40826                       441145.13
3761569.94        5.12946
         441195.13    3761569.94        5.22693                       441245.13
3761569.94        5.31625
         441145.13    3761619.94        6.56868                       441195.13
3761619.94        6.69431
         441245.13    3761619.94        6.81545                       441145.13
3761669.94       10.10519
         441195.13    3761669.94       10.23751                       441245.13
3761669.94       10.43567
         441917.00    3761316.31        2.23719                       441967.00
3761316.31        2.15063
         442017.00    3761316.31        2.05817                       442067.00
3761316.31        1.95886
         441917.00    3761366.31        2.52824                       441967.00
3761366.31        2.43024
         442017.00    3761366.31        2.31977                       442067.00
3761366.31        2.20360
         441917.00    3761416.31        2.90031                       441967.00
3761416.31        2.78244
         442017.00    3761416.31        2.64958                       442067.00
3761416.31        2.50700
         441917.00    3761466.31        3.37925                       441967.00
3761466.31        3.24041
         442017.00    3761466.31        3.08064                       442067.00
3761466.31        2.90531
         441917.00    3761516.31        4.01749                       441967.00
3761516.31        3.86243
         442017.00    3761516.31        3.67208                       442067.00
3761516.31        3.45341
         441917.00    3761566.31        4.93706                       441967.00
3761566.31        4.76335
         442017.00    3761566.31        4.53939                       442067.00
3761566.31        4.27107
         441917.00    3761616.31        6.43030                       441967.00
3761616.31        6.24776
         442017.00    3761616.31        5.98790                       442067.00
3761616.31        5.64761
         442847.68    3761995.12        1.72874                       442897.68
3761995.12        1.60440
         442947.68    3761995.12        1.49525                       442997.68
3761995.12        1.39790
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 1.31088 | 443097.68 | 3761995.12 | 1.23271 |
| 443147.68 | 3761995.12 | 1.16201 | 443197.68 | 3761995.12 | 1.09791 |
| 442847.68 | 3762045.12 | 1.74467 | 442897.68 | 3762045.12 | 1.61966 |
| 442947.68 | 3762045.12 | 1.50914 | 442997.68 | 3762045.12 | 1.41061 |
| 443047.68 | 3762045.12 | 1.32257 | 443097.68 | 3762045.12 | 1.24341 |
| 443147.68 | 3762045.12 | 1.17192 | 443197.68 | 3762045.12 | 1.10705 |
| 442447.68 | 3762095.12 | 3.73719 | 442497.68 | 3762095.12 | 3.31581 |
| 442547.68 | 3762095.12 | 2.96987 | 442597.68 | 3762095.12 | 2.68021 |
| 442647.68 | 3762095.12 | 2.43610 | 442697.68 | 3762095.12 | 2.22526 |
| 442747.68 | 3762095.12 | 2.04311 | 442797.68 | 3762095.12 | 1.88411 |
| 442847.68 | 3762095.12 | 1.74474 | 442897.68 | 3762095.12 | 1.62101 |
| 442947.68 | 3762095.12 | 1.51110 | 442997.68 | 3762095.12 | 1.41272 |
| 443047.68 | 3762095.12 | 1.32498 | 443097.68 | 3762095.12 | 1.24594 |
| 443147.68 | 3762095.12 | 1.17452 | 443197.68 | 3762095.12 | 1.10938 |
| 442447.68 | 3762145.12 | 3.61035 | 442497.68 | 3762145.12 | 3.21567 |
| 442547.68 | 3762145.12 | 2.89278 | 442597.68 | 3762145.12 | 2.61989 |

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         442647.68    3762145.12        2.38900                       442697.68
3762145.12        2.18929
         442747.68    3762145.12        2.01493                       442797.68
3762145.12        1.86229
         442847.68    3762145.12        1.72809                       442897.68
3762145.12        1.60778
         442947.68    3762145.12        1.50048                       442997.68
3762145.12        1.40423
         443047.68    3762145.12        1.31802                       443097.68
3762145.12        1.24020
         443147.68    3762145.12        1.16970                       443197.68
3762145.12        1.10540
         442447.68    3762195.12        3.41997                       442497.68
3762195.12        3.06389
         442547.68    3762195.12        2.77217                       442597.68
3762195.12        2.52307
         442647.68    3762195.12        2.31034                       442697.68
3762195.12        2.12557
         442747.68    3762195.12        1.96342                       442797.68
3762195.12        1.82074
         442847.68    3762195.12        1.69379                       442897.68
3762195.12        1.57952
         442947.68    3762195.12        1.47694                       442997.68
3762195.12        1.38456
         443047.68    3762195.12        1.30129                       443097.68
3762195.12        1.22584
         443147.68    3762195.12        1.15732                       443197.68
3762195.12        1.09475
         442447.68    3762245.12        3.16527                       442497.68
3762245.12        2.86280
         442547.68    3762245.12        2.61070                       442597.68
3762245.12        2.39240
         442647.68    3762245.12        2.20397                       442697.68
3762245.12        2.03843
         442747.68    3762245.12        1.89201                       442797.68
3762245.12        1.76109
         442847.68    3762245.12        1.64357                       442897.68
3762245.12        1.53745
         442947.68    3762245.12        1.44167                       442997.68
3762245.12        1.35485
         443047.68    3762245.12        1.27603                       443097.68
3762245.12        1.20409
         443147.68    3762245.12        1.13844                       443197.68
3762245.12        1.07820
         442822.81    3761611.77        1.25892                       442872.81
3761611.77        1.18891
         442922.81    3761611.77        1.12521                       442972.81
3761611.77        1.06688
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 1.34877 | 442872.81 | 3761661.77 | 1.26859 |
| 442922.81 | 3761661.77 | 1.19650 | 442972.81 | 3761661.77 | 1.13107 |
| 442732.29 | 3762366.08 | 1.68832 | 442782.29 | 3762366.08 | 1.59114 |
| 442832.29 | 3762366.08 | 1.50087 | 442732.29 | 3762416.08 | 1.57500 |
| 442782.29 | 3762416.08 | 1.49399 | 442832.29 | 3762416.08 | 1.41762 |
| 442732.29 | 3762466.08 | 1.46117 | 442782.29 | 3762466.08 | 1.39528 |
| 442832.29 | 3762466.08 | 1.33167 | 441922.75 | 3762323.77 | 4.68766 |
| 441972.75 | 3762323.77 | 4.63763 | 442022.75 | 3762323.77 | 4.55726 |
| 442072.75 | 3762323.77 | 4.45456 | 441922.75 | 3762373.77 | 3.33566 |
| 441972.75 | 3762373.77 | 3.31293 | 442022.75 | 3762373.77 | 3.26973 |
| 442072.75 | 3762373.77 | 3.21347 | 441922.75 | 3762423.77 | 2.57978 |
| 441972.75 | 3762423.77 | 2.57161 | 442022.75 | 3762423.77 | 2.55059 |
| 442072.75 | 3762423.77 | 2.52077 | 441922.75 | 3762473.77 | 2.07941 |
| 441972.75 | 3762473.77 | 2.07820 | 442022.75 | 3762473.77 | 2.07041 |
| 442072.75 | 3762473.77 | 2.05540 | 441922.75 | 3762523.77 | 1.71665 |
| 441972.75 | 3762523.77 | 1.72136 | 442022.75 | 3762523.77 | 1.72166 |

```
         442072.75    3762523.77        1.71574                       441922.75
3762573.77        1.44071
         441972.75    3762573.77        1.44944                       442022.75
3762573.77        1.45382
         442072.75    3762573.77        1.45427                       441922.75
3762623.77        1.22522
         441972.75    3762623.77        1.23514                       442022.75
3762623.77        1.24205
         442072.75    3762623.77        1.24606                       441109.54
3762319.57        3.59227
         441159.54    3762319.57        3.79178                       441209.54
3762319.57        3.96346
         441259.54    3762319.57        4.10285                       441109.54
3762369.57        2.35776
         441159.54    3762369.57        2.51178                       441209.54
3762369.57        2.64660
         441259.54    3762369.57        2.76445                       441109.54
3762419.57        1.73788
         441159.54    3762419.57        1.84993                       441209.54
3762419.57        1.95424
         441259.54    3762419.57        2.05127                       441109.54
3762469.57        1.36849
         441159.54    3762469.57        1.44660                       441209.54
3762469.57        1.52334
         441259.54    3762469.57        1.59624                       441109.54
3762519.57        1.12417
         441159.54    3762519.57        1.17932                       441209.54
3762519.57        1.23474
         441259.54    3762519.57        1.29018                       441109.54
3762569.57        0.94921
         441159.54    3762569.57        0.99040                       441209.54
3762569.57        1.03094
         441259.54    3762569.57        1.07246                       441109.54
3762619.57        0.82070
         441159.54    3762619.57        0.85065                       441209.54
3762619.57        0.88011
         441259.54    3762619.57        0.91017                       441109.54
3762669.57        0.72095
         441159.54    3762669.57        0.74196                       441209.54
3762669.57        0.76357
         441259.54    3762669.57        0.78626                       441109.54
3762719.57        0.63869
         441159.54    3762719.57        0.65501                       441209.54
3762719.57        0.67142
         441259.54    3762719.57        0.68913                       441109.54
3762769.57        0.57210
         441159.54    3762769.57        0.58464                       441209.54
3762769.57        0.59786
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                          ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 0.61136 | 441313.48 | 3762805.42 | 0.57580 |
| 441363.48 | 3762805.42 | 0.58736 | 441413.48 | 3762805.42 | 0.60023 |
| 441463.48 | 3762805.42 | 0.61315 | 441513.48 | 3762805.42 | 0.62583 |
| 441563.48 | 3762805.42 | 0.64052 | 441613.48 | 3762805.42 | 0.65491 |
| 441663.48 | 3762805.42 | 0.66835 | 441713.48 | 3762805.42 | 0.68141 |
| 441763.48 | 3762805.42 | 0.69569 | 441813.48 | 3762805.42 | 0.70828 |
| 441313.48 | 3762855.42 | 0.51700 | 441363.48 | 3762855.42 | 0.52635 |
| 441413.48 | 3762855.42 | 0.53629 | 441463.48 | 3762855.42 | 0.54673 |
| 441513.48 | 3762855.42 | 0.55727 | 441563.48 | 3762855.42 | 0.56845 |
| 441613.48 | 3762855.42 | 0.58049 | 441663.48 | 3762855.42 | 0.59189 |
| 441713.48 | 3762855.42 | 0.60310 | 441763.48 | 3762855.42 | 0.61505 |
| 441813.48 | 3762855.42 | 0.62532 | 441313.48 | 3762905.42 | 0.46773 |
| 441363.48 | 3762905.42 | 0.47562 | 441413.48 | 3762905.42 | 0.48278 |
| 441463.48 | 3762905.42 | 0.49134 | 441513.48 | 3762905.42 | 0.49972 |
| 441563.48 | 3762905.42 | 0.50872 | 441613.48 | 3762905.42 | 0.52105 |
| 441663.48 | 3762905.42 | 0.52805 | 441713.48 | 3762905.42 | 0.53802 |

```
         441763.48    3762905.42        0.55103                      441813.48
3762905.42        0.55767
         441313.48    3762955.42        0.42624                      441363.48
3762955.42        0.43248
         441413.48    3762955.42        0.43832                      441463.48
3762955.42        0.44496
         441513.48    3762955.42        0.45176                      441563.48
3762955.42        0.45950
         441613.48    3762955.42        0.46756                      441663.48
3762955.42        0.47478
         441713.48    3762955.42        0.48344                      441763.48
3762955.42        0.49264
         441813.48    3762955.42        0.50079                      440408.22
3761498.57        1.30647
         440956.50    3762849.59        0.46188                      440559.26
3761306.11        1.41361
         440752.05    3761305.37        1.81832                      440857.69
3761312.76        2.06423
         440969.23    3761308.33        2.24174                      440936.73
3761237.41        1.92134
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000789    , L0000790
, L0000791    , L0000792    , L0000793    ,
                L0000794    , L0000795    , L0000796    , L0000797    , L0000798
, L0000799    , L0000800    , L0000801    ,
                L0000802    , L0000803    , L0000804    , L0000805    , L0000806
, L0000807    , L0000808    , L0000809    ,
                L0000810    , L0000811    , L0000812    , L0000813    , L0000814
, L0000815    , L0000816    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         440400.61    3761994.75        0.32002                      440450.61
3761994.75        0.33330
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| | | | | | |
|---|---|---|---|---|---|
| 440500.61 | 3761994.75 | 0.34749 | 440550.61 | 3761994.75 | 0.36271 |
| 440600.61 | 3761994.75 | 0.37904 | 440650.61 | 3761994.75 | 0.39660 |
| 440400.61 | 3762044.75 | 0.31834 | 440450.61 | 3762044.75 | 0.33149 |
| 440500.61 | 3762044.75 | 0.34555 | 440550.61 | 3762044.75 | 0.36062 |
| 440600.61 | 3762044.75 | 0.37679 | 440650.61 | 3762044.75 | 0.39418 |
| 440400.61 | 3762094.75 | 0.31570 | 440450.61 | 3762094.75 | 0.32910 |
| 440500.61 | 3762094.75 | 0.34287 | 440550.61 | 3762094.75 | 0.35774 |
| 440600.61 | 3762094.75 | 0.37382 | 440650.61 | 3762094.75 | 0.39002 |
| 440400.61 | 3762144.75 | 0.31029 | 440450.61 | 3762144.75 | 0.32441 |
| 440500.61 | 3762144.75 | 0.33740 | 440550.61 | 3762144.75 | 0.35297 |
| 440600.61 | 3762144.75 | 0.36808 | 440650.61 | 3762144.75 | 0.38397 |
| 441145.13 | 3761319.94 | 0.60554 | 441195.13 | 3761319.94 | 0.63992 |
| 441245.13 | 3761319.94 | 0.67727 | 441145.13 | 3761369.94 | 0.61815 |
| 441195.13 | 3761369.94 | 0.65419 | 441245.13 | 3761369.94 | 0.69354 |
| 441145.13 | 3761419.94 | 0.63003 | 441195.13 | 3761419.94 | 0.66782 |
| 441245.13 | 3761419.94 | 0.70937 | 441145.13 | 3761469.94 | 0.64124 |
| 441195.13 | 3761469.94 | 0.68060 | 441245.13 | 3761469.94 | 0.72447 |
| 441145.13 | 3761519.94 | 0.65151 | 441195.13 | 3761519.94 | 0.69237 |
| 441245.13 | 3761519.94 | 0.73780 | 441145.13 | 3761569.94 | 0.66067 |
| 441195.13 | 3761569.94 | 0.70285 | 441245.13 | 3761569.94 | 0.74971 |
| 441145.13 | 3761619.94 | 0.66849 | 441195.13 | 3761619.94 | 0.71203 |
| 441245.13 | 3761619.94 | 0.76049 | 441145.13 | 3761669.94 | 0.67510 |
| 441195.13 | 3761669.94 | 0.71966 | 441245.13 | 3761669.94 | 0.76945 |
| 441917.00 | 3761316.31 | 1.67449 | 441967.00 | 3761316.31 | 1.80099 |
| 442017.00 | 3761316.31 | 1.93599 | 442067.00 | 3761316.31 | 2.07631 |
| 441917.00 | 3761366.31 | 1.81754 | 441967.00 | | |

3761366.31 1.97363
442017.00 3761366.31 2.14029 442067.00
3761366.31 2.31999
441917.00 3761416.31 1.97551 441967.00
3761416.31 2.16541
442017.00 3761416.31 2.37391 442067.00
3761416.31 2.60257
441917.00 3761466.31 2.14366 441967.00
3761466.31 2.37691
442017.00 3761466.31 2.64101 442067.00
3761466.31 2.93943
441917.00 3761516.31 2.31966 441967.00
3761516.31 2.60714
442017.00 3761516.31 2.94416 442067.00
3761516.31 3.34032
441917.00 3761566.31 2.50187 441967.00
3761566.31 2.85176
442017.00 3761566.31 3.28007 442067.00
3761566.31 3.81251
441917.00 3761616.31 2.68455 441967.00
3761616.31 3.10321
442017.00 3761616.31 3.63788 442067.00
3761616.31 4.34688
442847.68 3761995.12 14.45267 442897.68
3761995.12 10.57714
442947.68 3761995.12 8.33313 442997.68
3761995.12 6.82720



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 5.73987 | 443097.68 | 3761995.12 | 4.91649 |
| 443147.68 | 3761995.12 | 4.27480 | 443197.68 | 3761995.12 | 3.75995 |
| 442847.68 | 3762045.12 | 13.19335 | 442897.68 | 3762045.12 | 9.71539 |
| 442947.68 | 3762045.12 | 7.74115 | 442997.68 | 3762045.12 | 6.41178 |
| 443047.68 | 3762045.12 | 5.44961 | 443097.68 | 3762045.12 | 4.71141 |
| 443147.68 | 3762045.12 | 4.12772 | 443197.68 | 3762045.12 | 3.65805 |
| 442447.68 | 3762095.12 | 20.32381 | 442497.68 | 3762095.12 | 20.03074 |
| 442547.68 | 3762095.12 | 17.89468 | 442597.68 | 3762095.12 | 18.39305 |
| 442647.68 | 3762095.12 | 16.62953 | 442697.68 | 3762095.12 | 16.96427 |
| 442747.68 | 3762095.12 | 15.81198 | 442797.68 | 3762095.12 | 12.83922 |
| 442847.68 | 3762095.12 | 10.63194 | 442897.68 | 3762095.12 | 8.32649 |
| 442947.68 | 3762095.12 | 6.84652 | 442997.68 | 3762095.12 | 5.78968 |
| 443047.68 | 3762095.12 | 5.01750 | 443097.68 | 3762095.12 | 4.40386 |
| 443147.68 | 3762095.12 | 3.90590 | 443197.68 | 3762095.12 | 3.49964 |
| 442447.68 | 3762145.12 | 16.94456 | 442497.68 | 3762145.12 | 14.22452 |
| 442547.68 | 3762145.12 | 13.01678 | 442597.68 | 3762145.12 | 12.12111 |
| 442647.68 | 3762145.12 | 11.52236 | 442697.68 | 3762145.12 | 10.84854 |
| 442747.68 | 3762145.12 | 9.96147 | 442797.68 | 3762145.12 | 8.88722 |
| 442847.68 | 3762145.12 | 7.82704 | 442897.68 | 3762145.12 | 6.72330 |
| 442947.68 | 3762145.12 | 5.82038 | 442997.68 | 3762145.12 | 5.08818 |
| 443047.68 | 3762145.12 | 4.51224 | 443097.68 | 3762145.12 | 4.02864 |
| 443147.68 | 3762145.12 | 3.62193 | 443197.68 | 3762145.12 | 3.27769 |
| 442447.68 | 3762195.12 | 14.12430 | 442497.68 | 3762195.12 | 11.21413 |

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         442547.68    3762195.12        9.89634                      442597.68
3762195.12        8.92680
         442647.68    3762195.12        8.27116                      442697.68
3762195.12        7.68862
         442747.68    3762195.12        7.10525                      442797.68
3762195.12        6.56483
         442847.68    3762195.12        5.99822                      442897.68
3762195.12        5.39125
         442947.68    3762195.12        4.85323                      442997.68
3762195.12        4.38108
         443047.68    3762195.12        3.97808                      443097.68
3762195.12        3.62287
         443147.68    3762195.12        3.30902                      443197.68
3762195.12        3.03131
         442447.68    3762245.12       11.60933                      442497.68
3762245.12        9.10475
         442547.68    3762245.12        7.92224                      442597.68
3762245.12        7.04917
         442647.68    3762245.12        6.48535                      442697.68
3762245.12        6.01521
         442747.68    3762245.12        5.60842                      442797.68
3762245.12        5.19099
         442847.68    3762245.12        4.79114                      442897.68
3762245.12        4.40243
         442947.68    3762245.12        4.06170                      442997.68
3762245.12        3.75186
         443047.68    3762245.12        3.47758                      443097.68
3762245.12        3.21989
         443147.68    3762245.12        2.98349                      443197.68
3762245.12        2.76667
         442822.81    3761611.77        7.16797                      442872.81
3761611.77        6.02148
         442922.81    3761611.77        5.12504                      442972.81
3761611.77        4.42662
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000789    , L0000790
, L0000791    , L0000792    , L0000793    ,
                 L0000794    , L0000795    , L0000796    , L0000797    , L0000798
, L0000799    , L0000800    , L0000801    ,
                 L0000802    , L0000803    , L0000804    , L0000805    , L0000806
, L0000807    , L0000808    , L0000809    ,
                 L0000810    , L0000811    , L0000812    , L0000813    , L0000814
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, L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 10.29132 | 442872.81 | 3761661.77 | 7.83306 |
| 442922.81 | 3761661.77 | 6.29140 | 442972.81 | 3761661.77 | 5.23813 |
| 442732.29 | 3762366.08 | 3.47618 | 442782.29 | 3762366.08 | 3.26100 |
| 442832.29 | 3762366.08 | 3.05233 | 442732.29 | 3762416.08 | 2.87066 |
| 442782.29 | 3762416.08 | 2.73327 | 442832.29 | 3762416.08 | 2.59677 |
| 442732.29 | 3762466.08 | 2.40100 | 442782.29 | 3762466.08 | 2.29737 |
| 442832.29 | 3762466.08 | 2.19241 | 441922.75 | 3762323.77 | 2.15989 |
| 441972.75 | 3762323.77 | 2.44664 | 442022.75 | 3762323.77 | 2.79832 |
| 442072.75 | 3762323.77 | 3.29203 | 441922.75 | 3762373.77 | 1.89279 |
| 441972.75 | 3762373.77 | 2.15613 | 442022.75 | 3762373.77 | 2.42600 |
| 442072.75 | 3762373.77 | 2.78051 | 441922.75 | 3762423.77 | 1.63723 |
| 441972.75 | 3762423.77 | 1.88318 | 442022.75 | 3762423.77 | 2.08998 |
| 442072.75 | 3762423.77 | 2.32804 | 441922.75 | 3762473.77 | 1.46660 |
| 441972.75 | 3762473.77 | 1.62077 | 442022.75 | 3762473.77 | 1.79375 |
| 442072.75 | 3762473.77 | 1.91165 | 441922.75 | 3762523.77 | 1.30559 |
| 441972.75 | 3762523.77 | 1.41340 | 442022.75 | 3762523.77 | 1.53642 |
| 442072.75 | 3762523.77 | 1.62817 | 441922.75 | 3762573.77 | 1.14925 |
| 441972.75 | 3762573.77 | 1.23278 | 442022.75 | 3762573.77 | 1.31203 |
| 442072.75 | 3762573.77 | 1.38410 | 441922.75 | 3762623.77 | 1.02660 |
| 441972.75 | 3762623.77 | 1.08127 | 442022.75 | | |

3762623.77 1.13668
442072.75 3762623.77 1.18593 441109.54
3762319.57 0.56256
441159.54 3762319.57 0.60028 441209.54
3762319.57 0.63768
441259.54 3762319.57 0.66894 441109.54
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441159.54 3762419.57 0.55934 441209.54
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441259.54 3762519.57 0.58374 441109.54
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441159.54 3762569.57 0.49427 441209.54
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441259.54 3762569.57 0.56519 441109.54
3762619.57 0.43539
441159.54 3762619.57 0.47205 441209.54
3762619.57 0.50554
441259.54 3762619.57 0.52689 441109.54
3762669.57 0.42324
441159.54 3762669.57 0.44624 441209.54
3762669.57 0.46811
441259.54 3762669.57 0.49069 441109.54
3762719.57 0.40192
441159.54 3762719.57 0.42306 441209.54
3762719.57 0.44279
441259.54 3762719.57 0.46630 441109.54
3762769.57 0.38605
441159.54 3762769.57 0.40421 441209.54
3762769.57 0.42491



*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: P1EXHAUS ***

INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 , L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 , L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 , L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 0.44489 | 441313.48 | 3762805.42 | 0.44397 |
| 441363.48 | 3762805.42 | 0.46017 | 441413.48 | 3762805.42 | 0.48041 |
| 441463.48 | 3762805.42 | 0.49966 | 441513.48 | 3762805.42 | 0.51670 |
| 441563.48 | 3762805.42 | 0.54244 | 441613.48 | 3762805.42 | 0.56718 |
| 441663.48 | 3762805.42 | 0.58743 | 441713.48 | 3762805.42 | 0.60665 |
| 441763.48 | 3762805.42 | 0.63524 | 441813.48 | 3762805.42 | 0.65668 |
| 441313.48 | 3762855.42 | 0.42114 | 441363.48 | 3762855.42 | 0.43663 |
| 441413.48 | 3762855.42 | 0.45323 | 441463.48 | 3762855.42 | 0.47056 |
| 441513.48 | 3762855.42 | 0.48678 | 441563.48 | 3762855.42 | 0.50491 |
| 441613.48 | 3762855.42 | 0.52692 | 441663.48 | 3762855.42 | 0.54510 |
| 441713.48 | 3762855.42 | 0.56232 | 441763.48 | 3762855.42 | 0.58499 |
| 441813.48 | 3762855.42 | 0.59874 | 441313.48 | 3762905.42 | 0.39895 |
| 441363.48 | 3762905.42 | 0.41477 | 441413.48 | 3762905.42 | 0.42530 |
| 441463.48 | 3762905.42 | 0.44107 | 441513.48 | 3762905.42 | 0.45425 |
| 441563.48 | 3762905.42 | 0.46903 | 441613.48 | 3762905.42 | 0.50309 |
| 441663.48 | 3762905.42 | 0.50261 | 441713.48 | 3762905.42 | 0.52046 |

441763.48 3762905.42 0.56149 441813.48
3762905.42 0.55594
441313.48 3762955.42 0.37935 441363.48
3762955.42 0.39233
441413.48 3762955.42 0.40170 441463.48
3762955.42 0.41369
441513.48 3762955.42 0.42504 441563.48
3762955.42 0.43986
441613.48 3762955.42 0.45527 441663.48
3762955.42 0.46470
441713.48 3762955.42 0.48168 441763.48
3762955.42 0.50239
441813.48 3762955.42 0.51678 440408.22
3761498.57 0.31915
440956.50 3762849.59 0.32255 440559.26
3761306.11 0.34853
440752.05 3761305.37 0.41000 440857.69
3761312.76 0.45219
440969.23 3761308.33 0.50252 440936.73
3761237.41 0.47531



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5
YEARS FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS
***

** CONC OF PM_10 IN MICROGRAMS/M**3
**

X-COORD (M) Y-COORD (M) CONC X-COORD (M)
Y-COORD (M) CONC
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - -
440400.61 3761994.75 0.29546 440450.61
3761994.75 0.30750
440500.61 3761994.75 0.32037 440550.61
3761994.75 0.33410
440600.61 3761994.75 0.34885 440650.61
3761994.75 0.36471
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3762044.75 0.30030
440500.61 3762044.75 0.31268 440550.61

3762044.75 0.32591
440600.61 3762044.75 0.34008 440650.61
3762044.75 0.35529
440400.61 3762094.75 0.28161 440450.61
3762094.75 0.29273
440500.61 3762094.75 0.30461 440550.61
3762094.75 0.31729
440600.61 3762094.75 0.33086 440650.61
3762094.75 0.34544
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3762144.75 0.28492
440500.61 3762144.75 0.29629 440550.61
3762144.75 0.30841
440600.61 3762144.75 0.32138 440650.61
3762144.75 0.33528
441145.13 3761319.94 0.72352 441195.13
3761319.94 0.77006
441245.13 3761319.94 0.82101 441145.13
3761369.94 0.72647
441195.13 3761369.94 0.77426 441245.13
3761369.94 0.82686
441145.13 3761419.94 0.72752 441195.13
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441245.13 3761519.94 0.83196 441145.13
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3761569.94 0.82925
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441245.13 3761619.94 0.82508 441145.13
3761669.94 0.71161
441195.13 3761669.94 0.76186 441245.13
3761669.94 0.81844
441917.00 3761316.31 2.25817 441967.00
3761316.31 2.44284
442017.00 3761316.31 2.63987 442067.00
3761316.31 2.84390
441917.00 3761366.31 2.42412 441967.00
3761366.31 2.65030
442017.00 3761366.31 2.89054 442067.00
3761366.31 3.15076
441917.00 3761416.31 2.60129 441967.00
3761416.31 2.87194
442017.00 3761416.31 3.16789 442067.00
3761416.31 3.49307

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         441917.00    3761466.31        2.77726                      441967.00
3761466.31        3.10352
         442017.00    3761466.31        3.47196                      442067.00
3761466.31        3.88874
         441917.00    3761516.31        2.94307                      441967.00
3761516.31        3.33787
         442017.00    3761516.31        3.79841                      442067.00
3761516.31        4.33960
         441917.00    3761566.31        3.09852                      441967.00
3761566.31        3.56409
         442017.00    3761566.31        4.13235                      442067.00
3761566.31        4.84330
         441917.00    3761616.31        3.23657                      441967.00
3761616.31        3.77319
         442017.00    3761616.31        4.45421                      442067.00
3761616.31        5.35023
         442847.68    3761995.12       17.40033                      442897.68
3761995.12       12.54420
         442947.68    3761995.12        9.89738                      442997.68
3761995.12        8.15227
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE  71
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         443047.68    3761995.12        6.88645                      443097.68
3761995.12        5.91677
         443147.68    3761995.12        5.14942                      443197.68
3761995.12        4.52744
         442847.68    3762045.12       15.46718                      442897.68
3762045.12       11.27341
         442947.68    3762045.12        9.03621                      442997.68
3762045.12        7.55239
         443047.68    3762045.12        6.46269                      443097.68
```

3762045.12 5.61621
443147.68 3762045.12 4.93526 443197.68
3762045.12 4.37478
442447.68 3762095.12 25.69466 442497.68
3762095.12 23.00128
442547.68 3762095.12 21.45849 442597.68
3762095.12 20.25397
442647.68 3762095.12 19.37934 442697.68
3762095.12 18.29647
442747.68 3762095.12 17.01491 442797.68
3762095.12 14.83613
442847.68 3762095.12 11.46429 442897.68
3762095.12 9.22162
442947.68 3762095.12 7.75398 442997.68
3762095.12 6.67958
443047.68 3762095.12 5.84278 443097.68
3762095.12 5.16497
443147.68 3762095.12 4.60193 443197.68
3762095.12 4.12561
442447.68 3762145.12 15.86423 442497.68
3762145.12 12.40537
442547.68 3762145.12 11.00775 442597.68
3762145.12 10.22979
442647.68 3762145.12 9.70811 442697.68
3762145.12 9.24793
442747.68 3762145.12 8.76774 442797.68
3762145.12 8.24860
442847.68 3762145.12 7.68942 442897.68
3762145.12 7.02261
442947.68 3762145.12 6.32628 442997.68
3762145.12 5.68383
443047.68 3762145.12 5.11888 443097.68
3762145.12 4.62467
443147.68 3762145.12 4.19176 443197.68
3762145.12 3.80998
442447.68 3762195.12 13.29184 442497.68
3762195.12 9.83837
442547.68 3762195.12 8.28231 442597.68
3762195.12 7.41400
442647.68 3762195.12 6.87787 442697.68
3762195.12 6.49484
442747.68 3762195.12 6.18095 442797.68
3762195.12 5.90459
442847.68 3762195.12 5.64543 442897.68
3762195.12 5.37255
442947.68 3762195.12 5.06420 442997.68
3762195.12 4.72742
443047.68 3762195.12 4.38610 443097.68
3762195.12 4.05599
443147.68 3762195.12 3.74596 443197.68
3762195.12 3.45831

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         442447.68    3762245.12       10.67022                      442497.68
3762245.12        7.88403
         442547.68    3762245.12        6.57259                      442597.68
3762245.12        5.80605
         442647.68    3762245.12        5.32501                      442697.68
3762245.12        4.99481
         442747.68    3762245.12        4.75004                      442797.68
3762245.12        4.55342
         442847.68    3762245.12        4.38624                      442897.68
3762245.12        4.23312
         442947.68    3762245.12        4.07714                      442997.68
3762245.12        3.90328
         443047.68    3762245.12        3.71146                      443097.68
3762245.12        3.50745
         443147.68    3762245.12        3.30036                      443197.68
3762245.12        3.09558
         442822.81    3761611.77        7.76518                      442872.81
3761611.77        6.38496
         442922.81    3761611.77        5.39137                      442972.81
3761611.77        4.64296
```



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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                              *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         442822.81    3761661.77       11.79492                      442872.81
3761661.77        8.58782
         442922.81    3761661.77        6.82603                      442972.81
3761661.77        5.66322
         442732.29    3762366.08        2.81716                      442782.29
3762366.08        2.73223
         442832.29    3762366.08        2.66056                      442732.29
3762416.08        2.27700
         442782.29    3762416.08        2.23717                      442832.29
```

3762416.08 2.19934
442732.29 3762466.08 1.84096 442782.29
3762466.08 1.83558
442832.29 3762466.08 1.82428 441922.75
3762323.77 1.45288
441972.75 3762323.77 1.62076 442022.75
3762323.77 1.82779
442072.75 3762323.77 2.09316 441922.75
3762373.77 1.26016
441972.75 3762373.77 1.37858 442022.75
3762373.77 1.51379
442072.75 3762373.77 1.66897 441922.75
3762423.77 1.09542
441972.75 3762423.77 1.17750 442022.75
3762423.77 1.26533
442072.75 3762423.77 1.35880 441922.75
3762473.77 0.95597
441972.75 3762473.77 1.01243 442022.75
3762473.77 1.07116
442072.75 3762473.77 1.13161 441922.75
3762523.77 0.83827
441972.75 3762523.77 0.87832 442022.75
3762523.77 0.91981
442072.75 3762523.77 0.96233 441922.75
3762573.77 0.73986
441972.75 3762573.77 0.76966 442022.75
3762573.77 0.80060
442072.75 3762573.77 0.83260 441922.75
3762623.77 0.65798
441972.75 3762623.77 0.68109 442022.75
3762623.77 0.70540
442072.75 3762623.77 0.73042 441109.54
3762319.57 0.45609
441159.54 3762319.57 0.48090 441209.54
3762319.57 0.50789
441259.54 3762319.57 0.53724 441109.54
3762369.57 0.43669
441159.54 3762369.57 0.45966 441209.54
3762369.57 0.48442
441259.54 3762369.57 0.51121 441109.54
3762419.57 0.41820
441159.54 3762419.57 0.43935 441209.54
3762419.57 0.46205
441259.54 3762419.57 0.48654 441109.54
3762469.57 0.40058
441159.54 3762469.57 0.41992 441209.54
3762469.57 0.44062
441259.54 3762469.57 0.46272 441109.54
3762519.57 0.38360
441159.54 3762519.57 0.40129 441209.54
3762519.57 0.42006

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         441259.54    3762519.57        0.44004                      441109.54
3762569.57        0.36716
         441159.54    3762569.57        0.38328                      441209.54
3762569.57        0.40025
         441259.54    3762569.57        0.41818                      441109.54
3762619.57        0.35132
         441159.54    3762619.57        0.36586                      441209.54
3762619.57        0.38104
         441259.54    3762619.57        0.39689                      441109.54
3762669.57        0.33593
         441159.54    3762669.57        0.34888                      441209.54
3762669.57        0.36234
         441259.54    3762669.57        0.37634                      441109.54
3762719.57        0.32077
         441159.54    3762719.57        0.33233                      441209.54
3762719.57        0.34424
         441259.54    3762719.57        0.35655                      441109.54
3762769.57        0.30608
         441159.54    3762769.57        0.31632                      441209.54
3762769.57        0.32683
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE  73
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                              *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                         ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
         441259.54    3762769.57        0.33756                      441313.48
3762805.42        0.33495
         441363.48    3762805.42        0.34478                      441413.48
3762805.42        0.35473
         441463.48    3762805.42        0.36457                      441513.48
3762805.42        0.37416
         441563.48    3762805.42        0.38395                      441613.48
3762805.42        0.39358
         441663.48    3762805.42        0.40288                      441713.48
```

3762805.42 0.41209
441763.48 3762805.42 0.42207 441813.48
3762805.42 0.43189
441313.48 3762855.42 0.31586 441363.48
3762855.42 0.32422
441413.48 3762855.42 0.33250 441463.48
3762855.42 0.34065
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3762905.42 0.29782
441363.48 3762905.42 0.30492 441413.48
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440956.50 3762849.59 0.25903 440559.26
3761306.11 0.39061
440752.05 3761305.37 0.46885 440857.69
3761312.76 0.52210
440969.23 3761308.33 0.58885 440936.73
3761237.41 0.56653


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 3.12186 | 440450.61 | 3761994.75 | 3.47010 |
| 440500.61 | 3761994.75 | 3.90005 | 440550.61 | 3761994.75 | 4.46133 |
| 440600.61 | 3761994.75 | 5.19936 | 440650.61 | 3761994.75 | 6.22800 |
| 440400.61 | 3762044.75 | 3.02463 | 440450.61 | 3762044.75 | 3.35575 |
| 440500.61 | 3762044.75 | 3.76349 | 440550.61 | 3762044.75 | 4.28852 |
| 440600.61 | 3762044.75 | 4.98803 | 440650.61 | 3762044.75 | 5.97343 |
| 440400.61 | 3762094.75 | 2.90184 | 440450.61 | 3762094.75 | 3.21066 |
| 440500.61 | 3762094.75 | 3.58862 | 440550.61 | 3762094.75 | 4.07164 |
| 440600.61 | 3762094.75 | 4.72598 | 440650.61 | 3762094.75 | 5.61314 |
| 440400.61 | 3762144.75 | 2.76819 | 440450.61 | 3762144.75 | 3.05581 |
| 440500.61 | 3762144.75 | 3.39325 | 440550.61 | 3762144.75 | 3.83854 |
| 440600.61 | 3762144.75 | 4.40819 | 440650.61 | 3762144.75 | 5.20359 |
| 441145.13 | 3761319.94 | 5.72487 | 441195.13 | 3761319.94 | 5.88837 |
| 441245.13 | 3761319.94 | 6.04429 | 441145.13 | 3761369.94 | 6.27435 |
| 441195.13 | 3761369.94 | 6.45394 | 441245.13 | 3761369.94 | 6.62555 |

441145.13 3761419.94 6.94683 441195.13
3761419.94 7.14891
441245.13 3761419.94 7.34431 441145.13
3761469.94 7.80433
441195.13 3761469.94 8.03026 441245.13
3761469.94 8.25958
441145.13 3761519.94 8.94617 441195.13
3761519.94 9.20207
441245.13 3761519.94 9.45416 441145.13
3761569.94 10.57993
441195.13 3761569.94 10.87083 441245.13
3761569.94 11.14925
441145.13 3761619.94 13.23526 441195.13
3761619.94 13.57938
441245.13 3761619.94 13.90793 441145.13
3761669.94 18.95193
441195.13 3761669.94 19.30973 441245.13
3761669.94 19.74161
441917.00 3761316.31 8.01921 441967.00
3761316.31 8.19196
442017.00 3761316.31 8.37525 442067.00
3761316.31 8.55885
441917.00 3761366.31 8.86358 441967.00
3761366.31 9.08785
442017.00 3761366.31 9.31562 442067.00
3761366.31 9.56568
441917.00 3761416.31 9.87899 441967.00
3761416.31 10.14909
442017.00 3761416.31 10.43705 442067.00
3761416.31 10.75639
441917.00 3761466.31 11.09849 441967.00
3761466.31 11.43254
442017.00 3761466.31 11.80332 442067.00
3761466.31 12.22783
441917.00 3761516.31 12.61248 441967.00
3761516.31 13.03622
442017.00 3761516.31 13.51838 442067.00
3761516.31 14.08981
441917.00 3761566.31 14.63583 441967.00
3761566.31 15.15421
442017.00 3761566.31 15.77230 442067.00
3761566.31 16.55523
441917.00 3761616.31 17.67978 441967.00
3761616.31 18.30522
442017.00 3761616.31 19.07031 442067.00
3761616.31 20.08497
442847.68 3761995.12 35.05817 442897.68
3761995.12 26.10320
442947.68 3761995.12 21.00193 442997.68
3761995.12 17.56856

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | X-COORD (M) | Y-COORD (M) | CONC |
|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 15.05516 | 443097.68 | 3761995.12 | 13.11720 |
| 443147.68 | 3761995.12 | 11.58081 | 443197.68 | 3761995.12 | 10.32803 |
| 442847.68 | 3762045.12 | 31.89894 | 442897.68 | 3762045.12 | 23.99542 |
| 442947.68 | 3762045.12 | 19.57789 | 442997.68 | 3762045.12 | 16.58334 |
| 443047.68 | 3762045.12 | 14.36789 | 443097.68 | 3762045.12 | 12.63761 |
| 443147.68 | 3762045.12 | 11.24128 | 443197.68 | 3762045.12 | 10.09378 |
| 442447.68 | 3762095.12 | 53.00779 | 442497.68 | 3762095.12 | 49.22565 |
| 442547.68 | 3762095.12 | 44.89953 | 442597.68 | 3762095.12 | 43.65680 |
| 442647.68 | 3762095.12 | 40.55351 | 442697.68 | 3762095.12 | 39.41430 |
| 442747.68 | 3762095.12 | 36.63828 | 442797.68 | 3762095.12 | 31.18600 |
| 442847.68 | 3762095.12 | 25.33808 | 442897.68 | 3762095.12 | 20.56088 |
| 442947.68 | 3762095.12 | 17.40974 | 442997.68 | | |

3762095.12 15.10336
443047.68 3762095.12 13.32960 443097.68
3762095.12 11.89060
443147.68 3762095.12 10.69637 443197.68
3762095.12 9.69917
442447.68 3762145.12 39.56934 442497.68
3762145.12 32.64760
442547.68 3762145.12 29.42666 442597.68
3762145.12 27.25347
442647.68 3762145.12 25.69161 442697.68
3762145.12 24.18243
442747.68 3762145.12 22.49224 442797.68
3762145.12 20.61117
442847.68 3762145.12 18.72823 442897.68
3762145.12 16.73922
442947.68 3762145.12 14.94406 442997.68
3762145.12 13.39521
443047.68 3762145.12 12.09317 443097.68
3762145.12 10.96966
443147.68 3762145.12 9.99814 443197.68
3762145.12 9.15543
442447.68 3762195.12 33.84096 442497.68
3762195.12 26.80229
442547.68 3762195.12 23.36540 442597.68
3762195.12 21.06919
442647.68 3762195.12 19.47889 442697.68
3762195.12 18.16778
442747.68 3762195.12 16.96746 442797.68
3762195.12 15.87699
442847.68 3762195.12 14.80430 442897.68
3762195.12 13.71518
442947.68 3762195.12 12.68423 442997.68
3762195.12 11.70681
443047.68 3762195.12 10.80766 443097.68
3762195.12 9.98128
443147.68 3762195.12 9.22737 443197.68
3762195.12 8.54534
442447.68 3762245.12 28.26243 442497.68
3762245.12 22.38847
442547.68 3762245.12 19.40387 442597.68
3762245.12 17.35736
442647.68 3762245.12 15.95517 442697.68
3762245.12 14.84164
442747.68 3762245.12 13.90914 442797.68
3762245.12 13.04828
442847.68 3762245.12 12.26090 442897.68
3762245.12 11.52550
442947.68 3762245.12 10.85051 442997.68
3762245.12 10.20614
443047.68 3762245.12 9.59041 443097.68
3762245.12 8.99449

```
         443147.68    3762245.12        8.42669                      443197.68
3762245.12        7.89313
         442822.81    3761611.77       17.34531                      442872.81
3761611.77       14.68108
         442922.81    3761611.77       12.66618                      442972.81
3761611.77       11.10538
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        07:43:46

                                  PAGE  76
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES AVERAGED OVER   5
YEARS FOR SOURCE GROUP: ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                 L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                 L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                 L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

       X-COORD (M)   Y-COORD (M)        CONC                       X-COORD (M)
Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - -
         442822.81    3761661.77       24.65203                      442872.81
3761661.77       18.83129
         442922.81    3761661.77       15.38815                      442972.81
3761661.77       13.04555
         442732.29    3762366.08        9.51144                      442782.29
3762366.08        9.02753
         442832.29    3762366.08        8.58019                      442732.29
3762416.08        8.17024
         442782.29    3762416.08        7.83653                      442832.29
3762416.08        7.51463
         442732.29    3762466.08        7.06153                      442782.29
3762466.08        6.82271
         442832.29    3762466.08        6.58216                      441922.75
3762323.77       13.89107
         441972.75    3762323.77       14.16522                      442022.75
3762323.77       14.44024
```

442072.75 3762323.77 14.86730 441922.75
3762373.77 10.55943
441972.75 3762373.77 10.87973 442022.75
3762373.77 11.09758
442072.75 3762373.77 11.40582 441922.75
3762423.77 8.44811
441972.75 3762423.77 8.77525 442022.75
3762423.77 8.97234
442072.75 3762423.77 9.17357 441922.75
3762473.77 7.06540
441972.75 3762473.77 7.25658 442022.75
3762473.77 7.44180
442072.75 3762473.77 7.52273 441922.75
3762523.77 5.99649
441972.75 3762523.77 6.13106 442022.75
3762523.77 6.27540
442072.75 3762523.77 6.34276 441922.75
3762573.77 5.12945
441972.75 3762573.77 5.24622 442022.75
3762573.77 5.33642
442072.75 3762573.77 5.40386 441922.75
3762623.77 4.45823
441972.75 3762623.77 4.53299 442022.75
3762623.77 4.60059
442072.75 3762623.77 4.65164 441109.54
3762319.57 9.46028
441159.54 3762319.57 9.95926 441209.54
3762319.57 10.35689
441259.54 3762319.57 10.53474 441109.54
3762369.57 6.62156
441159.54 3762369.57 7.20477 441209.54
3762369.57 7.54005
441259.54 3762369.57 7.70852 441109.54
3762419.57 5.14089
441159.54 3762419.57 5.62769 441209.54
3762419.57 5.97147
441259.54 3762419.57 6.25141 441109.54
3762469.57 4.28016
441159.54 3762469.57 4.62723 441209.54
3762469.57 4.89671
441259.54 3762469.57 5.05405 441109.54
3762519.57 3.64837
441159.54 3762519.57 3.94058 441209.54
3762519.57 4.14624
441259.54 3762519.57 4.32240 441109.54
3762569.57 3.17257
441159.54 3762569.57 3.39722 441209.54
3762569.57 3.60367
441259.54 3762569.57 3.78420 441109.54
3762619.57 2.84110
441159.54 3762619.57 3.00745 441209.54

3762619.57 3.15941
441259.54 3762619.57 3.24774 441109.54
3762669.57 2.58332
441159.54 3762669.57 2.68210 441209.54
3762669.57 2.77125
441259.54 3762669.57 2.86094 441109.54
3762719.57 2.32803
441159.54 3762719.57 2.41524 441209.54
3762719.57 2.49070
441259.54 3762719.57 2.57607 441109.54
3762769.57 2.13080
441159.54 3762769.57 2.20078 441209.54
3762769.57 2.27592



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE ANNUAL AVERAGE CONCENTRATION VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001 , L0000002 , L0000003 , L0000004 ,
L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC X-COORD (M) Y-COORD (M) CONC
- - - -

3762805.42 2.65285
441763.48 3762805.42 2.71665 441813.48
3762805.42 2.75907
441313.48 3762855.42 2.04491 441363.48
3762855.42 2.08758
441413.48 3762855.42 2.13247 441463.48
3762855.42 2.17787
441513.48 3762855.42 2.21762 441563.48
3762855.42 2.26203
441613.48 3762855.42 2.31639 441663.48
3762855.42 2.35722
441713.48 3762855.42 2.39424 441763.48
3762855.42 2.44465
441813.48 3762855.42 2.47111 441313.48
3762905.42 1.87697
441363.48 3762905.42 1.92060 441413.48
3762905.42 1.94367
441463.48 3762905.42 1.98405 441513.48
3762905.42 2.01452
441563.48 3762905.42 2.04936 441613.48
3762905.42 2.13944
441663.48 3762905.42 2.12822 441713.48
3762905.42 2.16898
441763.48 3762905.42 2.26688 441813.48
3762905.42 2.24700
441313.48 3762955.42 1.73543 441363.48
3762955.42 1.76864
441413.48 3762955.42 1.78840 441463.48
3762955.42 1.81644
441513.48 3762955.42 1.84181 441563.48
3762955.42 1.87747
441613.48 3762955.42 1.91395 441663.48
3762955.42 1.93305
441713.48 3762955.42 1.97283 441763.48
3762955.42 2.02100
441813.48 3762955.42 2.05234 440408.22
3761498.57 3.01886
440956.50 3762849.59 1.72743 440559.26
3761306.11 3.21379
440752.05 3761305.37 4.03285 440857.69
3761312.76 4.55094
440969.23 3761308.33 4.98266 440936.73
3761237.41 4.36366


*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 3.98138 | (12122024) | 440450.61 | 3761994.75 | 4.45494 | (12122024) |
| 440500.61 | 3761994.75 | 5.03164 | (12122024) | 440550.61 | 3761994.75 | 5.71756 | (12122024) |
| 440600.61 | 3761994.75 | 6.59196 | (12122024) | 440650.61 | 3761994.75 | 7.73381 | (12122024) |
| 440400.61 | 3762044.75 | 4.12483 | (12122024) | 440450.61 | 3762044.75 | 4.57615 | (12122024) |
| 440500.61 | 3762044.75 | 5.13705 | (12122024) | 440550.61 | 3762044.75 | 5.80826 | (12122024) |
| 440600.61 | 3762044.75 | 6.65426 | (12122024) | 440650.61 | 3762044.75 | 7.76702 | (12122024) |
| 440400.61 | 3762094.75 | 4.29174 | (12122024) | 440450.61 | 3762094.75 | 4.69794 | (12122024) |
| 440500.61 | 3762094.75 | 5.21719 | (12122024) | 440550.61 | 3762094.75 | 5.84765 | (12122024) |
| 440600.61 | 3762094.75 | 6.61624 | (12122024) | 440650.61 | 3762094.75 | 7.75010 | (12122024) |
| 440400.61 | 3762144.75 | 4.38495 | (12122024) | 440450.61 | 3762144.75 | 4.73531 | (12122024) |
| 440500.61 | 3762144.75 | 5.23452 | (12122024) | 440550.61 | 3762144.75 | 5.77402 | (12122024) |
| 440600.61 | 3762144.75 | 6.52753 | (12122024) | 440650.61 | 3762144.75 | 7.53204 | (12122024) |
| 441145.13 | 3761319.94 | 4.55485m | (13010324) | 441195.13 | 3761319.94 | 4.67159m | (13010324) |
| 441245.13 | 3761319.94 | 4.77344m | (13010324) | 441145.13 | 3761369.94 | 5.10595m | (13010324) |
| 441195.13 | 3761369.94 | 5.23300m | (13010324) | 441245.13 | 3761369.94 | 5.34170m | (13010324) |

441145.13 3761419.94 5.78182m (13010324) 441195.13
3761419.94 5.92206m (13010324)
441245.13 3761419.94 6.04218m (13010324) 441145.13
3761469.94 6.63464m (13010324)
441195.13 3761469.94 6.78371m (13010324) 441245.13
3761469.94 6.91734m (13010324)
441145.13 3761519.94 7.73761m (13010324) 441195.13
3761519.94 7.89464m (13010324)
441245.13 3761519.94 8.02652m (13010324) 441145.13
3761569.94 9.23454m (13010324)
441195.13 3761569.94 9.39767m (13010324) 441245.13
3761569.94 9.52740m (13010324)
441145.13 3761619.94 11.45832m (13010324) 441195.13
3761619.94 11.63286m (13010324)
441245.13 3761619.94 11.76665m (13010324) 441145.13
3761669.94 14.62927m (13010324)
441195.13 3761669.94 14.80671m (13010324) 441245.13
3761669.94 14.91588m (13010324)
441917.00 3761316.31 4.46474m (13010324) 441967.00
3761316.31 4.27152m (13010324)
442017.00 3761316.31 4.05105m (13010324) 442067.00
3761316.31 3.80585m (13010324)
441917.00 3761366.31 4.94759m (13010324) 441967.00
3761366.31 4.73981m (13010324)
442017.00 3761366.31 4.48847m (13010324) 442067.00
3761366.31 4.20897m (13010324)
441917.00 3761416.31 5.53903m (13010324) 441967.00
3761416.31 5.30618m (13010324)
442017.00 3761416.31 5.02224m (13010324) 442067.00
3761416.31 4.69536m (13010324)
441917.00 3761466.31 6.27020m (13010324) 441967.00
3761466.31 6.01309m (13010324)
442017.00 3761466.31 5.69446m (13010324) 442067.00
3761466.31 5.31502m (13010324)
441917.00 3761516.31 7.21657m (13010324) 441967.00
3761516.31 6.93448m (13010324)
442017.00 3761516.31 6.57730m (13010324) 442067.00
3761516.31 6.13541m (13010324)
441917.00 3761566.31 8.53063m (13010324) 441967.00
3761566.31 8.21465m (13010324)
442017.00 3761566.31 7.80854m (13010324) 442067.00
3761566.31 7.28994m (13010324)
441917.00 3761616.31 10.55036m (13010324) 441967.00
3761616.31 10.19188m (13010324)
442017.00 3761616.31 9.71946m (13010324) 442067.00
3761616.31 9.09561m (13010324)
442847.68 3761995.12 3.24566m (12050224) 442897.68
3761995.12 3.13004m (12050224)
442947.68 3761995.12 2.90043m (12050224) 442997.68
3761995.12 2.73530m (12050224)
*** AERMOD - VERSION 24142 *** *** Center Park Operational LST - PM10

*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 2.61087m | (12050224) | 443097.68 | 3761995.12 | 2.48711m | (12050224) |
| 443147.68 | 3761995.12 | 2.40682m | (12050224) | 443197.68 | 3761995.12 | 2.32954m | (12050224) |
| 442847.68 | 3762045.12 | 3.43436m | (12050224) | 442897.68 | 3762045.12 | 3.25304m | (12050224) |
| 442947.68 | 3762045.12 | 3.07631m | (12050224) | 442997.68 | 3762045.12 | 2.93508m | (12050224) |
| 443047.68 | 3762045.12 | 2.79162m | (12050224) | 443097.68 | 3762045.12 | 2.67279m | (12050224) |
| 443147.68 | 3762045.12 | 2.56130m | (12050224) | 443197.68 | 3762045.12 | 2.47876m | (12050224) |
| 442447.68 | 3762095.12 | 6.28878 | (12080324) | 442497.68 | 3762095.12 | 5.74397 | (12080324) |
| 442547.68 | 3762095.12 | 5.33657 | (12080324) | 442597.68 | 3762095.12 | 5.03223 | (12080324) |
| 442647.68 | 3762095.12 | 4.57222 | (12080324) | 442697.68 | 3762095.12 | 4.32414m | (12050224) |
| 442747.68 | 3762095.12 | 4.06309m | (12050224) | 442797.68 | 3762095.12 | 3.80804m | (12050224) |
| 442847.68 | 3762095.12 | 3.52619m | (12050224) | 442897.68 | 3762095.12 | 3.34995m | (12050224) |
| 442947.68 | 3762095.12 | 3.18739m | (12050224) | 442997.68 | | | |

3762095.12 3.10141m (12050224)
443047.68 3762095.12 2.94211m (12050224) 443097.68
3762095.12 2.80312m (12050224)
443147.68 3762095.12 2.67543m (12050224) 443197.68
3762095.12 2.62412m (12050224)
442447.68 3762145.12 6.11073 (12080324) 442497.68
3762145.12 5.64834 (12080324)
442547.68 3762145.12 5.12438 (12080324) 442597.68
3762145.12 4.92921 (12080324)
442647.68 3762145.12 4.50106m (12050224) 442697.68
3762145.12 4.23809m (12050224)
442747.68 3762145.12 4.03433m (12050224) 442797.68
3762145.12 3.80196m (12050224)
442847.68 3762145.12 3.50550m (12050224) 442897.68
3762145.12 3.37101m (12050224)
442947.68 3762145.12 3.23976m (12050224) 442997.68
3762145.12 3.13293m (12050224)
443047.68 3762145.12 2.98704m (12050224) 443097.68
3762145.12 2.84949m (12050224)
443147.68 3762145.12 2.72200m (12050224) 443197.68
3762145.12 2.63925m (12050224)
442447.68 3762195.12 6.29053 (12120224) 442497.68
3762195.12 5.63753 (12120224)
442547.68 3762195.12 4.94998 (12120224) 442597.68
3762195.12 4.66724 (12080324)
442647.68 3762195.12 4.40414 (13072424) 442697.68
3762195.12 4.19084 (13072424)
442747.68 3762195.12 3.99069 (13072424) 442797.68
3762195.12 3.72084m (12050224)
442847.68 3762195.12 3.46791m (12050224) 442897.68
3762195.12 3.34008m (12050224)
442947.68 3762195.12 3.25122m (12050224) 442997.68
3762195.12 3.14752m (12050224)
443047.68 3762195.12 3.02308m (12050224) 443097.68
3762195.12 2.89884m (12050224)
443147.68 3762195.12 2.76432m (12050224) 443197.68
3762195.12 2.65848m (12050224)
442447.68 3762245.12 6.43315 (12120224) 442497.68
3762245.12 5.76496 (12120224)
442547.68 3762245.12 5.10424 (12120224) 442597.68
3762245.12 4.72253 (12120224)
442647.68 3762245.12 4.29232 (12120224) 442697.68
3762245.12 4.02390 (13072424)
442747.68 3762245.12 3.76452 (13072424) 442797.68
3762245.12 3.58495 (13072424)
442847.68 3762245.12 3.43065 (13072424) 442897.68
3762245.12 3.36487 (13072424)
442947.68 3762245.12 3.24285 (13072424) 442997.68
3762245.12 3.13971 (13072424)
443047.68 3762245.12 2.97939 (13072424) 443097.68
3762245.12 2.86605 (13072424)

```
        443147.68   3762245.12        2.72786  (13072424)                443197.68
3762245.12        2.63189  (13072424)
        442822.81   3761611.77        2.57470  (13050124)                442872.81
3761611.77        2.47134  (13050124)
        442922.81   3761611.77        2.37354  (13050124)                442972.81
3761611.77        2.28086  (13050124)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        07:43:46

                                   PAGE  80
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   1ST HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P2EXHAUS ***
                                   INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                 L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                 L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                 L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                                 *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                            ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -
        442822.81   3761661.77        2.80784  (13050124)                442872.81
3761661.77        2.67768  (13050124)
        442922.81   3761661.77        2.55657  (13050124)                442972.81
3761661.77        2.44361  (13050124)
        442732.29   3762366.08        3.97817  (12120224)                442782.29
3762366.08        3.72001  (12120224)
        442832.29   3762366.08        3.50491  (12120224)                442732.29
3762416.08        4.03505  (12120224)
        442782.29   3762416.08        3.78788  (12120224)                442832.29
3762416.08        3.54889  (12120224)
        442732.29   3762466.08        4.01623  (12120224)                442782.29
3762466.08        3.79779  (12120224)
        442832.29   3762466.08        3.59475  (12120224)                441922.75
3762323.77       10.44886m (16031424)
        441972.75   3762323.77       10.39343m (16031424)                442022.75
3762323.77       10.31777m (16031424)
```

442072.75 3762323.77 10.18583 (12120224) 441922.75
3762373.77 8.72539m (16031424)
441972.75 3762373.77 8.56746m (16031424) 442022.75
3762373.77 8.50801m (16031424)
442072.75 3762373.77 8.29103m (16031424) 441922.75
3762423.77 7.63372m (16031424)
441972.75 3762423.77 7.44831m (16031424) 442022.75
3762423.77 7.35808m (16031424)
442072.75 3762423.77 7.19466m (16031424) 441922.75
3762473.77 6.68860m (16031424)
441972.75 3762473.77 6.61911m (16031424) 442022.75
3762473.77 6.52099m (16031424)
442072.75 3762473.77 6.42328m (16031424) 441922.75
3762523.77 5.94606m (16031424)
441972.75 3762523.77 5.91761m (16031424) 442022.75
3762523.77 5.83816m (16031424)
442072.75 3762523.77 5.76850m (16031424) 441922.75
3762573.77 5.35650m (16031424)
441972.75 3762573.77 5.33861m (16031424) 442022.75
3762573.77 5.30059m (16031424)
442072.75 3762573.77 5.23176m (16031424) 441922.75
3762623.77 4.83630m (16031424)
441972.75 3762623.77 4.84946m (16031424) 442022.75
3762623.77 4.82543m (16031424)
442072.75 3762623.77 4.76780m (16031424) 441109.54
3762319.57 10.01249 (12120624)
441159.54 3762319.57 10.19150 (12120624) 441209.54
3762319.57 10.36165 (12120624)
441259.54 3762319.57 10.70360 (12120624) 441109.54
3762369.57 7.99460 (12120624)
441159.54 3762369.57 7.96394 (12120624) 441209.54
3762369.57 8.08818 (12120624)
441259.54 3762369.57 8.32627 (12120624) 441109.54
3762419.57 6.73855 (12120624)
441159.54 3762419.57 6.64190 (12120624) 441209.54
3762419.57 6.71264 (12120624)
441259.54 3762419.57 6.75307 (12120624) 441109.54
3762469.57 5.78990 (12120624)
441159.54 3762469.57 5.72251 (12120624) 441209.54
3762469.57 5.75502 (12120624)
441259.54 3762469.57 5.87772 (12120624) 441109.54
3762519.57 5.11351 (12120624)
441159.54 3762519.57 5.03677 (12120624) 441209.54
3762519.57 5.05761 (12120624)
441259.54 3762519.57 5.10698 (12120624) 441109.54
3762569.57 4.58194 (12120624)
441159.54 3762569.57 4.53721 (12120624) 441209.54
3762569.57 4.50169 (12120624)
441259.54 3762569.57 4.49086 (12120624) 441109.54
3762619.57 4.11851 (12120624)
441159.54 3762619.57 4.09481 (12120624) 441209.54

3762619.57  4.07470  (12120624)
441259.54  3762619.57  4.14014  (12120624)  441109.54
3762669.57  3.72764  (12120624)
441159.54  3762669.57  3.74431  (12120624)  441209.54
3762669.57  3.76940  (12120624)
441259.54  3762669.57  3.79282  (12120624)  441109.54
3762719.57  3.43409  (12120624)
441159.54  3762719.57  3.43791  (12120624)  441209.54
3762719.57  3.45006  (12120624)
441259.54  3762719.57  3.45606  (12120624)  441109.54
3762769.57  3.16607  (12120624)
441159.54  3762769.57  3.16721  (12120624)  441209.54
3762769.57  3.16415  (12120624)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC (YYMMDDHH) X-COORD (M) Y-COORD (M) CONC (YYMMDDHH)
- - - -

3762805.42 3.12439m (16031424)
441763.48 3762805.42 3.20285m (16031424) 441813.48
3762805.42 3.28292m (16031424)
441313.48 3762855.42 2.74702 (12120624) 441363.48
3762855.42 2.72654 (12120624)
441413.48 3762855.42 2.69959 (12120624) 441463.48
3762855.42 2.66623 (12120624)
441513.48 3762855.42 2.62479 (12120624) 441563.48
3762855.42 2.60878m (16031424)
441613.48 3762855.42 2.69060m (16031424) 441663.48
3762855.42 2.77203m (16031424)
441713.48 3762855.42 2.85219m (16031424) 441763.48
3762855.42 2.92586m (16031424)
441813.48 3762855.42 3.00319m (16031424) 441313.48
3762905.42 2.53765 (12120624)
441363.48 3762905.42 2.51119 (12120624) 441413.48
3762905.42 2.47300 (12120624)
441463.48 3762905.42 2.44215 (14020924) 441513.48
3762905.42 2.45317 (14020924)
441563.48 3762905.42 2.43981 (14020924) 441613.48
3762905.42 2.46399m (16031424)
441663.48 3762905.42 2.55085m (16031424) 441713.48
3762905.42 2.62044m (16031424)
441763.48 3762905.42 2.66124m (16031424) 441813.48
3762905.42 2.75184m (16031424)
441313.48 3762955.42 2.35112 (12120624) 441363.48
3762955.42 2.31866 (12120624)
441413.48 3762955.42 2.27769 (14020924) 441463.48
3762955.42 2.30350 (14020924)
441513.48 3762955.42 2.31300 (14020924) 441563.48
3762955.42 2.29371 (14020924)
441613.48 3762955.42 2.29456m (16031424) 441663.48
3762955.42 2.36201m (16031424)
441713.48 3762955.42 2.42292m (16031424) 441763.48
3762955.42 2.47791m (16031424)
441813.48 3762955.42 2.53409m (16031424) 440408.22
3761498.57 3.46733 (16122724)
440956.50 3762849.59 2.78673 (12120624) 440559.26
3761306.11 2.91719 (16122724)
440752.05 3761305.37 3.50303 (15011524) 440857.69
3761312.76 3.83256 (15011524)
440969.23 3761308.33 4.00823 (15011524) 440936.73
3761237.41 3.49030 (15011524)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 7.09797 | (12122024) | 440450.61 | 3761994.75 | 7.92518 | (12122024) |
| 440500.61 | 3761994.75 | 8.90724 | (12122024) | 440550.61 | 3761994.75 | 10.09854 | (12122024) |
| 440600.61 | 3761994.75 | 11.58399 | (12122024) | 440650.61 | 3761994.75 | 13.49133 | (12122024) |
| 440400.61 | 3762044.75 | 7.06788 | (12122024) | 440450.61 | 3762044.75 | 7.85598 | (12122024) |
| 440500.61 | 3762044.75 | 8.79701 | (12122024) | 440550.61 | 3762044.75 | 9.93939 | (12122024) |
| 440600.61 | 3762044.75 | 11.36357 | (12122024) | 440650.61 | 3762044.75 | 13.21679 | (12122024) |
| 440400.61 | 3762094.75 | 6.92812 | (12122024) | 440450.61 | 3762094.75 | 7.65710 | (12122024) |
| 440500.61 | 3762094.75 | 8.53086 | (12122024) | 440550.61 | 3762094.75 | 9.59598 | (12122024) |
| 440600.61 | 3762094.75 | 10.93170 | (12122024) | 440650.61 | 3762094.75 | 12.68839 | (12122024) |
| 440400.61 | 3762144.75 | 6.72597 | (12122024) | 440450.61 | 3762144.75 | 7.37791 | (12122024) |
| 440500.61 | 3762144.75 | 8.15231 | (12122024) | 440550.61 | 3762144.75 | 9.10257 | (12122024) |
| 440600.61 | 3762144.75 | 10.30419 | (12122024) | 440650.61 | 3762144.75 | 11.90953 | (12122024) |
| 441145.13 | 3761319.94 | 10.53125 | (13122324) | 441195.13 | 3761319.94 | 10.47632 | (13122324) |
| 441245.13 | 3761319.94 | 10.55287c | (12112224) | 441145.13 | 3761369.94 | 11.70923 | (13122324) |
| 441195.13 | 3761369.94 | 11.66853 | (13122324) | 441245.13 | 3761369.94 | 11.71704c | (12112224) |
| 441145.13 | 3761419.94 | 13.04839 | (13122324) | 441195.13 | 3761419.94 | 13.02727 | (13122324) |
| 441245.13 | 3761419.94 | 13.05641c | (12112224) | 441145.13 | 3761469.94 | 14.61988 | (13122324) |
| 441195.13 | 3761469.94 | 14.61171 | (13122324) | 441245.13 | 3761469.94 | 14.63274c | (12112224) |
| 441145.13 | 3761519.94 | 16.53324 | (13122324) | 441195.13 | | | |

3761519.94  16.53557  (13122324)
441245.13  3761519.94  16.52249c (12112224)  441145.13
3761569.94  19.02473  (13122324)
441195.13  3761569.94  19.02519  (13122324)  441245.13
3761569.94  18.98993  (13122324)
441145.13  3761619.94  22.70956  (13122324)  441195.13
3761619.94  22.72561  (13122324)
441245.13  3761619.94  22.73139  (13122324)  441145.13
3761669.94  30.69182  (13122324)
441195.13  3761669.94  30.60056  (13122324)  441245.13
3761669.94  30.76232  (13122324)
441917.00  3761316.31  8.40786  (14011824)  441967.00
3761316.31  8.07160  (14011824)
442017.00  3761316.31  7.79084  (12112324)  442067.00
3761316.31  7.25211  (12112324)
441917.00  3761366.31  9.10546  (14011824)  441967.00
3761366.31  8.77498  (14011824)
442017.00  3761366.31  8.49494  (12112324)  442067.00
3761366.31  7.96628  (12112324)
441917.00  3761416.31  9.94744  (14011824)  441967.00
3761416.31  9.61111  (14011824)
442017.00  3761416.31  9.30625  (12112324)  442067.00
3761416.31  8.79004  (12112324)
441917.00  3761466.31  10.94819  (14011824)  441967.00
3761466.31  10.62291  (14011824)
442017.00  3761466.31  10.27855  (12112324)  442067.00
3761466.31  9.79370  (12112324)
441917.00  3761516.31  12.23359  (12010524)  441967.00
3761516.31  11.89518  (14011824)
442017.00  3761516.31  11.51241  (12112324)  442067.00
3761516.31  11.07063  (12112324)
441917.00  3761566.31  14.08595c (14012124)  441967.00
3761566.31  13.68144  (12010524)
442017.00  3761566.31  13.21579  (12112324)  442067.00
3761566.31  12.85562  (13122124)
441917.00  3761616.31  17.64164c (14012124)  441967.00
3761616.31  17.04205c (14012124)
442017.00  3761616.31  16.25034c (14012124)  442067.00
3761616.31  15.68784  (13122124)
442847.68  3761995.12  6.34175  (12060124)  442897.68
3761995.12  5.99487  (12060124)
442947.68  3761995.12  5.67509  (12060124)  442997.68
3761995.12  5.37792  (12060124)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 5.10206 | (12060124) | 443097.68 | 3761995.12 | 4.84617 | (12060124) |
| 443147.68 | 3761995.12 | 4.60833 | (12060124) | 443197.68 | 3761995.12 | 4.38761 | (12060124) |
| 442847.68 | 3762045.12 | 6.58567 | (12060124) | 442897.68 | 3762045.12 | 6.23422 | (12060124) |
| 442947.68 | 3762045.12 | 5.90699 | (12060124) | 442997.68 | 3762045.12 | 5.60124 | (12060124) |
| 443047.68 | 3762045.12 | 5.31540 | (12060124) | 443097.68 | 3762045.12 | 5.04799 | (12060124) |
| 443147.68 | 3762045.12 | 4.79770 | (12060124) | 443197.68 | 3762045.12 | 4.56350 | (12060124) |
| 442447.68 | 3762095.12 | 11.35911 | (13080424) | 442497.68 | 3762095.12 | 10.29680 | (13080424) |
| 442547.68 | 3762095.12 | 9.50170 | (12060124) | 442597.68 | 3762095.12 | 8.90259 | (12060124) |
| 442647.68 | 3762095.12 | 8.36888 | (12060124) | 442697.68 | 3762095.12 | 7.88234 | (12060124) |
| 442747.68 | 3762095.12 | 7.43935 | (12060124) | 442797.68 | 3762095.12 | 7.03256 | (12060124) |
| 442847.68 | 3762095.12 | 6.65788 | (12060124) | 442897.68 | 3762095.12 | 6.30885 | (12060124) |
| 442947.68 | 3762095.12 | 5.98400 | (12060124) | 442997.68 | 3762095.12 | 5.67951 | (12060124) |
| 443047.68 | 3762095.12 | 5.39551 | (12060124) | 443097.68 | 3762095.12 | 5.12862 | (12060124) |
| 443147.68 | 3762095.12 | 4.87802 | (12060124) | 443197.68 | 3762095.12 | 4.64148 | (12060124) |
| 442447.68 | 3762145.12 | 11.17868 | (13080424) | 442497.68 | 3762145.12 | 10.15192 | (13080424) |
| 442547.68 | 3762145.12 | 9.29312 | (12060124) | 442597.68 | 3762145.12 | 8.70670 | (12060124) |
| 442647.68 | 3762145.12 | 8.18628 | (12060124) | 442697.68 | 3762145.12 | 7.71476 | (12060124) |
| 442747.68 | 3762145.12 | 7.28471 | (12060124) | 442797.68 | 3762145.12 | 6.89201 | (12060124) |
| 442847.68 | 3762145.12 | 6.53227 | (12060124) | 442897.68 | | | |

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3762145.12        6.19699  (12060124)
        442947.68   3762145.12        5.88607  (12060124)                442997.68
3762145.12        5.59602  (12060124)
        443047.68   3762145.12        5.32549  (12060124)                443097.68
3762145.12        5.07164  (12060124)
        443147.68   3762145.12        4.83259  (12060124)                443197.68
3762145.12        4.60667  (12060124)
        442447.68   3762195.12       10.72087  (13080424)                442497.68
3762195.12        9.79319  (13080424)
        442547.68   3762195.12        9.00759  (13080424)                442597.68
3762195.12        8.31536  (13080424)
        442647.68   3762195.12        7.70650  (12060124)                442697.68
3762195.12        7.27530  (12060124)
        442747.68   3762195.12        6.88473  (12060124)                442797.68
3762195.12        6.52977  (12060124)
        442847.68   3762195.12        6.20357  (12060124)                442897.68
3762195.12        5.90053  (12060124)
        442947.68   3762195.12        5.61943  (12060124)                442997.68
3762195.12        5.35766  (12060124)
        443047.68   3762195.12        5.11330  (12060124)                443097.68
3762195.12        4.88398  (12060124)
        443147.68   3762195.12        4.66792  (12060124)                443197.68
3762195.12        4.46342  (12060124)
        442447.68   3762245.12       10.05814  (13080424)                442497.68
3762245.12        9.29164  (13080424)
        442547.68   3762245.12        8.63268  (13080424)                442597.68
3762245.12        8.04336  (13080424)
        442647.68   3762245.12        7.51595  (13080424)                442697.68
3762245.12        7.03442  (13080424)
        442747.68   3762245.12        6.66351  (13072424)                442797.68
3762245.12        6.36533  (13072424)
        442847.68   3762245.12        6.08773  (13072424)                442897.68
3762245.12        5.82708  (13072424)
        442947.68   3762245.12        5.58266  (13072424)                442997.68
3762245.12        5.35210  (13072424)
        443047.68   3762245.12        5.13446  (13072424)                443097.68
3762245.12        4.92794  (13072424)
        443147.68   3762245.12        4.73228  (13072424)                443197.68
3762245.12        4.54616  (13072424)
        442822.81   3761611.77        5.40779c (16012024)                442872.81
3761611.77        5.21194c (16012024)
        442922.81   3761611.77        5.02169c (16012024)                442972.81
3761611.77        4.83715c (16012024)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE  84
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*
```

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 5.60675c | (14041624) | 442872.81 | 3761661.77 | 5.41812c | (14041624) |
| 442922.81 | 3761661.77 | 5.23988c | (14041624) | 442972.81 | 3761661.77 | 5.06989c | (14041624) |
| 442732.29 | 3762366.08 | 6.27182 | (13080424) | 442782.29 | 3762366.08 | 5.98878 | (13080424) |
| 442832.29 | 3762366.08 | 5.71226 | (13080424) | 442732.29 | 3762416.08 | 6.17516 | (12060224) |
| 442782.29 | 3762416.08 | 5.83007 | (12060224) | 442832.29 | 3762416.08 | 5.55119 | (13080424) |
| 442732.29 | 3762466.08 | 6.09717 | (12060224) | 442782.29 | 3762466.08 | 5.83179 | (12060224) |
| 442832.29 | 3762466.08 | 5.57321 | (12060224) | 441922.75 | 3762323.77 | 15.29362c | (12120424) |
| 441972.75 | 3762323.77 | 15.18928c | (12120424) | 442022.75 | 3762323.77 | 15.01770c | (12120424) |
| 442072.75 | 3762323.77 | 14.75104c | (12120424) | 441922.75 | 3762373.77 | 11.83853c | (12120424) |
| 441972.75 | 3762373.77 | 11.78932c | (12120424) | 442022.75 | 3762373.77 | 11.66095c | (12120424) |
| 442072.75 | 3762373.77 | 11.60069 | (14062824) | 441922.75 | 3762423.77 | 9.77183 | (14062824) |
| 441972.75 | 3762423.77 | 9.90502 | (14062824) | 442022.75 | 3762423.77 | 9.98348 | (14062824) |
| 442072.75 | 3762423.77 | 9.98103 | (14062824) | 441922.75 | 3762473.77 | 8.52747 | (14062824) |
| 441972.75 | 3762473.77 | 8.67301 | (14062824) | 442022.75 | 3762473.77 | 8.76714 | (14062824) |
| 442072.75 | 3762473.77 | 8.77031 | (14062824) | 441922.75 | 3762523.77 | 7.50215 | (14062824) |
| 441972.75 | 3762523.77 | 7.66372 | (14062824) | 442022.75 | 3762523.77 | 7.77161 | (14062824) |
| 442072.75 | 3762523.77 | 7.78854 | (14062824) | 441922.75 | 3762573.77 | 6.61776 | (14062824) |
| 441972.75 | 3762573.77 | 6.79639 | (14062824) | 442022.75 | 3762573.77 | 6.91835 | (14062824) |
| 442072.75 | 3762573.77 | 6.94809 | (14062824) | 441922.75 | | | |

3762623.77 5.98440m (16031424)
441972.75 3762623.77 6.06818m (16031424) 442022.75
3762623.77 6.15729 (14062824)
442072.75 3762623.77 6.20027 (14062824) 441109.54
3762319.57 14.58268 (12120624)
441159.54 3762319.57 14.75129 (12120624) 441209.54
3762319.57 14.87392 (12120624)
441259.54 3762319.57 14.93862 (12120624) 441109.54
3762369.57 10.99880 (12120624)
441159.54 3762369.57 11.09012 (12120624) 441209.54
3762369.57 11.13951 (12120624)
441259.54 3762369.57 11.15367 (12120624) 441109.54
3762419.57 8.90096 (12120624)
441159.54 3762419.57 8.94460 (12120624) 441209.54
3762419.57 8.95977 (12120624)
441259.54 3762419.57 8.99803m (14021824) 441109.54
3762469.57 7.43788 (12120624)
441159.54 3762469.57 7.43487 (12120624) 441209.54
3762469.57 7.46900m (14021824)
441259.54 3762469.57 7.57687m (14021824) 441109.54
3762519.57 6.35206 (12120624)
441159.54 3762519.57 6.30173 (12120624) 441209.54
3762519.57 6.35498m (14021824)
441259.54 3762519.57 6.44943m (14021824) 441109.54
3762569.57 5.51201 (12120624)
441159.54 3762569.57 5.42649 (12120624) 441209.54
3762569.57 5.44472m (14021824)
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3762619.57 4.85302 (12120624)
441159.54 3762619.57 4.73594 (12120624) 441209.54
3762619.57 4.80415 (14020924)
441259.54 3762619.57 4.92546 (14020924) 441109.54
3762669.57 4.30670 (12120624)
441159.54 3762669.57 4.24869 (14020924) 441209.54
3762669.57 4.42234 (14020924)
441259.54 3762669.57 4.55296 (14020924) 441109.54
3762719.57 3.82963 (12120624)
441159.54 3762719.57 3.90162 (14020924) 441209.54
3762719.57 4.07677 (14020924)
441259.54 3762719.57 4.21286 (14020924) 441109.54
3762769.57 3.48035m (15011124)
441159.54 3762769.57 3.58760 (14020924) 441209.54
3762769.57 3.75731 (14020924)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 3.89510 | (14020924) | 441313.48 | 3762805.42 | 3.78922 | (14020924) |
| 441363.48 | 3762805.42 | 3.84951 | (14020924) | 441413.48 | 3762805.42 | 3.86952 | (14020924) |
| 441463.48 | 3762805.42 | 3.85222 | (14020924) | 441513.48 | 3762805.42 | 3.79973 | (14020924) |
| 441563.48 | 3762805.42 | 3.71796 | (14020924) | 441613.48 | 3762805.42 | 3.60593 | (14020924) |
| 441663.48 | 3762805.42 | 3.53207m | (16031424) | 441713.48 | 3762805.42 | 3.66314m | (16031424) |
| 441763.48 | 3762805.42 | 3.80526m | (16031424) | 441813.48 | 3762805.42 | 3.94180m | (16031424) |
| 441313.48 | 3762855.42 | 3.50465 | (14020924) | 441363.48 | 3762855.42 | 3.57158 | (14020924) |
| 441413.48 | 3762855.42 | 3.60011 | (14020924) | 441463.48 | 3762855.42 | 3.59047 | (14020924) |
| 441513.48 | 3762855.42 | 3.54390 | (14020924) | 441563.48 | 3762855.42 | 3.46336 | (14020924) |
| 441613.48 | 3762855.42 | 3.35293 | (14020924) | 441663.48 | 3762855.42 | 3.22616m | (16031424) |
| 441713.48 | 3762855.42 | 3.34006m | (16031424) | 441763.48 | 3762855.42 | 3.46467m | (16031424) |
| 441813.48 | 3762855.42 | 3.58452m | (16031424) | 441313.48 | 3762905.42 | 3.23316 | (14020924) |
| 441363.48 | 3762905.42 | 3.30616 | (14020924) | 441413.48 | 3762905.42 | 3.34227 | (14020924) |
| 441463.48 | 3762905.42 | 3.34174 | (14020924) | 441513.48 | 3762905.42 | 3.30222 | (14020924) |
| 441563.48 | 3762905.42 | 3.22684 | (14020924) | 441613.48 | 3762905.42 | 3.12647 | (14020924) |
| 441663.48 | 3762905.42 | 2.98505 | (14020924) | 441713.48 | 3762905.42 | 3.06758m | (16031424) |
| 441763.48 | 3762905.42 | 3.19201m | (16031424) | 441813.48 | 3762905.42 | 3.28286m | (16031424) |
| 441313.48 | 3762955.42 | 2.97583 | (14020924) | 441363.48 | 3762955.42 | 3.05232 | (14020924) |
| 441413.48 | 3762955.42 | 3.09612 | (14020924) | 441463.48 | | | |

3762955.42 3.10481 (14020924)
441513.48 3762955.42 3.07480 (14020924) 441563.48
3762955.42 3.00914 (14020924)
441613.48 3762955.42 2.91006 (14020924) 441663.48
3762955.42 2.77833 (14020924)
441713.48 3762955.42 2.84133m (16031424) 441763.48
3762955.42 2.93337m (16031424)
441813.48 3762955.42 3.02483m (16031424) 440408.22
3761498.57 7.02462c (12011724)
440956.50 3762849.59 3.24926m (15011124) 440559.26
3761306.11 8.10421c (12112224)
440752.05 3761305.37 9.83074 (13122324) 440857.69
3761312.76 10.40140 (13122324)
440969.23 3761308.33 10.36260 (13122324) 440936.73
3761237.41 9.22534 (13122324)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC (YYMMDDHH) X-COORD (M) Y-COORD (M) CONC (YYMMDDHH)
- - - -

3762044.75 1.05620 (12122024)
440500.61 3762044.75 1.10689 (12122024) 440550.61
3762044.75 1.16136 (12122024)
440600.61 3762044.75 1.21998 (12122024) 440650.61
3762044.75 1.28318 (12122024)
440400.61 3762094.75 1.06742 (12122024) 440450.61
3762094.75 1.11007 (12122024)
440500.61 3762094.75 1.16512 (12122024) 440550.61
3762094.75 1.22227 (12122024)
440600.61 3762094.75 1.28157 (12122024) 440650.61
3762094.75 1.36234 (12122024)
440400.61 3762144.75 1.16806 (12122024) 440450.61
3762144.75 1.19526 (12122024)
440500.61 3762144.75 1.26184 (12122024) 440550.61
3762144.75 1.30441 (12122024)
440600.61 3762144.75 1.37670 (12122024) 440650.61
3762144.75 1.45973 (12122024)
441145.13 3761319.94 2.12553 (16122724) 441195.13
3761319.94 2.26455 (16122724)
441245.13 3761319.94 2.41327 (16122724) 441145.13
3761369.94 2.11737 (16122724)
441195.13 3761369.94 2.26164 (16122724) 441245.13
3761369.94 2.41791 (16122724)
441145.13 3761419.94 2.09880 (16122724) 441195.13
3761419.94 2.24746 (16122724)
441245.13 3761419.94 2.41065 (16122724) 441145.13
3761469.94 2.07032 (16122724)
441195.13 3761469.94 2.22112 (16122724) 441245.13
3761469.94 2.39016 (16122724)
441145.13 3761519.94 2.03100 (16122724) 441195.13
3761519.94 2.18225 (16122724)
441245.13 3761519.94 2.35176 (16122724) 441145.13
3761569.94 1.98072 (16122724)
441195.13 3761569.94 2.13043 (16122724) 441245.13
3761569.94 2.29830 (16122724)
441145.13 3761619.94 2.02317 (12020624) 441195.13
3761619.94 2.14643 (12020624)
441245.13 3761619.94 2.28264 (12020624) 441145.13
3761669.94 2.06029 (12020624)
441195.13 3761669.94 2.18901 (12020624) 441245.13
3761669.94 2.33204 (12020624)
441917.00 3761316.31 4.79572 (15031324) 441967.00
3761316.31 5.00968 (15011524)
442017.00 3761316.31 5.37618 (15011524) 442067.00
3761316.31 5.71462 (15011524)
441917.00 3761366.31 5.18302 (15031324) 441967.00
3761366.31 5.50894 (15031324)
442017.00 3761366.31 5.88829 (15011524) 442067.00
3761366.31 6.35147 (15011524)
441917.00 3761416.31 5.66529 (16122724) 441967.00
3761416.31 6.02466 (15031324)

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        442017.00   3761416.31        6.43398  (15011524)                442067.00
3761416.31        7.05082  (15011524)
        441917.00   3761466.31        6.37785  (16122724)                441967.00
3761466.31        6.67291  (16122724)
        442017.00   3761466.31        7.13234  (15031324)                442067.00
3761466.31        7.83078  (15011524)
        441917.00   3761516.31        7.05634  (16122724)                441967.00
3761516.31        7.58392  (16122724)
        442017.00   3761516.31        8.05885  (16122724)                442067.00
3761516.31        8.70103  (15031324)
        441917.00   3761566.31        7.65271  (16122724)                441967.00
3761566.31        8.44118  (16122724)
        442017.00   3761566.31        9.28111  (16122724)                442067.00
3761566.31       10.11696  (16122724)
        441917.00   3761616.31        8.11687  (16122724)                441967.00
3761616.31        9.15207  (16122724)
        442017.00   3761616.31       10.38207  (16122724)                442067.00
3761616.31       11.86149  (16122724)
        442847.68   3761995.12       22.99231  (13020624)                442897.68
3761995.12       17.83783  (13020624)
        442947.68   3761995.12       14.49049  (13020624)                442997.68
3761995.12       12.18518  (13020624)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        07:43:46

                                  PAGE  87
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   1ST HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P1EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000789    , L0000790
, L0000791    , L0000792    , L0000793    ,
                L0000794    , L0000795    , L0000796    , L0000797    , L0000798
, L0000799    , L0000800    , L0000801    ,
                L0000802    , L0000803    , L0000804    , L0000805    , L0000806
, L0000807    , L0000808    , L0000809    ,
                L0000810    , L0000811    , L0000812    , L0000813    , L0000814
, L0000815    , L0000816    ,  . . .      ,

                                                 *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                            ** CONC OF PM_10    IN MICROGRAMS/M**3
                  **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - -
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443047.68 3761995.12 10.45361 (13020624) 443097.68
3761995.12 9.09535 (13020624)
443147.68 3761995.12 8.03490 (13020624) 443197.68
3761995.12 7.26370m (12050224)
442847.68 3762045.12 22.51157 (12120224) 442897.68
3762045.12 17.34081 (12120224)
442947.68 3762045.12 14.01589 (12120224) 442997.68
3762045.12 11.68828 (12120224)
443047.68 3762045.12 10.03825 (13020624) 443097.68
3762045.12 8.84459 (13020624)
443147.68 3762045.12 7.87660 (13020624) 443197.68
3762045.12 7.11503 (13020624)
442447.68 3762095.12 34.23435 (12120624) 442497.68
3762095.12 33.90119 (12120624)
442547.68 3762095.12 30.04869 (12120624) 442597.68
3762095.12 31.06478 (12120624)
442647.68 3762095.12 27.28436 (12120624) 442697.68
3762095.12 27.62452 (12120624)
442747.68 3762095.12 26.67943 (12120224) 442797.68
3762095.12 24.23052 (12120224)
442847.68 3762095.12 21.00994 (12120224) 442897.68
3762095.12 16.82341 (12120224)
442947.68 3762095.12 14.00307 (12120224) 442997.68
3762095.12 12.30412 (12120224)
443047.68 3762095.12 10.59292 (12120224) 443097.68
3762095.12 9.20879 (12120224)
443147.68 3762095.12 8.01866 (12120224) 443197.68
3762095.12 7.29936 (12120224)
442447.68 3762145.12 28.41558 (12120624) 442497.68
3762145.12 24.54389 (12120624)
442547.68 3762145.12 22.53683 (12120624) 442597.68
3762145.12 21.18103 (12120624)
442647.68 3762145.12 20.36711m (16031424) 442697.68
3762145.12 19.83499m (16031424)
442747.68 3762145.12 19.07340m (16031424) 442797.68
3762145.12 17.83651 (12120224)
442847.68 3762145.12 16.68897 (12120224) 442897.68
3762145.12 14.99764 (12120224)
442947.68 3762145.12 13.31464 (12120224) 442997.68
3762145.12 11.96624 (12120224)
443047.68 3762145.12 10.57024 (12120224) 443097.68
3762145.12 9.31944 (12120224)
443147.68 3762145.12 8.26272 (12120224) 443197.68
3762145.12 7.49835 (12120224)
442447.68 3762195.12 23.39463 (12120624) 442497.68
3762195.12 19.33303 (12120624)
442547.68 3762195.12 17.18179 (12120624) 442597.68
3762195.12 16.13685m (16031424)
442647.68 3762195.12 15.82719m (16031424) 442697.68
3762195.12 15.47423m (16031424)
442747.68 3762195.12 14.93625m (16031424) 442797.68

3762195.12 14.01771m (16031424)
442847.68 3762195.12 13.11827 (12120224) 442897.68
3762195.12 12.67510 (12120224)
442947.68 3762195.12 12.00192 (12120224) 442997.68
3762195.12 11.26799 (12120224)
443047.68 3762195.12 10.33856 (12120224) 443097.68
3762195.12 9.40363 (12120224)
443147.68 3762195.12 8.45630 (12120224) 443197.68
3762195.12 7.65456 (12120224)
442447.68 3762245.12 19.52445 (12120624) 442497.68
3762245.12 15.83822 (12120624)
442547.68 3762245.12 14.00659m (16031424) 442597.68
3762245.12 13.42532m (16031424)
442647.68 3762245.12 13.00237m (16031424) 442697.68
3762245.12 12.61971m (16031424)
442747.68 3762245.12 12.14637m (16031424) 442797.68
3762245.12 11.65359m (16031424)
442847.68 3762245.12 11.08356m (16031424) 442897.68
3762245.12 10.66429 (12120224)
442947.68 3762245.12 10.44159 (12120224) 442997.68
3762245.12 10.10533 (12120224)
443047.68 3762245.12 9.45975 (12120224) 443097.68
3762245.12 8.89243 (12120224)
443147.68 3762245.12 8.15599 (12120224) 443197.68
3762245.12 7.53112 (12120224)
442822.81 3761611.77 14.78220 (14110424) 442872.81
3761611.77 12.22843 (14110424)
442922.81 3761611.77 9.98917 (14110424) 442972.81
3761611.77 8.33808c (13020924)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 19.24435 | (14110424) | 442872.81 | 3761661.77 | 14.31593 | (14110424) |
| 442922.81 | 3761661.77 | 11.38706c | (13020924) | 442972.81 | 3761661.77 | 9.60500c | (13112024) |
| 442732.29 | 3762366.08 | 8.78546m | (16031424) | 442782.29 | 3762366.08 | 8.51892m | (16031424) |
| 442832.29 | 3762366.08 | 8.31828m | (16031424) | 442732.29 | 3762416.08 | 7.89421m | (16031424) |
| 442782.29 | 3762416.08 | 7.63845m | (16031424) | 442832.29 | 3762416.08 | 7.38750m | (16031424) |
| 442732.29 | 3762466.08 | 7.04563m | (16031424) | 442782.29 | 3762466.08 | 6.85927m | (16031424) |
| 442832.29 | 3762466.08 | 6.67577m | (16031424) | 441922.75 | 3762323.77 | 6.60860 | (12020424) |
| 441972.75 | 3762323.77 | 7.47033 | (12020424) | 442022.75 | 3762323.77 | 8.45985 | (12020424) |
| 442072.75 | 3762323.77 | 9.56621 | (12020424) | 441922.75 | 3762373.77 | 6.42164 | (12020424) |
| 441972.75 | 3762373.77 | 6.98057 | (12020424) | 442022.75 | 3762373.77 | 7.61794 | (12020424) |
| 442072.75 | 3762373.77 | 8.21124 | (12020424) | 441922.75 | 3762423.77 | 6.17313 | (12020424) |
| 441972.75 | 3762423.77 | 6.35244 | (12020424) | 442022.75 | 3762423.77 | 6.63737 | (12020424) |
| 442072.75 | 3762423.77 | 7.50780m | (15011124) | 441922.75 | 3762473.77 | 5.61246 | (12020424) |
| 441972.75 | 3762473.77 | 5.74598m | (15011124) | 442022.75 | 3762473.77 | 6.32834m | (15011124) |
| 442072.75 | 3762473.77 | 7.14315m | (15011124) | 441922.75 | 3762523.77 | 4.99931 | (12020424) |
| 441972.75 | 3762523.77 | 5.58916m | (15011124) | 442022.75 | 3762523.77 | 6.05732m | (15011124) |
| 442072.75 | 3762523.77 | 6.50191m | (15011124) | 441922.75 | 3762573.77 | 4.92221m | (15011124) |
| 441972.75 | 3762573.77 | 5.38879m | (15011124) | 442022.75 | 3762573.77 | 5.75722m | (15011124) |
| 442072.75 | 3762573.77 | 6.00211m | (15011124) | 441922.75 | 3762623.77 | 4.80056m | (15011124) |
| 441972.75 | 3762623.77 | 5.17363m | (15011124) | 442022.75 | 3762623.77 | 5.41166m | (15011124) |
| 442072.75 | 3762623.77 | 5.49936m | (15011124) | 441109.54 | 3762319.57 | 2.55540 | (12122024) |
| 441159.54 | 3762319.57 | 2.63069 | (12122024) | 441209.54 | 3762319.57 | 2.74879 | (12122024) |

441259.54  3762319.57  2.95529  (12122024)  441109.54
3762369.57  2.58348  (12122024)
441159.54  3762369.57  2.55399  (12122024)  441209.54
3762369.57  2.64709  (12122024)
441259.54  3762369.57  2.81866  (12122024)  441109.54
3762419.57  2.52036  (12122024)
441159.54  3762419.57  2.45009  (12122024)  441209.54
3762419.57  2.48578  (12122024)
441259.54  3762419.57  2.56088  (12122024)  441109.54
3762469.57  2.36163  (12122024)
441159.54  3762469.57  2.30931  (12122024)  441209.54
3762469.57  2.33300  (12011324)
441259.54  3762469.57  2.53224  (12011324)  441109.54
3762519.57  2.29951  (12011324)
441159.54  3762519.57  2.30066  (12011324)  441209.54
3762519.57  2.40161  (12011324)
441259.54  3762519.57  2.52400  (12011324)  441109.54
3762569.57  2.41384  (12011324)
441159.54  3762569.57  2.38734  (12011324)  441209.54
3762569.57  2.40667  (12011324)
441259.54  3762569.57  2.46526  (12011324)  441109.54
3762619.57  2.43043  (12011324)
441159.54  3762619.57  2.41517  (12011324)  441209.54
3762619.57  2.41930  (12011324)
441259.54  3762619.57  2.55284  (12011324)  441109.54
3762669.57  2.38358  (12011324)
441159.54  3762669.57  2.44409  (12011324)  441209.54
3762669.57  2.51797  (12011324)
441259.54  3762669.57  2.59051  (12011324)  441109.54
3762719.57  2.37343  (12011324)
441159.54  3762719.57  2.41235  (12011324)  441209.54
3762719.57  2.46179  (12011324)
441259.54  3762719.57  2.48062  (12011324)  441109.54
3762769.57  2.28273  (12011324)
441159.54  3762769.57  2.30843  (12011324)  441209.54
3762769.57  2.31243  (12011324)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806

, L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814
, L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 2.40659 | (16060324) | 441313.48 | 3762805.42 | 2.59793 | (16060324) |
| 441363.48 | 3762805.42 | 2.71579 | (16060324) | 441413.48 | 3762805.42 | 2.77700 | (16060324) |
| 441463.48 | 3762805.42 | 2.83866 | (16060324) | 441513.48 | 3762805.42 | 2.90363 | (16060324) |
| 441563.48 | 3762805.42 | 2.92404 | (12020424) | 441613.48 | 3762805.42 | 2.92117 | (12020424) |
| 441663.48 | 3762805.42 | 2.87335 | (12020424) | 441713.48 | 3762805.42 | 3.08824m | (15011124) |
| 441763.48 | 3762805.42 | 3.38513m | (15011124) | 441813.48 | 3762805.42 | 3.66531m | (15011124) |
| 441313.48 | 3762855.42 | 2.55408 | (16060324) | 441363.48 | 3762855.42 | 2.61916 | (16060324) |
| 441413.48 | 3762855.42 | 2.65868 | (16060324) | 441463.48 | 3762855.42 | 2.68042 | (12020424) |
| 441513.48 | 3762855.42 | 2.72218 | (12020424) | 441563.48 | 3762855.42 | 2.71736 | (12020424) |
| 441613.48 | 3762855.42 | 2.65900 | (12020424) | 441663.48 | 3762855.42 | 2.80157m | (15011124) |
| 441713.48 | 3762855.42 | 3.09370m | (15011124) | 441763.48 | 3762855.42 | 3.34241m | (15011124) |
| 441813.48 | 3762855.42 | 3.57230m | (15011124) | 441313.48 | 3762905.42 | 2.47121 | (16060324) |
| 441363.48 | 3762905.42 | 2.47957 | (16060324) | 441413.48 | 3762905.42 | 2.52291 | (16060324) |
| 441463.48 | 3762905.42 | 2.54196 | (12020424) | 441513.48 | 3762905.42 | 2.53610 | (12020424) |
| 441563.48 | 3762905.42 | 2.48276 | (12020424) | 441613.48 | 3762905.42 | 2.52870m | (15011124) |
| 441663.48 | 3762905.42 | 2.83350m | (15011124) | 441713.48 | 3762905.42 | 3.07437m | (15011124) |
| 441763.48 | 3762905.42 | 3.18165m | (15011124) | 441813.48 | 3762905.42 | 3.41835m | (15011124) |
| 441313.48 | 3762955.42 | 2.33686 | (16060324) | 441363.48 | 3762955.42 | 2.35177 | (12020424) |
| 441413.48 | 3762955.42 | 2.38301 | (12020424) | 441463.48 | | | |

3762955.42  2.37144  (12020424)
441513.48  3762955.42  2.32062  (12020424)  441563.48
3762955.42  2.35682m (15011124)
441613.48  3762955.42  2.59534m (15011124)  441663.48
3762955.42  2.83844m (15011124)
441713.48  3762955.42  3.03145m (15011124)  441763.48
3762955.42  3.16083m (15011124)
441813.48  3762955.42  3.24975m (15011124)  440408.22
3761498.57  0.98286  (12020624)
440956.50  3762849.59  2.00885  (12011324)  440559.26
3761306.11  1.10318  (16122724)
440752.05  3761305.37  1.34241  (16122724)  440857.69
3761312.76  1.50577  (16122724)
440969.23  3761308.33  1.71530  (16122724)  440936.73
3761237.41  1.66668  (16122724)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC (YYMMDDHH) X-COORD (M) Y-COORD (M) CONC (YYMMDDHH)
- - - -

440500.61 3762094.75 2.68162 (16121524) 440550.61
3762094.75 2.75268 (16121524)
440600.61 3762094.75 2.82604 (16121524) 440650.61
3762094.75 2.90200 (16121524)
440400.61 3762144.75 2.39005 (16121524) 440450.61
3762144.75 2.44640 (16011924)
440500.61 3762144.75 2.52430 (16011924) 440550.61
3762144.75 2.60495 (16011924)
440600.61 3762144.75 2.68852 (16011924) 440650.61
3762144.75 2.77563 (14120124)
441145.13 3761319.94 4.56931c (12011724) 441195.13
3761319.94 4.84498c (12011724)
441245.13 3761319.94 5.12990c (12011724) 441145.13
3761369.94 4.66046m (16123124)
441195.13 3761369.94 4.93078c (12011724) 441245.13
3761369.94 5.24039c (12011724)
441145.13 3761419.94 4.94046m (16123124) 441195.13
3761419.94 5.10888m (16123124)
441245.13 3761419.94 5.32295c (12011724) 441145.13
3761469.94 5.07287m (16123124)
441195.13 3761469.94 5.30373m (16123124) 441245.13
3761469.94 5.54095m (16123124)
441145.13 3761519.94 5.10670m (16123124) 441195.13
3761519.94 5.37911m (16123124)
441245.13 3761519.94 5.66816m (16123124) 441145.13
3761569.94 5.10756m (16123124)
441195.13 3761569.94 5.40416m (16123124) 441245.13
3761569.94 5.72463m (16123124)
441145.13 3761619.94 5.12114m (16123124) 441195.13
3761619.94 5.43270m (16123124)
441245.13 3761619.94 5.77456m (16123124) 441145.13
3761669.94 5.15579m (16123124)
441195.13 3761669.94 5.47547m (16123124) 441245.13
3761669.94 5.82959m (16123124)
441917.00 3761316.31 15.55362c (12112224) 441967.00
3761316.31 16.53726c (12112224)
442017.00 3761316.31 17.20360c (12112224) 442067.00
3761316.31 17.57519c (12112224)
441917.00 3761366.31 15.94721c (12112224) 441967.00
3761366.31 17.46981c (12112224)
442017.00 3761366.31 18.60484c (12112224) 442067.00
3761366.31 19.36681c (12112224)
441917.00 3761416.31 15.96021c (12112224) 441967.00
3761416.31 18.04936c (12112224)
442017.00 3761416.31 19.85769c (12112224) 442067.00
3761416.31 21.17175c (12112224)
441917.00 3761466.31 16.09163 (13122324) 441967.00
3761466.31 18.09874c (12112224)
442017.00 3761466.31 20.72909c (12112224) 442067.00
3761466.31 22.94826c (12112224)
441917.00 3761516.31 15.98458 (13122324) 441967.00

3761516.31  18.49355  (13122324)
442017.00  3761516.31  21.21751  (13122324)  442067.00
3761516.31  24.37926c (12112224)
441917.00  3761566.31  15.16680  (13122324)  441967.00
3761566.31  18.11612  (13122324)
442017.00  3761566.31  21.66745  (13122324)  442067.00
3761566.31  25.87976  (13122324)
441917.00  3761616.31  15.95909  (12121624)  441967.00
3761616.31  18.45147  (12121624)
442017.00  3761616.31  21.60138  (12121624)  442067.00
3761616.31  26.08448  (13122324)
442847.68  3761995.12  43.36489  (13080424)  442897.68
3761995.12  34.40642  (13080424)
442947.68  3761995.12  28.86594  (13080424)  442997.68
3761995.12  24.84366  (13080424)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC (YYMMDDHH) X-COORD (M) Y-COORD (M) CONC (YYMMDDHH)
- - - -

442547.68 3762095.12 55.43294c (12120424) 442597.68
3762095.12 53.68916c (12120424)
442647.68 3762095.12 52.21682c (12120424) 442697.68
3762095.12 50.24696c (12120424)
442747.68 3762095.12 47.22145c (12120424) 442797.68
3762095.12 45.17286 (12120224)
442847.68 3762095.12 36.33746 (12120224) 442897.68
3762095.12 29.06914 (12120224)
442947.68 3762095.12 24.17062 (12120224) 442997.68
3762095.12 20.43822 (13080424)
443047.68 3762095.12 18.52614 (13080424) 443097.68
3762095.12 16.91145 (13080424)
443147.68 3762095.12 15.50287 (13080424) 443197.68
3762095.12 14.24185 (13080424)
442447.68 3762145.12 33.93297c (12120424) 442497.68
3762145.12 30.58036c (12120424)
442547.68 3762145.12 29.65552c (12120424) 442597.68
3762145.12 29.32199c (12120424)
442647.68 3762145.12 29.11529c (12120424) 442697.68
3762145.12 28.64616c (12120424)
442747.68 3762145.12 27.99308 (14062824) 442797.68
3762145.12 27.07620 (12120224)
442847.68 3762145.12 27.27319 (12120224) 442897.68
3762145.12 25.35919 (12120224)
442947.68 3762145.12 22.56564 (12120224) 442997.68
3762145.12 19.84312 (12120224)
443047.68 3762145.12 17.40603 (12120224) 443097.68
3762145.12 15.26580 (12120224)
443147.68 3762145.12 14.20626 (13080424) 443197.68
3762145.12 13.30059 (13080424)
442447.68 3762195.12 29.15960c (12120424) 442497.68
3762195.12 24.98329c (12120424)
442547.68 3762195.12 23.13625c (12120424) 442597.68
3762195.12 22.22322c (12120424)
442647.68 3762195.12 22.34680m (16031424) 442697.68
3762195.12 22.38465m (16031424)
442747.68 3762195.12 21.51768m (16031424) 442797.68
3762195.12 20.67133c (13081424)
442847.68 3762195.12 20.88627c (13081424) 442897.68
3762195.12 20.82860 (14062824)
442947.68 3762195.12 19.83450 (14062824) 442997.68
3762195.12 18.22230 (12120224)
443047.68 3762195.12 16.55557 (12120224) 443097.68
3762195.12 14.88814 (12120224)
443147.68 3762195.12 13.33343 (12120224) 443197.68
3762195.12 12.41227 (12060224)
442447.68 3762245.12 26.23496c (12120424) 442497.68
3762245.12 22.15616c (12120424)
442547.68 3762245.12 19.99242c (12120424) 442597.68
3762245.12 18.64075c (12120424)
442647.68 3762245.12 18.39066m (16031424) 442697.68

3762245.12  18.18837m (16031424)
442747.68  3762245.12  17.23953m (16031424)  442797.68
3762245.12  16.87419c (13081424)
442847.68  3762245.12  17.27495c (13081424)  442897.68
3762245.12  17.23082c (13081424)
442947.68  3762245.12  17.28723  (14062824)  442997.68
3762245.12  16.75677  (14062824)
443047.68  3762245.12  15.67824  (14062824)  443097.68
3762245.12  14.26571  (14062824)
443147.68  3762245.12  12.94686  (12120224)  443197.68
3762245.12  11.77192  (12120224)
442822.81  3761611.77  24.88279  (12010524)  442872.81
3761611.77  19.99966  (14110424)
442922.81  3761611.77  17.72968c (12100524)  442972.81
3761611.77  16.20959c (12100524)



*** MODELOPTs:  RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

*** THE  1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP:  P1FUGITI ***
INCLUDING SOURCE(S):  PAREA2  ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10  IN MICROGRAMS/M**3  **

X-COORD (M)  Y-COORD (M)  CONC  (YYMMDDHH)  X-COORD (M)  Y-COORD (M)  CONC  (YYMMDDHH)
- - - -

441972.75 3762323.77 13.12291 (12120624) 442022.75
3762323.77 14.59296 (12120624)
442072.75 3762323.77 16.48983 (12120624) 441922.75
3762373.77 10.99314 (16060324)
441972.75 3762373.77 12.28178 (16060324) 442022.75
3762373.77 13.51122 (16060324)
442072.75 3762373.77 14.39986 (16060324) 441922.75
3762423.77 10.76750 (16060324)
441972.75 3762423.77 11.49687 (16060324) 442022.75
3762423.77 11.82810 (16060324)
442072.75 3762423.77 12.03295 (13012424) 441922.75
3762473.77 9.87933 (16060324)
441972.75 3762473.77 9.94245 (16060324) 442022.75
3762473.77 9.87037 (13012424)
442072.75 3762473.77 10.91778m (15011124) 441922.75
3762523.77 8.48723 (16060324)
441972.75 3762523.77 8.26689 (13012424) 442022.75
3762523.77 9.26687m (15011124)
442072.75 3762523.77 9.92659m (15011124) 441922.75
3762573.77 7.02147 (13012424)
441972.75 3762573.77 7.98579m (15011124) 442022.75
3762573.77 8.68538m (15011124)
442072.75 3762573.77 8.82216m (15011124) 441922.75
3762623.77 6.95533m (15011124)
441972.75 3762623.77 7.65019m (15011124) 442022.75
3762623.77 7.94842m (15011124)
442072.75 3762623.77 7.74203m (15011124) 441109.54
3762319.57 4.36295 (12122024)
441159.54 3762319.57 4.54901 (12122024) 441209.54
3762319.57 4.73672 (12122024)
441259.54 3762319.57 4.92429 (12122024) 441109.54
3762369.57 4.16630 (12122024)
441159.54 3762369.57 4.30670 (12122024) 441209.54
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441259.54 3762369.57 4.57188 (12122024) 441109.54
3762419.57 3.86571 (12122024)
441159.54 3762419.57 3.95680 (12122024) 441209.54
3762419.57 4.03883 (12122024)
441259.54 3762419.57 4.11231 (12122024) 441109.54
3762469.57 3.65617 (13101324)
441159.54 3762469.57 3.77116 (13101324) 441209.54
3762469.57 3.87042 (13101324)
441259.54 3762469.57 3.95151 (13101324) 441109.54
3762519.57 3.54110 (13101324)
441159.54 3762519.57 3.59477 (13101324) 441209.54
3762519.57 3.88808c (13091724)
441259.54 3762519.57 4.25806c (13091724) 441109.54
3762569.57 3.54055c (13091724)
441159.54 3762569.57 3.86428c (13091724) 441209.54
3762569.57 4.19201c (13091724)
441259.54 3762569.57 4.51694c (13091724) 441109.54

3762619.57 3.81055c (13091724)
441159.54 3762619.57 4.09561c (13091724) 441209.54
3762619.57 4.37136c (13091724)
441259.54 3762619.57 4.62912c (13091724) 441109.54
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441159.54 3762669.57 4.20116c (13091724) 441209.54
3762669.57 4.40738c (13091724)
441259.54 3762669.57 4.58268c (13091724) 441109.54
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441159.54 3762719.57 4.17193c (13091724) 441209.54
3762719.57 4.29864c (13091724)
441259.54 3762719.57 4.38484c (13091724) 441109.54
3762769.57 3.94203c (13091724)
441159.54 3762769.57 4.01597c (13091724) 441209.54
3762769.57 4.06237c (13091724)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P1FUGITI ***
INCLUDING SOURCE(S): PAREA2 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC (YYMMDDHH) X-COORD (M) Y-COORD (M) CONC (YYMMDDHH)
- - - -

```
        441413.48   3762855.42        4.24385  (16060324)                441463.48
3762855.42        4.13829  (16060324)
        441513.48   3762855.42        3.98745  (16060324)                441563.48
3762855.42        3.80858  (16060324)
        441613.48   3762855.42        3.76330b (14081524)                441663.48
3762855.42        3.94470b (14081524)
        441713.48   3762855.42        4.23981m (15011124)                441763.48
3762855.42        4.72728m (15011124)
        441813.48   3762855.42        5.14131m (15011124)                441313.48
3762905.42        3.97761  (16060324)
        441363.48   3762905.42        3.89666  (16060324)                441413.48
3762905.42        3.77639  (16060324)
        441463.48   3762905.42        3.61450  (16060324)                441513.48
3762905.42        3.51039  (12020424)
        441563.48   3762905.42        3.57720b (14081524)                441613.48
3762905.42        3.64030b (14081524)
        441663.48   3762905.42        3.81899m (15011124)                441713.48
3762905.42        4.27266m (15011124)
        441763.48   3762905.42        4.62618m (15011124)                441813.48
3762905.42        4.95887m (15011124)
        441313.48   3762955.42        3.58593  (16060324)                441363.48
3762955.42        3.45126  (16060324)
        441413.48   3762955.42        3.37382  (12020424)                441463.48
3762955.42        3.30267  (12020424)
        441513.48   3762955.42        3.37763b (14081524)                441563.48
3762955.42        3.53546b (14081524)
        441613.48   3762955.42        3.58222b (14081524)                441663.48
3762955.42        3.86919m (15011124)
        441713.48   3762955.42        4.24865m (15011124)                441763.48
3762955.42        4.54928m (15011124)
        441813.48   3762955.42        4.73471m (15011124)                440408.22
3761498.57        2.75970  (14020624)
        440956.50   3762849.59        3.48634c (13091724)                440559.26
3761306.11        3.21580m (16123124)
        440752.05   3761305.37        3.59722m (16123124)                440857.69
3761312.76        3.81099m (16123124)
        440969.23   3761308.33        3.96514m (16123124)                440936.73
3761237.41        3.83180  (12112124)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE  94
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   1ST HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                 L0000005    , L0000006    , L0000007    , L0000008    , L0000009
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, L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017
, L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025
, L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 13.36781 | (12122024) | 440450.61 | 3761994.75 | 14.79696 | (12122024) |
| 440500.61 | 3761994.75 | 16.49402 | (12122024) | 440550.61 | 3761994.75 | 18.52016 | (12122024) |
| 440600.61 | 3761994.75 | 21.04087 | (12122024) | 440650.61 | 3761994.75 | 24.26409 | (12122024) |
| 440400.61 | 3762044.75 | 13.70005 | (12122024) | 440450.61 | 3762044.75 | 15.07805 | (12122024) |
| 440500.61 | 3762044.75 | 16.72883 | (12122024) | 440550.61 | 3762044.75 | 18.70249 | (12122024) |
| 440600.61 | 3762044.75 | 21.14491 | (12122024) | 440650.61 | 3762044.75 | 24.29655 | (12122024) |
| 440400.61 | 3762094.75 | 13.98016 | (12122024) | 440450.61 | 3762094.75 | 15.25516 | (12122024) |
| 440500.61 | 3762094.75 | 16.80702 | (12122024) | 440550.61 | 3762094.75 | 18.67094 | (12122024) |
| 440600.61 | 3762094.75 | 20.95360 | (12122024) | 440650.61 | 3762094.75 | 24.05272 | (12122024) |
| 440400.61 | 3762144.75 | 14.17089 | (12122024) | 440450.61 | 3762144.75 | 15.30104 | (12122024) |
| 440500.61 | 3762144.75 | 16.74839 | (12122024) | 440550.61 | 3762144.75 | 18.39474 | (12122024) |
| 440600.61 | 3762144.75 | 20.54377 | (12122024) | 440650.61 | 3762144.75 | 23.36656 | (12122024) |
| 441145.13 | 3761319.94 | 18.46132 | (13122324) | 441195.13 | 3761319.94 | 18.97237 | (13122324) |
| 441245.13 | 3761319.94 | 19.47860 | (13122324) | 441145.13 | 3761369.94 | 19.66197 | (13122324) |
| 441195.13 | 3761369.94 | 20.16687 | (13122324) | 441245.13 | 3761369.94 | 20.66346 | (13122324) |
| 441145.13 | 3761419.94 | 21.15157 | (13122324) | 441195.13 | 3761419.94 | 21.65124 | (13122324) |
| 441245.13 | 3761419.94 | 22.14418 | (13122324) | 441145.13 | 3761469.94 | 23.06279 | (13122324) |
| 441195.13 | 3761469.94 | 23.54467 | (13122324) | 441245.13 | | | |

3761469.94 24.04677 (13122324)
441145.13 3761519.94 25.58387 (13122324) 441195.13
3761519.94 26.04587 (13122324)
441245.13 3761519.94 26.51093 (13122324) 441145.13
3761569.94 29.09840 (13122324)
441195.13 3761569.94 29.52993 (13122324) 441245.13
3761569.94 29.95076 (13122324)
441145.13 3761619.94 34.58054 (13122324) 441195.13
3761619.94 35.00660 (13122324)
441245.13 3761619.94 35.43661 (13122324) 441145.13
3761669.94 45.61605 (13122324)
441195.13 3761669.94 45.95265 (13122324) 441245.13
3761669.94 46.44565 (13122324)
441917.00 3761316.31 27.91199c (12112224) 441967.00
3761316.31 28.54156c (12112224)
442017.00 3761316.31 28.94492c (12112224) 442067.00
3761316.31 29.10557c (12112224)
441917.00 3761366.31 29.81866c (12112224) 441967.00
3761366.31 30.85233c (12112224)
442017.00 3761366.31 31.62413c (12112224) 442067.00
3761366.31 32.13928c (12112224)
441917.00 3761416.31 31.77875c (12112224) 441967.00
3761416.31 33.19376c (12112224)
442017.00 3761416.31 34.47116c (12112224) 442067.00
3761416.31 35.44582c (12112224)
441917.00 3761466.31 33.83594c (12112224) 441967.00
3761466.31 35.57603c (12112224)
442017.00 3761466.31 37.44506c (12112224) 442067.00
3761466.31 39.14323c (12112224)
441917.00 3761516.31 36.45326 (13122324) 441967.00
3761516.31 38.24742 (13122324)
442017.00 3761516.31 40.55575c (12112224) 442067.00
3761516.31 43.20063c (12112224)
441917.00 3761566.31 39.72104 (13122324) 441967.00
3761566.31 41.88889 (13122324)
442017.00 3761566.31 44.52722 (13122324) 442067.00
3761566.31 47.78223 (13122324)
441917.00 3761616.31 44.57571 (13122324) 441967.00
3761616.31 46.90832 (13122324)
442017.00 3761616.31 49.89686 (13122324) 442067.00
3761616.31 53.98281 (13122324)
442847.68 3761995.12 71.73132 (13111924) 442897.68
3761995.12 56.58781 (13111924)
442947.68 3761995.12 47.18250 (13111924) 442997.68
3761995.12 40.63964 (13111924)

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   1ST HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3
                  **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - -
        443047.68   3761995.12       35.95396  (12080324)                443097.68
3761995.12       32.49175  (12060124)
        443147.68   3761995.12       29.95384  (12060124)                443197.68
3761995.12       27.79203  (12060124)
        442847.68   3762045.12       66.40756  (13111924)                442897.68
3762045.12       52.22773  (13111924)
        442947.68   3762045.12       43.93764  (13111924)                442997.68
3762045.12       38.71384  (12080324)
        443047.68   3762045.12       34.76361  (12080324)                443097.68
3762045.12       31.61735  (12080324)
        443147.68   3762045.12       28.98247  (12080324)                443197.68
3762045.12       26.80754  (12080324)
        442447.68   3762095.12      103.74007  (12120624)                442497.68
3762095.12       98.49108  (12120624)
        442547.68   3762095.12       92.12885c (12120424)                442597.68
3762095.12       90.60146c (12120424)
        442647.68   3762095.12       85.09328c (12120424)                442697.68
3762095.12       83.03596c (12120424)
        442747.68   3762095.12       78.11320  (12120224)                442797.68
3762095.12       75.18454  (12120224)
        442847.68   3762095.12       62.53246  (12120224)                442897.68
3762095.12       50.62957  (12120224)
        442947.68   3762095.12       42.52683  (12120224)                442997.68
3762095.12       36.79890  (12120224)
        443047.68   3762095.12       31.77503  (12120224)                443097.68
3762095.12       29.26742  (12080324)
        443147.68   3762095.12       27.14840  (12080324)                443197.68
3762095.12       25.52525  (12080324)
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3762145.12 62.92993c (12120424)
442547.68 3762145.12 59.45959c (12120424) 442597.68
3762145.12 57.24013c (12120424)
442647.68 3762145.12 55.23618c (12120424) 442697.68
3762145.12 54.09637m (16031424)
442747.68 3762145.12 51.98062m (16031424) 442797.68
3762145.12 51.41676 (12120224)
442847.68 3762145.12 49.76325 (12120224) 442897.68
3762145.12 45.68385 (12120224)
442947.68 3762145.12 40.78755 (12120224) 442997.68
3762145.12 36.36124 (12120224)
443047.68 3762145.12 32.19044 (12120224) 443097.68
3762145.12 28.50268 (12120224)
443147.68 3762145.12 25.32416 (12120224) 443197.68
3762145.12 23.62627 (14062924)
442447.68 3762195.12 61.73492c (12120424) 442497.68
3762195.12 52.67926c (12120424)
442547.68 3762195.12 48.12116c (12120424) 442597.68
3762195.12 45.54892m (16031424)
442647.68 3762195.12 44.62690m (16031424) 442697.68
3762195.12 43.62458m (16031424)
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3762195.12 40.34818 (12120224)
442847.68 3762195.12 40.06001 (12120224) 442897.68
3762195.12 39.10754 (12120224)
442947.68 3762195.12 37.12278 (12120224) 442997.68
3762195.12 34.54559 (12120224)
443047.68 3762195.12 31.57310 (12120224) 443097.68
3762195.12 28.63859 (12120224)
443147.68 3762195.12 25.83691 (12120224) 443197.68
3762195.12 23.37162 (12120224)
442447.68 3762245.12 55.66289 (12120224) 442497.68
3762245.12 46.84140c (12120424)
442547.68 3762245.12 42.18539c (12120424) 442597.68
3762245.12 39.17263m (16031424)
442647.68 3762245.12 37.78208m (16031424) 442697.68
3762245.12 36.52782m (16031424)
442747.68 3762245.12 34.50989m (16031424) 442797.68
3762245.12 33.89669 (12120224)
442847.68 3762245.12 33.88921 (12120224) 442897.68
3762245.12 33.75542 (12120224)
442947.68 3762245.12 32.98764 (12120224) 442997.68
3762245.12 31.70540 (12120224)
443047.68 3762245.12 29.77823 (12120224) 443097.68
3762245.12 27.75057 (12120224)
443147.68 3762245.12 25.49506 (12120224) 443197.68
3762245.12 23.41570 (12120224)
442822.81 3761611.77 44.04040 (14110424) 442872.81
3761611.77 37.29887 (14110424)
442922.81 3761611.77 31.12988 (14110424) 442972.81

3761611.77  27.96138c (12100524)
*** AERMOD - VERSION 24142  ***  *** Center Park Operational LST - PM10
***  05/08/25
*** AERMET - VERSION  16216 ***  ***
***  07:43:46

PAGE  96
*** MODELOPTs:  RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

*** THE  1ST HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  ALL  ***
INCLUDING SOURCE(S):  PAREA1  , L0000001
, L0000002  , L0000003  , L0000004  ,
L0000005  , L0000006  , L0000007  , L0000008  , L0000009
, L0000010  , L0000011  , L0000012  ,
L0000013  , L0000014  , L0000015  , L0000016  , L0000017
, L0000018  , L0000019  , L0000020  ,
L0000021  , L0000022  , L0000023  , L0000024  , L0000025
, L0000026  , L0000027  ,  . . .  ,

*** DISCRETE CARTESIAN RECEPTOR POINTS
***

** CONC OF PM_10  IN MICROGRAMS/M**3
**

X-COORD (M)  Y-COORD (M)  CONC  (YYMMDDHH)  X-COORD (M)
Y-COORD (M)  CONC  (YYMMDDHH)
- - - -

3762423.77 26.45914 (12120624)
441972.75 3762423.77 26.50144 (12120624) 442022.75
3762423.77 26.70150 (12120624)
442072.75 3762423.77 26.93848 (12120624) 441922.75
3762473.77 22.61891 (12120624)
441972.75 3762473.77 22.54861 (12120624) 442022.75
3762473.77 22.45747 (12120624)
442072.75 3762473.77 22.64388 (12120624) 441922.75
3762523.77 19.51390 (12120624)
441972.75 3762523.77 19.40885 (12120624) 442022.75
3762523.77 19.30938 (12120624)
442072.75 3762523.77 19.37788 (12120624) 441922.75
3762573.77 17.10755 (12120624)
441972.75 3762573.77 16.99993 (12120624) 442022.75
3762573.77 17.13862m (15011124)
442072.75 3762573.77 17.06439m (15011124) 441922.75
3762623.77 15.16562 (12120624)
441972.75 3762623.77 15.56319m (15011124) 442022.75
3762623.77 15.63941m (15011124)
442072.75 3762623.77 15.19841m (15011124) 441109.54
3762319.57 28.20269 (12120624)
441159.54 3762319.57 28.83247 (12120624) 441209.54
3762319.57 29.45687 (12120624)
441259.54 3762319.57 30.26589 (12120624) 441109.54
3762369.57 22.69100 (12120624)
441159.54 3762369.57 23.04251 (12120624) 441209.54
3762369.57 23.56500 (12120624)
441259.54 3762369.57 24.23319 (12120624) 441109.54
3762419.57 19.45692 (12120624)
441159.54 3762419.57 19.70044 (12120624) 441209.54
3762419.57 20.12716 (12120624)
441259.54 3762419.57 20.54374 (12120624) 441109.54
3762469.57 17.17897 (12120624)
441159.54 3762469.57 17.41120 (12120624) 441209.54
3762469.57 17.76924 (12120624)
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3762519.57 15.57771 (12120624)
441159.54 3762519.57 15.72957 (12120624) 441209.54
3762519.57 16.03730 (12120624)
441259.54 3762519.57 16.39504 (12120624) 441109.54
3762569.57 14.39168 (12120624)
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3762569.57 14.67566 (12120624)
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3762619.57 13.39954 (12120624)
441159.54 3762619.57 13.48391 (12120624) 441209.54
3762619.57 13.61010 (12120624)
441259.54 3762619.57 13.88370 (12120624) 441109.54
3762669.57 12.53538 (12120624)
441159.54 3762669.57 12.65390 (12120624) 441209.54
3762669.57 12.79511 (12120624)

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        441259.54   3762669.57       12.94035  (12120624)                441109.54
3762719.57       11.85004  (12120624)
        441159.54   3762719.57       11.89203  (12120624)                441209.54
3762719.57       11.95406  (12120624)
        441259.54   3762719.57       11.99260  (12120624)                441109.54
3762769.57       11.15023  (12120624)
        441159.54   3762769.57       11.13128  (12120624)                441209.54
3762769.57       11.10064  (12120624)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE  97
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   1ST HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
        441259.54   3762769.57       11.07408  (12120624)                441313.48
3762805.42       10.39788  (12120624)
        441363.48   3762805.42       10.34616  (12120624)                441413.48
3762805.42       10.27617  (12120624)
        441463.48   3762805.42       10.23299  (12120624)                441513.48
3762805.42       10.21218  (12120624)
        441563.48   3762805.42       10.21687  (12120624)                441613.48
3762805.42       10.25828  (12120624)
        441663.48   3762805.42       10.32925m (15011124)                441713.48
3762805.42       10.82964m (15011124)
        441763.48   3762805.42       11.26499m (15011124)                441813.48
3762805.42       11.62168m (15011124)
        441313.48   3762855.42        9.58755  (16060324)                441363.48
3762855.42        9.42811  (16060324)
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441413.48 3762855.42 9.33079 (12120624) 441463.48
3762855.42 9.27970 (12120624)
441513.48 3762855.42 9.26641 (12120624) 441563.48
3762855.42 9.29874 (12120624)
441613.48 3762855.42 9.64626m (15011124) 441663.48
3762855.42 10.08293m (15011124)
441713.48 3762855.42 10.49450m (15011124) 441763.48
3762855.42 10.81944m (15011124)
441813.48 3762855.42 11.05245m (15011124) 441313.48
3762905.42 8.81644 (16060324)
441363.48 3762905.42 8.58525 (12120624) 441413.48
3762905.42 8.51491 (12120624)
441463.48 3762905.42 8.48763 (12120624) 441513.48
3762905.42 8.67133m (15011124)
441563.48 3762905.42 9.05557m (15011124) 441613.48
3762905.42 9.40864m (15011124)
441663.48 3762905.42 9.81198m (15011124) 441713.48
3762905.42 10.12374m (15011124)
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3762905.42 10.42925m (15011124)
441313.48 3762955.42 8.06953m (16081424) 441363.48
3762955.42 7.88386 (12120624)
441413.48 3762955.42 7.87773m (15011124) 441463.48
3762955.42 8.19611m (15011124)
441513.48 3762955.42 8.53298m (15011124) 441563.48
3762955.42 8.87575m (15011124)
441613.48 3762955.42 9.20256m (15011124) 441663.48
3762955.42 9.50363m (15011124)
441713.48 3762955.42 9.72267m (15011124) 441763.48
3762955.42 9.82455m (15011124)
441813.48 3762955.42 9.80155m (15011124) 440408.22
3761498.57 12.27824 (16122724)
440956.50 3762849.59 10.10701 (12120624) 440559.26
3761306.11 11.85629 (12121624)
440752.05 3761305.37 14.45143 (13122324) 440857.69
3761312.76 15.75676 (13122324)
440969.23 3761308.33 16.59548 (13122324) 440936.73
3761237.41 15.25840 (13122324)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2EXHAUS ***
INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 ,
L0000006 , L0000007 , L0000008 , L0000009 , L0000010

, L0000011 , L0000012 , L0000013 ,
L0000014 , L0000015 , L0000016 , L0000017 , L0000018
, L0000019 , L0000020 , L0000021 ,
L0000022 , L0000023 , L0000024 , L0000025 , L0000026
, L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 2.88749 | (16122724) | 440450.61 | 3761994.75 | 3.30671 | (16122724) |
| 440500.61 | 3761994.75 | 3.83063 | (16122724) | 440550.61 | 3761994.75 | 4.44572 | (16122024) |
| 440600.61 | 3761994.75 | 5.18996 | (16122024) | 440650.61 | 3761994.75 | 6.19485 | (16122024) |
| 440400.61 | 3762044.75 | 2.82077 | (13012524) | 440450.61 | 3762044.75 | 3.17078 | (13012524) |
| 440500.61 | 3762044.75 | 3.61927 | (13012524) | 440550.61 | 3762044.75 | 4.16543 | (13012524) |
| 440600.61 | 3762044.75 | 4.97475 | (16122724) | 440650.61 | 3762044.75 | 5.91808 | (14010524) |
| 440400.61 | 3762094.75 | 2.89154 | (14010524) | 440450.61 | 3762094.75 | 3.26299 | (12011324) |
| 440500.61 | 3762094.75 | 3.69746c | (12122924) | 440550.61 | 3762094.75 | 4.24489c | (12122924) |
| 440600.61 | 3762094.75 | 4.90174 | (16122024) | 440650.61 | 3762094.75 | 5.78995 | (16122024) |
| 440400.61 | 3762144.75 | 2.80419 | (15112924) | 440450.61 | 3762144.75 | 3.12749c | (12122924) |
| 440500.61 | 3762144.75 | 3.52227c | (12122924) | 440550.61 | 3762144.75 | 4.04815c | (12122924) |
| 440600.61 | 3762144.75 | 4.66820 | (16122024) | 440650.61 | 3762144.75 | 5.44682 | (16122024) |
| 441145.13 | 3761319.94 | 4.07041 | (16020924) | 441195.13 | 3761319.94 | 4.08214 | (16020924) |
| 441245.13 | 3761319.94 | 4.11744 | (13122724) | 441145.13 | 3761369.94 | 4.52239 | (16020924) |
| 441195.13 | 3761369.94 | 4.53762 | (16020924) | 441245.13 | 3761369.94 | 4.57179 | (14011524) |
| 441145.13 | 3761419.94 | 5.06573 | (16020924) | 441195.13 | 3761419.94 | 5.08794 | (16020924) |
| 441245.13 | 3761419.94 | 5.13283 | (13122724) | 441145.13 | 3761469.94 | 5.74259 | (16020924) |
| 441195.13 | 3761469.94 | 5.76939 | (16020924) | 441245.13 | | | |

3761469.94 5.83886 (14011524)
441145.13 3761519.94 6.61368 (16020924) 441195.13
3761519.94 6.70124 (14011524)
441245.13 3761519.94 6.75407 (13122724) 441145.13
3761569.94 7.87445 (14011524)
441195.13 3761569.94 7.95416c (12112224) 441245.13
3761569.94 8.08262c (12112224)
441145.13 3761619.94 9.83189 (15010724) 441195.13
3761619.94 9.98565 (15010724)
441245.13 3761619.94 10.10694 (15010724) 441145.13
3761669.94 13.08614 (13122124)
441195.13 3761669.94 13.26361 (13122124) 441245.13
3761669.94 13.39387 (13122124)
441917.00 3761316.31 3.68821 (12012524) 441967.00
3761316.31 3.57132 (12012524)
442017.00 3761316.31 3.44107 (12112324) 442067.00
3761316.31 3.32979 (12112324)
441917.00 3761366.31 4.08901 (13110124) 441967.00
3761366.31 3.96737 (12012524)
442017.00 3761366.31 3.82540 (12012424) 442067.00
3761366.31 3.67341 (13110124)
441917.00 3761416.31 4.58133 (12112324) 441967.00
3761416.31 4.45131 (12012524)
442017.00 3761416.31 4.27533 (13110124) 442067.00
3761416.31 4.12288 (14110424)
441917.00 3761466.31 5.24329 (12012524) 441967.00
3761466.31 5.06322 (12012524)
442017.00 3761466.31 4.86243 (12012424) 442067.00
3761466.31 4.70526 (12012424)
441917.00 3761516.31 6.07534 (12012524) 441967.00
3761516.31 5.87146 (12012524)
442017.00 3761516.31 5.64037 (12012424) 442067.00
3761516.31 5.44211 (12012424)
441917.00 3761566.31 7.33134c (12112224) 441967.00
3761566.31 7.05364c (12112224)
442017.00 3761566.31 6.75439 (12012424) 442067.00
3761566.31 6.49652 (12012424)
441917.00 3761616.31 9.04254 (16121124) 441967.00
3761616.31 8.90993 (12010924)
442017.00 3761616.31 8.54364 (16121124) 442067.00
3761616.31 8.18168 (14110424)
442847.68 3761995.12 2.94342 (13050124) 442897.68
3761995.12 2.82538b (13091024)
442947.68 3761995.12 2.59382 (13073124) 442997.68
3761995.12 2.43419c (12080124)

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P2EXHAUS ***
                                   INCLUDING SOURCE(S):     L0000001    , L0000002
, L0000003    , L0000004    , L0000005    ,
                L0000006    , L0000007    , L0000008    , L0000009    , L0000010
, L0000011    , L0000012    , L0000013    ,
                L0000014    , L0000015    , L0000016    , L0000017    , L0000018
, L0000019    , L0000020    , L0000021    ,
                L0000022    , L0000023    , L0000024    , L0000025    , L0000026
, L0000027    , L0000028    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM_10    IN MICROGRAMS/M**3
                  **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - -
        443047.68   3761995.12        2.32000c (12080124)                443097.68
3761995.12        2.20678c (12080124)
        443147.68   3761995.12        2.13303c (12080124)                443197.68
3761995.12        2.06201c (12080124)
        442847.68   3762045.12        3.03111b (13091024)                442897.68
3762045.12        2.83898  (12091224)
        442947.68   3762045.12        2.65658  (13081924)                442997.68
3762045.12        2.54456  (13081924)
        443047.68   3762045.12        2.42123  (13081924)                443097.68
3762045.12        2.32836  (13081924)
        443147.68   3762045.12        2.24040  (13081924)                443197.68
3762045.12        2.18804  (13081924)
        442447.68   3762095.12        5.82711  (12031624)                442497.68
3762095.12        5.30094  (14062924)
        442547.68   3762095.12        4.91931  (13073124)                442597.68
3762095.12        4.66492  (13020624)
        442647.68   3762095.12        4.21337  (13020624)                442697.68
3762095.12        3.92649  (12102224)
        442747.68   3762095.12        3.64862  (13111924)                442797.68
3762095.12        3.34763  (13111924)
        442847.68   3762095.12        3.05147b (12061224)                442897.68
3762095.12        2.90320b (12061224)
        442947.68   3762095.12        2.76853b (12061224)                442997.68
3762095.12        2.71292  (12102224)
        443047.68   3762095.12        2.56631  (12102224)                443097.68
3762095.12        2.43810  (12102224)
        443147.68   3762095.12        2.32155  (12102224)                443197.68
3762095.12        2.26585  (12102224)
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| | | | | | |
|---|---|---|---|---|---|
| 442447.68 | 3762145.12 | 5.82099 | (13020524) | 442497.68 | 3762145.12 |
| 5.31267 | (13020524) | | | | |
| 442547.68 | 3762145.12 | 4.79657 | (13020524) | 442597.68 | 3762145.12 |
| 4.61915 | (13020624) | | | | |
| 442647.68 | 3762145.12 | 4.17893 | (13073124) | 442697.68 | 3762145.12 |
| 3.84709 | (13020624) | | | | |
| 442747.68 | 3762145.12 | 3.61923 | (13111924) | 442797.68 | 3762145.12 |
| 3.35532 | (12102224) | | | | |
| 442847.68 | 3762145.12 | 3.00441 | (14062924) | 442897.68 | 3762145.12 |
| 2.90159 | (13081924) | | | | |
| 442947.68 | 3762145.12 | 2.80172 | (12102224) | 442997.68 | 3762145.12 |
| 2.68695 | (12102224) | | | | |
| 443047.68 | 3762145.12 | 2.54905 | (12102224) | 443097.68 | 3762145.12 |
| 2.42215 | (12102224) | | | | |
| 443147.68 | 3762145.12 | 2.31063b | (12061224) | 443197.68 | 3762145.12 |
| 2.25421b | (12061224) | | | | |
| 442447.68 | 3762195.12 | 5.65877 | (13072424) | 442497.68 | 3762195.12 |
| 5.18485 | (13111924) | | | | |
| 442547.68 | 3762195.12 | 4.61496 | (12031624) | 442597.68 | 3762195.12 |
| 4.42040 | (12091224) | | | | |
| 442647.68 | 3762195.12 | 4.13561 | (12060124) | 442697.68 | 3762195.12 |
| 3.87678 | (13073124) | | | | |
| 442747.68 | 3762195.12 | 3.67940 | (13020524) | 442797.68 | 3762195.12 |
| 3.37997 | (13020524) | | | | |
| 442847.68 | 3762195.12 | 3.07590 | (13020524) | 442897.68 | 3762195.12 |
| 2.90577 | (13020524) | | | | |
| 442947.68 | 3762195.12 | 2.84638 | (13081924) | 442997.68 | 3762195.12 |
| 2.78118 | (13081924) | | | | |
| 443047.68 | 3762195.12 | 2.63972 | (14062924) | 443097.68 | 3762195.12 |
| 2.48908 | (14062924) | | | | |
| 443147.68 | 3762195.12 | 2.33074 | (14062924) | 443197.68 | 3762195.12 |
| 2.20778 | (14062924) | | | | |
| 442447.68 | 3762245.12 | 5.39087m | (16070324) | 442497.68 | 3762245.12 |
| 4.95922 | (13040124) | | | | |
| 442547.68 | 3762245.12 | 4.48701m | (16070324) | 442597.68 | 3762245.12 |
| 4.28208 | (13020624) | | | | |
| 442647.68 | 3762245.12 | 3.98541 | (13020624) | 442697.68 | 3762245.12 |
| 3.74514 | (12091224) | | | | |
| 442747.68 | 3762245.12 | 3.49893 | (12091224) | 442797.68 | 3762245.12 |
| 3.23034 | (13073124) | | | | |
| 442847.68 | 3762245.12 | 3.10319 | (13073124) | 442897.68 | 3762245.12 |
| 3.05659 | (13073124) | | | | |
| 442947.68 | 3762245.12 | 2.89548 | (13020524) | 442997.68 | 3762245.12 |
| 2.74073 | (13020524) | | | | |
| 443047.68 | 3762245.12 | 2.57418 | (13081924) | 443097.68 | 3762245.12 |
| 2.49177 | (13081924) | | | | |
| 443147.68 | 3762245.12 | 2.38847 | (13081924) | 443197.68 | 3762245.12 |
| 2.27640 | (14062924) | | | | |
| 442822.81 | 3761611.77 | 2.16998 | (12072624) | 442872.81 | 3761611.77 |
| 2.05795b | (14070124) | | | | |
| 442922.81 | 3761611.77 | 1.98197b | (14070124) | 442972.81 | |

3761611.77 1.89238 (15050424)

*** AERMOD - VERSION 24142 *** *** Center Park Operational LST - PM10 *** 05/08/25

*** AERMET - VERSION 16216 *** *** *** 07:43:46

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*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2EXHAUS ***

INCLUDING SOURCE(S): L0000001 , L0000002 , L0000003 , L0000004 , L0000005 , L0000006 , L0000007 , L0000008 , L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 , L0000017 , L0000018 , L0000019 , L0000020 , L0000021 , L0000022 , L0000023 , L0000024 , L0000025 , L0000026 , L0000027 , L0000028 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 2.30945 | (12102124) | 442872.81 | 3761661.77 | 2.17737 | (12102124) |
| 442922.81 | 3761661.77 | 2.05662 | (12102124) | 442972.81 | 3761661.77 | 1.94359 | (16100524) |
| 442732.29 | 3762366.08 | 3.29627 | (12100424) | 442782.29 | 3762366.08 | 3.21655 | (12100424) |
| 442832.29 | 3762366.08 | 3.18845 | (12100424) | 442732.29 | 3762416.08 | 3.26554 | (13091824) |
| 442782.29 | 3762416.08 | 3.18491 | (13061424) | 442832.29 | 3762416.08 | 3.04082 | (13061424) |
| 442732.29 | 3762466.08 | 3.20700 | (13040124) | 442782.29 | 3762466.08 | 3.11692 | (13091824) |
| 442832.29 | 3762466.08 | 3.04245 | (13091824) | 441922.75 | 3762323.77 | 9.27075c | (12121724) |
| 441972.75 | 3762323.77 | 9.07254c | (12121724) | 442022.75 | 3762323.77 | 8.90678c | (16121324) |
| 442072.75 | 3762323.77 | 8.41785c | (12121724) | 441922.75 | 3762373.77 | 7.18185 | (12021324) |
| 441972.75 | 3762373.77 | 7.06708 | (14062824) | 442022.75 | 3762373.77 | 6.88604c | (16121324) |
| 442072.75 | 3762373.77 | 6.77190 | (12121524) | 441922.75 | | | |

3762423.77 6.10135 (12120624)
441972.75 3762423.77 5.82685 (12061524) 442022.75
3762423.77 5.86283 (12021324)
442072.75 3762423.77 5.73030 (12021324) 441922.75
3762473.77 5.15829 (12061524)
441972.75 3762473.77 5.15975 (12061524) 442022.75
3762473.77 5.13450 (12021324)
442072.75 3762473.77 5.04118 (12021324) 441922.75
3762523.77 4.47846 (12061524)
441972.75 3762523.77 4.52687 (12061524) 442022.75
3762523.77 4.53721c (12120424)
442072.75 3762523.77 4.42607 (16101624) 441922.75
3762573.77 4.03215b (14030724)
441972.75 3762573.77 4.02041b (14030724) 442022.75
3762573.77 4.03980 (12061524)
442072.75 3762573.77 3.99469 (16101624) 441922.75
3762623.77 3.55563 (16101624)
441972.75 3762623.77 3.61208c (12120124) 442022.75
3762623.77 3.64537 (12021324)
442072.75 3762623.77 3.63027 (16101624) 441109.54
3762319.57 8.59534 (13012524)
441159.54 3762319.57 8.79153 (14120524) 441209.54
3762319.57 9.01880m (16031424)
441259.54 3762319.57 9.03602 (13122124) 441109.54
3762369.57 6.31268 (12120724)
441159.54 3762369.57 6.70408 (14010724) 441209.54
3762369.57 6.85930 (12123024)
441259.54 3762369.57 6.82479 (14120324) 441109.54
3762419.57 5.06677m (16031424)
441159.54 3762419.57 5.30317 (12120724) 441209.54
3762419.57 5.58206 (13122124)
441259.54 3762419.57 5.68496 (14010724) 441109.54
3762469.57 4.29771 (14020924)
441159.54 3762469.57 4.42950m (16031424) 441209.54
3762469.57 4.58322 (16120724)
441259.54 3762469.57 4.66590c (13102524) 441109.54
3762519.57 3.76798 (12022524)
441159.54 3762519.57 3.81299 (12120724) 441209.54
3762519.57 3.98640 (14020924)
441259.54 3762519.57 4.06610 (14020924) 441109.54
3762569.57 3.41461 (12022524)
441159.54 3762569.57 3.42642 (12022524) 441209.54
3762569.57 3.44871m (16031424)
441259.54 3762569.57 3.56198 (13012424) 441109.54
3762619.57 3.06712m (16081424)
441159.54 3762619.57 3.08176 (16120724) 441209.54
3762619.57 3.15685 (12022524)
441259.54 3762619.57 3.21477 (12022524) 441109.54
3762669.57 2.73879m (16081424)
441159.54 3762669.57 2.80898 (16120724) 441209.54
3762669.57 2.89305 (13012424)

441259.54  3762669.57  2.87036m (16031424)  441109.54
3762719.57  2.51102m (16081424)
441159.54  3762719.57  2.56616  (16120724)  441209.54
3762719.57  2.60062  (13012424)
441259.54  3762719.57  2.56368m (16031424)  441109.54
3762769.57  2.33708  (14122524)
441159.54  3762769.57  2.35098  (16120724)  441209.54
3762769.57  2.35280  (13012424)



*** MODELOPTs:  RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

*** THE  8TH HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP:  P2EXHAUS ***
INCLUDING SOURCE(S):  L0000001  , L0000002 , L0000003  , L0000004  , L0000005  ,
L0000006  , L0000007  , L0000008  , L0000009  , L0000010 , L0000011  , L0000012  , L0000013  ,
L0000014  , L0000015  , L0000016  , L0000017  , L0000018 , L0000019  , L0000020  , L0000021  ,
L0000022  , L0000023  , L0000024  , L0000025  , L0000026 , L0000027  , L0000028  ,  . . .  ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10  IN MICROGRAMS/M**3  **

X-COORD (M)  Y-COORD (M)  CONC  (YYMMDDHH)  X-COORD (M)  Y-COORD (M)  CONC  (YYMMDDHH)
- - - -

441413.48  3762855.42  2.26707m (14021824)  441463.48
3762855.42  2.24393m (15011124)
441513.48  3762855.42  2.13984m (15011124)  441563.48
3762855.42  2.08243  (15011024)
441613.48  3762855.42  2.10290  (13102424)  441663.48
3762855.42  2.13776m (14021824)
441713.48  3762855.42  2.16553  (16120724)  441763.48
3762855.42  2.16417  (16101624)
441813.48  3762855.42  2.22758  (16101624)  441313.48
3762905.42  1.93489m (16031424)
441363.48  3762905.42  2.03962m (16031424)  441413.48
3762905.42  2.07858m (14021824)
441463.48  3762905.42  2.05229m (14021824)  441513.48
3762905.42  1.95111m (15011124)
441563.48  3762905.42  1.92423  (16112724)  441613.48
3762905.42  1.92639  (14120624)
441663.48  3762905.42  1.94321m (14021824)  441713.48
3762905.42  1.98643b (14030724)
441763.48  3762905.42  1.99117  (16101624)  441813.48
3762905.42  2.05601  (16101624)
441313.48  3762955.42  1.78775m (16031424)  441363.48
3762955.42  1.88627m (16031424)
441413.48  3762955.42  1.91313m (14021824)  441463.48
3762955.42  1.88244m (14021824)
441513.48  3762955.42  1.80129  (16112724)  441563.48
3762955.42  1.79541  (16112724)
441613.48  3762955.42  1.78835  (14120624)  441663.48
3762955.42  1.80639  (12071724)
441713.48  3762955.42  1.82833b (14030724)  441763.48
3762955.42  1.87007c (13102524)
441813.48  3762955.42  1.90505  (16101624)  440408.22
3761498.57  2.52438  (15112224)
440956.50  3762849.59  2.00523  (13112324)  440559.26
3761306.11  2.60562  (12111324)
440752.05  3761305.37  3.11613  (12111324)  440857.69
3761312.76  3.38287  (15111224)
440969.23  3761308.33  3.61751  (15111224)  440936.73
3761237.41  3.11374m (15020724)


*** MODELOPTs:  RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

*** THE  8TH HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP:  P2FUGITI ***
INCLUDING SOURCE(S):  PAREA1  ,

*** DISCRETE CARTESIAN RECEPTOR POINTS

***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 5.35245 | (16021824) | 440450.61 | 3761994.75 | 5.92198 | (12020624) |
| 440500.61 | 3761994.75 | 6.77375 | (12020624) | 440550.61 | 3761994.75 | 7.83649 | (16010124) |
| 440600.61 | 3761994.75 | 9.03929 | (16011924) | 440650.61 | 3761994.75 | 10.50916 | (16011924) |
| 440400.61 | 3762044.75 | 5.26686 | (16121524) | 440450.61 | 3762044.75 | 5.63160 | (16021824) |
| 440500.61 | 3762044.75 | 6.24812 | (16010124) | 440550.61 | 3762044.75 | 7.25684c | (16121324) |
| 440600.61 | 3762044.75 | 8.38670 | (12020624) | 440650.61 | 3762044.75 | 9.74683 | (14020624) |
| 440400.61 | 3762094.75 | 4.96895 | (16021824) | 440450.61 | 3762094.75 | 5.44150 | (16121524) |
| 440500.61 | 3762094.75 | 5.89605c | (12122524) | 440550.61 | 3762094.75 | 6.70768 | (16010124) |
| 440600.61 | 3762094.75 | 7.61432c | (16121324) | 440650.61 | 3762094.75 | 8.96741 | (12020624) |
| 440400.61 | 3762144.75 | 4.85950 | (16010824) | 440450.61 | 3762144.75 | 5.26190 | (13012524) |
| 440500.61 | 3762144.75 | 5.77065 | (16011924) | 440550.61 | 3762144.75 | 6.37716 | (16011924) |
| 440600.61 | 3762144.75 | 7.14288c | (16121324) | 440650.61 | 3762144.75 | 8.39862 | (16011924) |
| 441145.13 | 3761319.94 | 8.43327 | (13121724) | 441195.13 | 3761319.94 | 8.50529 | (13122724) |
| 441245.13 | 3761319.94 | 8.68865 | (14011824) | 441145.13 | 3761369.94 | 9.15496 | (13121724) |
| 441195.13 | 3761369.94 | 9.32119 | (13121724) | 441245.13 | 3761369.94 | 9.40373 | (13122724) |
| 441145.13 | 3761419.94 | 10.00397 | (13121724) | 441195.13 | 3761419.94 | 10.16770 | (13122724) |
| 441245.13 | 3761419.94 | 10.30334 | (13122724) | 441145.13 | 3761469.94 | 11.08102 | (13122724) |
| 441195.13 | 3761469.94 | 11.24792 | (13122724) | 441245.13 | 3761469.94 | 11.40674 | (13122724) |
| 441145.13 | 3761519.94 | 12.63687 | (12010424) | 441195.13 | 3761519.94 | 12.75629 | (12010424) |
| 441245.13 | 3761519.94 | 12.84922 | (12010424) | 441145.13 | 3761569.94 | 14.95987c | (12011024) |
| 441195.13 | 3761569.94 | 15.03205c | (12011024) | 441245.13 | 3761569.94 | 15.06844c | (12011024) |

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        441145.13   3761619.94       17.83668  (13120224)                441195.13
3761619.94       17.93891  (16110824)
        441245.13   3761619.94       18.05356  (16110824)                441145.13
3761669.94       25.08343c (12011024)
        441195.13   3761669.94       25.14725c (12011024)                441245.13
3761669.94       25.37178c (12011024)
        441917.00   3761316.31        7.17718  (14112824)                441967.00
3761316.31        6.98681  (14112824)
        442017.00   3761316.31        6.76040  (14112824)                442067.00
3761316.31        6.45602  (14010124)
        441917.00   3761366.31        7.86631  (16021124)                441967.00
3761366.31        7.66291c (12011124)
        442017.00   3761366.31        7.33132c (12011024)                442067.00
3761366.31        6.99989  (14112824)
        441917.00   3761416.31        8.66970  (14010124)                441967.00
3761416.31        8.42923c (12011124)
        442017.00   3761416.31        7.97544c (12011124)                442067.00
3761416.31        7.66227  (13110124)
        441917.00   3761466.31        9.67709  (16021124)                441967.00
3761466.31        9.33334  (13110124)
        442017.00   3761466.31        8.95719c (12011124)                442067.00
3761466.31        8.49626  (13110124)
        441917.00   3761516.31       10.97910  (14112724)                441967.00
3761516.31       10.61720  (14010124)
        442017.00   3761516.31       10.23325c (12011124)                442067.00
3761516.31        9.68621  (13011524)
        441917.00   3761566.31       13.01951  (16110824)                441967.00
3761566.31       12.42897c (12011124)
        442017.00   3761566.31       11.97065  (14010124)                442067.00
3761566.31       11.40557  (13011524)
        441917.00   3761616.31       16.15192  (14112724)                441967.00
3761616.31       15.66941  (14112724)
        442017.00   3761616.31       14.78764c (12011124)                442067.00
3761616.31       14.08591c (12011124)
        442847.68   3761995.12        5.37947  (14070924)                442897.68
3761995.12        5.07964  (14070924)
        442947.68   3761995.12        4.83372  (13042524)                442997.68
3761995.12        4.62692  (13042524)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 103
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P2FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA1      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
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** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 443047.68 | 3761995.12 | 4.43453 | (13042524) | 443097.68 | 3761995.12 | 4.25498 | (13042524) |
| 443147.68 | 3761995.12 | 4.08626 | (13042524) | 443197.68 | 3761995.12 | 3.92809 | (13111924) |
| 442847.68 | 3762045.12 | 5.38143 | (12091224) | 442897.68 | 3762045.12 | 5.06985 | (14070924) |
| 442947.68 | 3762045.12 | 4.80875 | (14070924) | 442997.68 | 3762045.12 | 4.56394c | (14041624) |
| 443047.68 | 3762045.12 | 4.34572 | (14070924) | 443097.68 | 3762045.12 | 4.16089 | (13073024) |
| 443147.68 | 3762045.12 | 4.00653 | (13073024) | 443197.68 | 3762045.12 | 3.83220 | (13073124) |
| 442447.68 | 3762095.12 | 9.93317 | (12051924) | 442497.68 | 3762095.12 | 8.95950 | (12051924) |
| 442547.68 | 3762095.12 | 8.17072 | (13072424) | 442597.68 | 3762095.12 | 7.57640 | (13073124) |
| 442647.68 | 3762095.12 | 7.12653 | (13073124) | 442697.68 | 3762095.12 | 6.71816 | (13073124) |
| 442747.68 | 3762095.12 | 6.33195 | (13072424) | 442797.68 | 3762095.12 | 5.97120 | (13072424) |
| 442847.68 | 3762095.12 | 5.50656 | (13080424) | 442897.68 | 3762095.12 | 5.24941 | (12091224) |
| 442947.68 | 3762095.12 | 4.92883 | (12091224) | 442997.68 | 3762095.12 | 4.63965 | (13080724) |
| 443047.68 | 3762095.12 | 4.43311m | (12050224) | 443097.68 | 3762095.12 | 4.24580m | (12050224) |
| 443147.68 | 3762095.12 | 4.07049m | (12050224) | 443197.68 | 3762095.12 | 3.90061 | (13072424) |
| 442447.68 | 3762145.12 | 9.73554c | (13061724) | 442497.68 | 3762145.12 | 8.89064 | (13080624) |
| 442547.68 | 3762145.12 | 8.11788 | (14052524) | 442597.68 | 3762145.12 | 7.57734 | (13080724) |
| 442647.68 | 3762145.12 | 7.11303 | (13080724) | 442697.68 | 3762145.12 | 6.69197 | (13080724) |
| 442747.68 | 3762145.12 | 6.30634 | (13080724) | 442797.68 | 3762145.12 | 5.98702 | (13073124) |
| 442847.68 | 3762145.12 | 5.65628 | (13080424) | 442897.68 | 3762145.12 | 5.32223 | (13080724) |
| 442947.68 | 3762145.12 | 5.03909 | (13080724) | 442997.68 | 3762145.12 | 4.76037 | (12091224) |
| 443047.68 | 3762145.12 | 4.50620m | (12050224) | 443097.68 | 3762145.12 | 4.30658 | (13080724) |

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        443147.68   3762145.12        4.11627  (13081924)                443197.68
3762145.12        3.96401  (13081924)
        442447.68   3762195.12        9.53445  (12091224)                442497.68
3762195.12        8.79995  (13080624)
        442547.68   3762195.12        8.03760  (13080624)                442597.68
3762195.12        7.45562  (13080724)
        442647.68   3762195.12        6.96204  (13111924)                442697.68
3762195.12        6.49628  (13111924)
        442747.68   3762195.12        6.09050  (14062924)                442797.68
3762195.12        5.72418  (13111924)
        442847.68   3762195.12        5.44384  (12080524)                442897.68
3762195.12        5.20063  (12080524)
        442947.68   3762195.12        4.97551  (12080524)                442997.68
3762195.12        4.65298m (12050224)
        443047.68   3762195.12        4.46481m (12050224)                443097.68
3762195.12        4.29916  (13081924)
        443147.68   3762195.12        4.12391m (12050224)                443197.68
3762195.12        3.93470  (13080724)
        442447.68   3762245.12        8.99239  (12080324)                442497.68
3762245.12        8.28823  (12060124)
        442547.68   3762245.12        7.74757  (12100424)                442597.68
3762245.12        7.16907c (13061724)
        442647.68   3762245.12        6.64432  (13080724)                442697.68
3762245.12        6.29307  (13080724)
        442747.68   3762245.12        5.90609  (12100424)                442797.68
3762245.12        5.57731  (13073124)
        442847.68   3762245.12        5.35068  (13073124)                442897.68
3762245.12        5.01323  (14062924)
        442947.68   3762245.12        4.69996  (14062924)                442997.68
3762245.12        4.50894  (13081924)
        443047.68   3762245.12        4.35367  (13081924)                443097.68
3762245.12        4.16644  (13080424)
        443147.68   3762245.12        3.99543m (12050224)                443197.68
3762245.12        3.85447m (12050224)
        442822.81   3761611.77        4.19703  (14101824)                442872.81
3761611.77        3.96138c (12022024)
        442922.81   3761611.77        3.75916  (12100824)                442972.81
3761611.77        3.56670  (14101824)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***       07:43:46

                                  PAGE 104
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P2FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA1      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
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** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 442822.81 | 3761661.77 | 4.30381c | (12100524) | 442872.81 | 3761661.77 | 4.01129 | (13080224) |
| 442922.81 | 3761661.77 | 3.79882 | (14010424) | 442972.81 | 3761661.77 | 3.65380 | (14010424) |
| 442732.29 | 3762366.08 | 5.58405 | (13072424) | 442782.29 | 3762366.08 | 5.24549c | (13050524) |
| 442832.29 | 3762366.08 | 5.04254c | (13050524) | 442732.29 | 3762416.08 | 5.07058c | (13050524) |
| 442782.29 | 3762416.08 | 4.93737c | (13050524) | 442832.29 | 3762416.08 | 4.80232c | (13050524) |
| 442732.29 | 3762466.08 | 4.81071 | (12050724) | 442782.29 | 3762466.08 | 4.59057 | (13061424) |
| 442832.29 | 3762466.08 | 4.41491c | (13050524) | 441922.75 | 3762323.77 | 12.49522 | (13032824) |
| 441972.75 | 3762323.77 | 12.62867 | (12061524) | 442022.75 | 3762323.77 | 12.61598 | (12111824) |
| 442072.75 | 3762323.77 | 12.36750 | (13040524) | 441922.75 | 3762373.77 | 9.59406 | (13032824) |
| 441972.75 | 3762373.77 | 9.60694 | (12080624) | 442022.75 | 3762373.77 | 9.67281 | (12080624) |
| 442072.75 | 3762373.77 | 9.73954 | (13091124) | 441922.75 | 3762423.77 | 7.95350 | (13032824) |
| 441972.75 | 3762423.77 | 7.99086 | (13032824) | 442022.75 | 3762423.77 | 8.03813 | (13091124) |
| 442072.75 | 3762423.77 | 8.14754 | (13091124) | 441922.75 | 3762473.77 | 6.73166 | (12050724) |
| 441972.75 | 3762473.77 | 6.90582 | (12050724) | 442022.75 | 3762473.77 | 7.03031 | (13032824) |
| 442072.75 | 3762473.77 | 7.08008 | (13032824) | 441922.75 | 3762523.77 | 5.89568b | (14030724) |
| 441972.75 | 3762523.77 | 5.97560b | (14030724) | 442022.75 | 3762523.77 | 6.06082 | (12050724) |
| 442072.75 | 3762523.77 | 6.21409 | (12050724) | 441922.75 | 3762573.77 | 5.30856b | (14030724) |
| 441972.75 | 3762573.77 | 5.38814 | (13102424) | 442022.75 | 3762573.77 | 5.45255 | (13102424) |
| 442072.75 | 3762573.77 | 5.51021 | (13102424) | 441922.75 | 3762623.77 | 4.65182 | (12061524) |
| 441972.75 | 3762623.77 | 4.80871 | (12061524) | 442022.75 | 3762623.77 | 4.95322 | (12061524) |
| 442072.75 | 3762623.77 | 4.95327b | (14030724) | 441109.54 | 3762319.57 | 10.01060 | (15082524) |

441159.54  3762319.57  10.25348 (13070224)  441209.54
3762319.57  10.45878c (13091724)
441259.54  3762319.57  10.53053 (13070224)  441109.54
3762369.57  7.67423 (13070224)
441159.54  3762369.57  7.84346 (13070224)  441209.54
3762369.57  7.96499 (16060324)
441259.54  3762369.57  8.22381 (14020924)  441109.54
3762419.57  6.32338m (16081424)
441159.54  3762419.57  6.36851 (13070224)  441209.54
3762419.57  6.48050 (13070224)
441259.54  3762419.57  6.61183 (16060324)  441109.54
3762469.57  5.47220 (12083024)
441159.54  3762469.57  5.54868m (16081424)  441209.54
3762469.57  5.53912 (14070424)
441259.54  3762469.57  5.58563 (16060324)  441109.54
3762519.57  4.89497 (12083024)
441159.54  3762519.57  4.87386 (12083024)  441209.54
3762519.57  4.88364 (16120724)
441259.54  3762519.57  4.90906 (14070424)  441109.54
3762569.57  4.42925 (12083024)
441159.54  3762569.57  4.38905 (12083024)  441209.54
3762569.57  4.42058 (16120724)
441259.54  3762569.57  4.47010m (15011124)  441109.54
3762619.57  3.98670 (13012424)
441159.54  3762619.57  3.92946c (12121724)  441209.54
3762619.57  3.92097 (12022524)
441259.54  3762619.57  3.93048 (12022524)  441109.54
3762669.57  3.64164 (13012424)
441159.54  3762669.57  3.55087m (16081424)  441209.54
3762669.57  3.55510 (12111824)
441259.54  3762669.57  3.58396 (12022524)  441109.54
3762719.57  3.28866m (16081424)
441159.54  3762719.57  3.20718 (16120724)  441209.54
3762719.57  3.21929 (12111824)
441259.54  3762719.57  3.28283 (12111824)  441109.54
3762769.57  2.96308c (12121724)
441159.54  3762769.57  2.92969 (12022524)  441209.54
3762769.57  2.92878 (12111824)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P2FUGITI ***
INCLUDING SOURCE(S): PAREA1 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS

***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 2.99016 | (12111824) | 441313.48 | 3762805.42 | 2.76349 | (16100124) |
| 441363.48 | 3762805.42 | 2.78125m | (16031424) | 441413.48 | 3762805.42 | 2.88393m | (14021824) |
| 441463.48 | 3762805.42 | 2.88833 | (12022524) | 441513.48 | 3762805.42 | 2.92940m | (14021824) |
| 441563.48 | 3762805.42 | 2.95824m | (14021824) | 441613.48 | 3762805.42 | 2.92124 | (16120724) |
| 441663.48 | 3762805.42 | 2.92758c | (15072824) | 441713.48 | 3762805.42 | 2.96589c | (15072824) |
| 441763.48 | 3762805.42 | 2.99717c | (15072824) | 441813.48 | 3762805.42 | 3.03570b | (16120624) |
| 441313.48 | 3762855.42 | 2.62391m | (14021824) | 441363.48 | 3762855.42 | 2.58704m | (14021824) |
| 441413.48 | 3762855.42 | 2.64546 | (16100124) | 441463.48 | 3762855.42 | 2.63846 | (16100124) |
| 441513.48 | 3762855.42 | 2.65183 | (12022524) | 441563.48 | 3762855.42 | 2.64056c | (15072824) |
| 441613.48 | 3762855.42 | 2.70486 | (16120724) | 441663.48 | 3762855.42 | 2.63245m | (14021824) |
| 441713.48 | 3762855.42 | 2.69535c | (14071524) | 441763.48 | 3762855.42 | 2.77325 | (12051424) |
| 441813.48 | 3762855.42 | 2.79254b | (16120624) | 441313.48 | 3762905.42 | 2.41212m | (14021824) |
| 441363.48 | 3762905.42 | 2.39089m | (16031424) | 441413.48 | 3762905.42 | 2.51475m | (16031424) |
| 441463.48 | 3762905.42 | 2.43354 | (12051424) | 441513.48 | 3762905.42 | 2.50828 | (16100124) |
| 441563.48 | 3762905.42 | 2.47524c | (15072824) | 441613.48 | 3762905.42 | 2.51241 | (16120724) |
| 441663.48 | 3762905.42 | 2.43702 | (15062724) | 441713.48 | 3762905.42 | 2.51985c | (14071524) |
| 441763.48 | 3762905.42 | 2.59123c | (14071524) | 441813.48 | 3762905.42 | 2.58142b | (16120624) |
| 441313.48 | 3762955.42 | 2.23865m | (14021824) | 441363.48 | 3762955.42 | 2.23443 | (12070724) |
| 441413.48 | 3762955.42 | 2.32254m | (15011124) | 441463.48 | 3762955.42 | 2.28519 | (12070724) |
| 441513.48 | 3762955.42 | 2.31868 | (12022524) | 441563.48 | 3762955.42 | 2.36007 | (16100124) |
| 441613.48 | 3762955.42 | 2.33622 | (16120724) | 441663.48 | 3762955.42 | 2.30369 | (13082224) |

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        441713.48   3762955.42        2.35477c (14071524)                441763.48
3762955.42        2.42139b (16120624)
        441813.48   3762955.42        2.39263b (16120624)                440408.22
3761498.57        5.72069  (15120124)
        440956.50   3762849.59        2.79443c (12121724)                440559.26
3761306.11        5.76974  (13010424)
        440752.05   3761305.37        6.87891  (14012424)                440857.69
3761312.76        7.30399  (14011524)
        440969.23   3761308.33        7.72469  (14011524)                440936.73
3761237.41        6.79159  (13122224)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                        ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        07:43:46

                                   PAGE 106
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P1EXHAUS ***
                                   INCLUDING SOURCE(S):     L0000789    , L0000790
, L0000791    , L0000792    , L0000793    ,
                L0000794    , L0000795    , L0000796    , L0000797    , L0000798
, L0000799    , L0000800    , L0000801    ,
                L0000802    , L0000803    , L0000804    , L0000805    , L0000806
, L0000807    , L0000808    , L0000809    ,
                L0000810    , L0000811    , L0000812    , L0000813    , L0000814
, L0000815    , L0000816    ,  . . .      ,

                                                 *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                            ** CONC OF PM_10    IN MICROGRAMS/M**3
                  **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
        440400.61   3761994.75        0.78482  (12121224)                440450.61
3761994.75        0.81486  (12121224)
        440500.61   3761994.75        0.84685  (12121224)                440550.61
3761994.75        0.88090  (12121224)
        440600.61   3761994.75        0.91734  (12121224)                440650.61
3761994.75        0.95712  (16010124)
        440400.61   3762044.75        0.77028  (16010124)                440450.61
3762044.75        0.80048  (16010124)
        440500.61   3762044.75        0.83269  (16010124)                440550.61
3762044.75        0.86711  (16010124)
        440600.61   3762044.75        0.90397  (16010124)                440650.61
3762044.75        0.94353  (16010124)
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440400.61 3762094.75 0.76331 (13112224) 440450.61
3762094.75 0.78965 (13112224)
440500.61 3762094.75 0.81890 (13112224) 440550.61
3762094.75 0.85153 (16010124)
440600.61 3762094.75 0.88694 (16010124) 440650.61
3762094.75 0.93435 (14120124)
440400.61 3762144.75 0.77789 (13012524) 440450.61
3762144.75 0.79259 (13012524)
440500.61 3762144.75 0.83088 (13012524) 440550.61
3762144.75 0.85632 (13012524)
440600.61 3762144.75 0.89825 (13012524) 440650.61
3762144.75 0.94661 (13012524)
441145.13 3761319.94 1.57120 (12122824) 441195.13
3761319.94 1.66556 (12122824)
441245.13 3761319.94 1.76583 (12122824) 441145.13
3761369.94 1.59727 (13010424)
441195.13 3761369.94 1.69222 (14010524) 441245.13
3761369.94 1.77588 (12122824)
441145.13 3761419.94 1.59592 (13100524) 441195.13
3761419.94 1.69517 (13100524)
441245.13 3761419.94 1.80638 (13010424) 441145.13
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441195.13 3761469.94 1.69986 (13100524) 441245.13
3761469.94 1.81593 (13100524)
441145.13 3761519.94 1.57373 (13121024) 441195.13
3761519.94 1.68571 (13100524)
441245.13 3761519.94 1.80463 (16010124) 441145.13
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441195.13 3761569.94 1.68684 (13121024) 441245.13
3761569.94 1.80047 (13121024)
441145.13 3761619.94 1.61979c (13010124) 441195.13
3761619.94 1.70957c (13010124)
441245.13 3761619.94 1.81403 (13121024) 441145.13
3761669.94 1.61165 (14122624)
441195.13 3761669.94 1.74974 (14122624) 441245.13
3761669.94 1.85821c (13010124)
441917.00 3761316.31 4.13989 (16012724) 441967.00
3761316.31 4.40950 (12111324)
442017.00 3761316.31 4.71501 (13121624) 442067.00
3761316.31 4.95091 (16020924)
441917.00 3761366.31 4.53130 (16012724) 441967.00
3761366.31 4.84073 (12111324)
442017.00 3761366.31 5.19100 (12111324) 442067.00
3761366.31 5.53153 (16020924)
441917.00 3761416.31 4.89759 (16102024) 441967.00
3761416.31 5.31671 (16122924)
442017.00 3761416.31 5.75926 (16122924) 442067.00
3761416.31 6.22626 (12111324)
441917.00 3761466.31 5.26896 (12111324) 441967.00
3761466.31 5.82427 (12111324)
442017.00 3761466.31 6.42423 (12111324) 442067.00

3761466.31  6.92722  (16020924)
441917.00  3761516.31  5.64068  (16012724)  441967.00
3761516.31  6.30772  (16012724)
442017.00  3761516.31  7.07790  (13010424)  442067.00
3761516.31  8.02166  (12111324)
441917.00  3761566.31  5.91964  (16012724)  441967.00
3761566.31  6.77146  (12020624)
442017.00  3761566.31  7.72195  (16012724)  442067.00
3761566.31  8.93409  (16102024)
441917.00  3761616.31  6.14564  (16020424)  441967.00
3761616.31  7.19652  (16020424)
442017.00  3761616.31  8.39432  (14042924)  442067.00
3761616.31  10.03754  (14120224)
442847.68  3761995.12  21.36269c (12121724)  442897.68
3761995.12  16.00412  (12080324)
442947.68  3761995.12  12.82208c (13112024)  442997.68
3761995.12  10.89090m (12050224)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

X-COORD (M) Y-COORD (M) CONC (YYMMDDHH) X-COORD (M) Y-COORD (M) CONC (YYMMDDHH)
- - - -

3762045.12 15.02518c (12121724)
442947.68 3762045.12 12.29970 (12080324) 442997.68
3762045.12 10.50078 (12102224)
443047.68 3762045.12 9.14173m (12050224) 443097.68
3762045.12 8.08993 (13040124)
443147.68 3762045.12 7.21120 (13030624) 443197.68
3762045.12 6.54989 (13030624)
442447.68 3762095.12 31.25865 (14010724) 442497.68
3762095.12 30.77870 (14010724)
442547.68 3762095.12 27.44736c (12121724) 442597.68
3762095.12 28.20172 (13102424)
442647.68 3762095.12 25.47317c (12011024) 442697.68
3762095.12 26.28460 (12120224)
442747.68 3762095.12 24.50398 (12120624) 442797.68
3762095.12 20.13792 (13020524)
442847.68 3762095.12 17.00085 (12121524) 442897.68
3762095.12 13.54212 (12031624)
442947.68 3762095.12 11.39928 (15052224) 442997.68
3762095.12 9.95766m (16031424)
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3762095.12 7.66157 (14111224)
443147.68 3762095.12 6.87635 (12031624) 443197.68
3762095.12 6.45766m (12050224)
442447.68 3762145.12 25.65875 (12120724) 442497.68
3762145.12 21.81496 (12120724)
442547.68 3762145.12 20.48693c (12011024) 442597.68
3762145.12 19.09532c (12120124)
442647.68 3762145.12 18.46182 (12121524) 442697.68
3762145.12 17.77991 (12121524)
442747.68 3762145.12 16.39612 (12021324) 442797.68
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442847.68 3762145.12 13.24944 (12021324) 442897.68
3762145.12 11.35198 (13020524)
442947.68 3762145.12 10.00255 (15052224) 442997.68
3762145.12 8.93486 (14032624)
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443147.68 3762145.12 6.42333 (16103024) 443197.68
3762145.12 6.13122 (15052224)
442447.68 3762195.12 21.10047 (12120724) 442497.68
3762195.12 17.13838 (12123024)
442547.68 3762195.12 15.38789 (13102424) 442597.68
3762195.12 14.21572 (14120524)
442647.68 3762195.12 13.42883c (12121724) 442697.68
3762195.12 12.88646 (12021324)
442747.68 3762195.12 12.26463 (16101624) 442797.68
3762195.12 11.51606 (12121524)
442847.68 3762195.12 10.72882m (16031324) 442897.68
3762195.12 9.95176c (12121724)
442947.68 3762195.12 9.03997 (12061524) 442997.68
3762195.12 8.31055 (15100424)

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        443047.68   3762195.12        7.65919  (12061524)                443097.68
3762195.12        7.07098  (15100424)
        443147.68   3762195.12        6.44585  (13040124)                443197.68
3762195.12        5.96413  (13020624)
        442447.68   3762245.12       17.59520c (12011024)                442497.68
3762245.12       14.09766c (12011024)
        442547.68   3762245.12       12.54152  (13102424)                442597.68
3762245.12       11.24304c (12121724)
        442647.68   3762245.12       10.67834c (12112224)                442697.68
3762245.12       10.33029  (12021324)
        442747.68   3762245.12        9.91208  (12121524)                442797.68
3762245.12        9.29202  (12110924)
        442847.68   3762245.12        8.78796m (16031324)                442897.68
3762245.12        8.38040  (12061524)
        442947.68   3762245.12        7.99618  (12061524)                442997.68
3762245.12        7.62896  (12021324)
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3762245.12        6.58661  (12061524)
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3762245.12        5.72068  (15100424)
        442822.81   3761611.77       12.79812c (13020924)                442872.81
3761611.77       10.32552  (14110524)
        442922.81   3761611.77        8.66969c (13032224)                442972.81
3761611.77        7.64304c (12120524)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 108
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P1EXHAUS ***
                                  INCLUDING SOURCE(S):     L0000789    , L0000790
, L0000791    , L0000792    , L0000793    ,
                L0000794    , L0000795    , L0000796    , L0000797    , L0000798
, L0000799    , L0000800    , L0000801    ,
                L0000802    , L0000803    , L0000804    , L0000805    , L0000806
, L0000807    , L0000808    , L0000809    ,
                L0000810    , L0000811    , L0000812    , L0000813    , L0000814
, L0000815    , L0000816    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                              ** CONC OF PM_10    IN MICROGRAMS/M**3
                    **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
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- - - -

3762419.57  1.45929  (15030124)
441159.54  3762419.57  1.49179  (16122024)  441209.54
3762419.57  1.56238  (16122624)
441259.54  3762419.57  1.69203  (16122624)  441109.54
3762469.57  1.44643c (13091724)
441159.54  3762469.57  1.48212  (16122624)  441209.54
3762469.57  1.56692  (13121024)
441259.54  3762469.57  1.65823  (13121024)  441109.54
3762519.57  1.53041  (16032624)
441159.54  3762519.57  1.47647c (13091724)  441209.54
3762519.57  1.54010  (12020424)
441259.54  3762519.57  1.67346  (16060324)  441109.54
3762569.57  1.64021  (16032624)
441159.54  3762569.57  1.55401  (16122624)  441209.54
3762569.57  1.58453  (15121824)
441259.54  3762569.57  1.63207  (13021524)  441109.54
3762619.57  1.59647  (15112924)
441159.54  3762619.57  1.58334  (12020424)  441209.54
3762619.57  1.61079c (13091724)
441259.54  3762619.57  1.73212c (13091724)  441109.54
3762669.57  1.54624  (15121824)
441159.54  3762669.57  1.64388  (16122624)  441209.54
3762669.57  1.66717  (14101224)
441259.54  3762669.57  1.73646  (14101224)  441109.54
3762719.57  1.57016c (13091524)
441159.54  3762719.57  1.65451  (14101224)  441209.54
3762719.57  1.71002c (13091524)
441259.54  3762719.57  1.76062c (13091524)  441109.54
3762769.57  1.61605c (13091524)
441159.54  3762769.57  1.67418c (13091524)  441209.54
3762769.57  1.70936c (13091524)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE 8TH HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: P1EXHAUS ***
INCLUDING SOURCE(S): L0000789 , L0000790 , L0000791 , L0000792 , L0000793 ,
L0000794 , L0000795 , L0000796 , L0000797 , L0000798 , L0000799 , L0000800 , L0000801 ,
L0000802 , L0000803 , L0000804 , L0000805 , L0000806 , L0000807 , L0000808 , L0000809 ,
L0000810 , L0000811 , L0000812 , L0000813 , L0000814 , L0000815 , L0000816 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS

***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 441259.54 | 3762769.57 | 1.75744c | (13091524) | 441313.48 | 3762805.42 | 1.84313m | (16081424) |
| 441363.48 | 3762805.42 | 1.92631c | (13091524) | 441413.48 | 3762805.42 | 1.93503 | (13012424) |
| 441463.48 | 3762805.42 | 1.96376 | (15122824) | 441513.48 | 3762805.42 | 1.94200c | (13091524) |
| 441563.48 | 3762805.42 | 2.00793 | (12120624) | 441613.48 | 3762805.42 | 2.15123 | (12120624) |
| 441663.48 | 3762805.42 | 2.23452c | (12121724) | 441713.48 | 3762805.42 | 2.35905c | (12121724) |
| 441763.48 | 3762805.42 | 2.38354c | (12121724) | 441813.48 | 3762805.42 | 2.42956m | (14021824) |
| 441313.48 | 3762855.42 | 1.81502c | (13091524) | 441363.48 | 3762855.42 | 1.83182c | (13091524) |
| 441413.48 | 3762855.42 | 1.82286c | (13091524) | 441463.48 | 3762855.42 | 1.79235c | (13091524) |
| 441513.48 | 3762855.42 | 1.88203c | (12121724) | 441563.48 | 3762855.42 | 2.00441c | (12121724) |
| 441613.48 | 3762855.42 | 2.08794c | (12121724) | 441663.48 | 3762855.42 | 2.18595c | (12121724) |
| 441713.48 | 3762855.42 | 2.26377c | (12121724) | 441763.48 | 3762855.42 | 2.26471c | (15062224) |
| 441813.48 | 3762855.42 | 2.28383c | (12121724) | 441313.48 | 3762905.42 | 1.71826 | (15122824) |
| 441363.48 | 3762905.42 | 1.68998 | (12011324) | 441413.48 | 3762905.42 | 1.65749c | (12121724) |
| 441463.48 | 3762905.42 | 1.76788c | (12121724) | 441513.48 | 3762905.42 | 1.89814c | (12121724) |
| 441563.48 | 3762905.42 | 2.00305m | (16081424) | 441613.48 | 3762905.42 | 1.95223c | (12121724) |
| 441663.48 | 3762905.42 | 2.14578c | (12121724) | 441713.48 | 3762905.42 | 2.09758c | (15062224) |
| 441763.48 | 3762905.42 | 1.99794c | (12121724) | 441813.48 | 3762905.42 | 2.11220 | (12083024) |
| 441313.48 | 3762955.42 | 1.55433 | (15122824) | 441363.48 | 3762955.42 | 1.52971c | (12121724) |
| 441413.48 | 3762955.42 | 1.66121m | (15011124) | 441463.48 | 3762955.42 | 1.77817c | (12121724) |
| 441513.48 | 3762955.42 | 1.89153c | (12121724) | 441563.48 | 3762955.42 | 1.87522 | (13112324) |
| 441613.48 | 3762955.42 | 2.01554c | (12121724) | 441663.48 | 3762955.42 | 2.03279 | (16060324) |

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        441713.48   3762955.42        2.02489  (14083024)                441763.48
3762955.42        1.95547m (14021824)
        441813.48   3762955.42        2.01545  (15022024)                440408.22
3761498.57        0.77264  (16020824)
        440956.50   3762849.59        1.36454  (12020424)                440559.26
3761306.11        0.86397  (13121024)
        440752.05   3761305.37        1.03564  (13100524)                440857.69
3761312.76        1.15494  (13100524)
        440969.23   3761308.33        1.29663  (13100524)                440936.73
3761237.41        1.25038  (12122824)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 110
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
        440400.61   3761994.75        2.02529  (16011924)                440450.61
3761994.75        2.10078  (16120124)
        440500.61   3761994.75        2.17868  (16120124)                440550.61
3761994.75        2.26077  (16120124)
        440600.61   3761994.75        2.34778  (16120124)                440650.61
3761994.75        2.43999  (16120124)
        440400.61   3762044.75        2.00251  (16021824)                440450.61
3762044.75        2.06553  (16021824)
        440500.61   3762044.75        2.13162  (16021824)                440550.61
3762044.75        2.20094  (16021824)
        440600.61   3762044.75        2.27375  (16021824)                440650.61
3762044.75        2.35017  (16021824)
        440400.61   3762094.75        1.92147  (16030224)                440450.61
3762094.75        1.99069  (16030224)
        440500.61   3762094.75        2.06217  (16030224)                440550.61
3762094.75        2.13606  (16030224)
        440600.61   3762094.75        2.21247  (16030224)                440650.61
3762094.75        2.29136  (16030224)
        440400.61   3762144.75        1.94282  (13030724)                440450.61
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3762144.75 2.01241 (13030724)
440500.61 3762144.75 2.09973 (12122024) 440550.61
3762144.75 2.20796 (16030224)
440600.61 3762144.75 2.27501 (16030224) 440650.61
3762144.75 2.33555 (16030124)
441145.13 3761319.94 4.04840 (14010524) 441195.13
3761319.94 4.22287c (12102424)
441245.13 3761319.94 4.32448c (12102424) 441145.13
3761369.94 4.09584 (13021224)
441195.13 3761369.94 4.36712 (13021224) 441245.13
3761369.94 4.45954 (15120124)
441145.13 3761419.94 4.16897 (16041224) 441195.13
3761419.94 4.33774 (14020624)
441245.13 3761419.94 4.57939c (12102424) 441145.13
3761469.94 4.35154 (12101324)
441195.13 3761469.94 4.53748 (14012824) 441245.13
3761469.94 4.68303 (14012824)
441145.13 3761519.94 4.32249 (12121624) 441195.13
3761519.94 4.62117 (12121624)
441245.13 3761519.94 4.91466 (12101324) 441145.13
3761569.94 4.14588 (13112124)
441195.13 3761569.94 4.32716 (13112124) 441245.13
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441145.13 3761619.94 3.94181c (12011724) 441195.13
3761619.94 4.20520 (16122224)
441245.13 3761619.94 4.35695 (16122224) 441145.13
3761669.94 3.64093 (14102124)
441195.13 3761669.94 3.86483c (12011724) 441245.13
3761669.94 4.20604c (12011724)
441917.00 3761316.31 10.09719 (16102024) 441967.00
3761316.31 10.62061 (12020624)
442017.00 3761316.31 11.42636 (12121624) 442067.00
3761316.31 12.03453 (16102024)
441917.00 3761366.31 10.72449c (15120624) 441967.00
3761366.31 11.36633c (15120624)
442017.00 3761366.31 12.42865 (12121624) 442067.00
3761366.31 13.27812 (13122224)
441917.00 3761416.31 11.44669 (13010424) 441967.00
3761416.31 12.27494 (12121624)
442017.00 3761416.31 13.56566 (14012424) 442067.00
3761416.31 14.92735 (14012424)
441917.00 3761466.31 12.18791 (12121624) 441967.00
3761466.31 13.32613 (12120924)
442017.00 3761466.31 14.19743 (14012424) 442067.00
3761466.31 16.05014 (14012424)
441917.00 3761516.31 13.27589c (12011724) 441967.00
3761516.31 14.17377 (16102024)
442017.00 3761516.31 15.30612 (12120924) 442067.00
3761516.31 17.08232 (14012424)
441917.00 3761566.31 13.30928 (14120224) 441967.00
3761566.31 15.72297 (14120224)

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        442017.00   3761566.31       16.91430  (16102024)                442067.00
3761566.31       18.54641  (16122724)
        441917.00   3761616.31       13.37143  (12111324)                441967.00
3761616.31       15.27958  (12111324)
        442017.00   3761616.31       18.61989  (14120224)                442067.00
3761616.31       21.12115c (12011724)
        442847.68   3761995.12       38.72324  (13091124)                442897.68
3761995.12       29.48274c (13061924)
        442947.68   3761995.12       24.69518  (12080324)                442997.68
3761995.12       20.97372  (12100424)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                        ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                      ***        07:43:46

                                  PAGE 111
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
        443047.68   3761995.12       18.20886  (12100424)                443097.68
3761995.12       16.01669c (13061724)
        443147.68   3761995.12       14.23499  (13072424)                443197.68
3761995.12       12.77172  (13080724)
        442847.68   3762045.12       36.82190  (13080624)                442897.68
3762045.12       28.39997  (13111924)
        442947.68   3762045.12       23.50092  (13111924)                442997.68
3762045.12       20.18225  (13111924)
        443047.68   3762045.12       17.61420  (12100424)                443097.68
3762045.12       15.73871  (13111924)
        443147.68   3762045.12       14.05473c (13061724)                443197.68
3762045.12       12.65070  (12100424)
        442447.68   3762095.12       47.67177  (12100424)                442497.68
3762095.12       45.92769  (16031924)
        442547.68   3762095.12       44.90277  (16031924)                442597.68
3762095.12       44.73136  (14062824)
        442647.68   3762095.12       44.45330  (12120224)                442697.68
3762095.12       42.66613  (12050724)
        442747.68   3762095.12       41.96952  (12031624)                442797.68
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3762095.12 40.85899 (13091124)
442847.68 3762095.12 30.40824 (12050424) 442897.68
3762095.12 24.89486c (13061724)
442947.68 3762095.12 21.17350 (13080624) 442997.68
3762095.12 18.53202 (13080624)
443047.68 3762095.12 16.37157 (13080624) 443097.68
3762095.12 14.58695 (16071324)
443147.68 3762095.12 13.27156 (12080324) 443197.68
3762095.12 12.16876m (16070324)
442447.68 3762145.12 30.55632 (12070724) 442497.68
3762145.12 26.24566 (12070724)
442547.68 3762145.12 24.88556 (13102424) 442597.68
3762145.12 24.83997 (13032824)
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3762145.12 25.16414 (12061524)
442747.68 3762145.12 25.65463 (13102424) 442797.68
3762145.12 25.15455 (13040524)
442847.68 3762145.12 23.41308 (15090324) 442897.68
3762145.12 21.04057 (13102424)
442947.68 3762145.12 18.51884 (13072524) 442997.68
3762145.12 16.71621 (13072524)
443047.68 3762145.12 15.03516 (13072524) 443097.68
3762145.12 13.48769 (13072524)
443147.68 3762145.12 12.38665 (16071324) 443197.68
3762145.12 11.33198 (16071324)
442447.68 3762195.12 26.23087 (12031624) 442497.68
3762195.12 21.48657 (16031924)
442547.68 3762195.12 19.51496 (12100424) 442597.68
3762195.12 18.81306m (14021824)
442647.68 3762195.12 18.41316 (12050724) 442697.68
3762195.12 18.43761 (12061524)
442747.68 3762195.12 19.00928 (12120224) 442797.68
3762195.12 18.80527m (16031424)
442847.68 3762195.12 18.35954 (12031624) 442897.68
3762195.12 17.42126c (14111124)
442947.68 3762195.12 16.00609 (12060224) 442997.68
3762195.12 14.83380 (13072524)
443047.68 3762195.12 13.38623c (13061724) 443097.68
3762195.12 12.59553 (13072524)
443147.68 3762195.12 11.59180 (14062924) 443197.68
3762195.12 10.40580 (12100424)
442447.68 3762245.12 23.48114 (16031924) 442497.68
3762245.12 18.36189 (14062824)
442547.68 3762245.12 16.35225 (14020924) 442597.68
3762245.12 15.40071 (14062824)
442647.68 3762245.12 14.73804 (12050724) 442697.68
3762245.12 14.78931 (12050724)
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3762245.12 15.26313 (12050724)
442847.68 3762245.12 15.14752 (12050724) 442897.68
3762245.12 14.49410 (12031624)

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        442947.68   3762245.12       13.78622  (12050724)                442997.68
3762245.12       12.92317  (12050724)
        443047.68   3762245.12       12.06239  (12050724)                443097.68
3762245.12       11.21414  (12050724)
        443147.68   3762245.12       10.38335m (16070324)                443197.68
3762245.12        9.97126  (13072524)
        442822.81   3761611.77       21.58056  (13122124)                442872.81
3761611.77       18.05343  (16031824)
        442922.81   3761611.77       15.17913  (16031824)                442972.81
3761611.77       13.39426c (13110324)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 112
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
        442822.81   3761661.77       29.16863  (12012424)                442872.81
3761661.77       21.63528c (12022024)
        442922.81   3761661.77       17.94184c (12120524)                442972.81
3761661.77       15.60358c (12120524)
        442732.29   3762366.08       10.05741c (14071524)                442782.29
3762366.08       10.02195  (14062824)
        442832.29   3762366.08        9.87744  (13091124)                442732.29
3762416.08        8.62200  (16101624)
        442782.29   3762416.08        8.75580  (14062824)                442832.29
3762416.08        8.46989  (13040524)
        442732.29   3762466.08        7.62535c (14071524)                442782.29
3762466.08        7.63572  (13032824)
        442832.29   3762466.08        7.54934  (12050724)                441922.75
3762323.77        8.78367  (14101224)
        441972.75   3762323.77        9.55448  (15013024)                442022.75
3762323.77       11.14300  (12083024)
        442072.75   3762323.77       12.92579  (12020424)                441922.75
3762373.77        8.20619  (15013024)
        441972.75   3762373.77        9.33145  (15013024)                442022.75
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3762373.77 10.19542 (12011324)
442072.75 3762373.77 11.18020c (12121724) 441922.75
3762423.77 7.96459 (12083024)
441972.75 3762423.77 8.35413c (12121724) 442022.75
3762423.77 9.08447c (12121724)
442072.75 3762423.77 9.32978c (12071424) 441922.75
3762473.77 7.14218c (12121724)
441972.75 3762473.77 7.65745c (12121724) 442022.75
3762473.77 7.94590c (13090224)
442072.75 3762473.77 8.13237c (13090224) 441922.75
3762523.77 6.65780 (12020424)
441972.75 3762523.77 6.88478 (12120624) 442022.75
3762523.77 6.98931 (15013024)
442072.75 3762523.77 6.94269 (12120624) 441922.75
3762573.77 6.07089c (12121724)
441972.75 3762573.77 6.11333 (15013024) 442022.75
3762573.77 6.18997 (13112324)
442072.75 3762573.77 6.04734 (15022024) 441922.75
3762623.77 5.50747c (12121724)
441972.75 3762623.77 5.39463c (12121724) 442022.75
3762623.77 5.48418 (14083024)
442072.75 3762623.77 5.67890 (15022024) 441109.54
3762319.57 3.08856 (16012924)
441159.54 3762319.57 3.17206 (14120124) 441209.54
3762319.57 3.19448 (14120124)
441259.54 3762319.57 3.34452 (13012524) 441109.54
3762369.57 2.77881 (15030124)
441159.54 3762369.57 2.89512 (15030124) 441209.54
3762369.57 3.04810 (13082924)
441259.54 3762369.57 3.26542 (12011324) 441109.54
3762419.57 2.72227 (15010824)
441159.54 3762419.57 2.90365 (12120624) 441209.54
3762419.57 3.09767 (15112924)
441259.54 3762419.57 3.28817 (13012524) 441109.54
3762469.57 2.77296c (13091724)
441159.54 3762469.57 2.94338 (16081824) 441209.54
3762469.57 3.05027 (13012524)
441259.54 3762469.57 3.18221 (15112924) 441109.54
3762519.57 2.69016 (13012524)
441159.54 3762519.57 2.87278 (15112924) 441209.54
3762519.57 3.02573 (13012524)
441259.54 3762519.57 3.05117 (12122024) 441109.54
3762569.57 2.65838 (15112924)
441159.54 3762569.57 2.70130 (15112924) 441209.54
3762569.57 2.83712 (13082424)
441259.54 3762569.57 3.04505c (13091524) 441109.54
3762619.57 2.55726 (13082424)
441159.54 3762619.57 2.72515 (13082424) 441209.54
3762619.57 2.90002c (13091524)
441259.54 3762619.57 3.05151 (13082424) 441109.54
3762669.57 2.60174 (13082424)

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        441159.54   3762669.57        2.73972  (13082424)                441209.54
3762669.57        2.86964  (13082424)
        441259.54   3762669.57        3.03478  (15122824)                441109.54
3762719.57        2.58467  (13082424)
        441159.54   3762719.57        2.71453  (15122824)                441209.54
3762719.57        2.92289  (15122824)
        441259.54   3762719.57        3.10620  (14101224)                441109.54
3762769.57        2.63864  (15122824)
        441159.54   3762769.57        2.80041  (14101224)                441209.54
3762769.57        2.85059  (14101224)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 113
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  P1FUGITI ***
                                  INCLUDING SOURCE(S):     PAREA2      ,

                                             *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                        ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
        441259.54   3762769.57        2.93047  (12081324)                441313.48
3762805.42        2.89452  (12020424)
        441363.48   3762805.42        3.08509  (15122824)                441413.48
3762805.42        3.23049  (16122624)
        441463.48   3762805.42        3.21308  (15013024)                441513.48
3762805.42        3.34728  (15013024)
        441563.48   3762805.42        3.34594b (14081524)                441613.48
3762805.42        3.46141c (12121724)
        441663.48   3762805.42        3.69846c (12121724)                441713.48
3762805.42        3.82993  (16060324)
        441763.48   3762805.42        3.63164  (16060324)                441813.48
3762805.42        3.73483  (13081724)
        441313.48   3762855.42        2.87204  (16122624)                441363.48
3762855.42        2.93939  (12120624)
        441413.48   3762855.42        2.93329  (12083024)                441463.48
3762855.42        3.08077  (15013024)
        441513.48   3762855.42        3.14977  (15013024)                441563.48
3762855.42        3.19599  (15013024)
        441613.48   3762855.42        3.40321c (14070524)                441663.48
```

3762855.42 3.42936 (13012424)
441713.48 3762855.42 3.37232c (12092524) 441763.48
3762855.42 3.35652c (15062224)
441813.48 3762855.42 3.61102c (12121724) 441313.48
3762905.42 2.64804c (13091724)
441363.48 3762905.42 2.73922 (12083024) 441413.48
3762905.42 2.85448 (15013024)
441463.48 3762905.42 2.89079 (15013024) 441513.48
3762905.42 2.93116c (13061824)
441563.48 3762905.42 3.15817c (13090224) 441613.48
3762905.42 3.13387 (16060324)
441663.48 3762905.42 3.20043 (12083024) 441713.48
3762905.42 3.08177c (12092524)
441763.48 3762905.42 3.28991c (15062224) 441813.48
3762905.42 3.24193 (12083024)
441313.48 3762955.42 2.56924 (12083024) 441363.48
3762955.42 2.64290 (15013024)
441413.48 3762955.42 2.66233 (15013024) 441463.48
3762955.42 2.78830c (13061824)
441513.48 3762955.42 2.92552c (12092524) 441563.48
3762955.42 2.98417c (14070524)
441613.48 3762955.42 2.93906 (12083024) 441663.48
3762955.42 2.88265 (14101024)
441713.48 3762955.42 3.02557 (14101024) 441763.48
3762955.42 3.08950c (12121724)
441813.48 3762955.42 3.10745 (14020924) 440408.22
3761498.57 2.04511 (14102124)
440956.50 3762849.59 2.28942 (15122824) 440559.26
3761306.11 2.70013 (12111324)
440752.05 3761305.37 2.96772 (12112124) 440857.69
3761312.76 3.23657 (12111324)
440969.23 3761308.33 3.53704 (16041224) 440936.73
3761237.41 3.36480 (14010524)



*** THE 8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): PAREA1 , L0000001
, L0000002 , L0000003 , L0000004 ,
L0000005 , L0000006 , L0000007 , L0000008 , L0000009
, L0000010 , L0000011 , L0000012 ,
L0000013 , L0000014 , L0000015 , L0000016 , L0000017
, L0000018 , L0000019 , L0000020 ,
L0000021 , L0000022 , L0000023 , L0000024 , L0000025
, L0000026 , L0000027 , . . . ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10 IN MICROGRAMS/M**3 **

| X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) | X-COORD (M) | Y-COORD (M) | CONC | (YYMMDDHH) |
|---|---|---|---|---|---|---|---|
| 440400.61 | 3761994.75 | 10.44583 | (16010124) | 440450.61 | 3761994.75 | 11.67395 | (16010124) |
| 440500.61 | 3761994.75 | 12.84638c | (12122524) | 440550.61 | 3761994.75 | 14.19636c | (12122524) |
| 440600.61 | 3761994.75 | 15.84145 | (13121024) | 440650.61 | 3761994.75 | 18.39233c | (12122524) |
| 440400.61 | 3762044.75 | 10.05934 | (16121524) | 440450.61 | 3762044.75 | 11.15276 | (16010124) |
| 440500.61 | 3762044.75 | 12.53112c | (12122524) | 440550.61 | 3762044.75 | 13.83207c | (12122524) |
| 440600.61 | 3762044.75 | 15.42669c | (16121324) | 440650.61 | 3762044.75 | 17.75290 | (13121024) |
| 440400.61 | 3762094.75 | 9.81585 | (12020624) | 440450.61 | 3762094.75 | 10.75934 | (12020624) |
| 440500.61 | 3762094.75 | 11.90950 | (12020624) | 440550.61 | 3762094.75 | 13.30143c | (12122524) |
| 440600.61 | 3762094.75 | 14.85591m | (16123124) | 440650.61 | 3762094.75 | 17.13917 | (12120624) |
| 440400.61 | 3762144.75 | 9.41989 | (15120424) | 440450.61 | 3762144.75 | 10.29721 | (15120424) |
| 440500.61 | 3762144.75 | 11.44562 | (12120624) | 440550.61 | 3762144.75 | 12.62130c | (12122524) |
| 440600.61 | 3762144.75 | 14.09749c | (12122524) | 440650.61 | 3762144.75 | 16.13439c | (12122524) |
| 441145.13 | 3761319.94 | 14.83190 | (15011524) | 441195.13 | 3761319.94 | 15.13804 | (15011524) |
| 441245.13 | 3761319.94 | 15.42474 | (13121224) | 441145.13 | 3761369.94 | 15.89187c | (14012124) |
| 441195.13 | 3761369.94 | 16.21936c | (14012124) | 441245.13 | 3761369.94 | 16.53061c | (14012124) |
| 441145.13 | 3761419.94 | 17.37480c | (14012124) | 441195.13 | 3761419.94 | 17.71582c | (14012124) |
| 441245.13 | 3761419.94 | 18.04341c | (14012124) | 441145.13 | 3761469.94 | 19.22808c | (14012124) |
| 441195.13 | 3761469.94 | 19.60726 | (13120224) | 441245.13 | 3761469.94 | 20.03078 | (13120224) |
| 441145.13 | 3761519.94 | 21.75501 | (13120224) | 441195.13 | 3761519.94 | 22.24146 | (13120224) |
| 441245.13 | 3761519.94 | 22.69714 | (13120224) | 441145.13 | 3761569.94 | 25.31333 | (13120224) |

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        441195.13   3761569.94       25.58793  (12111324)                441245.13
3761569.94       25.83046  (12111324)
        441145.13   3761619.94       30.20566c (14012124)                441195.13
3761619.94       30.70005c (14012124)
        441245.13   3761619.94       31.19675c (14012124)                441145.13
3761669.94       40.85680c (14012124)
        441195.13   3761669.94       41.28800c (14012124)                441245.13
3761669.94       41.94896c (14012124)
        441917.00   3761316.31       20.07108  (14010724)                441967.00
3761316.31       21.05743  (13012924)
        442017.00   3761316.31       21.78201  (16110824)                442067.00
3761316.31       22.81169  (12010124)
        441917.00   3761366.31       21.74507  (15011524)                441967.00
3761366.31       22.36819  (13121724)
        442017.00   3761366.31       23.59856  (13121724)                442067.00
3761366.31       24.76823  (16110824)
        441917.00   3761416.31       23.85016  (16012724)                441967.00
3761416.31       24.73612  (15011524)
        442017.00   3761416.31       25.52647  (15011524)                442067.00
3761416.31       26.79242  (16110824)
        441917.00   3761466.31       25.83098  (12010124)                441967.00
3761466.31       27.04147  (12010124)
        442017.00   3761466.31       28.38924  (14112624)                442067.00
3761466.31       29.64013  (15011524)
        441917.00   3761516.31       28.89701  (12010424)                441967.00
3761516.31       30.11738  (16012724)
        442017.00   3761516.31       31.50547  (12121624)                442067.00
3761516.31       33.16419  (16012724)
        441917.00   3761566.31       32.53592  (14120224)                441967.00
3761566.31       33.64922  (15011524)
        442017.00   3761566.31       35.60594  (15011524)                442067.00
3761566.31       37.95157  (12010424)
        441917.00   3761616.31       38.08749c (14012124)                441967.00
3761616.31       39.40333c (14012124)
        442017.00   3761616.31       41.43392  (13120224)                442067.00
3761616.31       43.80048  (14020624)
        442847.68   3761995.12       63.67466  (12080524)                442897.68
3761995.12       50.53325  (13042824)
        442947.68   3761995.12       42.19696  (12100424)                442997.68
3761995.12       36.19511  (12100424)
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 115
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      , L0000001
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, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                                *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                            ** CONC OF PM_10    IN MICROGRAMS/M**3
                   **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
        443047.68   3761995.12       32.17203  (13072424)                443097.68
3761995.12       29.24997  (13073124)
        443147.68   3761995.12       26.71289  (13072424)                443197.68
3761995.12       24.62294m (12050224)
        442847.68   3762045.12       61.13682  (13102424)                442897.68
3762045.12       47.81531  (14062924)
        442947.68   3762045.12       40.85841  (14062924)                442997.68
3762045.12       35.69112  (13020624)
        443047.68   3762045.12       31.51750  (13020624)                443097.68
3762045.12       28.32212  (13073124)
        443147.68   3762045.12       26.19061  (13073124)                443197.68
3762045.12       24.43331  (13073124)
        442447.68   3762095.12       85.76980  (13032824)                442497.68
3762095.12       83.02276c (12120124)
        442547.68   3762095.12       78.92461c (12120124)                442597.68
3762095.12       78.23516m (14021824)
        442647.68   3762095.12       74.58370  (12100424)                442697.68
3762095.12       73.53338  (12100424)
        442747.68   3762095.12       69.98927  (13040524)                442797.68
3762095.12       63.97212m (16031424)
        442847.68   3762095.12       50.90647  (13080424)                442897.68
3762095.12       42.61632  (12080324)
        442947.68   3762095.12       36.69251  (13080624)                442997.68
3762095.12       33.09933  (13080624)
        443047.68   3762095.12       30.21188  (12060124)                443097.68
3762095.12       27.65092  (12120224)
        443147.68   3762095.12       25.05166  (12100424)                443197.68
3762095.12       23.30191  (12100424)
        442447.68   3762145.12       64.21326  (13111924)                442497.68
3762145.12       56.02397  (12031624)
        442547.68   3762145.12       52.58931  (12031624)                442597.68
3762145.12       50.77742  (12031624)
        442647.68   3762145.12       48.15033  (12100424)                442697.68
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3762145.12 46.57602 (14062824)
442747.68 3762145.12 45.82872 (14062824) 442797.68
3762145.12 43.40980 (14062824)
442847.68 3762145.12 39.50084 (13091124) 442897.68
3762145.12 36.01001 (15090324)
442947.68 3762145.12 32.45703 (14062924) 442997.68
3762145.12 29.49041c (12120124)
443047.68 3762145.12 27.26232 (12080324) 443097.68
3762145.12 25.70275 (12100424)
443147.68 3762145.12 23.46081 (12091224) 443197.68
3762145.12 22.37153 (12100424)
442447.68 3762195.12 58.17328 (13102424) 442497.68
3762195.12 47.71400 (12120224)
442547.68 3762195.12 43.11563c (12120124) 442597.68
3762195.12 40.70152c (12120124)
442647.68 3762195.12 38.17776 (12100424) 442697.68
3762195.12 36.72305 (14062824)
442747.68 3762195.12 36.09637 (13040524) 442797.68
3762195.12 34.48025 (12061524)
442847.68 3762195.12 32.59658 (12061524) 442897.68
3762195.12 30.67237 (15090324)
442947.68 3762195.12 29.14672 (13072524) 442997.68
3762195.12 27.06220 (13091124)
443047.68 3762195.12 25.10425c (12120124) 443097.68
3762195.12 23.51972 (16071324)
443147.68 3762195.12 22.06054 (16071324) 443197.68
3762195.12 20.70853 (16071324)
442447.68 3762245.12 52.32914 (12111824) 442497.68
3762245.12 42.26739 (16031924)
442547.68 3762245.12 37.62344c (12120124) 442597.68
3762245.12 34.74952c (12120124)
442647.68 3762245.12 32.79475 (12100424) 442697.68
3762245.12 31.07735 (12100424)
442747.68 3762245.12 29.74660 (14062824) 442797.68
3762245.12 28.88471 (12061524)
442847.68 3762245.12 27.98611 (12061524) 442897.68
3762245.12 26.55193 (12061524)
442947.68 3762245.12 25.55431 (13072524) 442997.68
3762245.12 24.94409 (12060224)
443047.68 3762245.12 22.90800 (13102424) 443097.68
3762245.12 21.65340m (16070324)
443147.68 3762245.12 20.33801 (13080424) 443197.68
3762245.12 19.35649 (12100424)
442822.81 3761611.77 37.10118c (12100524) 442872.81
3761611.77 31.21988 (13011624)
442922.81 3761611.77 27.90223 (16053024) 442972.81
3761611.77 25.13451b (14072524)

```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                              *** THE   8TH HIGHEST 24-HR AVERAGE CONCENTRATION
VALUES FOR SOURCE GROUP:  ALL      ***
                                  INCLUDING SOURCE(S):     PAREA1      , L0000001
, L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    , L0000008    , L0000009
, L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    , L0000016    , L0000017
, L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    , L0000024    , L0000025
, L0000026    , L0000027    ,  . . .      ,

                                                 *** DISCRETE CARTESIAN RECEPTOR POINTS
***

                                          ** CONC OF PM_10    IN MICROGRAMS/M**3
                  **

      X-COORD (M)  Y-COORD (M)        CONC     (YYMMDDHH)              X-COORD (M)
Y-COORD (M)        CONC     (YYMMDDHH)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - -
        442822.81   3761661.77       49.35823c (12110224)                442872.81
3761661.77       39.31895  (13011524)
        442922.81   3761661.77       33.28255  (12072624)                442972.81
3761661.77       29.41367  (12072624)
        442732.29   3762366.08       22.76048  (13102424)                442782.29
3762366.08       22.23780  (12061524)
        442832.29   3762366.08       21.66461m (16031424)                442732.29
3762416.08       20.51579  (13102424)
        442782.29   3762416.08       20.34505  (12031624)                442832.29
3762416.08       19.76921m (16031424)
        442732.29   3762466.08       18.59786c (12120124)                442782.29
3762466.08       18.32800c (12120124)
        442832.29   3762466.08       18.13321c (12120124)                441922.75
3762323.77       27.38380  (12111824)
        441972.75   3762323.77       28.09699  (12111824)                442022.75
3762323.77       28.90096  (13012424)
        442072.75   3762323.77       30.17837  (12111824)                441922.75
3762373.77       22.02006  (13012424)
        441972.75   3762373.77       22.52599  (15013024)                442022.75
3762373.77       23.56944m (15011124)
        442072.75   3762373.77       25.81262  (16060324)                441922.75
3762423.77       19.05901  (12083024)
        441972.75   3762423.77       19.94786m (15011124)                442022.75
3762423.77       21.35814m (16081424)
        442072.75   3762423.77       20.90039  (16120724)                441922.75
3762473.77       17.45970m (15011124)
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441972.75 3762473.77 18.07736m (16081424) 442022.75
3762473.77 17.91729 (16120724)
442072.75 3762473.77 18.70764 (16120724) 441922.75
3762523.77 15.62046m (16081424)
441972.75 3762523.77 15.70899 (16120724) 442022.75
3762523.77 16.26833 (16120724)
442072.75 3762523.77 16.68356 (13012424) 441922.75
3762573.77 13.89207 (12083024)
441972.75 3762573.77 14.38026 (16120724) 442022.75
3762573.77 14.80979 (16120724)
442072.75 3762573.77 14.63380m (16031424) 441922.75
3762623.77 12.82006 (16120724)
441972.75 3762623.77 13.22579 (16120724) 442022.75
3762623.77 13.27296 (13012424)
442072.75 3762623.77 13.32755 (15022024) 441109.54
3762319.57 20.27662 (15030124)
441159.54 3762319.57 20.56456 (15030124) 441209.54
3762319.57 20.85219 (13032824)
441259.54 3762319.57 21.28657c (13102524) 441109.54
3762369.57 16.27718 (15030124)
441159.54 3762369.57 16.50337 (15030124) 441209.54
3762369.57 16.61239 (13101324)
441259.54 3762369.57 17.06242 (15022024) 441109.54
3762419.57 13.89545 (15022024)
441159.54 3762419.57 14.12945c (12120424) 441209.54
3762419.57 14.48777c (13091724)
441259.54 3762419.57 14.72543 (12011324) 441109.54
3762469.57 12.26209 (14121624)
441159.54 3762469.57 12.36301 (14121624) 441209.54
3762469.57 12.55139 (13012424)
441259.54 3762469.57 12.71724 (13012424) 441109.54
3762519.57 11.18816 (13012424)
441159.54 3762519.57 11.26988 (15022024) 441209.54
3762519.57 11.43902c (12121724)
441259.54 3762519.57 11.71563 (13012424) 441109.54
3762569.57 10.51560m (16081424)
441159.54 3762569.57 10.60754 (13012424) 441209.54
3762569.57 10.66123 (13012524)
441259.54 3762569.57 10.73271 (13012524) 441109.54
3762619.57 9.73198 (13012524)
441159.54 3762619.57 9.69962 (13012524) 441209.54
3762619.57 9.66278 (13012524)
441259.54 3762619.57 9.85195c (12121724) 441109.54
3762669.57 8.92182 (13012524)
441159.54 3762669.57 8.87974 (13012524) 441209.54
3762669.57 8.90603c (12121724)
441259.54 3762669.57 9.11318c (12121724) 441109.54
3762719.57 8.15775c (12121724)
441159.54 3762719.57 8.24056 (12083024) 441209.54
3762719.57 8.41212 (12083024)
441259.54 3762719.57 8.56958 (12083024) 441109.54

3762769.57  7.82494  (12083024)
441159.54  3762769.57  7.93973  (12083024)  441209.54
3762769.57  8.04634  (12011324)



*** MODELOPTs:  RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

*** THE  8TH HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP:  ALL  ***
INCLUDING SOURCE(S):  PAREA1  , L0000001 , L0000002  , L0000003  , L0000004  ,
L0000005  , L0000006  , L0000007  , L0000008  , L0000009 , L0000010  , L0000011  , L0000012  ,
L0000013  , L0000014  , L0000015  , L0000016  , L0000017 , L0000018  , L0000019  , L0000020  ,
L0000021  , L0000022  , L0000023  , L0000024  , L0000025 , L0000026  , L0000027  ,  . . .  ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF PM_10  IN MICROGRAMS/M**3  **

X-COORD (M)  Y-COORD (M)  CONC  (YYMMDDHH)  X-COORD (M)  Y-COORD (M)  CONC  (YYMMDDHH)
- - - -

3762855.42 8.28481 (16120724)
441713.48 3762855.42 8.34432c (12120424) 441763.48
3762855.42 8.37495c (12120424)
441813.48 3762855.42 8.38057c (12120424) 441313.48
3762905.42 7.23290 (15013024)
441363.48 3762905.42 7.21138 (15013024) 441413.48
3762905.42 7.44474 (13012424)
441463.48 3762905.42 7.72910 (14020924) 441513.48
3762905.42 7.67295c (12121724)
441563.48 3762905.42 7.70470 (13012424) 441613.48
3762905.42 7.64251 (16120724)
441663.48 3762905.42 7.69685c (12120424) 441713.48
3762905.42 7.71248c (12120424)
441763.48 3762905.42 7.61237c (12120424) 441813.48
3762905.42 7.84442 (13081724)
441313.48 3762955.42 6.81971 (12020424) 441363.48
3762955.42 6.98501 (13012424)
441413.48 3762955.42 7.17806 (14020924) 441463.48
3762955.42 7.09382 (13012424)
441513.48 3762955.42 7.17949 (13012424) 441563.48
3762955.42 7.29285 (13012424)
441613.48 3762955.42 7.26169 (16120724) 441663.48
3762955.42 7.18325c (12120424)
441713.48 3762955.42 7.11132c (12120424) 441763.48
3762955.42 7.11274 (12022524)
441813.48 3762955.42 7.42014b (16120624) 440408.22
3761498.57 10.10624 (15120124)
440956.50 3762849.59 7.05404 (12083024) 440559.26
3761306.11 10.61221 (14120224)
440752.05 3761305.37 12.07522 (12010424) 440857.69
3761312.76 12.82850 (15011524)
440969.23 3761308.33 13.62641 (15011524) 440936.73
3761237.41 12.00626 (12111324)



*** MODELOPTs: RegDFAULT CONC ELEV FLGPOL URBAN ADJ_U*

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS
AVERAGED OVER 5 YEARS ***

** CONC OF PM_10 IN MICROGRAMS/M**3
**

NETWORK
GROUP ID AVERAGE CONC RECEPTOR (XR, YR, ZELEV,

```
ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - -
```

```
  213.99,    2.00)  DC
          4TH HIGHEST VALUE IS      17.89468 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          5TH HIGHEST VALUE IS      16.96427 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          6TH HIGHEST VALUE IS      16.94456 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
          7TH HIGHEST VALUE IS      16.62953 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
          8TH HIGHEST VALUE IS      15.81198 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
          9TH HIGHEST VALUE IS      14.45267 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
         10TH HIGHEST VALUE IS      14.22452 AT (  442497.68,  3762145.12,   214.09,
  214.09,    2.00)  DC

P1FUGITI  1ST HIGHEST VALUE IS      25.69466 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
          2ND HIGHEST VALUE IS      23.00128 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
          3RD HIGHEST VALUE IS      21.45849 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          4TH HIGHEST VALUE IS      20.25397 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
          5TH HIGHEST VALUE IS      19.37934 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
          6TH HIGHEST VALUE IS      18.29647 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          7TH HIGHEST VALUE IS      17.40033 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
          8TH HIGHEST VALUE IS      17.01491 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
          9TH HIGHEST VALUE IS      15.86423 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
         10TH HIGHEST VALUE IS      15.46718 AT (  442847.68,  3762045.12,   212.50,
  212.50,    2.00)  DC
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                        ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 119
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                                   *** THE SUMMARY OF MAXIMUM ANNUAL RESULTS
AVERAGED OVER   5 YEARS ***


                                    ** CONC OF PM_10    IN MICROGRAMS/M**3
               **
```

```
                        NETWORK
GROUP ID                      AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV,
ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS      53.00779 AT (  442447.68,  3762095.12,   213.71,
  213.71,    2.00)  DC
          2ND HIGHEST VALUE IS      49.22565 AT (  442497.68,  3762095.12,   213.64,
  213.64,    2.00)  DC
          3RD HIGHEST VALUE IS      44.89953 AT (  442547.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          4TH HIGHEST VALUE IS      43.65680 AT (  442597.68,  3762095.12,   213.99,
  213.99,    2.00)  DC
          5TH HIGHEST VALUE IS      40.55351 AT (  442647.68,  3762095.12,   213.61,
  213.61,    2.00)  DC
          6TH HIGHEST VALUE IS      39.56934 AT (  442447.68,  3762145.12,   214.06,
  214.06,    2.00)  DC
          7TH HIGHEST VALUE IS      39.41430 AT (  442697.68,  3762095.12,   213.74,
  213.74,    2.00)  DC
          8TH HIGHEST VALUE IS      36.63828 AT (  442747.68,  3762095.12,   213.60,
  213.60,    2.00)  DC
          9TH HIGHEST VALUE IS      35.05817 AT (  442847.68,  3761995.12,   211.86,
  211.86,    2.00)  DC
         10TH HIGHEST VALUE IS      33.84096 AT (  442447.68,  3762195.12,   214.36,
  214.36,    2.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 120
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

                                                *** THE SUMMARY OF HIGHEST 24-HR
RESULTS ***


                                  ** CONC OF PM_10    IN MICROGRAMS/M**3
               **

                                                     DATE
                                        NETWORK
GROUP ID                          AVERAGE CONC     (YYMMDDHH)             RECEPTOR
```

```
(XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - -

P2EXHAUS HIGH   1ST HIGH VALUE IS      14.91588m ON 13010324: AT (  441245.13,
3761669.94,   207.75,   207.75,    2.00)  DC
         HIGH   8TH HIGH VALUE IS      13.39387  ON 13122124: AT (  441245.13,
3761669.94,   207.75,   207.75,    2.00)  DC

P2FUGITI HIGH   1ST HIGH VALUE IS      30.76232  ON 13122324: AT (  441245.13,
3761669.94,   207.75,   207.75,    2.00)  DC
         HIGH   8TH HIGH VALUE IS      25.37178c ON 12011024: AT (  441245.13,
3761669.94,   207.75,   207.75,    2.00)  DC

P1EXHAUS HIGH   1ST HIGH VALUE IS      34.23435  ON 12120624: AT (  442447.68,
3762095.12,   213.71,   213.71,    2.00)  DC
         HIGH   8TH HIGH VALUE IS      31.25865  ON 14010724: AT (  442447.68,
3762095.12,   213.71,   213.71,    2.00)  DC

P1FUGITI HIGH   1ST HIGH VALUE IS      60.16243  ON 12120624: AT (  442447.68,
3762095.12,   213.71,   213.71,    2.00)  DC
         HIGH   8TH HIGH VALUE IS      47.67177  ON 12100424: AT (  442447.68,
3762095.12,   213.71,   213.71,    2.00)  DC

ALL      HIGH   1ST HIGH VALUE IS     103.74007  ON 12120624: AT (  442447.68,
3762095.12,   213.71,   213.71,    2.00)  DC
         HIGH   8TH HIGH VALUE IS      85.76980  ON 13032824: AT (  442447.68,
3762095.12,   213.71,   213.71,    2.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
 *** AERMOD - VERSION 24142  ***   *** Center Park Operational LST - PM10
                         ***        05/08/25
 *** AERMET - VERSION  16216 ***   ***
                       ***        07:43:46

                                  PAGE 121
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  FLGPOL  URBAN  ADJ_U*

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of           65 Warning Message(s)
 A Total of         1279 Informational Message(s)

 A Total of        43848 Hours Were Processed
```

```
 A Total of          917 Calm Hours Identified

 A Total of          362 Missing Hours Identified (  0.83 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 ME W186    2509       MEOPEN: THRESH_1MIN 1-min ASOS wind speed threshold used
     0.50
 ME W187    2509       MEOPEN: ADJ_U* Option for Stable Low Winds used in AERMET

 CN W732     384         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012011624
 CN W732    1632         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012030824
 CN W732    2856         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012042824
 CN W732    2880         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012042924
 CN W732    2904         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012043024
 CN W732    2952         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012050224
 CN W732    3792         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012060624
 CN W732    3816         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012060724
 CN W732    3840         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012060824
 CN W732    3864         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012060924
 CN W732    3888         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012061024
 CN W732    3912         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012061124
 CN W732    3936         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012061224
 CN W732    7296         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012103024
 CN W732    7848         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012112224
 CN W732    8016         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012112924
 CN W732    8784         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2012123124
 CN W732    8856         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013010324
```

```
 CN W732   10488         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031224
 CN W732   10512         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031324
 CN W732   10536         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031424
 CN W732   10560         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031524
 CN W732   10608         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031724
 CN W732   10632         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031824
 CN W732   10656         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013031924
 CN W732   16920         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013120524
 CN W732   17544         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2013123124
 CN W732   17760         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014010924
 CN W732   20952         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014052224
 CN W732   20976         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014052324
 CN W732   21744         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014062424
 CN W732   22704         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014080324
 CN W732   22728         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014080424
 CN W732   22800         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014080724
 CN W732   23016         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014081624
 CN W732   23040         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014081724
 CN W732   23064         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014081824
 CN W732   23088         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014081924
 CN W732   23112         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014082024
 CN W732   23136         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014082124
 CN W732   23280         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014082724
 CN W732   23304         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014082824
 CN W732   23496         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014090524
 CN W732   23568         AVER: 24-hr avg, < 18 hours of data, calms policy used.
```

```
2014090824
 CN W732   23640         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014091124
 CN W732   23688         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014091324
 CN W732   25200         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014111524
 CN W732   26304         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2014123124
 CN W732   27216         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015020724
 CN W732   27960         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015031024
 CN W732   28512         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015040224
 CN W732   29424         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015051024
 CN W732   31680         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015081224
 CN W732   34080         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015112024
 CN W732   34464         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015120624
 CN W732   35064         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2015123124
 CN W732   36816         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016031324
 CN W732   36840         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016031424
 CN W732   38424         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016051924
 CN W732   40416         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016081024
 CN W732   40512         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016081424
 CN W732   43248         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016120624
 CN W732   43848         AVER: 24-hr avg, < 18 hours of data, calms policy used.
2016123124

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

**APPENDIX B2**

## ENERGY ASSESSMENT

# Energy Assessment

# Center Park Specific Plan Project

**Prepared for:**

City of Ontario
Rafael Torres
Assistant Planner
303 East N Street
Ontario, California 91764
909.395.297

**Prepared by:**

Kimley-Horn and Associates, Inc.
1100 W. Town and Country Road, Suite 700
Orange, California 92868
714.939.1030

May 2025

Kimley»Horn

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## Appendices

Appendix A: Energy Data

# LIST OF ABBREVIATED TERMS

| | |
|---|---|
| AH | Affordable Housing |
| AG | Agriculture |
| AFVs | Alternative fuel vehicles |
| AB | Assembly Bill |
| APN | Assessor Parcel Number |
| BTU | British Thermal Unit |
| BRT | Bus Rapid Transit |
| CARB | California Air Resources Board |
| CalEEMod | California Emissions Estimator Model |
| CEC | California Energy Commission |
| CalGreen | California Green Building Standards |
| CEQA | California Environmental Quality Act |
| CNO | Chino Airport |
| CCAP | Community Climate Action Plan |
| DU | Dwelling units |
| EMFAC | EMission FACtor |
| EAP | Energy Action Plan |
| EISA | Energy Independence and Security Act |
| EIRs | Environmental Impact Reports |
| FSEIR | Final Supplemental Environmental Impact Report |
| GWh | Gigawatt-hours |
| GHG | Greenhouse gas |
| I-10 | Interstate 10 |
| I-15 | Interstate 15 |
| kWh | Kilowatt-hours |
| LOR | Laws, ordinances and regulations |
| MDR | Medium Density Residential |
| MWh | Megawatt-hours |
| MW | Megawatts |
| $CH_4$ | Methane |
| MPG | Miles per gallon |
| MM | Mitigation Measure |
| MU – Great Park | Mixed-Use – Great Park |
| OS – R | Open Space – Recreation |
| PAs | Planning Areas |
| RFS | Renewable Fuel Standard |
| SB | Senate Bill |
| SCE | Southern California Edison |
| SoCalGas | Southern California Gas Company |
| SP | Specific Plan |
| SF | Square feet |
| SR-60 | State Route 60 |

| | |
|---|---|
| SR-91 | State Route 91 |
| TOP 2050 | The Ontario Plan 2050 |
| U.S. EPA | U.S. Environmental Protection Agency |
| VMT | Vehicle miles traveled |

# 1.0 INTRODUCTION

This report documents the results of an Energy Assessment completed for the Center Park Specific Plan Project (Project). The purpose of this Energy Assessment is to evaluate the potential construction and operational energy consumption associated with the Project and determine the level of impact the Project would have on the environment. A comparative analysis has been undertaken to determine whether the Project would result in any new or substantially more severe significant environmental impacts as compared to the conclusions discussed in The Ontario Plan (TOP) 2050, certified Final Supplemental Environmental Impact Report (FSEIR), pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning). Applicable mitigation measures from the FSEIR have been incorporated into this analysis.

## 1.1 Project Location

The Project site is comprised of 29 parcels totaling 257.34 acres within Ontario Ranch, City of Ontario (City), San Bernardino County (County), California; see **Figure 1: Regional Location Map.** The Assessor Parcel Numbers (APNs) comprising the Project site are 1053-301-01, -02; 1053-311-01, -02; 1053-321-01, -02, -03; 1053 331 01, 02, -03, -04; 1053-341-01, -02; 1053-351-01, -02; 1053-361-01, -02, -03; 1053-371-01, -02; 0216-311-01, -02, -09; 0216-321-03, -08; 0216-322-03, -04, -10; see **Figure 2: Project Site Assessor Parcel Numbers**. The Project site is bounded by a Southern California Edison (SCE) Easement to the north, Walker Avenue to the east, Eucalyptus Avenue to the south, and Campus Avenue to the west; see **Figure 3: Local Vicinity Map**. Land uses surrounding the Project site include a nursery, crop farms, rural residential uses, and dairy farm operations.

Regional access to the Project site is provided by State Route 60 (SR-60) located approximately 2.1 miles to the north, Interstate 15 (I-15) located approximately 4.0 miles to the east, State Route 71 (SR-71), which connects to State Route 91 (SR-91) to the south, located approximately 3.5 miles to the southwest, and Euclid Avenue, which connects SR-71, SR-60, and Interstate 10 (I-10) to the north, located approximately 0.8 mile to the west.

TOP 2050 designates the Project site land use as Medium Density Residential (MDR), Mixed-Use – Great Park (MU – Great Park), Open Space – Recreation (OS – R), and Open Space – Non-Recreation (OS – NR); see **Figure 4: Existing Land Use and Zoning**. The MDR designation permits single-family and multi-family residential uses. The MU – Great Park designation permits commercial, office, and multi-family residential uses. The OS – R designation permits recreational uses. The OS – NR designation permits utility easements and drainage channels and prohibits building development. TOP 2050 zones the Project site as Specific Plan (SP) with an Agriculture (AG) and Chino Airport (CNO) Overlay zoning overlay. The AG overlay requires a transition buffer area between the existing agricultural uses and the proposed urban uses. In addition, the Project site areas designated MDR or MU – Great Park have an Affordable Housing (AH) zoning overlay to increase affordable housing opportunities in compliance with the City's Housing Element and State Housing Element law.

## 1.2 Project Description

The proposed SP would implement the TOP 2050 vision, establish development standards and

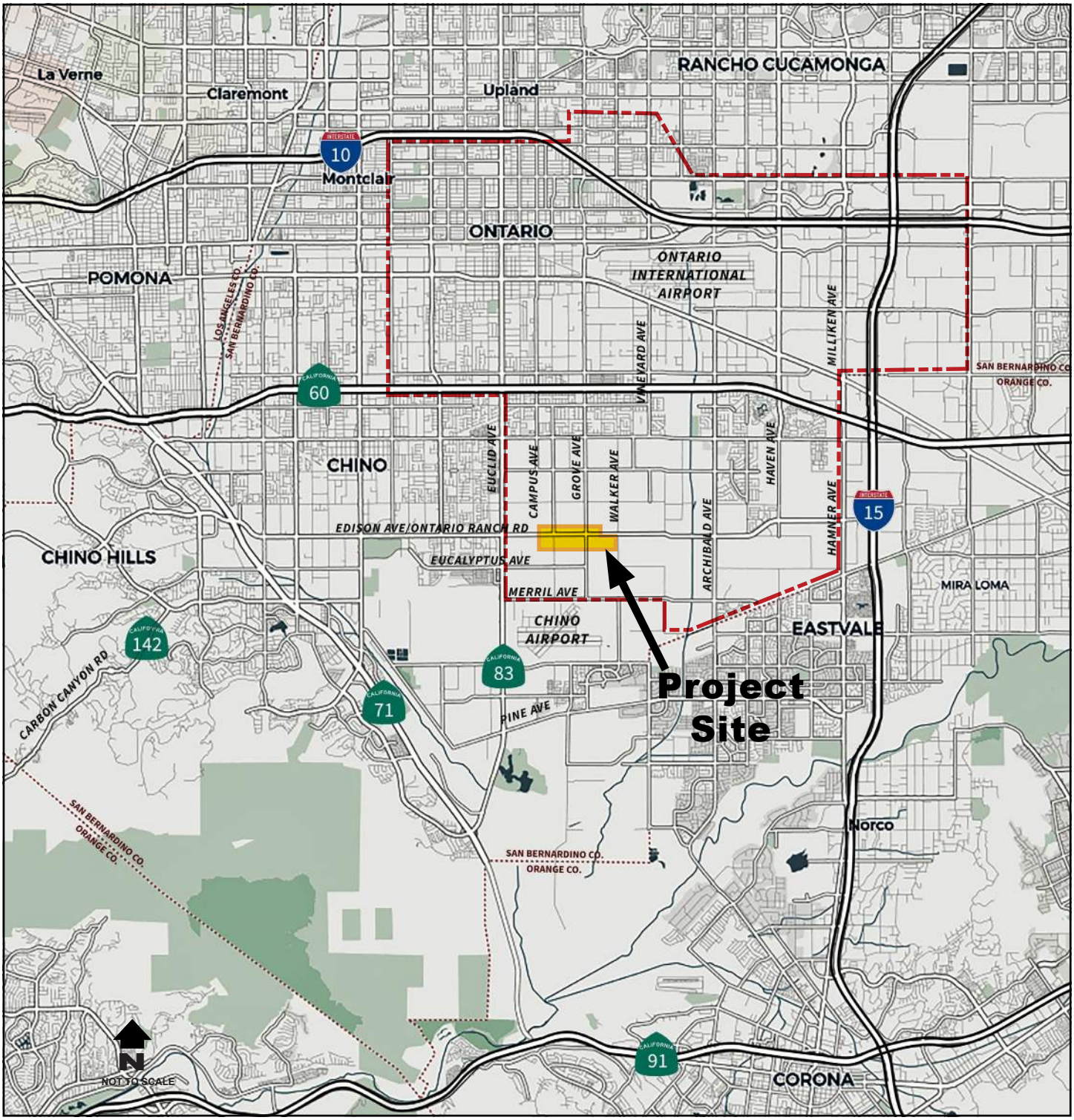


*Source: CenterPark Specific Plan Exhibit 1-1 Regional Location Map, 2024.*

**Figure 1:** Regional Location Map
*Center Park Specific Plan Project*

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Kimley»Horn

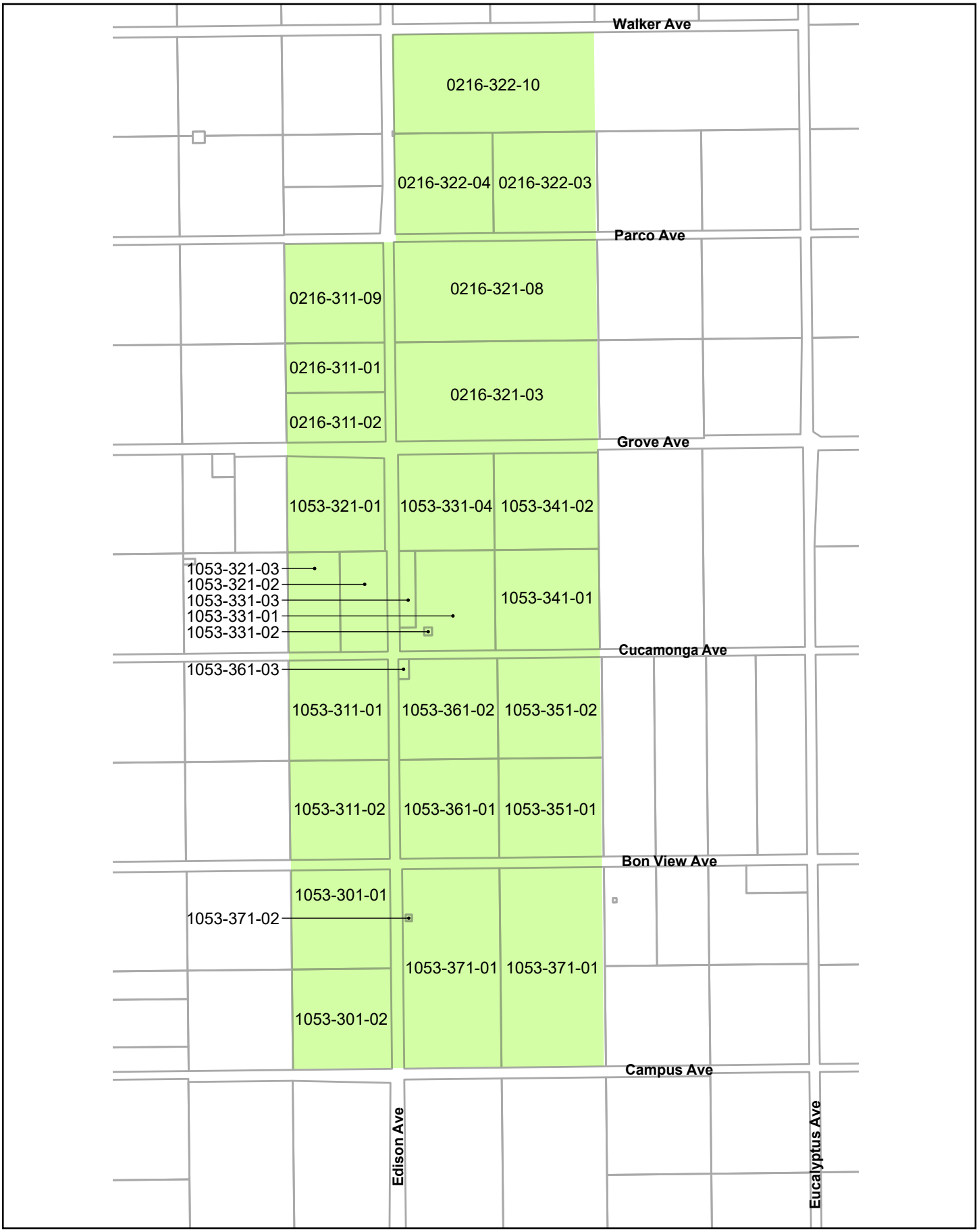


*Source: CenterPark Specific Plan Exhibit 3-1 Assessor's Parcel Numbers, 2024.*

**Figure 2:** Project Site Assessor Parcel Numbers
*Center Park Specific Plan Project*

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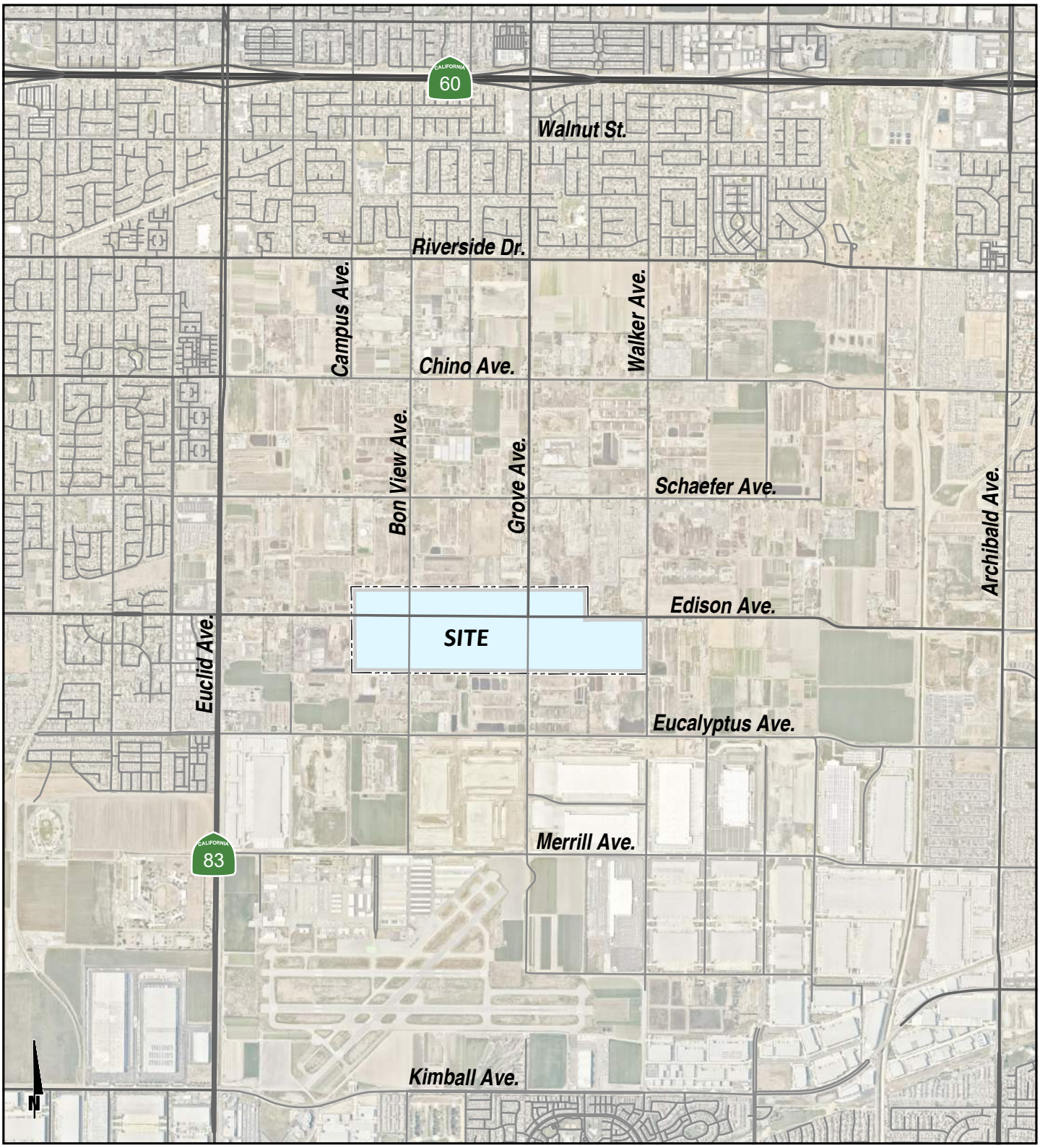


*Source: Center Park Specific Plan Traffic Analysis, Exhibit 1-1 Location Map, 2025.*

**Figure 3:** Local Vicinity Map
*Center Park Specific Plan Project*

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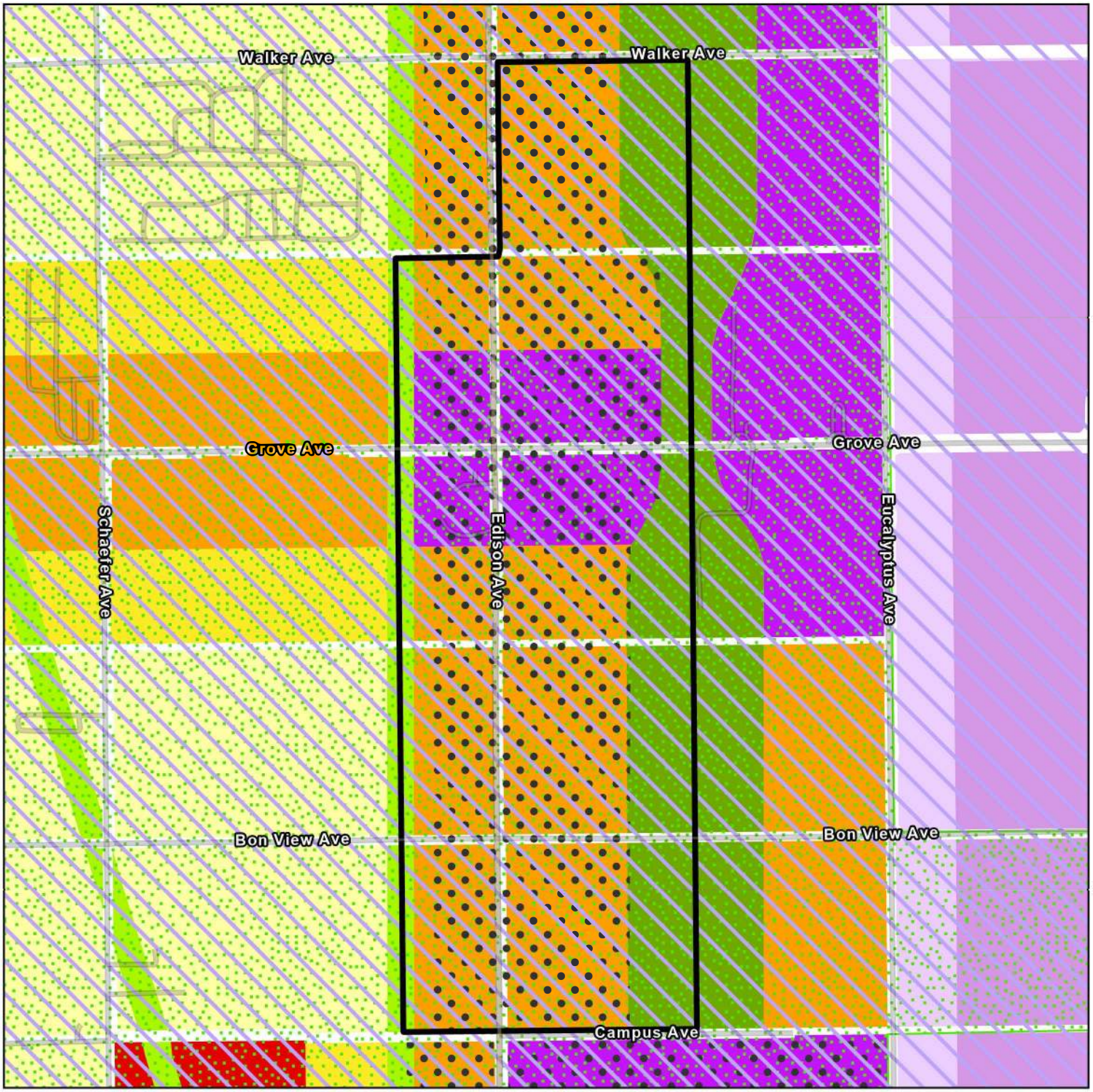


Project Site

**TOP 2050 Land Use Designations**

- RR Rural Residential
- LDR Low Density Residential
- LMDR Low Medium Density Residential
- MDR Medium Density Residential
- HDR High Density Residential
- MU Mixed Use
- NC Neighborhood Commercial
- GC General Commercial
- OC Office Commercial
- HOS Hospitality
- BP Business Park
- IND Industrial
- OS-NR Open Space - Non-Rec
- OS-R Open Space - Recreation
- OS-W Open Space - Water
- PF Public Facility
- PS Public School
- ARPT Airport
- LF Landfill
- Rail

**Zoning Overlay**

- CNO (Chino Airport) Overlay
- AH Affordable Housing
- AG Agricultural

*Source: City of Ontario The Ontario Plan 2050, 2024.*

**Figure 4:** Existing Land Use and Zoning
*Center Park Specific Plan Project*

Not to scale

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procedures, become the governing zoning standards for the Project site, permit a maximum of 802 single-family dwelling units (DUs), 3,491 multi-family DUs, 250,920 square feet (SF) of commercial space, 55.98 acres of recreational open space, and 11.28 acres of non-recreational open space. The Project site is currently developed by ruderal vegetation, rural residences, and agricultural uses such as livestock raising, field crop farming, and dairy farm operations. The Project would remove all on-site uses and improvements to implement the proposed Project.

The proposed SP would divide the Project site into 22 planning areas (PAs); see **Figure 5: Land Use Plan**. The Project site land use designations would remain consistent with TOP 2050. The proposed SP would serve as the Project site zoning designation, consistent with TOP 2050. The Project would be classified as a Tier 2 affordable housing project, which designates at least 25 percent of the DUs as affordable housing. The Project would be developed in two phases; see **Figure 6: Project Phasing Plan**. Phase I would be developed by the private Applicant. Phase II would be dedicated to the City and would be developed at an unknown, later date following Phase I. This analysis conservatively evaluates the maximum Project development potential, with Phase II being evaluated at the programmatic level.

Phase I

Phase I would develop 256 single-family DUs, 768 multi-family DUs, 19.64 acres of recreational open space, and 3.38 acres of non-recreational open space within PAs 6, 12, 13, 17, 18, and 22; see **Table 1: Maximum Phase I Buildout**. The recreational open space would be designated as part of the City's Grand Park, a planned regional park within the Ontario Ranch area. The developer would construct the recreational open space in accordance with the City's Recreation and Parks Master Plan. The Applicant would submit a Development Plan and Tentative Parcel Map for the Phase I Project site following Project approval. Phase I is anticipated to begin construction as early as 2025 and be operational as early as 2029. For purposes of this analysis, it is conservatively assumed that Phase I would be operational as soon as construction is completed in 2027. This is a worst-case assumption as Phase I occupancy would be dependent on market conditions and permit approvals.

**Table 1: Maximum Phase I Buildout**

| Planning Area | Land Use | TOP 2050 Acreage (AC) | Maximum Residential Density (DU/AC)[1] | Maximum Residential (DU) |
|---|---|---|---|---|
| 6 | MDR | 7.33 | -- | 161 |
| 12 | MDR | 15.46 | 22.0 | 340 |
| 13 | MDR | 23.75 | 22.0 | 523 |
| 17 | OS – R | 6.20 | -- | -- |
| 18 | OS – R | 13.44 | -- | -- |
| 22 | OS – NR | 3.38 | -- | -- |
| | **Phase I Total** | **69.56** | **--** | **1,024** |

AC = acres; DU/AC = dwelling units/ acre; DU = dwelling unit; SF = square feet; MDR = Medium Density Residential; OS – R = Open Space – Recreation; and OS – NR = Open Space – Non-Recreation
1. Maximum residential density per The Ontario Plan 2050, Final Supplemental Environmental Impact Report.

Phase II

Phase II would develop 546 single-family DUs, 2,723 multi-family DUs, 250,920 SF of commercial space, 36.34 acres of recreational open space, and 7.9 acres of non-recreational open space

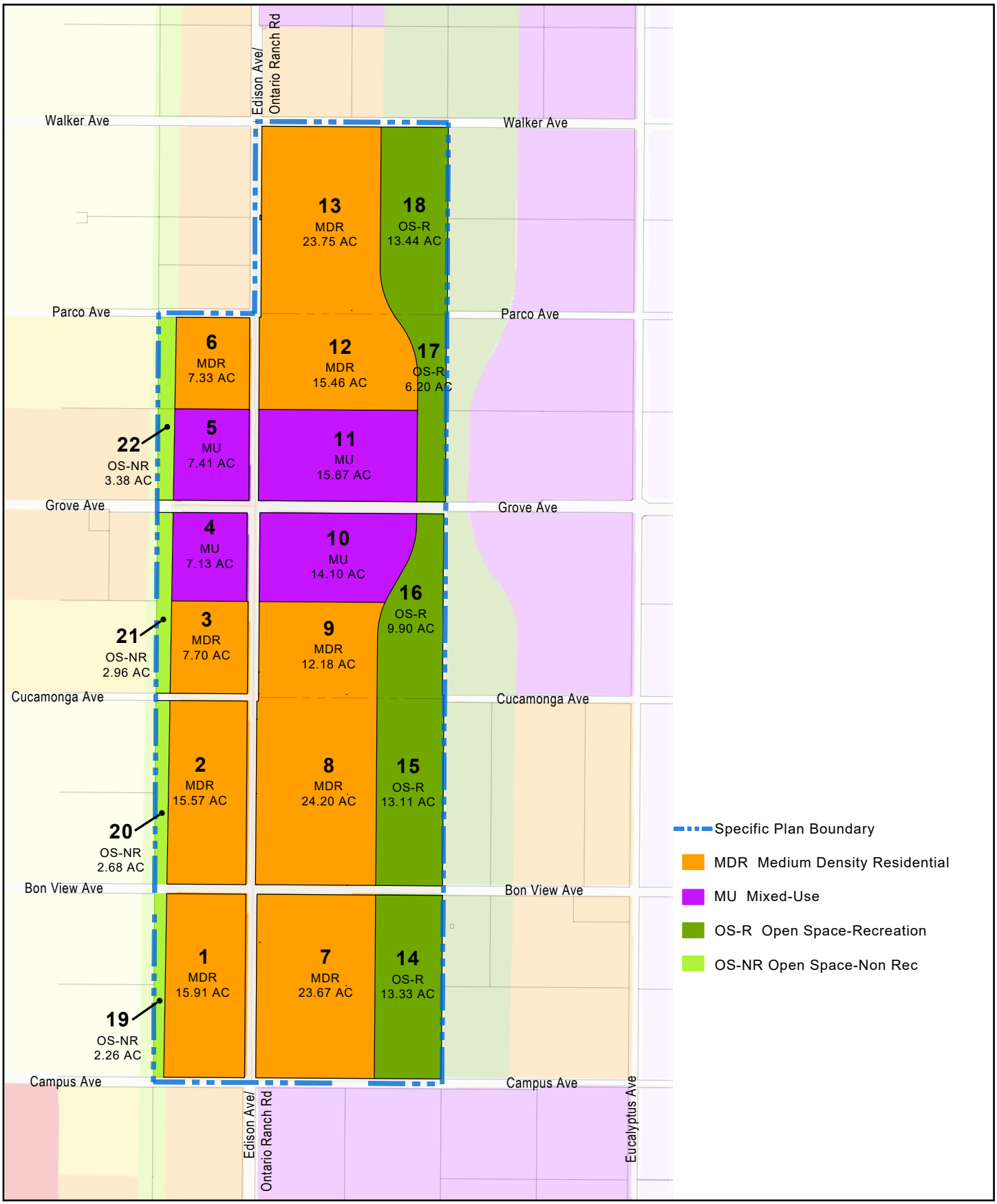


*Source: CenterPark Specific Plan Exhibit 1-3 Land Use Plan, 2024.*

**Figure 5:** Land Use Plan
*Center Park Specific Plan Project*

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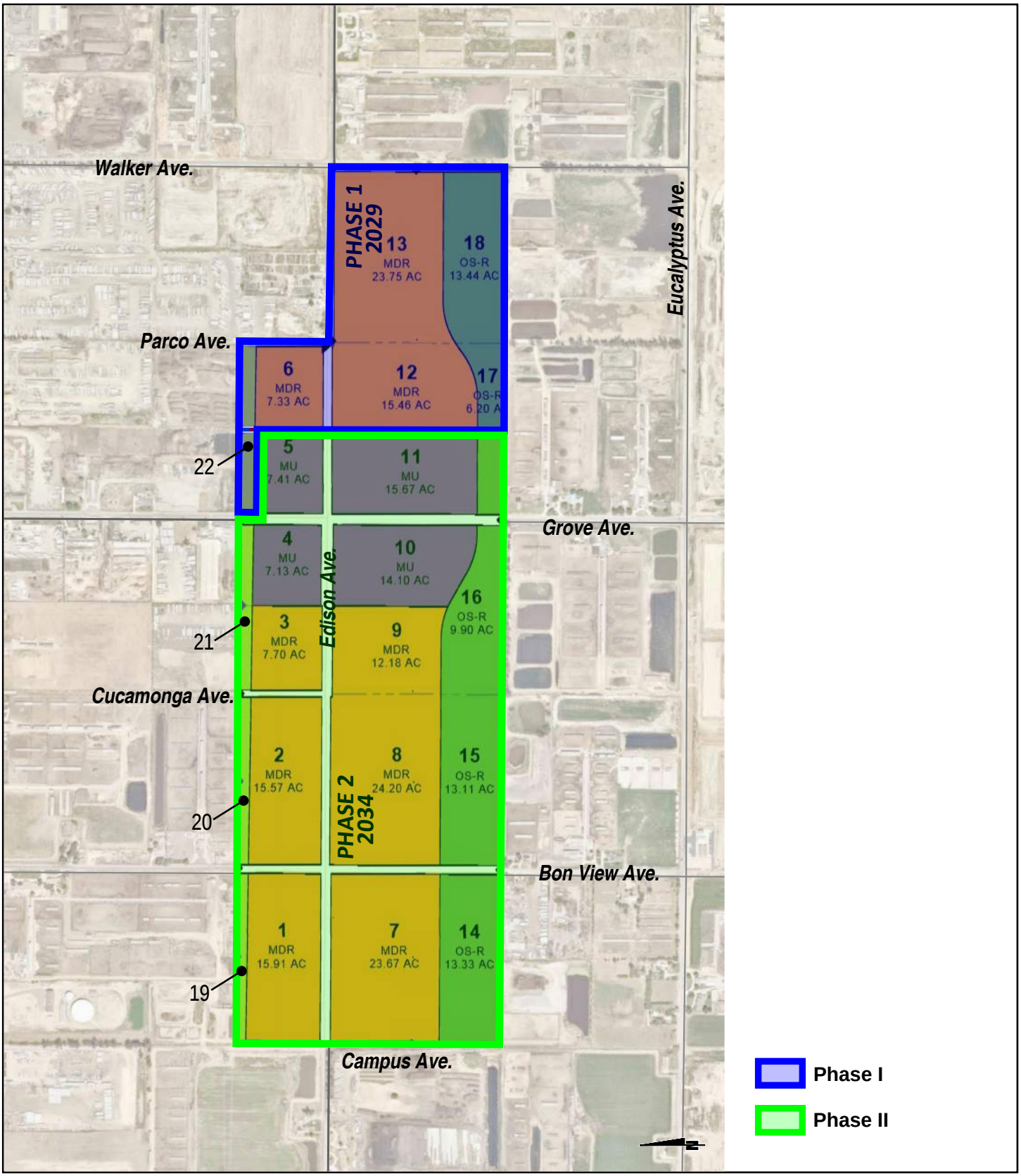


*Source: CenterPark Specific Plan Traffic Analysis, Exhibit 1-2 Preliminary Land Use Plan and Phasing Plan, 2025.*

**Figure 6:** Project Phasing Plan
*Center Park Specific Plan*

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within PAs 1 through 5, 7 through 11, 14 through 16, and 19 through 2; see **Table 2: Maximum Phase II Buildout**. The recreational open space would be designated as part of the City's Grand Park, a planned regional park within the Ontario Ranch area. The developer would construct the recreational open space in accordance with the City's Recreation and Parks Master Plan. For construction phasing purposes, Phase II is anticipated to begin construction as early as 2026 and be operational as early as 2034. It is conservatively assumed that Phase II would be operational as soon as construction is completed in 2030. This is a worst-case assumption as Phase II construction and occupancy would be dependent on market conditions and permit approvals.

**Table 2: Maximum Phase II Buildout**

| Planning Area | Land Use | TOP 2050 Acreage (AC) | Maximum Residential Density (DU/AC)[1] | Maximum Residential (DU) | Maximum Retail (SF) | Maximum Office (SF) |
|---|---|---|---|---|---|---|
| 1 | MDR | 15.91 | 22.0 | 350 | -- | -- |
| 2 | MDR | 15.57 | 22.0 | 343 | -- | -- |
| 3 | MDR | 7.70 | 22.0 | 169 | -- | -- |
| 4 | MU – Residential | 4.99 | 35.0 | 175 | -- | -- |
| 4 | MU – Retail | 1.43 | -- | -- | 18,635 | -- |
| 4 | MU – Office | 0.71 | -- | -- | -- | 21,741 |
| 5 | MU – Residential | 5.19 | 35.0 | 182 | -- | -- |
| 5 | MU – Retail | 1.48 | -- | -- | 19,367 | -- |
| 5 | MU – Office | 0.74 | -- | -- | -- | 22,595 |
| 7 | MDR | 23.67 | 22.0 | 521 | -- | -- |
| 8 | MDR | 24.20 | 22.0 | 532 | -- | -- |
| 9 | MDR | 12.18 | 22.0 | 268 | -- | -- |
| 10 | MU - Residential | 9.87 | 35.0 | 345 | -- | -- |
| 10 | MU – Retail | 2.82 | -- | -- | 36,852 | -- |
| 10 | MU – Office | 1.41 | -- | -- | -- | 42,994 |
| 11 | MU – Residential | 10.97 | 35.0 | 384 | -- | -- |
| 11 | MU – Retail | 3.13 | -- | -- | 40,955 | -- |
| 11 | MU – Office | 1.57 | -- | -- | -- | 47,781 |
| 14 | OS – R | 13.33 | -- | -- | -- | -- |
| 15 | OS – R | 13.11 | -- | -- | -- | -- |
| 16 | OS – R | 9.90 | -- | -- | -- | -- |
| 19 | OS – NR | 2.26 | -- | -- | -- | -- |
| 20 | OS – NR | 2.68 | -- | -- | -- | -- |
| 21 | OS – NR | 2.96 | -- | -- | -- | -- |
| | **Phase II Total** | **187.79** | **--** | **3,269** | **115,809** | **135,111** |

AC = acres; DU/AC = dwelling units/ acre; DU = dwelling unit; SF = square feet; MDR = Medium Density Residential; MU = Mixed-Use; OS – R = Open Space – Recreation; OS – NR = Open Space – Non-Recreation
1. Maximum residential density per The Ontario Plan 2050, Final Supplemental Environmental Impact Report.

Circulation

The Project would include a Circulation Plan to facilitate the movement of vehicles, pedestrians, and cyclists within the Project area. Local access to the Project site would be provided via Campus Avenue, Bon View Avenue, Cucamonga Avenue, Grove Avenue, Parco Avenue, Walker Avenue, and Edison Avenue/Ontario Ranch Road. Pedestrian circulation would be provided throughout the Project area via a paved sidewalk system that would interconnect with the roadway right-of-way. TOP 2050 proposed Class II bicycle lanes transversing in a north/south direction along the west

side of Walker Avenue. The City's Recreation and Parks Master Plan proposed Class I bicycle lanes transversing in an east/west direction along the Project site's southern property line. The Project would be connected to off-site areas through the City's master planned multipurpose trails/bikeways located along the neighborhood edges of the Project site. An Omnitrans Bus Rapid Transit (BRT) Corridor is proposed along Edison Avenue/Ontario Ranch Road as a part of future development.

On-site and Off-site Improvements

Roadway and utility infrastructure improvements (i.e., storm drains, sewer, potable water, recycled water, fiber optics, and underground electricity) would be constructed prior to the issuance of building occupancy permits. The developer would construct the improvements in accordance with the City's Master Plans, City's Ordinances, and proposed Specific Plan provisions or with the City Engineer's approval. Phasing and construction of the improvements would be determined by the City Engineer and Project requirements.

The Project would include landscaping along roadway frontages and between the pedestrian sidewalk and roadway. Landscaping would be developed in accordance with the City's development code and proposed Specific Plan provisions. Landscape and Construction Irrigation Documentation Plans would be submitted to the City prior to the issuance of building permits. The Project would comply with City Ordinance 2689, which requires the use of recycled water for all approved uses, including but not limited to landscape irrigation.

# 2.0 ENVIRONMENTAL SETTING

## 2.1 Energy Conservation

In 1975, largely in response to the oil crisis of the 1970s, the California State Legislature adopted Assembly Bill (AB) 1575, which created the California Energy Commission (CEC). The statutory mission of the CEC is to forecast future energy needs, license thermal power plants of 50 megawatts or larger, develop energy technologies and renewable energy resources, plan for and direct State responses to energy emergencies, and promote energy efficiency through the adoption and enforcement of appliance and building energy efficiency standards. AB 1575 also amended Public Resources Code Section 21100 to require Environmental Impact Reports (EIRs) to consider the consumption of energy caused by a project. Thereafter, the State Resources Agency created Appendix F, *Energy Conservation*, in the CEQA Guidelines. CEQA Guidelines Appendix F is an advisory document that assists EIR preparers in determining whether a project will result in the inefficient, wasteful, and unnecessary consumption of energy.

In addition, the California Natural Resources Agency finalized updates to the CEQA Guidelines in December 2018. CEQA Guidelines Section 15126.2(b) requires mitigation for "significant environmental effects due to wasteful, inefficient, or unnecessary" energy consumption as a significant environmental impact. As a result, energy thresholds have been incorporated into Appendix G of the CEQA Guidelines. This report has been prepared to assess energy impacts in accordance with Appendix G of the CEQA Guidelines.

## 2.2 Energy Consumption

Energy consumption is analyzed in this technical assessment due to the potential direct and indirect environmental impacts associated with the Project. Such impacts include the depletion of nonrenewable resources and emissions of pollutants from Project construction and operations.

Energy consumption is typically quantified using the British Thermal Unit (BTU). The total energy usage in California was 6,822.4 trillion BTUs in 2022 (the most recent year for which this specific data is available).[1] Of California's total energy usage, the breakdown by sector is 43 percent transportation, 22 percent industrial, 17 percent commercial, and 18 percent residential.[2] Electricity and natural gas in California are generally consumed by stationary users such as residences, and commercial, and industrial facilities, whereas petroleum consumption is generally accounted for by transportation-related energy use.

### Electricity

Southern California Edison (SCE) provides electrical services to the City through State-regulated public utility contracts. Over the past 15 years, electricity generation in California has undergone a transition. California has historically relied heavily on oil- and gas-fired plants to generate electricity. Spurred by regulatory measures and tax incentives, California's electrical system has become more reliant on renewable energy sources; including cogeneration, wind energy, solar

[1] U.S. Energy Information Administration, *Table F35: Total energy consumption, price, and expenditure estimates, 2024,* https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_te.html&sid=CA, accessed January 2025.

[2] U.S. Energy Information Administration, *California State Energy Profile, 2025, https://www.eia.gov/state/print.php?sid=CA*, accessed January 2025.

energy, geothermal energy, biomass conversion, transformation plants, and small hydroelectric plants. Unlike petroleum production, electricity generation is not usually tied to the location of the fuel source and can be delivered great distances via the electrical grid. The generating capacity of a unit of electricity is expressed in megawatts (MW). Net generation refers to the gross amount of energy produced by a unit minus the amount of energy the unit consumes. Electrical consumption is typically measured in megawatt-hours (MWh), kilowatt-hours (kWh), or gigawatt-hours (GWh).

**Table 3: Electricity Consumption in San Bernardino County 2012 - 2022** shows the electricity consumption attributable to the County steadily increased by 16 percent from 2012 to 2022.

**Table 3: Electricity Consumption in San Bernardino County 2012 - 2022**

| Year | Total Electricity Consumption (Million Kilowatt-Hours) |
|---|---|
| 2012 | 14,308 |
| 2013 | 14,315 |
| 2014 | 14,680 |
| 2015 | 14,685 |
| 2016 | 14,902 |
| 2017 | 15,237 |
| 2018 | 15,326 |
| 2019 | 15,259 |
| 2020 | 15,910 |
| 2021 | 16,169 |
| 2022 | 16,630 |

Source: California Energy Commission, *Electricity Consumption by County*, http://www.ecdms.energy.ca.gov/, accessed January 2025.

### Natural Gas

Southern California Gas Company (SoCalGas) provides natural gas services to the City. Natural gas is a hydrocarbon fuel found in reservoirs beneath the Earth's surface and primarily composed of methane ($CH_4$). It is used for space and water heating, process heating and electricity generation, and as transportation fuel. Use of natural gas to generate electricity is expected to increase in coming years because it is a relatively clean alternative to other fossil fuels (e.g., oil and coal). In California and throughout the western United States, many new electrical generation plants fired by natural gas are being brought online. Thus, there is great interest in importing liquefied natural gas from other parts of the world. California's natural gas-fired electric generation decreased by 2 percent in 2023, accounting for approximately 44 percent of in-state generation.[3] Natural gas consumption is generally expressed in Therms, a unit of heat energy that is equal to 100,000 BTUs.

**Table 4: Natural Gas Consumption in San Bernardino County 2012 - 2022** presents the natural gas consumption attributable to the County from 2012 to 2022. As shown in **Table 4**, the natural gas consumption in the County increased by less than one percent from 2021 to 2022.

[3] California Energy Commission, *2023 Total System Electric Generation*, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2023-total-system-electric-generation, accessed January 2025.

| Table 4: Natural Gas Consumption in San Bernardino County 2012 - 2022 | |
|---|---|
| **Year** | **Total Natural Gas Consumption (Millions Therms)** |
| 2012 | 489 |
| 2013 | 511 |
| 2014 | 468 |
| 2015 | 485 |
| 2016 | 494 |
| 2017 | 493 |
| 2018 | 500 |
| 2019 | 547 |
| 2020 | 527 |
| 2021 | 561 |
| 2022 | 562 |
| Source: California Energy Commission, *Natural Gas Consumption by County*, http://www. ecdms.energy.ca.gov/, accessed January 2025. | |

### Transportation Fuel

Transportation energy demand in California is largely related to vehicular traffic (e.g., passenger vehicles, light duty trucks, semi-trucks, etc.), with most transportation-related energy demand currently met by gasoline and diesel fuel. Gasoline and diesel fuel is supplied by widely distributed service stations both inside and around the City and is generally expressed as gallons. **Table 5: Transportation Fuel Consumption in San Bernardino County 2012 - 2022** presents the automotive fuel consumption attributable to the County from 2011 to 2022. As shown in **Table 5**, gasoline consumption in the County increased by approximately five percent and diesel consumption increased by approximately 24 percent between 2011 and 2022.

| Table 5: Transportation Fuel Consumption in San Bernardino County 2012 - 2022 | | |
|---|---|---|
| **Year** | **Gasoline Consumption (Million Gallons)** | **Diesel Fuel Consumption (Million Gallons)** |
| 2012 | 824 | 221 |
| 2013 | 824 | 231 |
| 2014 | 833 | 234 |
| 2015 | 862 | 237 |
| 2016 | 887 | 252 |
| 2017 | 894 | 264 |
| 2018 | 894 | 260 |
| 2019 | 895 | 261 |
| 2020 | 764 | 265 |
| 2021 | 869 | 273 |
| 2022 | 867 | 276 |
| Source: California Air Resources Board, *EMFAC,* https://arb.ca.gov/emfac/, accessed January 2025. | | |

# 3.0 REGULATORY SETTING

## 3.1 Federal

### National Energy Conservation Policy Act

The National Energy Conservation Policy Act serves as the underlying authority for federal energy management goals and requirements. Signed into law in 1978, it has been regularly updated and amended by subsequent laws and regulations. This act is the foundation of most federal energy requirements.

### Energy Policy Act of 1992 and 2005

The Energy Policy Act of 1992 was passed to reduce the country's dependence on foreign petroleum and improve air quality. The act includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. The act requires certain federal, state, and local government and private fleets to purchase a percentage of light-duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in the act. Federal tax deductions are allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the Energy Policy Act to consider a variety of incentive programs to help promote AFVs. The Energy Policy Act of 2005 provides renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

### Energy Independence and Security Act of 2007

The Energy Independence and Security Act (EISA; Public Law 110-140) was signed into law by President George W. Bush on December 19, 2007. The Act's goal is to achieve energy security in the United States by increasing renewable fuel production, improving energy efficiency and performance, protecting consumers, improving vehicle fuel economy, and promoting research on greenhouse gas (GHG) capture and storage. Under the EISA, the Renewable Fuel Standard (RFS) program was expanded in several keyways:

- Expanded the RFS program to include diesel, in addition to gasoline;
- Increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022;
- Established new categories of renewable fuel and set separate volume requirements for each; and
- Required the U.S. Environmental Protection Agency (U.S. EPA) to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

The RFS program lays the foundation for achieving significant reductions of GHG emissions from the use of renewable fuels, for reducing imported petroleum, and encouraging the development and expansion of our nation's renewable fuels sector.

The EISA also includes a variety of new standards for lighting and for residential and commercial appliance equipment. The equipment includes residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

## 3.2 State of California

**State Energy Plan**

The CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The State Energy Plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies several strategies, including assistance to public agencies and fleet operators and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access.

**2008 California Energy Action Plan Update**

The 2008 Energy Action Plan (EAP) Update provides a status update to the 2005 EAP II, which is the State's principal energy planning and policy document. The 2008 EAP continues the goals of the original EAP and describes a coordinated implementation plan for State energy policies and identifies specific action areas to ensure that California's energy is adequate, affordable, technologically advanced, and environmentally sound. First-priority actions to address California's increasing energy demands are energy efficiency, demand response (i.e., reduction of customer energy usage during peak periods in order to address system reliability and support the best use of energy infrastructure), and the use of renewable sources of power. If these actions are unable to satisfy the increasing energy and capacity needs, the plan supports clean and efficient fossil-fired generation.

**Renewable Portfolio Standard[4]**

In 2002, the State established its RPS program with the goal of increasing the annual percentage of renewable energy in the State's electricity mix by the equivalent of at least 1 percent of sales, with an aggregate total of 20 percent by 2017. The California Public Utilities Commission subsequently accelerated that goal to 2010 for retail sellers of electricity (Public Utilities Code Section 399.15(b)(1)). Then-Governor Schwarzenegger signed Executive Order S-14-08 in 2008, increasing the target to 33 percent renewable energy by 2020. In September 2009, Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the California Air Resources Board (CARB) under its AB 32 authority to enact regulations to help the State meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020. In September 2010, the California Air Resources Board adopted its Renewable Electricity Standard regulations, which require all of the State's load-serving entities to meet this target. In October 2015, then-Governor Brown signed into legislation Senate Bill (SB) 350, which requires retail sellers and publicly owned utilities to procure 50 percent of their electricity from eligible renewable energy resources by 2030. Signed in 2018, SB 100 revised the goal of the

[4] California Public Utilities Commission, *Renewable Portfolio Standard (RPS) Program, 2021,* https://www.cpuc.ca.gov/rps/, accessed April 2025.

program to achieve the 50 percent renewable resources target by December 31, 2026, and to achieve a 60 percent target by December 31, 2030. SB 100 also established a further goal to have an electric grid that is entirely powered by clean energy by 2045. Under the SB 100, the State cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target. Approved in 2022, SB 1020 revised the State policy to provide that eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035; 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040; 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045; and, 100 percent of electricity procured to serve all State agencies by December 31, 2035.

**California Building Energy Efficiency Standards: Title 24**

The California Building Energy Efficiency Standards (Title 24, Part 6) commonly referred to as the Energy Code, was created as part of the California Building Standards Code (Title 24 of the California Code of Regulations) by the California Building Standards Commission in 1978 to establish statewide building energy efficiency standards to reduce California's energy use. In general, the Energy Code is designed to reduce wasteful and unnecessary energy consumption in newly constructed and existing buildings. The CEC updates the Title 24 Energy Efficiency Standards every three years to allow for consideration and possible incorporation of new energy efficiency technologies and methods. The 2022 Energy Code was adopted by the CEC on August 11, 2022 and went into effective on January 1, 2023.

The California Green Building Standards Code (California Code of Regulations, Title 24, Part 11), commonly referred to as the CALGreen Code, is a statewide mandatory construction code that was developed and adopted by the California Building Standards Commission and the California Department of Housing and Community Development. CALGreen standards require new residential and commercial buildings to comply with mandatory measures under five topical areas: planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and environmental quality. CALGreen also provides voluntary measures (CALGreen Tier 1 and Tier 2) that local governments may adopt which encourage or require additional measures in the five green building topics. The 2022 CALGreen Code was adopted in 2022 and went into effect January 1, 2023. Projects whose permit applications are applied for on or after January 1, 2023, must comply with the 2022 CALGreen Code. [5]

## 3.3 Local

**City of Ontario General Plan**

The City of Ontario General Plan (TOP 2050) is a policy plan that guides the City's long-term development. TOP 2050 establishes energy conservation goals and policies within the Environmental Resources Element and Mobility Element. The following goals and policies are applicable to the Project:

[5] California Energy Commission, *2022 Building Energy Efficiency Standards*, https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency, accessed April 2025.

Environmental Resources Element

**Goal ER-3** **Cost-effective and reliable energy system sustained through a combination of low impact buildings, site and neighborhood energy conservation, and diverse sources of energy generation that collectively helps to minimize the region's carbon footprint.**

**Policy ER-3.1** **Conservation Strategy.** We require conservation as the first strategy to be employed to meet applicable energy-saving standards.

**Policy ER-3.2** **Green Development – Communities.** We encourage the use of the LEED Neighborhood Development rating system, or similar mechanism, to guide the planning and development of all new communities.

**Policy ER-3.3** **Building and Site Design.** We require new construction to incorporate energy efficient building and site design strategies, which could include appropriate solar orientation, maximum use of natural daylight, passive solar, and natural ventilation.

**Policy ER-3.4** **Green Development – Public Buildings**. We require all new and substantially renovated City buildings in excess of 10,000 square feet achieve a LEED Silver Certification standard, as determined by the U.S. Green Building Council.

**Policy ER-3.5** **Fuel Efficient and Alternative Energy Vehicles and Equipment.** We require purchase and use vehicles and equipment that are fuel efficient and meet or surpass state emissions requirements and/or use renewable sources of energy.

**Policy ER-3.6** **Generation – Renewable Sources. We promote the use of renewable energy**

Mobility Element

**Goal M-1** **A system of roadways that meets the mobility needs of a dynamic and prosperous Ontario.**

Policy M-1.6 **Reduce Vehicle Miles Traveled.** We will strive to reduce VMT through a combination of land use, transportation projects, travel demand management strategies, and other trip reduction measures in coordination with development projects and public capital improvement projects.

**Goal M-2** **A system of trails and corridors that facilitate and encourage active modes of transportation.**

Policy M-2.2 **Bicycle System.** We provide off-street multipurpose trails and Class II bikeways as our preferred paths of travel and use the Class III for connectivity in constrained circumstances. When truck routes and bicycle facilities share a right-of-way, we prefer Class I or Class IV bicycle facilities. We require new development to include bicycle facilities, such as bicycle parking and secure storage areas.

**City of Ontario Climate Action Plan**

The City adopted a Community Climate Action Plan (CCAP) in 2022 to reduce GHG emissions, provides guidance on how to analyze and determine the significance of project-level GHG

emissions, and foster a sustainable community. The CCAP includes Screening Tables, which are reduction measures related to transportation, water, solid waste, offroad equipment, energy, and renewable energy sources. The CCAP establishes a GHG emissions reduction target for 2030, 2040, and 2050, consistent with broader State and federal targets.

# 4.0 SIGNIFICANCE CRITERIA AND METHODOLOGY

State CEQA Guidelines Appendix G contains analysis guidelines related to energy impacts. A project would create a significant environmental impact if it would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation; and/or
- Conflict with or obstruct a State or local plan for renewable energy or energy efficiency.

## Methodology

The impact analysis focuses on the three sources of energy that are relevant to the proposed Project: electricity, natural gas, and transportation fuel.

**Electricity and Natural Gas**: Electricity and natural gas usage would be generated by land uses developed by the Project. The CARB-approved California Emissions Estimator Model (CalEEMod) version 2022.1 was used to quantify energy use for occupancy based on default rates and Project-specific features such as number of units and building square footage.

**Transportation Fuel**: The construction fuel usage was calculated based on CalEEMod emissions outputs and conversion ratios from the Climate Registry. The operational fuel usage was estimated using default rates and VMT outputs from CalEEMod and the typical daily fuel use in San Bernardino County from CARB's EMissions FACtor (EMFAC) 2021 model.

# 5.0 POTENTIAL IMPACTS AND MITGATION

## Threshold 5.1 Would the Project result in potentially significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

### Construction

The Project is anticipated to be constructed in two phases with construction activity to occur over a duration of approximately four years and three months, beginning in late-2025. This analysis conservatively assumes that the two phases would be developed simultaneously. The energy usage associated with Project construction includes electricity associated with water usage for dust control, diesel fuel from on-road hauling trips, vendor trips, and off-road construction diesel equipment, and gasoline fuel from on-road worker commute trips. Because construction activities typically do not require natural gas, it is not included in the following discussion. Energy usage during Project construction are provided in **Table 6: Energy Use During Construction**. The emissions outputs and energy calculations are included in **Appendix A: Energy Data**.

**Table 6: Energy Use During Construction**

| Source | Total Construction Energy | San Bernardino County Annual Energy[1,2] | Percentage of Countywide Consumption |
|---|---|---|---|
| **Electricity (GWh)** | | | |
| Water[3] | 0.034 | 16,630 | 0.0002% |
| **Diesel Use[4] (Gallons)** | | | |
| On-Road Construction Trips | 450,111 | 281,399,849 | 0.16% |
| Off-Road Construction Equipment | 319,574 | 281,399,849 | 0.11% |
| Construction Diesel Total | 769,685 | 281,399,849 | 0.27% |
| **Gasoline Use[4] (Gallons)** | | | |
| Mobile | 1,162,390 | 828,612,797 | 0.14% |

1. Total County electricity use from California Energy Commission energy reports available through ecdms.energy.ca.gov.
2. Total County fuel use per EMFAC 2021 model of projected fuel usage in 2025 – first year of construction.
3. Water usage is based on the CalEEMod default energy intensity for supply, distribution, and treatment of water per gallon of water, daily acreage disturbed, and estimated water use per acre.
4. Construction fuel use was calculated based on CalEEMod emissions outputs and conversion ratios from the Climate Registry.

Source: Refer to energy calculations in **Appendix A.**

<u>Electricity</u>

**Water for Construction Dust Control.** Electricity associated with water usage for construction dust control is calculated based on total water use and the energy intensity for supply, distribution, and treatment of water. The total number of gallons of water used is calculated based on acreage disturbed during grading and site preparation, as well as the daily watering rate per acre disturbed.

- The total acres disturbed are calculated using the methodology described in Chapter 4.2 of Appendix C of the CalEEMod User's Guide.
- The water application rate of 3,020 gallons per acre per day is from the Air and Waste Management Association's Air Pollution Engineering Manual (1992).
- The energy intensity value is based on the CalEEMod default energy intensity per gallon of water for San Bernardino County.

As summarized in **Table 6**, the electricity demand associated with Project water usage for the construction dust control would be approximately 0.034 GWh over the duration of construction and would represent approximately 0.0002 percent of the current electricity use in San Bernardino County. SCE's total energy sales are projected to be 111,670 GWh of electricity in 2025 (the first year of Project construction).[6] The Project construction-related net annual electricity consumption of 0.0024 GWh would represent less than one percent of SCE's projected sales. Therefore, it is anticipated that SCE's existing and planned electricity capacity and electricity supplies would be sufficient to serve the Project's temporary construction electricity demand. Impacts would be less than significant, and no mitigation is required.

Natural Gas

It is not anticipated that construction equipment used for the Project would be powered by natural gas. Impacts would be less than significant, and no mitigation is required.

Transportation Fuel

**On-Road Diesel Construction Trips.** The diesel fuel emissions associated with on-road construction mobile trips is calculated based on vehicle miles traveled (VMT) from vehicle trips (i.e., worker, vendor, and hauling), the CalEEMod default diesel fleet percentage, and vehicle fuel efficiency in miles per gallon (MPG). VMT for the entire construction period is calculated based on the number of trips multiplied by the trip lengths for each phase shown in CalEEMod. Construction diesel fuel was calculated based on CalEEMod emissions outputs and conversion ratios from the Climate Registry. Total diesel fuel consumption associated with on-road construction trips for the Project would be approximately 450,111 gallons (see **Table 6**).

**Off-Road Diesel Construction Equipment.** Similarly, the construction diesel fuel associated with the off-road construction equipment that is calculated based on CalEEMod emissions outputs and conversion ratios from the Climate Registry. The total diesel fuel associated with the Project off-road construction equipment is approximately 319,574 gallons (see **Table 6**). The combined diesel usage from on-road and off-road construction sources is 769,685 gallons.

**On-Road Gasoline Construction Trips.** The gasoline fuel associated with on-road construction mobile trips is calculated based on VMT from vehicle trips (i.e., worker, vendor, and hauling), the CalEEMod default gasoline fleet percentage, and vehicle fuel efficiency in MPG using the same methodology as the construction on-road trip diesel fuel calculation discussed above. The total gasoline fuel associated with Project on-road construction trips would be approximately 1,162,390 gallons (see **Table 6**).

San Bernardino County annual fuel use is anticipated to be 281,399,849 gallons of diesel and 828,62,797 gallons of gasoline in 2025.[7] The total Project construction diesel fuel would represent approximately 0.27 percent of the annual diesel used in the County. The total Project construction gasoline fuel would represent 0.14 percent of the annual gasoline used in the County. Due to the Project's relatively low construction fuel use proportional to annual County use, the Project would not substantially affect existing fuel supplies or resources and new capacity or additional sources

[6] California Energy Commission, *CED 2022 LSE and BA planning Forecast Tables,* https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update-2, accessed January 2025.

[7] Total annual county fuel per EMFAC 2021 model of projected fuel usage in 2025 – first year of construction.

of fuel are not anticipated to be required.

There are no unusual characteristics that would necessitate the use of construction equipment that would be less energy-efficient than at comparable construction sites in the region or state. Furthermore, the Project would reduce energy usage through compliance with State and federal requirements. In accordance with California Code of Regulations, Title 13, Sections 2485 and 2449, construction contractors are required to reduce diesel particulate matter and criteria pollutant emissions from in-use off-road diesel-fueled vehicles and limit the idling of heavy-duty construction equipment to no more than five minutes. This requirement indirectly relates to construction energy conservation as energy use is reduced when air pollutant emissions are reduced from monitoring and the efficient use of equipment and materials.

Due to increasing transportation costs and fuel prices, contractors and owners have a strong financial incentive to avoid wasteful, inefficient, and unnecessary use of energy during construction. There is growing recognition among developers and retailers that sustainable construction is not prohibitively expensive and that there is a significant cost-savings potential in green building practices. Substantial reduction in energy inputs for construction materials can be achieved by selecting building materials composed of recycled materials that require substantially less energy to produce than non-recycled materials. The Project-related incremental increase in the use of energy bound in construction materials such as asphalt, steel, concrete, pipes, and manufactured or processed materials (e.g., lumber and gas) would not substantially increase demand for energy compared to overall local and regional demand for construction materials. It is reasonable to assume that production of building materials such as concrete, steel, etc., would employ all reasonable energy conservation practices in the interest of minimizing the costs of business.

As described above, the Project's fuel consumption and energy usage from the entire construction period would constitute less than one percent of the total consumption in the County. It should be noted that the State CEQA Guideline Appendix G and Appendix F criteria require the Project's effects on local and regional energy supplies and on the requirements for additional capacity to be addressed. A less than one percent increase in temporary demand is not anticipated to trigger the need for additional capacity. Additionally, construction fuel consumption would be temporary and would cease once the Project is fully developed. As such, Project construction would have a nominal effect on the local and regional energy supplies. Impacts would be less than significant, and no mitigation is required.

**Operations**

Energy consumption associated with Project operations would occur from building energy (electricity and natural gas) usage, water use, and transportation-related fuel use. **Table 7: Annual Energy Use During Operations** presents the Project operational energy usage.

**Table 7: Annual Energy Use During Operations**

| Source | Annual Operational Energy[1] | San Bernardino County Annual Energy[2,3] | Percentage of Countywide |
|---|---|---|---|
| **Electricity Use (GWh)** | | | |
| Electricity Demand[4] | 27.13 | 16,630 | 0.16% |
| Water Electricity | 2.04 | | 0.01% |
| Total Electricity | 29.17 | | 0.18% |
| **Natural Gas Use (Therms)** | | | |
| Area | 959,999 | 562,123,065 | 0.17% |
| **Diesel Use (Gallons)** | | | |
| Mobile[4,5] | 1,403,826 | 276,486,333 | 0.51% |
| **Gasoline Use (Gallons)** | | | |
| Mobile[4,5] | 9,087,436 | 759,783,908 | 1.20% |

1. The electricity, natural gas, and water usage are based on Project-specific estimates and CalEEMod defaults.
2. County total energy values from California Energy Commission energy reports available through ecdms.energy.ca.gov
3. Total annual county fuel per EMFAC 2021 model of projected operational fuel usage in 2030 – Project buildout.
4. FSEIR MM 3-2 would require development projects to include access or linkages to alternative modes of transportation. FSIER MM AQ-1 would require development projects to provide bicycle parking, changing/shower, and supportive electric charging station facilities and Energy Star certified appliances.
5. Calculated based on the mobile source fuel use based on vehicle miles traveled (VMT) and fleet-average fuel consumption (in gallons per mile) from EMFAC2021 for operational year 2030.

Source: Refer to energy calculations in **Appendix A.**

Electricity

The electricity consumed by the Project is based on CalEEMod defaults. The Project is subject to FSEIR Mitigation Measure (MM) AQ-1, which requires new development projects to install Energy Star certified appliances. The Project's total electricity consumption would be approximately 29.17 GWh per year, which would account for 0.18 percent of consumption within the County (see **Table 7**). The Project would use approximately 321 million gallons of water per year, which would require approximately 2.04 GWh per year for conveyance and treatment. SCE's total energy sales are projected to be 120,378 GWh of electricity in 2030 (the first operational year).[8] The Project operational-related net annual electricity consumption of approximately 29.17 GWh would represent less than one percent of SCE's projected sales. Project operations would not substantially affect existing energy or fuel supplies or resources. Moreover, the Project would comply with applicable energy standards and new capacity would not be required. Impacts would be less than significant, and no mitigation is required.

Natural Gas

The natural gas use associated with the Project is based on CalEEMod default rates. The Project would consume approximately 960,000 therms of natural gas per year (see **Table 7**). The Project's operational natural gas use would constitute 0.17 percent of natural gas usage in the County. Project operations would not substantially affect existing energy or fuel supplies or resources. Moreover, the Project would comply with applicable energy standards and new capacity would not be required. Impacts would be less than significant, and no mitigation is required.

[8] California Energy Commission, *CED 2022 LSE and BA planning Forecast Tables,* https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update-2, accessed January 2025.

Transportation Fuel

The gasoline and diesel fuel associated with on-road vehicular trips is calculated based on the trip generation from the Traffic Analysis and average fuel efficiency from the EMFAC model.[9] The EMFAC fuel efficiency data incorporates the Pavley Clean Car Standards and the Advanced Clean Cars Program.[10] The Project is subject to FSEIR MM 3-2 and MM AQ-1, which requires development projects to provide access to alternative modes of transportation, bicycle parking, changing/shower and supportive electric charging station facilities, and Energy Star certified appliances. The total diesel and gasoline fuel associated with the Project would be approximately 16,745,350 gallons per year and 196,288,626 gallons per year, respectively (see **Table 7**). The County's annual diesel fuel use is anticipated to be 276,486,333 gallons and gasoline fuel use is anticipated to be 759,783,908 gallons in 2030.[11] The Project operational diesel and gasoline consumption would represent approximately 0.51 percent of diesel use and 1.2 percent of gasoline use in the County. Project operations would not substantially affect existing energy or fuel supplies or resources. Moreover, the Project would comply with applicable energy standards, would not require new capacity, and would include a Circulation Plan to provide connectivity to existing pedestrian sidewalks and bicycle lanes. The City is coordinating with regional transit agencies to implement a BRT service line along Edison Avenue/Ontario Ranch Road. These features and aspects of the Project would contribute to minimizing VMT and transportation-related fuel usage. Overall, it is expected that operation-related fuel usage associated with the Project would not be any more inefficient, wasteful, or unnecessary than similar development projects. Impacts would be less than significant, and no mitigation is required.

## Conclusion

The Project's consumption of electricity, natural gas, gasoline, and diesel would not require new infrastructure, nor would it be any more inefficient, wasteful, or unnecessary than similar development projects. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

## Laws, Ordinances, and Regulations

Laws, ordinances, and regulations (LORs) are existing requirements that are based on local, State, or federal regulations or laws that are frequently required independent of CEQA review. Typical standard conditions and requirements include compliance with the provisions of the Building Code, SCAQMD Rules, etc. The City may impose additional conditions during the approval process, as appropriate. Because LORs are neither project-specific nor a result of development of the Project, they are not considered to be either project design features or mitigation measures.

[9] Urban Crossroads, *Center Park Specific Plan Traffic Analysis,* 2025.

[10] The CARB EMFAC 2017 Technical Documentation from March 2018 notes that emissions are estimated with all current controls active, except Low Carbon Fuel Standards (LCFS). The reason for excluding LCFS is that most of the emissions benefits due to the LCFS come from the production cycle (upstream emissions) of the fuel rather than the combustion cycle (tailpipe). As a result, LCFS is assumed to not have a significant impact on CO2 emissions from EMFAC's tailpipe emission estimates.

[11] Total annual county fuel per EMFAC 2021 model of projected fuel usage in 2030 – Project buildout.

**LOR EN-1** Construction activities are required to adhere to Title 13 California Code of Regulations Section 2499, which requires that nonessential idling of construction equipment is restricted to five minutes or less.

**LOR EN-2** New buildings are required to achieve the current Energy Code (Title 24, Part 6) and the CALGreen Code (Title 24, Part 11). The 2022 Energy Code was effective starting January 1, 2023. The Energy Code and the CALGreen Code are updated triennially with a goal to achieve 100 percent clean carbon neutrality by 2050 within the State.

**LOR EN-3** New buildings are required to adhere to the CALGreen Code requirement to provide bicycle parking for new non-residential buildings, or meet local bicycle parking ordinances, whichever is stricter (CALGreen Code Sections 5.106.4.1, 14.106.4.1, and 5.106.4.1.2).

**LOR EN-4** The CALGreen Code requires the recycling and/or salvaging for reuse at minimum of 65 percent of the nonhazardous construction and demolition waste generated during most "new construction" projects (CALGreen Code Sections 4.408 and 5.408). Construction contractors are required to submit a construction waste management plan that identifies the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project, or salvaged for future use or sale and the amount (by weight or volume).

**LOR EN-5** New buildings are required to adhere to the CALGreen Code and Water Efficient Landscape Ordinance requirements to increase water efficiency and reduce urban per capita water demand.

**LOR EN-6** CARB's RPS is a foundational element of the State's emissions reduction plan. These mandates apply directly to investor-owned utilities. On September 10, 2018, SB 100 was signed into law and established the following RPS targets: 50 percent renewable resources target by December 31, 2026, and 60 percent target by December 31, 2030. SB 100 also requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 52 percent of retail sales by December 31, 2027, and 60 percent by December 31, 2030.

**FSEIR Mitigation Measures**

The FSEIR analyzed emission impacts associated with land development throughout the City and implemented the following mitigation measures, which are applicable to the Project.

**3-2** The City of Ontario shall evaluate new development proposals within the City and require all developments to include access or linkages to alternative modes of transportation, such as transit stops, bike paths, and/or pedestrian paths (e.g., sidewalks).

**AQ-1** Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project

operation-phase-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with SCAQMD methodology in assessing air quality impacts. If operation-related air pollutants are determined to have the potential to exceed the SCAQMD–adopted thresholds of significance, the City of Ontario Planning Department shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities. The identified measures shall be included as part of the conditions of approval. Possible mitigation measures to reduce long-term emissions could include, but are not limited to the following:

- For site-specific development that requires refrigerated vehicles, the construction documents shall demonstrate an adequate number of electrical service connections at loading docks for plug-in of the anticipated number of refrigerated trailers to reduce idling time and emissions.
- Applicants for manufacturing and light industrial uses shall consider energy storage and combined heat and power in appropriate applications to optimize renewable energy generation systems and avoid peak energy use.
- Site-specific developments with truck delivery and loading areas and truck parking spaces shall include signage as a reminder to limit idling of vehicles while parked for loading/unloading in accordance with California Air Resources Board Rule 2845 (13 CCR Chapter 10 sec. 2485).
- Provide changing/shower facilities as specified in Section A5.106.4.3 of CALGreen (Nonresidential Voluntary Measures).
- Provide bicycle parking facilities per Section A4.106.9 of CALGreen (Residential Voluntary Measures).
- Provide preferential parking spaces for low-emitting, fuel-efficient, and carpool/van vehicles per Section A5.106.5.1 of CALGreen (Nonresidential Voluntary Measures).
- Provide facilities to support electric charging stations per Section A5.106.5.3 and Section A5.106.8.2 of CALGreen (Nonresidential Voluntary Measures; Residential Voluntary Measures).
- Applicant-provided appliances shall be Energy Star–certified appliances or appliances of equivalent energy efficiency (e.g., dishwashers, refrigerators, clothes washers, and dryers). Installation of Energy Star– certified or equivalent appliances shall be verified by the City during plan check.

**Mitigation Measures:** No additional mitigation is required.

**Level of Significance:** Less than significant impact.

## Threshold 5.2 Would the Project conflict with or obstruct a State or local plan for renewable energy or energy efficiency?

### Energy Efficient Measures

As discussed above, the Energy Code creates uniform building codes to reduce California's energy use and provide energy efficiency standards for residential and non-residential buildings. These standards are incorporated within the California Building Code and are expected to substantially reduce the growth in electricity and natural gas use. The 2022 Title 24 standards for new residential and nonresidential buildings will focus on encouraging electric heat pump technology and use, promote electric-ready buildings to incentivize owners to use cleaner electric heating, cooking, and vehicle charging, expanding solar photovoltaic systems and battery storage systems to reduce reliance on fossil fuel power plants. The Project would be constructed in accordance with Title 24 of the California Building Standards Code – Energy Efficiency Standards as well as the appliance energy efficiency standards in Title 20 of the California Code of Regulations. The Project would include bicycle parking and supportive electric charging station facilities and water conservation strategies. The buildings developed by the Project would have rooftops that can support solar panels (i.e., solar-ready), which would enable future tenants to install a PV system and would offset the amount of electricity needed from SCE's grid. As discussed below, the Project would comply and be consistent with the CCAP and TOP 2050.

It should also be noted that SCE is subject to the RPS, which requires investor-owned utilities, electric service providers, and community choice aggregators to increase total procurement from eligible renewable energy resources to achieve a 60 percent target by December 31, 2030. In addition, SB 100 established a further goal to have an electric grid that is entirely powered by clean energy by 2045.

The Project's operational energy consumption would constitute less than one percent of the corresponding energy consumption projections within the County. Therefore, Project operations would not substantially affect existing energy or fuel supplies or resources. In addition, the Project would comply with energy and fuel efficiency laws and regulations and would not result in the inefficient, wasteful, and unnecessary consumption of energy. Impacts would be less than significant, and no mitigation is required.

### Community Climate Action Plan

The primary purpose of the CCAP is to feasibly reduce GHG emissions generated by land development projects, consistent with the statewide GHG reduction efforts. The City has identified a series of reduction measures that improve building energy efficiency, increase use of public and active transit. alternative-fueled vehicles, and renewable energy, and reduce VMT and water consumption.

**Table 8: Community Climate Action Plan Consistency** evaluates the consistency of the Project to the applicable measures of the CCAP.

| **Table 8: Community Climate Action Plan Consistency** | | |
|---|---|---|
| **Strategy** | **Measure Description** | **Consistency** |
| **Energy** | | |
| Strategy 1 | **Building electrification.** Promote and incentivize the phase-out of gas appliances in new and existing homes and businesses throughout the community to advance GHG reductions, increase energy efficiency, and protect public safety and environmental health. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. Furthermore, the residential uses would not include natural gas hearths. |
| Strategy 2 | **Onsite solar energy for existing residential development.** Continue to support and facilitate installation of rooftop solar photovoltaic and onsite solar energy systems in existing residential development. | **N/A:** This measure only applies to existing residential development and is not applicable to the proposed Project. |
| Strategy 3 | **Onsite Solar Energy Systems for Nonresidential Development:** Ensure new large non-residential development, including City facilities, includes on-site renewable energy to support the site's energy needs by requiring solar photovoltaic panels or other appropriate on-site renewable energy generation systems for the following types of projects:<br>• New commercial and office buildings, or existing commercial and office building expansions greater or equal to 45,000 square feet in size.<br>• New industrial or existing industrial buildings expansions greater or equal to 100,000 square feet in size. | **Consistent:** The proposed commercial uses would incorporate energy efficient building designs such as flat roofs that allow for solar panels, subject to the City of Ontario policies and development regulations. |
| Strategy 4 | **Green roofs.** Promote and incentivize residents and business owners to install green roofs to conserve energy and reduce surface water runoff. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| Strategy 5 | **Urban Cooling:** Maintain and expand the City's existing tree canopy, with a goal of planting 500 trees annually through 2050 and promote the use of pervious concrete and cool pavement for pavement projects. | **Consistent:** This measure is to be taken at the City level. The Project would require trees along streetscapes, neighborhood edges, parking lots, and open space areas. |
| Strategy 6 | **Energy efficiency retrofits for low-income households.** Promote and incentivize voluntary energy efficiency retrofits of homes to reduce natural gas and electricity usage, with the goal of retrofitting 9,000 low-income homes by 2050. Partner with community services agencies to fund energy efficiency projects, including heating, ventilation, air conditioning, indoor lighting, water heating equipment, insulation, and weatherization for low-income residents. | **N/A:** This measure is not applicable to the proposed Project, as retrofits only apply to existing structures. |
| Strategy 7 | **Energy efficiency retrofits.** Promote and incentivize voluntary energy efficiency retrofits to reduce in natural gas and electricity usage. Partner | **N/A:** This measure is not applicable to the proposed Project, as retrofits only apply to existing structures. |

| Table 8: Community Climate Action Plan Consistency | | |
|---|---|---|
| **Strategy** | **Measure Description** | **Consistency** |
| | with regional agencies to expand access to existing energy efficiency and conservation opportunities, incentives, and technical assistance for residents and businesses. | |
| Strategy 8 | **Smart Growth and Infill.** Encourage revitalization of neighborhoods through higher-density, mixed-use, infill development and creative reuse of underutilized sites within the urban core. | **Consistent:** The Project proposes a mixed-use development on an underutilized site in the City. |
| **Transportation** | | |
| Strategy 9 | **Transit-Oriented Development:** Encourage development of compact, mixed-use, and transit-oriented development to improve the regional jobs-housing balance, especially on corridors served by high-ridership transit and bus rapid transit, such as Holt Avenue. | **Consistent:** The Project proposes a mixed-use development along a high-volume corridor, Euclid Avenue. Transit turnouts would be constructed within the proposed Specific Plan area in coordination with Omnitrans. An Omnitrans BRT Corridor is planned along Edison Avenue/Ontario Ranch Road. |
| Strategy 10 | **Increase Transportation Ridership.** Ensure a reliable and responsive transit system with dedicated and secure funding and resources to support increased ridership. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| Strategy 11 | **Traffic signal synchronization and roadway management.** Implement traffic and roadway management strategies to improve mobility and efficiency and reduce associated emissions. | **Consistent:** The Project would construct a roadway network in accordance with the City of Ontario Master Plan of Streets and Highways and The Ontario Ranch Streetscape Master Plan. The roadway network would be designed to maintain an efficient control of all modes of traffic. |
| Strategy 12 | **Community vehicle electrification.** Promote and incentivize the adoption of electric vehicles (EV) citywide, including light-duty and heavy-duty vehicles, for municipal, commercial, and residential uses. | **Consistent:** This measure is to be taken at the City level. The Project would construct facilities to support electric charging stations. |
| Strategy 13 | **Active Transportation Networks:** Work with transit agencies, school districts, and employers to facilitate an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling, and walking. | **Consistent:** The Project would develop Multipurpose Trails along Euclid Avenue/Ontario Ranch Road, Campus Avenue, Grove Avenue, and Walker Avenue, which would connect to a Class II Bike Path and off-site Multipurpose Trails. Transit turnouts would be constructed within the proposed Specific Plan area in coordination with Omnitrans. An Omnitrans BRT Corridor is planned along Edison Avenue/Ontario Ranch Road. |

| **Table 8: Community Climate Action Plan Consistency** | | |
|---|---|---|
| **Strategy** | **Measure Description** | **Consistency** |
| Strategy 14 | **Vehicle Idling:** Limit idling of heavy-duty trucks. Support the SCAMQD and CARB anti-idling requirements and provide signage in key areas where idling that is not consistent with SCAMQD or CARB requirements might occur. | **Consistent:** Commercial motor vehicles are required to comply with CCR Section 2485 which would limit the idling of Diesel fueled vehicles to no more than five minutes. |
| Strategy 15 | **Parking policy and event parking.** Adopt a comprehensive parking policy that encourages carpooling and the use of alternative transportation, including providing parking spaces for car-share vehicles at convenient locations with access to public transportation. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| **Off-road Equipment** | | |
| Strategy 16 | **Electrification of construction and landscaping equipment.** Promote and incentivize the transition to electric construction and landscaping equipment. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| Strategy 17 | **Idling Ordinance for Construction Equipment:** Limit idling of heavy-duty off-road construction equipment to reduce air pollution and GHG emissions from construction activity. | **Consistent:** Construction would be required to comply with CCR Section 2485 and 2499 which would limit the idling of heavy-duty construction equipment to no more than five minutes. |
| **Water** | | |
| Strategy 21 | **Indoor water efficiency.** Encourage water-efficient retrofits of new and existing buildings by working with water providers and regional agencies. | **Consistent:** The Project would comply with CALGreen Code Section 4.303 and require the installation of low flow fixtures. In addition, the Project would comply with the City of Ontario Recycled Water Master Plan and irrigate landscaped areas with recycled water. The irrigations systems would have automatic controllers, including automatic rain shut-off devices. |
| Strategy 22 | **Water Efficient Landscapes and Water Recycling:** Promote drought-tolerant and fire-wise landscaping. Encourage increased use of reclaimed water for landscape irrigation, agricultural, and industrial use. | **Consistent:** The Project would include drought tolerant landscaping and would irrigate landscape areas with recycled water as required by the City of Ontario Recycled Water Master Plan. |
| Strategy 23 | **Water system and wastewater operations efficiency.** Maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak demand schedules for heavy commercial and industrial users. | **N/A:** This measure is not applicable to the proposed Project. |
| Strategy 24 | **Methane capture for wastewater treatment.** | **N/A:** This measure is not applicable to |

| Table 8: Community Climate Action Plan Consistency | | |
|---|---|---|
| **Strategy** | **Measure Description** | **Consistency** |
| | Work with Inland Empire Utilities Agency (IEUA), the local wastewater treatment provider, to increase methane capture rate. | the proposed Project. |
| N/A = not applicable | | |
| Source: City of Ontario, *Ontario Community Climate Action Plan,* 2022, https://content.ontarioca.gov/sites/default/files/2025-01/Ontario-CCAP_Adopted_20220816.pdf, accessed April 2025. | | |

As discussed in **Table 8**, the Project would be consistent with all applicable measures and would not conflict with the goals of the CCAP. Impacts would be less than significant, and no mitigation is required.

### City of Ontario General Plan

TOP 2050 establishes policies that address energy conservation within new land development projects. **Table 9: Consistency with The Ontario Plan 2050** evaluates the consistency of the Project to the applicable TOP 2050 policies.

| Table 9: Consistency with The Ontario Plan 2050 | | |
|---|---|---|
| **Policy** | **Goal/ Policy** | **Consistency** |
| **Policy ER 3-1** | **Conservation Strategy:** Require conservation as the first strategy to be employed to meet applicable energy saving standards. | **Consistent:** The Project would include energy-saving conservation strategies such as bicycle parking, drought-tolerant landscaping, and energy efficiency and sustainable building designs. |
| **Policy ER 3-2** | **Green Development – Communities:** Encourage the use of LEED Neighborhood Development rating system, or similar mechanism, to guide the planning and development of all new communities. | **Consistent:** The buildings developed by the Project would use passive design to improve building energy performance, have flat roofs for solar panels, and be designed in compliance with the CALGreen Code. |
| **Policy ER 3-3** | **Building and Site Design:** Require new construction to incorporate energy efficient building and site design strategies, which could include appropriate solar orientation, maximum use of natural daylight, passive solar and natural ventilation. | **Consistent:** The buildings developed by the Project would use passive design to improve building energy performance, have flat roofs that can support solar panels, include drought-tolerant landscaping, and be designed in compliance with the CALGreen Code. |
| **Policy ER 3-4** | **Green Development – Public Buildings:** We require all new and substantially renovated City buildings in excess of 10,000 square feet achieve a LEED Silver Certification standard, as determined by the U.S. Green Building Council. | **N/A:** This measure is not applicable to the proposed Project. |
| **Policy ER 3-5** | **Fuel Efficient and Alternative Energy Vehicles and Equipment:** We purchase and use vehicles and equipment that are fuel efficient and meet or surpass state emissions requirements and/or use renewable sources of energy. | **N/A:** This measure is not applicable to the proposed Project. Project implementation would not conflict with this policy. |
| **Policy ER 3-6** | **Generation – Renewable Sources:** Promote the use of renewable energy sources to serve public and private sector development. | **Consistent:** The buildings developed under the Project would have flat rooftops that can support solar panels (i.e., solar-ready), which would comply the Energy Code solar ready requirements and would enable future tenants |

| Table 9: Consistency with The Ontario Plan 2050 | | |
|---|---|---|
| **Policy** | **Goal/ Policy** | **Consistency** |
| | | to install a PV system. |
| N/A: not applicable | | |
| Source: City of Ontario, *TOP 2050, Environmental Resources Element, 2022,* https://www.ontarioca.gov/about-ontario-ontario-plan-policy-plan/environmental-resources, accessed January 2025. | | |

As discussed in **Table 9**, the Project would be consistent with all applicable TOP 2050 policies. Impacts would be less than significant, and no mitigation is required.

## Conclusion

The Project would be consistent with the applicable energy efficient measures outlined in Title 24, Title 20, CCAP, and TOP 2050. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

**Mitigation Measure:** No mitigation is required.

**Level of Significance:** Less than significant impact.

### Cumulative Impacts

Potential cumulative impacts to energy would result if the proposed Project, in combination with past, present, and future projects, would result in the wasteful, inefficient, or unnecessary use of energy. This could result from development that would not incorporate sufficient building energy efficiency features, would not meet the Energy Code, or would result in the unnecessary use of energy during construction and/or operation.

The cumulative projects within the areas serviced by the energy service providers would be applicable to this analysis. Projects that include development of large buildings or other structures that would have the potential to consume energy in an inefficient manner would have the potential to contribute to a cumulative impact.

Project construction and operations would consume energy, but not in an inefficient, unnecessary, or wasteful manner. Energy consumption attributable to the Project would not be substantial in comparison to statewide electricity, natural gas, gasoline, and diesel demand; refer to **Table 6** and **Table 7**. The Project's construction electricity consumption would be negligible relative to SCE's generated electricity, and electricity supplies would be sufficient to serve the Project's temporary construction electricity demand. SCE will review the Project's estimated electricity consumption in order to ensure that the estimated power requirement would be part of the total load growth forecast for their service area and accounted for in the planned growth of the power system. It should be noted that SCE and SoCalGas consider planned development for their service areas and are in and of themselves providing for cumulative growth. Therefore, it is likely that cumulative growth associated with the related projects is already accounted for in the planning of future supplies to cover projected demand. Furthermore, SCE and SoCalGas have policies, programs, and projects in place to provide continued, adequate energy to their users, including the proposed Project. Substantial reductions to the cumulative demand for energy can result from an increased reliance on renewable energy systems (as required by the RPS) and the construction of energy-

efficient buildings. Cumulative projects would be subject to applicable Title 24 and CALGreen requirements similar to the Project, which includes energy efficiency standards to minimize the wasteful and inefficient use of energy.

Transportation fuels (gasoline and diesel) are produced from crude oil, which can be domestic or imported from various regions around the world. Based on current proven reserves, current crude oil production would be sufficient to meet worldwide consumption demand until 2050. As such, it is expected that existing and planned transportation fuel supplies would be sufficient to serve the Project's construction and operational demand. New capacity or supplies of energy resources would not be required. Additionally, the Project would be subject to compliance with all federal, state, and local requirements for energy efficiency. State regulations, including the Low Carbon Fuel Standard, Pavley Clean Car Standards, and Low Emission Vehicle Program, would serve to reduce the transportation fuel demand of cumulative projects.

The Project would represent a consistent continuation of the planned pattern of development within the Ontario Ranch area, as the City has long anticipated that this area would transition from dairy/agricultural to urban uses. The Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency, nor would the Project require additional facilities other than local connections to, or undergrounding of, existing facilities in the Project area. Therefore, the proposed Project's incremental demand for electricity and natural gas facilities would not be cumulatively considerable. Thus, the Project would not contribute to a cumulative impact to the wasteful, unnecessary, or inefficient use of energy. Impacts would be less than significant, and no mitigation is required. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe cumulative impacts than previously analyzed in the FSEIR.

## Conclusion

**Table 10: Project Consistency with the FSEIR** summarizes the consistency of the Project's impacts with the findings of the FSEIR. The Project would not result in or contribute to a cumulative impact to the wasteful, unnecessary, or inefficient use of energy. Furthermore, the Project would not conflict with or obstruct applicable renewable energy or energy efficiency plans. As shown in **Table 10**, the Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

**Table 10: Project Consistency with the FSEIR**

| Impact | FSEIR Findings | Project Findings |
|---|---|---|
| Construction and Operational Energy Consumption | Less than Significant | Less than Significant |
| Applicable Plans, Policies, and Regulations Consistency | Less than Significant | Less than Significant |
| Cumulative Considerable Net Increase of Energy Consumption | Less than Significant | Less than Significant |

# 6.0 REFERENCES

1. California Energy Commission, 2022 Building Energy Efficiency Standards, https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2022-building-energy-efficiency, accessed April 2025.
2. California Energy Commission, 2023 Total System Electric Generation, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2023-total-system-electric-generation, accessed January 2025.
3. California Energy Commission, CED 2022 LSE and BA planning Forecast Tables, https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update-2, accessed January 2025.
4. California Public Utilities Commission, Renewable Portfolio Standard (RPS) Program, 2021, https://www.cpuc.ca.gov/rps/, accessed April 2025.
5. U.S. Energy Information Administration, California State Energy Profile, 2025, https://www.eia.gov/state/print.php?sid=CA, accessed January 2025.
6. U.S. Energy Information Administration, Table F35: Total energy consumption, price, and expenditure estimates, 2024, https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_te.html&sid=CA, accessed January 2025.
7. Urban Crossroads, Center Park Specific Plan Traffic Analysis, 2025.

# Appendix A

## Energy Data

# Center Park Specific Plan
## CalEEMod Assumptions

# Phase I

Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 6 | 7.32 | Single Family Detached | 40 | DU | 22 | 1.82 |
| | | Multifamily (Low-Rise) Residential | 121 | DU | 22 | 5.50 |
| 12 | 15.45 | Single Family Detached | 85 | DU | 22 | 3.86 |
| | | Multifamily (Low-Rise) Residential | 255 | DU | 22 | 11.59 |
| 13 | 23.77 | Single Family Detached | 131 | DU | 22 | 5.95 |
| | | Multifamily (Low-Rise) Residential | 392 | DU | 22 | 17.82 |
| 17 | 6.20 | Public Park | 6.20 | AC | -- | -- |
| 18 | 13.44 | Active Park | 13.44 | AC | -- | -- |
| 22 | 3.38 | Non-Recreational Park | 3.38 | AC | -- | -- |

PA = planning area, AC = acres; DU = dwelling unit
1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 22, which was taken from TOP 2025.
3. The building lot size was calculated using the following equation: building lot size = dwelling units * (dwelling units/acre).

Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 256 | DU | 506,880 | -- | 11.64 |
| Apartments (Low-Rise)[1] | 768 | DU | 152,0640 | -- | 34.91 |
| City Park[2,3] | 19.64 | AC | -- | 855,518.40 | 19.64 |
| Other Non-Asphalt Surfaces[2,4] | 3.38 | AC | -- | 147,232.80 | 3.38 |

DU = dwelling unit; AC = acres; SF = square feet
1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The city park and other non-asphalt surfaces was assumed to be fully landscaped with “special landscaping” because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
3. The public park and active park were modeled as city park.
4. The non-recreational park was modeled as non-asphalt surfaces.

# Construction

## Schedule

| Construction Phase | Start Date | End Date | Workdays |
|---|---|---|---|
| Demolition | 12/1/2025 | 6/1/2026 | 131 |
| Site Preparation | 12/15/2025 | 6/15/2026 | 131 |
| Grading | 4/1/2026 | 12/1/2026 | 175 |
| Infrastructure Improvements | 8/1/2026 | 2/1/2027 | 131 |
| Building Construction | 12/2/2026 | 5/2/2027 | 108 |
| Paving | 2/2/2027 | 3/2/2027 | 21 |
| Architectural Coating | 5/3/2027 | 5/31/2027 | 21 |

## Construction Phase Overlap

| Construction Phase | Start Date | End Date |
|---|---|---|
| Demolition + Site Preparation | 12/15/2025 | 3/31/2026 |
| Demolition + Site Preparation + Grading | 4/1/2026 | 6/1/2026 |
| Site Preparation + Grading | 6/2/2026 | 6/15/2026 |
| Grading + Infrastructure Improvements | 8/1/2026 | 12/1/2026 |
| Infrastructure Improvements + Building Construction | 12/2/2026 | 2/1/2027 |
| Building Construction + Paving | 2/2/2027 | 3/2/2027 |

## Equipment

| Construction Phase | Equipment | Number per Day | Hours per Day |
|---|---|---|---|
| Demolition | Rubber Tired Dozers | 2 | 8 |
| | Excavators | 3 | 8 |
| | Concrete/Industrial Saws | 1 | 8 |
| Site Preparation | Rubber Tired Dozers | 3 | 8 |
| | Tractors/Loaders/Backhoes | 4 | 8 |
| Grading | Graders | 1 | 8 |
| | Excavators | 2 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| | Scrapers | 2 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| Infrastructure Improvements | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Building Construction | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Paving | Pavers | 2 | 8 |
| | Paving Equipment | 2 | 8 |
| | Rollers | 2 | 8 |
| Architectural Coating | Air Compressors | 1 | 6 |

## Worker, Vendor, and Haul Trips

| Trip Type | # One-Way Trips/Day | Trip Length (miles) |
|---|---|---|
| **Demolition** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 24.32 | 20 |
| On-Site Truck | -- | -- |
| **Site Preparation** | | |
| Worker | 17.5 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Grading** | | |
| Worker | 20 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Infrastructure Improvements** | | |
| Worker | 645.12 | 18.5 |
| Vendor | 109.47 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Building Construction** | | |
| Worker | 645.12 | 18.5 |
| Vendor | 109.47 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Paving** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Architectural Coating** | | |
| Worker | 258.05 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |

## Demolition

| Construction Phase | Amount (tons) |
|---|---|
| Demolition | 12,744 |

## Notes

Construction would include (per SCAQMD Rule 403 and FSEIR MM 3-1)

- watering exposed areas 3 times per day during earthmoving activities (site preparation and grading)
- watering demolished areas 2 times per day during demolition
- watering unpaved roads 2 times per day and limit vehicle speeds on unpaved roads to 25 mph throughout construction

# Operations

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 256 | DU | 9.4375000 | 2,416 |
| Apartments Low Rise | 768 | DU | 6.739583333 | 5,176 |
| City Park | 19.64 | AC | 34.52138493 | 678 |
| Other Non-Asphalt Surfaces | 3.38 | AC | 0 | 0 |
| | | | **Total** | **8,270** |
| DU = dwelling unit; AC = acres | | | | |
| Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025. | | | | |

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.43607679 | 4.945488532 | 7.468766689 |
| Apartments Low Rise | 18.43607679 | 4.945488532 | 7.468766689 |
| City Park | 18.43607679 | 6.967184162 | 11.74551353 |
| Other Non-Asphalt Surfaces | 18.43607679 | 6.967184162 | 11.74551353 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 41.4893616 | 6.3829787 | 52.1276596 |
| Apartments Low Rise | 100 | 0 | 0 | 41.4893616 | 6.3829787 | 52.1276596 |
| City Park | 100 | 0 | 0 | 79.5918367 | 10.2040816 | 10.2040816 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 79.5918367 | 10.2040816 | 10.2040816 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| Apartments (Low-Rise) | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| City Park | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| Other Non-Asphalt Surfaces | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |

Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 174.4 | 81.6 |
| Apartments Low Rise | 523.2 | 244.8 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments.<br>The Project would not include natural gas fireplaces.<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces. | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Construction** | | |
| C-2* | Limit Heavy-Duty Diesel Vehicle Idling | Construction equipment idling would be limited to 5 minutes per FSEIR MM 3-1 |
| C-5 | Use Advanced Engine Tiers | Construction equipment would have Tier 4 Final engines per FSEIR MM 3-1 |
| C-13 | Use Low-VOC Paints for Construction | Architectural coatings would have a VOC content <10 g/L per FSEIR MM 3-1 |
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

# Phase II

Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 1 | 15.91 | Single Family Detached | 88 | DU | 22 | 4.00 |
| | | Multifamily (Low-Rise) Residential | 262 | DU | 22 | 11.91 |
| 2 | 15.59 | Single Family Detached | 86 | DU | 22 | 3.91 |
| | | Multifamily (Low-Rise) Residential | 257 | DU | 22 | 11.68 |
| 3 | 7.68 | Single Family Detached | 42 | DU | 22 | 1.91 |
| | | Multifamily (Low-Rise) Residential | 127 | DU | 22 | 5.77 |
| 4 | 5.00 | Multifamily (Low-Rise) Residential | 175 | DU | 35 | 5.00 |
| | 1.43 | Retail | 18,635 | SF | -- | 0.43 |
| | 0.71 | General Office | 21,741 | SF | -- | 0.50 |
| 5 | 5.19 | Multifamily (Low-Rise) Residential | 182 | DU | 35 | 5.20 |
| | 1.48 | Retail | 19,367 | SF | -- | 0.44 |
| | 0.74 | General Office | 22,595 | SF | -- | 0.52 |
| 7 | 23.68 | Single Family Detached | 130 | DU | 22 | 5.91 |
| | | Multifamily (Low-Rise) Residential | 391 | DU | 22 | 17.77 |
| 8 | 24.18 | Single Family Detached | 133 | DU | 22 | 6.05 |
| | | Multifamily (Low-Rise) Residential | 399 | DU | 22 | 18.14 |
| 9 | 12.18 | Single Family Detached | 67 | DU | 22 | 3.05 |
| | | Multifamily (Low-Rise) Residential | 201 | DU | 22 | 9.14 |
| 10 | 9.86 | Multifamily (Low-Rise) Residential | 345 | DU | 35 | 9.86 |
| | 2.82 | Retail | 36,852 | SF | -- | 0.85 |
| | 1.41 | General Office | 42,994 | SF | -- | 0.99 |
| 11 | 10.97 | Multifamily (Low-Rise) Residential | 384 | DU | 35 | 10.97 |
| | 3.13 | Retail | 40,955 | SF | -- | 0.94 |
| | 1.57 | General Office | 47,781 | SF | -- | 1.10 |
| 14 | 13.33 | Active Park | 13.33 | AC | -- | -- |
| 15 | 13.11 | Active Park | 13.11 | AC | -- | -- |
| 16 | 9.90 | Public Park | 9.90 | AC | -- | -- |
| 19 | 2.26 | Non-Recreational Park | 2.26 | AC | -- | -- |
| 20 | 2.68 | Non-Recreational Park | 2.68 | AC | -- | -- |
| 21 | 2.96 | Non-Recreational Park | 2.96 | AC | -- | -- |

PA = planning area; AC = acres; DU = dwelling unit; SF = square feet

1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 19 through 21, which were taken from TOP 2025.
3. The residential building lot size was calculated using the following equation: building lot size = dwelling units *(dwelling units/acre). The retail and general office building lot size was assumed to be equal to the land use size in acres.

## Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 546 | DU | 1,081,080 | -- | 24.82 |
| Apartments Low Rise[1] | 2,723 | DU | 4,592,864 | -- | 105.44 |
| Strip Mall[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant w/o Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant with Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| General Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| Medical Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| City Park[6,7] | 36.34 | AC | -- | 158,2970.4 | 36.34 |
| Other Non-Asphalt Surfaces[6,8] | 7.90 | AC | -- | 344,124 | 7.9 |
| Parking Lot[9] | 6.954 | AC | -- | -- | 6.954 |

DU = dwelling unit; KSF = thousand square feet; AC = acres; SF = square feet

1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The retail size was evenly divided between the strip mall, fast food restaurant w/o drive thru, and fast food restaurant with drive thru land uses.
3. Per the proposed Specific Plan, the retail and office land uses would include landscaping equal to 10% of the building square footage.
4. The lot size included the building size and landscaping in acres.
5. The general office size was evenly divided between the general office building and medical office building land uses.
6. The city park and other non-asphalt surfaces was assumed to be fully landscaped with "special landscaping" because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
7. The public park and active park were modeled as city park.
8. The non-recreational park was modeled as non-asphalt surfaces.
9. Assumed the retail and office lot acreage not occupied by buildings or landscaping would be dedicated to parking lots. The lot size in acres was calculated using the following equation: lot size = total lot size – building size – landscaping.

# Construction

## Schedule

| Construction Phase | Start Date | End Date | Workdays |
|---|---|---|---|
| Demolition | 12/2/2026 | 6/2/2027 | 131 |
| Site Preparation | 12/15/2026 | 6/15/2027 | 131 |
| Grading | 4/1/2027 | 12/1/2027 | 175 |
| Infrastructure Improvements | 8/1/2027 | 12/1/2028 | 350 |
| Building Construction | 10/1/2028 | 3/1/2030 | 370 |
| Paving | 8/1/2028 | 2/1/2029 | 133 |
| Architectural Coating | 3/2/2030 | 3/30/2030 | 20 |

## Construction Phase Overlap

| Construction Phase | Start Date | End Date |
|---|---|---|
| Demolition + Site Preparation | 12/15/2026 | 3/31/2027 |
| Demolition + Site Preparation + Grading | 4/1/2027 | 6/2/2027 |
| Site Preparation + Grading | 6/3/2027 | 6/15/2027 |
| Grading + Infrastructure Improvements | 8/1/2027 | 12/1/2027 |
| Infrastructure Improvements + Paving | 8/1/2028 | 9/30/2028 |
| Infrastructure Improvements + Paving + Building Construction | 10/1/2028 | 12/1/2028 |
| Building Construction + Paving | 12/2/2028 | 2/1/2029 |

## Equipment

| Construction Phase | Equipment | Number per Day | Hours per Day |
|---|---|---|---|
| Demolition | Rubber Tired Dozers | 2 | 8 |
| | Excavators | 3 | 8 |
| | Concrete/Industrial Saws | 1 | 8 |
| Site Preparation | Rubber Tired Dozers | 3 | 8 |
| | Tractors/Loaders/Backhoes | 4 | 8 |
| Grading | Graders | 1 | 8 |
| | Excavators | 2 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| | Scrapers | 2 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| Infrastructure Improvements | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Building Construction | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Paving | Pavers | 2 | 8 |
| | Paving Equipment | 2 | 8 |
| | Rollers | 2 | 8 |
| Architectural Coating | Air Compressors | 1 | 6 |

## Worker, Vendor, and Haul Trips

| Trip Type | # One-Way Trips/Day | Trip Length (miles) |
|---|---|---|
| **Demolition** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 58.8015 | 20 |
| On-Site Truck | -- | -- |
| **Site Preparation** | | |
| Worker | 17.5 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Grading** | | |
| Worker | 20 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Infrastructure Improvements** | | |
| Worker | 2245.1353 | 18.5 |
| Vendor | 390.5820 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Building Construction** | | |
| Worker | 2245.1353 | 18.5 |
| Vendor | 390.5820 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Paving** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Architectural Coating** | | |
| Worker | 898.0541 | 18.5 |
| Vendor | 0 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |

## Demolition

| Construction Phase | Amount (tons) |
|---|---|
| Demolition | 30,810 |

## Notes

Construction would include (per SCAQMD Rule 403 and FSEIR MM 3-1)

- watering exposed areas 3 times per day during earthmoving activities (site preparation and grading)
- watering demolished areas 2 times per day during demolition
- watering unpaved roads 2 times per day and limit vehicle speeds on unpaved roads to 25 mph throughout construction

# Operations

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 546 | DU | 6.285047956 | 3,432 |
| Apartments Low Rise | 2723 | DU | 5.388308416 | 14,672 |
| Strip Mall | 38.603 | KSF | 15.38740512 | 594 |
| Fast Food Restaurant w/o Drive Thru | 38.603 | KSF | 179.0910682 | 6,913 |
| Fast Food Restaurant with Drive Thru | 38.603 | KSF | 185.84689 | 7,174 |
| General Office Building | 67.556 | KSF | 7.972483979 | 539 |
| Medical Office Building | 67.556 | KSF | 26.48781562 | 1789 |
| City Park | 36.34 | AC | 36.65382499 | 1,332 |
| Other Non-Asphalt Surfaces | 7.9 | AC | 0 | 0 |
| Parking Lot | 6.954 | AC | 0 | 0 |
| | | | **Total** | **36,446** |
| DU = dwelling unit; KSF = thousand square feet; AC = acres | | | | |
| Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025. | | | | |

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.81393411 | 20.96433004 | 6.45145941 |
| Apartments Low Rise | 18.81393411 | 20.96433004 | 6.45145941 |
| Strip Mall | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant w/o Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant with Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| General Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| Medical Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| City Park | 18.81393411 | 6.477110207 | 6.883326689 |
| Other Non-Asphalt Surfaces | 18.81393411 | 6.477110207 | 6.883326689 |
| Parking Lot | 18.81393411 | 6.477110207 | 6.883326689 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Apartments Low Rise | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Strip Mall | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant w/o Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant with Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| General Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| Medical Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| City Park | 100 | 0 | 0 | 80 | 8 | 12 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 80 | 8 | 12 |
| Parking Lot | 100 | 0 | 0 | 80 | 8 | 12 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Apartments Low Rise | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Strip Mall | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant w/o Drive Thru | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant with Drive Thru | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| General Office Building | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Medical Office Building | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| City Park | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Other Non-Asphalt Surfaces | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Parking Lot | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

## Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 371.96 | 174.04 |
| Apartments Low Rise | 1,855.04 | 867.96 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments<br>The Project would not include natural gas fireplaces<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Construction** | | |
| C-2* | Limit Heavy-Duty Diesel Vehicle Idling | Construction equipment idling would be limited to 5 minutes per FSEIR MM 3-1 |
| C-5 | Use Advanced Engine Tiers | Construction equipment would have Tier 4 Final engines per FSEIR MM 3-1 |
| C-13 | Use Low-VOC Paints for Construction | Architectural coatings would have a VOC content <10 g/L per FSEIR MM 3-1 |
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

# Project Buildout (Phase I + Phase II)

## Construction Phase Overlap between Phase I and Phase II

| Construction Phase | Start Date | End Date |
|---|---|---|
| Phase I Building Construction + Infrastructure Improvements<br>+ Phase II Demolition | 12/2/2026 | 12/14/2026 |
| Phase I Building Construction + Infrastructure Improvements<br>+ Phase II Demolition + Site Preparation | 12/15/2026 | 2/1/2027 |
| Phase I Building Construction + Paving<br>Phase II Demolition + Site Preparation | 2/2/2027 | 3/2/2027 |
| Phase I Building Construction<br>Phase II Demolition + Site Preparation | 3/3/2027 | 3/31/2027 |
| Phase I Building Construction +<br>Phase II Demolition + Site Preparation + Grading | 4/1/2027 | 5/2/2027 |
| Phase I Architectural Coatings +<br>Phase II Demolition + Site Preparation + Grading | 5/3/2027 | 5/31/2027 |
| See Phase I and Phase II above for the construction schedule, planning areas, and modeled land uses. | | |

# Operations

## Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 1 | 15.91 | Single Family Detached | 88 | DU | 22 | 4.00 |
| | | Multifamily (Low-Rise) Residential | 262 | DU | 22 | 11.91 |
| 2 | 15.59 | Single Family Detached | 86 | DU | 22 | 3.91 |
| | | Multifamily (Low-Rise) Residential | 257 | DU | 22 | 11.68 |
| 3 | 7.68 | Single Family Detached | 42 | DU | 22 | 1.91 |
| | | Multifamily (Low-Rise) Residential | 127 | DU | 22 | 5.77 |
| 4 | 5.00 | Multifamily (Low-Rise) Residential | 175 | DU | 35 | 5.00 |
| | 1.43 | Retail | 18,635 | SF | -- | 0.43 |
| | 0.71 | General Office | 21,741 | SF | -- | 0.50 |
| 5 | 5.19 | Multifamily (Low-Rise) Residential | 182 | DU | 35 | 5.20 |
| | 1.48 | Retail | 19,367 | SF | -- | 0.44 |
| | 0.74 | General Office | 22,595 | SF | -- | 0.52 |
| 6 | 7.32 | Single Family Detached | 40 | DU | 22 | 1.82 |
| | | Multifamily (Low-Rise) Residential | 121 | DU | 22 | 5.50 |
| 7 | 23.68 | Single Family Detached | 130 | DU | 22 | 5.91 |
| | | Multifamily (Low-Rise) Residential | 391 | DU | 22 | 17.77 |
| 8 | 24.18 | Single Family Detached | 133 | DU | 22 | 6.05 |
| | | Multifamily (Low-Rise) Residential | 399 | DU | 22 | 18.14 |
| 9 | 12.18 | Single Family Detached | 67 | DU | 22 | 3.05 |
| | | Multifamily (Low-Rise) Residential | 201 | DU | 22 | 9.14 |
| 10 | 9.86 | Multifamily (Low-Rise) Residential | 345 | DU | 35 | 9.86 |
| | 2.82 | Retail | 36,852 | SF | -- | 0.85 |
| | 1.41 | General Office | 42,994 | SF | -- | 0.99 |
| 11 | 10.97 | Multifamily (Low-Rise) Residential | 384 | DU | 35 | 10.97 |
| | 3.13 | Retail | 40,955 | SF | -- | 0.94 |
| | 1.57 | General Office | 47,781 | SF | -- | 1.10 |
| 12 | 15.45 | Single Family Detached | 85 | DU | 22 | 3.86 |
| | | Multifamily (Low-Rise) Residential | 255 | DU | 22 | 11.59 |
| 13 | 23.77 | Single Family Detached | 131 | DU | 22 | 5.95 |
| | | Multifamily (Low-Rise) Residential | 392 | DU | 22 | 17.82 |
| 14 | 13.33 | Active Park | 13.33 | AC | -- | -- |
| 15 | 13.11 | Active Park | 13.11 | AC | -- | -- |
| 16 | 9.90 | Public Park | 9.90 | AC | -- | -- |
| 17 | 6.20 | Public Park | 6.20 | AC | -- | -- |
| 18 | 13.44 | Active Park | 13.44 | AC | -- | -- |
| 19 | 2.26 | Non-Recreational Park | 2.26 | AC | -- | -- |
| 20 | 2.68 | Non-Recreational Park | 2.68 | AC | -- | -- |
| 21 | 2.96 | Non-Recreational Park | 2.96 | AC | -- | -- |
| 22 | 3.38 | Non-Recreational Park | 3.38 | AC | -- | -- |

PA = planning area; AC = acres; DU = dwelling unit; SF = square feet

1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 19 through 22, which were taken from TOP 2025.
3. The residential building lot size was calculated using the following equation: building lot size = dwelling units * (dwelling units/acre). The retail and general office building lot size was assumed to be equal to the land use size in acres.

## Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 802 | DU | 1,587,960 | -- | 36.45 |
| Apartments Low Rise[1] | 3,491 | DU | 6,113,504.5 | -- | 140.35 |
| Strip Mall[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant w/o Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant with Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| General Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| Medical Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| City Park[6,7] | 55.98 | AC | -- | 2,438,488.8 | 36.34 |
| Other Non-Asphalt Surfaces[6,8] | 11.28 | AC | -- | 491,356.8 | 7.9 |
| Parking Lot[9] | 6.954 | AC | -- | -- | 6.954 |

DU = dwelling unit; KSF = thousand square feet; AC = acres; SF = square feet

1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The retail size was evenly divided between the strip mall, fast food restaurant w/o drive thru, and fast food restaurant with drive thru land uses.
3. Per the proposed Specific Plan, the retail and office land uses would include landscaping equal to 10% of the building square footage.
4. The lot size included the building size and landscaping in acres.
5. The general office size was evenly divided between the general office building and medical office building land uses.
6. The city park and other non-asphalt surfaces was assumed to be fully landscaped with "special landscaping" because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
7. The public park and active park were modeled as city park.
8. The non-recreational park was modeled as non-asphalt surfaces.
9. Assumed the retail and office lot acreage not occupied by buildings or landscaping would be dedicated to parking lots. The lot size in acres was calculated using the following equation: lot size = total lot size – building size – landscaping.

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 802 | DU | 7.291317 | 5,848 |
| Apartments Low Rise | 3,491 | DU | 5.685581 | 19,848 |
| Strip Mall | 38.603 | KSF | 15.387405 | 594 |
| Fast Food Restaurant w/o Drive Thru | 38.603 | KSF | 179.091068 | 6,913 |
| Fast Food Restaurant with Drive Thru | 38.603 | KSF | 185.846890 | 7,174 |
| General Office Building | 67.556 | KSF | 7.972543 | 539 |
| Medical Office Building | 67.556 | KSF | 26.488012 | 1789 |
| City Park | 55.98 | AC | 35.905681 | 2010 |
| Other Non-Asphalt Surfaces | 11.28 | AC | 0.000000 | 0 |
| Parking Lot | 6.954 | AC | 0 | 0 |
| | | | **Total** | **44,716** |

DU = dwelling unit; KSF = thousand square feet; AC = acres

Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.81393411 | 20.96433004 | 6.45145941 |
| Apartments Low Rise | 18.81393411 | 20.96433004 | 6.45145941 |
| Strip Mall | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant w/o Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant with Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| General Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| Medical Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| City Park | 18.81393411 | 6.477110207 | 6.883326689 |
| Other Non-Asphalt Surfaces | 18.81393411 | 6.477110207 | 6.883326689 |
| Parking Lot | 18.81393411 | 6.477110207 | 6.883326689 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Apartments Low Rise | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Strip Mall | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant w/o Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant with Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| General Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| Medical Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| City Park | 100 | 0 | 0 | 80 | 8 | 12 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 80 | 8 | 12 |
| Parking Lot | 100 | 0 | 0 | 80 | 8 | 12 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Apartments Low Rise | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Strip Mall | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant w/o Drive Thru | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant with Drive Thru | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| General Office Building | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Medical Office Building | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| City Park | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Other Non-Asphalt Surfaces | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Parking Lot | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 546.36 | 256.64 |
| Apartments Low Rise | 2,378.24 | 1,112.76 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments<br>The Project would not include natural gas fireplaces<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

**Construction Water Energy**

| | | |
|---|---|---|
| Daily Soil Disturbance[1] | 3.5 | acres |
| Days of Soil Disturbance[2] | 612 | days |
| Water Concentration[3] | 3,020 | gallons/acre |
| Water Energy Intensity[4] | 5,306 | kWh/million gallons/year |
| Water Usage | 6.47 | million gallons/year |
| **Water Energy** | 34,324 | kWh/year |
| | 0.0343 | GWh/year |
| **San Bernardino County Annual Electricity** | 16,630 | GWh/year |
| **% Consumption** | 0.0002% | |

NOTES:

1. Total daily acres disturbed from offroad equipment per CalEEMod (3.0 Construction Emissions Detail) and maximum SCAQMD LST values for soil-disturbing equipment.
2. Number of days of construction with soil-disturbing equipment per CalEEMod (5.1 Construction Schedule).
3. Water application rate per Air and Waste Management Association's Air Pollution Engineering Manual.
4. Water energy intensity factor for subarea per CalEEMod User Guide, Appendix G, Tab G-32.

**Construction Emissions by Year**

**Phase I**

| Construction Year[1] | Demolition | | | Site Preparation | | | Grading | | |
|---|---|---|---|---|---|---|---|---|---|
| | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gas (Worker) | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gas (Worker) | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gas (Worker) |
| 2025 | 34.518 | 17.778 | 2.002 | 29.266 | 0.000 | 1.281 | 0.000 | 0.000 | 0.000 |
| 2026 | 169.329 | 85.479 | 9.610 | 285.918 | 0.000 | 12.244 | 525.584 | 0.000 | 20.653 |
| **Total** | **204** | **103** | **12** | **315** | **0** | **14** | **526** | **0** | **21** |
| **Construction Year[1]** | **Building Construction/Infrastructure Improvements** | | | **Paving** | | | **Architectural Coating** | | |
| | **On-Site Diesel (Off-Road)** | **Off-Site Diesel (Hauling/Vendor)** | **Off-Site Gas (Worker)** | **On-Site Diesel (Off-Road)** | **Off-Site Diesel (Hauling/Vendor)** | **Off-Site Gas (Worker)** | **On-Site Diesel (Off-Road)** | **Off-Site Diesel (Hauling/Vendor)** | **Off-Site Gas (Worker)** |
| 2026 | 142.623 | 206.530 | 497.597 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 2027 | 120.013 | 170.316 | 410.230 | 14.443 | 0.000 | 1.821 | 1.276 | 0.000 | 31.327 |
| **Total** | **263** | **377** | **908** | **14** | **0** | **2** | **1** | **0** | **31** |

**Phase II**

| Construction Year[1] | Demolition | | | Site Preparation | | | Grading | | |
|---|---|---|---|---|---|---|---|---|---|
| | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gas (Worker) | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gas (Worker) | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gas (Worker) |
| 2026 | 33.420 | 40.790 | 1.897 | 29.281 | 0.000 | 1.254 | 0.000 | 0.000 | 0.000 |
| 2027 | 170.458 | 203.983 | 9.477 | 285.911 | 0.000 | 11.995 | 525.545 | 0.000 | 20.233 |
| **Total** | **204** | **245** | **11** | **315** | **0** | **13** | **526** | **0** | **20** |
| **Construction Year[1]** | **Building Construction/Infrastructure Improvements** | | | **Paving** | | | **Architectural Coating** | | |
| | **On-Site Diesel (Off-Road)** | **Off-Site Diesel (Hauling/Vendor)** | **Off-Site Gas (Worker)** | **On-Site Diesel (Off-Road)** | **Off-Site Diesel (Hauling/Vendor)** | **Off-Site Gas (Worker)** | **On-Site Diesel (Off-Road)** | **Off-Site Diesel (Hauling/Vendor)** | **Off-Site Gas (Worker)** |
| 2027 | 119.234 | 603.756 | 1418.406 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 2028 | 333.591 | 1,651.355 | 3,893.302 | 75.161 | 0.000 | 9.299 | 0.000 | 0.000 | 0.000 |
| 2029 | 284.418 | 1,369.815 | 3,260.816 | 15.716 | 0.000 | 1.910 | 0.000 | 0.000 | 0.000 |
| 2030 | 46.754 | 218.822 | 526.940 | 0.000 | 0.000 | 0.000 | 1.215 | 0.000 | 98.36220305 |
| **Total** | **784** | **3,844** | **9,099** | **91** | **0** | **11** | **1** | **0** | **98** |

NOTES:

1. $MTCO_2e$ rates from CalEEMod (3.0 Construction Emissions Details).

## Construction Fuel

| On-site Diesel[1] (off-road construction equipment) | $MTCO_2e$ | Gallons of Fuel[4] |
|---|---|---|
| Demolition | 408 | 40,170 |
| Site Preparation | 630 | 62,106 |
| Grading | 1,051 | 103,559 |
| Building Construction/Infrastructure Improvements | 1,047 | 103,116 |
| Paving | 105 | 10,376 |
| Architectural Coating | 2 | 245 |
| **Total** | **3,244** | **319,574** |

| Off-site Diesel[1] (on-road construction trips) | $MTCO_2e$ | Gallons of Fuel[4] |
|---|---|---|
| Demolition | 348 | 34,289 |
| Site Preparation | 0 | 0 |
| Grading | 0 | 0 |
| Building Construction/Infrastructure Improvements | 4,221 | 415,822 |
| Paving | 0 | 0 |
| Architectural Coating | 0 | 0 |
| **Total** | **4,569** | **450,111** |

| Off-site Gasoline[2] (worker) | $MTCO_2e$ | Gallons of Fuel[4] |
|---|---|---|
| Demolition | 23 | 2,609 |
| Site Preparation | 27 | 3,039 |
| Grading | 41 | 4,641 |
| Building Construction/Infrastructure Improvements | 10,007 | 1,135,902 |
| Paving | 13 | 1,479 |
| Architectural Coating | 130 | 14,721 |
| **Total** | **10,241** | **1,162,390** |

| Summary | $MTCO_2e$ | Gallons of Fuel[4] | 2025 San Bernardino County Fuel Use (Gallons) | % Consumption |
|---|---|---|---|---|
| On-site Diesel (off-road construction equipment) | 3,244 | 319,574 | 281,399,849 | 0.11% |
| Off-site Diesel (on-road construction trips) | 4,569 | 450,111 | 281,399,849 | 0.16% |
| Total Diesel Fuel (On-site + Off-site) | 7,812 | 769,685 | 281,399,849 | 0.27% |
| Total Gasoline Fuel | 10,241 | 1,162,390 | 828,612,797 | 0.14% |
| Total Construction Fuel | 18,053 | 1,932,075 | | |

| Construction Phase[3,4] | Demolition | | | Site Preparation | | | Grading | | |
|---|---|---|---|---|---|---|---|---|---|
| | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gasoline (Worker) | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gasoline (Worker) | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gasoline (Worker) |
| Phase I | 204 | 103 | 12 | 315 | 0 | 14 | 526 | 0 | 21 |
| Phase II | 204 | 245 | 11 | 315 | 0 | 13 | 526 | 0 | 20 |
| **Total** | **408** | **348** | **23** | **630** | **0** | **27** | **1,051** | **0** | **41** |

| Construction Phase[3] | Building Construction/ Infrastructure Improvements | | | Paving | | | Architectural Coating | | |
|---|---|---|---|---|---|---|---|---|---|
| | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gasoline (Worker) | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gasoline (Worker) | On-Site Diesel (Off-Road) | Off-Site Diesel (Hauling/Vendor) | Off-Site Gasoline (Worker) |
| Phase I | 263 | 377 | 908 | 14 | 0 | 2 | 1 | 0 | 31 |
| Phase II | 784 | 3,844 | 9,099 | 91 | 0 | 11 | 1 | 0 | 98 |
| **Total** | **1,047** | **4,221** | **10,007** | **105** | **0** | **13** | **2** | **0** | **130** |

NOTES:
1. Fuel used for off-road, hauling, and vendor trips assumed to be diesel.
2. Fuel used for worker trips assumed to be gasoline.
3. MTCO2e rates from CalEEMod (3.0 Construction Emissions Details).
4. For CO2e emissions, see Chapter 13 (page 94); Conversion Ratios: Climate Registry, General Reporting Protocol, 2016.

**Operational Water Energy**

| | | |
|---|---|---|
| Indoor Water Usage | 225.72 | million gallons |
| Indoor Energy Intensity Factor[1] | 6807 | kWh/MG/year |
| Outdoor Water Usage | 95.32 | million gallons |
| Outdoor Energy Intensity Factor[2] | 5306 | kWh/MG/year |
| **Water Energy** | 2,042,190 | kWh/year |
| | 2.04 | GWh/year |
| **San Bernardino County Annual Electricity** | 16,630 | GWh/year |
| **Percentage Increase** | 0.012% | |

| **Land Use[3]** | **(gal/year)** | |
|---|---|---|
| | **Indoor** | **Outdoor** |
| Single Family Housing | 33,428,302 | 0 |
| Apartments Low Rise | 145,508,982 | 0 |
| Strip Mall | 2,859,422 | 61,993 |
| Fast Food Restaurant w/o Drive Thru | 11,717,312 | 61,993 |
| Fast Food Restaurant with Drive Thru | 11,717,312 | 61,993 |
| General Office Building | 12,006,981 | 108,488 |
| Medical Office Building | 8,476,963 | 108,488 |
| City Park | 0 | 87,022,206 |
| Other Non-Asphalt Surfaces | 0 | 7,890,759 |
| Parking Lot | 0 | 0.00 |
| **Total Operational Water (million gallons/year)** | **226** | **95** |

NOTES:
1. Indoor water energy intensity factor for subarea per CalEEMod User Guide, Appendix G, Tab G-32. Factor includes supply, treatment, distribution, and wastewater.
2. Outdoor water energy intensity factor for subarea per CalEEMod User Guide, Appendix G, Tab G-32. Factor includes supply, treatment, and distribution.
3. Operational water use values per CalEEMod (5.12 Operational Water and Wastewater Consumption).

## Operational Elecricity/Natural Gas Energy

| | Energy Usage | San Bernardino County Annual Energy[3] | % Consumption |
|---|---|---|---|
| Electricity (kWh/yr) | 27,128,467.0190 | -- | -- |
| (GWh/yr) | 27.128 | 16,630 | 0.16% |
| Water Energy (GWh/yr) | 2.042 | 16,630 | 0.01% |
| Total Electrical Demad (GWh/yr) | 29.171 | 16,630 | 0.18% |
| Natural Gas (kBTU/yr) | 95,999,854 | -- | -- |
| Natural Gas (therms/yr) | 959,999 | 562,123,065 | 0.171% |

| Land Use | Electricity[1] (kWh/yr) | Natural Gas[2] (kBTU/yr) |
|---|---|---|
| | Mitigated | Unmitigated |
| Single Family Housing | 5,895,110 | 25,094,352 |
| Apartments Low Rise | 15,527,143 | 58,148,047 |
| Strip Mall | 375,543 | 227,584 |
| Fast Food Restaurant w/o Drive Thru | 1,353,678 | 4,411,198 |
| Fast Food Restaurant with Drive Thru | 1,353,678 | 4,411,198 |
| General Office Building | 1,178,980 | 1,853,738 |
| Medical Office Building | 1,178,980 | 1,853,738 |
| City Park | 0 | 0 |
| Other Non-Asphalt Surfaces | 0 | 0 |
| Parking Lot | 265,355 | 0 |
| **Total** | **27,128,467** | **95,999,854** |

NOTES:
1. Electricity use per CalEEMod (5.11 Operational Energy Consumption).
2. Natural Gas use per CalEEMod (5.11 Operational Energy Consumption).
3. County total energy values in 2022 from California Energy Commission energy reports available through ecdms.energy.ca.gov.

**Operational Fuel**

| Vehicle Type | Percent | Annual VMT[1] | MPG[2] | Annual Fuel Use (Gallons) | Fuel Type | 2030 San Bernardino County Fuel Use (Gallons) | % Consumption |
|---|---|---|---|---|---|---|---|
| Passenger Cars | 92.14% | 196,288,626 | 21.6 | 9,087,436 | Gas | 759,783,908.85 | 1.20% |
| Light/Medium Trucks | 5.95% | 12,678,430 | 17.2 | 737,118 | Diesel | 276,486,333.22 | 0.27% |
| Heavy Trucks/Other | 1.91% | 4,066,920 | 6.1 | 666,708 | Diesel | 276,486,333.22 | 0.24% |
| Total Truck | 7.86% | 16,745,350 | | 1,403,826 | Diesel | 276,486,333.22 | 0.51% |

| Land Use[5] | LDA | LDT1 | LDT2 | MCY | MDV | LHD1 | LHD2 | MHD | OBUS | UBUS | SBUS | MH | HHD | VMT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 22,636,404 |
| Apartments Low Rise | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 76,833,708 |
| Strip Mall | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 3,546,684 |
| Fast Food Restaurant w/o Drive Thru | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 41,279,181 |
| Fast Food Restaurant with Drive Thru | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 42,836,349 |
| General Office Building | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 3,215,858 |
| Medical Office Building | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 10,684,381 |
| City Park | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 12,001,407 |
| Other Non-Asphalt Surfaces | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 0 |
| Parking Lot | 49.1071 | 3.5715 | 22.2553 | 2.0352 | 15.1705 | 2.7621 | 0.7600 | 1.8692 | 0.0575 | 0.0302 | 0.1071 | 0.3652 | 1.9090 | 0 |

NOTES:
1. Total annual operational VMT based on annual VMT from CalEEMod (5.9 Operational Mobile Sources).
2. Average fuel economy derived from Department of Transportation.
3. Total annual county fuel per EMFAC 2021 model of projected operational fuel usage in buildout year 2030.

# Center Park Specific Plan- Phase I Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan- Phase I |
| Construction Start Date | 12/1/2025 |
| Operational Year | 2027 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99350362244249, -117.62396749625904 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5260 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 256 | Dwelling Unit | 11.6 | 506,880 | 0.00 | — | 847 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 768 | Dwelling Unit | 34.9 | 1,520,640 | 0.00 | — | 2,542 | — |
| City Park | 19.6 | Acre | 19.6 | 0.00 | 855,518 | 855,518 | — | — |
| Other Non-Asphalt Surfaces | 3.38 | Acre | 3.38 | 0.00 | 147,233 | 147,233 | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Construction | C-2* | Limit Heavy-Duty Diesel Vehicle Idling |
| Construction | C-5 | Use Advanced Engine Tiers |
| Construction | C-13 | Use Low-VOC Paints for Construction |
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 608 | 607 | 79.2 | 90.4 | 0.15 | 3.23 | 12.0 | 13.6 | 2.97 | 4.07 | 7.04 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| Mit. | 122 | 122 | 13.7 | 100 | 0.15 | 0.31 | 12.0 | 12.3 | 0.31 | 4.07 | 4.37 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| % Reduced | 80% | 80% | 83% | -11% | — | 90% | — | 10% | 90% | — | 38% | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 9.06 | 7.47 | 56.1 | 100 | 0.11 | 2.30 | 18.7 | 19.6 | 2.12 | 4.47 | 5.27 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| Mit. | 7.20 | 5.99 | 18.8 | 104 | 0.11 | 0.25 | 18.7 | 19.0 | 0.25 | 4.47 | 4.71 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| % Reduced | 21% | 20% | 67% | -4% | — | 89% | — | 3% | 88% | — | 10% | — | — | — | — | — | — | — |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 36.3 | 36.1 | 35.4 | 48.3 | 0.08 | 1.35 | 6.91 | 8.26 | 1.25 | 2.26 | 3.50 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| Mit. | 8.09 | 7.91 | 8.47 | 52.2 | 0.08 | 0.16 | 6.91 | 7.07 | 0.16 | 2.26 | 2.42 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| % Reduced | 78% | 78% | 76% | -8% | — | 88% | — | 14% | 87% | — | 31% | — | — | — | — | — | — | — |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 6.63 | 6.58 | 6.45 | 8.81 | 0.01 | 0.25 | 1.26 | 1.51 | 0.23 | 0.41 | 0.64 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| Mit. | 1.48 | 1.44 | 1.55 | 9.53 | 0.01 | 0.03 | 1.26 | 1.29 | 0.03 | 0.41 | 0.44 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| % Reduced | 78% | 78% | 76% | -8% | — | 88% | — | 14% | 87% | — | 31% | — | — | — | — | — | — | — |

## 2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 4.51 | 3.91 | 13.7 | 100 | 0.15 | 0.31 | 12.0 | 12.3 | 0.31 | 4.07 | 4.37 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| 2027 | 122 | 122 | 8.50 | 59.9 | 0.05 | 0.12 | 9.37 | 9.49 | 0.12 | 2.24 | 2.36 | — | 14,381 | 14,381 | 0.43 | 0.81 | 35.2 | 14,669 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2025 | 1.23 | 1.03 | 9.36 | 49.5 | 0.09 | 0.18 | 7.34 | 7.52 | 0.18 | 3.05 | 3.24 | — | 10,823 | 10,823 | 0.55 | 0.36 | 0.14 | 10,944 |
| 2026 | 7.20 | 5.99 | 18.8 | 104 | 0.11 | 0.25 | 18.7 | 19.0 | 0.25 | 4.47 | 4.71 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| 2027 | 6.91 | 5.76 | 17.9 | 98.6 | 0.10 | 0.25 | 18.7 | 19.0 | 0.24 | 4.47 | 4.71 | — | 27,322 | 27,322 | 0.89 | 1.62 | 1.83 | 27,830 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 0.06 | 0.05 | 0.50 | 2.21 | < 0.005 | 0.01 | 0.30 | 0.31 | 0.01 | 0.11 | 0.12 | — | 506 | 506 | 0.03 | 0.02 | 0.13 | 512 |
| 2026 | 2.02 | 1.74 | 8.47 | 52.2 | 0.08 | 0.16 | 6.91 | 7.07 | 0.16 | 2.26 | 2.42 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| 2027 | 8.09 | 7.91 | 3.00 | 16.8 | 0.02 | 0.04 | 2.99 | 3.03 | 0.04 | 0.71 | 0.75 | — | 4,443 | 4,443 | 0.14 | 0.25 | 4.88 | 4,527 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 0.01 | 0.01 | 0.09 | 0.40 | < 0.005 | < 0.005 | 0.05 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 83.7 | 83.7 | < 0.005 | < 0.005 | 0.02 | 84.8 |
| 2026 | 0.37 | 0.32 | 1.55 | 9.53 | 0.01 | 0.03 | 1.26 | 1.29 | 0.03 | 0.41 | 0.44 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| 2027 | 1.48 | 1.44 | 0.55 | 3.07 | < 0.005 | 0.01 | 0.55 | 0.55 | 0.01 | 0.13 | 0.14 | — | 736 | 736 | 0.02 | 0.04 | 0.81 | 749 |

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 102,332 | 102,854 | 57.2 | 3.93 | 272 | 105,728 |
| Mit. | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 101,949 | 102,471 | 57.2 | 3.93 | 272 | 105,343 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 97,007 | 97,529 | 57.3 | 4.04 | 21.2 | 100,189 |
| Mit. | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 96,625 | 97,147 | 57.3 | 4.04 | 21.2 | 99,806 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 94,171 | 94,693 | 57.1 | 4.05 | 126 | 97,453 |
| Mit. | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 93,790 | 94,312 | 57.1 | 4.04 | 126 | 97,069 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 13.0 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,591 | 15,678 | 9.46 | 0.67 | 20.8 | 16,134 |
| Mit. | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 12.9 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,528 | 15,614 | 9.45 | 0.67 | 20.8 | 16,071 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 35.1 | 31.5 | 31.4 | 309 | 0.81 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 82,685 | 82,685 | 3.47 | 3.62 | 257 | 84,107 |
| Area | 52.8 | 52.5 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | 0.00 | 4,176 | 4,176 | 0.26 | 0.03 | — | 4,192 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 101,949 | 102,471 | 57.2 | 3.93 | 272 | 105,343 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 33.1 | 29.4 | 33.7 | 256 | 0.75 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 77,516 | 77,516 | 3.58 | 3.74 | 6.67 | 78,726 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | 47.4 | 47.4 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 96,625 | 97,147 | 57.3 | 4.04 | 21.2 | 99,806 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 32.8 | 29.2 | 34.3 | 266 | 0.76 | 0.53 | 71.0 | 71.5 | 0.49 | 18.0 | 18.5 | — | 78,319 | 78,319 | 3.58 | 3.77 | 111 | 79,642 |
| Area | 51.1 | 50.9 | 0.38 | 39.8 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 382 | 382 | 0.02 | < 0.005 | — | 383 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 93,790 | 94,312 | 57.1 | 4.04 | 126 | 97,069 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 5.99 | 5.33 | 6.26 | 48.5 | 0.14 | 0.10 | 12.9 | 13.0 | 0.09 | 3.29 | 3.38 | — | 12,967 | 12,967 | 0.59 | 0.62 | 18.4 | 13,186 |
| Area | 9.32 | 9.28 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | 0.00 | 63.2 | 63.2 | < 0.005 | < 0.005 | — | 63.4 |
| Energy | 0.11 | 0.06 | 0.96 | 0.41 | 0.01 | 0.08 | — | 0.08 | 0.08 | — | 0.08 | — | 2,382 | 2,382 | 0.18 | 0.01 | — | 2,390 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 13.5 | 116 | 129 | 1.40 | 0.03 | — | 174 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 72.9 | 0.00 | 72.9 | 7.28 | 0.00 | — | 255 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.40 | 2.40 |
| Total | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 12.9 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,528 | 15,614 | 9.45 | 0.67 | 20.8 | 16,071 |

# 3. Construction Emissions Details

## 3.2. Demolition (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,425 | 3,425 | 0.14 | 0.03 | — | 3,437 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.27 | 1.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 208 | 208 | 0.01 | < 0.005 | — | 208 |
| Demolition | — | — | — | — | — | — | 0.08 | 0.08 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.05 | 0.20 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 34.4 | 34.4 | < 0.005 | < 0.005 | — | 34.5 |
| Demolition | — | — | — | — | — | — | 0.01 | 0.01 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.88 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 194 | 194 | 0.01 | 0.01 | 0.02 | 196 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.21 | 0.03 | 2.11 | 1.14 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,682 | 1,682 | 0.18 | 0.28 | 0.09 | 1,769 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.9 | 11.9 | < 0.005 | < 0.005 | 0.02 | 12.1 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.13 | 0.07 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 102 | 102 | 0.01 | 0.02 | 0.09 | 107 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.97 | 1.97 | < 0.005 | < 0.005 | < 0.005 | 2.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | < 0.005 | 0.02 | 0.01 | < 0.005 | < 0.005 | < 0.005 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 16.9 | 16.9 | < 0.005 | < 0.005 | 0.02 | 17.8 |

## 3.4. Demolition (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.11 | 0.11 | 1.34 | 5.41 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 1,019 | 1,019 | 0.04 | 0.01 | — | 1,023 |
| Demolition | — | — | — | — | — | — | 0.40 | 0.40 | — | 0.06 | 0.06 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.24 | 0.99 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 169 | 169 | 0.01 | < 0.005 | — | 169 |
| Demolition | — | — | — | — | — | — | 0.07 | 0.07 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.07 | 0.06 | 0.06 | 1.08 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 207 | 207 | 0.01 | 0.01 | 0.71 | 210 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.20 | 0.03 | 1.95 | 1.11 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,651 | 1,651 | 0.17 | 0.26 | 3.36 | 1,737 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.82 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 190 | 190 | < 0.005 | 0.01 | 0.02 | 192 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.20 | 0.02 | 2.03 | 1.12 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,652 | 1,652 | 0.17 | 0.26 | 0.09 | 1,735 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.26 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 57.3 | 57.3 | < 0.005 | < 0.005 | 0.09 | 58.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.06 | 0.01 | 0.61 | 0.33 | < 0.005 | 0.01 | 0.13 | 0.14 | 0.01 | 0.04 | 0.04 | — | 491 | 491 | 0.05 | 0.08 | 0.43 | 516 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.48 | 9.48 | < 0.005 | < 0.005 | 0.02 | 9.61 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.11 | 0.06 | < 0.005 | < 0.005 | 0.02 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 81.3 | 81.3 | 0.01 | 0.01 | 0.07 | 85.5 |

## 3.6. Site Preparation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipm | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,295 | 5,295 | 0.21 | 0.04 | — | 5,314 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.09 | 0.94 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 176 | 176 | 0.01 | < 0.005 | — | 177 |
| Dust From Material Movement | — | — | — | — | — | — | 0.17 | 0.17 | — | 0.09 | 0.09 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 29.2 | 29.2 | < 0.005 | < 0.005 | — | 29.3 |
| Dust From Material Movement | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.08 | 0.08 | 1.03 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 226 | 226 | 0.01 | 0.01 | 0.02 | 229 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.63 | 7.63 | < 0.005 | < 0.005 | 0.01 | 7.74 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.26 | 1.26 | < 0.005 | < 0.005 | < 0.005 | 1.28 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.8. Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 0.84 | 9.20 | 0.02 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,721 | 1,721 | 0.07 | 0.01 | — | 1,727 |
| Dust From Material Movement | — | — | — | — | — | — | 1.66 | 1.66 | — | 0.85 | 0.85 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.03 | 0.03 | 0.15 | 1.68 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 285 | 285 | 0.01 | < 0.005 | — | 286 |
| Dust From Material Movement | — | — | — | — | — | — | 0.30 | 0.30 | — | 0.16 | 0.16 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.08 | 0.07 | 1.26 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 242 | 242 | 0.01 | 0.01 | 0.83 | 245 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.08 | 0.95 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 222 | 222 | < 0.005 | 0.01 | 0.02 | 224 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.02 | 0.03 | 0.33 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | 0.02 | 0.02 | — | 73.0 | 73.0 | < 0.005 | < 0.005 | 0.12 | 74.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | 0.02 | 12.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.10. Grading (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,599 | 6,599 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,599 | 6,599 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.31 | 0.31 | 2.12 | 16.9 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,164 | 3,164 | 0.13 | 0.03 | — | 3,175 |
| Dust From Material Movement | — | — | — | — | — | — | 1.15 | 1.15 | — | 0.46 | 0.46 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.06 | 0.39 | 3.09 | 0.01 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 524 | 524 | 0.02 | < 0.005 | — | 526 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | — | 0.21 | 0.21 | — | 0.08 | 0.08 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.10 | 0.09 | 0.08 | 1.44 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 276 | 276 | 0.01 | 0.01 | 0.94 | 280 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.09 | 1.09 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 253 | 253 | < 0.005 | 0.01 | 0.02 | 256 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.04 | 0.04 | 0.05 | 0.55 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 123 | 123 | < 0.005 | < 0.005 | 0.20 | 125 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.10 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | — | 20.4 | 20.4 | < 0.005 | < 0.005 | 0.03 | 20.7 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.12. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.17 | 0.87 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 141 | 141 | 0.01 | < 0.005 | — | 141 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.03 | 0.16 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 23.3 | 23.3 | < 0.005 | < 0.005 | — | 23.4 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 2.92 | 2.60 | 2.84 | 35.1 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,166 | 8,166 | 0.13 | 0.32 | 0.79 | 8,265 |
| Vendor | 0.33 | 0.06 | 3.73 | 1.97 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,322 | 3,322 | 0.24 | 0.51 | 0.23 | 3,481 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.15 | 0.18 | 2.17 | 0.00 | 0.00 | 0.49 | 0.49 | 0.00 | 0.11 | 0.11 | — | 486 | 486 | 0.01 | 0.02 | 0.77 | 493 |
| Vendor | 0.02 | < 0.005 | 0.22 | 0.12 | < 0.005 | < 0.005 | 0.05 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 195 | 195 | 0.01 | 0.03 | 0.22 | 205 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.40 | 0.00 | 0.00 | 0.09 | 0.09 | 0.00 | 0.02 | 0.02 | — | 80.5 | 80.5 | < 0.005 | < 0.005 | 0.13 | 81.6 |
| Vendor | < 0.005 | < 0.005 | 0.04 | 0.02 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 32.3 | 32.3 | < 0.005 | < 0.005 | 0.04 | 33.9 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.14. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.08 | 0.08 | 0.67 | 3.54 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 572 | 572 | 0.02 | < 0.005 | — | 574 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.01 | 0.12 | 0.65 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 94.8 | 94.8 | < 0.005 | < 0.005 | — | 95.1 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.97 | 2.66 | 2.25 | 43.2 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,726 | 8,726 | 0.10 | 0.31 | 27.4 | 8,847 |
| Vendor | 0.30 | 0.07 | 3.43 | 1.87 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,258 | 3,258 | 0.23 | 0.49 | 7.81 | 3,417 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.81 | 2.49 | 2.55 | 32.6 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,004 | 8,004 | 0.11 | 0.31 | 0.71 | 8,098 |
| Vendor | 0.30 | 0.06 | 3.60 | 1.89 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,260 | 3,260 | 0.23 | 0.49 | 0.20 | 3,411 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.67 | 0.60 | 0.67 | 8.15 | 0.00 | 0.00 | 1.99 | 1.99 | 0.00 | 0.47 | 0.47 | — | 1,938 | 1,938 | 0.03 | 0.07 | 2.83 | 1,963 |
| Vendor | 0.07 | 0.02 | 0.86 | 0.45 | 0.01 | 0.01 | 0.22 | 0.23 | 0.01 | 0.06 | 0.07 | — | 778 | 778 | 0.06 | 0.12 | 0.80 | 815 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.12 | 0.11 | 0.12 | 1.49 | 0.00 | 0.00 | 0.36 | 0.36 | 0.00 | 0.09 | 0.09 | — | 321 | 321 | < 0.005 | 0.01 | 0.47 | 325 |
| Vendor | 0.01 | < 0.005 | 0.16 | 0.08 | < 0.005 | < 0.005 | 0.04 | 0.04 | < 0.005 | 0.01 | 0.01 | — | 129 | 129 | 0.01 | 0.02 | 0.13 | 135 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.16. Infrastructure Improvements (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.10 | 0.84 | 4.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 718 | 718 | 0.03 | 0.01 | — | 720 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.15 | 0.81 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 119 | 119 | < 0.005 | < 0.005 | — | 119 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 3.09 | 2.79 | 2.55 | 46.5 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,904 | 8,904 | 0.38 | 0.31 | 30.5 | 9,035 |
| Vendor | 0.33 | 0.07 | 3.59 | 1.95 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,320 | 3,320 | 0.24 | 0.51 | 8.76 | 3,488 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.92 | 2.60 | 2.84 | 35.1 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,166 | 8,166 | 0.13 | 0.32 | 0.79 | 8,265 |
| Vendor | 0.33 | 0.06 | 3.73 | 1.97 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,322 | 3,322 | 0.24 | 0.51 | 0.23 | 3,481 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.88 | 0.78 | 0.93 | 11.1 | 0.00 | 0.00 | 2.49 | 2.49 | 0.00 | 0.58 | 0.58 | — | 2,479 | 2,479 | 0.04 | 0.10 | 3.94 | 2,513 |
| Vendor | 0.10 | 0.02 | 1.13 | 0.59 | 0.01 | 0.01 | 0.28 | 0.29 | 0.01 | 0.08 | 0.09 | — | 994 | 994 | 0.07 | 0.15 | 1.13 | 1,043 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.16 | 0.14 | 0.17 | 2.02 | 0.00 | 0.00 | 0.46 | 0.46 | 0.00 | 0.11 | 0.11 | — | 410 | 410 | 0.01 | 0.02 | 0.65 | 416 |
| Vendor | 0.02 | < 0.005 | 0.21 | 0.11 | < 0.005 | < 0.005 | 0.05 | 0.05 | < 0.005 | 0.01 | 0.02 | — | 165 | 165 | 0.01 | 0.03 | 0.19 | 173 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.18. Infrastructure Improvements (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.18 | 0.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 150 | 150 | 0.01 | < 0.005 | — | 151 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.03 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 24.9 | 24.9 | < 0.005 | < 0.005 | — | 24.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.81 | 2.49 | 2.55 | 32.6 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,004 | 8,004 | 0.11 | 0.31 | 0.71 | 8,098 |
| Vendor | 0.30 | 0.06 | 3.60 | 1.89 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,260 | 3,260 | 0.23 | 0.49 | 0.20 | 3,411 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.18 | 0.16 | 0.18 | 2.14 | 0.00 | 0.00 | 0.52 | 0.52 | 0.00 | 0.12 | 0.12 | — | 508 | 508 | 0.01 | 0.02 | 0.74 | 515 |
| Vendor | 0.02 | < 0.005 | 0.23 | 0.12 | < 0.005 | < 0.005 | 0.06 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 204 | 204 | 0.01 | 0.03 | 0.21 | 214 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.39 | 0.00 | 0.00 | 0.10 | 0.10 | 0.00 | 0.02 | 0.02 | — | 84.1 | 84.1 | < 0.005 | < 0.005 | 0.12 | 85.2 |
| Vendor | < 0.005 | < 0.005 | 0.04 | 0.02 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 33.8 | 33.8 | < 0.005 | 0.01 | 0.03 | 35.4 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.20. Paving (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.11 | 0.61 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 86.9 | 86.9 | < 0.005 | < 0.005 | — | 87.2 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.11 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 14.4 | 14.4 | < 0.005 | < 0.005 | — | 14.4 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.06 | 0.76 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 186 | 186 | < 0.005 | 0.01 | 0.02 | 188 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 10.9 | 10.9 | < 0.005 | < 0.005 | 0.02 | 11.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.80 | 1.80 | < 0.005 | < 0.005 | < 0.005 | 1.82 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.22. Architectural Coating (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.65 | 0.96 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 121 | 121 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.04 | 0.06 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 7.68 | 7.68 | < 0.005 | < 0.005 | — | 7.71 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architect Coatings | 6.96 | 6.96 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.27 | 1.27 | < 0.005 | < 0.005 | — | 1.28 |
| Architectural Coatings | 1.27 | 1.27 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.19 | 1.06 | 0.90 | 17.3 | 0.00 | 0.00 | 3.37 | 3.37 | 0.00 | 0.79 | 0.79 | — | 3,490 | 3,490 | 0.04 | 0.12 | 11.0 | 3,539 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.06 | 0.79 | 0.00 | 0.00 | 0.19 | 0.19 | 0.00 | 0.04 | 0.04 | — | 187 | 187 | < 0.005 | 0.01 | 0.27 | 189 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.14 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.01 | 0.01 | — | 30.9 | 30.9 | < 0.005 | < 0.005 | 0.05 | 31.3 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 10.2 | 9.13 | 8.95 | 87.8 | 0.23 | 0.15 | 20.3 | 20.5 | 0.14 | 5.16 | 5.30 | — | 23,411 | 23,411 | 0.99 | 1.03 | 72.7 | 23,816 |
| Apartments Low Rise | 21.8 | 19.6 | 19.2 | 188 | 0.49 | 0.32 | 43.5 | 43.9 | 0.30 | 11.1 | 11.4 | — | 50,156 | 50,156 | 2.13 | 2.21 | 156 | 51,022 |
| City Park | 3.16 | 2.78 | 3.28 | 33.0 | 0.09 | 0.06 | 7.96 | 8.02 | 0.05 | 2.02 | 2.07 | — | 9,117 | 9,117 | 0.35 | 0.38 | 28.5 | 9,269 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 35.1 | 31.5 | 31.4 | 309 | 0.81 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 82,685 | 82,685 | 3.47 | 3.62 | 257 | 84,107 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 9.57 | 8.54 | 9.61 | 72.9 | 0.21 | 0.15 | 20.3 | 20.5 | 0.14 | 5.16 | 5.30 | — | 21,949 | 21,949 | 1.02 | 1.06 | 1.89 | 22,293 |
| Apartments Low Rise | 20.5 | 18.3 | 20.6 | 156 | 0.46 | 0.32 | 43.5 | 43.9 | 0.30 | 11.1 | 11.4 | — | 47,023 | 47,023 | 2.19 | 2.28 | 4.04 | 47,761 |
| City Park | 2.99 | 2.61 | 3.52 | 26.9 | 0.08 | 0.06 | 7.96 | 8.02 | 0.05 | 2.02 | 2.07 | — | 8,544 | 8,544 | 0.36 | 0.40 | 0.74 | 8,672 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 33.1 | 29.4 | 33.7 | 256 | 0.75 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 77,516 | 77,516 | 3.58 | 3.74 | 6.67 | 78,726 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 1.73 | 1.55 | 1.78 | 13.8 | 0.04 | 0.03 | 3.66 | 3.69 | 0.03 | 0.93 | 0.96 | — | 3,672 | 3,672 | 0.17 | 0.18 | 5.20 | 3,734 |
| Apartments Low Rise | 3.72 | 3.31 | 3.82 | 29.6 | 0.08 | 0.06 | 7.85 | 7.91 | 0.05 | 1.99 | 2.05 | — | 7,866 | 7,866 | 0.36 | 0.38 | 11.1 | 7,999 |
| City Park | 0.54 | 0.47 | 0.66 | 5.10 | 0.02 | 0.01 | 1.43 | 1.45 | 0.01 | 0.36 | 0.37 | — | 1,429 | 1,429 | 0.06 | 0.07 | 2.04 | 1,453 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 5.99 | 5.33 | 6.26 | 48.5 | 0.14 | 0.10 | 12.9 | 13.0 | 0.09 | 3.29 | 3.38 | — | 12,967 | 12,967 | 0.59 | 0.62 | 18.4 | 13,186 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 2,743 | 2,743 | 0.17 | 0.02 | — | 2,753 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 4,979 | 4,979 | 0.31 | 0.04 | — | 4,997 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 7,721 | 7,721 | 0.48 | 0.06 | — | 7,750 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 2,743 | 2,743 | 0.17 | 0.02 | — | 2,753 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 4,979 | 4,979 | 0.31 | 0.04 | — | 4,997 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 7,721 | 7,721 | 0.48 | 0.06 | — | 7,750 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 454 | 454 | 0.03 | < 0.005 | — | 456 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 824 | 824 | 0.05 | 0.01 | — | 827 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 1,278 | 1,278 | 0.08 | 0.01 | — | 1,283 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.24 | 0.12 | 2.02 | 0.86 | 0.01 | 0.16 | — | 0.16 | 0.16 | — | 0.16 | — | 2,567 | 2,567 | 0.23 | < 0.005 | — | 2,574 |
| Apartments Low Rise | 0.38 | 0.19 | 3.23 | 1.37 | 0.02 | 0.26 | — | 0.26 | 0.26 | — | 0.26 | — | 4,100 | 4,100 | 0.36 | 0.01 | — | 4,111 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 6,667 | 6,667 | 0.59 | 0.01 | — | 6,685 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.24 | 0.12 | 2.02 | 0.86 | 0.01 | 0.16 | — | 0.16 | 0.16 | — | 0.16 | — | 2,567 | 2,567 | 0.23 | < 0.005 | — | 2,574 |
| Apartments Low Rise | 0.38 | 0.19 | 3.23 | 1.37 | 0.02 | 0.26 | — | 0.26 | 0.26 | — | 0.26 | — | 4,100 | 4,100 | 0.36 | 0.01 | — | 4,111 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 6,667 | 6,667 | 0.59 | 0.01 | — | 6,685 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.04 | 0.02 | 0.37 | 0.16 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 425 | 425 | 0.04 | < 0.005 | — | 426 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartment Low Rise | 0.07 | 0.03 | 0.59 | 0.25 | < 0.005 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 679 | 679 | 0.06 | < 0.005 | — | 681 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.11 | 0.06 | 0.96 | 0.41 | 0.01 | 0.08 | — | 0.08 | 0.08 | — | 0.08 | — | 1,104 | 1,104 | 0.10 | < 0.005 | — | 1,107 |

## 4.3. Area Emissions by Source

### 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Consumer Products | 43.9 | 43.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 3.49 | 3.49 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 5.38 | 5.10 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | — | 155 | 155 | 0.01 | < 0.005 | — | 156 |
| Total | 52.8 | 52.5 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | 0.00 | 4,176 | 4,176 | 0.26 | 0.03 | — | 4,192 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Consumer Products | 43.9 | 43.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 3.49 | 3.49 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 47.4 | 47.4 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 45.6 | 45.6 | < 0.005 | < 0.005 | — | 45.8 |
| Consumer Products | 8.01 | 8.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 0.64 | 0.64 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 0.67 | 0.64 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 17.6 | 17.6 | < 0.005 | < 0.005 | — | 17.7 |
| Total | 9.32 | 9.28 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | 0.00 | 63.2 | 63.2 | < 0.005 | < 0.005 | — | 63.4 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 20.4 | 106 | 126 | 2.10 | 0.05 | — | 194 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 61.3 | 318 | 379 | 6.31 | 0.15 | — | 582 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 236 | 236 | 0.01 | < 0.005 | — | 237 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 40.6 | 40.6 | < 0.005 | < 0.005 | — | 40.8 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 20.4 | 106 | 126 | 2.10 | 0.05 | — | 194 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 61.3 | 318 | 379 | 6.31 | 0.15 | — | 582 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 236 | 236 | 0.01 | < 0.005 | — | 237 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 40.6 | 40.6 | < 0.005 | < 0.005 | — | 40.8 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 3.39 | 17.5 | 20.9 | 0.35 | 0.01 | — | 32.1 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 10.2 | 52.6 | 62.7 | 1.04 | 0.03 | — | 96.3 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 39.1 | 39.1 | < 0.005 | < 0.005 | — | 39.2 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 6.73 | 6.73 | < 0.005 | < 0.005 | — | 6.75 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 13.5 | 116 | 129 | 1.40 | 0.03 | — | 174 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 133 | 0.00 | 133 | 13.3 | 0.00 | — | 466 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 306 | 0.00 | 306 | 30.6 | 0.00 | — | 1,071 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 0.00 | 0.91 | 0.09 | 0.00 | — | 3.18 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 133 | 0.00 | 133 | 13.3 | 0.00 | — | 466 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 306 | 0.00 | 306 | 30.6 | 0.00 | — | 1,071 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 0.00 | 0.91 | 0.09 | 0.00 | — | 3.18 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 22.1 | 0.00 | 22.1 | 2.21 | 0.00 | — | 77.2 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 50.7 | 0.00 | 50.7 | 5.06 | 0.00 | — | 177 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.15 | 0.00 | 0.15 | 0.02 | 0.00 | — | 0.53 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 72.9 | 0.00 | 72.9 | 7.28 | 0.00 | — | 255 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.63 | 3.63 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 10.9 | 10.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.63 | 3.63 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 10.9 | 10.9 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.60 | 0.60 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.80 | 1.80 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.40 | 2.40 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remove | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Demolition | Demolition | 12/1/2025 | 6/1/2026 | 5.00 | 131 | — |
| Site Preparation | Site Preparation | 12/15/2025 | 6/15/2026 | 5.00 | 131 | — |
| Grading | Grading | 4/1/2026 | 12/1/2026 | 5.00 | 175 | — |
| Building Construction | Building Construction | 12/2/2026 | 5/2/2027 | 5.00 | 108 | — |
| Infrastructure Improvements | Building Construction | 8/1/2026 | 2/1/2027 | 5.00 | 131 | — |
| Paving | Paving | 2/2/2027 | 3/2/2027 | 5.00 | 21.0 | — |
| Architectural Coating | Architectural Coating | 5/3/2027 | 5/31/2027 | 5.00 | 21.0 | — |

## 5.2. Off-Road Equipment

### 5.2.2. Mitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Demolition | Rubber Tired Dozers | Diesel | Tier 4 Final | 2.00 | 8.00 | 367 | 0.40 |
| Demolition | Excavators | Diesel | Tier 4 Final | 3.00 | 8.00 | 36.0 | 0.38 |
| Demolition | Concrete/Industrial Saws | Diesel | Tier 4 Final | 1.00 | 8.00 | 33.0 | 0.73 |
| Site Preparation | Rubber Tired Dozers | Diesel | Tier 4 Final | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Graders | Diesel | Tier 4 Final | 1.00 | 8.00 | 148 | 0.41 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Grading | Excavators | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Grading | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 2.00 | 8.00 | 84.0 | 0.37 |
| Grading | Scrapers | Diesel | Tier 4 Final | 2.00 | 8.00 | 423 | 0.48 |
| Grading | Rubber Tired Dozers | Diesel | Tier 4 Final | 1.00 | 8.00 | 367 | 0.40 |
| Building Construction | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Building Construction | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Infrastructure Improvements | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Infrastructure Improvements | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Infrastructure Improvements | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Infrastructure Improvements | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Infrastructure Improvements | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Paving | Pavers | Diesel | Tier 4 Final | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Tier 4 Final | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Tier 4 Final | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.2. Mitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Demolition | — | — | — | — |

| | | | | |
|---|---|---|---|---|
| Demolition | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Demolition | Vendor | — | 10.2 | HHDT,MHDT |
| Demolition | Hauling | 24.3 | 20.0 | HHDT |
| Demolition | Onsite truck | — | — | HHDT |
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 18.5 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 10.2 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 20.0 | 18.5 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 10.2 | HHDT,MHDT |
| Grading | Hauling | 0.00 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 645 | 18.5 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 109 | 10.2 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 10.2 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 258 | 18.5 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 10.2 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |

| | | | | |
|---|---|---|---|---|
| Architectural Coating | Onsite truck | — | — | HHDT |
| Infrastructure Improvements | — | — | — | — |
| Infrastructure Improvements | Worker | 645 | 18.5 | LDA,LDT1,LDT2 |
| Infrastructure Improvements | Vendor | 109 | 10.2 | HHDT,MHDT |
| Infrastructure Improvements | Hauling | 0.00 | 20.0 | HHDT |
| Infrastructure Improvements | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

| Control Strategies Applied | PM10 Reduction | PM2.5 Reduction |
|---|---|---|
| Water unpaved roads twice daily | 55% | 55% |
| Limit vehicle speeds on unpaved roads to 25 mph | 44% | 44% |

## 5.5. Architectural Coatings

| Phase Name | Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|---|
| Architectural Coating | 4,105,728 | 1,368,576 | 0.00 | 0.00 | 8,834 |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (cy) | Material Exported (cy) | Acres Graded (acres) | Material Demolished (Ton of Debris) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Demolition | 0.00 | 0.00 | 0.00 | 12,744 | — |
| Site Preparation | — | — | 197 | 0.00 | — |
| Grading | — | — | 525 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 6.20 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 3 | 74% | 74% |
| Water Demolished Area | 2 | 36% | 36% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Single Family Housing | 2.82 | 0% |
| Apartments Low Rise | — | 0% |
| City Park | 0.00 | 0% |
| Other Non-Asphalt Surfaces | 3.38 | 0% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2025 | 0.00 | 532 | 0.03 | < 0.005 |
| 2026 | 0.00 | 532 | 0.03 | < 0.005 |
| 2027 | 0.00 | 532 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 2,416 | 2,416 | 2,416 | 881,840 | 28,649 | 28,649 | 28,649 | 10,456,835 |
| Apartments Low Rise | 5,176 | 5,176 | 5,176 | 1,889,240 | 61,377 | 61,377 | 61,377 | 22,402,558 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| City Park | 677 | 677 | 677 | 246,933 | 11,219 | 11,219 | 11,219 | 4,094,910 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 174 |
| No Fireplaces | 82 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 523 |
| No Fireplaces | 245 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |

| | |
|---|---|
| Pellet Wood Stoves | 0 |

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 4105728 | 1,368,576 | 0.00 | 0.00 | 8,834 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 1,881,731 | 532 | 0.0330 | 0.0040 | 8,010,167 |
| Apartments Low Rise | 3,415,883 | 532 | 0.0330 | 0.0040 | 12,792,237 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Single Family Housing | 10,670,381 | 0.00 |
| Apartments Low Rise | 32,011,142 | 0.00 |

| | | |
|---|---|---|
| City Park | 0.00 | 30,530,835 |
| Other Non-Asphalt Surfaces | 0.00 | 5,254,288 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 247 | — |
| Apartments Low Rise | 568 | — |
| City Park | 1.69 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

#### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

#### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 19.8 | annual days of extreme heat |
| Extreme Precipitation | 3.10 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 6.78 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |

| | |
|---|---|
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |

| | |
|---|---|
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |

| | |
|---|---|
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|
| Land Use | per center park specific plan provisions and traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Construction: Construction Phases | per construction questionnaire from client |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD 445 (Wood Burning) prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

# Center Park Specific Plan - Phase II Custom Report

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4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.2. Mitigated

4.2. Energy

4.2.2. Electricity Emissions By Land Use - Mitigated

4.2.4. Natural Gas Emissions By Land Use - Mitigated

4.3. Area Emissions by Source

4.3.2. Mitigated

4.4. Water Emissions by Land Use

4.4.2. Mitigated

4.5. Waste Emissions by Land Use

4.5.2. Mitigated

4.6. Refrigerant Emissions by Land Use

4.6.2. Mitigated

4.7. Offroad Emissions By Equipment Type

4.7.2. Mitigated

4.8. Stationary Emissions By Equipment Type

4.8.2. Mitigated

4.9. User Defined Emissions By Equipment Type

4.9.2. Mitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.2. Mitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

5.10.4. Landscape Equipment - Mitigated

5.11. Operational Energy Consumption

5.11.2. Mitigated

5.12. Operational Water and Wastewater Consumption

5.12.2. Mitigated

5.13. Operational Waste Generation

5.13.2. Mitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.2. Mitigated

5.15. Operational Off-Road Equipment

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan - Phase II |
| Construction Start Date | 12/2/2026 |
| Operational Year | 2030 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99545776525716, -117.63174085978615 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5259 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 546 | Dwelling Unit | 24.8 | 1,081,080 | 0.00 | — | 1,807 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 2,723 | Dwelling Unit | 105 | 4,592,865 | 0.00 | — | 9,013 | — |
| Strip Mall | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant w/o Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant with Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| General Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| Medical Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| City Park | 36.3 | Acre | 36.3 | 0.00 | 1,582,970 | 1,582,970 | — | — |
| Other Non-Asphalt Surfaces | 7.90 | Acre | 7.90 | 0.00 | 344,124 | 344,124 | — | — |
| Parking Lot | 6.95 | Acre | 6.95 | 0.00 | 0.00 | — | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Construction | C-2* | Limit Heavy-Duty Diesel Vehicle Idling |
| Construction | C-5 | Use Advanced Engine Tiers |
| Construction | C-13 | Use Low-VOC Paints for Construction |
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 16.2 | 13.6 | 78.2 | 199 | 0.17 | 3.06 | 35.3 | 36.9 | 2.82 | 8.81 | 10.3 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| Mit. | 12.5 | 10.5 | 27.4 | 209 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| % Reduced | 23% | 22% | 65% | -5% | — | 88% | — | 3% | 87% | — | 10% | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 1,904 | 1,904 | 64.7 | 259 | 0.24 | 2.14 | 65.6 | 66.8 | 1.97 | 15.6 | 16.6 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| Mit. | 371 | 370 | 47.8 | 264 | 0.24 | 0.53 | 65.6 | 66.1 | 0.37 | 15.6 | 16.0 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| % Reduced | 81% | 81% | 26% | -2% | — | 75% | — | 1% | 81% | — | 4% | — | — | — | — | — | — | — |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 105 | 105 | 38.4 | 113 | 0.10 | 1.29 | 27.1 | 27.6 | 1.19 | 6.47 | 6.84 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| Mit. | 21.4 | 21.1 | 20.5 | 114 | 0.10 | 0.22 | 27.1 | 27.3 | 0.20 | 6.47 | 6.61 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| % Reduced | 80% | 80% | 47% | -2% | — | 83% | — | 1% | 83% | — | 3% | — | — | — | — | — | — | — |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 19.3 | 19.2 | 7.01 | 20.5 | 0.02 | 0.24 | 4.95 | 5.03 | 0.22 | 1.18 | 1.25 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| Mit. | 3.90 | 3.86 | 3.75 | 20.9 | 0.02 | 0.04 | 4.95 | 4.99 | 0.04 | 1.18 | 1.21 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| % Reduced | 80% | 80% | 47% | -2% | — | 83% | — | 1% | 83% | — | 3% | — | — | — | — | — | — | — |

## 2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2027 | 12.5 | 10.5 | 27.4 | 209 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| 2028 | 10.8 | 9.79 | 24.3 | 172 | 0.13 | 0.28 | 32.9 | 33.2 | 0.19 | 7.85 | 8.04 | — | 45,254 | 45,254 | 1.24 | 2.84 | 111 | 46,243 |
| 2029 | 9.89 | 8.99 | 20.8 | 151 | 0.11 | 0.16 | 32.7 | 32.8 | 0.16 | 7.80 | 7.96 | — | 42,706 | 42,706 | 1.12 | 2.73 | 98.2 | 43,647 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 1.49 | 1.05 | 12.1 | 50.9 | 0.11 | 0.21 | 9.89 | 10.1 | 0.21 | 3.52 | 3.73 | — | 13,129 | 13,129 | 0.76 | 0.73 | 0.25 | 13,365 |
| 2027 | 11.9 | 9.93 | 29.0 | 171 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 48,731 | 48,731 | 1.59 | 2.88 | 3.22 | 49,633 |
| 2028 | 20.3 | 18.2 | 47.8 | 264 | 0.24 | 0.53 | 65.6 | 66.1 | 0.35 | 15.6 | 16.0 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| 2029 | 9.78 | 7.90 | 24.2 | 130 | 0.13 | 0.19 | 32.9 | 33.1 | 0.19 | 7.85 | 8.04 | — | 41,995 | 41,995 | 1.23 | 2.75 | 2.55 | 42,848 |
| 2030 | 371 | 370 | 20.8 | 112 | 0.11 | 0.16 | 32.7 | 32.8 | 0.16 | 7.80 | 7.96 | — | 39,526 | 39,526 | 1.07 | 2.73 | 2.26 | 40,370 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.07 | 0.05 | 0.65 | 2.25 | 0.01 | 0.01 | 0.44 | 0.45 | 0.01 | 0.14 | 0.15 | — | 631 | 631 | 0.04 | 0.04 | 0.24 | 644 |
| 2027 | 4.17 | 3.45 | 13.4 | 75.4 | 0.10 | 0.20 | 14.0 | 14.2 | 0.20 | 3.91 | 4.11 | — | 19,987 | 19,987 | 0.76 | 1.09 | 17.3 | 20,349 |
| 2028 | 8.38 | 7.54 | 20.5 | 114 | 0.10 | 0.22 | 27.1 | 27.3 | 0.14 | 6.47 | 6.61 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| 2029 | 6.72 | 5.43 | 16.1 | 89.7 | 0.08 | 0.12 | 23.1 | 23.2 | 0.12 | 5.51 | 5.62 | — | 29,160 | 29,160 | 0.84 | 1.95 | 30.3 | 29,794 |
| 2030 | 21.4 | 21.1 | 2.63 | 15.9 | 0.01 | 0.02 | 4.43 | 4.45 | 0.02 | 1.05 | 1.07 | — | 5,277 | 5,277 | 0.13 | 0.34 | 5.05 | 5,388 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.01 | 0.01 | 0.12 | 0.41 | < 0.005 | < 0.005 | 0.08 | 0.08 | < 0.005 | 0.03 | 0.03 | — | 104 | 104 | 0.01 | 0.01 | 0.04 | 107 |
| 2027 | 0.76 | 0.63 | 2.45 | 13.8 | 0.02 | 0.04 | 2.56 | 2.60 | 0.04 | 0.71 | 0.75 | — | 3,309 | 3,309 | 0.13 | 0.18 | 2.86 | 3,369 |
| 2028 | 1.53 | 1.38 | 3.75 | 20.9 | 0.02 | 0.04 | 4.95 | 4.99 | 0.03 | 1.18 | 1.21 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| 2029 | 1.23 | 0.99 | 2.93 | 16.4 | 0.01 | 0.02 | 4.21 | 4.23 | 0.02 | 1.00 | 1.03 | — | 4,828 | 4,828 | 0.14 | 0.32 | 5.02 | 4,933 |
| 2030 | 3.90 | 3.86 | 0.48 | 2.90 | < 0.005 | < 0.005 | 0.81 | 0.81 | < 0.005 | 0.19 | 0.20 | — | 874 | 874 | 0.02 | 0.06 | 0.84 | 892 |

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 296 | 278 | 145 | 1,508 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.7 | 92.4 | 2,650 | 452,002 | 454,652 | 285 | 17.3 | 1,028 | 467,980 |
| Mit. | 296 | 278 | 145 | 1,506 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.6 | 92.3 | 2,650 | 450,333 | 452,983 | 285 | 17.3 | 1,027 | 466,298 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 270 | 254 | 153 | 1,082 | 3.58 | 3.72 | 349 | 353 | 3.58 | 88.7 | 92.3 | 2,650 | 427,769 | 430,419 | 286 | 17.8 | 186 | 443,057 |
| Mit. | 270 | 254 | 153 | 1,080 | 3.57 | 3.71 | 349 | 353 | 3.58 | 88.6 | 92.2 | 2,650 | 426,132 | 428,782 | 285 | 17.8 | 186 | 441,409 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 282 | 265 | 156 | 1,258 | 3.62 | 3.79 | 345 | 349 | 3.64 | 87.7 | 91.3 | 2,650 | 419,861 | 422,511 | 285 | 17.9 | 537 | 435,494 |
| Mit. | 282 | 265 | 156 | 1,256 | 3.62 | 3.79 | 345 | 349 | 3.63 | 87.5 | 91.2 | 2,650 | 418,220 | 420,870 | 285 | 17.8 | 536 | 433,840 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 51.4 | 48.3 | 28.5 | 230 | 0.66 | 0.69 | 63.0 | 63.7 | 0.66 | 16.0 | 16.7 | 439 | 69,513 | 69,952 | 47.2 | 2.96 | 88.9 | 72,101 |
| Mit. | 51.4 | 48.3 | 28.5 | 229 | 0.66 | 0.69 | 62.9 | 63.6 | 0.66 | 16.0 | 16.6 | 439 | 69,241 | 69,680 | 47.1 | 2.95 | 88.8 | 71,827 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 136 | 121 | 124 | 1,299 | 3.69 | 2.18 | 349 | 351 | 2.04 | 88.6 | 90.6 | — | 378,689 | 378,689 | 14.3 | 16.1 | 864 | 384,694 |
| Area | 157 | 156 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | 0.00 | 13,376 | 13,376 | 0.82 | 0.10 | — | 13,426 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 296 | 278 | 145 | 1,506 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.6 | 92.3 | 2,650 | 450,333 | 452,983 | 285 | 17.3 | 1,027 | 466,298 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 129 | 114 | 133 | 1,071 | 3.45 | 2.18 | 349 | 351 | 2.05 | 88.6 | 90.6 | — | 355,028 | 355,028 | 14.7 | 16.5 | 22.4 | 360,348 |
| Area | 138 | 138 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 270 | 254 | 153 | 1,080 | 3.57 | 3.71 | 349 | 353 | 3.58 | 88.6 | 92.2 | 2,650 | 426,132 | 428,782 | 285 | 17.8 | 186 | 441,409 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 128 | 113 | 136 | 1,112 | 3.49 | 2.18 | 345 | 347 | 2.04 | 87.5 | 89.6 | — | 358,701 | 358,701 | 14.7 | 16.7 | 373 | 364,408 |
| Area | 151 | 150 | 1.25 | 135 | 0.01 | 0.07 | — | 0.07 | 0.05 | — | 0.05 | 0.00 | 1,249 | 1,249 | 0.07 | 0.01 | — | 1,254 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 282 | 265 | 156 | 1,256 | 3.62 | 3.79 | 345 | 349 | 3.63 | 87.5 | 91.2 | 2,650 | 418,220 | 420,870 | 285 | 17.8 | 536 | 433,840 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 23.4 | 20.7 | 24.7 | 203 | 0.64 | 0.40 | 62.9 | 63.3 | 0.37 | 16.0 | 16.4 | — | 59,387 | 59,387 | 2.43 | 2.76 | 61.7 | 60,332 |
| Area | 27.6 | 27.4 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | 0.00 | 207 | 207 | 0.01 | < 0.005 | — | 208 |
| Energy | 0.41 | 0.20 | 3.50 | 1.75 | 0.02 | 0.28 | — | 0.28 | 0.28 | — | 0.28 | — | 9,258 | 9,258 | 0.68 | 0.05 | — | 9,289 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 58.1 | 389 | 447 | 5.98 | 0.14 | — | 640 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 381 | 0.00 | 381 | 38.0 | 0.00 | — | 1,332 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 27.1 | 27.1 |
| Total | 51.4 | 48.3 | 28.5 | 229 | 0.66 | 0.69 | 62.9 | 63.6 | 0.66 | 16.0 | 16.6 | 439 | 69,241 | 69,680 | 47.1 | 2.95 | 88.8 | 71,827 |

# 3. Construction Emissions Details

## 3.2. Demolition (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.26 | 1.07 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 201 | 201 | 0.01 | < 0.005 | — | 202 |
| Demolition | — | — | — | — | — | — | 0.19 | 0.19 | — | 0.03 | 0.03 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.05 | 0.19 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 33.3 | 33.3 | < 0.005 | < 0.005 | — | 33.4 |
| Demolition | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.82 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 190 | 190 | < 0.005 | 0.01 | 0.02 | 192 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.49 | 0.06 | 4.90 | 2.70 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,994 | 3,994 | 0.40 | 0.64 | 0.21 | 4,194 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.3 | 11.3 | < 0.005 | < 0.005 | 0.02 | 11.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.03 | < 0.005 | 0.29 | 0.16 | < 0.005 | < 0.005 | 0.06 | 0.07 | < 0.005 | 0.02 | 0.02 | — | 234 | 234 | 0.02 | 0.04 | 0.21 | 246 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.87 | 1.87 | < 0.005 | < 0.005 | < 0.005 | 1.90 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.05 | 0.03 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 38.8 | 38.8 | < 0.005 | 0.01 | 0.03 | 40.8 |

## 3.4. Demolition (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,439 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,439 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road | 0.11 | 0.11 | 1.35 | 5.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 1,026 | 1,026 | 0.04 | 0.01 | — | 1,030 |
| Demolition | — | — | — | — | — | — | 0.98 | 0.98 | — | 0.15 | 0.15 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.25 | 0.99 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 170 | 170 | 0.01 | < 0.005 | — | 170 |
| Demolition | — | — | — | — | — | — | 0.18 | 0.18 | — | 0.03 | 0.03 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.05 | 1.01 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 203 | 203 | < 0.005 | 0.01 | 0.64 | 206 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.46 | 0.06 | 4.54 | 2.58 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,911 | 3,911 | 0.40 | 0.64 | 7.45 | 4,119 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.06 | 0.76 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 186 | 186 | < 0.005 | 0.01 | 0.02 | 188 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.46 | 0.06 | 4.74 | 2.59 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,912 | 3,912 | 0.40 | 0.64 | 0.19 | 4,113 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.24 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 56.5 | 56.5 | < 0.005 | < 0.005 | 0.08 | 57.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.14 | 0.02 | 1.43 | 0.77 | 0.01 | 0.02 | 0.32 | 0.34 | 0.02 | 0.09 | 0.10 | — | 1,171 | 1,171 | 0.12 | 0.19 | 0.96 | 1,232 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.35 | 9.35 | < 0.005 | < 0.005 | 0.01 | 9.48 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.03 | < 0.005 | 0.26 | 0.14 | < 0.005 | < 0.005 | 0.06 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 194 | 194 | 0.02 | 0.03 | 0.16 | 204 |

## 3.6. Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.09 | 0.94 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 176 | 176 | 0.01 | < 0.005 | — | 177 |
| Dust From Material Movement | — | — | — | — | — | — | 0.17 | 0.17 | — | 0.09 | 0.09 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 29.2 | 29.2 | < 0.005 | < 0.005 | — | 29.3 |
| Dust From Material Movement | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.08 | 0.95 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 222 | 222 | < 0.005 | 0.01 | 0.02 | 224 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.47 | 7.47 | < 0.005 | < 0.005 | 0.01 | 7.57 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.24 | 1.24 | < 0.005 | < 0.005 | < 0.005 | 1.25 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.8. Site Preparation (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 0.84 | 9.20 | 0.02 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,721 | 1,721 | 0.07 | 0.01 | — | 1,727 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | — | 1.66 | 1.66 | — | 0.85 | 0.85 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.03 | 0.03 | 0.15 | 1.68 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 285 | 285 | 0.01 | < 0.005 | — | 286 |
| Dust From Material Movement | — | — | — | — | — | — | 0.30 | 0.30 | — | 0.16 | 0.16 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.06 | 1.17 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 237 | 237 | < 0.005 | 0.01 | 0.74 | 240 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.07 | 0.88 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 217 | 217 | < 0.005 | 0.01 | 0.02 | 220 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.30 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | 0.02 | 0.02 | — | 71.5 | 71.5 | < 0.005 | < 0.005 | 0.10 | 72.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.8 | 11.8 | < 0.005 | < 0.005 | 0.02 | 12.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.10. Grading (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,598 | 6,598 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,598 | 6,598 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.31 | 0.31 | 2.12 | 16.9 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,163 | 3,163 | 0.13 | 0.03 | — | 3,174 |
| Dust From Material Movement | — | — | — | — | — | — | 1.15 | 1.15 | — | 0.46 | 0.46 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.06 | 0.39 | 3.09 | 0.01 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 524 | 524 | 0.02 | < 0.005 | — | 526 |
| Dust From Material Movement | — | — | — | — | — | — | 0.21 | 0.21 | — | 0.08 | 0.08 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.07 | 1.34 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 271 | 271 | < 0.005 | 0.01 | 0.85 | 274 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.08 | 1.01 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 248 | 248 | < 0.005 | 0.01 | 0.02 | 251 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.04 | 0.04 | 0.04 | 0.51 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 121 | 121 | < 0.005 | < 0.005 | 0.18 | 122 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.09 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | — | 20.0 | 20.0 | < 0.005 | < 0.005 | 0.03 | 20.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.12. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipm | 0.06 | 0.06 | 0.51 | 2.67 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 432 | 432 | 0.02 | < 0.005 | — | 433 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.09 | 0.49 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 71.5 | 71.5 | < 0.005 | < 0.005 | — | 71.7 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.36 | 7.85 | 105 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,329 | 27,329 | 0.40 | 1.06 | 2.23 | 27,659 |
| Vendor | 1.06 | 0.23 | 12.2 | 6.55 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,366 | 11,366 | 0.73 | 1.74 | 0.64 | 11,903 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.52 | 1.50 | 1.58 | 20.0 | 0.00 | 0.00 | 5.22 | 5.22 | 0.00 | 1.22 | 1.22 | — | 4,989 | 4,989 | 0.07 | 0.19 | 6.67 | 5,055 |
| Vendor | 0.19 | 0.04 | 2.20 | 1.17 | 0.02 | 0.03 | 0.60 | 0.63 | 0.02 | 0.16 | 0.18 | — | 2,046 | 2,046 | 0.13 | 0.31 | 1.92 | 2,144 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.28 | 0.27 | 0.29 | 3.65 | 0.00 | 0.00 | 0.95 | 0.95 | 0.00 | 0.22 | 0.22 | — | 826 | 826 | 0.01 | 0.03 | 1.10 | 837 |
| Vendor | 0.03 | 0.01 | 0.40 | 0.21 | < 0.005 | 0.01 | 0.11 | 0.11 | < 0.005 | 0.03 | 0.03 | — | 339 | 339 | 0.02 | 0.05 | 0.32 | 355 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.14. Building Construction (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.25 | 0.23 | 2.01 | 10.6 | 0.02 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 1,712 | 1,712 | 0.07 | 0.01 | — | 1,718 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.05 | 0.04 | 0.37 | 1.93 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 283 | 283 | 0.01 | < 0.005 | — | 284 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.41 | 6.78 | 130 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 29,248 | 29,248 | 0.30 | 1.06 | 76.5 | 29,649 |
| Vendor | 0.98 | 0.24 | 11.2 | 6.16 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 11,061 | 11,061 | 0.73 | 1.65 | 21.7 | 11,593 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.12 | 7.00 | 7.80 | 98.1 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 26,840 | 26,840 | 0.35 | 1.06 | 1.98 | 27,167 |
| Vendor | 0.96 | 0.23 | 11.7 | 6.25 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 11,068 | 11,068 | 0.73 | 1.65 | 0.56 | 11,579 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 5.76 | 5.00 | 5.57 | 74.0 | 0.00 | 0.00 | 20.7 | 20.7 | 0.00 | 4.85 | 4.85 | — | 19,439 | 19,439 | 0.25 | 0.76 | 23.6 | 19,696 |
| Vendor | 0.69 | 0.17 | 8.38 | 4.44 | 0.06 | 0.06 | 2.36 | 2.43 | 0.06 | 0.65 | 0.72 | — | 7,903 | 7,903 | 0.52 | 1.18 | 6.71 | 8,274 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.05 | 0.91 | 1.02 | 13.5 | 0.00 | 0.00 | 3.78 | 3.78 | 0.00 | 0.89 | 0.89 | — | 3,218 | 3,218 | 0.04 | 0.13 | 3.90 | 3,261 |
| Vendor | 0.13 | 0.03 | 1.53 | 0.81 | 0.01 | 0.01 | 0.43 | 0.44 | 0.01 | 0.12 | 0.13 | — | 1,308 | 1,308 | 0.09 | 0.20 | 1.11 | 1,370 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.16. Building Construction (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.04 | 0.04 | 0.33 | 1.74 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 281 | 281 | 0.01 | < 0.005 | — | 282 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.06 | 0.32 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 46.6 | 46.6 | < 0.005 | < 0.005 | — | 46.8 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 7.77 | 6.71 | 6.78 | 91.5 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 26,384 | 26,384 | 0.35 | 1.06 | 1.77 | 26,712 |
| Vendor | 0.86 | 0.22 | 11.2 | 6.06 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 10,745 | 10,745 | 0.63 | 1.65 | 0.49 | 11,253 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.91 | 0.78 | 0.80 | 11.3 | 0.00 | 0.00 | 3.40 | 3.40 | 0.00 | 0.80 | 0.80 | — | 3,141 | 3,141 | 0.04 | 0.12 | 3.44 | 3,183 |
| Vendor | 0.10 | 0.03 | 1.32 | 0.71 | 0.01 | 0.01 | 0.39 | 0.40 | 0.01 | 0.11 | 0.12 | — | 1,261 | 1,261 | 0.07 | 0.19 | 0.96 | 1,322 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.14 | 0.15 | 2.06 | 0.00 | 0.00 | 0.62 | 0.62 | 0.00 | 0.15 | 0.15 | — | 520 | 520 | 0.01 | 0.02 | 0.57 | 527 |
| Vendor | 0.02 | < 0.005 | 0.24 | 0.13 | < 0.005 | < 0.005 | 0.07 | 0.07 | < 0.005 | 0.02 | 0.02 | — | 209 | 209 | 0.01 | 0.03 | 0.16 | 219 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.18. Infrastructure Improvements (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.10 | 0.84 | 4.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 718 | 718 | 0.03 | 0.01 | — | 720 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.15 | 0.81 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 119 | 119 | < 0.005 | < 0.005 | — | 119 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 10.3 | 9.26 | 7.85 | 150 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 30,366 | 30,366 | 0.35 | 1.06 | 95.5 | 30,788 |
| Vendor | 1.08 | 0.24 | 12.2 | 6.65 | 0.09 | 0.18 | 3.34 | 3.52 | 0.18 | 0.92 | 1.10 | — | 11,626 | 11,626 | 0.83 | 1.74 | 27.9 | 12,192 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 9.78 | 8.66 | 8.86 | 113 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,854 | 27,854 | 0.40 | 1.06 | 2.47 | 28,184 |
| Vendor | 1.06 | 0.23 | 12.8 | 6.75 | 0.09 | 0.18 | 3.34 | 3.52 | 0.18 | 0.92 | 1.10 | — | 11,633 | 11,633 | 0.83 | 1.74 | 0.72 | 12,172 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.94 | 2.61 | 2.93 | 35.6 | 0.00 | 0.00 | 8.68 | 8.68 | 0.00 | 2.03 | 2.03 | — | 8,457 | 8,457 | 0.12 | 0.32 | 12.3 | 8,567 |
| Vendor | 0.32 | 0.07 | 3.84 | 2.01 | 0.03 | 0.05 | 0.99 | 1.04 | 0.05 | 0.27 | 0.33 | — | 3,482 | 3,482 | 0.25 | 0.52 | 3.60 | 3,647 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.54 | 0.48 | 0.53 | 6.49 | 0.00 | 0.00 | 1.58 | 1.58 | 0.00 | 0.37 | 0.37 | — | 1,400 | 1,400 | 0.02 | 0.05 | 2.04 | 1,418 |
| Vendor | 0.06 | 0.01 | 0.70 | 0.37 | < 0.005 | 0.01 | 0.18 | 0.19 | 0.01 | 0.05 | 0.06 | — | 576 | 576 | 0.04 | 0.09 | 0.60 | 604 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.20. Infrastructure Improvements (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.23 | 0.22 | 1.85 | 9.75 | 0.02 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 1,576 | 1,576 | 0.06 | 0.01 | — | 1,582 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.04 | 0.04 | 0.34 | 1.78 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 261 | 261 | 0.01 | < 0.005 | — | 262 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 9.01 | 8.86 | 7.75 | 139 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 29,788 | 29,788 | 0.35 | 1.06 | 85.6 | 30,199 |
| Vendor | 1.07 | 0.24 | 11.7 | 6.44 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,359 | 11,359 | 0.73 | 1.74 | 24.7 | 11,920 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.36 | 7.85 | 105 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,329 | 27,329 | 0.40 | 1.06 | 2.23 | 27,659 |
| Vendor | 1.06 | 0.23 | 12.2 | 6.55 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,366 | 11,366 | 0.73 | 1.74 | 0.64 | 11,903 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 5.57 | 5.47 | 5.76 | 73.1 | 0.00 | 0.00 | 19.1 | 19.1 | 0.00 | 4.46 | 4.46 | — | 18,222 | 18,222 | 0.26 | 0.70 | 24.4 | 18,461 |
| Vendor | 0.70 | 0.15 | 8.05 | 4.27 | 0.06 | 0.12 | 2.17 | 2.29 | 0.06 | 0.60 | 0.66 | — | 7,471 | 7,471 | 0.48 | 1.14 | 7.01 | 7,830 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.02 | 1.00 | 1.05 | 13.3 | 0.00 | 0.00 | 3.48 | 3.48 | 0.00 | 0.81 | 0.81 | — | 3,017 | 3,017 | 0.04 | 0.12 | 4.03 | 3,056 |
| Vendor | 0.13 | 0.03 | 1.47 | 0.78 | 0.01 | 0.02 | 0.40 | 0.42 | 0.01 | 0.11 | 0.12 | — | 1,237 | 1,237 | 0.08 | 0.19 | 1.16 | 1,296 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.22. Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.05 | 0.05 | 0.58 | 3.17 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 452 | 452 | 0.02 | < 0.005 | — | 454 |
| Paving | 0.04 | 0.04 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.01 | 0.01 | 0.11 | 0.58 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 74.9 | 74.9 | < 0.005 | < 0.005 | — | 75.2 |
| Paving | 0.01 | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.05 | 0.93 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 199 | 199 | < 0.005 | 0.01 | 0.57 | 202 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.05 | 0.70 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 183 | 183 | < 0.005 | 0.01 | 0.01 | 185 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.22 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 55.4 | 55.4 | < 0.005 | < 0.005 | 0.07 | 56.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.18 | 9.18 | < 0.005 | < 0.005 | 0.01 | 9.30 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.24. Paving (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.12 | 0.66 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 94.6 | 94.6 | < 0.005 | < 0.005 | — | 94.9 |
| Paving | 0.01 | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.12 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 15.7 | 15.7 | < 0.005 | < 0.005 | — | 15.7 |
| Paving | < 0.005 | < 0.005 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.05 | 0.05 | 0.66 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 179 | 179 | < 0.005 | 0.01 | 0.01 | 182 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.4 | 11.4 | < 0.005 | < 0.005 | 0.01 | 11.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.89 | 1.89 | < 0.005 | < 0.005 | < 0.005 | 1.91 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.26. Architectural Coating (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.02 | 0.02 | 0.65 | 0.96 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 368 | 368 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.04 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 7.32 | 7.32 | < 0.005 | < 0.005 | — | 7.34 |
| Architectural Coatings | 20.1 | 20.1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.21 | 1.21 | < 0.005 | < 0.005 | — | 1.22 |
| Architectural Coatings | 3.68 | 3.68 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 3.11 | 2.68 | 2.71 | 36.6 | 0.00 | 0.00 | 11.7 | 11.7 | 0.00 | 2.75 | 2.75 | — | 10,554 | 10,554 | 0.14 | 0.43 | 0.71 | 10,685 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.15 | 0.15 | 2.11 | 0.00 | 0.00 | 0.64 | 0.64 | 0.00 | 0.15 | 0.15 | — | 586 | 586 | 0.01 | 0.02 | 0.64 | 594 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.38 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 97.1 | 97.1 | < 0.005 | < 0.005 | 0.11 | 98.4 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 12.0 | 10.8 | 9.76 | 99.6 | 0.27 | 0.16 | 25.8 | 26.0 | 0.15 | 6.55 | 6.71 | — | 28,143 | 28,143 | 1.15 | 1.24 | 63.9 | 28,604 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 51.3 | 46.3 | 41.7 | 426 | 1.17 | 0.70 | 110 | 111 | 0.66 | 28.0 | 28.7 | — | 120,328 | 120,328 | 4.91 | 5.28 | 273 | 122,298 |
| Strip Mall | 2.36 | 2.08 | 2.35 | 25.1 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 7,456 | 7,456 | 0.27 | 0.31 | 17.1 | 7,571 |
| Fast Food Restaurant w/o Drive Thru | 27.5 | 24.2 | 27.4 | 292 | 0.85 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 86,775 | 86,775 | 3.11 | 3.59 | 198 | 88,122 |
| Fast Food Restaurant with Drive Thru | 28.6 | 25.1 | 28.4 | 303 | 0.88 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 90,049 | 90,049 | 3.22 | 3.73 | 206 | 91,447 |
| General Office Building | 2.14 | 1.88 | 2.14 | 22.7 | 0.07 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,760 | 6,760 | 0.24 | 0.28 | 15.5 | 6,865 |
| Medical Office Building | 7.12 | 6.25 | 7.09 | 75.5 | 0.22 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 22,460 | 22,460 | 0.80 | 0.93 | 51.4 | 22,809 |
| City Park | 5.30 | 4.66 | 5.28 | 56.2 | 0.16 | 0.10 | 15.5 | 15.5 | 0.09 | 3.92 | 4.01 | — | 16,719 | 16,719 | 0.60 | 0.69 | 38.2 | 16,978 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 136 | 121 | 124 | 1,299 | 3.69 | 2.18 | 349 | 351 | 2.04 | 88.6 | 90.6 | — | 378,689 | 378,689 | 14.3 | 16.1 | 864 | 384,694 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 11.3 | 10.2 | 10.5 | 83.2 | 0.26 | 0.16 | 25.8 | 26.0 | 0.15 | 6.55 | 6.71 | — | 26,394 | 26,394 | 1.19 | 1.27 | 1.66 | 26,805 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 48.5 | 43.5 | 44.8 | 356 | 1.10 | 0.70 | 110 | 111 | 0.66 | 28.0 | 28.7 | — | 112,852 | 112,852 | 5.07 | 5.44 | 7.08 | 114,608 |
| Strip Mall | 2.25 | 1.96 | 2.53 | 20.5 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 6,988 | 6,988 | 0.27 | 0.32 | 0.44 | 7,090 |
| Fast Food Restaurant w/o Drive Thru | 26.2 | 22.8 | 29.5 | 238 | 0.79 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 81,334 | 81,334 | 3.17 | 3.70 | 5.15 | 82,522 |
| Fast Food Restaurant with Drive Thru | 27.2 | 23.7 | 30.6 | 247 | 0.82 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 84,402 | 84,402 | 3.29 | 3.84 | 5.34 | 85,635 |
| General Office Building | 2.04 | 1.78 | 2.29 | 18.5 | 0.06 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,336 | 6,336 | 0.25 | 0.29 | 0.40 | 6,429 |
| Medical Office Building | 6.77 | 5.91 | 7.62 | 61.6 | 0.20 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 21,052 | 21,052 | 0.82 | 0.96 | 1.33 | 21,359 |
| City Park | 5.04 | 4.40 | 5.67 | 45.9 | 0.15 | 0.10 | 15.5 | 15.5 | 0.09 | 3.92 | 4.01 | — | 15,670 | 15,670 | 0.61 | 0.71 | 0.99 | 15,899 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 129 | 114 | 133 | 1,071 | 3.45 | 2.18 | 349 | 351 | 2.05 | 88.6 | 90.6 | — | 355,028 | 355,028 | 14.7 | 16.5 | 22.4 | 360,348 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 2.05 | 1.84 | 1.94 | 15.7 | 0.05 | 0.03 | 4.65 | 4.68 | 0.03 | 1.18 | 1.21 | — | 4,415 | 4,415 | 0.20 | 0.21 | 4.57 | 4,488 |
| Apartments Low Rise | 8.78 | 7.87 | 8.29 | 67.3 | 0.20 | 0.13 | 19.9 | 20.0 | 0.12 | 5.05 | 5.17 | — | 18,876 | 18,876 | 0.84 | 0.91 | 19.5 | 19,187 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | 0.41 | 0.36 | 0.47 | 3.88 | 0.01 | 0.01 | 1.24 | 1.25 | 0.01 | 0.32 | 0.32 | — | 1,169 | 1,169 | 0.05 | 0.05 | 1.22 | 1,187 |
| Fast Food Restaurant w/o Drive Thru | 4.74 | 4.13 | 5.47 | 45.2 | 0.15 | 0.09 | 14.5 | 14.6 | 0.08 | 3.67 | 3.76 | — | 13,606 | 13,606 | 0.53 | 0.62 | 14.2 | 13,817 |
| Fast Food Restaurant with Drive Thru | 4.92 | 4.29 | 5.67 | 46.9 | 0.15 | 0.09 | 15.0 | 15.1 | 0.09 | 3.81 | 3.90 | — | 14,119 | 14,119 | 0.54 | 0.64 | 14.7 | 14,338 |
| General Office Building | 0.37 | 0.32 | 0.43 | 3.52 | 0.01 | 0.01 | 1.13 | 1.13 | 0.01 | 0.29 | 0.29 | — | 1,060 | 1,060 | 0.04 | 0.05 | 1.11 | 1,076 |
| Medical Office Building | 1.23 | 1.07 | 1.42 | 11.7 | 0.04 | 0.02 | 3.74 | 3.77 | 0.02 | 0.95 | 0.97 | — | 3,522 | 3,522 | 0.14 | 0.16 | 3.67 | 3,576 |
| City Park | 0.91 | 0.80 | 1.05 | 8.70 | 0.03 | 0.02 | 2.79 | 2.80 | 0.02 | 0.71 | 0.72 | — | 2,621 | 2,621 | 0.10 | 0.12 | 2.73 | 2,662 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 23.4 | 20.7 | 24.7 | 203 | 0.64 | 0.40 | 62.9 | 63.3 | 0.37 | 16.0 | 16.4 | — | 59,387 | 59,387 | 2.43 | 2.76 | 61.7 | 60,332 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 5,849 | 5,849 | 0.36 | 0.04 | — | 5,872 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 17,652 | 17,652 | 1.09 | 0.13 | — | 17,719 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 31,818 | 31,818 | 1.97 | 0.24 | — | 31,939 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 5,849 | 5,849 | 0.36 | 0.04 | — | 5,872 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 17,652 | 17,652 | 1.09 | 0.13 | — | 17,719 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 31,818 | 31,818 | 1.97 | 0.24 | — | 31,939 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 968 | 968 | 0.06 | 0.01 | — | 972 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 2,922 | 2,922 | 0.18 | 0.02 | — | 2,934 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 90.6 | 90.6 | 0.01 | < 0.005 | — | 91.0 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 64.0 | 64.0 | < 0.005 | < 0.005 | — | 64.3 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 5,268 | 5,268 | 0.33 | 0.04 | — | 5,288 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.50 | 0.25 | 4.31 | 1.84 | 0.03 | 0.35 | — | 0.35 | 0.35 | — | 0.35 | — | 5,475 | 5,475 | 0.48 | 0.01 | — | 5,490 |
| Apartments Low Rise | 1.34 | 0.67 | 11.5 | 4.87 | 0.07 | 0.93 | — | 0.93 | 0.93 | — | 0.93 | — | 14,536 | 14,536 | 1.29 | 0.03 | — | 14,576 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 24,100 | 24,100 | 2.13 | 0.05 | — | 24,167 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.50 | 0.25 | 4.31 | 1.84 | 0.03 | 0.35 | — | 0.35 | 0.35 | — | 0.35 | — | 5,475 | 5,475 | 0.48 | 0.01 | — | 5,490 |
| Apartments Low Rise | 1.34 | 0.67 | 11.5 | 4.87 | 0.07 | 0.93 | — | 0.93 | 0.93 | — | 0.93 | — | 14,536 | 14,536 | 1.29 | 0.03 | — | 14,576 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 24,100 | 24,100 | 2.13 | 0.05 | — | 24,167 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 0.09 | 0.05 | 0.79 | 0.33 | 0.01 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 906 | 906 | 0.08 | < 0.005 | — | 909 |
| Apartments Low Rise | 0.24 | 0.12 | 2.09 | 0.89 | 0.01 | 0.17 | — | 0.17 | 0.17 | — | 0.17 | — | 2,407 | 2,407 | 0.21 | < 0.005 | — | 2,413 |
| Strip Mall | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | — | 12.1 |
| Fast Food Restaurant w/o Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| Fast Food Restaurant with Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| General Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| Medical Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.41 | 0.20 | 3.50 | 1.75 | 0.02 | 0.28 | — | 0.28 | 0.28 | — | 0.28 | — | 3,990 | 3,990 | 0.35 | 0.01 | — | 4,001 |

## 4.3. Area Emissions by Source

## 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Consumer Products | 128 | 128 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 10.4 | 10.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 18.9 | 17.8 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | — | 541 | 541 | 0.02 | < 0.005 | — | 543 |
| Total | 157 | 156 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | 0.00 | 13,376 | 13,376 | 0.82 | 0.10 | — | 13,426 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Consumer Products | 128 | 128 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 10.4 | 10.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 138 | 138 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 146 | 146 | 0.01 | < 0.005 | — | 146 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Consum Products | 23.3 | 23.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 1.90 | 1.90 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 2.36 | 2.23 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 61.3 | 61.3 | < 0.005 | < 0.005 | — | 61.5 |
| Total | 27.6 | 27.4 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | 0.00 | 207 | 207 | 0.01 | < 0.005 | — | 208 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 43.6 | 226 | 269 | 4.49 | 0.11 | — | 414 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 217 | 1,126 | 1,344 | 22.4 | 0.54 | — | 2,063 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 437 | 437 | 0.03 | < 0.005 | — | 439 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 95.0 | 95.0 | 0.01 | < 0.005 | — | 95.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 43.6 | 226 | 269 | 4.49 | 0.11 | — | 414 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 217 | 1,126 | 1,344 | 22.4 | 0.54 | — | 2,063 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 437 | 437 | 0.03 | < 0.005 | — | 439 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 95.0 | 95.0 | 0.01 | < 0.005 | — | 95.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 7.22 | 37.4 | 44.6 | 0.74 | 0.02 | — | 68.5 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 36.0 | 186 | 222 | 3.70 | 0.09 | — | 342 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 4.78 | 5.68 | 0.09 | < 0.005 | — | 8.69 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 3.81 | 19.9 | 23.7 | 0.39 | 0.01 | — | 36.3 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 2.69 | 14.1 | 16.8 | 0.28 | 0.01 | — | 25.7 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 72.3 | 72.3 | < 0.005 | < 0.005 | — | 72.6 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 15.7 | 15.7 | < 0.005 | < 0.005 | — | 15.8 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 58.1 | 389 | 447 | 5.98 | 0.14 | — | 640 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 284 | 0.00 | 284 | 28.4 | 0.00 | — | 995 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,085 | 0.00 | 1,085 | 108 | 0.00 | — | 3,797 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 1.68 | 0.00 | 1.68 | 0.17 | 0.00 | — | 5.89 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 284 | 0.00 | 284 | 28.4 | 0.00 | — | 995 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,085 | 0.00 | 1,085 | 108 | 0.00 | — | 3,797 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 1.68 | 0.00 | 1.68 | 0.17 | 0.00 | — | 5.89 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 47.1 | 0.00 | 47.1 | 4.71 | 0.00 | — | 165 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 180 | 0.00 | 180 | 18.0 | 0.00 | — | 629 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 3.62 | 0.00 | 3.62 | 0.36 | 0.00 | — | 12.7 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 5.61 | 0.00 | 5.61 | 0.56 | 0.00 | — | 19.6 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 65.1 | 0.00 | 65.1 | 6.51 | 0.00 | — | 228 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.28 | 0.00 | 0.28 | 0.03 | 0.00 | — | 0.98 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 381 | 0.00 | 381 | 38.0 | 0.00 | — | 1,332 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.74 | 7.74 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 32.9 | 32.9 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.74 | 7.74 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 32.9 | 32.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.28 | 1.28 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.45 | 5.45 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.04 | 0.04 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.03 | 0.03 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.29 | 0.29 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 27.1 | 27.1 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

### 4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Demolition | Demolition | 12/2/2026 | 6/2/2027 | 5.00 | 131 | — |

| | | | | | | |
|---|---|---|---|---|---|---|
| Site Preparation | Site Preparation | 12/15/2026 | 6/15/2027 | 5.00 | 131 | — |
| Grading | Grading | 4/1/2027 | 12/1/2027 | 5.00 | 175 | — |
| Building Construction | Building Construction | 10/1/2028 | 3/1/2030 | 5.00 | 370 | — |
| Infrastructure Improvements | Building Construction | 8/1/2027 | 12/1/2028 | 5.00 | 350 | — |
| Paving | Paving | 8/1/2028 | 2/1/2029 | 5.00 | 133 | — |
| Architectural Coating | Architectural Coating | 3/2/2030 | 3/30/2030 | 5.00 | 20.0 | — |

## 5.2. Off-Road Equipment

### 5.2.2. Mitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Demolition | Rubber Tired Dozers | Diesel | Tier 4 Final | 2.00 | 8.00 | 367 | 0.40 |
| Demolition | Excavators | Diesel | Tier 4 Final | 3.00 | 8.00 | 36.0 | 0.38 |
| Demolition | Concrete/Industrial Saws | Diesel | Tier 4 Final | 1.00 | 8.00 | 33.0 | 0.73 |
| Site Preparation | Rubber Tired Dozers | Diesel | Tier 4 Final | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Graders | Diesel | Tier 4 Final | 1.00 | 8.00 | 148 | 0.41 |
| Grading | Excavators | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Grading | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 2.00 | 8.00 | 84.0 | 0.37 |
| Grading | Scrapers | Diesel | Tier 4 Final | 2.00 | 8.00 | 423 | 0.48 |
| Grading | Rubber Tired Dozers | Diesel | Tier 4 Final | 1.00 | 8.00 | 367 | 0.40 |
| Building Construction | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Building Construction | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Infrastructure Improvements | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Infrastructure Improvements | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Infrastructure Improvements | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Infrastructure Improvements | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Infrastructure Improvements | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Paving | Pavers | Diesel | Tier 4 Final | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Tier 4 Final | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Tier 4 Final | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.2. Mitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Demolition | — | — | — | — |
| Demolition | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Demolition | Vendor | — | 10.2 | HHDT,MHDT |
| Demolition | Hauling | 58.8 | 20.0 | HHDT |
| Demolition | Onsite truck | — | — | HHDT |
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 18.5 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 10.2 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |

| | | | | |
|---|---|---|---|---|
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 20.0 | 18.5 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 10.2 | HHDT,MHDT |
| Grading | Hauling | 0.00 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 2,245 | 18.5 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 391 | 10.2 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 10.2 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 898 | 18.5 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 10.2 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |
| Architectural Coating | Onsite truck | — | — | HHDT |
| Infrastructure Improvements | — | — | — | — |
| Infrastructure Improvements | Worker | 2,245 | 18.5 | LDA,LDT1,LDT2 |
| Infrastructure Improvements | Vendor | 391 | 10.2 | HHDT,MHDT |
| Infrastructure Improvements | Hauling | 0.00 | 20.0 | HHDT |
| Infrastructure Improvements | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

| Control Strategies Applied | PM10 Reduction | PM2.5 Reduction |
|---|---|---|
| Water unpaved roads twice daily | 55% | 55% |
| Limit vehicle speeds on unpaved roads to 25 mph | 44% | 44% |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (cy) | Material Exported (cy) | Acres Graded (acres) | Material Demolished (Ton of Debris) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Demolition | 0.00 | 0.00 | 0.00 | 30,810 | — |
| Site Preparation | — | — | 197 | 0.00 | — |
| Grading | — | — | 525 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 20.9 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 3 | 74% | 74% |
| Water Demolished Area | 2 | 36% | 36% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Single Family Housing | 6.02 | 0% |
| Apartments Low Rise | — | 0% |
| Strip Mall | 0.00 | 0% |
| Fast Food Restaurant w/o Drive Thru | 0.00 | 0% |
| Fast Food Restaurant with Drive Thru | 0.00 | 0% |

| | | |
|---|---|---|
| General Office Building | 0.00 | 0% |
| Medical Office Building | 0.00 | 0% |
| City Park | 0.00 | 0% |
| Other Non-Asphalt Surfaces | 7.90 | 0% |
| Parking Lot | 6.95 | 100% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2026 | 0.00 | 532 | 0.03 | < 0.005 |
| 2027 | 0.00 | 532 | 0.03 | < 0.005 |
| 2028 | 0.00 | 532 | 0.03 | < 0.005 |
| 2029 | 0.00 | 532 | 0.03 | < 0.005 |
| 2030 | 0.00 | 532 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 3,432 | 3,432 | 3,432 | 1,252,547 | 36,394 | 36,394 | 36,394 | 13,283,984 |
| Apartments Low Rise | 14,672 | 14,672 | 14,672 | 5,355,413 | 155,609 | 155,609 | 155,609 | 56,797,233 |
| Strip Mall | 593 | 593 | 593 | 216,323 | 9,717 | 9,717 | 9,717 | 3,546,684 |
| Fast Food Restaurant w/o Drive Thru | 6,898 | 6,898 | 6,898 | 2,517,742 | 113,094 | 113,094 | 113,094 | 41,279,181 |
| Fast Food Restaurant with Drive Thru | 7,158 | 7,158 | 7,158 | 2,612,719 | 117,360 | 117,360 | 117,360 | 42,836,349 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| General Office Building | 537 | 537 | 537 | 196,143 | 8,811 | 8,811 | 8,811 | 3,215,834 |
| Medical Office Building | 1,785 | 1,785 | 1,785 | 651,668 | 29,272 | 29,272 | 29,272 | 10,684,302 |
| City Park | 1,329 | 1,329 | 1,329 | 485,088 | 21,790 | 21,790 | 21,790 | 7,953,171 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 372 |
| No Fireplaces | 174 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 1855 |

| | |
|---|---|
| No Fireplaces | 868 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 11489737.756275 | 3,829,913 | 376,382 | 125,461 | 38,822 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 4,013,379 | 532 | 0.0330 | 0.0040 | 17,084,185 |
| Apartments Low Rise | 12,111,261 | 532 | 0.0330 | 0.0040 | 45,355,810 |
| Strip Mall | 375,543 | 532 | 0.0330 | 0.0040 | 227,584 |
| Fast Food Restaurant w/o Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| Fast Food Restaurant with Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| General Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |

| | | | | | |
|---|---|---|---|---|---|
| Medical Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Parking Lot | 265,355 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Single Family Housing | 22,757,922 | 0.00 |
| Apartments Low Rise | 113,497,840 | 0.00 |
| Strip Mall | 2,859,422 | 61,993 |
| Fast Food Restaurant w/o Drive Thru | 11,717,312 | 61,993 |
| Fast Food Restaurant with Drive Thru | 11,717,312 | 61,993 |
| General Office Building | 12,006,981 | 108,488 |
| Medical Office Building | 8,476,963 | 108,488 |
| City Park | 0.00 | 56,491,371 |
| Other Non-Asphalt Surfaces | 0.00 | 12,280,733 |
| Parking Lot | 0.00 | 0.00 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 528 | — |
| Apartments Low Rise | 2,014 | — |
| Strip Mall | 40.5 | — |
| Fast Food Restaurant w/o Drive Thru | 445 | — |

| | | |
|---|---|---|
| Fast Food Restaurant with Drive Thru | 445 | — |
| General Office Building | 62.8 | — |
| Medical Office Building | 730 | — |
| City Park | 3.13 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |
| Parking Lot | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Strip Mall | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Strip Mall | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |
| Strip Mall | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant w/o Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant w/o Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant with Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant with Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant with Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| General Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.02 | 0.60 | 0.00 | 1.00 |
| General Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Medical Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.45 | 0.60 | 0.00 | 1.00 |
| Medical Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 17.8 | annual days of extreme heat |
| Extreme Precipitation | 3.00 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 9.13 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |

| | |
|---|---|
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |

| | |
|---|---|
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |

| | |
|---|---|
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |

| | |
|---|---|
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|

| | |
|---|---|
| Land Use | per center park specific plan provisions and traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Construction: Construction Phases | per construction questionnaire from client |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD Rule 445 (Wood Burning) - prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

# Center Park Specific Plan - Buildout Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan - Buildout |
| Operational Year | 2030 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99497622020672, -117.6290606636939 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5259 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 802 | Dwelling Unit | 36.5 | 1,587,960 | 0.00 | — | 2,655 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 3,491 | Dwelling Unit | 140 | 6,113,505 | 0.00 | — | 11,555 | — |
| Strip Mall | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant w/o Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant with Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| General Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| Medical Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| City Park | 56.0 | Acre | 56.0 | 0.00 | 2,438,489 | 2,438,489 | — | — |
| Other Non-Asphalt Surfaces | 11.3 | Acre | 11.3 | 0.00 | 491,357 | 491,357 | — | — |
| Parking Lot | 6.95 | Acre | 6.95 | 0.00 | 0.00 | — | — | — |

### 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

### 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 378 | 358 | 175 | 1,817 | 4.55 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 542,346 | 545,518 | 342 | 20.7 | 1,204 | 561,449 |
| Mit. | 378 | 357 | 175 | 1,815 | 4.54 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 540,295 | 543,467 | 342 | 20.7 | 1,202 | 559,383 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 346 | 326 | 184 | 1,292 | 4.26 | 4.55 | 414 | 419 | 4.39 | 105 | 110 | 3,172 | 513,554 | 516,727 | 342 | 21.3 | 205 | 531,841 |
| Mit. | 345 | 326 | 184 | 1,290 | 4.25 | 4.55 | 414 | 418 | 4.39 | 105 | 109 | 3,172 | 511,537 | 514,709 | 342 | 21.3 | 205 | 529,811 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 361 | 341 | 188 | 1,515 | 4.31 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 502,691 | 505,864 | 341 | 21.3 | 621 | 521,381 |
| Mit. | 361 | 340 | 188 | 1,514 | 4.30 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 500,669 | 503,841 | 341 | 21.3 | 620 | 519,344 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 65.9 | 62.2 | 34.4 | 277 | 0.79 | 0.85 | 74.7 | 75.6 | 0.81 | 19.0 | 19.8 | 525 | 83,226 | 83,752 | 56.5 | 3.53 | 103 | 86,321 |
| Mit. | 65.8 | 62.1 | 34.3 | 276 | 0.79 | 0.85 | 74.6 | 75.5 | 0.81 | 19.0 | 19.8 | 525 | 82,891 | 83,417 | 56.5 | 3.53 | 103 | 85,983 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 165 | 148 | 148 | 1,548 | 4.38 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 449,461 | 449,461 | 17.1 | 19.1 | 1,024 | 456,617 |
| Area | 210 | 208 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | 0.00 | 17,551 | 17,551 | 1.07 | 0.13 | — | 17,618 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 378 | 357 | 175 | 1,815 | 4.54 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 540,295 | 543,467 | 342 | 20.7 | 1,202 | 559,383 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 157 | 139 | 159 | 1,278 | 4.10 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 421,399 | 421,399 | 17.6 | 19.7 | 26.6 | 427,743 |
| Area | 186 | 186 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 345 | 326 | 184 | 1,290 | 4.25 | 4.55 | 414 | 418 | 4.39 | 105 | 109 | 3,172 | 511,537 | 514,709 | 342 | 21.3 | 205 | 529,811 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 156 | 138 | 162 | 1,327 | 4.14 | 2.59 | 409 | 411 | 2.43 | 104 | 106 | — | 425,755 | 425,755 | 17.6 | 19.9 | 442 | 432,559 |
| Area | 202 | 201 | 1.62 | 175 | 0.01 | 0.09 | — | 0.09 | 0.07 | — | 0.07 | 0.00 | 1,631 | 1,631 | 0.09 | 0.01 | — | 1,637 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 361 | 340 | 188 | 1,514 | 4.30 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 500,669 | 503,841 | 341 | 21.3 | 620 | 519,344 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mobile | 28.4 | 25.2 | 29.6 | 242 | 0.76 | 0.47 | 74.6 | 75.1 | 0.44 | 19.0 | 19.4 | — | 70,489 | 70,489 | 2.92 | 3.29 | 73.2 | 71,615 |
| Area | 36.9 | 36.7 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 270 | 270 | 0.02 | < 0.005 | — | 271 |
| Energy | 0.52 | 0.26 | 4.46 | 2.16 | 0.03 | 0.36 | — | 0.36 | 0.36 | — | 0.36 | — | 11,640 | 11,640 | 0.86 | 0.06 | — | 11,679 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 71.6 | 493 | 564 | 7.37 | 0.18 | — | 802 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 454 | 0.00 | 454 | 45.3 | 0.00 | — | 1,587 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 29.5 | 29.5 |
| Total | 65.8 | 62.1 | 34.3 | 276 | 0.79 | 0.85 | 74.6 | 75.5 | 0.81 | 19.0 | 19.8 | 525 | 82,891 | 83,417 | 56.5 | 3.53 | 103 | 85,983 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 20.4 | 18.5 | 16.6 | 170 | 0.47 | 0.28 | 44.0 | 44.3 | 0.26 | 11.2 | 11.4 | — | 47,956 | 47,956 | 1.96 | 2.11 | 109 | 48,741 |
| Apartments Low Rise | 69.3 | 62.6 | 56.4 | 576 | 1.58 | 0.95 | 149 | 150 | 0.89 | 37.9 | 38.8 | — | 162,776 | 162,776 | 6.64 | 7.15 | 369 | 165,441 |
| Strip Mall | 2.36 | 2.08 | 2.35 | 25.1 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 7,456 | 7,456 | 0.27 | 0.31 | 17.1 | 7,571 |
| Fast Food Restaurant w/o Drive Thru | 27.5 | 24.2 | 27.4 | 292 | 0.85 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 86,775 | 86,775 | 3.11 | 3.59 | 198 | 88,122 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 28.6 | 25.1 | 28.4 | 303 | 0.88 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 90,049 | 90,049 | 3.22 | 3.73 | 206 | 91,447 |
| General Office Building | 2.14 | 1.88 | 2.14 | 22.7 | 0.07 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,760 | 6,760 | 0.24 | 0.28 | 15.5 | 6,865 |
| Medical Office Building | 7.12 | 6.25 | 7.09 | 75.5 | 0.22 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 22,460 | 22,460 | 0.80 | 0.93 | 51.4 | 22,809 |
| City Park | 8.00 | 7.03 | 7.97 | 84.8 | 0.25 | 0.14 | 23.3 | 23.5 | 0.14 | 5.92 | 6.06 | — | 25,229 | 25,229 | 0.90 | 1.05 | 57.7 | 25,621 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 165 | 148 | 148 | 1,548 | 4.38 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 449,461 | 449,461 | 17.1 | 19.1 | 1,024 | 456,617 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 19.3 | 17.4 | 17.8 | 142 | 0.44 | 0.28 | 44.0 | 44.3 | 0.26 | 11.2 | 11.4 | — | 44,977 | 44,977 | 2.02 | 2.17 | 2.82 | 45,677 |
| Apartments Low Rise | 65.6 | 58.9 | 60.5 | 481 | 1.48 | 0.95 | 149 | 150 | 0.89 | 37.9 | 38.8 | — | 152,663 | 152,663 | 6.86 | 7.36 | 9.58 | 155,039 |
| Strip Mall | 2.25 | 1.96 | 2.53 | 20.5 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 6,988 | 6,988 | 0.27 | 0.32 | 0.44 | 7,090 |
| Fast Food Restaurant w/o Drive Thru | 26.2 | 22.8 | 29.5 | 238 | 0.79 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 81,334 | 81,334 | 3.17 | 3.70 | 5.15 | 82,522 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 27.2 | 23.7 | 30.6 | 247 | 0.82 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 84,402 | 84,402 | 3.29 | 3.84 | 5.34 | 85,635 |
| General Office Building | 2.04 | 1.78 | 2.29 | 18.5 | 0.06 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,336 | 6,336 | 0.25 | 0.29 | 0.40 | 6,429 |
| Medical Office Building | 6.77 | 5.91 | 7.62 | 61.6 | 0.20 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 21,052 | 21,052 | 0.82 | 0.96 | 1.33 | 21,359 |
| City Park | 7.61 | 6.64 | 8.56 | 69.2 | 0.23 | 0.14 | 23.3 | 23.5 | 0.14 | 5.92 | 6.06 | — | 23,647 | 23,647 | 0.92 | 1.08 | 1.50 | 23,992 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 157 | 139 | 159 | 1,278 | 4.10 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 421,399 | 421,399 | 17.6 | 19.7 | 26.6 | 427,743 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 3.50 | 3.14 | 3.30 | 26.8 | 0.08 | 0.05 | 7.93 | 7.98 | 0.05 | 2.01 | 2.06 | — | 7,523 | 7,523 | 0.33 | 0.36 | 7.78 | 7,647 |
| Apartments Low Rise | 11.9 | 10.6 | 11.2 | 91.1 | 0.27 | 0.17 | 26.9 | 27.1 | 0.16 | 6.84 | 7.00 | — | 25,535 | 25,535 | 1.14 | 1.23 | 26.4 | 25,956 |
| Strip Mall | 0.41 | 0.36 | 0.47 | 3.88 | 0.01 | 0.01 | 1.24 | 1.25 | 0.01 | 0.32 | 0.32 | — | 1,169 | 1,169 | 0.05 | 0.05 | 1.22 | 1,187 |
| Fast Food Restaurant w/o Drive Thru | 4.74 | 4.13 | 5.47 | 45.2 | 0.15 | 0.09 | 14.5 | 14.6 | 0.08 | 3.67 | 3.76 | — | 13,606 | 13,606 | 0.53 | 0.62 | 14.2 | 13,817 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 4.92 | 4.29 | 5.67 | 46.9 | 0.15 | 0.09 | 15.0 | 15.1 | 0.09 | 3.81 | 3.90 | — | 14,119 | 14,119 | 0.54 | 0.64 | 14.7 | 14,338 |
| General Office Building | 0.37 | 0.32 | 0.43 | 3.52 | 0.01 | 0.01 | 1.13 | 1.13 | 0.01 | 0.29 | 0.29 | — | 1,060 | 1,060 | 0.04 | 0.05 | 1.11 | 1,076 |
| Medical Office Building | 1.23 | 1.07 | 1.42 | 11.7 | 0.04 | 0.02 | 3.74 | 3.77 | 0.02 | 0.95 | 0.97 | — | 3,522 | 3,522 | 0.14 | 0.16 | 3.67 | 3,576 |
| City Park | 1.38 | 1.20 | 1.59 | 13.1 | 0.04 | 0.03 | 4.20 | 4.23 | 0.02 | 1.07 | 1.09 | — | 3,956 | 3,956 | 0.15 | 0.18 | 4.13 | 4,017 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 28.4 | 25.2 | 29.6 | 242 | 0.76 | 0.47 | 74.6 | 75.1 | 0.44 | 19.0 | 19.4 | — | 70,489 | 70,489 | 2.92 | 3.29 | 73.2 | 71,615 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 8,592 | 8,592 | 0.53 | 0.06 | — | 8,625 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 22,631 | 22,631 | 1.40 | 0.17 | — | 22,716 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 39,539 | 39,539 | 2.45 | 0.30 | — | 39,689 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 8,592 | 8,592 | 0.53 | 0.06 | — | 8,625 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 22,631 | 22,631 | 1.40 | 0.17 | — | 22,716 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 39,539 | 39,539 | 2.45 | 0.30 | — | 39,689 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 1,423 | 1,423 | 0.09 | 0.01 | — | 1,428 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 3,747 | 3,747 | 0.23 | 0.03 | — | 3,761 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 90.6 | 90.6 | 0.01 | < 0.005 | — | 91.0 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 64.0 | 64.0 | < 0.005 | < 0.005 | — | 64.3 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 6,546 | 6,546 | 0.41 | 0.05 | — | 6,571 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.74 | 0.37 | 6.34 | 2.70 | 0.04 | 0.51 | — | 0.51 | 0.51 | — | 0.51 | — | 8,042 | 8,042 | 0.71 | 0.02 | — | 8,065 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartme Low Rise | 1.72 | 0.86 | 14.7 | 6.25 | 0.09 | 1.19 | — | 1.19 | 1.19 | — | 1.19 | — | 18,636 | 18,636 | 1.65 | 0.04 | — | 18,687 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 30,767 | 30,767 | 2.72 | 0.06 | — | 30,852 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.74 | 0.37 | 6.34 | 2.70 | 0.04 | 0.51 | — | 0.51 | 0.51 | — | 0.51 | — | 8,042 | 8,042 | 0.71 | 0.02 | — | 8,065 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 1.72 | 0.86 | 14.7 | 6.25 | 0.09 | 1.19 | — | 1.19 | 1.19 | — | 1.19 | — | 18,636 | 18,636 | 1.65 | 0.04 | — | 18,687 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 30,767 | 30,767 | 2.72 | 0.06 | — | 30,852 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.14 | 0.07 | 1.16 | 0.49 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,332 | 1,332 | 0.12 | < 0.005 | — | 1,335 |
| Apartments Low Rise | 0.31 | 0.16 | 2.68 | 1.14 | 0.02 | 0.22 | — | 0.22 | 0.22 | — | 0.22 | — | 3,085 | 3,085 | 0.27 | 0.01 | — | 3,094 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | — | 12.1 |
| Fast Food Restaurant w/o Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| Fast Food Restaurant with Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| General Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| Medical Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.52 | 0.26 | 4.46 | 2.16 | 0.03 | 0.36 | — | 0.36 | 0.36 | — | 0.36 | — | 5,094 | 5,094 | 0.45 | 0.01 | — | 5,108 |

## 4.3. Area Emissions by Source

### 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Consumer Products | 172 | 172 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 13.9 | 13.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 24.2 | 22.9 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | — | 696 | 696 | 0.03 | 0.01 | — | 699 |
| Total | 210 | 208 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | 0.00 | 17,551 | 17,551 | 1.07 | 0.13 | — | 17,618 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Consumer Products | 172 | 172 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 13.9 | 13.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 186 | 186 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 191 | 191 | 0.01 | < 0.005 | — | 192 |
| Consumer Products | 31.3 | 31.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 2.54 | 2.54 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Landsca Equipment | 3.03 | 2.86 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 78.9 | 78.9 | < 0.005 | < 0.005 | — | 79.2 |
| Total | 36.9 | 36.7 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 270 | 270 | 0.02 | < 0.005 | — | 271 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 64.1 | 332 | 396 | 6.59 | 0.16 | — | 608 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 279 | 1,444 | 1,723 | 28.7 | 0.69 | — | 2,645 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 673 | 673 | 0.04 | 0.01 | — | 676 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 61.0 | 61.0 | < 0.005 | < 0.005 | — | 61.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 64.1 | 332 | 396 | 6.59 | 0.16 | — | 608 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 279 | 1,444 | 1,723 | 28.7 | 0.69 | — | 2,645 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 673 | 673 | 0.04 | 0.01 | — | 676 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 61.0 | 61.0 | < 0.005 | < 0.005 | — | 61.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 10.6 | 54.9 | 65.5 | 1.09 | 0.03 | — | 101 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 46.2 | 239 | 285 | 4.75 | 0.11 | — | 438 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 4.78 | 5.68 | 0.09 | < 0.005 | — | 8.69 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 3.81 | 19.9 | 23.7 | 0.39 | 0.01 | — | 36.3 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 2.69 | 14.1 | 16.8 | 0.28 | 0.01 | — | 25.7 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 111 | 111 | 0.01 | < 0.005 | — | 112 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 10.1 | 10.1 | < 0.005 | < 0.005 | — | 10.1 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 71.6 | 493 | 564 | 7.37 | 0.18 | — | 802 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 418 | 0.00 | 418 | 41.8 | 0.00 | — | 1,462 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,391 | 0.00 | 1,391 | 139 | 0.00 | — | 4,867 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 2.59 | 0.00 | 2.59 | 0.26 | 0.00 | — | 9.08 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 418 | 0.00 | 418 | 41.8 | 0.00 | — | 1,462 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,391 | 0.00 | 1,391 | 139 | 0.00 | — | 4,867 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 2.59 | 0.00 | 2.59 | 0.26 | 0.00 | — | 9.08 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.91 | 0.00 | — | 242 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 230 | 0.00 | 230 | 23.0 | 0.00 | — | 806 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 3.62 | 0.00 | 3.62 | 0.36 | 0.00 | — | 12.7 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 5.61 | 0.00 | 5.61 | 0.56 | 0.00 | — | 19.6 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 65.1 | 0.00 | 65.1 | 6.51 | 0.00 | — | 228 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.43 | 0.00 | 0.43 | 0.04 | 0.00 | — | 1.50 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 454 | 0.00 | 454 | 45.3 | 0.00 | — | 1,587 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 11.4 | 11.4 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 43.8 | 43.8 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 11.4 | 11.4 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 43.8 | 43.8 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.88 | 1.88 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.25 | 7.25 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.04 | 0.04 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.03 | 0.03 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.29 | 0.29 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 29.5 | 29.5 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 5,848 | 5,848 | 5,848 | 2,134,387 | 62,018 | 62,018 | 62,018 | 22,636,404 |
| Apartments Low Rise | 19,848 | 19,848 | 19,848 | 7,244,653 | 210,503 | 210,503 | 210,503 | 76,833,708 |
| Strip Mall | 593 | 593 | 593 | 216,323 | 9,717 | 9,717 | 9,717 | 3,546,684 |
| Fast Food Restaurant w/o Drive Thru | 6,898 | 6,898 | 6,898 | 2,517,742 | 113,094 | 113,094 | 113,094 | 41,279,181 |
| Fast Food Restaurant with Drive Thru | 7,158 | 7,158 | 7,158 | 2,612,719 | 117,360 | 117,360 | 117,360 | 42,836,349 |
| General Office Building | 537 | 537 | 537 | 196,145 | 8,811 | 8,811 | 8,811 | 3,215,858 |
| Medical Office Building | 1,785 | 1,785 | 1,785 | 651,673 | 29,272 | 29,272 | 29,272 | 10,684,381 |
| City Park | 2,005 | 2,005 | 2,005 | 732,002 | 32,881 | 32,881 | 32,881 | 12,001,407 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

## 5.10.1. Hearths

### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 546 |
| No Fireplaces | 256 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 2378 |
| No Fireplaces | 1113 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |

## 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 15595465.756275 | 5,198,489 | 376,382 | 125,461 | 47,656 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 5,895,110 | 532 | 0.0330 | 0.0040 | 25,094,352 |
| Apartments Low Rise | 15,527,143 | 532 | 0.0330 | 0.0040 | 58,148,047 |
| Strip Mall | 375,543 | 532 | 0.0330 | 0.0040 | 227,584 |
| Fast Food Restaurant w/o Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| Fast Food Restaurant with Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| General Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| Medical Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Parking Lot | 265,355 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|

| | | |
|---|---|---|
| Single Family Housing | 33,428,302 | 0.00 |
| Apartments Low Rise | 145,508,982 | 0.00 |
| Strip Mall | 2,859,422 | 61,993 |
| Fast Food Restaurant w/o Drive Thru | 11,717,312 | 61,993 |
| Fast Food Restaurant with Drive Thru | 11,717,312 | 61,993 |
| General Office Building | 12,006,981 | 108,488 |
| Medical Office Building | 8,476,963 | 108,488 |
| City Park | 0.00 | 87,022,206 |
| Other Non-Asphalt Surfaces | 0.00 | 7,890,759 |
| Parking Lot | 0.00 | 0.00 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 775 | — |
| Apartments Low Rise | 2,581 | — |
| Strip Mall | 40.5 | — |
| Fast Food Restaurant w/o Drive Thru | 445 | — |
| Fast Food Restaurant with Drive Thru | 445 | — |
| General Office Building | 62.8 | — |
| Medical Office Building | 730 | — |
| City Park | 4.81 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |
| Parking Lot | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

## 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Strip Mall | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Strip Mall | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |
| Strip Mall | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant w/o Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant w/o Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant w/o Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant with Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant with Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant with Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| General Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.02 | 0.60 | 0.00 | 1.00 |
| General Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Medical Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.45 | 0.60 | 0.00 | 1.00 |
| Medical Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

#### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

#### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

#### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 17.8 | annual days of extreme heat |
| Extreme Precipitation | 3.00 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 9.13 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |

| | | | | |
|---|---|---|---|---|
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |

| | |
|---|---|
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |

| | |
|---|---|
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |

| | |
|---|---|
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|
| Land Use | per center park specific plan provisions and  traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD Rule 445 (Wood Burning) - prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

**APPENDIX B3**

# GREENHOUSE GAS EMISSIONS ASSESSMENT

# Greenhouse Gas Emissions Assessment

# Center Park Specific Plan Project

**Prepared for:**

City of Ontario
Rafael Torres
Assistant Planner
303 East N Street
Ontario, California 91764
909.395.297

**Prepared by:**

Kimley-Horn and Associates, Inc.
1100 W. Town and Country Road, Suite 700
Orange, California 92868
714.939.1030

May 2025

Kimley»Horn

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Appendix A: Air Quality Data

**LIST OF ABBREVIATED TERMS**

| | |
|---|---|
| ACF | Advanced Clean Fleets |
| AH | Affordable Housing |
| AG | Agriculture |
| AB | Assembly Bill |
| APN | Assessor Parcel Number |
| BRT | Bus Rapid Transit |
| CARB | California Air Resource Board |
| CCR | California Code of Regulations |
| CalEEMod | California Emissions Estimator Model |
| CEQA | California Environmental Quality Act |
| CALGreen Code | California Green Building Standards Code |
| CPUC | California Public Utilities Commission |
| $CO_2$ | Carbon dioxide |
| $CO_2e$ | Carbon dioxide equivalent |
| CNO | Chino Airport |
| CFC | Chlorofluorocarbon |
| CAP | Climate Action Plan |
| CCAP | Community Climate Action Plan |
| CAFE | Corporate average fuel economy |
| DPR | Development Plan Review |
| DU | Dwelling unit |
| EV | Electric vehicle |
| EMFAC | Emission FACtor |
| FCAA | Federal Clean Air Act |
| FSEIR | Final Supplemental Environmental Impact Report |
| GHG | Greenhouse gas |
| HCFC | Hydrochlorofluorocarbon |
| HFC | Hydrofluorocarbon |
| IEUA | Inland Empire Utilities Agency |
| I-10 | Interstate 10 |
| I-15 | Interstate 15 |
| LOR | Laws, Ordinances, and Regulations |
| LST | Localized significance thresholds |
| LCFS | Low Carbon Fuel Standard |
| LEV | Low Emissions Vehicle |
| MDR | Medium Density Residential |
| $CH_4$ | Methane |
| $MTCO_2e$ | Metric tons of carbon dioxide equivalent |
| $MMTCO_2e$ | Million metric tons of carbon dioxide equivalent |
| MM | Mitigation Measure |
| MU – Great Park | Mixed-Use – Great Park |
| NHTSA | National Highway Traffic Safety Administration |
| $NF_3$ | Nitrogen trifluoride |

| | |
|---|---|
| $N_2O$ | Nitrous oxide |
| OS – NR | Open Space – Non-Recreation |
| OS – R | Open Space – Recreation |
| PAs | Planning Areas |
| PFC | Perfluorocarbon |
| RTP/SCS | Regional Transportation Plan/Sustainable Communities Strategy |
| SAFE | Safer Affordable Fuel-Efficient |
| SB | Senate Bill |
| SCAQMD | South Coast Air Quality Management District |
| SCAG | Southern California Association of Government |
| SCE | Southern California Edison |
| SP | Specific Plan |
| SF | Square feet |
| SR-60 | State Route 60 |
| SR-91 | State Route 91 |
| $SF_6$ | Sulfur hexafluoride |
| TOP 2050 | The Ontario Plan 2050 |
| TAC | Toxic air contaminants |
| U.S. EPA | United States Environmental Protection Agency |
| VMT | Vehicle miles traveled |
| ZE | Zero-emission |
| ZEV | Zero emission vehicle |

# 1.0 INTRODUCTION

This report documents the results of an Air Quality Assessment completed for the Center Park Specific Plan (Project). The purpose of this Air Quality Assessment is to identify the potential construction and operations emissions associated with the Project and determine the level of impact the Project would have on the environment. A comparative analysis has been undertaken to determine whether the Project would result in any new or substantially more severe significant environmental impacts as compared to the conclusions discussed in The Ontario Plan (TOP) 2050, certified Final Supplemental Environmental Impact Report (FSEIR), pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning). Applicable mitigation measures from the FSEIR have been incorporated into this analysis.

## 1.1 Project Location

The Project site is comprised of 29 parcels totaling 257.34 acres within Ontario Ranch, City of Ontario (City), San Bernardino County (County), California; see **Figure 1: Regional Location Map.** The Assessor Parcel Numbers (APNs) comprising the Project site are 1053-301-01, -02; 1053-311-01, -02; 1053-321-01, -02, -03; 1053 331 01, 02, -03, -04; 1053-341-01, -02; 1053-351-01, -02; 1053-361-01, -02, -03; 1053-371-01, -02; 0216-311-01, -02, -09; 0216-321-03, -08; 0216-322-03, -04, -10; see **Figure 2: Project Site Assessor Parcel Numbers**. The Project site is bounded by a Southern California Edison (SCE) Easement to the north, Walker Avenue to the east, Eucalyptus Avenue to the south, and Campus Avenue to the west; see **Figure 3: Local Vicinity Map**. Land uses surrounding the Project site include a nursery, crop farms, rural residential uses, and dairy farm operations.

Regional access to the Project site is provided by State Route 60 (SR-60) located approximately 2.1 miles to the north, Interstate 15 (I-15) located approximately 4.0 miles to the east, State Route 71 (SR-71), which connects to State Route 91 (SR-91) to the south, located approximately 3.5 miles to the southwest, and Euclid Avenue, which connects SR-71, SR-60, and Interstate 10 (I-10) to the north, located approximately 0.8 mile to the west.

TOP 2050 designates the Project site land use as Medium Density Residential (MDR), Mixed-Use – Great Park (MU – Great Park), Open Space – Recreation (OS – R), and Open Space – Non-Recreation (OS – NR); see **Figure 4: Existing Land Use and Zoning**. The MDR designation permits single-family and multi-family residential uses. The MU – Great Park designation permits commercial, office, and multi-family residential uses. The OS – R designation permits recreational uses. The OS – NR designation permits utility easements and drainage channels and prohibits building development. TOP 2050 zones the Project site as Specific Plan (SP) with an Agriculture (AG) and Chino Airport (CNO) Overlay zoning overlay. The AG overlay requires a transition buffer area between the existing agricultural uses and the proposed urban uses. In addition, the Project site areas designated MDR or MU – Great Park have an Affordable Housing (AH) zoning overlay to increase affordable housing opportunities in compliance with the City's Housing Element and State Housing Element law.

## 1.2 Project Description

The proposed SP would implement the TOP 2050 vision, establish development standards and procedures, become the governing zoning standards for the Project site, permit a maximum of 802 single-family dwelling units (DUs), 3,491 multi-family DUs, 250,920 square feet (SF) of commercial

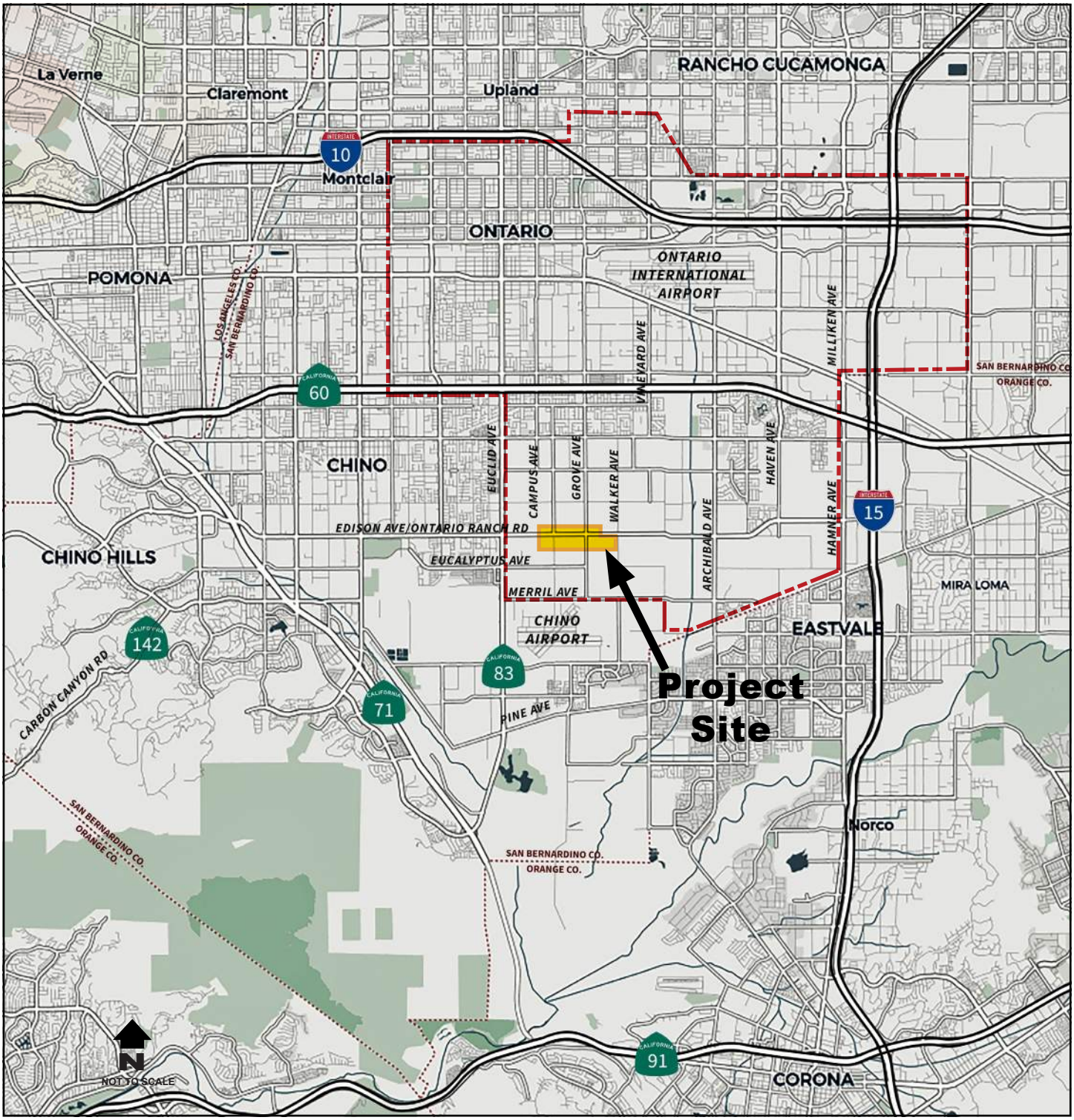


*Source: CenterPark Specific Plan Exhibit 1-1 Regional Location Map, 2024.*

**Figure 1:** Regional Location Map
*Center Park Specific Plan Project*

Not to scale

Kimley»Horn

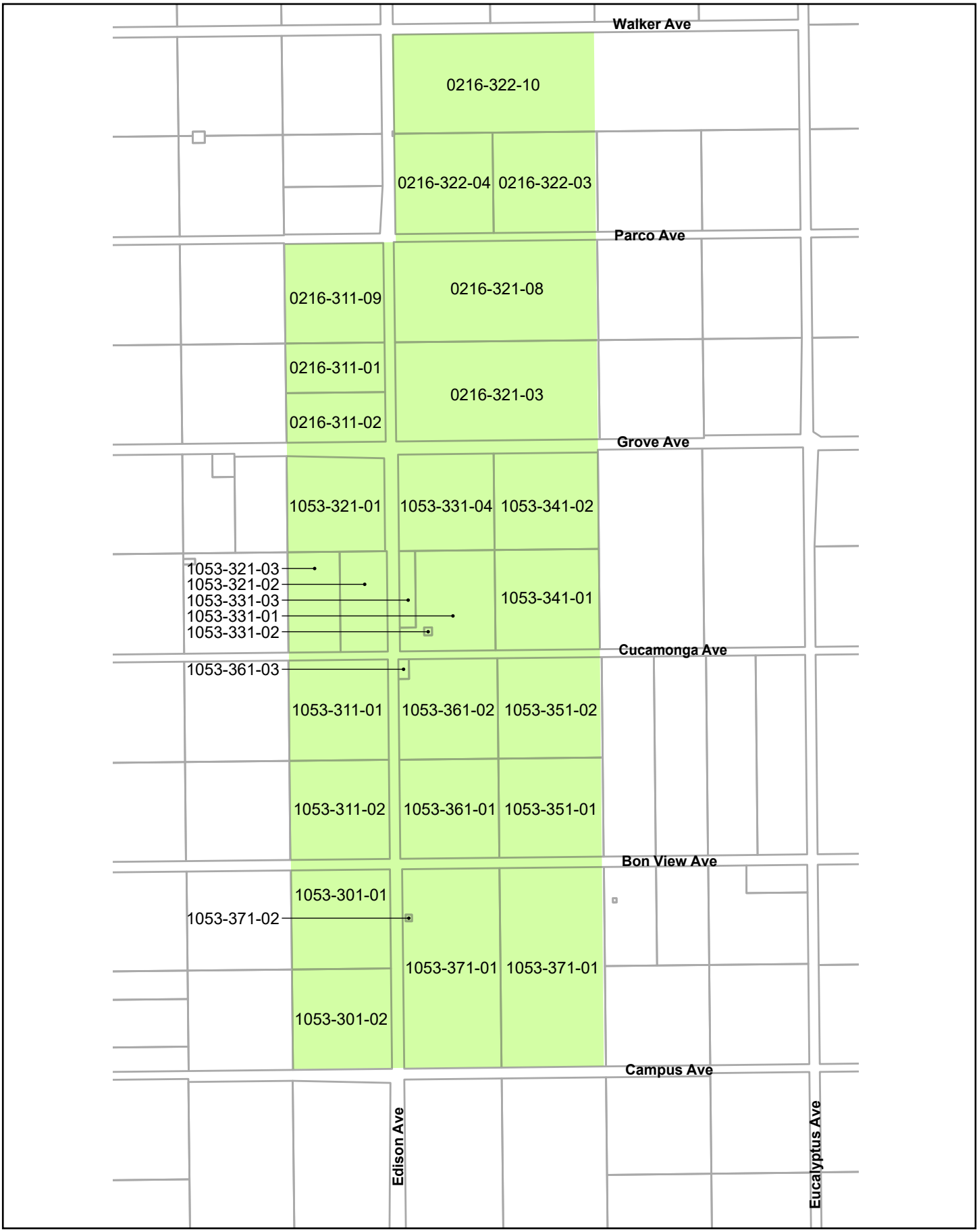


*Source: CenterPark Specific Plan Exhibit 3-1 Assessor's Parcel Numbers, 2024.*

**Figure 2:** Project Site Assessor Parcel Numbers
*Center Park Specific Plan Project*

Not to scale

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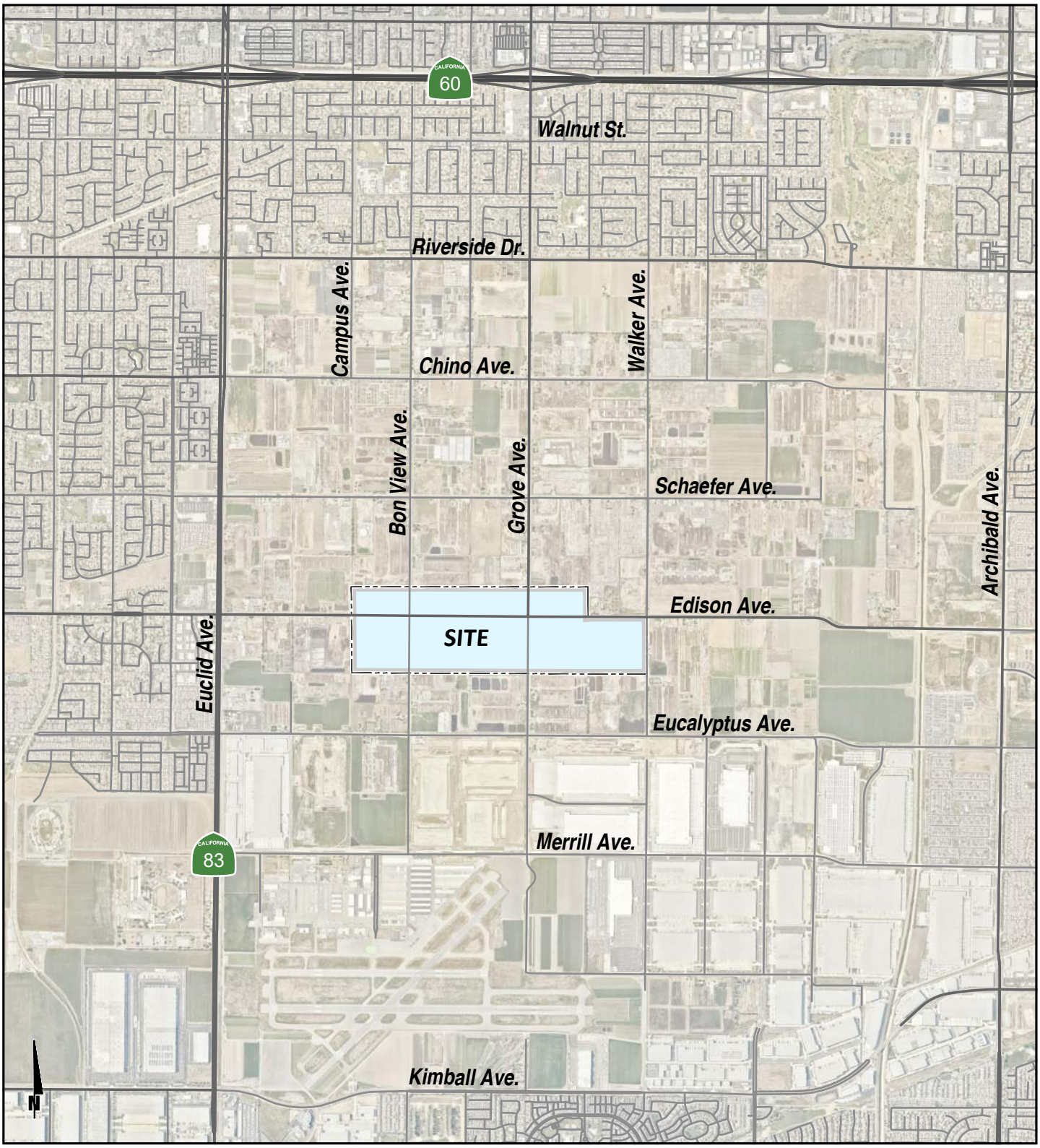


*Source: Center Park Specific Plan Traffic Analysis, Exhibit 1-1 Location Map, 2025.*

**Figure 3:** Local Vicinity Map
*Center Park Specific Plan Project*

Not to scale

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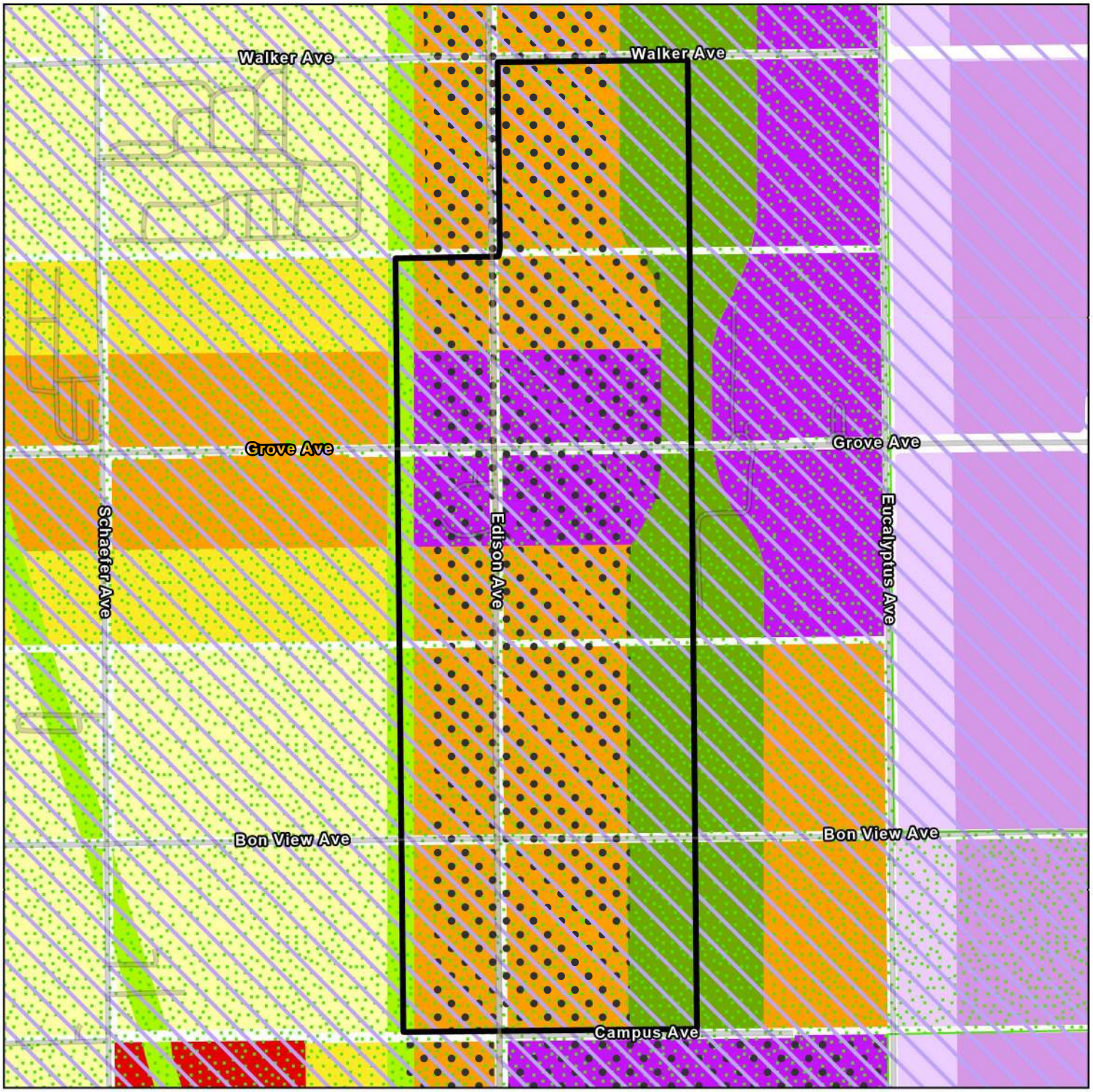


Project Site

**TOP 2050 Land Use Designations**

- RR Rural Residential
- LDR Low Density Residential
- LMDR Low Medium Density Residential
- MDR Medium Density Residential
- HDR High Density Residential
- MU Mixed Use
- NC Neighborhood Commercial
- GC General Commercial
- OC Office Commercial
- HOS Hospitality
- BP Business Park
- IND Industrial
- OS-NR Open Space - Non-Rec
- OS-R Open Space - Recreation
- OS-W Open Space - Water
- PF Public Facility
- PS Public School
- ARPT Airport
- LF Landfill
- Rail

**Zoning Overlay**

- CNO (Chino Airport) Overlay
- AH Affordable Housing
- AG Agricultural

*Source: City of Ontario The Ontario Plan 2050, 2024.*

**Figure 4:** Existing Land Use and Zoning
*Center Park Specific Plan Project*

Not to scale

Kimley»Horn

space, 55.98 acres of recreational open space, and 11.28 acres of non-recreational open space. The Project site is currently developed by ruderal vegetation, rural residences, and agricultural uses such as livestock raising, field crop farming, and dairy farm operations. The Project would remove all on-site uses and improvements to implement the proposed Project.

The proposed SP would divide the Project site into 22 planning areas (PAs); see **Figure 5: Land Use Plan**. The Project site land use designations would remain consistent with TOP 2050. The proposed SP would serve as the Project site zoning designation, consistent with TOP 2050. The Project would be classified as a Tier 2 affordable housing project, which designates at least 25 percent of the DUs as affordable housing. The Project would be developed in two phases; see **Figure 6: Project Phasing Plan**. Phase I would be developed by the private Applicant. Phase II would be dedicated to the City and would be developed at an unknown, later date following Phase I. This analysis conservatively evaluates the maximum Project development potential, with Phase II being evaluated at the programmatic level.

Phase I

Phase I would develop 256 single-family DUs, 768 multi-family DUs, 19.64 acres of recreational open space, and 3.38 acres of non-recreational open space within PAs 6, 12, 13, 17, 18, and 22; see **Table 1: Maximum Phase I Buildout**. The recreational open space would be designated as part of the City's Grand Park, a planned regional park within the Ontario Ranch area. The developer would construct the recreational open space in accordance with the City's Recreation and Parks Master Plan. The Applicant would submit a Development Plan and Tentative Parcel Map for the Phase I Project site following Project approval. Phase I is anticipated to begin construction as early as 2025 and be operational as early as 2029. For purposes of this analysis, it is conservatively assumed that Phase I would be operational as soon as construction is completed in 2027. This is a worst-case assumption as Phase I occupancy would be dependent on market conditions and permit approvals.

**Table 1: Maximum Phase I Buildout**

| Planning Area | Land Use | TOP 2050 Acreage (AC) | Maximum Residential Density (DU/AC)[1] | Maximum Residential (DU) |
|---|---|---|---|---|
| 6 | MDR | 7.33 | -- | 161 |
| 12 | MDR | 15.46 | 22.0 | 340 |
| 13 | MDR | 23.75 | 22.0 | 523 |
| 17 | OS – R | 6.20 | -- | -- |
| 18 | OS – R | 13.44 | -- | -- |
| 22 | OS – NR | 3.38 | -- | -- |
| | **Phase I Total** | **69.56** | **--** | **1,024** |

AC = acres; DU/AC = dwelling units/ acre; DU = dwelling unit; SF = square feet; MDR = Medium Density Residential; OS – R = Open Space – Recreation; and OS – NR = Open Space – Non-Recreation
1. Maximum residential density per The Ontario Plan 2050, Final Supplemental Environmental Impact Report.

Phase II

Phase II would develop 546 single-family DUs, 2,723 multi-family DUs, 250,920 SF of commercial space, 36.34 acres of recreational open space, and 7.9 acres of non-recreational open space within PAs 1 through 5, 7 through 11, 14 through 16, and 19 through 2; see **Table 2: Maximum Phase II Buildout**. The recreational open space would be designated as part of the City's Grand Park, a planned regional park within the Ontario Ranch area. The developer would construct the recreational

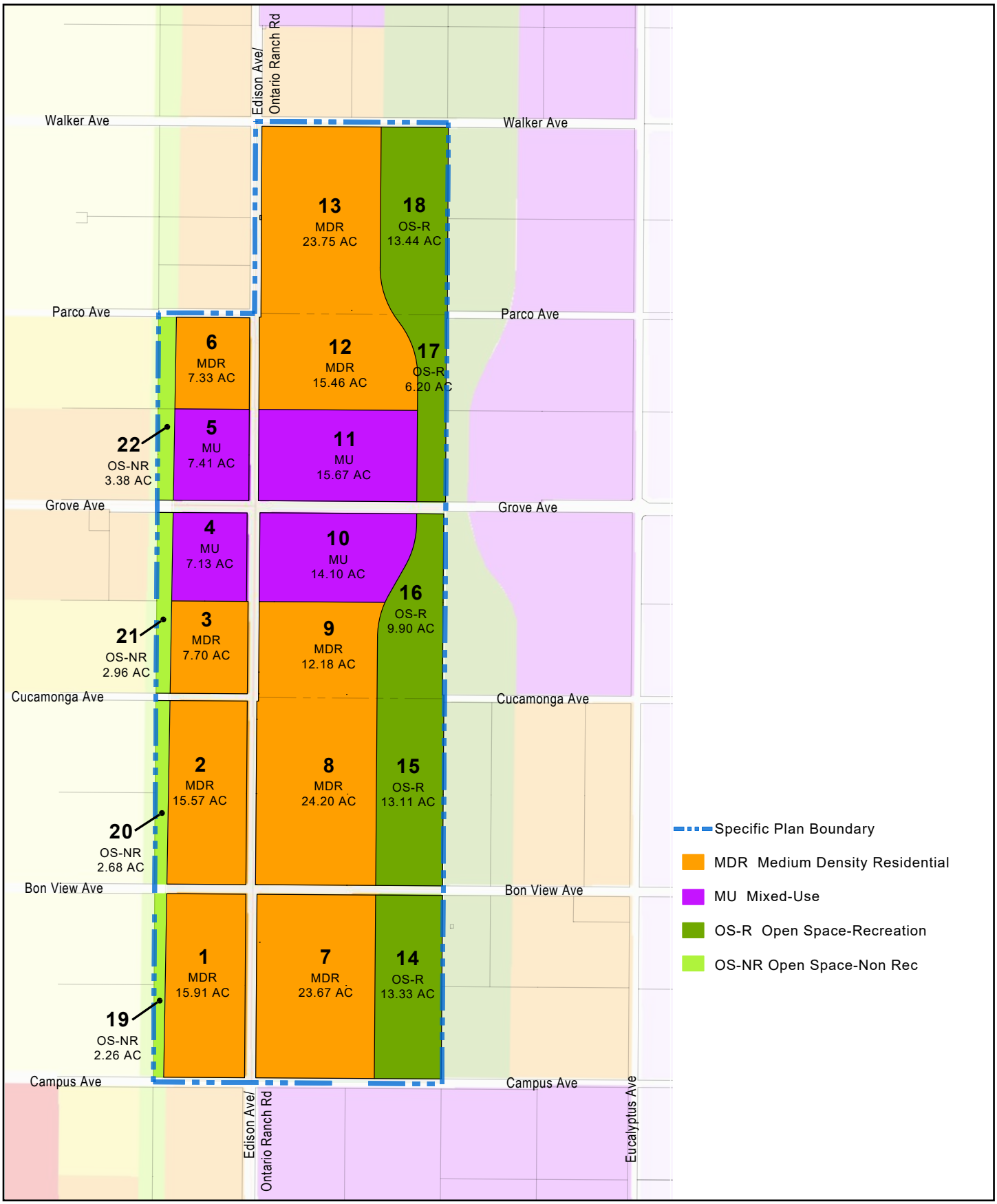


*Source: CenterPark Specific Plan Exhibit 1-3 Land Use Plan, 2024.*

**Figure 5:** Land Use Plan
*Center Park Specific Plan Project*

Not to scale

Kimley»Horn

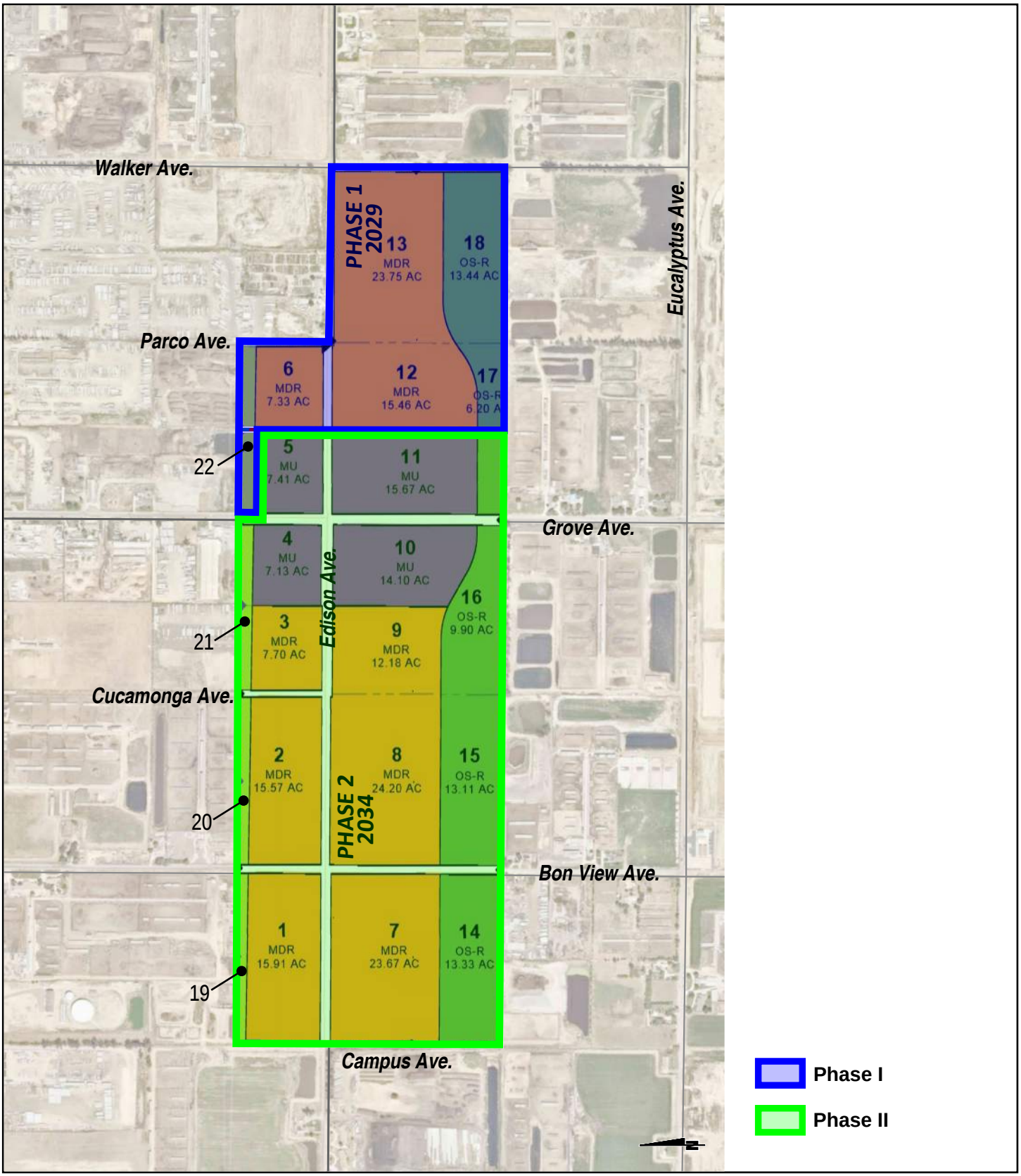


*Source: CenterPark Specific Plan Traffic Analysis, Exhibit 1-2 Preliminary Land Use Plan and Phasing Plan, 2025.*

**Figure 6:** Project Phasing Plan
*Center Park Specific Plan*

Not to scale

Kimley»Horn

open space in accordance with the City's Recreation and Parks Master Plan. For construction phasing purposes, Phase II is anticipated to begin construction as early as 2026 and be operational as early as 2034. It is conservatively assumed that Phase II would be operational as soon as construction is completed in 2030. This is a worst-case assumption as Phase II construction and occupancy would be dependent on market conditions and permit approvals.

**Table 2: Maximum Phase II Buildout**

| Planning Area | Land Use | TOP 2050 Acreage (AC) | Maximum Residential Density (DU/AC)[1] | Maximum Residential (DU) | Maximum Retail (SF) | Maximum Office (SF) |
|---|---|---|---|---|---|---|
| 1 | MDR | 15.91 | 22.0 | 350 | -- | -- |
| 2 | MDR | 15.57 | 22.0 | 343 | -- | -- |
| 3 | MDR | 7.70 | 22.0 | 169 | -- | -- |
| 4 | MU – Residential | 4.99 | 35.0 | 175 | -- | -- |
| 4 | MU – Retail | 1.43 | -- | -- | 18,635 | -- |
| 4 | MU – Office | 0.71 | -- | -- | -- | 21,741 |
| 5 | MU – Residential | 5.19 | 35.0 | 182 | -- | -- |
| 5 | MU – Retail | 1.48 | -- | -- | 19,367 | -- |
| 5 | MU – Office | 0.74 | -- | -- | -- | 22,595 |
| 7 | MDR | 23.67 | 22.0 | 521 | -- | -- |
| 8 | MDR | 24.20 | 22.0 | 532 | -- | -- |
| 9 | MDR | 12.18 | 22.0 | 268 | -- | -- |
| 10 | MU - Residential | 9.87 | 35.0 | 345 | -- | -- |
| 10 | MU – Retail | 2.82 | -- | -- | 36,852 | -- |
| 10 | MU – Office | 1.41 | -- | -- | -- | 42,994 |
| 11 | MU – Residential | 10.97 | 35.0 | 384 | -- | -- |
| 11 | MU – Retail | 3.13 | -- | -- | 40,955 | -- |
| 11 | MU – Office | 1.57 | -- | -- | -- | 47,781 |
| 14 | OS – R | 13.33 | -- | -- | -- | -- |
| 15 | OS – R | 13.11 | -- | -- | -- | -- |
| 16 | OS – R | 9.90 | -- | -- | -- | -- |
| 19 | OS – NR | 2.26 | -- | -- | -- | -- |
| 20 | OS – NR | 2.68 | -- | -- | -- | -- |
| 21 | OS – NR | 2.96 | -- | -- | -- | -- |
| | **Phase II Total** | **187.79** | **--** | **3,269** | **115,809** | **135,111** |

AC = acres; DU/AC = dwelling units/ acre; DU = dwelling unit; SF = square feet; MDR = Medium Density Residential; MU = Mixed-Use; OS – R = Open Space – Recreation; OS – NR = Open Space – Non-Recreation
1. Maximum residential density per The Ontario Plan 2050, Final Supplemental Environmental Impact Report.

Circulation

The Project would include a Circulation Plan to facilitate the movement of vehicles, pedestrians, and cyclists within the Project area. Local access to the Project site would be provided via Campus Avenue, Bon View Avenue, Cucamonga Avenue, Grove Avenue, Parco Avenue, Walker Avenue, and Edison Avenue/Ontario Ranch Road. Pedestrian circulation would be provided throughout the Project area via a paved sidewalk system that would interconnect with the roadway right-of-way. TOP 2050 proposed Class II bicycle lanes transversing in a north/south direction along the west side of Walker Avenue. The City's Recreation and Parks Master Plan proposed Class I bicycle lanes transversing in an east/west direction along the Project site's southern property line. The Project would be connected to off-site areas through the City's master planned multipurpose trails/bikeways located along the neighborhood edges of the Project site. An Omnitrans Bus Rapid

Transit (BRT) Corridor is proposed along Edison Avenue/Ontario Ranch Road as a part of future development.

On-site and Off-site Improvements

Roadway and utility infrastructure improvements (i.e., storm drains, sewer, potable water, recycled water, fiber optics, and underground electricity) would be constructed prior to the issuance of building occupancy permits. The developer would construct the improvements in accordance with the City's Master Plans, City's Ordinances, and proposed Specific Plan provisions or with the City Engineer's approval. Phasing and construction of the improvements would be determined by the City Engineer and Project requirements.

The Project would include landscaping along roadway frontages and between the pedestrian sidewalk and roadway. Landscaping would be developed in accordance with the City's development code and proposed Specific Plan provisions. Landscape and Construction Irrigation Documentation Plans would be submitted to the City prior to the issuance of building permits. The Project would comply with City Ordinance 2689, which requires the use of recycled water for all approved uses, including but not limited to landscape irrigation.

# 2.0 ENVIRONMENTAL SETTING

Certain gases in the earth's atmosphere classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

The primary GHGs contributing to the greenhouse effect are carbon dioxide ($CO_2$), methane ($CH_4$), and nitrous oxide ($N_2O$). Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Examples of fluorinated gases include chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride ($SF_6$), and nitrogen trifluoride ($NF_3$); however, it is noted that these gases are not associated with typical land use development. Human-caused emissions of GHGs exceeding natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the Earth's climate, known as global climate change or global warming.

GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants (TACs), which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of a GHG molecule is dependent on multiple variables and cannot be pinpointed, more $CO_2$ is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, or other forms of carbon sequestration. Of the total annual human-caused $CO_2$ emissions, approximately 55 percent is sequestered through ocean and land uptakes every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused $CO_2$ emissions remains stored in the atmosphere.[1] **Table 3: Description of Greenhouse Gases** describes the primary GHGs attributed to global climate change, including their physical properties.

**Table 3: Description of Greenhouse Gases**

| Greenhouse Gas | Description |
|---|---|
| Carbon Dioxide ($CO_2$) | $CO_2$ is a colorless, odorless gas that is emitted naturally and through human activities. Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. The largest source of $CO_2$ emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, and industrial facilities. The atmospheric lifetime of $CO_2$ is variable because it is readily exchanged in the atmosphere. $CO_2$ is the most widely emitted GHG and is the reference gas (Global Warming Potential of 1) for determining Global Warming Potentials for |

[1] Intergovernmental Panel on Climate Change, Carbon and Other Biogeochemical Cycles. *In: Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 2013, https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf, accessed December 2024.

**Table 3: Description of Greenhouse Gases**

| Greenhouse Gas | Description |
|---|---|
| | other GHGs. |
| Nitrous Oxide ($N_2O$) | $N_2O$ is largely attributable to agricultural practices and soil management. Primary human-related sources of $N_2O$ include agricultural soil management, sewage treatment, combustion of fossil fuels, and adipic and nitric acid production. $N_2O$ is produced from biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of $N_2O$ is approximately 120 years. The Global Warming Potential of $N_2O$ is 298. |
| Methane ($CH_4$) | $CH_4$, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. Methane is the major component of natural gas, about 87 percent by volume. Human-related sources include fossil fuel production, animal husbandry, rice cultivation, biomass burning, and waste management. Natural sources of $CH_4$ include wetlands, gas hydrates, termites, oceans, freshwater bodies, non-wetland soils, and wildfires. The atmospheric lifetime of $CH_4$ is about 12 years and the Global Warming Potential is 25. |
| Hydrofluorocarbons (HFCs) | HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is increasing, as the continued phase out of CFCs and HCFCs gains momentum. The 100-year Global Warming Potential of HFCs range from 124 for HFC-152 to 14,800 for HFC-23. |
| Perfluorocarbons (PFCs) | PFCs have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Two main sources of PFCs are primary aluminum production and semiconductor manufacturing. Global Warming Potentials range from 6,500 to 9,200. |
| Chlorofluorocarbons (CFCs) | CFCs are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their production in 1987. Global Warming Potentials for CFCs range from 3,800 to 14,400. |
| Sulfur Hexafluoride ($SF_6$) | $SF_6$ is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. This gas is manmade and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas. The Global Warming Potential of $SF_6$ is 23,900. |
| Hydrochlorofluorocarbons (HCFCs) | HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, HCFCs are subject to a consumption cap and gradual phase out. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The 100-year Global Warming Potentials of HCFCs range from 90 for HCFC-123 to 1,800 for HCFC-142b. |
| Nitrogen Trifluoride ($NF_3$) | $NF_3$ was added to Health and Safety Code Section 38505(g)(7) as a GHG of concern. This gas is used in electronics manufacture for semiconductors and liquid crystal displays. It has a high global warming potential of 17,200. |

Source: Compiled from U.S. EPA, *Overview of Greenhouse Gases*, 2018, https://www.epa.gov/ghgemissions/overview-greenhouse-gases, accessed February 2025; U.S. EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016*, 2018, https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-1990-2016, accessed February 2025; Intergovernmental Panel on Climate Change, *Climate Change 2007: The Physical Science Basis*, 2007, https://www.ipcc.ch/site/assets/uploads/2020/02/ar4-wg1-sum_vol_en.pdf, accessed February 2025; National Research Council, *Advancing the Science of Climate Change*, 2010; and U.S. EPA, *Methane and Nitrous Oxide Emission from Natural Sources*, April 2010.

# 3.0 REGULATORY SETTING

## 3.1 Federal

To date, national standards have not been established for nationwide GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level. Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

**Energy Independence and Security Act of 2007**

The Energy Independence and Security Act of 2007 (December 2007), among other key measures, requires the following, which would aid in the reduction of national GHG emissions:

- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Set a target of 35 miles per gallon for the combined fleet of cars and light trucks by model year 2020 and direct the National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

Additional provisions of the Energy Independence and Security Act (EISA) address energy savings in government and public institutions, promote research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

**U.S. Environmental Protection Agency Endangerment Finding**

The U.S. Environmental Protection Agency (U.S. EPA) authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Federal Clean Air Act (FCAA) and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, the U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs ($CO_2$, $CH_4$, $N_2O$, HFCs, PFCs, and $SF_6$) constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing FCAA and the U.S. EPA's assessment of the scientific evidence that form the basis for the U.S. EPA's regulatory actions.

**Federal Vehicle Standards**

In response to the U.S. Supreme Court ruling discussed above, Executive Order 13432 was issued in 2007 directing the U.S. EPA, the Department of Transportation, and the Department of Energy to establish regulations that reduce GHG emissions from motor vehicles, non-road vehicles, and non-road engines by 2008. In 2009, the NHTSA issued a final rule regulating fuel efficiency and GHG emissions from cars and light-duty trucks for model year 2011, and in 2010, the U.S. EPA and NHTSA issued a final rule regulating cars and light-duty trucks for model years 2012–2016.

In 2010, an Executive Memorandum was issued directing the Department of Transportation, Department of Energy, U.S. EPA, and NHTSA to establish additional standards regarding fuel efficiency and GHG reduction, clean fuels, and advanced vehicle infrastructure. In response to this directive, the U.S. EPA and NHTSA proposed stringent, coordinated federal GHG and fuel economy standards for model years 2017–2025 light-duty vehicles. The proposed standards projected to achieve 163 grams per mile of $CO_2$ in model year 2025, on an average industry fleet-wide basis, which is equivalent to 54.5 miles per gallon if this level were achieved solely through fuel efficiency. The final rule was adopted in 2012 for model years 2017–2021. On January 12, 2017, the U.S. EPA finalized its decision to maintain the current GHG emissions standards for model years 2022–2025 cars and light trucks.

In 2021, the U.S. EPA reversed its previous decision and issued a final rule to strengthen the GHG emissions standards for cars and light trucks for model years 2023-2026. The proposed fuel efficiency standards would be the most stringent standards established by the U.S. EPA at 55 mpg in model year 2026. On March 20, 2024, the U.S. EPA established a final rule for cars and light trucks for model years 2027-2032 to reduce the projected fleet average emissions target levels by 50% relative to the projected model year 2026 standard.

In addition to the regulations applicable to cars and light-duty trucks described above, in 2011, the U.S. EPA and NHTSA announced fuel economy and GHG standards for medium- and heavy-duty trucks for model years 2014–2018. The standards for $CO_2$ emissions and fuel consumption are tailored to three main vehicle categories: combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles. According to the U.S. EPA, this regulatory program will reduce GHG emissions and fuel consumption for the affected vehicles by 6 to 23 percent over the 2010 baselines.

In August 2016, the U.S. EPA and NHTSA announced the adoption of the phase two program related to the fuel economy and GHG standards for medium- and heavy-duty trucks. The phase two program will apply to vehicles with model year 2018 through 2027 for certain trailers, and model years 2021 through 2027 for semi-trucks, large pickup trucks, vans, and all types and sizes of buses and work trucks. The final standards are expected to lower $CO_2$ emissions by approximately 1.1 billion metric tons and reduce oil consumption by up to 2 billion barrels over the lifetime of the vehicles sold under the program.

In 2018, the President and the U.S. EPA stated their intent to halt various federal regulatory activities to reduce GHG emissions, including the phase two program. California and other states have stated their intent to challenge federal actions that would delay or eliminate GHG reduction measures and have committed to cooperating with other countries to implement global climate change initiatives. On September 27, 2019, the U.S. EPA and the NHTSA published the "Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program." (84 Fed. Reg. 51,310 (Sept. 27, 2019.) The Part One Rule revokes California's authority to set its own GHG emissions standards and set zero-emission vehicle mandates in California. On March 31, 2020, the U.S. EPA and NHTSA finalized rulemaking for SAFE Part Two which sets $CO_2$ emissions standards and corporate average fuel economy (CAFE) standards for passenger vehicles and light duty trucks, covering model years 2021-2026. The U.S. EPA and NHSTA repealed SAFE Rule Part One, effective January 28, 2022, allowing states to set stricter GHG emissions standards.

In December 2021, the U.S. EPA finalized federal GHG emissions standards for passenger cars and

light trucks for Model Years 2023 through 2026. The updated standards will result in avoiding more than three billion tons of GHG emissions through 2050.[2]

On June 7, 2024, the NHSTA announced the final rule for passenger cars and light trucks for model years 2027-2031, which strengthened previous emission standards and proposed an industry-wide fleet average of approximately 50.4 mpg in model year 2031. The new CAFE standards for model years 2027-2031 would reduce fuel use by 70 billion gallons through 2050.[3]

## 3.2 State of California

**California Air Resources Board**

The California Air Resources Board (CARB) is responsible for the coordination and oversight of State and local air pollution control programs in California. Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness about climate change and its potential for severe long-term adverse environmental, social, and economic effects. California is a significant emitter of $CO_2e$ in the world and produced 381.3 million metric tons of $CO_2e$ in 2021.[4] In the state, the transportation sector is the largest emitter of GHGs, followed by industrial operations such as manufacturing and oil and gas extraction.

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation, such as the landmark Assembly Bill (AB) 32, *California Global Warming Solutions Act of 2006*, was specifically enacted to address GHG emissions. Other legislation, such as Title 24 building efficiency standards and Title 20 appliance energy standards, were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

<u>AB 32 (California Global Warming Solutions Act of 2006)</u>

AB 32 instructs CARB to develop and enforce regulations for the reporting and verification of statewide GHG emissions. AB 32 also directed CARB to set a GHG emissions limit based on 1990 levels, to be achieved by 2020. It set a timeline for adopting a scoping plan for achieving GHG reductions in a technologically and economically feasible manner. The Scoping Plan was first approved by CARB in 2008 and must be updated every five years. Since 2008, there have been updates in 2013, 2017 and 2022, each with policies to guide the state to achieve its GHG targets. According to the latest Scoping Plan (2022 Scoping Plan), California met the target established by AB 32 ahead of schedule.[5]

Adopted December 15, 2022, CARB's 2022 Scoping Plan for Achieving Carbon Neutrality (2022 Scoping Plan) sets a path to achieve targets for carbon neutrality and reduce anthropogenic GHG

[2] U.S. Environmental Protection Agency, *Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026,* 2021, https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions, accessed April 2025.

[3] National Highway Traffic Safety Administration, *NHTSA Announces Final Rule for CAFE and HDPUV Standards*, https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy, accessed February 2025.

[4] California Air Resources Board, *California Greenhouse Gas Emissions from 2000 to 2021: Trends of Emissions and Other Indicators*. 2023, https://ww2.arb.ca.gov/sites/default/files/2023-12/2000_2021_ghg_inventory_trends.pdf, accessed April 2025.

[5] California Air Resources Board, *Final 2022 Scoping Plan Update*, December 2022, https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents, accessed April 2025.

emissions by 85 percent below 1990 levels by 2045 in accordance with AB 1279. To achieve the targets of AB 1279, the 2022 Scoping Plan relies on existing and emerging fossil fuel alternatives and clean technologies, as well as carbon capture and storage. Specifically, the 2022 Scoping Plan focuses on zero-emission transportation; phasing out use of fossil gas use for heating homes and buildings; reducing chemical and refrigerants with high global warming potential; providing communities with sustainable options for walking, biking, and public transit; displacement of fossil-fuel fired electrical generation through use of renewable energy alternatives (e.g., solar arrays and wind turbines); and scaling up new options such as green hydrogen.

The key elements of the 2022 CARB Scoping Plan focus on transportation. Specifically, the 2022 Scoping Plan aims to rapidly move towards zero-emission transportation (i.e., electrifying cars, buses, trains, and trucks), which constitutes California's single largest source of GHGs. The regulations that impact the transportation sector are adopted and enforced by CARB on vehicle manufacturers and are outside the jurisdiction and control of local governments. The 2022 Scoping Plan accelerates development of new regulations as well as amendments to strengthen regulations and programs already in place.

Included in the 2022 Scoping Plan is a set of Local Actions (2022 Scoping Plan Appendix D) aimed at providing local jurisdictions with recommendations to reduce GHGs and assist the state in meeting the ambitious targets set forth in the 2022 Scoping Plan. Appendix D to the 2022 Scoping Plan is not regulatory, is not exhaustive, and does not include everything local governments can implement to support the State's climate goals. It focuses primarily on climate action plans (CAPs) and local authority over new residential development. It includes a section on evaluating plan-level and project-level alignment with the State's Climate Goals in CEQA GHG analyses. In this section, CARB identifies several recommendations and strategies that should be considered for new development in order to determine consistency with the 2022 Scoping Plan. CARB specifically states that Section 3 of Appendix D, which discusses land use plans and development projects, does not address land uses other than residential and mixed-use residential. However, CARB plans to explore new approaches for other land use types in the future.

<u>Advanced Clean Cars I and II</u>

Advanced Clean Cars combines several regulations into one package including the Low-Emission Vehicle (LEV) criteria and greenhouse gas regulations and the zero-emission vehicle (ZEV) regulation. Advanced Clean Cars I was adopted in 2012 and Advanced Clean Cars II was adopted in 2022. These regulations rapidly scale down emissions of light-duty passenger cars, pickup trucks and SUVs and require an increased number of zero-emission vehicles to meet air quality and climate change emissions goals. By 2035 all new passenger cars, trucks and SUVs sold in California will be zero-emissions (ZE). The Advanced Clean Cars II regulations take the State's already growing zero-emission vehicle market and robust motor vehicle emission control rules and augments them to meet more aggressive tailpipe emissions standards and ramp up to 100% ZEVs.

<u>Advanced Clean Truck Regulation</u>

CARB adopted the Advanced Clean Truck Regulation in June 2020 requiring truck manufacturers to transition from diesel trucks and vans to electric zero-emission trucks beginning in 2024. By 2045, every new truck sold in California is required to be zero-emission. This rule directly addresses disproportionate risks and health and pollution burdens and puts California on the path for an all

zero-emission short-haul drayage fleet in ports and railyards by 2035, and zero-emission "last-mile" delivery trucks and vans by 2040. The Advanced Clean Truck Regulation accelerates the transition of zero-emission medium-and heavy-duty vehicles from Class 2b to Class 8. The regulation has two components including a manufacturer sales requirement, and a reporting requirement:

- Zero-Emission Truck Sales: Manufacturers who certify Class 2b through 8 chassis or complete vehicles with combustion engines are required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales need to be 55 percent of Class 2b – 3 truck sales, 75 percent of Class 4 – 8 straight truck sales, and 40 percent of truck tractor sales.
- Company and Fleet Reporting: Large employers including retailers, manufacturers, brokers and others would be required to report information about shipments and shuttle services. Fleet owners with 50 or more trucks would be required to report about their existing fleet operations. This information would help identify future strategies to ensure that fleets purchase available zero-emission trucks and place them in service where suitable to meet their needs.

Advanced Clean Fleets Regulation

CARB approved the Advanced Clean Fleets Regulation (ACF) on April 28, 2023, which requires fleet owners to begin transitioning toward ZEVs starting in 2024. Due to the impact that truck traffic has on residents living near heavily trafficked corridors, drayage trucks will need to be ZE by 2035. All other fleet owners have the option to transition a percentage of their vehicles to meet expected zero-emission milestones, which gives owners the flexibility to continue operating combustion-powered vehicles as needed during the move toward cleaner technology.

On January 13, 2025 California withdrew its request for federal approval of the ACF and is evaluating next steps. CARB will not enforce portions of the regulation requiring federal authorization, such as those affecting high-priority and drayage fleets. However, State and local government fleet requirements remain unchanged.[6]

**Senate Bill 32 (California Global Warming Solutions Act of 2006: Emissions Limit)**

Signed into law in September 2016, Senate Bill (SB) 32 codifies the 2030 GHG reduction target in Executive Order B-30-15 (40 percent below 1990 levels by 2030). The bill authorizes CARB to adopt an interim GHG emissions level target to be achieved by 2030. CARB also must adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective GHG reductions.

With SB 32, the Legislature passed companion legislation, AB 197, which provides additional direction for developing the Scoping Plan. On December 14, 2017, CARB adopted a second update to the Scoping Plan (CARB, 2017b). The 2017 Scoping Plan details how the State will reduce GHG emissions to meet the 2030 target set by Executive Order B-30-15 and codified by SB 32. Other objectives listed in the 2017 Scoping Plan are to provide direct GHG emissions reductions; support climate investment in disadvantaged communities; and support the Clean Power Plan and other

[6] California Air Resources Board, *ACF Waiver Update*, https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets, accessed April 2025.

Federal actions. In 2022, CARB published the 2022 Scoping Plan, which is discussed above.

**SB 375 (The Sustainable Communities and Climate Protection Act of 2008)**

Signed into law on September 30, 2008, SB 375 provides a process to coordinate land use planning, regional transportation plans, and funding priorities to help California meet the GHG reduction goals established by AB 32. SB 375 requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, aligns planning for transportation and housing, and creates specified incentives for the implementation of the strategies.

**AB 1493 (Pavley Regulations and Fuel Efficiency Standards)**

AB 1493, enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the U.S. EPA's denial of an implementation waiver. The U.S. EPA subsequently granted the requested waiver in 2009, which was upheld by the U.S. District Court for the District of Columbia in 2011. The regulations establish one set of emission standards for model years 2009–2016 and a second set of emissions standards for model years 2017 to 2025. By 2025, when all rules will be fully implemented, new automobiles will emit 34 percent fewer $CO_2e$ emissions and 75 percent fewer smog-forming emissions. In 2018, the U.S. EPA proposed the SAFE Vehicles Rule, which would roll back fuel economy standards and revoke California's waiver. However, in December 2021, the NHTSA repealed the SAFE Vehicle Rule Part One.

**SB 1368 (Emission Performance Standards)**

SB 1368 is the companion bill of AB 32, which directs the California Public Utilities Commission (CPUC) to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 limits carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than 5 years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. The new law effectively prevents California's utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. The CPUC adopted the regulations required by SB 1368 on August 29, 2007. The regulations implementing SB 1368 establish a standard for baseload generation owned by, or under long-term contract to publicly owned utilities, for 1,100 pounds of $CO_2$ per megawatt-hour.

**SB 1078, SB 107, and SBX1-2 (Renewable Electricity Standards)**

SB 1078 (2002) required California to generate 20 percent of its electricity from renewable energy by 2017. SB 107 (2006) changed the due date to 2010 instead of 2017. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which established a Renewable Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Executive Order S-21-09 also directed CARB to adopt a regulation by July 31, 2010, requiring the State's load serving entities to meet a 33 percent renewable energy target by 2020. CARB approved the Renewable Electricity Standard on September 23, 2010, by Resolution 10-23. SBX1-2 (2011) codified the 33 percent by 2020 goal.

**SB 350 (Clean Energy and Pollution Reduction Act of 2015)**

Signed into law on October 7, 2015, SB 350 implements the goals of Executive Order B-30-15. The objectives of SB 350 are to increase the procurement of electricity from renewable sources from 33 percent to 50 percent (with interim targets of 40 percent by 2024, and 25 percent by 2027) and to double the energy efficiency savings in electricity and natural gas end uses of retail customers through energy efficiency and conservation. SB 350 also reorganizes the Independent System Operator to develop more regional electricity transmission markets and improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States.

**AB 398 (Market-Based Compliance Mechanisms)**

Signed on July 25, 2017, AB 398 extended the duration of the Cap-and-Trade program from 2020 to 2030. AB 398 required CARB to update the Scoping Plan and for all GHG rules and regulations adopted by the State. It also designated CARB as the statewide regulatory body responsible for ensuring that California meets its statewide carbon pollution reduction targets, while retaining local air districts' responsibility and authority to curb toxic air contaminants and criteria pollutants from local sources that severely impact public health. AB 398 also decreased free carbon allowances over 40 percent by 2030 and prioritized Cap-and-Trade spending to various programs including reducing diesel emissions in impacted communities.

**SB 150 (Regional Transportation Plans)**

Signed on October 10, 2017, SB 150 aligns local and regional GHG reduction targets with State targets (i.e., 40 percent below their 1990 levels by 2030). SB 150 creates a process to include communities in discussions on how to monitor their regions' progress on meeting these goals. The bill also requires the CARB to regularly report on that progress, as well as on the successes and the challenges regions experience associated with achieving their targets. SB 150 provides for accounting of climate change efforts and GHG reductions and identify effective reduction strategies.

**SB 100 (California Renewables Portfolio Standard Program: Emissions of Greenhouse Gases)**

Signed into law in September 2018, SB 100 increased California's renewable electricity portfolio from 50 to 60 percent by 2030. SB 100 also established a further goal to have an electric grid that is entirely powered by clean energy by 2045.

**AB 1346 (Air Pollution: Small Off-Road Engines)**

Signed into law in October 2021, AB 1346 requires CARB, to adopt cost-effective and technologically feasible regulations to prohibit engine exhaust and evaporative emissions from new small off-road engines, consistent with federal law, by July 1, 2022. The bill requires CARB to identify and, to the extent feasible, make available funding for commercial rebates or similar incentive funding as part of any updates to existing applicable funding program guidelines to local air pollution control districts and air quality management districts to support the transition to zero-emission small off-road equipment operations.

**AB 1279 (The California Climate Crisis Act)**

AB 1279 establishes the policy of the State to achieve carbon neutrality as soon as possible, but no

later than 2045; to maintain net negative GHG emissions thereafter; and to ensure that by 2045 statewide anthropogenic GHG emissions are reduced at least 85 percent below 1990 levels. The bill requires CARB to ensure that Scoping Plan updates identify and recommend measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable $CO_2$ removal solutions and carbon capture, utilization, and storage technologies.

**SB 1020 (100 Percent Clean Electric Grid)**

Signed on September 16, 2022, SB 1020 provides additional goals for the path to the 2045 goal of 100 percent clean electricity retail sales. It creates a target of 90 percent clean electricity retail sales by 2035 and 95 percent clean electricity retail sales by 2040.

**SB 905 (Carbon Sequestration Program)**

Signed on September 16, 2022, SB 905 establishes regulatory framework and policies that involve carbon removal, carbon capture, utilization, and sequestration. It also prohibits the injecting of concentrated carbon dioxide fluid into a Class II injection well for the purpose of enhanced oil recovery.

**AB 1757 (Nature-Based Solutions)**

Signed on September 16, 2022, AB 1757 requires State agencies to develop a range of targets for natural carbon sequestration and nature-based climate solutions that reduce GHG emissions to meet the 2030, 2038, and 2045 goals which would be integrated into a scoping plan addressing natural and working lands.

## Executive Orders Related to GHG Emissions

California's Executive Branch has taken several actions to reduce GHGs using executive orders. Although not regulatory, they set the tone for the State and guide the actions of state agencies.

**Executive Order S-3-05**

Executive Order S-3-05 was issued on June 1, 2005, which established the following GHG emissions reduction targets:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is an executive order, the goals are not legally enforceable for local governments or the private sector.

**Executive Order S-01-07**

Issued on January 18, 2007, Executive Order S 01-07 mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. The executive order established a Low Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, CARB, the University of California, and other agencies to develop and propose

protocols for measuring the "life-cycle carbon intensity" of transportation fuels. CARB adopted the LCFS on April 23, 2009.

**Executive Order S-13-08**

Issued on November 14, 2008, Executive Order S-13-08 facilitated the California Natural Resources Agency development of the 2009 California Climate Adaptation Strategy. Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

**Executive Order S-14-08**

Issued on November 17, 2008, Executive Order S-14-08 expands the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. CARB adopted the Renewable Electricity Standard on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

**Executive Order S-21-09**

Issued on July 17, 2009, Executive Order S-21-09 directs CARB to adopt regulations to increase California's RPS to 33 percent by 2020. This builds upon SB 1078 (2002), which established the California RPS program, requiring 20 percent renewable energy by 2017, and SB 107 (2006), which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II.

**Executive Order B-30-15**

Issued on April 29, 2015, Executive Order B-30-15 established a California GHG reduction target of 40 percent below 1990 levels by 2030 and directs CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of $CO_2e$ ($MMTCO_2e$). The 2030 target acts as an interim goal on the way to achieving reductions of 80 percent below 1990 levels by 2050, a goal set by Executive Order S-3-05. The executive order also requires the State's climate adaptation plan to be updated every three years and for the State to continue its climate change research program, among other provisions. With the enactment of SB 32 in 2016, the Legislature codified the goal of reducing GHG emissions by 2030 to 40 percent below 1990 levels.

**Executive Order B-55-18**

Issued on September 10, 2018, Executive Order B-55-18 establishes a goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. This goal is in addition to the existing statewide targets of reducing GHG emissions. The executive order requires CARB to work with relevant state agencies to develop a framework for implementing this goal. It also requires CARB to update the Scoping Plan to identify and recommend measures to achieve carbon neutrality. The executive order also requires state agencies to develop sequestration targets in the Natural and Working Lands Climate Change Implementation Plan.

### Executive Order N-79-20

Signed in September 2020, Executive Order N-79-20 establishes as a goal that where feasible, all new passenger cars and trucks, as well as all drayage/cargo trucks and off-road vehicles and equipment, sold in California, will be zero-emission by 2035. The executive order sets a similar goal requiring that all medium and heavy-duty vehicles will be zero-emission by 2045 where feasible. It also directs CARB to develop and propose rulemaking for passenger vehicles and trucks, medium- and heavy-duty fleets where feasible, drayage trucks, and off-road vehicles and equipment "requiring increasing volumes" of new ZEVs "towards the target of 100 percent." The executive order directs the California Environmental Protection Agency, the California Geologic Energy Management Division, and the California Natural Resources Agency to transition and repurpose oil production facilities with a goal toward meeting carbon neutrality by 2045. Executive Order N-79-20 builds upon the CARB Advanced Clean Trucks regulation.

## California Regulations and Building Codes

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California's energy consumption relatively flat even with rapid population growth.

### Title 20 Appliance Efficiency Regulations

The appliance efficiency regulations (California Code of Regulations [CCR] Title 20, Sections 1601-1608) include standards for new appliances. Twenty-three categories of appliances are included in the scope of these regulations. These standards include minimum levels of operating efficiency, and other cost-effective measures, to promote the use of energy- and water-efficient appliances.

### Title 24 Building Energy Efficiency Standards

California's Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR Title 24, Part 6) commonly referred to as the Energy Code, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The California Energy Commission adopted the 2022 Energy Code on August 11, 2021, which was subsequently approved by the California Building Standards Commission for inclusion into the California Building Standards Code. The 2022 Title 24 standards will result in less energy use, thereby reducing air pollutant emissions associated with energy consumption across California. For example, the 2022 Title 24 standards will require efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, and strengthens ventilation standards.

### Title 24 California Green Building Standards Code

The California Green Building Standards Code (CCR Title 24, Part 11 code) commonly referred to as the CALGreen Code, is a statewide mandatory construction code developed and adopted by the California Building Standards Commission and the Department of Housing and Community Development. The CALGreen standards require new residential and commercial buildings to comply

with mandatory measures under the topics of planning and design, energy efficiency, water efficiency/conservation, material conservation and resource efficiency, and environmental quality. CALGreen also provides voluntary tiers and measures that local governments may adopt that encourage or require additional measures in the five green building topics. The most recent update to the CALGreen Code went into effect January 1, 2023 (2022 CALGreen). The 2022 CALGreen standards continue to improve upon the existing standards for new construction of, and additions and alterations to, residential and nonresidential buildings.

## 3.3 Regional

**Southern California Association of Governments**

The Southern California Association of Governments (SCAG) updates Connect SoCal, the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), every four years. The most recent Connect SoCal (*2024 - 2050* RTP/SCS) is a long-range vision plan for a more resilient and equitable future and contains policies and strategies for achieving the region's shared goals through 2050.[7]

The SCAG region strives toward sustainability through integrated land use and transportation planning. The SCAG region must achieve specific federal air quality standards and is required by state law to lower regional GHG emissions. Per SB 375, CARB has set GHG reduction targets at 8 percent below 2005 per capita emissions levels by 2020, and 19 percent below 2005 per capita emissions levels by 2035. On May 10, 2024, the Federal Highway Administration and the Federal Transit Administration completed their review and determined the 2024 – 2050 RTP/SCS conformed with the applicable State Implementation Plan.

## 3.4 Local

**City of Ontario General Plan**

The City of Ontario General Plan (TOP 2050) is a policy plan that guides the City's long-term development. TOP 2050 establishes GHG-reducing goals and policies within the Environmental Resources Element, Land Use Element, and Safety Element. The following goals and policies are applicable to the Project.

<u>Environmental Resources Element</u>

**Goal ER-2** **A cost effective, integrated waste management system that meets or exceeds state and federal recycling and waste diversion mandates.**

**Policy ER-2.1** **Waste Diversion.** We shall meet or exceed AB 939 requirements.

**Goal ER-3** **Cost-effective and reliable energy system sustained through a combination of low impact buildings, site and neighborhood energy conservation, and diverse sources of energy generation that collectively helps to minimize the region's carbon footprint.**

**Policy ER-3.1** **Conservation Strategy.** We require conservation as the first strategy to be employed

[7] Southern California Association of Governments, Connect SoCal (2024 – 2050 Regional Transportation Plan/Sustainable Communities Strategy), 2024.

to meet applicable energy-saving standards.

**Policy ER-3.2** **Green Development–Communities.** We encourage the use of the LEED Neighborhood Development rating system, or similar mechanism, to guide the planning and development of all new communities.

**Policy ER-3.3** **Building and Site Design**. We require new construction to incorporate energy efficient building and site design strategies, which could include appropriate solar orientation, maximum use of natural daylight, passive solar, and natural ventilation.

**Policy ER-3.5** **Fuel-Efficient and Alternative Energy Vehicles and Equipment.** We require purchase and use vehicles and equipment that are fuel efficient and meet or surpass state emissions requirements and/or use renewable sources of energy.

**Policy ER-3.6** **Generation- Renewable Sources.** We promote the use of renewable energy sources (e.g., solar, wind, biomass) in public and private sector development.

**Goal ER-4** **Improved indoor and outdoor air quality and reduced locally generated pollutant emissions.**

**Policy ER-4.1** **Land Use.** We reduce GHG and other local pollutant emissions through compact, mixed use, and transit-oriented development and development that improves the regional jobs-housing balance.

**Policy ER-4.3** **Greenhouse Gases (GHG) Emissions Reductions.** We will reduce GHG emissions in accordance with regional, state, and federal regulations.

**Policy ER-4.8** **Tree Planting.** We protect healthy trees within the City and plant new trees to increase carbon sequestration and help the regional/local air quality. We expand the tree canopy in environmental justice areas to enhance air quality and reduce the "heat island" effect.

<u>Land Use Element</u>

**Goal LU-2** **Compatibility between a wide range of uses and resultant urban patterns and forms.**

**Policy LU-2.2** **Buffers.** We require new uses to provide mitigation or buffers between existing uses where potential adverse impacts could occur. Additional mitigation is required when new uses could negatively impact environmental justice areas.

**Policy LU-2.4** **Regulation of Nuisances**. We regulate the location, concentration, and operation of potential nuisances

**Policy LU-2.8** **Transitional Areas**. We require development in transitional areas to protect the quality of life of current residents.

<u>Safety Element</u>

**Goal S-9** **Incorporate energy efficient practices and renewable energy systems to improve air quality, comfort, and energy reliability during temporary power outages.**

**Policy S-9.1** **Solar Energy.** We support and may incentivize the installation of residential and commercial solar panels and battery storage systems that can provide electricity during power outages.

### City of Ontario Community Climate Action Plan

The City adopted a Community Climate Action Plan (CCAP) in 2022 to reduce GHG emissions, foster a sustainable community, and streamline the GHG emissions environmental review for future development projects. The CCAP establishes a GHG emissions reduction target that is 40 percent below 1990 levels by 2030, consistent with SB 32, Executive Order S-03-05, Executive Order B-55-18, and the CARB 2017 Scoping Plan. The CCAP provides guidance on how to analyze and determine the significance of project-level GHG emissions. Pursuant to the CCAP guidelines, projects that exceed the project size thresholds identified in **Table 4: Project Size Thresholds for Land Use Development** are subject to the City's Development Plan Review (DPR) and are required to show consistency with the CCAP through Screening Tables.

**Table 4: Project Size Thresholds for Land Use Development**

| Project Type | Project Size Threshold |
|---|---|
| Single Family Residential (Single Family Detached) | 60 Units |
| Apartments / Condominiums / Townhouse | 20 Units |
| General Commercial / Retail / Office | 20,000 square feet |
| Supermarket / Grocery / Discount Club | 36,000 square feet |
| Restaurants (sit down) | 8,200 square feet |
| Fast-Food Restaurants (with or without drive thru) | 5,300 square feet |
| Gas Station | 4,200 square feet |
| Logistics / Warehouse | 45,000 square feet |
| Passive Park | 200 acres |
| Active Park | 60 acres |

Source: City of Ontario, *Ontario Community Climate Action Plan, Greenhouse Gas Emissions Screening Tables*, *Table 1, Project Size Thresholds for Land Use Development,* 2023, https://www.ontarioca.gov/sites/default/files/Ontario-Files/Planning/CCAP/Screening%20Table/Ontario-CCAP_Screening-Tables-MARCH%202023.pdf, accessed February 2025.

<u>Screening Tables</u>

The City published Screening Tables for residential and non-residential land uses. The Screening Tables include reduction measures related to transportation, water, solid waste, offroad equipment, energy, and renewable energy sources. Projects that garner a minimum of 100 points from selected Screening Table Measures would be consistent with the CCAP and have a less than significant impact regarding GHG emissions. Mixed-use projects must achieve a minimum of 100 points from each applicable Screening Table.

# 4.0 SIGNIFICANCE CRITERIA AND METHODOLOGY

## 4.1 Thresholds and Significance Criteria

According to State CEQA Guidelines Appendix G, a project would normally have a significant effect on the environment if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

Addressing GHG emissions generation impacts requires an agency to determine what constitutes a significant impact. The amendments to the CEQA Guidelines specifically allow lead agencies to determine thresholds of significance that illustrate the extent of an impact and are a basis from which to apply mitigation measures. This means that each agency is left to determine whether a project's GHG emissions will have a "significant" impact on the environment. The guidelines direct that agencies are to use "careful judgment" and "make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" the project's GHG emissions.[8]

### Ontario Community Climate Action Plan

The CCAP establishes procedures and significance thresholds to evaluate project-level GHG emissions impacts for CEQA purposes. Developments that exceed the project size thresholds outlined in **Table 4** must undergo the DPR, which requires projects to achieve a minimum of 100 points from applicable Screening Tables. The Screening Tables include reduction measures that provide projects flexibility in reducing GHG emissions to levels that align with the City's reduction goals.

## 4.2 Methodology

Global climate change is, by definition, a cumulative impact of GHG emissions. Therefore, there is no project-level analysis. The baseline against which to compare potential impacts of the project includes the natural and anthropogenic drivers of global climate change, including worldwide GHG emissions from human activities which almost doubled between 1970 and 2010 from approximately 27 gigatons (Gt) of $CO_2$ per year to nearly 49 $GtCO_2$ per year.[9] As such, the geographic extent of climate change and GHG emissions cumulative impact discussion is worldwide.

The Project's construction and operational emissions were calculated using the CARB-approved California Emissions Estimator Model (CalEEMod) version 2022.1, designed to model emissions for land use development projects based on typical construction requirements. Details of the modeling assumptions and emission factors are provided in **Appendix A: Greenhouse Gas Emissions Data**.

### Construction

CalEEMod calculates emissions from off-road equipment usage and on-road vehicle travel

[8] 14 California Code of Regulations, Section 15064.4a
[9] Intergovernmental Panel on Climate Change, *Climate Change 2013 Mitigation of Climate Change Working Group III Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 2013.

associated with haul, delivery, and construction worker trips. GHG emissions during construction were forecasted based on the proposed construction schedule and applying the mobile-source and fugitive dust emissions factors derived from CalEEMod. The Project's construction-related GHG emissions would be generated from off-road construction equipment, on-road hauling and vendor (material delivery) trucks, and worker vehicles. It is assumed that Phase I construction would occur from late-2025 to mid-2027. At this stage of the planning process, the Phase II construction timeline is not yet available. As such, reasonable assumptions have been made as a conservative measure. It is assumed that Phase II construction would occur from late-2026 to early-2030 and would overlap with Phase I construction.

In accordance with the South Coast Air Quality Management District's (SQAMD's) guidance, GHG emissions from construction were amortized (i.e., averaged annually) over the lifetime of the Project. As impacts from construction activities occur over a relatively short-term period of time, they contribute a relatively small portion of the overall lifetime project GHG emissions. In addition, GHG emission reduction measures for construction equipment are relatively limited. Therefore, SCAQMD recommended that construction emissions be amortized over a 30-year project lifetime, so that GHG reduction measures will address construction GHG emissions as part of the operational GHG reduction strategies.[10] Thus, total construction GHG emissions were divided by 30 to determine an estimate of annual construction emissions comparable to operational emissions.

**Operations**

CalEEMod calculates the GHG emissions generated by mobile sources (Project generated vehicle trips), area sources (architectural coatings, landscaping equipment, and consumer product usage), energy sources (electrical and natural gas usage), water supply and wastewater treatment, solid waste generation and decomposition, and refrigerants. The Project vehicle trip generation was obtained from the Traffic Analysis.[11] The emissions generated by vehicles idling in drive-thru lanes were estimated using CARB's EMission FACtor (EMFAC) projected emissions rates in San Bernardino County, the miles traveled on-site, and the vehicle trip generation from the Traffic Analysis.[12] Project occupancy would be dependent on market conditions and permit approvals. As such, it is conservatively assumed Phase I and Phase II would be operational as soon as construction is completed. In addition, operational emissions associated with the maximum potential buildout are conservatively calculated based on an operational year of 2030.

[10] South Coast Air Management District, Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans, 2008.
[11] Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.
[12] Ibid.

# 5.0 POTENTIAL IMPACTS AND MITIGATION

## 5.1 Greenhouse Gas Emissions

**Threshold 5.1 Would the Project generate GHG emissions, either directly or indirectly, that could have a significant impact on the environment?**

Project construction would result in direct GHG emissions from construction equipment and the transport of materials and construction workers to and from the Project site. Construction GHG emissions are typically summed and amortized over the lifetime of the Project (assumed to be 30 years), then added to the operational emissions.[13] However, generation of construction-related GHG emissions would cease with construction completion.

Operational or long-term emissions would occur over the life of the Project. GHG emissions would result from mobile sources (Project generated vehicle trips), area sources (architectural coatings, landscaping equipment, and consumer product usage), energy sources (electrical and natural gas usage), water supply and wastewater treatment, solid waste generation and decomposition, refrigerants, and vehicles idling in drive-thru lanes.

### Phase I - Proposed Development

#### Construction Emissions

**Table 5: Phase I Construction Greenhouse Gas Emissions** includes the total and approximate daily GHG emissions generated during Phase I construction.

**Table 5: Phase I Construction Greenhouse Gas Emissions**

| Category | $MTCO_2e$ |
|---|---|
| 2025 | 85 |
| 2026 | 1,956 |
| 2027 | 749 |
| Total Construction Emissions[1] | 2,790 |
| 30-Year Amortized Construction | 93 |

$MTCO_2e$ = metric tons of carbon dioxide equivalent
1. Totals may not equal 100 percent due to rounding.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

As shown in **Table 5,** Phase I would generate approximately 2,790 $MTCO_2e$ over the course of construction. The amortized Phase I construction emissions would be approximately 93 $MTCO_2e$ per year.

#### Operational Emissions

Phase I is subject to FSEIR Mitigation Measure (MM) 3-2 and MM AQ-1, TOP 2050 Policy ER-3.5, and Laws, Ordinances, and Regulations (LOR) GHG-1 through GHG-8. FSEIR MM 3-2 requires development projects to include access to alternative modes of transportation. FSEIR MM AQ-1

[13] The project lifetime is based on the standard 30-year assumption of the South Coast Air Quality Management District (South Coast Air Quality Management District, *Minutes for the GHG CEQA Significance Threshold Stakeholder Working Group #13,* August 26, 2009).

requires development projects to provide bicycle parking, changing/shower, and supportive electric charging station facilities, preferential parking for fuel efficient and carpool vehicles, and Energy Star certified appliances. TOP 2050 Policy ER-3.5 requires Phase I occupants to purchase and use vehicles that comply with the Advanced Clean Cars II and Advanced Clean Trucks. LOR GHG-1 requires new buildings to comply with the Energy Code and CALGreen Code. LOR GHG-2 requires new buildings to provide bicycle parking for non-residential buildings according to the CALGreen Code or City ordinance. LOR GHG-3 requires construction to recycle a minimum of 65 percent of waste pursuant to the CALGreen Code. LOR GHG-4 requires new buildings to comply with the CALGreen Code and Water Efficient Landscape Ordinance. LOR GHG-5 requires investor-owned utilities to comply with the State's emissions reduction plan. LOR GHG-6 requires compliance with SB 375. LOR GHG-7 requires owners to retrofit their heavy-duty tractors and trailers fleet with U.S. EPA SmartWay certified vehicles. LOR GHG-8 requires medium-duty and heavy-duty vehicle engines to comply with the U.S. EPA's GHG and fuel efficiency standards.

**Table 6: Phase I Operational Greenhouse Gas Emissions** summarizes the total GHG emissions associated with Phase I operations.

**Table 6: Phase I Operational Greenhouse Gas Emissions**

| Source | $MTCO_2e$ per Year |
|---|---|
| Construction Amortized Over 30 Years | 93 |
| Mobile[1] | 13,186 |
| Area | 63 |
| Energy[2] | 2,390 |
| Waste | 174 |
| Water and Wastewater | 255 |
| Refrigerants | 2 |
| **Total Phase I Emissions[3]** | **16,071** |

$MTCO_2e$ = metric tons of carbon dioxide equivalent
1. FSEIR MM 3-2 requires development projects to include access to alternative modes of transportation. FSEIR MM AQ-1 requires development projects to provide bicycle parking, changing/shower, and supportive electric charging station facilities, and preferential parking for fuel efficient and carpool vehicles.
2. FSEIR MM AQ-1 requires development projects to provide Energy Star certified appliances.
3. Totals may not equal 100 percent due to rounding.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

Below is a description of the primary operational emission sources:

- **Area Sources**. Area source emissions occur from architectural coatings, landscaping equipment, and consumer product usage. The primary emissions from architectural coatings are volatile organic compounds, which are relatively insignificant as direct GHG emissions. Additionally, landscaping is anticipated to occur throughout the Phase I Project area.
- **Energy Consumption.** Energy source emissions would be generated due to electricity and natural gas usage, including heating and cooling, water heating, ventilation, lighting, appliances, and electronics. The residential uses would not include natural gas hearths.

- **Mobile Sources**. Mobile source emissions were calculated with CalEEMod based on the trip generation from the Traffic Analysis.[14] Phase I would generate 8,270 total daily vehicle trips.
- **Solid Waste**. Solid waste decomposes and releases GHG emissions in the form of methane.
- **Water and Wastewater**. Electricity consumption associated with water conveyance and treatment would generate GHG emissions.
- **Refrigerants**. Refrigerants used in refrigeration and air conditioning equipment generate GHG emissions.

**Table 6** shows that Phase I operations would generate approximately 16,071 $MTCO_2e$ per year. It should be noted that 82 percent of GHG emissions are associated with non-construction-related mobile sources. Vehicle fuel efficiency and emissions are regulated by federal and State standards and neither the Applicant nor the City has control over these standards.

Since Phase I would exceed the project size thresholds outlined in **Table 4**, Phase I would be required to incorporate project design features to achieve a minimum score of 100 points on the applicable Screening Tables. As stated above, projects that achieve a minimum score of 100 points are considered less than significant. At the time of this analysis, Phase I is in the design phase, where project design features needed to achieve consistency with the Screening Tables are being considered and implemented. The Applicant must complete and submit a final set of screening tables showing the achievement of the required 100 points prior to issuance of the building permit. Phase I would have a less than significant impact with implementation of FSEIR MM 3-2 and MM AQ-1 and compliance with the CCAP. Impacts would be less than significant, and no mitigation is required.

## Phase II - Future Development

### Construction Emissions

**Table 7: Phase II Construction Greenhouse Gas Emissions** includes the total and approximate daily GHG emissions generated during Phase II construction.

**Table 7: Phase II Construction Greenhouse Gas Emissions**

| Category | $MTCO_2e$ |
|---|---|
| 2026 | 107 |
| 2027 | 3,369 |
| 2028 | 5,963 |
| 2029 | 4,933 |
| 2030 | 892 |
| Total Construction Emissions[1] | 15,263 |
| 30-Year Amortized Construction | 509 |

$MTCO_2e$ = metric tons of carbon dioxide equivalent
1. Totals may not equal 100 percent due to rounding.

[14] Urban Crossroads, *Center Park Specific Plan Traffic Analysis,* 2025.

| **Table 7: Phase II Construction Greenhouse Gas Emissions** |
|---|
| Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs. |

As shown in **Table 7,** the Phase II would result in the generation of approximately 15,263 $MTCO_2e$ over the course of construction. The amortized Phase II construction emissions would be approximately 509 $MTCO_2e$ per year.

### Operational Emissions

Phase II is subject to FSEIR MM 3-2 and MM AQ-1, TOP 2050 Policy ER-3.5, and LOR GHG-1 through GHG-8. FSEIR MM 3-2 requires development projects to include access to alternative modes of transportation. FSEIR MM AQ-1 requires development projects to provide bicycle parking, changing/shower, and supportive electric charging station facilities, preferential parking for fuel efficient and carpool vehicles, and Energy Star certified appliances. TOP 2050 Policy ER-3.5 requires Phase II occupants to purchase and use vehicles that comply with the Advanced Clean Cars II and Advanced Clean Trucks. LOR GHG-1 requires new buildings to comply with the Energy Code and CALGreen Code. LOR GHG-2 requires new buildings to provide bicycle parking for non-residential buildings according to the CALGreen Code or City ordinance. LOR GHG-3 requires construction to recycle a minimum of 65 percent of waste pursuant to the CALGreen Code. LOR GHG-4 requires new buildings to comply with the CALGreen Code and Water Efficient Landscape Ordinance. LOR GHG-5 requires investor-owned utilities to comply with the State's emissions reduction plan. LOR GHG-6 requires compliance with SB 375. LOR GHG-7 requires owners to retrofit their heavy-duty tractors and trailers fleet with U.S. EPA SmartWay certified vehicles. LOR GHG-8 requires medium-duty and heavy-duty vehicle engines to comply with the U.S. EPA's GHG and fuel efficiency standards.

**Table 8: Phase II Operational Greenhouse Gas Emissions** summarizes the total GHG emissions associated with Phase II operations.

**Table 8: Phase II Operational Greenhouse Gas Emissions**

| Source | $MTCO_2e$ per Year |
|---|---|
| Construction Amortized Over 30 Years | 509 |
| Mobile[1] | 60,332 |
| Area | 208 |
| Energy[2] | 9,289 |
| Waste | 640 |
| Water and Wastewater | 1,332 |
| Refrigerants | 27 |
| Drive-Thru Idling | 3 |
| **Total Phase II Emissions[3]** | **71,830** |

$MTCO_2e$ = metric tons of carbon dioxide equivalent

1. FSEIR MM 3-2 requires development projects to include access to alternative modes of transportation. FSEIR MM AQ-1 requires development projects to provide bicycle parking, changing/shower, and supportive electric charging station facilities, and preferential parking for fuel efficient and carpool vehicles.

| **Table 8: Phase II Operational Greenhouse Gas Emissions** | |
|---|---|
| **Source** | **$MTCO_2e$ per Year** |
| 2. FSEIR MM AQ- requires development projects to provide Energy Star certified appliances.<br>3. Totals may not equal 100 percent due to rounding. | |
| Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs. | |

Below is a description of the primary operational emission sources:

- **Area Sources**. Area source emissions occur from architectural coatings, landscaping equipment, and consumer product usage. The primary emissions from architectural coatings are volatile organic compounds, which are relatively insignificant as direct GHG emissions. Additionally, landscaping is anticipated to occur throughout the Phase II Project area.
- **Energy Consumption.** Energy source emissions would be generated due to electricity and natural gas usage, including heating and cooling, water heating, ventilation, lighting, appliances, and electronics. The residential uses would not include natural gas hearths.
- **Mobile Sources**. Mobile source emissions were calculated with CalEEMod based on the trip generation from the Traffic Analysis.[15] Phase II would generate 36,446 total daily vehicle trips.
- **Solid Waste**. Solid waste decomposes and releases GHG emissions in the form of methane.
- **Water and Wastewater**. Electricity consumption associated with water conveyance and treatment would generate GHG emissions.
- **Refrigerants**. Refrigerants used in refrigeration and air conditioning equipment generate GHG emissions.
- **Drive-Thru Idling.** Vehicles idling in the drive-thru lanes would generate GHG emissions, which were calculated with EMFAC projected emission rates in San Bernardino County, the potential maximum miles traveled on-site within the MU – Great Park land use (PAs 4, 5, 10, and 11), and the trip generation from the Traffic Analysis.[16] It is conservatively assumed the potential maximum miles traveled on-site within a PA designated as MU – Great Park would be 0.20 miles.[17] Conservatively assuming that 70 percent of drive thru restaurant trips would utilize drive-thru lanes, Phase II would generate 5,022 total daily drive-thru trips.

**Table 8** shows that Phase II operations would generate approximately 71,830 $MTCO_2e$ per year. It should be noted that 84 percent of GHG emissions are associated with non-construction-related mobile sources. Vehicle fuel efficiency and emissions are regulated by federal and State standards and neither the Applicant nor the City has control over these standards.

Since Phase II would exceed the project size thresholds outlined in **Table 4**, developments within Phase II would be required to incorporate project design features to achieve a minimum score of 100 points on the applicable Screening Tables. As stated above, projects that achieve a minimum score

[15] Ibid.
[16] Ibid.
[17] The distance was measured on Google Earth, 2025.

of 100 points are considered less than significant. At the time of this analysis, Phase II is in the design phase, where project design features needed to achieve consistency with the Screening Tables are being considered and implemented. The Applicant must complete and submit a final set of screening tables showing the achievement of the required 100 points prior to issuance of the building permit. Phase II would have a less than significant impact with implementation of FSEIR MM 3-2 and MM AQ-1 and compliance with the CCAP. Impacts would be less than significant, and no mitigation is required.

### Project Buildout (Phase I + Phase II)

#### Construction Emissions

As it is speculative to assume the Phase II construction timeline, it is conservatively assumed that Phase I construction would overlap with Phase II construction. **Table 9: Project Construction Greenhouse Gas Emissions** includes the total and approximate daily GHG emissions generated during Phase I and Phase II construction.

**Table 9: Project Construction Greenhouse Gas Emissions**

| Category | $MTCO_2e$ |
|---|---|
| 2025 | 85 |
| 2026 | 2,062 |
| 2027 | 4,118 |
| 2028 | 5,963 |
| 2029 | 4,933 |
| 2030 | 892 |
| Total Construction Emissions | 18,053 |
| 30-Year Amortized Construction | 602 |

$MTCO_2e$ = metric tons of carbon dioxide equivalent
1. Totals may not equal 100 percent due to rounding.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

As shown in **Table 9,** the Project would result in the generation of approximately 18,053 $MTCO_2e$ over the course of construction. The amortized Project construction emissions would be 602 $MTCO_2e$ per year.

#### Operational Emissions

The Project would include all emission sources from Phase I and Phase II when the entire Project is built and operational. The Project operations are subject to FSEIR MM 3-2 and MM AQ-1, TOP 2050 Policy ER-3.5, and LOR GHG-1 through GHG-8. FSEIR MM 3-2 requires development projects to include access to alternative modes of transportation. FSEIR MM AQ-1 requires development projects to provide bicycle parking, changing/shower, and supportive electric charging station facilities, preferential parking for fuel efficient and carpool vehicles, and Energy Star certified appliances. TOP 2050 Policy ER-3.5 requires the Project occupants to purchase and use vehicles that comply with the Advanced Clean Cars II and Advanced Clean Trucks. LOR GHG-1 requires new buildings to comply with the Energy Code and CALGreen Code. LOR GHG-2 requires new buildings

to provide bicycle parking for non-residential buildings according to the CALGreen Code or City ordinance. LOR GHG-3 requires construction to recycle a minimum of 65 percent of waste pursuant to the CALGreen Code. LOR GHG-4 requires new buildings to comply with the CALGreen Code and Water Efficient Landscape Ordinance. LOR GHG-5 requires investor-owned utilities to comply with the State's emissions reduction plan. LOR GHG-6 requires compliance with SB 375. LOR GHG-7 requires owners to retrofit their heavy-duty tractors and trailers fleet with U.S. EPA SmartWay certified vehicles. LOR GHG-8 requires medium-duty and heavy-duty vehicle engines to comply with the U.S. EPA's GHG and fuel efficiency standards.

**Table 10: Project Operational Greenhouse Gas Emissions** summarizes the total GHG emissions associated with Project Buildout operations.

**Table 10: Project Operational Greenhouse Gas Emissions**

| Source | $MTCO_2e$ per Year |
|---|---|
| Construction Amortized Over 30 Years | 602 |
| Mobile[1] | 71,615 |
| Area | 271 |
| Energy[2] | 11,679 |
| Waste | 802 |
| Water and Wastewater | 1,587 |
| Refrigerants | 29 |
| Drive-Thru Idling | 3 |
| **Total Project Emissions[3]** | **85,987** |

$MTCO_2e$ = metric tons of carbon dioxide equivalent
1. FSEIR MM 3-2 requires development projects to include access to alternative modes of transportation. FSEIR MM AQ-1 requires development projects to provide bicycle parking, changing/shower, and supportive electric charging station facilities, and preferential parking for fuel efficient and carpool vehicles.
2. FSEIR MM AQ-1 requires development projects to provide Energy Star certified appliances.
3. Totals may not equal 100 percent due to rounding.

Source: CalEEMod version 2022.1. Refer to **Appendix A** for the model outputs.

Below is a description of the primary operational emission sources:

- **Area Sources**. Area source emissions occur from architectural coatings, landscaping equipment, and consumer product usage. The primary emissions from architectural coatings are volatile organic compounds, which are relatively insignificant as direct GHG emissions. Additionally, landscaping is anticipated to occur throughout the Project area.
- **Energy Consumption.** Energy source emissions would be generated due to electricity and natural gas usage, including heating and cooling, water heating, ventilation, lighting, appliances, and electronics. The residential uses would not include natural gas hearths.

- **Mobile Sources**. Mobiles source emissions were calculated with CalEEMod based on the trip generation from the Traffic Analysis.[18] The Project would generate 44,716 total daily vehicle trips.
- **Solid Waste**. Solid waste decomposes and releases GHG emissions in the form of methane.
- **Water and Wastewater**. Electricity consumption associated with water conveyance and treatment would generate GHG emissions.
- **Refrigerants**. Refrigerants used in refrigeration and air conditioning equipment generate GHG emissions.
- **Drive-Thru Idling.** Vehicles idling in the drive-thru lanes would generate GHG emissions, which were calculated with EMFAC projected emission rates in San Bernardino County, the maximum potential miles traveled on-site within the MU – Great Park land use (PAs 4, 5, 10, and 11), and the trip generation from the Traffic Analysis.[19] It is conservatively assumed the potential maximum miles traveled on-site within a PA designated as MU – Great Park would be 0.20 miles.[20] Conservatively assuming that 70 percent of drive thru restaurant trips would utilize drive-thru lanes, the Project would generate 5,022 total daily drive-thru trips.

**Table 10** shows that Project operations would generate approximately 85,987 $MTCO_2e$ per year. It should be noted that 83 percent of the mitigated GHG emissions are associated with non-construction-related mobile sources. Vehicle fuel efficiency and emissions are regulated by federal and State standards and neither the Applicant nor the City has control over these standards.

Since the Project would exceed the project size thresholds outlined in **Table 4**, developments within the Project would be required to incorporate project design features to achieve a minimum score of 100 points on the applicable Screening Tables. As stated above, projects that achieve a minimum score of 100 points are considered less than significant. At the time of this analysis, the Project is in the design phase, where project design features needed to achieve consistency with the Screening Tables are being considered and implemented. The Applicant must complete and submit a final set of screening tables showing the achievement of the required 100 points prior to issuance of the building permit.

The Project would have a less than significant impact with implementation of FSEIR MM 3-2 and MM AQ-1 and compliance with the CCAP. Impacts would be less than significant, and no mitigation is required.

## Conclusion

As shown in **Table 10**, the Project would generate approximately 85,987 $MTCO_2e$ per year with implementation of FSEIR MM 3-2 and MM AQ-1. Since the majority of emissions are from mobile sources, neither the Applicant nor the City have regulatory authority to control tailpipe emissions. Consistent with the DRP and CCAP, the Project would incorporate project design features to achieve a minimum score of 100 points on the Screening Tables. As stated in the CCAP, projects that achieve a minimum score of 100 points are considered less than significant. At the time of this analysis, the Project is in the design phase, where project design features needed to achieve consistency with the

[18] Urban Crossroads, Center Park Specific Plan Traffic Analysis, 2025.
[19] Ibid.
[20] The distance was measured on Google Earth, 2025.

Screening Tables are being considered and implemented. The Applicant must complete and submit a final set of screening tables showing the achievement of the required 100 points prior to issuance of the building permit. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR

**Laws, Ordinances, and Regulations**

LORs are existing requirements that are based on local, State, or federal regulations or laws that are frequently required independent of CEQA review. Typical standard conditions and requirements include compliance with the provisions of the Building Code, SCAQMD Rules, etc. The City may impose additional conditions during the approval process, as appropriate. Because LORs are neither project-specific nor a result of development of the Project, they are not considered to be either project design features or mitigation measures.

**LOR GHG-1** New buildings are required to achieve the current Energy Code (Title 24, Part 6) and the CALGreen Code (Title 24, Part 11). The 2022 Energy Code become effective on January 1, 2023. The Energy Code and CALGreen Code are updated triennially with a goal to achieve 100 percent clean carbon neutrality by 2050 within the State.

**LOR GHG-2** New non-residential buildings are required to adhere to the CALGreen Code requirement to provide bicycle parking, or meet local bicycle parking ordinances, whichever is stricter (CALGreen Code Sections 5.106.4.1).

**LOR GHG-3** The CALGreen Code requires the recycling and/or salvaging for reuse at minimum of 65 percent of the nonhazardous construction and demolition waste generated during most "new construction" projects (CALGreen Code Sections 4.408 and 5.408). Construction contractors are required to submit a construction waste management plan that identifies the construction and demolition waste materials to be diverted from disposal by recycling, reuse on the project, or salvaged for future use or sale and the amount (by weight or volume).

**LOR GHG-4** New buildings are required to adhere to the CALGreen Code and Water Efficient Landscape Ordinance requirements to increase water efficiency and reduce urban per capita water demand.

**LOR GHG-5** CARB's RPS is a foundational element of the State's emissions reduction plan. These mandates apply directly to investor-owned utilities, which in the case of the proposed Project is SCE. On September 10, 2018, SB 100 was signed into law and established the following RPS targets: 50 percent renewable resources target by December 31, 2026, and 60 percent target by December 31, 2030. SB 100 also requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt hours of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024; 52 percent by December 31, 2027; and 60 percent by December 31, 2030.

**LOR GHG-6** SB 375 requires the reduction of GHG emissions from light trucks and automobiles

through land use and transportation efforts that will reduce VMT. In essence, SB 375's goal is to control GHGs by curbing urban sprawl and through better land use planning. SB 375 essentially becomes the land use contribution to the GHG reduction requirements of AB 32, California's global warming bill enacted in 2006, and SB 32.

**LOR GHG-7** The heavy-duty tractors and trailers (i.e., trucks that are 53-foot or longer) must use U.S. EPA SmartWay certified tractors and trailers or retrofit their existing fleet with SmartWay verified technologies in accordance with CARB's Heavy-Duty (Tractor-Trailer) GHG Regulation. Owners are responsible for replacing or retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. Sleeper cab tractors model year 2011 and later must be SmartWay certified. All other tractors must use SmartWay verified low rolling resistance tires. Trailers must have low rolling resistance tires and aerodynamic devices.

**LOR GHG-8** The medium-duty and heavy-duty vehicle engines are required to comply with the U.S. EPA's GHG and fuel efficiency standards. The federal and California Phase 1 standards took effect with model year 2014 tractors, vocational vehicles, and heavy-duty pick-up trucks and vans and the engines powering such vehicles (the Phase 1 standards excludes trailers). The federal Phase 2 standards cover model years 2018-2027 for certain trailers and model years 2021- 2027 for semi-trucks and large pick-up trucks, vans and all types and sizes of buses and work trucks. California is aligned with the federal Phase 2 standards in structure, timing, and stringency, but with some minor California differences. The California Phase 2 regulations became effective April 1, 2019.

**FSEIR Mitigation Measures**

The FSEIR analyzed emission impacts associated with land development throughout the City and implemented the following mitigation measures, which are applicable to the Project.

**3-2** The City of Ontario shall evaluate new development proposals within the City and require all developments to include access or linkages to alternative modes of transportation, such as transit stops, bike paths, and/or pedestrian paths (e.g., sidewalks).

**AQ-1** Prior to discretionary approval by the City of Ontario for development projects subject to CEQA (California Environmental Quality Act) review (i.e., nonexempt projects), project applicants shall prepare and submit a technical assessment evaluating potential project operation-phase-related air quality impacts to the City of Ontario Planning Department for review and approval. The evaluation shall be prepared in conformance with SCAQMD methodology in assessing air quality impacts. If operation-related air pollutants are determined to have the potential to exceed the SCAQMD–adopted thresholds of significance, the City of Ontario Planning Department shall require that applicants for new development projects incorporate mitigation measures to reduce air pollutant emissions during operational activities. The identified measures shall be included as part of the conditions of approval. Possible mitigation measures to reduce long-term emissions could include, but are not limited to the following:

- For site-specific development that requires refrigerated vehicles, the construction documents shall demonstrate an adequate number of electrical service connections at loading docks for plug-in of the anticipated number of refrigerated trailers to reduce idling time and emissions.
- Applicants for manufacturing and light industrial uses shall consider energy storage and combined heat and power in appropriate applications to optimize renewable energy generation systems and avoid peak energy use.
- Site-specific developments with truck delivery and loading areas and truck parking spaces shall include signage as a reminder to limit idling of vehicles while parked for loading/unloading in accordance with California Air Resources Board Rule 2845 (13 CCR Chapter 10 sec. 2485).
- Provide changing/shower facilities as specified in Section A5.106.4.3 of CALGreen (Nonresidential Voluntary Measures).
- Provide bicycle parking facilities per Section A4.106.9 of CALGreen (Residential Voluntary Measures).
- Provide preferential parking spaces for low-emitting, fuel-efficient, and carpool/van vehicles per Section A5.106.5.1 of CALGreen (Nonresidential Voluntary Measures).
- Provide facilities to support electric charging stations per Section A5.106.5.3 and Section A5.106.8.2 of CALGreen (Nonresidential Voluntary Measures; Residential Voluntary Measures).
- Applicant-provided appliances shall be Energy Star–certified appliances or appliances of equivalent energy efficiency (e.g., dishwashers, refrigerators, clothes washers, and dryers). Installation of Energy Star– certified or equivalent appliances shall be verified by the City during plan check.

**Mitigation Measures:** No additional mitigation is required.

**Level of Significance:** Less than significant impact.

## 5.2 Greenhouse Gas Reduction Plan Compliance

**Threshold 5.2 Would the Project conflict with an applicable plan, policy, or regulation of an agency adopted for the purpose of reducing GHG emissions?**

**City of Ontario Community Climate Action Plan**

The primary purpose of the CCAP is to feasibly reduce GHG emissions generated by land development projects, consistent with the statewide Scoping Plan GHG reduction efforts. The City has identified a series of reduction measures that improve building energy efficiency, increase use of public and active transit, alternative-fueled vehicles, and renewable energy, and reduce VMT and water consumption. **Table 11: Community Climate Action Plan Consistency** evaluates the consistency of the Project to the applicable measures of the CCAP.

| **Table 11: Community Climate Action Plan Consistency** | | |
|---|---|---|
| **Strategy** | **Measure Description** | **Consistency** |
| **Energy** | | |
| Strategy 1 | **Building electrification.** Promote and incentivize the phase-out of gas appliances in new and existing homes and businesses throughout the community to advance GHG reductions, increase energy efficiency, and protect public safety and environmental health. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. Furthermore, the residential uses would not include natural gas hearths. |
| Strategy 2 | **Onsite solar energy for existing residential development.** Continue to support and facilitate installation of rooftop solar photovoltaic and onsite solar energy systems in existing residential development. | **N/A:** This measure only applies to existing residential development and is not applicable to the proposed Project. |
| Strategy 3 | **Onsite Solar Energy Systems for Nonresidential Development:** Ensure new large non-residential development, including City facilities, includes on-site renewable energy to support the site's energy needs by requiring solar photovoltaic panels or other appropriate on-site renewable energy generation systems for the following types of projects:<br>• New commercial and office buildings, or existing commercial and office building expansions greater or equal to 45,000 square feet in size.<br>• New industrial or existing industrial buildings expansions greater or equal to 100,000 square feet in size. | **Consistent:** The proposed commercial uses would incorporate energy efficient building designs such as flat roofs that allow for solar panels, subject to the City of Ontario policies and development regulations. |
| Strategy 4 | **Green roofs.** Promote and incentivize residents and business owners to install green roofs to conserve energy and reduce surface water runoff. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| Strategy 5 | **Urban Cooling:** Maintain and expand the City's existing tree canopy, with a goal of planting 500 trees annually through 2050 and promote the use of pervious concrete and cool pavement for pavement projects. | **Consistent:** This measure is to be taken at the City level. The Project would require trees along streetscapes, neighborhood edges, parking lots, and open space areas. |
| Strategy 6 | **Energy efficiency retrofits for low-income households.** Promote and incentivize voluntary energy efficiency retrofits of homes to reduce natural gas and electricity usage, with the goal of retrofitting 9,000 low-income homes by 2050. Partner with community services agencies to fund energy efficiency projects, including heating, ventilation, air conditioning, indoor lighting, water heating equipment, insulation, and weatherization for low-income residents. | **N/A:** This measure is not applicable to the proposed Project, as retrofits only apply to existing structures. |
| Strategy 7 | **Energy efficiency retrofits.** Promote and incentivize voluntary energy efficiency retrofits to reduce in natural gas and electricity usage. Partner | **N/A:** This measure is not applicable to the proposed Project, as retrofits only apply to existing structures. |

| **Table 11: Community Climate Action Plan Consistency** | | |
|---|---|---|
| **Strategy** | **Measure Description** | **Consistency** |
| | with regional agencies to expand access to existing energy efficiency and conservation opportunities, incentives, and technical assistance for residents and businesses. | |
| Strategy 8 | **Smart Growth and Infill.** Encourage revitalization of neighborhoods through higher-density, mixed-use, infill development and creative reuse of underutilized sites within the urban core. | **Consistent:** The Project proposes a mixed-use development on an underutilized site in the City. |
| **Transportation** | | |
| Strategy 9 | **Transit-Oriented Development:** Encourage development of compact, mixed-use, and transit-oriented development to improve the regional jobs-housing balance, especially on corridors served by high-ridership transit and bus rapid transit, such as Holt Avenue. | **Consistent:** The Project proposes a mixed-use development along a high-volume corridor, Euclid Avenue. Transit turnouts would be constructed within the proposed Specific Plan area in coordination with Omnitrans. An Omnitrans BRT Corridor is planned along Edison Avenue/Ontario Ranch Road. |
| Strategy 10 | **Increase Transportation Ridership.** Ensure a reliable and responsive transit system with dedicated and secure funding and resources to support increased ridership. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| Strategy 11 | **Traffic signal synchronization and roadway management.** Implement traffic and roadway management strategies to improve mobility and efficiency and reduce associated emissions. | **Consistent:** The Project would construct a roadway network in accordance with the City of Ontario Master Plan of Streets and Highways and The Ontario Ranch Streetscape Master Plan. The roadway network would be designed to maintain an efficient control of all modes of traffic. |
| Strategy 12 | **Community vehicle electrification.** Promote and incentivize the adoption of electric vehicles (EV) citywide, including light-duty and heavy-duty vehicles, for municipal, commercial, and residential uses. | **Consistent:** This measure is to be taken at the City level. The Project would construct facilities to support electric charging stations. |
| Strategy 13 | **Active Transportation Networks:** Work with transit agencies, school districts, and employers to facilitate an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling, and walking. | **Consistent:** The Project would develop Multipurpose Trails along Euclid Avenue/Ontario Ranch Road, Campus Avenue, Grove Avenue, and Walker Avenue, which would connect to a Class II Bike Path and off-site Multipurpose Trails. Transit turnouts would be constructed within the proposed Specific Plan area in coordination with Omnitrans. An Omnitrans BRT Corridor is planned along Edison Avenue/Ontario Ranch Road. |

| **Table 11: Community Climate Action Plan Consistency** | | |
|---|---|---|
| **Strategy** | **Measure Description** | **Consistency** |
| Strategy 14 | **Vehicle Idling:** Limit idling of heavy-duty trucks. Support the SCAMQD and CARB anti-idling requirements and provide signage in key areas where idling that is not consistent with SCAMQD or CARB requirements might occur. | **Consistent:** Commercial motor vehicles are required to comply with CCR Section 2485, which would limit the idling of diesel fueled vehicles to no more than five minutes. |
| Strategy 15 | **Parking policy and event parking.** Adopt a comprehensive parking policy that encourages carpooling and the use of alternative transportation, including providing parking spaces for car-share vehicles at convenient locations with access to public transportation. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| **Off-road Equipment** | | |
| Strategy 16 | **Electrification of construction and landscaping equipment.** Promote and incentivize the transition to electric construction and landscaping equipment. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| Strategy 17 | **Idling Ordinance for Construction Equipment:** Limit idling of heavy-duty off-road construction equipment to reduce air pollution and GHG emissions from construction activity. | **Consistent:** Construction would be required to comply with CCR Section 2485 and 2499 which would limit the idling of heavy-duty construction equipment to no more than five minutes. |
| **Waste** | | |
| Strategy 18 | **Methane capture at landfills.** Support efforts to reduce methane emissions from regional landfills. | **N/A:** This measure is not applicable to the proposed Project. |
| Strategy 19 | **Waste Diversion:** Exceed waste diversion goals recommended by AB 939 and CALGreen by adopting a citywide diversion target of at least 75 percent of waste. | **Consistent:** The Project would be subject to all applicable local, State, and federal waste diversion requirement. |
| Strategy 20 | **Construction and Demolition Waste Recovery Ordinance:** Increase the amount of waste recycled during construction and demolition of buildings. | **Consistent:** Contractors are required to comply with CALGreen Code Sections 4.408 and 5.408, requiring the recycling of a minimum of 65 percent of construction and demolition waste, refer to LOR GHG-3. |
| **Water** | | |
| Strategy 21 | **Indoor water efficiency.** Encourage water-efficient retrofits of new and existing buildings by working with water providers and regional agencies. | **Consistent:** The Project would comply with CALGreen Code Section 4.303 and require the installation of low flow fixtures. In addition, the Project would comply with the City of Ontario Recycled Water Master Plan and irrigate landscaped areas with recycled water. The irrigations systems would have automatic controllers, including automatic rain shut-off devices. |

**Table 11: Community Climate Action Plan Consistency**

| Strategy | Measure Description | Consistency |
|---|---|---|
| Strategy 22 | **Water Efficient Landscapes and Water Recycling:** Promote drought-tolerant and fire-wise landscaping. Encourage increased use of reclaimed water for landscape irrigation, agricultural, and industrial use. | **Consistent:** The Project would include drought tolerant landscaping and would irrigate landscape areas with recycled water as required by the City of Ontario Recycled Water Master Plan. |
| Strategy 23 | **Water system and wastewater operations efficiency.** Maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak demand schedules for heavy commercial and industrial users. | **N/A:** This measure is not applicable to the proposed Project. |
| Strategy 24 | **Methane capture for wastewater treatment.** Work with Inland Empire Utilities Agency (IEUA), the local wastewater treatment provider, to increase methane capture rate. | **N/A:** This measure is not applicable to the proposed Project. |
| **Other** | | |
| Strategy 25 | **Methane capture for dairy operations.** Encourage and incentivize local dairy operations to reduce methane emissions through methane capture technology. | **N/A:** This measure is not applicable to the proposed Project. |
| Strategy 26 | **Climate change awareness and education.** Promote climate change awareness and GHG reduction community-wide through a variety of mechanisms, including through support of climate change education in schools or community colleges. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| Strategy 27 | **Carbon sequestration.** Establish a citywide carbon sequestration project and sequestration goal of 5,000 MT $CO_2$ per year. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |
| Strategy 28 | **Green jobs.** Support green job trainings and opportunities to create sustainable, living wage, quality employment opportunities. | **N/A:** This measure is to be taken at the City level. Project implementation would not conflict with this strategy. |

N/A = not applicable

Source: City of Ontario, *Ontario Community Climate Action Plan,* 2022, https://content.ontarioca.gov/sites/default/files/2025-01/Ontario-CCAP_Adopted_20220816.pdf, accessed April 2025.

As discussed in **Table 11**, the Project would be consistent with all applicable measures and would not conflict with the goals of the CCAP.

The CCAP establishes a points system that assigns values for each GHG emissions mitigating design feature incorporated into a given development project. Projects with features that yield at least 100 points from the Screening Table points are considered consistent with the reduction quantities anticipated in the CCAP and would be determined to have a less than significant individual and cumulative GHG emissions impact. The Applicant may work with the City to determine point values for additional design features to achieve a minimum of 100 points. Since the Project contains both residential and commercial developments, both the residential and commercial screening tables

would need to achieve 100 points. The Project would have the opportunity to receive more points for additional measures including renewable energy installments, EV recharging stations, and land use based trips and VMT reductions. As noted above, the Applicant must complete and submit a final set of screening tables showing the achievement of the required 100 points prior to issuance of the building permit. This measure would ensure that future Project development is consistent with the City's CCAP and would reduce impacts to less than significant.

**SCAG Regional Transportation Plan/Sustainable Communities Strategy Consistency**

On April 4, 2024, SCAG's Regional Council adopted 2024-2050 RTP/SCS, which is long-range visioning plan that balances future mobility and housing needs with economic, environmental, and public health goals. 21 Under SB 375, SCAG's 2024-2050 RTP/SCS establishes GHG emissions goals to reduce GHG emissions in the region by eight percent from 2005 levels by 2020 and 19 percent below 2005 levels by 2035.[22]

SCAG plays a critical role in project selection, programming, and administration of federal funds available to the region. The 2024-2050 RTP/SCS account for operations and maintenance costs to ensure reliability, longevity, and cost effectiveness. Implementation of the 2024 RTP/SCS would add 181,200 new miles of transit revenue service, 4,000 new miles of bike lanes and 869 new miles to the Regional Express Lane Network. Strategic investments in infrastructure and transportation would improve access to employment centers and stimulate regional economic growth and opportunity in historically underserved areas.

The 2024-2050 RTP/SCS is supported by a combination of transportation and land use strategies that help the region achieve state GHG emissions reduction goals and FCAA requirements, increased housing production, improved equity and resilience, the preservation of natural lands, improvement of public health, increased transportation safety, support for the region's vital goods movement industries and more efficient use of resources. GHG emissions resulting from development-related mobile sources are the most potent source of emissions, and therefore project comparison to the 2024-2050 RTP/SCS is an appropriate indicator of whether the Project would inhibit the post-2020 GHG reduction goals promulgated by the state. The Project's consistency with the 2024-2050 RTP/SCS goals is analyzed in detail in **Table 12: 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy Consistency**.

**Table 12: 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy Consistency**

| RTP/SCS Goal | Consistency |
|---|---|
| **Mobility: Build and maintain an integrated multimodal transportation network.** | |
| Support investments that are well-maintained and operated, coordinated, resilient and result in improved safety, improved air quality and minimized greenhouse gas emissions | **Consistent:** This measure is to be taken at the regional level. Project implementation would not conflict with the goal. As discussed above, the Project would be constructed in accordance with the Title 24 of the California Building Standards Code, Title 20 of the California Code of Regulations, and CALGreen Code standards. Furthermore, the Project would |

[21] Southern California Association of Governments, *Connect SoCal (2024 – 2050 Regional Transportation Plan/Sustainable Communities Strategy),* 2024, *https://scag.ca.gov/sites/default/files/2024-05/23-2987-connect-socal-2024-final-complete-040424.pdf*, accessed April 2025.
[22] Ibid.

| **Table 12: 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy Consistency** | |
|---|---|
| **RTP/SCS Goal** | **Consistency** |
| | include facilities that support electric charging station and flat roofs that allow for solar panels. |
| Ensure that reliable, accessible, affordable, and appealing travel options are readily available, while striving to enhance equity in the offerings in high-need communities | **Consistent**: This measure is to be taken at the regional level. Project implementation would not conflict with the goal. The Project proposes a mixed-use development in an area that is transitioning from dairy/agriculture uses to urban uses. The Project site would connect to a Class II Bike Path and off-site Multipurpose Trails and would provide bicycle parking. |
| Support planning for people of all ages, abilities, and backgrounds | **Consistent:** This measure is to be taken at the regional level. Project implementation would not conflict with the goal. The Project would include new market rate and affordable residential dwelling units. |
| **Communities: Develop, connect, and sustain communities that are livable and thriving** | |
| Create human-centered communities in urban, suburban, and rural settings to increase mobility options and reduce travel distances | **Consistent**: The Project proposes a mixed-use development that would support the transition from dairy/agriculture uses to urban uses. The proposed Project would provide Multipurpose Trails along Euclid Avenue/Ontario Ranch Road, Campus Avenue, Grove Avenue, and Walker Avenue, which would connect to a Class II Bike Path and off-site Multipurpose Trails. Transit turnouts would be constructed within the proposed Specific Plan area in coordination with Omnitrans. An Omnitrans BRT Corridor is planned along Edison Avenue/Ontario Ranch Road. |
| Produce and preserve diverse housing types in an effort to improve affordability, accessibility, and opportunities for all households | **Consistent**: The Project would include new market rate and affordable residential uses. |
| **Environment: Create a healthy region for the people of today and tomorrow** | |
| Develop communities that are resilient and can mitigate, adapt to, and respond to chronic and acute stresses and disruptions, such as climate change | **Consistent**: The Project would promote non-auto travel and reduce single-occupant vehicle trips by improving the pedestrian environment, connecting to Class II Bike Path and off-site Multipurpose Trails, and providing bicycle parking.<br><br>The Project would be constructed in accordance with the Title 24 of the California Building Standards Code, Title 20 of the California Code of Regulations, and CALGreen Code standards. Furthermore, the Project would include facilities that support electric charging stations and flat roofs that allow for solar panels.<br><br>The Project would include GHG-reducing project design features, consistent with the CCAP. The Project would include drought tolerant landscaping and would irrigate landscape areas with recycled water as required by the City of Ontario Recycled Water Master Plan.<br><br>The Project would develop a resilient community, integrating the region's development pattern and transportation network to improve air quality, reduce GHG emissions and enable more sustainable use of energy and water. |
| Integrate the region's development pattern and transportation network to improve air quality, reduce greenhouse gas emissions and enable more sustainable use of energy and water | |

| **Table 12: 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy Consistency** | |
|---|---|
| **RTP/SCS Goal** | **Consistency** |
| Conserve the region's resources | **Consistent**: Although the Project would remove dairy/agriculture uses, the Project would represent a consistent and logical continuation of the existing and planned pattern of development in the Ontario Ranch area. Furthermore, the Project would develop open space areas between the existing agriculture uses and the proposed urban uses, consistent with TOP 2050 FSEIR and the Agriculture Overlay zoning. |
| **Economy: Support a sustainable, efficient, and productive regional economic environment that provides opportunities for all people in the region** | |
| Improve access to jobs and educational resources | **Consistent:** The Project proposes a mixed-use development that would connect residents to jobs and services. In addition, the Project would represent a consistent and logical continuation of the existing and planned pattern of development in the Ontario Ranch area. |
| Advance a resilient and efficient goods movement system that supports the economic vitality of the region, attainment of clean air and quality of life for our communities | **Consistent:** This measure is to be taken at the regional level. Project implementation would not conflict with the goal. As discussed above, the Project would promote clean air and non-auto travel by developing the pedestrian environment and providing bicycle parking. The Project would incorporate a flat roof design that would allow for solar panels. The Project would incorporate a variety of strategies for sustainability and water conservation as required by the CCAP. The Project would contribute toward and facilitate the City's long-term housing needs. |
| N/A = not applicable | |
| Source: Southern California Association of Governments, *Connect SoCal (2024 – 2050 Regional Transportation Plan/Sustainable Communities Strategy),* 2024, *https://scag.ca.gov/sites/default/files/2024-05/23-2987-connect-socal-2024-final-complete-040424.pdf*, accessed April 2025. | |

As shown in **Table 12**, the Project would be consistent with all applicable stated goals of the 2024-2050 RTP/SCS. Project implementation would not result in any significant impacts or interfere with SCAG's ability to achieve the region's post-2020 mobile source GHG reduction targets.

### California Air Resource Board Scoping Plan Consistency

The 2022 Scoping Plan sets a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85 percent below 1990 levels by 2045 in accordance with AB 1279. The transportation, electricity, and industrial sectors are the largest GHG contributors in the State. The 2022 Scoping Plan aims to achieve the AB 1279 targets primarily through zero-emission transportation (e.g., electrifying cars, buses, trains, and trucks) and decarbonizing the electricity and industrial sectors.

Statewide strategies to reduce GHG emissions in the latest 2022 Scoping Plan include:

- Implementing SB 100 (achieve 100 percent clean electricity by 2045);
- Achieving 100 percent ZEV sales in 2035 through Advanced Clean Cars II; and
- Implementing the ACF regulation to deploy ZEV buses and trucks.

The 2022 Scoping Plan would continue to implement SB 375. GHGs would be further reduced through the Cap-and-Trade Program carbon pricing and SB 905. SB 905 requires CARB to create the Carbon Capture, Removal, Utilization, and Storage Program to evaluate, demonstrate, and regulate carbon dioxide removal projects and technology.

While these measures are not directly applicable to the Project, any commercial activity associated with goods movement would be required to comply with these measures as adopted. The Project would not obstruct or interfere with efforts to increase ZEVs or State efforts to improve system efficiency. Compliance with applicable State standards would ensure consistency with State and regional GHG reduction planning efforts, including the 2022 Scoping Plan.

As discussed herein, the Project would comply with the Energy Code, the CALGreen Code, and energy efficiency measures implemented by the CCAP. Consistent with the CAP, the buildings developed under the Project would have rooftops that can support solar panels (i.e., solar-ready) which will comply with solar ready requirements of the Energy Code, which would enable future tenants to install a PV system. Therefore, implementation of the Project would support the statewide goal of decarbonization by 2045.

Appendix D (Local Actions)

The Appendix D of the 2022 Scoping Plan establishes guidelines on evaluating plan-level and project-level alignment with the State's Climate Goals in CEQA GHG analyses.

Appendix D notes that project consistency with the Scoping Plan can be determined through consistency with a qualified CAP, and absent consistency with a qualified CAP the State recommends that residential and mixed-use projects meet the following three priority areas will reduce GHG emissions and should accommodate growth in a manner consistent with State GHG reduction and equity prioritization goals. These project attributes are intended to help local jurisdictions qualitatively identify projects that are clearly consistent with the Scoping Plan. Appendix D also notes that lead agencies may determine, with adequate additional supporting evidence, that projects that incorporate some, but not all, of the key project attributes are consistent with the State's climate goals.[23]

- **Transportation Electrification.** Appendix D, Table 3 notes that to be clearly consistent with the State's goals, projects should provide EV charging infrastructure that, at minimum, meets the most ambitious voluntary standard in the CALGreen code.
- **VMT Reduction.** The Scoping Plan notes that to be consistent with the VMT reduction attribute, projects should be located on sites that are surrounded by existing urban uses and reuses or redevelops previously undeveloped or underutilized land; do not result in the loss or conversion of natural and working lands; and consist of transit-supportive densities (minimum of 20 residential dwelling units per acre).
- **Building Decarbonization.** Building decarbonization involves maximizing energy efficiency and reducing the use of fossil fuel energy.

The CCAP is a CEQA-qualified CAP and was adopted in 2022. **Table 11** demonstrates the Project

[23] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality*, Appendix D: Local Actions, Page 23, 2022. https://ww2.arb.ca.gov/sites/default/files/2022-11/2022-sp-appendix-d-local-actions.pdf, accessed December 2024.

would be consistent with the CCAP. Therefore, the Project is consistent with the 2022 Scoping Plan and would comply with all applicable regulatory requirements.

### Conclusion

As discussed above, the Project consistency with applicable Plan strategies and goals would reduce GHG emissions. In addition, the Project would include several sustainable design features as required by the CCAP that would further reduce GHG emissions. As stated in the CCAP, projects that achieve a minimum score of 100 points are considered less than significant. At the time of this analysis, the Project is in the design phase, where project design features needed to achieve consistency with the Screening Tables are being considered and implemented. The Applicant must complete and submit a final set of screening tables showing the achievement of the required 100 points prior to issuance of the building permit. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

**Mitigation Measures:** No mitigation is required.

**Level of Significance:** Less than significant impact.

## 5.3 Cumulative Impacts

Project-related GHG emissions are not confined to a particular air basin but are dispersed worldwide. Therefore, impacts under Impact Threshold 5.1 are not Project-specific impacts, but the proposed Project's contribution to cumulative GHG impact. As discussed previously, the Project would be required to achieve a minimum of 100 points from the Screening Table Measures. Projects with features that yield at least 100 points are considered consistent with the reduction quantities anticipated in the CCAP and are determined to have a less than significant individual and cumulative GHG emissions impact. In addition, the Project would represent a consistent and logical continuation of the existing and planned pattern of development in the Ontario Ranch area. The City has long anticipated that this area would transition from dairy/agricultural to urban uses.[24] Therefore, Project-related GHG emissions and their contribution to global climate change would not be cumulatively considerable. Impacts would be less than significant. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe cumulative impacts than previously analyzed in the FSEIR.

### Conclusion

**Table 13: Project Consistency with the FSEIR** summarizes the consistency of the Project's impacts with the findings of the FSEIR. The Project would demonstrate consistency with the CCAP by achieving a minimum score of 100 points from the Screening Tables. Therefore, the Project construction and operational-related GHG emissions would not exceed the applicable thresholds. Furthermore, the Project would be consistent with the applicable GHG-reducing plans and policies. As shown in **Table 13**, the Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously

[24] City of Ontario, *The Ontario Plan 2050, Final Supplemental Environmental Impact Report, Section 5.8: Greenhouse Gas Emissions*, 2022, https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf, accessed April 2025.

analyzed in the FSEIR.

**Table 13: Project Consistency with the FSEIR**

| Impact | FSEIR Findings | Project Findings |
|---|---|---|
| GHG Emissions Violation | Less than Significant | Less than Significant |
| Cumulative Considerable Net Increase of GHGs | Less than Significant | Less than Significant |
| Applicable Plans, Policies, and Regulations Consistency | Less than Significant | Less than Significant |

# 6.0 REFERENCES

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2. California Air Resources Board, ACF Waiver Update, https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets, accessed April 2025.
3. California Air Resources Board, California Greenhouse Gas Emissions from 2000 to 2021: Trends of Emissions and Other Indicators. 2023, https://ww2.arb.ca.gov/sites/default/files/2023-12/2000_2021_ghg_inventory_trends.pdf, accessed April 2025.
4. California Air Resources Board, Final 2022 Scoping Plan Update, December 2022, https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents, accessed April 2025.
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6. Intergovernmental Panel on Climate Change, Carbon and Other Biogeochemical Cycles. In: Climate Change 2013: The Physical Science Basis, Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 2013, https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf, accessed December 2024.
7. National Highway Traffic Safety Administration, NHTSA Announces Final Rule for CAFE and HDPUV Standards, https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy, accessed February 2025.
8. South Coast Air Quality Management District, Minutes for the GHG CEQA Significance Threshold Stakeholder Working Group #13, August 26, 2009
9. U.S. Environmental Protection Agency, Final Rule to Revise Existing National GHG Emissions Standards for Passenger Cars and Light Trucks Through Model Year 2026, 2021, https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-revise-existing-national-ghg-emissions, accessed April 2025.
10. Urban Crossroads, Center Park Specific Plan Traffic Analysis, 2025.

# Appendix A

## Greenhouse Gas Emissions Data

# Center Park Specific Plan
## CalEEMod Assumptions

# Phase I

Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 6 | 7.32 | Single Family Detached | 40 | DU | 22 | 1.82 |
| | | Multifamily (Low-Rise) Residential | 121 | DU | 22 | 5.50 |
| 12 | 15.45 | Single Family Detached | 85 | DU | 22 | 3.86 |
| | | Multifamily (Low-Rise) Residential | 255 | DU | 22 | 11.59 |
| 13 | 23.77 | Single Family Detached | 131 | DU | 22 | 5.95 |
| | | Multifamily (Low-Rise) Residential | 392 | DU | 22 | 17.82 |
| 17 | 6.20 | Public Park | 6.20 | AC | -- | -- |
| 18 | 13.44 | Active Park | 13.44 | AC | -- | -- |
| 22 | 3.38 | Non-Recreational Park | 3.38 | AC | -- | -- |

PA = planning area, AC = acres; DU = dwelling unit
1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 22, which was taken from TOP 2025.
3. The building lot size was calculated using the following equation: building lot size = dwelling units * (dwelling units/acre).

Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 256 | DU | 506,880 | -- | 11.64 |
| Apartments (Low-Rise)[1] | 768 | DU | 152,0640 | -- | 34.91 |
| City Park[2,3] | 19.64 | AC | -- | 855,518.40 | 19.64 |
| Other Non-Asphalt Surfaces[2,4] | 3.38 | AC | -- | 147,232.80 | 3.38 |

DU = dwelling unit; AC = acres; SF = square feet
1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The city park and other non-asphalt surfaces was assumed to be fully landscaped with “special landscaping” because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
3. The public park and active park were modeled as city park.
4. The non-recreational park was modeled as non-asphalt surfaces.

# Construction

## Schedule

| Construction Phase | Start Date | End Date | Workdays |
|---|---|---|---|
| Demolition | 12/1/2025 | 6/1/2026 | 131 |
| Site Preparation | 12/15/2025 | 6/15/2026 | 131 |
| Grading | 4/1/2026 | 12/1/2026 | 175 |
| Infrastructure Improvements | 8/1/2026 | 2/1/2027 | 131 |
| Building Construction | 12/2/2026 | 5/2/2027 | 108 |
| Paving | 2/2/2027 | 3/2/2027 | 21 |
| Architectural Coating | 5/3/2027 | 5/31/2027 | 21 |

## Construction Phase Overlap

| Construction Phase | Start Date | End Date |
|---|---|---|
| Demolition + Site Preparation | 12/15/2025 | 3/31/2026 |
| Demolition + Site Preparation + Grading | 4/1/2026 | 6/1/2026 |
| Site Preparation + Grading | 6/2/2026 | 6/15/2026 |
| Grading + Infrastructure Improvements | 8/1/2026 | 12/1/2026 |
| Infrastructure Improvements + Building Construction | 12/2/2026 | 2/1/2027 |
| Building Construction + Paving | 2/2/2027 | 3/2/2027 |

## Equipment

| Construction Phase | Equipment | Number per Day | Hours per Day |
|---|---|---|---|
| Demolition | Rubber Tired Dozers | 2 | 8 |
| | Excavators | 3 | 8 |
| | Concrete/Industrial Saws | 1 | 8 |
| Site Preparation | Rubber Tired Dozers | 3 | 8 |
| | Tractors/Loaders/Backhoes | 4 | 8 |
| Grading | Graders | 1 | 8 |
| | Excavators | 2 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| | Scrapers | 2 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| Infrastructure Improvements | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Building Construction | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Paving | Pavers | 2 | 8 |
| | Paving Equipment | 2 | 8 |
| | Rollers | 2 | 8 |
| Architectural Coating | Air Compressors | 1 | 6 |

## Worker, Vendor, and Haul Trips

| Trip Type | # One-Way Trips/Day | Trip Length (miles) |
|---|---|---|
| **Demolition** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 24.32 | 20 |
| On-Site Truck | -- | -- |
| **Site Preparation** | | |
| Worker | 17.5 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Grading** | | |
| Worker | 20 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Infrastructure Improvements** | | |
| Worker | 645.12 | 18.5 |
| Vendor | 109.47 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Building Construction** | | |
| Worker | 645.12 | 18.5 |
| Vendor | 109.47 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Paving** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Architectural Coating** | | |
| Worker | 258.05 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |

## Demolition

| Construction Phase | Amount (tons) |
|---|---|
| Demolition | 12,744 |

## Notes

Construction would include (per SCAQMD Rule 403 and FSEIR MM 3-1)

- watering exposed areas 3 times per day during earthmoving activities (site preparation and grading)
- watering demolished areas 2 times per day during demolition
- watering unpaved roads 2 times per day and limit vehicle speeds on unpaved roads to 25 mph throughout construction

# Operations

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 256 | DU | 9.4375000 | 2,416 |
| Apartments Low Rise | 768 | DU | 6.739583333 | 5,176 |
| City Park | 19.64 | AC | 34.52138493 | 678 |
| Other Non-Asphalt Surfaces | 3.38 | AC | 0 | 0 |
| | | | **Total** | **8,270** |
| DU = dwelling unit; AC = acres | | | | |
| Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025. | | | | |

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.43607679 | 4.945488532 | 7.468766689 |
| Apartments Low Rise | 18.43607679 | 4.945488532 | 7.468766689 |
| City Park | 18.43607679 | 6.967184162 | 11.74551353 |
| Other Non-Asphalt Surfaces | 18.43607679 | 6.967184162 | 11.74551353 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 41.4893616 | 6.3829787 | 52.1276596 |
| Apartments Low Rise | 100 | 0 | 0 | 41.4893616 | 6.3829787 | 52.1276596 |
| City Park | 100 | 0 | 0 | 79.5918367 | 10.2040816 | 10.2040816 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 79.5918367 | 10.2040816 | 10.2040816 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| Apartments (Low-Rise) | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| City Park | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |
| Other Non-Asphalt Surfaces | 1.831775158643 | 49.75321590 | 3.836376592 | 21.20354026 | 2.828409709 | 0.774669507 | 2.080284990 | 15.27987122 | 0.419818004 | 1.791886053 | 0.060261401 | 0.108909897 | 0.030982101 |

Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 174.4 | 81.6 |
| Apartments Low Rise | 523.2 | 244.8 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments.<br>The Project would not include natural gas fireplaces.<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces. | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Construction** | | |
| C-2* | Limit Heavy-Duty Diesel Vehicle Idling | Construction equipment idling would be limited to 5 minutes per FSEIR MM 3-1 |
| C-5 | Use Advanced Engine Tiers | Construction equipment would have Tier 4 Final engines per FSEIR MM 3-1 |
| C-13 | Use Low-VOC Paints for Construction | Architectural coatings would have a VOC content <10 g/L per FSEIR MM 3-1 |
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

# Phase II

Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 1 | 15.91 | Single Family Detached | 88 | DU | 22 | 4.00 |
| | | Multifamily (Low-Rise) Residential | 262 | DU | 22 | 11.91 |
| 2 | 15.59 | Single Family Detached | 86 | DU | 22 | 3.91 |
| | | Multifamily (Low-Rise) Residential | 257 | DU | 22 | 11.68 |
| 3 | 7.68 | Single Family Detached | 42 | DU | 22 | 1.91 |
| | | Multifamily (Low-Rise) Residential | 127 | DU | 22 | 5.77 |
| 4 | 5.00 | Multifamily (Low-Rise) Residential | 175 | DU | 35 | 5.00 |
| | 1.43 | Retail | 18,635 | SF | -- | 0.43 |
| | 0.71 | General Office | 21,741 | SF | -- | 0.50 |
| 5 | 5.19 | Multifamily (Low-Rise) Residential | 182 | DU | 35 | 5.20 |
| | 1.48 | Retail | 19,367 | SF | -- | 0.44 |
| | 0.74 | General Office | 22,595 | SF | -- | 0.52 |
| 7 | 23.68 | Single Family Detached | 130 | DU | 22 | 5.91 |
| | | Multifamily (Low-Rise) Residential | 391 | DU | 22 | 17.77 |
| 8 | 24.18 | Single Family Detached | 133 | DU | 22 | 6.05 |
| | | Multifamily (Low-Rise) Residential | 399 | DU | 22 | 18.14 |
| 9 | 12.18 | Single Family Detached | 67 | DU | 22 | 3.05 |
| | | Multifamily (Low-Rise) Residential | 201 | DU | 22 | 9.14 |
| 10 | 9.86 | Multifamily (Low-Rise) Residential | 345 | DU | 35 | 9.86 |
| | 2.82 | Retail | 36,852 | SF | -- | 0.85 |
| | 1.41 | General Office | 42,994 | SF | -- | 0.99 |
| 11 | 10.97 | Multifamily (Low-Rise) Residential | 384 | DU | 35 | 10.97 |
| | 3.13 | Retail | 40,955 | SF | -- | 0.94 |
| | 1.57 | General Office | 47,781 | SF | -- | 1.10 |
| 14 | 13.33 | Active Park | 13.33 | AC | -- | -- |
| 15 | 13.11 | Active Park | 13.11 | AC | -- | -- |
| 16 | 9.90 | Public Park | 9.90 | AC | -- | -- |
| 19 | 2.26 | Non-Recreational Park | 2.26 | AC | -- | -- |
| 20 | 2.68 | Non-Recreational Park | 2.68 | AC | -- | -- |
| 21 | 2.96 | Non-Recreational Park | 2.96 | AC | -- | -- |

PA = planning area; AC = acres; DU = dwelling unit; SF = square feet

1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 19 through 21, which were taken from TOP 2025.
3. The residential building lot size was calculated using the following equation: building lot size = dwelling units *(dwelling units/acre). The retail and general office building lot size was assumed to be equal to the land use size in acres.

## Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 546 | DU | 1,081,080 | -- | 24.82 |
| Apartments Low Rise[1] | 2,723 | DU | 4,592,864 | -- | 105.44 |
| Strip Mall[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant w/o Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant with Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| General Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| Medical Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| City Park[6,7] | 36.34 | AC | -- | 158,2970.4 | 36.34 |
| Other Non-Asphalt Surfaces[6,8] | 7.90 | AC | -- | 344,124 | 7.9 |
| Parking Lot[9] | 6.954 | AC | -- | -- | 6.954 |

DU = dwelling unit; KSF = thousand square feet; AC = acres; SF = square feet

1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The retail size was evenly divided between the strip mall, fast food restaurant w/o drive thru, and fast food restaurant with drive thru land uses.
3. Per the proposed Specific Plan, the retail and office land uses would include landscaping equal to 10% of the building square footage.
4. The lot size included the building size and landscaping in acres.
5. The general office size was evenly divided between the general office building and medical office building land uses.
6. The city park and other non-asphalt surfaces was assumed to be fully landscaped with "special landscaping" because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
7. The public park and active park were modeled as city park.
8. The non-recreational park was modeled as non-asphalt surfaces.
9. Assumed the retail and office lot acreage not occupied by buildings or landscaping would be dedicated to parking lots. The lot size in acres was calculated using the following equation: lot size = total lot size – building size – landscaping.

# Construction

## Schedule

| Construction Phase | Start Date | End Date | Workdays |
|---|---|---|---|
| Demolition | 12/2/2026 | 6/2/2027 | 131 |
| Site Preparation | 12/15/2026 | 6/15/2027 | 131 |
| Grading | 4/1/2027 | 12/1/2027 | 175 |
| Infrastructure Improvements | 8/1/2027 | 12/1/2028 | 350 |
| Building Construction | 10/1/2028 | 3/1/2030 | 370 |
| Paving | 8/1/2028 | 2/1/2029 | 133 |
| Architectural Coating | 3/2/2030 | 3/30/2030 | 20 |

## Construction Phase Overlap

| Construction Phase | Start Date | End Date |
|---|---|---|
| Demolition + Site Preparation | 12/15/2026 | 3/31/2027 |
| Demolition + Site Preparation + Grading | 4/1/2027 | 6/2/2027 |
| Site Preparation + Grading | 6/3/2027 | 6/15/2027 |
| Grading + Infrastructure Improvements | 8/1/2027 | 12/1/2027 |
| Infrastructure Improvements + Paving | 8/1/2028 | 9/30/2028 |
| Infrastructure Improvements + Paving + Building Construction | 10/1/2028 | 12/1/2028 |
| Building Construction + Paving | 12/2/2028 | 2/1/2029 |

## Equipment

| Construction Phase | Equipment | Number per Day | Hours per Day |
|---|---|---|---|
| Demolition | Rubber Tired Dozers | 2 | 8 |
| | Excavators | 3 | 8 |
| | Concrete/Industrial Saws | 1 | 8 |
| Site Preparation | Rubber Tired Dozers | 3 | 8 |
| | Tractors/Loaders/Backhoes | 4 | 8 |
| Grading | Graders | 1 | 8 |
| | Excavators | 2 | 8 |
| | Tractors/Loaders/Backhoes | 2 | 8 |
| | Scrapers | 2 | 8 |
| | Rubber Tired Dozers | 1 | 8 |
| Infrastructure Improvements | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Building Construction | Forklifts | 3 | 8 |
| | Generator Sets | 1 | 8 |
| | Cranes | 1 | 7 |
| | Welders | 1 | 8 |
| | Tractors/Loaders/Backhoes | 3 | 7 |
| Paving | Pavers | 2 | 8 |
| | Paving Equipment | 2 | 8 |
| | Rollers | 2 | 8 |
| Architectural Coating | Air Compressors | 1 | 6 |

## Worker, Vendor, and Haul Trips

| Trip Type | # One-Way Trips/Day | Trip Length (miles) |
|---|---|---|
| **Demolition** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 58.8015 | 20 |
| On-Site Truck | -- | -- |
| **Site Preparation** | | |
| Worker | 17.5 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Grading** | | |
| Worker | 20 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Infrastructure Improvements** | | |
| Worker | 2245.1353 | 18.5 |
| Vendor | 390.5820 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Building Construction** | | |
| Worker | 2245.1353 | 18.5 |
| Vendor | 390.5820 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Paving** | | |
| Worker | 15 | 18.5 |
| Vendor | -- | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |
| **Architectural Coating** | | |
| Worker | 898.0541 | 18.5 |
| Vendor | 0 | 10.2 |
| Hauling | 0 | 20 |
| On-Site Truck | -- | -- |

## Demolition

| Construction Phase | Amount (tons) |
|---|---|
| Demolition | 30,810 |

## Notes

Construction would include (per SCAQMD Rule 403 and FSEIR MM 3-1)

- watering exposed areas 3 times per day during earthmoving activities (site preparation and grading)
- watering demolished areas 2 times per day during demolition
- watering unpaved roads 2 times per day and limit vehicle speeds on unpaved roads to 25 mph throughout construction

# Operations

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 546 | DU | 6.285047956 | 3,432 |
| Apartments Low Rise | 2723 | DU | 5.388308416 | 14,672 |
| Strip Mall | 38.603 | KSF | 15.38740512 | 594 |
| Fast Food Restaurant w/o Drive Thru | 38.603 | KSF | 179.0910682 | 6,913 |
| Fast Food Restaurant with Drive Thru | 38.603 | KSF | 185.84689 | 7,174 |
| General Office Building | 67.556 | KSF | 7.972483979 | 539 |
| Medical Office Building | 67.556 | KSF | 26.48781562 | 1789 |
| City Park | 36.34 | AC | 36.65382499 | 1,332 |
| Other Non-Asphalt Surfaces | 7.9 | AC | 0 | 0 |
| Parking Lot | 6.954 | AC | 0 | 0 |
| | | | **Total** | **36,446** |
| DU = dwelling unit; KSF = thousand square feet; AC = acres | | | | |
| Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025. | | | | |

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.81393411 | 20.96433004 | 6.45145941 |
| Apartments Low Rise | 18.81393411 | 20.96433004 | 6.45145941 |
| Strip Mall | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant w/o Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant with Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| General Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| Medical Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| City Park | 18.81393411 | 6.477110207 | 6.883326689 |
| Other Non-Asphalt Surfaces | 18.81393411 | 6.477110207 | 6.883326689 |
| Parking Lot | 18.81393411 | 6.477110207 | 6.883326689 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Apartments Low Rise | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Strip Mall | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant w/o Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant with Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| General Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| Medical Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| City Park | 100 | 0 | 0 | 80 | 8 | 12 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 80 | 8 | 12 |
| Parking Lot | 100 | 0 | 0 | 80 | 8 | 12 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Apartments Low Rise | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Strip Mall | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant w/o Drive Thru | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant with Drive Thru | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| General Office Building | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Medical Office Building | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| City Park | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Other Non-Asphalt Surfaces | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Parking Lot | 1.9090477377 | 49.107 11348 | 3.5715 38254 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

## Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 371.96 | 174.04 |
| Apartments Low Rise | 1,855.04 | 867.96 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments<br>The Project would not include natural gas fireplaces<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Construction** | | |
| C-2* | Limit Heavy-Duty Diesel Vehicle Idling | Construction equipment idling would be limited to 5 minutes per FSEIR MM 3-1 |
| C-5 | Use Advanced Engine Tiers | Construction equipment would have Tier 4 Final engines per FSEIR MM 3-1 |
| C-13 | Use Low-VOC Paints for Construction | Architectural coatings would have a VOC content <10 g/L per FSEIR MM 3-1 |
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

# Project Buildout (Phase I + Phase II)

## Construction Phase Overlap between Phase I and Phase II

| Construction Phase | Start Date | End Date |
|---|---|---|
| Phase I Building Construction + Infrastructure Improvements<br>+ Phase II Demolition | 12/2/2026 | 12/14/2026 |
| Phase I Building Construction + Infrastructure Improvements<br>+ Phase II Demolition + Site Preparation | 12/15/2026 | 2/1/2027 |
| Phase I Building Construction + Paving<br>Phase II Demolition + Site Preparation | 2/2/2027 | 3/2/2027 |
| Phase I Building Construction<br>Phase II Demolition + Site Preparation | 3/3/2027 | 3/31/2027 |
| Phase I Building Construction +<br>Phase II Demolition + Site Preparation + Grading | 4/1/2027 | 5/2/2027 |
| Phase I Architectural Coatings +<br>Phase II Demolition + Site Preparation + Grading | 5/3/2027 | 5/31/2027 |
| See Phase I and Phase II above for the construction schedule, planning areas, and modeled land uses. | | |

# Operations

## Planning Areas

| PA | Total Lot Size (AC)[1] | Land Use[2] | Size[2] | Unit[2] | DU/AC[1] | Building Lot Size (AC)[3] |
|---|---|---|---|---|---|---|
| 1 | 15.91 | Single Family Detached | 88 | DU | 22 | 4.00 |
| | | Multifamily (Low-Rise) Residential | 262 | DU | 22 | 11.91 |
| 2 | 15.59 | Single Family Detached | 86 | DU | 22 | 3.91 |
| | | Multifamily (Low-Rise) Residential | 257 | DU | 22 | 11.68 |
| 3 | 7.68 | Single Family Detached | 42 | DU | 22 | 1.91 |
| | | Multifamily (Low-Rise) Residential | 127 | DU | 22 | 5.77 |
| 4 | 5.00 | Multifamily (Low-Rise) Residential | 175 | DU | 35 | 5.00 |
| | 1.43 | Retail | 18,635 | SF | -- | 0.43 |
| | 0.71 | General Office | 21,741 | SF | -- | 0.50 |
| 5 | 5.19 | Multifamily (Low-Rise) Residential | 182 | DU | 35 | 5.20 |
| | 1.48 | Retail | 19,367 | SF | -- | 0.44 |
| | 0.74 | General Office | 22,595 | SF | -- | 0.52 |
| 6 | 7.32 | Single Family Detached | 40 | DU | 22 | 1.82 |
| | | Multifamily (Low-Rise) Residential | 121 | DU | 22 | 5.50 |
| 7 | 23.68 | Single Family Detached | 130 | DU | 22 | 5.91 |
| | | Multifamily (Low-Rise) Residential | 391 | DU | 22 | 17.77 |
| 8 | 24.18 | Single Family Detached | 133 | DU | 22 | 6.05 |
| | | Multifamily (Low-Rise) Residential | 399 | DU | 22 | 18.14 |
| 9 | 12.18 | Single Family Detached | 67 | DU | 22 | 3.05 |
| | | Multifamily (Low-Rise) Residential | 201 | DU | 22 | 9.14 |
| 10 | 9.86 | Multifamily (Low-Rise) Residential | 345 | DU | 35 | 9.86 |
| | 2.82 | Retail | 36,852 | SF | -- | 0.85 |
| | 1.41 | General Office | 42,994 | SF | -- | 0.99 |
| 11 | 10.97 | Multifamily (Low-Rise) Residential | 384 | DU | 35 | 10.97 |
| | 3.13 | Retail | 40,955 | SF | -- | 0.94 |
| | 1.57 | General Office | 47,781 | SF | -- | 1.10 |
| 12 | 15.45 | Single Family Detached | 85 | DU | 22 | 3.86 |
| | | Multifamily (Low-Rise) Residential | 255 | DU | 22 | 11.59 |
| 13 | 23.77 | Single Family Detached | 131 | DU | 22 | 5.95 |
| | | Multifamily (Low-Rise) Residential | 392 | DU | 22 | 17.82 |
| 14 | 13.33 | Active Park | 13.33 | AC | -- | -- |
| 15 | 13.11 | Active Park | 13.11 | AC | -- | -- |
| 16 | 9.90 | Public Park | 9.90 | AC | -- | -- |
| 17 | 6.20 | Public Park | 6.20 | AC | -- | -- |
| 18 | 13.44 | Active Park | 13.44 | AC | -- | -- |
| 19 | 2.26 | Non-Recreational Park | 2.26 | AC | -- | -- |
| 20 | 2.68 | Non-Recreational Park | 2.68 | AC | -- | -- |
| 21 | 2.96 | Non-Recreational Park | 2.96 | AC | -- | -- |
| 22 | 3.38 | Non-Recreational Park | 3.38 | AC | -- | -- |

PA = planning area; AC = acres; DU = dwelling unit; SF = square feet

1. Designated by TOP 2050.
2. Land use, size, and unit were taken from the Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025, except for PA 19 through 22, which were taken from TOP 2025.
3. The residential building lot size was calculated using the following equation: building lot size = dwelling units * (dwelling units/acre). The retail and general office building lot size was assumed to be equal to the land use size in acres.

## Land Use

| Land Use | Size | Unit | Building Size (SF) | Landscaping (SF) | Lot Size (AC) |
|---|---|---|---|---|---|
| Single Family Housing[1] | 802 | DU | 1,587,960 | -- | 36.45 |
| Apartments Low Rise[1] | 3,491 | DU | 6,113,504.5 | -- | 140.35 |
| Strip Mall[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant w/o Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| Fast Food Restaurant with Drive Thru[2,3,4] | 38.603 | KSF | 38,603 | 3,860.3 | 0.975 |
| General Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| Medical Office Building[3,4,5] | 67.556 | KSF | 67,556 | 6,755.55 | 1.706 |
| City Park[6,7] | 55.98 | AC | -- | 2,438,488.8 | 36.34 |
| Other Non-Asphalt Surfaces[6,8] | 11.28 | AC | -- | 491,356.8 | 7.9 |
| Parking Lot[9] | 6.954 | AC | -- | -- | 6.954 |

DU = dwelling unit; KSF = thousand square feet; AC = acres; SF = square feet

1. Assumed the lot would be fully developed by a building. Therefore, the building size was assumed to be equal to the lot size in square feet.
2. The retail size was evenly divided between the strip mall, fast food restaurant w/o drive thru, and fast food restaurant with drive thru land uses.
3. Per the proposed Specific Plan, the retail and office land uses would include landscaping equal to 10% of the building square footage.
4. The lot size included the building size and landscaping in acres.
5. The general office size was evenly divided between the general office building and medical office building land uses.
6. The city park and other non-asphalt surfaces was assumed to be fully landscaped with "special landscaping" because the landscaping would be irrigated with recycled water per City of Ontario Ordinance 2689.
7. The public park and active park were modeled as city park.
8. The non-recreational park was modeled as non-asphalt surfaces.
9. Assumed the retail and office lot acreage not occupied by buildings or landscaping would be dedicated to parking lots. The lot size in acres was calculated using the following equation: lot size = total lot size – building size – landscaping.

## Vehicle Data

| Land Use | Size | Unit | Trip Rate | Daily Trip Generation |
|---|---|---|---|---|
| Single Family Housing | 802 | DU | 7.291317 | 5,848 |
| Apartments Low Rise | 3,491 | DU | 5.685581 | 19,848 |
| Strip Mall | 38.603 | KSF | 15.387405 | 594 |
| Fast Food Restaurant w/o Drive Thru | 38.603 | KSF | 179.091068 | 6,913 |
| Fast Food Restaurant with Drive Thru | 38.603 | KSF | 185.846890 | 7,174 |
| General Office Building | 67.556 | KSF | 7.972543 | 539 |
| Medical Office Building | 67.556 | KSF | 26.488012 | 1789 |
| City Park | 55.98 | AC | 35.905681 | 2010 |
| Other Non-Asphalt Surfaces | 11.28 | AC | 0.000000 | 0 |
| Parking Lot | 6.954 | AC | 0 | 0 |
| | | | **Total** | **44,716** |

DU = dwelling unit; KSF = thousand square feet; AC = acres

Source: Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

## Trip Length

| Land Use | Trip Length (miles) | | |
|---|---|---|---|
| | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 18.81393411 | 20.96433004 | 6.45145941 |
| Apartments Low Rise | 18.81393411 | 20.96433004 | 6.45145941 |
| Strip Mall | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant w/o Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| Fast Food Restaurant with Drive Thru | 18.81393411 | 6.477110207 | 6.883326689 |
| General Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| Medical Office Building | 18.81393411 | 6.477110207 | 6.883326689 |
| City Park | 18.81393411 | 6.477110207 | 6.883326689 |
| Other Non-Asphalt Surfaces | 18.81393411 | 6.477110207 | 6.883326689 |
| Parking Lot | 18.81393411 | 6.477110207 | 6.883326689 |

## Trip Purpose and Percent

| Land Use | Trip Percent (%) | | | Trip Purpose (%) | | |
|---|---|---|---|---|---|---|
| | Primary | Diverted | Pass-By | Non-Res H-W / Res H-W | Non-Res W-O / Res H-S | Non-Res O-O / Res H-O |
| Single Family Housing | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Apartments Low Rise | 100 | 0 | 0 | 28.5714285 | 4.2857143 | 67.1428571 |
| Strip Mall | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant w/o Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| Fast Food Restaurant with Drive Thru | 100 | 0 | 0 | 80 | 8 | 12 |
| General Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| Medical Office Building | 100 | 0 | 0 | 80 | 8 | 12 |
| City Park | 100 | 0 | 0 | 80 | 8 | 12 |
| Other Non-Asphalt Surfaces | 100 | 0 | 0 | 80 | 8 | 12 |
| Parking Lot | 100 | 0 | 0 | 80 | 8 | 12 |

## Fleet Mix

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| Single Family Housing | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Apartments Low Rise | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Strip Mall | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant w/o Drive Thru | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Fast Food Restaurant with Drive Thru | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| General Office Building | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Medical Office Building | 1.9090477377 | 49.1071134 | 3.571538 25 | 22.25527167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.17045050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

| Land Use | Fleet Mix (%) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HHD | LDA | LDT1 | LDT2 | LHD1 | LHD2 | MCY | MDV | MH | MHD | OBUS | SBUS | UBUS |
| City Park | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Other Non-Asphalt Surfaces | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |
| Parking Lot | 1.9090477377 | 49.1071134 | 3.571 53825 | 22.255 27167 | 2.7621 09413 | 0.7600 36101 | 2.0352 1437 | 15.170 45050 | 0.3651 94398 | 1.8691 86013 | 0.0574 96002 | 0.1071 16298 | 0.0302 26900 |

Hearths

| Land Use | # Electric | # Without Fireplaces |
|---|---|---|
| Single Family Housing | 546.36 | 256.64 |
| Apartments Low Rise | 2,378.24 | 1,112.76 |
| SCAQMD 445 (Wood Burning) prohibits permanently installed wood burning devices in new developments<br>The Project would not include natural gas fireplaces<br>The # wood burning and # gas fireplaces were split 75% to # electric and 25% to # without fireplaces | | |

## Quantified Measures

| # | Measure | Notes[1] |
|---|---|---|
| **Operations** | | |
| T-10 | Provide End-of-Trip Bicycle Facilities | End-of-trip facilities (showers and lockers) would be provided for employee use per FSEIR MM AQ-1 |
| T-14* | Provide Electric Vehicle Charging Infrastructure | EV charging infrastructure per FSEIR MM AQ-1 |
| T-34* | Provide Bike Parking | Bicycle parking facilities would be provided for workers, residents, and visitors per FSEIR MM AQ-1 |
| T-39* | Implement Preferential Parking Permit Program | Fuel efficient and carpool vehicles would receive preferential parking per FSEIR MM AQ-1 |
| E-2 | Require Energy Efficient Appliances | Residential appliances (modeled refrigerator, clothes washer, dishwasher, and ceiling fans) would be Energy Star certified per FSEIR MM AQ-1 |

FSEIR = Final Supplemental Environmental Impact Report, MM = Mitigation Measure
* Qualitative or supporting measures. Emission reductions are not included in the mitigated emissions results.
1. Compliance with the applicable FSEIR and SCAQMD regulation has been applied in CalEEMod and is shown as the "Mitigated" emissions in the CalEEMod outputs. The "Mitigated" emission outputs would be unmitigated, as the Project would not include and would not require mitigation measures.

**Construction GHG Emissions**

| Year | Phase I | Phase II | Buildout |
|---|---|---|---|
| 2025 | 85 | 0 | 85 |
| 2026 | 1,956 | 107 | 2,062 |
| 2027 | 749 | 3,369 | 4,118 |
| 2028 | 0 | 5,963 | 5,963 |
| 2029 | 0 | 4,933 | 4,933 |
| 2030 | 0 | 892 | 892 |
| **Total** | **2,790** | **15,263** | **18,053** |
| **Amortized** | **93** | **509** | **602** |

**Operational GHG Emissions**

| Source | Phase I | Phase II | Buildout |
|---|---|---|---|
| Construction | 93 | 509 | 602 |
| Mobile | 13,186 | 60,332 | 71,615 |
| Area | 63 | 208 | 271 |
| Energy | 2,390 | 9,289 | 11,679 |
| Water | 174 | 640 | 802 |
| Waste | 255 | 1,332 | 1,587 |
| Refrig. | 2 | 27 | 29 |
| Drive-Thru | 0 | 3 | 3 |
| **Total** | **16,071** | **71,831** | **85,987** |

Drive-Through On-site Emissions

| | |
|---|---|
| Total Trips/Day[1] | 7,174 |
| Drive-Through Trips | 5,022 |
| Minutes/Trip | 5 |
| Distance (mi/trip)[2] | 0.2 |

| | $CO_2$ | $CH_4$ | $N_2O$ | $CO_2e$ |
|---|---|---|---|---|
| EMFAC Emissions Rate (g/mi)[3] | 109.9223 | 0.0029127 | 0.0015025 | -- |
| MT/year | 3.3580 | 0.00 | 0.00 | 3.3739505 |

NOTES:

1. total trips per day from Urban Crossroads, *Center Park Specfic Plan Traffic Analysis,* 2025
2. PAs 4, 5, 10, and 11 are designated as MU - Great Park land use and would include restaurants w/ drive-thru lanes the potential maximum drive-thru lane measured across PA 11 from Google Earth, 2025.
3. EMFAC2021 (v1.0.0) Emission Rates, San Bernardino (MD) Sub-Area, Year 2030, Annual.

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: Sub-Area
Region: San Bernardino (MD)
Calendar Year: 2030
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

| | ROG | NOx | CO | SOx | $PM_{10}$ | $PM_{2.5}$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|
| EMFAC Emissions Rate (g | 0.012540143 | 0.013691122 | 0.243508723 | 0.001086364 | 0.002265962 | 0.000793087 | 109.9223071 | 0.002912712 | 0.001502499 |

| Region | Calendar Year | Vehicle Category | Model Year | Speed | Fuel | Total VMT | CVMT | EVMT | ROG_RUNEX | NOx_RUNEX | CO_RUNEX | SOx_RUNEX | PM10_RUNEX | PM2.5_RUNEX | CO2_RUNEX | CH4_RUNEX | N2O_RUNEX | TOG_RUNEX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| San Bernardino (MD) | 2030 | LDA | Aggregate | 5 | Gasoline | 3915.495943 | 3915.495943 | 0 | 0.039277545 | 0.053745033 | 1.245661046 | 0.006071957 | 0.005954562 | 0.002084097 | 614.1963808 | 0.01140915 | 0.007220653 | 0.057313701 |
| San Bernardino (MD) | 2030 | LDA | Aggregate | 5 | Diesel | 5.816026442 | 5.816026442 | 0 | 0.233153742 | 0.185222503 | 4.645922104 | 0.005305266 | 0.006122135 | 0.002142747 | 559.8924775 | 0.010829546 | 0.088211288 | 0.265430034 |
| San Bernardino (MD) | 2030 | LDA | Aggregate | 5 | Electricity | 30835.76206 | 0 | 30835.76206 | 0 | 0 | 0 | 0 | 0.001329156 | 0.000465205 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | LDA | Aggregate | 5 | Plug-in Hybrid | 4109.611964 | 73.87671591 | 4035.735248 | 0.000482534 | 0.000469094 | 0.040639009 | 0.000151215 | 0.001330616 | 0.000465716 | 15.29588549 | 0.000151864 | 8.44919E-05 | 0.000704112 |
| San Bernardino (MD) | 2030 | LDT1 | Aggregate | 5 | Gasoline | 287.2992717 | 287.2992717 | 0 | 0.146332154 | 0.199405211 | 2.645395342 | 0.007347597 | 0.008523843 | 0.002983345 | 743.231163 | 0.03393778 | 0.015421796 | 0.213527535 |
| San Bernardino (MD) | 2030 | LDT1 | Aggregate | 5 | Diesel | 0.002820831 | 0.002820831 | 0 | 0.592560129 | 0.409303603 | 3.61420863 | 0.008683089 | 0.008458939 | 0.002960629 | 916.3718166 | 0.027523285 | 0.144374753 | 0.67459031 |
| San Bernardino (MD) | 2030 | LDT1 | Aggregate | 5 | Electricity | 248.3305489 | 0 | 248.3305489 | 0 | 0 | 0 | 0 | 0.001326324 | 0.000464213 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | LDT1 | Aggregate | 5 | Plug-in Hybrid | 64.25680427 | 1.015129558 | 63.24167471 | 0.000424056 | 0.000412245 | 0.035875847 | 0.000133087 | 0.001326138 | 0.000464148 | 13.46209759 | 0.000133556 | 7.43553E-05 | 0.000618781 |
| San Bernardino (MD) | 2030 | LDT2 | Aggregate | 5 | Gasoline | 1952.78956 | 1952.78956 | 0 | 0.053226165 | 0.085799407 | 1.449997479 | 0.007319839 | 0.008202678 | 0.002870937 | 740.4234213 | 0.014730145 | 0.008839566 | 0.077667495 |
| San Bernardino (MD) | 2030 | LDT2 | Aggregate | 5 | Diesel | 7.144075189 | 7.144075189 | 0 | 0.264345404 | 0.156950946 | 2.690102885 | 0.006548436 | 0.008147726 | 0.002851704 | 691.0907535 | 0.012278339 | 0.10888163 | 0.300939668 |
| San Bernardino (MD) | 2030 | LDT2 | Aggregate | 5 | Electricity | 2408.878796 | 0 | 2408.878796 | 0 | 0 | 0 | 0 | 0.001327109 | 0.000464488 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | LDT2 | Aggregate | 5 | Plug-in Hybrid | 901.5605528 | 15.01538332 | 886.5451695 | 0.000447056 | 0.000434605 | 0.037726772 | 0.00014019 | 0.001328602 | 0.000465011 | 14.18059398 | 0.000140299 | 7.78505E-05 | 0.000652344 |
| San Bernardino (MD) | 2030 | LHDT1 | Aggregate | 5 | Gasoline | 23.31692094 | 23.31692094 | 0 | 0.08654334 | 0.181435413 | 2.02593115 | 0.01439763 | 0.078000022 | 0.027300008 | 1456.362905 | 0.018968053 | 0.010424339 | 0.126283839 |
| San Bernardino (MD) | 2030 | LHDT1 | Aggregate | 5 | Diesel | 12.62605226 | 12.62605226 | 0 | 0.356079181 | 1.847486561 | 1.17611733 | 0.010987489 | 0.078000022 | 0.027300008 | 1159.567236 | 0.016539197 | 0.18269029 | 0.405372473 |
| San Bernardino (MD) | 2030 | LHDT1 | Aggregate | 5 | Electricity | 3.000874152 | 0 | 3.000874152 | 0 | 0 | 0 | 0 | 0.039000011 | 0.013650004 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | MCY | Aggregate | 5 | Gasoline | 30.64331434 | 30.64331434 | 0 | 6.337982441 | 0.878491722 | 27.07711462 | 0.004583571 | 0.012000003 | 0.004200001 | 463.6417568 | 1.017212003 | 0.064162555 | 7.765901828 |
| San Bernardino (MD) | 2030 | MDV | Aggregate | 5 | Gasoline | 1251.724221 | 1251.724221 | 0 | 0.084112754 | 0.139354421 | 1.788353884 | 0.009131768 | 0.008483233 | 0.002969132 | 923.7054006 | 0.021357446 | 0.011866456 | 0.122737134 |
| San Bernardino (MD) | 2030 | MDV | Aggregate | 5 | Diesel | 18.11237387 | 18.11237387 | 0 | 0.193685632 | 0.148925829 | 4.202219576 | 0.008698701 | 0.008719741 | 0.003051909 | 918.0194472 | 0.008996327 | 0.144634338 | 0.220498215 |
| San Bernardino (MD) | 2030 | MDV | Aggregate | 5 | Electricity | 2425.290164 | 0 | 2425.290164 | 0 | 0 | 0 | 0 | 0.00132809 | 0.000464832 | 0 | 0 | 0 | 0 |
| San Bernardino (MD) | 2030 | MDV | Aggregate | 5 | Plug-in Hybrid | 557.5071295 | 9.429934019 | 548.0771954 | 0.000454024 | 0.000441378 | 0.038309785 | 0.000142369 | 0.001329674 | 0.000465386 | 14.40099818 | 0.000142082 | 7.86292E-05 | 0.000662511 |

| Vehicle Category | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| LDA | 153.7910675 | 210.4384604 | 4877.380773 | 23.77472114 | 23.31506471 | 8.160272648 | 2404883.437 | 44.67248174 | 28.2724386 | 224.4115646 |
| LDA | 1.356028328 | 1.077258976 | 27.02080581 | 0.030855566 | 0.0356065 | 0.012462275 | 3256.349454 | 0.062984924 | 0.513039183 | 1.543748097 |
| LDA | 0 | 0 | 0 | 0 | 40.985539 | 14.34493865 | 0 | 0 | 0 | 0 |
| LDA | 1.983025445 | 1.927792815 | 167.0105567 | 0.621436619 | 5.468315539 | 1.913910439 | 62860.154 | 0.624103349 | 0.347228904 | 2.893626074 |
| LDT1 | 42.04112116 | 57.28897192 | 760.0201553 | 2.110959185 | 2.448893816 | 0.857112835 | 213529.7719 | 9.750299341 | 4.430670837 | 61.3463053 |
| LDT1 | 0.001671512 | 0.001154576 | 0.01019507 | 2.44935E-05 | 2.38612E-05 | 8.35143E-06 | 2.584929633 | 7.76385E-05 | 0.000407257 | 0.001902905 |
| LDT1 | 0 | 0 | 0 | 0 | 0.329366748 | 0.115278362 | 0 | 0 | 0 | 0 |
| LDT1 | 0.027248474 | 0.02648953 | 2.305267307 | 0.008551716 | 0.085213394 | 0.029824688 | 865.0313697 | 0.008581859 | 0.004777832 | 0.039760909 |
| LDT2 | 103.9394994 | 167.5481866 | 2831.539939 | 14.29410582 | 16.01810304 | 5.606336063 | 1445891.127 | 28.7648737 | 17.26181145 | 151.6682736 |
| LDT2 | 1.888503442 | 1.121269356 | 19.21829728 | 0.04678252 | 0.058207969 | 0.020372789 | 4937.204306 | 0.087717375 | 0.777858549 | 2.149935612 |
| LDT2 | 0 | 0 | 0 | 0 | 3.196844914 | 1.11889572 | 0 | 0 | 0 | 0 |
| LDT2 | 0.403048333 | 0.391822345 | 34.01296974 | 0.126389421 | 1.197815012 | 0.419235254 | 12784.66415 | 0.126488323 | 0.070186919 | 0.588127181 |
| LHDT1 | 2.017924219 | 4.230515186 | 47.23847645 | 0.3357084 | 1.818720354 | 0.636552124 | 33957.8987 | 0.4422766 | 0.243063498 | 2.944550284 |
| LHDT1 | 4.495874345 | 23.32646188 | 14.84971888 | 0.138728609 | 0.984832359 | 0.344691326 | 14640.75653 | 0.20882477 | 2.306657153 | 5.118254036 |
| LHDT1 | 0 | 0 | 0 | 0 | 0.117034125 | 0.040961944 | 0 | 0 | 0 | 0 |
| MCY | 194.2167883 | 26.91989798 | 829.7325348 | 0.140455801 | 0.367719878 | 0.128701957 | 14207.5201 | 31.17074717 | 1.966153337 | 237.9729709 |
| MDV | 105.285972 | 174.4333036 | 2238.525873 | 11.43045555 | 10.61866858 | 3.716534003 | 1156224.423 | 26.73363205 | 14.85353053 | 153.6330432 |
| MDV | 3.508106578 | 2.697400288 | 76.11217204 | 0.157554121 | 0.157935207 | 0.055277322 | 16627.51145 | 0.162944845 | 2.6196712 | 3.993746104 |
| MDV | 0 | 0 | 0 | 0 | 3.221004377 | 1.127351532 | 0 | 0 | 0 | 0 |
| MDV | 0.253121689 | 0.246071564 | 21.35797806 | 0.07937147 | 0.741302927 | 0.259456024 | 8028.659156 | 0.079211524 | 0.043836331 | 0.369354574 |

# Center Park Specific Plan- Phase I Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan- Phase I |
| Construction Start Date | 12/1/2025 |
| Operational Year | 2027 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99350362244249, -117.62396749625904 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5260 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 256 | Dwelling Unit | 11.6 | 506,880 | 0.00 | — | 847 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 768 | Dwelling Unit | 34.9 | 1,520,640 | 0.00 | — | 2,542 | — |
| City Park | 19.6 | Acre | 19.6 | 0.00 | 855,518 | 855,518 | — | — |
| Other Non-Asphalt Surfaces | 3.38 | Acre | 3.38 | 0.00 | 147,233 | 147,233 | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Construction | C-2* | Limit Heavy-Duty Diesel Vehicle Idling |
| Construction | C-5 | Use Advanced Engine Tiers |
| Construction | C-13 | Use Low-VOC Paints for Construction |
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 608 | 607 | 79.2 | 90.4 | 0.15 | 3.23 | 12.0 | 13.6 | 2.97 | 4.07 | 7.04 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| Mit. | 122 | 122 | 13.7 | 100 | 0.15 | 0.31 | 12.0 | 12.3 | 0.31 | 4.07 | 4.37 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| % Reduced | 80% | 80% | 83% | -11% | — | 90% | — | 10% | 90% | — | 38% | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 9.06 | 7.47 | 56.1 | 100 | 0.11 | 2.30 | 18.7 | 19.6 | 2.12 | 4.47 | 5.27 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| Mit. | 7.20 | 5.99 | 18.8 | 104 | 0.11 | 0.25 | 18.7 | 19.0 | 0.25 | 4.47 | 4.71 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| % Reduced | 21% | 20% | 67% | -4% | — | 89% | — | 3% | 88% | — | 10% | — | — | — | — | — | — | — |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 36.3 | 36.1 | 35.4 | 48.3 | 0.08 | 1.35 | 6.91 | 8.26 | 1.25 | 2.26 | 3.50 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| Mit. | 8.09 | 7.91 | 8.47 | 52.2 | 0.08 | 0.16 | 6.91 | 7.07 | 0.16 | 2.26 | 2.42 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| % Reduced | 78% | 78% | 76% | -8% | — | 88% | — | 14% | 87% | — | 31% | — | — | — | — | — | — | — |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 6.63 | 6.58 | 6.45 | 8.81 | 0.01 | 0.25 | 1.26 | 1.51 | 0.23 | 0.41 | 0.64 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| Mit. | 1.48 | 1.44 | 1.55 | 9.53 | 0.01 | 0.03 | 1.26 | 1.29 | 0.03 | 0.41 | 0.44 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| % Reduced | 78% | 78% | 76% | -8% | — | 88% | — | 14% | 87% | — | 31% | — | — | — | — | — | — | — |

## 2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 4.51 | 3.91 | 13.7 | 100 | 0.15 | 0.31 | 12.0 | 12.3 | 0.31 | 4.07 | 4.37 | — | 21,497 | 21,497 | 0.99 | 0.90 | 40.2 | 21,830 |
| 2027 | 122 | 122 | 8.50 | 59.9 | 0.05 | 0.12 | 9.37 | 9.49 | 0.12 | 2.24 | 2.36 | — | 14,381 | 14,381 | 0.43 | 0.81 | 35.2 | 14,669 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2025 | 1.23 | 1.03 | 9.36 | 49.5 | 0.09 | 0.18 | 7.34 | 7.52 | 0.18 | 3.05 | 3.24 | — | 10,823 | 10,823 | 0.55 | 0.36 | 0.14 | 10,944 |
| 2026 | 7.20 | 5.99 | 18.8 | 104 | 0.11 | 0.25 | 18.7 | 19.0 | 0.25 | 4.47 | 4.71 | — | 27,771 | 27,771 | 0.92 | 1.70 | 2.03 | 28,303 |
| 2027 | 6.91 | 5.76 | 17.9 | 98.6 | 0.10 | 0.25 | 18.7 | 19.0 | 0.24 | 4.47 | 4.71 | — | 27,322 | 27,322 | 0.89 | 1.62 | 1.83 | 27,830 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 0.06 | 0.05 | 0.50 | 2.21 | < 0.005 | 0.01 | 0.30 | 0.31 | 0.01 | 0.11 | 0.12 | — | 506 | 506 | 0.03 | 0.02 | 0.13 | 512 |
| 2026 | 2.02 | 1.74 | 8.47 | 52.2 | 0.08 | 0.16 | 6.91 | 7.07 | 0.16 | 2.26 | 2.42 | — | 11,662 | 11,662 | 0.46 | 0.44 | 6.90 | 11,812 |
| 2027 | 8.09 | 7.91 | 3.00 | 16.8 | 0.02 | 0.04 | 2.99 | 3.03 | 0.04 | 0.71 | 0.75 | — | 4,443 | 4,443 | 0.14 | 0.25 | 4.88 | 4,527 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2025 | 0.01 | 0.01 | 0.09 | 0.40 | < 0.005 | < 0.005 | 0.05 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 83.7 | 83.7 | < 0.005 | < 0.005 | 0.02 | 84.8 |
| 2026 | 0.37 | 0.32 | 1.55 | 9.53 | 0.01 | 0.03 | 1.26 | 1.29 | 0.03 | 0.41 | 0.44 | — | 1,931 | 1,931 | 0.08 | 0.07 | 1.14 | 1,956 |
| 2027 | 1.48 | 1.44 | 0.55 | 3.07 | < 0.005 | 0.01 | 0.55 | 0.55 | 0.01 | 0.13 | 0.14 | — | 736 | 736 | 0.02 | 0.04 | 0.81 | 749 |

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 102,332 | 102,854 | 57.2 | 3.93 | 272 | 105,728 |
| Mit. | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 101,949 | 102,471 | 57.2 | 3.93 | 272 | 105,343 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 97,007 | 97,529 | 57.3 | 4.04 | 21.2 | 100,189 |
| Mit. | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 96,625 | 97,147 | 57.3 | 4.04 | 21.2 | 99,806 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 94,171 | 94,693 | 57.1 | 4.05 | 126 | 97,453 |
| Mit. | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 93,790 | 94,312 | 57.1 | 4.04 | 126 | 97,069 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 13.0 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,591 | 15,678 | 9.46 | 0.67 | 20.8 | 16,134 |
| Mit. | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 12.9 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,528 | 15,614 | 9.45 | 0.67 | 20.8 | 16,071 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 35.1 | 31.5 | 31.4 | 309 | 0.81 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 82,685 | 82,685 | 3.47 | 3.62 | 257 | 84,107 |
| Area | 52.8 | 52.5 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | 0.00 | 4,176 | 4,176 | 0.26 | 0.03 | — | 4,192 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 88.5 | 84.3 | 37.2 | 369 | 0.84 | 0.98 | 71.8 | 72.8 | 0.94 | 18.2 | 19.2 | 522 | 101,949 | 102,471 | 57.2 | 3.93 | 272 | 105,343 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 33.1 | 29.4 | 33.7 | 256 | 0.75 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 77,516 | 77,516 | 3.58 | 3.74 | 6.67 | 78,726 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area | 47.4 | 47.4 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 81.1 | 77.1 | 39.0 | 258 | 0.79 | 0.95 | 71.8 | 72.8 | 0.92 | 18.2 | 19.2 | 522 | 96,625 | 97,147 | 57.3 | 4.04 | 21.2 | 99,806 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 32.8 | 29.2 | 34.3 | 266 | 0.76 | 0.53 | 71.0 | 71.5 | 0.49 | 18.0 | 18.5 | — | 78,319 | 78,319 | 3.58 | 3.77 | 111 | 79,642 |
| Area | 51.1 | 50.9 | 0.38 | 39.8 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 382 | 382 | 0.02 | < 0.005 | — | 383 |
| Energy | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 14,388 | 14,388 | 1.07 | 0.07 | — | 14,436 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Total | 84.5 | 80.4 | 39.9 | 308 | 0.80 | 0.97 | 71.0 | 71.9 | 0.93 | 18.0 | 19.0 | 522 | 93,790 | 94,312 | 57.1 | 4.04 | 126 | 97,069 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 5.99 | 5.33 | 6.26 | 48.5 | 0.14 | 0.10 | 12.9 | 13.0 | 0.09 | 3.29 | 3.38 | — | 12,967 | 12,967 | 0.59 | 0.62 | 18.4 | 13,186 |
| Area | 9.32 | 9.28 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | 0.00 | 63.2 | 63.2 | < 0.005 | < 0.005 | — | 63.4 |
| Energy | 0.11 | 0.06 | 0.96 | 0.41 | 0.01 | 0.08 | — | 0.08 | 0.08 | — | 0.08 | — | 2,382 | 2,382 | 0.18 | 0.01 | — | 2,390 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 13.5 | 116 | 129 | 1.40 | 0.03 | — | 174 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 72.9 | 0.00 | 72.9 | 7.28 | 0.00 | — | 255 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.40 | 2.40 |
| Total | 15.4 | 14.7 | 7.29 | 56.2 | 0.15 | 0.18 | 12.9 | 13.1 | 0.17 | 3.29 | 3.46 | 86.4 | 15,528 | 15,614 | 9.45 | 0.67 | 20.8 | 16,071 |

# 3. Construction Emissions Details

## 3.2. Demolition (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,425 | 3,425 | 0.14 | 0.03 | — | 3,437 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.27 | 1.10 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 208 | 208 | 0.01 | < 0.005 | — | 208 |
| Demolition | — | — | — | — | — | — | 0.08 | 0.08 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.05 | 0.20 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 34.4 | 34.4 | < 0.005 | < 0.005 | — | 34.5 |
| Demolition | — | — | — | — | — | — | 0.01 | 0.01 | — | < 0.005 | < 0.005 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.88 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 194 | 194 | 0.01 | 0.01 | 0.02 | 196 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.21 | 0.03 | 2.11 | 1.14 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,682 | 1,682 | 0.18 | 0.28 | 0.09 | 1,769 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.9 | 11.9 | < 0.005 | < 0.005 | 0.02 | 12.1 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.13 | 0.07 | < 0.005 | < 0.005 | 0.03 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 102 | 102 | 0.01 | 0.02 | 0.09 | 107 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.97 | 1.97 | < 0.005 | < 0.005 | < 0.005 | 2.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | < 0.005 | < 0.005 | 0.02 | 0.01 | < 0.005 | < 0.005 | < 0.005 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 16.9 | 16.9 | < 0.005 | < 0.005 | 0.02 | 17.8 |

## 3.4. Demolition (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 1.35 | 1.35 | — | 0.20 | 0.20 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.11 | 0.11 | 1.34 | 5.41 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 1,019 | 1,019 | 0.04 | 0.01 | — | 1,023 |
| Demolition | — | — | — | — | — | — | 0.40 | 0.40 | — | 0.06 | 0.06 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.24 | 0.99 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 169 | 169 | 0.01 | < 0.005 | — | 169 |
| Demolition | — | — | — | — | — | — | 0.07 | 0.07 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.07 | 0.06 | 0.06 | 1.08 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 207 | 207 | 0.01 | 0.01 | 0.71 | 210 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.20 | 0.03 | 1.95 | 1.11 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,651 | 1,651 | 0.17 | 0.26 | 3.36 | 1,737 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.82 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 190 | 190 | < 0.005 | 0.01 | 0.02 | 192 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.20 | 0.02 | 2.03 | 1.12 | 0.01 | 0.02 | 0.45 | 0.47 | 0.02 | 0.12 | 0.14 | — | 1,652 | 1,652 | 0.17 | 0.26 | 0.09 | 1,735 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.26 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 57.3 | 57.3 | < 0.005 | < 0.005 | 0.09 | 58.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.06 | 0.01 | 0.61 | 0.33 | < 0.005 | 0.01 | 0.13 | 0.14 | 0.01 | 0.04 | 0.04 | — | 491 | 491 | 0.05 | 0.08 | 0.43 | 516 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.48 | 9.48 | < 0.005 | < 0.005 | 0.02 | 9.61 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.11 | 0.06 | < 0.005 | < 0.005 | 0.02 | 0.03 | < 0.005 | 0.01 | 0.01 | — | 81.3 | 81.3 | 0.01 | 0.01 | 0.07 | 85.5 |

## 3.6. Site Preparation (2025) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipm | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,295 | 5,295 | 0.21 | 0.04 | — | 5,314 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.09 | 0.94 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 176 | 176 | 0.01 | < 0.005 | — | 177 |
| Dust From Material Movement | — | — | — | — | — | — | 0.17 | 0.17 | — | 0.09 | 0.09 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 29.2 | 29.2 | < 0.005 | < 0.005 | — | 29.3 |
| Dust From Material Movement | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.08 | 0.08 | 1.03 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 226 | 226 | 0.01 | 0.01 | 0.02 | 229 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.63 | 7.63 | < 0.005 | < 0.005 | 0.01 | 7.74 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.26 | 1.26 | < 0.005 | < 0.005 | < 0.005 | 1.28 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.8. Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 0.84 | 9.20 | 0.02 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,721 | 1,721 | 0.07 | 0.01 | — | 1,727 |
| Dust From Material Movement | — | — | — | — | — | — | 1.66 | 1.66 | — | 0.85 | 0.85 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.03 | 0.03 | 0.15 | 1.68 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 285 | 285 | 0.01 | < 0.005 | — | 286 |
| Dust From Material Movement | — | — | — | — | — | — | 0.30 | 0.30 | — | 0.16 | 0.16 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.08 | 0.07 | 1.26 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 242 | 242 | 0.01 | 0.01 | 0.83 | 245 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.08 | 0.95 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 222 | 222 | < 0.005 | 0.01 | 0.02 | 224 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.02 | 0.03 | 0.33 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | 0.02 | 0.02 | — | 73.0 | 73.0 | < 0.005 | < 0.005 | 0.12 | 74.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | 0.02 | 12.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.10. Grading (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,599 | 6,599 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,599 | 6,599 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.31 | 0.31 | 2.12 | 16.9 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,164 | 3,164 | 0.13 | 0.03 | — | 3,175 |
| Dust From Material Movement | — | — | — | — | — | — | 1.15 | 1.15 | — | 0.46 | 0.46 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.06 | 0.39 | 3.09 | 0.01 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 524 | 524 | 0.02 | < 0.005 | — | 526 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | — | 0.21 | 0.21 | — | 0.08 | 0.08 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.10 | 0.09 | 0.08 | 1.44 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 276 | 276 | 0.01 | 0.01 | 0.94 | 280 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.09 | 1.09 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 253 | 253 | < 0.005 | 0.01 | 0.02 | 256 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.04 | 0.04 | 0.05 | 0.55 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 123 | 123 | < 0.005 | < 0.005 | 0.20 | 125 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.10 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | — | 20.4 | 20.4 | < 0.005 | < 0.005 | 0.03 | 20.7 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.12. Building Construction (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.17 | 0.87 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 141 | 141 | 0.01 | < 0.005 | — | 141 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.03 | 0.16 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 23.3 | 23.3 | < 0.005 | < 0.005 | — | 23.4 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 2.92 | 2.60 | 2.84 | 35.1 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,166 | 8,166 | 0.13 | 0.32 | 0.79 | 8,265 |
| Vendor | 0.33 | 0.06 | 3.73 | 1.97 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,322 | 3,322 | 0.24 | 0.51 | 0.23 | 3,481 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.15 | 0.18 | 2.17 | 0.00 | 0.00 | 0.49 | 0.49 | 0.00 | 0.11 | 0.11 | — | 486 | 486 | 0.01 | 0.02 | 0.77 | 493 |
| Vendor | 0.02 | < 0.005 | 0.22 | 0.12 | < 0.005 | < 0.005 | 0.05 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 195 | 195 | 0.01 | 0.03 | 0.22 | 205 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.40 | 0.00 | 0.00 | 0.09 | 0.09 | 0.00 | 0.02 | 0.02 | — | 80.5 | 80.5 | < 0.005 | < 0.005 | 0.13 | 81.6 |
| Vendor | < 0.005 | < 0.005 | 0.04 | 0.02 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 32.3 | 32.3 | < 0.005 | < 0.005 | 0.04 | 33.9 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.14. Building Construction (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.08 | 0.08 | 0.67 | 3.54 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 572 | 572 | 0.02 | < 0.005 | — | 574 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.01 | 0.12 | 0.65 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 94.8 | 94.8 | < 0.005 | < 0.005 | — | 95.1 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.97 | 2.66 | 2.25 | 43.2 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,726 | 8,726 | 0.10 | 0.31 | 27.4 | 8,847 |
| Vendor | 0.30 | 0.07 | 3.43 | 1.87 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,258 | 3,258 | 0.23 | 0.49 | 7.81 | 3,417 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.81 | 2.49 | 2.55 | 32.6 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,004 | 8,004 | 0.11 | 0.31 | 0.71 | 8,098 |
| Vendor | 0.30 | 0.06 | 3.60 | 1.89 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,260 | 3,260 | 0.23 | 0.49 | 0.20 | 3,411 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.67 | 0.60 | 0.67 | 8.15 | 0.00 | 0.00 | 1.99 | 1.99 | 0.00 | 0.47 | 0.47 | — | 1,938 | 1,938 | 0.03 | 0.07 | 2.83 | 1,963 |
| Vendor | 0.07 | 0.02 | 0.86 | 0.45 | 0.01 | 0.01 | 0.22 | 0.23 | 0.01 | 0.06 | 0.07 | — | 778 | 778 | 0.06 | 0.12 | 0.80 | 815 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.12 | 0.11 | 0.12 | 1.49 | 0.00 | 0.00 | 0.36 | 0.36 | 0.00 | 0.09 | 0.09 | — | 321 | 321 | < 0.005 | 0.01 | 0.47 | 325 |
| Vendor | 0.01 | < 0.005 | 0.16 | 0.08 | < 0.005 | < 0.005 | 0.04 | 0.04 | < 0.005 | 0.01 | 0.01 | — | 129 | 129 | 0.01 | 0.02 | 0.13 | 135 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.16. Infrastructure Improvements (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.10 | 0.84 | 4.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 718 | 718 | 0.03 | 0.01 | — | 720 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.15 | 0.81 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 119 | 119 | < 0.005 | < 0.005 | — | 119 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 3.09 | 2.79 | 2.55 | 46.5 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,904 | 8,904 | 0.38 | 0.31 | 30.5 | 9,035 |
| Vendor | 0.33 | 0.07 | 3.59 | 1.95 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,320 | 3,320 | 0.24 | 0.51 | 8.76 | 3,488 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.92 | 2.60 | 2.84 | 35.1 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,166 | 8,166 | 0.13 | 0.32 | 0.79 | 8,265 |
| Vendor | 0.33 | 0.06 | 3.73 | 1.97 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,322 | 3,322 | 0.24 | 0.51 | 0.23 | 3,481 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.88 | 0.78 | 0.93 | 11.1 | 0.00 | 0.00 | 2.49 | 2.49 | 0.00 | 0.58 | 0.58 | — | 2,479 | 2,479 | 0.04 | 0.10 | 3.94 | 2,513 |
| Vendor | 0.10 | 0.02 | 1.13 | 0.59 | 0.01 | 0.01 | 0.28 | 0.29 | 0.01 | 0.08 | 0.09 | — | 994 | 994 | 0.07 | 0.15 | 1.13 | 1,043 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.16 | 0.14 | 0.17 | 2.02 | 0.00 | 0.00 | 0.46 | 0.46 | 0.00 | 0.11 | 0.11 | — | 410 | 410 | 0.01 | 0.02 | 0.65 | 416 |
| Vendor | 0.02 | < 0.005 | 0.21 | 0.11 | < 0.005 | < 0.005 | 0.05 | 0.05 | < 0.005 | 0.01 | 0.02 | — | 165 | 165 | 0.01 | 0.03 | 0.19 | 173 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.18. Infrastructure Improvements (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.18 | 0.93 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 150 | 150 | 0.01 | < 0.005 | — | 151 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.03 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 24.9 | 24.9 | < 0.005 | < 0.005 | — | 24.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.81 | 2.49 | 2.55 | 32.6 | 0.00 | 0.00 | 8.43 | 8.43 | 0.00 | 1.98 | 1.98 | — | 8,004 | 8,004 | 0.11 | 0.31 | 0.71 | 8,098 |
| Vendor | 0.30 | 0.06 | 3.60 | 1.89 | 0.02 | 0.05 | 0.94 | 0.99 | 0.05 | 0.26 | 0.31 | — | 3,260 | 3,260 | 0.23 | 0.49 | 0.20 | 3,411 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.18 | 0.16 | 0.18 | 2.14 | 0.00 | 0.00 | 0.52 | 0.52 | 0.00 | 0.12 | 0.12 | — | 508 | 508 | 0.01 | 0.02 | 0.74 | 515 |
| Vendor | 0.02 | < 0.005 | 0.23 | 0.12 | < 0.005 | < 0.005 | 0.06 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 204 | 204 | 0.01 | 0.03 | 0.21 | 214 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.39 | 0.00 | 0.00 | 0.10 | 0.10 | 0.00 | 0.02 | 0.02 | — | 84.1 | 84.1 | < 0.005 | < 0.005 | 0.12 | 85.2 |
| Vendor | < 0.005 | < 0.005 | 0.04 | 0.02 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 33.8 | 33.8 | < 0.005 | 0.01 | 0.03 | 35.4 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.20. Paving (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.11 | 0.61 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 86.9 | 86.9 | < 0.005 | < 0.005 | — | 87.2 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.11 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 14.4 | 14.4 | < 0.005 | < 0.005 | — | 14.4 |
| Paving | 0.00 | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.06 | 0.76 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 186 | 186 | < 0.005 | 0.01 | 0.02 | 188 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 10.9 | 10.9 | < 0.005 | < 0.005 | 0.02 | 11.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.80 | 1.80 | < 0.005 | < 0.005 | < 0.005 | 1.82 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.22. Architectural Coating (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.65 | 0.96 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 121 | 121 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.04 | 0.06 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 7.68 | 7.68 | < 0.005 | < 0.005 | — | 7.71 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Architect Coatings | 6.96 | 6.96 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.27 | 1.27 | < 0.005 | < 0.005 | — | 1.28 |
| Architectural Coatings | 1.27 | 1.27 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.19 | 1.06 | 0.90 | 17.3 | 0.00 | 0.00 | 3.37 | 3.37 | 0.00 | 0.79 | 0.79 | — | 3,490 | 3,490 | 0.04 | 0.12 | 11.0 | 3,539 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.06 | 0.79 | 0.00 | 0.00 | 0.19 | 0.19 | 0.00 | 0.04 | 0.04 | — | 187 | 187 | < 0.005 | 0.01 | 0.27 | 189 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.14 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.01 | 0.01 | — | 30.9 | 30.9 | < 0.005 | < 0.005 | 0.05 | 31.3 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 10.2 | 9.13 | 8.95 | 87.8 | 0.23 | 0.15 | 20.3 | 20.5 | 0.14 | 5.16 | 5.30 | — | 23,411 | 23,411 | 0.99 | 1.03 | 72.7 | 23,816 |
| Apartments Low Rise | 21.8 | 19.6 | 19.2 | 188 | 0.49 | 0.32 | 43.5 | 43.9 | 0.30 | 11.1 | 11.4 | — | 50,156 | 50,156 | 2.13 | 2.21 | 156 | 51,022 |
| City Park | 3.16 | 2.78 | 3.28 | 33.0 | 0.09 | 0.06 | 7.96 | 8.02 | 0.05 | 2.02 | 2.07 | — | 9,117 | 9,117 | 0.35 | 0.38 | 28.5 | 9,269 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 35.1 | 31.5 | 31.4 | 309 | 0.81 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 82,685 | 82,685 | 3.47 | 3.62 | 257 | 84,107 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 9.57 | 8.54 | 9.61 | 72.9 | 0.21 | 0.15 | 20.3 | 20.5 | 0.14 | 5.16 | 5.30 | — | 21,949 | 21,949 | 1.02 | 1.06 | 1.89 | 22,293 |
| Apartments Low Rise | 20.5 | 18.3 | 20.6 | 156 | 0.46 | 0.32 | 43.5 | 43.9 | 0.30 | 11.1 | 11.4 | — | 47,023 | 47,023 | 2.19 | 2.28 | 4.04 | 47,761 |
| City Park | 2.99 | 2.61 | 3.52 | 26.9 | 0.08 | 0.06 | 7.96 | 8.02 | 0.05 | 2.02 | 2.07 | — | 8,544 | 8,544 | 0.36 | 0.40 | 0.74 | 8,672 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 33.1 | 29.4 | 33.7 | 256 | 0.75 | 0.53 | 71.8 | 72.3 | 0.49 | 18.2 | 18.7 | — | 77,516 | 77,516 | 3.58 | 3.74 | 6.67 | 78,726 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 1.73 | 1.55 | 1.78 | 13.8 | 0.04 | 0.03 | 3.66 | 3.69 | 0.03 | 0.93 | 0.96 | — | 3,672 | 3,672 | 0.17 | 0.18 | 5.20 | 3,734 |
| Apartments Low Rise | 3.72 | 3.31 | 3.82 | 29.6 | 0.08 | 0.06 | 7.85 | 7.91 | 0.05 | 1.99 | 2.05 | — | 7,866 | 7,866 | 0.36 | 0.38 | 11.1 | 7,999 |
| City Park | 0.54 | 0.47 | 0.66 | 5.10 | 0.02 | 0.01 | 1.43 | 1.45 | 0.01 | 0.36 | 0.37 | — | 1,429 | 1,429 | 0.06 | 0.07 | 2.04 | 1,453 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 5.99 | 5.33 | 6.26 | 48.5 | 0.14 | 0.10 | 12.9 | 13.0 | 0.09 | 3.29 | 3.38 | — | 12,967 | 12,967 | 0.59 | 0.62 | 18.4 | 13,186 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 2,743 | 2,743 | 0.17 | 0.02 | — | 2,753 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 4,979 | 4,979 | 0.31 | 0.04 | — | 4,997 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 7,721 | 7,721 | 0.48 | 0.06 | — | 7,750 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 2,743 | 2,743 | 0.17 | 0.02 | — | 2,753 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 4,979 | 4,979 | 0.31 | 0.04 | — | 4,997 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 7,721 | 7,721 | 0.48 | 0.06 | — | 7,750 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 454 | 454 | 0.03 | < 0.005 | — | 456 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 824 | 824 | 0.05 | 0.01 | — | 827 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 1,278 | 1,278 | 0.08 | 0.01 | — | 1,283 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.24 | 0.12 | 2.02 | 0.86 | 0.01 | 0.16 | — | 0.16 | 0.16 | — | 0.16 | — | 2,567 | 2,567 | 0.23 | < 0.005 | — | 2,574 |
| Apartments Low Rise | 0.38 | 0.19 | 3.23 | 1.37 | 0.02 | 0.26 | — | 0.26 | 0.26 | — | 0.26 | — | 4,100 | 4,100 | 0.36 | 0.01 | — | 4,111 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 6,667 | 6,667 | 0.59 | 0.01 | — | 6,685 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.24 | 0.12 | 2.02 | 0.86 | 0.01 | 0.16 | — | 0.16 | 0.16 | — | 0.16 | — | 2,567 | 2,567 | 0.23 | < 0.005 | — | 2,574 |
| Apartments Low Rise | 0.38 | 0.19 | 3.23 | 1.37 | 0.02 | 0.26 | — | 0.26 | 0.26 | — | 0.26 | — | 4,100 | 4,100 | 0.36 | 0.01 | — | 4,111 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.61 | 0.31 | 5.25 | 2.24 | 0.03 | 0.42 | — | 0.42 | 0.42 | — | 0.42 | — | 6,667 | 6,667 | 0.59 | 0.01 | — | 6,685 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.04 | 0.02 | 0.37 | 0.16 | < 0.005 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 425 | 425 | 0.04 | < 0.005 | — | 426 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartment Low Rise | 0.07 | 0.03 | 0.59 | 0.25 | < 0.005 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 679 | 679 | 0.06 | < 0.005 | — | 681 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.11 | 0.06 | 0.96 | 0.41 | 0.01 | 0.08 | — | 0.08 | 0.08 | — | 0.08 | — | 1,104 | 1,104 | 0.10 | < 0.005 | — | 1,107 |

## 4.3. Area Emissions by Source

### 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Consumer Products | 43.9 | 43.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 3.49 | 3.49 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 5.38 | 5.10 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | — | 155 | 155 | 0.01 | < 0.005 | — | 156 |
| Total | 52.8 | 52.5 | 0.55 | 58.1 | < 0.005 | 0.03 | — | 0.03 | 0.02 | — | 0.02 | 0.00 | 4,176 | 4,176 | 0.26 | 0.03 | — | 4,192 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Consumer Products | 43.9 | 43.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 3.49 | 3.49 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 47.4 | 47.4 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 4,020 | 4,020 | 0.25 | 0.03 | — | 4,036 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 45.6 | 45.6 | < 0.005 | < 0.005 | — | 45.8 |
| Consumer Products | 8.01 | 8.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 0.64 | 0.64 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 0.67 | 0.64 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 17.6 | 17.6 | < 0.005 | < 0.005 | — | 17.7 |
| Total | 9.32 | 9.28 | 0.07 | 7.27 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | 0.00 | 63.2 | 63.2 | < 0.005 | < 0.005 | — | 63.4 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 20.4 | 106 | 126 | 2.10 | 0.05 | — | 194 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 61.3 | 318 | 379 | 6.31 | 0.15 | — | 582 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 236 | 236 | 0.01 | < 0.005 | — | 237 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 40.6 | 40.6 | < 0.005 | < 0.005 | — | 40.8 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 20.4 | 106 | 126 | 2.10 | 0.05 | — | 194 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 61.3 | 318 | 379 | 6.31 | 0.15 | — | 582 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 236 | 236 | 0.01 | < 0.005 | — | 237 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 40.6 | 40.6 | < 0.005 | < 0.005 | — | 40.8 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 81.8 | 700 | 782 | 8.43 | 0.20 | — | 1,054 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 3.39 | 17.5 | 20.9 | 0.35 | 0.01 | — | 32.1 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 10.2 | 52.6 | 62.7 | 1.04 | 0.03 | — | 96.3 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 39.1 | 39.1 | < 0.005 | < 0.005 | — | 39.2 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 6.73 | 6.73 | < 0.005 | < 0.005 | — | 6.75 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 13.5 | 116 | 129 | 1.40 | 0.03 | — | 174 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 133 | 0.00 | 133 | 13.3 | 0.00 | — | 466 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 306 | 0.00 | 306 | 30.6 | 0.00 | — | 1,071 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 0.00 | 0.91 | 0.09 | 0.00 | — | 3.18 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 133 | 0.00 | 133 | 13.3 | 0.00 | — | 466 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 306 | 0.00 | 306 | 30.6 | 0.00 | — | 1,071 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 0.00 | 0.91 | 0.09 | 0.00 | — | 3.18 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 440 | 0.00 | 440 | 44.0 | 0.00 | — | 1,540 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 22.1 | 0.00 | 22.1 | 2.21 | 0.00 | — | 77.2 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 50.7 | 0.00 | 50.7 | 5.06 | 0.00 | — | 177 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.15 | 0.00 | 0.15 | 0.02 | 0.00 | — | 0.53 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 72.9 | 0.00 | 72.9 | 7.28 | 0.00 | — | 255 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.63 | 3.63 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 10.9 | 10.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 3.63 | 3.63 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 10.9 | 10.9 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 14.5 | 14.5 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.60 | 0.60 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.80 | 1.80 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 2.40 | 2.40 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Remove | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Demolition | Demolition | 12/1/2025 | 6/1/2026 | 5.00 | 131 | — |
| Site Preparation | Site Preparation | 12/15/2025 | 6/15/2026 | 5.00 | 131 | — |
| Grading | Grading | 4/1/2026 | 12/1/2026 | 5.00 | 175 | — |
| Building Construction | Building Construction | 12/2/2026 | 5/2/2027 | 5.00 | 108 | — |
| Infrastructure Improvements | Building Construction | 8/1/2026 | 2/1/2027 | 5.00 | 131 | — |
| Paving | Paving | 2/2/2027 | 3/2/2027 | 5.00 | 21.0 | — |
| Architectural Coating | Architectural Coating | 5/3/2027 | 5/31/2027 | 5.00 | 21.0 | — |

## 5.2. Off-Road Equipment

### 5.2.2. Mitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Demolition | Rubber Tired Dozers | Diesel | Tier 4 Final | 2.00 | 8.00 | 367 | 0.40 |
| Demolition | Excavators | Diesel | Tier 4 Final | 3.00 | 8.00 | 36.0 | 0.38 |
| Demolition | Concrete/Industrial Saws | Diesel | Tier 4 Final | 1.00 | 8.00 | 33.0 | 0.73 |
| Site Preparation | Rubber Tired Dozers | Diesel | Tier 4 Final | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Graders | Diesel | Tier 4 Final | 1.00 | 8.00 | 148 | 0.41 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Grading | Excavators | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Grading | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 2.00 | 8.00 | 84.0 | 0.37 |
| Grading | Scrapers | Diesel | Tier 4 Final | 2.00 | 8.00 | 423 | 0.48 |
| Grading | Rubber Tired Dozers | Diesel | Tier 4 Final | 1.00 | 8.00 | 367 | 0.40 |
| Building Construction | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Building Construction | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Infrastructure Improvements | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Infrastructure Improvements | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Infrastructure Improvements | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Infrastructure Improvements | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Infrastructure Improvements | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Paving | Pavers | Diesel | Tier 4 Final | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Tier 4 Final | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Tier 4 Final | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.2. Mitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Demolition | — | — | — | — |

| | | | | |
|---|---|---|---|---|
| Demolition | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Demolition | Vendor | — | 10.2 | HHDT,MHDT |
| Demolition | Hauling | 24.3 | 20.0 | HHDT |
| Demolition | Onsite truck | — | — | HHDT |
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 18.5 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 10.2 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 20.0 | 18.5 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 10.2 | HHDT,MHDT |
| Grading | Hauling | 0.00 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 645 | 18.5 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 109 | 10.2 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 10.2 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 258 | 18.5 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 10.2 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |

| | | | | |
|---|---|---|---|---|
| Architectural Coating | Onsite truck | — | — | HHDT |
| Infrastructure Improvements | — | — | — | — |
| Infrastructure Improvements | Worker | 645 | 18.5 | LDA,LDT1,LDT2 |
| Infrastructure Improvements | Vendor | 109 | 10.2 | HHDT,MHDT |
| Infrastructure Improvements | Hauling | 0.00 | 20.0 | HHDT |
| Infrastructure Improvements | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

| Control Strategies Applied | PM10 Reduction | PM2.5 Reduction |
|---|---|---|
| Water unpaved roads twice daily | 55% | 55% |
| Limit vehicle speeds on unpaved roads to 25 mph | 44% | 44% |

## 5.5. Architectural Coatings

| Phase Name | Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|---|
| Architectural Coating | 4,105,728 | 1,368,576 | 0.00 | 0.00 | 8,834 |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (cy) | Material Exported (cy) | Acres Graded (acres) | Material Demolished (Ton of Debris) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Demolition | 0.00 | 0.00 | 0.00 | 12,744 | — |
| Site Preparation | — | — | 197 | 0.00 | — |
| Grading | — | — | 525 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 6.20 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 3 | 74% | 74% |
| Water Demolished Area | 2 | 36% | 36% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Single Family Housing | 2.82 | 0% |
| Apartments Low Rise | — | 0% |
| City Park | 0.00 | 0% |
| Other Non-Asphalt Surfaces | 3.38 | 0% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2025 | 0.00 | 532 | 0.03 | < 0.005 |
| 2026 | 0.00 | 532 | 0.03 | < 0.005 |
| 2027 | 0.00 | 532 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 2,416 | 2,416 | 2,416 | 881,840 | 28,649 | 28,649 | 28,649 | 10,456,835 |
| Apartments Low Rise | 5,176 | 5,176 | 5,176 | 1,889,240 | 61,377 | 61,377 | 61,377 | 22,402,558 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| City Park | 677 | 677 | 677 | 246,933 | 11,219 | 11,219 | 11,219 | 4,094,910 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 174 |
| No Fireplaces | 82 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 523 |
| No Fireplaces | 245 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |

| | |
|---|---|
| Pellet Wood Stoves | 0 |

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 4105728 | 1,368,576 | 0.00 | 0.00 | 8,834 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 1,881,731 | 532 | 0.0330 | 0.0040 | 8,010,167 |
| Apartments Low Rise | 3,415,883 | 532 | 0.0330 | 0.0040 | 12,792,237 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Single Family Housing | 10,670,381 | 0.00 |
| Apartments Low Rise | 32,011,142 | 0.00 |

| | | |
|---|---|---|
| City Park | 0.00 | 30,530,835 |
| Other Non-Asphalt Surfaces | 0.00 | 5,254,288 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 247 | — |
| Apartments Low Rise | 568 | — |
| City Park | 1.69 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

#### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

#### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 19.8 | annual days of extreme heat |
| Extreme Precipitation | 3.10 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 6.78 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.

The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |

| | |
|---|---|
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |

| | |
|---|---|
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |

| | |
|---|---|
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|
| Land Use | per center park specific plan provisions and traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Construction: Construction Phases | per construction questionnaire from client |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD 445 (Wood Burning) prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

# Center Park Specific Plan - Phase II Custom Report

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1. Basic Project Information

1.1. Basic Project Information

1.2. Land Use Types

1.3. User-Selected Emission Reduction Measures by Emissions Sector

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

2.3. Construction Emissions by Year, Mitigated

2.4. Operations Emissions Compared Against Thresholds

2.6. Operations Emissions by Sector, Mitigated

3. Construction Emissions Details

3.2. Demolition (2026) - Mitigated

3.4. Demolition (2027) - Mitigated

3.6. Site Preparation (2026) - Mitigated

3.8. Site Preparation (2027) - Mitigated

3.10. Grading (2027) - Mitigated

3.12. Building Construction (2028) - Mitigated

3.14. Building Construction (2029) - Mitigated

3.16. Building Construction (2030) - Mitigated

3.18. Infrastructure Improvements (2027) - Mitigated

3.20. Infrastructure Improvements (2028) - Mitigated

3.22. Paving (2028) - Mitigated

3.24. Paving (2029) - Mitigated

3.26. Architectural Coating (2030) - Mitigated

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.2. Mitigated

4.2. Energy

4.2.2. Electricity Emissions By Land Use - Mitigated

4.2.4. Natural Gas Emissions By Land Use - Mitigated

4.3. Area Emissions by Source

4.3.2. Mitigated

4.4. Water Emissions by Land Use

4.4.2. Mitigated

4.5. Waste Emissions by Land Use

4.5.2. Mitigated

4.6. Refrigerant Emissions by Land Use

4.6.2. Mitigated

4.7. Offroad Emissions By Equipment Type

4.7.2. Mitigated

4.8. Stationary Emissions By Equipment Type

4.8.2. Mitigated

4.9. User Defined Emissions By Equipment Type

4.9.2. Mitigated

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

5. Activity Data

5.1. Construction Schedule

5.2. Off-Road Equipment

5.2.2. Mitigated

5.3. Construction Vehicles

5.3.2. Mitigated

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

5.6.2. Construction Earthmoving Control Strategies

5.7. Construction Paving

5.8. Construction Electricity Consumption and Emissions Factors

5.9. Operational Mobile Sources

5.9.2. Mitigated

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.2. Mitigated

5.10.2. Architectural Coatings

5.10.4. Landscape Equipment - Mitigated

5.11. Operational Energy Consumption

5.11.2. Mitigated

5.12. Operational Water and Wastewater Consumption

5.12.2. Mitigated

5.13. Operational Waste Generation

5.13.2. Mitigated

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.2. Mitigated

5.15. Operational Off-Road Equipment

5.15.2. Mitigated

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

5.16.2. Process Boilers

5.17. User Defined

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.2. Mitigated

5.18.1. Biomass Cover Type

5.18.1.2. Mitigated

5.18.2. Sequestration

5.18.2.2. Mitigated

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

6.2. Initial Climate Risk Scores

6.3. Adjusted Climate Risk Scores

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

7.2. Healthy Places Index Scores

7.3. Overall Health & Equity Scores

7.4. Health & Equity Measures

7.5. Evaluation Scorecard

7.6. Health & Equity Custom Measures

8. User Changes to Default Data

# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan - Phase II |
| Construction Start Date | 12/2/2026 |
| Operational Year | 2030 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99545776525716, -117.63174085978615 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5259 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 546 | Dwelling Unit | 24.8 | 1,081,080 | 0.00 | — | 1,807 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 2,723 | Dwelling Unit | 105 | 4,592,865 | 0.00 | — | 9,013 | — |
| Strip Mall | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant w/o Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant with Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| General Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| Medical Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| City Park | 36.3 | Acre | 36.3 | 0.00 | 1,582,970 | 1,582,970 | — | — |
| Other Non-Asphalt Surfaces | 7.90 | Acre | 7.90 | 0.00 | 344,124 | 344,124 | — | — |
| Parking Lot | 6.95 | Acre | 6.95 | 0.00 | 0.00 | — | — | — |

## 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Construction | C-2* | Limit Heavy-Duty Diesel Vehicle Idling |
| Construction | C-5 | Use Advanced Engine Tiers |
| Construction | C-13 | Use Low-VOC Paints for Construction |
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

## 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 16.2 | 13.6 | 78.2 | 199 | 0.17 | 3.06 | 35.3 | 36.9 | 2.82 | 8.81 | 10.3 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| Mit. | 12.5 | 10.5 | 27.4 | 209 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| % Reduced | 23% | 22% | 65% | -5% | — | 88% | — | 3% | 87% | — | 10% | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 1,904 | 1,904 | 64.7 | 259 | 0.24 | 2.14 | 65.6 | 66.8 | 1.97 | 15.6 | 16.6 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| Mit. | 371 | 370 | 47.8 | 264 | 0.24 | 0.53 | 65.6 | 66.1 | 0.37 | 15.6 | 16.0 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| % Reduced | 81% | 81% | 26% | -2% | — | 75% | — | 1% | 81% | — | 4% | — | — | — | — | — | — | — |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 105 | 105 | 38.4 | 113 | 0.10 | 1.29 | 27.1 | 27.6 | 1.19 | 6.47 | 6.84 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| Mit. | 21.4 | 21.1 | 20.5 | 114 | 0.10 | 0.22 | 27.1 | 27.3 | 0.20 | 6.47 | 6.61 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| % Reduced | 80% | 80% | 47% | -2% | — | 83% | — | 1% | 83% | — | 3% | — | — | — | — | — | — | — |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 19.3 | 19.2 | 7.01 | 20.5 | 0.02 | 0.24 | 4.95 | 5.03 | 0.22 | 1.18 | 1.25 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| Mit. | 3.90 | 3.86 | 3.75 | 20.9 | 0.02 | 0.04 | 4.95 | 4.99 | 0.04 | 1.18 | 1.21 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| % Reduced | 80% | 80% | 47% | -2% | — | 83% | — | 1% | 83% | — | 3% | — | — | — | — | — | — | — |

## 2.3. Construction Emissions by Year, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2027 | 12.5 | 10.5 | 27.4 | 209 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 51,258 | 51,258 | 1.54 | 2.88 | 124 | 52,281 |
| 2028 | 10.8 | 9.79 | 24.3 | 172 | 0.13 | 0.28 | 32.9 | 33.2 | 0.19 | 7.85 | 8.04 | — | 45,254 | 45,254 | 1.24 | 2.84 | 111 | 46,243 |
| 2029 | 9.89 | 8.99 | 20.8 | 151 | 0.11 | 0.16 | 32.7 | 32.8 | 0.16 | 7.80 | 7.96 | — | 42,706 | 42,706 | 1.12 | 2.73 | 98.2 | 43,647 |
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 1.49 | 1.05 | 12.1 | 50.9 | 0.11 | 0.21 | 9.89 | 10.1 | 0.21 | 3.52 | 3.73 | — | 13,129 | 13,129 | 0.76 | 0.73 | 0.25 | 13,365 |
| 2027 | 11.9 | 9.93 | 29.0 | 171 | 0.17 | 0.37 | 35.3 | 35.7 | 0.37 | 8.81 | 9.18 | — | 48,731 | 48,731 | 1.59 | 2.88 | 3.22 | 49,633 |
| 2028 | 20.3 | 18.2 | 47.8 | 264 | 0.24 | 0.53 | 65.6 | 66.1 | 0.35 | 15.6 | 16.0 | — | 83,879 | 83,879 | 2.52 | 5.66 | 5.75 | 85,635 |
| 2029 | 9.78 | 7.90 | 24.2 | 130 | 0.13 | 0.19 | 32.9 | 33.1 | 0.19 | 7.85 | 8.04 | — | 41,995 | 41,995 | 1.23 | 2.75 | 2.55 | 42,848 |
| 2030 | 371 | 370 | 20.8 | 112 | 0.11 | 0.16 | 32.7 | 32.8 | 0.16 | 7.80 | 7.96 | — | 39,526 | 39,526 | 1.07 | 2.73 | 2.26 | 40,370 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.07 | 0.05 | 0.65 | 2.25 | 0.01 | 0.01 | 0.44 | 0.45 | 0.01 | 0.14 | 0.15 | — | 631 | 631 | 0.04 | 0.04 | 0.24 | 644 |
| 2027 | 4.17 | 3.45 | 13.4 | 75.4 | 0.10 | 0.20 | 14.0 | 14.2 | 0.20 | 3.91 | 4.11 | — | 19,987 | 19,987 | 0.76 | 1.09 | 17.3 | 20,349 |
| 2028 | 8.38 | 7.54 | 20.5 | 114 | 0.10 | 0.22 | 27.1 | 27.3 | 0.14 | 6.47 | 6.61 | — | 35,243 | 35,243 | 1.05 | 2.37 | 40.0 | 36,015 |
| 2029 | 6.72 | 5.43 | 16.1 | 89.7 | 0.08 | 0.12 | 23.1 | 23.2 | 0.12 | 5.51 | 5.62 | — | 29,160 | 29,160 | 0.84 | 1.95 | 30.3 | 29,794 |
| 2030 | 21.4 | 21.1 | 2.63 | 15.9 | 0.01 | 0.02 | 4.43 | 4.45 | 0.02 | 1.05 | 1.07 | — | 5,277 | 5,277 | 0.13 | 0.34 | 5.05 | 5,388 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.01 | 0.01 | 0.12 | 0.41 | < 0.005 | < 0.005 | 0.08 | 0.08 | < 0.005 | 0.03 | 0.03 | — | 104 | 104 | 0.01 | 0.01 | 0.04 | 107 |
| 2027 | 0.76 | 0.63 | 2.45 | 13.8 | 0.02 | 0.04 | 2.56 | 2.60 | 0.04 | 0.71 | 0.75 | — | 3,309 | 3,309 | 0.13 | 0.18 | 2.86 | 3,369 |
| 2028 | 1.53 | 1.38 | 3.75 | 20.9 | 0.02 | 0.04 | 4.95 | 4.99 | 0.03 | 1.18 | 1.21 | — | 5,835 | 5,835 | 0.17 | 0.39 | 6.63 | 5,963 |
| 2029 | 1.23 | 0.99 | 2.93 | 16.4 | 0.01 | 0.02 | 4.21 | 4.23 | 0.02 | 1.00 | 1.03 | — | 4,828 | 4,828 | 0.14 | 0.32 | 5.02 | 4,933 |
| 2030 | 3.90 | 3.86 | 0.48 | 2.90 | < 0.005 | < 0.005 | 0.81 | 0.81 | < 0.005 | 0.19 | 0.20 | — | 874 | 874 | 0.02 | 0.06 | 0.84 | 892 |

## 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 296 | 278 | 145 | 1,508 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.7 | 92.4 | 2,650 | 452,002 | 454,652 | 285 | 17.3 | 1,028 | 467,980 |
| Mit. | 296 | 278 | 145 | 1,506 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.6 | 92.3 | 2,650 | 450,333 | 452,983 | 285 | 17.3 | 1,027 | 466,298 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 270 | 254 | 153 | 1,082 | 3.58 | 3.72 | 349 | 353 | 3.58 | 88.7 | 92.3 | 2,650 | 427,769 | 430,419 | 286 | 17.8 | 186 | 443,057 |
| Mit. | 270 | 254 | 153 | 1,080 | 3.57 | 3.71 | 349 | 353 | 3.58 | 88.6 | 92.2 | 2,650 | 426,132 | 428,782 | 285 | 17.8 | 186 | 441,409 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 282 | 265 | 156 | 1,258 | 3.62 | 3.79 | 345 | 349 | 3.64 | 87.7 | 91.3 | 2,650 | 419,861 | 422,511 | 285 | 17.9 | 537 | 435,494 |
| Mit. | 282 | 265 | 156 | 1,256 | 3.62 | 3.79 | 345 | 349 | 3.63 | 87.5 | 91.2 | 2,650 | 418,220 | 420,870 | 285 | 17.8 | 536 | 433,840 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 51.4 | 48.3 | 28.5 | 230 | 0.66 | 0.69 | 63.0 | 63.7 | 0.66 | 16.0 | 16.7 | 439 | 69,513 | 69,952 | 47.2 | 2.96 | 88.9 | 72,101 |
| Mit. | 51.4 | 48.3 | 28.5 | 229 | 0.66 | 0.69 | 62.9 | 63.6 | 0.66 | 16.0 | 16.6 | 439 | 69,241 | 69,680 | 47.1 | 2.95 | 88.8 | 71,827 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 136 | 121 | 124 | 1,299 | 3.69 | 2.18 | 349 | 351 | 2.04 | 88.6 | 90.6 | — | 378,689 | 378,689 | 14.3 | 16.1 | 864 | 384,694 |
| Area | 157 | 156 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | 0.00 | 13,376 | 13,376 | 0.82 | 0.10 | — | 13,426 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 296 | 278 | 145 | 1,506 | 3.82 | 3.82 | 349 | 353 | 3.66 | 88.6 | 92.3 | 2,650 | 450,333 | 452,983 | 285 | 17.3 | 1,027 | 466,298 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 129 | 114 | 133 | 1,071 | 3.45 | 2.18 | 349 | 351 | 2.05 | 88.6 | 90.6 | — | 355,028 | 355,028 | 14.7 | 16.5 | 22.4 | 360,348 |
| Area | 138 | 138 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 270 | 254 | 153 | 1,080 | 3.57 | 3.71 | 349 | 353 | 3.58 | 88.6 | 92.2 | 2,650 | 426,132 | 428,782 | 285 | 17.8 | 186 | 441,409 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 128 | 113 | 136 | 1,112 | 3.49 | 2.18 | 345 | 347 | 2.04 | 87.5 | 89.6 | — | 358,701 | 358,701 | 14.7 | 16.7 | 373 | 364,408 |
| Area | 151 | 150 | 1.25 | 135 | 0.01 | 0.07 | — | 0.07 | 0.05 | — | 0.05 | 0.00 | 1,249 | 1,249 | 0.07 | 0.01 | — | 1,254 |
| Energy | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 55,918 | 55,918 | 4.11 | 0.28 | — | 56,105 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Total | 282 | 265 | 156 | 1,256 | 3.62 | 3.79 | 345 | 349 | 3.63 | 87.5 | 91.2 | 2,650 | 418,220 | 420,870 | 285 | 17.8 | 536 | 433,840 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 23.4 | 20.7 | 24.7 | 203 | 0.64 | 0.40 | 62.9 | 63.3 | 0.37 | 16.0 | 16.4 | — | 59,387 | 59,387 | 2.43 | 2.76 | 61.7 | 60,332 |
| Area | 27.6 | 27.4 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | 0.00 | 207 | 207 | 0.01 | < 0.005 | — | 208 |
| Energy | 0.41 | 0.20 | 3.50 | 1.75 | 0.02 | 0.28 | — | 0.28 | 0.28 | — | 0.28 | — | 9,258 | 9,258 | 0.68 | 0.05 | — | 9,289 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 58.1 | 389 | 447 | 5.98 | 0.14 | — | 640 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 381 | 0.00 | 381 | 38.0 | 0.00 | — | 1,332 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 27.1 | 27.1 |
| Total | 51.4 | 48.3 | 28.5 | 229 | 0.66 | 0.69 | 62.9 | 63.6 | 0.66 | 16.0 | 16.6 | 439 | 69,241 | 69,680 | 47.1 | 2.95 | 88.8 | 71,827 |

# 3. Construction Emissions Details

## 3.2. Demolition (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,438 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.26 | 1.07 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 201 | 201 | 0.01 | < 0.005 | — | 202 |
| Demolition | — | — | — | — | — | — | 0.19 | 0.19 | — | 0.03 | 0.03 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.05 | 0.19 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 33.3 | 33.3 | < 0.005 | < 0.005 | — | 33.4 |
| Demolition | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.01 | 0.01 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.07 | 0.82 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 190 | 190 | < 0.005 | 0.01 | 0.02 | 192 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.49 | 0.06 | 4.90 | 2.70 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,994 | 3,994 | 0.40 | 0.64 | 0.21 | 4,194 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.3 | 11.3 | < 0.005 | < 0.005 | 0.02 | 11.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.03 | < 0.005 | 0.29 | 0.16 | < 0.005 | < 0.005 | 0.06 | 0.07 | < 0.005 | 0.02 | 0.02 | — | 234 | 234 | 0.02 | 0.04 | 0.21 | 246 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.87 | 1.87 | < 0.005 | < 0.005 | < 0.005 | 1.90 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.01 | < 0.005 | 0.05 | 0.03 | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | < 0.005 | — | 38.8 | 38.8 | < 0.005 | 0.01 | 0.03 | 40.8 |

## 3.4. Demolition (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,439 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.36 | 0.36 | 4.51 | 18.2 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,427 | 3,427 | 0.14 | 0.03 | — | 3,439 |
| Demolition | — | — | — | — | — | — | 3.26 | 3.26 | — | 0.49 | 0.49 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road | 0.11 | 0.11 | 1.35 | 5.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 1,026 | 1,026 | 0.04 | 0.01 | — | 1,030 |
| Demolition | — | — | — | — | — | — | 0.98 | 0.98 | — | 0.15 | 0.15 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.25 | 0.99 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 170 | 170 | 0.01 | < 0.005 | — | 170 |
| Demolition | — | — | — | — | — | — | 0.18 | 0.18 | — | 0.03 | 0.03 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.05 | 1.01 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 203 | 203 | < 0.005 | 0.01 | 0.64 | 206 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.46 | 0.06 | 4.54 | 2.58 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,911 | 3,911 | 0.40 | 0.64 | 7.45 | 4,119 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.07 | 0.06 | 0.06 | 0.76 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 186 | 186 | < 0.005 | 0.01 | 0.02 | 188 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.46 | 0.06 | 4.74 | 2.59 | 0.03 | 0.05 | 1.09 | 1.14 | 0.05 | 0.30 | 0.35 | — | 3,912 | 3,912 | 0.40 | 0.64 | 0.19 | 4,113 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.24 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 56.5 | 56.5 | < 0.005 | < 0.005 | 0.08 | 57.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.14 | 0.02 | 1.43 | 0.77 | 0.01 | 0.02 | 0.32 | 0.34 | 0.02 | 0.09 | 0.10 | — | 1,171 | 1,171 | 0.12 | 0.19 | 0.96 | 1,232 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.35 | 9.35 | < 0.005 | < 0.005 | 0.01 | 9.48 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.03 | < 0.005 | 0.26 | 0.14 | < 0.005 | < 0.005 | 0.06 | 0.06 | < 0.005 | 0.02 | 0.02 | — | 194 | 194 | 0.02 | 0.03 | 0.16 | 204 |

## 3.6. Site Preparation (2026) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.09 | 0.94 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 176 | 176 | 0.01 | < 0.005 | — | 177 |
| Dust From Material Movement | — | — | — | — | — | — | 0.17 | 0.17 | — | 0.09 | 0.09 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.17 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 29.2 | 29.2 | < 0.005 | < 0.005 | — | 29.3 |
| Dust From Material Movement | — | — | — | — | — | — | 0.03 | 0.03 | — | 0.02 | 0.02 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.08 | 0.95 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 222 | 222 | < 0.005 | 0.01 | 0.02 | 224 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.03 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 7.47 | 7.47 | < 0.005 | < 0.005 | 0.01 | 7.57 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.24 | 1.24 | < 0.005 | < 0.005 | < 0.005 | 1.25 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.8. Site Preparation (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.50 | 0.50 | 2.59 | 28.3 | 0.05 | 0.10 | — | 0.10 | 0.10 | — | 0.10 | — | 5,298 | 5,298 | 0.21 | 0.04 | — | 5,316 |
| Dust From Material Movement | — | — | — | — | — | — | 5.11 | 5.11 | — | 2.63 | 2.63 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 0.84 | 9.20 | 0.02 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,721 | 1,721 | 0.07 | 0.01 | — | 1,727 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | — | 1.66 | 1.66 | — | 0.85 | 0.85 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.03 | 0.03 | 0.15 | 1.68 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 285 | 285 | 0.01 | < 0.005 | — | 286 |
| Dust From Material Movement | — | — | — | — | — | — | 0.30 | 0.30 | — | 0.16 | 0.16 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.06 | 1.17 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 237 | 237 | < 0.005 | 0.01 | 0.74 | 240 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.08 | 0.07 | 0.07 | 0.88 | 0.00 | 0.00 | 0.23 | 0.23 | 0.00 | 0.05 | 0.05 | — | 217 | 217 | < 0.005 | 0.01 | 0.02 | 220 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.30 | 0.00 | 0.00 | 0.07 | 0.07 | 0.00 | 0.02 | 0.02 | — | 71.5 | 71.5 | < 0.005 | < 0.005 | 0.10 | 72.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.05 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.8 | 11.8 | < 0.005 | < 0.005 | 0.02 | 12.0 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.10. Grading (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,598 | 6,598 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.64 | 0.64 | 4.43 | 35.3 | 0.06 | 0.12 | — | 0.12 | 0.12 | — | 0.12 | — | 6,598 | 6,598 | 0.27 | 0.05 | — | 6,621 |
| Dust From Material Movement | — | — | — | — | — | — | 2.39 | 2.39 | — | 0.95 | 0.95 | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.31 | 0.31 | 2.12 | 16.9 | 0.03 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 3,163 | 3,163 | 0.13 | 0.03 | — | 3,174 |
| Dust From Material Movement | — | — | — | — | — | — | 1.15 | 1.15 | — | 0.46 | 0.46 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.06 | 0.06 | 0.39 | 3.09 | 0.01 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 524 | 524 | 0.02 | < 0.005 | — | 526 |
| Dust From Material Movement | — | — | — | — | — | — | 0.21 | 0.21 | — | 0.08 | 0.08 | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.07 | 1.34 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 271 | 271 | < 0.005 | 0.01 | 0.85 | 274 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.09 | 0.08 | 0.08 | 1.01 | 0.00 | 0.00 | 0.26 | 0.26 | 0.00 | 0.06 | 0.06 | — | 248 | 248 | < 0.005 | 0.01 | 0.02 | 251 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.04 | 0.04 | 0.04 | 0.51 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 121 | 121 | < 0.005 | < 0.005 | 0.18 | 122 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.01 | 0.01 | 0.01 | 0.09 | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.01 | 0.01 | — | 20.0 | 20.0 | < 0.005 | < 0.005 | 0.03 | 20.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.12. Building Construction (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipm | 0.06 | 0.06 | 0.51 | 2.67 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 432 | 432 | 0.02 | < 0.005 | — | 433 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.09 | 0.49 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 71.5 | 71.5 | < 0.005 | < 0.005 | — | 71.7 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.36 | 7.85 | 105 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,329 | 27,329 | 0.40 | 1.06 | 2.23 | 27,659 |
| Vendor | 1.06 | 0.23 | 12.2 | 6.55 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,366 | 11,366 | 0.73 | 1.74 | 0.64 | 11,903 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.52 | 1.50 | 1.58 | 20.0 | 0.00 | 0.00 | 5.22 | 5.22 | 0.00 | 1.22 | 1.22 | — | 4,989 | 4,989 | 0.07 | 0.19 | 6.67 | 5,055 |
| Vendor | 0.19 | 0.04 | 2.20 | 1.17 | 0.02 | 0.03 | 0.60 | 0.63 | 0.02 | 0.16 | 0.18 | — | 2,046 | 2,046 | 0.13 | 0.31 | 1.92 | 2,144 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.28 | 0.27 | 0.29 | 3.65 | 0.00 | 0.00 | 0.95 | 0.95 | 0.00 | 0.22 | 0.22 | — | 826 | 826 | 0.01 | 0.03 | 1.10 | 837 |
| Vendor | 0.03 | 0.01 | 0.40 | 0.21 | < 0.005 | 0.01 | 0.11 | 0.11 | < 0.005 | 0.03 | 0.03 | — | 339 | 339 | 0.02 | 0.05 | 0.32 | 355 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.14. Building Construction (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.25 | 0.23 | 2.01 | 10.6 | 0.02 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 1,712 | 1,712 | 0.07 | 0.01 | — | 1,718 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.05 | 0.04 | 0.37 | 1.93 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 283 | 283 | 0.01 | < 0.005 | — | 284 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.41 | 6.78 | 130 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 29,248 | 29,248 | 0.30 | 1.06 | 76.5 | 29,649 |
| Vendor | 0.98 | 0.24 | 11.2 | 6.16 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 11,061 | 11,061 | 0.73 | 1.65 | 21.7 | 11,593 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.12 | 7.00 | 7.80 | 98.1 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 26,840 | 26,840 | 0.35 | 1.06 | 1.98 | 27,167 |
| Vendor | 0.96 | 0.23 | 11.7 | 6.25 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 11,068 | 11,068 | 0.73 | 1.65 | 0.56 | 11,579 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 5.76 | 5.00 | 5.57 | 74.0 | 0.00 | 0.00 | 20.7 | 20.7 | 0.00 | 4.85 | 4.85 | — | 19,439 | 19,439 | 0.25 | 0.76 | 23.6 | 19,696 |
| Vendor | 0.69 | 0.17 | 8.38 | 4.44 | 0.06 | 0.06 | 2.36 | 2.43 | 0.06 | 0.65 | 0.72 | — | 7,903 | 7,903 | 0.52 | 1.18 | 6.71 | 8,274 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.05 | 0.91 | 1.02 | 13.5 | 0.00 | 0.00 | 3.78 | 3.78 | 0.00 | 0.89 | 0.89 | — | 3,218 | 3,218 | 0.04 | 0.13 | 3.90 | 3,261 |
| Vendor | 0.13 | 0.03 | 1.53 | 0.81 | 0.01 | 0.01 | 0.43 | 0.44 | 0.01 | 0.12 | 0.13 | — | 1,308 | 1,308 | 0.09 | 0.20 | 1.11 | 1,370 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.16. Building Construction (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.04 | 0.04 | 0.33 | 1.74 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 281 | 281 | 0.01 | < 0.005 | — | 282 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.06 | 0.32 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 46.6 | 46.6 | < 0.005 | < 0.005 | — | 46.8 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 7.77 | 6.71 | 6.78 | 91.5 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 26,384 | 26,384 | 0.35 | 1.06 | 1.77 | 26,712 |
| Vendor | 0.86 | 0.22 | 11.2 | 6.06 | 0.09 | 0.09 | 3.34 | 3.43 | 0.09 | 0.92 | 1.01 | — | 10,745 | 10,745 | 0.63 | 1.65 | 0.49 | 11,253 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.91 | 0.78 | 0.80 | 11.3 | 0.00 | 0.00 | 3.40 | 3.40 | 0.00 | 0.80 | 0.80 | — | 3,141 | 3,141 | 0.04 | 0.12 | 3.44 | 3,183 |
| Vendor | 0.10 | 0.03 | 1.32 | 0.71 | 0.01 | 0.01 | 0.39 | 0.40 | 0.01 | 0.11 | 0.12 | — | 1,261 | 1,261 | 0.07 | 0.19 | 0.96 | 1,322 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.14 | 0.15 | 2.06 | 0.00 | 0.00 | 0.62 | 0.62 | 0.00 | 0.15 | 0.15 | — | 520 | 520 | 0.01 | 0.02 | 0.57 | 527 |
| Vendor | 0.02 | < 0.005 | 0.24 | 0.13 | < 0.005 | < 0.005 | 0.07 | 0.07 | < 0.005 | 0.02 | 0.02 | — | 209 | 209 | 0.01 | 0.03 | 0.16 | 219 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.18. Infrastructure Improvements (2027) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.82 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,405 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.10 | 0.10 | 0.84 | 4.44 | 0.01 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 718 | 718 | 0.03 | 0.01 | — | 720 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.02 | 0.02 | 0.15 | 0.81 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 119 | 119 | < 0.005 | < 0.005 | — | 119 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 10.3 | 9.26 | 7.85 | 150 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 30,366 | 30,366 | 0.35 | 1.06 | 95.5 | 30,788 |
| Vendor | 1.08 | 0.24 | 12.2 | 6.65 | 0.09 | 0.18 | 3.34 | 3.52 | 0.18 | 0.92 | 1.10 | — | 11,626 | 11,626 | 0.83 | 1.74 | 27.9 | 12,192 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 9.78 | 8.66 | 8.86 | 113 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,854 | 27,854 | 0.40 | 1.06 | 2.47 | 28,184 |
| Vendor | 1.06 | 0.23 | 12.8 | 6.75 | 0.09 | 0.18 | 3.34 | 3.52 | 0.18 | 0.92 | 1.10 | — | 11,633 | 11,633 | 0.83 | 1.74 | 0.72 | 12,172 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 2.94 | 2.61 | 2.93 | 35.6 | 0.00 | 0.00 | 8.68 | 8.68 | 0.00 | 2.03 | 2.03 | — | 8,457 | 8,457 | 0.12 | 0.32 | 12.3 | 8,567 |
| Vendor | 0.32 | 0.07 | 3.84 | 2.01 | 0.03 | 0.05 | 0.99 | 1.04 | 0.05 | 0.27 | 0.33 | — | 3,482 | 3,482 | 0.25 | 0.52 | 3.60 | 3,647 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.54 | 0.48 | 0.53 | 6.49 | 0.00 | 0.00 | 1.58 | 1.58 | 0.00 | 0.37 | 0.37 | — | 1,400 | 1,400 | 0.02 | 0.05 | 2.04 | 1,418 |
| Vendor | 0.06 | 0.01 | 0.70 | 0.37 | < 0.005 | 0.01 | 0.18 | 0.19 | 0.01 | 0.05 | 0.06 | — | 576 | 576 | 0.04 | 0.09 | 0.60 | 604 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.20. Infrastructure Improvements (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.35 | 0.33 | 2.81 | 14.8 | 0.02 | 0.07 | — | 0.07 | 0.07 | — | 0.07 | — | 2,397 | 2,397 | 0.10 | 0.02 | — | 2,406 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.23 | 0.22 | 1.85 | 9.75 | 0.02 | 0.05 | — | 0.05 | 0.05 | — | 0.05 | — | 1,576 | 1,576 | 0.06 | 0.01 | — | 1,582 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.04 | 0.04 | 0.34 | 1.78 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 261 | 261 | 0.01 | < 0.005 | — | 262 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 9.01 | 8.86 | 7.75 | 139 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 29,788 | 29,788 | 0.35 | 1.06 | 85.6 | 30,199 |
| Vendor | 1.07 | 0.24 | 11.7 | 6.44 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,359 | 11,359 | 0.73 | 1.74 | 24.7 | 11,920 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 8.56 | 8.36 | 7.85 | 105 | 0.00 | 0.00 | 29.3 | 29.3 | 0.00 | 6.88 | 6.88 | — | 27,329 | 27,329 | 0.40 | 1.06 | 2.23 | 27,659 |
| Vendor | 1.06 | 0.23 | 12.2 | 6.55 | 0.09 | 0.18 | 3.34 | 3.52 | 0.09 | 0.92 | 1.01 | — | 11,366 | 11,366 | 0.73 | 1.74 | 0.64 | 11,903 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 5.57 | 5.47 | 5.76 | 73.1 | 0.00 | 0.00 | 19.1 | 19.1 | 0.00 | 4.46 | 4.46 | — | 18,222 | 18,222 | 0.26 | 0.70 | 24.4 | 18,461 |
| Vendor | 0.70 | 0.15 | 8.05 | 4.27 | 0.06 | 0.12 | 2.17 | 2.29 | 0.06 | 0.60 | 0.66 | — | 7,471 | 7,471 | 0.48 | 1.14 | 7.01 | 7,830 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 1.02 | 1.00 | 1.05 | 13.3 | 0.00 | 0.00 | 3.48 | 3.48 | 0.00 | 0.81 | 0.81 | — | 3,017 | 3,017 | 0.04 | 0.12 | 4.03 | 3,056 |
| Vendor | 0.13 | 0.03 | 1.47 | 0.78 | 0.01 | 0.02 | 0.40 | 0.42 | 0.01 | 0.11 | 0.12 | — | 1,237 | 1,237 | 0.08 | 0.19 | 1.16 | 1,296 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.22. Paving (2028) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.05 | 0.05 | 0.58 | 3.17 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 452 | 452 | 0.02 | < 0.005 | — | 454 |
| Paving | 0.04 | 0.04 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.01 | 0.01 | 0.11 | 0.58 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 74.9 | 74.9 | < 0.005 | < 0.005 | — | 75.2 |
| Paving | 0.01 | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.05 | 0.93 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 199 | 199 | < 0.005 | 0.01 | 0.57 | 202 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.06 | 0.06 | 0.05 | 0.70 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 183 | 183 | < 0.005 | 0.01 | 0.01 | 185 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.02 | 0.22 | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.01 | 0.01 | — | 55.4 | 55.4 | < 0.005 | < 0.005 | 0.07 | 56.2 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 9.18 | 9.18 | < 0.005 | < 0.005 | 0.01 | 9.30 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.24. Paving (2029) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.16 | 0.16 | 1.93 | 10.6 | 0.01 | 0.03 | — | 0.03 | 0.03 | — | 0.03 | — | 1,511 | 1,511 | 0.06 | 0.01 | — | 1,516 |
| Paving | 0.14 | 0.14 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.01 | 0.12 | 0.66 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 94.6 | 94.6 | < 0.005 | < 0.005 | — | 94.9 |
| Paving | 0.01 | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.02 | 0.12 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 15.7 | 15.7 | < 0.005 | < 0.005 | — | 15.7 |
| Paving | < 0.005 | < 0.005 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.05 | 0.05 | 0.66 | 0.00 | 0.00 | 0.20 | 0.20 | 0.00 | 0.05 | 0.05 | — | 179 | 179 | < 0.005 | 0.01 | 0.01 | 182 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.04 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | < 0.005 | < 0.005 | — | 11.4 | 11.4 | < 0.005 | < 0.005 | 0.01 | 11.5 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.89 | 1.89 | < 0.005 | < 0.005 | < 0.005 | 1.91 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.26. Architectural Coating (2030) - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.02 | 0.02 | 0.65 | 0.96 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 134 | 134 | 0.01 | < 0.005 | — | 134 |
| Architectural Coatings | 368 | 368 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.04 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 7.32 | 7.32 | < 0.005 | < 0.005 | — | 7.34 |
| Architectural Coatings | 20.1 | 20.1 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.21 | 1.21 | < 0.005 | < 0.005 | — | 1.22 |
| Architectural Coatings | 3.68 | 3.68 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 3.11 | 2.68 | 2.71 | 36.6 | 0.00 | 0.00 | 11.7 | 11.7 | 0.00 | 2.75 | 2.75 | — | 10,554 | 10,554 | 0.14 | 0.43 | 0.71 | 10,685 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.17 | 0.15 | 0.15 | 2.11 | 0.00 | 0.00 | 0.64 | 0.64 | 0.00 | 0.15 | 0.15 | — | 586 | 586 | 0.01 | 0.02 | 0.64 | 594 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.03 | 0.38 | 0.00 | 0.00 | 0.12 | 0.12 | 0.00 | 0.03 | 0.03 | — | 97.1 | 97.1 | < 0.005 | < 0.005 | 0.11 | 98.4 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 12.0 | 10.8 | 9.76 | 99.6 | 0.27 | 0.16 | 25.8 | 26.0 | 0.15 | 6.55 | 6.71 | — | 28,143 | 28,143 | 1.15 | 1.24 | 63.9 | 28,604 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 51.3 | 46.3 | 41.7 | 426 | 1.17 | 0.70 | 110 | 111 | 0.66 | 28.0 | 28.7 | — | 120,328 | 120,328 | 4.91 | 5.28 | 273 | 122,298 |
| Strip Mall | 2.36 | 2.08 | 2.35 | 25.1 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 7,456 | 7,456 | 0.27 | 0.31 | 17.1 | 7,571 |
| Fast Food Restaurant w/o Drive Thru | 27.5 | 24.2 | 27.4 | 292 | 0.85 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 86,775 | 86,775 | 3.11 | 3.59 | 198 | 88,122 |
| Fast Food Restaurant with Drive Thru | 28.6 | 25.1 | 28.4 | 303 | 0.88 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 90,049 | 90,049 | 3.22 | 3.73 | 206 | 91,447 |
| General Office Building | 2.14 | 1.88 | 2.14 | 22.7 | 0.07 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,760 | 6,760 | 0.24 | 0.28 | 15.5 | 6,865 |
| Medical Office Building | 7.12 | 6.25 | 7.09 | 75.5 | 0.22 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 22,460 | 22,460 | 0.80 | 0.93 | 51.4 | 22,809 |
| City Park | 5.30 | 4.66 | 5.28 | 56.2 | 0.16 | 0.10 | 15.5 | 15.5 | 0.09 | 3.92 | 4.01 | — | 16,719 | 16,719 | 0.60 | 0.69 | 38.2 | 16,978 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 136 | 121 | 124 | 1,299 | 3.69 | 2.18 | 349 | 351 | 2.04 | 88.6 | 90.6 | — | 378,689 | 378,689 | 14.3 | 16.1 | 864 | 384,694 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 11.3 | 10.2 | 10.5 | 83.2 | 0.26 | 0.16 | 25.8 | 26.0 | 0.15 | 6.55 | 6.71 | — | 26,394 | 26,394 | 1.19 | 1.27 | 1.66 | 26,805 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 48.5 | 43.5 | 44.8 | 356 | 1.10 | 0.70 | 110 | 111 | 0.66 | 28.0 | 28.7 | — | 112,852 | 112,852 | 5.07 | 5.44 | 7.08 | 114,608 |
| Strip Mall | 2.25 | 1.96 | 2.53 | 20.5 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 6,988 | 6,988 | 0.27 | 0.32 | 0.44 | 7,090 |
| Fast Food Restaurant w/o Drive Thru | 26.2 | 22.8 | 29.5 | 238 | 0.79 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 81,334 | 81,334 | 3.17 | 3.70 | 5.15 | 82,522 |
| Fast Food Restaurant with Drive Thru | 27.2 | 23.7 | 30.6 | 247 | 0.82 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 84,402 | 84,402 | 3.29 | 3.84 | 5.34 | 85,635 |
| General Office Building | 2.04 | 1.78 | 2.29 | 18.5 | 0.06 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,336 | 6,336 | 0.25 | 0.29 | 0.40 | 6,429 |
| Medical Office Building | 6.77 | 5.91 | 7.62 | 61.6 | 0.20 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 21,052 | 21,052 | 0.82 | 0.96 | 1.33 | 21,359 |
| City Park | 5.04 | 4.40 | 5.67 | 45.9 | 0.15 | 0.10 | 15.5 | 15.5 | 0.09 | 3.92 | 4.01 | — | 15,670 | 15,670 | 0.61 | 0.71 | 0.99 | 15,899 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 129 | 114 | 133 | 1,071 | 3.45 | 2.18 | 349 | 351 | 2.05 | 88.6 | 90.6 | — | 355,028 | 355,028 | 14.7 | 16.5 | 22.4 | 360,348 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 2.05 | 1.84 | 1.94 | 15.7 | 0.05 | 0.03 | 4.65 | 4.68 | 0.03 | 1.18 | 1.21 | — | 4,415 | 4,415 | 0.20 | 0.21 | 4.57 | 4,488 |
| Apartments Low Rise | 8.78 | 7.87 | 8.29 | 67.3 | 0.20 | 0.13 | 19.9 | 20.0 | 0.12 | 5.05 | 5.17 | — | 18,876 | 18,876 | 0.84 | 0.91 | 19.5 | 19,187 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | 0.41 | 0.36 | 0.47 | 3.88 | 0.01 | 0.01 | 1.24 | 1.25 | 0.01 | 0.32 | 0.32 | — | 1,169 | 1,169 | 0.05 | 0.05 | 1.22 | 1,187 |
| Fast Food Restaurant w/o Drive Thru | 4.74 | 4.13 | 5.47 | 45.2 | 0.15 | 0.09 | 14.5 | 14.6 | 0.08 | 3.67 | 3.76 | — | 13,606 | 13,606 | 0.53 | 0.62 | 14.2 | 13,817 |
| Fast Food Restaurant with Drive Thru | 4.92 | 4.29 | 5.67 | 46.9 | 0.15 | 0.09 | 15.0 | 15.1 | 0.09 | 3.81 | 3.90 | — | 14,119 | 14,119 | 0.54 | 0.64 | 14.7 | 14,338 |
| General Office Building | 0.37 | 0.32 | 0.43 | 3.52 | 0.01 | 0.01 | 1.13 | 1.13 | 0.01 | 0.29 | 0.29 | — | 1,060 | 1,060 | 0.04 | 0.05 | 1.11 | 1,076 |
| Medical Office Building | 1.23 | 1.07 | 1.42 | 11.7 | 0.04 | 0.02 | 3.74 | 3.77 | 0.02 | 0.95 | 0.97 | — | 3,522 | 3,522 | 0.14 | 0.16 | 3.67 | 3,576 |
| City Park | 0.91 | 0.80 | 1.05 | 8.70 | 0.03 | 0.02 | 2.79 | 2.80 | 0.02 | 0.71 | 0.72 | — | 2,621 | 2,621 | 0.10 | 0.12 | 2.73 | 2,662 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 23.4 | 20.7 | 24.7 | 203 | 0.64 | 0.40 | 62.9 | 63.3 | 0.37 | 16.0 | 16.4 | — | 59,387 | 59,387 | 2.43 | 2.76 | 61.7 | 60,332 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 5,849 | 5,849 | 0.36 | 0.04 | — | 5,872 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 17,652 | 17,652 | 1.09 | 0.13 | — | 17,719 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 31,818 | 31,818 | 1.97 | 0.24 | — | 31,939 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 5,849 | 5,849 | 0.36 | 0.04 | — | 5,872 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 17,652 | 17,652 | 1.09 | 0.13 | — | 17,719 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 31,818 | 31,818 | 1.97 | 0.24 | — | 31,939 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 968 | 968 | 0.06 | 0.01 | — | 972 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 2,922 | 2,922 | 0.18 | 0.02 | — | 2,934 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 90.6 | 90.6 | 0.01 | < 0.005 | — | 91.0 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 64.0 | 64.0 | < 0.005 | < 0.005 | — | 64.3 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 5,268 | 5,268 | 0.33 | 0.04 | — | 5,288 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.50 | 0.25 | 4.31 | 1.84 | 0.03 | 0.35 | — | 0.35 | 0.35 | — | 0.35 | — | 5,475 | 5,475 | 0.48 | 0.01 | — | 5,490 |
| Apartments Low Rise | 1.34 | 0.67 | 11.5 | 4.87 | 0.07 | 0.93 | — | 0.93 | 0.93 | — | 0.93 | — | 14,536 | 14,536 | 1.29 | 0.03 | — | 14,576 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 24,100 | 24,100 | 2.13 | 0.05 | — | 24,167 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.50 | 0.25 | 4.31 | 1.84 | 0.03 | 0.35 | — | 0.35 | 0.35 | — | 0.35 | — | 5,475 | 5,475 | 0.48 | 0.01 | — | 5,490 |
| Apartments Low Rise | 1.34 | 0.67 | 11.5 | 4.87 | 0.07 | 0.93 | — | 0.93 | 0.93 | — | 0.93 | — | 14,536 | 14,536 | 1.29 | 0.03 | — | 14,576 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.22 | 1.11 | 19.2 | 9.59 | 0.12 | 1.54 | — | 1.54 | 1.54 | — | 1.54 | — | 24,100 | 24,100 | 2.13 | 0.05 | — | 24,167 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 0.09 | 0.05 | 0.79 | 0.33 | 0.01 | 0.06 | — | 0.06 | 0.06 | — | 0.06 | — | 906 | 906 | 0.08 | < 0.005 | — | 909 |
| Apartments Low Rise | 0.24 | 0.12 | 2.09 | 0.89 | 0.01 | 0.17 | — | 0.17 | 0.17 | — | 0.17 | — | 2,407 | 2,407 | 0.21 | < 0.005 | — | 2,413 |
| Strip Mall | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | — | 12.1 |
| Fast Food Restaurant w/o Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| Fast Food Restaurant with Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| General Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| Medical Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.41 | 0.20 | 3.50 | 1.75 | 0.02 | 0.28 | — | 0.28 | 0.28 | — | 0.28 | — | 3,990 | 3,990 | 0.35 | 0.01 | — | 4,001 |

## 4.3. Area Emissions by Source

## 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Consumer Products | 128 | 128 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 10.4 | 10.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 18.9 | 17.8 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | — | 541 | 541 | 0.02 | < 0.005 | — | 543 |
| Total | 157 | 156 | 1.82 | 197 | 0.01 | 0.10 | — | 0.10 | 0.08 | — | 0.08 | 0.00 | 13,376 | 13,376 | 0.82 | 0.10 | — | 13,426 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Consumer Products | 128 | 128 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 10.4 | 10.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 138 | 138 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 12,835 | 12,835 | 0.80 | 0.10 | — | 12,884 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 146 | 146 | 0.01 | < 0.005 | — | 146 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Consum Products | 23.3 | 23.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 1.90 | 1.90 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 2.36 | 2.23 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 61.3 | 61.3 | < 0.005 | < 0.005 | — | 61.5 |
| Total | 27.6 | 27.4 | 0.23 | 24.6 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | 0.00 | 207 | 207 | 0.01 | < 0.005 | — | 208 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 43.6 | 226 | 269 | 4.49 | 0.11 | — | 414 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 217 | 1,126 | 1,344 | 22.4 | 0.54 | — | 2,063 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 437 | 437 | 0.03 | < 0.005 | — | 439 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 95.0 | 95.0 | 0.01 | < 0.005 | — | 95.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 43.6 | 226 | 269 | 4.49 | 0.11 | — | 414 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 217 | 1,126 | 1,344 | 22.4 | 0.54 | — | 2,063 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 437 | 437 | 0.03 | < 0.005 | — | 439 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 95.0 | 95.0 | 0.01 | < 0.005 | — | 95.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 351 | 2,351 | 2,702 | 36.1 | 0.87 | — | 3,864 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 7.22 | 37.4 | 44.6 | 0.74 | 0.02 | — | 68.5 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 36.0 | 186 | 222 | 3.70 | 0.09 | — | 342 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 4.78 | 5.68 | 0.09 | < 0.005 | — | 8.69 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 3.81 | 19.9 | 23.7 | 0.39 | 0.01 | — | 36.3 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 2.69 | 14.1 | 16.8 | 0.28 | 0.01 | — | 25.7 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 72.3 | 72.3 | < 0.005 | < 0.005 | — | 72.6 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 15.7 | 15.7 | < 0.005 | < 0.005 | — | 15.8 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 58.1 | 389 | 447 | 5.98 | 0.14 | — | 640 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 284 | 0.00 | 284 | 28.4 | 0.00 | — | 995 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,085 | 0.00 | 1,085 | 108 | 0.00 | — | 3,797 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 1.68 | 0.00 | 1.68 | 0.17 | 0.00 | — | 5.89 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 284 | 0.00 | 284 | 28.4 | 0.00 | — | 995 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,085 | 0.00 | 1,085 | 108 | 0.00 | — | 3,797 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 1.68 | 0.00 | 1.68 | 0.17 | 0.00 | — | 5.89 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,299 | 0.00 | 2,299 | 230 | 0.00 | — | 8,045 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 47.1 | 0.00 | 47.1 | 4.71 | 0.00 | — | 165 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 180 | 0.00 | 180 | 18.0 | 0.00 | — | 629 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 3.62 | 0.00 | 3.62 | 0.36 | 0.00 | — | 12.7 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 5.61 | 0.00 | 5.61 | 0.56 | 0.00 | — | 19.6 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 65.1 | 0.00 | 65.1 | 6.51 | 0.00 | — | 228 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.28 | 0.00 | 0.28 | 0.03 | 0.00 | — | 0.98 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 381 | 0.00 | 381 | 38.0 | 0.00 | — | 1,332 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.74 | 7.74 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 32.9 | 32.9 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.74 | 7.74 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 32.9 | 32.9 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 163 | 163 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.28 | 1.28 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5.45 | 5.45 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.04 | 0.04 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.03 | 0.03 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.29 | 0.29 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 27.1 | 27.1 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

### 4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Demolition | Demolition | 12/2/2026 | 6/2/2027 | 5.00 | 131 | — |

| | | | | | | |
|---|---|---|---|---|---|---|
| Site Preparation | Site Preparation | 12/15/2026 | 6/15/2027 | 5.00 | 131 | — |
| Grading | Grading | 4/1/2027 | 12/1/2027 | 5.00 | 175 | — |
| Building Construction | Building Construction | 10/1/2028 | 3/1/2030 | 5.00 | 370 | — |
| Infrastructure Improvements | Building Construction | 8/1/2027 | 12/1/2028 | 5.00 | 350 | — |
| Paving | Paving | 8/1/2028 | 2/1/2029 | 5.00 | 133 | — |
| Architectural Coating | Architectural Coating | 3/2/2030 | 3/30/2030 | 5.00 | 20.0 | — |

## 5.2. Off-Road Equipment

### 5.2.2. Mitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Demolition | Rubber Tired Dozers | Diesel | Tier 4 Final | 2.00 | 8.00 | 367 | 0.40 |
| Demolition | Excavators | Diesel | Tier 4 Final | 3.00 | 8.00 | 36.0 | 0.38 |
| Demolition | Concrete/Industrial Saws | Diesel | Tier 4 Final | 1.00 | 8.00 | 33.0 | 0.73 |
| Site Preparation | Rubber Tired Dozers | Diesel | Tier 4 Final | 3.00 | 8.00 | 367 | 0.40 |
| Site Preparation | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 4.00 | 8.00 | 84.0 | 0.37 |
| Grading | Graders | Diesel | Tier 4 Final | 1.00 | 8.00 | 148 | 0.41 |
| Grading | Excavators | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Grading | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 2.00 | 8.00 | 84.0 | 0.37 |
| Grading | Scrapers | Diesel | Tier 4 Final | 2.00 | 8.00 | 423 | 0.48 |
| Grading | Rubber Tired Dozers | Diesel | Tier 4 Final | 1.00 | 8.00 | 367 | 0.40 |
| Building Construction | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Building Construction | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Building Construction | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Infrastructure Improvements | Forklifts | Diesel | Tier 4 Final | 3.00 | 8.00 | 82.0 | 0.20 |
| Infrastructure Improvements | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Infrastructure Improvements | Cranes | Diesel | Tier 4 Final | 1.00 | 7.00 | 367 | 0.29 |
| Infrastructure Improvements | Welders | Diesel | Tier 4 Final | 1.00 | 8.00 | 46.0 | 0.45 |
| Infrastructure Improvements | Tractors/Loaders/Back hoes | Diesel | Tier 4 Final | 3.00 | 7.00 | 84.0 | 0.37 |
| Paving | Pavers | Diesel | Tier 4 Final | 2.00 | 8.00 | 81.0 | 0.42 |
| Paving | Paving Equipment | Diesel | Tier 4 Final | 2.00 | 8.00 | 89.0 | 0.36 |
| Paving | Rollers | Diesel | Tier 4 Final | 2.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Tier 4 Final | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.2. Mitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Demolition | — | — | — | — |
| Demolition | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Demolition | Vendor | — | 10.2 | HHDT,MHDT |
| Demolition | Hauling | 58.8 | 20.0 | HHDT |
| Demolition | Onsite truck | — | — | HHDT |
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 17.5 | 18.5 | LDA,LDT1,LDT2 |
| Site Preparation | Vendor | — | 10.2 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |

| | | | | |
|---|---|---|---|---|
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 20.0 | 18.5 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 10.2 | HHDT,MHDT |
| Grading | Hauling | 0.00 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 2,245 | 18.5 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 391 | 10.2 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 15.0 | 18.5 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 10.2 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 898 | 18.5 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 10.2 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |
| Architectural Coating | Onsite truck | — | — | HHDT |
| Infrastructure Improvements | — | — | — | — |
| Infrastructure Improvements | Worker | 2,245 | 18.5 | LDA,LDT1,LDT2 |
| Infrastructure Improvements | Vendor | 391 | 10.2 | HHDT,MHDT |
| Infrastructure Improvements | Hauling | 0.00 | 20.0 | HHDT |
| Infrastructure Improvements | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

| Control Strategies Applied | PM10 Reduction | PM2.5 Reduction |
|---|---|---|
| Water unpaved roads twice daily | 55% | 55% |
| Limit vehicle speeds on unpaved roads to 25 mph | 44% | 44% |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (cy) | Material Exported (cy) | Acres Graded (acres) | Material Demolished (Ton of Debris) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Demolition | 0.00 | 0.00 | 0.00 | 30,810 | — |
| Site Preparation | — | — | 197 | 0.00 | — |
| Grading | — | — | 525 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 20.9 |

### 5.6.2. Construction Earthmoving Control Strategies

| Control Strategies Applied | Frequency (per day) | PM10 Reduction | PM2.5 Reduction |
|---|---|---|---|
| Water Exposed Area | 3 | 74% | 74% |
| Water Demolished Area | 2 | 36% | 36% |

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Single Family Housing | 6.02 | 0% |
| Apartments Low Rise | — | 0% |
| Strip Mall | 0.00 | 0% |
| Fast Food Restaurant w/o Drive Thru | 0.00 | 0% |
| Fast Food Restaurant with Drive Thru | 0.00 | 0% |

| | | |
|---|---|---|
| General Office Building | 0.00 | 0% |
| Medical Office Building | 0.00 | 0% |
| City Park | 0.00 | 0% |
| Other Non-Asphalt Surfaces | 7.90 | 0% |
| Parking Lot | 6.95 | 100% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2026 | 0.00 | 532 | 0.03 | < 0.005 |
| 2027 | 0.00 | 532 | 0.03 | < 0.005 |
| 2028 | 0.00 | 532 | 0.03 | < 0.005 |
| 2029 | 0.00 | 532 | 0.03 | < 0.005 |
| 2030 | 0.00 | 532 | 0.03 | < 0.005 |

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 3,432 | 3,432 | 3,432 | 1,252,547 | 36,394 | 36,394 | 36,394 | 13,283,984 |
| Apartments Low Rise | 14,672 | 14,672 | 14,672 | 5,355,413 | 155,609 | 155,609 | 155,609 | 56,797,233 |
| Strip Mall | 593 | 593 | 593 | 216,323 | 9,717 | 9,717 | 9,717 | 3,546,684 |
| Fast Food Restaurant w/o Drive Thru | 6,898 | 6,898 | 6,898 | 2,517,742 | 113,094 | 113,094 | 113,094 | 41,279,181 |
| Fast Food Restaurant with Drive Thru | 7,158 | 7,158 | 7,158 | 2,612,719 | 117,360 | 117,360 | 117,360 | 42,836,349 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| General Office Building | 537 | 537 | 537 | 196,143 | 8,811 | 8,811 | 8,811 | 3,215,834 |
| Medical Office Building | 1,785 | 1,785 | 1,785 | 651,668 | 29,272 | 29,272 | 29,272 | 10,684,302 |
| City Park | 1,329 | 1,329 | 1,329 | 485,088 | 21,790 | 21,790 | 21,790 | 7,953,171 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

### 5.10.1. Hearths

#### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 372 |
| No Fireplaces | 174 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 1855 |

| | |
|---|---|
| No Fireplaces | 868 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |

### 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|
| 11489737.756275 | 3,829,913 | 376,382 | 125,461 | 38,822 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 4,013,379 | 532 | 0.0330 | 0.0040 | 17,084,185 |
| Apartments Low Rise | 12,111,261 | 532 | 0.0330 | 0.0040 | 45,355,810 |
| Strip Mall | 375,543 | 532 | 0.0330 | 0.0040 | 227,584 |
| Fast Food Restaurant w/o Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| Fast Food Restaurant with Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| General Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |

| | | | | | |
|---|---|---|---|---|---|
| Medical Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Parking Lot | 265,355 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|
| Single Family Housing | 22,757,922 | 0.00 |
| Apartments Low Rise | 113,497,840 | 0.00 |
| Strip Mall | 2,859,422 | 61,993 |
| Fast Food Restaurant w/o Drive Thru | 11,717,312 | 61,993 |
| Fast Food Restaurant with Drive Thru | 11,717,312 | 61,993 |
| General Office Building | 12,006,981 | 108,488 |
| Medical Office Building | 8,476,963 | 108,488 |
| City Park | 0.00 | 56,491,371 |
| Other Non-Asphalt Surfaces | 0.00 | 12,280,733 |
| Parking Lot | 0.00 | 0.00 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 528 | — |
| Apartments Low Rise | 2,014 | — |
| Strip Mall | 40.5 | — |
| Fast Food Restaurant w/o Drive Thru | 445 | — |

| | | |
|---|---|---|
| Fast Food Restaurant with Drive Thru | 445 | — |
| General Office Building | 62.8 | — |
| Medical Office Building | 730 | — |
| City Park | 3.13 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |
| Parking Lot | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

### 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Strip Mall | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Strip Mall | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |
| Strip Mall | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant w/o Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant w/o Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant with Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant with Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant with Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| General Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.02 | 0.60 | 0.00 | 1.00 |
| General Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Medical Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.45 | 0.60 | 0.00 | 1.00 |
| Medical Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 17.8 | annual days of extreme heat |
| Extreme Precipitation | 3.00 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 9.13 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |

| | |
|---|---|
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |

| | |
|---|---|
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |

| | |
|---|---|
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |

| | |
|---|---|
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|

| | |
|---|---|
| Land Use | per center park specific plan provisions and traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Construction: Construction Phases | per construction questionnaire from client |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD Rule 445 (Wood Burning) - prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

# Center Park Specific Plan - Buildout Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | Center Park Specific Plan - Buildout |
| Operational Year | 2030 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 2.60 |
| Precipitation (days) | 18.8 |
| Location | 33.99497622020672, -117.6290606636939 |
| County | San Bernardino-South Coast |
| City | Ontario |
| Air District | South Coast AQMD |
| Air Basin | South Coast |
| TAZ | 5259 |
| EDFZ | 10 |
| Electric Utility | Southern California Edison |
| Gas Utility | Southern California Gas |
| App Version | 2022.1.1.29 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 802 | Dwelling Unit | 36.5 | 1,587,960 | 0.00 | — | 2,655 | — |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 3,491 | Dwelling Unit | 140 | 6,113,505 | 0.00 | — | 11,555 | — |
| Strip Mall | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant w/o Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| Fast Food Restaurant with Drive Thru | 38.6 | 1000sqft | 0.97 | 38,603 | 3,860 | — | — | — |
| General Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| Medical Office Building | 67.6 | 1000sqft | 1.71 | 67,556 | 6,756 | — | — | — |
| City Park | 56.0 | Acre | 56.0 | 0.00 | 2,438,489 | 2,438,489 | — | — |
| Other Non-Asphalt Surfaces | 11.3 | Acre | 11.3 | 0.00 | 491,357 | 491,357 | — | — |
| Parking Lot | 6.95 | Acre | 6.95 | 0.00 | 0.00 | — | — | — |

### 1.3. User-Selected Emission Reduction Measures by Emissions Sector

| Sector | # | Measure Title |
|---|---|---|
| Transportation | T-10 | Provide End-of-Trip Bicycle Facilities |
| Transportation | T-14* | Provide Electric Vehicle Charging Infrastructure |
| Transportation | T-34* | Provide Bike Parking |
| Transportation | T-39* | Implement Preferential Parking Permit Program |
| Energy | E-2 | Require Energy Efficient Appliances |

* Qualitative or supporting measure. Emission reductions not included in the mitigated emissions results.

# 2. Emissions Summary

### 2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 378 | 358 | 175 | 1,817 | 4.55 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 542,346 | 545,518 | 342 | 20.7 | 1,204 | 561,449 |
| Mit. | 378 | 357 | 175 | 1,815 | 4.54 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 540,295 | 543,467 | 342 | 20.7 | 1,202 | 559,383 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 346 | 326 | 184 | 1,292 | 4.26 | 4.55 | 414 | 419 | 4.39 | 105 | 110 | 3,172 | 513,554 | 516,727 | 342 | 21.3 | 205 | 531,841 |
| Mit. | 345 | 326 | 184 | 1,290 | 4.25 | 4.55 | 414 | 418 | 4.39 | 105 | 109 | 3,172 | 511,537 | 514,709 | 342 | 21.3 | 205 | 529,811 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 361 | 341 | 188 | 1,515 | 4.31 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 502,691 | 505,864 | 341 | 21.3 | 621 | 521,381 |
| Mit. | 361 | 340 | 188 | 1,514 | 4.30 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 500,669 | 503,841 | 341 | 21.3 | 620 | 519,344 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 65.9 | 62.2 | 34.4 | 277 | 0.79 | 0.85 | 74.7 | 75.6 | 0.81 | 19.0 | 19.8 | 525 | 83,226 | 83,752 | 56.5 | 3.53 | 103 | 86,321 |
| Mit. | 65.8 | 62.1 | 34.3 | 276 | 0.79 | 0.85 | 74.6 | 75.5 | 0.81 | 19.0 | 19.8 | 525 | 82,891 | 83,417 | 56.5 | 3.53 | 103 | 85,983 |
| % Reduced | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | — | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% | < 0.5% |

## 2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Sector | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 165 | 148 | 148 | 1,548 | 4.38 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 449,461 | 449,461 | 17.1 | 19.1 | 1,024 | 456,617 |
| Area | 210 | 208 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | 0.00 | 17,551 | 17,551 | 1.07 | 0.13 | — | 17,618 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 378 | 357 | 175 | 1,815 | 4.54 | 4.68 | 414 | 419 | 4.49 | 105 | 110 | 3,172 | 540,295 | 543,467 | 342 | 20.7 | 1,202 | 559,383 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 157 | 139 | 159 | 1,278 | 4.10 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 421,399 | 421,399 | 17.6 | 19.7 | 26.6 | 427,743 |
| Area | 186 | 186 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 345 | 326 | 184 | 1,290 | 4.25 | 4.55 | 414 | 418 | 4.39 | 105 | 109 | 3,172 | 511,537 | 514,709 | 342 | 21.3 | 205 | 529,811 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Mobile | 156 | 138 | 162 | 1,327 | 4.14 | 2.59 | 409 | 411 | 2.43 | 104 | 106 | — | 425,755 | 425,755 | 17.6 | 19.9 | 442 | 432,559 |
| Area | 202 | 201 | 1.62 | 175 | 0.01 | 0.09 | — | 0.09 | 0.07 | — | 0.07 | 0.00 | 1,631 | 1,631 | 0.09 | 0.01 | — | 1,637 |
| Energy | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 70,306 | 70,306 | 5.18 | 0.36 | — | 70,541 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Total | 361 | 340 | 188 | 1,514 | 4.30 | 4.64 | 409 | 414 | 4.46 | 104 | 108 | 3,172 | 500,669 | 503,841 | 341 | 21.3 | 620 | 519,344 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mobile | 28.4 | 25.2 | 29.6 | 242 | 0.76 | 0.47 | 74.6 | 75.1 | 0.44 | 19.0 | 19.4 | — | 70,489 | 70,489 | 2.92 | 3.29 | 73.2 | 71,615 |
| Area | 36.9 | 36.7 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 270 | 270 | 0.02 | < 0.005 | — | 271 |
| Energy | 0.52 | 0.26 | 4.46 | 2.16 | 0.03 | 0.36 | — | 0.36 | 0.36 | — | 0.36 | — | 11,640 | 11,640 | 0.86 | 0.06 | — | 11,679 |
| Water | — | — | — | — | — | — | — | — | — | — | — | 71.6 | 493 | 564 | 7.37 | 0.18 | — | 802 |
| Waste | — | — | — | — | — | — | — | — | — | — | — | 454 | 0.00 | 454 | 45.3 | 0.00 | — | 1,587 |
| Refrig. | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 29.5 | 29.5 |
| Total | 65.8 | 62.1 | 34.3 | 276 | 0.79 | 0.85 | 74.6 | 75.5 | 0.81 | 19.0 | 19.8 | 525 | 82,891 | 83,417 | 56.5 | 3.53 | 103 | 85,983 |

# 4. Operations Emissions Details

## 4.1. Mobile Emissions by Land Use

### 4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 20.4 | 18.5 | 16.6 | 170 | 0.47 | 0.28 | 44.0 | 44.3 | 0.26 | 11.2 | 11.4 | — | 47,956 | 47,956 | 1.96 | 2.11 | 109 | 48,741 |
| Apartments Low Rise | 69.3 | 62.6 | 56.4 | 576 | 1.58 | 0.95 | 149 | 150 | 0.89 | 37.9 | 38.8 | — | 162,776 | 162,776 | 6.64 | 7.15 | 369 | 165,441 |
| Strip Mall | 2.36 | 2.08 | 2.35 | 25.1 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 7,456 | 7,456 | 0.27 | 0.31 | 17.1 | 7,571 |
| Fast Food Restaurant w/o Drive Thru | 27.5 | 24.2 | 27.4 | 292 | 0.85 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 86,775 | 86,775 | 3.11 | 3.59 | 198 | 88,122 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 28.6 | 25.1 | 28.4 | 303 | 0.88 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 90,049 | 90,049 | 3.22 | 3.73 | 206 | 91,447 |
| General Office Building | 2.14 | 1.88 | 2.14 | 22.7 | 0.07 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,760 | 6,760 | 0.24 | 0.28 | 15.5 | 6,865 |
| Medical Office Building | 7.12 | 6.25 | 7.09 | 75.5 | 0.22 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 22,460 | 22,460 | 0.80 | 0.93 | 51.4 | 22,809 |
| City Park | 8.00 | 7.03 | 7.97 | 84.8 | 0.25 | 0.14 | 23.3 | 23.5 | 0.14 | 5.92 | 6.06 | — | 25,229 | 25,229 | 0.90 | 1.05 | 57.7 | 25,621 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 165 | 148 | 148 | 1,548 | 4.38 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 449,461 | 449,461 | 17.1 | 19.1 | 1,024 | 456,617 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 19.3 | 17.4 | 17.8 | 142 | 0.44 | 0.28 | 44.0 | 44.3 | 0.26 | 11.2 | 11.4 | — | 44,977 | 44,977 | 2.02 | 2.17 | 2.82 | 45,677 |
| Apartments Low Rise | 65.6 | 58.9 | 60.5 | 481 | 1.48 | 0.95 | 149 | 150 | 0.89 | 37.9 | 38.8 | — | 152,663 | 152,663 | 6.86 | 7.36 | 9.58 | 155,039 |
| Strip Mall | 2.25 | 1.96 | 2.53 | 20.5 | 0.07 | 0.04 | 6.89 | 6.93 | 0.04 | 1.75 | 1.79 | — | 6,988 | 6,988 | 0.27 | 0.32 | 0.44 | 7,090 |
| Fast Food Restaurant w/o Drive Thru | 26.2 | 22.8 | 29.5 | 238 | 0.79 | 0.50 | 80.2 | 80.7 | 0.47 | 20.4 | 20.8 | — | 81,334 | 81,334 | 3.17 | 3.70 | 5.15 | 82,522 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 27.2 | 23.7 | 30.6 | 247 | 0.82 | 0.51 | 83.2 | 83.7 | 0.48 | 21.1 | 21.6 | — | 84,402 | 84,402 | 3.29 | 3.84 | 5.34 | 85,635 |
| General Office Building | 2.04 | 1.78 | 2.29 | 18.5 | 0.06 | 0.04 | 6.25 | 6.29 | 0.04 | 1.59 | 1.62 | — | 6,336 | 6,336 | 0.25 | 0.29 | 0.40 | 6,429 |
| Medical Office Building | 6.77 | 5.91 | 7.62 | 61.6 | 0.20 | 0.13 | 20.8 | 20.9 | 0.12 | 5.27 | 5.39 | — | 21,052 | 21,052 | 0.82 | 0.96 | 1.33 | 21,359 |
| City Park | 7.61 | 6.64 | 8.56 | 69.2 | 0.23 | 0.14 | 23.3 | 23.5 | 0.14 | 5.92 | 6.06 | — | 23,647 | 23,647 | 0.92 | 1.08 | 1.50 | 23,992 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 157 | 139 | 159 | 1,278 | 4.10 | 2.59 | 414 | 416 | 2.43 | 105 | 108 | — | 421,399 | 421,399 | 17.6 | 19.7 | 26.6 | 427,743 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 3.50 | 3.14 | 3.30 | 26.8 | 0.08 | 0.05 | 7.93 | 7.98 | 0.05 | 2.01 | 2.06 | — | 7,523 | 7,523 | 0.33 | 0.36 | 7.78 | 7,647 |
| Apartments Low Rise | 11.9 | 10.6 | 11.2 | 91.1 | 0.27 | 0.17 | 26.9 | 27.1 | 0.16 | 6.84 | 7.00 | — | 25,535 | 25,535 | 1.14 | 1.23 | 26.4 | 25,956 |
| Strip Mall | 0.41 | 0.36 | 0.47 | 3.88 | 0.01 | 0.01 | 1.24 | 1.25 | 0.01 | 0.32 | 0.32 | — | 1,169 | 1,169 | 0.05 | 0.05 | 1.22 | 1,187 |
| Fast Food Restaurant w/o Drive Thru | 4.74 | 4.13 | 5.47 | 45.2 | 0.15 | 0.09 | 14.5 | 14.6 | 0.08 | 3.67 | 3.76 | — | 13,606 | 13,606 | 0.53 | 0.62 | 14.2 | 13,817 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | 4.92 | 4.29 | 5.67 | 46.9 | 0.15 | 0.09 | 15.0 | 15.1 | 0.09 | 3.81 | 3.90 | — | 14,119 | 14,119 | 0.54 | 0.64 | 14.7 | 14,338 |
| General Office Building | 0.37 | 0.32 | 0.43 | 3.52 | 0.01 | 0.01 | 1.13 | 1.13 | 0.01 | 0.29 | 0.29 | — | 1,060 | 1,060 | 0.04 | 0.05 | 1.11 | 1,076 |
| Medical Office Building | 1.23 | 1.07 | 1.42 | 11.7 | 0.04 | 0.02 | 3.74 | 3.77 | 0.02 | 0.95 | 0.97 | — | 3,522 | 3,522 | 0.14 | 0.16 | 3.67 | 3,576 |
| City Park | 1.38 | 1.20 | 1.59 | 13.1 | 0.04 | 0.03 | 4.20 | 4.23 | 0.02 | 1.07 | 1.09 | — | 3,956 | 3,956 | 0.15 | 0.18 | 4.13 | 4,017 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 28.4 | 25.2 | 29.6 | 242 | 0.76 | 0.47 | 74.6 | 75.1 | 0.44 | 19.0 | 19.4 | — | 70,489 | 70,489 | 2.92 | 3.29 | 73.2 | 71,615 |

## 4.2. Energy

### 4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 8,592 | 8,592 | 0.53 | 0.06 | — | 8,625 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 22,631 | 22,631 | 1.40 | 0.17 | — | 22,716 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 39,539 | 39,539 | 2.45 | 0.30 | — | 39,689 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 8,592 | 8,592 | 0.53 | 0.06 | — | 8,625 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 22,631 | 22,631 | 1.40 | 0.17 | — | 22,716 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 547 | 547 | 0.03 | < 0.005 | — | 549 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 1,973 | 1,973 | 0.12 | 0.01 | — | 1,980 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 1,718 | 1,718 | 0.11 | 0.01 | — | 1,725 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 387 | 387 | 0.02 | < 0.005 | — | 388 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 39,539 | 39,539 | 2.45 | 0.30 | — | 39,689 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | 1,423 | 1,423 | 0.09 | 0.01 | — | 1,428 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | 3,747 | 3,747 | 0.23 | 0.03 | — | 3,761 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | 90.6 | 90.6 | 0.01 | < 0.005 | — | 91.0 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | 327 | 327 | 0.02 | < 0.005 | — | 328 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | 284 | 284 | 0.02 | < 0.005 | — | 286 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | — | 64.0 | 64.0 | < 0.005 | < 0.005 | — | 64.3 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | 6,546 | 6,546 | 0.41 | 0.05 | — | 6,571 |

## 4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.74 | 0.37 | 6.34 | 2.70 | 0.04 | 0.51 | — | 0.51 | 0.51 | — | 0.51 | — | 8,042 | 8,042 | 0.71 | 0.02 | — | 8,065 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartme Low Rise | 1.72 | 0.86 | 14.7 | 6.25 | 0.09 | 1.19 | — | 1.19 | 1.19 | — | 1.19 | — | 18,636 | 18,636 | 1.65 | 0.04 | — | 18,687 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 30,767 | 30,767 | 2.72 | 0.06 | — | 30,852 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.74 | 0.37 | 6.34 | 2.70 | 0.04 | 0.51 | — | 0.51 | 0.51 | — | 0.51 | — | 8,042 | 8,042 | 0.71 | 0.02 | — | 8,065 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apartments Low Rise | 1.72 | 0.86 | 14.7 | 6.25 | 0.09 | 1.19 | — | 1.19 | 1.19 | — | 1.19 | — | 18,636 | 18,636 | 1.65 | 0.04 | — | 18,687 |
| Strip Mall | 0.01 | < 0.005 | 0.06 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 72.9 | 72.9 | 0.01 | < 0.005 | — | 73.1 |
| Fast Food Restaurant w/o Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| Fast Food Restaurant with Drive Thru | 0.13 | 0.07 | 1.18 | 1.00 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,414 | 1,414 | 0.13 | < 0.005 | — | 1,418 |
| General Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| Medical Office Building | 0.05 | 0.03 | 0.50 | 0.42 | < 0.005 | 0.04 | — | 0.04 | 0.04 | — | 0.04 | — | 594 | 594 | 0.05 | < 0.005 | — | 596 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 2.84 | 1.42 | 24.4 | 11.8 | 0.15 | 1.96 | — | 1.96 | 1.96 | — | 1.96 | — | 30,767 | 30,767 | 2.72 | 0.06 | — | 30,852 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | 0.14 | 0.07 | 1.16 | 0.49 | 0.01 | 0.09 | — | 0.09 | 0.09 | — | 0.09 | — | 1,332 | 1,332 | 0.12 | < 0.005 | — | 1,335 |
| Apartments Low Rise | 0.31 | 0.16 | 2.68 | 1.14 | 0.02 | 0.22 | — | 0.22 | 0.22 | — | 0.22 | — | 3,085 | 3,085 | 0.27 | 0.01 | — | 3,094 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | < 0.005 | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 12.1 | 12.1 | < 0.005 | < 0.005 | — | 12.1 |
| Fast Food Restaurant w/o Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| Fast Food Restaurant with Drive Thru | 0.02 | 0.01 | 0.22 | 0.18 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 234 | 234 | 0.02 | < 0.005 | — | 235 |
| General Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| Medical Office Building | 0.01 | < 0.005 | 0.09 | 0.08 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 98.4 | 98.4 | 0.01 | < 0.005 | — | 98.6 |
| City Park | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | 0.52 | 0.26 | 4.46 | 2.16 | 0.03 | 0.36 | — | 0.36 | 0.36 | — | 0.36 | — | 5,094 | 5,094 | 0.45 | 0.01 | — | 5,108 |

## 4.3. Area Emissions by Source

### 4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Source | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Consumer Products | 172 | 172 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 13.9 | 13.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Landscape Equipment | 24.2 | 22.9 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | — | 696 | 696 | 0.03 | 0.01 | — | 699 |
| Total | 210 | 208 | 2.37 | 255 | 0.01 | 0.13 | — | 0.13 | 0.10 | — | 0.10 | 0.00 | 17,551 | 17,551 | 1.07 | 0.13 | — | 17,618 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Consumer Products | 172 | 172 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 13.9 | 13.9 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | 186 | 186 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 16,855 | 16,855 | 1.05 | 0.13 | — | 16,919 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Hearths | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | — | 0.00 | 0.00 | 191 | 191 | 0.01 | < 0.005 | — | 192 |
| Consumer Products | 31.3 | 31.3 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Architectural Coatings | 2.54 | 2.54 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Landsca Equipment | 3.03 | 2.86 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | — | 78.9 | 78.9 | < 0.005 | < 0.005 | — | 79.2 |
| Total | 36.9 | 36.7 | 0.30 | 31.9 | < 0.005 | 0.02 | — | 0.02 | 0.01 | — | 0.01 | 0.00 | 270 | 270 | 0.02 | < 0.005 | — | 271 |

## 4.4. Water Emissions by Land Use

### 4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 64.1 | 332 | 396 | 6.59 | 0.16 | — | 608 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 279 | 1,444 | 1,723 | 28.7 | 0.69 | — | 2,645 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 673 | 673 | 0.04 | 0.01 | — | 676 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 61.0 | 61.0 | < 0.005 | < 0.005 | — | 61.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 64.1 | 332 | 396 | 6.59 | 0.16 | — | 608 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 279 | 1,444 | 1,723 | 28.7 | 0.69 | — | 2,645 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 5.48 | 28.8 | 34.3 | 0.56 | 0.01 | — | 52.5 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 22.5 | 117 | 139 | 2.31 | 0.06 | — | 213 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 23.0 | 120 | 143 | 2.37 | 0.06 | — | 219 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 16.2 | 84.9 | 101 | 1.67 | 0.04 | — | 155 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 673 | 673 | 0.04 | 0.01 | — | 676 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 61.0 | 61.0 | < 0.005 | < 0.005 | — | 61.3 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 433 | 2,977 | 3,409 | 44.5 | 1.08 | — | 4,843 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 10.6 | 54.9 | 65.5 | 1.09 | 0.03 | — | 101 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 46.2 | 239 | 285 | 4.75 | 0.11 | — | 438 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 0.91 | 4.78 | 5.68 | 0.09 | < 0.005 | — | 8.69 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 3.72 | 19.3 | 23.0 | 0.38 | 0.01 | — | 35.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 3.81 | 19.9 | 23.7 | 0.39 | 0.01 | — | 36.3 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 2.69 | 14.1 | 16.8 | 0.28 | 0.01 | — | 25.7 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 111 | 111 | 0.01 | < 0.005 | — | 112 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 10.1 | 10.1 | < 0.005 | < 0.005 | — | 10.1 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 71.6 | 493 | 564 | 7.37 | 0.18 | — | 802 |

## 4.5. Waste Emissions by Land Use

### 4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 418 | 0.00 | 418 | 41.8 | 0.00 | — | 1,462 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,391 | 0.00 | 1,391 | 139 | 0.00 | — | 4,867 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 2.59 | 0.00 | 2.59 | 0.26 | 0.00 | — | 9.08 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 418 | 0.00 | 418 | 41.8 | 0.00 | — | 1,462 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 1,391 | 0.00 | 1,391 | 139 | 0.00 | — | 4,867 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 21.8 | 0.00 | 21.8 | 2.18 | 0.00 | — | 76.4 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 240 | 0.00 | 240 | 24.0 | 0.00 | — | 838 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 33.9 | 0.00 | 33.9 | 3.38 | 0.00 | — | 118 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 393 | 0.00 | 393 | 39.3 | 0.00 | — | 1,376 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 2.59 | 0.00 | 2.59 | 0.26 | 0.00 | — | 9.08 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 2,740 | 0.00 | 2,740 | 274 | 0.00 | — | 9,586 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | 69.2 | 0.00 | 69.2 | 6.91 | 0.00 | — | 242 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | 230 | 0.00 | 230 | 23.0 | 0.00 | — | 806 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | 3.62 | 0.00 | 3.62 | 0.36 | 0.00 | — | 12.7 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | 39.7 | 0.00 | 39.7 | 3.97 | 0.00 | — | 139 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | 5.61 | 0.00 | 5.61 | 0.56 | 0.00 | — | 19.6 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | 65.1 | 0.00 | 65.1 | 6.51 | 0.00 | — | 228 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | 0.43 | 0.00 | 0.43 | 0.04 | 0.00 | — | 1.50 |
| Other Non-Asphalt Surfaces | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Parking Lot | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | 454 | 0.00 | 454 | 45.3 | 0.00 | — | 1,587 |

## 4.6. Refrigerant Emissions by Land Use

### 4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 11.4 | 11.4 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 43.8 | 43.8 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 11.4 | 11.4 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 43.8 | 43.8 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.24 | 0.24 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 60.3 | 60.3 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.16 | 0.16 |
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.73 | 1.73 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 178 | 178 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Single Family Housing | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 1.88 | 1.88 |
| Apartments Low Rise | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 7.25 | 7.25 |
| Strip Mall | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.04 | 0.04 |
| Fast Food Restaurant w/o Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| Fast Food Restaurant with Drive Thru | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 9.99 | 9.99 |
| General Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.03 | 0.03 |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medical Office Building | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.29 | 0.29 |
| City Park | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 0.00 | 0.00 |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 29.5 | 29.5 |

## 4.7. Offroad Emissions By Equipment Type

### 4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.8. Stationary Emissions By Equipment Type

### 4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.9. User Defined Emissions By Equipment Type

### 4.9.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Equipment Type | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

## 4.10. Soil Carbon Accumulation By Vegetation Type

### 4.10.4. Soil Carbon Accumulation By Vegetation Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Vegetation | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.5. Above and Belowground Carbon Accumulation by Land Use Type - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Land Use | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Total | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

4.10.6. Avoided and Sequestered Emissions by Species - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Species | TOG | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | R | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Avoided | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Sequestered | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Removed | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subtotal | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

# 5. Activity Data

## 5.9. Operational Mobile Sources

### 5.9.2. Mitigated

| Land Use Type | Trips/Weekday | Trips/Saturday | Trips/Sunday | Trips/Year | VMT/Weekday | VMT/Saturday | VMT/Sunday | VMT/Year |
|---|---|---|---|---|---|---|---|---|
| Single Family Housing | 5,848 | 5,848 | 5,848 | 2,134,387 | 62,018 | 62,018 | 62,018 | 22,636,404 |
| Apartments Low Rise | 19,848 | 19,848 | 19,848 | 7,244,653 | 210,503 | 210,503 | 210,503 | 76,833,708 |
| Strip Mall | 593 | 593 | 593 | 216,323 | 9,717 | 9,717 | 9,717 | 3,546,684 |
| Fast Food Restaurant w/o Drive Thru | 6,898 | 6,898 | 6,898 | 2,517,742 | 113,094 | 113,094 | 113,094 | 41,279,181 |
| Fast Food Restaurant with Drive Thru | 7,158 | 7,158 | 7,158 | 2,612,719 | 117,360 | 117,360 | 117,360 | 42,836,349 |
| General Office Building | 537 | 537 | 537 | 196,145 | 8,811 | 8,811 | 8,811 | 3,215,858 |
| Medical Office Building | 1,785 | 1,785 | 1,785 | 651,673 | 29,272 | 29,272 | 29,272 | 10,684,381 |
| City Park | 2,005 | 2,005 | 2,005 | 732,002 | 32,881 | 32,881 | 32,881 | 12,001,407 |
| Other Non-Asphalt Surfaces | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Parking Lot | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 5.10. Operational Area Sources

## 5.10.1. Hearths

### 5.10.1.2. Mitigated

| Hearth Type | Unmitigated (number) |
|---|---|
| Single Family Housing | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 546 |
| No Fireplaces | 256 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |
| Apartments Low Rise | — |
| Wood Fireplaces | 0 |
| Gas Fireplaces | 0 |
| Propane Fireplaces | 0 |
| Electric Fireplaces | 2378 |
| No Fireplaces | 1113 |
| Conventional Wood Stoves | 0 |
| Catalytic Wood Stoves | 0 |
| Non-Catalytic Wood Stoves | 0 |
| Pellet Wood Stoves | 0 |

## 5.10.2. Architectural Coatings

| Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 15595465.756275 | 5,198,489 | 376,382 | 125,461 | 47,656 |

### 5.10.4. Landscape Equipment - Mitigated

| Season | Unit | Value |
|---|---|---|
| Snow Days | day/yr | 0.00 |
| Summer Days | day/yr | 250 |

## 5.11. Operational Energy Consumption

### 5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

| Land Use | Electricity (kWh/yr) | CO2 | CH4 | N2O | Natural Gas (kBTU/yr) |
|---|---|---|---|---|---|
| Single Family Housing | 5,895,110 | 532 | 0.0330 | 0.0040 | 25,094,352 |
| Apartments Low Rise | 15,527,143 | 532 | 0.0330 | 0.0040 | 58,148,047 |
| Strip Mall | 375,543 | 532 | 0.0330 | 0.0040 | 227,584 |
| Fast Food Restaurant w/o Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| Fast Food Restaurant with Drive Thru | 1,353,678 | 532 | 0.0330 | 0.0040 | 4,411,198 |
| General Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| Medical Office Building | 1,178,980 | 532 | 0.0330 | 0.0040 | 1,853,738 |
| City Park | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Other Non-Asphalt Surfaces | 0.00 | 532 | 0.0330 | 0.0040 | 0.00 |
| Parking Lot | 265,355 | 532 | 0.0330 | 0.0040 | 0.00 |

## 5.12. Operational Water and Wastewater Consumption

### 5.12.2. Mitigated

| Land Use | Indoor Water (gal/year) | Outdoor Water (gal/year) |
|---|---|---|

| | | |
|---|---|---|
| Single Family Housing | 33,428,302 | 0.00 |
| Apartments Low Rise | 145,508,982 | 0.00 |
| Strip Mall | 2,859,422 | 61,993 |
| Fast Food Restaurant w/o Drive Thru | 11,717,312 | 61,993 |
| Fast Food Restaurant with Drive Thru | 11,717,312 | 61,993 |
| General Office Building | 12,006,981 | 108,488 |
| Medical Office Building | 8,476,963 | 108,488 |
| City Park | 0.00 | 87,022,206 |
| Other Non-Asphalt Surfaces | 0.00 | 7,890,759 |
| Parking Lot | 0.00 | 0.00 |

## 5.13. Operational Waste Generation

### 5.13.2. Mitigated

| Land Use | Waste (ton/year) | Cogeneration (kWh/year) |
|---|---|---|
| Single Family Housing | 775 | — |
| Apartments Low Rise | 2,581 | — |
| Strip Mall | 40.5 | — |
| Fast Food Restaurant w/o Drive Thru | 445 | — |
| Fast Food Restaurant with Drive Thru | 445 | — |
| General Office Building | 62.8 | — |
| Medical Office Building | 730 | — |
| City Park | 4.81 | — |
| Other Non-Asphalt Surfaces | 0.00 | — |
| Parking Lot | 0.00 | — |

## 5.14. Operational Refrigeration and Air Conditioning Equipment

## 5.14.2. Mitigated

| Land Use Type | Equipment Type | Refrigerant | GWP | Quantity (kg) | Operations Leak Rate | Service Leak Rate | Times Serviced |
|---|---|---|---|---|---|---|---|
| Single Family Housing | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Single Family Housing | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Apartments Low Rise | Average room A/C & Other residential A/C and heat pumps | R-410A | 2,088 | < 0.005 | 2.50 | 2.50 | 10.0 |
| Apartments Low Rise | Household refrigerators and/or freezers | R-134a | 1,430 | 0.12 | 0.60 | 0.00 | 1.00 |
| Strip Mall | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Strip Mall | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |
| Strip Mall | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant w/o Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant w/o Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant w/o Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |
| Fast Food Restaurant with Drive Thru | Household refrigerators and/or freezers | R-134a | 1,430 | 0.00 | 0.60 | 0.00 | 1.00 |
| Fast Food Restaurant with Drive Thru | Other commercial A/C and heat pumps | R-410A | 2,088 | 1.80 | 4.00 | 4.00 | 18.0 |
| Fast Food Restaurant with Drive Thru | Walk-in refrigerators and freezers | R-404A | 3,922 | < 0.005 | 7.50 | 7.50 | 20.0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| General Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.02 | 0.60 | 0.00 | 1.00 |
| General Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| Medical Office Building | Household refrigerators and/or freezers | R-134a | 1,430 | 0.45 | 0.60 | 0.00 | 1.00 |
| Medical Office Building | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Other commercial A/C and heat pumps | R-410A | 2,088 | < 0.005 | 4.00 | 4.00 | 18.0 |
| City Park | Stand-alone retail refrigerators and freezers | R-134a | 1,430 | 0.04 | 1.00 | 0.00 | 1.00 |

## 5.15. Operational Off-Road Equipment

### 5.15.2. Mitigated

| Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

## 5.16. Stationary Sources

### 5.16.1. Emergency Generators and Fire Pumps

| Equipment Type | Fuel Type | Number per Day | Hours per Day | Hours per Year | Horsepower | Load Factor |
|---|---|---|---|---|---|---|

### 5.16.2. Process Boilers

| Equipment Type | Fuel Type | Number | Boiler Rating (MMBtu/hr) | Daily Heat Input (MMBtu/day) | Annual Heat Input (MMBtu/yr) |
|---|---|---|---|---|---|

## 5.17. User Defined

| Equipment Type | Fuel Type |
|---|---|

## 5.18. Vegetation

### 5.18.1. Land Use Change

#### 5.18.1.2. Mitigated

| Vegetation Land Use Type | Vegetation Soil Type | Initial Acres | Final Acres |
|---|---|---|---|

### 5.18.1. Biomass Cover Type

#### 5.18.1.2. Mitigated

| Biomass Cover Type | Initial Acres | Final Acres |
|---|---|---|

### 5.18.2. Sequestration

#### 5.18.2.2. Mitigated

| Tree Type | Number | Electricity Saved (kWh/year) | Natural Gas Saved (btu/year) |
|---|---|---|---|

# 6. Climate Risk Detailed Report

## 6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

| Climate Hazard | Result for Project Location | Unit |
|---|---|---|
| Temperature and Extreme Heat | 17.8 | annual days of extreme heat |
| Extreme Precipitation | 3.00 | annual days with precipitation above 20 mm |
| Sea Level Rise | — | meters of inundation depth |
| Wildfire | 9.13 | annual hectares burned |

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (Radke et al., 2017, CEC-500-2017-008), and consider inundation location and depth for the San Francisco Bay, the Sacramento-San Joaquin River Delta and California coast resulting different increments of sea level rise coupled with extreme storm events. Users may select from four scenarios to view the range in potential inundation depth for the grid cell. The four scenarios are: No rise, 0.5 meter, 1.0 meter, 1.41 meters
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

## 6.2. Initial Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 0 | 0 | N/A |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 0 | 0 | N/A |
| Wildfire | 1 | 0 | 0 | N/A |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 0 | 0 | 0 | N/A |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

## 6.3. Adjusted Climate Risk Scores

| Climate Hazard | Exposure Score | Sensitivity Score | Adaptive Capacity Score | Vulnerability Score |
|---|---|---|---|---|
| Temperature and Extreme Heat | 2 | 1 | 1 | 3 |
| Extreme Precipitation | N/A | N/A | N/A | N/A |
| Sea Level Rise | 1 | 1 | 1 | 2 |

| | | | | |
|---|---|---|---|---|
| Wildfire | 1 | 1 | 1 | 2 |
| Flooding | N/A | N/A | N/A | N/A |
| Drought | N/A | N/A | N/A | N/A |
| Snowpack Reduction | N/A | N/A | N/A | N/A |
| Air Quality Degradation | 1 | 1 | 1 | 2 |

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

# 7. Health and Equity Details

## 7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Exposure Indicators | — |
| AQ-Ozone | 77.1 |
| AQ-PM | 93.4 |
| AQ-DPM | 57.1 |
| Drinking Water | 100.0 |
| Lead Risk Housing | 17.5 |
| Pesticides | 84.9 |
| Toxic Releases | 67.6 |
| Traffic | 18.1 |
| Effect Indicators | — |
| CleanUp Sites | 80.3 |
| Groundwater | 98.1 |
| Haz Waste Facilities/Generators | 86.6 |

| | |
|---|---|
| Impaired Water Bodies | 87.0 |
| Solid Waste | 98.9 |
| Sensitive Population | — |
| Asthma | 16.5 |
| Cardio-vascular | 29.1 |
| Low Birth Weights | 49.0 |
| Socioeconomic Factor Indicators | — |
| Education | 52.9 |
| Housing | 59.3 |
| Linguistic | 68.9 |
| Poverty | 35.4 |
| Unemployment | 36.4 |

## 7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

| Indicator | Result for Project Census Tract |
|---|---|
| Economic | — |
| Above Poverty | 73.60451687 |
| Employed | 6.274862056 |
| Median HI | 76.55588349 |
| Education | — |
| Bachelor's or higher | 64.85307327 |
| High school enrollment | 100 |
| Preschool enrollment | 66.93186193 |
| Transportation | — |
| Auto Access | 63.41588605 |
| Active commuting | 24.5989991 |
| Social | — |

| | |
|---|---|
| 2-parent households | 66.95752598 |
| Voting | 70.69164635 |
| Neighborhood | — |
| Alcohol availability | 97.0101373 |
| Park access | 52.77813422 |
| Retail density | 10.02181445 |
| Supermarket access | 6.557166688 |
| Tree canopy | 8.238162453 |
| Housing | — |
| Homeownership | 60.78532016 |
| Housing habitability | 61.41408957 |
| Low-inc homeowner severe housing cost burden | 71.53856025 |
| Low-inc renter severe housing cost burden | 18.38829719 |
| Uncrowded housing | 64.30129603 |
| Health Outcomes | — |
| Insured adults | 73.78416528 |
| Arthritis | 95.7 |
| Asthma ER Admissions | 84.6 |
| High Blood Pressure | 97.7 |
| Cancer (excluding skin) | 89.7 |
| Asthma | 34.7 |
| Coronary Heart Disease | 98.7 |
| Chronic Obstructive Pulmonary Disease | 94.6 |
| Diagnosed Diabetes | 96.0 |
| Life Expectancy at Birth | 75.7 |
| Cognitively Disabled | 56.3 |
| Physically  Disabled | 69.8 |
| Heart Attack ER Admissions | 68.4 |

| | |
|---|---|
| Mental Health Not Good | 54.9 |
| Chronic Kidney Disease | 97.1 |
| Obesity | 68.0 |
| Pedestrian Injuries | 19.6 |
| Physical Health Not Good | 86.2 |
| Stroke | 97.8 |
| Health Risk Behaviors | — |
| Binge Drinking | 28.2 |
| Current Smoker | 59.6 |
| No Leisure Time for Physical Activity | 76.7 |
| Climate Change Exposures | — |
| Wildfire Risk | 0.0 |
| SLR Inundation Area | 0.0 |
| Children | 9.0 |
| Elderly | 91.7 |
| English Speaking | 35.1 |
| Foreign-born | 48.1 |
| Outdoor Workers | 88.5 |
| Climate Change Adaptive Capacity | — |
| Impervious Surface Cover | 78.1 |
| Traffic Density | 21.6 |
| Traffic Access | 23.0 |
| Other Indices | — |
| Hardship | 45.2 |
| Other Decision Support | — |
| 2016 Voting | 74.7 |

## 7.3. Overall Health & Equity Scores

| Metric | Result for Project Census Tract |
|---|---|
| CalEnviroScreen 4.0 Score for Project Location (a) | 72.0 |
| Healthy Places Index Score for Project Location (b) | 55.0 |
| Project Located in a Designated Disadvantaged Community (Senate Bill 535) | No |
| Project Located in a Low-Income Community (Assembly Bill 1550) | No |
| Project Located in a Community Air Protection Program Community (Assembly Bill 617) | No |

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

## 7.4. Health & Equity Measures

No Health & Equity Measures selected.

## 7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

## 7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

# 8. User Changes to Default Data

| Screen | Justification |
|---|---|
| Land Use | per center park specific plan provisions and  traffic study from Urban Crossroads<br>per the City Ordinance 2689, developments within Ontario Ranch would use recycled water to irrigate landscaping |
| Operations: Vehicle Data | per traffic study from Urban Crossroads |
| Operations: Hearths | SCAQMD Rule 445 (Wood Burning) - prohibits permanently installed wood-burning devices in new developments<br>the Project would not include natural gas fireplaces |

**APPENDIX C1**

# BIOLOGICAL RESOURCES TECHNICAL REPORT

# Biological Resources Technical Report

## Center Park Specific Plan
## City of Ontario, California

**FINAL REPORT**

***Prepared for:***

**Kimley-Horn**
3801 University Avenue, Suite 300
Riverside, CA 92501
Contact: Sabrina Wallace, (951) 382-0818

***Prepared by:***

**Cadre Environmental**
701 Palomar Airport Road, Suite 300
Carlsbad, CA 92011
Contact: Ruben Ramirez, (949) 300-0212

**October 2024**

CADRE Environmental

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# INTRODUCTION

The following biological resources technical report describes a detailed assessment of potential sensitive natural resources located within and/or immediately adjacent to the "Center Park Specific Plan" project (Specific Plan Boundary). The report has been prepared to support compliance with the California Environmental Quality Act (CEQA) documentation including the preparation of an Initial Study (IS), Environmental Impact Report (EIR) and environmental review process conducted by the City of Ontario. As discussed below, the assessment included a thorough literature review, site reconnaissance characterizing existing conditions (including floral, faunal and dominant vegetation communities), impact analysis, and applicable standards and regulations to ensure impacts remain at a level below significance.

## SPECIFIC PLAN LOCATION

The Specific Plan boundary includes a total of 194.05-acres onsite (Project Site), 63.29-acres within a Programmatic Assessment Area (Project Level Assessment Area), and 19.81-acres of offsite right-of-way impact areas (Offsite Areas), as shown in Figure 1, *Regional Location Map*, Figure 2, *Specific Plan Map*, and summarized in Table 1, *Specific Plan Acreages*.

The 194.05-acre Project Site is located within the southern region of the Specific Plan Boundary including Assessor Parcel Numbers (APNs) 0216-311-01,-02, -09, 0216-321-03, -08, 0216-322-03, -04, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, -03, 1053-331-01 to -04, 1053-341-01, -02, 1053-351-01, -02, 1053-361-01 to -03, 1053-371-01, -02, and portion of 0216-322-10.

The 63.29-acre Project Level Assessment Area is located within the northern region of the Specific Plan Boundary including APN's 0216-311-09, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, and -03. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction, **CM BIO-7** Programmatic Assessment Area CEQA Analysis.

The 19.81-acre Offsite Areas include existing right-of-ways within the Specific Plan Boundary including but not limited to Comet Avenue, Grove Avenue, Cucamonga Avenue, Bon View Avenue, and Ontario Ranch Road/Edison Avenue.

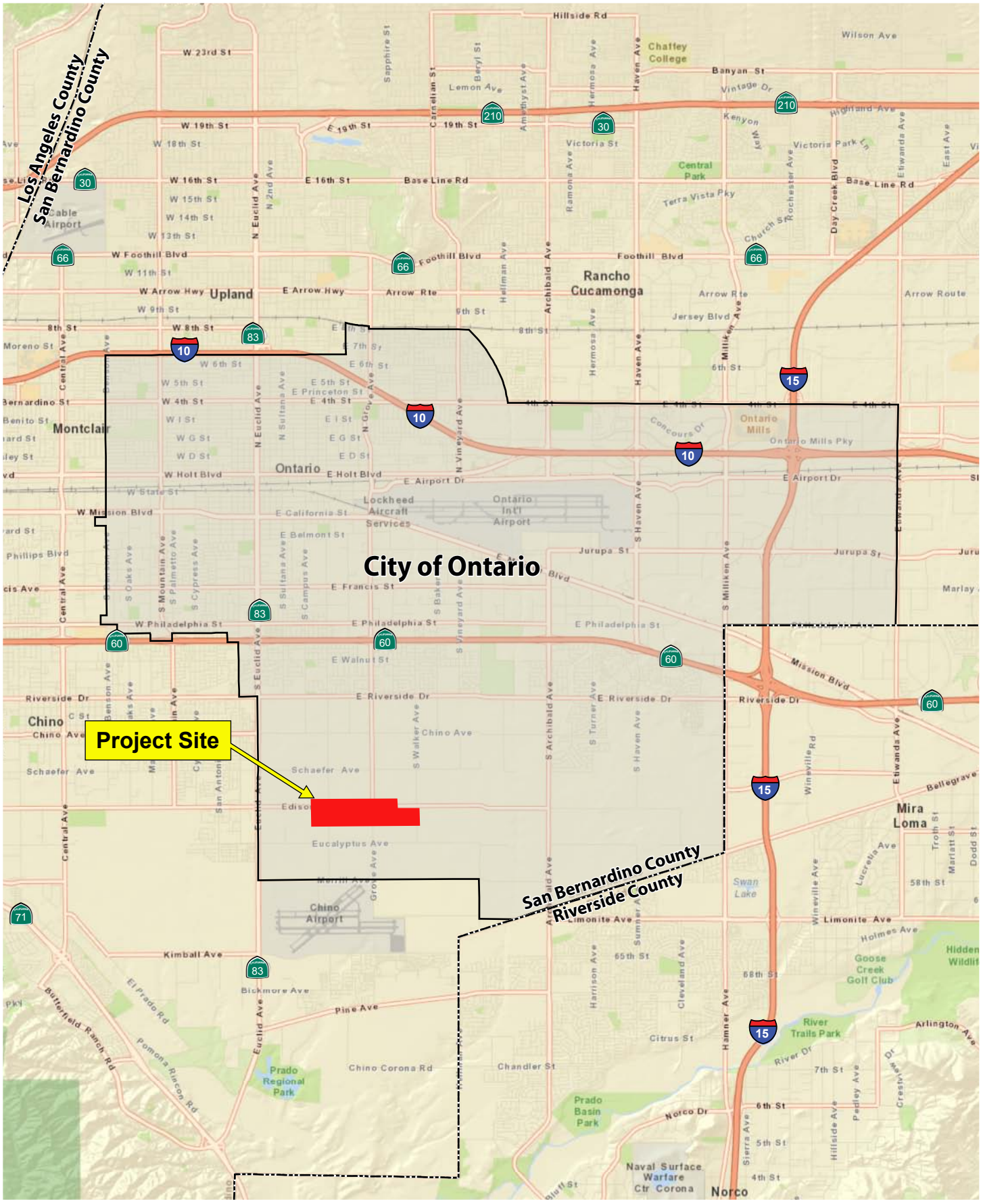
Los Angeles County
San Bernardino County
Project Site
City of Ontario
San Bernardino County
Riverside County
Upland
Rancho Cucamonga
Montclair
Ontario
Chino
Mira Loma
Norco
Chaffey College
Central Park
Ontario Mills
Lockheed Aircraft Services
Ontario Int'l Airport
Chino Airport
Prado Regional Park
Prado Basin Park
River Trails Park
Goose Creek Golf Club
Naval Surface Warfare Ctr Corona
Hillside Rd
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Banyan St
Vintage Dr
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Base Line Rd
Foothill Blvd
Arrow Rte
Arrow Route
Jersey Blvd
Terra Vista Pky
Ontario Mills Pky
E Airport Dr
Jurupa St
Mission Blvd
Riverside Dr
Chino Ave
Schaefer Ave
Eucalyptus Ave
Limonite Ave
Kimball Ave
Bellegrave
Pine Ave
Chino Corona Rd
Chandler St
Norco Dr
Citrus St
Butterfield Ranch Rd
El Prado Rd
Pomona Rincon Rd
Bickmore Ave
Euclid Ave
Central Ave
Etiwanda Ave
Haven Ave
Archibald Ave
Hamner Ave
Wineville Rd
Day Creek Blvd
Rochester Ave
Milliken Ave
Vineyard Ave
Hellman Ave
Ramona Ave
Hermosa Ave
Sapphire St
Carnelian St
Beryl St
Amethyst Ave
Victoria St
Victoria Park Ln
Highland Ave
East Ave
Moreno St
Bernardino St
Benito St
Phillips Blvd
Marlay
Holmes Ave
Lucretia Ave
Troth St
Marlatt St
Dodd St
58th St
Swan Lake
Arlington Ave
River Dr
Pedley Ave
Hillside Ave
Sierra Ave
Crestview Dr
Cleveland Ave
Harrison Ave
Sumner Ave
Turner Ave
Walker Ave
Grove Ave
Merrill Ave
Edison
Merlot St
Chino Ave
Schaefer Ave
Eucalyptus Ave
Limonite Ave
Kimball Ave
Bickmore Ave
Pine Ave
Chino Corona Rd
Chandler St
Norco Dr
Citrus St
Hamner Ave
Sierra Ave
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Crestview Dr
River Dr
Arlington Ave
Bellegrave
Etiwanda Ave
Wineville Rd
Mission Blvd
Riverside Dr
Chino Ave
Schaefer Ave
Eucalyptus Ave
Merrill Ave
Kimball Ave
Bickmore Ave
Pine Ave
Chino Corona Rd
Chandler St
Norco Dr
Citrus St
Butterfield Ranch Rd
El Prado Rd
Pomona Rincon Rd
Euclid Ave
Central Ave
Etiwanda Ave
Haven Ave
Archibald Ave
Hamner Ave
Wineville Rd
Day Creek Blvd
Rochester Ave
Milliken Ave
Vineyard Ave
Hellman Ave
Ramona Ave
Hermosa Ave
Sapphire St
Carnelian St
Beryl St
Amethyst Ave
Victoria St
Victoria Park Ln
Highland Ave
East Ave
Moreno St
Bernardino St
Benito St
Phillips Blvd
Marlay
Holmes Ave
Lucretia Ave
Troth St
Marlatt St
Dodd St
58th St
Swan Lake
Arlington Ave
River Dr
Pedley Ave
Hillside Ave
Sierra Ave
Crestview Dr
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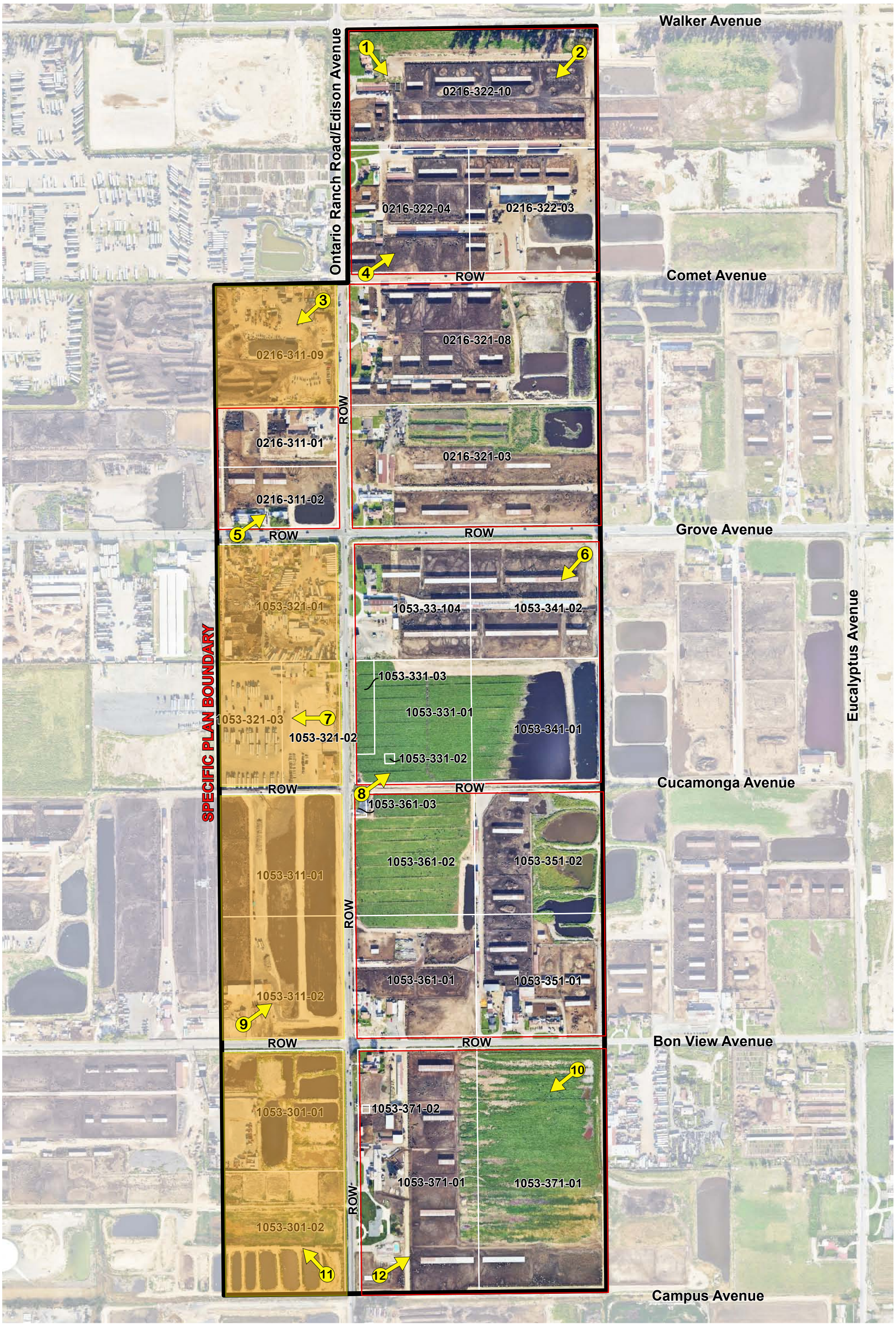


**Figure 2 - Specific Plan Map**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

1 inch = 450 feet

**Table 1.**
**Specific Plan Acreages**

| Specific Plan Boundary | Acres |
|---|---|
| Project Site (Project Site) | 194.05 |
| Programmatic Assessment Area (Project Level Assessment Area) | 63.29 |
| ***subtotal*** | ***257.34*** |
| Offsite Right of Way Impact Areas (Offsite Areas) | 19.81 |
| ***subtotal*** | ***19.81*** |
| **TOTAL** | **277.15** |

## SPECIFIC PLAN DESCRIPTION

The proposed action includes the development of medium density residential (22-35 Dwelling Units/Acre), mixed use (retail (379,029 SF), office (289,521 SF)) and open space-recreational (parkland) within the Specific Plan Boundary.

# METHODOLOGY

The following section details the methods implemented prior to and during the reconnaissance survey conducted throughout the Project Site and Offsite Areas.

## LITERATURE REVIEW

Existing biological resource conditions within and adjacent to the Specific Plan Boundary was initially investigated through review of pertinent scientific literature. Federal register listings, protocols, and species data provided by the United States Fish and Wildlife Service (USFWS) were also reviewed in conjunction with anticipated federally listed species potentially occurring within the region of the Specific Plan Boundary. The California Natural Diversity Database (CNDDB) (CDFW 2024a), a California Department of Fish and Wildlife (CDFW) Natural Heritage Division species account database, was also reviewed for all pertinent information regarding the locations of known occurrences of sensitive species in the vicinity of the property. In addition, numerous regional floral and faunal field guides were utilized in the identification of species and suitable habitats. Combined, the reviewed sources provided an excellent baseline from which to inventory the biological resources potentially occurring in the area. Other CDFW reports and publications consulted include the following:

- Special Animals (CDFW 2024b);
- State and Federally Listed Endangered and Threatened Animals of California (CDFW 2024c);
- Endangered, Threatened, and Rare Plants of California (CDFW 2024d); and
- Special Vascular Plants and Bryophytes List (CDFW 2024e).

## FIELD SURVEY

A reconnaissance survey of the Project Site and Offsite Areas was conducted by Ruben Ramirez of Cadre Environmental on June 13th, 2024 in order to characterize and identify potential sensitive plant and wildlife habitats, and to establish the accuracy of the data identified in the literature search. Geologic and soil maps were examined to identify local soil types that may support sensitive taxa. Aerial photograph, topographic maps, vegetation and rare plant maps prepared for previous studies in the region were used to determine community types and other physical features that may support sensitive plants/wildlife, uncommon taxa, or rare communities that occur within or adjacent to the Project Site and Offsite Areas. Habitat assessments were conducted for, but not limited to, the following target species/groups.

- Delhi sands flower loving fly – Federally Endangered (FE)
- Coastal California gnatcatcher – Federally Threatened (FT)/State Species of Special Concern (SSC)
- Burrowing owl - SSC
- San Bernardino kangaroo rat – FE/SSC
- Common and sensitive bat species
- Sensitive plants

As previously stated, authorization to access the Project Level Assessment Area was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction, **CM BIO-7** Programmatic Assessment Area CEQA Analysis.

### Vegetation Communities/Habitat Classification Mapping

Natural community names and hierarchical structure follows the "*Manual of California Vegetation*" (Sayer and Keeler-Wolf 2009) classification system, which has been refined and augmented where appropriate to better characterize the habitat types observed throughout the Specific Plan Boundary.

All plants observed during the survey efforts were either identified in the field or collected and later identified using taxonomic keys. Plant taxonomy follows Hickman (1993). Scientific nomenclature and common names used in this report generally follow Roberts et al. (2004) or Baldwin et al. (2012) for updated taxonomy. Scientific names are included only at the first mention of a species; thereafter, common names alone are used.

### Wildlife Resources Inventory

All animals identified during the reconnaissance survey by sight, call, tracks, scat, or other characteristic sign were documented. In addition to species actually detected, expected use of the site by other wildlife was derived from the analysis of habitats on the site,

combined with known habitat preferences of regionally occurring wildlife species. Vertebrate taxonomy followed in this report is according to the Center for North American Herpetology (2024 for amphibians and reptiles), the American Ornithologists' Union (1988 and supplemental) for birds, and Baker et al. (2003) for mammals. Both common and scientific names are used during the first mention of a species; common names only are used in the remainder of the text.

### Jurisdictional Resources Assessment

The Project Site and Offsite Areas were assessed for the presence/absence of United States Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), and Regional Water Quality Control Board (RWQCB) jurisdictional resources. Non-wetland waters of the United States were assessed based on the limits of the Ordinary High-Water Mark (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in vegetation and soil characteristics. The assessment utilized the methodology for routine wetland determination according to the methods outlined in the USACE Wetland Delineation Manual (Environmental Laboratory 1987) and the Arid West Wetland Delineation Supplement and updated regulatory guidance letters (USACE 2008). Wetlands are identified by the presence of three characteristics: hydrophytic vegetation, wetland hydrology, and hydric soils. If any of these criteria were met, one or more transects were run to determine the extent of the wetland. Specifically, the presence of wetland hydrology was evaluated throughout the Project Site and Offsite Areas by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil pits, where applicable. In addition, indicators of wetland or riverine hydrology were recorded, including water marks, drift lines, rack, debris, and sediment deposits, as warranted. Any indicators of hydric soils, such as redoximorphic features, buried organic matter, organic streaking, reduced soil conditions, gleyed or low-chroma soils, or sulfidic odor were also recorded.

## EXISTING ENVIRONMENTAL SETTING

The following section presents the existing conditions of the Specific Plan Boundary. The Specific Plan Boundary is characterized primarily as heavily disturbed active dairy and agricultural facilities as shown in Figure 3, *Specific Plan Vegetation Communities Map*, Figures 4 to 9, *Current Specific Plan Photographs,* and outlined in Table 2, *Specific Plan Vegetation Community Acreages*. The Specific Plan Boundary is completely bordered by high traffic roads, commercial/residential development and active dairy and agricultural facilities.

The Soil Survey of the San Bernardino County Area has the following soils mapped within the Specific Plan Boundary as shown on Figure 10, *Specific Plan Soils Association Map*:

- Db – Delhi fine sand
- Hr – Hilmar loamy fine sand
- TuB – Tujunga loamy sand 0 to 5 percent slopes.

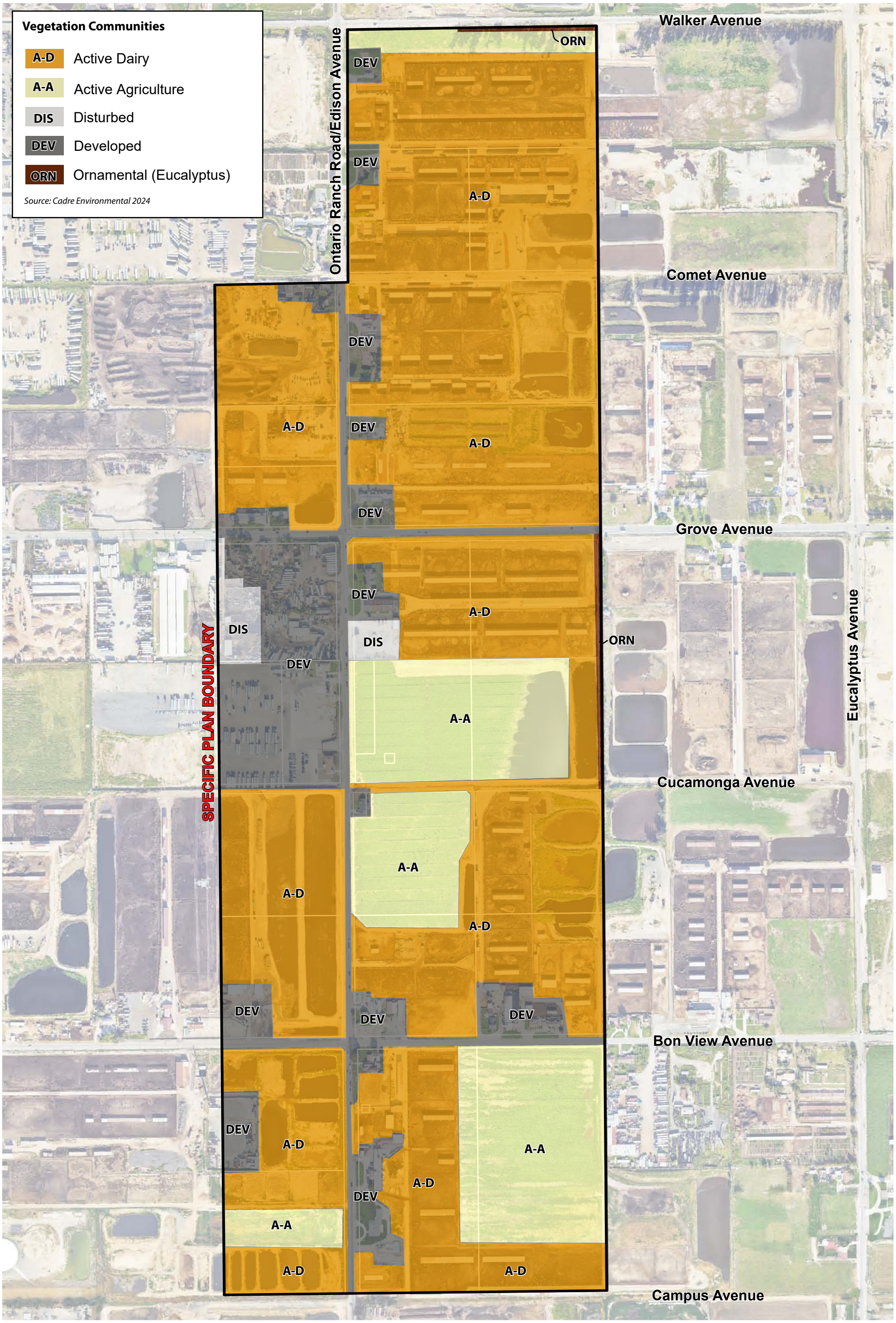


**Figure 3 - Specific Plan Vegetation Communities Map**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

1 inch = 450 feet

PHOTOGRAPH 1 - Southwest view of Specific Plan from Walker Avenue and Ontario Ranch Road/Edison Avenue intersection.

PHOTOGRAPH 2 - Northwest view of Specific Plan from southeast corner adjacent to Walker Avenue.

*Refer to Figure 2 for Photographic Key Map*

**Figure 4 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 3 - Northwest view of eastern region of Specific Plan from Ontario Ranch Road/Edison Avenue.

PHOTOGRAPH 4 - Southeast view of eastern region of Specific Plan from Ontario Ranch Road/Edison Avenue.

*Refer to Figure 2 for Photographic Key Map*

**Figure 5 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 5 - Southeast view of eastern region of Specific Plan from Grove Avenue.

PHOTOGRAPH 6 - Northwest view of eastern region of Specific Plan from Grove Avenue.

*Refer to Figure 2 for Photographic Key Map*

**Figure 6 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 7 - Northward view of central region of Specific Plan from Ontario Ranch Road/Edison Avenue.

PHOTOGRAPH 8 - Southeast view of central region of Specific Plan from Edison Avenue and Cucamonga avenue intersection.

*Refer to Figure 2 for Photographic Key Map*

**Figure 7 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 9 - Southeast view of western region of Specific Plan from Bon View Avenue.

PHOTOGRAPH 10 - Northwest view of western region of Specific Plan from Bon View Avenue.

*Refer to Figure 2 for Photographic Key Map*

**Figure 8 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

PHOTOGRAPH 11 - Northeast view of western region of Specific Plan from Edison Avenue and Campus Avenue intersection.

PHOTOGRAPH 12 - Southeast view of western region of Specific Plan from Edison Avenue and Campus Avenue intersection.

*Refer to Figure 2 for Photographic Key Map*

**Figure 9 - Current Specific Plan Photographs**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

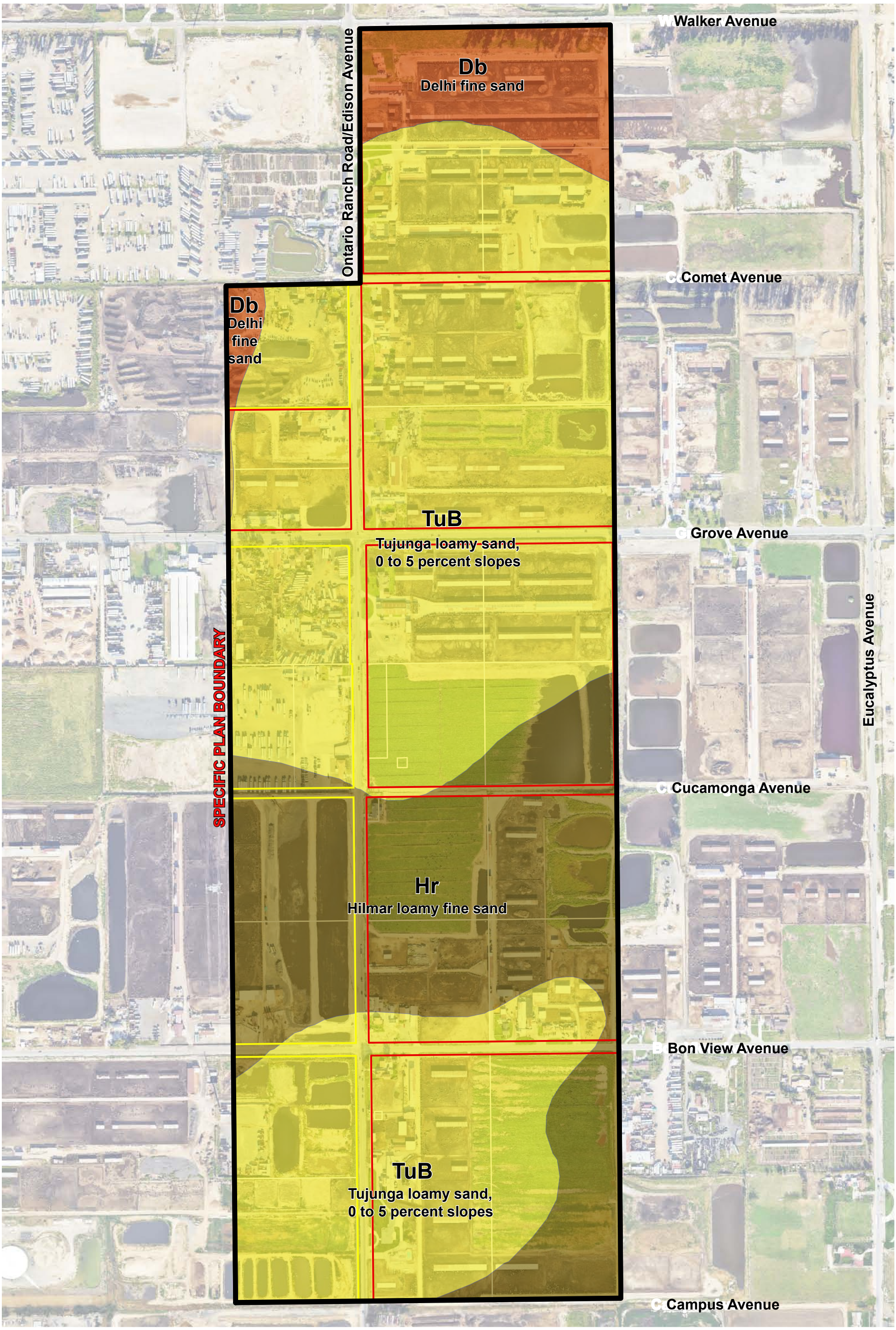


**Figure 10 - Specific Plan Soils Association Map**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

1 inch = 450 feet

## VEGETATION COMMUNITIES

### Active Dairy

The majority of the Specific Plan Boundary has and continues to be utilized as active dairy facilities including dry lots, milking parlors/feed storage facilities and housing. These areas are either devoid of vegetation or dominated by ornamental, ruderal non-native and native species commonly detected in disturbed habitats including Palmer's amaranth (*Amaranthus palmeri*), summer cypress (*Bassia scoparia*), horseweed (*Erigeron canadensis*), Russian thistle (*Salsola tragus*), prostate knotweed (*Polygonum aviculare*), cheeseweed (*Malva parviflora*), red-stemmed filaree (*Erodium cicutarium*), castor bean (*Ricinus communis*), prickly lettuce (*Lactuca serriola*), Bermuda grass (*Cynodon dactylon*), truncate finger grass (*Chloris truncata*), barnyard grass (*Echinochloa crus-galli*), goose grass (*Eleusine indica*), wild oat (*Avena fatua*), foxtail barley (*Hordeum murinum*), and ripgut brome (*Bromus diandrus*). Several dairy effluent retention ponds are located onsite and are either devoid of vegetation or inundated with discharge. No riparian scrub, forest or woodland habitat is associated with these ponds.

### Active Agriculture

Several regions of the Specific Plan Boundary have and continue to be actively farmed including the current production of feed and hay products. These areas area also utilized as cattle pastures and fertilizer spreading grounds.

### Disturbed

Disturbed regions of the Specific Plan Boundary are either devoid of vegetation (dirt roads and fallow fields) or dominated by the following species including golden crown beard (*Verbesina encelioides*), tumbling pigweed (*Amaranthus albus*), puncture vine (*Tribulus terrestris*), London rocket (*Sisymbrium irio*), stinknet (*Oncosiphon pilulifer*), giant reed (*Arundo donax*), salt cedar (*Tamarisk ramosissima*), tree tobacco (*Nicotiana glauca*), sacred datura (*Datura wrightii*), milk thistle (*Silybum marianum*), Australian saltbush (*Atriplex semibaccata*), Boccone's sand spurrey (*Spergularia bocconi*), spiny cocklebur (*Xanthium spinosum*), Mediterranean canarygrass (*Phalaris minor*), field bindweed (*Convolvulus arvensis*), common sow thistle (*Sonchus oleraceus*), annual beard-grass (*Polypogon monspeliensis*), and annual sunflower (*Helianthus annus*).

### Developed

Developed regions of the Specific Plan Boundary include the existing roadways within the rights-of-way and ranch house compounds. Species documented within developed areas include Peruvian peppertree (*Schinus molle*), bougainvillea (*Bougainvillea* sp.), pine (*Pinus* sp.), California sycamore (*Platanus racemosa*), Mexican fan palm (*Washingtonia robusta*), white mulberry (*Morus alba*), ash (*Fraxinus* sp.), olive (*Olea europaea*), Chinese elm (*Ulmus parvifolia*), tree of heaven (*Ailanthus altissima*), and jacaranda (*Jacaranda* sp.).

### Ornamental (Eucalyptus)

Several blue gum (*Eucalyptus globulus*) and red gum trees (*Eucalyptus camaldulensis*) are located adjacent to the eastern and southeastern Specific Plan Boundary.

**Table 2.**
**Specific Plan Vegetation Community Acreages**

| Vegetation Community | Project Site Acres | *Project Level Assessment Area Acres | Offsite Areas Acres | Total Acres |
|---|---|---|---|---|
| Active Dairy | 133.55 | 38.56 | 7.55 | 179.66 |
| Active Agriculture | 45.92 | 2.77 | 1.01 | 49.70 |
| Disturbed | 1.11 | 2.31 | 0.19 | 3.61 |
| Developed | 13.19 | 19.65 | 10.60 | 43.44 |
| Ornamental (Eucalyptus) | 0.28 | 0.00 | 0.46 | 0.74 |
| **TOTAL** | **194.05** | **63.29** | **19.81** | **277.15** |

** The 63.29-acre Project Level Assessment Area is located within the northern region of the Specific Plan Boundary including APN's 0216-311-09, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, and -03. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction,* ***CM BIO-7*** *Programmatic Assessment Area CEQA Analysis.*

## GENERAL PLANT & WILDIFE SPECIES

All plant species documented within the Project Site and Offsite Areas are presented and listed in the previous section. General wildlife species documented on site or within the vicinity of the Project Site and Offsite Areas include white-faced ibis (*Plegadis chihi*), red-winged blackbird (*Agelaius phoeniceus*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), rock dove (*Columba livia*), American kestrel (*Falco sparverius*), northern mockingbird (*Mimus polyglottos*), Anna's hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), black phoebe (*Sayornis nigricans*), Say's phoebe (*Sayornis saya*), western meadowlark (*Sturnella neglecta*), cliff swallow (*Petrochelidon pyrrhonota*), American crow (*Corvus brachyrhynchos*), hooded oriole (*Icterus cucullatus*), Brewer's blackbird (*Euphagus cyanocephalus*), brown-headed cowbird (*Molothrus ater*), European starling (*Sturnus vulgaris*), yellow rumped warbler (*Setophaga coronata*), lesser gold finch (*Spinus psaltria*), house finch (*Haemorhous mexicanus*), scaly-breasted munia (*Lonchura punctulate*), white-crowned sparrow (*Zonotrichia leucophrys*) house sparrow (*Passer domesticus*), desert cottontail rabbit (*Sylvilagus audubonii*), and California ground squirrel (*Otospermophilus beecheyi*).

## JURISDICTIONAL WETLAND RESOURCES

No wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project Site and Offsite Areas. The artificially created

unvegetated dairy effluent retention ponds are isolated located in uplands and currently rotated in use resulting in a wet (inundated) and dry phase. All of the active retention ponds are devoid of wetland vegetation including but not limited to riparian scrub, forest or woodland habitat.

Impacts to water quality would be less than significant during both construction and operation following preparation of a Water Quality Management Plan (WQMP), Storm Water Pollution Prevention Plan (SWPPP) and compliance with National Pollutant Discharge Elimination System (NPDES) permit and San Bernardino County Regional Municipal Separate Stormwater Sewer System (MS4) code provisions.

## SENSITIVE BIOLOGICAL RESOURCES

The following discussion describes the plant and wildlife species present, or potentially present within the property boundaries, that have been afforded special recognition by federal, state, or local resource conservation agencies and organizations, principally due to the species' declining or limited population sizes, usually resulting from habitat loss. Also discussed are habitats that are unique, of relatively limited distribution, or of particular value to wildlife. Protected sensitive species are classified by state and/or federal resource management agencies, or both, as threatened or endangered, under provisions of the state and federal endangered species act. Vulnerable or "at-risk" species that are proposed for listing as threatened or endangered (and thereby for protected status) are categorized administratively as "candidates" by the USFWS. CDFW uses various terminology and classifications to describe vulnerable species.

Sensitive biological resources are habitats or individual species that have special recognition by federal, state, or local conservation agencies and organizations as endangered, threatened, or rare. The CDFW, USFWS, and special groups like the California Native Plant Society (CNPS) maintain watch lists of such resources. For the purpose of this assessment sources used to determine the sensitive status of biological resources are:

**Plants**: USFWS (2024), CNDDB (CDFW 2024a), CDFW (2024d, 2024e), CNPS (2024), and Skinner and Pavlik (1994),

**Invertebrate -** Crotch's bumble bee *Bombus crotchii:* Leif Richardson, Paul Williams, Robbin Thorp and Sheila Colla, et al. (2022), CDFW (2019), CDFW (2023), Hatfield, et al. (2019).

**Wildlife:** California Wildlife Habitat Relationships (2008), USFWS (2024), CNDDB (CDFW 2024a), CDFW (2024b, 2024c, 2024f), and Leif Richardson, Paul Williams, Robbin Thorp and Sheila Colla, et al. (2022).

**Habitats**: CNDDB (CDFW 2024a, 2024f).

## FEDERAL PROTECTION AND CLASSIFICATIONS

The Federal Endangered Species Act of 1973 (FESA) defines an endangered species as "any species that is in danger of extinction throughout all or a significant portion of its range..." Threatened species are defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." Under provisions of Section 9(a)(1)(B) of the FESA it is unlawful to "take" any listed species. "Take" is defined as follows in Section 3(18) of the FESA: "...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Further, the USFWS, through regulation, has interpreted the terms "harm" and "harass" to include certain types of habitat modification as forms of a "take." These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a federal agency for an action that could affect a federally listed plant and animal species, the property owner and agency are required to consult with USFWS. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants. Recently, the USFWS instituted changes in the listing status of former candidate species. Former C1 (candidate) species are now referred to simply as candidate species and represent the only candidates for listing. Former C2 species (for which the USFWS had insufficient evidence to warrant listing at this time) and C3 species (either extinct, no longer a valid taxon or more abundant than was formerly believed) are no longer considered as candidate species. Therefore, these species are no longer maintained in list form by the USFWS, nor are they formally protected. However, some USFWS field offices have issued memoranda stating that former C2 species are henceforth to be considered Federal Species of Concern. This term is employed in this document but carries no official protections. All references to federally protected species in this report (whether listed, proposed for listing or candidate) include the most current published status or candidate category to which each species has been assigned by USFWS. For purposes of this assessment, the following acronyms are used for federal status species:

| | |
|---|---|
| FE | Federal Endangered |
| FT | Federal Threatened |
| FPE | Federal Proposed Endangered |
| FPT | Federal Proposed Threatened |
| FC | Federal Candidate for Listing |

The designation of critical habitat can also have a significant impact on the development of land designated as "*critical habitat*." The FESA prohibits federal agencies from taking any action that will "*adversely modify or destroy*" critical habitat (16 U.S.C. § 1536(a)(2)). This provision of the FESA applies to the issuance of permits by federal agencies. Before approving an action affecting critical habitat, the federal agency is required to consult with the USFWS who then issues a biological opinion evaluating whether the action will "*adversely modify"* critical habitat. Thus, the designation of critical habitat effectively gives the USFWS extensive regulatory control over the development of land designated as critical habitat.

The Migratory Bird Treaty Act of 1918 (MBTA) makes it unlawful to "*take*" any migratory bird or part, nest, or egg of such bird listed in wildlife protection treaties between the United States and Great Britain, the Republic of Mexico, Japan, and the Union of Soviet States. For purposes of the MBTA, "*take*" is defined as to pursue, hunt, capture, kill, or possess or attempt to do the same.

The Bald Eagle and Golden Eagle Protection Act explicitly protects the bald eagle and golden eagle and imposes its own prohibition on any taking of these species. As defined in this act, take means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb. Current USFWS policy is not to refer the incidental take of bald eagles for prosecution under the Bald Eagle and Golden Eagle Protection Act (16 U.S.C. 668-668d).

## STATE PROTECTION AND CLASSIFICATIONS

California's Endangered Species Act (CESA) defines an endangered species as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease." The State defines a threatened species as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter. Any animal determined by the commission as rare on or before January 1, 1985 is a threatened species." Candidate species are defined as "...a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the commission has formally noticed as being under review by the department for addition to either the list of endangered species or the list of threatened species, or a species for which the commission has published a notice of proposed regulation to add the species to either list." Candidate species may be afforded temporary protection as though they were already listed as threatened or endangered at the discretion of the Fish and Game Commission. Unlike FESA, CESA does not include listing provisions for invertebrate species.

Article 3, Sections 2080 through 2085, of CESA addresses the taking of threatened or endangered species by stating "No person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts, except as otherwise provided..." Under CESA, "take" is defined as "...hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Exceptions authorized by the state to allow "take" require "...permits or memorandums of understanding..." and can be authorized for "...endangered species, threatened species, or candidate species for scientific, educational, or management purposes." Sections 1901 and 1913 of the California Fish and Game Code provide that notification is required prior to disturbance.

Additionally, some sensitive mammals and birds are protected by the State as Fully Protected Mammals or Fully Protected Birds, as described in the California Fish and Game Code, Sections 4700 and 3511, respectively. SSC ("special" animals and plants)

listings include special status species, including all state and federal protected and candidate taxa, Bureau of Land Management (BLM) and US Forest Service (USFS) sensitive species, species considered to be declining or rare by the CNPS or National Audubon Society, and a selection of species which are considered to be under population stress but are not formally proposed for listing. This list is primarily a working document for the CDFW's CNDDB project. Informally listed taxa are not protected per se, but warrant consideration in the preparation of biotic assessments. For some species, the CNDDB is only concerned with specific portions of the life history, such as roosts, rookeries, or nest sites.

For the purposes of this assessment, the following acronyms are used for State status species:

| | |
|---|---|
| SE | State Endangered |
| ST | State Threatened |
| SCE | State Candidate Endangered |
| SCT | State Candidate Threatened |
| SFP | State Fully Protected |
| SP | State Protected |
| SR | State Rare |
| SSC | California Species of Special Concern |
| CWL | California Watch List |

Nesting birds, including raptors, are protected under California Fish and Game Code Section 3503, which reads, “It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto.” In addition, under California Fish and Game Code Section 3503.5, “it is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto”. Passerines and non-passerine land birds are further protected under California Fish and Game Code 3513. As such, CDFW typically recommends surveys for nesting birds that could potentially be directly (e.g., actual removal of trees/vegetation) or indirectly (e.g., noise disturbance) impacted by project-related activities. Disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered “take” by CDFW.

The CNPS is a private plant conservation organization dedicated to the monitoring and protection of sensitive species in the State. This organization has compiled an inventory comprised of the information focusing on geographic distribution and qualitative characterization of rare, threatened, or endangered vascular plant species of California (Tibor 2001). The list serves as the candidate list for listing as threatened and endangered by CDFW. The CNPS has developed five categories of rarity (CRPR):

| | |
|---|---|
| CRPR 1A | Presumed extinct in California |
| CRPR 1B | Rare, threatened, or endangered in California and elsewhere |
| CRPR 2A | Plants presumed extirpated in California but common elsewhere |
| CRPR 2B | Plants rare, threatened, or endangered in California but more common elsewhere |
| CRPR 3 | Plants about which we need more information – a review list |
| CRPR 4 | Species of limited distribution in California (i.e., naturally rare in the wild), but whose existence does not appear to be susceptible to threat |

As stated by the CNPS:

> "*Threat Rank is an extension added onto the California Rare Plant Rank and designates the level of endangerment by a 1 to 3 ranking with 1 being the most endangered and 3 being the least endangered. A Threat Rank is present for all California Rare Plant Rank 1B's, 2's, 4's, and the majority of California Rare Plant Rank 3's. California Rare Plant Rank 4 plants are seldom assigned a Threat Rank of 0.1, as they generally have large enough populations to not have significant threats to their continued existence in California; however, certain conditions exist to make the plant a species of concern and hence be assigned a California Rare Plant Rank. In addition, all California Rare Plant Rank 1A (presumed extinct in California), and some California Rare Plant Rank 3 (need more information) plants, which lack threat information, do not have a Threat Rank extension."* (CNPS 2024)

| | |
|---|---|
| 0.1 | Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat) |
| 0.2 | Fairly threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat) |
| 0.3 | Not very threatened in California (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known) |

## LOCAL PROTECTION AND CLASSIFICATIONS

<u>The following Local Protection and Classifications sections are excerpted from The Ontario Plan 2050 (Placeworks 2022).</u>

The City of Ontario Plan Environmental Resources Element contains goals and policies which pertain to the protection of biological resources in the City of Ontario:

**Goal ER5** Protected high value habitat and farming and mineral resource extraction activities that are compatible with adjacent development.

**Policy ER5-1** Habitat Conservation Areas. We support the protection of biological resources through the establishment restoration, and conservation of high-quality areas.

**Policy ER5-2** Entitlement and Permitting Process. We comply with state and federal regulations regarding protected species.

**Policy ER5-4** Transition of Farms. We protect both existing farms and sensitive uses around them as agricultural areas transition to urban uses.

### City of Ontario Municipal Codes

#### Municipal Code, Volume II, Chapter 2

Title 10, Parks and Recreation, Chapter 2, Parkway Trees, of the City's Municipal Code provides provisions on the preservation, regulation on the maintenance and removal of parkway trees, and establishes types and the locations for planting parkway trees. Parkway is defined as "…that portion of any public street right-of-way between the right-of-way boundary line and the curb line, and also the area enclosed within the curb lines of a medial divider."

The property owner abutting a public right-of-way is responsible for watering any tree in the parkway and for trimming that can be done from the ground to preserve the neat appearance and non-obstructed use of the parkway; the City is responsible for all major pruning. Removal or relocation of any parkway tree requires prior authorization from the City Public Works Agency through a permit process, and planting a replacement tree, whenever feasible, is a condition on any permit issued by the City for the removal of a parkway tree. Alternatively, an in-lieu deposit may be accepted as an alternate to the actual planting of any required parkway tree based on a fair value established by the Public Facilities Manager (The Ontario Plan 2022).

#### Municipal Code, Section 6.05.020

Section 6.05.020, Tree Preservation Policy and Protection Measures, of the Ontario Development Code establishes policies and measures that will further the preservation, protection, and maintenance of established and healthy heritage trees within the City. A Heritage Tree is one that is designated for preservation as a tree of historic or cultural significance, or a tree of importance to the community due to any one of the following factors:

- It is one of the largest or oldest trees of species located within the City and has a trunk diameter of 18 inches or greater when measured at 54 inches above grade;
- It has a historical significance due to association with a historic building, site, street, person, or event;
- It is a defining landmark or significant outstanding feature of a neighborhood or district, typical of early Ontario Landscapes. This includes Camphor Tree (*Cinnamomum camphora*), Deodar Cedar (*Cedrus deodara*), London Planetree (*Platanus acerifolia*), Cork Oak (*Quercus suber*), Holly Oak (*Quercus ilex*), and California Pepper (*Schinus molle*);

- It is a Native Tree. This means that it is one of the following California native tree species with a trunk diameter of more than 8 inches, measured at 54 inches above natural grade: California Sycamore (*Platanus racemose*), Torrey Pine (*Pinus torreyana*), Coast Live Oak (*Quercus agrifolia*), Engelmann Oak (*Quercus engelmannii*), Valley Oak (*Quercus lobata*), or California Bay (*Umbellularia californica*).

Healthy Heritage Trees that are approved for removal shall be replaced with new trees with a total trunk diameter equal to the tree(s) removed, or as deemed appropriate by the Approve Authority based on lot size and available planting space. Replacement trees are to be in addition to the quantity of trees required for landscaping. The Approving Authority is responsible for reviewing the landscape plan and approving appropriate species for tree replacement (The Ontario Plan 2022).

A tree inventory will be required and prepared by a City approved certified arborist or qualified horticulturalist, to determine the presence/absence of Heritage Trees including assessment of health, structure, condition, and expected life span of all affected specimens.

Property proposed for development on which a Heritage Tree exists, shall require the submittal of a Tree Inventory and Preservation Plan prepared by a licensed landscape architect, horticulturalist, certified arborist, or other related professional. Said plan shall be submitted concurrent with a Development Plan or building permit request for alterations of a site, and shall be reviewed and approved by the Approving Authority for the corresponding application request.

The Tree Inventory and Preservation Plan shall show all existing on-site trees, and those existing trees on abutting lots and public rights-of-way with a canopy or root zone that extends onto the site or within 8 feet of a construction, staging or storage area, or graded site. Furthermore, the Tree Inventory and Preservation Plan shall identify Tree Protection Areas and trees requested to be removed, and shall show replacement trees as required by this Division.

**Sphere of Influence General Plan Amendment, Final EIR, and Settlement Agreement**

In January 1998, the Ontario City Council approved a general plan amendment (GPA) and associated Final EIR for the sphere of influence (SOI), which is now known as the Ontario Ranch (previously the New Model Colony (NMC)). The GPA designated Ontario Ranch for a range of urban and suburban uses, including residential, commercial, business park, industrial, and open space. Most of Ontario Ranch was then in agricultural use. The Final EIR for the GPA assessed the impacts on biological resources of the conversion of Ontario Ranch from agricultural uses to developed urban and suburban uses. Before mitigation, significant impacts were identified for waterfowl and waterfowl habitat, raptors and raptor habitat, and the Delhi Sands Flower-Loving Fly (DSFLF) Ontario Recovery Unit. The EIR included three mitigation measures for impacts to biological resources:

- Mitigation Measure BR-1 modified the general plan to require the creation of new waterfowl habitat and specified a mitigation ratio of 2:1 for each acre of such habitat lost. This is off-site mitigation in the Prado Basin.
- Mitigation Measure BR-2 stipulated that the City shall create a Waterfowl and Raptor Conservation Area (WRCA), and included requirements and definitions for it; mitigation is off-site in the Prado Basin.
- Mitigation Measure BR-3 required the City to cooperate with the USFWS in taking specified actions to mitigate impacts to the Delhi Sands Flower-Loving Fly Recovery Unit.

Subsequent to the 1998 adoption of the SOI GPA and EIR, a lawsuit was filed against the City of Ontario by the Endangered Habitats League and the Sierra Club, challenging the City's CEQA compliance and approval of the SOI GPA. A Settlement Agreement was reached and agreed to by all parties that set forth revised mitigation measures for potential impacts in the New Model Colony (referred to as Annexation Area 163 in the agreement) to the burrowing owl, the DSFLF, raptor foraging and wildlife habitat, loss of open space, actual and potential habitat and agricultural land, and sensitive (listed and non-listed) species. These measures will be in effect until all the developable acres in the Ontario Ranch reach full buildout, as determined by the City.

- Prior to issuance of grading permits, Ontario shall impose a $4,320 per net acre mitigation fee on proposed developments in Annexation Area 163 that require discretionary approval or permitting from the City.
- Ontario, in consultation with CDFW, will identify, through CEQA review, lands occupied by burrowing owl and suitable as long-term habitat. The City will require avoidance of those lands to maintain a viable territory and require long-term maintenance through dedication in fee or grant of easement to the Land Trust. If the site is not viable long-term habitat, the developer shall pay the mitigation fee and make provisions for relocation of the owls.
- Since habitat that benefits DSFLF can be expected to benefit burrowing owl, up to 25 percent of the mitigation fee maybe used by the City for DSFLF recovery.
- All mitigation fees collected shall be used for the above-described purposes and may be used to purchase property, conservation easements, or other land with long-term conservation value for the environmental impacts; enhance/restore lands with such values; maintain and operates these lands; and pay for related administrative costs (not to exceed 10 percent of the total fees).
- Land/easements dedicated, conveyed, or purchased to benefit wildlife, waterfowl, raptors, and/or burrowing owl must have long-term conservation value for those species and must be managed by the land trust. The parcels must be in the habitat area designated as part of the settlement agreement. Unacceptable properties are those that would otherwise be purchased by another entity or group as open space mitigation for environmental impacts.

### City of Ontario Biological Resources Habitat Mitigation Fee

Since the Settlement Agreement, the City has established a habitat mitigation fee to cover potential environmental impacts to the Burrowing Owl, DSFLF, raptor foraging, loss of open space, and agricultural lands. Development impact fees for new development in Ontario Ranch were adopted on June 23, 2003, by the City Council. The Ontario Ranch

development impact fees include a habitat mitigation fee of $4,320 per net acre for proposed residential, commercial, hotel and restaurant, office, and industrial development. Mitigation fees have been collected by the City and have been deposited into a trust fund to be used for the acquisition, restoration, rehabilitation, and maintenance of lands deemed to have long-term conservation value. Up to $500 of the fees may be used for DSFLF. In addition, current City procedure is to require a habitat assessment to determine existing habitat and biological resources on proposed development sites. If the assessment determines that there is potential habitat for sensitive species, focused protocol surveys are required. If potential DSFLF habitat is present, two-year (consecutive) protocol surveys per the USFWS Interim General Survey Guidelines for DSFLF are required (The Ontario Plan 2022).

The land use plan for Ontario Ranch originally provided for establishment of the WRCA, a wetlands and habitat area near the confluence of the Cucamonga Creek and the Lower Deer Creek Channels. Creation of the WRCA as part of Ontario Ranch was intended to provide a concentrated area for wetlands that would receive storm drainage from the west. Funding for the environmental restoration of the existing 85-acre Lower Cucamonga flood control basin under the WRCA would have been provided through the USACE with matching funds from the City of Ontario. This conservation area plus acquisition of 145 acres of off-site mitigation land were intended to provide mitigation for impacts resulting from development of Ontario Ranch. However, under the conditions of the settlement agreement, the WRCA is no longer proposed (The Ontario Plan 2022).

In 2010, the Ontario City Council approved the selection of the Riverside Land Conservancy (today known as River and Land Conservancy) as the administrator of the habitat mitigation fees and to create a habitat program pursuant to the requirements of the Settlement Agreement between the City of Ontario, the Endangered Habitats League, and the Sierra Club. However, due to the economic downturn shortly after 2010, the contract between the City and the Riverside Land Conservancy was never ratified. It was anticipated that once development in Ontario Ranch began to commence, the City would ratify the contract (The Ontario Plan 2022).

In 2022, the City will be going out with a Request for Proposals (RFP) to select a non-profit land trust and/or organization specializing in habitat conservation. The selected non-profit and/or organization will be responsible for the administration of the habitat mitigation fees and creation of a habitat program pursuant to the requirements of the Settlement Agreement between the City of Ontario, the Endangered Habitats League, and the Sierra Club. In partnership with the CDFW, the City will work with the selected non-profit and/or organization to maintain an interactive mapping and current inventory of the burrowing owl occurrences and in the selection of adequate lands for passive relocation (The Ontario Plan 2022).

## SENSITIVE HABITATS

As stated by CDFW:

> "*One purpose of the vegetation classification is to assist in determining the level of rarity and imperilment of vegetation types. Ranking of alliances according to their degree of imperilment (as measured by rarity, trends, and*

*threats) follows NatureServe's Heritage Methodology, in which all alliances are listed with a G (global) and S (state) rank. For alliances with State ranks of S1-S3, all associations within them are also considered to be highly imperiled*". (CDFW 2024f)

No sensitive or undisturbed native habitats were documented within the Project Site and Offsite Areas. The Project Site and Offsite Areas are characterized primarily as heavily disturbed active dairy and agricultural facilities

## SENSITIVE PLANTS

Based on a review of the CNDDB, The Ontario Plan 2050 and existing conditions within and adjacent to the Specific Plan Boundary, a total of thirteen (13) sensitive plant species have potential to occur within the vicinity of the Project Site and Offsite Area. as presented in Table 3, *Sensitive Plant Species Assessment*.

**Table 3.**
**Sensitive Plant Species Assessment**

| **Species Name** (*Scientific Name*) Status | **Habitat Description** | **Comments** |
|---|---|---|
| | | |
| **Nevin's barberry** (*Berberis nevinii*)<br><br>FE/SE<br>CRPR 1B.1 | Perennial evergreen shrub which generally blooms from February to June within chaparral, cismontane woodland, coastal scrub, and riparian scrub in sandy, gravelly substrates (CNPS 2024). | Not detected. |
| **Plummer's mariposa-lily** (*Calochortus plummerae*)<br><br>CRPR 4.2 | Perennial bulbiferous herb which generally blooms from May to June within chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, and grassland habitats with granite and rocky substrates (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Lucky morning glory** (*Calystegia felix*)<br><br>CRPR 1B.1 | Annual rhizomatous herb generally blooming from March to September within meadows, seeps and riparian scrub habitat (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Parry's spineflower** (*Chorizanthe parryi var. parryi*)<br><br>CRPR 1B.1 | Annual herb which generally blooms from April to June within chaparral, cismontane woodland, coastal scrub and grassland habitats with sandy and/or rocky openings. (CNPS 2024) | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Slender-horned spineflower**<br>(*Dodecahema leptoceras*)<br><br>CRPR 1B.1<br>FE/SE | Annual herb which generally blooms from April to June within chaparral, cismontane woodland and coastal scrub (alluvial fan) with sandy substrates. (CNPS 2024) | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Mesa horkelia**<br>(*Horkelia cuneata ssp. puberula*)<br><br>CRPR 1B.1 | Perennial herb which generally blooms from February to September within chaparral (maritime), cismontane woodland and coastal scrub with sandy or gravelly substrates. (CNPS 2024) | Not detected. |
| **Robinson's pepper-grass**<br>(*Lepidium virginicum var. robinsonii*)<br><br>CRPR 4.3 | Annual herb which generally blooms from January to July within chaparral and coastal sage scrub habitats (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Prostate vernal pool navarretia**<br>(*Navarretia prostrata*)<br><br>CRPR 1B.2 | Annual herb generally blooming from April to July within coastal scrub, meadows and seeps, valley and foothill grasslands and vernal pools (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **Brand's star phacelia**<br>(*Phacelia stellaris*)<br><br>CRPR 1B.1 | Annual herb generally blooming from March to June within coastal sage scrub and dune habitats (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |
| **White rabbit tobacco**<br>(*Pseudognaphalium leucocephalum)*<br><br>CRPR 2B.2 | Perennial herb generally blooming from July to December within chaparral, cismontane woodland, coastal scrub and riparian woodland habitats (CNPS 2024). | Not detected. |
| **Salt spring checkerbloom**<br>(*Sidalcea neomexicana*)<br><br>CRPR 2.2 | Perennial herb which generally blooms from March to June within chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playas within alkaline/mesic gravelly substrates (CNPS 2024). | Not detected. |
| **San Bernardino aster**<br>(*Symphyotrichum defoliatum*)<br><br>CRPR 1B.2 | Perennial rhizomatous herb generally blooming from July to December within various vegetation communities in associating with wetland substrates (ditches, streams and springs) (CNPS 2024). | Not detected. |

| **Species Name** (*Scientific Name*) Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Rigid fringepod** (*Thysanocarpus rigidus*)<br><br>CRPR 1B.2 | Annual herb generally blooming from February to May within pinyon and juniper woodland habitats (CNPS 2024). | No Potential. Not expected to occur onsite based on a lack of suitable or undisturbed vegetation or soils. |

**California Native Plant Society (CNPS): California Rare Plant Rank (CRPR)**
CRPR 1A – plants presumed extinct in California
CRPR 1B – plants rare, threatened, or endangered in California, but more common elsewhere
CRPR 2A – plants presumed extirpated in California but common elsewhere
CRPR 2B – plants rare, threatened, or endangered in California but more common elsewhere
CRPR 3 – plants about which we need more information, a review list
CRPR 4 – plants of limited distribution, a watch list
.1 – Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

**Federal (USFWS) Protection and Classification**
FE – Federally Endangered
FT – Federally Threatened
FC – Federal Candidate for Listing

**State (CDFW) Protection and Classification**
SE – State Endangered
ST – State Threatened

No suitable habitat for sensitive plant species including those listed as federal or state threatened/endangered was documented within the Project Site and Offsite Areas. No sensitive plant species listed in Table 3, *Sensitive Plant Species Assessment* or undisturbed native habitats were documented or expected to occur within the Project Site and Offsite Areas. The Project Site and Offsite Areas are primarily characterized as heavily disturbed active dairy and agricultural facilities.

## SENSITIVE WILDLIFE

Based on a review of the CNDDB, The Ontario Plan 2050 and existing site conditions, a total of fifty (50) sensitive invertebrate and wildlife species have the potential of occurring within the vicinity of the Specific Plan Boundary, as presented in Table 4, *Sensitive Wildlife Species Assessment*.

**Table 4. Sensitive Wildlife Species Assessment**

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **INVERTEBRATES** | | |
| **Crotch bumble bee**<br>(*Bombus crotchii*)<br><br>SC | Range extends from southern to northern California within a variety of habitats including grassland, scrub, chaparral and desert habitats. Food plants include but are not limited to the following genera: *Antirrhinum, Phacelia, Clarkia, Cordylanthus, Dendromecon, Medicago Eschscholzia, Chaenactis, Eriogonum, Hypericum, Lantana, Lupinus, Salvia, Asclepias, Cirsium, Monardella, Keckiella, Acmispon, Euthamia, Ehrendorferia, Vicia,* and/or *Trichostema*. | No Potential. Not expected to occur onsite based on a lack of suitable food sources and heavily disturbed condition of the Project Site and Offsite Areas. |
| **Delhi Sands flower-loving fly**<br>(*Rhaphiomidas terminatus abdominalis*)<br><br>FE | Restricted to Delhi sand formations in Riverside and San Bernardino Counties. | Low Potential. The Delhi Sands flower-loving fly is not expected to occur onsite based on the historic and ongoing impacts to the Project Site and Offsite Areas respective of active dairy and agricultural use. However, approximately 19-acres of the eastern region of the Project Site and Project Level Assessment Area are mapped as Delhi soils, as shown in Figure 10, *Soils Association Map*. |
| **AMPHIBIANS** | | |
| **Western spadefoot**<br>(*Spea hammondii*)<br><br>SSC | Primary habitat for this species includes suitable breeding habitat below 1500 meters (i.e., vernal pools or other standing water that is free of exotic species) with secondary habitats including adjacent chaparral, sage scrub, grassland, and alluvial scrub habitats. | No Potential. Not expected to occur onsite based on a lack of suitable undisturbed soils and continuous dairy and agricultural activities conducted throughout the Project Site and Offsite Areas. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **REPTILES** | | |
| **Southern California legless lizard**<br>(*Anniella stebbinsi*)<br><br>SSC | Broadleaved upland forest, chaparral, coastal dunes, and coastal scrub. Occurs in sandy or loose loamy soils under sparse vegetation, generally in moist, loose soil (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation or soils. |
| **California glossy snake**<br>(*Arizona elegans occidentalis*)<br><br>SSC | Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Impact Area based on a lack of suitable undisturbed vegetation or soils. |
| **Coastal western whiptail**<br>(*Aspidoscelis tigris stejnegeri*)<br><br>SSC | The coastal western whiptail occurs in a wide variety of habitats including coastal sage scrub, desert scrub, Riversidean alluvial fan scrub, woodlands, grasslands, playas, and respective ecotones between these habitats. | No Potential. Not expected to occur within Project Site and Offsite Impact Area based on a lack of suitable undisturbed vegetation or soils. |
| **San Bernardino ringneck snake**<br>(*Diadophis punctatus modestus*) | Chaparral, coastal sage scrub, grassland, riparian, and woodlands (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation or soils. |
| **Western pond turtle**<br>(*Actinemys marmorata*)<br><br>SSC | The western pond turtle inhabits slow moving permanent or intermittent streams, small ponds, small lakes, reservoirs, abandoned gravel pits, permanent and ephemeral shallow wetlands, stock ponds, and sewage treatment lagoons (Rathbun *et al*., 1992; Holland, 1994). Pools are the preferred habitat within streams (Bury, 1972,) | Not Detected. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed basking sites and permanent water. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Coast horned lizard**<br>(*Phrynosoma blainvillii*)<br><br>SSC | Open areas of sandy soil with coastal sage scrub, chaparral, grassland, riparian, and washes and watercourses (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation or soils. |
| **Coast patch-nosed snake**<br>(*Salvadora hexalepis virgultea*)<br><br>SSC | The coast patch-nosed snake prefers brushy coastal sage scrub/ chaparral habitats. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation or soils. |
| **Two-striped gartersnake**<br>(*Thamnophis hammondii*)<br><br>SSC | Marsh and swamp, riparian scrub, riparian woodland, and wetland. Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation, soils or permanent water. |
| **BIRDS** | | |
| **Cooper's hawk**<br>(*Accipiter cooperii*)<br><br>SSC | Cooper's hawk is most commonly found within or adjacent to riparian/oak forest and woodland habitats. This uncommon resident of California increases in numbers during winter migration. | Low Potential – May occasionally forage within Project Site and Offsite Areas and breed within the mature Eucalyptus trees. |
| **Sharp-shinned hawk**<br>(*Accipiter striatus*)<br><br>CWL | Potential habitat for the sharp-shinned hawk includes montane coniferous forest for potential breeding areas and riparian scrub, woodland, forest habitat, oak woodland and forest, chaparral, coastal sage scrub, desert scrub, and Riversidean alluvial fan sage scrub for foraging. | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Tri-colored blackbird**<br>(*Agelaius tricolor*)<br><br>ST/SSC | Marshes, grasslands. Breeding colonies require nearby water, nesting substrate, foraging habitat of grassland, woodland, agricultural cropland (Placeworks 2022). | No Potential. Not expected to occur onsite based on a lack of nesting habitat (cattail, rushes, and willows) within or adjacent to the Project Site and Offsite Areas. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Golden eagle**<br>(*Aquila chrysaetos*)<br><br>CWL, SFP | Within southern California, the species prefers grasslands, brushlands (coastal sage scrub and chaparral), deserts, oak savannas, open coniferous forests, and montane valleys (Garrett and Dunn 1981) | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Great egret**<br>(*Ardea alba*)<br><br>Nesting Colony | Wet areas, fields, margins of open water. | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas but not breed. |
| **Great blue heron**<br>(*Ardea herodias*)<br><br>Nesting Colony | Wet areas, fields, margins of open water. | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas but not breed. |
| **Burrowing owl**<br>(*Athene cunicularia)*<br><br>SSC | The burrowing owl uses predominantly open land, including grassland, agriculture, playa, sparse coastal sage scrub, desert scrub habitats. Some breeding burrowing owls are year-round residents and additional individuals from the north may winter throughout the region. | Moderate Potential – Suitable burrows larger than 4 inches in diameter and foraging habitat documented within the fallow fields within Project Site and Offsite Areas. |
| **Ferruginous hawk**<br>(*Buteo regalis*)<br><br>CWL | Grasslands and other open terrain of the plains and foothills. Wintering species. Primarily open fields with low vegetation (Placeworks 2022). | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Swainson's hawk**<br>(*Buteo swainsoni*)<br><br>ST | Grasslands and other open terrain (Placeworks 2022). | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Mountain plover**<br>(*Charadrius montanus*)<br><br>SSC | Dry upland prairies and plains, semidesert, bare dirt fields (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation. |
| **Northern harrier**<br>(*Circus cyaneus*)<br><br>SSC | The northern harrier frequents open wetlands, wet/lightly grazed pastures, fields, dry uplands/prairies, mesic | High Potential. Observed adjacent to within Project Site and Offsite Areas during previous surveys of adjacent |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| | grasslands, drained marshlands, croplands, meadows, grasslands, open rangelands, fresh and saltwater emergent wetlands. | properties in 2022 (Cadre Environmental 2023). |
| **Western yellow-billed cuckoo**<br>(*Coccyzus americanus occidentalis*)<br><br>FT/SE | Riparian. Uncommon to rare summer resident of valley foothill and desert riparian habitats (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed riparian scrub, forest or woodland vegetation. |
| **Snowy egret**<br>(*Egretta thula*)<br><br>Nesting Colony | Wet areas, fields, margins of open water (Placeworks 2022). | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas but not breed. |
| **White-tailed kite**<br>(*Elanus leucurus*)<br><br>SFP | The white-tailed kite is found in riparian, oak woodlands adjacent to large open spaces including grasslands, wetlands, savannahs and agricultural fields. This non-migratory bird species occurs throughout the lower elevations of California and commonly nests in coast live oaks (Unitt 2004). | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **California horned lark**<br>(*Eremophila alpestris actia*)<br><br>CWL | Variety of open habitats, usually where trees and large shrubs are absent (Placeworks 2022). | Moderate Potential – Expected to occasionally forage and breed within Project Site and Offsite Areas. |
| **Merlin**<br>(*Falco columbarius*)<br><br>CWL | Grasslands, coastal sage scrub and estuaries, windrows, open fields (Placeworks 2022). | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **Prairie falcon**<br>(*Falco mexicanus*)<br><br>CWL | Habitat use of the prairie falcon includes annual grasslands to alpine meadows. The prairie falcon is associated primarily with perennial grasslands, savannahs, rangeland, some agricultural fields during the winter season, and | Low Potential – May occasionally forage within Project Site and Offsite Areas. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| | desert scrub areas, all typically dry environments of western North American where there are cliffs or bluffs for nest sites (Brown and Amadon 1968) | |
| **American peregrine falcon**<br>(*Falco peregrinus anatum*)<br><br>SFP | Throughout the species' range, peregrine falcons are found in a large variety of open habitats, including tundra, marshes, seacoasts, savannahs and high mountains (AOU 1998) | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed vegetation. |
| **Loggerhead shrike**<br>(*Lanius ludovicianus*)<br><br>SSC | This species of shrike hunts in open or grassy areas and nests in large chaparral shrubs such as ceanothus and lemonade berry. | Low Potential – May occasionally forage within Project Site and Offsite Areas. |
| **California gull**<br>(*Larus californicus*)<br><br>CWL | Nearly all types of fresh and salt water, cropland, landfills, refuse areas, open lawns (Placeworks 2022). | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas. |
| **California black rail**<br>(*Laterallus jamaicensis coturniculus*)<br><br>ST/SFP | Brackish marsh, freshwater marsh, marsh and swamp, salt marsh, wetland. Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering large bays (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Long-billed curlew**<br>(*Numenius americanus*)<br><br>CWL | Coastal estuaries, upland herbaceous areas, croplands, wet areas, open fields, shores of open water. | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas. |
| **Double-crested cormorant**<br>(*Nannopterum auritum*)<br><br>CWL | Lakes, fresh, salt, and estuarine waters (Placeworks 2022). | Moderate Potential – Expected to occasionally forage within Project Site and Offsite Areas. |
| **White-faced ibis**<br>(*Plegadis chihi*)<br><br>CWL | Freshwater marshes and brackish areas (Placeworks 2022). | High Potential. Observed adjacent to within Project Site and Offsite Areas during previous surveys of adjacent properties in 2022 (Cadre Environmental 2023). |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Coastal California gnatcatcher**<br>(*Polioptila californica californica*)<br><br>FT/SSC | The coastal California gnatcatcher is a non-migratory bird species that primarily occurs within sage scrub habitats in coastal southern California dominated by California sagebrush. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats including coastal sage scrub and associations. |
| **MAMMALS** | | |
| **Pallid bat**<br>(*Antrozous pallidus*)<br><br>SSC | Chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, riparian woodland, Sonoran desert scrub, upper montane coniferous forest, and valley and foothill grassland. Oak and grassland ecotones. Prefers foraging in the open. Roosts in attics or rock cracks; in the open, near foliage at night (Placeworks 2022). | Low Potential. Expected to occasionally forage within Project Site and Offsite Areas. |
| **Northwestern San Diego pocket mouse**<br>(*Chaetodipus fallax fallax*)<br><br>SSC | The northwestern San Diego pocket mouse occurs in coastal sage, upland sage scrubs, and alluvial fan sage scrub, sage scrub/grassland ecotones, chaparral, and desert scrubs at all elevations up to 6,000 feet. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats including coastal sage scrub and associations. |
| **Townsend's big-eared bat**<br>(*Corynorhinus townsendii*)<br><br>SSC | A wide variety of habitats including woodlands and arid grasslands. Roosts in mines and caves (Placeworks 2022). | Low Potential. Expected to occasionally forage within Project Site and Offsite Areas. |
| **San Bernardino kangaroo rat**<br>(*Dipodomys merriami parvus*)<br><br>FE/SSC | Prefers alluvial scrub, coastal sage scrub habitats with sandy and gravelly substrates. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats including Riversidean alluvial fan sage scrub and associations. |
| **Stephens' kangaroo rat**<br>(*Dipodomys stephensi*) | The Stephens' kangaroo rat is found almost exclusively in open | No Potential. Not expected to occur within Project Site and Offsite Areas based on |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| FE/ST | grasslands or sparse shrublands with cover of less than 50 percent during the summer. | a lack of suitable undisturbed habitats. |
| **Western mastiff bat**<br>(*Eumops perotis californicus*)<br><br>SSC | Roosts in rocky areas and forages in grassland, shrublands, and woodlands. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Western yellow bat**<br>(*Lasiurus xanthinus*)<br><br>SSC | Roosts in the skirts of palm trees and forages in adjacent habitats. | Low Potential. Scattered palm trees representing potential roosting habitat documented within the central region of the within Project Site and Offsite Areas. |
| **San Diego black-tailed jackrabbit**<br>(*Lepus californicus bennettii*)<br><br>SSC | The San Diego black-tailed jackrabbit in open habitats, primarily including grasslands, sage scrub, alluvial fan sage scrub, and Great Basin sage scrub. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Western small-footed myotis**<br>(*Myotis ciliolabrum*) | Feeds among trees or over brush. Roosts in caves, mines, and in cliff or rock openings (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Yuma myotis**<br>(*Myotis yumanensis*) | Water and wooded canyon bottoms. Roosts in caves and abandoned buildings (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **San Diego desert woodrat**<br>(*Neotoma lepida intermedia*)<br><br>SSC | Riversidean and coastal sage scrub, chaparral and nonnative grasslands. Shrub and desert habitats, primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Pocketed free-tailed bat**<br>(*Nyctinomops femorosaccus*)<br><br>SSC | Desert habitats. Roosts in rock crevices in cliffs (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |

| **Species Name**<br>(*Scientific Name*)<br>Status | **Habitat Description** | **Comments** |
|---|---|---|
| **Big free-tailed bat**<br>(*Nyctinomops macrotis*)<br><br>SSC | Desert habitats. Roosts in rock crevices in cliffs (Placeworks 2022). | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |
| **Los Angeles pocket mouse**<br>(*Perognathus longimembris brevinasus*)<br><br>SSC | Low elevation grassland alluvial sage scrub and coastal sage scrub habitats. | No Potential. Not expected to occur within Project Site and Offsite Areas based on a lack of suitable undisturbed habitats. |

**Federal (USFWS) Protection and Classification**
FE – Federally Endangered
FT – Federally Threatened
FC – Federal Candidate for Listing

**State (CDFW) Protection and Classification**
SE – State Endangered
SSC – State Species of Special Concern
CWL – California Watch List
SFP – State Fully Protected
SC – State Candidate for Listing

The federally endangered Delhi Sands flower-loving fly (DSFLF) is not expected to occur within Project Site and Offsite Areas based on the historic and ongoing impacts to the Project Site respective of active dairy and agricultural use. However, approximately 19-acres of the eastern region of the Project Site and Project Level Assessment Area are mapped as Delhi soils, as shown in Figure 10, *Specific Plan Soils Association Map*.

The heavily disturbed active dairy and agricultural facilities documented within the within Project Site and Offsite Areas provide low to high likelihood of occurrence (foraging, breeding and roosting habitat) for the following sensitive or locally monitored species:

- Cooper's hawk (*Accipiter cooperii*), SSC
- Sharp-shinned hawk (*Accipiter striatus*), CWL
- Golden eagle (*Aquila chrysaetos*), CWL, SFP
- Great egret (*Ardea alba*), Nesting Colony
- Great blue heron (*Ardea herodias*), Nesting Colony
- Burrowing owl (*Athene cunicularia),* SSC
- Ferruginous hawk (*Buteo regalis*), CWL
- Swainson's hawk (*Buteo swainsoni*), ST
- Northern harrier (*Circus cyaneus*), SSC
- Snowy egret (*Egretta thula*), Nesting Colony
- White-tailed kite (*Elanus leucurus*), SFP
- California horned lark (*Eremophila alpestris actia*), CWL
- Merlin (*Falco columbarius*), CWL
- Prairie falcon (*Falco mexicanus*), CWL
- Loggerhead shrike (*Lanius ludovicianus*), SSC

- California gull (*Larus californicus*), CWL
- Long-billed curlew (*Numenius americanus*), CWL
- Double-crested cormorant (*Nannopterum auritum*), CWL
- White-faced ibis (*Plegadis chihi*), CWL
- Pallid bat (*Antrozous pallidus*), SSC
- Townsend's big-eared bat (*Corynorhinus townsendii*), SSC
- Western yellow bat (*Lasiurus xanthinus*), SSC

The Project Site and Areas do not occur within or adjacent to a USFWS designated critical habitat for any federally listed threatened or endangered species.

### JURISDICTIONAL WETLAND RESOURCES

No wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project Site and Offsite Areas. The artificially created unvegetated dairy effluent retention ponds are isolated, located in uplands and currently rotated in use resulting in a wet (inundated) and dry phase. All of the active retention ponds are devoid of wetland vegetation including but not limited to riparian scrub, forest or woodland habitat.

Impacts to water quality would be less than significant during both construction and operation following preparation of a WQMP, SWPPP and compliance with NPDES permit and San Bernardino County Regional MS4 code provisions.

## ENVIRONMENTAL IMPACTS

The following section includes an analysis of the direct and/or indirect impacts of the proposed action on sensitive biological resources. This analysis characterizes the project related activities that are anticipated to adversely impact the species, and when feasible, quantifies such impacts. Direct effects are defined as actions that may cause an immediate effect on the species or its habitat, including the effects of interrelated actions and interdependent actions. Indirect effects are caused by or result from the proposed actions, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the proposed action.

### THRESHOLD OF SIGNIFICANCE

The environmental impacts relative to biological resources are assessed using impact significance criteria which mirror the policy statement contained in the CEQA at Section 21001 (c) of the Public Resources Code. This section reflects that the legislature has established it to be the policy of the state to:

> "*Prevent the elimination of fish and wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities*…"

The following definitions apply to the significance criteria for biological resources:

- "*Endangered*" means that the species is listed as endangered under state or federal law.

- "*Threatened*" means that the species is listed as threatened under state or federal law.

- "*Rare*" means that the species exists in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens.

- "*Region*" refers to the area within southern California that is within the range of the individual species.

- "*Sensitive habitat*" refers to habitat for plants and animals (1) which plays a special role in perpetuating species utilizing the habitat on the property, and (2) without which there would be substantial danger that the population of that species would drop below self-perpetuating levels.

- "*Substantial effect*" means significance loss or harm of a magnitude which, based on current scientific data and knowledge, (1) would cause a species or a native plant or animal community to drop below self-perpetuating levels on a statewide or regional basis or (2) would cause a species to become threatened or endangered.

Also, the determination of impacts has been made according to the federal definition of "*take*". FESA prohibits the "*taking*" of a member of an endangered or threatened wildlife species or removing, damaging, or destroying a listed plant species by any person (including private individuals and private or government entities). FESA defines "*take*" as "*to harass, harm, pursue, hunt, shoot, would, kill, trap, capture or collect*" an endangered or threatened species, or to attempt to engage in these activities.

## DIRECT IMPACTS

Specifically, the biological resources assessment report addresses the following CEQA Environmental Checklist items.

| **Environmental Issues** | **Potentially Significant Impact** | **Less than Significant with Mitigation** | **Less than Significant Impact** | **No Impact** |
|---|---|---|---|---|
| Would the Project: | | | | |
| **a)** Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | | **X** | | |

| Environmental Issues | Potentially Significant Impact | Less than Significant with Mitigation | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **b)** Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | | **X** | | |
| **c)** Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | | | | **X** |
| **d)** Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | | **X** | | |
| **e)** Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | | X | | |
| **f)** Conflict with the provisions of an adopted Habitat Conservation Plan, Native Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | | | | **X** |

*a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?*

**Less than Significant with Mitigation**. The 213.86-acre Project Site and Offsite Areas would not have a substantial adverse effect, either directly or through habitat modifications, on any plant species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS. No native undisturbed suitable habitat, soils or sensitive plant species observations were documented or expected to occur within the Project Site and Offsite Areas, as outlined in Table 3. *Sensitive Plant Species Assessment*. Therefore, no mitigation is required or proposed.

The 213.86-acre Project Site and Offsite Areas may result in a substantial adverse effect, either directly or through habitat modifications, on wildlife species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS, as outlined in Table 4, *Sensitive Wildlife Species Assessment*.

The federally endangered Delhi Sands flower-loving fly is not expected to occur onsite based on the historic and ongoing impacts to the Project Site and Offsite Areas respective of active dairy and agricultural use. However, approximately 19-acres of the eastern region of the Project Site and Project Level Assessment Area is mapped as Delhi soils, as shown in Figure 10, *Soils Association Map*. Current City procedure is to require a habitat assessment to determine existing habitat and biological resources on proposed development sites. If the assessment determines that there is potential habitat for Delhi Sands flower-loving fly, two-year (consecutive) protocol surveys per the USFWS Interim General Survey Guidelines for DSFLF are required (The Ontario Plan 2022). Potential impacts to DSFLS would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee, and **CM BIO-3**: Delhi Sands Flower-loving Fly Habitat Assessment.

Suitable foraging and nesting habitat for the Cooper's hawk (SSC) was documented within the Project Site and Offsite Areas. Potential impacts to foraging and nesting habitat for this species would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee, and Conservation Measure **CM BIO-4**: Nesting Bird and Raptor Preconstruction Surveys.

Suitable foraging and/or breeding habitat for the *s*harp-shinned hawk *(*CWL), golden eagle (CWL, SFP), great egret, great blue heron, burrowing owl (SSC), ferruginous hawk (CWL), Swainson's hawk (ST), northern harrier (SSC), snowy egret, white-tailed kite (SFP), California horned lark (CWL), merlin (CWL), prairie falcon (CWL), loggerhead shrike (SSC), California gull (CWL), long-billed curlew (CWL), double-crested cormorant (CWL), and white-faced ibis *(*CWL) was documented within the agricultural fields and artificially created unvegetated dairy effluent retention ponds within the Project Site and Offsite Areas. Potential impacts to foraging and/or breeding habitat for these species would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee, and Conservation Measure **CM BIO-4**: Nesting Bird and Raptor Preconstruction Surveys.

Suitable burrows larger than 4-inches in diameter and foraging habitat for the burrowing owl (SSC) were documented within and adjacent to the Project Site and Offsite Areas. Potential impacts to refugia, nesting and foraging habitat for this species would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee, and Conservation Measure **CM-BIO-5:** Focused and Preconstruction Burrowing Owl Surveys.

Suitable foraging and/or roosting habitat for the following bat species including pallid bat (SSC), Townsend's big-eared bat (SSC), and western yellow bat (SSC) was documented onsite. Potential impacts to foraging habitat for these species would be mitigated to a

level of less than significant following implementation of Mitigation Measure **MM BIO-6**: Focused Bat Survey.

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS?*

**Less than Significant with Mitigation**. A total of 194.05-acres within the Project Site and 19.81-acre Offsite Area (213.86-acres total) of vegetation communities and developed areas will be directly and permanently impacted as a result of project implementation, as summarized in Table 5, *Specific Plan Vegetation Community Impacts,* and illustrated on Figure 11*, Vegetation Communities Impact Map*. No riparian (scrub, forest, woodland), sensitive or undisturbed native/natural habitats were documented within or adjacent to the Project Site and Offsite Areas. The Project Site and Offsite Areas are characterized as heavily disturbed active dairy and agricultural facilities. Several artificially created dairy effluent retention ponds are located onsite and are either devoid of vegetation of inundated with discharge. Permanent impacts to primarily dairy, agricultural lands and artificially created dairy effluent retention ponds would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-1**: City of Ontario Biological Resources Habitat Mitigation Fee.

**Table 5.**
**Specific Plan Vegetation Community Impacts**

| Vegetation Community | Project Site Acres | *Project Level Assessment Area Acres | Offsite Areas Acres | Project Site Impact Acres | Offsite Areas Impacts Acres | Total Project Site & Offsite Areas Impacts |
|---|---|---|---|---|---|---|
| Active Dairy | 133.55 | 38.56 | 7.55 | 133.55 | 7.55 | 141.1 |
| Active Agriculture | 45.92 | 2.77 | 1.01 | 45.92 | 1.01 | 46.93 |
| Disturbed | 1.11 | 2.31 | 0.19 | 1.11 | 0.19 | 1.3 |
| Developed | 13.19 | 19.65 | 10.60 | 13.19 | 10.60 | 23.79 |
| Ornamental | 0.28 | 0.00 | 0.46 | 0.28 | 0.46 | 0.74 |
| **TOTAL** | **194.05** | **63.29** | **19.81** | **194.05** | **19.81** | **213.86** |

** The 63.29-acre Project Level Assessment Area is located within the northern region of the Specific Plan Boundary including APN's 0216-311-09, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, and -03. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction,* ***CM BIO-7*** *Programmatic Assessment Area CEQA Analysis.*

c) *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

**No Impact.** No wetlands or jurisdictional resources regulated by the USACE, CDFW, or RWQCB were documented within the Project Site and Offsite Areas. The artificially created unvegetated dairy effluent retention ponds are isolated, located in uplands and currently rotated in use resulting in a wet (inundated) and dry phase. All of the active retention ponds are devoid of wetland, riparian scrub, forest or woodland habitats.

Impacts to water quality would be less than significant during both construction and operation following preparation of a Water Quality Management Plan, Storm Water Pollution Prevention Plan and compliance with National Pollutant Discharge Elimination System permit and San Bernardino County Regional Municipal Separate Stormwater Sewer System (MS4) code provisions. Therefore, no mitigation is required or proposed.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

**Less than Significant with Mitigation.** The Project Site and Offsite Areas are completely bordered by high traffic roads, commercial/residential development, active dairy/agricultural facilities and does not represent a wildlife movement corridor or route between open space habitats. Therefore, no mitigation is required or proposed.

The Project Site and Offsite Areas possess vegetation including trees and shrubs expected to potentially provide nesting habitat for raptors and migratory birds protected under the CDFG Codes. Measures for potential direct/indirect impacts to common and sensitive bird and raptor species will require compliance with the CDFG Code Section 3503. Construction outside the nesting season (between September 1st and January 31st) does not require preconstruction nesting bird surveys. However, if construction is proposed between February 1st and August 31st, a qualified biologist will conduct a preconstruction nesting bird and raptor survey(s) no more than three (3) days prior to initiation of grading to document the presence or absence of nesting birds or raptors within or directly adjacent (200 feet, up to 500 feet for raptors) to the Project Site and Offsite Areas.

Loss of an active nest would be considered a potentially significant impact. Impacts to raptor foraging and potential nesting bird habitat would be reduced to less than significant with the implementation of Conservation Measure **CM BIO-4**: Nesting Bird and Raptor Preconstruction Surveys.

e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*

**Less than Significant with Mitigation.** Several mature trees including but not limited to pine, California sycamore white mulberry, California ash, olive, Chinese elm, tree of heaven, blue gum and red gum trees are scattered throughout the Project Site and Offsite Areas primarily within right-of-way's and adjacent to existing residences. Therefore, a

tree inventory will be required and prepared by a City approved certified arborist or qualified horticulturalist, to determine the presence/absence of Heritage Trees including assessment of health, structure, condition, and expected life span of all affected specimens.

Property proposed for development on which a Heritage Tree exists, shall require the submittal of a Tree Inventory and Preservation Plan prepared by a licensed landscape architect, horticulturalist, certified arborist, or other related professional. Said plan shall be submitted concurrent with a Development Plan or building permit request for alterations of a site, and shall be reviewed and approved by the Approving Authority for the corresponding application request. Permanent impacts to Heritage Trees would be mitigated to a level of less than significant following implementation of Mitigation Measure **MM BIO-2**: Tree Inventory and Preservation Plan.

*f) Conflict with the provisions of an adopted Habitat Conservation Plan, Native Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

**No Impact**. The Project Site and Offsite Areas are not located within or adjacent to a Conservation Program Area. Therefore, implementation of the project would not result in a conflict with the provisions of an adopted habitat conservation plan and no impact would occur. Therefore, no mitigation is required or proposed.

**INDIRECT IMPACTS**

**Water Quality**

Impacts to water quality would be less than significant during both construction and operation following preparation of a Water Quality Management Plan, Storm Water Pollution Prevention Plan and compliance with National Pollutant Discharge Elimination System permit and San Bernardino County Regional Municipal Separate Stormwater Sewer System (MS4) code provisions. Therefore, no mitigation is required or proposed.

**Toxics**

Toxic sources within the Project Site and Offsite Areas would be limited to those commonly associated with residential and mixed-use developments such as pesticides, insecticides, herbicides, fertilizers, and vehicle emissions. In order to mitigate for the potential effects of these toxics, the project will incorporate structural BMPs, as required in association with compliance with the NPDES permit system as warranted, in order to reduce the level of toxins introduced into the drainage system. Water quality measures will be implemented and no significant impacts are anticipated.

**Lighting**

No impacts related to lighting would occur during both construction and operation. The Project Site and Offsite Areas are not located adjacent to any open space habitats or sensitive biological resources. No impact.

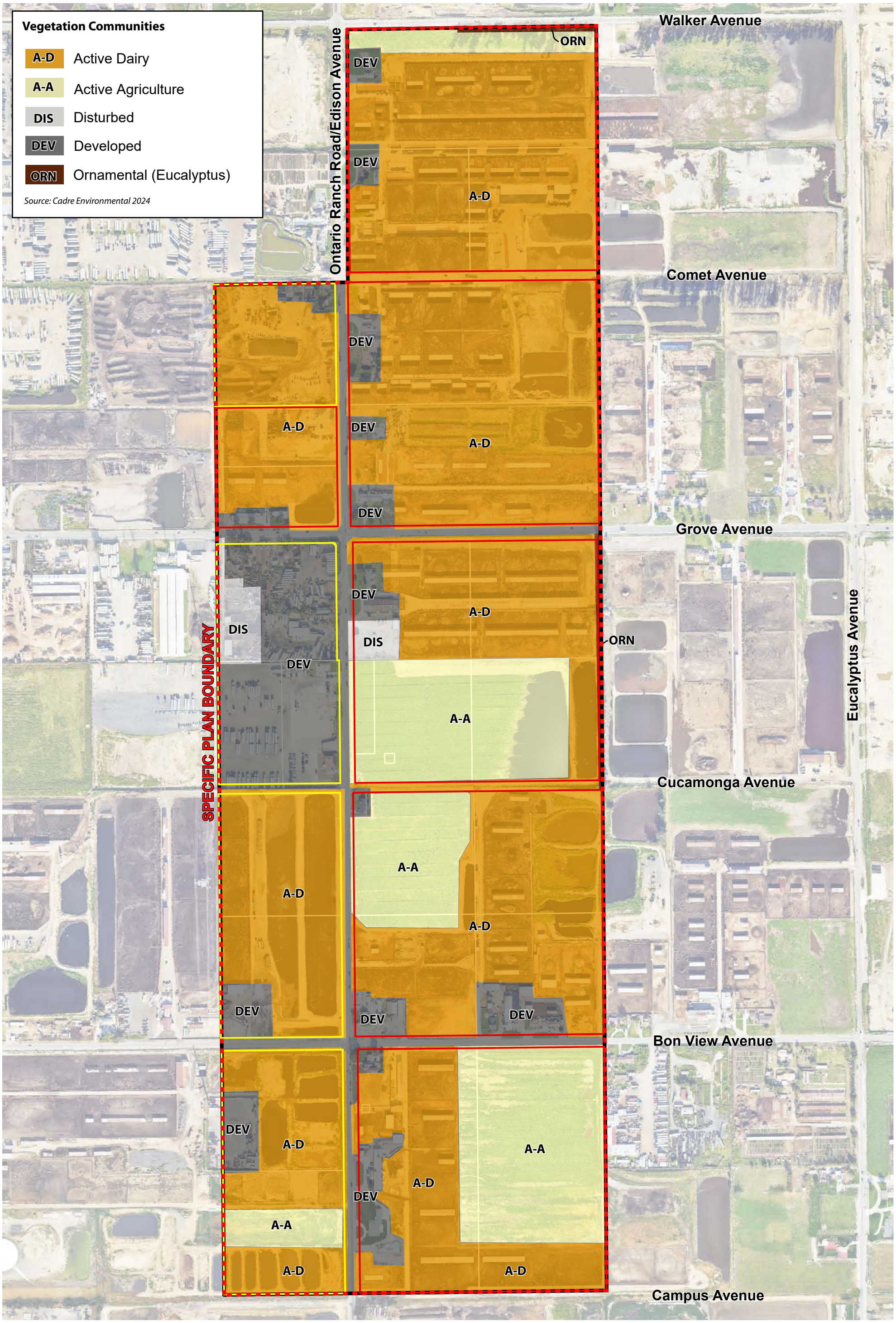


**Figure 11 - Specific Plan Vegetation Communities Impact Map**
*Biological Resources Technical Report*
*Center Park Specific Plan, City of Ontario, California*

CADRE Environmental

1 inch = 450 feet

### Noise

Noise and vibration associated with the use of heavy equipment during project construction has the potential to disrupt bird nesting, foraging and breeding behavior within or adjacent to the Project Site and Offsite Areas. Conservation Measure **CM BIO-4:** Nesting Bird and Raptor Preconstruction Survey has been incorporated into the project to collectively contribute to reducing potential indirect noise impacts to nesting bird species located within or adjacent to the Project Site and Offsite Areas. No impact anticipated.

## CUMULATIVE IMPACTS

The direct and/or indirect impacts of the project would not result in significant cumulative impacts (CEQA Section 15310) to environmental resources within the region of the Project Site and Offsite Areas. Cumulative impacts refer to incremental effects of an individual project when assessed with the effects of past, current, and proposed projects. The project represents the development of 194.05-acres within the Project Site and 19.81-acre Offsite Areas (213.86-acres total) of primarily dairy, agricultural habitat and disturbed/developed habitats, surrounded by dairy/agricultural, commercial, residential development and high traffic roads, and therefore will not result in an adverse cumulative impact to sensitive resources. Impacts related to buildout of the City and Sphere of Influence are anticipated to be less than significant if projects comply with Ontario Ranch mitigation measures and The Ontario Plan 2050 policies and standard conditions. Following implementation of the following mitigation and conservation measures, the proposed action would not conflict with the general plan policies and standard conditions for the protection of sensitive resources.

## MITIGATION & CONSERVATION MEASURES

The following biological mitigation and conservation measures (Conditions of Approval) are relevant to the protection of biological resources to the extent practicable as part of ensuring all potential impacts to sensitive or regulated biological resources are in compliance with CEQA.

### MM BIO-1: City of Ontario Biological Resources Habitat Mitigation Fee

The City of Ontario has established a habitat mitigation fee to cover potential environmental impacts to the burrowing owl, DSFLF, raptor foraging, loss of open space, and agricultural lands. Development impact fees for new development in Ontario Ranch were adopted on June 23rd, 2003, by the City Council. The Ontario Ranch development impact fees include a habitat mitigation fee of $4,320 per net acre for proposed residential, commercial, hotel and restaurant, office, and industrial development. Mitigation fees have been collected by the City of Ontario and have been deposited into a trust fund to be used for the acquisition, restoration, rehabilitation, and maintenance of lands deemed to have long-term conservation value.

**MM BIO-2: Tree Inventory and Preservation Plan**

A tree inventory will be required and prepared by a City approved certified arborist or qualified horticulturalist, to determine the presence/absence of Heritage Trees including assessment of health, structure, condition, and expected life span of all affected specimens.

Property proposed for development on which a Heritage Tree exists, shall require the submittal of a Tree Inventory and Preservation Plan prepared by a licensed landscape architect, horticulturalist, certified arborist, or other related professional. Said plan shall be submitted concurrent with a Development Plan or building permit request for alterations of a site, and shall be reviewed and approved by the Approving Authority for the corresponding application request.

The Tree Inventory and Preservation Plan shall show all existing on-site trees, and those existing trees on abutting lots and public rights-of-way with a canopy or root zone that extends onto the site or within 8 feet of a construction, staging or storage area, or graded site. Furthermore, the Tree Inventory and Preservation Plan shall identify Tree Protection Areas and trees requested to be removed, and shall show replacement trees as required by this Division.

**CM BIO-3**: **Delhi Sands Flower-loving Fly Habitat Assessment**

The eastern region of the Project Site is mapped as Delhi fine sand soils and may represent suitable habitat for the Delhi sands flower-loving fly (NRCS 2024). Either 1) a habitat assessment is conducted by a USFWS permitted biologist and concurrence from the USFWS is received that suitable habitat for the Delhi sands flower-loving fly does not occur onsite and focused surveys are not warranted or, 2) a two-year protocol survey for the Delhi sands flower-loving fly shall be conducted to determine presence/absence. If the species is detected onsite, formal consultation with the USFWS will be required.

**CM BIO-4: Nesting Bird & Raptor Preconstruction Survey**

Regulatory requirement for potential direct/indirect impacts to nesting common and sensitive bird and raptor species will require compliance with the CDFG Code Section 3503. Construction outside the nesting season (between September 1$^{st}$ and January 31$^{st}$) do not require pre-removal nesting bird surveys. If construction is proposed between February 1$^{st}$ and August 31$^{st}$, a qualified biologist will conduct a nesting bird survey(s) no more than three (3) days prior to initiation of grading to document the presence or absence of nesting birds within or directly adjacent (200 feet, up to 500 feet for raptors) to the Project Site and Offsite Areas.

The survey(s) will focus on identifying any raptors and/or bird nests that are directly or indirectly affected by construction activities. If active nests are documented, species-specific measures will be prepared by a qualified biologist and implemented to prevent abandonment of the active nest. At a minimum, grading in the vicinity of a nest will be postponed until the young birds have fledged. The perimeter of the nest setback zone will be fenced or adequately demarcated with stakes and flagging at 20-foot intervals, and construction personnel and activities restricted from the area. A survey report by a

qualified biologist verifying that no active nests are present, or that the young have fledged, will be submitted to the City of Ontario for review and approval prior to initiation of grading in the nest-setback zone.

The qualified biologist will serve as a construction monitor during those periods when construction activities occur near active nest areas to ensure that no inadvertent impacts on these nests occur. A final monitoring report of the findings, prepared by a qualified biologist, will be submitted to the City of Ontario documenting compliance with the CDFG Code. Any nest permanently vacated for the season would not warrant protection pursuant to the CDFG Code.

### CM BIO-5 Focused and Preconstruction Burrowing Owl Surveys

Focused surveys for burrowing owl will be conducted in accordance with the March 7, 2022, CDFG staff report on Burrowing Owl Mitigation. Specifically, a total of 4 surveys will be conducted: 1) at least one site visit between February 15th and April 15th, and 2) a minimum of three (3) surveys, at least three weeks apart, between Apr$^{il}$ 15th and July 15th, with at least one visit after June 15th. A report of the findings prepared by a qualified biologist shall be submitted to the City of Ontario prior to any permit or approval for ground disturbing activities.

A 14-day burrowing owl preconstruction survey will be conducted immediately prior to the initiation of ground-disturbing construction to ensure protection for this species. The survey will be conducted in compliance with CDFW guidelines (CDFW 2012). A report of the findings prepared by a qualified biologist shall be submitted to the City of Ontario prior to any permit or approval for ground disturbing activities.

If burrowing owls are detected onsite during the focused surveys or 14-day preconstruction survey efforts, during the breeding season (February 1$^{st}$ to August 31$^{st}$) then construction activities shall be limited to beyond 300 feet of the active burrows until a qualified biologist has confirmed that nesting efforts are compete or not initiated. In addition to monitoring breeding activity, if construction is proposed to be initiated during the breeding season or active relocation is proposed, a burrowing owl relocation plan will be developed and approved by the City of Ontario, CDFW and USFWS.

### CM BIO-6 Preconstruction Focused Bat Survey

Prior to implementation of project activities, a qualified biologist shall be retained to determine whether potential roosting sites for bats may be affected. For large ornamental trees and palms suitable for bat roosting/nursery, exit counts and acoustic surveys shall be performed prior to initial ground disturbance, vegetation or structure removal to determine whether the Project Site, Offsite Areas and a 300-foot buffer supports a nursery or roost, and by which species. This work will occur between late -spring and late summer and/or in the fall (generally mid-March through late October).

If the results of the bat survey find a total of a single roosting individual of a special status bat species or 25 or more individuals of a non-special status bat species with potential to be present in the Project Site and Offsite Areas (i.e., pallid bat, Townsend's big-eared bat, and western yellow bat), a Bat Management Plan shall be developed to ensure

mortality to bats does not occur. For each location confirmed to be occupied by bats, the plan will provide details both in text and graphically where exclusion devises/and or staged tree removal will need to occur, the timing for exclusion work and the timeline and methodology needed to exclude the bats. The plan will need to be reviewed and approved by CDFW prior to disturbance of the roosts.

### CM BIO-7 Programmatic Assessment Area CEQA Analysis

The 63.29-acre Project Level Assessment Area is located within the northern region of the Specific Plan Boundary including APN's 0216-311-09, 1053-301-01, -02, 1053-311-01, -02, 1053-321-01, -02, and -03. Authorization to access this region of the project was not provided and therefore was analyzed programmatically based on aerial photographs and assessments from the adjacent parcel boundaries. To ensure that potential adverse effects to sensitive species and resources are reduced to a less than significant level, a focused biological resources assessment and impact analysis shall be conducted in this Project Level Assessment Area portion of the Specific Plan Boundary prior to approval of development within this region. In addition to completing CEQA review, any focused surveys and required mitigation measures shall be implemented prior to project approval and initiation of construction

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Certification "*I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge".*

Author:_____ Date: October 2, 2024

Contact: Ruben S. Ramirez, Jr. 949-300-0212, r.ramirez@cadreenvironmental.com

**APPENDIX C2**

# DELHI SANDS FLOWER LOVING FLY HABITAT ASSESSMENT

# SARES-REGIS BROOKFIELD SITE

## CITY OF ONTARIO, SAN BERNARDINO COUNTY, CALIFORNIA

within Assessor Parcel Numbers (APNs) 0216-321-01, -02, -03, -06, -07, and -08, and 0216-322-01, -02, -03, -04, and -10.

### Delhi Sands Flower-Loving Fly Habitat Suitability Assessment

---

Prepared For:

**Sares-Regis**
3501 Jamboree Road, Suite 3000
Newport Beach, CA 92620
Contact: *Patrick Russell*

Prepared By:

**ELMT Consulting, Inc.**
2201 N. Grand Avenue #10098
Santa Ana, California 92711
Contact: *Thomas J. McGill, Ph.D.*

August 2024

# SARES-REGIS BROOKFIELD SITE

## CITY OF ONTARIO, SAN BERNARDINO COUNTY, CALIFORNIA

### Delhi Sands Flower-Loving Fly Habitat Suitability Assessment

---

The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.


Thomas J. McGill, Ph.D.
Managing Director
ELMT Consulting


August 2024

# Executive Summary

This report contains the findings of a habitat suitability assessment for the Delhi Sands flower-loving fly (*Rhaphiomidas terminatus abdominalis*) (DSF), a federally endangered species, for the Sares-Regis proposed Brookfield site in the City of Ontario, San Bernardino County, California. The purpose of this assessment is to characterize existing site conditions at the project site and assess the quality of Delhi sand soils on the project to determine if they provide suitable habitat for DSF. DSF requires clean, aeolian deposited Delhi Sand soil that has not been mixed with clay soils. Delhi Sand soils mixed with clay soils will harden or consolidate. Consolidated soils prevent DSF from burrowing into the soils and, thus, are unsuitable for the species. The habitat suitability assessment was conducted by Thomas J. McGill, Ph.D. (ELMT Consulting) on July 30, 2024.

The project site is mapped by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey as Delhi Sand soils. However, the site has been subject to several decades of use as cattle ranches and dairy farms. Due to this long-standing agricultural use, there is no native habitat on the site. The site supports one (1) land cover type that is classified as heavily disturbed. Due to this regime of constant site disturbance, the site does not support clean Delhi sand soils and is unsuitable for DSF.

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**Appendix**

Appendix A Site Photographs

# Section 1 Introduction

ELMT Consulting (ELMT) prepared this Delhi Sands Flower-loving Fly (DSF) Habitat Suitability Assessment for the proposed Brookfield Project Site (project site or site) located in the City of Ontario, San Bernardino County, California. Thomas J. McGill, Ph.D., inventoried and evaluated the condition of the habitat on July 30, 2024. This assessment was conducted to determine the project site supports clean Delhi sand soils capable of providing suitable habitat for DSF. DSF requires clean, aeolian (wind) deposited Delhi Sand soil that has not been mixed with clay soils. Delhi Sand soil mixed with clay soil will harden or consolidate. Consolidated soils prevent DSF from burrowing into the soil and, thus, are unsuitable for DSF.

## 1.1 PROJECT LOCATION

The project site is generally located south of State Route 60, west of Interstate 15, north of the State Route 91, and east of State Route 83 in the City of Ontario, San Bernardino County, California. The project site is depicted on the Corona North and Prado Dam quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series in an unsectioned portion of Township 2 South, Range 7 (refer to Exhibit 1, *Site Vicinity*). Specifically, the project site is bordered by Ontario Ranch Road (Edison Avenue) to the north, Walker Avenue to the east, Eucalyptus Avenue to the south, and Grove Avenue to the west (refer to Exhibit 2, *Project Site*). The following Assessor Parcel Numbers (APNs) 0216-321-01, -02, -03, -06, -07, and -08, and 0216-322-01, -02, -03, -04, and -10 occur onsite.

## 1.2 PROJECT DESCRIPTION

The Brookfield project proposes the construction and operation of residential, industrial and commercial uses.

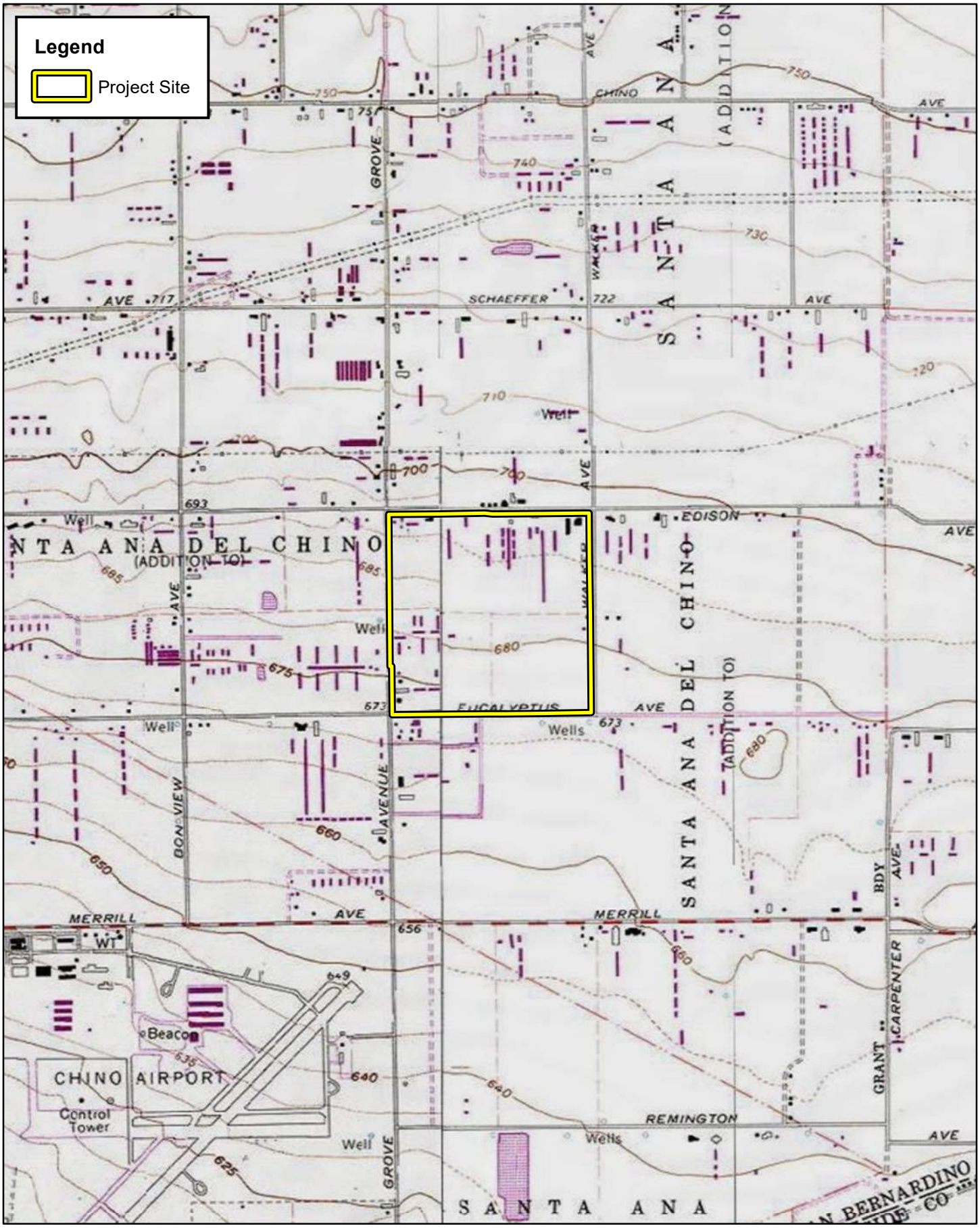


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

# Site Vicinity

ELMT CONSULTING

0 1,000 2,000 4,000 Feet

Source: USA Topographic Map, San Bernardino County

Exhibit 1

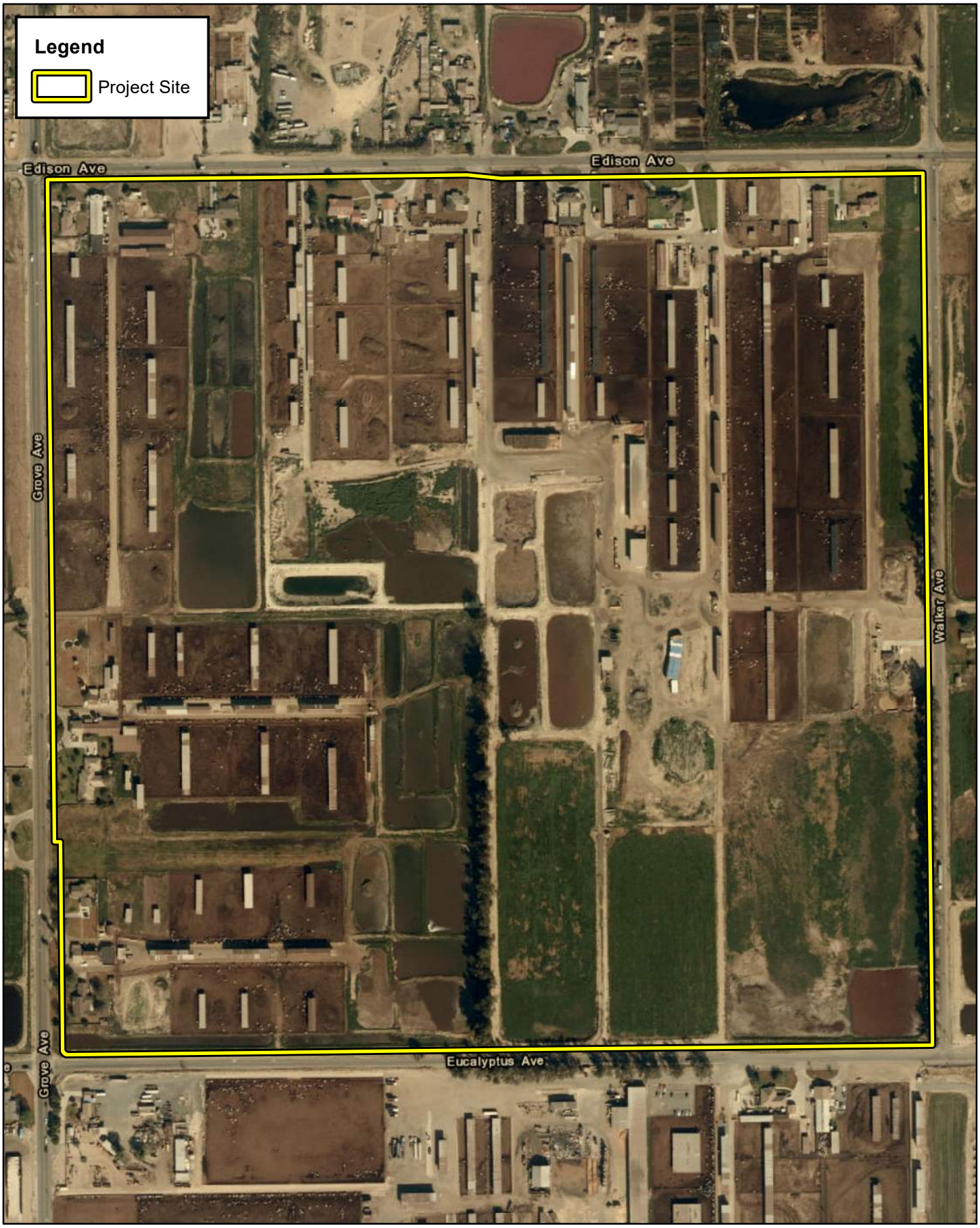


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, San Bernardino County

# Project Site

Exhibit 2

# Section 2 Background

It has been generally acknowledged that DSF occurs in Delhi sand soils, particularly clean dune formations composed of Aeolian sands. Conversely, soils and sands deposited by fluvial processes from the surrounding alluvial fans do not support DSF. These alluvial soils are composed of course sands, cobble and gravel (Tujunga soils) or coarse sands, silts and clays (Cieneba soils). In this part of San Bernardino County, the separation of soil types has been lost due to the mixing and cross contamination from years of agricultural activities, development, and other man-made disturbances.

Depending on the extent of mixing and contamination, some areas formally mapped as Delhi sand soils no longer have potential to support DSF populations. Conversely, some areas formally mapped as Cieneba soils may now support wind deposited Delhi sand soils and have potential to support DSF. Six DSF experts (Ken Osborne, Greg Ballmer, Rudy Matoni, Karin Cleary-Rose, Alison Anderson and Tom McGill) used this criterion, the relative abundance of clean Delhi sand soils versus the amount of Cienba or other alluvial soils, to rate the suitability of the habitat to support DSF (Michael Brandman Associates, 2003). Soils high in gravel and alluvial materials, or high in fine materials such as silts and clays, were rated low, while soils that appear to be high in Aeolian deposited sands were rated high. This qualitative assessment of DSF habitat was further refined by considering the relative degree of soil compaction. Alluvial soils have a tendency to solidify to a hard surface pavement, while Aeolian soils are easier to penetrate and provide good substrate for DSF.

Although it has been common to attribute the presence of four common plant species California buckwheat (*Eriogonum fasciculatum*), California croton (*Croton californicus*), deer weed (*Acmispon glaber*), and telegraph weed (*Heterotheca grandiflora*) as indicators of habitat suitability, for the assessment, vegetation composition was not given much weight in making this habitat evaluation. These dominant plant species, and plant species composition of habitats, may not be directly relevant to larval development (due to likely predatory or parasitic habitat of DSF larvae) (Osborne, et al. 2003). The known immature life histories of the nine asiloid fly families, including that to which the DSF is classified, are primarily predatory and/or parasitic on other invertebrate species (mainly insects) and the presence or absence of plant species appears not to be relevant to the life history of these flies. Regardless, none of these plant species were observed within the site boundary.

Land with suitable DSF habitat includes those areas with open, clean and unconsolidated Delhi Series soils that have not been permanently altered by residential, commercial, or industrial development, or other human actions. Areas known to contain Delhi sand soils and/or to be occupied by DSF have been divided by USFWS into three recovery units (Colton, Jurupa, and Ontario Recovery Units (USFWS, 1997)). These recovery units are defined as large geographic areas based on geographic proximity, similarity of habitat, and potential genetic exchange. The project site is located within the Ontario Recovery Unit (refer to Exhibit 3, *DSF Recovery Units*).

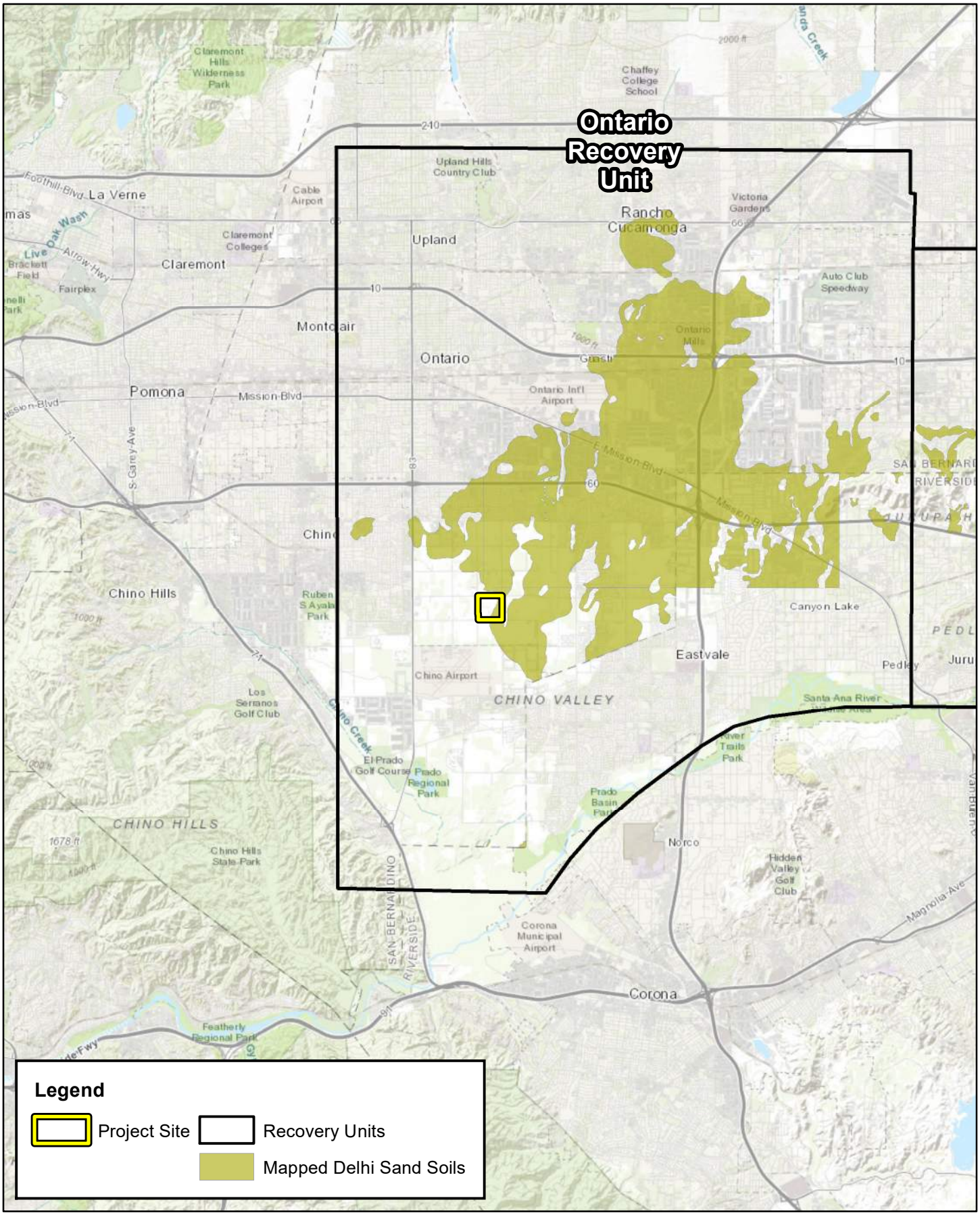


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

# DSF Recovery Units

ELMT CONSULTING

0 1 2 4 Miles

Source: World Topographic Map, Riverside County

Exhibit 3

# Section 3 Methodology

The criteria discussed in detail below were used to rate the relative abundance of clean Delhi sand soils verses the amount of Cieneba Tujunga, or other alluvial soils, to rate the suitability of the habitat to support DSF. Soils high in gravel and alluvial materials, or high in fine materials such as silts and clays, were rated low, while soils that appear to be high in Aeolian deposited sands were rated high. This qualitative assessment of DSF habitat was further refined by considering the relative degree of soil compaction. Alluvial soils have a tendency to solidify to a hard surface pavement, while Aeolian soils are loose sandy soils that are easier to penetrate and provide good substrate for DSF.

## 3.1 SOIL

Onsite soils were researched prior to the field visit using the United States Department of Agricultural (USDA) Natural Resources Conservation Survey (NRCS) Soil Survey for San Bernardino County, California. In particular, the USDA NRCS was reviewed to determine the location of mapped Delhi sand soils on or within the immediate vicinity of the project site.

## 3.2 VEGETATION

Vegetative resources and surrounding land uses were also assessed as part of determining baseline conditions by walking meander transects and recording all species observed and adjacent land uses. Common plant species observed during the field investigation were identified by visual characteristics and morphology in the field and recorded in a field notebook. Unusual and less-familiar plants were photographed in the field and identified in the laboratory using taxonomic guides. Taxonomic nomenclature used in this study follows the 2012 Jepson Manual (Hickman 2012). In this report, scientific names are provided immediately following common names of plant species (first reference only).

## 3.3 HABITAT SUITABILITY ASSESSMENT

The scope of the habitat suitability assessment was to determine the presence or absence of unconsolidated Delhi sand deposits and to determine its quality as it pertains to DSF. DSF permitted biologist, ELMT biologist Tom McGill surveyed the project site on July 30, 2024. The habitat suitability assessment consisted of a visual and tactile inspection of all areas on the project site that contain Delhi sand soils. Soils along the eastern portion of the project site are mapped as Delhi fine sands (refer to Exhibit 4, *Soils*). The site was evaluated for the quality or purity of Delhi Sands and for its potential to support DSF. Areas were assigned one or more ratings ranging between 1 and 5, with 5 being the best quality and most suitable habitat, as detailed below in each paragraph:

Ratings

1 Soils dominated by heavy deposits of alluvial material including coarse sands and gravels with little or no Delhi sand soils and evidence of soil compaction. Developed areas, non-Delhi sands soils with high clay, silt, and/or gravel content. Delhi sands extensively and deeply covered by dumping of exotic soils, rubble, trash or organic debris. *Unsuitable.*

2 Delhi sand soils are present, but the soil characteristics include a predominance of alluvial materials (Tujunga Soils and Hilmar loamy sand), or predominance of other foreign contamination. Sever and frequent disturbance (such as maintenance yard or high use roadbed). *Very Low Quality*.

3 Although not clean, sufficient Delhi sand soil are present to prevent soil compaction. Moderately contaminated Delhi sands. Delhi sands with moderate to high disturbance (such as annual disking). Sufficient Delhi sands are present to prevent soil compaction (related to contamination by foreign soils). Some sandy soils exposed on the surface due to fossorial animal activity. *Low Quality*.

4 Abundant clean Delhi sand soils with little or no foreign soils (such as alluvial material, Tujunga soils or Hilmar loamy sand) present. Moderate abundance of exposed sands on the soil surface. Low vegetative cover. Evidence of moderate degree of fossorial animal activity by vertebrates and invertebrates. May represent high quality habitat with mild or superficial disturbance. *Moderate Quality*.

5 Sand dune habitat with clean Delhi sand soils. High abundance of exposed sands on the soil surface. Low vegetative cover. Evidence (soil surface often gives under foot) of high degree of fossorial animal activity by vertebrates and invertebrates. Sand associated plant and arthropod species may be abundant. *High Quality*.

It should be noted that habitat qualities often vary spatially within a site so that conditions on a site fall within a range of qualities. Further, overall habitat quality is affected by the overall habitat value of a site.

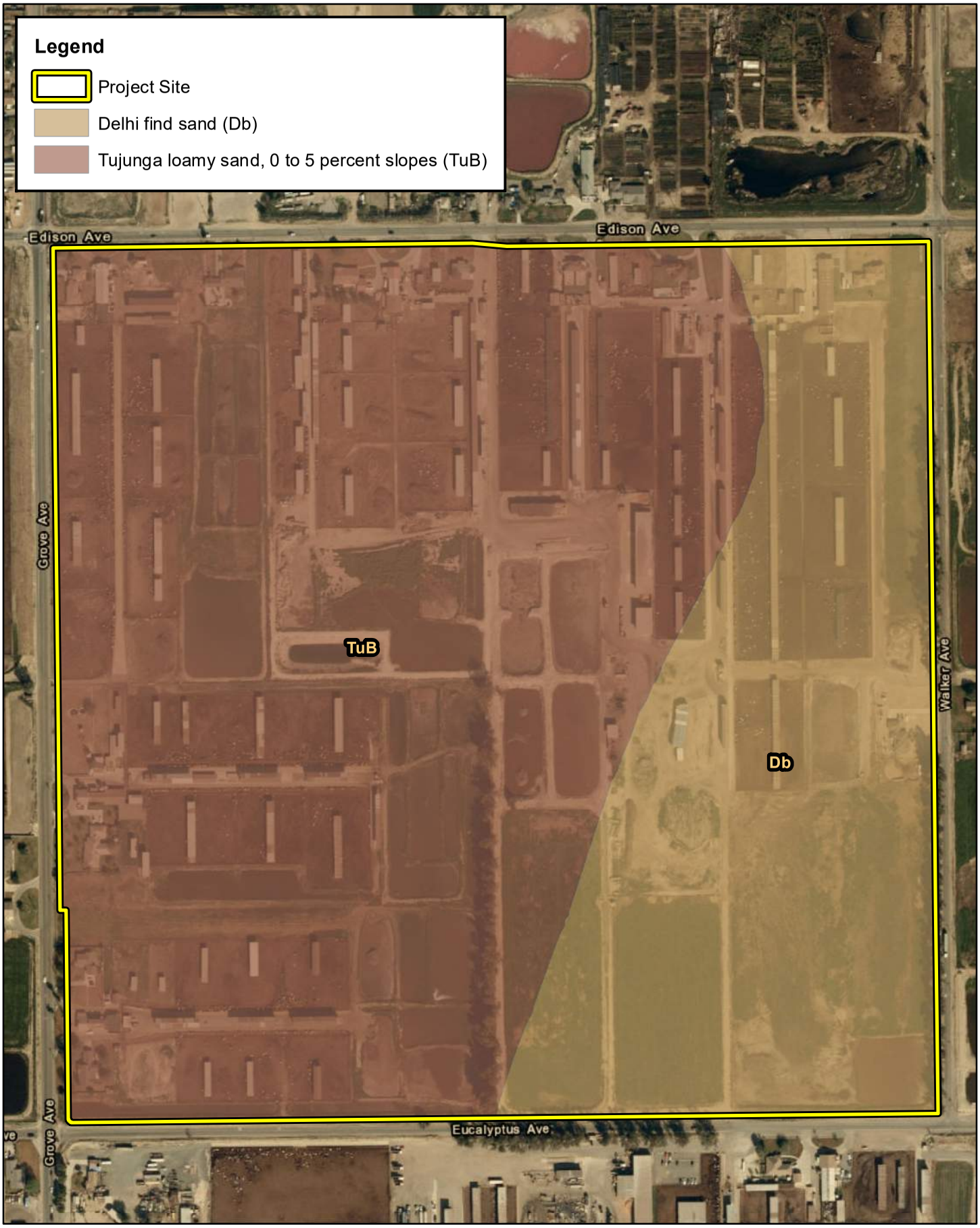


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

# USDA Mapped Soils

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, Soil Survey Geographic Database, San Bernardino County

Exhibit 4

# Section 4 Results

## 4.1 EXISTING CONDITIONS

Due to historic and existing land uses, no native or natural/undisturbed plant communities were observed on the project site. The project site consists of a mixture of land uses, including rural residential structures, cattle stock yards, waste ponds, and other agricultural uses. These disturbances have eliminated the natural plant communities that once occurred on and surrounding the project site (refer to Appendix A, *Site Photographs*, for representative site photographs).

The disturbed from its decadence is a direct result of the long-standing use of the site as a cattle ranch resulting in barren, contaminated soils with little or no vegetation. The dominant land use feature are the numerous stockyards for cows. These areas are completely barren with a thick layer of cow mature on top of the native soil that is periodically removed. Stock ponds created to treat wastewater are the second most dominate feature and are in constant flux as ponds are filled, dried out and refilled.

Developed areas include several rural residences along the northern and western boundaries with landscaped yards. Facilities for hay storage, diary operations and equipment maintenance and repair and stock piling of soils are found in the central portion of the project site.

It should be noted that several small non-native grasslands occur in scattered patches across the site that are dominated by invasive non-native grasses and may contain a variety of native and other non-native species. Areas of non-native grassland are dominated by brome (*Bromus* spp.) and wild oats (*Avena fatua*). In addition, Russian thistle (*Salsola tragus*) and puncture vine (*Tribulus terrestris*), short-podded mustard (*Hirschfeldia incana*), common fiddleneck (*Amsinckia intermedia*), telegraph weed (*Heterotheca grandiflora*), and western ragweed (*Ambrosia psilostachya*) were also identified in these small patches on non-native grasses.

## 4.2 HABITAT SUITABILITY ASSESSMENT

Per USDA NRCS Soil Survey results, Delhi sand soils have been mapped along the eastern boundary of the project site. Since Delhi sand soils are wind deposited (aeolian) as surface soils, they(See Exhibit 1, Regional Location) are affected by surface disturbance. Land with suitable DSF habitat include those areas with open, undisturbed Delhi Series soils that have not been permanently altered by residential, commercial, or industrial development, or other human actions. Areas known to contain Delhi sand soils and/or to be occupied by DSF have been divided by USFWS into three recovery units (Colton, Jurupa, and Ontario Recovery Units (USFWS, 1997)). These recovery units are defined as large geographic areas based on geographic proximity, similarity of habitat, and potential genetic exchange. As noted above, the project site is within the Ontario Recovery Unit.

Areas that have been mapped as supporting Delhi Sand soils have either been converted into pastures/holding pins or large stock ponds used to process wastewater or rural residential housing and infrastructure needed for managing the dairy farms. The stockyards are covered by a thick continuous layer of cow mature that has been mixed over the decades into any underlying Delhi Sand soils by the

constant movement of cow in the stockyards. The underlying soils contaminated with the organic waste found in the cow mature has become compacted and no longer penetrable by DSF.

The stock ponds found throughout the project site are in continuous use and either contain wastewater or are in the process of drying out for the removal of the underlying contaminated soil and deposed of offsite in an appropriate landfill. The repetitive process of contaminating the underlying soils with organic waste products, drying out the ponds and removing and deposing of the soils have eliminated all of the underlying Delhi Sand soils.

All Delhi Sand soils that may have occurred on the project site have either been removed by maintenance of the stock ponds or is so contaminated with cow mature and other waste products that clean Delhi Sand soils needed by DSF no longer exist with the project site. All areas designated as supporting Delhi Sand soils were determined to no longer support clean Delhi Sands needed by the species and were rated as unsuitable with a habitat suitability rating of 1 (see Exhibit 5, *DSF Habitat Suitability*).

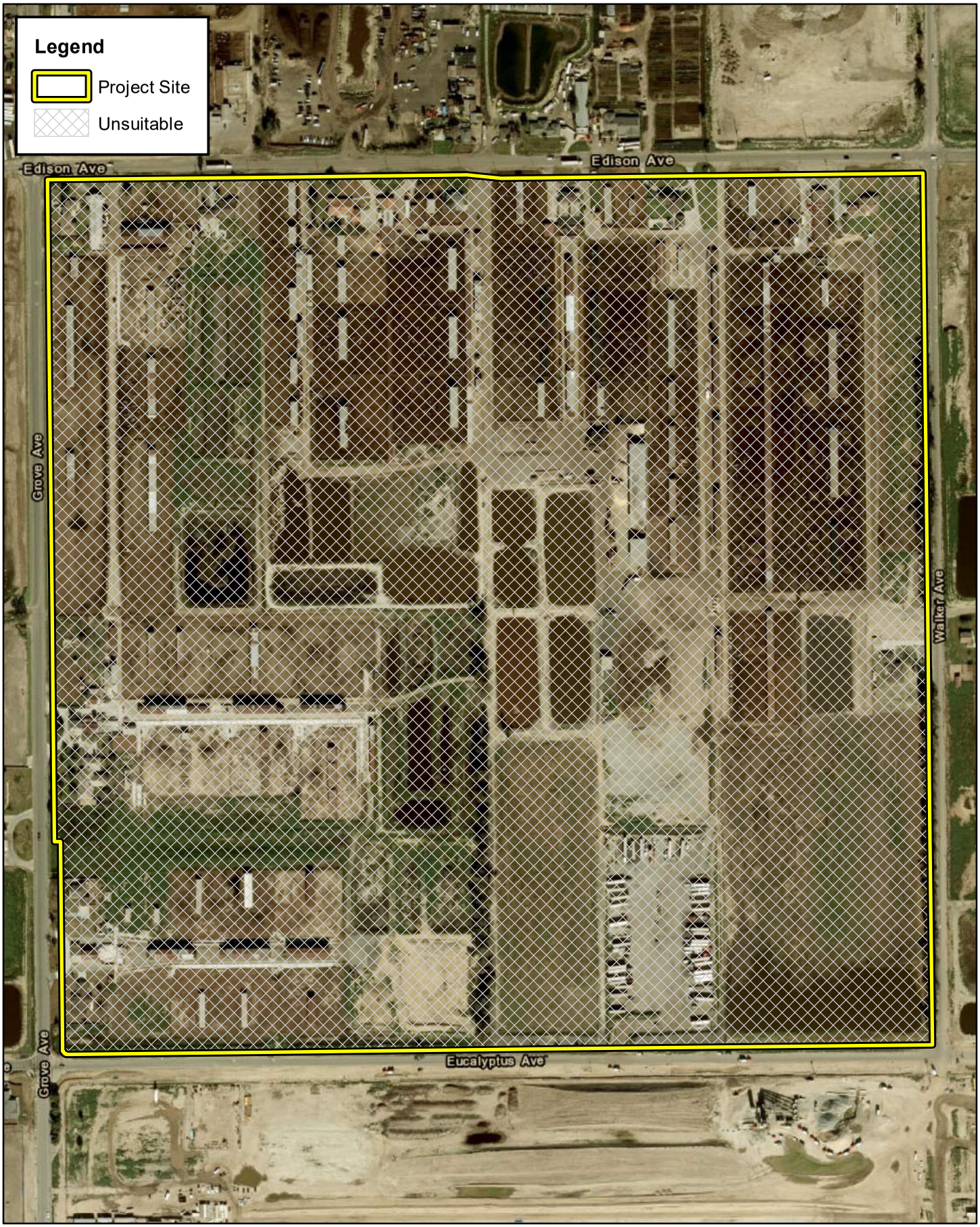


DSF SUITABILITY ASSESSMENT
BROOKFIELD PROJECT

# DSF Habitat Suitability

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, San Bernardino County

Exhibit 5

# Section 5 Conclusion and Recommendations

Based on his twenty-five years of experience with DSF and occupied DSF ecosystems, the information provided in this report, and information based on the referenced DSF habitat suitability scale (Ballmer, Osborne, McGill 2003), Dr. McGill determined that the site no longer supports clean Delhi Sand soils and was rated as unsuitable habitat with a habitat rating of 1. Implementation of the project will have no significant impacts on federally or State listed species known to have historically occurred in the general vicinity of the project site, specifically DSF. Critical Habitat has not been designated for the species. No further surveys are recommended.

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U.S. Fish and Wildlife Services. 2008. Delhi Sands Flower-Loving Fly (*Rhaphiomidas terminatus abdominalis*) 5-Year Review: Summary and Evaluation. Carlsbad, California. March 2008.

# Appendix A Site Photographs

**Photograph 1:** Looking south from the northeast corner of the project site along Walker Road. A row of eucalyptus can be seen in the background.

**Photograph 2:** Looking east along Ontario Ranch Road at the rural residences along the northern boundary of the site.

**Photograph 3:** Stock yard at the northern boundary. Note the extent of manure onsite.

**Photograph 4:** Stock yard at the northern boundary.

**Photograph 5:** Looking north from the center of the project site at cows feeding within one of the stock yards.

**Photograph 6:** One of several stock ponds found throughout the Project Site.

**Photograph 7:** Storage yard and staging area in the center of the Project Site.

**Photograph 8:** Stock pond used to process wastewater in the foreground and eucalyptus row in the background.

**Photograph 9:** Stock ponds are periodically dried out and the accumulated organic matter and other wastes are removed.

**Photograph 10:** Untreated wastewater being added to stock pond.

# APPENDIX D

## CULTURAL RESOURCES ASSESSMENT

# Cultural Resources Inventory and Evaluation Report for the Center Park Specific Plan Project, City of Ontario, San Bernardino County, California

October 16, 2025

**Prepared By:**

Jessica Mauck & Jamie Parra

Cultural Resources Management

Kimley-Horn and Associates, Inc.

3801 University Ave, Suite 300

Riverside, CA 92501

Kimley»Horn

## EXECUTIVE SUMMARY

Kimley-Horn and Associates, Inc. (Kimley-Horn) is under contract to complete a Cultural Resources Inventory and Evaluation Report for the proposed Center Park Specific Plan Project (Project) in City of Ontario (City), San Bernardino County, California. The proposed Project consists of a land use plan for residential and mixed-used retail/office development and is being reviewed pursuant to California Environmental Quality Act (CEQA) with the City of Ontario acting as the Lead Agency. This report is intended to support the City's review and consideration of the Project and potential impacts it may have on the environment specifically as it relates to cultural resources.

Kimley-Horn conducted research and cultural resources records searches through the Native American Heritage Commission (NAHC), South Central Coastal Information Center (SCCIC), California Office of Historic Preservation (OHP), and the City for the Project area and vicinity. Kimley-Horn staff identified 15 cultural resources in the Project area during the record search, all of which consist of historic-period dairy farms and associated homes. Kimley-Horn also conducted a survey of the Project area and revisited all 15 identified resources. As a result of the record search and survey, it was noted that some previously recorded sites had missing or incomplete records, to include missing data related to the original delineation of site boundaries. As such, Kimley-Horn re-created the site boundaries where possible based on record search data, while creating new ones for those with missing or incomplete information, based on the results of research and survey. Additionally, Kimley-Horn prepared preliminary evaluations for each site's eligibility for listing in the CRHR and local inventory. After survey and initial evaluations were completed, Kimley-Horn was notified that the City had obtained Urbana Preservation & Planning, LLC (Urbana) to complete an updated inventory and evaluation for the broader Ontario Ranch/New Model Colony Area, including the Project area. As such, recordation and evaluation efforts were undertaken in conjunction with Urbana for each resource to identify their potential eligibility for listing in the California Register of Historical Resources (CRHR) and/or designation as City of Ontario Historic Landmark.

As a result of these efforts, a total of 12 cultural resources with historic structures in the Project were identified as a result of this study. Three (3) of the identified resources are recommended eligible for listing in the CRHR and/or for designation as a City of Ontario Historic Landmark, and are considered historical resources under CEQA. Conditions related to reducing impacts to significance historic built environment resources are recommended, though with the understanding that such actions may not reduce impacts to these resources to less than significant. This study also concludes that the Project area has a high sensitivity for historic archaeological resources associated with the dairy farming industry, though maintains a relatively low sensitivity for buried prehistoric archaeological resources as a result of prior disturbance. However, both due to the high sensitivity of historic archaeological resources and due to the fact that the Project area was underlain by Holocene-age soils that would have maintained a moderate-to-high potential for prehistoric archaeological resources prior to disturbance, it is recommended that conditions related to archaeological monitoring during Project implementation and the process for inadvertent discoveries be included as a part of the proposed Project. With these conditions in place, impacts to unique archaeological resources would be reduced to less than significant.

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Appendix B: Record Search Results from the South Central Coastal Information Center (SCCIC)
Appendix C: CA DPR 523 Series Site Records
Appendix D: Relocation Feasibility Study

## INTRODUCTION

Kimley-Horn and Associates, Inc. (Kimley-Horn) is under contract to complete a Cultural Resources Inventory and Evaluation Report for the proposed Center Park Specific Plan Project (Project) in the City of Ontario (City), San Bernardino County, California. The Project is subject to review pursuant to California Environmental Quality Act (CEQA) with the City of Ontario acting as the Lead Agency. This report is intended to support the City's review and consideration of the Project and potential impacts it may have on the environment specifically as it relates to cultural resources. Efforts conducted for this assessment include a pedestrian survey of the Project area, cultural resources records searches, a Sacred Lands File (SLF) search, literature review, a review of cultural databases and repositories, and a review of historic maps and imagery, as well as recordation and evaluation of each resource. Due to a concurrent effort being conducted by Urbana Preservation & Planning, LLC (Urbana) to update inventories and evaluations of the broader Ontario Ranch/New Model Colony Area, recordation and evaluations for resources within the Project area were completed in conjunction with Urbana and the City. This report presents the results of these collective efforts, as well as recommended mitigation measures for the Project.

## PROJECT DESCRIPTION

The Project area is in the southwestern portion of the City of Ontario within San Bernardino County (**Figure 1**). The Project area is bounded to the north by a Southern California Edison (SCE) Easement located approximately 330 feet north of Edison Avenue/Ontario Ranch Road, Eucalyptus Avenue to the south, Campus Avenue to the west, and Walker Avenue to the east (**Figure 2**). The Project area is made up of 29 existing parcels totaling 257.34 acres. The proposed Project consists of a Specific Plan to allow for a residential and mixed-used retail/office development on the existing 29 parcels. The development would include up to 250,919 square feet of commercial retail/office uses, up to 4,293 residential units across low, low-medium, and mixed-use residential uses, 67.26 acres of open space parkland/non-recreation uses, and associated on-site and off-site infrastructure improvements, as described further below. The Project area is anticipated to be developed in four phases within 22 planning areas.

## REGULATORY SETTING

### California Environmental Quality Act

The California Environmental Quality Act (CEQA) applies to all discretionary projects undertaken or subject to approval by the state's public agencies (California Code of Regulations 14(3), § 15002(i)). Under CEQA, "A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment" (Cal. Code Regs. Tit. 14(3), § 15064.5(b)). Guidelines for Implementation of the California Environmental Quality Act (State CEQA Guidelines) section 15064.5(a) defines a "historical resource" as a resource that meets one or more of the following criteria:

- Listed in, or eligible for listing in, the California Register of Historical Resources (California Register)
- Listed in a local register of historical resources (as defined at Cal. Public Res. Code § 5020.1(k))
- Identified as significant in a historical resource survey meeting the requirements of § 5024.1(g) of the Cal. Public Res. Code

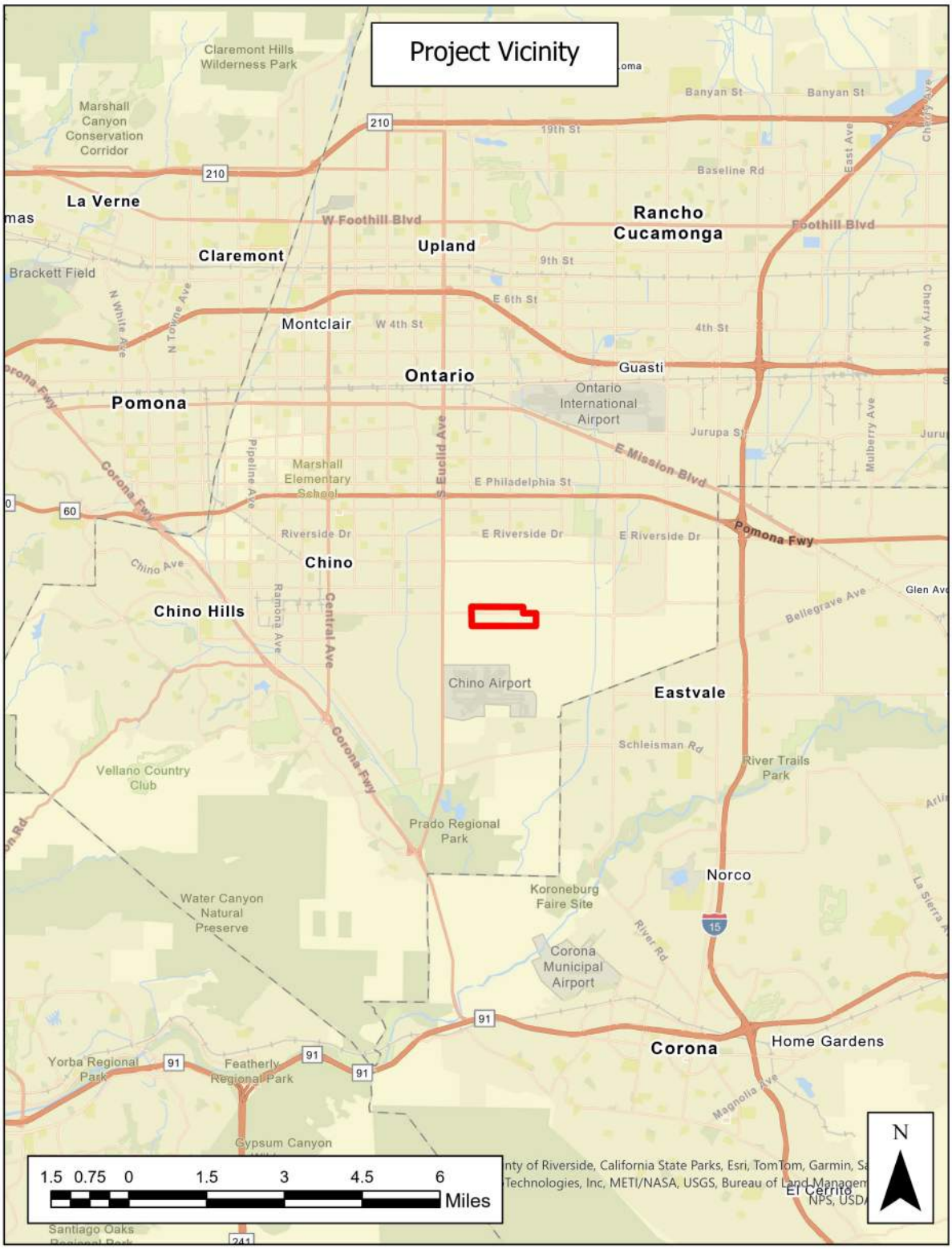


Figure 1: Project Vicinity Map

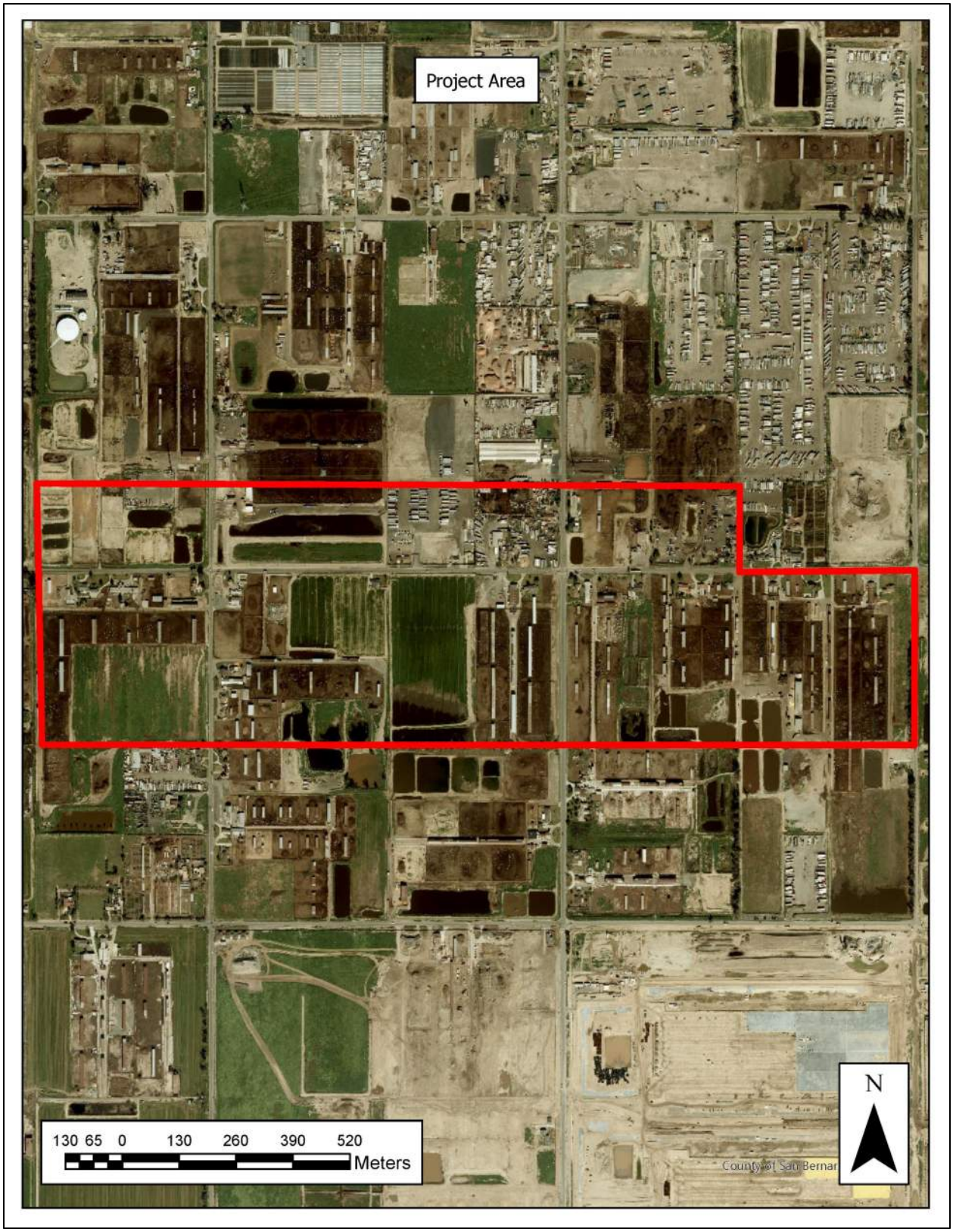


Figure 2: Project Area Map

- Determined to be a historical resource by a project's lead agency (Cal. Code Regs. Tit. 14(3), § 15064.5(a))

A historical resource consists of "Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California… Generally, a resource shall be considered by the lead agency to be 'historically significant' if the resource meets the criteria for listing in the California Register of Historical Resources" (Cal. Code Regs. Tit. 14(3), § 15064.5(a)(3)). The significance of a historical resource is impaired when a project demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for the California Register. If an impact on a historical or archaeological resource is significant, CEQA requires feasible measures to minimize the impact (State CEQA Guidelines § 15126.4 (a)(1)). Mitigation of significant impacts must lessen or eliminate the physical impact that the project will have on the resource. Section 5024.1 of the Cal. Public Res. Code established the California Register. Generally, a resource is considered by the lead agency to be "historically significant" if the resource meets the criteria for listing in the California Register (Cal. Code Regs. tit. 14(3), § 15064.5(a)(3)).

Finally, CEQA requires that significant effects on unique archaeological resources be considered and addressed. CEQA defines a unique archaeological resource as any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

CEQA Guidelines Section 15064.5 Appendix G includes significance criteria relative to archaeological and historical resources. These have been utilized as thresholds of significance here, and a project would have a significant environmental impact if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in section 10564.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 10564.5;
- Disturb any human remains, include those interred outside of formal cemeteries.

**California Public Resources Code**

California Public Resources Code (PRC) § 5024.1 establishes the California Register of Historical Resources (CRHR). The register lists all California properties considered to be significant historical resources. The

CRHR also includes all properties listed or determined eligible for listing in the NRHP, including properties evaluated and determined eligible under § 106.

California Public Resources Code (PRC) § 5020 to 5029.5 continued the former Historical Landmarks Advisory Committee as the State Historical Resources Commission. The commission oversees the administration of the California Register of Historical Resources and is responsible for designating State Historical Landmarks and Historical Points of Interest.

California Public Resources Code (PRC) § 5079 to 5079.65 define the functions and duties of the Office of Historic Preservation, which administers federal- and state-mandated historic preservation programs in California as well as the California Heritage Fund.

California Public Resources Code (PRC) § 5097.9 to 5097.991 provide protection to Native American historical and cultural resources and sacred sites; identify the powers and duties of the Native American Heritage Commission (NAHC); require that descendants be notified when Native American human remains are discovered; and provide for treatment and disposition of human remains and associated grave goods.

**California Health and Safety Code**

California Health and Safety Code § 7050.5-7055 govern the process for reporting inadvertent discoveries of human remains to the County Coroner; the process for the County Coroner to report human remains of Native American descent to the Native American Heritage Commission (NAHC); and the protections offered against removal or desecration of human remains.

**California Code of Regulations**

The California Code of Regulations govern the nomination of resources to the California Register of Historical Resources (CRHR) (14 California Code of Regulations [CCR] § 4850). The regulations set forth the criteria for eligibility as well as guidelines for assessing historical integrity and resources that have special considerations.

**California Register of Historical Resources (CRHR)**

The State Historical Resources Commission has designed this program for use by state and local agencies, private groups, and citizens to identify, evaluate, register, and protect California's historical resources. The California Register of Historic Resources (CRHR) is the authoritative guide to the state's significant historical and archeological resources.

The California Register of Historic Resources (CRHR) program encourages public recognition and protection of resources of architectural, historical, archeological, and cultural significance; identifies historical resources for state and local planning purposes; determines eligibility for state historic preservation grant funding; and affords certain protections under the California Environmental Quality Act (CEQA). To be eligible for listing in the CRHR, a resource must meet at least one of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- Is associated with the lives of persons important to local, California, or national history.
- Embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of a master; or possesses high artistic values.
- Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance. Alterations to a resource or changes in its use over time may change its historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

Isolated finds, such as a single artifact with no other associated cultural materials, are generally considered to be ineligible for listing in the CRHR. However, the nature of the isolated resource and any available ethnographic data regarding affiliated Native American populations should be carefully considered during the evaluation process, particularly as it relates to potential eligibility under Criterion 4.

**California Historical Landmarks**

California Historical Landmarks are buildings, structures, sites, or places that have been determined to have statewide historical significance. The resource must be approved for designation by the County Board of Supervisors or the City/Town Council in whose jurisdiction it is located; be recommended by the State Historical Resources Commission; and be officially designated by the Director of California State Parks. A resource must meet at least one of these following criteria:

- Be the first, last, only, or most significant of its type in the state or within a large geographic region (Northern, Central, or Southern California).
- Be associated with an individual or group having a profound influence on the history of California.
- Be a prototype of, or an outstanding example of, a period, style, architectural movement or construction or is one of the more notable works or the best surviving work in a region of a pioneer architect, designer, or master builder.

**California Points of Historical Interest**

California Points of Historical Interest are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points of Historical Interest designated after

December 1997 and recommended by the State Historical Resources Commission are also listed in the CRHR. No historical resource may be designated as both a landmark and a point. If a point is subsequently granted status as a landmark, the point designation is retired. To be eligible for designation as a Point of Historical Interest, a resource must meet at least one of the following criteria:

- Be the first, last, only, or most significant of its type within the local geographic region (city or county).
- Be associated with an individual or group having a profound influence on the history of the local area.
- Be a prototype of, or an outstanding example of, a period, style, architectural movement or construction or be one of the more notable works or the best surviving work in the local region of a pioneer architect, designer or master builder.

**California Historic Building Code**

The California Historic Building Code—California Code of Regulations, Title 24, Part 8—provides regulations for the preservation, restoration, rehabilitation, relocation, or reconstruction of buildings or properties designated as qualified historical buildings or properties. The California Historic Building Code is intended to provide solutions for the preservation of qualified historical buildings or properties, to promote sustainability, to provide access for persons with disabilities, to provide a cost-effective approach to preservation, and to provide for the reasonable safety of the occupants or users.

**City of Ontario**

The City of Ontario is a Certified Local Government (CLG) and a Preserve America Community that maintains a robust Historic Preservation Program (HPP) governed by the City's Historic Preservation Ordinance (HPO) and Article 26 of the City's Development Code. Per the City's process, all aspects of historic preservation are overseen by planning staff, the Historic Preservation Commission (HPC), and the Historic Preservation Subcommittee (HPSC). Cultural resources within the City are subject to evaluation for local listing under the City's Historic Landmark designation criteria:

a. It exemplifies or reflects special elements of the City's history;
b. It is identified with persons or events significant in local, state, or national history;
c. It is representative of the work of a notable builder, designer, architect, or artist;
d. It embodies distinguishing architectural characteristics of a style, type, period, or method of construction;
e. It is a noteworthy example of the use of indigenous materials or craftsmanship;
f. It embodies elements that represent a significant structural, engineering, or architectural achievement or innovation;
g. It has a unique location, a singular physical characteristic, or is an established and familiar visual feature of a neighborhood, community or the City; or
h. It is one of the few remaining examples in the City, region, state, or nation possessing distinguishing characteristics of an architectural or historical type or specimen.

Pursuant to Chapters 4 and 7 of the City's Development Code, minor alterations, restoration, rehabilitation, and demolition of historic resources listed in the local register require issuance of a

Certificate of Appropriateness with findings and an approved replacement structure/building prior to impact. Additionally, as outlined in Subsections G and H of Chapter 4, listed/eligible properties are designated a tier from a 3-tier system by the Historic Preservation Commission (or potentially a subcommittee of the commission) that helps identify a mitigation fee for properties based on size, type, and significance.

*Subsection G: Historic Resources Tiering System*

1. Tier I consists of historic resources that should not be demolished or significantly altered under any circumstances, regardless of their designation status, as they are the City's most significant historical or cultural resources:
    a. A resource listed on the Ontario Register that meets at least one of the criteria within the Architecture/Form category, and 3 criteria within the History category, listed in Subsection H; or
    b. A contributing resource within a district that meets at least one of the criteria within the Architecture/Form Category and 3 criteria within the History Category as listed below.
2. Tier II consists of historic resources wherein demolition of these properties should be avoided:
    a. Any historic resource listed or determined eligible for listing in the National Register of Historic Places;
    b. Any historic resource listed or determined eligible for listing in the California Register of Historic Resources;
    c. A historic resource listed on the Ontario Register and meets at least 2 criteria within the Architecture/Form or History categories, listed in Subsection H; or
    d. A contributing resource within an eligible historic district wherein the district meets at least 2 of the criteria in either the Architecture/Form or History categories as listed in Subsection H (Historic Resource Tiering Criteria) of this Section.
3. Tier III consists of historic resources that are Designated Local Historic Landmarks, are contributing properties within Designated Local Historic Districts, or are eligible historic resources. Demolition of these resources should be avoided where possible but may be appropriate under certain circumstances.

*Subsection H: Historic Resources Tiering Criteria*

1. Local Historic Landmark
    *a.* Architecture/Form
        (1) The resource is prototypical, or one of the finest examples, of a period, style, architectural movement, or construction in the City of a particular style of architecture, building type, or historical or archeological object. Only preeminent examples should be considered. Good representative examples of a style, period or method of construction are not appropriate; or
        (2) The resource is the first, last, only, or one of the finest examples, notable works, or the best surviving work by an architect or designer of major importance to the City, State or Nation.

*b.* History

(1) The resource is the location of a historic event(s) that has significantly contributed to the history of the City, State, or Nation;

(2) The resource is associated with a business, company, or individual that has made a significant cultural, social, or scientific contribution to the City, State, or Nation;

(3) The resource is identified with a person(s) who has exerted a major influence on the heritage or history of the City, State, or Nation;

(4) The resource embodies the ideals or principles of the "Model Colony" or furthers the ideals or principals established by the Chaffey Brothers;

(5) The resource has a direct relationship to one of the principal historic contexts in the City's history, including the "Model Colony," (includes the Chaffey Brothers, the Ontario Land and Improvement Company, or the citrus industry), the Guasti Winery or the wine industry, or the Dairy Preserve or the dairy industry;

(6) The resource is related with a business, company, or individual significant in the agricultural history of the City;

(7) The resource is related to the archeological past of the region.

2. Local Historic Districts

*a.* Architecture/Form

(1) The district contains resources that are a prototype of, or one of the finest examples of, or the first, last, only, or few remaining groupings of a period, style, architectural movement, or construction in the City of a particular style of architecture, building type, or historical or archeological object. Only preeminent examples should be considered. Good representative examples of a style, period or method of construction are not appropriate; or

(2) The district contains resources that are the first, last, only, or the finest examples, notable works, or the best surviving work by an architect or designer of major importance to the City, State or Nation.

*b.* History

(1) The district is the location of a historic event(s) that has significantly contributed to the history of the City, State, or Nation;

(2) The district is associated with a business, company, or individual that has made a significant, cultural, social, or scientific contribution to the City, State, or Nation;

(3) The district is identified with a person(s) who has exerted a major influence on the heritage or history of the City, State, or Nation;

(4) The district embodies the ideals or principles of the "Model Colony," or furthers the ideals or principals established by the Chaffey Brothers;

(5) The district has a direct relationship to one of the principal historic contexts in the City's history, including the "Model Colony," (includes the Chaffey Brothers, the Ontario Land and Improvement Company, or the citrus industry), the Guasti Winery or the wine industry, or the Dairy Preserve or the dairy industry, or the citrus industry; or

(6) The district is related with a business, company, or individual significant in the agricultural history of the City.

## ENVIRONMENTAL SETTING

The Project is situated in the northern Chino Valley region. The Chino Valley is characterized by a Mediterranean climate consisting of warm, dry summers and mild, wet winters. The Santa Ana River is located seven miles southeast of the Project area, and it originates in the San Bernardino Mountains and flows southwest through San Bernardino, Riverside, and Orange Counties to the Pacific Ocean. Elevation at the Project area is approximately 700 feet above mean sea level, and the topography is relatively flat across an alluvial fan. The late Quaternary Central Avenue fault line is located 5.5 miles to the west (U.S. Geological Survey 2024). Soil compositions consist mostly of Hilmar loamy fine sand (Hr) and Tujunga loamy sand (TuB) across the Project area (SoilWeb 2024). Geologic maps for this vicinity indicate that the Project area was originally underlaid by Holocene-age alluvial gravel and sand of valleys areas (Qa) (Dibblee and Ehrenspeck 2001; Dibblee and Minch 2002). However, the entire Project area has been graded and disced as a result of decades of agricultural activities. Minimal vegetation is present on the Project area as a result of the historic and modern agricultural disturbances, but this region would have once been a wet, lush valley that supported a variety of plant and animal resources. Surrounding land uses are also agricultural and rural land.

## CULTURAL AND HISTORICAL SETTING

### Ethnography

The proposed Project area is located within the ancestral territory of the Gabrieleño/Tongva. Although Alfred Kroeber recorded the territories of southern California tribes in 1925, the ancient territorial borders remain inexact for two reasons: first, territorial boundaries were flexible and, secondly, indigenous borders and land use were not recorded until after European settlements displaced many Native American communities. Although firm and defining borders cannot be known, archaeological, ethnographic, and historic evidence exists to support the prehistoric use by the Gabrieleño/Tongva in the Chino Valley.

The Gabrieleño/Tongva have a rich and diverse material culture, traditionally including shell set in asphaltum, carvings, painting, baskets, an extensive steatite industry, and a wide range of stone, shell, and bone materials. At the time of European colonization, they inhabited numerous permanent villages in fertile lowlands along waterways in sheltered areas along the coast, each of which held a population in the low hundreds. Smaller villages were also located at varying distances from these permanent villages, all of which were highly connected via economic, religious, and social ties (Bean and Smith 1978). Villages contained circular and domed homes made of tule mats, fern, or carrizo, as well as small, circular earth-covered sweathouses (Bean and Smith 1978; Kroeber 1925). Their hunting and gathering subsistence strategy included land and offshore efforts that resulted in the take of both small and large land animals, sea mammals, river and ocean fish, and a variety of plant resources. The population sometimes migrated between villages on a temporary basis throughout the year, returning to their permanent villages for ceremony or when resources needed to be replenished (Hudson and Blackburn 1982).

Records show that the long history of European colonization and harmful displacement of Native Americans initially began in 1542 as a result of Juan Rodríguez Cabrillo visiting the area during exploration. Following many subsequent Spanish visits to the region, the colonization of the indigenous population continued in 1769 around the same time as the establishment of Missions San Gabriel in 1771 and San

Fernando in 1797. Due in part to the introduction of new diseases, as well as the harsh conditions of mission life, the indigenous population quickly dwindled and cultural practices were lost. Following the secularization of the missions, most surviving Gabrieleño/Tongva became wage laborers on the ranchos of Mexican California and were later nearly completely wiped out as a result of a smallpox outbreak in the 1860s. The combination of removal, murder, disease, forced labor, and poor diet contributed to the harmful diaspora of the Gabrieleño/Tongva from established villages to scattered areas of the Los Angeles Basin for survival (Bean and Smith 1978). This history of displacement within their own ancestral lands has led to difficulty in attaining federal recognition. However, the 20th century found a revitalization of the Gabrieleño/Tongva people and culture, and though the communities remain unrecognized by the Federal government, they remain a very active people in their ancestral lands today.

**Prehistory**

Cultural theoretic frameworks for southern California archaeology are frequently debated and refined by archaeologists. The early chronologic models proposed by Wallace (1955, 1978) and Warren (1968) continue to be incorporated into current cultural studies with revisions. Archaeologists have developed the cultural frameworks in southern California by generally relying on relative dating methods using diagnostic artifacts, as opposed to absolute dating, due to a general lack of chronometric data available in the regional archaeological record. The framework proposed by Wallace introduced the Early Period, Millingstone Period, Intermediate Period, and Late Prehistoric Period, which generally follows the geologic time scale of Early, Middle and Late Holocene.

<u>Early Holocene (10,000-7500 calibrated years Before Present (cal BP)</u>

A gradual warming of the environment occurred during the Early Holocene. Researchers have proposed that groups from the Early Holocene were highly mobile and traveled across wide ranges. Cultural resources were portable or expedient to accommodate mobility. Archaeologists have recorded artifacts associated with hunting and plant processing at early Holocene sites, such as projectile points, bifaces, and groundstone tools.

<u>Middle Holocene (7500-3500 cal BP)</u>

The Millingstone Period during the Middle Holocene is characterized by new artifact types. The warming of the environment resulted in adaptations to changing environments and associated plant and animal resources. Temporary and seasonal camps were utilized during the Middle Holocene. Tools were intentionally cached, which indicate an intent to return to specific sites over time. Diagnostic artifacts have been recorded at Middle Holocene sites, such as Pinto and Silver Lake projectile points.

<u>Late Holocene (3500 cal BP through Historic Contact)</u>

Archaeological sites from the Late Holocene contain increasingly diverse artifact assemblages. Increased population is evident and multiple family groups likely coexisted within the communities. Proximity to water was an important factor for the seasonal and permanent settlements. Late Prehistoric archaeological sites contained diverse artifact assemblages, including projectile points, ceramics, pendants, incised stones, and shell beads. An increase in hunting efficiency occurred during the Late Prehistoric Period and Protohistoric Period, which is evident by the bow and arrow technology. An

abundance of mortars and pestles have been recorded at village sites and further indicate a transition towards sedentary habitation.

**History**

The Spanish first arrived at San Bernardino County in 1772 with the expedition of Pedro Fages. In 1774, Juan Bautista de Anza reached the San Bernardino Valley due to his commission to set up quarters at the Mission San Gabriel (Beck and Haase 1974). At this time, an estimated thousands of Native Americans, including the Gabrieleño/Tongva, were either taken to the Mission, removed to work as forced agricultural labor at the estancia in Redlands that served as outpost for the Mission, fled the region, or were killed (Beattie 1923). The Mission San Gabriel and its outposts resulted in a large pastoral empire that extended across the San Bernardino Valley. Cattle ranching became a major local industry during the Mission period.

In 1821, Mexico overthrew Spanish rule, and the Missions began to decline. By 1833, the Mexican government passed the Secularization Act and the Missions, reorganized as parish churches, lost their vast land holdings, and released the indigenous people that remained. Following this, land throughout present-day California was organized into Mexican land grants, and these large pastoral estates continued conducting cattle ranching during the Mexican or Rancho Period (Bacich 2017). One of the largest land grants in the area was the 22,000-acre Rancho Santa Ana del Chino, which encompassed the current Project area. In 1841, the Spanish governor Alvarado granted Rancho Santa Ana del Chino to his uncle, Antonio Maria Lugo. After receiving half of the ownership from Lugo, Isaac Williams built the Chino Ranch into an empire. The Treaty of Guadalupe Hidalgo in 1848 ended the Mexican-American War and the Mexican Rancho Period, triggering what is commonly referred to as the American Period (Del Castillo 1992).

California achieved statehood in the U.S. in 1850, which was quickly followed by the establishment of the County of San Bernardino in 1853. The arrival of the Southern Pacific Railroad to the San Bernardino Valley stimulated further development and settlement. The citrus industry continued to fuel the local economy and contributed to the regional land boom. The local area of Ontario began as a township founded in 1881 by two brothers George and William Chaffey. The local landowners and developers named the township after their hometown of Ontario, Canada. The Chaffey brothers purchased 6,000 acres of land with water rights in present-day Ontario to start the township. Part of the land included space for the Chaffey Agricultural College. The planned Ontario township was declared a “Model Colony” by an Act of Congress. The water rights, agricultural college, and access to transportation encouraged farmers to settle there (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2024). Euclid Avenue was established as a main boulevard in the colony. Dairies were established in the local area in the 1890s after dairy cows came to the California market as a part of the Gold Rush (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2024).

The City of Ontario was incorporated in 1891, during which time citrus crops were the staple of the successful agricultural community, with the local dairy industry only just beginning. The Steel and Green Dairy, which was comprised of adobe buildings at the location of the Battle of Chino, is considered to be

the first dairy developed in the area. Large, available tracts of land prime for agricultural uses in the area were a draw for dairy farmers from Los Angeles County, though citrus remained the dominate industry through the 1940s. Dairies remained smaller family-owned businesses during this period, and the 1920s saw an influx of Dutch immigrants establishing dairies in the areas. Despite the smaller sizes of the operations, the industry boomed alongside surrounding population growth, and dairies began switching from free grazing to dry-lot dairying and mechanized milking in order to optimize milk production and improve efficiency (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2004).

After World War I, many dairies were plagued by tuberculosis in dairy cows, leading to new requirements around pasteurization. Around the same time, some of the industry in Ontario transitioned to aviation when aviation enthusiasts Waldo Waterman and Archie Mitchell established Latimer Field. Eventually, the fliers were moved east to Ontario World Airport, which operated as a training facility for pilots during World War II. During this time, the population across the Los Angeles basin began to grow into a large urban area, pushing dairy farms further into the Chino Valley. By 1949, dairies in the local area provided for over 33% of the dairy production within the County. In the 1950s, the City experienced the same post-World War II population and related housing boom that was so common across the region, and many farming families firmly settled in the area so that by the late 1950s/early 1960s, the Chino Valley was home to the most technologically advanced dairies in the entire country (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2004).

During the post-World War II era, an increased popularity in utilizing Herringbone milk parlors that raised cows on platforms for milking became popular as a way of providing safer working conditions and controlling costs of labor. Prior to this in the 1920s through 1940s, milk parlors were more often constructed in an Art Deco style (1920s-1930s) followed by the Streamline Moderne style (1930s-1940). While the Art Deco milk parlors were more decorative with chevrons and zig-zags and maintained geometric and angular edges, the Streamline Moderne style milk parlors were more utilitarian and designed as two-part buildings with a large area for milking with a connected cooling area that would have maintained a smooth symmetrical style with a flat roof, stucco cladding, and glass block windows. The popularity of the glass block windows in milk parlors peaked in the 1950s, though continued to be constructed in the 1960s (Brunzell 2023; City of Ontario 2024; Galvin and Associates 2004).

In 1967, the County of San Bernardino designated 14,000 acres of Chino Valley agricultural land as an agricultural preserve and, by 1980, the local area had evolved into a world-class dairy center (City of Ontario 2024; Galvin and Associates 2004). However, the land was annexed into Ontario, Chino, and Chino Hills during the 1990s due to rising dairy operation costs and housing demands. The City of Ontario then began referring to their annexed 8,200 acres of the former San Bernardino Agricultural Preserve as the New Model Colony (NMC), which was named after the original Model Colony of Ontario established by the Chaffey brothers. The NMC is also modernly known as Ontario Ranch (City of Ontario 2024; Galvin and Associates 2004).

Ontario’s diverse history of irrigation, agriculture, viticulture, dairy, aeronautics, and World War II production transitioned the City to the next stage of expansive growth, which was focused primarily on

service industries and warehouses in the second half of the 20th century. The City's modern economic base is primarily focused on industrial and manufacturing operations and transportation (freeway, rail, and airport). Today, the City is approximately 32,000 acres in size and continues to be a booming and thriving community (City of Ontario 2024; Galvin and Associates 2004).

## METHODS

All efforts made for the completion of this report were completed pursuant to requirements set forth in the California Environmental Quality Act (CEQA). This study is intended to identify whether cultural resources are located within the Project area, whether any cultural resources are potentially significant pursuant to the above-referenced regulations and standards, and to develop specific recommendations that will address potential impacts to existing or potential resources. Tasks completed include:

- A Sacred Lands Files (SLF) search through the Native American Heritage Commission (NAHC) and a cultural records search through the South Central Coastal Information Center (SCCIC),
- A review of local, state, and national registers and inventories,
- A review of the City's 2004 Historic Context and 2025 draft Historic Context,
- Outreach to the California Office of Historic Preservation (OHP), the City, and GPA Consulting (formerly Galvin & Associates),
- A review of historical and topographic maps and other available literature,
- A pedestrian survey of the Project area,
- Recordation and evaluation of identified cultural resources, and
- Development of recommendations and/or mitigation measures for cultural resources identified or potentially unrecorded within the Project area.

## RESEARCH

### Sacred Lands File Search

The NAHC conducted a search of SLFs for the Project area and vicinity at the request of Kimley-Horn. The NAHC responded on June 10, 2024 and indicated that the results are positive for documented sacred lands in or near the Project area. The results are included in **Appendix A** of this report. The NAHC also provided a list of Native American Tribes who should be contacted for further information. The City of Ontario is responsible for conducting the applicable Assembly Bill (AB) 52 and Senate Bill (SB) 18 Tribal consultation with the Native American Tribes. The results of any Tribal consultation conducted by the City, and any information about Tribal Cultural Resources provided during consultation, will be outlined in the environmental documents prepared for the proposed Project.

### Cultural Resource Records Search

Kimley-Horn cultural resources management staff conducted a cultural resource records search at the SCCIC for the Project area plus a 0.5-mile buffer (record search area) on June 10, 2024 (**Figure 3**). No cultural resources were identified within the Project area during the records search at SCCIC, though two (2) cultural resources were identified within the 0.5-mile buffer: two (2) Southern California Edison transmission lines originally constructed during the historic period. According to the SCCIC's records, four (4) previous cultural studies have occurred in the Project area. However, the studies incorporated large-

scale linear surveys for proposed utility projects and covered very little of the Project area. The results of the records search are outlined in **Table 1** and **Table 2** below, as well as in **Appendix B** of this report.

**Table 1: Previously Recorded Cultural Resources in the Record Search Area**

| Resource | Resource Name | Age | Type | Approximate Location |
|---|---|---|---|---|
| P-36-025440 | Chino-Mira Loma No. 1 Transmission Line | Historic | Structure | 0.35 miles northwest of Project area |
| P-36-026051 | Hayfield-Chino 220kV Transmission Line | Historic | Structure | 0.05 miles north of Project area |

**Table 2: Previous Cultural Studies Identified in the Record Search Area**

| Report | Year | Author | Title |
|---|---|---|---|
| SB-01499 | 1985 | Foster, John M. and Roberta S. Greenwood | Cultural Resources Overview: California Portion, Proposed Pacific Texas Pipeline Project |
| SB-03012* | 1995 | Owen, Shelley Marie | Cultural Resources Survey and Impact Assessment for The Cajon/EPTC Pipeline Project Located in Portions of Los Angeles, San Bernardino, And Orange Counties, CA |
| SB-06095 | 2009 | Applied Earthworks | Confidential Cultural Resources Specialist Report for The Tehachapi Renewal Transmission Project |
| SB-07956* | 2007 | Doolittle, Christopher J. | Archaeological Survey Report for Southern California Edison's G.O. 131-D Assessment of The Chino A-Bank System and System Split Project San Bernadino County, CA |
| SB-07968* | 2011 | Holm, Lisa and John Holson | Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segment 8 East (Phases 2 And 3) And West (Phase 4), Los Angeles/San Bernardino Counties, CA |
| SB-07977* | 2010 | Panich, Lee, Tsim D. Schneider, and John Holson | Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segment 8 East (Phases 2 And 3), San Bernardino County, CA |

**Intersects Project Area*

**Local, State, and National Registers and Inventories**

Staff conducted a review of the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), National Historic Landmarks list (NHL), and the Built Environment Resource Directory (BERD). The BERD listed five (5) built environment resources located within the Project area:

- 7587 Edison Avenue
- 7721 Edison Avenue
- 7914 Edison Avenue
- 8185 Edison Avenue
- 14213 Bon View Avenue

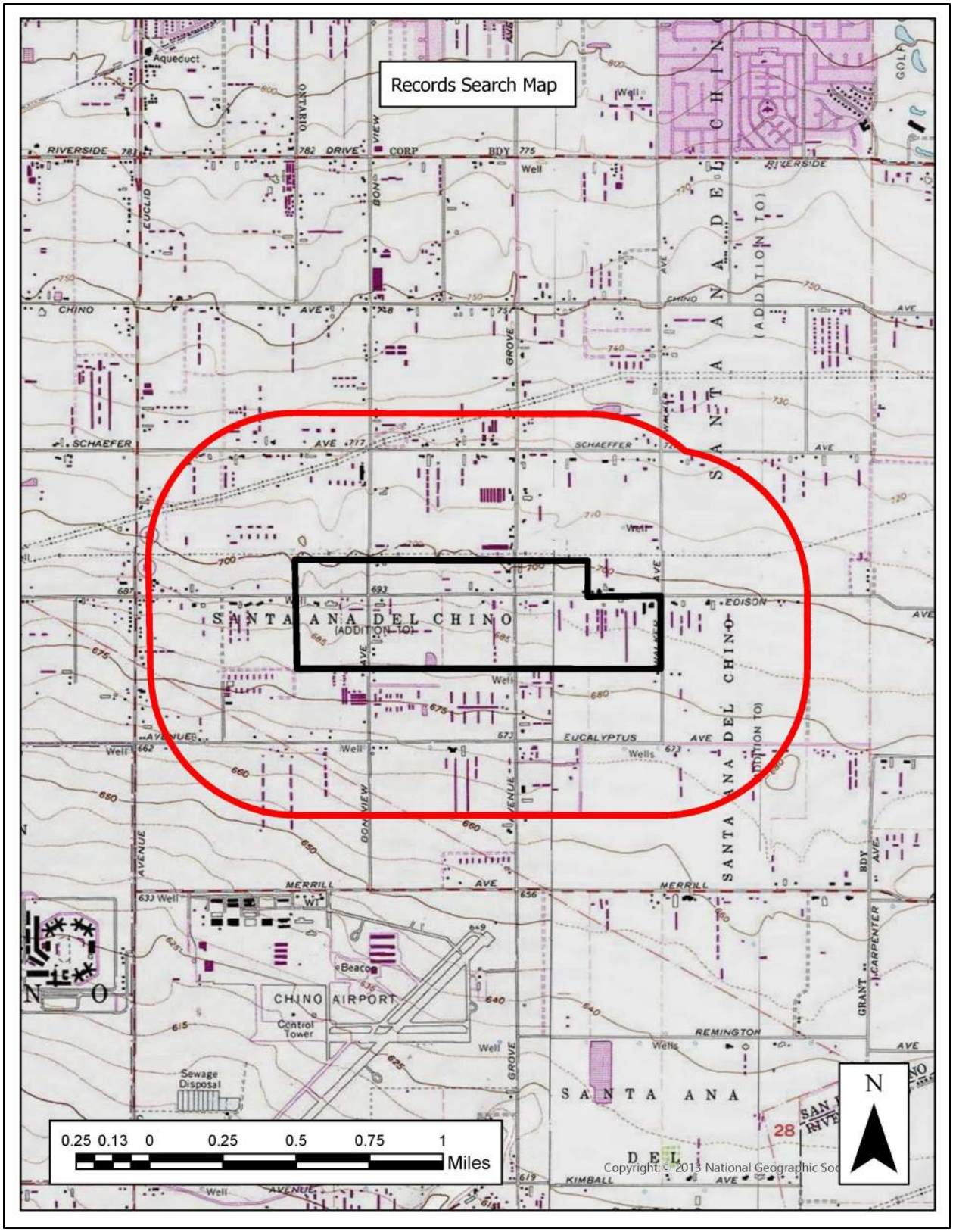


Figure 3: Record Search Area Map

Each resource was assigned a California Historical Resource Status Code of 7R, which indicates they were identified during a reconnaissance level survey but not evaluated for significance. Many additional buildings located in the Project vicinity, but outside of the Project area, were also listed in the BERD, specifically along Edison Avenue, Bon View Avenue, and Grove Avenue.

**2004 Historic Context Review**

In 2024, Kimley-Horn staff reviewed the Historic Context for the City of Ontario dairy industry prepared by Galvin and Associates in 2004. The historic context examined the New Model Colony (NMC) across 711 individual parcels and 8,200 acres, an area now known as Ontario Ranch. The current Project area is entirely located within the Ontario Ranch community. The NMC historic context identified three (3) distinct periods in local and regional dairy farming: 1) Free Grazing, 2) Dry Lot to Mechanization, and 3) Intense High Technology. Most of the dairy properties in their study area encompassed, at the minimum, a single-family residence and a milking parlor (barn). The authors also identified six (6) architectural styles or influences within their study area:

1. Victorian (1870-1915) and Italianate (1890-1935) influences
2. Craftsman Bungalow style (1905-1930)
3. Art Deco/Art Moderne style (1920-1940)
4. Minimal traditional style (1930-1960)
5. Ranch style (1935-1990)
6. Utilitarian buildings (no specific date)

Using this data, Galvin and Associates (2004) defined nine (9) historic contexts for the NMC study area:

1. Pre-1930: Rural Residential or Free-Grazing Dairy Properties
2. 1920-1940: Art Deco or Streamline Moderne Milk Parlors
3. 1930-1949: Dry Lot Dairying with Mechanization
4. Post-1950: Scientific, Large Capacity Dairies
5. No date specified: Dairy Support Industries or Other Commercial Properties
6. No date specified: Ranch Style Houses
7. No date specified: Craftsman Style Houses
8. No date specified: Buildings with Portuguese Design Influence, and
9. No date specified: Buildings with Dutch Design Influences

Galvin and Associates' 2004 study identified 15 properties within the current Project area. The 15 properties consist of the following addresses, also identified in **Table 3** below:

- 14213 Bon View Avenue
- 14283 Bon View Avenue
- 7587 Edison Avenue
- 7691 Edison Avenue
- 7721 Edison Avenue
- 7891 Edison Avenue
- 7914 Edison Avenue
- 8061 Edison Avenue
- 8185 Edison Avenue
- 8292 Edison Avenue
- 8311 Edison Avenue
- 8381 Edison Avenue
- 8485 Edison Avenue
- 14049 Grove Avenue
- 14117 Grove Avenue

The 2004 study indicated each property was recorded, though no site records were located at the SCCIC during the record search. As such, Kimley-Horn contacted the City on Ontario, OHP, and GPA Consulting (formerly Galvin and Associates) to request copies of any existing documentation of the 15 cultural resources. GPA Consulting indicated that the records were digitized in the City's internal California Historical Resources Inventory Database (CHRID) and that they did not have copies of the records. OHP was able to identify and provide DPR forms for four (4) resources, and the City of Ontario was able to provide one (1) additional site record. The City of Ontario also directed Kimley-Horn to the City's digital database, CHRID, to see if any additional information could be obtained for the sites. The platform is no longer managed and, therefore, the majority of the data is no longer retrievable. However, nine (9) of the addresses were located within CHRID and their records did provide data related to the original Assessor Parcel Numbers (APNs) that were recorded as a part of each site. As such, Kimley-Horn staff were able to re-create the majority of the original site boundaries to facilitate early stages of research for this study. More detail related to data available for each resource is located in **Table 3** below, excluding information related to the SCCIC, as the record search did not produce any relevant site data.

| **Color Key for Table 3 (below)** |
|---|
| No records were located |
| A record was located, but is missing key details, such as site information, site boundary data, etc. |
| A record was located and maintains sufficient site information, site boundary data, etc. |

**Table 3: Results of Record Searches and Record Outreach for Each Property**

| Address | CHRID | City of Ontario | OHP |
|---|---|---|---|
| 14213 Bon View Ave | Data Located | Data Located | Data Located |
| 14283 Bon View Ave | No Data Located | No Data Located | No Data Located |
| 7587 Edison Ave | Data Located | Data Located | Data Located |
| 7691 Edison Ave | No Data Located | No Data Located | No Data Located |
| 7721 Edison Ave | Data Located | Data Located | Data Located |
| 7891 Edison Ave | Data Located | No Data Located | No Data Located |
| 7914 Edison Ave | Data Located | Data Located | No Data Located |
| 8061 Edison Ave | Data Located | No Data Located | No Data Located |
| 8185 Edison Ave | No Data Located | Data Located | Data Located |
| 8292 Edison Ave | No Data Located | No Data Located | No Data Located |
| 8311 Edison Ave | Data Located | No Data Located | No Data Located |
| 8381 Edison Ave | No Data Located | No Data Located | No Data Located |
| 8485 Edison Ave | No Data Located | No Data Located | No Data Located |
| 14049 Grove Ave | Data Located | No Data Located | No Data Located |
| 14117 Grove Ave | Data Located | Data Located | No Data Located |

As a result of outreach to the City, it was noted that an update to the 2004 historic context, which would include recordation and evaluation of all historic-era structures in the NMC area, was in development by

Urbana Preservation & Planning, LLC (Urbana) and that site records for the Project area would be available for utilization in this report. As such, Kimley-Horn conducted a review of the updated 2025 historic context as a part of this study, the results of which are noted below. Additionally, site information compiled as a result of both Kimley-Horn and Urbana surveys is included later in this report, and copies of all site records prepared by Urbana can be found in **Appendix C**.

**2025 Draft Historic Context Review**

Kimley-Horn staff reviewed the draft Historic Context for the City of Ontario dairy industry prepared by Urbana in 2025. This historic context served as an update to the 2004 study described above and examined the same 8,200-acre area that makes up the NMC, now known as Ontario Ranch. During review of the 2004 study for a nearby project in 2023, BCR Consulting identified issues with data availability within the historic context and argued that actual construction of Streamline Moderne Milking Parlors did not take place within the Art Deco era (1920-1940). Instead, their study resulted in the recordation and evaluation of this building type with an associated period of significance of 1940-1965 (Brunzell 2023). During the efforts made for the 2025 historic context update, Urbana recognized a similar error in the 2004 study, though differently from BCR Consulting, concluded that both the Art Deco and Streamline Moderne styles were utilized from the 1920s through the 1960s. Additionally, Urbana's investigations identified inaccuracies with the year-built data utilized in the 2004 report, noting that many properties were developed later than what was recorded. As such, the 2025 study not only provides an updated historical narrative for the regional dairy industry but also includes necessary corrections to the prior context.

The 2025 study identified six (6) distinct themes and associated time periods in local and regional dairy farming: 1) Early Dairy Farms in Ontario, 1900s-1929, 2) Depression-Era and Wartime Dairies, 1930s-1945, 3) Postwar, Large-Capacity Dairies, 1945-1980, 4) Consolidation of Dairy Operations, 1980s-1998, 5) Important Persons, Families, and Ethnic Groups, and 6) Historic Architectural Styles, 1880s-1980s. Though significant people and ethnic groups were noted in the 2004 study, the 2025 study provides a much more detailed summary with an emphasis on Mexican, Portuguese, Basque, and Dutch immigrants. Additionally, the 2025 study includes an updated overview of significant architectural styles, categories, and influences for Ontario Ranch:

- Utilitarian, Vernacular Agricultural Architecture (1880s-1930s)
- Folk Victorian (1880s-1915)
- Craftsman (1900s-1930s)
- Art Deco (1920-1960s)
- Streamline Moderne Style (1930-1960s)
- Minimal Traditional Style (1930-1960)
- Ranch Style (1950-1980)
    - Dutch Influences
    - Portuguese Influences

In addition to updates to the historical context, the 2025 study included a large-scale survey of the Ontario Ranch area. The survey effort included recordation and evaluations of historic-era resources using the

updated historic context, significant themes, and architectural styles. As a result of the survey, Urbana identified 14 properties within the current Project area. The information in **Table 4** below includes the addresses for each of these properties, as well as details regarding their relationship to the 15 properties recorded in 2004.

| **Table 4: Properties Identified in 2025 Historic Context and Their Relationship to 2004 Properties** | |
|---|---|
| **Addresses/Name** | **Relationship to 2004 Properties** |
| 13839-13905 Bon View Ave | Not previously recorded within Project area; consists of 3 APNs, though the 1 APN within the Project area does not contain structures |
| 7587-7697 Edison Ave | Includes 2 previously recorded properties (7587 and 7691 Edison Ave) that were recorded separately; now combined |
| 14213-14297, 14333-14353, 14450, and 14451 Bon View Ave | Includes 2 previously recorded properties (14213 and 14283 Bon View Ave) that were recorded separately; now combined |
| 7914 Edison Ave | Previously recorded with the same address |
| 7595 Schaefer Ave and 13752 Bon View Ave | Not previously recorded within Project area; consists of 7 APNs, though the 2 APNs within the Project area do not contain structures |
| 13715-13751 Grove Ave, 13817-13819 Grove Ave, 8270-8292 Edison Ave | Includes 1 previously recorded property (8292 Edison Ave) in the Project area; 8270 Edison Ave was not previously recorded in the Project area; remainder of the properties are not located in the Project area |
| 8040 Schaefer Ave and 14050 Grove Ave | Not previously recorded within the Project area, though resides entirely within the Project area and contains historic structures |
| 8061 Edison Ave | Previously recorded with the same address |
| 7721-7891 Edison Ave | Includes 2 previously recorded properties (7721 and 7891 Edison Ave) that were recorded separately; now combined |
| 8185 Edison Ave | Includes 2 previously recorded properties (8185 Edison Ave and 14117 Grove Ave) that were recorded separately; now combined |
| 8311 Edison Ave | Previously recorded with the same address |
| 8335-8381 Edison Ave | Previously recorded as separate properties; now combined; consists of 4 APNs, though only 2 APNs that make up 8381 Edison Ave are within the Project area; 8335 Edison Ave was not previously recorded in the Project area |
| 8485 Edison Ave and 14350 Walker Ave | Previously recorded only as 8485 Edison Ave; now combined with 14350 Walker Ave, which was not previously recorded |
| 14049 Grove Ave | Previously recorded with the same address |

As indicated in the above table, Urbana's study made numerous changes to the site boundary delineation of the previously recorded properties, including separating resources, combining resources, and adding new APNs to resources, though all of the previously recorded properties in the current Project area were included in the updated inventory. The resource names and site boundaries reported within the 2025 Urbana study are henceforth utilized within this report for consistency.

It is important to note that while 13839-13905 Bon View Avenue and 7595 Schaefer Avenue/13752 Bon View Avenue both overlap with the Project area, the portions of the properties within the Project area consist of vacant land and there are no recorded historic-era features (i.e., buildings or structures) from these properties within the Project area. Therefore, there is no potential to impact these properties as potential historical resources, as defined under CEQA, and these properties will not be reported as cultural resources within the current Project area for the purposes of this study. As such, Kimley-Horn identified 12 cultural resources with historic structures in the Project area via the review of Urbana's 2025 study.

**Archival and Historical Research**

Kimley-Horn conducted a review of historic maps and imagery to determine the land use history across the Project area, as shown in **Figures 4-9** below (Historic Aerials 2024).

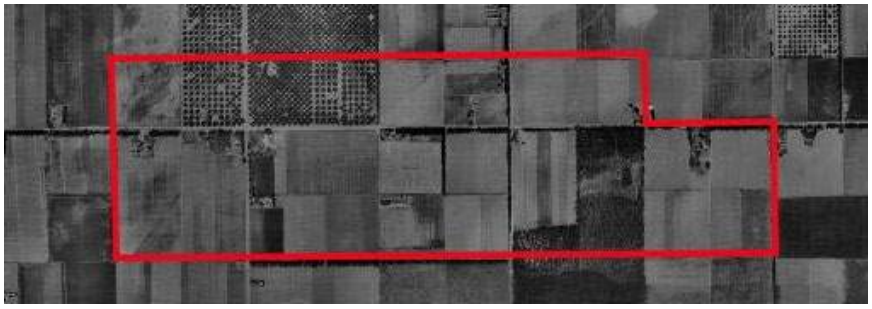

Figure 4: Historic Aerial Image of Project Area (1938)

Figure 5: Historic Aerial Image of Project Area (1946)

Figure 6: Historic Aerial Image of Project Area (1959)

Figure 7: Historic Aerial Image of Project Area (1966)

Figure 8: Historic Aerial Image of Project Area (1980)

Figure 9: Historic Aerial Image of Project Area (2020)

**Cultural Field Survey**

On June 13, July 3, July 10, and July 16, 2024, a pedestrian survey was conducted for the Project area by Kimley-Horn cultural resources management staff utilizing intensive-level and reconnaissance methods (**Figure 10**). All surface exposures were carefully inspected for the presence of cultural resources. Digital photographs were taken at various points in the Project area. Reconnaissance methods were incorporated when access was impeded by active dairy operations or landowner permissions. Survey was limited to the public right-of-way at parcels where access was not granted.

The Project area remains an active dairy and agricultural area. As such, ground visibility ranged widely during the pedestrian survey but averaged 80%. While visibility was excellent in the agricultural pastures,

the Project area also contained many paved areas that affected surface soil visibility. It was also noted that the portions of the Project area with visible soil have been heavily disturbed due to over a century of dairy and agricultural activities. Additionally, while most of the parcels were in use for active dairy operations, some parcels had been modernly developed.

Staff observed multiple building types during the survey, including single-family residences, milk parlors, ancillary buildings (garages, storage sheds), and ancillary dairy farm structures (pole barns, shade structures, troughs, holding tanks). Numerous architectural styles or influences were identified in the Project area during the survey, such as Craftsman, Ranch, Midcentury Modern, Minimal Traditional, Vernacular, Streamline Moderne, and Art Deco. Staff noted that many of the milk parlors and adjacent residences corresponded in their architectural styles. All historic-era structures were photographed and notes were taken for later use in the report. No prehistoric archaeological resources were observed during the survey.

Figure 10: Project Area Overview

Urbana surveyed the entire Ontario Ranch area between October 2024 and April 2025 for the City's updated historic context, with a focus on dairy farms and properties developed and utilized through the 1980s. Their survey observed the Project area in similar condition as the Kimley-Horn surveys.

**Resource Summary**

As noted previously, many of the previously recorded resources within the Project area had either missing or incomplete site records when Kimley-Horn initiated this study in 2024. As such, Kimley-Horn prepared new site descriptions as a result of record search and survey efforts for use in this report. Additionally, Kimley-Horn prepared preliminary evaluations of each resource, though these were conducted utilizing the 2004 historic context. However, upon receiving copies of the updated 2025 historic context and new site records prepared by Urbana from the City, Kimley-Horn made extensive updates within this report to

ensure consistency with the resource names/addresses, boundaries, site descriptions, and evaluations reflected in Urbana's documents.

As a result of this study, a total of 12 cultural resources were identified within the Project area. A list of each resource, including the address and associated APNs for each resource, is included below in **Table 5** below. Additionally, the exact location of all 12 resources, plus the two (2) resources that were excluded from the study due to lack of historic structures in the Project area, can be viewed on **Figure 11** on page 37 of this report.

| **Table 5: List of Properties (Addresses and APNs) Identified within the Project Area** | |
|---|---|
| **Addresses/Name** | **APNs** |
| 7587-7697 Edison Ave | 105337101, 105337102, and 105353101 |
| 14213-14297, 14333-14353, 14450, and 14451 Bon View Ave | 105335101, 105335102, 105354101, 105354102, 105357101, and 105357102 |
| 7914 Edison Ave | 105317101, 105332102, 105332103, and 105317106 |
| 13715-13751 Grove Ave, 13817-13819 Grove Ave, 8270-8292 Edison Ave | 021631105, 021631104, 021631103, 021631108, and 021631109 |
| 8040 Schaefer Ave and 14050 Grove Ave | 105332101 |
| 8061 Edison Ave | 105333101, 105333102, 105333103, 105333104, 105334101, and 105334102 |
| 7721-7891 Edison Ave | 105336101, 105336102, and 105336103 |
| 8185 Edison Ave | 021632103 |
| 8311 Edison Ave | 021632108 |
| 8335-8381 Edison Ave | 021632201, 021632202, 021632203, and 021632204 |
| 8485 Edison Ave and 14350 Walker Ave | 021632205 and 021632210 |
| 14049 Grove Ave | 021631101 and 021631102 |

**RESOURCE DESCRIPTIONS AND EVALUATIONS**

The 12 cultural resources identified within the Project area are briefly described below, along with conclusion made as to their eligibility for listing in the California Register of Historical Resources (CRHR) and designation as a City of Ontario Historic Landmark. Much of the below narrative was retrieved directly from the respective site record prepared by Urbana located in **Appendix C**, though each record contains additional detailed information for each resource.

*7587-7697 Edison Ave*

This property includes three (3) parcels that total 46.58 acres located south of Edison Avenue between Sultana and Bon View Avenues. It includes a Craftsman Bungalow style dwelling and detached garage, a

Ranch style milk parlor, a Ranch style dwelling, several ancillary structures/features associated with dairy operations (silos, troughs, feeding gates, sheds, pole structures, etc.), and a paved driveway. The property dates to pre-1935 with later developments between 1959 and 1966 and was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The pre-1935 Craftsman house has an asymmetrical façade with a one-and-a-half-story irregular floor plan. The exterior is clad in tan stucco with red trim on the windows and doors. The high-pitched, side-gabled roof is covered in composition shingles and includes a wide eave overhang, open eaves, decorative wood brackets below the gable end, and exposed rafter ends. A stucco chimney rises from the front roof slope. The fenestration consists of wood-framed, one-over-one, double-hung and fixed windows with red-painted lintels and sills. The main (north) elevation features a full-width front porch beneath the main roofline, supported by tapered wood/concrete beams, as well as a gabled dormer centered on the roof slope. At the rear (south) elevation, a two-story addition was added to the southwest corner in the late 1970s, which has a gabled roof, aluminum sliding sash windows, and a tan stucco façade. It is easily distinguishable from the original structure but is compatible with the dwelling's historic character and did not result in the removal of original character-defining features. East of the dwelling is a detached one-car garage with a rectangular floorplan, tan stucco facade, and gabled roof.

The Ranch style dwelling at 7587 Edison Avenue and the associated Ranch style milk parlor were constructed between 1959 and 1966. The milk parlor features a horizontal floor plan with two milking parlor wing sections separated by a breezeway. The front section exhibits Ranch style characteristics, including a hip-and-gable roof with wood shake shingles, stucco walls, metal fixed and casement windows, and a stone veneer. The breezeway has metal doors on both the east and west elevations. South of the breezeway, the milking parlor sections have low sloped gable roofs oriented along an east-west axis. Ventilation is provided by horizontal louvered metal shutters on the north and south elevations, positioned between concrete walls. Additional features include a metal door at the main (north) entryway, a circular driveway, and a bulk tank in front with two silos are located at the rear. The dwelling has an asymmetrical façade and a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a stone veneer on the main (north) elevation. The moderately pitched hip-and-gable roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, a cupola above the breezeway, and a stone chimney on the rear roof slope. The fenestration consists of a mix of aluminum fixed and sliding sash windows and vinyl units. The primary elevation features a recessed entryway below the main roofline with two double half-lite wood doors, a small concrete stoop, a stone planter, and box bay windows accented by red horizontal wood siding. A wide, open breezeway on the east elevation connects the three-car garage to the dwelling.

- The entire property is eligible under CRHR and City of Ontario criteria 1/a for its significant association with the "Postwar, Large-Capacity Dairies, 1945–1980" theme.
- The pre-1935 Craftsman Bungalow is individually eligible under CRHR and City of Ontario criteria 3/d within the "Craftsman Bungalow Style, 1900s–1930s" context with a period of significance of 1920s-1930s.

- The Ranch style dwelling is individually eligible under CRHR and City of Ontario criteria 3/d within the "Ranch Style, 1950–1970s" context with a period of significance of 1959-1966.
- The Ranch style milk parlor is not individually significant, though remains a contributor to the overall significance of the property as a Postwar Large Capacity Dairy complex.

*14213-14297, 14333-14353, 14450, and 14451 Bon View Ave*

This property includes six (6) parcels that total 56.47 acres located east of Bon View Avenue between Euclid and Eucalyptus Avenues. It includes two (2) Ranch style milk parlors, two (2) Minimal Traditional residences, two (2) Craftsman Bungalow residences, two (2) Ranch style dwellings, and multiple geometrically spaced ancillary storage structures located to the rear of the buildings. The property dates to pre-1935 with later improvements between the 1950s and 1990s, and was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

Both Craftsman Bungalows were constructed before 1935. One (1) bungalow located at 14213 Bon View Avenue is a one-and-a-half-story dwelling that has a compact rectilinear floorplan and an asymmetrical façade. The exterior is clad in tan stucco with brown trim on the windows. The high-pitched, cross-gabled roof is topped with composition shingles and features a moderate eave overhang, support brackets below the gable, open eaves with exposed rafter ends, and a shed dormer on the main (west) elevation. The fenestration consists primarily of aluminum sliding sash windows and wood panel doors. The main elevation includes a full-length porch supported by two (2) metal columns, a small stoop, and four (4) concrete square columns approximately four (4) feet in height. The rear (east) elevation features an early addition that was added between 1938 and 1946 and features a stucco façade, gabled roof topped with composition shingles, open eaves with exposed rafter ends, and aluminum windows. It likely originally featured wood-framed, double-hung windows as well as columns composed of a different material, which were removed or altered. The other bungalow at 14343 Bon View Avenue features a rectangular footprint and an asymmetrical façade with a tan stucco exterior. The high-pitched, side-gabled roof is topped with composition shingles and includes a minimal eave overhang, boxed eaves, and two (2) gabled dormers on the north and south elevations. The fenestration primarily consists of aluminum sliding sash windows. An addition was constructed at the east elevation between 1959 and 1966. The dwelling exhibits minimal decorative detailing throughout. A few feet north of the dwelling is a one-car garage, which features a front-gabled roof and a metal overhead door.

A Ranch style milk parlor and two (2) Minimal Traditional residences at 14213-14297 Bon View Avenue were constructed between 1959 and 1966. The milk parlor is a one-story structure that has been substantially altered and now consists of three (3) sections: the front milk house with an addition to the south elevation, the original rear milking parlor to the east of the milk house, now modified as a storage shed, and a new milking parlor section extending from the milk house addition. The milk house and milking parlor are separated by a breezeway which features a metal sliding barn door with a handle on the south elevation. Additional elements include metal doors at the front, a dairy association sign below the gable, and a circular driveway in front of the milk parlor. Both associated Minimal Traditional residences feature asymmetrical façades and rectilinear floorplans atop concrete foundations. The 14283 Bon View Avenue

dwelling has a tan stucco exterior, a hipped roof topped with composition shingles, moderate eave overhang, and boxed eaves. The main entryway is recessed, with a partial porch that includes a small stoop and decorative iron railing and columns. Fenestration consists of aluminum sliding sash windows and paneled doors. The 14297 Bon View Avenue dwelling features a tan stucco façade, a side-gabled roof with composition shingles, and an attached narrow garage with an overhead metal door. The main elevation includes a half-width porch supported by decorative metal columns and railing, a small stoop, aluminum sliding sash windows, and paneled doors.

The Ranch style dwellings were both constructed between 1968 and 1975. The dwelling at 14353 Bon View Avenue features an asymmetrical, horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan-painted stucco with brown window trim. The low-pitched hipped roof is topped with terracotta tiles and features a minimal eave overhang with boxed eaves. The fenestration is mostly obscured from the public right-of-way but appears to consist of fixed multi-lite or single pane picture windows. A detached one-car garage is situated south of the dwelling, featuring a tan stucco façade, a hipped roof with terracotta tiles, and a metal overhead door. The dwelling at 14451 Bon View Avenue has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a brick veneer and a planter on the main (west) elevation. The low-pitched hipped roof is topped with composition shingles, featuring a moderate eave overhang, boxed eaves, and a stone chimney on the rear roof slope. The main elevation showcases a recessed entryway beneath the roofline, with two (2) decorative wood-paneled doors and box bays accented by horizontal wood siding. The fenestration throughout consists primarily of vinyl sliding sash windows.

The Ranch style milk parlor at 14450 Bon View Avenue was constructed between 1968 and 1975. It is a one-story milk parlor with a front milk house and rear milking parlor separated by a breezeway. The milk house features modest Ranch style elements, including a hip-and-gable roof with wood shake shingles, a stucco façade with stone accents along the corners of the main (west) elevation, and metal casement windows on the north elevation. The fenestration throughout has since been boarded up. East of the breezeway, the building is divided into a milking area and a wider holding area. The milking area features louvered horizontal shutters on the north and south elevations, set atop concrete walls. The holding area, which extends outward beyond the milking area, is partially open and supported by concrete walls and metal poles. Both sections have gabled roofs oriented along an east-west axis. Additional features include two (2) glass industrial doors at the front, a circular driveway in front of the milk parlor, and a dairy association sign.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- Though the property retains integrity of location, setting, feeling, and association, several buildings have been subjected to extensive alteration and, therefore, the property does not retain integrity of design, materials, or workmanship.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*7914 Edison Ave*

This property includes four (4) parcels that total 18.79 acres located north of Edison Avenue between Bon View and Grove Avenues. It includes two (2) Ranch style dwellings and a Streamline Moderne milk parlor. One (1) Ranch style residence and the milk parlor were constructed between 1952 and 1959, while the second residence was added between 1966 and 1980. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The older Ranch style residence has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with brick and wood shiplap veneer on the main elevation. The low-pitched hipped roof is topped with composition shingles, has a moderate eave overhang, boxed eaves, and a brick chimney along the roof slope at the rear (north) elevation. The fenestration consists of metal casement windows and sliding sash windows. The main elevation features a partial-width porch beneath a shed roof supported by decorative metal beams, a small stoop, and additional decorative metal details. To the west side of the dwelling is a one-car garage installed by the 1980s with a brown paneled overhead door. The Streamline Moderne milk parlor is directly west of the residence, though retains only the front milk house section. The rear milking parlor section was demolished by April 2022.

The second Ranch style residence has an asymmetrical façade and a mostly rectilinear floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a partial brick veneer on the main (south) elevation. The low-pitched hipped roof features a moderate eave overhang and boxed eaves. The fenestration primarily consists of vinyl sliding sash windows, which replaced the original aluminum units in 2022. The main (south) elevation features a recessed main entryway with decorative double wood-paneled doors, a small stoop, a decorative metal beam beneath the roofline and entryway, and an attached garage on the west side with an overhead door.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- While the Streamline Moderne milk parlor may have once been a distinctive example of this architectural type, the building has been subjected to extensive alteration/demolition and, therefore, no longer retains integrity of design, materials, workmanship, feeling, or association.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*13715-13751 Grove Ave, 13817-13819 Grove Ave, 8270-8292 Edison Ave*

This property includes five (5) parcels that total 46.80 acres located east of Grove Avenue between Schaefer and Edison Avenues. It includes two (2) Ranch style dwellings and two (2) associated milk parlors with Dutch style characteristics, as well as two (2) Minimal Traditional style dwellings. The older Minimal Traditional style residences were constructed between 1948 and 1952, while the Ranch Style structures were constructed between 1959 and 1966. It was historically associated with dairy operations and retains

that association today. Historical aerials indicate the built environment has remained the same since that time period.

The first Ranch-style residence features an asymmetrical façade with a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in yellow painted stucco with horizontal wood siding on a portion of the main (west) elevation, accented by white trim around the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and features a moderate eave overhang, open eaves with exposed rafter tails, and decorative scalloped barge board at the gable ends. The fenestration visible from the public right-of-way consists of wood single-hung windows and a wood half-lite diamond patterned door. The main (west) elevation exhibits Northern European or Dutch influences, such as the diamond-patterned door, scalloped barge board, wood spindle porch supports, and a square cupola. The attached two-car garage is connected to the residence by a breezeway on the south elevation. Additional features include a stone planter and concrete steps at the main entryway.

A milk parlor is located south of the residence. The building has a horizontal floor plan and is divided into two sections: the front milk house and a rear milking parlor, separated by an open breezeway. The front section reflects Ranch style characteristics, featuring a front-gabled roof with wood shake shingles, yellow painted stucco walls, and metal casement and fixed windows. An open breezeway separates this front section from the rear portion of the building. South of the breezeway, the milking parlor has a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls and along the gable ridge. Additional features include a circular driveway, metal doors at the main entryway, and a stone planter. The main (west) elevation of the front section also displays Northern European or Dutch influences, such as diamond-patterned fixed windows and a gabled shed roof above the main entryway supported by curved knee brackets.

The second Ranch-style residence also features an asymmetrical façade with a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in beige painted stucco with tan horizontal wood siding on a portion of the main (west) elevation, accented by white trim around the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and features a moderate eave overhang, boxed eaves, horizontal wood siding below the gable, and decorative scalloped barge board at the gable ends. The fenestration visible from the public right-of-way consists of wood single hung windows, some with decorative shutters, and a wood half-lite diamond patterned door. The main (west) elevation exhibits Northern European or Dutch influences, such as the diamond-patterned half-lite door and windows, scalloped barge board, box bay accented with wood-siding, and a square cupola. The attached three-car garage is connected to the residence by a breezeway on the south elevation. Additional features include a stone planter, a stone chimney on the rear elevation, and concrete steps at the main entryway.

The second milk parlor is located south of the second residence. The building is divided into two sections: the front milk house and a rear milking parlor, separated by an open breezeway. The front section reflects Ranch style characteristics, featuring a hip-and-gable roof with wood shake shingles, beige painted stucco

walls, and metal casement and fixed windows. A breezeway, located between the two sections on the north and south elevations, is partially hidden from the public right-of-way. East of the breezeway, the milking parlor features a gable roof oriented along an east-west axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls and along the gable ridge. Additional features include a circular driveway, metal doors at the main entryway, and a stone planter. The main (west) elevation of the front section also displays Northern European or Dutch influences, such as diamond-patterned windows, decorative wood spindles below the roofline, and scalloped barge board at the gable end.

The two Minimal Traditional style dwellings feature asymmetrical compact floor plans with minimal decorative details. The first dwelling has a square floor plan with a hipped roof topped with composition shingles. The exterior is stucco painted white. All the windows and doors have since been boarded up with plywood. The second dwelling features a rectilinear floor plan and a white stucco exterior with red trim around the windows and doors. The hipped roof is also topped with composition shingles and includes a moderate eave overhang. Fenestration consists of a combination of aluminum single-hung windows and wood double-hung windows, along with a flush wood entry door. Both dwellings are modest in appearance and do not exhibit distinctive characteristics of the Minimal Traditional style.

The Ranch style structures exemplify Northern European/Dutch stylistic influences and contain low-pitched roofs, stucco cladding, decorative scalloped barge board, diamond-patterned doors and windows, cupolas, and stone planters in-vogue in the postwar period. These structures are located in the northern portion of the property and are outside of the Project area. The two (2) Minimal Traditional residences are the only structures located in the Project area, and are modest, utilitarian examples of the style that lack distinctive detailing or architectural character.

- The Ranch style structures are eligible under CRHR and City of Ontario criteria 3/d for its significant association with the “Ranch Style, 1950-1970s” theme.
- The Minimal Traditional dwellings are not individually eligible nor contributors to any broader eligibility of the property.

*8040 Schaefer Ave and 14050 Grove Ave*

This property includes one (1) parcel that totals 8.62 acres located at the northwest corner of Grove and Edison Avenues. It includes a Minimal Traditional residence, as well as two (2) Ranch style dwellings and milk parlor. The Minimal Traditional residence was constructed prior to 1935, followed by the milk parlor between 1948 and 1946, and the Ranch Style residences between 1966 and 1968. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Minimal Traditional residence has an asymmetrical façade and a rectilinear floorplan. The exterior is clad in tan-painted stucco. The low-pitched gabled roof is topped with composition shingles and has a moderate eave overhang. The primary (south) elevation includes a recessed entryway beneath the

roofline, a small stoop, and a shed roof over a bay window accented with a brick veneer. The fenestration consists of aluminum windows.

The milk parlor is situated between the two (2) Ranch style residences and consists of a front milk house and the rear milking parlor separated by a breezeway. The milk house has some Ranch-style elements, including a cross-gable roof with wood shake shingles and a stucco façade. It features a gable roof oriented along an east-west axis that is clad in corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the north and south elevations, positioned above concrete walls, along with a vent system along the gable ridge. There is no curved driveway in front of the milk parlor.

The Ranch-style dwelling south of the milk parlor has an asymmetrical façade and an irregular floorplan atop a concrete foundation. Its exterior is clad in tan painted stucco. The moderately pitched hipped roof is topped with composition shingles and features minimal eave overhang and boxed eaves. The recessed main entryway includes a red paneled door, and box bay windows are visible on the primary (east) elevation. The Ranch-style dwelling north of the milk parlor has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The dwelling has a similar appearance to the first residence and features a stucco façade, a bay window, hipped roof topped with composition shingles, and a recessed main entryway.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- Though the property retains integrity of location, setting, feeling, design, materials, and workmanship, it lacks integrity of association.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*8061 Edison Ave*

This property includes six (6) parcels that total 36.18 acres located south of Edison Avenue between Bon View and Grove Avenues. It includes a Ranch style dwelling, a Ranch Style milk parlor, and ancillary structures. The residence was constructed between 1938 and 1946 along with a milk parlor, though that parlor was demolished and replaced with the current milk parlor between 1966 and 1968. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Ranch style residence is a one-story residence with an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with brown trim on the windows and doors. The moderately pitched hipped roof is topped with composition shingles and has a moderate eave overhang, and boxed eaves. The fenestration consists of vinyl multi-lite sliding sash and single-hung windows and wood paneled doors. The main elevation has a bay window and a stone planter. An attached one-car garage is located on the west elevation and features a white paneled overhead door. The milk parlor just west of the dwelling contains a front milk house and rear milking parlor separated by a breezeway. The milk house is modest in design, incorporating Ranch-style elements such as a hip-and-

gable roof with composition shingles, a moderate eave overhang with boxed eaves, and a stucco façade. The fenestration consists of metal multi-lite fixed windows, metal casement windows, and industrial metal glass door. South of the breezeway, the milking parlor features a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Additional features include a circular driveway in front of the milk parlor.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*7721-7891 Edison Ave*

This property includes three (3) parcels that total 18.16 acres located south of Edison Avenue between Bon View and Grove Avenues. It includes a Ranch Style residence, a Craftsman Bungalow residence, an Art Deco milk parlor, and ancillary structures. The residence was constructed before 1935 along with three other structures that are no longer present on the property. The milk parlor was added between 1935 and 1946, followed by the Ranch Style residence between 1959 and 1966. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has been modified via additional construction in the 1990s, as well as the destruction of the rear section of the milk parlor in 2017.

The Ranch style residence at 7891 Edison Avenue is a one-story dwelling with an asymmetrical façade and an irregular floorplan atop a concrete foundation. Its exterior is clad in yellow board-and-batten siding, with a partial stone veneer on the main (north) elevation. The low-pitched cross-gabled roof, covered with composition shingles, has a moderate eave overhang, boxed eaves, and a chimney on the rear roof slope. The fenestration consists of vinyl sliding sash windows. The main elevation includes a recessed entryway with a single paneled door, a concrete stoop, a stone planter, and an attached one-car garage with a paneled overhead door. It is smaller example of its type in the area and exhibits modest characteristics of the style.

The Craftsman Bungalow residence is a one-and-a-half story dwelling with a symmetrical façade and a mostly square floor plan. The exterior is clad in tan-painted stucco with blue trim on the windows and doors. The high-pitched, side-gabled roof is topped with composition shingles and has a wide eave overhang with wood brackets beneath the gable. The fenestration visible from the public right-of-way consists of vinyl single-hung windows and fixed wood windows. The main (north) elevation includes a centered gabled dormer with four vinyl single-hung windows, an enclosed full-width porch, a centered main entryway with a wood-paneled door and metal security door, and concrete steps. The milk parlor is located south of the bungalow, though only the front milk house section remains. It retains some Art Deco characteristics, including smooth stucco walls, a flat roof, a symmetrical boxy form, and glass block windows.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*8185 Edison Ave*

This property includes one (1) parcel that totals 18.56 acres located at the southeast corner of Edison and Grove Avenues. It includes a Ranch style dwelling with Northern European/Dutch influences, a Minimal Traditional residence, and a Streamline Moderne milk parlor constructed between 1952 and 1959. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Minimal Traditional dwelling has an asymmetrical façade and a rectilinear floorplan atop a concrete foundation. The exterior is clad in tan-painted stucco with green trim on the windows and roof fascia. The low-pitched hipped roof is finished with composition shingles and features a minimal eave overhang with boxed eaves. Fenestration visible from the public right-of-way consists of aluminum sliding sash windows. The main (west) elevation includes a recessed main entryway with a concrete stoop, metal security gate, and a wide stone chimney. The detached garage, located directly north of the dwelling, features two (2) paneled overhead doors, a tan stucco façade, and a hipped roof.

The Ranch style dwelling that exhibits Northern European or Dutch influences has an asymmetrical façade and a one-story horizontal floorplan atop a concrete foundation. The exterior is clad in horizontal wood siding painted yellow, with green trim on the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and includes a moderate eave overhang with open eaves and exposed rafter ends. A chimney is located on the rear (south) elevation. Fenestration consists of wood-framed diamond-patterned windows, some with green decorative shutters. The main (north) elevation features diamond-patterned windows, box bays with decorative wood support brackets, a stone planter, and an extended roof girder. A garage is attached to the main dwelling by a wide open breezeway on the west elevation.

The Streamline Moderne milk parlor contains a front milk house and rear milking parlor separated by a breezeway. The front section reflects Streamline Moderne characteristics, with smooth stucco walls, a flat roof, curvilinear corners, a central vertical projection, and curved glass block windows. The west elevation contains metal multi-lite casement windows, though the windows on the east elevation are boarded up. The breezeway features a metal barn-style sliding door on both the east and west elevations. South of the breezeway, the milking parlor has a gable roof oriented along a north-south axis clad in corrugated sheet metal. Ventilation is provided by horizontal metal shutters on the east and west elevations, positioned above concrete walls, along with a vent system along the gable ridge. Additional features include a circular driveway in front of the milk parlor and two (2) metal doors.

- The Ranch Style dwelling and Streamline Moderne milk parlor are eligible under CRHR and City of Ontario criteria 3/d within the "Ranch Style, 1950–1970s" and "Streamline Modern style, 1930s-1960s" contexts with a period of significance of 1952-1959.
- The City's Historic Preservation Subcommittee determined the property (identified as 14117 Grove Ave) met local landmark designation and Tier II criterion in November 2014.
- The Minimal Traditional dwelling is not individually eligible nor a contributor to any broader eligibility of the property.

*8311 Edison Ave*

This property includes one (1) parcel that totals 18.77 acres located south of Edison Avenue and Ontario Ranch Road between Grove and Walker Avenues. It includes a Ranch style dwelling and milk parlor constructed between 1968 and 1975. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has been altered via the addition of ancillary structures in the 1990s.

The Ranch style residence has an asymmetrical façade and an irregular horizontal floorplan atop a concrete foundation. The low-pitched cross-gabled roof has a moderate eave overhang with boxed eaves and is topped with terracotta tiles, which likely replaced the original composition or wood shingles at an unidentified date. The exterior is clad in tan-painted stucco. Additional features include a recessed main entryway accessed via concrete steps, two (2) brown paneled doors, metal sliding sash windows, a stone planter, and decorative blue shutters on some of the windows. An attached three-car garage addition was appended to the east elevation and features a roofline that does not match the original structure, resulting in an uneven and visually uneven roofline. To the east of the dwelling is the milk parlor, which contains a front milk house, rear milking parlor separated by a breezeway, and holding area. The milk house shares a similar design with the main dwelling, incorporating Ranch style elements such as a hip and gable roof topped with terracotta tiles, a moderate eave overhang with boxed eaves, and a stucco façade. Its fenestration consists of metal casement windows. South of the milk house, the milking parlor features a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation elements include metal horizontal louvered shutters set atop concrete walls, along with a vent system along the gable ridge. Further south, the holding area is partially open and enclosed by concrete walls. Additional features include metal doors at the main entryway, bulk tanks, and a circular driveway in front of the milk parlor.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*8335-8381 Edison Ave*

This property includes four (4) parcels that total 37.42 acres located south of Edison Avenue between Grove and Walker Avenues. It includes a Craftsman Bungalow style residence, a Ranch style milk parlor, and ancillary structures. The Craftsman was constructed prior to 1935, while the milk parlor was added

between 1959 and 1966. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Craftsman Bungalow style residence has an asymmetrical façade and an irregular floorplan. The exterior is clad in clapboard siding painted brown with dark brown trim on the windows and doors. The moderately pitched hipped roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, and a dormer on the main (north) elevation. The fenestration visible from the public right-of-way consists of wood-framed fixed and double-hung windows, along with some vinyl sliding sash and single-hung windows. The main elevation features a partial-width porch beneath a hipped roof extension, supported by tapered brick columns, concrete steps, and a brick pony wall. Despite the removal of some original windows and roofing, the dwelling maintains a strong representation of the Craftsman Bungalow style through its massing, roof form, and characteristic design features.

The Ranch style milk parlor has a front milk house, rear milking parlor separated by a breezeway, and an open holding area. The milk house incorporates some Ranch style elements such as a hip-and-gable roof, a moderate eave overhang with boxed eaves, and a stucco façade with wood-siding below the gable end. Its fenestration consists of metal multi-lite windows and vinyl windows. South of the milk house, the milking parlor features a flat roof oriented along a north-south axis. Ventilation elements include metal vertical louvered shutters set between concrete walls. Further south, the holding area is open and enclosed behind concrete walls. Additional features include industrial glass doors at the main entryway and a circular driveway in front of the milk parlor.

- The Craftsman Bungalow is eligible under CRHR and City of Ontario criteria 3/d within the "Craftsman Bungalow Style, 1900s–1930s" context with a period of significance of pre-1935.
- The Ranch style milk parlor is not individually eligible nor a contributor to any broader eligibility of the property.

*8485 Edison Ave and 14350 Walker Ave*

This property includes two (2) parcels that total 36.95 acres located on the southwest corner of Ontario Ranch Road and Walker Avenue. It includes two (2) Ranch style dwellings and milk parlor. One (1) Ranch style residence and the milk parlor were constructed between 1959 and 1966, while the second residence was added between 1966 and 1968. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The older Ranch style residence is a one-story structure with an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. Its exterior is clad in tan-painted stucco with a stone veneer along the lower span of the main (north) elevation. The low-pitched hip-and-gable roof is topped with composition shingles and features a moderate eave overhang, boxed eaves, a stone chimney on the rear roof slope, and a cupola. Below the gable end is white horizontal wood siding and a scalloped fascia board. The fenestration consists of vinyl sliding sash units that replaced the original wood-framed windows, some of which featured a diamond pattern. One (1) of the original window openings to the left

of the main entryway was substantially altered and replaced with a smaller window unit. The main elevation includes a stone planter, box bays accented by white horizontal wood siding, a decorative wood spindle column, and a recessed main entryway. On the west elevation, a partially open breezeway connects the dwelling to a two-car garage with white paneled overhead doors. To the west is the Ranch style milk parlor, which has a front milk house and rear milking parlor separated by a breezeway. The milk house incorporates Ranch style elements such as a hip-and-gable roof, a moderate eave overhang with boxed eaves, and a stucco façade. Its fenestration consists of metal multi-lite fixed and casement windows. The breezeway, located between the two (2) sections on the east and west elevations, features two (2) metal barn-style sliding doors. South of the milk house, the milking parlor features a gabled roof oriented along a north-south axis and steel beams. Ventilation elements include metal vertical louvered shutters set on top concrete walls. Additional features include two (2) metal doors at the main entryway and a circular driveway in front of the milk parlor.

The second Ranch style residence has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in stucco with a stone veneer on the main (east) elevation. The moderately-pitched hipped roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, and a stone chimney on the rear roof slope. The fenestration consists of aluminum windows. An enclosed breezeway is located on the north elevation and connects the dwelling to a two-car garage.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

*14049 Grove Ave*

This property includes two (2) parcels that total 9.04 acres located on the northeast corner of Grove Avenue and Ontario Ranch Road. It includes a Ranch style dwelling with a garage, milk parlor, and ancillary structures constructed between 1959 and 1966. It was historically associated with dairy operations and retains that association today. Historical aerials indicate the built environment has remained the same since that time period.

The Ranch style residence has rectilinear, two-story floorplan with a flat roof and a moderate eave overhang. The exterior is clad in white stucco and includes vinyl sliding sash windows. The main entryway is sheltered by a portico supported by decorative wood spindle columns. Additional features include an attached one-car garage with a paneled overhead door and a deck enclosed by a decorative metal railing above the garage.

A utilitarian milk parlor is located east of the residence and has a front milk house and side milking parlor separated by a breezeway. The milk house features a concrete façade with a bubbled textured section, industrial glass doors, large, fixed windows, and a flat roof. The breezeway, located between the two (2) sections on the east and west elevations, is enclosed by metal barn-style sliding doors. North of the milk house, the milking parlor has a flat roof oriented along a north-south axis. Ventilation elements include

metal vertical louvered shutters set between concrete walls. Additional features include a curved driveway in front of the milk parlor.

- Though associated with several themes and contexts identified within the 2025 historic context, the property as a whole, as well as the individual buildings, do not possess documented significance in relation to the themes and contexts.
- Though the property retains integrity of location, setting, feeling, design, materials, and workmanship, it lacks integrity of association.
- The property is not eligible under any criteria for the CRHR or City of Ontario.

**FINDINGS**

A total of 12 cultural resources were identified in the Project area during the efforts conducted for this study. The resources consist entirely of historic-period dairy farms with associated milk parlors, residential buildings, and/or ancillary structures. As a result of evaluations of potential eligibility for listing in the CRHR and/or designation as City of Ontario Historic Landmark, a total of four (4) resources were identified as eligible for listing or listed:

1. 7587-7697 Edison Ave – eligible for listing, significant historic structures in the Project area
2. 8185 Edison Ave (previously identified as 14117 Grove Ave) – previously determined by the City's Historic Preservation Subcommittee as meeting local landmark designation and Tier II criterion; also meets criteria for listing in the CRHR and is a historical resource under CEQA
3. 8335-8381 Edison Ave – eligible for listing, significant historic structures in the Project area
4. 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue – eligible for listing, but no significant historic structures in the Project area

As 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue does not contain any buildings or structures within the Project area that are considered eligible/contributors to the eligibility of the site, there is no potential to impact the resource. As such, for the purposes of this study, only three (3) resources (7587-7697 Edison Ave, 8185 Edison Ave, and 8335-8381 Edison Ave) will be considered historical resources identified within the Project area. An overview of the evaluation results is included in **Table 6** and **Figure 11** below, with eligible sites that require further consideration highlighted.

| Table 6: Summary of Resource Evaluations | |
|---|---|
| **Addresses/Name** | **Evaluation Summary** |
| 7587-7697 Edison Ave | The property as a whole is eligible under CRHR criterion 1 and local designation a. Individually, the Craftsman Bungalow and Ranch style residences are each eligible under CRHR criterion 3 and local designation d. The Ranch style milk parlor is not individually eligible but remains a contributor to the eligibility of the whole property. |
| 14213-14297, 14333-14353, 14450, and 14451 Bon View Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 7914 Edison Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 13715-13751 Grove Ave, 13817-13819 Grove Ave, 8270-8292 Edison Ave | Only the Ranch Style properties that are outside of the Project area are eligible under CRHR criterion 3 and local designation d. The Minimal Traditional residences within the Project area are not eligible under any criteria for the CRHR or City of Ontario. |
| 8040 Schaefer Ave and 14050 Grove Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 8061 Edison Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 7721-7891 Edison Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 8185 Edison Ave | The Ranch Style residence and Streamline Moderne milk parlor are each eligible under CRHR criterion 3 and local designation d. The Minimal Traditional dwelling is not eligible. The City's Historic Preservation Subcommittee determined the property (identified as 14117 Grove Ave) met local landmark designation and Tier II criteria in November 2014. |
| 8311 Edison Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 8335-8381 Edison Ave | The Craftsman Bungalow style residence is eligible under CRHR criterion 3 and local designation d. The Ranch style milk parlor is not eligible. |
| 8485 Edison Ave and 14350 Walker Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |
| 14049 Grove Ave | The property is not eligible under any criteria for the CRHR or City of Ontario. |

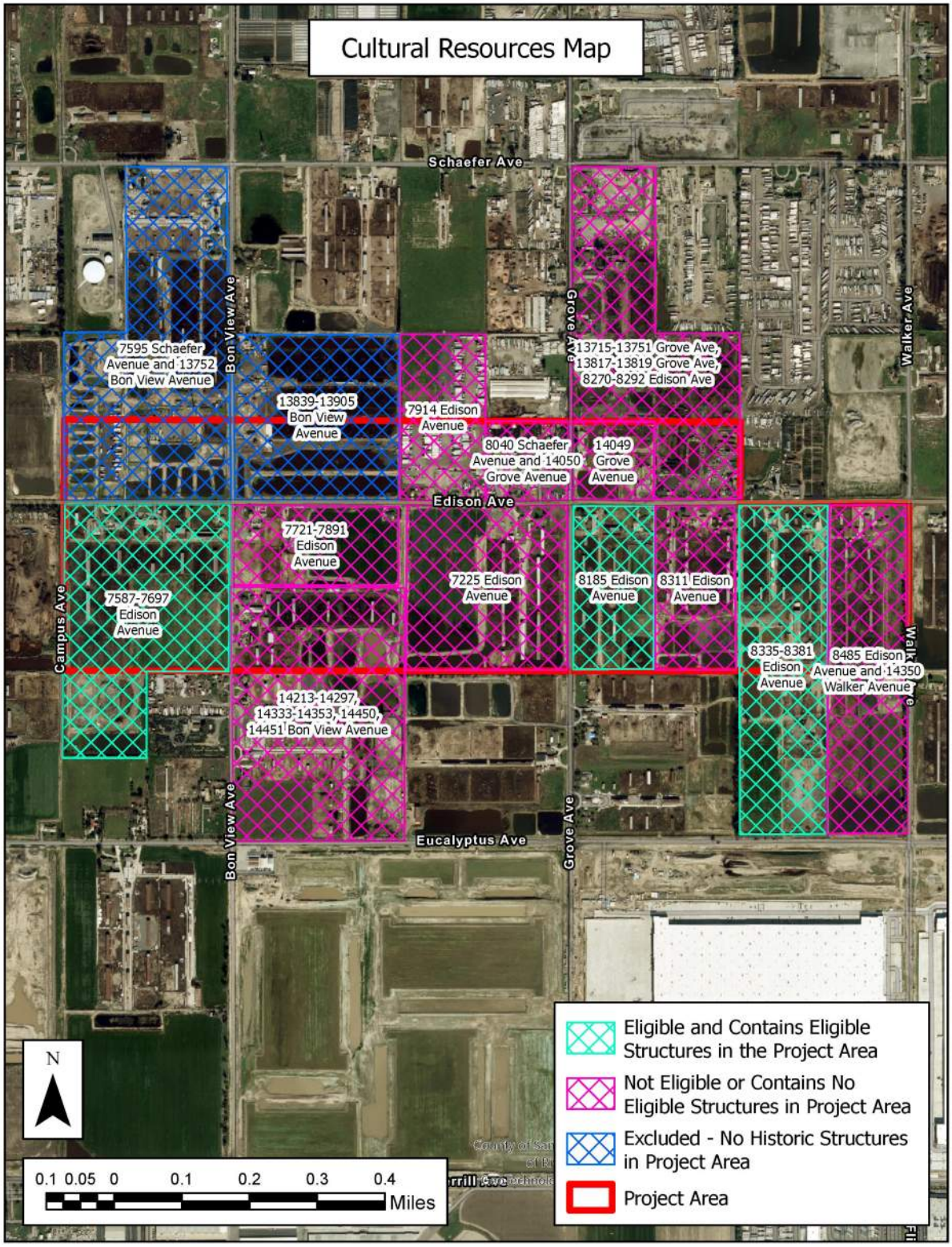


Figure 11: Cultural Resources Map

**Historic Resources Tiering**

As a result of eligibility evaluations, three (3) of the identified resources (7587-7697 Edison Ave, 8185 Edison Ave, and 8335-8381 Edison Ave) are recommended eligible for listing the CRHR and designation as a City of Ontario Historic Landmark, and are considered historical resources under CEQA with the potential to be impacted by the Project. One (1) of these properties, 8185 Edison Ave (previously identified as 14117 Grove Ave) was determined by the City's Historic Preservation Subcommittee to meet local landmark designation and Tier II criteria in November 2014. However, the remaining two (2) properties (7587-7697 Edison Ave and 8335-8381 Edison Ave) have not yet been subject to this review. As such, while the City's Historic Preservation Committee (or a specified subcommittee) maintains authority to make tiering determinations for resources, this report includes a brief discussion related to potential tiers for each of the two (2) remaining resources to provide preliminary insights into potential mitigation fee requirements for each resource and to later support the City's review:

- 7587-7697 Edison Ave – Under the criteria for Local Historic Landmarks, the property seems to meet tiering criteria 1 and 2 under the Architecture/Form section and criteria 4, 5, and 6 under the History section. It is also recommended eligible for listing in the California Register. As such, it is likely that this resource meets criteria within the tiering system as a Tier II property.
- 8335-8381 Edison Ave – Under the criteria for Local Historic Landmarks, the property seems to meet tiering criterion 1 under the Architecture/Form section. It is also recommended eligible for listing in the California Register. As such, it is likely that this resource meets criteria within the tiering system as a Tier II property.

Upon closer review of the Tiering system, it appears that Tiers II and III share a minimum threshold, in that any eligible historic property could be considered a Tier II or III resource. However, given the resources noted above meet additional criteria beyond just the fact that they are eligible resources, and given a property (8185 Edison Ave, formerly identified as 14117 Grove Ave) within the same area was already provided a Tier II determination, it is likely that each of the above-noted properties will be determined Tier II resources as opposed to Tier III.

**RECOMMENDATIONS**

Mitigation is recommended to reduce impacts to the three (3) eligible resources. Such mitigation often includes educational components, such as the requisite Historic American Building Survey (HABS), a documentary, and comparative studies, as well as physical preservation efforts, such as investigating relocation feasibility. For these resources, a HABS level 3 is recommended. However, both a documentary of the Ontario Ranch area and a comparative study of the area with other dairy farming areas in California were recently prepared as a result of mitigation adopted in the City for a nearby project. As such, those actions are not recommended to be included in mitigation for the current Project. Additionally, while it is common to include the preparation of a relocation feasibility study as a mitigation measure, a study for the properties has already been completed (**Appendix D**). The study concluded the following with respect to the three (3) eligible resources:

1. The milk parlor at 7587-7697 Edison Ave can be feasibly relocated in part. Relocation is limited to the front portion of the building, and it may require repairs. It is not feasible to relocate the back portion of the building without disassembling the structure.
2. The milk parlor at 8185 Edison Ave can be feasibly relocated in part. Relocation is limited to the front portion of the building. It is not feasible to relocate the back portion of the building.
3. The Craftsman Bungalow at 8335-8381 Edison Ave can be feasibly relocated in its entirety, excluding crawl space framings and foundations.

As such, it is recommended to include some level of mitigation related to relocating one or more of the structures/portions of structures that have been identified as feasible for relocation. While a series of mitigation measures will support the reduction of impacts to these resources, it is anticipated that mitigation will not reduce impacts to the resources to a less than significant level due to the unique circumstances related to the significance of each resource and the resource type. Measures for consideration are included below as **MM CUL-1** through **MM CUL-6**.

In addition to the identified historical resources, the Project area has a high sensitivity for historic archaeological resources that could be inadvertently discovered and/or impacted during Project implementation. Conversely, the sensitivity for buried prehistoric archaeological resources within the Project area is relatively low as a result of prior extensive disturbance across the Project area. However, the archaeological sensitivity for prehistoric resources in this area may have once been moderate to high due to the Holocene-age sediments underlying the Project area. As such, it is recommended that mitigation measures that outline the process for inadvertent discoveries be incorporated for the proposed Project. Measures for consideration are included below as **MM CUL-7** through **MM CUL-9**. With these mitigation measures in place, impacts to archaeological resources as a result of the proposed Project would be reduced to less than significant.

**MM CUL-1:** The applicant shall obtain a building permit prior to any demolition, relocation, or construction.

**MM CUL-2:** Prior to issuance of a building permit for demolition of any historical resources, at the same time or separately, a HABS (level 3) documentation, including but not limited to as built drawing, historical narrative, and Historic American Building Survey (HABS) photographs of the three (3) historical resources subject properties, shall be submitted to the Planning Department for review, approval, and subsequent release to the Ovitt Family Community Library, Model Colony History Room. Digital files and 2 printed copies are required (one archival and one non-archival).

**MM CUL-3:** Prior to issuance of a demolition building permit, a relocation plan for at least one (1) property identified as feasible for relocation shall be submitted to the City. The plan shall include location options identified by the City, as well as a relocation schedule and any protective measures to ensure minimal impact to the resource during relocation efforts. Every effort shall be made to facilitate the relocation. The buildings shall be offered at no cost for those who can

relocate off-site. Advertisements notifying the public of the opportunity to relocate the building shall be placed for a minimum of 30 days: on-site with temporary signage, in at least three local publications (newspapers, magazines, local organization newsletters), and on local bulletin boards.

**MM CUL-4:** A mitigation fee pursuant to Section 7.01.030 of the Ontario Development Code shall be paid to the Planning Department prior to issuance of building permit for demolition of any of the identified historical resources for which relocation was determined by the City to be infeasible. Mitigation fee is equal to 30% of the price per square foot construction cost as established in the most current International Code Council Building Valuation Data. The fee amount will be provided by the Planning Department at the time of payment. Funds will be deposited into the City's Historic Preservation Trust Fund.

**MM CUL-5:** Prior to issuance of a building permit for demolition of any of the three (3) historical resources, a determination shall be made by the Planning Department whether items within or on the historic properties should be salvaged. The applicant shall be responsible for the removal, relocation, and donation of such items selected for salvaging. An inventory of salvaged items shall be provided by the applicant to the Planning Department prior to the issuance of building permit.

**MM CUL-6:** Should 8185 Edison Ave be subject to demolition, and prior to issuance of a building permit for demolition of the resource, which is listed in the City's Historic Resources Inventory, the applicant shall apply for a Certificate of Appropriateness and approval of a Demolition approval by the Historic Preservation Subcommittee prior to demolition pursuant to the Ontario Development Code, Section 4.02.050. A Certificate of Appropriateness shall not be issued for the demolition of the resource, either in whole or in part, until such time that a demolition permit application and a replacement structure has been approved by the City, and appropriate permits have been issued for its construction.

**MM CUL-7:** Prior to the issuance of any grading permits for the Project area, a Cultural Awareness Training Program shall be provided to all construction managers and construction personnel prior to commencing any ground disturbance work within the Project area. The training shall be prepared and conducted by a Qualified Archaeologist to the satisfaction of the City Planning Department. The training may be discontinued when ground disturbance is completed. Construction personnel shall not be permitted to operate equipment within the construction area unless they have attended the training. A copy of the training transcript and/or training video, as well as a list of the names of all personnel who attended the training and copies of the signed acknowledgment forms shall be submitted to the City Planning Department for their review and approval.

**MM CUL-8:** Should any cultural resources be discovered during Project implementation, the City Planning Department and a Qualified Archaeologist shall be notified to assess the nature and significance of the find. Should any cultural resources be deemed significant, the Qualified

Archaeologist shall draft a treatment plan for review and approval by the City Planning Department. Tribes listed on the City's contact list for the Project shall be notified of any significance discovery that is Native American in origin and be given the opportunity to comment on the treatment plan prior to implementation. All final site records, reports, etc. associated with the discovery, evaluation, and treatment of cultural resources discovered during Project implementation shall be submitted to the South-Central Coastal Information Center (SCCIC).

**MM CUL-9:** If human remains are encountered during the undertaking, California State Health and Safety Code Section 7050.5 states that excavation shall stop and no further disturbance shall occur within 100 feet of the discovery until the County Coroner has made a determination of origin and disposition of the remains pursuant to Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the Native American Heritage Commission (NAHC), who will determine and notify a Most Likely Descendant (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery within 48 hours of notification. If the NAHC is unable to identify an MLD, the MLD fails to make a recommendation, or the landowner or his/her authorized representative rejects the recommendation, the human remains and associated items will be interred on the property with appropriate dignity in a location that will not be subject to future disturbance.

## REFERENCES

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# APPENDIX A

## Sacred Lands File (SLF) Search Results from the Native American Heritage Commission (NAHC)

# NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
**Reginald Pagaling**
*Chumash*

VICE-CHAIRPERSON
**Buffy McQuillen**
*Yokayo Pomo, Yuki, Nomlaki*

SECRETARY
**Sara Dutschke**
*Miwok*

PARLIAMENTARIAN
**Wayne Nelson**
*Luiseño*

COMMISSIONER
**Isaac Bojorquez**
*Ohlone-Costanoan*

COMMISSIONER
**Stanley Rodriguez**
*Kumeyaay*

COMMISSIONER
**Laurena Bolden**
*Serrano*

COMMISSIONER
**Reid Milanovich**
*Cahuilla*

COMMISSIONER
**Bennae Calac**
*Pauma-Yuima Band of Luiseño Indians*

EXECUTIVE SECRETARY
**Raymond C. Hitchcock**
*Miwok, Nisenan*

**NAHC HEADQUARTERS**
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov

June 10, 2024

Jamie Nord
Kimley-Horn

***Via Email to:*** ***Jamie.Nord@kimley-horn.com***

**Re: Ontario Center Park SP Project, San Bernardino County**

To whom it may concern:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information submitted for the above referenced project. The results were positive. Please contact the tribes on the attached list for information. Please note that tribes do not always record their sacred sites in the SLF, nor are they required to do so. A SLF search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with a project's geographic area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites, such as the appropriate regional California Historical Research Information System (CHRIS) archaeological Information Center for the presence of recorded archaeological sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. Please contact all of those listed; if they cannot supply information, they may recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: murphy.donahue@nahc.ca.gov

Sincerely,

Murphy Donahue

Murphy Donahue
*Cultural Resources Analyst*

Attachment

**Native American Heritage Commission**
**Native American Contact List**
**San Bernardino County**
**6/17/2024**

| County | Tribe Name | Contact Person | Contact Address | Phone # | Fax # | Email Address | Cultural Affiliation |
|---|---|---|---|---|---|---|---|
| San Bernardino | Agua Caliente Band of Cahuilla Indians | Lacy Padilla, Director of Historic Preservation/THPO | 5401 Dinah Shore Drive<br>Palm Springs, CA, 92264 | (760) 333-5222 | (760) 699-6919 | ACBCI-THPO@aguacaliente.net | Cahuilla |
| | Cahuilla Band of Indians | Erica Schenk, Chairperson | 52701 CA Highway 371<br>Anza, CA, 92539 | (951) 590-0942 | (951) 763-2808 | chair@cahuilla-nsn.gov | Cahuilla |
| | Cahuilla Band of Indians | Anthony Madrigal, Tribal Historic Preservation Officer | 52701 CA Highway 371<br>Anza, CA, 92539 | (951) 763-5549 | | anthonymad2002@gmail.com | Cahuilla |
| | Cahuilla Band of Indians | BobbyRay Esaprza, Cultural Director | 52701 CA Highway 371<br>Anza, CA, 92539 | (951) 763-5549 | | besparza@cahuilla-nsn.gov | Cahuilla |
| | Gabrieleno Band of Mission Indians - Kizh Nation | Christina Swindall Martinez, Secretary | P.O. Box 393<br>Covina, CA, 91723 | (844) 390-0787 | | admin@gabrielenoindians.org | Gabrieleno |
| | Gabrieleno Band of Mission Indians - Kizh Nation | Andrew Salas, Chairperson | P.O. Box 393<br>Covina, CA, 91723 | (844) 390-0787 | | admin@gabrielenoindians.org | Gabrieleno |
| | Gabrieleno/Tongva San Gabriel Band of Mission Indians | Anthony Morales, Chairperson | P.O. Box 693<br>San Gabriel, CA, 91778 | (626) 483-3564 | (626) 286-1262 | GTTribalcouncil@aol.com | Gabrieleno |
| | Gabrielino Tongva Indians of California Tribal Council | Robert Dorame, Chairperson | P.O. Box 490<br>Bellflower, CA, 90707 | (562) 761-6417 | (562) 761-6417 | gtongva@gmail.com | Gabrielino |
| | Gabrielino Tongva Indians of California Tribal Council | Christina Conley, Cultural Resource Administrator | P.O. Box 941078<br>Simi Valley, CA, 93094 | (626) 407-8761 | | christina.marsden@alumni.usc.edu | Gabrielino |
| | Gabrielino/Tongva Nation | Sandonne Goad, Chairperson | 106 1/2 Judge John Aiso St., #231<br>Los Angeles, CA, 90012 | (951) 807-0479 | | sgoad@gabrielino-tongva.com | Gabrielino |
| | Gabrielino-Tongva Tribe | Sam Dunlap, Cultural Resource Director | P.O. Box 3919<br>Seal Beach, CA, 90740 | (909) 262-9351 | | tongvatcr@gmail.com | Gabrielino |
| | Gabrielino-Tongva Tribe | Charles Alvarez, Chairperson | 23454 Vanowen Street<br>West Hills, CA, 91307 | (310) 403-6048 | | Chavez1956metro@gmail.com | Gabrielino |
| | Juaneno Band of Mission Indians Acjachemen Nation - Belardes | Joyce Perry, Cultural Resource Director | 4955 Paseo Segovia<br>Irvine, CA, 92603 | (949) 293-8522 | | kaamalam@gmail.com | Juaneno |
| | Juaneno Band of Mission Indians Acjachemen Nation 84A | Heidi Lucero, Chairperson, THPO | 31411-A La Matanza Street<br>San Juan Capistrano, CA, 92675 | (562) 879-2884 | | jbmian.chairwoman@gmail.com | Juaneno |
| | Morongo Band of Mission Indians | Ann Brierty, THPO | 12700 Pumarra Road<br>Banning, CA, 92220 | (951) 755-5259 | (951) 572-6004 | abrierty@morongo-nsn.gov | Cahuilla Serrano |
| | Morongo Band of Mission Indians | Robert Martin, Chairperson | 12700 Pumarra Road<br>Banning, CA, 92220 | (951) 755-5110 | (951) 755-5177 | abrierty@morongo-nsn.gov | Cahuilla Serrano |

| | | | | | | |
|---|---|---|---|---|---|---|
| Pala Band of Mission Indians | Shasta Gaughen, Tribal Historic Preservation Officer | PMB 50, 35008 Pala Temecula Road Pala, CA, 92059 | (760) 891-3515 | | sgaughen@palatribe.com | Cupeno Luiseno |
| Pala Band of Mission Indians | Alexis Wallick, Assistant THPO | PMB 50, 35008 Pala Temecula Road Pala, CA, 92059 | (760) 891-3537 | | awallick@palatribe.com | Cupeno Luiseno |
| Pala Band of Mission Indians | Christopher Nejo, Legal Analyst/Researcher | PMB 50, 35008 Pala Temecula Road Pala, CA, 92059 | (760) 891-3564 | | cnejo@palatribe.com | Cupeno Luiseno |
| Pechanga Band of Indians | Steve Bodmer, General Counsel for Pechanga Band of Indians | P.O. Box 1477 Temecula, CA, 92593 | (951) 770-6171 | (951) 695-1778 | sbodmer@pechanga-nsn.gov | Luiseno |
| Pechanga Band of Indians | Tuba Ebru Ozdil, Pechanga Cultural Analyst | P.O. Box 2183 Temecula, CA, 92593 | (951) 770-6313 | (951) 695-1778 | eozdil@pechanga-nsn.gov | Luiseno |
| Quechan Tribe of the Fort Yuma Reservation | Manfred Scott, Acting Chairman - Kw'ts'an Cultural Committee | P.O. Box 1899 Yuma, AZ, 85366 | (928) 210-8739 | | culturalcommittee@quechantribe.com | Quechan |
| Quechan Tribe of the Fort Yuma Reservation | Jill McCormick, Historic Preservation Officer | P.O. Box 1899 Yuma, AZ, 85366 | (928) 261-0254 | | historicpreservation@quechantribe.com | Quechan |
| Quechan Tribe of the Fort Yuma Reservation | Jordan Joaquin, President, Quechan Tribal Council | P.O.Box 1899 Yuma, AZ, 85366 | (760) 919-3600 | | executivesecretary@quechantribe.com | Quechan |
| Rincon Band of Luiseno Indians | Joseph Linton, Tribal Council/Culture Committee Member | One Government Center Lane Valley Center, CA, 92082 | (760) 803-3548 | | jlinton@rincon-nsn.gov | Luiseno |
| Rincon Band of Luiseno Indians | Cheryl Madrigal, Cultural Resources Manager/Tribal Historic Preservation Officer | One Government Center Lane Valley Center, CA, 92082 | (760) 648-3000 | | cmadrigal@rincon-nsn.gov | Luiseno |
| Rincon Band of Luiseno Indians | Laurie Gonzalez, Tribal Council/Culture Committee Member | One Government Center Lane Valley Center, CA, 92082 | (760) 484-4835 | | lgonzalez@rincon-nsn.gov | Luiseno |
| Rincon Band of Luiseno Indians | Denise Turner Walsh, Attorney General | One Government Center Lane Valley Center, CA, 92082 | (760) 689-5727 | | dwalsh@rincon-nsn.gov | Luiseno |
| San Manuel Band of Mission Indians | Alexandra McCleary, Senior Manager of Cultural Resources Management | 26569 Community Center Drive Highland, CA, 92346 | (909) 633-0054 | | alexandra.mccleary@sanmanuel-nsn.gov | Serrano |
| Santa Rosa Band of Cahuilla Indians | Vanessa Minott, Tribal Administrator | P.O. Box 391820 Anza, CA, 92539 | (951) 659-2700 | (951) 659-2228 | vminott@santarosa-nsn.gov | Cahuilla |
| Santa Rosa Band of Cahuilla Indians | Steven Estrada, Tribal Chairman | P.O. Box 391820 Anza, CA, 92539 | (951) 659-2700 | (951) 659-2228 | sestrada@santarosa-nsn.gov | Cahuilla |
| Serrano Nation of Mission Indians | Wayne Walker, Co-Chairperson | P. O. Box 343 Patton, CA, 92369 | (253) 370-0167 | | serranonation1@gmail.com | Serrano |
| Serrano Nation of Mission Indians | Mark Cochrane, Co-Chairperson | P. O. Box 343 Patton, CA, 92369 | (909) 578-2598 | | serranonation1@gmail.com | Serrano |
| Soboba Band of Luiseno Indians | Jessica Valdez, Cultural Resource Specialist | P.O. Box 487 San Jacinto, CA, 92581 | (951) 663-6261 | (951) 654-4198 | jvaldez@soboba-nsn.gov | Cahuilla Luiseno |

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|---|---|---|---|---|---|---|---|
| | Soboba Band of Luiseno Indians | Joseph Ontiveros, Tribal Historic Preservation Officer | P.O. Box 487 San Jacinto, CA, 92581 | (951) 663-5279 | (951) 654-4198 | jontiveros@soboba-nsn.gov | Cahuilla Luiseno |

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Sections 65352.3, 65352.4 et seq. and Public Resources Code Sections 21080.3.1 for the proposed Center Park Specific Plan, San Bernardino County.

# APPENDIX B

## Record Search Results from the South Central Coastal Information Center (SCCIC)

# Resource List

**Center Park Ontario**

| Primary No. | Trinomial | Other IDs | Type | Age | Attribute codes | Recorded by | Reports |
|---|---|---|---|---|---|---|---|
| P-36-025440 | | Resource Name - Chino-Mira Loma No. 1 Transmission Line | Structure | Historic | HP11 | 2010 (Wendy Tinsley Becker, Urbana Preservation & Planning) | SB-06037 |
| P-36-026051 | | Resource Name - Devers-San Bernardino 220kV;<br>Other - P-33-015035;<br>Resource Name - SCE Hayfield-Chino 220kV Transmission Line;<br>Other - Julian Hinds-Mirage 220kV, Devers-Mirage 220 kV, Devers-San Bernardino No. 1 220kV;<br>Other - Mira Loma-Vista 220 kV, and Chino Mira Loma No. 3 220 kV Transmission Lines;<br>Voided - 36-027693 | Structure | Historic | HP11 | 2012 (Davidson, et al., LSA Associates, Inc.);<br>2013 (Wendy Tinsley/Steven Treffers, Urbana Preservation/SWCA);<br>2014 (Daniel Ballester, CRM Tech);<br>2018 (Robert Cunningham, ECORP);<br>2019 (Riordan Goodwin, LSA) | SB-07946, SB-07955, SB-08426 |

# Report List

**Center Park Ontario**

| Report No. | Other IDs | Year | Author(s) | Title | Affiliation | Resources |
|---|---|---|---|---|---|---|
| SB-01499 | NADB-R - 1061499; Voided - 85-7.4A-B | 1985 | FOSTER, JOHN M. and ROBERTA S. GREENWOOD | CULTURAL RESOURCES OVERVIEW: CALIFORNIA PORTION, PROPOSED PACIFIC TEXAS PIPELINE PROJECT | GREENWOOD AND ASSOCIATES | |
| SB-03012 | NADB-R - 1063012 | 1995 | OWEN, SHELLEY MARIE | CULTURAL RESOURCES SURVEY AND IMPACT ASSESSMENT FOR THE CAJON/EPTC PIPELINE PROJECT LOCATED IN PORTIONS OF LOS ANGELES, SAN BERNARDINO, AND ORANGE COUNTIES, CA | EIP ASSOCIATES | 36-005689, 36-005690, 36-005691, 36-008124, 36-008125 |
| SB-06095 | NADB-R - 1066095 | 2009 | Applied Earthworks | Confidential Cultural Resources Specialist Report for the Tehachapi Renewal Transmission Project. | Applied Earthworks | 36-003690, 36-019845, 36-019846, 36-019847, 36-019848 |
| SB-07956 | | 2007 | Doolittle, Christopher J. | Archaeological Survey report for Southern California Edison's G.O. 131-D Assessment of the Chino A-Bank System and System Split Project San Bernadino County, California | Eath Tech, Inc. | |
| SB-07968 | | 2011 | Holm, Lisa and John Holson | Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segement 8 East (Phases 2 and 3) and West (Phase 4), Los Angeles and San Bernardino Counties, California | Pacific Legacy, Inc. | 36-012533, 36-012621, 36-012622 |
| SB-07977 | | 2010 | Panich, Lee, Tsim D. Schneider, and John Holson | Supplemental Archaeological Survey Report: Tehachapi Renewable Transmission Project Segment 8 East (Phases 2 and 3), San Bernardino County California | Pacific Legacy, Inc. | 36-013330, 36-013636 |

# APPENDIX C

## CA DPR 523 Series Site Records

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 36

Review Code _____ Reviewer _____ Date _____
**Resource Name: 13839-13905 Bon View Avenue**


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ ¼ **of** _ ¼ **of Sec** _; _S. B._ **B.M.** __
c. Address: 13839-13905 Bon View Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441295, 441487, 441487, 441295 mE / 3762377, 3762377, 3762181, 3762181mN
e. Other Locational Data: San Bernardino County APN:105318101, 105318102, 105331101, 105331102

***P3a. Description:** The evaluated property consists of four parcels (APN: 105318101, 105318102, 105331101, and 105331102), historically addressed as 13839-13905 Bon View Avenue. The surrounding area is characterized by open space and agricultural land with historical ties to dairy operations. Encompassing 37.38 acres, the property is located northeast corner of Bon View and Edison Avenues. The property includes a one-story Neo-eclectic residence (13839 Bon View Ave), a Ranch style milk parlor (13905 Bon View Avenue), and several ancillary pole structures. Landscaping and hardscaping are minimal consisting of concrete driveways, and some scattered trees and shrubbery. The property continues to function as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View northeast of 13905 Bon View Ave milk parlor (IMG_8684; October 21, 2024).
***P6. Date Constructed/Age and Source**
1968-1975/NETR HistoricAerials (1968, 1975, 1987, 1994)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
County of San Bernardino
825 E Third Street
San Bernardino CA
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Bon View Farms
**B2. Common Name:** 13839-13905 Bon View Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of four parcels under common ownership. No historic-era building permits were found on file for the property at the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System and supplemented by aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and subsequent years. Aerial imagery indicates that the property was initially developed between 1968 and 1975 with the construction of a Ranch style milk parlor and Neo-eclectic single-family residence. Subsequent aerial imagery suggests that the configuration of the remaining buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980 **Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The 13839-13905 Bon View Avenue property was improved between 1968 and 1975. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former Chino Agricultural Preserve. The property is associated with the historical context of Postwar, Large-Capacity Dairies, 1945-1980, but it does not possess documented significance in relation to the theme. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

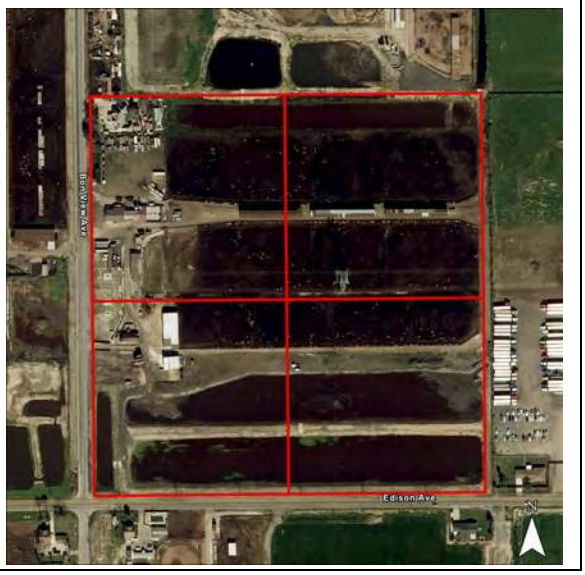


(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name: 13839-13905 Bon View Avenue**
**Page 3 of 5**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 36

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Constructed between 1966 and 1975, the 13839-13905 Bon View Avenue property is located on parcel 105318101 and consist of a one-and-a-half story residence constructed in the Neo-eclectic style and a Ranch style milk parlor. The dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The dwelling features a brick and stucco exterior, brick chimney, a high-pitched cross-gabled roof topped with composition shingles, vinyl multi-lite windows, and arched decorative false columns around the windows on the main (west) elevation. The building is mostly obscured from the public right-of-way.

South of the residence is the Ranch style milk parlor, constructed between 1966 and 1975. The structure is divided into two sections: the front milk house and the rear milking parlor, separated by a breezeway. The milk house is modest in design, incorporating Ranch style elements such as a front gable roof, tan stucco façade, a carport on the main elevation supported by brick columns, aluminum sliding sash windows, and a partial brick veneer on the lower span of the building. The breezeway, located between the two sections on the north and south elevations, is obscured from the public right-of-way. East of the breezeway, the milking parlor features a gable roof oriented along an east-west axis. Ventilation features include louvered vertical shutters on the north and west elevations. Additional features include large metal doors with small openings at the bottom of the main north entryway and a circular driveway in front of the milk parlor.

View east of 13839-13905 Bon View Avenue SFR (IMG_8685; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
In 1983, the property was owned by Bernard Te Velde and known as Bon View Farms.

**B10. Statement of Significance from Page 2:**
For lack of significant association with the theme, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b. as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 13839-13905 Bon View Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 13839-13905 Bon View Avenue property has been found not significant and ineligible and is no longer active, it maintains integrity of location, setting, design, materials, workmanship, feeling, and association as an active and in-use dairy farming property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 3S/3CS/5S3
Other Listings: Urbana Survey No.: 41

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 7587-7697 Edison Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._**B.M.** __
c. Address: 7587-7697 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441085 mE / 3762050mN
e. Other Locational Data: APN: San Bernardino County APN: 105337101, 105337102, 105353101

***P3a. Description:** The evaluated property consists of three parcels (APN: 105337101, 105337102, and 105353101), historically addressed as 7587-7697 Edison Avenue. Covering 46.58 acres, the property is situated south of Edison Avenue, between Sultana and Bon View Avenues. The surrounding area remains largely open space and agricultural land. The property includes a Craftsman Bungalow style dwelling and detached garage, a Ranch style milk parlor, a Ranch style dwelling, and several ancillary structures/features associated with dairy operations (silos, troughs, feeding gates, sheds, pole structures, etc.). The buildings are located on parcel 105337101. Landscaping and hardscaping are minimal, consisting of some trees and shrubs around the dwellings and milk parlor, as well as a paved driveway. The property is partially enclosed behind a metal fence. The property was historically associated with dairy operations and retains that association today. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View south of 7587 Eucalyptus Avenue milk parlor (IMG_8682; October 21, 2024).
***P6. Date Constructed/Age and Source**
pre-1935,1959-1966/UC Santa Barbara FrameFinder (1935)/NETR HistoricAerials (1959-1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
De Groot, Ernest Trust 8/1/81 -EST O
7587 Edison Ave
Ontario CA 91762
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Paul Brockmeier Property/De Groot Dairy
**B2. Common Name:** 7587-7697 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style/Craftsman Bungalow Style

***B6. Construction History:** This property consists of three parcels under common ownership. No historic-era building permits were located in the City of Ontario's records for the site. Construction dates and building characteristics were therefore established using data from the San Bernardino County Assessor's Property Management Information System and reviewed in conjunction with aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and later years. Aerial imagery indicates that the 7587–7697 Edison Avenue property was first developed prior to 1935 with the construction of a Craftsman Bungalow style dwelling. At the time, a large portion of the parcel appears to have been used as farmland, likely for dairy-related purposes. Between 1959 and 1966, a Ranch style dwelling and a Ranch style milk parlor were added to the property. Subsequent aerials suggest that the overall configuration of the built environment has remained largely unchanged since that period. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified **B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Craftsman Bungalow Style, 1900s-1930s, Ranch Style, 1950–1970s **Area:** San Bernardino County **Period of Significance:** Pre-1935-1966
**Property Type:** Postwar, Large-Capacity Dairy/Craftsman Bungalow Style/Ranch Style
**Applicable Criteria:** NRHP/CRHR/Local A and C/1 and 3/a and d

The 7587–7697 Edison Avenue property was initially developed prior to 1935 with the existing Craftsman Bungalow. Between 1959 and 1966, the existing Ranch style milk parlor and Ranch style dwelling were constructed reflecting an expansion of operations. The property and its environs was designated as part of the San Bernardino County Agricultural Preserve in 1967 and later annexed into the City of Ontario in 1999 as part of the New Model Colony, which encompassed portions of the former agricultural preserve. The 7587-7697 Edison Avenue property is eligible as a whole for listing under NRHP, CRHR, and City of Ontario criteria A/1/a for its significant association with the theme Postwar, Large-Capacity Dairies, 1945–1980. Additionally, the two dwellings are also individually significant and eligible. The pre-1935 Craftsman Bungalow is individually eligible under criteria C/3/d within the context Craftsman Bungalow Style, 1900s–1930s, with a period of significance of ca. 1920s to the 1930s (pending identification of original construction date). The Ranch style dwelling is individually eligible under the context Ranch Style, 1950–1970s, with a period of significance of ca. 1959 to 1966 representing its original construction campaign. The ca. 1959-1966 Ranch style milk parlor is not individually significant, however, it remains a significant contributing element of the property as a significant Postwar Large Capacity Dairy complex. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 7587-7697 Edison Avenue


Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 3S/3CS/5S3
Other Listings: Urbana Survey No.: 41

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**

Improved prior to 1935 with later developments between 1959 and 1966, the property includes a Craftsman Bungalow style dwelling and detached garage, a Ranch style milk parlor, a Ranch style dwelling, and several ancillary structures/features associated with dairy operations (silos, troughs, feeding gates, sheds, pole structures, etc.).

Towards the northeast corner of parcel 105337101 is the Craftsman Bungalow dwelling, listed as 7697 Edison Avenue. Constructed before 1935, the house faces Edison Avenue and features an asymmetrical façade with a one-and-a-half-story irregular floor plan. The exterior is clad in tan stucco with red trim on the windows and doors. The high-pitched, side-gabled roof is covered in composition shingles and includes a wide eave overhang, open eaves, decorative wood brackets below the gable end, and exposed rafter ends. A stucco chimney rises from the front roof slope. The fenestration consists of wood-framed, one-over-one, double-hung and fixed windows with red-painted lintels and sills. The main (north) elevation features a full-width front porch beneath the main roofline, supported by tapered wood/concrete beams, as well as a gabled dormer centered on the roof slope.

At the rear (south) elevation, a two-story addition was appended to the southwest corner between 1975 and 1979. This addition has a gabled roof, aluminum sliding sash windows, and a tan stucco façade. It is largely obscured from the public right-of-way and remains subordinate, secondary, and easily distinguishable from the original structure. The addition is compatible with the dwelling's historic character, in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. It did not result in the removal of original character-defining features. East of the dwelling is a detached one-car garage with a rectangular floorplan, tan stucco facade, and gabled roof.

Centered on the north side of the parcel, fronting Edison Avenue, is the Ranch style milk parlor. Constructed between 1959 and 1966, the building features a horizontal floor plan with two milking parlor wing sections, extending from the front milk house section, separated by a breezeway. The front section exhibits Ranch style characteristics, including a hip-and-gable roof with wood shake shingles, stucco walls, metal fixed and casement windows, and a stone veneer. The breezeway, located between the front and rear wing sections, has metal doors on both the east and west elevations. South of the breezeway, the milking parlor sections have low sloped gable roofs oriented along an east-west axis. Ventilation is provided by horizontal louvered metal shutters on the north and south elevations, positioned between concrete walls. Additional features include a metal door at the main (north) entryway, a circular driveway, and a bulk tank in front. Two silos are located at the rear.

West of the milk parlor is the Ranch style dwelling, listed as 7587 Edison Avenue. Constructed between 1959 and 1966, the dwelling has an asymmetrical façade and a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a stone veneer on the main (north) elevation. The moderately pitched hip-and-gable roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, a cupola above the breezeway, and a stone chimney on the rear roof slope. The fenestration consists of a mix of aluminum fixed and sliding sash windows and vinyl units. The primary elevation features a recessed entryway below the main roofline with two double half-lite wood doors, a small concrete stoop, a stone planter, and box bay windows accented by red horizontal wood siding. A wide, open breezeway on the east elevation connects the three-car garage to the dwelling.

Ancillary pole structures, storage sheds, feeding gates and other features are located throughout the property.

**Primary Record Information Continued:**

View southwest of 7587 Eucalyptus Avenue SFR (IMG_8680; October 21, 2024).

View southeast of 7587 Eucalyptus Avenue milk parlor (IMG_8681; October 21, 2024).

**Primary Record Information Continued:**

View south of 7697 Edison Avenue bungalow SFR (IMG_8683; October 21, 2024).

View south of 7697 Edison Avenue bungalow SFR (IMG_9158; October 23, 2024).

**Primary Record Information Continued:**

View southwest of 7697 Edison Avenue bungalow SFR (IMG_9159; October 23, 2024).

View southwest of 7697 Edison Avenue detached garage and bungalow SFR (IMG_9161; October 23, 2024).

**Primary Record Information Continued:**

View southeast of 7697 Edison Avenue bungalow SFR (IMG_9162; October 23, 2024).

View south of 7587 Eucalyptus Avenue milk parlor (IMG_9165; October 23, 2024).

**Primary Record Information Continued:**

View southwest of 7587 Eucalyptus Avenue milk parlor (IMG_9167; October 23, 2024).

View southeast of 7587 Eucalyptus Avenue milk parlor (IMG_9168; October 23, 2024).

**Primary Record Information Continued:**

View southwest of 7587 Eucalyptus Avenue milk parlor front section (IMG_9169; October 23, 2024).

View southwest of 7587 Eucalyptus Avenue milk parlor (IMG_9173; October 23, 2024).

**Primary Record Information Continued:**

View east of 7587 Eucalyptus Avenue milk parlor rear section wing (IMG_9175; October 23, 2024).

View east of 7587 Eucalyptus Avenue silos behind milk parlor (IMG_9182; October 23, 2024).

**Primary Record Information Continued:**

View east of 7587 Eucalyptus Avenue Ranch style SFR (IMG_9177; October 23, 2024).

View east of 7587 Eucalyptus Avenue Ranch style SFR rear elevation (IMG_9179; October 23, 2024).

**Primary Record Information Continued:**

View southwest of 7587 Eucalyptus Avenue Ranch style SFR main elevation (IMG_9185; October 23, 2024).

View south of 7587 Eucalyptus Avenue Ranch style SFR breezeway (IMG_9186; October 23, 2024).

**Primary Record Information Continued:**

View south of 7587 Eucalyptus Avenue Ranch style SFR main entryway (IMG_9187; October 23, 2024).

View southeast of 7587 Eucalyptus Avenue Ranch style SFR (IMG_9188; October 23, 2024).

**Primary Record Information Continued:**

View south of 7587 Eucalyptus Avenue ancillary buildings (IMG_9191; October 23, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**
Over the years, the residences have undergone minor alterations. A two-story addition was appended to the rear (southwest corner) of the Craftsman Bungalow between 1975 and 1979. The addition features a gabled roof, aluminum sliding sash windows, and a tan stucco exterior. It remains subordinate to the original structure, is largely obscured from public view, and is easily distinguishable from the original section. The addition is compatible with the dwelling's historic character and complies with the Secretary of the Interior's Standards for the Treatment of Historic Properties, as it did not result in the removal of original character-defining features. East of the dwelling is a detached one-car garage with a rectangular floorplan, gabled roof, and tan stucco façade.

Some original windows on the main elevation of the Ranch style dwelling have been replaced with vinyl units set within the original openings. Despite these alterations, the dwelling retains most of the seven aspects of integrity and continues to convey its original Ranch style design. It remains one of the better-preserved and more representative examples of the Ranch architectural style in the area.

**Ownership/Occupancy**

**7587 Edison Ave**
Between the mid-1920s and 1931, the property was owned by Paul Brockmeier. Born in 1894 in Freeport, Illinois, Brockmeier was a salesman, dairyman, and farmer who operated a business known as Brockmeier Brothers. In 1925, the Brockmeier Brothers won the highest yielding dairy cow award in the San Bernardino County Testing Association competition held at Chaffey High School. In January 1929, the Daily Report noted that oat and alfalfa hay were for sale at the property. In 1931, the property was sold to an unidentified buyer.

Between 1955 and 1959, Mr. and Mrs. Albert Alluis Jr. acquired and resided at the property. Born in 1908, Mr. Alluis was the son of a French immigrant who arrived in the United States in the early 1900s and worked as a dairyman in Arcadia, California. On the property, he cultivated potatoes.

In 1976, the property was owned by Ernest De Groot and his son, Chuck De Groot, and operated as Twin Palms Dairy. Born in 1910, Ernest De Groot was a native of Norman County, Minnesota, and the son of Dutch immigrants who arrived in the United States in the late 1800s. In the 1930s, his family relocated to Downey, California, in the Los Angeles Basin, where they worked in the dairy industry. By the mid-to-late 1960s, De Groot moved to the Chino Valley/Ontario region, where he later acquired the property.

In 1986, the property was part of a public dairy open house hosted by the Dairy Committee. According to the Chino Champion, the dairy housed nearly 600 cows and grew approximately one-quarter of its own feed on farmland elsewhere in the Chino Valley. Between 1970 and 1977, the De Groot cows ranked among the top-producing dairy cows in the region.

Ernest De Groot passed away in 2003 at the age of 92, and the property remained under the De Groot family trust. By 2008, it was listed as the Paul Huizenga Dairy, still under the De Groot family's ownership.

**7697 Edison Ave**
Between 1959 and 1962, the Craftsman Bungalow style dwelling was occupied by Mr. and Mrs. Homer Gibson. In 1965, the dwelling was occupied Mr. and Mrs. Pirie Grant. Between 1977 and 1982, Mr. and Mrs. Charles De Groot occupied the dwelling.

**Building, Structure, Object Information Continued:**

**FOR SALE**

FOR SALE—Large bronze breeding tom turkey; also persimmons. U. O. Gurlock, 1752 North Euclid, Ontario. Phone Upland 454-R. 2432

FOR SALE—Good vigorous baby chicks from my own stock of selected hens and pedigreed male birds. Glad to show the parent stock. Also chicks from same now in the brooder. 324 Acacia street. Phone 484-R. 2431

FOR SALE—Lion electric brooder, capacity 500 chicks, $10. Phone 1241-W. 2426

FOR SALE—Oat and alfalfa hay. Southwest corner Bon View and Edison avenue. Phone Chino 6072. 2425

"For Sale," Daily Report, January 14, 1929.

**MISCELLANEOUS**

To all real estate brokers: Our property located on the southwest corner of Bon View and Edison avenue is off the market.

Brockmeier Bros.
Paul Brockmeier.
3152

"Miscellaneous," Daily Report, January 3, 1931.

**Building, Structure, Object Information Continued:**

## DeGroot cow tops Andrews testing

A cow owned by Ernest DeGroot of Chino led the honor roll of the Andrews Lab's April report, with production of 938.8 pounds of butterfat and 25,350 pounds of milk.

George Andrews said that the average milk per cow per day was 54.5 pounds, the average butterfat per cow per month was 58.5 pounds and the average test was 3.58 percent.

"DeGroot Cow Tops Andrews Testing," Chino Champion, May 26, 1976.

## DeGroot cow tops testing by Andrews lab for June

Cow number 472 of Ernest DeGroot's Twin Palm dairy of Chino was high cow for the month of June tests done by the Andrews Lab. She produced 978 pounds milk in 23,240 pounds milk during the 305-day lactation period.

"De Groot Cow Tops Testing by Andrews Lab for June," Chino Champion, August 5, 1977.

**Building, Structure, Object Information Continued:**

**Ernest DeGroot** will be honored along with his son **Chuck,** and several other local dairymen at the annual Dairy Appreciation Dinner on Tuesday night. Ernest founded the family dairy which now includes son Chuck as a major administrator.

Chino Champion, September 18, 1981.

1982 California Dairy Industries Association producer raw milk class winners for San Bernardino County as announced by the Dairy Industries Association.

**Grand Trophy Winner**

Ted Miller Dairy, Chino.

Trophy winner—Producing over 19,000 lbs milk daily.

Tie-Andrew Stellingwerf Dairy, Chino; Twin Palms Dairy, Chino, Chuck and Ernest DeGroot.

Trophy Winner—Producing under 19,000 lbs milk daily.

J & L Dairy, Corona, Larry Vander Berge.

Chino Champion, December 17, 1982.

**Building, Structure, Object Information Continued:**

B-10-Chino Champion Fri., June 13, 1986

# Local dairies show how they do it

By Matthew Erlich, Staff Writer

Hundreds of Chino area residents got a taste of the dairy life, literally drinking down its pleasures when the Twin Palms and Costa View dairies hosted open houses June 7. The event was geared to kick off June as Dairy Month.

Highlight of the event was the milk drinking competition which saw children and adults race to finish small cartons and bottles of milk.

At the Twin Palms Dairy, 7587 Edison Ave, people on hand saw Jim Staal hoof trim cows. Mr Staal was demonstrating something he knows well, trimming between 8,000-10,000 head per year.

Mr Staal uses a custom-built truck that lifts cows and holds them in place for the trimming.

The dairy is owned by Mr and Mrs Ernest De Groot, Mr and Mrs Charles De Groot, and Mr and Mrs Paul Huizenga. The family operation milks 590 cows, and calves are raised on the site.

Ernest De Groot went broke once trying to start a dairy. His second effort in 1944 was more successful. He moved to Chino from Artesia in 1964.

At the Costa View Dairy, 14451 Bon View Ave, participants saw a calf with a fifth leg and glimpsed the computerized feeding process at the dairy.

Mr Costa has operated his dairy at Bon View Ave since 1970.

The milk drinking contest at the Twin Palms Dairy was hosted by Larry Bentley. Winners were:

**3-4 year olds;** Nicole Kleiman, Brian Hooper, Michelle Toledo, all of Chino.

**5-7 year olds;** Jennifer Galinbo of Ontario, Justin White, and Kenny Beattie, both of Chino.

**8-10 year olds;** Vincent Edwards-Ramirez of Ontario, Ernest De Groot and Luke Huizenga, both of Chino.

**11-14 year olds;** Shannon Mason, Nancy Garza and Jason Valencich, all of Chino.

**Adults;** Dennis Parker of Chino Hills, Dorita Valencich of Chino, and Mike Miller of the Chino Hills.

**HASTE MAKES WASTE — This young man is too busy to cry over spilt milk as he tries to get started during the milk drinking competition. Besides the milk they drank, winners received ribbons for their performance.**

Staff photo by Matthew Erlich

**ADULT WINNER — Dennis Parker, 34, of the Chino Hills (center) was the winner of the milk drinking contest for adults who were adorned with a bib and had to drink milk from a nipple. Miss Vitality Kim Stueve (left) and the 1986 Southern California Dairy Princess Sherrie Hoekstra (right) also were on hand for the event and led some dairy tours.**

Staff photo by Matthew Erlich

**THE CONVERSATION — Miss Chino Jane Carroll (right) talks with Mrs Ernest De Groot during the Dairy Open House. The chamber sponsored event was considered a success.**

Staff photo by Matthew Erlich

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•Family Entertainment
•Sports •140 Channels & More
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THANK YOU
FOR YOUR SUPPORT

"Local Dairies Show How They Do It," Chino Champion, June 13, 1986. p20

**B12. References Continued:**

2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
The 7587-7697 Edison Avenue property is recommended significant and eligible as an excellent example of a postwar dairy under the historic context theme for Postwar, Large-Capacity Dairies, 1945–1980. It retains multiple contributing features and clearly conveys its historical association with large scale, industrial dairy production that emerged in the region in the postwar era. Contributing features include a Craftsman Bungalow constructed prior to 1935, a Ranch Style residence built between 1959 and 1966, a Ranch Style Milk Parlor with a circular drive, and a range of ancillary structures including but not limited to silos, stalls, pole barns, a detached garage, feeding gates, water features, and bulk tanks. Under the historic context for Postwar, Large-Capacity Dairies, eligible properties must retain integrity of location, design, setting, materials, workmanship, feeling, and association, and demonstrate a direct and significant association with the dairy industry during the postwar period. This property as a whole meets the eligibility criteria for NRHP Criterion A / CRHR Criterion 1 / City of Ontario Criterion a, as it clearly conveys its historical association with large scale dairy operations that emerged in the region in the postwar.

Individually, the Craftsman Bungalow, built before 1935, is also recommended eligible under NRHP Criterion C / CRHR Criterion 3 / City of Ontario Criterion d. It retains its original shape, scale, and design features such as exposed rafter tails, wood siding, and overhanging eaves. Although a two-story rear addition was built between 1975 and 1979, it is set back, secondary in scale, and does not compromise the building's architectural character. The house continues to convey the key qualities of the Craftsman Bungalow style.

The Ranch style residence, constructed between 1959 and 1966, is also recommended individually eligible under NRHP Criterion C / CRHR Criterion 3 / City of Ontario Criterion d, under the context of Ranch Style, 1950–1970s. The dwelling features a horizontal rambling floorplan, low-pitched roof, wide eaves, cupola, and an integrated attached garage via an open breezeway. Although some windows have been replaced with vinyl units within the original openings, the overall design, materials, and feeling remain intact. The dwelling retains the necessary aspects of integrity and clearly represents a postwar Ranch style residence in Ontario.

While the milk parlor was considered for individual eligibility, the building reflects the standard Ranch style form and layout associated with large-capacity dairy operations. The milk parlor does not exhibit distinctive design features or architectural detailing that would elevate it to individual significance. Its configuration, materials, and construction are typical of postwar dairy facilities and do not reflect a uniquely representative or distinguishing example of the style or type. Accordingly, the building is not recommended for individual eligibility.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B. _**B.M.** __
c. Address: 14213-14297, 14333-14353, 14450, 14451 Bon View Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441295, 441487, 441407, 441407, 441407, 441407 mE / 3761773, 3761773, 3761622, 3761522, 3761424, 3761328 mN
e. Other Locational Data: San Bernardino County APN:105335101, 105335102, 105354101, 105354102, 105357101, 105357102

***P3a. Description:** The evaluated property consists of six parcels (APN: 105335101, 105335102, 105354101, 105354102, 105357101, and 105357102), historically addressed as 14213-14297, 14333-14353, 14450, and 14451 Bon View Avenue. The surrounding area is characterized by open space and agricultural land with historical ties to dairy operations. Covering 56.47 acres, the property is situated east of Bon View Avenue, between Euclid and Eucalyptus Avenues. The property includes two Ranch style milk parlors, two Minimal Traditional residences, two Craftsman Bungalow residences, two Ranch style dwellings, and multiple geometrically spaced ancillary storage structures located to the rear of the buildings. Water retention ponds are located to the rear portion of the parcels. Landscaping and hardscaping are minimal, consisting of paved driveways and scattered trees and shrubs. Today, the parcels continue to operate as dairy farms. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: View east of 14213 Bon View Avenue milk parlor (IMG_8730; October 21, 2024).
***P6. Date Constructed/Age and Source** pre-1935, 1959-1966, 1968-1975/UC Santa Barbara FrameFinder (1938, 1959, 1966, 1968, 1975)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Dlazevedo Enterprises LP
13309 Melissa Court
Madera CA 93637
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Rocha Dairy/Dimas Costa Dairy/ Costa View Farms No. 3/ Costa View Dairy/ Costa View Farms No. 1/ H & R Dairy
**B2. Common Name:** 14213-14297, 14333-14353, 14450, 14451 Bon View Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style/Minimal Traditional Style/Craftsman Bungalow Style

***B6. Construction History:** This property consists of six parcels under common ownership. No historic-era building permits were found on file for the property at the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and subsequent years. Aerial imagery indicates that the parcels at 14213-14297 Bon View Avenue and 14333-14353 Bon View Avenue were first improved with the construction of Craftsman Bungalow-style dwellings. Between 1959 and 1966, a Ranch style milk parlor and two Minimal Traditional-style residences were constructed at 14213-14297 Bon View Avenue. Between 1968 and 1975, a Ranch style dwelling was added at 14333-14353 Bon View Avenue.

During the same period (1968–1975), a Ranch style milk parlor and a Ranch style dwelling were constructed at 14450 and 14451 Bon View Avenue. Over the years, the milk parlor at 14213-14297 Bon View Avenue underwent substantial alterations between 1966 and the 1990s. Additionally, the Craftsman Bungalow dwelling features an early rear addition, appended between 1938 and 1946, and both Craftsman Bungalow dwellings have since lost their original windows. Subsequent aerial imagery suggests that the configuration of the remaining buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified **B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Early Dairy Farms in Ontario, 1900s-1929; Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s **Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 14213-14297, 14333-14353, 14450, 14451 Bon View Avenue was initially developed prior to 1935, with subsequent improvements/alterations made between the 1950s and 1990s. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former Chino Agricultural Preserve. The property is associated with the historical contexts of Early Dairy Farms in Ontario, 1900s-1929; Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s; however, the property does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 14213-14297, 14333-14353 , 14450, 14451 Bon View Avenue



Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 48

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
The 14213, 14333, 14450, and 14451 Bon View Avenue property spans multiple parcels fronting Bon View Avenue. Below is a description of each parcel and the buildings/structures located on them.

**14213-14297 Bon View Avenue (APN:105335101 and 105335102), pre-1935, 1959-1966**
Improved prior to 1935 with later developments between 1959 and 1966, the 14213-14297 Bon View Avenue property includes a Craftsman Bungalow style dwelling with a detached garage (14213 Bon View Ave), a Ranch style milk parlor (14239 Bon View Ave), two Minimal Traditional style residences (14283-14297 Bon View Ave), and several geometrically spaced pole structures to the rear.

To the far northwest corner of the parcel is a Craftsman Bungalow-style residence listed as 14213 Bon View Avenue. Constructed prior to 1935, the one-and-a-half-story dwelling has a compact rectilinear floorplan and an asymmetrical façade. The exterior is clad in tan-painted stucco with brown trim on the windows. The high-pitched, cross-gabled roof is topped with composition shingles and features a moderate eave overhang, support brackets below the gable, open eaves with exposed rafter ends, and a shed dormer on the main (west) elevation. The fenestration consists primarily of aluminum sliding sash windows and wood panel doors. The main elevation includes a full-length porch supported by two metal columns, a small stoop, and four concrete square columns approximately four feet in height. The rear (east) elevation features an early addition that was appended between 1938 and 1946. The addition features a stucco façade, gabled roof topped with composition shingles, open eaves with exposed rafter ends, and aluminum windows. The dwelling likely originally featured wood-framed, double-hung windows, as well as columns composed of a different material, which were removed or altered at an unidentified date.

A few feet east of the dwelling is one-car detached garage constructed between 1959 and 1966. The garage has a square floorplan, a gable roof, tan stucco façade, and a white overhead door.

Directly south of the Craftsman Bungalow dwelling is a Ranch style milk parlor listed as 14239 Bon View Avenue. Constructed between 1959 and 1966, the one-story structure has been substantially altered and now consists of three sections: the front milk house with an addition to the south elevation, the original rear milking parlor to the east of the milk house, now modified as a storage shed, and a new milking parlor section extending from the milk house addition. The milk house and milking parlor are separated by a breezeway, which features a metal sliding barn door with a handle on the south elevation. East of the breezeway, the building is divided into a milking area and a wider holding area. The milking area features louvered horizontal shutters on the south elevation, set atop concrete walls, while the north elevation is obscured by the original rear section. The rear section has a gabled roof oriented along an east-west axis. Additional elements include metal doors at the front, a dairy association sign below the gable, and a circular driveway in front of the milk parlor.

South of the milk house are two modest Minimal Traditional residences and a detached garage, historically addressed as 14283-14297 Bon View Avenue. Constructed between 1959 and 1966, the 14283 Bon View Avenue dwelling is situated north of the 14297 Bon View Avenue dwelling, with the detached garage positioned between them. Both residences feature asymmetrical façades and rectilinear floorplans atop concrete foundations. The 14283 Bon View Avenue dwelling has a tan stucco exterior, a hipped roof topped with composition shingles, moderate eave overhang, and boxed eaves. The main entryway is recessed, with a partial porch that includes a small stoop and decorative iron railing and columns. Fenestration consists of aluminum sliding sash windows and paneled doors. The 14297 Bon View Avenue dwelling features a tan stucco façade, a side-gabled roof with composition shingles, and an attached narrow garage with an overhead metal door. The main elevation includes a half-width porch supported by decorative metal columns and railing, a small stoop, aluminum sliding sash windows, and paneled doors.

The detached garage shares a similar appearance with the dwellings, featuring a tan stucco façade, a front-gabled roof, and a metal overhead door. East of the milk parlor and dwellings, several geometrically spaced pole structures are present, along with metal silos and ancillary storage buildings.

## Primary Record Information Continued:

P3a. Continued from Page 1:
The 14213, 14333, 14450, and 14451 Bon View Avenue property spans multiple parcels fronting Bon View Avenue. Below is a description of each parcel and the buildings/structures located on them.

14213-14297 Bon View Avenue (APN:105335101 and 105335102), pre-1935, 1959-1966
Improved prior to 1935 with later developments between 1959 and 1966, the 14213-14297 Bon View Avenue property includes a Craftsman Bungalow style dwelling with a detached garage (14213 Bon View Ave), a Ranch style milk parlor (14239 Bon View Ave), two Minimal Traditional style residences (14283-14297 Bon View Ave), and several geometrically spaced pole structures to the rear.

To the far northwest corner of the parcel is a Craftsman Bungalow-style residence listed as 14213 Bon View Avenue. Constructed prior to 1935, the one-and-a-half-story dwelling has a compact rectilinear floorplan and an asymmetrical façade. The exterior is clad in tan-painted stucco with brown trim on the windows. The high-pitched, cross-gabled roof is topped with composition shingles and features a moderate eave overhang, support brackets below the gable, open eaves with exposed rafter ends, and a shed dormer on the main (west) elevation. The fenestration consists primarily of aluminum sliding sash windows and wood panel doors. The main elevation includes a full-length porch supported by two metal columns, a small stoop, and four concrete square columns approximately four feet in height. The rear (east) elevation features an early addition that was appended between 1938 and 1946. The addition features a stucco façade, gabled roof topped with composition shingles, open eaves with exposed rafter ends, and aluminum windows. The dwelling likely originally featured wood-framed, double-hung windows, as well as columns composed of a different material, which were removed or altered at an unidentified date.

A few feet east of the dwelling is one-car detached garage constructed between 1959 and 1966. The garage has a square floorplan, a gable roof, tan stucco façade, and a white overhead door.

Directly south of the Craftsman Bungalow dwelling is a Ranch style milk parlor listed as 14239 Bon View Avenue. Constructed between 1959 and 1966, the one-story structure has been substantially altered and now consists of three sections: the front milk house with an addition to the south elevation, the original rear milking parlor to the east of the milk house, now modified as a storage shed, and a new milking parlor section extending from the milk house addition. The milk house and milking parlor are separated by a breezeway, which features a metal sliding barn door with a handle on the south elevation. East of the breezeway, the building is divided into a milking area and a wider holding area. The milking area features louvered horizontal shutters on the south elevation, set atop concrete walls, while the north elevation is obscured by the original rear section. The rear section has a gabled roof oriented along an east-west axis. Additional elements include metal doors at the front, a dairy association sign below the gable, and a circular driveway in front of the milk parlor.

South of the milk house are two modest Minimal Traditional residences and a detached garage, historically addressed as 14283-14297 Bon View Avenue. Constructed between 1959 and 1966, the 14283 Bon View Avenue dwelling is situated north of the 14297 Bon View Avenue dwelling, with the detached garage positioned between them. Both residences feature asymmetrical façades and rectilinear floorplans atop concrete foundations. The 14283 Bon View Avenue dwelling has a tan stucco exterior, a hipped roof topped with composition shingles, moderate eave overhang, and boxed eaves. The main entryway is recessed, with a partial porch that includes a small stoop and decorative iron railing and columns. Fenestration consists of aluminum sliding sash windows and paneled doors. The 14297 Bon View Avenue dwelling features a tan stucco façade, a side-gabled roof with composition shingles, and an attached narrow garage with an overhead metal door. The main elevation includes a half-width porch supported by decorative metal columns and railing, a small stoop, aluminum sliding sash windows, and paneled doors.

The detached garage shares a similar appearance with the dwellings, featuring a tan stucco façade, a front-gabled roof, and a metal overhead door. East of the milk parlor and dwellings, several geometrically spaced pole structures are present, along with metal silos and ancillary storage buildings.

## Primary Record Information Continued:

**14333-14353 Bon View Avenue (APN:105354102), pre-1935, 1968-1975**
Improved prior to 1935, with later developments between 1968 and 1975, the property includes a Craftsman Bungalow-style dwelling at 14353 Bon View Avenue, a Ranch style dwelling at 14343 Bon View Avenue, a detached garage, and four ancillary pole structures situated to the rear.

To the far southwest corner of the parcel is a Craftsman Bungalow-style dwelling, historically addressed as 14343 Bon View Avenue. Constructed prior to 1935, the dwelling features a rectangular footprint and an asymmetrical façade. The exterior is clad in tan-painted stucco. The high-pitched, side-gabled roof is topped with composition shingles and includes a minimal eave overhang, boxed eaves, and two gabled dormers on the north and south elevations. The fenestration primarily consists of aluminum sliding sash windows. An addition, constructed between 1959 and 1966, extends from the east elevation. The dwelling exhibits minimal decorative detailing throughout.

A few feet north of the dwelling is a one-car garage, which features a front-gabled roof and a metal overhead door.

To the far northwest corner of the parcel is the Ranch style dwelling at 14353 Bon View Avenue. Constructed between 1968 and 1975, the dwelling features an asymmetrical, horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan-painted stucco with brown window trim. The low-pitched hipped roof is topped with terracotta tiles and features a minimal eave overhang with boxed eaves. The fenestration is mostly obscured from the public right-of-way but appears to consist of fixed multi-lite or single-pane picture windows. A detached one-car garage is situated south of the dwelling, featuring a tan stucco façade, a hipped roof with terracotta tiles, and a metal overhead door. Additional features include a stone planter and a circular driveway in front of the residence.

East of the dwellings, four pole structures are present.

**14450 Bon View Avenue (APN:105354101),1968-1975**
Improved between 1968 and 1975, the parcel includes a Ranch style milk parlor and several ancillary structures associated with dairy operations. The one-story milk parlor consists of two sections: the front milk house and the rear milking parlor, separated by a breezeway. The milk house features modest Ranch style elements, including a hip-and-gable roof with wood shake shingles, a stucco façade with stone accents along the corners of the main (west) elevation, and metal casement windows on the north elevation. The fenestration throughout has since been boarded up. The breezeway, located between the two sections on the north and south elevations, is obscured from the public right-of-way.
East of the breezeway, the building is divided into a milking area and a wider holding area. The milking area features louvered horizontal shutters on the north and south elevations, set atop concrete walls. The holding area, which extends outward beyond the milking area, is partially open and supported by concrete walls and metal poles. Both sections have gabled roofs oriented along an east-west axis. Additional features include two glass industrial doors at the front, a circular driveway in front of the milk parlor, and a dairy association sign.

Several geometrically spaced pole structures are located around the milk parlor, along with metal silos and ancillary storage buildings.

**14451 Bon View Avenue (APN:105357101 and 105357102),1968-1975**
Improved between 1968 and 1975, the 14451 Bon View Avenue property includes a Ranch style dwelling with an attached garage and several geometrically spaced pole structures to the rear. The dwelling is located on parcel 105357101, while parcel 105357102 to the south remains mostly undeveloped. The dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a brick veneer and a planter on the main (west) elevation. The low-pitched hipped roof is topped with composition shingles, featuring a moderate eave overhang, boxed eaves, and a stone chimney on the rear roof slope.
The main elevation showcases a recessed entryway beneath the roofline, with two decorative wood-paneled doors and box bays accented by horizontal wood siding. The fenestration throughout consists primarily of vinyl sliding sash windows. At the far northern end is a one-car attached garage with a white paneled overhead door.

## Primary Record Information Continued:

View east of 14450 Bon View Avenue (IMG_8725; October 21, 2024).

View northeast of 14450 Bon View Avenue (IMG_8726; October 21, 2024).

## Primary Record Information Continued:

View northeast of 14450 Bon View Avenue milk parlor (IMG_8727; October 21, 2024).

View east of 14333 Bon View Avenue Minimal Traditional SFR (IMG_8729; October 21, 2024).

## Primary Record Information Continued:

View east of 14213 Bon View Avenue bungalow and Ranch style SFR (IMG_8731; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**

**14213 Bon View Ave**
In 1957, the 14213 Bon View Avenue property was advertised for rent by local newspapers as a 19 acre ranch with water and soil good for sweet potatoes. In 1962, Frank Bernard lived at the property. In 1970, Mr. and Mrs. Dennis M. Coelho lived at the property. In 1973, Mr. and Mrs. Elcidio Rocha lived at the property. In 1982, the dwelling was part of a dairy known as the Jose Rocha Dairy. In 1987, the property appears to have been under the ownership of the Rocha and Coelho family. In 1989, the dwelling was part of the Costa View Farms No. 3 Dairy.

**14297 Bon View Ave**
In 1969, the milk parlor was listed as part of the Rocha family dairy.

**14283 Bon View Ave**
No Results.

**14297 Bon View Ave**
Between the 1960s and 1970s, the dwelling is listed as part of the Rocha Dairy.

## Building, Structure, Object Information Continued:

**14333 Bon View Ave**
Between 1957-1963, the dwelling was occupied by Gene Souza family. In 1966, the property was occupied by Manuel Costa Cordoza Sr., of the Azores. In 1971, Mr. and Mrs. Antonio R. Cota occupied the dwelling.

**14343-14353 Bon View Ave**
No Results.

**14451 Bon View Ave**
No Results.

**14450 Bon View Ave**
Between 1970-1980s, the dwelling was occupied by the Dimas Costa family and part of the Costa Dairy farm. In 1978, the Costa dairy was part of a tour sponsored by the Chamber of Commerce Dairy Committee. In 1981, the dairy farm was known as the Costa View Farms. In 1989, the dwelling was part of the Costa View Farms No.1. In 2003, the dwelling was part of the H & R Dairy owned by Dorothy Miersma family trust.

Chino Champion--Section 2, page 26 Chino, Calif., Fri., June 2, 1978

# Dairies on tour set for June 24

The Chamber of Commerce Dairy Committee will sponsor a three-dairy open house to celebrate June is Dairy Month on June 24 from 10 a.m. to 3 p.m.

Dimas Costa's dairy at 14451 Bon View will be one of those open to the public. He has been at his present location eight years and has a total of 750 cows,

Continued on page 27

A PORTION of the 30-acre Costa diary is given to storage of hay and feed. — Champion Photo.

AN UNUSUAL FEATURE of the dairy barn at Jennie and Fred DeBoer's new dairy is a large dairy scene stained glass window visible from the East Riverside Dr. location. The newly expanded dairy will still be under construction when it is featured as part of a tri-dairy tour sponsored by the Chamber of Commerce on June 24. — Champion Photo.

GOODYEAR
CONGRATULATIONS! Al Unser Winner Of The 1978 Indianapolis 500 On Goodyear Racing Tires
'Be A Winner...Go Goodyear'
DOUBLE BELTED DOUBLE FEATURE!
BLACKWALL $28 A78-13 blackwall plus $1.71 F.E.T. and old tire
WHITEWALL $31 A78-13 whitewall plus $1.71 F.E.T. and old tire

| Size | Blackwall Price | Whitewall Price | Plus F.E.T. No trade needed |
|---|---|---|---|
| E78-14 | $33.00 | $36.00 | $2.19 |
| F78-14 | $39.00 | $42.00 | $2.34 |

Goodyear's Best-Selling Glass Belted Tire...Custom Cushion Power Polyglas'
POLYESTER SUPERSTAR!
'All-Weather' 78 Goodyear Quality At A Budget Price
$20 B78-13 blackwall plus $1.72 F.E.T. and old tire

"Dairies on Tour set for June 24," Chino Champion, Jun 2, 1978.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b. as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 14213-14297, 14333-14353 , 14450, 14451 Bon View Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 14213-14297, 14333-14353 , 14450, 14451 Bon View Avenue property has been found not significant and ineligible, while it maintains integrity of location, setting, feeling, and association as an active and in-use dairy farming property, some of the buildings have lost integrity of design, materials, and workmanship due to modifications.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 53

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 7914 Edison Avenue
**Page** 1 **of** 5

**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._**B.M.** __
c. Address: 7914 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441677, 441692 mE / 3762364, 3762132mN
e. Other Locational Data: San Bernardino County APN:105317101, 105332102, 105332103, 105317106

***P3a. Description:** The evaluated property consists of four parcels (APN: 105317101, 105332102, 105332103, and 105317106), historically addressed as 7914 Edison Avenue. Located in an area characterized by open space and agricultural land with historical ties to dairy operations, the property spans 18.79 acres. It is situated north of Edison Avenue, between Bon View and Grove Avenues. The property includes two Ranch style single-family residences and a Streamline Modern milk parlor. The property is mostly obscured from the public right-of-way and enclosed by a chain-link fence with privacy fabric. The buildings are located on parcel 105332102, while the remaining parcels are undeveloped. Originally the property was owned by Earl Abram Musser, son of Charles Sumner Musser, founder of the Shady Grove Dairy. Dairy operations have ceased at the property. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View north of 7914 Edison Avenue (IMG_8735; October 21, 2024).
***P6. Date Constructed/Age and Source**
1952-1959, 1966-1980/UC Santa Barbara FrameFinder (1952)/NETR HistoricAerials (1959, 1966,1980)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Edison Ranch LLC
PO Box 1578
Chino CA
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Earl Musser Property
**B2. Common Name:** 7914 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Single-Family Residence
***B5. Architectural Style:** Ranch Style/Streamline Moderne Style

***B6. Construction History:** This property consists of four parcels under common ownership. No historic-era building permits were found in the City of Ontario's records. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System and supplemented by aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and subsequent years. Aerial imagery indicates that initial development occurred between 1952 and 1959 with the construction of the existing Ranch style residence and Streamline Moderne milk parlor. Between 1966 and 1980, a second Ranch style residence was added. Aside from the addition of an attached garage to the first dwelling, aerial imagery suggests that the configuration of the existing buildings has remained largely unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 7914 Edison Avenue was initially developed between 1952 and 1959. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 7914 Edison Avenue
**Page 3 of** 5

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 53

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

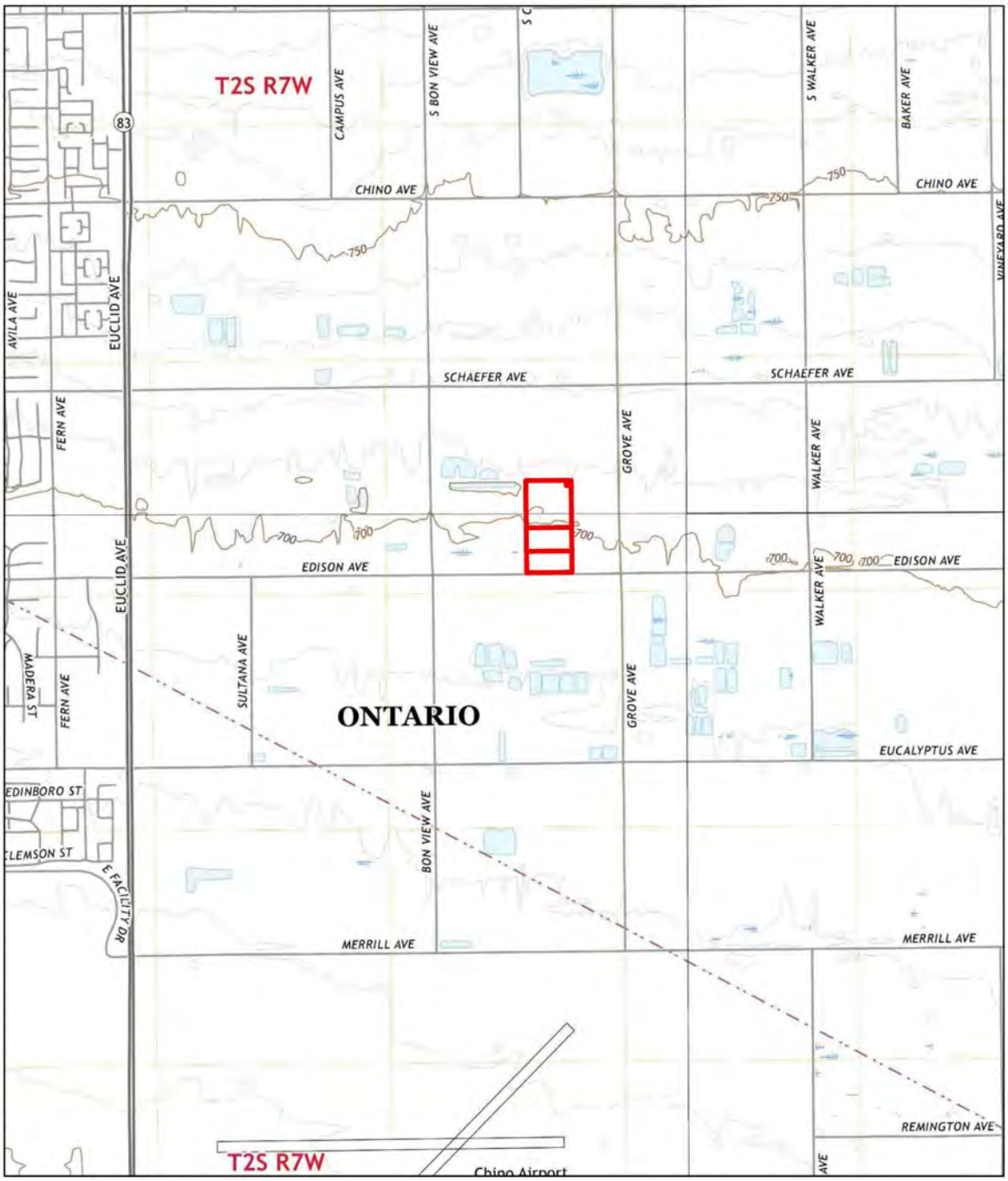


URBANA PRESERVATION & PLANNING LLC

0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**

Improved between 1952 and 1959 with later developments between 1966 and 1980, the 7914 Edison Avenue property includes two Ranch style residences and a Streamline Moderne milk parlor. The property is obscured behind a fence. Based on Google Street View images and aerial imagery, the dwelling features an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with brick and wood shiplap veneer on the main elevation. The low-pitched hipped roof is topped with composition shingles, has a moderate eave overhang, boxed eaves, and a brick chimney along the roof slope at the rear (north) elevation. The fenestration consists of metal casement windows and sliding sash windows. The main elevation features a partial-width porch beneath a shed roof supported by decorative metal beams, a small stoop, and additional decorative metal details. To the west side of the dwelling is a one-car garage addition, installed by the 1980s, with a brown paneled overhead door.

Directly west of the residence is the Streamline Moderne milk parlor. Constructed between 1952 and 1959, the structure retains only the front milk house section, as the rear milking parlor section was demolished by April 2022. The milk house exhibits distinctive Streamline Moderne characteristics, including smooth stucco walls, a flat roof, curvilinear corners, a central vertical projection, and glass block windows, some of which are diamond-shaped. Originally, the milk house featured a white painted stucco exterior, but by 2022, it had been repainted tan. The original metal casement windows on the west and east elevations were replaced with incompatible vinyl single-hung windows. While the milk parlor may have been eligible as a distinctive example of the Streamline Moderne style, it no longer retains sufficient integrity to convey its significance.

To the far southwest corner of the parcel is the second Ranch style residence, constructed between 1966 and 1980. The residence has an asymmetrical façade and a mostly rectilinear floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with a partial brick veneer on the main (south) elevation. The low-pitched hipped roof features a moderate eave overhang and boxed eaves. The fenestration primarily consists of vinyl sliding sash windows, which were installed in 2022, replacing the original aluminum units. The main (south) elevation features a recessed main entryway with decorative double wood-paneled doors, a small stoop, a decorative metal beam beneath the roofline and entryway, and an attached garage on the west side with an overhead door.

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**

During the 1970s, Henry Donkers and his wife lived at the subject property.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b. as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 7914 Edison Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

The 7914 Edison Avenue property has been found not significant and ineligible. While the milk parlor may have once been eligible as a distinctive example of the Streamline Moderne style and retains integrity of location and setting, it no longer possesses sufficient integrity of design, materials, workmanship, feeling, or association as an active dairy farming property or a site historically connected to dairy operations.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B. _**B.M.** __
c. Address: 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442103, 442291, 442289 mE / 3762770, 3762181, 3762380mN
e. Other Locational Data: APN: San Bernardino County APN: 021631103, 021631104, 021631105, 021631108, 021631109

***P3a. Description:** The evaluated property consists of five parcels (APN: 021631103, 021631104, 021631105, 021631108, and 021631109), historically addressed as 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, and 8270-8292 Edison Avenue. Covering 46.80 acres, the property is located on the east side of Grove Avenue and extends between Schaefer and Edison Avenues. The surrounding area remains largely open space and agricultural land, historically associated with dairy farming. The property includes a Ranch style dwelling and milk parlor with Dutch style characteristics located at 13715–13751 Grove Avenue on parcel 021631105, as well as a second Ranch style dwelling and milk parlor with Dutch style characteristics at 13817–13819 Grove Avenue on parcel 021631104, with some ancillary structures. It also includes two Minimal Traditional style dwellings at 8270–8292 Edison Avenue on parcel 021631109. Water retention ponds are present on parcels 021631103 and 021631109. Although historically associated with dairy operations, the property no longer functions as an active dairy. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View east of 13715 Grove Avenue Ranch style milk parlor # 2 with perpendicular wing (IMG_8772; October 21, 2024).

***P6. Date Constructed/Age and Source**
1948-1952, 1959-1966/UC Santa Barbara FrameFinder (1952); NETR HistoricAerials (1948, 1959,1966)
☒Historic:
☐ Prehistoric
☐ Both

***P7. Owner and Address:**
Grove Schaefer Ontario LLC
14240 Sapphire Hill Ln
Chino Hills CA 91709

***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com

***P9. Date Recorded:** October 2024

***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.

***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Hofstra Dairy
**B2. Common Name:** 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Single-Family Property
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of five parcels under a single ownership. No historic-era building permits were found in the City of Ontario's records. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System and supplemented by aerial imagery from 1935, 1938, 1939, 1946, 1948, 1952, 1959, 1966, and subsequent years. Aerial imagery indicates that initial development occurred between 1948 and 1952, with the construction of two Minimal Traditional residences listed as 8270-8292 Edison Avenue. Between 1959 and 1966, a Ranch style residence and milk parlor was constructed on 13715-13751 Grove Avenue and a Ranch style residence and milk parlor on 13817-13819 Grove Avenue. Several ancillary structures/features were constructed to the rear of the buildings. By the 2018, most of these supporting structures/features had been demolished. Subsequent aerial imagery suggests that the configuration of the existing buildings has remained relatively unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Ranch Style, 1950-1970s **Area:** San Bernardino County
**Period of Significance:** 1959-1966 **Property Type:** Ranch Style
**Applicable Criteria:** NRHP/CRHR/Local C/3/d

The 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue property was improved between 1948 and 1952 with additional developments between 1959 and 1966. In 1967 the area was established as part of the San Bernardino County Agricultural Preserve. In 1999, the area was annexed as part of the New Model Colony, formed from a portion of the former agricultural preserve. The property was evaluated under multiple themes, including the Postwar, Large-Capacity Dairies, 1945-1980; Ranch Style, 1950-1970s; and the Minimal Traditional Style, 1930s-1960s.However, the only Ranch style milk parlor and residences are significant under NRHP / NRHP / CRHR / City of Ontario C/3/d under the context of the Ranch style, with a period of significance of 1959 through 1966, representing original construction of the buildings**. See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 13715-13751 Grove Avenue, 13817-13819 Grove Avenue, 8270-8292 Edison Avenue



Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 3S/3CS/5S3
Other Listings: Urbana Survey No.: 69

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**

Improved between 1948 and 1952, with later developments occurring between 1959 and 1966, the property includes two Ranch style milk parlors with associated residences, two Minimal Traditional style dwellings, and several ancillary structures historically associated with dairy operations, including some ancillary structures associated with former dairy operations. The majority of the ancillary structures and features have been demolished. A description of each parcel and its associated buildings is provided below.

**13715-13751 Grove Avenue (APN: 021631105), 1959-1966**

Located on the northeast corner of Grove and Schaefer Avenues, 13715–13751 Grove Avenue includes a Ranch style residence and milk parlor situated on parcel 021631105. The dwelling is located in the northwest corner of the parcel and features an asymmetrical façade with a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in yellow painted stucco with horizontal wood siding on a portion of the main (west) elevation, accented by white trim around the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and features a moderate eave overhang, open eaves with exposed rafter tails, and decorative scalloped barge board at the gable ends. The fenestration visible from the public right-of-way consists of wood single-hung windows and a wood half-lite diamond patterned door. The main (west) elevation exhibits Northern European or Dutch influences, such as the diamond-patterned door, scalloped barge board, wood spindle porch supports, and a square cupola. The attached two-car garage is connected to the residence by a breezeway on the south elevation. Additional features include a stone planter and concrete steps at the main entryway.

South of the residence is the Ranch style milk parlor. The building has a horizontal floorplan and is divided into two sections: the front milk house and a rear milking parlor, separated by an open breezeway. The front section reflects Ranch style characteristics, featuring a front-gabled roof with wood shake shingles, yellow painted stucco walls, and metal casement and fixed windows. An open breezeway separates this front section from the rear portion of the building. South of the breezeway, the milking parlor has a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls and along the gable ridge. Additional features include a circular driveway, metal doors at the main entryway, and a stone planter. The main (west) elevation of the front section also displays Northern European or Dutch influences, such as diamond-patterned fixed windows and a gabled shed roof above the main entryway supported by curved knee brackets.

The dwelling and milk parlor are strong examples of Ranch style architecture with Northern European or Dutch influences, having undergone minimal alterations. While the property is associated with the postwar, large-capacity dairy theme, several key ancillary structures and features related to former dairy operations are no longer extant. As a result, the property no longer represents a strong example of a postwar, large-capacity dairy. However, the buildings appear individually eligible under the Ranch style theme.

**13817-13819 Grove Avenue (APN: 021631104), 1959-1966**

Located east of Grove Avenue, 13817-13819 Grove Avenue includes a Ranch style residence and milk parlor situated on parcel 021631104. The dwelling is located in the northwest corner of the parcel and features an asymmetrical façade with a one-story horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in beige painted stucco with tan horizontal wood siding on a portion of the main (west) elevation, accented by white trim around the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and features a moderate eave overhang, boxed eaves, horizontal wood siding below the gable, and decorative scalloped barge board at the gable ends. The fenestration visible from the public right-of-way consists of wood single-hung windows, some with decorative shutters, and a wood half-lite diamond patterned door. The main (west) elevation exhibits Northern European or Dutch influences, such as the diamond-patterned half-lite door and windows, scalloped barge board, box bay accented with wood-siding, and a square cupola. The attached three-car garage is connected to the residence by a breezeway on the south elevation. Additional features include a stone planter, a stone chimney on the rear elevation, and concrete steps at the main entryway.

South of the residence is the Ranch style milk parlor. The building is divided into two sections: the front milk house and a rear milking parlor, separated by an open breezeway. The front section reflects Ranch style characteristics, featuring a hip-and-gable roof with wood shake shingles, beige painted stucco walls, and metal casement and fixed windows. A breezeway, located between the two sections on the north and south elevations, is partially hidden from the public right-of-way. East of the breezeway, the

## Primary Record Information Continued:

milking parlor features a gable roof oriented along an east-west axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls and along the gable ridge. Additional features include a circular driveway, metal doors at the main entryway, and a stone planter. The main (west) elevation of the front section also displays Northern European or Dutch influences, such as diamond-patterned windows, decorative wood spindles below the roofline, and scalloped barge board at the gable end.

The dwelling and milk parlor are good examples of the Ranch style with Northern European or Dutch influences and minimal alterations. The However, several of the ancillary structures and features associated with former dairy operations are no longer extant. As a result, the property does not represent a strong example of a postwar, scientific, large-capacity dairy.

**8270-8292 Edison Avenue (APN: 021631109), 1948-1952**

Located north of Edison Avenue, 8270-8292 Edison Avenue includes two Minimal Traditional style dwellings situated on parcel 021631109. Both dwellings were constructed between 1948 and 1952 and features an asymmetrical compact floorplan with minimal decorative details. The 8270 Edison Avenue dwelling is located west of 8292 Edison Avenue. The dwelling has a square floorplan with a hipped roof topped with composition shingles. The exterior is stucco painted white. All the windows and doors have since been boarded up with plywood.

The 8292 Edison Avenue dwelling features a rectilinear floorplan and a white stucco exterior with red trim around the windows and doors. The hipped roof is also topped with composition shingles and includes a moderate eave overhang. Fenestration consists of a combination of aluminum single-hung windows and wood double-hung windows, along with a flush wood entry door. Both dwellings are modest in appearance and do not exhibit distinctive characteristics of the Minimal Traditional style.

View southeast of 13715 Grove Ave Ranch style SFR (IMG_8765; October 21, 2024).

## Primary Record Information Continued:

View southeast of 13715 Grove Ave Ranch style milk parlor (IMG_8766; October 21, 2024).

View southeast of 13715 Grove Ave Ranch style milk parlor # 2 with perpendicular wing (IMG_8767; October 21, 2024).

**Primary Record Information Continued:**

View east of 13715 Grove Ave Ranch style milk parlor # 2 with perpendicular wing (IMG_8769; October 21, 2024).

View east of 13715 Grove Ave Ranch style milk parlor # 2 with perpendicular wing (IMG_8770; October 21, 2024).

## Primary Record Information Continued:

View east of 13715 Grove Ave Ranch style SFR (IMG_8771; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
**13715-13751 Grove Avenue (APN: 021631105), 1959-1966**
Between the 1960s and 2021, the property was under the Dick Hofstra family's ownership.

**13817-13819 Grove Avenue (APN: 021631104), 1959-1966**
Between the 1960s and 2021, the property was under the Dick Hofstra family's ownership.

**8270-8292 Edison Avenue (APN: 021631109), 1948-1952**
Between the 1960s and 2021, the property was under the Dick Hofstra family's ownership.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
The two Ranch style residences and associated milk parlors, constructed between 1959 and 1966, are individually significant under NRHP, CRHR, and City of Ontario Criterion C/3/d as strong examples of the Ranch style with Northern European or Dutch stylistic influences. Their low-pitched roofs, stucco cladding, decorative scalloped barge board, diamond-patterned doors and windows, cupolas, and stone planters reflect design characteristics in-vogue in the postwar period. The buildings remain largely intact and retain integrity of location, design, materials, workmanship, and feeling. Accordingly, the property is eligible under NRHP, CRHR, and City of Ontario Local Register under C/3/d under the Ranch Style theme.

The property as a whole may have been eligible under NRHP, CRHR, and City of Ontario Criterion A/1/a for its association with the Postwar, Large-Capacity Dairies theme; however, it no longer retains sufficient integrity to convey its significance. As originally developed, the property embodied the postwar dairy type, with two milk parlors, multiple residences, and expansive acreage under single ownership. By 2018, most of the ancillary structures and features historically associated with the dairy, including corrals, barns, silos, pole structures, and feeding areas, had been removed. As a result, the property no longer retains the integrity necessary to convey significance under this theme.

Individually, the two Minimal Traditional style dwellings constructed between 1948 and 1952 are not eligible. They are modest, utilitarian examples of the style that lack distinctive detailing or architectural character and therefore do not rise to the threshold of individual significance.

Under the established context, an eligible property must retain integrity of location, setting, materials, design, feeling, workmanship, and association aspects of integrity to convey significance. The Ranch style milk parlors and residences retains necessary integrity to convey significance including location, setting, feeling, design, materials, workmanship, and association. Accordingly, the property is eligible under NRHP / CRHR / City of Ontario Criterion C/3/d, as it embodies the distinctive characteristics of the Ranch style, qualifying as a historical resource under Section 15064.5 of the CEQA Guidelines.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 103

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 7595 Schaefer Avenue, 13752 Bon View Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._ **B.M.** __
c. Address: 7595 Schaefer Avenue, 13752 Bon View Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441084, 440891, 441084 mE / 3762774, 3762181, 3762377 mN
e. Other Locational Data: San Bernardino County APN: 105311104, 105312101, 105312102, 105319101, 105319102, 105330101, 105330102

***P3a. Description:** The evaluated property consists of seven parcels (APN: 105311104, 105312101, 105312102, 105319101, 105319102, 105330101, and 105330102), historically addressed as 7595 Schaefer Avenue and 13752 Bon View Avenue. Encompassing 61.21 acres, the property is located west of Bon View Avenue, extending between Schaefer and Edison Avenues. The surrounding area remains predominantly open space and agricultural land, historically associated with dairy farming. The property includes a Ranch style residence on parcel 105311104, a Ranch style residence and milk parlor on parcel 105312101, several geometrically spaced ancillary pole structures and sheds, and water retention ponds on parcels 105319101, 105330101, and 105330102. Landscaping and hardscaping features are minimal and consist of paved driveways and some organized trees around the dwellings. The property continues to function as a dairy farm today. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo: View west of 13752 Bon View Ave (IMG_8687; October 21, 2024).
***P6. Date Constructed/Age and Source**
1952-1959/UC Santa Barbara FrameFinder (1952, 1959)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Nederand Family Partnership
4998 Hogg Rd
Homedale ID 83628
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Driftwood Dairy Farm/Vander Poel Bros/Nederend Dairy
**B2. Common Name:** 7595 Schaefer Avenue, 13752 Bon View Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of seven parcels under single ownership (APN: 105311104, 105312101, 105312102, 105319101, 105319102, 105330101, and 105330102). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 7595 Schaefer Avenue, 13752 Bon View Avenue was initially developed between 1952 and 1959 with the construction of the existing Ranch style residences and milk parlor. The property was originally part of the Driftwood Dairy. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 7595 Schaefer Avenue, 13752 Bon View Avenue was originally developed between 1952 and 1959. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

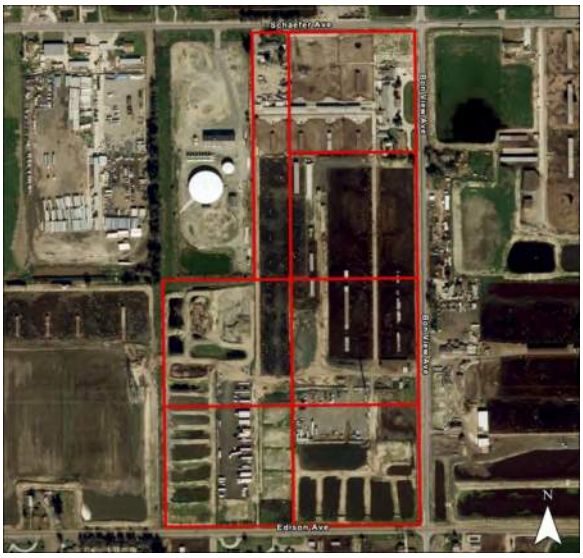


(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 7595 Schaefer Avenue, 13752 Bon View Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 103

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved between 1952 and 1959, the property includes two Ranch style dwellings, a Ranch style milk parlor, several ancillary structures, and water retention ponds. Below is a description of the buildings/structures and parcels.

**7595 Schaefer Avenue, 1952-1959 (APN: 105311104)**
Located on the northern end of parcel 105311104, the Ranch style dwelling at 7595 Schaefer Avenue faces Schaefer Avenue. The residence features an asymmetrical façade and a horizontal, irregular floor plan atop a concrete foundation. Its exterior is clad in yellow painted stucco. The low-pitched cross-gabled roof is covered with composition shingles and includes a moderate eave overhang with open eaves and exposed rafter ends. Fenestration consists of vinyl fixed and sliding sash windows. The main elevation features a combination of stucco and horizontal wood siding, along with a recessed main entryway situated beneath an extended roof girder, supported by a carved wood spindle. An attached garage is located on the west elevation and is clad in both stucco and board-and-batten siding.

**13752 Bon View Avenue, 1952-1959 (APN: 105312101, 105312102)**
Situated on the northwest side of parcels 105312101 and 105312102, the Ranch style milk parlor and residence at 13752 Bon View Avenue face Bon View Avenue. Constructed between 1952 and 1959, the milk parlor has a horizontal layout with two wings and consists of three sections: the front milk house, the rear milking parlor, and two holding areas at the wings. The front section incorporates Ranch style elements, including a cross-gable roof topped with wood shake shingles, a moderate eave overhang, wood siding with decorative brackets below the gable end, a stone planter, diamond-patterned casement windows, and a stucco façade. To the rear of the front section, the milking parlor and holding areas feature a gabled roof oriented along a north-south axis, with concrete walls. Additional features include industrial glass doors, silos, and a circular driveway in front of the milk parlor.

North of the milk parlor, a small rectilinear structure features a gabled roof clad in corrugated sheet metal, concrete walls, and horizontal louvered shutters set between the concrete walls.

South of the milk parlor is a Ranch style residence designed with similar architectural elements. The dwelling features an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. Its exterior is clad in yellow painted stucco. The low-pitched cross-gabled roof is topped with tiles and includes a moderate eave overhang, open eaves, a stone chimney on the rear roof slope, and exposed rafter ends. The main elevation showcases horizontal wood siding along the lower span of the building, a partial stone veneer, and aluminum diamond-patterned casement and fixed windows of various sizes. Additional features include a box bay accented with wood siding, a recessed entryway beneath an extended roof girder supported by a decorative wood spindle, and a wood half-lite door with a diamond pattern. An attached garage is located on the north elevation, featuring board-and-batten siding, diamond-patterned casement windows with wood shutters, and a cupola on the roof ridge.

## Primary Record Information Continued:

View southwest of 13752 Bon View Ave (IMG_8688; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
**7595 Schaefer Ave and 13752 Bon View Avenue (APN: 105311104, 105312101, 105312102)**
In the 1950s and 1960s, the dairy was owned by Albert J. Shaw Dairy and listed as the Driftwood Dairy Farm. By 1971, ownership had transferred to Mr. and Mrs. Pete Vander Poel, and the property was renamed the Vander Poel Bros Dairy. By 1980, it became known as the Nederend Dairy under the ownership of Hans Nederend.

The remaining parcels appear to have been acquired under the Nederend family's ownership.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 7595 Schaefer Avenue, 13752 Bon View Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 7595 Schaefer Avenue, 13752 Bon View Avenue property has been found not significant and ineligible, it maintains integrity of location, setting, design, materials, workmanship, feeling, and association as an active and in-use dairy farming property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 104

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 8040 Schaefer Avenue, 14050 Grove Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B. _**B.M.** __
c. Address: 8040 Schaefer Avenue, 14050 Grove Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441872 mE / 3762194mN
e. Other Locational Data: San Bernardino County APN: 105332101

***P3a. Description:** The evaluated property consists of a single parcel (APN: 105332101), historically addressed as 7595 Schaefer Avenue and 13752 Bon View Avenue. Encompassing 8.62 acres, the property is located northwest corner of Grove and Edison Avenues. The surrounding area remains predominantly open space and agricultural land, historically associated with dairy farming. The property includes a Minimal Traditional residence, two Ranch style residences and milk parlor, and several ancillary structures. Landscaping and hardscaping features consist of paved driveways and some organized trees around the dwellings. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View northwest of 14050 Grove Ave (IMG_8738; October 21, 2024).
***P6. Date Constructed/Age and Source**
Pre-1935, 1938-1946, 1966-1968/UC Santa Barbara FrameFinder (1935, 1938, 1946, 1966, 1968)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ocean Coast LLC
650 Camino De Gloria
Walnut CA 91789
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Silas Koopal Dairy
**B2. Common Name:** 8040 Schaefer Avenue, 14050 Grove Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Goat Farm
***B5. Architectural Style:** Ranch Style/Minimal Traditional Style

***B6. Construction History:** This property consists of one parcel (APN: 105332101). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 8040 Schaefer Avenue and 14050 Grove Avenue were initially developed prior to 1935 with the construction of the existing Minimal Traditional residence at 8040 Schaefer Avenue, followed by a milk parlor between 1938 and 1946. Between 1966 and 1968, the existing Ranch-style residences were constructed on the property. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s **Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 8040 Schaefer Avenue, 14050 Grove Avenue was originally developed prior to 1935, followed by later developments between 1938 and 1946 and 1966 and 1968. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes.
**See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 8040 Schaefer Avenue, 14050 Grove Avenue


Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 104

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

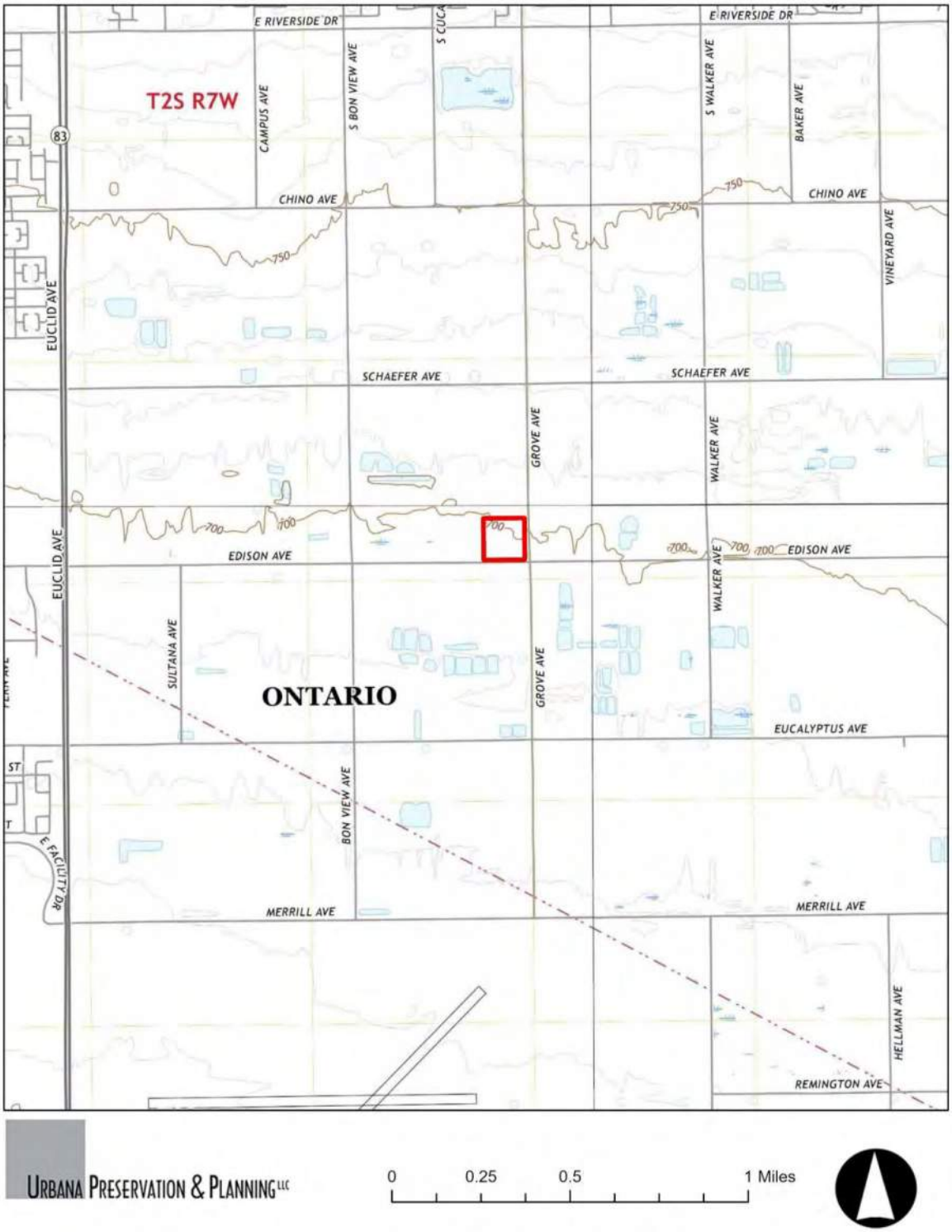

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved prior to 1935, with later developments between 1938 and 1946 and 1966 and 1968, the property includes a Minimal Traditional dwelling (8040 Schaefer Avenue), two Ranch style dwelling and a Ranch style milk parlor (14050 Grove Avenue), and several ancillary structures. Below is a description of the buildings/structures and parcels.

**8040 Schaefer Avenue, pre-1935**
Constructed prior to 1935, the dwelling at 8040 Schaefer Avenue is a modest Minimal Traditional residence facing Schaefer Avenue. It features an asymmetrical façade and a rectilinear floorplan. The exterior is clad in tan-painted stucco. The low-pitched gabled roof is topped with composition shingles and has a moderate eave overhang. The primary (south) elevation includes a recessed entryway beneath the roofline, a small stoop, and a shed roof over a bay window accented with a brick veneer. The fenestration visible from the public right-of-way consists of aluminum windows.

A detached garage is situated east of the dwelling toward the rear of the property. Several shed structures are also present nearby, associated with the property's current goat operations.

**14050 Grove Avenue, 1938-1946, 1966-1968**
The Ranch-style milk parlor and two residences at 14050 Grove Avenue front Grove Avenue and are partially obscured by dense tree cover. Constructed between 1938 and 1946, the milk parlor is centered between the two dwellings. The milk parlor consists of two sections: the front milk house and the rear milking parlor, separated by a breezeway. The milk house has a modest design with some Ranch-style elements, including a cross-gable roof with wood shake shingles and a stucco façade. The fenestration and breezeway are not visible from the public right-of-way. West of the front section, the milking parlor features a gable roof oriented along an east-west axis, clad in corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the north and south elevations, positioned above concrete walls, along with a vent system along the gable ridge. There is no curved driveway in front of the milk parlor.

South of the milk parlor is a Ranch-style dwelling, which is largely obscured from view. Constructed between 1966 and 1968, the dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. Its exterior is clad in tan painted stucco. The moderately pitched hipped roof is topped with composition shingles and features minimal eave overhang and boxed eaves. The recessed main entryway includes a red paneled door, and box bay windows are visible on the primary (east) elevation. A detached garage is located north of the dwelling.

North of the milk parlor is the second Ranch style dwelling. Constructed between 1966 and 1968, dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The dwelling has a similar appearance to the first residence and features a stucco façade, a bay window, hipped roof topped with composition shingles, and a recessed main entryway.

To the rear of the buildings are some pole structures associated with former dairy operations.

## Primary Record Information Continued:

View north of 14050 Grove Avenue (IMG_8739; October 21, 2024).

View west of 14050 Grove Avenue milk parlor (IMG_8740; October 21, 2024).

## Primary Record Information Continued:

View southwest of 14050 Grove Avenue SFR (IMG_8741; October 21, 2024).

View west of 14050 Grove Avenue milk parlor (IMG_8742; October 21, 2024).

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 8040 Schaefer Avenue, 14050 Grove Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 8040 Schaefer Avenue, 14050 Grove Avenue has been found not significant and ineligible for historical designation, it generally retains all aspects of integrity in location, setting, design, materials, workmanship, and feeling. However, the property lacks integrity of association, as it no longer functions as a property associated with the dairy industry.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 108

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 8061 Edison Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ ¼ **of** _ ¼ **of Sec** _; _S. B._**B.M.** __
c. Address: 8061 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441891, 441886 mE / 3761966, 3761776mN
e. Other Locational Data: San Bernardino County APN:105333101, 105333102, 105333103, 105333104, 105334101, 105334102

***P3a. Description:** The evaluated property consists of six parcels (APN: 105333101, 105333102, 105333103, 105333104, 105334101, and 105334102), historically addressed as 7225 Edison Avenue. Encompassing 36.18 acres, the property is located south of Edison Avenue, between Bon View and Grove Avenues. The surrounding area remains predominantly open space and agricultural land, historically associated with dairy farming. The property includes a Ranch style dwelling, a Ranch style milk parlor, several geometrically spaced ancillary pole structures, and water retention ponds. The buildings and structures are located on parcels 105334102 and 105333104, while the water retention ponds are positioned toward the rear on parcel 105334101. Landscaping and hardscaping are minimal, consisting of paved driveways and some organized tree plantings. The property continues to operate as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View southeast of 8061 Edison Ave Ranch style milk parlor (IMG_8736; October 21, 2024).

***P6. Date Constructed/Age and Source**
1966-1968/UC Santa Barbara FrameFinder (1938, 1946, 1966, 1968)
☒Historic:
☐ Prehistoric
☐ Both

***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660

***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com

***P9. Date Recorded:** October 2024

***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.

***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Jack Tuls and Sons Dairy/Jorritsma & Co.
**B2. Common Name:** 8061 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of six parcels under common ownership (APN: 105333101, 105333102, 105333103, 105333104, 105334101, and 105334102). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that the 8061 Edison Avenue was initially developed between 1938 and 1946 with the construction of a milk parlor (no longer extant). Between 1966 and 1968, the original milk parlor was demolished and replaced with the existing milk parlor and single-family residence. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 8061 Edison Avenue was developed between 1966 and 1968. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

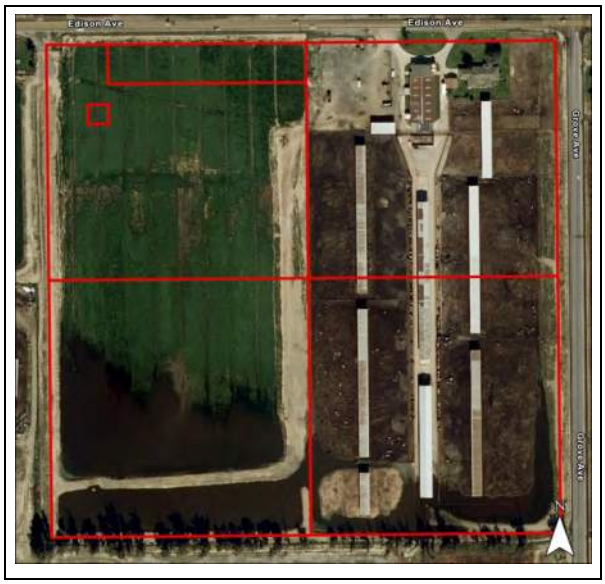


(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8061 Edison Avenue
**Page 3 of 5**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 108

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

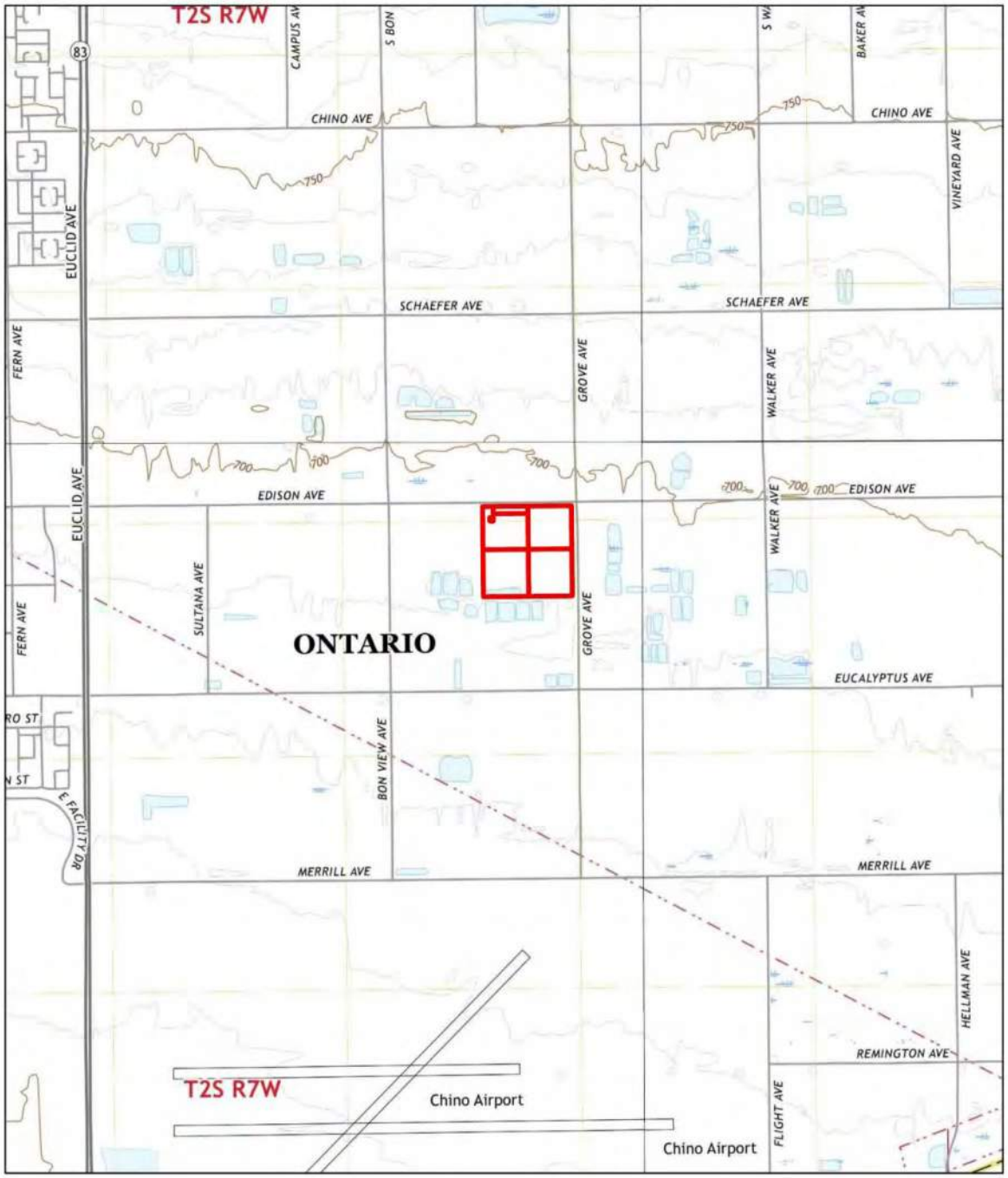

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Constructed between 1966 and 1968, the Ranch style milk parlor and residence are located towards the north end of the parcel fronting Edison Avenue. The dwelling is a one-story residence with an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. The exterior is clad in tan painted stucco with brown trim on the windows and doors. The moderately pitched hipped roof is topped with composition shingles and has a moderate eave overhang, and boxed eaves. The fenestration visible from the public right-of-way consists of vinyl multi-lite sliding sash and single-hung windows and wood paneled doors. The main elevation has a bay window and a stone planter. An attached one-car garage is located on the west elevation and features a white paneled overhead door.

West of the dwelling is the Ranch style milk parlor. The structure is divided into two sections: the front milk house and the rear milking parlor, separated by a breezeway. The milk house is modest in design, incorporating Ranch-style elements such as a hip-and-gable roof with composition shingles, a moderate eave overhang with boxed eaves, and a stucco façade. The fenestration consists of metal multi-lite fixed windows and metal casement windows, and industrial metal glass door. The breezeway, situated between the two sections on the east and west elevations, is obscured from the public right-of-way. South of the breezeway, the milking parlor features a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation is provided by horizontal louvered metal shutters on the east and west elevations, positioned above concrete walls, along with a vent system along the gable ridge. Additional features include a circular driveway in front of the milk parlor.

To the rear of the buildings are several geometrically spaced ancillary pole structures and storage sheds associated with dairy operations.

View south of 8061 Edison Ave Ranch style SFR (IMG_8737; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
In the 1960s and 1970s, the property was owned by Mr. and Mrs. Jack Tuls and operated as Jack Tuls & Sons Dairy. By 1979, it was acquired by the Jorritsma family and listed as Jorritsma & Company.

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 78061 Edison Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 8061 Edison Avenue property has been found not significant and ineligible, it maintains integrity of location, setting, design, materials, workmanship, feeling, and association as an active and in-use dairy farming property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 109

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 7721-7891 Edison Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B. _**B.M.** _
c. Address: 7721-7891 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 441477 mE / 3761957mN
e. Other Locational Data: San Bernardino County APN:105336101, 105336102, 105336103

***P3a. Description:** The evaluated property consists of three parcels (APN: 105336101, 105336102, and 105336103), historically addressed as 7721-7891 Edison Avenue. Encompassing 18.16 acres, it is situated south of Edison Avenue, between Bon View and Grove Avenues. The surrounding area remains predominantly open space and agricultural land, historically associated with dairy farming. The property includes a Craftsman Bungalow style residence, an Art Deco style milk parlor, ancillary structures and features related to former dairy operations, and manufactured trailer offices on parcel 105336101. Additionally, a Ranch style residence is located on parcel 105336103. Landscaping and hardscaping are minimal, consisting primarily of paved driveways. The property no longer functions as an active dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View northeast of 7721 Edison Ave Streamline Moderne Style Milk Parlor and Bungalow residence (IMG_8733; October 21, 2024).
***P6. Date Constructed/Age and Source**
pre-1935, 1935-1946, 1959-1966/UC Santa Barbara FrameFinder (1935, 1946, 1959, 1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Jim Bootsma Dairy **B2. Common Name:** 7721-7891 Edison Avenue **B3. Original Use:** Dairy Farm
**B4. Present Use:** Dairy Farm ***B5. Architectural Style:** Art Deco Style/Bungalow Style/Ranch Style

***B6. Construction History:** This property consists of three parcels under common ownership (APN: 105336101, 105336102, and 105336103). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 7721-7891 Edison Avenue was initially developed before 1935 with the construction of a Craftsman Bungalow dwelling and three unidentified buildings, none of which remain. Between 1935 and 1946, the existing Art Deco milk parlor was constructed south of the dwelling, accompanied by an ancillary pole structure and corrals. Between 1959 and 1966, a Ranch style residence was built on parcel 105336103. By 1998, additional pole structures and silos had been added south of the dwelling. In 2017, the rear section of the milk parlor was demolished, followed by the removal of several pole structures and other ancillary features associated with the property's dairy operations. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Early Dairy Farms in Ontario, 1900s-1929; Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s; Art Deco, 1920-1960s
**Area:** San Bernardino County **Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The 7721-7891 Edison Avenue property was initially improved prior to 1935, with later developments between 1938 and 1946 and 1959 and 1966. In 1999, the area was annexed into the City as part of the New Model Colony, formed from a portion of the former San Bernardino County Agricultural Preserve. The 7721-7891 Edison Avenue property is significant under NRHP / NRHP / CRHR / City of Ontario C/3/c-f under the context of Early Dairy Farms in Ontario, 1900s-1929; Depression-Era and Wartime Dairies, 1930s-1945; Postwar, Large-Capacity Dairies, 1940-1970s; Art Deco Style, 1920-1960s, with a period of significance of pre-1935 through 1966, representing original construction through completion of the final residential building.

Under the established context, an eligible property must retain most aspects of integrity to convey significance. This property does not retain the necessary integrity to convey significance. It has been altered and the Art Deco style milk parlor is missing key features associated with the property type. Accordingly, the property is not eligible under NRHP / CRHR / City of Ontario Criterion C/3/c-f and does not qualify as an historical resource pursuant to Section 15064.5 of the CEQA Guidelines.

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 7721-7891 Edison Avenue


Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 109

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

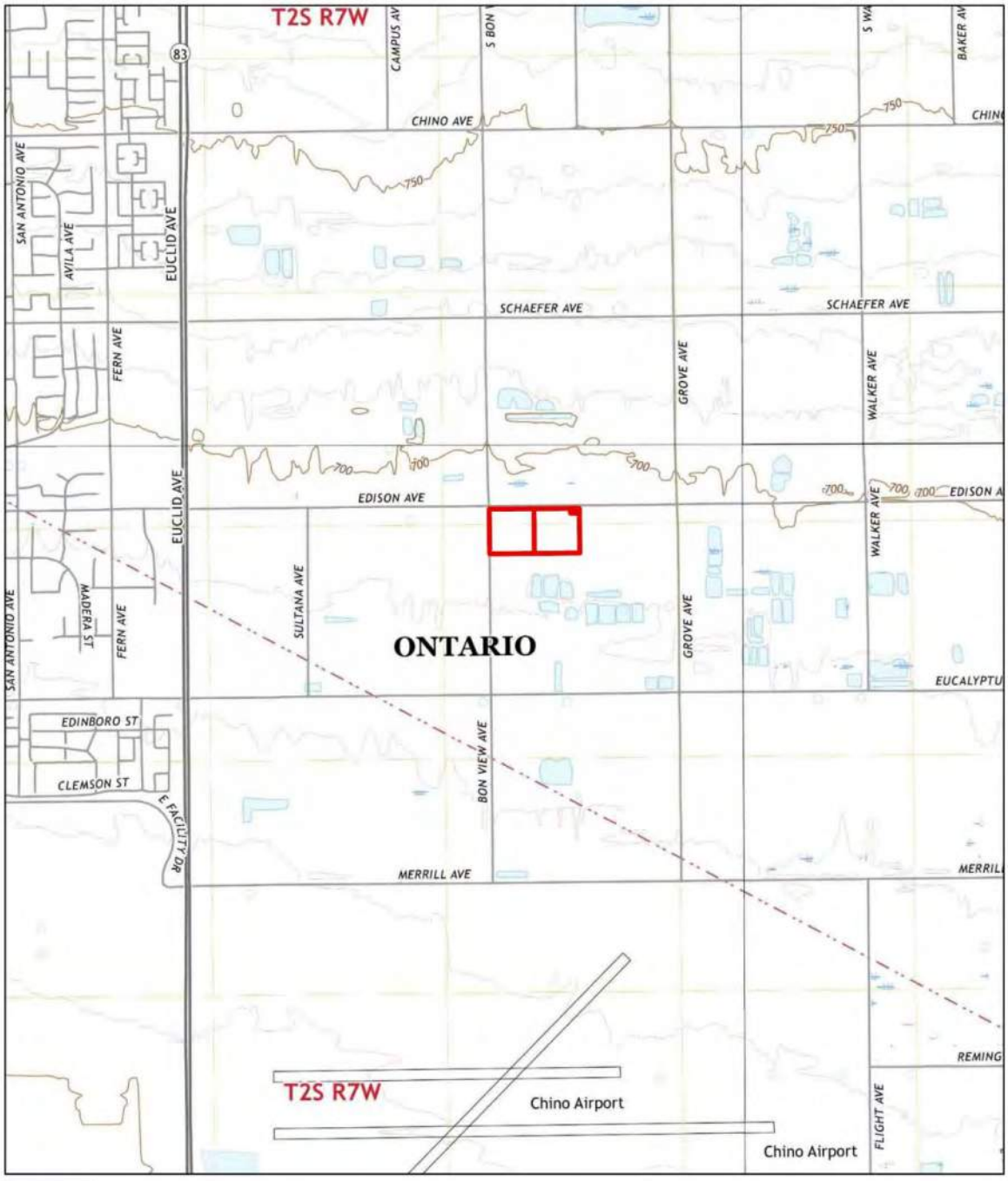


URBANA PRESERVATION & PLANNING LLC

0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
The property includes a Craftsman Bungalow style residence, Art Deco style milk parlor, Ranch style residences, manufactured trailer offices, and ancillary structures/features associated with dairy operations. Below is a description of the buildings and parcels.

**7721 Edison Avenue (APN: 105336101), pre-1935, 1935-1946**
Constructed prior to 1935, with later developments between 1935 and 1946, the parcel includes a Craftsman Bungalow style dwelling, an Art Deco style milk parlor, ancillary structures and features associated with former dairy operations, and manufactured trailer offices. The parcel is partially enclosed behind a concrete masonry unit wall.

The Craftsman Bungalow style residence is located at the northwest corner of the parcel, fronting Edison Avenue. This one-and-a-half story dwelling features a symmetrical façade and a mostly square floor plan. The exterior is clad in tan-painted stucco with blue trim on the windows and doors. The high-pitched, side-gabled roof is topped with composition shingles and has a wide eave overhang with wood brackets beneath the gable. The fenestration visible from the public right-of-way consists of vinyl single-hung windows and fixed wood windows. The main (north) elevation includes a centered gabled dormer with four vinyl single-hung windows, an enclosed full-width porch, a centered main entryway with a wood-paneled door and metal security door, and concrete steps.

Directly south of the dwelling stands the Art Deco-style milk parlor, constructed between 1935 and 1946. Only the front milk house section remains, as the rear milking parlor was demolished in 2017. This remaining section retains some Art Deco characteristics, including smooth stucco walls, a flat roof, a symmetrical boxy form, and glass block windows.

East of the dwelling are two storage sheds with gabled roofs. To the rear of the milk parlor are two manufactured office trailers installed after 2017.

Prior to 2017, the parcel contained several pole structures, large metal silos, cattle feeding gates, and corrals located behind the dwelling. While the property may have once exemplified a Depression-era and Wartime dairy operation, it no longer retains sufficient integrity to convey its historical significance.

**7891 Edison Avenue (APN: 105336103), 1959-1966**
Constructed between 1959 and 1966, the Ranch style residence at 7891 Edison Avenue faces Edison Avenue. The one-story dwelling features an asymmetrical façade and an irregular floorplan atop a concrete foundation. Its exterior is clad in yellow board-and-batten siding, with a partial stone veneer on the main (north) elevation. The low-pitched cross-gabled roof, covered with composition shingles, has a moderate eave overhang, boxed eaves, and a chimney on the rear roof slope.

The fenestration visible from the public right-of-way consists of vinyl sliding sash windows. The main elevation includes a recessed entryway with a single paneled door, a concrete stoop, a stone planter, and an attached one-car garage with a paneled overhead door. Compared to other Ranch style residences in the area, the dwelling is smaller in size and exhibits modest characteristics of the style.

## Primary Record Information Continued:

View south of 7891 Edison Ave Ranch style SFR (IMG_8734; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
**7721 Edison Ave (APN: 105336101)**
In the 1920s, the property was originally owned by Thomas H. Settles, a farmer from Virginia. He retained ownership until 1925, when he relocated to Upland. From the early 1950s to 2017, the property was owned by the Bootsma family, who had moved to the area from Artesia in the Los Angeles Basin during the 1940s.

The family patriarch, Jim Bootsma, immigrated to the United States from Holland and was a member of the California Milk Producers Council. Together with his wife, Tryntje, he had six sons Garret, Symon, Jim Jr., Will, Ike, and John Bootsma and three daughters, Agnes, Nell, and Vicky. In 1979, Jim Bootsma passed away at the age of 76, and the property was passed on to his immediate family.

**7891 Edison Ave (APN: 105336103)**
In 1967, Mr. and Mrs. Symon Bootsma lived at the subject residence.

**Building, Structure, Object Information Continued:**

CHINO CHAMPION
DAIRY FESTIVAL EDITION

Thursday, June 4, 1959
Section 3, page 15

# As the Seed is Planted . .

Both Bootsma boys are vocational agriculture students at Chino high school. Paul Wade, agricultural instructor at the school instructs boys here in the agriculture room, located in the shop building at the high school. —Champion photo

Symon Bootsma works with his milking heifer, part of his Future Farmer project work and a start toward a herd of his own. Boys such as Symon learn not only proper livestock husbandry in vocational agriculture, but are furthered in a science the principles of which they learn by doing on their home ranches. —Champion photo

Milk is one of the world's oldest known foods.

What's a good farm? A good farm boy. And good farm boys are what the Future Farmers are attempting to mould.

Sometimes — in fact most of the time—the FFA leaders have only to direct, for the boy comes to his high school vocational agriculture teachers with a background in farming well moulded by the last remaining industry which is family based in this specialized world of ours.

Such a family is the Bootsma family, 7721 Edison avenue. The 11 member Bootsma family, with Patriarch Jim at their head, run a dairy there, shipping to Arden Creamery.

The family milks some 100 plus head of cows, raise all their own replacements.

This year two of the Bootsma boys, Jim and Symon were in the upper grades at Chino high school. Another, Wilbur, just entered the Chino high school.

The Bootsma boys walked off with their share of the awards at the FFA banquet Thursday night too. The boys raise beef show animals, favoring Angus, and raise milk cows and calves as well.

Symon graduates this year while Jim, Jr., takes over as president of the local FFA chapter next year.

Active in the FFA, the boys rise at 2:30 a.m., to milk before going off to school. Then they leave early again to get home for milking chores.

This year, Jim was vice president and Symon, treasurer of the local chapter. Symon earned 391 points in his work this year, earning his third letter.

Jim not only earned his third letter, but was awarded his state farmer degree and won third in the 20-30 project awards.

The Bootsma's live in a pleasant two-story home on their dairy. Mr. and Mrs. Bootsma, who moved into the valley some 18 years ago from Artesia to found their dairy, were both born in Holland.

Mr. Bootsma presides over a large family, a family which well fills the dinner table even though the two oldest girls have married and moved to homes of their own.

In addition to Mr. and Mrs. Bootsma there are Mrs. Agnes Jacobs, Mrs. Nellie Johnson; Garret Bootsma, 19, a graduate of Chino high school who now works for his father on the dairy; Symon Bootsma, 18, who will graduate and join his father in the dairy; Jim, Jr., 16, and a senior at high school next year; Wilbur, 14; Ike, 12; John, 9; and Vicky, 6.

What do the boys get out of FFA work? They get an eye for beef and dairy cattle. They learn to work with and lead others in the farming community; they learn much about this industry which takes real business sense to operate; and they learn how to use the latest scientific information pouring out of experiment stations and universities to help the farmer make a better living.

Jim Bootsma with his prize Angus bull which he has shown in a number of fairs, and will show at the Junior Fair here this weekend. In the Future Farmers, boys like Jim learn not only scientific farming but leadership as well. Jim is president of the local chapter next year. —Champion photo

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WITH DOWPON*

Keep grass from creeping into your best land. Simply sprinkle or spray DOWPON on your thickest grass and watch it wither away. Kills roots too!

*TRADEMARK OF THE DOW CHEMICAL COMPANY

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COVERS 225 SQ. FT.

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13232 Central Opposite City Hall
DEALERS FOR DOW WEED, GRASS, AND BRUSH KILLERS

You're invited to save!
OPEN HOUSE

Door Prizes – Refreshments – Entertainment
Saturday, June 6, 8 a.m. to 5 p.m.

We are giving away FREE: $36.95 Skil Drill Kit, $19.95 Redwood Picnic Table, $5.45 Gallon of Paint, An Aluminum Screen Door and many other Prizes.

For Our Open House Specials, See Advertisement in Main News Section

PETE AND ANNE JOHNSON, LEIGHTON JONES, PAUL CARR, FRANK MARTINEZ, R. B. McLAUGHLIN

VALLEY LUMBER CO.
"HOME OWNED AND HOME OPERATED"
13339 Central Ave. -- Chino NA 8-4771

Chino Champion, Jun 4, 1959.

## Building, Structure, Object Information Continued:

**B12. References Continued:**

2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 3S/3CS/5S2
Other Listings: Urbana Survey No.: 112

Review Code _____ Reviewer _____ Date _____
**Resource Name: 8185 Edison Avenue**


**P1. Other Identifier:** 14117 S. Grove Avenue
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ ¼ **of** _ ¼ **of Sec** _; _S. B._**B.M.** __
c. Address: 8185 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442100 mE / 3761854mN
e. Other Locational Data: San Bernardino County APN: 021632103

***P3a. Description:** The evaluated property consists of a single parcel (APN: 021632103) addressed as 8185 Edison Avenue. Covering 18.56 acres, the property is located at the southeast corner of Edison and Grove Avenues. The property and its environs is historically associated with dairy farming and remains largely open space and agricultural land. The property includes a Ranch style dwelling that exhibits Northern European or Dutch influences, a Minimal Traditional style dwelling, a Streamline Moderne style milk parlor, and several ancillary structures and features associated with dairy operations. A water retention pond is located in the southeast corner of the parcel. Landscaping and hardscaping features include trees and shrubs near the buildings and paved driveways. The property continues to function as an active dairy farm.

The property was previously recorded, and the Ranch style dwelling and Streamline Moderne milk parlor were determined eligible in 2014, but not formally designated. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View southeast of 8185 Edison Ave Streamline Moderne Style milk parlor from Ontario Ranch Road (IMG_8758; October 21, 2024).
***P6. Date Constructed/Age and Source**
1952-1959/NETR HistoricAerials (1952, 1959)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Not Identified
**B2. Common Name:** 8185 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Streamline Moderne Style/Ranch Style

***B6. Construction History:** This property consists of a single parcel (APN: 021632103). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that the 8185 Edison Avenue was initially developed between 1952 and 1959 with the construction of a Ranch style dwelling, a Minimal Traditional style dwelling, and Streamline Moderne style milk parlor. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. Based on aerial imagery, most of the ancillary structures/features visible on the property today were added after 1987 into the 1990s.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Streamline Moderne, 1930s-1960s; Ranch Style, 1950-1970s **Area:** San Bernardino County
**Period of Significance:** 1952-1959 **Property Type:** Streamline Moderne Style/Ranch Style
**Applicable Criteria:** NRHP/CRHR/Local C/3/d

The 8185 Edison Avenue property was improved between 1952 and 1959 with the construction of a Ranch style residence, Minimal Traditional style residence, and Streamline Moderne style milk parlor. In 1967 the area was established as part of the San Bernardino County Agricultural Preserve. In 1999, the area was annexed as part of the New Model Colony, formed from a portion of the former agricultural preserve. The 8185 Edison Avenue property is associated with multiple themes, including Postwar, Large-Capacity Dairies, 1945-1980; Ranch Style, 1950-1970s; Streamline Moderne style, 1930s-1960s; Minimal Traditional style, 1930-1950s; and Consolidation of Dairy Operations, 1980s-1998. However, only the Ranch style dwelling and Streamline Moderne style milk parlor are considered significant under NRHP, CRHR, and City of Ontario criteria C/3/d within the context of Ranch Style, 1950-1970s; Streamline Moderne style, 1930s-1960s, with a period of significance of 1952-1959, representing the dwelling and milk parlor's original construction. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8185 Edison Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 3S/3CS/5S2
Other Listings: Urbana Survey No.: 112

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Constructed between 1952 and 1959, the property includes a Ranch style dwelling, a Minimal Traditional style dwelling, a Streamline Moderne milk parlor, and several ancillary structures and features associated with dairy operations. Located on the northeast corner of the parcel is a Ranch style dwelling that exhibits Northern European or Dutch influences. The dwelling features an asymmetrical façade and a one-story horizontal floorplan atop a concrete foundation. The exterior is clad in horizontal wood siding painted yellow, with green trim on the windows and doors. The low-pitched cross-gabled roof is covered with composition shingles and includes a moderate eave overhang with open eaves and exposed rafter ends. A chimney is located on the rear (south) elevation. Fenestration consists of wood-framed diamond-patterned windows, some with green decorative shutters. The main (north) elevation features diamond-patterned windows, box bays with decorative wood support brackets, a stone planter, and an extended roof girder. A garage is attached to the main dwelling by a wide open breezeway on the west elevation.

West of the Ranch style dwelling is a Streamline Moderne milk parlor. The building is divided into two sections: the front milk house and the rear milking parlor, separated by a breezeway. The front section reflects Streamline Moderne characteristics, with smooth stucco walls, a flat roof, curvilinear corners, a central vertical projection, and curved glass block windows. The west elevation contains metal multi-lite casement windows. The windows on the east elevation are boarded up. The breezeway, located between the two sections, features a metal barn-style sliding door on both the east and west elevations. South of the breezeway, the milking parlor has a gable roof oriented along a north-south axis, clad in corrugated sheet metal. Ventilation is provided by horizontal metal shutters on the east and west elevations, positioned above concrete walls, along with a vent system along the gable ridge. Additional features include a circular driveway in front of the milk parlor and two metal doors.

Located on the northwest corner of the parcel is a Minimal Traditional dwelling with a detached garage. The dwelling has an asymmetrical façade and a rectilinear floorplan atop a concrete foundation. The exterior is clad in tan-painted stucco with green trim on the windows and roof fascia. The low-pitched hipped roof is finished with composition shingles and features a minimal eave overhang with boxed eaves. Fenestration visible from the public right-of-way consists of aluminum sliding sash windows. The main (west) elevation includes a recessed main entryway with a concrete stoop, metal security gate, and a wide stone chimney. The detached garage, located directly north of the dwelling, features two paneled overhead doors, a tan stucco façade, and a hipped roof.

Several ancillary pole structures, sheds, and features are located throughout the property.

The property features a good example of a postwar Streamline Moderne milk parlor and a Ranch style dwelling that incorporates Northern European or Dutch architectural influences. The milk parlor exhibits Streamline Moderne elements that are evident in the smooth stucco surfaces, rounded corners, glass block windows, and horizontal emphasis that give the building a sleek, aerodynamic appearance typical of the style. A circular driveway situated in front of the milk parlor not only enhances the property's functionality but also reflects the era's emphasis on automobile accessibility and streamlined movement through the site. The dwelling's Ranch style influence is seen in the low horizontal massing, asymmetrical layout, and integration of indoor and outdoor spaces. Northern European or Dutch architectural touches include diamond-patterned windows, decorative shutters, and extended roof girders, lending additional character and ornamentation to the design.

## Primary Record Information Continued:

View southeast of 8185 Edison Ave Ranch style SFR (IMG_8759; October 21, 2024).

**B10. Statement of Significance from Page 2:**
The 8185 Edison Avenue property was developed between 1952 and 1959 and includes a Ranch style dwelling, a Streamline Moderne milk parlor, a Minimal Traditional dwelling, and several later-added ancillary structures. The Ranch style residence and milk parlor date to the postwar era and reflect two distinct architectural styles tied to Ontario's postwar dairy development.

The property was evaluated under the Postwar, Large-Capacity Dairy, 1945-1980 context, however, is not recommended eligible under that theme as the majority of ancillary structures, such as pole barns, feeding gates, and other operational infrastructure, do not appear in aerial imagery until after 1987, placing them outside the defined period of significance. The absence of these character-defining features needed to demonstrate large-capacity operations indicate that the 8185 Edison Avenue property is not significant or eligible as a Postwar, Large-Capacity Dairy operation.

While several ancillary structures, including pole barns and feeding gates within the property, appear to date to the 1980s-1995 period, placing them within the Consolidation of Dairy Operations, 1980s-1998 thematic timeframe, there is no evidence that the property represents a true consolidation of multiple dairy operations. Accordingly, the 8185 Edison Avenue property is not eligible under the theme of Consolidation of Dairy Operations, 1980s-1998. The property does not contain multiple milk parlors or residences from different operations or periods of operation, nor does it exhibit the spatial layout or landscape features, such as retention ponds or geometrically organized infrastructure, associated with a merged or large-scale consolidated dairy.

The property as a whole is not significant or eligible under NRHP/CRHR/Local criteria. The extant improvements appear to reflect continued use or isolated upgrades rather than a large capacity dairy operation or a broader consolidation effort typical of the late twentieth-century shift in dairy operations across Ontario and the Chino Valley.

**Building, Structure, Object Information Continued:**

Individually, the Ranch style dwelling is recommended eligible under NRHP Criterion C / CRHR Criterion 3 / City of Ontario Criterion d, within the context of Ranch Style, 1950–1970s. The residence exhibits key features of the style, including its one-story, low horizontal massing, an asymmetrical layout, horizontal wood siding, and an attached garage connected by an open breezeway. Additionally, Northern European or Dutch architectural influences are evident in diamond-patterned windows, decorative shutters, and extended roof girders, which lend ornamentation and character to the building. The dwelling retains the necessary aspects of integrity and is a representative example of a Ranch style home in the New Model Colony / Ontario Ranch area. The Ranch style dwelling is not individually eligible under any other NRHP/CRHR/Local criteria.

The Streamline Moderne milk parlor, also constructed between 1952 and 1959, is recommended individually eligible under NRHP Criterion C / CRHR Criterion 3 / City of Ontario Criterion d, as a good example reflecting the Streamline Moderne aesthetic. It features smooth stucco walls, a central bay that projects beyond the front wall plane with rounded corners, and large glass block windows. The structure's front milk house and rear milking parlor are separated by a central breezeway. A character-defining circular driveway in installed in front of the milk parlor representing an key operational feature used for deliveries and for large trucks to load milk from the milk house. The milk parlor building retains the necessary aspects of integrity and is a representative example of a postwar milk parlor designed in the Streamline Moderne style in the New Model Colony / Ontario Ranch area. The milk parlor building is not individually eligible under any other NRHP/CRHR/Local criteria.

The Minimal Traditional residence was also evaluated for individual eligibility and although the dwelling retains integrity, it lacks the distinctive features necessary to be considered a strong or representative example of the style within the survey area. Beyond its architectural appearance, no information was identified to support a positive eligibility finding for the house relative to an individual association with significant events, important persons, or information potential. Accordingly, the Minimal Traditional style home is individually ineligible under all NRHP/CRHR/Local criteria.

Under the established historic context, eligibility requires retention of integrity of location, setting, materials, design, feeling, workmanship, and association. Both the Ranch style dwelling and Streamline Moderne milk parlor meet these integrity requirements and embody the distinctive characteristics of their respective types and periods of construction. As such, both buildings qualify as an historical resource under Section 15064.5 of the CEQA Guidelines.

**B12. References Continued:**

2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 113

Review Code _____ Reviewer _____ Date _____
**Resource Name: 8311 Edison Avenue**


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._ **B.M.** __
c. Address: 8311 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442292 mE / 3761854mN
e. Other Locational Data: San Bernardino County APN: 021632108

***P3a. Description:** The evaluated property consists of a single parcel (APN: 021632108) addressed as 8311 Edison Avenue. Covering 18.77 acres, the property is located south of Edison Avenue and Ontario Ranch Road, between Grove and Walker Avenues. The property and its environs are historically associated with dairy farming and remain largely open space and agricultural land. The property includes a modest Ranch style residence and milk parlor, a manufactured dwelling, several geometrically spaced ancillary structures, storage sheds, and various features associated with dairy operations. Water retention ponds are located to the rear of the property. Landscaping and hardscaping consist of paved driveways and a few organized trees and shrubs around the buildings. The property continues to function as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View south of 8311 Edison Ave Ranch style milk parlor (IMG_8836; October 21, 2024).
***P6. Date Constructed/Age and Source**
1968-1975/UC Santa Barbara FrameFinder (1968, 1975)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Martin De Hoog Dairy/Double "D" Dairy
**B2. Common Name:** 8311 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of a single parcel (APN: 021632108). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that the 8311 Edison Avenue was initially developed between 1968 and 1975 with the construction of a Ranch style milk parlor and dwelling. Between 1980 and 1985, a manufactured dwelling was added to the property. Subsequent aerial imagery suggests that the overall configuration of the existing milk parlor has remained unchanged. An early three-car garage addition was appended to the east elevation of the residence. Based on aerial imagery, most of the ancillary structures/features visible on the property today were added in the late 1990s. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The 8311 Edison Avenue property was developed between 1968 and 1975. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945–1980; Consolidation of Dairy Operations, 1980s–1998; and Historic Architectural Styles, 1880s–1980s, but it does not possess documented significance in relation to any of these themes. The Ranch style residence and herringbone-style milk parlor are modest examples of their architectural styles and property types, and while ancillary structures are present, they were constructed after the period of significance for the postwar dairy context. Additionally, there is no evidence that the property functioned as part of a consolidated dairy operation during the 1980s–1998 period. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8311 Edison Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 113

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
The dwelling is located west of the milk parlor and has a modest appearance. It features an asymmetrical facade and an irregular horizontal floorplan atop a concrete foundation. The low-pitched cross-gabled roof has a moderate eave overhang with boxed eaves and is topped with terracotta tiles, which likely replaced the original composition or wood shingles at an unidentified date. The exterior is clad in tan-painted stucco. Additional features include a recessed main entryway accessed via concrete steps, two brown paneled doors, metal sliding sash windows, a stone planter, and decorative blue shutters on some of the windows. An attached three-car garage addition was appended to the east elevation and features a roofline that does not match the original structure, resulting in an uneven and visually uneven roofline.

Directly east of the dwelling is the Ranch style milk parlor, which is divided into three sections: the front milk house, the rear milking parlor separated by a breezeway, and a holding area. The milk house shares a similar design with the main dwelling, incorporating Ranch style elements such as a hip and gable roof topped with terracotta tiles, a moderate eave overhang with boxed eaves, and a stucco façade. Its fenestration consists of metal casement windows. The breezeway, located between the two sections on the north and south elevations, is obscured from the public right of way. South of the milk house, the milking parlor features a gable roof oriented along a north-south axis, topped with corrugated sheet metal. Ventilation elements include metal horizontal louvered shutters set atop concrete walls, along with a vent system along the gable ridge. Further south, the holding area is partially open and enclosed by concrete walls. Additional features include metal doors at the main entryway, bulk tanks, and a circular driveway in front of the milk parlor.

East of the milk parlor is the manufactured home. The building features a low-pitched side-gabled roof topped with composition shingles, wood siding painted tan, aluminum sliding sash and single-hung windows, and a shed roof extension.

Within proximity to the buildings are several features and structures associated with dairy operations, including silos, pole structures, feeding gates, corrals, and storage sheds. Water retention ponds are located at the rear of the property. These ancillary features were installed by the late 1990s.

## Primary Record Information Continued:

View south of 8311 Edison Ave Ranch style SFR (IMG_8838; October 21, 2024).

View south of 8311 Edison Ave Ranch style SFR (IMG_8839; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
The property was originally owned by Martin De Hoog and was listed as the De Hoog Dairy. By 1977, it was recorded as the Double "D" Dairy. The property remained under the ownership of the De Hoog family until 2022.

**B10. Statement of Significance from Page 2:**
Comparative study of other Postwar Scientific Large-Capacity Dairies in the survey area reveals that the 8311 Edison Avenue property is a more modest example of the property type. The property contains a single Ranch style residence and a Ranch herringbone-style milk parlor. While these components are associated with the Postwar, Large-Capacity Dairy (1945–1980) theme, the property does not appear to be a significant example. Although ancillary structures such as pole barns and feeding infrastructure are present, aerial imagery and field observations indicate that these features were added in the late 1990s, after the defined period of significance for the postwar large capacity theme. Accordingly, the property does not contain the necessary character-defining features needed to demonstrate a postwar scientific large-capacity dairy operation and is therefore ineligible under this theme.

The property also does not meet the thresholds for significance under the Consolidated Dairy Operations (1980s–1998) theme. Although some extant features, such as pole barns and feeding infrastructure, date to this period, there is no evidence that the property functioned as a consolidated operation formed through the merging of multiple dairy facilities. It lacks multiple milk parlors or residences associated with separate earlier operations, key indicators of consolidation. Instead, the improvements appear to reflect continued individual use or isolated upgrades, rather than consolidation efforts.

Additionally, neither the Ranch style residence nor the Ranch style milk parlor is considered a distinctive example of its type. Both buildings are individually ineligible. The residence appears to have been altered early in its history by the addition of a three-car garage, resulting in a modest and irregular layout that lacks defining Ranch style features such as a breezeway or cupola. Similarly, while the milk parlor includes Ranch style elements such as steel casement windows, and a stucco facade, it does not rise to the level of an exemplary or distinctive Ranch style design.

The property as a whole is not significant or eligible under any NRHP/CRHR/Local criteria. It is not eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a due to lack of a significant association with local, regional, state, or national patterns of dairy farming. It is not eligible under Criterion B / 2 / b as it lacks association with any person, family, or group important in Ontario's dairy history. It does not appear to meet Criterion C / 3 / c–f, as the residence and milk parlor do not embody distinctive characteristics of a type, period, or method of construction and are not the work of a master. The property is also not eligible under City of Ontario Criteria g or h, nor under Criterion D / 4, as it is not likely to yield important historical information.

Although the property has been found not significant and ineligible, it retains integrity of location, setting, design, materials, workmanship, feeling, and association as an active dairy property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 3S/3CS/5S3
Other Listings: Urbana Survey No.: 114

Review Code _____ Reviewer _____ Date _____
**Resource Name: 8335-8381 Edison Avenue**


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._ **B.M.** __
c. Address: 8335-8381 Edison Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442498, 442501 mE / 3761964, 3761376mN
e. Other Locational Data: San Bernardino County APN: 021632201, 021632202, 021632203, 021632204

***P3a. Description:** The evaluated property consists of four parcels (APN: 021632201, 021632202, 021632203, and 021632204), historically addressed as 8335-8381 Edison Avenue. Covering 37.42 acres, it is located south of Edison Avenue and Ontario Ranch Road, between Grove and Walker Avenues. The surrounding area remains largely open space and agricultural land, historically associated with dairy farming. The property includes a Craftsman Bungalow style dwelling, a Ranch style milk parlor, several geometrically spaced ancillary structures, storage sheds, and various features associated with dairy operations. Water retention ponds are located to the rear of the property on parcels 021632202 and 021632203. The milk parlor and residence are located on parcel 021632204. Landscaping and hardscaping consist of paved driveways and a few organized trees and shrubs around the buildings. The property continues to function as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View south of 8335 Edison Ave Craftsman Bungalow SFR (IMG_8834; October 21, 2024).
***P6. Date Constructed/Age and Source**
pre-1935,1959-1966/NETR HistoricAerials (1959, 1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** John T. Veenstra Dairy/De Hoog Dairy/Three D Dairy
**B2. Common Name:** 8335-8381 Edison Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style/Craftsman Bungalow Style

***B6. Construction History:** This property consists of four parcels under single ownership (APN: 021632201, 021632202, 021632203, 021632204). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 8335 Edison Avenue was initially developed prior to 1935 with the construction of a two-story Craftsman Bungalow style residence and several ancillary structures, which are no longer extant. By 1959, a detached garage had been added to the property. Between 1959 and 1966, a Ranch style milk parlor was constructed. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Craftsman Bungalow Style, 1900s-1930s **Area:** San Bernardino County
**Period of Significance:** Pre-1935 **Property Type:** Craftsman Bungalow Style
**Applicable Criteria:** NRHP/CRHR/Local C/3/d

The 8335 Edison Avenue property was improved prior to 1935 with the construction of a Craftsman Bungalow residence, with additional developments occurring between 1959 and 1966. In 1967 the area was established as part of the San Bernardino County Agricultural Preserve. In 1999, the area was annexed as part of the New Model Colony, formed from a portion of the former agricultural preserve. The 8335 Edison Avenue property is associated with multiple themes, including Depression-Era and Wartime Dairies, 1930s-1945; Craftsman Bungalow Style, 1900s-1930s; Postwar, Large-Capacity Dairies, 1945-1980; Ranch Style, 1950-1970s. However, only the Craftsman Bungalow style dwelling is considered significant under NRHP, CRHR, and City of Ontario criteria C/3/d within the context of Craftsman Bungalow Style, 1900s-1930s, with a period of significance of pre-1935, representing the dwelling's original construction. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8335-8381 Edison Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 3S/3CS/5S3
Other Listings: Urbana Survey No.: 114

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC 0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved prior to 1935 with later developments between 1959 and 1966, the property includes a Craftsman Bungalow style dwelling, a Ranch style milk parlor, several ancillary structures and water retention ponds.

The Craftsman Bungalow style residence is located towards the northeast corner of parcel 021632204. The dwelling is two-story and has an asymmetrical façade and an irregular floorplan. The exterior is clad in clapboard siding painted brown with dark brown trim on the windows and doors. The moderately pitched hipped roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, and a dormer on the main (north) elevation. The fenestration visible from the public right-of-way consists of wood-framed fixed and double-hung windows, along with some vinyl sliding sash and single-hung windows. The main elevation features a partial-width porch beneath a hipped roof extension, supported by tapered brick columns, concrete steps, and a brick pony wall.

The dwelling retains key characteristics of the Craftsman Bungalow style, including its use of natural materials such as wood clapboard siding and brick. The dormer, exposed rafter tails, wood-cased windows, and decorative porch elements, such as brick tapered columns and pony wall, further exemplify the style's emphasis on handcrafted architectural details and a connection to nature. Despite the removal of some original windows and roofing, the dwelling maintains a strong representation of the Craftsman Bungalow style through its massing, roof form, and characteristic design features.

South of the dwelling is a detached three-car garage constructed ca. 1959. The garage was designed in a similar fashion to the residence with wood-siding painted brown, hip-and-gable roof with composition shingles, three wood paneled overhead doors, and a small cupola on the top of the roof ridge.

West of the dwelling is the Ranch style milk parlor, which is divided into three sections: the front milk house, the rear milking parlor separated by a breezeway, and an open holding area. Constructed between 1959 and 1966, the milk house incorporates some Ranch style elements such as a hip-and-gable roof, a moderate eave overhang with boxed eaves, and a stucco façade with wood-siding below the gable end. Its fenestration consists of metal multi-lite windows and vinyl windows. The breezeway, located between the two sections on the north and south elevations, is obscured from the public right of way. South of the milk house, the milking parlor features a flat roof oriented along a north-south axis. Ventilation elements include metal vertical louvered shutters set between concrete walls. Further south, the holding area is open and enclosed behind concrete walls. Additional features include industrial glass doors at the main entryway and a circular driveway in front of the milk parlor.

Within proximity to the buildings are several features and structures associated with dairy operations, including silos, pole structures, feeding gates, corrals, and storage sheds. Water retention ponds are located at the rear of the property.

## Primary Record Information Continued:

View south of 8335 Edison Ave Ranch style milk parlor (IMG_8835; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
In the 1950s, the property was owned by John T. Veenstra. By 1981, ownership transferred to Martin De Hoog. The property remained under the De Hoog family's ownership until 2022 and was initially known as the De Hoog Dairy before being renamed Three D Dairy.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
The 8335 Edison Avenue property is an excellent example of a Craftsman Bungalow style residence, retaining key characteristics of the Craftsman Bungalow style, including the use of natural materials such as wood clapboard siding and brick. The dormer, wood-cased windows, and decorative porch elements, such as brick tapered columns and pony wall, further exemplify the style's emphasis on handcrafted architectural details and a connection to nature. Despite the removal of some original windows and roofing, the dwelling maintains a strong representation of the Craftsman Bungalow style through its massing and characteristic design features.

The property also includes a Ranch style milk parlor and a detached garage. Although minimally altered, the milk parlor is not a representative example of the Ranch style within the survey area. The detached garage, constructed circa 1959, well after the original dwelling, does not contribute to the historic character of the property and is not considered a contributing resource.

Under the established context, an eligible property must retain integrity of location, setting, materials, design, feeling, workmanship, and association aspects of integrity to convey significance. Despite minor modifications, the dwelling retains necessary integrity to convey significance including location, setting, feeling, design, materials, workmanship, and association. Accordingly, the property is eligible under NRHP / CRHR / City of Ontario Criterion C/3/d, as it embodies the distinctive characteristics of its type, period, and method of construction, qualifying as a historical resource under Section 15064.5 of the CEQA Guidelines.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 115

Review Code _____ Reviewer _____ Date _____
**Resource Name: 8485 Edison Avenue and 14350 Walker Avenue**


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._ **B.M.** __
c. Address: 8485 Edison Avenue,
14350 Walker Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442694 mE / 3761653mN
e. Other Locational Data: San Bernardino County APN: 021632205, 021632210

***P3a. Description:** The evaluated property consists of two parcels (APN: 021632205 and 021632210), historically addressed as 8485 Edison Avenue and 14350 Walker Avenue. Covering 36.95 acres, it is located on the southwest corner of Ontario Ranch Road and Walker Avenue. The surrounding area remains largely open space and agricultural land, historically associated with dairy farming. The property includes two one-story Ranch style residences, a Ranch style milk parlor, several geometrically spaced ancillary structures, metal storage sheds, and various features associated with dairy operations. Water retention ponds are located to the rear of the property. One of the residences is located towards the rear on the southeast side of the parcel. Landscaping and hardscaping is minimal consisting of paved driveways and some trees. Eucalyptus trees line most of the east side of the parcel. The property continues to function as a dairy farm. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space; HP33-Farm/Ranch
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View south of 14350 Walker Ave Ranch style milk parlor (IMG_8831; October 21, 2024).
***P6. Date Constructed/Age and Source**
1959-1966, 1966-1968/NETR HistoricAerials (1959, 1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Ontario Ranch Venture II LLC
3501 Jamboree Rd Ste 3000
Newport Beach CA 92660
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Ed Swager Dairy
**B2. Common Name:** 8485 Edison Avenue and 14350 Walker Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Dairy Farm
***B5. Architectural Style:** Ranch Style

***B6. Construction History:** This property consists of two parcels under single ownership (APN: 021632205 and 021632210). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 8485 Edison and 14350 Walker Avenue property was initially developed between 1959 and 1966, with the construction of a Ranch style milk parlor and residence listed as 8485 Edison Avenue. Between 1966 and 1968, a second Ranch style residence was constructed on the property, listed as 14350 Walker Avenue. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 8485 Edison and 14350 Walker Avenue was originally developed between 1959 and 1966 with later developments between 1966 and 1968. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

**State of California — The Resources Agency**
**DEPARTMENT OF PARKS AND RECREATION**

# LOCATION MAP

**Resource Name:** 8485 Edison Avenue and 14350 Walker Avenue
**Page 3 of 6**

Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 115

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC

0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved between 1959 and 1966, with later developments between 1966 and 1968, the property includes two Ranch style dwellings, a Ranch style milk parlor, several ancillary structures/features and water retention ponds.

Fronting Ontario Ranch Road is one of the Ranch style dwellings and the Ranch style milk parlor, listed as 8485 Edison Avenue. Constructed between 1959 and 1966, the dwelling is a one-story structure with an asymmetrical façade and a horizontal, rambling floorplan atop a concrete foundation. Its exterior is clad in tan-painted stucco with a stone veneer along the lower span of the main (north) elevation. The low-pitched hip-and-gable roof is topped with composition shingles and features a moderate eave overhang, boxed eaves, a stone chimney on the rear roof slope, and a cupola. Below the gable end, is white horizontal wood siding and a scalloped fascia board. The fenestration consists of vinyl sliding sash units, which replaced the original wood-framed windows, some of which featured a diamond pattern. One of the original window openings to the left of the main entryway was substantially altered and replaced with a smaller window unit. The main elevation includes a stone planter, box bays accented by white horizontal wood siding, a decorative wood spindle column, and a recessed main entryway. On the west elevation, a partially open breezeway connects the dwelling to a two-car garage with white paneled overhead doors.

West of the dwelling is the Ranch style milk parlor, which is divided into two sections: the front milk house section and the rear milking parlor separated by a breezeway. The milk house incorporates Ranch style elements such as a hip-and-gable roof, a moderate eave overhang with boxed eaves, and a stucco façade. Its fenestration consists of metal multi-lite fixed and casement windows. The breezeway, located between the two sections on the east and west elevations, features two metal barn-style sliding doors. South of the milk house, the milking parlor features a gabled roof oriented along a north-south axis and steel beams. Ventilation elements include metal vertical louvered shutters set on top concrete walls. Additional features include two metal doors at the main entryway and a circular driveway in front of the milk parlor.

To the rear portion of the parcel fronting Walker Avenue is the second Ranch style residence, listed as 14350 Walker Avenue. Constructed between 1966 and 1968, the dwelling has an asymmetrical façade and an irregular floorplan atop a concrete foundation. The exterior is clad in stucco painted tan and has a stone veneer on the main (east) elevation. The moderately-pitched hipped roof is topped with composition shingles and has a moderate eave overhang, boxed eaves, and a stone chimney on the rear roof slope. The fenestration visible from the public right-of-way consists of aluminum windows. An enclosed breezeway is located on the north elevation and connects the dwelling to a two-car garage.

## Primary Record Information Continued:

View south of 14350 Walker Ave Ranch style SFR (IMG_8830; October 21, 2024).

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
The property was owned by the Edward Swager family between the 1960s and 2022.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 8485 Edison and 14350 Walker Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 8485 Edison and 14350 Walker Avenue property has been found not significant and ineligible, it maintains integrity of location, setting, design, materials, workmanship, feeling, and association as an active and in-use dairy farming property.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# PRIMARY RECORD

Primary#: P-36-xxx
HRI#: N/A
Trinomial #: N/A
**CRHR Status Code:** 6Z
Other Listings: Urbana Survey No.: 120

Review Code _____ Reviewer _____ Date _____
**Resource Name:** 14049 Grove Avenue


**P1. Other Identifier:** N/A
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted**
***a. County:** San Bernardino
***b. USGS 7.5' Quad:** See DPR 523 J Location Map Date: 2021 **T** _; **R** _; _ **¼ of** _ **¼ of Sec** _; _S. B._**B.M.** __
c. Address: 14049 Grove Avenue City: Ontario Zip: 91761
d. UTM Zone: 11S, 442052, 442147 mE / 3762180, 3762181mN
e. Other Locational Data: San Bernardino County APN: 021631101, 021631102

***P3a. Description:** The evaluated property consists of two parcels (APN: 021631101 and 021631102), historically addressed as 14049 Grove Avenue. Covering 9.04 acres, the property is located on the northeast corner of Grove Avenue and Ontario Ranch Road. The surrounding area remains largely open space and agricultural land, historically associated with dairy farming. The property includes a two-story Ranch style residence with an attached garage, a utilitarian milk parlor, and some ancillary pole structures and two water retention ponds. Some ancillary pole structures are located to the rear of the buildings. The dwelling and milk parlor are located on parcel 021631102. Landscaping and hardscaping features consist of a paved driveway and walkway, and some organized trees and plantings around the buildings. The property is enclosed behind a metal fence. Today, the property no longer functions as an active dairy and is listed as Agromin, a local soil company. **For a more detailed property description, please refer to the Continuation Sheet.**

***P3b. Resource Attributes:** HP2-Single Family Property; HP32- Rural Open Space
***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5b. Description of Photo:
View northeast of 14049 Grove Avenue milk parlor (IMG_8745; October 21, 2024).
***P6. Date Constructed/Age and Source**
1959-1966/NETR HistoricAerials (1959, 1966)
☒Historic:
☐ Prehistoric
☐ Both
***P7. Owner and Address:**
Pietersma, Ronald & Kristine Family TR
PO Box 2500
Chino CA
***P8. Recorded by:** Urbana Preservation & Planning, LLC / www.urbanapreservation.com
***P9. Date Recorded:** October 2024
***P10. Survey Type:** Intensive Level NRHP / CRHR / Local Register Evaluation

***P11. Report Citation**: Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
***Attachments:** ☐ None ☒ Location Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

**B1. Historic Name:** Jacob Bosma Dairy
**B2. Common Name:** 14049 Grove Avenue
**B3. Original Use:** Dairy Farm **B4. Present Use:** Single-Family
***B5. Architectural Style:** Utilitarian Style/Minimal Traditional Style

***B6. Construction History:** This property consists of two parcels under single ownership (APN: 021631101 and 021631102). No historic-era building permits were found on file with the City of Ontario. Year-built data and property characteristics were obtained from the San Bernardino County Assessor's Property Management Information System, supplemented by aerial imagery from 1935, 1938, 1946, 1948, 1952, 1959, 1968, and subsequent years. Available aerial imagery indicates that 14049 Grove Avenue was initially developed between 1959 and 1966, with the construction of a Ranch style single-family residence and utilitarian milk parlor. Subsequent aerial imagery suggests that the overall configuration of the existing buildings has remained unchanged. **See Continuation Sheet for ownership/occupancy information.**

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A
***B8. Related Features:** None Identified
**B9a.** Architect: Not Identified **b.** Builder: Not Identified
***B10. Significance: Theme:** Postwar, Large-Capacity Dairies, 1945-1980; Historic Architectural Styles, 1880s-1980s
**Area:** San Bernardino County
**Period of Significance:** N/A **Property Type:** N/A
**Applicable Criteria:** NRHP/CRHR/ Local ineligible

The property at 14049 Grove Avenue was originally developed between 1959 and 1966. In 1999, the area was annexed into the City of Ontario as part of the New Model Colony, which was formed from a portion of the former San Bernardino County Agricultural Preserve. The property is associated with the historical contexts of Postwar, Large-Capacity Dairies, 1945-1980 and Historic Architectural Styles, 1880s-1980s, but it does not possess documented significance in relation to the themes. **See Continuation Sheet for significance and integrity conclusions.**

**B11. Additional Resource Attributes:** None
***B12. References:** Urbana Preservation & Planning, LLC, City of Ontario New Model Colony Historic Context Statement and Resource Survey, 2025.
**See Continuation Sheet for additional references.**
**B13. Remarks:** None
***B14. Evaluator:** Urbana Preservation & Planning, LLC | www.urbanapreservation.com
***Date of Evaluation:** 2025

(This space reserved for official comments.)

# LOCATION MAP

**Resource Name:** 14049 Grove Avenue


Primary#: P-36-xxx
HRI #: N/A
Trinomial: N/A
**CRHR Status Code**: 6Z
Other Listings: Urbana Survey No.: 120

*Map Name: Ontario; Guasti; Prado Dam; Corona North *Scale: 1:24,000 *Map Date: 2021; 2021; 2022; 2022

URBANA PRESERVATION & PLANNING LLC

0 0.25 0.5 1 Miles

## Primary Record Information Continued:

**P3a. Continued from Page 1:**
Improved between 1959 and 1966, the property includes a Ranch style single-family residence and a milk parlor. The dwelling features a rectilinear, two-story floorplan with a flat roof and a moderate eave overhang. The exterior is clad in white stucco and includes vinyl sliding sash windows. The main entryway is sheltered by a portico supported by decorative wood spindle columns. Additional features include an attached one-car garage with a paneled overhead door and a deck enclosed by a decorative metal railing above the garage.

East of the dwelling is a utilitarian milk parlor, which is divided into two sections: the front milk house and the side milking parlor, separated by a breezeway. The milk house features a concrete façade with a bubbled textured section, industrial glass doors, large, fixed windows, and a flat roof. The breezeway, located between the two sections on the east and west elevations, is enclosed by metal barn-style sliding doors. North of the milk house, the milking parlor has a flat roof oriented along a north-south axis. Ventilation elements include metal vertical louvered shutters set between concrete walls. Additional features include a curved driveway in front of the milk parlor.

View east of 14049 Grove Avenue SFR (IMG_8743; October 21, 2024).

**Primary Record Information Continued:**

View northeast of 14049 Grove Ave milk parlor (IMG_8744; October 21, 2024).

View northeast of 14049 Grove Avenue milk parlor (IMG_8746; October 21, 2024).

## Primary Record Information Continued:

View north of 14049 Grove Avenue SFR (IMG_8747; October 21, 2024)

## Building, Structure, Object Information Continued:

**B6. Construction History Continued from Page 2:**

**Ownership/Occupancy**
The property was originally owned by Jacob J. Bosma since the 1960s and remained in the Bosma family's ownership until 2021.

## Building, Structure, Object Information Continued:

**B10. Statement of Significance from Page 2:**
For lack of significant association with the themes, the subject property has not been found eligible under NRHP / CRHR / City of Ontario Criterion A / 1 / a as the property has not in and of itself been directly associated with significant events or patterns of events in dairy farming in local, regional, state, or national history, nor does it exemplify or reflect special elements of the City's history; not eligible under NRHP / CRHR / City of Ontario Criterion B / 2 / b as it has not been identified as having an association with an important person, family, or ethnic group significant in the local dairy farming industry; not eligible under NRHP / CRHR / City of Ontario Criterion C / 3 / c-f as none of the buildings at the property, nor the property as a whole, embodies the distinctive characteristics of a type, period, or method of construction and has not been identified as being the work of a master or an important and creative individual; not eligible under City of Ontario Criterion g and h as the property does not in and of itself offer a unique location, a singular physical characteristic, or an established and familiar visual feature within the city of Ontario or the Ontario New Model Colony / Ontario Ranch community, nor is it in and of itself one of the few remaining examples in the City, region, state or nation, possessing distinguishing characteristics of an architectural or historical type or specimen; and not eligible under NRHP / CRHR / City of Ontario Criterion D / 4 / as further study of the 14049 Grove Avenue would not appear to yield information which could be considered important in local, regional, state, or national history.

Although the 14049 Grove Avenue has been found not significant and ineligible for historical designation, it generally retains all aspects of integrity in location, setting, design, materials, workmanship, and feeling. However, the property lacks integrity of association, as it no longer functions as a property associated with the dairy industry.

**B12. References Continued:**
2. California Digital Newspaper Collection, University of California Riverside
3. Digital Newspaper Collection, Genealogybank.com
4. Digital Newspaper Collection, Newspapers.com
5.Digital Collection, Ancestry.com
6.Online Historic Aerial Photographs, Historic Aerials.com
7. University California Santa Barbara Online Historic Aerial Collection
8. U.S. Department of the Interior Earth Explorer Historic Aerial Collection
9. Bureau of Land Management, General Land Office Records, https://glorecords.blm.gov

# APPENDIX D

## Relocation Feasibility Study

August 20, 2025

Jason Lee
V.P. RCCD Inc.
jasonl@rccdinc.com

Reference: **RELOCATION OF FIVE STRUCTURES – FEASIBILITY STUDY**
**7587 EDISON AVE, 8311 EDISON AVE, 8381 EDISON AVE, 8485 EDISON AVE, AND 14117 GROVE AVE**
**ONTARIO, CALIFORNIA**
**[S.F. PROJECT #25198]**

Dear Jason:

We have completed our feasibility study for the relocation of four historic milking barns and a historic house located at 7587 Edison Avenue, 8311 Edison Avenue, 8485 Edison Avenue, 14117 Grove Avenue, and 8381 Edison Avenue in Ontario, CA, respectively. Our findings are based on visual observations made while on all five sites on August 8, 2025. Cole Cisakowski of RCCD accompanied Gabriela Pascualy of Structural Focus on the site visit. No existing building drawings or backgrounds were provided for our use, and no exploratory demolition or materials investigation was performed as part of the site visit.

**Building Descriptions**

*7587 Edison Avenue*

The milking barn at 7587 Edison is separated into a smaller wood framed front portion and a larger concrete back portion. The front portion is an enclosed space that is approximately 40 feet wide by 24 feet deep and has a large tank in front of it, along with a tank, washrooms, and storage rooms inside the building. The wood framed stud walls appear to be supported on concrete stem walls which are a few feet tall. There are several window openings and large door openings. The roof is wood framed.

The back portion of the building is much larger at approximately 200 feet wide by approximately 30 feet deep. It consists of concrete roof slabs supported by a central line of built-up steel beams & columns and concrete walls (potentially tilt-up) on the long sides of the building. The roof slabs consist of two spans which overlap & are vertically offset in the center of the building, allowing airflow. The walls contain many window and door openings with five of the window openings infilled with concrete at the northeast corner. The west side of the building is open while the east side has a solid wall. Animal stalls and equipment for milking operations fill this portion of the building.

Foundations for the building were not visible but are presumed to be concrete strip footings below the walls and concrete spread footings below the columns.

*8311 Edison Avenue*

The milking barn at 8311 Edison is separated into a smaller wood framed front portion and a larger metal and wood framed back portion. The front portion is an enclosed space that is approximately 30 feet wide by 15 feet deep with a tank on the exterior of the west side of the building that appears to penetrate the exterior wall. The inside contains washrooms and storage rooms. The wood framed stud walls appear to be supported on concrete stem walls which are a few feet tall. There are several window openings and large door openings. The roof is wood framed with clay tile roofing.

The back portion of the building extends more than three times the depth of the front portion but decreases in width before it expands back to the width of the front portion. The roof consists of corrugated metal sheets

over wood framing, supported by posts only along the exterior in the middle, narrower area and supported by steel posts along the exterior and center in the end, wider area. There are partial height concrete walls along the long sides. Animal stalls and equipment for milking operations fill this portion of the building.

Foundations for the building were not visible but are presumed to be concrete strip footings below the walls and concrete spread footings below the columns.

*8381 Edison Avenue*

The building at 8381 Edison is a craftsman-style single family home. The 2-story house has a covered porch and detached 3-car garage. Interior access to the house was not provided, so our observations are based on what could be seen while walking around the perimeter of the building. The home is likely constructed of wood floor and wall framing, supported by exterior bearing walls and interior posts in the crawl space. Foundations for the bearing walls were not visible but are presumed to be concrete strip footings. In the crawl space, small concrete pad footings were visible below the posts. The garage is also wood framed with what is likely a concrete slab on grade.

*8485 Edison Avenue*

The milking barn at 8485 Edison is separated into a smaller wood framed front portion and a larger metal framed back portion. The front portion is an enclosed space that is approximately 25 feet wide by 15 feet deep and contains storage tanks, washrooms, and storage rooms. Wood framed stud walls are supported on concrete stem walls and there are several window and door openings in the walls. The roof is wood framed.

The back portion of the building is much larger with the same width but extends more than three times the depth of the front portion. The roof consists of corrugated metal sheets supported by metal joists framing into metal frames. There are six total steel beam and column frames with individual concrete pad footings visible below each of the columns. Each frame consists of two exterior columns with a beam spanning between them. There are partial height concrete walls along the long sides of the back portion with metal slats above them spanning vertically to the underside of the roof. Animal stalls and equipment for milking operations fill this portion of the building.

Most foundations are not visible but are presumed to be concrete strip footings below the stem walls (not visible) and concrete spread footings below the columns (visible).

*14117 Grove Avenue*

The building at 14117 Grove is separated into a smaller front portion and a larger back portion. The front portion is an enclosed space that is approximately 35 feet wide by 15 feet deep and contains storage tanks for the milk product, washrooms, and storage rooms. Wood framed stud walls are supported on concrete (or possibly concrete block) stem walls. There are several glass block infill windows in the wood stud walls. The ceiling and roof are wood framed.

The back portion is much larger with the same width but extends more than three times the depth of the front portion. The back portion of the building has a corrugated metal roof supported by wood carpenter trusses spanning to wood beams, supported by steel pipe posts along the exterior of the building. It is an open structure with partial height walls along the sides (likely concrete). Animal stalls and equipment for milking operations fill this portion of the building.

Foundations for the buildings are not visible but are presumed to be concrete spread footings below the stem walls and pipe posts.

**Site Visit Observations**

*7587 Edison Avenue*

The front portion of the milking barn at 7587 Edison appears to have water and weather damage leading to sagging of some of the wood framing. Specifically, the stucco on the underside of the overhang at the southwest corner of the front portion appears to have sagged downward exposing the wood roof joists. The ceiling near the doorway to the back portion has also sagged significantly, presumably from damaged wood framing above.

The back portion is in relatively good condition. During the site visit a crack was observed in the concrete header above the doorway between the front and back portions of the building.

*8311 Edison Avenue*

The front portion of the milking barn at 8311 Edison is in relatively good condition. Some edge members are missing at the north corners of the building, exposing roof members in the area. The visible members show signs of deterioration, but it is presumed that the deterioration is due to exposure to the elements and is limited to the exposed areas.

The back portion also shows some signs of deterioration, likely due to the age of the building and exposure to the elements.

*8381 Edison Avenue*

The house at 8381 Edison was observed from the exterior only. It appears to be in good condition and is currently inhabited.

*8485 Edison Avenue*

The milking barn at 8485 Edison is functioning as a working parlor – both the front and back portions are in relatively good condition.

*14117 Grove Avenue*

The milking barn at 14117 Grove is no longer functioning as a working parlor as of recently and was only observed from the exterior. The front portion appears to be in relatively good condition. The wood trusses in the back portion are deteriorated and in poor condition, with evidence of some previous repairs. In the event that the back portion becomes occupiable again, the roof framing should be shored and repaired.

**Conclusions**

It is our opinion that it is feasible to relocate the front portion of all four milking barns, located at 7587 Edison Ave, 8311 Edison Ave, 8485 Edison Ave, and 14117 Grove Ave; the back portion of the milking barns located at 8311 Edison Ave and 8485 Edison Ave; and the house located at 8381 Edison Ave. The wood framed walls in the front portions of all four milking barns could be detached and lifted off the stem walls. New foundations and stem walls would need to be constructed at the receiver site to support the relocated wood portions. The back portions of the milking barns previously listed could be lifted at the lines of steel/wood posts for relocation of the posts and roofs. The perimeter stem walls and animal stalls would need to be rebuilt at the receiver site. The house could be detached and lifted off the crawl space. New perimeter crawl space walls, interior crawl space posts, and all associated foundations would need to be constructed at the receiver site to support the relocated house.

The back portions of the milking barns located at 7587 Edison Ave and 14117 Grove Ave are not feasible to relocate in their current conditions. The nature of the concrete construction at 7587 Edison Ave makes the structure extremely challenging to relocate without causing damage. However, the structure may be relocated if it is first disassembled and then reassembled at the receiver site.

**Summary**

**7587 Edison Ave** – It **is** feasible to relocate the **front** portion of the building, but it **is not** feasible to relocate the **back** portion of the building without first disassembling the structure. Some repairs to the front portion may be required at the discretion of the relocation specialist.

**8311 Edison Ave** – It **is** feasible to relocate the building in its entirety (with the exception of the stem walls in the front and back portions, the animal stalls in the back, and the foundations).

**8381 Edison Ave** – It **is** feasible to relocate the building in its entirety (with the exception of the crawl space framing and foundations).

**8485 Edison Ave** – It **is** feasible to relocate the building in its entirety (with the exception of the stem walls in the front and back portions, the animal stalls in the back, and the foundations).

**14117 Grove Ave** – It **is** feasible to relocate the **front** portion of the building, but it **is not** feasible to relocate the **back** portion of the building in its current state.

Thank you very much for the opportunity to work with you on this challenging and interesting project. If you have any questions, please feel free to contact us at your convenience.

Sincerely,
STRUCTURAL FOCUS

Russell Kehl, S.E.
Principal, President

Gabriela Pascualy, P.E.
Senior Structural Designer

# APPENDIX E

## GEOTECHNICAL INVESTIGATION

Converse Consultants
Geotechnical Engineering
Environmental & Groundwater Science
Inspection & Testing Services

# PRELIMINARY GEOTECHNICAL INVESTIGATION & ORGANIC SOIL/MANURE EVALUATION REPORT

## SARES REGIS NORTH

Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernadino County, California

*CONVERSE PROJECT NO. 24-81-184-01*

*Prepared For:*
RCCD, INC.
8101 E. Kaiser Boulevard, Suite 140
Anaheim Hills, California 92808

*Presented By:*
CONVERSE CONSULTANTS
2021 Rancho Drive, Suite 1
Redlands, CA 92373
909-796-0544

September 10, 2024

**Converse Consultants**
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

September 10, 2024

Mr. Jason Lee
Ontario Ranch Ventures I & II, LP (ORV I & II)
c/o RCCD, Inc.
Vice President
RCCD, Inc.
8101 E. Kaiser Boulevard, Suite 140
Anaheim Hills, California 92808

Subject: **PRELIMINARY GEOTECHNICAL INVESTIGATION AND ORGANIC SOIL/MANURE EVALUATION REPORT**
**Sares Regis North**
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
Converse Project No. 24-81-184-01

Dear Mr. Lee:

Converse Consultants (Converse) is pleased to submit this Preliminary Geotechnical Investigation and Organic Soil/Manure Evaluation Report to assist with the proposed Sares Regis North medium density residential and mixed-use development located at the southwest corner of Edison Avenue and Walker Avenue, in the City of Ontario, San Bernardino County, California. This report was prepared in accordance with our proposals dated May 21, 2024 and your Professional Services Agreement, dated May 21, 2024.

Based upon our field investigation, laboratory data, and analyses, the project site is considered feasible from a geotechnical standpoint, provided the recommendations presented in this report are incorporated into the design and development of the project.

We appreciate the opportunity to be of service to Ontario Ranch Ventures I & II, LP (ORV I & II). Should you have any questions, please do not hesitate to contact us at 909-474-2847.

**CONVERSE CONSULTANTS**

Hashmi S. E. Quazi, PhD, GE, PE
Principal Engineer

Dist.: 1/Addressee (e-mail) HSQ/RLG/SM/kvg

# PROFESSIONAL CERTIFICATION

This report has been prepared by the individuals whose seals and signatures appear herein.

The findings, recommendations, specifications, or professional opinions contained in this report were prepared in accordance with generally accepted professional engineering, engineering geologic principles, and practice in this area of Southern California. There is no warranty, either expressed or implied.

Catherine Nelson, GIT
Project Geologist

Robert Gregorek, PG, CEG
Senior Geologist

Hashmi S. E. Quazi, PhD, PE, GE
Principal Engineer

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## APPENDICES

Appendix A ..... *Field Exploration*
Appendix B ..... *Laboratory Testing Program*
Appendix C ..... *Liquefaction and Dynamic Settlement Analysis*
Appendix D ..... *Earthwork Specifications*

# 1.0 INTRODUCTION

This preliminary geotechnical investigation and organic soil/manure evaluation prepared by Converse for the approximately 185-acre rectangular shaped Sares Regis NORTH site is located at the southwest corner of Edison Avenue and Walker Avenue, in the City of Ontario, San Bernardino County, California. The approximate location of the proposed project is shown in Figure No. 1, *Approximate Site Location Map.*

The purpose of this investigation was to evaluate the current nature and engineering properties of the subsurface soils and groundwater conditions and to provide geotechnical recommendations for the proposed residential development.

This report was prepared for the project described herein and is intended for use solely by Ontario Ranch Ventures I & II, LP (ORV I & II), RCCD, Inc. and their authorized agents. This report may be made available to the prospective bidders for bidding purposes. However, the bidders are responsible for their own interpretation of the site conditions between and beyond the boring locations, based on factual data contained in this report. This report may not contain sufficient information for use by others and/or other purposes.

# 2.0 SITE DESCRIPTION AND BACKGROUND

The approximately 185-acre rectangular site, consisting of several active dairies and agricultural fields, is located at the southeast corner of Ontario Ranch Road and Walker Avenue, in the City of Ontario, San Bernardino County, California. The property is bounded to the north by Edison Avenue, to the east by Walker Avenue, to the west by future Campus Avenue, and to the south by dairies and agricultural land.

The site gently slopes from the northeast to southwest. Elevations range from approximately 696 feet above mean sea level (msl) in the northwest corner of the site to approximately 677 feet above msl in the southwest portion of the site. The present site conditions are depicted in Photographs Nos. 1 through 5.

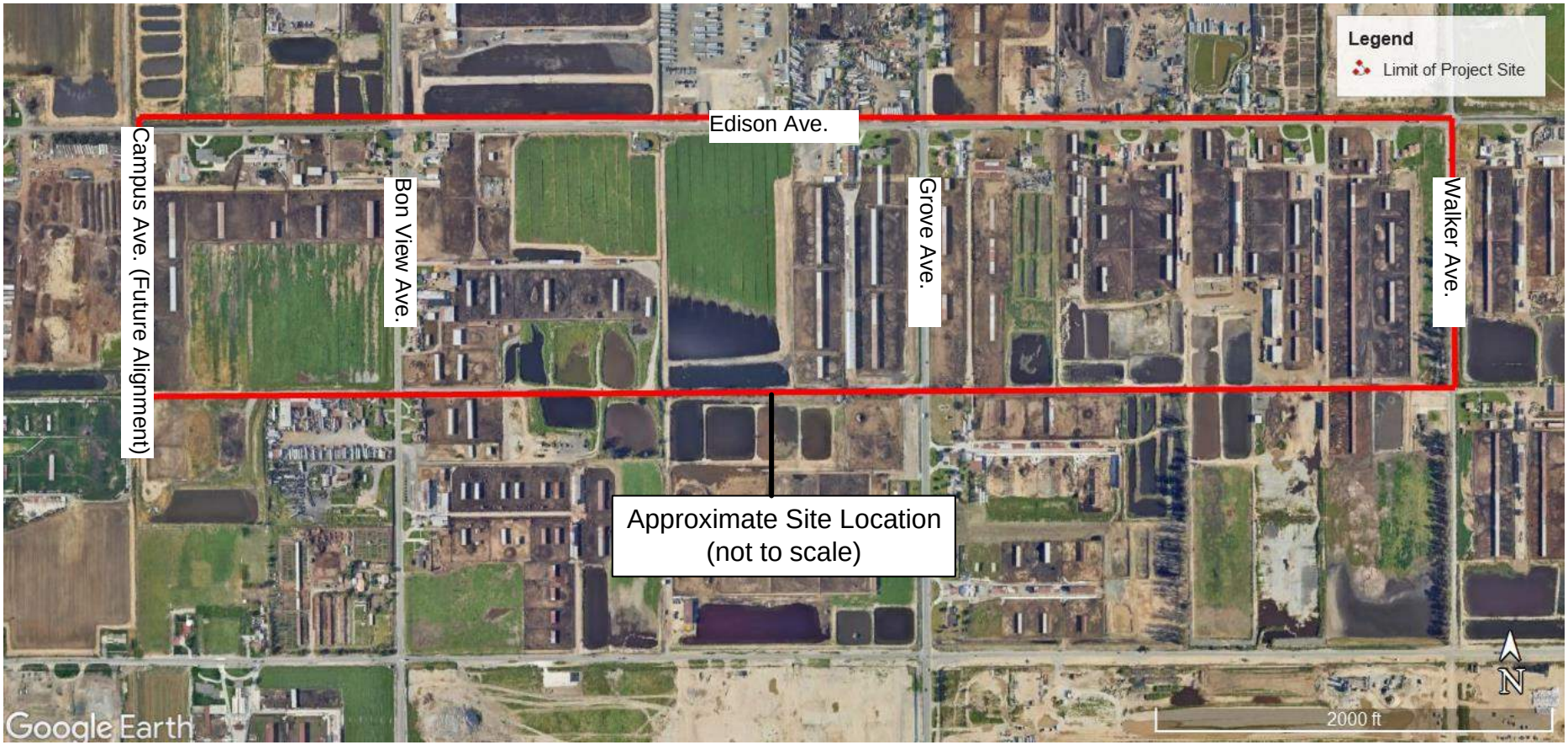


Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Site Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
1

*Photograph No. 1: Current site conditions, facing north.*

*Photograph No. 2: Current site conditions, facing south.*

*Photograph No. 3: Current site conditions, facing southeast.*

*Photograph No. 4: Current site conditions at large southeastern berm, facing south.*

*Photograph No. 5: Current site conditions at stockpile in eastern cow pens, facing southeast.*

# 3.0 PROJECT DESCRIPTION

Based on conversations with Mr. Jason Lee of RCCD, Inc. the property will be developed for medium density residential, mixed use, and open space. No development or grading plans are available at this time. The structures will likely be one to two-story tilt up buildings founded on shallow footings with slab-on-grade with concrete wall, steel and possible block wall construction. Associated with the development will likely be above and below ground utilities, access roads, and interior streets.

# 4.0 PREVIOUS SITE INVESTIGATIONS

The 2 referenced previous geotechnical feasibility studies of the subject site, which were provided, were performed by Southern California Geotechnical (SoCalGeo) in 2022, with the pertinent data incorporated into this report.

# 5.0 SCOPE OF WORK

The scope of Converse's investigation is described in the following sections.

## *5.1 Project Set-up*

The project set-up consisted of the following tasks.

- Reviewed existing plans, geotechnical reports provided, and data relevant to the project.

- Conducted a site reconnaissance to mark the exploration locations and to verify drill rig/backhoe access to the proposed locations were available.
- Notified Underground Service Alert (USA) at least 48 hours prior to conducting field work to clear the exploration locations of any conflict with existing underground utilities.
- Engaged a drill rig company to conduct exploratory borings and a backhoe company to excavate exploratory test pits.

### *5.2 Subsurface Exploration*

Ten exploratory borings (BH-01 through BH-10) were drilled using a truck-mounted GT-16 drill rig equipped with 8-inch diameter hollow-stem augers to investigate the subsurface conditions on May 24, 2024 and May 29, 2024. The borings were drilled to depths ranging from 16.5 feet to 51.5 feet below the existing ground surface (bgs).

Thirteen exploratory test pits (TP-01 through TP-13) were excavated using a backhoe equipped with 24-inch-wide bucket to investigate the subsurface conditions on June 11 and 12, 2024. The test pits were excavated between 4.1 feet and 7.6 feet bgs.

The approximate locations of the current exploratory borings and test pits are shown on Figures No. 2a through 2e, *Approximate Boring, Test Pit, and Overexcavation Location Maps*. A detailed discussion of subsurface exploration is presented in Appendix A, *Field Exploration*.

### *5.3 Laboratory Testing*

Representative samples of the site soils were tested in the laboratory to aid in soil classification, and to evaluate relevant engineering properties. These tests included the following.

- *In-situ* moisture contents and dry densities (ASTM D2216-19 and D2937-17)
- Organic Content (ASTM D2974-20e1, Methods A and C)
- Expansion Index (ASTM D4829-21)
- R-value (California Test 301)
- Soils Corrosivity (CTM 643, 422, 417, 532)
- Collapse (ASTM D4546-21)
- Grain size analysis (ASTM D6913/D6913M-17)
- Maximum dry density and optimum-moisture content (ASTM D1557-12R21)
- Direct shear (ASTM D3080/D3080M-21)
- Consolidation (ASTM D2435/D2435M-11R20)

For *in-situ* moisture and dry density data, see the logs of boring in Appendix A, *Field Exploration*. For a description of the laboratory test methods and test results, see Appendix B, *Laboratory Testing Program*.

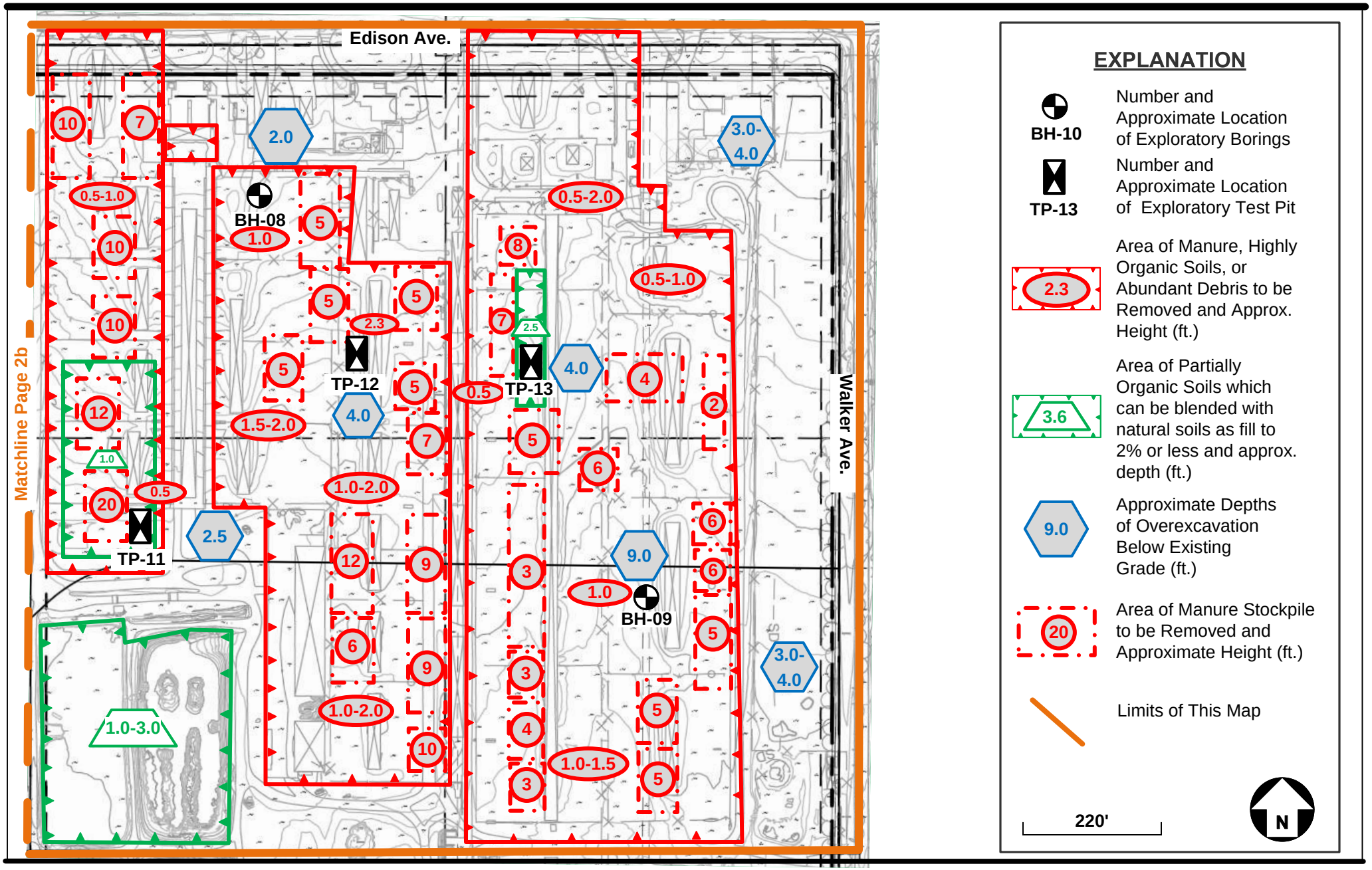


Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2a

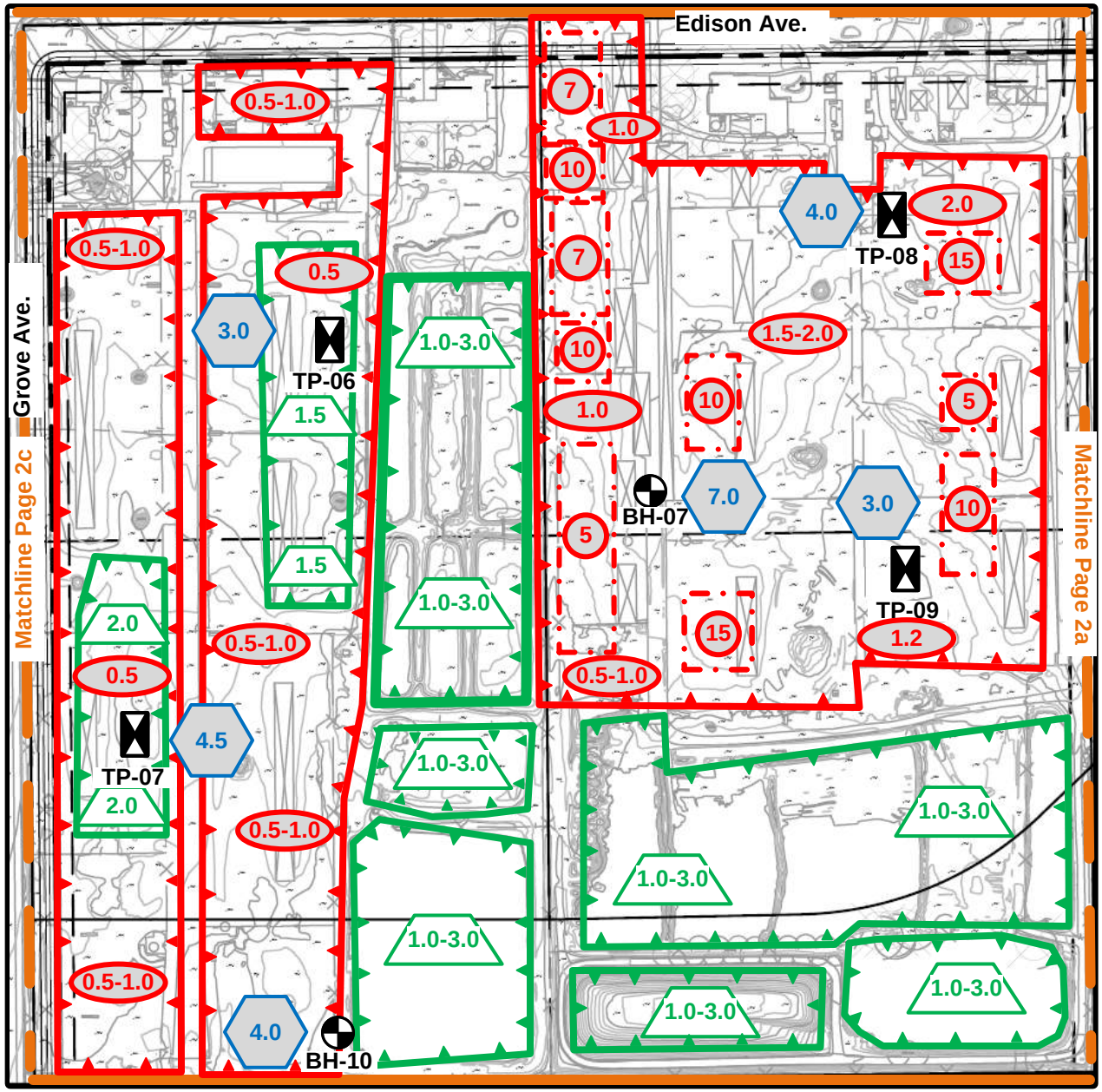


## EXPLANATION

BH-10 — Number and Approximate Location of Exploratory Borings

TP-13 — Number and Approximate Location of Exploratory Test Pit

2.3 — Area of Manure, Highly Organic Soils, or Abundant Debris to be Removed and Approx. Height (ft.)

3.6 — Area of Partially Organic Soils which can be blended with natural soils as fill to 2% or less and approx. depth (ft.)

9.0 — Approximate Depths of Overexcavation Below Existing Grade (ft.)

20 — Area of Manure Stockpile to be Removed and Approximate Height (ft.)

Limits of This Map

220'

N

Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2b

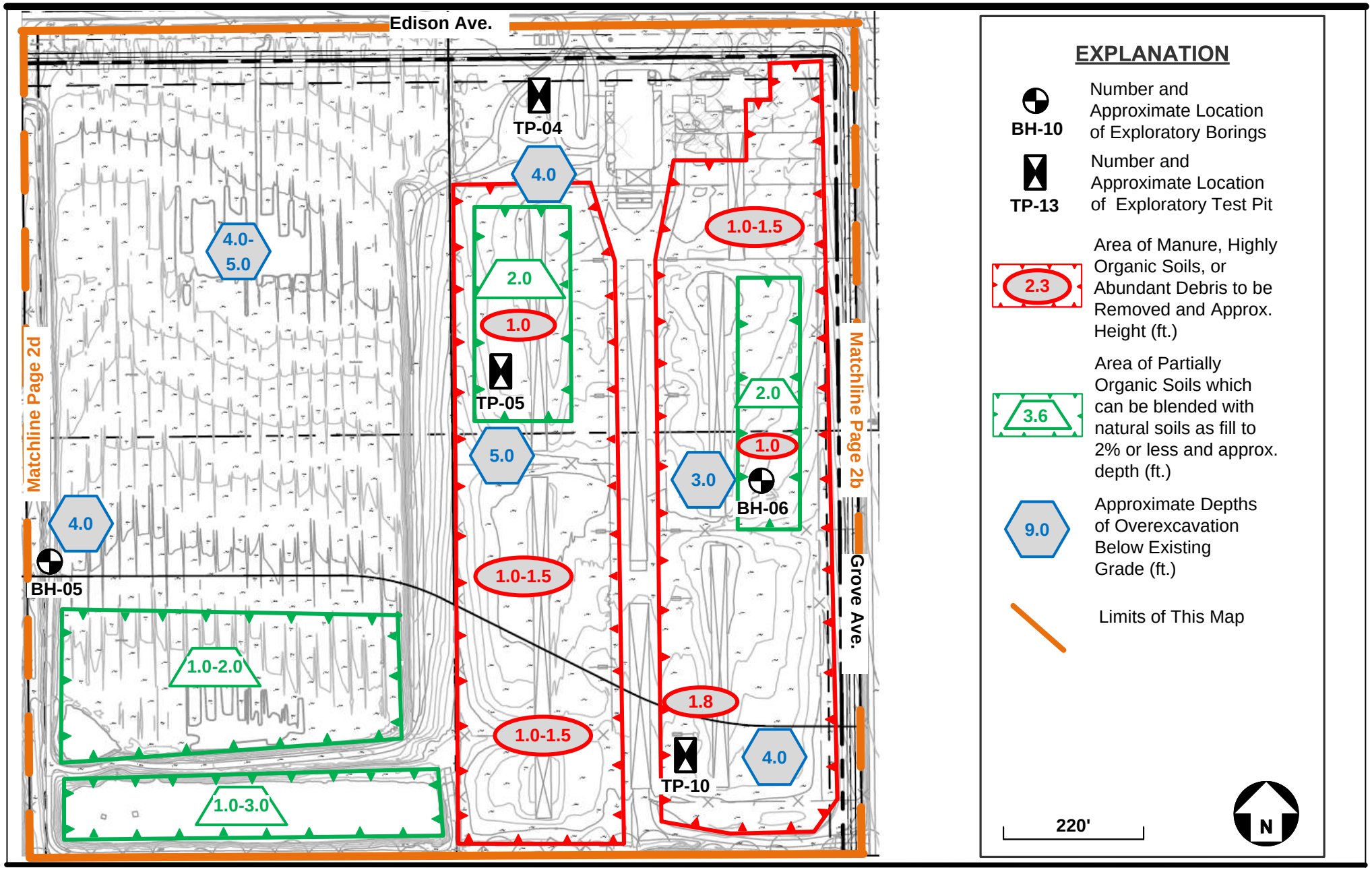


Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2c

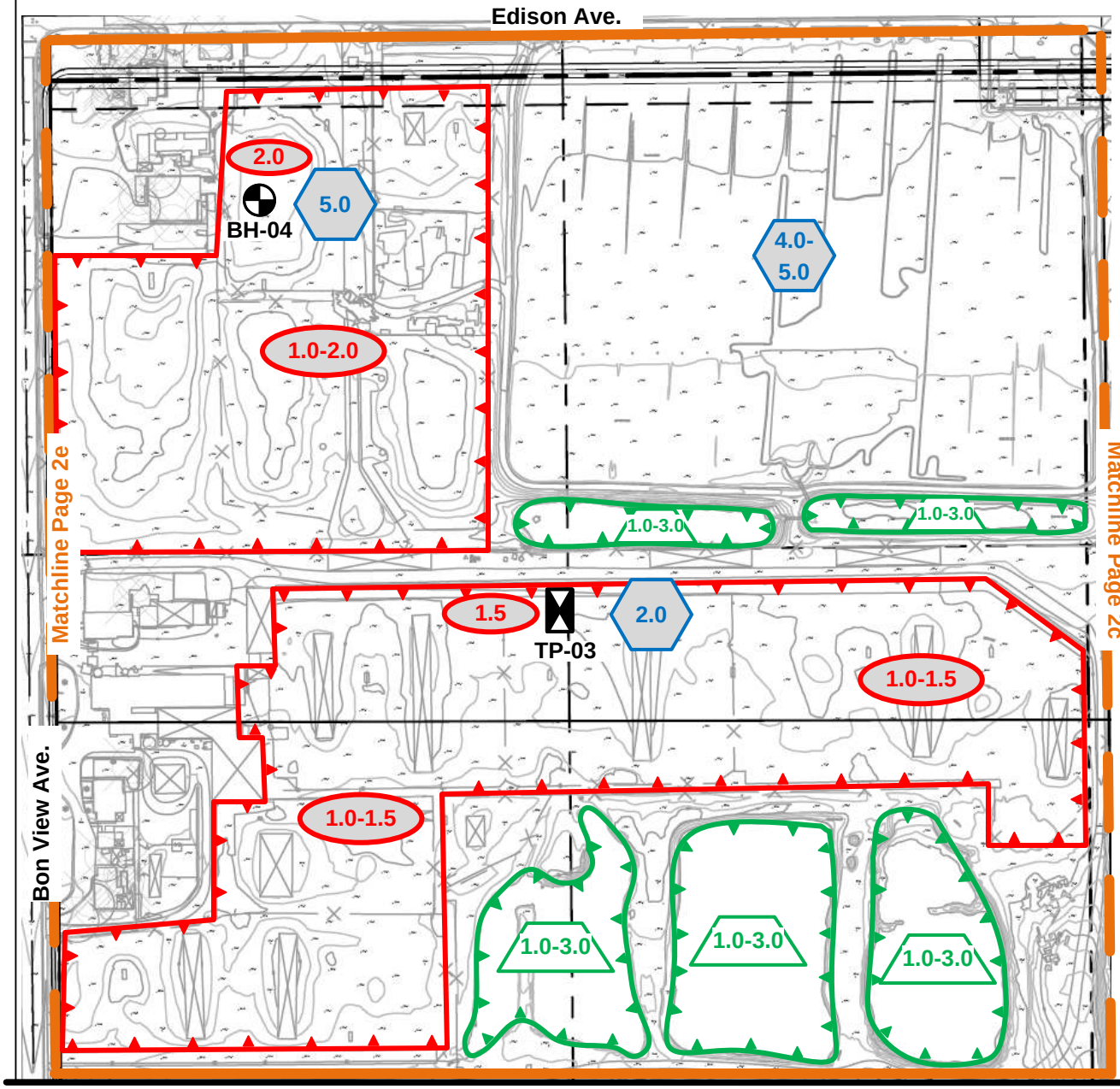


## EXPLANATION

BH-10 — Number and Approximate Location of Exploratory Borings

TP-13 — Number and Approximate Location of Exploratory Test Pit

2.3 — Area of Manure, Highly Organic Soils, or Abundant Debris to be Removed and Approx. Height (ft.)

3.6 — Area of Partially Organic Soils which can be blended with natural soils as fill to 2% or less and approx. depth (ft.)

9.0 — Approximate Depths of Overexcavation Below Existing Grade (ft.)

Limits of This Map

220'

N

Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2d

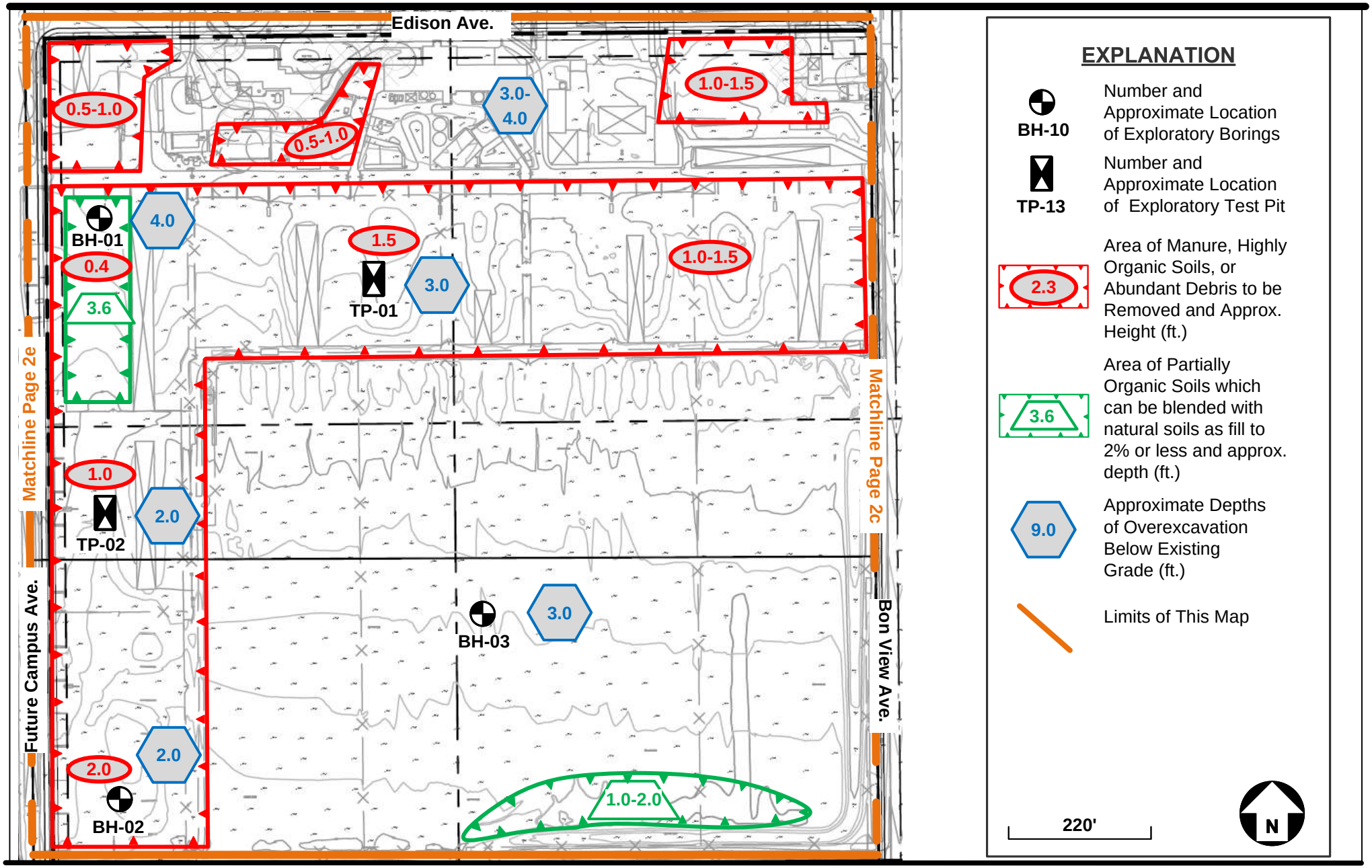


Project: Sares Regis North

Location: Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California

For: RCCD, Inc.

# Approximate Boring, Test Pit, and Overexcavation Location Map

**Project No.**
24-81-184-01

**Converse Consultants**

**Figure No.**
2e

### *5.4 Analysis and Report Preparation*

Data obtained from the field exploration and laboratory testing program was assembled and evaluated. Geotechnical analyses of the compiled data were performed, followed by the preparation of this report to present our findings, conclusions, and recommendations for the project.

## 6.0 SITE CONDITIONS

A general description of the subsurface conditions, various materials and groundwater conditions encountered at the site during our field exploration is discussed below.

### *6.1 Subsurface Profile*

Based on our field exploration and laboratory test results, the subsurface soil at the project site consisted primarily of manure, organic artificial fill soil, topsoil and alluvium.

The various subsurface profiles and description of the earth material soils encountered are discussed below.

Manure/Highly Organic Soil: Due to the site being active dairy farms the site is partially covered by generally approximately 0.4 feet to 2.3 foot and locally, within random stockpiles, as much as approximately 3.0 feet to 20.0 feet of manure or highly organic soils. The stockpiles of these materials are located in the eastern portion of the site. This manure and highly organic soils will need to be removed from the site prior to any grading in areas of proposed development. The approximate locations and depth of this material is shown on Figures No. 2a through 2e, *Approximate Boring, Test Pit and Overexcavation Location Maps*.

Artificial Fill Soil: Due to the current dairy and agricultural use the surface of the majority of the project site is generally partially covered by up to approximately 1.0 feet to 9.0 feet of undocumented artificial fill, which is in some areas is partially organic. The partially organic artificial fill is approximately 1.0 feet to 3.6 feet thick. This material was encountered within some of the exploratory excavations and was generally comprised of sandy gravel, silty sand, clayey sand, sandy silt, silt and sandy clay, which was fine to coarse-grained, with trace to few scattered gravel up to 2.0-inches maximum dimension, some localized debris and concrete, some roots and rootlets, locally layered, loose to dense/soft to very stiff, moist and various shades of brown, gray, black, red and orange. The partially organic artificial fill areas were slightly to moderately organic with traces of manure. The approximate locations and depths of the partially organic fill material is shown on Figures No. 2a through 2e, *Approximate Boring, Test Pit and Overexcavation Locations Maps*.

Topsoil: Topsoil was encountered at the surface within some of the exploratory excavations ranging in thickness from approximately 3.0 feet to 4.0 feet bgs. This material was generally comprised of sand and silty sand, which was fine to medium-grained, medium dense to dense, moist and various shades of brown and gray.

Alluvium: Holocene alluvium was encountered below the artificial fill and topsoil in all of the of the exploratory excavations at depths ranging from approximately 1.0 foot to 9.0 feet bgs. Where observed, this material was generally comprised of sand, silty sand, clayey sand, sandy silt, clayey silt and sandy clay, which was fine to coarse-grained, with trace gravel to 1-inch maximum dimension, slightly to very desiccated, some oxidation staining, trace caliche, some pinhole porosity, some scattered carbon, locally micaceous, medium dense to very dense/medium stiff to very stiff, moist and various shades of brown, tan, orange, red, yellow, green and gray. Portions of the upper 0.5 foot to 3.0 feet are weathered and low in density.

For a detailed description of the subsurface materials encountered in the exploratory borings and test pits, see the logs, Drawing Nos. A-2 through A-24, in Appendix A, *Field Exploration.*

### *6.2 Groundwater*

Groundwater was not encountered during our field investigation explored to 51.5 feet.

For comparison, regional groundwater data of available near-by water well information was conducted using the generalized coordinates of 33.9977 N and 117.6193 W were used for the following comparisons.

The GeoTracker database (SWRCB, 2024) was reviewed to evaluate the current and historical groundwater elevation data within a 1.0-mile radius of the project site. A noted active well, named City of Chino Well Number 16/Well #CA3610012_019_019. No groundwater level data was identified in the given well information.

The National Water Information System (USGS, 2024) was reviewed for current and historical groundwater data from sites within an approximately 1.0-mile radius of the project site and no wells with groundwater data were identified.

The California Department of Water Resources database (DWR, 2024) was reviewed for historical groundwater data from sites within a 1.0-mile radius of the project site. One site was identified within a 1.0-mile radius of the project site that contained groundwater elevation data. Details of that record are listed below.

- Well Name CHINO-1208672 (Station 340045N1176407W001), located northwest of the project site, reported groundwater at depths ranging from 137.01 to 145.74 feet bgs between 2011 and 2021.

Based on the available data and the findings of our investigation, the historical high groundwater level and the current groundwater level is estimated to be deeper than approximately 137.0 feet bgs. Groundwater is not expected to be encountered during construction of the proposed project. It should be noted that the groundwater level could vary depending upon the seasonal precipitation and possible groundwater pumping activity in each site vicinity. Perched water layers at depth may be present locally, particularly following high precipitation and irrigation events.

### *6.3 Expansive Soils*

Expansive soils are characterized by their ability to undergo significant volume changes (shrink or swell) due to variations in moisture content. Changes in soil moisture content can result from precipitation, landscape irrigation, utility leakage, roof drainage, perched groundwater, drought, or other factors and may result in unacceptable settlement or heave of structures or concrete slabs supported on grade. Depending on the extent and location below finish subgrade, expansive soils can have a detrimental effect on structures.

Based on the 2 laboratory tests conducted during this investigation and a previous geotechnical feasibility study by SoCalGeo, the expansion index of the upper 4.0 feet to 5.0 feet of the general site soils was 0 to 12, corresponding to a very low potential.

### *6.4 Collapse Potential*

Soil deposits subjected to collapse/hydro-consolidation generally exist in regions of moisture deficiency. Collapsible soils are generally defined as soils that have potential to suddenly decrease in volume upon increase in moisture content even without an increase in external loads. Moreover, some soils may have a different degree of collapse/hydro-consolidation based on the amount of proposed fill or structure loads. Soils susceptible to collapse/ hydro-consolidation include wind-blown silt, weakly cemented sand, and silt where the cementing agent is soluble (e.g., soluble gypsum, halite), alluvial or colluvial deposits within semi-arid to arid climate, and certain weathered bedrock above the groundwater table.

Granular soils may have a potential to collapse upon wetting in arid climate regions. Collapse/hydro-consolidation may occur when the soluble cements (carbonates) in the soil matrix dissolve, causing the soil to densify from its loose/low density configuration from deposition.

The degree of collapse of a soil can be defined by the collapse potential value, which is expressed as a percentage of collapse of the total sample using the Collapse Potential Test (ASTM D4546-21). According to the ASTM guideline, the severity of collapse potential is commonly evaluated by the following Table No. 1, *Collapse Potential Values*.

**Table No. 1, Collapse Potential Values**

| Collapse Potential Value (%) | Severity of Problem |
|---|---|
| 0 | None |
| 0.1 to 2 | Slight |
| 2.1 to 6.0 | Moderate |
| 6.0 to 10.0 | Moderately Severe |
| >10 | Severe |

Two collapse tests were conducted for this project. Based on the laboratory test result a collapse potential value of 1.6 percent at a depth of 2.0 feet bgs in boring BH-02 was measured. A collapse potential value of 0.2 percent at a depth of 3.0 feet bgs in boring BH-06 was measured. Three consolidation tests were also conducted for this project. No collapse potential value at a depth of 3.0 feet bgs in boring BH-03 was measured. A collapse potential value of 0.2 percent at a depth of 6.0 feet bgs in boring BH-06 was measured. A collapse potential value of 0.1 percent at a depth of 4.0 feet bgs in boring BH-07 was measured. These indicate only a none to slight problem at the site. Collapse potential distress is typically considered a concern when a measured collapse potential value is over 2% (LA County, 2013).

### *6.5 Excavatability*

The subsurface materials of the project are expected to be excavatable by conventional heavy-duty earth moving and trenching equipment.

The phrase “conventional heavy-duty excavation equipment” is intended to include commonly used equipment such as excavators, scrapers, and trenching machines. It does not include hydraulic hammers (“breakers”), jackhammers, blasting, or other specialized equipment and techniques used to excavate hard earth materials. Selection of an appropriate excavation equipment models should be done by an experienced earthwork contractor.

### *6.6 Subsurface Variations*

Based on results of the subsurface exploration and our experience, some variations in the continuity and nature of subsurface soil conditions within the project site should be anticipated. Because of the uncertainties involved in the nature and depositional characteristics of the earth material, care should be exercised in interpolating or extrapolating subsurface conditions between or beyond the boring locations.

### *6.7 Caving*

Caving was not encountered in any of the exploratory borings or test pits. Localized caving may occur in excavations that extend into granular soils that are encountered on-site.

## 7.0 ENGINEERING GEOLOGY

The regional and local geology within the proposed project area is discussed below.

### *7.1 Regional Geology*

The project site is located within the northern Peninsular Ranges Geomorphic Province of Southern California. The Peninsular Ranges Geomorphic Province consists of a series of northwest-trending mountain ranges and valleys bounded on the north by the San Bernardino and San Gabriel Mountains, on the west by the Los Angeles Basin, and on the south by the Pacific Ocean.

The province is a seismically active region characterized by a series of northwest-trending strike-slip faults. The most prominent of the nearby fault zones include the San Jacinto, Cucamonga, and San Andreas Fault Zones, all of which have been known to be active during Quaternary time.

Topography within the province is generally characterized by broad alluvial valleys separated by linear mountain ranges. This northwest-trending linear fabric is created by the regional faulting within the granitic basement rock of the Southern California Batholith. Broad, linear, alluvial valleys have been formed by erosion of these principally granitic mountain ranges.

The project site is located within the Chino Basin between the Chino Hills to the southwest and San Gabriel Basin to the north. The Elsinore Fault Zone is located approximately four miles south of the project site. This fault is a north to northwest trending reverse fault that dips steeply towards the southwest. The Chino-Central Avenue Fault acts as a groundwater barrier along the western margin of the Chino Basin.

### *7.2 Local Geology*

The project site is primarily underlain by Young alluvial-fan deposits, (Middle Holocene), consisting of slightly to moderately consolidated silt, sand, and coarse-grained sand with some gravel, cobbles and boulders, having slightly to moderately dissected surfaces.

## 8.0 FAULTING AND SEISMICITY

The location of the site with respect to active faults and associated seismicity is discussed below.

### *8.1 Faulting*

The project site is situated in a seismically active region. As is the case for most areas of Southern California, ground-shaking resulting from earthquakes associated with nearby and more distant faults may occur at the project site. During the life of the project, seismic activity associated with active faults can be expected to generate moderate to strong ground shaking at the site. Review of recent seismological and geophysical publications indicates that the seismic hazard for the project is high.

The project site is not located within a currently mapped State of California or San Bernadino County Earthquake Fault Zone for surface fault rupture.

Table No. 2, *Summary of Regional Faults,* summarizes selected data of known faults capable of seismic activity within 100 kilometers of the project site (coordinate 33.9977 Nand 117.6193 W). The data presented below was calculated using the National Seismic Hazard Maps Database and other published geologic data.

**Table No. 2, Summary of Regional Faults**

| Fault Name and Section | Closest Distance (km) | Slip Sense | Length (km) | Slip Rate (mm/year) | Maximum Magnitude |
|---|---|---|---|---|---|
| Chino, alt 2 | 8.40 | strike slip | 29 | 1 | 6.80 |
| Chino, alt 1 | 8.61 | strike slip | 24 | 1 | 6.70 |
| San Jose | 14.08 | strike slip | 20 | 0.5 | 6.70 |
| Elsinore | 15.95 | strike slip | 241 | n/a | 7.85 |
| Cucamonga | 17.00 | thrust | 28 | 5 | 6.70 |
| Sierra Madre Connected | 17.88 | reverse | 76 | 2 | 7.30 |
| Sierra Madre | 17.88 | reverse | 57 | 2 | 7.20 |
| Puente Hills (Coyote Hills) | 25.54 | thrust | 17 | 0.7 | 6.90 |
| San Jacinto | 28.44 | strike slip | 241 | n/a | 7.88 |
| S. San Andreas | 33.58 | strike slip | 512 | n/a | 8.18 |
| Clamshell-Sawpit | 34.12 | reverse | 16 | 0.5 | 6.70 |
| San Jacinto | 35.30 | strike slip | 196 | n/a | 7.03 |

| Fault Name and Section | Closest Distance (km) | Slip Sense | Length (km) | Slip Rate (mm/year) | Maximum Magnitude |
|---|---|---|---|---|---|
| Cleghorn | 37.57 | strike slip | 25 | 3.0 | 6.80 |
| Puente Hills (Santa Fe Springs) | 37.65 | strike slip | 11 | 0.7 | 6.70 |
| Raymond | 38.90 | strike slip | 22 | 1.5 | 6.80 |
| San Joaquin Hills | 39.21 | thrust | 27 | 0.5 | 7.10 |
| Elysian Park (Upper) | 45.14 | reverse | 20 | 1.3 | 6.70 |
| Puente Hills (LA) | 47.01 | reverse | 22 | 1.3 | 7.00 |
| North Frontal (West) | 47.89 | reverse | 50 | 1.0 | 7.50 |
| Newport-Inglewood, alt 1 | 49.87 | strike slip | 65 | 1.0 | 7.20 |
| Verdugo | 51.57 | reverse | 29 | 0.5 | 6.90 |
| Newport-Inglewood (Offshore) | 52.78 | strike slip | 66 | 1.5 | 7.00 |
| Hollywood | 58.06 | strike slip | 66 | 1.0 | 6.70 |
| Santa Monica Connected alt 2 | 62.69 | strike slip | 93 | 2.4 | 7.40 |
| Palos Verdes | 65.04 | strike slip | 99 | 3 | 7.30 |
| Palos Verdes Connected | 65.04 | strike slip | 285 | 3 | 7.70 |
| Sierra Madre (San Fernando) | 69.75 | thrust | 18 | 2 | 6.70 |
| San Gabriel | 70.60 | strike slip | 71 | 1 | 7.30 |
| Santa Monica, alt 1 | 73.69 | strike slip | 14 | 1 | 6.60 |
| Santa Monica Connected alt 1 | 73.69 | strike slip | 79 | 2.6 | 7.30 |
| Northridge | 78.13 | thrust | 33 | 1.5 | 6.90 |
| Helendale-So Lockhart | 78.63 | strike slip | 114 | 0.6 | 7.40 |
| Pinto Mtn | 83.13 | strike slip | 74 | 2.5 | 7.30 |
| Malibu Coast, alt 1 | 83.82 | strike slip | 38 | 0.3 | 6.70 |
| Malibu Coast, alt 2 | 83.82 | strike slip | 38 | 0.3 | 7.00 |
| Coronado Bank | 84.34 | strike slip | 186 | 3.0 | 7.40 |
| North Frontal (East) | 84.34 | thrust | 27 | 0.5 | 7.00 |
| Anacapa-Dume, alt 2 | 86.28 | thrust | 65 | 3 | 7.20 |
| Santa Susana, alt 1 | 88.62 | reverse | 27 | 5 | 6.90 |
| Holser, alt 1 | 97.52 | reverse | 20 | 0.4 | 6.80 |
| Lenwood-Lockhart-Old Woman Springs | 98.05 | strike slip | 145 | 0.9 | 7.50 |
| Rose Canyon | 98.72 | strike slip | 70 | 1.5 | 6.90 |
| Anacapa-Dume, alt 1 | 99.49 | thrust | 51 | 3.0 | 7.20 |

(Source: https://earthquake.usgs.gov/cfusion/hazfaults_2008_search/)

### *8.2 Seismic Design Parameters*

Seismic parameters based on the 2022 California Building Code (CBSC, 2022) and ASCE 7-16 are provided in the following table. These parameters were determined using the coordinate (33.9977N and 117.6193W) and the Seismic Design Maps ATC online tool.

**Table No. 3, CBC Seismic Design Parameters**

| Seismic Parameters | |
|---|---|
| Site Coordinates | 333.9977N and 117.6193W |
| Site Class | D* |
| Risk Category | II |
| Mapped Short period (0.2-sec) Spectral Response Acceleration, $S_s$ | 1.629g |
| Mapped 1-second Spectral Response Acceleration, $S_1$ | 0.585g |
| Site Coefficient (from Table 11.4-1), $F_a$ | 1.000 |
| Site Coefficient (from Table 11.4-2), $F_v$ | 1.700 |
| MCE 0.2-sec period Spectral Response Acceleration, $S_{MS}$ | 1.629g |
| MCE 1-second period Spectral Response Acceleration, $SM_1$ | 1.000g |
| Design Spectral Response Acceleration for short period $S_{DS}$ | 1.086g |
| Design Spectral Response Acceleration for 1-second period, $S_{D1}$ | 0.700g |
| Site Modified Maximum Peak Ground Acceleration, $PGA_M$ | 0.745g |

** Stiff Soil Classification*

### *8.3 Secondary Effects of Seismic Activity*

In general, secondary effects of seismic activity include surface fault rupture, soil liquefaction, landslides, lateral spreading, and settlement due to seismic shaking, tsunamis, seiches, and earthquake-induced flooding. The site-specific potential for each of these seismic hazards is discussed in the following sections.

***Surface Fault Rupture:*** No portion of the project site is located within a currently designated State of California or San Bernadino County Earthquake Fault Zone (CGS, 2007 and San Bernadino County, 2010). The potential for surface rupture resulting from the movement of nearby or distant faults is not known with certainty but is considered very low.

***Liquefaction:*** Liquefaction is defined as the phenomenon in which a cohesionless soil mass within the upper 50 feet of the ground surface suffers a substantial reduction in its shear strength, due to the improvement of excess pore pressures. During earthquakes,

excess pore pressures in saturated soil deposits may develop as a result of induced cyclic shear stresses, resulting in liquefaction.

Soil liquefaction generally occurs in submerged granular soils and non-plastic silts during or after strong ground shaking. There are several general requirements for liquefaction to occur and they are as follows.

- Soils must be submerged.
- Soils must be loose to medium-dense.
- Ground motion must be intense.
- Duration of shaking must be sufficient for the soils to lose shear resistance.

Based on review of hazard maps, the site is not located within a State of California or San Bernadino County designated zone of liquefaction susceptibility (CGS, 2007; San Bernadino County, 2010). Based on a site-specific settlement analysis presented in Appendix C, *Liquefaction and Settlement Analysis*, and groundwater being deeper than approximately 137 feet bgs we estimate that liquefaction induced settlement of the site is negligible.

***Seismic Settlement***: Dynamic dry settlement may occur in loose, granular, unsaturated soils during a large seismic event. Our analysis of the potential dynamic settlement is presented in Appendix C, Liquefaction and Settlement Analysis. Based on our analysis, we anticipate the site has the potential for up to 1.15 inches of seismically induced settlement. The dynamic differential settlement resulting from dynamic loads is anticipated to be equal to one-half of the total dry seismic settlement over a lateral distance of 40 feet.

***Landslides:*** Seismically induced landslides and slope failures are common occurrences during or soon after large earthquakes. Due to the flat nature of the project site, the potential for seismically induced landslides affecting the pump station is considered to be negligible.

***Lateral Spreading:*** Seismically induced lateral spreading involves primarily lateral movement of earth materials over underlying materials which are liquefied due to ground shaking. It differs from slope failure in that complete ground failure involving large movement does not occur due to the relatively smaller gradient of the initial ground surface. Lateral spreading is demonstrated by near-vertical cracks with predominantly horizontal movement of the soil mass involved. Generally due to the negligible risk for liquefaction and flat nature of project site, the risk of lateral spreading is considered very low.

***Tsunamis:*** Tsunamis are large waves generated in open bodies of water by fault displacement or major ground movement. Due to the inland location of the project site, tsunamis are not considered to be a risk.

***Seiches:*** Seiches are large waves generated in enclosed bodies of water in response to ground shaking. There are no enclosed bodies of water near the project site, therefore, seiching is not considered to be a risk during construction.

***Earthquake-Induced Flooding***: Dams or other water-retaining structures may fail as a result of large earthquakes. The project site is not located within a designated dam inundation area (DSOD, 2024).

# 9.0 LABORATORY TEST RESULTS

Laboratory testing was performed to determine the physical and chemical characteristics and engineering properties of the subsurface soils. Current physical test results are included in Appendix A, *Field Exploration* and Appendix B, *Laboratory Testing Program*. Discussions of the various test results are presented below.

## *9.1 Physical Testing*

- *In-situ* Moisture and Dry Density: *In-situ* dry densities and moisture contents of the site soils were determined in accordance with ASTM Standard D2216-19 and D2937-17. The dry densities of the soils in borings BH-01 to BH-10 ranged from 82 to 139 pounds per cubic foot (pcf) with moisture contents of 3 to 33 percent. The dry density of the manure and highly organic soils in boring BH-01 was 64 pounds per cubic foot (pcf) with a moisture content of 67 percent. Results are presented on the Log of Borings and Test Pits in Appendix A, *Field Exploration.*
- Organic Content: Eight organic content tests were performed during the current geotechnical investigation, in accordance with ASTM Standard D2974-20e1 on representative bulk soil samples. The amount of organic material present in the organic artificial fill soils ranged from 2.1 percent to 12.2 percent and in the undisturbed natural soils ranged from 1.1 percent to 1.9 percent.
- Expansion Index: Two representative bulk soil samples were tested during the current geotechnical investigation of the general site soils to evaluate the expansion potential in accordance with ASTM Standard D4829-21. The test results indicated in both samples returned an expansion index of 0, corresponding to very low expansion potential.
- R-Value: Two representative bulk samples were tested in accordance with Caltrans Test Method 301. The result of the R-value test was 59 and 64.
- Collapse Potential: Two representative samples were tested to determine the collapse potential in accordance with the ASTM Standard D4596. The test results of 0.2 and 1.6 percent correspond to a slight collapse potential.
- Grain Size Analysis: Three representative samples were tested to determine the relative grain size distribution in accordance with the ASTM Standard D6913/D6913M-17. Test results are graphically presented in Drawing No. B-1, *Grain Size Distribution Results.* Based on the test results, soils are typically silty sand.

- Maximum Dry Density and Optimum Moisture Content: Two typical moisture-density relationships of representative soil samples were tested, in accordance with ASTM Standard D1557-12R21, with the results presented in Drawing No. B-2, *Moisture-Density Relationship Results*, in Appendix B, *Laboratory Testing Program.* The laboratory maximum dry densities were 117.5 and 118.6 pounds per cubic feet (pcf), with optimum moisture contents of 11.1 and 12.7 percent, respectively.
- Direct Shear: Three direct shear tests were performed in accordance with ASTM Standard D3080/D3080M-23. The results of the direct shear tests are presented in Drawing Nos. B-3 through B-5, *Direct Shear Test Results* in Appendix B, *Laboratory Testing Program*.
- Consolidation Test: Three consolidation tests were performed on relatively undisturbed samples of the site soil, in accordance with ASTM Standard D2435/D2435-11R20. The test results also indicated a collapse potential of 0.0 and 0.3 percent, which corresponds to a none to slight collapse potential. The test results are shown on Drawing No. B-6 through B-8, *Consolidation Test Results,* in Appendix B, *Laboratory Testing Program.*

### *9.2 Chemical Testing - Corrosivity Evaluation*

One representative soil sample was tested during the current geotechnical investigation within site to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of these tests was to determine the corrosion potential of site soils when placed in contact with common pipe materials. The current test was performed by Keegan Labs, LLC (Pomona, CA) in accordance with California Test Methods 643, 422, and 417. The current and previous test results are presented in Appendix B, *Laboratory Testing Program and* are summarized in below*.*

- The pH measurement of the sample tested ranged was 6.7.
- The sulfate contents of the sample tested was 90 ppm (0.0090 percent by weight).
- The chloride concentration of the sample tested was 25 ppm.
- The minimum electrical resistivity when saturated was 4,620 ohm-cm.

## 10.0 EARTHWORK AND SITE GRADING RECOMMENDATIONS

Earthwork for the project will include grading, trench excavation, pipe subgrade preparation, pipeline bedding placement and trench backfill, as well as roadway pavement construction. Recommendations for earthwork are presented in the following subsections. General Earthwork Specifications are presented in Appendix D*, Earthwork Specifications.*

### *10.1 General*

This section contains our general recommendations regarding earthwork for the proposed medium density residential and mixed use Sares Regis North development in the City of Ontario, San Bernardino County, California.

These recommendations are based on the results of our field exploration and laboratory testing as well as our experience with similar projects, and data evaluation as presented in the preceding sections. These recommendations may require modification by the geotechnical consultant based on observation of the actual field conditions during remedial grading.

Prior to the start of construction, all underground existing utilities and appurtenances should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications. All excavations should be conducted in such a manner as not to cause loss of bearing and/or lateral support of existing structures or utilities.

All existing structures, debris, deleterious material and surficial soils containing roots and perishable materials should be stripped and removed from the project site. Deleterious material, including manure, significant organics, highly organic disturbed fill soils, concrete, and debris generated during excavation, should not be placed as fill.

It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.

### *10.2 Private Sewage System Abandonment*

From a geotechnical standpoint, any seepage pits, other private sewage systems, and/or other subsurface structures that may be encountered should be located, mapped on the grading plans, removed and/or properly abandoned. Abandonment and/or removal of septic systems that may exist should be in accordance with local codes and recommendations by Converse. Seepage pits, if abandoned in-place, should be pumped clean, backfilled with gravel or clean sand jetted into place, and then capped with a minimum of 2 feet of a 2-sack or greater slurry or concrete for a minimum distance of 2 feet outside the edge of the seepage pit. The top of the slurry or concrete cap should be at a minimum 10 feet below the proposed grade.

### *10.3 Overexcavation*

The site is generally underlain by approximately 1.5 feet to 5.0 feet of potentially compressible soils (artificial fill, topsoil and the upper low-density portions of the alluvium), and locally as much as 7.0 feet to 9.0 feet, which may be prone to future settlement under the surcharge of foundation, improvements and/or fill loads. Therefore, these materials should be over-excavated to competent alluvium, within all areas of proposed structures and other improvements, and replaced with compacted fill soils. Within the entire level

portions of the building pad areas, over-excavations should also extend at least 5.0 feet below proposed pad grade, or at least 3.0 feet below the lowest proposed footings, within the proposed building areas, whichever is deeper. Within any proposed wall footings areas over-excavation should also be a minimum of 5.0 feet below proposed pad grade or 2.0 feet below the proposed wall footings areas, whichever is deeper. All over-excavations should extend at least 5.0 feet or equal to the depth of over-excavation, whichever is greater, outside the entire level portions of the building pad area.

The final bottom surfaces of all excavations should be observed and approved by the project geotechnical consultant prior to placing any fill or structures. However, localized, deeper over-excavation could be encountered, based on findings observations and field testing by the geotechnical consultant during grading of the final bottom surfaces of all excavations, prior to any scarification.

The estimated locations and approximate depths of over-excavation of unsuitable, compressible soil materials are indicated on Figures No. 2a through 2e, *Approximate Boring, Test Pit and Overexcavation Location Maps*.

If isolated pockets of very soft, loose, eroded, or pumping soil are encountered, the unstable soil should be excavated as needed to expose undisturbed, firm, and unyielding soils.

The contractor should determine the best manner to conduct the excavations, such that there are no losses of bearing and/or lateral support to the existing structures or utilities (if any).

Areas to receive fill and/or other surface improvements should be scarified to a minimum depth of 6 inches, brought to a near-optimum moisture condition, and recompacted to at least 90 percent relative compaction (based on ASTM Test Method D1557-12R21).

### *10.4 Cut and Shallow Fill Under Building Pad Areas*

Fill building pads with shallow cut and fill areas should be capped with a minimum of 5.0 feet of engineered structural fill, so that all footings for structures and walls are founded into engineered fill with a minimum of 3.0 feet of fill below footings for proposed structures and 2.0 feet below footings for proposed walls. Over-excavation should extend to the entire level portions of the building pad area with proposed structures or walls, to the depth of fill.

### *10.5 Cut/Fill Transition and Fill Differentials*

To mitigate distress to structures related to the potential adverse effects of excessive differential settlement, cut/fill transitions should be eliminated from all level portions of the building pad areas. This should be accomplished by overexcavating the entire "cut" portion of the building pad area by at least 5.0 feet below proposed grade and replacing the excavated materials as properly compacted fill, so that all footings for structures and walls are founded into engineered fill with a minimum of 3.0 feet of fill below footings for proposed structures and 2.0 feet below footings for proposed walls. Recommended depths of over-excavation are provided in the following table.

**Table No. 4, Overexcavation Depth for Cut/Fill Transitions**

| Depth of Fill ("Fill" Portion) | Depth of Overexcavation ("Cut" Portion) |
|---|---|
| Up to 5.0 feet | 5.0 feet |
| Greater than 5.0 feet | One-third the maximum thickness of fill placed on the "fill" portion (15 feet maximum) |

### *10.6 Engineered Fill*

No fill should be placed until excavations and/or natural ground preparation have been observed by the geotechnical consultant. The native soils encountered within the project sites are generally considered suitable for re-use as compacted fill. Excavated soils should be processed, including removal of roots and debris, removal of oversized particles, mixing, and moisture conditioning, before placing as compacted fill. On-sites soils used as fill should meet the following criteria.

- No particles larger than 8 inches in largest dimension.
- Rocks larger than 4 inches should not be placed within the upper 12 inches of subgrade soils.
- Free of all significant organic matter, debris, or other deleterious material.
- Expansion index of 20 or less.
- Sand Equivalent greater than 15 (greater than 30 for pipe bedding).
- Contain less than 30 percent by weight retained in 3/4-inch sieve.
- Contain less than 45 percent fines (passing #200 sieve).

Based on field investigation and laboratory testing results, on-sites soils may be suitable as fill materials.

Imported materials, if required, should meet the above criteria prior to being used as compacted fill. Any imported fills should be tested and approved by geotechnical representative at least 72 hours prior to delivery to the site.

### *10.7 Organic Content*

Based on the current and previous laboratory test results of the approximately the upper 1.0 foot to 3.7 feet of the partially organic fill soils on portions of the site has about 2.1 percent to 10.3 percent of organic content. This would be an average organic content of about 5.3 percent, for an average depth of approximately 2.0 feet, in the subject areas. Laboratory testing also indicated that generally the undisturbed natural soils below these depths (alluvium) had natural organic contents of about 1.1 percent to 2.4 percent. This would be an average organic content of about 1.9 percent. Therefore, these partially organic should be blended with undisturbed natural soils or removed from the site.

Fill materials should contain no more than 2 percent overall organics. The partially organic soils can be blended with the on-site natural soils at a ratio of at least 3 to 1 (natural soils/clean imported soils to partially organic soils) and placed as compacted fill, provided they are completely mixed during fill placement. The type of equipment and method of placement; blending and mixing of the partially organic materials with onsite natural soils or clean imported soils to be utilized by the grading contractor, should be reviewed and accepted by the geotechnical consultant prior to implementation. A possible method of placement that could be considered would be to place the partially organic materials at an angle to the pattern of the placement of the onsite natural soils or clean imported soils. The testing frequency for verifying the percent organic content should be established by the geotechnical consultant prior to fill placement once the method of blending, placement, and mixing of the partially organic materials with onsite natural soils or clean imported soils. The estimated locations and approximate depths of partially organic to be removed from the site or blended are also indicated on Figures No. 2a through 2e, *Approximate Boring, Test Pit and Overexcavation Location Maps*.

### *10.8 Compacted Fill Placement*

All surfaces to receive structural fills should be scarified to a depth of 12 inches. The soil should be moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils. The scarified soils should be recompacted to at least 90 percent of the laboratory maximum dry density.

Fill soils should be thoroughly mixed, and moisture conditioned to within ±3 percent of optimum moisture content for coarse soils and 0 to 2 percent above optimum moisture content for fine soils. Fill soils should be evenly spread in horizontal lifts not exceeding 8 inches in uncompacted thickness.

Fill soils should be thoroughly mixed, and moisture conditioned to at least 0 to 2 percent above optimum moisture content. Fill soils should be evenly spread in horizontal lifts not exceeding 8 inches in uncompacted thickness.
All fill placed at the site should be compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Standard D1557-12R21 test method unless a higher compaction is specified herein. The upper 12 inches of subgrade soils

underneath pavements intended to support vehicle loads should be scarified, moisture conditioned, and compacted to at least 95 percent of the laboratory maximum dry density.

Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not resume until the geotechnical consultant approves the moisture and density conditions of the previously placed fill.

Observations and field tests should be performed by the project soils consultant to confirm that the required degree of compaction has been obtained. Where compaction is less than specified, additional compactive effort should be made with adjustment of the moisture content as necessary, until the specified compaction is obtained.

Additional expansion index and corrosion testing should be completed after all fill has been placed and compacted at the site in order to confirm the soil properties and revise the foundation design parameters if necessary.

### *10.9 Backfill Recommendations Behind Walls*

Compaction of backfill adjacent to retaining walls, which may be proposed, can produce excessive lateral pressures. Improper types and locations of compaction equipment and/or compaction techniques may damage the walls. The use of heavy compaction equipment should not be permitted within a horizontal distance of 5 feet from the wall. Backfill behind any structural walls within the recommended 5-foot zone should be compacted using lightweight construction equipment such as handheld compactors to avoid overstressing the walls.

### *10.10 Shrinkage and Subsidence*

The volume of excavated and recompacted soils will decrease as a result of grading. The shrinkage would depend on, among other factors, the depth of cut and/or fill, and the grading method and equipment utilized. Based on our exploration as well as previous experience in the other projects in close vicinity of this site, for the preliminary estimation, shrinkage factors for various units of earth material at the site may be taken as presented below.

- The shrinkage factor (defined as a percentage of soil volume reduction when moisture conditioned and compacted to the average of 92 percent relative compaction) for the upper 15 feet of soils is estimated to range from approximately 1 to 24 percent. An average value of 3 percent to 8 percent may be used for preliminary earthwork planning.
- Subsidence (defined as the settlement of native materials from the equipment load applied during grading and proposed fill loads) would depend on the construction methods including type of equipment utilized. Ground subsidence is estimated to be approximately 0.20 foot to 0.25 foot.

Although these values are only approximate, they represent our best estimates of the factors to be used to calculate lost volume that may occur during grading. If more accurate shrinkage and subsidence factors are needed, it is recommended that field-testing using the actual equipment and grading techniques be conducted.

### *10.11 Site Drainage*

Adequate positive drainage should be provided away from the structures and excavation areas to prevent ponding and to reduce percolation of water into the foundation soils. A desirable drainage gradient is 1 percent for paved areas and 2 percent for landscaped areas. Surface drainage should be directed to suitable non-erosive devices.

### *10.12 Utility Trench Backfill*

The following sections present earthwork recommendations for utility trench backfill, including subgrade preparation and trench zone backfill.

Open cuts adjacent to existing roadways or structures are not recommended within a 1:1 (horizontal: vertical) plane extending down and away from the roadway or structure perimeter (if any).

Soils from the trench excavation should not be stockpiled more than 6 feet in height or within a horizontal distance from the trench edge equal to the depth of the trench. Soils should not be stockpiled behind the shoring, if any, within a horizontal distance equal to the depth of the trench, unless the shoring has been designed for such loads.

#### 10.12.1 Pipeline Subgrade Preparation

The final subgrade surface should be level, firm, uniform, and free of loose materials and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. Protruding oversize particles larger than 2 inches in dimension, if any, should be removed from the trench bottom and replaced with compacted on-site materials.

Any loose, soft and/or unsuitable materials encountered at the pipe subgrade should be removed and replaced with an adequate bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom as near its full length as is practicable.

### 10.12.2 Pipe Bedding

Bedding is defined as the material supporting and surrounding the pipe to 1 foot above the pipe. Recommendations for pipe bedding are provided below.

To provide uniform and firm support for the pipe, compacted granular materials such as clean sand, gravel or ¾-inch crushed aggregate, or crushed rock may be used as pipe bedding material. Typically, soils with sand equivalent value of 30 or more are used as pipe bedding material. The pipe designer should determine if the soils are suitable as pipe bedding material.

The type and thickness of the granular bedding placed underneath and around the pipe, if any, should be selected by the pipe designer. The load on the rigid pipes and deflection of flexible pipes and, hence, the pipe design, depends on the type and the amount of bedding placed underneath and around the pipe.

Bedding materials should be vibrated in-place to achieve compaction. Care should be taken to densify the bedding material below the spring line of the pipe. Prior to placing the pipe bedding material, the pipe subgrade should be uniform and properly graded to provide uniform bearing and support to the entire section of the pipe placed on bedding material. During the digging of depressions for proper sealing of the pipe joints, the pipe should rest on a prepared bottom as near its full length as is practicable.

Based on the design groundwater depth, migration of fines from the surrounding native and/or fill soils may not be considered in selecting the gradation of any imported bedding material.

### 10.12.3 Trench Zone Backfill

The trench zone is defined as the portion of the trench above the pipe bedding extending up to the final grade level of the trench surface. Excavated sites soil free of oversize particles and deleterious matter may be used to backfill the trench zone. Detailed trench backfill recommendations are provided below.

- Trench excavations to receive backfill should be free of trash, debris or other unsatisfactory materials at the time of backfill placement.
- Trench zone backfill should be compacted to at least 90 percent of the laboratory maximum dry density as per ASTM D1557-12R21 test method. At least the upper 1 foot of trench backfill underlying pavement should be compacted to at least 95

percent of the laboratory maximum dry density as per ASTM D1557-12R21 test method.

- Particles larger than 1 inch should not be placed within 12 inches of the pavement subgrade. No more than 30 percent of the backfill volume should be larger than ¾-inch in the largest dimension. Gravel should be well mixed with finer soil. Rocks larger than 3 inches in the largest dimension should not be placed as trench backfill.
- Trench backfill should be compacted by mechanical methods, such as sheepsfoot, vibrating or pneumatic rollers or mechanical tampers to achieve the density specified herein. The backfill materials should be brought to within ± 3 percent of optimum moisture content for coarse-grained soil, and between optimum and 2 percent above optimum for fine-grained soil, then placed in horizontal layers. The thickness of uncompacted layers should not exceed 8 inches. Each layer should be evenly spread, moistened or dried as necessary, and then tamped or rolled until the specified density has been achieved.
- The contractor should select the equipment and processes to be used to achieve the specified density without damage to adjacent ground, structures, utilities and completed work.
- It should be the responsibility of the contractor to maintain safe working conditions during all phases of construction.
- The field density of the compacted soil should be measured by the ASTM D1556 (Sand Cone) or ASTM D6938 (Nuclear Gauge) or equivalent.
- Trench backfill should not be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rain, fill operations should not resume until field tests by the project's geotechnical consultant indicate that the moisture content and density of the fill are in compliance with project specifications.

# 11.0 DESIGN RECOMMENDATIONS

Design recommendations for the structures are provided in the following section.

## *11.1 General Evaluation*

The various design recommendations provided in this section are based on the laboratory testing as well as the assumption that in preparing the site, the earthwork recommendations provided in this report will be implemented.

### *11.2 Preliminary Shallow Foundation Design Parameters*

The proposed one- and two-story concrete tilt up buildings and possible retaining walls may be supported on continuous or isolated spread footings founded completely within competent compacted fill. The design of the shallow foundations should be based on the recommended parameters presented in the table below.

**Table No. 5, Recommended Foundation Parameters**

| Parameter | 1-Story Value | 2-Story Value |
|---|---|---|
| Minimum continuous width (interior and exterior) | 12 inches | 15 inches |
| Minimum continuous or isolated footing depth of embedment below lowest adjacent grade (interior and exterior) | 15 inches | 18 inches |
| Allowable net bearing capacity | 3,000 psf | 3,300 psf |

The isolated interior and exterior footings should be at least 24 inches wide. The footing dimensions and reinforcement should be based on structural design. The allowable bearing capacity can be increased by 500 pounds per square foot (psf) with each foot of additional embedment and 100 psf with each foot of additional width up to a maximum of 4,000 psf.

The net allowable bearing values indicated above are for the dead loads and frequently applied live loads and are obtained by applying a factor of safety of 3.0 to the net ultimate bearing capacity. If normal code requirements are applied for design, the above vertical bearing value may be increased by 33 percent for short duration loadings, which will include loadings induced by wind or seismic forces.

### *11.3 Lateral Earth Pressures and Resistance to Lateral Loads*

In the following subsections, the lateral earth pressures and resistance to lateral loads are estimated by using on-site native soils strength parameters obtained from laboratory testing.

#### 11.3.1 Active Earth Pressures

The active earth pressure behind any buried walls or foundation depends primarily on the allowable wall movement, type of backfill materials, backfill slopes, wall or foundation inclination, surcharges, and any hydrostatic pressures. The lateral earth pressures for the project site are presented in the following table.

**Table No. 6, Active and At-Rest Earth Pressures**

| Loading Conditions | Lateral Earth Pressure[1] (psf) | Lateral Earth Pressure[2] (psf) |
|---|---|---|
| | Level backfill | 2:1 backfill |
| Active earth conditions (wall is free to deflect at least 0.001 radian) | 40 | 65 |
| At-rest (wall is restrained) | 60 | 110 |

These pressures assume no surcharge and no hydrostatic pressure. If water pressure is allowed to build up behind the structure, the active pressures should be reduced by 50 percent and added to a full hydrostatic pressure to compute the design pressures against the structure.

### 11.3.2 Passive Earth Pressure

Resistance to lateral loads can be assumed to be provided by a combination of friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.35 between formed concrete and soil may be used with the dead load forces. An allowable passive earth pressure of 240 psf per foot of depth may be used for the sides of footings poured against recompacted soils. A factor of safety of 1.5 was applied in calculating passive earth pressure. The maximum value of the passive earth pressure should be limited to 2,400 psf for compacted fill.

Vertical and lateral bearing values indicated above are for the total dead loads and frequently applied live loads. If normal code requirements are applied for design, the above vertical bearing and lateral resistance values may be increased by 33 percent for short duration loading, which will include the effect of wind or seismic forces.

Due to the low overburden stress of the soil at shallow depth, the upper 1 foot of passive resistance should be neglected unless the soil is confined by pavement or slab.

## *11.4 Retaining Walls Drainage*

The recommended lateral earth pressure values do not include lateral pressures due to hydrostatic forces. Therefore, wall backfill should be free draining and provisions should be made to collect and dispose of excess water that may accumulate behind earth retaining structures. Behind wall drainage may be provided by free-draining gravel surrounded by synthetic filter fabric or by prefabricated, synthetic drain panels or weep holes. In either case, drainage should be collected by perforated pipes and directed to a sump, storm drain, or other suitable location for disposal. We recommend drain rock should consist of durable stone having 100 percent passing the 1-inch sieve and less than 5 percent passing the No. 4 sieve. Synthetic filter fabric should have an equivalent opening size (EOS), U.S. Standard Sieve, of between 40 and 70, a minimum flow rate of

110 gallons per minute per square foot of fabric, and a minimum puncture strength of 110 pounds.

### *11.5 Slabs-on-Grade*

Slabs-on-grade should be supported on properly compacted fill. Compacted fill used to support slabs-on-grade should be placed and compacted in accordance with Section 10.8 *Compacted Fill Placement*.

Slabs should be designed and constructed as promulgated by the American Concrete Institute (ACI) and the Portland Cement Association (PCA). Care should be taken during concrete placement to avoid slab curling. Prior to the slab pour, all utility trenches should be properly backfilled and compacted.

Concrete floors should be underlain with a moisture-vapor retarder consisting of a 10-mil thick vapor barrier. Laps within the membrane should be sealed and overlapped at least 6 inches. Two inches or more of clean sand should be placed above and below the membrane. These recommendations must be confirmed (and/or modified) by the foundation engineer with our concurrence, based upon the performance expectations of the foundation. It is the responsibility of the contractor to ensure that the moisture/vapor barrier systems are placed in accordance with the project plans and specifications, and that the moisture/vapor retarder materials are free of tears and punctures prior to concrete placement. Additional moisture reduction and/or prevention measures may be needed, depending on the performance requirements of future interior floor coverings.

In hot weather, the contractor should take appropriate curing precautions after placement of concrete to minimize cracking or curling of the slabs. The potential for slab cracking may be lessened by the addition of fiber mesh to the concrete and/or control of the water/cement ratio (maximum 0.45).

Concrete should be cured by protecting it against loss of moisture and rapid temperature change for at least 7 days after placement. Moist curing, waterproof paper, white polyethylene sheeting, white liquid membrane compound, or a combination thereof may be used after finishing operations have been completed. The edges of concrete slabs exposed after removal of forms should be immediately protected to provide continuous curing.

### *11.6 Expansion Potential*

Based on the results of the current and previous expansion testing of representative site soils, the general on-site soils have an expansion index of 0 to 12 for an expansion potential of **Very Low.**

The expansion indices of the final finish-grade soils will vary from the results obtained during our current and previous investigations. The expansion potential of the finish-grade soils should be tested at the completion of grading.

### 11.6.1 Very Low Expansion Potential

The following are additional recommendations where foundation soils exhibit **Very Low** expansion potential (E.I. of 0 to 20) as classified in accordance with 2022 CBC.

Slabs-on-grade should have a minimum thickness of 5 inches for support of nominal live loads and reinforced with No. 3 bars spaced 24 inches or less on-centers, both ways. Slab reinforcement should be supported on concrete chairs so that the desired placement is properly placed by the design engineer. Structural design elements of slabs-on-grade, including but not limited to thickness, reinforcement, joint spacing of more heavily loaded slabs will be dependent upon the anticipated loading conditions and the modulus of subgrade reaction (200 kcf) of the supporting materials and should be designed by a structural engineer.

Subgrade for slabs-on-grade should be firm and uniform. All loose or disturbed soils including under-slab utility trench backfill should be recompacted. Prior to placing concrete, the subgrade soils below all floor slabs should be pre-watered to achieve a moisture content that is equal to 100% of the optimum moisture content of the subgrade soils. The moisture content should penetrate to a minimum depth of 12 inches. This should promote uniform curing of the concrete and minimize the development of shrinkage cracks.

## *11.7 Settlement*

The total settlement of shallow footings, designed as recommended above, from static structural loads and short-term settlement of properly compacted fill is anticipated to be 0.35 inch or less. The static differential settlement can be taken as equal to one-half of the static total settlement over a lateral distance of 40 feet.

Our analysis of the potential dynamic settlement is presented in Appendix C, *Liquefaction and Settlement Analysis*. Based on our analysis, we anticipate the reservoir site has the potential for up to 1.15 inches of dry seismic settlement and negligible liquefaction induced settlement. The differential dry seismic settlement resulting from dynamic loads is anticipated to be equal to one-half of the total dry seismic settlement over a lateral distance of 40 feet. The structural engineer should consider this in the design.

## *11.8 Pipe Design for Underground Utilities*

The structural design of pipes requires proper evaluation of all possible loads acting on pipes. The stresses and strains induced on buried pipes depend on many factors, including the type of soil, density, bearing pressure, angle of internal friction, coefficient

of passive earth pressure, and coefficient of friction at the interface between the backfill and native soils. The recommended values of the various soil parameters for the pipe design are provided in Table No. 7, *Soil Parameters for Pipe Design*.

Where pipes are connecting to rigid structures near, or at its lower levels, and then are subjected to significant loads as the backfill is placed to finish grade, we recommend that provisions be incorporated in the design to provide support of these pipes where they exit the structure. Consideration can be given to flexible connections, concrete slurry support beneath the pipes where they exit the structures, overlaying and supporting the pipes with a few inches of compressible material, (i.e., Styrofoam, or other materials), or other techniques. Automatic shutoffs should be installed to limit the potential leakage from seismic event related damage.

**Table No. 7, Soil Parameters for Pipe Design**

| Soil Parameters | Parameters |
|---|---|
| Total unit weight of compacted backfill (assuming 92% average relative compaction), $\gamma$ | 123 pcf |
| Angle of internal friction of soils, $\phi$ | 29º |
| Soil cohesion, c | 136 psf |
| Coefficient of friction between concrete and native soils, fs | 0.35 |
| Coefficient of friction between pipe and native soils, fs | 0.25 for metal or HDPE pipe<br>0.30 for CML&C pipe |
| Bearing pressure against Compacted Fill or Natural Soils | 3,000 psf |
| Coefficient of passive earth pressure, Kp | 1.86 |
| Coefficient of active earth pressure, Ka | 0.54 |
| Modulus of Soil Reaction, E’ | 1,500 psi |

### *11.9 Soil Corrosivity*

The results of current and previous chemical testing of representative site soils with respect to common construction materials such as concrete and steel are presented in Appendix B, *Laboratory Testing Program*, and a general discussion are presented below.

The sulfate contents of the sampled soils correspond to American Concrete Institute (ACI) exposure category S0 for these sulfate concentrations (ACI 318-19, Table 19.3.1.1). No concrete type restrictions are specified for exposure category S0 (ACI 318-19, Table 19.3.2.1). A minimum compressive strength of 2,500 psi is recommended.

We anticipate that concrete will be exposed to moisture from precipitation and irrigation. Based on the project location and the results of chloride testing of the soils, we do not anticipate that concrete structures will be exposed to external sources of chlorides, such

as deicing chemicals, salt, brackish water, or seawater. ACI specifies exposure category C1 where concrete is exposed to moisture, but not to external sources of chlorides (ACI 318-19, Table 19.3.1.1). ACI provides concrete design recommendations in ACI 318-19, Table 19.3.2.1, including a compressive strength of at least 2,500 psi and a maximum chloride content of 0.3 percent.

The measured values of the minimum electrical resistivities of the samples when saturated were between 1,360 and 4,620 Ohm-cm. This indicates that the soils tested are moderately corrosive to corrosive to ferrous metals in contact with the soils (Keegan, 2024). Converse does not practice in the area of corrosion consulting. If needed, a qualified corrosion consultant should provide appropriate corrosion mitigation measures for any ferrous metals in contact with the site and site soils.

According to Keegan Labs LLC, 2024, the following tables provide general guidelines of soil corrosion based on electrical resistivity, sulfates, chlorides and pH.

**Table No. 8a, Correlation Between Resistivity and Corrosion**

| Electrical Resistivity of Soil | |
|---|---|
| **Soil Resistivity (ohm-cm) per Caltrans CT 643** | **Corrosivity Category** |
| Greater than 10,000 | Mildly Corrosive |
| 2,001 to 10,000 | Moderately Corrosive |
| 1,001 to 2,000 | Corrosive |
| 0 to 1,000 | Severe Corrosive |

**Table No. 8b, Correlation Between Sulfates and Corrosion**

| Sulfate in Soil per ACI 318 | |
|---|---|
| **Sulfate Level (mg/kg)** | **Classification** |
| Less than 1,000 (<0.1%) | Negligible |
| 1,000 to 2,000 (0.1 to 0.2%) | Moderate |
| 2,000 to 20,000 (0.2 to 2.0%) | Severe |
| Over 20,000 (>2.0%) | Very Severe |

**Table No. 8c, Correlation Between Chlorides and Corrosion**

| Chloride in Soil per ACI 318 | |
|---|---|
| **Concentration (mg/kg)** | **Classification** |
| ND to 100 | Negligible |
| 100 to 350 | Little Added Concern |
| 350 to 500 | Potential Concern |
| Over 500 | Definite Concern |

**Table No. 8d, Correlation Between pH and Corrosion**

| pH | |
|---|---|
| **pH Range** | **Description** |
| <3.5 | Ultra Acidic |
| 3.5 to 4.4 | Extremely Acidic |
| 4.5 to 5.0 | Very Strongly Acidic |
| 5.1 to 5.5 | Strongly Acidic* |
| 5.6 to 6.0 | Moderately Acidic |
| 6.1 to 6.5 | Slightly Acidic |
| 6.6 to 7.3 | Neutral |
| 7.4 to 7.8 | Slightly Alkaline |
| 7.9 to 8.4 | Moderately Alkaline |
| 8.5 to 9.0 | Strongly Alkaline |
| >9.0 | Very Strongly Alkaline |

*This range and below should have total acidity testing performed to evaluate corrosivity.

### *11.10 Asphalt Concrete Pavement*

Two soil samples were tested by Converse to determine the R-value of the subgrade soils. Based on laboratory testing, the R-values were 59 and 64. For pavement design, we have utilized a maximum design R-value of 50, and City of Ontario designated design Traffic Indices (TIs) ranging from 5.0 to 10.0.

Based on the above information, asphalt concrete and aggregate base thickness results are presented using the Caltrans Highway Design Manual (Caltrans, 2020), Chapter 630 with a safety factor of 0.2 for asphalt concrete/aggregate base section and 0.1 for full depth asphalt concrete section. Preliminary asphalt concrete pavement sections are presented in the following table below. The city of Ontario minimum asphalt pavement and aggregate base thickness requirements were also considered in the pavement designs.

**Table No. 9, Recommended Preliminary Pavement Sections**

| R-value | Traffic Index (TI) | Pavement Section | | |
|---|---|---|---|---|
| | | Option 1 | | Option 2 |
| | | Asphalt Concrete (inches) | Aggregate Base (inches) | Full AC Section (inches) |
| 50 | 5.0 (alleys) | 4.0 | 6.0 | 4.5 |
| | 5.5 (interior street) | 4.0 | 6.0 | 5.0 |
| | 8.0 (exterior street) | 6.0 | 8.0 | 8.0 |
| | 10.0 (exterior street) | 7.0 | 8.0 | 10.0 |

At or near the completion of grading, subsurface samples should be tested to evaluate the actual subgrade R-value for final pavement design.

Prior to placement of aggregate base, at least the upper 12 inches of finish grade should be scarified, moisture-conditioned if necessary, and recompacted to at least 95 percent of the laboratory maximum dry density as defined by ASTM Standard D1557-12R21 test method. Base materials should conform with Section 200-2.2,"*Crushed Aggregate Base*," of the current Standard Specifications for Public Works Construction (SSPWC; Public Works Standards, 2021) and should be placed in accordance with Section 301.2 of the SSPWC.

Asphaltic concrete materials should conform to Section 203 of the SSPWC and should be placed in accordance with Section 302-5 of the SSPWC.

### *11.11 Concrete Flatwork*

Except as modified herein, concrete walks, driveways, access ramps, curb and gutters should be constructed in accordance with Section 303-5, *Concrete Curbs, Walks, Gutters, Cross-Gutters, Alley Intersections, Access Ramps, and Driveways*, of the Standard Specifications for Public Works Construction (Public Works Standards, 2018).

The subgrade soils under the above-mentioned improvements should consist of compacted fill placed as described in section 9.8 of this report. Prior to placement of concrete, the upper 12 inches of finish grade should be moisture conditioned to within 3 percent of optimum moisture content for coarse-grained soils and 0 and 2 percent above optimum for fine-grained soils.

The thickness of driveways for passenger vehicles should be at least 4 inches, or as required by the civil or structural engineer. Transverse control joints for driveways should be spaced not more than 10 feet apart. Driveways wider than 12 feet should be provided with a longitudinal control joint.

Concrete walks subjected to pedestrian and bicycle loading should be at least 4 inches thick, or as required by the civil or structural engineer. Transverse joints should be spaced 15 feet or less and should be cut to a depth of one-fourth the slab thickness.

Positive drainage should be provided away from all driveways and sidewalks to prevent seepage of surface and/or subsurface water into the concrete base and/or subgrade.

# 12.0 CONSTRUCTION RECOMMENDATIONS

Temporary sloped excavation recommendations are presented in the following sections.

## *12.1 General*

Prior to the start of construction, all existing underground utilities (if any) should be located at the project site. Such utilities should either be protected in-place or removed and replaced during construction as required by the project specifications.

Vertical braced excavations can be considered for the foundations. Sloped excavations may not be feasible in locations adjacent to existing utilities, pavement, or structure (if any). Recommendations pertaining to temporary excavations are presented in this section.

Excavations near existing structures may require vertical side wall excavation. Where the side of the excavation is a vertical cut, it should be adequately supported by temporary shoring to protect workers and any adjacent structures.

All applicable requirements of the California Construction and General Industry Safety Orders, the Occupational Safety and Health Act, and the Construction Safety Act should be met. The soils exposed in cuts should be observed during excavation by the geotechnical consultant and the competent person designated by the contractor. If potentially unstable soil conditions are encountered, modifications of slope ratios for temporary cuts may be required.

## *12.2 Temporary Sloped Excavations*

Temporary open-cut trenches may be constructed with side slopes as recommended in the following table. Temporary cuts encountering soft and wet fine-grained soils; dry loose, cohesionless soils or loose fill from trench backfill may have to be constructed at a flatter gradient than presented below.

**Table No. 10, Slope Ratios for Temporary Excavations**

| Soil Type | OSHA Soil Type | Depth of Cut (feet) | Recommended Maximum Slope (Horizontal:Vertical)[1] |
|---|---|---|---|
| Silty Sand (SM) | C | 0-10 | 1.5:1 |

[1] Slope ratio assumed to be uniform from top to toe of slope.

For shallow excavations up to 4 feet bgs can vertical. For steeper temporary construction slopes or deeper excavations, or unstable soil encountered during the excavation, shoring or trench shields should be provided by the contractor to protect the workers in the excavation. Design recommendations for temporary shoring are provided in the following section.

Surfaces exposed in slope excavations should be kept moist but not saturated to retard raveling and sloughing during construction. Adequate provisions should be made to protect the slopes from erosion during periods of rainfall. Surcharge loads, including construction materials, should not be placed within 5 feet of the unsupported slope edge. Stockpiled soils with a height higher than 6 feet will require greater distance from trench edges.

## 13.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

The project geotechnical consultant should review plans and specifications as the project design progresses. Such review is necessary to identify design elements, assumptions, or new conditions which require revisions or additions to our geotechnical recommendations.

The project geotechnical consultant should be present to observe conditions during construction. Geotechnical observation and testing should be performed as needed to verify compliance with project specifications. Additional geotechnical recommendations may be required based on subsurface conditions encountered during construction.

## 14.0 CLOSURE

This report is prepared for the project described herein and is intended for use solely by Ontario Ranch Ventures I & II, LP (ORV I & II), RCCD, Inc. and their authorized agents, to assist in the development of the proposed project. Our findings and recommendations were obtained in accordance with generally accepted professional principles practiced in geotechnical engineering. We make no other warranty, either expressed or implied.

Converse Consultants is not responsible or liable for any claims or damages associated with interpretation of available information provided to others. Site exploration identifies actual soil conditions only at those points where samples are taken, when they are taken. Data derived through sampling and laboratory testing is extrapolated by Converse employees who render an opinion about the overall soil conditions. Actual conditions in

areas not sampled may differ. In the event that changes to the project occur, or additional, relevant information about the project is brought to our attention, the recommendations contained in this report may not be valid unless these changes and additional relevant information are reviewed, and the recommendations of this report are modified or verified in writing. In addition, the recommendations can only be finalized by observing actual subsurface conditions revealed during construction. Converse cannot be held responsible for misinterpretation or changes to our recommendations made by others during construction.

As the project evolves, a continued consultation and construction monitoring by a qualified geotechnical consultant should be considered an extension of geotechnical investigation services performed to date. The geotechnical consultant should review plans and specifications to verify that the recommendations presented herein have been appropriately interpreted, and that the design assumptions used in this report are valid. Where significant design changes occur, Converse may be required to augment or modify the recommendations presented herein. Subsurface conditions may differ in some locations from those encountered in the explorations, and may require additional analyses and, possibly, modified recommendations.

Design recommendations given in this report are based on the assumption that the recommendations contained in this report are implemented. Additional consultation may be prudent to interpret Converse's findings for contractors, or to possibly refine these recommendations based upon the review of the actual site conditions encountered during construction. If the scope of the project changes, if project completion is to be delayed, or if the report is to be used for another purpose, this office should be consulted.

## 15.0 REFERENCES

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# Appendix A

## Field Exploration

# APPENDIX A

# FIELD EXPLORATION

Our field investigation included a site reconnaissance and a subsurface exploration program consisting of drilling exploratory borings and excavating test pits. During the site reconnaissance, the surface conditions were noted, and the test pit and boring locations were marked in the field using the referenced topographic maps and from approximate distances from local streets as a guide and should be considered accurate only to the degree implied by the method used to locate them. Description of the field investigation method is presented below.

***Exploratory Borings***

Ten exploratory borings (BH-01 through BH-10) were drilled on May 24, 2024 and May 29, 2024, within the project site to investigate the subsurface conditions. The borings were drilled to depths ranging from 16.5 to 51.5 feet (bgs).

The borings were advanced using a truck-mounted drill rig equipped with 8-inch diameter hollow-stem augers for soils sampling. Encountered materials were continuously logged by a Converse geologist and classified in the field by visual classification in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven into the bottom of the borehole with successive drops of a 140-pound driving weight falling 30 inches. Blow counts at each sample interval are presented on the boring logs. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. Representative bulk samples were collected from selected depths and placed in large plastic bags for delivery to our laboratory.

Standard Penetration Testing (SPT) were also performed in borings (BH-02, BH-05. BH-06, BH-08 and BH-10) in accordance with the ASTM Standard D1586 using a standard (1.4 inches inside diameter and 2.0 inches outside diameter) split-barrel sampler. The mechanically driven hammer for the SPT sampler was 140 pounds, falling 30 inches for each blow. The recorded blow counts for every 6 inches for a total of 1.5 feet of sampler penetration are shown on the Logs of Borings.

Following completion of logging and sampling, borings BH-01 through BH-10 were backfilled with excavated soil cuttings and compacted by pushing down with the auger using the weight of the drill rig. If construction is delayed the ground surface at the boring locations may settle over time. We recommend the owner monitor the boring locations

and backfill any depressions that occur or provide protection around the boring locations to prevent trip and fall injuries from occurring.

***Test Pits***

Thirteen exploratory test pits (TP-01 through TP-13) were excavated using a backhoe equipped with 24-inch-wide bucket to investigate the subsurface conditions on June 11 and 12, 2024. The test pits were excavated between 4.1 feet and 7.6 feet below the existing ground surface (bgs).

During exploration, encountered materials were continuously logged by a Converse geologist and classified in the field by visual classification in accordance with the Unified Soil Classification System. Where appropriate, the field descriptions and classifications have been modified to reflect laboratory test results.

Relatively undisturbed samples were obtained from the test pits using California Modified Samplers (2.4 inches inside diameter and 3.0 inches outside diameter) lined with thin sample rings. The steel ring sampler was driven at selected level benches in the test pit using manual hand-operated equipment with successive drops of a 35-pound driving weight falling 30 inches. Samples were retained in brass rings (2.4 inches inside diameter and 1.0 inch in height) and carefully sealed in waterproof plastic containers for shipment to the Converse laboratory. In-situ dry densities and moisture contents of the site soils were also determined in the test pits with a nuclear gauge in accordance with ASTM Standard D6938. Representative bulk samples were collected from selected depths and placed in plastic bags for delivery to our laboratory.

Test pits were backfilled in lifts with excavated soil, tamped, and then wheel rolled at the surface using the bucket under the weight of the backhoe. If construction is delayed the ground surface at the test pit locations may settle over time. We recommend the owner monitor the test pit locations and backfill any depressions that occur or provide protection around the test pit locations to prevent trip and fall injuries from occurring.

For a key to soil symbols and terminology used in the test pit and boring logs, refer to Drawing Nos. A-1a and A-1b, *Unified Soil Classification and Key to Boring Log and Test Pit Symbols*. For logs of Borings and Test Pits, see Drawings No. A-2 through A-24, *Logs of Borings and Test Pits*.

# SOIL CLASSIFICATION CHART

| MAJOR DIVISIONS | | | SYMBOLS GRAPH | SYMBOLS LETTER | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|
| COARSE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVEL AND GRAVELLY SOILS<br>MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE | CLEAN GRAVELS<br>(LITTLE OR NO FINES) | | GW | WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | | | GP | POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES |
| | | GRAVELS WITH FINES<br>(APPRECIABLE AMOUNT OF FINES) | | GM | SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES |
| | | | | GC | CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES |
| | SAND AND SANDY SOILS<br>MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE | CLEAN SANDS<br>(LITTLE OR NO FINES) | | SW | WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES |
| | | | | SP | POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES |
| | | SANDS WITH FINES<br>(APPRECIABLE AMOUNT OF FINES) | | SM | SILTY SANDS, SAND - SILT MIXTURES |
| | | | | SC | CLAYEY SANDS, SAND - CLAY MIXTURES |
| FINE GRAINED SOILS<br>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS | LIQUID LIMIT LESS THAN 50 | | ML | INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY |
| | | | | CL | INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS |
| | | | | OL | ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY |
| | SILTS AND CLAYS | LIQUID LIMIT GREATER THAN 50 | | MH | INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS |
| | | | | CH | INORGANIC CLAYS OF HIGH PLASTICITY |
| | | | | OH | ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS |
| HIGHLY ORGANIC SOILS | | | | PT | PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS |

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

## FIELD AND LABORATORY TESTS

| | |
|---|---|
| C | Consolidation (ASTM D 2435) |
| CL | Collapse Potential (ASTM D 4546) |
| CP | Compaction Curve (ASTM D 1557) |
| CR | Corrosion, Sulfates, Chlorides (CTM 643-99; 417; 422) |
| CU | Consolidated Undrained Triaxial (ASTM D 4767) |
| DS | Direct Shear (ASTM D 3080) |
| EI | Expansion Index (ASTM D 4829) |
| M | Moisture Content (ASTM D 2216) |
| OC | Organic Content (ASTM D 2974) |
| P | Permeablility (ASTM D 2434) |
| PA | Particle Size Analysis (ASTM D 6913 [2002]) |
| PI | Liquid Limit, Plastic Limit, Plasticity Index (ASTM D 4318) |
| PL | Point Load Index (ASTM D 5731) |
| PM | Pressure Meter |
| PP | Pocket Penetrometer |
| R | R-Value (CTM 301) |
| SE | Sand Equivalent (ASTM D 2419) |
| SG | Specific Gravity (ASTM D 854) |
| SW | Swell Potential (ASTM D 4546) |
| TV | Pocket Torvane |
| UC | Unconfined Compression - Soil (ASTM D 2166) |
| | Unconfined Compression - Rock (ASTM D 7012) |
| UU | Unconsolidated Undrained Triaxial (ASTM D 2850) |
| UW | Unit Weight (ASTM D 2937) |
| WA | Passing No. 200 Sieve |

## BORING LOG SYMBOLS

SAMPLE TYPE

- STANDARD PENETRATION TEST — Split barrel sampler in accordance with ASTM D-1586-84 Standard Test Method
- DRIVE SAMPLE — 2.42" I.D. sampler (CMS).
- DRIVE SAMPLE — No recovery
- BULK SAMPLE
- GROUNDWATER WHILE DRILLING
- GROUNDWATER AFTER DRILLING

## DRILLING METHOD SYMBOLS

- Auger Drilling
- Mud Rotary Drilling
- Dynamic Cone or Hand Driven
- Diamond Core

# UNIFIED SOIL CLASSIFICATION AND KEY TO BORING AND TEST PIT LOGS SYMBOLS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **A-1a**

## CONSISTENCY OF COHESIVE SOILS

| Descriptor | Unconfined Compressive Strength (tsf) | SPT Blow Counts | Pocket Penetrometer (tsf) | CA Sampler | Torvane (tsf) | Field Approximation |
|---|---|---|---|---|---|---|
| Very Soft | <0.25 | < 2 | <0.25 | <3 | <0.12 | Easily penetrated several inches by fist |
| Soft | 0.25 - 0.50 | 2 - 4 | 0.25 - 0.50 | 3 - 6 | 0.12 - 0.25 | Easily penetrated several inches by thumb |
| Medium Stiff | 0.50 - 1.0 | 5 - 8 | 0.50 - 1.0 | 7 - 12 | 0.25 - 0.50 | Can be penetrated several inches by thumb with moderate effort |
| Stiff | 1.0 - 2.0 | 9 - 15 | 1.0 - 2.0 | 13 - 25 | 0.50 - 1.0 | Readily indented by thumb but penetrated only with great effort |
| Very Stiff | 2.0 - 4.0 | 16 - 30 | 2.0 - 4.0 | 26 - 50 | 1.0 - 2.0 | Readily indented by thumbnail |
| Hard | >4.0 | >30 | >4.0 | >50 | >2.0 | Indented by thumbnail with difficulty |

## APPARENT DENSITY OF COHESIONLESS SOILS

| Descriptor | SPT $N_{60}$- Value (blows / foot) | CA Sampler |
|---|---|---|
| Very Loose | <4 | <5 |
| Loose | 4- 10 | 5 - 12 |
| Medium Dense | 11 - 30 | 13 - 35 |
| Dense | 31 - 50 | 36 - 60 |
| Very Dense | >50 | >60 |

## MOISTURE

| Descriptor | Criteria |
|---|---|
| Dry | Absence of moisture, dusty, dry to the touch |
| Moist | Damp but no visible water |
| Wet | Visible free water, usually soil is below water table |

## PERCENT OF PROPORTION OF SOILS

| Descriptor | Criteria |
|---|---|
| Trace (fine)/ Scattered (coarse) | Particles are present but estimated to be less than 5% |
| Few | 5 to 10% |
| Little | 15 to 25% |
| Some | 30 to 45% |
| Mostly | 50 to 100% |

## SOIL PARTICLE SIZE

| Descriptor | | Size |
|---|---|---|
| Boulder | | > 12 inches |
| Cobble | | 3 to 12 inches |
| Gravel | Coarse | 3/4 inch to 3 inches |
| | Fine | No. 4 Sieve to 3/4 inch |
| Sand | Coarse | No. 10 Sieve to No. 4 Sieve |
| | Medium | No. 40 Sieve to No. 10 Sieve |
| | Fine | No. 200 Sieve to No. No. 40 Sieve |
| Silt and Clay | | Passing No. 200 Sieve |

## PLASTICITY OF FINE-GRAINED SOILS

| Descriptor | Criteria |
|---|---|
| Nonplastic | A 1/8-inch thread cannot be rolled at any water content. |
| Low | The thread can barely be rolled, and the lump cannot be formed when drier than the plastic limit. |
| Medium | The thread is easy to roll, and not much time is required to reach the plastic limit; it cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit. |
| High | It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit. |

## CEMENTATION/ Induration

| Descriptor | Criteria |
|---|---|
| Weak | Crumbles or breaks with handling or little finger pressure. |
| Moderate | Crumbles or breaks with considerable finger pressure. |
| Strong | Will not crumble or break with finger pressure. |

**NOTE:** This legend sheet provides descriptions and associated criteria for required soil description components only. Refer to Caltrans Soil and Rock Logging, Classification, and Presentation Manual (2010), Section 2, for tables of additional soil description components and discussion of soil description and identification.

# UNIFIED SOIL CLASSIFICATION AND KEY TO BORING AND TEST PIT LOGS SYMBOLS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01** Drawing No. **A-1b**

# Log of Boring No. BH-01

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 684 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.4 feet thick. | | | | | | |
| | | **TOPSOIL**<br>**SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, dark grayish brown. | ■ | | 5/7/11 | 5 | 102 | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, dense, moist, light grayish brown. | ■ | ▨ | 20/22/24 | 5 | 105 | OC<br>CR, PA, CP, DS |
| | | -@7.0': medium dense, light brown. | ■ | ▨ | 8/12/18 | 5 | 109 | DS |
| 10 | | -@10.0':orange oxidation. | ■ | ▨ | 10/10/13 | 11 | 107 | |
| 15 | | -@15.0': orange oxidation staining, dense, light orangish gray. | ■ | | 8/20/31 | 5 | 113 | |

End of boring at 16.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with augers using the weight of the drill rig on 5/29/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-2

# Log of Boring No. BH-02

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 679 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.4 feet thick. | | | | | | OC |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, moderately to highly organic, loose to medium dense, moist, black. | ■ | | 5/10/15 | 10 | 111 | CL, R |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine-grained, trace rootlets, brown oxidation, medium dense, moist, light brown. | ■ | | 7/12/18 | 10 | 111 | |
| | | -@8.0': light green brown. | ■ | | 6/9/12 | 23 | 100 | |
| 10 | | | | | | | | |
| | | **SANDY CLAY (CL):** fine-grained sand, orange oxidation, medium stiff, moist to wet, light brownish grey. | ■ | | 4/5/6 | 33 | 88 | |
| 15 | | -@16.0': orange and brown oxidation staining, very stiff. | ■ | | 4/9/18 | 30 | 97 | |
| 20 | | -@21.0': trace silt, orange oxidation, stiff. | ☒ | | 6/5/10 | 13 | | |
| 25 | | -@26.0': trace sand, very stiff, moist, brown. | ■ | | 4/12/21 | 16 | 116 | |
| | | End of boring at 27.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings and compacted with augers using the weight of the drill rig on 5/29/2024. | | | | | | |

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-3

# Log of Boring No. BH-03

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 679 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **TOPSOIL**<br>**SAND (SP):** fine to medium-grained, medium dense, moist, gray-brown. | ■ | | 7/11/19 | 15 | 114 | |
| | | **ALLUVIUM**<br>**CLAYEY SAND (SC):** fine to medium-grained, medium dense, moist, gray-brown. | ■ | | 8/13/15 | 15 | 117 | C, R |
| 5 | | -@6.0': caliche, brown | ■ | | 4/8/11 | 18 | 115 | |
| 10 | | **SANDY CLAY (CL):** fine to medium grained sand, trace caliche, stiff, moist, brown. | ■ | | 5/6/8 | 24 | 101 | |
| 15 | | **SAND (SP):** coarse-grained, trace silt, orange oxidation, scattered gravel up to 0.5 inch maximum dimension, dense, moist, brown. | ■ | | 14/21/29 | 12 | 120 | |
| 20 | | **SILTY SAND (SM):** fine to coarse-grained, orange oxidation, very dense, moist, brown. | ■ | | 11/37/40 | 13 | 117 | |
| 25 | | **CLAYEY SILT (CL):** trace fine to medium-grained sand, stiff, wet, brown. | ■ | | 4/8/10 | 29 | 97 | |

End of boring at 25.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with augers using the weight of the drill rig on 5/24/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-4

# Log of Boring No. BH-04

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 683 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ARTIFICIAL FILL**<br>**SILT (ML):** fine-grained, highly organic material, soft, moist, dark brown to black. | | | | | | |
| | | **ALLUVIUM** | | | 11/24/23 | | | *no recovery |
| 5 | | **SILTY SAND (SM):** medium-grained, dense, moist, brown. | ■ | | 19/18/26 | 11 | 110 | |
| | | -@8.0': dessicated, medium dense. | ■ | | 10/16/15 | 16 | 107 | |
| 10 | | **CLAYEY SILT (ML):** trace fine to medium-grained sand, very stiff, moist, tan brown. | ■ | | 4/7/11 | 20 | 110 | |
| 15 | | **SILTY SAND (SM):** fine to medium-grained, dense, moist, orange oxidation, brown. | ■ | | 10/18/31 | 15 | 113 | |
| 20 | | -@21.0': very dense. | ■ | | 12/23/50-6" | 15 | 118 | |
| 25 | | **SAND (SP):** fine to coarse-grained, medium dense, moist, orange oxidation, brown. | ■ | | 14/13/11 | 9 | 82 | |
| | | End of boring at 27.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings and compacted with augers using the weight of the drill rig on 5/24/2024. | | | | | | |

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Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-5

# Log of Boring No. BH-05

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 682 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **TOPSOIL**<br>**SILTY SAND (SM):** fine to medium-grained, dense, moist, dark brown. | ■ | | 11/24/23 | 8 | 111 | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, dense, moist, gray-brown. | ■ | | 8/17/30 | 11 | 120 | |
| | | **CLAYEY SAND (SC):** fine to medium-grained, medium dense, some caliche, moist, tan brown. | ■ | | 7/14/17 | 17 | 112 | |
| 10 | | | ■ | | 6/9/13 | 24 | 104 | |
| 15 | | | | | 7/11/14 | | | *no recovery |
| 20 | | **SAND (SP):** fine to coarse-grained, trace silt, medium dense, moist, light brown. | ☒ | | 8/14/19 | 6 | | |
| 25 | | **SILTY SAND (SM):** fine to medium-grained, trace clay, medium dense, moist, brown. | ■ | | 7/11/19 | 16 | 116 | |
| 30 | | | ☒ | | 4/5/7 | 22 | | |

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-6a

# Log of Boring No. BH-05

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 682 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, trace clay, dense, moist, reddish-brown. | ■ | | 8/15/28 | 14 | 119 | |
| 40 | | -@40.0': medium dense. | ☒ | | 5/7/9 | 19 | | |
| 45 | | -@45.0': very dense. | ■ | | 16/34/50-6" | 13 | 120 | |
| 50 | | -@50.0': fine to medium grained, medium dense, brown. | ☒ | | 8/11/14 | 18 | | |
| | | End of boring at 51.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings<br>and compacted with augers using the weight of the drill rig on 5/24/2024. | | | | | | |

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-6b

# Log of Boring No. BH-06

Date Drilled: 5/24/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 683 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ARTIFICIAL FILL**<br>**SILT (ML):** soil with organic material and manure, soft, moist, brown-black. | ■ | | 22/25/39 | 13 | 121 | |
| | | **SANDY CLAY (CL):** fine to medium-grained sand, trace silt, hard, moist, brown-black. | ■ | ▨ | 15/21/21 | 5 | 101 | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, dense, moist, brown.<br>-@6.0': medium dense. | ■ | ▨ | 8/9/15 | 7 | 109 | CL, C |
| 10 | | | ■ | | 9/11/15 | 12 | 120 | |
| 15 | | -@14.0': trace clay, caliche, light brown. | ■ | ▨ | 9/11/22 | 14 | 123 | |
| 20 | | -@19.0': slight orange oxidation, dense. | ■ | | 14/20/30 | 11 | 124 | |
| 25 | | **SANDY CLAY (CL):** fine to medium-grained sand, trace silt, scattered carbon fragments, medium stiff, moist, tan brown. | ▨ | | 7/4/4 | 20 | | |

End of boring at 25.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with augers using the weight of the drill rig on 5/24/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-7

# Log of Boring No. BH-07

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 680 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.3 feet thick. | | | | | | OC |
| | | **ARTIFICIAL FILL**<br>**SANDY SILT (ML):** fine to coarse-grained sand, organics and manure, soft, brown-black. | ■ | | 9/11/12 | 5 | 108 | DS, CP |
| 5 | | **SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, light orange-brown.<br>-@5.0': loose. | ■ | | 4/4/6 | 6 | 103 | C |
| | | **ALLUVIUM**<br>**CLAYEY SAND/ SANDY CLAY (SC-CL):** medium-grained, pinhole porosity, moderately to very desiccated, trace caliche, slight orange oxidation staining, medium dense/stiff, moist, orange-brown. | ■ | | 6/10/14 | 13 | 117 | |
| 10 | | -@10.0': trace silt, caliche stringers. | ■ | | 7/10/14 | 12 | 121 | |
| 15 | | -@15.0': caliche stringers, orange oxidation, medium dense/very stiff. | ■ | | 8/13/17 | 12 | 121 | |

End of boring at 16.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with augers using the weight of the drill rig on 5/29/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-8

# Log of Boring No. BH-08

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 687 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE** 1.0 foot thick. | | | | | | |
| | | **ALLUVIUM** | | | | | | |
| | | **SILTY SAND (SM):** fine to coarse-grained, slightly desiccated, very dense, moist, light brown. | ■ | ▨ | 20/32/36 | 5 | 116 | EI, R, CR, PA. |
| 5 | | -@5.0': medium dense. | ■ | | 12/15/18 | 5 | 110 | |
| | | -@8.0': moderately desiccated. | ■ | | 7/12/16 | 7 | 114 | |
| 10 | | | | | | | | |
| | | **SAND WITH SILT (SP-SM):** fine to coarse-grained, trace clay, medium dense, moist, light brown. | ■ | ▨ | 7/9/10 | 17 | 103 | |
| 15 | | -@16.0': moderate orange and brown oxidation. | ■ | | 12/13/14 | 4 | 97 | |
| 20 | | | | | | | | |
| | | **SILTY SAND (SM):** fine to coarse-grained, trace clay, moderate orange oxidation, medium dense, moist, light gray brown. | ■ | | 6/6/12 | 19 | 104 | |
| 25 | | | ╳ | | 4/7/10 | 13 | | |
| | | End of boring at 27.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings<br>and compacted with augers using the weight of the drill rig on 5/29/2024. | | | | | | |

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-9

# Log of Boring No. BH-09

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 693 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.3 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SANDY SILT (ML):** fine-grained sand, organics and manure, soft, dark brown to black. | ■ | | 6/12/6 | 8 | 98 | |
| | | | | ▨ | 13/23/20 | | | -no recovery |
| 5 | | **SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 0.5 inches maximum dimension, medium dense, moist, brown.<br>-@3.0': dense.<br>-@6.0': loose, light brown. | ■ | | 3/4/7 | 6 | 106 | |
| 10 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, light to orange brown. | ■ | | 6/7/12 | 5 | 112 | |
| 15 | | -@14.0': fine to medium grained, trace clay, pinhole porosity. | ■ | ▨ | 5/6/10 | 17 | 106 | |
| 20 | | -@19.0': slight to moderate orange oxidation, light greenish brown. | ■ | | 7/9/15 | 6 | 101 | |
| 25 | | | ■ | | 8/11/16 | 7 | 98 | |
| | | End of boring at 25.5 feet below ground surface<br>No groundwater encountered<br>Boring backfilled with cuttings and compacted with augers using the weight of the drill rig on 5/29/2024. | | | | | | |

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-10

# Log of Boring No. BH-10

Date Drilled: 5/29/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 8" DIAMETER HOLLOW STEM AUGER Driving Weight and Drop: 140 lbs / 30 in

Ground Surface Elevation (ft): 685 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the boring and at the time of drilling. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine-grained sand, moist, very stiff, brown. | ■ | | 10/10/17 | 11 | 118 | EI, PA |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, slightly desiccated, medium dense, moist, orangish brown. | ■ | | 9/9/12 | 5 | 113 | |
| | | -@7.0': trace clay, caliche stringers, dense. | ■ | | 8/12/17 | 11 | 111 | |
| 10 | | -@10.0': slight to moderate desiccated, light green brown. | ■ | | 7/10/14 | 9 | 115 | |
| 15 | | -@15.0': orange oxidation. | ■ | | 5/7/14 | 17 | 110 | |
| 20 | | -@20.0': few clay. | ■ | | 8/12/17 | 3 | 100 | |
| 25 | | **SANDY CLAY (CL):** fine-grained sand, orange oxidation, moist, stiff, greenish brown. | ☒ | | 3/5/6 | 29 | | |

End of boring at 26.5 feet below ground surface
No groundwater encountered
Boring backfilled with cuttings
and compacted with auger using the weight of the drill rig on 5/29/2024.

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. 24-81-184-01

Drawing No. A-11

# Log of Test Pit No. TP-01

Date Drilled: 6/12/2024 Logged by: Anselm Krause Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 684 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.6 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, moderate to highly organic, loose, dark brown. | | | | | | |
| 5 | | **SANDY GRAVEL (GP):** medium-grained, channel deposit, gravel up 0.5 inch maximum dimension, loose, light brown. | | | | | | |
| | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, medium dense, moist, brown.<br>-@3.0': dense. | | | | | | |
| | | End of Test Pit at 5.2 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-12

# Log of Test Pit No. TP-02

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 680 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.7 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, moderatly to highly organic, dense, moist, green and reddish brown. | | | | | | OC |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** medium-grained, medium dense, moist, light brown to brown.<br>-@2.0': dense. | | | | | | |
| | | End of Test Pit at 5.5 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-13

# Log of Test Pit No. TP-03

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 681 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.7 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, trace clay, slightly to highly organic, layered, medium dense to dense, moist, light brown to brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**CLAYEY SAND (SC):** fine to medium-grained, medium dense, moist, brown. | | | | | | |
| | | End of Test Pit at 5.8 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-14

# Log of Test Pit No. TP-04

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 690 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **0.2' ASPHALT CONCRETE/1.8' AGGREGATE BASE** | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, layered, dense to very dense, moist, reddish brown and light brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, slight red oxidation staining, medium dense, reddish-brown.<br>-@4.0': dense | | | | | | |
| | | End of Test Pit at 8.5 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-15

# Log of Test Pit No. TP-05

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 685 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE** 1.0 foot thick. | | | | | | OC |
| | | **ARTIFICIAL FILL**<br>**CLAYEY SAND (SC):** fine to medium-grained alternating layers, scattered debris, moist, dense, brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND/CLAYEY SAND (SM-SC):** fine to medium-grained, moist, medium dense, brown.<br>-@5.0: some carbon, dense. | | | | | | |
| | | End of Test Pit at 5.8 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-16

# Log of Test Pit No. TP-06

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 687 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, some gravel up to 0.5 inches maximum dimension, dense, moist, brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to coarse-grained, medium dense, moist, yellow brown.<br>-@3.0': dense, light brown. | | | | | | |
| | | End of Test Pit at 4.8 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-17

# Log of Test Pit No. TP-07

Date Drilled: 6/12/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 684 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**CLAYEY SAND (SC):** fine to coarse-grained, scattered gravel 1.5 inches maximum dimension, slight to moderate organics, medium dense, moist, dark reddish brown. | | | | | | OC |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, slightly desiccated, medium dense, moist, light orange brown.<br>-@4.5': dense. | | | | | | |
| | | End of Test Pit at 5.0 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/12/24. | | | | | | |

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Drawing No. A-18

# Log of Test Pit No. TP-08

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 690 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.4 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to medium-grained, slightly to moderately organic, dense, moist, reddish-brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SILTY SAND (SM):** fine to medium-grained, medium dense, moist, light brown.<br>-@4.0': dense. | | | | | | OC |
| | | End of Test Pit at 5.1 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-19

# Log of Test Pit No. TP-09

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 687 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.3 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, slightly to highly organic, dense, moist, brown. | | | | | | |
| | | **ALLUVIUM** | | | | | | |
| 5 | | **SAND WITH SILT (SP-SM):** fine to medium-grained, medium dense, moist, light brown.<br>-@3.0': dense. | | | | | | |
| | | End of Test Pit at 6.0 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-20

# Log of Test Pit No. TP-10

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 684 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.3 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 1 inch maximum dimension, slightly to highly organic, dense, moist, orange-brown. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SAND WITH SILT (SP-SM):** fine to medium-grained, medium dense, moist, light brown.<br>-@4.0': dense. | | | | | | |
| | | End of Test Pit at 5.6 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-21

# Log of Test Pit No. TP-11

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 685 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES DRIVE | SAMPLES BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND (SM):** fine to coarse-grained, scattered gravel up to 2 inches maximum dimension, dense, moist, orange-light, gray-brown.<br>-@1.0': continuous 1.5 inch red layer. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SAND WITH SILT (SP-SM):** fine to medium-grained, medium dense to dense, moist, orange brown.<br>-@2.5': dense. | | | | | | OC |
| | | End of Test Pit at 6.0 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-22

# Log of Test Pit No. TP-12

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 690 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND WITH GRAVEL (SM):** fine to coarse-grained, scattered gravel up to 2 inches maximum dimension, slightly to highly organic, dense, moist, light gray. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SAND WITH SILT (SP-SM):** fine to medium-grained, dense, moist, light orange brown.<br>-@4.0': dense. | | | | | | |
| | | End of Test Pit at 5.3 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-23

# Log of Test Pit No. TP-13

Date Drilled: 6/11/2024 Logged by: Elizabeth Hernandez Checked By: Robert L Gregorek II

Equipment: 24" WIDE BACKHOE BUCKET Driving Weight and Drop: N/A

Ground Surface Elevation (ft): 691 Depth to Water (ft, bgs): NOT ENCOUNTERED

| Depth (ft) | Graphic Log | SUMMARY OF SUBSURFACE CONDITIONS<br>This log is part of the report prepared by Converse for this project and should be read together with the report. This summary applies only at the location of the test pit and at the time of excavation. Subsurface conditions may differ at other locations and may change at this location with the passage of time. The data presented is a simplification of actual conditions encountered. | SAMPLES: DRIVE | SAMPLES: BULK | BLOWS | MOISTURE (%) | DRY UNIT WT. (pcf) | OTHER |
|---|---|---|---|---|---|---|---|---|
| | | **MANURE:** 0.5 feet thick. | | | | | | |
| | | **ARTIFICIAL FILL**<br>**SILTY SAND WITH GRAVEL (SM):** fine to coarse-grained, some pieces of concrete, dense, moist, light grayish brown.<br>-@2.0': 4 inch concrete slab. | | | | | | |
| 5 | | **ALLUVIUM**<br>**SAND (SP):** fine to medium-grained, dune deposit, moist, medium dense to dense, brown.<br>-@4.0': dense. | | | | | | |
| | | End of Test Pit at 5.4 feet.<br>No groundwater encountered.<br>Test pit backfilled in lifts with backhoe and compacted using a sheep's foot roller on 6/11/24. | | | | | | |

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Drawing No. A-24

# Appendix B

## Laboratory Testing Program

# APPENDIX B

## LABORATORY TESTING PROGRAM

Tests were conducted in our laboratory on representative soil samples for the purpose of classification and evaluation of their physical properties and engineering characteristics. The amount and selection of tests were based on the geotechnical parameters required for this project. Test results are presented herein and on the Logs of Borings and Test Pits, in Appendix A, *Field Exploration*. The following is a summary of the various laboratory tests conducted for this project.

### ***In-Situ* Moisture Content and Dry Density**

In-situ dry density and moisture content tests were performed on relatively undisturbed ring samples, in accordance with ASTM Standard D2216-19 and D2937-17 to aid in soils classification and to provide qualitative information on strength and compressibility characteristics of the site soils. For test results, see the Logs of Borings and Test Pits in Appendix A, *Field Exploration*.

### **Organic Content (OC)**

Tests were performed on eight select bulk samples during the current geotechnical investigation and eighteen select samples during the previous geotechnical feasibility study by SoCalGeo of the soil on the site, to determine the organic content, in accordance with the ASTM Standard D2974-20e1 test, Methods A and C. Test results are summarized in the table below.

**Table No. B-1, Summary of Organic Content Test Results**

| Boring/Test Pit No. | Depth (feet) | Soil Description | Total Organic Content (%) |
|---|---|---|---|
| BH-01 | 4.0-10.0 | Silty Sand (SM), Native | 1.1 |
| BH-02 | 0.4-2.0 | Silty Sand (SM), Fill | 2.1 |
| BH-07 | 0.3-1.0 | Sandy Silt (ML), Fill | 7.1 |
| TP-02 | 0.7-1.0 | Silty Sand (SM), Fill | 6.0 |
| TP-05 | 0.0-1.0 | Manure/Clayey Sand (SC), Fill | 12.2 |
| TP-07 | 0.5-2.5 | Clayey Sand/Sandy Clay (SC-CL), Fill | 2.1 |
| TP-08 | 5.0-6.0 | Silty Sand (SM), Native | 1.3 |
| TP-11 | 5.0-6.0 | Silty Sand (SM), Native | 1.9 |

**Table No. B-1a, Summary of Organic Content Test Results (SoCalGeo, 1 & 3/2022)**

| Test Pit No. | Depth (feet) | Soil Description | Total Organic Content (%) |
|---|---|---|---|
| HA-1 (1/22) | 0.0-0.5 | Silty Sand (SM), Fill | 13.0 |
| HA-1 (1/22) | 0.5-1.0 | Silty Sand (SM), Fill | 5.9 |
| HA-1 (1/22) | 1.0-1.5 | Silty Sand (SM), Fill | 7.9 |
| HA-1 (1/22) | 1.5-2.0 | Silty Sand (SM), Fill | 2.5 |
| HA-1 (1/22) | 3.0-3.5 | Sand, trace silt (SP), Native | 1.6 |
| HA-2 (1/22) | 0.0-0.5 | Silty Sand (SM), Fill | 24.3 |
| HA-2 (1/22) | 0.5-1.0 | Silty Sand (SM), Fill | 19.0 |
| HA-2 (1/22) | 1.0-1.5 | Sand, trace silt (SP), Fill | 10.3 |
| HA-2 (1/22) | 1.5-2.0 | Sand, trace silt (SP), Fill | 2.7 |
| HA-2 (1/22) | 3.0-3.5 | Sand, trace silt (SP), Native | 2.0 |
| HA-1 (3/22) | 0.0-0.5 | Silty Sand (SM), Fill | 6.6 |
| HA-1 (3/22) | 0.5-1.0 | Silty Sand (SM), Fill | 5.9 |
| HA-1 (3/22) | 1.0-1.5 | Silty Sand (SM), Fill | 4.0 |
| HA-1 (3/22) | 1.5-2.0 | Sandy Silt (ML), Native | 2.4 |
| HA-2(3/22) | 0.0-0.5 | Silty Sand (SM), Fill | 14.4 |
| HA-2(3/22) | 0.5-1.0 | Silty Sand (SM), Fill | 18.5 |
| HA-2(3/22) | 1.0-1.5 | Silty Sand (SM), Fill | 8.5 |
| HA-2(3/22) | 1.5-2.0 | Silty Sand (SM), Fill | 2.7 |

**Expansion Index (EI)**

Two representative bulk samples were tested during the current geotechnical investigation and one bulk sample weas tested during a previous geotechnical feasibility study by SoCalGeo of the soil on the site, to evaluate the expansion potential of materials encountered at the site in accordance with ASTM D4829-21 Standard. The test results are presented in the following table.

**Table No. B-2, Expansion Index Test Results**

| Boring No. | Depth feet) | Soil Description | Expansion Index | Expansion Potential |
|---|---|---|---|---|
| BH-08 | 0.0-5.0 | Silty Sand (SM) | 0 | Very Low |
| BH-10 | 0.0-4.0 | Silty Sand (SM) | 0 | Very Low |

**Table No. B-2a, Expansion Index Test Results (SoCalGeo, 1/2022)**

| Boring No. | Depth feet) | Soil Description | Expansion Index | Expansion Potential |
|---|---|---|---|---|
| B-7 | 0-5 | Clayey Sand (SC) | 12 | Very Low |

**R-value (R)**

Two representative bulk soil samples were tested for resistance value (R-value) in accordance with California Test Method CT301. This test provides a relative measure of soil strength for use in pavement design. The test result is presented in the table below.

**Table No. B-3, R-Value Test Result**

| Boring No. | Depth (feet) | Soil Classification | Measured R-value |
|---|---|---|---|
| BH-02 | 2.0-5.0 | Silty Sand (SM) | 64 |
| BH-08 | 0-5.0 | Silty Sand (SM) | 59 |

**Soil Corrosivity (CR)**

One representative soil sample was tested during the current geotechnical investigation and three bulk samples were tested during previous geotechnical feasibility studies by SoCalGeo within site, to determine minimum electrical resistivity, pH, and chemical content, including soluble sulfate and chloride concentrations. The purpose of this test was to determine the corrosion potential of site soils when placed in contact with common construction materials. The tests were performed by Keegan Labs. (Pomona, CA) in accordance with Caltrans Test Methods 643, 422 and 417. Test results are presented in the following table.

**Table No. B-4, Summary of Soil Corrosivity Test Results**

| Boring No. | Depth (feet) | pH | Soluble Sulfates (CA 417) (ppm) | Soluble Chlorides (CA 422) (ppm) | Min. Resistivity (CA 643) (Ohm-cm) |
|---|---|---|---|---|---|
| BH-08 | 0.0-5.0 | 6.7 | 90 | 25 | 4,620 |

**Table No. B-4a, Soil Corrosivity Test Result (SoCalGeo, 1 & 3/2022)**

| Boring No. | Depth (feet) | pH | Soluble Sulfates (CA 417) (ppm) | Soluble Chlorides (CA 422) (ppm) | Min. Resistivity (CA 643) (Ohm-cm) |
|---|---|---|---|---|---|
| B-1 (1/22) | 0-5 | 7.5 | 17 | 119.0 | 1,360 |
| B-7 (3/22) | 0-5 | 8.3 | 122 | 94.4 | 2.435 |
| B-9 (3/22) | 0-5 | 9.4 | 72 | 33.1 | 3,216 |

**Collapse (CL)**

To evaluate the moisture sensitivity (collapse/swell potential) of the encountered soils, two collapse tests were performed in accordance with the ASTM Standard D4546-21 laboratory procedure. The samples were loaded to approximately 1 kip per square foot (ksf), allowed to stabilize under load, and then submerged. The test results are presented in the following table.

**Table No. B-5, Collapse Test Results**

| Boring No. | Depth (feet) | Soil Classification | Percent Swell (+) Percent Collapse (-) | Collapse Potential |
|---|---|---|---|---|
| BH-02 | 2.0-3.5 | Silty Sand (SM) | -1.6 | Slight |
| BH-06 | 3.0-4.5 | Silty Sand (SM) | -0.2 | Slight |

**Grain-Size Analysis (PA)**

To assist in soil classification, mechanical grain-size analyses was performed on three select samples in accordance with the ASTM Standard D6913/D6913M-17 test method. Grain-size distribution is summarized in the table below and plotted in Drawing No. B-1, *Grain Size Distribution Results*.

**Table No. B-6, Grain Size Distribution Test Results**

| Boring No. | Depth (ft) | Soil Classification | % Gravel | % Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|
| BH-01 | 4.0-10.0 | Silty Sand (SM) | 0.0 | 82.3 | 17.7 | |
| BH-08 | 0.0-5.0 | Silty Sand (SM) | 0.0 | 72.9 | 27.1 | |
| BH-10 | 0.0-4.0 | Silty Sand (SM) | 0.0 | 59.9 | 40.1 | |

**Maximum Dry Density and Optimum Moisture Content (CP)**

Laboratory maximum dry density-optimum moisture content relationship tests were performed on two representative bulk samples. These tests were conducted in accordance with the ASTM Standard D1557-12R21 test method. The test results are presented in Drawing No. B-2, *Moisture-Density Relationship Results,* and is summarized in the following table.

**Table No B-7, Summary of Moisture-Density Relationship Results**

| Boring No. | Depth (feet) | Soil Description | Optimum Moisture (%) | Maximum Density (lb./cft) |
|---|---|---|---|---|
| BH-01 | 4.0-10.0 | Silty Sand (SM), Brown | 11.1 | 118.6 |
| BH-07 | 1.0-4.0 | Silty Sand (SM), Brown | 12.7 | 117.5 |

**Direct Shear (DS)**

Three direct shear tests were performed; one direct shear test was performed on a relatively undisturbed sample and two direct shear tests were performed on samples remolded to 90% of the maximum dry density under soaked moisture conditions in accordance with ASTM D3080/D3080M-23. on relatively undisturbed samples in accordance with ASTM D3080. For each test, three samples contained in brass sampler rings were placed, one at a time, directly into the test apparatus and subjected to a range of normal loads appropriate for the anticipated conditions. The samples were then sheared at a constant strain rate of 0.02 inch/minute. Shear deformation was recorded until a maximum of about 0.25-inch shear displacement was achieved. Ultimate strength was selected from the shear-stress deformation data and plotted to determine the shear strength parameters. For test data, including sample density and moisture content, see Drawings No. B-3 through B-5*, Direct Shear Test Results,* and the following table.

**Table No. B-8, Summary of Direct Shear Test Results**

| Boring No. | Depth (feet) | Soil Description | Peak Strength Parameters | |
|---|---|---|---|---|
| | | | Friction Angle (degrees) | Cohesion (psf) |
| *BH-01 | 4.0-10.0 | Silty Sand (SM) | 31 | 70 |
| BH-01 | 7.0-8.5 | Silty Sand (SM) | 27 | 150 |
| *BH-07 | 1.0-4.0 | Silty Sand (SM) | 31 | 190 |

*Remolded to 90% of the maximum dry density

**Consolidation (C)**

Three consolidation tests were conducted in accordance with ASTM Standard D2435/D2435M-11R20 method. Data obtained from the test performed on relatively undisturbed ring samples were used to evaluate the settlement characteristics of the on-site soils under load. Preparation for these tests involved trimming the sample, placing it in a 1-inch-high brass ring, and loading it into the test apparatus, which contained porous stones to accommodate drainage during testing. Normal axial loads were applied to one end of the sample through the porous stones, and the resulting deflections were recorded at various time periods. The load was increased after the sample reached a reasonable state of equilibrium. Normal loads were applied at a constant load-increment ratio, successive loads being generally twice the preceding load. For test results, including sample density and initial moisture content, see Drawings No. B-6 through B-8, *Consolidation Test Results*.

**Sample Storage**

Soil samples presently stored in our laboratory will be discarded 30 days after the date of this report, unless this office receives a specific request to retain the samples for a longer period.

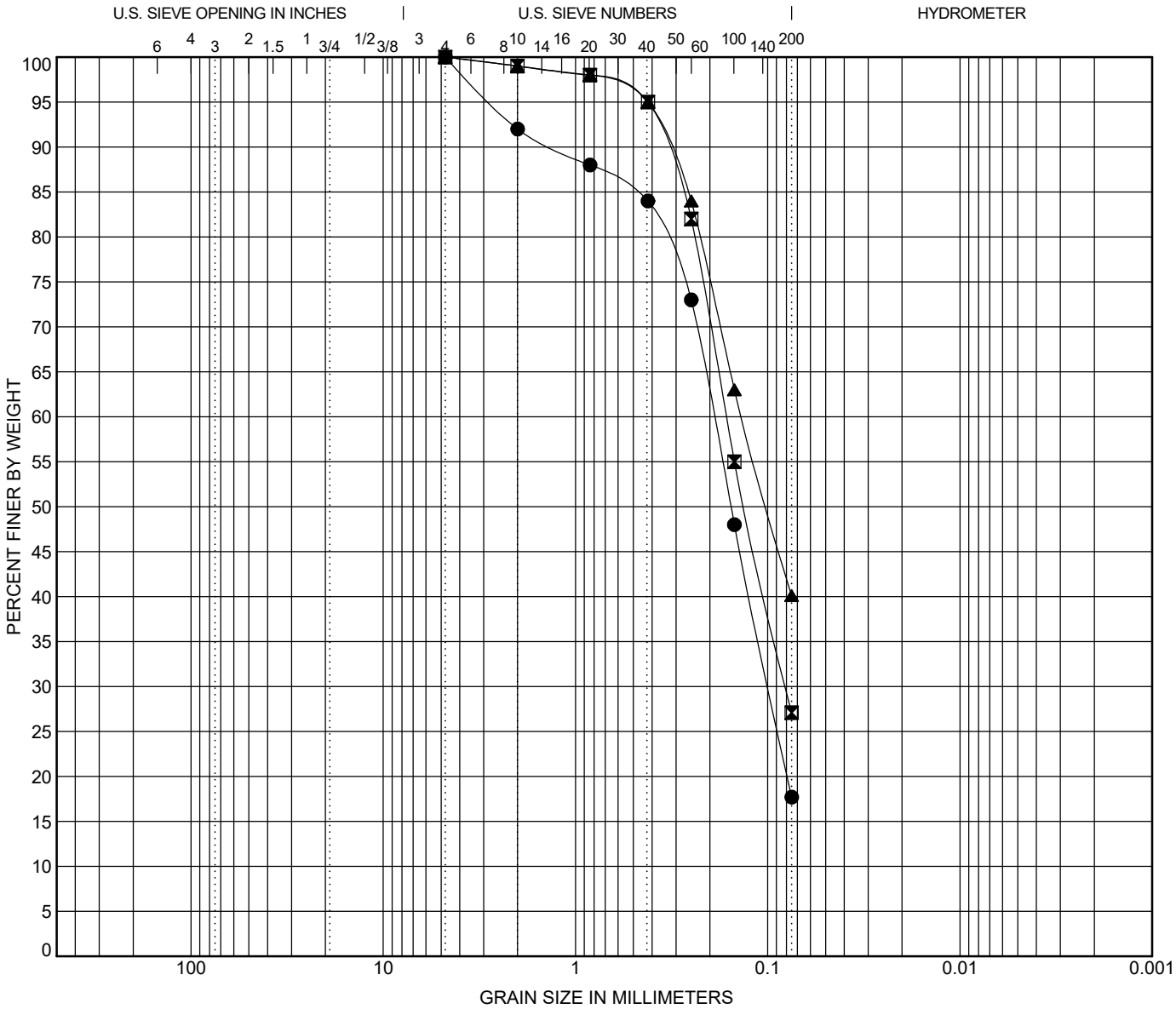


| COBBLES | GRAVEL | | SAND | | | SILT OR CLAY |
|---|---|---|---|---|---|---|
| | coarse | fine | coarse | medium | fine | |

| | Boring No. | Depth (ft) | Description | LL | PL | PI | Cc | Cu |
|---|---|---|---|---|---|---|---|---|
| ● | **BH-01** | **4.0-10.0** | **SILTY SAND (SM)** | | | | | |
| ⊠ | **BH-08** | **0.0-5.0** | **SILTY SAND (SM)** | | | | | |
| ▲ | **BH-10** | **0.0-4.0** | **SANDY CLAY (CL)** | | | | | |
| | | | | | | | | |
| | | | | | | | | |

| | Boring No. | Depth (ft) | D100 | D60 | D30 | D10 | %Gravel | %Sand | %Silt | %Clay |
|---|---|---|---|---|---|---|---|---|---|---|
| ● | **BH-01** | **4.0-10.0** | **4.75** | **0.191** | **0.099** | | **0.0** | **82.3** | **17.7** | |
| ⊠ | **BH-08** | **0.0-5.0** | **4.75** | **0.164** | **0.081** | | **0.0** | **72.9** | **27.1** | |
| ▲ | **BH-10** | **0.0-4.0** | **4.75** | **0.136** | | | **0.0** | **59.9** | **40.1** | |
| | | | | | | | | | | |
| | | | | | | | | | | |

# GRAIN SIZE DISTRIBUTION RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **B-1**

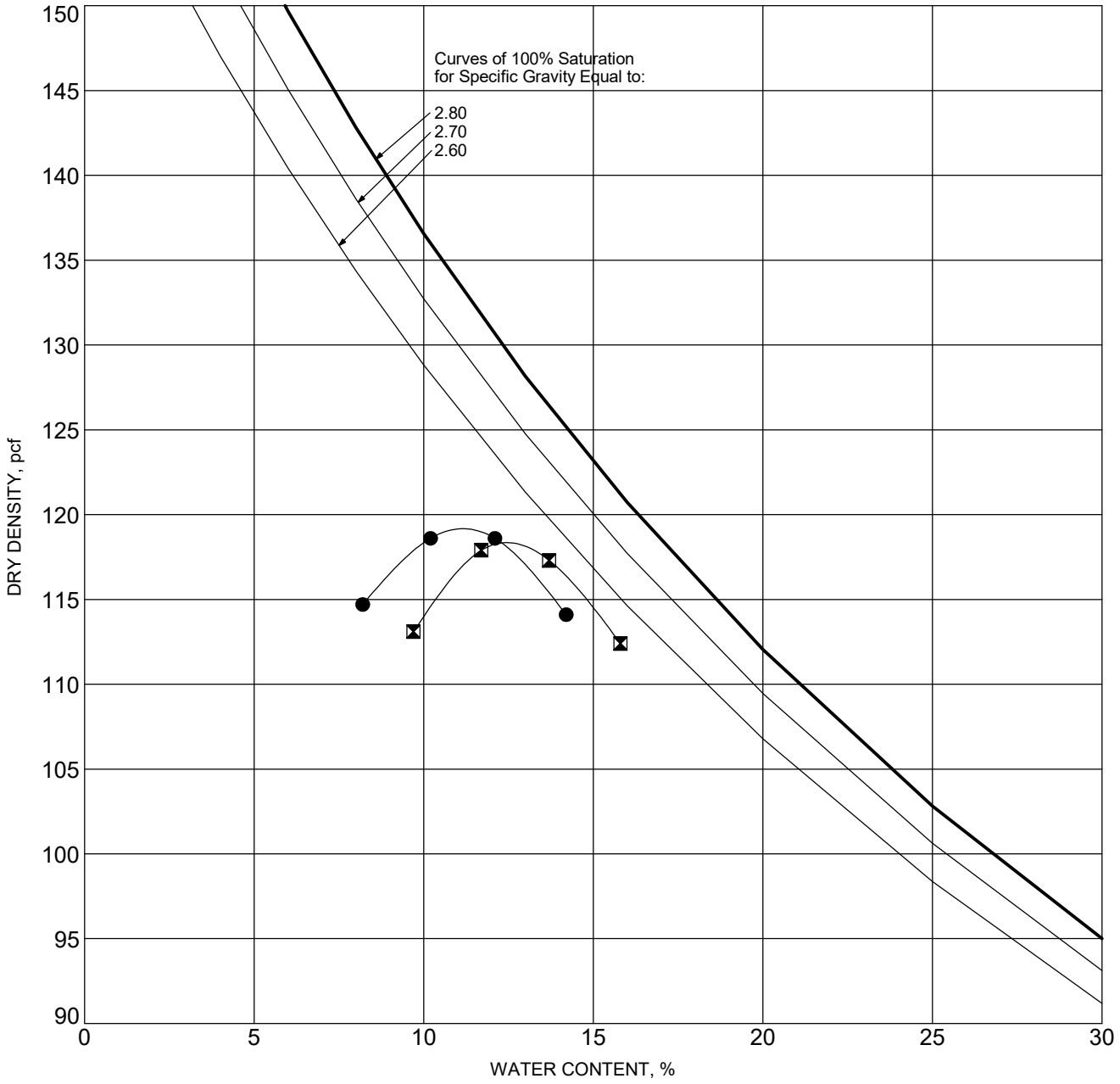


| SYMBOL | BORING NO. | DEPTH (ft) | DESCRIPTION | ASTM TEST METHOD | OPTIMUM WATER, % | MAXIMUM DRY DENSITY, pcf |
|---|---|---|---|---|---|---|
| ● | **BH-01** | **4.0-10.0** | **SILTY SAND (SM), Light Grayish Brown** | **D1557 - A** | **11.1** | **118.6** |
| ⊠ | **BH-07** | **1.0-4.0** | **SILTY SAND (SM), Light Orange-Brown** | **D1557 - A** | **12.7** | **117.5** |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# MOISTURE-DENSITY RELATIONSHIP RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For RCCD, Inc.

Project No.
**24-81-184-01**

Drawing No.
**B-2**

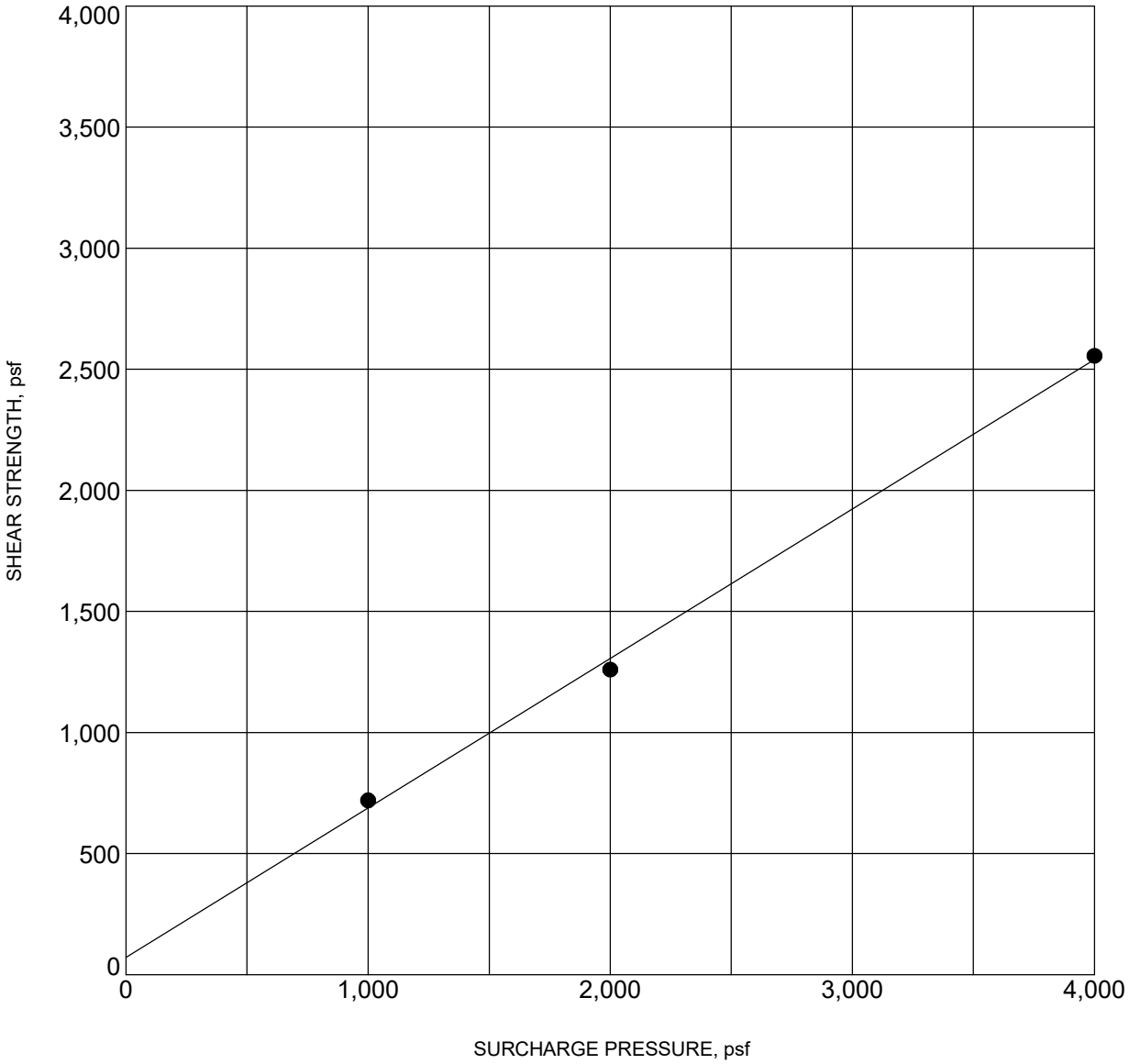


| | | | |
|---|---|---|---|
| BORING NO. : | **BH-01** | DEPTH (ft) : | **4.0-10.0*** |
| DESCRIPTION : | **SILTY SAND (SM)** | | |
| COHESION (psf) : | **80** | FRICTION ANGLE (degrees): | **32** |
| MOISTURE CONTENT (%) : | **11.1** | DRY DENSITY (pcf) : | **116.0** |

* Remolded to 90% laboratory maximum dry density

NOTE: Ultimate Strength.

# DIRECT SHEAR TEST RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **B-3**

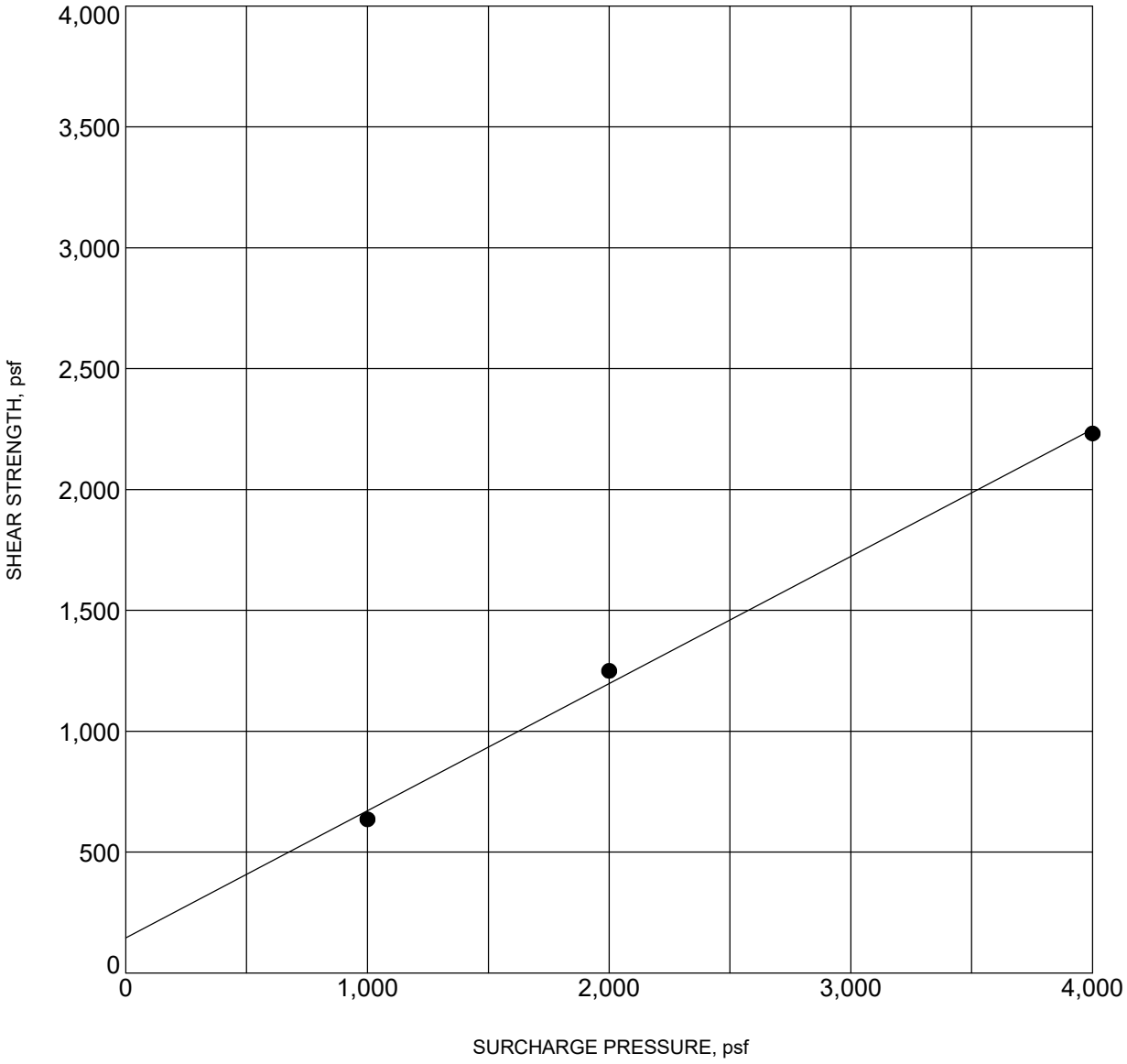


| | | | |
|---|---|---|---|
| BORING NO. : | **BH-01** | DEPTH (ft) : | **7.0-8.5** |
| DESCRIPTION : | **SILTY SAND (SM)** | | |
| COHESION (psf) : | **150** | FRICTION ANGLE (degrees): | **28** |
| MOISTURE CONTENT (%) : | **8.0** | DRY DENSITY (pcf) : | **101.0** |

NOTE: Ultimate Strength.

# DIRECT SHEAR TEST RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **B-4**

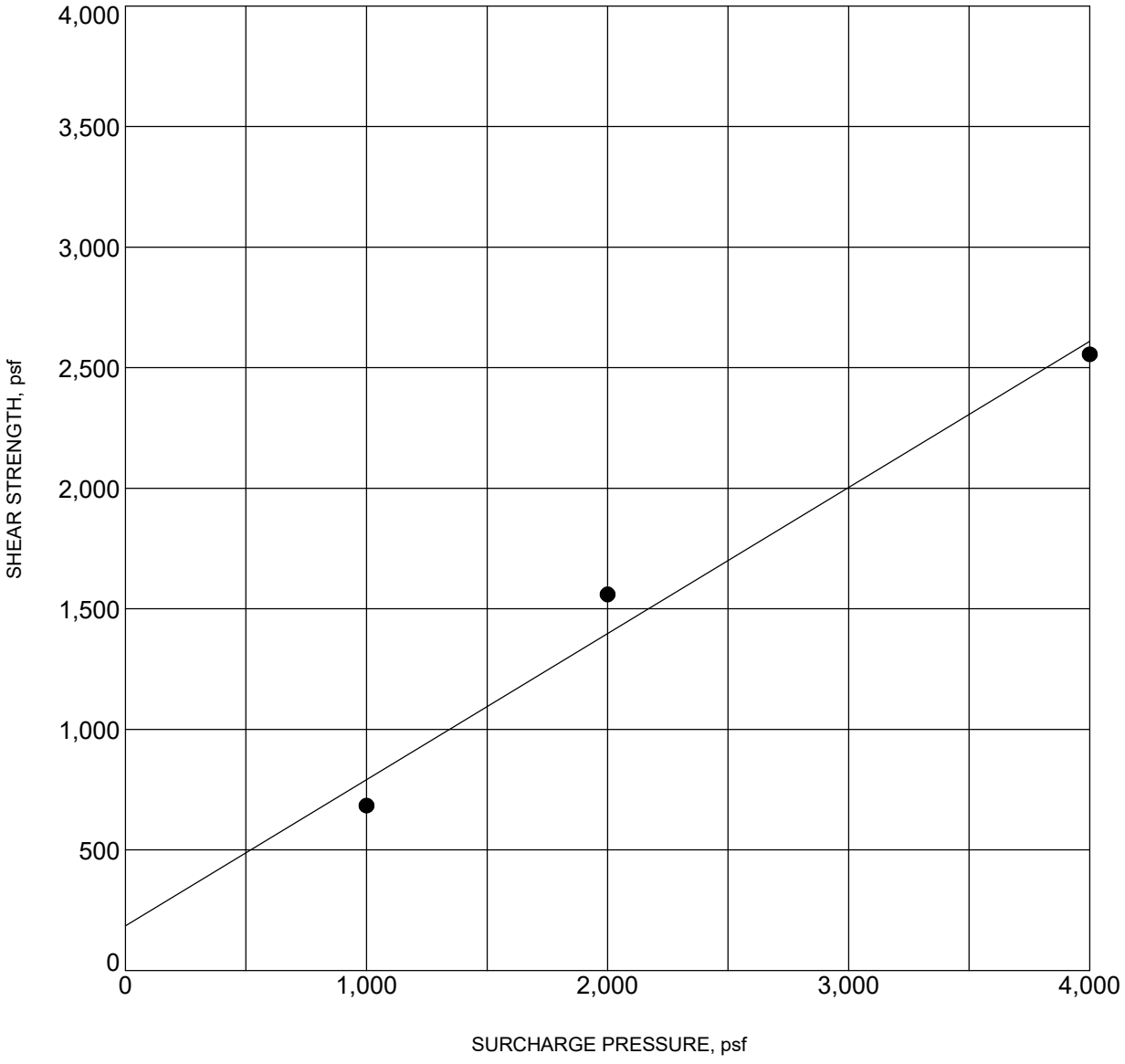


| | | | |
|---|---|---|---|
| BORING NO. : | **BH-07** | DEPTH (ft) : | **1.0-4.0*** |
| DESCRIPTION : | **SILTY SAND (SM)** | | |
| COHESION (psf) : | **190** | FRICTION ANGLE (degrees): | **31** |
| MOISTURE CONTENT (%) : | **12.7** | DRY DENSITY (pcf) : | **116.0** |

* Remolded to 90% laboratory maximum dry density

NOTE: Ultimate Strength.

# DIRECT SHEAR TEST RESULTS

Converse Consultants

Sares Regis North
Southwest Corner of Edison Avenue and Walker Avenue
City of Ontario, San Bernardino County, California
For: RCCD, Inc.

Project No. **24-81-184-01**

Drawing No. **B-5**

# Appendix C

## Liquefaction & Dynamic Settlement Analysis

# APPENDIX C

## LIQUEFACTION AND DYNAMIC SETTLEMENT ANALYSIS

The subsurface data obtained from the boring BH-05 was used to evaluate the liquefaction potential and associated dry seismic settlement when subjected to ground shaking during earthquakes.

A simplified liquefaction hazard analysis was performed using the program SPTLIQ (InfraGEO Software, 2021) using the liquefaction triggering analysis method by Boulanger and Idriss (2014). A modal earthquake magnitude of M 6.66 was selected based on the results of seismic deaggregation analysis using the USGS interactive online tool (https://earthquake.usgs.gov/hazards/interactive/).

A peak ground acceleration ($PGA_M$) of 0.749g for the MCE design event, where g is the acceleration due to gravity, was selected for this analysis. The PGA was based on the CBC seismic design parameters presented in Section 8.2, *CBC Seismic Design Parameters.* The result of our analysis is presented on Plates No. C-1 through C-3 and summarized in the following table.

**Table C-1, Estimated Dynamic Settlements**

| Location | Groundwater Conditions | Groundwater Depth (feet bgs) | Dry Seismic Settlement (inches) | Liquefaction Induced Settlement (inches) |
|---|---|---|---|---|
| BH-05 | Current | >50 | 1.01 | Negligible |
| | Historical | >50 | | |

Based on our analysis, the project site has the potential for up to 1.01 inches of dry seismic settlement with negligible liquefaction induced settlement under the current groundwater conditions. For design purpose, the dynamic differential settlement of the site should be equal to one-half of the total dry seismic settlement over a lateral distance of 40 feet.

# SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

(Copyright © 2015, 2021, SPTLIQ, All Rights Reserved; By: InfraGEO Software)

## PROJECT INFORMATION

| | |
|---|---|
| Project Name | Sares Regis North |
| Project No. | 24-81-184-01 |
| Project Location | City of Ontario, San Bernardino County, California |
| Analyzed By | Catherine Nelson |
| Reviewed By | Hashmi S. Quazi |

## SELECTED METHODS OF ANALYSIS

| | |
|---|---|
| Analysis Description | |
| Triggering of Liquefaction | Boulanger-Idriss (2014) |
| Severity of Liquefaction | LPI: Liquefaction Potential Index based on Iwasaki et al. (1978) |
| Seismic Compression Settlement (Dry/Unsaturated Soil) | Pradel (1998) |
| Liquefaction-Induced Settlement (Saturated Soil) | Ishihara and Yoshimine (1992) |
| Liquefaction-Induced Lateral Spreading | Zhang et al. (2004) |
| Residual Shear Strength of Liquefied Soil | Idriss and Boulanger (2008) |

## SEISMIC DESIGN PARAMETERS

| | | |
|---|---|---|
| Earthquake Moment Magnitude, $M_w$ | 6.66 | |
| Peak Ground Acceleration, $A_{max}$ | 0.75 | g |
| Factor of Safety Against Liquefaction, FS | 1.20 | |

## BORING DATA AND SITE CONDITIONS

| | | |
|---|---|---|
| Boring No. | BH-05 | |
| Ground Surface Elevation | 682.00 | feet |
| Proposed Grade Elevation | 682.00 | feet |
| GWL Depth Measured During Test | 52.00 | feet |
| GWL Depth Used in Design | 52.00 | feet |
| Borehole Diameter | 8.00 | inches |
| Hammer Weight | 140.00 | pounds |
| Hammer Drop | 30.00 | inches |
| Hammer Energy Efficiency Ratio, ER (%) | 86.00 | % |
| Hammer Distance to Ground Surface | 5.00 | feet |
| Topographic Site Condition: | TSC1 | (Level Ground with No Nearby Free Face) |
| - Ground Slope, S (%) | <<= Leave this blank | |
| - Free Face Distance to Slope Height Ratio, (L/H) | 5.00 | <<= Leave this blank Set H to zero =>> 15.00 feet |

## INPUT SOIL PROFILE DATA

| Depth to Top of Soil Layer (feet) | Depth to Bottom of Soil Layer (feet) | Material Type USCS Group Symbol (ASTM D2487) | Liquefaction Screening *Susceptible Soil? (Y, N)* | Total Soil Unit Weight $\gamma_t$ (pcf) | Type of Soil Sampler | Field Blow Count $N_{field}$ (blows/ft) | Fines Content FC (%) |
|---|---|---|---|---|---|---|---|
| 0.00 | 5.00 | SM | N | 119.9 | MCal | 47.00 | 28.30 |
| 5.00 | 7.50 | SM | Y | 126.5 | MCal | 47.00 | 28.30 |
| 7.50 | 10.00 | SC | Y | 132.2 | MCal | 31.00 | 30.00 |
| 10.00 | 15.00 | SC | Y | 130.2 | MCal | 27.00 | 30.00 |
| 15.00 | 20.00 | SC | Y | 129.2 | MCal | 25.00 | 30.00 |
| 20.00 | 25.00 | SP | Y | 110.5 | SPT1 | 33.00 | 20.00 |
| 25.00 | 30.00 | SM | Y | 134.6 | MCal | 30.00 | 28.30 |
| 30.00 | 35.00 | SM | Y | 141.5 | SPT1 | 12.00 | 28.30 |
| 35.00 | 40.00 | SM | Y | 135.7 | MCal | 43.00 | 28.30 |
| 40.00 | 45.00 | SM | Y | 141.6 | SPT1 | 16.00 | 28.30 |
| 45.00 | 50.00 | SM | Y | 135.6 | MCal | 84.00 | 28.30 |

# SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

(Copyright © 2015, 2021, SPTLIQ, All Rights Reserved; By: InfraGEO Software)

## PROJECT INFORMATION

| | |
|---|---|
| Project Name | Sares Regis North |
| Project No. | 24-81-184-01 |
| Project Location | City of Ontario, San Bernardino County, California |
| Analyzed By | Catherine Nelson |
| Reviewed By | Hashmi S. Quazi |

## SEISMIC DESIGN PARAMETERS

| | |
|---|---|
| Earthquake Moment Magnitude, $M_w$ | 6.66 |
| Peak Ground Acceleration, $A_{max}$ | 0.75 g |
| Factor of Safety Against Liquefaction, FS | 1.20 |

## BORING DATA AND SITE CONDITIONS

| | |
|---|---|
| Boring No. | BH-05 |
| Ground Surface Elevation | 682.00 feet |
| Proposed Grade Elevation | 682.00 feet |
| GWL Depth Measured During Test | 52.00 feet |
| GWL Depth Used in Design | 52.00 feet |
| Borehole Diameter | 8.00 inches |
| Hammer Weight | 140.00 pounds |
| Hammer Drop | 30.00 inches |
| Hammer Energy Efficiency Ratio, ER | 86.00 % |
| Hammer Distance to Ground Surface | 5.00 feet |
| Topographic Site Condition: | TSC1 (Level Ground with No Nearby Free Face) |
| - Ground Slope, S | 0.00 % |
| - Free Face (L/H) Ratio | 5.00 H = 15 feet |

## SUMMARY OF RESULTS

**Severity of Liquefaction:**

Total Thickness of Liquefiable Soils: 0.00 feet (cumulative total thickness in the upper 65 feet)

Liquefaction Potential Index (LPI): 0.00 *** (Very low risk, with no surface manifestation of liquefaction)

| Seismic Ground Settlements: | Analysis Method | Upper 30 feet | Upper 50 feet | Upper 65 feet | |
|---|---|---|---|---|---|
| Seismic Compression Settlement: | Pradel (1998) | 0.38 inches | 1.01 inches | 1.01 inches | (Dry/Unsaturated Soils) |
| Liquefaction-Induced Settlement: | Ishihara and Yoshimine (1992) | 0.00 inches | 0.00 inches | 0.00 inches | (Saturated Soils) |
| Total Seismic Settlement: | | 0.38 inches | 1.01 inches | 1.01 inches | |

| Seismic Lateral Displacements: | Analysis Method | Upper 30 feet | Upper 50 feet | Upper 65 feet | |
|---|---|---|---|---|---|
| Cyclic Lateral Displacement: | Tokimatsu and Asaka (1998) | 0.38 inches | 0.79 inches | 0.79 inches | (During Ground Shaking) |
| Lateral Spreading Displacement: | Zhang et al. (2004) | 0.00 inches | 0.00 inches | 0.00 inches | (After Ground Shaking) |

## NOTES AND REFERENCES

\+ This method of analysis is based on observed seismic performance of level ground sites using correlation with normalized and fines-corrected SPT blow count, $(N_1)_{60cs} = f\{(N_1)_{60}, FC\}$ where $(N_1)_{60} = N_{field}\, C_N\, C_E\, C_B\, C_R\, C_S$

++ Liquefaction susceptibility screening is performed to identify soil layers assessed to be non-liquefiable based on laboratory test results using the criteria proposed by Cetin and Seed (2003), Bray and Sancio (2006), or Idriss and Boulanger (2008).

* $FS_{liq}$ = Factor of Safety against liquefaction = (CRR/CSR), where $CRR = CRR_{7.5}\, MSF\, K_\sigma\, K_\alpha$, MSF = Magnitude Scaling Factor, $K_\sigma = f[(N_1)_{60}, \sigma'_{vo}]$, $K_\alpha$ =1.0, (level ground), CSR = Cyclic Stress Ratio = $0.65\, A_{max}\, (\sigma_{vo}/\sigma'_{vo})\, r_d$, and $CRR_{7.5}$ = Cyclic Resistance Ratio is a function of $(N_1)_{60cs}$ and corrected for an earthquake magnitude $M_w$ of 7.5.

** Residual strength values of liquefied soils are based on correlation with post-earthquake, normalized and fines-corrected SPT blow count derived by Idriss and Boulanger (2008).

*** Based on Iwasaki et al. (1978) and Toprak and Holzer (2003)

+ Reference: Boulanger, R.W. and Idriss, I.M. (2014), "CPT and SPT Based Liquefaction Triggering Procedures," University of California Davis, Center for Geotechnical Modeling Report No. UCD/CGM-14/01, 1-134.

## INPUT SOIL PROFILE DATA / LIQUEFACTION TRIGGERING ANALYSIS BASED ON R.W. BOULANGER AND I.M. IDRISS (2014) METHOD +

| Depth to Top of Soil Layer (feet) | Depth to Bottom of Soil Layer (feet) | Material Type USCS Group Symbol (ASTM D2487) | Liquefaction Susceptibility Screening ++ Susceptible Soil? (Y/N) | Total Soil Unit Weight $\gamma_t$ (pcf) | Type of Soil Sampler | Field SPT Blow Count $N_{field}$ (blows/ft) | Fines Content FC (%) | Total Vert. Stress (Design) $\sigma_{vo}$ (psf) | Effective Vert. Stress (Design) $\sigma'_{vo}$ (psf) | SPT Corr. for Vert. Stress $C_N$ | SPT Corr. for Hammer Energy $C_E$ | SPT Corr. for Borehole Size $C_B$ | SPT Corr. for Rod Length $C_R$ | SPT Corr. for Sampling Method $C_S$ | Corrected SPT Blow Count $N_{60}$ | Normalized SPT Blow Count $(N_1)_{60}$ | Fines Corrected SPT Blow Count $(N_1)_{60cs}$ | Shear Stress Reduction Coefficient $r_d$ | Correction for High Overburden Stress $K_\sigma$ | Cyclic Stress Ratio CSR | Cyclic Resistance Ratio CRR | Factor of Safety * $FS_{liq}$ | Liquefaction Analysis Results | Residual Shear Strength ** $S_r$ (psf) | Seismic Porewater Pressure Ratio $r_u$ (%) | Cumulative Seismic Settlement (inches) | Cumulative Cyclic Lateral Displacement (inches) | Cumulative Lateral Spreading Displacement (inches) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 5.00 | SM | N | 119.90 | MCal | 47.00 | 28.30 | 299.75 | 299.75 | | | | | | | | | 0.999 | | 0.486 | | | | | | 1.01 | 0.79 | 0.00 |
| 5.00 | 7.50 | SM | Y | 126.50 | MCal | 47.00 | 28.30 | 757.63 | 757.63 | 1.259 | 1.433 | 1.150 | 0.800 | 0.650 | 40.3 | 50.7 | 56.0 | 0.985 | 1.100 | 0.479 | | | | | | 1.01 | 0.79 | 0.00 |
| 7.50 | 10.00 | SC | Y | 132.18 | MCal | 31.00 | 30.00 | 1,080.97 | 1,080.97 | 1.227 | 1.433 | 1.150 | 0.850 | 0.650 | 28.2 | 34.6 | 40.0 | 0.974 | 1.100 | 0.474 | | | | | | 1.01 | 0.79 | 0.00 |
| 10.00 | 15.00 | SC | Y | 130.18 | MCal | 27.00 | 30.00 | 1,571.65 | 1,571.65 | 1.097 | 1.433 | 1.150 | 0.850 | 0.650 | 24.6 | 27.0 | 32.3 | 0.957 | 1.043 | 0.466 | | | | | | 0.99 | 0.75 | 0.00 |
| 15.00 | 20.00 | SC | Y | 129.21 | MCal | 25.00 | 30.00 | 2,220.13 | 2,220.13 | 0.959 | 1.433 | 1.150 | 0.950 | 0.650 | 25.4 | 24.4 | 29.8 | 0.931 | 0.983 | 0.453 | | | | | | 0.89 | 0.64 | 0.00 |
| 20.00 | 25.00 | SP | Y | 110.45 | SPT1 | 33.00 | 20.00 | 2,819.28 | 2,819.28 | 0.916 | 1.433 | 1.150 | 0.950 | 1.000 | 51.7 | 47.3 | 51.8 | 0.903 | 0.897 | 0.440 | | | | | | 0.75 | 0.52 | 0.00 |
| 25.00 | 30.00 | SM | Y | 134.56 | MCal | 30.00 | 28.30 | 3,431.81 | 3,431.81 | 0.804 | 1.433 | 1.150 | 0.950 | 0.650 | 30.5 | 24.6 | 29.8 | 0.873 | 0.914 | 0.425 | | | | | | 0.75 | 0.52 | 0.00 |
| 30.00 | 35.00 | SM | Y | 141.52 | SPT1 | 12.00 | 28.30 | 4,122.01 | 4,122.01 | 0.697 | 1.433 | 1.150 | 1.000 | 1.000 | 19.8 | 13.8 | 19.1 | 0.842 | 0.923 | 0.410 | | | | | | 0.63 | 0.41 | 0.00 |
| 35.00 | 40.00 | SM | Y | 135.66 | MCal | 43.00 | 28.30 | 4,814.96 | 4,814.96 | 0.746 | 1.433 | 1.150 | 1.000 | 0.650 | 46.1 | 34.4 | 39.6 | 0.811 | 0.778 | 0.395 | | | | | | 0.26 | 0.21 | 0.00 |
| 40.00 | 45.00 | SM | Y | 141.61 | SPT1 | 16.00 | 28.30 | 5,508.13 | 5,508.13 | 0.619 | 1.433 | 1.150 | 1.000 | 1.000 | 26.4 | 16.3 | 21.6 | 0.780 | 0.882 | 0.380 | | | | | | 0.21 | 0.14 | 0.00 |
| 45.00 | 50.00 | SM | Y | 135.60 | MCal | 84.00 | 28.30 | 6,201.16 | 6,201.16 | 0.901 | 1.433 | 1.150 | 1.000 | 0.650 | 90.0 | 81.0 | 86.3 | 0.749 | 0.661 | 0.365 | | | | | | 0.00 | 0.00 | 0.00 |

# SIMPLIFIED LIQUEFACTION HAZARDS ASSESSMENT USING STANDARD PENETRATION TEST (SPT) DATA

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| PROJECT INFORMATION | |
|---|---|
| Project Name | Sares Regis North |
| Project No. | 24-81-184-01 |
| Project Location | City of Ontario, San Bernardino County, California |
| Analyzed By | Catherine Nelson |
| Reviewed By | Hashmi S. Quazi |

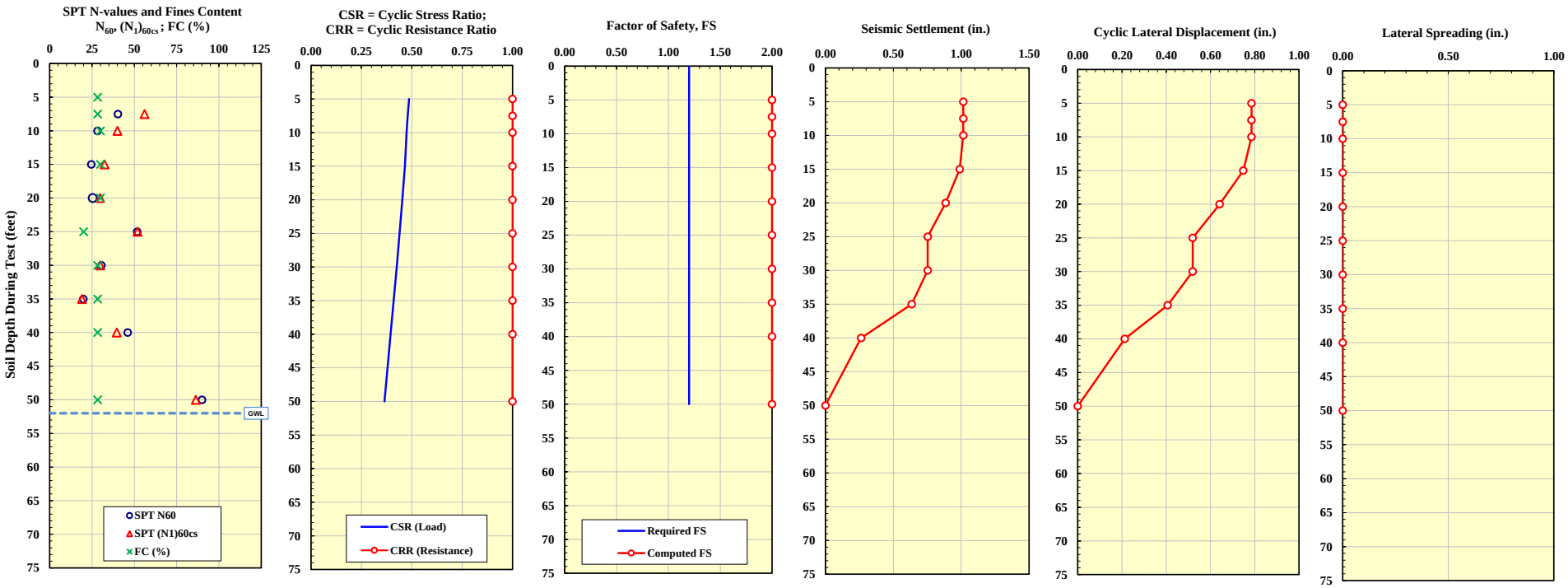


| Analysis Methods Used ==>> | Liquefaction Triggering: | | Seismic Settlements: | Cyclic Lateral Displacements: | Lateral Spreading: |
|---|---|---|---|---|---|
| | Boulanger-Idriss (2014) | Above GWL: | Pradel (1998) | Pradel (1998) | Zhang et al. (2004) |
| | | Below GWL: | Ishihara and Yoshimine (1992) | Tokimatsu and Asaka (1998) | |

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# Appendix D

## Earthwork Specifications

# APPENDIX D

# EARTHWORK SPECIFICATIONS

## D1.1 Scope of Work

The work includes all labor, supplies and construction equipment required to construct the building pads in a good manner, as shown on the drawings and herein specified. The major items of work covered in this section include the following.

- Site Inspection
- Authority of Geotechnical Engineer
- Site Clearing
- Excavations
- Preparation of Fill Areas
- Placement and Compaction of Fill
- Observation and Testing

## D1.2 Site Inspection

1. The Contractor should carefully examine the site and make all inspections necessary in order to determine the full extent of the work required to make the completed work conform to the drawings and specifications. The Contractor should satisfy himself as to the nature and location of the work, ground surface and the characteristics of equipment and facilities needed prior to and during prosecution of the work. The Contractor should satisfy himself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered. Any inaccuracies or discrepancies between the actual field conditions and the drawings, or between the drawings and specifications must be brought to the Owner's attention in order to clarify the exact nature of the work to be performed.
2. This *Preliminary Geotechnical Investigation and Organic Soil/Manure Evaluation Report, dated September 10, 2024,* by Converse Consultants may be used as a reference to the surface and subsurface conditions on this project. The information presented in this report is intended for use in design and is subject to confirmation of the conditions encountered during construction. The exploration logs and related information depict subsurface conditions only at the particular time and location designated on the boring logs. Subsurface conditions at other locations may differ from conditions encountered at the exploration locations. In addition, the passage of time may result in a change in subsurface conditions at the exploration locations. Any review of this information should not relieve the Contractor from performing such independent investigation and evaluation to satisfy himself as to the nature of the surface and subsurface conditions to be encountered and the procedures to be used in performing his work.

## D1.3 Authority of the Geotechnical Engineer

1. The Geotechnical Engineer will observe the placement of compacted fill and will take sufficient tests to evaluate the uniformity and degree of compaction of filled ground.
2. As the Owner's representative, the Geotechnical Engineer will (a) have the authority to cause the removal and replacement of loose, soft, disturbed and other unsatisfactory soils and uncontrolled fill; (b) have the authority to approve the preparation of native ground to receive fill material; and (c) have the authority to approve or reject soils proposed for use in building areas.
3. The Civil Engineer and/or Owner will decide all questions regarding (a) the interpretation of the drawings and specifications, (b) the acceptable fulfillment of the contract on the part of the Contractor and (c) the matters of compensation.

## D1.4 Site Clearing

1. Clearing and grubbing should consist of the removal from areas to be graded: all existing pavement, utilities, and vegetation.
2. Organic and inorganic materials resulting from the clearing and grubbing operations should be hauled away from the areas to be graded.

## D1.5 Excavations

Based on observations made during our field explorations, the surficial soils can be excavated with conventional earthwork equipment.

## D1.6 Preparation of Fill Areas

1. All highly organic soils, manure and debris should be removed from the proposed foundation, improvements and/or fill areas.
2. After the required removals have been made, the exposed earth materials (undocumented artificial fill, topsoil and the upper low-density portions of the alluvium), should be overexcavated to provide a zone of structural fill for the support of footings, slabs-on-grade, and exterior flatwork or proposed improvements. All loose, soft or disturbed earth materials should be removed from the bottom of excavations before placing structural fill. Any structures will require a minimum of 3.0 feet of compacted fill beneath building footings and 2.0 feet below any proposed wall footings or 5.0 feet below proposed grade, whichever is deeper.
3. The subgrade in all areas to receive fill should be scarified to a minimum depth of 6 inches. Scarification may be terminated on moderately hard to hard, cemented earth materials with the approval of the Geotechnical Engineer. The soil moisture should be adjusted to at least 2 percent above optimum for fine-grained soils and within 3 percent of optimum moisture content for granular soils, and then

compacted to at least 90 percent of the laboratory maximum dry density as determined by ASTM Standard D1557-12R21 test method.

4. Compacted fill may be placed on native soils that have been properly scarified and recompacted as discussed above.
5. All areas to receive compacted fill will be observed and approved by the Geotechnical Engineer before the placement of fill.

## D1.7 Placement and Compaction of Fill

1. Compacted fill placed for the construction of the embankment or for any planned structures will be considered structural fill. Structural fill may consist of approved on-site soils or imported fill that meets the criteria indicated below.
2. Fill consisting of selected on-site earth materials or imported soils approved by the Geotechnical Engineer should be placed in layers on approved earth materials. Soils used as compacted structural fill should have the following characteristics:
   a. All fill soil particles should not exceed 8 inches in nominal size and should not have an organic content greater than 2%, as well as free of matter and miscellaneous inorganic debris and inert rubble.
   b. Imported fill materials should have an Expansion Index (EI) of less than 20. All imported fill should be compacted to at least 90 percent of the laboratory maximum dry density (ASTM Standard D1557-12R21) at about 2 percent above optimum moisture for fine-grained soils, and within 3 percent of optimum for granular soils.
3. Fill exceeding 5 feet in height should not be placed on native slopes that are steeper than 5:1 horizontal:vertical (H:V). Where native slopes are steeper than 5:1 H:V, and the height of the fill is greater than 5 feet, the fill should be benched into competent materials. The height and width of the benches should be at least 2 feet.
4. Representative samples of materials being used, as compacted fill will be analyzed in the laboratory by the Geotechnical Engineer to obtain information on their physical properties. Maximum laboratory density of each soil type used in the compacted fill will be determined by the ASTM Standard D1557-12R21 compaction method.
5. Fill materials should not be placed, spread or compacted during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations should not resume until the Geotechnical Engineer approves the moisture and density conditions of the previously placed fill.
6. It should be the Grading Contractor's obligation to take all measures deemed necessary during grading to provide erosion control devices in order to protect slope areas and adjacent properties from storm damage and flood hazard originating on this project. It should be the Contractor's responsibility to maintain slopes in their as-graded form until all slopes are in satisfactory compliance with

job specifications, all berms have been properly constructed, and all associated drainage devices meet the requirements of the Civil Engineer.

## D1.8 Fill Slope Construction

1. Fill slopes placed above existing surfaces or cut slopes should be constructed with keyways.
2. Where fill is placed against existing slopes steeper than 5:1 H:V, the new fill slopes should be keyed and benched to provide increased lateral support after removal of the unsuitable surficial soils, when present.

## D1.9 Observation and Testing

1. During the progress of grading and trench backfill, the Geotechnical Engineer will provide observation of the fill placement operations.
2. Field density tests of all compacted fill will be made during grading and trench backfill to provide an opinion on the degree of compaction being obtained by the Contractor. Where compaction of less than specified herein is indicated, additional compactive effort with adjustment of the moisture content should be made as necessary, until the required degree of compaction is obtained.
3. A sufficient number of field density tests will be performed to provide an opinion to the degree of compaction achieved. In general, density tests will be performed on each one-foot lift of fill, but not less than one for each 500 cubic yards of fill placed.

**APPENDIX F**

## PHASE 1 ENVIRONMENTAL SITE ASSESSMENT

# Phase I Environmental Site Assessment

Edison Avenue and Walker Avenue
Ontario, California

March 24, 2025

Prepared for:

**Ontario Ranch Venture, LLC and**
**Ontario Ranch Venture II, LLC**

Prepared by:

**Roux Associates, Inc.**
5150 E. Pacific Coast Highway, Suite 450
Long Beach, California, 90804

3669.0004L101/R

Environmental Consulting
& Management
+1.800.322.ROUX
rouxinc.com

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# 1. Title Page

# Phase I Environmental Site Assessment

**Subject Property:**
Ontario Ranch Proposed Residential Development
Edison Avenue and Walker Avenue
Ontario, California

**Report Date:** March 24, 2025

**Site Visit Date:** January 22 and 31, 2025

**Database Report Date:** February 27, 2025

**Prepared by:**

Mauricio Escobar, Principal Geologist/Vice President
Kasia Anderson, Project Geologist

**Roux Associates, Inc**.
5150 East Pacific Coast Highway, Suite 450
Long Beach, California 90804
Main: 310-879-4900

# 2. Executive Summary

Ontario Ranch Venture, LLC and Ontario Ranch Venture II, LLC (the User) retained Roux Associates, Inc. (Roux) to perform a Phase I Environmental Site Assessment (ESA) of an approximately 180-acre rectangular parcel located south of Edison Avenue and west of Walker Avenue in the City of Ontario, California (Subject Property; Figures 1 and 2). The Subject Property is proposed for residential development and encompasses the northern half of the properties referred to by the User as the Ontario Ranch I and Ontario Ranch II properties (Figure 3). The Subject Property consists of all or portions of seven (7) individual properties referred to herein as the DeGroot Trust (DeGroot), Costa, GH Dairy, Alewyn, DeHoog I, DeHoog II, and Swager Properties (Figures 2 and 3 in Appendix A).Roux performed this Phase I ESA in general accordance with the American Society for Testing and Materials (ASTM) International *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E1527-21) in an effort to identify, to the extent feasible, the presence of Recognized Environmental Conditions (RECs) with respect to the Subject Property as defined in ASTM E1527-21. Exceptions to, or deletions from, this practice are described in Section 3 of this report.

On January 22 and 31, 2025, Roux representative Ms. Tahsin Annoor visually assessed the Subject Property for potential RECs, including, but not limited to, potential underground storage tanks (USTs), aboveground storage tanks (ASTs), polychlorinated biphenyl (PCB)-containing equipment, hazardous materials storage or handling areas, containerized or bulk wastes, and visual indications of impacted soil. At the time of this assessment, the properties were used as dairies and for residential purposes. The User purchased the Alewyn, DeHoog I, DeHoog II, and Swager Properties (associated with Ontario Ranch I) in 2022 and GH Dairy in 2024 and is considering purchasing the remaining portions of the Subject Property for residential development.

From at least 1938 to 1953, the Subject Property was used for agricultural purposes (row crops and orchards) with a few dwellings. By the mid-1950s, the Subject Property became increasingly used for dairy farming purposes. Each of the individual properties at the Subject Property are used for dairy farming purposes and are improved with at least one and up to three residences, a milking barn, wastewater pond(s), and various ancillary dairy farm structures including corral canopies, sheds, and feed silos.

Roux also performed a records review in an effort to identify potential RECs in connection with the Subject Property. This records review addressed the Subject Property and surrounding properties. Roux reviewed commercially available records associated with these nearby properties to assess potential concerns associated with the migration of hazardous substances. The records review also included reasonably ascertainable historical data, which can be helpful in identifying the past uses of the Subject Property and surrounding areas, as it may relate to the environmental condition of the Subject Property.

Roux performed interviews and file reviews with various government agencies and other parties with possible knowledge of the Subject Property and surrounding properties in an effort to identify current and past uses of the Subject Property and surrounding areas, as they may relate to the environmental condition of the Subject Property.

ASTM E 1527-21 defines:

A REC as:

> "The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not recognized environmental conditions."

A Controlled Recognized Environmental Condition (CREC) as:

> "A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a No Further Action (NFA) letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls)."

And a Historical Recognized Environmental Condition (HREC) as:

> "A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls). Before calling the past release a historical recognized environmental condition, the environmental professional must determine whether the past release is a recognized environmental condition at the time the Phase I ESA is conducted (for example, if there has been a change in the regulatory criteria). If the Environmental Professional considers the past release to be a recognized environmental condition at the time the Phase I ESA is conducted, the condition shall be included in the conclusions section of the report as a recognized environmental condition."

The term recognized environmental condition is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

This Executive Summary provides a brief overview of the findings of this Phase I ESA. Although the Executive Summary is an integral part of a report, it does not substitute for reading the entire report or the appended or referenced documents in order to fully understand the findings and potential environmental concerns associated with the Subject Property.

Based on the information obtained through the performance of this Phase I ESA, Roux identified the following REC:

**REC 1 – Historical Agricultural Use (Subject Property).** Based on the historical use of the Subject Property for agricultural purposes from at least the 1930s through 1950s, it is likely that pesticides were used. In 2005, soil sampling at the eastern portion of the Subject Property (Swager Property) was conducted to further investigate the potential presence of pesticides. No detectable to low concentrations of organochlorine pesticides were reported in the samples collected and all but one were below regulatory

screening levels. The sample that exceeded residential screening levels was collected from the central portion of the Swager Property and contained slightly elevated dieldrin.

**REC 2 – Vapor Encroachment Concern (Off-Site Hindelang Property).** Historical records for the south adjoining Hindelang Property (immediately south of the DeGroot Property) indicate that manufacturing of fiberglass camper shells from at least 1986 through 1992 included the use and storage of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-trichloroethane (1,1,1-TCA) and hydrocarbon solvents, rubber adhesive, etc. Previous environmental reports noted poor housekeeping practices and automobile repair operations at the Hindelang Property. Based on the documented use of chlorinated solvents (1,1,1-TCA), poor general housekeeping, and noted automobile repair operations, the south adjoining Hindelang Property represents a potential vapor encroachment concern and a REC.

Based upon the information described in this report, this Phase I ESA did not reveal evidence of CRECs, HRECs, or independent Business Environmental Risks (BERs) in connection with the Subject Property.

Other environmental features (OEFs) identified in connection with the current and historical operations at the Subject Property or adjacent properties include:

**OEF 1 – Dairy Farm Operations (Methane).** Due to the historical and current use of the Subject Property for dairy farming purposes, methane gas may be present in shallow soil. Methane gas is naturally produced during the biodegradation of organic matter such as animal manure. Based on the historical dairy farming land use of the Subject Property, methane gas surveys were reportedly completed by others at the Alewyn, DeHoog II, and Swager properties. Results of these surveys indicate sporadic elevated concentrations of methane gas exceeding the Lower Explosive Limit (LEL) of methane (i.e., 50,000 parts per million [ppm]).

Prior to the redevelopment of dairy farms, the City of Ontario Building Department requires that an investigation be performed to evaluate the possible build-up of methane gas in shallow soils and to determine the level of methane gas mitigation required. Proper removal and disposal of manure-laden shallow soil in accordance with local regulatory guidance may also be required prior to redevelopment of the Subject Property.

**OEF 2 – Private Groundwater Wells.** During the site reconnaissance, Roux observed a total of eight groundwater wells throughout the Subject Property that have been used for agricultural, residential, and/or dairy water supply purposes. Groundwater has been identified immediately south of the Subject Property to occur at depths of approximately 120 feet below the ground surface (bgs) and flows in a south to southwesterly direction. These features would not be considered an environmental concern to the Subject Property, but may need to be abandoned prior to redevelopment per State and County guidance.

**OEF 3 – Septic Systems.** Each residential structure on the Subject Property is reportedly equipped with a septic tank. Based on the non-hazardous nature of the domestic waste discharged to the septic systems, these represent an OEF.

**OEF 4 – Hazardous Materials Storage.** A total of eight ASTs containing diesel fuel were observed on the Subject Property including the DeGroot, Costa, GH Dairy, DeHoog II, and Swager Properties; the ASTs ranged from approximately 100 to 500 gallons in size. No significant signs of a release were observed in the vicinity of the ASTs. Additionally, various other chemicals associated with the dairy activities are stored in 55-

gallon drums and used on-site including, but not limited to, iodine, acid wash, and hydrogen peroxide for sanitation purposes. The hazardous material use on-site therefore represents an OEF.

**OEF 5 – Regional Dairy Farm Operations (Groundwater Degradation).** The Subject Property is located within the Chino Groundwater Basin. Concentrated animal feeding lots such as dairy farms can be a source of local groundwater degradation due to nitrates and total dissolved solids (TDS). According to information provided on the EPA website, the Chino Basin once had the highest concentration of dairy animals in the world, with approximately 350 dairies located within a 20-square mile area. Although the number of dairies has declined significantly, historical land application of manure and process water has resulted in significant groundwater degradation due to high levels of TDS and nitrate. The Dairy Farm General Permit was created to minimize continued degradation of groundwater in the Chino Basin as well as other parts of the Santa Ana Region. According to the California Regional Water Quality Control Board, Santa Ana Region (SARWQCB) website, the Subject Property is located within the Chino 2 "antidegradation" management zone which indicates that the SARWQCB has determined that the lowering of water quality is not of maximum benefit to the public. The SARWQCB has reportedly noted that new property owners are not being held liable for this regional issue associated with historical land uses. Based on the known regional groundwater degradation issues in the Chino Basin, the potential presence of elevated TDS and nitrates in groundwater beneath the Subject Property represents an OEF.

**OEF 6 – South Archibald TCE Plume.** The eastern portion of the Subject Property is located within a large regional VOC groundwater plume comprised mostly of trichloroethene (TCE), referred to as the South Archibald TCE Plume. This plume originates from a source approximately 1.7 miles northeast of the Subject Property as a result of historical land use of numerous metal plating and finishing facilities. Low concentrations of TCE were reported from 2017 to 2022 in groundwater from two on-site wells on the DeHoog II and Swager Properties at concentrations of 1.2 and 0.46 micrograms per liter (ug/l), respectively, well below the State Water Resources Control Board (SWRCB), Division of Drinking Water Maximum Contaminant Levels (MCLs) for TCE in drinking water of 5 ug/l. Based on the depth of groundwater and low concentrations of VOCs detected beneath the Subject Property, there is a low likelihood that a vapor intrusion issue is present. Since there are low concentrations of TCE detected beneath the Subject Property and no vapor intrusion issue is present, the regional TCE groundwater plume would be considered an OEF.

**OEF 7 – Former UST, 7587 Edison Avenue (DeGroot Property).** The DeGroot Property reportedly previously operated a 500-gallon diesel UST that was removed in 1987. In 2000, the San Bernardino County Fire Department (SBCFD) was informed of the UST removal following purchase of the property by Paul Huizenga and requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs in the reported location of the former UST. The laboratory results indicated no detectable concentrations of total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and xylenes (BTEX), and methyl tertiary butyl ether (MTBE). No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a NFA letter dated February 13, 2001. Based on this information, the former UST represents an OEF.

**OEF 8 – Former UST, 8185 Edison Avenue (Alewyn Property).** The Alewyn Property reportedly used a 250-gallon diesel UST that was removed in 1978 without regulatory oversight and no confirmation soil samples were collected. In 2021, soil samples were collected in the reported former location of the UST. Laboratory results indicated no detectable concentrations of total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) above laboratory reporting limits. Based on these results, the former 250-gallon

diesel UST would not be considered an environmental concern to the Subject Property and represents an OEF.

**OEF 9 – Former UST, 8311 Edison Avenue (DeHoog I Property).** The DeHoog I Property reportedly used a 500-gallon diesel UST that was removed in 1998 with oversight from the SBCFD. A soil sample was collected from beneath the center of the former tank location. The soil sample was analyzed for TPHg, BTEX, and MTBE. Laboratory results indicated no detectable concentrations of these constituents above laboratory reporting limits. Based on these concentrations, the UST was issued a NFA letter, dated January 6, 1999. Based on the regulatory closure and sampling results, the former UST would not be considered an environmental concern to the Subject Property and represents an OEF.

**OEF 10 – Former UST, 8381 Edison Avenue (DeHoog II Property).** A previous Phase I ESA completed by others included an interview with the former property owner, Mr. Joe De Hoog, in which Mr. De Hoog indicated that a 500-gallon gasoline UST was historically present immediately south of the detached three-car garage and was removed in the late-1970s. In 2021, soil samples were collected in the reported former location of the UST. Laboratory results indicated no detectable concentrations of TPH and VOCs above laboratory reporting limits. Based on these results, the former 500-gallon gasoline UST would not be considered an environmental concern to the Subject Property and represents an OEF.

Roux identified the following de minimis condition:

**De Minimis Condition 1 – Surficial Staining.** Roux observed evidence of surficial petroleum stains associated with aboveground storage tanks ASTs and/or equipment storage areas at the GH Dairy, Costa, and DeHoog II properties. The surficial staining noted on these properties appeared to be limited in scale and are not anticipated to present a threat to human health or the environment. A SMP should be implemented to manage any potentially impacted areas encountered during redevelopment of the Subject Property.

During conduct of this ESA, the following data gaps, as defined in ASTM Standard E1527-21, were identified:

- Previous Subject Property owners/operators were not available for an interview. This data gap is not considered significant due to sufficient information regarding Subject Property history available from Environmental Data Resources (EDR) historical documents, previous environmental reports for the Subject Property, GeoTracker and Freedom of Information Act (FOIA)/ Public Records Act (PRA) requests.

- During the site reconnaissance, Roux staff was provided guided access through the Alewyn, DeHoog I, Dehoog II and Swager properties. Roux's reconnaissance of the remaining properties, DeGroot, LMSAME and GH Dairy, was self-guided. Roux staff was not able to access the private residences, areas within the cattle corrals, feeding pastures, or other fenced areas. Due to the types of uses (residential, cattle corrals, etc.), the lack of entry into these areas is not considered a significant data gap in accordance with ASTM Standards.

- Due to time constraints associated with completion of this Phase I ESA, not all regulatory agencies have responded to public records requests. This data gap is not considered significant due to sufficient information regarding Subject Property history available from EDR historical documents, previous environmental reports for the Subject Property, and other regulatory agency responses.

- The DeGroot Property reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. During a property inspection in 1994, a SBCFD inspector was shown the removed

USTs, which were reportedly still stored on-site. The inspection report indicated the UST file had already been removed from the “alpha list” and that the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed and the location of these features was also not documented. Based on the lack of official regulatory closure following removal of the USTs, these USTs would be considered a data gap.

# 3. Qualifying Conditions

Roux Associates, Inc. (Roux) completed this Phase I Environmental Site Assessment (ESA) an approximately 180-acre rectangular parcel located south of Edison Avenue and west of Walker Avenue in the City of Ontario, California (the Subject Property). Figures 1 and 2 (Appendix A) show the location of the Subject Property. Roux performed this Phase I ESA in compliance with the scope and limitations of ASTM E1527-21 and the terms and conditions of Roux's proposal dated February 6, 2025. Roux conducted this Phase I ESA for the benefit of Ontario Ranch Venture, LLC and Ontario Ranch Venture II, LLC (the User).

The Subject Property is proposed for residential development and encompasses the northern half of the properties referred to by the User as the Ontario Ranch I and Ontario Ranch II properties (Figure 3). The Subject Property consists of all or portions of seven (7) individual properties referred to herein as the DeGroot Trust (DeGroot), Costa, GH Dairy, Alewyn, DeHoog I, DeHoog II, and Swager Properties (Figures 2 and 3 in Appendix A). The User purchased the Alewyn, DeHoog I, DeHoog II, and Swager Properties (associated with Ontario Ranch I) in 2022 and GH Dairy in 2024 and is considering purchasing the remaining portions of the Subject Property for residential development.

The following sections of this report present Phase I ESA findings and conclusions. Appendices presented at the end of the report consist of figures, photographic documentation, historic sources, a third party vendor database report, local and state agency records, records of communication, references, resumes for the individuals who prepared the Phase I ESA, previous investigations, regulatory records, closure reports, and permits.

## 3.1 Purpose

The purpose of this Phase I ESA is to identify and report, to the extent feasible, RECs with respect to the Subject Property. Performing a Phase I ESA in general compliance with ASTM E 1527-21 may enable a User to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner, or bona fide prospective purchaser defenses pursuant to the federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and the Small Business Liability Relief and Brownfields' Revitalization Act of 2002, 42 U.S.C. 9601-9675 (collectively referred to hereinafter as "CERCLA") liability. That is, the practice that constitutes one of the requirements for "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 USC Section 9601(35) (B).

## 3.2 Scope of Services

The scope of services for this Phase I ESA included, but was not limited to, the activities listed below.

- A review of reasonably ascertainable and practicably reviewable topographic maps, historical aerial photographs, and city directories, if available, to investigate past Subject Property conditions;
- A review of specific government lists pursuant to ASTM Standard E 1527-21 regarding environmental activities for the Subject Property and local area properties;
- A review of recorded land title records, building, assessors, and fire department records, for permits, citations, and reports connected to the Subject Property that were reasonably ascertainable, practicably reviewable, and publicly available within reasonable time and cost;

- An inspection by an environmental professional to investigate the current use of the Subject Property and to identify environmental concerns including but not limited to, the presence of hazardous substances or petroleum products, wastes, USTs, ASTs, or other environmental concerns;
- An inspection by an environmental professional to investigate the current use of the adjoining properties from reasonably available public viewpoints to identify the current use of these properties to identify environmental concerns including but not limited to, the presence of hazardous substances or petroleum products, wastes, USTs, ASTs, or other environmental concerns;
- Interviews with available representatives of the owner of the Subject Property, occupants, key Subject Property manager, and local government officials by an environmental professional; and
- Preparation of this Phase I ESA report.

Roux initiated this Phase I ESA pursuant to receipt of written authorization to proceed on January 8, 2025.

## 3.3 Standard of Care

Roux conducted this Phase I ESA using a defined scope of services considered appropriate and agreed upon by all parties on the date the service was authorized, unless the scope of services or the methods used were later modified, in writing, and accepted by all parties prior to performance. Roux conducted this Phase I ESA in accordance with generally accepted practices in a manner consistent with that level of care exercised by other members of our profession in the same locality and under similar conditions of time and accessibility of improvements and information. No other representations expressed or implied, and no warranty or guarantee is included or intended to be part of this Phase I ESA.

Please note that the scope of services performed in execution of this assessment may not be appropriate to satisfy the needs of other parties. We, therefore, are not responsible for independent conclusions, opinions, or recommendations of others based on our assessment. Furthermore, this Phase I ESA relates to the environmental conditions of the Subject Property and does not address issues raised in transactions such as business risk, purchase of business entities, or interests therein, or of their assets, that may well involve environmental liabilities pertaining to properties previously owned or operated or other offsite liabilities.

Additionally, the findings of this Phase I ESA are based on Roux's observations, inquiries, and historical research using reasonably ascertainable and practically reviewable information obtained within reasonable time and cost constraints. Roux does not represent that this Phase I ESA is an exhaustive investigation that reflects the findings of all of the information available for the Subject Property, nor is it representative of future Subject Property conditions. If additional information is generated from the Subject Property, it should be provided to Roux so that we may evaluate its impact on our conclusions. As such, activities or episodes that transpire subsequent to this Phase I ESA are not considered in this assessment. It is not intended that a Phase I ESA in accordance with ASTM E1527-21 be an exhaustive assessment of a property nor can it wholly eliminate uncertainty regarding the potential for RECs in connection with a property.

## 3.4 Assumptions

This Phase I ESA Report, including the exhibits attached hereto, describes the results of Roux's investigation to identify the presence of RECs connected with the Subject Property in accordance with ASTM E1527-21, as allowed by and consistent with the regulatory requirements of the All Appropriate Inquiry Rule, 40 CFR Part 312, Amendment to Standards and Practices for All Appropriate Inquires Under CERCLA, Final Rule, published December 30, 2021 (AAI Rule). Specifically, the preamble to the amended AAI Rule states:

*The Environmental Protection Agency (EPA) today is taking final action to amend the standards and practices for conducting all appropriate inquiries under the CERCLA to reference a standard practice recently made available by ASTM International, a widely recognized standards development organization. Specifically, this final rule amends the "All Appropriate Inquiries Rule" at 40 CFR Part 312 to reference ASTM International's E1527–21 "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" and make clear that persons conducting all appropriate inquiries may use the procedures included in this standard to comply with the All Appropriate Inquiries Rule*[1].

One of the requirements that a person acquiring real property must meet in order to qualify for either the innocent landowner, contiguous owner, or bona fide prospective purchaser (collectively hereinafter "Prospective Purchaser") defense to liability under CERCLA is that person must conduct all appropriate inquiries into the previous ownership and uses of the property in conformance with the AAI Rule (or the ASTM E1527-21) prior to acquisition of the property. The Client has acknowledged that, under the AAI Rule, Roux's performance of this Phase I ESA in accordance with ASTM E1527-21 will not alone result in the Client satisfying all requirements of the AAI Rule and will not in itself provide a defense to CERCLA liability. The Client has acknowledged that the AAI Rule also requires that the Prospective Purchaser undertake certain additional inquiries and post-acquisition activities to satisfy the CERCLA AAI requirements. Accordingly, Roux makes no guarantees or warranties, expressed or implied, regarding this Phase I ESA, including without limitation, that this Phase I ESA alone will qualify the Client for a defense to CERCLA liability.

Roux has performed this Phase I ESA in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. Professional judgments expressed herein are based on the facts currently available to Roux.

The AAI Rule requires, and the conclusions and recommendations stated herein represent, the application of a variety of engineering and technical disciplines to material facts and conditions associated with the Subject Property. As such, these conclusions and recommendations are based on subjective interpretations and the exercise of discretion based on the facts available to Roux and conditions at the time of the performance of this Phase I ESA. Many of these facts and conditions are subject to change over time. Accordingly, the conclusions and recommendations must be considered within this context.

Client has agreed that Roux shall not be responsible for conditions or consequences arising from relevant facts that were concealed, withheld, or not fully disclosed at the time this Phase I ESA was performed. To the extent practicable, Roux has identified data gaps, and has evaluated the potential significance of such data gaps. Recommendations to address those data gaps are presented herein and are based on the data available at the time of the performance of this Phase I ESA. Implementation of the recommendations may not fully address the data gaps, and the information obtained from execution of those recommendations may alter and/or modify the interpretation of the Subject Property conditions and conclusions, herein. This Phase I ESA does not include consideration of matters specifically excluded by ASTM E1527-21, including but not limited to, asbestos-containing building materials, radon, lead-based paint, lead in drinking water, wetlands,

[1] Federal Register: December 30, 2013 (Volume 78, Number 250) Page 79319

regulatory compliance, and mold unless specifically identified herein. PFAS[2] in drinking water was considered in this Phase I ESA as a REC.

This Phase I ESA Report should not be considered a legal interpretation of existing environmental laws and regulations. This Phase I ESA was conducted with a reasonable degree of inquiry to identify RECs, but uncertainty is not eliminated. No Phase I ESA can wholly eliminate uncertainty regarding the potential for RECs in connection with a property. The Phase I ESA process is intended to reduce, but not eliminate, the uncertainty involved with identifying RECs.

This Phase I ESA Report is not an appraisal or value judgment of the Subject Property. Client has agreed that Roux shall not be liable for any use of this Phase I ESA Report as an appraisal or value judgment of the Subject Property.

This Phase I ESA Report has been prepared for the exclusive use of Client for specific application to the Subject Property covered by this Phase I ESA Report. Client has agreed that, except as set forth in any written agreement by Roux, any third-party use of this Phase I ESA Report, upon disclosure by Client, is the sole responsibility and at the sole liability of Client.

## 3.5 Limitations and Exceptions

There were no limitations or exceptions associated with the performance of this Phase I ESA other than the data gaps identified in Section 3.8.

## 3.6 Special Terms and Conditions

There were no special terms and conditions associated with performing this assessment.

## 3.7 User Reliance

This report is confidential and has been prepared for the exclusive use of the User. No additional parties may use the information contained in this report without obtaining the written permission of Roux or the User. Roux's duties and obligations extend to the User and to no other party. Roux's duties and obligations to the User are not transferable to persons, corporations, or organizations without the express written consent of the User and Roux.

This Phase I ESA report must be read and interpreted as a whole and can only be considered representative of the conditions of the Subject Property as of the date of our site reconnaissance described herein. Roux makes no representation whatsoever concerning the condition of the Subject Property beyond the date of our site reconnaissance described herein. Individual sections and appendices of this report are dependent on the balance of this report, and on the terms, conditions, and stipulations contained in the proposal and written amendments accepted by Roux.

## 3.8 Data Gaps

During conduct of this ESA, the following data gaps, as defined in ASTM Standard E1527-21 were identified:

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[2] PFAS have been used in a wide variety of industrial and commercial processes and products and have been recently added to the hazardous substances list in the Commonwealth of Pennsylvania.

- During the site reconnaissance, Roux staff was provided guided access through the Alewyn, DeHoog I, Dehoog II and Swager properties. Roux's reconnaissance of the remaining properties, DeGroot, LMSAME and GH Dairy, was self-guided. Roux staff was not able to access the private residences, areas within the cattle corrals, feeding pastures, or other fenced areas. Due to the types of uses (residential, cattle corrals, etc.), the lack of entry into these areas is not considered a significant data gap in accordance with ASTM Standards.

- Previous site owners/operators were not available for an interview. This data gap is not considered significant due to sufficient information regarding Subject Property history available from EDR historical documents, previous environmental reports for the Subject Property, and FOIA/OPRA requests.

- Due to time constraints associated with completion of this Phase I ESA, not all regulatory agencies have responded to public records requests. This data gap is not considered significant due to sufficient information regarding Subject Property history available from EDR historical documents, previous environmental reports for the Subject Property, and other regulatory agency responses.

- The DeGroot Property reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. During a property inspection in 1994, a SBCFD inspector was shown the removed USTs, which were reportedly still stored on-site. The inspection report indicated the UST file had already been removed from the "alpha list" and that the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed and the location of these features was also not documented. Based on the lack of official regulatory closure following removal of the USTs, these USTs would be considered a data gap.

## 3.9 Deviations

Roux performed this assessment in accordance with the generally accepted practices for environmental assessments at the time of implementation. Roux made a reasonable effort to ensure that the information presented in this report is materially complete and accurate.

# 4. Property Overview

## 4.1 Site and Vicinity General Characteristics

The Subject Property is located southwest of the intersection of Edison Avenue and Walker Avenue in Ontario, California and consists of approximately 180-acres of mostly dairy farms and few residences. The Subject Property consists of seven (7) individual properties referred to herein as the DeGroot, Costa, GH Dairy, Alewyn, DeHoog I, DeHoog II, and Swager Properties (Figures 2 and 3 in Appendix A). Roux photographed the Subject Property to support this written report. Those photographs are included in **Appendix B** – Photographic Documentation. The following table presents the addresses and Assessor's Parcel Numbers (APNs) associated with the Subject Property.

| Property | Address | APN |
|---|---|---|
| DeGroot Trust | 7325, 7371, 7397, 7587, and 7697 Edison Avenue | 1053-371-01-0000<br>1053-371-02-0000 |
| Costa | 14213, 14239, 14279, 14283, and 14297 Bon View Avenue | 1053-351-01-0000<br>1053-351-02-0000 |
| GH Dairy | 7721, 7891, 8061, and 8065 Edison Avenue<br>14203 Bon View Ave | 1053-361-01-0000<br>1053-361-02-0000<br>1053-361-03-0000<br>1053-331-01-0000<br>1053-331-02-0000<br>1053-331-03-0000<br>1053-331-04-0000<br>1053-341-01-0000<br>1053-341-02-0000 |
| Alewyn | 8185 Edison Avenue<br>14117 Grove Ave | 0216-321-03-0000 |
| DeHoog I | 8245, 8295, 8285, and 8311 Edison Avenue | 0216-321-08-0000 |
| DeHoog II | 8335, 8377, and 8381 Edison Avenue | 0216-322-03-0000<br>0216-322-04-0000 |
| Swager | 8405 and 8485 Edison Avenue | 0216-322-10-0000 |

As depicted on the Prado Dam, California (2022) 7.5-minute quadrangle topographic map published by the United States Geological Survey (USGS) and included as **Appendix A** – Subject Property Location Map and the EDR Radius Report Map (EDR Report), the Subject Property has an approximate elevation of 682 feet above mean sea level (msl) and generally slopes to the south.

## 4.2 Current and Past Use of the Site

From at least 1938 to 1953, the Subject Property was used for agricultural purposes (row crops and orchards) with a few dwellings. By the mid-1950s, the Subject Property became increasingly used for dairy farm purposes with some residences.

At the time of this assessment, the Subject Property was used for dairy farming and residential purposes. Additional information regarding on-site features and current operations is discussed below in Section 7.

## 4.3 Current Uses of the Adjoining Properties

The Subject Property is located in a mixed agricultural/dairy farm and residential area. Current uses/occupants of surrounding properties are as follows and are presented on Figure 2:

- North – The Subject Property is bound to the north by Edison Avenue, beyond which are dairy farms, residences, a nursery, truck storage yards, and vacant land;
- East – The Subject Property is bound to the east by Walker Avenue, beyond which is a dairy farm and residences;
- South – The Subject Property is bound to the south by dairy farms and residences including the larger properties associated with the DeGroot, LMSAME, et al, Alewyn, DeHoog II, and Swager Properties, and a storage yard; and
- West – The Subject Property is bound to the west by a potting soil production property.

During the site visits on January 22 and 31, 2025, Roux did not identify RECs on the adjacent properties based on observations from public rights-of-way.

# 5. Property Background/Operating History

## 5.1 Historical Use Information

Pursuant to ASTM, Roux requested the following standard historical sources from EDR:

- Historical Sanborn fire insurance maps;
- Historical aerial photographs;
- Historical USGS 7.5-minute topographic quadrangle maps; and
- Local street directories.

Presented in the following sections is Roux's review of standard historical sources obtained during this Phase I ESA. Copies of the historical records that Roux obtained are included in **Appendix C** – Historic Sources.

### 5.1.1 Historical Sanborn Fire Insurance Maps

Roux requested historical Sanborn fire insurance maps from EDR. Sanborn Fire Insurance Maps were not identified for the Subject Property.

### 5.1.2 Historical Aerial Photographs

Roux requested from EDR a search for historical aerial photographs. Aerial photographs were provided by EDR for the years 1938 through 2020.

**DeGroot**

- **1938, 1946, 1948, and 1953** – The property consisted of agricultural land with approximately two residences present along Edison Avenue. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the northern portion of the property was expanding use for dairy farming and by 2002, the western and southwestern portions of the property were as well. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**Costa**

- **1938, 1946, 1948, and 1953** – The property consisted of agricultural land with a residence present along Bon View Avenue. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the property was expanding use for dairy farming. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**GH Dairy**

- **1938, 1946, 1948, and 1953** – The property consisted of mostly agricultural land with approximately two residences noted along the northern boundary of the property and a possible other residence was noted in the central portion of the property. Edison Avenue, Grove Avenue, and Bon View Avenue were present to the north, east, and west of this property. By 1946, an additional dwelling and a farm building associated with a dairy farm were developed in the northeast portion of the property. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the northwest portion of the property was expanding dairy farm uses and by 1975, the east portion of the

property was as well. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**Alewyn**

- **1938, 1946, 1948, and 1953** – The property was used for agricultural purposes or undeveloped land with a residence noted in the northwest corner of the property. The southern portion of the property appeared to consist of forested land. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the property was developed with the existing northeastern residence and hay barn and was partially developed for dairy farm use as noted by the presence of corrals. By 1985, the dairy farm uses expanded and a wastewater pond was noted in the southeast corner of the property. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**DeHoog I**

- **1938, 1946, 1948, 1953, and 1966** – The property appeared to consist of forested land. By 1966, the land was cleared and vacant. The property vicinity generally consisted of agricultural land and spare residences.
- **1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1975, the property was used for dairy farming purposes and feature residential buildings along the northern portion of the property along Edison Avenue. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**DeHoog II**

- **1938, 1946, 1948, and 1953** – The property consisted of agricultural land with two residences noted in the northeastern corner of the property. By 1946, corrals and a possible barn were noted west of the residences. The Subject Property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the dairy farming operations began expanding into the remainder of the property was as well. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

**Swager**

- **1938, 1946, 1948, and 1953** – The property consisted of agricultural land. The property vicinity generally consisted of agricultural land with sparce residences.
- **1966, 1975, 1987, 1989, 1990, 1994, 2002, 2006, 2009, 2012, 2016, and 2020** – By 1966, the property began development of a dairy farm with a residence. The property vicinity transitioned to agricultural and dairy farming operations during this timeframe as well.

### 5.1.3 Historical USGS Topographic Maps

Roux requested from EDR a search for historical USGS topographic maps. Coverage was available for select years from 1902 through 2022.

- **1902** – This map had a large scale and did not show site specific details, although the Subject Property and vicinity were generally depicted as vacant land.
- **1933, 1941, 1947, 1949, 1950, and 1967** – These maps depicted the Subject Property and vicinity as vacant land with sporadic residences. Bon View Avenue, Edison Avenue, and Grove Avenue were noted.
- **1973 and 1981** – The Subject Property showed evidence of dairy farm use. The Subject Property vicinity was increasingly depicted with likely dairy farm use.
- **2012, 2018, and 2022** – These maps did not show site specific details.

### 5.1.4 Local City Directories

Roux requested from EDR a search for city directories for select Subject Property addresses and the immediate vicinity. City directories between the years 1922 and 2020 were reviewed using select addresses for each property. Listings for the Subject Property included farming and/or residential occupant listings since at least 1960. Listings for the Subject Property vicinity reflected similar uses.

# 6. Environmental Setting

Roux obtained and reviewed published, reasonably ascertainable information concerning the physical setting of the Subject Property. The following is a summary of our review of those physical setting sources.

## 6.1 Topography

Roux reviewed the Prado Dam, CA (2021) 7.5-minute quadrangle topographic map showing the area in which the Subject Property is located (see **Appendix A** for Subject Property Location Map). The Subject Property slopes slightly to the south with an approximate elevation of 682 feet above msl.

## 6.2 Subsurface Geology and Hydrogeology

The table below, based on information obtained from the EDR Radius Map Report, the United States Department of Agriculture Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm), and the Statewide Geologic Map and Fault Activity Map of California (California Geological Survey, 1977) summarizes mapped geologic conditions in the vicinity of the Subject Property.

| Feature | Description |
|---|---|
| Surficial Geology | Quaternary age alluvium, lake, playa, and terrace deposits; unconsolidated and semi-consolidated |
| Soil | Tujunga loamy sand; Hilmar loamy fine sand; Grangeville fine sandy loam; Chino silt loam |

According to the *Winter and Spring 2024 Semiannual Groundwater Monitoring Report* by Tetra Tech, shallow groundwater at the northern portion of Chino Airport, located approximately 0.5-miles south of the Subject Property, occurs at depths of approximately 56 to 87 feet bgs and flows in a south to southwesterly direction. Based on State Water Resource Control Board (SWRCB) records for the south adjoining property, 14400 South Grove Avenue, groundwater was identified in 2004 at a depth of 120 feet bgs.

The Subject Property is located within the Chino Groundwater Basin. Concentrated animal feeding lots such as dairy farms can be a source of local groundwater degradation due to nitrates and TDS. According to information provided on the EPA website, the Chino Basin once had the highest concentration of dairy animals in the world, with approximately 350 dairies located within a 20-square mile area. Although the number of dairies has declined significantly, historical land application of manure and process water has resulted in significant groundwater degradation due to high levels of TDS and nitrate. The Dairy Farm General Permit was created to minimize continued degradation of groundwater in the Chino Basin as well as other parts of the Santa Ana Region. According to the California Regional Water Quality Control Board, Santa Ana Region (SARWQCB) website, the Subject Property is located within the Chino 2 “antidegradation” management zone which indicates that the SARWQCB has determined that the lowering of water quality is not of maximum benefit to the public. These contaminants do not pose a potential human health risk to occupants of the Subject Property.

Additionally, based on a review of the Chino Basin Watermaster online Map Viewer, the eastern portion of the Subject Property is located within a large regional VOC groundwater plume comprised mostly of TCE, referred to as the South Archibald TCE Plume. This plume originates from a source approximately 1.7 miles northeast of the Subject Property as a result of historical land use of numerous metal plating and finishing

facilities. Based on the 2022 State of the Basin Report, low concentrations of TCE were reported from 2017 to 2022 in groundwater from two on-site wells on the DeHoog II and Swager Properties at concentrations of 1.2 and 0.46 ug/l, respectively, well below the SWRCB, Division of Drinking Water MCLs for TCE in drinking water of 5 ug/l. Based on the depth of groundwater and low concentrations of VOCs detected beneath the Subject Property, there is a low likelihood that a vapor intrusion issue is present. At least three of the Subject Property occupants (Swager, DeHoog I, and DeHoog II Properties) have drinking water supplied by the City of Ontario. Based on the historical and current land use at the Subject Property (i.e., agricultural, diaries, and residential), there is a low likelihood that on-site land use activities have contributed to the regional groundwater issue. Groundwater monitoring within the plume area is on-going and a remediation system to treat the contaminated groundwater is currently in the design and permitting phases.

# 7. Results of On-Site Inspection

Roux representative Ms. Tahsin Annoor conducted a reconnaissance of the Subject Properties and surrounding areas on January 22 and 31, 2025. During the site reconnaissance, the weather was sunny and 75° Fahrenheit.

Roux's site reconnaissance methods included a site visit to physically observe the Subject Properties in an effort to identify RECs in connection with the Subject Properties. Ms. Tahsin Annoor traversed the Subject Properties to observe conditions during the site reconnaissance. Photographs taken to document conditions encountered at the time of the site reconnaissance are included in Appendix B – Photographic Documentation. Ms. Tahsin Annoor also visually and/or physically observed adjoining properties from reasonably accessible locations on the Subject Property and public thoroughfares. The following sections summarize observations during the inspection.

## 7.1 Discussion of Property Operations

At the time of the January 22 and 31, 2025 site visits, the Subject Property consisted of seven properties (referred to as the DeGroot, Costa, GH Dairy, Alewyn, DeHoog I, DeHoog II, and Swager Properties) that were occupied by dairy farms and/or residences. Roux staff was provided guided access through the Alewyn, DeHoog I, Dehoog II and Swager properties. Roux's reconnaissance of the remaining properties, DeGroot, LMSAME and GH Dairy, was self-guided. Roux staff was not able to access the private residences, areas within the cattle corrals, feeding pastures, or other fenced areas. Due to the types of uses (residential, cattle corrals, etc.), the lack of entry into these areas is not considered a significant data gap in accordance with ASTM Standards.

As previously noted, select properties located within the boundaries of the Subject Property are part of a larger property. The following presents a summary description of each property (or portions of properties thereof) as they pertain to the boundaries of the Subject Property:

- **DeGroot Property (portion) –** The DeGroot Property is part of a larger property, comprising of two parcels. The larger, northern parcel associated with APN: 1053-371-01-0000 is located within the Subject Property boundary. Within this select portion of the DeGroot property consists of an active dairy farm and is developed with two residences (7587 and 7697 Edison Avenue), a milking barn, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed one agricultural water well.

- **Costa Property (portion) –** The LMSAME Property is part of a larger property, comprising of six parcels. Two of these parcels, associated with APNs: 1053-351-01-0000 and 1053-351-02-0000, are located within the Subject Property boundary. Within the select portions of the LMSAME property consists of an active dairy farm and is developed with various private residence (14213 through 14297 Bon View Avenue), a milking barn, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed an agricultural water well and an in-ground truck scale.

- **GH Dairy Property –** The entirety of the GH Dairy Property is located within the Subject Property boundary. The GH Dairy Property consists of an active dairy farm and is developed with three residences (7721, 7891, and 8061 Edison Avenue), a milking barn, wastewater pond, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux observed one active agricultural water well, one active residential well, and one idle water well.

- **Alewyn Property (portion) –** The Alewyn Property is part of a larger property, comprising of three parcels. Of these, the larger, northern parcel associated with APN: 0216-321-03-0000 is located within the Subject Property boundary. Within this select portion of the Alewyn property is an active dairy farm and is developed with two residences (8185 Edison Avenue and 14117 Grove Avenue), a decommissioned milking barn, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed an agricultural water well.

- **DeHoog I Property –** The entirety of the DeHoog I Property is located within the Subject Property boundary. The DeHoog I Property consisted of an active dairy farm and is developed with two residences (8295 and 8311 Edison Avenue), a milking barn, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos.

- **DeHoog II Property (portion) –** The DeHoog II Property is part of a larger property, comprising of four parcels. Of these, the two northern parcels associated with APNs: 0216-322-03-0000 and 0216-322-04-0000 are located within the Subject Property boundary. Within the select portions of the DeHoog II Property is an active dairy farm and is developed with one single-family home (8381 Edison Avenue), a milking barn, an office building, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed agricultural water well and an in-ground truck scale.

- **Swager Property (portion) –** The Swager Property is part of a larger property, comprising of an approximately 36.95-acre parcel. In general, the northern half (approximately 18.48-acres) of the Swager Property is located within the Subject Property boundary. Within this select portion of the Swager Property is an active dairy farm and is developed with one single-family home (8485 Edison Avenue), an active milking barn, wastewater ponds, and various ancillary dairy farm structures including corral canopies, sheds, and feed silos. Roux also observed an agricultural water well.

The following sections summarize other of Roux's Subject Property reconnaissance observations.

## 7.2 Site Inspection Observations

### 7.2.1 Stained Soil, Pavement, or Interior Staining

Roux observed evidence of staining, unusual odors, petroleum sheens, or distressed vegetation at the Subject Property during the site visit on January 22 and 31, 2025. In general, Roux observed surficial staining in the milk barns and feed silos areas associated with the dairy farm operations. According to the staff, the staining observed in the milk barn and feed silos areas are a result of acid wash (a concentrated, non-foaming, tri-blend detergent) and molasses (liquid cattle feed), respectively. Roux also observed small areas of surficial staining along the area surrounding diesel ASTs observed in the LMSAME Property. Moderate to heavy oil staining was noted on and within the vicinity of the diesel ASTs located in the central area of the DeHoog II Property. This area of the DeHoog II Property appeared to concrete/asphalt paved, although the hardscape appeared to be damaged and/or broken.

During the January 2025 site reconnaissance, the surficial staining observed on the different properties located within the Subject Property appeared to be limited in scale and are not anticipated to present a threat to human health or the environment. The staining observed is considered to be de minimis in nature.

### 7.2.2 Wastewater

With the exception of DeGroot Property, wastewater ponds associated with dairy farm operations were observed on all properties located within the boundaries of the Subject Property. These ponds represent permitted features, and no chemical uses were noted to be associated with these features.

### 7.2.3 Oil/Water Separators (OWS)

No evidence of OWS were observed during the site reconnaissance on January 22 and 31, 2025.

### 7.2.4 Utilities

No utilities of environmental concern were noted during the site visit on January 22 and 31, 2025.

### 7.2.5 Flooring and Paved Surfaces

Flooring and paved surfaces were observed to be in good condition throughout the Subject Property. Surface staining was observed on the flooring and paved surfaces of several of the properties within the Subject Property as discussed in Section 7.2.1.

### 7.2.6 Surface Water

Wastewater ponds associated with dairy farm operations were observed on all properties with the exception of the portion of the DeGroot Property located within the Subject Property boundary.

### 7.2.7 Archeological / Endangered Species / Landmarks

No potential for historic landmarks/structures, and/or archaeological features were identified during the January 22 and 31, 2025 site visit.

### 7.2.8 Industrial Processes

Dairy farm operations were noted on the Subject Property during the January 22 and 31, 2025 site visit. Subject Property occupant activities include dairy farm operations, storage, shipping, and receiving of products. Milk manufacturing processes occur on-site.

### 7.2.9 Exterior Industrial Features

Exterior industrial features were observed by Roux during the January 22 and 31, 2025 site visit including milk barns, cattle corral canopies, and feed silos. No railroad spurs, baghouses, air emissions, or barrels were observed. All properties were equipped with milk ASTs and feed silos.

### 7.2.10 Interior Industrial Features

Interior industrial features were observed by Roux during the January 22 and 31, 2025 site visit including milk pump rooms and cattle wash areas.

### 7.2.11 Hydraulic Equipment and PCBs

During the Subject Property reconnaissance on January 22 and 31, 2025, Roux observed several single to triple pole-mounted electrical transformers along Bon View Avenue, and one triple pole-mounted transformer on the DeGroot Property. Based on the available information, all observed transformers are expected to be non-PCB containing and/or dry-type transformers. No staining was observed in the areas of the pole-mounted transformers; therefore, the transformers are not considered a REC and do not warrant additional investigation.

No hydraulic equipment was observed on the Subject Property during the January 22 and 31, 2025 site visit.

### 7.2.12 Surface Features

Roux did not observe landfills or evidence of dumping at the Subject Property during the site visit on January 22 and 31, 2025. Odors associated with dairy farm operations (manure, wastewater ponds) were observed throughout the Subject Property and surrounding area.

### 7.2.13 Aboveground Storage Tanks (ASTs) & Underground Storage Tanks (USTs)

The following features were noted during the January 22 and 31, 2025 site visit:

- **DeGroot Property –** Roux observed a 10,000-gallon water AST, one 10,000-gallon milk AST, two feed silos, and three 500-gallon diesel ASTs.

- **Costa Property –** Roux observed a 4,000-gallon water AST located south of the milk barn; a 500-gallon fuel AST; two 10,000-gallon milk ASTs located north and south of the milking barn; an emergency generator with a 100-gallon diesel fuel AST located immediately south of the milk barn.

- **GH Dairy Property –** Roux observed two 2,000-gallon water ASTs, a 4,000-gallon water AST, two 7,000-gallon milk ASTs, and two 4,000-gallon liquid feed ASTs, and an emergency electrical generator with a 100-gallon diesel fuel AST located immediately west of the milk barn.

- **Alewyn Property –** Roux observed a 2,500-gallon water AST, and 10,000-gallon milk barn wash AST located immediately east of the decommissioned milking barn.

- **DeHoog I Property –** Roux observed one steel AST for storing water west of the milking barn, and two additional ASTs located west of the milking barn, likely used to store water from an associated water well.

- **DeHoog II Property –** Roux observed an AST located southeast of the residence. This AST was viewed from a distance; therefore, the contents are not known. Roux also observed 12,000-gallon milking barn wash tank located in the central north boundary, a water well and associated 4,000-gallon water pressure AST located northwest of the office building, and an emergency generator with a 250-gallon diesel fuel tank located immediately east of the milking barn.

- **Swager Property –** Roux observed an emergency generator with a 200-gallon diesel fuel tank, a water well and associated 2,000-gallon water pressure AST, and a 12,000-gallon water AST located west of the milking barn.

### 7.2.14 On-site Chemical Storage

During the site visit on January 22 and 31, 2025, Roux observed chemical storage, specifically within milk barns, at all properties associated with the dairy farm operations. Chemicals observed in the milk barn areas included numerous 55-gallon drums of iodine, acid wash, and hydrogen peroxide for sanitation purposes.

### 7.2.15 Agricultural

Cattle wash and other sanitation chemicals, farm waste, and feed lot spoils, and wastewater ponds were seen used or stored on-site during the January 22 and 31, 2025 site visit on each of the dairy farm operations located on the Subject Property.

### 7.2.16 Oil / Gas / Mineral Exploration

Roux did not identify any well exploration or refinery activities during the site visit.

### 7.2.17 Asbestos-Containing Materials (ACM)

The manufacture of most ACMs in the United States was phased out in the 1970s. Based on the age of the buildings (1930s to mid-1960s), it is possible that ACM are present. Additionally, underground asbestos-cement pipelines (ACPs) were commonly used to transfer irrigation water. Based on the historical agricultural use of the Subject Property, ACPs may be present.

### 7.2.18 Lead Based Paint (LBP)

The manufacture of LBP was phased out in the United States in approximately 1978. Based on the age of the buildings (1930s to mid-1960s), it is possible that LBP are present.

### 7.2.19 Water Intrusion and Mold

No water intrusion or mold was noted during the site visit on January 22 and 31, 2025.

## 7.3 Interviews

During the site reconnaissance, Roux staff was provided guided access through the Alewyn, DeHoog I, Dehoog II and Swager properties by Mr. Jason Lee, a representative of the residential redevelopment contractor, RCCD, Inc. The information obtained is provided throughout the report.

Roux was unable to conduct interviews with previous site owners or operators. This data gap is not considered significant due to sufficient information regarding Subject Property history available from EDR historical documents, previous environmental reports for the Subject Property, GeoTracker and FOIA/PRA requests. The User was able to provide information and assist in identifying possible RECs in connection with the Subject Property.

## 7.4 User Provided Information

The following sections summarize information provided by the User to assist in identifying possible environmental concerns associated with the Subject Property.

ASTM E1527-21 provides an optional User Questionnaire to present select User-provided information that can assist in identifying possible RECs in connection with the Subject Property. According to ASTM E1527-21, these tasks do not require the technical expertise of an environmental professional and the environmental professional generally does not perform these tasks. Roux administered the optional questionnaire to the User at the beginning of this Phase I ESA to assist them with these tasks. The following sections outline the parts of the questionnaire that the User completed. The questionnaire was completed by Ms. Janine Padia, User representative. The completed questionnaire is provided in Appendix D.

### 7.4.1 Environmental Liens or Activity and Use Limitations

The User indicated that they have no knowledge regarding environmental liens or activity use limitations with respect to the Subject Property.

### 7.4.2 Specialized Knowledge

The User did not report any specialized knowledge related to the Subject Property or nearby properties. The User provided previous environmental reports summarized in Section 7.4.6.

### 7.4.3 Valuation Reduction for Environmental Issues

The User did not report any valuation reduction for environmental issues.

### 7.4.4 Commonly Known or Reasonably Ascertainable Information

The User did not report knowledge of any commonly known or reasonably ascertainable information, other than the historical use of the Subject Property includes dairy farm uses.

### 7.4.5 Specialized Knowledge

The User did not report specialized knowledge of the Subject Property.

### 7.4.6 Other User Provided Information

The User provided Roux with multiple previous environmental reports that included portions of the Subject Property. The Subject Property consists of the northern portions of larger properties referred to cumulatively as Ontario Ranch I and Ontario Ranch II (Figure 3). The Alewyn, DeHoog I, DeHoog II, and Swager properties of the Subject Property are associated with the northern portion of Ontario Ranch I. The DeGroot, LMSAME et al., and GH Dairy properties of the Subject Property are associated with the northern portion of Ontario Ranch II. The following presents a summary of the previous environmental reports provided by the User. Copies of these reports are provided in **Appendix D**.

#### *7.4.6.1 Previous Reports for Ontario Ranch I*

The following presents previous environmental reports associated with Ontario Ranch I. Only information associated with the Subject Property is included in these report summaries.

**Phase I ESA and Limited Site Characterization (LOR, 2005) – Swager Property**

At the time of LOR's report, the property was improved with the existing residence and dairy farm. The following presents the findings and conclusions:

- Three water wells were present on-site. If the wells are destroyed/abandoned during redevelopment, these activities should be completed in accordance with regulatory requirements.
- Due to the extensive dairy farming activities, the potential exists for elevated soil organic levels and the associated presence of subsurface methane gas.
- Portions of the property were utilized for agricultural purposes, therefore pesticides may be present in soils.

To further investigate the potential presence of pesticides, LOR conducted limited soil sampling for pesticides. Seven soil samples were collected in various locations throughout the property at depths of 6 to 12 inches bgs. Trace to low concentrations of organochlorine pesticides were detected in the sampled locations, below residential screening levels, except for one location. One soil sample from the center of the property reported slightly elevated dieldrin. Considering that this was an isolated area, the clearing and grading of the property will reduce the dieldrin level below screening levels, therefore unrestricted use of the property is warranted.

**Phase I ESA (GeoKinetics, 2006a) – DeHoog II Property**

At the time of GeoKinetics's report, the property was improved with the existing residence and dairy farm. The following presents the findings and conclusions:

- Due to the historic dairy farming activities since the 1940s, the potential exists for elevated soil organic levels and the associated presence of subsurface methane gas.
- Portions of the property were utilized for agricultural purposes between the early 1900s and early 1960s, therefore pesticides may be present in soils.
- Surficial staining was noted in various locations throughout the property.
- The on-site septic system will need to be properly removed prior to redevelopment.
- One active water supply well is present east of the milking barn and one sump and associated pump are located at the south end of the feed lanes, which should be abandoned during redevelopment of the property.
- Twelve ASTs are present on the property and should be properly removed and disposed of prior to redevelopment of the property.
- A 500-gallon gasoline UST was reportedly previously operated and removed during the 1970s and soil contamination was not detected.
- Organic rich sediment from wastewater holding ponds should be removed.

**Phase I ESA (GeoKinetics, 2006b) – Alewyn Property**

At the time of GeoKinetics's report, the property was improved with the existing residences and dairy farms. The following presents the findings and conclusions:

- Due to the historic dairy farming activities since the 1950s, the potential exists for elevated soil organic levels and the associated presence of subsurface methane gas.
- Portions of the property were utilized for agricultural purposes between the early 1900s and early 1950s, therefore pesticides may be present in soils.
- Surficial staining was noted in various locations throughout the property.
- The on-site septic system will need to be properly removed prior to redevelopment.
- Two active water supply wells and one sump and associated pump are present, which should be abandoned during redevelopment of the property.
- Nine ASTs are present on the property and should be properly removed and disposed of prior to redevelopment of the property.
- Underground clay drain lines should be removed.
- Organic rich sediment from wastewater holding ponds should be removed.

- A former 250-gallon diesel UST was reportedly removed from the northern dairy. Soil contamination was reportedly not encountered during the tank removal.

**Phase I ESA (GeoKinetics, 2007) – Swager Property**

At the time of GeoKinetics's report, the property was improved with the existing residence and dairy farm. The following presents the findings and conclusions:

- Due to the historic dairy farming activities since the 1960s, the potential exists for elevated soil organic levels and the associated presence of subsurface methane gas.
- Portions of the property were utilized for agricultural purposes between the early 1900s and early 1960s, therefore pesticides may be present in soils.
- Surficial staining was noted in various locations throughout the property.
- The two on-site septic systems will need to be properly removed prior to redevelopment.
- Three active water supply wells are present, which should be abandoned during redevelopment of the property.
- Four ASTs are present on the property and should be properly removed and disposed of prior to redevelopment of the property.
- Underground drain lines should be removed.
- Organic rich sediment from wastewater holding ponds should be removed.

**Phase I ESA (Hillman, 2014) – DeHoog I Property**

At the time of Hillman's report, the property was improved with the existing residence and dairy farm. The following presents the findings and conclusions:

- Chlorinated solvents identified in on-site well water from an upgradient source represents a REC.
- The likely use of pesticides represents a REC.
- Two large evaporation ponds were noted on the south portion of the Property. The evaporation ponds are likely to contain significant accumulations of organically rich sediment. Further, cleaning and sanitizing chemicals are reported to be washed down the barn floor drains to the ponds and spray fields. This was noted as a REC.
- A historic 500-gallon gasoline UST represents a hREC.

**Draft Phase I ESA (Ardent, 2021a)**

Ardent's Phase I ESA was completed for the entirety of Ontario Ranch I. At the time of Ardent's report, the Alewyn, DeHoog I, DeHoog II, and Swager properties were used as dairies. The Subject Property was mainly used for agricultural purposes from at least 1938 through 1953.

- Based on the historical dairy land use, methane gas surveys have been completed by others at the Alewyn, DeHoog II, and Swager properties. Results of these surveys indicate sporadic elevated concentrations of methane gas exceeding the Lower Explosive Limit (LEL) of methane (i.e., 50,000 ppm). Based on our experience, the City of Ontario will require the developer to complete a comprehensive methane gas survey under its jurisdiction following the removal of the source materials (i.e., organic debris) and grading activities to determine the type of methane gas mitigation system that will be required for the proposed buildings. At a minimum, the City requires a passive system. It has been our experience that methane gas surveys completed following the source removal and grading activities result in much lower concentrations (i.e., below guidelines requiring an active methane gas mitigation system). Due to the City requirement, the possible presence of methane gas beneath the site would be considered a de-minimis condition.

- There are 10 groundwater wells located throughout Ontario Ranch I that have been used for agricultural, residential, and/or dairy water supply purposes. These features would not be considered an environmental concern, however, would be identified as a de minimis condition by ASTM Standards. Other unknown wells may be present.

- The Alewyn Property reportedly operated a former 250-gallon diesel UST at JAD #1 was located immediately west of one of the groundwater wells and removed in 1978. This UST was removed prior to UST regulations, and therefore, no regulatory oversight or confirmation soil samples were collected. Based on this information, the former 250-gallon diesel UST at the Alewyn Property would be considered a REC.

- The DeHoog II Property reportedly operated a former 500-gallon gasoline UST was reportedly removed during the late-1970s. This UST was removed prior to UST regulations, and therefore, no regulatory oversight or confirmation soil samples were collected. Based on this information, the former 500-gallon gasoline UST at the DeHoog II Property would be considered an REC.

- Ardent noted that the Subject Property lies within the "South Archibald TCE Plume." Low concentrations of TCE were recently detected at the time of Ardent's report in groundwater from an on-site well, far below the state standards for purveyors of drinking water. Based on the depth of groundwater and low concentrations of VOCs detected beneath the Subject Property, Ardent concluded there is a low likelihood that a vapor intrusion issue is present. Based on the historical and current land use (i.e., agricultural, diaries, and residential), there is a low likelihood that on-site land use activities have contributed to the regional groundwater issue. Groundwater monitoring within the plume area is on-going and a remediation system to treat the contaminated groundwater is currently in the design and permitting phases. Since there are low concentrations of TCE detected beneath the Subject Property and no vapor intrusion issue is present, the regional TCE groundwater plume would be considered a de minimis condition.

- The site is located within the Chino Groundwater Basin. Groundwater in the basin has been reportedly contaminated with elevated salts, namely nitrates, associated with the historical agricultural and dairy activities in this area. According to the SARWQCB, new property owners are not being held liable for this regional issue associated with historical land uses. Groundwater in the basin is undergoing remedial treatment at designed desalination plants. Based on the agency involvement and active remediation, the regional groundwater nitrate issue associated with the Chino Groundwater Basin would be considered a CREC.

- Based on the age of the buildings (1930s to mid-1960s), it is possible that ACM and LBP are present. Based on the historical agricultural use at the site, underground ACPs were commonly used to transfer irrigation water. Based on this information, the possible presence of ACPs would be considered a de minimis condition.

**Draft Subsurface Investigation (Ardent, 2021b)**

Based on the preliminary findings of the Phase I ESA, Ardent completed a subsurface investigation to further evaluate potential impacts associated with the former 250-gallon diesel UST at the Alewyn Property (8185 Edison Avenue) and former 500-gallon gasoline UST at the DeHoog II Property. The location of the 250-gallon diesel UST former UST was generally provided by others in a previous 2006 Phase I ESA and general area was verified by the property owner during a site visit by Ardent personnel during completion of its Phase I ESA. Due to the small size and general location provided, Ardent drilled two soil borings at this location. The location of 500-gallon gasoline UST was verified by the property owner during a site visit by Ardent personnel during completion of its Phase I ESA. Due to the concretely identified location of the former UST, Ardent advanced one soil boring in the reported location of this former feature.

Borings were advanced to 15 feet bgs and soil samples were collected at 5, 10, and 15 feet bgs. Soil samples collected at 10 feet bgs from each boring (the anticipated bottom of the former excavation associated with the tanks) was analyzed for TPH and VOCs in general accordance with EPA Method Nos. 8015 (modified) and 8260B/5035. Laboratory results indicated no detectable concentrations of TPH and VOCs above laboratory reporting limits. Based on these results, the former 250-gallon diesel UST removed from the Alewyn Property and the 500-gallon gasoline UST removed from the DeHoog II property would no longer be considered an REC.

#### *7.4.6.2 Previous Reports for Ontario Ranch II*

The following presents previous environmental reports associated with Ontario Ranch II. Only information associated with the Subject Property is included in these report summaries.

**Draft Phase I ESA (Ardent, 2022)**

Ardent's Phase I ESA was completed for the entirety of Ontario Ranch II. At the time of Ardent's report, the GH Dairy and the DeGroot properties were used as dairies. The Costa Property (referred to by Ardent as the LMSAME et al. Property) was a vacant diary. Ardent identified the following findings and conclusions:

- Based on the historical land use of the site as a dairy, there is a moderate likelihood that methane gas might be present. Methane gas is naturally produced during the biodegradation of organic materials such as animal manure. Based on our experience, the City of Ontario will require the developer to complete a comprehensive methane gas survey under its jurisdiction following the removal of the source materials (i.e., organic debris) and grading activities to determine the type of methane gas mitigation system that will be required for the proposed buildings. Due to the City requirement, the possible presence of methane gas beneath the site would be considered a de-minimis condition.

- There are seven groundwater wells located on Ontario Ranch II that have been used for agricultural, residential, and/or dairy water supply purposes. These features would not be considered an environmental concern, however, would be identified as a de-minimis condition by ASTM Standards. Other unknown wells may be present.

- The DeGroot Property at 7325 Edison Avenue reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. A SBCFD inspector was present at the removal and indicated the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed. The location of these features was also not documented. Although no confirmation laboratory results were available for review, based on the County inspectors' closure, the small volume of the USTs, and depth to groundwater, there is a low likelihood that a significant release has occurred from these

USTs. Based on this information, these USTs would not be considered an environmental concern to the site.

- The DeGroot Property, 7587 Edison Avenue, reportedly used a 500-gallon diesel UST that was removed in 1987. When later informed of the removal, the SBCFD requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs. The laboratory results indicated no detectable concentrations of TPHg, BTEX, and MTBE. No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a no further action (NFA) letter dated February 13, 2001. Ardent agrees with this determination.

- The LMSAME,et al. Property, 14451 Bon View Avenue, reportedly removed a 550-gallon gasoline UST in 1998. A confirmation soil sample was collected. Laboratory results indicated no detectable to low concentrations of metals, TPHg, BTEX, and MTBE. Based on these results, the SBCFD issued a NFA letter dated May 5, 2000. Ardent compared these results to current regulatory guidelines. Based on these results, Ardent concurred with the SBCFD that no further work is needed.

- The Subject Property is located within the Chino Groundwater Basin. Groundwater in the basin has been reportedly contaminated with elevated salts, namely nitrates, associated with the historical agricultural and dairy activities in this area. According to the SARWQCB, new property owners are not being held liable for this regional issue associated with historical land uses. Groundwater in the basin is undergoing remedial treatment at designed desalination plants. Based on the agency involvement and active remediation, the regional groundwater nitrate issue associated with the Chino Groundwater Basin would be considered a CREC.

- Based on the age of the buildings (1930s to mid-1960s), it is possible that ACM and LBP are present. Based on the historical agricultural use at the site, underground ACPs were commonly used to transfer irrigation water. Based on this information, the possible presence of ACPs would be considered a de minimis condition.

**Phase I ESA (Roux, 2024)**

Roux's Phase I ESA was completed for the entirety of Ontario Ranch II. At the time of this assessment, the GH Dairy, Costa, and DeGroot properties were used as dairies and for residential purposes. From at least 1938 to 1953, the Subject Property was used for agricultural purposes (row crops and orchards) with a few dwellings. By 1966, the Subject Property became increasingly used for dairy farm purposes.

Based on the findings of the Phase I ESA, Roux identified the following other environmental features (OEFs) in connection with the current and historical operations at the Subject Property or adjacent properties:

**OEF 1 – Dairy Farm Operations (Methane).** Due to the historical and current use of the Subject Property for dairy farming purposes, methane gas may be present in shallow soil. Methane gas is naturally produced during the biodegradation of organic matter such as animal manure. Prior to the redevelopment of dairy farms, the City of Ontario Building Department requires that an investigation be performed to evaluate the possible build-up of methane gas in shallow soils. Proper removal and disposal of manure-laden shallow soil in accordance with local regulatory guidance may be required prior to redevelopment of the Subject Property.

**OEF 2 – Private Groundwater Wells.** During the site reconnaissance, Roux observed a total of eight groundwater wells throughout the Subject Property that have been used for agricultural, residential, and/or dairy water supply purposes. Groundwater has been identified at the Subject Property to occur at depths of approximately 120 feet bgs and flows in a south to southwesterly

direction. These features would not be considered an environmental concern to the Subject Property, but may need to be abandoned per State and County guidance.

**OEF 3 – Septic Systems.** Each residential structure on the Subject Property is reportedly equipped with a septic tank. Based on the non-hazardous nature of the domestic waste discharged to the septic systems, these represent an OEF.

**OEF 4 – Hazardous Materials Storage.** A total of five ASTs containing diesel fuel were observed on-site; the ASTs ranged from approximately 100 to 500 gallons in size. No secondary containment was observed with the exception of the two emergency generators which are typically constructed with built-in secondary containment. No significant signs of a release were observed in the vicinity of the ASTs. The on-site ASTs containing hazardous materials therefore represent an OEF.

**OEF 5 – Regional Dairy Farm Operations (Groundwater Degradation).** The Subject Property is located within the Chino Groundwater Basin. Concentrated animal feeding lots such as dairy farms can be a source of local groundwater degradation due to nitrates and TDS. According to information provided on the EPA website, the Chino Basin once had the highest concentration of dairy animals in the world, with approximately 350 dairies located within a 20-square mile area. Although the number of dairies has declined significantly, historical land application of manure and process water has resulted in significant groundwater degradation due to high levels of TDS and nitrate. The Dairy Farm General Permit was created to minimize continued degradation of groundwater in the Chino Basin as well as other parts of the Santa Ana Region. According to the SARWQCB website, the Subject Property is located within the Chino 2 “antidegradation” management zone which indicates that the SARWQCB has determined that the lowering of water quality is not of maximum benefit to the public. The SARWQCB has reportedly noted that new property owners are not being held liable for this regional issue associated with historical land uses. Based on the known regional groundwater degradation issues in the Chino Basin, the potential presence of elevated TDS and nitrates in groundwater beneath the Subject Property represents an OEF.

**OEF 6 – Former UST, 14451 Bon View Avenue.** A 550-gallon gasoline UST was removed from the LMSAME,et al. Property on October 28, 1998 with oversight from the SBCFD. One confirmation soil sample was collected from beneath the UST at a reported depth of 8 feet bgs. Laboratory results indicated low concentrations of lead, TPHg, BTEX, and MTBE. Based on these results, the SBCFD issued a NFA letter dated May 5, 2000. Roux compared these results to current regulatory screening levels for the protection of human health at commercial/industrial properties. Based on this review, the results do not exceed current regulatory screening levels. Therefore, Roux agrees with the SBCFD that no further investigation is necessary. Based on the confirmation sample results and regulatory oversight approval of no further investigation, this former UST represents an OEF.

**OEF 7 – Former UST, 7587 Edison Avenue.** The DeGroot Property reportedly previously operated a 500-gallon diesel UST that was removed in 1987. In 2000, the SBCFD was informed of the UST removal following purchase of the property by Paul Huizenga and requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs in the reported location of the former UST. The laboratory results indicated no detectable concentrations of TPHg, BTEX, and MTBE. No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a NFA letter dated February 13, 2001. Based on this information, the former UST represents an OEF.

**OEF 8 – Former UST, 7325 Edison Avenue.** The DeGroot Property reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. During a property inspection in 1994, a SBCFD inspector was shown the removed USTs, which were reportedly still stored on-site. The inspection report indicated the UST file had already been removed from the “alpha list” and that the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed and the location of these features was also not documented. Although no confirmation laboratory

results were available for review, based on the County inspectors' closure, the small volume of the USTs, and depth to groundwater, there is a low likelihood that a significant release has occurred from these USTs. Based on this information, these USTs would not be considered an environmental concern to the Subject Property and represent an OEF.

Roux identified the following de minimis condition:

**De Minimis Condition 1 – Surficial Staining.** Roux observed evidence of surficial petroleum stains associated with aboveground storage tanks ASTs and/or equipment storage and truck repair areas at the GH Dairy and Costa properties. The surficial staining noted on these properties appeared to be limited in scale and are not anticipated to present a threat to human health or the environment.

Roux identified an REC associated with two properties, referred to as the Hindelang and B&G Properties, within Ontario Ranch II that are located off-site immediately south of the eastern portion of the DeGroot Property.

**REC 1 – General Industrial Uses (Hindelang and B&G Properties).** Historical records for the Hindelang Property indicate that the property was used to manufacture fiberglass camper shells from at least 1986 through 1992. This operation reportedly used and stored small quantities of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-trichloroethane (1,1,1-TCA) and hydrocarbon solvents, rubber adhesive, etc. No other regulatory records associated with this facility were provided. During the site reconnaissance of the Hindelang Property, Roux observed general poor housekeeping practices and automobile repair operations. This property is unpaved outside of the storage building and automobile repair canopy areas. Based on the documented use of chlorinated solvents (1,1,1-TCA), lack of regulatory records, poor general housekeeping, and noted automobile repair operations, the general industrial uses of the Hindelang Property represent a REC.

Environmental database records for the B&G property report hazardous wastes including 0.17-tons of halogenated solvents (chloroforms, methyl chloride, perchloroethylene [PCE], etc.) in 1997. During Roux's site reconnaissance, access to this property was not provided, however, storage of large piles of tires was visible from the fence line and the property was noted to be unpaved. From a 2024 Google Earth aerial photograph of the property, possible soil stockpiles are visible along the western and eastern portions of the property. Based on the documented use of chlorinated solvents, lack of records providing clear information regarding the historical use of the property, and possible soil stockpiles, the general industrial uses of the B&G Property represent a REC.

# 8. Regulatory/Government Agency Inquiries

Roux contacted governmental agencies for reasonably ascertainable information concerning environmental conditions at the Subject Property. Roux contacted or reviewed information from the agencies in the following table. Copies of relevant records are provided in **Appendix E**.

| **Federal and State Agencies** | |
|---|---|
| U.S. Environmental Protection Agency (EPA) – FOIAonline | Roux was referred to the USEPA My Property Database. |
| U.S. EPA MyProperty Database | GH Dairy (7721 and 8061 Edison Avenue) and Costa (14213 Bon View Avenue) were listed for Waste Discharge Requirements associated with the dairy farm operations. |
| National Pipeline Mapping System (NPMS) Online Database | Gas Transmission and Hazardous Liquid pipelines were reported within 500 feet of the Subject Property running through Edison Ave. |
| State Water Resources Control Board (SWRCB): GeoTracker Online Database | Roux was provided a Waste Discharge permit associated with the DeGroot Property (7325 Edison Avenue). See below for further information. |
| SWRCB: Storm Water Multiple Application and Report Tracking System (SMARTS) Online Database | Listings were associated with wastewater discharge permits. See below for further information. |
| Department of Toxic Substances Control (DTSC) | No records were associated with the Subject Property. |
| DTSC: EnviroStor Online Database | No listings were associated with the Subject Property. |
| DTSC: Hazardous Waste Tracking System (HWTS) Online Database | Subject Property addresses 8061 Edison Avenue (GH Dairy) was listed with hazardous waste generator ID numbers, but no waste manifests were recorded. Listing on this database is for permitting purposes. |
| California Air Resources Board (CARB) | No records were associated with the Subject Property. |
| California Office of Environmental Health Hazard Assessment (OEHHA) | No response has been received as of this report date. |
| CalEPA CalRecycle | No records were associated with the Subject Property. |
| State of California Department of Conservation: Geological Energy Management (CalGEM) Online Database | No oil wells were associated with the Subject Property or located within 500 feet of the Subject Property. |

| Regional and Local Agencies | |
|---|---|
| Santa Ana Regional Water Quality Control Board (SARWQCB) | The SARWQCB referred Roux to records available on the GeoTracker online database. |
| South Coast Air Quality Management District (SCAQMD) Facility Information Detail (FIND) Online Database | Records were identified for the Facility and Subject Property and are discussed below. |
| San Bernardino County Fire Department | The SBCFD provided records associated with hazardous material permitting and inspections reports for various Subject Property addresses. Records provided also documented the removal of multiple USTs on the Subject Property. See below for further information. |
| City of Ontario Building Department | Various building records associated with the existing residential buildings and AST permits were provided. |

*SWRCB GeoTracker Database/SARWQCB*

Roux requested records from the SARWQCB for the Subject Property addresses. The SARWQCB shared a GeoTracker web-link for the Subject Property address 7325 Edison Avenue (DeGroot Property). These records were associated with Residuals Recovery Group, Inc. and included a Notice of Intent (NOI) for waste discharge requirements for composting operations from June 2021, an associated Technical Report from September 2023, and a Notice of Applicability (NOA) permitting the composting operations from November 2023. This permitted activity does not represent an environmental concern to the Subject Property.

*SWRCB SMARTS Database*

The Subject Property was listed on this database twice for 7325 Edison Avenue (DeGroot Property). One listing included the permit for Residuals Recovery Group, Inc. discussed above. The other listing was for Material Recovery Solutions, Inc. and associated with the management of dairy wastewater collection, retention and disposal system at the SNS Dairy operation. Wastewater/stormwater is stored in on-site retention ponds.

The Subject Property was also listed for 8381 Edison Avenue (DeHoog II Property). Records included a Notice of Intent to discharge stormwater.

*South Coast Air Quality Management District (SCAQMD) FINDS Database*

Records available on the FINDS online database include emissions permits for 7325 and 7587 Edison Avenue (DeGroot Property) associated with the dairy farm and composting operations and permits for an emergency electrical generator. Records for the 8061 Edison Avenue (GH Dairy Property) included emissions permits for the dairy farm operations and for an emergency electrical generator. Records for 8311 Edison Avenue (DeHoog I Property) included a permit to operate a 500-gallon gasoline AST from 1971. Records for 8381 Editon Avenue (DeHoog II Property) included emissions permits for the dairy farm operations and for an emergency electrical generator. Records for 8485 Edison Avenue (Swager Property) included emissions permits for the dairy farm operations. The Alewyn Property (8185 Edison Avenue) was listed with the Facility ID 147414 and was reportedly issued a Notice to Comply in 2006 associated with a diesel powered emergency generator, which was brought to compliance.

*San Bernardino County Fire Department*

Roux requested records from the SBCFD associated with the known current and historical Subject Property addresses. The SBCFD provided records associated with the following Subject Property addresses: 8311 Edison Avenue (DeHoog I Property), 8381 Edison Avenue (DeHoog II Property), 7325, 7371, 7587 Edison Avenue (DeGroot Property), 7721 and 8061 Edison Avenue (GH Dairy), 14213 Bon View Avenue (Costa Property), 8185 Edison Avenue (Alewyn Property), and 8485 Edison Avenue (Swager Property). A majority of the records provided by the SBCFD were associated with permits and inspection reports for hazardous materials associated with the dairy operations, including the storage of chemicals such as soap detergent, acid cleaner, chlorine bleach, iodine, sodium hypochlorite, diesel fuel, etc. No environmentally significant violations were noted.

The following presents a summary of the UST records for the Subject Property. It should be noted that earlier SBCFD documents reportedly indicated the Subject Property addresses as located in the City of Chino, rather than Ontario.

**DeGroot Property**

**7325 Edison Avenue**

The DeGroot Property reportedly used a 500-gallon UST and a 1,000-gallon UST, which were removed in 1992. During a property inspection in 1994, a SBCFD inspector was shown the removed USTs, which were reportedly still stored on-site. The inspection report indicated the UST file had already been removed from the “alpha list” and that the file was to be closed. No confirmation soil sample results were provided in regulatory files reviewed and the location of these features was also not documented. Although no confirmation laboratory results were available for review, based on the County inspectors’ closure, the small volume of the USTs, and depth to groundwater, there is a low likelihood that a significant release has occurred from these USTs. Based on this information, these USTs would not be considered an environmental concern to the Subject Property.

**7587 Edison Avenue**

The DeGroot Property reportedly previously operated a 500-gallon diesel UST that was removed in 1987. In 2000, the SBCFD was informed of the UST removal following purchase of the property by Paul Huizenga and requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs in the reported location of the former UST. The laboratory results indicated no detectable concentrations of TPHg, BTEX, and MTBE. No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a NFA letter dated February 13, 2001.

**Alewyn Property**

**8185 Edison Avenue**

An inspection of the property was conducted in 2007 and a Notice of Violation was issued due to the removal of the 250-gallon UST in 1978 without regulatory oversight or confirmation soil samples being collected.

**DeHoog I Property**

**8311 Edison Avenue**

The DeHoog I Property reportedly previously operated a 500-gallon gasoline UST that was removed in 1998. A Site Closure report by A&J Environmental, dated November 30, 1998 indicated that the UST removal activities were overseen by the SBCFD and a soil sample was collected from beneath the center of the former tank location. The soil sample was analyzed for TPHg, BTEX, and MTBE. Laboratory results indicated no detectable concentrations of these constituents above laboratory reporting limits. Based on these concentrations, the UST was issued a NFA letter, dated January 6, 1999. Based on the regulatory closure and sampling results, the former UST would not be considered an environmental concern to the Subject Property.

## 8.1 Vapor Encroachment Condition

In accordance with ASTM E2600 Standard Guide for Vapor Encroachment Screening and in accordance with applicable federal and local guidance Roux conducted a review of potential vapor encroachment concerns at the Subject Property.

Historical records for the south adjoining Hindelang Property indicate that the property was used to manufacture fiberglass camper shells from at least 1986 through 1992. This operation reportedly used and stored small quantities of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-trichloroethane (1,1,1-TCA) and hydrocarbon solvents, rubber adhesive, etc. No other regulatory records associated with this facility were provided. Previous environmental reports that include this property note poor housekeeping practices and automobile repair operations. Based on the documented use of chlorinated solvents (1,1,1-TCA), poor general housekeeping, and noted automobile repair operations, the south adjoining Hindelang Property represents a potential vapor encroachment concern.

## 8.2 Standard Environmental Record Sources

According to ASTM Standard E1527-21, the purpose of reviewing regulatory records is to obtain and review records that will help identify RECs in connection with the Subject Property. In addition, some records to be reviewed pertain not only to the Subject Property, but also to properties within an additional “approximate minimum search distance” in order to help assess the likelihood of problems from migrating hazardous substances or petroleum products. The basis of the “approximate minimum search distance” is the Subject Property boundary.

Roux retained EDR of Shelton, Connecticut to provide an EDR Report for this Subject Property. This report is a computerized search of select state and federal environmental databases that identify various properties with a record of environmental activity. Roux reviewed the report and summarized the relevant findings in the following sections. A copy of the compiled EDR Report has been included in **Appendix F** – Third Party Vendor Database Report.

The following sections describe the findings of the database search. Properties that meet the criteria presented below are discussed in this report.

- Properties with listings indicative of a release (e.g., State Hazardous Waste Sites [SHWS], LUST, VCP, RELEASE). Nonadjacent sites with hazardous waste generator, FINDS, ECHO, NPDES, AIRS, or UST listings only will not be discussed in this report.

- Properties adjoining the Subject Site are examined due to their proximity to the Subject Site and the potential for surface water discharges (e.g., storm water runoff, surface water effluent discharges) to enter the Subject Site or through the migration of groundwater.
- Properties located within 1/8-mile topographically upgradient of the Subject Property. Based on local topography and drainage, groundwater flow in the Subject Property vicinity is interpreted to be to the south/southeast. Therefore, properties considered upgradient are located north/northwest of the Subject Property. Sites that are located downgradient or cross gradient to the Subject Property but do not adjoin the Subject Property are not discussed in this report.

### 8.2.1 Subject Property

An EDR Report was generated on February 27, 2025, and is provided in **Appendix F**. The Subject Property was identified on the following databases searched by EDR.

**DeGroot**

- **7325 Edison Avenue:** SWF/LF, LDS, NPDES, CERS

  The SWF/LF listings Residuals Recovery Group and Recycled Wood Products indicate the facility is actively used as an agricultural material composting operation.

- **7371 Edison Avenue:** San Bernardino County Permit

  This listing for SNS Dairy reports an inactive permit from 1997 with no additional relevant details.

- **7397 Edison Avenue:** FINDS, CIWQS
- **7587 Edison Avenue:** AST, EMI, ENF, CIWQS, CERS, EMI, San Bernardino County Permit, UST

  These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1990s with animal wastewater discharge. The AST and UST databases did not provide any detailed information.

**Costa**

- **14213 Bon View Avenue:** FINDS, ECHO, WDS, ENF, San Bernardino County Permit, CIWQS, CERS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1980s with animal wastewater discharge.

**GH Dairy**

- **7721 Edison Avenue:** ENF, San Bernardino County Permit, CIWQS
- **8061 Edison Avenue:** ECHO, FINDS, EMI, ENF, HWTS, San Bernardino County Permit, CIWQS, CERS, WDS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1990s with animal wastewater discharge.

**Alewyn**

- **8185 Edison Avenue:** ENF, San Bernardino County Permit, UST, SWEEPS UST, CA FID UST, HIST UST, CIWQS, FINDS, WDS, ECHO, CERS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1980s with animal wastewater discharge. The UST databases are associated with the former 250-gallon UST discussed above in Section 8.

**DeHoog I**

- **8311 Edison Avenue:** ENF, San Bernardino County Permit, CIWQS, ECHO, CERS, FINDS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least 2001 with animal wastewater discharge.

**DeHoog II**

- **8381 Edison Avenue:** ENF, San Bernardino County Permit, CIWQS, ECHO, CERS, FINDS, AST

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least the 1980s with animal wastewater discharge. The AST database did not provide any detailed information.

**Swager**

- **8485 Edison Avenue:** HIST UST, WDS

These listings indicate the Subject Property has been used and permitted for dairy farming purposes since at least 1994 with animal wastewater discharge. The HIST UST database is associated with the former 250-gallon UST at the Alewyn Property (8185 Edison Avenue).

### 8.2.2 Site Vicinity

Roux reviewed a Database Report prepared by EDR for the Subject Property. A copy of the Database Report is provided in **Appendix F**. Based on Roux's review, facilities near the Subject Property were generally reported as dairy farms and listed on similar databases to the Subject Property. One notable upgradient facility was identified and is summarized below:

- Redwood Products of Chino Inc., located at 13814 South Grove Avenue, approximately 0.32-miles north to northeast of the Subject Property, was listed on the SWF/LF, CERS HAZ WASTE, CERS TANKS, LDS, HWTS, San Bernardino County Permit, and CERS databases. These databases indicate this facility is an active green materials transfer and processing operation. No hazardous material/waste releases have been reported at this facility.

Based on the information listed in the databases, this facility is not considered a REC.

### 8.2.3 Orphan Sites

The EDR Report includes a section addressing "Orphan Sites." Orphan sites are sites, which, due to incomplete geographic location data, incomplete address information or incorrect address information, cannot be plotted correctly. The database report identified thirteen unmapped facilities. Based on the noted locations or listed databases, these listings are not considered to represent RECs in the context of this Phase I ESA.

# 9. Small Business Administration

Reliance to the US Small Business Administration and the participating Community Development Corporation is not applicable. Therefore, a reliance letter will not be provided at this time.

# 10. Conflict Certification

Roux has no present or contemplated future ownership interest or financial interest in the real estate that is the subject of this Report; and Roux has no personal interest with respect to the subject matter of the Report of the parties involved and consultant has no relationship with the property or the owners thereof which would prevent an independent analysis of the environmental or other conditions of the property.

# 11. Environmental Professional Statement

Roux performed this assessment in accordance with the generally accepted practices for environmental assessments at the time of implementation. Roux made a reasonable effort to ensure that the information presented in this report is materially complete and accurate.

Roux completed a Phase I ESA in general compliance with the scope and limitations of ASTM Practice E1527-21 of the 180-acre proposed residential development property south of Edison Avenue and west of Walker Avenue in the City of Ontario, California.

"We declare that, to the best of our professional knowledge and belief, we meet the definition of Environmental professional as defined in §312.10 of 40 CFR 312" and,

"We have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject property. We have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312."

Roux performed this Phase I ESA by, or under direct supervision of, the undersigned environmental professionals. Resumes are included in **Appendix G**. Resumes for the individuals who prepared the Phase I ESA**.**

Respectfully Submitted,

**ROUX ASSOCIATES, INC.**

Kasia Anderson
Project Geologist

Mauricio H. Escobar, P.G.
Vice President / Principal Geologist

# 12. Conclusions, Opinions and Recommendations

Roux has performed this Phase I ESA in general compliance with the scope and limitations of ASTM Standard Practice E1527-21. Roux separated the findings of this assessment into the following four categories: RECs, controlled RECs, historical RECs and de minimis conditions. Exceptions to or deletions from this practice are described in Section 3.5 and Section 3.8 of this report.

## 12.1 Recognized Environmental Conditions

Based on the information obtained through the performance of this Phase I ESA, Roux identified the following REC:

**REC 1 – Historical Agricultural Use (Subject Property).** Based on the historical use of the Subject Property for agricultural purposes from at least the 1930s through 1950s, it is likely that pesticides were used. In 2005, soil sampling at the eastern portion of the Subject Property (Swager Property) was conducted to further investigate the potential presence of pesticides. No detectable to low concentrations of organochlorine pesticides were reported in the samples collected and all but one were below regulatory screening levels. The sample that exceeded residential screening levels was collected from the central portion of the Swager Property and contained slightly elevated dieldrin.

**REC 2 – Vapor Encroachment Concern (Off-Site Hindelang Property).** Historical records for the south adjoining Hindelang Property (immediately south of the DeGroot Property) indicate that manufacturing of fiberglass camper shells from at least 1986 through 1992 included the use and storage of hazardous materials including polyester resin, polyester gel coat, MEK peroxide catalyst, acetone, 1,1,1-TCA and hydrocarbon solvents, rubber adhesive, etc. Previous environmental reports noted poor housekeeping practices and automobile repair operations at the Hindelang Property. Based on the documented use of chlorinated solvents (1,1,1-TCA), poor general housekeeping, and noted automobile repair operations, the south adjoining Hindelang Property represents a potential vapor encroachment concern and a REC.

## 12.2 Controlled Recognized Environmental Conditions

Based upon the information described in this report, this Phase I ESA did not reveal evidence of CRECs.

## 12.3 Historical Recognized Environmental Conditions

Based upon the information described in this report, this Phase I ESA did not reveal evidence of HRECs.

## 12.4 De Minimis Conditions

Roux identified the following de minimis condition:

**De Minimis Condition 1 – Surficial Staining.** Roux observed evidence of surficial petroleum stains associated with aboveground storage tanks ASTs and/or equipment storage areas at the GH Dairy, Costa, and DeHoog II properties. The surficial staining noted on these properties appeared to be limited in scale and are not anticipated to present a threat to human health or the environment. A SMP should be implemented to manage any potentially impacted areas encountered during redevelopment of the Subject Property.

## 12.5 Business Environmental Risks

Based upon the information described in this report, this Phase I ESA did not reveal evidence of independent Business Environmental Risks (BERs) in connection with the Subject Property.

## 12.6 Other Environmental Features

Other environmental features (OEFs) identified in connection with the current and historical operations at the Subject Property or adjacent properties include:

**OEF 1 – Dairy Farm Operations (Methane).** Due to the historical and current use of the Subject Property for dairy farming purposes, methane gas may be present in shallow soil. Methane gas is naturally produced during the biodegradation of organic matter such as animal manure. Based on the historical dairy farming land use of the Subject Property, methane gas surveys were reportedly completed by others at the Alewyn, DeHoog II, and Swager properties. Results of these surveys indicate sporadic elevated concentrations of methane gas exceeding the Lower Explosive Limit (LEL) of methane (i.e., 50,000 parts per million [ppm]).

Prior to the redevelopment of dairy farms, the City of Ontario Building Department requires that an investigation be performed to evaluate the possible build-up of methane gas in shallow soils and to determine the level of methane gas mitigation required. Proper removal and disposal of manure-laden shallow soil in accordance with local regulatory guidance may also be required prior to redevelopment of the Subject Property.

**OEF 2 – Private Groundwater Wells.** During the site reconnaissance, Roux observed a total of eight groundwater wells throughout the Subject Property that have been used for agricultural, residential, and/or dairy water supply purposes. Groundwater has been identified immediately south of the Subject Property to occur at depths of approximately 120 feet below the ground surface (bgs) and flows in a south to southwesterly direction. These features would not be considered an environmental concern to the Subject Property, but may need to be abandoned prior to redevelopment per State and County guidance.

**OEF 3 – Septic Systems.** Each residential structure on the Subject Property is reportedly equipped with a septic tank. Based on the non-hazardous nature of the domestic waste discharged to the septic systems, these represent an OEF.

**OEF 4 – Hazardous Materials Storage.** A total of eight ASTs containing diesel fuel were observed on the Subject Property including the DeGroot, Costa, GH Dairy, DeHoog II, and Swager Properties; the ASTs ranged from approximately 100 to 500 gallons in size. No significant signs of a release were observed in the vicinity of the ASTs. Additionally, various other chemicals associated with the dairy activities are stored in 55-gallon drums and used on-site including, but not limited to, iodine, acid wash, and hydrogen peroxide for sanitation purposes. The hazardous material use on-site therefore represents an OEF.

**OEF 5 – Regional Dairy Farm Operations (Groundwater Degradation).** The Subject Property is located within the Chino Groundwater Basin. Concentrated animal feeding lots such as dairy farms can be a source of local groundwater degradation due to nitrates and TDS. According to information provided on the EPA website, the Chino Basin once had the highest concentration of dairy animals in the world, with approximately 350 dairies located within a 20-square mile area. Although the number of dairies has declined significantly, historical land application of manure and process water has resulted in significant groundwater degradation due to high levels of TDS and nitrate. The Dairy Farm General Permit was created to minimize continued degradation of groundwater in the Chino Basin as well as other parts of the Santa Ana Region. According to the SARWQCB website, the Subject Property is located within the Chino 2 “antidegradation” management zone which indicates that the SARWQCB has determined that the lowering of water quality is not of maximum

benefit to the public. The SARWQCB has reportedly noted that new property owners are not being held liable for this regional issue associated with historical land uses. Based on the known regional groundwater degradation issues in the Chino Basin, the potential presence of elevated TDS and nitrates in groundwater beneath the Subject Property represents an OEF.

**OEF 6 – South Archibald TCE Plume.** The eastern portion of the Subject Property is located within a large regional VOC groundwater plume comprised mostly of TCE, referred to as the South Archibald TCE Plume. This plume originates from a source approximately 1.7 miles northeast of the Subject Property as a result of historical land use of numerous metal plating and finishing facilities. Low concentrations of TCE were reported from 2017 to 2022 in groundwater from two on-site wells on the DeHoog II and Swager Properties at concentrations of 1.2 and 0.46 ug/l, respectively, well below the SWRCB, Division of Drinking Water MCLs for TCE in drinking water of 5 ug/l. Based on the depth of groundwater and low concentrations of VOCs detected beneath the Subject Property, there is a low likelihood that a vapor intrusion issue is present. Since there are low concentrations of TCE detected beneath the Subject Property and no vapor intrusion issue is present, the regional TCE groundwater plume would be considered an OEF.

**OEF 7 – Former UST, 7587 Edison Avenue (DeGroot Property).** The DeGroot Property reportedly previously operated a 500-gallon diesel UST that was removed in 1987. In 2000, the SBCFD was informed of the UST removal following purchase of the property by Paul Huizenga and requested that soil samples be collected. A soil sample was collected from approximately 10 feet bgs in the reported location of the former UST. The laboratory results indicated no detectable concentrations of TPHg, BTEX, and MTBE. No other information was provided (e.g., a closure report or illustration showing where the UST was located). Based on these results, the SBCFD issued a NFA letter dated February 13, 2001. Based on this information, the former UST represents an OEF.

**OEF 8 – Former UST, 8185 Edison Avenue (Alewyn Property).** The Alewyn Property reportedly used a 250-gallon diesel UST that was removed in 1978 without regulatory oversight and no confirmation soil samples were collected. In 2021, soil samples were collected in the reported former location of the UST. Laboratory results indicated no detectable concentrations of TPH and VOCs above laboratory reporting limits. Based on these results, the former 250-gallon diesel UST would not be considered an environmental concern to the Subject Property and represents an OEF.

**OEF 9 – Former UST, 8311 Edison Avenue (DeHoog I Property).** The DeHoog I Property reportedly used a 500-gallon diesel UST that was removed in 1998 with oversight from the SBCFD. A soil sample was collected from beneath the center of the former tank location. The soil sample was analyzed for TPHg, BTEX, and MTBE. Laboratory results indicated no detectable concentrations of these constituents above laboratory reporting limits. Based on these concentrations, the UST was issued a NFA letter, dated January 6, 1999. Based on the regulatory closure and sampling results, the former UST would not be considered an environmental concern to the Subject Property and represents an OEF.

**OEF 10 – Former UST, 8381 Edison Avenue (DeHoog II Property).** A previous Phase I ESA completed by others included an interview with the former property owner, Mr. Joe De Hoog, in which Mr. De Hoog indicated that a 500-gallon gasoline UST was historically present immediately south of the detached three-car garage and was removed in the late-1970s. In 2021, soil samples were collected in the reported former location of the UST. Laboratory results indicated no detectable concentrations of TPH and VOCs above laboratory reporting limits. Based on these results, the former 500-gallon gasoline UST would not be considered an environmental concern to the Subject Property and represents an OEF.

# 13. Appendices

A. Figures
B. Photographic Documentation
C. Historic Sources
D. User Provided Information
E. Regulatory Agency Records
F. Third Party Vendor Database Report
G. Resumes
H. References

# APPENDICES

A. Figures

B. Photographic Documentation

C. Historic Sources

D. User Provided Information

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# Figures

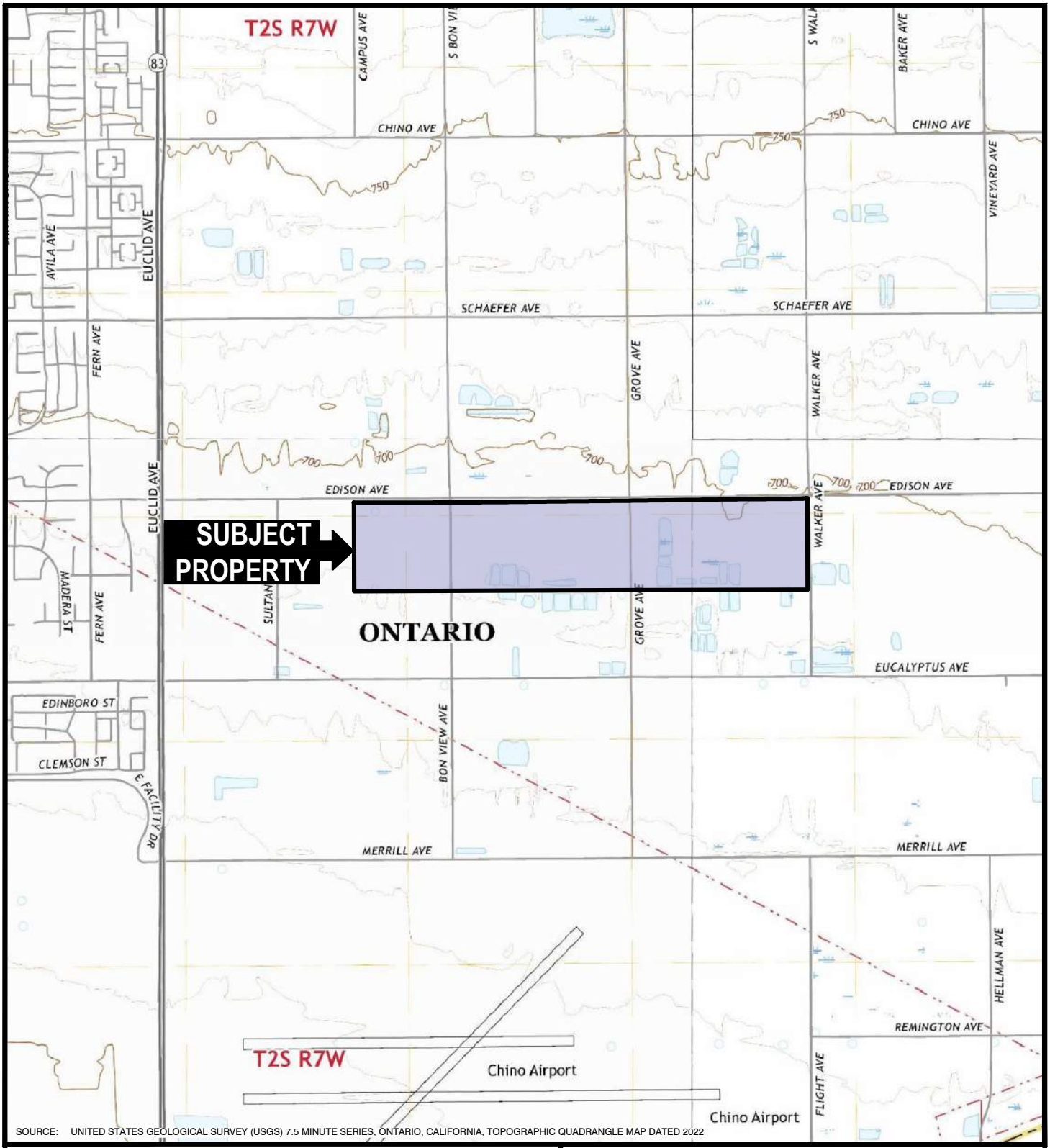


SOURCE: UNITED STATES GEOLOGICAL SURVEY (USGS) 7.5 MINUTE SERIES, ONTARIO, CALIFORNIA, TOPOGRAPHIC QUADRANGLE MAP DATED 2022

QUADRANGLE LOCATION

N

2,000' 0 2,000

Title:

# SITE LOCATION MAP

PROPOSED RESIDENTIAL - ONTARIO RANCH
ONTARIO, CALIFORNIA

Prepared for:

ONTARIO RANCH VENTURE, LLC AND
ONTARIO RANCH VENTURE II, LLC

ROUX

| | | |
|---|---|---|
| Compiled by: K.A. | Date: 2025-03-24 | FIGURE |
| Prepared by: A.W. | Scale: AS SHOWN | 1 |
| Project Mgr: K.A. | Project: 3669.0004L | |
| File: 010_3669.0004 - SITE LOCATION MAP.DWG | | |

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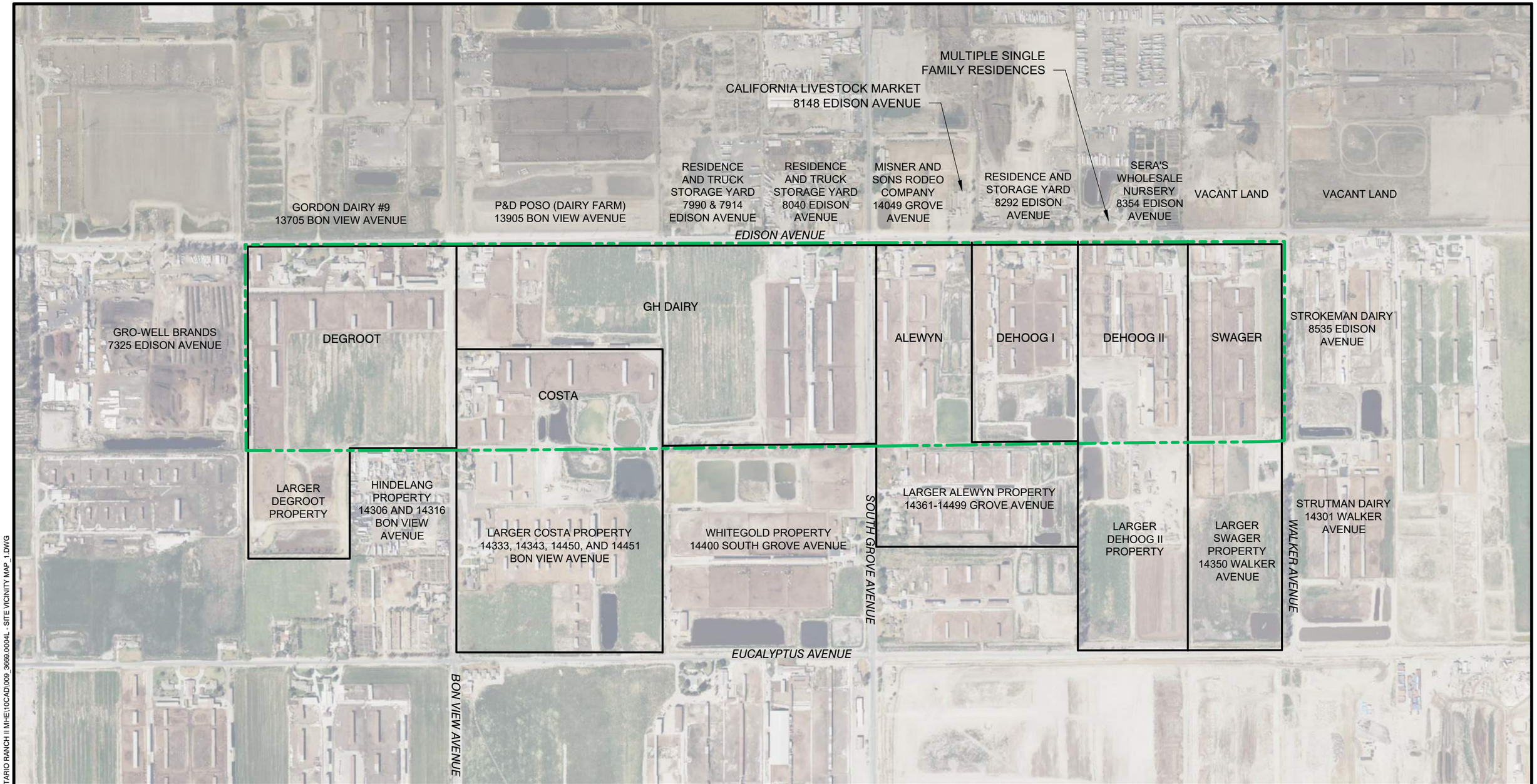


LEGEND

APPROXIMATE SUBJECT PROPERTY BOUNDARY

PROPERTY BOUNDARY

N

600' 0 600'

Title:

**SITE VICINITY MAP**

PROPOSED RESIDENTIAL - ONTARIO RANCH
ONTARIO, CALIFORNIA

Prepared For:

ONTARIO RANCH VENTURE, LLC AND
ONTARIO RANCH VENTURE II, LLC

ROUX

| | | |
|---|---|---|
| Compiled by: K.A. | Date: 2025-03-21 | FIGURE |
| Prepared by: A.W. | Scale: AS SHOWN | 2 |
| Project Mgr: K.A. | Project: 3669.0004L | |
| File: 009_3669.0004L - SITE VICINITY MAP_1.DWG | | |

\\SRVLACAFP1\LA SHARED\CLIENTS\3669.0004L SRG ONTARIO RANCH II MHE\10CAD\009_3669.0004L - SITE VICINITY MAP_1.DWG

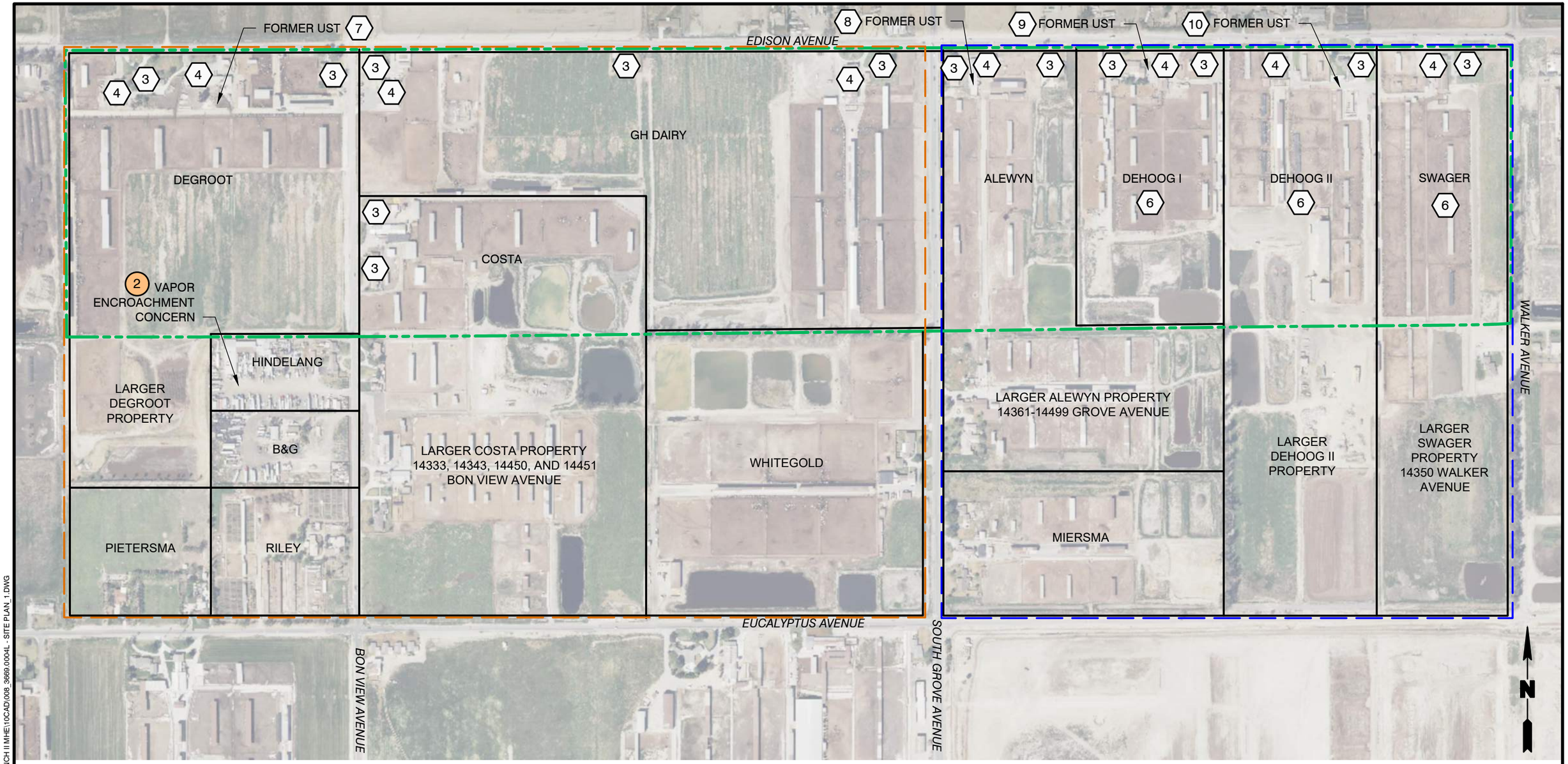


## LEGEND

- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- PROPERTY BOUNDARY
- ONTARIO RANCH I BOUNDARY
- ONTARIO RANCH II BOUNDARY
- # RECOGNIZED ENVIRONMENTAL CONDITION (REC)
- # OTHER ENVIRONMENTAL FEATURE (OEF)
- 1 HISTORICAL AGRICULTURAL USE - SITEWIDE
- 1 DAIRY FARM OPERATIONS (METHANE) - SITEWIDE
- 2 PRIVATE GROUNDWATER WELLS
- 3 SEPTIC SYSTEMS
- 4 HAZARDOUS MATERIALS STORAGE
- 5 REGIONAL DAIRY FARM OPERATIONS (GROUNDWATER DEGRADATION) - SITEWIDE
- 6 SOUTH ARCHIBALD TCE PLUME

## NOTES

1. UST = UNDERGROUND STORAGE TANK
2. TCE = TRICHLOROETHENE

440' 0 440'

Title:

# SITE PLAN

PROPOSED RESIDENTIAL - ONTARIO RANCH
ONTARIO, CALIFORNIA

Prepared For:

ONTARIO RANCH VENTURE, LLC AND
ONTARIO RANCH VENTURE II, LLC

ROUX

| | | |
|---|---|---|
| Compiled by: K.A. | Date: 2025-03-21 | FIGURE |
| Prepared by: A.W. | Scale: AS SHOWN | 3 |
| Project Mgr: K.A. | Project: 3669.0004L | |
| File: 008_3669.0004L - SITE PLAN_1.DWG | | |

\\SRVLACAFP1\LA SHARED\CLIENTS\3669.0004L SRG ONTARIO RANCH II MHE\10CAD\008_3669.0004L - SITE PLAN_1.DWG

# APPENDIX B

Photographic Documentation

# Appendix B. Photo Documentation

**B-1.** Private residence (7587 Edison Avenue) located at the northwestern area of DeGroot Property, facing Southwest. (01/22/2025)

**B-2.** Active Milk Barn associated 10,000-gallon milk AST located in the northern portion of the DeGroot Property, facing South. (01/22/2025)

**B-3.** View the interior/entrance area of the DeGroot Milk Barn. (01/22/2025)

**B-4.** View of the rear exterior (cattle entrance) portion of the DeGroot Milk Barn, facing Northwest. (01/22/2025)

**B-5.** View of the attached commodity bays used for equipment storage located in the rear exterior of the DeGroot Milk Barn, facing North. (01/22/2025)

**B-6.** A close-up view of commodity bays used for equipment storage located in the rear exterior of the DeGroot Milk Barn, facing North. (01/22/2025)

**B-7.** View of two feed silos (left) and one bulk grain hopper (right) located immediately south of the DeGroot Milk Barn, looking West. (01/22/2025)

**B-8.** View of commodity bays with metal canopy located in northeastern area of the DeGroot Property, facing Northeast. (01/22/2025)

**B-9.** Water well and associated 10,000-gallon water AST located in the northern portion of DeGroot Property, facing West. (01/22/2025)

**B-10.** Another view of cattle corrales and feed area located in the central portions of the DeGroot Property, facing East. (01/22/2025)

**B-11.** View of vacant land located immediately south of the DeGoot cattle corrales, facing West. (01/22/2025)

**B-12**. Private residences (14213 through 14297 Bon View Avenue) in the western portion of the Costa Property, along Bon View Avenue, facing Northeast. (01/22/2025)

**B-13.** Active Milk Barn and associated 10,000-gallon milk AST located in the western portion of the Costa Property, facing East. (01/22/2025)

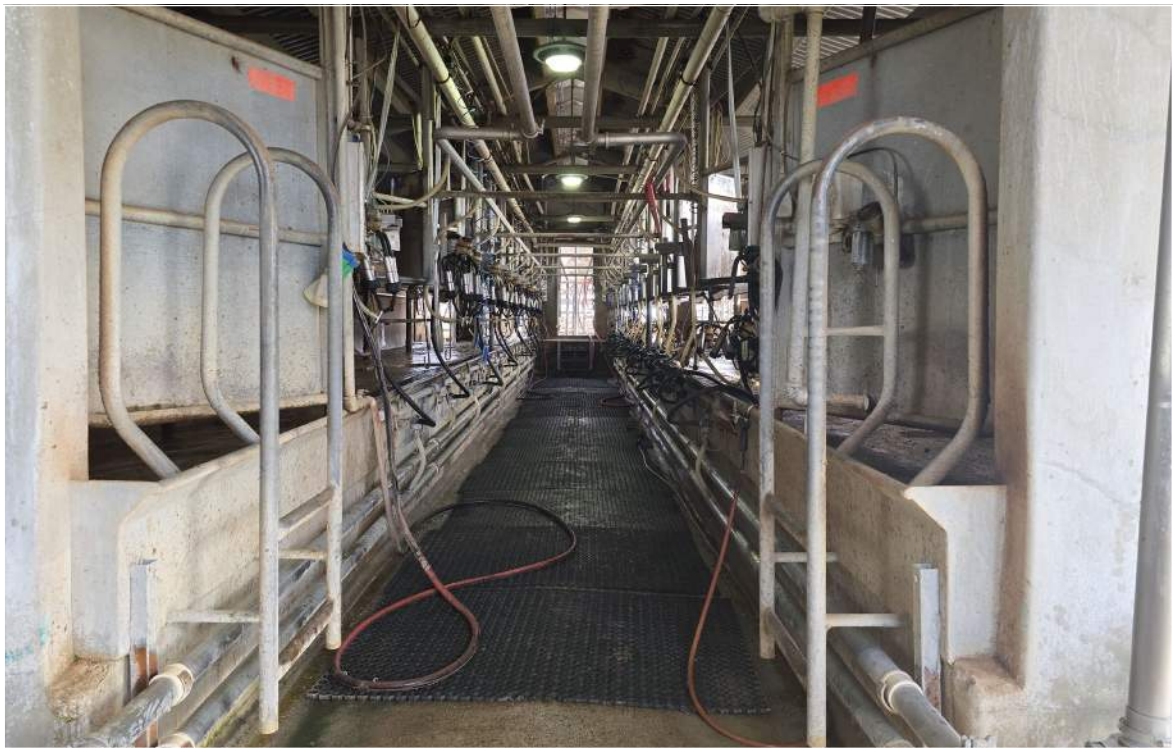

**B-14.** View of the milking parlor of the Costa Milk Barn. (01/22/2025)

**B-15.** View of an interior storage room wihin the Costa Milk Barn, with 55-gallon drums of iodine, acid wash, and/or hydrogen peroxide for sanitation purposes. (01/22/2025)

**B-16.** Another view of the interior storage room wihin the Costa Milk Barn with various miscellaneous items. (01/22/2025

**B-17.** View of two Liquid Feed (molasses) silos (left) and the 10,000-gallon milk AST located immediately north of the Costa Milk Barn, facing Southeaset. (01/22/2025)

**B-18.** View of two diesel ASTs and bulk grain hoppers located in the northwestern area of the Costa Property, facing Northeast. (01/22/2025)

**B-19.** Commodity bay with metal capoy cover located immediately east of the diesel fuel ASTs in the Costa Property, facing Southeast. (01/22/2025)

**B-20.** View of feeding corral within Costa Property, facing West. (01/22/2025)

**B-21.** Wasterwater pond in the southern portion of the Costa Property, facing Northeast. (01/22/2025)

**B-22.** Private residence (8061 Edison Avenue) located on the northeastern corner of the GH Dairy Property, facing Southeast. (01/22/2025)

**B-23.** Active Milk Barn located in the northeastern portion of the GH Dairy Property, facing Southeast. (01/22/2025)

**B-24.** Interior view of the active GH Dairy Milk Barn. (01/22/2025)

**B-25.** Two 7,000-gallon milk ASTs loacted immediately east of the active GH Dairy Milk Barn, facing West. (01/22/2025)

**B-26.** Emergency generator located immediately west of the active GH Dairy Milk Barn, facing East. (01/22/2025)

**B-27.** Water well and associated water pressure AST located west of the active GH Dairy Milk Barn, facing East. (01/22/2025)

**B-28.** Water well and standpipe located east of the private residence (7891 Edison Avenue) within the GH Dairy Property. (01/22/2025)

**B-29.** Cattle corrals and feeding area located within the GH Dairy Property, facing Southeast. (01/22/2025)

**B-30.** Grazing pastures/vacant land within the GH Dairy Property, facing Southwest. (01/22/2025))

**B-31.** View of the wastewater pond and pasture area/vacant land of the GH Dairy Property, facing Northeast. (01/22/2025)

**B-32.** Private residence (8185 Edison Avenue) located in the northern portion of the Alewyn Property, facing Southeast. (01/31/2025)

**B-33.** Inactive Milk Barn located in the northern portion of the Alewyn Property, facing Southwest. (01/31/2025)

**B-34.** Interior view of the entrance area of the inactive Alewyn Milk Barn. (01/31/2025)

**B-35.** Interior view of the inactive Alewyn Milk Barn. (01/31/2025)

**B-36.** View 10,000-gallon milk AST located within the inactive Alewyn Milk Barn. (01/31/2025)

**B-37.** A vehicle and equipment storage area located immidiately south of the private residence (8185 Edison Avenue) of the Alewyn Property, facing East. (01/31/2025)

**B-38.** View of vehicle and equipment storage area, facing Southeast. (01/31/2025)

**B-39.** View of miscellaneous items stored in the vehicle and equipment storage area, facing East. (01/31/2025)

**B-40.** Cattle corral and feeding area loacted within the Alewyn Property, facing South. (01/31/2025)

**B-41.** View of the corral area within the Alewyn Property, facing South. (01/31/2025)

**B-42.** View of pasture area/vacant land and wasterwater pond located in the southeastern area of the Alewyn Property, facing Southwest. (01/31/2025)

**B-43.** Private residence (8311 Edison Avenue) located in the northern portion of the DeHoog I Property, facing Southeast. (01/31/2025)

**B-44.** Active Milk Barn and three ASTs located in the northern portion of the DeHoog I Property, facing Southeast. (01/31/2025)

**B-45.** View of 10,000-gallon milk AST (left), water well and associated water pressure AST (center) and a water AST (right) located immediately west of the DeHoog I Milk Barn, facing Northeast. (01/31/2025)

**B-46.** Idle water well located in the southeastn area of the DeHoog I Property, facing North. (01/31/2025)

**B-47.** A 5,000-gallon water AST located in the northern portion the DeHoog I Property, facing North. (01/31/2025)

**B-48.** View metal storage shed and feeding corral within the DeHoog I Property, facing South. (01/31/2025)

**B-49.** Typical interior view of storage sheds located within the dairy farm properties. (01/31/2025)

**B-50.** View cattle corrals and feeding area of the DeHoog I Property, facing East. (01/31/2025)

**B-51.** Corral area of the DeHoog I Property, facing Southwest. (01/31/2025)

**B-52.** Pasture area/vacant land located in the south portion of the DeHoog I Property, facing Southwest. (01/31/2025)

**B-53.** Waterwater pond located in the southern area of the DeHoog I Propertry, facing Southeast. (01/31/2025)

**B-54.** Private residence (8381 Edison Avenue) located in the northern area of the DeHoof II Property, facing Southeast. (01/31/2025)

**B-55.** Milk Barn located in the northern area of the DeHoog II Property, facing Southeast. (01/31/2025)

**B-56.** View of the milking parlor of the DeHoog II Milk Barn. (01/31/2025)

**B-57.** View of the 10,000-gallon milk AST located inside the DeHoog II Milk Barn. (01/31/2025)

**B-58.** Water well and associated pressure water AST located east of the DeHoog II Milk Barn, facing Southeast. (01/31/2025)

**B-59.** Water well and pump located northeast of the private residence (8381 Edison Avenue), facing Northwest. (01/31/2025)

**B-60.** Standpipe and 12,000-gallon milking barn wash tank located in the northeastern area of the DeHoog II Property, by Edison Avenue, facing South. (01/31/2025)

**B-61.** Water well located in the northeastern corner of the wastewater ponds at the DeHoog II Property, facing South. (01/31/2025)

**B-62.** Diesel fuel ASTs located in the central area of the DeHoog II Property, facing North. (01/31/2025)

**B-63.** View of a weigh scale located in the south-central area of the DeHoog II Property, facing Southeast. (01/31/2025)

**B-64.** View cattle corrals and feeding areas within the DeHoog II Property, facing Northwest. (01/31/2025)

**B-65.** View of cattle corrals and hay bales storage canopies located within the DeHoog II Property, facing Sothwest. (01/31/2025)

**B-66.** View of commodity bays with metal canopies and a wastewater pond located int he southern portion of the DeHoog II Property, facing Northeast. (01/31/2025)

**B-67.** Private residence (8485 Edison Avenue) located in the northeastern area of the Swager Property, facing Southeast. (01/31/2025)

**B-68.** Active Milk Barn located in the northern area of the Swager Property, facing Southeast. (01/31/2025)

**B-69.** Interior view of the Swager Milk Barn with 55-gallon dums containing iodine, acid wash, and hydrogen peroxide for sanitation purposes. (01/31/2025)

**B-70.** View of the milking parlor of the Swager Milk Barn. (01/31/2025)

**B-71.** Water well and associated water pressure AST and water AST, facing Southeast. (01/31/2025)

**B-72.** Emergency generator immidiately west-adjacent to the active Swager Milk Barn, facing East. (01/31/2025)

**B-73.** Corral and feeding area f the Swager Property, facing Southwest. (01/31/2025)

**B-74.** Corral area of the Swager Property, facing Northwest. (01/31/2025)

**B-75.** View of corral area of the Swager Property, facing Northeast. (01/31/2025)

**B-76.** View of western vacant area of the Swager Property, facing Northeast. (01/31/2025)

# APPENDIX C

Historic Sources

**Ontario Ranch I**

8185 Edison Avenue

Ontario, CA 91762

Inquiry Number: 7869218.8

January 13, 2025

# The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Aerial Photo Decade Package

01/13/25

**Site Name:**

Ontario Ranch I
8185 Edison Avenue
Ontario, CA 91762
EDR Inquiry # 7869218.8

**Client Name:**

Roux Associates
5150 E Pacific Coast Highway
Long Beach, CA 90804
Contact: Ashley Whitaker

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

***Search Results:***

| *Year* | *Scale* | *Details* | *Source* |
|---|---|---|---|
| 2020 | 1"=500' | Flight Year: 2020 | USDA/NAIP |
| 2016 | 1"=500' | Flight Year: 2016 | USDA/NAIP |
| 2012 | 1"=500' | Flight Year: 2012 | USDA/NAIP |
| 2009 | 1"=500' | Flight Year: 2009 | USDA/NAIP |
| 2006 | 1"=500' | Flight Year: 2006 | USDA/NAIP |
| 2002 | 1"=500' | Acquisition Date: January 01, 2002 | USGS/DOQQ |
| 1994 | 1"=500' | Acquisition Date: June 01, 1994 | USGS/DOQQ |
| 1990 | 1"=500' | Flight Date: August 29, 1990 | USDA |
| 1989 | 1"=500' | Flight Date: August 03, 1989 | USDA |
| 1985 | 1"=500' | Flight Date: July 28, 1985 | USDA |
| 1975 | 1"=500' | Flight Date: August 01, 1975 | USGS |
| 1966 | 1"=500' | Flight Date: April 16, 1966 | USGS |
| 1953 | 1"=500' | Flight Date: March 03, 1953 | USDA |
| 1948 | 1"=500' | Flight Date: July 10, 1948 | USGS |
| 1946 | 1"=500' | Flight Date: December 29, 1946 | USGS |
| 1938 | 1"=500' | Flight Date: June 03, 1938 | USDA |

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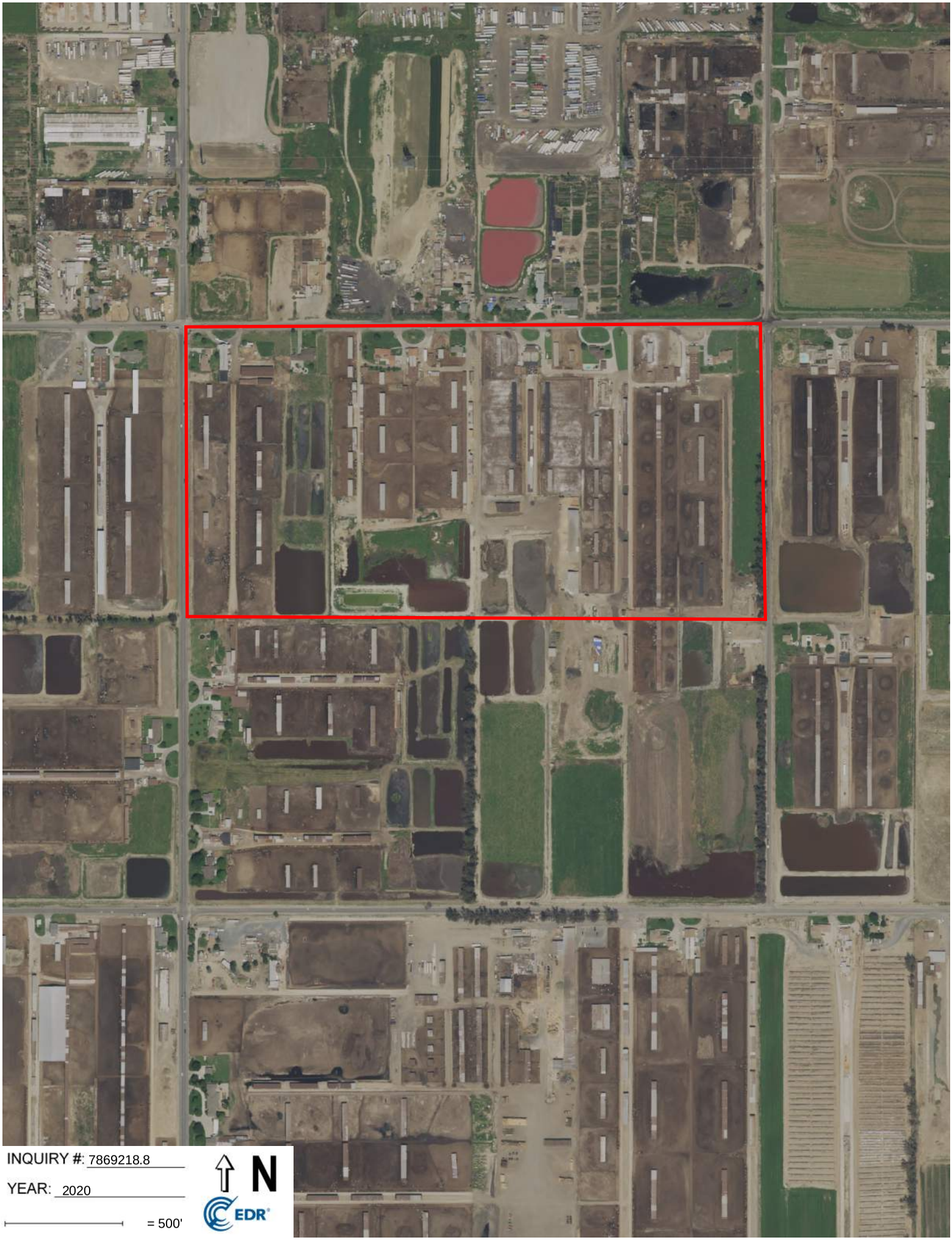
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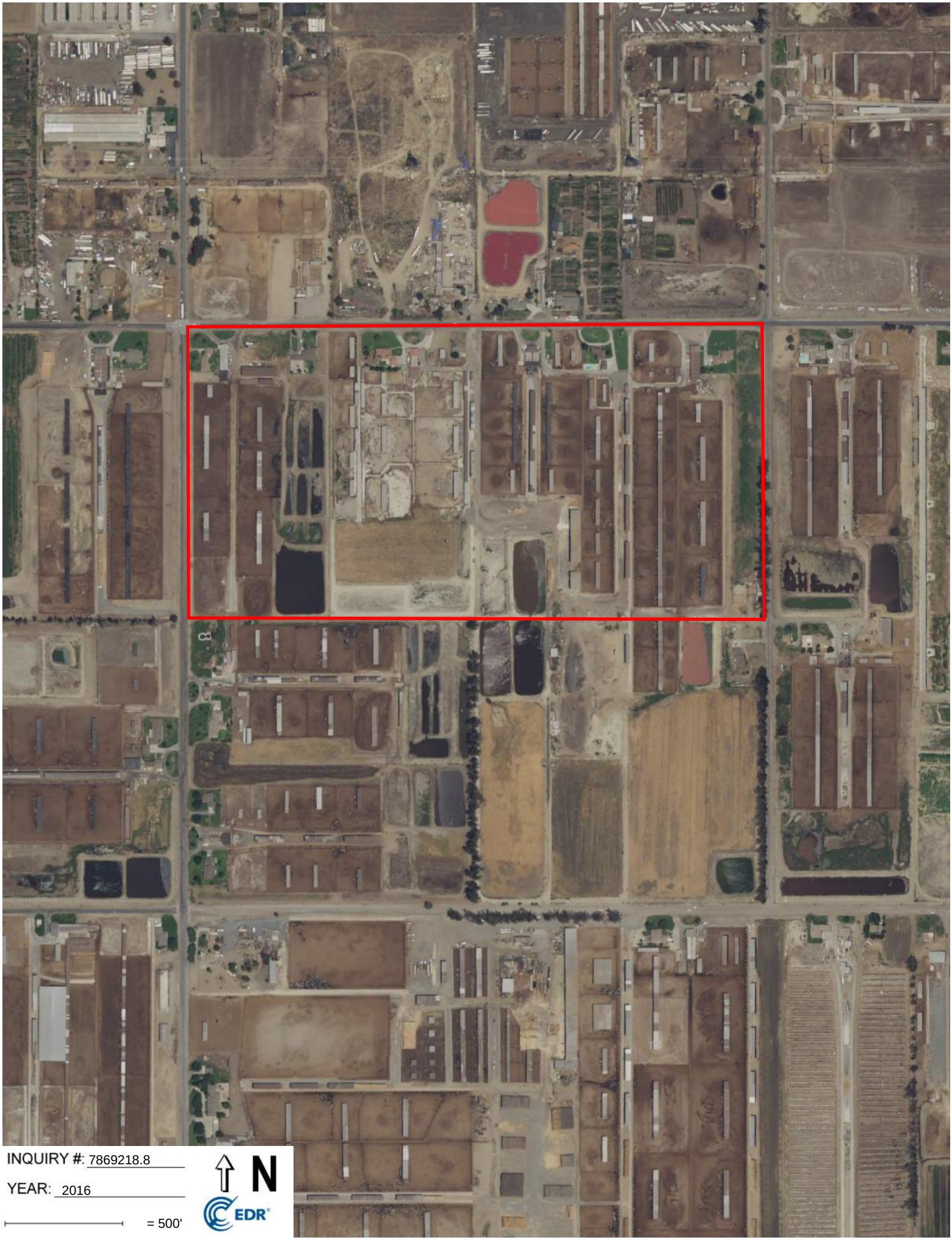

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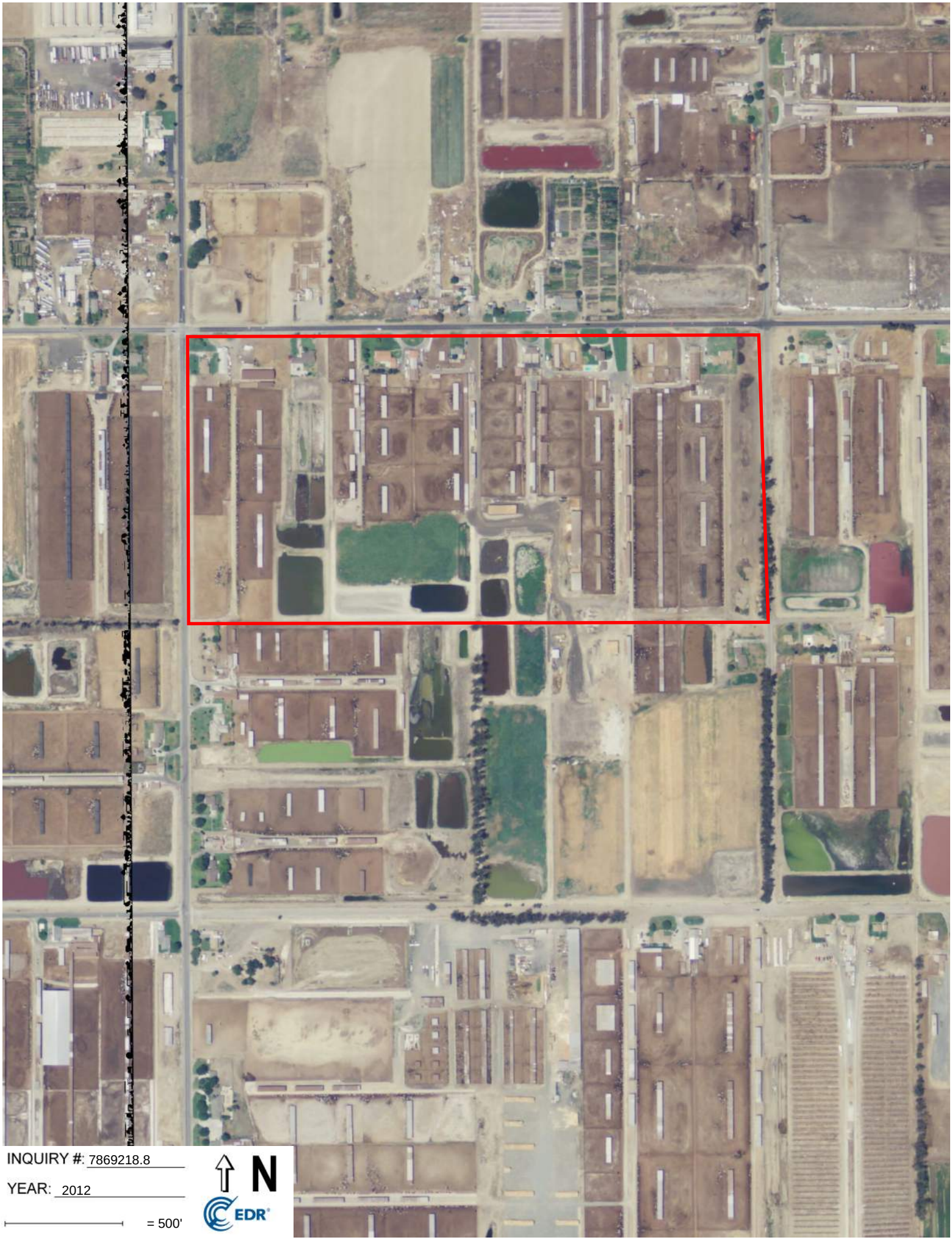
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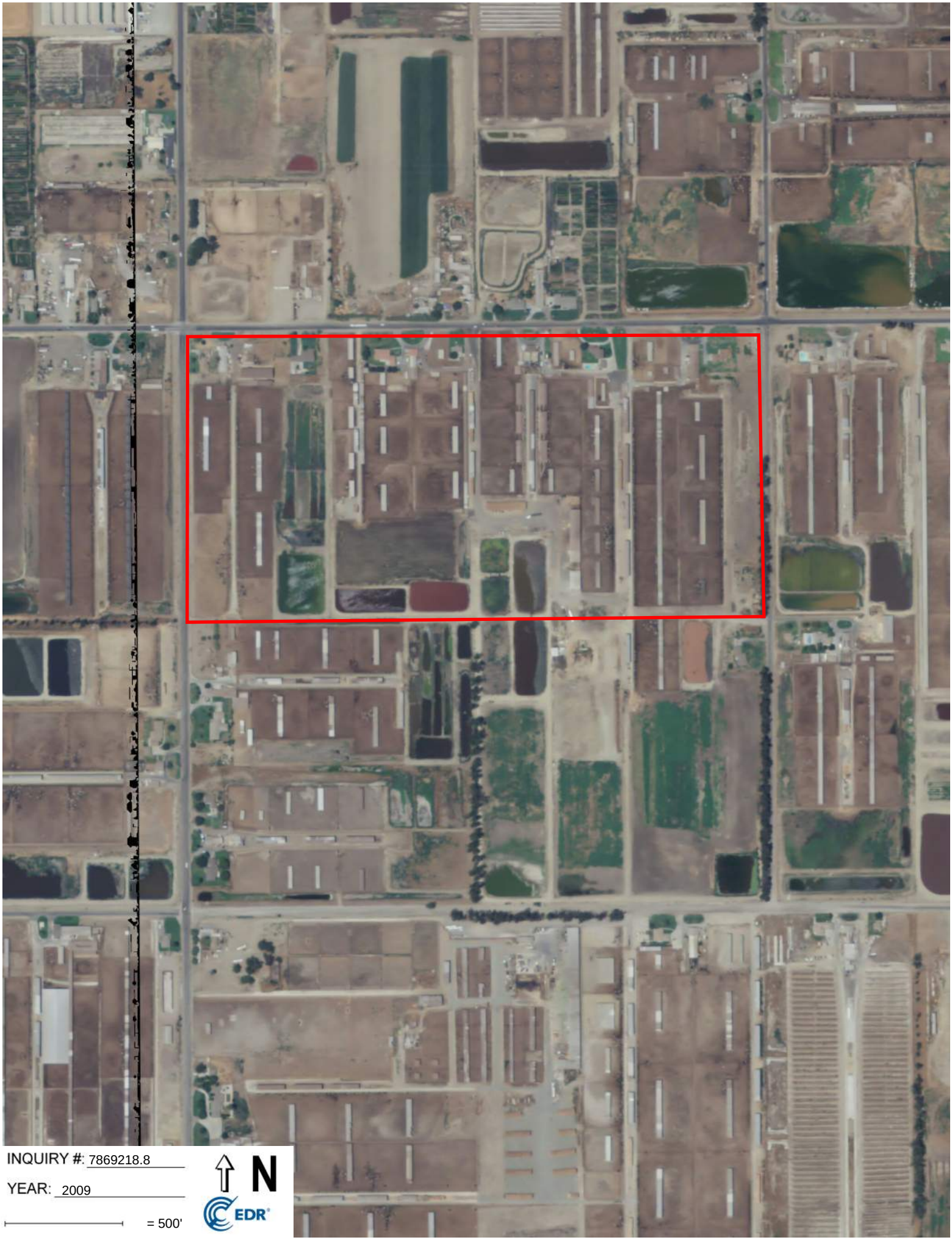
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EDR

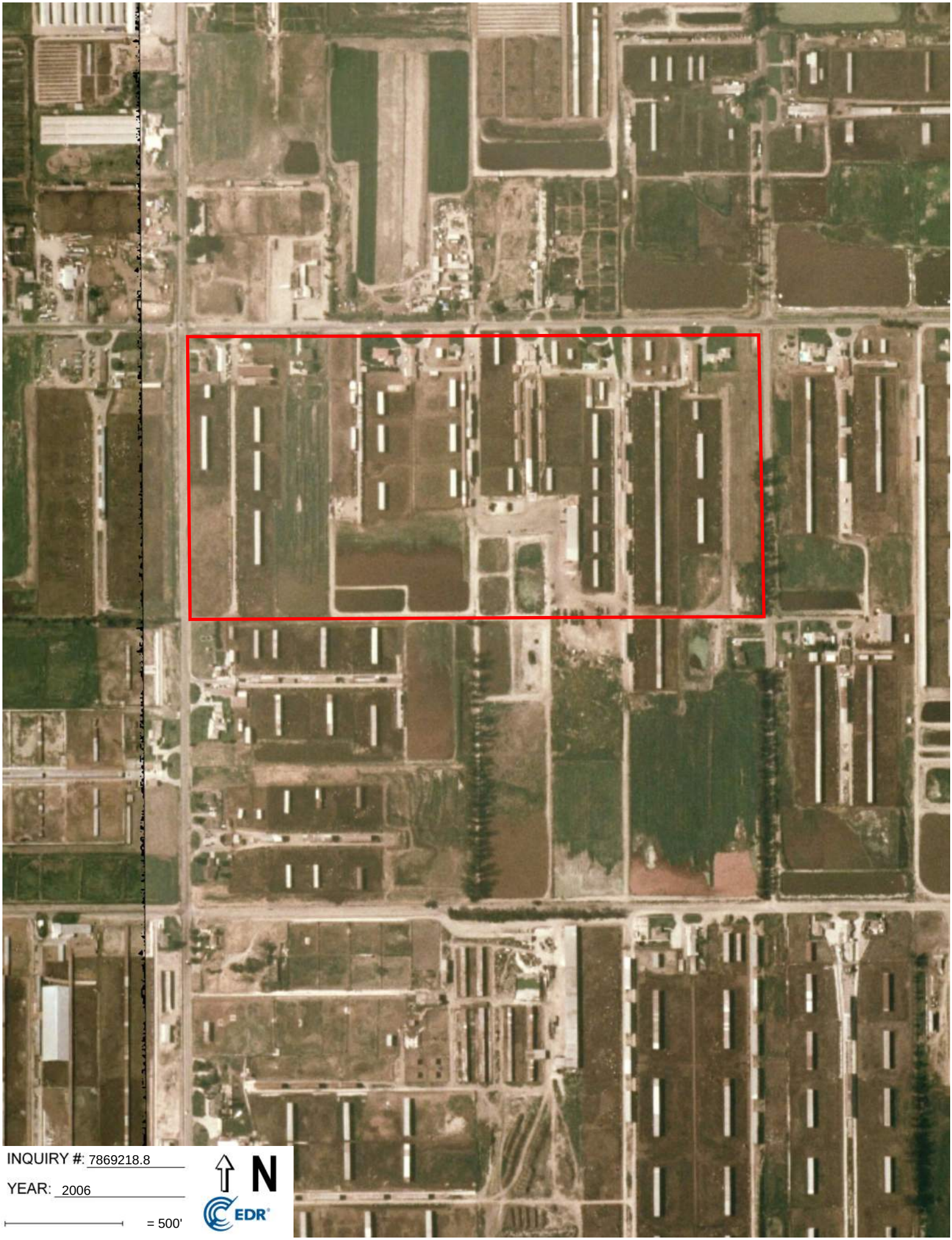

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YEAR: 2006

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EDR

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YEAR: 2002
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EDR

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EDR

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EDR

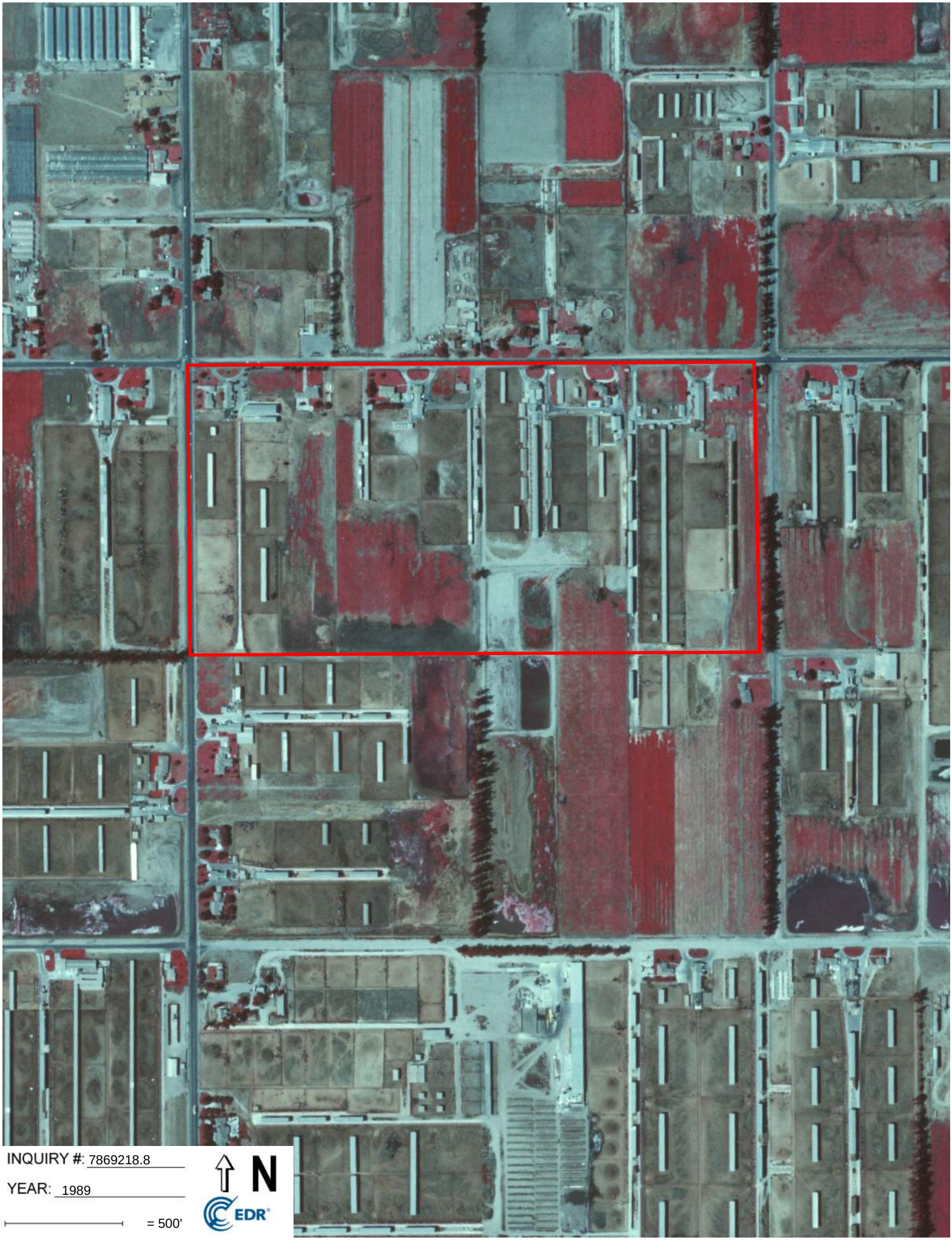
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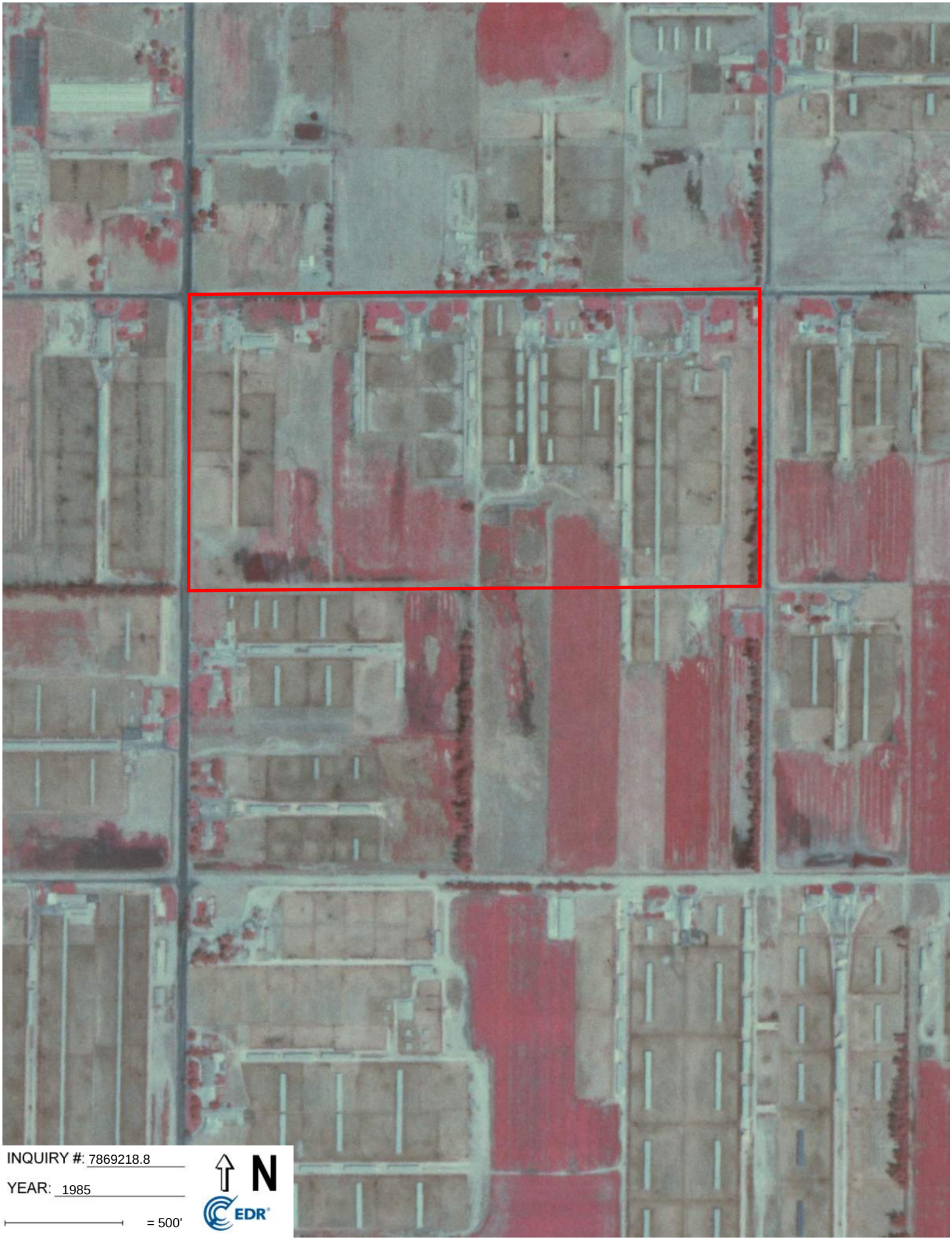
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EDR

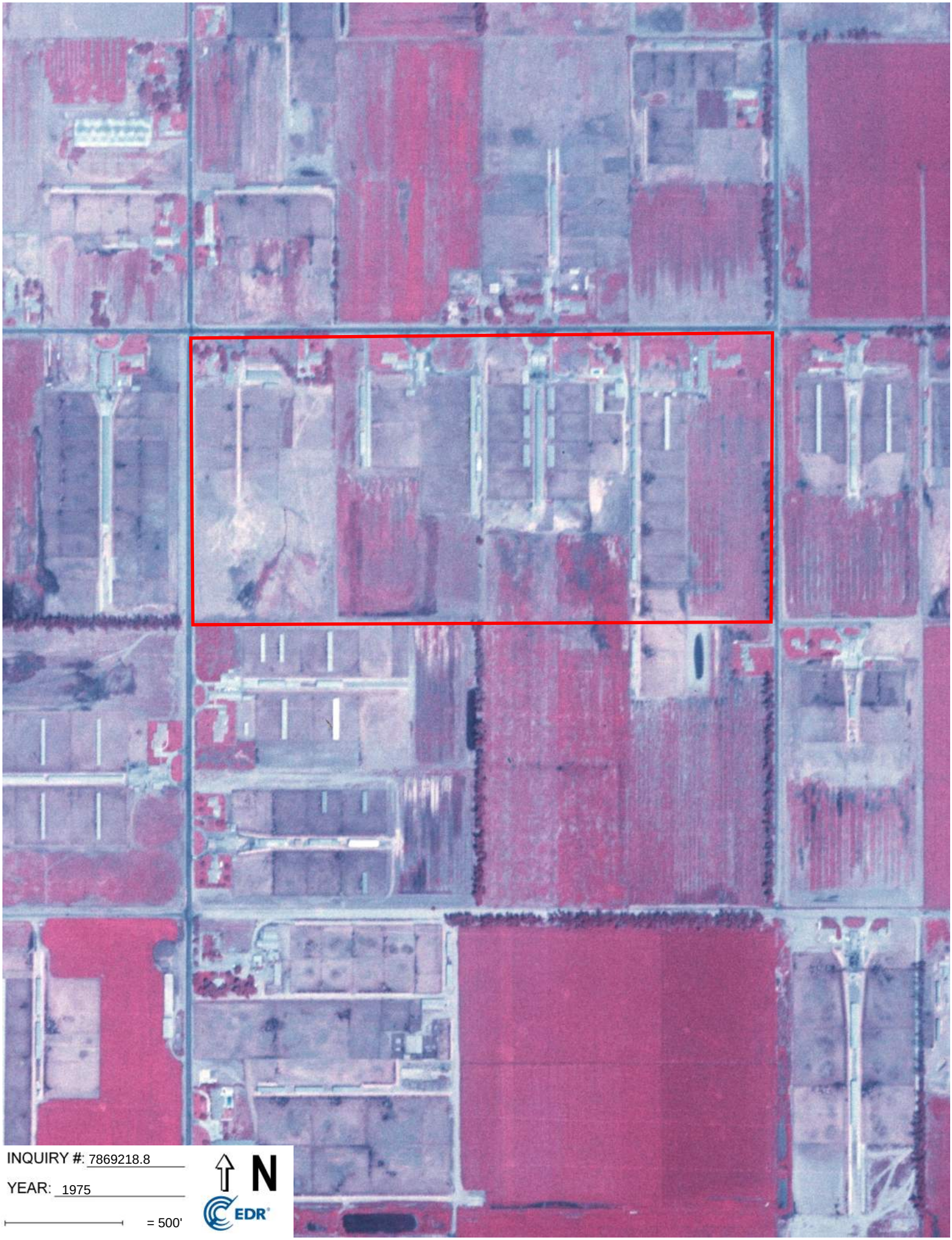

INQUIRY #: 7869218.8

YEAR: 1975

= 500'

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EDR

INQUIRY #: 7869218.8

YEAR: 1966

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EDR

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YEAR: 1953
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EDR

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YEAR: 1948
= 500'
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EDR

INQUIRY #: 7869218.8

YEAR: 1946

= 500'

N

EDR

INQUIRY #: 7869218.8

YEAR: 1938

= 500'

N

EDR

**Ontario Ranch II**

14366 Bon View Avenue

Ontario, CA 91762

Inquiry Number: 7568463.8

February 15, 2024

# The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Aerial Photo Decade Package

02/15/24

**Site Name:**

Ontario Ranch II
14366 Bon View Avenue
Ontario, CA 91762
EDR Inquiry # 7568463.8

**Client Name:**

Roux Associates
5150 E Pacific Coast Highway
Long Beach, CA 90804
Contact: Kasia Anderson

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| *Year* | *Scale* | *Details* | *Source* |
|---|---|---|---|
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| 2012 | 1"=625' | Flight Year: 2012 | USDA/NAIP |
| 2009 | 1"=625' | Flight Year: 2009 | USDA/NAIP |
| 2006 | 1"=625' | Flight Year: 2006 | USDA/NAIP |
| 2002 | 1"=625' | Acquisition Date: January 01, 2002 | USGS/DOQQ |
| 1994 | 1"=625' | Acquisition Date: June 01, 1994 | USGS/DOQQ |
| 1990 | 1"=625' | Flight Date: August 29, 1990 | USDA |
| 1989 | 1"=625' | Flight Date: August 03, 1989 | USDA |
| 1987 | 1"=625' | Flight Date: March 29, 1987 | USDA |
| 1975 | 1"=625' | Flight Date: August 01, 1975 | USGS |
| 1966 | 1"=625' | Flight Date: April 16, 1966 | USGS |
| 1953 | 1"=625' | Flight Date: March 03, 1953 | USDA |
| 1948 | 1"=625' | Flight Date: July 10, 1948 | USGS |
| 1946 | 1"=625' | Flight Date: December 29, 1946 | USGS |
| 1938 | 1"=625' | Flight Date: June 03, 1938 | USDA |

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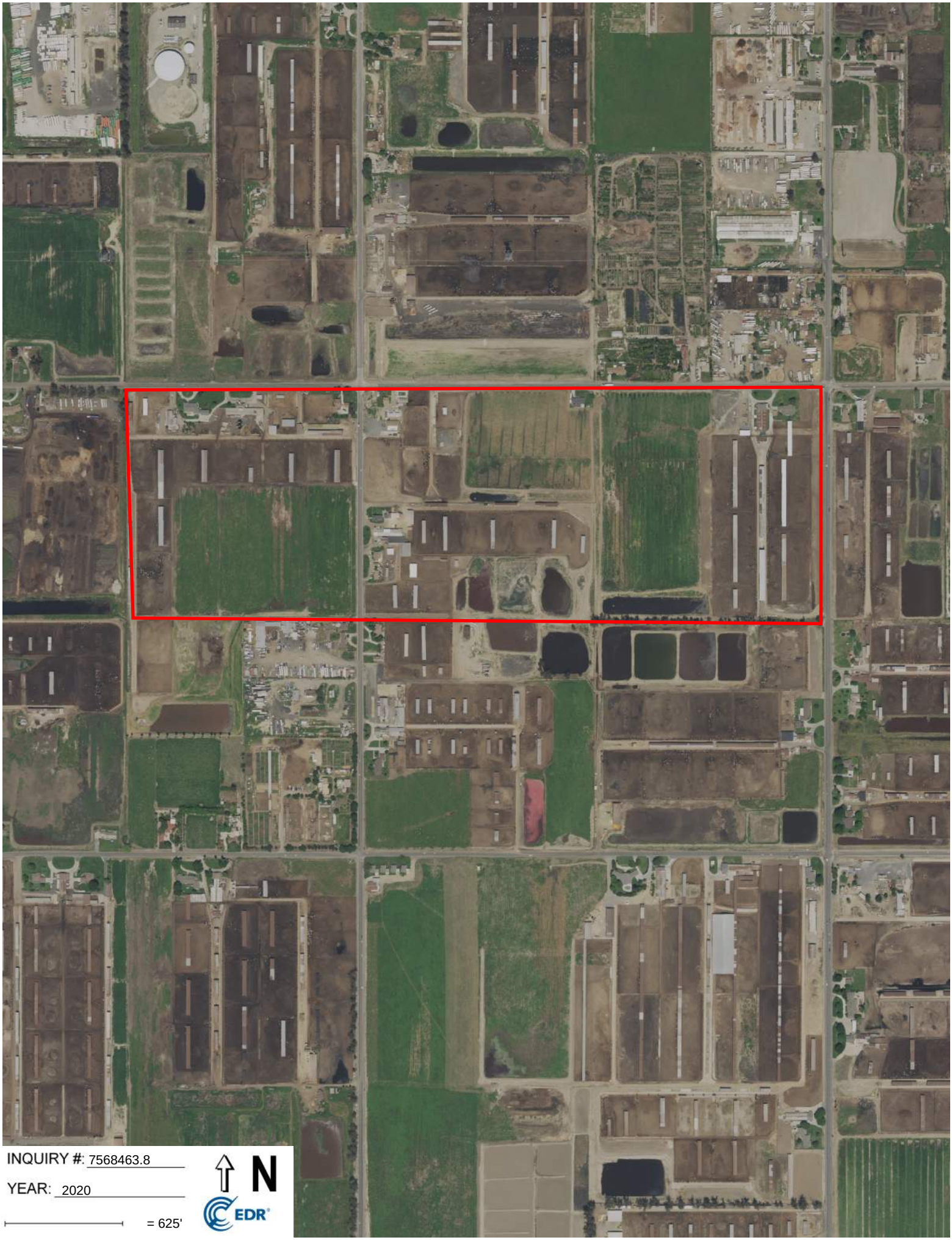
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YEAR: 2020
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EDR

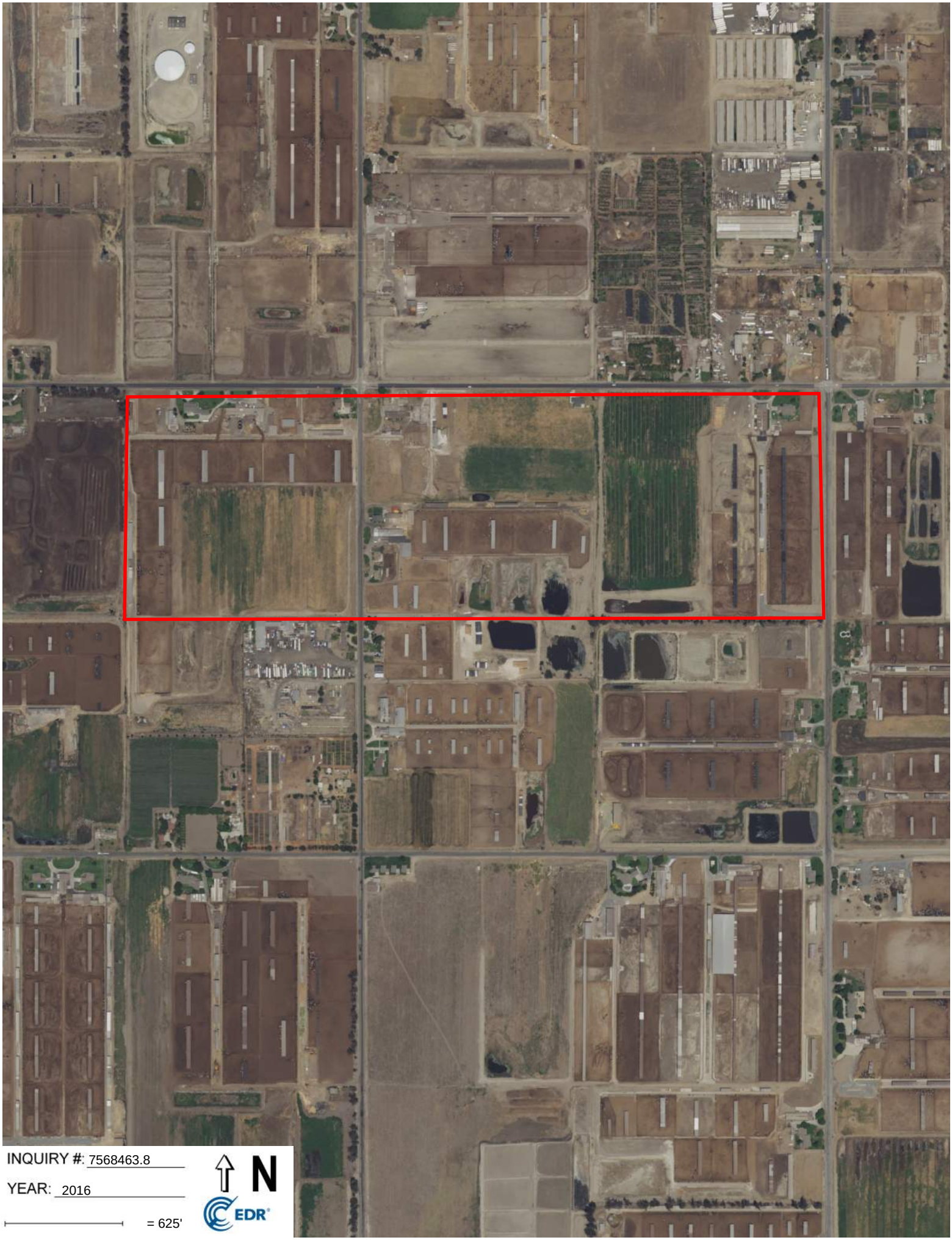
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YEAR: 2016
= 625'
N
EDR

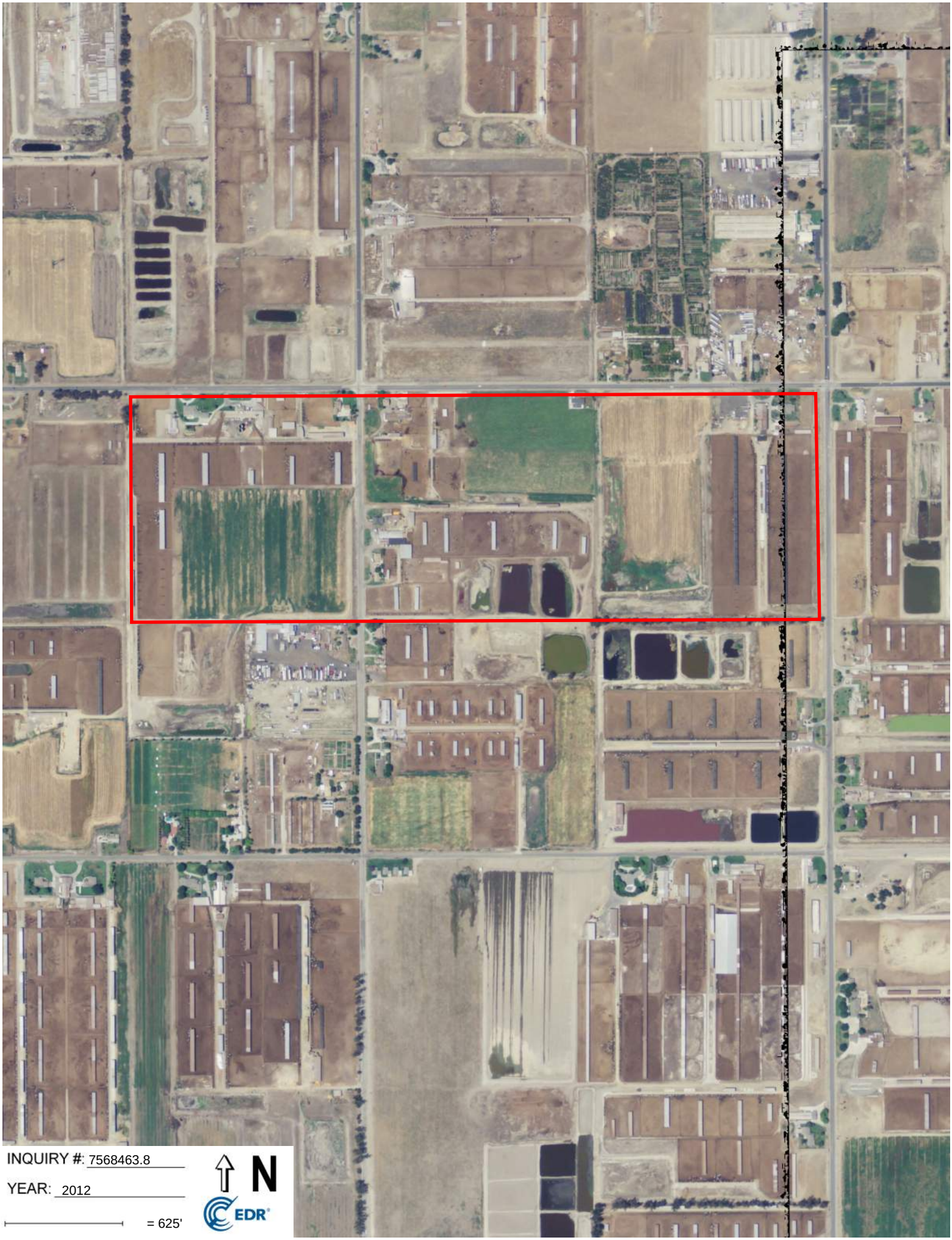
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YEAR: 2012
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 2009
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 2006
= 625'
N
EDR

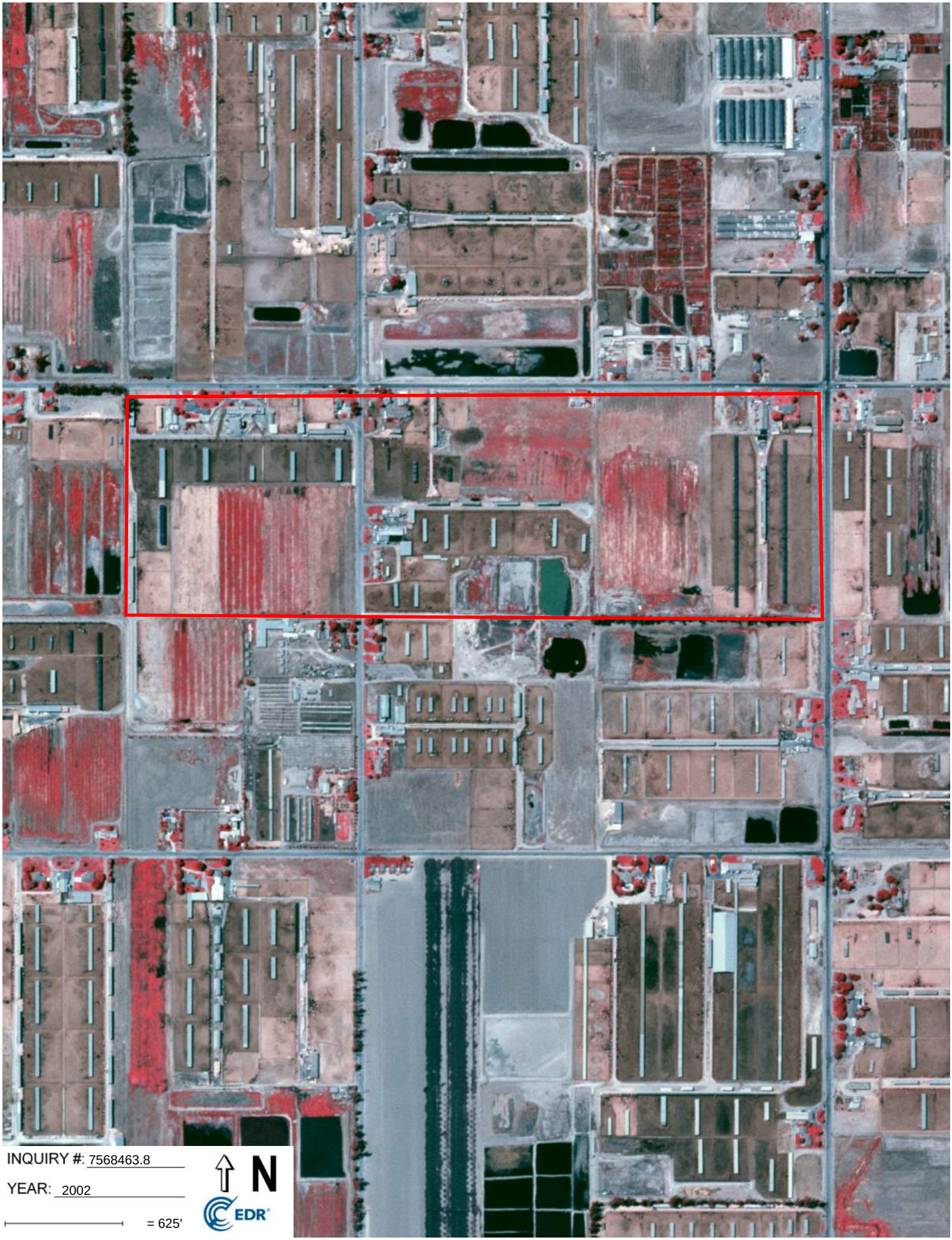
INQUIRY #: 7568463.8
YEAR: 2002
= 625'
N
EDR

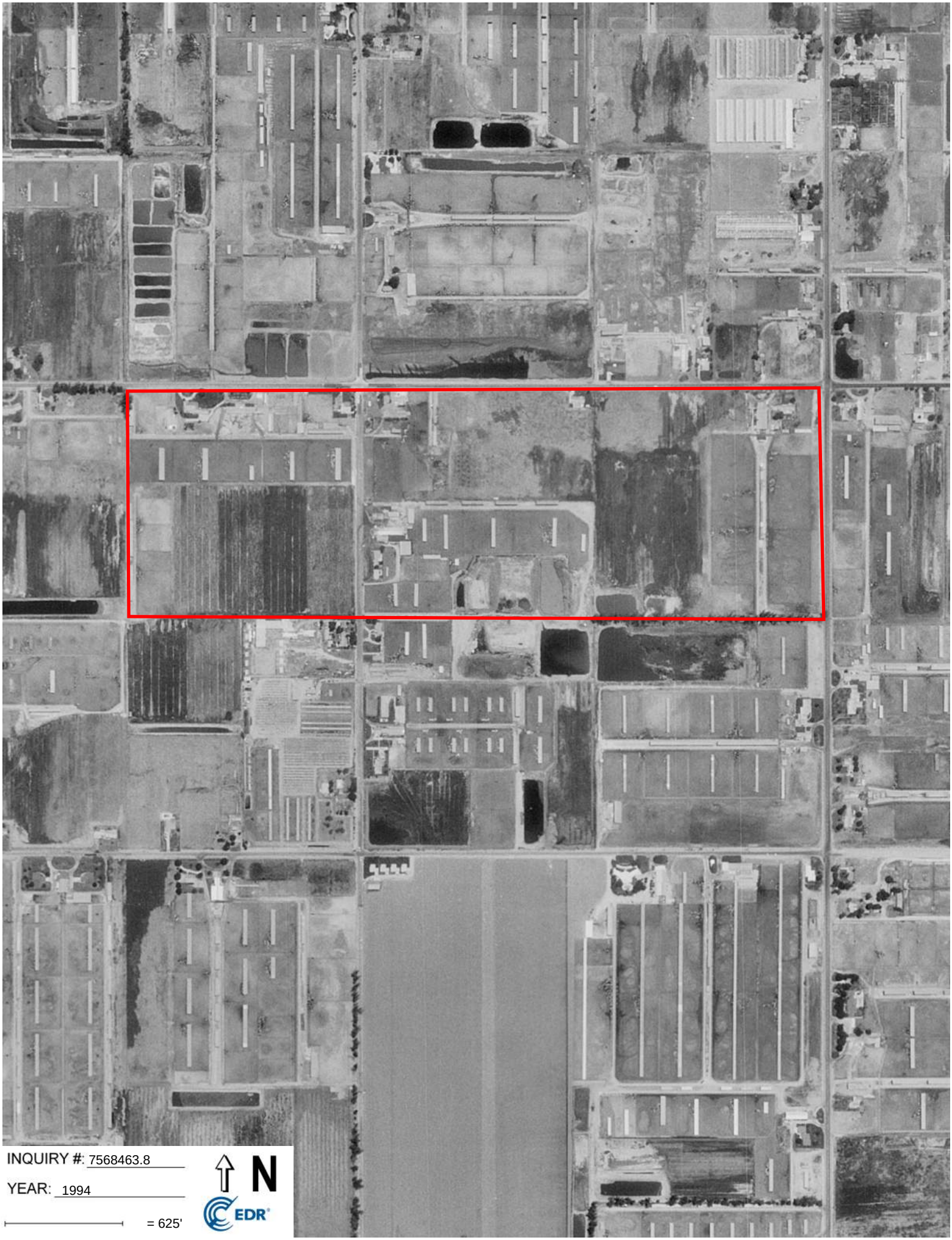
INQUIRY #: 7568463.8
YEAR: 1994
= 625'
N
EDR

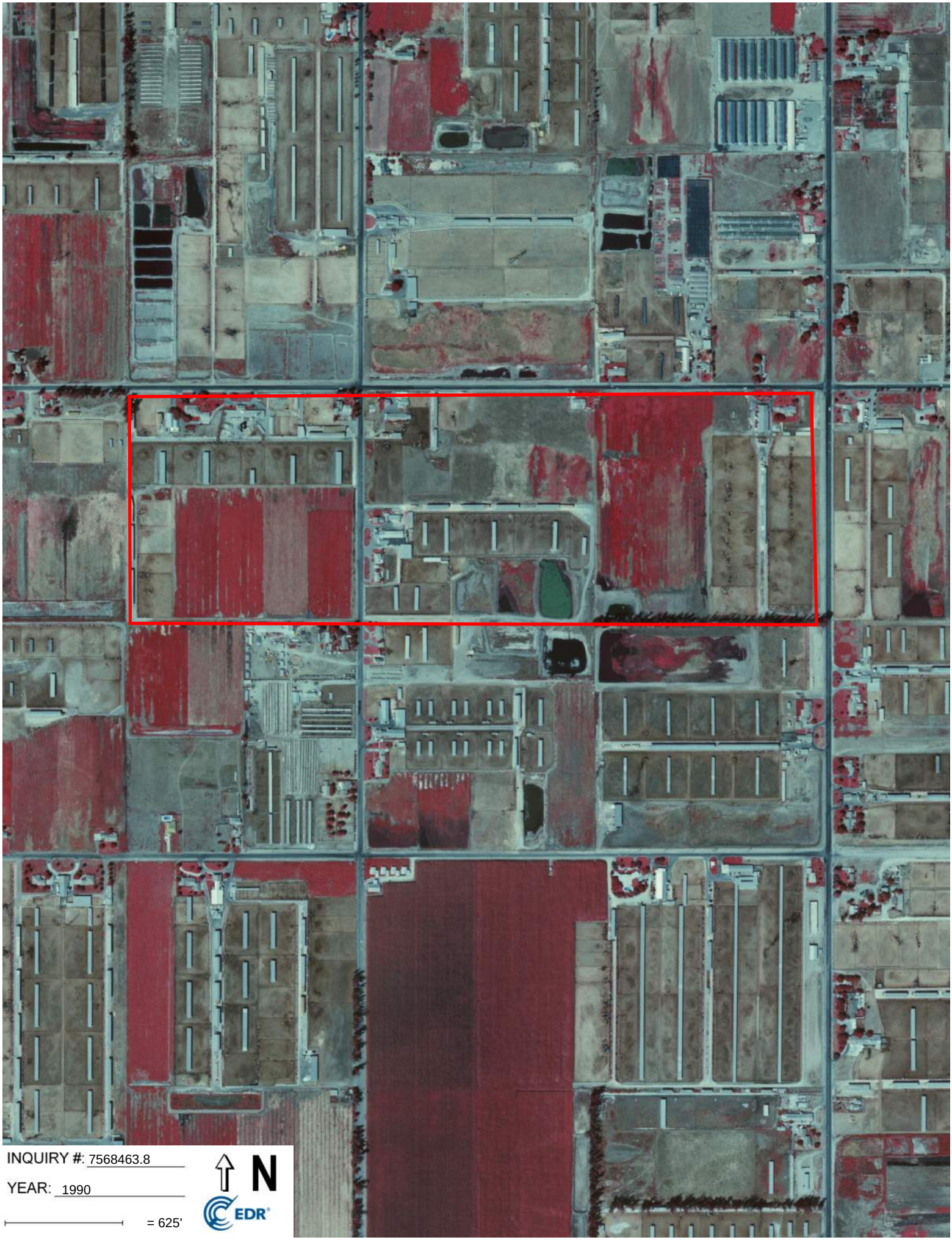
INQUIRY #: 7568463.8
YEAR: 1990
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1989
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1987
= 625'
N
EDR

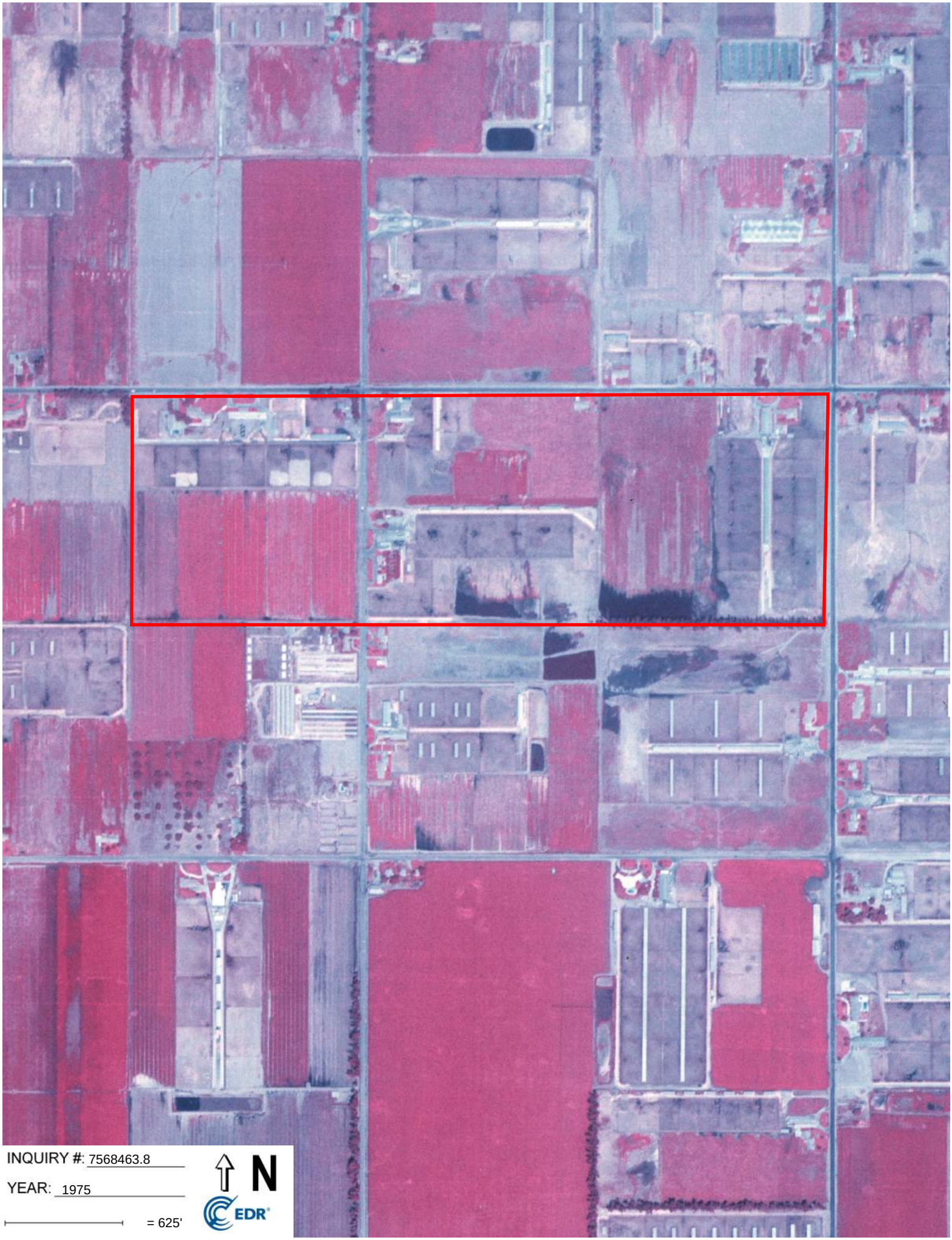
INQUIRY #: 7568463.8
YEAR: 1975
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1966
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1953
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1948
= 625'
N
EDR

INQUIRY #: 7568463.8
YEAR: 1946
= 625'
N
EDR

INQUIRY #: 7568463.8

YEAR: 1938

= 625'

N

EDR

**Ontario Ranch II**
14366 Bon View Avenue
Ontario, CA 91762

Inquiry Number: 7568463.5
February 14, 2024

# The EDR-City Directory Abstract

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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**Executive Summary**

**Findings**

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

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# EXECUTIVE SUMMARY

## DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at approximately five year intervals.

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1922 through current. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 1320 feet of the target property.

Summary information obtained is provided in the text of this report.

## RECORD SOURCES

The EDR City Directory Report accesses a variety of business directory sources, including Haines, InfoUSA, Polk, Cole, Bresser, and Stewart. Listings marked as EDR Digital Archive access Cole and InfoUSA records. The various directory sources enhance and complement each other to provide a more thorough and accurate report.

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## RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

| Year | Source | TP | Adjoining | Text Abstract | Source Image |
|---|---|---|---|---|---|
| 2020 | EDR Digital Archive | - | X | X | - |
| | EDR Digital Archive | X | X | X | - |
| 2017 | Cole Information | - | X | X | - |
| | Cole Information | X | X | X | - |
| 2014 | Cole Information | X | X | X | - |
| 2010 | Cole Information | X | X | X | - |
| 2008 | Haines Company, Inc. | X | X | X | - |
| 2005 | Cole Information | X | X | X | - |
| 2003 | Haines & Co Publishers | X | X | X | - |
| 2002 | Cole Information Services | - | - | - | - |
| 2000 | Cole Information | X | X | X | - |
| 1996 | GTE | X | X | X | - |
| 1995 | Cole Information | X | X | X | - |
| 1992 | Cole Information | X | X | X | - |
| 1991 | GTE California Incorporated | - | - | - | - |
| 1990 | GTE California Incorporated | X | X | X | - |

# EXECUTIVE SUMMARY

| Year | Source | TP | Adjoining | Text Abstract | Source Image |
|---|---|---|---|---|---|
| 1985 | GTE | X | X | X | - |
| 1981 | General Telephone Company of California | - | - | - | - |
| 1980 | GTE | X | X | X | - |
| 1975 | Pacific Telephone Co | X | - | X | - |
| 1970 | General Telephone Company of California | X | X | X | - |
| 1965 | GTE | X | - | X | - |
| 1964 | Luskey Brothers & Co | - | - | - | - |
| 1961 | Luskey Brothers& Co Publishers | - | - | - | - |
| 1960 | Luskey Brothers & Co Publishers | X | - | X | - |
| 1956 | General Telephone Company Publishers | - | - | - | - |
| 1955 | Luskey Brothers Co Publishers | - | - | - | - |
| 1951 | Los Angeles Directory Co Publishers | - | - | - | - |
| 1950 | The Pacific Telephone and Telegraph Co | - | - | - | - |
| 1949 | San Bernardino Directory Co. Publishers | - | - | - | - |
| 1946 | Los Angeles Directory Company Publishers | - | - | - | - |
| 1945 | Southern Califronia Telephone Company | - | - | - | - |
| 1942 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1941 | Associated Telephone Company Limited | - | - | - | - |
| 1940 | Los Angeles Directory Co. | - | - | - | - |
| 1938 | Los Angeles Directory Co. | - | - | - | - |
| 1936 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1934 | Los Angeles Directory Co. | - | - | - | - |
| 1931 | Los Angeles Directory Co. | - | - | - | - |
| 1930 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1926 | Los Angeles Directory Co. | - | - | - | - |
| 1923 | Los Angeles Directory Company | - | - | - | - |
| 1922 | R.L. Polk & Co Publishers | - | - | - | - |

# EXECUTIVE SUMMARY

## SELECTED ADDRESSES

The following addresses were selected by the client, for EDR to research. An "X" indicates where information was identified.

| *Address* | *Type* | *Findings* |
|---|---|---|
| 8061 Edison Avenue | Client Entered | |
| 14400 South Grove Avenue | Client Entered | |
| 7587 Edison Avenue | Client Entered | |
| 14451 Bon View Avenue | Client Entered | |
| 7325 Edison Avenue | Client Entered | |
| 14316 Bon View Avenue | Client Entered | |
| 7634 Eucalyptus Avenue | Client Entered | |
| 7721 Edison Avenue | Client Entered | |
| 14213 Bon View Avenue | Client Entered | |

# FINDINGS

## TARGET PROPERTY INFORMATION

### ADDRESS

14366 Bon View Avenue
Ontario, CA 91762

### FINDINGS DETAIL

Target Property research detail.

### BON VIEW AVE

**14213 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | GORDON | EDR Digital Archive |
| 2017 | GORDON | Cole Information |
| 2014 | GORDON | Cole Information |
| 2005 | JESUS CARDENAS | Cole Information |
| 2003 | COSTA D | Haines & Co Publishers |
| 2000 | COSTA VIEW FARMS NO 3 | Cole Information |
| | DOLORES VIVEROS | Cole Information |
| 1996 | COSTA VIEW FARMS NO | GTE |
| | VIveros Dolores | GTE |
| 1995 | COSTA VIEW FARMS | Cole Information |
| | VELASCO, JOSE G | Cole Information |
| 1992 | COSTA VIEW FARMS 3 | Cole Information |
| 1970 | ROCHA ELCIDIO | General Telephone Company of California |

**14316 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | LAUREN HINDELANG | EDR Digital Archive |
| | MICHAEL HINDELANG | EDR Digital Archive |
| 2017 | MIKE HINDELANG | Cole Information |
| 2014 | ALBERT HINDELANG | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| 2005 | ALBERT HINDELANG | Cole Information |
| 1992 | HINDELANG, ALBERT | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 1992 | QUALITY BLT FBRGLSS | Cole Information |
| 1990 | HINDELANG ALBERT | GTE California Incorporated |
| | QUALITY BUILT | GTE California Incorporated |
| 1985 | HINDELANG ALBERT | GTE |
| 1970 | BENTO TONY | General Telephone Company of California |

**14366 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| | WHY PRODUCE CO | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | B & G CATTLE CO | Cole Information |
| | OCCUPANT UNKNOWN | Cole Information |
| 2003 | XXXX | Haines & Co Publishers |
| 2000 | BEKENDAM CATTLE COMPANY | Cole Information |
| | OCCUPANT UNKNOWN | Cole Information |
| 1996 | BEKENDAM CATTLE CO | GTE |
| | VEstrada Albert | GTE |
| 1995 | BEKENDAM CATTLE CO | Cole Information |
| 1992 | BEKENDAM CATTLE CO | Cole Information |
| 1990 | B 8 G CATTLE CO | GTE California Incorporated |
| | BEKENDAM CATTLE CO | GTE California Incorporated |
| 1985 | B & G CATTLE CO | GTE |
| | GARCIA CARLOS | GTE |
| 1980 | NB & G CATTLE CO | GTE |

**14451 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | CAROL KUHL | EDR Digital Archive |
| | JORDAN KUHL | EDR Digital Archive |
| | PETER KUHL | EDR Digital Archive |
| | STARLA KUHL | EDR Digital Archive |
| 2017 | LENA ALBERS | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2017 | RAYMOND ALBERS | Cole Information |
| 2014 | RAYMOND ALBERS | Cole Information |
| 2010 | H & R DAIRY | Cole Information |
| | RON MIERSMA | Cole Information |
| 2008 | MIERSMA Ron | Haines Company, Inc. |
| 2005 | H & R DAIRY | Cole Information |
| 2003 | MIERSMA Ron | Haines & Co Publishers |
| 2000 | COSTA VIEW FARMS NO 1 | Cole Information |
| | DENISE MIERSMA | Cole Information |
| 1996 | Costa Dimas | GTE |
| | COSTA VIEW FARMS | GTE |
| 1995 | COSTA VIEW FARMS | Cole Information |
| | COSTA, DIMAS | Cole Information |
| 1992 | COSTA VIEW FARMS 1 | Cole Information |
| | COSTA, DIMAS | Cole Information |
| 1990 | COSTA DIMAS | GTE California Incorporated |
| | COSTA VIEW FARMS | GTE California Incorporated |
| 1985 | COSTA DIMAS | GTE |
| 1980 | COSTA DIMAS | GTE |

## Bon View Avenue

**14213 Bon View Avenue**

| Year | Uses | Source |
|---|---|---|

**14316 Bon View Avenue**

| Year | Uses | Source |
|---|---|---|

**14451 Bon View Avenue**

| Year | Uses | Source |
|---|---|---|

# FINDINGS

## EDISON AVE

**7325 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 1970 | MELLO JOE | General Telephone Company of California |

**7587 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2008 | HUIZENGA Paul | Haines Company, Inc. |
| 2003 | DE Groat Ernest | Haines & Co Publishers |
| 1996 | De Groot Ernest | GTE |
| | TWIN PALMS DAIRY | GTE |
| 1990 | De Groot Ernest | GTE |
| | Or | GTE |
| | Twin Palms Dairy | GTE |
| | Twinkee The Clown Mntclr | GTE |
| | DE GROOT ERNEST | GTE California Incorporated |
| | TWIN PALMS DAIRY | GTE California Incorporated |
| 1985 | DE GROOT ERNEST | GTE |
| 1980 | DE GROOT ERNEST | GTE |
| | DE GROOT ERNEST | GTE |
| 1975 | De Groot Ernest | GTE Directories |
| 1970 | DE GRCOT ERNEST | General Telephone Company of California |
| | DE GROOT ERNEST | General Telephone Company of California |
| 1965 | DE GROOT ERNEST | GTE |
| 1960 | Alluis Albeft Jr | General Telephone Company Publishers |

**7721 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2008 | BOOTSMA Garret | Haines Company, Inc. |
| 2003 | BOOTSMA Garret | Haines & Co Publishers |
| | BOOTSMA Wilbur | Haines & Co Publishers |
| 1996 | Bootsma Garret | GTE |
| 1990 | Bootsma Garret | GTE |
| | BOOTSMA GARRET | GTE California Incorporated |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 1985 | BOOTSMA GARRET | GTE |
| 1980 | + BOOTSMA GARRET | GTE |
| | BOOTSMA JIM | GTE |
| 1975 | Bootsma Jim | GTE Directories |
| 1970 | BOOTSMA JIM | General Telephone Company of California |
| 1965 | BOOTSMA J NA | GTE |
| 1960 | Bootsma Jim | General Telephone Company Publishers |

**8061 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2008 | JORRITSMA Jas D | Haines Company, Inc. |
| 2003 | JORRITSMA Jas D | Haines & Co Publishers |
| 1996 | Jorritsma Jas D | GTE |
| 1990 | Jorritsma Jas D | GTE |
| | JORRITSMA JAS D | GTE California Incorporated |
| 1985 | CERDA REYES | GTE |
| | JORRITSMA JAS | GTE |
| 1980 | JORRITSMA JAS D | GTE |
| 1975 | Tuls Jack G | GTE Directories |
| 1970 | TULS JACK G | General Telephone Company of California |

## Edison Avenue

**7325 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**7587 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**7721 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

# FINDINGS

**8061 Edison Avenue**

| *Year* | *Uses* | *Source* |
|---|---|---|

## EUCALYPTUS AVE

**7634 EUCALYPTUS AVE**

| *Year* | *Uses* | *Source* |
|---|---|---|
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | CHINO CORONA VETERINARY SERVICES | Cole Information |

## Eucalyptus Avenue

**7634 Eucalyptus Avenue**

| *Year* | *Uses* | *Source* |
|---|---|---|

## South Grove Avenue

**14400 South Grove Avenue**

| *Year* | *Uses* | *Source* |
|---|---|---|

# FINDINGS

## ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

## BON VIEW AVE

**14214 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2000 | OCCUPANT UNKNOWN | Cole Information |

**14283 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | CAESAR URIBE | Cole Information |
| 2014 | ANA VARGAS | Cole Information |
| 2010 | ANA VARGAS | Cole Information |
| 2003 | XXXX | Haines & Co Publishers |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1996 | Boettcher Shane | GTE |
| 1995 | BOETTCHER, SHANE | Cole Information |
| 1985 | COELHO DENNIS | GTE |
| 1980 | COELHO DENNIS | GTE |
| 1970 | FRANCO FRANCISCO | General Telephone Company of California |

**14297 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | MARIA AVINA | Cole Information |
| 2005 | MARIA AVINA | Cole Information |
| 2000 | CRAIG CARR | Cole Information |
| 1996 | VBoettcher Wayne | GTE |
| 1995 | HANSEN, MAX | Cole Information |

**14306 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2010 | ALBERT HINDELANG | Cole Information |
| 2005 | WILLIAM HINDELANG | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2003 | HINDELANG William | Haines & Co Publishers |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1995 | HERNANDEZ, IRMA | Cole Information |
| 1992 | HERNANDEZ, IRMA | Cole Information |
| | QEVEDO, MIGUEL | Cole Information |
| | BON VIEW HORSE BRDN | Cole Information |
| 1990 | BON VIEW HORSE BRDNG | GTE California Incorporated |
| 1985 | BON VIEW HORSE BRDNG | GTE |
| | MARTINEZ JUAN | GTE |
| 1980 | LE EQUESTRIAN CENTRE | GTE |
| 1970 | HINOELANG JR WM | General Telephone Company of California |

**14330 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | GEROGEANN RILEY | Cole Information |
| 2014 | GEORGEANN RILEY | Cole Information |
| 2005 | OCCUPANT UNKNOWN | Cole Information |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1995 | OCCUPANT UNKNOWNN | Cole Information |

**14333 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | DELILAH RODIGUEZ | Cole Information |
| 2014 | BEATRIZ HERNANDEZ | Cole Information |
| 2010 | JOAQUIN CORRAL | Cole Information |
| 2003 | COSTA D | Haines & Co Publishers |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1996 | Silva Joso | GTE |
| 1995 | SILVA, JOAO | Cole Information |
| 1990 | MEDEIROS RUI | GTE California Incorporated |
| 1985 | LOURENCO JOHN | GTE |
| 1980 | LOURENCO JOHN | GTE |
| 1970 | COTA ANTONIO | General Telephone Company of California |

# FINDINGS

**14343 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | LIZ BARAJAS | Cole Information |
| 2014 | JOEL FLORES | Cole Information |
| 2008 | BARAJAS Irene | Haines Company, Inc. |
| 2003 | XXXX | Haines & Co Publishers |
| 2000 | OCCUPANT UNKNOWN | Cole Information |
| 1996 | Costa Teresa | GTE |
| 1995 | OCCUPANT UNKNOWNN | Cole Information |
| 1990 | BOOTSMA JIM | GTE California Incorporated |
| 1970 | ROCHA JOE C | General Telephone Company of California |

**14450 BON VIEW AVE**

| Year | Uses | Source |
|---|---|---|
| 2003 | COSTA Dimas | Haines & Co Publishers |

## EUCALYPTS AVE

**7565 EUCALYPTS AVE**

| Year | Uses | Source |
|---|---|---|
| 2000 | LOYOLA DAIRY | Cole Information |

**7698 EUCALYPTS AVE**

| Year | Uses | Source |
|---|---|---|
| 2000 | GOLDEN STATE HOLSTEINS INCORPORATED | Cole Information |

## EUCALYPTUS AVE

**7511 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | BRAD OWEN | EDR Digital Archive |
| | AMY OWEN | EDR Digital Archive |
| 2017 | BRAD OWEN | Cole Information |
| 2014 | BRAD OWEN | Cole Information |
| 2010 | BRAD OWEN | Cole Information |
| 2008 | OWEN Brad | Haines Company, Inc. |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2005 | BRAD OWEN | Cole Information |

**7556 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | TOM WORTHINGTON | Cole Information |
| 2014 | TOM WORTHINGTON | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | THOMAS WORTHINGTON | Cole Information |

**7565 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | CHINO VALLEY DAIRY | EDR Digital Archive |
| 2017 | MARTY VANLEEUWEN | Cole Information |
| 2014 | MARTY VANLEEUWEN | Cole Information |
| 2010 | FRANK SOUZA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | OCCUPANT UNKNOWN | Cole Information |

**7698 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | MODESTO MILLING | EDR Digital Archive |
| 2008 | AMYS FARM TOURS | Haines Company, Inc. |
| | GOLDEN STATE HOLSTEINS INC | Haines Company, Inc. |
| 2005 | GOLDEN STATE HOLSTEINS INC | Cole Information |
| | AMYS FARM TOURS | Cole Information |

**7721 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | CARMEN MONTANEZ | Cole Information |
| 2014 | CARMEN MONTANEZ | Cole Information |
| 2010 | CARMEN MONTANEZ | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |

**7735 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | ROCIO VEGA | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2014 | SOLEDAD MENDEZ | Cole Information |
| 2010 | SOLEDAD MENDEZ | Cole Information |
| 2008 | MENDEZ Soledad | Haines Company, Inc. |

**7745 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | JAVIER CAYETANO | Cole Information |
| 2014 | JAVIER CAYETANO | Cole Information |
| 2010 | SILMA CAYETANO | Cole Information |
| 2008 | CAYETANO Francisco | Haines Company, Inc. |
| 2005 | FRANCISCO CAYETANO | Cole Information |

**7755 EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| 2008 | ARANDA Yvonne | Haines Company, Inc. |
| 2005 | EDUARDO ARANDA | Cole Information |

## W EUCALYPTUS AVE

**7698 W EUCALYPTUS AVE**

| Year | Uses | Source |
|---|---|---|
| 2000 | AMYS FARM TOURS | Cole Information |

# FINDINGS

## ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14214 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14283 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14297 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14306 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14330 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14333 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14343 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14450 BON VIEW AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7511 EUCALYPTUS AVE | 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7556 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7556 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7556 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7556 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 7565 EUCALYPTS AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7565 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 EUCALYPTS AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 EUCALYPTUS AVE | 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7698 W EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7721 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 7721 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7721 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7721 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7735 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7735 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7735 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7735 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7745 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7755 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2008, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
| --- | --- |
| 7755 EUCALYPTUS AVE | 2020, 2017, 2014, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7755 EUCALYPTUS AVE | 2020, 2017, 2014, 2010, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7755 EUCALYPTUS AVE | 2020, 2017, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

## TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

| Address Researched | Address Not Identified in Research Source |
| --- | --- |
| 14366 Bon View Avenue | 2002, 1991, 1981, 1964, 1961, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

**Ontario Ranch I**
8185 Edison Avenue
Ontario, CA 91762

Inquiry Number: 7869218.5
January 14, 2025

# The EDR-City Directory Abstract

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

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**Executive Summary**

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

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# EXECUTIVE SUMMARY

## DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at approximately five year intervals.

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1922 through current. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 1320 feet of the target property.

Summary information obtained is provided in the text of this report.

## RECORD SOURCES

The EDR City Directory Report accesses a variety of business directory sources, including Haines, InfoUSA, Polk, Cole, Bresser, and Stewart. Listings marked as EDR Digital Archive access Cole and InfoUSA records. The various directory sources enhance and complement each other to provide a more thorough and accurate report.

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## RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

| Year | Source | TP | Adjoining | Text Abstract | Source Image |
|---|---|---|---|---|---|
| 2020 | EDR Digital Archive | - | X | X | - |
| | EDR Digital Archive | X | X | X | - |
| 2017 | Cole Information | - | X | X | - |
| | Cole Information | X | X | X | - |
| 2014 | Cole Information | X | X | X | - |
| 2010 | Cole Information | X | X | X | - |
| 2008 | Haines Company, Inc. | X | X | X | - |
| 2005 | Cole Information | X | X | X | - |
| 2003 | Haines Co Publishers | X | - | X | - |
| 2002 | Cole Information Services | - | - | - | - |
| 2000 | Cole Information | - | - | - | - |
| 1996 | GTE | X | - | X | - |
| 1995 | Cole Information | X | - | X | - |
| | GTE Directories | X | - | X | - |
| 1992 | Cole Information | - | - | - | - |
| 1991 | GTE California Incorporated | - | - | - | - |

# EXECUTIVE SUMMARY

| Year | Source | TP | Adjoining | Text Abstract | Source Image |
|---|---|---|---|---|---|
| 1990 | GTE California Incorporated | X | - | X | - |
| 1985 | GTE | X | - | X | - |
| 1981 | General Telephone Company of California | - | - | - | - |
| 1980 | GTE | X | - | X | - |
| 1975 | Pacific Telephone Co | X | - | X | - |
| 1970 | General Telephone Company of California | X | X | X | - |
| 1965 | GTE | - | X | X | - |
| 1964 | Luskey Brothers & Co | - | - | - | - |
| 1961 | Luskey Brothers& Co Publishers | - | - | - | - |
| 1960 | Luskey Brothers & Co Publishers | X | - | X | - |
| 1956 | General Telephone Company Publishers | - | - | - | - |
| 1955 | Luskey Brothers Co Publishers | - | - | - | - |
| 1951 | Los Angeles Directory Co Publishers | - | - | - | - |
| 1950 | The Pacific Telephone and Telegraph Co | - | - | - | - |
| 1949 | San Bernardino Directory Co. Publishers | - | - | - | - |
| 1946 | Los Angeles Directory Company Publishers | - | - | - | - |
| 1945 | Southern Califronia Telephone Company | - | - | - | - |
| 1942 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1941 | Associated Telephone Company Limited | - | - | - | - |
| 1940 | Los Angeles Directory Co. | - | - | - | - |
| 1938 | Los Angeles Directory Co. | - | - | - | - |
| 1936 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1934 | Los Angeles Directory Co. | - | - | - | - |
| 1931 | Los Angeles Directory Co. | - | - | - | - |
| 1930 | San Bernardino Directory Co Publisher | - | - | - | - |
| 1926 | Los Angeles Directory Co. | - | - | - | - |
| 1923 | Los Angeles Directory Company | - | - | - | - |
| 1922 | R.L. Polk & Co Publishers | - | - | - | - |

# EXECUTIVE SUMMARY

## SELECTED ADDRESSES

The following addresses were selected by the client, for EDR to research. An "X" indicates where information was identified.

| *Address* | *Type* | *Findings* |
|---|---|---|
| 14361 Grove Avenue | Client Entered | |
| 14117 Grove Avenue | Client Entered | |
| 8311 Edison Avenue | Client Entered | |
| 8295 Edison Avenue | Client Entered | |
| 8381 Edison Avenue | Client Entered | |
| 8335 Edison Avenue | Client Entered | |
| 8485 Edison Avenue | Client Entered | |
| 14350 Walker Avenue | Client Entered | |
| 14474 Grove Avenue | Client Entered | |
| 14441 Grove Avenue | Client Entered | |

# FINDINGS

## TARGET PROPERTY INFORMATION

### ADDRESS

8185 Edison Avenue
Ontario, CA 91762

### FINDINGS DETAIL

Target Property research detail.

## Edison

**8335 Edison**

| Year | Uses | Source |
|---|---|---|
| 2003 | DEHOOG Michael | Haines & Co Publishers |

**8381 Edison**

| Year | Uses | Source |
|---|---|---|
| 2008 | DEHOOG DAIRY | Haines Company, Inc. |
| | DEHOOG Michael | Haines Company, Inc. |
| | DEHOOG Michelle | Haines Company, Inc. |
| 2003 | DE Hoog Michael | Haines & Co Publishers |
| | DE Hoog Michelle | Haines & Co Publishers |
| | DEHOOG DAIRY | Haines & Co Publishers |
| 1995 | Dehoog Michael | GTE Directories |
| | DEHOOG DAIRY | GTE Directories |
| 1990 | De Hoog Michael | GTE |
| | De Hoog Michelle | GTE |
| | Kooi Holsteins Inc | GTE |
| 1985 | DE HOOG MICHAEL | GTE General Telephone Company of California |
| | s K 0001 HOLSTEINS INC | GTE General Telephone Company of California |
| 1980 | KOOI HOLSTEIN | GTE General Telephone Company of California |
| | KOOI HOLSTEINS INC | GTE General Telephone Company of California |
| 1975 | Van Der Koni Charlie | GTE Directories |
| 1960 | Veenstra John | General Telephone Company Publishers |

# FINDINGS

**8485 Edison**

| Year | Uses | Source |
|---|---|---|
| 2008 | GIBSON Leanne | Haines Company, Inc. |
| 2003 | SWAGER Edw | Haines & Co Publishers |
| 1995 | Swager Edw | GTE Directories |
| 1990 | Swager Edw | GTE |
| 1985 | SWAGER EDW | GTE General Telephone Company of California |
| 1980 | SWAGER EDW 947 516f | GTE General Telephone Company of California |
| 1975 | Swager Edw | GTE Directories |

## EDISON AVE

**8185 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | NOE BRACAMONTES | Cole Information |
| 2010 | JACK ALEWYN | Cole Information |
| 2008 | ALEWYN Jack | Haines Company, Inc. |
| 2005 | JACK ALEWYN | Cole Information |
| | JACK ALEWYN DAIRY | Cole Information |

**8295 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | MARIA LOZANO | Cole Information |
| 2014 | CARLOS RODRIGUEZ | Cole Information |
| 2010 | CARLOS RODRIGUEZ | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | CARLOS RODRIGUEZ | Cole Information |

**8311 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | ELIZABETH DEHOOG | EDR Digital Archive |
| | REBECCA DE HOOG | EDR Digital Archive |
| | SARAH DEHOOG | EDR Digital Archive |
| 2017 | ELIZABETH DEHOOG | Cole Information |
| 2014 | DEHOOG MARTIN L | Cole Information |
| | MARTIN DEHOOG | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2010 | DEHOOG MARTIN L | Cole Information |
| | MARTIN DEHOOG | Cole Information |
| | MICHAEL DEHOOG | Cole Information |
| 2008 | DEHOOG MARTIN L | Haines Company, Inc. |
| 2005 | MARTIN DEHOOG | Cole Information |

## Edison Avenue

**8295 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**8311 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**8335 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**8381 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

**8485 Edison Avenue**

| Year | Uses | Source |
|---|---|---|

## grove

**14117 grove**

| Year | Uses | Source |
|---|---|---|
| 1985 | BROWN S COW SERVICE | GTE |
| 1980 | SMITH THOS | GTE |
| 1975 | Sieperda Peter | GTE Directories |
| 1970 | SIEPERDA PETER | General Telephone Company of California |

# FINDINGS

**14361 grove**

| Year | Uses | Source |
|---|---|---|
| 2008 | ALEWYN Elane R | Haines Company, Inc. |
| 2003 | ALEWYN Jake J | Haines & Co Publishers |
| 1990 | Alewyn Jake J | GTE |
| 1980 | ALEWYN JAKE J | GTE |
| 1975 | Alewyn Jake J | GTE Directories |

**14441 grove**

| Year | Uses | Source |
|---|---|---|
| 2008 | XXXX | Haines Company, Inc. |
| 2003 | XXXX | Haines & Co Publishers |
| 1990 | ENGELSMA JEFF | GTE California Incorporated |
| 1980 | MIERSMA BOB | GTE |
| 1975 | Miersma Harlan | GTE Directories |
| 1970 | VANOERVEEN JOE | General Telephone Company of California |

**14474 grove**

| Year | Uses | Source |
|---|---|---|
| 2008 | MOUW Travis N | Haines Company, Inc. |
| 2003 | MIERSMA Harlan | Haines & Co Publishers |
| 1996 | Miersma Harlan | GTE |
| 1990 | Miersma Harlan | GTE |
| | MIERSMA HARLAN | GTE California Incorporated |
| 1985 | MIERSMA HARLAN | GTE |
| 1980 | MIERSMA HARLAN | GTE |
| 1975 | Miersma Harry | GTE Directories |
| 1970 | VANDER VEEN WILBUR | General Telephone Company of California |

## GROVE AVE

**14117 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | PEDRO CASTRO | EDR Digital Archive |
| 2014 | JACK ALEWYN | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2005 | OCCUPANT UNKNOWN | Cole Information |

## Grove Avenue

**14117 Grove Avenue**

| Year | Uses | Source |
|---|---|---|

**14361 Grove Avenue**

| Year | Uses | Source |
|---|---|---|

**14441 Grove Avenue**

| Year | Uses | Source |
|---|---|---|

**14474 Grove Avenue**

| Year | Uses | Source |
|---|---|---|

## walker

**14350 walker**

| Year | Uses | Source |
|---|---|---|
| 2008 | XXXX | Haines Company, Inc. |
| 2003 | DEHOOG Joe | Haines & Co Publishers |
| | SWAGER Johanna | Haines & Co Publishers |
| 1995 | Dehoog Joe | GTE Directories |
| 1990 | Swager Dale R | GTE |
| 1985 | SWAGER DALE R | GTE General Telephone Company of California |
| 1980 | END OF SECTION | GTE General Telephone Company of California |
| | LA BRUCHERIE RONALD | GTE General Telephone Company of California |
| 1975 | Swager John E | GTE Directories |

# FINDINGS

## Walker Avenue

**14350 Walker Avenue**

| *Year* | *Uses* | *Source* |
|---|---|---|

# FINDINGS

## ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

## EDISON AVE

**7990 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | JAY HARP | Cole Information |
| 2014 | OCCUPANT UNKNOWN | Cole Information |

**8040 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | JOSE DELEON | Cole Information |
| 2014 | JOSE DELEON | Cole Information |
| 2010 | LUIS DELEON | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | NUTRIUS INC | Cole Information |

**8061 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | DIANA PEREZ | EDR Digital Archive |
| 2017 | ISIDRO PEREZ | Cole Information |
| 2014 | ISIDRO PEREZ | Cole Information |
| 2010 | GREG ANEMA | Cole Information |
| 2008 | JORRITSMA Jas D | Haines Company, Inc. |
| 2005 | JORRITSMA AND ANEMA DAIRY | Cole Information |
| | JAMES JORRITSMA | Cole Information |

**8148 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | CALIFORNIA LIVESTOCK MKT INC | EDR Digital Archive |
| 2017 | CHINO LIVESTOCK MARKET | Cole Information |
| 2014 | CHINO LIVESTOCK MARKET | Cole Information |
| 2010 | CHINO LIVESTOCK MARKET | Cole Information |
| 2008 | CHINO LIVESTOCK MARKET | Haines Company, Inc. |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2005 | LIBERTY LIVESTOCK AUCTION | Cole Information |

**8250 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | P B SOD FARM | Cole Information |

**8270 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | DALVINA NEWBOLT | EDR Digital Archive |
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | VALVINA NEWBOLT | Cole Information |
| 2008 | NEWBOLT Valvina | Haines Company, Inc. |
| 2005 | VALVINA NEWBOLD | Cole Information |

**8292 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | JOHN ESQUEDA | EDR Digital Archive |
| 2017 | STEPHANIE WANTUCH | Cole Information |
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | DON GRIEPSMA | Cole Information |
| 2008 | GRIEPSMA Don | Haines Company, Inc. |
| 2005 | DON GRIEPSMA | Cole Information |

**8314 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | ADRIANA ARROYO | Cole Information |
| 2014 | ADRIANA ARROYO | Cole Information |
| 2010 | RIOS FONSECA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |

**8332 EDISON AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | CARLY HUGHES | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| 2008 | LATCHIC Rick | Haines Company, Inc. |

# FINDINGS

## GROVE AVE

**13908 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2010 | JENILE BORBA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | SOUTH WEST POOL & SPA | Cole Information |
| | OCCUPANT UNKNOWN | Cole Information |
| 1970 | REARICK RICHARD | General Telephone Company of California |
| 1965 | HAYS J E NA | GTE |

**13932 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2014 | ABEL VILLAPANDO | Cole Information |
| 2010 | ABEL VILLAPANDO | Cole Information |
| 1965 | JENNINGS C R | GTE |

**13934 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 1965 | GONSALVES J L | GTE |

**13960 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | VOORTMAN'S EGG RANCH | EDR Digital Archive |
| | BROOK VOORTMAN | EDR Digital Archive |
| | MELISSA VOORTMAN | EDR Digital Archive |
| | EDWIN VOORTMAN | EDR Digital Archive |
| 2017 | BROOK VOORTMAN | Cole Information |
| | VOORTMANS EGG RANCH | Cole Information |
| 2014 | BROOK VOORTMAN | Cole Information |
| | VOORTMANS EGG RANCH | Cole Information |
| 2010 | OCCUPANT UNKNOWN | Cole Information |
| | VOORTMANS EGG RANCH | Cole Information |
| 2008 | VOORTMAN B M | Haines Company, Inc. |
| | VOORTMANS EGG RANCH | Haines Company, Inc. |
| 2005 | OCCUPANT UNKNOWN | Cole Information |

# FINDINGS

| Year | Uses | Source |
|---|---|---|
| 2005 | VOORTMANS EGG RANCH | Cole Information |

**14016 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2017 | RAMON MARTINEZ | Cole Information |
| 2014 | RAMON MARTINEZ | Cole Information |
| 2010 | RAMON MARTINEZ | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | RAMON MARTINEZ | Cole Information |

**14049 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | DAVID MISNER | EDR Digital Archive |
| 2017 | DAVID MISNER | Cole Information |
| 2014 | DAVID MISNER | Cole Information |
| 2010 | JOHN BOSMA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | JOHN BOSMA | Cole Information |

**14050 GROVE AVE**

| Year | Uses | Source |
|---|---|---|
| 2020 | ANNABELLE MARTINEZ | EDR Digital Archive |
| | EDUARDO MARTINEZ | EDR Digital Archive |
| 2017 | EDUARDO MARTINEZ | Cole Information |
| 2014 | OCCUPANT UNKNOWN | Cole Information |
| 2010 | BRUCE IDSINGA | Cole Information |
| 2008 | XXXX | Haines Company, Inc. |
| 2005 | BRUCE IDSINGA | Cole Information |

# FINDINGS

## ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

| Address Researched | Address Not Identified in Research Source |
|---|---|
| 13908 GROVE AVE | 2020, 2017, 2014, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 13932 GROVE AVE | 2020, 2017, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 13934 GROVE AVE | 2020, 2017, 2014, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 13960 GROVE AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14016 GROVE AVE | 2020, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14049 GROVE AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 14050 GROVE AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 7990 EDISON AVE | 2020, 2010, 2008, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8040 EDISON AVE | 2020, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8061 EDISON AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8148 EDISON AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8250 EDISON AVE | 2020, 2017, 2014, 2010, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8270 EDISON AVE | 2017, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8292 EDISON AVE | 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

# FINDINGS

| Address Researched | Address Not Identified in Research Source |
| --- | --- |
| 8314 EDISON AVE | 2020, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |
| 8332 EDISON AVE | 2020, 2017, 2005, 2003, 2002, 2000, 1996, 1995, 1992, 1991, 1990, 1985, 1981, 1980, 1975, 1970, 1965, 1964, 1961, 1960, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

## TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

| Address Researched | Address Not Identified in Research Source |
| --- | --- |
| 8185 Edison Avenue | 2002, 2000, 1992, 1991, 1981, 1965, 1964, 1961, 1956, 1955, 1951, 1950, 1949, 1946, 1945, 1942, 1941, 1940, 1938, 1936, 1934, 1931, 1930, 1926, 1923, 1922 |

Ontario Ranch I

8185 Edison Avenue

Ontario, CA 91762

Inquiry Number: 7869218.3

January 13, 2025

# Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# Certified Sanborn® Map Report

01/13/25

| Site Name: | Client Name: |
|---|---|
| Ontario Ranch I | Roux Associates |
| 8185 Edison Avenue | 5150 E Pacific Coast Highway |
| Ontario, CA 91762 | Long Beach, CA 90804 |
| EDR Inquiry # 7869218.3 | Contact: Ashley Whitaker |

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Roux Associates were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

## *Certified Sanborn Results:*

**Certification #** 953A-4D1D-AA64

**PO #** 3669.0004L

**Project** Ontario Ranch I

**UNMAPPED PROPERTY**

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 953A-4D1D-AA64

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

*The Sanborn Library LLC Since 1866™*

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Ontario Ranch I

8185 Edison Avenue

Ontario, CA 91762

Inquiry Number: 7869218.4

January 13, 2025

# EDR Historical Topo Map Report

## with QuadMatch™

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Historical Topo Map Report

01/13/25

| Site Name: | Client Name: |
|---|---|
| Ontario Ranch I | Roux Associates |
| 8185 Edison Avenue | 5150 E Pacific Coast Highway |
| Ontario, CA 91762 | Long Beach, CA 90804 |
| EDR Inquiry # 7869218.4 | Contact: Ashley Whitaker |

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Roux Associates were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

| *Search Results:* | | *Coordinates:* | |
|---|---|---|---|
| **P.O.#** | 3669.0004L | **Latitude:** | 33.995819 33° 59' 45" North |
| **Project:** | Ontario Ranch I | **Longitude:** | -117.62695 -117° 37' 37" West |
| | | **UTM Zone:** | Zone 11 North |
| | | **UTM X Meters:** | 442099.25 |
| | | **UTM Y Meters:** | 3761869.53 |
| | | **Elevation:** | 690.00' above sea level |

**Maps Provided:**

| | | |
|---|---|---|
| 2022, 2021 | 1966, 1967 | 1903 |
| 2018 | 1954 | 1902 |
| 2015 | 1950, 1953, 1954 | 1900 |
| 2012 | 1949 | 1897 |
| 1981 | 1944, 1947 | |
| 1976 | 1942 | |
| 1975 | 1941 | |
| 1973 | 1933 | |

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## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 2022, 2021 Source Sheets

Prado Dam
2022
7.5-minute, 24000

Corona North
2022
7.5-minute, 24000

Ontario
2021
7.5-minute, 24000

Guasti
2021
7.5-minute, 24000

### 2018 Source Sheets

Prado Dam
2018
7.5-minute, 24000

Corona North
2018
7.5-minute, 24000

Ontario
2018
7.5-minute, 24000

Guasti
2018
7.5-minute, 24000

### 2015 Source Sheets

Prado Dam
2015
7.5-minute, 24000

Corona North
2015
7.5-minute, 24000

Ontario
2015
7.5-minute, 24000

Guasti
2015
7.5-minute, 24000

### 2012 Source Sheets

Prado Dam
2012
7.5-minute, 24000

Corona North
2012
7.5-minute, 24000

Ontario
2012
7.5-minute, 24000

Guasti
2012
7.5-minute, 24000

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1981 Source Sheets

Guasti
1981
7.5-minute, 24000
Aerial Photo Revised 1978

Corona North
1981
7.5-minute, 24000
Aerial Photo Revised 1978

Ontario
1981
7.5-minute, 24000
Aerial Photo Revised 1978

Prado Dam
1981
7.5-minute, 24000
Aerial Photo Revised 1978

### 1976 Source Sheets

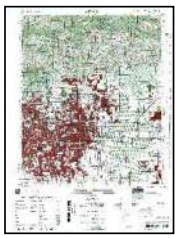

ONTARIO
1976
15-minute, 50000

### 1975 Source Sheets

Corona North
1975
7.5-minute, 24000
Aerial Photo Revised 1975

### 1973 Source Sheets

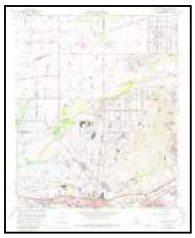

Corona North
1973
7.5-minute, 24000
Aerial Photo Revised 1973

Prado Dam
1973
7.5-minute, 24000
Aerial Photo Revised 1973

Guasti
1973
7.5-minute, 24000
Aerial Photo Revised 1973

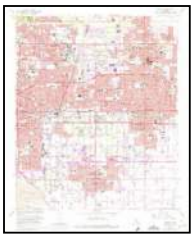

Ontario
1973
7.5-minute, 24000
Aerial Photo Revised 1973

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1966, 1967 Source Sheets

Guasti
1966
7.5-minute, 24000
Aerial Photo Revised 1966

Corona North
1967
7.5-minute, 24000
Aerial Photo Revised 1966

Prado Dam
1967
7.5-minute, 24000
Aerial Photo Revised 1966

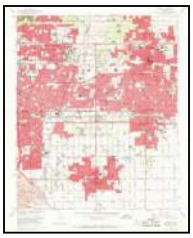

Ontario
1967
7.5-minute, 24000
Aerial Photo Revised 1966

### 1954 Source Sheets

Ontario
1954
15-minute, 62500
Aerial Photo Revised 1952

### 1950, 1953, 1954 Source Sheets

Prado Dam
1950
7.5-minute, 24000
Aerial Photo Revised 1946

Guasti
1953
7.5-minute, 24000
Aerial Photo Revised 1952

Corona North
1954
7.5-minute, 24000
Aerial Photo Revised 1952

### 1949 Source Sheets

Prado Dam
1949
7.5-minute, 24000
Aerial Photo Revised 1946

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1944, 1947 Source Sheets

CUCAMONGA
1944
15-minute, 50000

CORONA
1947
15-minute, 50000

### 1942 Source Sheets

Ontario and Vicinity
1942
7.5-minute, 31680

Corona and Vicinity
1942
7.5-minute, 31680

### 1941 Source Sheets

Prado
1941
7.5-minute, 31680

GUASTI VICINITY
1941
7.5-minute, 31680

### 1933 Source Sheets

Prado
1933
7.5-minute, 31680

Ontario
1933
7.5-minute, 31680

## *Topo Sheet Key*

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

### 1903 Source Sheets

Cucamonga
1903
15-minute, 62500

### 1902 Source Sheets

Corona
1902
30-minute, 125000

### 1900 Source Sheets

Cucamonga
1900
15-minute, 62500

### 1897 Source Sheets

Cucamonga
1897
15-minute, 62500

# Historical Topo Map

2022, 2021

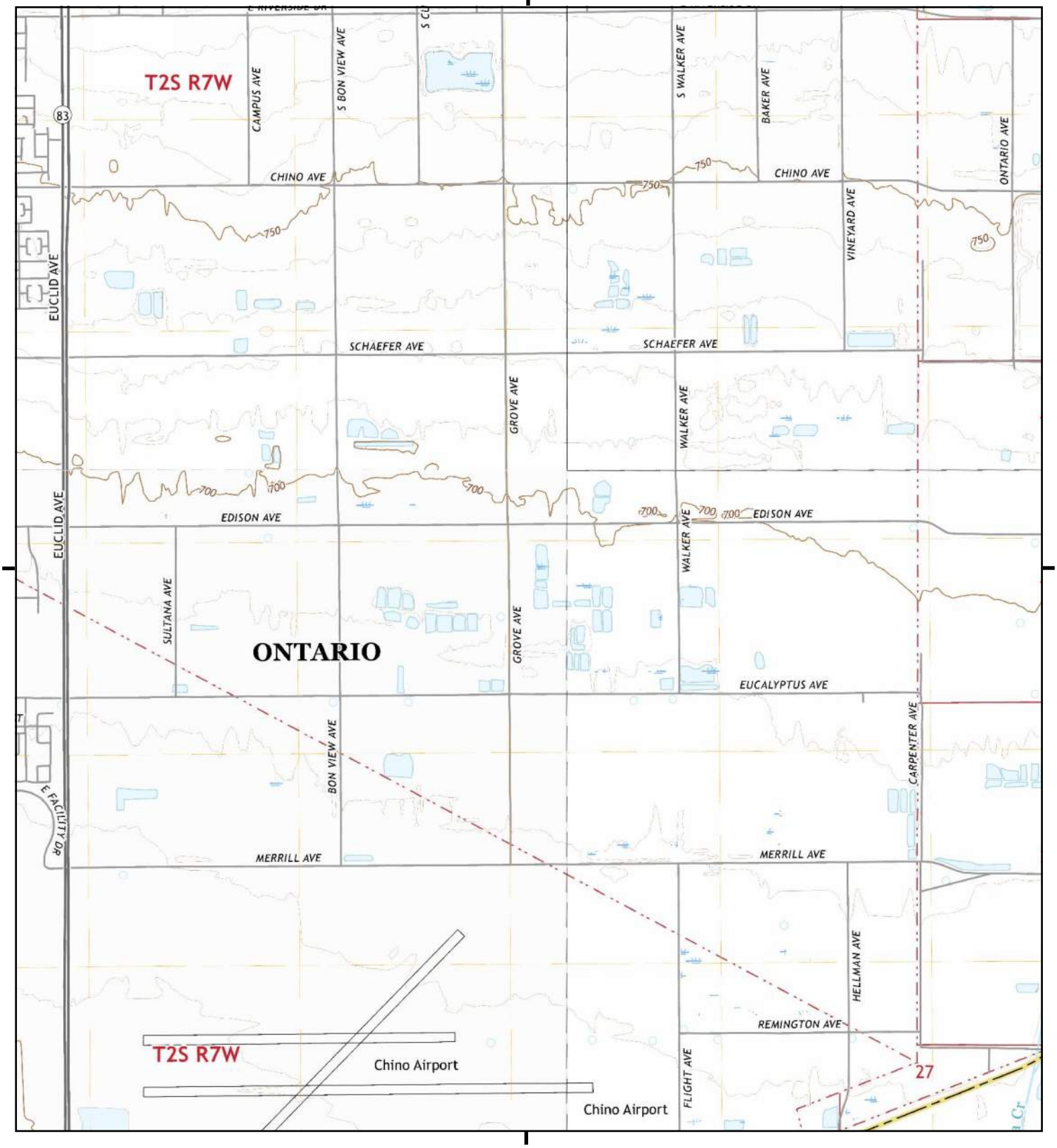


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

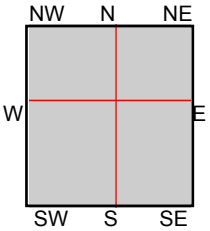


TP, Prado Dam, 2022, 7.5-minute
NE, Guasti, 2021, 7.5-minute
SE, Corona North, 2022, 7.5-minute
NW, Ontario, 2021, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

2018

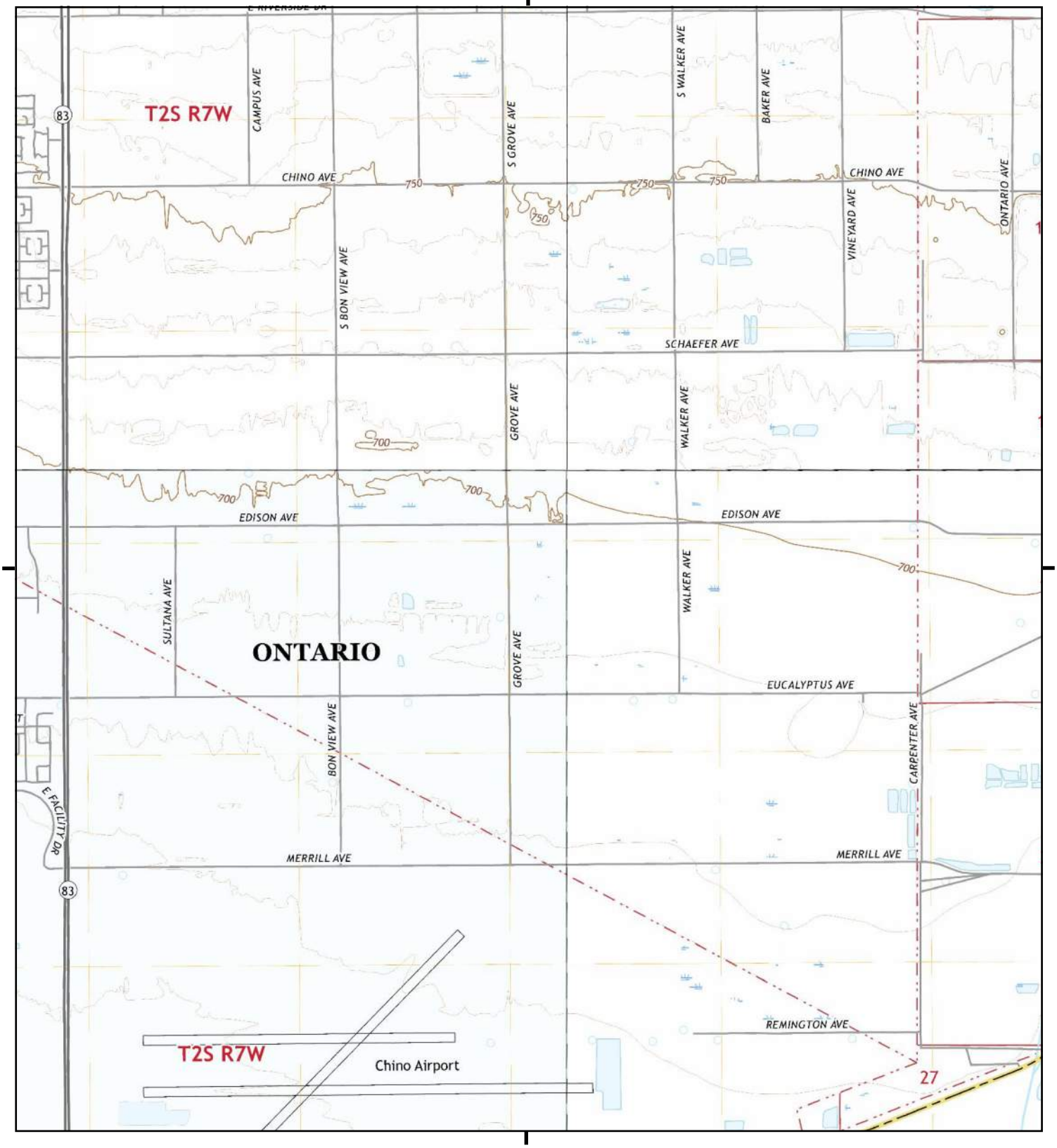


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

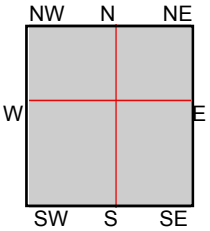


TP, Prado Dam, 2018, 7.5-minute
NE, Guasti, 2018, 7.5-minute
SE, Corona North, 2018, 7.5-minute
NW, Ontario, 2018, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

2015

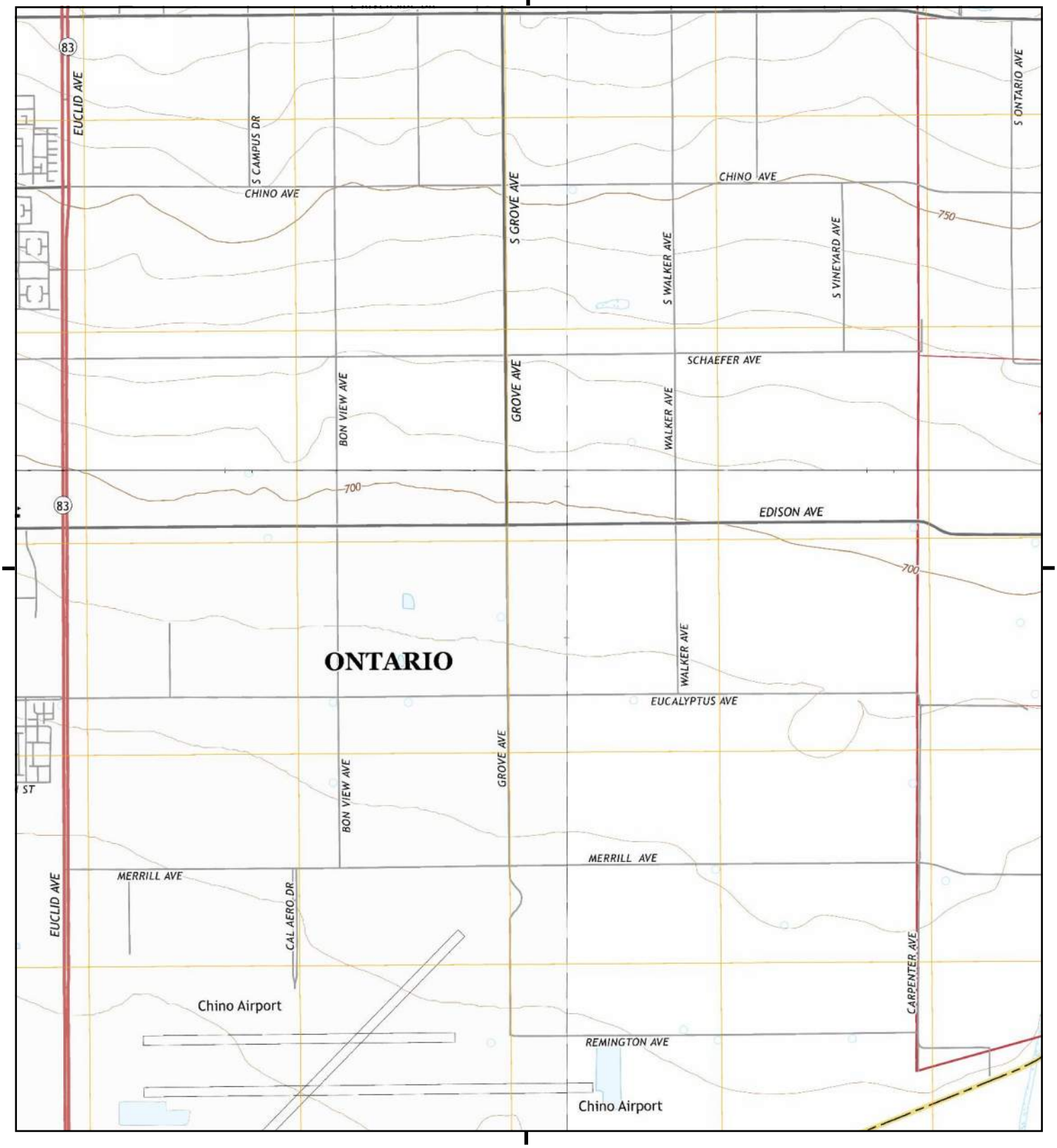


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

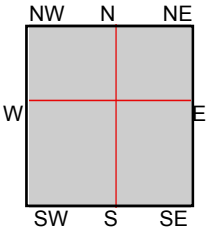


TP, Prado Dam, 2015, 7.5-minute
NE, Guasti, 2015, 7.5-minute
SE, Corona North, 2015, 7.5-minute
NW, Ontario, 2015, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

2012

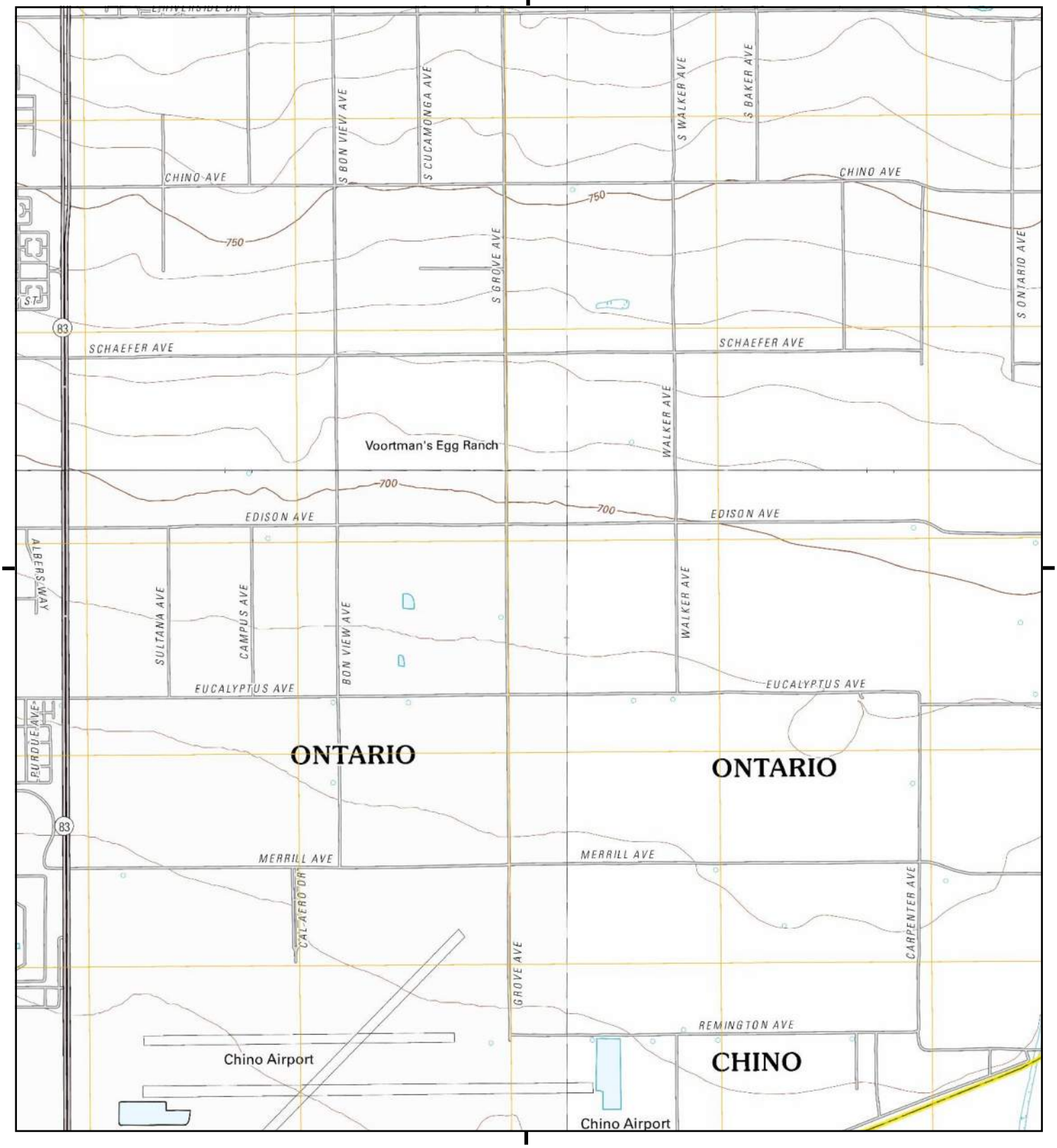


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Prado Dam, 2012, 7.5-minute
NE, Guasti, 2012, 7.5-minute
SE, Corona North, 2012, 7.5-minute
NW, Ontario, 2012, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1981

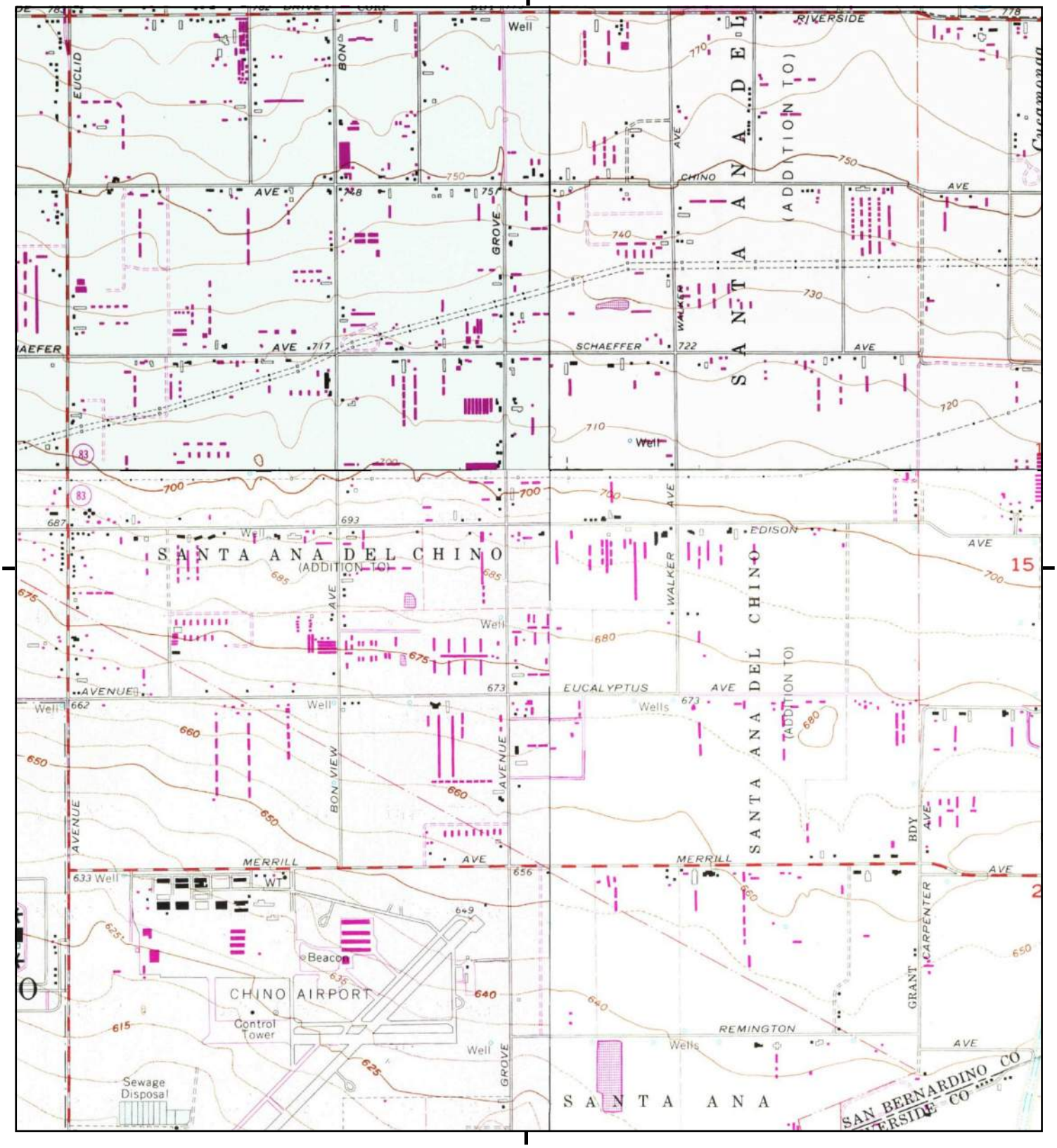


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

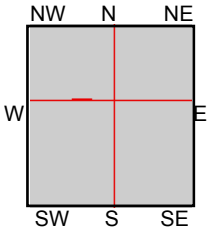


TP, Prado Dam, 1981, 7.5-minute
NE, Guasti, 1981, 7.5-minute
SE, Corona North, 1981, 7.5-minute
NW, Ontario, 1981, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1976

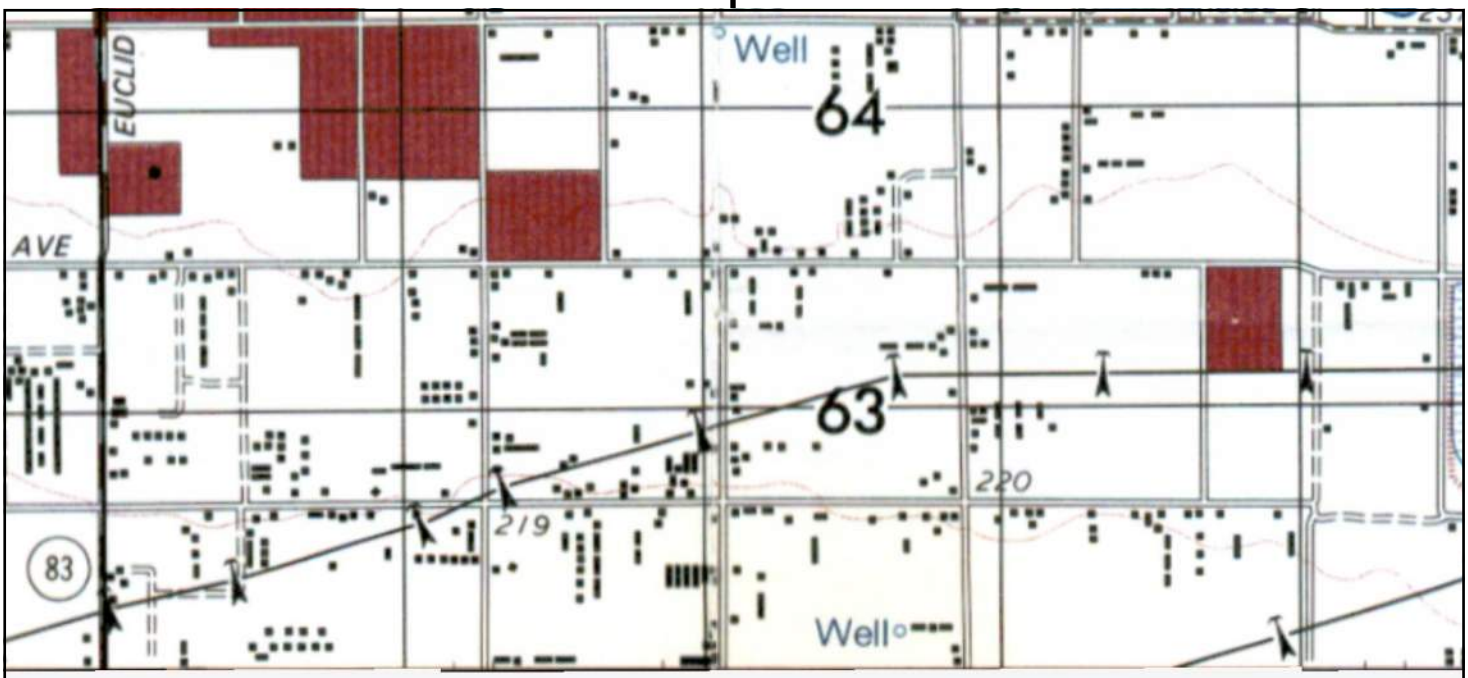


UNMAPPED

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

N, ONTARIO, 1976, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1975

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

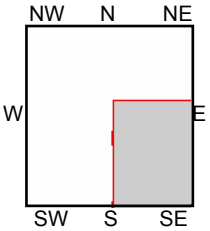


SE, Corona North, 1975, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1973

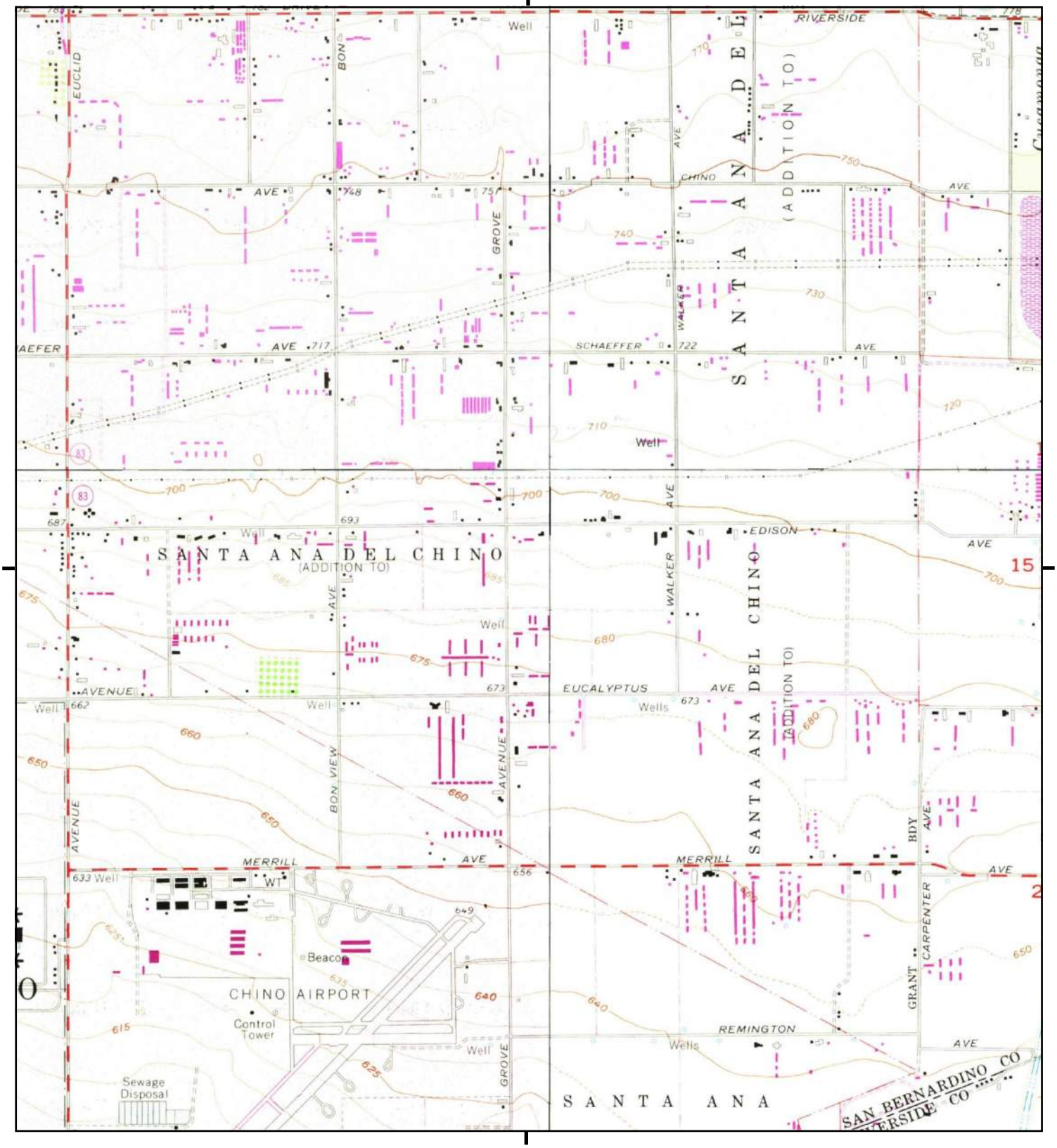


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

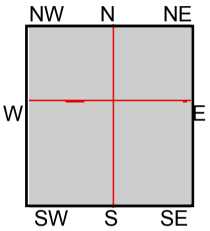


TP, Prado Dam, 1973, 7.5-minute
NE, Guasti, 1973, 7.5-minute
SE, Corona North, 1973, 7.5-minute
NW, Ontario, 1973, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1966, 1967

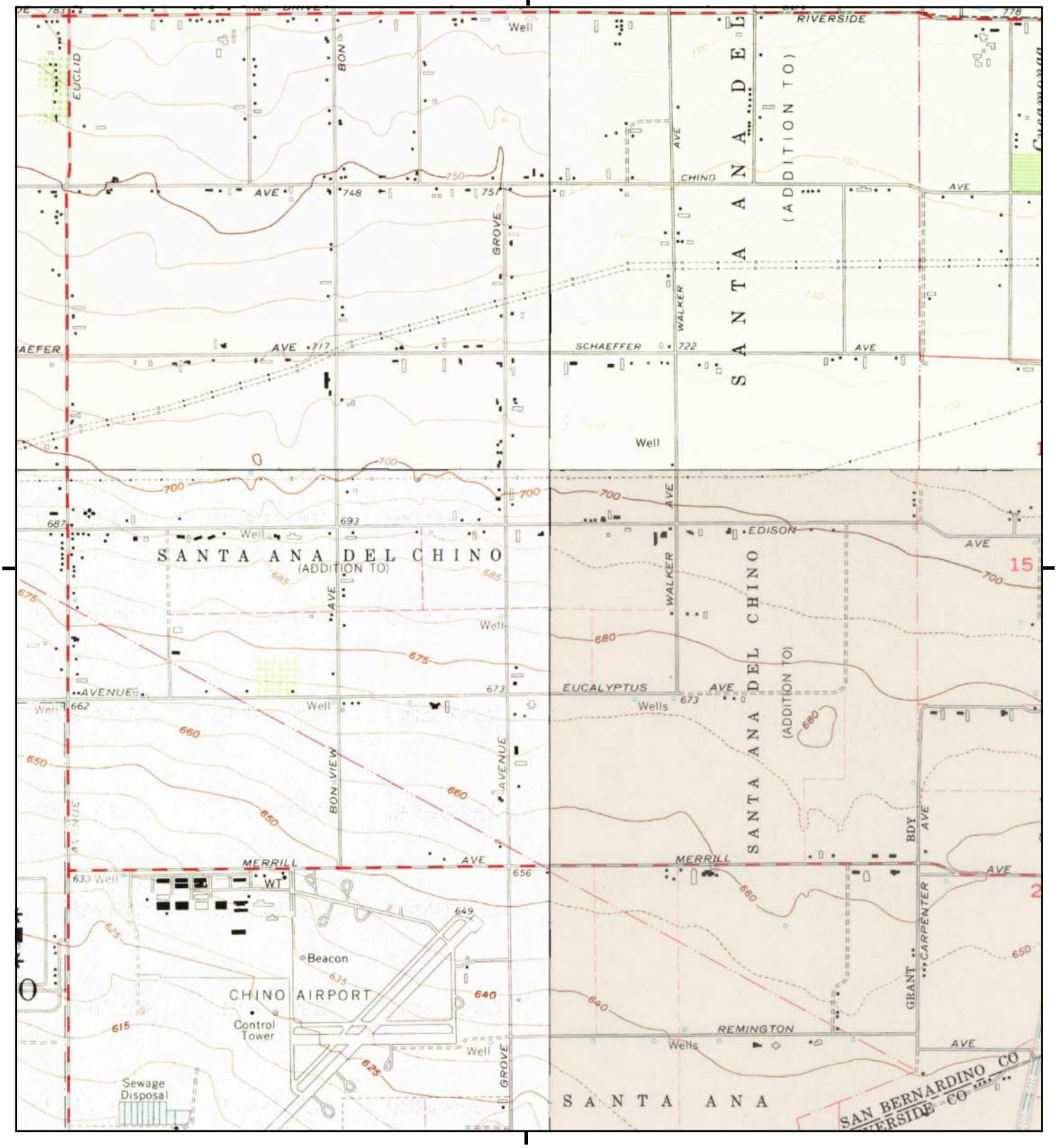


This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

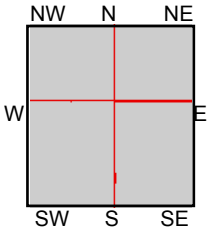


TP, Prado Dam, 1967, 7.5-minute
NE, Guasti, 1966, 7.5-minute
SE, Corona North, 1967, 7.5-minute
NW, Ontario, 1967, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1954

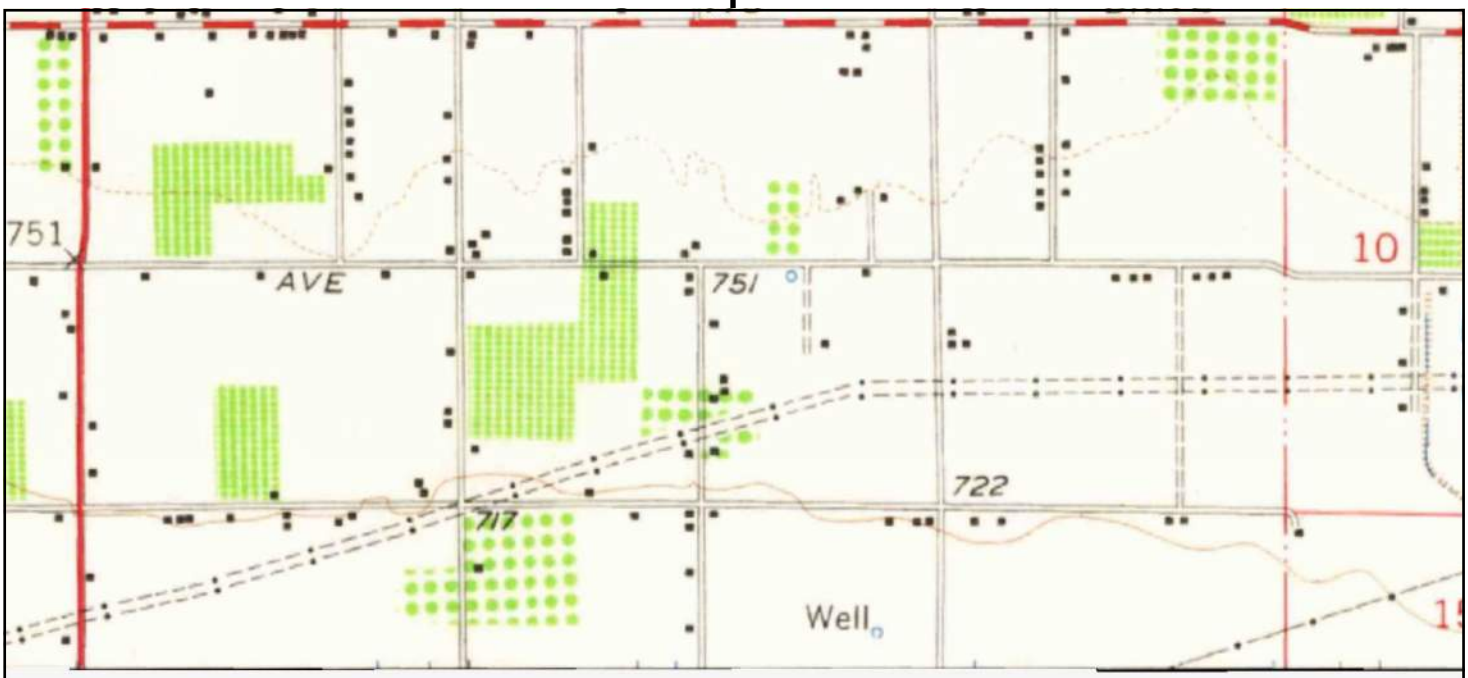


UNMAPPED

This report includes information from the following map sheet(s).

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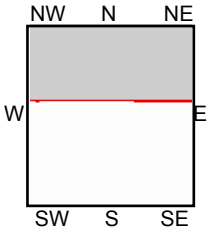


N, Ontario, 1954, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1950, 1953, 1954

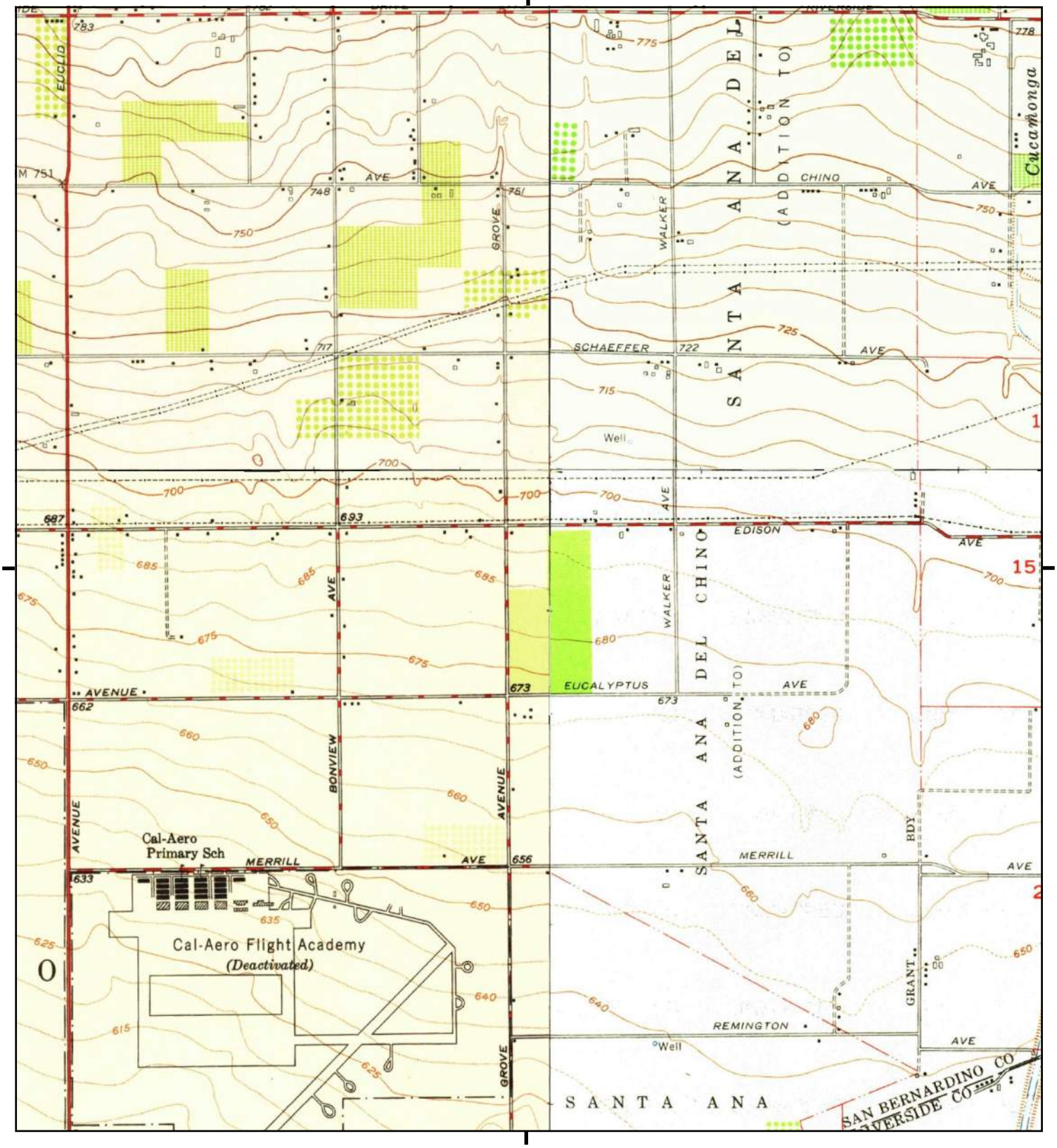


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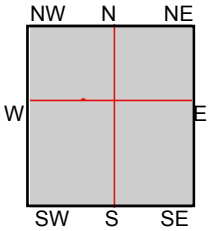


TP, Prado Dam, 1950, 7.5-minute
NE, Guasti, 1953, 7.5-minute
SE, Corona North, 1954, 7.5-minute
NW, Ontario, 1954, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1949

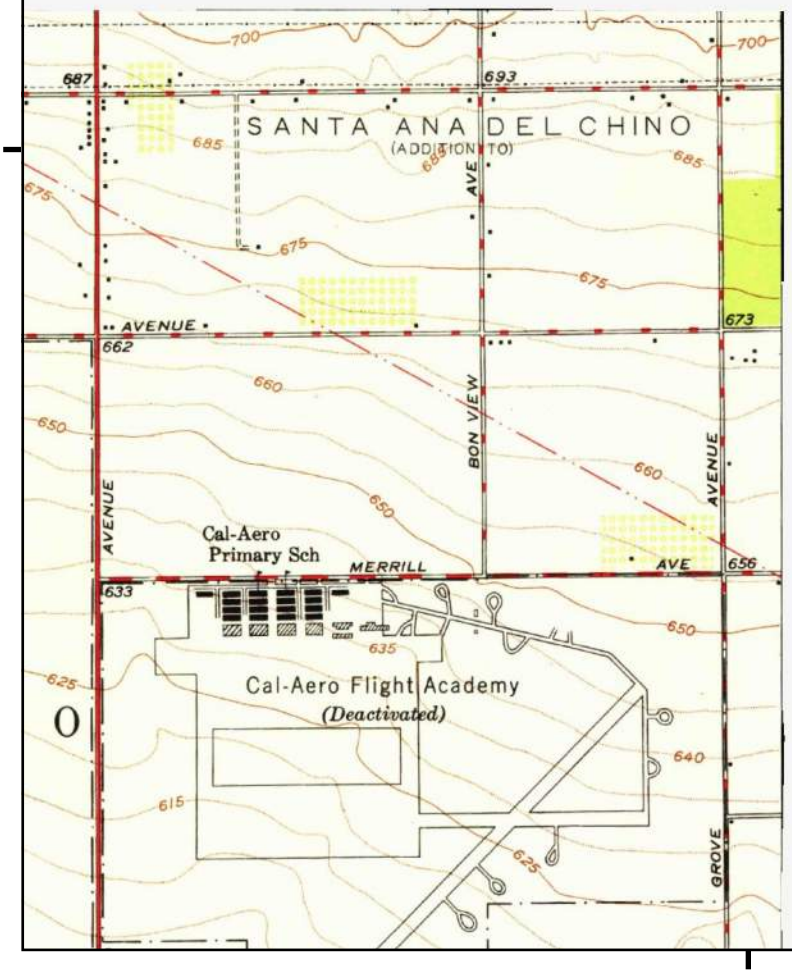


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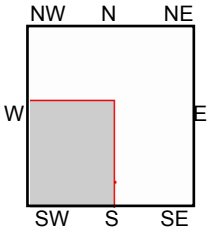


TP, Prado Dam, 1949, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1944, 1947

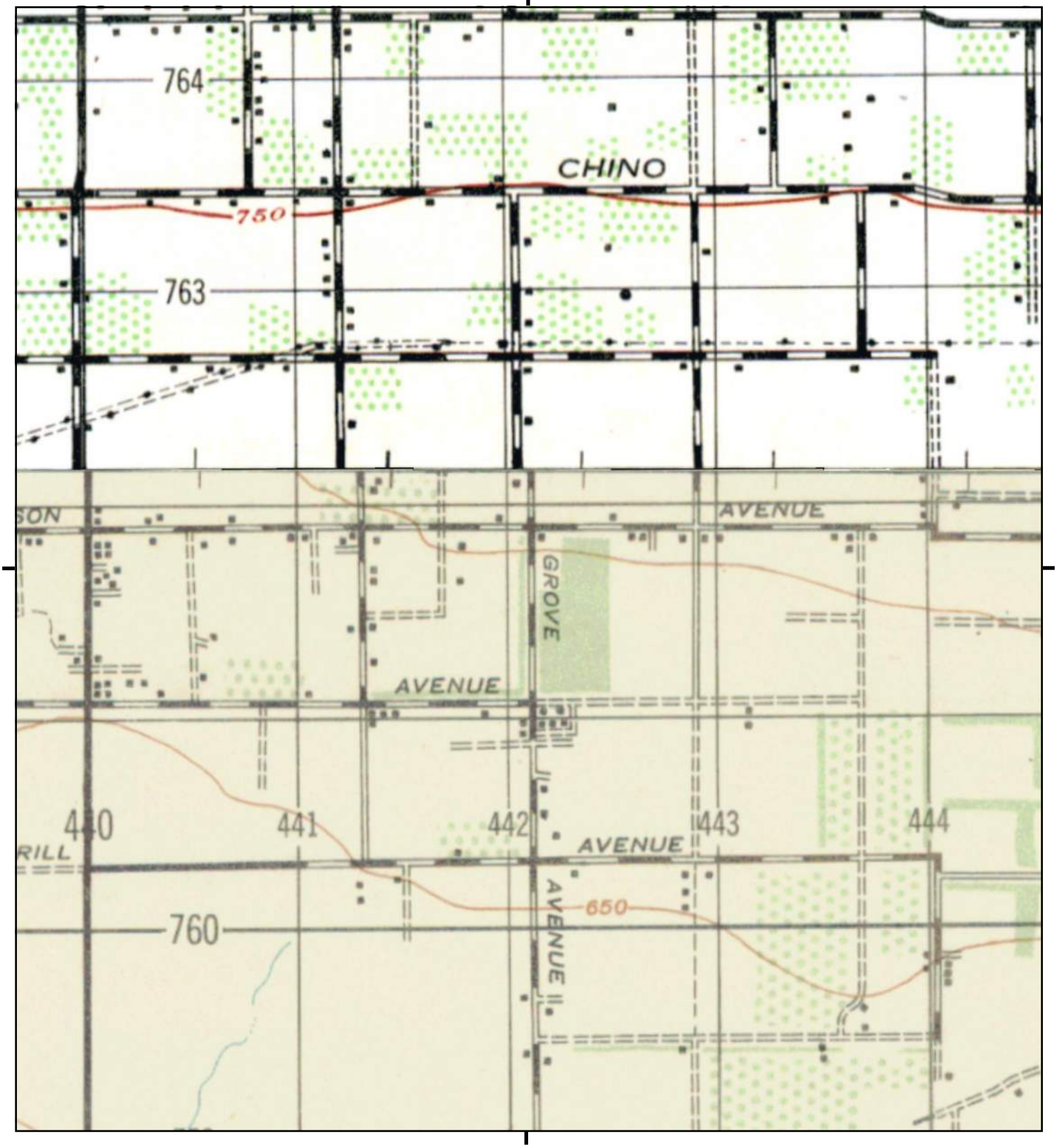


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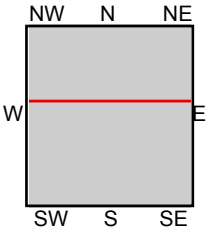


TP, CORONA, 1947, 15-minute
N, CUCAMONGA, 1944, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1942

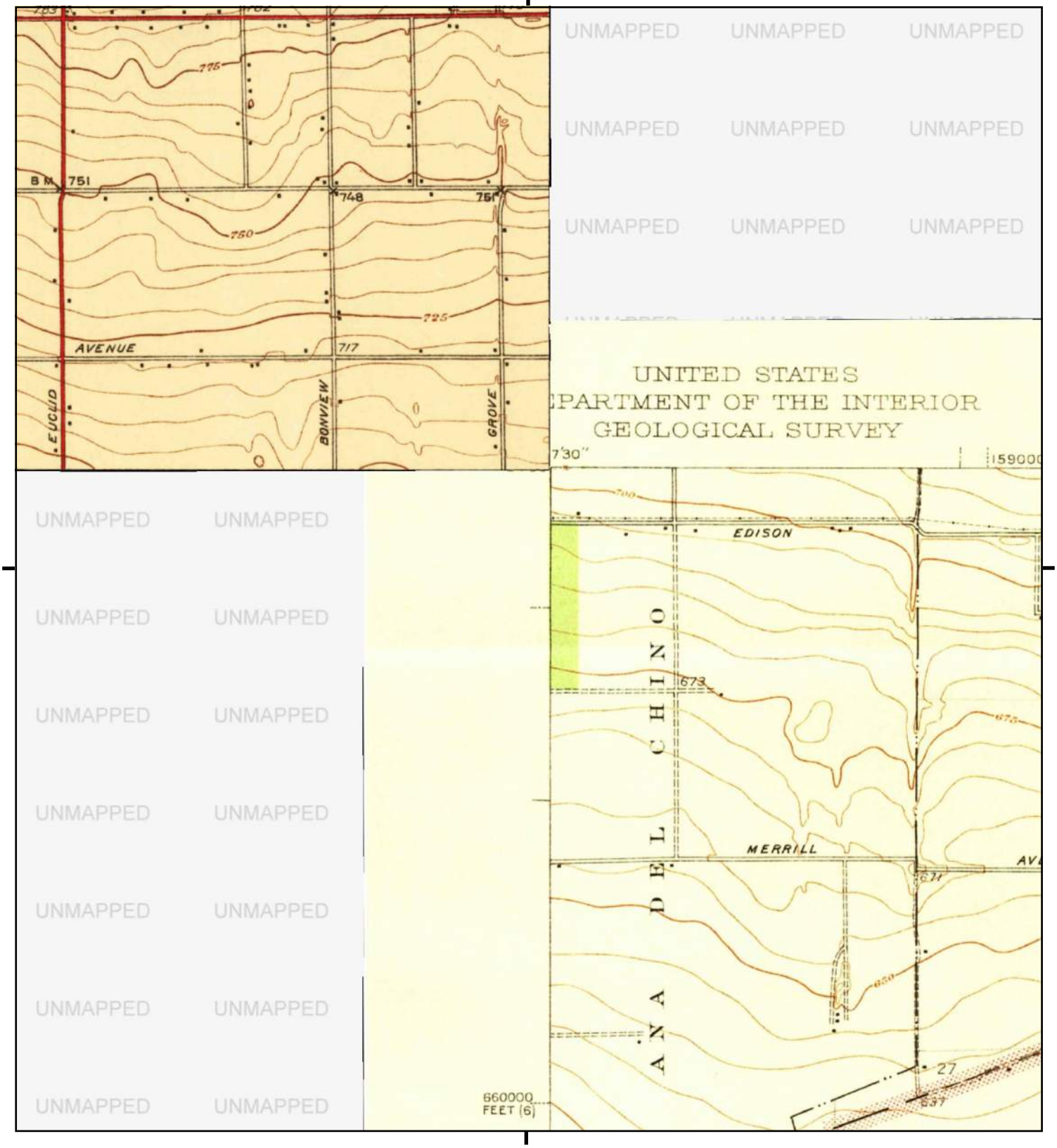


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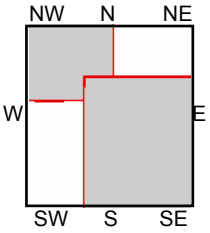


SE, Corona and Vicinity, 1942, 7.5-minute
NW, Ontario and Vicinity, 1942, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1941

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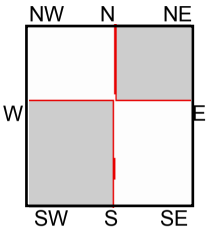


TP, Prado, 1941, 7.5-minute
NE, GUASTI VICINITY, 1941, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1933

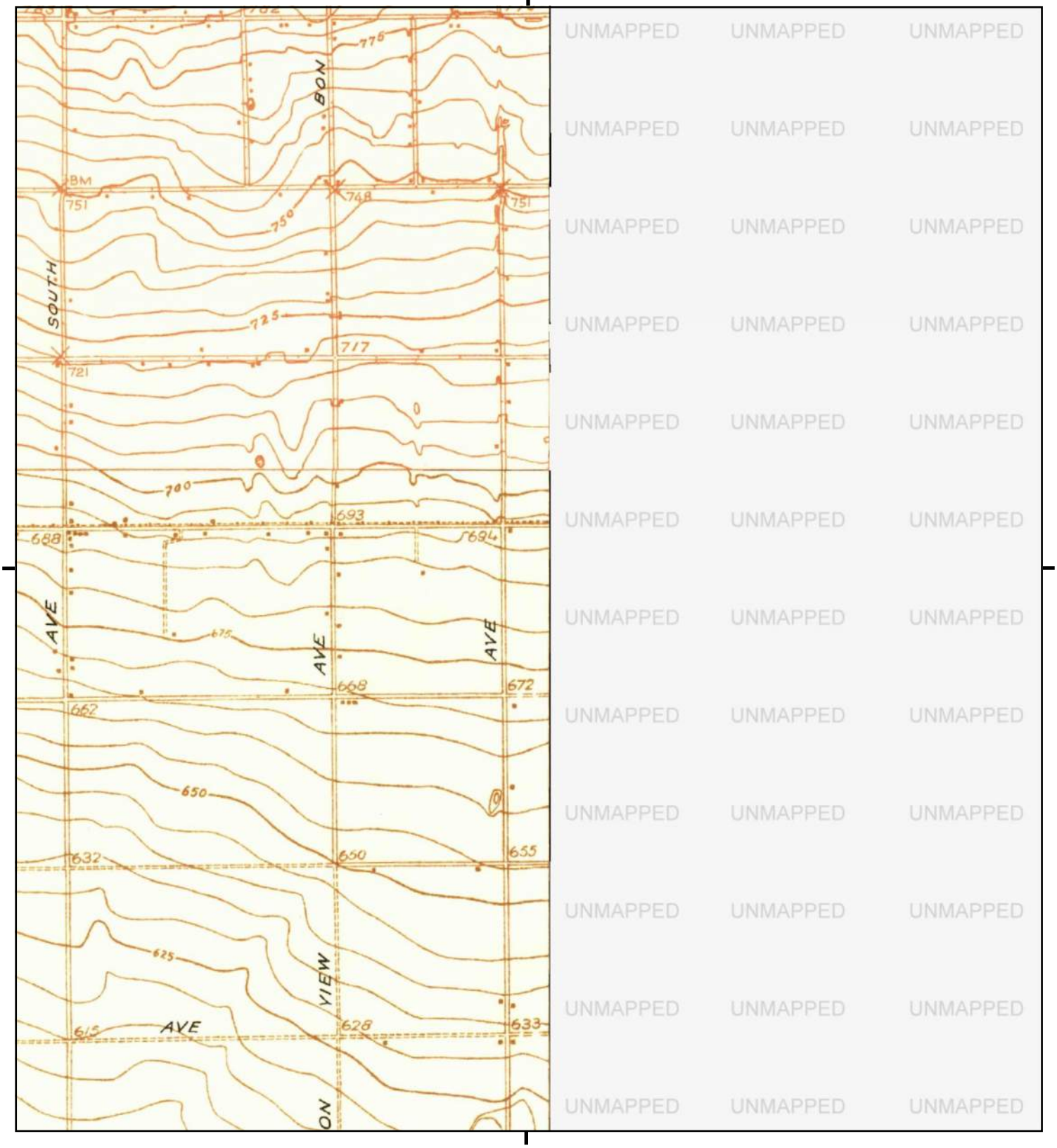


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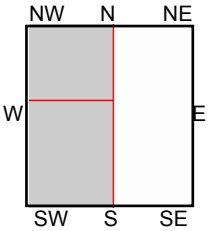


TP, Prado, 1933, 7.5-minute
NW, Ontario, 1933, 7.5-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1903

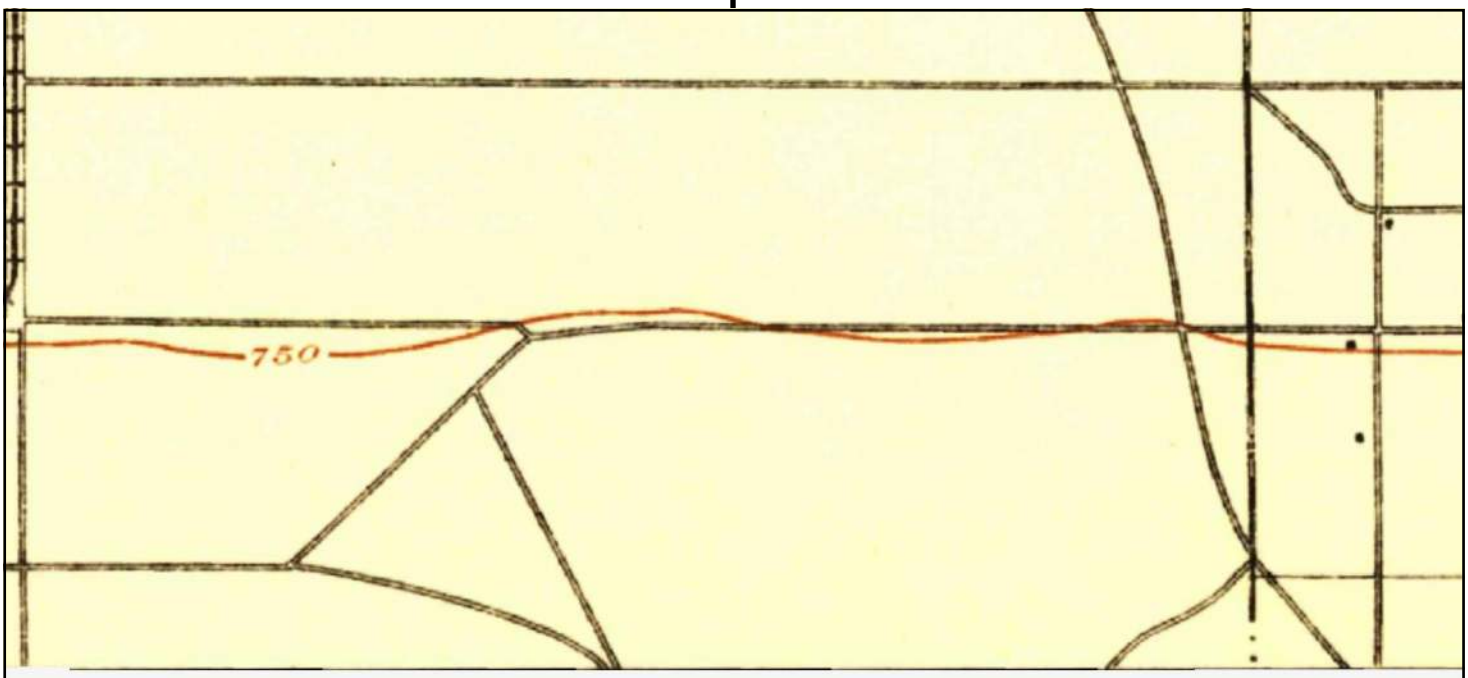


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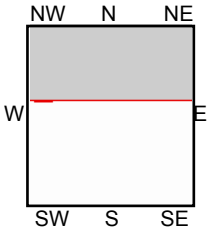


N, Cucamonga, 1903, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1902

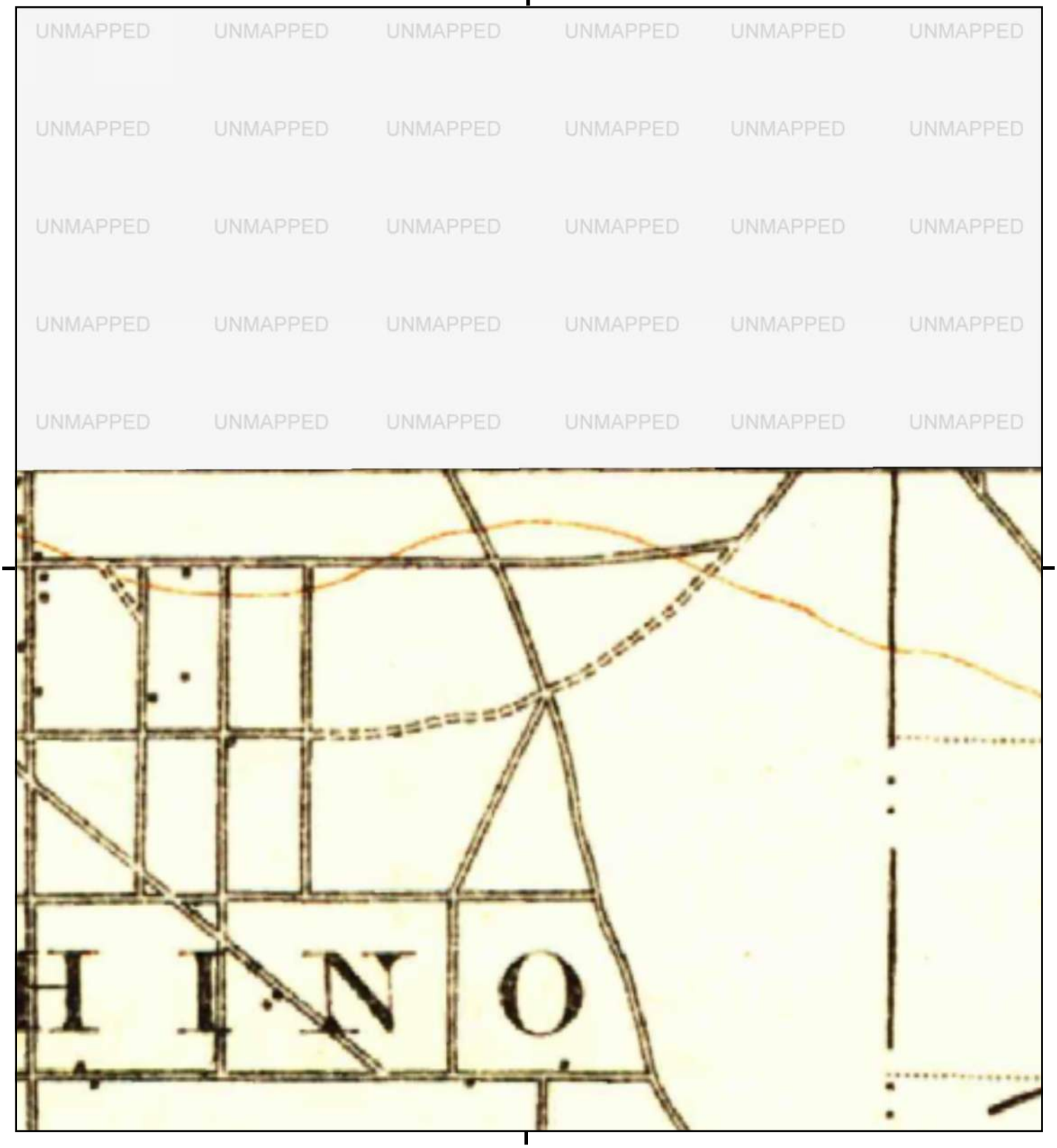


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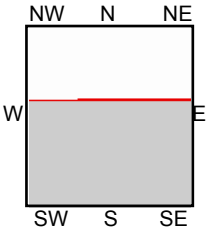


TP, Corona, 1902, 30-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1900

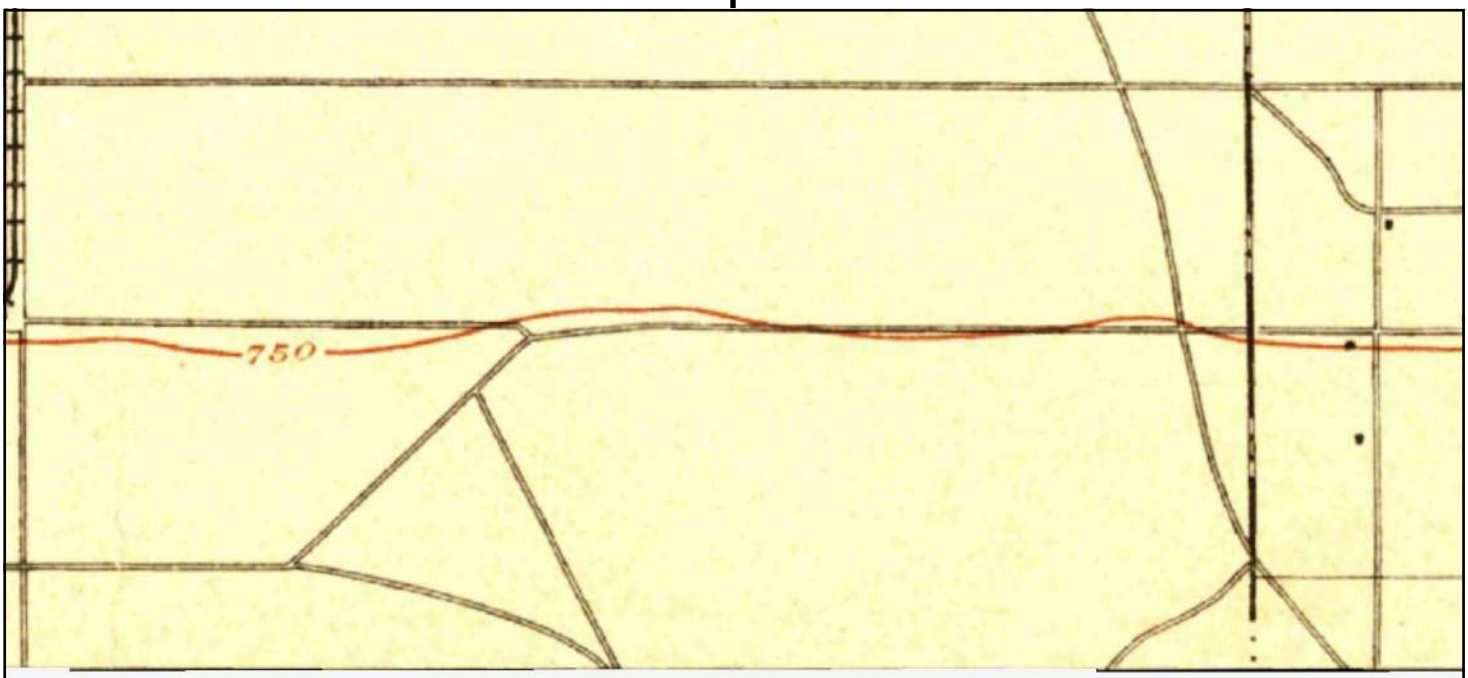


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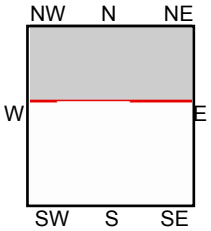


N, Cucamonga, 1900, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# Historical Topo Map

1897

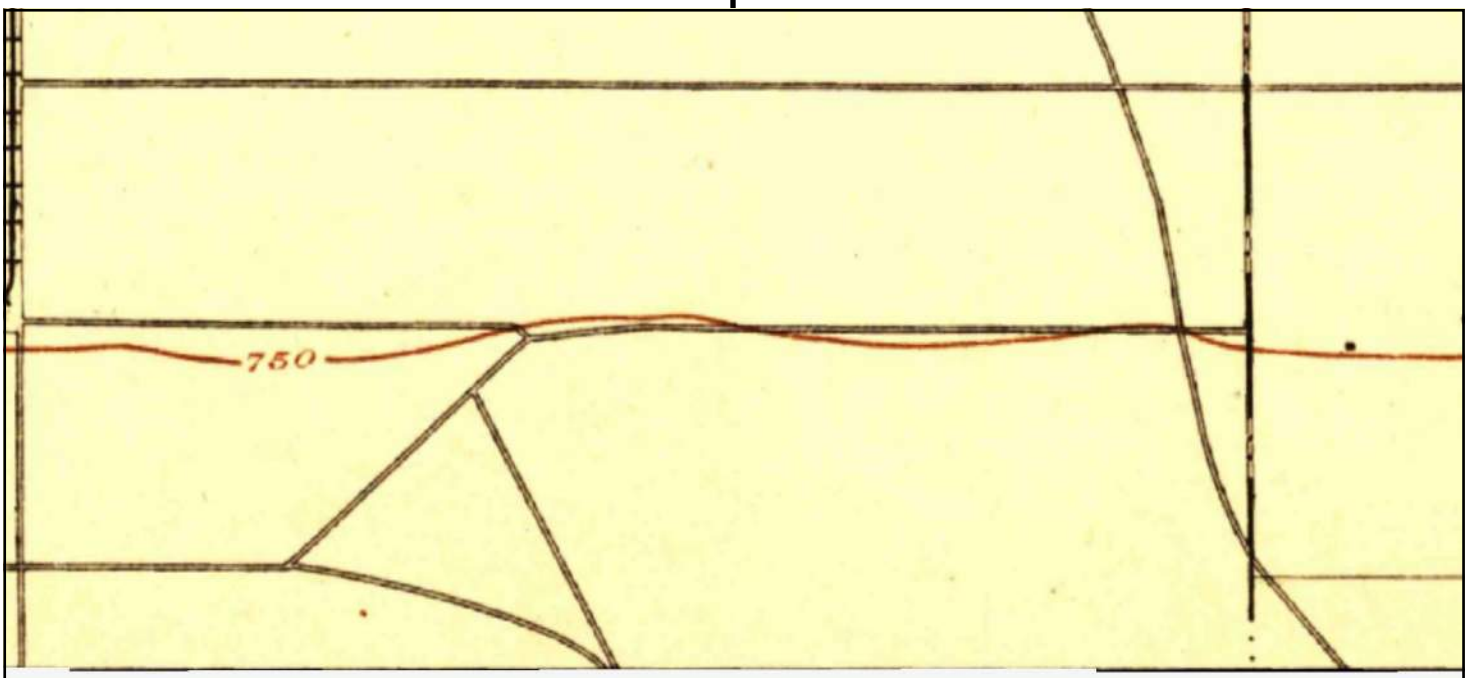


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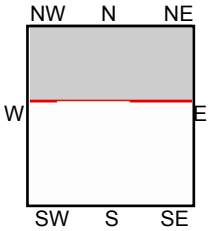


N, Cucamonga, 1897, 15-minute

SITE NAME: Ontario Ranch I
ADDRESS: 8185 Edison Avenue
Ontario, CA 91762
CLIENT: Roux Associates

N

# APPENDIX D

User Provided Information

(Provided as separate document)

# APPENDIX E

Regulatory Agency Records

State Water Resources Control Board

# NOTICE OF INTENT

GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH INDUSTRIAL ACTIVITY (WQ ORDER No. 2014-0057-DWQ)
(Excluding Construction Activities)

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR
ENVIRONMENTAL PROTECTION

WDID: 8 36I006432 Status: Terminated

## Operator Information

Type: Private Business

Name: Michael DeHoog Dairy
Contact Name: Michael De Hoog
Address: 8381 Edison Ave
Title:
Address 2:
Phone Number: 909-947-4712
City/State/Zip: Chino CA 91710
Email Address:
Federal Tax ID:

## Facility Information

Level:

Contact Name: Michael De Hoog
Title:
Site Name: Michael De Hoog Dairy
Address: 8381 Edison
City/State/Zip: Ontario CA 91762
Site Phone #: 909-947-4712
County: San Bernardino
Email Address:
Latitude: 33.99775 Longitude: -117.62196
Site Size:
Industrial Area Exposed to Storm Water:
Percent of Site Impervious (Including Rooftops): %

## SIC Code Information

1.
2.
3.

## Additional Information

Receiving Water: Sata Ane River
Flow: Indirectly
Storm Drain System:
Compliance Group:

RWQCB Jurisdiction: Region 8 - Santa Ana
Phone: 951-782-4130
Email: r8_stormwater@waterboards.ca.gov

## Certification

Name:
Date:
Title:

State Water Resources Control Board

# NOTICE OF INTENT

GENERAL PERMIT TO DISCHARGE STORM WATER
ASSOCIATED WITH INDUSTRIAL ACTIVITY (WQ ORDER No. 2014-0057-DWQ)
(Excluding Construction Activities)

GAVIN NEWSOM
GOVERNOR

YANA GARCIA
SECRETARY FOR
ENVIRONMENTAL PROTECTION

WDID: 8 36NNA000183 Status: No Action Required

## Operator Information

Type: Private Business

Name: Material Recovery Solutions Inc
Contact Name: Brent Van kampen
Address: 7325 Edison Ave
Title:
Address 2:
Phone Number: 562-577-9047
City/State/Zip: Ontario CA 91762
Email Address: Materialrecoverysolutions@gmail.com
Federal Tax ID:

## Facility Information

Level:

Contact Name: Brent Van kampen
Title:
Site Name: Material Recovery Solutions Inc
Address: 7325 Edison Ave
City/State/Zip: Ontario CA 91762
Site Phone #: 562-577-9047
County: San Bernardino
Email Address: Materialrecoverysolutions@gmail.com
Latitude: 33.99427 Longitude: -117.64495
Site Size: 110200 Sq.Feet
Industrial Area Exposed to Storm Water:
Percent of Site Impervious (Including Rooftops): %

## SIC Code Information

1. 2875 Fertilizers, Mixing Only
2.
3.

## Additional Information

Receiving Water:
Flow: Indirectly
Storm Drain System:
Compliance Group:

RWQCB Jurisdiction: Region 8 - Santa Ana
Phone: 951-782-4130
Email: r8_stormwater@waterboards.ca.gov

## Certification

Name: Brent Van kampen
Date: September 20, 2016
Title: Vice president

D

Rec'd 1/7/04

# ENGINEERED WASTE MANAGEMENT PLAN

Accepted 8-22-05

Prepared For:

SNS DAIRY
7325 Edison Avenue
Chino, CA 91710
(909) 732-8165
(909) 627-9432

NOLTE
BEYOND ENGINEERING

JOB NO.IEB0103
December 2003

This Engineered Waste Management Plan was prepared under the direction and supervision of Paul Hacunda, Professional Engineer.

Paul J. Hacunda, P.E. No. 41627

REGISTERED PROFESSIONAL ENGINEER
PAUL J. HACUNDA
No. 41627
Exp. 12/31/07
CIVIL
STATE OF CALIFORNIA

For additional questions and comments, please contact:


Paul Hacunda
Associate

Gary Koontz
Project Manager

NOLTE ASSOCIATES, INC.
255 East Rincon Street, Suite 110
Corona, CA 92879
Tel: (909) 739-5700
Fax: (909) 739-7510

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**ENGINEERED WASTE MANAGEMENT PLAN**
**for**
**SNS DAIRY**
**7325 Edison Avenue**
**Chino, CA 91710**
**(909) 732-8165**

## I. INTRODUCTION

This plan describes the operational setting of SNS Dairy and recommended procedures of the operation and management of the dairy wastewater collection, retention, and disposal system at the:

SNS Dairy

| | |
|---|---|
| Owner/Operator: | Sam Souza |
| Location: | 7325 Edison Avenue, Chino,California |
| Mailing Address: | same |

| | | | |
|---|---|---|---|
| EWMP Responsible Party: | Primary: | Sam Souza | (909) 732-8165 |
| | Secondary: | Sam Souza Jr. | (909) 203-5905 |

The dairy is situated on the south side of Edison Avenue. The west boundary of the dairy is adjacent to the Sultana Avenue right-of-way. The east boundary is adjacent to the Campus Avenue right-of-way.

The gross area of the dairy is approximately 36.55 acres. The dairy operations occupy approximately 33.41 acres of the total acres and include the following uses:

- Corrals,
- Hay barns,
- Commodity barn,
- Milk barn, and
- Wastewater lagoons

The current typical animal population is:

- 850 milk cows, and
- 150 dry cows

This onsite stock count equates to 1400 animal units. SNS Dairy has not plans for expansion at this time. However, the operator does intend to abandon milking operations in the near future and use the facility for raising his heifers. The EWMP is designed for a milking herd to provide the option of leasing out the facility to a dairy operator if he chooses.

At the time this report was prepared, this dairy could not comply with the RWQCB's 2001 Guidelines for the Development of EWMPs. The quantities reported are the result of the proposed improvements described herein under Section II, Recommendations.

Portions of SNS Dairy that require containment of runoff include approximately 12.73 acres of corrals, 1.49 acres of concrete feed alleys, 3.15 acres of dirt areas, and 6.97 acres of fields and pastures. The wastewater lagoon and evaporation basins occupy 8.74 acres and have a combined storage capacity of 10,301,007 gallons (31.61 acre-ft). SNS Dairy generates approximately 24,861 gallons of wash water per day (See Appendix A, page 1).

SNS Dairy has a very efficient and effective way of managing its wash water and storm water. Wash water from the milk barn gravity flows to a sump located just east of the milk barn. From the sump the wash water continues by gravity flow through a 4 inch PVC line to a series of check valves located along the northerly portion of Field #2. Water can be dispersed via the check valves to various portions of Field #2 to evaporate and percolate. Any wash water or storm runoff from Field #2 is collected in a series of evaporation basins located to the south.

Storm runoff from Corral #1 flows south, then east to commingle with runoff from Corrals #2 through #5 and continue south via a swale located along the west boundary of the corrals. Just south of Corral #5, a berm directs the runoff to the east and ultimately into Basin #1. Storm runoff from Corrals #6 through #9 flows east to the west boundary of Field #1, then south to Basin #1. Storm runoff from Corral #10 flows south to Field #1 and ultimately to Basin #1. Corrals #11 through #13 drain south to Field #2 and ultimately into Evaporation Basins #1 through #5.

Corral #14 receives some runoff from the dirt area located to the north of the corral. There is a potential for runoff exiting the corral along the south fence line to flow southeast and offsite. Any runoff that exits the facility along the east fence line will be contained within a small swale located between the east fence line for SNS Dairy and the Feed Alley for the adjacent facility to the east. The runoff will then be channeled, within the swale, to the south along the Campus Avenue right-of-way. This report includes a recommendation that Corral #14 be abandoned, the manure removed and a two foot berm constructed along the west fence line between Corral #13 and #14. By implementing this recommendation, runoff from the dirt area and Corral #14 will remain uncontaminated with manure and, therefore, can flow offsite along the natural drainage course within the Campus Avenue right-of-way.

SNS Dairy has adequate protection against on-site storm water leaving the property. In general, storm runoff drains from north to south to either Basin #1 or Evaporation Basins #1 through #5. The west boundary is protected by a berm along the west part of the Sultana Avenue right-of-way. Potential runoff along the south boundary is contained by the west to east extension of the west berm. Runoff is directed in an easterly direction into Basin #1. Runoff along the east boundary, south of the dirt area and Corral #14, is contained within Evaporation Basin #5.

SNS Dairy also has excellent protection against offsite entering the property. The northern property line is protected from run-on by a series of dirt and asphalt berms depicted on the Plot Plan. The storm runoff from Edison Avenue is directed west and away from the dairy. The remaining boundaries of the dairy are protected by the berms and Basin #1, as discussed above and depicted on the Plot Plan.

SNS Dairy was built prior to November 27, 1984. Therefore, they are not required to protect their manured areas from the 100-year peak stream flow. However, they are required to protect all manured areas from the 20-year peak stream flow. Studies have not been done to calculate the flood elevations of a 20-year peak stream flow. In order to protect the dairy from, and prepare for, a 20-year peak flow, it must maintain regular maintenance programs as described herein. All onsite flows and the required volumes for the 25-year, 24-hour storm must be contained (See Appendix H, 100 Year Flood Plain Data).

## II. DESIGN

SNS Dairy was originally contracted to comply with Order No. 99-11. Since that time, guidelines for achieving compliance with Order No. 99-11 have been issued (Guidelines for the Development of Engineered Waste Management Plans for Concentrated Animal Feeding Operations, February 5, 2001). This Engineered Waste Management Plan (EWMP) was prepared under the recommendations of the new guidelines.

Order No. 99-11 required the containment of the daily production of wastewater and storm water runoff from a 24-hour, 25-year storm. The new guidelines to Order No. 99-11 require the containment of:

- 150 days of the daily production of wastewater,
- A 24-hour, 25-year storm,
- 150 days of winter precipitation, and
- The 150-day accumulation of 10% of manure solids that could end up in the lagoons.

Although evaporation and percolation can be accounted for, the new guidelines require a large change in containment from Order No. 99-11.

In order to accommodate the new guidelines, this report contains two sets of calculations. The first set of calculations determines the amount of capacity required for 150 days storage. The second set of calculations performs a month-by-month water balance analysis of the amount of wastewater generated and eliminated. This second set of calculations was developed for those dairies that do not meet the requirements of the new guidelines. This second set of calculations optimizes the amount of storage required by including percolation and evaporation on a month by month basis.

The Engineered Wastewater Management Plan (EWMP) developed for SNS Dairy in December 2003 determined that the dairy has appreciable wastewater storage. SNS Dairy meets all of the requirements of the new guidelines. In Table 1, wastewater volumes and the capacity of the settling basin & lagoon are summarized.

| Table 1<br>Capacity Summary | | |
|---|---|---|
| Total Days Required | 150 | days |
| Total Milkhouse and Parlor Water Rate | 3,045 | gal per day |
| Total Wash Pen Rate | 21,816 | gal per day |
| Total Milkhouse and Wash Pen Rate | 24,861 | gal per day |
| Total Required Storm Water Volume | 15.44 | acre-ft |
| Total Manure Volume | 0.66 | acre-ft |
| Total Required Containment Facility Volume | 27.54 | acre-ft |
| Total Available Volume | 31.61 | acre-ft |
| ADDITIONAL VOLUME REQUIRED | 0 | acre-ft |
| | | |
| Total Annual Washwater and Storm Water Accumulation | 59.07 | acre-ft |
| Total Annual Evaporation and Percolation Capability | 134.57 | acre-ft |
| | | |
| Total Winter (Nov.-Dec.-Jan.-Feb.-Mar.) Washwater and Storm Water Accumulation (Inflow) | 35.46 | acre-ft |
| Total Winter (Nov.-Dec.-Jan.-Feb.-Mar.) Evaporation and Percolation Capability (Outflow) | 9.72 | acre-ft |

The data presented in this report was generated in the spreadsheets labeled "Worksheet for Determining Containment Facility Volume" (Appendix A). The first page[1] details the current animal population and the daily wash water generated on the dairy. All numbers for milk house and wash pen water rates were generated from Rain Bird and Weather Tech Sprinkler Volume Ratings for single and double nozzles. An average of 5.05 Gallons per minute was used for single nozzles and 7.1 gallons per minute was used for double nozzles. These numbers were confirmed by watching the total run time of the wash pen sprinklers per cow pen and matched with research from the University of California Cooperative Extension Program for Dairies (see Appendix C).

The second page[1] shows the equivalent gallons per cow per day. This calculation was generated in response to the EWMP guidelines adopted by the Regional Board. The guidelines recommend that as much as 100 gal/cow/day should be used to generate

[1] Appendix A, "Worksheet for Determining Containment Facility Volume".

wastewater during winter months. The calculation on the second page[1] shows a more accurate estimate of the volume of water used per cow per day on SNS Dairy.

Page two[1] also shows the total storm water accumulation generated on the dairy. Evaporation was considered, based on data from the California Department of Water Resources. Manure was also considered in the total volume calculations. The Total Required Containment Facility Volume is shown on the bottom of the second page[1].

The Total Available Volume is shown on page three[1] for SNS Dairy. The Additional Volume Required was found by subtracting the Total Required Volume from the Current Capacity. In the case of SNS Dairy, no additional volume is required.

Also included on page three[1] is a calculation showing the total depth needed in the basins to contain the 24-hr, 25-yr storm. This calculation was developed to show how much depth should be retained at the top of the basins to ensure that the 24-hr, 25-yr storm can be fully contained. This calculation also shows the maximum fill depth of the basins before pumping must be initiated. The calculation assumes that all storm water flows by gravity to the basins and is contained before it is pumped to application fields. In the case of SNS Dairy, 3.00 feet must be maintained at the top of the Basins #1 and 0.60 feet maintained at the top of Evaporation Basins #1-5 to ensure capacity of the 24-hr, 25-yr storm.

Shown below are two examples of wastewater lagoons. Figure 1 shows an optimum dairy lagoon that is able to contain all of the required wastewater and runoff volumes. Figure 2 shows a more common situation where two lagoons are used to split the total wastewater and runoff volumes. There should always be enough room in one lagoon to hold the 24-hr, 25-yr storm. By leaving enough room for the 24-hr, 25-yr storm, it eliminates dependency on the pump and eliminates potential spills due to pump failure. The calculation on the bottom of page three[1] shows exactly how much depth is needed at the top of the lagoon to ensure containment of the 24-hr, 25-yr storm.

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[1] Appendix A, "Worksheet for Determining Containment Facility Volume"

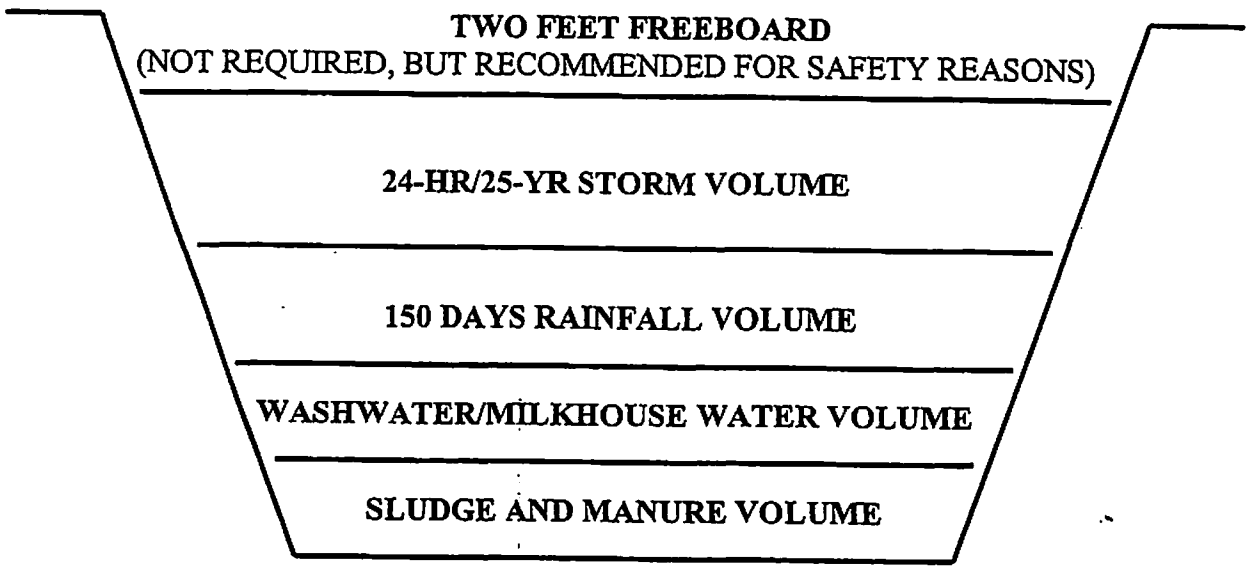


**Figure 1.** Cross section of optimum dairy lagoon.

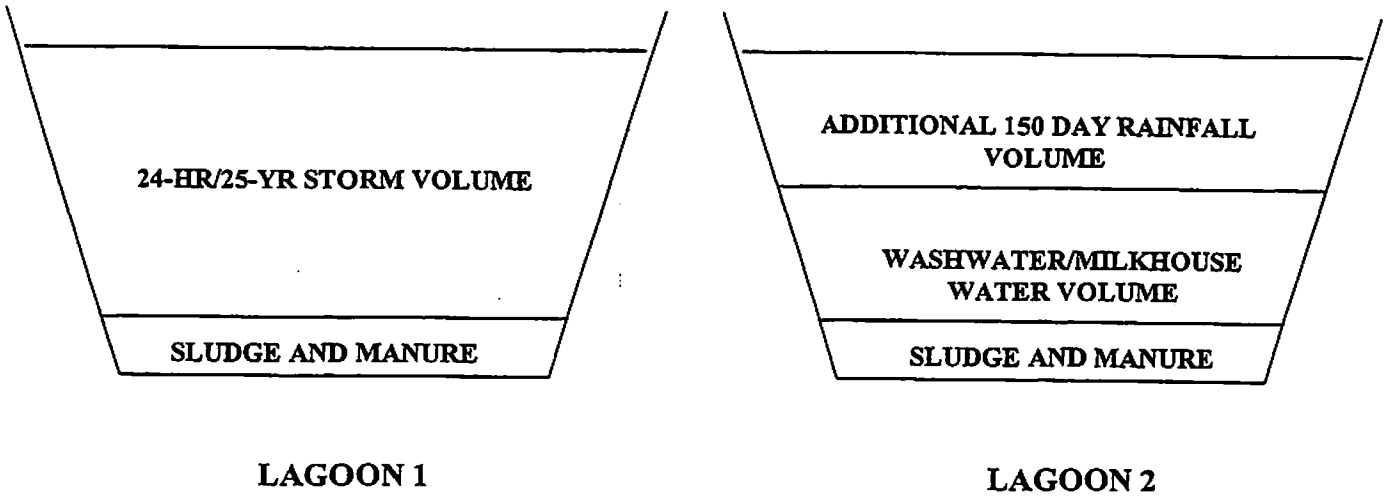


**Figure 2.** Cross sections of typical dairy lagoons with split volumes.

Appendix B contains the Inflow-Outflow computations designed to optimize the amount of storage required. This spreadsheet models the month-by-month totals of operations water, precipitation, 24-hour, 25-year storm data, evaporation and percolation. Although the 24-hour - 25-year storm could occur at any time, it was assumed to occur during the month of

January. Percolation is not included for November through March. All data is referenced in Appendices D-G. As can be seen in the spreadsheets, SNS Dairy has 19,245,907 million gallons of total inflow (Column [15]), and 43,846,695 gallons of total outflow (Column [27]).

Column [28] compares the total inflow with the total outflow on a month-by-month basis. The calculation subtracts the total outflow from the total inflow to give a clear estimate of which months have more inflow than outflow. If there is more inflow than outflow, additional storage is required. Since all factors including evaporation and percolation are included, this calculation gives an accurate estimate of how much storage is needed per month. The total capacity needed on the dairy based on all the months that have more inflow than outflow is then shown at the bottom of the calculation sheet. In the case of SNS Dairy, there are 5 months (November through March) where there is more inflow than outflow. There is a total of 8,386,434 gallons that need to be contained over the year. This number when compared with the total available capacity on the dairy shows if the lagoons need to be expanded or not. Since the SNS Dairy has 10,301,007 gallons of capacity, there is no need to expand the lagoons.

Following the spreadsheets are two charts showing the results of the Inflow-Outflow Computation, titled "Inflow-Outflow Comparison Chart" and "3D Inflow-Outflow Comparison Chart." The 3D Inflow-Outflow Comparison Chart is simply a 3D version of the Inflow-Outflow Comparison Chart. The dark blue line on the chart depicts the total operation water generated in gallons per month. The light blue line shows the total precipitation over the site in gallons per month. The yellow line shows the combination of operation water and precipitation water. The light red line shows the Total Inflow for the dairy including the operations water, precipitation, and the 24-hour, 25-year storm. The large jump in the light blue line denotes the 24-hour, 25-year storm. The purple line shows the evaporation from the fields and lagoons per month. The orange line shows the percolation from the fields per month. The large drop in the line denotes the lack of percolation in the winter months. The green line shows the Total Outflow from the dairy, including evaporation and percolation, per month.

This chart is an excellent reference because it shows the total amount of storage time that would be needed to properly manage the wastewater and storm water. In the case of SNS Dairy, there is more total inflow than total outflow in the months of November through March. This shows that the dairy technically needs 150 days of storage to properly manage the wastewater and storm runoff. In every other month there is more potential evaporation and percolation than there is inflow.

The SNS Dairy meets the requirements of the guidelines to Order No. 99-11 for 150 days storage. The following recommendations should be performed to meet the other requirements of the guidelines to Order No. 99-11.

**Recommendations**

1. Remove all animals from Corral #14. Clean the manure from the corral and construct a berm along the west fence line per Section I-I on the Plot Plan. Continue the berm south of the Corral to divert runoff from Corral #14 and run-on from the adjacent dairy away from Field #2. This portion of the berm should be constructed per Section L-L on the Plot Plan.

2. Construct a spillway near the southeast corner of Basin #1 per Detail 1 of the Plat Plan. The spillway shall be constructed of a material such as concrete, asphalt, or rip rap and shall include aprons designed to control slope erosion.

## III. PLOT (SITE) PLAN

Please see Plot Plan at the end of this report. (Plate 1)

## IV. COMPACTION

For construction and/or replacement of berms, the following procedures should be followed:

A. Over excavate the soil to 1'-2' below original ground before building berms.

B. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Backfill and fill materials should be completely free from manure.

C. Uniformly moisten sub-grade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

    1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
    2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

D. The excavation shall be backfilled and compacted to a relative compaction of no less than 90 percent. A Soils Engineer will need to be hired to ensure 90 percent compaction.

## V. OPERATION AND MAINTENANCE

The basic maintenance objectives are to ensure the reliable storage and disposal of accumulated wastewater and waste solids. To achieve this, there are several tasks that must be accomplished on a routine basis:

- Disposal of accumulated wastewater
- Measurement of accumulated waste solids
- Removal and disposal of accumulated waste solids
- Repair and maintenance of dikes and berms
- Maintenance of site grading
- Weed Abatement
- Record keeping

### Accumulated Wastewater Disposal

It is important that the water level in the wastewater holding ponds be properly maintained so that the ponds can provide the required storage capacity during wet weather periods. The California Regional Water Quality Control Board - Santa Ana Region (CRWQCB) has developed specific standards for the handling and storage of wastewater and storm water collected from the dairy operations. This portion of the Engineered Waste Management Plan describes the recommended maintenance procedures for the wastewater holding ponds to ensure compliance with CRWQCB standards.

In order to meet the requirements of the CRWQCB, the following general guidelines should be followed in disposing of wastewater in the ponds:

- Empty ponds just prior to the start of the wet weather season (November 1st) to ensure maximum capacity for the winter months. If stagnant water remains at the bottom of the ponds below the reach of the pumps, portable pumps should be used to remove all wastewater before the start of the wet season.
- Take advantage of dry weather periods during the annual wet weather period to dispose of accumulated wastewater. Fields must be bermed to prevent overflow from disposal areas onto adjacent properties.
- Start to empty ponds at end of wet weather season (March 31st) to maximize percolation and to create additional capacity in the lagoons.

General Equipment Maintenance. Pumps, pipelines and all pertinent equipment used in the handling of wastewater must be routinely checked and serviced to ensure proper operation:

- Check all wastewater distribution and application equipment weekly to ensure proper operation condition.
- Check and service motors and pumps three times a year. Portable replacement pumps should be available in case of a pump failure. If portable pumps are not available on-site, a rental company phone number should be posted with high visibility for all

employees. Rental company phone numbers are also listed on the last page of this report.

- Check transmission pipes for proper condition.
- Take inventory of spare parts and check sources of emergency repair.
- Disc percolation areas (fields) to about 18 inches to assure maximum percolation during wet seasons. Disking of the disposal area should occur as early in the year as possible, as soon as the fields are dry enough for the procedure to be effective. All of the disposal area should be disked at least once each year.

Dry Weather Disposal. Following the annual wet weather months, wastewater accumulated in the ponds should be disposed of in a timely manner in preparation of the coming wet weather months. The following guidelines should be followed for wastewater disposal during dry weather conditions:

- Apply wastewater to each of the evaporation/percolation disposal areas (fields) on a rotational basis.
- Wastewater should be applied to fields in a manner so that all wastewater will percolate and evaporate. Wastewater should be applied to all parts of the field to improve percolation and evaporation and to prevent stagnant wastewater.
- Observe the wastewater levels in the disposal areas on a daily basis and apply additional wastewater as the drying and percolation rates permit.
- Avoid having the fields completely flooded for extended periods of time. The best disposal rates will occur if the fields are flooded 4 to 6 inches and then allowed to evaporate and percolate. Fields can only be flooded to 4 to 6 inches if proper berms exist around the boundaries of the field. If stagnant wastewater develops, a portable pump or other measures should be used to help spread the water and prevent insect breeding conditions.

Wet Weather Disposal. During the wet weather months, there may be weeks of dry weather available to dispose of accumulated wastewater. Take advantage of every opportunity to reduce the wastewater levels in the holding basins/lagoons so that in the event of a large storm the chances of overflow and inadvertent runoff are reduced. The following guidelines should be followed for wastewater disposal during wet weather months:

- Apply wastewater to each of the disposal areas on a rotational basis.
- Apply wastewater in a manner so that all wastewater will percolate and evaporate. Fields should be watered so that all parts of the field receive wastewater. This will help percolation and evaporation and will help prevent stagnant wastewater.
- Observe the wastewater levels in the disposal areas on a daily basis. Apply additional wastewater only if the previously applied wastewater has evaporated or percolated and if a large storm is not eminent.
- Do not flood the fields and leave standing water for a long period of time unless it has so been designated.

## Accumulated Solids Removal and Disposal

Solids contained in the dairy-generated wastewater and in the storm water will naturally settle and accumulate in the bottom of the holding basins/lagoons. The settled solids will reduce the holding capacity of the ponds. To maintain holding pond storage capacity, solids must be routinely checked and periodically removed. The frequency of solids removal will depend on how quickly solids accumulate in the ponds.

Solids Removal. Remove accumulated solids 1st by agitation and pumping, 2nd by dredging, and 3rd by draining and scraping. If dredging is used, ensure that dredging runoff and excess wastewater taken from the ponds is contained and returned to the ponds. Lagoon solids should be removed *every summer* to ensure full capacity in the lagoons before the start of the next winter season.

Solids Disposal. Solids removed from the ponds can be applied to application areas on-site or must be hauled off-site to farm ground for land application. Solids from lagoon applied to application areas should be tilled and mixed into the native soils shortly after application.

## Levee, Berm and Dike Maintenance

The integrity of pond berms, levees, and dikes must be maintained. Follow these guidelines to ensure proper maintenance of the levees and berms:

- Check pond dikes, levees, and berms a minimum of two times per year for erosion and settlement, and repair as necessary (one inspection to occur just prior to the rainy season).
- Check pond dikes, levees, and berms a minimum of two times per year for rodent damage, and repair as necessary (one inspection to occur just prior to the rainy season).
- If immediate repairs must be made, compacted soil should be used to fill all cracks and holes until further repair can be performed.
- Apply suitable rodent control measures for widespread or frequent rodent damage. These may include Anti-Coagulant Bait, Trapping or Fumigation. Pest Control Specialists should be contacted before using any of these methods.

## Site Grading Maintenance

Site grading must be maintained to ensure proper drainage patterns across the dairy. The goal is to minimize the amount of water contaminated with manure and flowing into the holding ponds and to prevent contaminated wastewater from running off-site. The following guidelines should be followed to maintain site grading:

- Ensure that all wastewater generated by the daily dairy operations flows to the wastewater holding ponds. Re-grade as needed.
- Clean and repair buried drain lines as needed.

- Ensure that rainfall collected from cow holding pens, feed storage areas, and other manured areas flows to the holding ponds or containment areas. Re-grade as needed.
- Check the condition of containment walls and berms surrounding the cow confined areas, and repair as necessary.
- Ensure that storm water from off-site areas is diverted away from holding pens and other manured areas.
- Ensure that storm water from other off-site areas does not drain into the holding ponds.

**Weed Abatement**

Weed abatement measures such as pesticides and clearing and grubbing should be used to control weeds in fields, lagoons, wastewater transport channels, and wastewater access paths. Clearing manure out of lagoons once a year and discing fields at a minimum of once a year will help ensure weed abatement.

**Maintenance and Operations Records**

Keep records of all maintenance activities for future reference.

| Maintenance Activity | | Frequency |
|---|---|---|
| Holding Basin/Lagoon Levels | Pond Depth in Feet | Weekly |
| Holding Basin/Lagoon General Inspection | Berm and Lagoon Wall Stability | Weekly |
| Wastewater distribution/ Application Equipment | Pump/Pipe/Ditch Inspection | Weekly |
| Rainfall Totals | Days of Rain & Inches of Rainfall | Daily/Monthly |
| Solids Level | Solids Depth in Feet | Annually |
| Wastewater Application | Wastewater Depth in Inches | Daily |
| Wastewater Application | Days Applied & Approximate Volume | Weekly |
| Lagoon Solids Removal/Disposal | Days Removed & Volume Removed | Annually |
| Corral Solids Removal/Disposal | Days Removed & Volume Removed | Semi-Annually |
| Dikes and Berms Maintenance | Damage Found & Date Repairs Made | Semi-Annually |
| Site Grading Maintenance | Improvements Made & Date | Annually |
| Equipment Maintenance | Service and Repair Records & Dates | Semi-Annually |

- Daily inspections should be made upon all ponds, berms and wastewater distribution and application equipment following the first significant rain event of each Winter season. These daily inspections should continue until large rain events cease in the Spring.

- Should an unauthorized discharge be made from the facility, the dairy operator should follow the guidelines described in Monitoring and Reporting Program No. 99-11. (See back pages of Order No. 99-11.) Emergency phone numbers are located on the next page of this report.

**Emergency Spill Plan**

In the case of an emergency spill on the dairy, these directions should be followed.

First, the Regional Water Quality Control Board should be contacted if a spill occurs. This requirement is based on Order 99-11.
At least one of these people should be contacted in the case of a spill.

Regional Water Quality Control Board
Steve Mayville (909) 782-4130
Chief of the Dairy Units

Should a pump or piece of equipment break down, these numbers should be used to pursue emergency temporary equipment.

Vandenberg Manufacturing Company, Inc.
(909)-597-3412

Below is a list of spare parts that could be used in the case of an emergency spill.

There are no spare parts on-site.

## VII. GLOSSARY

| | | |
|---|---|---|
| **AFO** | - - | Animal Feeding Operation |
| **BMP** | - - | Best Management Practices |
| **Board** | - - | See CRWQCB, SAR |
| **CAFO** | - - | Concentrated Animal Feeding Operation |
| **Catastrophic Rainfall:** | | Any single event which would total the volume of the 25 year, 24 hour storm event; this could include tornadoes, hurricanes or other catastrophic conditions which could cause overflow due to winds or mechanical damage. |
| **CFR** | - - | Code of Federal Regulations |
| **Chronic Rain fall:** | - | A series of wet weather conditions which would not provide opportunity for dewatering and which total the volume of the 25 year, 24 hour storm event. |
| **CNMP** | - - | Comprehensive Nutrient Management Plan |
| **CRWQCB** | - - | California Regional Water Quality Control Board |
| **CWA** | - - | Clean Water Act |
| **Discharger** | - - | Persons discharging, or proposing to discharge, dairy wastes or other similar kinds of wastes from an existing dairy or related facility in any manner that may affect water quality. |
| **EWMP** | - - | Engineered Waste Management Plan |
| **NPDES** | - - | National Pollutant Discharge Elimination System |
| **Process Wastewater:** | | Water directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems |
| **Regional Board:** | - | See CRWQCB, SAR |
| **Run-on** | - - | Storm water that occurs off-site, but enters the CAFO |
| **SAR** | - - | Santa Ana Region |
| **SWRCB** | - - | State Water Resources Control Board |
| **TDS** | - - | Total Dissolved Solids |
| **TMDL** | - - | Total Maximum Daily Load |
| **USDA** | - - | United States Department of Agriculture |
| **USEPA** | - - | United States Environmental Protection Agency |
| **Washwater** | - - | Water used to wash cows prior to milking, milk equipment & milk barn |

# APPENDIX A

## WORKSHEET FOR DETERMINING CONTAINMENT FACILITY VOLUME

NOLTE
BEYOND ENGINEERING

WORKSHEET FOR DETERMINING
CONTAINMENT FACILITY VOLUME

NAME OF FACILITY: SNS Dairy

NAME OF OPERATOR: Sam Souza
7325 Edison Avenue
Chino, CA 91710

DATE: 12/03/03
PHONE: (909) 627-9432

**TOTAL ACRES OF PROPERTY** 36.55
**DAIRY SITE (Manured Areas)** 33.41 Acres

**TOTAL DAYS STORAGE:** 150

## ANIMAL UNITS

| | Milk Cows | Dry Cows | Bred Heifers | Heifers 1 yr/breed | Calves 3 m to 1yr | Baby Calves |
|---|---|---|---|---|---|---|
| Number (N) | 850 | 150 | 0 | 0 | 0 | 0 |
| Weights (lbs) | 1,400 | 1,400 | 1,100 | 775 | 450 | 150 |
| Pounds (lbs.x N) | 1,190,000 | 210,000 | 0 | 0 | 0 | 0 |
| Units ((N x lbs.)/1000) | 1,190.0 | 210.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | TOTAL ANIMAL UNIT | 1400.0 |

## MILKHOUSE AND PARLOR WATER RATE

| | Gal Per Milking | # Milkings Per Day | # Cows | Totals (Gal Per Day) |
|---|---|---|---|---|
| Bulk Tank Wash Volume [1] | 35 | 2 | | 70 |
| Pipeline Wash Volume [1] | 250 | 2 | | 500 |
| Milkhouse Parlor Floor Wash [1] | 250 | 2 | | 500 |
| Cow Prep (hose wash per cow) [1] | 0.25 | 2 | 850 | 425 |
| Miscellaneous Equipment (buckets etc.) [1] | 250 | 2 | | 500 |
| Miscellaneous Wash (wash/drip pen hose etc.) [1] | 525 | 2 | | 1050 |
| TOTAL DAILY MILK HOUSE AND PARLOR WATER USE | | | | 3,045 |

## WASH PEN/HOLDING PEN WATER RATE

| | | # Strings | Totals (Gal Per Day) |
|---|---|---|---|
| Number of Holding Pen Sprinklers | 54 | | |
| Duration of Sprinkler Wash Cycle (minutes) | 5 | | |
| Number of Wash Cycles (cow pens) | 8 | | |
| Sprinkler Flow Rate (gallons per minute) [1] | 5.05 | | |
| TOTAL WASH PEN WATER USE | 10,908 | 2 | 21,816 |

## WASHWATER VOLUME

| | | |
|---|---|---|
| Milkhouse and Wash Pen (gal per day) | | 24,861 |
| Required days for Containment Facility to hold | | 150 |
| TOTAL WASHWATER VOLUME | Gallons | 3,729,150 |
| | Cu. Ft. | 498,549 |

| EQUIVALENT GALLONS PER COW PER DAY | Gal Per Day | # Cows | # Cows |
|---|---|---|---|
| | 24,861 | 850 | 29.25 Gal/Cow/Day |

[1] University of California Cooperative Extension - Dairy Management Series, Planning and designing dairy waste storage

## WHOLE DAIRY: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 64,725 | 100% | 64,725 |
| Roofed Surface Area Draining Into Lagoon | 14,000 | 100% | 14,000 |
| Surface Area Of The Lagoon | 380,900 | 100% | 380,900 |
| Corral Surface Area Draining Into Lagoon | 554,525 | 50% | 277,263 |
| Pasture Area Draining Into Lagoon | 303,575 | 15% | 45,536 |
| Any Other Dirt Surface Area Draining Into Lagoon | 137,400 | 30% | 41,220 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 1,455,125 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | 33.41 | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **823,644** |

| REQUIRED STORM WATER AND RAINFALL RATES (WHOLE DAIRY) | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| TOTAL STORMWATER RUNOFF VOLUME | | |
|---|---|---|
| | **Gallons** | **7,582,986** |
| | **Cu Ft.** | **1,013,768** |
| | **Acre-Ft.** | **23.27** |

**EVAPORATION CALCULATION FOR WINTER MONTHS**

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 70,684 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| E. Basin 1-5 | 680 | 445 | 0 | 5.00 | 0.00 | - | - | 302,600 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| **Total Lagoon Area #1, #2 & #3** | | | | | | | | **373,284** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

| | | | | |
|---|---|---|---|---|
| *This data is provided by the State of California,* | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPORATION | | | |
|---|---|---|---|
| Area of coverage: 57% | Gallons | 2,553,341 |
| | Cu Ft. | 341,356 |
| | Acre-Ft. | 7.84 |

| NET REQUIRED STORM WATER STORAGE VOLUME | | |
|---|---|---|
| | Gallons | 5,029,645 |
| | Cu Ft. | 672,412 |
| | Acre-Ft. | 15.44 |

| WASHWATER AND STORM WATER TOTAL VOLUME | | |
|---|---|---|
| (Wash Water and Storm Water) | Gallons | 8,758,795 |
| | Cu Ft. | 1,170,962 |

## MANURE CONSIDERATION

(daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet)

| | | | |
|---|---|---|---|
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 1,400.00 | | |
| Total Volume: | 1,918.00 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 191.80 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 28,770 |
| | | Acre-Ft. | 0.66 |

| Total Required Containment Facility Volume | | |
|---|---|---|
| | Gallons | 8,973,994 |
| | Cu Ft. | 1,199,732 |
| | Acre-Ft. | 27.54 |

## AREA #1: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 64,725 | 100% | 64,725 |
| Roofed Surface Area Draining Into Lagoon | 14,000 | 100% | 14,000 |
| Surface Area Of The Lagoon | 78,300 | 100% | 78,300 |
| Corral Surface Area Draining Into Lagoon | 428,125 | 50% | 214,063 |
| Pasture Area Draining Into Lagoon | 156,625 | 15% | 23,494 |
| Any Other Dirt Surface Area Draining Into Lagoon | 71,550 | 30% | 21,465 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 813,325 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | **18.67** | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **416,046** |

| REQUIRED STORM WATER AND RAINFALL RATES (Area 1) | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| TOTAL STORMWATER RUNOFF VOLUME | | |
|---|---|---|
| | **Gallons** | **3,830,385** |
| | **Cu Ft.** | **512,084** |
| | **Acre-Ft.** | **11.76** |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| | Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 70,684 |
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 |
| **Total Lagoon Area #1** | | | | | | | | | **70,684** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** **150.00** =Storgae Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| | | | |
|---|---|---|---|
| TOTAL WINTER MONTHS EVAPOARTION | | Gallons | 424,117 |
| Area of coverage: | 50% | Cu Ft. | 56,700 |
| | | Acre-Ft. | 1.30 |

| | | |
|---|---|---|
| NET REQUIRED STORM WATER STORAGE VOLUME | Gallons | 3,406,268 |
| | Cu Ft. | 455,383 |
| | Acre-Ft. | 10.45 |

| | | | |
|---|---|---|---|
| **WASHWATER AND STORM WATER TOTAL VOLUME** | | | |
| (Wash Water and Storm Water) | 0% | **Gallons** | **3,406,268** |
| | | **Cu Ft.** | **455,383** |

| | | | |
|---|---|---|---|
| **MANURE CONSIDERATION** | | | |
| (daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet) | | | |
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 782.51 | (Percentage) | 55.89% |
| Total Volume: | 1,072.04 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 107.20 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 16,081 |
| | | Acre-Ft. | 0.37 |

| | | |
|---|---|---|
| **Total Required Containment Facility Volume** | **Gallons** | **3,526,551** |
| | **Cu Ft.** | **471,464** |
| | **Acre-Ft.** | **10.82** |

## AREA #2: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 0 | 100% | 0 |
| Roofed Surface Area Draining Into Lagoon | 0 | 100% | 0 |
| Surface Area Of The Lagoon | 302,600 | 100% | 302,600 |
| Corral Surface Area Draining Into Lagoon | 126,400 | 50% | 63,200 |
| Pasture Area Draining Into Lagoon | 146,950 | 15% | 22,043 |
| Any Other Dirt Surface Area Draining Into Lagoon | 65,850 | 30% | 19,755 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 641,800 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | **14.73** | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **407,598** |

## REQUIRED STORM WATER AND RAINFALL RATES (Area #2)

| | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| | | |
|---|---|---|
| **TOTAL STORMWATER AND RUNOFF VOLUME** | **Gallons** | **3,752,601** |
| | **Cu Ft.** | **501,685** |
| | **Acre-Ft.** | **11.52** |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| E. Basin 1-5 | 680 | 445 | 445 | 5.0 | 0.0 | - | - | 302,600 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| **Total Lagoon Area #2** | | | | | | | | **302,600** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPOARTION | | | |
|---|---|---|---|
| Area of coverage: 60% | Gallons | 2,178,787 |
| | Cu Ft. | 291,282 |
| | Acre-Ft. | 6.69 |

| NET REQUIRED STORM WATER STORAGE VOLUME | | |
|---|---|---|
| | Gallons | 1,573,814 |
| | Cu Ft. | 210,403 |
| | Acre-Ft. | 4.83 |

| WASHWATER AND STORM WATER TOTAL VOLUME | | |
|---|---|---|
| (Wash Water and Storm Water) % Wash Water : 100% | Gallons | 5,302,964 |
| | Cu Ft. | 708,952 |

| MANURE CONSIDERATION | | | | |
|---|---|---|---|---|
| (daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet) | | | | |
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | | |
| Total Units | 617.49 | (Percentage) | | 44.11% |
| Total Volume: | 845.96 | (Cubic ft Per Day) | | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | | 84.60 |
| Storage Period (days) | | | | 150 |
| TOTAL MANURE VOLUME | | | Cu Ft. | 12,689 |
| | | | Acre-Ft. | 0.29 |

| Total Required Containment Facility Volume | | |
|---|---|---|
| | Gallons | 5,397,880 |
| | Cu Ft. | 721,642 |
| | Acre-Ft. | 16.57 |

## AREA #3: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 0 | 100% | 0 |
| Roofed Surface Area Draining Into Lagoon | 0 | 100% | 0 |
| Surface Area Of The Lagoon | 0 | 100% | 0 |
| Corral Surface Area Draining Into Lagooh | 0 | 50% | 0 |
| Pasture Area Draining Into Lagoon | 0 | 15% | 0 |
| Any Other Dirt Surface Area Draining Into Lagoon | 0 | 30% | 0 |
| TOTAL SQUARE FEET OF DAIRY OPERATIONS | 0 | (MANURED AREAS) | |
| TOTAL ACREAGE OF DAIRY OPERATIONS | 0.00 | (MANURED AREAS) | |
| TOTAL SQUARE FEET OF SURFACE RUNOFF | | | 0 |

## REQUIRED STORM WATER AND RAINFALL RATES (Area #3)

| | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | TOTAL INCHES | 14.77 |

| | | |
|---|---|---|
| TOTAL STORMWATER AND RUNOFF VOLUME | Gallons | 0 |
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| Total Lagoon Area #3 | | | | | | | | 0 |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPOARTION | | Gallons | 0 |
|---|---|---|---|
| Area of coverage: | 50% | Cu Ft. | 0 |
| | | Acre-Ft. | 0.00 |

| NET REQUIRED STORM WATER STORAGE VOLUME | Gallons | 0 |
|---|---|---|
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

## WASHWATER AND STORM WATER TOTAL VOLUME

| (Wash Water and Storm Water) | % Wash Water : 0% | Gallons | 0 |
|---|---|---|---|
| | | Cu Ft. | 0 |

## MANURE CONSIDERATION

(daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet)

| | | | |
|---|---|---|---|
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 0.00 | (Percentage) | 0.00% |
| Total Volume: | 0.00 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 0.00 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 0 |
| | | Acre-Ft. | 0.00 |

| Total Required Containment Facility Volume | Gallons | 0 |
|---|---|---|
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

TOTAL AVAILABLE VOLUME (Cu.ft.)

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. | Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 78,300 | 620,640 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| E. Basin 1-5 | 680 | 445 | 445 | 5 | 0 | - | - | 302,600 | 756,500 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 | 0 |
| | | | | | | | Total: | 380,900 | 1,377,140 |

## WHOLE DAIRY

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **10,301,007** |
| | | **Cu Ft.** | **1,377,140** |
| | | **Acre-Ft.** | **31.61** |
| **Additional Volume Required** | -1,327,013 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-1

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **4,642,387** |
| | | **Cu Ft.** | **620,640** |
| | | **Acre-Ft.** | **14.25** |
| **Additional Volume Required** | -1,115,836 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-2

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **5,658,620** |
| | | **Cu Ft.** | **756,500** |
| | | **Acre-Ft.** | **17.37** |
| **Additional Volume Required** | -260,740 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-3

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |
| **Additional Volume Required** | 0 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## DEPTH IN STORAGE AREA-1 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 228,748 |
| | Total Area #1 | 78,300 |
| **Total Depth Needed at Top of Lagoon to Hold 24 HR, 25 Year Storm** | | 3.00 |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

## DEPTH IN STORAGE AREA-2 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 180,506 |
| | Total Area #2 | 302,600 |
| **Total Depth Needed at Top of Basin to Hold 24 HR, 25 Year Storm** | | 0.60 |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

## DEPTH IN STORAGE AREA-3 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 0 |
| | Total Area #3 | 0 |
| **Total Depth Needed at Top of Basin to Hold 24 HR, 25 Year Storm** | | #DIV/0! |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

# APPENDIX B

## INFLOW-OUTFLOW COMPUTATION

**Annual Totals Worksheet (Per Month)**

| Month | [1] Operations Water | [2] | [3] Precipitation | [4] | [5] Drainage Per Month | [6] | [7] | [8] Total Inflow | [9] 25 Year Storm | [10] | [11] Drainage Per Month | [12] | [13] | [14] Manure Inflow | [15] Total Inflow |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | [4] x [5] | [5] x 7.48 | [2] + [7] | | | | [10] x [11] | [12] x 7.48 | | [8] + [13] + [14] |
| | Volume | | | | Area | Volume | | Volume | | | Area | Volume | | Volume | Volume |
| | Gal per day | Gal per Month[A] | Inches | Feet | Square feet | Cubic feet | Gal per Month | Gal per Month | Inches | Feet | Square feet | Cubic feet | Gal per Month | Gallons per Month | Gallons per Month |
| August | 24,661 | 770,891 | 0.20 | 0.02 | 823,844 | 13,727 | 102,661 | 673,372 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 918,412 |
| September | 24,861 | 745,830 | 0.39 | 0.03 | 823,644 | 26,788 | 200,228 | 946,058 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 989,098 |
| October | 24,861 | 770,691 | 0.37 | 0.03 | 823,844 | 25,396 | 189,960 | 960,651 | 0.0 | 0.00 | 823,844 | 0 | 0 | 44,475 | 1,005,125 |
| November | 24,861 | 745,830 | 1.54 | 0.13 | 823,844 | 105,701 | 790,843 | 1,536,473 | 0.0 | 0.00 | 823,844 | 0 | 0 | 43,040 | 1,579,513 |
| December | 24,861 | 770,891 | 1.85 | 0.15 | 823,844 | 128,978 | 949,799 | 1,720,490 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 1,764,964 |
| January | 24,861 | 770,891 | 2.35 | 0.20 | 823,644 | 181,297 | 1,206,501 | 1,977,192 | 4.5 | 0.38 | 823,644 | 308,858 | 2,310,321 | 44,475 | 4,331,987 |
| February | 24,861 | 696,108 | 2.64 | 0.22 | 623,644 | 181,202 | 1,355,388 | 2,051,496 | 0.0 | 0.00 | 823,644 | 0 | 0 | 40,171 | 2,091,667 |
| March | 24,861 | 770,891 | 1.89 | 0.16 | 823,644 | 129,724 | 970,335 | 1,741,028 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 1,785,500 |
| April | 24,861 | 745,830 | 0.83 | 0.07 | 823,644 | 56,969 | 426,126 | 1,171,956 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 1,214,996 |
| May | 24,861 | 770,891 | 0.21 | 0.02 | 823,644 | 14,414 | 107,615 | 878,506 | 0.0 | 0.00 | 623,644 | 0 | 0 | 44,475 | 922,981 |
| June | 24,861 | 745,830 | 0.04 | 0.00 | 823,644 | 2,745 | 20,536 | 788,366 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 809,406 |
| July | 24,661 | 770,891 | 0.03 | 0.00 | 823,644 | 13,727 | 102,681 | 848,511 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 917,847 |
| | | | | | | | | | | | | | Total | | 19,245,907 [B] |
| | | | | | | | | | | | | | | *Annual Total* | *59.07 [B] Acre-Ft.* |
| | | | | | | | | | | | | | | *Winter Months Total* | *35.46 [F] Acre-Ft.* |

| Month | [15] Evaporation (Inches) | [17] | [18] Area (sq ft.) | [19] | [20] Total Evaporation | [21] | [22] | [23] Percolation Application | [24] | [25] Percolation Field Area[C] | [25] | [27] Total Outflow | [28] Total Balance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | [18] + [19] | [17] x [20] | [21] x 7.48 | | | | [23] x [25] | [21] + [24] | [15] - [27] |
| | | | | | Area | Volume | | Rate Per Day | Rate Per Month | Rate | | Rate | Volume |
| | Inches[E] | Feet | Field[D] | Lagoon | Square feet | Cubic Feet | Gal per Month | Gallon / feet$^2$ x Day | Gallon / feet$^2$ x Days | Square feet | Gal per Month | Gallons per Month | Gallons per Month |
| August | 10.00 | 0.83 | 146,950 | 380,900 | 527,850 | 439,874 | 3,290,258 | 0.7 | 21.7 | 146,950 | 3,188,815 | 8,479,073 | -5,562,682 |
| September | 7.91 | 0.88 | 148,950 | 380,900 | 527,850 | 348,089 | 2,603,708 | 0.7 | 21 | 145,950 | 3,085,950 | 5,689,658 | -4,700,561 |
| October | 5.87 | 0.47 | 148,950 | 380,900 | 527,850 | 249,377 | 1,865,343 | 0.7 | 21.7 | 146,950 | 3,186,815 | 5,054,158 | -4,049,033 |
| November | 2.11 | 0.18 | 148,950 | 380,900 | 527,850 | 92,851 | 693,027 | 0 | 0 | 146,950 | 0 | 693,027 | 888,486 |
| December | 1.69 | 0.14 | 148,950 | 380,900 | 527,850 | 74,487 | 557,012 | 0 | 0 | 146,950 | 0 | 557,012 | 1,207,952 |
| January | 1.71 | 0.14 | 146,950 | 380,900 | 527,850 | 75,333 | 563,489 | 0 | 0 | 146,950 | 0 | 563,489 | 3,768,498 |
| February | 1.75 | 0.15 | 148,950 | 380,900 | 527,850 | 77,065 | 576,443 | 0 | 0 | 148,950 | 0 | 578,443 | 1,515,224 |
| March | 2.38 | 0.20 | 148,950 | 380,900 | 527,850 | 103,907 | 777,228 | 0 | 0 | 146,950 | 0 | 777,226 | 1,008,274 |
| April | 8.14 | 0.61 | 146,950 | 380,900 | 527,850 | 270,159 | 2,020,789 | 0.7 | 21 | 146,950 | 3,085,950 | 5,106,739 | -3,891,743 |
| May | 7.68 | 0.64 | 148,950 | 380,900 | 527,850 | 337,899 | 2,525,988 | 0.7 | 21.7 | 146,950 | 3,188,815 | 5,714,801 | -4,791,820 |
| June | 8.62 | 0.72 | 148,950 | 380,900 | 527,850 | 379,282 | 2,838,878 | 0.7 | 21 | 146,950 | 3,085,950 | 5,922,828 | -5,113,420 |
| July | 10.71 | 0.89 | 146,950 | 380,900 | 527,850 | 471,048 | 3,523,426 | 0.7 | 21.7 | 146,950 | 3,188,815 | 8,712,241 | -5,795,829 |
| | | | | | | | | | | | Total | 43,846,895 [B] | -25,518,835 |
| | | | | | | | | | | | | *Annual Total* | *134.57 [B] Acre-Ft.* |
| | | | | | | | | | | | | *Winter Months Total* | *9.72 [F] Acre-Ft.* |

[A] Calculation includes actual number of days in each month
[B] Annual totals are calculated January through December
[C] Assumes no percolation during winter months (Nov.-Mar.)
[D] Assumes field is barred for winter disposal. Null values are inserted if field cannot be used for winter disposal.
[E] Evaporation inches reduced 50% during winter months (Nov.-Mar.)
[F] Winter months totals are calculated November through March

| | | |
|---|---|---|
| TOTAL CAPACITY NEEDED ON DAIRY | 8,388,434 | Gallons |
| | 1,121,161 | Cubic Feet |
| | 25.74 | Acre-Ft. |

| | | |
|---|---|---|
| TOTAL AVAILABLE CAPACITY | 10,301,007 | Gallons |
| | 31.61 | Acre-Ft. |

## Inflow - Outflow Comparison Chart

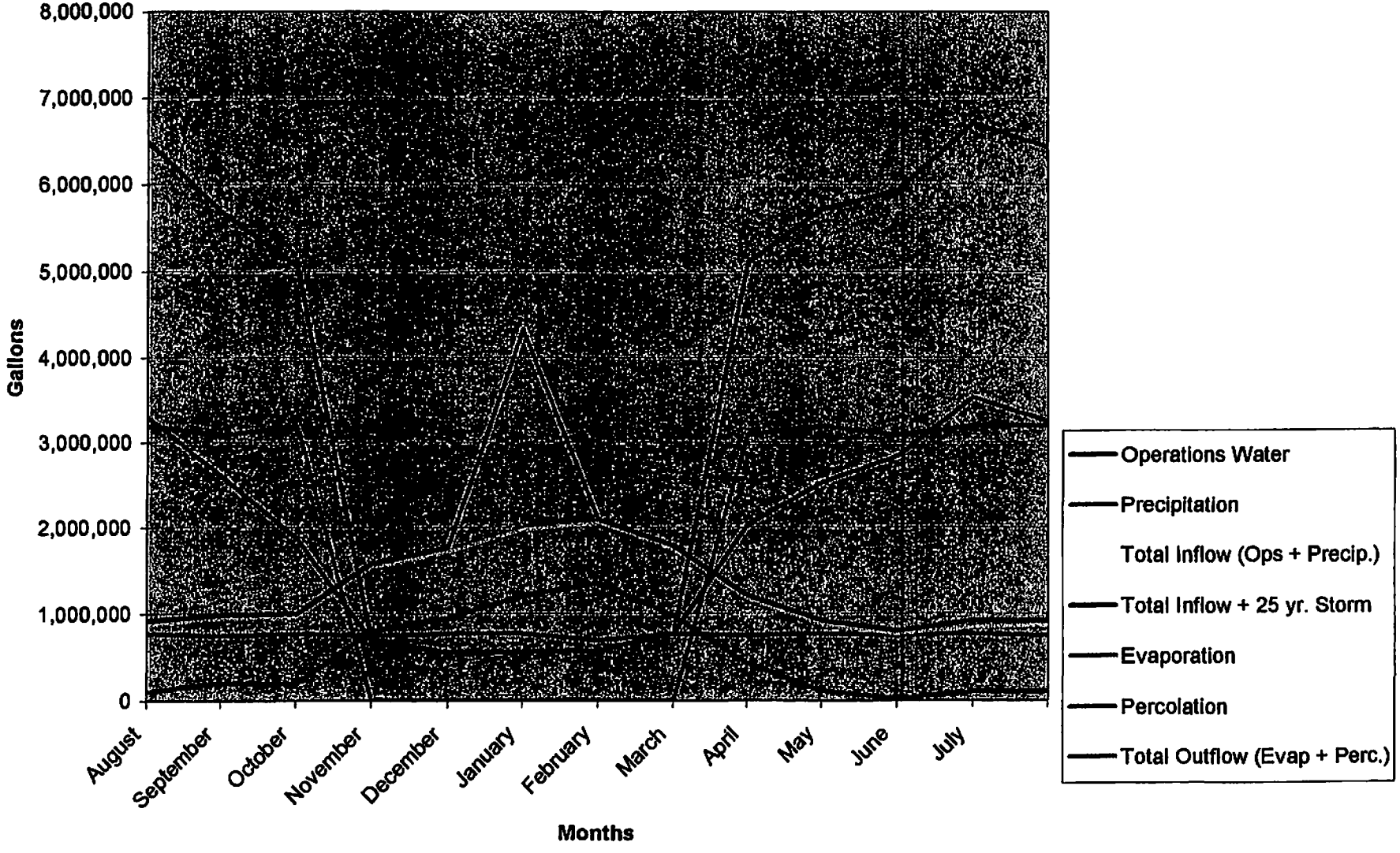

**Evaporation-vs-Percipitation Comparison Chart**

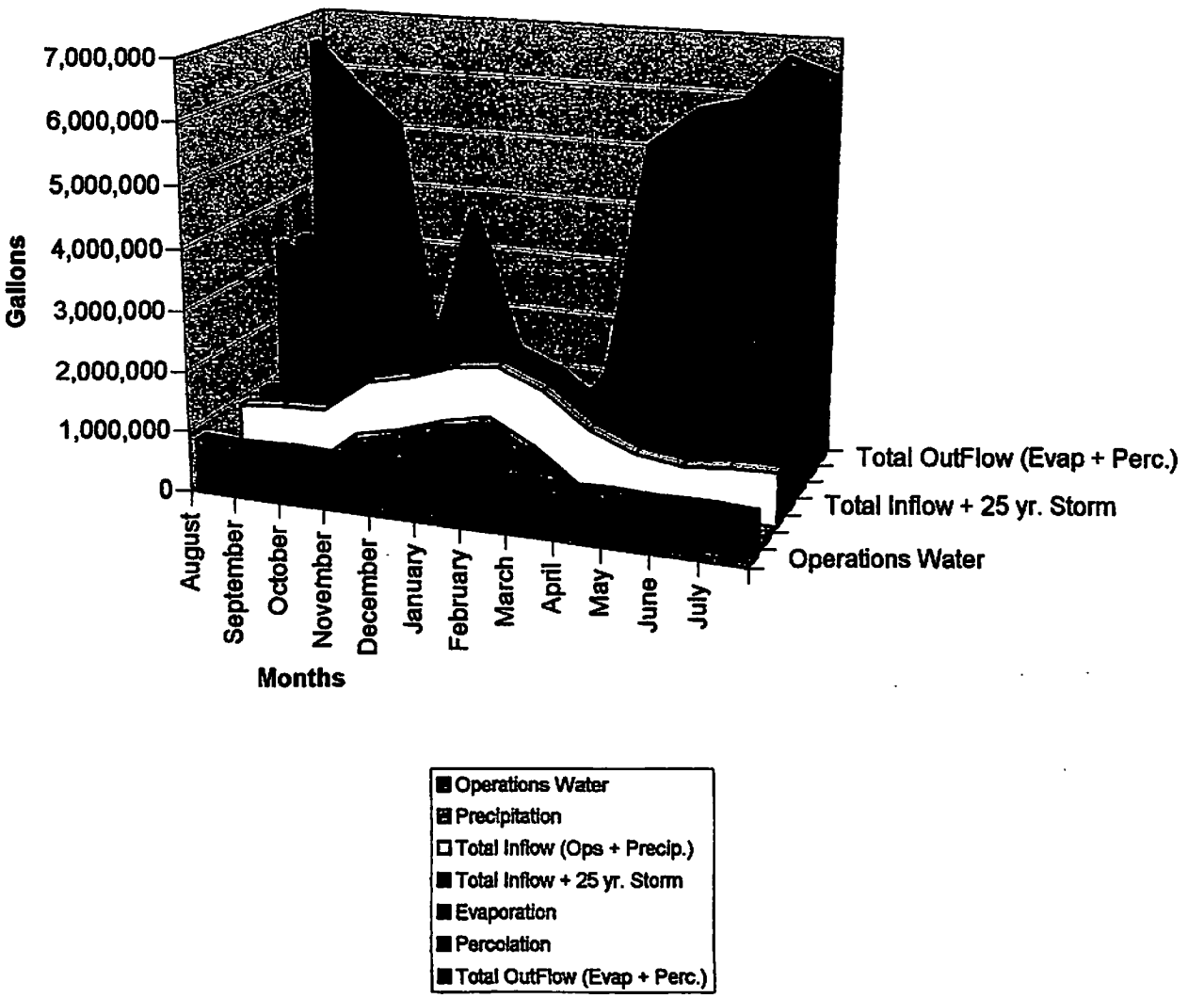

# APPENDIX C

## MILKHOUSE AND WASH PEN VOLUME ESTIMATION DATA

*University of California*
*Cooperative Extension*

# *Dairy Manure Management Series*

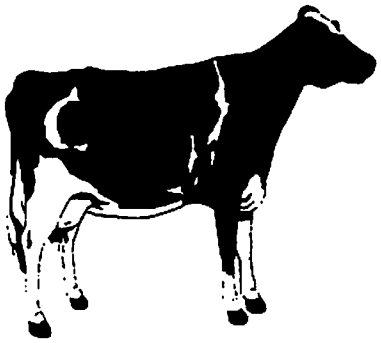

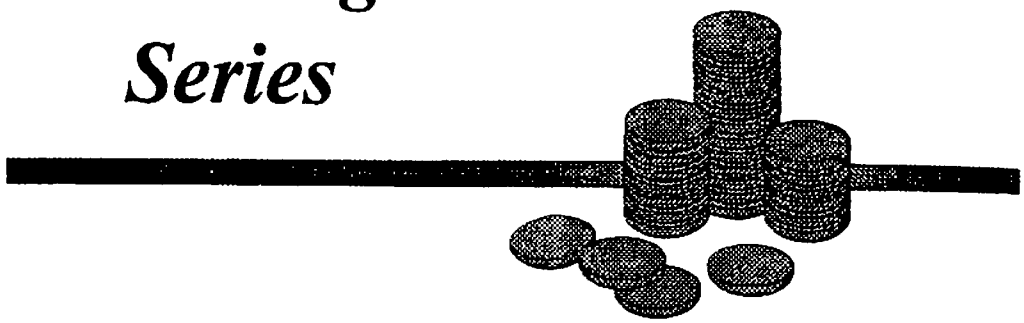

## PLANING AND DESIGNING DAIRY WASTE STORAGE FACILITIES

**Alison Van Eenennaam[1]**

A dairy waste management system must be planned, designed and managed to:

- Prevent water pollution
- Control odors
- Eliminate breeding places for insects
- Provide a convenient and efficient operation for the dairy owner/operator
- Require minimal investment, maintenance and operational costs
- Meet legal requirements.

Proper management of manure and waste water ensures further benefits in providing a healthy atmosphere for the animals. A facility that is clean, dry and free of manure provides a less desirable environment for disease organisms to thrive.

The purposes of this document are to:

- detail the factors to consider in designing a waste management storage facility;
- outline the major factors to be considered when designing dairy waste holding ponds; and
- provide an example of how to size a dairy manure holding pond.

[1]University of California Cooperative Extension Postdoctoral Associate.

## TABLES

**Table 1.** Waste produced daily by a 1,000 pound dairy cow and where it is deposited (2).

| Area | Percent | Cubic Feet |
|---|---|---|
| Housing area | 40 | .548 |
| Feeding area | 45 | .617 |
| Holding pen | 10 | .137 |
| Milk parlor | 5 | .068 |
| Total cubic feet/1,000 lb cow | | 1.370 |

**Table 2.** Volume of milkhouse and parlor water (2, and D. Johnson, NRCS, pers. comm.).

| Washing operation | Water Volume |
|---|---|
| Bulk Tank | |
| Automatic, 3 cycle wash | 60 to 110 gal/wash |
| Manual wash | 30 to 50 gal/wash |
| Pipeline | |
| In parlor (volume is higher for long flat barns) | 75 to 150 gal/wash |
| Milkhouse and parlor floors | 300 to 700 gal/wash |
| Pail milkers | 30 to 40 gal/wash |
| Miscellaneous equipment | 30 gal/day |
| Cow preparation wash | |
| Automatic | 1 to 4.5 gal/wash/cow |
| Manual | .25 to .5 gal/wash/cow |
| Holding pen (sprinklers) | 5 gal/min/head (dependent upon nozzle size & pressure) |

# APPENDIX D

RAINFALL DATA

# CORONA , CALIFORNIA (042031)

## 1961-1990 Monthly Climate Summary

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 67.40 | 69.40 | 71.10 | 75.20 | 79.40 | 85.10 | 91.80 | 92.10 | 88.70 | 82.30 | 70.80 | 67.40 | 78.60 |
| Average Max. Temperature (F) | 40.60 | 41.70 | 43.00 | 45.70 | 50.40 | 54.60 | 58.50 | 59.90 | 56.90 | 50.90 | 42.90 | 39.80 | 48.90 |
| Average Total Precipitation (in.) | 2.35 | 2.64 | 1.89 | 0.83 | 0.21 | 0.04 | 0.03 | 0.20 | 0.39 | 0.37 | 1.54 | 1.85 | 12.32 |

Unofficial values based on averages/sums of smoothed daily data. Information is computed from available daily data during the 1961-1990 period. Smoothing, missing data and observation-time changes may cause these 1961-1990 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made for missing data or time of observation. Check **NCDC normals** table for official data.

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*Western Regional Climate Center,* wrcc@dri.edu

*Total Rainfall Winter Months:*

| November | | December | | January | | Febuary | | March | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1.54* | + | *1.85* | + | *2.35* | + | *2.64* | + | *1.89* | = | *10.27* | inches |

# CORONA, CALIFORNIA

## 1961 - 1990 Temperature and Precipitation

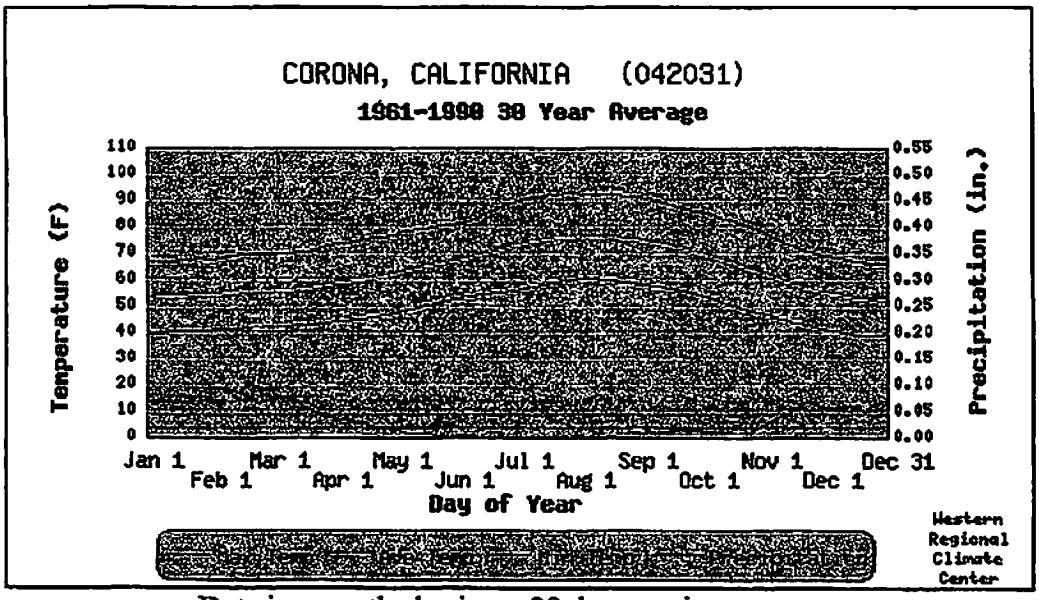


Data is smoothed using a 29 day running average.

■ - Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1961 and 1990.
■ - Ave. Temp. is the average of all daily average temperatures recorded for the day of the year the years 1961 and 1990.
■ - Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1961 and 1990.
■ - Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1961 and 1990.

# APPENDIX E

EVAPORATION DATA

State of California
The Resources Agency

Department of
Water Resources

save water
DWR

# Evaporation from Water Surfaces in California

Bulletin 73-79
November 1979

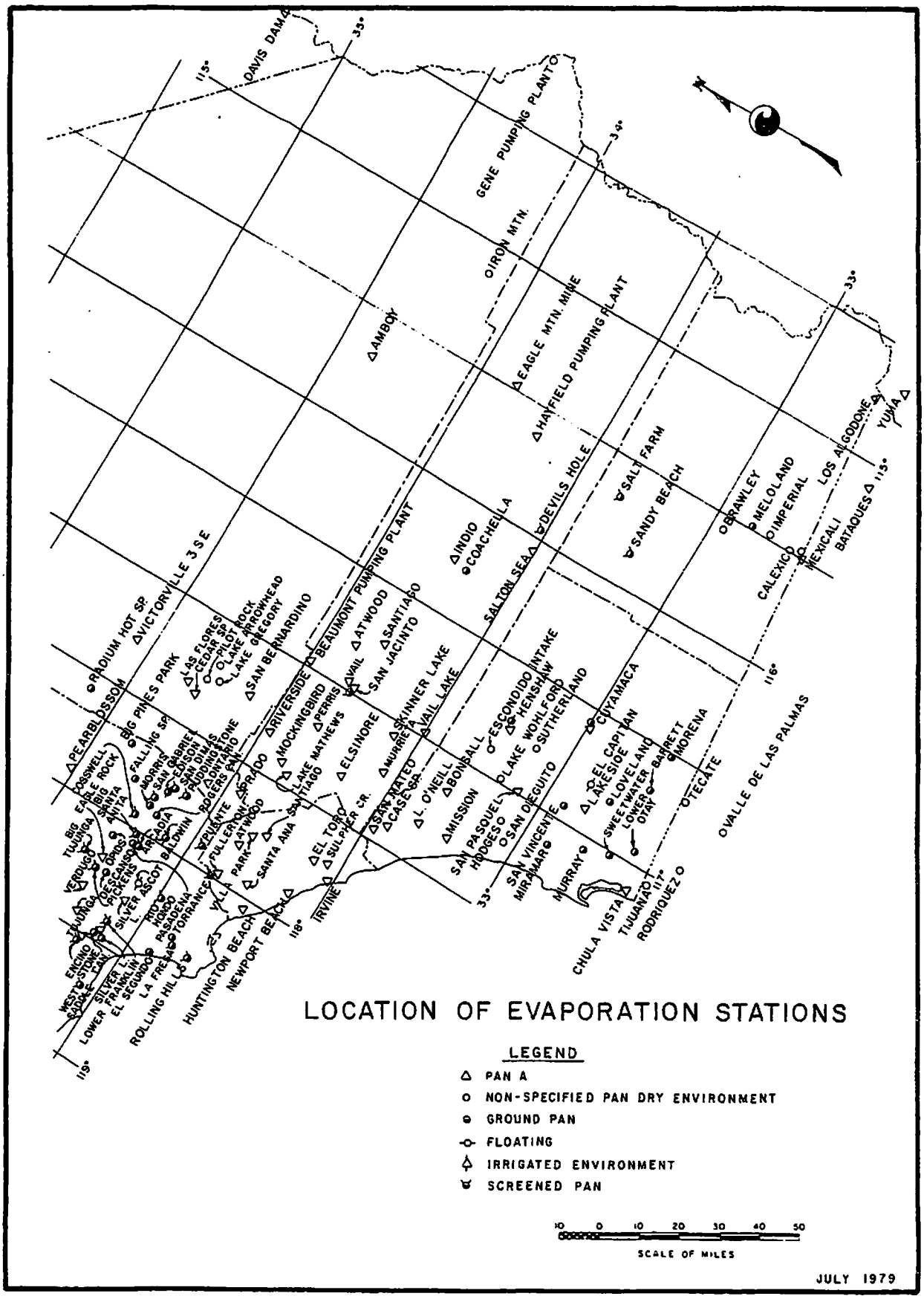
LOCATION OF EVAPORATION STATIONS
LEGEND
PAN A
NON-SPECIFIED PAN DRY ENVIRONMENT
GROUND PAN
FLOATING
IRRIGATED ENVIRONMENT
SCREENED PAN
10 0 10 20 30 40 50
SCALE OF MILES
JULY 1979
DAVIS DAM
GENE PUMPING PLANT
IRON MTN.
AMBOY
EAGLE MTN. MINE
HAYFIELD PUMPING PLANT
SALT FARM
SANDY BEACH
DEVILS HOLE
INDIO
COACHELLA
SALTON SEA
BEAUMONT PUMPING PLANT
VICTORVILLE 3 SE
RADIUM HOT SP.
PEARBLOSSOM
BIG PINES PARK
LAS FLORES
CEDAR SP.
PILOT ROCK
LAKE ARROWHEAD
LAKE GREGORY
SAN BERNARDINO
RIVERSIDE
PERRIS
AVAIL
ATWOOD
SANTIAGO
SAN JACINTO
SKINNER LAKE
AVAIL LAKE
ESCONDIDO INTAKE
HENSHAW
LAKE WOHLFORD
SUTHERLAND
CUYAMACA
EL CAPITAN
LAKESIDE
LOVELAND
SWEETWATER
LOWER OTAY
BARRETT
MORENA
OTECATE
VALLE DE LAS PALMAS
BRAWLEY
MELOLAND
IMPERIAL
CALEXICO
MEXICALI
LOS ALGODONES
YUMA
BATAQUES
MOSSWELL
EAGLE ROCK
BIG TUJUNGA
SANTA ANITA
FALLING SP.
MORRIS
SAN GABRIEL
EDISON
SAN DIMAS
FLUDDINGTONE
ONTARIO
ROGERS PAN
PRADO
MOCKINGBIRD
LAKE MATHEWS
SANTIAGO
ELSINORE
MURRIETA
VERDUGO
GRIDS
PICKENS
ARCADIA
BALDWIN
PUENTE
FULLERTON
ATWOOD
PARK
SANTA ANA
EL TORO
SULPHUR CR.
SAN MATEO
CASESA
L. O'NEILL
BONSALL
MISSION
SAN PASQUEL
HODGES
SAN DIEGUITO
SAN VINCENTE
MIRAMAR
MURRAY
CHULA VISTA
TIJUANA
RODRIQUEZ
ENCINO
WESTSTONE
SADDLE PAK
SILVER LAKE
LOWER FRANKLIN
EL SEGUNDO
SILVER
L. ASCOT
PICO
HOOD
PASADENA
TORRANCE
LA FREE
ROLLING HILLS
HUNTINGTON BEACH
NEWPORT BEACH
IRVINE
33°
34°
115°
116°
117°
118°

EVAPORATION MEASUREMENT REPORT
UNIT OF MEASURE = MILLIMETRES



| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 705010 | POMONA (NEAR)-AGR EXPT ST | 857 | 01S 09W 27 S | 34 03 | 117 49 | LAX | 907 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | 1903 | | | | | | | | | | | 230 | 238 | 160 |
| | 1904 | 1729 | 168 | 108 | 64 | 71 | 65 | 94 | 127 | 165 | 208 | 237 | 238 | 184 |
| | 1905 | 1597 | 136 | 103 | 75 | 49 | 42 | 95 | 104 | 152 | 196 | 227 | 229 | 189 |
| | 1906 | | 134 | 103 | 75 | | | | | | | | | |
| G | MEAN | 1552 | 146 | 105 | 71 | 60 | 54 | 95 | 116 | 159 | 202 | 231 | 235 | 178 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 705011 | POMONA SPRR | 876 | 01S 08W 29 S | 34 03 17 | 117 45 02 | LAX | 410 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1933 | | | | | | | | | | | 306 | 272 | 183 |
| | 1934 | | 157 | 170 | 73 | 118 | 84 | 178 | 200 | 259 | | 314 | 282 | 251 |
| A | MEAN | 2043 | 157 | 170 | 73 | 118 | 84 | 178 | 200 | 259 | | 310 | 277 | 217 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 712301 | PRADO DAM | 565 | 03S 07W 20 P S | 33 53 30 | 117 38 03 | RIV | 415 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1930 | | | | | | | | | | | 279 | 250 | |
| | 1931 | | | 128 | 97 | 102 | 62 | 146 | 154 | 197 | 232 | 293 | 250 | 194 |
| | 1932 | 1914 | 137 | 90 | 64 | 107 | 94 | 131 | 153 | 208 | 232 | 253 | 266 | 179 |
| | 1933 | 1942 | 152 | 137 | 70 | 30 | 112 | 134 | 138 | 191 | 229 | 270 | 241 | 188 |
| | 1934 | 1346 | 130 | 113 | 57 | 100 | 69 | 124 | 161 | 232 | 182 | 257 | 225 | 196 |
| | 1935 | 1630 | 119 | 65 | 52 | 52 | 69 | 90 | 118 | 170 | 216 | 266 | 227 | 186 |
| | 1936 | 1916 | 139 | 86 | 85 | 82 | 78 | 115 | 132 | 197 | 258 | 285 | 256 | 203 |
| | 1937 | 1737 | 130 | 105 | 69 | 41 | 58 | 93 | 148 | 171 | 231 | 256 | 230 | 205 |
| | 1938 | | 139 | 70 | 77 | | | | | | 45 | 255 | 235 | 197 |
| | 1939 | 1789 | 137 | 151 | 90 | 68 | 87 | 91 | 138 | 179 | 217 | 241 | 221 | 169 |
| | 1940 | 1533 | 135 | 70 | 57 | 41 | 70 | 114 | 105 | 174 | 165 | 215 | 204 | 163 |
| | 1941 | 1771 | 114 | 99 | 54 | 66 | 61 | 114 | 135 | 225 | 225 | 281 | 221 | 176 |
| | 1942 | 2245 | 148 | 136 | 72 | 117 | 109 | 177 | 131 | 269 | 243 | 315 | 308 | 220 |
| | 1943 | 2297 | 178 | 148 | 104 | 146 | 130 | 110 | 148 | 242 | 262 | 307 | 288 | 234 |
| | 1944 | 2105 | 166 | 166 | 107 | 114 | 81 | 182 | 178 | 211 | 236 | 272 | 229 | 163 |
| | 1945 | 2034 | 148 | 91 | 88 | 49 | 87 | 133 | 192 | 219 | 218 | 296 | 278 | 235 |
| | 1946 | 2073 | 116 | 117 | 81 | 113 | 125 | 80 | 200 | 168 | 275 | 319 | 301 | 178 |
| | 1947 | 2081 | 154 | 94 | 60 | 100 | 77 | 129 | 195 | 204 | 245 | 312 | 284 | 227 |
| | 1948 | 2167 | 146 | 120 | 98 | 144 | 106 | 114 | 179 | 210 | 223 | 288 | 290 | 249 |
| | 1949 | 2095 | 141 | 188 | 93 | 93 | 65 | 90 | 178 | 191 | 258 | 280 | 288 | 230 |
| | 1950 | 2017 | 167 | 136 | 83 | 68 | 51 | 139 | 164 | 197 | 248 | 302 | 272 | 190 |
| | 1951 | 2139 | 188 | 138 | 69 | 93 | 86 | 191 | 151 | 179 | 228 | 311 | 283 | 222 |
| | 1952 | 2080 | 201 | 118 | 81 | 67 | 115 | 123 | 136 | 230 | 229 | 294 | 275 | 211 |
| | 1953 | 2081 | 135 | 88 | 76 | 106 | 134 | 155 | 154 | 233 | 241 | 304 | 253 | 202 |
| | 1954 | 1978 | 140 | 84 | 167 | 67 | 122 | 97 | 130 | 186 | 203 | 262 | 220 | 200 |
| | 1955 | 1924 | 149 | 104 | 92 | 63 | 94 | 137 | 186 | 165 | 198 | 255 | 260 | 221 |
| | 1956 | 1829 | 116 | 88 | 42 | 55 | 89 | 142 | 179 | 181 | 227 | 260 | 226 | 224 |
| | 1957 | 2057 | 155 | 158 | 128 | 66 | 65 | 78 | 148 | 190 | 255 | 306 | 292 | 216 |
| | 1958 | 1950 | 119 | 92 | 94 | 103 | 64 | 49 | 182 | 202 | 275 | 276 | 253 | 241 |
| | 1959 | 2089 | 160 | 123 | 118 | 78 | 68 | 168 | 172 | 195 | 238 | 304 | 268 | 197 |
| | 1960 | 2270 | 169 | 181 | 120 | 53 | 100 | 125 | 185 | 218 | 242 | 325 | 288 | 264 |
| | 1961 | 2273 | 169 | 63 | 124 | 147 | 133 | 146 | 196 | 225 | 254 | 311 | 300 | 205 |
| | 1962 | 1589 | 138 | 95 | 98 | 118 | 33 | 73 | 134 | 145 | 172 | 220 | 221 | 142 |
| | 1963 | 1558 | 91 | 69 | 67 | 81 | 79 | 97 | 102 | 162 | 190 | 235 | 220 | 165 |
| | 1964 | 1672 | 102 | 82 | 99 | 111 | 141 | 112 | 146 | 166 | 181 | 185 | 192 | 155 |
| | 1965 | 1614 | 123 | 108 | 83 | 71 | 106 | 72 | 157 | 159 | 190 | 171 | 222 | 152 |
| | 1966 | 1811 | 144 | 46 | 60 | 76 | 85 | 124 | 163 | 173 | 215 | 267 | 249 | 209 |
| | 1967 | 2045 | 196 | 73 | 136 | 107 | 121 | 130 | 125 | 209 | 201 | 271 | 274 | 202 |
| | 1968 | 1850 | 177 | 68 | 101 | 88 | 65 | 118 | 166 | 191 | 202 | 203 | 248 | 223 |
| | 1969 | | 117 | 89 | 51 | 75 | | | | 138 | 156 | | | |
| A | MEAN | 1930 | 144 | 107 | 86 | 87 | 89 | 120 | 156 | 195 | 219 | 272 | 254 | 201 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 747300 | RIVERSIDE CITRUS EXP | 1015 | 02S 04W 30 K S | 33 58 00 | 117 20 05 | RIV | 900 | D |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1925 | | | | | 90 | 67 | 127 | 134 | 166 | 213 | 269 | 242 | 182 |
| | 1926 | 1773 | 58 | 128 | 75 | 112 | 97 | 123 | 116 | 200 | 189 | 230 | 237 | 178 |
| | 1927 | 1609 | 150 | 65 | 48 | 30 | 24 | 105 | 102 | 193 | 193 | 253 | 262 | 184 |
| | 1928 | 1756 | 143 | 96 | 50 | 65 | 114 | 99 | 171 | 146 | 193 | 242 | 240 | 197 |
| | 1929 | 1656 | 119 | 82 | 72 | 61 | 60 | 105 | 117 | 175 | 219 | 256 | 253 | 137 |
| | 1930 | 1665 | 140 | 139 | 91 | 45 | 56 | 99 | 138 | 148 | 195 | 241 | 216 | 157 |
| | 1931 | 1806 | 126 | 106 | 75 | 72 | 124 | 145 | 149 | 178 | 191 | 248 | 237 | 155 |
| | 1932 | | 109 | 68 | 46 | | | 133 | 149 | 155 | 155 | 227 | 220 | 147 |
| | 1933 | 1546 | 100 | 101 | 54 | 60 | 91 | 122 | 97 | 160 | 191 | 227 | 202 | 141 |
| | 1934 | 1763 | 115 | 129 | 45 | 99 | 64 | 120 | 188 | 215 | 170 | 232 | 217 | 169 |
| | 1935 | 1508 | 110 | 67 | 55 | 51 | 64 | 85 | 118 | 164 | 203 | 225 | 203 | 163 |
| | 1936 | 1603 | 120 | 75 | 61 | 60 | 65 | 106 | 137 | 188 | 208 | 210 | 207 | 166 |
| | 1937 | 1499 | 112 | 85 | 41 | 35 | 52 | 100 | 152 | 145 | 195 | 195 | 209 | 178 |
| | 1938 | 1584 | 127 | 59 | 67 | 76 | 62 | 92 | 139 | 176 | 182 | 219 | 209 | 176 |
| | 1939 | 1630 | 115 | 99 | 65 | 59 | 81 | 94 | 144 | 173 | 212 | 228 | 214 | 146 |
| | 1940 | 1765 | 149 | 71 | 69 | 68 | 101 | 120 | 166 | 198 | 189 | 241 | 216 | 177 |
| | 1941 | 1529 | 153 | 108 | 52 | 39 | 44 | 96 | 156 | 165 | 181 | 236 | 164 | 135 |
| | 1942 | 1671 | 134 | 75 | 82 | 64 | 77 | 129 | 114 | 193 | 183 | 251 | 215 | 154 |
| | 1943 | 1591 | 113 | 81 | 59 | 74 | 76 | 82 | 117 | 187 | 198 | 217 | 212 | 175 |
| | 1944 | 1548 | 111 | 94 | 51 | 56 | 62 | 134 | 132 | 158 | 168 | 203 | 226 | 153 |
| | 1945 | 1503 | 106 | 64 | 55 | 55 | 67 | 94 | 144 | 171 | 165 | 218 | 196 | 168 |
| | 1946 | 1575 | 107 | 81 | 47 | 91 | 71 | 105 | 137 | 135 | 211 | 205 | 215 | 170 |

# APPENDIX F

PERCOLATION DATA

NOLTE

## SOILS SURVEY

**Percolation Data:**

| *Soil Series* [1] | *Type* [1] | *USDA Texture* [1] | *Depth from Surface* | *Soils Table* [1] | *Soils Survey Map* [1] |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | | |
| 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | | |

**Table 13-9** [2]

| Recommended rates of wastewater application for Trench and Bed Bottom Areas [a] | | |
|---|---|---|
| Soil Texture | Percolation rate, min/in | *Application rate, gal / ft² x d* [b,c] |
| Gravel, coarse sand | <1 | Not Suitable [d] |
| Coarse to medium sand | 1-5 | 1.20 |
| Fine sand, loamy sand | 5-15 | 0.80 |
| Sand loam, loam | 16-30 | 0.60 |
| Loam, porous silt loam | 31-60 | 0.45 |
| Silty clay loam, clay loam [a,f] | 61-120 | 0.20 |
| Clays, colloidal clays | >120 | Not Suitable [g] |

Use Application Rate of 0.7 to Fit B/Re( Classification"

[a] From U.S. EPA (1980).

[b] Rates based on septic tank effluent from a domestic waste source. A factor of safety may be desirable for wastewater's of significantly different strength or character.

[c] May be suitable for sidewall infiltration rates.

[d] Soils with percolation rates less than 1 min/in may be suitable for septic tank effluent if a 2ft layer of loamy sand or other soil is placed above or in place of the native topsoil.

[e] These soils are suitable if they are without significant amounts of expandable clays.

[f] Soil easily damaged during construction.

[g] Alternative pretreatment may be needed and alternative disposal (wetlands or evaporation systems) may be required.

Bibliography:


1 Refer to Pecolation Appendix

2 Crites & Tchobanoglous, "Small and Decentralized Wastewater Management Systems", McGraw-Hill, Boston, 1998

SOIL SURVEY OF

# San Bernardino County Southwestern Part, California

United States Department of Agriculture
Soil Conservation Service
in cooperation with
University of California
Agricultural Experiment Station

TABLE 4.—*Estimated soil properties*

[Absence of information indicates that a determination was not made or that it would not be applicable. The symbol > means made up of two or more kinds of soil. The soils in such mapping units have different properties and limitations and for this reason

| Soil series and map symbols | Depth to bedrock or hardpan | Depth from surface of typical profile | (Typical profile) USDA texture | Classification | | Coarse fraction greater than 3 inches | Percentage less than 3 in. passing sieve— | |
|---|---|---|---|---|---|---|---|---|
| | | | | Unified | AASHTO | | No. 4 (4.7 mm) | No. 10 (2.0 mm) |
| | *Feet* | *Inches* | | | | | | |
| Alo: AaF | 2–3 | 0–36 | Clay | CH, CL | A–7 | | 100 | 100 |
| | | 36 | Shale and sandstone. | | | | | |
| Chino: Cb | >5 | 0–16 | Silt loam | ML, CL-ML | A–4 | | 100 | 100 |
| | | 16–60 | Silty clay loam | CL | A–6 | | 100 | 100 |
| Chualar: CkA, CkC, CkD | >5 | 0–36 | Clay loam | CL | A–6 | | 100 | 100 |
| | | 36–60 | Loam | CL, CL-ML | A–4 | | 100 | 100 |
| *Cieneba: CnD, Cp, Cr. For properties of Friant soils in Cp, refer to Friant series. | 1–1½ | 0–14 | Sandy loam | SM | A–2 | 0–10 | 90–100 | 90–100 |
| | | 14 | Weathered granitic rock. | | | | | |
| Crafton: Cs2 | 1½–3 | 0–26 | Sandy loam | SM | A–2 | 0–15 | 80–100 | 75–100 |
| | | 26 | Weathered micaceous schist. | | | | | |
| Delhi: Db | >5 | 0–18 | Fine sand | SM | A–2 | | 100 | 95–100 |
| | | 18–60 | Sand | SP-SM or SW-SM | A–3 | | 100 | 90–100 |
| Fontana: FoE, FoF | 2–3 | 0–28 | Clay loam, some shale fragments. | CL | A–6 | 0–10 | 85–100 | 70–95 |
| | | 28 | Weathered fractured shale. | | | | | |
| Friant: Fr | 1–1½ | 0–14 | Fine sandy loam | SM | A–4 | | 95–100 | 80–95 |
| | | 14 | Hard mica schist. | | | | | |
| Garretson: GaC | >5 | 0–7 | Very fine sandy loam | ML | A–4 | | 100 | 100 |
| | | 7–28 | Loam | CL-ML, CL | A–4 | | 100 | 100 |
| | | 28–34 | Fine sandy loam | SM | A–4 | | 95–100 | 90–100 |
| | | 34–42 | Gravelly sandy loam | SM | A–2 | | 65–90 | 65–80 |
| | | 42–60 | Loam | CL-ML, CL | A–4 | | 100 | 100 |
| Gaviota: Go | 1–1½ | 0–15 | Fine sandy loam | SM | A–4 | 0–5 | 95–100 | 80–95 |
| | | 15 | Hard sandstone. | | | | | |
| Grangeville: | | | | | | | | |
| Gr | >5 | 0–60 | Fine sandy loam | SM | A–4 | | 100 | 100 |
| Gs | | 0–60 | Fine sandy loam | SM | A–4 | | 100 | 100 |
| Greenfield: | | | | | | | | |
| GtC, GtD | >5 | 0–16 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| | | 16–50 | Fine sandy loam | SM | A–4 | | 95–100 | 85–100 |
| | | 50–60 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| GuD | >5 | 0–16 | Cobbly sandy loam | SM | A–2 | 25–40 | 90–100 | 85–95 |
| | | 16–50 | Fine sandy loam | SM | A–4 | | 95–100 | 85–100 |
| | | 50–60 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| Hanford: HaC, HaD, HbA | >5 | 0–60 | Sandy loam | SM | A–2 | | 100 | 90–100 |
| Hilmar: Hr | >5 | 0–23 | Loamy fine sand and loamy sand. | SM | A–2 | | | 95–100 |
| | | 23–60 | Stratified loam.[2] | CL-ML, CL | A–4 | | 100 | 100 |
| Merrill: Me | 2–3½ | 0–25 | Silt loam | CL-ML or ML | A–4 | | 100 | 95–100 |
| | | 25–43 | Loam that is 25 to 50 percent extremely hard lime nodules. | GM | A–4 or A–2 | 0–5 | 40–70 | 35–65 |
| | | 43–60 | Loam | CL-ML or CL | A–4 | | 100 | 95–100 |
| Metz: MgC | >5 | 0–19 | Coarse sandy loam | SM | A–2 | | 95–100 | 90–100 |
| | | 19–60 | Gravelly sand and loamy coarse sand. | SM | A–1 | | 70–80 | 55–75 |
| Monserate: MoC | 2½–3 | 0–10 | Sandy loam | SM | A–2, A–4 | | 100 | 100 |
| | | 10–30 | Clay loam | CL | A–6 | | 100 | 100 |
| | | 30–45 | Indurated hardpan | | | | | |
| | | 45–60 | Coarse sandy loam | SM | A–2 | | 95–100 | 90–100 |

## Hilmar Series

The Hilmar series consists of somewhat poorly drained, nearly level soils on alluvial valley floors and fans. These soils formed in wind-laid coarse-textured material underlain by medium-textured granitic alluvium. Slopes are 0 to 2 percent. Elevation is 600 to 900 feet. Vegetation is annual grasses and forbs. The average annual precipitation is 12 to 16 inches, the mean annual air temperature is 62° to 65° F, and the frost-free season is 230 to 280 days.

In a representative profile, the surface layer is grayish-brown loamy fine sand about 13 inches thick. The underlying material, to a depth of 23 inches, is light yellowish-brown and grayish-brown loamy sand. Below this, to a depth of 60 inches, it is light brownish-gray mottled loam stratified with thin lenses of sandy loam and loamy sand. Hilmar soils are moderately alkaline throughout the profile and are slightly calcareous in the upper 23 inches and strongly calcareous below.

In these soils the surface layer and the upper part of the underlying material that formed in coarse-textured material are rapidly permeable. The lower part of the underlying material that formed in medium-textured material is slowly permeable. Available water capacity is about 7 to 9 inches. Roots penetrate to a depth of 60 inches or more. Originally the soils were somewhat poorly drained, but the drainage has been altered by lowering the ground water table through pumping.

These soils are used mainly for such irrigated crops as grapes, alfalfa, pasture plants, and small grains.

Representative profile of Hilmar loamy fine sand, about 100 feet south of Edison Road and about 200 feet west of Cucamonga Creek, SE¼NW¼NW¼ sec. 22, T. 2 S., R. 7 W; San Bernardino base line and meridian:

Ap—0 to 13 inches, grayish-brown (2.5Y 5/2) loamy fine sand, very dark grayish brown (2.5Y 3/2) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; many very fine and fine roots; slightly effervescent; moderately alkaline; gradual, smooth boundary.

C1—13 to 16 inches, light yellowish-brown (2.5Y 6/4) loamy sand, light olive brown (2.5Y 5/4) when moist; few, fine, distinct, brownish-yellow (10YR 6/6) mottles, yellowish brown (10YR 5/6) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline; gradual, smooth boundary.

C2—16 to 23 inches, grayish-brown (2.5Y 5/2) loamy sand, light brownish gray (2.5Y 6/2) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline; abrupt, smooth boundary.

IIC3—23 to 60 inches, light brownish-gray (2.5Y 6/2) loam stratified with thin lenses of sandy loam and loamy sand, grayish brown (2.5Y 5/2) when moist; common, medium, distinct, brownish-yellow (10YR 6/6) mottles, yellowish brown (10YR 5/6) when moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; strongly effervescent; moderately alkaline.

The A horizon is grayish brown, dark grayish brown, or brown loamy fine sand or loamy sand. The soil material is dominantly single grained but has weak, very fine to fine, subangular blocky structure in small areas, and in some places it is massive. The soil material is slightly effervescent but is strongly effervescent in a few spots. The A horizon ranges from 8 to 14 inches in thickness but is 13 inches thick in most places.

The C horizon is generally light yellowish brown to grayish brown, but in a few places it is light brownish gray. Yellowish-brown, brownish-yellow, or dark yellowish-brown mottles are common. They range from few to common in abundance, fine to medium in size, and faint to distinct in contrast. The C horizon is loamy sand or loamy fine sand. The soil material is typically single grained, but in some places it is massive. Lime content varies from slight to strong. Thickness is about 10 inches but ranges from 8 to 12 inches.

The IIC horizon is light brownish gray, grayish brown, or light gray. Brownish-yellow or yellowish-brown mottles range from common to many in abundance, fine to medium in size, and distinct to prominent in contrast. The IIC horizon is generally loam that has thin lenses of sandy loam, coarse sandy loam, or loamy sand, but in a few places, it is clay loam or silt loam stratified with thin lenses of coarse-textured material. The IIC horizon is typically massive, but in some places it has weak, moderate, subangular blocky structure. Reaction ranges from mildly alkaline to strongly alkaline.

**Hilmar loamy fine sand (Hr).**—This nearly level soil is on valley floors and alluvial fans. Included with it in mapping are areas of Delhi fine sand that make up about 10 percent of each area. Also included are patches of Tujunga loamy sand, 0 to 5 percent slopes, and small areas where slopes are 2 or 3 percent.

Runoff is slow, and the hazard of water erosion is slight. If the soils are left without a protective cover of vegetation, the hazard of soil blowing is high.

The Hilmar soil is used chiefly for irrigated alfalfa, grapes, small grains, and pasture plants. Capability unit IIe-4 irrigated.

## Merrill Series

The Merrill series consists of somewhat poorly drained, nearly level soils that formed on alluvial fans in medium-textured granitic alluvium. Slopes are 0 to 2 percent, elevation is 500 to 700 feet. Vegetation is mainly annual grasses and forbs, but perennial grasses grow in some areas. The average annual precipitation is 12 to 16 inches, the mean annual air temperature is 62° to 65° F, and the frost-free season is 230 to 280 days.

In a representative profile, the surface layer is gray silt loam about 25 inches thick. The underlying material, to a depth of 43 inches, is light-gray loam that is weakly cemented and contains many extremely hard silica-lime cemented nodules. Below this the underlying material is light brownish-gray loam that extends to a depth of 60 inches or more. Merrill soils are strongly calcareous and moderately alkaline throughout their profile.

These soils are slowly permeable. Their available water capacity is 4 to 7 inches. Roots can penetrate to a depth of 25 to 40 inches. Drainage has been altered on these soils by pumping ground water for irrigation.

These soils are used for such irrigated crops as pasture plants, alfalfa, small grains, and some truck crops.

Representative profile of Merrill silt loam, about 300 feet northwest of Eucalyptus and Central Avenue;

SHEET NO. 11

SAN BERNARDINO COUNTY, SOUTHWESTERN PART, CALIFORNIA

(PRADO DAM)

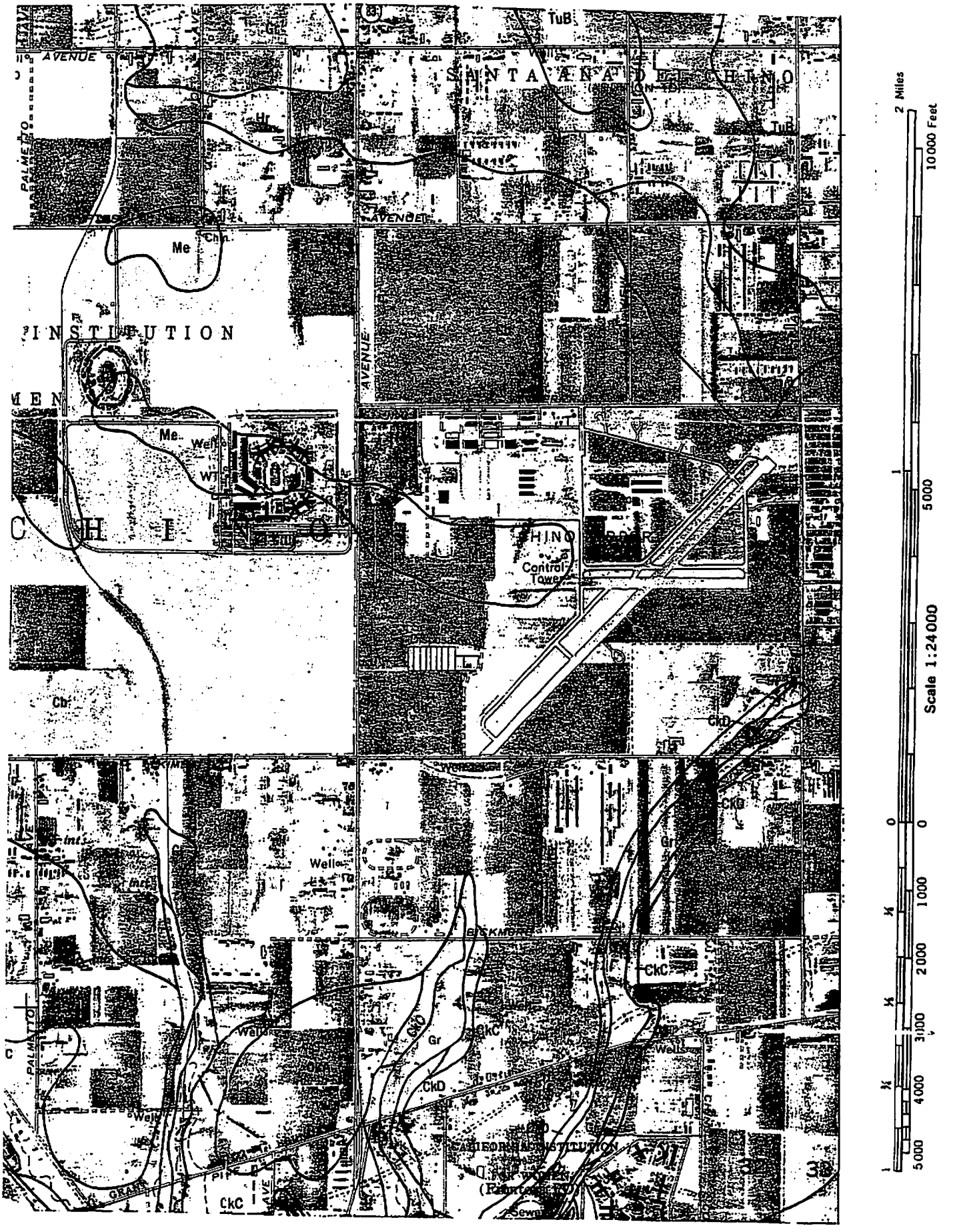


U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

# APPENDIX G

24 HOUR – 25 YEAR STORM DATA

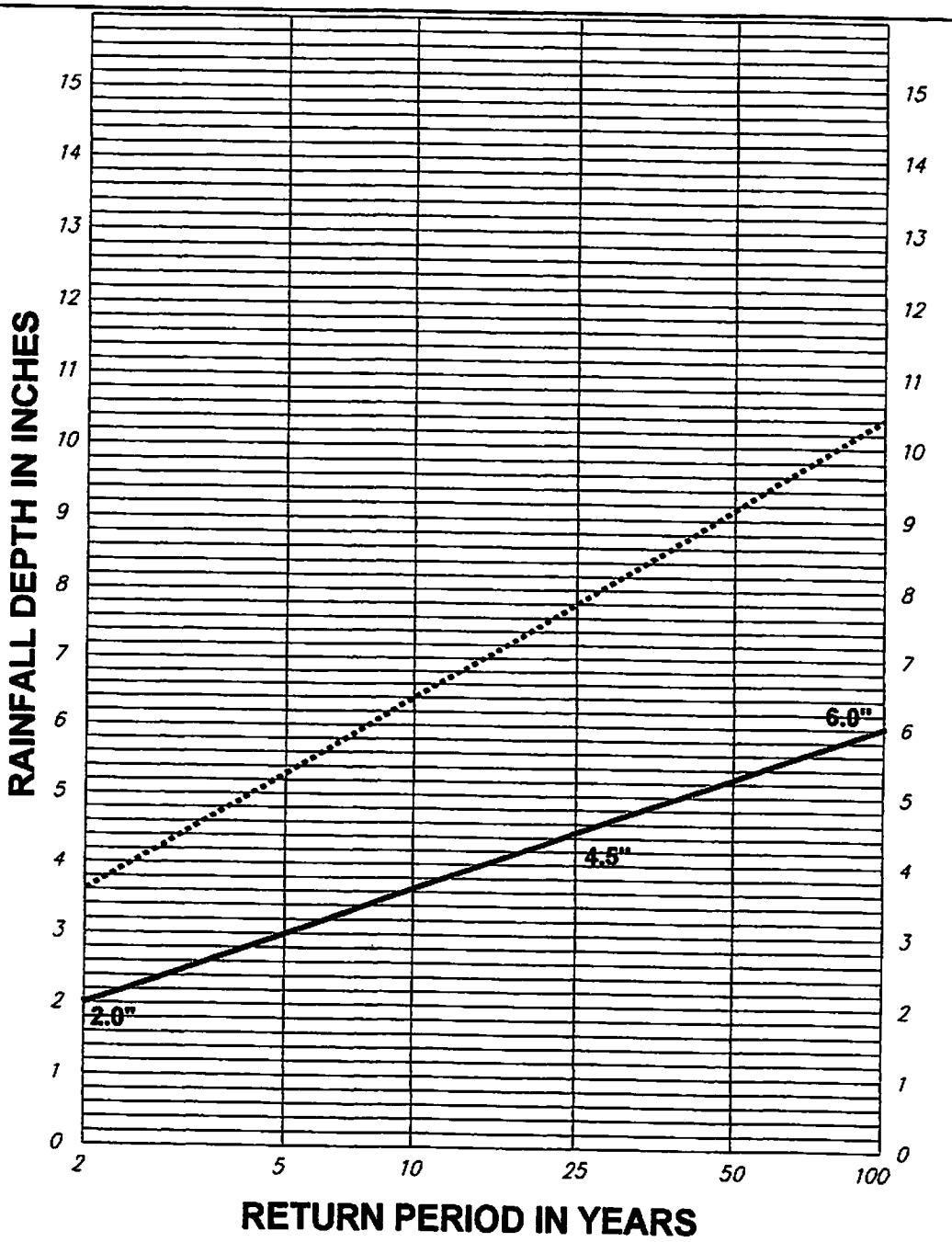


NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for specific duration, then connect points and read value for desired return periond. For example given 2-year 24-hour = 3.5"' and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

Reference: NOAA atlas 2, Volume XI - California, 1973

**RCFC & WCD**

**Hydrology Manual**

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

PLATE E-5.7

# APPENDIX H

100 YEAR FLOOD PLAIN DATA

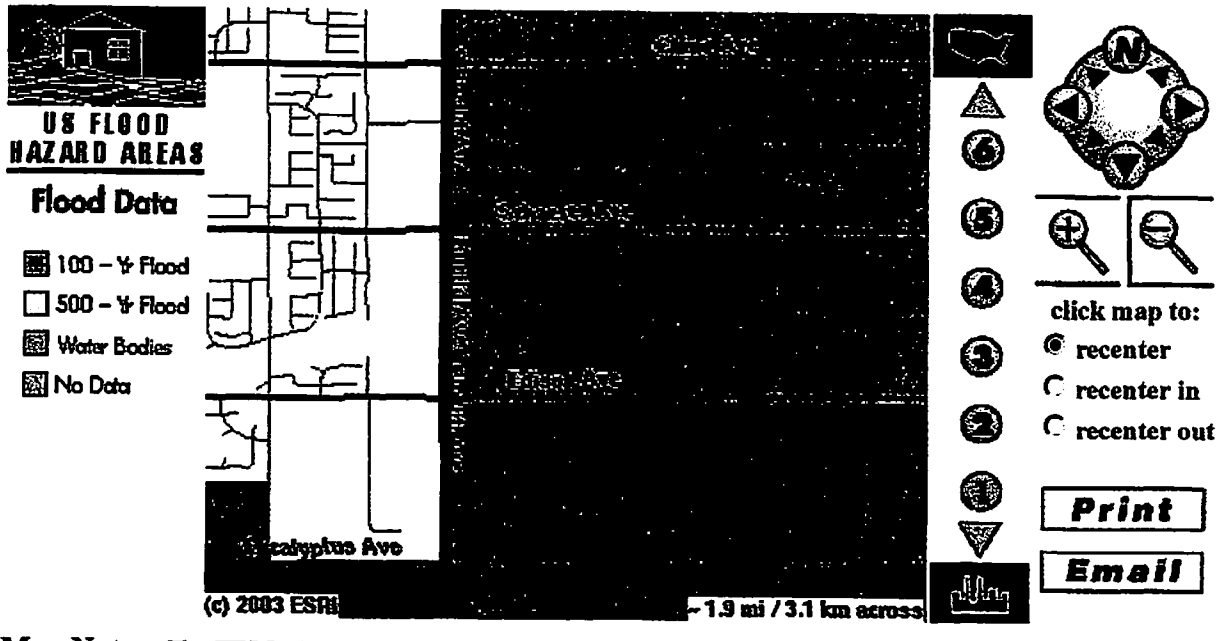


**Map Notes:** The **FEMA Digital Q3 Flood Data** displayed on this Web site is developed by scanning the existing Flood Insurance Rate Map (FIRM) hardcopy and capturing a thematic overlay of flood risks. Digital Q3 Flood Data files contain only certain features from the FIRM hardcopy in effect at the time of scanning and do not replace the existing FIRM hardcopy maps. The Q3 Flood Data is being displayed here with basemap data from the GDT Dynamap/2000 data set. The Q3 Flood Data is currently available for approximately **1,200 counties** across the United States.

**Current Map View:**

Flood Hazard Areas

**Change View**

The maps displayed on this site should be considered an **advisory tool** for general hazard awareness, education, and flood plain management. The flood hazard maps displayed on this site are **not the legal document** to be used when making a single site flood hazard determination. For more information on these maps, please refer to the **Frequently Asked Questions** page.

**Make New Map**

**Return to Home Page**

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Thu May 15 08:24:53 2003

# APPENDIX I

USGS TOPO MAP

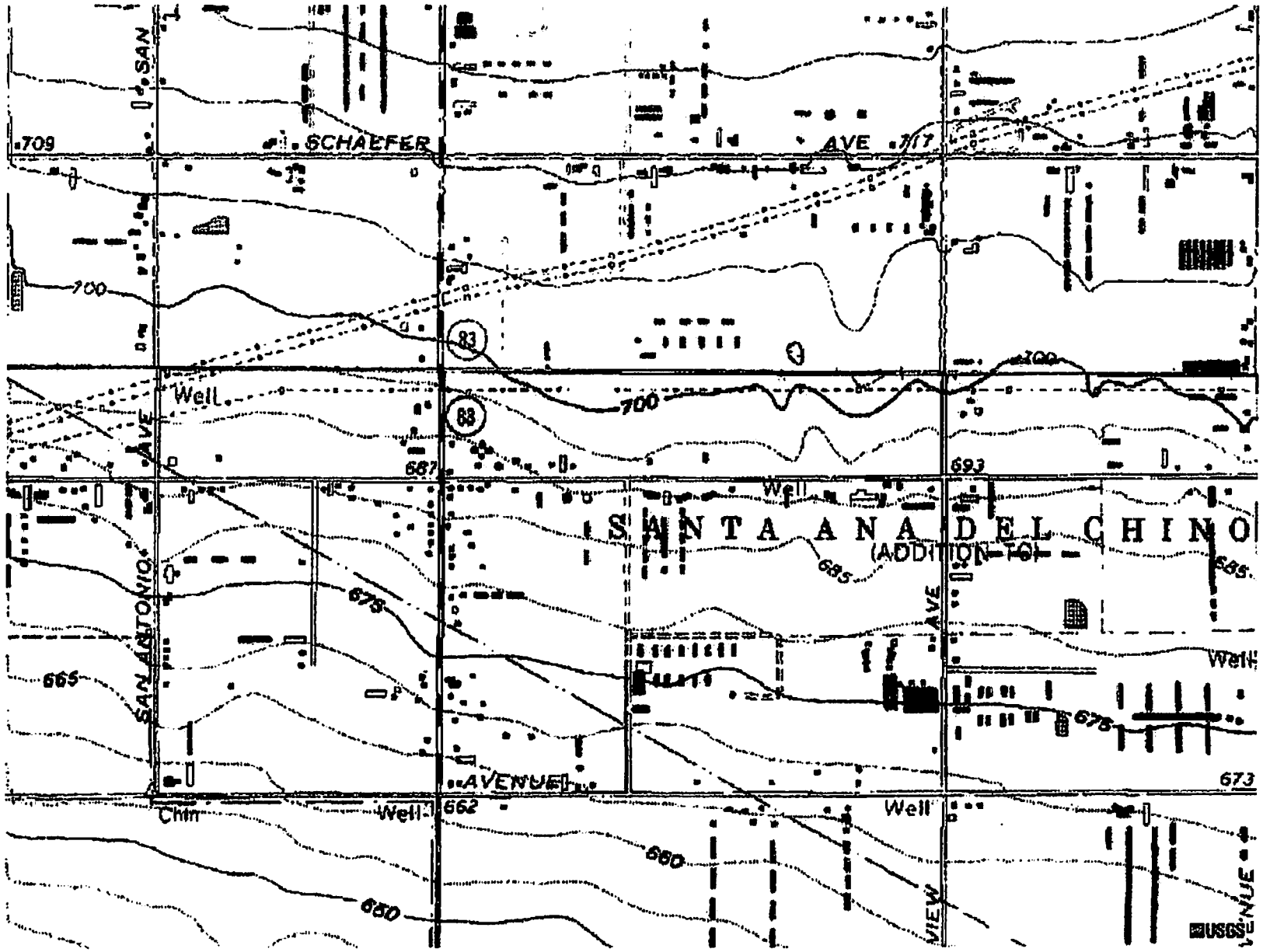
SAN
SCHAEFER
AVE
709
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83
88
Well
AVE
687
693
Well
SANTA ANA DEL CHINO
(ADDITION TO)
685
675
SAN ANTONIO
AVE
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Well
678
AVENUE
673
Chin
Well
662
Well
660
650
VIEW
VENUE
USGS

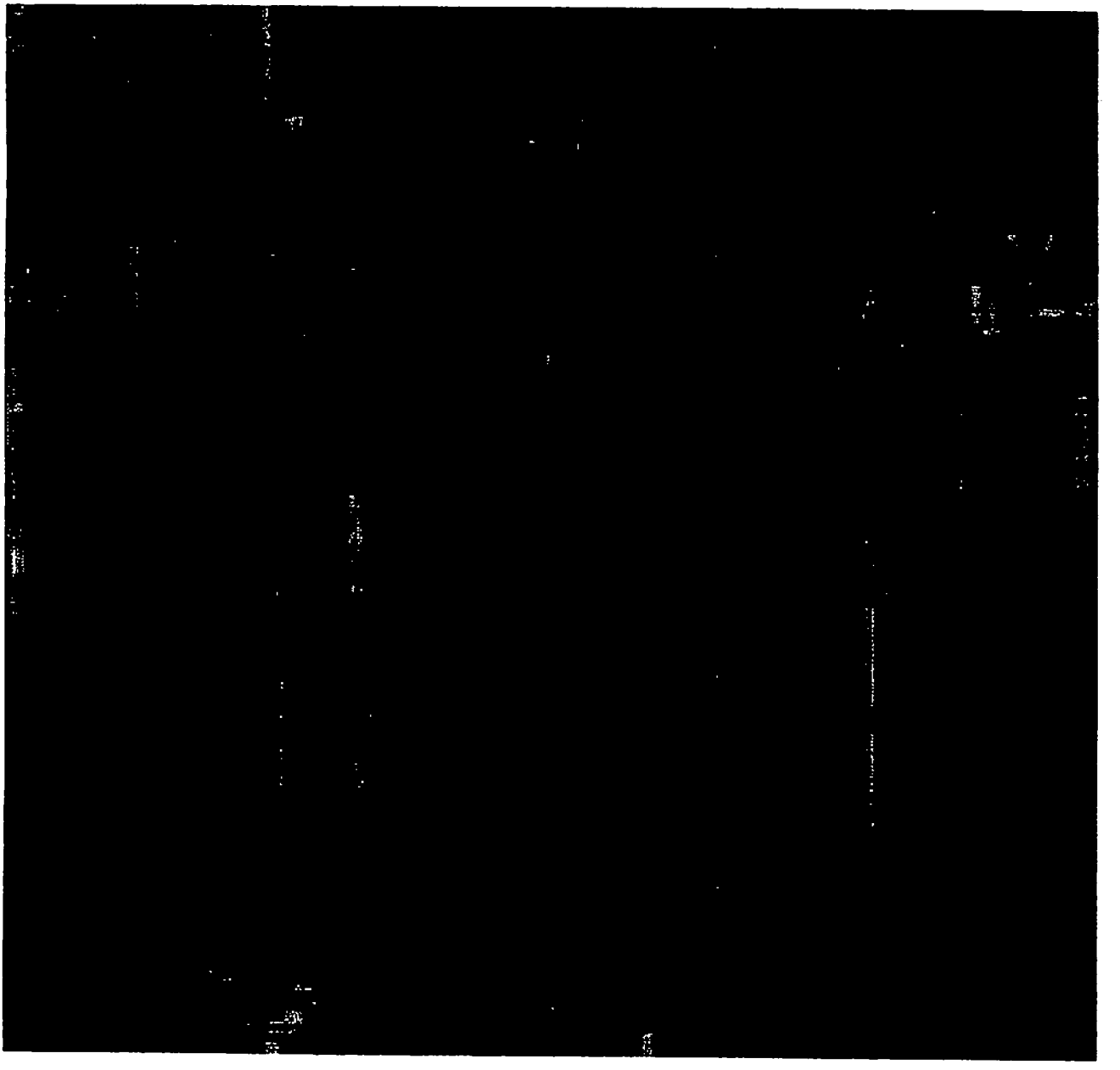

0
300m
900ft
S Bon View Ave
Bon View Ave
Edison Ave
Edison Ave
Edison Ave
Euclid Ave
S Euclid Ave
Sultana Ave
Eucalyptus Ave
Fern Ave
Fern Ave
Cherry Ct
Cherry Ave
Dogwood Ave
Live Oak Ct
Bartlett St
San Antonio Ave
Stone Pine Ct
Ironbark Ave
Schaefer Ave
Homan Ct
Joy Ct
Villa Ave

# APPENDIX J

GUIDELINES FOR ORDER NO. 99-11

# Guidelines for the Development of Engineered Waste Management Plans For Concentrated Animal Feeding Operations

(Dairies and Related Facilities)

California Regional Water Quality Control Board
Santa Ana Region

February 2001

## Introduction

On August 20, 1999, the California Regional Water Quality control Board, Santa Ana Region (Board), adopted Order No. 99-11 (NPDES No. CAG018001), General Waste Discharge Requirements for Concentrated Animal Feeding Operations (Dairies and Related Facilities) in the Santa Ana Region. This order required all operators of dairies and related facilities (i.e., heifer ranches and calf nurseries) authorized to discharge wastes under Order No. 99-11 to develop and implement an engineered waste management plan (EWMP). The primary purpose of an EWMP is to provide a wastewater management system that is designed, constructed, operated and maintained to comply with the wastewater containment requirements in Order No. 99-11. Order No. 99-11 included applicable state and federal regulations that address waste discharges from animal feeding operations.

## Background

The Board began issuing waste discharge requirements to all animal feeding operations in the Region in 1972. These waste discharge requirements stated that each facility had to contain, on the property, all wastewater (i.e., dairy wash water, storm water runoff from manured areas, etc.), including the storm water runoff from a 24-hour, 25-year storm. In an attempt to comply with this requirement, many facilities constructed new ponds, enlarged existing ponds, constructed berms, and implemented other measures. However, these measures were generally implemented in a piecemeal fashion, usually on an as-needed basis, and often did not integrate well with other wastewater containment measures at the facility. It became more and more apparent that many of the wastewater containment improvements that were being made were not very effective. For example, ponds were not sized properly, and therefore, did not have sufficient capacity to contain the entire volume of wastewater generated at the site; berms were sized and constructed improperly, resulting in failures; wastewater pumps, pipelines, etc., were often inoperable and were not replaced when needed; and most wastewater containment structures and equipment were often in a state of disrepair. All of these situations resulted in frequent discharges of wastewater to surface waters, primarily during the winter.

To minimize discharges to surface waters, it became apparent that an overall plan for containing wastewater was necessary. In the late 1980's, Board staff prepared a two-page document that provided guidelines for preparing an EWMP. An EWMP was then generally requested from animal feeding operations that had a history of recurring wastewater discharges. In 1994, the Board adopted Order No. 94-7 (NPDES No. CAG018001), General Waste Discharge Requirements for Concentrated Animal Feeding Operations (CAFOs). Order No. 94-7 required that, in addition to an EWMP being required from CAFOs that had a history of recurring wastewater discharges, EWMPs were to be prepared by anyone initiating a new CAFO at either a new or existing facility. The guidelines for preparing an EWMP were then included as an attachment to Order No.

94-7. Order No. 94-7 expired in March 1999, and the Board adopted Order No. 99-11 in August 1999. To assure that every CAFO had a wastewater management system capable of complying with wastewater containment requirements, Order No. 99-11 required that all CAFO operators develop and fully implement an EWMP. The existing guidelines for preparing an EWMP were included as an attachment to Order No. 99-11. However, the existing EWMP guidelines were outdated, general in nature, and did not contain sufficient criteria to comply with the wastewater containment requirements in Order No. 99-11. Therefore, Order No. 99-11 authorized the Executive Officer to make necessary revisions to the guidelines.

These revised guidelines are longer than the previous guidelines. This is primarily the result of adding explanations and clarification to make EWMPs prepared in accordance with the guidelines as consistent as possible. There are two significant differences between these guidelines and the previous guidelines. First, the new guidelines outline criteria for determining the storage capacity necessary to comply with waste discharge requirements. These criteria will result in the need for significantly more storage capacity than the criteria included in the previous guidelines. However, this does not reflect a change in state or federal regulations. Instead, previous guidelines did not accurately specify criteria for determining the storage capacity necessary to comply with state and federal regulations. Regardless of what was included in previous guidelines, CAFOs have always been, and still are, required to comply with all applicable state and federal regulations. Second, the new guidelines identify several items (such as best management practices) that should be considered in the development and implementation of EWMPs. Many of these items have been included in EWMPs approved by the Executive Officer in the past.

## Purpose

The purpose of an EWMP is to provide a wastewater management system that is designed, constructed, operated and maintained to comply with the wastewater containment requirements in Order No. 99-11. These guidelines do not address the management, application or disposal of manure removed from the corrals. Compliance with waste discharge requirements associated with the discharge of manure removed from corrals is addressed separately. The development and implementation of an EWMP is required by Order No. 99-11. Discharges of wastewater from a CAFO are allowed only if the CAFO operator has constructed and maintained containment structures as required, and if a chronic or catastrophic rainfall event occurs. A chronic rainfall event is a series of wet weather conditions that would total the volume of the 24-hour, 25-year storm event, and would not provide reasonable opportunity for dewatering containment structures prior to the next storm events. A catastrophic storm event includes events such as tornadoes and hurricanes, and any single event that totals the runoff volume of the 24-hour, 25-year storm event. Order No. 99-11 requires that an EWMP be developed in accordance with guidelines established by the Executive Officer. However, these are guidelines, not regulations, and any EWMP that will result in compliance with waste discharge requirements will be acceptable by the Executive Officer. Adhering to these

guidelines, though, will provide consistency for preparing EWMPs, and will increase the likelihood that the EWMP will be acceptable.

## Elements of an EWMP

The EWMP must be prepared by a registered engineer (civil, or other appropriate discipline) or other qualified person (required by Order No. 99-11). The qualified person preparing the EWMP must have the knowledge, technical expertise and experience appropriate to develop an EWMP. This guidance document describes five basic elements that should be addressed in an EWMP. These elements include an introduction, a design, a plot (site) plan, construction specifications, and an operation and management plan. These elements should include a detailed description, as follows:

## I. Introduction

The introduction should describe the existing animal population, the design population for the EWMP, existing wastewater containment facilities, and the operation of those facilities. At a minimum, the Introduction should consist of a brief narrative that addresses the following:

- The facility address, operator name, land owner, and location of the facility with respect to cross streets or other landmarks.
- The name, telephone number and address of the person responsible for implementing the EWMP on an on-going basis (CAFO operator or other designated person)
- The number, telephone number and address of the person(s) to be contacted, if necessary, in the event that the CAFO operator or designated person is not available.
- Current and design animal population (for the expected life of the CAFO)
- The estimated volume of wash water generated at the facility each day (based on gallons per cow per day)
- Total size of the facility (acres)
- The size (acres) of existing ponds, corrals, wastewater disposal areas and wastewater containment areas
- General location and height of berms
- How dairy wastewater is managed and where it is discharged
- Storm water run-on problems (storm water that occurs off-site, but enters the CAFO), including run-on from neighboring facilities, etc.

## II. Design

To comply with Order No. 99-11, containment facilities must be designated to contain all wastewater generated at the facility (i.e., dairy wash water, storm water runoff from manured areas, etc.) and all storm water runoff that comes into contact with manure generated by a 24-hour, 25-year storm. A 24-hour, 25-year storm is a 24-hour storm with

a return frequency of once every 25 years. The design must take into consideration that this storm can and should be expected to occur each year. CAFOs are required to contain the storm water runoff from all lesser storms, if that runoff has come into contact with manure.

If a CAFO does not have existing structures capable of containing the required volume of wastewater, then additional structures must be provided. This may include significantly deepening existing ponds, adding additional ponds, connecting to a sewer system, raising berms to increase the volume of wastewater that can be stored in containment areas, etc. An EWMP may be acceptable if the design has maximized the amount of wastewater that can be contained and the operation and management plan optimizes utilization of the containment capacity provided by the containment structures. **However, acceptance of such a plan will not relieve the CAFO operator of responsibility for any discharges that are not allowed by Order No. 99-11. Wastewater that is discharged off the CAFO property, even after implementing an acceptable EWMP, is still a violation of Order No. 99-11. unless the discharge occurred as a result of a chronic or catastrophic storm event.**

- Historically, containment of wash water and storm water runoff at CAFOs in the Region between the drier months of April through October has not been a problem. However, containing storm water runoff from corrals, wastewater disposal fields, etc., and daily wash water, has been problematic during the five generally wet months of November through March. During these months, evaporation is minimal, and since disposal fields are usually saturated by rainfall, percolation is minimal. Since it is difficult to dispose of daily wash water and accumulated storm water runoff during these months, wastewater facilities should be designed to contain all wastewater generated during this 150-day period, as noted below.

- Containment structures should be designed to contain 150 days of annual storm water runoff <u>and</u> the runoff from a 24-hour, 25-year storm. For the Chino Basin area, average rainfall for the 150 days from November through March is approximately 13 inches, and a 24-hour, 25-year storm generates approximately 4.5 inches of precipitation (based on information from the National Weather Service). For the San Jacinto area, average annual rainfall for the 150 days from November through March is approximately 11 inches, and a 24-hour, 25-year storm is approximately 3.5 inches. These are average values for these areas, and other values can be used for a particular CAFO, if justification is provided.

- Containment structures should be designed to contain 150 days of wash water. This should be based on the maximum number of milking cows for the life of the facility. Otherwise, the EWMP may have to be revised in the future, at such time that the number of milking cows exceeds the number of cows stated in the EWMP. Recent studies have shown that the average daily wash water generated at dairies in the Region is about 70 gal/cow/day (based on two milkings/cow/day). The average daily wash water produced during winter months, however, can exceed 100 gal/cow/day. The average gal/cow/day used during the winter should be used in determining the

volume of storage required for wash water. This volume can vary, depending on specific site practices, but should be about 100 gal/cow/day unless adequate justification is provided for using a smaller number. The installation of a water meter can verify the amount of water used and assist in efforts to conserve water usage, and thereby reduce the amount of water discharged to containment structures. A wash water meter will be required to justify a volume significantly less than 100 gal/cow/day.

- During the winter, evaporation is minimal. Also, ponds tend to seal up over time, and disposal fields are generally saturated during the winter, thereby minimizing percolation. In addition, the amount of wastewater percolated during the winter at a CAFO can vary, depending on the particular wastewater disposal practices implemented at that CAFO. Allowances for loss of wastewater due to percolation and evaporation can be made in determining the amount of storage required for wastewater, as long as reasonable assumptions are made that consider winter conditions and practical CAFO specific wastewater disposal practices.

- The accumulation of solids in ponds and other containment structures decreases the storage capacity available for wastewater. It is estimated that dairy wash water in the Region contains about 10% of the manure generated by a milking cow. Also, solids are present in storm water runoff from corrals, disposal land and other areas. The estimated annual decrease in available storage capacity resulting from the accumulation of these solids should be determined (the volume of manure in wash water can be considered to be 10% of what a milking cow expels).

- Calculations should be provided showing the design capacity of all wastewater containment structures (existing and proposed).

- The total capacity of the containment structures should be at least equal to the volume determined by the following equation: 150 days dairy wash water + 150 days annual storm water runoff + 24-hour, 25-year storm runoff + accumulation of solids + wastewater in containment structures on November 1 – percolation – evaporation.

- A description of all wastewater conveyance equipment and structures (pipelines, surface channels, pumps, etc.), including their design capacities, should be provided.

- CAFOs in operation prior to November 27, 1984 must be designed to protect all manured areas from inundation or washout by overflow from any stream channel during a 20-year peak stream flow (required by Order No. 99-11).

- CAFOs built after November 27, 1984 must be designed to process all manured areas from inundation or washout by overflow from any stream channel during a 100-year peak stream flow (required by Order No. 99-11).

- The use of pumps must be considered for ponds and other containment structures so that wastewater can be pumped from ponds or containment areas to disposal areas, in

order to restore needed capacity in the containments structures. If pumps are not utilized, exceptional justification for not utilizing pumps must be included.

- Storm water containment structures must be protected against inundation from off-site storm water sources, unless such run-on is fully contained (required by Order No. 99-11). If it is not practical to divert all storm water run-on away from a CAFO, a justification should be included that explains why it is not practical to do so. If all storm water run-on from up to a 24-hour, 25-year storm cannot be diverted from containment structures, a description of how the design takes the run-on into consideration should be included.

- The addition of roof structures in areas where manure is present, and diverting the roof runoff off site, should be considered in order to minimize the amount of precipitation that comes into contact with manure.

- Structures should be designed to prevent storm water runoff from non-manured areas (roofs, residence area, paved surfaces, etc.) from entering wastewater containment structures. The use of rain gutters and diversion trenches should be considered. If the CAFO cannot be designed to prevent or minimize the flow of this water onto containment areas, an explanation should be provided that describes how the design accounts for such flows.

- The design for ponds and other wastewater containment areas should allow vehicle access for mosquito abatement personnel to inspect and treat these areas to reduce the risk of mosquito-borne disease and to prevent insect nuisance conditions.

- An emergency spillway must be designed to provide for a controlled release of wastewater, and to maintain the integrity of existing containment structures, in the event that storm events cause the capacity of the containment structures to be exceeded. The use of gateways, valves, or other similar devices for the purpose of manually releasing wastewater, is not acceptable.

- If visual observations, hand-level measurements and information provided by the CAFO operator and others are not sufficient to determine rise and fall dimensions and flow directions for adequately calculating runoff volumes for placing and sizing appropriate containment structures, then current contours must be determined, based on acceptable engineering and surveying practices (it is expected that current contours will be necessary for most CAFOs).

- Structures should be designed to accommodate future increases in animal population.

## III. Plot (Site) Plan

The plot plan should be a standard blue line print, using an appropriate scale, that shows sufficient detail of all containment structures, drainage patterns, and equipment. The plot plan should include:

- The legal description of the property (i.e., parcel numbers), the primary address and any other addresses that may exist at the property, and the location of significant structures on the property (residences, milk barn, hay alleys, etc.).
- The property boundaries, the gross acreage of the property, vicinity map (insert), north arrow, legend and date the plan was prepared.
- The location, elevation contours and dimensions of all areas associated with the generation, storage or management of wastewater and manure (corrals, ponds, access roads around wastewater containment areas, wastewater disposal areas, temporary manure storage areas, cropland, etc.).
- The location of all facilities necessary for containment and management of wastewater (berms, upstream diversion structures, pumps, spillway, distribution lines, etc.) and the dimensions, elevation and cross-sections of all containment structures.
- The drainage patterns (indicated by arrows) for on-site surface drainage courses (swales, ditches, etc.) and any off-site surface drainage that can flow onto, or immediately adjacent to, the facility.

## IV. Construction

The construction plan should describe all construction materials, construction methods (i.e., compaction), criteria and specifications, etc., necessary for proper construction of all containment and conveyance structures (berms, ponds, levees, pipelines, channels, etc.).

- Existing berms that are not sized properly, not adequately compacted, or contain materials (i.e., manure) that are deleterious to the berm's long term stability and effectiveness, must be replaced or improved to a standard that is equivalent to that which would be expected from a new berm constructed in accordance with best engineering practices.
- Actions necessary to restore existing structures to proper conditions and capacities should be clearly described (i.e., clean out existing ponds or containment areas, regarding, repair or replacement of existing berms, etc.).

- Manure shall not be used to construct new containment structures (i.e., berms0, and manure shall not be used to improve or raise existing containment structures (prohibited by Order No. 99-11).

- In accordance with acceptable engineering practices, specifications developed to assure that construction material is applied in lifts of appropriate depth, and rolled and watered to achieve a minimum compaction of 90%, must be included.

## V. Operation and Maintenance

An operation and maintenance plan should be provided to implement effective operation of all containment structures and equipment. During the wet season, wastewater should be managed on a daily basis to maximize the volume of containment capacity available.

- Specific procedures should be included to assure that containment structures have the maximum capacity available just prior to the wet season (November – March).

- Management practices to reduce, to the maximum extent practicable, the volume of dairy wash water generated should be addressed, particularly if the proposed structures are incapable of containing the required volume of wastewater.

- Replacement pumps should be available on-site, or advanced arrangements made for the immediate and reliable delivery of portable pumps.

- Specific procedures for operating standpipes or other conveyance systems used for applying wastewater to land should be provided to efficiently utilize the entire area available for wastewater disposal (i.e., avoid localized over-application that can occur with furrow application, and utilize methods to maximize the spreading of wastewater).

- If all storm water run-on cannot be diverted, the EWMP should contain a description of how storm water run-on will be managed or handled to minimize the impact on wastewater containment structures and to minimize the amount of wastewater that could be discharged from the CAFO.

- Specific measures to minimize the effects of gophers, squirrels or other rodents on the integrity of the containment structures should be identified.

- Removal of solids from containment structures on a scheduled basis should be specified so that the design capacity of the containment structures will be restored prior to each rain season.

- Measures for minimizing the accumulation of stagnant wastewater in low lying areas (corrals, disposal areas, etc.) and preventing potential insect nuisance conditions should be addressed.

- Weekly inspections of ponds, berms, wastewater distribution and application equipment, etc., should be specified to provide assurance that all containment structures are intact and all equipment is in proper operating condition. Daily inspections should be conducted following the first significant rain events at the beginning of the wet season (generally in early Fall), continuing through the cessation of significant rain events (generally in early Spring). Provisions for the immediate repair of any damaged containment structures (i.e., rodent holes, cracks, erosion, etc.) should be provided.

- A description of methods and schedules for maintaining disposal areas in a condition that maximizes the efficient disposal of wastewater in the winter should be provided (i.e., grading, disking, etc.).

- An equipment maintenance schedule should be provided to assure the efficient, consistent and reliable operation of all pumps, sumps, pipelines, etc.

- Weed abatement measures to maintain access to containment structures, maintain capacity of containment structures and to maintain the efficient distribution of wastewater through channels, etc., should be addressed.

- A brief emergency spill plan must be included. The plan must include a list of spare parts (pumps, piping, valves, etc.) that are to be kept on site to maintain adequate wastewater containment facilities, a list of names and phone numbers for contacts for obtaining immediate emergency equipment (pump, piping, valves, heavy equipment, etc.), and a list of names and phone numbers for reporting problems (Board staff, County staff, etc.).

# APPENDIX K

ORDER NO. 99-11

California Regional Water Quality Control Board
Santa Ana Region

Order No. 99-11
NPDES No. CAG018001

# GENERAL WASTE DISCHARGE REQUIREMENTS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (DAIRIES AND RELATED FACILITIES) WITHIN THE SANTA ANA REGION

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter, Regional Board), finds that:

1. On February 17, 1994, the Board adopted Order No. 94-7, General Waste Discharge Requirements For Concentrated Animal Feeding Operations, Including Dairies, Within The Santa Ana Region (NPDES NO. CAG018001).

2. Order No. 94-7 satisfied the criteria cited in 40 CFR 122.28 and, as such, served as a General NPDES Permit. 40 CFR 122.28 pertains to the issuance of general permits to regulate discharges of waste that meet the following criteria:

   a. Waste discharges involving the same or substantially similar types of operations;
   b. Discharge the same types of wastes;
   c. Require the same or similar operating conditions;
   d. Require the same or similar monitoring ; and
   e. Are more appropriately regulated under a general permit rather than individual permits.

3. 40 CFR Part 122.23 defines a concentrated animal feeding operation (CAFO) as any animal feeding operation that has more than 1,000 animal units (dairy cattle are considered 1.4 animal units). Pursuant to the Clean Water Act (CWA), all CAFOs are point sources and are subject to NPDES permitting requirements. Smaller animal feeding operations can also be designated as CAFOs by the permitting agencies after considering certain criteria cited under 40 CFR 122.23 (b)(1). The Regional Board has determined that all dairies, heifer ranches, and calf nurseries in the Region shall be designated as CAFOs.

4. Order No. 94-7 has expedited the preparation of waste discharge requirements and has allowed the Regional Board to better utilize staff resources. To date, approximately 215 CAFOs have been enrolled under Order No. 94-7. Another 72 CAFOs are in the process of obtaining authorization to discharge wastes under that order. Order No. 94-7 expired on March 1, 1999. The dairies currently enrolled under Order No. 94-7, or in the process of enrolling under Order No. 94-7, will want to continue to discharge waste. Therefore, it is necessary to renew the waste discharge requirements contained in Order No. 94-7 to continue this expedited permitting process.

5. Persons discharging, or proposing to discharge, dairy wastes or other similar kinds of wastes in any manner that may affect water quality are hereinafter referred to as "discharger" and are subject to the terms and conditions of this order. Persons discharging, or proposing to discharge, wastes from other types of animal feeding operations must obtain coverage under a separate general permit or individual waste discharge requirements.

6. The Regional Board adopted a revised Water Quality Control Plan (Basin Plan) on March 11, 1994. The Basin Plan became effective on January 24, 1995. The Basin Plan specifies beneficial uses and water quality objectives for surface and ground waters in the Santa Ana Region (Chapters 3 and 4). This order specifies requirements necessary to meet the water quality objectives and to protect the beneficial uses.

7. Revised regulations governing discharges from CAFOs, including dairies, are contained in Division 2, Title 27 of the Combined State Water Resources Control Board/California Integrated Waste Management Board AB 1220 Regulations, which became effective on July 18, 1997. Chapter 7, Subchapter 2 (Article 1) contains requirements for Confined Animal Facilities. Previously, these regulations were specified in Chapter 15, Division 3, Article 6, Title 23 of the California Code of Regulations.

8. Section 402(p) of the CWA as amended by the Water Quality Act of 1987 and the related regulations published by the U.S. EPA on November 16, 1990 (40 CFR Parts 122, 123 and 124), requires an NPDES permit for pollutant discharges from CAFOs. The EPA's Effluent Guidelines and Standards for Feedlots are contained in 40 CFR Part 412 (revised July 1, 1993).

9. On April 17, 1997, the State Water Resources Control Board adopted the General Industrial Storm Water Permit, Order No. 97-03-DWQ, NPDES No. CAS000001. Order No. 97-03-DWQ implements the final regulations (40 CFR 122, 123, and 124) for storm water runoff published on November 16, 1990 by the U.S. EPA in compliance with Section 402(p) of the CWA. This order includes those provisions of the General Industrial Storm Water Permit that pertains to dairies. Once a discharger is authorized under Order No. 99-11, coverage under the State Water Resources Control Board's General Industrial Storm Water Permit (Order No. 97-03-DWQ) will be terminated.

10. Wastes from CAFOs contain high concentrations of salts (total dissolved solids and nitrates). Previous studies conducted by the Board have shown that cow manure produced in the Region contains about 160 pounds of salt per (dry) ton of manure (110 pounds of salt per ton of manure @ 33% moisture). The application of manure or the discharge of process wastewater[1] to land results in the discharge of salts that has adversely impacted, and continues to adversely impact, the quality of groundwater and surface water in the Region.

[1] Process wastewater shall mean any process generated wastewater and any precipitation (rain or snow) which comes into contact with any manure, litter or bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g. milk, eggs).

11. Most of the CAFOs in the Region overlie the Chino Groundwater Basin. The Chino II and III Groundwater Subbasins lack assimilative capacity for additional salt inputs (total dissolved solids and nitrogen). For groundwater subbasins without assimilative capacity, salt inputs that exceed the water quality objectives for these subbasins cannot be allowed (State Water Resources Control Board Order No. 73-4, the Rancho Caballero decision). To meet the Chino Basin groundwater objectives, as well as the groundwater objectives for any other subbasin lacking assimilative capacity, the discharge of manure and other animal wastes, such as process waste water, and their application as fertilizer and irrigation water, must be controlled to prevent further exceedance of water quality objectives. Salt discharges in excess of water quality objectives can only be allowed if the additional salt inputs are offset.

12. The Basin Plan assumed that two desalters would be built in the Chino Basin. The amount of salt to be extracted from the Basin from these desalters was assumed to be adequate to provide sufficient salt removal to offset the present and projected salt loads from ongoing discharges from CAFOs. However, only one desalter is currently being built. This desalter will extract enough salt to offset the amount of salt being added to the basin from process wastewater water discharges. No mitigation measures are currently in place to offset the salt loading from manure application within the Basin. Therefore, the discharge of manure, and its application as fertilizer, must be prohibited.

13. The Board has considered antidegradation pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16 and finds that these discharges are consistent with the State and Federal regulations, as long as appropriate salt offset programs are implemented.

14. In accordance with Water Code Section 13389, the issuance of waste discharge requirements for these discharges is exempt from those provisions of the California Environmental Quality Act contained in Chapter 3 (Commencing with Section 21100), Division 13 of the Public Resources Code.

15. The Regional Board has notified interested agencies and persons of its intent to issue general waste discharge requirements for discharges of wastes CAFOs, and has provided them with an opportunity to submit their views and recommendations.

16. The Regional Board, in a public meeting, heard and considered all comments pertaining to discharges of wastes from CAFOs proposed to be regulated under the general waste discharge requirements.

IT IS HEREBY ORDERED that, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Clean Water Act as amended, and regulations and guidelines adopted thereunder, dischargers, their agents, successors, and assigns, discharging wastes from CAFOs shall comply with the following:

## A. DISCHARGE SPECIFICATIONS:

1. The discharger shall design, construct and maintain containment structures to retain all wastewater within its facility, including all process generated wastewater[2] and all precipitation on, and drainage through, manured areas resulting from storms up to and including a 24-hour, 25-year storm.

2. The discharger shall develop and fully implement an Engineered Waste Management Plan (EMWP) acceptable to the Executive Officer. The EMWP shall be developed by a registered professional engineer, or other qualified individual, in accordance with the guidelines specified in Attachment "B" of this order. The Executive Officer is hereby authorized to make necessary revisions to the guidelines for the preparation of an EWMP outlined in Attachment "B".

3. The discharge to any surface water bodies, or tributary thereof, is prohibited unless a chronic[3] or catastrophic[4] rainfall causes overflow from a storage facility designed, constructed, maintained and operated to contain all process generated wastewater plus the runoff from a 24-hour, 25-year storm.

4. Retention ponds and manured areas at CAFOs in operation on November 27, 1984, shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Facilities existing before November 27, 1984 that are protected against 100-year peak stream flows must continue to provide such protection. New facilities (built after November 27, 1984) shall be protected from 100-year peak stream flows.

5. Disposal of manure to land is prohibited, unless allowed by separate waste discharge requirements issued by the Board.

6. The use of manure as a fertilizer in any area that may affect a groundwater subbasin lacking assimilative capacity, including the Chino Groundwater Basin, is prohibited unless a plan, acceptable to the Executive Officer, is implemented which mitigates the effects of that use on the underlying groundwater subbasin.

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[2] Process generated wastewater shall mean water directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems; washing, cleaning of flushing pens, barns, manure pits or other feedlot facilities; direct contact swimming, washing or spray cooling of animals; and dust control.

[3] Chronic rainfall means a series of wet weather conditions which would not provide opportunity for dewatering and which total the volume of the 25 year, 24 hour storm event.

[4] Catastrophic rainfall means any single event which would total the volume of the 25 year, 24 hour storm event; this could include tornadoes, hurricanes or other catastrophic conditions which could cause overflow due to winds or mechanical damage.

7. Manure applied to cultivated cropland outside of any area that may affect a groundwater subbasin lacking assimilative capacity, including the Chino Groundwater Basin, shall not exceed agronomic rates and shall be incorporated into soil soon after application or appropriate containment (based upon the specific crop grown) controls must be provided. For any application of manure to cropland above 12 dry tons per acre per year (17.5 tons/year @ 33% moisture), an explanation of the type of crop and the number of times it is harvested per year shall also be included in the annual report.

8. Manure removed from the corrals shall be removed from the facility within 180 days. Any manure remaining at the facility after 180 days of being removed from the corrals is considered to be disposal of manure and is prohibited in accordance with Discharge Specification A.5. A manifest of the manure hauled away shall be prepared and submitted with the annual report in accordance with Monitoring and Reporting Program No. 99-11. (The discharger shall be responsible for active management of legal disposal of manure from the property over the six month period following removal of the manure from corrals. This means that legal disposal must be coordinated with periods of rainfall such that manure can be removed from the facility within 180 days of being scraped from corrals.)

9. On two designated "clean days" per calendar year, facilities subject to this order shall be free of all stockpiled manure that has been removed from corrals. These "clean days" shall be selected by each discharger, beginning in 2000. The two "clean days" shall be at least four months apart. Each "clean day" shall be identified and reported to the Board office at least five working days in advance of the selected date.

10. All surface drainage from outside of the facility shall be diverted away from any manured areas unless such drainage is fully contained.

## B. PROVISIONS:

1. Neither the treatment nor the discharge of wastes shall create, or threaten to create, a nuisance or pollution as defined by Section 13050 of the California Water Code.

2. This order shall serve as a general National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Clean Water Act or amendments thereto. The general permit shall become effective 10 days after the date of its adoption provided the Regional Administrator of the Environmental Protection Agency has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

3. This order expires on August 1, 2004. However, it shall continue in force and effect until a new general permit is issued. All dischargers authorized to discharge under the expired permit may continue to discharge waste in accordance with that permit until a new permit is issued.

4. Upon receipt of an application to discharge wastes under this order, the Executive Officer shall authorize the proposed discharge by transmitting a "Discharge Authorization Letter" to the discharger. The discharge authorization letter may be terminated or revised by the Executive Officer at any time.

5. Upon issuance of a discharge authorization letter from the Executive Officer to discharge wastes under this order, the discharger's authorization to discharge waste under the State Water Resources Control Board's General Industrial Storm Water Permit (Order No. 97-03-DWQ) is hereby terminated.

6. All discharges from the facility must comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to storm drain systems or other courses under their jurisdiction.

7. Storm flows in excess of a 24-hour, 25-year storm event may be discharged to surface water bodies in accordance with the requirements specified in U.S. Environmental Protection Agency's "Effluent Guidelines and Standards for Feedlot's, 40 CFR Part 412". Additionally, storm flows resulting from chronic or catastrophic events may also be discharged to surface water bodies in accordance with the U.S. Environmental Protection Agency's effluent guidelines referenced above.

8. The discharger shall comply with Monitoring and Reporting Program No. 99-11.

9. The discharge of wastes to property not owned or controlled by the discharger, except as authorized by this order, is prohibited.

10. The discharger shall comply with all Federal, State, County and local laws and regulations pertaining to the discharge of wastes from the facility.

11. Following a storm event, the discharger shall restore the wastewater holding capacity of retention ponds in a timely manner.

12. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from liabilities under Federal, State, or local laws, nor guarantee the discharger a capacity right in the receiving waters.

13. This order does not convey any property rights of any sort, or any exclusive privilege.

14. An authorization to discharge wastes under this order is not transferable to any person without written authorization from the Executive Officer.

15. The discharger shall comply with all requirements of this order and all terms, conditions, and limitations specified in the discharge authorization letter issued by the Executive Officer.

16. The discharger shall take all reasonable steps to minimize or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment.

17. Any instance of noncompliance with this order constitutes a violation of the Clean Water Act (CWA), its regulations, and the California Water Code, and is grounds for enforcement action, and/or termination of the authorization to discharge.

18. The provisions of this order are severable, and if any provision of this order, or the application of any provisions of this order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this order shall not be affected thereby.

19. It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this order.

20. Compliance determination with the terms of this order shall be based on the following:

    a. Periodic inspections by Regional Board staff;
    b. Evaluation of the annual report of animal waste and storm water discharge submitted according to the attached monitoring and reporting program; and
    c. Any other information deemed necessary by the Executive Officer.

21. The Regional Board, USEPA, and other authorized representatives shall be allowed:

    a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this general permit;
    b. Access to copy any records that are kept under the conditions of this general permit;
    c. To inspect any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and
    d. To photograph, sample, and monitor for the purpose of assuring compliance with this general permit, or as otherwise authorized by the CWA.

## C. PERMIT REOPENING, REVISION, REVOCATION, AND RE-ISSUANCE:

1. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal CWA, or amendments thereto, the Board will revise and modify this order in accordance with such standards.

2. This order may be reopened to address any changes in State or Federal plans, policies or regulations that would affect the quality requirements for the discharges.

## D. PENALTIES:

1. The CWA provides that any person who violates a provision implementing sections 301, 302, 306, 307, or 308 of the CWA is subject to a civil penalty not to exceed $11,000 per day of such violation. Any person who willfully or negligently violates provisions implementing these sections of the CWA is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

2. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $11,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $11,000 per violation, or by imprisonment for not more than six months per violation, or by both.

4. The California Water Code provides that any person who violates a waste discharge requirement or a provision of the California Water Code is subject to civil penalties of up to $5,000 per day, $10,000 per day, or $25,000 per day of violation, or when the violation involves the discharge of pollutants, is subject to civil penalties of up to $10 per gallon per day, or $20 per gallon per day of violation; or some combination thereof, depending on the violation, or upon the combination of violations.

## E. REQUIRED REPORTS AND NOTICES:

1. Reporting Provisions:

   a. All applications, annual reports, or information submitted to the Regional Board shall be signed and certified in accordance with 40 CFR 122.22.

   b. Any discharger authorized to discharge waste under this order shall furnish, within a reasonable time, any information the Regional Board or EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating their authorization or this general permit. The discharger shall also furnish to the Regional Board, upon request, copies of records required to be kept by this order.

c. Except for data determined to be confidential under Section 308 of the CWA, all reports prepared in accordance with the terms of this general permit shall be available for public inspection at the offices of the Regional Water Quality Control Board and the Regional Administrator of USEPA. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act and Section 13387 of the California Water Code.

2. The discharger shall notify the Regional Board by telephone within 24 hours of any unauthorized discharge of waste from the facility. This notification shall be followed by a written report including the following:

   a. The approximate date and time of the discharge;
   b. The volume and duration of the discharge;
   c. The cause of the discharge; and
   d. A time schedule and a plan to implement necessary corrective actions to prevent the recurrence of such discharges.

3. The discharger shall report promptly in writing to the Regional Board of any changes or proposed changes in:

   a. The control, ownership, operation or location of the facility;
   b. The character, location, volume or disposal methods of waste discharges; and
   c. The size of the animal population, if it increases beyond the design capacity of the facility specified in the EWMP.

4. The discharger shall give advance notice to the Regional Board of any planned changes in the permitted facility or activity that may result in noncompliance with this general permit.

## F. APPLICATION REQUIREMENTS:

1. Dischargers previously authorized to discharge wastes under Order No. 94-7, dischargers currently discharging wastes under individual waste discharge requirements, and dischargers who have submitted a notice of intent to discharge wastes under Order No. 94-7 are automatically enrolled under this Order, unless they file an application to be covered under an individual permit. Once the Executive Officer issues a discharge authorization letter, the individual waste discharge requirements are hereby rescinded.

2. Dischargers not previously authorized to discharge waste under Order No. 94-7 are required to submit the following within 60 days of the effective date of this Order for existing discharges and at least 60 days before the start of any new discharge:

a. A completed Notice of Intent Form (see attachment "A") with the appropriate filing fee;
b. An Engineered Waste Management Plan for the facility, acceptable to the Executive Officer (see Attachment "B");
c. If an acceptable EWMP has not been developed, the discharger must submit the name of the engineer, or other qualified individual, who will develop the EWMP and a proposed time schedule for its development; and
d. Any other information deemed necessary by the Executive Officer.

If the proposed discharge meets the requirements of this order, the Executive Officer will provide the discharger with a written authorization to discharge waste in accordance with these waste discharge requirements.

3. The following types of facilities are generally not required to obtain authorization under this order. Such facilities must not discharge waste which may affect water quality, or cause a nuisance or pollution as defined in Section 13050 of the California Water Code.

a. Dairies where the animal population is less than 20 (dry or milking cows).
b. Heifer or calf ranches where the herd size is less than 50.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on August 20, 1999.

G J Thibeault

Gerard J. Thibeault
Executive Officer

Attachment "A" NOI

# REQUIREMENTS FOR AN ENGINEERED WASTE MANAGEMENT PLAN

**The Engineered Waste Management Plan must be prepared by a registered professional engineer in the State of California or another qualified individual.**

## A. SITE PLAN:

Site plan shall include:

1. Address and/or legal description of the property.

2. Name, address, and telephone number of the owner and operator of the property.

3. Total gross acreage of the property, showing property boundaries and all existing and proposed facilities including buildings, storage areas, berms/levees, holding ponds, pumping facilities, culverts, drainage easements, disposal areas, croplands (whether farmed by the owner/operator or another party), etc. The site plan must include the overall dimensions, contours, a vicinity map, north arrow, and the date the plan was prepared. The plan shall be drawn on a standard blue print format using an appropriate scale that shows sufficient details of all facilities.

4. Containment facilities shall be designed to retain, on the property, all process generated wastewater and storm water runoff due to precipitation and drainage through manured areas which results from a 24-hour, 25-year storm event. Facilities in operation on November 27, 1984 shall be designed for protection of all manured areas from inundation or washout by overflow from any stream channel during 20-year peak stream flows. All manured areas for new facilities (built after November 27, 1984) shall be protected from inundation resulting from a 100-year peak stream flow. The site plan shall show all facilities necessary for containment and management of on-site storm water runoff as well as the interception and conveyance of any off-site storm water runoff through the property.

5. The site plan shall show the size, elevation, and location of all facilities proposed for containment of process generated wastewater and storm water runoff on the property (berms/levees, holding ponds, upstream diversion structures, etc.). Cross section details of these facilities shall be presented.

6. A description of existing and proposed disposal areas or cropland, designated to receive operational water.

## B. DESIGN CALCULATIONS:

Design calculations shall include:

1. Present and proposed animal population (numbers of each: milk cows, dry cows, calves, heifers, etc.) and the volume of wash water generated.

2. Amount of storm water runoff resulting from a 24-hour, 25-year storm event.

3. Total amount of wastewater (wash water and storm water) to be contained on the property.

4. Dimensions and capacity of the holding ponds.

5. Percolation rates, if used.

## C. CONSTRUCTION SPECIFICATIONS:

Construction specifications shall include the construction materials and method of compaction utilized to build berms/levees and other containment facilities.

## D. OPERATION AND MANAGEMENT PLAN:

Operations and maintenance plan shall include:

1. A proposed holding pond management plan (to provide maximum pond capacity prior to winter storms; periodic dredging, etc.).

2. A proposed wastewater distribution plan (periodic rotation of wastewater to disposal areas or croplands).

3. A proposed maintenance plan for berms/levees and other containment facilities, including a proposed rodent control plan (periodic inspections to monitor for holes/cracks or breaks, etc.)

California Regional Water Quality Control Board
Santa Ana Region

Monitoring and Reporting Program No. 99-11
for
Concentrated Animal Feeding Operations (Dairies and Related Facilities)
Santa Ana Region

## A. Monitoring

1. The discharger(s) shall inspect the waste holding and disposal areas and note any discharges off the property that is under the control of the discharger. Inspections will be made daily when wastewater is being applied to cropland and weekly during other periods. The results of all inspections will be recorded and submitted with the required reports.

2. During each significant storm event[5], the discharger(s) shall make visual inspections of all storm water containment structures.

3. The discharger(s) shall record the approximate time of each storm-related discharge that results in off-property discharges of storm water commingled with wastewater or manure, and its approximate duration.

4. The discharger(s) shall record each manure-hauling event on a manure tracking manifest form.

## B. Reporting

1. By January 15 of each year, an annual report of animal waste discharge and storm water discharge shall be submitted.

2. The annual report shall be submitted on forms provided by Regional Board staff and shall also include copies of all manure tracking manifests for the reporting period and copies of the inspection logs required to be maintained under A.1. and A.4. above.

3. The discharger shall notify the Regional Board by telephone within 24 hours of any unauthorized discharge of wastes. This notification shall be followed by a written report which shall be submitted to the Regional Board within two weeks of the discharge . The written report shall contain:

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[5] A significant storm event is defined as a storm event which results in continuous discharge of storm water for a minimum of one hour, or intermittent discharge of storm water for a minimum of three hours in a 12-hour period.

a. The approximate date and time of the discharge;

b. The flow rate and duration of the discharge;

c. The specific type and source of the waste discharges (e.g., overflow from holding pond, rainfall runoff from manure storage areas, etc.); and

d. A time schedule and a plan to implement necessary corrective actions to prevent the recurrence of the discharge.

All reports shall be signed by a responsible officer or duly authorized representative of the discharger(s) and shall be submitted under penalty of perjury.

Ordered by
Gerard J. Thibeault
Executive Officer

August 20 , 1999

California Regional Water Quality Control Board
Santa Ana Region

FACT SHEET

# GENERAL WASTE DISCHARGE REQUIREMENTS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (DAIRIES AND RELATED FACILITIES) WITHIN THE SANTA ANA REGION, ORDER NO. 99-11, NPDES NO. CAG018001

## I. Need for General Waste Discharge Requirements

There are approximately 302 animal feeding operations (AFOs), including dairies, heifer ranches and calf nurseries in the Santa Ana Region. These AFOs contain about 370,000 animals [213,000 lactating (milking) cows, 37,000 dry (pregnant) cows, 56,000 heifers (12-18 month old cows), and 60,000 calves (less than 12 month old cows)]. Two hundred and seventy nine of these facilities (320,000 animals) are located in the Chino Basin, while 23 of the facilities (50,000 animals) are located in the San Jacinto Basin. The wastes generated at these facilities include manure, wash water[1] and storm water runoff from manured areas. About 950,000 tons of manure (at 33% moisture) were produced in the corrals by these facilities in 1998. This is equivalent to about 4,000,000 cubic yards of manure (at 33% moisture). About 15 million gallons of washwater, which contains about 10% of the manure produced by milking cows, is discharged to the ground each day. Wastes produced at AFOs contain high levels of bacteria, biochemical oxygen demand, ammonia, nitrate, phosphorus, and other salts.

Wastes in rainfall runoff from AFOs in the Chino Basin affect Chino Creek, Mill Creek and Reach 3 of the Santa Ana River, which are 303(d) listed impacted water bodies. Wastes from AFOs that are discharged to the Santa Ana River also affect the quality of groundwater in Orange County, since the Orange County Water District captures and percolates a significant amount of the flow of the Santa Ana River to recharge the Santa Ana Forebay Groundwater Subbasin. The Chino Basin is considered to have the highest concentration of dairy animals in the world, with its 279 facilities and 320,000 animals located within an area of less than 50 square miles (30,000 acres). The application of manure to the ground in the Chino Basin has resulted in significant groundwater pollution, specifically total dissolved solids (TDS) and nitrate. Affected groundwater in the Chino Basin also impacts the quality of the Santa Ana River because the Santa Ana River becomes a gaining steam in the Prado Basin where groundwater from the Chino Basin contributes to the surface flow of the Santa Ana River.

Wastes in surface runoff from AFOs in the San Jacinto Basin affect the San Jacinto River, Canyon Lake and Lake Elsinore. Phosphorus from AFOs is considered to be the primary cause of algae blooms in Lake Elsinore, the largest natural freshwater lake in Southern California. These algae blooms deplete oxygen in the lake, creating fish kills and other conditions which affect the economic development and aesthetics of the area. Proper management of wastes from AFOs is essential to protect the surface and groundwater resources of the Region.

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[1] Water used to wash cows prior to milking, milking equipment and the milk barn.

Beginning in 1972, and continuing through 1994, the Board's regulatory approach was to issue individual waste discharge requirements to each AFO. Changes in the location, size, number of animals, or operator of these facilities were frequent and necessitated rescinding existing waste discharge requirements and issuing new requirements. The time demands to draft and rescind individual waste discharge requirements far exceeded the staff resources available to do so.

Criteria cited in 40 CFR 122.28 state that general permits may be issued for facilities 1) involving the same or substantially similar types of operations; 2) discharging the same types of wastes; 3) having the same or similar operating conditions; 4) requiring the same or similar monitoring; and 5) that are more appropriately regulated under a general permit rather than individual permits. The types of wastes and appropriate waste discharge requirements for dairies and related facilities are similar. Given this, the AFOs in the Region can be adequately and appropriately regulated by coverage under the terms of a general waste discharge permit.

On February 17, 1994, the Board adopted Order No. 94-7, General Waste Discharge Requirements For Concentrated Animal Feeding Operations, Including Dairies, Within The Santa Ana Region (NPDES NO. CAG018001). Order No. 94-7 has allowed the Board to better utilize staff resources. Currently, approximately 215 AFOs have been enrolled under Order No. 94-7. The remaining AFOs are either covered under individual waste discharge requirements issued prior to 1994, have submitted a Notice of Intent (NOI) to be covered under Order No. 94-7, or have not yet submitted a NOI. AFOs that have submitted a NOI and have not yet been granted coverage under Order No. 94-7 and AFOs that are still covered under individual waste discharge requirements, have not been granted coverage under Order No. 94-7 because they have not yet completed Engineered Waste Management Plans (EWMPs). Order No. 94-7 expired on March 1, 1999. Therefore, it is necessary to renew the waste discharge requirements contained in Order No. 94-7.

Although Order No. 94-7 regulated the discharge of waste from all AFOs (including non-dairy related facilities), the proposed order only addresses the discharge of wastes from dairies and related facilities, such as calf nurseries and heifer ranches. Over 95% of the dischargers enrolled, or waiting to be enrolled, under Order 94-7 are dairies and related facilities. Many of the requirements contained in Order No. 94-7, and this proposed order, are not appropriate for most other types of AFOs. Therefore, persons discharging, or proposing to discharge, wastes from other types of AFOs must obtain coverage under individual waste discharge requirements or another general permit, if one is adopted.

Currently, the larger AFOs are required to get coverage under the State Water Resources Control Board (State Board) General Industrial Storm Water Permit (Order No. 91-13-DWQ) for storm water runoff from their facilities. However, the proposed order consolidates all requirements for AFOs, including those for storm water runoff, into a single permit. Once coverage is granted under this order, other waste discharge requirements issued by this Regional Board and coverage under the State's General Permit will be terminated.

The Federal Clean Water Act (CWA) states that all concentrated animal feeding operations (CAFOs) are point sources and are subject to NPDES permitting requirements. The CWA defines a CAFO as any AFO that has more than 1,000 animal units (i.e., dairy cattle are considered 1.4 animal units). About 70% of the AFOs in the Region have over 1,000 animal units, and are, therefore, considered CAFOs under the CWA. However, the CWA states that smaller facilities can be designated as CAFOs by the permitting authority (i.e., Regional Board) after considering certain criteria. These criteria include, in part, the location of the AFO relative to surface waters, the slope, rainfall and other factors that increase the likelihood or frequency of discharges, and the impact of the aggregate amount of waste from many small operations in a watershed that exceed that of lager operations. Board staff has determined that all dairies, heifer ranches and calf nurseries in the Region meet one or more of these criteria, and, therefore, should be designated as CAFOs under the CWA. Tentative Order No. 99-11 designates all dairies, heifer ranches and calf nurseries in the Region as CAFOs, and makes them subject to NPDES requirements. Therefore, the acronym "CAFO" will be used to describe all facilities addressed by Tentative Order No. 99-11.

## II. Basis for Discharge Limitations

### Development and Implementation of Engineered Waste Management Plans

In compliance with the CWA and the California Code of Regulations, Tentative Order No. 99-11 prohibits discharges to any surface water bodies, or tributary thereof, unless rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 25-year, 24-hour rainfall event. (Title 27, Chapter 7, Subchapter 2, Article 1, Section 22562(a), California Code of Regulations and 40 CFR Part 412). Therefore, process waste water in overflows resulting from rainfall events that are chronic or catastrophic, or are in excess of a 24-hour, 25-year rainfall event, may be discharged to surface water bodies in accordance with requirements specified in this order. To insure that compliance with these requirements is achieved, all CAFOs are required to develop and implement an Engineered Waste Management Plan (EWMP). The guidelines for the preparation of an EWMP are included in Attachment "B" of the proposed order. Attachment "B" is intended to be revised by the Executive Officer in the near future. As with expired Order No. 94-7, Tentative Order No. 99-11 authorizes the Executive Officer to make necessary revisions to "Attachment B".

### Prohibition on the Application of Manure to Land in the Chino Basin

The Regional Board has conducted extensive studies on TDS and nitrate using computer models to determine acceptable salt loading rates to groundwater from various land uses, including dairies and other animal confinement facilities. These studies are the basis of the TDS and nitrogen management plan specified in the Water Quality Control Plan (Basin Plan) for the Region. In accordance with the TDS/nitrogen management plan, since 1972, waste discharge requirements adopted by the Board for CAFOs limited the amount of manure disposal on disposal acreage at

CAFOs to 3 (dry) tons (4.38 tons @ 33% moisture) per acre per year to address potential groundwater impacts. The resultant salt load is roughly equivalent to that permitted by the plan for other types of land use when the affected receiving waters have salt assimilative capacity. Dairy manure contains much more salt per unit of nitrogen than other types of fertilizers. The Board's 1990 Dairy Report, "Dairies and Their Relationship to Water Quality Impacts in the Chino Basin", showed that the use of manure as a fertilizer results in two to four times more salt reaching groundwater (up to 10 times more non-nitrate salts) than the use of non-manure commercial fertilizers. For this reason, the use of manure to meet the nutrient needs of crops results in excessive application of salts that are not utilized by plants and which can, therefore, migrate to groundwater. Order No. 94-7 limited manure application to cropland to agronomic rates [up to 12 (dry) tons (17.5 tons @ 33% moisture) per acre per year]. Limiting the amount of manure applied to cropland to agronomic rates was an attempt to minimize the amount of salt that would reach groundwater from the use of manure on cropland, without hindering the effective use of manure as a fertilizer.

Ninety percent of the CAFOs in the Region are located in the Chino Basin, which has severe TDS and nitrate groundwater quality problems. As noted in the Board's Basin Plan, the Chino II and III Groundwater Subbasins lack assimilative capacity for these constituents. For groundwater subbasins without assimilative capacity, additional salt inputs at rates above Basin Plan objectives cannot be allowed (State Water Resources Control Board Order No. 73-4, the Rancho Caballero decision). To meet the Chino Basin groundwater objectives, the discharge of manure and other animal wastes, such as dairy wash water, and their application as fertilizer, cannot be legally permitted unless this salt load is offset. The Basin Plan contains a dairy regulatory strategy that was developed in the Board's 1990 Dairy Report. One element of that strategy addresses waste discharge requirements for manure and wash water disposal and application of wastes to cropland. That element specifies that ongoing manure and wash water disposal or application to cropland in the Chino Basin must be prohibited unless suitable salt offset programs are implemented.

In 1994, the Board was informed that two desalters would be built in the Chino Basin. The Board was also informed that a significant amount of manure would be exported from the Chino Basin by the proposed Chino Basin Co-Composting Facility. It was assumed that after the Chino Basin Co-Composting Facility began operation and began exporting a significant amount of manure, the amount of salt to be extracted from the Chino Basin by the two desalters would be adequate to provide sufficient salt removal to offset the present and projected salt loads from ongoing dairy discharges. Therefore, the Board adopted Order No. 94-7, allowing manure and wash water discharges to continue, on the assumption that adequate salt offsets would be implemented. However, the desalters were never built (although one is now under construction) and the Co-Composting Facility, built in 1995, has never exported the significant amount of manure that had been projected. Therefore, sufficient offsets were not implemented, and manure and wash water discharges, and the use of manure on cropland, have been continuing without adequate salt offsets, in violation of State law.

Board staff estimates that over 13 million tons of manure have been applied in the Chino Basin since the mid-1950's, resulting in over 1.4 million tons of salt that have reached, or will reach,

groundwater. The application of about 400,000 tons of manure (@ 33% moisture) per year to disposal land, cropland and ongoing stockpiles in the Chino Basin is continuing. Board staff estimates that the current rate of application of manure and wash water to land in the Chino Basin is resulting in about 34,000 tons of salt that will reach groundwater each year. About 30,000 tons per year is from the application of manure, and about 4,200 tons per year is from the discharge of wash water. A desalter is currently being built in the Chino Basin. The extraction wells that will supply water for the desalter are expected to remove about 11,500 tons of salt per year from the Chino Basin. Kaiser Steel will be credited with an offset of 4,000 tons of this salt each year for a period of 25 years, in accordance with a previous settlement agreement with the Board. The Board has previously indicated that it would accept the remainder of the salt that will be removed from the extraction wells as an offset for continuing discharges from CAFOs in the Chino Basin. However, that amounts to an offset of only 7,500 tons of salt per year, compared to a current CAFO salt loading to groundwater of about 34,000 tons per year. In addition to the 4,200 tons of salt that reaches groundwater each year from wash water discharges, salt also is discharged to groundwater as a result of the percolation of rainfall runoff from corrals and drainage from manure stockpiles. The amount of salt that reaches groundwater each year from the percolation of rainfall runoff from corrals and percolation of drainage from manure stockpiles has not yet been adequately determined. However, staff believes that it may account for the remaining 3,800 tons of salt offset provided by the desalter, leaving no, or very little, salt offset available for continued manure application in the Chino Basin. No other mitigation measures are currently in place, and none are expected to be in place immediately, to offset the salt loading from ongoing manure application in the Chino Basin. Therefore, the discharge of manure and its application as fertilizer in the Chino II and Chino III Subbasins must be prohibited. The remainder of the subbasins in the Chino Basin are of excellent quality and are tributary to the Chino II and Chino III Subbasins. Also, the addition of salt to those subbasins by the application of manure was not considered when the assimilative capacity for those subbasins was determined. Therefore, Tentative Order No. 99-11 prohibits the discharge of manure and its application as fertilizer throughout the entire Chino Basin (The accompanying cease and desist order allows manure to continue to be applied to cultivated croplands within the Chino Basin at agronomic rates as long as significant progress is being made towards the construction and operation of a second desalter within the Chino Basin). Tentative Order No. 99-11 does not prohibit the on-site discharge of wash water, rainfall runoff from corrals, or drainage from manure stockpiles, since the salt loadings from these discharges appear to be offset by the salt that will be removed by the desalter facility.

Removal of Manure from the Facility

Tentative Order No. 99-11 requires that manure be hauled from each facility within 180 days after being removed from the corrals. Any manure remaining at the facility after 180 days of being removed from the corrals is considered to be disposal of manure and is prohibited by Tentative Order No. 99-11. Draft Order No. 99-11, which was distributed for comments in March and April 1999, proposed requiring the removal of manure from the facility within 90 days after removal of the manure from the corrals. Several comments were received in writing and orally at Board Workshops, stating reasons why this time frame was unreasonable. Board staff also solicited

comments from farm advisors with the University of California Cooperative Extension. It was determined that it is beneficial to "cure" manure for 90 to 180 days prior to composting or for application to cropland, and that the nutrient value of the manure is not significantly affected when manure is stored for less than 180 days. During the winter, 90 days would not allow sufficient time for the manure to dry adequately prior to hauling. Providing 180 days of storage will allow the moisture content of the manure to be sufficiently reduced, making it lighter per unit of volume, and easier and less expensive to haul. Some commercial fertilizer facilities in the Chino Basin prefer receiving manure that has been aged for at least 150 days. Also, CAFOs generally remove manure from their corrals twice a year. Allowing up to 180 days (6 months) storage will result in manure being removed from the facility prior to the next corral cleaning, and will still achieve the goal of preventing the long term accumulation of manure at CAFOs. Board staff believes that allowing for 180 days storage is reasonable, and that there would be no significant difference in water quality impacts from storing manure at the facility for 180 days instead of 90 days.

Change in Language Pertaining to Containment of Storm Water Runoff

Order No. 94-7 and Draft Order No. 99-11 included the following Discharge Specification: "The discharge to any surface water bodies, or tributary thereof, is prohibited unless a chronic, catastrophic or cumulative rainfall causes overflow from a storage facility designed, constructed, maintained and operated to contain all process generated wastewater plus the runoff from a 24-hour, 25-year storm." These Orders defined a chronic, catastrophic or cumulative rainfall as rainfall occurring over a 7-day period or less which is equivalent to that from a 24-hour, 25-year storm event. This language is slightly different than similar language included in the CWA that does not refer to "cumulative" rainfall, and does not contain a definition that refers to rainfall "occurring over a 7-day period." The specification included in Order No. 94-7 and Draft Order No. 99-11 is, overall, more stringent than the language in the CWA, and was developed to provide a more objective basis for determining compliance with the rainfall containment requirement and to be consistent with the Board's EWMP Guidelines. However, the USEPA, and others, have noted that there could be instances during certain storm events of less than 7 days when the specification included in Order No. 94-7 and Draft Order No. 99-11 can be less restrictive than the language included in the CWA. They have requested that the language proposed in Draft Order No. 99-11 be changed to be consistent with the language in the CWA, since NPDES permits cannot contain requirements that can be less restrictive than the CWA. Therefore, the term "cumulative" and the reference to rainfall "occurring over a 7-day period" has been removed from Tentative Order No. 99-11 to make the rainfall containment requirement consistent with the CWA.

Consistency with USDA/USEPA "Unified National Strategy for Animal Feeding Operations"

In March 1999, the United States Department of Agriculture (USDA) and the USEPA finalized their unified national strategy for AFOs. Among other items, the national strategy recommended that general permits require the development and implementation of Comprehensive Nutrient Management Plans (CNMPs). In general, development and implementation of CNMPs is intended to bring each CAFO into compliance with the requirements of the CWA and to minimize the

impacts to groundwater and surface water by the implementation of best management practices. The national strategy describes many best management practices that could be included in CNMPs for individual CAFOs. The best management practices included in each CNMP for each CAFO would include specific best management practices for that CAFO, depending on the specific situations that exist at that particular CAFO. In general, the CNMP would assure that appropriate wastewater facilities were developed, constructed and maintained to comply with the requirements of the CWA, and that the use and application of waste water and manure (i.e., nutrient management) was managed to minimize impacts to groundwater and surface water. Tentative Order No. 99-11 does not require the development and implementation of CNMPs, as described and recommended in the national strategy. This is because the requirements included in Tentative Order No. 99-11 are equivalent to, or more stringent than, what would be required in CNMPs. Also, many of the BMPs recommended to be included in CNMPs are not relevant to the specific, isolated conditions that exist in the Chino Basin. The requirements in Tentative Order No. 99-11 for wastewater and rainfall are equivalent to what the national strategy requires. General BMPs that can be implemented to comply with the wastewater and rainfall containment requirements will be further addressed in the Board's EWMP Guidelines when they are revised in the near future. Specific BMPs that will be implemented at each CAFO to comply with the wastewater and rainfall containment requirements will be addressed in each CAFO's specific EWMP. The prohibition on the application of manure in the Chino Basin is obviously a more stringent requirement than the BMPs for manure application and management that the national strategy recommends to be included in CNMPs, since application of manure is not permitted. The limitation on the application of manure to agronomic rates, not to exceed 12 (dry) tons (17.5 tons @ 33% moisture) per acre per year, in groundwater basins outside the Chino Basin where assimilative capacity exists and application of manure is permitted, is equivalent to the nutrient management guidelines included in the national strategy. Specific BMPs addressing application of manure will be included in each CAFOs specific EWMP.

Prohibition on Covering New Discharges in the Chino Basin Under this Order

The 1998 California 303(d) List and TMDL Priority Schedule includes several surface water bodies as impaired due to CAFOs, including Chino Creek, Mill Creek (Prado Area), and Reach 3 of the Santa Ana River for nutrients, pathogens, salinity/TDS/chlorides, and suspended solids. The CWA states that NPDES permits cannot be issued to a new source (discharger) if the discharge will cause or contribute to the violation of water quality standards, unless certain specified criteria are met, including the development of TMDLs. In the absence of a current TMDL, USEPA has recommended that this general permit be limited to current facilities, and that any new sources (i.e., construction of any new facilities) be processed through an application for an individual NPDES permit. Therefore, Tentative Order No. 99-11 prohibits new sources (i.e., new facilities) from being covered under this general permit. Since the most recent new construction of a CAFO facility in the Chino Basin was approximately 20 years ago, this prohibition is not expected to be a significant issue.

Inability of Many CAFOs to Immediately Comply with Several Requirements Included in this Order

Many CAFOs will not be able to immediately comply with several of the requirements contained in Tentative Order No. 99-11. These requirements include the prohibition on the application of manure in the Chino Basin, implementation of EWMPs and containment of rainfall from a 24-hour, 25-year storm. The Board will consider adoption of a Cease and Desist Order No. 99-65 with a time schedule for compliance with these requirements.

## III. Coverage Under the General NPDES Permit

### A. Dischargers Currently Regulated Under Order No. 94-7 or Under Individual Waste Discharge Requirements, and Dischargers that have Submitted NOIs

These dischargers will be automatically enrolled under the proposed order, once it is adopted. Dischargers who have not yet submitted an acceptable EWMP (see Attachment "B" of the order) are required to do so.

### B. Dischargers Not Currently Regulated Under Order No. 94-7 or Under Individual Waste Discharge Requirements, and Dischargers that have not Submitted NOIs:

At least 60 days prior to initiating a discharge at an existing facility, the discharger shall submit a Notice of Intent (NOI) (see Attachment "A") with the appropriate filing fee (currently, the filing fee is $2,000.00 for each facility) and an acceptable EWMP[2].

## IV. Discharge Authorization Letter

Upon adoption of this order, the Executive Officer shall issue discharge authorization letters to dischargers currently enrolled under Order No. 94-7, discharging waste under individual waste discharge requirements or who have submitted an NOI to be covered under a general permit.

Upon receipt of a complete application for initiation of a discharge at an existing facility, the Executive Officer will review the application to determine eligibility for discharge under this order. If the Executive Officer determines that the discharger is eligible to discharge wastes under this general order, the Executive Officer may authorize the proposed discharge. Otherwise, the Executive Officer may require the discharger to obtain individual waste discharge requirements.

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[2] New operators/owners of existing facilities for which an EWMP has been approved are not required to submit an additional EWMP.

## V. Antidegradation Analysis

The Regional Board conducted extensive TDS and nitrate studies using computer models to determine acceptable salt loading rates to groundwater from various land uses, including dairies and other concentrated animal feeding operations. These studies indicate that if the requirements specified in the proposed general permit are met, water quality of the Region is not expected to degrade as a result of discharges authorized under this general permit. The Regional Board, in establishing the requirements in the tentative order, has taken into consideration the requirements of the State and Federal "antidegradation policies" and has determined that the discharges are in conformance with the antidegradation policies.

## VI. Written Comments

All written comments regarding the proposed general order should be submitted to: Robert Holub, Regional Water Quality Control Board, 3737 Main Street, Suite 500, Riverside, CA 92501.

## VII. Information and Copying

Persons wishing further information may write to the address given below (see IX, below) or call the Regional Board at (909) 782-4130. Copies of the proposed waste discharge requirements, and other documents (other than those which the Executive Officer maintains as confidential) are available at the Regional Board office for inspection and copying by appointment scheduled between the hours of 10:00 a.m. and 4:00 p.m., Monday through Thursday (excluding holidays).

## VIII. Register of Interested Persons

Any person interested in a general permit, or in a particular application or group of applications, may leave his name, address, and phone number as part of the file for an application. Copies of tentative waste discharge requirements will be mailed to all interested parties.

## IX. Workshops and Public Hearing

The Regional Board conducted public workshops on April 9, 1999, May 21, 1999, and June 25, 1999, to solicit comments on the draft general waste discharge requirements that were distributed in March and April 1999. Oral comments were received during these workshops, and written comments were submitted by several parties. These comments were considered by staff and incorporated into Tentative Order No. 99-11, as appropriate.

The Regional Board will hold a public hearing and consider adopting Tentative Order No. 99-11 during a public meeting on August 20, 1999, beginning at 9:00 a.m. The meeting will be held at the City Council Chambers of Loma Linda, 25541 Barton Road, Loma Linda.

Further information regarding the conduct and nature of workshops and pubic hearings concerning waste discharge requirements may be obtained by writing or visiting the Santa Ana Regional Board office, 3737 Main Street, Suite 500, Riverside, 92501 or by calling Robert Holub of Regional Board Staff at (909) 782-3298.

California Regional Water Quality Control Board
Santa Ana Region

August 20, 1999

ITEM:

SUBJECT: General Waste Discharge Requirements For Concentrated Animal Feeding Operations (Dairies And Related Facilities) Within The Santa Ana Region, Order No. 99-11, NPDES No. CAG018001

DISCUSSION:

See attached Fact Sheet

RECOMMENDATION:

Adopt Order No. 99-11, as presented.

Comments were solicited from the following agencies and/or persons:

U.S. EPA, Washington, Office of Wastewater Enforcement and Compliance - Michael B. Cook
U.S. EPA, San Francisco – Alexis Straus
U.S. EPA, Permit Issuance Section - Terry Oda (W-5-1)
U.S. EPA, San Francisco – Dan Meer
State Water Resources Control Board, Office of the Chief Counsel - Ted Cobb
State Water Resources Control Board, DWQ – Jim Kessel, Jack Hodges, Cheryl Closson
State Department of Water Resources - Glendale
State Department of Health Services - San Bernardino/Santa Ana/San Diego
State Department of Fish and Game - Fred Worthley
Regional Water Quality Control Board (1) - Lee Michlin
Regional Water Quality Control Board (2) - Loretta Barsamian
Regional Water Quality Control Board (3) - Roger Briggs
Regional Water Quality Control Board (4) - Dennis Dickerson
Regional Water Quality Control Board (5) - Gary Carlton
Regional Water Quality Control Board (6) - Harold J. Singer
Regional Water Quality Control Board (7) - Philip Gruenberg
Regional Water Quality Control Board (9) - John Robertus
San Bernardino County Board of Supervisors
San Bernardino County Department of Environmental Health Services - Pam Bennett
San Bernardino County Transportation/Flood Control District - Naresh Varma
San Bernardino County LEA
Riverside County Board of Supervisors
Riverside County Department of Environmental Health Services

Riverside County Flood Control and Water Conservation District - Jason Christie
Riverside County LEA
City of Chino
City of Ontario
Milk Producers Council - Robert Feenstra
California Milk Producers Association – John Godino
Santa Ana Watershed Project Authority - Joseph Grindstaff
Inland Empire Utilities Agency – Doug Drury
Orange County Water District - Bill Mills, Nira Yamachika
U.C. Extension, San Bernardino - Abraham Wubishet
Inland Empire West Resource Conservation District - Jeff Wilson
National Resource Conservation Service - Jim Earsom
City of Lake Elsinore – Dick Watenpaugh, Pat Kilroy
Eastern Valley Municipal Water District
Western United Dairymen - Gary Conover, John Borges
Chino Basin Watermaster - Tracy Stewart
Daily Bulletin - Bob Page
Orange County Register
Press Enterprise - Leslie Bergman
Northwest Mosquito and Vector Control District
Santa Ana River Watershed Group - Lindel Marsh
Orange County Sanitation District - Blake Anderson
Water Advisory Committee of Orange County – H. E. Hartge
Los Alisos Water District – Kenneth Petersen
Municipal Water District of Orange County – Stanley E. Sprague
El Toro Water District – Ronald Kennedy
Mesa Consolidated Water District – Fred Bockmiller
Irvine Ranch Water District – Paul D. Jones II
Metropolitan Water District – Bob Huntley
Yorba Linda Water District – Arthur C. Korn
City of Anaheim, Public Utilities Department – Edward K. Aghjayan
Dairy Mailing List

D

Rec'd 1/7/04

# ENGINEERED WASTE MANAGEMENT PLAN

Accepted 8-22-05

Prepared For:

SNS DAIRY
7325 Edison Avenue
Chino, CA 91710
(909) 732-8165
(909) 627-9432

NOLTE
BEYOND ENGINEERING

JOB NO.IEB0103
December 2003

This Engineered Waste Management Plan was prepared under the direction and supervision of Paul Hacunda, Professional Engineer.

Paul J. Hacunda, P.E. No. 41627

REGISTERED PROFESSIONAL ENGINEER
PAUL J. HACUNDA
No. 41627
Exp. 12/31/07
CIVIL
STATE OF CALIFORNIA

For additional questions and comments, please contact:


Paul Hacunda
Associate

Gary Koontz
Project Manager

NOLTE ASSOCIATES, INC.
255 East Rincon Street, Suite 110
Corona, CA 92879
Tel: (909) 739-5700
Fax: (909) 739-7510

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**ENGINEERED WASTE MANAGEMENT PLAN**
**for**
**SNS DAIRY**
**7325 Edison Avenue**
**Chino, CA 91710**
**(909) 732-8165**

## I. INTRODUCTION

This plan describes the operational setting of SNS Dairy and recommended procedures of the operation and management of the dairy wastewater collection, retention, and disposal system at the:

SNS Dairy

| | |
|---|---|
| Owner/Operator: | Sam Souza |
| Location: | 7325 Edison Avenue, Chino,California |
| Mailing Address: | same |

| | | | |
|---|---|---|---|
| EWMP Responsible Party: | Primary: | Sam Souza | (909) 732-8165 |
| | Secondary: | Sam Souza Jr. | (909) 203-5905 |

The dairy is situated on the south side of Edison Avenue. The west boundary of the dairy is adjacent to the Sultana Avenue right-of-way. The east boundary is adjacent to the Campus Avenue right-of-way.

The gross area of the dairy is approximately 36.55 acres. The dairy operations occupy approximately 33.41 acres of the total acres and include the following uses:

- Corrals,
- Hay barns,
- Commodity barn,
- Milk barn, and
- Wastewater lagoons

The current typical animal population is:

- 850 milk cows, and
- 150 dry cows

This onsite stock count equates to 1400 animal units. SNS Dairy has not plans for expansion at this time. However, the operator does intend to abandon milking operations in the near future and use the facility for raising his heifers. The EWMP is designed for a milking herd to provide the option of leasing out the facility to a dairy operator if he chooses.

At the time this report was prepared, this dairy could not comply with the RWQCB's 2001 Guidelines for the Development of EWMPs. The quantities reported are the result of the proposed improvements described herein under Section II, Recommendations.

Portions of SNS Dairy that require containment of runoff include approximately 12.73 acres of corrals, 1.49 acres of concrete feed alleys, 3.15 acres of dirt areas, and 6.97 acres of fields and pastures. The wastewater lagoon and evaporation basins occupy 8.74 acres and have a combined storage capacity of 10,301,007 gallons (31.61 acre-ft). SNS Dairy generates approximately 24,861 gallons of wash water per day (See Appendix A, page 1).

SNS Dairy has a very efficient and effective way of managing its wash water and storm water. Wash water from the milk barn gravity flows to a sump located just east of the milk barn. From the sump the wash water continues by gravity flow through a 4 inch PVC line to a series of check valves located along the northerly portion of Field #2. Water can be dispersed via the check valves to various portions of Field #2 to evaporate and percolate. Any wash water or storm runoff from Field #2 is collected in a series of evaporation basins located to the south.

Storm runoff from Corral #1 flows south, then east to commingle with runoff from Corrals #2 through #5 and continue south via a swale located along the west boundary of the corrals. Just south of Corral #5, a berm directs the runoff to the east and ultimately into Basin #1. Storm runoff from Corrals #6 through #9 flows east to the west boundary of Field #1, then south to Basin #1. Storm runoff from Corral #10 flows south to Field #1 and ultimately to Basin #1. Corrals #11 through #13 drain south to Field #2 and ultimately into Evaporation Basins #1 through #5.

Corral #14 receives some runoff from the dirt area located to the north of the corral. There is a potential for runoff exiting the corral along the south fence line to flow southeast and offsite. Any runoff that exits the facility along the east fence line will be contained within a small swale located between the east fence line for SNS Dairy and the Feed Alley for the adjacent facility to the east. The runoff will then be channeled, within the swale, to the south along the Campus Avenue right-of-way. This report includes a recommendation that Corral #14 be abandoned, the manure removed and a two foot berm constructed along the west fence line between Corral #13 and #14. By implementing this recommendation, runoff from the dirt area and Corral #14 will remain uncontaminated with manure and, therefore, can flow offsite along the natural drainage course within the Campus Avenue right-of-way.

SNS Dairy has adequate protection against on-site storm water leaving the property. In general, storm runoff drains from north to south to either Basin #1 or Evaporation Basins #1 through #5. The west boundary is protected by a berm along the west part of the Sultana Avenue right-of-way. Potential runoff along the south boundary is contained by the west to east extension of the west berm. Runoff is directed in an easterly direction into Basin #1. Runoff along the east boundary, south of the dirt area and Corral #14, is contained within Evaporation Basin #5.

SNS Dairy also has excellent protection against offsite entering the property. The northern property line is protected from run-on by a series of dirt and asphalt berms depicted on the Plot Plan. The storm runoff from Edison Avenue is directed west and away from the dairy. The remaining boundaries of the dairy are protected by the berms and Basin #1, as discussed above and depicted on the Plot Plan.

SNS Dairy was built prior to November 27, 1984. Therefore, they are not required to protect their manured areas from the 100-year peak stream flow. However, they are required to protect all manured areas from the 20-year peak stream flow. Studies have not been done to calculate the flood elevations of a 20-year peak stream flow. In order to protect the dairy from, and prepare for, a 20-year peak flow, it must maintain regular maintenance programs as described herein. All onsite flows and the required volumes for the 25-year, 24-hour storm must be contained (See Appendix H, 100 Year Flood Plain Data).

## II. DESIGN

SNS Dairy was originally contracted to comply with Order No. 99-11. Since that time, guidelines for achieving compliance with Order No. 99-11 have been issued (Guidelines for the Development of Engineered Waste Management Plans for Concentrated Animal Feeding Operations, February 5, 2001). This Engineered Waste Management Plan (EWMP) was prepared under the recommendations of the new guidelines.

Order No. 99-11 required the containment of the daily production of wastewater and storm water runoff from a 24-hour, 25-year storm. The new guidelines to Order No. 99-11 require the containment of:

- 150 days of the daily production of wastewater,
- A 24-hour, 25-year storm,
- 150 days of winter precipitation, and
- The 150-day accumulation of 10% of manure solids that could end up in the lagoons.

Although evaporation and percolation can be accounted for, the new guidelines require a large change in containment from Order No. 99-11.

In order to accommodate the new guidelines, this report contains two sets of calculations. The first set of calculations determines the amount of capacity required for 150 days storage. The second set of calculations performs a month-by-month water balance analysis of the amount of wastewater generated and eliminated. This second set of calculations was developed for those dairies that do not meet the requirements of the new guidelines. This second set of calculations optimizes the amount of storage required by including percolation and evaporation on a month by month basis.

The Engineered Wastewater Management Plan (EWMP) developed for SNS Dairy in December 2003 determined that the dairy has appreciable wastewater storage. SNS Dairy meets all of the requirements of the new guidelines. In Table 1, wastewater volumes and the capacity of the settling basin & lagoon are summarized.

| Table 1<br>Capacity Summary | | |
|---|---|---|
| Total Days Required | 150 | days |
| Total Milkhouse and Parlor Water Rate | 3,045 | gal per day |
| Total Wash Pen Rate | 21,816 | gal per day |
| Total Milkhouse and Wash Pen Rate | 24,861 | gal per day |
| Total Required Storm Water Volume | 15.44 | acre-ft |
| Total Manure Volume | 0.66 | acre-ft |
| Total Required Containment Facility Volume | 27.54 | acre-ft |
| Total Available Volume | 31.61 | acre-ft |
| ADDITIONAL VOLUME REQUIRED | 0 | acre-ft |
| | | |
| Total Annual Washwater and Storm Water Accumulation | 59.07 | acre-ft |
| Total Annual Evaporation and Percolation Capability | 134.57 | acre-ft |
| | | |
| Total Winter (Nov.-Dec.-Jan.-Feb.-Mar.) Washwater and Storm Water Accumulation (Inflow) | 35.46 | acre-ft |
| Total Winter (Nov.-Dec.-Jan.-Feb.-Mar.) Evaporation and Percolation Capability (Outflow) | 9.72 | acre-ft |

The data presented in this report was generated in the spreadsheets labeled "Worksheet for Determining Containment Facility Volume" (Appendix A). The first page[1] details the current animal population and the daily wash water generated on the dairy. All numbers for milk house and wash pen water rates were generated from Rain Bird and Weather Tech Sprinkler Volume Ratings for single and double nozzles. An average of 5.05 Gallons per minute was used for single nozzles and 7.1 gallons per minute was used for double nozzles. These numbers were confirmed by watching the total run time of the wash pen sprinklers per cow pen and matched with research from the University of California Cooperative Extension Program for Dairies (see Appendix C).

The second page[1] shows the equivalent gallons per cow per day. This calculation was generated in response to the EWMP guidelines adopted by the Regional Board. The guidelines recommend that as much as 100 gal/cow/day should be used to generate

[1] Appendix A, "Worksheet for Determining Containment Facility Volume".

wastewater during winter months. The calculation on the second page[1] shows a more accurate estimate of the volume of water used per cow per day on SNS Dairy.

Page two[1] also shows the total storm water accumulation generated on the dairy. Evaporation was considered, based on data from the California Department of Water Resources. Manure was also considered in the total volume calculations. The Total Required Containment Facility Volume is shown on the bottom of the second page[1].

The Total Available Volume is shown on page three[1] for SNS Dairy. The Additional Volume Required was found by subtracting the Total Required Volume from the Current Capacity. In the case of SNS Dairy, no additional volume is required.

Also included on page three[1] is a calculation showing the total depth needed in the basins to contain the 24-hr, 25-yr storm. This calculation was developed to show how much depth should be retained at the top of the basins to ensure that the 24-hr, 25-yr storm can be fully contained. This calculation also shows the maximum fill depth of the basins before pumping must be initiated. The calculation assumes that all storm water flows by gravity to the basins and is contained before it is pumped to application fields. In the case of SNS Dairy, 3.00 feet must be maintained at the top of the Basins #1 and 0.60 feet maintained at the top of Evaporation Basins #1-5 to ensure capacity of the 24-hr, 25-yr storm.

Shown below are two examples of wastewater lagoons. Figure 1 shows an optimum dairy lagoon that is able to contain all of the required wastewater and runoff volumes. Figure 2 shows a more common situation where two lagoons are used to split the total wastewater and runoff volumes. There should always be enough room in one lagoon to hold the 24-hr, 25-yr storm. By leaving enough room for the 24-hr, 25-yr storm, it eliminates dependency on the pump and eliminates potential spills due to pump failure. The calculation on the bottom of page three[1] shows exactly how much depth is needed at the top of the lagoon to ensure containment of the 24-hr, 25-yr storm.

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[1] Appendix A, "Worksheet for Determining Containment Facility Volume"

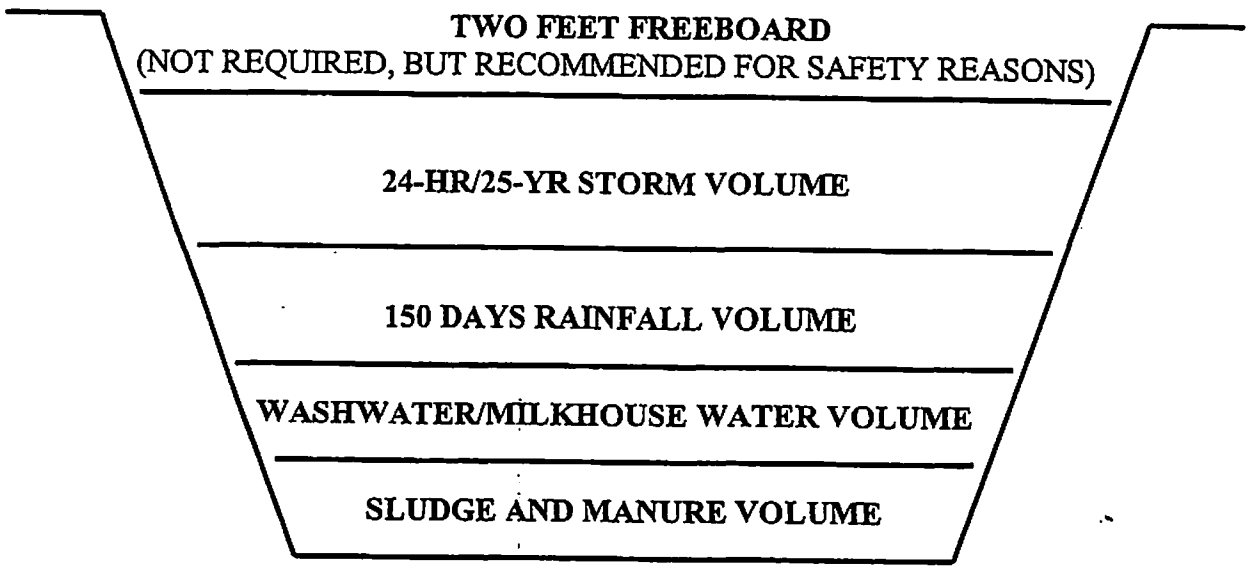


**Figure 1.** Cross section of optimum dairy lagoon.

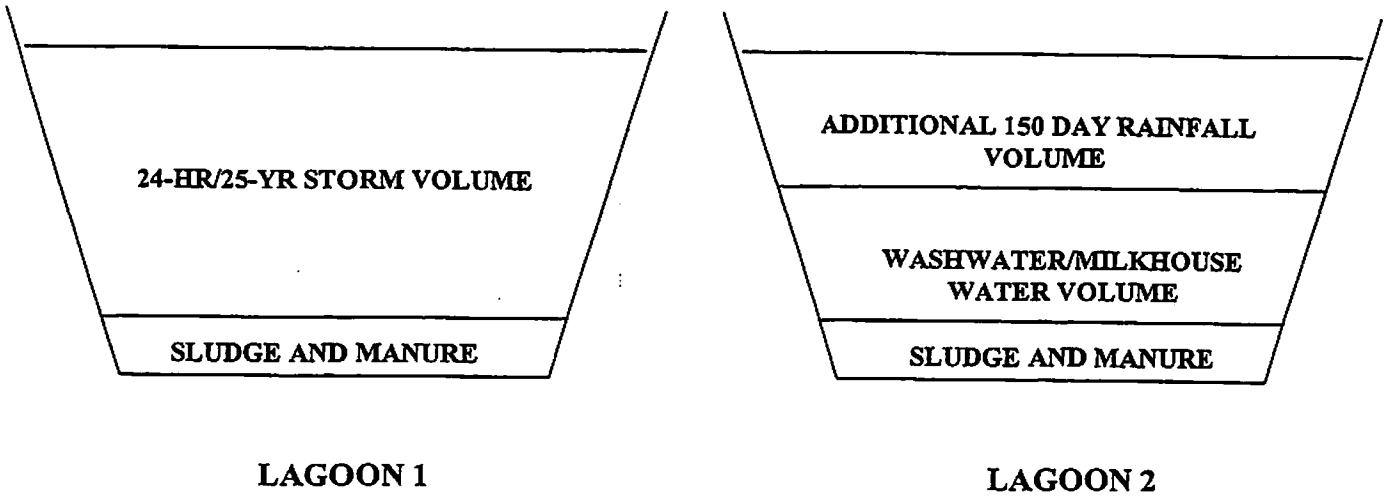


**Figure 2.** Cross sections of typical dairy lagoons with split volumes.

Appendix B contains the Inflow-Outflow computations designed to optimize the amount of storage required. This spreadsheet models the month-by-month totals of operations water, precipitation, 24-hour, 25-year storm data, evaporation and percolation. Although the 24-hour - 25-year storm could occur at any time, it was assumed to occur during the month of

January. Percolation is not included for November through March. All data is referenced in Appendices D-G. As can be seen in the spreadsheets, SNS Dairy has 19,245,907 million gallons of total inflow (Column [15]), and 43,846,695 gallons of total outflow (Column [27]).

Column [28] compares the total inflow with the total outflow on a month-by-month basis. The calculation subtracts the total outflow from the total inflow to give a clear estimate of which months have more inflow than outflow. If there is more inflow than outflow, additional storage is required. Since all factors including evaporation and percolation are included, this calculation gives an accurate estimate of how much storage is needed per month. The total capacity needed on the dairy based on all the months that have more inflow than outflow is then shown at the bottom of the calculation sheet. In the case of SNS Dairy, there are 5 months (November through March) where there is more inflow than outflow. There is a total of 8,386,434 gallons that need to be contained over the year. This number when compared with the total available capacity on the dairy shows if the lagoons need to be expanded or not. Since the SNS Dairy has 10,301,007 gallons of capacity, there is no need to expand the lagoons.

Following the spreadsheets are two charts showing the results of the Inflow-Outflow Computation, titled "Inflow-Outflow Comparison Chart" and "3D Inflow-Outflow Comparison Chart." The 3D Inflow-Outflow Comparison Chart is simply a 3D version of the Inflow-Outflow Comparison Chart. The dark blue line on the chart depicts the total operation water generated in gallons per month. The light blue line shows the total precipitation over the site in gallons per month. The yellow line shows the combination of operation water and precipitation water. The light red line shows the Total Inflow for the dairy including the operations water, precipitation, and the 24-hour, 25-year storm. The large jump in the light blue line denotes the 24-hour, 25-year storm. The purple line shows the evaporation from the fields and lagoons per month. The orange line shows the percolation from the fields per month. The large drop in the line denotes the lack of percolation in the winter months. The green line shows the Total Outflow from the dairy, including evaporation and percolation, per month.

This chart is an excellent reference because it shows the total amount of storage time that would be needed to properly manage the wastewater and storm water. In the case of SNS Dairy, there is more total inflow than total outflow in the months of November through March. This shows that the dairy technically needs 150 days of storage to properly manage the wastewater and storm runoff. In every other month there is more potential evaporation and percolation than there is inflow.

The SNS Dairy meets the requirements of the guidelines to Order No. 99-11 for 150 days storage. The following recommendations should be performed to meet the other requirements of the guidelines to Order No. 99-11.

**Recommendations**

1. Remove all animals from Corral #14. Clean the manure from the corral and construct a berm along the west fence line per Section I-I on the Plot Plan. Continue the berm south of the Corral to divert runoff from Corral #14 and run-on from the adjacent dairy away from Field #2. This portion of the berm should be constructed per Section L-L on the Plot Plan.

2. Construct a spillway near the southeast corner of Basin #1 per Detail 1 of the Plat Plan. The spillway shall be constructed of a material such as concrete, asphalt, or rip rap and shall include aprons designed to control slope erosion.

## III. PLOT (SITE) PLAN

Please see Plot Plan at the end of this report. (Plate 1)

## IV. COMPACTION

For construction and/or replacement of berms, the following procedures should be followed:

A. Over excavate the soil to 1'-2' below original ground before building berms.

B. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Backfill and fill materials should be completely free from manure.

C. Uniformly moisten sub-grade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

    1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
    2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

D. The excavation shall be backfilled and compacted to a relative compaction of no less than 90 percent. A Soils Engineer will need to be hired to ensure 90 percent compaction.

## V. OPERATION AND MAINTENANCE

The basic maintenance objectives are to ensure the reliable storage and disposal of accumulated wastewater and waste solids. To achieve this, there are several tasks that must be accomplished on a routine basis:

- Disposal of accumulated wastewater
- Measurement of accumulated waste solids
- Removal and disposal of accumulated waste solids
- Repair and maintenance of dikes and berms
- Maintenance of site grading
- Weed Abatement
- Record keeping

### Accumulated Wastewater Disposal

It is important that the water level in the wastewater holding ponds be properly maintained so that the ponds can provide the required storage capacity during wet weather periods. The California Regional Water Quality Control Board - Santa Ana Region (CRWQCB) has developed specific standards for the handling and storage of wastewater and storm water collected from the dairy operations. This portion of the Engineered Waste Management Plan describes the recommended maintenance procedures for the wastewater holding ponds to ensure compliance with CRWQCB standards.

In order to meet the requirements of the CRWQCB, the following general guidelines should be followed in disposing of wastewater in the ponds:

- Empty ponds just prior to the start of the wet weather season (November 1st) to ensure maximum capacity for the winter months. If stagnant water remains at the bottom of the ponds below the reach of the pumps, portable pumps should be used to remove all wastewater before the start of the wet season.
- Take advantage of dry weather periods during the annual wet weather period to dispose of accumulated wastewater. Fields must be bermed to prevent overflow from disposal areas onto adjacent properties.
- Start to empty ponds at end of wet weather season (March 31st) to maximize percolation and to create additional capacity in the lagoons.

General Equipment Maintenance. Pumps, pipelines and all pertinent equipment used in the handling of wastewater must be routinely checked and serviced to ensure proper operation:

- Check all wastewater distribution and application equipment weekly to ensure proper operation condition.
- Check and service motors and pumps three times a year. Portable replacement pumps should be available in case of a pump failure. If portable pumps are not available on-site, a rental company phone number should be posted with high visibility for all

employees. Rental company phone numbers are also listed on the last page of this report.

- Check transmission pipes for proper condition.
- Take inventory of spare parts and check sources of emergency repair.
- Disc percolation areas (fields) to about 18 inches to assure maximum percolation during wet seasons. Disking of the disposal area should occur as early in the year as possible, as soon as the fields are dry enough for the procedure to be effective. All of the disposal area should be disked at least once each year.

Dry Weather Disposal. Following the annual wet weather months, wastewater accumulated in the ponds should be disposed of in a timely manner in preparation of the coming wet weather months. The following guidelines should be followed for wastewater disposal during dry weather conditions:

- Apply wastewater to each of the evaporation/percolation disposal areas (fields) on a rotational basis.
- Wastewater should be applied to fields in a manner so that all wastewater will percolate and evaporate. Wastewater should be applied to all parts of the field to improve percolation and evaporation and to prevent stagnant wastewater.
- Observe the wastewater levels in the disposal areas on a daily basis and apply additional wastewater as the drying and percolation rates permit.
- Avoid having the fields completely flooded for extended periods of time. The best disposal rates will occur if the fields are flooded 4 to 6 inches and then allowed to evaporate and percolate. Fields can only be flooded to 4 to 6 inches if proper berms exist around the boundaries of the field. If stagnant wastewater develops, a portable pump or other measures should be used to help spread the water and prevent insect breeding conditions.

Wet Weather Disposal. During the wet weather months, there may be weeks of dry weather available to dispose of accumulated wastewater. Take advantage of every opportunity to reduce the wastewater levels in the holding basins/lagoons so that in the event of a large storm the chances of overflow and inadvertent runoff are reduced. The following guidelines should be followed for wastewater disposal during wet weather months:

- Apply wastewater to each of the disposal areas on a rotational basis.
- Apply wastewater in a manner so that all wastewater will percolate and evaporate. Fields should be watered so that all parts of the field receive wastewater. This will help percolation and evaporation and will help prevent stagnant wastewater.
- Observe the wastewater levels in the disposal areas on a daily basis. Apply additional wastewater only if the previously applied wastewater has evaporated or percolated and if a large storm is not eminent.
- Do not flood the fields and leave standing water for a long period of time unless it has so been designated.

## Accumulated Solids Removal and Disposal

Solids contained in the dairy-generated wastewater and in the storm water will naturally settle and accumulate in the bottom of the holding basins/lagoons. The settled solids will reduce the holding capacity of the ponds. To maintain holding pond storage capacity, solids must be routinely checked and periodically removed. The frequency of solids removal will depend on how quickly solids accumulate in the ponds.

Solids Removal. Remove accumulated solids 1st by agitation and pumping, 2nd by dredging, and 3rd by draining and scraping. If dredging is used, ensure that dredging runoff and excess wastewater taken from the ponds is contained and returned to the ponds. Lagoon solids should be removed *every summer* to ensure full capacity in the lagoons before the start of the next winter season.

Solids Disposal. Solids removed from the ponds can be applied to application areas on-site or must be hauled off-site to farm ground for land application. Solids from lagoon applied to application areas should be tilled and mixed into the native soils shortly after application.

## Levee, Berm and Dike Maintenance

The integrity of pond berms, levees, and dikes must be maintained. Follow these guidelines to ensure proper maintenance of the levees and berms:

- Check pond dikes, levees, and berms a minimum of two times per year for erosion and settlement, and repair as necessary (one inspection to occur just prior to the rainy season).
- Check pond dikes, levees, and berms a minimum of two times per year for rodent damage, and repair as necessary (one inspection to occur just prior to the rainy season).
- If immediate repairs must be made, compacted soil should be used to fill all cracks and holes until further repair can be performed.
- Apply suitable rodent control measures for widespread or frequent rodent damage. These may include Anti-Coagulant Bait, Trapping or Fumigation. Pest Control Specialists should be contacted before using any of these methods.

## Site Grading Maintenance

Site grading must be maintained to ensure proper drainage patterns across the dairy. The goal is to minimize the amount of water contaminated with manure and flowing into the holding ponds and to prevent contaminated wastewater from running off-site. The following guidelines should be followed to maintain site grading:

- Ensure that all wastewater generated by the daily dairy operations flows to the wastewater holding ponds. Re-grade as needed.
- Clean and repair buried drain lines as needed.

- Ensure that rainfall collected from cow holding pens, feed storage areas, and other manured areas flows to the holding ponds or containment areas. Re-grade as needed.
- Check the condition of containment walls and berms surrounding the cow confined areas, and repair as necessary.
- Ensure that storm water from off-site areas is diverted away from holding pens and other manured areas.
- Ensure that storm water from other off-site areas does not drain into the holding ponds.

**Weed Abatement**

Weed abatement measures such as pesticides and clearing and grubbing should be used to control weeds in fields, lagoons, wastewater transport channels, and wastewater access paths. Clearing manure out of lagoons once a year and discing fields at a minimum of once a year will help ensure weed abatement.

**Maintenance and Operations Records**

Keep records of all maintenance activities for future reference.

| Maintenance Activity | | Frequency |
|---|---|---|
| Holding Basin/Lagoon Levels | Pond Depth in Feet | Weekly |
| Holding Basin/Lagoon General Inspection | Berm and Lagoon Wall Stability | Weekly |
| Wastewater distribution/ Application Equipment | Pump/Pipe/Ditch Inspection | Weekly |
| Rainfall Totals | Days of Rain & Inches of Rainfall | Daily/Monthly |
| Solids Level | Solids Depth in Feet | Annually |
| Wastewater Application | Wastewater Depth in Inches | Daily |
| Wastewater Application | Days Applied & Approximate Volume | Weekly |
| Lagoon Solids Removal/Disposal | Days Removed & Volume Removed | Annually |
| Corral Solids Removal/Disposal | Days Removed & Volume Removed | Semi-Annually |
| Dikes and Berms Maintenance | Damage Found & Date Repairs Made | Semi-Annually |
| Site Grading Maintenance | Improvements Made & Date | Annually |
| Equipment Maintenance | Service and Repair Records & Dates | Semi-Annually |

- Daily inspections should be made upon all ponds, berms and wastewater distribution and application equipment following the first significant rain event of each Winter season. These daily inspections should continue until large rain events cease in the Spring.

- Should an unauthorized discharge be made from the facility, the dairy operator should follow the guidelines described in Monitoring and Reporting Program No. 99-11. (See back pages of Order No. 99-11.) Emergency phone numbers are located on the next page of this report.

**Emergency Spill Plan**

In the case of an emergency spill on the dairy, these directions should be followed.

First, the Regional Water Quality Control Board should be contacted if a spill occurs. This requirement is based on Order 99-11.
At least one of these people should be contacted in the case of a spill.

Regional Water Quality Control Board
Steve Mayville (909) 782-4130
Chief of the Dairy Units

Should a pump or piece of equipment break down, these numbers should be used to pursue emergency temporary equipment.

Vandenberg Manufacturing Company, Inc.
(909)-597-3412

Below is a list of spare parts that could be used in the case of an emergency spill.

There are no spare parts on-site.

## VII. GLOSSARY

| | | |
|---|---|---|
| **AFO** | - - | Animal Feeding Operation |
| **BMP** | - - | Best Management Practices |
| **Board** | - - | See CRWQCB, SAR |
| **CAFO** | - - | Concentrated Animal Feeding Operation |
| **Catastrophic Rainfall:** | | Any single event which would total the volume of the 25 year, 24 hour storm event; this could include tornadoes, hurricanes or other catastrophic conditions which could cause overflow due to winds or mechanical damage. |
| **CFR** | - - | Code of Federal Regulations |
| **Chronic Rain fall:** | - | A series of wet weather conditions which would not provide opportunity for dewatering and which total the volume of the 25 year, 24 hour storm event. |
| **CNMP** | - - | Comprehensive Nutrient Management Plan |
| **CRWQCB** | - - | California Regional Water Quality Control Board |
| **CWA** | - - | Clean Water Act |
| **Discharger** | - - | Persons discharging, or proposing to discharge, dairy wastes or other similar kinds of wastes from an existing dairy or related facility in any manner that may affect water quality. |
| **EWMP** | - - | Engineered Waste Management Plan |
| **NPDES** | - - | National Pollutant Discharge Elimination System |
| **Process Wastewater:** | | Water directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems |
| **Regional Board:** | - | See CRWQCB, SAR |
| **Run-on** | - - | Storm water that occurs off-site, but enters the CAFO |
| **SAR** | - - | Santa Ana Region |
| **SWRCB** | - - | State Water Resources Control Board |
| **TDS** | - - | Total Dissolved Solids |
| **TMDL** | - - | Total Maximum Daily Load |
| **USDA** | - - | United States Department of Agriculture |
| **USEPA** | - - | United States Environmental Protection Agency |
| **Washwater** | - - | Water used to wash cows prior to milking, milk equipment & milk barn |

# APPENDIX A

## WORKSHEET FOR DETERMINING CONTAINMENT FACILITY VOLUME

NOLTE
BEYOND ENGINEERING

WORKSHEET FOR DETERMINING
CONTAINMENT FACILITY VOLUME

NAME OF FACILITY: SNS Dairy

NAME OF OPERATOR: Sam Souza
7325 Edison Avenue
Chino, CA 91710

DATE: 12/03/03
PHONE: (909) 627-9432

**TOTAL ACRES OF PROPERTY** 36.55
**DAIRY SITE (Manured Areas)** 33.41 Acres

**TOTAL DAYS STORAGE:** 150

## ANIMAL UNITS

| | Milk Cows | Dry Cows | Bred Heifers | Heifers 1 yr/breed | Calves 3 m to 1yr | Baby Calves |
|---|---|---|---|---|---|---|
| Number (N) | 850 | 150 | 0 | 0 | 0 | 0 |
| Weights (lbs) | 1,400 | 1,400 | 1,100 | 775 | 450 | 150 |
| Pounds (lbs.x N) | 1,190,000 | 210,000 | 0 | 0 | 0 | 0 |
| Units ((N x lbs.)/1000) | 1,190.0 | 210.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | | | | | TOTAL ANIMAL UNIT | 1400.0 |

## MILKHOUSE AND PARLOR WATER RATE

| | Gal Per Milking | # Milkings Per Day | # Cows | Totals (Gal Per Day) |
|---|---|---|---|---|
| Bulk Tank Wash Volume [1] | 35 | 2 | | 70 |
| Pipeline Wash Volume [1] | 250 | 2 | | 500 |
| Milkhouse Parlor Floor Wash [1] | 250 | 2 | | 500 |
| Cow Prep (hose wash per cow) [1] | 0.25 | 2 | 850 | 425 |
| Miscellaneous Equipment (buckets etc.) [1] | 250 | 2 | | 500 |
| Miscellaneous Wash (wash/drip pen hose etc.) [1] | 525 | 2 | | 1050 |
| TOTAL DAILY MILK HOUSE AND PARLOR WATER USE | | | | 3,045 |

## WASH PEN/HOLDING PEN WATER RATE

| | | # Strings | Totals (Gal Per Day) |
|---|---|---|---|
| Number of Holding Pen Sprinklers | 54 | | |
| Duration of Sprinkler Wash Cycle (minutes) | 5 | | |
| Number of Wash Cycles (cow pens) | 8 | | |
| Sprinkler Flow Rate (gallons per minute) [1] | 5.05 | | |
| TOTAL WASH PEN WATER USE | 10,908 | 2 | 21,816 |

## WASHWATER VOLUME

| | | |
|---|---|---|
| Milkhouse and Wash Pen (gal per day) | | 24,861 |
| Required days for Containment Facility to hold | | 150 |
| TOTAL WASHWATER VOLUME | Gallons | 3,729,150 |
| | Cu. Ft. | 498,549 |

| EQUIVALENT GALLONS PER COW PER DAY | Gal Per Day | # Cows | # Cows |
|---|---|---|---|
| | 24,861 | 850 | 29.25 Gal/Cow/Day |

[1] University of California Cooperative Extension - Dairy Management Series, Planning and designing dairy waste storage

## WHOLE DAIRY: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 64,725 | 100% | 64,725 |
| Roofed Surface Area Draining Into Lagoon | 14,000 | 100% | 14,000 |
| Surface Area Of The Lagoon | 380,900 | 100% | 380,900 |
| Corral Surface Area Draining Into Lagoon | 554,525 | 50% | 277,263 |
| Pasture Area Draining Into Lagoon | 303,575 | 15% | 45,536 |
| Any Other Dirt Surface Area Draining Into Lagoon | 137,400 | 30% | 41,220 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 1,455,125 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | 33.41 | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **823,644** |

| REQUIRED STORM WATER AND RAINFALL RATES (WHOLE DAIRY) | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| TOTAL STORMWATER RUNOFF VOLUME | | |
|---|---|---|
| | **Gallons** | **7,582,986** |
| | **Cu Ft.** | **1,013,768** |
| | **Acre-Ft.** | **23.27** |

**EVAPORATION CALCULATION FOR WINTER MONTHS**

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 70,684 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| E. Basin 1-5 | 680 | 445 | 0 | 5.00 | 0.00 | - | - | 302,600 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.00 | 0.00 | - | - | 0 |
| **Total Lagoon Area #1, #2 & #3** | | | | | | | | **373,284** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

| | | | | |
|---|---|---|---|---|
| *This data is provided by the State of California,* | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPORATION | | | |
|---|---|---|---|
| Area of coverage: 57% | Gallons | 2,553,341 |
| | Cu Ft. | 341,356 |
| | Acre-Ft. | 7.84 |

| NET REQUIRED STORM WATER STORAGE VOLUME | | |
|---|---|---|
| | Gallons | 5,029,645 |
| | Cu Ft. | 672,412 |
| | Acre-Ft. | 15.44 |

| WASHWATER AND STORM WATER TOTAL VOLUME | | |
|---|---|---|
| (Wash Water and Storm Water) | Gallons | 8,758,795 |
| | Cu Ft. | 1,170,962 |

## MANURE CONSIDERATION

(daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet)

| | | | |
|---|---|---|---|
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 1,400.00 | | |
| Total Volume: | 1,918.00 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 191.80 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 28,770 |
| | | Acre-Ft. | 0.66 |

| Total Required Containment Facility Volume | | |
|---|---|---|
| | Gallons | 8,973,994 |
| | Cu Ft. | 1,199,732 |
| | Acre-Ft. | 27.54 |

## AREA #1: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 64,725 | 100% | 64,725 |
| Roofed Surface Area Draining Into Lagoon | 14,000 | 100% | 14,000 |
| Surface Area Of The Lagoon | 78,300 | 100% | 78,300 |
| Corral Surface Area Draining Into Lagoon | 428,125 | 50% | 214,063 |
| Pasture Area Draining Into Lagoon | 156,625 | 15% | 23,494 |
| Any Other Dirt Surface Area Draining Into Lagoon | 71,550 | 30% | 21,465 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 813,325 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | **18.67** | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **416,046** |

| REQUIRED STORM WATER AND RAINFALL RATES (Area 1) | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| TOTAL STORMWATER RUNOFF VOLUME | | |
|---|---|---|
| | **Gallons** | **3,830,385** |
| | **Cu Ft.** | **512,084** |
| | **Acre-Ft.** | **11.76** |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| | Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 70,684 |
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 |
| **Total Lagoon Area #1** | | | | | | | | | **70,684** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** **150.00** =Storgae Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| | | | |
|---|---|---|---|
| TOTAL WINTER MONTHS EVAPOARTION | | Gallons | 424,117 |
| Area of coverage: | 50% | Cu Ft. | 56,700 |
| | | Acre-Ft. | 1.30 |

| | | |
|---|---|---|
| NET REQUIRED STORM WATER STORAGE VOLUME | Gallons | 3,406,268 |
| | Cu Ft. | 455,383 |
| | Acre-Ft. | 10.45 |

| | | | |
|---|---|---|---|
| **WASHWATER AND STORM WATER TOTAL VOLUME** | | | |
| (Wash Water and Storm Water) | 0% | **Gallons** | **3,406,268** |
| | | **Cu Ft.** | **455,383** |

| | | | |
|---|---|---|---|
| **MANURE CONSIDERATION** | | | |
| (daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet) | | | |
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 782.51 | (Percentage) | 55.89% |
| Total Volume: | 1,072.04 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 107.20 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 16,081 |
| | | Acre-Ft. | 0.37 |

| | | |
|---|---|---|
| **Total Required Containment Facility Volume** | **Gallons** | **3,526,551** |
| | **Cu Ft.** | **471,464** |
| | **Acre-Ft.** | **10.82** |

## AREA #2: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 0 | 100% | 0 |
| Roofed Surface Area Draining Into Lagoon | 0 | 100% | 0 |
| Surface Area Of The Lagoon | 302,600 | 100% | 302,600 |
| Corral Surface Area Draining Into Lagoon | 126,400 | 50% | 63,200 |
| Pasture Area Draining Into Lagoon | 146,950 | 15% | 22,043 |
| Any Other Dirt Surface Area Draining Into Lagoon | 65,850 | 30% | 19,755 |
| **TOTAL SQUARE FEET OF DAIRY OPERATIONS** | 641,800 | (MANURED AREAS) | |
| **TOTAL ACREAGE OF DAIRY OPERATIONS** | **14.73** | (MANURED AREAS) | |
| **TOTAL SQUARE FEET OF SURFACE RUNOFF** | | | **407,598** |

## REQUIRED STORM WATER AND RAINFALL RATES (Area #2)

| | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | **TOTAL INCHES** | **14.77** |

| | | |
|---|---|---|
| **TOTAL STORMWATER AND RUNOFF VOLUME** | **Gallons** | **3,752,601** |
| | **Cu Ft.** | **501,685** |
| | **Acre-Ft.** | **11.52** |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| E. Basin 1-5 | 680 | 445 | 445 | 5.0 | 0.0 | - | - | 302,600 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| **Total Lagoon Area #2** | | | | | | | | **302,600** |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPOARTION | | | |
|---|---|---|---|
| Area of coverage: 60% | Gallons | 2,178,787 |
| | Cu Ft. | 291,282 |
| | Acre-Ft. | 6.69 |

| NET REQUIRED STORM WATER STORAGE VOLUME | | |
|---|---|---|
| | Gallons | 1,573,814 |
| | Cu Ft. | 210,403 |
| | Acre-Ft. | 4.83 |

| WASHWATER AND STORM WATER TOTAL VOLUME | | |
|---|---|---|
| (Wash Water and Storm Water) % Wash Water : 100% | Gallons | 5,302,964 |
| | Cu Ft. | 708,952 |

| MANURE CONSIDERATION | | | | |
|---|---|---|---|---|
| (daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet) | | | | |
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | | |
| Total Units | 617.49 | (Percentage) | | 44.11% |
| Total Volume: | 845.96 | (Cubic ft Per Day) | | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | | 84.60 |
| Storage Period (days) | | | | 150 |
| TOTAL MANURE VOLUME | | | Cu Ft. | 12,689 |
| | | | Acre-Ft. | 0.29 |

| Total Required Containment Facility Volume | | |
|---|---|---|
| | Gallons | 5,397,880 |
| | Cu Ft. | 721,642 |
| | Acre-Ft. | 16.57 |

## AREA #3: RUNOFF VOLUME RAIN AND STORM WATERS

| | Square Feet | Runoff Coeff | Total Sq. Ft. |
|---|---|---|---|
| Concrete Surface Area Draining Into The Lagoon | 0 | 100% | 0 |
| Roofed Surface Area Draining Into Lagoon | 0 | 100% | 0 |
| Surface Area Of The Lagoon | 0 | 100% | 0 |
| Corral Surface Area Draining Into Lagooh | 0 | 50% | 0 |
| Pasture Area Draining Into Lagoon | 0 | 15% | 0 |
| Any Other Dirt Surface Area Draining Into Lagoon | 0 | 30% | 0 |
| TOTAL SQUARE FEET OF DAIRY OPERATIONS | 0 | (MANURED AREAS) | |
| TOTAL ACREAGE OF DAIRY OPERATIONS | 0.00 | (MANURED AREAS) | |
| TOTAL SQUARE FEET OF SURFACE RUNOFF | | | 0 |

## REQUIRED STORM WATER AND RAINFALL RATES (Area #3)

| | | |
|---|---|---|
| 150 | day Average Rainfall for Region (inches) | 10.27 |
| 24-hr, 25 year Storm Rainfall (inches) | | 4.50 |
| | TOTAL INCHES | 14.77 |

| | | |
|---|---|---|
| TOTAL STORMWATER AND RUNOFF VOLUME | Gallons | 0 |
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

## EVAPORATION CALCULATION FOR WINTER MONTHS

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. |
|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 |
| Total Lagoon Area #3 | | | | | | | | 0 |

## WINTER MONTH EVAPORATION RATE

Winter (5) Months Evaporation Rate for **Prado Dam** 150 =Storage Days

*This data is provided by the State of California,*

| | | | | |
|---|---|---|---|---|
| | | **107** | *mm* | ***November*** |
| | | **86** | *mm* | ***December*** |
| | | **87** | *mm* | ***January*** |
| | | **89** | *mm* | ***February*** |
| add | + | **120** | *mm* | ***March*** |
| | | 489 | *mm* | Total winter months evap. rate in millimeters |
| multiply | x | 0.03937 | | convert to inches |
| | | 19.25 | *in.* | Total winter months evap. rate in inches |
| divide | / | 12.00 | | *inches in a foot* |
| | | **1.60** | *ft.* | Total winter months evaporation rate in feet |

| TOTAL WINTER MONTHS EVAPOARTION | | Gallons | 0 |
|---|---|---|---|
| Area of coverage: | 50% | Cu Ft. | 0 |
| | | Acre-Ft. | 0.00 |

| NET REQUIRED STORM WATER STORAGE VOLUME | Gallons | 0 |
|---|---|---|
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

## WASHWATER AND STORM WATER TOTAL VOLUME

| (Wash Water and Storm Water) | % Wash Water : 0% | Gallons | 0 |
|---|---|---|---|
| | | Cu Ft. | 0 |

## MANURE CONSIDERATION

(daily animal waste produced per 1000 lb Animal Unit equals 1.37 cubic feet)

| | | | |
|---|---|---|---|
| Daily Production Capacity per Unit | 1.37 | (Cubic ft) | |
| Total Units | 0.00 | (Percentage) | 0.00% |
| Total Volume: | 0.00 | (Cubic ft Per Day) | |
| Percent of daily manure produced contained in liquid (per day) | 10.00% | | 0.00 |
| Storage Period (days) | | | 150 |
| TOTAL MANURE VOLUME | | Cu Ft. | 0 |
| | | Acre-Ft. | 0.00 |

| Total Required Containment Facility Volume | Gallons | 0 |
|---|---|---|
| | Cu Ft. | 0 |
| | Acre-Ft. | 0.00 |

TOTAL AVAILABLE VOLUME (Cu.ft.)

| Storage | Length | Width | | Depth | | Slope | Freeboard | Sq. Ft. | Cu. Ft. |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| Basin #1 | 870 | 90 | | 8.00 | | 1.00 | 1.00 | 78,300 | 620,640 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| E. Basin 1-5 | 680 | 445 | 445 | 5 | 0 | - | - | 302,600 | 756,500 |
| 0 | 0 | 0 | 0 | 0 | 0 | - | - | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | | 0.00 | | 0.00 | 0.00 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.0 | 0.0 | - | - | 0 | 0 |
| | | | | | | | Total: | 380,900 | 1,377,140 |

## WHOLE DAIRY

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **10,301,007** |
| | | **Cu Ft.** | **1,377,140** |
| | | **Acre-Ft.** | **31.61** |
| **Additional Volume Required** | -1,327,013 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-1

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **4,642,387** |
| | | **Cu Ft.** | **620,640** |
| | | **Acre-Ft.** | **14.25** |
| **Additional Volume Required** | -1,115,836 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-2

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **5,658,620** |
| | | **Cu Ft.** | **756,500** |
| | | **Acre-Ft.** | **17.37** |
| **Additional Volume Required** | -260,740 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## VOLUME DRAINING INTO AREA-3

| | | | |
|---|---|---|---|
| **Current Capacity** | | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |
| **Additional Volume Required** | 0 | **Gallons** | **0** |
| | | **Cu Ft.** | **0** |
| | | **Acre-Ft.** | **0.00** |

## DEPTH IN STORAGE AREA-1 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 228,748 |
| | Total Area #1 | 78,300 |
| **Total Depth Needed at Top of Lagoon to Hold 24 HR, 25 Year Storm** | | 3.00 |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

## DEPTH IN STORAGE AREA-2 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 180,506 |
| | Total Area #2 | 302,600 |
| **Total Depth Needed at Top of Basin to Hold 24 HR, 25 Year Storm** | | 0.60 |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

## DEPTH IN STORAGE AREA-3 NEEDED TO HOLD 24 HR, 25 YR STORM

| | | |
|---|---|---|
| *75% Runoff Coeff* [3] | Total Required Storm Water Volume [2] | 0 |
| | Total Area #3 | 0 |
| **Total Depth Needed at Top of Basin to Hold 24 HR, 25 Year Storm** | | #DIV/0! |

[2] Total Required Storm Water Volume during a 24 hour, 25 year storm is calculated based on Total Sq. feet of Dairy Operations multiplied by an alternate Runoff Coeff [3].

# APPENDIX B

## INFLOW-OUTFLOW COMPUTATION

**Annual Totals Worksheet (Per Month)**

| Month | [1] Operations Water | [2] | [3] Precipitation | [4] | [5] Drainage Per Month | [6] | [7] | [8] Total Inflow | [9] 25 Year Storm | [10] | [11] Drainage Per Month | [12] | [13] | [14] Manure Inflow | [15] Total Inflow |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | [4] x [5] | [5] x 7.48 | [2] + [7] | | | | [10] x [11] | [12] x 7.48 | | [8] + [13] + [14] |
| | Volume | | | | Area | Volume | | Volume | | | Area | Volume | | Volume | Volume |
| | Gal per day | Gal per Month[A] | Inches | Feet | Square feet | Cubic feet | Gal per Month | Gal per Month | Inches | Feet | Square feet | Cubic feet | Gal per Month | Gallons per Month | Gallons per Month |
| August | 24,661 | 770,891 | 0.20 | 0.02 | 823,844 | 13,727 | 102,661 | 673,372 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 918,412 |
| September | 24,861 | 745,830 | 0.39 | 0.03 | 823,644 | 26,788 | 200,228 | 946,058 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 989,098 |
| October | 24,861 | 770,691 | 0.37 | 0.03 | 823,844 | 25,396 | 189,960 | 960,651 | 0.0 | 0.00 | 823,844 | 0 | 0 | 44,475 | 1,005,125 |
| November | 24,861 | 745,830 | 1.54 | 0.13 | 823,844 | 105,701 | 790,843 | 1,536,473 | 0.0 | 0.00 | 823,844 | 0 | 0 | 43,040 | 1,579,513 |
| December | 24,861 | 770,891 | 1.85 | 0.15 | 823,844 | 128,978 | 949,799 | 1,720,490 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 1,764,964 |
| January | 24,861 | 770,891 | 2.35 | 0.20 | 823,644 | 181,297 | 1,206,501 | 1,977,192 | 4.5 | 0.38 | 823,644 | 308,858 | 2,310,321 | 44,475 | 4,331,987 |
| February | 24,861 | 696,108 | 2.64 | 0.22 | 623,644 | 181,202 | 1,355,388 | 2,051,496 | 0.0 | 0.00 | 823,644 | 0 | 0 | 40,171 | 2,091,667 |
| March | 24,861 | 770,891 | 1.89 | 0.16 | 823,644 | 129,724 | 970,335 | 1,741,028 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 1,785,500 |
| April | 24,861 | 745,830 | 0.83 | 0.07 | 823,644 | 56,969 | 426,126 | 1,171,956 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 1,214,996 |
| May | 24,861 | 770,891 | 0.21 | 0.02 | 823,644 | 14,414 | 107,615 | 878,506 | 0.0 | 0.00 | 623,644 | 0 | 0 | 44,475 | 922,981 |
| June | 24,861 | 745,830 | 0.04 | 0.00 | 823,644 | 2,745 | 20,536 | 788,366 | 0.0 | 0.00 | 823,644 | 0 | 0 | 43,040 | 809,406 |
| July | 24,661 | 770,891 | 0.03 | 0.00 | 823,644 | 13,727 | 102,681 | 848,511 | 0.0 | 0.00 | 823,644 | 0 | 0 | 44,475 | 917,847 |
| | | | | | | | | | | | | | Total | | 19,245,907 [B] |
| | | | | | | | | | | | | | | *Annual Total* | *59.07 [B] Acre-Ft.* |
| | | | | | | | | | | | | | | *Winter Months Total* | *35.46 [F] Acre-Ft.* |

| Month | [15] Evaporation (Inches) | [17] | [18] Area (sq ft.) | [19] | [20] Total Evaporation | [21] | [22] | [23] Percolation Application | [24] | [25] Percolation Field Area[C] | [25] | [27] Total Outflow | [28] Total Balance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | [18] + [19] | [17] x [20] | [21] x 7.48 | | | | [23] x [25] | [21] + [24] | [15] - [27] |
| | | | | | Area | Volume | | Rate Per Day | Rate Per Month | Rate | | Rate | Volume |
| | Inches[E] | Feet | Field[D] | Lagoon | Square feet | Cubic Feet | Gal per Month | Gallon / feet$^2$ x Day | Gallon / feet$^2$ x Days | Square feet | Gal per Month | Gallons per Month | Gallons per Month |
| August | 10.00 | 0.83 | 146,950 | 380,900 | 527,850 | 439,874 | 3,290,258 | 0.7 | 21.7 | 146,950 | 3,188,815 | 8,479,073 | -5,562,682 |
| September | 7.91 | 0.88 | 148,950 | 380,900 | 527,850 | 348,089 | 2,603,708 | 0.7 | 21 | 145,950 | 3,085,950 | 5,689,658 | -4,700,561 |
| October | 5.87 | 0.47 | 148,950 | 380,900 | 527,850 | 249,377 | 1,865,343 | 0.7 | 21.7 | 146,950 | 3,186,815 | 5,054,158 | -4,049,033 |
| November | 2.11 | 0.18 | 148,950 | 380,900 | 527,850 | 92,851 | 693,027 | 0 | 0 | 146,950 | 0 | 693,027 | 888,486 |
| December | 1.69 | 0.14 | 148,950 | 380,900 | 527,850 | 74,487 | 557,012 | 0 | 0 | 146,950 | 0 | 557,012 | 1,207,952 |
| January | 1.71 | 0.14 | 146,950 | 380,900 | 527,850 | 75,333 | 563,489 | 0 | 0 | 146,950 | 0 | 563,489 | 3,768,498 |
| February | 1.75 | 0.15 | 148,950 | 380,900 | 527,850 | 77,065 | 576,443 | 0 | 0 | 148,950 | 0 | 578,443 | 1,515,224 |
| March | 2.38 | 0.20 | 148,950 | 380,900 | 527,850 | 103,907 | 777,228 | 0 | 0 | 146,950 | 0 | 777,226 | 1,008,274 |
| April | 8.14 | 0.61 | 146,950 | 380,900 | 527,850 | 270,159 | 2,020,789 | 0.7 | 21 | 146,950 | 3,085,950 | 5,106,739 | -3,891,743 |
| May | 7.68 | 0.64 | 148,950 | 380,900 | 527,850 | 337,899 | 2,525,988 | 0.7 | 21.7 | 146,950 | 3,188,815 | 5,714,801 | -4,791,820 |
| June | 8.62 | 0.72 | 148,950 | 380,900 | 527,850 | 379,282 | 2,838,878 | 0.7 | 21 | 146,950 | 3,085,950 | 5,922,828 | -5,113,420 |
| July | 10.71 | 0.89 | 146,950 | 380,900 | 527,850 | 471,048 | 3,523,426 | 0.7 | 21.7 | 146,950 | 3,188,815 | 8,712,241 | -5,795,829 |
| | | | | | | | | | | | Total | 43,846,895 [B] | -25,518,835 |
| | | | | | | | | | | | | *Annual Total* | *134.57 [B] Acre-Ft.* |
| | | | | | | | | | | | | *Winter Months Total* | *9.72 [F] Acre-Ft.* |

[A] Calculation includes actual number of days in each month
[B] Annual totals are calculated January through December
[C] Assumes no percolation during winter months (Nov.-Mar.)
[D] Assumes field is barred for winter disposal. Null values are inserted if field cannot be used for winter disposal.
[E] Evaporation inches reduced 50% during winter months (Nov.-Mar.)
[F] Winter months totals are calculated November through March

| | | |
|---|---|---|
| TOTAL CAPACITY NEEDED ON DAIRY | 8,388,434 | Gallons |
| | 1,121,161 | Cubic Feet |
| | 25.74 | Acre-Ft. |

| | | |
|---|---|---|
| TOTAL AVAILABLE CAPACITY | 10,301,007 | Gallons |
| | 31.61 | Acre-Ft. |

## Inflow - Outflow Comparison Chart

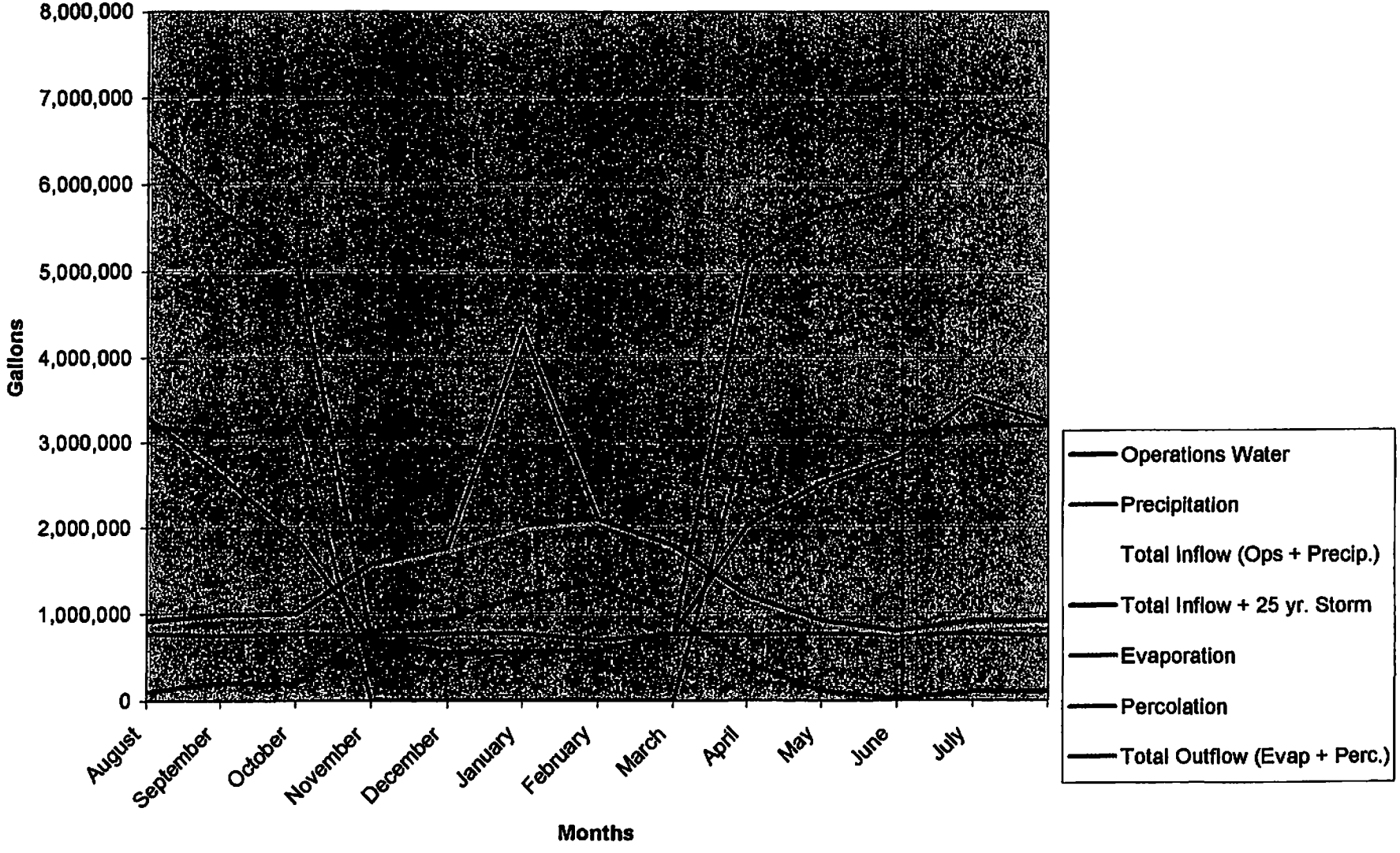

**Evaporation-vs-Percipitation Comparison Chart**

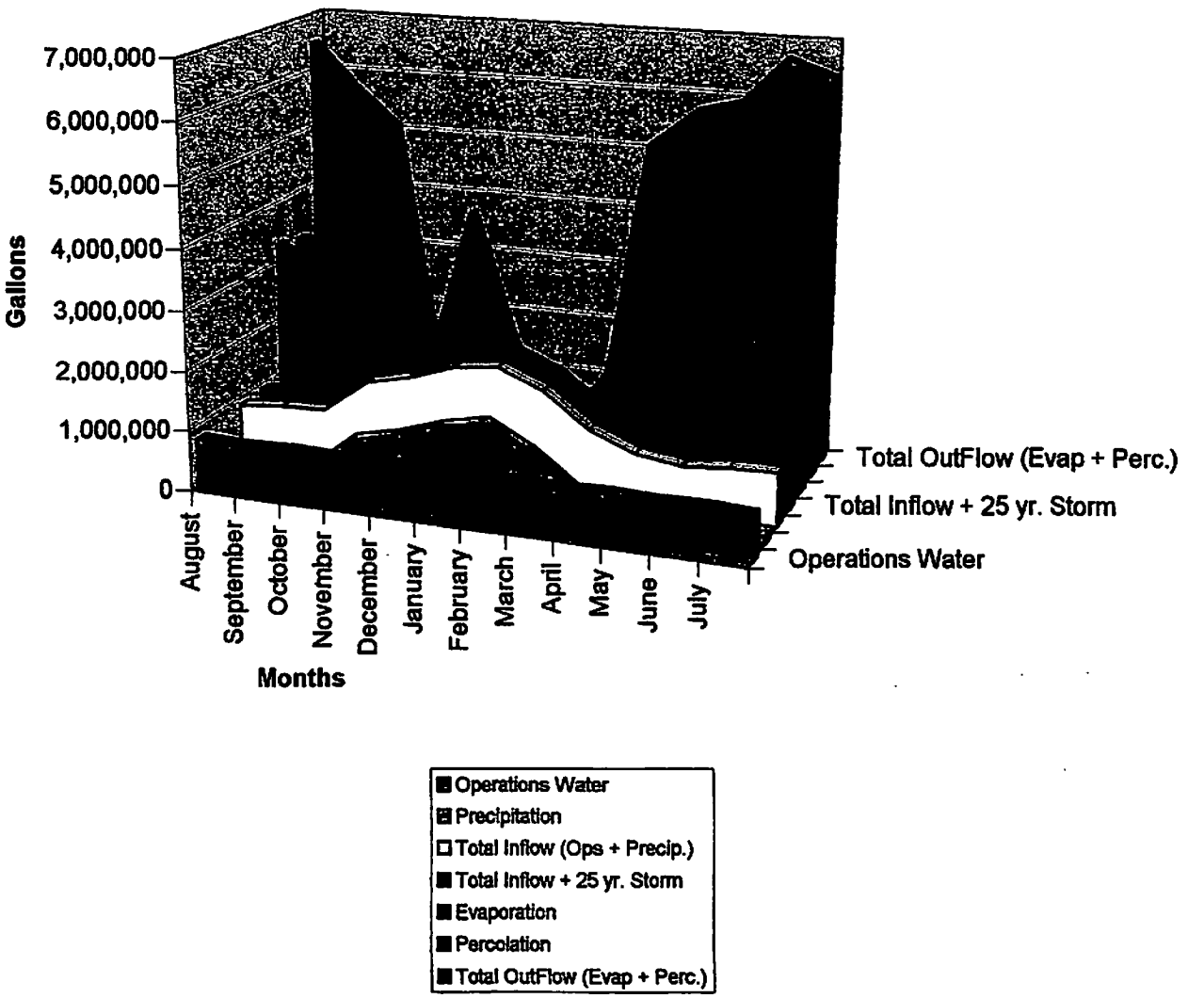

# APPENDIX C

## MILKHOUSE AND WASH PEN VOLUME ESTIMATION DATA

*University of California*
*Cooperative Extension*

# *Dairy Manure Management Series*

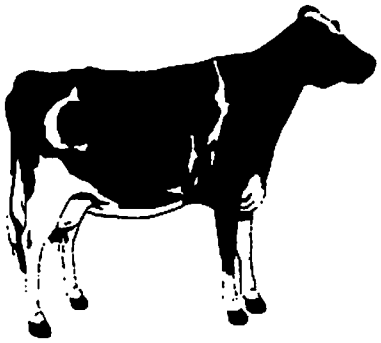

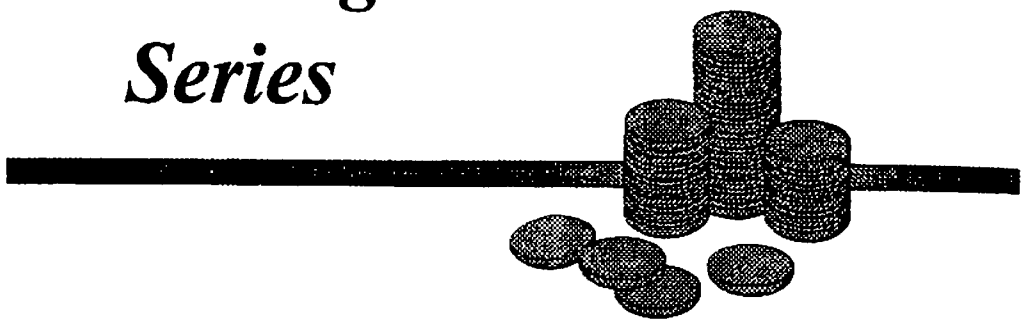

## PLANING AND DESIGNING DAIRY WASTE STORAGE FACILITIES

**Alison Van Eenennaam[1]**

A dairy waste management system must be planned, designed and managed to:

- Prevent water pollution
- Control odors
- Eliminate breeding places for insects
- Provide a convenient and efficient operation for the dairy owner/operator
- Require minimal investment, maintenance and operational costs
- Meet legal requirements.

Proper management of manure and waste water ensures further benefits in providing a healthy atmosphere for the animals. A facility that is clean, dry and free of manure provides a less desirable environment for disease organisms to thrive.

The purposes of this document are to:

- detail the factors to consider in designing a waste management storage facility;
- outline the major factors to be considered when designing dairy waste holding ponds; and
- provide an example of how to size a dairy manure holding pond.

[1]University of California Cooperative Extension Postdoctoral Associate.

## TABLES

**Table 1.** Waste produced daily by a 1,000 pound dairy cow and where it is deposited (2).

| Area | Percent | Cubic Feet |
|---|---|---|
| Housing area | 40 | .548 |
| Feeding area | 45 | .617 |
| Holding pen | 10 | .137 |
| Milk parlor | 5 | .068 |
| Total cubic feet/1,000 lb cow | | 1.370 |

**Table 2.** Volume of milkhouse and parlor water (2, and D. Johnson, NRCS, pers. comm.).

| Washing operation | Water Volume |
|---|---|
| Bulk Tank | |
| Automatic, 3 cycle wash | 60 to 110 gal/wash |
| Manual wash | 30 to 50 gal/wash |
| Pipeline | |
| In parlor (volume is higher for long flat barns) | 75 to 150 gal/wash |
| Milkhouse and parlor floors | 300 to 700 gal/wash |
| Pail milkers | 30 to 40 gal/wash |
| Miscellaneous equipment | 30 gal/day |
| Cow preparation wash | |
| Automatic | 1 to 4.5 gal/wash/cow |
| Manual | .25 to .5 gal/wash/cow |
| Holding pen (sprinklers) | 5 gal/min/head (dependent upon nozzle size & pressure) |

# APPENDIX D

RAINFALL DATA

# CORONA , CALIFORNIA (042031)

## 1961-1990 Monthly Climate Summary

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 67.40 | 69.40 | 71.10 | 75.20 | 79.40 | 85.10 | 91.80 | 92.10 | 88.70 | 82.30 | 70.80 | 67.40 | 78.60 |
| Average Max. Temperature (F) | 40.60 | 41.70 | 43.00 | 45.70 | 50.40 | 54.60 | 58.50 | 59.90 | 56.90 | 50.90 | 42.90 | 39.80 | 48.90 |
| Average Total Precipitation (in.) | 2.35 | 2.64 | 1.89 | 0.83 | 0.21 | 0.04 | 0.03 | 0.20 | 0.39 | 0.37 | 1.54 | 1.85 | 12.32 |

Unofficial values based on averages/sums of smoothed daily data. Information is computed from available daily data during the 1961-1990 period. Smoothing, missing data and observation-time changes may cause these 1961-1990 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made for missing data or time of observation. Check **NCDC normals** table for official data.

---

*Western Regional Climate Center,* wrcc@dri.edu

*Total Rainfall Winter Months:*

| November | | December | | January | | Febuary | | March | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *1.54* | + | *1.85* | + | *2.35* | + | *2.64* | + | *1.89* | = | *10.27* | inches |

# CORONA, CALIFORNIA

## 1961 - 1990 Temperature and Precipitation

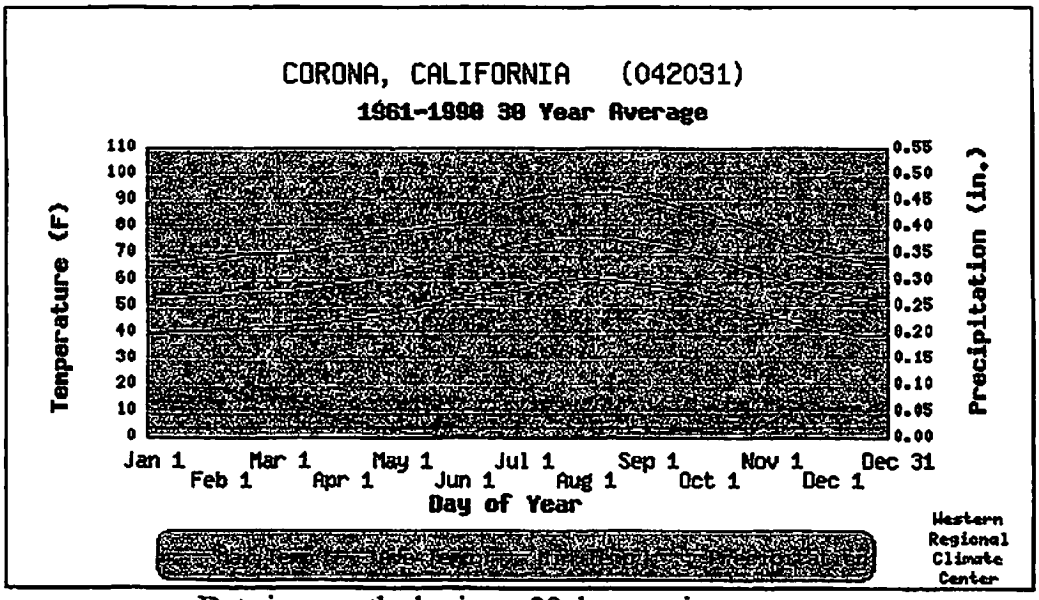


Data is smoothed using a 29 day running average.

■ - Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1961 and 1990.
■ - Ave. Temp. is the average of all daily average temperatures recorded for the day of the year the years 1961 and 1990.
■ - Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1961 and 1990.
■ - Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1961 and 1990.

# APPENDIX E

EVAPORATION DATA

State of California
The Resources Agency

Department of
Water Resources

save water
DWR

# Evaporation from Water Surfaces in California

Bulletin 73-79
November 1979

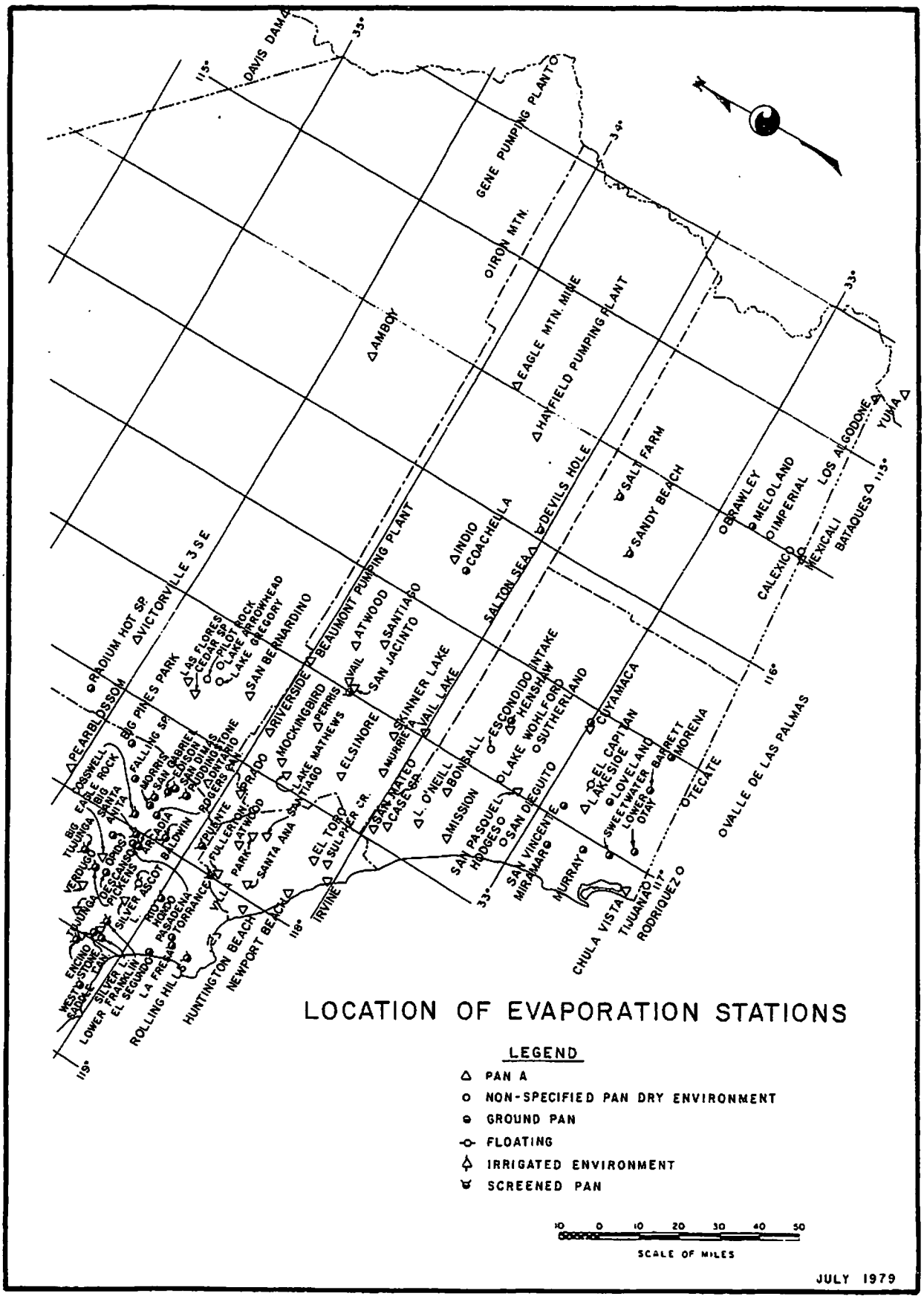
LOCATION OF EVAPORATION STATIONS
LEGEND
PAN A
NON-SPECIFIED PAN DRY ENVIRONMENT
GROUND PAN
FLOATING
IRRIGATED ENVIRONMENT
SCREENED PAN
10 0 10 20 30 40 50
SCALE OF MILES
JULY 1979
DAVIS DAM
GENE PUMPING PLANT
IRON MTN.
AMBOY
EAGLE MTN. MINE
HAYFIELD PUMPING PLANT
SALT FARM
SANDY BEACH
DEVILS HOLE
INDIO
COACHELLA
SALTON SEA
BEAUMONT PUMPING PLANT
VICTORVILLE 3 SE
RADIUM HOT SP.
PEARBLOSSOM
BIG PINES PARK
LAS FLORES
CEDAR SP.
PILOT ROCK
LAKE ARROWHEAD
LAKE GREGORY
SAN BERNARDINO
RIVERSIDE
PERRIS
AVAIL
ATWOOD
SANTIAGO
SAN JACINTO
SKINNER LAKE
AVAIL LAKE
ESCONDIDO INTAKE
HENSHAW
LAKE WOHLFORD
SUTHERLAND
CUYAMACA
EL CAPITAN
LAKESIDE
LOVELAND
SWEETWATER
LOWER OTAY
BARRETT
MORENA
OTECATE
VALLE DE LAS PALMAS
BRAWLEY
MELOLAND
IMPERIAL
CALEXICO
MEXICALI
LOS ALGODONES
YUMA
BATAQUES
MOSSWELL
EAGLE ROCK
BIG TUJUNGA
SANTA ANITA
FALLING SP.
MORRIS
SAN GABRIEL
EDISON
SAN DIMAS
FLUDDINGTONE
ONTARIO
ROGERS PAN
PRADO
MOCKINGBIRD
LAKE MATHEWS
SANTIAGO
ELSINORE
MURRIETA
VERDUGO
GRIDS
PICKENS
ARCADIA
BALDWIN
PUENTE
FULLERTON
ATWOOD
PARK
SANTA ANA
EL TORO
SULPHUR CR.
SAN MATEO
CASESA
L. O'NEILL
BONSALL
MISSION
SAN PASQUEL
HODGES
SAN DIEGUITO
SAN VINCENTE
MIRAMAR
MURRAY
CHULA VISTA
TIJUANA
RODRIQUEZ
ENCINO
WESTSTONE
SADDLE PAK
SILVER LAKE
LOWER FRANKLIN
EL SEGUNDO
SILVER
L. ASCOT
PICO
HOOD
PASADENA
TORRANCE
LA FREE
ROLLING HILLS
HUNTINGTON BEACH
NEWPORT BEACH
IRVINE
33°
34°
115°
116°
117°
118°

EVAPORATION MEASUREMENT REPORT
UNIT OF MEASURE = MILLIMETRES



| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 705010 | POMONA (NEAR)-AGR EXPT ST | 857 | 01S 09W 27 S | 34 03 | 117 49 | LAX | 907 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G | 1903 | | | | | | | | | | | 230 | 238 | 160 |
| | 1904 | 1729 | 168 | 108 | 64 | 71 | 65 | 94 | 127 | 165 | 208 | 237 | 238 | 184 |
| | 1905 | 1597 | 136 | 103 | 75 | 49 | 42 | 95 | 104 | 152 | 196 | 227 | 229 | 189 |
| | 1906 | | 134 | 103 | 75 | | | | | | | | | |
| G | MEAN | 1552 | 146 | 105 | 71 | 60 | 54 | 95 | 116 | 159 | 202 | 231 | 235 | 178 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 705011 | POMONA SPRR | 876 | 01S 08W 29 S | 34 03 17 | 117 45 02 | LAX | 410 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1933 | | | | | | | | | | | 306 | 272 | 183 |
| | 1934 | | 157 | 170 | 73 | 118 | 84 | 178 | 200 | 259 | | 314 | 282 | 251 |
| A | MEAN | 2043 | 157 | 170 | 73 | 118 | 84 | 178 | 200 | 259 | | 310 | 277 | 217 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 712301 | PRADO DAM | 565 | 03S 07W 20 P S | 33 53 30 | 117 38 03 | RIV | 415 | |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1930 | | | | | | | | | | | 279 | 250 | |
| | 1931 | | | 128 | 97 | 102 | 62 | 146 | 154 | 197 | 232 | 293 | 250 | 194 |
| | 1932 | 1914 | 137 | 90 | 64 | 107 | 94 | 131 | 153 | 208 | 232 | 253 | 266 | 179 |
| | 1933 | 1942 | 152 | 137 | 70 | 30 | 112 | 134 | 138 | 191 | 229 | 270 | 241 | 188 |
| | 1934 | 1346 | 130 | 113 | 57 | 100 | 69 | 124 | 161 | 232 | 182 | 257 | 225 | 196 |
| | 1935 | 1630 | 119 | 65 | 52 | 52 | 69 | 90 | 118 | 170 | 216 | 266 | 227 | 186 |
| | 1936 | 1916 | 139 | 86 | 85 | 82 | 78 | 115 | 132 | 197 | 258 | 285 | 256 | 203 |
| | 1937 | 1737 | 130 | 105 | 69 | 41 | 58 | 93 | 148 | 171 | 231 | 256 | 230 | 205 |
| | 1938 | | 139 | 70 | 77 | | | | | | 45 | 255 | 235 | 197 |
| | 1939 | 1789 | 137 | 151 | 90 | 68 | 87 | 91 | 138 | 179 | 217 | 241 | 221 | 169 |
| | 1940 | 1533 | 135 | 70 | 57 | 41 | 70 | 114 | 105 | 174 | 165 | 215 | 204 | 163 |
| | 1941 | 1771 | 114 | 99 | 54 | 66 | 61 | 114 | 135 | 225 | 225 | 281 | 221 | 176 |
| | 1942 | 2245 | 148 | 136 | 72 | 117 | 109 | 177 | 131 | 269 | 243 | 315 | 308 | 220 |
| | 1943 | 2297 | 178 | 148 | 104 | 146 | 130 | 110 | 148 | 242 | 262 | 307 | 288 | 234 |
| | 1944 | 2105 | 166 | 166 | 107 | 114 | 81 | 182 | 178 | 211 | 236 | 272 | 229 | 163 |
| | 1945 | 2034 | 148 | 91 | 88 | 49 | 87 | 133 | 192 | 219 | 218 | 296 | 278 | 235 |
| | 1946 | 2073 | 116 | 117 | 81 | 113 | 125 | 80 | 200 | 168 | 275 | 319 | 301 | 178 |
| | 1947 | 2081 | 154 | 94 | 60 | 100 | 77 | 129 | 195 | 204 | 245 | 312 | 284 | 227 |
| | 1948 | 2167 | 146 | 120 | 98 | 144 | 106 | 114 | 179 | 210 | 223 | 288 | 290 | 249 |
| | 1949 | 2095 | 141 | 188 | 93 | 93 | 65 | 90 | 178 | 191 | 258 | 280 | 288 | 230 |
| | 1950 | 2017 | 167 | 136 | 83 | 68 | 51 | 139 | 164 | 197 | 248 | 302 | 272 | 190 |
| | 1951 | 2139 | 188 | 138 | 69 | 93 | 86 | 191 | 151 | 179 | 228 | 311 | 283 | 222 |
| | 1952 | 2080 | 201 | 118 | 81 | 67 | 115 | 123 | 136 | 230 | 229 | 294 | 275 | 211 |
| | 1953 | 2081 | 135 | 88 | 76 | 106 | 134 | 155 | 154 | 233 | 241 | 304 | 253 | 202 |
| | 1954 | 1978 | 140 | 84 | 167 | 67 | 122 | 97 | 130 | 186 | 203 | 262 | 220 | 200 |
| | 1955 | 1924 | 149 | 104 | 92 | 63 | 94 | 137 | 186 | 165 | 198 | 255 | 260 | 221 |
| | 1956 | 1829 | 116 | 88 | 42 | 55 | 89 | 142 | 179 | 181 | 227 | 260 | 226 | 224 |
| | 1957 | 2057 | 155 | 158 | 128 | 66 | 65 | 78 | 148 | 190 | 255 | 306 | 292 | 216 |
| | 1958 | 1950 | 119 | 92 | 94 | 103 | 64 | 49 | 182 | 202 | 275 | 276 | 253 | 241 |
| | 1959 | 2089 | 160 | 123 | 118 | 78 | 68 | 168 | 172 | 195 | 238 | 304 | 268 | 197 |
| | 1960 | 2270 | 169 | 181 | 120 | 53 | 100 | 125 | 185 | 218 | 242 | 325 | 288 | 264 |
| | 1961 | 2273 | 169 | 63 | 124 | 147 | 133 | 146 | 196 | 225 | 254 | 311 | 300 | 205 |
| | 1962 | 1589 | 138 | 95 | 98 | 118 | 33 | 73 | 134 | 145 | 172 | 220 | 221 | 142 |
| | 1963 | 1558 | 91 | 69 | 67 | 81 | 79 | 97 | 102 | 162 | 190 | 235 | 220 | 165 |
| | 1964 | 1672 | 102 | 82 | 99 | 111 | 141 | 112 | 146 | 166 | 181 | 185 | 192 | 155 |
| | 1965 | 1614 | 123 | 108 | 83 | 71 | 106 | 72 | 157 | 159 | 190 | 171 | 222 | 152 |
| | 1966 | 1811 | 144 | 46 | 60 | 76 | 85 | 124 | 163 | 173 | 215 | 267 | 249 | 209 |
| | 1967 | 2045 | 196 | 73 | 136 | 107 | 121 | 130 | 125 | 209 | 201 | 271 | 274 | 202 |
| | 1968 | 1850 | 177 | 68 | 101 | 88 | 65 | 118 | 166 | 191 | 202 | 203 | 248 | 223 |
| | 1969 | | 117 | 89 | 51 | 75 | | | | 138 | 156 | | | |
| A | MEAN | 1930 | 144 | 107 | 86 | 87 | 89 | 120 | 156 | 195 | 219 | 272 | 254 | 201 |

| STATION NUM. | STATION NAME | ELEV | T R S L B | LATITUDE | LONGITUDE | CO. | AGENCY | ENV. CO. |
|---|---|---|---|---|---|---|---|---|
| Y01 747300 | RIVERSIDE CITRUS EXP | 1015 | 02S 04W 30 K S | 33 58 00 | 117 20 05 | RIV | 900 | D |

| PAN | YEAR | TOTAL | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1925 | | | | | 90 | 67 | 127 | 134 | 166 | 213 | 269 | 242 | 182 |
| | 1926 | 1773 | 58 | 128 | 75 | 112 | 97 | 123 | 116 | 200 | 189 | 230 | 237 | 178 |
| | 1927 | 1609 | 150 | 65 | 48 | 30 | 24 | 105 | 102 | 193 | 193 | 253 | 262 | 184 |
| | 1928 | 1756 | 143 | 96 | 50 | 65 | 114 | 99 | 171 | 146 | 193 | 242 | 240 | 197 |
| | 1929 | 1656 | 119 | 82 | 72 | 61 | 60 | 105 | 117 | 175 | 219 | 256 | 253 | 137 |
| | 1930 | 1665 | 140 | 139 | 91 | 45 | 56 | 99 | 138 | 148 | 195 | 241 | 216 | 157 |
| | 1931 | 1806 | 126 | 106 | 75 | 72 | 124 | 145 | 149 | 178 | 191 | 248 | 237 | 155 |
| | 1932 | | 109 | 68 | 46 | | | 133 | 149 | 155 | 155 | 227 | 220 | 147 |
| | 1933 | 1546 | 100 | 101 | 54 | 60 | 91 | 122 | 97 | 160 | 191 | 227 | 202 | 141 |
| | 1934 | 1763 | 115 | 129 | 45 | 99 | 64 | 120 | 188 | 215 | 170 | 232 | 217 | 169 |
| | 1935 | 1508 | 110 | 67 | 55 | 51 | 64 | 85 | 118 | 164 | 203 | 225 | 203 | 163 |
| | 1936 | 1603 | 120 | 75 | 61 | 60 | 65 | 106 | 137 | 188 | 208 | 210 | 207 | 166 |
| | 1937 | 1499 | 112 | 85 | 41 | 35 | 52 | 100 | 152 | 145 | 195 | 195 | 209 | 178 |
| | 1938 | 1584 | 127 | 59 | 67 | 76 | 62 | 92 | 139 | 176 | 182 | 219 | 209 | 176 |
| | 1939 | 1630 | 115 | 99 | 65 | 59 | 81 | 94 | 144 | 173 | 212 | 228 | 214 | 146 |
| | 1940 | 1765 | 149 | 71 | 69 | 68 | 101 | 120 | 166 | 198 | 189 | 241 | 216 | 177 |
| | 1941 | 1529 | 153 | 108 | 52 | 39 | 44 | 96 | 156 | 165 | 181 | 236 | 164 | 135 |
| | 1942 | 1671 | 134 | 75 | 82 | 64 | 77 | 129 | 114 | 193 | 183 | 251 | 215 | 154 |
| | 1943 | 1591 | 113 | 81 | 59 | 74 | 76 | 82 | 117 | 187 | 198 | 217 | 212 | 175 |
| | 1944 | 1548 | 111 | 94 | 51 | 56 | 62 | 134 | 132 | 158 | 168 | 203 | 226 | 153 |
| | 1945 | 1503 | 106 | 64 | 55 | 55 | 67 | 94 | 144 | 171 | 165 | 218 | 196 | 168 |
| | 1946 | 1575 | 107 | 81 | 47 | 91 | 71 | 105 | 137 | 135 | 211 | 205 | 215 | 170 |

# APPENDIX F

PERCOLATION DATA

NOLTE

## SOILS SURVEY

**Percolation Data:**

| *Soil Series* [1] | *Type* [1] | *USDA Texture* [1] | *Depth from Surface* | *Soils Table* [1] | *Soils Survey Map* [1] |
|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | | |
| 0 | 0 | 0 | 0 | 0 | 0 |
| | | 0 | 0 | | |

**Table 13-9** [2]

| Recommended rates of wastewater application for Trench and Bed Bottom Areas [a] | | |
|---|---|---|
| Soil Texture | Percolation rate, min/in | *Application rate, gal / ft² x d* [b,c] |
| Gravel, coarse sand | <1 | Not Suitable [d] |
| Coarse to medium sand | 1-5 | 1.20 |
| Fine sand, loamy sand | 5-15 | 0.80 |
| Sand loam, loam | 16-30 | 0.60 |
| Loam, porous silt loam | 31-60 | 0.45 |
| Silty clay loam, clay loam [a,f] | 61-120 | 0.20 |
| Clays, colloidal clays | >120 | Not Suitable [g] |

Use Application Rate of 0.7 to Fit B/Re( Classification"

[a] From U.S. EPA (1980).

[b] Rates based on septic tank effluent from a domestic waste source. A factor of safety may be desirable for wastewater's of significantly different strength or character.

[c] May be suitable for sidewall infiltration rates.

[d] Soils with percolation rates less than 1 min/in may be suitable for septic tank effluent if a 2ft layer of loamy sand or other soil is placed above or in place of the native topsoil.

[e] These soils are suitable if they are without significant amounts of expandable clays.

[f] Soil easily damaged during construction.

[g] Alternative pretreatment may be needed and alternative disposal (wetlands or evaporation systems) may be required.

Bibliography:


1 Refer to Pecolation Appendix

2 Crites & Tchobanoglous, "Small and Decentralized Wastewater Management Systems", McGraw-Hill, Boston, 1998

SOIL SURVEY OF

# San Bernardino County Southwestern Part, California

United States Department of Agriculture
Soil Conservation Service
in cooperation with
University of California
Agricultural Experiment Station

TABLE 4.—*Estimated soil properties*

[Absence of information indicates that a determination was not made or that it would not be applicable. The symbol > means made up of two or more kinds of soil. The soils in such mapping units have different properties and limitations and for this reason

| Soil series and map symbols | Depth to bedrock or hardpan | Depth from surface of typical profile | (Typical profile) USDA texture | Classification | | Coarse fraction greater than 3 inches | Percentage less than 3 in. passing sieve— | |
|---|---|---|---|---|---|---|---|---|
| | | | | Unified | AASHTO | | No. 4 (4.7 mm) | No. 10 (2.0 mm) |
| | *Feet* | *Inches* | | | | | | |
| Alo: AaF | 2–3 | 0–36 | Clay | CH, CL | A–7 | | 100 | 100 |
| | | 36 | Shale and sandstone. | | | | | |
| Chino: Cb | >5 | 0–16 | Silt loam | ML, CL-ML | A–4 | | 100 | 100 |
| | | 16–60 | Silty clay loam | CL | A–6 | | 100 | 100 |
| Chualar: CkA, CkC, CkD | >5 | 0–36 | Clay loam | CL | A–6 | | 100 | 100 |
| | | 36–60 | Loam | CL, CL-ML | A–4 | | 100 | 100 |
| *Cieneba: CnD, Cp, Cr. For properties of Friant soils in Cp, refer to Friant series. | 1–1½ | 0–14 | Sandy loam | SM | A–2 | 0–10 | 90–100 | 90–100 |
| | | 14 | Weathered granitic rock. | | | | | |
| Crafton: Cs2 | 1½–3 | 0–26 | Sandy loam | SM | A–2 | 0–15 | 80–100 | 75–100 |
| | | 26 | Weathered micaceous schist. | | | | | |
| Delhi: Db | >5 | 0–18 | Fine sand | SM | A–2 | | 100 | 95–100 |
| | | 18–60 | Sand | SP-SM or SW-SM | A–3 | | 100 | 90–100 |
| Fontana: FoE, FoF | 2–3 | 0–28 | Clay loam, some shale fragments. | CL | A–6 | 0–10 | 85–100 | 70–95 |
| | | 28 | Weathered fractured shale. | | | | | |
| Friant: Fr | 1–1½ | 0–14 | Fine sandy loam | SM | A–4 | | 95–100 | 80–95 |
| | | 14 | Hard mica schist. | | | | | |
| Garretson: GaC | >5 | 0–7 | Very fine sandy loam | ML | A–4 | | 100 | 100 |
| | | 7–28 | Loam | CL-ML, CL | A–4 | | 100 | 100 |
| | | 28–34 | Fine sandy loam | SM | A–4 | | 95–100 | 90–100 |
| | | 34–42 | Gravelly sandy loam | SM | A–2 | | 65–90 | 65–80 |
| | | 42–60 | Loam | CL-ML, CL | A–4 | | 100 | 100 |
| Gaviota: Go | 1–1½ | 0–15 | Fine sandy loam | SM | A–4 | 0–5 | 95–100 | 80–95 |
| | | 15 | Hard sandstone. | | | | | |
| Grangeville: | | | | | | | | |
| Gr | >5 | 0–60 | Fine sandy loam | SM | A–4 | | 100 | 100 |
| Gs | | 0–60 | Fine sandy loam | SM | A–4 | | 100 | 100 |
| Greenfield: | | | | | | | | |
| GtC, GtD | >5 | 0–16 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| | | 16–50 | Fine sandy loam | SM | A–4 | | 95–100 | 85–100 |
| | | 50–60 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| GuD | >5 | 0–16 | Cobbly sandy loam | SM | A–2 | 25–40 | 90–100 | 85–95 |
| | | 16–50 | Fine sandy loam | SM | A–4 | | 95–100 | 85–100 |
| | | 50–60 | Sandy loam | SM | A–2 | | 95–100 | 90–100 |
| Hanford: HaC, HaD, HbA | >5 | 0–60 | Sandy loam | SM | A–2 | | 100 | 90–100 |
| Hilmar: Hr | >5 | 0–23 | Loamy fine sand and loamy sand. | SM | A–2 | | | 95–100 |
| | | 23–60 | Stratified loam.[2] | CL-ML, CL | A–4 | | 100 | 100 |
| Merrill: Me | 2–3½ | 0–25 | Silt loam | CL-ML or ML | A–4 | | 100 | 95–100 |
| | | 25–43 | Loam that is 25 to 50 percent extremely hard lime nodules. | GM | A–4 or A–2 | 0–5 | 40–70 | 35–65 |
| | | 43–60 | Loam | CL-ML or CL | A–4 | | 100 | 95–100 |
| Metz: MgC | >5 | 0–19 | Coarse sandy loam | SM | A–2 | | 95–100 | 90–100 |
| | | 19–60 | Gravelly sand and loamy coarse sand. | SM | A–1 | | 70–80 | 55–75 |
| Monserate: MoC | 2½–3 | 0–10 | Sandy loam | SM | A–2, A–4 | | 100 | 100 |
| | | 10–30 | Clay loam | CL | A–6 | | 100 | 100 |
| | | 30–45 | Indurated hardpan | | | | | |
| | | 45–60 | Coarse sandy loam | SM | A–2 | | 95–100 | 90–100 |

## Hilmar Series

The Hilmar series consists of somewhat poorly drained, nearly level soils on alluvial valley floors and fans. These soils formed in wind-laid coarse-textured material underlain by medium-textured granitic alluvium. Slopes are 0 to 2 percent. Elevation is 600 to 900 feet. Vegetation is annual grasses and forbs. The average annual precipitation is 12 to 16 inches, the mean annual air temperature is 62° to 65° F, and the frost-free season is 230 to 280 days.

In a representative profile, the surface layer is grayish-brown loamy fine sand about 13 inches thick. The underlying material, to a depth of 23 inches, is light yellowish-brown and grayish-brown loamy sand. Below this, to a depth of 60 inches, it is light brownish-gray mottled loam stratified with thin lenses of sandy loam and loamy sand. Hilmar soils are moderately alkaline throughout the profile and are slightly calcareous in the upper 23 inches and strongly calcareous below.

In these soils the surface layer and the upper part of the underlying material that formed in coarse-textured material are rapidly permeable. The lower part of the underlying material that formed in medium-textured material is slowly permeable. Available water capacity is about 7 to 9 inches. Roots penetrate to a depth of 60 inches or more. Originally the soils were somewhat poorly drained, but the drainage has been altered by lowering the ground water table through pumping.

These soils are used mainly for such irrigated crops as grapes, alfalfa, pasture plants, and small grains.

Representative profile of Hilmar loamy fine sand, about 100 feet south of Edison Road and about 200 feet west of Cucamonga Creek, SE¼NW¼NW¼ sec. 22, T. 2 S., R. 7 W; San Bernardino base line and meridian:

Ap—0 to 13 inches, grayish-brown (2.5Y 5/2) loamy fine sand, very dark grayish brown (2.5Y 3/2) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; many very fine and fine roots; slightly effervescent; moderately alkaline; gradual, smooth boundary.

C1—13 to 16 inches, light yellowish-brown (2.5Y 6/4) loamy sand, light olive brown (2.5Y 5/4) when moist; few, fine, distinct, brownish-yellow (10YR 6/6) mottles, yellowish brown (10YR 5/6) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline; gradual, smooth boundary.

C2—16 to 23 inches, grayish-brown (2.5Y 5/2) loamy sand, light brownish gray (2.5Y 6/2) when moist; single grained; loose when dry and moist, nonsticky and nonplastic; common very fine and fine roots; slightly effervescent; moderately alkaline; abrupt, smooth boundary.

IIC3—23 to 60 inches, light brownish-gray (2.5Y 6/2) loam stratified with thin lenses of sandy loam and loamy sand, grayish brown (2.5Y 5/2) when moist; common, medium, distinct, brownish-yellow (10YR 6/6) mottles, yellowish brown (10YR 5/6) when moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; strongly effervescent; moderately alkaline.

The A horizon is grayish brown, dark grayish brown, or brown loamy fine sand or loamy sand. The soil material is dominantly single grained but has weak, very fine to fine, subangular blocky structure in small areas, and in some places it is massive. The soil material is slightly effervescent but is strongly effervescent in a few spots. The A horizon ranges from 8 to 14 inches in thickness but is 13 inches thick in most places.

The C horizon is generally light yellowish brown to grayish brown, but in a few places it is light brownish gray. Yellowish-brown, brownish-yellow, or dark yellowish-brown mottles are common. They range from few to common in abundance, fine to medium in size, and faint to distinct in contrast. The C horizon is loamy sand or loamy fine sand. The soil material is typically single grained, but in some places it is massive. Lime content varies from slight to strong. Thickness is about 10 inches but ranges from 8 to 12 inches.

The IIC horizon is light brownish gray, grayish brown, or light gray. Brownish-yellow or yellowish-brown mottles range from common to many in abundance, fine to medium in size, and distinct to prominent in contrast. The IIC horizon is generally loam that has thin lenses of sandy loam, coarse sandy loam, or loamy sand, but in a few places, it is clay loam or silt loam stratified with thin lenses of coarse-textured material. The IIC horizon is typically massive, but in some places it has weak, moderate, subangular blocky structure. Reaction ranges from mildly alkaline to strongly alkaline.

**Hilmar loamy fine sand (Hr).**—This nearly level soil is on valley floors and alluvial fans. Included with it in mapping are areas of Delhi fine sand that make up about 10 percent of each area. Also included are patches of Tujunga loamy sand, 0 to 5 percent slopes, and small areas where slopes are 2 or 3 percent.

Runoff is slow, and the hazard of water erosion is slight. If the soils are left without a protective cover of vegetation, the hazard of soil blowing is high.

The Hilmar soil is used chiefly for irrigated alfalfa, grapes, small grains, and pasture plants. Capability unit IIe-4 irrigated.

## Merrill Series

The Merrill series consists of somewhat poorly drained, nearly level soils that formed on alluvial fans in medium-textured granitic alluvium. Slopes are 0 to 2 percent, elevation is 500 to 700 feet. Vegetation is mainly annual grasses and forbs, but perennial grasses grow in some areas. The average annual precipitation is 12 to 16 inches, the mean annual air temperature is 62° to 65° F, and the frost-free season is 230 to 280 days.

In a representative profile, the surface layer is gray silt loam about 25 inches thick. The underlying material, to a depth of 43 inches, is light-gray loam that is weakly cemented and contains many extremely hard silica-lime cemented nodules. Below this the underlying material is light brownish-gray loam that extends to a depth of 60 inches or more. Merrill soils are strongly calcareous and moderately alkaline throughout their profile.

These soils are slowly permeable. Their available water capacity is 4 to 7 inches. Roots can penetrate to a depth of 25 to 40 inches. Drainage has been altered on these soils by pumping ground water for irrigation.

These soils are used for such irrigated crops as pasture plants, alfalfa, small grains, and some truck crops.

Representative profile of Merrill silt loam, about 300 feet northwest of Eucalyptus and Central Avenue;

SHEET NO. 11

SAN BERNARDINO COUNTY, SOUTHWESTERN PART, CALIFORNIA

(PRADO DAM)

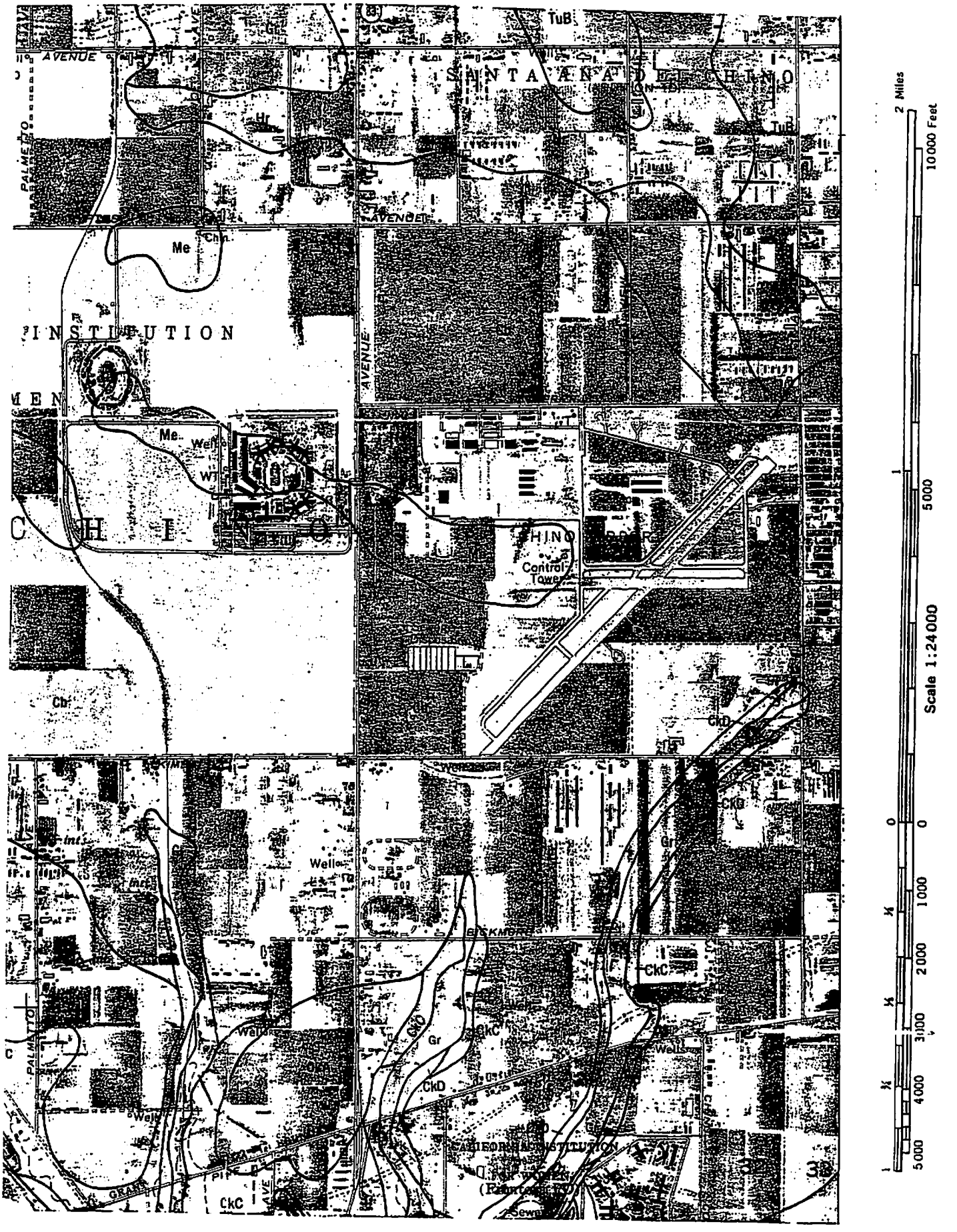


U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

# APPENDIX G

24 HOUR – 25 YEAR STORM DATA

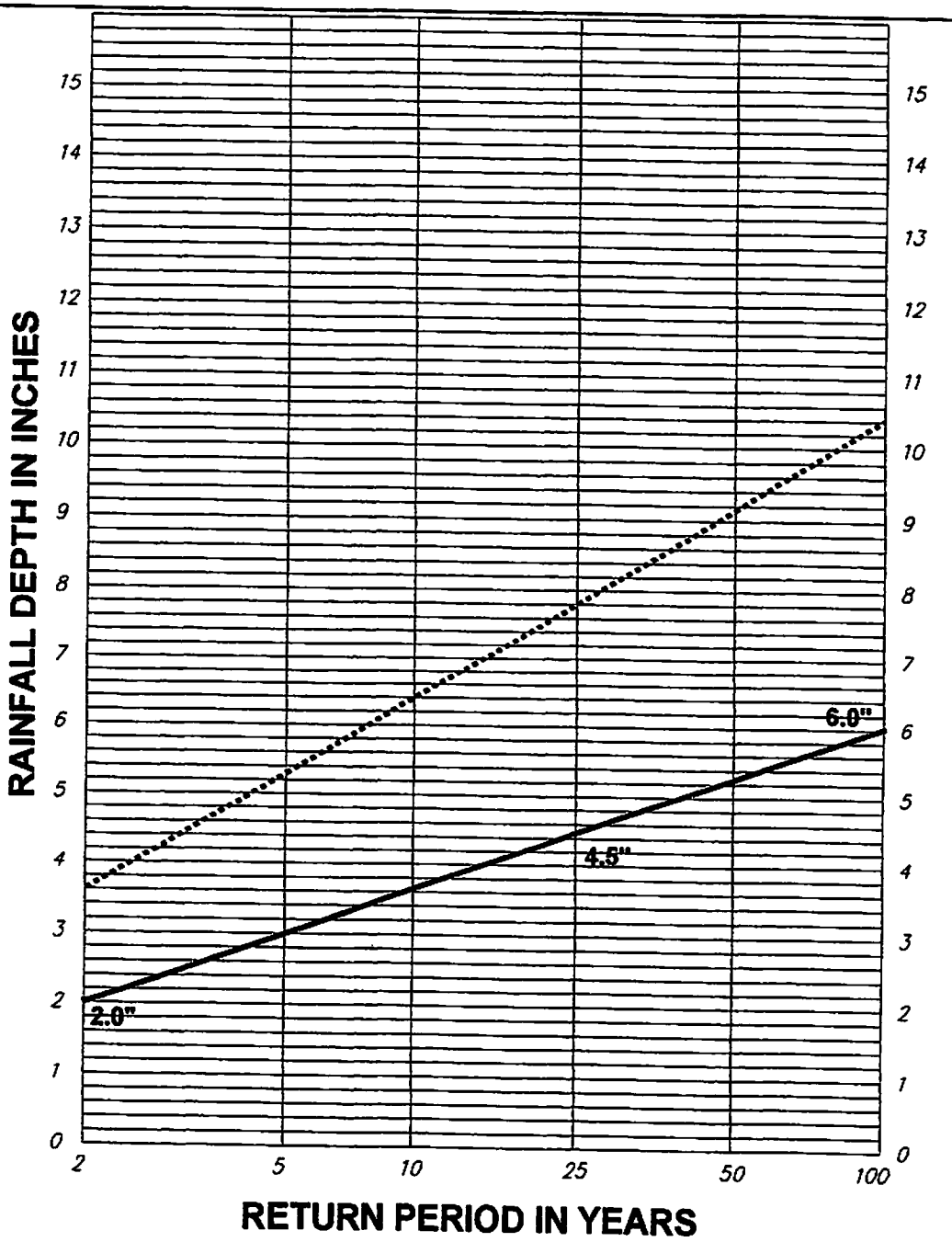


NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for specific duration, then connect points and read value for desired return periond. For example given 2-year 24-hour = 3.5"' and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

Reference: NOAA atlas 2, Volume XI - California, 1973

**RCFC & WCD**

**Hydrology Manual**

RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

PLATE E-5.7

# APPENDIX H

100 YEAR FLOOD PLAIN DATA

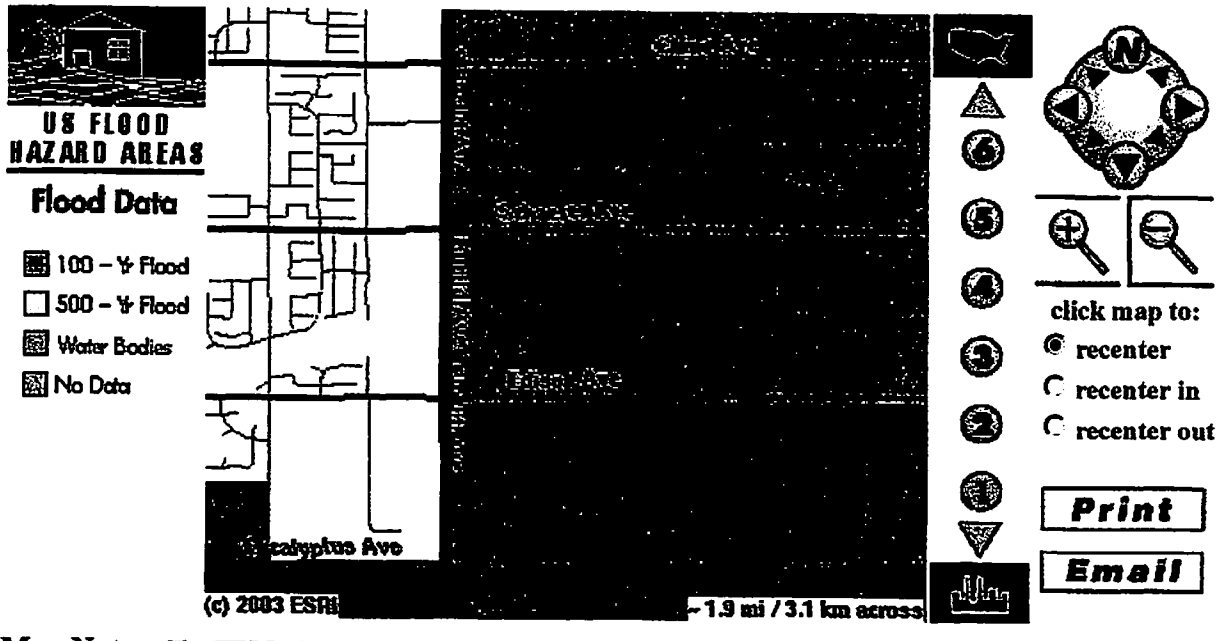


**Map Notes:** The **FEMA Digital Q3 Flood Data** displayed on this Web site is developed by scanning the existing Flood Insurance Rate Map (FIRM) hardcopy and capturing a thematic overlay of flood risks. Digital Q3 Flood Data files contain only certain features from the FIRM hardcopy in effect at the time of scanning and do not replace the existing FIRM hardcopy maps. The Q3 Flood Data is being displayed here with basemap data from the GDT Dynamap/2000 data set. The Q3 Flood Data is currently available for approximately **1,200 counties** across the United States.

**Current Map View:**

Flood Hazard Areas

**Change View**

The maps displayed on this site should be considered an **advisory tool** for general hazard awareness, education, and flood plain management. The flood hazard maps displayed on this site are **not the legal document** to be used when making a single site flood hazard determination. For more information on these maps, please refer to the **Frequently Asked Questions** page.

**Make New Map**

**Return to Home Page**

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Thu May 15 08:24:53 2003

# APPENDIX I

USGS TOPO MAP

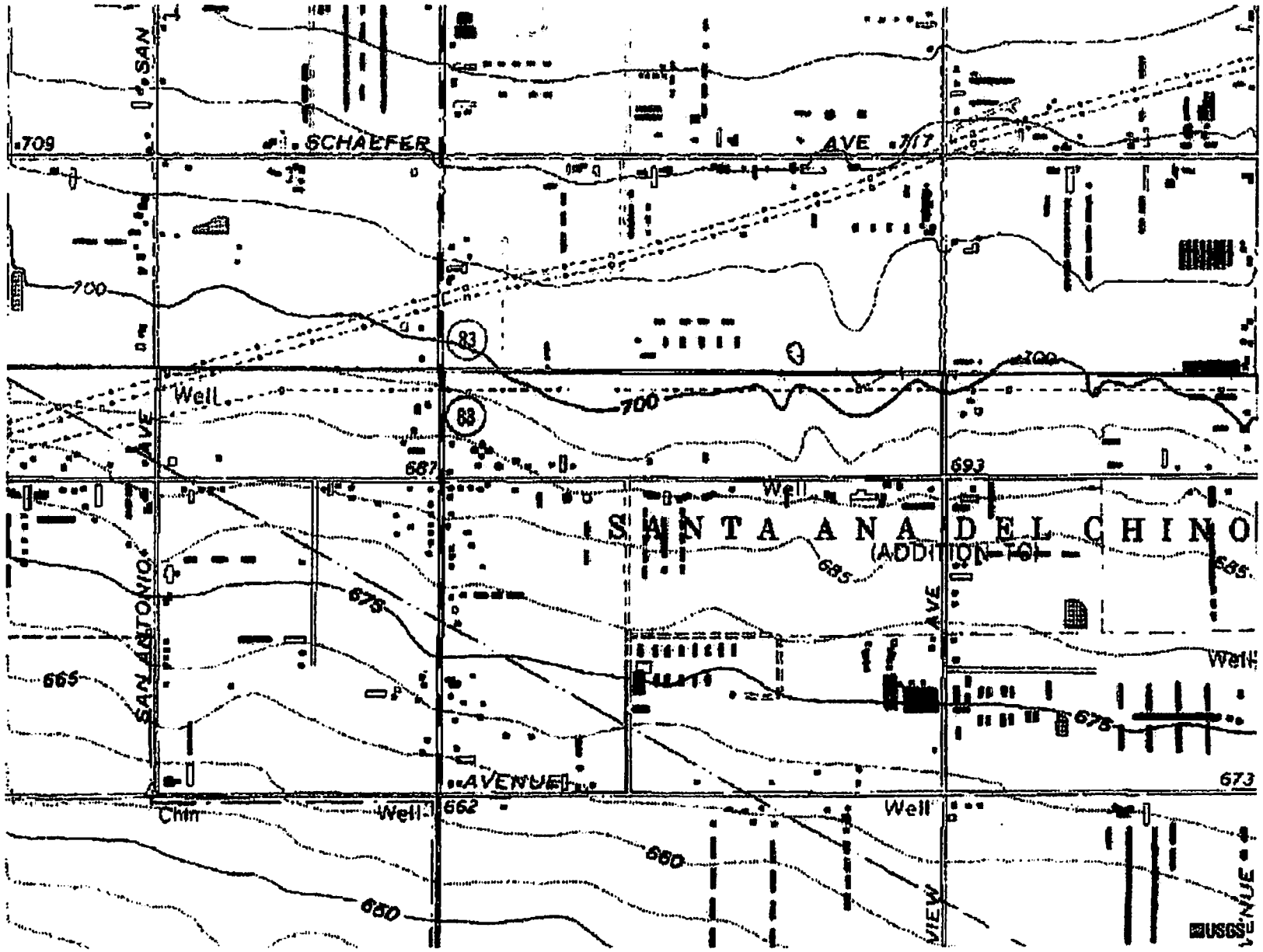
SAN
SCHAEFER
AVE
709
717
700
83
88
Well
AVE
687
693
Well
SANTA ANA DEL CHINO
(ADDITION TO)
685
675
SAN ANTONIO
AVE
665
Well
678
AVENUE
673
Chin
Well
662
Well
660
650
VIEW
VENUE
USGS

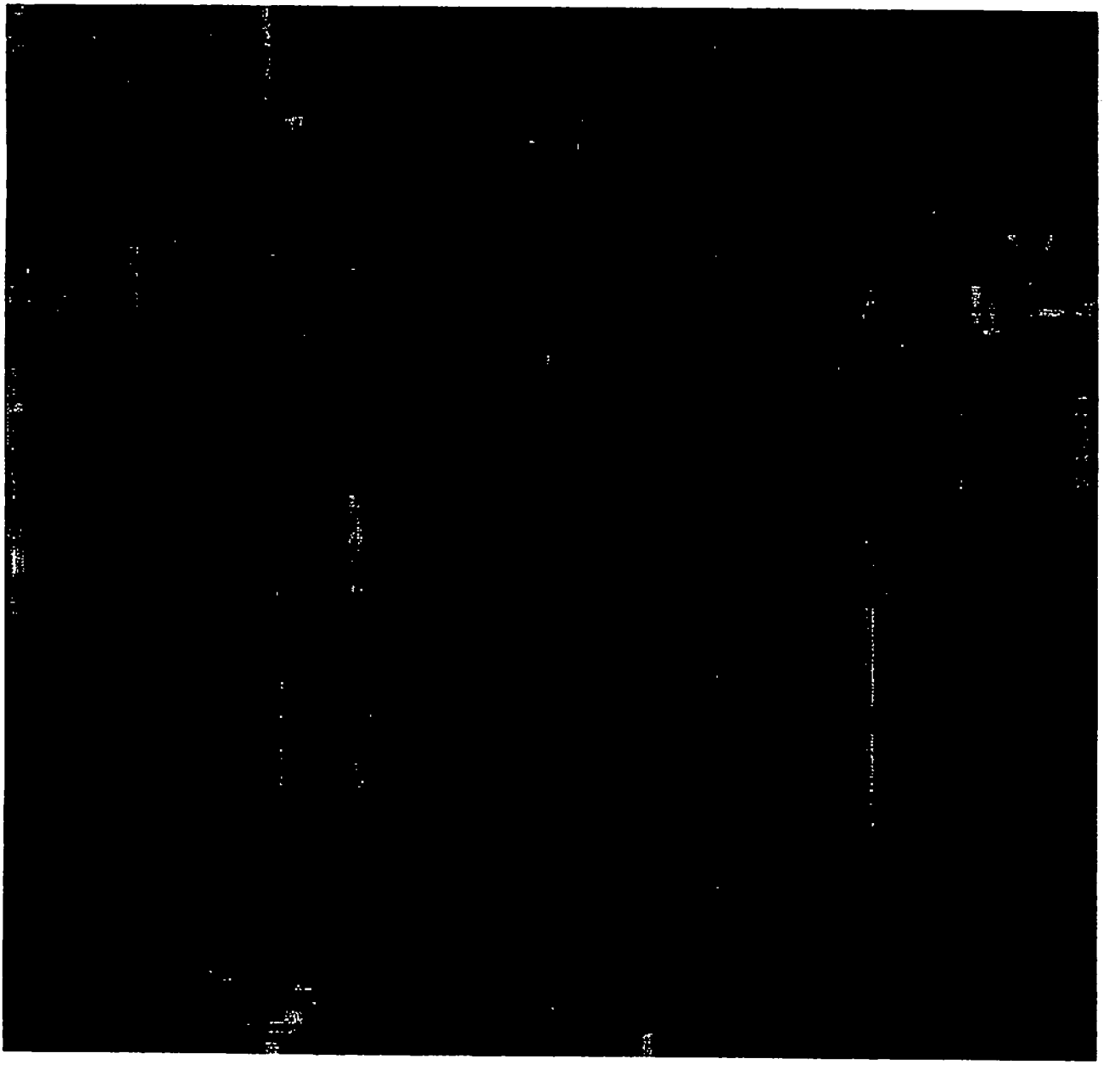

0
300m
900ft
S Bon View Ave
Bon View Ave
Edison Ave
Edison Ave
Edison Ave
Euclid Ave
S Euclid Ave
Sultana Ave
Eucalyptus Ave
Fern Ave
Fern Ave
Cherry Ct
Cherry Ave
Dogwood Ave
Live Oak Ct
Bartlett St
San Antonio Ave
Stone Pine Ct
Ironbark Ave
Schaefer Ave
Homan Ct
Joy Ct
Villa Ave

# APPENDIX J

GUIDELINES FOR ORDER NO. 99-11

# Guidelines for the Development of Engineered Waste Management Plans For Concentrated Animal Feeding Operations

(Dairies and Related Facilities)

California Regional Water Quality Control Board
Santa Ana Region

February 2001

## Introduction

On August 20, 1999, the California Regional Water Quality control Board, Santa Ana Region (Board), adopted Order No. 99-11 (NPDES No. CAG018001), General Waste Discharge Requirements for Concentrated Animal Feeding Operations (Dairies and Related Facilities) in the Santa Ana Region. This order required all operators of dairies and related facilities (i.e., heifer ranches and calf nurseries) authorized to discharge wastes under Order No. 99-11 to develop and implement an engineered waste management plan (EWMP). The primary purpose of an EWMP is to provide a wastewater management system that is designed, constructed, operated and maintained to comply with the wastewater containment requirements in Order No. 99-11. Order No. 99-11 included applicable state and federal regulations that address waste discharges from animal feeding operations.

## Background

The Board began issuing waste discharge requirements to all animal feeding operations in the Region in 1972. These waste discharge requirements stated that each facility had to contain, on the property, all wastewater (i.e., dairy wash water, storm water runoff from manured areas, etc.), including the storm water runoff from a 24-hour, 25-year storm. In an attempt to comply with this requirement, many facilities constructed new ponds, enlarged existing ponds, constructed berms, and implemented other measures. However, these measures were generally implemented in a piecemeal fashion, usually on an as-needed basis, and often did not integrate well with other wastewater containment measures at the facility. It became more and more apparent that many of the wastewater containment improvements that were being made were not very effective. For example, ponds were not sized properly, and therefore, did not have sufficient capacity to contain the entire volume of wastewater generated at the site; berms were sized and constructed improperly, resulting in failures; wastewater pumps, pipelines, etc., were often inoperable and were not replaced when needed; and most wastewater containment structures and equipment were often in a state of disrepair. All of these situations resulted in frequent discharges of wastewater to surface waters, primarily during the winter.

To minimize discharges to surface waters, it became apparent that an overall plan for containing wastewater was necessary. In the late 1980's, Board staff prepared a two-page document that provided guidelines for preparing an EWMP. An EWMP was then generally requested from animal feeding operations that had a history of recurring wastewater discharges. In 1994, the Board adopted Order No. 94-7 (NPDES No. CAG018001), General Waste Discharge Requirements for Concentrated Animal Feeding Operations (CAFOs). Order No. 94-7 required that, in addition to an EWMP being required from CAFOs that had a history of recurring wastewater discharges, EWMPs were to be prepared by anyone initiating a new CAFO at either a new or existing facility. The guidelines for preparing an EWMP were then included as an attachment to Order No.

94-7. Order No. 94-7 expired in March 1999, and the Board adopted Order No. 99-11 in August 1999. To assure that every CAFO had a wastewater management system capable of complying with wastewater containment requirements, Order No. 99-11 required that all CAFO operators develop and fully implement an EWMP. The existing guidelines for preparing an EWMP were included as an attachment to Order No. 99-11. However, the existing EWMP guidelines were outdated, general in nature, and did not contain sufficient criteria to comply with the wastewater containment requirements in Order No. 99-11. Therefore, Order No. 99-11 authorized the Executive Officer to make necessary revisions to the guidelines.

These revised guidelines are longer than the previous guidelines. This is primarily the result of adding explanations and clarification to make EWMPs prepared in accordance with the guidelines as consistent as possible. There are two significant differences between these guidelines and the previous guidelines. First, the new guidelines outline criteria for determining the storage capacity necessary to comply with waste discharge requirements. These criteria will result in the need for significantly more storage capacity than the criteria included in the previous guidelines. However, this does not reflect a change in state or federal regulations. Instead, previous guidelines did not accurately specify criteria for determining the storage capacity necessary to comply with state and federal regulations. Regardless of what was included in previous guidelines, CAFOs have always been, and still are, required to comply with all applicable state and federal regulations. Second, the new guidelines identify several items (such as best management practices) that should be considered in the development and implementation of EWMPs. Many of these items have been included in EWMPs approved by the Executive Officer in the past.

## Purpose

The purpose of an EWMP is to provide a wastewater management system that is designed, constructed, operated and maintained to comply with the wastewater containment requirements in Order No. 99-11. These guidelines do not address the management, application or disposal of manure removed from the corrals. Compliance with waste discharge requirements associated with the discharge of manure removed from corrals is addressed separately. The development and implementation of an EWMP is required by Order No. 99-11. Discharges of wastewater from a CAFO are allowed only if the CAFO operator has constructed and maintained containment structures as required, and if a chronic or catastrophic rainfall event occurs. A chronic rainfall event is a series of wet weather conditions that would total the volume of the 24-hour, 25-year storm event, and would not provide reasonable opportunity for dewatering containment structures prior to the next storm events. A catastrophic storm event includes events such as tornadoes and hurricanes, and any single event that totals the runoff volume of the 24-hour, 25-year storm event. Order No. 99-11 requires that an EWMP be developed in accordance with guidelines established by the Executive Officer. However, these are guidelines, not regulations, and any EWMP that will result in compliance with waste discharge requirements will be acceptable by the Executive Officer. Adhering to these

guidelines, though, will provide consistency for preparing EWMPs, and will increase the likelihood that the EWMP will be acceptable.

## Elements of an EWMP

The EWMP must be prepared by a registered engineer (civil, or other appropriate discipline) or other qualified person (required by Order No. 99-11). The qualified person preparing the EWMP must have the knowledge, technical expertise and experience appropriate to develop an EWMP. This guidance document describes five basic elements that should be addressed in an EWMP. These elements include an introduction, a design, a plot (site) plan, construction specifications, and an operation and management plan. These elements should include a detailed description, as follows:

## I. Introduction

The introduction should describe the existing animal population, the design population for the EWMP, existing wastewater containment facilities, and the operation of those facilities. At a minimum, the Introduction should consist of a brief narrative that addresses the following:

- The facility address, operator name, land owner, and location of the facility with respect to cross streets or other landmarks.
- The name, telephone number and address of the person responsible for implementing the EWMP on an on-going basis (CAFO operator or other designated person)
- The number, telephone number and address of the person(s) to be contacted, if necessary, in the event that the CAFO operator or designated person is not available.
- Current and design animal population (for the expected life of the CAFO)
- The estimated volume of wash water generated at the facility each day (based on gallons per cow per day)
- Total size of the facility (acres)
- The size (acres) of existing ponds, corrals, wastewater disposal areas and wastewater containment areas
- General location and height of berms
- How dairy wastewater is managed and where it is discharged
- Storm water run-on problems (storm water that occurs off-site, but enters the CAFO), including run-on from neighboring facilities, etc.

## II. Design

To comply with Order No. 99-11, containment facilities must be designated to contain all wastewater generated at the facility (i.e., dairy wash water, storm water runoff from manured areas, etc.) and all storm water runoff that comes into contact with manure generated by a 24-hour, 25-year storm. A 24-hour, 25-year storm is a 24-hour storm with

a return frequency of once every 25 years. The design must take into consideration that this storm can and should be expected to occur each year. CAFOs are required to contain the storm water runoff from all lesser storms, if that runoff has come into contact with manure.

If a CAFO does not have existing structures capable of containing the required volume of wastewater, then additional structures must be provided. This may include significantly deepening existing ponds, adding additional ponds, connecting to a sewer system, raising berms to increase the volume of wastewater that can be stored in containment areas, etc. An EWMP may be acceptable if the design has maximized the amount of wastewater that can be contained and the operation and management plan optimizes utilization of the containment capacity provided by the containment structures. **However, acceptance of such a plan will not relieve the CAFO operator of responsibility for any discharges that are not allowed by Order No. 99-11. Wastewater that is discharged off the CAFO property, even after implementing an acceptable EWMP, is still a violation of Order No. 99-11. unless the discharge occurred as a result of a chronic or catastrophic storm event.**

- Historically, containment of wash water and storm water runoff at CAFOs in the Region between the drier months of April through October has not been a problem. However, containing storm water runoff from corrals, wastewater disposal fields, etc., and daily wash water, has been problematic during the five generally wet months of November through March. During these months, evaporation is minimal, and since disposal fields are usually saturated by rainfall, percolation is minimal. Since it is difficult to dispose of daily wash water and accumulated storm water runoff during these months, wastewater facilities should be designed to contain all wastewater generated during this 150-day period, as noted below.

- Containment structures should be designed to contain 150 days of annual storm water runoff <u>and</u> the runoff from a 24-hour, 25-year storm. For the Chino Basin area, average rainfall for the 150 days from November through March is approximately 13 inches, and a 24-hour, 25-year storm generates approximately 4.5 inches of precipitation (based on information from the National Weather Service). For the San Jacinto area, average annual rainfall for the 150 days from November through March is approximately 11 inches, and a 24-hour, 25-year storm is approximately 3.5 inches. These are average values for these areas, and other values can be used for a particular CAFO, if justification is provided.

- Containment structures should be designed to contain 150 days of wash water. This should be based on the maximum number of milking cows for the life of the facility. Otherwise, the EWMP may have to be revised in the future, at such time that the number of milking cows exceeds the number of cows stated in the EWMP. Recent studies have shown that the average daily wash water generated at dairies in the Region is about 70 gal/cow/day (based on two milkings/cow/day). The average daily wash water produced during winter months, however, can exceed 100 gal/cow/day. The average gal/cow/day used during the winter should be used in determining the

volume of storage required for wash water. This volume can vary, depending on specific site practices, but should be about 100 gal/cow/day unless adequate justification is provided for using a smaller number. The installation of a water meter can verify the amount of water used and assist in efforts to conserve water usage, and thereby reduce the amount of water discharged to containment structures. A wash water meter will be required to justify a volume significantly less than 100 gal/cow/day.

- During the winter, evaporation is minimal. Also, ponds tend to seal up over time, and disposal fields are generally saturated during the winter, thereby minimizing percolation. In addition, the amount of wastewater percolated during the winter at a CAFO can vary, depending on the particular wastewater disposal practices implemented at that CAFO. Allowances for loss of wastewater due to percolation and evaporation can be made in determining the amount of storage required for wastewater, as long as reasonable assumptions are made that consider winter conditions and practical CAFO specific wastewater disposal practices.

- The accumulation of solids in ponds and other containment structures decreases the storage capacity available for wastewater. It is estimated that dairy wash water in the Region contains about 10% of the manure generated by a milking cow. Also, solids are present in storm water runoff from corrals, disposal land and other areas. The estimated annual decrease in available storage capacity resulting from the accumulation of these solids should be determined (the volume of manure in wash water can be considered to be 10% of what a milking cow expels).

- Calculations should be provided showing the design capacity of all wastewater containment structures (existing and proposed).

- The total capacity of the containment structures should be at least equal to the volume determined by the following equation: 150 days dairy wash water + 150 days annual storm water runoff + 24-hour, 25-year storm runoff + accumulation of solids + wastewater in containment structures on November 1 – percolation – evaporation.

- A description of all wastewater conveyance equipment and structures (pipelines, surface channels, pumps, etc.), including their design capacities, should be provided.

- CAFOs in operation prior to November 27, 1984 must be designed to protect all manured areas from inundation or washout by overflow from any stream channel during a 20-year peak stream flow (required by Order No. 99-11).

- CAFOs built after November 27, 1984 must be designed to process all manured areas from inundation or washout by overflow from any stream channel during a 100-year peak stream flow (required by Order No. 99-11).

- The use of pumps must be considered for ponds and other containment structures so that wastewater can be pumped from ponds or containment areas to disposal areas, in

order to restore needed capacity in the containments structures. If pumps are not utilized, exceptional justification for not utilizing pumps must be included.

- Storm water containment structures must be protected against inundation from off-site storm water sources, unless such run-on is fully contained (required by Order No. 99-11). If it is not practical to divert all storm water run-on away from a CAFO, a justification should be included that explains why it is not practical to do so. If all storm water run-on from up to a 24-hour, 25-year storm cannot be diverted from containment structures, a description of how the design takes the run-on into consideration should be included.

- The addition of roof structures in areas where manure is present, and diverting the roof runoff off site, should be considered in order to minimize the amount of precipitation that comes into contact with manure.

- Structures should be designed to prevent storm water runoff from non-manured areas (roofs, residence area, paved surfaces, etc.) from entering wastewater containment structures. The use of rain gutters and diversion trenches should be considered. If the CAFO cannot be designed to prevent or minimize the flow of this water onto containment areas, an explanation should be provided that describes how the design accounts for such flows.

- The design for ponds and other wastewater containment areas should allow vehicle access for mosquito abatement personnel to inspect and treat these areas to reduce the risk of mosquito-borne disease and to prevent insect nuisance conditions.

- An emergency spillway must be designed to provide for a controlled release of wastewater, and to maintain the integrity of existing containment structures, in the event that storm events cause the capacity of the containment structures to be exceeded. The use of gateways, valves, or other similar devices for the purpose of manually releasing wastewater, is not acceptable.

- If visual observations, hand-level measurements and information provided by the CAFO operator and others are not sufficient to determine rise and fall dimensions and flow directions for adequately calculating runoff volumes for placing and sizing appropriate containment structures, then current contours must be determined, based on acceptable engineering and surveying practices (it is expected that current contours will be necessary for most CAFOs).

- Structures should be designed to accommodate future increases in animal population.

## III. Plot (Site) Plan

The plot plan should be a standard blue line print, using an appropriate scale, that shows sufficient detail of all containment structures, drainage patterns, and equipment. The plot plan should include:

- The legal description of the property (i.e., parcel numbers), the primary address and any other addresses that may exist at the property, and the location of significant structures on the property (residences, milk barn, hay alleys, etc.).
- The property boundaries, the gross acreage of the property, vicinity map (insert), north arrow, legend and date the plan was prepared.
- The location, elevation contours and dimensions of all areas associated with the generation, storage or management of wastewater and manure (corrals, ponds, access roads around wastewater containment areas, wastewater disposal areas, temporary manure storage areas, cropland, etc.).
- The location of all facilities necessary for containment and management of wastewater (berms, upstream diversion structures, pumps, spillway, distribution lines, etc.) and the dimensions, elevation and cross-sections of all containment structures.
- The drainage patterns (indicated by arrows) for on-site surface drainage courses (swales, ditches, etc.) and any off-site surface drainage that can flow onto, or immediately adjacent to, the facility.

## IV. Construction

The construction plan should describe all construction materials, construction methods (i.e., compaction), criteria and specifications, etc., necessary for proper construction of all containment and conveyance structures (berms, ponds, levees, pipelines, channels, etc.).

- Existing berms that are not sized properly, not adequately compacted, or contain materials (i.e., manure) that are deleterious to the berm's long term stability and effectiveness, must be replaced or improved to a standard that is equivalent to that which would be expected from a new berm constructed in accordance with best engineering practices.
- Actions necessary to restore existing structures to proper conditions and capacities should be clearly described (i.e., clean out existing ponds or containment areas, regarding, repair or replacement of existing berms, etc.).

- Manure shall not be used to construct new containment structures (i.e., berms0, and manure shall not be used to improve or raise existing containment structures (prohibited by Order No. 99-11).

- In accordance with acceptable engineering practices, specifications developed to assure that construction material is applied in lifts of appropriate depth, and rolled and watered to achieve a minimum compaction of 90%, must be included.

## V. Operation and Maintenance

An operation and maintenance plan should be provided to implement effective operation of all containment structures and equipment. During the wet season, wastewater should be managed on a daily basis to maximize the volume of containment capacity available.

- Specific procedures should be included to assure that containment structures have the maximum capacity available just prior to the wet season (November – March).

- Management practices to reduce, to the maximum extent practicable, the volume of dairy wash water generated should be addressed, particularly if the proposed structures are incapable of containing the required volume of wastewater.

- Replacement pumps should be available on-site, or advanced arrangements made for the immediate and reliable delivery of portable pumps.

- Specific procedures for operating standpipes or other conveyance systems used for applying wastewater to land should be provided to efficiently utilize the entire area available for wastewater disposal (i.e., avoid localized over-application that can occur with furrow application, and utilize methods to maximize the spreading of wastewater).

- If all storm water run-on cannot be diverted, the EWMP should contain a description of how storm water run-on will be managed or handled to minimize the impact on wastewater containment structures and to minimize the amount of wastewater that could be discharged from the CAFO.

- Specific measures to minimize the effects of gophers, squirrels or other rodents on the integrity of the containment structures should be identified.

- Removal of solids from containment structures on a scheduled basis should be specified so that the design capacity of the containment structures will be restored prior to each rain season.

- Measures for minimizing the accumulation of stagnant wastewater in low lying areas (corrals, disposal areas, etc.) and preventing potential insect nuisance conditions should be addressed.

- Weekly inspections of ponds, berms, wastewater distribution and application equipment, etc., should be specified to provide assurance that all containment structures are intact and all equipment is in proper operating condition. Daily inspections should be conducted following the first significant rain events at the beginning of the wet season (generally in early Fall), continuing through the cessation of significant rain events (generally in early Spring). Provisions for the immediate repair of any damaged containment structures (i.e., rodent holes, cracks, erosion, etc.) should be provided.

- A description of methods and schedules for maintaining disposal areas in a condition that maximizes the efficient disposal of wastewater in the winter should be provided (i.e., grading, disking, etc.).

- An equipment maintenance schedule should be provided to assure the efficient, consistent and reliable operation of all pumps, sumps, pipelines, etc.

- Weed abatement measures to maintain access to containment structures, maintain capacity of containment structures and to maintain the efficient distribution of wastewater through channels, etc., should be addressed.

- A brief emergency spill plan must be included. The plan must include a list of spare parts (pumps, piping, valves, etc.) that are to be kept on site to maintain adequate wastewater containment facilities, a list of names and phone numbers for contacts for obtaining immediate emergency equipment (pump, piping, valves, heavy equipment, etc.), and a list of names and phone numbers for reporting problems (Board staff, County staff, etc.).

# APPENDIX K

ORDER NO. 99-11

California Regional Water Quality Control Board
Santa Ana Region

Order No. 99-11
NPDES No. CAG018001

# GENERAL WASTE DISCHARGE REQUIREMENTS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (DAIRIES AND RELATED FACILITIES) WITHIN THE SANTA ANA REGION

The California Regional Water Quality Control Board, Santa Ana Region (hereinafter, Regional Board), finds that:

1. On February 17, 1994, the Board adopted Order No. 94-7, General Waste Discharge Requirements For Concentrated Animal Feeding Operations, Including Dairies, Within The Santa Ana Region (NPDES NO. CAG018001).

2. Order No. 94-7 satisfied the criteria cited in 40 CFR 122.28 and, as such, served as a General NPDES Permit. 40 CFR 122.28 pertains to the issuance of general permits to regulate discharges of waste that meet the following criteria:

   a. Waste discharges involving the same or substantially similar types of operations;
   b. Discharge the same types of wastes;
   c. Require the same or similar operating conditions;
   d. Require the same or similar monitoring ; and
   e. Are more appropriately regulated under a general permit rather than individual permits.

3. 40 CFR Part 122.23 defines a concentrated animal feeding operation (CAFO) as any animal feeding operation that has more than 1,000 animal units (dairy cattle are considered 1.4 animal units). Pursuant to the Clean Water Act (CWA), all CAFOs are point sources and are subject to NPDES permitting requirements. Smaller animal feeding operations can also be designated as CAFOs by the permitting agencies after considering certain criteria cited under 40 CFR 122.23 (b)(1). The Regional Board has determined that all dairies, heifer ranches, and calf nurseries in the Region shall be designated as CAFOs.

4. Order No. 94-7 has expedited the preparation of waste discharge requirements and has allowed the Regional Board to better utilize staff resources. To date, approximately 215 CAFOs have been enrolled under Order No. 94-7. Another 72 CAFOs are in the process of obtaining authorization to discharge wastes under that order. Order No. 94-7 expired on March 1, 1999. The dairies currently enrolled under Order No. 94-7, or in the process of enrolling under Order No. 94-7, will want to continue to discharge waste. Therefore, it is necessary to renew the waste discharge requirements contained in Order No. 94-7 to continue this expedited permitting process.

5. Persons discharging, or proposing to discharge, dairy wastes or other similar kinds of wastes in any manner that may affect water quality are hereinafter referred to as "discharger" and are subject to the terms and conditions of this order. Persons discharging, or proposing to discharge, wastes from other types of animal feeding operations must obtain coverage under a separate general permit or individual waste discharge requirements.

6. The Regional Board adopted a revised Water Quality Control Plan (Basin Plan) on March 11, 1994. The Basin Plan became effective on January 24, 1995. The Basin Plan specifies beneficial uses and water quality objectives for surface and ground waters in the Santa Ana Region (Chapters 3 and 4). This order specifies requirements necessary to meet the water quality objectives and to protect the beneficial uses.

7. Revised regulations governing discharges from CAFOs, including dairies, are contained in Division 2, Title 27 of the Combined State Water Resources Control Board/California Integrated Waste Management Board AB 1220 Regulations, which became effective on July 18, 1997. Chapter 7, Subchapter 2 (Article 1) contains requirements for Confined Animal Facilities. Previously, these regulations were specified in Chapter 15, Division 3, Article 6, Title 23 of the California Code of Regulations.

8. Section 402(p) of the CWA as amended by the Water Quality Act of 1987 and the related regulations published by the U.S. EPA on November 16, 1990 (40 CFR Parts 122, 123 and 124), requires an NPDES permit for pollutant discharges from CAFOs. The EPA's Effluent Guidelines and Standards for Feedlots are contained in 40 CFR Part 412 (revised July 1, 1993).

9. On April 17, 1997, the State Water Resources Control Board adopted the General Industrial Storm Water Permit, Order No. 97-03-DWQ, NPDES No. CAS000001. Order No. 97-03-DWQ implements the final regulations (40 CFR 122, 123, and 124) for storm water runoff published on November 16, 1990 by the U.S. EPA in compliance with Section 402(p) of the CWA. This order includes those provisions of the General Industrial Storm Water Permit that pertains to dairies. Once a discharger is authorized under Order No. 99-11, coverage under the State Water Resources Control Board's General Industrial Storm Water Permit (Order No. 97-03-DWQ) will be terminated.

10. Wastes from CAFOs contain high concentrations of salts (total dissolved solids and nitrates). Previous studies conducted by the Board have shown that cow manure produced in the Region contains about 160 pounds of salt per (dry) ton of manure (110 pounds of salt per ton of manure @ 33% moisture). The application of manure or the discharge of process wastewater[1] to land results in the discharge of salts that has adversely impacted, and continues to adversely impact, the quality of groundwater and surface water in the Region.

[1] Process wastewater shall mean any process generated wastewater and any precipitation (rain or snow) which comes into contact with any manure, litter or bedding, or any other raw material or intermediate or final material or product used in or resulting from the production of animals or poultry or direct products (e.g. milk, eggs).

11. Most of the CAFOs in the Region overlie the Chino Groundwater Basin. The Chino II and III Groundwater Subbasins lack assimilative capacity for additional salt inputs (total dissolved solids and nitrogen). For groundwater subbasins without assimilative capacity, salt inputs that exceed the water quality objectives for these subbasins cannot be allowed (State Water Resources Control Board Order No. 73-4, the Rancho Caballero decision). To meet the Chino Basin groundwater objectives, as well as the groundwater objectives for any other subbasin lacking assimilative capacity, the discharge of manure and other animal wastes, such as process waste water, and their application as fertilizer and irrigation water, must be controlled to prevent further exceedance of water quality objectives. Salt discharges in excess of water quality objectives can only be allowed if the additional salt inputs are offset.

12. The Basin Plan assumed that two desalters would be built in the Chino Basin. The amount of salt to be extracted from the Basin from these desalters was assumed to be adequate to provide sufficient salt removal to offset the present and projected salt loads from ongoing discharges from CAFOs. However, only one desalter is currently being built. This desalter will extract enough salt to offset the amount of salt being added to the basin from process wastewater water discharges. No mitigation measures are currently in place to offset the salt loading from manure application within the Basin. Therefore, the discharge of manure, and its application as fertilizer, must be prohibited.

13. The Board has considered antidegradation pursuant to 40 CFR 131.12 and State Board Resolution No. 68-16 and finds that these discharges are consistent with the State and Federal regulations, as long as appropriate salt offset programs are implemented.

14. In accordance with Water Code Section 13389, the issuance of waste discharge requirements for these discharges is exempt from those provisions of the California Environmental Quality Act contained in Chapter 3 (Commencing with Section 21100), Division 13 of the Public Resources Code.

15. The Regional Board has notified interested agencies and persons of its intent to issue general waste discharge requirements for discharges of wastes CAFOs, and has provided them with an opportunity to submit their views and recommendations.

16. The Regional Board, in a public meeting, heard and considered all comments pertaining to discharges of wastes from CAFOs proposed to be regulated under the general waste discharge requirements.

IT IS HEREBY ORDERED that, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Clean Water Act as amended, and regulations and guidelines adopted thereunder, dischargers, their agents, successors, and assigns, discharging wastes from CAFOs shall comply with the following:

## A. DISCHARGE SPECIFICATIONS:

1. The discharger shall design, construct and maintain containment structures to retain all wastewater within its facility, including all process generated wastewater[2] and all precipitation on, and drainage through, manured areas resulting from storms up to and including a 24-hour, 25-year storm.

2. The discharger shall develop and fully implement an Engineered Waste Management Plan (EMWP) acceptable to the Executive Officer. The EMWP shall be developed by a registered professional engineer, or other qualified individual, in accordance with the guidelines specified in Attachment "B" of this order. The Executive Officer is hereby authorized to make necessary revisions to the guidelines for the preparation of an EWMP outlined in Attachment "B".

3. The discharge to any surface water bodies, or tributary thereof, is prohibited unless a chronic[3] or catastrophic[4] rainfall causes overflow from a storage facility designed, constructed, maintained and operated to contain all process generated wastewater plus the runoff from a 24-hour, 25-year storm.

4. Retention ponds and manured areas at CAFOs in operation on November 27, 1984, shall be protected from inundation or washout by overflow from any stream channel during 20-year peak stream flows. Facilities existing before November 27, 1984 that are protected against 100-year peak stream flows must continue to provide such protection. New facilities (built after November 27, 1984) shall be protected from 100-year peak stream flows.

5. Disposal of manure to land is prohibited, unless allowed by separate waste discharge requirements issued by the Board.

6. The use of manure as a fertilizer in any area that may affect a groundwater subbasin lacking assimilative capacity, including the Chino Groundwater Basin, is prohibited unless a plan, acceptable to the Executive Officer, is implemented which mitigates the effects of that use on the underlying groundwater subbasin.

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[2] Process generated wastewater shall mean water directly or indirectly used in the operation of a feedlot for any or all of the following: Spillage or overflow from animal or poultry watering systems; washing, cleaning of flushing pens, barns, manure pits or other feedlot facilities; direct contact swimming, washing or spray cooling of animals; and dust control.

[3] Chronic rainfall means a series of wet weather conditions which would not provide opportunity for dewatering and which total the volume of the 25 year, 24 hour storm event.

[4] Catastrophic rainfall means any single event which would total the volume of the 25 year, 24 hour storm event; this could include tornadoes, hurricanes or other catastrophic conditions which could cause overflow due to winds or mechanical damage.

7. Manure applied to cultivated cropland outside of any area that may affect a groundwater subbasin lacking assimilative capacity, including the Chino Groundwater Basin, shall not exceed agronomic rates and shall be incorporated into soil soon after application or appropriate containment (based upon the specific crop grown) controls must be provided. For any application of manure to cropland above 12 dry tons per acre per year (17.5 tons/year @ 33% moisture), an explanation of the type of crop and the number of times it is harvested per year shall also be included in the annual report.

8. Manure removed from the corrals shall be removed from the facility within 180 days. Any manure remaining at the facility after 180 days of being removed from the corrals is considered to be disposal of manure and is prohibited in accordance with Discharge Specification A.5. A manifest of the manure hauled away shall be prepared and submitted with the annual report in accordance with Monitoring and Reporting Program No. 99-11. (The discharger shall be responsible for active management of legal disposal of manure from the property over the six month period following removal of the manure from corrals. This means that legal disposal must be coordinated with periods of rainfall such that manure can be removed from the facility within 180 days of being scraped from corrals.)

9. On two designated "clean days" per calendar year, facilities subject to this order shall be free of all stockpiled manure that has been removed from corrals. These "clean days" shall be selected by each discharger, beginning in 2000. The two "clean days" shall be at least four months apart. Each "clean day" shall be identified and reported to the Board office at least five working days in advance of the selected date.

10. All surface drainage from outside of the facility shall be diverted away from any manured areas unless such drainage is fully contained.

## B. PROVISIONS:

1. Neither the treatment nor the discharge of wastes shall create, or threaten to create, a nuisance or pollution as defined by Section 13050 of the California Water Code.

2. This order shall serve as a general National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Clean Water Act or amendments thereto. The general permit shall become effective 10 days after the date of its adoption provided the Regional Administrator of the Environmental Protection Agency has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

3. This order expires on August 1, 2004. However, it shall continue in force and effect until a new general permit is issued. All dischargers authorized to discharge under the expired permit may continue to discharge waste in accordance with that permit until a new permit is issued.

4. Upon receipt of an application to discharge wastes under this order, the Executive Officer shall authorize the proposed discharge by transmitting a "Discharge Authorization Letter" to the discharger. The discharge authorization letter may be terminated or revised by the Executive Officer at any time.

5. Upon issuance of a discharge authorization letter from the Executive Officer to discharge wastes under this order, the discharger's authorization to discharge waste under the State Water Resources Control Board's General Industrial Storm Water Permit (Order No. 97-03-DWQ) is hereby terminated.

6. All discharges from the facility must comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges of storm water to storm drain systems or other courses under their jurisdiction.

7. Storm flows in excess of a 24-hour, 25-year storm event may be discharged to surface water bodies in accordance with the requirements specified in U.S. Environmental Protection Agency's "Effluent Guidelines and Standards for Feedlot's, 40 CFR Part 412". Additionally, storm flows resulting from chronic or catastrophic events may also be discharged to surface water bodies in accordance with the U.S. Environmental Protection Agency's effluent guidelines referenced above.

8. The discharger shall comply with Monitoring and Reporting Program No. 99-11.

9. The discharge of wastes to property not owned or controlled by the discharger, except as authorized by this order, is prohibited.

10. The discharger shall comply with all Federal, State, County and local laws and regulations pertaining to the discharge of wastes from the facility.

11. Following a storm event, the discharger shall restore the wastewater holding capacity of retention ponds in a timely manner.

12. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, nor protect the discharger from liabilities under Federal, State, or local laws, nor guarantee the discharger a capacity right in the receiving waters.

13. This order does not convey any property rights of any sort, or any exclusive privilege.

14. An authorization to discharge wastes under this order is not transferable to any person without written authorization from the Executive Officer.

15. The discharger shall comply with all requirements of this order and all terms, conditions, and limitations specified in the discharge authorization letter issued by the Executive Officer.

16. The discharger shall take all reasonable steps to minimize or prevent any discharge that has a reasonable likelihood of adversely affecting human health or the environment.

17. Any instance of noncompliance with this order constitutes a violation of the Clean Water Act (CWA), its regulations, and the California Water Code, and is grounds for enforcement action, and/or termination of the authorization to discharge.

18. The provisions of this order are severable, and if any provision of this order, or the application of any provisions of this order to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this order shall not be affected thereby.

19. It shall not be a defense for a discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this order.

20. Compliance determination with the terms of this order shall be based on the following:

    a. Periodic inspections by Regional Board staff;
    b. Evaluation of the annual report of animal waste and storm water discharge submitted according to the attached monitoring and reporting program; and
    c. Any other information deemed necessary by the Executive Officer.

21. The Regional Board, USEPA, and other authorized representatives shall be allowed:

    a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this general permit;
    b. Access to copy any records that are kept under the conditions of this general permit;
    c. To inspect any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this general permit; and
    d. To photograph, sample, and monitor for the purpose of assuring compliance with this general permit, or as otherwise authorized by the CWA.

## C. PERMIT REOPENING, REVISION, REVOCATION, AND RE-ISSUANCE:

1. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal CWA, or amendments thereto, the Board will revise and modify this order in accordance with such standards.

2. This order may be reopened to address any changes in State or Federal plans, policies or regulations that would affect the quality requirements for the discharges.

## D. PENALTIES:

1. The CWA provides that any person who violates a provision implementing sections 301, 302, 306, 307, or 308 of the CWA is subject to a civil penalty not to exceed $11,000 per day of such violation. Any person who willfully or negligently violates provisions implementing these sections of the CWA is subject to a fine of not less than $2,500 nor more than $25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

2. The CWA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $11,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

3. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $11,000 per violation, or by imprisonment for not more than six months per violation, or by both.

4. The California Water Code provides that any person who violates a waste discharge requirement or a provision of the California Water Code is subject to civil penalties of up to $5,000 per day, $10,000 per day, or $25,000 per day of violation, or when the violation involves the discharge of pollutants, is subject to civil penalties of up to $10 per gallon per day, or $20 per gallon per day of violation; or some combination thereof, depending on the violation, or upon the combination of violations.

## E. REQUIRED REPORTS AND NOTICES:

1. Reporting Provisions:

   a. All applications, annual reports, or information submitted to the Regional Board shall be signed and certified in accordance with 40 CFR 122.22.

   b. Any discharger authorized to discharge waste under this order shall furnish, within a reasonable time, any information the Regional Board or EPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating their authorization or this general permit. The discharger shall also furnish to the Regional Board, upon request, copies of records required to be kept by this order.

c. Except for data determined to be confidential under Section 308 of the CWA, all reports prepared in accordance with the terms of this general permit shall be available for public inspection at the offices of the Regional Water Quality Control Board and the Regional Administrator of USEPA. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statements on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the Act and Section 13387 of the California Water Code.

2. The discharger shall notify the Regional Board by telephone within 24 hours of any unauthorized discharge of waste from the facility. This notification shall be followed by a written report including the following:

   a. The approximate date and time of the discharge;
   b. The volume and duration of the discharge;
   c. The cause of the discharge; and
   d. A time schedule and a plan to implement necessary corrective actions to prevent the recurrence of such discharges.

3. The discharger shall report promptly in writing to the Regional Board of any changes or proposed changes in:

   a. The control, ownership, operation or location of the facility;
   b. The character, location, volume or disposal methods of waste discharges; and
   c. The size of the animal population, if it increases beyond the design capacity of the facility specified in the EWMP.

4. The discharger shall give advance notice to the Regional Board of any planned changes in the permitted facility or activity that may result in noncompliance with this general permit.

## F. APPLICATION REQUIREMENTS:

1. Dischargers previously authorized to discharge wastes under Order No. 94-7, dischargers currently discharging wastes under individual waste discharge requirements, and dischargers who have submitted a notice of intent to discharge wastes under Order No. 94-7 are automatically enrolled under this Order, unless they file an application to be covered under an individual permit. Once the Executive Officer issues a discharge authorization letter, the individual waste discharge requirements are hereby rescinded.

2. Dischargers not previously authorized to discharge waste under Order No. 94-7 are required to submit the following within 60 days of the effective date of this Order for existing discharges and at least 60 days before the start of any new discharge:

a. A completed Notice of Intent Form (see attachment "A") with the appropriate filing fee;
b. An Engineered Waste Management Plan for the facility, acceptable to the Executive Officer (see Attachment "B");
c. If an acceptable EWMP has not been developed, the discharger must submit the name of the engineer, or other qualified individual, who will develop the EWMP and a proposed time schedule for its development; and
d. Any other information deemed necessary by the Executive Officer.

If the proposed discharge meets the requirements of this order, the Executive Officer will provide the discharger with a written authorization to discharge waste in accordance with these waste discharge requirements.

3. The following types of facilities are generally not required to obtain authorization under this order. Such facilities must not discharge waste which may affect water quality, or cause a nuisance or pollution as defined in Section 13050 of the California Water Code.

a. Dairies where the animal population is less than 20 (dry or milking cows).
b. Heifer or calf ranches where the herd size is less than 50.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on August 20, 1999.

G J Thibeault

Gerard J. Thibeault
Executive Officer

Attachment "A" NOI

# REQUIREMENTS FOR AN ENGINEERED WASTE MANAGEMENT PLAN

**The Engineered Waste Management Plan must be prepared by a registered professional engineer in the State of California or another qualified individual.**

## A. SITE PLAN:

Site plan shall include:

1. Address and/or legal description of the property.

2. Name, address, and telephone number of the owner and operator of the property.

3. Total gross acreage of the property, showing property boundaries and all existing and proposed facilities including buildings, storage areas, berms/levees, holding ponds, pumping facilities, culverts, drainage easements, disposal areas, croplands (whether farmed by the owner/operator or another party), etc. The site plan must include the overall dimensions, contours, a vicinity map, north arrow, and the date the plan was prepared. The plan shall be drawn on a standard blue print format using an appropriate scale that shows sufficient details of all facilities.

4. Containment facilities shall be designed to retain, on the property, all process generated wastewater and storm water runoff due to precipitation and drainage through manured areas which results from a 24-hour, 25-year storm event. Facilities in operation on November 27, 1984 shall be designed for protection of all manured areas from inundation or washout by overflow from any stream channel during 20-year peak stream flows. All manured areas for new facilities (built after November 27, 1984) shall be protected from inundation resulting from a 100-year peak stream flow. The site plan shall show all facilities necessary for containment and management of on-site storm water runoff as well as the interception and conveyance of any off-site storm water runoff through the property.

5. The site plan shall show the size, elevation, and location of all facilities proposed for containment of process generated wastewater and storm water runoff on the property (berms/levees, holding ponds, upstream diversion structures, etc.). Cross section details of these facilities shall be presented.

6. A description of existing and proposed disposal areas or cropland, designated to receive operational water.

## B. DESIGN CALCULATIONS:

Design calculations shall include:

1. Present and proposed animal population (numbers of each: milk cows, dry cows, calves, heifers, etc.) and the volume of wash water generated.

2. Amount of storm water runoff resulting from a 24-hour, 25-year storm event.

3. Total amount of wastewater (wash water and storm water) to be contained on the property.

4. Dimensions and capacity of the holding ponds.

5. Percolation rates, if used.

## C. CONSTRUCTION SPECIFICATIONS:

Construction specifications shall include the construction materials and method of compaction utilized to build berms/levees and other containment facilities.

## D. OPERATION AND MANAGEMENT PLAN:

Operations and maintenance plan shall include:

1. A proposed holding pond management plan (to provide maximum pond capacity prior to winter storms; periodic dredging, etc.).

2. A proposed wastewater distribution plan (periodic rotation of wastewater to disposal areas or croplands).

3. A proposed maintenance plan for berms/levees and other containment facilities, including a proposed rodent control plan (periodic inspections to monitor for holes/cracks or breaks, etc.)

California Regional Water Quality Control Board
Santa Ana Region

Monitoring and Reporting Program No. 99-11
for
Concentrated Animal Feeding Operations (Dairies and Related Facilities)
Santa Ana Region

## A. Monitoring

1. The discharger(s) shall inspect the waste holding and disposal areas and note any discharges off the property that is under the control of the discharger. Inspections will be made daily when wastewater is being applied to cropland and weekly during other periods. The results of all inspections will be recorded and submitted with the required reports.

2. During each significant storm event[5], the discharger(s) shall make visual inspections of all storm water containment structures.

3. The discharger(s) shall record the approximate time of each storm-related discharge that results in off-property discharges of storm water commingled with wastewater or manure, and its approximate duration.

4. The discharger(s) shall record each manure-hauling event on a manure tracking manifest form.

## B. Reporting

1. By January 15 of each year, an annual report of animal waste discharge and storm water discharge shall be submitted.

2. The annual report shall be submitted on forms provided by Regional Board staff and shall also include copies of all manure tracking manifests for the reporting period and copies of the inspection logs required to be maintained under A.1. and A.4. above.

3. The discharger shall notify the Regional Board by telephone within 24 hours of any unauthorized discharge of wastes. This notification shall be followed by a written report which shall be submitted to the Regional Board within two weeks of the discharge . The written report shall contain:

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[5] A significant storm event is defined as a storm event which results in continuous discharge of storm water for a minimum of one hour, or intermittent discharge of storm water for a minimum of three hours in a 12-hour period.

a. The approximate date and time of the discharge;

b. The flow rate and duration of the discharge;

c. The specific type and source of the waste discharges (e.g., overflow from holding pond, rainfall runoff from manure storage areas, etc.); and

d. A time schedule and a plan to implement necessary corrective actions to prevent the recurrence of the discharge.

All reports shall be signed by a responsible officer or duly authorized representative of the discharger(s) and shall be submitted under penalty of perjury.

Ordered by
Gerard J. Thibeault
Executive Officer

August 20 , 1999

California Regional Water Quality Control Board
Santa Ana Region

FACT SHEET

# GENERAL WASTE DISCHARGE REQUIREMENTS FOR CONCENTRATED ANIMAL FEEDING OPERATIONS (DAIRIES AND RELATED FACILITIES) WITHIN THE SANTA ANA REGION, ORDER NO. 99-11, NPDES NO. CAG018001

## I. Need for General Waste Discharge Requirements

There are approximately 302 animal feeding operations (AFOs), including dairies, heifer ranches and calf nurseries in the Santa Ana Region. These AFOs contain about 370,000 animals [213,000 lactating (milking) cows, 37,000 dry (pregnant) cows, 56,000 heifers (12-18 month old cows), and 60,000 calves (less than 12 month old cows)]. Two hundred and seventy nine of these facilities (320,000 animals) are located in the Chino Basin, while 23 of the facilities (50,000 animals) are located in the San Jacinto Basin. The wastes generated at these facilities include manure, wash water[1] and storm water runoff from manured areas. About 950,000 tons of manure (at 33% moisture) were produced in the corrals by these facilities in 1998. This is equivalent to about 4,000,000 cubic yards of manure (at 33% moisture). About 15 million gallons of washwater, which contains about 10% of the manure produced by milking cows, is discharged to the ground each day. Wastes produced at AFOs contain high levels of bacteria, biochemical oxygen demand, ammonia, nitrate, phosphorus, and other salts.

Wastes in rainfall runoff from AFOs in the Chino Basin affect Chino Creek, Mill Creek and Reach 3 of the Santa Ana River, which are 303(d) listed impacted water bodies. Wastes from AFOs that are discharged to the Santa Ana River also affect the quality of groundwater in Orange County, since the Orange County Water District captures and percolates a significant amount of the flow of the Santa Ana River to recharge the Santa Ana Forebay Groundwater Subbasin. The Chino Basin is considered to have the highest concentration of dairy animals in the world, with its 279 facilities and 320,000 animals located within an area of less than 50 square miles (30,000 acres). The application of manure to the ground in the Chino Basin has resulted in significant groundwater pollution, specifically total dissolved solids (TDS) and nitrate. Affected groundwater in the Chino Basin also impacts the quality of the Santa Ana River because the Santa Ana River becomes a gaining steam in the Prado Basin where groundwater from the Chino Basin contributes to the surface flow of the Santa Ana River.

Wastes in surface runoff from AFOs in the San Jacinto Basin affect the San Jacinto River, Canyon Lake and Lake Elsinore. Phosphorus from AFOs is considered to be the primary cause of algae blooms in Lake Elsinore, the largest natural freshwater lake in Southern California. These algae blooms deplete oxygen in the lake, creating fish kills and other conditions which affect the economic development and aesthetics of the area. Proper management of wastes from AFOs is essential to protect the surface and groundwater resources of the Region.

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[1] Water used to wash cows prior to milking, milking equipment and the milk barn.

Beginning in 1972, and continuing through 1994, the Board's regulatory approach was to issue individual waste discharge requirements to each AFO. Changes in the location, size, number of animals, or operator of these facilities were frequent and necessitated rescinding existing waste discharge requirements and issuing new requirements. The time demands to draft and rescind individual waste discharge requirements far exceeded the staff resources available to do so.

Criteria cited in 40 CFR 122.28 state that general permits may be issued for facilities 1) involving the same or substantially similar types of operations; 2) discharging the same types of wastes; 3) having the same or similar operating conditions; 4) requiring the same or similar monitoring; and 5) that are more appropriately regulated under a general permit rather than individual permits. The types of wastes and appropriate waste discharge requirements for dairies and related facilities are similar. Given this, the AFOs in the Region can be adequately and appropriately regulated by coverage under the terms of a general waste discharge permit.

On February 17, 1994, the Board adopted Order No. 94-7, General Waste Discharge Requirements For Concentrated Animal Feeding Operations, Including Dairies, Within The Santa Ana Region (NPDES NO. CAG018001). Order No. 94-7 has allowed the Board to better utilize staff resources. Currently, approximately 215 AFOs have been enrolled under Order No. 94-7. The remaining AFOs are either covered under individual waste discharge requirements issued prior to 1994, have submitted a Notice of Intent (NOI) to be covered under Order No. 94-7, or have not yet submitted a NOI. AFOs that have submitted a NOI and have not yet been granted coverage under Order No. 94-7 and AFOs that are still covered under individual waste discharge requirements, have not been granted coverage under Order No. 94-7 because they have not yet completed Engineered Waste Management Plans (EWMPs). Order No. 94-7 expired on March 1, 1999. Therefore, it is necessary to renew the waste discharge requirements contained in Order No. 94-7.

Although Order No. 94-7 regulated the discharge of waste from all AFOs (including non-dairy related facilities), the proposed order only addresses the discharge of wastes from dairies and related facilities, such as calf nurseries and heifer ranches. Over 95% of the dischargers enrolled, or waiting to be enrolled, under Order 94-7 are dairies and related facilities. Many of the requirements contained in Order No. 94-7, and this proposed order, are not appropriate for most other types of AFOs. Therefore, persons discharging, or proposing to discharge, wastes from other types of AFOs must obtain coverage under individual waste discharge requirements or another general permit, if one is adopted.

Currently, the larger AFOs are required to get coverage under the State Water Resources Control Board (State Board) General Industrial Storm Water Permit (Order No. 91-13-DWQ) for storm water runoff from their facilities. However, the proposed order consolidates all requirements for AFOs, including those for storm water runoff, into a single permit. Once coverage is granted under this order, other waste discharge requirements issued by this Regional Board and coverage under the State's General Permit will be terminated.

The Federal Clean Water Act (CWA) states that all concentrated animal feeding operations (CAFOs) are point sources and are subject to NPDES permitting requirements. The CWA defines a CAFO as any AFO that has more than 1,000 animal units (i.e., dairy cattle are considered 1.4 animal units). About 70% of the AFOs in the Region have over 1,000 animal units, and are, therefore, considered CAFOs under the CWA. However, the CWA states that smaller facilities can be designated as CAFOs by the permitting authority (i.e., Regional Board) after considering certain criteria. These criteria include, in part, the location of the AFO relative to surface waters, the slope, rainfall and other factors that increase the likelihood or frequency of discharges, and the impact of the aggregate amount of waste from many small operations in a watershed that exceed that of lager operations. Board staff has determined that all dairies, heifer ranches and calf nurseries in the Region meet one or more of these criteria, and, therefore, should be designated as CAFOs under the CWA. Tentative Order No. 99-11 designates all dairies, heifer ranches and calf nurseries in the Region as CAFOs, and makes them subject to NPDES requirements. Therefore, the acronym "CAFO" will be used to describe all facilities addressed by Tentative Order No. 99-11.

## II. Basis for Discharge Limitations

### Development and Implementation of Engineered Waste Management Plans

In compliance with the CWA and the California Code of Regulations, Tentative Order No. 99-11 prohibits discharges to any surface water bodies, or tributary thereof, unless rainfall events, either chronic or catastrophic, cause an overflow of process waste water from a facility designed, constructed and operated to contain all process generated waste waters plus the runoff from a 25-year, 24-hour rainfall event. (Title 27, Chapter 7, Subchapter 2, Article 1, Section 22562(a), California Code of Regulations and 40 CFR Part 412). Therefore, process waste water in overflows resulting from rainfall events that are chronic or catastrophic, or are in excess of a 24-hour, 25-year rainfall event, may be discharged to surface water bodies in accordance with requirements specified in this order. To insure that compliance with these requirements is achieved, all CAFOs are required to develop and implement an Engineered Waste Management Plan (EWMP). The guidelines for the preparation of an EWMP are included in Attachment "B" of the proposed order. Attachment "B" is intended to be revised by the Executive Officer in the near future. As with expired Order No. 94-7, Tentative Order No. 99-11 authorizes the Executive Officer to make necessary revisions to "Attachment B".

### Prohibition on the Application of Manure to Land in the Chino Basin

The Regional Board has conducted extensive studies on TDS and nitrate using computer models to determine acceptable salt loading rates to groundwater from various land uses, including dairies and other animal confinement facilities. These studies are the basis of the TDS and nitrogen management plan specified in the Water Quality Control Plan (Basin Plan) for the Region. In accordance with the TDS/nitrogen management plan, since 1972, waste discharge requirements adopted by the Board for CAFOs limited the amount of manure disposal on disposal acreage at

CAFOs to 3 (dry) tons (4.38 tons @ 33% moisture) per acre per year to address potential groundwater impacts. The resultant salt load is roughly equivalent to that permitted by the plan for other types of land use when the affected receiving waters have salt assimilative capacity. Dairy manure contains much more salt per unit of nitrogen than other types of fertilizers. The Board's 1990 Dairy Report, "Dairies and Their Relationship to Water Quality Impacts in the Chino Basin", showed that the use of manure as a fertilizer results in two to four times more salt reaching groundwater (up to 10 times more non-nitrate salts) than the use of non-manure commercial fertilizers. For this reason, the use of manure to meet the nutrient needs of crops results in excessive application of salts that are not utilized by plants and which can, therefore, migrate to groundwater. Order No. 94-7 limited manure application to cropland to agronomic rates [up to 12 (dry) tons (17.5 tons @ 33% moisture) per acre per year]. Limiting the amount of manure applied to cropland to agronomic rates was an attempt to minimize the amount of salt that would reach groundwater from the use of manure on cropland, without hindering the effective use of manure as a fertilizer.

Ninety percent of the CAFOs in the Region are located in the Chino Basin, which has severe TDS and nitrate groundwater quality problems. As noted in the Board's Basin Plan, the Chino II and III Groundwater Subbasins lack assimilative capacity for these constituents. For groundwater subbasins without assimilative capacity, additional salt inputs at rates above Basin Plan objectives cannot be allowed (State Water Resources Control Board Order No. 73-4, the Rancho Caballero decision). To meet the Chino Basin groundwater objectives, the discharge of manure and other animal wastes, such as dairy wash water, and their application as fertilizer, cannot be legally permitted unless this salt load is offset. The Basin Plan contains a dairy regulatory strategy that was developed in the Board's 1990 Dairy Report. One element of that strategy addresses waste discharge requirements for manure and wash water disposal and application of wastes to cropland. That element specifies that ongoing manure and wash water disposal or application to cropland in the Chino Basin must be prohibited unless suitable salt offset programs are implemented.

In 1994, the Board was informed that two desalters would be built in the Chino Basin. The Board was also informed that a significant amount of manure would be exported from the Chino Basin by the proposed Chino Basin Co-Composting Facility. It was assumed that after the Chino Basin Co-Composting Facility began operation and began exporting a significant amount of manure, the amount of salt to be extracted from the Chino Basin by the two desalters would be adequate to provide sufficient salt removal to offset the present and projected salt loads from ongoing dairy discharges. Therefore, the Board adopted Order No. 94-7, allowing manure and wash water discharges to continue, on the assumption that adequate salt offsets would be implemented. However, the desalters were never built (although one is now under construction) and the Co-Composting Facility, built in 1995, has never exported the significant amount of manure that had been projected. Therefore, sufficient offsets were not implemented, and manure and wash water discharges, and the use of manure on cropland, have been continuing without adequate salt offsets, in violation of State law.

Board staff estimates that over 13 million tons of manure have been applied in the Chino Basin since the mid-1950's, resulting in over 1.4 million tons of salt that have reached, or will reach,

groundwater. The application of about 400,000 tons of manure (@ 33% moisture) per year to disposal land, cropland and ongoing stockpiles in the Chino Basin is continuing. Board staff estimates that the current rate of application of manure and wash water to land in the Chino Basin is resulting in about 34,000 tons of salt that will reach groundwater each year. About 30,000 tons per year is from the application of manure, and about 4,200 tons per year is from the discharge of wash water. A desalter is currently being built in the Chino Basin. The extraction wells that will supply water for the desalter are expected to remove about 11,500 tons of salt per year from the Chino Basin. Kaiser Steel will be credited with an offset of 4,000 tons of this salt each year for a period of 25 years, in accordance with a previous settlement agreement with the Board. The Board has previously indicated that it would accept the remainder of the salt that will be removed from the extraction wells as an offset for continuing discharges from CAFOs in the Chino Basin. However, that amounts to an offset of only 7,500 tons of salt per year, compared to a current CAFO salt loading to groundwater of about 34,000 tons per year. In addition to the 4,200 tons of salt that reaches groundwater each year from wash water discharges, salt also is discharged to groundwater as a result of the percolation of rainfall runoff from corrals and drainage from manure stockpiles. The amount of salt that reaches groundwater each year from the percolation of rainfall runoff from corrals and percolation of drainage from manure stockpiles has not yet been adequately determined. However, staff believes that it may account for the remaining 3,800 tons of salt offset provided by the desalter, leaving no, or very little, salt offset available for continued manure application in the Chino Basin. No other mitigation measures are currently in place, and none are expected to be in place immediately, to offset the salt loading from ongoing manure application in the Chino Basin. Therefore, the discharge of manure and its application as fertilizer in the Chino II and Chino III Subbasins must be prohibited. The remainder of the subbasins in the Chino Basin are of excellent quality and are tributary to the Chino II and Chino III Subbasins. Also, the addition of salt to those subbasins by the application of manure was not considered when the assimilative capacity for those subbasins was determined. Therefore, Tentative Order No. 99-11 prohibits the discharge of manure and its application as fertilizer throughout the entire Chino Basin (The accompanying cease and desist order allows manure to continue to be applied to cultivated croplands within the Chino Basin at agronomic rates as long as significant progress is being made towards the construction and operation of a second desalter within the Chino Basin). Tentative Order No. 99-11 does not prohibit the on-site discharge of wash water, rainfall runoff from corrals, or drainage from manure stockpiles, since the salt loadings from these discharges appear to be offset by the salt that will be removed by the desalter facility.

Removal of Manure from the Facility

Tentative Order No. 99-11 requires that manure be hauled from each facility within 180 days after being removed from the corrals. Any manure remaining at the facility after 180 days of being removed from the corrals is considered to be disposal of manure and is prohibited by Tentative Order No. 99-11. Draft Order No. 99-11, which was distributed for comments in March and April 1999, proposed requiring the removal of manure from the facility within 90 days after removal of the manure from the corrals. Several comments were received in writing and orally at Board Workshops, stating reasons why this time frame was unreasonable. Board staff also solicited

comments from farm advisors with the University of California Cooperative Extension. It was determined that it is beneficial to "cure" manure for 90 to 180 days prior to composting or for application to cropland, and that the nutrient value of the manure is not significantly affected when manure is stored for less than 180 days. During the winter, 90 days would not allow sufficient time for the manure to dry adequately prior to hauling. Providing 180 days of storage will allow the moisture content of the manure to be sufficiently reduced, making it lighter per unit of volume, and easier and less expensive to haul. Some commercial fertilizer facilities in the Chino Basin prefer receiving manure that has been aged for at least 150 days. Also, CAFOs generally remove manure from their corrals twice a year. Allowing up to 180 days (6 months) storage will result in manure being removed from the facility prior to the next corral cleaning, and will still achieve the goal of preventing the long term accumulation of manure at CAFOs. Board staff believes that allowing for 180 days storage is reasonable, and that there would be no significant difference in water quality impacts from storing manure at the facility for 180 days instead of 90 days.

Change in Language Pertaining to Containment of Storm Water Runoff

Order No. 94-7 and Draft Order No. 99-11 included the following Discharge Specification: "The discharge to any surface water bodies, or tributary thereof, is prohibited unless a chronic, catastrophic or cumulative rainfall causes overflow from a storage facility designed, constructed, maintained and operated to contain all process generated wastewater plus the runoff from a 24-hour, 25-year storm." These Orders defined a chronic, catastrophic or cumulative rainfall as rainfall occurring over a 7-day period or less which is equivalent to that from a 24-hour, 25-year storm event. This language is slightly different than similar language included in the CWA that does not refer to "cumulative" rainfall, and does not contain a definition that refers to rainfall "occurring over a 7-day period." The specification included in Order No. 94-7 and Draft Order No. 99-11 is, overall, more stringent than the language in the CWA, and was developed to provide a more objective basis for determining compliance with the rainfall containment requirement and to be consistent with the Board's EWMP Guidelines. However, the USEPA, and others, have noted that there could be instances during certain storm events of less than 7 days when the specification included in Order No. 94-7 and Draft Order No. 99-11 can be less restrictive than the language included in the CWA. They have requested that the language proposed in Draft Order No. 99-11 be changed to be consistent with the language in the CWA, since NPDES permits cannot contain requirements that can be less restrictive than the CWA. Therefore, the term "cumulative" and the reference to rainfall "occurring over a 7-day period" has been removed from Tentative Order No. 99-11 to make the rainfall containment requirement consistent with the CWA.

Consistency with USDA/USEPA "Unified National Strategy for Animal Feeding Operations"

In March 1999, the United States Department of Agriculture (USDA) and the USEPA finalized their unified national strategy for AFOs. Among other items, the national strategy recommended that general permits require the development and implementation of Comprehensive Nutrient Management Plans (CNMPs). In general, development and implementation of CNMPs is intended to bring each CAFO into compliance with the requirements of the CWA and to minimize the

impacts to groundwater and surface water by the implementation of best management practices. The national strategy describes many best management practices that could be included in CNMPs for individual CAFOs. The best management practices included in each CNMP for each CAFO would include specific best management practices for that CAFO, depending on the specific situations that exist at that particular CAFO. In general, the CNMP would assure that appropriate wastewater facilities were developed, constructed and maintained to comply with the requirements of the CWA, and that the use and application of waste water and manure (i.e., nutrient management) was managed to minimize impacts to groundwater and surface water. Tentative Order No. 99-11 does not require the development and implementation of CNMPs, as described and recommended in the national strategy. This is because the requirements included in Tentative Order No. 99-11 are equivalent to, or more stringent than, what would be required in CNMPs. Also, many of the BMPs recommended to be included in CNMPs are not relevant to the specific, isolated conditions that exist in the Chino Basin. The requirements in Tentative Order No. 99-11 for wastewater and rainfall are equivalent to what the national strategy requires. General BMPs that can be implemented to comply with the wastewater and rainfall containment requirements will be further addressed in the Board's EWMP Guidelines when they are revised in the near future. Specific BMPs that will be implemented at each CAFO to comply with the wastewater and rainfall containment requirements will be addressed in each CAFO's specific EWMP. The prohibition on the application of manure in the Chino Basin is obviously a more stringent requirement than the BMPs for manure application and management that the national strategy recommends to be included in CNMPs, since application of manure is not permitted. The limitation on the application of manure to agronomic rates, not to exceed 12 (dry) tons (17.5 tons @ 33% moisture) per acre per year, in groundwater basins outside the Chino Basin where assimilative capacity exists and application of manure is permitted, is equivalent to the nutrient management guidelines included in the national strategy. Specific BMPs addressing application of manure will be included in each CAFOs specific EWMP.

Prohibition on Covering New Discharges in the Chino Basin Under this Order

The 1998 California 303(d) List and TMDL Priority Schedule includes several surface water bodies as impaired due to CAFOs, including Chino Creek, Mill Creek (Prado Area), and Reach 3 of the Santa Ana River for nutrients, pathogens, salinity/TDS/chlorides, and suspended solids. The CWA states that NPDES permits cannot be issued to a new source (discharger) if the discharge will cause or contribute to the violation of water quality standards, unless certain specified criteria are met, including the development of TMDLs. In the absence of a current TMDL, USEPA has recommended that this general permit be limited to current facilities, and that any new sources (i.e., construction of any new facilities) be processed through an application for an individual NPDES permit. Therefore, Tentative Order No. 99-11 prohibits new sources (i.e., new facilities) from being covered under this general permit. Since the most recent new construction of a CAFO facility in the Chino Basin was approximately 20 years ago, this prohibition is not expected to be a significant issue.

Inability of Many CAFOs to Immediately Comply with Several Requirements Included in this Order

Many CAFOs will not be able to immediately comply with several of the requirements contained in Tentative Order No. 99-11. These requirements include the prohibition on the application of manure in the Chino Basin, implementation of EWMPs and containment of rainfall from a 24-hour, 25-year storm. The Board will consider adoption of a Cease and Desist Order No. 99-65 with a time schedule for compliance with these requirements.

## III. Coverage Under the General NPDES Permit

### A. Dischargers Currently Regulated Under Order No. 94-7 or Under Individual Waste Discharge Requirements, and Dischargers that have Submitted NOIs

These dischargers will be automatically enrolled under the proposed order, once it is adopted. Dischargers who have not yet submitted an acceptable EWMP (see Attachment "B" of the order) are required to do so.

### B. Dischargers Not Currently Regulated Under Order No. 94-7 or Under Individual Waste Discharge Requirements, and Dischargers that have not Submitted NOIs:

At least 60 days prior to initiating a discharge at an existing facility, the discharger shall submit a Notice of Intent (NOI) (see Attachment "A") with the appropriate filing fee (currently, the filing fee is $2,000.00 for each facility) and an acceptable EWMP[2].

## IV. Discharge Authorization Letter

Upon adoption of this order, the Executive Officer shall issue discharge authorization letters to dischargers currently enrolled under Order No. 94-7, discharging waste under individual waste discharge requirements or who have submitted an NOI to be covered under a general permit.

Upon receipt of a complete application for initiation of a discharge at an existing facility, the Executive Officer will review the application to determine eligibility for discharge under this order. If the Executive Officer determines that the discharger is eligible to discharge wastes under this general order, the Executive Officer may authorize the proposed discharge. Otherwise, the Executive Officer may require the discharger to obtain individual waste discharge requirements.

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[2] New operators/owners of existing facilities for which an EWMP has been approved are not required to submit an additional EWMP.

## V. Antidegradation Analysis

The Regional Board conducted extensive TDS and nitrate studies using computer models to determine acceptable salt loading rates to groundwater from various land uses, including dairies and other concentrated animal feeding operations. These studies indicate that if the requirements specified in the proposed general permit are met, water quality of the Region is not expected to degrade as a result of discharges authorized under this general permit. The Regional Board, in establishing the requirements in the tentative order, has taken into consideration the requirements of the State and Federal "antidegradation policies" and has determined that the discharges are in conformance with the antidegradation policies.

## VI. Written Comments

All written comments regarding the proposed general order should be submitted to: Robert Holub, Regional Water Quality Control Board, 3737 Main Street, Suite 500, Riverside, CA 92501.

## VII. Information and Copying

Persons wishing further information may write to the address given below (see IX, below) or call the Regional Board at (909) 782-4130. Copies of the proposed waste discharge requirements, and other documents (other than those which the Executive Officer maintains as confidential) are available at the Regional Board office for inspection and copying by appointment scheduled between the hours of 10:00 a.m. and 4:00 p.m., Monday through Thursday (excluding holidays).

## VIII. Register of Interested Persons

Any person interested in a general permit, or in a particular application or group of applications, may leave his name, address, and phone number as part of the file for an application. Copies of tentative waste discharge requirements will be mailed to all interested parties.

## IX. Workshops and Public Hearing

The Regional Board conducted public workshops on April 9, 1999, May 21, 1999, and June 25, 1999, to solicit comments on the draft general waste discharge requirements that were distributed in March and April 1999. Oral comments were received during these workshops, and written comments were submitted by several parties. These comments were considered by staff and incorporated into Tentative Order No. 99-11, as appropriate.

The Regional Board will hold a public hearing and consider adopting Tentative Order No. 99-11 during a public meeting on August 20, 1999, beginning at 9:00 a.m. The meeting will be held at the City Council Chambers of Loma Linda, 25541 Barton Road, Loma Linda.

Further information regarding the conduct and nature of workshops and pubic hearings concerning waste discharge requirements may be obtained by writing or visiting the Santa Ana Regional Board office, 3737 Main Street, Suite 500, Riverside, 92501 or by calling Robert Holub of Regional Board Staff at (909) 782-3298.

California Regional Water Quality Control Board
Santa Ana Region

August 20, 1999

ITEM:

SUBJECT: General Waste Discharge Requirements For Concentrated Animal Feeding Operations (Dairies And Related Facilities) Within The Santa Ana Region, Order No. 99-11, NPDES No. CAG018001

DISCUSSION:

See attached Fact Sheet

RECOMMENDATION:

Adopt Order No. 99-11, as presented.

Comments were solicited from the following agencies and/or persons:

U.S. EPA, Washington, Office of Wastewater Enforcement and Compliance - Michael B. Cook
U.S. EPA, San Francisco – Alexis Straus
U.S. EPA, Permit Issuance Section - Terry Oda (W-5-1)
U.S. EPA, San Francisco – Dan Meer
State Water Resources Control Board, Office of the Chief Counsel - Ted Cobb
State Water Resources Control Board, DWQ – Jim Kessel, Jack Hodges, Cheryl Closson
State Department of Water Resources - Glendale
State Department of Health Services - San Bernardino/Santa Ana/San Diego
State Department of Fish and Game - Fred Worthley
Regional Water Quality Control Board (1) - Lee Michlin
Regional Water Quality Control Board (2) - Loretta Barsamian
Regional Water Quality Control Board (3) - Roger Briggs
Regional Water Quality Control Board (4) - Dennis Dickerson
Regional Water Quality Control Board (5) - Gary Carlton
Regional Water Quality Control Board (6) - Harold J. Singer
Regional Water Quality Control Board (7) - Philip Gruenberg
Regional Water Quality Control Board (9) - John Robertus
San Bernardino County Board of Supervisors
San Bernardino County Department of Environmental Health Services - Pam Bennett
San Bernardino County Transportation/Flood Control District - Naresh Varma
San Bernardino County LEA
Riverside County Board of Supervisors
Riverside County Department of Environmental Health Services

Riverside County Flood Control and Water Conservation District - Jason Christie
Riverside County LEA
City of Chino
City of Ontario
Milk Producers Council - Robert Feenstra
California Milk Producers Association – John Godino
Santa Ana Watershed Project Authority - Joseph Grindstaff
Inland Empire Utilities Agency – Doug Drury
Orange County Water District - Bill Mills, Nira Yamachika
U.C. Extension, San Bernardino - Abraham Wubishet
Inland Empire West Resource Conservation District - Jeff Wilson
National Resource Conservation Service - Jim Earsom
City of Lake Elsinore – Dick Watenpaugh, Pat Kilroy
Eastern Valley Municipal Water District
Western United Dairymen - Gary Conover, John Borges
Chino Basin Watermaster - Tracy Stewart
Daily Bulletin - Bob Page
Orange County Register
Press Enterprise - Leslie Bergman
Northwest Mosquito and Vector Control District
Santa Ana River Watershed Group - Lindel Marsh
Orange County Sanitation District - Blake Anderson
Water Advisory Committee of Orange County – H. E. Hartge
Los Alisos Water District – Kenneth Petersen
Municipal Water District of Orange County – Stanley E. Sprague
El Toro Water District – Ronald Kennedy
Mesa Consolidated Water District – Fred Bockmiller
Irvine Ranch Water District – Paul D. Jones II
Metropolitan Water District – Bob Huntley
Yorba Linda Water District – Arthur C. Korn
City of Anaheim, Public Utilities Department – Edward K. Aghjayan
Dairy Mailing List

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San Francisco, CA
56 °F Mostly Cloudy(/weather/us/ca/san-francisco/37.78,-122.42)

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34.05 °N, 117.61 °W

# Ontario, CA Weather History

65° ONTARIO INTERNATIONAL AIRPORT STATION (/DASHBOARD/PWS/KCAONTAR23?CM_VEN=LOCALWX_PWSDASH) | CHANGE

HISTORY (/HISTORY/DAILY/US/CA/ONTARIO/KONT)

- TODAY (/WEATHER/US/CA/ONTARIO/KONT)
- HOURLY (/HOURLY/US/CA/ONTARIO/KONT)
- 10-DAY (/FORECAST/US/CA/ONTARIO/KONT)
- CALENDAR (/CALENDAR/US/CA/ONTARIO/KONT)
- HISTORY (/HISTORY/DAILY/US/CA/ONTARIO/KONT)
- WUNDERMAP (/WUNDERMAP?LAT=34.049&LON=-117.607)

Daily (/history/daily/us/ca/ontario/KONT/date/2010-12-21) Weekly (/history/weekly/us/ca/ontario/KONT/date/2010-12-21) Monthly (/history/monthly/us/ca/ontario/KONT/date/2010-12)

December 21 2010 View

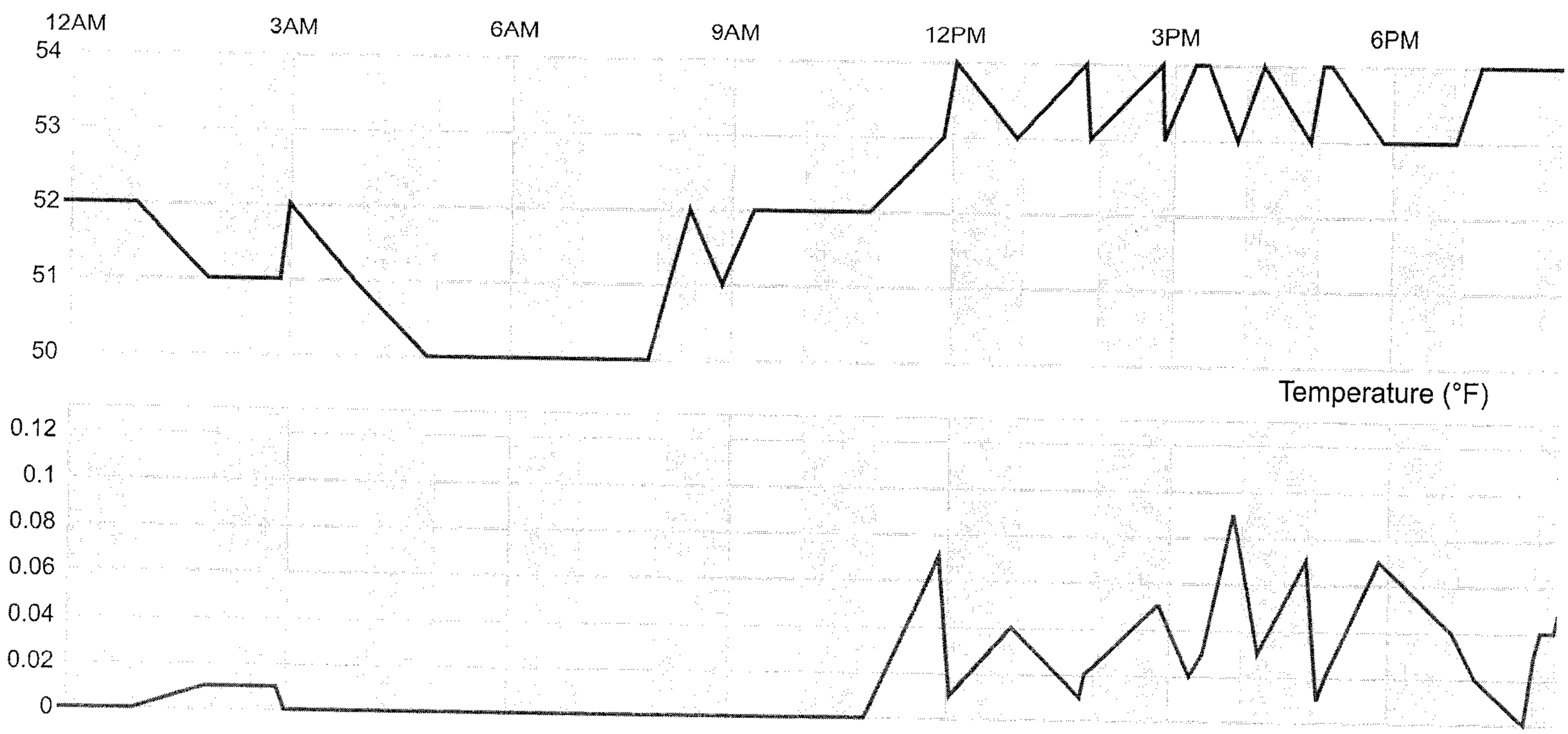

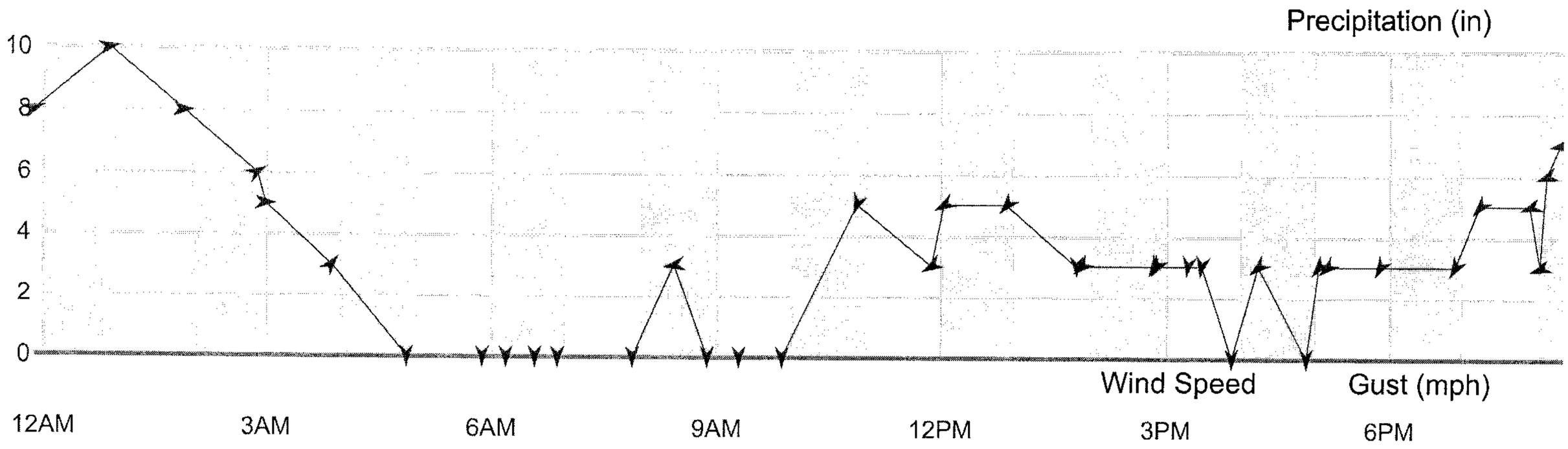


# Summary

| **Temperature (°F)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| High Temp | 54 | 68 | 81 |
| Low Temp | 50 | 44 | 28 |
| Day Average Temp | 52.68 | 56 | - |

| **Precipitation (in)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Precipitation (past 24 hours from 08:53:00) | 0.00 | 0.06 | - |

| **Dew Point (°F)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Dew Point | 51.07 | - | - |
| High | 54 | - | - |
| Low | 48 | - | - |
| Average | 51.07 | - | - |

| **Wind (mph)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Max Wind Speed | 10 | - | - |
| Visibility | 9 | - | - |

| **Sea Level Pressure (in)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Sea Level Pressure | 28.93 | - | - |

| **Astronomy** | Day Length | Rise | Set |
|---|---|---|---|

| Temperature (°F) | Actual | Historic Avg. | Record |
|---|---|---|---|
| Actual Time | 9h 52m | 6:53 AM | 4:46 PM |
| Civil Twilight | | 6:25 AM | 5:14 PM |
| Nautical Twilight | | 5:54 AM | 5:45 PM |
| Astronomical Twilight | | 5:23 AM | 6:15 PM |
| Moon: waning gibbous | | 5:24 PM | 7:12 AM |

# Daily Observations

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Prec |
|---|---|---|---|---|---|---|---|---|
| 11:53 PM | 52 °F | 52 °F | 100 % | WSW | 8 mph | 0 mph | 28.85 in | 0.0 i |
| 12:53 AM | 52 °F | 51 °F | 97 % | W | 10 mph | 0 mph | 28.84 in | 0.0 i |
| 1:53 AM | 51 °F | 50 °F | 96 % | W | 8 mph | 0 mph | 28.84 in | 0.0 i |
| 2:53 AM | 51 °F | 50 °F | 96 % | WSW | 6 mph | 0 mph | 28.86 in | 0.0 i |
| 3:00 AM | 52 °F | 50 °F | 94 % | W | 5 mph | 0 mph | 28.87 in | 0.0 i |
| 3:53 AM | 51 °F | 50 °F | 96 % | SW | 3 mph | 0 mph | 28.85 in | 0.0 i |
| 4:53 AM | 50 °F | 49 °F | 96 % | CALM | 0 mph | 0 mph | 28.86 in | 0.0 i |
| 5:53 AM | 50 °F | 49 °F | 96 % | CALM | 0 mph | 0 mph | 28.87 in | 0.0 i |
| 6:12 AM | 50 °F | 48 °F | 94 % | CALM | 0 mph | 0 mph | 28.88 in | 0.0 i |
| 6:35 AM | 50 °F | 48 °F | 94 % | CALM | 0 mph | 0 mph | 28.88 in | 0.0 i |
| 6:53 AM | 50 °F | 49 °F | 96 % | CALM | 0 mph | 0 mph | 28.89 in | 0.0 i |
| 7:53 AM | 50 °F | 49 °F | 96 % | CALM | 0 mph | 0 mph | 28.90 in | 0.0 i |
| 8:26 AM | 52 °F | 50 °F | 94 % | E | 3 mph | 0 mph | 28.91 in | 0.0 i |
| 8:53 AM | 51 °F | 50 °F | 96 % | CALM | 0 mph | 0 mph | 28.92 in | 0.0 i |
| 9:18 AM | 52 °F | 50 °F | 94 % | CALM | 0 mph | 0 mph | 28.92 in | 0.0 i |
| 9:53 AM | 52 °F | 50 °F | 93 % | CALM | 0 mph | 0 mph | 28.93 in | 0.0 i |
| 10:53 AM | 52 °F | 50 °F | 93 % | NNE | 5 mph | 0 mph | 28.93 in | 0.0 i |
| 11:53 AM | 53 °F | 50 °F | 89 % | ENE | 3 mph | 0 mph | 28.91 in | 0.1 i |
| 12:03 PM | 54 °F | 50 °F | 88 % | ENE | 5 mph | 0 mph | 28.90 in | 0.0 i |
| 12:53 PM | 53 °F | 50 °F | 89 % | NE | 5 mph | 0 mph | 28.89 in | 0.0 i |
| 1:49 PM | 54 °F | 52 °F | 94 % | VAR | 3 mph | 0 mph | 28.88 in | 0.0 i |

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Prec |
|---|---|---|---|---|---|---|---|---|
| 1:53 PM | 53 °F | 51 °F | 93 % | NE | 3 mph | 0 mph | 28.89 in | 0.0 i |
| 2:51 PM | 54 °F | 52 °F | 94 % | NNE | 3 mph | 0 mph | 28.88 in | 0.1 i |
| 2:53 PM | 53 °F | 52 °F | 96 % | NNE | 3 mph | 0 mph | 28.87 in | 0.1 i |
| 3:18 PM | 54 °F | 52 °F | 94 % | N | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 3:29 PM | 54 °F | 52 °F | 94 % | N | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 3:53 PM | 53 °F | 52 °F | 96 % | CALM | 0 mph | 0 mph | 28.89 in | 0.1 i |
| 4:14 PM | 54 °F | 52 °F | 94 % | NE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 4:53 PM | 53 °F | 52 °F | 96 % | CALM | 0 mph | 0 mph | 28.88 in | 0.1 i |
| 5:03 PM | 54 °F | 52 °F | 94 % | NE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 5:10 PM | 54 °F | 52 °F | 94 % | NE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 5:53 PM | 53 °F | 52 °F | 96 % | NNE | 3 mph | 0 mph | 28.88 in | 0.1 i |
| 6:53 PM | 53 °F | 52 °F | 96 % | NNE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 7:13 PM | 54 °F | 52 °F | 94 % | NE | 5 mph | 0 mph | 28.88 in | 0.0 i |
| 7:53 PM | 54 °F | 52 °F | 94 % | ENE | 5 mph | 0 mph | 28.88 in | 0.0 i |
| 8:01 PM | 54 °F | 52 °F | 94 % | ENE | 3 mph | 0 mph | 28.88 in | 0.0 i |
| 8:06 PM | 54 °F | 52 °F | 94 % | ENE | 6 mph | 0 mph | 28.88 in | 0.0 i |
| 8:17 PM | 54 °F | 52 °F | 94 % | E | 7 mph | 0 mph | 28.88 in | 0.0 i |
| 8:30 PM | 54 °F | 52 °F | 94 % | ENE | 7 mph | 0 mph | 28.88 in | 0.1 i |
| 8:42 PM | 54 °F | 54 °F | 100 % | ENE | 5 mph | 0 mph | 28.88 in | 0.1 i |
| 8:49 PM | 54 °F | 52 °F | 94 % | ENE | 7 mph | 0 mph | 28.88 in | 0.1 i |
| 8:53 PM | 53 °F | 53 °F | 100 % | ENE | 5 mph | 0 mph | 28.88 in | 0.1 i |
| 9:53 PM | 53 °F | 52 °F | 96 % | E | 8 mph | 0 mph | 28.85 in | 0.0 i |
| 10:53 PM | 54 °F | 52 °F | 93 % | NE | 5 mph | 0 mph | 28.82 in | 0.0 i |
| 11:34 PM | 54 °F | 54 °F | 100 % | ENE | 3 mph | 0 mph | 28.82 in | 0.1 i |

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34.05 °N, 117.61 °W

# Ontario, CA Weather History

65° ONTARIO INTERNATIONAL AIRPORT STATION (/DASHBOARD/PWS/KCAONTAR23?CM_VEN=LOCALWX_PWSDASH) | CHANGE

HISTORY (/HISTORY/DAILY/US/CA/ONTARIO/KONT)

- TODAY (/WEATHER/US/CA/ONTARIO/KONT)
- HOURLY (/HOURLY/US/CA/ONTARIO/KONT)
- 10-DAY (/FORECAST/US/CA/ONTARIO/KONT)
- CALENDAR (/CALENDAR/US/CA/ONTARIO/KONT)
- HISTORY (/HISTORY/DAILY/US/CA/ONTARIO/KONT)
- WUNDERMAP (/WUNDERMAP?LAT=34.049&LON=-117.607)

Daily Weekly Monthly

(/history/daily/us/ca/ontario/KONT/date/2010-12-22) (/history/weekly/us/ca/ontario/KONT/date/2010-12-22) (/history/monthly/us/ca/ontario/KONT/date/2010-12)

December 22 2010 View

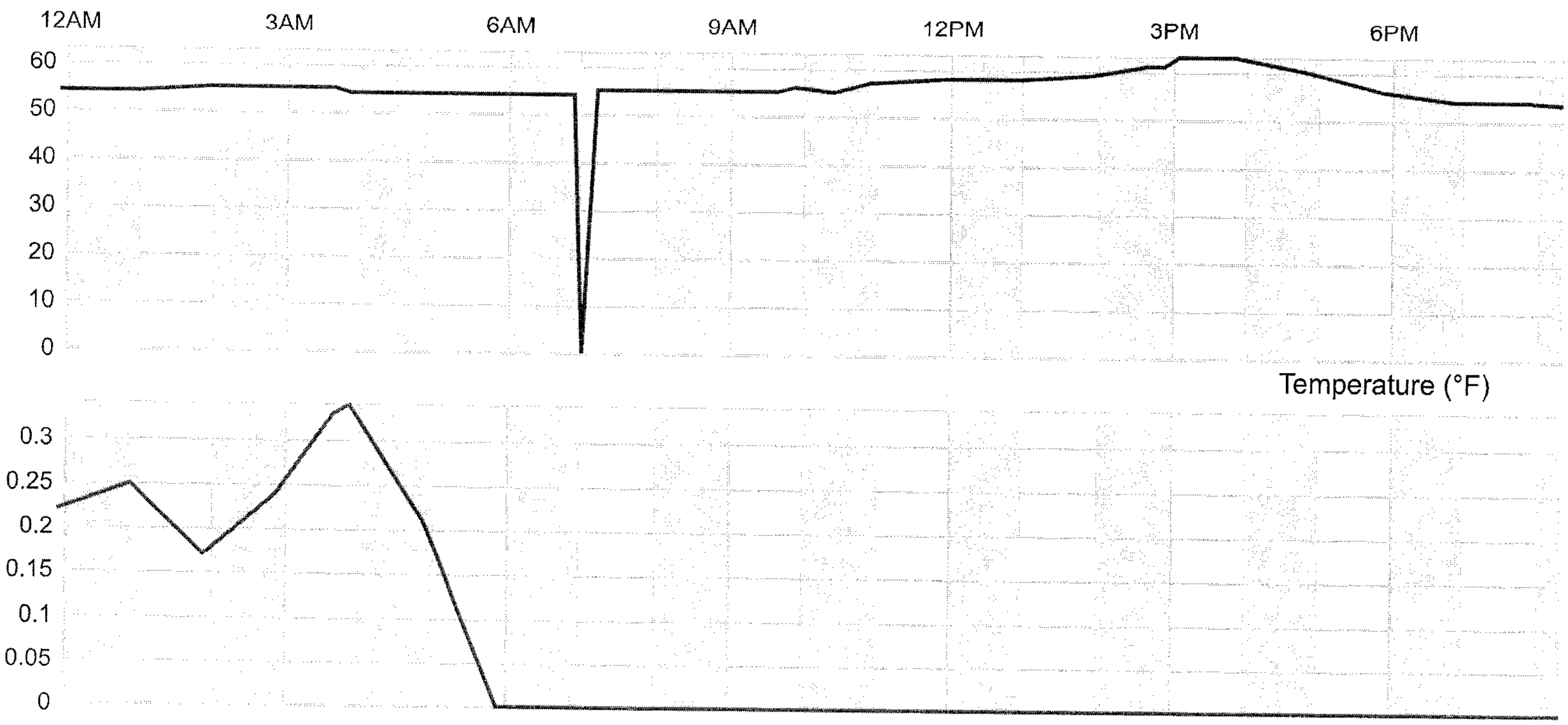

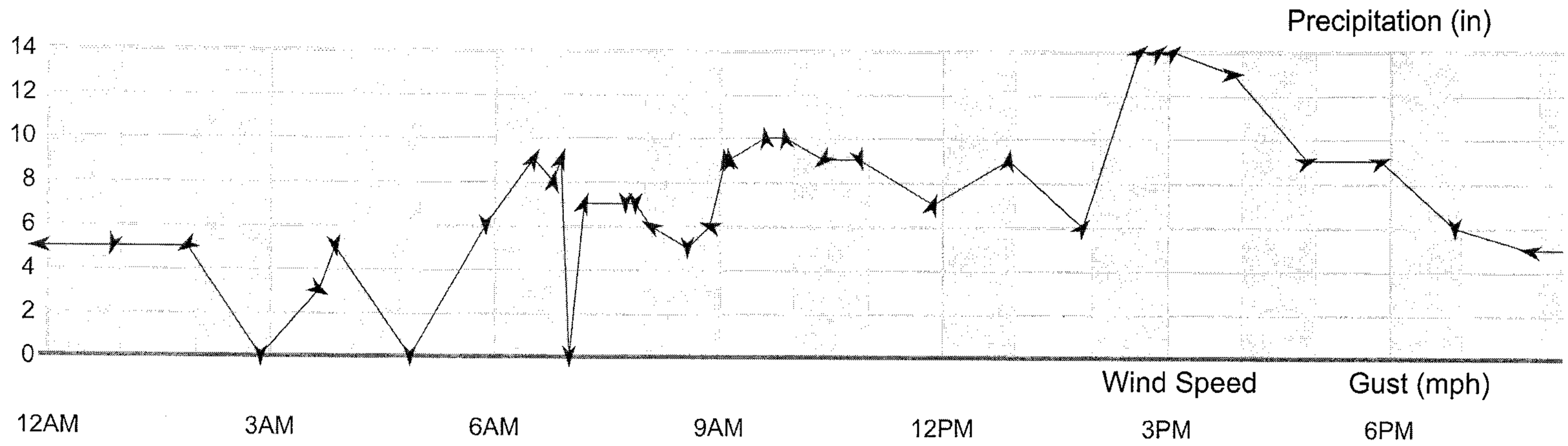


# Summary

| **Temperature (°F)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| High Temp | 63 | 68 | 81 |
| Low Temp | 0 | 44 | 30 |
| Day Average Temp | 54.43 | 56 | - |

| **Precipitation (in)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Precipitation (past 24 hours from 08:53:00) | 0.00 | 0.06 | - |

| **Dew Point (°F)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Dew Point | 51.73 | - | - |
| High | 55 | - | - |
| Low | 0 | - | - |
| Average | 51.73 | - | - |

| **Wind (mph)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Max Wind Speed | 14 | - | - |
| Visibility | 10 | - | - |

| **Sea Level Pressure (in)** | Actual | Historic Avg. | Record |
|---|---|---|---|
| Sea Level Pressure | 28.98 | - | - |

| **Astronomy** | Day Length | Rise | Set |
|---|---|---|---|

| Temperature (°F) | Actual | Historic Avg. | Record |
|---|---|---|---|
| Actual Time | 9h 52m | 6:53 AM | 4:46 PM |
| Civil Twilight | | 6:26 AM | 5:14 PM |
| Nautical Twilight | | 5:54 AM | 5:45 PM |
| Astronomical Twilight | | 5:24 AM | 6:16 PM |
| Moon: waning gibbous | | 6:31 PM | 8:01 AM |

# Daily Observations

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Prec |
|---|---|---|---|---|---|---|---|---|
| 11:53 PM | 54 °F | 53 °F | 97 % | E | 5 mph | 0 mph | 28.82 in | 0.2 i |
| 12:53 AM | 54 °F | 54 °F | 100 % | NNE | 5 mph | 0 mph | 28.79 in | 0.3 i |
| 1:53 AM | 55 °F | 54 °F | 96 % | ENE | 5 mph | 0 mph | 28.78 in | 0.2 i |
| 2:53 AM | 55 °F | 54 °F | 96 % | CALM | 0 mph | 0 mph | 28.77 in | 0.2 i |
| 3:40 AM | 55 °F | 54 °F | 94 % | WNW | 3 mph | 0 mph | 28.75 in | 0.3 i |
| 3:53 AM | 54 °F | 53 °F | 97 % | N | 5 mph | 0 mph | 28.74 in | 0.3 i |
| 4:53 AM | 54 °F | 53 °F | 97 % | CALM | 0 mph | 0 mph | 28.75 in | 0.2 i |
| 5:53 AM | 54 °F | 54 °F | 100 % | VAR | 6 mph | 0 mph | 28.74 in | 0.0 i |
| 6:31 AM | 54 °F | 54 °F | 100 % | SSW | 9 mph | 0 mph | 28.77 in | 0.0 i |
| 6:47 AM | 54 °F | 54 °F | 100 % | S | 8 mph | 0 mph | 28.76 in | 0.0 i |
| 6:53 AM | 54 °F | 54 °F | 99 % | SSW | 9 mph | 0 mph | 28.75 in | 0.0 i |
| 7:00 AM | 0 °F | 0 °F | 0 % | | 0 mph | 0 mph | 28.75 in | 0.0 i |
| 7:12 AM | 55 °F | 54 °F | 94 % | SSW | 7 mph | 0 mph | 28.76 in | 0.0 i |
| 7:45 AM | 55 °F | 54 °F | 94 % | VAR | 7 mph | 0 mph | 28.77 in | 0.0 i |
| 7:53 AM | 55 °F | 54 °F | 99 % | VAR | 7 mph | 0 mph | 28.77 in | 0.0 i |
| 8:05 AM | 55 °F | 55 °F | 100 % | ESE | 6 mph | 0 mph | 28.78 in | 0.0 i |
| 8:35 AM | 55 °F | 55 °F | 100 % | VAR | 5 mph | 0 mph | 28.78 in | 0.0 i |
| 8:53 AM | 55 °F | 55 °F | 99 % | ESE | 6 mph | 0 mph | 28.78 in | 0.0 i |
| 9:05 AM | 55 °F | 55 °F | 100 % | S | 9 mph | 0 mph | 28.79 in | 0.0 i |
| 9:08 AM | 55 °F | 55 °F | 100 % | S | 9 mph | 0 mph | 28.79 in | 0.0 i |
| 9:37 AM | 55 °F | 55 °F | 100 % | S | 10 mph | 0 mph | 28.81 in | 0.0 i |

| Time | Temperature | Dew Point | Humidity | Wind | Wind Speed | Wind Gust | Pressure | Prec |
|---|---|---|---|---|---|---|---|---|
| 9:53 AM | 56 °F | 55 °F | 97 % | S | 10 mph | 0 mph | 28.81 in | 0.0 i |
| 10:24 AM | 55 °F | 55 °F | 100 % | NE | 9 mph | 0 mph | 28.80 in | 0.0 i |
| 10:53 AM | 57 °F | 55 °F | 95 % | NNW | 9 mph | 0 mph | 28.78 in | 0.0 i |
| 11:53 AM | 58 °F | 54 °F | 89 % | SSW | 7 mph | 0 mph | 28.78 in | 0.0 i |
| 12:53 PM | 58 °F | 53 °F | 83 % | S | 9 mph | 0 mph | 28.76 in | 0.0 i |
| 1:53 PM | 59 °F | 52 °F | 79 % | SW | 6 mph | 0 mph | 28.75 in | 0.0 i |
| 2:38 PM | 61 °F | 52 °F | 72 % | SW | 14 mph | 0 mph | 28.76 in | 0.0 i |
| 2:53 PM | 61 °F | 51 °F | 71 % | SW | 14 mph | 0 mph | 28.76 in | 0.0 i |
| 3:05 PM | 63 °F | 52 °F | 68 % | SW | 14 mph | 0 mph | 28.79 in | 0.0 i |
| 3:53 PM | 63 °F | 51 °F | 64 % | W | 13 mph | 0 mph | 28.81 in | 0.0 i |
| 4:53 PM | 60 °F | 54 °F | 80 % | WSW | 9 mph | 0 mph | 28.85 in | 0.0 i |
| 5:53 PM | 56 °F | 48 °F | 74 % | WSW | 9 mph | 0 mph | 28.87 in | 0.0 i |
| 6:53 PM | 54 °F | 49 °F | 81 % | VAR | 6 mph | 0 mph | 28.89 in | 0.0 i |
| 7:53 PM | 54 °F | 49 °F | 82 % | E | 5 mph | 0 mph | 28.93 in | 0.0 i |
| 8:53 PM | 53 °F | 48 °F | 82 % | E | 5 mph | 0 mph | 28.94 in | 0.0 i |
| 9:53 PM | 54 °F | 53 °F | 94 % | CALM | 0 mph | 0 mph | 28.96 in | 0.0 i |
| 10:53 PM | 54 °F | 53 °F | 95 % | CALM | 0 mph | 0 mph | 28.98 in | 0.0 i |


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(https://searchtopics.net/index.php?rgid=246489&gclid=GiBeOmrTPuRMmIDEdQT3O4cP_fAViJZvj8B9ecboZ6t3qyCIrVQo5KvY_-aC1d9A)

# RECYCLED WOOD PRODUCTS -IV GREEN WASTE COMPOSTING NONA REPORT

## 1.0 INTRODUCTION

The Recycled Wood Products IV (RWP) is a green waste (Tier I) composting facility in the city of Ontario, operated by Mr. Chris Kiralla. This property is leased from Golden Ontario Holdings by Mr. Bob Feenstra. The property is located at 7325 Edison Avenue in Ontario. The total size of the property is 36.5 acres, A total of 10.5 acres of the site is used for the active green waste composting operation. Two other small side businesses consisting of fruit waste recycling, and wood chips & manure bagging are also in operating at this site. The APN numbers for the entire site is 1053-391-01. Prior to the composting operation, the facility was a dairy site. The corrals, and the pond were cleaned of any manure residue prior to start of the composting operation.

**Facility Data**

The following data has been obtained from the client by Sierra's Engineering staff.

| | |
|---|---|
| Property Owner: | Mr. Gary Dou, Golden Ontario Holdings |
| Address | 14240 Sapphire Hill Lane<br>Chino Hills, CA 91709 |
| Contact No. | (562)921-9974 |
| Property Lease Holder: | Mr. Bob Feenstra<br>Residual Recovery Group<br>P.O. Box 17482<br>Anaheim Hills, CA 92817 |
| Contact No: | (909)597-3222 |
| Email Address: | bobfeenstra@gmail.com |
| Facility Operator: | Mr. Chris Kiralla<br>RWP Ontario IV<br>1313 E. Philips Rd.<br>Pomona, CA 91766 |
| Email Address | chris@rwpmulch.com |
| Contact No. | (909)868-6882 |
| Facility Location: | RWP Ontario IV<br>7325 Edison Avenue<br>Ontario, CA 91762 |

| | | | |
|---|---|---|---|
| Acreage: | Composting Area ( green waste receiving, 2 acres, active curing 6 Acres, finished products & storage, 2.5 Acres) | 10.50 | acres |
| | SMC Fruit Waste Processing Area | 3.0 | acres |
| | Gro Well Wood Chips & Manure Bagging | 10.0 | acres |
| | Buildings, Road ways, lawns, Display Area | 10.05 | acres |
| | Containment Pond, Drainage path & Berms. | 3.0 | acres |
| Total | | 36.55 | acres |

About 5 acres of the property consist of buildings, barns, offices and landscaped area facing Edison Avenue. The stormwater runoff from this area drains toward Edison Avenue on the north side of the property.

The property is listed in the Assessor Map Book No. 682 , Section 17, Township 2S, Range 7W, the property and the surrounding area land use is agricultural. The total size of the green waste composting area is about 10.5 acres. The land use within 1 mile radius of the facility is primarily agricultural, with some mixed residential. The facility receives city water, but, the onsite irrigation well is the main source of water for the composting operation ( see the site plan for the ground water well location). The nearest surface water body to the site is Cucamonga Creek at about 1.5 miles distance from the composting operation.

The new operations at the site consist of discarded fruits & vegetable recovery for animal feed, wood chips & manure bagging & the green waste composting operations.

## 2. FRUITS & VEGETABLES RECOVERY OPERATION

The fruits and vegetables are received in packaged and un packaged containers. Approximately 60% of the material (fruits, vegetables and a little bit of breads) received is clean (no packaging). The other 40% has some sort of packaging that is de-packaged at the site.

The material (discarded fruits and vegetables) arrive in cardboard totes and is unloaded from the trucks. The total number of trucks unloaded is four (4) per day. The maximum amount of fruits and vegetable received and processed per day is 75 tons, or about 62 cubic yards. Once unloaded, the totes are tipped into one of the two cement pits depending if the material is clean or not. The tipped clean material is scraped from a pit with a front loader and loaded directly into a trailer. The tipped material that has packaging is scrapped from a pit and loaded into a de-packager. Once de-packaged, the clean material is conveyed into a cement lined bunker; then scraped and loaded into a trailer. Once the trailer is full with clean material, it is hauled down the street to feed cattle that are either owned by the Ontario Agricultural Commodities (OAC) or by one of the partnering cattle producers. This whole process from unloading the material to delivering clean feed to the cattle takes only a couple of hours.

Recently, part of the operation has become mechanized by utilizing a press on a small portion of the clean material. The pressed juice from the material is pumped into a tanker and once full,

delivered by the tanker to Vivotien ( a local business) as feed for them to mix in and feed to their larvae. The solids left over from the press are used as cattle feed.

The packaging left over from the de-packager is conveyed to a separate cement lined bunker where it is scraped and loaded into an on-site roll-off container that is owned by the City of Ontario and picked up every day, 6 days a week.

## 2.1 Wood Chips & Manure Bagging Operation

The Gro Well wood chips & bagging operation consist of receiving by trucks dry manure and wood chips. The materials are piled on the south west side of the facility, and then delivered by fork lift into the stationary hopper, where it is dropped on a reclining conveyor belt and moved to the automated bagging units. The wood chips or dry manure is transferred from the inclined conveyor belt into 30 lbs bags attached on the automated bagging chain line. The bags are filled and sealed by the automated system and dropped on the pallets on the ground. Each bag filling duration is about 15 seconds. The processing rate is about 200 bags per hour, and the facility operates one shift per day. The pallets containing about 20 bags are then picked up by the forklift and delivered to a temporary station for loading into the trucks and delivery to the customer. The entire bagging system is in a covered area, and the bagging unit is equipped by dust control unit for collection of any dust generated during the bags filling operation.

The facility has a stock pile of dry manure on the south west side of the property. The stock piled manure is being continually used for the manure bagging operation, During the spring season there is a greater demand for dry manure for landscaping and gardening purposes. The manure stock pile has been reduced in size by more than 50% since last year. The measured size of the manure stock pile last year was 200'W. X 240'L. X 12' H. which equals to 576,000 CF, or 21,333 CY. The recently measured stock pile dimensions is 140' W. X 150' L. X 12 H. which is equivalent to 252,000 CF or 9,333 CY of manure. This indicates that the size and amount of the manure stockpile has been reduced by 56% in one year. Based on the current rate of production the manure stock pile will be used up & finished in less than one year from now. The bagging operation for dry manure and wood chips peaks during late winter, & spring seasons.

The facility operators conduct routine daily maintenance at the site, remove any dirt piles, or bagged materials that may block the drainage pathway.

## 2.2 Green Waste Composting Operation

The materials used in the green waste composting operation consist of untreated wood pallets, salvaged wood from warehouses, plus cut out section of trees and branches from landscaping operations. The operator has no use for blending of manure as feed. Green materials is the primary materials used in the composting process, however, a small amount of agricultural, paper ( maximum of 500 cu yard/day agricultural, and 20 cubic

yard/day vegetative food material may be used in feedstock or final products as variation when requested. The total amount of vegetative food material added to the compost will be less than 5000 cubic yards per year. There will not be also any use of the additive non-vegetative food material in the feed or final product The received green waste material is mixed and shredded into a pile. The piles are kept in long rows separated at a minimum of 25 feet intervals. The windrow piles are wetted by water spray from the water trucks moving in between the rows. Backhoes turn the piles on a going basis to distribute the moisture evenly within the mixed materials. The moistened piles are kept onsite for a period of 60 days in the curing area. The total duration for receipt, mixing, curing, storage, and delivery of the compost material is less than 90 days. The pile's moisture content and temperature is checked in the curing area on daily basis to prevent overheating, and excess moisture content building up. Once the cured material temperature is stabilized between 125 to 130 F, it is transferred to the final staging area for final screening, pick up, and delivery. The facility may keep onsite a maximum of 1,000 cubic yards of manure to amend the final product. The final product is placed in the trucks for delivery to landscaping, and gardening material suppliers and distributors in Southern California. Based on the operational history, there is no wastewater generation or runoff from the green waste curing process. The estimated size of the active composting area is 6 acres, the curing area is about 3 acres. The final material staging area is around 1.5 acres. The residual material is screened out of the compost blends with a trammel screener. A very small percentage of the material is collected as residuals. The collected residuals in placed into trash bins, stored at a designated secure area, and hauled out within a few days to the landfill. The composting operation area is not in the flood zone, and there is no creek or waterway within the 1-1/2 miles radius of this operation.

## MATERIAL PROCESS FLOW CHART

**Green Waste Receiving Area > Initial Screening & Separation>Grinding & Screening>Mixing & Curing> Final Staging Area & Residual Removal> Final Material Storage >Loading & Delivery By Trucks to Farms**

## 3. WASTEWATER MANAGEMENT SYSTEM

There is one groundwater well on-site at a **greater distance than 100 feet** from the composting area, that is used for pumping and transfer of water to the water spray tanker trucks. Each tanker truck can hold up to 2,000 gallons of water. During the dry weather condition, the tanker truck turnover rate is about 20 times per day. In the mild weather, the turnover rate could fluctuate between 10 to 12 trucks per day. The tank truck sprays water into the windrow piles at a consistent rate. An attendant is onsite during the entire moistening process to assure that there is no over spraying or runoff from the spraying,

and the water content within the piles is distributed evenly. As observed during the site inspection, no water is collected in the detention pond on non-rainy days or on rainy days with low precipitation. This indicates that there is no wastewater runoff from the composting process. The water collected in the pond is associated with occasional stormwater runoff during the wet season. No water is stored in the pond primarily throughout the year, except on rainy occasions, which generally lasts for a few days. Also, the perimeter area around the composting operation is bermed and protected from run-on. Since no composting wastewater is collected and stored in the pond, no water sampling will be conducted.

### 3.1 Stormwater Run-off/Run on

The site is bordered on the north by Edison Avenue, and on the south, east, and west by adjacent dairy, and pasture land areas. There is no potential of stormwater runoff or run-on from the property boundary areas. According to the Riverside County Flood Control, the average annual precipitation in the Chino/Ontario area is about 13 inches. The maximum historical rainfall recorded at Ontario Air Port for 24 Hr storm event in December 2010 is 2.8 inches. The maximum recorded monthly and annual rainfall are respectively 3.2 and 15 inches.

As shown in the site plan, the property is sloped to the south, and the stormwater runoff from the green waste compost production & side operations drains to the big pond situated on the south side of the composting facility via the compacted and sloped drainage pathways in between the piles. The stormwater run-off from the composting area drainage pathway is led to several surface inlets of 4 to 5 feet in width along the bermed-up length of the detention pond ( see the site plan). Stormwater runoff from the nonproduction area flows toward the southwest side of the pond. To allow a greater a greater stormwater runoff containment capacity the depth of the pond will increased from 8 feet to 12 feet. A data search of the Ontario International Weather Air Port Station indicates that highest amount of 24 rainfall occurred on December 21 to December 22 (see the attachment). The rainfall started at 11:53 AM on December 21, 2010 and stopped at 5:53 AM on December 22, 2010. The total rainfall during this period was 2.8 inches.

### 3.2 Stormwater Containment Volume

The retention pond containment volume exceeds the total volume required for the maximum 24-hr historic rainfall. The pond's average depth has been increased from 8 feet to 12 feet (see the attached site plan). The total containment volume for the pond at the site is as follows:

**Pond's Containment Capacity**

| Pond No. 1 | Area (Sq. Ft.) | Average Depth (Ft.) | Volume (Cuft.) |
|---|---|---|---|
| **780' x 86'x12' (Avg)** | **64,740** (sloped sides) | **12** | **776,880** |

**Total Area = 64,740 Sq. ft** **Total Containment Volume = 776,880 Cu. ft**

Total area of stormwater runoff leading into the containment pond = 31.5 Acres
1 acre-ft = 325,829 Gallons, = 43,560 cu. ft
Runoff from maximum-24hour storm = 2.8 inch /12 inch x 31.5 acre-ft = 7.35 acre-ft
= 320,166 cu. ft
Suspended Solids Volume = 50 cu. ft
= 320,216 cu. ft
Total Containment Volume Required = 320,216 Cu. Ft, 7.36 acre-ft
Total Containment Volume Available = 776,880 Cu. Ft. 17.83 acre-ft

As shown by the above data, the containment pond capacity well exceeds the stormwater runoff volume generated from maximum historic rainfall in the Ontario/Chino area, without taking into account the additional losses in evaporation.

## 4.0 REFERENCES


**1.0** Composting facility site inspection, February 28, 2020.

**2.0** California Water Quality Control Boards Technical Guidelines, August 4, 2015.

**3.0** Riverside County Flood Control Hydrology Manual, April 1978.

**4.0** DWR, Groundwater Wells Profile.

**5.0** Updated information on materials storage, and operation status at the site, furnished by Nathan De Boom, April 14, 2021.

**6.0** Historic rainfall data, Ontario International Air Port, Ontario, CA, December 2010.


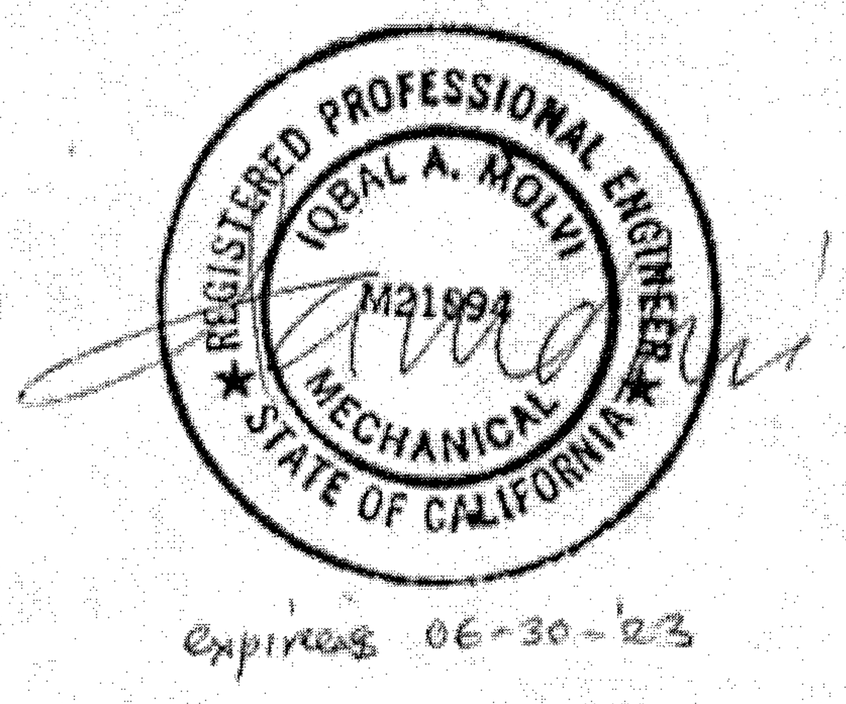


The data confirms that the containment volume exceeds the Stormwater runoff.

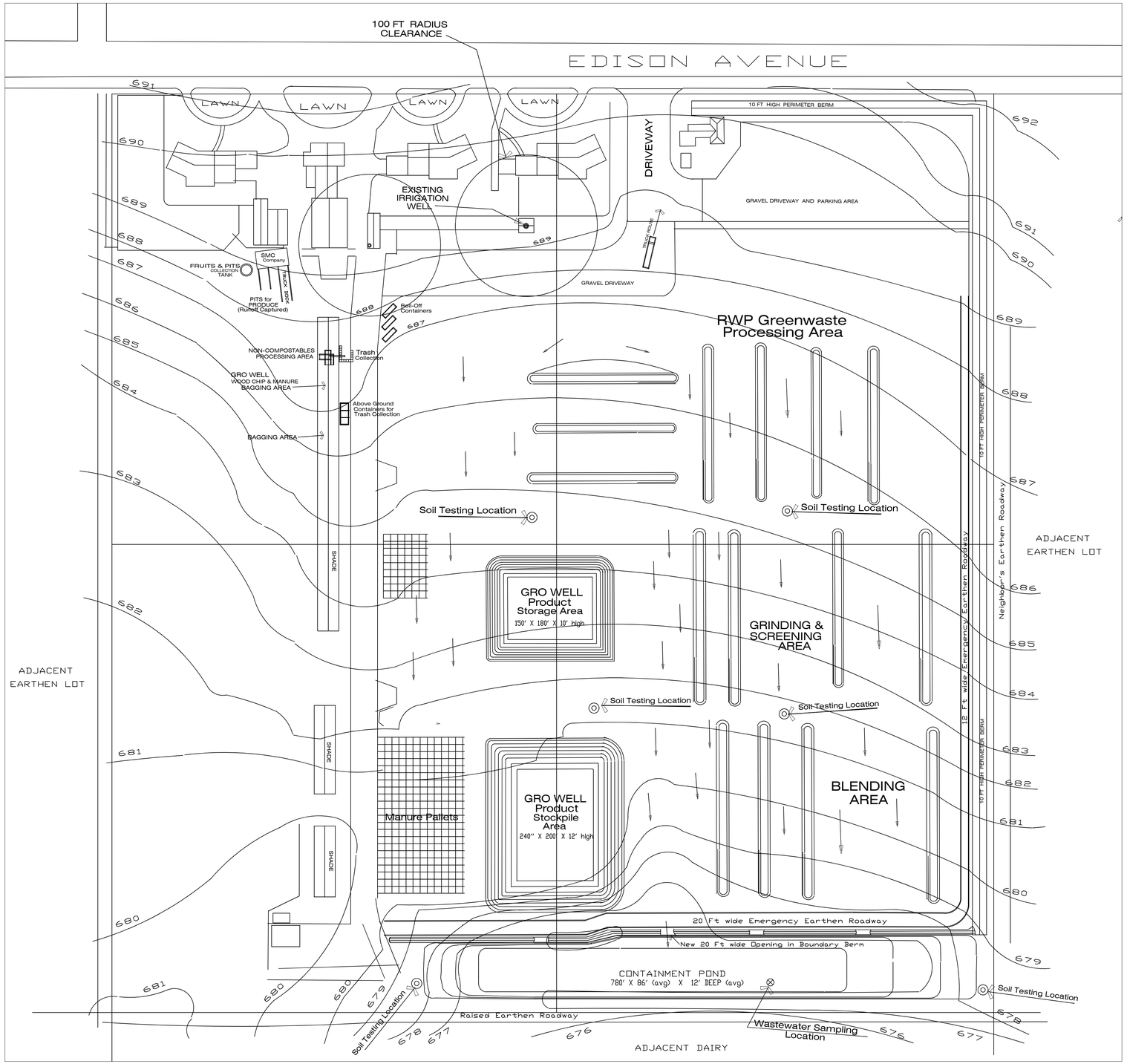


# SITE PLAN

Scale : 1"=75'

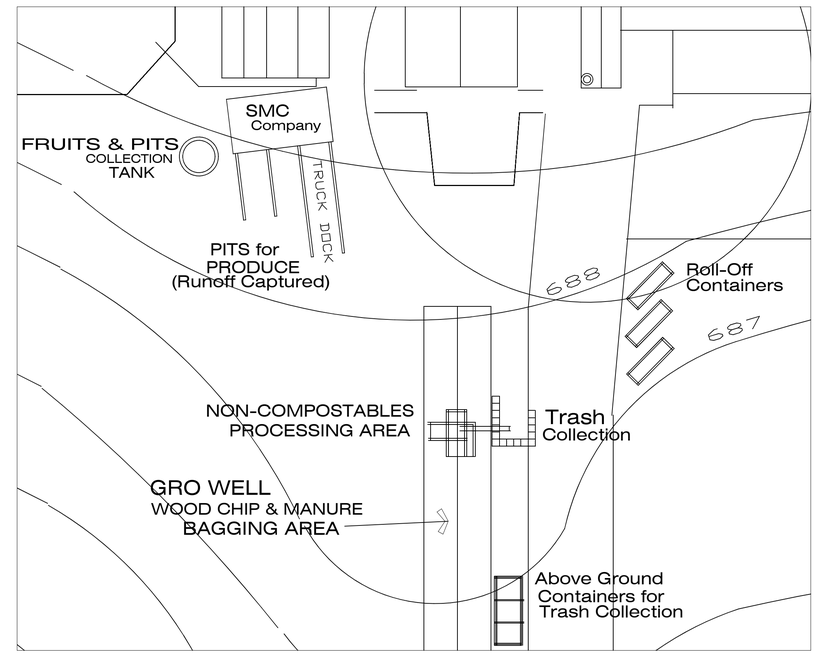


# NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

## GRADING NOTES

1 ALL DIKES AND BERMS SHALL BE CONSTRUCTED OF MINERAL EARTH FREE OF VEGETATION AND DELETERIOUS MATERIAL.

2 NO ROCKS OR COBBLES GREATER THAN 6 INCHES IN DIAMETER SHALL BE PLACED IN ANY FILL.

3 ALL AREAS TO RECIEVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.

4 ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES, WHEELED ROLLED AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

## KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILLWAY

DIGALERT

DIAL TOLL FREE 1-800-227-2600 AT LEAST TWO DAYS BEFORE YOU DIG

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SITE CONDITION RESPONSIBILITY:

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDASNCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 210
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APPVD | DATE |
|---|---|---|---|---|
| 2 | np | Pond depth increase | | 9/29/22 |
| 1 | np | Wastewater sampling location, fruits & pits collection tank | | 8/26/22 |

# SITE PLAN
## RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. 1053 - 391 - 01

DATE: 5-20-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2020
SHEET 1 OF 1

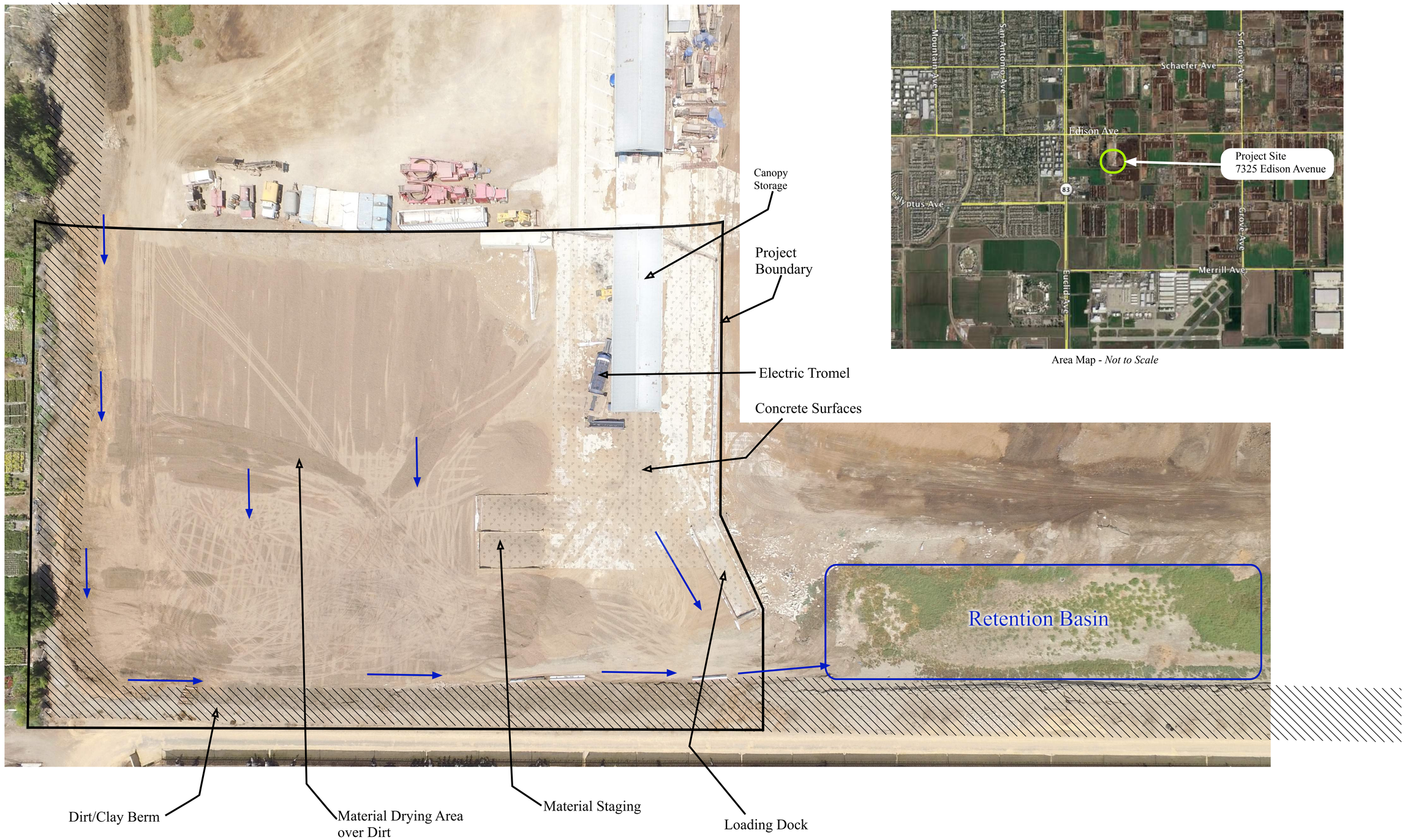





Area Map - *Not to Scale*

*Prepared by:*

Environmental & Chemical Consulting, Inc.

Material Recovery Solutions, Inc.
Water Quality Management Plan
7325 Edison Avenue
Ontario, CA 91762
760-623-6909

APN:
1053-391-01

Water Flow

Approvals:

Revision

| No | Description | Date |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

*Drawn by:*
Wade Riddering

CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL
CPESC
WADE RIDDERING
No. 8136

August 5, 2016

Water Quality Management Plan

Sheet Number:

**Figure 1**

N

Scale 1" = 23'

23 ft

(Sheet = 36" x 24")

# Handler Profile



Search for an ID Number

## CAL000319397 - JORRITSMA & ANEMA DAIRY

Status: INACTIVE

Esri Community Maps Contributors, County of Riverside, County of San Bernardino, California State Parks, © OpenStreetMap, Microsoft, Esri, TomTom, Garmin, SafeGraph, GeoTe… Powered by Esri

### ID Number Profile

| | |
|---|---|
| ID Number: | CAL000319397 |
| Facility Name: | JORRITSMA & ANEMA DAIRY |
| ID Number Status: | INACTIVE (expired: 6/30/2013) |
| ID Type: | PERMANENT |
| ID Category: | STATE |
| Entity Types: | GENERATOR |
| Issued Date: | 5/8/2007 |
| Last Updated: | 3/26/2014 |

### Facility Address

8061 EDISON AVE
ONTARIO, CA 91762
SAN BERNARDINO County
(33.997818, -117.610259)

### Mailing Address

8061 EDISON AVE
ONTARIO, CA 91762

### Owner

**JAMES JORRITSMA & GREG ANEMA**
8061 EDISON AVE
ONTARIO, CA 91762
(909) 597-1317

### Requestor

,

## Contact

**GREG ANEMA**
8061 EDISON AVE
ONTARIO, CA 91762
(951) 741-6184

## CalEnviroScreen 4.0 Results

**Census Tract:** 6071001903 (Population: 13753)

The results for each indicator range from 0-100 and represent the percentile ranking of census tract 6071001903 relative to other census tracts.

| | |
|---|---|
| **Overall Percentiles** | |
| CalEnviroScreen: | 72 |
| Pollution Burden: | 99 |
| Population Characteristics: | 37 |
| **Environmental Effects** | |
| Cleanup Sites: | 80 |
| Groundwater Threats: | 98 |
| Hazardous Waste: | 87 |
| Solid Waste: | 99 |

## NAICS Codes

| | |
|---|---|
| 11212 | Dairy Cattle and Milk Production |

## Annual ID Number Verification History

| Year | Status | Method | VQ Number (eVQ) | Completion Date | Signed By |
|---|---|---|---|---|---|
| 2012 | COMPLETE | PAPER | | 10/17/2012 | |
| 2011 | COMPLETE | PAPER | | 9/21/2011 | |
| 2010 | COMPLETE | PAPER | | 11/2/2010 | |
| 2009 | COMPLETE | PAPER | | 10/6/2009 | |
| 2008 | COMPLETE | PAPER | | 4/15/2009 | |

Page Size: 10 1 to 5 of 5 Page 1 of 1

## Manifests

No Manifest Data for this ID Number.

## Waste Code Matrix

Copyright © 2025 State of California

STATE WATER RESOURCES CONTROL BOARD
ORDER WQ 2015-0121-DWQ
GENERAL WASTE DISCHARGE REQUIREMENTS FOR COMPOSTING OPERATIONS

## ATTACHMENT C – NOTICE OF INTENT

Received JUN 2021 CRWQCB Santa Ana Region 8

### DISCHARGER INFORMATION

| | | | | |
|---|---|---|---|---|
| Owner Name: Residuals Recovery Group INC./Bob Feenstra | | | | |
| Street Address: P.O. Box 17482 | | | | |
| City/Locale: Anaheim Hills | County: Orange | State: CA | Zip: 92817 | Telephone Number: (909) 591-6387 |
| Facsimile Number: (909) 597-3226 | | Email Address: bobfeenstra@gmail.com | | |
| Owner Type (check one): | □ Individual | ☒ Corporation | □ Partnership | □ Other: |

| | | | | |
|---|---|---|---|---|
| Operator Name (if different than above): Chris Kiralla | | | | |
| Mailing Address: 1313 E. Philips Rd. | | | | |
| City/Locale: Pomona | County: LA | State: CA | Zip: 91766 | Telephone Number: (909) 868-6882 |
| Facsimile Number: (909) 868-0595 | | Email Address: chris@rwpmulch.com | | |

### 1. COMPOSTING OPERATION INFORMATION

| | | | | |
|---|---|---|---|---|
| Compost Facility Name: RWP ontario IV | | | | |
| Street Address: 7325 Edison Avenue | | | | |
| City/Locale: Ontario | County: San Bernardino | State: CA | Zip: 91762 | Telephone Number: (909) 868-6882 |

| | |
|---|---|
| Type (check one):<br>☒ Existing Composting Operation<br>□ New Composting Operation | Facility Acreage (acres): 36.5<br>Total Facility Capacity (cubic yards): 12,500<br>Average Weekly Throughput (cubic yards per week): 12,500 |

| | |
|---|---|
| Assessor Parcel Number(s): 1053-391-01 | Regional Water Board Office: Santa Ana Region |
| Latitude 33.9966 Longitude 117.64.34 | Regional Water Board Address: 3737 Main Street, Riverside, CA 92501 |

### 2. REASONS FOR FILING

| | | |
|---|---|---|
| □ New Discharge | ☒ Existing Discharge | □ Expansion or Change in Operations |
| ☒ Changes in Ownership/Operator | □ Other: | |

### 3. STORM WATER PERMIT

Is there an Industrial Storm Water Permit for this facility? □ Yes □ No If yes, WDID Number:_____
Related to storm water, have you received a "No Exposure Certification", "Notice of Termination", or "Notice of Exemption" for this facility? ☒ Yes □ No If yes, please provide a copy. NONA Exemption is being applied for.

The Notice of Intent for coverage under the Industrial Storm Water Permit may be obtained over the internet at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/industrial.shtml

## 4. OTHER PERMITS

| | |
|---|---|
| Has another agency issued permits or other entitlements (e.g., solid waste facility permit, notification permit, conditional use permit, building permits, air permits) for the unit? ☒ Yes ☐ No | |
| For each permit or entitlement, list the type, issuing agency, and date of issuance: Conditional Use Permit, City of Ontario PCUP 19-020, 12,9,2019. LEA Notification 36-AA-0483 10/1/2019 | |

## 5. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

| | |
|---|---|
| Has a CEQA determination been made by an agency? ☒ Yes ☐ No | Name of Agency: City of ontario |
| Type and Date of Determination: Negative Dec 12/9/19 | State Clearinghouse Number: |

## 6. PROCESS

| Allowable Materials (check all that apply, and specify the quantity onsite at any time): | | | |
|---|---|---|---|
| ☒ agricultural material | cu. yds.: 500 | ☐ anaerobic digestate | cu. yds.: |
| ☐ biosolids (Class A, B, or EQ) | cu. yds.: | ☐ food material (non-vegetative) | cu. yds.: |
| ☒ green material | cu. yds.: 10,000 | ☐ manure | cu. yds.: |
| ☐ paper material | cu. yds.: | ☒ vegetative food material | cu. yds.: 20 |
| ☐ residentially co-collected food and green material | cu. yds.: | | |
| Current Processing Capacity (cubic yards): 12,500 | | | |
| Months during which compostable materials will be on-site: Throughout the Year | | | |
| Additives/Amendments and maximum dry weight percentage used (list): 280. CY of manure | | | |

## 7. SITE CONDITIONS

| | |
|---|---|
| Anticipated highest groundwater elevation (feet mean sea level): | >150' |
| Average ground surface material percolation rate (minutes per inch) or attach results of percolation testing: | |
| Annual average precipitation (inches per year): | 13 inches |
| Distance to nearest water supply well (feet): | >100 feet |
| Closest surface water and distance (name, feet): | Cucamonga Creek >5500 feet |

## 8. DESIGN SPECIFICATION TIERS (check one)

| | | |
|---|---|---|
| ☒ Tier I | ☐ Tier II | ☐ Tier II (monitoring) |
| If the box for Tier II (monitoring) has been marked, provide the proposed Groundwater Protection Monitoring Plan with Technical Report. | | |

## 9. TECHNICAL REPORT

Provide a complete technical report with all the information required in Attachment D of this General Order.

## 10. FILING FEE

Pursuant to California Water Code section 13260 et seq., Dischargers enrolled under this General Order are required to pay an annual fee, as determined by the State Water Resources Control Board. The filing fee accompanying this NOI is the first year's annual fee. The annual fee is based on the threat to water quality and complexity of the discharge in accordance with California Code of Regulations, title 23, section 2200. Dischargers enrolled under this General Order will be assigned a threat to water quality and complexity rating as described in the General Order and will be assessed the corresponding fee, plus any applicable surcharges. The NOI is to be accompanied by a check, made out to the State Water Resources Control Board for the payment of the filing fee.

## 11. CERTIFICATION

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

| | |
|---|---|
| Bob Feenstra | 6/7/21 |
| Signature (Owner or Authorized Representative) | Date |
| Bob Feenstra | Authorized Rep |
| Print Name | Title |
| 951 313-1818 | Bobfeenstra@gmail.com |
| Telephone Number | Email |

**AG CONCEPTS, INC**
PO BOX 17482
ANAHEIM CA 92817-7482

5494

11-35/1210 CA
91093

DATE 4/20/2021

PAY TO THE ORDER OF State Water Resources Board $ 2848 00

two thousand eight hundred forty eight DOLLARS

Photo Safe Deposit® Details on back

**BANK OF AMERICA**

ACH R/T 121000358

FOR Compost Permit.

[redacted]

Inspection ID: 48689269 Date Printed: 08/16/2022

# FACILITIES INSPECTION REPORT

| | | |
|---|---|---|
| Region/Office: 8 | Status: Performed | Reg. Measure ID: 448758 |
| Program Type: LNDISPOTH | WDID: 8 363012001 | Order Number: 2015-0121-DWQ |
| Scheduled Insp. Date: | Actual Insp. Date: 08/02/2022 | |

**Discharger Information**

| | | | |
|---|---|---|---|
| Party ID: 556646 | Discharger Organization Name: Recycled Wood Products | | |
| Address: 1313 East Phillips Boulevard | | City, State, Zip: Pomona, CA 91766 | |
| Discharger Contact Person: | Chris Kiralla | Discharger Contact Phone: | Multiple Phone Numbers |
| Discharger Contact Email Address: chris@rwpmulch.com | | | |

**Facility Information**

| | | | |
|---|---|---|---|
| Place ID 240263 | Facility Name: Residuals Recovery Group, Inc | | |
| Address: 7325 Edison Avenue | | City, State, Zip: Ontario, CA 91762-7241 | |
| County: San Bernardino | Latitude: 33.99572 | Longitude: -117.64335 | Method: |

**Lead Inspector Information**

Lead Inspector Party ID: 138121 Lead Inspector Name: Joanne Lee

Inspector Type: ☒ State ☐ State Contractor ☐ EPA Contractor ☐ EPA (Regional) ☐ EPA and State (EPA Lead) ☐ EPA and State (State Lead)

# INSPECTION TYPE

Inspection Type: Prerequirement inspection

# VIOLATIONS

Were Violations noted during this inspection? ☐ Yes ☒ No

| Violation ID | Violation Type | Occurrence Date | Rank | Description |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

## INSPECTION SUMMARY (REQUIRED) (500 character limit)

An pre-requirement inspection performed at Recycled Wood Products (RWP), Ontario IV and others at this location to verify information submitted in the permit application by RWP for coverage under the Composting General Order and to gather site information for application approval. Santa Ana Water Board staff (Joanne Lee and Cindy Li) met with San Bernardino County Dept. of Environmental Health, Local Enforcement Agency (LEA) staff (Griselda Reisinger) for this inspection.

## GENERAL NOTES (OPTIONAL) (2000 character limit)

In 2016, Residual Recovery Group leased and operated a manure composting facility at this location. In 2020, RRG ceased operations and the property was sub-leased to multiple operators with multiple operations at the site.

Santa Ana Water Board staff joined LEA staff for a joint facility inspection. There are four different operations observed during inspection: Recycled Wood Products greenwaste composting operations, Gro-Well dairy manure stockpiling/bagging operations, Salvadore Coco fruit and vegetable waste processing operations, and Residual Recovery Group (RRG) one-time chicken manure composting operations. Bob Feenstra of RRG/AG Concepts, Inc. is the master lease holder and representative of the landowner. RRG sub-leases the property to RWP, Gro-Well , and Salvadore Coco for their operations.

All surface runoff from the site drains to the detention pond, installed by the former dairy at this location. A rusty steel drum was found on the east (west-facing) slope of the pond. RRG planned to remove the former empty cattle feed drum from the pond and reuse it offsite.

Santa Ana Water Board staff recommended that RWP composting operations be covered under the Composting General Order and begin water quality monitoring of the pond water and for the need to implement any further groundwater protection measures.

| For Internal Use (Optional) | | | | | |
|---|---|---|---|---|---|
| Reviewed By: | (1) | | (2) | (3) | |
| CIWQS Entry Date: | | Regional Board File Number: | | CIWQS Inspection ID: | |

Recycled Wood Products, Ontario IV Composting Facility, 7325 Edison Avenue, Ontario,  August 2, 2022 Pre-requirement Facility Inspection, 9:30-11:15am (sunny and hot)

Looking southwest at the detention pond located south at the site (see attached site plan). Some water was observed in the pond. Surface runoff from all operations at the site discharges to the pond.

Looking south at the pond.

Looking southeast at the pond.

Looking southeast at an empty steel drum sitting on the west-facing slope of the pond. Residual Recovery Group (RRG), the master lease holder of the site property and landowner's representative, was later contacted to remove the drum from the pond. RRG stated that the empty drum was an old dairy feed (molasses) tank that was moved out back when the site was converted from a dairy to composting operations. RRG planned to remove the empty drum for offsite use.

Earthen berm located north of the pond for drainage control and runoff diversion to pond.

Looking northwest at Gro-Well manure stockpiling, bagging and storage operations (by Elvia Medina) at the site.

Looking northeast at RWP greenwaste composting operations.

RWP composting operations at the site.

Looking north at the site entrance.

RWP composting operations.

Looking west at an area north of the pond, south of Gro-Well operations at the site.

RWP windrow compost piles.

RWP windrow compost piles.

A pile of residual waste generated from screening incoming greenwaste at RWP.

Salvadore CoCo's fruit and vegetable waste processing facility, located at the northwest portion of the site, is one of the operations currently onsite. Fruit and vegetable scraps are pressed to produce juice for processing at the City's digester and solid scrap is used as cattle feed.

Looking southwest at the chicken manure composting operations by Residual Recovery Group (RRG) in an area north of Gro-Well's operations. Sheridan Griepsma and Bob Feenstra of RRG explained that this was a one-time composting event to take and compost

about 400 cubic yards of manure from a local chicken producer that is going out of business.

Looking southeast at the manure windrow compost piles. There were several windrow piles.

Looking south at the manure windrow piles. Gro-Well's manure stockpile is in the background.

Looking southwest at the manure windrow piles.

One of the manure piles measured a temperature of 126.4ºF, below 131ºF (the active composting temperature).

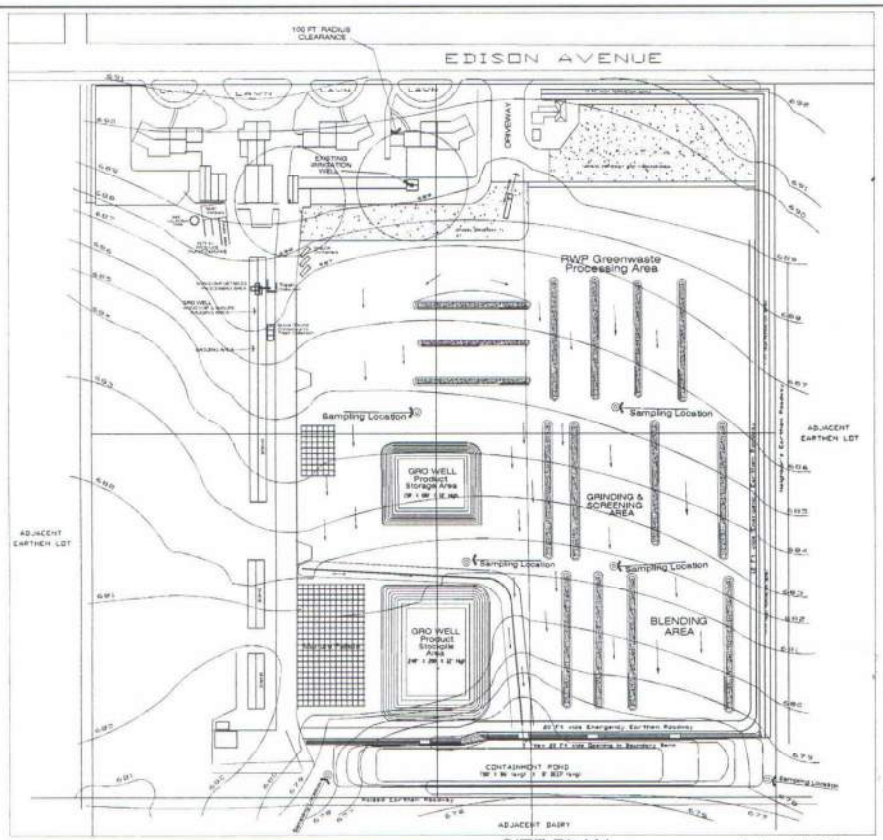


SITE PLAN Scale : 1"=75'

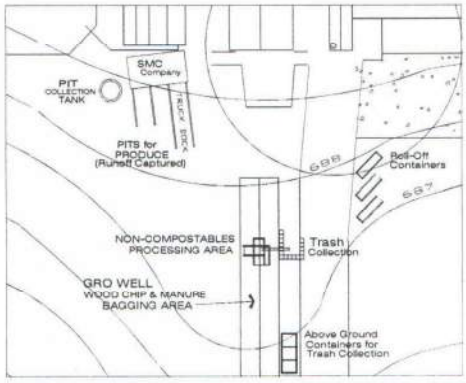


NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

GRADING NOTES

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3. ALL AREAS TO RECEIVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.
4. ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES. WHEELED ROLLER AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILL WALL

DIGALERT

SITE CONDITION RESPONSIBILITY:

CONTRACTOR CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICE, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES

(1750) SIERRA CIRCLE, STE. 210
RIVERSIDE, CA 92506
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APP'D | DATE |
|---|---|---|---|---|

SITE PLAN
RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. (APN - 3N - 8)

DATE: 2-26-2020
SCALE: 1"=75'
PROJECT NUMBER: 4-19-2020
SHEET 1 OF 1

# TECHNICAL REPORT

PREPARED FOR

# RECYCLED WOOD PRODUCTS-IV

IN ONTARIO

BY

SIERRA ENGINEERING SERVICES

September 2023

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   2.3 Fruits & Vegetables Recovery Operation----------Pg 5
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   3.2 Stratigraphy ----------Pg 7

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APPENDIX VII- SOIL PERCOLATION TEST REPORT

# RECYCLED WOOD PRODUCTS -IV GREEN WASTE COMPOSTING TECHNICAL REPORT

## 1.0 INTRODUCTION

This Technical Report has been submitted for review and approval by the Santa Ana Region Water Quality Control Board. The Recycled Wood Products IV (RWP) is a green waste (Tier I) composting facility in the city of Ontario, operated by Mr. Chris Kiralla. This property is leased from Golden Ontario Holdings by Mr. Bob Feenstra. Under the adopted order No. WQ2020-0012DWQ, the California Regional Water Quality Control Board, the composting facilities are to submit and implement a Technical Report. The property is located at 7325 Edison Avenue in Ontario. The total size of the property is 36.5 acres, A total of 10.5 acres of the site is used for the active green waste composting operation. Two other small side businesses consisting of fruit waste recycling, and wood chips & manure bagging are also operating at this site. The APN numbers for the entire site is 1053-391-01. The property was used as a Tier II manure composting facility prior to starting of the green waste composting operation. The manure composting operation ceased on October 17, 2019. Prior to the composting operation, the facility was a dairy site. The corrals and the pond were cleaned of any manure residue prior to the start of the composting operation.

**Facility Data**

The following data has been obtained from RWP-IV by the Sierra's Engineering staff.

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|---|---|
| Property Owner: | Mr. Gary Dou, Golden Ontario Holdings |
| Address | 14240 Sapphire Hill Lane<br>Chino Hills, CA 91709 |
| Contact No. | (562)921-9974 |
| Property Lease Holder: | Mr. Bob Feenstra<br>Residual Recovery Group<br>P.O. Box 17482<br>Anaheim Hills, CA 92817 |
| Contact No: | (909)597-3222 |
| Email Address: | bobfeenstra@gmail.com |
| Facility Operator:<br>&<br>Mailing Address | Mr. Chris Kiralla<br>RWP Ontario IV<br>1313 E. Philips Rd.<br>Pomona, CA 91766 |
| Email Address | chris@rwpmulch.com |

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|---|---|
| Contact No. | (909)868-6882 |
| Compost Facility | RWP Ontario IV |
| Contact | Nathan De Boom<br>7325 Edison Avenue,<br>Ontario, CA 91762<br>Tel : (951)452-1148 |

**Non-Composting Operations Onsite:**

Gro Well Brands, Inc.
Operating Manager: Elvia Medina
Contact Number: (909) 310-2124
Email Address: emedina@gro-well.com
Mailing Address: 7325 Edison Avenue
Ontario, CA 91762

SMC Company
Director of Operations: Salvadore Coco
Contact Number: (951)788-6042
Email Address: sal@smczerowaste.com
Mailing Address: P. O. Box 79200
Corona, CA 92877

| | | | |
|---|---|---|---|
| Acreage: | Composting Area ( green waste receiving, 2 acres, active curing 6 Acres, finished products & storage, 2.5 Acres) | 10.50 | acres |
| | SMC Fruit Waste Processing Area | 3.0 | acres |
| | Gro Well Wood Chips & Manure Bagging | 10.0 | acres |
| | Buildings, Road ways, lawns, Display Area | 10.05 | acres |
| | Containment Pond, Drainage path & Berms. | 3.0 | acres |
| Total | | 36.55 | acres |

The area of the buildings, houses, roadways, and lawn areas draining toward Edison Avenue is 4.4 acres.

The property is listed in the Assessor Map Book No. 682, Section 17, Township 2S, Range 7W, the property, and the surrounding area land use is agricultural. The total size of the green waste composting area is about 10.5 acres. The land use within a one mile radius of the facility is primarily agricultural, with some mixed residential. The facility receives city water, but, the onsite irrigation well is the main source of water for the composting operation (see the site plan for the groundwater well location). The nearest surface water body to the site is Cucamonga Creek about 1.5 miles distance from the composting operation.

The new non-composting operations at the site consist of discarded fruits and vegetable recovery for animalfeed, wood chips and manure bagging, and green waste composting operations.

## 2. SITE OPERATIONS

### 2.1 Wood Chips & Manure Bagging Operation

The Gro Well wood chips and bagging operation consists of receiving trucks of dry manure and wood chips. The materials are piled on the southwest side of the facility and then delivered by forklift into the stationary hopper, where it is dropped on a reclining conveyor belt and moved to the automated bagging units. The wood chips or dry manure are transferred from the inclined conveyor belt into the bags attached to the automated bagging chain line. The bags are filled and sealed by the automated system and dropped

on the pallets on the ground. **Each bag filling duration is about 15 seconds. The maximum processing rate is about 200 bags per hour, and the facility operates one shift per day. Each bag of wood chips weighs 30 lbs, and each bag of manure weighs 50 lbs. The average number of wood chip & dry manure bags processed on daily basis is 150. The estimated annual amount of wood chips and dry manure processed are respectively 2700 & 4500 tons/yr. The estimated amount of wood chips that is stored onsite will be limited to about four weeks' supply, around 250 tons.** The pallets containing about 20 bags are then picked up by the forklift and delivered to a temporary station for loading into the trucks and delivery to the customer. The entire bagging system is in a covered area, and the bagging unit is equipped with a dust control unit for the collection of any dust generated during the bag-filling operation.

The facility has a stockpile of dry manure on the southwest side of the property. The stockpiled manure is being continually used for the manure bagging operation, During the spring season, there is a greater demand for dry manure for landscaping and gardening purposes. The manure stockpile has been reduced in size by more than 50% since the start of the operation. The measured size of the manure stockpile at the start of operation was about 200' W. X 240'L. X 12' H. which equals to 576,000 CF, or 21,333 CY. The recently measured stockpile dimensions is 140' W. X 150' L. X 12 H. which is equivalent to 252,000 CF or 9,333 CY of manure. This indicates that the size and amount of the manure stockpile were reduced by 56% in about two years. The recent events caused a slow down in manure bagging operation, but the stockpile continues to be reduced & possibly finished in less than two years. The bagging operation for dry manure and wood chips peaks during late winter, & spring seasons. **Currently The Gro well facility has two more years of the lease remaining, with an option to extend the lease for an additional two years. Once the current manure stockpile is depleted, Gro well will import dry manure for their bagging operation, but no more than 5,000 CY of dry manure will be stored at the site at any one time.**

The facility operators conduct routine daily maintenance at the site and remove any dirt piles or bagged materials that may block the drainage pathway.

## 2.2 Green Waste Composting Operation

The materials used in the green waste composting operation consist of untreated wood pallets, salvaged wood from warehouses, and cut-out sections of trees and branches from landscaping operations. The operator has no use for blending manure as feedstock but a very small amount of manure may be added as an additive on occasion per customer demand. The maximum amount of manure that may be added on an annual basis will be less than 980 Cubic yards.

Green materials is the primary materials used in the composting process, however, a small amount of agricultural/green materials ( maximum of 500 cu yard/day) and 20 cubic yard /day vegetative food material may be used in feed stock or final products as variation when requested. The total amount of vegetative food material added to the compost will be less than 5,000 cubic yards per year. There will not be any use of the additive non-vegetative food material in the feed or final product The received green waste material is mixed and shredded into a pile. The piles are kept in long rows separated at a minimum of 25 feet intervals. The windrow piles are wetted by water spray from the water trucks moving in between the rows. Backhoes turn the piles on an ongoing basis to distribute the moisture evenly within the mixed materials. The moistened piles are kept onsite for a period of **60 days in the active composting and curing area**. The total duration for receipt, mixing, curing, storage, and delivery of the compost material is less than 90 days. The pile's moisture content and temperature are checked in the curing area on a daily basis to prevent overheating and excess moisture content build-up. Once the cured material temperature is stabilized between 125 to 130 F, it is transferred to the final staging area for final screening, pickup, and delivery. The facility may keep onsite a maximum of 1,000 cubic yards of manure to amend the final product. The final product is placed in the trucks for delivery to landscaping, and gardening material suppliers and distributors in Southern California. Based on the operational history, there is no waste water generationor runoff from the green waste curing process. The estimated size of the active composting area is 6 acres, the curing area is about 3 acres. The final material staging area is around 1.5 acres. The residual material is screened out of the compost blends with a trammel screener. A very small percentage of the material is collected as residuals . The collected residuals in placed into trash bins, stored at a designated secure area, and hauled out within a few days to landfill. The composting operation area is not in the floodzone, and there is no creek or water way within the 1-1/2 miles radius of this operation.

## 2.3 Fruits & Vegetables Recovery Operation

Fruits and vegetables are received in packaged and unpackaged containers. Approximately 60% of the materials ( fruits, vegetables, and few pieces of bread) that are received, are unpackaged clean materials picked from local supermarkets and grocery stores. The other 40% has some sort of packaging that is removed at the site. The materials (discarded fruits and vegetables) arrive in totes and are unloaded from the trucks. A total of four (4) trucks of materials are received per day. The maximum amount of fruits and vegetables received and processed per day is 75 tons, or 62 cubic yards. Once unloaded, the totes are tipped into one of the two cement pits depending if the material is clean or not. The tipped clean material is scraped from a pit with a front loader, and loaded directly into the trailer. The tipped material that has packaging is scrapped from a pit and loaded into a de-packager. Once de-packaged, the clean material is conveyed into a cement-lined bunker; then scraped and loaded into a trailer. Once the trailer is full of clean material, it is hauled down the street to feed cattle that are either owned by the Ontario Agricultural Commodities (OAC) or by one of the partnering cattle producers. This whole process from unloading the material to delivering from clean feed to the cattle takes only couple of hours.

Recently, part of the operation has become mechanized by utilizing a press on a small portion of the

clean material. The pressed juice from the material is pumped into a tanker and once full, it is delivered by the tanker to Vivotien ( a local business) as feed for them to mix in and fed to their larvae. The solids left over from the press are used as cattle feed. The packaging left over from the de-packer is conveyed to a separate cement lined bunker, where it is scraped and loaded into an onsite roll off container that is owned by the City of Ontario, and picked up 6 days a week.

**MATERIAL PROCESS FLOW CHART**

**Green Waste Receiving Area> Initial Screening & Separation>Grinding & Screening>Mixing, Active Composting & Curing> Final Staging Area & Residual Removal> FinalMaterial Storage >Loading & Delivery By Trucks to Farms**

## 3. SITE GEOLOGY

The geology and hydrogeology of the site and adjacent areas (unless otherwise specified) are taken from:

*"2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement"*, Prepared for Chino Basin Watermaster by Wildermuth Environmental, Inc. October 2015

The subject site is located within the Chino Basin. The Chino Basin consists of about 235 square miles of the Upper Santa Ana river watershed . The basin is bounded by the Cucamonga Basin and the San Gabriel Mountains to the north; the Rialto-Colton Basin to the northeast; the chain of Jurupa, Pedley, and La Sierra Hills to the southeast; the Temescal Basin to the south; the Chino and Puente Hills to the southwest; and the San Jose Hills and the Pomona and Claremont Basins to the northwest (Figure 1-1). The location of the subject site is shown on **Figure 1-1.**

## 3.1 Geologic Setting

The general geology of the Chino Basin is shown on **Figure 2-1.** Although the entire Basin is immediately underlain by Quaternary Alluvium, **Figure 2.1** shows (within shaded borders) the nature of the rock units that underlie the water-bearing sediments of the Quaternary Alluvium. The Chino Basin was formed as a result of tectonic activity along major fault zones during the Quaternary Period. It is part of a large, broad, alluvial-filled plain located between the San Gabriel Mountains to the north (Transverse Ranges) and the elevated Perris block to the south (Peninsular Ranges), which is sometimes referred to as the Chino Plain. The Santa Ana River is the main tributary draining the area.

A number of major faults are at least partly responsible for the uplift of the surrounding mountains and the depression of the Chino Basin. These faults are the Cucamonga Fault Zone, the Rialto-Colton Fault, the Red Hill Fault, the San Jose Fault, and the Chino Fault **(Figure 1-1).** The bottom of the basin, the effective base of the freshwater aquifer, consists of impermeable sedimentary and igneous bedrock formations. These formations are exposed at the surface in the surrounding mountains and hills. Sediments were eroded and washed out from the surrounding mountains and filled the Chino Basin to form its groundwater reservoirs. These sediments are greater than 1,000 feet thick in the deepest portions of the Basin.

The major faults form groundwater barriers and form some of the external boundaries of the Basin by influencing the magnitude and direction of groundwater flow.

## 3.2 Stratigraphy

### 3.2.1 Consolidated Bedrock

The consolidated bedrock formations of the Chino Basin area include the basement complex; consolidated marine sedimentary and volcanic strata; and more recent semi-

consolidated continental sedimentary deposits. Reference **to Figure 2-1** shows the surface outcrops of the consolidated bedrock formations that surround the Chino Basin.

#### 3.2.1.1 Basement Complex

The basement complex consists of deformed and re-crystallized metamorphic rocks that have been intruded by masses of granitic and related igneous rocks. These rocks were subsequently uplifted and exposed by erosion. They have been the major source of detritus to the younger sedimentary formations, particularly the younger water-bearing sediments of the Chino Basin.

#### 3.2.1.2 Undifferentiated Pre-Pliocene Formations

Well-stratified marine sandstones, conglomerates, shales, and interlayered lava flows (late Cretaceous to Miocene) overlie the basement complex and crop out along the western margin of the Chino Basin. This sequence reaches a total stratigraphic thickness of 24,000 feet in the Puente Hills, and is down-warped more than 8,000 feet below sea-level in the Prado Dam area.

#### 3.2.1.3 Plio-Pleistocene Formations

A thick series of semi-consolidated clays, sands, and gravels of marine and non-marine origin overly the older consolidated bedrock formations. These sediments have been named the Fernando Group. The upper portion of the Fernando Group is more permeable than the lower portion and thus represents a gradual transition from non-water-bearing consolidated rocks to water-bearing sediments.

## 4. WATER-BEARINGING SEDIMENTS

An intense episode of faulting, occurring in the Pleistocene, depressed the Chino Basin area and uplifted the surrounding mountains and hills. Detritus eroded from the mountains were transported and deposited in the Chino Basin on top of the bedrock formations. they were deposited as interbedded, discontinuous layers of gravel, sand, silt, and clay to form water-bearing sediments. These water-bearing sediments are differentiated into Older Alluvium of Pleistocene Age and Younger Alluvium of Holocene Age.

### 4.1 Older Alluvium

The Older Alluvium varies in thickness from about 200 feet near the southwestern end of the Chino Basin to over 1,000 feet southwest of Fontana. The pumping capacities of wells completed in the Older Alluvium generally range between 500 and 1,500 gallons per minute (gpm). Capacities exceeding 1,000 gpm are common, and some modern production wells test-pumped at over 4,000 gpm. In the southern part of the Basin where the water-bearing sediments tend to be more clay-rich, the wells generally yield less than 1,000 gpm.

### 4.2 Younger Alluvium

The streambeds, washes, and other areas of recent sedimentation are occupied by the Younger Alluvium. The You8nger Alluvium varies in thickness from over 100 feet near the mountains to just a few feet south of Interstate 10 and generally covers most of the north half of the Basin. The Younger Alluvium is not saturated and, thus , does not yield water directly to wells.

### 4.3 Effective Base of the Freshwater Aquifer

**Figure 2-2** shows the Water master's interpretation of the effective base of the freshwater aquifer in the Chino Basin.

#### 4.3.1 Eastern Chino Basin

The subject site does not lie within the Eastern Chino Basin, so that portion of the Chino Basin (east of Archibald Avenue) will not be discussed here.

#### 4.3.2 Western Chino Basin

On the west side of the Chino Basin (west of Archibald Avenue) and in the Temescal Basin, the determination of the bottom of the aquifer is not straightforward. Some boreholes to 1,400 feet bgs did not penetrate the basement complex, but terminated in highly-weathered and consolidated sediments that may be formations of the sedimentary bedrock formations. There is evidence to suggest that that the upper portions of the sedimentary bedrock formations have a useful porosity and permeability, and that these formations contribute water to deep production wells.

**Figure 2-2** shows deep wells in the western portion of the Chino Basin with screens deeper than 1,000 feet bgs. All of the well boreholes penetrated a similar sequence of sediments that include sands, gravels, silts, and clays.

## 5. SITE HYDROGEOLOGY

### 5.1 Groundwater Flow

The physical nature of the Chino Basin as a groundwater reservoir is described with regard to Basin boundaries, recharge, groundwater flow, internal barriers to groundwater flow, and discharge. **Figure 2-1** shows the physical boundaries of the Basin, primarily composed of faults and surrounding mountains and hills.

The predominant source of recharge to the Basin groundwater reservoirs is the percolation of direct precipitation and returns of applied water.

In general, groundwater flow mimics surface drainage patterns: from the forebay areas of high elevation in the north and east flanking San Gabriel and Jurupa Mountains, towards areas of discharge near the Santa Ana River within Prado Basin. The directions of groundwater flow within the Basin are shown by the groundwater contours depicted on **Exhibit 18,** taken from Chino Basin Watermaster Engineering Report-State of the Basin 2012. The direction of groundwater flow at any location is perpendicular to the groundwater contour line. In the area of the subject site, the direction of groundwater flow is directly south.

There is only one documented barrier to groundwater flow within the aquifer systems of the Chino Basin. This barrier exists only within the deep aquifer system of the western Chino Basin. The location of this barrier is shown in **Figure 2-2** just to the west of the subject site) and is named the Riley Barrier.

Groundwater moves generally in alluvium south of the mountains and west from adjacent basins through the Chino Basin; it rises to the surface along the Santa Ana River between Riverside narrows and the Prado Dam. Subsurface flow past Prado Dam has been stopped by means of a sheet-steel wall driven to the base of the water-bearing sediments (Geological Survey Water-Supply Paper 1999-G, 1972)

### 5.2 Aquifer Systems

The saturated sediments within the Chino Basin comprise one groundwater reservoir, but the reservoir can be subdivided into distinct aquifer systems based on the physical and hydraulic characteristics of the aquifer-system sediments and the contained groundwater. These aquifer systems include Layer 1 (shallow), Layer 2 (intermediate), and Layer 3 (deep). The sediments that comprise the shallow aquifer system (Layer 1) are almost fully saturated in the southern portion of the Chino Basin. Depth to groundwater increases to the north to provide a thick vadose zone for percolating groundwater in the forebay regions of the Chino Basin. The sediments within the deep aquifer system are always fully saturated. The shallow aquifer system is generally characterized by unconfined to semi-confined groundwater conditions, high permeability within its sand and gravel units and high concentrations of dissolved solids and nitrate (especially in the southern portions of the Basin). The deep aquifer system is generally characterized by confined groundwater conditions, lower permeability within its sand and gravel units, and lower concentrations of dissolved solids and nitrate. There is generally a downward hydraulic gradient.

The distinction between the aquifer systems is most pronounced within the west-southwest portions of the Chino Basin. This is likely because of the relative abundance of fine-grained sediments in the southwest (multiple layers of clays and silts). Groundwater flowing from high-elevation forebay areas to the north and east become confined beneath these fine-grained sediments in the west-southwest, and these sediments effectively isolate the shallow aquifer system from the deep aquifer system(s). The three-dimensional extent of these fine-grained sedimentary units and their effectiveness as confining layers is shown by the fact that the subject site is located in an area of historical

flowing artesian conditions, which indicates the existence of confining layers in this area. The presence of these fine-grained sedimentary units is verified by the driller's log of a water well located at 7330 Edison Avenue, directly across Edison Avenue, to the north of the site. The driller's log is contained in the DWR Water Well Drillers Report No. 105755, for State Well Number 2S/7W-17E 1. This well is 357 feet deep, with clay strata at the following intervals:

31-54 feet
115-131 feet
150-168 feet
212-225 feet
227-278 feet
280-285 feet
323-357 feet

Standing water was in the well casing at a depth of 135 feet following 35 hours of well testing. The yield was 750 gallons per minute with 23 feet of drawdown. The date of the Well Drillers Report was May 31, 1976. Reference to Exhibit 18 indicates that, in the Spring of 2012, the depth to groundwater at the site was approximately 133 feet, very similar.

The presence of confining layers beneath the site is an indication that any contaminants produced at the subject site will not likely penetrate below layer 1 and will remain in the Shallow Aquifer.

Layer 1 consists of the upper 150-950 feet of sediments and is generally representative of the shallow aquifer system. Layer 1 sediments are typically coarse (sand and gravel layers) and, where saturated, transmit large quantities of groundwater to wells due to high hydraulic conductivities. On the west side of the Chino Basin, Layer 1 sediments are composed of a greater fraction of finer-grained sediments (silt and clay layers), especially in the uppermost 100 feet. Layer 1 water quality is generally poor in the southern portion of the Basin with relatively high concentrations of TDS and nitrate. **Figure 2-6c** displays the profile view of cross-section J-J' (**Figure 2-5** shows the map view of the hydro Stratigraphic cross sections), which is aligned southwest-northeast and illustrates the thickening of layer 1 in the northeastern direction at the expense of layer 2. The thickening of Layer 1 is supported by the observation that the silt and clay layers, which are typical of Layer 2 sediments in the southwestern Chino Basin, become thinner and less abundant in the eastern and northeastern portion of the Basin. Layers 2 and 3 will not be discussed in detail due to the fact that the site is underlain by extensive clay strata and any contaminants that may leak from the site will not likely penetrate below Layer 1.

### 5.3 Hydraulic Conductivity

The vertical hydraulic conductivity of Layer 1 in the area of the subject site ranges from 5.4 x $10^{-7}$ to 2.5 x $10^{-3}$ cm/sec **(Figure 2-13a).** The hydraulic conductivity of the soil layer immediately beneath the site was determined by conducting soil percolation

tests following the procedure specified by County and local agencies. As shown on the site plan four locations within the composting working pads, and drainage pads area were designated for soil and hydraulic conductivity tests in accordance with the Technical guidelines. Two additional soil testing locations were designated along the perimeter of the detention pond.

**The soil percolation tests were conducted at a greater depth of 2 feet below the working pads, and below the bottom of the detention pond, at the designated locations shown on the site map on December 9th and 10th 2021. A copy of the soil percolation test results is attached in the Appendices.**

## 6. WASTEWATER MANAGEMENT SYSTEM

There is one groundwater well on site at a **greater distance than 100 feet** from the composting area, that is used for pumping and transfer of water to the water spray tanker trucks. Each tanker truck can hold up to 2,000 gallons of water. During the dry weather condition, the tanker truck turnover rate is about 20 times per day. In the mild weather, the turnover rate could fluctuate between 10 to 12 trucks per day. The tank truck sprays water into the wind row piles at a consistent rate. An attendant is onsite during the entire moistening process to assure that there is no over spraying or runoff from the spraying, and the water content within the piles is distributed evenly. As observed during the site inspection, no water is collected in the detention pond in non-rainy days or on rainy days with low precipitation. No water is stored in the pond primarily through-out the year, except on rainy occasions and during the wet season, which generally lasts for few days or few weeks depending on the duration or intensity of the rainy event. **Quarterly wastewater samples will be collected, when adequate amount of water is in the pond for collection of representative samples. A wastewater sample was collected during the last wet season and analyzed for the parameters listed in the Tech Report Guidelines for the Tier I composting facility. Copy of the test results is attached in the appendices.** It needs to be noted that the perimeter area around the composting operation is bermed and protected from run-on.

### 6.1 Storm water Run-off/Run on

The site is bordered on the north by Edison Avenue, and on the south, east and west by adjacent dairy, and pasture land area. There are no potential of stormwater runoff or run on from the property boundary areas. According to the Riverside County Flood Control, the average annual precipitation in the Chino/Ontario area is about 13 inches. The rain fall during the 25 yr, 24 hr storm event is around 4.2 inches. The nearest weather station at the Chino Airport indicate a maximum annual rainfall is about 15 inches. A review of the published data shows a mean annual evaporation rate in the Chino area of 75 inches. As shown in the site plan, the property is sloped to the south, and the stormwater runoff from the green waste compost production & side operations drains to the big pond situated on the south side of the composting facility via the compacted and sloped drainage pathways in between the piles. The stormwater runoff from the composting area drainage pathway is led to several surface inlets of 4 to 5 feet in width along the bermed-up length of the detention pond (see the site plan). Stormwater runoff from the non

production area flows toward the southwest side of the pond.

### 6.2 Stormwater Containment Volume

The proposed retention pond containment volume exceeds the total volume required for the annual rainfall and 25 yr, 24 hr storm. The containment volumes for the proposed ponds at the site are as follows:

**Pond's Containment Capacity**

| **Pond No.1** | **Area (Sq. Ft.)** | **Average Depth (Ft.)** | **Volume (Cuft.)** |
|---|---|---|---|
| **780' x 86'x12' (Avg)** | **64740** (sloped sides) | **12** | **776,880** |

**Total Area= 64740 Sq. ft** **Total Existing Volume= 776,880 Cu. ft**

Runoff from 25-year-24-hour storm 399,700 cu. ft., 9.17 acre-ft
Runoff from 150-day annual rainfall 382,602 cu. ft., 8.78 *acre-ft.*
Suspended Solids Volume = 50 cu. ft.
Total Containment Volume Required 743,526 Cu. Ft, 17.95 acre-ft

Runoff from the 25-year, 24-hour storm was calculated as shown in Appendix I. The 25-year, 24-hour rainfall was calculated according to plate E-5.7 in the *Riverside County Hydrology Manual.* (Riverside County was used because it provides an expanded chart). Rainfall was converted to runoff using Figure C-5, with roofed areas assigned a watershed curve number (CN) of 100, paved areas a CN of 97, and unpaved areas a CN of 90.

The containment pond capacity exceeds the 24 hr-25year storm and 150 days annual rainfall without taking into account the additional losses in evaporation.

The RWP-IV green waste composting operation is a Tier I facility. There is no process wastewater discharge or stormwater runoff from this operation off-site at the facility. The facility has obtained a NONA permit from the Regional Water Board for containing the entire stormwater runoff during a 25-year, 24-hour storm.

## 7. SITE DESIGN INFORMATION

The composting facility is designed and built to minimize soil erosion and dust formation, by having paved, and gravel roadways for materials delivery and movement. The roadways are built around the composting area, to make easy access to the windrow piles. All working surfaces are properly graded and compacted to prevent ponding and ease the surface water flow from storm events. Areas used for receiving, processing, and delivery of composting materials are designed, constructed, and maintained to control and manage stormwater run-on, and runoff.

The current size of the containment pond is 780' L. X 86' W. X 8' H. However, the containment pond will be enlarged within the next few weeks ( by November 30, 2022) by increasing the average depth of the pond from 8 feet to 12 feet. The overall dimensions of the pond will be 780' L. X 86' W. X 12' H. The composting area working pads, and drainage pathways are graded and compacted at greater than 90 %. compaction. The compacted area meets the design criteria set for the hydraulic, and soil percolation rate limits set by the State's Water Board. Hydraulic tests were conducted at the working pads, and the pond area to demonstrate compliance ( see the test results in the appendices section). The proposed pond has extra holding capacity to capture 24 hr, 25 yr storm, and annual rainfall from the composting and non-composting operations at the site.

## 8. EROSION CONTROL PLAN

The prevalent slope per onsite observation ( **no survey data is available**) is toward the southeast, where, the large containment pond is situated. The site is graded properly to prevent the settling of stormwater and soil erosion associated with loose soil and water accumulation. The composting facility and the side operations are inspected by the operators on a regular basis and prior to the start of the wet season. The production area is scraped on an annual basis and cleared from any residue that may have been accumulated during the composting process. Working surfaces are monitored after each storm event, and areas with an uneven grade, or loosened soil are compacted and re-graded. To prevent ponding and ease the stormwater flow to the containment area, all weeds, dead vegetation, and debris that may be encountered in the water flow path is cleared. Mosquito and Vector control measures are strictly enforced, and operators are trained to conduct a weekly inspection, to ensure the integrity of the structure, that there are no holes in the bermed-up areas, and soil erosion does not occur due to the presence of gophers, rabbits, rats, etc.. Additional compaction and reshaping of the bermed areas will be done if any breakdown or soil erosion is encountered.

## 9. OPERATIONS & MONITORING

To comply with the **Water Quality Board Order WQ-2015-0121-DWQ, as amended by order WQ-2020-0012-DWQ,** the facility operators are trained to conduct maintenance

and monitoring of the composting operations periodically. The operators conduct quarterly inspections of the working surfaces, berms, drainage path,

and facility perimeter. The composting facility operator also follows a strict procedure in odor control, and the site is cleaned and the residuals are placed in trash bins and hauled out onweekly basis. The composting facility has an in-house odor control program and a trained staff that conduct routine inspection and maintenance to prevent the growth of vegetation and the formation of algae in the drainage pathways and the pond area.

The facility operators are also trained in utilizing erosion control Best Management Practices (BMP). A thorough inspection of the facility is conducted on annual basis, prior to the start of the wet season to assure that no residues remain on the ground, through scraping and cleaning of the material production area, and working surfaces. Any area with loose or eroded soil will be resurfaced, compacted, and re-graded. The containment pond structure, embankments, berms, and surface drainage areas will be inspected for signs of surface failure, such as cracking or spilling. Any visible sign of surface deterioration will be logged, and taken care of within 24 hrs. Additional measures are taken during the dry season, by preventing soil erosion and dust formation, by slightly wetting and compacting the working surfaces if needed. Receiving and delivery trucks' tires are also inspected and cleaned from dust and debris.

During the rainy event, the piled material will be checked and turned over on an as-needed basis, to prevent wastewater or leachate formation. The operators will inspect the entire facility one day after each major storm event, and log in their observations. Stormwater runoff resulting in the formation of ponding will be collected and cleared within 24 hrs. If any damages are encountered, it will be repaired, and the surface will be graded, and compacted within 10 days of the storm event. The encountered damages and repairs conducted along with visible pictures will be included in the annual report submitted to the Regional Water Board The detention pond will be monitored after each storm event to determine the depth and level of the water collected. The pond will be equipped with a scaled stick for measuring the collected water in the deepest area. During the last few years of composting at the site, the operators have observed that the water collected duringthe rainy days is due to stormwater runoff. Generally few days after the rainfall the pond is dried, and no water is collected until the next rainfall. **A quarterly sampling of stormwater runoff and wastewater that is stored in the detention pond will be conducted, provided that adequate volume is collected for representative sampling.** On January 10, 2022, representative samples of the water in the pond were collected and analyzed for the parameters listed in the Technical Guideline for Tier I composting operations. The test report (see Appendix VI) showed a low concentration of the tested parameters. E Coliform will be added to the list of parameters that are to be analyzed.

Additional measures will be taken to maintain the containment pond integrity and holding capacity. The pond will be cleaned of any vegetation, dead algae, and debris. A mosquito, and vector control plan in accordance with the San Bernardino County Department of Public Health has been implemented onsite. The working surface area is cleaned from any trash, and residues on a regular basis, and maintained free of odor. All trash are collected in covered trash bins and hauled out of the facility on a weekly. Surface drainage and the pathway to the containment pond are also inspected on a weekly basis to ensure it is free of debris and sediments to ease the conveyance of water runoff. During heavy rainfall, if any of the piles can no longer absorb the precipitation, will be coveredwith a tarp to prevent material runoff, soil erosion, or the formation of a slurry.

## 10. CLOSURE PLAN

Due to the type of composting operation, and size of the production and location, as well a routine maintenance monitoring program, the chances of soil or groundwater contamination has been minimized. However, the operator, 90 days prior to vacating the site, or ceasing the operation, will submit a detailed closure plan to the Santa Ana Regional Water Quality Control Board (RWQCB) specifying the site condition, and methods used for inspection, cleaning and disposal of residues, or any potentially contaminated area. Per obtaining the plan approval, the closure activities will be conducted. The RWQCB, and local enforcement agency will be notified in writing at the conclusion of the closure activities.

## 11. COMPLIANCE SHEDULE

To show compliance with the State's Water Board requirement, **RWP-IV** conducted soil percolation tests in accordance with the Technical Guidelines per the site map designated locations of the composting area working pads and the detention pond on December 9th & 10th 2021 ( Appendix VII). The test result showed the water percolation rate well below allowable limits in Table I of the Technical Guidelines. One of the locations chosen for testing failed due to the build-up of silt and sediments. The containment pond enlargement shall be completed by November 30th 2022.

## 12. REFERENCES


**1.0** Composting facility site inspection, February 28, 2020.

**2.0** California Water Quality Control Boards Technical Guidelines, August 4, 2015.

**3.0** Riverside County Flood Control Hydrology Manual, April 1978.

**4.0** Chino Basin 2013 Groundwater Model Update, by Wildermuth Environmental, October 2015

**5.0** DWR, Groundwater Wells Profile.

**6.0** Updated information on materials storage, and operation status at the site, furnished by Nathan De Boom, April 14. 2021.

**7.0** Soil Test Report, RWP-4, Chino, March 2022

**8.** Pond Water Test Report, RWP-IV, Chino, December 2021

# Appendix I:

# Storm water Runoff Storage Pond Evaluation

## Storm & Wastewater Storage Pond Capacity Evaluation

**Dairy Farm**: Recycled Wood Products #4 **Location** Ontario, CA
**Prepared By**: Saeed Ahdout **Date**: 9/26/2022 **Checked By**: FB.

***Runoff Volume Computations***

Average 150 days Rainfall 13 inches 25-year, 24-hour Rainfall: 4.5 inches

**Roofed Area Runoff** (CN= 100) ( 13 + 4.5 ) x 22,260/12 = 32,463

| 150 days Rainfall (inches) | 25-yr, 24-hr Rainfall (inches) | Roof Area (sq. ft) | Runoff Volume (cu. ft.) |
|---|---|---|---|

Paved Area Runoff **(CN= 97)** ( 13 + 4.2 ) **x** 25,000 /12 = 35,833

| 150 days Rainfall (inches) | 25-yr, 24-hr Rainfall (inches) | Area (sq. ft) | Runoff Volume (cu. ft.) |
|---|---|---|---|

Annual Runoff % _____

**Earthen Area Runoff** (CN= 90) ( 2.6 + 3.4) x 31 x 3,630 = 675,180

| 150 days Rainfall (inches) | 25-yr, 24-hr Rainfall (inches) | Area (acres) | Runoff Volume (cu. ft.) |
|---|---|---|---|

Annual Runoff % 20

**Design Runoff Volume = 743,476**

***Storage Volume Computations***

***Design Runoff Volume*** (cu. ft.): **743,476**
(from calculation above)
**Solids Weight** (tons): 1.0
(Multiply tons/year by 50 cu. ft/ton.): 50
***Other Solids Volume*** (cu. ft.): _____

***Process Wastewater Volume*** (cu. ft.): 0
(Divide gallons/year by 7.5 cu. ft.)
***Total Volume Required*** (cu. ft.): **743,526**

***Approximate Design Dimensions*** Depth 12 Width 86 Length 780
(select dimensions from Table 8c that result in a pond volume equal or greater than the design volume)

**Existing Containment Volume**: **776,880**
(cu.ft.)

**The existing pond containment capacity, exceed the proposed containment volume.**

# Appendix II:

## GENERAL Geology & Hydrology Maps

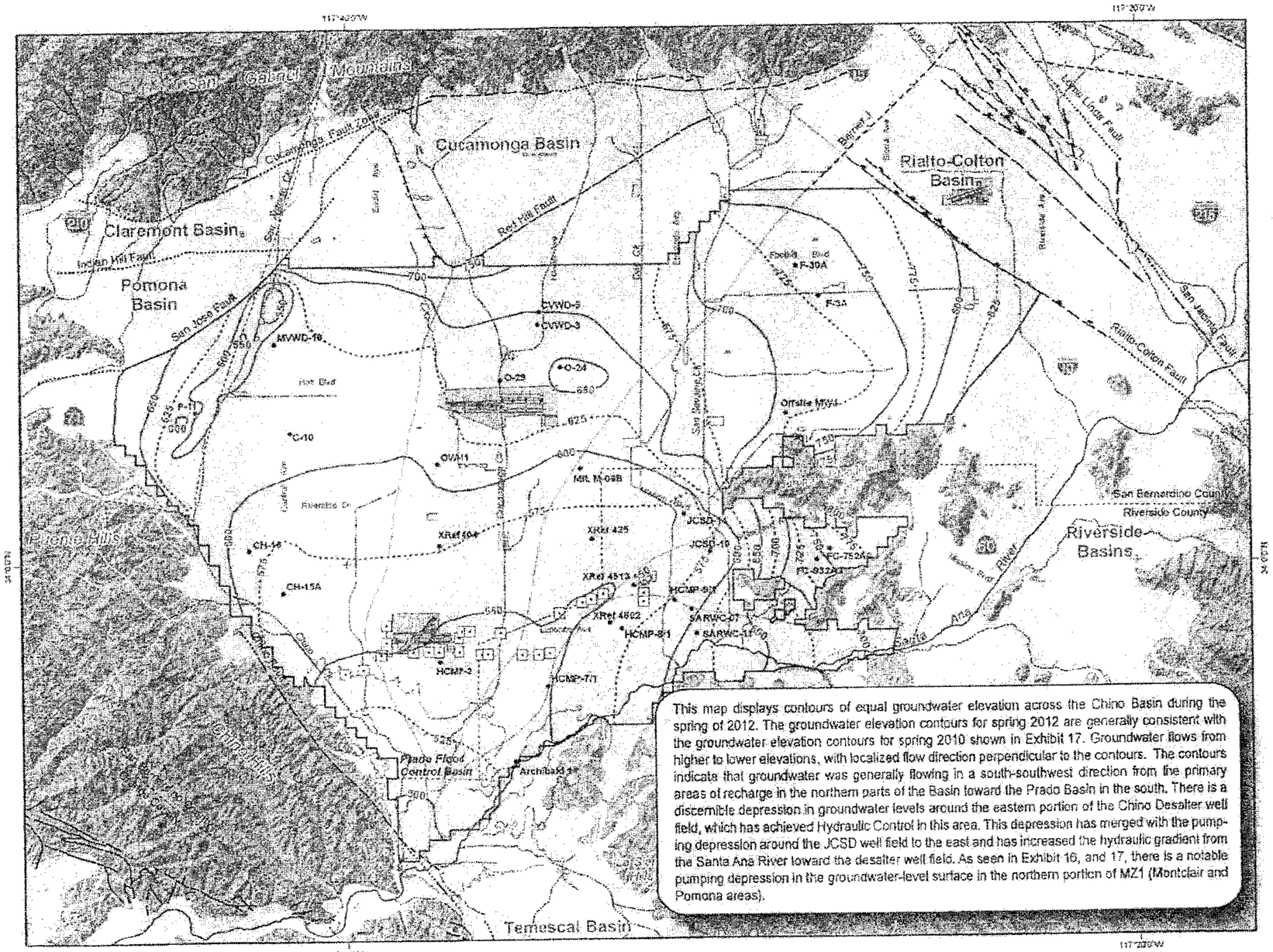


This map displays contours of equal groundwater elevation across the Chino Basin during the spring of 2012. The groundwater elevation contours for spring 2012 are generally consistent with the groundwater elevation contours for spring 2010 shown in Exhibit 17. Groundwater flows from higher to lower elevations, with localized flow direction perpendicular to the contours. The contours indicate that groundwater was generally flowing in a south-southwest direction from the primary areas of recharge in the northern parts of the Basin toward the Prado Basin in the south. There is a discernible depression in groundwater levels around the eastern portion of the Chino Desalter well field, which has achieved Hydraulic Control in this area. This depression has merged with the pumping depression around the JCSD well field to the east and has increased the hydraulic gradient from the Santa Ana River toward the desalter well field. As seen in Exhibit 16, and 17, there is a notable pumping depression in the groundwater-level surface in the northern portion of MZ1 (Montclair and Pomona areas).

Groundwater Elevation Contours (feet above mean sea-level)

Boundry of Contoured Area (contours are not shown outside of this boundary due to lack of water level data)

Well With a Water-Level Time History Plotted on Exhibits 24 through 28.

OSMP Management Zones

Chino Desalter Wells

Streams & Flood Control Channels

Flood Control & Conservation Basins

**Geology**

*Water-Bearing Sediments*

Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain

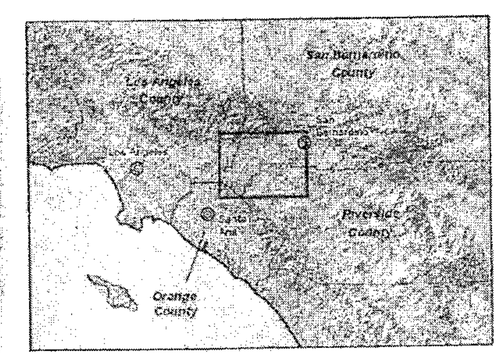


Produced by:

WILDERMUTH ENVIRONMENTAL

23692 Birtcher Drive
Lake Forest, CA 92630
949-420-5010
www.wildermuthenvironmental.com

Author: TCR
Date: 20121130
File: Exhibit_18.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 KM

2012 State of the Basin
*Groundwater Levels*

**Groundwater Elevation Contours in Spring 2012**

*Shallow Aquifer System*

**Exhibit 18**

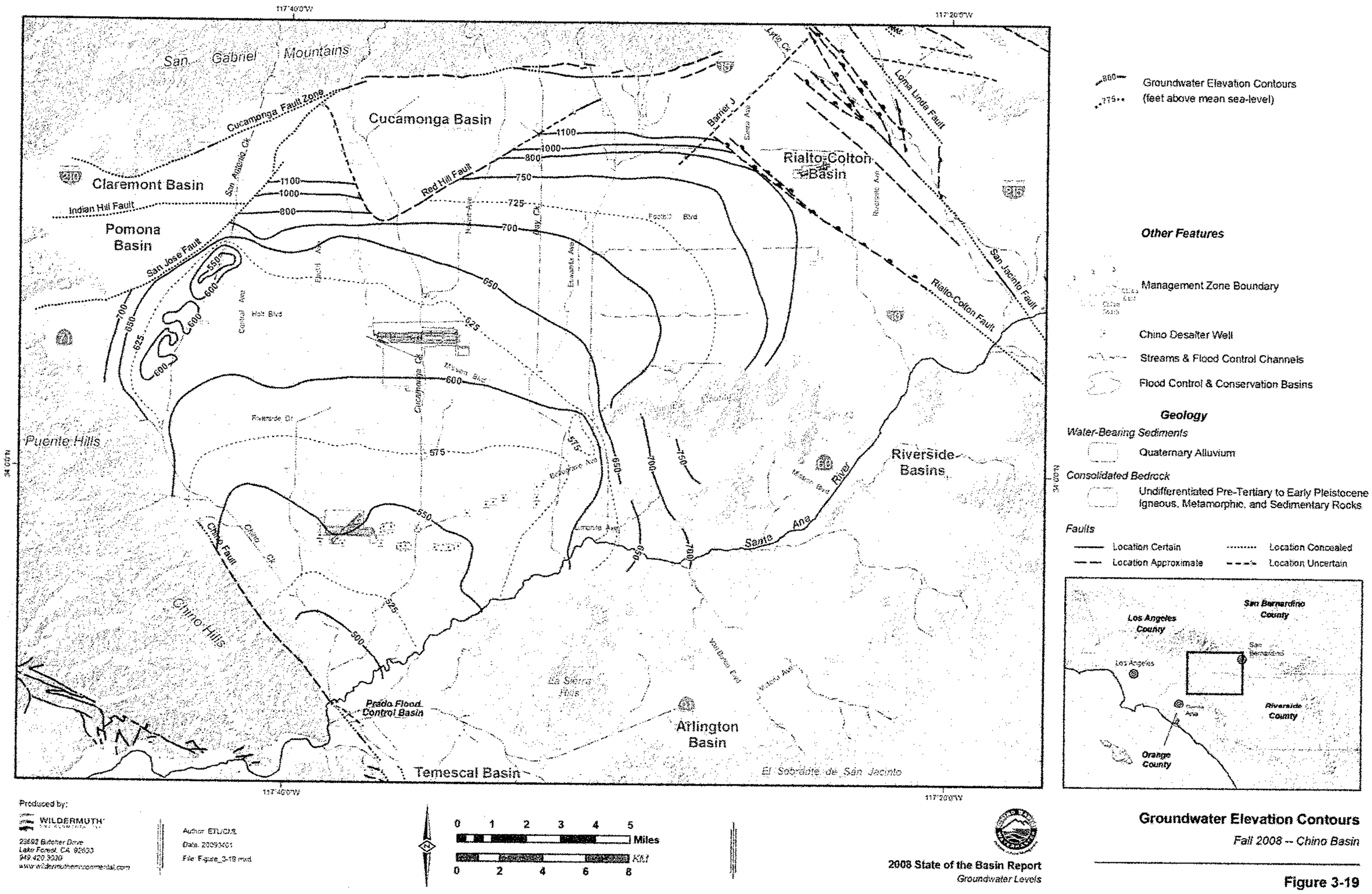


Produced by:
WILDERMUTH ENVIRONMENTAL
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wildermuthenvironmental.com

Author: ETL/CMR
Date: 20090401
File: Figure_3-19.mxd

2008 State of the Basin Report
*Groundwater Levels*

**Groundwater Elevation Contours**
*Fall 2008 -- Chino Basin*

**Figure 3-19**

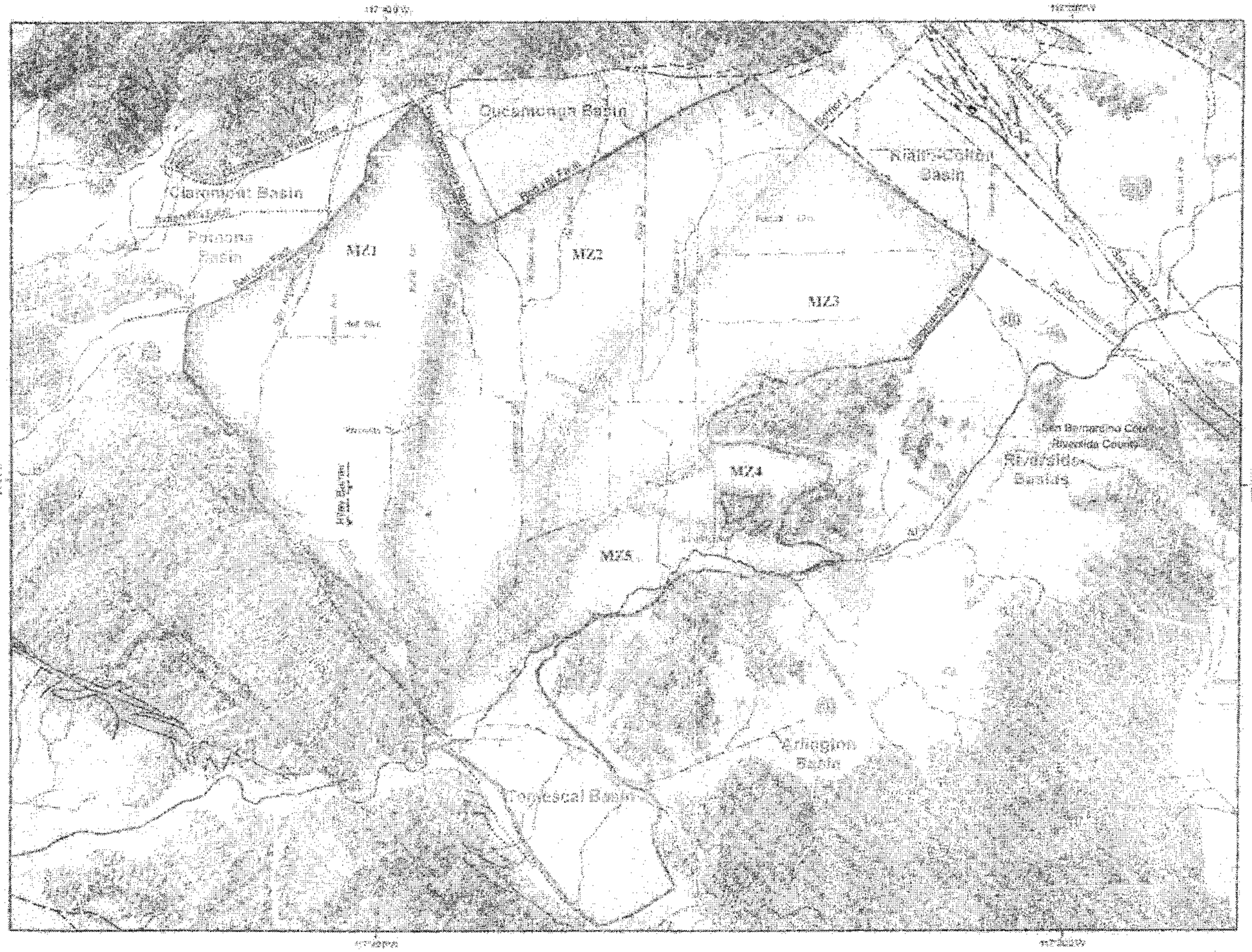


**Geologic Map and Boundaries of the Chino Basin**

**Figure 2-1**

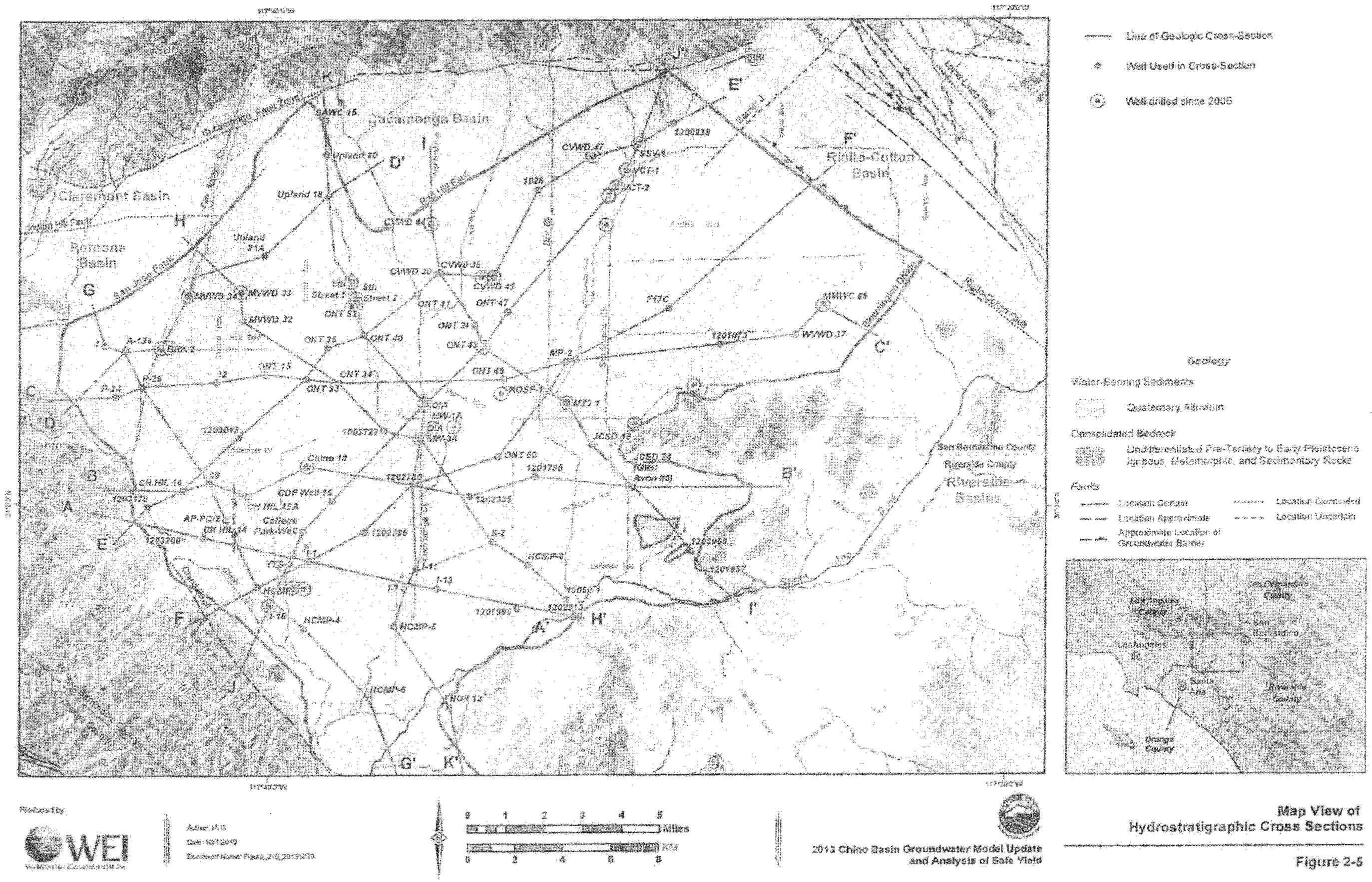


Prepared by:

WEI

2013 Chino Basin Groundwater Model Update and Analysis of Safe Yield

**Map View of Hydrostratigraphic Cross Sections**

Figure 2-5

# Appendix III:

# GROUNWATER WELL PROFILE

ORIGINAL
File with DWR

APR 30 1977

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF WATER RESOURCES

# WATER WELL DRILLERS REPORT

*Do Not Fill In*

№ 107275

State Well No.
Other Well No. 02S/07W17E

(1) OWNER:
Name [redacted]
Address

(2) LOCATION OF WELL:
County San Bernardino Owner's number, if any
Township, Range, and Section
Distance from cities, roads, railroads, etc. 500' East of Walker and 250' South of Schaeffer

(3) TYPE OF WORK (*check*):
New Well ☒ Deepening ☐ Reconditioning ☐ Destroying ☐
*If destruction, describe material and procedure in Item 11.*

(4) PROPOSED USE (*check*):
Domestic ☐ Industrial ☐ Municipal ☐
Irrigation ☒ Test Well ☐ Other ☐

(5) EQUIPMENT:
Rotary ☒
Cable ☐
Other ☐

(6) CASING INSTALLED:
STEEL: SINGLE ☒ DOUBLE ☐ OTHER:

| From ft. | To ft. | Diam. | Gage or Wall | Diameter of Bore | From ft. | To ft. |
|---|---|---|---|---|---|---|
| 0 | 450 | 16 | 1/4 | 26" | 0 | 454 |

If gravel packed

Size of shoe or well ring: Bull Nose Size of gravel: 3/8" Pea
Describe joint: Butt Weld

(7) PERFORATIONS OR SCREEN:
Type of perforation or name of screen: Vertical Mill Slot

| From ft. | To ft. | Perf. per row | Rows per ft. | Size in. x in. |
|---|---|---|---|---|
| 280 | 450 | 16 | 4 | 2½ X 1/8 |

(8) CONSTRUCTION:
Was a surface sanitary seal provided? Yes ☒ No ☐ To what depth 50 ft.
Were any strata sealed against pollution? Yes ☐ No ☒ If yes, note depth of strata
From ft. to ft.
From ft. to ft.
Method of sealing 30" Conductor Cemented In 36" Hole

(9) WATER LEVELS:
Depth at which water was first found, if known ft.
Standing level before perforating, if known ft.
Standing level after perforating and developing 149 ft.

(10) WELL TESTS:
Was pump test made? Yes ☒ No ☐ If yes, by whom? McCalla Bros.
2000 gal./min. with 88 ft. drawdown after 37 hrs.
Temperature of water Was a chemical analysis made? Yes ☐ No ☒
Was electric log made of well? Yes ☐ No ☒ If yes, attach copy

(11) WELL LOG:
Total depth 454 ft. Depth of completed well 450 ft.
Formation: *Describe by color, character, size of material, and structure*

| From ft. | To ft. | Formation |
|---|---|---|
| 0 | 50 | Conductor |
| 50 | 98 | Sand and Gravel |
| 98 | 136 | Clay and Streaks of Gravel |
| 136 | 161 | Gravel |
| 161 | 164 | Fine and Coarse Sand |
| 164 | 168 | Clay |
| 168 | 170 | Sand and Gravel |
| 170 | 175 | Clay |
| 175 | 190 | Sand, Gravel and Clay Streaks |
| 190 | 204 | Sand and Gravel |
| 204 | 206 | Clay |
| 206 | 212 | Sand, Gravel and Clay Streaks |
| 212 | 230 | Clay |
| 230 | 240 | Sand and Gravel |
| 240 | 249 | Clay |
| 249 | 255 | Sand and Gravel |
| 255 | 265 | Clay |
| 265 | 270 | Sand and Gravel |
| 270 | 284 | Clay |
| 284 | 296 | Sand and Gravel |
| 296 | 300 | Clay |
| 300 | 361 | Sand, Gravel and Boulders |
| 361 | 381 | Clay |
| 381 | 406 | Sand and Gravel |
| 406 | 410 | Clay |
| 410 | 415 | Sand and Gravel |
| 415 | 426 | Clay |
| 426 | 450 | Sand and Gravel |
| 450 | 454 | Clay |

elev 720

850 GPM @ 190' Pump Level
1200 GPM @ 202' Pump Level
1700 GPM @ 224' Pump Level
2000 GPM @ 237' Pump Level

CONFIDENTIAL - NOT FOR PUBLIC RELEASE

Work started 6-30-76 19 Completed 10-18-76

WELL DRILLER'S STATEMENT:
*This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.*

NAME McCalla Bros.
(Person, firm, or corporation) (*Typed or printed*)
Address 3819 West First Street
Santa Ana, CA 92703
[SIGNED] (*Well Driller*)
License No. 196824 Dated April 26, 1977, 19

SKETCH LOCATION OF WELL ON REVERSE SIDE

DWR 188 (REV. 9-68)

47150-260 9-72 30M YKIP Ⓣr OBP

# Appendix IV:

# FEMA Flood Zone Map

SITE

## NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

**Coastal Base Flood Elevations** shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations tables in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations tables should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) zone 11 North. The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit its website at http://www.ngs.noaa.gov.

**Base map** information shown on this FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency. This imagery was flown in 2005 and was produced with a 1-meter ground sample distance.

This map may reflect more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to confirm to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study Report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

**Corporate limits** shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at http://www.fema.gov.

**WARNING:** This map contains levees, dikes, or other structures that have been provisionally accredited and mapped as providing protection from the 1-percent-annual-chance flood. To maintain accreditation, the levee owner or community is required to submit documentation necessary to comply with 44 CFR Section 65.10 by August 8, 2009. Because of the risk of overtopping or failure of the structure, communities should take proper precautions to protect lives and minimize damages in these areas, such as issuing an evacuation plan and encouraging property owners to purchase flood insurance.

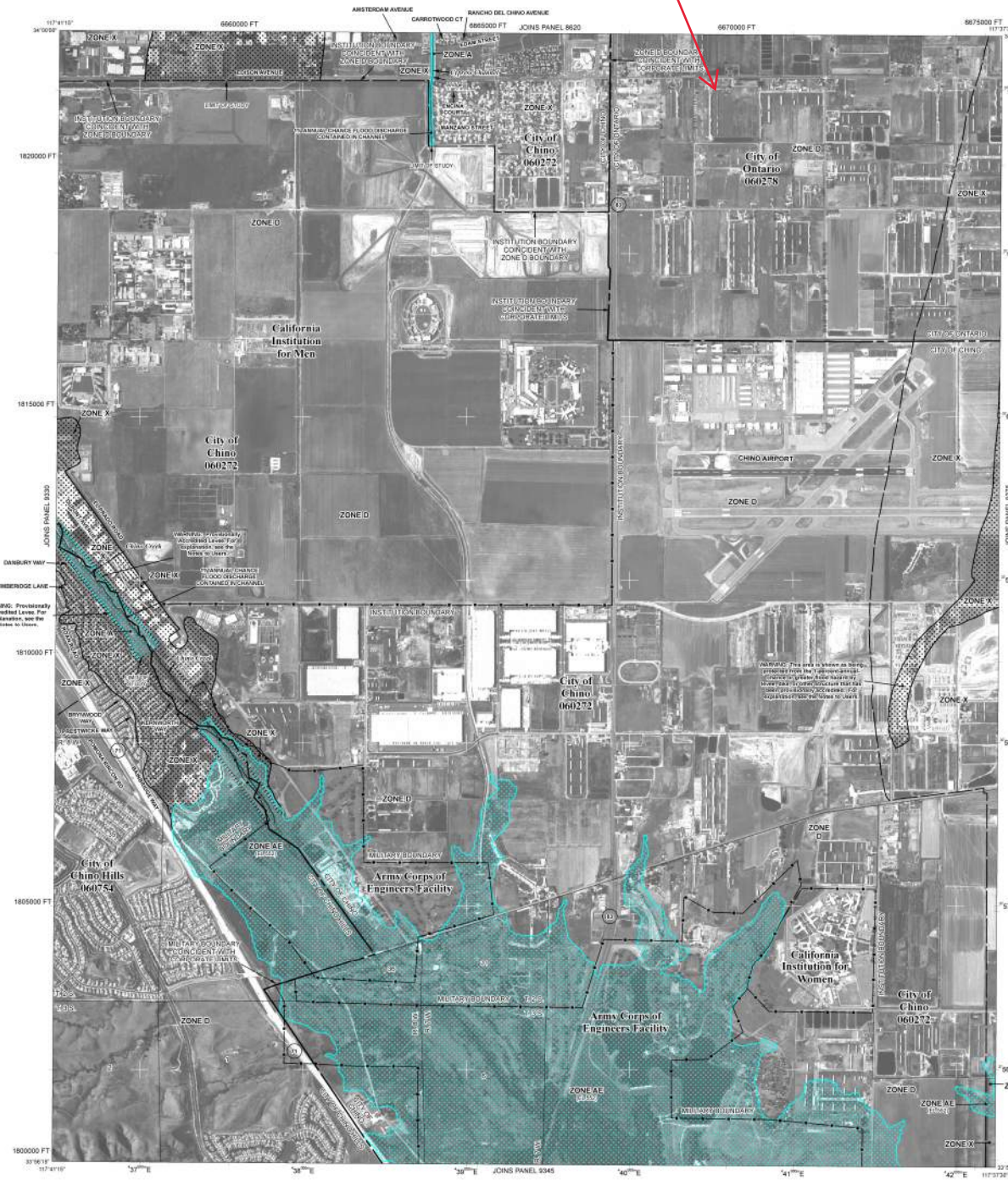


## LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

| | |
|---|---|
| ZONE A | No Base Flood Elevations determined. |
| ZONE AE | Base Flood Elevations determined. |
| ZONE AH | Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined. |
| ZONE AO | Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined. |
| ZONE AR | Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood. |
| ZONE A99 | Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined. |
| ZONE V | Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined. |
| ZONE VE | Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined. |

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

~~~ 513 ~~~ Base Flood Elevation line and value; elevation in feet*

(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

\* Referenced to the North American Vertical Datum of 1988

(A)———(A) Cross section line

(B)- - - - - -(B) Transect line

87°07'45", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

4276000 FT N 1000-meter Universal Transverse Mercator grid values, zone 11N

600000 FT 5000-foot grid ticks: California State Plane coordinate system, zone V (FIPSZONE 0405), Lambert Conformal Conic projection

DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)

•M1.5 River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
March 18, 1996

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
August 28, 2008 - to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 9335H

# FIRM

FLOOD INSURANCE RATE MAP

**SAN BERNARDINO COUNTY, CALIFORNIA**
AND INCORPORATED AREAS
**PANEL 9335 OF 9400**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| CHINO HILLS, CITY OF | 060754 | 9335 | H |
| CHINO, CITY OF | 060272 | 9335 | H |
| ONTARIO, CITY OF | 060278 | 9335 | H |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**
**06071C9335H**

**MAP REVISED**
**AUGUST 28, 2008**

Federal Emergency Management Agency
~~~

# Appendix V:

# Site Plan

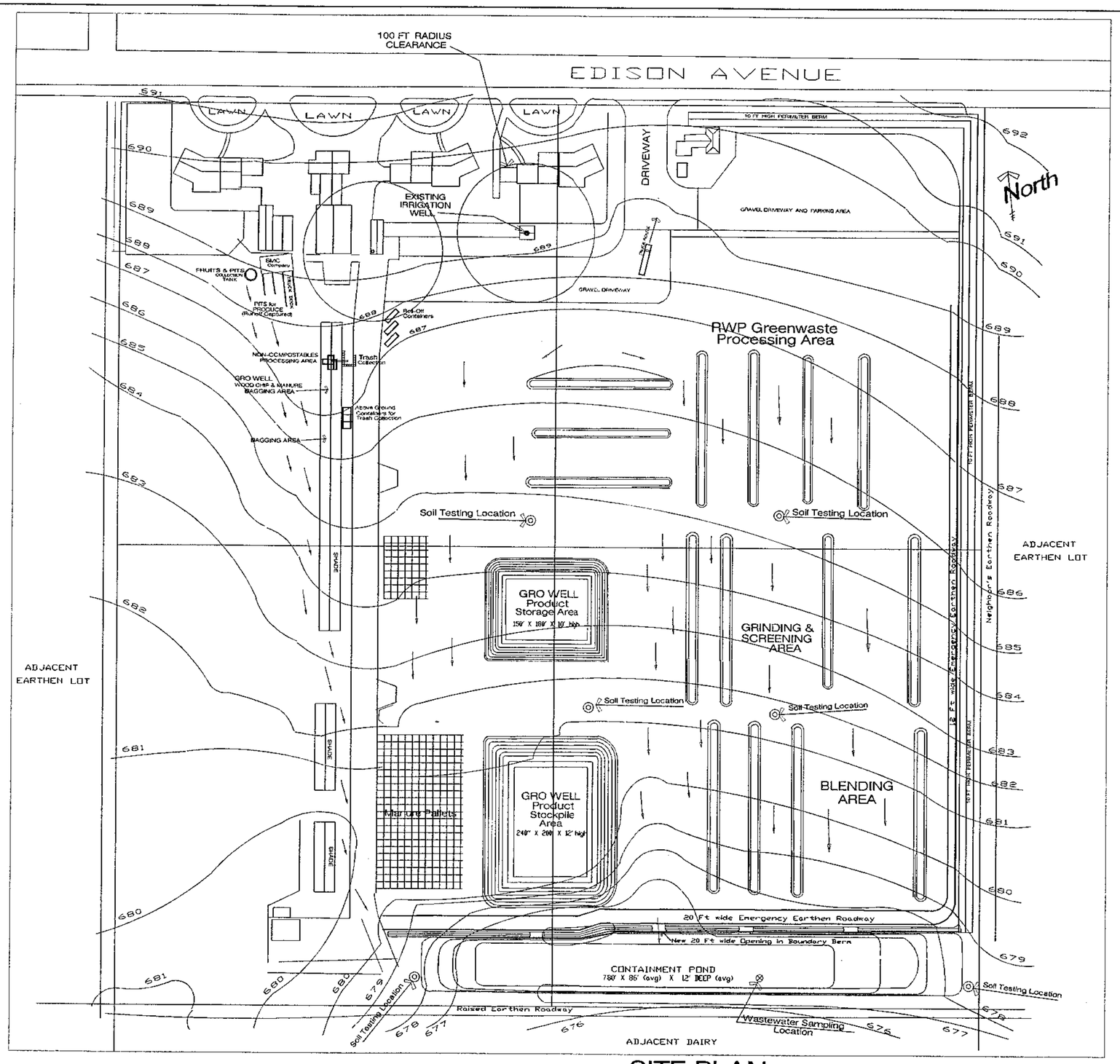


## SITE PLAN

Scale : 1"=75'

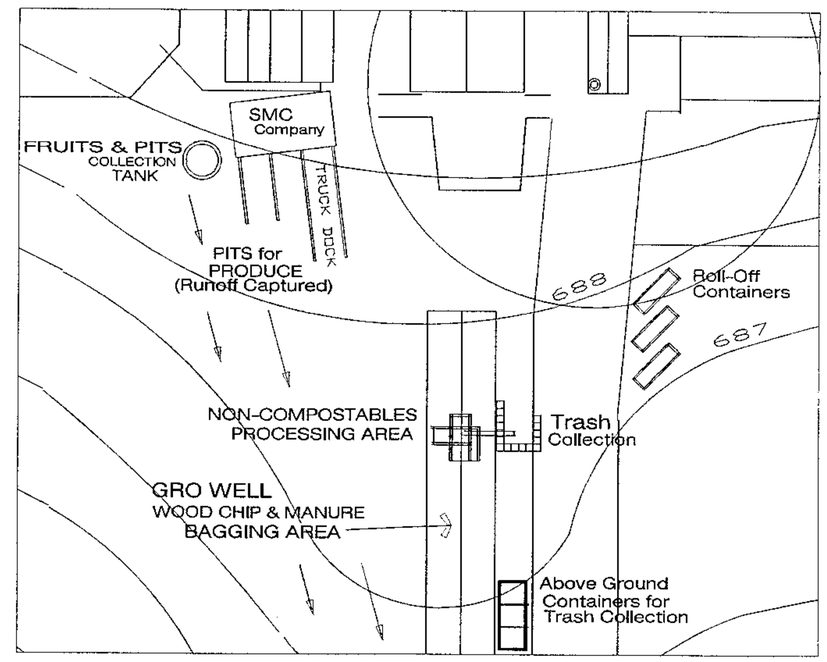


## NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

### GRADING NOTES

1. ALL DIKES AND BERMS SHALL BE CONSTRUCTED OF MINERAL EARTH FREE OF VEGETATION AND DELETERIOUS MATERIAL.
2. NO ROCKS OR COBBLES GREATER THAN 6 INCHES IN DIAMETER SHALL BE PLACED IN ANY FILL.
3. ALL AREAS TO RECIEVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.
4. ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES, WHEELED ROLLED AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

### KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILLWAY

DIGALERT

CALL TOLL FREE 1-800-227-2600 AT LEAST TWO DAYS BEFORE YOU DIG.

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SITE CONDITION RESPONSIBILITY:

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDASNCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 210
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APPVD | DATE |
|---|---|---|---|---|
| 3 | np | SMC flow lines and N arrow | | 9/12/23 |
| 2 | np | Pond depth increase | | 9/29/22 |
| 1 | np | Wastewater sampling location, fruits & pits collection tank | | 8/26/22 |

# SITE PLAN
## RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. 1053 - 391 - 01

DATE: 5-20-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2020
SHEET 1 OF 1

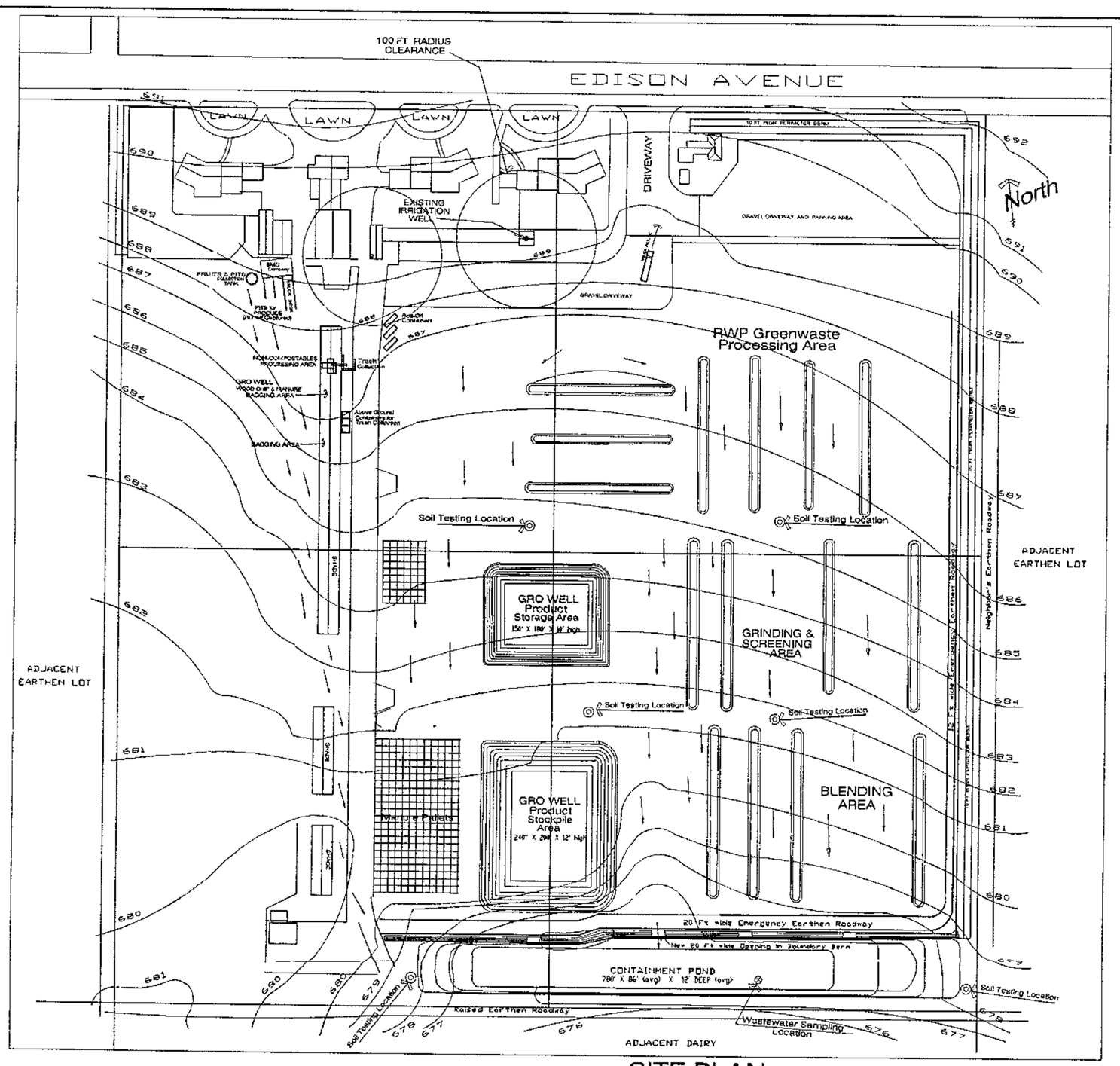


SITE PLAN

Scale : 1"=75'

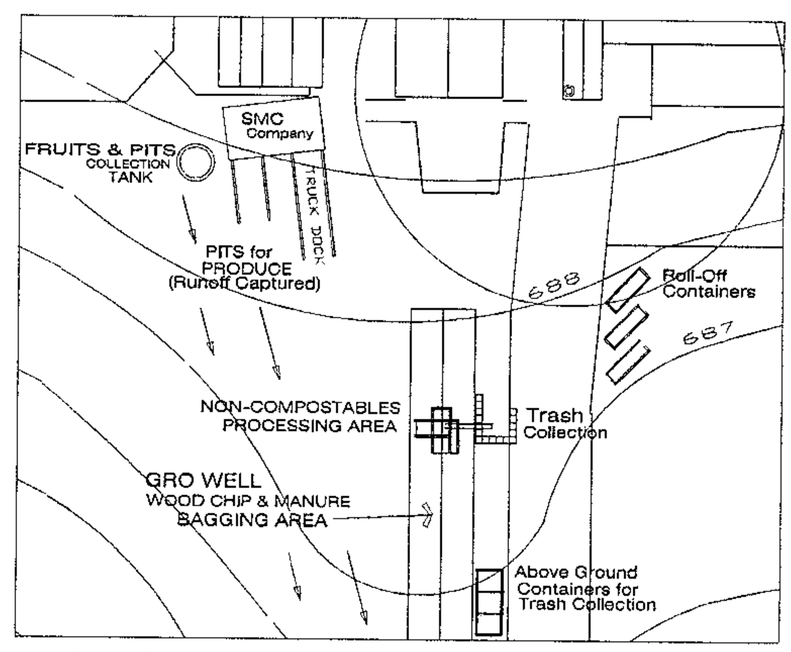


NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

GRADING NOTES

1 ALL DIKES AND BERMS SHALL BE CONSTRUCTED OF MINERAL EARTH FREE OF VEGETATION AND DELETERIOUS MATERIAL.
2 NO ROCKS OR COBBLES GREATER THAN 6 INCHES IN DIAMETER SHALL BE PLACED IN ANY FILL.
3 ALL AREAS TO RECIEVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.
4 ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES. WHEELED ROLLED AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILLWAY

DIGALERT

CALL TOLL FREE 1-800-227-2600 AT LEAST TWO DAYS BEFORE YOU DIG

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SITE CONDITION RESPONSIBILITY:

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 210
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APPVD | DATE |
|---|---|---|---|---|
| 3 | np | SMC Flow lines and N arrow | | 9/12/23 |
| 2 | np | Pond depth increase | | 9/29/22 |
| 1 | np | Wastewater sampling location, fruits & pits collection tank | | 8/26/22 |

SITE PLAN
RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. 1053 - 391 - 01

DATE: 5-20-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2020
SHEET 1 OF 1

# Appendix VI

# Pond Water Test Report

Waypoint ANALYTICAL

# Chain of Custody

23-034-0000
07327
02-03-2023
10:12:21

Residuals Recovery Group Inc/Aq Concepts
7325 Edison Storm Water Pond

| | | | |
|---|---|---|---|
| Company Name: Residuals Recovery | Account Number: 7327 | Phone Number | Analysis Requeste (Note special detection limits / r |
| Project/Site: 7325 Edison Stormwater Pond | State Project Location: CA | PO Number | |
| Type of Event (Routine Sampling Events Only): ☐ Single ☐ Daily ☐ Weekly ☐ Monthly ☐ Quarterly ☐ Semi-Annual ☐ Annually ☐ Bi-Monthly | | FID Number | |
| | | Project Number | |
| Project Manager/Contact: Nathan deBoom | RUSH ☐ (Surcharges may apply) | Matrix: 1) Wastewater 4) Sludge 2) Aqueous 5) Oil/Solvent 3) Soil/Sediment 6) Other | |
| E-mail Address: all | Ice ☐ | | |

SPL Quote No.

Which Regulations Apply?
☐ NPDES ☐ Risk Based Limits
☐ Wastewater ☐ TRRP 13
☐ RCRA ☐ LA RECAP
☐ UST ☐ USACE
Other ☐

| # of Containers | Sample ID/Number | Depth | Sample Date & Time | Matrix | Grab/Comp | TDS 50665 | Nitrite as N 50450 | | | | | | | | Comments | Lab ID Number (for internal use only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Edison Pond | 1' | 2/8/2023 9:00AM | | | X | X | | | | | | | | | 057807 |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
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| | | | |
|---|---|---|---|
| Sampled By: Nathan deBoom | Method of Shipment | Blank/Cooler Temp | Remarks |

| | | | | | |
|---|---|---|---|---|---|
| Relinquished By (sign) | Date | Time | Received By (sign) | Date | Time |
| Relinquished By (sign) | Date | Time | Received By Lab (print/sign) | Date | Time |

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

## Sample Summary Table

**Report Number:** **22-010-0010**

**Client Project Description:** **7325 Edison Pond**

| Lab No | Client Sample ID | Matrix | Date Collected | Date Received | Method | Lab ID |
|---|---|---|---|---|---|---|
| 98137 | 7325 Edison Pond | Aqueous | 01/10/2022 14:33 | 01/10/2022 | 2540C-2011 | |
| 98137 | 7325 Edison Pond | Aqueous | 01/10/2022 14:33 | 01/10/2022 | EPA-300.0 | |

: A&L Analytical Laboratories, Inc., Memphis, TN

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

07327
Residuals Recovery Group Inc/Ag Concepts
7325 Edison Ave

Ontario , CA 91762

Project Information : 7325 Edison Pond

Report Number : **22-010-0010**

***REPORT OF ANALYSIS***

Report Date : 01/14/2022
Received : 01/10/2022

Lab No : **98137**
Sample ID : **7325 Edison Pond**

Matrix: **Aqueous**
Sampled: **1/10/2022 14:33**

**Analytical Method:** 2540C-2011

| Test | Results | Units | MQL | DF | Date / Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | **2240** | mg/L | 89.2 | 1 | 01/12/22 17:09 | CJR | L594400 |

**Analytical Method:** EPA-300.0 **Prep Batch(es):** **L594456** 01/13/22 09:16
**Prep Method:** EPA-300.0 (PREP)

| Test | Results | Units | MQL | DF | Date / Time Analyzed | By | Analytical Batch |
|---|---|---|---|---|---|---|---|
| Nitrite (NO2-N) | <10.0 H | mg/L | 10.0 | 100 | 01/13/22 18:49 | JCA | L594506 |
| Nitrate (NO3-N) | <10.0 H | mg/L | 10.0 | 100 | 01/13/22 18:49 | JCA | L594506 |
| Nitrate+Nitrite-N | <10.0 H | mg/L | 10.0 | 100 | 01/13/22 18:49 | | L594506 |

**Qualifiers/ Definitions**

DF Dilution Factor
MQL Method Quantitation Limit
H Beyond holding time

Waypoint ANALYTICAL

4741 East Hunter Ave. Suite A
Anaheim, CA 92807
Main 714-282-8777 ° Fax 714-282-8575
www.waypointanalytical.com

## *SOLUBLE FERTILIZER IN WATER*

| Send To: | Project : | Report No : | **22-010-0012** |
|---|---|---|---|
| Residuals Recovery Group Inc/Ag Concepts | 7325 Edison Pond | Cust No : | 07327 |
| 7325 Edison Ave | | Date Printed : | 1/12/2022 |
| Ontario , CA 91762 | | Date Received : | 1/10/2022 |
| | | Page : | Page 1 of 1 |

| Tests | | UOM | 98139 |
|---|---|---|---|
| Ammonium Nitrogen | NH4-N | ppm | 7 |
| Electrical Conductivity | ECw | dS/m | 2.63 |
| Hydrogen Ion Activity | pH | s.u | 7.5 |
| Nitrate Nitrogen | NO3-N | ppm | 0 |
| Total Nitrogen | TN | ppm | 70 |

| Lab No. | Sample ID |
|---|---|
| # 98139 | 7325 Edison Pond |

All analyses above performed on filtered sample.

# Appendix VII

# Soil Percolation Test Report

AM/PAC

1-800-564-7372
(951) 354-6500
FAX 354-8600

# PERCOLATION INVESTIGATION FOR A COMPOSTING OPERATION

**PROJECT NUMBER:** 21-14993

**DATE:** MARCH 14, 2022

**JOB SITE LOCATION:**

RECYCLED WOOD PRODUCTS, COMPOST FACILITY, TIER 1, AT:
7325 EDISON AVENUE ONTARIO, CA. 91762
APN: 1053-391-01-0000 & 1053-521-01 & 02-0000

**PREPARED FOR:**

AG CONCEPTS, INC.
ATT: MR. NATHAN DE BOOM (951) 452-1148
7325 EDISON AVENUE ONTARIO, CA. 91762
VIA E-MAIL: n8deboom@gmail.com

THIS REPORT IS NOT TRANSFERABLE WITHOUT THE WRITTEN AUTHORIZATION FROM AM/PAC AND ASSOCIATES, INC.

3 1422

GEORGE E. HAWES, VICE PRESIDENT
RCE [illegible]79 STATE OF CALIFORNIA
LIC. EXP [illegible]9/30/23

DATE

DAVID [illegible]GER, PRESIDENT
AM/PAC [illegible]OCIATES, INC.

this official s[illegible] is in [illegible]
otherwise a copy

REGISTERED PROFESSIONAL ENGINEER
GEORGE E. HAWES
No. C034779
STATE OF CALIFORNIA

AM/PAC AND ASSOCIATES, INC.
2900 Adams St., Suite C-35 • Riverside, CA 92504

**PROJECT NUMBER:** 17-13272 **DATE:** NOVEMBER 10, 2017

**1.1 CLIENT REQUESTING REPORT:**

AG CONCEPTS, INC.
ATT: MR. NATHAN DE BOOM (951) 452-1148
7325 EDISON AVENUE ONTARIO, CA. 91762
VIA E-MAIL: n8deboom@gmail.com

**1.2 JOB SITE LOCATION:**

RECYCLED WOOD PRODUCTS, COMPOST FACILITY, TIER 1, AT:
7325 EDISON AVENUE ONTARIO, CA. 91762
APN: 1053-391-01-0000 & 1053-521-01 & 02-0000

ASSESSORS, VICINITY MAPS AND THE SITE PLAN ARE FOUND IN THE APPENDIX OF THIS REPORT

**1.3 PROPOSED DEVELOPMENT:**

THIS IS AN EXISTING RECYCLED WOOD COMPOSTING PLANT. THE DESIGN CIVIL ENGINEER AND THE FACILITY MANAGER HAVE REQUESTED A PERCOLATION/INFILTRATION INVESTIGATION TO COMPLY WITH THE "STATE WATER RESOURCES CONTROL BOARD, ORDER WQ 2015-0121-DWQ".

**PURPOSE AND SCOPE OF THIS REPORT:**

THIS TEST AND INVESTIGATION WAS PERFORMED TO DETERMINE THE PERCOLATION RATE AT 6 PREDETERMINED LOCATIONS ON THE PROPERTY. THE DATA IS TO BE UTILIZED BY THE DESIGN CIVIL.

**1.4 PROPERTY DESCRIPTION:**

THIS PARCEL IS A TOTAL OF 55.28 ACRES, 3 SEPARATELY DEEDED PARCELS, RECTANGULAR IN SHAPE, FRONTING EDISON AVENUE ALONG THE NORTHERLY LOT LINE AND SULTANA AVENUE ALONG THE WESTERLY LOT LINE OF THE PROPERTY. NO ROCK OUTCROPPINGS, TREES, SEASONAL DRAINAGE COURSES OR DETRIMENTAL FEATURES WERE NOTED ON THE PROPERTY.

GROUNDCOVER OF THE PROPERTY CONSISTS OF COMPOSTED WOOD AND BARE SOIL. TOPOGRAPHY IS NOTED AS FALLING FROM THE NORTHERLY PROPERTY LINE DOWN TO THE SOUTHERLY PROPERTY LINE APPROXIMATELY 13 FEET OVERALL. NO NEIGHBOR WELLS WERE NOTED WITHIN 100' OF THIS PARCEL. THIS PARCEL IS EASILY FOUND. PLEASE SEE THE VICINITY MAP, ASSESSORS PARCEL MAP AND GOOGLE EARTH AERIAL ATTACHED.

**2. EQUIPMENT USED:**

PER THE COUNTY OF SAN BERNARDINO, DEPARTMENT OF ENVIRONMENTAL HEALTH'S REQUIREMENTS: ALL EXCAVATIONS WERE MADE USING AM/PAC'S TRUCK MOUNTED MOBILE DRILL B-34, CONTINUOUS FLIGHT AUGER, DRILL RIG. AN 8" DIAMETER AUGER WAS USED TO EXCAVATE THE PERCOLATION TEST HOLES AND THE EXPLORATORY BORING.
ALSO UTILIZED DURING TESTING WAS A SOLINST WATER LEVEL METER, PERFORATED PIPE SLEEVES TO DEPTH AND A 300 GALLON WATER TANK.

**3.1 LOCATION OF EXPLORATORY BORINGS AND TRENCHES:**

THE CLIENT HAS PROVIDED THIS OFFICE WITH A SITE PLAN IN AN ENGINEERS SCALE. THIS OFFICE HAS UTILIZED THE PLAN FOR USE AS A TEST LOCATION PLOT PLAN.

**3.2 SOIL CHARACTERISTICS:**

THE SOILS IN THIS GEOGRAPHICAL AREA OF THE COUNTY AS WELL AS THE SOILS EXCAVATED ON THIS PROJECT, ARE BEST DESCRIBED, AS FAVORABLE. THE SOIL IS SANDY WITH NO CLAYS OR SILTS. THERE IS NO VISUAL EVIDENCE OF SHALLOW GROUNDWATER, BEDROCK, IMPERVIOUS MATERIALS, ETC. TESTS AND BORINGS PERFORMED AGREE WITH THE VISUAL EVIDENCE. THE NATURAL/FINISHED SLOPE OF THE AREA IS LESS THAN 5%.

**3.3.1 BORING/TRENCHING LOG:**

| | | |
|---|---|---|
| 0-5' | S/M | TANNISH BROWN SANDS, SILTY-FINE GRAINED SANDS, SLIGHT AMOUNTS OF SUB-ANGULAR GRAVELS AND COBBLES 1" TO THE LARGEST DIMENSION, LOOSE AND MOIST. |
| 5-10' | S/M | MEDIUM BROWN, SILTY-FINE TO MEDIUM GRAINED SANDS, FIRM AND DRY. |
| 10-15' | S/W | MEDIUM BROWN, FINE GRAINED SANDS, DENSE AND DRY. |

## GROUNDWATER INFORMATION

GROUNDWATER AT THE TIME OF BORING: NONE
GROUNDWATER AT THE 24 HR. RECHECK: NONE
MONITORING WELL INSTALLED? YES

**3.3.4 MINIMUM NUMBER OF TESTS:**

TESTING WAS PERFORMED PER THE STATE OF CALIFORNIA, WATER RESOURCES CONTROL BOARD, ORDER WQ 2015-0121-DWQ, GENERAL WASTE DISCHARGE REQUIREMENTS FOR COMPOSTING OPERATIONS, DATED AUGUST 4, 2015. NOTED WAS ATTACHMENT A (PAGE A-6) "PERCOLATION TEST". THE REQUIREMENT IS NOTED AS FOUR PERCOLATION TEST HOLES A MINIMUM OF 24 INCHES DEEP THROUGHOUT THE OPERATIONS PAD AREA
(SEE TESTS 1-6)

ALSO, TWO PERCOLATION TEST HOLES OUTSIDE OF THE PERIMETER OF THE DETENTION POND NEAREST THE DEEPEST CORNER (SEE TEST 1 AND 2) THESE HOLES MUST BE DRILLED 24" DEEPER THAN THE BOTTOM OF THE DETENTION POND.

PERCOLATION TESTING HAS BEEN CONDUCTED IN THE MANNER SET FORTH BY THE COUNTY OF SAN BERNARDINO DEPARTMENT OF ENVIRONMENTAL HEALTH, LAND USE DIVISION AS SET FORTH IS THE PUBLICATION, "PERCOLATION TESTING AND REPORT WRITING FOR ON-SITE WASTE-WATER TREATMENT SYSTEMS, "SEPTEMBER 2019. AS NOTED ON THE COVER PAGE OF THIS REPORT, THIS TESTING AND REPORT HAS BEEN PERFORMED UNDER THE DIRECTION OF GEORGE HAWES P.E, CALIFORNIA REGISTRATION NUMBER C034779, LIC. EXP. 9-30-23.

### 3.4.1 PERCOLATION TEST PROCEDURE FOR LEACH LINES:

ALL PERCOLATION TEST SITE HOLES WERE EXCAVATED USING THE DRILL RIG. ALL LOOSE MATERIAL WAS REMOVED FROM THE HOLE USING THE POST HOLE DIGGER. ALL TESTS WERE PERFORMED AT LEVELS REQUESTED BY THE DESIGN CIVIL. SIERRA ENGINEERING SERVICES. AN 6 INCH DIAMETER PERFORATED PIPE SLEEVE, WITH A SOLID CAP BOTTOM, ¼" DIAMETER HOLES DRILLED IN THE CAP BOTTOM TO ALLOW WATER TO ESCAPE TO THE SIDEWALL OF THE TEST HOLE, WAS INSERTED INTO EACH OF THE TEST HOLES. THE CAP AT THE BOTTOM ELIMINATES THE NEED FOR PEA GRAVEL AND PREVENTS SCOURING OF THE BOTTOM OF THE TEST HOLE DURING FILLINGS. THE DEPTH OF EACH TEST HOLE IS NOTED ON THE "FIELD DATA SHEET" ATTACHED.

THE TEST HOLES WERE FILLED WITH 10 INCHES OF CLEAR WATER AS MEASURED ABOVE THE PIPE CAP BOTTOM. AS NOTED ON THE "FIELD TEST DATA" SHEET, 10 INCHES OF CLEAR WATER DID NOT SEEP OR PERCOLATE AWAY IN LESS THAN 10 MINUTES TIME, TWICE IN CONSECUTIVE READINGS. THE NATURAL SOIL IS NOTED TO BE OF SILTY-FINE GRAINED AND CLAYEY MATERIAL. THEREFORE, PRESOAKING WAS THEN CONDUCTED. TESTING WAS PERFORMED AFTER AN OVERNIGHT PRESOAK.

EACH TEST HOLE WAS THEN FILLED WITH 8 INCHES OF CLEAR WATER AS MEASURED FROM THE BOTTOM OF THE HOLE. AS NOTED ON THE "FIELD DATA SHEET" ATTACHED, THE TESTS WERE RUN AT INTERVALS OF 30 MINUTES OVER A 6 HOUR CYCLE. REFILLING EACH TEST HOLE AFTER EACH READING. ALL MEASUREMENTS WERE TAKEN TO THE NEAREST 1/10$^{TH}$ OF AN INCH.

EXPLORATORY BORING AND PERCOLATION TESTING WERE PERFORMED ON DECEMBER 9 THROUGH DECEMBER 10, 2021. ALL TEST SITES ARE MARKED WITH LATH AND FLAGGING.

### 4. DISCUSSION OF RESULTS:

AS SHOWN IN THE TEST RESULTS, THE SOILS TESTED ARE NOTED TO BE UNIFORM IN CLASSIFICATION, GRADATION AND THE DEMONSTRATED ABILITY TO ABSORB WATER DURING TESTING. NO RESTRICTIVE SOIL LAYERS WERE ENCOUNTERED TO THE DEPTHS TESTED. NO TESTS WERE NOTED AS FAILING. THERE IS NO INDICATION OF ANY POSSIBLE SOURCE OF ERROR OR VARIABILITY OF THE RESULTS AS SHOWN. ALTHOUGH BIOTURBATION WAS OBSERVED AND NOTED, NO EVIDENCE OF ANY GOPHER HOLES WAS PRESENT AT ANY EXCAVATED TEST SITE.

### 5 HISTORIC HIGH GROUNDWATER DATA:

THE CALIFORNIA DEPT. OF WATER RESOURCES SOUTHERN DISTRICT DATA SHOWS WELL LEVELS AT 250 TO 300 FEET BELOW GRADE FOR THIS AREA. NO GROUNDWATER WAS ENCOUNTERED IN AM/PAC'S EXPLORATORY BORE TO A DEPTH OF 15'.

### 6. PERCOLATION TEST RESULTS: (SEE DATA SHEETS ATTACHED)

| | | |
|---|---|---|
| P-1 - 30:00 MPI | P-2 - FAILED MPI | P-3 - 25:00 MPI |
| P-4 - 25:00 MPI | P-5 – 30:00 MPI | P-6 -30:00 MPI |

## APPENDIX

A-1 FIELD TEST DATA SHEETS

A-2 ASSESSOR'S MAP

A-3 VICINITY MAPS

A-4 SITE PLAN PREPARED BY SIERRA ENGINEERING SERVICES

- CONTINUOUS FLIGHT AUGER RIG WITH 8 INCH BORE USED.
- ALL FILLS RETURNED TO ZERO ON INDICATORS

Project No. 21-14993
Date 3-14-21

# Field Percolation Test Data

Compost Facility

**TEST 1** — DEPTH 60"

SOIL TYPE: (SC)(SM)

| Time | Fill | In. Drp |
|---|---|---|
| 30 | 0 | 2.7 |
| 1 | | 2.4 |
| 30 | | 2.0 |
| 2 | | 1.7 |
| 30 | | 1.5 |
| 3 | | 1.5 |
| 30 | | 1.4 |
| 4 | | 1.2 |
| 30 | | 1.1 |
| 5 | | 1.1 |
| 30 | | 1.0 |
| 6 hr | | 1.0 |

DESIGN RATE: 30:00 MIN/IN

— $Ft^2$/100 Gallons/Day

**TEST 2** — DEPTH 60"

SOIL TYPE: (SC)

| Time | Fill | In. Drp |
|---|---|---|
| 30 | 0 | |
| 1 | | |
| 30 | | |
| 2 | | |
| 30 | | |
| 3 | | |
| 30 | | |
| 4 | | |
| 30 | | |
| 5 | | FAILED |
| 30 | | 1.1 |
| 6 hr | | 1.1 |

DESIGN RATE: FAILED MIN/INCH

— $Ft^2$/100 Gallons/Day

**TEST 3** — DEPTH 60"

SOIL TYPE: (SM)

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | 2.8 |
| 1 | | 2.5 |
| 30 | | 2.2 |
| 2 | | 2.0 |
| 30 | | 1.8 |
| 3 | | 1.6 |
| 30 | | 1.6 |
| 4 | | 1.6 |
| 30 | | 1.4 |
| 5 | | 1.3 |
| 30 | | 1.2 |
| 6 hr | | 1.2 |

DESIGN RATE: 25:00 MIN/IN

MINIMUM AREA REQUIRED

— $Ft^2$/100 Gallons/Day

**TEST 4** — DEPTH 60"

SOIL TYPE: (SM)

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | 2.9 |
| 1 | | 2.6 |
| 30 | | 2.4 |
| 2 | | 2.1 |
| 30 | | 1.9 |
| 3 | | 1.9 |
| 30 | | 1.6 |
| 4 | | 1.5 |
| 30 | | 1.5 |
| 5 | | 1.3 |
| 30 | | 1.2 |
| 6 hr | | 1.2 |

DESIGN RATE: 25:00 MIN/INCH

MINIMUM AREA REQUIRED

— $Ft^2$/100 Gallons/Day

DESIGN RATE

— MIN/INCH

MINIMUM AREA REQUIRED

— $Ft^2$/100 Gallons/Day

- CONTINUOUS FLIGHT AUGER RIG WITH 8 INCH BORE USED.
- ALL FILLS RETURNED TO ZERO ON INDICATORS

Project No 21-14993
Date 3-14-21

# Field Percolation Test Data

TEST: 5
DEPTH: 60"
SOIL TYPE: (SM)
DESIGN RATE: 30:00 MIN/IN

| Time | Fill | In. Drp |
|---|---|---|
| 30 | 0 | 2.3 |
| 1 | | 2.1 |
| 30 | | 1.8 |
| 2 | | 1.8 |
| 30 | | 1.5 |
| 3 | | 1.5 |
| 30 | | 1.3 |
| 4 | | 1.2 |
| 30 | | 1.2 |
| 5 | | 1.1 |
| 30 | | 1.0 |
| 6 hr | | 1.0 |

— $Ft^2$/100 Gallons/Day

TEST: 6
DEPTH: 60"
SOIL TYPE: (SM)
DESIGN RATE: 30:00 MIN/INCH

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | 2.4 |
| 1 | | 2.1 |
| 30 | | 1.8 |
| 2 | | 1.8 |
| 30 | | 1.6 |
| 3 | | 1.5 |
| 30 | | 1.5 |
| 4 | | 1.3 |
| 30 | | 1.3 |
| 5 | | 1.1 |
| 30 | | 1.0 |
| 6 hr | | 1.0 |

— $Ft^2$/100 Gallons/Day

TEST
DEPTH
SOIL TYPE
DESIGN RATE MIN/IN

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | |
| 1 | | |
| 30 | | |
| 2 | | |
| 30 | | |
| 3 | | |
| 30 | | |
| 4 | | |
| 30 | | |
| 5 | | |
| 30 | | |
| 6 hr | | |

MINIMUM AREA REQUIRED
$Ft^2$/100 Gallons/Day

TEST
DEPTH
SOIL TYPE
DESIGN RATE MIN/INCH

| Time | Fill | In. Drop |
|---|---|---|
| 30 | 0 | |
| 1 | | |
| 30 | | |
| 2 | | |
| 30 | | |
| 3 | | |
| 30 | | |
| 4 | | |
| 30 | | |
| 5 | | |
| 30 | | |
| 6 hr | | |

MINIMUM AREA REQUIRED
$Ft^2$/100 Gallons/Day

DESIGN RATE
— MIN/INCH

MINIMUM AREA REQUIRED
— $Ft^2$/100 Gallons/Day

THIS MAP IS FOR THE PURPOSE OF AD VALOREM TAXATION ONLY

Ptn. Rancho Santa Ana Del Chino, M.B. 6/15

City of Ontario
Tax Rate Area
4074

1053 - 39

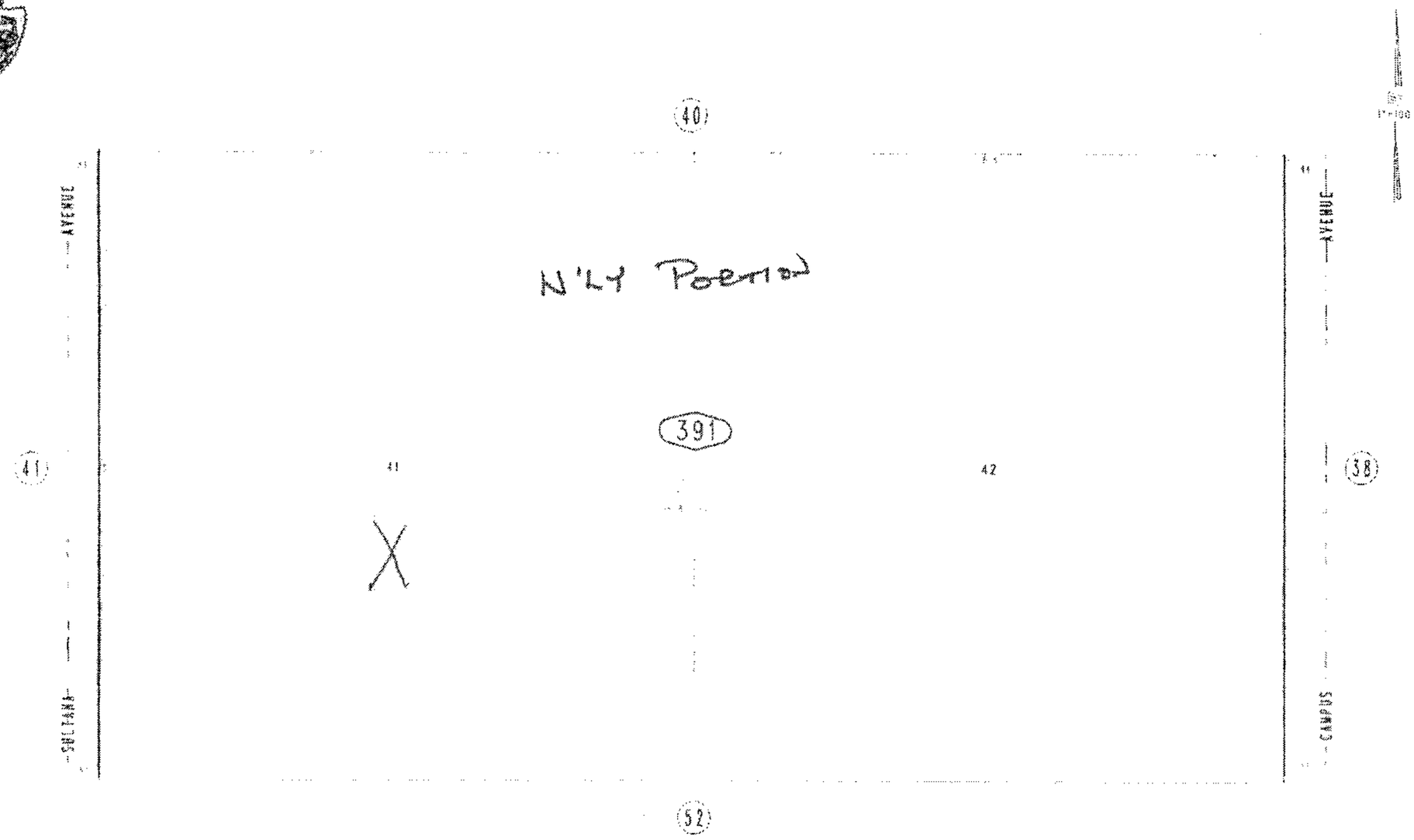


November 2004

Ptn. S.W.1/4, Sec.39
T.2S.,R.7W., S.B.B.&M.

Assessor's Map
Book 1053 Page 39
San Bernardino County

THIS MAP IS FOR THE PURPOSE OF AD VALOREM TAXATION ONLY

Ptn. Rancho Santa Ana Del Chino, M.B. 6/15

City of Ontario
Tax Rate Area
4074

1053 - 52

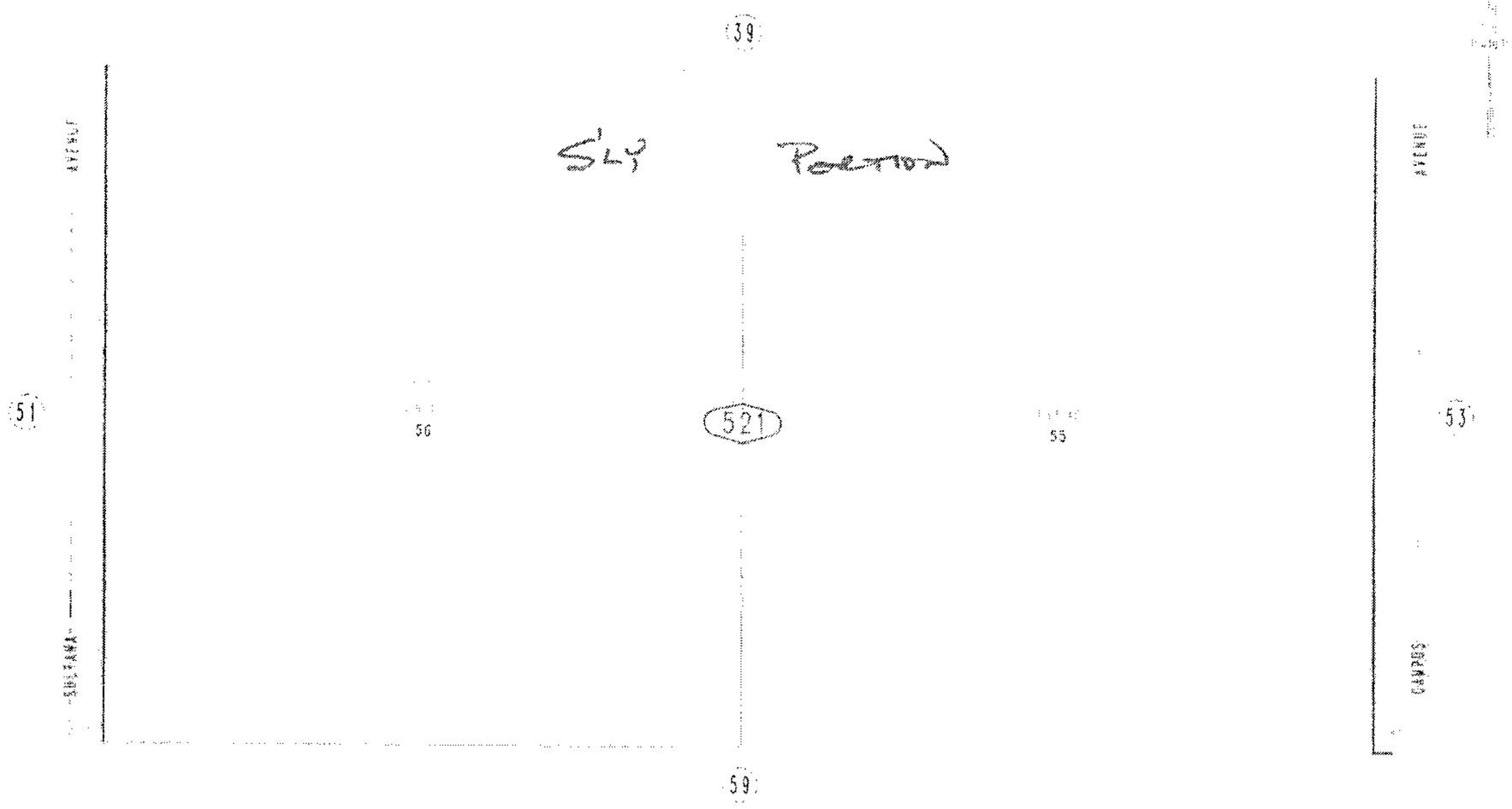


November 2004

Ptn. S.W.1/4, Sec.17
T.2S.,R.7W., S.B.B.&M.

Assessor's Map
Book 1053 Page 52
San Bernardino County

Perk Test #1

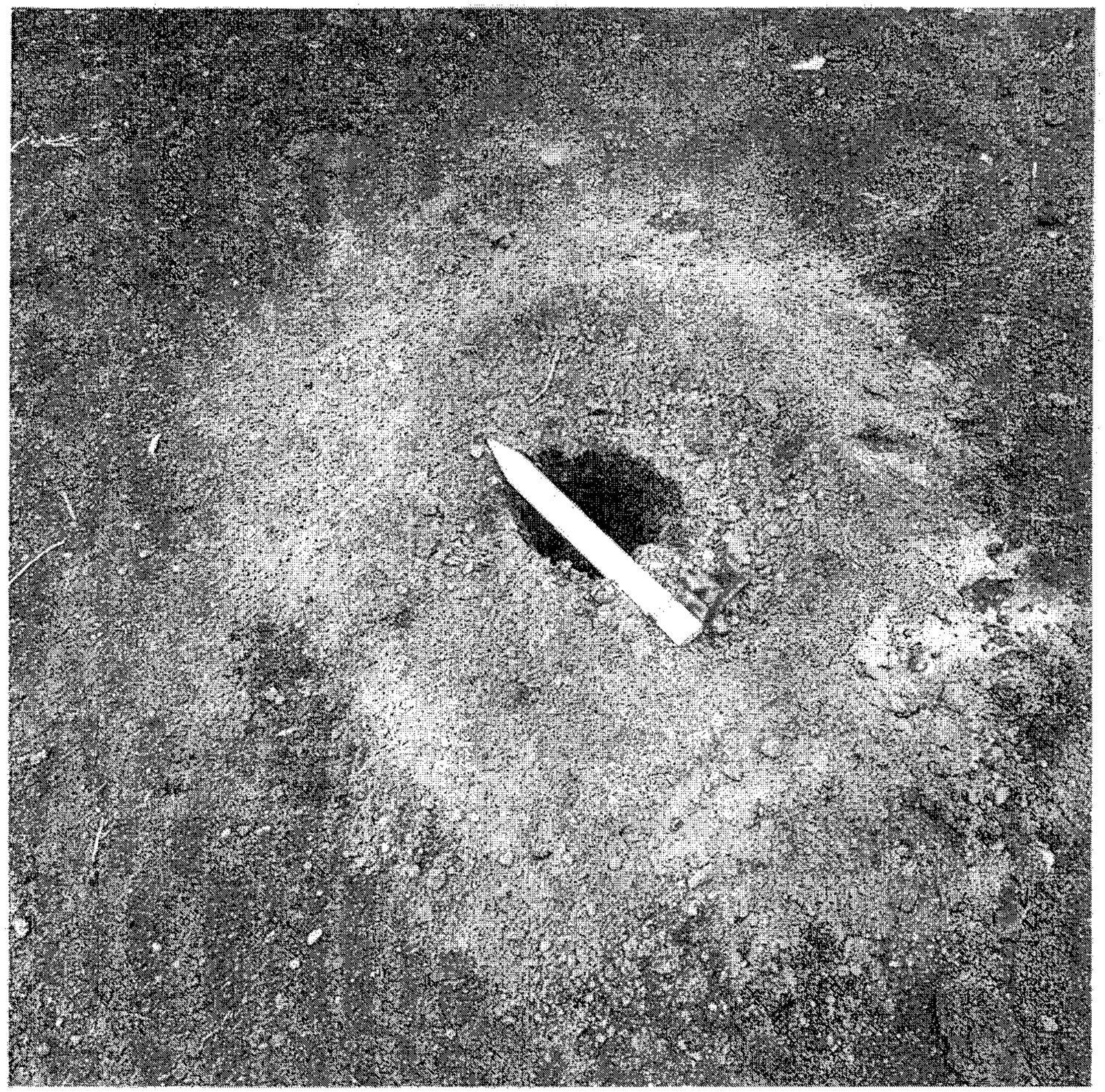

Peak Test #2

Peek Test #3

Peek Test #5

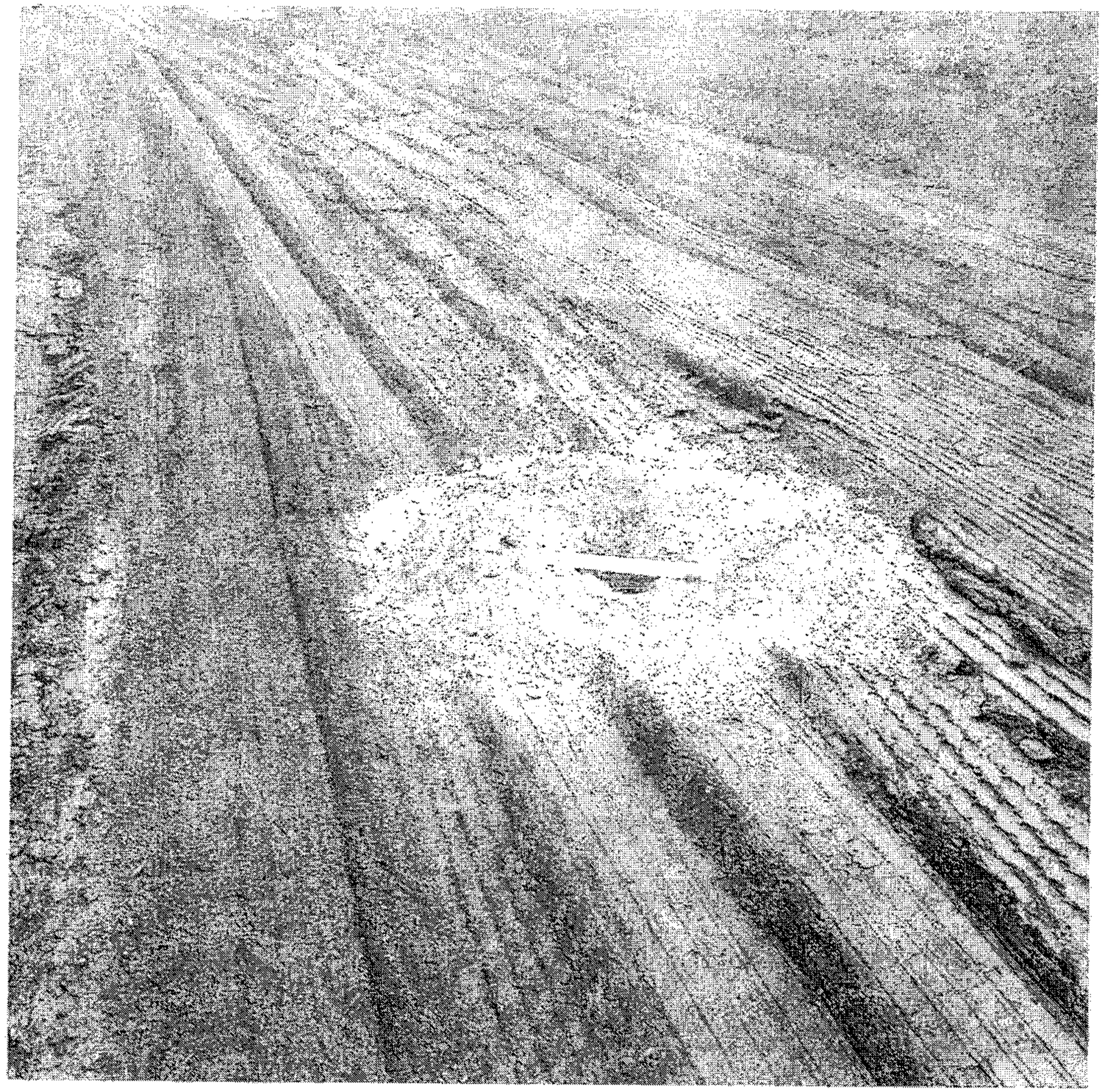

Peck Test # 6

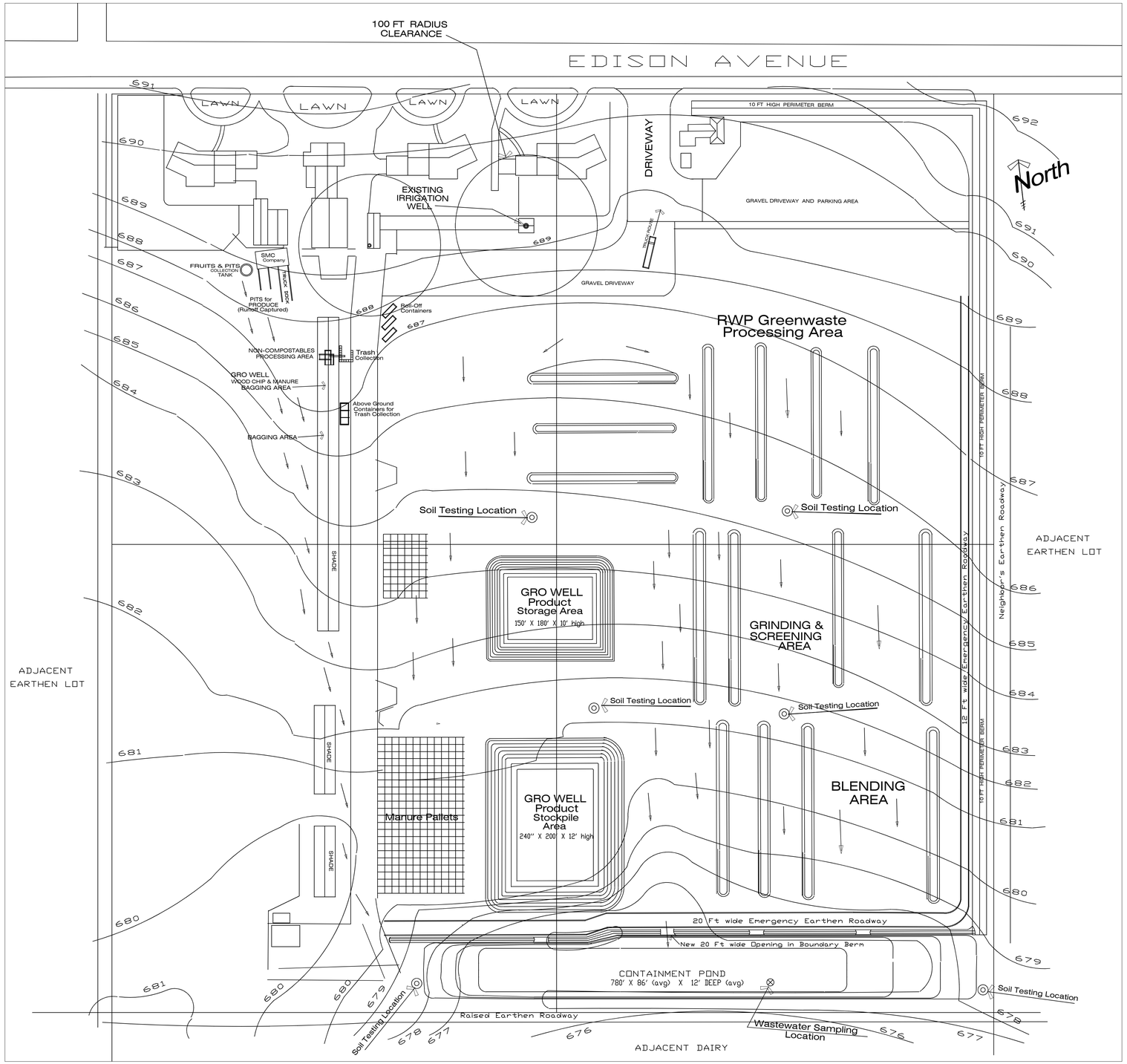


# SITE PLAN

Scale : 1"=75'

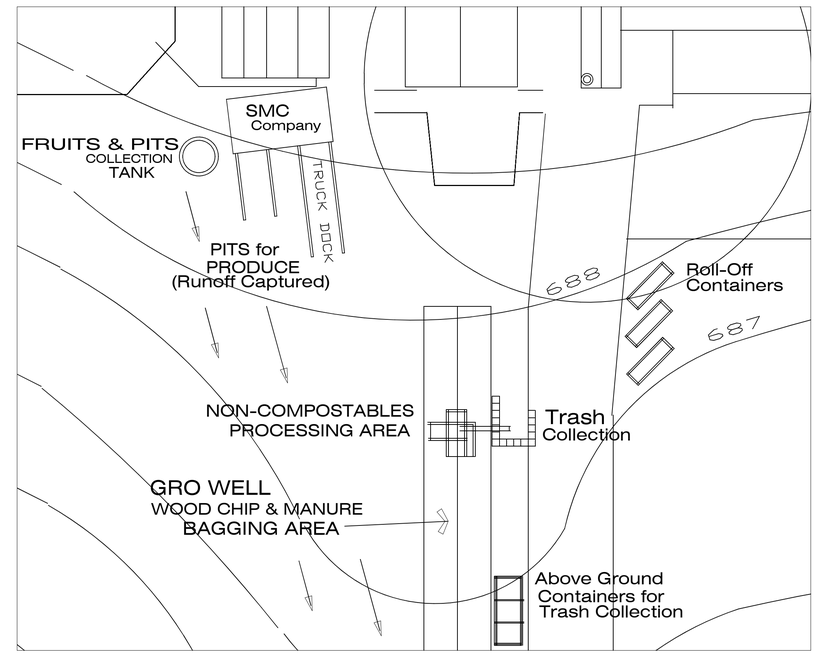


# NON-COMPOSTABLES PROCESSING AREA

Scale : 1"=30'

## GRADING NOTES

1 ALL DIKES AND BERMS SHALL BE CONSTRUCTED OF MINERAL EARTH FREE OF VEGETATION AND DELETERIOUS MATERIAL.

2 NO ROCKS OR COBBLES GREATER THAN 6 INCHES IN DIAMETER SHALL BE PLACED IN ANY FILL.

3 ALL AREAS TO RECIEVE FILL SHALL BE SCARIFIED OR RIPPED TO A DEPTH OF 6 INCHES PRIOR TO THE PLACEMENT OF ANY MATERIAL.

4 ALL MATERIAL SHALL BE PLACED IN LIFTS NO GREATER THAN 8 INCHES, WHEELED ROLLED AND WATERED TO ACHIEVE ADEQUATE COMPACTION.

## KEY

- PROPERTY LINE
- LIMIT-OF-WORK
- EXISTING CORRAL
- EXISTING FENCE
- PROPOSED SPILLWAY

DIGALERT

DIAL TOLL FREE 1-800-227-2600 AT LEAST TWO DAYS BEFORE YOU DIG

UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

SITE CONDITION RESPONSIBILITY:

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDASNCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND NOT TO BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ENGINEER.

SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 210
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970

| REV. | BY | REVISIONS | APPVD | DATE |
|---|---|---|---|---|
| 3 | np | SMC flow lines and N arrow | | 9/12/23 |
| 2 | np | Pond depth increase | | 9/29/22 |
| 1 | np | Wastewater sampling location, fruits & pits collection tank | | 8/26/22 |

# SITE PLAN
## RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762

OPERATOR:
OWNER:
A.P. NO. 1053 - 391 - 01

DATE: 5-20-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2020
SHEET 1 OF 1

# Santa Ana Regional Water Quality Control Board

November 28, 2023

Mr. Chris Kiralla
Owner/Operator
Recycled Wood Products
(chris@rwpmulch.com)
1313 East Philips Road
Pomona, CA 91766

**NOTICE OF APPLICABILITY FOR COVERAGE UNDER WATER QUALITY ORDER WQ 2020-0012-DWQ, STATEWIDE GENERAL WASTE DISCHARGE REQUIREMENTS – RECYCLED WOOD PRODUCTS ONTARIO IV, 7325 EDISON AVENUE, ONTARIO, SAN BERNARDINO COUNTY**
**GEOTRACKER ID: T10000020070**

Dear Mr. Kiralla:

You have submitted a Report of Waste Discharge application to obtain coverage under Water Quality (WQ) Order WQ 2015-0121-DWQ, as amended by Order WQ 2020-0012-DWQ, General Waste Discharge Requirements for Commercial Composting Operations (Composting General Order) for Recycled Wood Products Ontario IV (the Facility), located at the above-referenced address.

A copy of the Composting General Order is accessible at:
https://www.waterboards.ca.gov/water_issues/programs/compost/

The application, formally received on June 16, 2020, consists of a Notice of Intent (NOI) and a Technical Report. A filing fee of $2,848 was received on June 11, 2021, with the corrected fee of $3,326 received in full on July 2, 2022. The NOI and Technical Report were subsequently updated and submitted in April 2021, October 2021, June 2022, August 2022, September 2022, October 2022, December 2022, September 2023, and October 2023 to address comments from Santa Ana Regional Water Quality Control Board (Santa Ana Water Board) staff. Based on our review of the updated NOI and Technical Report, we considered the application complete on October 9, 2023. A summary of the Facility description, composting operations and system design, run-on and runoff drainage control system, and monitoring and reporting plan is provided in Table 1. The Facility site plan that you provided in your application is enclosed with this letter as Figure 1.

Based on the information provided, Santa Ana Water Board staff has determined that the Facility meets the conditions for coverage under the Composting General Order,

and it is hereby authorized for coverage as a Tier 1 facility (Site-specific Composting General Order WQ 2020-0012-DWQ-R8018). You will be assessed an annual fee with the discharge rating of 3C until your facility coverage under the Composting General Order is officially terminated.

This letter constitutes the Notice of Applicability (NOA), authorizing the coverage of the Facility under the Composting General Order, which incorporates the NOI and Technical Report. The NOA is contingent upon continual compliance with the Composting General Order.

To ensure compliance with the Composting General Order, it is essential that you and your operators are familiar with the contents of the Composting General Order and the Technical Report. Any non-compliance with the Composting General Order constitutes a violation of the California Water Code and is grounds for enforcement action and/or termination of enrollment under the Composting General Order.

In accordance with Notification Requirements of the Composting General Order, please notify Santa Ana Water Board staff in writing or by email for:

- Any proposed change in materials (feedstock materials, additives, amendments), facility design, and composting operations identified in the NOI and Technical Report;
- Any change in facility ownership or transfer; and
- Any proposed termination of facility operations or termination of coverage under the General Order. A Site Closure Plan must be submitted at least 90 days prior to terminating composting operations for approval by the Executive Officer of the Santa Ana Water Board.

All monitoring and technical reports must be submitted by uploading them to the State Water Resources Control Board's GeoTracker database in searchable Portable Document Format (PDF) under a site-specific global identification number (Global ID). In addition, analytical data must be uploaded to the GeoTracker database in Electronic Deliverable Format (EDF). Guidance for the Electronic Submittal of Information (ESI) to GeoTracker database for composting operations is provided at:
ESI Beginner's Guide - Responsible Party (ca.gov)

**Your first Annual Monitoring and Maintenance Report, for the January 1-December 31, 2023 monitoring period, is due April 1, 2024.** Please use the following site reference information for uploading documents to GeoTracker or for submitting a written notification:

| | |
|---|---|
| **Attention:** | Joanne Lee (Joanne.Lee@waterboards.ca.gov)<br>Land Disposal & DoD Program Section<br>California Regional Water Quality Control Board<br>Santa Ana Region (8)<br>3737 Main Street, Suite 500<br>Riverside, CA 92501<br>Phone: (951) 782-4130<br>Fax: (951) 781-6288 |
| **Facility Name:** | Recycled Wood Products Ontario IV |
| **Facility Address:** | 7325 Edison Avenue, Ontario, CA 91762 |
| **Site-specific Composting General Order No.:** | Order WQ 2020-0012-DWQ-R8018 |
| **Waste Discharge ID (WDID):** | 8 363012001 |
| **CIWQS Place ID:** | 240263 |
| **GeoTracker Global ID:** | T10000020070 |

If you have any questions regarding this letter, please contact Joanne Lee of our Land Disposal & DoD Program Section at (951) 782-3291, or by email at Joanne.Lee@wateraboards.ca.gov, or Cindy Li, Supervisor of our Land Disposal & DoD Program Section at (951) 782-4906, or by email at Cindy.Li@waterboards.ca.gov.

Sincerely,

Jayne Joy
Digitally signed by Jayne Joy
Date: 2023.11.28 09:53:50
-08'00'

Jayne Joy, P.E.
Executive Officer
Santa Ana Regional Water Quality Control Board

Enclosures: Table 1
Figure 1 (Facility site plan from application)

cc: Ember Christensen (Ember.Christensen@waterboards.ca.gov), DWQ, SWRCB
Brianna St. Pierre (Brianna.St.Pierre@waterboards.ca.gov), DWQ, SWRCB
Theodore Tasiopoulos (Theodore.Tasiopoulos@CalRecycle.ca.gov), CalRecycle
Kimberly Tra (kimberly.tra@dph.sbcounty.gov), San Bernardino County Department of Environmental Health, LEA
Rodney Tolosa (Rodney.Tolosa@dph.sbcounty.gov), San Bernardino County Department of Environmental Health, LEA
Bob Feenstra (bobfeenstra@gmail.com), Residual Recovery Group
Saeed Ahdout (sierraeng6@gmail.com), Sierra Engineering

## Table 1

| Composting Facility Information | Description |
|---|---|
| Facility Name | Recycled Wood Products Ontario IV |
| Facility Address | 7325 Edison Avenue, Ontario, CA 91762 |
| Facility Operator | Chris Kiralla |
| Facility Landowner | Mr. Gary Dou, Golden Ontario Holdings |
| Facility Size (acreage) | 10.5 acres of the 36.6-acre site |
| Facility Accessor Parcel No. | APN 1053-391-01 |
| Facility Capacity | Up to 12,500 cubic yards |
| Feedstock Materials | Vegetative agricultural materials, green materials, and vegetative food materials |
| Additives/Amendments | Manure |
| Facility Type | Tier 1 Facility |
| GPS Coordinates | 33.9966 latitude and 117.6434 longitude |
| Water Supply (domestic/Industrial) | Onsite irrigation well |
| **Affected Water Bodies** | |
| Groundwater Management Zone | Chino-North |
| Depth to Groundwater | Approximately 133 feet below ground surface |
| Groundwater Flow Direction | South |
| Distance to Nearest Water Supply Well | The nearest water supply well is over 100 feet from the site |
| Distance to Nearest Surface Water Bodies | Cucamonga Creek (over 5,500 feet east of the site) |
| **Facility Operations/Design Information** | |
| Composting Method | Turned Windrow Pile Method |
| Composting Pad/Working Surfaces Design | Compacted pad |
| Runoff Drainage Control System Design | Earthen drainage ditches and berms; all working surfaces are graded and compacted to drain to a 17.8-acre-foot detention basin. |
| Run-on Drainage Control System Design | The facility is bordered by Edison Ave to the north, and dairy and pastureland to the south, east and west. Run-on drainage to the facility is not anticipated. |
| Compliance Schedule | Onsite soil percolation tests were conducted in December 2021. The detention pond was enlarged to adequately contain surface runoff from the site in November 2022. |
| **Monitoring** | |
| Facility Inspection & Maintenance | Comply with Section A.1, Attachment B (Monitoring and Reporting Program), Order WQ 2020-0012-DWQ |
| Detention Pond Monitoring | Comply with Sections A.2 and A.5, Attachment B, Order WQ 2020-0012-DWQ |
| Groundwater Monitoring (if applicable) | Not applicable |
| **Reporting/Notifications** | |
| Annual Monitoring and Maintenance Report | Comply with Section B.1, Attachment B, Order WQ 2020-0012-DWQ |
| Notification of Violations/Non-compliances | Comply with Sections B.2 and B.3, Attachment B, Order WQ 2020-0012-DWQ |
| Record-keeping | Comply with Section C, Attachment B, Order WQ 2020-0012-DWQ |
| Revised NOI | To be submitted at least 90 days prior to any proposed changes to the approved NOI [Page 37 of Order WQ 2020-0012-DWQ] |
| Change in Ownership | To submit a written notice, at least 30 days in advance of any transfer of the General Order's responsibility and coverage from the current owner to a new owner [Page 37 of Order WQ 2020-0012-DWQ] |
| Site Closure Plan | To be submitted at least 90 days prior to discontinuing composting operations [Page 34 of Order WQ 2020-0012-DWQ] |
| Notice of Termination | Comply with Attachment E, Order WQ 2020-0012-DWQ |

**Figure 1**

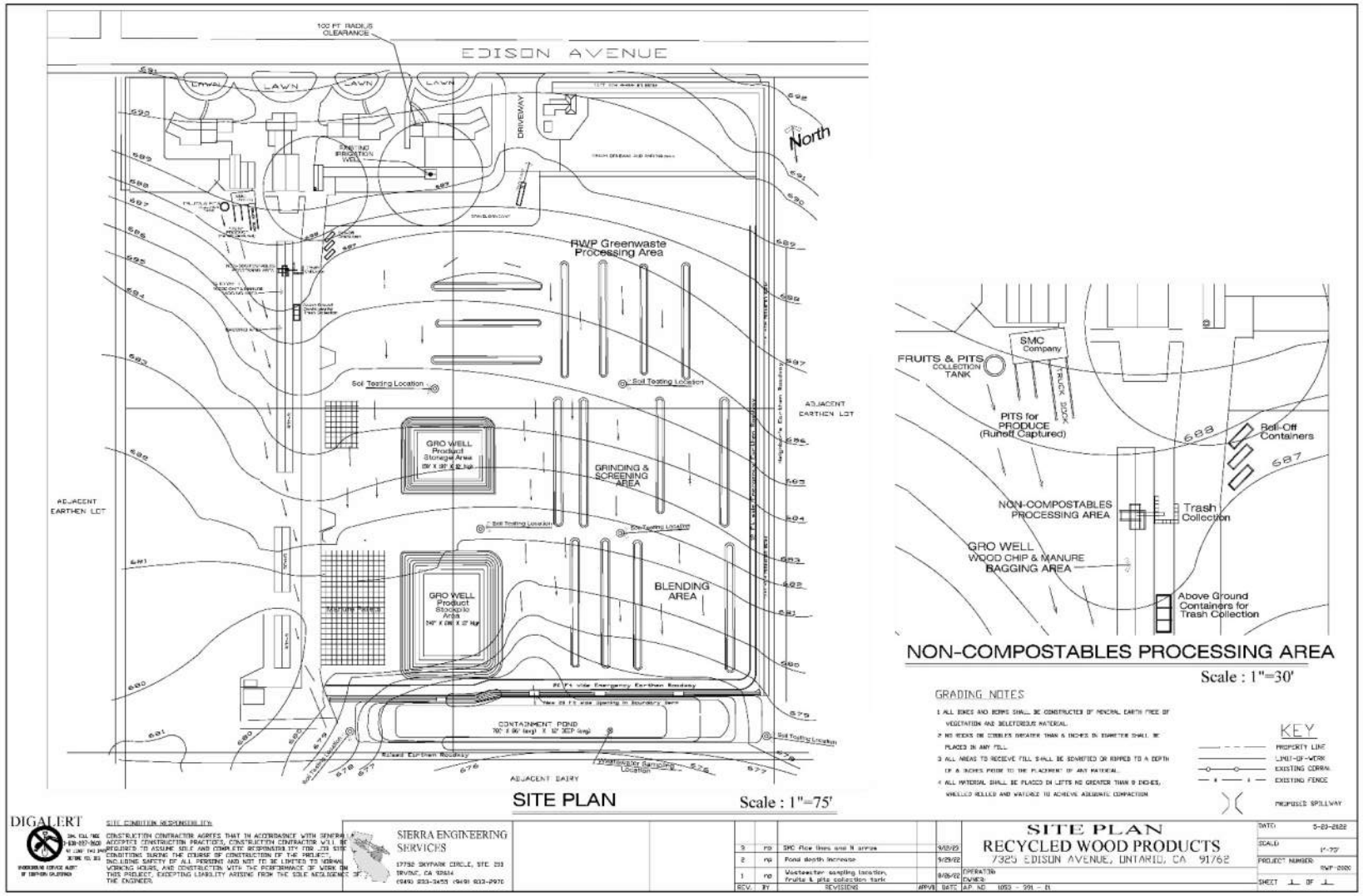
EDISON AVENUE
100 FT RADIUS CLEARANCE
LAWN
DRIVEWAY
North
RWP Greenwaste Processing Area
Soil Testing Location
GRO WELL Product Stockpile Area
GRINDING & SCREENING AREA
BLENDING AREA
GRO WELL Product Stockpile Area
CONTAINMENT POND
ADJACENT EARTHEN LOT
ADJACENT DAIRY
SITE PLAN
Scale : 1"=75'
FRUITS & PITS COLLECTION TANK
SMC Company
TRUCK DOCK
PITS for PRODUCE (Runoff Captured)
Roll-Off Containers
NON-COMPOSTABLES PROCESSING AREA
Trash Collection
GRO WELL WOOD CHIP & MANURE BAGGING AREA
Above Ground Containers for Trash Collection
NON-COMPOSTABLES PROCESSING AREA
Scale : 1"=30'
GRADING NOTES
KEY
PROPERTY LINE
LIMIT-OF-WORK
EXISTING CORRAL
EXISTING FENCE
PROPOSED SPILLWAY
DIGALERT
SIERRA ENGINEERING SERVICES
17752 SKYPARK CIRCLE, STE. 230
IRVINE, CA 92614
(949) 833-3455 (949) 833-2970
SITE PLAN
RECYCLED WOOD PRODUCTS
7325 EDISON AVENUE, ONTARIO, CA 91762
DATE: 5-23-2022
SCALE: 1"=75'
PROJECT NUMBER: RWP-2000
SHEET 1 OF 1
3 rd SMC flow lines and N arrow 9/12/23
2 rd Pond depth increase 9/29/22
1 rd Wastewater sampling location, fruits & pits collection tank 8/26/22
REV. BY REVISIONS APPVD DATE
APP. NO 1053 - 291 - 21

FIELD NARRATIVE DOCUMENTATION SHEET
HAZARDOUS MATERIALS DIVISION
ENVIRONMENTAL ASSESSMENT/LAND USE
SAN BERNARDINO COUNTY

Mello & Sousa / SNS Dairy — Sam Sousa
COMPANY NAME — PERSON CONTACTED

7325 Edison Chino CA
ADDRESS — TELEPHONE NO.

**********
DISCUSSION:

Site inspection made at above address. Sam Sousa owner and operator said tanks (2) were removed in 1992. 500 gallon and 1000 gallon.

He showed me the tanks that were removed.

File has already been removed off alpha list. Stays closed and send to closed file room.

Craig A. Fraker — 1-28-94
INSPECTOR/SURVEYOR — DATE

# HAZARDOUS WASTE GENERATOR PRODUCTION PROCESS FLOW CHART

County of San Bernardino - Department of Environmental Health Services

| List of all Raw Materials Used | Production Process/Final Product (short narrative) | Hazardous Wastes | Amount |
|---|---|---|---|
| 1. JOE MELLO Dairy 8:00AM | SAM SOUSA - OWNER of SNS Dairy next door | | |
| 2. back by Monday | | | |
| 3. 1 above grnd tank Diesal | about 5PM. | | |
| NO UGST. | 9:00 AM on 12/20 | | |
| 5. { tanks | } | | |
| 6. {Removed 1 - 1½ years ago} according to Mrs Mello / | | How do we handle those removals? | |
| 7. Ag tanks are suppose to meet all removal requirements. | | | |
| 8. Owners must show proof of Removal ie. Receipts for | | | |
| 9. removal fees, bills from lab or for dry ie, pictures etc. | | | |
| 10. | | | |
| 11. | 1992 | | |
| . | | | |
| 13. SNS Dairy, Sam Sousa, 2 tanks, 500 gallon, 1000 gallon | | | |
| 14. | | | |
| 15. | | | |
| 16. | | | |

Facility Name: _____ Inspector: _____

Situs Address: _____ Date: _____

2/86

## AGRICULTURAL HAZARDOUS MATERIALS INVENTORY

BUSINESS NAME Mello + Sousa

EMERGENCY CONTACT Joe Mello 714-597-2414

ADDRESS 7325 Edison

EMERGENCY PHONE # 714-597-3537

CITY Chino

STATE Cal ZIP 91710

PHONE NUMBER 714-597-2414

| MATERIAL | MAXIMUM QUANTITY | USED HOW | STORED AT |
|---|---|---|---|
| Fertilizer. | 1954 tons a year | Hauled away 4 times a year. | |
| Chlorine | 6 gal a month | pipeline rinse | milkhouse |
| Acid | 200 gal a year | pipeline washup | milkhouse |

[ ] I HAVE NO HAZARDOUS MATERIALS IN REPORTABLE QUANTITIES HELD FOR MORE THAN 30 DAYS.

[✓] I HAVE AN UNDERGROUND TANK. TANK SIZE (2) 550 - 1000

[✓] I CERTIFY THAT A "HAZARDOUS MATERIALS STORAGE AREA" SIGN HAS BEEN POSTED AS REQUIRED.

THE ABOVE INFORMATION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

NAME Mello & Sousa DATE Nov 5, 1987

SIGNATURE _____

**PLEASE SUBMIT IN TRIPLICATE**
AGRICULTURAL COMMISSIONER
777 E. RIALTO AVENUE
SAN BERNARDINO, CA. 92415

ENVIRONMENTAL HEALTH SERVICES

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

385 North Arrowhead Avenue • San Bernardino, CA 92415-0160 • (714) 387-4646

PAUL F. RYAN, R.S., MPPA
Director

9. **INVENTORY OF HAZARDOUS MATERIALS ON SITE (INDICATE UNITS USED).**

A. HAZARDOUS MATERIALS

1. Chemical Name pipeline Acid
CAS # (if known) ____
Composition ____
Hazard Code/s (See Page 9) ____/____/____/____
Common Name ____
Solid ____ Liquid ✓ Gas ____ Mix ____ Pure ____
Maximum amount at one time on site 30 gal
Average daily amount on site ____
Number of days on site/year All year
Container type PlASTIC Barrel
Storage Pressure ____ Storage Temp (°F) ____

2. Chemical Name chlorine
CAS # (if known) ____
Composition ____
Hazard Code/s (See Page 9) ____/____/____/____
Common Name ____
Solid ____ Liquid ✓ Gas ____ Mix ____ Pure ____
Maximum amount at one time on site 30 gal
Average daily amount on site ____
Number of days on site/year All year
Container type PlASTIC Barrel
Storage Pressure ____ Storage Temp (°F) ____

3. Chemical Name Diesel
CAS # (if known) ____
Composition ____
Hazard Code/s (See Page 9) ____/____/____/____
Common Name ____
Solid ____ Liquid ✓ Gas ____ Mix ____ Pure ____
Maximum amount at one time on site 200 gal
Average daily amount on site ____
Number of days on site/year ____
Container type Steel TANK.
Storage Pressure ____ Storage Temp ( F) ____

4. Chemical Name ____
CAS # (if known) ____
Composition ____
Hazard Code/s (See Page 9) ____
Common Name ____
Solid ____ Liquid ____ Gas ____ Mix ____ Pure ____
Maximum amount at one time on site ____
Average daily amount on site ____
Number of days on site/year ____
Container type ____
Storage Pressure ____ Storage Temp ( F) ____

MAKE ADDITIONAL COPIES OF INVENTORY FORM AS NEEDED FOR EVERY CHEMICAL.

9. **INVENTORY OF WASTE CATEGORY WITH COMPOSITION OF EVERY HAZARDOUS WASTE HANDLED (INDICATE UNITS USED)**

B. HAZARDOUS WASTE

1. Name_____
Waste Category No. (See back of manifest)_____
Hazard Code/s (See Page 9) _____/_____/_____/_____/_____
Common Name_____
Solid_____ Liquid_____ Gas_____ Mix_____ Pure____
Maximum amount at one time on site_____
Average daily amount on site_____
Waste generated/month_____
Number of days on site/year_____
Container type_____

2. Name_____
Waste Category No. (See back of manifest)_____
Hazard Code/s (See Page 9)_____/_____/_____/_____/_____
Common Name_____
Solid_____ Liquid_____ Gas_____ Mix_____ Pure____
Maximum amount at one time on site_____
Average daily amount on site_____
Waste generated/month_____
Number of days on site/year_____
Container type_____

3. Name_____
Waste Category No. (See back of manifest)_____
Hazard Code/s (See Page 9)_____/_____/_____/_____
Common Name_____
Solid_____ Liquid_____ Gas_____ Mix_____ Pure____
Maximum amount at one time on site_____
Average daily amount on site_____
Waste generated/month_____
Numbers of days on site/year_____
Container type_____

4. Name_____
Waste Category No. (See back of manifest)_____
Hazard Code/s (See Page 9)_____/_____/_____/_____
Common Name_____
Solid_____ Liquid_____ Gas_____ Mix_____ Pure____
Maximum amount at one time on site_____
Average daily amount on site_____
Waste generated/month_____
Numbers of days on site/year_____
Container type_____

MAKE ADDITIONAL COPIES OF INVENTORY FORM AS NEEDED FOR EVERY CHEMICAL.

# ENVIRONMENTAL HEALTH SERVICES

☒ 385 North Arrowhead Avenue • San Bernardino, CA 92415-0160 • (714) 387-4646
☐ 320 East "D" Street • Ontario, CA 91764 • (714) 391-7570
☐ 15505 Civic Drive • Victorville, CA 92392 • (619) 243-8141
☐

PLEASE REPLY TO ADDRESS CHECKED

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

PAUL F. RYAN, R.S., MPPA
Director

Also serving the cities of:

| | |
|---|---|
| Adelanto | Montclair |
| Barstow | Needles |
| Big Bear Lake | Ontario |
| Chino | Rancho Cucamonga |
| Colton | Redlands |
| Fontana | Rialto |
| Grand Terrace | San Bernardino |
| Hesperia | Twentynine Palm. |
| Highland | Upland |
| Loma Linda | Victorville |


**LABORATORY BUSINESS PLAN FORM**

Labs which handle hazardous materials **must** complete this form.

I. Joe Mello Dairy
Name
13832 MOUNTAIN APN
Address
CHINO CAL 91710 Parcel No.

II. _____
Telephone number of laboratory

III. _____
Type of Laboratory (activity/description)
Analytical_____ University/College_____
Clinical_____ Dental_____
Research_____ Other Dairy

IV. Two (2) Emergency Contacts for Laboratory:

Name_____ phone_____
Title
Name_____ phone_____
Title

V. _____
Emergency Notification (* Mandatory in case of release of hazardous material)
911 or list other local emergency agency if 911 is not available

* (800) 852-7550 Office of Emergency Services
* (800) 33-TOXIC San Bernardino Co. Department of Environmental Health Services
(800) 424-8802 National Response Center
_____Other (ie. Main office, insurance company, etc.)
_____

VI. Briefly explain lab employee emergency notification and evacuation procedures.

**LABORATORY BUSINESS PLAN FORM (Continued)**

VII. Briefly explain the lab employee Hazard Communication Program (OSHA) or training program (Ed. Code) currently implemented or proposed.

VIII. Briefly explain emergency procedures developed for laboratory personnel in case of emergency (list emergency coordinator and other emergency personnel.

IX. Briefly explain preventive measures currently implemented or proposed for the laboratory (to prevent or minimize the potential for accidents).

X. List emergency equipment in laboratory (include fire extinguishers, eyewash stations, breathing apparatus, emergency kits, etc.).

XI. Provide Maps - See page 9 of this document.

Check all chemicals located at the laboratory and give the maximum amount on hand of that substance. Substances that are not listed on this inventory page must be included on the laboratories Business Plan form and submitted with a Material Safety Data Sheet.

## LABORATORY INVENTORY

| PLEASE CHECK | CHEMICAL NAME | MAXIMUM AMOUNT ON HAND (INCLUDING UNITS) |
|---|---|---|
| | Acetic Acid | |
| | Acetone | |
| | Acetonitrile | |
| ✓ | Acetylene (compressed gas) | 500 lbs |
| | Acrylamide | |
| | Aluminum Ammonium Sulfate | |
| | Aluminum Chloride | |
| | Aluminum Granular | |
| | Aluminum Oxide | |
| | Aluminum Potassium Sulfate | |
| | Aluminum Sodium Sulfate | |
| | Aluminum Sulfate | |
| | * Ammonia | |
| | Ammonium Carbonate | |
| | Ammonium Chloride | |
| | Ammonium Hydroxide | |
| | Ammonium Nibrate | |
| | Ammonium Persulfate | |
| | Ammonium Phosphate | |
| | Ammonium Sulfate | |
| | Ammonium Sulfide | |
| | Ammonium Tartrate | |
| | Ammonium Thiocyanate | |
| | Amyl Acetate | |
| | Amyl Alcohol | |
| | Antimony | |
| | Antimony Trichloride | |
| | Barium Hydroxide | |
| | Barium Chloride | |
| | Barium Nitrate | |
| | Barium Oxide | |
| | Barium Sulfate | |
| | * Benzene | |
| | Benzoic Acid | |
| | Boric Acid | |
| | Bromine Water | |
| | Bromophenol Blue | |
| | Bromothymol Blue | |

**LABORATORY BUSINESS PLAN FORM (Continued)**

Hazardous Material Inventory- See attached inventory. Any hazardous materials that are handled by your business which does not appear on the specific inventory page, LIST those substances here. Indicate the quantity (maximum at any one time), the CAS number and submit a Material Safety Data Sheet for those substances.

| Chemical | CAS # | Maximum on Site (Include Units) |
|---|---|---|

Send forms in triplicate to San Bernardino County Department of
Environmental Health Services
Hazardous Materials Management
385 N. Arrowhead Ave.
San Bernardino, CA 92415-0160

Questions??? Call (714)387-3044
Are there any exemptions?

*COMPLETE THIS FORM AND ATTACH TO EACH COPY OF THE BUSINESS PLAN

BUSINESS NAME: Joe Mello Dairy

ADDRESS: 13832 MOUNTAIN

CONTACT PERSON: Joe Mello

PHONE #: 714-597-2414

I declare, under penalty of perjury, that the information provided herein is true and correct to the best of my knowledge.

Joe Mello
Signature

1-26-89
Date

Business Plan Prepared By: _____

_____

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 1002400 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: 0000000000 ***

ESTAB NBR: 88015443 BILL FLAG: O LOC: 53 PARCEL NBR: PROBLEM PGM: STATUS: ESTAB DATE: 022388 INACTIVE DATE: 000000

*** CONTROL NUMBER: 1002401 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: 8802240047 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8802240047 | 226008 | | 03/31/88 | | 00 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 1002401 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: 8802240047 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 000 | | | | | |

*** CONTROL NUMBER: 1002499 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: A ***

*** CONTROL NUMBER: 1002499 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: E ***

*** CONTROL NUMBER: 1002499 ESTABLISHMENT NUMBER: 88015443 PERMIT NUMBER: O ***

ESTAB: MELLO & SOUSA
7325 0/0 EDISON
00000
CHINO CA 91710-0000
(714) 597-2414

APPL: MELLO & SOUSA
7325 0/0 EDISON
00000
CHINO CA 91710-0000
(714) 597-2414

OWNR: MELLO & SOUSA
7325 0/0 EDISON
00000
CHINO CA 91710-0000
(714) 597-2414

.ERGENCY MANAGEMENT PROGRA
AUTOMATED PERMIT BILLING SYSTEM
DATA INPUT SHEET

ACTION CODE: I EST. # _____ PERMIT # _____

**ESTABLISHMENT INFO: (00)**

BILL TO: LOCATION: # 53 EST. DATE: _____

**ADDRESSING INFORMATION (99):**

E

NAME: Mello & Sousa

ST #: 7325 FRAC: ____ DIR: ____ ST NAME: Edison

ST. DESIG. _____ APT/SP _____ CITY Chino

STATE CA ZIP 91710 PH #: ( 714 ) 597 - 2414

A

NAME: Same

ST #: _____ FRAC: ____ DIR: ____ ST NAME: _____

ST. DESIG. _____ APT/SP _____ CITY _____

STATE _____ ZIP _____ PH #: ( ) _____ - _____

O

NAME: Same

ST #: _____ FRAC: ____ DIR: ____ ST NAME: _____

ST. DESIG. _____ APT/SP _____ CITY _____

STATE _____ ZIP _____ PH #: ( ) _____ - _____

**PERMIT INFORMATION (01):**

CATEGORY # 226006 226007 (226008)

EXP. DATE: _____ SANITARIAN DIST/AREA: _____ SANITARIAN DIST.EMP #: 00

RENEWAL CODE: (N) MFR # _____

**PROGRAM INFORMATION:**

# OF EMPLOYEES: N/A # OF CHEMICALS: N/A

FEB 23 1988

DATE ENTERED: _____ CONTROL #: 10024

SUBMITTED BY (INITIAL): R.P. ENTERED BY (INITIAL) TR

**COMMENTS/REMARKS:** Needs to be invoiced the AG Haz Materials Handlers fee and entered into the data BASE

| | | | | |
|---|---|---|---|---|
| 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | CHINO |

*EMAILED GRM TO PULL FILE 1/3/24 CR

7325 EDISON AVE / 1053-391-01 SFR 3

7371 EDISON AVE / “ “

7397 EDISON AVE / “ “

7587 EDISON AVE / 1053-371-01 DAIRY

7697 EDISON AVE / N/A

14306 BON VIEW AVE / N/A

14316 BON VIEW AVE / N/A

14330 BON VIEW AVE / N/A

14451 BON VIEW AVE / N/A

14366 BON VIEW AVE / N/A

7556 EUCALYPTUS AVE / 1053-581-03 GRAZING

7634 EUCALYPTUS AVE / N/A

| | | | | | |
|---|---|---|---|---|---|
| ✓ 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | | CHINO |
| ✓ FA0000648 | SNS DAIRY | 02 | 7371 EDISON AVE | | ONTARIO |
| ✓ FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | | ONTARIO |
| ✓ FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | | ONTARIO |
| ✓ 90020263 | QUALITY BUILT FIBERGLASS | 14316 | BON VIEW | | CHINO |
| ✓ FA0000393 | COSTA VIEW FARM | 02 | 14451 BON VIEW | | ONTARIO |

*EMAILED GRM TO SCAN FILES 2/13/24 CR

AG - info updated/closed

CREATE EXPANDED + BOLDING

# HAZARDOUS MATERIAL FIELD SERVICE
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A ONTARIO

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000554

NAME: ~~SOUSA, SERAFIN, ET AL~~ Sam Sousa

ADDRESS 1: ~~7397~~ EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91761

COUNTRY:

PHONE: (909) 627-9432

EXT:

FAX:

ALT PHONE:

EXT:

DRIVER LICENSE:

TAX ID:

LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Sam Sousa

DBA: ~~SOUSA, SERAFIN, ET AL~~ SNS Dairy

ADDRESS1: 7397 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710~~ 91761

COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000648

NAME: ~~AG-~~SNS DAIRY

ADDRESS 1: 7371 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-1710~~ 91761

CITY CODE: ~~CHINO~~ Ontario

SIC CODE:

BUSINESS CODE: 02

BUSINESS TYPE: 03

CENSUS: N/A

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: ~~05~~ 03

PHONE: (909) 627-9432

EXT:

FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG-~~SNS DAIRY

CARE OF:

ADDRESS 1: 7371 EDISON AVE

ADDRESS 2:

CITY: CHINO

STATE: CA

ZIP CODE: 91710-1710

COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000649

RESPONSIBLE PARTY: Sam Sousa

CARE OF: SNS Dairy

ADDRESS 1: 7371 Edison

ADDRESS 2:

CITY: Ontario

STATE:

ZIP CODE:

COUNTRY:

PHONE: (909) 627-9432

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 04/05/2007

ALT PHONE:

EXT:

TAX ID:

ANNIVERSARY DATE: 04/30/1997

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT000893 | ACTIVE | 4210 | /01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009820 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008934 | ACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009821 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 0 NUMBER OF UST'S ENTERED 0 MFR #

DATE SUBMITTED: 4-19-07 DATE ENTERED: MAY 03 2007 FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY: Jose Cisneros

COMMENTS/REMARKS:

Per inspection: No longer milk producer, no hazardous materials or hazardous wastes onsite.

Remove "Ag" prefix from name and update city to Ontario.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000648 Facility Name: SNS Dairy Inspection Date: April 17, 2007

Site Address: 7371 Edison Phone #: (909) 627-9432

City: Ontario Zip Code: 91761 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Sam Sousa Title: Owner # Emp: 0

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | |
| 107. Contingency Plan established | CCR 66265.51(a) | | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR | | | |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | X | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | |
| 202. Business Plan established | CHSC 25503.5 | | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | |
| 230. Business Plan implemented | CHSC 25503.5 | | | |

**INSPECTION NARRATIVE**

An inspection was conducted to verify operating status of this dairy.

Facility raises cattle only, no milk production occurs. No hazardous materials or hazardous wastes were observed at time of inspection.

Correct the following violation:

(117) Contaminated containers not managed properly - CCR 66261.7

Empty containers larger than 5 gallons are required to be labeled as empty along with the date on which the container became empty.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] Sign Name — Leslie Alaviside Print Name

Received By: [signature] Sign Name — Sam Sousa Print Name

Title: Owner

Report Date: April 17, 2007

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620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org

# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 17, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0006648 | SVS Dairy | 7371 Edison, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Sam Sousa | TITLE Owner |

Observed several empty 55-gallon drums in the milking parlor and around feed dispenser.

To correct this violation: Submit a copy of the receipt documenting removal of empty containers.

Submit receipt within 30 days (along with Certificate of Compliance for Sousa Dairy across the street).

If you have any questions, please call (909) 386-8401.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) Leslie Haviside (Print Name)

Received By: [signature] (Sign Name) Sam Sousa (Print Name)

Title: Owner

Report Date: April 17, 2007

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

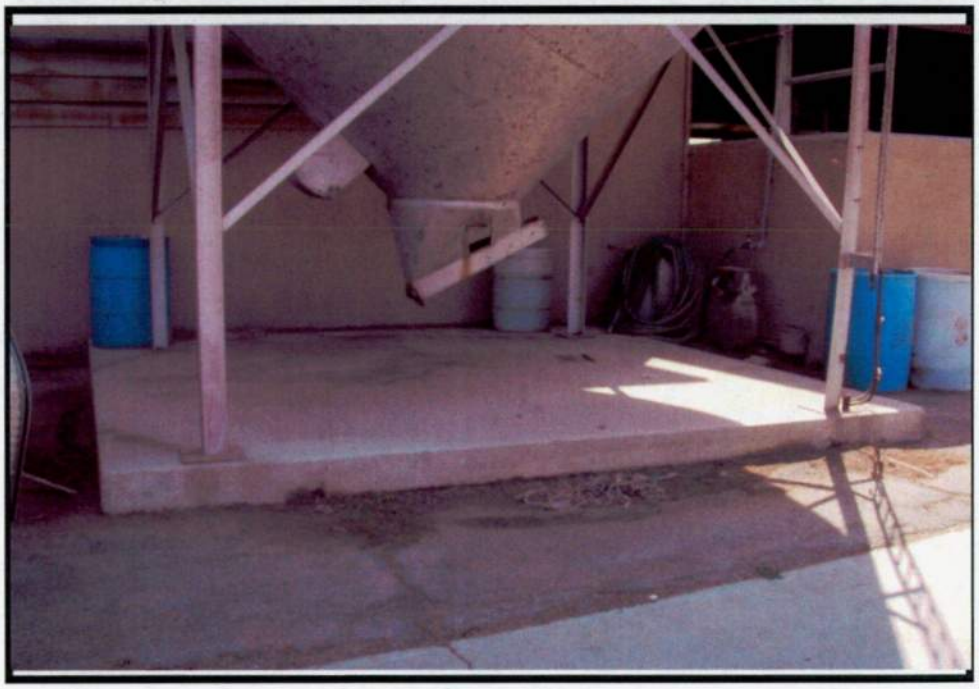

Facility/Case Name: **SNS Dairy**

Facility ID #: **FA0000648**

Address: **7371 Edison Avenue, Ontario**

1) Description: **Sign at front of property**

2) Description: **Empty 55-gallon drums**

Date Taken: **April 17, 2007**

Taken By: **Leslie Heaviside**

Signature: Li Hei

Revised 10/12/2000

WALCO

NTARIO DIVISION
06 East Cedar Street
Ontario, CA 91761
(909) 947-4957

# DRUM RETURNS

№ 3331

Customer Name: SAM SOUSA Customer No.: Date: 5/21/07

| QTY | CODE | DESCRIPTION | SIZE |
|---|---|---|---|
| 6 | | TEAT DIP | 55 |
| | | ACID | 30 |
| | | CHLORINE | 30 |

Driver: WALT Customer Signature: Sam Sousa Approved:

| | | | | | |
|---|---|---|---|---|---|
| ✓ 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | | CHINO |
| ✓ FA0000648 | SNS DAIRY | 02 | 7371 EDISON AVE | | ONTARIO |
| ✓ FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | | ONTARIO |
| ✓ FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | | ONTARIO |
| ✓ 90020263 | QUALITY BUILT FIBERGLASS | 14316 | BON VIEW | | CHINO |
| ✓ FA0000393 | COSTA VIEW FARM | 02 | 14451 BON VIEW | | ONTARIO |

*EMAILED GRM TO SCAN FILES 2/13/24 CR

# TiVa DAIRY (CERSID: 10052128)

**Facility Information Certified Feb 15, 2024**

Certified on 2/15/2024 2:13:50 PM by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

- Business Activities
- Business Owner/Operator Identification

**Hazardous Materials Inventory Certified Feb 15, 2024**

Certified on 2/15/2024 2:13:50 PM by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

- Hazardous Material Inventory (5)
- Site Map (Official Use Only)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 4366KB)

**Emergency Response and Training Plans Certified Feb 15, 2024**

Certified on 2/15/2024 2:13:50 PM by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

- Emergency Response/Contingency Plan
  - *Emergency Response/Contingency Plan* (Adobe PDF, 390KB)
- Employee Training Plan
  - Provided In Submital Element: Emergency Response and Training Plans
- Locally-Required Documentation
  - Provided In Submital Element: Emergency Response and Training Plans

## Site Identification

**TiVa DAIRY**
7587 EDISON AVE
ONTARIO, CA 91762
County
San Bernardino

CERS ID
**10052128**
EPA ID Number

## Submittal Status

Certified on 2/15/2024 by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

## Hazardous Materials

| | |
|---|---|
| Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | Yes |

## Underground Storage Tank(s) (UST)

| | |
|---|---|
| Does your facility own or operate underground storage tanks? | No |

## Hazardous Waste

| | |
|---|---|
| Is your facility a Hazardous Waste Generator? | No |
| Does your facility treat hazardous waste on-site? | No |
| Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | No |
| Does your facility consolidate hazardous waste generated at a remote site? | No |
| Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site? | No |
| Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month greater than 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | No |
| Is your facility a Household Hazardous Waste (HHW) Collection site? | No |

## Excluded and/or Exempted Materials

| | |
|---|---|
| Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)? | No |

## Aboveground Petroleum Storage

| | |
|---|---|
| Does your facility own or operate aboveground petroleum storage tanks or containers AND:<br>* have a total aboveground petroleum storage capacity of 1,320 gallons or more, OR<br>* have one or more petroleum tanks in an underground area? | No |

## Regulated Substances

| | |
|---|---|
| Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)? | No |

## Additional Information

No additional comments provided.

## Facility/Site

**TiVa DAIRY**
7587 EDISON AVE
ONTARIO, CA 91762

CERS ID
**10052128**

## Submittal Status

Certified on 2/15/2024 by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)

## Identification

Dickie Vander Meulen

| Operator Phone | Business Phone | Business Fax |
|---|---|---|
| (951) 202-8787 | (951) 202-8787 | |

| Beginning Date | Ending Date | |
|---|---|---|
| Dun & Bradstreet | SIC Code | Primary NAICS |

## Facility/Site Mailing Address

14382 Bethany Ave
Chino, CA 91710

## Primary Emergency Contact

Dickie Vander Meulen
Title
Partner- Operator

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (951) 202-8787 | (951) 202-8787 | |

## Owner

DICKIE VANDERMEULEN
(951) 202-8787
14382 Bethany Ave
Chino, CA 91710

## Secondary Emergency Contact

Harold Tillema
Title
Partner

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 226-1160 | (909) 226-1160 | |

## Billing Contact

DICKIE VANDERMEULEN
(951) 202-8787 tivadairy@gmail.com
14382 Bethany Ave
Chino, CA 91710

## Environmental Contact

Dickie Vander Meulen
(951) 202-8787 tivadairy@gmail.com
14382 Bethany Ave
Chino, CA 91710

| Name of Signer | Signer Title | Document Preparer |
|---|---|---|
| dickie vandermeulen | Partner | dickie vandermeulen |

Additional Information

## Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

### Property Owner

Phone

Mailing Address

,

Assessor Parcel Number (APN)

Number of Employees
6

Facility ID
FA0011003

# Hazardous Materials And Wastes Inventory Matrix Report

CERS Business/Org. **TIVA DAIRY**
Facility Name **TiVa DAIRY**
7587 EDISON AVE, ONTARIO 91762

Chemical Location
**chemical storage room in milk barn**

CERS ID **10052128**
Facility ID **FA0011003**
Status **Submitted** on 2/15/2024 2:13 PM

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 8 - Corrosives (Liquids and Solids)<br><br>Corrosive, Oxidizing, Class 2 | **Sodium Hypochlorite**<br>CAS No<br>7681-52-9 | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **55**<br>Storage Container<br>Plastic/Non-metalic Drum<br><br>Days on Site: 365 | **55** | 55<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | | | | |
| Corrosive | **sodium hydroxide**<br>CAS No<br>61789-31-9 | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **55**<br>Storage Container<br>Plastic/Non-metalic Drum<br><br>Days on Site: 365 | **55** | 55<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Health Acute Toxicity<br>- Health Serious Eye Damage Eye Irritation | | | | |
| Corrosive | **insecticide**<br>CAS No | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **55**<br>Storage Container<br>Plastic/Non-metalic Drum<br><br>Days on Site: 365 | **55** | 55<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Health Acute Toxicity<br>- Health Skin Corrosion Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **TIVA DAIRY** | Chemical Location | CERS ID **10052128** |
| Facility Name | **TiVa DAIRY** | **Chemical storage room in milk house** | Facility ID **FA0011003** |
| | 7587 EDISON AVE, ONTARIO 91762 | | Status **Submitted** on 2/15/2024 2:13 PM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Corrosive | **Iodine solution**<br>CAS No | **Gallons**<br>State: Liquid<br>Type: Mixture | **300**<br>Storage Container: Tote Bin<br>Days on Site: 365 | **300** | 300<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Acute Toxicity<br>- Health Serious Eye Damage Eye Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

CERS Business/Org. **TIVA DAIRY**
Facility Name **TiVa DAIRY**
7587 EDISON AVE, ONTARIO 91762

Chemical Location
**side of barn**

CERS ID **10052128**
Facility ID **FA0011003**
Status **Submitted** on 2/15/2024 2:13 PM

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 3 - Flammable and Combustible Liquids<br><br>Combustible Liquid, Class II | **Diesel Fuel No. 2**<br>CAS No<br>68476-34-6 | **Gallons**<br>State<br>Liquid<br>Type<br>Pure | **500**<br>Storage Container<br>Aboveground Tank<br><br>Days on Site: 365 | **500** | 500<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Physical Flammable<br>- Health Carcinogenicity<br>- Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Respiratory Skin Sensitization<br>- Health Specific Target Organ Toxicity<br>- Health Aspiration Hazard | | | | |

CALIFORNIA ENVIRONMENTAL REPORTING SYSTEM (CERS)

# CONSOLIDATED EMERGENCY RESPONSE / CONTINGENCY PLAN

*Prior to completing this Plan, please refer to the INSTRUCTIONS FOR COMPLETING A CONSOLIDATED CONTINGENCY PLAN*

## A. FACILITY IDENTIFICATION AND OPERATIONS OVERVIEW

| | | | |
|---|---|---|---|
| FACILITY ID # FA0000672 | A1. | CERS ID # 10034845 A2. | DATE OF PLAN PREPARATION/REVISION (MM/DD/YYYY) 04/29/2019 A3. |

BUSINESS NAME *(Same as Facility Name or DBA - Doing Business As)*
TiVa Dairy A4.

BUSINESS SITE ADDRESS
7587 Edison Avenue A5.

| | | |
|---|---|---|
| BUSINESS SITE CITY Ontario A6. | CA | ZIP CODE 91710-0000 A7. |

| | |
|---|---|
| TYPE OF BUSINESS (e.g., Painting Contractor) dairy farm A8. | INCIDENTAL OPERATIONS (e.g., Fleet Maintenance) none A9. |

THIS PLAN COVERS CHEMICAL SPILLS, FIRES, AND EARTHQUAKES INVOLVING (Check all that apply): A10.

- [x] 1. HAZARDOUS MATERIALS; [ ] 2. HAZARDOUS WASTES

## B. INTERNAL RESPONSE

INTERNAL FACILITY EMERGENCY RESPONSE WILL OCCUR BY (Check all that apply): B1.

- [x] 1. CALLING PUBLIC EMERGENCY RESPONDERS (e.g., 9-1-1)
- [ ] 2. CALLING HAZARDOUS WASTE CONTRACTOR
- [ ] 3. ACTIVATING IN-HOUSE EMERGENCY RESPONSE TEAM

## C. EMERGENCY COMMUNICATIONS, PHONE NUMBERS AND NOTIFICATIONS

In the event of an emergency involving hazardous materials and/or hazardous waste, all facilities must IMMEDIATELY:

1. Notify facility personnel and evacuate if necessary in accordance with the Emergency Action Plan (Title 8 California Code of Regulations §3220);
2. Notify local emergency responders by calling 9-1-1;
3. Notify the local Unified Program Agency (UPA) at the phone number below; and
4. Notify the State Warning Center at (800) 852-7550.

Facilities that generate, treat, store or dispose of hazardous waste have additional responsibilities to notify and coordinate with other response agencies. Whenever there is an imminent or actual emergency situation such as an explosion, fire, or release, the Emergency Coordinator must follow the appropriate requirements for the category of facility and type of release involved:

1. Title 22 California Code of Regulations §66265.56. Emergency Procedures for generators of 1,000 kilograms or more of hazardous waste in any calendar month.
2. Title 22 California Code of Regulations §66265.196. Response to Leaks or Spills and Disposition of Leaking or Unfit-for-Use Tank Systems.
3. Title 40 Code of Federal Regulations §302.6. Notification requirements for a release of a hazardous substance equal to or greater than the reportable quantity.
4. Title 22 California Code of Regulations §66262.34(d)(2) and Title 40 Code of Federal Regulations §262.34(d)(5)(ii) for generators of less than 1000 kilograms of hazardous waste in any calendar month.

Following notification and before facility operations are resumed in areas of the facility affected by the incident, the Emergency Coordinator shall notify the local UPA and the local fire department's hazardous materials program, if necessary, that the facility is in compliance with requirements to:

1. Provide for proper storage and disposal of recovered waste, contaminated soil or surface water, or any other material that results from an explosion, fire, or release at the facility; and
2. Ensure that no material that is incompatible with the released material is transferred, stored, or disposed of in areas of the facility affected by the incident until cleanup procedures are completed.

| EMERGENCY RESPONSE PHONE NUMBERS: | | |
|---|---|---|
| AMBULANCE, FIRE, POLICE AND CHP | | 9-1-1 |
| CALIFORNIA STATE WARNING CENTER (CSWC)/CAL OES | | (800) 852-7550 |
| NATIONAL RESPONSE CENTER (NRC) | | (800) 424-8802 |
| POISON CONTROL CENTER | | (800) 222-1222 |
| LOCAL UNIFIED PROGRAM AGENCY (UPA) | | (909) 386-8425 C1. |
| OTHER (Specify): | C2. | C3. |
| NEAREST MEDICAL FACILITY / HOSPITAL NAME: | Kaiser Permanente 2295 S. Vineyard, Ontario CA C4. | (909) 724-5000 C5. |

| AGENCY NOTIFICATION PHONE NUMBERS: | | |
|---|---|---|
| CALIFORNIA DEPT. OF TOXIC SUBSTANCES CONTROL (DTSC) | | (916) 255-3545 |
| REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) | | (951) 782-4130 C6. |
| U.S. ENVIRONMENTAL PROTECTION AGENCY (US EPA) | | (800) 300-2193 |
| CALIFORNIA DEPT. OF FISH AND WILDLIFE (CDFW) | | (916) 358-2900 |
| U.S. COAST GUARD (USCG) | | (202) 267-2180 |
| CAL OSHA | | (916) 263-2800 |
| CAL FIRE OFFICE OF THE STATE FIRE MARSHAL (OSFM) | | (916) 323-7390 |
| OTHER (Specify): | C7. | C8. |
| OTHER (Specify): | C9. | C10. |

INTERNAL FACILITY EMERGENCY COMMUNICATIONS OR ALARM NOTIFICATION WILL OCCUR BY (Check all that apply): C11.

- [x] 1. VERBAL WARNINGS;
- [ ] 2. PUBLIC ADDRESS OR INTERCOM SYSTEM;
- [x] 3. TELEPHONE;
- [ ] 4. PAGERS;
- [ ] 5. ALARM SYSTEM;
- [ ] 6. PORTABLE RADIO

NOTIFICATIONS TO NEIGHBORING FACILITIES THAT MAY BE AFFECTED BY AN OFF-SITE RELEASE WILL OCCUR BY (Check all that apply): C12.

- [x] 1. VERBAL WARNINGS;
- [ ] 2. PUBLIC ADDRESS OR INTERCOM SYSTEM;
- [x] 3. TELEPHONE;
- [ ] 4. PAGERS;
- [ ] 5. ALARM SYSTEM;
- [ ] 6. PORTABLE RADIO

EMERGENCY COORDINATOR CONTACT INFORMATION: Dickie Vander Meulen C13.

PRIMARY EMERGENCY COORDINATOR NAME: Dickie Vander Meulen PHONE NO.: (951) 202-8787 PHONE NO.: (951) 202-8787

ALTERNATE EMERGENCY COORDINATOR NAME: Harold Tillema PHONE NO.: (909) 226-1160 PHONE NO.: (909) 226-1160

[ ] Check if additional Emergency Coordinator contact and address information is available onsite or by calling PHONE NO.:

Note: If more than one alternate emergency coordinator is designated, attach a list in order of responsibility.

## D. EMERGENCY CONTAINMENT AND CLEANUP PROCEDURES

Check the applicable boxes to indicate your facility's procedures for containing spills and preventing and mitigating releases, fires and/or explosions.

D1.

- [x] 1. MONITOR FOR LEAKS, RUPTURES, PRESSURE BUILD-UP, ETC.;
- [x] 2. PROVIDE STRUCTURAL PHYSICAL BARRIERS (e.g., Portable spill containment walls, built-in berms);
- [x] 3. PROVIDE ABSORBENT PHYSICAL BARRIERS (e.g., Pads, spill pigs, spill pillows);
- [x] 4. COVER OR BLOCK FLOOR AND/OR STORM DRAINS;
- [ ] 5. LINED TRENCH DRAINS AND/OR SUMPS;
- [ ] 6. AUTOMATIC FIRE SUPPRESSION SYSTEM;
- [x] 7. ELIMINATE SOURCES OF IGNITION FOR FLAMMABLE HAZARDS;
- [x] 8. STOP PROCESSES AND/OR OPERATIONS;
- [ ] 9. AUTOMATIC / ELECTRONIC EQUIPMENT SHUT-OFF SYSTEM;
- [x] 10. SHUT OFF WATER, GAS, ELECTRICAL UTILITIES;
- [x] 11. CALL 9-1-1 FOR PUBLIC EMERGENCY RESPONDER ASSISTANCE AND/OR MEDICAL AID;
- [x] 12. NOTIFY AND EVACUATE PERSONS IN ALL THREATENED AND/OR IMPACTED AREAS;
- [x] 13. ACCOUNT FOR EVACUATED PERSONS IMMEDIATELY AFTER EVACUATION;
- [ ] 14. PROVIDE PROTECTIVE EQUIPMENT FOR ON-SITE EMERGENCY RESPONSE TEAM;
- [x] 15. REMOVE CONTAINERS AND/OR ISOLATE AREAS;
- [ ] 16. HIRE LICENSED HAZARDOUS WASTE CONTRACTOR;
- [x] 17. USE ABSORBENT MATERIAL FOR SPILL CONTAINMENT;
- [ ] 18. VACUUM SUCTION USING APPROPRIATE VACUUM (e.g., Intrinsically safe) FOR SPILL CONTROL AND/OR CLEANUP;
- [ ] 19. DECONTAMINATE PERSONNEL AND EQUIPMENT WITHIN DESIGNATED AREA AND DISPOSE OF WASTEWATER AS HAZARDOUS WASTE;
- [ ] 20. PROVIDE SAFE TEMPORARY STORAGE OF HAZARDOUS WASTE GENERATED DURING EMERGENCY ACTIONS;
- [ ] 21. OTHER (Specify):

D2.

## E. FACILITY EVACUATION

THE FOLLOWING ALARM SIGNAL(S) WILL BE USED TO BEGIN EVACUATION OF THE FACILITY (Check all that apply): E1.

- [ ] 1. BELLS;
- [ ] 2. HORNS/SIRENS;
- [x] 3. VERBAL (i.e., Shouting);
- [x] 4. OTHER (Specify): personal cellular telephones

E2.

THE FOLLOWING LOCATION(S) WILL BE USED FOR AN EMERGENCY ASSEMBLY AREA(S) (e.g., Parking lot, street corner): E3.

grass area adjacent to Edison Avenue, north side of milk barn

Note: The Emergency Coordinator must account for all onsite employees and visitors after evacuation.

EVACUATION ROUTE S AND ALTERNATE EVACUATION ROUTES ARE DESCRIBED AS FOLLOWS: E4.

- [ ] 1. WRITTEN PROCEDURES DESCRIBING ROUTES, EXITS, AND ASSEMBLY AREAS;
- [x] 2. EVACUATION MAP(S) DEPICTING ROUTES, EXITS, AND ASSEMBLY AREAS;
- [ ] 3. OTHER (Specify):

E5.

Note: Evacuation procedures and/or maps should be posted in visible facility locations and must be included in the Contingency Plan.

## F. ARRANGEMENTS FOR EMERGENCY SERVICES

ADVANCE ARRANGEMENTS FOR LOCAL EMERGENCY SERVICES (Check one of the following): F1.

- [x] 1. HAVE BEEN DETERMINED NOT NECESSARY;
- [ ] 2. THE FOLLOWING ARRANGEMENTS HAVE BEEN MADE (Specify):

F2.

Note: Advance arrangements with local fire and police departments, hospitals, state and local emergency response teams, and/or emergency services contractors should be made for your facility, if necessary. Large Quantity Generators must describe arrangements in the Contingency Plan.

## G. EMERGENCY EQUIPMENT

**Check the applicable boxes to list emergency response equipment available at the facility, identify the location(s) where the equipment is kept, and indicate the equipment's capability, if applicable.**

| TYPE | EQUIPMENT AVAILABLE G1. | LOCATION G2. | CAPABILITY G3. |
|---|---|---|---|
| *EXAMPLE* | ☒ *CHEMICAL PROTECTIVE GLOVES* | *SPILL RESPONSE KIT* | *SINGLE USE, OIL RESISTANT ONLY* |
| **Safety and First Aid** | 1. ☒ CHEMICAL PROTECTIVE SUITS, APRONS, AND/OR VESTS | Chemical room | apron |
| | 2. ☐ CHEMICAL PROTECTIVE GLOVES | | |
| | 3. ☒ CHEMICAL PROTECTIVE BOOTS | employees all wear rubber boots | |
| | 4. ☐ SAFETY GLASSES, GOGGLES, AND FACE SHIELDS | | |
| | 5. ☐ HARD HATS | | |
| | 6. ☐ AIR-PURIFYING RESPIRATORS | | |
| | 7. ☐ SELF-CONTAINED BREATHING APPARATUS (SCBA) | | |
| | 8. ☒ FIRST AID KITS | office | |
| | 9. ☐ PLUMBED EYEWASH FOUNTAIN AND/OR SHOWER | | |
| | 10. ☐ PORTABLE EYEWASH KITS AND/OR STATION | | |
| | 11. ■ OTHER | drop hoses in milking area fresh water | |
| **Fire Fighting** | 12. ☒ PORTABLE FIRE EXTINGUISHERS | office | |
| | 13. ☐ FIXED FIRE SUPPRESSION SYSTEMS AND/ OR SPRINKLERS | | |
| | 14. ☐ FIRE ALARM BOXES | | |
| | 15. ☐ OTHER | | |
| **Spill Control and Clean-Up** | 16. ☐ ALL-IN-ONE SPILL KIT | | |
| | 17. ☒ ABSORBENT MATERIAL | feed storage area- soil | |
| | 18. ☐ CONTAINER FOR USED ABSORBENT | | |
| | 19. ☒ BERM AND/OR DIKING EQUIPMENT | front end loader- feed storage area | |
| | 20. ☐ BROOM | | |
| | 21. ■ SHOVEL | feed storage area | |
| | 22. ☐ VACUUM | | |
| | 23. ☐ EXHAUST HOOD | | |
| | 24. ☐ SUMP AND/OR HOLDING TANK | | |
| | 25. ☐ CHEMICAL NEUTRALIZERS | | |
| | 26. ☐ GAS CYLINDER LEAK REPAIR KIT | | |
| | 27. ☐ SPILL OVERPACK DRUMS | | |
| | 28. ☐ OTHER | | |
| **Communications and Alarm Systems** | 29. ☒ TELEPHONES (e.g., Cellular) | all employees have personal cell phone | |
| | 30. ☐ INTERCOM AND/OR PA SYSTEM | | |
| | 31. ☐ PORTABLE RADIOS | | |
| | 32. ☐ AUTOMATIC ALARM CHEMICAL MONITORING EQUIPMENT | | |
| **Other** | 33. ☐ OTHER | | |
| | 34. ☐ OTHER | | |

## H. EARTHQUAKE VULNERABILITY

Identify areas of the facility that are vulnerable to hazardous materials releases due to seismic motion. These areas require immediate isolation and inspection.

| VULNERABLE AREAS (Check all that apply): H1. | LOCATIONS (e.g., Shop, outdoor shed, lab): H2. |
|---|---|
| ☒ 1. HAZARDOUS MATERIALS AND/OR WASTE STORAGE AREAS | chemical room |
| ☐ 2. PROCESS LINES AND PIPING | |
| ☐ 3. LABORATORY | |
| ☐ 4. WASTE TREATMENT AREA | |

Identify mechanical systems vulnerable to releases / spills due to earthquake-related motion. These systems require immediate isolation and inspection.

| VULNERABLE SYSTEMS AND/OR EQUIPMENT (Check all that apply): H3. | LOCATIONS: H4. |
|---|---|
| ☒ 1. SHELVES, CABINETS AND/OR RACKS | chemical room |
| ☒ 2. TANKS AND SHUT-OFF VALVES | |
| ☐ 3. PORTABLE GAS CYLINDERS | |
| ☒ 4. EMERGENCY SHUT-OFF AND/OR UTILITY VALVES | machine room |
| ☐ 5. SPRINKLER SYSTEMS | |
| ☐ 6. STATIONARY PRESSURIZED CONTAINERS (e.g., Propane tank) | |

## I. EMPLOYEE TRAINING

Employee training is required for all employees and/or contractors handling hazardous materials and/or hazardous wastes during normal and/or emergency operations. Most facilities will need to submit a separate Training Plan. However, your CUPA may accept this section as the Training Plan for some small facilities. Employee training plans may include the following content:

- Applicable laws and regulations;
- Emergency response plans and procedures;
- Safety Data Sheets;
- Hazard communication related to health and safety;
- Methods for safe handling of hazardous substances;
- Hazards of materials and processes (e.g., fire, explosion, asphyxiation);
- Hazard mitigation, prevention and abatement procedures;
- Coordination of emergency response actions;
- Notification procedures for local emergency responders, CUPA, Cal OES, and onsite personnel;
- Communication and alarm systems;
- Personal protective equipment;
- Use and maintenance of emergency response equipment and supplies (e.g. Fire extinguishers, respirators, spill control materials);
- Decontamination procedures;
- Evacuation procedures and evacuation staging locations;
- Identification of facility areas, equipment, and systems vulnerable to earthquakes and other natural disasters.
- OTHER (Specify):

Check the applicable boxes below to indicate how the employee training program is administered.

☐ 1. FORMAL CLASSROOM ☐ 2. VIDEOS ☐ 3. SAFETY MEETINGS ☐ 4. STUDY GUIDES / MANUALS I1.

☒ 5. OTHER (Specify): tailgate meetings as needed I2.

☐ 6. NOT APPLICABLE SINCE FACILITY HAS NO EMPLOYEES

☐ 7. CHECK IF A SEPARATE EMPLOYEE TRAINING PLAN IS USED AND UPLOADED TO CERS AS A PDF DOCUMENT I3.

☐ 8. CHECK IF EMPLOYEE TRAINING IS COVERED BY THE ABOVE REFERENCED CONTENT AND OTHER DOCUMENTS ONSITE I4.

**EMPLOYEE TRAINING FREQUENCY AND RECORDKEEPING TRAINING MUST BE:**

- Provided initially for new employees as soon as possible following the date of hire. New employees should not work in an unsupervised position that involves hazardous materials handling and/or hazardous waste management without proper training;
- Provided within six months from the date of hire for new employees at a large quantity generator;
- Ongoing and provided at least annually;
- Amended prior to a change in process or work assignment;
- Given upon modification to the Emergency Response/Contingency Plan.

**Large Quantity Generator Training:** Large quantity generators (1,000 kg or more) must retain written plan and documentation of employee training which includes:

- A written description of the type and amount of both initial and ongoing training that will be given to persons filling each job position having responsibility for hazardous waste management and/or emergency response.
- The name, job title and job description for each position at the facility related to hazardous waste management.
- Current employee training records must be retained until closure of the facility and former employee training records must be retained for at least three years after termination of employment.

**Small Quantity Generator Training:** Small quantity generators (less than 1,000 kg) must include basic hazardous waste management and emergency response procedures but a written employee training plan and training records are not required. In order to show that the facility has met the small quantity generator employee training requirement, an employee training plan and training records may be made available.

**Hazardous Materials Business Plan Training**: Businesses must provide initial and annual employee training that includes the content referenced above. The training may be based on the job position and training records must be made available for a period of at least three years.

## J. LIST OF ATTACHMENTS

Check one of the following:

☒ 1. NO ATTACHMENTS ARE REQUIRED; or J1.

☐ 2. THE FOLLOWING DOCUMENTS ARE ATTACHED: J2.

CALIFORNIA ENVIRONMENTAL REPORTING SYSTEM (CERS)

# CONSOLIDATED EMERGENCY RESPONSE / CONTINGENCY PLAN

*Prior to completing this Plan, please refer to the INSTRUCTIONS FOR COMPLETING A CONSOLIDATED CONTINGENCY PLAN*

## A. FACILITY IDENTIFICATION AND OPERATIONS OVERVIEW

| FACILITY ID # | A1. | CERS ID # A2. | DATE OF PLAN PREPARATION/REVISION (MM/DD/YYYY) A3. |
|---|---|---|---|
| FA | | 10052128 | 07/02/2019 |

BUSINESS NAME *(Same as Facility Name or DBA - Doing Business As)* A4.
TiVa Dairy

BUSINESS SITE ADDRESS A5.
7587 Edison Avenue

| BUSINESS SITE CITY A6. | | ZIP CODE A7. |
|---|---|---|
| Ontario | CA | 91710-0000 |

| TYPE OF BUSINESS (e.g., Painting Contractor) A8. | INCIDENTAL OPERATIONS (e.g., Fleet Maintenance) A9. |
|---|---|
| dairy farm | none |

THIS PLAN COVERS CHEMICAL SPILLS, FIRES, AND EARTHQUAKES INVOLVING (Check all that apply): A10.

- [x] 1. HAZARDOUS MATERIALS;
- [ ] 2. HAZARDOUS WASTES

## B. INTERNAL RESPONSE

INTERNAL FACILITY EMERGENCY RESPONSE WILL OCCUR BY (Check all that apply): B1.

- [x] 1. CALLING PUBLIC EMERGENCY RESPONDERS (e.g., 9-1-1)
- [ ] 2. CALLING HAZARDOUS WASTE CONTRACTOR
- [ ] 3. ACTIVATING IN-HOUSE EMERGENCY RESPONSE TEAM

## C. EMERGENCY COMMUNICATIONS, PHONE NUMBERS AND NOTIFICATIONS

In the event of an emergency involving hazardous materials and/or hazardous waste, all facilities must IMMEDIATELY:
1. Notify facility personnel and evacuate if necessary in accordance with the Emergency Action Plan (Title 8 California Code of Regulations §3220);
2. Notify local emergency responders by calling 9-1-1;
3. Notify the local Unified Program Agency (UPA) at the phone number below; and
4. Notify the State Warning Center at (800) 852-7550.

Facilities that generate, treat, store or dispose of hazardous waste have additional responsibilities to notify and coordinate with other response agencies. Whenever there is an imminent or actual emergency situation such as an explosion, fire, or release, the Emergency Coordinator must follow the appropriate requirements for the category of facility and type of release involved:
1. Title 22 California Code of Regulations §66265.56. Emergency Procedures for generators of 1,000 kilograms or more of hazardous waste in any calendar month.
2. Title 22 California Code of Regulations §66265.196. Response to Leaks or Spills and Disposition of Leaking or Unfit-for-Use Tank Systems.
3. Title 40 Code of Federal Regulations §302.6. Notification requirements for a release of a hazardous substance equal to or greater than the reportable quantity.
4. Title 22 California Code of Regulations §66262.34(d)(2) and Title 40 Code of Federal Regulations §262.34(d)(5)(ii) for generators of less than 1000 kilograms of hazardous waste in any calendar month.

Following notification and before facility operations are resumed in areas of the facility affected by the incident, the Emergency Coordinator shall notify the local UPA and the local fire department's hazardous materials program, if necessary, that the facility is in compliance with requirements to:
1. Provide for proper storage and disposal of recovered waste, contaminated soil or surface water, or any other material that results from an explosion, fire, or release at the facility; and
2. Ensure that no material that is incompatible with the released material is transferred, stored, or disposed of in areas of the facility affected by the incident until cleanup procedures are completed.

| EMERGENCY RESPONSE PHONE NUMBERS: | | |
|---|---|---|
| | AMBULANCE, FIRE, POLICE AND CHP | 9-1-1 |
| | CALIFORNIA STATE WARNING CENTER (CSWC)/CAL OES | (800) 852-7550 |
| | NATIONAL RESPONSE CENTER (NRC) | (800) 424-8802 |
| | POISON CONTROL CENTER | (800) 222-1222 |
| | LOCAL UNIFIED PROGRAM AGENCY (UPA) | (909) 386-8425 C1. |
| | OTHER (Specify): C2. | C3. |
| NEAREST MEDICAL FACILITY / HOSPITAL NAME: | Kaiser Permanente 2295 S. Vineyard, Ontario CA C4. | (909) 724-5000 C5. |

| AGENCY NOTIFICATION PHONE NUMBERS: | | |
|---|---|---|
| | CALIFORNIA DEPT. OF TOXIC SUBSTANCES CONTROL (DTSC) | (916) 255-3545 |
| | REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) | (951) 782-4130 C6. |
| | U.S. ENVIRONMENTAL PROTECTION AGENCY (US EPA) | (800) 300-2193 |
| | CALIFORNIA DEPT. OF FISH AND WILDLIFE (CDFW) | (916) 358-2900 |
| | U.S. COAST GUARD (USCG) | (202) 267-2180 |
| | CAL OSHA | (916) 263-2800 |
| | CAL FIRE OFFICE OF THE STATE FIRE MARSHAL (OSFM) | (916) 323-7390 |
| | OTHER (Specify): C7. | C8. |
| | OTHER (Specify): C9. | C10. |

INTERNAL FACILITY EMERGENCY COMMUNICATIONS OR ALARM NOTIFICATION WILL OCCUR BY (Check all that apply): C11.

- [x] 1. VERBAL WARNINGS;
- [ ] 2. PUBLIC ADDRESS OR INTERCOM SYSTEM;
- [x] 3. TELEPHONE;
- [ ] 4. PAGERS;
- [ ] 5. ALARM SYSTEM;
- [ ] 6. PORTABLE RADIO

NOTIFICATIONS TO NEIGHBORING FACILITIES THAT MAY BE AFFECTED BY AN OFF-SITE RELEASE WILL OCCUR BY (Check all that apply): C12.

- [x] 1. VERBAL WARNINGS;
- [ ] 2. PUBLIC ADDRESS OR INTERCOM SYSTEM;
- [x] 3. TELEPHONE;
- [ ] 4. PAGERS;
- [ ] 5. ALARM SYSTEM;
- [ ] 6. PORTABLE RADIO

EMERGENCY COORDINATOR CONTACT INFORMATION: Dickie Vander Meulen C13.

PRIMARY EMERGENCY COORDINATOR NAME: Dickie Vander Meulen PHONE NO.: (951) 202-8787 PHONE NO.: (951) 202-8787

ALTERNATE EMERGENCY COORDINATOR NAME: Harold Tillema PHONE NO.: (909) 226-1160 PHONE NO.: (909) 226-1160

- [ ] Check if additional Emergency Coordinator contact and address information is available onsite or by calling PHONE NO.:

Note: If more than one alternate emergency coordinator is designated, attach a list in order of responsibility.

## D. EMERGENCY CONTAINMENT AND CLEANUP PROCEDURES

Check the applicable boxes to indicate your facility's procedures for containing spills and preventing and mitigating releases, fires and/or explosions.

D1.

- [x] 1. MONITOR FOR LEAKS, RUPTURES, PRESSURE BUILD-UP, ETC.;
- [x] 2. PROVIDE STRUCTURAL PHYSICAL BARRIERS (e.g., Portable spill containment walls, built-in berms);
- [x] 3. PROVIDE ABSORBENT PHYSICAL BARRIERS (e.g., Pads, spill pigs, spill pillows);
- [x] 4. COVER OR BLOCK FLOOR AND/OR STORM DRAINS;
- [ ] 5. LINED TRENCH DRAINS AND/OR SUMPS;
- [ ] 6. AUTOMATIC FIRE SUPPRESSION SYSTEM;
- [x] 7. ELIMINATE SOURCES OF IGNITION FOR FLAMMABLE HAZARDS;
- [x] 8. STOP PROCESSES AND/OR OPERATIONS;
- [ ] 9. AUTOMATIC / ELECTRONIC EQUIPMENT SHUT-OFF SYSTEM;
- [x] 10. SHUT OFF WATER, GAS, ELECTRICAL UTILITIES;
- [x] 11. CALL 9-1-1 FOR PUBLIC EMERGENCY RESPONDER ASSISTANCE AND/OR MEDICAL AID;
- [x] 12. NOTIFY AND EVACUATE PERSONS IN ALL THREATENED AND/OR IMPACTED AREAS;
- [x] 13. ACCOUNT FOR EVACUATED PERSONS IMMEDIATELY AFTER EVACUATION;
- [ ] 14. PROVIDE PROTECTIVE EQUIPMENT FOR ON-SITE EMERGENCY RESPONSE TEAM;
- [x] 15. REMOVE CONTAINERS AND/OR ISOLATE AREAS;
- [ ] 16. HIRE LICENSED HAZARDOUS WASTE CONTRACTOR;
- [x] 17. USE ABSORBENT MATERIAL FOR SPILL CONTAINMENT;
- [ ] 18. VACUUM SUCTION USING APPROPRIATE VACUUM (e.g., Intrinsically safe) FOR SPILL CONTROL AND/OR CLEANUP;
- [ ] 19. DECONTAMINATE PERSONNEL AND EQUIPMENT WITHIN DESIGNATED AREA AND DISPOSE OF WASTEWATER AS HAZARDOUS WASTE;
- [ ] 20. PROVIDE SAFE TEMPORARY STORAGE OF HAZARDOUS WASTE GENERATED DURING EMERGENCY ACTIONS;
- [ ] 21. OTHER (Specify): D2.

## E. FACILITY EVACUATION

THE FOLLOWING ALARM SIGNAL(S) WILL BE USED TO BEGIN EVACUATION OF THE FACILITY (Check all that apply): E1.

E2.

- [ ] 1. BELLS;
- [ ] 2. HORNS/SIRENS;
- [x] 3. VERBAL (i.e., Shouting);
- [x] 4. OTHER (Specify): personal cellular telephones

THE FOLLOWING LOCATION(S) WILL BE USED FOR AN EMERGENCY ASSEMBLY AREA(S) (e.g., Parking lot, street corner): E3.

grass area adjacent to Edison Avenue, north side of milk barn

Note: The Emergency Coordinator must account for all onsite employees and visitors after evacuation.

EVACUATION ROUTE S AND ALTERNATE EVACUATION ROUTES ARE DESCRIBED AS FOLLOWS: E4.

- [ ] 1. WRITTEN PROCEDURES DESCRIBING ROUTES, EXITS, AND ASSEMBLY AREAS;
- [x] 2. EVACUATION MAP(S) DEPICTING ROUTES, EXITS, AND ASSEMBLY AREAS;
- [ ] 3. OTHER (Specify): E5.

Note: Evacuation procedures and/or maps should be posted in visible facility locations and must be included in the Contingency Plan.

## F. ARRANGEMENTS FOR EMERGENCY SERVICES

ADVANCE ARRANGEMENTS FOR LOCAL EMERGENCY SERVICES (Check one of the following): F1.

- [x] 1. HAVE BEEN DETERMINED NOT NECESSARY;
- [ ] 2. THE FOLLOWING ARRANGEMENTS HAVE BEEN MADE (Specify): F2.

Note: Advance arrangements with local fire and police departments, hospitals, state and local emergency response teams, and/or emergency services contractors should be made for your facility, if necessary. Large Quantity Generators must describe arrangements in the Contingency Plan.

## G. EMERGENCY EQUIPMENT

**Check the applicable boxes to list emergency response equipment available at the facility, identify the location(s) where the equipment is kept, and indicate the equipment's capability, if applicable.**

| TYPE | EQUIPMENT AVAILABLE G1. | LOCATION G2. | CAPABILITY G3. |
|---|---|---|---|
| *EXAMPLE* | ☒ *CHEMICAL PROTECTIVE GLOVES* | *SPILL RESPONSE KIT* | *SINGLE USE, OIL RESISTANT ONLY* |
| **Safety and First Aid** | 1. ☒ CHEMICAL PROTECTIVE SUITS, APRONS, AND/OR VESTS | Chemical room | apron |
| | 2. ☐ CHEMICAL PROTECTIVE GLOVES | | |
| | 3. ☒ CHEMICAL PROTECTIVE BOOTS | employees all wear rubber boots | |
| | 4. ☐ SAFETY GLASSES, GOGGLES, AND FACE SHIELDS | | |
| | 5. ☐ HARD HATS | | |
| | 6. ☐ AIR-PURIFYING RESPIRATORS | | |
| | 7. ☐ SELF-CONTAINED BREATHING APPARATUS (SCBA) | | |
| | 8. ☒ FIRST AID KITS | office | |
| | 9. ☐ PLUMBED EYEWASH FOUNTAIN AND/OR SHOWER | | |
| | 10. ☐ PORTABLE EYEWASH KITS AND/OR STATION | | |
| | 11. ☒ OTHER | drop hoses in milking area fresh water | |
| **Fire Fighting** | 12. ☒ PORTABLE FIRE EXTINGUISHERS | office | |
| | 13. ☐ FIXED FIRE SUPPRESSION SYSTEMS AND/ OR SPRINKLERS | | |
| | 14. ☐ FIRE ALARM BOXES | | |
| | 15. ☐ OTHER | | |
| **Spill Control and Clean-Up** | 16. ☐ ALL-IN-ONE SPILL KIT | | |
| | 17. ☒ ABSORBENT MATERIAL | feed storage area- soil | |
| | 18. ☐ CONTAINER FOR USED ABSORBENT | | |
| | 19. ☒ BERM AND/OR DIKING EQUIPMENT | front end loader- feed storage area | |
| | 20. ☐ BROOM | | |
| | 21. ☒ SHOVEL | feed storage area | |
| | 22. ☐ VACUUM | | |
| | 23. ☐ EXHAUST HOOD | | |
| | 24. ☐ SUMP AND/OR HOLDING TANK | | |
| | 25. ☐ CHEMICAL NEUTRALIZERS | | |
| | 26. ☐ GAS CYLINDER LEAK REPAIR KIT | | |
| | 27. ☐ SPILL OVERPACK DRUMS | | |
| | 28. ☐ OTHER | | |
| **Communi-cations and Alarm Systems** | 29. ☒ TELEPHONES (e.g., Cellular) | all employees have personal cell phone | |
| | 30. ☐ INTERCOM AND/OR PA SYSTEM | | |
| | 31. ☐ PORTABLE RADIOS | | |
| | 32. ☐ AUTOMATIC ALARM CHEMICAL MONITORING EQUIPMENT | | |
| **Other** | 33. ☐ OTHER | | |
| | 34. ☐ OTHER | | |

## H. EARTHQUAKE VULNERABILITY

Identify areas of the facility that are vulnerable to hazardous materials releases due to seismic motion. These areas require immediate isolation and inspection.

| VULNERABLE AREAS (Check all that apply): H1. | LOCATIONS (e.g., Shop, outdoor shed, lab): H2. |
|---|---|
| ☒ 1. HAZARDOUS MATERIALS AND/OR WASTE STORAGE AREAS | chemical room |
| ☐ 2. PROCESS LINES AND PIPING | |
| ☐ 3. LABORATORY | |
| ☐ 4. WASTE TREATMENT AREA | |

Identify mechanical systems vulnerable to releases / spills due to earthquake-related motion. These systems require immediate isolation and inspection.

| VULNERABLE SYSTEMS AND/OR EQUIPMENT (Check all that apply): H3. | LOCATIONS: H4. |
|---|---|
| ☒ 1. SHELVES, CABINETS AND/OR RACKS | chemical room |
| ☒ 2. TANKS AND SHUT-OFF VALVES | |
| ☐ 3. PORTABLE GAS CYLINDERS | |
| ☒ 4. EMERGENCY SHUT-OFF AND/OR UTILITY VALVES | machine room |
| ☐ 5. SPRINKLER SYSTEMS | |
| ☐ 6. STATIONARY PRESSURIZED CONTAINERS (e.g., Propane tank) | |

## I. EMPLOYEE TRAINING

Employee training is required for all employees and/or contractors handling hazardous materials and/or hazardous wastes during normal and/or emergency operations. Most facilities will need to submit a separate Training Plan. However, your CUPA may accept this section as the Training Plan for some small facilities.
Employee training plans may include the following content:

- Applicable laws and regulations;
- Emergency response plans and procedures;
- Safety Data Sheets;
- Hazard communication related to health and safety;
- Methods for safe handling of hazardous substances;
- Hazards of materials and processes (e.g., fire, explosion, asphyxiation);
- Hazard mitigation, prevention and abatement procedures;
- Coordination of emergency response actions;
- Notification procedures for local emergency responders, CUPA, Cal OES, and onsite personnel;
- Communication and alarm systems;
- Personal protective equipment;
- Use and maintenance of emergency response equipment and supplies (e.g. Fire extinguishers, respirators, spill control materials);
- Decontamination procedures;
- Evacuation procedures and evacuation staging locations;
- Identification of facility areas, equipment, and systems vulnerable to earthquakes and other natural disasters.
- OTHER (Specify):

Check the applicable boxes below to indicate how the employee training program is administered.

☐ 1. FORMAL CLASSROOM ☐ 2. VIDEOS ☐ 3. SAFETY MEETINGS ☐ 4. STUDY GUIDES / MANUALS I1.
☒ 5. OTHER (Specify): tailgate meetings as needed I2.
☐ 6. NOT APPLICABLE SINCE FACILITY HAS NO EMPLOYEES
☐ 7. CHECK IF A SEPARATE EMPLOYEE TRAINING PLAN IS USED AND UPLOADED TO CERS AS A PDF DOCUMENT I3.
☐ 8. CHECK IF EMPLOYEE TRAINING IS COVERED BY THE ABOVE REFERENCED CONTENT AND OTHER DOCUMENTS ONSITE I4.

**EMPLOYEE TRAINING FREQUENCY AND RECORDKEEPING TRAINING MUST BE:**

- Provided initially for new employees as soon as possible following the date of hire. New employees should not work in an unsupervised position that involves hazardous materials handling and/or hazardous waste management without proper training;
- Provided within six months from the date of hire for new employees at a large quantity generator;
- Ongoing and provided at least annually;
- Amended prior to a change in process or work assignment;
- Given upon modification to the Emergency Response/Contingency Plan.

**Large Quantity Generator Training:** Large quantity generators (1,000 kg or more) must retain written plan and documentation of employee training which includes:

- A written description of the type and amount of both initial and ongoing training that will be given to persons filling each job position having responsibility for hazardous waste management and/or emergency response.
- The name, job title and job description for each position at the facility related to hazardous waste management.
- Current employee training records must be retained until closure of the facility and former employee training records must be retained for at least three years after termination of employment.

**Small Quantity Generator Training:** Small quantity generators (less than 1,000 kg) must include basic hazardous waste management and emergency response procedures but a written employee training plan and training records are not required. In order to show that the facility has met the small quantity generator employee training requirement, an employee training plan and training records may be made available.

**Hazardous Materials Business Plan Training**: Businesses must provide initial and annual employee training that includes the content referenced above. The training may be based on the job position and training records must be made available for a period of at least three years.

## J. LIST OF ATTACHMENTS

Check one of the following: J1.
☒ 1. NO ATTACHMENTS ARE REQUIRED; or
☐ 2. THE FOLLOWING DOCUMENTS ARE ATTACHED: J2.

AG-003

# HAZ )OUS MATERIAL FIELD SERVI
# COMPUTER DATABASE UPDATE AUTHORIZATION

RCD SDD FIRE FISCAL
07 JUN 15 PM 1:57

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000579

NAME: TWIN PALMS DAIRY

ADDRESS 1: 7587 EDISON AV

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91762

COUNTRY:

PHONE:

EXT:

FAX:

ALT PHONE: 714-597-2176

EXT:

DRIVER LICENSE:

TAX ID:

LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF:

DBA: TWIN PALMS DAIRY

ADDRESS1: 7587 EDISON AV

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710~~ 91762

COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000673

NAME: AG-TWIN PALM DAIRY

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-0000~~ 91762

CITY CODE: ~~CHINO~~ Ontario

SIC CODE:

BUSINESS CODE:

BUSINESS TYPE: D3

CENSUS:

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: ~~05~~ 03

PHONE: 714-597-2176

EXT:

FIRE JURISDICTION: CHINO VALLEY FIRE

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: AG-TWIN PALM DAIRY

CARE OF:

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-0000~~ 91762

COUNTRY:

EMAIL:

RCD SDD FIRE FISCAL
07 JUN 15 PM 12: 3

## A- A/R INFORMATION

ACCOUNT ID: AR0000674

RESPONSIBLE PARTY:

CARE OF:

ADDRESS 1:

ADDRESS 2:

CITY:

STATE:

ZIP CODE:

COUNTRY:

PHONE:

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 05/04/2007

ALT PHONE:

EXT:

EXEMPT FROM BILLING: YES

TAX ID:

ANNIVERSARY DATE:

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | N/A<br>PERMIT NUMBER | PERMIT STATUS | N/A<br>ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| GHP OR UST ID | CURRENT STATUS(BILLING) | NA<br>GHP FOR UST(PH) | NA<br>CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ADD NEW P.E. | 0202<br>NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. _____ NUMBER OF USTS 0 MFR # _____

ENTERED

DATE SUBMITTED: 5-11-07 DATE ENTERED: JUN 14 2007 FISCAL DATE: _____

SUBMITTED BY: Leslie Heavisides ENTERED BY: Jose Casteros

**COMMENTS/REMARKS:**

per inspection: Huizenga Dairy is now operating at this location.

Assign 0202 PE

A/O - new facility

# HAZA OUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

RCD SDD FIRE FISCAL

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE:

07 JUN 15 PM 1:57

## O- OWNER INFORMATION

OWNER ID: new 9237

NAME: Paul Huizenga

ADDRESS 1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: (909) 597-4695 EXT: FAX: (909) 597-7164

ALT PHONE: (909) 241-3694 EXT: DRIVER LICENSE:

TAX ID: 33-0834181 OWNER SWITCH DATE: LAST UPDATED:

### OWNER MAILING ADDRESS

CARE OF: Paul Huizenga DBA: Huizenga Dairy

ADDRESS1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY: FA 11003

## F- FACILITY INFORMATION

FACILITY ID: new

NAME: Huizenga Dairy

ADDRESS 1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 CITY CODE: Ontario

SIC CODE: BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: N/A SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 3

PHONE: (909) 597-4695 EXT: FIRE JURISDICTION: Ontario

ALT PHONE: EXT: FAX: LAST UPDATED:

### FACILITY MAILING ADDRESS

BUSINESS NAME: Huizenga Dairy

CARE OF: Paul Huizenga

ADDRESS 1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

EMAIL:

RCD SDD FIRE FISCAL 07 JUN 15 PM 12: 38

## A- A/R INFORMATION

ACCOUNT ID: new

RESPONSIBLE PARTY: Paul Huizenga

CARE OF: Huizenga Dairy

ADDRESS 1: 7587 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: (909) 597-4695 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED:

ALT PHONE: EXT: TAX ID:

ANNIVERSARY DATE: TOTAL DUE: ACCOUNT STATUS:

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | N/A<br>PERMIT NUMBER. | PERMIT STATUS | N/A<br>ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| GHP OR UST ID | CURRENT STATUS(BILLING) | NA<br>GHP FOR UST(PH) | NA<br>CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ADD NEW P.E. | 4221<br>NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 8 NUMBER OF USTS 0 MFR #

ENTERED
JUN 14 2007

DATE SUBMITTED: 5-11-07 DATE ENTERED: FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

Per inspection: facility name & owner change. Huizenga Dairy has taken over at previous location of FA 673.

Assign handler only PE.

Demand bill.

Overall Site with 1 Fac. Unit

## General Information

Location: 0007587 EDISON AV
Community: Chino

Map:
Grid:

Haz:1 Type: 1
F/U: 1 AOV: 0.0

| Contact Name | Title | Business Phone | 24-Hour Phone |
|---|---|---|---|
| ERNEST DE GROOT | DAIRY FARMER | (909) 597-2176 x<br>(~~714~~) 597-2176 x | (909) 597-2176<br>( ) - |

Summary

## Hazmat Inventory List in Quantity Order

### All Materials at Site

| F/U | Material Name | --Hazards-- | | Max Qty | Unit | MCP |
|---|---|---|---|---|---|---|
| F/U: 02 - Fixed Containers at Site | | | | | | |
| | TEAT DIP | | | 0 | | Unrated |
| | DIESEL FUEL | F | IH | 800 | GAL | Low |
| | GASOLINE | F | IH DH | 500 | GAL | Moderate |
| | MOTOR OIL | F | IH | 200 | GAL | Minimal |
| | SANITIZER - BOVADINE | | IH | 22 | GAL | Unrated |
| | SANITIZER - RIDSTONE ACID | | IH | 16 | GAL | Unrated |
| | SANITIZER - G-P CHLOR | | IH | 4 | GAL | Unrated |
| | DETERGENT | | IH DH | 4 | GAL | High |

## AGRICULTURAL HAZARDOUS MATERIALS INVENTORY

BUSINESS NAME _____ EMERGENCY CONTACT ERNEST DE GROOT

ADDRESS Twin Palms Dairy 7587 Edison Ave. EMERGENCY PHONE # 714-597-2176

CITY Chino, Calif. 91710

STATE _____ ZIP _____

PHONE NUMBER _____

| MATERIAL | MAXIMUM QUANTITY | USED HOW | STORED AT |
|---|---|---|---|
| RIDSTONE ACID | 16 gal | SANITIZER | 7587 EDISON AVE |
| G-P CHLOR | 4 gal. | " | " |
| BOVADINE | 22 gal | " | " |
| TEAT DIP | | | " |
| DYNE | 4 gal | DETERGENT | " |
| DETERGENT | | | |
| ENGINE OIL | 200 gal | | " |
| DIESEL FUEL | 800 gal | | " |
| | | | |
| | | | |
| | | | |

[ ] I HAVE NO HAZARDOUS MATERIALS IN REPORTABLE QUANTITIES HELD FOR MORE THAN 30 DAYS.

[X] I HAVE AN UNDERGROUND TANK. TANK SIZE ~~500 gal gas~~ PUMP, PAINTED, RED

[X] I CERTIFY THAT A "HAZARDOUS MATERIALS STORAGE AREA" SIGN HAS BEEN POSTED AS REQUIRED. AS SOON AS THE SIGNS ARE AVAILABLE. FARM BUREAU HAS THEM ON ORDER

THE ABOVE INFORMATION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

NAME ERNEST DE GROOT DATE 11-9-87

SIGNATURE Ernest DeGroot

**PLEASE SUBMIT IN TRIPLICATE**
AGRICULTURAL COMMISSIONER
777 E. RIALTO AVENUE
SAN BERNARDINO, CA. 92415

# ENVIRONMENTAL HEALTH SERVICES

☒ 385 North Arrowhead Avenue • San Bernardino, CA 92415-0160 • (714) 387-4646
☐ 320 East "D" Street • Ontario, CA 91764 • (714) 391-7570
☐ 15505 Civic Drive • Victorville, CA 92392 • (619) 243-8141
☐

PLEASE REPLY TO ADDRESS CHECKED

COUNTY OF SAN BERNARDINO
ENVIRONMENTAL
PUBLIC WORKS AGENCY

PAUL F. RYAN, R.S., MPPA
Director

**TO ALL AGRICULTURAL BUSINESSES**

As you may recall, last year you returned to the San Bernardino County Agricultural Commissioner, an inventory form requesting information about your hazardous materials at your facility. Many of you have recently received another request for similar information (Business Plan) from the Department of Environmental Health Services.

A complete Business Plan does not need to be submitted. If your inventory of hazardous materials has not changed since you reported last year, please fill in the form below and send to:

**Ag. Commissioner**
**777 East Rialto Avenue**
**San Bernardino, CA 92415-0720**
**Attention: John Gardner**

If your inventory of hazardous materials has changed, please send in duplicate a statement to the above address explaining the changes (added or deleted substances) and include the name of the hazardous material, maximum quantity on hand and how it is stored (i.e., underground tank, bags, drum, etc.).

This will satisfy the state mandated disclosure requirement for agricultural businesses pursuant to Chp. 6.95 of the Health & Safety Code. Please refer questions to (714) 387-2120.

Thank you for your cooperation.

---

**BUSINESS NAME** Ernest Twin Palms Dairy

**BUSINESS ADDRESS** 7587 Edison Ave.
Chino, Calif. 91710

**PHONE NUMBER** 714. 5972176

The inventory of hazardous materials at the above address has not changed since reported on the 1987-88 Inventory Form requested by the County Ag. Commissioner and the Department of Environmental Health Services.

Authorized Signature: Ernest De Groot

Title: Dairy Farmer

MSDS

TRACKING SHEET FOR BUSINESS PLANS

Facility Name: Ag - Twin Palms Dairy

Facility site address: 7587 Edison Ave.

City: Chino, CA 91710

Fire Agency:

Trade Secrets: _____ Y _____ N

| | | Sent to FD | Sent to PD |
|---|---|---|---|
| _____ (# of copies) | | | |
| Business Plan Received | 11/10/87 | __/__/__ | __/__/__ |
| Result of Review(s) | | | |
| Deficiency | | __/__/__ | |
| Conditional Approval | | __/__/__ | |
| Approval | | __/__/__ | |

| | | Sent to FD | Sent to PD |
|---|---|---|---|
| Revised Plan(s) Received | 2/14/89 | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ | __/__/__ |

Other

| Date | Action/documentation (update, new plan, etc.) |
|---|---|
| 2/01/94 | Entered in MSDS / Printout |
| __/__/__ | |
| __/__/__ | |
| __/__/__ | |
| __/__/__ | |
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| __/__/__ | |
| __/__/__ | |

# ENVIRONMENTAL HEALTH SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO, CALIFORNIA

THIS PERMIT EXPIRES:
03/31/91

'IN PALMS DAIRY
.587 EDISON AV
CHINO, CA 91710
EST - 88015451 PERMIT - 8802240055

# PERMIT

## NON-TRANSFERABLE

This permit may be suspended or revoked by the health officer for cause. This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force by the United States Government, the State of California and the County of San Bernardino pertaining to the above mentioned business. Penalty fees are assessed on permits renewed 30 days after expiration date indicated above, or for failure to obtain new permit in case of transfer of ownership.

TYPE OF PERMIT - AGRICULTURAL HAZARDOUS MATERIAL HANDLER

FEE PAID $50.00

TWIN PALMS DAIRY
DBA: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

Richard S. Roberts
Director
ENVIRONMENTAL HEALTH SERVICES

04-1804-631 REV. 3/85

PERMIT DOES NOT IMPLY APPROVAL

POST IN A
CONSPICUOUS PLACE

# ENVIRONMENTAL HEALTH SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO, CALIFORNIA

THIS PERMIT EXPIRES:
03/31/90

WIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710
EST - 88015451 PERMIT - 8802240055

# PERMIT

## NON-TRANSFERABLE

This permit may be suspended or revoked by the health officer for cause. This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force by the United States Government, the State of California and the County of San Bernardino pertaining to the above mentioned business. Penalty fees are assessed on permits renewed 30 days after expiration date indicated above, or for failure to obtain new permit in case of transfer of ownership.

TYPE OF PERMIT - AGRICULTURAL HAZARDOUS MATERIAL HANDLER

FEE PAID $50.00

TWIN PALMS DAIRY
DBA TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

04-1804-631 REV. 3/85

PERMIT DOES NOT IMPLY APPROVAL

POST IN A
CONSPICUOUS PLACE

Director
ENVIRONMENTAL HEALTH SERVICES

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 1003500 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: 0000000000 ***

ESTAB NBR: 88015451 BILL FLAG: O LOC: 53 PARCEL NBR: PROBLEM PGM: STATUS: ESTAB DATE: 022388 INACTIVE DATE: 000000

*** CONTROL NUMBER: 1003501 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: 8802240055 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN DISTRICT AREA | EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8802240055 | 226008 | | 03/31/88 | | 00 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 1003501 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: 8802240055 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 000 | | | | | |

*** CONTROL NUMBER: 1003599 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: A ***

*** CONTROL NUMBER: 1003599 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: E ***

*** CONTROL NUMBER: 1003599 ESTABLISHMENT NUMBER: 88015451 PERMIT NUMBER: O ***

| ESTAB: | APPL: | OWNR: |
|---|---|---|
| TWIN PALMS DAIRY | TWIN PALMS DAIRY | TWIN PALMS DAIRY |
| 7587 0/0 EDISON AV | 7587 0/0 EDISON AV | 7587 0/0 EDISON AV |
| 00000 | 00000 | 00000 |
| CHINO CA 91710-0000 | CHINO CA 91710-0000 | CHINO CA 91710-0000 |
| (714) 597-2176 | (714) 597-2176 | (714) 597-2176 |

ERGENCY MANAGEMENT PROGRA
AL OMATED PERMIT BILLING SYSTEM
DATA INPUT SHEET

ACTION CODE: I EST. # _____ PERMIT # _____

ESTABLISHMENT INFO: (00)

BILL TO: LOCATION: # 53 EST. DATE: _____

ADDRESSING INFORMATION (99):

E

NAME: Twin Palms Dairy

ST #: 7587 FRAC: ____ DIR: ____ ST NAME: Edison Ave.

ST. DESIG. _____ APT/SP _____ CITY Chino

STATE CA. ZIP 91710 PH #: ( 714 ) 597 - 2176

A

NAME: Same

ST #: _____ FRAC: ____ DIR: ____ ST NAME: _____

ST. DESIG. _____ APT/SP _____ CITY _____

STATE _____ ZIP _____ PH #: ( ) _____ - _____

O

NAME: Same

ST #: _____ FRAC: ____ DIR: ____ ST NAME: _____

ST. DESIG. _____ APT/SP _____ CITY _____

STATE _____ ZIP _____ PH #: ( ) _____ - _____

PERMIT INFORMATION (01):

CATEGORY # 226006 226007 226008

EXP. DATE: _____ SANITARIAN DIST/AREA: _____ SANITARIAN DIST.EMP #: 00

RENEWAL CODE: N MFR # _____

PROGRAM INFORMATION:

# OF EMPLOYEES: N/A # OF CHEMICALS: N/A

DATE ENTERED: _____ CONTROL #: 10035 FEB 23 1988

SUBMITTED BY (INITIAL): R.P. ENTERED BY (INITIAL) K

COMMENTS/REMARKS: Needs to be invoiced the HAZ Materials Handles fee and entered into the data Base

MONTHLY

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
I N V O I C E

PAGE 1
BILL DATE 02/26/90
HEALTH PERMIT EXPIRATION DATE 03/31/90

*** REMIT COPY ***

ESTABLISHMENT NBR 88015451

TWIN PALMS DAIRY
DBA: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 880[illegible]055 | 226014 | PREVIOUS BALANCE | | 0.00 |
| | | AGRICULTURAL HAZARDOUS MATERIAL HANDLER | 101 | 50.00 |
| | | PERMIT TOTAL | | 50.00 |
| | | TOTAL DUE | | 50.00 |

MAR 15 1990

PAID
Amt $50-
Date 3-15-90
By vam
#1549

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS
WASTE GENERATORS -- 387-3080
UNDERGROUND STORAGE
TANK PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3044
MOBILEHOME PARK PERMITS -- 387-6515
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-6515
HOME OCCUPATION PERMITS -- 387-6512
TEMPORARY OFFICES/SIGNS -- 387-6512
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4666
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-6512

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

MONTHLY

# RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

LEGAL OWNER INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

< > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

IS THIS A TRANSFER? _____

IF YES: FORMER ESTABLISHMENT NAME _____
FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

| OFFICE USE ONLY |
|---|
| EST NBR 88015451 |
| PERMIT NBR 8802240055 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226014 |
| EXPIR DATE 03/31/90 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 0000 |
| MFR NBR |
| APN |
| PERMIT FEE $50- |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D $50- |

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

SIGNED Ernest DeHoot DATED 3-12-90 TITLE Dairy Farmer

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
I N V O I C E

PAGE 1
BILL DATE 02/24/89
HEALTH PERMIT EXPIRATION DATE 03/31/89

*** REMIT COPY ***

ESTABLISHMENT NBR 88015451

TWIN PALMS DAIRY
DBA: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 88 )055 | 226014 | PREVIOUS BALANCE | | 0.00 |
| | | AGRICULTURAL HAZARDOUS MATERIAL HANDLER | 101 | 50.00 |
| | | PERMIT TOTAL | | 50.00 |
| | | TOTAL DUE | | 50.00 |

MAR 06 1989

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

PAID
Amt 50.00
Date 3-3-89
By RD

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS
WASTE GENERATORS -- 387-3080
UNDERGROUND STORAGE
TANK PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3044
MOBILEHOME PARK PERMITS -- 387-4670
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-4670
HOME OCCUPATION PERMITS -- 387-4678
TEMPORARY OFFICES/SIGNS -- 387-4678
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4655
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-4678

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

<X> CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO TWIN PALMS DAIRY
(714) 597-2176 7587 EDISON AV
CHINO, CA 91710

LEGAL OWNER INFO TWIN PALMS DAIRY
(7) 597-2176 7587 EDISON AV
CHINO, CA 91710

IS THIS A TRANSFER? _____

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

NUMBER OF EMPLOYEES: 00000

| OFFICE USE ONLY |
|---|
| EST NBR 88015451 |
| PERMIT NBR 8802240055 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226014 |
| EXPIR DATE 03/31/89 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 0000 |
| MFR NBR |
| APN |
| PERMIT FEE 50.00 |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D 50.00 |

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

SIGNED Ernest DeGroot DATED 3-1-89 TITLE Dairy Farmer

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

# CUPA

San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

## UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Huizenga Dairy (previously Twin Palms Dairy) Date: May 9, 2007
Street Address: 7589 Edison Ave Facility No. FA0000673
City: Ontario Zip Code: 91762 Program Record No. —
Facility Contact: Paul Huizenga Facility Phone No. (909) 597-4695 Number of Tanks: —

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 302. UST permit fees paid and current | CHSC 25287(a) | | | ✓ |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | ✓ |
| 308. Failure to report change of ownership within 30 days | CHSC 25284(c) | | | ✓ |
| 306. Owner/Operator agreement available | CHSC 25284(a)(3) | | | ✓ |
| 307. Certificate of Financial Responsibility submitted | CHSC 25292.2(a) | | | ✓ |
| 330. Leak Detection/Monitoring and Response Plan | CCR 2632, 2634 or 2641(h) | | | ✓ |
| 304. UST monitoring/maintenance records available for 3 years | CHSC 25284(c) | | | ✓ |
| 312. Designated Operator Statement submitted | CCR 2715(a) | | | ✓ |
| 313. Monthly inspections completed by Designated Operator | CCR 2715(c) | | | ✓ |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | ✓ |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | ✓ |
| 311. Business Plan submitted/updated | CHSC 25505 | | | ✓ |
| **MONITORING OF UST SYSTEMS** | | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | ✓ |
| 331. Monitoring system(s) certified annually | CCR 2638 or 2641(j) | | | ✓ |
| 334. Audible/visual alarms operational | CCR 2632(c)(2)(B) and 2636(f)(1) | | | ✓ |
| 314. Certification sticker/tag affixed to monitoring equipment | CCR 2638(f) | | | ✓ |
| 318. Sensors placed at low point of UST system(s) | CCR 2630(d) or 2641(a) | | | ✓ |
| 319. Leak detection equipment tampered with or disabled | CHSC 25299(f)(2) | | | ✓ |
| 323. Containment sump(s) free of debris/liquid | CCR 2590.21(c)(3) | | | ✓ |
| 324. Line leak detector(s) installed and functioning properly | CCR 2636(f)(2) or 2641(f) | | | ✓ |
| 333. Overspill containment installed/tested annually | CHSC 25284.2 | | | ✓ |
| 327. Overfill protection device installed/operational | CCR 2635(b)(2) | | | ✓ |
| 328. Secondary containment components tested | CCR 2637(a) | | | ✓ |
| 329. UST system design, construction, and monitoring | CCR 2630 or 2640 | | | ✓ |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | ✓ |
| 341. Failure to report unauthorized release | CHSC 25299(d)(1) | | | ✓ |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | ✓ |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | ✓ |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | ✓ |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | ✓ |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | ✓ |
| **UNIFORM FIRE CODE REQUIREMENTS** | | | | |
| 335. Emergency fuel shut-off device operational | UFC 5201.5.3 | | | ✓ |
| 336. Impact valve(s) installed at dispenser(s) | UFC 5202.5.3.2 | | | ✓ |
| 337. Fire extinguisher(s) present and charged | UFC 5201.9 | | | ✓ |
| 338. Address clearly visible from street | UFC 901.4.4 | | | ✓ |
| **OTHER REQUIREMENTS** | | | | |
| Significant Operational Compliance – Prevention | 40 CFR Part 280 | | | ✓ |
| Significant Operational Compliance – Detection | 40 CFR Part 280 | | | ✓ |
| Significant Operational Compliance – Both | 40 CFR Part 280 | | | ✓ |

**NARRATIVE / CORRECTIONS**

A file review was conducted in conjuction with inspection of May 9, 2007.

This site previously had (1) 500 gallon UST. Tank was removed prior to Mr. Huizenga taking over property. Sampling was conducted in 2001 and a closure letter was issued on 2-13-01.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: Leslie Heaviside Received by: [signature] Title: Owner

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
*Fire Chief*
County Fire Warden


February 13, 2001

ERNEST DE GROOT
7587 EDISON AVE
CHINO, CA 91710

**SUBJECT: SOIL SAMPLING IN AREA OF FORMER UNDERGROUND STORAGE TANK AT 7587 EDISON, CHINO**

The Department has received the sample results and/or closure report submitted by George Bryant Construction, dated January 30, 2001. After review of the reports prepared by you or your agent, it has been determined that the extent of contamination or lack thereof would indicate that no further investigation is warranted at this time.

**It is important to note** that this can not be construed as a release of liability for the site or declaration that the site is free from contamination. Should further projects or environmental investigations reveal additional contaminants on site you will be responsible and held liable for the investigation and remedial actions.

If you have any questions, please call (909) 387-3082.

**CHRISTINE PARSONS**
**Hazardous Materials Field Services**

CP/lld

cc: George Bryant Construction

CUPA
San Bernardino County Fire Departmen
HAZARDOUS MATE S DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 N. Arrowhead Ave., 2nd floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323

## UNDERGROUND STORAGE TANK REMOVAL INSPECTION FORM

DATE: 1/11/01 TIME: 2:10 pm LOG # 042000-05

FACILITY NAME: Paul Huizengea
LOCATION: 7587 Edison Avenue, Chino
CONTRACTOR: George Bryant

INSPECTORS PRESENT HAZMAT C. Parsons FIRE
AQMD OTHER

| | QUANTITY | HAULER | DESTINATION |
|---|---|---|---|
| TRIPLE RINSATE | N/A | N/A | N/A |
| TANKS | " | " | " |

DEGASSING CONTRACTOR "

MANIFEST # N/A SCAQMD REFERENCE # N/A DRY ICE USED (25 # / 1000 g) N/A

NOTES:

Facility is a farm that previously had a 500 gallon diesel tank onsite. Tank was classified as a farm tank and was removed approximately 5-10 years before by property owner (Ernest De Groot). Paul Huizengea (leasee) does not know what happened to the UST once it was removed.

Hours: 1

Page ___/___

| TANK # | SIZE | MATERIAL HELD | UL # | APPEARANCE (RUSTY, HOLED, SOUND, ETC.) |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

FACILITY MAP:

[redacted]

| | SAMPLE # | DATE/ TIME | DESCRIPTION (soil / odor) | LOCATION | DEPTH | EPA TEST # 'S |
|---|---|---|---|---|---|---|
| 1) | 1 | 1/11/01 | | | 10 ft. | 8020, 8015, MTBE |
| 2) | | | | | | |
| 3) | | | | | | |
| 4) | | | | | | |
| 5) | | | | | | |
| 6) | | | | | | |
| 7) | | | | | | |
| 8) | | | | | | |
| 9) | | | | | | |
| 10) | | | | | | |

SAMPLES TAKEN BY George Bryant LABORATORY Del Mar Analytical

CONTAINER _____ LABELS _____ SPLITS _____ HEADSPACE _____ SEALS _____

REFRIGERATED _____ CHAIN OF CUSTODY _____ OTHER _____

REQUIRED EPA TESTS:
Gasoline: 8020 (BTEX) or 8021B , 8015 (TRPH - modified for gas) & MTBE
Diesel: 8020 (BTEX) or 8021B , 8015 (TRPH - modified for diesel) & MTBE
Solvents/HVO's: 8010 or 8021B
Waste Oil: 418.1 (with 8010 or 8021B if solvents are suspect) & CAM 17 for metals
Metals: 7030 (Cd), 7190 (Cr), 7950 (Zn), 7420 or 6010 (Pb), 7080 (As), 8080 (PCB), 9010 (CN's) OR CAM 17
Pesticides: 8080 (organo-Cl's), 8140 (N & P containing)

USTs ≥1000 gal. require a minimum of 2 samples. One from the fill end and one from the turbine end. Also, a sample from the dispenser should be taken. Samples should be taken from at least 2' below native soil (not fill). If discoloration is noted in sidewalls, take samples there. And sample stockpiles if contamination is suspect. For piping, samples should be taken ± every 20' & at major connections.

**Note: Methods 8020 and 8010 were deleted in SW846 -III and combined as 8021B. Also, 8260B may be used in place of 8021B for more accurate analyses when sampling for potential legal actions.**

Revised 11/18/99

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153
(909) 387-3080 • Fax (909) 387-4323

PETER R. HILLS
Fire Chief
County Fire Warden

## AGRICULTURAL UNDERGROUND STORAGE TANK (UST) CERTIFICATE OF COMPLIANCE

**Please Return Certification within 30 days to Inspector** C. Payne

Name of UST/Property Owner Ernest De Groot

Establishment Name Twin Palms Dairy

Establishment Address 7587 Edison Ave, Chino

Establishment Number 8801545 1

Number of UST's (if known) _____

I certify that:
*(Check appropriate box(s), if you check more than one box in the section below, please write an explanation below)*

☐ AUSTs containing motor vehicle fuels (gasoline, diesel, or heating oil) on my property have a capacity less than or equal to 1100 gallons and is **currently in use.**

☐ AUSTs with a capacity greater than 1100 gallons or any size UST containing materials or waste other than motor vehicle fuels located on my property **have been upgraded** to meet December 22, 1998 standards.

☒ The AUST(s) on my property were **previously removed.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ The AUST(s) on my property are **no longer in use.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ AUSTs with a capacity greater than 1100 gallons or **any size** UST containing materials or waste on my property **have not been upgraded** to December 22, 1998 standards. (Contact San Bernardino County Fire Department Hazardous Materials Division for upgrade or closure requirements).

Signature: Paul A. Huizenga — Date: 9-5-2000

Print Name: PAUL A. HUIZENGA — Title: OWNER - PAUL HUIZENGA DAIRY

Additional Information/Explanation:

500 GAL. TANK WAS REMOVED BY ERNEST DE GROOT 5-10 YRS. AGO. I AM RENTING THE DAIRY FACILITY FROM ERNEST DE GROOT.

RECEIVED
SEP 07 2000
COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS

WILLIAM H. RANDOLPH
County Administrative Officer

Board of Supervisors
KATHY A. DAVIS ..... First District
JON D. MIKELS ..... Second District
DENNIS HANSBERGER ..... Third District
FRED AGUIAR ..... Fourth District
JERRY EAVES ..... Fifth District

FD011TP
EH037

FDS Permit Billing System
Establishment Summary

11/30/00
08:56:13

Estab . . 88015451

Established: 02/23/1988
Status . . : DB
Location . : 53
Parcel . . :
Inactive . :
Federal id :

AG-TWIN PALM DAIRY
7587 EDISON AVE
CHINO, CA 91710 (714) 597-2176

Bill to: O Attn:
Contact: Drvr lic: Exp: State:

Applicant: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710 (714) 597-2176
Owner: TWIN PALMS DAIRY
7587 EDISON AV
CHINO, CA 91710 (714) 597-2176

Comment:

F1=Help F3=Exit F5=Refresh
F13=EstbUpd F14=AddrUpd F17=PrmtInq F21=Srch F23=Print

Linda has tank file

FDPMTCU 011 - This is the first page of data

Estab . . 88015451 AG-TWIN PALM DAIRY

| Sel | Permit | Catgy | Expire Date | MFR | Sani | Balance | Stat | Size |
|---|---|---|---|---|---|---|---|---|
| | 8802240055 | 226014 | 03/31/1991 | 111087 | 0500 | .00 | | 0 |
| | Last bill: 02/26/1990 | | Last delq: | | | Delq cnt: 0 | | |
| | 9008130054 | 222800 | 09/30/1990 | | 0500 | .00 | | 1 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |
| | 9008130055 | 222801 | 09/30/1990 | | 0500 | .00 | | 1 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |
| | 9709091468 | 227001 | 03/31/1991 | | 0500 | .00 | | 0 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |

F1=Help F3=Exit F5=Refresh F7=Bkwd F8=Fwd
F15=PrmtUpd F19=ItemInq F20=FiscInq F21=Srch F22=Smry F23=Print

**George Bryant Construction Inc.**
9333 Golden St.
Alta Loma, CA 91737-2821
**(909) 944-3517**
**(909) 948-2876 Fax**

General Engineering - Lic# 718466
General Contracting - Lic# 718466
Hazardous Certificate # A3666
Asbestos Certificate # A5559
DOSH Certificate # 361
Demo, C21

To LOP M. Ward

January 30, 2001

Attention: Christine Parsons
San Bernardino County Fire Department
385 N. Arrowhead Ave., Second Floor
San Bernardino, CA 92415-0153

Re: Site Closure Letter
7587 Edison
Chino, CA 91710

Dear Ms. Parsons:

Enclosed please find the analytical results from the samples taken in your presence, on January 11, 2001, at the above referenced project. As you can see from the test results, all samples were non-detect or below acceptable levels. No further action is required at this site.

Please forward you Site Closure Letter for this project at your earliest convenience.

Sincerely,

M. S. Bryant

M. S. Bryant
George Bryant Construction, Inc.

Enclosures
Cc: Paul Huizenga

01 JAN 32 AM 10:51
COUNTY FIRE
HAZARDOUS MATERIALS

Del Mar Analytical

2852 Alton / /ine, CA 92606 (949) 261-1022 FAX (949) 261-1228
1014 E. Cooley Dr., Suite A, Colton, CA 92324 (909) 370-4667 FAX (909) 370-1046
7277 Hayvenhurst, Suite B-12, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (858) 505-9596 FAX (858) 505-9689
9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851

# LABORATORY REPORT

Prepared For: George Bryant Construction
9333 Golden Street
Alta Loma, CA 91737

Attention: Ron Franklin
Project: Paul Huizenga
930

Sampled: 01/11/01
Received: 01/11/01
Reported: 01/19/01

*This laboratory report is confidential and is intended for the sole use of Del Mar Analytical and its client. This entire report was reviewed and approved for release.*

CA ELAP Certificate #1169
AZ DHS License #AZ0062

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

*The results pertain only to the samples tested in the laboratory. This report shall not be reproduced, except in full, without written permission from Del Mar Analytical.*

Del Mar Analytical

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| | | |
|---|---|---|
| George Bryant Construction | Client Project ID: Paul Huizenga | |
| 9333 Golden Street | 930 | Sampled:01/11/01 |
| Alta Loma, CA 91737 | Report Number: CKA0092 | Received:01/11/01 |
| Attention: Ron Franklin | | |

# VOLATILE FUEL HYDROCARBONS/BTEX/MTBE (EPA 5030B/8015B/8021B)

| Analyte | Method | Batch | Reporting Limit | Sample Result | Dilution Factor | Date Extracted | Date Analyzed | Data Qualifiers |
|---|---|---|---|---|---|---|---|---|
| | | | mg/kg | mg/kg | | | | |
| **Sample ID: CKA0092-01 (#1 10' B/S - Soil)** | | | | | | | | |
| Volatile Fuel Hydrocarbons | EPA 8015B/8021 | C1A1602 | 1.0 | ND | 1 | 1/16/01 | 1/16/01 | QG |
| Benzene | EPA 8015B/8021 | C1A1602 | 0.0050 | ND | 1 | 1/16/01 | 1/16/01 | |
| Toluene | EPA 8015B/8021 | C1A1602 | 0.0050 | ND | 1 | 1/16/01 | 1/16/01 | |
| Ethylbenzene | EPA 8015B/8021 | C1A1602 | 0.0050 | ND | 1 | 1/16/01 | 1/16/01 | |
| Xylenes, Total | EPA 8015B/8021 | C1A1602 | 0.015 | ND | 1 | 1/16/01 | 1/16/01 | |
| Methyl-tert-butyl Ether (MTBE) | EPA 8015B/8021 | C1A1602 | 0.035 | ND | 1 | 1/16/01 | 1/16/01 | |
| *Surrogate: 4-BFB (PID) (60-145%)* | | | | *115 %* | | | | |
| *Surrogate: aaa-TFT (FID) (50-135%)* | | | | *79.3 %* | | | | |

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

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| | | |
|---|---|---|
| George Bryant Construction<br>9333 Golden Street<br>Alta Loma, CA 91737<br>Attention: Ron Franklin | Client Project ID: Paul Huizenga<br>930<br>Report Number: CKA0092 | Sampled:01/11/01<br>Received:01/11/01 |

## METHOD BLANK/QC DATA

## VOLATILE FUEL HYDROCARBONS/BTEX/MTBE (EPA 5030B/8015B/8021B)

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Data Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch: C1A1602 Extracted: 01/16/01** | | | | | | | | | | |
| **Blank Analyzed: 01/16/01 (C1A1602-BLK1)** | | | | | | | | | | |
| Volatile Fuel Hydrocarbons | ND | 1.0 | mg/kg | | | | | | | *QG* |
| Benzene | ND | 0.0050 | mg/kg | | | | | | | |
| Toluene | ND | 0.0050 | mg/kg | | | | | | | |
| Ethylbenzene | ND | 0.0050 | mg/kg | | | | | | | |
| Xylenes, Total | ND | 0.015 | mg/kg | | | | | | | |
| Methyl-tert-butyl Ether (MTBE) | ND | 0.035 | mg/kg | | | | | | | |
| *Surrogate: 4-BFB (PID)* | *0.105* | | *mg/kg* | *0.100* | | *105* | *60-145* | | | |
| *Surrogate: aaa-TFT (FID)* | *0.0801* | | *mg/kg* | *0.100* | | *80.1* | *50-135* | | | |
| **LCS Analyzed: 01/16/01 (C1A1602-BS1)** | | | | | | | | | | |
| Volatile Fuel Hydrocarbons | 1.22 | 1.0 | mg/kg | 1.10 | | 111 | 75-140 | | | *QG* |
| Benzene | 0.110 | 0.0050 | mg/kg | 0.100 | | 110 | 80-125 | | | |
| Toluene | 0.113 | 0.0050 | mg/kg | 0.100 | | 113 | 85-115 | | | |
| Ethylbenzene | 0.109 | 0.0050 | mg/kg | 0.100 | | 109 | 80-115 | | | |
| Xylenes, Total | 0.323 | 0.015 | mg/kg | 0.300 | | 108 | 80-115 | | | |
| Methyl-tert-butyl Ether (MTBE) | 1.87 | 0.035 | mg/kg | 1.50 | | 125 | 60-135 | | | |
| *Surrogate: 4-BFB (PID)* | *0.120* | | *mg/kg* | *0.100* | | *120* | *60-145* | | | |
| *Surrogate: aaa-TFT (FID)* | *0.0839* | | *mg/kg* | *0.100* | | *83.9* | *50-135* | | | |
| **Matrix Spike Analyzed: 01/16/01 (C1A1602-MS1)** | | | | | **Source: CKA0062-01** | | | | | |
| Volatile Fuel Hydrocarbons | 1.18 | 1.0 | mg/kg | 1.10 | ND | 107 | 45-160 | | | *QG* |
| Benzene | 0.109 | 0.0050 | mg/kg | 0.100 | ND | 109 | 75-140 | | | |
| Toluene | 0.112 | 0.0050 | mg/kg | 0.100 | ND | 111 | 80-115 | | | |
| Ethylbenzene | 0.107 | 0.0050 | mg/kg | 0.100 | ND | 107 | 65-135 | | | |
| Xylenes, Total | 0.317 | 0.015 | mg/kg | 0.300 | ND | 106 | 75-120 | | | |
| Methyl-tert-butyl Ether (MTBE) | 1.92 | 0.035 | mg/kg | 1.50 | ND | 128 | 45-155 | | | |
| *Surrogate: 4-BFB (PID)* | *0.119* | | *mg/kg* | *0.100* | | *119* | *60-145* | | | |
| *Surrogate: aaa-TFT (FID)* | *0.0856* | | *mg/kg* | *0.100* | | *85.6* | *50-135* | | | |

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

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Del Mar Analytical

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| | | |
|---|---|---|
| George Bryant Construction<br>9333 Golden Street<br>Alta Loma, CA 91737<br>Attention: Ron Franklin | Client Project ID: Paul Huizenga<br>930<br>Report Number: CKA0092 | Sampled:01/11/01<br>Received:01/11/01 |

## METHOD BLANK/QC DATA

## VOLATILE FUEL HYDROCARBONS/BTEX/MTBE (EPA 5030B/8015B/8021B)

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Data Qualifiers |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch: C1A1602 Extracted: 01/16/01** | | | | | | | | | | |
| **Matrix Spike Dup Analyzed: 01/16/01 (C1A1602-MSD1)** | | | | | **Source: CKA0062-01** | | | | | |
| Volatile Fuel Hydrocarbons | 1.14 | 1.0 | mg/kg | 1.10 | ND | 104 | 45-160 | 3.45 | 25 | *QG* |
| Benzene | 0.102 | 0.0050 | mg/kg | 0.100 | ND | 102 | 75-140 | 6.64 | 25 | |
| Toluene | 0.112 | 0.0050 | mg/kg | 0.100 | ND | 111 | 80-115 | 0 | 25 | |
| Ethylbenzene | 0.106 | 0.0050 | mg/kg | 0.100 | ND | 106 | 65-135 | 0.939 | 25 | |
| Xylenes, Total | 0.312 | 0.015 | mg/kg | 0.300 | ND | 104 | 75-120 | 1.59 | 25 | |
| Methyl-tert-butyl Ether (MTBE) | 1.85 | 0.035 | mg/kg | 1.50 | ND | 123 | 45-155 | 3.71 | 20 | |
| *Surrogate: 4-BFB (PID)* | *0.119* | | *mg/kg* | *0.100* | | *119* | *60-145* | | | |
| *Surrogate: aaa-TFT (FID)* | *0.0824* | | *mg/kg* | *0.100* | | *82.4* | *50-135* | | | |

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

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9830 South 51st St., Suite B-120, Phoenix, AZ 85044 (480) 785-0043 FAX (480) 785-0851

| | | |
|---|---|---|
| George Bryant Construction | Client Project ID: Paul Huizenga | |
| 9333 Golden Street | 930 | Sampled:01/11/01 |
| Alta Loma, CA 91737 | Report Number: CKA0092 | Received:01/11/01 |
| Attention: Ron Franklin | | |

# DATA QUALIFIERS AND DEFINITIONS

**QG** Carbon ranges C6-C12 quantitated against a gasoline standard.

**ND** Analyte NOT DETECTED at or above the reporting limit or MDL, if MDL is specified.

**NR** Not reported.

**RPD** Relative Percent Difference

**Del Mar Analytical, Colton**
Jeanne Shoulder
Project Manager

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16525 Sherman Way, Suite C-11, Van Nuys, CA 91406 (818) 779-1844 FAX (818) 779-1843
2465 W 12th St., Suite 1, Tempe, AZ 85281 (602) 968-8272 FAX (602) 968-1338
9484 Chesapeake Dr., Suite 805, San Diego, CA 92123 (619) 505-9596 FAX (619) 505-9689

19079

# CHAIN OF CUSTODY FORM

Page 1 of 1

Client Name/Address: George Beynnt Const 9333 Galeton St Alta Loma CA 91737

Project/PO Number: JOB #930 Paul Huizenga

Project Manager: Rod Frankland

Phone Number: 909 944 3517

Sampler: Rod Frankland

Fax Number: 909 948 2876

| Sample Description | Sample Matrix | Container Type | # of Cont. | Sampling Date/Time | Preservatives | 8015 GRS | 8020 GRS | MTBE | | | | | | | Special Instructions |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #1 10' B/S | Soil | Glass | 1 | 1/11/01 2:15pm | | X | X | X | | | | | | | |

| Relinquished By: | Date /Time: | Received by: | Date /Time: |
|---|---|---|---|
| Rod Frankland | 1/11/01 3:10pm | [illegible] | 1/16/01 15:10 |
| Relinquished By: | Date /Time: | Received by: | Date /Time: |
| | | | |
| Relinquished By: | Date /Time: | Received in Lab by: | Date /Time: |
| | | [illegible] | 1/16/01 15:10 |

Turnaround Time: (Check)
same day ____ 72 hours ____
24 hours ____ 5 days ____
48 hours ____ normal X

Sample Integrity: (Check)
intact ____ on ice X

Note: By relinquishing samples to Del Mar Analytical, client agrees to pay for the services requested on this chain of custody form and any additional analyses performed on this project. Payment for services is due within 30 days from the date of invoice. Sample(s) will be disposed of after 30 days.

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden


December 22, 2000

ERNEST DE GROOT
7587 EDISON AVE
CHINO, CA 91710

**SUBJECT: EXPIRATION OF UNDERGROUND STORAGE TANK REMOVAL SAMPLING PERMIT FOR 7697 EDISON AVE, CHINO**

On April 20, 2000 a permit to conduct underground storage tank sampling was issued. This letter is a reminder to inform you that your permit for underground storage tank sampling located at 7697 Edison Avenue, Chino will expire on January 20, 2001.

If the underground storage tank sampling has not been conducted on or before the expiration date, you will be required to pay an additional permit fee.

Please feel free to contact me at (909) 387-3082, to schedule any necessary appointments needed to finalize this underground storage tank sampling permit application.

Thank you for your cooperation in this matter.

Linda Lara-Davis

**LINDA LARA-DAVIS, CLERK III**
**Hazardous Materials Field Services**

# COUNTY FIRE DEPARTMENT

Christine

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
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PETER R. HILLS
Fire Chief
County Fire Warden


## AGRICULTURAL UNDERGROUND STORAGE TANK STATEMENT OF DUE DILIGENCE

***(Fill out all of the information below. Incomplete statements will be considered invalid)***

Name of Property Owner ERNEST DE GROOT

Establishment Name PAUL HUIZENGA DAIRY

Establishment Address 7697 EDISON AVE.

Phone Number (909) 597-4695

Establishment Number _____

Number of underground storage tanks 0

***I certify under penalty of law that farm tanks reportedly located on my property have:***

☒ ***been removed without San Bernardino County oversight.***

☐ ***never existed to the best of my knowledge. I have performed research and find no record of their existence.***

I understand that should I receive information to the contrary, I will supply that information to the San Bernardino County Fire Fire Department, Hazmat Division within thirty days.

Paul A. Huizenga
***Signature***

Dec. 2, 2000
***Date***

PAUL A. HUIZENGA
***Print Name***

OWNER
***Title***

[redacted]
***Social Security/Federal ID#***

[redacted]
***Driver's License/ ID #***

FA0000673
UST File
3rd Page from letter


WILLIAM H. RANDOLPH
County Administrative Officer

KATHY
JON D.

of Supervisors
DENNIS HANSBERGER ..... Third District
FRED AGUIAR ..... Fourth District
..... Fifth District

# COUNTY FIRE DEPARTMENT

Christine

COUNTY OF SAN BERNARDINO

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PETER R. HILLS
Fire Chief
County Fire Warden


## AGRICULTURAL UNDERGROUND STORAGE TANK
## STATEMENT OF DUE DILIGENCE

***(Fill out all of the information below. Incomplete statements will be considered invalid)***

Name of Property Owner ERNEST DE GROOT

Establishment Name PAUL HUIZENGA DAIRY

Establishment Address 7697 EDISON AVE.

Phone Number (909) 597-4695

Establishment Number _____

Number of underground storage tanks 0

***I certify under penalty of law that farm tanks reportedly located on my property have:***

☒ ***been removed without San Bernardino County oversight.***

☐ ***never existed to the best of my knowledge. I have performed research and find no record of their existence.***

I understand that should I receive information to the contrary, I will supply that information to the San Bernardino County Fire Fire Department, Hazmat Division within thirty days.

| | |
|---|---|
| [signature] | Dec. 2, 2000 |
| ***Signature*** | ***Date*** |
| PAUL A. HUIZENGA | OWNER |
| ***Print Name*** | ***Title*** |
| / | |
| ***Social Security/Federal ID#*** | ***Driver's License/ ID #*** |


WILLIAM F. RANDOLPH
County Administrative Officer

Board of Supervisors
KATHY A. DAVIS . . . . . First District
JON D. MIKELS . . . . Second District
JERRY EAVES . . . . . Fifth District
DENNIS HANSBERGER . . Third District
FRED AGUIAR . . . . Fourth District

PAUL HUIZENGA DAIRY
7697 EDISON AVE.
CHINO CA 91710

COUNTY FIRE
HAZARDOUS MATERIALS

00 DEC -5 PM 2:45

INDUSTRY CA 917
PM
2000

HAPPY HOLIDAYS from the U.S. Postal Service!

33 USA

SAN BERNARDINO COUNTY FIRE DEPT.
HAZMAT DIVISION
385 NORTH ARROWHEAD AVE., 2ND FLOOR
SAN BERNARDINO, CA 92415-0153

92415+0153

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San Bernardino County Fire Departmei.
HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 N. Arrowhead Ave, 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323

# UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Twin Palms Dairy Date: 02-17-00

Street Address: 7587 Edison Avenue Est. No: 88015451

City: Chino Zip Code: 91710 Number of Tanks: 1

Facility Contact: Facility Phone No. Number of Employees:

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 301. UST permits obtained | CHSC 25284(a) | | | |
| 302. UST permit fees paid and current | CHSC 25287(a) | | | |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | |
| 304. UST monitoring/maintenance records available for 3 years | CCR 2712(b) | | | |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | |
| 306. Owner-operator agreement available | CHSC 25284(a)(3)(A) | | | |
| 307. Certification of Financial Responsibility submitted | CHSC 25292.2(a) | | | |
| 308. Failure to report change of ownership within 30 days | CCR 2712(d) | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | |
| 311. Business Plan submitted/updated | CHSC 25505 | | | |
| **MONITORING OF EXISTING UST SYSTEM (Pre 1984)** | | | | |
| **Monitoring in General -** | | | | |
| 315. Leak Detection/Monitoring and Response Plan available | CCR 2641 | | | |
| 316. Annual UST precision tests conducted | CHSC 25292(b) | | | |
| 317. Monitoring devices maintained annually | CCR 2641(j) | | | |
| **Piping -** | | | | |
| 320. Pressurized piping tested annually | CHSC 25292(e) | | | |
| 321. In-line leak detector installed on pressurized piping | CHSC 25292(e) | | | |
| 322. Suction piping tested every 3 years | CCR 2643(d) | | | |
| **Inventory Reconciliation for Single Wall USTs -** | | | | |
| 325. Monthly inventory reconciliation performed and available (ATG) | CCR 2646(c) | | | |
| 326. Dispenser meters calibrated annually | CCR 2646(l) | | | |
| **MONITORING OF NEW UST SYSTEMS (1984 to Present)** | | | | |
| 330. Leak Detection/Monitoring and Response Plan available | CCR 2632 | | | |
| 331. Monitoring systems certified annually | CCR 2630(d) | | | |
| 332. Pressurized piping maintained/tested | CCR 2636(f) | | | |
| 333. Overfill/spill protection installed | CHSC 25291(c) | | | |
| 334. Visual/audible alarms operational | CCR 2632(c)(2) | | | |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | |
| 341. Failure to report/record unauthorized release | CCR 2650 | | | |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | |

**NARRATIVE / CORRECTIONS**

A recent review of your file indicates that this facility has 1 underground storage tank onsite. The size of the UST was indicated to be 500 gallons. Please contact this office immediately regarding changes to UST status. This may include removal, no longer in use, and/or upgrading of the underground storage tank system to meet December 22, 1998 UST standards.

4/7/00 10am Spoke to Paul Huizenga re: this dairy. The property owner is his father-in-law, he (Paul) is leasing property. I sent an appl. packet for removal. Tank was removed 5-10 years ago.

χ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspector: CHRISTINE PARSONS

Received by: Title:

Revised 11/18/99

**CUPA**

**an Bernardino County Fire Departmen.**

**HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION**

**385 N. Arrowhead Ave, 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323**

## UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Twin Palms Dairy. Date: 2/17/00

Street Address: 7587 Edison Est. No: 88015451

City: Chino, CA Zip Code: 91710 Number of Tanks: 1

Facility Contact: Facility Phone No. Number of Employees:

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N | NARRATIVE / CORRECTIONS |
|---|---|---|---|---|---|
| 301. UST permits obtained | CHSC 25284(a) | | | | |
| 302. UST permit fees paid and current | CHSC 25287(a) | | | | |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | | One UST @ 500 gallons |
| 304. UST monitoring/maintenance records available for 3 years | CCR 2712(b) | | | | holds gasoline. |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | | |
| 306. Owner-operator agreement available | CHSC 25284(a)(3)(A) | | | | |
| 307. Certification of Financial Responsibility submitted | CHSC 25292.2(a) | | | | |
| 308. Failure to report change of ownership within 30 days | CCR 2712(d) | | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | | The only owner listed |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | | for this site is |
| 311. Business Plan submitted/updated | CHSC 25505 | | | | |
| **MONITORING OF EXISTING UST SYSTEM (Pre 1984)** | | | | | |
| **Monitoring in General -** | | | | | Twin Palms Dairy. |
| 315. Leak Detection/Monitoring and Response Plan available | CCR 2641 | | | | |
| 316. Annual UST precision tests conducted | CHSC 25292(b) | | | | |
| 317. Monitoring devices maintained annually | CCR 2641(j) | | | | |
| **Piping -** | | | | | |
| 320. Pressurized piping tested annually | CHSC 25292(e) | | | | There is no evidence |
| 321. In-line leak detector installed on pressurized piping | CHSC 25292(e) | | | | |
| 322. Suction piping tested every 3 years | CCR 2643(d) | | | | of removal. |
| **Inventory Reconciliation for Single Wall USTs -** | | | | | |
| 325. Monthly inventory reconciliation performed and available | CCR | | | | |
| 326. Dispenser meters calibrated annually | CCR 2646(l) | | | | |
| **MONITORING OF NEW UST SYSTEMS (1984 to Present)** | | | | | |
| 330. Leak Detection/Monitoring and Response Plan available | CCR 2632 | | | | |
| 331. Monitoring systems certified annually | CCR 2630(d) | | | | |
| 332. Pressurized piping maintained/tested | CCR 2636(f) | | | | |
| 333. Overfill/spill protection installed | CHSC 25291(c) | | | | |
| 334. Visual/audible alarms operational | CCR 2632(c)(2) | | | | |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | | |
| 340. UST system operated to prevent unauthorized | CHSC 25292.1(a) | | | | |
| 341. Failure to report/record unauthorized release | CCR 2650 | | | | |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | | |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | | |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | | |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | | |

x NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN _____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspector: Christine Parsons Received by: _____ Title: _____

**HAZARDOUS MATERIALS FIELD SERVICES**
**COMPUTER DATA BASE UPDATE AUTHORIZATION**

**CHANGE** [ ]

**INACTIVATE FACILITY** [X] **INACTIVATE PERMIT(S)** [X]

**BILL TO:** E A O **LOC/DIST NO:** _____ **EST NO:** 88015451
(Circle one)
**(Former Est. Name (if applicable)** _____

**E – Establishment Information**
**Name:** AG-Twin Palm Dairy
**Street No:** 7587 **Fraction:** _____ **Direction:** _____
**Street Name:** Edison Ave **Apt/Ste/Unit No:** _____
**City:** Chino **State:** CA **Zip Code:** 91710
**Attn:** **Telephone:** ( )

01 FEB 14 PM 4:18 RCD. SDC FIRE FISCAL

**A – Applicant Information**
**Name:** _____
**Street No:** _____ **Fraction:** _____ **Direction:** _____
**Street Name:** _____ **Apt/Ste/Unit No:** _____
**City:** _____ **State:** _____ **Zip Code:** _____
**Attn:** **Telephone:** ( )

**O – Owner Information**
**Name:** _____
**Street No:** _____ **Fraction:** _____ **Direction:** _____
**Street Name:** _____ **Apt/Ste/Unit No:** _____
**City:** _____ **State:** _____ **Zip Code:** _____
**Attn:** **Telephone:** ( )

**Program Information:** **MFR Number** _____
**Number of Employees:** _____ **Number of UST's:** _____
**Federal Tax I.D.Number/Social Security Number:**

**Permit Information: (Circle those that apply)**
**Change/Inactivate/Z.O.B./Add:** 226014 **Permit No:** 88022400 55
**Change/Inactivate/Z.O.B./Add:** 222800 **Permit No:** 9008130054
**Change/Inactivate/Z.O.B./Add:** 222801 **Permit No:** 9008130055
**Change/Inactivate/Z.O.B./Add:** 227001 **Permit No:** 9709091468
**Change/Inactivate/Z.O.B./Add:** _____ **Permit No:** _____
**Change/Inactivate/Z.O.B./Add:** _____ **Permit No:** _____

**Date Submitted:** 2/13/01 **Date Entered:** 2/21/01
**Submitted By:** L. Sara Davis **Entered By:** Tina Thomas

**Comments/Remarks:** Ag-Sampling conducted on 1/11/00
Closure letter sent 2/13/01. Tank removed w/out permit.

S BERNARDINO COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS DIVISION – FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVE., 2ND FLOOR, SAN BERNARDINO, CA 92415-0153
(909) 387-3082 • FAX (909) 387-4323

# APPLICATION FOR REMOVAL OF UNDERGROUND STORAGE TANK

$ 450.00 First Tank

$ _____ Each Additional Tank

Number of Tanks this Application 1

## JOB LOCATION

PAUL HUIZENGA DAIRY - PAUL HUIZENGA 909-597-5124

Facility Name | Contact Person | Phone No.

7697 EDISON AVE CHINO 91710

Situs Address | City | Zip Code

Water/Sewer Agency | Fire

## PROPERTY OWNER

ERNEST DEGROOT 909 597-2176

Name | Phone No.

7587 EDISON AVE CHINO 91710

Mailing Address | City | Zip Code

PAUL HUIZENGA 909 597-4695

Owner's Representative | Phone No.

## TANK CONTENTS

TANK WAS REMOVED 5-10 YEARS AGO.

## CONTRACTOR

Company Name | Contact Person | Phone No.

Mailing Address | City | Zip Code

Workman's Comp Insurance Carrier | Policy No.

State Contractor's License No. | Types of Licenses | Expiration Date

NOTE: The State of California has determined that tanks used for the storage of any hazardous or flammable substance shall be considered hazardous even if all contents have been removed.

All storage tanks shall be hauled as hazardous waste, accompanied by a state hazardous waste manifest, and taken to a licensed treatment, storage and disposal facility (TSDF); or if the tanks are triple rinsed on site and the rinsate manifested and hauled to a licensed TSDF, the tank may be handled as nonhazardous.

For information on licensed TSDFs that can accept nonrinsed tanks, contact the State of California Department of Health Services, Toxic Substance Control at (800) 258-6942.

PAUL A. HUIZENGA — Print Name Clearly

909 597-5124, 909 597-4695 — Phone

Signature

4-19-00 — Date

## OFFICE USE ONLY

Under Permit: [X] No [ ] Yes 99- Establishment Number

Number of Tanks: [ ]

Fees Current: [ ] No _____ Delinquent Amount

[ ] Yes _____ Expiration Date

$450.00 Permit Fee Paid THIS Application

1490982 / Receipt Number

1129 Check Number

4-20-00 Date Paid

Julie Caldera Taken by

002000-05 Log Number

63169 Job Card Number

03-19991-670 Rev. 5/98

**POST THIS CARD AT JOB SITE**

SAN BERNARDINO COUNTY FIRE DEPARTMENT/CUPA
HAZARDOUS MATERIALS DIVISION
FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVENUE, SECOND FLOOR
SAN BERNARDINO, CA 92415-0153

LOG # 042000-05 JOB CARD № 6369

INSTALL _____ REMOVE 1

**CONSTRUCTION AND/OR REMOVAL OF UNDERGROUND STORAGE FACILITY**

Site Name Ag-Paul Huizenga Dairy
Address 10017 Edison Ave, Chino
Contractor
Address/Phone

| | INSPECTION RECORD | APPROVED | DATE |
|---|---|---|---|
| FIRST INSPECTION | Excavation Clean, Approved Slope | | |
| | Bedding | | |
| | Holiday/Soap Test, Tanks Set X | | |
| | Manufacturer's UL # | | |
| | | | |
| | Additional Requirements | | |
| | | | |
| | **DO NOT BACKFILL UNTIL ABOVE APPROVED** | | |
| SECOND INSPECTION | Tank Air Test 5 PSI/30 Minutes | | |
| | Vent/Vapor Lines | | |
| | Products Lines 75 PSI/30 Minutes | | |
| | Product Line Containment | | |
| | Metal Piping Wrapped | | |
| | Sumps, Dispenser Pans Water Test | | |
| | | | |
| THIRD INSPECTION | Approved Fill Boxes | | |
| | Concrete or AC Paving 12" Beyond | | |
| | Leak Detectors/Monitors | | |
| | Lockable Fluid-Tight Access for Monitoring | | |
| | Precision Test Results | | |
| | Dispenser Containment | | |
| | Emergency Shut-off | | |
| | Additional Requirements | | |
| | | | |
| REQUIRED PRIOR TO OPERATING | Business Plan | | |
| | | | |
| | Monitoring Plan | | |
| | | | |
| | Financial Responsibility | | |

**FINAL APPROVAL AND CURRENT OPERATING PERMITS MUST BE OBTAINED PRIOR TO PLACING THESE TANKS INTO SERVICE ($5,000.00 FINE FOR NONCOMPLIANCE)**

| | | | |
|---|---|---|---|
| TANK REMOVAL INSPECTION | Tank(s) Removed X _____ | | |
| | Required Samples: 8020, 8015, MTBE, 418.1 | | |
| | Lead (pb) 7421 or ICP 6010, Metals EPA PP13 | | |
| | Additional Test Requirements | | |
| | | | |
| | **Removals Cannot be Finaled Until a Signed Copy of the Sample Results Have Been Received and Approved by this Department.** | | |
| | Final — Approved for Backfill | | |

Remarks:

FAILURE TO PROTECT AND MAINTAIN THIS CARD MAY RESULT IN JOB DELAY.
PRESERVE THIS RECORD OF INSPECTIONS.

**FOR INSPECTION CALL 48 HOURS IN ADVANCE AT (909) 387- 3082**

**THIS PERMIT EXPIRES DECEMBER 22, 1998**

☐ PETROLEUM ☐ WASTE OIL ☐ OTHER

*DISTRIBUTION: White — County Fire Department*
*Green — Contractor/Owner*

14-16867-670 Rev. 4/98

7325 EDISON AVE / 1053-391-01 SFR 3

7371 EDISON AVE / “ “

7397 EDISON AVE / “ “

7587 EDISON AVE / 1053-371-01 DAIRY

7697 EDISON AVE / N/A

14306 BON VIEW AVE / N/A

14316 BON VIEW AVE / N/A

14330 BON VIEW AVE / N/A

14451 BON VIEW AVE / N/A

14366 BON VIEW AVE / N/A

7556 EUCALYPTUS AVE / 1053-581-03 GRAZING

7634 EUCALYPTUS AVE / N/A

| | | | | | |
|---|---|---|---|---|---|
| ✓ 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | | CHINO |
| ✓ FA0000648 | SNS DAIRY | 02 | 7371 EDISON AVE | | ONTARIO |
| ✓ FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | | ONTARIO |
| ✓ FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | | ONTARIO |
| ✓ 90020263 | QUALITY BUILT FIBERGLASS | 14316 | BON VIEW | | CHINO |
| ✓ FA0000393 | COSTA VIEW FARM | 02 | 14451 BON VIEW | | ONTARIO |

*EMAILED GRM TO SCAN FILES 2/13/24 CR

For purposes of a Phase I Environmental Site Assessment, I would like to review all records in your possession, regarding but not limited to, underground storage tank, haz mat and remediation records for the following parcels. The parcels are contiguous and located south of Edison Avenue, and between Walker Avenue and Campus Avenue. I have included a parcel map for your reference.

APNs and Addresses:

0216-322-10, 14350 Walker Avenue
0216-322-03
0216-322-04 8335 EDISON AVE
0216-321-08, 8311 Edison Avenue
0216-321-03 8185 EDISON AVE
1053-331-04 8061 EDISON AVE
1053-341-02
1053-341-01
1053-361-02
1053-351-02
1053-361-01 7721 EDISON AVE
1053-351-01 14213 BON VIEW AVE
1053-371-01 7587 EDISON AVE
1053-371-02
1053-331-01
1053-331-02
1053-331-03
1053-361-03 7891 EDISON AVE

Thank you for your time,

Laurie Cattaneo

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
| | | | |
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| | | | |
| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

**CUPA**

**San Bernardino County Fire Department • Hazardous Materials Section**

**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

**CUPA COMPLIANCE INSPECTION REPORT**

| | |
|---|---|
| NAME: **TIVA DAIRY** | FACILITY ID: **FA0011003** |
| ADDRESS: **7587 EDISON AVE** | CERS ID: **10052128** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **1/18/2023** |

**Consent granted by:**

☒ **Photograph** ☒ **Inspect** **Name:** Dickie Vandermeulen **Title:** Owner

An inspection was conducted on 01/18/2023 to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Dickie Vandermeulen, Owner was the escort during the inspection.

Tiva Diary is a farm that raises cattle for milk production. The facility handles hazardous materials in the form of teat dip, multi chlor bleach solution, and diesel fuel. No hazardous waste is generated or stored on site. Per Mr. Vandermeulen the farm equipment is serviced by Ross Avery and all hazardous waste is managed by the servicer. Aramark provides the facility with a rag service.

The inventory observed during the inspection was consistent with that reported to the California Environmental Reporting System on 03/16/2022.

Document Review:

- CUPA program permits are current, expiration date 05/31/2023.
- This facility is a handler only and does not have EPA ID#.
- The Hazardous Materials Business Plan was previously submitted to the California Environmental Reporting System, or CERS, on 03/16/2022.

No violations were observed on this date.

Please contact Erick Tilus at (909) 386-8401 or by e-mail at etilus@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 1/18/23 10:30:56AM<br>LTR:1/18/2023 10:30:11AM |
|---|---|---|
| ERICK TILUS | Dickie Vandermeulen | Owner |
| INSPECTOR NAME | NAME<br>INSPECTION DATE: 01/18/2023 | TITLE<br>REPORT DATE: 1/18/23 10:35 am |

**This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

7018 1830 0001 5890 5583

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- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

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Total Postag

$

Alex
5-14-19

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*Sent To*

**TIVA DAIRY**

*Street and Ap*

**14761 CARPENTER AVE.**

*City, State, Zi*

**ONTARIO, CA 91762**

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

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- Electronic verification of delivery or attempted delivery.
- A record of delivery (including the recipient's signature) that is retained by the Postal Service™ for a specified period.

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  - Restricted delivery service, which provides delivery to the addressee specified by name, or to the addressee's authorized agent.
  - Adult signature service, which requires the signee to be at least 21 years of age (not available at retail).
  - Adult signature restricted delivery service, which requires the signee to be at least 21 years of age and provides delivery to the addressee specified by name, or to the addressee's authorized agent (not available at retail).
- To ensure that your Certified Mail receipt is accepted as legal proof of mailing, it should bear a USPS postmark. If you would like a postmark on this Certified Mail receipt, please present your Certified Mail item at a Post Office™ for postmarking. If you don't need a postmark on this Certified Mail receipt, detach the barcoded portion of this label, affix it to the mailpiece, apply appropriate postage, and deposit the mailpiece.

**IMPORTANT: Save this receipt for your records.**

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

***COMPLETE THIS SECTION ON DELIV***

A. Signature

X

B. Received by *(Printed Name)* C.

1. Ar

different from item 1? ☐ Y
ery address below: ☐ No

**TIVA DAIRY**
**14761 CARPENTER AVE.**
**ONTARIO, CA 91762**

RECEIVED
MAY 21 2019
SBCFIRE - HAZMAT

9590 9402 4087 8092 5468 14

2. Article Number *(Transfer from service label)*

7018 1830 0001 5890 5583

3. Service Type
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- ☐ Adult Signature Restricted Delivery
- ☑ Certified Mail®
- ☐ Certified Mail Restricted Delivery
- ☐ Collect on Delivery
- ☐ Collect on Delivery Restricted Delivery
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- ☐ Priority Mail Express®
- ☐ Registered Mail™
- ☐ Registered Mail Restricted Delivery
- ☐ Return Receipt for Merchandise
- ☑ Signature Confirmation™
- ☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

USPS TRACKING#:

9590 9402 4087 8092 5468 14

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**SAN BERNARDINO COUNTY**
**FIRE DEPARTMENT**
**ATTN: ALEXANDRA RODRIGUEZ**
**620 S. 'E' STREET**
**SAN BERNARDINO, CA 92415-0153**

CUPA

# CUPA COMPLIANCE INSPECTION REPORT

San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153
(909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

| | | | |
|---|---|---|---|
| FACILITY NAME: | Tiva Dairy | FACILITY ID: | FA0011003 |
| ADDRESS | 758 | CERS ID: | 10052128 |
| CITY: | Ont | INSPECTION DATE: | 5-1-2019 |

E: 91762

14761 CARPENTER Ave. Ontario, CA 91762

Consent Granted Title: Owner
Inspect y Vandermeulen

An inspection was c th applicable Hazardous Materials and Hazardous Waste laws and regulations. Dic cess and provided an escort throughout the inspection

This facility is a dair nga Dairy ceased operations in June 2018. Tiva Dairy is the new tenant. Hazardous I Hazardous Waste is generated on site. The operator, Dickey Vandermeulen, stor ncluded the Teat Dip did not contain any Hazardous Properties.

**INVENTORY:**

(3) 500 – Tanks of Diesel Fuel; (2) Tanks in service, (1) Tank out of service.

**DOCUMENTATION REVIEW:**

Hazardous Materials Handler Permit is current; Expires 11/30/2019.
The Business Plan elements were last submitted into the California Environmental Reporting System (CERS) on 08/15/2017.
CERS Identification Number – 10052128.
-Diesel Fuel is delivered by Mathisen Oil Company

Submit the completed Certificate of Compliance (CofC) with required documentation, to this office within 30 days of this inspection.

If you have any questions, feel free to contact me at 909-386-8401 or **asrodriguez@sbcfire.org**. If you have any questions regarding CERS, please call the **CERS helpline at 909-386-8432.**

14761
CARPENTER Ave.
Ontario, CA 91762

7587 Edison
Ontario

**CUPA**

**COMPLIANCE INSPECTION REPORT**

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153**
**(909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| FACILITY NAME: | **Tiva Dairy** | | | | | FACILITY ID: | **FA0011003** |
| ADDRESS | **7587 Edison Ave.** | | | | | CERS ID: | **10052128** |
| CITY: | **Ontrio** | STATE: | **CA** | ZIP CODE: | **91762** | INSPECTION DATE: | 5-1-2019 |

Consent Granted by: ☒ Photograph ☒ Inspect

Name: **Dickey Vandermeulen** Title: **Owner**

An inspection was conducted on May 1, 2019 to determine compliance with applicable Hazardous Materials and Hazardous Waste laws and regulations. Dickey Vandermeulen, Facility Owner, granted facility access and provided an escort throughout the inspection

This facility is a dairy milking operation. Per owner, Paul Huizenga, Huzienga Dairy ceased operations in June 2018. Tiva Dairy is the new tenant. Hazardous Materials stored on site is used for vehicle fueling. No Hazardous Waste is generated on site. The operator, Dickey Vandermeulen, stores and uses Teat Dip. Upon further research it was concluded the Teat Dip did not contain any Hazardous Properties.

**INVENTORY:**

(3) 500 – Tanks of Diesel Fuel; (2) Tanks in service, (1) Tank out of service.

**DOCUMENTATION REVIEW:**

-Hazardous Materials Handler Permit is current; Expires 11/30/2019.
-The Business Plan elements were last submitted into the California Environmental Reporting System (CERS) on 08/15/2017. CERS Identification Number – 10052128.
-Diesel Fuel is delivered by Mathisen Oil Company

Submit the completed Certificate of Compliance (CofC) with required documentation, to this office within 30 days of this inspection.

If you have any questions, feel free to contact me at 909-386-8401 or **asrodriguez@sbcfire.org.** If you have any questions regarding CERS, please call the **CERS helpline at 909-386-8432.**

San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153
(909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

***Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health and Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).***

**200 – HMRRP (HAZARDOUS MATERIALS HANDLER) VIOLATIONS**

| VIOLATION CODE | DESCRIPTION | SECTION | V | C | N |
|---|---|---|---|---|---|
| H201 | **Hazardous Material Handler Permit Current** | SBCC 23.0602(a) | ☐ | ☑ | ☐ |
| H202 | **Hazardous Materials Business Plan Established and Implemented** | CHSC 25507 | ☐ | ☑ | ☐ |
| H203 | **Hazardous Materials Business Plan Submittal**<br>**Violation Text:** Failure to complete and electronically submit a business plan when storing/ handling a hazardous material at or above reportable quantities.<br><br>**Observation**: Failure to submit Business plan via the California Environmental Reporting System (CERS). CERS Identification Number- 10052128.<br><br>**Corrective action**: Call the CERS help line on the number provided on the beginning of this report to acquire log in information. Once information is acquired, log into CERS, and submit all required elements. | CHSC 25505, 25508(a)(1) | ☐ | ☑ | ☐ |
| H204 | **Immediately Report Any Release or Threatened Release of a Hazardous Material** | CHSC 25510(a) | ☐ | ☑ | ☐ |
| H205 | **Facility Access for Inspection Granted** | CHSC 25511 | ☐ | ☑ | ☐ |
| H206 | **Business Plan Annual Review/Certification** | CHSC 25508(a)(1), 25508.2 | ☑ | ☐ | ☐ |
| H209 | **Business Plan Update Within 30 Days of Change**<br><br>**Violation Text:** Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material.<br>Any handling of a previously disclosed hazardous materials at or above reportable quantities.<br>A change of business address, business ownership, or business name.<br>A substantial change in the handler's operations that requires modification to any portion of the business plan.<br><br>**OBSERVATION:** Facility underwent a change of ownership, and has not been reported via CERS. Facility also needs to report current inventory.<br><br>**CORRECTIVE ACTION:** Using CERS update owner information and inventory information. | CHSC 25508.1(a)-(f) | ☑ | ☐ | ☐ |
| H215 | **Training Documentation** | CHSC 25505(a)(4) | ☐ | ☑ | ☐ |

**DDITIONAL HMRRP (HAZARDOUS MATERIALS HANDLER) VIOLATIONS**

| VIOLATION CODE | DESCRIPTION | SECTION | V | C | N |
|---|---|---|---|---|---|
| H210 | **Business Activities Page and/or Business Owner/Operator Identification Page** | CHSC 25508(a)(1) | ☐ | ☑ | ☐ |
| H211 | **Hazardous Materials Inventory** | CHSC 25505, 25506, 25508 | ☐ | ☑ | ☐ |
| H212 | **Site Map** | CHSC 25505(a)(2), 25508(a)(1) | ☐ | ☑ | ☐ |
| H213 | **Emergency Response Plan** | CHSC 25505(a)(3), 25508(a)(1) | ☐ | ☑ | ☐ |
| H214 | **Training Program Not Included And/or is Not Adequate** | CHSC 25505(a)(4), 25508(a)(1); 19 CCR 4 2658, 2659 | ☐ | ☑ | ☐ |

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| VIOLATION CODE | DESCRIPTION | SECTION | V | C | N |
|---|---|---|---|---|---|
| H216 | Business Plan Readily Available | CHSC 25505(c) | ☐ | ☑ | ☐ |
| H220 | Property Owner Notification | CHSC 25505.1 | ☐ | ☐ | ☑ |
| H221 | Property Owner Business Plan | CHSC 25505.1 | ☐ | ☐ | ☑ |
| H222 | Agricultural Handler Emergency Response Plan | CHSC 25508(a)(1), 25507.1 | ☐ | ☐ | ☑ |
| H223 | Agricultural Handler Training Program | CHSC 25508(a)(1), 25507.1 | ☐ | ☐ | ☑ |
| H224 | Remote Unstaffed Facility | CHSC 25505, 25506, 25507.2, 25508 | ☐ | ☐ | ☑ |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | CHSC 25507.1(a)(2); 19 CCR 4 2670, 2671 | ☐ | ☐ | ☑ |

| Inspected by | Received By | | Report Date |
|---|---|---|---|
| | CERTIFIED MAIL | | 5/13/2019 |
| Alexandra Rodriguez | Dickey Vandermeulen | Owner | |
| NAME | NAME | TITLE | |

This report shall serve as a notice to comply for minor violations and notice of violation for all other violations.
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIMEPERIOD NOTED ABOVE.**

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# CERTIFICATE OF COMPLIANCE

**Return certification to inspector** Asrodriguez@sbcfire.org **within 30 days of inspection unless otherwise specified.**

RESPONDENT: **Dickey Vandermeulen**
VIOLATION(S) CITED ON: **5/1/2019**

| | | | |
|---|---|---|---|
| FACILITY NAME: | **Tiva Dairy** | FACILITY ID: | **FA0011003** |
| SITE ADDRESS: | **7587 Edison Ave.** | | |
| CITY: | **Ontario** STATE: **CA** ZIP CODE: **91762** | CERS ID: | **10052128** |

## SUMMARY OF VIOLATIONS

**IMPORTANT** – Attach all requested documentation when returning this certification.

**Corrective action**: Call the CERS help line on the number provided on the beginning of this report to acquire log in information. Once information is acquired, log into CERS, and submit all required elements.

**CORRECTIVE ACTION:** Using CERS update owner information and inventory information.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

| | |
|---|---|
| SIGNATURE | DATE |
| PRINT NAME | TITLE |

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## PRELIMINARY FIELD INSPECTION REPORT

Page 1 of 1

INSPECTION DATE: 5-1-2019

| FACILITY ID: | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| TA0011003 | Tiva Dairy | Chino |
| Consent Granted by: ☒ Inspect ☐ Photograph | NAME: Dickey Vanderulle | TITLE: Owner |

**The following is a preliminary list of violations observed at the time of inspection. The final report may list additional violations. Violations must be corrected within 30 days of inspection unless otherwise specified below.**

An inspection was conducted on 5-1-2019 to determine Compliance with applicable hazardous materials and hazardous waste regulations.

Inventory:
(3) 55-gallon Diesel Fuel tanks

Contact Alexandra Rodriguez at (909) 386-8401 OR ARodriguez@SBCFire.org with any Questions Regarding this Report.
A Final Report will be provided within 60 days.

Inspected By: Alexandra Rodriguez (Sign Name) Received By: Dickie Vander Meulen (Sign Name) Title: Owner

Print Name: Dickie Vander Meulen Report Date: 5-1-19

Rev. 04/2018

DISTRIBUTION: White – CUPA File Yellow – Facility Pink – CUPA Inspector

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## PRELIMINARY FIELD INSPECTION REPORT

Page 1 of 1

| INSPECTION DATE: 5-1-2019 | | |
|---|---|---|
| FACILITY ID: FA0011003 | FACILITY NAME: Tiva Dairy | FACILITY LOCATION: Chino |
| Consent Granted by: ☐ Inspect ☐ Photograph | NAME: Dickey Vanderville | TITLE: Owner |

**The following is a preliminary list of violations observed at the time of inspection. The final report may list additional violations. Violations must be corrected within 30 days of inspection unless otherwise specified below.**

An inspection was conducted on 5-1-2019 to determine compliance with applicable hazardous materials and hazardous waste regulations.

Inventory:
(5) 55-gallon Diesel Fuel tanks

Contact Alexandra Rodriguez at (909) 386-8401 OR Arodriguez@SBCFire.org with any questions regarding this Report.
A Final Report will be provided within 65 days.

Inspected By: Alexandra Rodriguez (Sign Name) Received By: Dickie Vander Meulen (Sign Name) Title: Owner

Print Name: Dickie Vander Meulen (Print Name) Report Date: 5-1-19

# SAN BE 'ARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Mark A. Hartwig**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


June 20, 2016

HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**ATTN: PAUL HUIZENGA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0011003-HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

Mr. Huizenga,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on April 22, 2016:

- Owner/Operator shall electronically update the information submitted to the statewide information management system if operations require modification to any portion of the plan or there is a substantial change in the handler's operations.
- At least once every 12 months, the owner/owner shall review and certify that the information in the statewide information management system has been verified and is complete, accurate and up to date.
- Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**


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**CUPA COMPLIANCE INSPECTION REPORT**

NAME: **HUIZENGA DAIRY** FACILITY ID: **FA0011003**

ADDRESS: **7587 EDISON AVE** CERS ID:**10052128**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** INSPECTION DATE: **4/22/2016**

Inspector was given permission to: [X] photograph [X] inspect

**Inspection Narrative (v020000)**

An inspection was conducted to determine compliance with hazardous waste generator and hazardous material handler laws and regulations. Consent to conduct the inspection and take photographs was given by Paul Huizenga, the Owner.

This facility is a dairy milking operation. Hazardous materials are stored on site for vehicle fueling and the milking operation. No hazardous waste is generated by the facility.

HAZARDOUS MATERIALS INVENTORY:
(3) 500-gallon tanks of diesel fuel.
(2) 275-gallon and (1) 55-gallon containers of teat dip.
(1) 55-gallon drum of formaldehyde 37%.
(1) 400-pound container of alkaline pipe cleaner.

DOCUMENTATION REVIEW:
-Heavy equipment is serviced by Kent Avery.
-Indoor equipment is serviced by Southern California Dairy Equipment. SoCal Dairy also provides chemicals used in the milking process and removes the empty drums.
-Diesel fuel is delivered by Western Refining.
-The Business Plan elements were last submitted into CERS on 3/19/2013. CERS ID 10052128.
-The permits are current; expiration date of 11/30/2016.

Submit a signed Certificate of Compliance with required documentation to this office within 30 days.

If you have any questions, feel free to contact me at 909-658-5912 or bwade@sbcfire.org. If you have any questions regarding CERS, please call the CERS helpline at 909-386-8432.

**The following lines marked in the V column are violations that must be corrected. Marked items in the N column require additional information to determine compliance.**

| VIOLATION CODE | DESCRIPTION | SECTION | V | N |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| 0201 | Failure to obtain a CUPA Hazardous Matanals Handler parmit. | 23.0602(a) | | |
| 0202 | Failura to astablish a Businass Plan. | CAL. HEALTH & SAFETY CODE 25507 | | |
| 0203 | Failure to submit a Business Plan. | CAL. HEALTH & SAFETY CODE 25508 | X | |
| Violation: | Owner/Operator shall submit tha hazardous matanals inventory, amargency contacts, site plan and certification that the axisting plan is currant and up to data. | | | |
| Correction: | Using the California Environmental Reporting System (CERS), alactronically submit the Business Plan to the statewida information management system. | | | |
| Observation: | This facility has not submitted a Sita Map or tha amergency response/training plans section into CERS. | | | |
| | Comply by date: **5/22/2016** | | | |
| 0204 | Failura to immadiataly raport any relaase or threatanad release of a hazardous material. | CAL. HEALTH & SAFETY CODE 25510 | | |
| 0205 | Failure to allow a hazardous materials handler inspection. | CAL. HEALTH & SAFETY CODE 25511 | | |
| 0206 | Failure to update the Businass Plan | CAL. HEALTH & SAFETY CODE 25508.2 | X | |
| Violation: | At least once avary 12 months, tha owner/owner shall review and certify that the information in tha statewida information management systam has baen varifiad and is complate, accurata and up to data. | | | |
| Correction: | Using tha California Environmental Raporting Systam (CERS), alactronically updata tha information submittad to the statewida information management systam. | | | |
| Obsarvation: | Tha last Business Plan update submittad by this facility is dated 3/19/2013. | | | |
| | Comply by data: **5/22/2016** | | | |

| | | | |
|---|---|---|---|
| 0209 | Failure to submit an amendment to the inventory form within 30 days of change. | CAL. HEALTH & SAFETY CODE 25508.1 | X |
| Violation: | Owner/Operator shall electronically update the information submitted to the statewide information management system if operations require modification to any portion of the plan or there is a substantial change in the handler's operations. | | |
| Correction: | Using the California Environmental Reporting System (CERS), electronically update the information submitted to the statewide information management system. | | |
| Observation: | Hazardous materials were observed on site during the inspection that are listed in CERS in lesser quantities. Also, a secondary emergency contact must be provided to the facility information. Comply by date: **5/22/2016** | | |
| 1231 | Failure to submit a corrected Business Plan within 30 days after notification of deficiencies. | CAL. HEALTH & SAFETY CODE 25508 | |
| 1232 | Failure to submit a Business Plan revision within 30 days of a substantial change in operation. | CAL. HEALTH & SAFETY CODE 25508.1 | |

| | | |
|---|---|---|
| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 4/22/16 2:53:51PM<br>LTR:4/22/2016 2:45:18PM |
| BRIAN WADE | Paul Huizenga | Owner |
| NAME | NAME<br>INSPECTION DATE: 04/22/2016 | TITLE<br>PRINTED ON: 4/22/16 2:58 pm |

X **NOTICE OF VIOLATION: THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN THE SPECIFIED TIMEFRAME. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION.**

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# CERTIFICATE OF COMPLIANCE

**Return Certification within 30 Days of Receipt to Inspector BRIAN WADE**

RESPONDENT: Paul Huizenga

VIOLATION(S) CITED ON: 4/22/2016 CERTIFICATE OF COMPLIANCE DATE: 4/22/2016

| | |
|---|---|
| NAME: **HUIZENGA DAIRY** | FACILITY ID: **FA0011003** |
| ADDRESS: **7587 EDISON AVE** | CERS ID:**10052128** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | |

**Attach the following documentation when returning the Certificate of Compliance:**

| | |
|---|---|
| 0209 | Using the Calfornia Environmental Reporting System (CERS), electronically update the information submitted to the statewide information management system.Hazardous materials were observed on site during the inspection that are listed in CERS in lesser quantities. Also, a secondary emergency contact must be provided to the facility information. |
| 0206 | Using the California Environmental Reporting System (CERS), electronically update the information submitted to the statewide information management system.The last Business Plan update submitted by this facility is dated 3/19/2013. |
| 0203 | Using the California Environmental Reporting System (CERS), electronically submit the Business Plan to the statewide information management system.This facility has not submitted a Site Map or the emergency response/training plans section into CERS. |

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Huizenga Dairy** Facility ID #: **11003**

Address: **7587 Edison Avenue Ontario, CA 91762**

1) Description: **View of the facility from Edison facing South.**

2) Description: **(3) 500-gallon AST's of diesel fuel stored on the South side of the milking barn.**

Date Taken: **4/22/2016**

Taken By: **Brian Wade** Signature: Brian Wade

Revised 02/27/03

# PHOTO NARRATIVE



PHOTO 3

PHOTO 4

Facility/Case Name: **Huizenga Dairy** Facility ID #: **11003**

Address: **7587 Edison Avenue Ontario, CA 91762**

1) Description: **(2) 275-gallon and (1) 55-gallon containers of teat dip stored in a room on the South side of the milking barn.**

2) Description: **(2) 55-gallon drums of formaldehyde 37% stored near the milking area exit on the East side of the building.**

Date Taken: **4/22/2016**

Taken By: **Brian Wade** Signature: Brian Wade

Revised 02/27/03

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# ACCESS REQUEST to FACILITY RECORD IN CERS - SINGLE FACILITY*

For more information, see: http://www.sbcfire.org/hazmat/efile.aspx or call CERS help line (909) 386-8432

The purpose of the ACCESS REQUST is to ensure that only individuals designated by the facility owner/operator are authorized by the CUPA to access facility records and to create, edit, and submit electronic data on the owner's behalf to the statewide system, known as the California Environmental Reporting System (CERS). The initial business user authorized by the CUPA to have access to a facility on CERS is designated as a lead business user. Lead business users have the ability to add additional lead or standard business users, approve or reject other access requests, or delete other users for any facility for which they are listed as a lead user.

**AUTHORIZED LEAD BUSINESS USER**

| Name | Title |
|---|---|
| Luke Huizenga | Manager |
| **Email Address** | **Contact Phone** |
| Lukrishuiz@verizon.net | (951)205-5871 |

| OWNER NAME | OWNER EMAIL ADDRESS |
|---|---|
| Paul Huizenga | pdhuizenga@yahoo.com |

| OWNER MAILING ADDRESS | CITY | STATE | ZIP CODE | OWNER PHONE |
|---|---|---|---|---|
| 7587 Edison Ave. | Ontario | CA | 91762 | (909)597-5124 |

**Fill out the following information for the facility**

| FACILITY ID *(e.g., FA0123456)* | FACILITY NAME *(e.g., CUPA AUTO)* | SITE ADDRESS *(e.g., 123 N. MAIN ST.)* | CITY *(e.g., ANYTOWN)* |
|---|---|---|---|
| FA0011003 | Huizenga Dairy | 7587 Edison Ave. | Ontario |

✓ **I authorize the person and email address listed above to be a lead business user for the listed facility. This includes the ability to create, edit, and submit compliance data for the listed facility. I understand that as a lead business user this person may approve additional lead business users or standard business users, grant or reject facility access requests, and delete users from the facility listed on this authorization form.**

***Certification – I certify that I am the owner/operator or legal representative of the facility listed on this form. I understand that compliance documents prepared or submitted electronically are held to the same standard as their former paper equivalents.***

| SIGNATURE OF OWNER/OPERATOR OR LEGALLY DESIGNATED REPRESENTATIVE | DATE | NAME OF DOCUMENT PREPARER |
|---|---|---|
| [signature] | 3-19-13 | Luke Huizenga |
| **NAME OF SIGNER (print)** | **TITLE OF SIGNER** | |
| PAUL A. HUIZENGA | OWNER | |

*Each facility record that is entered into CERS is assigned to a business/organization. Multiple facilities that have the same owner/operator and that will have the same users managing the facility record in CERS can be grouped together into a single "umbrella" business/organization. If you own or operate multiple facilities and if the same users will be managing all of the facilities in CERS, you may want them to be grouped into a single business/organization. For more information please contact the San Bernardino CERS help line at (909) 386-8432.

Return completed form by Mail: San Bernardino County Fire Department, Hazardous Materials Division, 620 South E Street, San Bernardino, CA 92415-0153 or Fax: (909) 386-8460 or Email: Efile@sbcfire.org

OFFICE USE Notes: Initiated

Form Revised 11/14/12 Completed by: [signature] Date: 3-19-13

OFFICE USE ONLY: DATE STAMP

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0011003 Facility Name: Huizenga Dairy Inspection Date: 2/19/13

Site Address: 7587 Edison Ave. Phone #:

City: Ontario Zip Code: 91761 EPA ID #: Not req'd

Consent Granted by:

☒ Inspect ☐ Photograph Name: Paul Huizenga Title: Owner # Emp:

Refer to Title 19 and Title 22 of the California Codes of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | |
| 107. Contingency Plan established | CCR 66265.51(a) | | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | X | |
| 202. Business Plan established | CHSC 25503.5 | X | | |
| 203. Business Plan submitted/updated | CHSC 25505 | X | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | X | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |

**INSPECTION NARRATIVE**

An inspection was conducted to determine compliance with hazardous materials laws and regulations. I met with Paul Huizenga for the inspection.

This dairy uses chemicals for cleaning and disinfecting cows in the milking process.

They have three 500 gallon diesel fuel tanks, two 200-300lb drums of Pride chlorinated caustic detergent, and one 55 gallon drum of formaldehyde.

See next page

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] Sign Name — Duane Pianalto Print Name

Received By: [signature] Sign Name — PAUL HUIZENGA Print Name

Title:

Report Date: 2/19/13

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: 2/19/13

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0011003 | Huizenga Dairy | 7587 Edison Ave., Ontario |
| Consent Granted by: ☒ Inspect ☐ Photograph | NAME Paul Huizenga | TITLE Owner |

Violations to be corrected within 30 days:
202. Failure to establish a Business Plan.
203. Failure to submit the Business Plan
The Business Plan is required to be established and submitted annually. There is currently no Business Plan on file.
Compliance Requirement: using the California Environmental Reporting System (CERS) submit the Business Plan within 30 days from today. Submit a signed Certificate of Compliance to this office upon completion of the Business Plan.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) Duane Pianetto (Print Name)
Received By: [signature] (Sign Name) PAUL HUIZENGA (Print Name)
Title:
Report Date: 2/19/13

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden


February 05, 2008

HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**ATTN: PAUL HUIZENGA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0011003-HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

MR. HUIZENGA,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 09, 2007:

- Failure to establish a Business Plan

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

Handler

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

December 17, 2007

PAUL HUIZENGA
7587 EDISON AV
CHINO, CA 91710-9171

**ATTN: PAUL HUIZENGA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0011003-HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

MR. HUIZENGA,

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If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
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December 17, 2007

PAUL HUIZENGA
7587 EDISON AV
CHINO, CA 91710-9171

**ATTN: PAUL HUIZENGA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0011003-HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

MR. HUIZENGA,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 09, 2007:

- Failure to establish a Business Plan

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

County of San Bernardino
**OFFICE OF THE FIRE MARSHAL**
**Hazardous Materials Division**
620 South "E" Street
San Bernardino, CA 92415-0153

Recycled

*Return Service Requested*

RECEIVED
DEC 27 2007
S.B. CO. FIRE DEPT.

REPORTED FIRST CLASS

SAN BERNARDINO DEC 19'07 CA

00.36 :
H METER 711319

NIXIE 917 9C 1 70 12/20/07
RETURN TO SENDER
NO SUCH NUMBER
UNABLE TO FORWARD
BC: 924150153 *1009-01542-20-09

9171 [illegible] 0153

# HUIZENGA DAIRY

7587 EDISON AVE.
ONTARIO, CA 91762

OFFICE (909) 597-4695
MOBILE (909) 241-3694
FAX (909) 597-7164

California DAIRIES inc.

FA 11003

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: New Facility Name: Huizenga Dairy Inspection Date: May 9, 2007

Site Address: 7587 Edison Ave Phone #: (909) 597-4695

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by: ☒ Inspect ☒ Photograph Name: Paul Huizenga Title: Owner # Emp: 8 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires handler permit

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31)

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (2) 30-gal drum chlorinated powder soap
(2) 20-gal Dyne detergent germicide
(3) 500-gal AST's Diesel (1) 55 gal drum oil
(7) 55-gal drums formaldehyde (used in foot bath)

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2))

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) NA - does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) NA

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) NA

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) NA

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) NA

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) NA

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) NA

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) NA

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) NA

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) NA

**Compliance Requirement**: Submit copies of waste disposal records for the past

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) NA

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy milk production. Equipment is serviced by Kent Avery Repair, Inc.

Inspected By: [signature] (Sign Name) Leslie Heavside (Print Name)

Received By: [signature] (Sign Name) PAUL A. HUIZENGA (Print Name) Title: Owner

Report Date: May 9, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Paul Huizenga Dairy** Facility ID #: **NEW**

Address: **7587 Edison Avenue, Ontario**

1) Description: **Sign at front of dairy**

2) Description: **(1) 30-gallon drum of chlorinated powder soap**

Date Taken: **May 9, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

PHOTO 4

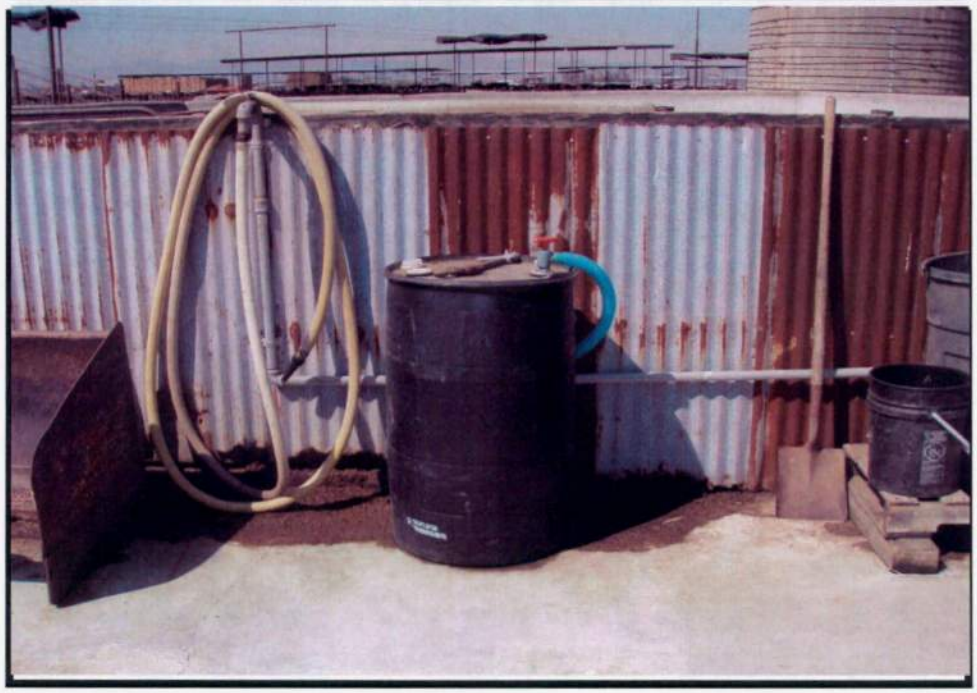

Facility/Case Name: **Paul Huizenga Dairy** Facility ID #: **NEW**

Address: **7587 Edison Avenue, Ontario**

3) Description: **(3) 500-gallon AST's of Diesel**

4) Description: **(1) 55-gallon drum of formaldehyde (used in foot bath)**

Date Taken: **May 9, 2007**

Taken By: **Leslie Heaviside** Signature: Lidei

Revised 10/12/2000

TRACKING SHEET FOR BUSINESS PLANS

*Establishment #*

*Facility Name:*

*Facility Site Address:*

*City:*

*Fire Agency:*

| _____(# of copies) | | Sent to FD |
|---|---|---|
| Business Plans Received | ___/___/___ | ___/___/___ |
| Results of Review(s) | | |
| Deficiency | | ___/___/___ |
| Conditional Approval | | ___/___/___ |
| Approval | | ___/___/___ |
| | | Sent to FD |
| Revised Plans Received | ___/___/___ | ___/___/___ |
| | ___/___/___ | ___/___/___ |

| Other Date | Action/Documentation (update, new plan, etc.) | Staff hours |
|---|---|---|
| ___/___/___ | | |
| ___/___/___ | | |
| ___/___/___ | | |
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| ___/___/___ | | |

California Environmental Reporting System: Regulator

Donna Juday's Account Sign Out Tools Reports Help

Submittals Facilities Businesses Regulators Compliance Responders Reports

# Business Owner/Operator Identification: TiVa DAIRY

Home » Submittal Search » Submittal: 1/30/2020 (10052128) » Facility Information: Business Owner/Operator Identification (Accepted)

**Submittal Element History**

Submitted for CERS ID 10052128 on 1/30/2020 11:56AM by *Betsy Hunter-Binns* of TIVA DAIRY (ONTARIO, CA)
Submittal was ***Accepted*** on 2/4/2020 by *Rose Marie Bruhn* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Rose Marie Bruhn at rbruhn@sbcfire.org or (909) 386-8401.

Return to Submittal

**Site Address**

TiVa DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**Identification**

Dickie Vander Meulen

Operator Phone: (951) 202-8787
Business Phone: (951) 202-8787
Business Fax: () -

Beginning Date: -
Ending Date: -

Dun & Bradstreet: -
SIC Code: -
Primary NAICS: -

**Facility/Site Mailing Address**

14382 Bethany Ave
Chino, CA 91710

**Owner**

DICKIE VANDERMEULEN
Phone
(951) 202-8787
Mailing Address
14382 Bethany Ave
Chino, CA 91710

**Billing Contact**

DICKIE VANDERMEULEN
Phone
(951) 202-8787
tivadairy@gmail.com
Mailing Address
14382 Bethany Ave
Chino, CA 91710

**Primary Emergency Contact**

Dickie Vander Meulen
Title
Partner- Operator
Business Phone: (951) 202-8787
24-Hour Phone: (951) 202-8787
Pager Number: -

**Secondary Emergency Contact**

Harold Tillema
Title
Partner
Business Phone: (909) 226-1160
24-Hour Phone: (909) 226-1160
Pager Number: -

**Environmental Contact**

Dickie Vander Meulen
(951) 202-8787
tivadairy@gmail.com
Mailing Address
14382 Bethany Ave
Chino, CA 91710

Name of Signer: dickie vandermeulen
Title of Signer: Partner
Name of Document Preparer: dickie vandermeulen
Additional Information: -

**Locally-collected Fields**

Some or all of the following fields may be required by your local regulator(s).

**Property Owner**

[No Name Provided]
Phone
() -
Mailing Address
-
, - - -

Assessor Parcel Number (APN): -
Number of Employees: 6
Facility ID Number (Regulator-provided): FA0011003

**Created By:** Betsy Hunter-Binns on 1/30/2020 11:56 AM
**Last Updated By:** Betsy Hunter-Binns on 1/30/2020 11:56 AM

Return to Submittal

Version 3.05.0004 | Enhancements | CERS Central

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CERS Technical Support: Request Technical Assistance

CERS Help Settings Notifications

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

0010675

- [ ] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [x] Other Change of Ownership (see attachment)
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [x] Demand Bill

### OWNER INFORMATION
OWNER ID: OW0009237 OW0009163

NAME: PAUL HUIZENGA

ADDRESS: 7587 EDISON AV ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91710-9171 COUNTRY: US

PHONE: 909-597-4695 EXT: FYI LAST UPDATED: 06/13/2018

### FACILITY INFORMATION
FACILITY ID: FA0011003

BUSINESS NAME: HUIZENGA DAIRY CERS ID:10052128

SITE ADDRESS: 7587 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 FAX: 909-597-5110

BUSINESS PHONE: 909-597-4695 EXT:

BUSINESS OPERATOR NAME: Paul Huizenga Dairy

OPERATOR PHONE: 909-597-5124 EXT: FYI LAST UPDATED: 06/14/2018

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: 7587 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

### BILLING CONTACT
ACCOUNT ID: AR0012473 AR0023220

BILLING CONTACT NAME: PAUL HUIZENGA

ADDRESS 1: 7587 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: US

PHONE: 909-597-4695 EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: Luke Huizenga PHONE: 909-597-5110 EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL): PHUIZE5111@AOL.COM

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: INDIVIDUAL * BUSINESS TYPE: FARM

* SUPERVISORIAL DISTRICT: 004 * INSPECTION DISTRICT: 03 * FIRE JURISDICTION: ONTARIO FIRE

FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 11/30/2007 FYI LAST BILLING: 10/16/2018

FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 0.00

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Motor Vehicle Fuel, 02-Fuel Distributor, 03-Farm, 04-Processor, 05-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| Date Initials | Date Initials | Date Initials | Date Initials |

JUN 06 2019

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0029980 | INACTIVE | 4029-APSA FARM/CONSTRUCTION C | 12/01/2015 | 11/30/2016 |
| | | | GHP OR UST ID: PR0038862 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0018968 | ACTIVE | 4241-HAZARDOUS MATERIALS 1-3 C | 12/01/2018 | 11/30/2019 |
| | | | GHP OR UST ID: PR0017868 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 5/16/2019 SUBMITTED BY: Alexandra Rodriguez

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

C Mz data exchanged on 05/16/2019-yr

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection conducted on 05/01/2019, Huizenga Dairy ceased operations in late 2018, and Tiva Dairy took over operations. Hazardous Materials pertaining to the previous owner are no longer at this location with the exception of (3) 500-gallon Diesel Tanks. Tiva Dairy will now be responsible for permit payment.

- -Keep same FA and assign new owner ID
- -Change anniversary date
- -No changes in permits or operations

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

Demand bill IN0139323

Due 7-31-19

AZ 6-17-19

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

FOR INFO ONLY

- [ ] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [x] Other Change of ownership
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID:

NAME: Dickie Vandermeulen

ADDRESS: 14382 Bethany Ave. ADDRESS 2: 14761 Carpenter Ave., Ontario, Ca 91762

CITY: Chino STATE: CA ZIP CODE: 91710 COUNTRY: US

PHONE: 951-202-8787 EXT: FYI LAST UPDATED:

### FACILITY INFORMATION — FACILITY ID: FA0011003

BUSINESS NAME: Tiva Dairy CERS ID: 10052128

SITE ADDRESS: 7587 Edison Ave. ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 FAX:

BUSINESS PHONE: 951-202-8787 EXT:

BUSINESS OPERATOR NAME: Tiva Dairy

OPERATOR PHONE: 951-202-8787 EXT: FYI LAST UPDATED:

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: 14382 Bethany Ave. ADDRESS 2:

CITY: Chino STATE: CA ZIP CODE: 91710 COUNTRY: US

### BILLING CONTACT — ACCOUNT ID:

BILLING CONTACT NAME: Same As Above

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

PHONE: EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: Same As Above PHONE: EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL): TIVADAIRY@GMAIL.COM

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: * BUSINESS TYPE:

* SUPERVISORIAL DISTRICT: * INSPECTION DISTRICT: * FIRE JURISDICTION:

ACCOUNT STATUS: ANNIVERSARY DATE: FYI LAST BILLING:

EXEMPT FROM BILLING: TOTAL DUE:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Motor Vehicle Fuel, 02-Fuel Distributor, 03-Farm, 04-Processor, 05-Other

### FOR OFFICE USE ONLY:

| | Date | Initials |
|---|---|---|
| [ ] EC Entry Complete | | |
| [ ] QC Complete | | |
| [ ] [ ] Fiscal Entry Complete (N/A) | | |
| [ ] [ ] Referral to Team CERS (N/A) | | |

# N BERNARDINO COUNTY CUP/
## FACILITY INFORMATION

0010675

☐ Update/Assign PEs ☐ Referral to Team CERS ☐ Closure ☐ Invoice Reversal ☐ Demand Bill
☐ Update Non-CERS Fields ☐ 0202 ☐ Other ☐ 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0009237**

NAME: **PAUL HUIZENGA** Dickey vander meulen

ADDRESS: ~~7587 EDISON AV~~ 14382 Bethany st. ADDRESS 2:

CITY: **CHINO** STATE: **CA** ZIP CODE: **91710-9171** COUNTRY: **US**

PHONE: **909-597-4695** EXT: FYI LAST UPDATED: **06/13/2018**

**FACILITY INFORMATION** — **FACILITY ID: FA0011003**

BUSINESS NAME: ~~HUIZENGA DAIRY~~ tivadairy@gmail CERS ID: **10052128**

SITE ADDRESS: **7587 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** FAX: **909-597-5110**

BUSINESS PHONE: **909-597-4695** EXT:

BUSINESS OPERATOR NAME: **Paul Huizenga Dairy**

OPERATOR PHONE: **909-597-5124** EXT: FYI LAST UPDATED: **06/14/2018**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **7587 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

**BILLING CONTACT** — **ACCOUNT ID: AR0012473**

BILLING CONTACT NAME: **PAUL HUIZENGA**

ADDRESS 1: **7587 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **US**

PHONE: **909-597-4695** EXT: EMAIL:

**ENVIRONMENTAL CONTACT**

NAME: **Luke Huizenga** PHONE: **909-597-5110** EXT:

EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL): **PHUIZE5111@AOL.COM**

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: **INDIVIDUAL** * BUSINESS TYPE: **FARM**

* SUPERVISORIAL DISTRICT: **004** * INSPECTION DISTRICT: **03** * FIRE JURISDICTION: **ONTARIO FIRE**

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **11/30/2007** FYI LAST BILLING: **10/16/2018**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

| | | | |
|---|---|---|---|
| ☐ EC Entry Complete | ☐ QC Complete | N/A ☐ ☐ Fiscal Entry Complete | N/A ☐ ☐ Referral to Team CERS |
| Date Initials | Date Initials | Date Initials | Date Initials |

# AN BERNARDINO COUNTY CUP
## FACILITY INFORMATION

☒ Update/Assign PEs ☐ Referral to Team CERS ☐ Closure ☐ Invoice Reversal ☐ Demand Bill
☒ Update Non-CERS Fields ☐ 0202 ☐ Other ☐ 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0009237**

NAME: **PAUL HUIZENGA**
ADDRESS: **7587 EDISON AV** ADDRESS 2:
CITY: **CHINO** STATE: **CA** ZIP CODE: **91710-9171** COUNTRY: **USA**
PHONE: **909-597-4695** EXT: FYI LAST UPDATED: **08/06/2015**

**FACILITY INFORMATION** — **FACILITY ID: FA0011003**

BUSINESS NAME: **HUIZENGA DAIRY** CERS ID: **10052128**
SITE ADDRESS: **7587 EDISON AVE** ADDRESS 2:
CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** FAX:
BUSINESS PHONE: **909-597-4695** EXT:
BUSINESS OPERATOR NAME: **PAUL HUIZENGA**
OPERATOR PHONE: EXT: FYI LAST UPDATED: **12/23/2015**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **7587 EDISON AVE** ADDRESS 2:
CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

**BILLING CONTACT** — **ACCOUNT ID: AR0012473**

BILLING CONTACT NAME: **PAUL HUIZENGA**
ADDRESS 1: **7587 EDISON AVE** ADDRESS 2:
CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**
PHONE: **909-597-4695** EXT: EMAIL:

**ENVIRONMENTAL CONTACT**

NAME: PHONE: EXT:
EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL): phuize5111@aol.com
LOCAL FACILITY PHONE (OPTIONAL): EXT:
CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: **INDIVIDUAL** BUSINESS TYPE: **FARM**
SUPERVISORIAL DISTRICT: **004** INSPECTION DISTRICT: **03** FIRE JURISDICTION: **ONTARIO FIRE**
FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **11/30/2007** FYI LAST BILLING: **10/15/2015**
FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=** 01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

ENTERED APR 28 2016

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ☐ | Entry Complete | ☐ | QC Complete | N/A ☐ | ☐ Fiscal Entry Complete | N/A ☐ | ☐ Referral to Team CERS | | |
| Date | Initials | Date | Initials | Date | Initials | Date | Initials | Date | Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE | PT0029980 | ACTIVE | 4029-APSA FARM/CONSTRUCTI | 12/01/2015 | 11/30/2016 |
| | | | GHP OR UST ID: PR0038862 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0018968 | ACTIVE | 4241-HAZARDOUS MATERIALS | 12/01/2015 | 11/30/2016 |
| | | | GHP OR UST ID: PR0017868 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☒ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

5011

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S **0**

DATE SUBMITTED: 4-26-16 SUBMITTED BY: Brian Wade

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

This facility is a dairy which stores less than 2,500 gallons of petroleum on site and is thus not subject to APSA regulations. Inactivate APSA PE 4029. Update Admin PE to 5011.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

Info update

# HAZA OUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: F

## O- OWNER INFORMATION

OWNER ID: OW0009237

NAME: PAUL HUIZENGA

ADDRESS 1: 7587 EDISON AV

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

COUNTRY: USA

PHONE: 909-597-4695

EXT:

FAX:

ALT PHONE: 909-241-3694

EXT:

DRIVER LICENSE:

TAX ID: 33-0834181

LAST UPDATED:

### OWNER MAILING ADDRESS

CARE OF: PAUL HUIZENGA

DBA: HUIZENGA DAIRY

ADDRESS1: 7587 EDISON AV

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91762

COUNTRY: USA

## F- FACILITY INFORMATION

FACILITY ID: FA0011003

NAME: HUIZENGA DAIRY

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

CITY CODE: ONTARIO

SIC CODE:

BUSINESS CODE: INDIVIDUAL

BUSINESS TYPE: FARM

CENSUS:

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: 03

PHONE: 909-597-4695

EXT:

FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 06/14/2007

### FACILITY MAILING ADDRESS

BUSINESS NAME: HUIZENGA DAIRY

CARE OF: PAUL HUIZENGA

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

COUNTRY: USA

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0012473

RESPONSIBLE PARTY: PAUL HUIZENGA

CARE OF: HUIZENGA DAIRY

ADDRESS 1: 7587 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

COUNTRY: USA

PHONE: 909-597-4695

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 01/04/2008

ALT PHONE:

EXT:

EXEMPT FROM BILLING: NO

TAX ID:

ANNIVERSARY DATE: 07/31/2007

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| UPDATE/CLOSE/Z.O.B. | PT001896 | ACTIVE | 4221 | ./01/2007 | 07/31/2008 |
|---|---|---|---|---|---|
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |

| PR0017868 | ACTIVE, BILLABLE | NA | NA | |
|---|---|---|---|---|
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. _____ NUMBER OF ACTIVE UST'S 0 MFR # _____

DATE SUBMITTED: 2-5-08 DATE ENTERED: 1/8/08 FISCAL DATE: _____

SUBMITTED BY: Leslie Heaviside ENTERED BY: CW

**COMMENTS/REMARKS:**

per Envision review: owner mailing address incorrect. Update city & zip.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:2 AR:0.00

**HUIZENGA DAIRY**
**PAUL HUIZENGA**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**This Unified Permit is hereby issued to:**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2014** **Expiration Date: 11/30/2015**

**CUPA Facility Type: 5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0029980 | 4029 APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT | PR0038862 |
| PT0018968 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0017868 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   Note: The UST ID Number is listed on the front of the permit for each UST

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Fire Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part2, Chapter 1,Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4 Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:3 AR:0.00

**ATTN :** **PAUL HUIZENGA**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**This Unified Permit is hereby issued to:**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2013** **Expiration Date: 11/30/2014**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0029980 | 4029 APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT | PR0038862 |
| PT0018968 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0017868 |
| PT0029981 | 5012 CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2 | PR0038863 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4, Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

**ATTN :** **PAUL HUIZENGA**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**This Unified Permit is hereby issued to:**
**HUIZENGA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2012** **Expiration Date: 11/30/2013**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

As a condition of the permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2011** **Expiration Date: 11/30/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Mark A. Hartwig, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.**

**Effective Date: 8/1/2010** **Expiration Date: 7/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Danny R. Wurl

**Danny R. Wurl, Fire Chief**

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.

**Effective Date: 8/1/2009** **Expiration Date: 7/31/2010**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.

**Effective Date: 8/1/2008** **Expiration Date: 7/31/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : PAUL HUIZENGA
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
HUIZENGA DAIRY
7587 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0011003 for a period not to exceed one year from effective date.

Effective Date: 8/1/2007 Expiration Date: 7/31/2008

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018968 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017868 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

12-20962-638 Rev. 9/06

7325 EDISON AVE / 1053-391-01 SFR 3

7371 EDISON AVE / “ “

7397 EDISON AVE / “ “

7587 EDISON AVE / 1053-371-01 DAIRY

7697 EDISON AVE / N/A

14306 BON VIEW AVE / N/A

14316 BON VIEW AVE / N/A

14330 BON VIEW AVE / N/A

14451 BON VIEW AVE / N/A

14366 BON VIEW AVE / N/A

7556 EUCALYPTUS AVE / 1053-581-03 GRAZING

7634 EUCALYPTUS AVE / N/A

| | | | | | |
|---|---|---|---|---|---|
| ✓ 88015443 | MELLO & SOUSA/SNS DAIRY | 7325 | EDISON AVE | | CHINO |
| ✓ FA0000648 | SNS DAIRY | 02 | 7371 EDISON AVE | | ONTARIO |
| ✓ FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | | ONTARIO |
| ✓ FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | | ONTARIO |
| ✓ 90020263 | QUALITY BUILT FIBERGLASS | 14316 | BON VIEW | | CHINO |
| ✓ FA0000393 | COSTA VIEW FARM | 02 | 14451 BON VIEW | | ONTARIO |

*EMAILED GRM TO SCAN FILES 2/13/24 CR

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

Fiscal

# HA RDOUS MATERIAL FIELD SER ES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

Quick Submit-Correct minor information without full verification. Grace request Inactivate PEs NON/NON

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A CURRENT INVOICE MAILING CODE: A

## O- OWNER INFORMATION — OWNER ID: OW0000369

Legal Owner

*NAME: BOOTSMA, GARRET

*ADDRESS 1: 7721 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *COUNTRY: USA

*PHONE: EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 08/27/2007

TAX ID: DRIVER LICENSE:

### OWNER MAILING ADDRESS

Same as Owner

CARE OF: DBA: BOOTSMA, GARRET

ADDRESS1: 7721 EDISONAVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

## F- FACILITY INFORMATION — FACILITY ID: FA0000454

*NAME: G BOOTSMA & SON'S

*ADDRESS 1: 7721 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

CENSUS: MILITARY SCHOOL MEDICAL *BUSINESS CODE: *BUSINESS TYPE:

SIC CODE: *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03

*PHONE: EXT: FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE: EXT: FAX: FYI LAST UPDATED: 01/18/2008

### FACILITY MAILING ADDRESS

Same as Facility

Same as Owner Mailing Address

BUSINESS NAME: G BOOTSMA & SON'S

CARE OF: GARRET BOOTSMA

ADDRESS 1: 7721 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION — ACCOUNT ID: AR0000456

Same as Owner Mailing Address Same as Facility Mailing Address

RESPONSIBLE PARTY: GARRET BOOTSMA

CARE OF: G BOOTSMA & SON'S

ADDRESS 1: 7721 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

PHONE: 909-597-6121 EXT: TAX ID: DRIVER LICENSE:

ALT PHONE: EXT: FYI EXEMPT FROM BILLING: NO FYI LAST UPDATED: 04/06/2009

ALT PHONE: EXT: FYI TOTAL DUE: 843.00

FYI ANNIVERSARY DATE: 04/30/1997 FYI ACCOUNT STATUS: ACTIVE ACCOUNT

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to **complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☒ ZERO OUT BALANCE | PT000895 | ACTIVE | 4221 | 5/01/2008 | 04/30/2009 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009818 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ☐ UPDATE<br>☒ INACTIVATE<br>☒ ZERO OUT BALANCE | PT0008932 | ACTIVE | 4420 | 05/01/2008 | 04/30/2009 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009819 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E. 0202

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP.: 2 NUMBER OF ACTIVE UST'S 0 MFR #

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? Yes (No)

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? Yes (No)

*DATE SUBMITTED: 4-16-09 DATE ENTERED: 4/21/09 FISCAL ENTRY DATE/ INITIAL: 4-30-09 BL

*SUBMITTED BY: Leslie Heaviside ENTERED BY: P Wilson ***Demand bill for updated PEs**: Yes (No)

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection: facility handles hazardous materials in quantities below 55 gallons & does not generate waste. Inactivate PE's and reverse invoice IN 53475.
assign 0202

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

*IN0053475843.00*

Please make your check payable to:
**San Bernardino County Fire Department**
Send to:
**157 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 387-9603**

**Facility Address**
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91761

| Invoice ID | Facility ID |
|---|---|
| IN0053475 | FA0000454 |

# INVOICE
## HAZARDOUS MATERIALS
## CUPA PERMITS

**Invoice Date** 3/17/09

**Total Account Balance** $ 843.00

**Total Due for Invoice** $ 843.00

**Total Paid**

TO : GARRET BOOTSMA
7721 EDISON AVE
ONTARIO, CA 91762

ATTN : G BOOTSMA & SON'S

☐ Change of Billing Address (see back)

Upon receipt of full payment of the balance due as shown on this invoice, you will receive your new annual permit with an effective date of: 5/1/2009 to 4/30/2010

PLEASE RETURN TOP PORTION WITH PAYMENT

| Program/ Element | Qty | Description | Permit Exp Date | | Amount |
|---|---|---|---|---|---|
| 4221 | 1 | HAZMAT HANDLER 0-10 EMPLOYEES | 4/30/10 | $ | 408.00 |
| 4420 | 1 | SPECIAL GENERATOR(B) | 4/30/10 | $ | 411.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | 4/30/10 | $ | 24.00 |
| | | | Total Due for This Invoice: | $ | 843.00 |

WE NO LONGER NEED A HAZARDOUS MATERIAL PERMIT
PLEASE UPDATE YOUR RECORDS.
THANK YOU,
951-218-3502

**ALL FEES ARE NOW DUE**
**PLEASE SUBMIT FULL PAYMENT BEFORE 4/30/2009**
**TO AVOID A 35% DELINQUENT FEE**
**THANK YOU.**

| 1-30 Days | 31-60 Days | 61-90 Days | 91-120 Days | 121+ Plus | Total Account Bal |
|---|---|---|---|---|---|
| $ 843.00 | $ 0.00 | $ 0.00 | $ 0.00 | $ 0.00 | $ 843.00 |

*IN0053475843.00*

**Permits are not transferable, you must contact this office for new permits.**
**If you have any questions regarding this bill, please call San Bernardino County Fire Department at (909) 387-9603.**

STREET NUMBER

STREET NAME

STE OR UNIT No

CITY NAME

STATE

ZIP CODE

ATTENTION

RCD SDD PRE FISCAL
09 APR 22 PM 3:22

**Hazardous Materials Division**

**Fee Change Authorization Form**

☐ RUSH -NEED BY _____ ☑ PRIORITY-NEED BY 4/10/09 ☐ FYI-PLEASE REVIEW ☐ OTHER _____

**FACILITY INFORMATION**

COMPLETED

NAME: G BOOTSMA & SON'S FACILITY ID: FA0000454

ADDRESS: 7721 EDISON AVE

CITY: ONTARIO STATE: CA ZIP CODE: 91761

PHONE: EXT: FAX:

ALT PHONE: EXT: LOCATION(INSPECTOR DISTRICT): 03

CONTACT PERSON: CITY CODE: ONTARIO DISTRICT(SUPERVISORIAL DISTRICT): 004

ANNIVERSARY DATE: 4/30/1997 12:00:00AM ACCOUNT STATUS: ACTIVE ACCOUNT

NUMBER OF EMP. NUMBER OF UST'S 0 MFR #

**ACTION REQUIRED**

☑ REQUEST VERIFICATION ☑ REQUEST FACILITY INSPECTION

☑ INACTIVATE / CLOSED ACCOUNT / O.O.B. ☑ REQUEST TO REVERSE OUTSTANDING INVOICE

COMMENTS: per fa NO HazMat on site

(See Attached)

REQUESTED BY: APPROVED BY: Rebekah Matteson

**PERMIT INFORMATION**

PROGRAM ELEMENT

PROGRAM ELEMENT

PROGRAM ELEMENT

PROGRAM ELEMENT

PROGRAM ELEMENT

RECEIVED 3/27/09

DATE SUBMITTED: 3/27/09 SUBMITTED BY: REBEKAH MATTESON

ADDITIONAL COMMENTS: Permits no longer required. Lexie Heaviside

4/1/09 SW → ch NS

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:0 AR:0.00

G BOOTSMA & SON'S
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0000454 for a period not to exceed one year from effective date.

Effective Date: 5/1/2009 Expiration Date: 4/30/2010

| Permit Number | Program-Element | Related ID |
|---|---|---|
| PT0008931 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009818 |
| PT0008932 | 4420 SPECIAL GENERATOR(B) | PR0009819 |

SAN BERNARDINO COUNTY
FIRE DEPT

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

G BOOTSMA & SON'S
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
G BOOTSMA & SON'S
7721 EDISON AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0000454 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2008** **Expiration Date: 4/30/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008931 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009818 |
| PT0008932 | 4420 SPECIAL GENERATOR(B) | PR0009819 |

Printed on 4/18/2008
Reconstructed by MIS on 8/12/2008

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Daniel R. Munsey
Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal/Deputy Fire Warden


October 14, 2021

21092805 Ontario-Chino RAL Ardent Env..

**ARDENT ENVIRONMENTAL GROUP, INC.**
**1876 CAPITAL STREET, SUITE 103**
**CORONA, CA 92880**

**ATTENTION:** **KASIA ANDERSON**

**SUBJECT:** **CERTIFIED RECORD SEARCH FINDINGS**
**7721, 7891, AND 8061 EDISON AVENUE; 14400 GROVE AVENUE; 14213, 14283, 14297, 14333, 14343, 14450, AND 14451 BON VIEW AVENUE, ONTARIO (CHINO), CALIFORNIA**

This is to confirm that the San Bernardino County Hazardous Materials Division has identified records that may pertain to the subject site, as described in your request for records search.

The file(s) shown below have been retrieved for review. If you wish to view the original documents, please e-mail this office at hazmatrecords@sbcfire.org or call the number at the end of this letter to arrange an appointment.

**ACTIVE PERMIT FACILITIES:** (Regulatory files for facilities with annual operating permits to maintain underground storage tanks, handle hazardous materials, and/or generate hazardous waste. Files include permits, inspections, reports, test results, correspondence, and related materials. Files will also include any underground tank removal/construction activity records and site remediation/contamination records for facilities still in operation).

| | |
|---|---|
| Gordon Hay Inc. Dairy #3<br>14213 S. Bon View Ave.<br>Ontario | FA0014875 ~ CERS ID. 10444234<br>Hazardous Materials 4-10 Chemicals Special Handler Permit<br>(Last CERS Submission: 05/08/2019) |
| GH Dairy #4<br>8061 Edison Ave.<br>Ontario | FA0017949 ~ CERS ID. 10741726<br>Hazardous Materials 4-10 Chemicals Handler Permit<br>(Last CERS Submission: 11/4/2019) |

**INACTIVE PERMIT AND/OR NON-PERMIT FACILITIES:** (Inactive regulatory files for formerly permitted facilities that maintained underground storage tanks, stored hazardous materials, and/or generated hazardous waste and/or facilities with underground storage tanks removed and/or materials and waste removed. Files will also include any underground tank removal/construction activity records and site remediation/contamination records for facilities no longer operating underground tanks).

| | |
|---|---|
| H & R Dairy<br>14213 Bon View Ave.<br>Ontario | FA0010971 ~ CERS ID. 10052083<br>Hazmat Handler Permit |


BOARD OF DIRECTORS

| Col. Paul Cook (Ret.) | Janice Rutherford | Dawn Rowe | Curt Hagman | Joe Baca Jr. | Leonard X. Hernandez |
|---|---|---|---|---|---|
| First District | Second District | Vice Chair, Third District | Chairman, Fourth District | Fifth District | Chief Executive Officer |

| | |
|---|---|
| Costa Dimas<br>14213 Bon View Ave.<br>Ontario (Chino) | FA0000395<br>Inactive – No Permits needed. |
| Costa View Farm<br>14451 Bon View<br>Chino (now considered Ontario) | FA0000393 ~ Est. # 87013958<br>Hazardous Material Handler – UST Only Permit<br>Underground Storage Tank (AG) |
| G Bootsma & Son's<br>7721 Edison Ave.<br>Ontario | FA0000454<br>Hazmat Handler Permit<br>Special Generator Permit |
| Jorritsma Dairy<br>8061 Edison Ave.<br>Ontario | FA0000522<br>Hazmat Handler Permit<br>Special Generator Permit |
| Joe Ferreira Jr. Dairy<br>14400 Grove Ave.<br>Chino (now known as Ontario) | FA0000515 ~ Est. # 88015348<br>Agricultural Hazard Material Handler Permit<br>Underground Storage Tanks (2) - AG |

**PERMITS TO REMOVE/INSTALL/MODIFY UNDERGROUND STORAGE TANKS:**

| | |
|---|---|
| Costa View Farm – AG<br>14451 Bon View<br>Chino | Issued 10/27/1998<br>Removal (1) – Removed on 10/28/1998<br>Log # 102798-01 ~ Job Card # 5687 |

- Removal of Underground Storage Tank Letter Closure letter/no further action letter dated 05/05/2000 is located in UST portion of facility file.

| | |
|---|---|
| Joe C. Ferreira Jr. Dairy<br>14400 S. Grove Ave.<br>Chino | Issued 06/10/2004<br>Removal (2) ~ Removed in December 1994<br>Log # 061004-01 ~ Job Card # 7557 |

**HAZARDOUS MATERIAL INCIDENT AND/OR COMPLAINT RESPONSE ACTIVITY:** (other records of spill notifications and/or complaints not listed below may also exist in facility permit files).

| | |
|---|---|
| Joe Ferreira Jr. Dairy<br>14400 Grove Ave.<br>Chino (now known as Ontario) | CO0001007<br>04/15/2004<br>Consultant (Leighton and Associates) had contacted Petra to remove contaminated soil at site. 2 USTS were removed in the past. Became Site Assessment (see below). |

**SITE REMEDIATION:** (Underground Storage Tank Clean-Up under Local Oversight Program or Voluntary Hazardous Waste Clean-Up activity under Local Jurisdiction) (documents may be included in regular active or inactive permit files listed above).

| | |
|---|---|
| Joe Ferreira Jr. Dairy<br>14400 Grove Ave.<br>Chino (now known as Ontario) | RO0001227<br>No soil samples were taken when USTs were removed. Phase I and Phase II Site Assessment reports prepared by Leighton Consulting dated 05/17/2004 are in file. Also |

# CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA 454 Facility Name: Bootsma & Sons Dairy Inspection Date: April 14, 2009
Site Address: 7721 Edison Avenue Phone #: 909-597-6121
City: Ontario Zip Code: 91761 EPA ID #: Not applicable
Consent Granted by:
☒ Inspect ☒ Photograph Name: Jim Bootsma Title: Owner # Emp: 2

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | ✓ |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | ✓ |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | ✓ |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | ✓ |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | ✓ |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | ✓ |
| 107. Contingency Plan established | CCR 66265.51(a) | | | ✓ |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | ✓ |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | ✓ |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | ✓ |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | ✓ |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | ✓ |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | ✓ |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | ✓ |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | ✓ |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | ✓ |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | ✓ |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | ✓ |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | ✓ |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | ✓ |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | ✓ |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | ✓ |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | ✓ |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | ✓ |
| 129. Biennial Report prepared | CCR 66262.41 | | | ✓ |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | ✓ |
| 131. Training documentation complete & available | CCR 66265.16 | | | ✓ |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | ✓ |
| 135. Used oil managed properly | CHSC 25250.4 | | | ✓ |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | ✓ |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | ✓ |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | ✓ |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | ✓ |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | ✓ |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | ✓ |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | ✓ |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | ✓ |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | ✓ |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | ✓ |
| 202. Business Plan established | CHSC 25503.5 | | | ✓ |
| 203. Business Plan submitted/updated | CHSC 25505 | | | ✓ |
| 204. Hazardous Materials release reported | CHSC 25507 | | | ✓ |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | ✓ |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | ✓ |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | ✓ |
| 230. Business Plan implemented | CHSC 25503.5 | | | ✓ |

**INSPECTION NARRATIVE**

An inspection was conducted to verify permit applicability as facility contacted Fiscal Division stating that hazardous materials are no longer present. Jim Bootsma escorted me along the inspection.

Hazardous Materials observed:
(1) 30-gallon drum containing Sodium Hypochlorite
(1) 30-gallon drum containing acid cleaner
(1) 30-gallon drum containing CIP cleaner
Diesel AST previously onsite has been removed (now purchased offsite as needed)
Kent Avery services equipment & removes waste. *Permits will be inactivated *

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Heuvisde (Print Name)
Received By: [signature] (Sign Name) GARRET BOOTSMA (Print Name)
Title: Owner
Report Date: April 14, 2009

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

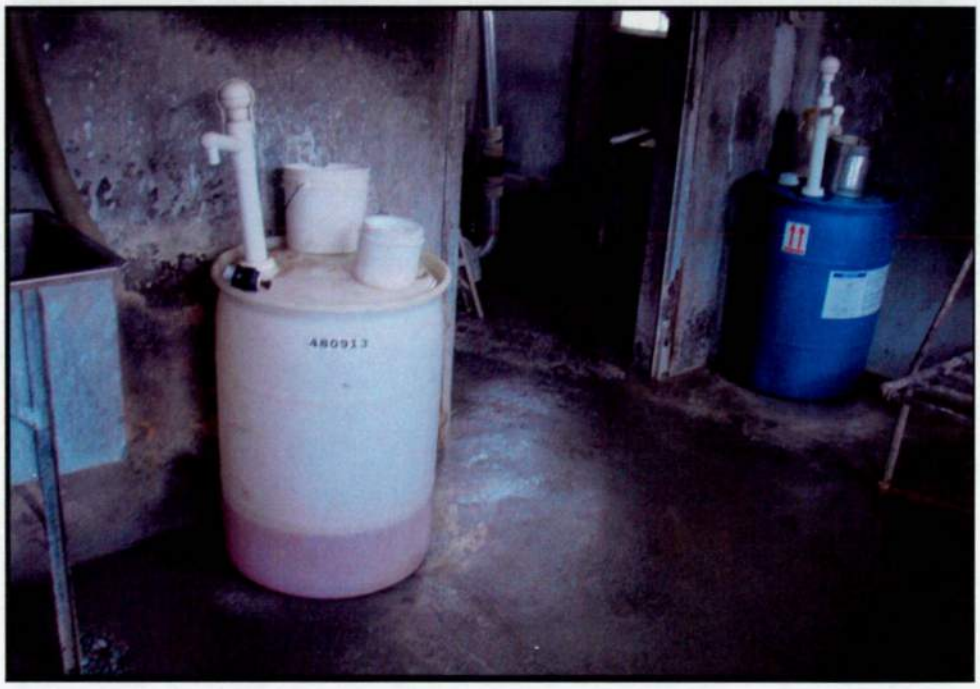


Facility/Case Name: **Bootsma & Sons Dairy** Facility ID #: **FA0000454**

Address: **7721 Edison Avenue, Ontario**

1) Description: **Previous storage location of Diesel AST**

2) Description: **(L to R): (1) 30-gallon drum containing acid cleaner; (1) 30-gallon drum containing Sodium Hypochlorite**

Date Taken: **April 14, 2009**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

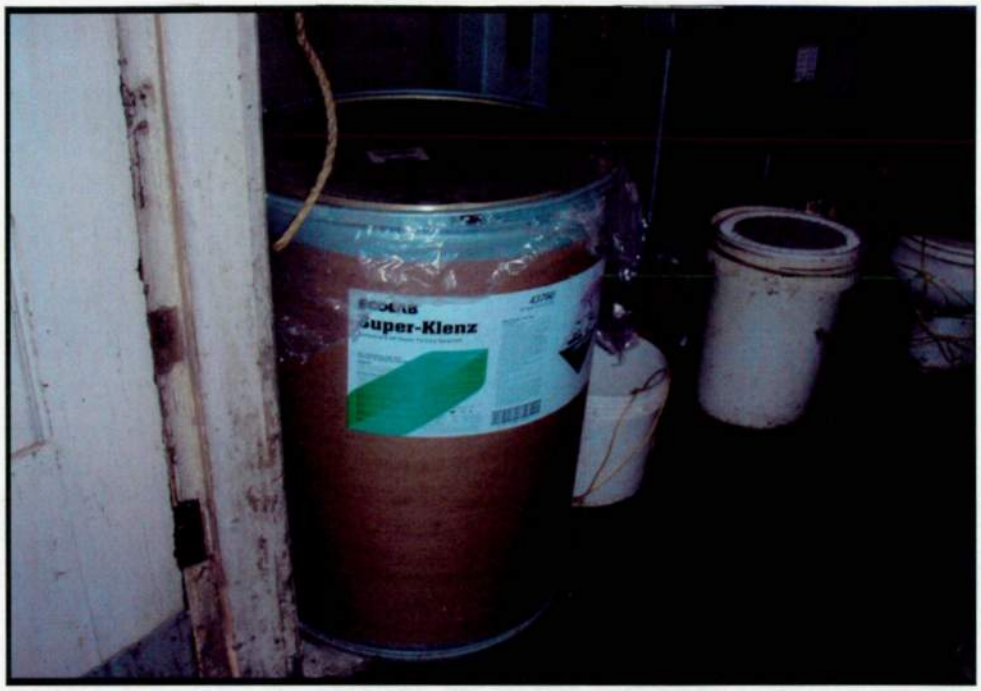


PHOTO 4

Facility/Case Name: **Bootsma & Sons Dairy** Facility ID #: **FA0000454**

Address: **7721 Edison Avenue, Ontario**

3) Description: **(1) 30-gallon drum containing CIP cleaner**

4) Description:

Date Taken: **April 14, 2009**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0004454 Facility Name: Garret Bootsma & Sons Inspection Date: April 17, 2007

Site Address: 7721 Edison Phone #:

City: Ontario Zip Code: 91761 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Gary Bootsma Title: Owner # Emp:

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | X | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | |
| 107. Contingency Plan established | CCR 66265.51(a) | | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR | | | |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | X | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | |
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| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | |
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| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | X | | |
| 202. Business Plan established | CHSC 25503.5 | X | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | X | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |
| 230. Business Plan implemented | CHSC 25503.5 | | | X |

**INSPECTION NARRATIVE**

An inspection was conducted to verify operating status and determine compliance with all applicable hazardous materials and hazardous waste laws and regulations.

Facility is a dairy (milk production)

Hazardous Materials Inventory

(1) 30 gallon drum Acid cleaner

(1) 55 gallon drum Dairy Du (Sodium Hypochlorite)

(2) 55 gallon drums teat dip.

(1) 150 gallon AST Diesel

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Hearnsberger (Print Name)

Received By: [signature] (Sign Name) GARRET BOOTSMA (Print Name)

Title:

Report Date: April 17, 2007

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org**

# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 17, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| A0000454 | Garret Bootsma & Sons | 7721 Edison, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Gary Bootsma | TITLE Owner |

No hazardous waste was observed at the time of inspection. Ken Avery provides repair service on equipment.

Correct the following violations:

(201) Hazardous material handler permit not current - CC 23.0602(b)(3)
Facilities that handle hazardous materials in quantities of 55 gallons or greater require a permit with this department.

To correct this violation: Submit payment upon receipt of invoice.

(202) Business Plan not established - CHSC 25503.5
Facilities that handle permittable quantities of hazardous materials must establish a Business Plan.

To correct this violation: Complete and submit the Business Emergency/Contingency Plan, original and 1 copy. Additionally, keep a copy onsite. Forms provided at time of inspection.

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Heavisides (Print Name)

Received By: [signature] (Sign Name) GARRET BOOTSMA (Print Name)

Title:

Report Date: April 17, 2007

**CUPA**

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 17, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000454 | Garret Bootsma & Sons | 7721 Edison, Ontario |
| Consent Granted by: ☑ Inspect ☑ Photograph | NAME Gary Bootsma | TITLE Owner |

(117) Contaminated containers not managed properly - CCR 66261.7 Empty containers larger than 5 gallons must be labeled as "empty" and the date on which they became empty. Observed several 55-gallon drums that were empty and not labeled properly (in & behind milking parlor and garage area). Empty containers must be removed 1 year from the date they became empty.

To correct this violation: Submit a statement indicating the drums are labeled properly or a copy of the receipt documenting disposal.

Submit requested documentation along with signed Certificate of Compliance within 30 days.

If you have questions, please call (909) 386-8401.

☑ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Heaviside (Print Name)

Received By: [signature] (Sign Name) GARRET BOOTSMA (Print Name)

Title:

Report Date: April 17, 2007

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

Page ____ of ____

**Return Certification within** 30 **Days of Receipt to Inspector** Leslie Hawkins

*In the Matter of Respondent:* _____

*Violation(s) cited on:* _____ *FA #::* _____

*Facility Name:* _____

*Site Address:* _____

*Certificate of Compliance Date:* _____

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| *Signature* | *Date* |
| *Printed or Typed Name* | *Title* |
| *Social Security/Federal ID Number* | *Drivers License/ID Number* |

*Attach the following documentation when returning the Certificate of Compliance:*

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

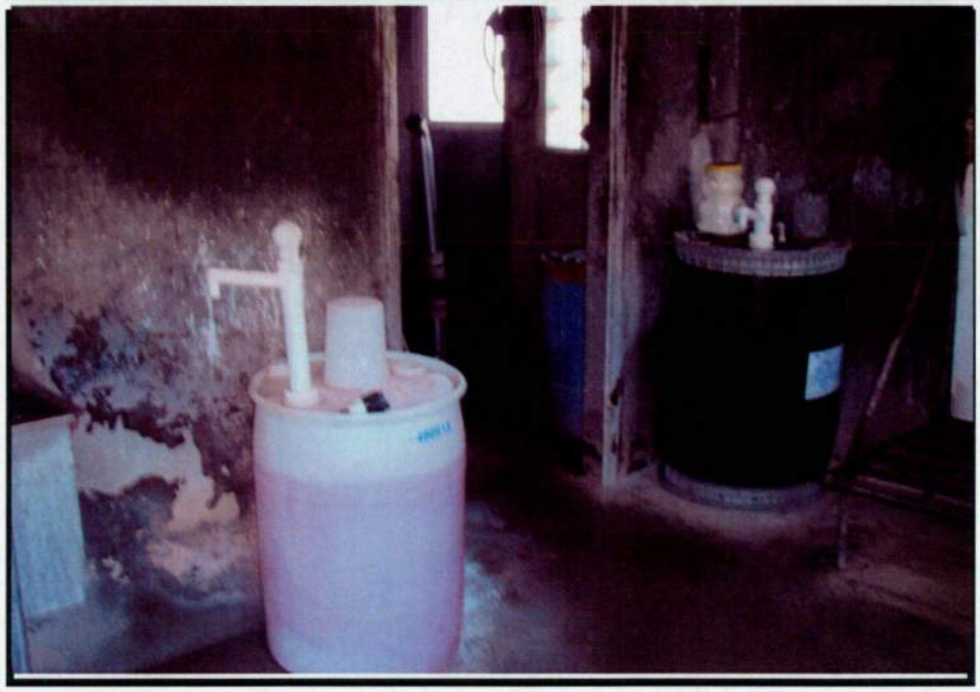

Facility/Case Name: **G. Bootsma & Sons** Facility ID #: **FA0000454**

Address: **7721 Edison Avenue, Ontario**

1) Description: **Sign at front of dairy**

2) Description: **(L to R): (1) 30-gallon drum of Acid; (1) 55-gallon drum of Sodium Hypochlorite**

Date Taken: **April 17, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

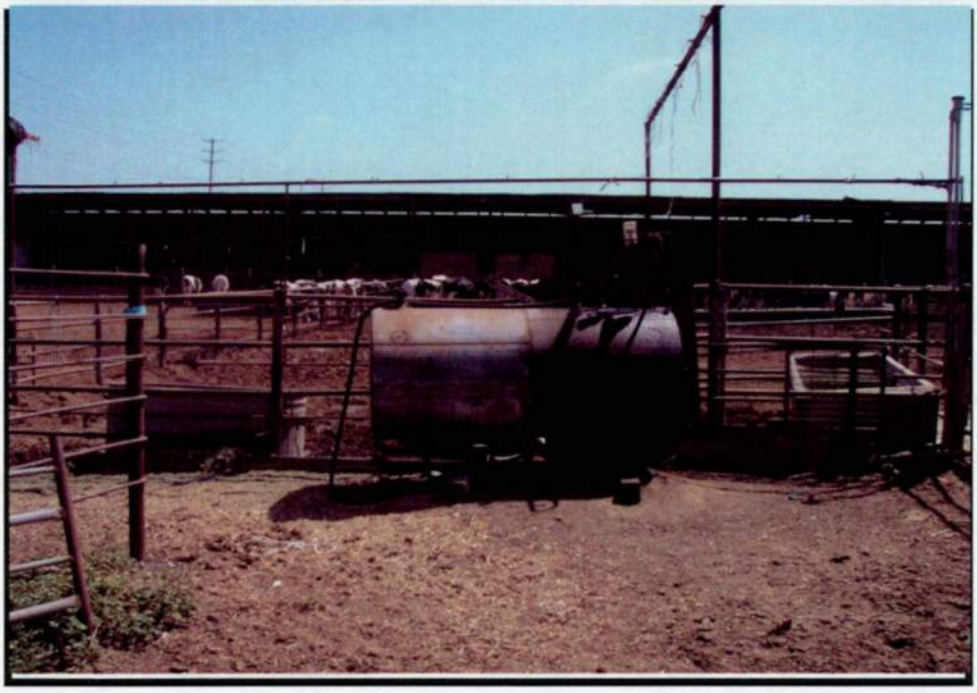

Facility/Case Name: **G. Bootsma & Sons** Facility ID #: **FA0000454**

Address: **7721 Edison Avenue, Ontario**

3) Description: **(L to R): (2) 55-gallon drums of teat dip; (3) empty 55-gallon drums**

4) Description: **150-gallon AST Diesel**

Date Taken: **April 17, 2007**

Taken By: **Leslie Heaviside** Signature: Li Hei

Revised 10/12/2000

Handler

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

December 17, 2007

G BOOTSMA & SON'S
7721 EDISON AVE
CHINO, CA 91761

**ATTN: GARETT BOOTSMA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000454-G BOOTSMA & SON'S**
**7721 EDISON AVE**
**ONTARIO, CA 91761**

MR. BOOTSMA,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on April 17, 2007:

- Failure to obtain CUPA Hazardous Material Handler Permits
- Failure to establish a Business Plan
- Unlawful management of contaminated containers

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

TRACKING SHEET FOR BUSINESS PLANS

_____

Establishment #

Facility Name:

Facility site address:

City:

Fire Agency:

| | | |
|---|---|---|
| _____ (# of copies) | | Sent to FD |
| Business Plan Received | ___/___/___ | ___/___/___ |
| Result of Review(s) | | |
| Deficiency | | ___/___/___ |
| Conditional Approval | | ___/___/___ |
| Approval | | ___/___/___ |
| | | Sent to FD |
| Revised Plan(s) Received | ___/___/___ | ___/___/___ |
| | ___/___/___ | ___/___/___ |

Other

| Date | Action/documentation (update, new plan, etc.) | Staff Hours |
|---|---|---|
| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |
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| ___/___/___ | _____ | _____ |
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| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |
| ___/___/___ | _____ | _____ |

| | | | | |
|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

7721 Edison Ave/1053-361-01-0000/Dairy

7891 Edison Ave/1053-361-03-0000/SFR

8061 Edison Ave/1053-331-04-0000/Dairy

14400 South Grove Ave/1053-551-01-0000/Dairy

14213 Bon View Ave

14283 Bon View Ave

14297 Bon View Ave

14333 Bon View Ave

14450 Bon View Ave

14451 Bon View Ave

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| | | | |
| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# GH Dairy #4 (CERSID: 10741726)

**Facility Information Accepted May 9, 2024**

Submitted on 5/8/2024 5:13:23 AM by *Patricia Mohr* of GH DAIRY (ONTARIO, CA)
Submittal was ***Accepted*** on 5/9/2024 12:07:25 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Business Activities
- Business Owner/Operator Identification

**Hazardous Materials Inventory Accepted May 9, 2024**

Submitted on 5/8/2024 5:13:23 AM by *Patricia Mohr* of GH DAIRY (ONTARIO, CA)
Submittal was ***Accepted*** on 5/9/2024 12:07:17 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Hazardous Material Inventory (9)
- Site Map (Official Use Only)
  - *Annotated Site Map (Official Use Only)* (Web graphic, 41KB)
  - *Annotated Site Legend (Official Use Only)* (MS Word, 14KB)

## Site Identification

**GH Dairy #4**
8061 Edison Ave
Ontario, CA 91762
County
San Bernardino

CERS ID
**10741726**
EPA ID Number

## Submittal Status

Submitted on 5/8/2024 by *Patricia Mohr* of GH DAIRY (ONTARIO, CA)
Submittal was ***Accepted***; Processed on 5/9/2024 by *Erick Tilus* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

## Hazardous Materials

| | |
|---|---|
| Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | **Yes** |

## Underground Storage Tank(s) (UST)

| | |
|---|---|
| Does your facility own or operate underground storage tanks? | **No** |

## Hazardous Waste

| | |
|---|---|
| Is your facility a Hazardous Waste Generator? | **No** |
| Does your facility treat hazardous waste on-site? | **No** |
| Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | **No** |
| Does your facility consolidate hazardous waste generated at a remote site? | **No** |
| Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site? | **No** |
| Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month greater than 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | **No** |
| Is your facility a Household Hazardous Waste (HHW) Collection site? | **No** |

## Excluded and/or Exempted Materials

| | |
|---|---|
| Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)? | **No** |

## Aboveground Petroleum Storage

| | |
|---|---|
| Does your facility own or operate aboveground petroleum storage tanks or containers AND:<br>* have a total aboveground petroleum storage capacity of 1,320 gallons or more, OR<br>* have one or more petroleum tanks in an underground area? | **No** |

## Regulated Substances

| | |
|---|---|
| Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)? | **No** |

## Additional Information

7 Employees

## Facility/Site

**GH Dairy #4**
8061 Edison Ave
Ontario, CA 91762

CERS ID
**10741726**

## Submittal Status

Submitted on 5/8/2024 by *Patricia Mohr* of GH DAIRY (ONTARIO, CA)
Submittal was ***Accepted***; Processed on 5/9/2024 by *Erick Tilus* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

## Identification

GH Dairy

| Operator Phone | Business Phone | Business Fax | Beginning Date | Ending Date | |
|---|---|---|---|---|---|
| (909) 606-6455 | (909) 606-6455 | (909) 606-1640 | | | |
| **Dun & Bradstreet** | | | **SIC Code** | | **Primary NAICS** |
| | | | 0241 | | |

## Facility/Site Mailing Address

7280 Eucalyptus Ave
Ontario, CA 91762

## Primary Emergency Contact

GH Dairy
Title
Owner

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 606-6455 | (951) 218-1994 | |

## Owner

Gerben Hettinga
(909) 606-6455
7280 Eucalyptus Ave
Ontario, CA 91762

## Secondary Emergency Contact

Patricia Mohr
Title
Controller

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 606-6455 | (714) 296-6146 | |

## Billing Contact

GH Dairy
(909) 606-6455 patricia@ghdairy.net
7280 Eucalyptus Ave
Ontario, CA 91762

## Environmental Contact

Patricia L Mohr
(909) 606-6455 patricia@ghdairy.net
14651 S Grove Ave
Ontario, CA 91762

| Name of Signer | Signer Title | Document Preparer |
|---|---|---|
| Patricia Mohr | Controller | Patricia Mohr |

Additional Information

## Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

### Property Owner

GH Dairy
Phone
(909) 606-6455
Mailing Address
7280 Eucalyptus Ave
Ontario, CA 91762

Assessor Parcel Number (APN)

Number of Employees
7

Facility ID
FA0017949

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **GH DAIRY** | Chemical Location | CERS ID **10741726** |
| Facility Name | **GH Dairy #4**<br>8061 Edison Ave, Ontario 91762 | **Between milk cows and chemical room** | Facility ID **FA0017949**<br>Status **Submitted** on 5/8/2024 5:13 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 8 - Corrosives (Liquids and Solids)<br><br>Corrosive, Oxidizing, Class 2 | **Coresan 12.5**<br>CAS No<br>7681-52-9<br>Map: 1 | **Gallons**<br>State<br>Liquid<br>Type<br>Pure | **165**<br>Storage Container<br>Plastic/Non-metalic Drum<br><br>Days on Site: 365 | **55** | 55<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Physical Corrosive To Metal<br>- Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation<br>- Health Specific Target Organ Toxicity | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **GH DAIRY** | Chemical Location | CERS ID **10741726** |
| Facility Name | **GH Dairy #4**<br>8061 Edison Ave, Ontario 91762 | **Between milking barn and Milk Cows** | Facility ID **FA0017949**<br>Status **Submitted** on 5/8/2024 5:13 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities: Max. Daily | Quantities: Largest Cont. | Quantities: Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only): Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 9 - Misc. Hazardous Materials<br><br>Toxic | **Copper Sulfate 40-90%**<br>CAS No<br>7758-98-7<br>Map: 2 | **Pounds**<br>State<br>Solid<br>Type<br>Pure | **2000**<br>Storage Container<br>Bag<br><br>Days on Site: 365 | **50** | 2000<br>Pressue<br>Ambient<br>Temperature<br>Ambient | 0<br>Waste Code | - Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | Copper Sulfate | 100% | | 7758-98-7 |

# Hazardous Materials And Wastes Inventory Matrix Report

CERS Business/Org. **GH DAIRY**
Facility Name **GH Dairy #4**
8061 Edison Ave, Ontario 91762

Chemical Location
**Chemical Room**

CERS ID **10741726**
Facility ID **FA0017949**
Status **Submitted** on 5/8/2024 5:13 AM

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DOT: 3 - Flammable and Combustible Liquids<br>Flammable Liquid, Class I-A, Corrosive | **Dyne**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **30**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **15** | 15<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Carcinogenicity<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation<br>- Health Specific Target Organ Toxicity | Hydriodic Acid<br>Isopropyl Alcohol<br>Iodine<br>Phosporic Acid | 10%<br>30%<br>10%<br>50% | | 10034-85-2<br>67-63-0<br>7553-56-2<br>7664-38-2 |
| DOT: 8 - Corrosives (Liquids and Solids)<br>Corrosive | **Aspen Clean Max**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **110**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | Sodium Hydroxide<br>Sodium Hypochlorite | 10%<br>5% | | 1310-73-2<br>7681-52-9 |
| DOT: 8 - Corrosives (Liquids and Solids)<br>Corrosive | **Mandate**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **110**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | Waste Code | - Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Respiratory Skin Sensitization<br>- Health Serious Eye Damage Eye Irritation | Phosphoric Acid<br>Citric Acid<br>Secondary Alkaensulphonates<br>Octanoic acid<br>Decanoic acid | 24%<br>20%<br>10%<br>6%<br>2% | ✓ | 7664-38-2<br>77-92-9<br>5324-84-5<br>124-07-2<br>334-48-5 |
| | **Oxy-Gard M Sanitizing Teat Dip**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **165**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Serious Eye Damage Eye Irritation | Glycerin<br>Lactic Acid<br>Dodecylbenzene Sulfonic Acid | 5%<br>5%<br>1% | | 56-81-5<br>50-21-5<br>27176-87-0 |
| DOT: 8 - Corrosives (Liquids and Solids)<br>Corrosive | **HD PL-10 Acid**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **110**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | Nitric Acid<br>Phosphoric Acid<br>Sulfuric Acid | 10%<br>10%<br>5% | ✓<br><br>✓ | 7697-37-2<br>7664-38-2<br>7664-93-9 |
| | **I-DEAL (NIL NPE)**<br>CAS No<br>Map: 3 | **Gallons**<br>State: Liquid<br>Type: Mixture | **165**<br>Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | 55<br>Pressue: Ambient<br>Temperature: Ambient | 0<br>Waste Code | - Health Serious Eye Damage Eye Irritation | Poly(oxy-1,2-ethanediyl), .alpha.-isotridecyl- .omega.-hydroxy-<br>Propylene glycol<br>Glycerin<br>Oxirane, methyl-, polymer with oxirane<br>Iodine | 5%<br>5%<br>5%<br>5%<br>1% | | 9043-30-5<br>57-55-6<br>56-81-5<br>9003-11-6<br>7553-56-2 |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **GH DAIRY** | Chemical Location | CERS ID **10741726** |
| Facility Name | **GH Dairy #4** | **Chemical Room** | Facility ID **FA0017949** |
| | 8061 Edison Ave, Ontario 91762 | | Status **Submitted** on 5/8/2024 5:13 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Exit II** | **Gallons** | **110** | **55** | 55 | 0 | - Health<br>Respiratory Skin Sensitization<br>- Health Specific Target Organ Toxicity | Permethrin | 1% | | 52645-53-1 |
| | | | | | | | | Piperonyl Butoxide Techinical | 1% | | 51-03-06 |
| | CAS No | State | Storage Container | | Pressue | Waste Code | | | | | |
| | | Liquid | Steel Drum | | Ambient | | | | | | |
| | Map: 3 | Type | | | Temperature | | | | | | |
| | | Mixture | Days on Site: 365 | | Ambient | | | | | | |

completed

## CERS Readiness Survey

Please return this survey to us by one of the following methods by October 31, 2012

Mail: Office of the Fire Marshal
620 South E Street
San Bernardino CA 92415-0153

Fax: (909) 386-8460

Scan & email: Efile@sbcfire.org

*Facility ID# (if known): FA0010956, FA0000522
Facility Name: 14389 Sultana, 8061 Edison Ave
Facility Address: Ontario CA 91761, Ontario, CA 91761

Please read the following descriptions and mark the answer(s) in the section that most closely describes your situation:

☐ I will put off electronic filing as long as possible. Since any Business Plan received on or after November 1st fulfills the requirement for the following March 1st deadline, I will submit a paper copy between November 1 and December 31, 2012, and not worry about tackling electronic filing until it is time to either meet the March 1, 2014, deadline or my Business Plan requires an update, whichever comes first.

☐ I have the situation covered. I don't anticipate needing any help beyond a possible call or two to the San Bernardino CUPA CERS Help Line at (909) 386-8432. (Be aware that there are almost 7,000 facilities in San Bernardino County with the same March 1st deadline, so those who wait until the last minute to file may find it really hard to get through to a live person by phone. The earlier the better!)

☐ A little assistance would be appreciated. I would feel more comfortable entering my facility information into CERS in a workshop setting, where there is someone there to explain the process and who would be immediately available to offer assistance as needed.
Best time for me to attend a workshop: (check more than one if applicable)
- ☐ Workdays (Mon-Fri) between 8 am & 5 pm
- ☐ Workdays in the evening (after 5 pm)
- ☐ Weekends (Saturday or Sunday)
- ☐ I would appreciate assistance in Spanish

☐ Help! I don't have a computer and/or don't know how to use one. I will definitely need help entering my facility's information.
- ☐ I would be able to make an appointment and travel to the San Bernardino Office of the Fire Marshal in order to receive one-on-one help
- ☐ I am unable to travel to San Bernardino and would need someone to travel to my location
- ☐ I would appreciate assistance in Spanish

☒ None of the above describes my situation. Below is a brief description:

We are closeing Down our Businesses on or around Nov. 1st 2012

Name: Greg Arema Assigned to Greg.

The best way to contact me:
☐ U.S Mail ☐ Email: _____ ☐ Phone: 951-741-6184

*If you report for more than one facility, fill out just one survey and note the total number of facilities that you report for.

| Facility ID | Name | Site Address | City | Account Stat | Status | |
|---|---|---|---|---|---|---|
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 | INACTIVE ACCOUNT | |

Inac.

AG-PE/info update

# HAZ. OUS MATERIAL FIELD SERVI S
# COMPUTER DATABASE UPDATE AUTHORIZATION

RCD. SDD FIRE FISCAL
07 MAY 10 PM 3:45

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000434

NAME: JORRITSMA, JAMES / Arema, Greg

ADDRESS 1: 8061 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91761

COUNTRY:

PHONE: 951-741-6184

EXT:

FAX:

ALT PHONE:

EXT:

DRIVER LICENSE:

TAX ID:

LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Jorritsma, James / Arema, Greg

DBA: ~~JORRITSMA, JAMES~~ Jorritsma Dairy

ADDRESS1: 8061 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: 91710

COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000522

NAME: ~~AG~~-JORRITSMA DAIRY

ADDRESS 1: 8061 EDISON AVE

ADDRESS 2: 91761

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-1710~~

CITY CODE: ~~CHINO~~ Ontario

SIC CODE:

BUSINESS CODE: 02

BUSINESS TYPE: 03

CENSUS: NA

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: ~~05~~ 03

PHONE: 951-741-6184

EXT:

FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-JORRITSMA DAIRY

CARE OF:

ADDRESS 1: 8061 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-1710~~ 91761

COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000524

RESPONSIBLE PARTY: Jorritsma, James / Arema, Greg

CARE OF: Jorritsma Dairy

ADDRESS 1: 8061 Edison Ave

ADDRESS 2:

CITY: Ontario

STATE:

ZIP CODE:

COUNTRY:

PHONE: 951-741-6184

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 04/05/2007

ALT PHONE:

EXT:

TAX ID:

ANNIVERSARY DATE: 04/30/1997

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT00089 | ACTIVE | 4210 | 5/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009814 | ACTIVE, BILLABLE | NA | NA | | 4221 |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008928 | ACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009815 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 6 NUMBER OF UST'S 0 MFR #

ENTERED MAY 09 2007

DATE SUBMITTED: 4-27-07 DATE ENTERED: FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

per inspection: Dairy is in operation. Update handler permit to handler only.

Remove "Ag" prefix from name. Change city to Ontario & update owner, FA & AR info.

Demand bill.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:0 AR:0.00

**ATTN :** GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

**This Unified Permit is hereby issued to:**
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2012** **Expiration Date: 11/30/2013**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |
| PT0008928 | 4420 SPECIAL GENERATOR | PR0009815 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

As a condition of the permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

ATTN : GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2011** **Expiration Date: 11/30/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |
| PT0008928 | 4420 SPECIAL GENERATOR | PR0009815 |

Mark A. Hartwig, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

ATTN : GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.**

**Effective Date: 8/1/2010** **Expiration Date: 7/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008928 | 4420 SPECIAL GENERATOR(B) | PR0009815 |
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |

Danny R. Wurl

Danny R. Wurl, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:3 AR:0.00

ATTN : GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.

**Effective Date: 8/1/2009** **Expiration Date: 7/31/2010**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008928 | 4420 SPECIAL GENERATOR(B) | PR0009815 |
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : GREG AREMA - JAMES JORRISTMA
JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0000522 for a period not to exceed one year from effective date.

**Effective Date: 8/1/1997** **Expiration Date: 7/31/1998**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008927 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009814 |
| PT0008928 | 4420 SPECIAL GENERATOR(B) | PR0009815 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

Page 1 of 1

**Return Certification within** 30 **Days of Receipt to Inspector** Leslie Heaviside

*In the Matter of Respondent:* Jorritsma Dairy

*Violation(s) cited on:* April 19, 2007 *FA #::* FA0000522

*Facility Name:* Jorritsma Dairy

*Site Address:* 8061 Edison Ave / Ontario

*Certificate of Compliance Date:* April 19, 2007

RECEIVED
JUN 01 2007
S.B. CO. FIRE DEPT.

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| Signature | 5-29-07<br>Date |
| Greg Anema<br>Printed or Typed Name | partner<br>Title |
| Social Security/Federal ID Number | Drivers License/ID Number |

*Attach the following documentation when returning the Certificate of Compliance:*

- Statement indicating an EPA ID number has been obtained. ~~CE~~ HA52
- Statement indicating all containers are labeled and closed.
- Business Emergency/Contingency Plan original and 1 copy.
- Copies of receipts documenting removal of empty containers and used oil. None removed in 3 years.

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620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

Page 1 of 1

**Return Certification within** 30 **Days of Receipt to Inspector** Leslie Heaviside

*In the Matter of Respondent:* Jorritsma Dairy

*Violation(s) cited on:* April 19, 2007 *FA #::* FA0000522

*Facility Name:* Jorritsma Dairy

*Site Address:* 8061 Edison Ave/Ontario

*Certificate of Compliance Date:* April 19, 2007

RECEIVED
JUN 01 2007
S.B. CO. FIRE DEPT.

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

Greg Anema
*Signature*

5-29-07
*Date*

Greg Anema
*Printed or Typed Name*

partner
*Title*

[redacted]
*Social Security/Federal ID Number*

[redacted]
*Drivers License/ID Number*

*Attach the following documentation when returning the Certificate of Comp*

- Statements indicating an EPA ID number [illegible] CA 52380
- Statements indicating all containers are la[illegible]
- Business Emergency/contingency plan ordi[illegible]
- Copies of receipts documenting removal of [illegible]rs and used oil. None removed in 3 years.

FA0000522
Jorritsma Dairy
Generator File
1st page

5/25/07

#1

All labels closed and labeled properly.

#10

# CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000522 Facility Name: Joostsma Dairy Inspection Date: April 19, 2007
Site Address: 8061 Edison Ave Phone #: (951) 741-6184
City: Ontario Zip Code: 91762 EPA ID #: not established
Consent Granted by:
☒ Inspect ☒ Photograph Name: Greg Arema ~~Joostsma~~ Title: Partner # Emp: 6

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | X | | |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | X | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | X | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | X | | |
| 107. Contingency Plan established | CCR 66265.51(a) | X | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR | X | | |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | X | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | X | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | X | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | X | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | X | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | X | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | X | | |
| 202. Business Plan established | CHSC 25503.5 | X | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | X | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |
| 230. Business Plan implemented | CHSC 25503.5 | | | X |

**INSPECTION NARRATIVE**

An ispection was conducted to determine compliance with all applicable hazardous materials and hazardous waste laws and regulations. Facility is a dairy (milk production).

Hazardous Materials Inventory
(1) 55 gal drum teat dip
(2) 55 gal powder Chlorinated Soap
(2) 30 gal Acid
(1) 30 gal Sodium Hypochlorite
(1) 250 gal ~~tote~~ teat dip
(6) 50 lbs bags Zinc Sulfate
(1) 55 gal Hydrochloric Acid
(1) 55 gal Oxene

**NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: Leslie Henriscko (Sign Name) Leslie Henriscko (Print Name)
Received By: Greg Arema (Sign Name) Greg Arema (Print Name)
Title: Partner
Report Date: April 19, 2007

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 19, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000522 | Joritsma Dairy | 8061 Edison Ave, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Greg Arema | TITLE Partner |

Note: The above items (HCl and Oxene) are mixed together to make Chlorine Dioxide. These are automatically ~~pumped~~ injected into the water tank to kill bacteria in water troughs for cattle.
(2) AST's Diesel (1-500 gal; 1-100 gal).

Hazardous waste inventory
(2) 30 gal used oil & (3) 5-gal used oil (open)
Mr. Joritsma indicated that the waste from this waste is consolidated at other location (FA 694). To date used oil has not been removed.

Note: Evaporation ponds onsite provide water for irrigation of fields.

Correct the following violations:
(10) Hazardous waste generator permit not current - CC 23.0602(b)(1)
(201) Hazardous material handler permit not current - CC 23.0602(b)(3)
Facilities that generate any amounts of hazardous waste and handle hazardous materials in quantities of 55 gallons or greater are required to have permits with this department.

To correct this violation: Submit payment upon receipt of invoice.

(104) EPA ID number not obtained - CCR 66262.12(a)
Facilities that generate hazardous waste must obtain an EPA ID number to track removal of hazardous waste.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) Leslie Hawisher (Print Name)
Received By: [signature] (Sign Name) Greg Arema (Print Name)
Title: Partner
Report Date: April 19, 2007

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org**

# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 19, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000522 | Joritsma Dairy | 8061 Edison Ave, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Greg Arema | TITLE Partner |

To correct this violation: Submit a statement indicating that an EPA ID number has been obtained.

(106) Facility not operated/maintained to prevent release - CCR 66265.31
(116) Hazardous waste containers not closed - CCR 66265.173 (a)
Having open containers of hazardous waste is not operating facility to prevent a release. Containers should be closed unless adding to or removing waste. (3) open 5-gallon containers of used oil observed.

To correct these violations: Submit a statement indicating all containers are closed.

(110) Tank/container not labeled/marked "Hazardous Waste" - CCR 66262.34 (a)(3)
(119) Hazardous waste not managed lawfully - CHSC 25154
Containers of hazardous waste must be labeled properly (see Compliance Made Easy handbook for guidance). Not labeling containers properly is unlawful management of hazardous waste. (2) drums of used oil not labeled.

To correct these violations: Submit a statement indicating all containers are labeled properly.

(107) Contingency Plan not established - CCR 66265.51(a)
(202) Business Plan not established - CHSC 25503.5
A Business Emergency/Contingency Plan has not been established.

**NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Heaviside (Print Name)
Received By: [signature] (Sign Name) Greg Arema (Print Name)
Title: Partner
Report Date: April 19, 2007

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: April 19, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000522 | Jorritsma Dairy | 8061 Edison Ave, Ontario |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Greg Arema | TITLE Partner |

To correct these violations: Complete and submit a Business Emergency/Contingency Plan, original and 1 copy. Additionally, keep a copy onsite.

(117) Contaminated containers not managed properly - CCR 66261.7
Empty containers must be labeled as "empty" with date they become empty and removed within 1 year. Observed several empty containers that were not labeled properly.

To correct this violation: Submit a statement indicating the containers are labeled properly or copy of receipt documenting removal.

(137) Consolidated manifesting records not available - CHSC 25160.2(b)(3)
Receipts documenting removal of used oil shall be maintained for at least 3 years. To date waste has not been removed.

To correct this violation: Submit a copy of the receipt documenting removal of used oil.

If you have any questions, call (909) 386-8401.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) Leslie Heaviside (Print Name)
Received By: [signature] (Sign Name) Greg Arema (Print Name)
Title: Partner
Report Date: April 19, 2007

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# CERTIFICATE OF COMPLIANCE

Page 1 of 1

**Return Certification within** 30 **Days of Receipt to Inspector** [illegible]

*In the Matter of Respondent:* [illegible]

*Violation(s) cited on:* [illegible] *FA #::* [illegible]

*Facility Name:* [illegible]

*Site Address:* [illegible]

*Certificate of Compliance Date:* [illegible]

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| *Signature* | *Date* |
| *Printed or Typed Name* | *Title* |
| *Social Security/Federal ID Number* | *Drivers License/ID Number* |

*Attach the following documentation when returning the Certificate of Compliance:*

| |
|---|
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |
| [illegible] |

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

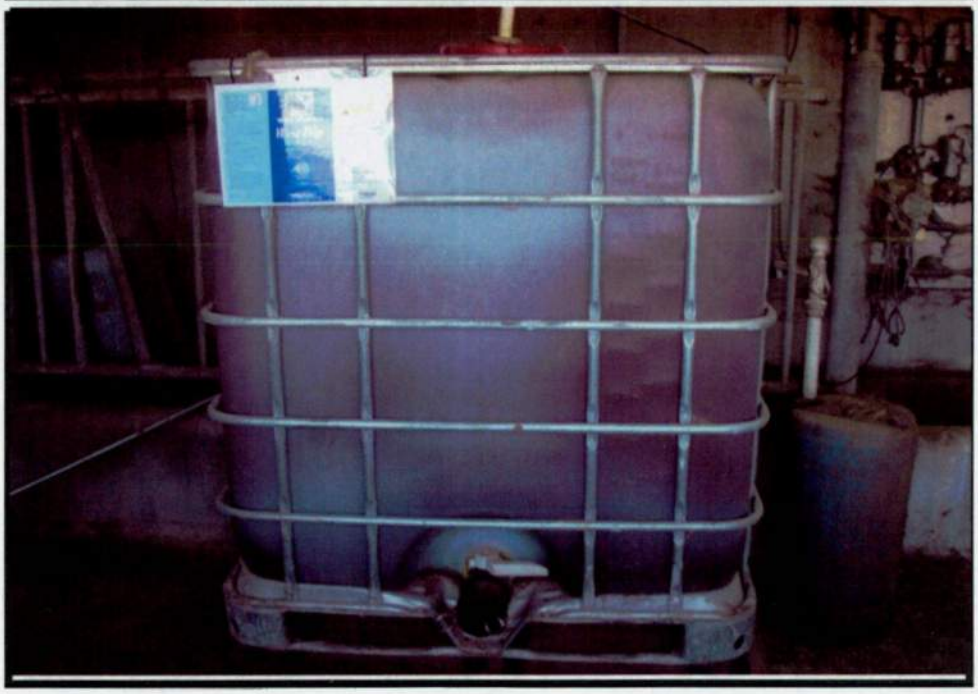

Facility/Case Name: **Jorritsma Dairy** Facility ID #: **FA0000522**

Address: **8061 Edison Avenue, Ontario**

1) Description: **Front of milking parlor**

2) Description: **(1) 250-gallon tote of teat dip**

Date Taken: **April 19, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

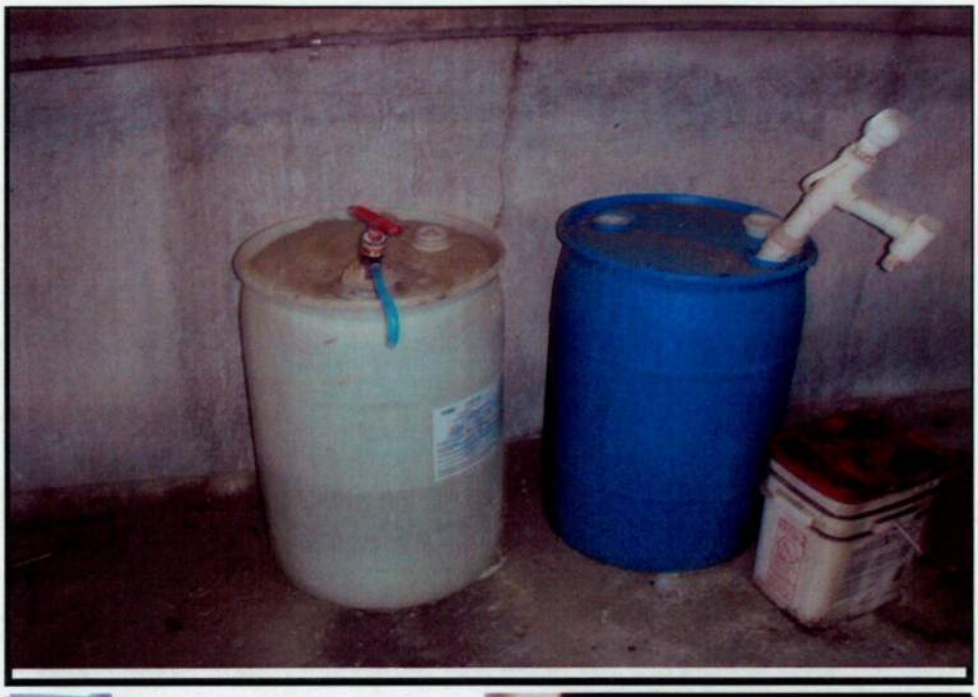

PHOTO 4

Facility/Case Name: **Jorritsma Dairy** Facility ID #: **FA0000522**

Address: **8061 Edison Avenue, Ontario**

3) Description: **(L to R) (1) 30-gallon drum of Sodium Hypochlorite; (1) 30-gallon drum acid**

4) Description: **(L to R) (1) 30-gallon drum of Acid; (2) 55-gallon drums of Chlorinated soap**

Date Taken: **April 19, 2007**

Taken By: **Leslie Heaviside** Signature: Li Hei

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 5

PHOTO 6

Facility/Case Name: **Jorritsma Dairy** Facility ID #: **FA0000522**

Address: **8061 Edison Avenue, Ontario**

5) Description: **Approximately (6) 50-pound bags of Zinc Sulfate**

6) Description: **(L to R): (1) 55-gallon drum of Vitamins A, D & E; (1) 55-gallon drum of Hydrochloric Acid; (1) 55-gallon drum of Oxene; empty 55-gallon drum**

Date Taken: **April 19, 2007**

Taken By: **Leslie Heaviside** Signature: Li Hei

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 7

PHOTO 8

Facility/Case Name: **Jorritsma Dairy** Facility ID #: **FA0000522**

Address: **8061 Edison Avenue, Ontario**

7) Description: **500-gallon AST of Diesel**

8) Description: **(2) 30-gallon drums and (3) 5-gallon containers of used oil**

Date Taken: **April 19, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

HAZARDOUS MATERIALS FIELD SERVICES
COMPUTER DATA BASE UPDATE AUTHORIZATION

Change ☑

Inactivate Permit/Facility ☐
(circle one)

Bill To: E A O Location/District No: _____ Est No: 97044515
(cirle one)
Former Est. Name: (if applicable): _____

Name: AG-JOORITSMA DAIRY
Street No.: 8061 Fraction: ___ Direction:
Street Name: EDISON Apt/Sp No.: _____
City: CHINO State: ____ Zip Code: _____
Telephone No.: ( ) _____

Name: _____
Street No.: _____ Fraction: ___ Direction: _____
Street Name: _____ Apt/Sp No.: _____
City: _____ State: ____ Zip Code: _____
Telephone No.: ( ) _____

Name: _____
Street No.: _____ Fraction: ___ Direction: _____
Street Name: _____ Apt/Sp No.: _____
City: _____ State: ____ Zip Code: _____
Telephone No.: ( ) _____

**Program Information:**

Number of Employees: _____ Number of UGST's: _____
Federal Tax I.D. Number/Social Security Number: _____

**Permit Information:** (Circle those that apply)

Change/Inactivate/Add 226 Permit No.: _____
Change/Inactivate/Add 228 Permit No.: _____
Change/Inactivate/Add _____ Permit No.: _____
Change/Inactivate/Add _____ Permit No.: _____

Date Submitted: 2/24/98 Date Entered: _____
Submitted By: MJW Entered By: None showing

Comments/Remarks: AG EXEMPT — ~~ZERO BALANCE~~ & REMOVE DEL. COUNT

## San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## BUSINESS OWNER/OPERATOR IDENTIFICATION

### I. IDENTIFICATION

| | | | |
|---|---|---|---|
| FACILITY ID# F A 0 0 0 0 5 2 2 (1) | BEGINNING DATE (100) | ENDING DATE (101) | |
| BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) (3): Jorritsma + Anema Dairy | BUSINESS PHONE (102): 951-741-6184 | | |
| BUSINESS SITE ADDRESS (103): 8061 Edison Avenue | BUSINESS FAX (102a) | | |
| BUSINESS SITE CITY (104): Ontario | CA | ZIP CODE (105): 91762 | COUNTY (108): San Bernardino |
| DUN & BRADSTREET (106) | PRIMARY SIC (107): 0241 | PRIMARY NAICS (107): 112120 | |
| BUSINESS MAILING ADDRESS (108a): 8061 Edison Avenue | | | |
| BUSINESS MAILING CITY (108b): Ontario | STATE (108c): CA | ZIP CODE (108d): 91762 | |
| BUSINESS OPERATOR NAME (109): Greg Anema | BUSINESS OPERATOR PHONE (110): 951-741-6184 | | |

### II. BUSINESS OWNER

| | | | |
|---|---|---|---|
| OWNER NAME (111): Dick Jorritsma / Greg Anema | OWNER PHONE (112): 909-597-1317/951-817-1859 | | |
| OWNER MAILING ADDRESS (113): 8061 Edison Avenue | | | |
| OWNER MAILING CITY (114): Ontario | STATE (115): CA | ZIP CODE (116): 91762 | |

### III. ENVIRONMENTAL CONTACT

| | | | |
|---|---|---|---|
| CONTACT NAME (117): Same as above | CONTACT PHONE (118) | | |
| CONTACT MAILING ADDRESS (119) | CONTACT EMAIL (119a): alinegreg@verizon.net | | |
| CONTACT MAILING CITY (120) | STATE (121) | ZIP CODE (122) | |

### IV. EMERGENCY CONTACTS

| -PRIMARY- | -SECONDARY- |
|---|---|
| NAME (123): Dick Jorritsma | NAME (128): Greg Anema |
| TITLE (124): Partner | TITLE (129): Partner |
| BUSINESS PHONE (125): 951-817-1859 | BUSINESS PHONE (130): 951-741-6184 |
| 24-HOUR PHONE (126): 951-817-1859 | 24-HOUR PHONE (131): 909-597-1317 |
| PAGER # (127) | PAGER # (132) |

ADDITIONAL LOCALLY COLLECTED INFORMATION: (133)

**Number of Employees:** 6 **Number of Underground Storage Tanks:** Ø

| | | |
|---|---|---|
| SIGNATURE OF OWNER/OPERATOR OR DESIGNATED REPRESENTATIVE | DATE (134) | NAME OF DOCUMENT PREPARER (135): Steven Goodwin |
| NAME OF SIGNER (print) (136): Greg Anema | TITLE OF SIGNER (137): Partner | |

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## BUSINESS OWNER/OPERATOR IDENTIFICATION

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| BUSINESS SITE CITY (104): Ontario | CA | ZIP CODE (105): 91762 | COUNTY (108): San Bernardino |
| DUN & BRADSTREET (106) | PRIMARY SIC (107): 0241 | PRIMARY NAICS (107): 112120 | |
| BUSINESS MAILING ADDRESS (108a): 8061 Edison Avenue | | | |
| BUSINESS MAILING CITY (108b): Ontario | STATE (108c): CA | ZIP CODE (108d): 91762 | |
| BUSINESS OPERATOR NAME (109): Greg Anema | BUSINESS OPERATOR PHONE (110): 951-741-6184 | | |

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| | | |
|---|---|---|
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| OWNER MAILING ADDRESS (113): 8061 Edison Avenue | | |
| OWNER MAILING CITY (114): Ontario | STATE (115): CA | ZIP CODE (116): 91762 |

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| CONTACT MAILING CITY (120) | STATE (121) | ZIP CODE (122) |

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| BUSINESS PHONE (125): 951-817-1859 | BUSINESS PHONE (130): 951-741-6184 |
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| PAGER # (127) | PAGER # (132) |

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| NAME OF SIGNER (print) (136): Greg Anema | TITLE OF SIGNER (137): Partner | |

## San Bernardino County Fire Department • Hazardous Materials Division

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# INVENTORY SUMMARY FORM

### I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 2 2 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA) Sorritsma + Arema Dairy

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Chlorine | 2 | 30 | gallons |
| 2 | Chlorinated Alkaline Detergent | 1 | 400 | lbs |
| 3 | Diesel, low sulfur | 1 | 500 | gallon |
| 4 | Fly Bait, QuickStrike | 1 | 5 | gallon |
| 5 | IodoZyme Liquid | 1 | 250 | gallon |
| 6 | Oil, Used | 2 | 30 | gallon |
| 7 | Power pHos 330 | 1 | 50 | gallon |
| 8 | Zinc Sulfate 7-Hydrate | 20 | 50 | lbs |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the Business Plan inventory on this page. Place this summary in front of the inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

### III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached Inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) | DATE |
|---|---|---|
| [signature] | Greg Arema | 8-3-11 |

# San Bernardino County Fire Department • Hazardous Materials Division

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## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE | Page ___ of ___

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As): Jorritsma & Anema Dairy (3)

FACILITY ID #: F A 0 0 0 0 5 2 2 (1) | MAP#: 1 (203) | GRID#: D5 (204)

### II. CHEMICAL INFORMATION

CHEMICAL NAME (205): Sodium Hypochlorite

TRADE SECRET (206): ☐ Yes ☒ No — If Subject to EPCRA, refer to Instructions

COMMON NAME (207): Chlorine Bleach

EHS* (208): ☐ Yes ☒ No

CAS# (209): 7681-52-9

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) (211): ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE

RADIOACTIVE (212): ☐ Yes ☒ No | CURIES (213):

PHYSICAL STATE (Check one item only) (214): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS

LARGEST CONTAINER (215): 30 gal

FED HAZARD CATEGORIES (Check all that apply) (216): ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE DAILY AMOUNT (217) | MAXIMUM DAILY AMOUNT (218) | ANNUAL WASTE AMOUNT (219) | STATE WASTE CODE (220) |
|---|---|---|---|
| 30 gal | 50 gal | | |

UNITS* (Check one item only) (221): ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 (222)

STORAGE CONTAINER (223):
☐ a. ABOVE GROUND TANK ☒ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE (224): ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE (225): ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 12.5 (226) | Sodium Hypochlorite (227) | ☐ Yes ☒ No (228) | 7681-52-9 (229) |
| 2 | 1.0 (230) | Sodium Hydroxide (231) | ☐ Yes ☒ No (232) | 1310-73-2 (233) |
| 3 | 10 (234) | Sodium Chloride (235) | ☐ Yes ☒ No (236) | 7647-14-5 (237) |
| 4 | Balance (238) | Water (239) | ☐ Yes ☒ No (240) | 7732-18-5 (241) |
| 5 | (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION (246)

If EPCRA, Please Sign Here

# EMERGENCY RESPONSE PLANS & PROCEDURES – AGENCY NOTIFICATION

3 BUSINESS NAME (Same as FACILITY NAME or DBA) Jorritsma + Anema Dairy

## POST BY TELEPHONE

**Agency Notification**: **If a situation is an emergency, call 911 first.** Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding Federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency (* Indicates mandatory notification) | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | **911** |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | **(800) 33-TOXIC** or **(909) 386-8425** |
| *Note: (800) 33-TOXIC does not work nationwide; non-local callers must use (909) 386-8425 to report **any** release or threatened release.* | |
| 3. *Cal E·M·A (Formerly known as OES) | **(800) 852-7550** or **(916) 845-8911** |
| 4. National Response Center | **(800) 424-8802** |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company name
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date:

# EMERGENCY RESPONSE PLANS AND PROCEDURES

BUSINESS NAME (Same as FACILITY NAME or DBA)
Jorritsma + Arena Dairy

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- ☒ New employee training
- ☒ Annual training & periodic refresher courses
- ☒ Familiarization with the Emergency Response Plans and Procedures of this Business Plan
- ☒ Spill control equipment
- ☐ Monitoring system
- ☒ Personal Protective Equipment
- ☒ On the job training (Described below)
- ☐ Other:

**EMERGENCY PROCEDURES:** Describe duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√ Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- ☒ Identify potential hazards and determine whether a release has occurred
- ☒ Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely
- ☒ Coordinate the notification and evacuation of employees, customers, and other visitors from the facility
- ☒ Make required agency notifications and request needed assistance
- ☒ Assist responding agencies by providing access to the facility and information about the facility
- ☐ Other:

9: 7-30-11

# MATERIAL SAFETY DATA SHEET

## L A CHEMCHLOR

## SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Los Angeles Chemical Company
4545 Ardine Street
South Gate, CA 90280
1-323-562-9500

**Product Name:** Sodium Hypochlorite Solution (10-16%)
**Synonyms:** Sodium Hypochlorite Solution -Trade % (11 – 19), Bleach, Javel Water, Clorox, Bacticide
**Major, Update:** 05/01/00 **Product Use:** Bleach, disinfectant **CAS#:** 7681-52-9

### Emergency Contacts (24 hr.)

FOR EMERGENCIES INVOLVING CHEMICAL SPILL OR RELEASE, CALL
**1-800-424-9300.**

## SECTION 2 – COMPOSITION / INFORMATION ON INGREDIENTS

| Hazardous Ingredient(s) | % (w/w) | ACGIH AIHA | CAS NO. |
|---|---|---|---|
| Sodium Hypochlorite | 10 - 16 | 0.5 ppm (STEL) 2 mg/m$^3$ (as chlorine) | 7681-52-9 |

## SECTION 3 – HAZARD IDENTIFICATION

**********

**Emergency Overview:** CORROSIVE! Contact with acid liberates toxic chlorine gas. Causes burns to skin, eyes, respiratory tract and mucous membranes. Harmful or fatal if swallowed. May cause sensitization by skin contact. Toxic to aquatic organisms. Read the entire MSDS for a more thorough evaluation of the hazards.

**********

**Potential Health Effects:**

**Inhalation:** Mist can irritate the nose and throat. If mixed with acids, hypochlorite solutions release large amounts of chlorine gas. This gas can cause severe irritation of the nose and throat. Exposure to high levels of chlorine gas may result in severe lung damage.
**Skin Contact:** Sodium hypochlorite mist and solutions can cause skin irritation. In severe cases, chemical burns may result.

**Eye Contact:** Can cause severe burns and corneal damage, which may result in permanent blindness.

**Ingestion:** Hypochlorite solutions release hypochlorous acid on contact with gastric juices, and ingestion causes irritation and corrosion of mucous membranes, pain, vomiting, and oedema of the pharynx and larynx; reduced blood pressure, delirium and coma may occur.

**Subchronic Effects:** SKIN: Prolonged or repeated skin contact with solutions containing as little as 4-6% sodium hypochlorite can cause allergic contact dermatitis. Symptoms include chronic, itchy eczema. Sensitized people can react to very dilute (0.04-0.06% NaOCl) solutions that touch their skin

**Existing Medical Conditions Possibly Aggravated By Exposure :** Skin irritation may be aggravated in individuals with existing skin lesions. Breathing of vapors or mists may aggravate acute or chronic asthma and chronic pulmonary disease such as emphysema and bronchitis.

**Carcinogenicity:** Sodium hypochlorite is not classified as carcinogenic by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as carcinogens by OSHA (Occupational Safety and Health Administration), and not listed as carcinogens by NTP (National Toxicology Program).

## SECTION 4 – FIRST AID MEASURES

**General:** If you feel unwell seek medical advice (show the label where possible).

**Inhalation:** Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Give Cardiopulmonary Resuscitation (CPR) only if there is no pulse AND no breathing. Obtain medical attention IMMEDIATELY.

**Skin Contact:** Immediately flush skin with running water for at least 15 - 20 minutes. Under running water remove contaminated clothing, jewelry, and shoes. If irritation persists, repeat flushing. For burns, obtain medical attention. Discard heavily contaminated clothing and shoes in a manner, which limits further exposure. Otherwise, wash clothing separately before reuse.

**Eye Contact:** Immediately flush eyes with running water for a minimum of 15 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

**Ingestion:** DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.

**Note to Physicians:** Symptomatic. Treatment and supportive therapy as indicated. Do NOT give acidic antidotes such as juice, soft drink, vinegar, etc. This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed. Following exposure the patient should be kept under medical review for at least 48 hours as delayed pneumonitis may occur. Pulmonary edema is likely and may be delayed. Steroid therapy, if given early, may be effective in preventing or alleviating edema.

## SECTION 5 – FIRE FIGHTING MEASURES

| | |
|---|---|
| **Flash Point** | Not applicable. Not combustible |
| **Flammable Limits (Lower)** | Not applicable |
| **Flammable Limits (Upper)** | Not applicable |
| **Auto Ignition Temperature** | Not applicable |
| **Combustion and Thermal Decomposition Products** | Chlorine, sodium oxide, oxygen |
| **Rate of Burning** | Not applicable |
| **Explosive Power** | Not applicable |
| **Sensitivity to Mechanical Impact** | Not applicable |

**Fire and Explosion Hazards:** Sodium hypochlorite is a strong chemical oxidant, but solutions do not support combustion. Reaction with nitrogen compounds, chloroorganic compounds, or easily oxidizable compounds (reducing agents) may be explosive. This material is non-flammable but is decomposed by heat and light, causing a pressure build-up, which could result in an explosion. When heated, it may

release chlorine gas. Vigorous reaction with oxidizable or organic materials may result in fire. See Section 10.

**Extinguishing Media :** For large fires use an all purpose type AFFF alcohol foam resistant medium expansion according to foam manufacturer's recommended techniques. The foam supplier should be consulted for recommendations regarding foam types and delivery rates for specific applications. Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog.

**Special Information:** Water may be used to cool containers of Hypochlorite solution exposed to heat from a fire. This should be done from a safe distance since containers may rupture.
Firefighters should wear protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode. Move containers from fire area if you can do it without risk. Dike fire control water for later disposal; do not scatter the material. Fire involving tanks or trailer loads: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Do not get water inside containers. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from the ends of tanks.

**Evacuation:** If tank or tank truck involved in a fire, ISOLATE and consider evacuation of one-half (1/2) mile radius.

**Fire Fighting Protective Equipment:** Full protective clothing, including a self-contained breathing apparatus, must be worn in a fire involving this material. Toxic gas and vapors are produced upon decomposition.

**NOTE:** Also see "Section 10 - Stability and Reactivity"

## SECTION 6 – ACCIDENTAL RELEASE MEASURES

**Spills, Leaks, or Releases:**
- Restrict access to area until completion of clean up. Ensure trained personnel conduct clean up.
- Remove all ignition sources (no smoking, flares, sparks or flames). All equipment should be grounded and non-sparking. Ventilate area.
- Wear adequate personal protective equipment. Do not touch spilled material.
- Stop leak if possible without personal risk.

Small spills: Cover with DRY earth, sand or other non-combustible material. Use clean non-sparking tools to collect material and place it into loosely covered plastic containers for later disposal. Rinse area with water.
Large spills: Prevent entry into sewers and confined areas. Dike with inert material (sand, earth, etc.). Contact fire and emergency services and supplier for advice. Collect product for recovery or disposal by pumping it into polyethylene containers. Consider in-situ neutralization and disposal. Ensure adequate decontamination of tools and equipment following clean up. Collect contaminated soil and water, and absorbent for proper disposal. Comply with Federal, Provincial/State and local regulations on reporting releases.

**Deactivation For Small Spills:** Hypochlorite can be broken down by covering it with a reducing agent such as sodium sulfite or sodium thiosulfate.

**Deactivating Chemicals:** Use sodium sulfite or diluted hydrogen peroxide to reduce the material. Ensure there is no chlorine residue before neutralizing with a weak solution of hydrochloric or sulfuric acid.

**Waste Disposal Methods:** Dispose of waste material at an approved waste treatment/disposal facility, in accordance with applicable regulations. Do not dispose of waste with normal garbage or to sewer systems.

Note - Clean-up material may be a RCRA Hazardous Waste on disposal.
- Spills are subject to CERCLA reporting requirements: RQ = 100 lbs.
-

## SECTION 7 – HANDLING AND STORAGE

**Precautions:** Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labeled. Wear appropriate Personal Protection Equipment. People working with this chemical should be properly trained regarding its hazards and its safe use.

**Handling Procedures and Equipment:** Avoid generating mist. Use smallest possible amounts in designated areas with adequate ventilation. Keep containers closed when not in use. Empty containers may contain hazardous residues. Use corrosion-resistant transfer equipment when dispensing.

**Storage Requirements:** Store in a cool, dry, well-ventilated area, out of direct sunlight. Store containers at 15 – 29 °C (59-84 °F). Do not store above 30 °C (86°F) or below freezing point. Keep containers tightly closed when not in use and when empty. Protect from damage. Vent caps should be checked with full personal protection. Store away from incompatible materials such as reducing materials, strong acids, nitrogen compounds, copper, nickel and cobalt. Use corrosion-resistant structural materials and lighting and ventilation systems in the storage area. This product has a shelf life of up to six months at 60°F or lower.

Outdoor storage tanks should be suitably diked or otherwise provided with an adequate means of secondary containment. Appropriate secondary containment measures should be taken to prevent spills or leaks from indoor storage tanks and tank-truck unloading stations from entering sewers or other channels that discharge directly to a water body or a municipal sewage system.

## SECTION 8 – EXPOSURE CONTROLS / PERSONAL PROTECTION

### PREVENTIVE MEASURES

**Recommendations listed in this section indicate the type of equipment, which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.**

**Engineering Controls:** Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact. Smoking should be prohibited in areas in which sodium hypochlorite solution is stored or handled.

### PERSONAL PROTECTIVE EQUIPMENT

**Eye Protection:** Wear splash resistant chemical goggles and full-face shield. Maintain eye wash fountain and quick-drench facilities in work area.
**Skin Protection:** Wear impervious protective clothing, including boots, gloves, lab coat, apron, rain jacket, pants or coveralls, as appropriate, to prevent skin contact.
RECOMMENDED (resistance to breakthrough longer than 8 hours): butyl rubber, natural rubber, neoprene, nitrile rubber, polyethylene, Viton(TM), Saranex(TM), Responder(TM).

Recommendations are valid for permeation rates reaching 0.1 ug/cm2/min or 1 mg/m2/min and over. Resistance of specific materials can vary from product to product. Breakthrough times are obtained under conditions of continuous contact, generally at room temperature. Evaluate resistance under conditions of use and maintain clothing carefully.

**Respiratory Protection:** A NIOSH/MSHA approved air-purifying respirator equipped with acid mist cartridges for concentrations up to 10 times the TLV. Use a supplied air respirator if concentrations are higher or unknown.

### EXPOSURE GUIDELINES

**PRODUCT:**
**Sodium hypochlorite:** Workplace environmental exposure level guides (WEELS) /American Industrial Hygiene Association (AIHA) / 1996 short-term time weighted average ; 2 mg/m$^3$: 15 minute

**Chlorine:**

| | | | |
|---|---|---|---|
| ACGIH TWA | 0.5 ppm as $Cl_2$ | ACGIH STEL | 1 ppm as $Cl_2$ |
| OSHA PEL | 0.5 ppm as $Cl_2$ | OSHA STEL | 1 ppm as $Cl_2$ |
| NIOSH IDLH | 10 ppm as $Cl_2$ | NIOSH (15 min. ceiling) 0.5 ppm | |

## SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Alternate Name(s)** | Hypochlorous acid , Clorox, Javelle water |
| **Chemical Name** | Sodium hypochlorite |
| **Chemical Family** | Hypochlorous acid salt |
| **Molecular Formula** | Na-O-Cl |
| **Molecular Weight** | 74.4 |
| **Appearance** | Green to yellow, watery liquid |
| **Odor** | Pungent chlorine-like odor |
| **pH** | 11-13 |
| **Vapor Pressure (mm Hg at 21 °C(69.8°F)** | 12 mmHg |
| **Vapor Density (Air = 1)** | No data |
| **Boiling Point** | Decomposes above 40 °C (104 ° F) |
| **Freezing Point** | 7.5°F (-13.6°C) |
| **Solubility (Water)** | Completely |
| **Specific Gravity** | About 1.198 (12.5%w/w solution) @ 20°C (68 ° F) |
| **Evaporation Rate** | Not available |
| **% Volatile by Volume** | Not available |

## SECTION 10 – STABILITY AND REACTIVITY

**Chemical Stability:** Stable at room temperature.

**Hazardous Decomposition Products:** Thermal decomposition: Chlorine, sodium oxide, oxygen, oxides of chlorine, sodium chlorate, and hydrogen.

**Conditions to Avoid:** Keep away from high heat, and sunlight or ultra-violet light. Do not store above 30°C (86°F). Do not allow solutions to evaporate dry. Keep away from incompatibles.

**Incompatibility with other Substances:** May react violently with strong acids producing chlorine gas, which is toxic. Other incompatibles include organic material, cellulose, oxidizable materials, ammonia, urea, ammonium salts, ethyleneimine, cyanides, nitrogen compounds, alcohols, metals, and metal oxides. Reacts with metals to produce flammable hydrogen gas. Metal and metal oxide catalysts decompose hypochlorites, evolving oxygen and often causing explosions. May react explosively with nitrogen containing compounds or form chloroamines, which are explosive. Alkaline hypochlorite solutions may react explosively with some chloroorganic compounds.

**Corrosivity to Metals:** Solutions can be corrosive to many metals.

**Hazardous Polymerization:** Will not occur.

## SECTION 11 – TOXICOLOGICAL INFORMATION

### TOXICOLOGICAL DATA:

**Toxicological Data:** Sodium Hypochlorite: Irritation Data: 10 mg eyes-rabbit moderate

Toxicity Data: 1 gm/kg oral-woman TDLo (Lowest published toxic dose);
45 mg/kg intravenous-man TDLo; LD50 oral rat- 8910 mg/kg

Sodium hydroxide: Irritation data: 500 mg/24 hour(s) skin-rabbit severe; 400 µg eyes-rabbit mild; 1 percent eyes-rabbit severe;
Toxicity data: 1350 mg/kg skin-rabbit $LD_{50}$; 104-340 mg/kg oral-rat $LD_{50}$

**Mutagenicity:** Sodium hypochlorite caused mutations in several short-term studies using bacteria and cultured mammalian cells. The significance of these tests is unclear. It was not mutagenic in tests (chromosome aberration and micronucleus) on live animals.

**Reproductive Effects:** No data available

**Teratogenicity and Fetotoxicity:** No data available

**Synergistic Materials:** None known

## SECTION 12 – ECOLOGICAL INFORMATION

**Ecotoxicological Information:** Fish Toxicity: LC50 (48 hr) rainbow trout 0.07 mg/ l.
LC50 (96 hr) fathead minnow 5.9 mg/l.
Invertebrate and Microbial Toxicity: LOEC Oncorhynchus kisutch 0.02 mg/ l.

**Persistence and Degradation:** No data available.

## SECTION 13 – DISPOSAL CONSIDERATIONS

Review federal, state and local government requirements prior to disposal.

Do not dispose of waste with normal garbage, or to sewer systems.

Whatever cannot be saved for recovery or recycling, including containers should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options.

**RCRA:** Test waste material for corrosivity, D002, prior to disposal.

## SECTION 14 – TRANSPORT INFORMATION

| | TDG | DOT |
|---|---|---|
| **Shipping Name** | Hypochlorite solutions- *with more than 5 percent but less than 16 percent available chlorine* | Hypochlorite solutions- *with more than 5 percent but less than 16 percent available chlorine* |
| **Hazard Class/Division** | 8: Corrosive<br>9.2 | 8: Corrosive |
| **Identification No.**<br>**Packing Group:** | UN1791<br>III | UN1791<br>III |

**IATA/ICAO Class:** 8

**Transportation Emergency Telephone Number:** 1-800-424-9300

## SECTION 15 – REGULATORY INFORMATION

**OSHA Classification:** Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

**SARA Regulations sections 313 and 40 CFR 372:** N

**SARA Hazard Categories, SARA SECTIONS 311/312 (40CFR370.21):**
ACUTE: Y
CHRONIC: N
FIRE: N
REACTIVE: N
SUDDEN RELEASE: N
OSHA PROCESS SAFETY (29CFR1910.119): N

**CERCLA SECTION 103 (40CFR302.4):** Y
**Reportable Quantity (RQ) under CERCLA:** 100 lb. (45.4 kg)

**TSCA Inventory Status:** Y

**Other Regulations/Legislation which apply to this product:**

**Right-to-Know/Disclosure Lists: Illinois, Massachusetts, New Jersey, Pennsylvania,**

California Proposition 65: N

This product does not contain nor is it manufactured with ozone depleting substances.

## Canadian Classification

**This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (Material Safety Data Sheet) contains all the information required by the CPR.**

**Controlled Products Regulations (WHMIS) Classification:** D2B: Toxic E: Corrosive

**CEPA / Canadian Domestic Substances List (DSL): Y**

**WHMIS Ingredient Disclosure List: Meets criteria for disclosure at 1% or greater.**

**EINECS Number: 231-668-3**

## SECTION 16 – OTHER INFORMATION

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate Los Angeles Chemical Company makes no representation as to its accuracy or sufficiency. Conditions of use are beyond Los Angeles Chemical Company's control and therefore users are responsible to verify this data under their own operating conditions to determine whether this product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process.

**National Fire Protection Association (NFPA) Rating**
**Hazardous Materials Identification System (HMIS) Rating**

| | NFPA | HMIS |
|---|---|---|
| HEALTH | 2 | 2 |
| FIRE | 0 | 0 |
| REACTIVITY | 1 | 1 |

4= Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum
W =Water Reactive

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE | Page ___ of ___

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Jorritsma + Arema Dairy

FACILITY ID # F A 0 0 0 0 5 2 2 1 | MAP# 203: 1 | GRID# 204: E5

### II. CHEMICAL INFORMATION

CHEMICAL NAME 205: Sodium Hydroxide

TRADE SECRET ☐ Yes ☒ No 206 — If Subject to EPCRA, refer to instructions

COMMON NAME 207: Vortex

EHS* ☐ Yes ☒ No 208

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 215: 400 lbs

FED HAZARD CATEGORIES (Check all that apply) 216: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

AVERAGE DAILY AMOUNT 217 | MAXIMUM DAILY AMOUNT 218 | ANNUAL WASTE AMOUNT 219 | STATE WASTE CODE 220

UNITS* (Check one item only) ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS 221

* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER 223:
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☒ i. FIBER DRUM
- ☐ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE 224: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE 225: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 4-5 (226) | Sodium dichloro-S-triazinetrione (227) | ☐ Yes ☐ No (228) | 51580-86-0 (229) |
| 2 | 15-16 (230) | Sodium Hydroxide (231) | ☐ Yes ☐ No (232) | 1310-73-2 (233) |
| 3 | (234) | (235) | ☐ Yes ☐ No (236) | (237) |
| 4 | (238) | (239) | ☐ Yes ☐ No (240) | (241) |
| 5 | (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

MANUFACTURED FOR:

DairyPro
150 S. Bolingbrook Dr., #357
Bolingbrook, IL 60440
Business Phone: 708-378-3906

FOR CHEMICAL EMERGENCY - spill, leak, fire, accident -
24 hours a day, 7 days a week:

Call 1-800-228-5635; Extension 149

# Material Safety Data Sheet

## Section 1 - General Information

**Product Name:** VORTEX

**DOT Hazard Class:** Corrosive, 8

**Chemical Name:** Mixture

**Chemical Family:** Powdered Caustic Cleaner, Chlorinated

(NE = None Established; NA = Not Available; NDF = No Data Found)

## Section 2 - Hazardous Ingredients

| Ingredients/CAS Number | Wt/Wt Percent | ACGIH TLV PPM | ACGIH TLV mg/M$^3$ | STEL | Vapor Pressure mm HG. 20°C |
|---|---|---|---|---|---|
| Sodium dichloro-s-triazinetrione, dihydrate/51580-86-0 | 4-5 | NE | NE | NE | NE |
| Sodium Hydroxide/1310-73-2 | 15-16 | NDF | 2 ceiling | NDF | 42 @ 1000°C |

## Section 3 - Physical Data

**Boiling Point:** Not applicable

**Specific Gravity ($H_2O$ = 1):** Not applicable

**Vapor Pressure (mm Hg.):** Not applicable

**Percent Volatile by Weight (%):** NDF

**pH:** > 12 (1% solution) typical

**Evaporation Rate (____ = 1):** Not applicable

**Solubility in Water:** Complete at use dilutions

**Viscosity @ 25°C:** Not applicable

**Appearance and Odor:** Free flowing white powder with a mild surfactant/chlorine odor.

## Section 4 - Health Hazard Data

**Threshold Limit Value:** None established.

**Note:** **This product does not contain any known carcinogens.**

**Effects of Overexposure:** Causes severe burns to eyes and skin. Harmful if swallowed.

**FOR ASSISTANCE WITH MEDICAL EMERGENCY,**
**CALL: 1-800-228-5635, Ext. 149 (24 HRS./DAY; 7 DAYS/WEEK)**

**Emergency First Aid:**

EXTERNAL: Flush with large volumes of water for at least 15 minutes. If irritation persists, seek medical attention.

EYES: Flush with large volumes of water for at least 15 minutes. Seek medical attention immediately.

INTERNAL: If swallowed, DO NOT INDUCE VOMITING. Rinse mouth, then give small amount/glass of water. Seek medical attention immediately. Never give anything by mouth to an unconscious person.

SEE OTHER SIDE

## Section 5 - Fire and Explosion Hazard Data

**Flash Point (test method):** Not applicable

**Flammable Limits:** Not applicable

**Extinguishing Media:** Use media appropriate for surrounding material.

**Special Fire Fighting Procedures:** Where there is potential for exposure, wear impervious clothing and Self-Contained Breathing Apparatus (SCBA).

**Unusual Fire & Explosion Hazards:** Excessive heat may liberate chlorine gas.

## Section 6 - Reactivity Data

**Stability:** ☒ Stable ☐ Unstable

**Hazardous Polymerization:** ☐ may occur ☒ will not occur

**Incompatibility:** Strong mineral acids and organic materials. Aluminum, zinc, tin, galvanized iron, or other soft metals.

**Hazardous Decomposition Products:** Chlorine gas.

## Section 7 - Spill or Leak Procedures

**Spill Response:** Shovel and sweep up spilled material. Place in labeled containers to await disposal. Flush spill area with water.

**Waste Disposal Method:** Observe all local, state, & federal regulations.

**We make no guarantee or warranty of any kind that the use or disposal of this product is in compliance with all federal, state or local laws. It is the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable statutes.**

## Section 8 - Special Protection Information

**Eye Protection:** Safety glasses, goggles or face shield if exposure is anticipated.

**Respiratory Protection:** NIOSH/MSHA approved respirator for dust if exposure is anticipated.

**Skin Protection:** As appropriate to avoid skin contact with powder.

**Other Protection:** N/A

**Ventilation Recommended:** General or local exhaust where dust may be generated.

## Section 9 - Special Precautions

**Hygienic Practices in Handling & Storage:** Avoid contact with eyes and skin. Avoid breathing dust (See Section 8.)

**Other Precautions:** KEEP OUT OF REACH OF CHILDREN.

**Date prepared:** APR. 17, 1995 **Prepared by:** Richard I. Engstrom R. I. Engstrom

The information contained herein is based on data available to us and is believed to be correct. Since this information may have been obtained in part from independent laboratories or other sources not under our direct supervision, no representation is made that the information is accurate, reliable, complete or representative and Buyer may rely thereon only at Buyer's risk. We make no guarantee that the health and safety precautions we have suggested will be adequate for all individuals and/or situations involving its handling and use. No warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Vendor assumes no responsibility for injury to vendee or third person proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in this data sheet.

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

Page 1 of 1

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3: Jorritsma + Anema Dairy

FACILITY ID # F A 0 0 0 0 5 2 2 1 | MAP# 203: 1 | GRID# 204: E3

### II. CHEMICAL INFORMATION

CHEMICAL NAME 206: Dinotefuran

TRADE SECRET ☐ Yes ☒ No 208 — If Subject to EPCRA, refer to instructions

COMMON NAME 207: QuikStrike Fly Scatter Bait

EHS* ☐ Yes ☐ No 208

CAS# 209:

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only) ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211

RADIOACTIVE ☐ Yes ☒ No 212

CURIES 213

PHYSICAL STATE (Check one item only) ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS 214

LARGEST CONTAINER 215

FED HAZARD CATEGORIES (Check all that apply) ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 216

AVERAGE DAILY AMOUNT 217 | MAXIMUM DAILY AMOUNT 218 | ANNUAL WASTE AMOUNT 219 | STATE WASTE CODE 220

UNITS* (Check one item only) ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS 221
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 222

STORAGE CONTAINER
☐ a. ABOVE GROUND TANK ☒ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON 223

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 0.5 226 | Dinotefuran 227 | ☐ Yes ☐ No 228 | 165252-70-0 229 |
| 2 | 0.04 230 | Guanidine 231 | ☐ Yes ☐ No 232 | 27519-02-4 233 |
| 3 | Balance 234 | Other ingredients 235 | ☐ Yes ☐ No 236 | 237 |
| 4 | 238 | 239 | ☐ Yes ☐ No 240 | 241 |
| 5 | 242 | 243 | ☐ Yes ☐ No 244 | 245 |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☐ MATERIAL ☐ WASTE | Page ___ of ___

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As) 3

| FACILITY ID # | F | A | | | | | | | | 1 | MAP# 203 | GRID# 204 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

### II. CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME 205 | TRADE SECRET ☐ Yes ☐ No 206<br>If Subject to EPCRA, refer to instructions |
| COMMON NAME 207 | EHS* ☐ Yes ☐ No 208 |
| CAS# 209 | *If EHS is "Yes", all amounts below must be in lbs. |

HAZARDOUS MATERIAL TYPE (Check one item only) ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE 211 | RADIOACTIVE ☐ Yes ☐ No 212 | CURIES 213

PHYSICAL STATE (Check one item only) ☐ a. SOLID ☐ b. LIQUID ☐ c. GAS 214 | LARGEST CONTAINER 215

FED HAZARD CATEGORIES (Check all that apply) ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH 216

| AVERAGE DAILY AMOUNT 217 | MAXIMUM DAILY AMOUNT 218 | ANNUAL WASTE AMOUNT 219 | STATE WASTE CODE 220 |
|---|---|---|---|
| | | | |

UNITS* (Check one item only) ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS 221 | DAYS ON SITE: 365 222

* If EHS, amount must be in pounds.

STORAGE CONTAINER
☐ a. ABOVE GROUND TANK ☐ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON 223

STORAGE PRESSURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT 224

STORAGE TEMPERATURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC 225

| %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|
| 1 226 | 227 | ☐ Yes ☐ No 228 | 229 |
| 2 230 | 231 | ☐ Yes ☐ No 232 | 233 |
| 3 234 | 235 | ☐ Yes ☐ No 236 | 237 |
| 4 238 | 239 | ☐ Yes ☐ No 240 | 241 |
| 5 242 | 243 | ☐ Yes ☐ No 244 | 245 |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION 246

If EPCRA, Please Sign Here

# MATERIAL SAFETY DATA SHEET
## Starbar QuikStrike Fly Scatter Bait

**Manufacturer:** Wellmark International

**Address:** 1501 East Woodfield Road, Suite 200-West Schaumburg, IL 60173

**Emergency Phone:** 800-347-8272

**Transportation Emergency Phone:** CHEMTREC: 1-800-424-9300

## 1. CHEMICAL PRODUCT INFORMATION

**Product Name:** Starbar QuikStrike Fly Scatter Bait

**Chemical Name/Synonym:** Dinotefuran; Guanidine, N-methyl-N'-nitro-N''-[(tetrahydro-3-furanyl)methyl]

**Chemical Family:** Neonicotinoid

**Formula:** C7 $H_{14}$ N4 O3

**EPA Registration No.:** 73049-450-2724

**RF Number:** 2061

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

| Component (chemical, common name) | CAS Number | Weight | Tolerance |
|---|---|---|---|
| Dinotefuran; Guanidine, N-methyl-N'-nitro-N''-[(tetrahydro-3-furanyl)methyl] | 165252-70-0 | 0.50% | |
| (Z)-9-Tricosene | 27519-02-4 | 0.04% | |
| Other ingredients (non-hazardous) | | 99.46% | |

## 3. HAZARD INFORMATION

**PRECAUTIONARY STATEMENT**
**CAUTION**
**KEEP OUT OF REACH OF CHILDREN**
**HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION**
**AVOID CONTACT WITH SKIN, EYES OR CLOTHING**

**PRIMARY ROUTE OF ENTRY** Dermal/Eye: Yes Oral: Yes Inhalation: No

**ACUTE TOXICITY**

**Oral:** No specific hazard identified.

**Dermal:** No specific hazard identified.

**Inhalation:** No specific hazard identified.

### OTHER TOXICOLOGICAL INFORMATION

**Skin Irritation:** May cause brief and/or minor irritation.

**Eye Irritation:** May cause minimal irritation.

**Sensitizer:** Not a skin sensitizer.

## 4. FIRST AID MEASURES

**Eye:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**Skin:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

**Ingestion:** Call a poison control center or doctor for treatment advice. Do not induce vomiting unless told to do so by the poison control center or doctor. Have person sip a glass of water if able to swallow. Do not give anything by mouth to an unconscious person.

**Note to Physician:** There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition.

## 5. FIRE FIGHTING MEASURES

**NFPA Rating:** **Health:** 1 **Fire:** 1 **Reactivity:** 0

**Flammability Class:** Solid.

**Flash Point:** N/A.

**Explosive Limits (% of Volume):** N/A.

**Extinguishing Media:** Water fog, carbon dioxide, foam, dry chemical.

**Special Protective Equipment:** Fire fighters should wear full protective clothing including self-contained breathing apparatus.

**Fire Fighting Procedures:** Products of combustion from fires involving this material may be toxic. Avoid breathing smoke and mists. Minimize the amount of water used for fire fighting. Do not allow fire fighting water to escape into waterways or sewers.

**Combustion Products:** Incomplete combustion can produce carbon monoxide. Normal combustion forms carbon dioxide, water vapor and may produce oxides of nitrogen.

**Unusual Fire/Explosion Hazards:** None known.

## 6. ACCIDENTAL RELEASE MEASURES

**Steps to be taken:** Do not allow spilled material to enter waterways or sewers.

**Absorbents:** None needed due to product form. Scoop up material and dispose of all wastes according to applicable regulations.

**Incompatibles:** None known.

## 7. HANDLING AND STORAGE

**Handling:** Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet. Remove clothing immediately if bait gets inside. Wash thoroughly and put on clean clothing. Do not use, pour, spill or store near heat or open flame.

**Storage:** Store in a cool, well-ventilated place away from sources of heat and direct sunlight. Keep container tightly closed. Keep only in original container. Do not contaminate water, food or feed by storage or disposal.

## 8. EXPOSURE CONTROL / PERSONAL MEASURES

**Exposure Limits:** None.

**Ventilation:** Use in a well ventilated area.

**Personal Protective Equipment:** Avoid contact with skin, eyes or clothing. Handlers and applicators should wear appropriate protective equipment including, at a minimum, long pants, long-sleeved shirt and shoes plus socks and chemical resistant gloves.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance and Odor:** Solid blue granules.

**Boiling Point:** Not applicable.

**Melting Point:** Not available.

**Vapor Pressure (mm Hg):** Not available.

**Vapor Density (Air = 1):** Not available.

**Specific Gravity:** 0.94.

**Bulk Density:** 59 lbs / cubic foot.

**Solubility:** Soluble in water.

**Evaporation Rate:** Not available.

**pH:** 6.15.

## 10. STABILITY AND REACTIVITY

**Stability:** Stable.

**Reactivity:** Not reactive.

**Incompatibility w/ Other Materials:** Reactive metals and strong oxidizers.

**Decomposition Products:** Oxides of nitrogen, carbon monoxide, carbon dioxide.

**Hazardous Polymerization:** Will not occur.

## 11. TOXICOLOGICAL INFORMATION

**ACUTE TOXICITY**

| | |
|---|---|
| Acute oral toxicity (rat): | LD50 >5000 mg/kg |
| Acute dermal toxicity: | LD50 >5050 mg/kg |
| Acute inhalation toxicity: | LC50 >4090 mg/m$^3$ |
| Skin irritation: | Slightly irritating |
| Eye irritation: | Mildly irritating |
| Dermal Sensitization: | Not a sensitizer |

**SUBCHRONIC/CHRONIC TOXICITY [Specific to Active Ingredient(s)]**

**Dinotefuran technical** was tested in 13-week dietary toxicity studies in rats, mice and dogs. In the rat study, a NOEL of 500 ppm was established, based on reduced body weight gain in females and adrenal cortical vacuolation in males and a NOAEL of 5,000 ppm based on marked growth retardation at 25,000 ppm (adrenal cortical vacuolation not adverse). A NOEL of 25,000 ppm was established in the mouse study based on reduced body weight gain at 50,000 ppm. In the dog 13-week dietary study, a NOEL of 8,000 ppm was established based on reduced body weight gain. No target organs were identified in subchronic inhalation or dermal toxicity studies in rats.

**Dinotefuran technical** was tested in lifetime studies with rats and mice and a one-year study with dogs. In common with the subchronic studies in these species, no specific target organs could be identified. In the 78-week mouse study a NOAEL of 2500 ppm was established, based on decreased weight gain and a decrease in circulating platelet counts. In the 104-week rat study a NOAEL of 2000 ppm was established, based on a decrease in weight gain in females. There were no treatment-related effects in rats or mice on survival or the nature and incidence of neoplastic and adverse non-neoplastic histomorphological findings in either species at any dose level. In the 52-week dog study, a NOAEL of 16000 ppm was established based on decreased weight gain in both sexes and decreased food consumption in females.

This product is not listed as a carcinogen by the National Toxicology Program (NTP), the International Agency for Research on Cancer (IARC), the Occupational Safety and Health Administration (OSHA) or ACGIH.

**DEVELOPMENTAL/REPRODUCTIVE TOXICITY** **[Specific to Active Ingredient(s)]**
**Dinotefuran technical** was tested in a two-generation rat reproduction study at doses of 0, 300, 1000, 3000 and 10000 ppm. The NOAEL for systemic toxicity in parental animals was 3000 ppm based on decreased body weight gain and food consumption and decreased spleen and thyroid weights at the highest dose level evaluated (10000 ppm). The NOAEL for reproductive effects was 10000 ppm. The NOAEL for effects on the offspring was 3000 ppm based on reduced preweaning weight gain at 10000 ppm.

In a developmental toxicity study of Dinotefuran technical in rats, the maternal NOAEL was 300 mg/kg/day based on reduced weight gain, food consumption and water intake at 1000 mg/kg/day. Dinotefuran technical did not produce developmental effects in rats at doses up to 1000 mg/kg/day (the highest does tested). In a study with rabbits, the maternal NOAEL was 52 mg/kg/day based on reduced weight gain, food consumption and water intake and clinical signs noted at 300 mg/kg/day and pathology findings in the liver and stomach at 125 mg/kg/day and higher. The developmental NOEL was 300 mg/kg/day.

**NEUROTOXICITY** **[Specific to Active Ingredient(s)]**
**Dinotefuran** did not produce any functional or histomorphological evidence of neurotoxicity in acute (gavage) and 13-week (dietary) neurotoxicity studies in rats. The NOEL for neurotoxicity in the acute study was 1,500 mg/kg, the highest dose level administered. The NOEL for neurotoxicity in the 13-week dietary study was 50,000 ppm. The NOEL for all effects in this study was 5,000 ppm based on reduced body weight gain and food consumption.

**MUTAGENICITY** **[Specific to Active Ingredient(s)]**
**Dinotefuran technical** was negative in the following *in vitro* assays: Ames Assay, mouse lymphoma (L5178Y), mammalian cytogenetics (CHL/IU) or DNA Repair. Dinotefuran technical was negative in the following *in vivo* assays: mouse micronucleus. Overall, Dinotefuran technical does not present a genetic hazard.

## 12 ECOLOGICAL INFORMATION

**ACUTE AND LONG-TERM TOXICITY TO FISH AND INVERTEBRATES:**
Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or public waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA.

ECOLOGICAL TOXICITY [Specific to Active Ingredient(s)]
**Dinotefuran Technical** is practically non-toxic to moderately toxic to avian species. Test results include:

Oral $LD_{50}$ quail: greater than 2000 mg/kg;
Dietary $LC_{50}$ Mallard duck: greater than 997.9 ppm;
Dietary $LC_{50}$ quail: greater than 1301 ppm;
Reproduction quail: NOEL = 5000 ppm;
Reproduction Mallard duck: NOEL = 2000 ppm.

**Dinotefuran Technical** is practically nontoxic to fish and practically nontoxic to highly toxic to aquatic invertebrate species. Test results include:

$LC_{50}$ (96 hr) Bluegill Sunfish: greater than 100 mg/l;
$LC_{50}$ (96 hr) Rainbow Trout: greater than 100 mg/l;
$LC_{50}$ (96 hr) Common Carp: greater than 100 mg/l;
$LC_{50}$ (96 hr) Sheepshead Minnow: greater than 109 mg/l;
NOEC (early life stage) Rainbow Trout: greater than 10 mg/l;
$EC_{50}$ (48 hr) Daphnia magna: greater than 1000 mg/l;
NOEC (lifecycle) Daphnia magna: greater than 10 mg/l;
$LC_{50}$ (96 hr) Mysid Shrimp: 0.79 mg/l;
$EC_{50}$ (96 hr) Oyster Shell Deposition: greater than 141 mg/l.

**OTHER ENVIRONMENTAL INFORMATION:**
**Dinotefuran Technical** is highly toxic to bees. The acute oral and contact $LD_{50}$ in bees were 0.056 µg/bee and 0.022 ug/bee, respectively.

## 13. DISPOSAL CONSIDERATIONS

Dispose of product and used containers in accordance with applicable Federal, State and local regulations. Do not contaminate water, food or feed by disposal. End users must dispose of any unused product as per the label recommendations.

## 14. TRANSPORT INFORMATION

**DOT49CFR Description:** Not Regulated.

**Freight Classification:** Insecticides NOI NMFC 102120 CL. 60.

## 15. REGULATORY INFORMATION

**CERCLA (Superfund):** Not regulated.

**RCRA:** Not regulated.

**SARA 311/312 HAZARD CATEGORIES**

**Immediate Health:** Yes.

**Delayed Health:** Yes.

**Fire:** No.

**Sudden Pressure:** No.

**Reactivity:** No.

*The information presented herein, while not guaranteed, was prepared by technically knowledgeable personnel and to the best of our knowledge is true and accurate. It is not intended to be all inclusive and the manner and conditions of use and handling may involve other or additional considerations.*

27-11-016

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE | Page ___ of ___

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As): Jorritsma + Ameno Dairy (3)

FACILITY ID #: F A 0 0 0 0 5 2 2 (1) | MAP#: 1 (203) | GRID#: D5 (204)

### II. CHEMICAL INFORMATION

CHEMICAL NAME: Iodozyme (205) | TRADE SECRET ☐ Yes ☒ No (206) — If Subject to EPCRA, refer to instructions

COMMON NAME (207) | EHS* ☐ Yes ☐ No (208)

CAS# (209) | *If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE (211) | RADIOACTIVE ☐ Yes ☒ No (212) | CURIES (213)

PHYSICAL STATE (Check one item only): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS (214) | LARGEST CONTAINER: 250 gallons (215)

FED HAZARD CATEGORIES (Check all that apply): ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH (216)

| AVERAGE DAILY AMOUNT (217) | MAXIMUM DAILY AMOUNT (218) | ANNUAL WASTE AMOUNT (219) | STATE WASTE CODE (220) |
|---|---|---|---|
| | | | |

UNITS* (Check one item only): ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (221) — * If EHS, amount must be in pounds. | DAYS ON SITE: 365 (222)

STORAGE CONTAINER:
☐ a. ABOVE GROUND TANK ☒ a. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON (223)

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT (224)

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC (225)

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 1-5 (226) | Iodine (227) | ☐ Yes ☐ No (228) | 7553-56-2 (229) |
| 2 | (230) | (231) | ☐ Yes ☐ No (232) | (233) |
| 3 | (234) | (235) | ☐ Yes ☐ No (236) | (237) |
| 4 | (238) | (239) | ☐ Yes ☐ No (240) | (241) |
| 5 | (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION (246)

If EPCRA, Please Sign Here

WESTAGRO®

# Iodozyme Liquid — Material Safety Data Sheet

**Preparation Date** 26-Nov-2007
**Revision Number:** 0
**Revision Date**

## 1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

**Product Description:** Iodozyme Liquid
**Item#:** 0145

**Supplier**
DeLaval Manufacturing
11100 N. Congress Ave.
Kansas City, MO 64153

Tel: 816-891-7700, 8am – 5pm M-F

**Emergency Telephone Number** Chemtrec 1-800-424-9300

## 2. HAZARDS IDENTIFICATION

**Emergency Overview**
May cause eye irritation

**Potential Health Effects**

**Principle Routes of Exposure** Eye contact
Ingestion

**Major effects of exposure**
**Eyes** Contact with eyes may cause irritation.
**Ingestion** Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea .

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Component | CAS-No | Weight % | OSHA PEL |
|---|---|---|---|
| Iodine | 7553-56-2 | 1 - 5 | Ceiling: 0.1 ppm<br>Ceiling: 1 mg/m$^3$ |

## 4. FIRST AID MEASURES

**Eye contact**
- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes
- If eye irritation persists, get medical advice/attention

**Ingestion** • Call a physician or Poison Control Centre immediately

## 5. FIRE-FIGHTING MEASURES

**Fire Hazard** The product is not flammable.

**Suitable Extinguishing Media** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment

**Protective Equipment and Precautions for Firefighters** As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**NFPA**

| Health | Flammability | Instability |
|---|---|---|
| 1 | 0 | 0 |

**NFPA Special Hazard** none

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions** Avoid contact with eyes.

**Environmental Precautions** Prevent further leakage or spillage if safe to do so. Do not flush into surface water or sanitary sewer system.

**Methods for cleaning up** Soak up with inert absorbent material. Sweep up and shovel into suitable containers for disposal.

## 7. HANDLING AND STORAGE

**Handling** Handle in accordance with good industrial hygiene and safety practice. Avoid contact with eyes.

**Storage** Keep containers tightly closed in a dry, cool and well-ventilated place. Do not freeze. Freezing will affect the physical condition but will not damage the material. Thaw and mix before using.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

| Component | ACGIH TLV | OSHA PEL |
|---|---|---|
| Iodine | Ceiling: 0.1 ppm | Ceiling: 0.1 ppm<br>Ceiling: 1 mg/m$^3$ |

**Engineering Controls** Ensure adequate ventilation, especially in confined areas.

**Eye/face Protection** Safety glasses with side-shields

**General Hygiene Considerations**
Handle in accordance with good industrial hygiene and safety practice.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| **Appearance** | Brown |
| **Form** | liquid |
| **Specific Gravity** | 1.23 |
| **Density** | 10.3 lb/gal |
| **Water Solubility** | soluble |
| **pH** | 3 - 4 |
| **Freezing point** | <10°F |

## 10. STABILITY AND REACTIVITY

**Chemical Stability** Stable under normal conditions.

**Incompatible Materials** strong oxidizing agents, strong acids, strong bases

## 11. TOXICOLOGICAL INFORMATION

| Component | LD50 Oral | LD50 Dermal | LC50 Inhalation |
|---|---|---|---|
| Iodine | 14000 mg/Kg | | 137 ppm |

**Chronic Toxicity**

**Carcinogenicity** Contains no ingredient listed as a carcinogen

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity**

| Component | Freshwater Algae | Freshwater Fish | Microtox | Water Flea |
|---|---|---|---|---|
| Iodine | | LC50 (96 h) 0.53 mg/L | | LC50 (48 h) 0.16 mg/L |

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Method** Dispose of in accordance with local regulations.

**Contaminated Packaging** Empty containers should be taken for local recycling, recovery or waste disposal.

## 14. TRANSPORT INFORMATION

Not regulated

## 15. REGULATORY INFORMATION

| Component | TSCA | DSL | NDSL | EINECS | ELINCS | ENCS | CHINA | KECL | PICCS | AICS |
|---|---|---|---|---|---|---|---|---|---|---|
| Iodine | Present | X | - | 231-442-4 | - | - | X | 97-3-0138 | X | X |

**USA**

**Federal Regulations**

**TSCA** Complies

**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**State Right-to-Know**

| Component | Massachusetts | New Jersey | Pennsylvania | Illinois | Rhode Island |
|---|---|---|---|---|---|
| Iodine | X | X | X | | X |

## 16. OTHER INFORMATION

**Preparation Date** 26-Nov-2007

**Revision Date**

**Disclaimer**

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

☒ MATERIAL ☐ WASTE

Page 1 of 1

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As): Jorritsma + Arena Dairy (3)

FACILITY ID #: F A 0 0 0 0 0 5 2 2 (1) | MAP#: 1 (203) | GRID#: E5 (204)

### II. CHEMICAL INFORMATION

CHEMICAL NAME (205)

TRADE SECRET ☐ Yes ☒ No (206) — If Subject to EPCRA, refer to instructions

COMMON NAME (207): Power pHOS 330

EHS* ☐ Yes ☐ No (208)

CAS# (209)

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE (211)

RADIOACTIVE ☐ Yes ☒ No (212) | CURIES (213)

PHYSICAL STATE (Check one item only): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS (214)

LARGEST CONTAINER: 50 gallon (215)

FED HAZARD CATEGORIES (Check all that apply): ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH (216)

| AVERAGE DAILY AMOUNT (217) | MAXIMUM DAILY AMOUNT (218) | ANNUAL WASTE AMOUNT (219) | STATE WASTE CODE (220) |
|---|---|---|---|
| | | | |

UNITS* (Check one item only): ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (221)
* If EHS, amount must be in pounds.

DAYS ON SITE: 365 (222)

STORAGE CONTAINER (223):
☐ a. ABOVE GROUND TANK ☒ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT (224)

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC (225)

| | %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|---|
| 1 | 75 (226) | Phosphoric Acid (227) | ☐ Yes ☐ No (228) | 7664-38-2 (229) |
| 2 | >93 (230) | Sulfuric Acid (231) | ☐ Yes ☐ No (232) | 7664-93-9 (233) |
| 3 | (234) | (235) | ☐ Yes ☐ No (236) | (237) |
| 4 | (238) | (239) | ☐ Yes ☐ No (240) | (241) |
| 5 | (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION (246)

If EPCRA, Please Sign Here

MANUFACTURED FOR:

DAIRY*PRO*
160 S. Bolingbrook Dr., #357
Bolingbrook, IL 60440
Business Phone: 630-378-3906

FOR CHEMICAL EMERGENCY, Spill, Leak, Fire, or Accident
24 hours/day, 7 days/week
CALL 1-800-228-5635 Extension 149

# Material Safety Data Sheet

## Section 1 - General Information

**Product Name:** POWER pHOS 330

**DOT Hazard Class:** Corrosive, 8

**Chemical Name:** Mixture

**Chemical Family:** Liquid Acid Cleaner

(NE – None Established; NA – Not Available; NDF – No Data Found)

## Section 2 - Hazardous Ingredients

| Ingredients/CAS Number | Wt/Wt Percent | ACGIH TLV PPM | ACGIH TLV mg/M$^3$ | STEL | Vapor Pressure mm HG. 20°C |
|---|---|---|---|---|---|
| Phosphoric acid (75%) /7664-38-2 | 11-12 | NDF | 1 | NDF | 5.7 |
| Sulfuric acid (>93%) /7664-93-9 | 9-10 | NDF | 1 | NDF | <0.3 |

## Section 3 - Physical Data

**Boiling Point:** NE

**Specific Gravity ($H_2O$ = 1):** 1.11 typical @ 25°C.

**Vapor Pressure (mm Hg.):** NE

**Percent Volatile by Weight (%):** NE

**pH:** 2.4 (1% solution) typical

**Evaporation Rate (____ = 1):** NE

**Solubility in Water:** Complete

**Viscosity @ 25°C:** 5 cps (Brookfield) typical

**Appearance and Odor:** Clear, red liquid with mild acid odor.

## Section 4 - Health Hazard Data

**Threshold Limit Value:** None established.

**Note:** This product does not contain any known carcinogens.

**Effects of Overexposure:** Causes severe burns to eyes and skin. Harmful if swallowed.

**FOR ASSISTANCE WITH MEDICAL EMERGENCY,**
**CALL: 1-800-228-5635, Ext. 149 (24 HRS./DAY; 7 DAYS/WEEK)**

**Emergency First Aid:**

SKIN: Flush with large volumes of cold water for at least 15 minutes. If irritation persists, seek medical attention.

EYES: Flush with large volumes of cold water for at least 15 minutes. Seek medical attention immediately.

INTERNAL: If swallowed, DO NOT INDUCE VOMITING. Rinse mouth, then give small amount/glass of water. Seek medical attention immediately. Never give anything by mouth to an unconscious person.

SEE OTHER SIDE

## Section 5 - Fire and Explosion Hazard Data

**Flash Point (test method):** Not applicable

**Flammable Limits:** Not applicable

**Extinguishing Media:** Use media appropriate for surrounding material.

**Special Fire Fighting Procedures:** Where there is potential for exposure, wear impervious clothing and Self-Contained Breathing Apparatus (SCBA).

**Unusual Fire & Explosion Hazards:** Keep away from strong alkaline materials and chlorinated materials.

## Section 6 - Reactivity Data

**Stability:** ☒ Stable ☐ Unstable

**Hazardous Polymerization:** ☐ may occur ☒ will not occur

**Incompatibility:** Strong alkaline materials and chlorinated products.

**Hazardous Decomposition Products:** N/A

## Section 7 - Spill or Leak Procedures

**Spill Response:**

Small Spills: Vacuum or mop up, then flush spill area with water.

Large Spills: Dike and contain spill with inert material (sand, earth, etc.). Transfer the liquid & solid separately to containers for recovery or disposal.

**Waste Disposal Method:** Observe all local, state, & federal regulations.

**e make no guarantee or warranty of any kind that the use or disposal of this product is in compliance with all federal, state or local laws. It is the obligation of each user of the product mentioned herein to determine and comply with the requirements of all applicable statutes.**

## Section 8 - Special Protection Information

**Eye Protection:** Safety glasses, goggles or face shield if exposure is anticipated.

**Respiratory Protection:** NIOSH/MSHA approved respirator when mist or vapors/fumes are generated by product use.

**Skin Protection:** Appropriate chemical resistant gloves and body splash protection if exposure is anticipated.

**Other Protection:** N/A

**Ventilation Recommended:** General or local exhaust

## Section 9 - Special Precautions

**Hygienic Practices in Handling & Storage:** Avoid contact with eyes and skin (See Section 8).

**Other Precautions:** KEEP OUT OF REACH OF CHILDREN.

**Date prepared:** JAN. 6, 1997 **Prepared by:** Richard J. Engstrom

The information contained herein is based on data available to us and is believed to be correct. Since this information may have been obtained in part from independent laboratories or other sources not under our direct supervision, no representation is made that the information is accurate, reliable, complete or representative and Buyer may rely thereon only at Buyer's risk. We make no guarantee that the health and safety precautions we have suggested will be adequate for all individuals and/or situations involving its handling and use. No warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Vendor assumes no responsibility for injury to vendee or third person proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in this data sheet.

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION

*☒ MATERIAL ☐ WASTE

Page 1 of 1

### I. FACILITY INFORMATION

BUSINESS NAME (Same as FACILITY NAME or DBA – Doing Business As): Jorritsma & Arema Dairy (3)

FACILITY ID #: F A 0 0 0 0 5 2 2 (1) | MAP#: 1 (203) | GRID#: D5 (204)

### II. CHEMICAL INFORMATION

CHEMICAL NAME: Zinc Sulfate 7-Hydrate (205)

TRADE SECRET ☐ Yes ☒ No (206) — If Subject to EPCRA, refer to instructions

COMMON NAME (207)

EHS* ☐ Yes ☐ No (208)

CAS#: 7446-20-0 (209)

*If EHS is "Yes", all amounts below must be in lbs.

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE (211)

RADIOACTIVE ☐ Yes ☒ No (212) | CURIES (213)

PHYSICAL STATE (Check one item only): ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS (214) | LARGEST CONTAINER (215)

FED HAZARD CATEGORIES (Check all that apply): ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH (216)

AVERAGE DAILY AMOUNT (217) | MAXIMUM DAILY AMOUNT (218) | ANNUAL WASTE AMOUNT (219) | STATE WASTE CODE (220)

UNITS* (Check one item only): ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS (221) — * If EHS, amount must be in pounds.

DAYS ON SITE: 365 (222)

STORAGE CONTAINER (223):
- ☐ a. ABOVE GROUND TANK
- ☐ b. UNDERGROUND TANK
- ☐ c. TANK INSIDE BUILDING
- ☐ d. STEEL DRUM
- ☐ e. PLASTIC/NONMETALLIC DRUM
- ☐ f. CAN
- ☐ g. CARBOY
- ☐ h. SILO
- ☐ i. FIBER DRUM
- ☒ j. BAG
- ☐ k. BOX
- ☐ l. CYLINDER
- ☐ m. GLASS BOTTLE
- ☐ n. PLASTIC BOTTLE
- ☐ o. TOTE BIN
- ☐ p. TANK WAGON
- ☐ q. RAIL CAR
- ☐ r. OTHER

STORAGE PRESSURE (224): ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE (225): ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | HAZARDOUS COMPONENT (For mixture or waste only) | EHS | CAS # |
|---|---|---|---|
| 1 (226) | Zinc Sulfate 7-Hydrate (227) | ☐ Yes ☐ No (228) | 7446-20-0 (229) |
| 2 (230) | (231) | ☐ Yes ☐ No (232) | (233) |
| 3 (234) | (235) | ☐ Yes ☐ No (236) | (237) |
| 4 (238) | (239) | ☐ Yes ☐ No (240) | (241) |
| 5 (242) | (243) | ☐ Yes ☐ No (244) | (245) |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic, or > 0.1% by weight if carcinogenic, attach additional sheets of paper capturing the required information.

ADDITIONAL LOCALLY COLLECTED INFORMATION (246)

If EPCRA, Please Sign Here

# Safety data for zinc sulfate 7-hydrate

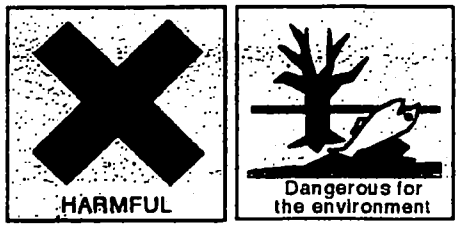


Click here for data on zinc sulfate in student-friendly format, from the HSci project

Glossary

Information on this web page is provided to help you to work safely, but it is intended to be an [illegible] not a replacement for a full [illegible]

## General

Synonyms: zinc sulfate heptahydrate, white vitriol, zinc sulphate 7-hydrate, zinc sulphate heptahydrate
Molecular formula: $ZnSO_4\ 7H_2O$
CAS No: 7446-20-0
EC No: 231-793-3

## Physical data

Appearance: colourless to white crystalline solid
Melting point:
Boiling point:
Vapour density:
Vapour pressure:
Specific gravity: 1.957
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility: high

## Stability

Stable. Incompatible with strong oxidizing agents. Hygroscopic - protect from

moisture.

## Toxicology

Harmful if swallowed. Severe eye irritant; may cause serious eye damage.

**Toxicity data**
(The meaning of any abbreviations which appear in this section is given here.)
UNR-MAN LDLO 221 mg $kg^{-1}$
ORL-RAT LD50 1260 mg $kg^{-1}$
ORL-MUS LD50 2200 mg $kg^{-1}$
IPR-RAT LD50 200 mg $kg^{-1}$

**Risk Phrases**
(The meaning of any risk phrases which appear in this section is given here.)
R22 R41 R50 R53.

## Environmental information

Very toxic to aquatic organisms - may cause long-term damage in the environment.

## Transport information

(The meaning of any UN hazard codes which appear in this section is given here.)
UN No 3077. Hazard class 9. Packing group III.

## Personal protection

Safety glasses, adequate ventilation.

**Safety phrases**
(The meaning of any safety phrases which appear in this section is given here.)
S22 S26 S39 S46 S60 S61.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

This information was last updated on October 21, 2006. We have tried to make it as accurate and useful as possible, but can take no responsibility for its use, misuse, or accuracy. We have not verified this information, and cannot guarantee that it is up-to-date.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 2 2 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma + Anema Dairy

FACILITY ADDRESS: 8061 Edison Ave

CITY: Ontario

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Used oil | 2 | 30 | gallon |
| 2 | teat dip | 2 | 250 | gallon |
| 3 | powder chlorinated soap | 2 | 55 | gallon |
| 4 | acid | 2 | 30 | gallon |
| 5 | sodium hypochlorite | 2 | 30 | gallon |
| 6 | teat dip | 1 | 55 | gallon |
| 7 | zinc sulfate | 20 | 50 | gallon |
| 8 | Hydrochloric acid | 1 | 55 | gallon |
| 9 | oxine | 1 | 55 | gallon |
| 10 | Diesel | 1 | 500 | gallon |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER *(print)* | DATE |
|---|---|---|
| [signature] | Greg Anema | 2-19-08 |

Inventory Summary Page 1 of 1

BP of 8-17-11 replaces this plan

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

### I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED AUG 17 2011 S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 0 0 5 2 2

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma & Arema Dairy

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8061 Edison Avenue | Ontario | 91762 |

### II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire Business Emergency/Contingency Plan whether new or revised)*

Submission Checklist ☒

- ☒ Business Activities Form
- ☒ Business Owner/Operator Identification Form
- ☒ Supplemental Emergency Contact Page
- ☒ Emergency Response Plans and Procedures
- ☒ Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number
- ☒ One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☒ Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I
- ☒ Facility map (using grid form provided) consisting of all required features including the location of each inventoried item
- ☒ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- X Area map - photocopied city map with location of site indicated
- ☒ Owner/Operator has signed and dated the plan and all required individual pages of the plan
- ☒ Submit the original and 1 copy to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction
- ☒ ***Retain one copy of the business emergency/contingency plan at the facility.***

### III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☒ Please incorporate the following into my Business Emergency/Contingency Plan

- ☐ New Business Owner/Operator Identification Form
- ☒ New Inventory Forms and new Inventory Summary Form (and maps, if affected)
- ☐ New Supplemental Emergency Contact Page

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

### IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER |
|---|---|---|
| | | Steven Goodwin |
| **NAME OF SIGNER** *(print)* | **TITLE OF SIGNER** *(print)* | |
| Greg Arema | Partner | |

ENTERED OCT 26 2011

ENTERED OCT 26 2011

FD SENT AUG 25 2011

# San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE (909) 386-8401 FAX (909) 386-8460 www.sbcfire.org

## BUSINESS ACTIVITIES

### I. FACILITY IDENTIFICATION

| | |
|---|---|
| FACILITY ID # F A 0 0 0 0 5 2 2 2 (1) | EPA ID # (Hazardous Waste Only) CAL 000319397 (2) |
| BUSINESS NAME (Same as Facility Name of DBA-Doing Business As) Jorritsma + Arema Dairy (3) | |
| BUSINESS SITE ADDRESS 8061 Edison Avenue (103) | |
| BUSINESS SITE CITY Ontario (104) | CA — ZIP CODE 91762 (105) |

### II. ACTIVITIES DECLARATION

| Does your facility... | If Yes, please complete these pages of the UPCF*.... | |
|---|---|---|
| A. HAZARDOUS MATERIALS<br>Have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | ☒ YES ☐ NO 4 | HAZARDOUS MATERIALS INVENTORY – CHEMICAL DESCRIPTION |
| B. REGULATED SUBSTANCES<br>Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO 4a | Coordinate with your local agency responsible for CalARP. |
| C. UNDERGROUND STORAGE TANKS (USTs)<br>Own or operate underground storage tanks? | ☐ YES ☒ NO 5 | UST FACILITY<br>UST TANK |
| D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)<br>Own or operate ASTs above these thresholds:<br>Store greater than 1,320 gallons of petroleum products (new or used) in aboveground tanks or containers. | ☐ YES ☒ NO 8 | NO FORM REQUIRED TO CUPAs |
| E. HAZARDOUS WASTE | | |
| Generate hazardous waste? | ☒ YES ☐ NO 9 | EPA ID NUMBER – provide at the top of this page |
| Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC 25143.2)? | ☐ YES ☒ NO 10 | RECYCLABLE MATERIALS REPORT (one per recycler) |
| Treat hazardous waste on-site? | ☐ YES ☒ NO 11 | ON-SITE HAZARDOUS WASTE TREATMENT – FACILITY<br>ON-SITE HAZARDOUS WASTE TREATMENT – UNIT |
| Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO 12 | CERTIFICATION OF FINANCIAL ASSURANCE |
| Consolidate hazardous waste generated at a remote site? | ☐ YES ☒ NO 13 | REMOTE WASTE / CONSOLIDATION SITE ANNUAL NOTIFICATION |
| Need to report the closure/removal of a tank that was classified as containing hazardous waste and cleaned on-site? | ☐ YES ☒ NO 14 | HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of Federal RCRA hazardous waste; or generate in any single calendar month, or accumulate at any time 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acutely hazardous waste. | ☐ YES ☒ NO 14a | Obtain Federal EPA ID Number, file Biennial Report (EPA Form 8700-13A/B), and satisfy requirements for RCRA Large Quantity Generator. |
| Household Hazardous Waste (HHW) Collection site? | ☐ YES ☒ NO 14b | See CUPA for required forms. |
| F. LOCAL REQUIREMENTS | | |

*Unified Program Consolidated Forms

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 2 2 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Jomitsma + Anema Dairy

FACILITY ADDRESS 103: 8061 Edison Ave

CITY 104: Ontario

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | used oil | 2 | 30 gal. | gallon |
| 2 | teat dip | 1 | 250gal. | gallon |
| 3 | powder chlorinated soap | 2 | 55 | gallon |
| 4 | acid | 2 | 30 | gallon |
| 5 | sodium hypochlorite | 2 | 30 | gallon |
| 6 | teat dip | 1 | 55 | gallon |
| 7 | Zinc Sulfate | 20 | 50 | lbs |
| 8 | Hydrochloric acid | 1 | 55 | gallon |
| 9 | oxine | 1 | 55 | gallon |
| 10 | Diesel | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

SIGNATURE OF OWNER/OPERATOR: [signature]

NAME OF SIGNER (*print*) 136: Greg Anema

DATE 134: 5-23-07

Inventory Summary Page 1 of 1

BP of 2-21-08 replaces this plan. BW

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages, otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**
**www.sbcfire.org**

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept. Use Only – Log In/Date Stamp
RECEIVED
FEB 21 2008
S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 0 0 5 2 2

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma + Anema Dairy

BUSINESS SITE ADDRESS: 8061 Edison Ave | CITY: Ontario | ZIPCODE: 91762

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ — *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☐ * Business Activities Form
- ☐ * Business Owner/Operator Identification Form
- ☐ * Locally Collected Inventory Information Form
- ☐ * Supplemental Emergency Contact Page
- ☐ Emergency Response Plans and Procedures
- ☐ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☐ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☐ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☐ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☐ Area map - photocopied city map with location of site indicated
- ☐ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit the original and 1 copy to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

- ☒ Please incorporate the following into my business emergency/contingency plan.
  - ☒ New Business Owner/Operator Identification Form
  - ☒ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
  - ☐ New Supplemental Emergency Contact Page.
- ☐ Other: _____

Brief explanation of changes: _____

- ☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:
  - The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
  - There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
  - No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
  - This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER |
|---|---|---|
| [signature] | 2-19-08 | Aline Anema |

| NAME OF SIGNER (*print*) | TITLE OF SIGNER (*print*) |
|---|---|
| Greg Anema | partner |

ENTERED
APR 28 2008

FD SENT
FEB 21 2008

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 6 0 5 2 2 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma + Anema Dairy

EPA ID # (Hazardous Waste Only): CAL000319397

BUSINESS ADDRESS: 8061 Edison Ave

CITY: Ontario

ZIP CODE: 91762

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☒ YES ☐ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

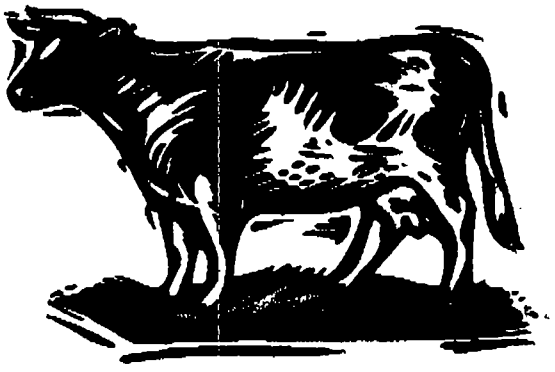

***Jorritsma & Anema Dairy***
***Sultana Dairy***
Greg Anema
8061 Edison Ave
Ontario, CA 91762
(909) 597-1317
Fax: (909) 597-4458
Cell (951) 741-6184

Feb. 12, 2008

Hazardous Materials Division

Dear Leslie Heaviside,

Could you please send a copy of the Business plan for both dairies to:
8061 Edison Ave
Ontario, CA 91762

Thank-you, you are a great help.

Aline Anema

Aline Anema
(909)597-1317

Owner: Greg Anema
(951)741-6184

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

PAT A. DENNEN
Fire Chief
County Fire Warden


January 3, 2008

Greg Anema
8061 Edison Avenue
Ontario, CA 91762

**SUBJECT: NOTICE OF BUSINESS PLAN REVIEW & UPDATE REQUIREMENTS**

**FACILITY: JORRITSMA DAIRY – 8061 EDISON AVENUE, ONTARIO**
**SULTANA DAIRY – 14389 SULTANA, ONTARIO**

The business emergency/contingency plan previously submitted for the above establishments have been reviewed and forwarded to your local fire department.

The next required deadline for you to annually update your business plan is March 1, 2008. You may need to do an interim update if your inventory information (including basic business information and emergency contacts) changes.

Whatever the reason for your next update, please use the enclosed forms. Based on our review of your previous submission, please be sure to address the following business plan elements/concerns in your next update:

**Jorritsma**

- Cover sheet: Submit a signed cover sheet.
- Business Owner/Operator Identification page: The Environmental Contact field was left blank. The environmental contact is intended to be the individual at the facility who will handle all environmental correspondence and will respond to enforcement activity (typically the individual who runs the day-to-day operations). Submit a revised Business Owner/Operator Identification page including the appropriate environmental contact.
- Inventory Summary an individual chemical description forms: The Maximum Quantity is intended to be listed in gallons not the number of containers. Additionally, the Maximum Quantity listed on the summary should be the same as the Maximum Amount listed on the individual description form. Submit a revised Summary and individual forms.

**Sultana**

- Business Owner/Operator Identification page: The Environmental Contact field was left blank. The environmental contact is intended to be the individual at the facility who will handle all environmental correspondence and will respond to enforcement activity (typically the individual who runs the day-to-day operations). Submit a revised Business Owner/Operator Identification page including the appropriate environmental contact.
- Inventory Summary an individual chemical description forms: The Maximum Quantity is intended to be listed in gallons not the number of containers. Additionally, the Maximum Quantity listed on the summary should be the same as the Maximum Amount listed on the individual description form. Used oil was omitted from the Inventory. Submit a revised Summary and individual forms.

Please submit 2 copies of your next update, **due no later than March 1, 2008.**

An electronic version of the Business Emergency/Contingency Plan Forms and Guidelines is available at our website www.sbcfire.org. Click on the HAZMAT bar located on the left side of the page. Then click on Forms & Guidelines in the title bar. Finally, click on the Business Plan title, this will link you to all forms associated with the Business Plan Program. Should you have any further questions, comments, or concerns, please feel free to contact me at (909) 386-8401 or lheaviside@sbcfire.org.

**LESLIE HEAVISIDE, REHS**
**Hazardous Materials Division, Field Services Section**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460
www.sbcfire.org

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED
JUN 01 2007
S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 0 0 5 2 2

BUSINESS NAME (Same as FACILITY NAME or DBA) 3
Jorritsma + Anema Dairy

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8061 Edison Ave | Ontario | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ — *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☒ * Business Activities Form
- ☒ * Business Owner/Operator Identification Form
- ☒ * Supplemental Emergency Contact Page
- ☒ Emergency Response Plans and Procedures
- ☒ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☒ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☒ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☒ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☒ Area map - photocopied city map with location of site indicated
- ☒ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.
- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:
- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER | 135 |
|---|---|---|---|
| [signature] | 5-19-07 | | |

| NAME OF SIGNER *(print)* | TITLE OF SIGNER *(print)* |
|---|---|
| Greg Anema | Partner |

ENTERED
JUL 26 2007

FD SENT
JUL 03 2007

## BUSINESS E .GENCY/CONTINGENCY PLAN COVER SH INSTRUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 2 2 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA): Jorritsma + Arema Dairy

EPA ID # (Hazardous Waste Only): CAL000319397

BUSINESS ADDRESS: 8061 Edison Ave

CITY: Ontario

ZIP CODE: 91762

## II. ACTIVITIES DECLARATION

| Does your facility... | | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☒ YES ☐ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page Instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California Identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

# Business Emergency/Contingency Plan Receipt

Mail to: JORRITSMA, JAMES
8061 EDISON AVE
ONTARIO, CA 91761

Site Address: JORRITSMA DAIRY
8061 EDISON AVE
ONTARIO, CA 91761

Service Request ID: SR0013922
Facility ID: FA0000522

The Business Emergency/Contingency Plan was received on June 01, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.
2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.
3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.
4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.
5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.
2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.
3. Change of business address, business ownership, or business name.
4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

**TRACKING SHEET FOR BUSINESS PLANS**

*Establishment #* FA 522

*Facility Name:* Sorritsma Dairy

*Facility Site Address:* 8061 Edison Ave

*City:* Ontario

*Fire Agency:* Ontario

2 (# of copies)

| | | Sent to FD |
|---|---|---|
| **Business Plans Received** | 06/01/07 | 07/03/07 |
| **Results of Review(s)** | | |
| **Deficiency** | | __/__/__ |
| **Conditional Approval** | | __/__/__ |
| **Approval** | | __/__/__ |
| | | **Sent to FD** |
| **Revised Plans Received** | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

**Other**

| **Date** | **Action/Documentation (update, new plan, etc.)** | **Staff hours** |
|---|---|---|
| 01/03/08 | BP - review letter sent LA | |
| 02/12/08 | BP - rec'd request for copy LA | |
| 02/12/08 | BP - copy mailed LA | |
| 2/21/08 | BP - Complete Submitted | BW |
| 8/17/11 | BP - Complete Submitted | BW |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

| | | | | |
|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

7721 Edison Ave/1053-361-01-0000/Dairy

7891 Edison Ave/1053-361-03-0000/SFR

8061 Edison Ave/1053-331-04-0000/Dairy

14400 South Grove Ave/1053-551-01-0000/Dairy

14213 Bon View Ave

14283 Bon View Ave

14297 Bon View Ave

14333 Bon View Ave

14450 Bon View Ave

14451 Bon View Ave

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

RBC - cb

[X] Update/Assign PEs [ ] Referral to Team CERS [ ] Closure [ ] Invoice Reversal [ ] Demand Bill
[X] Update Non-CERS Fields [ ] 0202 [ ] Other [ ] 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0009182**

NAME: **Gerben Hettinga**
ADDRESS: **14651 S Grove Ave** ADDRESS 2:
CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** COUNTRY: **US**
PHONE: **909-606-6455** EXT: FYI LAST UPDATED: **05/31/2018**

**FACILITY INFORMATION** — **FACILITY ID: FA0017949**

BUSINESS NAME: **GH Dairy #4** CERS ID: **10741726**
SITE ADDRESS: **8061 Edison Ave** ADDRESS 2:
CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** FAX: **909-606-6455**
BUSINESS PHONE: **909-606-6455** EXT:
BUSINESS OPERATOR NAME: **GH Dairy**
OPERATOR PHONE: **909-606-6455** EXT: FYI LAST UPDATED: **05/31/2018**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **14651 S Grove Ave** ADDRESS 2:
CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** COUNTRY: **US**

**BILLING CONTACT** — **ACCOUNT ID: AR0022849**

BILLING CONTACT NAME: **Patricia L Mohr**
ADDRESS 1: **14651 S Grove Ave** ADDRESS 2:
CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** COUNTRY: **US**
PHONE: **909-606-6455** EXT: EMAIL: **ghd123@earthlink.net**

**ENVIRONMENTAL CONTACT**

NAME: **Patricia L Mohr** PHONE: **909-606-6455** EXT:
EMAIL: **ghd123@earthlink.net**

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL):
LOCAL FACILITY PHONE (OPTIONAL): EXT:
CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: 02 BUSINESS TYPE: 03
SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: 18 - Ontario Fire
FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: ~~06/30/2018~~ 08/31/18 FYI LAST BILLING:
FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code**= 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type**=01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| 06/18/18 CB (Date Initials) | Date Initials | Date Initials | Date Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

NO CUPA ADMIN PE HAS BEEN ADDED

| | | | | | |
|---|---|---|---|---|---|
| [X] UPDATE<br>[ ] INACTIVATE<br>[ ] ZERO OUT BALANCE | PT0038752 | FEE EXEMPT | 4200-HAZMAT HANDLER GENERAL A | 07/01/2018 | 06/30/2019 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| | | | PR0050304 | TIVE, EXEMPT FROM BILLI | 4243 |
| | | | GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. |

ADD NEW P.E.

| | | | | | |
|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

[X] UPDATE
[ ] INACTIVATE
[ ] ZERO OUT BALANCE

5012
*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 6/12/18 SUBMITTED BY: Kristen Riegel Ward

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per CERS inventory submitted on 5/24/18, please assign the following:
Update PE 4200 to PE 4243 Active, Billable - facility reported 7 hazardous materials exceeding reporting threshold. No hazardous wastes generated.

Add CUPA Annual Administrative PE 5112 - facility handles 7 hazardous materials exceeding reporting threshold.

Update Business Code, Business Type, Supervisor District, Inspector, District, Fire Department.

Permit categories will be verified during facility inspection.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

[ ] 5050 scanned and emailed to Fiscal Date Initials

[ ] 5054 scanned and emailed to Fiscal Date Initials

# AN BERNARDINO COUNTY CUP
## FACILITY INFORMATION

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0009182

NAME: Gerben Hettinga

ADDRESS: 14651 S Grove Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY: US

PHONE: 909-606-6455 EXT: FYI LAST UPDATED: 05/31/2018

### FACILITY INFORMATION — FACILITY ID: FA0017949

BUSINESS NAME: GH Dairy #4 CERS ID: 10741726

SITE ADDRESS: 8061 Edison Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 FAX: 909-606-6455

BUSINESS PHONE: 909-606-6455 EXT:

BUSINESS OPERATOR NAME: GH Dairy

OPERATOR PHONE: 909-606-6455 EXT: FYI LAST UPDATED: 06/18/2018

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: 14651 S Grove Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY: US

### BILLING CONTACT — ACCOUNT ID: AR0022849

BILLING CONTACT NAME: Patricia L Mohr

ADDRESS 1: 14651 S Grove Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY: US

PHONE: 909-606-6455 EXT: EMAIL: ghd123@earthlink.net

### ENVIRONMENTAL CONTACT

NAME: Patricia L Mohr PHONE: 909-606-6455 EXT:

EMAIL: ghd123@earthlink.net

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: INDIVIDUAL BUSINESS TYPE: FARM

SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: ONTARIO FIRE

FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 08/31/2018 FYI LAST BILLING:

FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 0.00

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| Date: JUN 27 2018 Initials: CB | Date: Initials: | Date: Initials: | Date: Initials: |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

NO CUPA ADMIN PE HAS BEEN ADDED

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0038752 | ACTIVE | 4243-HAZARDOUS MATERIALS | 09/01/2018 | 08/31/2019 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| | | | PR0050304 | ACTIVE, BILLABLE | |
| | | | GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. |

| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

☐ UPDATE
☐ INACTIVATE
☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 6/27/18 SUBMITTED BY: Bezdek

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

per Blue book comment PE 5112 added. 6/18/18
• add PE 5012 - Remove PE 5112. 5112 - Incorrect PE

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

**SAN BERNARDIN COUNTY FIRE PROTECTION DIST T**

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Section**
**sbcfire.org**

**Daniel R. Munsey**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal/Deputy Fire Warden

October 07, 2022

GH Dairy #4
14651 S Grove Ave
Ontario, CA 91762

**ATTN: PATRICIA MOHR**

**SUBJECT: NOTICE OF POTENTIAL ENFORCEMENT ACTION**

**FACILITY: FA0017949-GH Dairy #4**
**8061 Edison Ave**
**Ontario, CA 91762**

Ms. Mohr,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 06, 2022:

- Failure to electronically update business plan within 30 days of any one of the following events:

1) A 100 percent or more increase in the quantity of a previously disclosed material.
2) Any handling of a previously undisclosed hazardous materials at or above reportable quantities.
3) A change of business address, business ownership, or business name.
4) A substantial change in the handler's operations that requires modification to any portion of the business plan.

**NOTICE OF POTENTIAL ENFORCEMENT ACTION:**
Failure to correct violations listed in this report and submit a signed and completed certificate of compliance may subject the facility to administrative enforcement action with penalties, and/or referral to the District Attorney's Office for Civil or Criminal Prosecution.

If you have any questions, please contact me at BWADE@SBCFIRE.ORG or call (909) 386-8401.

**BRIAN WADE, REHS**
**Hazardous Materials Section**

BOARD OF DIRECTORS

| Col. Paul Cook (Ret.) | Janice Rutherford | Dawn Rowe | Curt Hagman | Joe Baca Jr. | Leonard X. Hernandez |
|---|---|---|---|---|---|
| First District | Second District | Vice Chair, Third District | Chairman, Fourth District | Fifth District | Chief Executive Officer |

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

**CUPA COMPLIANCE INSPECTION REPORT**

| | |
|---|---|
| NAME: **GH Dairy #4** | FACILITY ID: **FA0017949** |
| ADDRESS: **8061 Edison Ave** | CERS ID: **10741726** |
| CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **5/6/2022** |

**Consent granted by:**

[X] **Photograph** [X] **Inspect** **Name:** Isidro Perez **Title:** Supervisor

An inspection was conducted on May 6, 2022 to determine compliance with applicable hazardous waste and hazardous material laws and regulations. Isidro Perez, Supervisor, provided escort throughout the inspection.

This facility is a dairy cow milking operation which maintains hazardous materials on site for use in milking barn cleaning and sanitation. Sodium hypochlorite is maintained on site for well water disinfection. Hazardous wastes are not being routinely generated on site.

HAZARDOUS MATERIALS INVENTORY:
The hazardous materials observed on site during the inspection appeared to be consistent with the inventory submitted in the California Environmental Reporting System (CERS) on 11/4/2019, CERS ID 10741726, except for the following:
(1) 55-gallon drum of Mandate
(2) 55-galllon drums of Clean Max
(3) 55-gallon drums of Oxy Gard M
back up generator with a diesel fuel belly tank

DOCUMENTATION REVIEW:
-Dairy equipment and the back up generator are serviced by SDS.
-Chemicals are supplied by Animal Health. Empty drums are removed by the supplier.
-CUPA permits are current; expiration date of 8/31/2022.
-Zoetis provides regular chemical safety training; the trainings are held twice per year.

Submit a signed Certificate of Compliance with required documentation to this office within 30 days.

If you have any questions, feel free to contact me at 909-658-5912 or bwade@sbcfire.org. If you have any questions regarding CERS, please contact the CERS helpline at 909-386-8432 or efile@sbcfire.org.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | Hazardous Materials Business Plan Submittal | CHSC | 25505, 25508(a)(1) | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | | Multiple | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508.2 | |
| H209 | **Business Plan Update Within 30 days of Change** | CHSC | 25508.1(a)-(f) | X |
| Violation: | Failure to electronically update business plan within 30 days of any one of the following events:<br>A 100 percent or more increase in the quantity of a previously disclosed material.<br>Any handling of a previously undisclosed hazardous materials at or above reportable quantities.<br>A change of business address, business ownership, or business name.<br>A substantial change in the handler's operations that requires modification to any portion of the business plan. | | | |
| MINOR | OBSERVATION: Hazardous materials were observed on site during the inspection that are not listed in the most current CERS inventory.<br><br>CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated in CERS. | | | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | | Multiple | |
| H211 | Hazardous Materials Inventory | CHSC | Multiple | |
| H212 | Site Map | CHSC | Multiple | |

| | | | | |
|---|---|---|---|---|
| H213 | Emergency Response Plan | | Multiple | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Not Provided and/or Documented | CHSC | 25505(a)(4) | |
| H216 | Hazardous Materials Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,255 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 5/6/22 2:30:56PM |
|---|---|---|
| Brian Wade | Isidro Perez | LTR:5/6/2022 2:30:43PM |
| BRIAN WADE | Isidro Perez | Supervisor |
| INSPECTOR NAME | NAME<br>INSPECTION DATE: 05/06/2022 | TITLE<br>REPORT DATE: 5/6/22 2:36 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector BRIAN WADE within 30 days of inspection unless otherwise specified.**

RESPONDENT: Patricia Mohr

VIOLATION(S) CITED ON: 5/6/2022

FACILITY NAME: **GH Dairy #4** FACILITY ID: **FA0017949**

SITE ADDRESS: **8061 Edison Ave** CERS ID: **10741726**

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H209 CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated in CERS.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: GH Dairy #4 Facility ID #: 17949

Address: 8061 Edison Avenue Ontario, CA 91762

1) Description: View of the facility from Edison Avenue facing South.

2) Description: Storage area for milking barn cleaning and sanitizing chemicals located on the West side of the barn.

Date Taken: **5/6/2022**

Taken By: **Brian Wade** Signature: _____

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

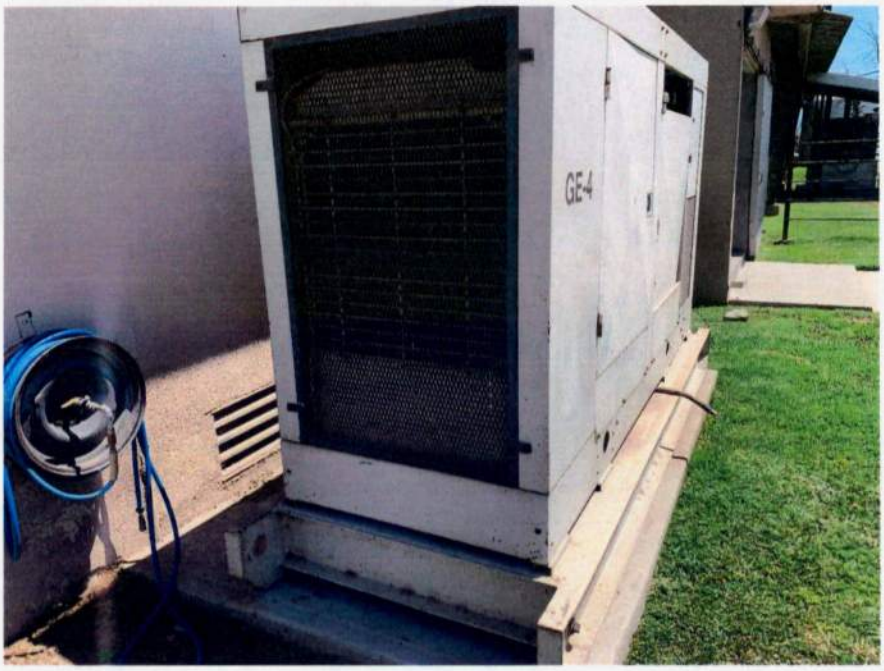


**PHOTO 4**

| | | | |
|---|---|---|---|
| Facility/Case Name: | GH Dairy #4 | Facility ID #: | 17949 |
| Address: | 8061 Edison Avenue Ontario, CA 91762 | | |
| 3) Description: | A back up generator with a diesel fuel belly tank of unknown quantity located outside on the West side of the milking barn. | | |
| 4) Description: | No Photo | | |

Date Taken: **5/6/2022**

Taken By: **Brian Wade** Signature: Brian Wade

Rev 06/29/2018

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Don Trapp
Interim Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal

October 22, 2019

GH DAIRY (GERBEN HETTINGA)
14651 S Grove Ave
Ontario, CA 91762

**ATTN: PATRICIA MOHR**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0017949-GH Dairy #4**
**8061 Edison Ave**
**Ontario, CA 91762**

Ms. Mohr,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on July 09, 2019:

- Failure to electronically update business plan within 30 days of any one of the following events:
  A 100 percent or more increase in the quantity of a previously disclosed material.
  Any handling of a previously undisclosed hazardous materials at or above reportable quantities.
  A change of business address, business ownership, or business name.
  A substantial change in the handler's operations that requires modification to any portion of the business plan.
- Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**

BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
|---|---|---|---|---|---|
| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

CUPA

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**CUPA COMPLIANCE INSPECTION REPORT**

| | |
|---|---|
| NAME: **GH Dairy #4** | FACILITY ID: **FA0017949** |
| ADDRESS: **8061 Edison Ave** | CERS ID: **10741726** |
| CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **7/9/2019** |

**Consent granted by:**

[X] **Photograph** [X] **Inspect** **Name:** Isidro Perez **Title:** Supervisor

An inspection was conducted on July 9, 2019 to determine compliance with hazardous waste and hazardous material laws and regulations. Isidro Perez, Supervisor, and Eric Perez, Part Time Worker, provided escort throughout the inspection.

This facility is a dairy operation which maintains hazardous materials on site for use in milking barn cleaning and sanitation. Sodium hypochlorite is used on site for well water disinfection. Hazardous wastes are not routinely generated on site.

HAZARDOUS MATERIALS INVENTORY:
The hazardous materials observed on site during the inspection appeared to be consistent with the inventory submitted in the California Environmental Reporting System (CERS) on 5/24/2018, CERS ID 10741726, except for the following:
(2) 55-gallon drums of Iodine Teat Dip
(2) 55-gallon drums of sodium hypochlorite
(2) 55-gallon drums of Oxy Gard M
Back up generator with a diesel belly tank of unknown maximum capacity

DOCUMENTATION REVIEW:
-Equipment and trucks are serviced by mechanics from GH Dairy 1. Any materials used and wastes generated are consolidated back at that location for disposal.
-The back up generator is serviced by WICO.
-Chemicals are delivered by Animal Health International. This company also removes the empty 55-gallon drums.
-The permits are current; expiration date of 8/31/2019.
-Zoetis provides regular chemical safety training and covers additional safety topics.

Submit a signed Certificate of Compliance with required documentation to this office within 30 days.

If you have any questions, feel free to contact me at 909-658-5912 or bwade@sbcfire.org. If you have any questions regarding CERS, please contact the CERS helpline at 909-386-8432 or efile@sbcfire.org.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | Hazardous Materials Business Plan Submittal | CHSC | 25505, 25508(a)(1) | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | CHSC | 25510(a) | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | **Business Plan Annual Review/Certification** | CHSC | 25508(a)(1), 25508.2 | X |
| Violation: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. | | | |
| MINOR | OBSERVATION: The last Business Plan update submitted by this facility is dated 5/24/2018.<br><br>CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS. | | | |

| | | | | |
|---|---|---|---|---|
| H209 | **Business Plan Update Within 30 days of change** | CHSC | 25508.1(a)-(f) | X |
| Violation:<br><br><br><br><br>MINOR | Failure to electronically update business plan within 30 days of any one of the following events:<br>A 100 percent or more increase in the quantity of a previously disclosed material.<br>Any handling of a previously undisclosed hazardous materials at or above reportable quantities.<br>A change of business address, business ownership, or business name.<br>A substantial change in the handler's operations that requires modification to any portion of the business plan.<br><br>OBSERVATION: Hazardous materials were observed on site during the inspection that are not listed in the most current CERS inventory or are listed in lesser quantities. Also, the emergency response plan submitted in CERS does not list the correct emergency contact number for the local CUPA. Revise the contact number to list either 909-386-8425 or 800-33-TOXIC and resubmit the plan.<br><br>CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS. | | | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | CHSC | 25508(a)(1) | |
| H211 | Hazardous Materials Inventory | CHSC | 25505, 25506, 25508 | |
| H212 | Site Map | CHSC | 25505(a)(2), 25508(a)(1) | |
| H213 | Emergency Response Plan | CHSC | 25505(a)(3), 25508(a)(1) | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Documentation | CHSC | 25505(a)(4) | |
| H216 | Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,255 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 7/9/19 2:22:41PM<br>LTR:7/9/2019 2:07:39PM |
|---|---|---|
| BRIAN WADE | Isidro Perez | Supervisor |
| INSPECTOR NAME | NAME<br>INSPECTION DATE: 07/09/2019 | TITLE<br>REPORT DATE: 7/9/19 2:24 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector BRIAN WADE within 30 days of inspection unless otherwise specified.**

RESPONDENT: Patricia Mohr

VIOLATION(S) CITED ON: 7/9/2019

FACILITY NAME: **GH Dairy #4** FACILITY ID: **FA0017949**

SITE ADDRESS: **8061 Edison Ave** CERS ID: **10741726**

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H209 CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS.

H206 CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: GH Dairy #4 Facility ID #: 17949

Address: 8061 Edison Avenue Ontario, CA 91762

1) Description: View of the facility from Edison facing South.

2) Description: (1) 55-gallon drum of sodium hypochlorite, (1) 55-gallon drum of HD PL-10 Acid Plus, (2) 55-gallon drums of iodine teat dip, and (1) 55-gallon drum of Liquid HD-325 stored in the milking barn.

Date Taken: **7/9/2019**

Taken By: **Brian Wade** Signature: Brian Wade

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

| | | | |
|---|---|---|---|
| Facility/Case Name: | GH Dairy #4 | Facility ID #: | 17949 |
| Address: | 8061 Edison Avenue Ontario, CA 91762 | | |
| 3) Description: | (1) 55-gallon drum of Exit fly killer and (2) 55-gallon drums of Oxy Gard M stored in the milking barn. | | |
| 4) Description: | (19) 50-pound bags of copper sulfate stored in the milking barn. | | |

Date Taken: **7/9/2019**

Taken By: **Brian Wade** Signature: Brian Wade

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 5**

**PHOTO 6**

Facility/Case Name: GH Dairy #4 Facility ID #: 17949

Address: 8061 Edison Avenue Ontario, CA 91762

5) Description: A back up generator with a diesel fuel belly tank located outside of the milking barn.

6) Description: (1) 55-gallon drum of sodium hypochlorite located to the West of the milking barn at a well used for water disinfection.

Date Taken: **7/9/2019**

Taken By: **Brian Wade** Signature: Brian Wade

Rev 06/29/2018

| | | | | |
|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

JACK & ELANE ALEWYN
9031 EUCALYPTUS AVE.
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JACK ALEWYN DAIRY
8185 EDISON BLVD
ONTARIO, CA 91761

Permit is issued to Facility: FA0000508 for a period not to exceed one year from effective date.

Effective Date: 12/1/2007 Expiration Date: 11/30/2008

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003498 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004040 |

SAN BERNARDINO COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO 1853

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ALEWYN DAIRY #3
9031 EUCALYPTUS AVE.
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
JACK ALEWYN DAIRY
8185 EDISON BLVD
ONTARIO, CA 91761

Permit is issued to Facility: FA0000508 for a period not to exceed one year from effective date.

Effective Date: 12/1/2006 Expiration Date: 11/30/2007

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003498 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004040 |

SAN BERNARDINO COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO 1853

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

12-20962-638 Rev. 9/06

OOB

# HAZARDOUS MATERIAL FIELD SERVICES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

File

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000275

Legal Owner

Closure

*NAME: JACK & ELANE ALEWYN

*ADDRESS 1: 9031 EUCALYPTUS AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *COUNTRY: USA

*PHONE: 909-721-4551 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 06/10/2010

**OWNER MAILING ADDRESS** ☐ Same as Owner

CARE OF: DBA: JACK & ELANE ALEWYN

ADDRESS1: 9031 EUCALYPTUS AVE. ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

### F- FACILITY INFORMATION — FACILITY ID: FA0000508

*NAME: JACK ALEWYN DAIRY CERS ID:

*ADDRESS 1: 8185 EDISON BLVD ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

*PHONE: 909-721-4551 EXT: ALT PHONE: EXT: FAX: 909-923-0714

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: INDIVIDUAL *BUSINESS TYPE: FARM FYI LAST UPDATED: 01/02/2013

**FACILITY MAILING ADDRESS** ☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: JACK ALEWYN DAIRY

CARE OF: JACK ALEWYN

ADDRESS 1: 8185 EDISON BLVD ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

*EMAIL:

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION — ACCOUNT ID: AR0000510

RESPONSIBLE PARTY: JACK ALEWYN ☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

CARE OF: JACK ALEWYN DAIRY

ADDRESS 1: 8185 EDISON ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

PHONE: 909-721-4551 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 10/15/2007

FYI ANNIVERSARY DATE: 11/30/2001 FYI ACCOUNT STATUS: ~~ACTIVE ACCOUNT~~ Inactive FYI TOTAL DUE: 0.00

ENVIRONMENTAL CONTACT NAME: JACK ALEWYN EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0003498<br>PERMIT NUMBER. | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-.<br>ORIGINAL P.E. | 12/01/2007<br>EFFECTIVE DATE | 11/30/2008<br>EXPIRATION DATE |
| | | | PR0004040<br>GHP OR UST ID | INACTIVE, NON-BILLAB<br>CURRENT STATUS(BILLING) | UPDATED P.E. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? (Yes) No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? (Yes) No

ENTERED

*DATE SUBMITTED: 1-10-13 DATE ENTERED: JAN 11 2013 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: K. Alfelor ENTERED BY: J. Guerra ***Demand bill for updated PEs**: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Closure inspection conducted on 1-9-13. Facility is no longer in business. No containers of hazardous materials and/or hazardous waste observed. Inactivate all operating permits.

– K. Alfelor

1-10-13

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to **complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0508 Facility Name: Jack Alewyn Dairy #1 Inspection Date: January 9, 2013

Site Address: 8185 Edison Blvd. Phone #: 909-721-4551

City: Ontario 91762 91761 EPA ID #:

Consent Granted by:

☒ Inspect ☒ Photograph Name: Title: # Emp: 0

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | X |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(a) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | X |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | X |
| 206. Regulated Substances registration filed | CHSC 25533 | | | X |
| 207. SPCC Plan prepared | CHSC 25270.4.5 | | | X |

**INSPECTION NARRATIVE**

**A closure inspection was conducted on 01/09/13 to determine compliance with applicable hazardous materials/ hazardous waste laws and regulations.**

**Jack Alewyn Dairy #1 is no longer in business. There were no containers of hazardous materials and hazardous waste observed onsite.**

**All operating permits will be inactivated immediately.**

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: Kris Alfelor (Sign Name) Received By: (Sign Name) Title:

Kristian Alfelor (Print Name) (Print Name) Report Date: January 10, 2013

KB

Form Revised 1/16/2007

Inactivate

# HAZAF US MATERIAL FIELD SERVICE
# COMPUTER DATABASE UPDATE AUTHORIZATION

**COMPLETED**

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

**OWNER ID: OW0000275**

NAME: **JACK & ELANE ALEWYN**

ADDRESS 1: **9031 EUCALYPTUS AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** COUNTRY: **USA**

PHONE: **909-721-4551** EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: **07/27/2007**

### OWNER MAILING ADDRESS

CARE OF: DBA: **JACK & ELANE ALEWYN**

ADDRESS1: **9031 EUCALYPTUS AVE.** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** COUNTRY: **USA**

## F- FACILITY INFORMATION

**FACILITY ID: FA0000508**

NAME: **JACK ALEWYN DAIRY**

ADDRESS 1: **8185 EDISON BLVD** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** CITY CODE: **ONTARIO**

SIC CODE: BUSINESS CODE: **INDIVIDUAL** BUSINESS TYPE: **FARM**

CENSUS: SUPERVISORIAL DISTRICT: **004** INSPECTION DISTRICT: **03**

PHONE: **909-721-4551** EXT: FIRE JURISDICTION: **ONTARIO FIRE**

ALT PHONE: EXT: FAX: **909-923-0714** LAST UPDATED: **07/26/2007**

### FACILITY MAILING ADDRESS

BUSINESS NAME: **JACK ALEWYN DAIRY**

CARE OF: **JACK ALEWYN**

ADDRESS 1: **8185 EDISON BLVD** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** COUNTRY: **USA**

EMAIL:

## A- A/R INFORMATION

**ACCOUNT ID: AR0000510**

RESPONSIBLE PARTY: **JACK ALEWYN**

CARE OF: **JACK ALEWYN DAIRY**

ADDRESS 1: **8185 EDISON** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761** COUNTRY: **USA**

PHONE: **909-721-4551** EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: **12/06/2007**

ALT PHONE: EXT: EXEMPT FROM BILLING: **NO** TAX ID:

ANNIVERSARY DATE: **11/30/2001** TOTAL DUE: **0.00** ACCOUNT STATUS: **ACTIVE ACCOUNT**

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| UPDATE/CLOSE/Z.O.B. | PT0003498 | ACTIVE | 4221 | I/2007 | 11/30/2008 |
|---|---|---|---|---|---|
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |

| PR0004040 | ACTIVE, BILLABLE | NA | NA | |
|---|---|---|---|---|
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. _____ NUMBER OF UST'S 0 MFR # _____

DATE SUBMITTED: 1-3-08 DATE ENTERED: 1/7/08 FISCAL DATE: _____

SUBMITTED BY: Leslie Heavisides ENTERED BY: CW

**COMMENTS/REMARKS:**

Per fire and BP: facility has below permittable quantities of haz mat.
Inactivate PE 4221.

AG - PE update

# HAZ OUS MATERIAL FIELD SERVI
# COMP TER DATABASE UPDATE AUTHORIZATION

(2)

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000275

NAME: ~~ALEWYN, JAKE J~~ Alewyn, Jack

ADDRESS 1: ~~14631 GROVE AV~~ 9031 Eucalyptus ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-9171~~ 91761 COUNTRY:

PHONE: (909) 721-4551 EXT: FAX:

ALT PHONE: 000-000-0000 EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Jack Alewyn DBA: ~~ALEWYN, JAKE J~~ Jack Alewyn Dairy

ADDRESS1: ~~14631 GROVE AV~~ 9031 Eucalyptus ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91761 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000508

NAME: ~~AG~~-JACK ALEWYN DAIRY

ADDRESS 1: 8185 EDISON BLVD ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-0000~~ 91761 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 03

PHONE: ~~000-000-0000~~ (909) 721 EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: 4551 EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-JACK ALEWYN DAIRY

CARE OF:

ADDRESS 1: 8185 EDISON BLVD ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91710-0000 COUNTRY:

EMAIL:

RCD SDD FIRE FISCAL
07 MAY 22 PM 12

## A- A/R INFORMATION

ACCOUNT ID: AR0000510

RESPONSIBLE PARTY: Jack Alewyn

CARE OF: Jack Alewyn Dairy

ADDRESS 1: 8185 Edison ADDRESS 2:

CITY: Ontario STATE: ZIP CODE: COUNTRY:

PHONE: (909) 721-4551 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 05/04/2007

ALT PHONE: EXT: EXEMPT FROM BILLING: YES TAX ID:

ANNIVERSARY DATE: 11/30/2001 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT00034! | ACTIVE | 4230 | !/01/2000 | 11/30/2001 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0004040 | ACTIVE, BILLABLE | NA | NA | | 4221 |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 3 NUMBER OF UST'S 0 MFR #

ENTERED

DATE SUBMITTED: 5-8-07 DATE ENTERED: MAY 14 2007 FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

Per inspection: Son, Jack Alcwyn, owns dairy. Update owner info.
Also update FA info (city change).

Assign PE 4221.
Demand bill.

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**

**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**

# BUSINESS OWNER / OPERATOR IDENTIFICATION

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 5 0 8 | | (This number is on your CUPA permit.) |
| EFFECTIVE DATE 100<br>May 1,2007 | ENDING DATE 101<br>3-1-08 | | |
| BUSINESS NAME (Same as FACILITY NAME or DBA)<br>Alewyn Dairy #1 | | BUSINESS PHONE<br>909/923-0714 | |
| BUSINESS SITE ADDRESS 103<br>8185 Edison Ave | | | |
| CITY 104<br>Ontario | COUNTY 108<br>SAN BERNARDINO | STATE<br>CA | ZIP CODE 105<br>91762 |
| D&B NUMBER | PRIMARY SIC/NAICS CODE 107<br>0241 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE<br>Milk Producer | |
| BUSINESS OPERATOR NAME 109<br>Jack & Elane Alewyn | | BUSINESS OPERATOR PHONE 110<br>909/923-0714 | |

## II. BUSINESS OWNER

| | | | |
|---|---|---|---|
| OWNER NAME 111<br>Jack & Elane Alewyn | | OWNER PHONE 112<br>909/923-0714 | |
| OWNER MAILING ADDRESS 113<br>9031 Eucalyptus Ave. | | | |
| CITY 114<br>Ontario | | STATE 115<br>CA | ZIP CODE 116<br>91762 |

## III. ENVIRONMENTAL CONTACT

| | | | |
|---|---|---|---|
| CONTACT NAME<br>Jack or Elane Alewyn | | CONTACT PHONE 118<br>909/923-0714 home 909/721-4550 cell 909/721-4551 | |
| CONTACT MAILING ADDRESS 119<br>9031 Eucalyptus Ave | | | |
| CITY 120<br>Ontario | | STATE 121<br>CA | ZIP CODE 122<br>91762 |

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123<br>Jack Alewyn | NAME 128<br>Elane Alewyn |
| TITLE 124<br>Owner | TITLE 129<br>Owner |
| BUSINESS PHONE 125<br>909/923-0714 | BUSINESS PHONE<br>909/923-0714 |
| HOME PHONE **(NOT CONFIDENTIAL - SEE NOTE BELOW)**<br>Same as above | HOME PHONE **(NOT CONFIDENTIAL - SEE NOTE BELOW)**<br>Same as above |
| OTHER 24-HOUR PHONE **(NOT CONFIDENTIAL – SEE NOTE BELOW)** | 24-HOUR PHONE **(NOT CONFIDENTIAL – SEE NOTE BELOW)** 131 |
| PAGER/CELL # 127<br>909/721-4551 | PAGER /CELL # 132<br>909/721-4550 |

***HOME** PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. **IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK.** ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

| | | |
|---|---|---|
| SIGNATURE OF OWNER/OPERATOR<br>Elane Alewyn | NAME OF SIGNER *(print)* 136<br>Elane Alewyn | DATE 134<br>5/1/07 |

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620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 0 8 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA) 3
Alewyn Dairy #1

FACILITY ADDRESS: 8185 Edison Ave
CITY: Ontario 91762 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

| BUSINESS MAILING ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 9031 Eucalyptus Ave. | Ontario | CA | 91762 |

| BUSINESS FAX NUMBER | BUSINESS E-MAIL |
|---|---|
| 909/923-0714 | |

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

| Total # of Employees per shift | SHIFT 1 | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION |
|---|---|---|---|---|
| 3 | 3 | 3 | | 24 |

| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | TOTAL # EMPLOYEES | TAXPAYER ID NUMBER |
|---|---|---|
| | 15 | 95-3247370 |

ASSESSORS PARCEL NUMBER (S): Unknown , leased
CROSS STREET: S/E corner Grove - Edison

BUSINESS DESCRIPTION: Milk Producer

Number of Underground Storage Tanks located at this facility: none

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☐ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 5-1-07

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| BUSINESS NAME (Same as FACILITY NAME or DBA) | | |
|---|---|---|
| Alewyn Dairy | | |
| FACILITY ADDRESS 103 | CITY 104 | |
| 8185 Edison Ave. | Ontario, CA 91762 | |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification**: **If a situation is an emergency, call 911 first.** Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | **911** |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | **(800) 33-TOXIC** or **(909) 386-8425** |
| 3. *State of California, Governor's Office of Emergency Services | **(800) 852-7550** or **(916) 845-8911** |
| 4. National Response Center | **(800) 424-8802** |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Alewyn Dairy | |
| FACILITY ADDRESS 103 | CITY 104<br>Ontario, CA 91762 |

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:

For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

**In case of emergency, all employees are directed to leave milking parlor thru open breezeways and go to grassy area in front circle Of milking barn. (Entire facility is in open air.)**

**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√ Check those items that apply and write additional information in the space provided).

- [x] Reduction of containers on site if not used or needed.
- [x] Containers are properly labeled and closed when not in use.
- [ ] Compressed gas cylinders are properly secured.
- [ ] Use of monitoring system. Type: _____
- [x] Other: Suppliers are contacted to remove empty containers in a timely fashion. (containers have empty container deposits.)

Date: 5/1/07

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Alewyn Dairy #1 | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8185 Edison Ave | Ontario, CA 91762 |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- [x] New employee training.
- [ ] Annual training & periodic refresher courses.
- [x] Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- [ ] Spill control equipment
- [ ] Monitoring system
- [ ] Personal Protective Equipment
- [x] On the job training. Describe below.
- [x] Other: weekly supply check by employee
  monthly supply check by suppliers

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√ Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- [x] Identify potential hazards and determine whether a release has occurred.
- [x] Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- [x] Coordinate the notification and evacuation of employees and customers from the facility.
- [x] Make required agency notifications and request needed assistance.
- [x] Assist responding agencies by providing access to the facility and information about the facility.
- [ ] Other:

BUSINESS NAME (Same as FACILITY NAME or DBA)
Alewyn Dairy

| FACILITY ADDRESS 103 | CITY 104 |
|---|---|
| | Ontario, CA 91762 |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√ Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | 1 ea hand held | Yearly |
| ☒ First aid kit(s) | 1 ea | replaced as needed |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☐ Personal Protective Equipment | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√ Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste  Floor Drains, open air storage
- ☐ Process vessels
- ☐ Aboveground storage tanks
- ☐ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☐ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√ Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler none
- ☐ Emergency response team
- ☐ Local Hospitals **Inland Industrial Medical, location posted in work area. Treatment plan in place for injuries**
- ☐ Other:
- ☐ No arrangements or agreements at this time

Date: 5/1/07

CUPA
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 0 8 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA)
Alewyn Dairy #1

FACILITY ADDRESS 103
8185 Edison Ave.

CITY 104
Ontario, CA 91762

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| | No qualifying hazardous materials | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER *(print)* 136 | DATE 134 |
|---|---|---|
| Elane Alewyn | Elane Alewyn | 5/1/07 |

Inventory Summary Page ____ of ____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

***One page per item. Indicate if material OR waste (Do not combine material and waste on one form)***

**MAKE COPIES OF THIS FORM AS NEEDED.**

***ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.***

**ITEM NUMBER** _____

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 5 0 8 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME<br>Alewyn Dairy | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS<br>8185 Edison Ave Ont 91762 | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME<br>no qualifying chemicals | TRADE SECRET ☐ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME | EHS* ☐ YES ☐ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)* ☐ a. PURE ☐ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☐ | CURIES

PHYSICAL STATE *(Check one item only)* ☐ a. SOLID ☐ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER:

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| | | | |

UNITS* *(Check one item only)* ☐ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE **365**

STORAGE CONTAINER *(Check all that apply)*

| | | | | |
|---|---|---|---|---|
| ☐ a. ABOVEGROUND TANK | ☐ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. | | ☐ YES ☐ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

| | |
|---|---|
| NOTES *(Trade names/synonyms or other information relevant to the substances listed)* | ***If EPCRA, Owner/Operator please sign this page*** |

Date: _____

Fax Coversheet:
To:

San Bernardino County
Fire Dept
January 3, 2008

Attn: Leslie
909/386-8460

From:

Alewyn Dairy #1

Site Address:
8185 Edison Ave.
Ontario

Memo:

The Dairy # 1 on Edison Ave. stores no qualifying chemicals over 55 gallons. The only chemical in bulk storage is Iodine Dip and that is less than 1%.

Thank you so much for your help. Please call me if you have any questions.

Elane Alewyn

Elane Alewyn
Alewyn Dairy
909/923-0714 fax and phone

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**
**www.sbcfire.org**

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp
RECEIVED
JUN 11 2007
S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 0 0 5 0 8

BUSINESS NAME (Same as FACILITY NAME or DBA) 3
Alewyn Dairy #1

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8185 Edison Ave | Ontario | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ — ***Items with an ' * ' are considered "Inventory" under State disclosure laws***

- ☒ * Business Activities Form
- ☒ * Business Owner/Operator Identification Form
- ☒ * Supplemental Emergency Contact Page
- ☒ Emergency Response Plans and Procedures
- ☒ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☒ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☒ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☒ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☒ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☒ Area map - photocopied city map with location of site indicated
- ☒ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☒ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☒ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.
- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER 135 |
|---|---|---|
| Elane Alewyn | 5-1-07 | Elane Alewyn |

| NAME OF SIGNER *(print)* | TITLE OF SIGNER *(print)* |
|---|---|
| Elane Alewyn | owner |

ENTERED
JUL 26 2007

FD SENT
JUL 03 2007

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 5 0 8 [redacted]

| BUSINESS NAME (Same as FACILITY NAME or DBA) | EPA ID # (Hazardous Waste Only) |
|---|---|
| Alewyn Dairy #1 | |

| BUSINESS ADDRESS | CITY | ZIP CODE |
|---|---|---|
| 9031 Eucalyptus Ave. | Ontario | 91762 |

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731)<br>* CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank)<br>* HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page<br>* BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY<br>* ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

# Business Emergency/Contingency Plan Receipt

Mail to: JACK & ELANE ALEWYN
9031 EUCALYPTUS AVE.
ONTARIO, CA 91761

Site Address: JACK ALEWYN DAIRY
8185 EDISON BLVD
ONTARIO, CA 91761

Service Request ID: SR0013911
Facility ID: FA0000508

The Business Emergency/Contingency Plan was received on June 11, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.

2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.

3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.

4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.

5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.

2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.

3. Change of business address, business ownership, or business name.

4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0005508 Facility Name: Jack Henryn Dairy Inspection Date: April 23, 2007

Site Address: 8185 Edison Phone #: (909) 724-4551

City: Ontario Zip Code: 91761 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: John Hernandez Title: Manager # Emp: 3 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☒ 101. 201 Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires hazardous materials permit

**Compliance requirements Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (4) 55 gal drums Thalore tank dip
(1) 30 gal Chlorinated Soap
(1) 30 gal drum Acid
- no hazardous waste observed

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) NA

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) NA

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) NA

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) NA

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) NA

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) NA

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) NA

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) NA

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) NA

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) NA

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) NA

**Compliance Requirement**: Submit copies of waste disposal records for the past NA

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) NA

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy-milk production. Equipment is serviced by Kent Aery.

Inspected By: [signature] Sign Name — Leslie Heaviside Print Name

Received By: [signature] Sign Name — Jack Henryn Print Name

Title: Owner

Report Date: April 23, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date



* see attached supplemental *

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org**

# SUPPLEMENTAL INSPECTION REPORT

Page 1 of 1

INSPECTION DATE: April 23, 2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0003508 | Jack Alewyn Dairy | 8185 Edison, Ontario |
| Consent Granted by: ☑ Inspect ☑ Photograph | NAME John Hernandez | TITLE Manager |

Jack Alewyn stated that the Indure teat dip is only 0.5% Iodine. However, the MSDS provided showed that the concentration of Iodine is 2.5 - 3.0%. Mr. Alewyn called the supplier to verify that the product is diluted to 0.5%. If an MSDS can be provided documenting that the only hazardous constituent in this product is 0.5% Iodine, a permit will not be required for this facility.
This facility will only be exempt from permitting as long as there is less than 55 gallons of hazardous materials and no hazardous waste is generated.

☑ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: [signature] (Sign Name) Leslie Hernandez (Print Name)

Received By: [signature] (Sign Name) Jack Alewyn (Print Name)

Title: Owner

Report Date: April 23, 2007

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

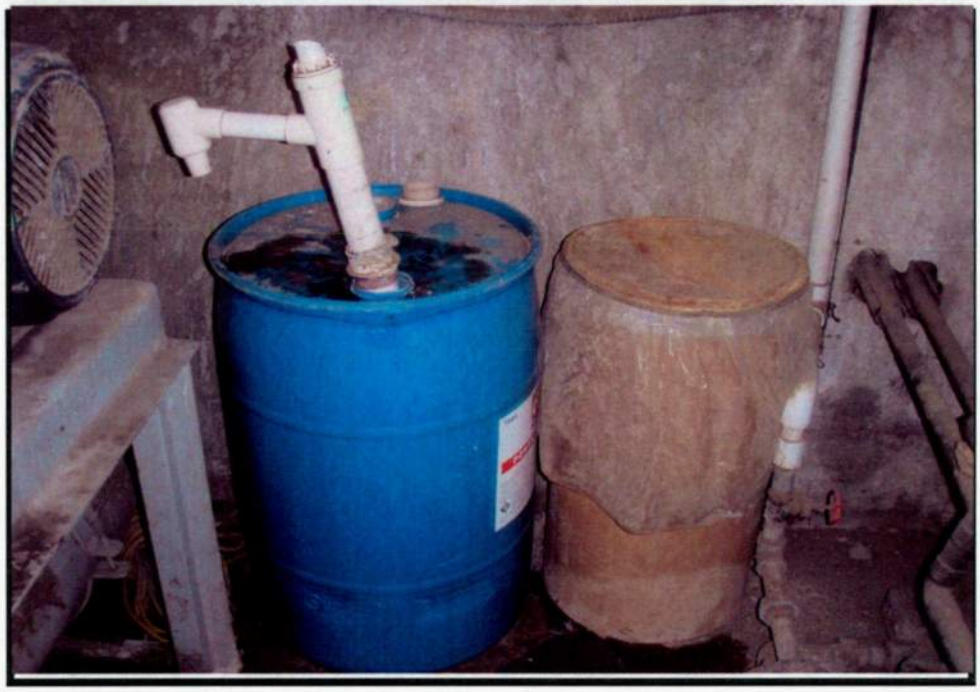

Facility/Case Name: **Jack Alewyn Dairy** Facility ID #: **FA0000508**

Address: **8185 Edison Avenue, Ontario**

1) Description: **(2) 55-gallon drums of teat dip**

2) Description: **(L to R): (1) 30-gallon drum of Power Plus acid cleaner; (1) 20-gallon container of chlorinated soap**

Date Taken: **April 23, 2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

TRACKING SHEET FOR BUSINESS PLANS

*Establishment #* FA 508

*Facility Name:* Jack Alewyn (Alewyn #1) Dairy

*Facility Site Address:* 8185 Edison

*City:* Ontario

*Fire Agency:* Ontario

2 (# of copies)

| | | Sent to FD |
|---|---|---|
| **Business Plans Received** | 06/11/07 | 07/03/07 |
| **Results of Review(s)** | | |
| **Deficiency** | | __/__/__ |
| **Conditional Approval** | | __/__/__ |
| **Approval** | | __/__/__ |

| | | Sent to FD |
|---|---|---|
| **Revised Plans Received** | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

| Other Date | Action/Documentation (update, new plan, etc.) | Staff hours |
|---|---|---|
| 01/03/08 | BP - rec'd fax indicating haz mat below 55 gals | 1h |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

HA[illegible]RDOUS MATERIALS FIELD SE[illegible]ICES
COMPUTER DATA BASE UPDATE AUTHORIZATION

CHANGE ☑

INACTIVATE PERMIT(S) ☒ INACTIVATE FACILITY ☐

BILL TO: E A O LOC/DIST NO: 53 EST NO: 87014228
(Circle one)
(Former Est. Name (if applicable)

**E – Establishment Information**
Name: AG-Jack Alewyn Dairy
Street No: 8185 Fraction: Direction:
Street Name: Edison Apt/Ste/Unit No:
City: Chino State: CA Zip Code: 91710
Attn: Telephone: ( )

**A – Applicant Information**
Name:
Street No: Fraction: Direction:
Street Name: Apt/Ste/Unit No:
City: State: Zip Code:
Attn: Telephone: ( )

**O – Owner Information**
Name:
Street No: Fraction: Direction:
Street Name: Apt/Ste/Unit No:
City: State: Zip Code:
Attn: Telephone: ( )

Program Information: MFR Number
Number of Employees: Number of UST's:
Federal Tax I.D.Number/Social Security Number:

Permit Information: (Circle those that apply)
Change/Inactivate/Add: 226000 Permit No: 8707300006
Change/Inactivate/Add: 222800 Permit No: 8808230004
Change/Inactivate/Add: 222801 Permit No: 8808230005
Change/Inactivate/Add: 227001 Permit No: 9709091180
Change/Inactivate/Add: 226014 Permit No:

Date Submitted: 9/26/01 Date Entered: 10/2/01
Submitted By: C Parsons. Entered By: L. Lara-Davis

Comments/Remarks:
Pls change permit catagories

222800 & 222801 inactivate all permits

70100 AUG 22 KV 8/19

**COMPUTER DATA BASE UPDATE AUTHORIZATION**

**ACTION REQUESTED (Circle One) est name

**Add** **Change** **Inactivate** **Delete**

**ESTABLISHMENT INFORMATION:

Jack Alewyn Dairy
(Name)

8185 Redlands Chino
(Number/Street) (City)

*PERMIT CATEGORY 222800 & 222801 - add

CHANGE PERMIT CATEGORY FROM _____ TO _____

LEGAL OWNER INFORMATION:

(Name)

(Mailing Address) (City) (Zip)

THIS IS A **NEW** ESTABLISHMENT: _____

THIS IS A **TRANSFER**: _____

Former Establishment Name: _____

PERMIT SECTION SHOULD SEND NEW APPLICATION: _____

NEW APPLICATION HAS BEEN GIVEN TO NEW OWNER: _____

ESTABLISHMENT **NAME CHANGE ONLY** (no change in ownership):

(Old Name)

* AG - Jack Alewyn Dairy
(New Name)

OK

MARK DESIRED BOX(ES):

| Make Change To | Date | Initial |
|---|---|---|
| EH PERMIT BILLING SYSTEM | | |
| SWEEPS | | |
| ESTABLISHMENT FILE | | |

**EHS PERMIT BILLING SYSTEM: 87014228
(Establishment Number)

(Permit Number - Mandatory except for new establishment)

*SWEEPS MFR NUMBER _____ *DIST/SANI NUMBER _____

CHANGE DIST/SANI FROM _____ TO _____

**PROGRAM _____ LOCATION _____

**PROGRAM SPECIFIC INFORMATION**

**FOOD:** Seating Capacity _____

Square Footage _____

**RECREATIONAL BATHING:** # of Pools _____

**MILK AND DAIRY:** Gallons _____

**HAZARDOUS MATERIALS:** # of Tanks 1

# of Employees _____

**HOUSING:** # of Units _____

**VECTOR:** # of Birds _____

**WASTE:** Daily Tons _____

Cubic Yards _____

**WATER:** # of Connections _____

License Number/Expiration Date 9/30/87

License Class 1 _____ 2 _____

*** = Mandatory for Food Program Only**
**** = Mandatory for ALL Programs**

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 7010001 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8808230004 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8808230004 | 222800 | I | 09/30/87 | | 00 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 7010001 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8808230004 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

*** CONTROL NUMBER: 7010002 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8808230005 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8808230005 | 222801 | I | 09/30/87 | | 00 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 7010002 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8808230005 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

Not On County Billing System

STATE: CA 36 SAN BERNARDINO #36
999 COUNTY AT LARGE
001 ENVIRONMENTAL HEALTH SERVICES

STATE SITE ID 00040260
LOCAL SITE ID [redacted]

NOTES

FACILITY ID#: 40260 # OF TANKS AT SITE 1 EPA ID:

FACILITY NAME: JACK ALEWYN DAIRY C/O:

ADDRESS: 8185 EDISON NAME TYPE: UNKNOWN

CITY: CHINO STATE: CA ZIP: 91710 PHONE: (714) 597-2081 EXT

TYPE OF BUSINESS: FARM INDIAN RESERVATION:

NEAREST CROSS STREET:GROVE

SITE INFORMATION (FORM A)
**********
**********
**********

| EMERGENCY CONTACT PERSON (PRIMARY) | | EMERGENCY CONTACT PERSON (SECONDARY) | |
|---|---|---|---|
| NAME | PHONE | NAME | PHONE |
| DAY:JAKE ALEWYN | (714) 597-2081 EXT | | ( ) - EXT |
| IGHT:ALEWYN, JACK | (714) 597-4114 EXT | | ( ) - EXT |

[redacted]

NOT ON ARBS

ROP OWNER NAME: JAKE J. ALEWYN C/O:

DDRESS: 14361 GROVE AVE NAME TYPE: UNKNOWN

ITY: CHINO STATE: CA ZIP: 91710 PHONE: ( ) - EXT

TANK OWNER NAME: JACK ALEWYN DAIRY C/O:

ADDRESS: 8185 EDISON NAME TYPE: UNKNOWN

CITY: CHINO STATE: CA ZIP: 91710 PHONE: ( ) - EXT

LEGAL/BILL NAME: JACK ALEWYN DAIRY C/O:

ADDRESS: 8185 EDISON NAME TYPE: UNKNOWN

CITY: CHINO STATE: CA ZIP: 91710 PHONE: ( ) - EXT

PERMIT #: APPRV'D DATE: - - EXP. DATE: - -

LOCATION: 99 #99 COUNTY AT LARGE CENSUS TRACT#:

DIV: SUP:01 DIST:01 BUSINESS PLAN FILED: N DATE FILED: - -

CHECK #: PERMIT AMT: $.00 SURCHARGE AMT: $.00

FEE CODE: RECEIPT #: REC'D BY:

STATE: CA 36 SAN BERNARDINO #36
999 COUNTY AT LARGE
001 ENVIRONMENTAL HEALTH SERVICES

STATE SITE ID 00040260
LOCAL SITE ID

NOTES

TANK INFORMATION (FORM 8)

FACILITY ID#: 40260 NAME: JACK ALEWYN DAIRY STATE-TANK-ID: 00040260-001

TANK NUMBER: 1 LOCAL-TANK-ID: -

TANK DESCRIPTION

A. OWNERS TANK ID#: 1 B. MANUFACTURED BY:

C. DATE INSTALLED: - - D. CAPACITY IN GALLONS: 250

TANK CONTENTS

A. TANK USE: 1 MOTOR VEHICLE FUEL B. STORAGE: 1 PRODUCT

C. VEHICLE FUEL: 3 DIESEL D. NAME: DIESEL, KEROSENE CAS#: 8008-20-6

TANK CONSTRUCTION

A. SYSTEM TYPE: 95 UNKNOWN B. MATERIAL: 95 UNKNOWN

C. INTERIOR LINING: 95 UNKNOWN IS METHANOL COMPATIBLE?:

D. CORROSION PROTECTION: 95 UNKNOWN

PIPING INFORMATION

| A. PIPING SYSTEM | B. CONSTRUCTION | C. MATERIAL |
|---|---|---|
| A/G 95 UNKNOWN | 95 UNKNOWN | 95 UNKNOWN |
| U/G 1 SUCTION | 95 UNKNOWN | 95 UNKNOWN |

LEAK DETECTION SYSTEM

PRIMARY: 91 NONE SECONDARY: 91 NONE

CLOSED TANK INFO

ESTIMATED LAST USE: - - QUANTITY REMAINING: INERT FILLED:

PERMIT #: APPRV'D DATE: - - EXP. DATE: - -

LOCATION: 99 #99 COUNTY AT LARGE CENSUS TRACT#:

DIV: SUP:01 DIST:01 BUSINESS PLAN FILED: N DATE FILED: - -

CHECK #: PERMIT AMT: $.00 SURCHARGE AMT: $.00

FEE CODE: RECEIPT #: REC'D BY:

AG

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
I N V O I C E

PAGE 1
BILL DATE 08/09/88
HEALTH PERMIT EXPIRATION DATE 09/30/87

*** REMIT COPY ***

ESTABLISHMENT NBR 87014228

ALEWYN, JAKE J
DBA: JACK ALEWYN DAIRY
14631 GROVE AV
CHINO, CA 91710

AUG 17 1988
AG

JACK ALEWYN DAIRY
~~8185 REDLANDS BLVD~~ 8185 EDISON
CHINO, CA 91710

INACT. PERMIT
AUG 17 1988

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 87073[illegible]006 | 226000 | HAZARDOUS MATERIAL HANDLER, UNDERGROUND TANK ONLY | 101 | 40.00 |
| | | PERMIT TOTAL | | 40.00 |
| | | TOTAL DUE | | 40.00 |

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE

REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA. 92415-0160

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK DAIRY ESTABLISHMENTS -- 387-4608
HAZ[illegible]S OR INFECTIOUS
WA[illegible] GENERATORS -- 387-3080
UNDERGROUND STORAGE
TANK PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3044

MOBILEHOME PARK PERMITS -- 387-4670
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-4670
HOME OCCUPATION PERMITS -- 387-4678
TEMPORARY OFFICES/SIGNS -- 387-4678
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4655
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-4678

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO JACK ALEWYN DAIRY
8185 ~~REDLANDS BLVD~~ 8185 EDISON
CHINO, CA 91710

< ✓ > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO ALEWYN, JAKE J
14631 GROVE AV
CHINO, CA 91710

LEGAL OWNER INFO ALEWYN, JAKE J
14631 GROVE AV
CHINO, CA 91710

IS THIS A TRANSFER? _____

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ✓ LEGAL OWNER ___APPLICANT

| OFFICE USE ONLY |
|---|
| EST NBR 87014228 |
| PERMIT NBR 8707300006 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226000 |
| EXPIR DATE 09/30/87 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 2200 |
| MFR NBR |
| APN |
| PERMIT FEE _____ |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D _____ |

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

SIGNED Mrs. Jake Alewyn DATED 8-15-85 TITLE Owner (Wife)

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
INVOICE

PAGE 1
BILL DATE 08/29/87
HEALTH PERMIT EXPIRATION DATE 09/30/87

*** REMIT COPY ***

ESTABLISHMENT NBR 87014228

ALEWYN, JAKE J
DBA: JACK ALEWYN DAIRY
14631 GROVE AV
CHINO, CA 91710

JACK ALEWYN DAIRY
8185 ~~ROLLINGS~~ EDISON BLVD
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 8707300004 | 222800 | PREVIOUS BALANCE | | 0.00 |
| | | UNDERGROUND STORAGE TANKS | 101 | 112.00 |
| | | PERMIT TOTAL | | 112.00 |
| 8707300005 | 222801 | PREVIOUS BALANCE | | 0.00 |
| | | UNDERGROUND STORAGE TANK STATE FEE | 101 | 0.00 |
| | | STATE FEE | 105 | 56.00 |
| | | PERMIT TOTAL | | 56.00 |
| 8707300006 | 226000 | PREVIOUS BALANCE | | 0.00 |
| | | HAZARDOUS MATERIAL HANDLER, UNDERGROUND TANK ONLY | 101 | 40.00 |
| | | PERMIT TOTAL | | 40.00 |
| | | TOTAL DUE | | 208.00 |

9-10-89
This is an agricultural business. The tank is used for diesel for our tractors only. Should your office need we will send you a copy of this form. We were already called regarding this with the same information.
Thank you
Mr. Jake Alewyn

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS
WASTE GENERATORS -- 387-4629
UNDERGROUND STORAGE
TANK PERMITS -- 387-4629
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3080

MOBILEHOME PARK PERMITS -- 387-4670
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-4670
HOME OCCUPATION PERMITS -- 387-4670
TEMPORARY OFFICES/SIGNS -- 387-4670
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4655
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO JACK ALEWYN DAIRY

8185 REDLANDS BLVD

CHINO, CA 91710

< > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO ALEWYN, JAKE J

14631 GROVE AV

CHINO, CA 91710

LEGAL OWNER INFO ALEWYN, JAKE J

14631 GROVE AV

CHINO, CA 91710

IS THIS A TRANSFER? _____

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

NUMBER OF UNDERGROUND STORAGE TANKS: 001

| EMERGENCY CONTACT: | POSITION: | WORK PHONE: | 24-HR PHONE: |
|---|---|---|---|
| _ _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

| OFFICE USE ONLY |
|---|
| EST NBR 87014228 |
| PERMIT NBR 8707300004 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 222800 |
| EXPIR DATE 09/30/87 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 2200 |
| MFR NBR |
| APN |
| PERMIT FEE _____ |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D _____ |

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

SIGNED _____ DATED _____ TITLE _____

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RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

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| OFFICE USE ONLY |
|---|
| EST NBR 87014228 |
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SIGNED _____ DATED _____ TITLE _____

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

TO JAKE ALEWYN
14631 GROVE AVE.
CHINO CA. 91710

FROM

SUBJECT CHECK # 8764 - $40.00

DATE 8/17/88

**MESSAGE** DUE TO CONFLICTING OPINIONS REGARDING AGRICULTURAL HAZARDOUS MATERIAL HANDLER STATUS, WE ARE NOT COLLECTING THIS fee AT THIS TIME. YOU WILL BE NOTIFIED SHOULD THIS PROGRAM BE IMPLEMENTED IN THE FUTURE.

SIGNED BILLING CLERK

**REPLY**

SIGNED

DATE / /

REDIFORM 4S 472

SEND PARTS 1 AND 3 INTACT - PART 3 WILL BE RETURNED WITH REPLY.

POLY PAK (50 SETS) 4P472

DETACH AND FILE FOR FOLLOW-UP

HAZARDOUS WASTE & TOXICS CONTROL SECTION
APBS DATA INPUT

FACE SHEET

ACTION CODE: I  Esta. # _____  Permit # _____

ESTABLISHMENT INFO (00)

Bill to: 0  Location # 53  Esta. Date _____

ADDRESSING INFO (99):

E
NAME: Jack Alewyn Dairy
ST. # 8185  FRAC: _____  DIR: _____  ST. NAME: Bedlands Blvd.
ST. DESIG. _____  APT/SP _____
CITY Chino  STATE Ca.  ZIP 91710  PH (___) ___ - _____

A
NAME: Jake J. Alewyn
ST. # 14631  FRAC: _____  DIR: _____  ST. NAME: Grove Ave.
ST. DESIG. _____  APT/SP _____
CITY Chino  STATE Ca.  ZIP 91710  PH (___) ___ - _____

O
NAME: _____
ST. # _____  FRAC: _____  DIR: _____  ST. NAME: _____
ST. DESIG. _____  APT/SP _____
CITY _____  STATE _____  ZIP _____  PH (___) ___ - _____

PERMIT INFO (01):

Category: 222800 "801 + 226000  Exp. Date 9/30/87  San Dist Area: 22  San Dist. Emp: 00

Renewal Code: ~~R~~ NEW  MFR#: _____

PROGRAM INFO:

# Tank 1

Date Entered : JUL 30 1987

Control # 10001

By (Initial): TK

COMMENTS/REMARKS:

File

E

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 1000100 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 0000000000 ***

ESTAB NBR: 87014228 BILL FLAG: 0 LOC: 53 PARCEL NBR: PROBLEM PGM: STATUS: ESTAB DATE: 073087 INACTIVE DATE: 000000

*** CONTROL NUMBER: 1000101 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300004 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8707300004 | 222800 | | 09/30/87 | | 22 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | |

*** CONTROL NUMBER: 1000101 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300004 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

*** CONTROL NUMBER: 1000102 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300005 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8707300005 | 222801 | | 09/30/87 | | 22 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | |

*** CONTROL NUMBER: 1000102 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300005 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

*** CONTROL NUMBER: 1000103 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300006 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8707300006 | 226000 | | 09/30/87 | | 22 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | |

*** CONTROL NUMBER: 1000103 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: 8707300006 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 001 | | | | | |

*** CONTROL NUMBER: 1000199 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: A ***

*** CONTROL NUMBER: 1000199 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: E ***

*** CONTROL NUMBER: 1000199 ESTABLISHMENT NUMBER: 87014228 PERMIT NUMBER: O ***

ESTAB: JACK ALEWYN DAIRY APPL: ALEWYN, JAKE J OWNR: ALEWYN, JAKE J
8185 0/0 REDLANDS BLVD 14631 0/0 GROVE AV 14631 0/0 GROVE AV
00000 00000 00000

CHINO
(000) 000-0000

CA 91710-0000

CHINO
(000) 000-0000

CA 91710-0000

CHINO
(000) 000-0000

CA 91710-0000

# CUPA

San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

## UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Jack Alewyn Dairy
Date: April 23, 2007
Street Address: 8185 Edison
Facility No. FA0000508
City: Ontario
Zip Code: 91761
Program Record No. —
Facility Contact: Jack Alewyn
Facility Phone No. (909) 721-4551
Number of Tanks: —

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 302. UST permit fees paid and current | CHSC 25287(a) | | | ✓ |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | ✓ |
| 308. Failure to report change of ownership within 30 days | CHSC 25284(c) | | | ✓ |
| 306. Owner/Operator agreement available | CHSC 25284(a)(3) | | | ✓ |
| 307. Certificate of Financial Responsibility submitted | CHSC 25292.2(a) | | | ✓ |
| 330. Leak Detection/Monitoring and Response Plan | CCR 2632, 2634 or 2641(h) | | | ✓ |
| 304. UST monitoring/maintenance records available for 3 years | CHSC 25284(c) | | | ✓ |
| 312. Designated Operator Statement submitted | CCR 2715(a) | | | ✓ |
| 313. Monthly inspections completed by Designated Operator | CCR 2715(c) | | | ✓ |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | ✓ |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | ✓ |
| 311. Business Plan submitted/updated | CHSC 25505 | | | ✓ |
| **MONITORING OF UST SYSTEMS** | | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | ✓ |
| 331. Monitoring system(s) certified annually | CCR 2638 or 2641(j) | | | ✓ |
| 334. Audible/visual alarms operational | CCR 2632(c)(2)(B) and 2636(f)(1) | | | ✓ |
| 314. Certification sticker/tag affixed to monitoring equipment | CCR 2638(f) | | | ✓ |
| 318. Sensors placed at low point of UST system(s) | CCR 2630(d) or 2641(a) | | | ✓ |
| 319. Leak detection equipment tampered with or disabled | CHSC 25299(f)(2) | | | ✓ |
| 323. Containment sump(s) free of debris/liquid | CCR 2590.21(c)(3) | | | ✓ |
| 324. Line leak detector(s) installed and functioning properly | CCR 2636(f)(2) or 2641(f) | | | ✓ |
| 333. Overspill containment installed/tested annually | CHSC 25284.2 | | | ✓ |
| 327. Overfill protection device installed/operational | CCR 2635(b)(2) | | | ✓ |
| 328. Secondary containment components tested | CCR 2637(a) | | | ✓ |
| 329. UST system design, construction, and monitoring | CCR 2630 or 2640 | | | ✓ |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | ✓ |
| 341. Failure to report unauthorized release | CHSC 25299(d)(1) | | | ✓ |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | ✓ |
| 343. Unlawful closure of USTs | CHSC 25298(c) | ✓ | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | ✓ |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | ✓ |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | ✓ |
| **UNIFORM FIRE CODE REQUIREMENTS** | | | | |
| 335. Emergency fuel shut-off device operational | UFC 5201.5.3 | | | ✓ |
| 336. Impact valve(s) installed at dispenser(s) | UFC 5202.5.3.2 | | | ✓ |
| 337. Fire extinguisher(s) present and charged | UFC 5201.9 | | | ✓ |
| 338. Address clearly visible from street | UFC 901.4.4 | | | ✓ |
| **OTHER REQUIREMENTS** | | | | |
| Significant Operational Compliance – Prevention | 40 CFR Part 280 | | | ✓ |
| Significant Operational Compliance – Detection | 40 CFR Part 280 | | | ✓ |
| Significant Operational Compliance – Both | 40 CFR Part 280 | | | ✓ |

**NARRATIVE / CORRECTIONS**

An inspection was conducted to verify proper removal of the UST located at this facility. This departments records indicate a 250 gallon UST was previously or still is located at this site. Evidence of removal and sampling was not provided to this department.

Correct the following violation:
(343) Unlawful closure of UST's - CHSC 25298(c): In order to properly close the UST evidence of removal and sampling must be provided.

Note: Mr. Alewyn stated he bought the property in 1978 and did not believe there was ever a UST on site.

If you have any questions, please call (909) 386-8401.

☑ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: Leslie Heavilside
Received by: Jack Alewyn
Title: Owner

CP

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden

## AGRICULTURAL UNDERGROUND STORAGE TANK (UST) CERTIFICATE OF COMPLIANCE

**Please Return Certification within 30 days to Inspector_____.**

Name of UST/Property Owner Jake Alewyn.

Establishment Name Alewyn Dairy.

Establishment Address 8185 Edison Ave Chino.

Establishment Number _____.

Number of UST's (if known) 0.

I certify that:
*(Check appropriate box(s), if you check more than one box in the section below, please write an explanation below)*

☐ AUSTs containing motor vehicle fuels (gasoline, diesel, or heating oil) on my property have a capacity less than or equal to 1100 gallons and is **currently in use.**

☐ AUSTs with a capacity greater than 1100 gallons or any size UST containing materials or waste other than motor vehicle fuels located on my property **have been upgraded** to meet December 22, 1998 standards.

☒ The AUST(s) on my property were **previously removed.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ The AUST(s) on my property are **no longer in use.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ AUSTs with a capacity greater than 1100 gallons or **any size** UST containing materials or waste on my property **have not been upgraded** to December 22, 1998 standards. (Contact San Bernardino County Fire Department Hazardous Materials Division for upgrade or closure requirements).

Elaine Alewyn
Signature

_____
Date

Elaine Alewyn
Print Name

owner / spouse
Title

Additional Information/Explanation:

fire dept offical came to check off for closure requirements.

WILLIAM H. RANDOLPH
County Administrative Officer

Board of Supervisors
KATHY A. DAVIS ..... First District
JON D. MIKELS ..... Second District
JERRY EAVES ..... Fifth District
DENNIS HANSBERGER ..... Third District
FRED AGUIAR ..... Fourth District

ALEWYN DAIRY
9031 EUCALYPTUS AVE
CHINO, CA 91710
909 / 923-0714

COUNTY FIRE
HAZARDOUS MATERIALS
00 MAY 18 PM 3:16

INDUSTRY CA 917 4
PM
16 MAY
2000

County F.D.
Hazardous Mat. Div.
385 N. Arrowhead Ave #2nd Floor
San Bernardino CA 92415-0153

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
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**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden


May 10, 2000

JACK ALEWYN TRUST
14361 GROVE AVENUE
CHINO, CA 91710

**SUBJECT: AGRICULTURAL UNDERGROUND STORAGE TANKS**

San Bernardino County Fire Department recently mailed information to all owners of agricultural underground storage tank(s) (AUST). The purpose of this follow up letter and the attached AUST certificate of compliance is to obtain current information regarding the status of existing AUSTs. In 1984, State Law exempted AUSTs from regulation if they contained motor vehicle fuels (gas, diesel, and heating oil). In 1987, State Law was amended to exempt AUST's 1100 gallons in capacity or less. AUSTs larger than 1100 or any size AUST containing waste or materials other than motor vehicle fuels are not exempt and are required to meet all current UST regulations.

Your cooperation and assistance is appreciated. Please complete the attached AUST certificate of compliance and return it within 30 days to:

COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS DIVISION
FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVE, 2ND FLOOR
SAN BERNARDINO, CA 92415-0153

If you have any questions or if you need further assistance, please contact your local inspector at (909) 387-3082.

**B. DOUGLAS SNYDER, CUPA PROGRAM MANAGER**
**Hazardous Materials Field Services**

BDS/jc

Attachment

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden


## AGRICULTURAL UNDERGROUND STORAGE TANK (UST) CERTIFICATE OF COMPLIANCE

**Please Return Certification within 30 days to Inspector_____.**

Name of UST/Property Owner_____.

Establishment Name_____.

Establishment Address_____.

Establishment Number_____.

Number of UST's (if known)_____.

I certify that:
*(Check appropriate box(s), if you check more than one box in the section below, please write an explanation below)*

☐ ASTUSTs containing motor vehicle fuels (gasoline, diesel, or heating oil) on my property have a capacity less than or equal to 1100 gallons and is **currently in use.**

☐ AUSTs with a capacity greater than 1100 gallons or any size UST containing materials or waste other than motor vehicle fuels located on my property **have been upgraded** to meet December 22, 1998 standards.

☐ The AUST(s) on my property were **previously removed.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ The AUST(s) on my property are **no longer in use.** (Contact San Bernardino County Fire Department Hazardous Materials Division regarding closure requirements).

☐ AUSTs with a capacity greater than 1100 gallons or any size UST containing materials or waste on my property **have not been upgraded** to December 22, 1998 standards. (Contact San Bernardino County Fire Department Hazardous Materials Division for upgrade or closure requirements).

_____ _____
Signature Date

_____ _____
Print Name Title

Additional Information/Explanation:

_____

_____

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X

**S ER:**

- ete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- A h this form to the front of the mailpiece, or on the back if space does not
- "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

JACK ALEWYN TRUST
14361 GROVE AVE
CHINO CA 91710

4a. Article Number
2 384 255 572

4b. Service Type

☐ Registered ☒ Certified
☐ Express Mail ☐ Insured
☐ Return Receipt for Merchandise ☐ COD

7. Date of Delivery
3/9/00

5. Received By: *(Print Name)*

8. Addressee's Address *(Only if requested and fee is paid)*

6. Signature: *(Addressee or Agent)*
X J. Alewyn

PS Form 3811, December 1994 102595-98-B-0229 Domestic Return Receipt

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

UNITED STATES POSTAL SERVICE

INDUSTRY CA 91716
09 MAR

First-Class Mail
Postage & F Paid
USPS
Permit No. G-10

• Print your name, address, and ZIP Code in this box •

COUNTY FIRE
HAZARDOUS MATERIALS
00 MAR 11 AM 2:26

County of San Bernardino
COUNTY FIRE DEPARTMENT
Hazardous Materials Division
385 N. Arrowhead Ave., 2nd Floor
San Bernardino, CA 92415-0153

HMFS- Christine Parsons

CUPA

**San Bernardino County Fire Department**

HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION

385 N. Arrowhead Ave, 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323

# UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Jack Alewyn Dairy Date: 02-17-00

Street Address: 8185 Edison Avenue Est. No: 87014228

City: Chino Zip Code: 91710 Number of Tanks: 1

Facility Contact: Facility Phone No. Number of Employees:

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 301. UST permits obtained | CHSC 25284(a) | | | |
| 302. UST permit fees paid and current | CHSC 25287(a) | | | |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | |
| 304. UST monitoring/maintenance records available for 3 years | CCR 2712(b) | | | |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | |
| 306. Owner-operator agreement available | CHSC 25284(a)(3)(A) | | | |
| 307. Certification of Financial Responsibility submitted | CHSC 25292.2(a) | | | |
| 308. Failure to report change of ownership within 30 days | CCR 2712(d) | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | |
| 311. Business Plan submitted/updated | CHSC 25505 | | | |
| **MONITORING OF EXISTING UST SYSTEM (Pre 1984)** | | | | |
| **Monitoring in General -** | | | | |
| 315. Leak Detection/Monitoring and Response Plan available | CCR 2641 | | | |
| 316. Annual UST precision tests conducted | CHSC 25292(b) | | | |
| 317. Monitoring devices maintained annually | CCR 2641(j) | | | |
| **Piping -** | | | | |
| 320. Pressurized piping tested annually | CHSC 25292(e) | | | |
| 321. In-line leak detector installed on pressurized piping | CHSC 25292(e) | | | |
| 322. Suction piping tested every 3 years | CCR 2643(d) | | | |
| **Inventory Reconciliation for Single Wall USTs -** | | | | |
| 325. Monthly inventory reconciliation performed and available (ATG) | CCR 2646(c) | | | |
| 326. Dispenser meters calibrated annually | CCR 2646(l) | | | |
| **MONITORING OF NEW UST SYSTEMS (1984 to Present)** | | | | |
| 330. Leak Detection/Monitoring and Response Plan available | CCR 2632 | | | |
| 331. Monitoring systems certified annually | CCR 2630(d) | | | |
| 332. Pressurized piping maintained/tested | CCR 2636(f) | | | |
| 333. Overfill/spill protection installed | CHSC 25291(c) | | | |
| 334. Visual/audible alarms operational | CCR 2632(c)(2) | | | |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | |
| 341. Failure to report/record unauthorized release | CCR 2650 | | | |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | ✓ | | |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | |

**NARRATIVE / CORRECTIONS**

A recent review of your file indicates that this facility has 1- 250 gallon underground storage tank onsite. Please contact this office immediately to inform us in any change to the current status of the UST. This includes: removal, no longer in use, and upgrading the UST systems to meet December 22, 1998 UST standards.

χ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: CHRISTINE PARSONS

Received by: Title:

Revised 11/18/99

Overall Site with 1 Fac. Unit

## General Information

Location: 8185 EDISON BLVD Map: Haz:1 Type: 1
Community: Chino Grid: F/U: 1 AOV: 0.0

| Contact Name | Title | Business Phone | 24-Hour Phone |
|---|---|---|---|
| JAKE ALEWYN | | (909) 597-2081 x | ( ) - |
| MRS JAKE ALEWYN | | (909) 597-2081 x | ( ) - |

Summary

## Hazmat Inventory List in MCP Order

### All Materials at Site

| F/U | Material Name | --Hazards-- | | Max Qty | Unit | MCP |
|---|---|---|---|---|---|---|
| F/U: 02 - Fixed Containers at Site | | | | | | |
| | DIESEL | F | IH DH | 250 | GAL | Moderate |

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

DE HOOG, MARTIN L
8311 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000410 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2013** **Expiration Date: 5/31/2014**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018959 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017852 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

As a condition of the permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
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**Effective Date: 6/1/2012** **Expiration Date: 5/31/2013**

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| PT0018959 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017852 |

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

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ONTARIO, CA 91762

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8311 EDISON AVE
ONTARIO, CA 91762

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**Effective Date: 6/1/2010** **Expiration Date: 5/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018959 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017852 |

Pat A. Dennen, Fire Chief/Fire Warden

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

DE HOOG, MARTIN L
8311 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000410 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2009** **Expiration Date: 5/31/2010**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018959 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017852 |

Pat A. Dennen, Fire Chief/Fire Warden

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# HA RDOUS MATERIAL FIELD SERV ES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000328

Closure

Legal Owner

*NAME: DE HOOG, MARTIN L

*ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY:

*PHONE: 909-947-3559 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 06/10/2010

#### OWNER MAILING ADDRESS

☐ Same as Owner

CARE OF: DBA: MARTIN DEHOOG DAIRY

ADDRESS1: 8311 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

### F- FACILITY INFORMATION — FACILITY ID: FA0000410

*NAME: MARTIN DEHOOG DAIRY CERS ID: 10034638

*ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *CITY CODE: ONTARIO

*PHONE: 909-947-3559 EXT: ALT PHONE: EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.: 6

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FYI LAST UPDATED: 02/19/2013

#### FACILITY MAILING ADDRESS

☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: MARTIN DEHOOG DAIRY

CARE OF: MARTIN DEHOOG

ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

*EMAIL: LIZDEHOOG@MSN.COM

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION — ACCOUNT ID: AR0000412

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY: MARTIN DEHOOG

CARE OF: MARTIN DEHOOG DAIRY

ADDRESS 1: 8311 EDISON ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-3559 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 04/17/2013

FYI ANNIVERSARY DATE: 05/31/2007 FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI TOTAL DUE: 0.00

ENVIRONMENTAL CONTACT NAME: MARTIN DEHOOG EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE TH/ PPLY)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0018959<br>PERMIT NUMBER | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-1U<br>ORIGINAL P.E. | 06/01/2013<br>EFFECTIVE DATE | 05/31/2014<br>EXPIRATION DATE |
| | | | PR0017852<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? (Yes) No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? Yes (No)

ENTERED

*DATE SUBMITTED: 1-13-14 DATE ENTERED: JAN 13 2014 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Brian Wade ENTERED BY: ***Demand bill for updated PEs**: Yes (No)

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

JG

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection of 1-8-14, this facility has ceased operation. All cows + equipment have been sold or transferred and all hazardous materials have been removed. Inactivate PE 4221.

**OPEN VIOLATIONS:**

FA0000410

INSPECTION DATE: **2/14/13** VIOLATION ID: **IV0079320** COMPLY BY: **03/17/2013**

INSPECTOR: **BRIAN WADE** COMPLIED ON:

**VIOLATION:** 4202034200-Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

QC ENTERED

JAN 28 2014

Lara

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

File

# HAZARDOUS MATERIAL FIELD SERVICES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

☑ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A  Update  CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000328

Legal Owner

*NAME: DE HOOG, MARTIN L

*ADDRESS 1: 8311 EDISON AVE  ADDRESS 2:

*CITY: ONTARIO  *STATE: CA  *ZIP CODE: 91762  *COUNTRY:

*PHONE: 909-947-3559  EXT:  FAX:

ALT PHONE:  EXT:  FYI LAST UPDATED: 06/10/2010

**OWNER MAILING ADDRESS** ☐ Same as Owner

CARE OF:  DBA: MARTIN DEHOOG DAIRY

ADDRESS1: 8311 EDISON AVE  ADDRESS 2:

CITY: ONTARIO  STATE: CA  ZIP CODE: 91762  COUNTRY:

### F- FACILITY INFORMATION — FACILITY ID: FA0000410

*NAME: MARTIN DEHOOG DAIRY  CERS ID: 10034638

*ADDRESS 1: 8311 EDISON AVE  ADDRESS 2:

*CITY: ONTARIO  *STATE: CA  *ZIP CODE: 91762  *CITY CODE: ONTARIO

*PHONE: 909-947-3559  EXT:  ALT PHONE:  EXT:  FAX:

CENSUS: MILITARY SCHOOL MEDICAL  *SUPERVISORIAL DISTRICT: 004  *INSPECTION DISTRICT: 03  NUMBER OF EMP.: 6

FIRE JURISDICTION: ONTARIO FIRE  SIC CODE:

*BUSINESS CODE:  *BUSINESS TYPE:  FYI LAST UPDATED: 04/18/2011

**FACILITY MAILING ADDRESS** ☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: MARTIN DEHOOG DAIRY

CARE OF: MARTIN DEHOOG

ADDRESS 1: 8311 EDISON AVE  ADDRESS 2:

CITY: ONTARIO  STATE: CA  ZIP CODE: 91762  COUNTRY:

*EMAIL: lizdehoog@msn.com

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION — ACCOUNT ID: AR0000412

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY: MARTIN DEHOOG

CARE OF: MARTIN DEHOOG DAIRY

ADDRESS 1: 8311 EDISON  ADDRESS 2:

CITY: ONTARIO  STATE: CA  ZIP CODE: 91762  COUNTRY:

PHONE: 909-947-3559  EXT:  ALT PHONE:  EXT:

ALT PHONE 2:  EXT:  FYI EXEMPT FROM BILLING: NO  FYI Last Billing: 04/17/2012

FYI ANNIVERSARY DATE: 05/31/2007  FYI ACCOUNT STATUS: ACTIVE ACCOUNT  FYI TOTAL DUE: 0.00

ENVIRONMENTAL CONTACT NAME: MARTIN DEHOOG  EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0018959<br>PERMIT NUMBER | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-[redacted]<br>ORIGINAL P.E. | | 06/01/2012<br>EFFECTIVE DATE | 05/31/2013<br>EXPIRATION DATE |
| | | | | PR0017852<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | UPDATED P.E. |
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes No

*Should this facility be inactivated upon verification that there is no balance due? Yes No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes No

*Does this 5050 have attached documents? Yes No

*DATE SUBMITTED: 2-15-13 DATE ENTERED: ENTERED FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Brian Wade ENTERED BY: FEB 19 2013 ***Demand bill for updated PEs**: Yes No

BY:

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

# H. RDOUS MATERIAL FIELD SER CES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

COMPLETED

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000328

Legal Owner

*NAME: DE HOOG, MARTIN L

*ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY:

*PHONE: 909-947-3559 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 06/11/2007

TAX ID: DRIVER LICENSE:

#### OWNER MAILING ADDRESS

☐ Same as Owner

CARE OF: DBA: MARTIN DEHOOG DAIRY

ADDRESS1: 8311 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

### F- FACILITY INFORMATION — FACILITY ID: FA0000410

*NAME: MARTIN DEHOOG DAIRY

*ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *CITY CODE: ONTARIO

CENSUS: MILITARY SCHOOL MEDICAL *BUSINESS CODE: *BUSINESS TYPE:

SIC CODE: *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03

*PHONE: 909-947-3559 EXT: FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE: EXT: FAX: FYI LAST UPDATED: 07/15/2008

#### FACILITY MAILING ADDRESS

☐ Same as Facility

☐ Same as Owner Mailing Address

BUSINESS NAME: MARTIN DEHOOG DAIRY

CARE OF: MARTIN DEHOOG

ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

EMAIL:

### A- A/R INFORMATION — ACCOUNT ID: AR0000412

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY: MARTIN DEHOOG

CARE OF: MARTIN DEHOOG DAIRY

ADDRESS 1: 8311 EDISON ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-3559 EXT: TAX ID: DRIVER LICENSE:

ALT PHONE: EXT: FYI EXEMPT FROM BILLING: NO FYI LAST UPDATED: 03/05/2009

ALT PHONE: EXT: FYI TOTAL DUE: 0.00

FYI ANNIVERSARY DATE: 5/31/07 ← ADD FYI ACCOUNT STATUS: ACTIVE ACCOUNT

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency

**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

☐ UPDATE
☐ INACTIVATE
☐ ZERO OUT BALANCE

| PT0018 | ACTIVE | 4221 | 6/01/2007 | 05/31/2008 |
|---|---|---|---|---|
| PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |

| PR0017852 | ACTIVE, BILLABLE | NA | NA | |
|---|---|---|---|---|
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP.: _____ NUMBER OF ACTIVE UST'S 0 MFR # _____

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes **No**

*Should this facility be inactivated upon verification that there is no balance due? Yes **No**

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes **No**

*Does this 5050 have attached documents? Yes **No**

*DATE SUBMITTED: 3/16/09 DATE ENTERED: 3/17/09 FISCAL ENTRY DATE/ INITIAL: _____

*SUBMITTED BY: EKing ENTERED BY: LLD ***Demand bill for updated PEs: Yes** No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered in Envision.

EXPL: ACTIVE PE 4221 added to an "ACTIVE" facility with no programs, which was imported as inac in '02 therefore never had an anniv. date

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Add ANNIV DATE 5/31/07 and demand bill for 08/09 PERMITS.

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

AG - PE & info update

# HAZA[redacted]OUS MATERIAL FIELD SERVIC[redacted]
# COMPUTER DATABASE UPDATE AUTHORIZATION

PROD. SDD

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

07 JUN 24 ONTARIO

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000328

NAME: DE HOOG, MARTIN L

ADDRESS 1: 8311 EDISON AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-9171~~ 91762 COUNTRY:

PHONE: (909) 947-3559 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Martin De Hoog Dairy DBA: DE HOOG, MARTIN L

ADDRESS1: 8311 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91762 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000410

NAME: ~~AG-DE HOOG, MARTIN L~~ Martin De Hoog Dairy

ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91762 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: 0241 BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: N/A SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 03

PHONE: (909) 947-3559 EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG-DE HOOG, MARTIN L~~ Martin De Hoog Dairy

CARE OF: Martin De Hoog

ADDRESS 1: 8311 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000412

RESPONSIBLE PARTY: Martin De Hoog

CARE OF: Martin De Hoog Dairy

ADDRESS 1: 8311 Edison ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: (909) 947-3559 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 04/05/2007

ALT PHONE: EXT: TAX ID:

ANNIVERSARY DATE: TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | N/A | | N/A | | 5/31/07 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| | | NA | | NA | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E. 4221

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 6 NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 6-4-07 DATE ENTERED: 6/11/07 FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY:

LLD

COMMENTS/REMARKS:

Per inspection: Assign handler only permits.
Update owner, FA & AIR info
Remove "Hg" prefix from name.

Demand bill.

TRACKING SHEET FOR BUSINESS PLANS

_____
Establishment #

Facility Name:

Facility site address:

City:

Fire Agency:

| | | Sent to FD |
|---|---|---|
| _____ (# of copies) | | |
| Business Plan Received | 1/10/08 | __/__/__ |
| Result of Review(s) | | |
| Deficiency | | __/__/__ |
| Conditional Approval | | __/__/__ |
| Approval | | __/__/__ |

| | | Sent to FD |
|---|---|---|
| Revised Plan(s) Received | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

Other

| Date | Action/documentation (update, new plan, etc.) | Staff Hours |
|---|---|---|
| 1/14/08 | BP-requested inv forms LH | |
| 04/15/08 | BP-corrections rec'd LH | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**

**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**

# BUSINESS OWNER / OPERATOR IDENTIFICATION

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 | | (This number is on your CUPA permit.) |
| EFFECTIVE DATE 100 | ENDING DATE 101 | | |
| BUSINESS NAME (Same as FACILITY NAME or DBA) | De Hoog Family Trust | BUSINESS PHONE | (909) 947-3559 |
| BUSINESS SITE ADDRESS 103 | 8311 Edison Ave. | | |
| CITY 104 | Ontario | COUNTY 108: SAN BERNARDINO | STATE: CA; ZIP CODE 105: 91762 |
| D&B NUMBER | — | PRIMARY SIC/NAICS CODE 107: 0241 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: Dairy |
| BUSINESS OPERATOR NAME 109 | MARTIN L. De Hoog | BUSINESS OPERATOR PHONE 110 | (909) 947-3559 |

## II. BUSINESS OWNER

| | | | |
|---|---|---|---|
| OWNER NAME 111 | MARTIN L. De Hoog | OWNER PHONE 112 | (909) 947-3559 |
| OWNER MAILING ADDRESS 113 | 8311 Edison Ave | | |
| CITY 114 | Ontario | STATE 115: CA | ZIP CODE 116: 91762 |

## III. ENVIRONMENTAL CONTACT

| | | | |
|---|---|---|---|
| CONTACT NAME | Martin L. De Hoog | CONTACT PHONE 118 | (909) 947-3559 |
| CONTACT MAILING ADDRESS 119 | 8311 Edison Ave. | | |
| CITY 120 | Ontario | STATE 121: CA | ZIP CODE 122: 91762 |

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | | - SECONDARY - | |
|---|---|---|---|
| NAME 123 | MARTIN L. De Hoog | NAME 128 | Marty De Hoog |
| TITLE 124 | Owner | TITLE 129 | Son |
| BUSINESS PHONE 125 | (909) 947-3559 | ~~BUSINESS~~ Home PHONE | (909) 597-7757 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126 | | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131 | |
| PAGER/CELL # 127 | | PAGER /CELL # 132 | (909) 917-8084 |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| Martin De Hoog | MARTIN DE Hoog | 1/8/08 |

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# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 4 1 0 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): De Hoog Family Trust (Dairy) — 3

FACILITY ADDRESS: 8311 Edison Ave — CITY: Ontario — 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

| BUSINESS MAILING ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 8311 Edison Ave | Ontario | CA | 91762 |

| BUSINESS FAX NUMBER | BUSINESS E-MAIL |
|---|---|
| 909-947-3559 | |

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

| Total # of Employees per shift | SHIFT 1 | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION |
|---|---|---|---|---|
| | 2 | 2 | 1 | |

| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | TOTAL # EMPLOYEES | TAXPAYER ID NUMBER |
|---|---|---|
| | 6 | |

ASSESSORS PARCEL NUMBER (S): — CROSS STREET:

BUSINESS DESCRIPTION: Dairy

Number of Underground Storage Tanks located at this facility: 0

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☐ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 1/08/08

**CUPA**

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| De'Hoog Family Trust (Dairy) | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8311 Edison Ave. | Ontario |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification**: **If a situation is an emergency, call 911 first**. Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | 911 |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | (800) 33-TOXIC or (909) 386-8425 |
| 3. *State of California, Governor's Office of Emergency Services | (800) 852-7550 or (916) 845-8911 |
| 4. National Response Center | (800) 424-8802 |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" *means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into* the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date: 1/08/08

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| DeHoog Family Trust (Martin DeHoog Dairy) | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8311 Edison Ave. | Ontario |

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:

For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

In Case of an Emergency We will notify all Employee's present and have them meet us by our mailBox by Edison Ave. between our house + Barn.

**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√Check those items that apply and write additional information in the space provided).

- [x] Reduction of containers on site if not used or needed.
- [x] Containers are properly labeled and closed when not in use.
- [ ] Compressed gas cylinders are properly secured.
- [ ] Use of monitoring system. Type: _____
- [ ] Other:

Date: 1/08/08

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| De Hoog Family Trust / Martin De Hoog Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8311 Edison Ave | Ontario |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- ☐ New employee training.
- ☐ Annual training & periodic refresher courses.
- ☐ Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- ☐ Spill control equipment
- ☐ Monitoring system
- ☐ Personal Protective Equipment
- ☒ On the job training. Describe below.
- ☐ Other:

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- ☒ Identify potential hazards and determine whether a release has occurred.
- ☒ Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- ☒ Coordinate the notification and evacuation of employees and customers from the facility.
- ☒ Make required agency notifications and request needed assistance.
- ☒ Assist responding agencies by providing access to the facility and information about the facility.
- ☐ Other:

Date: 1/08/08

BUSINESS NAME (Same as FACILITY NAME or DBA): DeHoog Family Trust (Martin DeHoog Dairy)

FACILITY ADDRESS 103: 8311 Edison Ave

CITY 104: Ontario

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | 1 - ABC | Annually |
| ☒ First aid kit(s) | 1 - General | As needed |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☒ Personal Protective Equipment | Nitrile gloves | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste
- ☒ Process vessels
- ☒ Aboveground storage tanks
- ☐ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☒ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler
- ☐ Emergency response team
- ☐ Local Hospitals
- ☐ Other:
- ☒ No arrangements or agreements at this time

Date: 1/08/08

## HELPFUL HINTS FOR COMPLETING THE INVENTORY SECTION

**Congratulations! You have completed the first half of the plan. The following pages require review of the hazardous materials and hazardous wastes at your facility to determine which items require disclosure.**

**Here are some helpful hints to assist you in filling out the hazardous materials inventory section:**

1) This CUPA offers an example business plan that is available on our website or by mail. If you are unfamiliar with the business plan requirement, we recommend that you look at the example before you get started so you can see how inventory summary, chemical description pages, and maps work together.

2) Before you start filling out forms, determine how many items require disclosure and make the appropriate number of copies of the Inventory Summary form and the Chemical Description form. Note the following criteria when determining which items require disclosure in the inventory section: hazardous materials with a maximum quantity of greater than 55 gallons, 500 pounds, or 200 cubic feet; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives.

3) Assign a unique item number to each inventoried item (e.g. 1,2,3, etc.) This same item number is used on the Inventory Summary, on the individual Chemical Description form, and to show the storage location(s) on the facility map.

4) Each inventoried item requires a Chemical Description page that gives additional details about each chemical. Material Safety Data Sheets (MSDSs) and container labels are the main sources of chemical information. Wastes do not have MSDSs, but waste analysis, profiles, or manifests may have useful information.

5) Review Appendix I to determine which inventoried items require submission of a Material Safety Data Sheet (MSDS). If the substance is not listed in Appendix I, attach the MSDS for that chemical to the corresponding individual Chemical Description page. Anytime you update or refile the Chemical Description Page, make sure to attach the current MSDS. If you do not have a MSDS for a material, you can get one from your chemical vendor and you need them for compliance with the OSHA Hazard Communication Standard. Hazardous wastes do not have MSDSs.

6) Materials and wastes of the same chemical (e.g. lubricating oil and used oil) require separate Chemical Description pages.

7) Since the Chemical Description Page requires location information, you will have to complete the facility map(s) before you can finalize the Chemical Description pages.

8) The Maximum Quantity should reflect the maximum amount that could ever be onsite at any one time. The maximum listed on the Inventory Summary and the maximum listed on the individual Chemical Description form should be the same.

9) Typically, liquids are disclosed in gallons, solids in pounds and compressed gases in cubic feet. If you have questions regarding the correct unit type for an item, contact this department for assistance.

10) Signatures: The Inventory Summary form requires the Owner/Operator signature. Additionally, EPCRA filers are required to sign all individual Chemical Description forms.

Note: If you have a large warehouse, trade secrets, or other unique situation, please call our office before you fill out chemical description pages. We can help you develop an inventory that will meet the requirements and accommodate a unique situation.

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 4 1 0 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA)
De Hoog Family Trust (Martin DeHoog Dairy)

FACILITY ADDRESS 103: 8311 Edison Ave

CITY 104: Ontario

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Diesel | 1,500 | 1,000 | Gal |
| 2 | Teat dip | 110 | 55 | Gal |
| 3 | Teat dip sanitizer | 55 | 55 | Gal |
| 4 | Gasoline | 80 | 40 | Gal |
| 5 | Powder chlorinated cleaner | 60 | 30 | Gal |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each Individual attached Inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| Martin DeHoog | MARTIN DeHoog | |

Inventory Summary Page ____ of ____

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages, otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER 1

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: De Hoog Family Trust (Martin De Hoog Dairy) | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Diesel | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES

PHYSICAL STATE (Check one item only): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 1,000

FED HAZARD CATEGORIES: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 750 | 1,500 | | |

UNITS* (Check one item only): ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE: 365

STORAGE CONTAINER (Check all that apply):
☒ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 100 | Diesel | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets

NOTES (*Trade names/synonyms or other information relevant to the substances listed*)

*If EPCRA, Owner/Operator please sign this page*

Martin De Hoog

Date: 1/08/08

## Hazardous Materials Inventory Form – Chemical Description Form

For each item listed on the Inventory Summary Form, complete a separate Chemical Description Form. Attach a Material Safety Data Sheet (MSDS) to corresponding Chemical Description Form, unless the material is not listed in Appendix I.

**Purpose:** The Hazardous Materials Inventory Form – Chemical Description Form is a more detailed inventory form which provides additional chemical information that can be used by the Local Fire Jurisdiction, as well as the CUPA.

**Chemical Description Form:** For each hazardous material or hazardous waste listed on the Inventory Summary Form, a separate Chemical Description Form must be completed. Do not combine materials and wastes on one form. For example, if your facility stores or uses new oil exceeding 55 gallons, and also generates waste oil waste, two separate Chemical Description Forms must be completed. *One form will be completed for the new oil; one form will be completed for the waste oil.* At the top of the form, check one of the two boxes (Material or Waste). Do not check both boxes.

**Item Number:** Use the same item number assigned on the Inventory Summary Form to list inventoried items.

**Chemical Location Information:** This section is used to identify the storage location of the specific hazardous material. Provide the Grid Coordinate(s) from the facility map to identify the storage location of each chemical. The Hazardous Materials Inventory Form – Chemical Description Form is provided to public requestors; however, maps showing storage locations are not. Do not include confidential storage location information on this page.

**Chemical Information:**

- Chemical Name – provide the name of the chemical being inventoried. The Chemical Name can be found on the Material Safety Data Sheet (MSDS), container, or your purchase invoice. For example, petroleum hydrocarbon is the chemical name for gasoline.
- Common Name – provide the common name of the chemical being inventoried. For example, gasoline is the common name for petroleum hydrocarbon.
- CAS # - Chemical Abstract Service number. Provide the CAS number for the chemical being inventoried. The CAS number can be obtained from the MSDS.
- Trade Secret - check the "NO" box. If your facility has a trade secret, contact this CUPA for specific filing instructions.
- EHS – Extremely Hazardous Substance. Check the "YES" box if the chemical being inventoried is listed in Appendix B. Remember, if the "YES" box is checked, the chemical amount must be listed using pounds, regardless if the EHS is a liquid, solid, or gas. If the chemical being inventoried is not in Appendix B, then check the "NO" box
- Hazardous Material Type – check only one box to indicate if the chemical being inventoried is a pure chemical, a mixture or a waste.
- Radioactive – check the "YES" box if the chemical being inventoried is radioactive. In the next box, provide the Curies. Check the "NO" box if the chemical being inventoried is not radioactive.
- Physical State – check only one box to indicate the physical state of the chemical.
- Size of Largest Container – Enter the total capacity of the largest container in which the material is stored. . If hazardous materials are stored in various containers, use the largest container size to complete this section.
- Federal Hazard Categories – check all categories that describe the physical and health hazards associated with the hazardous material. PHYSICAL HAZARDS - **Fire**: Flammable Liquids and Solids, Combustible Liquids, Pyrophorics, Oxidizers; **Reactive**: Unstable Reactive, Organic Peroxides, Water Reactive, Radioactive; **Pressure Release**: Explosives, Compressed Gases, Blasting Agents; HEALTH HAZARDS - **Acute Health (Immediate)**: Highly Toxic, Toxic, Irritants, Sensitizers, Corrosives, other hazardous chemicals with an adverse effect with short term exposure; **Chronic Health (Delayed)**: Carcinogens, other hazardous chemicals with an adverse effect with long term exposure.
- Average Amount – this is the average amount of the chemical being stored at your facility on a given day.
- Maximum Amount – this is the maximum amount of each hazardous material or mixture containing a hazardous material that is on site at any one time over the course of the year. This number represents a not to exceed quantity.
- Annual Waste Amount – this is the annual amount of waste generated during the year.
- State Waste Code – this 3-digit number identifies the type of hazardous waste that is generated. The number can be found on the Hazardous Waste Manifest or in Appendix F – Common Waste Codes.
- Units – check the appropriate box to describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Remember, Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.
- Storage Container – check all boxes that describe what type of container(s) are used to store the chemical.
- Storage Pressure – check the one box that describes the pressure that the chemical is stored at.
- Storage Temperature – check the one box that describes the temperature that the chemical is stored at.
- % WT - enter the percent by weight of the chemical components. If a range of percentages is available, report the highest percentage in that range.
- Composition – list all components of the chemical. If the chemical is a mixture list the hazardous components first, followed by the non-hazardous components.
- EHS - check "Yes" if the component is considered an Extremely Hazardous Substance or "No" if it is not.
- CAS# - Chemical Abstract Service number. Provide the CAS number for the chemical being inventoried. The CAS number can be obtained from the MSDS.
- Notes – this field can be used to provide additional information about the chemical. This CUPA does not require the fire code hazard class. If your local fire agency specifically requests this information, provide the fire code hazard class in this section.

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# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

**ITEM NUMBER** 2

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: De Hoop family Trust | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☐ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Teat dip | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)* ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE — RADIOACTIVE? Yes ☐ No ☒ — CURIES

PHYSICAL STATE *(Check one item only)* ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST — SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 55 | 110 | | |

UNITS* *(Check one item only)* ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: — DAYS ON SITE **365**

STORAGE CONTAINER *(Check all that apply)*

| | | | | |
|---|---|---|---|---|
| ☐ a. ABOVEGROUND TANK | ☒ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 1.75% | Iodine | ☐ YES ☐ NO | |
| 2. | INERT - omega-hydroxy poly (oxyethylene) alpha (P-Nonyl Phenyl) | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

*If EPCRA, Owner/Operator please sign this page*

Date: _____

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# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER 3

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: Dettoog Family Trust | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Teat dip sanitizer | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE — RADIOACTIVE? Yes ☐ No ☒ — CURIES

PHYSICAL STATE *(Check one item only)*: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST — SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES 2: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 25 | 55 | | |

UNITS* *(Check one item only)*: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: — DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:
☐ a. ABOVEGROUND TANK ☒ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☐ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 5.00% | nonylphenoxpolyethoxyethanol | ☐ YES ☐ NO | |
| 2. 10.00% | INERT GLYORIN | ☐ YES ☐ NO | |
| 3. 85% | other Inerts Buffering Agent + surfactants | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

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# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER 4

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: Dettoro Family Trust | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Gasoline | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE (Check one item only): ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES

PHYSICAL STATE (Check one item only): ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 40

FED HAZARD CATEGORIES: ☒ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☒ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 40 | 80 | | |

UNITS* (Check one item only): ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE: 365

STORAGE CONTAINER (Check all that apply):
☐ a. ABOVEGROUND TANK ☐ e. PLASTIC/NONMETALLIC DRUM ☐ i. FIBER DRUM ☐ m. GLASS BOTTLE ☐ q. RAIL CAR
☐ b. UNDERGROUND TANK ☐ f. CAN ☐ j. BAG ☐ n. PLASTIC BOTTLE ☐ r. OTHER
☐ c. TANK INSIDE BUILDING ☐ g. CARBOY ☐ k. BOX ☐ o. TOTE BIN
☒ d. STEEL DRUM ☐ h. SILO ☐ l. CYLINDER ☐ p. TANK WAGON

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 100 | Gasoline | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

*If EPCRA, Owner/Operator please sign this page*

Date: _____

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# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL ☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER 5

| | | | |
|---|---|---|---|
| FACILITY ID # | F A 0 0 0 0 4 1 0 [redacted] 1 | CHEMICAL LOCATION INFORMATION | |
| BUSINESS NAME: Dethoss Family Trust | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 8311 Edison Ave, Ontario | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Powder chlorinated soap | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☐ a. PURE ☒ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES

PHYSICAL STATE *(Check one item only)*: ☒ a. SOLID ☐ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 30

FED HAZARD CATEGORIES: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 30 | 60 | | |

UNITS* *(Check one item only)*: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:

| | | | | |
|---|---|---|---|---|
| ☐ a. ABOVEGROUND TANK | ☒ e. PLASTIC/NONMETALLIC DRUM | ☒ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. | Chlorine | ☐ YES ☐ NO | |
| 2. | Caustic chemicals + Protect equipment from pitting | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

**CUPA**

**San Bernardino County Fire Department • Hazardous Materials Division**

**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 410 Facility Name: Martin DeHoog Dairy Inspection Date: January 8, 2014

Site Address: 8311 Edison Avenue Phone #: 909-947-3559

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by:

☒ Inspect ☐ Photograph Name: Martin DeHoog Title: Owner # Emp: 0

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | |
| 107. Contingency Plan established | CCR 66265.51(a) | | | |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | |

**INSPECTION NARRATIVE**

An inspection was conducted to verify removal of hazardous materials. Consent to inspect was given by Martin DeHoog, Owner. This facility has ceased operation. Cows and equipment have either been sold off or shipped to Nebraska. All hazardous materials have been removed. The permit will be inactivated.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: Brian Wade (Sign Name) Brian Wade (Print Name)

Received By: Martin De Hoog (Sign Name) MARTIN DE HOOG (Print Name)

Title: Owner

Report Date: January 8, 2014

**SAN BERNARDINO COUNTY**
**FIRE DEPARTMENT**

**COUNTY OF SAN BERNARDINO**

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

**MARK A. HARTWIG**
**Fire Chief**

August 20, 2013

MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

**ATTN: MARTIN DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000410-MARTIN DEHOOG DAIRY**
**8311 EDISON AVE**
**ONTARIO, CA 91762**

Mr. DeHoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on February 14, 2013:

- Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**

Board of Supervisors
GREGORY C. DEVEREAUX
Chief Executive Officer
ROBERT A. LOVINGOOD ..... First District
JANICE RUTHERFORD..... Second District
JOSIE GONZALES ..... Fifth District
JAMES RAMOS.....Third District
GARY C. OVITT..... Fourth District

Using CERS at http://cers.calepa.ca.gov, submit the elements of the Basin's Plan.

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 410 Facility Name: Martin DeHoog Dairy Inspection Date: February 14, 2013

Site Address: 6311 Edison Avenue Phone #: 909-947-3559

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by: ☑ Inspect ☐ Photograph Name: Martin DeHoog Title: Owner # Emp: 6 Packet left on site? Yes/(No)

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permit is current
**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste
**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31)
**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☐ 202. A Business Plan has not been established. (CHSC 25503.5)

☒ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: 1 ~~1,000~~ gal + 1 ~~500~~ gal AST's diesel
2 x 55 gal teat dip,
2 x 40 gal tanks gasoline
1 x 55-gal teat barrier dip
1 x 55 gal sanitizer

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Basic safety training
**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3))

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2))
**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34)
**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171)

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b))

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a))
**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

Equipment serviced by outside mechanic.

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste
**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a))

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3))
**Compliance Requirement**: Submit copies of waste disposal records for the past

☐ 138. Unlawful management of used oil filters. (CCR 66266.130)
**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspected By: Brian Wade (Sign Name) Received By: Martin DeHoog (Sign Name) Title: Owner

Brian Wade (Print Name) Print Name Report Date: February 14, 2013

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

CUPA

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**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**
**www.sbcfire.org**

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED JAN 10 2008 S.B. CO. FIRE DEPT.

| FACILITY ID # | F | A | 0 | 0 | 0 | 0 | 4 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|

BUSINESS NAME (Same as FACILITY NAME or DBA): De Hoog Family Trust (Martin De Hoog Dairy

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8311 Edison | Ontario | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ — *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☒ * Business Activities Form
- ☒ * Business Owner/Operator Identification Form
- ☐ * Supplemental Emergency Contact Page
- ☐ Emergency Response Plans and Procedures
- ☐ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☐ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☐ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☐ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☐ Area map - photocopied city map with location of site indicated
- ☐ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.
- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. **(EPCRA requires complete annual submission)**

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER | 135 |
|---|---|---|---|
| Martin De Hoog | 1/8/08 | | |
| NAME OF SIGNER *(print)* | TITLE OF SIGNER *(print)* | | |
| MARTIN DE HOOG | Operator | | |

## BUSINES[illegible]RGENCY/CONTINGENCY PLAN COVER S[illegible] INSTRUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

CUPA
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# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 0 0 4 1 0 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA): De HOOG Family Trust

EPA ID # (Hazardous Waste Only):

BUSINESS ADDRESS: 8311 Edison Ave.

CITY: Ontario

ZIP CODE: 91762

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☒ YES ☐ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page Instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California Identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

Handler

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

December 17, 2007

MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

**ATTN: MARTIN DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000410-MARTIN DEHOOG DAIRY**
**8311 EDISON AVE**
**ONTARIO, CA 91762**

MR. DEHOOG,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 29, 2007:

- Failure to establish a Business Plan

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

Generator

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
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OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

December 17, 2007

SAM SOUSA
7397 EDISON AVE
ONTARIO, CA 91761

**ATTN: SAM SOUSA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000648-SNS DAIRY**
**7371 EDISON AVE**
**ONTARIO, CA 91761**

MR. SOUSA,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on April 12, 2007:

- Unlawful management of contaminated containers

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at LHEAVISIDE@SBCFIRE.ORG.

**LESLIE HEAVISIDE**
**Hazardous Materials Division, Field Services Section**

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0004412 Facility Name: Martin De Hoog Dairy Inspection Date: May 29, 2007

Site Address: 8311 Edison Phone #: (909) 947-3559

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Martin De Hoog Title: Owner # Emp: 6 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires handler permit only

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

**INVENTORY:** (2) AST's Diesel - (1) 1,000 gal & (1) 500-gal (1) 55 gal teat dip sanitizer (2) 55-gal aluminum tank dip (2) 40 gal tanks in back up generator (2) 30 gal drums powder chlorinated cleaner

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement**: Submit training documentation as required.

## Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) Does not generate waste

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) " " "

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) " " "

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) " " "

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

RECEIVED JAN 10 2008 S.B. CO. FIRE DEPT.

## Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) " " "

**Compliance Requirement**: Submit copies of waste disposal records for the past " " "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Equipment serviced by tent heavy repair

Inspected By: [signature] (Sign Name) Received By: Martin De Hoog (Sign Name) Title: Owner

Leslie Heaviside (Print Name) MARTIN DE HOOG (Print Name) Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Martin De Hoog (Name) 1/08/08 (Date)

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

PAT A. DENNEN
Fire Chief
County Fire Warden


## Business Emergency/Contingency Plan Receipt

Mail to: DE HOOG, MARTIN L
8311 EDISON AVE
ONTARIO, CA 91762

Site Address: MARTIN DEHOOG DAIRY
8311 EDISON AVE
ONTARIO, CA 91762

Service Request ID: SR0015002
Facility ID: FA0000410

The Business Emergency/Contingency Plan was received on January 10, 2008 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.
2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.
3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.
4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.
5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.
2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.
3. Change of business address, business ownership, or business name.
4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000410 Facility Name: Martin DeHoog Dairy Inspection Date: May 29, 2007

Site Address: 8311 Edison Phone #: (909) 947-3559

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Martin DeHoog Title: Owner # Emp: 6 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

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☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (2) AST's Diesel -(1) 1-000 gal & (1) 500-gal (1) 55 gal foot dip sanitizer (2) 55-gal drum tank dip (2) 40 gal tanks in back up generator (2) 30 gal drums powder chlorinated cleaner

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

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☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters.

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Equipment serviced by Kent Avery Repair, Inc

Inspected By: [signature] (Sign Name) Leslie Heavilside (Print Name)

Received By: Martin DeHoog (Sign Name) MARTIN DE HOOG (Print Name) Title: Owner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

# PHOTO NARRATIVE



PHOTO 1

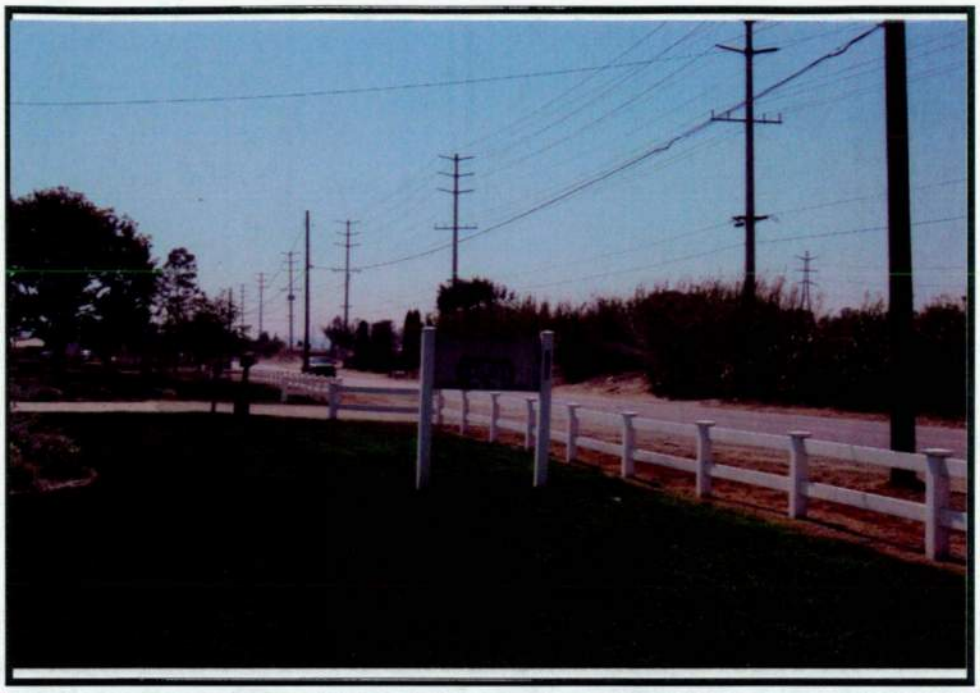

PHOTO 2

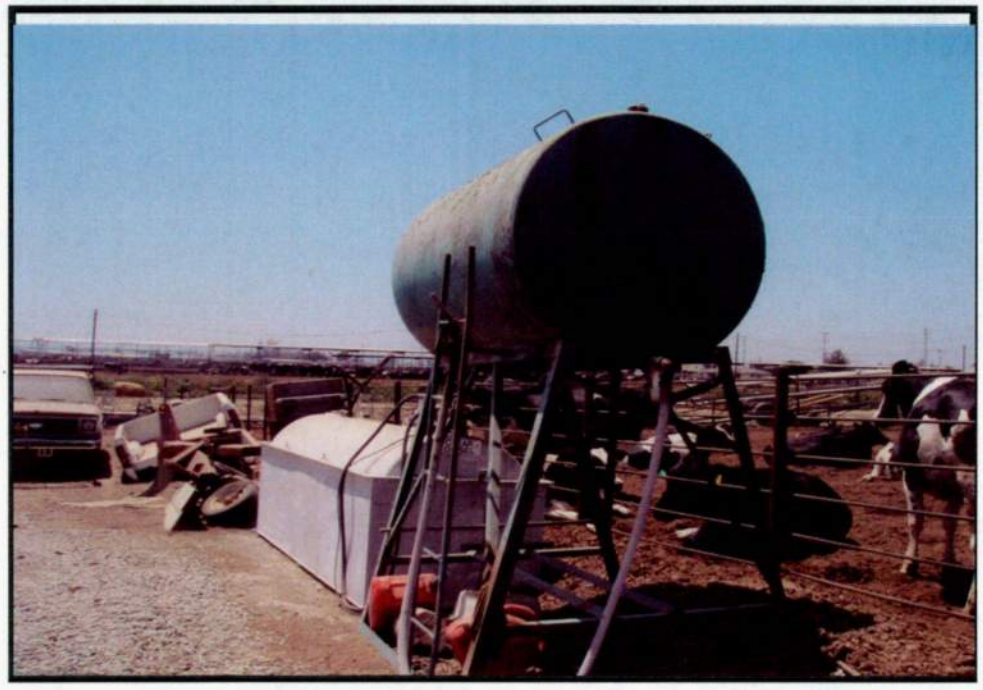

Facility/Case Name: **Martin DeHoog Dairy** Facility ID #: **FA0000410**

Address: **8311 Edison, Ontario**

1) Description: **Sign at front of dairy**

2) Description: **(L to R): (1) 1,000-gallon AST and (1) 500-gallon AST Diesel fuel**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

PHOTO 4

Facility/Case Name: **Martin DeHoog Dairy** Facility ID #: **FA0000410**

Address: **8311 Edison, Ontario**

3) Description: **(1) 30-gallon and (2) 5-gallon containers of powder chlorinated soap**

4) Description: **Back-up generator containing (2) 40-gallon tanks of Diesel fuel**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

05120104 Ontario Ral GeoKinetics

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PETER R. HILLS
Fire Chief
County Fire Warden

December 19, 2005

GeoKinetics
77 Bunsen
Irvine CA 92618

ATTENTION: Jennifer Wedner

**SUBJECT: REQUEST FOR RECORDS INFORMATION**

**RE: 8381 Edison**
**Ontario, California**

This is to confirm that the San Bernardino County Hazardous Materials Division has located records that may pertain to the subject site, as described in your request for records search.

The file(s) listed below are available for your review. Please e-mail this office at eking@sbcfire.org or call the number at the end of this letter to arrange an appointment.

**ACTIVE PERMITS:**
*(Regulatory files for facilities with annual operating permits to maintain underground storage tanks, storage hazardous materials, and/or generate hazardous waste. Files include permits, inspections, reports, test results, correspondence, and related materials. Files will also include any underground tank removal/construction activity records and site remediation/contamination records for facilities still in operation).*

No record of active permits/files

**INACTIVE PERMITS:**
*(Inactive regulatory files for formerly permitted facilities which maintained underground storage tanks, stored hazardous materials, and/or generated hazardous waste and/or facilities with underground storage tanks removed and/or materials and waste removed. Files will also include any underground tank removal/construction activity records and site remediation/contamination records for facilities no longer operating underground tanks).*

| | |
|---|---|
| AG-Martin L. DeHoog Dairy<br>8311 Edison<br>Chino | FA0000410 (AG-Exempt)<br>Hazardous Material Handler Permit<br>Underground Storage Tank Permit |

**PERMITS TO REMOVE/INSTALL/MODIFY UNDERGROUND STORAGE TANKS:**

| | |
|---|---|
| AG-DeHoog, Martin L.<br>8311 Edison<br>Chino | Issued 10/27/98<br>Remove 1 |

**HAZ MAT INCIDENT RESPONSE TEAM ACTIVITY:**

No record of haz mat incident response

**SITE REMEDIATION:**
*(Underground Storage Tank Clean-Up under Local Oversight Program or Hazardous Waste Clean-Up Activity under Local Jurisdiction) (documents may be included in regular active or inactive permit files listed above).*

No record of site remediation/clean-up action

Records searched include permit database systems for facilities with permits as hazardous waste generators, hazardous materials handlers, and/or underground storage tanks, including inactive and/or out of business records; logs of permits issued for the removal and/or installation of underground storage tanks; records and databases pertaining to illicit dumping and releases; records of non-permitted facilities; sites undergoing remediation for contaminated soil and/or groundwater; and incidents responded to by the hazardous materials emergency response team

Please e-mail me at eking@sbcfire.org or contact me at the number below for a review appointment or for further clarification.*

**ELIZABETH A. KING**
**Environmental Specialist II**
OFM/Hazardous Materials Division
(909) 386-8468 (909) 386-8460 fax
eking@sbcfire.org

*We will copy up to thirty (30) pre-selected pages from a file at a charge $0.25 per page copied. (Be prepared to make this payment at the time of service). If the copies selected exceed thirty (30) pages or if you want a copy of the entire file and it exceeds thirty (30) pages, we will refer you to a private copy service. If you prefer to bring a portable copier on site, you may do so. Please let us know your plans in advance so that accommodations can be made.

The file is about 30 pgs. or less. Please advise if you would like copies sent with an invoice for copying charges.

CUPA
San Bernardino County e Department • Hazardous Materials Divisi Public Records Section
620 South 'E' Street, San Bernardino, CA 92415-0153
(909) 386-8401 • FAX (909) 386-8460 • eking@sbcfire.org

# REQUEST FOR RECORDS RESEARCH

W/K 48

| For Office Use Only | |
|---|---|
| Reference No.: | 05120104 |
| Amount Paid: | 71.00 |
| Receipt No.: | 26497 |
| Date: | 12-15-05 |

**If this request is being faxed or e-mailed, please check the box below and indicate the amount to be mailed separately with the original form:**

☒ This request is being faxed or e-mailed. The original form will be mailed on 12/2/2005 along with a check or money order made payable to San Bernardino County Fire Department for the amount of: $ 71.00

| SITE INFORMATION | | |
|---|---|---|
| Facility Name / Owner Name | Site Address | City/Community |
| Brookfield – DeHoog | 8381 Edison Ave. | Ontario, California 91761 |

**SPECIFIC RECORDS REQUESTED**

| Record Type | Dates | Record Type | Dates |
|---|---|---|---|
| ☒ **ALL RECORDS** | | | |
| ☐ Active Permit Records | To | ☐ Risk Management Plan (RMP)/ CalARP | To |
| ☐ Inactive/Closed Permit Records | To | ☐ Hazardous Materials Handler Business Plan | To |
| ☐ Hazardous Waste Generator | To | ☐ Underground Storage Tank Removal Records | To |
| ☐ Hazardous Materials Handler | To | ☐ Site Remediation | To |
| ☐ Underground Storage Tank | To | ☐ Hazmat Incident/Emergency Response | To |
| ☐ Aboveground Storage Tank | To | ☐ | To |

*Records are searched by site location. If no site address exists, please provide other identifying location information, such as an Assessor's Parcel Number, address range (125-135 E. Main St.), street corner (NW Corner Main St. & Elm Ave.), legal description (Township, Range, Section), and/or a map.*

**NOTE: To obtain records information for sites within the City of Victorville, contact the Victorville City Fire Department at (760) 955-5229.**

**REQUESTOR INFORMATION**

| NAME | TITLE (*If individual, leave blank*) | COMPANY (*If individual, leave blank*) | |
|---|---|---|---|
| Jennifer Wedner | Project Coordinator | GeoKinetics | |
| **MAILING ADDRESS** | **CITY** | **STATE** | **ZIP CODE** |
| 77 Bunsen | Irvine | CA | 92618 |
| **TELEPHONE** | **FAX** | **EMAIL ADDRESS** | |
| 949/502.5353 | 949/502.5354 | Jennifer@appliedgeokinetics.com | |

**PURPOSE OF REQUEST**

| | |
|---|---|
| ☒ 1. Phase I site assessment or due diligence **AT THE SITE** | ☐ 7. Owner or operator of the above facility or property |
| ☐ 2. Environmental consultant or engineer involved with remediation **AT THE SITE** | ☐ 8. General interest/Community awareness |
| ☐ 3. Phase I site assessment or due diligence **NEARBY** | ☐ 9. Potential buyer |
| ☐ 4. Environmental consultant or engineer involved with remediation **NEARBY** | ☐ 10. Real Estate Agent, Lender, Appraiser |
| ☐ 5. Proposed School Site | ☐ 11. Legal reasons |
| ☐ 6. Proposed Drinking Water Well | ☐ 12. Other: |

- ***PAYMENT OF $71.00 MUST BE SUBMITTED WITH THIS REQUEST. A SEPARATE REQUEST MUST BE MADE FOR EACH SITE.***
- ***This form can be faxed or e-mailed. However, the original form must be mailed or delivered in person with the appropriate payment. Your faxed or e-mailed request will be logged at the time it is received (any request received after 5:00 PM will be logged in on the following business morning). Check the box in the upper left corner of this form to indicate that you have sent the original form with the fee by separate mail. PLEASE NOTE THAT THE SEARCH WILL NOT BEGIN UNTIL PAYMENT IS RECEIVED.***
- ***A rate of $71.00 per hour will be charged for any extended research.***
- ***If no records exist, you will be notified in writing. If records are identified, you will be notified in writing or by phone once they are located and retrieved, generally within two to three weeks, with a description of records that exist for the site and files that are available for review. Upon receipt of records availability, an appointment can be scheduled for your review of available files.***
- ***We will copy up to a maximum of 30 pages at the time records are examined at a rate of 25 cents per page. If more copies are required, you may bring a personal copier or arrange for a private copy service.***

**REQUESTOR'S SIGNATURE**

***I have read and understand the above record search procedures.***

| SIGNATURE OF REQUESTOR | DATE |
|---|---|
| | 12/1/2005 |

Overall Site with 1 Fac. Unit

## General Information

Location: 0008381 EDISON AV Map: Haz:1 Type: 1
Community: Chino Grid: F/U: 1 AOV: 0.0

| Contact Name | Title | Business Phone | 24-Hour Phone |
|---|---|---|---|
| MICHAEL DE HOOG | OWNER | (000) 000-0000 x | ( ) - |
| | | (000) 000-0000 x | ( ) - |

Summary

## Hazmat Inventory List in MCP Order

### All Materials at Site

| F/U | Material Name | --Hazards-- | Max Qty | Unit | MCP |
|---|---|---|---|---|---|
| F/U: 02 - Fixed Containers at Site | | | | | |
| | DIESEL | F IH DH | 280 | GAL | Moderate |

## AGRICULTURAL HAZARDOUS MATERIALS INVENTORY

BUSINESS NAME MICHAEL DE HOOG DAIRY

ADDRESS 8381 EDISON AVE. CHINO, CA 91710

CITY

STATE ZIP

PHONE NUMBER

EMERGENCY CONTACT MICHAEL DE HOOG DAIRY

EMERGENCY PHONE # 8381 EDISON AVE. CHINO, CA 91710

| MATERIAL | MAXIMUM QUANTITY | USED HOW | STORED AT |
|---|---|---|---|
| | | | |

[X] I HAVE NO HAZARDOUS MATERIALS IN REPORTABLE QUANTITIES HELD FOR MORE THAN 30 DAYS.

[X] I HAVE AN UNDERGROUND TANK. TANK SIZE 280 gallons

[ ] I CERTIFY THAT A "HAZARDOUS MATERIALS STORAGE AREA" SIGN HAS BEEN POSTED AS REQUIRED.

THE ABOVE INFORMATION IS CORRECT TO THE BEST OF MY KNOWLEDGE.

NAME

DATE 10-30-87

SIGNATURE Michael R. De Hoog

**PLEASE SUBMIT IN TRIPLICATE**

AGRICULTURAL COMMISSIONER
777 E. RIALTO AVENUE
SAN BERNARDINO, CA. 92415

FD011TP DS Permit Billing System 12/06/00
SD005A Establishment Summary 09:27:07

Estab . . 97042497

Established: 03/26/1997
Status . . : DB
Location . : 53
Parcel . . :
Inactive . :
Federal id :

AG-DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Bill to: O Attn:
Contact: Drvr lic: Exp: State:

Applicant: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710
Owner: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Comment: DAIRY- 1 UST REMOVED 11/12/98 - MIKE WARD

F1=Help F3=Exit F5=Refresh
F13=EstbUpd F14=AddrUpd F17=PrmtInq F21=Srch F23=Print

FD011TP DS Permit Billing System 12/06/00
SD005A Establishment Summary 09:32:19

Estab . . 97042497

Established: 03/26/1997
Status . . : IN
Location . : 53
Parcel . . :
Inactive . : 12/06/2000
Federal id :

AG-DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Bill to: O Attn:
Contact: Drvr lic: Exp: State:

Applicant: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710
Owner: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Comment: FACILITY NO LONGER IN BUS-PER WAYNE WILLIAMS-SURVEY 11/27/00

F1=Help F3=Exit F5=Refresh
F13=EstbUpd F14=AddrUpd F17=PrmtInq F21=Srch F23=Print

RECEIVED
NOV 3 0 2000
BY:

# HAZARDOUS MATERIALS FIELD SERVICES
# COMPUTER DATA BASE UPDATE AUTHORIZATION

CHANGE ☐

INACTIVATE FACILITY ☒ INACTIVATE PERMIT(S) ☒

BILL TO: E A O LOC/DIST NO: _____ EST NO: 97042497
(Circle one)
(Former Est. Name (if applicable)

**E – Establishment Information**
Name: AG - DE Hoog, Martin L.
Street No: 8311 Fraction: _____ Direction: _____
Street Name: EDISON Ave. Apt/Ste/Unit No: _____
City: Ontario State: CA Zip Code: 91710
Attn: Telephone: ( )

**A – Applicant Information**
Name: _____
Street No: _____ Fraction: _____ Direction: _____
Street Name: _____ Apt/Ste/Unit No: _____
City: _____ State: _____ Zip Code: _____
Attn: Telephone: ( )

**O – Owner Information**
Name: _____
Street No: _____ Fraction: _____ Direction: _____
Street Name: _____ Apt/Ste/Unit No: _____
City: _____ State: _____ Zip Code: _____
Attn: Telephone: ( )

Program Information: MFR Number _____
Number of Employees: _____ Number of UST's: _____
Federal Tax I.D.Number/Social Security Number:

Permit Information: (Circle those that apply)
Change/Inactivate/Add: 2260003 Permit No: 97032662322
Change/Inactivate/Add: 229707 Permit No: 97032662323
Change/Inactivate/Add: 227001 Permit No: 97009101316
Change/Inactivate/Add: _____ Permit No: _____
Change/Inactivate/Add: _____ Permit No: _____

Date Submitted: 11-27-00 Date Entered: 12/6/00
Submitted By: W. Williams Entered By: Dina Thomas

Comments/Remarks:
Facility no longer in business – per survey
Please inactivate all permits

llm

**HAZARDOUS MATERIALS FIELD SERVICES**
**COMPUTER DATA BASE UPDATE AUTHORIZATION**

**CHANGE [ ]**

(Circle one) **INACTIVATE PERMIT/FACILITY [ ✓ ]**

**BILL TO: E A O** **LOC/DIST NO:** _____ **EST NO:** 97042497

**(Former Est. Name (if applicable)**

**E – Establishment Information**
**Name:** Ag- De Hoog, Martin L
**Street No:** 8311 **Fraction:** _____ **Direction:** _____
**Street Name:** Edison Ave **Apt/Ste/Unit No:** _____
**City:** Chino **State:** CA **Zip Code:** 91710
**Attn:** _____ **Telephone: (** **)**

**A – Applicant Information**
**Name:** _____
**Street No:** _____ **Fraction:** _____ **Direction:** _____
**Street Name:** _____ **Apt/Ste/Unit No:** _____
**City:** _____ **State:** _____ **Zip Code:** _____
**Attn:** _____ **Telephone: (** **)**

**O – Owner Information**
**Name:** _____
**Street No:** _____ **Fraction:** _____ **Direction:** _____
**Street Name:** _____ **Apt/Ste/Unit No:** _____
**City:** _____ **State:** _____ **Zip Code:** _____
**Attn:** _____ **Telephone: (** **)**

**Program Information:**
**Number of Employees:** _____ **Number of UGST's:** _____

**Federal Tax I.D.Number/Social Security Number:** _____

**Permit Information: (Circle those that apply)**
**Change/Inactivate/Add:** 222800 **Permit No:** 9901128652 = IN
**Change/Inactivate/Add:** 222800A **Permit No:** _____
**Change/Inactivate/Add:** _____ **Permit No:** _____
**Change/Inactivate/Add:** _____ **Permit No:** _____
**Change/Inactivate/Add:** _____ **Permit No:** _____

Date Submitted: 1/6/99 Date Entered: JAN 1 2 1999
Sumitted By: Larita Entered By: ab van

**Comments/Remarks:** 1 Ag tank removed 11/12/98 (Mike Ward)

**POST THIS CARD AT JOB SITE**

SAN BERNARDINO COUNTY FIRE DEPARTMENT/CUPA
HAZARDOUS MATERIALS DIVISION
FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVENUE, SECOND FLOOR
SAN BERNARDINO, CA 92415-0153

LOG # 102798-05 **JOB CARD №** 5691

INSTALL | REMOVE X

## CONSTRUCTION AND/OR REMOVAL OF UNDERGROUND STORAGE FACILITY

Site Name Martin Dehoog Dairy
Address 8311 Edison Ave, Chino
Contractor A&J Environmental 947-3559
Address/Phone 4752-C Felspar #104, Riverside

| | INSPECTION RECORD | APPROVED | DATE |
|---|---|---|---|
| FIRST INSPECTION | Excavation Clean, Approved Slope | | |
| | Bedding | | |
| | Holiday/Soap Test, Tanks Set X | | |
| | Manufacturer's UL # | | |
| | | | |
| | Additional Requirements | | |
| | | | |
| | **DO NOT BACKFILL UNTIL ABOVE APPROVED** | | |
| SECOND INSPECTION | Tank Air Test 5 PSI/30 Minutes | | |
| | Vent/Vapor Lines | | |
| | Products Lines 75 PSI/30 Minutes | | |
| | Product Line Containment | | |
| | Metal Piping Wrapped | | |
| | Sumps, Dispenser Pans Water Test | | |
| | | | |
| THIRD INSPECTION | Approved Fill Boxes | | |
| | Concrete or AC Paving 12" Beyond | | |
| | Leak Detectors/Monitors | | |
| | Lockable Fluid-Tight Access for Monitoring | | |
| | Precision Test Results | | |
| | Dispenser Containment | | |
| | Emergency Shut-off | | |
| | Additional Requirements | | |
| | | | |
| REQUIRED PRIOR TO OPERATING | Business Plan | | |
| | | | |
| | Monitoring Plan | | |
| | | | |
| | Financial Responsibility | | |

**FINAL APPROVAL AND CURRENT OPERATING PERMITS MUST BE OBTAINED PRIOR TO PLACING THESE TANKS INTO SERVICE ($5,000.00 FINE FOR NONCOMPLIANCE)**

| | | | |
|---|---|---|---|
| TANK REMOVAL INSPECTION | Tank(s) Removed X | MN | 11/12/98 |
| | Required Samples: 8020, 8015, MTBE, 418.1 | | |
| | Lead (pb) 7421 or ICP 6010, Metals EPA PP13 | | |
| | Additional Test Requirements | | |
| | | | |
| | **Removals Cannot be Finaled Until a Signed Copy of the Sample Results Have Been Received and Approved by this Department.** | | |
| | Final — Approved for Backfill | MN | 12/2/98 |

Remarks:

FAILURE TO PROTECT AND MAINTAIN THIS CARD MAY RESULT IN JOB DELAY.
PRESERVE THIS RECORD OF INSPECTIONS.

**FOR INSPECTION CALL 48 HOURS IN ADVANCE AT (909) 387- 3082**

**THIS PERMIT EXPIRES DECEMBER 22, 1998**

[1] PETROLEUM [ ] WASTE OIL [ ] OTHER

*DISTRIBUTION:* *White — County Fire Department*
*Green — Contractor/Owner*

14-16867-670 Rev. 4/98

SAN BERNARDINO COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS DIVISION – FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVE., 2ND FLOOR, SAN BERNARDINO, CA 92415-0153
(909) 387-3082 • FAX (909) 387-4323

# APPLICATION FOR REMOVAL OF UNDERGROUND STORAGE TANK

$ 450.00 First Tank

$ _____ Each Additional Tank

Number of Tanks this Application 1

## JOB LOCATION

Facility Name: Martin De Hoog Dairy
Contact Person: Martin De Hoog
Phone No.: 909) 947-3559
Situs Address: 8311 Edison Ave
City: Chino
Zip Code: 91710
Water/Sewer Agency:
Fire: Chino Fire

## PROPERTY OWNER

Name: Martin De Hoog
Phone No.: 909) 947-3559
Mailing Address: 8311 Edison Ave
City: Chino
Zip Code: 91710
Owner's Representative: Asa Cosby
Phone No.: 909) 681-0708

## TANK CONTENTS

Tank # 1 - Motor vehicle Fuel

## CONTRACTOR

Company Name: A&J Environmental
Contact Person: Asa Cosby
Phone No.: 909) 681-0708
Mailing Address: 4752-C Felspar #104
City: Riverside
Zip Code: 92509
Workman's Comp Insurance Carrier:
Policy No.:
State Contractor's License No.: 653381
Types of Licenses: General-A Haz Cert.
Expiration Date:

NOTE: The State of California has determined that tanks used for the storage of any hazardous or flammable substance shall be considered hazardous even if all contents have been removed.

All storage tanks shall be hauled as hazardous waste, accompanied by a state hazardous waste manifest, and taken to a licensed treatment, storage and disposal facility (TSDF); or if the tanks are triple rinsed on site and the rinsate manifested and hauled to a licensed TSDF, the tank may be handled as nonhazardous.

For information on licensed TSDFs that can accept nonrinsed tanks, contact the State of California Department of Health Services, Toxic Substance Control at (800) 258-6942.

Print Name Clearly: Rudy Gil
Phone: 909) 681-0708
Signature: Rudy Gil
Date: 10/27/98

## OFFICE USE ONLY

Under Permit: ☐ No ☑ Yes
Establishment Number: 970D497
Number of Tanks: 0
Fees Current: ☐ No
Delinquent Amount: AG-Tank
☐ Yes
Expiration Date:

Permit Fee Paid THIS Application: $450.00
Receipt Number: 1488399
Check Number: 7814
Date Paid: 10/27/98
Taken by: Larita
Log Number: 102798-05
Job Card Number: 56091

03-19991-670 Rev. 5/98

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

# UNDERGROUND STORAGE TANK PERMIT APPLICATION - FORM A

COMPLETE THIS FORM FOR EACH FACILITY/SITE

MARK ONLY ONE ITEM
- [ ] 1 NEW PERMIT
- [ ] 2 INTERIM PERMIT
- [ ] 3 RENEWAL PERMIT
- [ ] 4 AMENDED PERMIT
- [ ] 5 CHANGE OF INFORMATION
- [ ] 6 TEMPORARY SITE CLOSURE
- [x] 7 PERMANENTLY CLOSED SITE

## I. FACILITY/SITE INFORMATION & ADDRESS - (MUST BE COMPLETED)

| | | | |
|---|---|---|---|
| DBA OR FACILITY NAME: Martin De Hoog Dairy | | NAME OF OPERATOR: Martin De Hoog | |
| ADDRESS: 6311 Edison Ave | | NEAREST CROSS STREET: Grove Ave | PARCEL # (OPTIONAL) |
| CITY NAME: Chino | STATE: CA | ZIP CODE: 91710 | SITE PHONE # WITH AREA CODE: 909) 947-3559 |

✓ BOX TO INDICATE: [ ] CORPORATION [x] INDIVIDUAL [ ] PARTNERSHIP [ ] LOCAL-AGENCY DISTRICTS * [ ] COUNTY-AGENCY * [ ] STATE-AGENCY * [ ] FEDERAL-AGENCY *

* If owner of UST is a public agency, complete the following: name of Supervisor of division, section, or office which operates the UST _____

| | | | |
|---|---|---|---|
| TYPE OF BUSINESS: [ ] 1 GAS STATION [ ] 2 DISTRIBUTOR [x] 3 FARM [ ] 4 PROCESSOR [ ] 5 OTHER | [ ] ✓ IF INDIAN RESERVATION OR TRUST LANDS | # OF TANKS AT SITE: 1 | E. P. A. I. D. # (optional) |

| EMERGENCY CONTACT PERSON (PRIMARY) | | EMERGENCY CONTACT PERSON (SECONDARY) - optional | |
|---|---|---|---|
| DAYS: NAME (LAST, FIRST): De Hoog, Martin | PHONE # WITH AREA CODE: 909) 947-3559 | DAYS: NAME (LAST, FIRST) | PHONE # WITH AREA CODE |
| NIGHTS: NAME (LAST, FIRST): De Hoog, Martin | PHONE # WITH AREA CODE: 909) 947-3559 | NIGHTS: NAME (LAST, FIRST) | PHONE # WITH AREA CODE |

## II. PROPERTY OWNER INFORMATION - (MUST BE COMPLETED)

| | | | |
|---|---|---|---|
| NAME: Martin De Hoog Dairy | CARE OF ADDRESS INFORMATION | | |
| MAILING OR STREET ADDRESS: 6311 Edison Ave | ✓ box to indicate: [x] INDIVIDUAL [ ] LOCAL-AGENCY [ ] STATE-AGENCY [ ] CORPORATION [ ] PARTNERSHIP [ ] COUNTY-AGENCY [ ] FEDERAL-AGENCY | | |
| CITY NAME: Chino | STATE: CA | ZIP CODE: 91710 | PHONE # WITH AREA CODE: 909) 947-3559 |

## III. TANK OWNER INFORMATION - (MUST BE COMPLETED)

| | | | |
|---|---|---|---|
| NAME OF OWNER: Martin De Hoog Dairy | CARE OF ADDRESS INFORMATION | | |
| MAILING OR STREET ADDRESS: 6311 Edison Ave | ✓ box to indicate: [x] INDIVIDUAL [ ] LOCAL-AGENCY [ ] STATE-AGENCY [ ] CORPORATION [ ] PARTNERSHIP [ ] COUNTY-AGENCY [ ] FEDERAL-AGENCY | | |
| CITY NAME: Chino | STATE: CA | ZIP CODE: 91710 | PHONE # WITH AREA CODE: 909) 947-3559 |

## IV. BOARD OF EQUALIZATION UST STORAGE FEE ACCOUNT NUMBER - Call (916) 322-9669 if questions arise.

TY (TK) HQ 4 4 - [ ][ ][ ][ ][ ][ ]

## V. PETROLEUM UST FINANCIAL RESPONSIBILITY - (MUST BE COMPLETED) – IDENTIFY THE METHOD(S) USED

✓ box to indicate
- [ ] 1 SELF-INSURED
- [ ] 5 LETTER OF CREDIT
- [x] 2 GUARANTEE
- [ ] 6 EXEMPTION
- [ ] 3 INSURANCE
- [ ] 99 OTHER _____
- [ ] 4 SURETY BOND

## VI. LEGAL NOTIFICATION AND BILLING ADDRESS

Legal notification and billing will be sent to the tank owner unless box I or II is checked.

CHECK ONE BOX INDICATING WHICH ABOVE ADDRESS SHOULD BE USED FOR LEGAL NOTIFICATIONS AND BILLING: I. [x] II. [ ] III. [ ]

*THIS FORM HAS BEEN COMPLETED UNDER PENALTY OF PERJURY, AND TO THE BEST OF MY KNOWLEDGE, IS TRUE AND CORRECT*

| | | |
|---|---|---|
| OWNER'S NAME (PRINTED & SIGNED): Rudy G.I / Rudy M / Agent for Martin De Hoog Dairy | OWNER'S TITLE | DATE MONTH/DAY/YEAR: 10/27/96 |

## LOCAL AGENCY USE ONLY

| COUNTY # | JURISDICTION # | FACILITY # |
|---|---|---|
| [ ][ ] | [ ][ ][ ] | [ ][ ][ ][ ][ ][ ] |

| LOCATION CODE - *OPTIONAL* | CENSUS TRACT # - *OPTIONAL* | SUPVISOR - DISTRICT CODE - *OPTIONAL* |
|---|---|---|
| | | |

THIS FORM MUST BE ACCOMPANIED BY AT LEAST (1) OR MORE PERMIT APPLICATION - FORM B, UNLESS THIS IS A CHANGE OF SITE INFORMATION ONLY.

OWNER MUST FILE THIS FORM WITH THE LOCAL AGENCY IMPLEMENTING THE UNDERGROUND STORAGE TANK REGULATIONS

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

# UNDERGROUND STORAGE TANK PERMIT APPLICATION - FORM B

COMPLETE A SEPARATE FORM FOR EACH TANK SYSTEM.

MARK ONLY ONE ITEM
- [ ] 1 NEW PERMIT
- [ ] 2 INTERIM PERMIT
- [ ] 3 RENEWAL PERMIT
- [ ] 4 AMENDED PERMIT
- [ ] 5 CHANGE OF INFORMATION
- [ ] 6 TEMPORARY TANK CLOSURE
- [ ] 7 PERMANENTLY CLOSED ON SITE
- [x] 8 TANK REMOVED

DBA OR FACILITY NAME WHERE TANK IS INSTALLED: Martin De Hoog Dairy

## I. TANK DESCRIPTION

COMPLETE ALL ITEMS – SPECIFY IF UNKNOWN

A. OWNER'S TANK I. D. # #1

B. MANUFACTURED BY: UNKNOWN

C. DATE INSTALLED (MO/DAY/YEAR) UNKNOWN

D. TANK CAPACITY IN GALLONS: 500 gal

## II. TANK CONTENTS

IF A-1 IS MARKED, COMPLETE ITEM C.

A.
- [x] 1 MOTOR VEHICLE FUEL
- [ ] 2 PETROLEUM
- [ ] 3 CHEMICAL PRODUCT
- [ ] 4 OIL
- [ ] 80 EMPTY
- [ ] 95 UNKNOWN

B.
- [x] 1 PRODUCT
- [ ] 2 WASTE

C.
- [x] 1a REGULAR UNLEADED
- [ ] 1b PREMIUM UNLEADED
- [ ] 2 LEADED
- [ ] 3 DIESEL
- [ ] 4 GASAHOL
- [ ] 5 JET FUEL
- [ ] 6 AVIATION GAS
- [ ] 7 METHANOL
- [ ] 99 OTHER (DESCRIBE IN ITEM D. BELOW)

D. IF (A.1) IS NOT MARKED, ENTER NAME OF SUBSTANCE STORED

C. A. S. # :

## III. TANK CONSTRUCTION

MARK ONE ITEM ONLY IN BOXES A, B, AND C, AND ALL THAT APPLIES IN BOX D AND E

A. TYPE OF SYSTEM
- [ ] 1 DOUBLE WALL
- [x] 2 SINGLE WALL
- [ ] 3 SINGLE WALL WITH EXTERIOR LINER
- [ ] 4 SECONDARY CONTAINMENT (VAULTED TANK)
- [ ] 95 UNKNOWN
- [ ] 99 OTHER

B. TANK MATERIAL (Primary Tank)
- [x] 1 BARE STEEL
- [ ] 2 STAINLESS STEEL
- [ ] 3 FIBERGLASS
- [ ] 4 STEEL CLAD W/ FIBERGLASS REINFORCED PLASTIC
- [ ] 5 CONCRETE
- [ ] 6 POLYVINYL CHLORIDE
- [ ] 7 ALUMINUM
- [ ] 8 100% METHANOL COMPATIBLE W/FRP
- [ ] 9 BRONZE
- [ ] 10 GALVANIZED STEEL
- [ ] 95 UNKNOWN
- [ ] 99 OTHER

C. INTERIOR LINING
- [ ] 1 RUBBER LINED
- [ ] 2 ALKYD LINING
- [ ] 3 EPOXY LINING
- [ ] 4 PHENOLIC LINING
- [ ] 5 GLASS LINING
- [ ] 6 UNLINED
- [x] 95 UNKNOWN
- [ ] 99 OTHER

IS LINING MATERIAL COMPATIBLE WITH 100% METHANOL ? YES ___ NO ___

D. CORROSION PROTECTION
- [ ] 1 POLYETHYLENE WRAP
- [ ] 2 COATING
- [ ] 3 VINYL WRAP
- [ ] 4 FIBERGLASS REINFORCED PLASTIC
- [ ] 5 CATHODIC PROTECTION
- [x] 91 NONE
- [ ] 95 UNKNOWN
- [ ] 99 OTHER

E. SPILL AND OVERFILL — SPILL CONTAINMENT INSTALLED (YEAR) N/A — OVERFILL PREVENTION EQUIPMENT INSTALLED (YEAR) N/A

## IV. PIPING INFORMATION

CIRCLE A IF ABOVE GROUND OR U IF UNDERGROUND, BOTH IF APPLICABLE

A. SYSTEM TYPE — A (U) 1 SUCTION; A U 2 PRESSURE; A U 3 GRAVITY; A U 99 OTHER

B. CONSTRUCTION — A (U) 1 SINGLE WALL; A U 2 DOUBLE WALL; A U 3 LINED TRENCH; A U 95 UNKNOWN; A U 99 OTHER

C. MATERIAL AND CORROSION PROTECTION
- A (U) 1 BARE STEEL
- A U 2 STAINLESS STEEL
- A U 3 POLYVINYL CHLORIDE (PVC)
- A U 4 FIBERGLASS PIPE
- A U 5 ALUMINUM
- A U 6 CONCRETE
- A U 7 STEEL W/ COATING
- A U 8 100% METHANOL COMPATIBLE W/FRP
- A U 9 GALVANIZED STEEL
- A U 10 CATHODIC PROTECTION
- A U 95 UNKNOWN
- A U 99 OTHER

D. LEAK DETECTION
- [ ] 1 AUTOMATIC LINE LEAK DETECTOR
- [x] 2 LINE TIGHTNESS TESTING
- [ ] 3 INTERSTITIAL MONITORING
- [ ] 99 OTHER

## V. TANK LEAK DETECTION

- [x] 1 VISUAL CHECK
- [ ] 2 INVENTORY RECONCILIATION
- [ ] 3 VADOZE MONITORING
- [ ] 4 AUTOMATIC TANK GAUGING
- [ ] 5 GROUND WATER MONITORING
- [ ] 6 TANK TESTING
- [ ] 7 INTERSTITIAL MONITORING
- [ ] 91 NONE
- [ ] 95 UNKNOWN
- [ ] 99 OTHER

## VI. TANK CLOSURE INFORMATION

1. ESTIMATED DATE LAST USED (MO/DAY/YR) UNKNOWN
2. ESTIMATED QUANTITY OF SUBSTANCE REMAINING Ø GALLONS
3. WAS TANK FILLED WITH INERT MATERIAL ? YES [ ] NO [x]

*THIS FORM HAS BEEN COMPLETED UNDER PENALTY OF PERJURY, AND TO THE BEST OF MY KNOWLEDGE, IS TRUE AND CORRECT*

APPLICANT'S NAME (PRINTED & SIGNATURE) Rudy Gil / Rudy MO / Agent for Martin De Hoog Dairy — DATE 10/27/92

## LOCAL AGENCY USE ONLY

THE STATE I.D. NUMBER IS COMPOSED OF THE FOUR NUMBERS BELOW

| STATE I.D.# | COUNTY # | JURISDICTION # | FACILITY # | TANK # |
|---|---|---|---|---|
| | | | | |

| PERMIT NUMBER | PERMIT APPROVED BY/DATE | PERMIT EXPIRATION DATE |
|---|---|---|
| | | |

THIS FORM MUST BE ACCOMPANIED BY A PERMIT APPLICATION - FORM A, UNLESS A CURRENT FORM A HAS BEEN FILED.
FILE THIS FORM WITH THE LOCAL AGENCY IMPLEMENTING THE UNDERGROUND STORAGE TANK REGULATIONS

# ENVIRONMENTAL HEALTH SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO, CALIFORNIA

THIS PERMIT EXPIRES:
05/30/91

MICHAEL DEHOOG DAIRY
8381 EDISON AV
CHINO, CA 91710
EST - 88015860 PERMIT - 8804250023

# PERMIT

## NON-TRANSFERABLE

This permit may be suspended or revoked by the health officer for cause. This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force by the United States Government, the State of California and the County of San Bernardino pertaining to the above mentioned business. Penalty fees are assessed on permits renewed 30 days after expiration date indicated above, or for failure to obtain new permit in case of transfer of ownership.

TYPE OF PERMIT - AGRICULTURAL HAZARDOUS MATERIAL HANDLER

FEE PAID $50.00

MICHAEL DEHOOG DAIRY
DBA: MICHAEL DEHOOG DAIRY
8381 EDISON AV
CHINO, CA 91710

04-1804-631 REV. 3/85

PERMIT DOES NOT IMPLY APPROVAL

POST IN A
CONSPICUOUS PLACE

Director
ENVIRONMENTAL HEALTH SERVICES

Changes A MAY 18 90

MONTHLY

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
INVOICE

PAGE 1
BILL DATE 04/30/90
HEALTH PERMIT EXPIRATION DATE 05/30/90

*** REMIT COPY ***

ESTABLISHMENT NBR 88015860

MICHAEL DEHOAG DAIRY
DBA: MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 880[illegible]23 | 226014 | PREVIOUS BALANCE | | 0.00 |
| | | AGRICULTURAL HAZARDOUS MATERIAL HANDLER | 101 | 50.00 |
| | | PERMIT TOTAL | | 50.00 |
| | | TOTAL DUE | | 50.00 |

MAY 18 1990

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

PAID
Amt $50
Date 5/18
By Pat
# 4743

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS WASTE GENERATORS -- 387-3080
UND[illegible]OUND STORAGE T[illegible] PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER PERMITS -- 387-3044
MOBILEHOME PARK PERMITS -- 387-6515
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-6515
HOME OCCUPATION PERMITS -- 387-6512
TEMPORARY OFFICES/SIGNS -- 387-6512
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4666
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-6512

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

MONTHLY

# RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO MICHAEL DE~~HOAG~~ Hoog DAIRY
8381 EDISON AV
CHINO, CA 91710

< > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO MICHAEL DE~~HOAG~~ Hoog DAIRY
8381 EDISON AV
CHINO, CA 91710

LEGAL OWNER INFO MICHAEL ~~DEHOAG~~ De Hoog DAIRY
8381 EDISON AV
CHINO, CA 91710

IS THIS A TRANSFER? no

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: ___ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

| OFFICE USE ONLY |
|---|
| EST NBR 88015860 |
| PERMIT NBR 8804250023 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226014 |
| EXPIR DATE 05/30/90 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 2200 |
| MFR NBR |
| APN |
| PERMIT FEE _____ |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D 150 |

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

SIGNED Michael De Hoog DATED 5/15/90 TITLE Owner

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

# ENVIRONMENTAL HEALTH SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO, CALIFORNIA

THIS PERMIT EXPIRES:
05/30/90

MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710
EST - 88015860 PERMIT - 8804250023

# PERMIT

## NON-TRANSFERABLE

This permit may be suspended or revoked by the health officer for cause. This permit is granted on condition that the person named in the permit will comply with the laws, ordinances and regulations that are now or may hereafter be in force by the United States Government, the State of California and the County of San Bernardino pertaining to the above mentioned business. Penalty fees are assessed on permits renewed 30 days after expiration date indicated above, or for failure to obtain new permit in case of transfer of ownership.

TYPE OF PERMIT - AGRICULTURAL HAZARDOUS MATERIAL HANDLER

FEE PAID $50.00

MICHAEL DEHOAG DAIRY
DBA MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

04-1804-631 REV. 3/85

PERMIT DOES NOT IMPLY APPROVAL

POST IN A
CONSPICUOUS PLACE

Director
ENVIRONMENTAL HEALTH SERVICES

COUNTY OF SAN BERNARDINO, CALIFORNIA
DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
I N V O I C E

PAGE 1
BILL DATE 04/24/89
HEALTH PERMIT EXPIRATION DATE 05/30/89

*** REMIT COPY ***

ESTABLISHMENT NBR 88015860

MICHAEL DEHOAG DAIRY
DBA: MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

| PERMIT NBR | CATEGORY | DESCRIPTION | BILL CODE | AMOUNT |
|---|---|---|---|---|
| 8804250023 | 226014 | PREVIOUS BALANCE | | 0.00 |
| | | AGRICULTURAL HAZARDOUS MATERIAL HANDLER | 101 | 50.00 |
| | | PERMIT TOTAL | | 50.00 |
| | | TOTAL DUE | | 50.00 |

MAY 05 1989

ALL FEES ARE NOW DUE AND PAYABLE. FAILURE TO PAY WITHIN 30 DAYS AFTER THE EXPIRATION DATE OF YOUR CURRENT PERMIT WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. DO NOT SEPARATE THESE FORMS. REVIEW, UPDATE, AND SIGN THE ATTACHED RENEWAL APPLICATION(S). RETURN REMIT COPY OF THE INVOICE AND APPLICATION(S) WITH REMITTANCE TO: ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVENUE
SAN BERNARDINO, CA 92415-0160

PAID
Amt 50.00
Date 5-5-89
By PD

IF YOU HAVE QUESTIONS CONCERNING YOUR BILLING PLEASE CALL:

FOOD ESTABLISHMENT PERMITS -- 387-4637
SWIMMING POOL PERMITS -- 387-4637
MILK & DAIRY ESTABLISHMENTS -- 387-4608
HAZARDOUS OR INFECTIOUS
WASTE GENERATORS -- 387-3080
UNDERGROUND STORAGE
TANK PERMITS -- 387-3080
HAZARDOUS MATERIAL HANDLER
PERMITS -- 387-3044
MOBILEHOME PARK PERMITS -- 387-4670
MOTEL, CAMP, MASSAGE PARLOR PERMITS -- 387-4670
HOME OCCUPATION PERMITS -- 387-4678
TEMPORARY OFFICES/SIGNS -- 387-4678
REFUSE HAULERS -- 387-4655
REFUSE DISPOSAL SITES -- 387-4655
DESIGNATED MAINTENANCE AREA -- 387-4655
WATER SYSTEMS -- 387-4666
WELL DRILLERS -- 387-4666
SPECIAL USE PERMITS -- 387-4678

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

RENEWAL APPLICATION FOR HEALTH PERMIT INSPECTION AND HEALTH SERVICES

SAN BERNARDINO COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH SERVICES
385 N. ARROWHEAD AVE., SAN BERNARDINO, CA. 92415-0160

PLEASE REVIEW THE FOLLOWING INFORMATION CAREFULLY. MAKE CORRECTIONS DIRECTLY ON THE FORM BY CROSSING OUT THE PRE-PRINTED INFORMATION AND ADDING THE CHANGES. *** PLEASE PRINT. ***

ESTABLISHMENT INFO MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

< > CHECK HERE IF APPLICANT IS SAME AS LEGAL OWNER

APPLICANT INFO MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

LEGAL OWNER INFO MICHAEL DEHOAG DAIRY
8381 EDISON AV
CHINO, CA 91710

IS THIS A TRANSFER? NO

IF YES: FORMER ESTABLISHMENT NAME _____

FORMER OWNER _____

IMPORTANT: ALL CORRESPONDENCE SHOULD BE SENT TO: X ESTABLISHMENT ADDRESS ___LEGAL OWNER ___APPLICANT

NUMBER OF EMPLOYEES: 00000

| OFFICE USE ONLY |
|---|
| EST NBR 88015860 |
| PERMIT NBR 8804250023 |
| FORMER EST NBR _____ |
| PERMIT CATEGORY 226014 |
| EXPIR DATE 05/30/89 |
| NEW, TRANS, RENEW R |
| LOC CODE 53 |
| SANI DIST 2200 |
| MFR NBR |
| APN |
| PERMIT FEE 50- |
| STATE FEE _____ |
| DELINQUENT FEE _____ |
| TOTAL FEE REC'D 50- |

I HEREBY MAKE APPLICATION FOR HEALTH SERVICES AND PERMIT TO ESTABLISH AND/OR OPERATE THE ABOVE MENTIONED BUSINESS, USE, OR SERVICE IN ACCORDANCE WITH THE LAWS, ORDINANCES, AND REGULATIONS THAT ARE NOW OR MAY HEREINAFTER BE IN FORCE BY THE UNITED STATES GOVERNMENT, THE STATE OF CALIFORNIA, AND THE COUNTY OF SAN BERNARDINO PERTAINING TO THE ABOVE MENTIONED BUSINESS. I HEREBY CONSENT TO ALL NECESSARY INSPECTIONS INCIDENT TO THE ISSUANCE OF THIS PERMIT AND THE OPERATION OF THE BUSINESS.

THIS FORM MUST BE RETURNED WITH YOUR REMITTANCE

SIGNED Michael DeHoog DATED 5-4-89 TITLE owner

NOTICE: ALL FEES ARE DUE AND PAYABLE WITHIN 30 DAYS. FAILURE TO PAY WILL RESULT IN THE ASSESSMENT OF A DELINQUENT FEE. APPLICATION AND FEE MUST BE SUBMITTED PRIOR TO OPERATION BY ANY NEW OWNER, OR A DELINQUENT FEE WILL BE CHARGED.

INSERT AUDIT TRAIL

*** CONTROL NUMBER: 7001100 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: 0000000000 ***

ESTAB NBR: 88015860 BILL FLAG: O LOC: 53 PARCEL NBR: PROBLEM PGM: STATUS: ESTAB DATE: 042588 INACTIVE DATE: 000000

*** CONTROL NUMBER: 7001101 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: 8804250023 ***

| PERMIT NBR | CATEGORY | STATUS | EXPIR DATE | MFR NUMBER | SANITARIAN AREA | DISTRICT EMPLOYEE | EXEMPT FLAG | DELQ FLAG | PRT FLG | BALANCE DUE | BILLED DATE | RENEWAL DATE | RENEWAL CODE | AREA | NBR SVCS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8804250023 | 226008 | | 05/30/88 | | 22 | 00 | | | | 0.00 | 00/00/00 | 00/00/00 | N | | |

*** CONTROL NUMBER: 7001101 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: 8804250023 ***

| PROGRAM DATA: | NUMBER SEATS | SQUARE FEET | NUMBER GALLONS | SOFT SERVE | DAILY TONS | DAILY CU YDS | NUMBER EMPLOYEES | NUMBER TANKS | SEWER ENTITY | NUMBER UNITS | NUMBER POOLS | NUMBER BIRDS | NUMBER CONNECTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 000 | | | | | |

*** CONTROL NUMBER: 7001199 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: A ***

*** CONTROL NUMBER: 7001199 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: E ***

*** CONTROL NUMBER: 7001199 ESTABLISHMENT NUMBER: 88015860 PERMIT NUMBER: O ***

| ESTAB: | APPL: | OWNR: |
|---|---|---|
| MICHAEL DEHOAG DAIRY | MICHAEL DEHOAG DAIRY | MICHAEL DEHOAG DAIRY |
| 8381 O/O EDISON AV | 8381 O/O EDISON AV | 8381 O/O EDISON AV |
| 00000 | 00000 | 00000 |
| CHINO CA 91710-0000 | CHINO CA 91710-0000 | CHINO CA 91710-0000 |
| (000) 000-0000 | (000) 000-0000 | (000) 000-0000 |

**EMERGENCY MANAGEMENT PROGRAM**
**AUTOMATED PERMIT BILLING SYSTEM**
**DATA INPUT SHEET**

ACTION CODE: I EST. # _____ PERMIT # _____

**ESTABLISHMENT INFO: (00)**

BILL TO: LOCATION: # 153 EST. DATE: _____

**ADDRESSING INFORMATION (99):**

E

NAME: MICHAEL DEHOIT DAIRY

ST #: 8381 FRAC: ____ DIR: ____ ST NAME: EDISON

ST. DESIG. AVE APT/SP ____ CITY CHINO

STATE CA ZIP 91710 PH #: ( ) ____ - ____

A

NAME: Same

ST #: ____ FRAC: ____ DIR: ____ ST NAME: ____

ST. DESIG. ____ APT/SP ____ CITY ____

STATE ____ ZIP ____ PH #: ( ) ____ - ____

O

NAME: Same

ST #: ____ FRAC: ____ DIR: ____ ST NAME: ____

ST. DESIG. ____ APT/SP ____ CITY ____

STATE ____ ZIP ____ PH #: ( ) ____ - ____

**PERMIT INFORMATION (01):**

CATEGORY # 226006 226007 226008

EXP. DATE: _____ SANITARIAN DIST/AREA: _____ SANITARIAN DIST.EMP #: 00

RENEWAL CODE: N MFR # _____

**PROGRAM INFORMATION:**

# OF EMPLOYEES: N/A # OF CHEMICALS: _____

DATE ENTERED: _____ CONTROL #: 70011

SUBMITTED BY (INITIAL): LG ENTERED BY (INITIAL) APR 25 1988

**COMMENTS/REMARKS:**

# CUPA

San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

## UNDERGROUND STORAGE TANK INSPECTION REPORT

Facility Name: Martin De Hoog — Date: May 29, 2007
Street Address: 8311 Edison — Facility No. FA0000410
City: Ontario — Zip Code: 91762 — Program Record No. N/A
Facility Contact: Martin De Hoog — Facility Phone No. (909) 947-3559 — Number of Tanks: 0

Refer to Title 23 of the California Code of Regulations (CCR) and Chapter 6.7 of the Health and Safety Code (CHSC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the Underground Storage Tank laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS | | V | C | N |
|---|---|---|---|---|
| 302. UST permit fees paid and current | CHSC 25287(a) | | | |
| 303. UST application package submitted (formerly Forms A&B) | CHSC 25286(a) | | | |
| 308. Failure to report change of ownership within 30 days | CHSC 25284(c) | | | |
| 306. Owner/Operator agreement available | CHSC 25284(a)(3) | | | |
| 307. Certificate of Financial Responsibility submitted | CHSC 25292.2(a) | | | |
| 330. Leak Detection/Monitoring and Response Plan | CCR 2632, 2634 or 2641(h) | | | |
| 304. UST monitoring/maintenance records available for 3 years | CHSC 25284(c) | | | |
| 312. Designated Operator Statement submitted | CCR 2715(a) | | | |
| 313. Monthly inspections completed by Designated Operator | CCR 2715(c) | | | |
| 305. Prior UST violations corrected within 30 days | CCR 2712(f) | | | |
| 310. Business Plan established and implemented | CHSC 25503.5 | | | |
| 311. Business Plan submitted/updated | CHSC 25505 | | | |
| **MONITORING OF UST SYSTEMS** | | | | |
| 309. Failure to properly monitor UST | CHSC 25293 | | | |
| 331. Monitoring system(s) certified annually | CCR 2638 or 2641(j) | | | |
| 334. Audible/visual alarms operational | CCR 2632(c)(2)(B) and 2636(f)(1) | | | |
| 314. Certification sticker/tag affixed to monitoring equipment | CCR 2638(f) | | | |
| 318. Sensors placed at low point of UST system(s) | CCR 2630(d) or 2641(a) | | | |
| 319. Leak detection equipment tampered with or disabled | CHSC 25299(f)(2) | | | |
| 323. Containment sump(s) free of debris/liquid | CCR 2590.21(c)(3) | | | |
| 324. Line leak detector(s) installed and functioning properly | CCR 2636(f)(2) or 2641(f) | | | |
| 333. Overspill containment installed/tested annually | CHSC 25284.2 | | | |
| 327. Overfill protection device installed/operational | CCR 2635(b)(2) | | | |
| 328. Secondary containment components tested | CCR 2637(a) | | | |
| 329. UST system design, construction, and monitoring | CCR 2630 or 2640 | | | |
| **UNAUTHORIZED RELEASE AND ABANDONMENT** | | | | |
| 340. UST system operated to prevent unauthorized releases | CHSC 25292.1(a) | | | |
| 341. Failure to report unauthorized release | CHSC 25299(d)(1) | | | |
| 342. Unlawful abandonment of USTs | CHSC 25298(a) | | | |
| 343. Unlawful closure of USTs | CHSC 25298(c) | | | |
| 344. Failure to properly temporarily close USTs | CHSC 25298(b) | | | |
| 346. Failure to upgrade or repair UST to prevent releases | CHSC 25292(d) | | | |
| 347. Unlawful deposit of fuel into a non-compliant UST | CHSC 25292.3 | | | |
| **UNIFORM FIRE CODE REQUIREMENTS** | | | | |
| 335. Emergency fuel shut-off device operational | UFC 5201.5.3 | | | |
| 336. Impact valve(s) installed at dispenser(s) | UFC 5202.5.3.2 | | | |
| 337. Fire extinguisher(s) present and charged | UFC 5201.9 | | | |
| 338. Address clearly visible from street | UFC 901.4.4 | | | |
| **OTHER REQUIREMENTS** | | | | |
| Significant Operational Compliance – Prevention | 40 CFR Part 280 | | | |
| Significant Operational Compliance – Detection | 40 CFR Part 280 | | | |
| Significant Operational Compliance – Both | 40 CFR Part 280 | | | |

**NARRATIVE / CORRECTIONS**

A file review was conducted in conjunction with hazardous material handler and hazardous waste generator inspection.
One 500-gallon gasoline UST was removed on 11-12-98. Sampling was conducted on the date of removal. A closure letter was issued on 1-6-99.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: Lester Hearnside — Received by: Martin De Hoog — Title: Owner

**CUPA**
**San Bernardino County Fire Department**
**HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION**
**385 N. Arrowhead Ave, 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323**

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

Facility Name: AG - Martin L. De Hoog Date: 11-21-00
Street Address: 8311 EDISON AVE. Est. No: 97042497
City: CHINO Zip Code: 91710 EPA ID No:
Facility Contact: MARTIN DeHoog Phone No. Number of Employees:

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, or in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N | |
|---|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 33.0732 | | | | • |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | | • |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | | • |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | | • |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | | • |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | | • |
| 107. Contingency Plan established | CCR 66265.51(a) | | | | • |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | | • |
| **STORAGE AND LABELING REQUIREMENTS** | | | | | |
| 110. Hazardous Waste containers labeled | CCR 66262.34(f)(3) | | | | |
| 111. Hazardous Waste container label complete | CCR 66262.34(f)(3) | | | | |
| 112. Accumulation start date on labels | CCR 66262.34(f)(2) | | | | |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | | |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | | • |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | | • |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | | |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | | • |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | | |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | | • |
| 120. Aboveground Tank storage area inspected daily | CCR 66265.195 | | | | |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | | • |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | | • |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | | |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | | |
| 129. Biennial Report prepared | CCR 66262.41 | | | | |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | | |
| 131. Training documentation complete & available | CCR 66265.16 | | | | • |
| 132. SB 14 completed and available | CCR 67100.3 | | | | |
| **MANAGEMENT OF USED OIL AND BATTERIES** | | | | | |
| 135. Used oil managed properly | CHSC 25250.4 | | | | |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | | |
| 137. Used oil receipts complete & available | CHSC 25250.8(b) | | | | |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | | |
| 139. Used batteries managed lawfully | CCR 66266.81 | | | | |
| **DISPOSAL AND TRANSPORTATION** | | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | | |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | | • |
| 147. Transportation of Hazardous Waste w/o registration | CHSC 25163 | | | | • |
| 148. Hazardous Waste hauled by registered transporter | CHSC 25163 | | | | • |
| 149. Haz. Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | | • |

| RELEASE AND RESPONSE/BUSINESS PLANS | | V | C | N | |
|---|---|---|---|---|---|
| 201. Hazardous Material handler permit current | CC 33.022 | | | | |
| 202. Business Plan established | CHSC 25503.5 | | | | |
| 203. Business Plan submitted/updated | CHSC 25505 | | | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | | |
| 205. Facility access for inspection granted - HM Only | CHSC 25508 | | | | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | | |
| 207. SPCC Plan completed | CHSC 25270.5(c) | | | | |

**INSPECTION NARRATIVE**

No HAZARDOUS MATERIALS / WASTES on site. The UST was removed 11-12-98.

Permits will be INACTIVATED.

☐ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN _____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspector: _____ Received by: _____ Title: _____

EH011TP EHS Permit Bi g System 10/24/00
EH002 Establishment Summary 09:00:35

Estab . . 97042497

Established: 03/26/1997
Status . . : DB
Location . : 53
Parcel . . :
Inactive . :
Federal id :

AG-DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Bill to: O Attn:
Contact: Drvr lic: Exp: State:

Applicant: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710
Owner: DE HOOG, MARTIN L
8311 EDISON AVE
CHINO, CA 91710

Comment: DAIRY- 1 UST REMOVED 11/12/98 - MIKE WARD

F1=Help F3=Exit F5=Refresh
F13=EstbUpd F14=AddrUpd F17=PrmtInq F21=Srch F23=Print

Wayne,
The UST here was removed, would you please verify for me whether they still need these other permits?
Thank you
Linda

Estab . . 97042497 AG-DE HOOG, MARTIN L

| Sel | Permit | Catgy | Expire Date | MFR | Sani | Balance | Stat | Size |
|---|---|---|---|---|---|---|---|---|
| | 9703262322 | 226008 | 04/30/1997 | | 0500 | .00 | | 0 |
| | Last bill: 03/29/1997 | | Last delq: | | | Delq cnt: 0 | | |
| | 9703262323 | 228707 | 04/30/1997 | | 0500 | .00 | | 0 |
| | Last bill: 03/29/1997 | | Last delq: | | | Delq cnt: 0 | | |
| | 9709101316 | 227001 | 04/30/1997 | | 0500 | .00 | | 0 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |
| | 9901128652 | 222800 | 07/31/1998 | | 0500 | .00 | I | 1 |
| | Last bill: | | Last delq: | | | Delq cnt: 0 | | |

F1=Help F3=Exit F5=Refresh F7=Bkwd F8=Fwd
F15=PrmtUpd F19=ItemInq F20=FiscInq F21=Srch F22=Smry F23=Print

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO

**HAZARDOUS MATERIALS DIVISION**
**FIELD SERVICES • ENVIRONMENTAL PROTECTION**
**385 North Arrowhead Avenue, Second Floor • San Bernardino, CA 92415-0153**
**(909) 387-3080 • Fax (909) 387-4323**

PETER R. HILLS
Fire Chief
County Fire Warden


JANUARY 6, 1999

MARTIN DE HOG
8311 EDISON AVE
CHINO, CA 91710

**SUBJECT: UNDERGROUND STORAGE TANK REMOVAL AT 8311 EDISON AVE, CHINO**

The Department has received the sample results and/or closure report submitted by Enviro-Chem, Inc dated 11/23/98. After review of the reports prepared by you or your agent, it has been determined that the extent of contamination or lack thereof would indicate that no further investigation is warranted at this time.

**It is important to note** that this can not be construed as a release of liability for the site or declaration that the site is free from contamination. Should further projects or environmental investigations reveal additional contaminants site you will be responsible and held liable for the investigation and remedial actions. If you have any questions, please call (909) 387-3082.

Mike Ward

**MIKE WARD, E.S. II**
**Hazardous Materials Division**

MW/ll

Cc: A & J Environmental

C10 SCD

San Bernardino County Fire Department
HAZARDOUS MATERIALS DIVISION • FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 N. Arrowhead Ave., 2nd Floor, San Bernardino, CA 92415-0153 • (909) 387-3080 FAX (909) 387-4323

# UNDERGROUND STORAGE TANK REMOVAL INSPECTION FORM

DATE: 12 NOV 98 TIME: 1300 LOG # _____

FACILITY NAME: Hogg Dairy
LOCATION: 8311 Edison, Chino
CONTRACTOR: A&J

INSPECTORS PRESENT — HAZMAT: Ward FIRE: Jensen
AQMD: _____ OTHER: _____

| | QUANTITY | HAULER | DESTINATION |
|---|---|---|---|
| TRIPLE RINSATE | 100g | JSE ENV. | Ind. Waste Svcs. |
| TANKS | 1 | " | AMR |

DEGASSING CONTRACTOR _____

MANIFEST # 99119670 SCAQMD REFERENCE # _____ DRY ICE USED (10-15 # / 1000 g) 10#

NOTES:

Hours: _____

Page ___/___

| TANK # | SIZE | MATERIAL HELD | UL # | APPEARANCE (RUSTY, HOLED, SOUND, ETC.) |
|---|---|---|---|---|
| 1 | 500 | Gasoline | | Sound |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

ACILITY MAP:

[redacted]

| SAMPLE # | DATE/ TIME | DESCRIPTION (soil / odor) | LOCATION | DEPTH | EPA TEST # 'S |
|---|---|---|---|---|---|
| TANK-1-C | | SILT / NONE | | 9' | 8015 / 8020 + MTBE |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| )) | | | | | |

AMPLES TAKEN BY Asa Cosby - A&J LABORATORY _____

ONTAINER GLASS LABELS x SPLITS N/A HEADSPACE ϕ SEALS N/A

EFRIGERATED x CHAIN OF CUSTODY x OTHER _____

EQUIRED EPA TESTS:
asoline: 8020 (BTEX) or 8021B , 8015 (TRPH - modified for gas) & MTBE
iesel: 8020 (BTEX) or 8021B , 8015 (TRPH - modified for diesel) & MTBE
olvents/HVO's: 8010 or 8021B
aste Oil: 418.1 (with 8010 or 8021B if solvents are suspect) & CAM 17 for metals
etals: 7030 (Cd), 7190 (Cr), 7950 (Zn), 7420 or 6010 (Pb), 7080 (As), 8080 (PCB), 9010 (CN's)
esticides: 8080 (organo-Cl's), 8140 (N & P containing)

NOTE:
USTs ≥1000 g require a minimum of 2 samples. One from the fill end and one from the turbine end. Also, a sample from the dispenser should be taken. Samples should be taken from at least 2' below native soil (not fill). If discoloration is noted in sidewalls, take samples there. And sample stockpiles if contamination is suspect. For piping, samples should be taken ± every 20' & at major connections.

**ote: Methods 8020 and 8010 were deleted i 346 -III and combined as 8021B. Also, 82( ay be used in place of 8021B for ore accurate analyses when sampling for pot...al legal actions.**

Environmental

RECEIVED
DEC - 2 1998
COUNTY FIRE DEPARTMENT
HAZARDOUS MATERIALS

November 30, 1998

Mr. Mike Curtis
San Bernardino Fire Department
Hazardous Materials Division
385 N. Arrowhead Ave. 2ND Floor
San Bernardino, Ca. 92415-0153

Subject: Site Closure: Martin Dehoog Dairy, 8311 Edison Avenue, Chino, CA.

Mr. Curtis,

A & J Environmental has prepared and is pleased to submit the following Closure Report with supporting documentation regarding the removal of one underground storage tank from the above referenced address.

## BACKGROUND

The site is located on a generally flat area consisting mostly of dairy farms. On November 12, 1998 one (1) underground storage tank was removed from the site. The tank had the capacity of 500 gallons and reportedly once contained gasoline. The tank was triple rinsed prior to the removal. Approximately 100 gallons of rinsate waste was generated during the tank cleaning and subsequently shipped to Industrial Service Oil Co., Inc (Manifest # 98119670 attached). The tank was removed using a backhoe and loaded onto a truck and transported to American Metal Recycling Inc.in Ontario for destruction (Ticket # 50215 attached). The tank removal procedures were witnessed by Inspector Curtis Armstrong of the San Bernardino County Fire Department, Hazardous Materials Division.

OK To Close
mfa 12/2/98

(Continued)

## SAMPLE COLLECTION PROCEDURES

Following the removal of the tank, a backhoe was used to obtain one (1) soil sample from underneath the center of the tank and identified as Tank # 1 Center. The sample was collected from near the teeth of the backhoe bucket and compacted into a glass jar. The jar was completely filled without any head space prior to sealing with a Teflon-lined threaded cap. The sample was placed into a chilled container and transported for analysis to Enviro-Chem, INC. (ECI), a State Certified Laboratory.

## FINDINGS

The sample collected was analyzed for EPA 8015-m, 8020 and MTBE. Sample Tank # 1 Center indicate non-detectable limits of Hydrocarbons. (ECI Laboratory Report and Chain of Custody attached).

## CONCLUSIONS

Based upon the above findings, we are asking that the San Bernardino County Fire Department, Hazardous Materials Division, to grant closure and require no further action at this site.

## LIMITATIONS

Our professional services were performed using that degree of care and skill ordinarily exercised by environmental consultants practicing in this or similar localities. The findings were mainly based upon analytical results provided by an independent laboratory. Interpretations of the subsurface conditions at the site for the purpose of this investigation are made from a limited number of available data points (i.e. soil samples) and subsurface conditions may vary away from these data points. No other warranty, expressed or implied, is made as to the professional recommendations contained in this report.

Thank you for taking time from your schedule to review this report. Please do not hesitate to contact us if you have any questions or comments regarding this matter. Our office number is (909) 681-0708

Sincerely

Asa Cosby, REA-03892

**POST THIS CARD AT JOB SITE**

SAN BERNARDINO COUNTY FIRE DEPARTMENT/CUPA
HAZARDOUS MATERIALS DIVISION
FIELD SERVICES/ENVIRONMENTAL PROTECTION
385 NORTH ARROWHEAD AVENUE, SECOND FLOOR
SAN BERNARDINO, CA 92415-0153

LOG # 102798-05 JOB CARD № 5691

INSTALL ____ REMOVE 1

## CONSTRUCTION AND/OR REMOVAL OF UNDERGROUND STORAGE FACILITY

Site Name Martin Dehoog Dairy
Address 8311 Edison Ave, Chino
Contractor AJ Environmental 947-3559
Address/Phone 4752-C Felspar #101, Riverside

| | INSPECTION RECORD | APPROVED | DATE |
|---|---|---|---|
| FIRST INSPECTION | Excavation Clean, Approved Slope | | |
| | Bedding | | |
| | Holiday/Soap Test, Tanks Set X | | |
| | Manufacturer's UL # | | |
| | | | |
| | Additional Requirements | | |
| | | | |
| | DO NOT BACKFILL UNTIL ABOVE APPROVED | | |
| SECOND INSPECTION | Tank Air Test 5 PSI/30 Minutes | | |
| | Vent/Vapor Lines | | |
| | Products Lines 75 PSI/30 Minutes | | |
| | Product Line Containment | | |
| | Metal Piping Wrapped | | |
| | Sumps, Dispenser Pans Water Test | | |
| | | | |
| THIRD INSPECTION | Approved Fill Boxes | | |
| | Concrete or AC Paving 12" Beyond | | |
| | Leak Detectors/Monitors | | |
| | Lockable Fluid-Tight Access for Monitoring | | |
| | Precision Test Results | | |
| | Dispenser Containment | | |
| | Emergency Shut-off | | |
| | Additional Requirements | | |
| | | | |
| REQUIRED PRIOR TO OPERATING | Business Plan | | |
| | | | |
| | Monitoring Plan | | |
| | | | |
| | Financial Responsibility | | |

**FINAL APPROVAL AND CURRENT OPERATING PERMITS MUST BE OBTAINED PRIOR TO PLACING THESE TANKS INTO SERVICE ($5,000.00 FINE FOR NONCOMPLIANCE)**

| | | | |
|---|---|---|---|
| TANK REMOVAL INSPECTION | Tank(s) Removed X | | |
| | Required Samples: 8020, 8015, MTBE, 418.1 | 3 | 11/12/98 |
| | Lead (pb) 7421 or ICP 6010, Metals EPA PP13 | | 3 |
| | Additional Test Requirements | | |
| | | | |
| | **Removals Cannot be Finaled Until a Signed Copy of the Sample Results Have Been Received and Approved by this Department.** | | |
| | Final — Approved for Backfill | | |

Remarks:

FAILURE TO PROTECT AND MAINTAIN THIS CARD MAY RESULT IN JOB DELAY.
PRESERVE THIS RECORD OF INSPECTIONS.

**FOR INSPECTION CALL 48 HOURS IN ADVANCE AT (909) 387- 3082**

**THIS PERMIT EXPIRES DECEMBER 22, 1998**

[1] PETROLEUM [ ] WASTE OIL [ ] OTHER

14-16867-670 Rev. 4/98

*DISTRIBUTION: White — County Fire Department*
*Green — Contractor/Owner*

Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-99)
Please print or type. Form designed for use on elite (12-pitch) typewriter.

**See Instructions on back of page 6.**

Department of Toxic Substances Control
Sacramento, California

98119670

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

# UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No: CAC001416616 | Manifest Document No.: 119167 10
2. Page 1 of 1

Information in the shaded areas is not required by Federal law.

A. State Manifest Document Number: 98119670

3. Generator's Name and Mailing Address: MARTEN DE HONG (NW) 8311 EDISON, AVE. CHINO, CA 91710

B. State Generator's ID:

4. Generator's Phone: (909) 947-3559

5. Transporter 1 Company Name: JOE ENVIRONMENTAL SERVICES
6. US EPA ID Number: CAL000018778 57

C. State Transporter's ID:

D. Transporter's Phone: (909) 984-5886

7. Transporter 2 Company Name:
8. US EPA ID Number:

E. State Transporter's ID:

F. Transporter's Phone:

9. Designated Facility Name and Site Address: INDUSTRIAL SERVICE OIL CO INC. 1700 S. SOTO ST. LOS ANGELES, CA 90023
10. US EPA ID Number: CAD099452791

G. State Facility's ID: CAD099452791

H. Facility's Phone: (562) 598-5577

| 11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID Number) | 12. Containers No. | Type | 13. Total Quantity | 14. Unit Wt/Vol | I. Waste Number |
|---|---|---|---|---|---|
| a. PETROLEUM OIL - WATER NON-RCRA. HAZARDOUS WASTE LIQUID | 0001 | TT | 00110 | G | State 222 / EPA/Other N/A |
| b. | | | | | State / EPA/Other |
| c. | | | | | State / EPA/Other |
| d. | | | | | State / EPA/Other |

J. Additional Descriptions for Materials Listed Above: 11.A. Petroleum Hydrocarbons + Water

K. Handling Codes for Wastes Listed Above: a. 01 b. c. d.

15. Special Handling Instructions and Additional Information: GLOVES - NO OPEN FLAME

16. **GENERATOR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

GENERATOR

Printed/Typed Name: Agent For Ace Cusy | Signature: Ace Cusy | Month 1 1 | Day 1 2 | Year 9 8

TRANSPORTER

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name: Carlos Mayorga | Signature: [illegible] | Month 1 1 | Day 1 2 | Year 9 8

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name: | Signature: | Month | Day | Year

FACILITY

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name: Carlos Reyna | Signature: [illegible] | Month 1 1 | Day 1 3 | Year 9 8

**DO NOT WRITE BELOW THIS LINE.**

DTSC 8022A (4/97)
EPA 8700-22

Green: TRANSPORTER RETAINS

**AMERICAN FUEL TANK METAL RECYCLING, INC.**

2202 S. MILLIKEN AVE. • ONTARIO, CA 91761
(909) 988-8000

№ 50215

# TANK DISPOSAL FORM

Date: 11/12/98.
Job#
P.O.#

CONTRACTOR: A & D Environmental
ADDRESS:
JOB SITE: Marten De Hoog
ADDRESS: 5311 Edison ave. Chino. Ca
DESTINATION: A.M.R. 2202 S. MILLIKEN AVE., ONTARIO, CA 91761

| DATE | TIME | PROJECTED TANKS | ORDERED BY: | LIC. NO. |
|---|---|---|---|---|
| | | | | |

SPECIAL INSTRUCTIONS: _____

TIME IN:
TIME OUT:

| ✔ | Services Rendered | Cost |
|---|---|---|
| ____ | Disposal Fee | |
| ____ | Extensive Loading Time | |
| ____ | Disposal Fee with Permit | |
| ____ | Fiberglass Tank Disposal Fee Per Tank | |
| ____ | Fiberglass Delivered | |
| ____ | Bobtail Disposal | |
| ____ | Cancellation Fee | |

**TOTAL CHARGES** $

All fees incurred are per load unless specified. Terms are net 30 days from date of invoice. Contractor's signature represents acceptance of terms for payment, and confirms that tank removal complies with State laws.

CONTRACTOR'S SIGNATURE

**TANKS RECEIVED**

| QTY | GALLONS | TYPE F* | TYPE S* | NET TONS | TOTAL |
|---|---|---|---|---|---|
| | 280 | ☐ | ☐ | .14 | |
| 1 | 500 | ☐ | ☑ | .21 | |
| | 550 | ☐ | ☐ | .24 | |
| | 1000 - 12 ft. | ☐ | ☐ | .44 | |
| | 1000 - 6 ft. | ☐ | ☐ | .61 | |
| | 1500 | ☐ | ☐ | .87 | |
| | 2000 | ☐ | ☐ | .97 | |
| | 2500 | ☐ | ☐ | 1.14 | |
| | 3000 | ☐ | ☐ | 1.32 | |
| | 4000 | ☐ | ☐ | 1.64 | |
| | 5000 | ☐ | ☐ | 2.42 | |
| | 6000 | ☐ | ☐ | 2.84 | |
| | 7500 | ☐ | ☐ | 3.26 | |
| | 8000 | ☐ | ☐ | 3.44 | |
| | 9000 | ☐ | ☐ | 3.82 | |
| | 10000 | ☐ | ☐ | 4.33 | |
| | 12000 | ☐ | ☐ | 4.93 | |

NO. OF TANKS: 1 TOTAL: ____ NET TONS: ____

*F - FIBERGLASS *S - STEEL 105

**CERTIFICATE OF TANK DISPOSAL / DESTRUCTION**

THIS IS TO CERTIFY THE RECEIPT AND ACCEPTANCE OF THE TANK(S) AS SPECIFIED ABOVE. ALL MATERIALS SPECIFIED HAVE BEEN COMPLETELY DESTROYED FOR SCRAP PUROSES ONLY.

Louise Doz
AUTHORIZED REP.

11/12/98
DATE

Enviro - Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

# LABORATORY REPORT

CUSTOMER: A & J ENVIRONMENTAL SERVICES
4752 C FELSPAR STREET, #104, RIVERSIDE, CA 92509
TEL(909)681-0708 FAX(909)681-8991

PROJECT: **Martin DeHoog Dairy**

MATRIX: SOIL
SAMPLING DATE: 11/12/98
REPORT TO: MR. ASA COSBY

DATE SAMPLES REC'D: 11/12/98
DATE ANALYZED: 11/13-15/98
DATE REPORTED: 11/23/98

---

SAMPLE I.D.: **Tank #1 Center**
LAB I.D.: 981112-17

---

| PARAMETER | SAMPLE RESULT, MG/KG | D.L.(X1) | EPA METHOD |
|---|---|---|---|
| TPH/GASOLINE RANGE (C4-C10) | ND | 0.1 | 5030/8015M |
| BENZENE | ND | 0.005 | 5030/8020A |
| TOLUENE | ND | 0.005 | 5030/8020A |
| ETHYLBENZENE | ND | 0.005 | 5030/8020A |
| TOTAL XYLENES | ND | 0.010 | 5030/8020A |
| MTBE | ND | 0.025 | 5030/8020A |

---

COMMENTS
MG/KG = PPM
D.L. = DETECTION LIMIT
ND = BELOW THE DETECTION LIMIT OR NON-DETECTED
TPH = TOTAL PETROLEUM HYDROCARBONS
MTBE = METHYL tert-BUTYL ETHER

---

DATA REVIEWED AND APPROVED BY: [signature]
CAL-DHS ELAP CERTIFICATE No.: 1555

**ENVIRO-CHEM, INC. LABORATORIES**
1214 E. Lexington Ave.
Pomona, CA 91766
(909) 590-5905 • Fax: (909) 590-5907

# CHAIN of CUSTODY RECORD

Lab Project # _____

CA-DHS ELAP CERTIFICATE # 1555

DATE: 11-12-98
PAGE: 1 of 1

REPORT TO: A+J Environmental
STREET: 4752-C Felspar #104
CITY: Riverside STATE: CA ZIP: 92509
TEL: (909) 681-0708 FAX: (909) 681-8991

PROJECT NAME: Martin DeHoog Dairy
PROJECT CONTACT: Ash Cosby
SAMPLER(S) SIGNATURE:

TURN AROUND TIME DESIRED
☐ Same Day ☐ 24 Hour ☐ 48 Hour
☐ 72 Hour ☑ 1 Week ☐ Standard (2 Weeks)
☐ Others:
Confirmed
By:

SHIPPING INFORMATION: ICE Chest

AFTER ANALYSES, SAMPLES ARE TO BE: ☐ DISPOSED OF ☐ STORED (30 days) ☐ RETURNED TO CLIENT ☐ OTHER:

| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE: | TIME: |
|---|---|---|---|
| Ash Cosby | Curtis Neals | 11/12/98 | 13:30 |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE: | TIME: |
| RELINQUISHED BY: (Signature) | RECEIVED BY: (Signature) | DATE: | TIME: |

| SAMPLE I.D. | LAB I.D. | SAMPLING DATE/TIME | MATRIX | Nº of Containers | ANALYSIS REQUESTED | COMMENTS | Sample Stored Location |
|---|---|---|---|---|---|---|---|
| Tank #1 Center | 981112-17 | 11-12-98 1:28 | Soil | 1 | EPA 8015 gas, 8020 MTBE | | R1 |
| Dropped #1 | | | Soil | 1 | " " " " " | | |
| Stock Pile | | | Soil | 1 | " " " " " | | |
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DISTRIBUTION: WHITE WITH REPORT • YELLOW TO COURIER

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

# Legend Dairy Farms (CERSID: 10034761)

**Facility Information Accepted Apr 23, 2024**

Submitted on 3/26/2024 10:15:27 AM by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted*** on 4/23/2024 3:39:11 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Business Activities
- Business Owner/Operator Identification

**Hazardous Materials Inventory Accepted Apr 23, 2024**

Submitted on 3/26/2024 10:15:27 AM by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted*** on 4/23/2024 3:39:20 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Hazardous Material Inventory (6)
- Site Map (Official Use Only)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 262KB)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 262KB)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 694KB)

**Emergency Response and Training Plans Accepted Apr 23, 2024**

Submitted on 3/26/2024 10:15:27 AM by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted*** on 4/23/2024 3:39:29 PM by Erick Tilus
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

- Emergency Response/Contingency Plan
  - *Emergency Response/Contingency Plan* (Web graphic, 1429KB)
  - *Emergency Response/Contingency Plan* (Web graphic, 867KB)
  - *Emergency Response/Contingency Plan* (Web graphic, 792KB)
  - *Emergency Response/Contingency Plan* (Web graphic, 617KB)
  - *Emergency Response/Contingency Plan* (Web graphic, 814KB)
- Employee Training Plan
  - Provided In Submital Element: Emergency Response and Training Plans

## Site Identification

**Legend Dairy Farms**
8381 EDISON AVE
ONTARIO, CA 91762
County
San Bernardino

CERS ID
**10034761**
EPA ID Number

## Submittal Status

Submitted on 3/26/2024 by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted***; Processed on 4/23/2024 by *Erick Tilus* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

## Hazardous Materials

| | |
|---|---|
| Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | **Yes** |

## Underground Storage Tank(s) (UST)

| | |
|---|---|
| Does your facility own or operate underground storage tanks? | **No** |

## Hazardous Waste

| | |
|---|---|
| Is your facility a Hazardous Waste Generator? | **No** |
| Does your facility treat hazardous waste on-site? | **No** |
| Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | **No** |
| Does your facility consolidate hazardous waste generated at a remote site? | **No** |
| Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site? | **No** |
| Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month greater than 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | **No** |
| Is your facility a Household Hazardous Waste (HHW) Collection site? | **No** |

## Excluded and/or Exempted Materials

| | |
|---|---|
| Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)? | **No** |

## Aboveground Petroleum Storage

| | |
|---|---|
| Does your facility own or operate aboveground petroleum storage tanks or containers AND:<br>* have a total aboveground petroleum storage capacity of 1,320 gallons or more, OR<br>* have one or more petroleum tanks in an underground area? | **No** |

## Regulated Substances

| | |
|---|---|
| Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)? | **No** |

## Additional Information

No additional comments provided.

## Facility/Site

**Legend Dairy Farms**
8381 EDISON AVE
ONTARIO, CA 91762

CERS ID
**10034761**

## Submittal Status

Submitted on 3/26/2024 by *Ronald Pietersma* of LEGEND DAIRY FARMS (ONTARIO, CA)
Submittal was ***Accepted***; Processed on 4/23/2024 by *Erick Tilus* for San Bernardino County Fire Department
Comments by regulator: Accepted pending field verification. If you have any questions, please contact Erick Tilus at etilus@sbcfire.org or (909) 386-8401.

## Identification

Ronald C. Pietersma

| Operator Phone | Business Phone | Business Fax |
|---|---|---|
| (909) 225-7672 | (909) 627-2100 | (909) 627-5150 |

| Beginning Date | Ending Date | |
|---|---|---|
| Dun & Bradstreet | SIC Code | Primary NAICS |

## Facility/Site Mailing Address

PO Box 2500
Chino, CA 91708

## Primary Emergency Contact

Ronald C. Pietersma
Title
Owner

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 627-2100 | (909) 225-7672 | |

## Owner

Ronald C. Pietersma
(909) 225-7672
PO Box 2500
Chino, CA 91708

## Secondary Emergency Contact

Lupe Mora
Title
Herdsman

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| | (951) 454-5068 | |

## Billing Contact

Ronald C. Pietersma
(909) 225-7672 rcpietersma@aol.com
PO Box 2500
Chino, CA 91708

## Environmental Contact

Ronald C. Pietersma
(909) 225-7672 rcpietersma@aol.com
PO Box 2500
Chino, CA 91708

| Name of Signer | Signer Title | Document Preparer |
|---|---|---|
| Ronald C. Pietersma | Owner | Tina C. Reyes |

Additional Information

## Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

### Property Owner

Ronald C. Pietersma
Phone
(909) 225-7672
Mailing Address
PO Box 2500
Chino, CA 91708

Assessor Parcel Number (APN)

Number of Employees

Facility ID
FA0000565

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms**<br>8381 EDISON AVE, ONTARIO 91762 | **1** | Facility ID **FA0000565**<br>Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Velocity-Two (CIP Soap Detergent)**<br>CAS No<br>7681-52-9 | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **110**<br>Storage Container<br>Plastic/Non-metalic Drum<br>Days on Site: 365 | **55** | Pressue<br>Temperature | Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | | | |
|---|---|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | | CERS ID | **10034761** |
| Facility Name | **Legend Dairy Farms** | **2** | | Facility ID | **FA0000565** |
| | 8381 EDISON AVE, ONTARIO 91762 | | | Status | **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Acid Cleaner EC** | **Gallons** | **110** | **55** | | | - Health Carcinogenicity<br>- Health Acute Toxicity<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation<br>- Health Specific Target Organ Toxicity | | | | |
| | CAS No | State: Liquid<br>Type: Mixture | Storage Container: Plastic/Non-metalic Drum<br>Days on Site: 365 | | Pressue<br>Temperature | Waste Code | | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms**<br>8381 EDISON AVE, ONTARIO 91762 | **3** | Facility ID **FA0000565**<br>Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **T-Chlor - Chlorine Bleach**<br>CAS No | **Gallons**<br>State: Liquid<br>Type | **110**<br>Storage Container: Plastic/Non-metalic Drum | **55** | Pressue<br>Temperature | Waste Code | - Physical Corrosive To Metal<br>- Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms**<br>8381 EDISON AVE, ONTARIO 91762 | **4** | Facility ID **FA0000565**<br>Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Quantities Largest Cont. | Quantities Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TCB 5000 NPF - Post-Dip for Udders**<br>CAS No | **Gallons**<br>State: Liquid<br>Type: Mixture | **110**<br>Storage Container: Plastic/Non-metalic Drum | **55** | Pressue<br>Temperature | Waste Code | - Health Acute Toxicity<br>- Health Reproductive Toxicity | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms** | **5** | Facility ID **FA0000565** |
| | 8381 EDISON AVE, ONTARIO 91762 | | Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **LuxSan V**<br>CAS No | **Gallons**<br>State<br>Liquid<br>Type<br>Mixture | **110**<br>Storage Container<br>Plastic/Non-metalic Drum | | Pressue<br>Temperature | Waste Code | - Health Skin Corrosion Irritation<br>- Health Serious Eye Damage Eye Irritation | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **LEGEND DAIRY FARMS** | Chemical Location | CERS ID **10034761** |
| Facility Name | **Legend Dairy Farms** | **6** | Facility ID **FA0000565** |
| | 8381 EDISON AVE, ONTARIO 91762 | | Status **Submitted** on 3/26/2024 10:15 AM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Aspen QM Pre-dip spray** | **Gallons** | **110** | | | | - Health Serious Eye Damage Eye Irritation | | | | |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue | Waste Code | | | | | |
| | | Type: Mixture | | | Temperature | | | | | | |

OWNER TRANSFER

0011262

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

☐ Update/Assign PEs ☐ Referral to Team CERS ☐ Closure ☐ Invoice Reversal ☐ Demand Bill
☐ Update Non-CERS Fields ☐ 0202 ☒ Other Ownership Change ☐ 5054 Attached

### OWNER INFORMATION — OWNER ID: ~~OW0000474~~ OW0009196

NAME: ~~MICHAEL DEHOOG DAIRY~~ Ron C. Pietersma
ADDRESS: ~~8381 EDISON AV~~ 12474 Central Ave — ADDRESS 2:
CITY: ~~ONTARIO~~ Chino — STATE: CA — ZIP CODE: ~~91762~~ 91710 — COUNTRY: US
PHONE: ~~909-947-0944~~ 909-627-2100 — EXT: CELL: 909-225-7672 — FYI LAST UPDATED: ~~09/20/2017~~ 11/01/2022

### FACILITY INFORMATION — FACILITY ID: FA0000565

BUSINESS NAME: ~~MICHAEL DEHOOG DAIRY~~ Legend Dairy Farms — CERS ID: 10034761
SITE ADDRESS: 8381 EDISON AVE — ADDRESS 2:
CITY: ONTARIO — STATE: CA — ZIP CODE: 91762 — FAX: ~~909-948-7074~~
BUSINESS PHONE: ~~909-947-0944~~ 909-627-2100 — EXT:
BUSINESS OPERATOR NAME: ~~Joe DeHoog~~ Lupe Mora
OPERATOR PHONE: ~~909-948-7074~~ 951-454-5068 — EXT: — FYI LAST UPDATED: ~~09/20/2017~~

NEW OWNER HAS NOT SUBMITTED ON CERS YET

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: ~~8381 EDISON AVE~~ P.O. Box 2500 — ADDRESS 2:
CITY: ~~ONTARIO~~ Chino — STATE: CA — ZIP CODE: ~~91762~~ 91708 — COUNTRY:

### BILLING CONTACT — ACCOUNT ID: AR0000566 AR0025965

BILLING CONTACT NAME: ~~JOE DEHOOG~~ Tina
ADDRESS 1: ~~8381 EDISON AV~~ 12474 Central Ave — ADDRESS 2:
CITY: ONTARIO Chino — STATE: CA — ZIP CODE: 91762 91710 — COUNTRY: US
PHONE: ~~909-947-0944~~ 909-627-2100 — EXT: — EMAIL: RCPietersma@aol.com

UPDATED

### ENVIRONMENTAL CONTACT

NAME: ~~Joe DeHoog~~ Ron C. Pietersma — PHONE: ~~909-948-7074~~ 909-225-7672 EXT:
EMAIL: RCPietersma@aol.com

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL): RCPietersma@aol.com
LOCAL FACILITY PHONE (OPTIONAL): 909-627-2100 — EXT:

UPDATED

CENSUS: MILITARY SCHOOL MEDICAL — * BUSINESS CODE: 02 - Individual — * BUSINESS TYPE: 6 - Other
* SUPERVISORIAL DISTRICT: 004 — * INSPECTION DISTRICT: 03 — * FIRE JURISDICTION: ONTARIO FIRE
FYI ACCOUNT STATUS: ACTIVE ACCOUNT — FYI ANNIVERSARY DATE: 05/31/1991 — FYI LAST BILLING: 04/14/2022
FYI EXEMPT FROM BILLING: NO — FYI TOTAL DUE: 0.00

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**1-Motor Vehicle Fuel, 2-Fuel Distributor, 3-Farm, 4-Processor, 6-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| ☒ EC Entry Complete | ☐ QC Complete | N/A ☐ ☐ Fiscal Entry Complete | N/A ☐ ☐ Referral to Team CERS |
| Date: 11/1/22 Initials: LS | Date: Initials: | Date: Initials: | Date: Initials: |

PEs SET TO 1/1/22 - 12/31/22

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0032862 | INACTIVE | 4029-APSA FARM/CONSTRUCTION C | 06/01/2016 | 05/31/2017 |
| | | | GHP OR UST ID: PR0041752 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0003791 | ACTIVE | 4243-HAZARDOUS MATERIALS 4-10 ( | 06/01/2022 | 05/31/2023 |
| | | | GHP OR UST ID: PR0004397 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☒ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

5012

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 11/01/2022 SUBMITTED BY: Erick Tilus

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Michael Dehoog Dairy has ceased operations at this facility. The new owner of this facility is Ron C. Pietersma, DBA Legend Dairy Farms.

"Legend Dairy Farms" operates the facilities located at 8311, 8381, and 8485 Edison Ave, Ontario, CA, 91762. These properties are contiguous.

Billing is current, please bill at regular billing cycle.

COMMENT ADDED

Thank you,

ET.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

# SAN BERNARDINO COUNTY CUP
## FACILITY INFORMATION

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0000474

NAME: MICHAEL DEHOOG DAIRY

ADDRESS: 8381 EDISON AV ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-0944 EXT: FYI LAST UPDATED: 08/06/2015

### FACILITY INFORMATION — FACILITY ID: FA0000565

BUSINESS NAME: MICHAEL DEHOOG DAIRY CERS ID: 10034761

SITE ADDRESS: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762-0000 FAX:

BUSINESS PHONE: 909-947-0944 EXT:

BUSINESS OPERATOR NAME: JOE DEHOOG

OPERATOR PHONE: EXT: FYI LAST UPDATED: 09/19/2014

### FACILITY MAILING ADDRESS

MAILING ADDRESS: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

### BILLING CONTACT — ACCOUNT ID: AR0000566

BILLING CONTACT NAME: MICHAEL DEHOOG

ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-0944 EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: JOE DEHOOG PHONE: EXT:

EMAIL: GOTMILKFOR6@JUNO.COM

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: BUSINESS TYPE:

SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: ONTARIO FIRE

FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 05/31/1991 FYI LAST BILLING: 04/14/2016

FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 0.00

**Business Code**= 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type**= 01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

### FOR OFFICE USE ONLY:

ENTERED AUG 31 2016

- [ ] EC Entry Complete
- [ ] QC Complete
- [ ] N/A Fiscal Entry Complete
- [ ] N/A Referral to Team CERS

| Date | Initials | Date | Initials | Date | Initials | Date | Initials |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE | PT0032862 | ACTIVE | 4029-APSA FARM/CONSTRUCTI | 06/01/2016 | 05/31/2017 |
| | | | GHP OR UST ID: PR0041752 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☒ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0003791 | ACTIVE | 4241-HAZARDOUS MATERIALS | 06/01/2016 | 05/31/2017 |
| | | | GHP OR UST ID: PR0004397 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E.: 4243 |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S **0**

DATE SUBMITTED: 8-29-16 SUBMITTED BY: Brian Wade

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection of 8-26-16, this facility does not store greater than 2,500 gallons of petroleum on site. Inactivate APSA PE 4029. Update handler PE to 4243.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials ☐ 5054 scanned and emailed to Fiscal Date Initials

**OPEN VIOLATIONS**

FA0000565

INSPECTION DATE: **1/30/13** VIOLATION ID: **IV0079031** COMPLY BY: **03/02/2013**

INSPECTOR: **JERRY WONG** COMPLIED ON:

**VIOLATION:** 4202034200-Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

File

# HA' 'DOUS MATERIAL FIELD SERV' 'S
## COMPUTER L.. ABASE UPDATE AUTHORIZAT. . (5050 Form)

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION — OWNER ID: OW0000474

Update

Legal Owner

*NAME: MICHAEL DEHOOG DAIRY

*ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY:

*PHONE: 909-947-0944 EXT: FAX:

ALT PHONE: 000-000-0000 EXT: FYI LAST UPDATED: 10/21/2010

**OWNER MAILING ADDRESS** ☐ Same as Owner

CARE OF: JOE DEHOOG DBA: MICHAEL DEHOOG DAIRY

ADDRESS1: 8381 EDISON AV ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

### F- FACILITY INFORMATION — FACILITY ID: FA0000565

*NAME: MICHAEL DEHOOG DAIRY CERS ID: 10034761

*ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762-0000 *CITY CODE: ONTARIO

*PHONE: 909-947-0944 EXT: ALT PHONE: EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FYI LAST UPDATED: 04/18/2011

**FACILITY MAILING ADDRESS** ☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: MICHAEL DEHOOG DAIRY

CARE OF: JOE DEHOOG

ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

*EMAIL:

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION — ACCOUNT ID: AR0000566

RESPONSIBLE PARTY: MICHAEL DEHOOG ☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

CARE OF: MICHAEL DEHOOG DAIRY

ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: 909-947-0944 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 04/17/2012

FYI ANNIVERSARY DATE: 05/31/1991 FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI TOTAL DUE: 0.00

ENVIRONMENTAL CONTACT NAME: Joe DeHoog EMAIL: GoTmilkFor6@Juno.com

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0003791<br>PERMIT NUMBER. | TIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-1( | 06/01/2012<br>EFFECTIVE DATE | 05/31/2013<br>EXPIRATION DATE | |
| | | | PR0004397<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | UPDATED P.E. | |
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S **0**

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes No

*Should this facility be inactivated upon verification that there is no balance due? Yes No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes No

*Does this 5050 have attached documents? Yes No

ENTERED

*DATE SUBMITTED: 1-31-2013 DATE ENTERED: JAN 31 2013 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Jay Ubas ENTERED BY: J. Guerra ***Demand bill for updated PEs**: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Update Env. Contact Email Address, thanks

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to **complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

AG - info & PE update

# HAZ. OUS MATERIAL FIELD SERVI
# COMPUTER DATABASE UPDATE AUTHORIZATION

CREATE EXPANDO + SOLDERS
INACTIVE 2000 DTSC
CA001466264

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

ROD. ST
ONTARIO
07 JU

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000474

NAME: MICHAEL DEHOOG DAIRY

ADDRESS 1: 8381 EDISON AV ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-9171~~ 91762 COUNTRY:

PHONE: (909) 947-0944 EXT: FAX:

ALT PHONE: 000-000-0000 EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Joe DeHoog DBA: MICHAEL DEHOOG DAIRY

ADDRESS1: 8381 EDISON AV ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91762 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000565

NAME: ~~AG~~-MICHAEL DEHOOG DAIRY

ADDRESS 1: ~~8311~~ EDISON AVE 8381 ADDRESS 2: 91762

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-0000~~ CITY CODE: ~~CHINO~~ Ontario

SIC CODE: 0241 BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 03

PHONE: ~~000-000-0000~~ (909) 947-0944 EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-MICHAEL DEHOOG DAIRY

CARE OF: Joe DeHoog

ADDRESS 1: 8381 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-0000~~ 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000566

RESPONSIBLE PARTY: Michael DeHoog

CARE OF: Michael DeHoog Dairy

ADDRESS 1: 8381 Edison Ave ADDRESS 2:

CITY: Ontario STATE: ZIP CODE: COUNTRY:

PHONE: (909) 947-0944 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 04/05/2007

ALT PHONE: EXT: TAX ID:

ANNIVERSARY DATE: 05/31/1991 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

| UPDATE/CLOSE/Z.O.B. | PT00037 | ACTIVE | 4230 | 5/01/1990 | 05/31/1991 |
|---|---|---|---|---|---|
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |

| PR0004397 | ACTIVE, BILLABLE | NA | NA | 4221 |
|---|---|---|---|---|
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 9 NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 6-4-07 DATE ENTERED: FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY:

COMMENTS/REMARKS:

Per inspection: Update handler permit.
Update owner, fa & A/R info.
Remove "Ag" prefix from name.

Demand bill.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:2 AR:0.00

MICHAEL DEHOOG
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2015** **Expiration Date: 5/31/2016**

**CUPA Facility Type: 5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0032862 | 4029 APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT | PR0041752 |
| PT0003791 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0004397 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   Note: The UST ID Number is listed on the front of the permit for each UST

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Fire Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part2, Chapter 1,Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4 Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:3 AR:0.00

MICHAEL DEHOOG DAIRY
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2014** **Expiration Date: 5/31/2015**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0032862 | 4029 APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT | PR0041752 |
| PT0003791 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0004397 |
| PT0032863 | 5012 CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2 | PR0041753 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

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a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4, Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

ATTN : JOE DEHOOG
MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2013** **Expiration Date: 5/31/2014**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

As a condition of the permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

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e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

ATTN : JOE DEHOOG
MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2012** **Expiration Date: 5/31/2013**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

Mark A. Hartwig, Fire Chief

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
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ONTARIO, CA 91762

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8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2011** **Expiration Date: 5/31/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

Mark A. Hartwig, Fire Chief

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

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MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2010** **Expiration Date: 5/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

Pat A. Dennen, Fire Chief/Fire Warden

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# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

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MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.

Effective Date: 6/1/2009 Expiration Date: 5/31/2010

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

SAN BERNARDINO COUNTY
COUNTY OF SAN BERNARDINO 1853
FIRE DEPT

Pat A. Dennen, Fire Chief/Fire Warden

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# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : JOE DEHOOG
MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

**Permit is issued to Facility: FA0000565 for a period not to exceed one year from effective date.**

**Effective Date: 6/1/2008** **Expiration Date: 5/31/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0003791 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0004397 |

Printed on 5/2/2008
Reconstructed by MIS on 8/12/2008

Pat A. Dennen, Fire Chief/Fire Warden

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CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ERICK TILUS within 30 days of inspection unless otherwise specified.**

RESPONDENT: Lupe Mora

VIOLATION(S) CITED ON: 10/28/2022

FACILITY NAME: **LEGEND DAIRY FARMS** FACILITY ID: **FA0000565**

SITE ADDRESS: **8381 EDISON AVE** CERS ID: **10034761**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H211 CORRECTIVE ACTION: Ensure a complete and accurate Hazardous Materials Business Plan is submitted to CERS. Sign and return the Certificate of Compliance to the inspector within 30 days of the inspection indicating the Hazardous Materials Inventory is complete and accurate.

I certify under penalty of law that:

- o Respondent has corrected violations specified in the above-entitled action.
- o I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- o Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- o I am authorized to file this certification on behalf of the Respondent.
- o I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE

11-17-22
DATE

Ronald C. Pietersma
PRINT NAME

OWNER: LEGEND DAIRY FARMS
TITLE

CUPA
San Berna ɔ County Fire Department • Hazardous Ma s Section
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CUPA COMPLIANCE INSPECTION REPORT

| | |
|---|---|
| NAME: **LEGEND DAIRY FARMS** | FACILITY ID: **FA0000565** |
| ADDRESS: **8381 EDISON AVE** | CERS ID: **10034761** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **10/28/2022** |

**Consent granted by:**

☒ **Photograph** ☒ **Inspect** **Name:** Lupe Mora **Title:** Lead Farmer

An inspection was conducted on 10/28/2022 to determine compliance with applicable hazardous materials laws and regulations. Lupe Mora, Lead Farmer, was the escort during the inspection.

Legend Dairy Farms is a livestock farm specializing in milk collection. Legend Dairy Farms has taken over operation of (3) contiguous properties. The facilities located at 8311 Edison, 8381 Edison, and 8485 Edison Ave, Ontario, CA, 91762 are all currently being operated by Legend Dairy Farms. The facility handles hazardous materials over threshold in the form of Iodine teat dip, TCB 5000 NPF teat dip, T-Chlor 12.5 solution, Acid Cleaner EC, and Velocity Two Chlorinated cleaner.

The following inventory was observed during the inspection:

(4) 55-gallon drums of TCB 5000 NPF teat dip
(4) 55-gallon drums of T-chlor 12.5 Solution
(3) Acid Cleaner EC
(2) Velocity Two Chlorinated Cleaner
(2) Soft Dine-10 Iodine teat dip

Document Review:

- CUPA program permit is current. Expiration Date:
- This facility is a handler only and is not required to maintain an active EPA ID#.
- The Hazardous Materials Business Plan was previously submitted to the California Environmental Reporting System 02/09/2022.

Complete and submit the Certificate of Compliance (CofC) provided along with all requested documentation, to the attention of Erick Tilus within 30 days of inspection.

Please contact Erick Tilus at (909) 386-8401 or by e-mail at etilus@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | - | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | Hazardous Materials Business Plan Submittal | CHSC | 25505, 25508(a)(1) | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | | Multiple | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508.2 | |
| H209 | Business Plan Update Within 30 days of Change | CHSC | 25508.1(a)-(f) | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | | Multiple | |

| | | | | |
|---|---|---|---|---|
| H211 | **Hazardous Materials Inventory** | CHSC | Multiple | X |
| ılation: | Failure to electronically submit comp nd accurate hazardous material inventory informati all reportable hazardous materials on site at or above reportable quantit. 55 gallons for liquids, 500 pounds for solids, or 20 ic feet for compressed gases. CHSC 6.95 25506, 25505(a)(1), 25508(a)(1), 25508(a)(3) | | | |
| MINOR | OBSERVATION: At the time of the inspection, the inventory observed on site was not consistent with that reported to CERS.<br><br>CORRECTIVE ACTION: Ensure a complete and accurate Hazardous Materials Business Plan is submitted to CERS. Sign and return the Certificate of Compliance to the inspector within 30 days of the inspection indicating the Hazardous Materials Inventory is complete and accurate. | | | |
| H212 | Site Map | CHSC | Multiple | |
| H213 | Emergency Response Plan | | Multiple | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Not Provided and/or Documented | CHSC | 25505(a)(4) | |
| H216 | Hazardous Materials Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,25 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: LTR: |
|---|---|---|
| ERICK TILUS<br>INSPECTOR NAME | NAME<br>INSPECTION DATE: 10/28/2022 | TITLE<br>REPORT DATE: 11/1/22 3:31 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations. THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
San Bernai ) County Fire Department • Hazardous Mat .s Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ERICK TILUS within 30 days of inspection unless otherwise specified.**

RESPONDENT: Lupe Mora

VIOLATION(S) CITED ON: 10/28/2022

FACILITY NAME: **LEGEND DAIRY FARMS** FACILITY ID: **FA0000565**

SITE ADDRESS: **8381 EDISON AVE** CERS ID: **10034761**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H211 CORRECTIVE ACTION: Ensure a complete and accurate Hazardous Materials Business Plan is submitted to CERS. Sign and return the Certificate of Compliance to the inspector within 30 days of the inspection indicating the Hazardous Materials Inventory is complete and accurate.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

TRACKING SHEET FOR BUSINESS PLANS

Establishment # FA0000565

Facility Name: Michael DeHoog

Facility site address: 8381 Edison

City: Ontario

Fire Agency: Ontario

1 (# of copies)

| | | Sent to FD |
|---|---|---|
| Business Plan Received | 07/19/07 | __/__/__ |
| Result of Review(s) | | |
| Deficiency | | 11/30/07 |
| Conditional Approval | | __/__/__ |
| Approval | | __/__/__ |
| | | Sent to FD |
| Revised Plan(s) Received | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

Other

| Date | Action/documentation (update, new plan, etc.) | Staff Hours |
|---|---|---|
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
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| __/__/__ | | |
| __/__/__ | | |

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# BUSINESS OWNER / OPERATOR IDENTIFICATION

| | | |
|---|---|---|
| FACILITY ID # | F A | (This number is on your CUPA permit.) |
| EFFECTIVE DATE 100 | ENDING DATE 101 | |
| BUSINESS NAME (Same as FACILITY NAME or DBA): Michael Deltoog Dairy | | BUSINESS PHONE: 909 947-0944 |
| BUSINESS SITE ADDRESS 103: 8381 Edison Ave | | |
| CITY 104: Ontario | COUNTY 108: SAN BERNARDINO | STATE: CA / ZIP CODE 105: 91762 |
| D&B NUMBER | PRIMARY SIC/NAICS CODE 107 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: Dairy - milk Production |
| BUSINESS OPERATOR NAME 109: Joe Deltoog / Michael Deltoog | | BUSINESS OPERATOR PHONE 110: 909 947-0944 |

## II. BUSINESS OWNER

| | |
|---|---|
| OWNER NAME 111: Michael Deltoog | OWNER PHONE 112: 909 947-4712 |
| OWNER MAILING ADDRESS 113: 8381 Edison Ave | |
| CITY 114: Ontario | STATE 115: CA / ZIP CODE 116: 91762 |

## III. ENVIRONMENTAL CONTACT

| | |
|---|---|
| CONTACT NAME: Joe Deltoog | CONTACT PHONE 118: 909 947-0944 |
| CONTACT MAILING ADDRESS 119: 8381 Edison Ave | |
| CITY 120: Ontario | STATE 121: CA / ZIP CODE 122: 91762 |

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123: Joe Deltoog | NAME 128: Michael Deltoog |
| TITLE 124: Partner | TITLE 129: Partner |
| BUSINESS PHONE 125: 909 947-0944 | BUSINESS PHONE: 909 947-0944 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126 | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131 |
| PAGER/CELL # 127 | PAGER /CELL # 132 |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

| | | |
|---|---|---|
| SIGNATURE OF OWNER/OPERATOR: Joe Deltoog | NAME OF SIGNER (*print*) 136: Joe Deltoog | DATE 134: 6-18-07 |

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**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A [redacted] (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Michael Deltoog Dairy 3

FACILITY ADDRESS: 8381 Edison Ave

CITY: Ontario 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

BUSINESS MAILING ADDRESS: 8381 Edison Ave

CITY: Ontario

STATE: CA

ZIP CODE: 91762

BUSINESS FAX NUMBER: 909 947-0944

BUSINESS E-MAIL:

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

Total # of Employees per shift: SHIFT 1 Day: 7; SHIFT 2 night: 3; SHIFT 3:

HOURS OF OPERATION: 6 To 5 am + pm

Total # of employees at this facility (as reported on your most recent tax withholding forms.): TOTAL # EMPLOYEES: ~~8~~ 9 [redacted]

TAXPAYER ID NUMBER: 87-

ASSESSORS PARCEL NUMBER (S):

CROSS STREET: Edison + Walker

BUSINESS DESCRIPTION: Dairy Farm

Number of Underground Storage Tanks located at this facility: 0 [redacted]

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☐ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 6-18-07

**CUPA**

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| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Michael DeHoog Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8381 Edison Ave | Ontario |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification:** **If a situation is an emergency, call 911 first.** Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | **911** |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | **(800) 33-TOXIC** or **(909) 386-8425** |
| 3. *State of California, Governor's Office of Emergency Services | **(800) 852-7550** or **(916) 845-8911** |
| 4. National Response Center | **(800) 424-8802** |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date: 6-18-07

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**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Michael De Hoog Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8381 Edison Ave | ONTARIO |

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:

For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√Check those items that apply and write additional information in the space provided).

- [x] Reduction of containers on site if not used or needed.
- [x] Containers are properly labeled and closed when not in use.
- [ ] Compressed gas cylinders are properly secured.
- [ ] Use of monitoring system. Type: _____
- [ ] Other:

Date: 6-18-07

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Michael Deffood Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8381 Edison Ave | Ontario |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- ☐ New employee training.
- ☐ Annual training & periodic refresher courses.
- ☐ Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- ☐ Spill control equipment
- ☐ Monitoring system
- ☐ Personal Protective Equipment
- ☒ On the job training. Describe below.
- ☐ Other:

All employee's are given Instructions on how to use cleaning Solutions.

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- ☒ Identify potential hazards and determine whether a release has occurred.
- ☒ Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- ☒ Coordinate the notification and evacuation of employees and customers from the facility.
- ☒ Make required agency notifications and request needed assistance.
- ☒ Assist responding agencies by providing access to the facility and information about the facility.
- ☐ Other:

Date: 6-18-07

BUSINESS NAME (Same as FACILITY NAME or DBA): Michael Deltoog Dairy

FACILITY ADDRESS 103: 8381 Edison Ave

CITY 104: Ontario

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | | Annually |
| ☒ First aid kit(s) | 1-General | As needed |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☐ Personal Protective Equipment | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste
- ☐ Process vessels
- ☒ Aboveground storage tanks
- ☐ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☒ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler
- ☐ Emergency response team
- ☐ Local Hospitals
- ☐ Other:
- ☒ No arrangements or agreements at this time

Date: 6-18-07

## HELPFUL HINTS FOR COMPLETING THE INVENTORY SECTION

**Congratulations! You have completed the first half of the plan. The following pages require review of the hazardous materials and hazardous wastes at your facility to determine which items require disclosure.**

**Here are some helpful hints to assist you in filling out the hazardous materials inventory section:**

1) This CUPA offers an example business plan that is available on our website or by mail. If you are unfamiliar with the business plan requirement, we recommend that you look at the example before you get started so you can see how inventory summary, chemical description pages, and maps work together.

2) Before you start filling out forms, determine how many items require disclosure and make the appropriate number of copies of the Inventory Summary form and the Chemical Description form. Note the following criteria when determining which items require disclosure in the inventory section: hazardous materials with a maximum quantity of greater than 55 gallons, 500 pounds, or 200 cubic feet; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives.

3) Assign a unique item number to each inventoried item (e.g. 1,2,3, etc.) This same item number is used on the Inventory Summary, on the individual Chemical Description form, and to show the storage location(s) on the facility map.

4) Each inventoried item requires a Chemical Description page that gives additional details about each chemical. Material Safety Data Sheets (MSDSs) and container labels are the main sources of chemical information. Wastes do not have MSDSs, but waste analysis, profiles, or manifests may have useful information.

5) Review Appendix I to determine which inventoried items require submission of a Material Safety Data Sheet (MSDS). If the substance is not listed in Appendix I, attach the MSDS for that chemical to the corresponding individual Chemical Description page. Anytime you update or refile the Chemical Description Page, make sure to attach the current MSDS. If you do not have a MSDS for a material, you can get one from your chemical vendor and you need them for compliance with the OSHA Hazard Communication Standard. Hazardous wastes do not have MSDSs.

6) Materials and wastes of the same chemical (e.g. lubricating oil and used oil) require separate Chemical Description pages.

7) Since the Chemical Description Page requires location information, you will have to complete the facility map(s) before you can finalize the Chemical Description pages.

8) The Maximum Quantity should reflect the maximum amount that could ever be onsite at any one time. The maximum listed on the Inventory Summary and the maximum listed on the individual Chemical Description form should be the same.

9) Typically, liquids are disclosed in gallons, solids in pounds and compressed gases in cubic feet. If you have questions regarding the correct unit type for an item, contact this department for assistance.

10) Signatures: The Inventory Summary form requires the Owner/Operator signature. Additionally, EPCRA filers are required to sign all individual Chemical Description forms.

Note: If you have a large warehouse, trade secrets, or other unique situation, please call our office before you fill out chemical description pages. We can help you develop an inventory that will meet the requirements and accommodate a unique situation.

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# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Michael DeHoog DAIRY

FACILITY ADDRESS 103: 8381 Edison AVE

CITY 104: ONTARIO

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Teat dip | 375 | 55 | gall |
| 2 | Diesel | 1,075 | 500 | gall |
| 3 | Hydro Clean 400 | 60 | 30 | gall |
| 4 | Acid cleaner | 60 | 30 | gall |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| Joe DeHoog | Joe DeHoog | 6-18-07 |

Inventory Summary Page ____ of ____

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages, otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

## KEY TO BUSINESS EMERGENCY/CONTINGENCY PLAN MAP SYMBOLS

— N — REFERENCE TO NORTH

INCLUDE ALL ADJACENT STREETS BY NAME

DRIVEWAY/GATE

DOORS

ERE — EMERGENCY RESPONSE EQUIPMENT

EVACUATION ROUTE

E/S — EVACUATION/STAGING AREA

FENCE/BARRIERS

FA — FIRE ALARM

FIRST AID

F — FIRE HOSE

F — FIRE EXTINGUISHER

FIRE HYDRANT

FLOOR DRAIN

MSDS BEP — MATERIAL SAFETY DATA SHEETS & BUSINESS EMERGENCY PLAN

RAILROAD TRACKS

S — SEWER

STORM DRAIN

**UTILITY CONNECTIONS/SHUTOFFS**

E — ELECTRIC METER

E — ELECTRIC SHUTOFF

G — GAS METER

G — GAS SHUTOFF

P — PUMP SHUTOFF

W — WATER MAIN LINE GATE VALVE

**STORAGE TANKS**

ABOVE GROUND TANK

UNDERGROUND TANK

HAZARDOUS WASTE TREATMENT FACILITIES MUST LOCATE TREATMENT UNIT (S) ON MAP.

ADDITIONAL SYMBOLS:

| Symbol | Description | Symbol | Description |
|---|---|---|---|
| 1 | Test Pip | | |
| 2 | Diesel fuel | | |
| 3 | Hydro clean | | |
| 4 | Acid cleaner | | |
| | | | |
| | | | |
| | | | |

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## SECTION IV: BUSINESS EMERGENCY CONTINGENCY PLAN MAPS

**Submit three (3) maps:**

- ❑ **Area Map** - location of facility in relation to community
- ❑ **Site Map** - overview of facility and its immediate surroundings
- ❑ **Facility Map(s)** - floor plan of facility, locations of hazardous materials, emergency equipment, building details.

**AREA MAP** - Provide a map showing entire area around the facility and property. The purpose of the area map is to identify primary and alternate routes to the facility and to see where in a community the facility is located. Be sure to identify location of the facility on map. (e.g. Thomas Brother's Guide map page or equivalent may be used). There is no form provided for the area map, since it is a copy of an existing map noting the location of the facility. *Area map **must** be to a legible scale on an 8 1/2 x 11" sheet of paper.*

**NOTE:** The following Sections require that you prepare a map of your facility and site location. A blank grid map has been provided for this purpose. You **must** use a grid system and use the map symbols provided. If you add additional symbol items on the map, provide an explanation of those symbols on the legend sheet area.

If your facility is very large and you cannot adequately fit the required items on the map forms provided, you may submit a series of maps. For example, enlarge a quadrant area on a main grid map and submit detail maps for a grid group. If you have difficulty with map preparation, contact this office for further assistance. The facility and the site map may be combined into one map **only if** you can provide all the required items in a legible scale on the sheets provided. These maps provide vital emergency information to emergency responders, and therefore it is important that you take the time to make them readable and accurate.

**SITE MAP** - The site map is an aerial overview of your facility. Complete this map on the sheet provided to a legible scale. The purpose of the site map is to provide the geographic context of the buildings, access points, and surrounding properties and streets around a facility. Below is a list of items that **must** be included on the drawing:

- ❑ Scale of map (i.e., 1" = 100 ft.)
- ❑ Site orientation (north, south, etc.)
- ❑ The names of all roads on all sides of the facility
- ❑ The location of your facility
- ❑ Property lines
- ❑ Types of surrounding facilities and/or uses of adjacent property
- ❑ Exit/entry routes (i.e., gates, driveways, etc.)
- ❑ Schools, hospitals, extended care facilities within 1000 feet of your facility.
- ❑ Fences or barriers on the site
- ❑ Location of any rail transportation sites (i.e., railroad tracks or spurs)

**FACILITY MAP** - The facility map is a drawing of the **FLOOR PLAN** of your establishment. Complete this map on the sheet provided to a legible scale. The purpose of the facility map is to locate inventoried hazardous materials (by item number), emergency equipment, and facility features that must be considered in responding to a fire or potential release of hazardous materials. Below is a list of items that **must** be included on the drawing:

- ❑ Scale of map (i.e., 1" = 100 ft.)
- ❑ Site orientation (north, south, etc.)
- ❑ Identify each hazardous material handling, use, or storage area using the item # assigned on the Inventory Summary. If the materials are too numerous to indicate on the map grid area, then provide a sequential letter (i.e., A, B, etc.) on the map where the items are located and list item # in the **"Notes"** area provided (i.e., A= #1,2,3,4,7, 9, 10, etc.).
- ❑ Identify location of emergency response equipment such as fire suppression equipment, protective clothing, etc.
- ❑ Identify any hazardous waste treatment units
- ❑ Identify exits, evacuation routes, doors, and wall separations
- ❑ Identify interior and exterior electrical, gas, water and any other emergency shut-off valves.
- ❑ Identify emergency alarm locations, and first aid equipment locations
- ❑ Identify location of material safety data sheets and business emergency plan
- ❑ Identify location of all floor drains
- ❑ Identify location of sewer and storm drains on or around facility site
- ❑ Identify location of parking and loading areas
- ❑ Identify location of evacuation staging areas
- ❑ Identify location of above and below ground storage tanks. Identify contents by inventory item # and indicate amount stored in tank (i.e., 10 pounds, 500 gallons.)

Use the symbols on the following key to locate features on the site and facility maps. If you add additional symbol items on the map, provide an explanation of those symbols on the legend sheet area.

U.S. Postal Service

# CERTIFIED MAIL® RECEIPT

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FA565

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- ☐ Return Receipt (electronic) $ _____
- ☐ Certified Mail Restricted Delivery $ _____
- ☐ Adult Signature Required $ _____
- ☐ Adult Signature Restricted Delivery $ _____

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11-4-22

Postmark
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City

LEGEND DAIRY FARMS
P.O. BOX 2500
CHINO, CA 91708

7020 1290 0001 2837 8921

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

- A receipt (this portion of the Certified Mail label).
- [illegible] 'nue identifier for your mailpiece.
  [illegible] nic verification of delivery or attempted [illegible] .y.
- A record of delivery (including the recipient's [illegible] signature) that is retained by the Postal Service™ for a specified period.

*Important Reminders:*

- You may purchase Certified Mail service with First-Class Mail®, First-Class Package Service®, or Priority Mail® service.
- Certified Mail service is *not* available for international mail.
- Insurance coverage is *not* available for purchase with Certified Mail service. However, the purchase of Certified Mail service does not change the insurance coverage automatically included with certain Priority Mail items.
- For an additional fee, and with a proper endorsement on the mailpiece, you may request the following services:
  - Return receipt service, which provides a record of delivery (including the recipient's signature). You can request a hardcopy return receipt or an electronic version. For a hardcopy return receipt, complete PS Form 3811, *Domestic Return Receipt*; attach PS Form 3811 to your mailpiece; for an electronic return receipt, see a retail associate for assistance. To [illegible] a duplicate return receipt for no additi[illegible] present this USPS®-postmarked Certifie[illegible] receipt to the retail associate.
  - Restricted delivery service, which provides delivery to the addressee specified by name, or to the addressee's authorized agent.
  - Adult signature service, which requires the signee to be at least 21 years of age (not available at retail).
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**IMPORTANT: Save this receipt for your records.**

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SAN BERNARDINO COUNTY FIRE DIST
ATTN: ERICK TILUS
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SAN BERNARDINO, CA 92415-0153

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SBCFIRE - HAZMAT

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- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

LEGEND DAIRY FARMS
P.O. BOX 2500
CHINO, CA 91708

9590 9402 7339 2028 5834 62

2. Article Number *(Transfer from service label)*

7020 1290 0001 2837 8921

*COMPLETE THIS SECTION ON DELIVERY*

A. Signature

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☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

11/10/2022

D. Is delivery address different from item 1? ☐ Yes
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PS Form 3811, July 2020 PSN 7530-02-000-9053 Domestic Return Receipt

CUPA
San Bernai County Fire Department • Hazardous Mat s Section
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (9 386-8460 • www.sbcfire.org

# CUPA COMPLIANCE INSPECTION REPORT

NAME: **LEGEND DAIRY FARMS** FACILITY ID: **FA0000565**

ADDRESS: **8381 EDISON AVE** CERS ID: **10034761**

CITY: **ONTARIO** STATE **CA** ZIP CODE: **91762** INSPECTION DATE: **10/28/2022**

**Consent granted by:**

☒ **Photograph** ☒ **Inspect** **Name:** Lupe Mora **Title:** Lead Farmer

An inspection was conducted on 10/28/2022 to determine compliance with applicable hazardous materials laws and regulations. Lupe Mora, Lead Farmer, was the escort during the inspection.

Legend Dairy Farms is a livestock fa en over operation of (3) contiguous properties. The facilities l tario, CA, 91762 are all currently being operated by Legend D old in the form of Iodine teat dip, TCB 5000 NPF teat dip, T-Ch cleaner.

The following inventory was observed

(4) 55-gallon drums of TCB 5000 NPF
(4) 55-gallon drums of T-chlor 12.5 Sc
(3) Acid Cleaner EC
(2) Velocity Two Chlorinated Cleaner
(2) Soft Dine-10 Iodine teat dip

LEGEND DAIRY FARMS
MAILING ADDRESS:
P.O. BOX 2500
CHINO, CA, 91708

Document Review:

- CUPA program permit is current.
- This facility is a handler only and
- The Hazardous Materials Busin ental Reporting System 02/09/2022.

Complete and submit the Certificate tation, to the attention of Erick Tilus within 30 days of inspectio

Please contact Erick Tilus at (909) 38 rding this report.

If you have any questions regarding

**Refer to Title 19 and Title 22 of the C of the California Health Safety Code (CHSC), and Division 3 ing lines marked in the V column are violations that must be**

| VIOLATION CODE | DESCRIPTION | | | V |
|---|---|---|---|---|
| 42 | H | | - | |
| H201 | Hazardous Material Handler Perm | | 602(a) | |
| H202 | Hazardous Materials Business Pl | | 07 | |
| H203 | Hazardous Materials Business Pl | | 05, 25508(a)(1) | |
| H204 | Immediately Report Any Release Material | | ltiple | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508.2 | |
| H209 | Business Plan Update Within 30 days of Change | CHSC | 25508.1(a)-(f) | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | | Multiple | |

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Don Trapp**
Interim Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


November 25, 2019

MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

**ATTN: CORY DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000565-MICHAEL DEHOOG DAIRY**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

Mr. Dehoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on October 11, 2019:

- Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
- Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.
- Failure to electronically update business plan within 30 days of any one of the following events:
  A 100 percent or more increase in the quantity of a previously disclosed material.
  Any handling of a previously undisclosed hazardous materials at or above reportable quantities.
  A change of business address, business ownership, or business name.
  A substantial change in the handler's operations that requires modification to any portion of the business plan.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation <u>immediately</u> may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at AVILLANUEVA@SBCFIRE.ORG.

**ANA VILLANUEVA**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

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# SAN BERNARDINO COUNTY FIRE DISTRICT

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**Hazardous Materials Division**
**sbcfire.org**

**Don Trapp**
Interim Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


October 28, 2019

MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762
**ATTN: JOE DEHOOG**

**SUBJECT: COMPLIANCE DEADLINE REMINDER NOTICE**

**FACILITY: FA0000565-MICHAEL DEHOOG DAIRY**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

Mr. DeHoog,

A post-inspection compliance review indicates that the following violations cited at the time of inspection on **October 11, 2019**, remain outstanding.

- Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
- Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.
- Failure to electronically update business plan within 30 days of any one of the following events:
  A 100 percent or more increase in the quantity of a previously disclosed material.
  Any handling of a previously undisclosed hazardous materials at or above reportable quantities.
  A change of business address, business ownership, or business name.
  A substantial change in the handler's operations that requires modification to any portion of the business plan.

If all compliance documentation ' ecently been submitted, please disregar s notice

**IMPORTANT:** All compliance documentation requested on the inspection report must be received by this Division within **30 days from the date of the violation** or as otherwise indicated in the inspection report. This CUPA (Certified Unified Program Agency) is required by the State of California to gain compliance from all facilities subject to hazardous materials and hazardous waste laws and regulations **Complying within 30 days of violation or as indicated in the inspection report, is the most efficient and the least inconvenient way for a facility to resolve outstanding violations.** If formal enforcement is necessary to gain compliance after 30 days, the facility will be **subject to substantial civil fines, costs and other penalties** pursuant to California Health and Safety Code (CHSC) 25404.1.1 & 25187.8.

If I can be of assistance in helping you correct the violations stated above or if you have any other questions, please don't hesitate to contact me at AVILLANUEVA@SBCFIRE.ORG or (909) 386-8401.

**ANA VILLANUEVA**
**Hazardous Materials Specialist**
**Hazardous Materials Division**

BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
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CUPA
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620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CUPA COMPLIANCE INSPECTION REPORT

NAME: MICHAEL DEHOOG DAIRY | FACILITY ID: FA0000565
ADDRESS: 8381 EDISON AVE | CERS ID: 10034761
CITY: ONTARIO STATE: CA ZIP CODE: 91762 | INSPECTION DATE: 10/11/2019

**Consent granted by:**
[X] **Photograph** [X] **Inspect** **Name:** Cory Dehoog **Title:** Ranch Hand

An inspection was conducted on 10/11/2019 to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Cory Dehoog, Ranch Hand, was the escort during the inspection. Also present during the inspection was Brian Wade, Hazardous Materials Specialist with San Bernardino County Fire.

The facility is a dairy cow milking operation. The hazardous materials stored on site are used for vehicle and equipment fueling and for cleaning and sanitizing the milking operation. This facility does not routinely generate hazardous waste.

Inventory:

-back up generator with approximately 200 gallons of diesel fuel
-(4) 55 gallon drums of Soft Dine 10 sanitizing teat dip
-(1) 55 gallon drum of sodium hypochlorite
-(2) 30 gallon drums of Hydroclean chlorinated cleaner
-(2) 30 gallon drum of acid cleaner
-(2) 1,000 gallon tanks of diesel fuel

Document Review:

- CUPA permits were valid during the time of the inspection and expire 5/31/2020.
- The Hazardous Materials Business Plan was last updated via California Environmental Reporting System (CERS) on 8/26/2017. CERS I.D. number: 10034761.
- All equipment and vehicles were serviced by Ross Avery.
- Chemicals were supplied by The Chem Guys and Vetex.
- Empty drums were picked up during the time of new deliveries.
- Diesel fuel was supplied by Merit Oil.

Complete and submit the Certificate of Compliance (CofC) provided along with all requested documentation, to the attention of Ana Villanueva within 30 days of inspection.

Please contact Ana Villanueva at (909)386-8401 or by email at avillanueva@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| 42 | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | Hazardous Materials Business Plan Submittal | CHSC | 25505, 25508(e)(1) | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | CHSC | 25510(e) | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | **Business Plan Annual Review/Certification** | CHSC | 25508(e)(1), 25508.2 | X |
| Violation: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. | | | |
| MINOR | OBSERVATION: The last business plan update submitted by this facility via CERS was dated 8/26/2017. | | | |
| | CORRECTIVE ACTION: Submit a signed statement that the business plan has been updated via CERS. Your CERS ID number is 10034761. | | | |

| | | | | |
|---|---|---|---|---|
| H209 | **Business Plan Update Within 30 da Change** | CHSC | 25508.1(a)-(f) | X |
| Violation: | Failure to electronically update business plan within 30 days of any one of the following events:<br>A 100 percent or more increase in the quantity of a previously disclosed material.<br>Any handling of a previously undisclosed hazardous materials at or above reportable quantities.<br>A change of business address, business ownership, or business name.<br>A substantial change in the handler's operations that requires modification to any portion of the business plan. | | | |
| MINOR | OBSERVATION: At the time of the inspection, hazardous materials were observed on site that were not listed on the current CERS inventory or were listed in lesser quantities.<br><br>CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated via CERS. | | | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | CHSC | 25508(a)(1) | |
| H211 | Hazardous Materials Inventory | CHSC | 25505, 25506, 25508 | |
| H212 | Site Map | CHSC | 25505(a)(2), 25508(a)(1) | |
| H213 | **Emergency Response Plan** | CHSC | 25505(a)(3), 25508(a)(1) | X |
| Violation: | Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material. | | | |
| MINOR | OBSERVATION: This facility has not submitted a complete emergency response plan to CERS. Stored at facility is not a valid option for the training plan.<br><br>CORRECTIVE ACTION: Submit a signed statement that a complete emergency response plan and training plan have been submitted to CERS. | | | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Documentation | CHSC | 25505(a)(4) | |
| H216 | Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,255 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 10/11/19 12:05:55PM<br>LTR:10/11/2019 12:01:06PM |
|---|---|---|
| ANA VILLANUEVA | CORY DEHOOG | RANCH HAND |
| INSPECTOR NAME | NAME | TITLE |
| | INSPECTION DATE: 10/11/2019 | REPORT DATE: 10/11/19 1:53 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
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# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ANA VILLANUEVA within 30 days of inspection unless otherwise specified.**

RESPONDENT: Cory Dehoog

VIOLATION(S) CITED ON: 10/11/2019

FACILITY NAME: **MICHAEL DEHOOG DAIRY** FACILITY ID: **FA0000565**

SITE ADDRESS: **8381 EDISON AVE** CERS ID: **10034761**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H206 CORRECTIVE ACTION: Submit a signed statement that the business plan has been updated via CERS. Your CERS ID number is 10034761.

H213 CORRECTIVE ACTION: Submit a signed statement that a complete emergency response plan and training plan have been submitted to CERS.

H209 CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated via CERS.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

| | |
|---|---|
| Facility/ Case Name: Michael Dehoog Dairy | Facility ID #: FA0000565 |
| Address:8381 Edison Ave., Ontario, CA 91762 | |
| *1) Description:* Front of the facility from Edison facing south. | |
| *2) Description:* Backup generator with approximately 200 gallons of diesel fuel located on the north side of the property. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature: Ana Villanueva

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

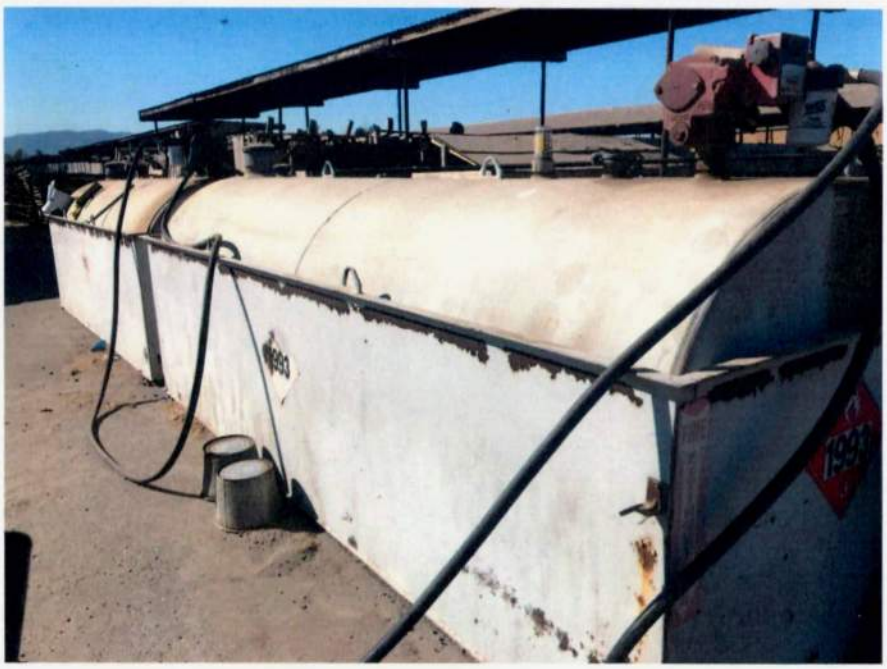

| Facility/ Case Name: Michael Dehoog Dairy | Facility ID #: FA0000565 |
|---|---|
| Address:8381 Edison Ave., Ontario, CA 91762 | |
| *3) Description:* (1) 55 gallon drum of used oil and (1) empty 55 gallon drum located on the south of the property. These drums are managed by a third party company operating on site. | |
| *4) Description:* (2) 1,000 gallon tanks of diesel fuel on the east side of the property. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature:

# PHOTO NARRATIVE



**PHOTO 5**

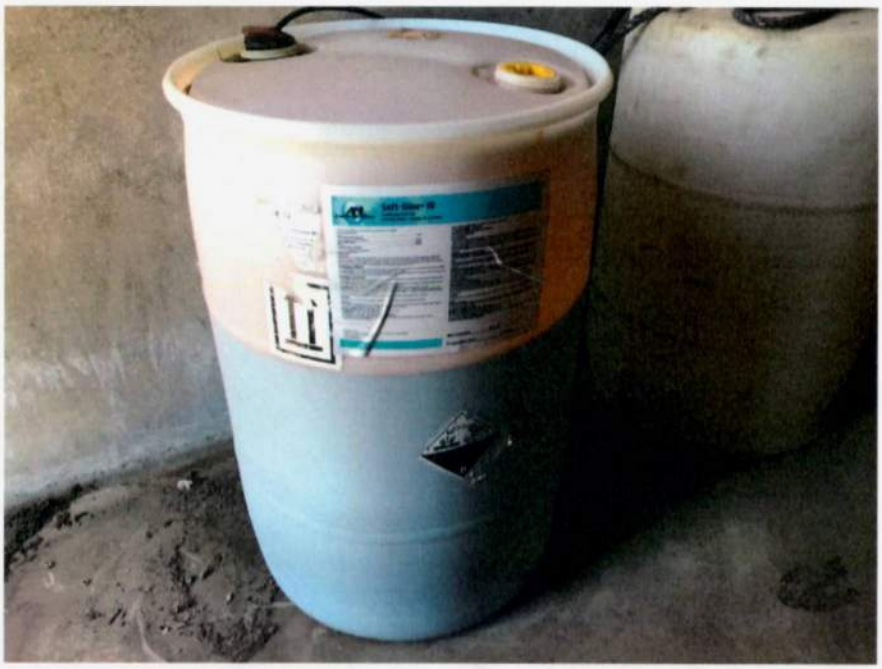

**PHOTO 6**

| Facility/ Case Name: Michael Dehoog Dairy | Facility ID #: FA0000565 |
|---|---|
| Address:8381 Edison Ave., Ontario, CA 91762 | |
| *5) Description:* (1) 55 gallon drum of Soft Dine 10 sanitizing teat dip located in the milking barn. | |
| *6) Description:* (1) empty 55 gallon drum and (1) 55 gallon drum of sodium hypochlorite located in the milking barn. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature: _____

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 7**

**PHOTO 8**

| | |
|---|---|
| Facility/ Case Name: Michael Dehoog Dairy | Facility ID #: FA0000565 |
| Address:8381 Edison Ave., Ontario, CA 91762 | |
| *7) Description:* (1) empty 30 gallon drum and (2) 30 gallon drums of Hydroclean chlorinated cleaner located in the milking barn. | |
| *8) Description:* (2) 30 gallon drums of acid cleaner located in the milking barn. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature:

Rev 06/29/2018

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Mark A. Hartwig
Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal


**July 28, 2017**

**MICHAEL DEHOOG**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

# NOTICE OF VIOLATION

| | | | |
|---|---|---|---|
| **CUPA Facility ID:** | FA0000565 | **CERS ID:** | 10034761 |
| **Facility Name:** | MICHAEL DEHOOG DAIRY | **Business Owner:** | MICHAEL DEHOOG DAIRY |
| **Business Address:** | 8381 EDISON AVE<br>ONTARIO, CA 917620000 | | |

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials and hazardous waste using the **California Environmental Reporting System (CERS)** annually. Your facility was also provided reasonable notice of this requirement from this agency in subsequent emails and/or inspections since that date.

**VIOLATION:** Failure to electronically submit / update business plan information annually using the statewide information management system, also known as CERS - California Health & Safety Code §25508(a)(1)(A) or 25508.2

**OBSERVATION:** As of the date of this letter, one or more of the following elements have not been submitted / updated in CERS:

- FACILITY INFORMATION
- HAZARDOUS MATERIALS INVENTORY
- EMERGENCY RESPONSE AND TRAINING PLANS

**REQUIREMENT:** Immediately submit / update business plan information using the instructions for accessing CERS and submitting business plan information that can be found on our website at http://www.sbcfire.org/ofm/Hazmat/ElectronicReporting-CERS.aspx

**COMPLY BY:** **August 25, 2017**

**NOTE: In accordance with Section 25515 of the California Health and Safety Code, a business that knowingly violates this article after reasonable notice of the violation is liable for an administrative penalty of up to five thousand dollars ($5,000) for each day in which the violation occurs. Failure to submit in CERS by the "Comply By" date noted above may subject your facility to this penalty. This will be your final notice- before administrative action takes place.**

**ADDITIONAL NOTE:** There may be other violations that are still open from the last inspection conducted at your facility. Please refer to the last inspection report that you received from this agency to verify compliance with all open violations, or contact this office to speak with the district inspector about complying with those violations.

Should you have any questions regarding this Notice of Violation, please contact Greg Zeigler at (909) 386-8430. For assistance with your CERS submittal, please contact the CERS Helpline at (909) 386-8432.

*Greg Zeigler, R.E.H.S.*
**Hazardous Materials Specialist IV**
**Hazardous Materials Enforcement Section**

Attachments: Workshop Announcement, Site Plan Instructions, Emergency Response & Training Plan


BOARD OF SUPERVISORS

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MICHAEL DEHOOG
8381 EDISON AVE
ONTARIO, CA 91762

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  - Restricted delivery service, which provides delivery to the addressee specified by name, or to the addressee's authorized agent.
  - Adult signature service, which requires the signee to be at least 21 years of age (not available at retail).
  - Adult signature restricted delivery service, which requires the signee to be at least 21 years of age and provides delivery to the addressee specified by name, or to the addressee's authorized agent (not available at retail).
- To ensure that your Certified Mail receipt is accepted as legal proof of mailing, it should bear a USPS postmark. If you would like a postmark on this Certified Mail receipt, please present your Certified Mail item at a Post Office™ for postmarking. If you don't need a postmark on this Certified Mail receipt, detach the barcoded portion of this label, affix it to the mailpiece, apply appropriate postage, and deposit the mailpiece.

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**SAN BERNARDINO COUNTY**
**FIRE DEPARTMENT**
**ATTN: PRISCILLA REYES**
**620 S. 'E' STREET**
**SAN BERNARDINO, CA 92415**

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
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**MICHAEL DEHOOG**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

9590 9402 2526 6306 8237 37

2. Article Number *(Transfer from service label)*

7016 0750 0000 3078 6163

***COMPLETE THIS SECTION ON DELIVERY***

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)* Janna Van Den Bosch

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

ONTARIO CA 91761
AUG 3 2017
USPS

3. Service Type

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PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

**SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT**

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Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Mark A. Hartwig
Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal

**July 28, 2017**

**MICHAEL DEHOOG**
**8381 EDISON AVE**
**ONTARIO, CA 91762**

# NOTICE OF VIOLATION

| | | | |
|---|---|---|---|
| **CUPA Facility ID:** | FA0000565 | **CERS ID:** | 10034761 |
| **Facility Name:** | MICHAEL DEHOOG DAIRY | **Business Owner:** | MICHAEL DEHOOG DAIRY |
| **Business Address:** | 8381 EDISON AVE<br>ONTARIO, CA 917620000 | | |

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials and hazardous waste using the **California Environmental Reporting System (CERS)** annually. Your facility was also provided reasonable notice of this requirement from this agency in subsequent emails and/or inspections since that date.

**VIOLATION:** Failure to electronically submit / update business plan information annually using the statewide information management system, also known as CERS - California Health & Safety Code §25508(a)(1)(A) or 25508.2

**OBSERVATION:** As of the date of this letter, one or more of the following elements have not been submitted / updated in CERS:

- FACILITY INFORMATION
- HAZARDOUS MATERIALS INVENTORY
- EMERGENCY RESPONSE AND TRAINING PLANS

**REQUIREMENT:** Immediately submit / update business plan information using the instructions for accessing CERS and submitting business plan information that can be found on our website at http://www.sbcfire.org/ofm/Hazmat/ElectronicReporting-CERS.aspx

**COMPLY BY:** **August 25, 2017**

**NOTE: In accordance with Section 25515 of the California Health and Safety Code, a business that knowingly violates this article after reasonable notice of the violation is liable for an administrative penalty of up to five thousand dollars ($5,000) for each day in which the violation occurs. Failure to submit in CERS by the "Comply By" date noted above may subject your facility to this penalty. This will be your final notice- before administrative action takes place.**

**ADDITIONAL NOTE:** There may be other violations that are still open from the last inspection conducted at your facility. Please refer to the last inspection report that you received from this agency to verify compliance with all open violations, or contact this office to speak with the district inspector about complying with those violations.

Should you have any questions regarding this Notice of Violation, please contact Greg Zeigler at (909) 386-8430. For assistance with your CERS submittal, please contact the CERS Helpline at (909) 386-8432.

*Greg Zeigler, R.E.H.S.*
**Hazardous Materials Specialist IV**
**Hazardous Materials Enforcement Section**

Attachments: Workshop Announcement, Site Plan Instructions, Emergency Response & Training Plan

BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | James Ramos | Curt Hagman | Josie Gonzales | Dena Smith |
|---|---|---|---|---|---|
| Chairman, First District | Second District | Third District | Vice Chairman, Fourth District | Fifth District | Interim Chief Executive Officer |

San Bernardino County CUPA
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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 565 Facility Name: Michael DeHoog Dairy Inspection Date: August 26, 2016

Site Address: 8381 Edison Avenue Phone #: 909-947-0944

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by:

☒ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner

*Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)*

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permits are current; expire 5/31/17

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) No spills or releases were observed

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a)) (2) 1,000-gal ASTs diesel fuel, (4) 55-gal drums iodine teat dip, (2) 55-gal drums iodine teat dip, (2) 30-gal drums and cleaner, (3) 30-gal drums Hydroclean 400

☐ 202. A Business Plan has not been established. (CHSC 25507) ☒ 206. Business Plan not updated w/in 12 months (CHSC 25508.2) 7/9/2007

☒ 203. A Business Plan has not been submitted. (CHSC 25508) CERS ID 10034761

**Compliance Requirement**: Using the California Environmental Reporting System (CERS), submit Business Plan information into the statewide information management system.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety training provided

**Compliance Requirement**: Submit training documentation as required.

## Container Storage and Labeling Requirements:

Chemicals delivered by SDS and Terco.

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

## Waste Management:

Heavy equipment serviced by Rent Avery. Diesel by Merit Oil.

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A

**Compliance Requirement**: Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspector: Brian Wade (Sign Name) Received By: Joe DeHoog (Sign Name) Title: PARTNER

Brian Wade (Print Name) Joe DeHoog (Print Name) Report Date: August 26, 2016

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name: Joe DeHoog Date: 11-15-16

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Mark A. Hartwig**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


October 29, 2016

MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762

**ATTN: JOE DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000565-MICHAEL DEHOOG DAIRY**
**8381 EDISON AVE**
**ONTARIO, CA 91762-0000**

Mr. DeHoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on August 26, 2016:

- At least once every 12 months, the owner/owner shall review and certify that the information in the statewide information management system has been verified and is complete, accurate and up to date.
- Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

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| Vice Chair, First District | Second District | Chair, Third District | Fourth District | Fifth District | Chief Executive Officer |

San Bernardino County CUPA

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 565 Facility Name: Michael DeHoog Dairy Inspection Date: August 26, 2016

Site Address: 8381 Edison Avenue Phone #: 909-947-0944

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by:

☒ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner

*Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)*

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permits are current; expire 5/31/17

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) No spills or releases were observed

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a)) (2) 1,000-gal ASTs diesel fuel, (4) 55-gal drums iodine teat dip, (2) 55-gal drums iodine teat dip, (2) 30-gal drums acid cleaner, (3) 30-gal drums hydroclean 400

☐ 202. A Business Plan has not been established. (CHSC 25507) ☒ 206. Business Plan not updated w/in 12 months (CHSC 25508.2) 7/9/2007

☒ 203. A Business Plan has not been submitted. (CHSC 25508) CERS ID 10034761

**Compliance Requirement**: Using the California Environmental Reporting System (CERS), submit Business Plan information into the statewide information management system.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety training provided

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements: Chemicals delivered by SDS and Terco.

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management: Heavy equipment serviced by Kent Avery. Diesel by Merit Oil.

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A

**Compliance Requirement**: Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspector: Brian Wade (Sign Name) Received By: Joe DeHoog (Sign Name) Title: PARTNER

Brian Wade (Print Name) Joe DeHoog (Print Name) Report Date: August 26, 2016

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** _____ Name _____ Date

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **565**

Address: **8381 Edison Avenue Ontario, CA 91762**

1) Description: **View of the facility from Edison facing South.**

2) Description: **(2) 1,000-gallon AST's of diesel fuel stored on the Eastern side of the property.**

Date Taken: **8/26/2016**

Taken By: **Brian Wade**

Signature: Brian Wade

Revised 02/27/03

# PHOTO NARRATIVE



PHOTO 3

PHOTO 4

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **565**

Address: **8381 Edison Avenue Ontario, CA 91762**

1) Description: **(2) 30-gallon drums of acid cleaner in the chemical storage room of the milking barn.**

2) Description: **(3) 30-gallon drums of Hydroclean 400 stored in the chemical storage room of the milking barn.**

Date Taken: **8/26/2016**

Taken By: **Brian Wade** Signature: Brian Wade

Revised 02/27/03

# PHOTO NARRATIVE



**PHOTO 5**

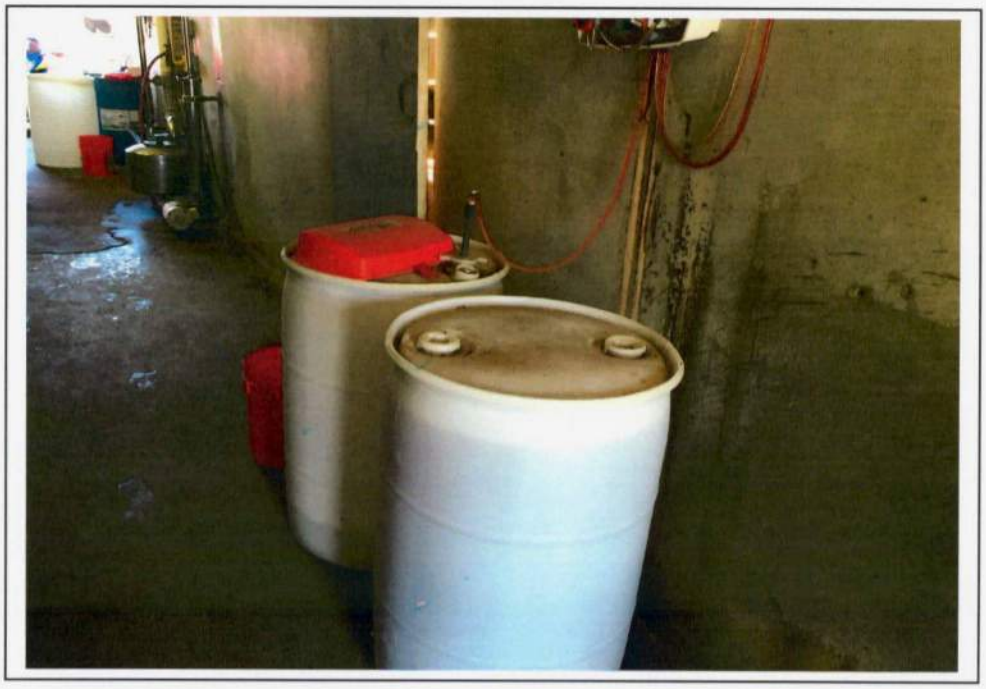

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **565**

Address: **8381 Edison Avenue Ontario, CA 91762**

1) Description: **(2) 55-gallon drums of non-iodine teat dip stored in the milking barn. In the rear of the photo are 55-gallon drums of iodine teat dip.**

Date Taken: **8/26/2016**

Taken By: **Brian Wade** Signature: Brian Wade

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153
(909) 386-8401 • FAX (909) 386-8460 • www.sbcfire.org

# ACCESS REQUEST to FACILITY RECORD IN CERS - SINGLE FACILITY*

For more information, see: http://www.sbcfire.org/hazmat/efile.aspx or call CERS help line (909) 386-8432

The purpose of the ACCESS REQUST is to ensure that only individuals designated by the facility owner/operator are authorized by the CUPA to access facility records and to create, edit, and submit electronic data on the owner's behalf to the statewide system, known as the California Environmental Reporting System (CERS). The initial business user authorized by the CUPA to have access to a facility on CERS is designated as a lead business user. Lead business users have the ability to add additional lead or standard business users, approve or reject other access requests, or delete other users for any facility for which they are listed as a lead user.

**AUTHORIZED LEAD BUSINESS USER**

| Name | Title |
|---|---|
| Joe DeHoog | Owner |
| **Email Address** | **Contact Phone** |
| 90TmilkFor6@Juno.com | 909 815-7074 |

| OWNER NAME | OWNER EMAIL ADDRESS |
|---|---|
| Joe DeHoog | Same |

| OWNER MAILING ADDRESS | CITY | STATE | ZIP CODE | OWNER PHONE |
|---|---|---|---|---|
| 8381 Edison Ave | ONTARIO | CA | 91762 | 909 947-0944 |

**Fill out the following information for the facility**

| FACILITY ID *(e.g., FA0123456)* | FACILITY NAME *(e.g., CUPA AUTO)* | SITE ADDRESS *(e.g., 123 N. MAIN ST.)* | CITY *(e.g., ANYTOWN)* |
|---|---|---|---|
| 565 + 668 | Michael DeHoog Dairy<br>Three D Dairy | 8381 Edison Ave<br>8485 Edison Ave | ONTARIO |

☑ **I authorize the person and email address listed above to be a lead business user for the listed facility. This includes the ability to create, edit, and submit compliance data for the listed facility. I understand that as a lead business user this person may approve additional lead business users or standard business users, grant or reject facility access requests, and delete users from the facility listed on this authorization form.**

**Certification – I certify that I am the owner/operator or legal representative of the facility listed on this form. I understand that compliance documents prepared or submitted electronically are held to the same standard as their former paper equivalents.**

| SIGNATURE OF OWNER/OPERATOR OR LEGALLY DESIGNATED REPRESENTATIVE | DATE | NAME OF DOCUMENT PREPARER |
|---|---|---|
| Joe DeHoog | 3-10-13 | |
| **NAME OF SIGNER (print)** | **TITLE OF SIGNER** | |
| Joe DeHoog | Owner | |

*Each facility record that is entered into CERS is assigned to a business/organization. Multiple facilities that have the same owner/operator and that will have the same users managing the facility record in CERS can be grouped together into a single "umbrella" business/organization. If you own or operate multiple facilities and if the same users will be managing all of the facilities in CERS, you may want them to be grouped into a single business/organization. For more information please contact the San Bernardino CERS help line at (909) 386-8432.

Return completed form by Mail: San Bernardino County Fire Department, Hazardous Materials Division, 620 South E Street, San Bernardino, CA 92415-0153 or Fax: (909) 386-8460 or Email: Efile@sbcfire.org

OFFICE USE Notes: invitation 3-18-13

Form Revised 11/14/12 Completed by: [illegible] Date: 3-18-13

OFFICE USE ONLY: DATE STAMP

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 565 Facility Name: Michael DeHoog Dairy Inspection Date: 1-30-2013

Site Address: 8381 Edison Phone #: (909) 947-0944

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:

☑ Inspect ☑ Photograph Name: Joe DeHoog Title: Owner # Emp: 4 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED** 5/31/2013

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Haz Mat Handler

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) N/A

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) Okay

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☐ 202. A Business Plan has not been established. (CHSC 25503.5)

☑ 203. A Business Plan has not been submitted / updated. (CHSC 25505) Last Submission 1/18/07

INVENTORY: 5% Iodine - Tit Dip 4X55 gal
Diesel - 2X1000 gallon Tanks

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety Meetings

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements: No Hazardous Waste Generated

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) N/A

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Discussed Universal Waste Mgmt

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) Kent Avery Diesel Mechanics - Service Equipment

**Compliance Requirement**: Submit copies of waste disposal records for the past

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - Milk Production

Inspected By: Jerry Wong (Sign Name) Received By: Joe DeHoog (Sign Name) Title: Owner

Jerry Wong (Print Name) Joe DeHoog (Print Name) Report Date: 1/30/2013

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

CUPA
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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: 1/30/2013

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| 565 | Michael DeHoog Dairy | 8381 Edison, Ontario |
| Consent Granted by: ☑ Inspect ☑ Photograph | NAME Joe DeHoog | TITLE Owner |

#203 - Failure to Update the Business Plan (CHSC Section 25505) Business Plans are to be updated annually. The current Business Plan on file has not been updated since 6/18/2007

Compliance Requirement - Using the California Environmental Reporting System (CERS) Please submit the elements of the Business Plan within 30 days of receipt of this Inspection. The Website is http://cers.calepa.ca.gov/

If you have any questions regarding CERS Please call the Help Line at (909) 386-8432

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: Jerry Wong (Sign Name) Jerry Wong (Print Name)

Received By: [signature] (Sign Name) Joe DeHoog (Print Name)

Title: Owner

Report Date: 1/30/2013

# PHOTO NARRATIVE



PHOTO 1

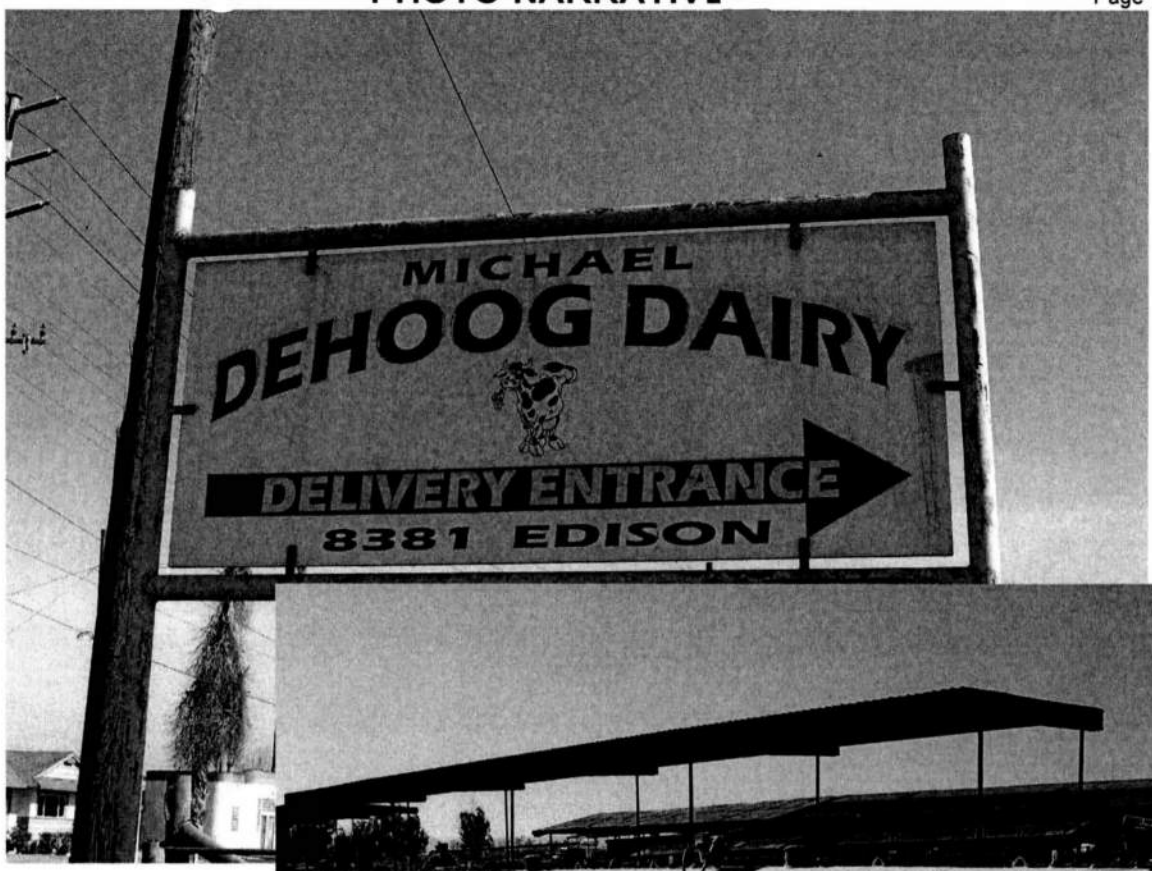


PHOTO 2

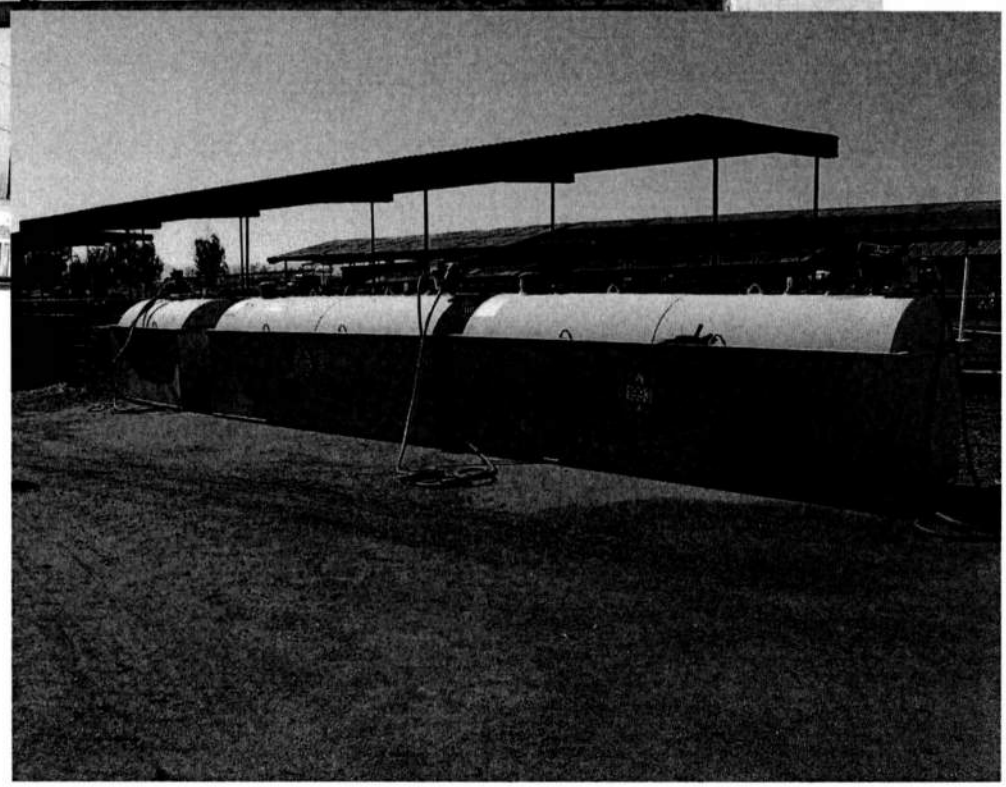

| | | |
|---|---|---|
| Facility/Case Name: | **MICHAEL DEHOOG DAIRY** | Facility ID 0000565 |
| Address: | **8381 Edison Avenue, Ontario, California, 91762** | |
| 1) Description: | **The facility is an agricultural business that produces milk. The owners of the facility are father and son.** | |
| 2) Description: | The facility is currently storing diesel fuel in two 1000 gallon tanks. The 500 gallon tank on the left is empty. | |
| Date Taken: | January 30, 2013 | |
| Taken By: | **Jerry Wong** | Signature: |

Revised 10/12/2000

PHOTO 1

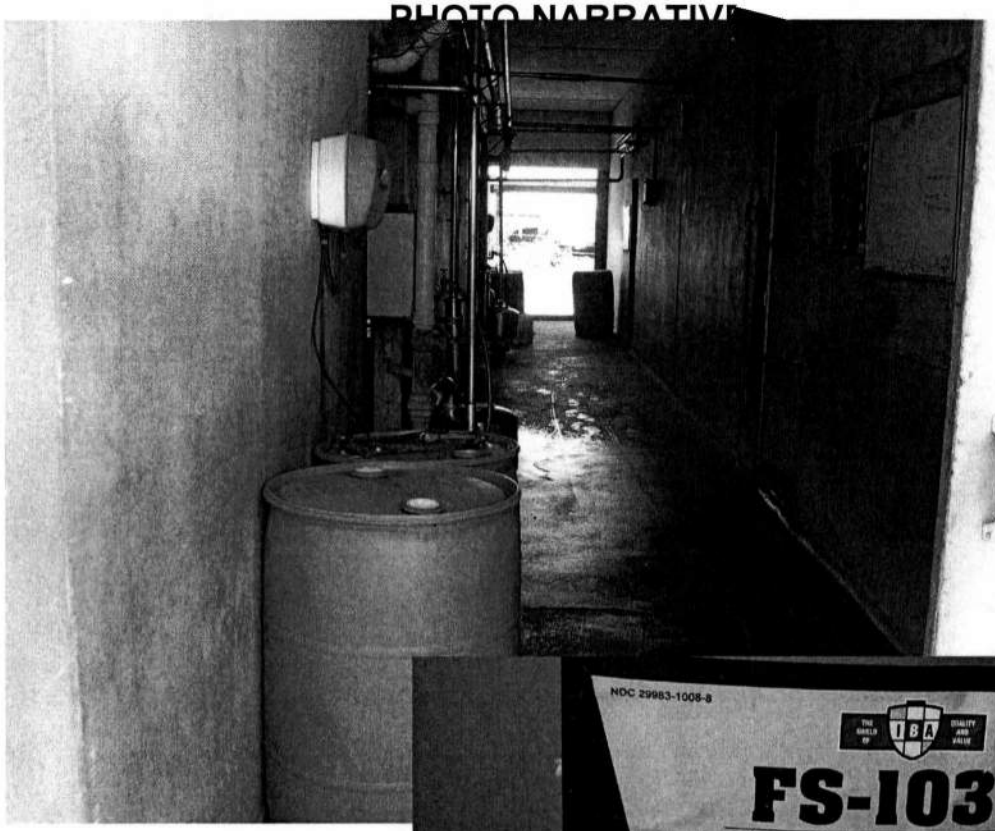

PHOTO 2

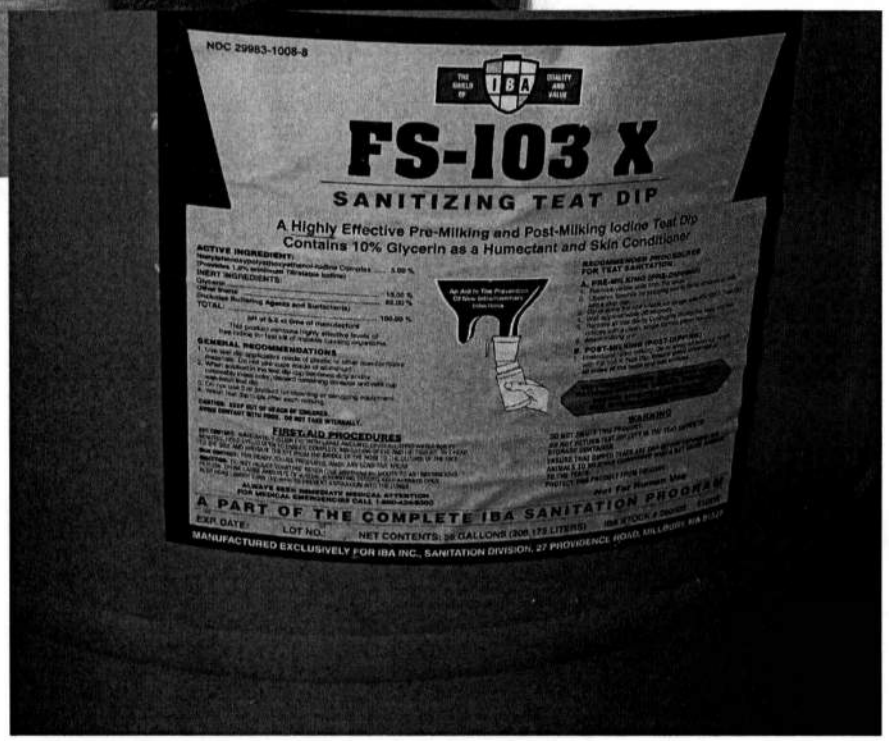


| | | |
|---|---|---|
| Facility/Case Name: | **MICHAEL DEHOOG DAIRY** | Facility ID 0000565 |
| Address: | **8381 Edison Avenue, Ontario, California, 91762** | |
| 1) Description: | **The facility stores drums of cleaning chemicals and sanitizing agents in the milk barn.** | |
| 2) Description: | The facility is currently storing four 55 gallon drums of this 5% iodine solution in the milk barn. | |
| Date Taken: | January 30, 2013 | |
| Taken By: | **Jerry Wong** | Signature: |

Revised 10/12/2000

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

PAT A. DENNEN
Fire Chief
County Fire Warden


November 30, 2007

Michael DeHoog Dairy
8381 Edison Avenue
Ontario, CA 91762

**ATTENTION: JOE DEHOOG**

**SUBJECT: NOTICE OF BUSINESS PLAN DEFICIENCIES**

**FACILITY: 8381 EDISON AVENUE, ONTARIO**

The Business Emergency/Contingency Plan submitted to the Hazardous Materials Division have been determined to be deficient. California Health & Safety Code, Chapter 6.95, § 25505 (a)(2) states, "*If, after review, the administering agency determines that the handler's Business Plan is deficient in any way, the administering agency shall notify the handler of those deficiencies. The handler shall submit a corrected Business Plan within 30 days from the date of the notice.*"

***This letter constitutes formal notice of business plan deficiencies. Please submit 2 copies of the information requested below with a copy of this letter for final review within 30 days from the above date.***

**The following are the items requiring correction:**

Locally Collected Inventory Information page

- Taxpayer ID Number: Provide the Taxpayer or Federal ID Number.

Emergency Response Plans and Procedures page 1 (page 5)

- Evacuation/Notification: Provide a description of how employees, customers and visitors at this facility will be notified of an emergency, e.g. loudspeaker, hand held radios, etc. Also, indicate where the emergency staging area is located. Submit a revised Emergency Response Plans and Procedures page 1 (page 5).

Inventory

- All items listed on the Inventory Summary are required to have an included individual chemical description forms. No individual chemical description forms were submitted. Enclosed find partially completed individual forms (I was unable to complete all of the form due to lack of information).

Submit completed individual chemical description forms for all items.


MARK H. UFFER
County Administrative Officer

NORMAN A. KANOLD
Assistant County Administrator
Public and Support
Services Group

Board of Supervisors
BRAD MITZELFELT ..... First District
PAUL BIANE ..... Second District
DENNIS HANSBERGER ..... Third District
GARY C. OVITT ..... Fourth District
JOSIE GONZALES ..... Fifth District

**Failure to correct the outstanding deficiencies could result in further enforcement actions and additional fees. If the response to this deficiency letter does not result in correction of the deficiencies, a records review fee of $123/hr will be assessed to recover those costs associated with additional file review.**

*CA Health and Safety Code, Chapter 6.95, § 25505 (a)(3) states, "If a handler fails, after reasonable notice, to submit a business plan in compliance with this article, the administering agency shall immediately take appropriate action to enforce this article, including the imposition of civil and criminal penalties as specified in this article." Penalties for business plan violations can range from $2000-$5000/day.*

An electronic version of the Business Emergency/Contingency Plan Forms and Guidelines is available at our website www.sbcfire.org. Click on the HAZMAT bar located on the left side of the page. Then click on Forms & Guidelines in the title bar. Finally, click on the Business Plan title, this will link you to all forms associated with the Business Plan Program. Should you have any further questions, comments, or concerns, please feel free to contact me at (909) 386-8401 or lheaviside@sbcfire.org.

**LESLIE HEAVISIDE, REHS**
**Hazardous Materials Division, Field Services Section**
Enclosures: Business Emergency/Contingency Plan Guidelines and Forms
Example Business Emergency/Contingency Plan

# Business Emergency/Contingency Plan Receipt

Mail to: MICHAEL DEHOOG DAIRY
8381 EDISON AV
ONTARIO, CA 91762

Site Address: MICHAEL DEHOOG DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-0000

Service Request ID: SR0013881
Facility ID: FA0000565

The Business Emergency/Contingency Plan was received on July 19, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.

2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.

3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.

4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.

5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.

2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.

3. Change of business address, business ownership, or business name.

4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**

**620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460**

**www.sbcfire.org**

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED
JUL 19 2007
S.B. CO. FIRE DEPT.

FACILITY ID # F A

BUSINESS NAME (Same as FACILITY NAME or DBA) 3

Michael DeHoog DAIRY

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8381 Edison Ave | ONTARIO | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☐ * Business Activities Form
- ☐ * Business Owner/Operator Identification Form
- ☐ * Supplemental Emergency Contact Page
- ☐ Emergency Response Plans and Procedures
- ☐ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☐ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☐ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☐ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☐ Area map - photocopied city map with location of site indicated
- ☐ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.

- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER 135 |
|---|---|---|
| Joe DeHoog | 6-18-07 | Joe DeHoog |

| NAME OF SIGNER (*print*) | TITLE OF SIGNER (*print*) |
|---|---|
| Joe De Hoog | PARTNER |

## BUSINESS RGENCY/CONTINGENCY PLAN COVER S. .T INSTRUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of Initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

| FACILITY ID # | F | A | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

| BUSINESS NAME (Same as FACILITY NAME or DBA) | EPA ID # (Hazardous Waste Only) |
|---|---|
| Michael DeHoog Dairy | NA |

| BUSINESS ADDRESS | CITY | ZIP CODE |
|---|---|---|
| 8381 Edison Ave | ONTARIO | 91762 |

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page Instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California Identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FH0000505 Facility Name: Michael DeHoog Dairy Inspection Date: May 29, 2007

Site Address: 8381 Edison Phone #: 909 947-1914

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:

☑ Inspect ☑ Photograph Name: Joe DeHoog Title: Partner # Emp: 9 Packet left on site? (Yes/No)

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☑ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires handler permit only

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☑ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

**INVENTORY:** 1) 55-gal drums tool oil (100% Textline) 2) 500-gal AST, 4111 ~ 75 gal AST diesel & back up generator 3) 30-gal liquid laundry cleaner 4) 30-gal acid pipe cleaner

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement**: Submit training documentation as required.

## Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) "

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) "

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

RECEIVED JUL 19 2007 S.B. CO. FIRE DEPT.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) "

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) "

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

## Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) Does not generate waste

**Compliance Requirement**: Submit copies of waste disposal records for the past "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Equipment serviced by Lost Hills Repair Inc.

Inspected By: [signature] (Sign Name) Leslie Hawkside (Print Name)

Received By: [signature] (Sign Name) Joe DeHoog (Print Name)

Title: Partner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** [signature] (Name) 6-30-07 (Date)

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000565 Facility Name: Michael DeHoog Dairy Inspection Date: May 29, 2007

Site Address: 8381 Edison Phone #: (909) 947-1944

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by: ☑ Inspect ☑ Photograph Name: Joe DeHoog Title: Partner # Emp: 9 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☒ 101. (201) Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires handler permit only

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking.

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (5) 55-gal drums teat dip (10% Iodine)
(2) 500-gal AST's (1) ~ 75 gal AST diesel & back up generator
(2) 30-gal liquid chlorinated cleaner
(2) 30-gal acid pipe cleaner

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement**: Submit training documentation as required.

## Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) " " " " "

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) " " " "

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) " " " " "

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) " " " "

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

## Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) Does not generate waste

**Compliance Requirement**: Submit copies of waste disposal records for the past " " " "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Equipment serviced by Kent Avery Repair, Inc.

Inspected By: [signature] Sign Name — Leslie Heaviside Print Name

Received By: [signature] Sign Name — Joe DeHoog Print Name

Title: Partner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **FA0000565**

Address: **8311 Edison Avenue, Ontario**

1) Description: **Front of milking parlor**

2) Description: **Back-up generator containing approximately 75 gallons Diesel fuel**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

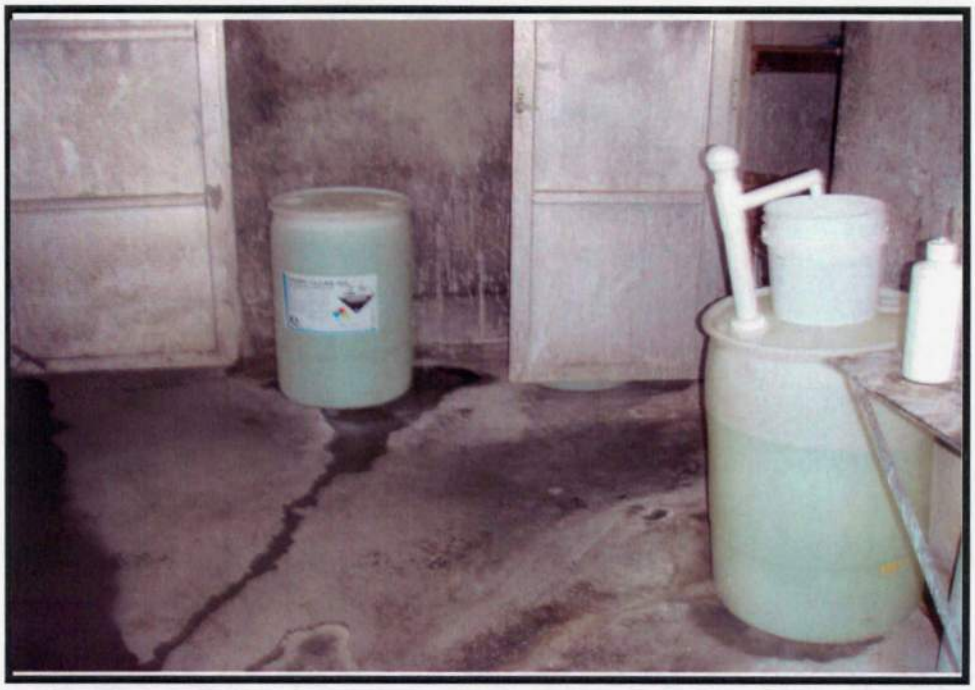

PHOTO 4

Facility/Case Name: **Michael DeHoog Dairy** Facility ID #: **FA0000565**

Address: **8311 Edison Avenue, Ontario**

3) Description: **(2) 30-gallon drums of HydroClean 400 (potassium hydroxide & sodium hypochlorite)**

4) Description: **(2) 500-gallon AST's Diesel fuel**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: _____

Revised 10/12/2000

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

THREE D DAIRY
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2015** **Expiration Date: 4/30/2016**

**CUPA Facility Type: 5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0009608 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   Note: The UST ID Number is listed on the front of the permit for each UST

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Fire Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part2, Chapter 1,Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4 Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:2 AR:0.00

JOE DEHOOG
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2014** **Expiration Date: 4/30/2015**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0009608 |
| PT0031936 | 5011 CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | PR0040824 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   *Note: The UST ID Number is listed on the front of the permit for each UST.*

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4, Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2013** **Expiration Date: 4/30/2014**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

**Permitted by:**
San Bernardino County Fire Protection District
Hazardous Materials Division
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

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a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7, 6.75, and Title 23 CCR, Chapters 16 & 18.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bemardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 and 6.75 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
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f. **Uniform Fire Code, Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25509.2, California Fire Code Chapter 27, Section 2701.5.1 and Section 2701.5.2, formerly referred to as UFC Section 80.103.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2012** **Expiration Date: 4/30/2013**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

Mark A. Hartwig, Fire Chief

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

# PERMIT CONDITIONS

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# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2011** **Expiration Date: 4/30/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

Daniel A. Odom, Interim Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
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# PERMIT CONDITIONS

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g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.**

**Effective Date: 5/1/2010** **Expiration Date: 4/30/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

DEHOOG,MICHAEL
14350 WALKER AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0010668 for a period not to exceed one year from effective date.

Effective Date: 5/1/2009 Expiration Date: 4/30/2010

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

SAN BERNARDINO COUNTY
COUNTY OF SAN BERNARDINO
1853
FIRE DEPT

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

DEHOOG,MICHAEL
14350 WALKER AVE
ONTARIO, CA 91762

This Unified Permit is hereby issued to:
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

Permit is issued to Facility: FA0000668 for a period not to exceed one year from effective date.

**Effective Date: 5/1/2008** **Expiration Date: 4/30/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0008721 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0009608 |

Printed on 5/2/2008
Reconstructed by MIS on 8/12/2008

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

CLOSURE

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

0011267
0015320

- [ ] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [x] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0000574

NAME: **DEHOOG,MICHAEL**

ADDRESS: **8381 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

PHONE: EXT: FYI LAST UPDATED: **06/10/2010**

### FACILITY INFORMATION — FACILITY ID: FA0000668

BUSINESS NAME: **THREE D DAIRY** CERS ID:**10034842**

INACTIVATED

SITE ADDRESS: **8485 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** FAX:

BUSINESS PHONE: **909-947-0944** EXT:

BUSINESS OPERATOR NAME: **JOE DEHOOG**

OPERATOR PHONE: EXT: FYI LAST UPDATED: **11/18/2016**

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: **8485 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

### BILLING CONTACT — ACCOUNT ID: AR0000669

BILLING CONTACT NAME: **JOE DEHOOG**

ADDRESS 1: **8485 EDISON AVE** ADDRESS 2:

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** COUNTRY: **USA**

PHONE: **909-947-0944** EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: PHONE: EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL): **GOTMILKFOR6@JUNO.COM**

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: * BUSINESS TYPE:

* SUPERVISORIAL DISTRICT: **004** * INSPECTION DISTRICT: **03** * FIRE JURISDICTION: **ONTARIO FIRE**

INACTIVATED

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **04/30/1997** FYI LAST BILLING: **03/15/2022**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**1-Motor Vehicle Fuel, 2-Fuel Distributor, 3-Farm, 4-Processor, 6-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [x] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| 11/1/22 LS | | | |
| Date Initials | Date Initials | Date Initials | Date Initials |

ALL PES INACTIVATED

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE | PT0008721 | ACTIVE | 4241-HAZARDOUS MATERIALS 1-3 C | 05/01/2022 | 04/30/2023 |
| | | | GHP OR UST ID: PR0009608 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE | PT0008722 | INACTIVE | 4420-SPECIAL GENERATOR | 05/01/1996 | 04/30/1997 |
| | | | GHP OR UST ID: PR0009609 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☐ UPDATE ☒ INACTIVATE ☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 11/01/2022 SUBMITTED BY: Erick Tilus

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Three D Dairy has ceased operations at this location. This facility is contiguous with (2) other farms operated by Ron C. Pietersma, OW0009196, effective 10/15/2022.

Please inactivate all permits for this FA.

Thanks,

ET

COMMENT ADDED

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

# SAN BERNARDINO COUNTY CUP
## FACILITY INFORMATION

☐ Update/Assign PEs ☐ Referral to Team CERS ☐ Closure ☐ Invoice Reversal ☐ Demand Bill
☑ Update Non-CERS Fields ☐ 0202 ☐ Other ☐ 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0000574**

NAME: DEHOOG,MICHAEL
ADDRESS: 8381 EDISON AVE ADDRESS 2:
CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA
PHONE: EXT: FYI LAST UPDATED: 06/10/2010

**FACILITY INFORMATION** — **FACILITY ID: FA0000668**

BUSINESS NAME: THREE D DAIRY CERS ID: 10034842
SITE ADDRESS: 8485 EDISON AVE ADDRESS 2:
CITY: ONTARIO STATE: CA ZIP CODE: 91762 FAX:
BUSINESS PHONE: 909-947-0944 EXT:
BUSINESS OPERATOR NAME: JOE DEHOOG
OPERATOR PHONE: EXT: FYI LAST UPDATED: 07/06/2015

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: 8485 EDISON AVE ADDRESS 2:
CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

**BILLING CONTACT** — **ACCOUNT ID: AR0000669**

BILLING CONTACT NAME: JOE DEHOOG
ADDRESS 1: 8485 EDISON AVE ADDRESS 2:
CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA
PHONE: 909-947-0944 EXT: EMAIL:

**ENVIRONMENTAL CONTACT**

NAME: PHONE: EXT:
EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL): gotmilkfor6@yahoo.com
LOCAL FACILITY PHONE (OPTIONAL): EXT:
CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: BUSINESS TYPE:
SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: ONTARIO FIRE
FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 04/30/1997 FYI LAST BILLING: 03/16/2016
FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 0.00

Business Code: 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
Business Type: 01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

ENTERED AUG 31 2016

| | | | |
|---|---|---|---|
| ☐ EC Entry Complete | ☐ QC Complete | N/A ☐ ☐ Fiscal Entry Complete | N/A ☐ ☐ Referral to Team CERS |
| Date Initials | Date Initials | Date Initials | Date Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0008721 | ACTIVE | 4241-HAZARDOUS MATERIALS | 05/01/2016 | 04/30/2017 |
| | | | GHP OR UST ID: PR0009608 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0008722 | INACTIVE | 4420-SPECIAL GENERATOR | 05/01/1996 | 04/30/1997 |
| | | | GHP OR UST ID: PR0009609 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLAB | UPDATED P.E. |

ADD NEW P.E.

| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

☐ UPDATE
☐ INACTIVATE
☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 7/29/16 SUBMITTED BY: Brian Wade

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

## SAN BERNARDIN OUNTY FIRE -HAZARDOUS MAT ALS DIVISION

### Request to Reverse Delinquent Penalty Fees

Requester: RUTH CLARK

Date: 5/20/2015 7:29:19AM

Facility ID: FA0000668
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

| Invoice ID | Total Account Balance | Total Due for Invoice |
|---|---|---|
| IN0103679 | $ 0.00 | $ 0.00 |
| **Invoice Date** | **Delinquent Penalties** | **Total Paid** |
| 3/17/15 | $ 108.85 | $ 419.85 |

Explanation: IN0103679 HAD DELINQUENT FEES ADDED IN ERROR. BILLING ADDRESS UPDATED IN CERS ON 3/25/13, BUT HAD NOT YET BEEN UPDATED IN ENVISION. PLEASE REVERSE $108.85 AND ISSUE THE CUSTOMER A REFUND. PLEASE SEE ATTACHED.

HazMat Supervisor — Date 5/27/15

Deputy Fire Marshal — Date 5/20/15

| Program/ Element | Qty | Description | | Amount |
|---|---|---|---|---|
| 4241 | 1 | HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | $ | 183.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | $ | 35.00 |
| 5011 | 1 | CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | $ | 93.00 |
| 9990 | 3 | DELINQUENT PENALTY FEE | $ | 108.85 |
| 9999 | 6 | PAYMENT RECEIVED - THANK YOU | $ | -419.85 |
| | | Total Due for This Invoice: | $ | 0.00 |

☐ Waive 9805 Administrative Fee

**Fiscal Section**

Fiscal Services Supervisor — Date 6-1-15

Michael Sadsad

OFM Administrative Supervisor — Date 5/20/15

COMPLETED

# SAN BERNARDINO COUNTY FIRE -HAZARDOUS MATERIALS DIVISION

## Request to Reverse Delinquent Penalty Fees

Requester: RUTH CLARK

Date: 5/20/2015 7:29:19AM

Facility ID: FA0000668
THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

| Invoice ID | Total Account Balance | Total Due for Invoice |
|---|---|---|
| IN0103679 | $ 0.00 | $ 0.00 |
| **Invoice Date** | **Delinquent Penalties** | **Total Paid** |
| 3/17/15 | $ 108.85 | $ 419.85 |

Explanation: IN0103679 HAD DELINQUENT FEES ADDED IN ERROR. BILLING ADDRESS UPDATED IN CERS ON 3/25/13, BUT HAD NOT YET BEEN UPDATED IN ENVISION. PLEASE REVERSE $108.85 AND ISSUE THE CUSTOMER A REFUND. PLEASE SEE ATTACHED.

Kristi Wal 5/27/15
HazMat Supervisor Date

5/20/15
Deputy Fire Marshal Date

| Program/ Element | Qty | Description | | Amount |
|---|---|---|---|---|
| 4241 | 1 | HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | $ | 183.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | $ | 35.00 |
| 5011 | 1 | CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | $ | 93.00 |
| 9990 | 3 | DELINQUENT PENALTY FEE | $ | 108.85 |
| 9999 | 6 | PAYMENT RECEIVED - THANK YOU | $ | -419.85 |
| | | Total Due for This Invoice: | **$** | **0.00** |

☐ Waive 9805 Administrative Fee

**Fiscal Section**

Fiscal Services Supervisor Date

5/20/15
OFM Administrative Supervisor Date

Please make your check payable to:
**San Bernardino County Fire Protection District**
Send to:
**157 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 386-8483**

**PAST DUE**
**HAZARDOUS MATERIALS**
**CUPA PERMITS**

Nice! mail to the wrong Address and Then Penalize me. (Only in Govt.)

**TO : THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

**ATTN : THREE D DAIRY**

☒ **Change of Billing Address (see back)**

**Facility Address**
**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

| CERS ID | Facility ID | Invoice ID |
|---|---|---|
| 10034842 | FA0000668 | IN0103679 |

**Invoice Date**
3/17/15

*IN0103679419.85*

**Total Account Balance**
$ 419.85

**Total Due for Invoice**
$ 419.85

**Total Paid**
419.85

**Upon receipt of full payment of the total account balance due as shown on this Invoice, you will receive your new annual permit with an effective date of:**
**5/1/2015 to 4/30/2016**

California Environmental Reporting System: Regulator

Ruth Clark's Account Sign Out Tools Reports Help

Submittals Facilities Businesses Regulators Compliance Responders Reports

# Business Owner/Operator Identification: THREE D DAIRY

Home » Submittal Search » Submittal: 3/25/2013 (10034842) » Facility Information: Business Owner/Operator Identification (Submitted)

**Submittal Element History**

Submitted for CERS ID 10034842 on 3/25/2013 1:16PM by Joe DeHoog of THREE D DAIRY (ONTARIO, CA)

Return to Submittal

**Site Address**

THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**Identification**

Joe DeHoog

**Operator Phone** **Business Phone** **Business Fax**
(909) 815-7174 (909) 947-0944 () -

**Beginning Date** **Ending Date**

**Dun & Bradstreet** **SIC Code** **Primary NAICS**
- - -

**Facility/Site Mailing Address**

8485 EDISON AVE
ONTARIO, CA 91762

**Owner**

DEHOOG,MICHAEL

**Phone**
(909) 947-0944

**Mailing Address**
9909
Ontario, CA 91762

**Billing Contact**

Joe DeHoog

**Phone**
(909) 815-7074
-

**Mailing Address**
8381 EDISON AVE
ONTARIO, CA 91762

**Primary Emergency Contact**

Joe DeHoog

**Title**
Partner

**Business Phone** **24-Hour Phone** **Pager Number**
(909) 947-0944 (909) 815-7074 -

**Secondary Emergency Contact**

[No Name Provided]

**Title**
-

**Business Phone** **24-Hour Phone** **Pager Number**
() - () - -

**Environmental Contact**

Joe DeHoog
(909) 815-7074
-

**Mailing Address**
8381 Edison Ave
Ontario, CA 91762

**Title of Signer** [No Name Provided]
- **Name of Document Preparer**
-

**Additional Information**
-

**Locally-collected Fields**

Some or all of the following fields may be required by your local regulator(s).

**Property Owner**

[No Name Provided]

**Phone**
() -

**Mailing Address**
-
, - - -

**Assessor Parcel Number (APN)**
-

**Number of Employees**
-

**Facility ID Number (Regulator-provided)**
FA0000668

**Created By:** System Administrator on 11/27/2012 1:19 PM
**Last Updated By:** Joe DeHoog on 3/25/2013 1:16 PM

Return to Submittal

Version 2.23.0002 | Enhancements | CERS Central

Diagnostics | Conditions of Use | Privacy Policy | Contact | Help

California Environmental Reporting System: Business | © 2015 California Environmental Protection Agency
CERS Technical Support: Request Technical Assistance

CERS Help Settings Notifications

Please make your check payable to:
**San Bernardino County Fire Protection District**
Send to:
**[redacted]7 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 386-8483**

**Facility Address**

**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

| CERS ID | Facility ID | Invoice ID |
|---|---|---|
| 10034842 | FA0000668 | IN0103679 |

**Invoice Date**
3/17/15

*IN0103679419.85*

**Total Account Balance**
$ 419.85

**Total Due for Invoice**
$ 419.85

**Total Paid**
419.85

# PAST DUE

**HAZARDOUS MATERIALS**
**CUPA PERMITS**

SAN BERNARDINO COUNTY CUPA CERTIFIED PROGRAM AGENCY

- Nice! Mail to the wrong Address and Then Penalize me (Only in Gov't.)

**TO : THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

**ATTN : THREE D DAIRY**

☒ **Change of Billing Address (see back)**

**Upon receipt of full payment of the total account balance due as shown on this invoice, you will receive your new annual permit with an effective date of:**
**5/1/2015 to 4/30/2016**

Add update

| STREET NUMBER | STREET NAME | STE OR UNIT No |
|---|---|---|
| 8381 | EDISON AVE | |

| CITY NAME | STATE | ZIP CODE |
|---|---|---|
| ONTARIO | CA | 91762 |

ATTENTION

GREENIE REQUEST

FISCAL

# HAZ DOUS MATERIAL FIELD SERV S
## COMPUTER DA ABASE UPDATE AUTHORIZATI (5050 Form)

☐ Quick Submit-Correct minor information without full verification. MAILING ADDRESS

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000574

Legal Owner

*NAME: DEHOOG,MICHAEL

*ADDRESS 1: 8381 EDISON AVE

ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY:

*PHONE: EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 02/08/2008

TAX ID: DRIVER LICENSE:

### OWNER MAILING ADDRESS

☒ Same as Owner

CARE OF: DBA: DEHOOG,MICHAEL

ADDRESS1: 14350 WALKER AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000668

*NAME: THREE D DAIRY

*ADDRESS 1: 8485 EDISON AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *CITY CODE: ONTARIO

CENSUS: MILITARY SCHOOL MEDICAL *BUSINESS CODE: *BUSINESS TYPE:

SIC CODE: *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03

*PHONE: 909-947-0944 EXT: FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE: EXT: FAX: FYI LAST UPDATED: 07/23/2007

### FACILITY MAILING ADDRESS

☐ Same as Facility

☐ Same as Owner Mailing Address

BUSINESS NAME: THREE D DAIRY

CARE OF: JOE DEHOOG

ADDRESS 1: 8485 EDISON AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000669

☒ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY:

CARE OF:

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

PHONE: EXT: TAX ID: DRIVER LICENSE:

ALT PHONE: EXT: FYI EXEMPT FROM BILLING: NO FYI LAST UPDATED: 04/21/2009

ALT PHONE: EXT: FYI TOTAL DUE: 0.00

FYI ANNIVERSARY DATE: 04/30/1997 FYI ACCOUNT STATUS: ACTIVE ACCOUNT

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency

**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE* ☑ INACTIVATE ☐ ZERO OUT BALANCE | PT0008721 | ACTIVE | 4221 | 01/2009 | 04/30/2010 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009608 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0008722 | INACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009609 | INACTIVE, NON-BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP.: _____ NUMBER OF ACTIVE UST'S 0 MFR # _____

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? Yes (No)

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? (Yes) No 5051

*DATE SUBMITTED: _____ DATE ENTERED: 5/4/09 FISCAL ENTRY DATE/ INITIAL: 5/13/09 M

*SUBMITTED BY: _____ ENTERED BY: PWilson ***Demand bill for updated PEs**: Yes (No)

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Update owner mailing address to:

8381 Edison Ave
Ontario, CA 91762

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

Please make your check payable to:
**San Bernardino County Fire Department**
Send to:
**157 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 387-9603**

# INVOICE

**HAZARDOUS MATERIALS**
**CUPA PERMITS**

**TO : DEHOOG,MICHAEL**
~~14350 WALKER AVE~~ 8381 Edison Ave
**ONTARIO, CA 91762**

**ATTN :**

☒ **Change of Billing Address (see back)**

*IN0053488432.00*

**Facility Address**

**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

| Invoice ID | Facility ID |
|---|---|
| IN0053488 | FA0000668 |

**Invoice Date**
3/17/09

**Total Account Balance**
$ 432.00

**Total Due for Invoice**
$ 432.00

**Total Paid**
432.00

8381 Edison Ave

STREET NUMBER | STREET NAME | STE OR UNIT No

ONTARIO | CA | 91762

CITY NAME | STATE | ZIP CODE

ATTENTION

Upon receipt of full payment of the balance due as shown on this invoice, you will receive your new annual permit with an effective date of:

5/1/2009 to 4/30/2010

**Hazardous Materials Division**

**Fee Change Authorization Form**

☐ RUSH -NEED BY _____ ☑ PRIORITY-NEED BY 5-8-09 ☐ FYI-PLEASE REVIEW ☐ OTHER _____

**FACILITY INFORMATION**

NAME: **THREE D DAIRY** FACILITY ID: **FA0000668**

ADDRESS: **8485 EDISON AVE**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

PHONE: **909-947-0944** EXT: _____ FAX: _____

ALT PHONE: _____ EXT: _____ LOCATION(INSPECTOR DISTRICT): **03**

CONTACT PERSON: _____ CITY CODE: **ONTARIO** DISTRICT(SUPERVISORIAL DISTRICT): **004**

ANNIVERSARY DATE: **4/30/1997 12:00:00AM** ACCOUNT STATUS: **ACTIVE ACCOUNT**

NUMBER OF EMP. _____ NUMBER OF UST'S **0** MFR # _____

**ACTION REQUIRED**

☑ REQUEST VERIFICATION ☐ REQUEST FACILITY INSPECTION

☐ INACTIVATE / CLOSED ACCOUNT / O.O.B. ☐ REQUEST TO REVERSE OUTSTANDING INVOICE

COMMENTS: Mailing address change

REQUESTED BY: _____ APPROVED BY: Rebekah Matteson

**PERMIT INFORMATION**

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

RECEIVED 5/14/09

DATE SUBMITTED: 4-24-09 SUBMITTED BY: REBEKAH MATTESON

ADDITIONAL COMMENTS: 5/14/09- Per request from facility update owner address to:
8381 Edison Ave
Ontario, CA
91762

Owner info update

# HAZA OUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000574

NAME: DEHOOG,MICHAEL

ADDRESS 1: 14350 WALKER AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91762

COUNTRY:

PHONE:

EXT:

FAX:

ALT PHONE:

EXT:

DRIVER LICENSE:

TAX ID:

LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF:

DBA: DEHOOG,MICHAEL

ADDRESS1: 14350 WALKER AVE

ADDRESS 2:

CITY: ~~CHINO~~ Ontario

STATE: CA

ZIP CODE: ~~91710-9171~~ 91762

COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000668

NAME: THREE D DAIRY

ADDRESS 1: 8485 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

CITY CODE: ONTARIO

SIC CODE:

BUSINESS CODE:

BUSINESS TYPE:

CENSUS:

SUPERVISORIAL DISTRICT: 004

INSPECTION DISTRICT: 03

PHONE: 909-947-0944

EXT:

FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE:

EXT:

FAX:

LAST UPDATED: 07/23/2007

### FACILITY MAILING ADDRESS

BUSINESS NAME: THREE D DAIRY

CARE OF: JOE DEHOOG

ADDRESS 1: 8485 EDISON AVE

ADDRESS 2:

CITY: ONTARIO

STATE: CA

ZIP CODE: 91762

COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000669

RESPONSIBLE PARTY:

CARE OF:

ADDRESS 1:

ADDRESS 2:

CITY:

STATE:

ZIP CODE:

COUNTRY:

PHONE:

EXT:

DRIVER LICENSE:

ALT PHONE:

EXT:

LAST UPDATED: 01/04/2008

ALT PHONE:

EXT:

EXEMPT FROM BILLING: NO

TAX ID:

ANNIVERSARY DATE: 04/30/1997

TOTAL DUE: 0.00

ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT000872 | ACTIVE | 4221 | /01/2007 | 04/30/2008 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009608 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT0008722 | INACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009609 | INACTIVE, NON-BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. _____ NUMBER OF ACTIVE UST'S 0 MFR # _____

DATE SUBMITTED: 2-5-08 DATE ENTERED: 2/8/08 FISCAL DATE: _____

SUBMITTED BY: Leslie Heaviside ENTERED BY: CW

**COMMENTS/REMARKS:**

Per Envision review: Owner city & zip code incorrect.

AG - per 4 info update

CREATE EXPAND DO
REV

# HAZ/ OUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

ADD OLD FIRE MODEL

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

07 JUN 24 PM 12:19

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000574

NAME: DEHOOG,MICHAEL

ADDRESS 1: ~~14350 WALKER AVE~~ 8485 Edison ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-9171~~ 91762 COUNTRY:

PHONE: (909) 947-0944 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Joe DeHoog DBA: DEHOOG,MICHAEL

ADDRESS1: ~~14350 WALKER AVE~~ 8485 Edison ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91762 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000668

NAME: ~~AG~~-THREE D DAIRY

ADDRESS 1: 8485 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91762 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: 0241 BUSINESS CODE: 02 BUSINESS TYPE: 03

CENSUS: NA SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 03

PHONE: (909) 947-0944 EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-THREE D DAIRY

CARE OF: Joe DeHoog

ADDRESS 1: 8485 EDISON AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91762 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000669

RESPONSIBLE PARTY: Michael DeHoog

CARE OF: Three D Dairy

ADDRESS 1: 8485 Edison ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 COUNTRY:

PHONE: (909) 947-0944 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 04/05/2007

ALT PHONE: EXT: TAX ID:

ANNIVERSARY DATE: 04/30/1997 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFO TION (CIRCLE THOSE THAT APPLY)

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT00087: PERMIT NUMBER. | ACTIVE PERMIT STATUS | 4210 ORIGINAL P.E. | 5/01/1996 EFFECTIVE DATE | 04/30/1997 EXPIRATION DATE |
| PR0009608 GHP OR UST ID | ACTIVE, BILLABLE CURRENT STATUS(BILLING) | NA GHP FOR UST(PH) | NA CURRENT STATUS FOR UST(PH) | | 4221 UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008722 PERMIT NUMBER. | ACTIVE PERMIT STATUS | 4420 ORIGINAL P.E. | 05/01/1996 EFFECTIVE DATE | 04/30/1997 EXPIRATION DATE |
| PR0009609 GHP OR UST ID | ACTIVE, BILLABLE CURRENT STATUS(BILLING) | NA GHP FOR UST(PH) | NA CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 6 NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 6-4-07 DATE ENTERED: 6/12/07 FISCAL DATE:

SUBMITTED BY: Leslie Heaviside ENTERED BY:

MD

COMMENTS/REMARKS:

per inspection: Update handler permit (not special handler). Facility no longer generates waste, inactivate PE 4420.

Remove "Ag" prefix from name.

Update owner, FA & AIR info.

Demand bill.

TRACKING SHEET FOR BUSINESS PLANS

*Establishishment #* FA 6668

*Facility Name:* Three D Dairy

*Facility Site Address:* 8485 Edison

*City:* Ontario

*Fire Agency:* Ontario

| | | Sent to FD |
|---|---|---|
| 1 (# of copies) | | |
| **Business Plans Received** | 07/19/07 | __/__/__ |
| **Results of Review(s)** | | |
| **Deficiency** | | 11/30/07 |
| **Conditional Approval** | | __/__/__ |
| **Approval** | | __/__/__ |

| | | Sent to FD |
|---|---|---|
| **Revised Plans Received** | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

| Other Date | Action/Documentation (update, new plan, etc.) | Staff hours |
|---|---|---|
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

HAZARDOUS MATERIALS FIELD SERVICES
COMPUTER DATA BASE UPDATE AUTHORIZATION

Change ☒

Inactivate Permit/Facility ☐
(circle one)

Bill To: E A O Location/District No: _____ Est No: 97042498
(cirle one)
Former Est. Name: (if applicable): _____

Name: AG-THREED DAIRY
Street No.: 8435 Fraction: ___ Direction:
Street Name: EDISON Apt/Sp No.: _____
City: CHINO State: ____ Zip Code: _____
Telephone No.: ( ) _____

Name: _____
Street No.: _____ Fraction: ___ Direction: _____
Street Name: _____ Apt/Sp No.: _____
City: _____ State: ____ Zip Code: _____
Telephone No.: ( ) _____

Name: _____
Street No.: _____ Fraction: ___ Direction: _____
Street Name: _____ Apt/Sp No.: _____
City: _____ State: ____ Zip Code: _____
Telephone No.: ( ) _____

**Program Information:**

Number of Employees: _____ Number of UGST's: _____
Federal Tax I.D. Number/Social Security Number: _____

**Permit Information:** (Circle those that apply)

Change/Inactivate/Add 226 Permit No.: _____
Change/Inactivate/Add 228 Permit No.: _____
Change/Inactivate/Add _____ Permit No.: _____
Change/Inactivate/Add _____ Permit No.: _____

Date Submitted: 2/24/98 Date Entered: _____
Submitted By: MJW Entered By: None showing

Comments/Remarks: AG EXEMPT — ~~[illegible]~~ & REMOVE DEL. COUNT

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# BUSINESS OWNER / OPERATOR IDENTIFICATION

FACILITY ID # F A (This number is on your CUPA permit.)

EFFECTIVE DATE 100 | ENDING DATE 101

BUSINESS NAME (Same as FACILITY NAME or DBA): Three D Dairy | BUSINESS PHONE:

BUSINESS SITE ADDRESS 103: 8485 Edison Ave

CITY 104: Ontario | COUNTY 108: SAN BERNARDINO | STATE: CA | ZIP CODE 105: 91762

D&B NUMBER: | PRIMARY SIC/NAICS CODE 107: | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: Dairy – Milk Production

BUSINESS OPERATOR NAME 109: Joe Deltoog | BUSINESS OPERATOR PHONE 110: 909 923-7839

## II. BUSINESS OWNER

OWNER NAME 111: Michael Deltoog | OWNER PHONE 112: 909 947-4712

OWNER MAILING ADDRESS 113: 8381 Edison Ave

CITY 114: Ontario | STATE 115: CA | ZIP CODE 116: 91762

## III. ENVIRONMENTAL CONTACT

CONTACT NAME: Joe Deltoog | CONTACT PHONE 118: 909 947-0944

CONTACT MAILING ADDRESS 119: 8381 Edison Ave

CITY 120: Ontario | STATE 121: CA | ZIP CODE 122: 91762

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123: Joe Deltoog | NAME 128: Michael Deltoog |
| TITLE 124: Partner | TITLE 129: Partner |
| BUSINESS PHONE 125: 909 947-0944 | BUSINESS PHONE: 909 947-0944 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW): | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW): |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126: | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131: |
| PAGER/CELL # 127: | PAGER /CELL # 132: |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

SIGNATURE OF OWNER/OPERATOR: Joe Deltoog | NAME OF SIGNER (*print*) 136: Joe Deltoog | DATE 134: 6-18-07

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**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): Three D Dairy 3

FACILITY ADDRESS: 8485 Edison Ave

CITY: Ontario 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

BUSINESS MAILING ADDRESS: 8381 Edison Ave

CITY: Ontario

STATE: CA

ZIP CODE: 91762

BUSINESS FAX NUMBER: 909 947-0944

BUSINESS E-MAIL:

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

| Total # of Employees per shift | SHIFT 1 DAY | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION AM+PM |
|---|---|---|---|---|
| | 3 | 2 | | 6:00 TO 5:00 |
| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | TOTAL # EMPLOYEES 6 | | | TAXPAYER ID NUMBER 87- |

ASSESSORS PARCEL NUMBER (S):

CROSS STREET: Edison + Walker

BUSINESS DESCRIPTION: Dairy Farm

Number of Underground Storage Tanks located at this facility: 0

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☐ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 6-18-07

**CUPA**
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**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Three D Dairy | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8485 Edison Ave | Ontario |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification:** **If a situation is an emergency, call 911 first.** Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | 911 |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | (800) 33-TOXIC or (909) 386-8425 |
| 3. *State of California, Governor's Office of Emergency Services | (800) 852-7550 or (916) 845-8911 |
| 4. National Response Center | (800) 424-8802 |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date: 6-18-07

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| Three O DAIRY | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8485 Edison Ave | ONTARIO |

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:

For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√Check those items that apply and write additional information in the space provided).

- ☒ Reduction of containers on site if not used or needed.
- ☒ Containers are properly labeled and closed when not in use.
- ☐ Compressed gas cylinders are properly secured.
- ☐ Use of monitoring system. Type: _____
- ☐ Other:

Date: 6-18-07

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| THREE D DAIRY | |
| FACILITY ADDRESS 103 | CITY 104 |
| 8485 Edison Ave | ONTARIO |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- ☐ New employee training.
- ☐ Annual training & periodic refresher courses.
- ☐ Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- ☐ Spill control equipment
- ☐ Monitoring system
- ☐ Personal Protective Equipment
- ☒ On the job training. Describe below.
- ☐ Other:

All employees are given Instructions on how to use cleaning solutions.

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- ☒ Identify potential hazards and determine whether a release has occurred.
- ☒ Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- ☒ Coordinate the notification and evacuation of employees and customers from the facility.
- ☒ Make required agency notifications and request needed assistance.
- ☒ Assist responding agencies by providing access to the facility and information about the facility.
- ☐ Other:

Date: 6-18-07

BUSINESS NAME (Same as FACILITY NAME or DBA): Three D Dairy

FACILITY ADDRESS 103: 8485 Edison Ave

CITY 104: Ontario

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√ Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | | Annually |
| ☒ First aid kit(s) | 1 - General | As needed |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☐ Personal Protective Equipment | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√ Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste
- ☐ Process vessels
- ☒ Aboveground storage tanks
- ☐ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☒ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√ Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler
- ☐ Emergency response team
- ☐ Local Hospitals
- ☐ Other:
- ☒ No arrangements or agreements at this time

Date: 6-18-07

## HELPFUL HINTS FOR COMPLETING THE INVENTORY SECTION

**Congratulations! You have completed the first half of the plan. The following pages require review of the hazardous materials and hazardous wastes at your facility to determine which items require disclosure.**

**Here are some helpful hints to assist you in filling out the hazardous materials inventory section:**

1) This CUPA offers an example business plan that is available on our website or by mail. If you are unfamiliar with the business plan requirement, we recommend that you look at the example before you get started so you can see how inventory summary, chemical description pages, and maps work together.

2) Before you start filling out forms, determine how many items require disclosure and make the appropriate number of copies of the Inventory Summary form and the Chemical Description form. Note the following criteria when determining which items require disclosure in the inventory section: hazardous materials with a maximum quantity of greater than 55 gallons, 500 pounds, or 200 cubic feet; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives.

3) Assign a unique item number to each inventoried item (e.g. 1,2,3, etc.) This same item number is used on the Inventory Summary, on the individual Chemical Description form, and to show the storage location(s) on the facility map.

4) Each inventoried item requires a Chemical Description page that gives additional details about each chemical. Material Safety Data Sheets (MSDSs) and container labels are the main sources of chemical information. Wastes do not have MSDSs, but waste analysis, profiles, or manifests may have useful information.

5) Review Appendix I to determine which inventoried items require submission of a Material Safety Data Sheet (MSDS). If the substance is not listed in Appendix I, attach the MSDS for that chemical to the corresponding individual Chemical Description page. Anytime you update or refile the Chemical Description Page, make sure to attach the current MSDS. If you do not have a MSDS for a material, you can get one from your chemical vendor and you need them for compliance with the OSHA Hazard Communication Standard. Hazardous wastes do not have MSDSs.

6) Materials and wastes of the same chemical (e.g. lubricating oil and used oil) require separate Chemical Description pages.

7) Since the Chemical Description Page requires location information, you will have to complete the facility map(s) before you can finalize the Chemical Description pages.

8) The Maximum Quantity should reflect the maximum amount that could ever be onsite at any one time. The maximum listed on the Inventory Summary and the maximum listed on the individual Chemical Description form should be the same.

9) Typically, liquids are disclosed in gallons, solids in pounds and compressed gases in cubic feet. If you have questions regarding the correct unit type for an item, contact this department for assistance.

10) Signatures: The Inventory Summary form requires the Owner/Operator signature. Additionally, EPCRA filers are required to sign all individual Chemical Description forms.

Note: If you have a large warehouse, trade secrets, or other unique situation, please call our office before you fill out chemical description pages. We can help you develop an inventory that will meet the requirements and accommodate a unique situation.

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA)
Three D Dairy

FACILITY ADDRESS 103
8485 Edison Ave

CITY 104
Ontario

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | Teat Dip | 165 | 55 | Gal |
| ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ |
| 2 | Hydro clean 400 | 60 | 30 | Gal |
| 3 | Acid cleaner | 60 | 30 | Gal |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| Joe DeHoog | Joe DeHoog | 6-18-07 |

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages, otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Daniel R. Munsey**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal/Deputy Fire Warden


**February 3, 2020**

**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

# NOTICE OF VIOLATION

| | | | |
|---|---|---|---|
| **CUPA Facility ID:** | FA0000668 | **CERS ID:** | 10034842 |
| **Facility Name:** | THREE D DAIRY | **Business Owner:** | MICHAEL DEHOOG |
| **Business Address:** | 8485 EDISON AVE<br>ONTARIO, CA 91762 | **Certified Mail:** | 7019 1120 0000 7119 0904 |

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials and hazardous waste using the **California Environmental Reporting System (CERS)** annually by March 1st. Your facility was also provided reasonable notice of this requirement from this agency in subsequent emails and/or inspections since that date.

**VIOLATION:** Failure to electronically submit / update business plan information annually using the statewide information management system, also known as CERS - California Health & Safety Code §25508(a)(1)(A) or 25508.2

**OBSERVATION:** As of the date of this letter, one or more of the following elements have not been submitted / updated in CERS:

- FACILITY INFORMATION
- HAZARDOUS MATERIALS INVENTORY
- EMERGENCY RESPONSE AND TRAINING PLANS

**REQUIREMENT:** Immediately submit / update business plan information using the instructions for accessing CERS and submitting business plan information that can be found on our website at http://www.sbcfire.org/ofm/Hazmat/ElectronicReporting-CERS.aspx

**COMPLY BY:** **Immediately**

**NOTE: In accordance with Section 25515 of the California Health and Safety Code, a business that knowingly violates this article after reasonable notice of the violation is liable for an administrative penalty of up to five thousand dollars ($5,000) for each day in which the violation occurs. Failure to submit in CERS immediately may subject your facility to this penalty. This will be your final notice-before administrative action takes place.**

**ADDITIONAL NOTE:** There may be other violations that are still open from the last inspection conducted at your facility. Please refer to the last inspection report that you received from this agency to verify compliance with all open violations, or contact this office to speak with the district inspector about complying with those violations.

Should you have any questions regarding this Notice of Violation, please contact Greg Zeigler at (909) 386-8423. For assistance with your CERS submittal, please contact the CERS Helpline at (909) 386-8432.

*Greg Zeigler, R.E.H.S.*
**Hazardous Materials Specialist IV, Enforcement Section**


BOARD OF DIRECTORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
|---|---|---|---|---|---|
| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Don Trapp**
Interim Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


November 25, 2019

THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**ATTN: CORY DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000668-THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

Mr. Dehoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on October 11, 2019:

- Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at AVILLANUEVA@SBCFIRE.ORG.

**ANA VILLANUEVA**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
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| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

# SAN BERNA DINO COUNTY FIRE DIS ICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Don Trapp**
Interim Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


October 28, 2019

DEHOOG,MICHAEL
8381 EDISON AVE
ONTARIO, CA 91762
**ATTN: JOE DEHOOG**

**SUBJECT: COMPLIANCE DEADLINE REMINDER NOTICE**

**FACILITY: FA0000668-THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

Mr. DeHoog,

A post-inspection compliance review indicates that the following violations cited at the time of inspection on **October 11, 2019**, remain outstanding.

- Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.

If all compliance documentation has recently been submitted, please disregard this notice.

**IMPORTANT:** All compliance documentation requested on the inspection report must be received by this Division within **30 days from the date of the violation** or as otherwise indicated in the inspection report. This CUPA (Certified Unified Program Agency) is required by the State of California to gain compliance from all facilities subject to hazardous materials and hazardous waste laws and regulations. **Complying within 30 days of violation or as indicated in the inspection report, is the most efficient and the least inconvenient way for a facility to resolve outstanding violations.** If formal enforcement is necessary to gain compliance after 30 days, the facility will be **subject to substantial civil fines, costs and other penalties** pursuant to California Health and Safety Code (CHSC) 25404.1.1 & 25187.8.

If I can be of assistance in helping you correct the violations stated above or if you have any other questions, please don't hesitate to contact me at AVILLANUEVA@SBCFIRE.ORG or (909) 386-8401.

**ANA VILLANUEVA**
**Hazardous Materials Specialist**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
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CUPA

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CUPA COMPLIANCE INSPECTION REPORT

| | |
|---|---|
| NAME: THREE D DAIRY | FACILITY ID: FA0000668 |
| ADDRESS: 8485 EDISON AVE | CERS ID: 10034842 |
| CITY: ONTARIO STATE: CA ZIP CODE: 91762 | INSPECTION DATE: 10/11/2019 |

**Consent granted by:**

[X] **Photograph** [X] **Inspect** **Name:** Cory Dehoog **Title:** Ranch Hand

An inspection was conducted on 10/11/2019 to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Cory Dehoog, Ranch Hand, was the escort during the inspection. Also present during the inspection was Brian Wade Hazardous Materials Specialist with San Bernardino County Fire.

The facility is a dairy cow milking operation. The hazardous materials stored on site are used for vehicle and equipment fueling and for cleaning and sanitizing the milking operation. This facility does not routinely generate hazardous waste.

Inventory:

-back up generator with approximately 100 gallons of diesel fuel
-(1) 275 gallon tote of Soft Dine 10 sanitizing teat dip
-(2) 55 gallon drums of Pre Prep Gold 55
-(2) 55 gallon drum of sodium hypochlorite
-(1) 30 gallon drums of Hydroclean chlorinated cleaner
-(1) 30 gallon drum of acid cleaner
-(1) 251 cubic feet cylinder of oxygen

Document Review:

- CUPA permits were valid during the time of the inspection and expire 4/30/2020.
- California Environmental Reporting System (CERS) I.D. number: 10034842.
- All equipment and vehicles were serviced by Ross Avery.
- Chemicals were supplied by The Chem Guys and Vetex.
- Empty drums were picked up during the time of new deliveries.
- Diesel fuel was supplied by Merit Oil.

Complete and submit the Certificate of Compliance (CofC) provided along with all requested documentation, to the attention of Ana Villanueva within 30 days of inspection.

Please contact Ana Villanueva at (909)386-8401 or by email at avillanueva@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

***Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.***

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| 42 | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | **Hazardous Materials Business Plan Submittal** | CHSC | 25505, 25508(a)(1) | X |
| Violation: | Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities. | | | |
| MINOR | OBSERVATION: This facility has not submitted a complete business plan via CERS. | | | |
| | CORRECTIVE ACTION: Submit a signed statement that the business plan has been submitted via CERS. Your CERS ID number is10034842. | | | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | CHSC | 25510(a) | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508(a)(1), 25508.2 | |

| | | | | |
|---|---|---|---|---|
| H209 | Business Plan Update Within 30 day[illegible] change | CHSC | 25508.1(a)-(f) | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | CHSC | 25508(a)(1) | |
| H211 | Hazardous Materials Inventory | CHSC | 25505, 25506, 25508 | |
| H212 | Site Map | CHSC | 25505(a)(2), 25508(a)(1) | |
| H213 | Emergency Response Plan | CHSC | 25505(a)(3), 25508(a)(1) | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Documentation | CHSC | 25505(a)(4) | |
| H216 | Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Response Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,255 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: 10/11/19 12:10:44PM<br>LTR:10/11/2019 12:01:25PM |
|---|---|---|
| ANA VILLANUEVA | CORY DEHOOG | RANCH HAND |
| INSPECTOR NAME | NAME<br>INSPECTION DATE: 10/11/2019 | TITLE<br>REPORT DATE: 10/11/19 1:55 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations.**
**THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

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# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ANA VILLANUEVA within 30 days of inspection unless otherwise specified.**

RESPONDENT: Cory Dehoog

VIOLATION(S) CITED ON: 10/11/2019

FACILITY NAME: **THREE D DAIRY** FACILITY ID: **FA0000668**

SITE ADDRESS: **8485 EDISON AVE** CERS ID: **10034842**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H203 CORRECTIVE ACTION: Submit a signed statement that the business plan has been submitted via CERS. Your CERS ID number is10034842.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

# PHOTO NARRATIVE



PHOTO 1

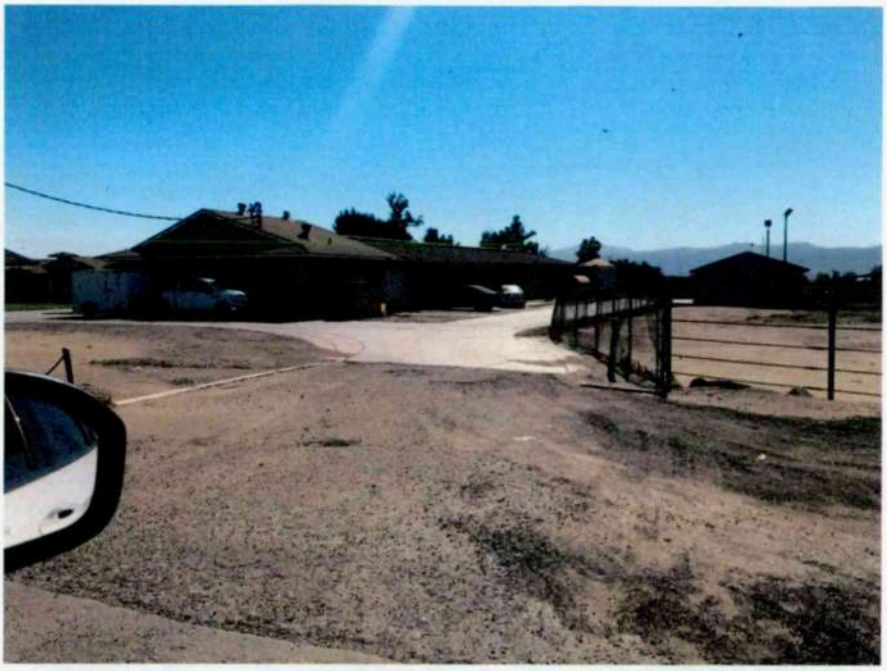

PHOTO 2

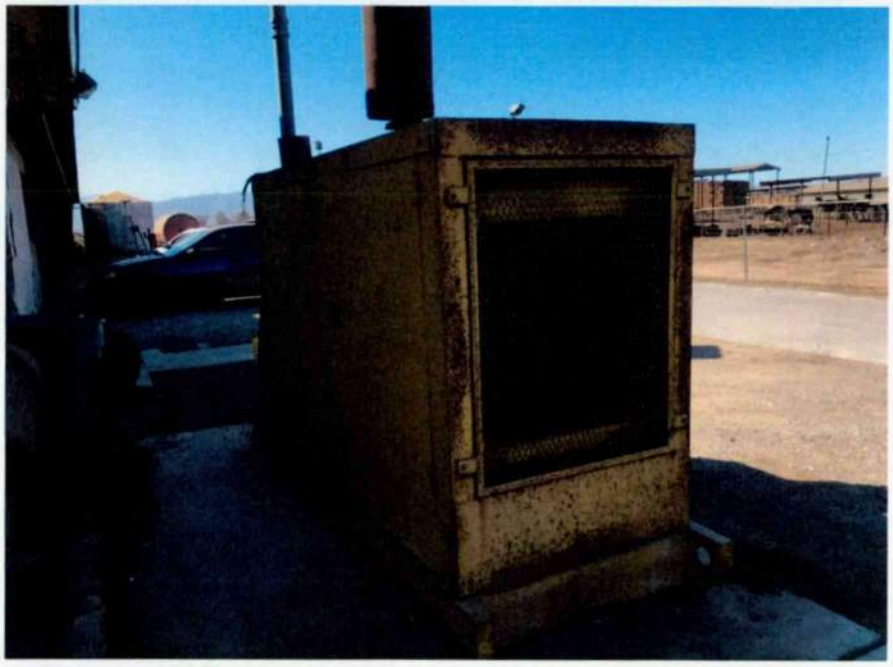

| Facility/ Case Name: Three D Dairy | Facility ID #: FA0000668 |
|---|---|
| Address: 8485 Edison Ave., Ontario, CA 91762 | |
| *1) Description:* Front of the facility from Edison Ave facing south. | |
| *2) Description:* Backup generator with approximately 100 gallons of diesel fuel located on the north side of the property. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature:

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

| Facility/ Case Name: Three D Dairy | Facility ID #: FA0000668 |
|---|---|
| Address: 8485 Edison Ave., Ontario, CA 91762 | |
| *3) Description:* (1) 275 gallon tote of Soft Dine 10 sanitizing teat dip, (2) 30 gallon drums of Pre Prep Gold 55 lactic acid, (2) empty 5 gallon containers, and (1) empty pail located in the milking barn. | |
| *4) Description:* (2) 55 gallon drums of sodium hypochlorite and (1) empty Folgers container located in the milking barn. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature:

# PHOTO NARRATIVE



PHOTO 5

PHOTO 6

| | |
|---|---|
| Facility/ Case Name: Three D Dairy | Facility ID #: FA0000668 |
| Address: 8485 Edison Ave., Ontario, CA 91762 | |
| *5) Description:* (1) 251 cubic feet cylinder of oxygen located on a maintenance truck. | |
| *6) Description:* (1) 30 gallon drum of acid cleaner and (1) 30 gallon drum of Hydroclean chlorinated cleaner located in the milking barn. | |

Date Taken: 10/11/2019

Taken By: Ana Villanueva

Signature: Ana Villanueva

RECEIVED
NOV 22 2016
S.B. CO. FIRE DEPT.

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 668 Facility Name: Three D Dairy Inspection Date: August 26, 2016
Site Address: 4485 Edison Avenue Phone #: 909-947-0944
City: Ontario Zip Code: 91762 EPA ID #: None
Consent Granted by:
☐ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner

*Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)*

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permits are current; 4/30/2017
**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste
**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) No spills or releases were observed
**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a)) (3) 55-gal drums non-iodine teat, (2) 30-gal drums acid cleaner, (2) 55-gal drums bleach, (1) 30 gal drum Hydroclean 400

☐ 202. A Business Plan has not been established. (CHSC 25507) ☒ 206. Business Plan not updated w/in 12 months (CHSC 25508.2)
7-14-07

☒ 203. A Business Plan has not been submitted. (CHSC 25508) CERS ID 10034842
**Compliance Requirement**: Using the California Environmental Reporting System (CERS), submit Business Plan information into the statewide information management system.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety training provided
**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements:

Heavy equipment serviced by Kent Avery

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A
**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A
**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A
**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

Chemicals delivered by SDS & The Chem Guys. Diesel by Merit Oil

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste
**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A
**Compliance Requirement**: Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A
**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspector: Brian Wade (Sign Name) Received By: Joe DeHoog (Sign Name) Title: PARTNER
Brian Wade (Print Name) Joe DeHoog (Print Name) Report Date: August 26, 2016

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Joe DeHoog (Name) 11-15-16 (Date)

# SAN BERNARDINO COUNTY FIRE DISTRICT

620 South "E" Street San Bernardino, CA 92415-0153 (909) 386-8401 Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Mark A. Hartwig**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal


October 29, 2016

THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

**ATTN: JOE DEHOOG**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0000668-THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

Mr. DeHoog,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on August 26, 2016:

- Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date.
- At least once every 12 months, the owner/owner shall review and certify that the information in the statewide information management system has been verified and is complete, accurate and up to date.

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at BWADE@SBCFIRE.ORG.

**BRIAN WADE, REHS**
**Hazardous Materials Division**


BOARD OF SUPERVISORS

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|---|---|---|---|---|---|
| Vice Chair, First District | Second District | Chair, Third District | Fourth District | Fifth District | Chief Executive Officer |

San Bernardino County CUPA

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 668 Facility Name: Three D Dairy Inspection Date: August 26, 2016

Site Address: 4485 Edison Avenue Phone #: 909-947-0944

City: Ontario Zip Code: 91762 EPA ID #: None

Consent Granted by:

☒ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner

*Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)*

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Permits are current; 4/30/2017

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Facility does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) No spills or releases were observed

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a)) (3) 55-gal drums non-iodine teat, (2) 30-gal drums acid cleaner, (2) 55-gal drums bleach, (1) 30 gal drum Hydroclean 400

☐ 202. A Business Plan has not been established. (CHSC 25507) 7-19-07

☒ 206. Business Plan not updated w/in 12 months (CHSC 25508.2)

☒ 203. A Business Plan has not been submitted. (CHSC 25508) CERS ID 10034842

**Compliance Requirement** : Using the California Environmental Reporting System (CERS), submit Business Plan information into the statewide information management system.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) Safety training provided

**Compliance Requirement**: Submit training documentation as required.

### Container Storage and Labeling Requirements: Heavy equipment serviced by Kent Avery

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Facility does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) N/A

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) N/A

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed .

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management: Chemicals delivered by SDS & The Chem Guys. Diesel by Merit Oil

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Facility does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A

**Compliance Requirement**: Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy

Inspector: Brian Wade (Sign Name) Received By: [signature] (Sign Name) Title: PARTNER

Brian Wade (Print Name) Joe DeHoog (Print Name) Report Date: August 26, 2016

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** _____ Name _____ Date

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Three D Dairy** Facility ID #: **668**

Address: **8485 Edison Avenue Ontario, CA 91762**

1) Description: **View of the facility from Edison facing South.**

2) Description: **(2) 55-gallon drums of non-iodine teat dip stored in the milking barn.**

Date Taken: **8/26/2016**

Taken By: **Brian Wade**

Signature: Brian Wade

Revised 02/27/03

# PHOTO NARRATIVE



**PHOTO 3**

| | | | |
|---|---|---|---|
| Facility/Case Name: | **Three D Dairy** | Facility ID #: | **668** |
| Address: | **8485 Edison Avenue Ontario, CA 91762** | | |
| 1) Description: | **Two 30-gallon drums of acid cleaner, (2) 55-gallon drums of bleach, and (1) 30-gallon drum of Hydroclean 400 stored in the milking barn.** | | |
| Date Taken: | **8/26/2016** | | |
| Taken By: | **Brian Wade** | Signature: | Brian Wade |

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 668 Facility Name: THREE "D" DAIRY Inspection Date: 2/13/13

Site Address: 8485 EDISON AVE Phone #: 909-947-0944

City: ONTARIO Zip Code: 91762 EPA ID #: N/A

Consent Granted by: ☑ Inspect ☑ Photograph Name: MICHAEL DEHOOG Title: OWNER # Emp: Packet left on site? ~~Yes/No~~

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☐ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) ACTIVE
**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) N/A
**Compliance Requirement:** Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) NO SPILLS OBSERVED
**Compliance Requirement:** Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☐ 202. A Business Plan has not been established. (CHSC 25503.5)

INVENTORY: CONSISTENT WITH BP DISCLOSURE

☑ 203. A Business Plan has not been submitted/updated. (CHSC 25505)
↳ SEE SUPPLEMENTAL
**Compliance Requirement:** Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) N/A
**Compliance Requirement:** Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) HAZ WASTE NOT
☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) MANAGED ON SITE.
☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2))
**Compliance Requirement:** Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) N/A
**Compliance Requirement:** Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) N/A

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) N/A

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) N/A
**Compliance Requirement:** Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) N/A
**Compliance Requirement:** Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) N/A

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) N/A
**Compliance Requirement:** Submit copies of waste disposal records for the past N/A

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) N/A
**Compliance Requirement:** Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** FACILITY IS A DAIRY 1 OF 2

Inspected By: [signature] Sign Name Received By: [signature] Sign Name Title: X

MICHAEL ANANDA Print Name MICHAEL DE HOOG Print Name Report Date: 2/13/13

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 •www.sbcfire.org

# SUPPLEMENTAL INSPECTION REPORT

Page 2 of 2

INSPECTION DATE: 2/13/13

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| 668 | THREE D DAIRY | 8485 EDISON AVE ONTARIO 91762 |
| Consent Granted by: ☑ Inspect ☑ Photograph | NAME<br>MICHAEL DEHOOG | TITLE<br>OWNER |

#203 ANNUAL UPDATE TO BUSINESS PLAN REQUIRE, CHSC 25505
BUSINESS PLANS (BP) ARE REQUIRED TO BE UPDATED ANNUALLY,
CURRENT BP HAS NOT BEEN UPDATE SINCE 7/19/07
COMPLIANCE REQUIREMENT! USE CALIFORNIA ENVIRONMENTAL
REPORTING SYSTEM (CERS) TO SUBMIT THE ELEMENTS
OF THE BUSINESS PLAN W/IN 30 DAYS
WEBSITE! http://cers.calepa.ca.gov/

☑ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] (Sign Name) MICHAEL ARANDA (Print Name)

Received By: [signature] (Sign Name) MICHAEL DE HOOG (Print Name)

Title:

Report Date: 2/13/13

# PHOTO NARRATIVE



PHOTO 1

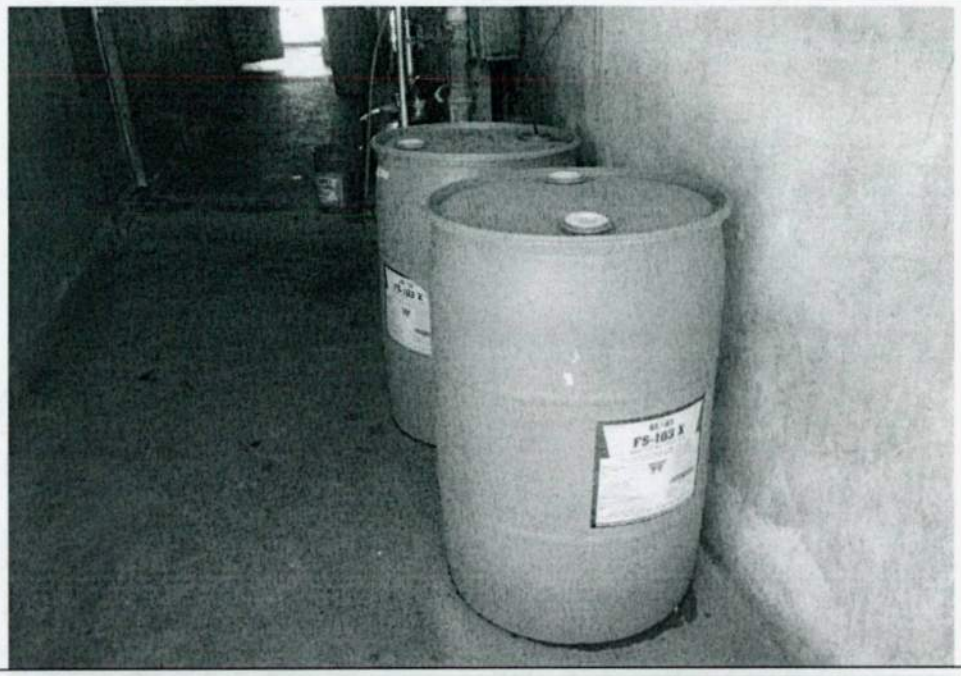

PHOTO 2

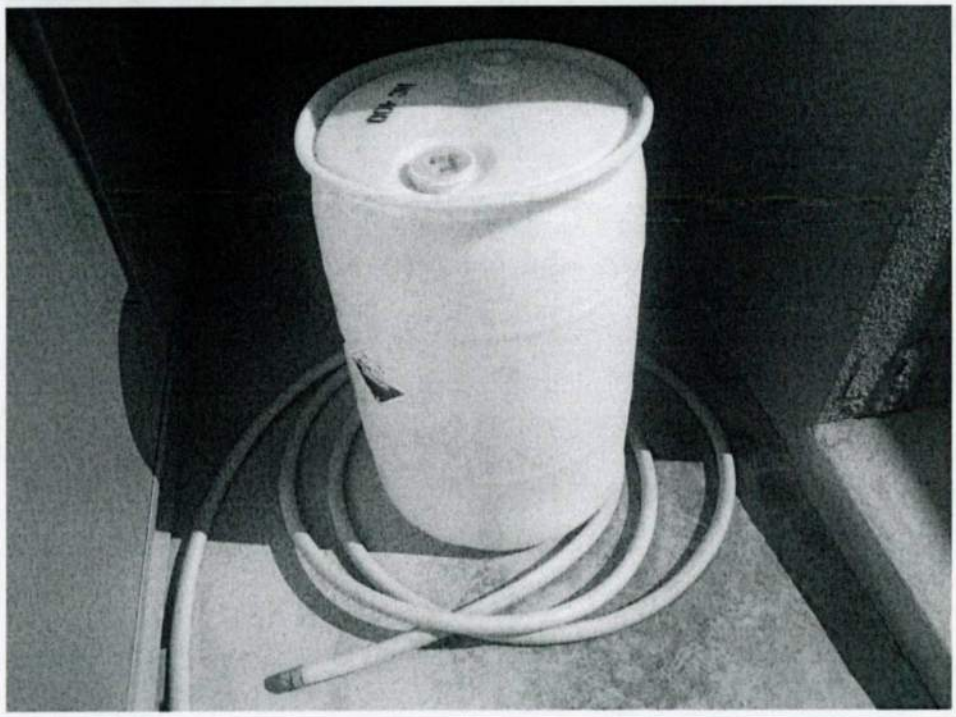

| | | |
|---|---|---|
| Facility/Case Name: | THREE D DAIRY | Facility ID#: 0000668 |
| Address: 8485 EDISON AVE, ONTARIO 91762 | | |
| Description #1: (2) 55 gallon drums of teat dip. | | |
| Description #2: (1) 30 gallon drum of acid cleaning solution. | | |
| Date Taken: February 13, 2013 | Taken By: Michael Aranda | |

Signature: _____

Revised 02/27/03

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

**OFFICE OF THE FIRE MARSHAL**
**HAZARDOUS MATERIALS DIVISION**
**620 South "E" Street • San Bernardino, CA 92415-0153**
**(909) 386-8401 • Fax (909) 386-8460**

PAT A. DENNEN
Fire Chief
County Fire Warden


November 30, 2007

Three D Dairy
8485 Edison Avenue
Ontario, CA 91762

**ATTENTION: JOE DEHOOG**

**SUBJECT: NOTICE OF BUSINESS PLAN DEFICIENCIES**

**FACILITY: 8485 EDISON AVENUE, ONTARIO**

The Business Emergency/Contingency Plan submitted to the Hazardous Materials Division have been determined to be deficient. California Health & Safety Code, Chapter 6.95, § 25505 (a)(2) states, "*If, after review, the administering agency determines that the handler's Business Plan is deficient in any way, the administering agency shall notify the handler of those deficiencies. The handler shall submit a corrected Business Plan within 30 days from the date of the notice.*"

***This letter constitutes formal notice of business plan deficiencies. Please submit 2 copies of the information requested below with a copy of this letter for final review within 30 days from the above date.***

**The following are the items requiring correction:**

Locally Collected Inventory Information page

- Taxpayer ID Number: Provide the Taxpayer or Federal ID Number.

Emergency Response Plans and Procedures page 1 (page 5)

- Evacuation/Notification: Provide a description of how employees, customers and visitors at this facility will be notified of an emergency, e.g. loudspeaker, hand held radios, etc. Also, indicate where the emergency staging area is located. Submit a revised Emergency Response Plans and Procedures page 1 (page 5).

Inventory

- All items listed on the Inventory Summary are required to have an included individual chemical description forms. No individual chemical description forms were submitted. Enclosed find partially completed individual forms (I was unable to complete all of the form due to lack of information).

Submit completed individual chemical description forms for all items.


MARK H. UFFER
County Administrative Officer

NORMAN A. KANOLD
Assistant County Administrator
Public and Support
Services Group

Board of Supervisors
BRAD MITZELFELT ..... First District
PAUL BIANE ..... Second District
DENNIS HANSBERGER ..... Third District
GARY C. OVITT ..... Fourth District
JOSIE GONZALES ..... Fifth District

**Failure to correct the outstanding deficiencies could result in further enforcement actions and additional fees. If the response to this deficiency letter does not result in correction of the deficiencies, a records review fee of $123/hr will be assessed to recover those costs associated with additional file review.**

*CA Health and Safety Code, Chapter 6.95, § 25505 (a)(3) states, "If a handler fails, after reasonable notice, to submit a business plan in compliance with this article, the administering agency shall immediately take appropriate action to enforce this article, including the imposition of civil and criminal penalties as specified in this article." Penalties for business plan violations can range from $2000-$5000/day.*

An electronic version of the Business Emergency/Contingency Plan Forms and Guidelines is available at our website www.sbcfire.org. Click on the HAZMAT bar located on the left side of the page. Then click on Forms & Guidelines in the title bar. Finally, click on the Business Plan title, this will link you to all forms associated with the Business Plan Program. Should you have any further questions, comments, or concerns, please feel free to contact me at (909) 386-8401 or lheaviside@sbcfire.org.

**LESLIE HEAVISIDE, REHS**
**Hazardous Materials Division, Field Services Section**
Enclosures: Business Emergency/Contingency Plan Guidelines and Forms
Example Business Emergency/Contingency Plan

# Business Emergency/Contingency Plan Receipt

Mail to: DEHOOG,MICHAEL
14350 WALKER AVE
CHINO, CA 91710-9171

Site Address: THREE D DAIRY
8485 EDISON AVE
ONTARIO, CA 91762

Service Request ID: SR0013880
Facility ID: FA0000668

The Business Emergency/Contingency Plan was received on July 19, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.

2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.

3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.

4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.

5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.

2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.

3. Change of business address, business ownership, or business name.

4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

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www.sbcfire.org

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

For Dept Use Only – Log In/Date Stamp

RECEIVED

JUL 19 2007

S.B. CO. FIRE DEPT.

FACILITY ID # F A

BUSINESS NAME (Same as FACILITY NAME or DBA) 3

Three D DAIRY

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 8485 Edison Ave | ONTARIO | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ *Items with an '*' are considered "Inventory" under State disclosure laws*

- ☐ * Business Activities Form
- ☐ * Business Owner/Operator Identification Form
- ☐ * Supplemental Emergency Contact Page
- ☐ Emergency Response Plans and Procedures
- ☐ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☐ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☐ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☐ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☐ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☐ Area map - photocopied city map with location of site indicated
- ☐ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☐ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☐ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.

- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is <u>not</u> being made to meet annual inventory submission requirements of EPCRA. **(EPCRA requires complete annual submission)**

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER 135 |
|---|---|---|
| Joe DeHoog | 6-18-07 | Joe DeHoog |

| NAME OF SIGNER (*print*) | TITLE OF SIGNER (*print*) |
|---|---|
| Joe DeHoog | Partner |

## BUSINESS E GENCY/CONTINGENCY PLAN COVER SH INSTRUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

| FACILITY ID # | F | A | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

| BUSINESS NAME (Same as FACILITY NAME or DBA) | EPA ID # (Hazardous Waste Only) |
|---|---|
| | |

| BUSINESS ADDRESS | CITY | ZIP CODE |
|---|---|---|
| | | |

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731)<br>* CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM<br>* UST TANK (Pages 1 and 2) (One set per tank)<br>* HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page<br>* BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY<br>* ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0002668 Facility Name: Three D Dairy Inspection Date: May 29, 2007

Site Address: 8485 Edison Phone #: (909) 947-3944

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by: ☐ Inspect ☐ Photograph Name: Joe DeHaan Title: Partner # Emp: 6 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires material handler permit (ML)

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste

**Compliance Requirement**: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking

**Compliance Requirement**: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

**INVENTORY:** (1) 55 gal hot Diesel tank - generator 3/55-gal drums feed dip (1) 55-gal sanitizing tank 2) 30-gal drums concentrated liquid cleaner 2) 30-gal drums acid cleaner (1) 55-gal drum sodium

**Compliance Requirement**: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement**: Submit training documentation as required.

RECEIVED JUL 19 2007 S.B. CO. FIRE DEPT.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) Does not generate waste

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) Does not generate waste

**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) Does not generate waste

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) Does not generate waste

**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) " " "

**Compliance Requirement**: Submit copies of waste disposal records for the past " " " "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters

**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Kent Dairy Repair Inc. services equipment.

Inspected By: [signature] (Sign Name) Leslie Hamilton (Print Name)

Received By: Joe DeHaan (Sign Name) Joe DeHaan (Print Name)

Title: Partner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Joe DeHaan (Name) 6-30-07 (Date)



Note: Diesel fuel from 8381 address is stored with this location

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0001668 Facility Name: Three D Dairy Inspection Date: May 29, 2007

Site Address: 8485 Edison Phone #: (909) 947-2944

City: Ontario Zip Code: 91762 EPA ID #: NA

Consent Granted by:

☒ Inspect ☒ Photograph Name: Joe DeHoog Title: Partner # Emp: 6 Packet left on site? Yes/No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

### General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Requires material handler permit only.

**Compliance requirement: Submit fees within 30 days of billing.**

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste.

**Compliance Requirement:** Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) All containers closed & not leaking.

**Compliance Requirement:** Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☐ 203. A Business Plan has not been submitted / updated. (CHSC 25505)

INVENTORY: (1) ~ 50 gal AST Diesel back-up generator. (3) 55-gal drums tank dip (1) 55-gal sanitizing tank dip (2) 30-gal drums chlorinated liquid cleaner (2) 30-gal drums acid cleaner (1) 55-gal drum sodium hypochl

**Compliance Requirement:** Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training

**Compliance Requirement:** Submit training documentation as required.

### Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) Does not generate waste

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) Does not generate waste

**Compliance Requirement:** Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste

**Compliance Requirement:** Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) Does not generate waste

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) Does not generate waste

**Compliance Requirement:** Waste containers must be sound, not leaking and closed when not in use.

### Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste

**Compliance Requirement:** Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) " " "

**Compliance Requirement:** Submit copies of waste disposal records for the past " " " "

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate used oil filters.

**Compliance Requirement:** Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. Kent dairy repair, tires services equipments

Inspected By: [signature] Sign Name Leslie Henrikse Print Name

Received By: [signature] Sign Name Joe DeHoog Print Name

Title: Partner

Report Date: May 29, 2007

**Sign and submit the yellow copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

Form Revised 1/16/2007 15-21060-638 Rev. 2/07 DISTRIBUTION: White – CUPA File Yellow – Facility returns to CUPA Pink – Facility

Note: Diesel fuel from 8381 address is shared with this location.

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Three D Dairy** Facility ID #: **FA0000668**

Address: **8485 Edison, Ontario**

1) Description: **Back-up generator containing approximately 50-gallons of Diesel Fuel**

2) Description: **(3) 55-gallon drums of teat dip**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: Li Hei

Revised 10/12/2000

# PHOTO NARRATIVE



PHOTO 3

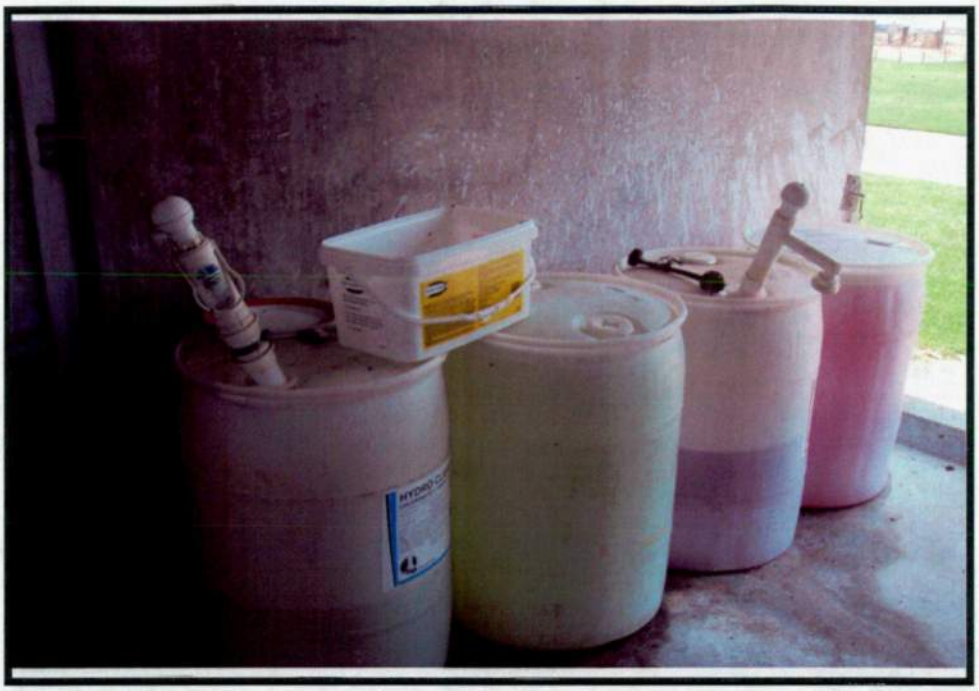

PHOTO 4

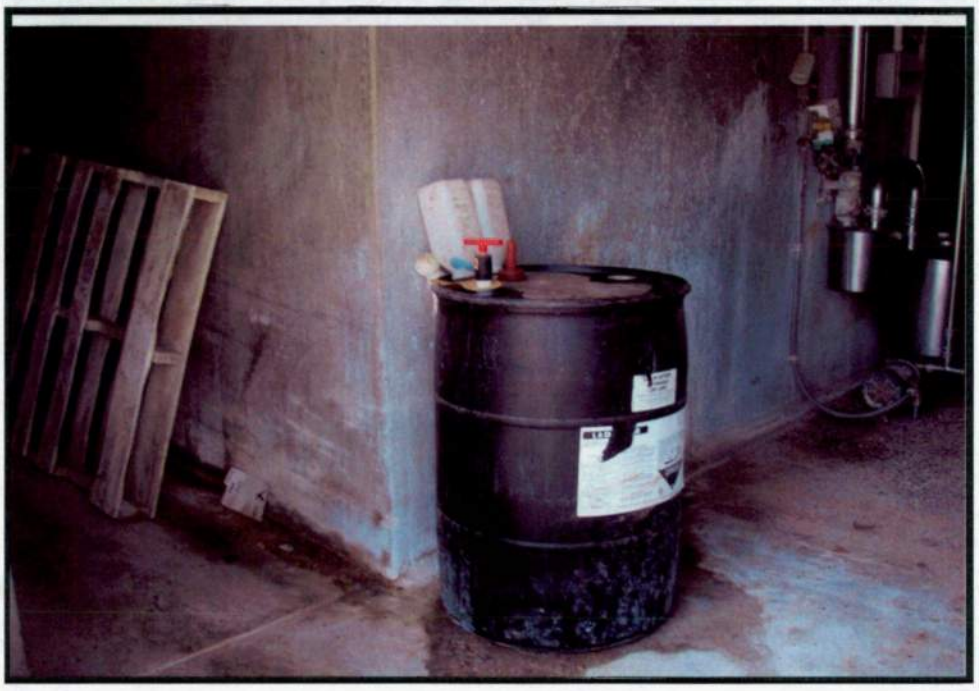

Facility/Case Name: **Three D Dairy** Facility ID #: **FA0000668**

Address: **8485 Edison, Ontario**

3) Description: **(2) 30-gallon drums of hydro clean 400 (potassium hydroxide & sodium hydroxide)**

4) Description: **(1) 55-gallon drum of sodium hypochlorite**

Date Taken: **05-29-2007**

Taken By: **Leslie Heaviside** Signature: Le He

Revised 10/12/2000

S

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

THREE D DAIRY
MICHAEL DEHOOG
8485 EDISON AVE
ONTARIO, CA 91762

RECEIVED
FEB 26 2020
SBCFIRE - HAZMAT

9590 9402 4889 9032 8171 17

2. Article Number *(Transfer from service label)*

7019 2280 0001 8674 2560

***COMPLETE THIS SECTION ON DELIVERY***

A. Signature

X NOEL M

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

FEB 22 2020

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

PS Form 3811, July 2015 PSN 7530-02-000-9053 Domestic Return Receipt

USPS TRACKING #

9590 9402 4889 9032 8171 17

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

**United States Postal Service**

• Sender: Please print your name, address, and ZIP+4® in this box•

COUNTY OF SAN BERNARDINO
OFFICE OF THE FIRE MARSHAL
620 SOUTH "E" STREET
SAN BERNARDINO, CA 92415

SAN BERNA. INO COUNTY FIRE PROTECT. .N DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

Office of the Fire Marshal
Hazardous Materials Division
sbcfire.org

Daniel R. Munsey
Fire Chief/Fire Warden

Michael A. Horton
Fire Marshal/Deputy Fire Warden

February 20, 2020

**THREE D DAIRY**
**ATTN: MICHAEL DEHOOG**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

RECEIVED
FEB 20 2020
SBCFIRE - HAZMAT

**CERTIFIED MAIL NO: 7019 2280 0001 8674 2560**

## ADMINISTRATIVE ENFORCEMENT ORDER WITH PENALTIES

**YOU ARE IN VIOLATION**

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials using the California Environmental Reporting System (CERS) annually, per California Health & Safety Code (CHSC) Section 25508. On October 11, 2019, the San Bernardino County Fire Hazardous Materials Division (HMD) conducted a routine inspection and issued a Notice of Violation, notifying the facility operator of the legal requirement to annually submit Business Plan information electronically using the California Environmental Reporting System (CERS) by November 11, 2019. On February 3, 2020, another Notice of Violation letter was sent to your facility, listing the violation and requiring compliance upon receipt.

**As of the date of this notice, this violation has not been corrected.**

Due to the above violation, CHSC Section 25404.1 authorizes HMD to pursue **immediate enforcement action**, including the imposition of a monetary penalty.

**ENFORCEMENT ORDER AND PENALTIES**

For the above noted violation, CHSC Section 25515 establishes a maximum penalty of **$5,000.00 for each day** in which the violation occurred. This letter serves to inform you that HMD is offering a settlement through the attached Consent Order Agreement. If settlement cannot be reached, HMD intends to issue a **Formal Enforcement Order** against above noted facility, which will impose a penalty of **$5,000.00 or more.** The Enforcement Order will be issued **within 20 days of receipt of this notice UNLESS you complete all of steps 1 through 4 on the following page:**

BOARD OF DIRECTORS

Robert A. Lovingood, First District | Janice Rutherford, Second District | Dawn Rowe, Third District | Curt Hagman, Chairman, Fourth District | Josie Gonzales, Vice Chair, Fifth District | Gary McBride, Chief Executive Officer

**SENDER: *COMPLETE THIS SECTION***

- Complete items 1, 2, and 3.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

THREE D DAIRY
Attn: MICHAEL DEHOOG
8485 EDISON AVE
ONTARIO, CA 91762

9590 9402 4889 9032 8174 83

2. Article Number *(Transfer from service label)*

7019 1120 0000 7119 0904

***COMPLETE THIS SECTION ON DELIVERY***

A. Signature

X

☐ Agent
☐ Addressee

B. Received by *(Printed Name)*

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type

☐ Adult Signature
☐ Adult Signature Restricted Delivery
☐ Certified Mail®
☐ Certified Mail Restricted Delivery
☐ Collect on Delivery
☐ Collect on Delivery Restricted Delivery
☐ Priority Mail Express®
☐ Registered Mail™
☐ Registered Mail Restricted Delivery
☐ Return Receipt for Merchandise
☐ Signature Confirmation™
☐ Signature Confirmation Restricted Delivery

(over $500)

PS Form 3811, July 2015 PSN 7530-02-000-9053

Domestic Return Receipt

USPS TRACKING #

9590 9402 4889 9032 8174 83

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

**United States Postal Service**

• Sender: Please print your name, address, and ZIP+4® in this box•

COUNTY OF SAN BERNARDINO
OFFICE OF THE FIRE MARSHAL
620 SOUTH "E" STREET
SAN BERNARDINO, CA 92415

RECEIVED
FEB 12 2024
SBCFIRE - Hi...

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Daniel R. Munsey**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal/Deputy Fire Warden


RECEIVED
FEB 03 2020
SBCFIRE - HAZMAT

ENTERED 2/3

**February 3, 2020**

**THREE D DAIRY**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

# NOTICE OF VIOLATION

| | | | |
|---|---|---|---|
| **CUPA Facility ID:** | FA0000668 | **CERS ID:** | 10034842 |
| **Facility Name:** | THREE D DAIRY | **Business Owner:** | MICHAEL DEHOOG |
| **Business Address:** | 8485 EDISON AVE<br>ONTARIO, CA 91762 | **Certified Mail:** | 7019 1120 0000 7119 0904 |

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials and hazardous waste using the **California Environmental Reporting System (CERS)** annually by March 1st. Your facility was also provided reasonable notice of this requirement from this agency in subsequent emails and/or inspections since that date.

**VIOLATION:** Failure to electronically submit / update business plan information annually using the statewide information management system, also known as CERS - California Health & Safety Code §25508(a)(1)(A) or 25508.2

**OBSERVATION:** As of the date of this letter, one or more of the following elements have not been submitted / updated in CERS:

- FACILITY INFORMATION
- HAZARDOUS MATERIALS INVENTORY
- EMERGENCY RESPONSE AND TRAINING PLANS

**REQUIREMENT:** Immediately submit / update business plan information using the instructions for accessing CERS and submitting business plan information that can be found on our website at http://www.sbcfire.org/ofm/Hazmat/ElectronicReporting-CERS.aspx

**COMPLY BY:** **Immediately**

**NOTE: In accordance with Section 25515 of the California Health and Safety Code, a business that knowingly violates this article after reasonable notice of the violation is liable for an administrative penalty of up to five thousand dollars ($5,000) for each day in which the violation occurs. Failure to submit in CERS immediately may subject your facility to this penalty. This will be your final notice-before administrative action takes place.**

**ADDITIONAL NOTE:** There may be other violations that are still open from the last inspection conducted at your facility. Please refer to the last inspection report that you received from this agency to verify compliance with all open violations, or contact this office to speak with the district inspector about complying with those violations.

Should you have any questions regarding this Notice of Violation, please contact Greg Zeigler at (909) 386-8423. For assistance with your CERS submittal, please contact the CERS Helpline at (909) 386-8432.

*Greg Zeigler, R.E.H.S.*
**Hazardous Materials Specialist IV, Enforcement Section**


BOARD OF DIRECTORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
|---|---|---|---|---|---|
| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

7019 2280 0001 8674 2560

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**CERTIFIED MAIL® RECEIPT**
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**OFFICIAL USE**

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Extra Services & Fees *(check box, add fee as appropriate)*
- ☐ Return Receipt (hardcopy) $
- ☐ Return Receipt (electronic) $
- ☐ Certified Mail Restricted Delivery $
- ☐ Adult Signature Required $
- ☐ Adult Signature Restricted Delivery $

Postmark Here

Postage
$

Total Postag
$

Sent To
THREE D DAIRY
MICHAEL DEHOOG
8485 EDISON AVE
ONTARIO, CA 91762

Street and A

City, State, Zip+4

PS Form 3800, April 2015 PSN 7530-02-000-9047 See Reverse for Instructions

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT

620 South "E" Street • San Bernardino, CA 92415-0153 • (909) 386-8401 • Fax (909) 386-8460

**Office of the Fire Marshal**
**Hazardous Materials Division**
**sbcfire.org**

**Daniel R. Munsey**
Fire Chief/Fire Warden

**Michael A. Horton**
Fire Marshal/Deputy Fire Warden


February 20, 2020

**THREE D DAIRY**
**ATTN: MICHAEL DEHOOG**
**8485 EDISON AVE**
**ONTARIO, CA 91762**

**CERTIFIED MAIL NO: 7019 2280 0001 8674 2560**

## ADMINISTRATIVE ENFORCEMENT ORDER WITH PENALTIES

---

**YOU ARE IN VIOLATION**

Beginning on January 1, 2013, Assembly Bill 2286 implemented the requirement for all regulated businesses to submit their business plan information regarding hazardous materials using the California Environmental Reporting System (CERS) annually, per California Health & Safety Code (CHSC) Section 25508. On October 11, 2019, the San Bernardino County Fire Hazardous Materials Division (HMD) conducted a routine inspection and issued a Notice of Violation, notifying the facility operator of the legal requirement to annually submit Business Plan information electronically using the California Environmental Reporting System (CERS) by November 11, 2019. On February 3, 2020, another Notice of Violation letter was sent to your facility, listing the violation and requiring compliance upon receipt.

**As of the date of this notice, this violation has not been corrected.**

Due to the above violation, CHSC Section 25404.1 authorizes HMD to pursue **immediate enforcement action**, including the imposition of a monetary penalty.

---

**ENFORCEMENT ORDER AND PENALTIES**

For the above noted violation, CHSC Section 25515 establishes a maximum penalty of **$5,000.00 for each day** in which the violation occurred. This letter serves to inform you that HMD is offering a settlement through the attached Consent Order Agreement. If settlement cannot be reached, HMD intends to issue a **Formal Enforcement Order** against above noted facility, which will impose a penalty of **$5,000.00 or more.** The Enforcement Order will be issued **within 20 days of receipt of this notice <u>UNLESS</u> you complete all of steps 1 through 4 on the following page:**


BOARD OF DIRECTORS

| Robert A. Lovingood | Janice Rutherford | Dawn Rowe | Curt Hagman | Josie Gonzales | Gary McBride |
|---|---|---|---|---|---|
| First District | Second District | Third District | Chairman, Fourth District | Vice Chair, Fifth District | Chief Executive Officer |

## YOU MUST COMPLETE ALL OF THE FOLLOWING FOUR STEPS:

1. **Immediately submit** the Business Plan information into the CERS system: You are encouraged to contact this office at (909) 386-8432 for assistance with completing the CERS submittal. **The CERS submittal must be completed within 20 days of receipt of this letter** (verified by certified mail).
2. **Sign** the enclosed **Consent Order** (Attachment 1); review and sign the enclosed Consent Order.
3. **Pay** the penalty in the amount of **$500.00:** through this Consent Order settlement, HMD has chosen to accept a penalty in an amount less than the maximum amount ($5,000/day). Payable by check, cashier's check, or money order. Payment shall be made payable to "San Bernardino County Fire Department" and shall identify the Respondent, the HM Case No. and the Case File No. as shown in the heading of this Consent Order. Payment shall be mailed or delivered to 620 South "E" Street, San Bernardino, CA 92415-0153.
4. **Return** the signed Consent Order and penalty payment to HMD within 20 days of receipt.

Completing **all** of the above requirements **within 20 days of receipt** will resolve the violation and penalties cited in this letter.

Should you choose not to accept the above noted settlement agreement or fail to complete all of the above noted steps, a Formal Enforcement Order may be issued against you, imposing a penalty in an amount of $5,000.00 or more. Compliance with the CERS Business Plan submittal will still be required. HMD has the option of referring this case to the District Attorney's Office for enforcement as well.

Should you have questions concerning this notice, please contact Greg Zeigler at (909) 386-8423.

Greg Beach

**Greg Beach, Supervising Hazardous Materials Specialist**
**Hazardous Materials Division**
**Office of the Fire Marshal**
**San Bernardino County Fire Department**

Attachments: Consent Order (Attachment 1)

# Southwest Dairy Inc. (CERSID: 10444234)

**Facility Information Certified Feb 19, 2024**

Certified on 2/19/2024 2:35:05 PM by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

- Business Activities
- Business Owner/Operator Identification

**Hazardous Materials Inventory Certified Feb 19, 2024**

Certified on 2/19/2024 2:35:05 PM by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

- Hazardous Material Inventory (4)
- Site Map (Official Use Only)
  - *Annotated Site Map (Official Use Only)* (Adobe PDF, 4417KB)

**Emergency Response and Training Plans Certified Feb 19, 2024**

Certified on 2/19/2024 2:35:05 PM by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

- Emergency Response/Contingency Plan
  - *Emergency Response/Contingency Plan* (Adobe PDF, 664KB)
- Employee Training Plan
  - Provided In Submital Element: Emergency Response and Training Plans

## Site Identification

**Southwest Dairy Inc.**
14213 Bon View Ave
Ontario, CA 91762

County
San Bernardino

CERS ID
**10444234**

EPA ID Number

## Submittal Status

Certified on 2/19/2024 by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

## Hazardous Materials

| | |
|---|---|
| Does your facility have on site (for any purpose) at any one time, hazardous materials at or above 55 gallons for liquids, 500 pounds for solids, or 200 cubic feet for compressed gases (include liquids in ASTs and USTs); or is regulated under more restrictive inventory local reporting requirements (shown below if present); or the applicable Federal threshold quantity for an extremely hazardous substance specified in 40 CFR Part 355, Appendix A or B; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70? | Yes |

## Underground Storage Tank(s) (UST)

| | |
|---|---|
| Does your facility own or operate underground storage tanks? | No |

## Hazardous Waste

| | |
|---|---|
| Is your facility a Hazardous Waste Generator? | No |
| Does your facility treat hazardous waste on-site? | No |
| Is your facility's treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | No |
| Does your facility consolidate hazardous waste generated at a remote site? | No |
| Does your facility need to report the closure/removal of a tank that was classified as hazardous waste and cleaned on-site? | No |
| Does your facility generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month greater than 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | No |
| Is your facility a Household Hazardous Waste (HHW) Collection site? | No |

## Excluded and/or Exempted Materials

| | |
|---|---|
| Does your facility recycle more than 100 kg/month of excluded or exempted recyclable materials (per HSC 25143.2)? | No |

## Aboveground Petroleum Storage

| | |
|---|---|
| Does your facility own or operate aboveground petroleum storage tanks or containers AND:<br>* have a total aboveground petroleum storage capacity of 1,320 gallons or more, OR<br>* have one or more petroleum tanks in an underground area? | No |

## Regulated Substances

| | |
|---|---|
| Does your facility have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release prevention Program (CalARP)? | No |

## Additional Information

No additional comments provided.

## Facility/Site

**Southwest Dairy Inc.**
14213 Bon View Ave
Ontario, CA 91762

CERS ID
**10444234**

## Submittal Status

Certified on 2/19/2024 by *Bryn Ameye* of Southwest Dairy Inc. (Ontario)

## Identification

Daric Ameye

| Operator Phone | Business Phone | Business Fax |
|---|---|---|
| (909) 754-4642 | (909) 754-4642 | |

| Beginning Date | Ending Date | |
|---|---|---|
| | | |
| **Dun & Bradstreet** | **SIC Code** | **Primary NAICS** |

## Facility/Site Mailing Address

14213 Bon View Ave
Ontario, CA 91762

## Primary Emergency Contact

Daric Ameye
Title
Owner/Operator

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (909) 754-4642 | (909) 754-4642 | |

## Owner

Daric Ameye
(909) 754-4642
14213 Bon View Ave
Ontario, CA 91762

## Secondary Emergency Contact

Bryn Ameye
Title
Owner/Operator

| Business Phone | 24-Hour Phone | Pager Number |
|---|---|---|
| (760) 594-6078 | (760) 594-6078 | |

## Billing Contact

Daric Ameye
(760) 594-6078 southwestdairyinc@gmail.com
14213 Bon View Ave
Ontario, CA 91762

## Environmental Contact

Daric Ameye
(99) 754-4642 southwestdairyinc@gmail.com
14213 Bon View Ave
Ontario, CA 91762

| Name of Signer | Signer Title | Document Preparer |
|---|---|---|
| Daric Ameye | Owner/Operator | Daric Ameye |

Additional Information

## Locally-collected Fields

Some or all of the following fields may be required by your local regulator(s).

### Property Owner

Phone

Mailing Address
southwestdairyinc@gmail.com
Ontario, CA 91762

Assessor Parcel Number (APN)

Number of Employees
2

Facility ID
FA0014875

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | | | |
|---|---|---|---|---|---|
| CERS Business/Org. | **Southwest Dairy Inc.** | Chemical Location | | CERS ID | **10444234** |
| Facility Name | **Southwest Dairy Inc.**<br>14213 Bon View Ave, Ontario 91762 | **South side of Milking Barn** | | Facility ID | **FA0014875** |
| | | | | Status | **Submitted** on 2/19/2024 2:35 PM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities Max. Daily | Largest Cont. | Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only) Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TCB 5000 Teat Dip** | **Gallons** | **500** | | | | | 2-bromo-2-nitro-1,3-propanediol | 0% | | 000052-51-7 |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue | Waste Code | | | | | |
| | | Type: Mixture | Days on Site: 365 | | Temperature | | | | | | |

# Hazardous Materials And Wastes Inventory Matrix Report

| | | | |
|---|---|---|---|
| CERS Business/Org. | **Southwest Dairy Inc.** | Chemical Location | CERS ID **10444234** |
| Facility Name | **Southwest Dairy Inc.**<br>14213 Bon View Ave, Ontario 91762 | **Wash House of Milking Barn** | Facility ID **FA0014875**<br>Status **Submitted** on 2/19/2024 2:35 PM |

| DOT Code/Fire Haz. Class | Common Name | Unit | Quantities: Max. Daily | Quantities: Largest Cont. | Quantities: Avg. Daily | Annual Waste Amount | Federal Hazard Categories | Hazardous Components (For mixture only): Component Name | % Wt | EHS | CAS No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Acid Cleaner EC** | **Gallons** | **110** | | | | - Health Acute Toxicity | Phosphoric Acid | 10% | | 7664-38-2 |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue: Ambient | Waste Code | | Nitric Acid | 10% | | 7697-37-2 |
| | | Type: Mixture | Days on Site: 365 | | Temperature: Ambient | | | Sulfuric Acid | 10% | | 7664-93-9 |
| | **LA Chemchlor** | **Gallons** | **110** | | | | - Health Acute Toxicity | Sodium Hypochlorite | 13% | | 7681-52-9 |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue: Ambient | Waste Code | | Sodium Hydroxide | 2% | | 1310-73-2 |
| | | Type: Mixture | Days on Site: 365 | | Temperature: Ambient | | | | | | |
| | **Velocity Two Detergent** | **Gallons** | **110** | | | | - Health Acute Toxicity | Sodium Hydroxide | 30% | | 1310-73-2 |
| | CAS No | State: Liquid | Storage Container: Plastic/Non-metalic Drum | | Pressue: Ambient | Waste Code | | | | | |
| | | Type: Mixture | Days on Site: 365 | | Temperature: Ambient | | | | | | |

&$/,)251,$ (19,5210(17$/ 5(3257,1*SYSTEM (CERS)

# CONSOLIDATED EMERGENCY RESPONSE / CONTINGENCY PLAN

*Prior to completing this Plan, please refer to the INSTRUCTIONS FOR COMPLETING A CONSOLIDATED CONTINGENCY PLAN*

## A. FACILITY IDENTIFICATION AND OPERATIONS OVERVIEW

FACILITY ID # F A 0 0 1 4 8 7 5 A1.

CERS ID # 1044234 A2.

DATE OF PLAN PREPARATION/REVISION (MM/DD/YYYY) 06/30/2022 A3.

BUSINESS NAME *(Same as Facility Name or DBA - Doing Business As)* A4.
Southwest Dairy Inc

BUSINESS SITE ADDRESS A5.
14213 Bon View Ave

BUSINESS SITE CITY A6.
Ontario

CA

ZIP CODE A7.
91762

TYPE OF BUSINESS (e.g., Painting Contractor) A8.
Dairy Farm

INCIDENTAL OPERATIONS (e.g., Fleet Maintenance) A9.

THIS PLAN COVERS CHEMICAL SPILLS, FIRES, AND EARTHQUAKES INVOLVING (Check all that apply): A10.

☒ 1. HAZARDOUS MATERIALS; ☐ 2. HAZARDOUS WASTES

## B. INTERNAL RESPONSE

INTERNAL FACILITY EMERGENCY RESPONSE WILL OCCUR BY (Check all that apply): B1.

☒ 1. CALLING PUBLIC EMERGENCY RESPONDERS (e.g., 9-1-1)
☐ 2. CALLING HAZARDOUS WASTE CONTRACTOR
☐ 3. ACTIVATING IN-HOUSE EMERGENCY RESPONSE TEAM

## C. EMERGENCY COMMUNICATIONS, PHONE NUMBERS AND NOTIFICATIONS

In the event of an emergency involving hazardous materials and/or hazardous waste, all facilities must IMMEDIATELY:
1. Notify facility personnel and evacuate if necessary in accordance with the Emergency Action Plan (Title 8 California Code of Regulations §3220);
2. Notify local emergency responders by calling 9-1-1;
3. Notify the local Unified Program Agency (UPA) at the phone number below; and
4. Notify the State Warning Center at (800) 852-7550.

Facilities that generate, treat, store or dispose of hazardous waste have additional responsibilities to notify and coordinate with other response agencies. Whenever there is an imminent or actual emergency situation such as an explosion, fire, or release, the Emergency Coordinator must follow the appropriate requirements for the category of facility and type of release involved:
1. Title 22 California Code of Regulations §66265.56. Emergency Procedures for generators of 1,000 kilograms or more of hazardous waste in any calendar month.
2. Title 22 California Code of Regulations §66265.196. Response to Leaks or Spills and Disposition of Leaking or Unfit-for-Use Tank Systems.
3. Title 40 Code of Federal Regulations §302.6. Notification requirements for a release of a hazardous substance equal to or greater than the reportable quantity.
4. Title 22 California Code of Regulations §66262.34(d)(2) and Title 40 Code of Federal Regulations §262.34(d)(5)(ii) for generators of less than 1000 kilograms of hazardous waste in any calendar month.

Following notification and before facility operations are resumed in areas of the facility affected by the incident, the Emergency Coordinator shall notify the local UPA and the local fire department's hazardous materials program, if necessary, that the facility is in compliance with requirements to:
1. Provide for proper storage and disposal of recovered waste, contaminated soil or surface water, or any other material that results from an explosion, fire, or release at the facility; and
2. Ensure that no material that is incompatible with the released material is transferred, stored, or disposed of in areas of the facility affected by the incident until cleanup procedures are completed.

EMERGENCY RESPONSE PHONE NUMBERS:

| | |
|---|---|
| AMBULANCE, FIRE, POLICE AND CHP | 9-1-1 |
| CALIFORNIA STATE WARNING CENTER (CSWC)/CAL OES | (800) 852-7550 |
| NATIONAL RESPONSE CENTER (NRC) | (800) 424-8802 |
| POISON CONTROL CENTER | (800) 222-1222 |
| LOCAL UNIFIED PROGRAM AGENCY (UPA) | (909) 386-8425 C1. |
| OTHER (Specify): C2. | C3. |
| NEAREST MEDICAL FACILITY / HOSPITAL NAME: C4. | C5. |

AGENCY NOTIFICATION PHONE NUMBERS:

| | |
|---|---|
| CALIFORNIA DEPT. OF TOXIC SUBSTANCES CONTROL (DTSC) | (916) 255-3545 |
| REGIONAL WATER QUALITY CONTROL BOARD (RWQCB) | (951) 782-4130 C6. |
| U.S. ENVIRONMENTAL PROTECTION AGENCY (US EPA) | (800) 300-2193 |
| CALIFORNIA DEPT. OF FISH AND WILDLIFE (CDFW) | (916) 358-2900 |
| U.S. COAST GUARD (USCG) | (202) 267-2180 |
| CAL OSHA | (916) 263-2800 |
| CAL FIRE OFFICE OF THE STATE FIRE MARSHAL (OSFM) | (916) 323-7390 |
| OTHER (Specify): C7. | C8. |
| OTHER (Specify): C9. | C10. |

INTERNAL FACILITY EMERGENCY COMMUNICATIONS OR ALARM NOTIFICATION WILL OCCUR BY (Check all that apply): C11.

☒ 1. VERBAL WARNINGS; ☐ 2. PUBLIC ADDRESS OR INTERCOM SYSTEM; ☒ 3. TELEPHONE;
☐ 4. PAGERS; ☐ 5. ALARM SYSTEM; ☐ 6. PORTABLE RADIO

NOTIFICATIONS TO NEIGHBORING FACILITIES THAT MAY BE AFFECTED BY AN OFF-SITE RELEASE WILL OCCUR BY (Check all that apply): C12.

☒ 1. VERBAL WARNINGS; ☐ 2. PUBLIC ADDRESS OR INTERCOM SYSTEM; ☒ 3. TELEPHONE;
☐ 4. PAGERS; ☐ 5. ALARM SYSTEM; ☐ 6. PORTABLE RADIO

EMERGENCY COORDINATOR CONTACT INFORMATION: C13.

PRIMARY EMERGENCY COORDINATOR NAME: Daric Ameye PHONE NO.:(909) 754-4642 PHONE NO.:

ALTERNATE EMERGENCY COORDINATOR NAME: Bryn Ameye PHONE NO.:(760) 594-6078 PHONE NO.:

☐ Check if additional Emergency Coordinator contact and address information is available onsite or by calling PHONE NO.:

Note: If more than one alternate emergency coordinator is designated, attach a list in order of responsibility.

## D. EMERGENCY CONTAINMENT AND CLEANUP PROCEDURES

Check the applicable boxes to indicate your facility's procedures for containing spills and preventing and mitigating releases, fires and/or explosions.

D1.

☒ 1. MONITOR FOR LEAKS, RUPTURES, PRESSURE BUILD-UP, ETC.;
☐ 2. PROVIDE STRUCTURAL PHYSICAL BARRIERS (e.g., Portable spill containment walls, built-in berms);
☐ 3. PROVIDE ABSORBENT PHYSICAL BARRIERS (e.g., Pads, spill pigs, spill pillows);
☐ 4. COVER OR BLOCK FLOOR AND/OR STORM DRAINS;
☒ 5. LINED TRENCH DRAINS AND/OR SUMPS;
☐ 6. AUTOMATIC FIRE SUPPRESSION SYSTEM;
☐ 7. ELIMINATE SOURCES OF IGNITION FOR FLAMMABLE HAZARDS;
☐ 8. STOP PROCESSES AND/OR OPERATIONS;
☐ 9. AUTOMATIC / ELECTRONIC EQUIPMENT SHUT-OFF SYSTEM;
☐ 10. SHUT OFF WATER, GAS, ELECTRICAL UTILITIES;
☐ 11. CALL 9-1-1 FOR PUBLIC EMERGENCY RESPONDER ASSISTANCE AND/OR MEDICAL AID;
☐ 12. NOTIFY AND EVACUATE PERSONS IN ALL THREATENED AND/OR IMPACTED AREAS;
☐ 13. ACCOUNT FOR EVACUATED PERSONS IMMEDIATELY AFTER EVACUATION;
☐ 14. PROVIDE PROTECTIVE EQUIPMENT FOR ON-SITE EMERGENCY RESPONSE TEAM;
☐ 15. REMOVE CONTAINERS AND/OR ISOLATE AREAS;
☐ 16. HIRE LICENSED HAZARDOUS WASTE CONTRACTOR;
☐ 17. USE ABSORBENT MATERIAL FOR SPILL CONTAINMENT;
☐ 18. VACUUM SUCTION USING APPROPRIATE VACUUM (e.g., Intrinsically safe) FOR SPILL CONTROL AND/OR CLEANUP;
☐ 19. DECONTAMINATE PERSONNEL AND EQUIPMENT WITHIN DESIGNATED AREA AND DISPOSE OF WASTEWATER AS HAZARDOUS WASTE;
☐ 20. PROVIDE SAFE TEMPORARY STORAGE OF HAZARDOUS WASTE GENERATED DURING EMERGENCY ACTIONS;
☐ 21. OTHER (Specify): D2.

## E. FACILITY EVACUATION

THE FOLLOWING ALARM SIGNAL(S) WILL BE USED TO BEGIN EVACUATION OF THE FACILITY (Check all that apply): E1.

☐ 1. BELLS; E2.
☐ 2. HORNS/SIRENS;
☒ 3. VERBAL (i.e., Shouting);
☐ 4. OTHER (Specify):

THE FOLLOWING LOCATION(S) WILL BE USED FOR AN EMERGENCY ASSEMBLY AREA(S) (e.g., Parking lot, street corner): E3.

Note: The Emergency Coordinator must account for all onsite employees and visitors after evacuation.

EVACUATION ROUTE S AND ALTERNATE EVACUATION ROUTES ARE DESCRIBED AS FOLLOWS: E4.

☐ 1. WRITTEN PROCEDURES DESCRIBING ROUTES, EXITS, AND ASSEMBLY AREAS;
☒ 2. EVACUATION MAP(S) DEPICTING ROUTES, EXITS, AND ASSEMBLY AREAS;
☐ 3. OTHER (Specify): E5.

Note: Evacuation procedures and/or maps should be posted in visible facility locations and must be included in the Contingency Plan.

## F. ARRANGEMENTS FOR EMERGENCY SERVICES

ADVANCE ARRANGEMENTS FOR LOCAL EMERGENCY SERVICES (Check one of the following): F1.

☒ 1. HAVE BEEN DETERMINED NOT NECESSARY;
☐ 2. THE FOLLOWING ARRANGEMENTS HAVE BEEN MADE (Specify): F2.

Note: Advance arrangements with local fire and police departments, hospitals, state and local emergency response teams, and/or emergency services contractors should be made for your facility, if necessary. Large Quantity Generators must describe arrangements in the Contingency Plan.

## G. EMERGENCY EQUIPMENT

**Check the applicable boxes to list emergency response equipment available at the facility, identify the location(s) where the equipment is kept, and indicate the equipment's capability, if applicable.**

| TYPE | EQUIPMENT AVAILABLE G1. | LOCATION G2. | CAPABILITY G3. |
|---|---|---|---|
| *EXAMPLE* | ☒ *CHEMICAL PROTECTIVE GLOVES* | *SPILL RESPONSE KIT* | *SINGLE USE, OIL RESISTANT ONLY* |
| **Safety and First Aid** | 1. ☐ CHEMICAL PROTECTIVE SUITS, APRONS, AND/OR VESTS | | |
| | 2. ☐ CHEMICAL PROTECTIVE GLOVES | | |
| | 3. ☐ CHEMICAL PROTECTIVE BOOTS | | |
| | 4. ☐ SAFETY GLASSES, GOGGLES, AND FACE SHIELDS | | |
| | 5. ☐ HARD HATS | | |
| | 6. ☐ AIR-PURIFYING RESPIRATORS | | |
| | 7. ☐ SELF-CONTAINED BREATHING APPARATUS (SCBA) | | |
| | 8. ☒ FIRST AID KITS | Barn | |
| | 9. ☒ PLUMBED EYEWASH FOUNTAIN AND/OR SHOWER | Barn | |
| | 10. ☐ PORTABLE EYEWASH KITS AND/OR STATION | | |
| | 11. ☐ OTHER | | |
| **Fire Fighting** | 12. ☒ PORTABLE FIRE EXTINGUISHERS | Barn | |
| | 13. ☐ FIXED FIRE SUPPRESSION SYSTEMS AND/ OR SPRINKLERS | | |
| | 14. ☐ FIRE ALARM BOXES | | |
| | 15. ☒ OTHER | Barn Hoses | |
| **Spill Control and Clean-Up** | 16. ☐ ALL-IN-ONE SPILL KIT | | |
| | 17. ☐ ABSORBENT MATERIAL | | |
| | 18. ☐ CONTAINER FOR USED ABSORBENT | | |
| | 19. ☐ BERM AND/OR DIKING EQUIPMENT | | |
| | 20. ☐ BROOM | | |
| | 21. ☐ SHOVEL | | |
| | 22. ☐ VACUUM | | |
| | 23. ☐ EXHAUST HOOD | | |
| | 24. ☐ SUMP AND/OR HOLDING TANK | | |
| | 25. ☐ CHEMICAL NEUTRALIZERS | | |
| | 26. ☐ GAS CYLINDER LEAK REPAIR KIT | | |
| | 27. ☐ SPILL OVERPACK DRUMS | | |
| | 28. ☐ OTHER | | |
| **Communi-cations and Alarm Systems** | 29. ☒ TELEPHONES (e.g., Cellular) | Cells in barn | |
| | 30. ☐ INTERCOM AND/OR PA SYSTEM | | |
| | 31. ☐ PORTABLE RADIOS | | |
| | 32. ☐ AUTOMATIC ALARM CHEMICAL MONITORING EQUIPMENT | | |
| **Other** | 33. ☐ OTHER | | |
| | 34. ☐ OTHER | | |

## H. EARTHQUAKE VULNERABILITY

Identify areas of the facility that are vulnerable to hazardous materials releases due to seismic motion. These areas require immediate isolation and inspection.

| VULNERABLE AREAS (Check all that apply): H1. | LOCATIONS (e.g., Shop, outdoor shed, lab): H2. |
|---|---|
| ☐ 1. HAZARDOUS MATERIALS AND/OR WASTE STORAGE AREAS | |
| ☐ 2. PROCESS LINES AND PIPING | |
| ☐ 3. LABORATORY | |
| ☐ 4. WASTE TREATMENT AREA | |

Identify mechanical systems vulnerable to releases / spills due to earthquake-related motion. These systems require immediate isolation and inspection.

| VULNERABLE SYSTEMS AND/OR EQUIPMENT (Check all that apply): H3. | LOCATIONS: H4. |
|---|---|
| ☐ 1. SHELVES, CABINETS AND/OR RACKS | |
| ☐ 2. TANKS AND SHUT-OFF VALVES | |
| ☐ 3. PORTABLE GAS CYLINDERS | |
| ☐ 4. EMERGENCY SHUT-OFF AND/OR UTILITY VALVES | |
| ☐ 5. SPRINKLER SYSTEMS | |
| ☐ 6. STATIONARY PRESSURIZED CONTAINERS (e.g., Propane tank) | |

## I. EMPLOYEE TRAINING

Employee training is required for all employees and/or contractors handling hazardous materials and/or hazardous wastes during normal and/or emergency operations. Most facilities will need to submit a separate Training Plan. However, your CUPA may accept this section as the Training Plan for some small facilities.
Employee training plans may include the following content:

- Applicable laws and regulations;
- Emergency response plans and procedures;
- Safety Data Sheets;
- Hazard communication related to health and safety;
- Methods for safe handling of hazardous substances;
- Hazards of materials and processes (e.g., fire, explosion, asphyxiation);
- Hazard mitigation, prevention and abatement procedures;
- Coordination of emergency response actions;
- Notification procedures for local emergency responders, CUPA, Cal OES, and onsite personnel;
- Communication and alarm systems;
- Personal protective equipment;
- Use and maintenance of emergency response equipment and supplies (e.g. Fire extinguishers, respirators, spill control materials);
- Decontamination procedures;
- Evacuation procedures and evacuation staging locations;
- Identification of facility areas, equipment, and systems vulnerable to earthquakes and other natural disasters.
- OTHER (Specify):

Check the applicable boxes below to indicate how the employee training program is administered.

☐ 1. FORMAL CLASSROOM ☐ 2. VIDEOS ☒ 3. SAFETY MEETINGS ☐ 4. STUDY GUIDES / MANUALS I1.
☐ 5. OTHER (Specify): _____ I2.
☐ 6. NOT APPLICABLE SINCE FACILITY HAS NO EMPLOYEES
☐ 7. CHECK IF A SEPARATE EMPLOYEE TRAINING PLAN IS USED AND UPLOADED TO CERS AS A PDF DOCUMENT I3.
☐ 8. CHECK IF EMPLOYEE TRAINING IS COVERED BY THE ABOVE REFERENCED CONTENT AND OTHER DOCUMENTS ONSITE I4.

**EMPLOYEE TRAINING FREQUENCY AND RECORDKEEPING TRAINING MUST BE:**

- Provided initially for new employees as soon as possible following the date of hire. New employees should not work in an unsupervised position that involves hazardous materials handling and/or hazardous waste management without proper training;
- Provided within six months from the date of hire for new employees at a large quantity generator;
- Ongoing and provided at least annually;
- Amended prior to a change in process or work assignment;
- Given upon modification to the Emergency Response/Contingency Plan.

**Large Quantity Generator Training:** Large quantity generators (1,000 kg or more) must retain written plan and documentation of employee training which includes:

- A written description of the type and amount of both initial and ongoing training that will be given to persons filling each job position having responsibility for hazardous waste management and/or emergency response.
- The name, job title and job description for each position at the facility related to hazardous waste management.
- Current employee training records must be retained until closure of the facility and former employee training records must be retained for at least three years after termination of employment.

**Small Quantity Generator Training:** Small quantity generators (less than 1,000 kg) must include basic hazardous waste management and emergency response procedures but a written employee training plan and training records are not required. In order to show that the facility has met the small quantity generator employee training requirement, an employee training plan and training records may be made available.

**Hazardous Materials Business Plan Training**: Businesses must provide initial and annual employee training that includes the content referenced above. The training may be based on the job position and training records must be made available for a period of at least three years.

## J. LIST OF ATTACHMENTS

Check one of the following: J1.
☒ 1. NO ATTACHMENTS ARE REQUIRED; or
☐ 2. THE FOLLOWING DOCUMENTS ARE ATTACHED: J2.

# HAZ DOUS MATERIAL FIELD SERVI S
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000314

NAME: COSTA, DIMAS

ADDRESS 1: 14451 BON VIEW AVE ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91710-9171 COUNTRY:

PHONE: EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: DBA: COSTA, DIMAS

ADDRESS1: 14451 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710~~ 91761 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000395

NAME: ~~AG~~-COSTA, DIMAS

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~9-1710~~ 91761 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: BUSINESS CODE: 1 BUSINESS TYPE: 3

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 3

PHONE: EXT: FIRE JURISDICTION: ~~CHINO VALLEY FIRE~~ Ontario

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG~~-COSTA, DIMAS

CARE OF:

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: ~~91710-1710~~ 91761 COUNTRY:

EMAIL:

ROCKBID FIRE FISCAL
MAY 22 PM 4:13

## A- A/R INFORMATION

ACCOUNT ID: AR0000397

RESPONSIBLE PARTY:

CARE OF:

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

PHONE: EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 05/04/2007

ALT PHONE: EXT: EXEMPT FROM BILLING: YES TAX ID:

ANNIVERSARY DATE: 04/30/1997 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE TH[illegible]PPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT000892[illegible] | ACTIVE | 4210 | [illegible]/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009816 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008930 | ACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009817 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E. 0202 inactive

NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E.

NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E. NEW P.E.

NUMBER OF EMP. N/A NUMBER OF UST'S 0 MFR #

ENTERED

DATE SUBMITTED: 3-May-2007 DATE ENTERED: FISCAL DATE:

MAY 18 2007

SUBMITTED BY: Shane Bach ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

Please update the following information
- owner information
- Facility information
- Remove Ag listing
- ~~Cle~~
- ~~R~~ Close P.E. 4210 and P.E. ~~4~~ 4420
- Add P.E. 0202 inactive

*note H and R dairy now occupies this Address

Thank you

Shane

| | | | | |
|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

**SAN BERNARDINO COU' 'Y**
**FIRE DEPARTMENT**

COUNTY OF SAN BERNARDINO

**ADMINISTRATIVE HEADQUARTERS**
**157 West Fifth Street, Second Floor • San Bernardino, CA 92415-0451**
**(909) 387-5974 • Fax (909) 387-5542**

**MARK A. HARTWIG**
Fire Chief

# FINAL NOTICE

H & R DAIRY
14441 GROVE AVE
ONTARIO, CA 91762

H + R Dairy
14213 Bon View
Ontario

December 12, 2012

File closed out.
Business closed.

ATTN: RON MEIRSMA

RE: Invoice # IN0086049

Facility: FA0010971-H & R DAIRY

Dear Sir or Madam:

Your account has been referred to our Collections Section with a request to set a date to be heard in **Small Claims Court**.

On December 05, 2012 a past due invoice was mailed to your facility for Hazardous Materials Permit Fees in the amount of **$598.05** to be paid no later than December 12, 2012. As of the date of this letter, we have not received a payment. Notices advising you of your unpaid account balance have received no response. Therefore, a **$64.00** administrative fee has been added to your past due amount.

Payment of these fees is required as a condition to operate your facility in accordance with San Bernardino County Ordinance No. 3846, Section 23.0605. **Without a valid permit, operation of your facility may be subject to closure. All owners are responsible for current and past due fees.**

At this time, San Bernardino County Fire considers legal action to be necessary. If you would like to settle out of court, please submit full payment before **December 17, 2012**. If full payment is not received by **December 17, 2012**, additional collection and court fees will be added to your current balance.

*IN0086049662.05*

Sincerely,
Hazardous Materials Collections Officer
San Bernardino County Fire Department

Detach here and return this portion with payment

MAKE CHECK PAYABLE TO: San Bernardino County Fire Department

Facility ID: FA0010971

Facility Name: H & R DAIRY

Invoice #: IN0086049

Balance Due: $662.05

*IN0086049662.05*

Rpt#9123

Board of Supervisors
GREGORY C. DEVEREAUX, Chief Executive Officer
ROBERT A. LOVINGOOD ..... First District
JANICE RUTHERFORD ..... Second District
JOSIE GONZALES ..... Fifth District
JAMES RAMOS ..... Third District
GARY C. OVITT ..... Fourth District

Please make your check payable to:
**San Bernardino County Fire Protection District**
Send to:
**157 W. Fifth Street**
**Second Floor**
**San Bernardino, CA 92415**
**(909) 386-8483**

**Facility Address**
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

| Facility ID | Invoice ID |
|---|---|
| FA0010971 | IN0086049 |

**Invoice Date**
10/17/12

*IN0086049598.05*

**Total Account Balance**
$ 598.05

**Total Due for Invoice**
$ 598.05

**Total Paid**

SAN BERNARDINO COUNTY FIRE DEPARTMENT
PAST DUE
HAZARDOUS MATERIALS
CUPA PERMITS
SAN BERNARDINO
1853

TO : H & R DAIRY
14441 GROVE AVE
ONTARIO, CA 91762

ATTN : RON MEIRSMA

☐ **Change of Billing Address (see back)**

**Upon receipt of full payment of the balance due as shown on this invoice, you will receive your new annual permit with an effective date of:**
**12/1/2012 to 11/30/2013**

**PLEASE RETURN TOP PORTION WITH PAYMENT**

| Program/ Element | Qty | Description | Permit Exp Date | | Amount |
|---|---|---|---|---|---|
| 4221 | 1 | HAZMAT HANDLER 0-10 EMPLOYEES | 11/30/12 | $ | 408.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | 11/30/12 | $ | 35.00 |
| 9990 | 2 | DELINQUENT PENALTY FEE | 11/30/12 | $ | 155.05 |
| | | | Total Due for This Invoice: | $ | 598.05 |

**ALL FEES ARE NOW DUE**
**PLEASE SUBMIT FULL PAYMENT BEFORE 12/12/2012**

| 1-30 Days | 31-60 Days | 61-90 Days | 91-120 Days | 121+ Plus | Total Account Bal |
|---|---|---|---|---|---|
| $ 155.05 | $ 443.00 | $ 0.00 | $ 0.00 | $ 0.00 | $ 598.05 |

**Permits are not transferable, you must contact this office for new permits.**
***If you have any questions regarding this bill, please call San Bernardino County Fire Protection District at (909) 386-8483.***

*IN0086049598.05*

**ALL FEES ARE NOW PAST DUE. FAILURE TO PAY WITHIN 7 DAYS WILL RESULT IN THIS ACCOUNT BEING FORWARDED TO COLLECTIONS FOR LEGAL ACTION.**

# H ARDOUS MATERIAL FIELD SEF CES

## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

Fiscal CPC/5051

FILE

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

### O- OWNER INFORMATION

OWNER ID: OW0009212

Legal Owner

*NAME: RON MIERSMA

*ADDRESS 1: ~~14451 BON VIEW AVE~~ 14441 ~~Bon~~ Grove Ave ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: ~~91761~~ 91762 *COUNTRY: USA

*PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 11/02/2011

#### OWNER MAILING ADDRESS

☐ Same as Owner

CARE OF: ROM MIERSMA DBA: H & R DAIRY

ADDRESS1: 14451 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

### F- FACILITY INFORMATION

FACILITY ID: FA0010971

*NAME: H & R DAIRY CERS ID: 10052083

*ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

*PHONE: 909-376-3379 EXT: ALT PHONE: 909-376-3373 EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FARM FYI LAST UPDATED: 04/18/2011

#### FACILITY MAILING ADDRESS

☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: H & R DAIRY

CARE OF: RON MIERSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

*EMAIL:

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

### A- A/R INFORMATION

ACCOUNT ID: AR0012409

RESPONSIBLE PARTY: H & R DAIRY

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

CARE OF: RON MEIRSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

PHONE: 909-376-3379 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 10/17/2012

FYI ANNIVERSARY DATE: 11/30/2007 FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI TOTAL DUE: 443.00

ENVIRONMENTAL CONTACT NAME: RON MIERSMA EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency

**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE T[illegible] APPLY)**

| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0018909<br>PERMIT NUMBER. | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER 0-[illegible]<br>ORIGINAL P.E. | 12/01/2011<br>EFFECTIVE DATE | 11/30/2012<br>EXPIRATION DATE |
|---|---|---|---|---|---|
| | | | PR0017775<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | UPDATED P.E. |

| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
|---|---|---|---|---|---|---|---|
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0.

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes No

*Should this facility be inactivated upon verification that there is no balance due? Yes No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes No

*Does this 5050 have attached documents? Yes No

ENTERED

*DATE SUBMITTED: 11/7/12 DATE ENTERED: NOV 10 2012 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Other ENTERED BY: ***Demand bill for updated PEs**: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Facility is still in operation, no change to permit billing

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

# CUPA

San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0010971 Facility Name: H and R Dairy Inspection Date: 11/07/12

Site Address: 14213 Bon View Ave Phone #:

City: Ontario Zip Code: 91761 EPA ID #:

Consent Granted by:

☐ Inspect ☐ Photograph Name: Title: # Emp:

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). *The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).*

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | X |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(a) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | X |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | X |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |
| 230. Business Plan implemented | CHSC 25503.5 | | | X |

**INSPECTION NARRATIVE**

**Closure inspection verified that facility is still in operation. Continue with billing for IN0086049**

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: Sign Name Received By: Sign Name Title:

Brian Otter Print Name Print Name Report Date: 11/07/12

Form Revised 1/16/2007

**Hazardous Materials Division**

**Fee Change Authorization Form**

☒ RUSH -NEED BY 11/19/12 ☐ PRIORITY-NEED BY _____ ☐ FYI-PLEASE REVIEW ☐ OTHER _____

## FACILITY INFORMATION

NAME: **H & R DAIRY** FACILITY ID: **FA0010971**

ADDRESS: **14213 BON VIEW AVE**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91761**

PHONE: **909-376-3379** EXT: _____ FAX: _____

ALT PHONE: **909-376-3373** EXT: _____ LOCATION(INSPECTOR DISTRICT): **03**

CONTACT PERSON: _____ CITY CODE: **ONTARIO** DISTRICT(SUPERVISORIAL DISTRICT): **004**

ANNIVERSARY DATE: **11/30/2007** ACCOUNT STATUS: **ACTIVE ACCOUNT**

NUMBER OF EMP. _____ NUMBER OF UST'S **0** MFR # _____

## ACTION REQUIRED

☒ REQUEST VERIFICATION ☒ REQUEST FACILITY INSPECTION

☒ INACTIVATE / CLOSED ACCOUNT / O.O.B. ☒ REQUEST TO REVERSE OUTSTANDING INVOICE

COMMENTS: RECEIVED RETURNED MAIL FROM FACILITY ADDRESS. FORWARDING ADDRESS TO MEIRSMA AT 14441 GROVE AVE. ONTARIO, CA 91762-7922.PLEASE SET FOR INSPECTION TO VERIFY POSSIBLE OOB. THANK YOU!

REQUESTED BY: Donna Judah APPROVED BY: [signature] 11/6/12

## PERMIT INFORMATION

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

PROGRAM ELEMENT _____

RECEIVED
NOV 07 2012
BEN

1N0080049

DATE SUBMITTED: _____ SUBMITTED BY: _____

ADDITIONAL COMMENTS: 11/7/12 Greg Z

EnvisionConnect

File Tools Help

Tuesday, December 18, 2012

Back Forward Home Refresh

Activities

EnvisionConnect

Common Tasks

Cancel workflow

Customize the List

Add or remove report heedings

Add or remove report groups

Sort results

Manage advanced report features

# Add a comment

Change View

Matches: 12

View: All Comments Related to this Facility, Sorted by Entered Date (Increasing)

| Comm... | Record ID | ... | Entered... |
|---|---|---|---|
| May 18... | FA00109... | | 5/18/2007 |
| INV D... | IN0036207 | | 5/29/2007 |
| Decem... | FA00109... | | 12/28/2007 |
| On 6-1... | IN0047563 | ... | 6/18/2008 |
| ON MA... | FA00109... | ... | 6/10/2011 |
| RECEI... | IN0086049 | | 10/30/2012 |
| PREPA... | IN0086049 | | 11/6/2012 |
| 5051: ... | FA00109... | | 11/10/2012 |
| SENT ... | IN0086049 | | 11/16/2012 |
| 5051 ... | FA00109... | | 12/4/2012 |
| ADMIN... | IN0086049 | | 12/13/2012 |
| 5054/... | FA00109... | | 12/17/2012 |

TEXT

5054/CLOSURE/INACTIVATE PERMITS: PER DISCUSSION WITH OWNER, CATTLE SOLD TO NEW DAIRY OPERATING AT THIS LOCATION SINCE 4/1/12. REVERSE INVOICE IN0086049. (LESLIE HEAVISIDE)

REVERSE INVOICE IN0086049 AND DELINQUENT CHARGES ASSOCIATED WITH INVOICE-5054 SUBMITTED.

Monday, December 17, 2012 10:30 AM - PRISCILLA LOPEZ

OOB

#15

AR

Add a Comment

Cancel

Save and Continue

Workflow: Add an Invoice

Connected | User: J0995 | Database: HazMat | Server: EnvisionSQL\SQL2005

Inbox - Micr...

envisionCon...

Untitled - DY...

4:40 PM

12/18/2012

County of San Bernardino
**FIRE PROTECTION DISTRICT**
**FISCAL DIVISION**
**Hazmat Permit Billing**
157 West 5th Street, 2nd Floor
San Bernardino, CA 92415-0451

Recycled

Hasler
018H13502254
ZIP 92415

US POSTAGE
$00.40
10/18/2012

RETURN SVC REQUESTED

PRSRT FIRST-CLASS MAIL

12 OCT 25 PM 1:06

10-19-2012

Hi Priscilla,

FA 0010971

Please update to:

↓ Thanks! Donna

917 NBE 1 412I 06 10/22/12
RETURN TO SENDER
MTERSMA
14441 GROVE AVE
ONTARIO CA 91762-7922
RETURN TO SENDER

SBCO FIRE DEPT
2012 OCT 25

IL*LRMB 91762
92415@0451

closure

Fiscal

# HAZ DOUS MATERIAL FIELD SERVI S
## COMPUTER D BASE UPDATE AUTHORIZATI (5050 Form)

5054/5051

Quick Submit-Correct minor information without full verification.

4201

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: A

## O- OWNER INFORMATION

OWNER ID: OW0009212

Legal Owner

*NAME: RON MIERSMA

*ADDRESS 1: 14441 GROVE AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY: USA

*PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 11/10/2012

### OWNER MAILING ADDRESS

Same as Owner

CARE OF: ROM MIERSMA DBA: H & R DAIRY

ADDRESS1: 14441 GROVE AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

## F- FACILITY INFORMATION

FACILITY ID: FA0010971

*NAME: H & R DAIRY CERS ID: 10052083

*ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

*PHONE: 909-376-3379 EXT: ALT PHONE: 909-376-3373 EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FARM FYI LAST UPDATED: 04/18/2011

### FACILITY MAILING ADDRESS

Same as Owner Mailing Address Same as Facility

BUSINESS NAME: H & R DAIRY

CARE OF: RON MIERSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

*EMAIL:

NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

## A- A/R INFORMATION

ACCOUNT ID: AR0012409

Same as Owner Mailing Address Same as Facility Mailing Address

RESPONSIBLE PARTY: H & R DAIRY

CARE OF: RON MEIRSMA

ADDRESS 1: 14441 GROVE AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

PHONE: 909-376-3379 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 10/17/2012

Inactive

FYI ANNIVERSARY DATE: 11/30/2007 FYI ACCOUNT STATUS: ~~ACTIVE ACCOUNT~~ FYI TOTAL DUE: 598.05

ENVIRONMENTAL CONTACT NAME: RON MIERSMA EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | | |
|---|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☒ ZERO OUT BALANCE | PT0018909<br>PERMIT NUMBER. | ACTIVE<br>PERMIT STATUS | 4221-HAZMAT HANDLER U<br>ORIGINAL P.E. | EI<br>12/01/2011<br>EFFECTIVE DATE | | 11/30/2012<br>EXPIRATION DATE |
| | | | PR0017775<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | | UPDATED P.E. |
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? (Yes) No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? (Yes) No

*DATE SUBMITTED: 12-12-12 DATE ENTERED: ENTERED DEC 17 2012 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Leslie Heaviside ENTERED BY: *Demand bill for updated PEs: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

Reverse IN0086049 + delinq. charges.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

per discussion with owner: cattle sold to new dairy operating at this location since 4-1-12. Reverse invoice IN0086049.

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected **to complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

# SAN BERNARDINO COUNTY FIRE -HAZARDOUS MATERIALS DIVISION

## Request to Reverse Delinquent Penalty Fee

Requester: LESLIE HEAVISIDE

Date: 12/14/2012 8:22:24AM

Facility ID: FA0010971
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

| Invoice ID | Total Account Balance | Total Due for Invoice |
|---|---|---|
| IN0086049 | $ 662.05 | $ 662.05 |
| **Invoice Date** | **Delinquent Penalties** | **Total Paid** |
| 10/17/12 | $ 155.05 | $ 0.00 |

X Categories were in dispute. Account on hold pending inspection.

Explanation: CATTLE WERE SOLD IN MARCH AND A NEW DAIRY BEGAN OPERATING AT THIS LOCATION IN APRIL. COPY OF BILL OF SALE ATTACHED.

C Beal 12/17/12
HazMat Supervisor Date

12/19/12
Deputy Fire Marshal Date

| Program/ Element | Qty | Description | | Amount |
|---|---|---|---|---|
| 4221 | 1 | HAZMAT HANDLER 0-10 EMPLOYEES | $ | 408.00 |
| 5002 | 1 | ALL FACILITY STATE SERVICE CHARGE | $ | 35.00 |
| 9805 | 1 | ADMINISTRATIVE FEE(COLLECTIONS) | $ | 64.00 |
| 9990 | 2 | DELINQUENT PENALTY FEE | $ | 155.05 |
| | | Total Due for This Invoice: | **$** | **662.05** |

☐ Waive 9805 Administrative Fee

**Fiscal Section**

12/17/12

Fiscal Services Supervisor Date

OFM Administrative Supervisor Date

Correction

RECEIVED
DEC 17 2012

COMPLETED

# BILL OF SALE

*KNOW ALL MEN BY THESE PRESENTS:* That DOROTHY MIERSMA, TRUSTEE, RON MIERSMA, TRUSTEE, DENISE MIERSMA, TRUSTEE, DBA H & R DAIRY, hereinafter designated as the Seller(s), for good and valuable consideration in and with lawful money of the United States of America, to them in hand paid by CRAIG GORDON, DBA GORDON HAY, INC., hereinafter designated as the Purchaser(s), the receipt whereof is hereby acknowledged, do by these presents grant, bargain, sell, and convey unto the Purchaser(s), executors, administrators, and assigns; the following described Personal Property;

~~468~~ head consisting of mature Holstein dairy cattle of various ages and descriptions.

*TO HAVE AND TO HOLD,* the same to the said Purchaser(s) their Executors, administrators and assigns forever. And the said Seller(s) do convey for their heirs, executors and administrators covenant and agree to and with the said Purchaser(s), their executors, administrators and assigns, to warrant and defend the title to the said property, goods and chattels hereby conveyed, against the just and lawful claims and demands of all persons whomsoever.

*WITNESS* our hands and seals this 30th day of March, 2012.

DOROTHY MIERSMA, TRUSTEE
RON MIERSMA, TRUSTEE
DENISE MIERSMA, TRUSTEE
DBA H & R DAIRY

Dorothy Miersma Trustee
Dorothy Miersma, Trustee

Ron Miersma Trustee
Ron Miersma, Trustee

Denise Miersma Trustee
Denise Miersma, Trustee

APPROVED AS TO FORM AND CONTENT

CRAIG GORDON, DBA GORDON HAY, INC.

Craig Gordon

CUPA

**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0010971 Facility Name: H & R Dairy Inspection Date: 12/12/12

Site Address: 14213 S. Bon View Ave. Phone #: 909-376-3379

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:

☐ Inspect ☐ Photograph Name: _____ Title: _____ # Emp: _____

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | X |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(a) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | X |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | X |
| 206. Regulated Substances registration filed | CHSC 25533 | | | X |
| 207. SPCC Plan prepared | CHSC 25270.4.5 | | | X |

**INSPECTION NARRATIVE**

An inspection was conducted to verify this business is no longer in operation at this location. Per copy of bill of sale, cattle were sold to another company that began operating a new dairy at this location on 4/1/12.

Business vacated this location prior to permit expiration; therefore, invoice IN0086049 for 2012/13 permits is not applicable. Invoice will be reversed and hazardous material handler permit will be inactivated.

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: _____ (Sign Name) Received By: USPS (Sign Name) Title: _____

Leslie Heaviside _____ Report Date: December 12, 2012

# PHOTO NARRATIVE



PHOTO 1

PHOTO 2

Facility/Case Name: **Gordon Hay Inc. Dairy #3** Facility ID #: **NEW**

Address: **14213 S. Bon View Ave., Ontario**

1) Description: **Signage located at front of dairy**

2) Description: **(L to R) (2) 55-gallon drums containing CIP cleaner, (1) 55-gallon drum containing sodium hypochlorite, (2) 55-gallon drums containing acid cleaner**

Date Taken: **December 12, 2012**

Taken By: **Leslie Heavlside** Signature: _____

# PHOTO NARRATIVE



PHOTO 3

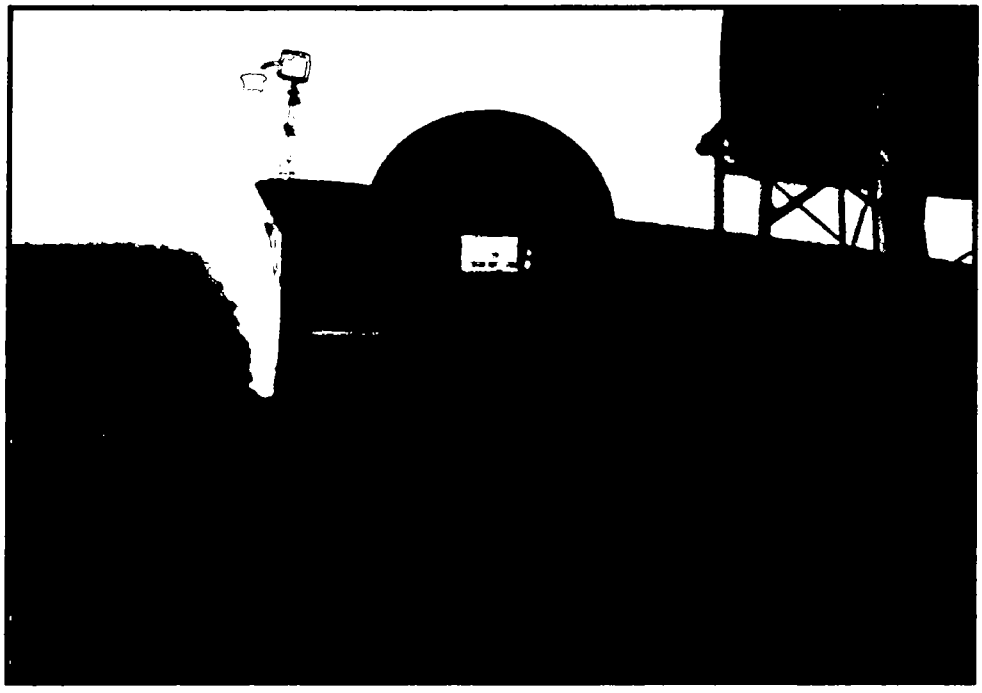

PHOTO 4

Facility/Case Name: **Gordon Hay Inc. Dairy #3** Facility ID #: **NEW**

Address: **14213 S. Bon View Ave., Ontario**

3) Description: **500-gallon AST containing Diesel fuel**

4) Description: **No photo**

Date Taken: **December 12, 2012**

Taken By: **Leslie Heaviside** Signature: _____

# HAZARDOUS MATERIAL FIELD SERVICES
## COMPUTER DATABASE UPDATE AUTHORIZAT. (5050 Form)

Fiscal 5054/5051

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A 4221

CURRENT INVOICE MAILING CODE: A

## O- OWNER INFORMATION — OWNER ID: OW0009212

Legal Owner

*NAME: RON MIERSMA

COMPLETED

*ADDRESS 1: 14441 GROVE AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91762 *COUNTRY: USA

*PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED: 11/10/2012

### OWNER MAILING ADDRESS

☐ Same as Owner

CARE OF: ROM MIERSMA DBA: H & R DAIRY

ADDRESS1: 14441 GROVE AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

## F- FACILITY INFORMATION — FACILITY ID: FA0010971

*NAME: H & R DAIRY CERS ID: 10052083

*ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

*CITY: ONTARIO *STATE: CA *ZIP CODE: 91761 *CITY CODE: ONTARIO

*PHONE: 909-376-3379 EXT: ALT PHONE: 909-376-3373 EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.:

FIRE JURISDICTION: ONTARIO FIRE SIC CODE:

*BUSINESS CODE: *BUSINESS TYPE: FARM FYI LAST UPDATED: 04/18/2011

### FACILITY MAILING ADDRESS

☐ Same as Owner Mailing Address ☐ Same as Facility

BUSINESS NAME: H & R DAIRY

CARE OF: RON MIERSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

*EMAIL:

☐ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name")

## A- A/R INFORMATION — ACCOUNT ID: AR0012409

☐ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

RESPONSIBLE PARTY: H & R DAIRY

CARE OF: RON MEIRSMA

ADDRESS 1: 14441 GROVE AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91762 COUNTRY: USA

PHONE: 909-376-3379 EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: FYI EXEMPT FROM BILLING: NO FYI Last Billing: 10/17/2012

FYI ANNIVERSARY DATE: 11/30/2007 FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI TOTAL DUE: 598.05

ENVIRONMENTAL CONTACT NAME: RON MIERSMA EMAIL:

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☒ INACTIVATE<br>☒ ZERO OUT BALANCE | PT0018909 | ACTIVE | 4221-HAZMAT HANDLER 0- | 12/01/2011 | 11/30/2012 |

| GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. |
|---|---|---|
| PR0017775 | ACTIVE, BILLABLE | |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

*Is this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)

*Should this facility be inactivated upon verification that there is no balance due? (Yes) No

*Is this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)

*Does this 5050 have attached documents? (Yes) No

*DATE SUBMITTED: 12-12-12 DATE ENTERED: ENTERED DEC 17 2012 FISCAL ENTRY DATE/ INITIAL:

*SUBMITTED BY: Leslie Heaviside ENTERED BY: *Demand bill for updated PEs: Yes No

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

Reverse IN0086049 + delinq. charges.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

per discussion with owner: cattle sold to new dairy operating at this location since 4-1-12. Reverse invoice IN0086049.

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor.** The requestor is expected to complete all fields on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

Owner address update

# HAZARDOUS MATERIAL FIELD SERVICE
# COMPUTER DATABASE UPDATE AUTHORIZATION

COMPLETED

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: F

## O- OWNER INFORMATION

OWNER ID: OW0009212

NAME: RON MIERSMA

ADDRESS 1: ~~14213 BON VIEW AVE~~ 14451 Bon View Ave ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED:

### OWNER MAILING ADDRESS

CARE OF: ROM MIERSMA DBA: H & R DAIRY

ADDRESS1: ~~14213 BON VIEW AVE~~ 14451 Bon View Ave ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

## F- FACILITY INFORMATION

FACILITY ID: FA0010971

NAME: H & R DAIRY

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 CITY CODE: ONTARIO

SIC CODE: BUSINESS CODE: BUSINESS TYPE: FARM

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03

PHONE: 909-376-3379 EXT: FIRE JURISDICTION: ONTARIO FIRE

ALT PHONE: 909-376-3373 EXT: FAX: LAST UPDATED: 12/18/2007

### FACILITY MAILING ADDRESS

BUSINESS NAME: H & R DAIRY

CARE OF: RON MIERSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0012409

RESPONSIBLE PARTY: H & R DAIRY

CARE OF: RON MEIRSMA

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ONTARIO STATE: CA ZIP CODE: 91761 COUNTRY: USA

PHONE: 909-376-3379 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 12/06/2007

ALT PHONE: EXT: EXEMPT FROM BILLING: NO TAX ID:

ANNIVERSARY DATE: 07/31/2007 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT0018909 | ACTIVE | 4221 | ,1/2007 | 07/31/2008 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0017775 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 12/27/07 DATE ENTERED: 12/28/07 FISCAL DATE:

SUBMITTED BY: Leslie Heavisile ENTERED BY: CW

**COMMENTS/REMARKS:**

Per BP: update owner address.

# HAZ DOUS MATERIAL FIELD SERVI S
# COMPUTER DATABASE UPDATE AUTHORIZATION

New Facility

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE:

## O- OWNER INFORMATION

OWNER ID: New 9212

NAME: Ron Miersma

ADDRESS 1: 14213 Bon View Ave. ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 COUNTRY:

PHONE: (909)376-3373 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED:

### OWNER MAILING ADDRESS

CARE OF: Ron Miersma DBA: H&R Dairy

ADDRESS1: 14213 Bon View Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: New 10971

NAME: H&R Dairy

ADDRESS 1: 14213 Bon View Ave. ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 CITY CODE: Ontario

SIC CODE: BUSINESS CODE: 2 BUSINESS TYPE: 3

CENSUS: SUPERVISORIAL DISTRICT: 4 INSPECTION DISTRICT: 3

PHONE: (909)376-3379 EXT: FIRE JURISDICTION: Ontario Fire

ALT PHONE: EXT: FAX: LAST UPDATED:

RCD SDD FIRE FISCAL
MAY 22 PM 4: 13

### FACILITY MAILING ADDRESS

BUSINESS NAME: H&R Dairy

CARE OF: Ron Miersma

ADDRESS 1: 14213 Bon View Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: New

RESPONSIBLE PARTY: H&R Dairy

CARE OF: Ron Miersma

ADDRESS 1: 14213 Bon View Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91761 COUNTRY:

PHONE: (909)376-3379 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED:

ALT PHONE: EXT: EXEMPT FROM BILLING: TAX ID:

ANNIVERSARY DATE: TOTAL DUE: ACCOUNT STATUS:

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | N/A<br>PERMIT NUMBER. | PERMIT STATUS | N/A<br>ORIGINAL P.E. | EFFECTIVE DATE | 7/31/07<br>EXPIRATION DATE |
| GHP OR UST ID | CURRENT STATUS(BILLING) | NA<br>GHP FOR UST(PH) | NA<br>CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| ADD NEW P.E. | 4221<br>NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF EMP. 5 NUMBER OF UST'S 0 MFR #

ENTERED

DATE SUBMITTED: 8-May-2006 DATE ENTERED: MAY 18 2007 FISCAL DATE:

SUBMITTED BY: Shane Barlas ENTERED BY: Jose Cisneros

**COMMENTS/REMARKS:**

Please update everything
- New Facility
  note* "Costa, Di Mas" was the previous Facility at this address. (FA0000395)
- New P.E. 4221

Thanks
Shane Barlas

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
## CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

ATTN : ROM MIERSMA
RON MIERSMA
14451 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.**

**Effective Date: 12/1/2011** **Expiration Date: 11/30/2012**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Mark A. Hartwig, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:1 AR:0.00

ATTN : RON MIERSMA
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.**

**Effective Date: 8/1/2010** **Expiration Date: 7/31/2011**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Danny R. Wurl

Danny R. Wurl, Fire Chief

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

AP:2 AR:0.00

ATTN : RON MIERSMA
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

**Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.**

**Effective Date: 8/1/2009** **Expiration Date: 7/31/2010**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : RON MIERSMA
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.

**Effective Date: 8/1/2008** **Expiration Date: 7/31/2009**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# COUNTY OF SAN BERNARDINO
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

ATTN : RON MIERSMA
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

This Unified Permit is hereby issued to:
H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

Permit is issued to Facility: FA0010971 for a period not to exceed one year from effective date.

Effective Date: 8/1/2007 Expiration Date: 7/31/2008

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0018909 | 4221 HAZMAT HANDLER 0-10 EMPLOYEES | PR0017775 |

Pat A. Dennen, Fire Chief/Fire Warden

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

12-20962-638 Rev. 9/06

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# BUSINESS OWNER / OPERATOR IDENTIFICATION

FACILITY ID # F A 0 0 1 0 9 7 1 (This number is on your CUPA permit.)

EFFECTIVE DATE 100 | ENDING DATE 101

BUSINESS NAME (Same as FACILITY NAME or DBA): H & R DAIRY

BUSINESS PHONE: 909-606-2996

BUSINESS SITE ADDRESS 103: 14213 BON VIEW AVE

CITY 104: ONTARIO, CA | COUNTY 108: SAN BERNARDINO | STATE: CA | ZIP CODE 105: 91762

D&B NUMBER | PRIMARY SIC/NAICS CODE 107 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: DAIRY FARM

BUSINESS OPERATOR NAME 109: RON MIERSMA | BUSINESS OPERATOR PHONE 110: 909-606-2996

## II. BUSINESS OWNER

OWNER NAME 111: RON MIERSMA | OWNER PHONE 112: 909-606-2996

OWNER MAILING ADDRESS 113: 14451 BON VIEW AVE

CITY 114: ONTARIO | STATE 115: CA | ZIP CODE 116: 91762

## III. ENVIRONMENTAL CONTACT

CONTACT NAME: RON MIERSMA | CONTACT PHONE 118: 909-356-3333

CONTACT MAILING ADDRESS 119: 14451 BON VIEW AVE

CITY 120: ONTARIO | STATE 121: CA | ZIP CODE 122: 91762

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123: RON MIERSMA | NAME 128: CARLOS GONZALEZ |
| TITLE 124: OWNER | TITLE 129: FOREMAN |
| BUSINESS PHONE 125: 909-356-3333 | BUSINESS PHONE: ~~909~~-732-8397 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126 | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131 |
| PAGER/CELL # 127: 909-356-3333 | PAGER /CELL # 132: 909-732-8397 |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

SIGNATURE OF OWNER/OPERATOR: [signature] | NAME OF SIGNER (*print*) 136: RON MIERSMA | DATE 134: 10/24/03

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 1 0 9 7 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): H & R DAIRY 3

FACILITY ADDRESS: 14213 BON VIEW AVE

CITY: ONTARIO 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

| BUSINESS MAILING ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 14451 BON VIEW AVE | ONTARIO | CA | 91762 |

| BUSINESS FAX NUMBER | BUSINESS E-MAIL |
|---|---|
| | |

***NOTE: ALL CORRESPONDENCE, INVOICES, PERMITS, AND NOTICES WILL BE SENT TO THE ABOVE ADDRESS***

| | SHIFT 1 | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION |
|---|---|---|---|---|
| Total # of Employees per shift | 4 | 2 | | 9-5, 9-5 |

| | TOTAL # EMPLOYEES | TAXPAYER ID NUMBER |
|---|---|---|
| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | 7 | |

| ASSESSORS PARCEL NUMBER (S) | CROSS STREET |
|---|---|
| | |

BUSINESS DESCRIPTION

Number of Underground Storage Tanks located at this facility

Does this facility:

1. Generate, handle or store any Perchlorate-containing substance or waste on site? ☐ YES ☒ NO
2. Generate, handle or store any PCB ballasts on site? ☐ YES ☒ NO
   If yes, must include PCB ballasts as hazardous waste on inventory summary and chemical description pages.
3. Generate any amount of Universal Waste (mercury containing devices, non-empty aerosols, electronic devices, fluorescent light tubes, non-automotive batteries)? ☒ YES ☒ NO
4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

If you need more information, get the Managing Universal Waste fact sheet from the website of DTSC, this CUPA, or by calling our office.

Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 10/24/07

CUPA

San Bernardino County Fire Department • Hazardous Materials Division

620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# BUSINESS OWNER / OPERATOR IDENTIFICATION

[redacted]

FACILITY ID # F A 0 0 1 0 9 7 1 (This number is on your CUPA permit.)

EFFECTIVE DATE 100 | ENDING DATE 101 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA): H&R DAIRY

BUSINESS PHONE: 909-606-2996

BUSINESS SITE ADDRESS 103: 14213 BON VIEW AVE

CITY 104: ONTARIO, CA | COUNTY 108: SAN BERNARDINO | STATE: CA | ZIP CODE 105: 91762

D&B NUMBER | PRIMARY SIC/NAICS CODE 107 | DESCRIPTION OF BUSINESS ACTIVITY FOR THIS PRIMARY SIC CODE: DAIRY FARM

BUSINESS OPERATOR NAME 109: RON MIERSMA | BUSINESS OPERATOR PHONE 110: 909-606-2996

## II. BUSINESS OWNER

OWNER NAME 111: RON MIERSMA | OWNER PHONE 112: 909-606-2996

OWNER MAILING ADDRESS 113: 14451 BON VIEW AVE

CITY 114: ONTARIO | STATE 115: CA | ZIP CODE 116: 91762

## III. ENVIRONMENTAL CONTACT

CONTACT NAME: RON MIERSMA | CONTACT PHONE 118: 909-356-3333

CONTACT MAILING ADDRESS 119: 14451 BON VIEW AVE

CITY 120: ONTARIO | STATE 121: CA | ZIP CODE 122: 91762

## IV. EMERGENCY CONTACTS*

| - PRIMARY - | - SECONDARY - |
|---|---|
| NAME 123: RON MIERSMA | NAME 128: CARLOS GONZALEZ |
| TITLE 124: OWNER | TITLE 129: FOREMAN |
| BUSINESS PHONE 125: 909-356-3333 | BUSINESS PHONE: ~~909~~-732-8397 |
| HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) | HOME PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) |
| OTHER 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 126 | 24-HOUR PHONE (NOT CONFIDENTIAL - SEE NOTE BELOW) 131 |
| PAGER/CELL # 127: 909-356-3333 | PAGER /CELL # 132: 909-732-8397 |

*HOME PHONE NUMBERS ARE REQUIRED FOR ALL HAZARDOUS WASTE GENERATORS. IF YOU WISH TO KEEP 24-HOUR OR HOME PHONE NUMBERS CONFIDENTIAL, FILE THE CONFIDENTIAL EMERGENCY CONTACT PAGE (PAGE 3) AND LEAVE THE ABOVE 24 HR FIELDS BLANK. ALSO USE THE SEPARATE PAGE (PAGE 3) TO DESIGNATE MORE THAN 2 EMERGENCY COORDINATORS.

## V. SIGNATURE

SIGNATURE OF OWNER/OPERATOR: [signature] | NAME OF SIGNER (print) 136: RON MIERSMA | DATE 134: 10/24/03

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# LOCALLY COLLECTED INVENTORY INFORMATION

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 1 0 9 7 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): H&R DAIRY 3

FACILITY ADDRESS: 14213 BON VIEW AVE

CITY: ONTARIO 104

## II. ADDITIONAL CONTACT & OPERATIONS INFORMATION

| BUSINESS MAILING ADDRESS | CITY | STATE | ZIP CODE |
|---|---|---|---|
| 14451 BON VIEW AVE | ONTARIO | CA | 91762 |

| BUSINESS FAX NUMBER | BUSINESS E-MAIL |
|---|---|
| | |

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| | SHIFT 1 | SHIFT 2 | SHIFT 3 | HOURS OF OPERATION |
|---|---|---|---|---|
| Total # of Employees per shift | 4 | 2 | | 9-5, 9-5 |

| | TOTAL # EMPLOYEES | TAXPAYER ID NUMBER |
|---|---|---|
| Total # of employees at this facility (as reported on your most recent tax withholding forms.): | 7 | |

| ASSESSORS PARCEL NUMBER (S) | CROSS STREET |
|---|---|
| | |

BUSINESS DESCRIPTION:

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4. Generate more than 220 pounds (100 kg) of RCRA hazardous waste including Universal Waste except CRT materials in a calendar month? ☐ YES ☒ NO
5. Accumulate more than 11,000 pounds (5,000 kg) of Universal Waste at any time in a calendar year? ☐ YES ☒ NO
   If yes, must obtain a federal EPA ID number and submit copy of notification to CUPA.
6. Receive Mercury-containing Universal Waste from another Universal Waste Handler? ☐ YES ☒ NO
   If yes, must include mercury-containing wastes as hazardous waste on inventory summary & chemical description pages.
7. Process (dismantle, puncture, etc.) any Universal Wastes? ☐ YES ☒ NO
   If yes, must notify DTSC of processing activity prior to operation.

Provide the name(s) of all Universal Wastes handled or generated on site:

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Does this facility have a laboratory on site ☐ YES* ☒ NO

* If yes, attach a general description of the laboratory and a **brief** description of the type(s) and quantity of hazardous materials in the lab.

## III. VULNERABLE POPULATIONS

Is there a school, hospital, or extended care facility within 1,000 ft. (straight-line distance) of this facility? ☐ YES ☒ NO

If yes, attach page with the name and address of each school hospital or extended care facility site within 1000 ft.

Date: 10/24/03

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

| BUSINESS NAME (Same as FACILITY NAME or DBA) | |
|---|---|
| H & R DAIRY | |
| FACILITY ADDRESS 103 | CITY 104 |
| 14213 BONVIEW AVE | ONTARIO |

**EMERGENCY RESPONSE PLANS & PROCEDURES - AGENCY NOTIFICATION**
**POST BY PHONE**

**Agency Notification:** **If a situation is an emergency, call 911 first**. Additionally, a handler of hazardous materials is required to immediately report any release or threatened release of a hazardous material to San Bernardino County Fire Department, Hazardous Materials Division and the Governor's Office of Emergency Services. Spills exceeding federal reportable quantities require additional notification to the National Response Center. However, California statute does not limit the requirement to report to any specific quantity. **Also note that calling 911 does not meet the requirement for the handler to report a release and that the local fire department cannot make required notifications on behalf of the handler.** This CUPA requires a written report within 15 days after any reportable release or threatened release. Contact the CUPA for further guidance.

| Agency | Phone Number |
|---|---|
| 1. *Local Emergency Response Agency (if an emergency) | 911 |
| 2. *San Bernardino County Fire Department Hazardous Materials Division | (800) 33-TOXIC or (909) 386-8425 |
| 3. *State of California, Governor's Office of Emergency Services | (800) 852-7550 or (916) 845-8911 |
| 4. National Response Center | (800) 424-8802 |
| 5. Other Agencies *(Cal OSHA, Regional Board, Air Quality, as applicable)* | |

(* Indicates mandatory notification.)

| *Agency Name* | *Phone Number* |
|---|---|
| *Agency Name* | *Phone Number* |
| *Agency Name* | *Phone Number* |

**EMERGENCY INFORMATION REQUIRED: BE PREPARED TO PROVIDE THE FOLLOWING INFORMATION**

- Name & phone number of person reporting
- Name and street address of the business
- Location of the incident or threatened release
- Type of incident or threatened release
- Hazardous materials involved & physical state
- Hazards to human health and/or environment
- Actions taken or planned
- Contractor or cleanup company
- Estimate of the quantity released
- Media (soil, water, air) into which release occurred
- Precautions to take (if known)
- Time and duration of the release
- Is the chemical an extremely hazardous substance?
- Extent of injuries, if any
- Is any assistance required?

Release reporting citations (California Health and Safety Code):

§ 25501. Definitions:
(r) "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment, unless permitted or authorized by a regulatory agency.
(u) "Threatened release," means a condition creating a substantial probability of harm, when the probability and potential extent of harm make it reasonably necessary to take immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment.

§ 25507(a) ... the handler or any employee, authorized representative, agent, or designee of a handler shall, upon discovery, immediately report any release or threatened release of a hazardous material to the administering agency, and to the office, in accordance with the regulations adopted pursuant to Section 25503. Each handler and any employee, authorized representative, agent, or designee of a handler shall provide all state, city, or county fire or public health or safety personnel and emergency rescue personnel with access to the handler's facilities.

See Appendix G for further citations and explanation.

Date: 10/25/07

**CUPA**
**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

BUSINESS NAME (Same as FACILITY NAME or DBA)
HYR DAIRY

FACILITY ADDRESS 103: 14213 BONVIEW AVE
CITY 104: ONTARIO

## EMERGENCY RESPONSE PLANS AND PROCEDURES

State Law requires your business to complete all sections of the Emergency Response Procedure listed below:
For each of the following, **briefly** describe your business's standard operating procedures relating to the release or threatened release of hazardous materials located at your facility. You may attach additional pages if necessary, but do not include copies of facility manuals unless requested to do so by this Department. You may reference manuals that are used by your facility for these procedures, but you must still give a brief description here.

**EVACUATION/NOTIFICATION**: Indicate location(s) where employees, customers, visitors or others on site are to evacuate in an emergency. Describe how your business will immediately notify people and evacuate the facility in the event of a release or threatened release of hazardous materials. Include the route and meeting place.

UPON AN EMERGENCY, ALL EMPLOYEES ARE TO MEET AT THE PARKING LOT SOUTH OF THE MILK BARN & IN FRONT OF MY OFFICE. ALL NEED TO KNOW PEOPLE WILL BE CALLED IMMEDIATELY.

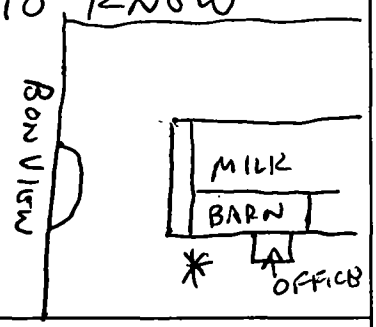


**PREVENTION/MITIGATION/ABATEMENT**: Describe what policies and procedures your business will follow to prevent, reduce and/or remove the hazard to persons, property or the environment caused by a release or threatened release of hazardous materials and/or hazardous wastes. (√Check those items that apply and write additional information in the space provided).

- [x] Reduction of containers on site if not used or needed.
- [x] Containers are properly labeled and closed when not in use.
- [ ] Compressed gas cylinders are properly secured.
- [ ] Use of monitoring system. Type: _____
- [ ] Other:

Date: 10/25/07

BUSINESS NAME (Same as FACILITY NAME or DBA)
H+R DAIRY

| FACILITY ADDRESS 103 | CITY 104 |
|---|---|
| 14213 BON VIEW AVE | ONTARIO |

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 2

**FACILITY TRAINING PLAN:** Describe employee and operator training including local emergency response coordination, use of facility emergency equipment, and provisions for initial and refresher training. In addition, describe training for hazardous materials/waste handling as required by OSHA. (√ Check those items that apply and write additional information in the space provided)

- [x] New employee training.
- [x] Annual training & periodic refresher courses.
- [x] Familiarization with the Emergency Response Plans and Procedures of this Business Plan.
- [x] Spill control equipment
- [ ] Monitoring system
- [x] Personal Protective Equipment
- [x] On the job training. Describe below.
- [ ] Other:

PUT EACH EMPLOYEE THROUGH AN ANNUAL TRAINING & REFRESHER COURSE. MAKE SURE THEY KNOW HOW TO USE SPILL EQUIPMENT & PROTECTIVE EQUIPMENT

**EMERGENCY PROCEDURES:** Give duties of the Emergency Coordinator and how implementation of Facility Emergency Response will be accomplished. (e.g. Notification, evacuation, emergency coordination) (√Check those items that apply and write additional information in the space provided)

Emergency Coordinator will:

- [x] Identify potential hazards and determine whether a release has occurred.
- [x] Activate local emergency systems (e.g. manual shutoff devices) and take appropriate immediate actions based on level of training and the ability to act safely.
- [x] Coordinate the notification and evacuation of employees and customers from the facility.
- [x] Make required agency notifications and request needed assistance.
- [x] Assist responding agencies by providing access to the facility and information about the facility.
- [ ] Other:

Date: 10/25/07

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**San Bernardino County Fire Department • Hazardous Materials Division**
**620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

BUSINESS NAME (Same as FACILITY NAME or DBA): A&R DAIRY

FACILITY ADDRESS (103): 14213 BON VIEW AVE

CITY (104): ONTARIO

## EMERGENCY RESPONSE PLANS AND PROCEDURES – PAGE 3

**FACILITY EMERGENCY EQUIPMENT:** List facility emergency equipment on site (fire extinguisher, fire alarms, spill control equipment, SCBA, first aid kits, etc.); include test/maintenance plan. (√Check those items that apply and write additional information in the space provided)

| Equipment | Quantity/Type | Maintenance Schedule/Frequency |
|---|---|---|
| ☒ Fire extinguisher(s) | 2 | |
| ☒ First aid kit(s) | 2 | |
| ☐ Fire alarm(s) | | |
| ☐ Spill control equipment | | |
| ☐ Monitoring system | | |
| ☒ Personal Protective Equipment | 2 | |
| ☐ | | |
| ☐ | | |
| ☐ | | |
| ☐ | | |

**FACILITY EARTHQUAKE RESPONSE:** Identify areas of the facility as well as mechanical or other systems that require immediate inspection due to their vulnerability to earthquake related ground motion. (E.g. Hazardous materials or waste storage locations, vessels, piping, pipe and tank supports, valves, gauges, etc.) (√Check those items that apply and write additional information in the space provided)

- ☒ Chemical Storage Locations – Product and Waste
- ☐ Process vessels
- ☒ Aboveground storage tanks
- ☒ Emergency shut-off systems
- ☐ Piping and pipe supports
- ☐ Utility connections
- ☐
- ☐
- ☐
- ☐

**ARRANGEMENTS/AGREEMENTS:** Describe any arrangements or agreements that you have with private emergency response teams, waste haulers, disposal companies, recyclers, local hospitals, police or fire. If you have no arrangements or agreements, state that fact in the space provided. (√Check those items that apply and write additional information in the space provided)

- ☐ Hazardous waste hauler
- ☐ Emergency response team
- ☐ Local Hospitals
- ☐ Other:
- ☒ No arrangements or agreements at this time

Date: 10/25/07

## HELPFUL HINTS FOR COMPLETING THE INVENTORY SECTION

**Congratulations! You have completed the first half of the plan. The following pages require review of the hazardous materials and hazardous wastes at your facility to determine which items require disclosure.**

**Here are some helpful hints to assist you in filling out the hazardous materials inventory section:**

1) This CUPA offers an example business plan that is available on our website or by mail. If you are unfamiliar with the business plan requirement, we recommend that you look at the example before you get started so you can see how inventory summary, chemical description pages, and maps work together.

2) Before you start filling out forms, determine how many items require disclosure and make the appropriate number of copies of the Inventory Summary form and the Chemical Description form. Note the following criteria when determining which items require disclosure in the inventory section: hazardous materials with a maximum quantity of greater than 55 gallons, 500 pounds, or 200 cubic feet; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives.

3) Assign a unique item number to each inventoried item (e.g. 1,2,3, etc.) This same item number is used on the Inventory Summary, on the individual Chemical Description form, and to show the storage location(s) on the facility map.

4) Each inventoried item requires a Chemical Description page that gives additional details about each chemical. Material Safety Data Sheets (MSDSs) and container labels are the main sources of chemical information. Wastes do not have MSDSs, but waste analysis, profiles, or manifests may have useful information.

5) Review Appendix I to determine which inventoried items require submission of a Material Safety Data Sheet (MSDS). If the substance is not listed in Appendix I, attach the MSDS for that chemical to the corresponding individual Chemical Description page. Anytime you update or refile the Chemical Description Page, make sure to attach the current MSDS. If you do not have a MSDS for a material, you can get one from your chemical vendor and you need them for compliance with the OSHA Hazard Communication Standard. Hazardous wastes do not have MSDSs.

6) Materials and wastes of the same chemical (e.g. lubricating oil and used oil) require separate Chemical Description pages..

7) Since the Chemical Description Page requires location information, you will have to complete the facility map(s) before you can finalize the Chemical Description pages.

8) The Maximum Quantity should reflect the maximum amount that could ever be onsite at any one time. The maximum listed on the Inventory Summary and the maximum listed on the individual Chemical Description form should be the same.

9) Typically, liquids are disclosed in gallons, solids in pounds and compressed gases in cubic feet. If you have questions regarding the correct unit type for an item, contact this department for assistance.

10) Signatures: The Inventory Summary form requires the Owner/Operator signature. Additionally, EPCRA filers are required to sign all individual Chemical Description forms.

Note: If you have a large warehouse, trade secrets, or other unique situation, please call our office before you fill out chemical description pages. We can help you develop an inventory that will meet the requirements and accommodate a unique situation.

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460

# INVENTORY SUMMARY FORM (REQUIRED)

## I. FACILITY IDENTIFICATION

FACILITY ID # F A 0 0 1 0 9 7 1 — 1 (This number is on your CUPA permit.)

BUSINESS NAME (Same as FACILITY NAME or DBA): H&R DAIRY

FACILITY ADDRESS 103: 14213 BONVIEW AVE

CITY 104: ONTARIO

## II. INVENTORY SUMMARY

| Item # | Name of Hazardous Material or Waste | Maximum Quantity | Size of Largest Container | Unit of Measure |
|---|---|---|---|---|
| *3.* | *Lubricating Oil (Example Only)* | *555* | *500* | *Gallon* |
| 1 | FUEL TANK - DIESEL | 500 | 500 | GAL. |
| 2 | CHLORINE BARRELS - LIQUID | 110 | 55 | GAL |
| 3 | ACID DETERGENT | 110 | 55 | GAL |
| 4 | CHLORINE - POWDER | 800 | 400 | lbs |
| 5 | FUEL TANK - DIESEL | 55 | 55 | GAL |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Summarize the business plan inventory on this page. Place this summary in front of inventory section of the Business Plan. Make copies of this sheet as necessary. Reminder: You need not report hazardous materials with a maximum quantity of less than 55 gallons, 500 pounds, 200 cubic feet, or the threshold planning quantity of an extremely hazardous substance. However, hazardous wastes, Category 1 and 2 pesticides, and explosives are reportable at any quantity.

## III. SIGNATURE- EPCRA Facilities MUST sign the bottom of each individual attached inventory form.

| SIGNATURE OF OWNER/OPERATOR | NAME OF SIGNER (*print*) 136 | DATE 134 |
|---|---|---|
| [signature] | RON MIERSMA | 10/23/03 |

Inventory Summary Page ____ of ____

## Business Plan Inventory Summary Form Instructions

File an Inventory Summary every time you update any or all of the Chemical Description Pages. This makes sure that your copy, the local Fire Agency, and the CUPA has the most current, complete information.

**Purpose:** The Inventory Summary is a critical document that acts as a table of contents for the individual chemical description pages; otherwise known as the Chemical Description Pages. It gives an important at-a-glance view of your inventory and acts as a key to the location of inventoried items on your facility map.

**Inventory:** Only items meeting the criteria and quantities of 55 gallons, 500 pounds, 200 cubic feet of a hazardous substance; extremely hazardous substances at or exceeding threshold quantities (see Appendix B); any amount of hazardous waste, category 1 or 2 pesticides, or explosives must be included in the Inventory Section of the Business Plan.

**Item Numbers:** Assign a unique number to each inventoried item. Place the item number on each individual Chemical Description Form, and then use the same item number to list the item in order of the attached Chemical Description Pages on the Inventory Summary Form. This item number is also used to locate the storage location of the inventoried items on the Facility Map(s).

**Name of Hazardous Material or Waste:** Provide the name of the Hazardous Material or Waste being inventoried. The same name should be used on the Chemical Description Form.

**Maximum Quantity:** Maximum quantities are a not-to-exceed amount for the reporting year.

**Largest Container Size:** Enter the total capacity of the largest container in which the material is stored. If hazardous materials are stored in various containers, use the largest container size to complete this section.

**Unit of Measure:** Describe how the hazardous material is being stored. Typically, liquids are listed in gallons; solids are listed as pounds; and gases are listed as cubic feet. Extremely Hazardous Substances (EHS) must be reported in pounds, regardless if the EHS is in a liquid, solid, or gas phase.

**Signature:** The owner/operator must sign the Inventory Summary Form, print their name, and date this page.

**EPCRA:** EPCRA filers must also sign and date all Chemical Description Pages.

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

***ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.***

**ITEM NUMBER ____1____**

| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION |
|---|---|---|
| BUSINESS NAME: H & R Dairy | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 14213 Bon View Ave. | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME: Diesel | TRADE SECRET ☒ NO — Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Diesel | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B) *If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)* ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE — RADIOACTIVE? Yes ☐ No ☒ — CURIES N/A

PHYSICAL STATE *(Check one item only)* ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST — SIZE OF LARGEST CONTAINER: 500

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 500 | 500 | | |

UNITS* *(Check one item only)* ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: — DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*
☒ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER _____

STORAGE PRESSURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE ☐ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 100 | Diesel | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER ____2____

| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION |
|---|---|---|
| BUSINESS NAME: H & R Dairy | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 14213 Bon View Ave. | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME: Chlorine | TRADE SECRET ☒ NO — Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Sodium Hypochlorite | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B) *If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE? Yes ☐ No ☒ CURIES N/A

PHYSICAL STATE *(Check one item only)*: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST

SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 55 | 110 | | |

UNITS* *(Check one item only)*: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER:

DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:

| | | | | |
|---|---|---|---|---|
| ☒ a. ABOVEGROUND TANK | ☐ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 12.5 | Sodium Hypochlorite | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER ____3____

| | | |
|---|---|---|
| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION |
| BUSINESS NAME: H & R Dairy | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 14213 Bon View Ave. | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME: Acid Detergent | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Acid Detergent | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES N/A

PHYSICAL STATE *(Check one item only)*: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES: ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 55 | 110 | | |

UNITS* *(Check one item only)*: ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:
☒ a. ABOVEGROUND TANK ☐ b. UNDERGROUND TANK ☐ c. TANK INSIDE BUILDING ☐ d. STEEL DRUM
☐ e. PLASTIC/NONMETALLIC DRUM ☐ f. CAN ☐ g. CARBOY ☐ h. SILO
☐ i. FIBER DRUM ☐ j. BAG ☐ k. BOX ☐ l. CYLINDER
☐ m. GLASS BOTTLE ☐ n. PLASTIC BOTTLE ☐ o. TOTE BIN ☐ p. TANK WAGON
☐ q. RAIL CAR ☐ r. OTHER _____

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. | Acid Detergent | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

**ITEM NUMBER ____4____**

| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION |
|---|---|---|
| BUSINESS NAME: H & R Dairy | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS: 14213 Bon View Ave. | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME: Chlorine Powder | TRADE SECRET ☒ NO — Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME: Chlorine Powder | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B) *If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)*: ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE

RADIOACTIVE? Yes ☐ No ☒ CURIES N/A

PHYSICAL STATE *(Check one item only)*: ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST

SIZE OF LARGEST CONTAINER: 400

FED HAZARD CATEGORIES: ☐ a. FIRE ☒ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 400 | 800 | | |

UNITS* *(Check one item only)*: ☐ a. GALLONS ☐ b. CUBIC FEET ☒ c. POUNDS ☐ d. TONS ☐ E. OTHER:

DAYS ON SITE: 365

STORAGE CONTAINER *(Check all that apply)*:

| | | | | |
|---|---|---|---|---|
| ☒ a. ABOVEGROUND TANK | ☐ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☐ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE: ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. | Chlorine Powder | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

San Bernardino County CUPA · HAZARDOUS MATERIALS DIVISION
620 South E Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460

# HAZARDOUS MATERIALS INVENTORY FORM - Chemical Description

☒ MATERIAL
☐ WASTE

*One page per item. Indicate if material OR waste (Do not combine material and waste on one form)*

MAKE COPIES OF THIS FORM AS NEEDED.

*ATTACH A MATERIAL SAFETY DATA SHEET (MSDS) IF THE MATERIAL IS NOT LISTED IN APPENDIX I OF THIS GUIDE.*

ITEM NUMBER ___4___

| FACILITY ID # | F A 0 0 1 0 9 7 1 [redacted] | CHEMICAL LOCATION INFORMATION | |
|---|---|---|---|
| BUSINESS NAME<br>H & R Dairy | | FACILITY MAP # | GRID COORDINATE(s) [redacted] |
| BUSINESS SITE ADDRESS<br>14213 Bon View Ave. | | | |

## CHEMICAL INFORMATION

| | |
|---|---|
| CHEMICAL NAME<br>Diesel | TRADE SECRET ☒ NO<br>Do not disclose trade secrets here. Contact this Dept for trade secret filing instructions. If EPCRA, follow EPA procedures |
| COMMON NAME<br>Diesel | EHS* ☐ YES ☒ NO |
| CAS# | EHS = Extremely Hazardous Substance (Appdx B)<br>*If EHS is "YES", all amounts MUST be in pounds |

HAZARDOUS MATERIAL TYPE *(Check one item only)* ☒ a. PURE ☐ b. MIXTURE ☐ c. WASTE | RADIOACTIVE? Yes ☐ No ☒ | CURIES N/A

PHYSICAL STATE *(Check one item only)* ☐ a. SOLID ☒ b. LIQUID ☐ c. GAS ☐ d. DUST | SIZE OF LARGEST CONTAINER: 55

FED HAZARD CATEGORIES ☐ a. FIRE ☐ b. REACTIVE ☐ c. PRESSURE RELEASE ☐ d. ACUTE HEALTH ☐ e. CHRONIC HEALTH

| AVERAGE AMOUNT | MAXIMUM AMOUNT | ANNUAL WASTE AMOUNT | STATE WASTE CODE |
|---|---|---|---|
| 55 | 55 | | |

UNITS* *(Check one item only)* ☒ a. GALLONS ☐ b. CUBIC FEET ☐ c. POUNDS ☐ d. TONS ☐ E. OTHER: | DAYS ON SITE 365

STORAGE CONTAINER *(Check all that apply)*

| | | | | |
|---|---|---|---|---|
| ☐ a. ABOVEGROUND TANK | ☐ e. PLASTIC/NONMETALLIC DRUM | ☐ i. FIBER DRUM | ☐ m. GLASS BOTTLE | ☐ q. RAIL CAR |
| ☐ b. UNDERGROUND TANK | ☐ f. CAN | ☐ j. BAG | ☐ n. PLASTIC BOTTLE | ☐ r. OTHER |
| ☐ c. TANK INSIDE BUILDING | ☐ g. CARBOY | ☐ k. BOX | ☐ o. TOTE BIN | |
| ☒ d. STEEL DRUM | ☐ h. SILO | ☐ l. CYLINDER | ☐ p. TANK WAGON | |

STORAGE PRESSURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT

STORAGE TEMPERATURE ☒ a. AMBIENT ☐ b. ABOVE AMBIENT ☐ c. BELOW AMBIENT ☐ d. CRYOGENIC

| %WT | COMPOSITION (LIST ALL COMPONENTS, HAZARDOUS FIRST) | EHS | CAS # |
|---|---|---|---|
| 1. 100 | Diesel | ☐ YES ☒ NO | |
| 2. | | ☐ YES ☐ NO | |
| 3. | | ☐ YES ☐ NO | |
| 4. | | ☐ YES ☐ NO | |
| 5. | | ☐ YES ☐ NO | |

**If more hazardous components are present at greater than 1% by weight if non-carcinogenic or 0.1% by weight if carcinogenic, attach additional sheets**

NOTES *(Trade names/synonyms or other information relevant to the substances listed)*

***If EPCRA, Owner/Operator please sign this page***

Date: _____

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South 'E' Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: 0010971 Facility Name: H & R Dairy Inspection Date: 12/12/12

Site Address: 14213 S. Bon View Ave. Phone #: 909-376-3379

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:

☐ Inspect ☐ Photograph Name: ---------- Title: ---------- # Emp: ----

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | | X |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(e) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(e) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR 66262.34(f)(3) | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(e)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | | | X |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | | | X |
| 202. Business Plan established | CHSC 25503.5 | | | X |
| 203. Business Plan submitted/updated | CHSC 25505 | | | X |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | | X |
| 206. Regulated Substances registration filed | CHSC 25533 | | | X |
| 207. SPCC Plan prepared | CHSC 25270.4.5 | | | X |

**INSPECTION NARRATIVE**

An inspection was conducted to verify this business is no longer in operation at this location. Per copy of bill of sale, cattle were sold to another company that began operating a new dairy at this location on 4/1/12.

Business vacated this location prior to permit expiration; therefore, invoice IN0086049 for 2012/13 permits is not applicable. Invoice will be reversed and hazardous material handler permit will be inactivated.

☐ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN ____ DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: [signature] Sign Name — Leslie Heaviside

Received By: USPS Sign Name — ----------

Title: ----------

Report Date: December 12, 2012

# BILL OF SALE

*KNOW ALL MEN BY THESE PRESENTS:* That DOROTHY MIERSMA, TRUSTEE, RON MIERSMA, TRUSTEE, DENISE MIERSMA, TRUSTEE, DBA H & R DAIRY, hereinafter designated as the Seller(s), for good and valuable consideration in and with lawful money of the United States of America, to them in hand paid by CRAIG GORDON, DBA GORDON HAY, INC., hereinafter designated as the Purchaser(s), the receipt whereof is hereby acknowledged, do by these presents grant, bargain, sell, and convey unto the Purchaser(s), executors, administrators, and assigns; the following described Personal Property;

58 head consisting of mature Holstein dairy cattle of various ages and descriptions.

*TO HAVE AND TO HOLD*, the same to the said Purchaser(s) their Executors, administrators and assigns forever. And the said Seller(s) do convey for their heirs, executors and administrators covenant and agree to and with the said Purchaser(s), their executors, administrators and assigns, to warrant and defend the title to the said property, goods and chattels hereby conveyed, against the just and lawful claims and demands of all persons whomsoever.

*WITNESS* our hands and seals this 7th day of March, 2012.

DOROTHY MIERSMA, TRUSTEE
RON MIERSMA, TRUSTEE
DENISE MIERSMA, TRUSTEE
DBA H & R DAIRY

Dorothy Miersma Trustee
Dorothy Miersma, Trustee

Ron Mi Trustee
Ron Miersma, Trustee

Denise Miersma Trustee
Denise Miersma, Trustee

APPROVED AS TO FORM AND CONTENT

CRAIG GORDON, DBA GORDON HAY, INC.

Craig Gordon

# COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden


October 17, 2007

RON MIERSMA
14213 BON VIEW AVE
ONTARIO, CA 91761

**ATTN: RON MIERSMA**

**SUBJECT: INSPECTION COMPLIANCE REQUIREMENTS**

**FACILITY: FA0010971-H & R DAIRY**
**14213 BON VIEW AVE**
**ONTARIO, CA 91761**

Mr. Miersma,

A recent review of our records indicates that the following violation(s) remain outstanding from the inspection conducted on May 02, 2007:

- Failure to establish a Business Plan
- Failure to submit/update a Business Plan
- Failure to train facility personnel in hazardous waste management procedures

**Failure to submit the signed and completed certificate of compliance with the previously requested documentation immediately may result in legal action.**

If you have any questions, please call me at (909) 386-8401 or email me at SBARBAO@SBCFIRE.ORG.

**SHANE BARBAO**
**Hazardous Materials Division, Field Services Section**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • PHONE: (909) 386-8401 FAX: (909) 386-8460
www.sbcfire.org

# BUSINESS EMERGENCY/CONTINGENCY PLAN COVER SHEET

## I. IDENTIFICATION

[redacted]

For Dept Use Only – Log In/Date Stamp

RECEIVED
OCT 10 2007
S.B. CO. FIRE DEPT.

FACILITY ID # F A 0 0 1 0 9 7 1 [redacted]

BUSINESS NAME (Same as FACILITY NAME or DBA) 3
H & R DAIRY

| BUSINESS SITE ADDRESS | CITY | ZIPCODE |
|---|---|---|
| 14213 BON VIEW AVE | ONTARIO | 91762 |

## II. SUBMISSION CHECKLIST

*(Complete this Section if submitting an entire business emergency/contingency plan whether new or revised)*

Submission Checklist ☒ *Items with an ' * ' are considered "Inventory" under State disclosure laws*

- ☒ * Business Activities Form
- ☒ * Business Owner/Operator Identification Form
- ☒ * Supplemental Emergency Contact Page
- ☒ Emergency Response Plans and Procedures
- ☒ * Hazardous Materials Inventory Summary Form for the facility listing materials (including wastes) by item number.
- ☒ * One Hazardous Materials Inventory Form for each hazardous material (including wastes) which meet reporting criteria
- ☒ * Material Safety Data Sheets attached to the inventory form of each material not listed in Appendix I.
- ☒ * Facility map (using grid form provided) consisting of all required features including the location of each inventoried item.
- ☒ Site map (using grid form provided) consisting of all required features including surrounding facilities and areas.
- ☒ Area map - photocopied city map with location of site indicated
- ☒ Owner/Operator has signed and dated the plan and all required individual pages of the plan.
- ☒ Submit 2 copies to the Hazardous Materials Division. One is for distribution to the local fire jurisdiction.
- ☒ ***Retain one copy of the business emergency/contingency plan at the facility.***

## III. UPDATE/CERTIFICATION

*(Complete this Section if submitting a partial update or re-certifying an existing Plan)*

**Check the appropriate boxes below and sign the certification statement. Submit 2 copies of all update information.**

☐ Please incorporate the following into my business emergency/contingency plan.

- ☐ New Business Owner/Operator Identification Form
- ☐ New Inventory Forms and new Inventory Summary Form (and maps, if affected).
- ☐ New Supplemental Emergency Contact Page.

☐ Other: _____

Brief explanation of changes: _____

☐ There have been no changes to the inventory. In place of submitting the annual inventory, I hereby attest to all of the following:

- The information contained in the inventory most recently submitted to the CUPA is complete, accurate and up to date.
- There has been no change in the quantity, storage, or handling of hazardous materials (including waste) reported in the most recently submitted inventory.
- No hazardous materials (including waste) subject to inventory requirements are being handled that are not listed on the most recently submitted inventory.
- This certification is **not** being made to meet annual inventory submission requirements of EPCRA. (**EPCRA requires complete annual submission**)

## IV. SIGNATURE

*(Complete this Section for all submissions)*

**Certification - Based on my inquiry of those individuals responsible for obtaining the information, I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and believe the information is true, accurate and complete.**

| SIGNATURE OF OWNER/OPERATOR | DATE | NAME OF DOCUMENT PREPARER 135 |
|---|---|---|
| Ron Miersma | 10/24/07 | |
| **NAME OF SIGNER (*print*)** | **TITLE OF SIGNER (*print*)** | |
| RON MIERSMA | OWNER | |

ENTERED DEC 18 2007

FD SENT DEC 12 2007

## BUSINESS EMEI .CY/CONTINGENCY PLAN COVER SHEET :RUCTIONS

Submit the Business Emergency/Contingency Plan Cover Sheet each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you determine which pages of the Business Emergency/Contingency Plan are required for full submissions and updates/ changes. If completed correctly, this form can also alert staff to changes that affect permitting such as ownership or business name changes. Finally, this form serves as documented certification that the plan contents have been reviewed by the Owner/Operator and are accurate to the best of that individual's knowledge.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing. Facility ID #'s are not transferable from one location to another. If you have questions regarding your Facility ID #, please contact this Department.

**Submission Checklist:** Complete this section if you are submitting an entire business plan. Checking off the boxes helps you to make sure that you have completed all the required pages and made the necessary copies.

**Update/Certification:** This section should be completed to notify this Department of significant changes such as an ownership change, changes to the inventory and changes relating to the emergency contact information. For more information about updates, see the instructions on page iii or call this office. Note that EPCRA facilities must provide a complete submission every year.

**Signature:** This section must be completed as the plan will not be accepted as complete unless the plan has been certified and signed by the Owner/Operator.

**CUPA**
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**620 South "E", San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460**

# BUSINESS ACTIVITIES

## I. FACILITY IDENTIFICATION

**FACILITY ID #** F A 0 0 1 0 9 7 1 [redacted]

**BUSINESS NAME** (Same as FACILITY NAME or DBA): H&R DAIRY

**EPA ID # (Hazardous Waste Only):**

**BUSINESS ADDRESS:** 14213 BON VIEW AVE

**CITY:** ONTARIO

**ZIP CODE:** 91762

## II. ACTIVITIES DECLARATION

| Does your facility... | If YES, the following additional information is required... (Items with an '*' must be submitted to this department) | |
|---|---|---|
| **A. HAZARDOUS MATERIALS** | | |
| 1. Have onsite (for any purpose) hazardous materials at or above 55 gallons for liquids, 500 pounds for solids or 200 cubic feet for compressed gases; or the applicable Federal threshold quantity for an extremely hazardous substance; or handle radiological materials in quantities for which an emergency plan is required pursuant to 10 CFR Parts 30, 40 or 70; or handle ANY amount of Class 1 or 2 explosives; or ANY amount Category I or II pesticides. | ☒ YES ☐ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Have extremely hazardous substances above threshold planning quantities or hazardous substances in quantities greater than 10,000 lbs (except retail gas stations up to 75,000 gallons of gasoline or 100,000 gallons of diesel fuel in upgraded USTs) or otherwise subject to EPCRA 311-312 reporting requirements. | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Must file annually according to EPCRA instructions to meet EPCRA SARA Title III Tier 2 reporting requirements – see instructions, pg i.) |
| **B. REGULATED SUBSTANCES** | | |
| Have Regulated Substances stored onsite in quantities greater than the threshold quantities established by the California Accidental Release Prevention Program (CalARP)? | ☐ YES ☒ NO | * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) * CalARP REGISTRATION FORM (See Section V of BP guidelines and forms) |
| **C. UNDERGROUND STORAGE TANKS (USTs)** | | |
| 1. Own or operate underground storage tanks? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 2. Intend to upgrade existing or install new USTs? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) |
| 3. Need to report closing a UST? | ☐ YES ☒ NO | * UST FACILITY FORM * UST TANK (Pages 1 and 2) (One set per tank) * HAZARDOUS WASTE TANK CLOSURE CERTIFICATION |
| **D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)** | | |
| Store greater than 1320 gallons of petroleum products (new or used) in aboveground tanks or containers? | ☐ YES ☒ NO | IF YES, PREPARE AND MAINTAIN A SPILL PREVENTION CONTROL & COUNTERMEASURES PLAN (SPCC) TO ADDRESS RELEASES FROM ABOVEGROUND STORAGE OF PETROLEUM AT YOUR FACILITY. |
| **E. HAZARDOUS WASTE** | | |
| 1. Generate ANY amount of hazardous waste? | ☐ YES ☒ NO | EPA ID NUMBER—provide at the top of this page * BUSINESS EMERGENCY/CONTINGENCY PLAN (Used in place of OES Form 2730 and 2731) |
| 2. Recycle more than 100 kg/month of excluded or exempted recyclable materials (per CHSC §25143.2)? | ☐ YES ☒ NO | * RECYCLABLE MATERIALS REPORT (Pages 1 and 2) |
| 3. Treat hazardous waste on site? | ☐ YES ☒ NO | * ONSITE HAZARDOUS WASTE TRT - FACILITY * ONSITE HAZARDOUS WASTE TRT - UNIT (one per unit) |
| 4. Treatment subject to financial assurance requirements (for Permit by Rule and Conditional Authorization)? | ☐ YES ☒ NO | * CERTIFICATION OF FINANCIAL ASSURANCE |
| 5. Consolidated hazardous waste generated at a remote site? | ☐ YES ☒ NO | * REMOTE WASTE/CONSOLIDATED SITE ANNUAL NOTIFICATION |
| 6. Generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. | ☐ YES ☒ NO | IF YES, OBTAIN FEDERAL EPA ID NUMBER, FILE BIENNIAL REPORT (EPA FORM 8700-13A/B) WITH USEPA, AND SATISFY REQUIREMENTS FOR RCRA LARGE QUANTITY GENERATOR. |

## Business Activities Page Instructions

Submit the Business Activities page each time you update the Business Emergency/Contingency Plan.

**Purpose:** This form helps you obtain a CUPA permit and file the appropriate forms for the different types of regulated activities for this specific facility. Specific forms and program explanations are available from our website, www.sbcfire.org. Click on Hazmat.

**Facility ID:** The Facility ID # is unique to an operation at a specific location under the control of a single employer. This CUPA issues the number. If this is your first application with our CUPA for this site, you will not have a Facility ID # yet and should simply leave this field blank on all forms. You can expect to receive your facility ID # with the invoice for your permits within 60 days of initial filing.

**EPA ID #:** If you generate, recycle, or treat hazardous waste, enter your facility's 12-character U.S. Environmental Protection Agency (U.S. EPA) or California Identification number. All hazardous waste generators are now required to have an ID number. This number is obtained by filing form DTSC 1358 by mail, email, or fax. This form is available from our website or from the DTSC web site at www.dtsc.ca.gov under Frequently Requested Information. There is no cost for an EPA ID #.

**Business Name & Address:** Enter the full legal name of the business at this location. This is the same as the terms "Facility Name" or "DBA-Doing Business As" that might have been used in the past. Business Address should be the location address of the actual operation, not a mailing address, post office box, or separate central office.

### A. HAZARDOUS MATERIALS

1. Answer "YES" to this question if you handle the indicated quantities of hazardous materials. Note that hazardous materials include oils, paints, solvents, cleaners, and all hazardous wastes. For definition, see the instructions, page ii. If "YES", complete and submit the Business Emergency/Contingency Plan.
2. Answer "YES" to this question if you handle the quantities indicated related to Sections 311-312 of the Federal Emergency Planning and Community Right to Know Act (EPCRA). See page i of these instructions or www.epa.gov/ceppo. If "YES", submit the Business Emergency/Contingency Plan following the EPCRA instructions, with annual complete submission and signatures.

### B. REGULATED SUBSTANCES

Answer "YES" to this question if you handle in a process greater than the threshold quantities of a regulated substance listed in the 3 tables in Appendix C. If "YES", submit the San Bernardino County CUPA CalARP Registration Form (also in Appendix C) and coordinate with this CUPA the submission of the Risk Management Plan (RMP) and the implementation of the Prevention Program.

### C. UNDERGROUND STORAGE TANKS (USTs)

1. Answer "YES" to this question if you own or operate USTs containing hazardous substances as defined in Health and Safety Code (HSC) §25316 or San Bernardino County Code. If "YES", then you must complete one UST Facility page and UST Tank pages for each tank. Other forms for upgrading or closing a UST may be obtained from our website.

### D. ABOVE GROUND PETROLEUM STORAGE TANKS (ASTs)

Answer "YES" to this question if you store greater than 1320 gallons of petroleum products either new or used, in aboveground tanks or containers: Note that "tank" in this law is defined to include all aboveground containers including drums, but does not include pressurized liquefied petroleum gases. If "YES", you must prepare a Spill Prevention Control and Countermeasures Plan (SPCC).

### E. HAZARDOUS WASTE

1. Answer "YES" if you generate **ANY** amount of hazardous waste (HW). A generator is the person or business whose acts or processes produce a HW or who causes a hazardous substance or waste to become subject to state HW law. Hazardous Waste includes waste oil, waste antifreeze, and many other common wastes. You are the generator even if the waste is ultimately recycled or if another company hauls it for you. If "YES", obtain an EPA ID number and use the Business Emergency/Contingency Plan Forms to meet Contingency Plan requirements.
2. Answer "No" to the recycling question if you only send materials to an offsite recycler (eg oil, antifreeze, parts washer solutions). Answer "YES" if this site recycles any amount of recyclable materials under a claim that the material is excluded or exempt per HSC § 25143.2. If "YES", complete the Recyclable Materials Reporting Form (Page 1 & 2).
3. Answer "YES" if your facility engages in onsite treatment of hazardous waste. "Treatment" means any method, technique, or process which is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose. "Treatment" does not include the removal of residues from manufacturing process equipment for the purposes of cleaning that equipment. There are exemptions from the definition of "treatment" for certain processes under specific, limited conditions described in CHSC section 25123.5(b). If "YES", complete the Onsite Hazardous Waste Treatment Notification- Facility page and one set of Onsite Hazardous Waste Treatment Notification-Unit pages with waste and treatment process information for each unit.
4. Answer "YES" if your facility is subject to Financial Assurance requirements for closure of an onsite treatment unit (for Permit by Rule and Conditional Authorization). Unless they are exempt, Permit by Rule (PBR) and Conditionally Authorized (CA) operations are required to provide financial assurance for closure costs (per 22 CCR §67450.13(b) and HSC §25245.4). If "YES", then complete the Certificate of Financial Assurance page.
5. Answer "YES" if you are a hazardous waste generator that collects hazardous waste initially at remote sites and subsequently transports the hazardous waste to a consolidation site you also operate. You must be eligible pursuant to the conditions in HSC §25110.10. If "YES", complete the Remote Waste Consolidation Site Annual Notification page.
6. Answer "YES" to this question if you generate in any single calendar month 1,000 kilograms (kg) (2,200 pounds) or more of federal RCRA hazardous waste, or generate in any single calendar month, or accumulate at any time, 1 kg (2.2 pounds) of RCRA acute hazardous waste; or generate or accumulate at any time more than 100 kg (220 pounds) of spill cleanup materials contaminated with RCRA acute hazardous waste. If "YES", obtain a Federal EPA ID number, file a biennial report, and satisfy other requirements for RCRA Large Quantity Generators.

COUNTY FIRE DEPARTMENT

COUNTY OF SAN BERNARDINO
PUBLIC AND SUPPORT
SERVICES GROUP

OFFICE OF THE FIRE MARSHAL
HAZARDOUS MATERIALS DIVISION
620 South "E" Street • San Bernardino, CA 92415-0153
(909) 386-8401 • Fax (909) 386-8460

PAT A. DENNEN
Fire Chief
County Fire Warden

# Business Emergency/Contingency Plan Receipt

Mail to: H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

Site Address: H & R DAIRY
14213 BON VIEW AVE
ONTARIO, CA 91761

Service Request ID: SR0014813
Facility ID: FA0010971

The Business Emergency/Contingency Plan was received on October 10, 2007 by the Hazardous Materials Division.

For future reference, please note the following Business Emergency/Contingency Plan requirements:

1. The contents of this plan are subject to field verification and a current copy of this plan must be available on site.
2. This plan contains important information on preventing, responding to, and reporting releases of hazardous materials/waste. Employees are expected to be familiar with these portions of the plan.
3. The plan is available for public inspection through this Division, with the exception of substantiated trade secrets, the separate confidential emergency contact page, and maps specifying the precise storage locations of hazardous materials/wastes.
4. Two copies of the plan and/or update is required to be filed with this Division. The second copy will be forwarded to the local fire jurisdiction.
5. The annual deadline for submission of business plan inventory is March 1st. Please note that EPA does not allow EPCRA facilities to file a recertification in place of annual inventory. Also, this Division typically does not send individual notices of this statutory deadline, so please note the March 1st date for future annual submissions.

Within 30 days of any of the following events, an amendment to the Business Emergency/Contingency Plan must be filed:

1. A 100 percent or more increase in quantity of a previously disclosed item.
2. Any handling of a previously undisclosed hazardous material (including waste) required to be inventoried or elimination of a previously inventoried item.
3. Change of business address, business ownership, or business name.
4. Change of emergency contact information or other site conditions that may significantly affect emergency response.

For more information please consult the latest version of the San Bernardino County CUPA Business Emergency/Contingency Plan guidelines and forms, available through our website at www.sbcfire.org or by calling this office at (909) 386-8401.

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# CERTIFICATE OF COMPLIANCE

Page 1 of 1

**Return Certification within** 30 **Days of Receipt to Inspector** Shane Barbao

*In the Matter of Respondent:* Ron ~~Miersma~~ Miersma

*Violation(s) cited on:* 3-May-2007 *FA #::* FA0010971

*Facility Name:* H and R Dairy

*Site Address:* 14213 Bon View

*Certificate of Compliance Date:* 3-May-2007

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| *Signature* | 11/8/07 *Date* |
| RON MIERSMA *Printed or Typed Name* | Owner *Title* |
| *Social Security/Federal ID Number* | *Drivers License/ID Number* |

*Attach the following documentation when returning the Certificate of Compliance:*

(1) Submit documentation showing that an employee safety program had taken place.
(2) Pay invoice for the hazardous materials handler permit. Invoice will be mailed to facility.
(3) Submit original and one copy of the business emergency/contingency plan. Keep one copy on site.

**CUPA**

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## HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: FA0000395 Facility Name: H and R Dairy Inspection Date: 3-May-2007

Site Address: 14213 Bon View Phone #: 909-376-3373

City: Ontario Zip Code: 91710 EPA ID #: N/A

Consent Granted by:

☒ Inspect ☒ Photograph Name: Ron ~~Miersna~~ Miersma Title: Owner # Emp: 5

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 of the Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC). The following code sections are either in Violation (V) of, in Compliance (C) with, the applicable laws and regulations, or compliance is not applicable, not addressed or unknown (N).

| GENERAL REQUIREMENTS FOR GENERATORS | | V | C | N |
|---|---|---|---|---|
| 101. Hazardous Waste Generator Permit current | CC 23.0602(b)(1) | | | X |
| 102. Facility access for inspection granted - HW only | CHSC 25185 | | X | |
| 103. Hazardous Waste determination made | CCR 66262.11 | | | X |
| 104. EPA ID Number obtained | CCR 66262.12(a) | | | X |
| 105. Hazardous Waste storage/treatment authorization | CHSC 25189.5(d) | | | X |
| 106. Facility operated/maintained to prevent release/fire | CCR 66265.31 | | | X |
| 107. Contingency Plan established | CCR 66265.51(a) | | | X |
| 108. Recyclable materials managed lawfully | CHSC 25143.2 | | | X |
| 905. Universal Waste managed lawfully | CCR 66273.1 | | | X |
| **STORAGE AND LABELING REQUIREMENTS** | | | | |
| 110. Tank/container labeled/marked "Hazardous Waste" | CCR | | | X |
| 111. Hazardous Waste label complete | CCR 66262.34(f)(3) | | | X |
| 112. Accumulation start date on tank/container | CCR 66262.34(f)(2) | | | X |
| 113. Hazardous Waste accumulation time not exceeded | CCR 66262.34 | | | X |
| 114. Hazardous Waste containers sound | CCR 66265.171 | | | X |
| 115. Hazardous Waste containers not leaking | CCR 66265.173(b) | | | X |
| 116. Hazardous Waste containers closed | CCR 66265.173(a) | | | X |
| 117. Contaminated containers managed properly | CCR 66261.7 | | | X |
| 118. Container storage area inspected weekly | CCR 66265.174 | | | X |
| 119. Hazardous Waste managed lawfully | CHSC 25154 | | | X |
| 120. Hazardous Waste aboveground tank system inspected | CCR 66262.34 | | | X |
| **HAZARDOUS WASTE RECORDS AND MANIFESTS** | | | | |
| 125. Hazardous Waste transported with a manifest | CCR 66262.20(a) | | | X |
| 126. Hazardous Waste manifest complete | CCR 66262.23 | | | X |
| 127. Hazardous Waste manifests sent to DTSC | CCR 66262.23(a)(4) | | | X |
| 128. Manifests retained for at least 3 years | CCR 66262.40(a) | | | X |
| 129. Biennial Report prepared | CCR 66262.41 | | | X |
| 130. Hazardous Waste analyses retained for 3 years | CCR 66262.40(c) | | | X |
| 131. Training documentation complete & available | CCR 66265.16 | X | | |
| 132. Copy of completed SB 14 available | CCR 67100.3 | | | X |
| 135. Used oil managed properly | CHSC 25250.4 | | | X |
| 136. Used oil not contaminated with Hazardous Waste | CHSC 25250.7 | | | X |
| 137. Consolidated manifesting records available | CHSC 25160.2(b)(3) | | | X |
| 138. Used oil filters managed lawfully | CCR 66266.130 | | | X |
| 139. Spent lead acid batteries managed lawfully | CCR 66266.81 | | | X |
| **DISPOSAL AND TRANSPORTATION** | | | | |
| 145. Illegal disposal/abandonment of Hazardous Waste | CHSC 25189.5(a) | | | X |
| 146. Illegal disposal of used oil | CHSC 25250.5(a) | | | X |
| 147. Transporting Hazardous Waste w/o valid registration | CHSC 25163 | | | X |
| 148. Hazardous Waste hauled by transporter w/o valid registration | CHSC 25163 | | | X |
| 149. Hazardous Waste transported to an unauthorized facility | CHSC 25189.5(c) | | | X |

| GENERAL REQUIREMENTS FOR HANDLERS | | V | C | N |
|---|---|---|---|---|
| 201. Hazardous Material Handler permit current | CC 23.0602(b)(3) | X | | |
| 202. Business Plan established | CHSC 25503.5 | X | | |
| 203. Business Plan submitted/updated | CHSC 25505 | X | | |
| 204. Hazardous Materials release reported | CHSC 25507 | | | X |
| 205. Facility access for inspection granted – HM | CHSC 25508 | | X | |
| 206. Regulated Substances registration filed | CHSC 25533(a) | | | X |
| 207. SPCC Plan prepared | CHSC 25270.5(c) | | | X |
| 230. Business Plan implemented | CHSC 25503.5 | | | X |

**INSPECTION NARRATIVE**

Unannounced inspection conducted at H and R Dairy on 3-May-2007. Purpose of inspection was to determine compliance with hazardous materials and waste laws. Ron Miersma accompanied me on the inspection.

Facility is a dairy. ~~that~~ Facility stores hazardous materials as a result of plant (dairy) sanitization ~~and~~ and vehicle fueling (diesel).

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: Shane Barbao (Sign Name) Received By: (Sign Name) Title: Owner

Shane Barbao (Print Name) Ron Miersma (Print Name) Report Date: 3-May-2007

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: 3-May-2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000395 | H and R dairy | 14213 Bon View |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Ron Miersma | TITLE Owner |

Hazardous materials inventory
(2) 400 pound drums of caustic cleaner
(1) 55 gallon drum of acid cleaner.
(2) 30 gallon drums of sodium hypochlorite, 12.5%
(2) 55 gallon drums of sodium hypochlorite, 12.5%
(7) 50 pound bags of copper sulfate.
(1) 500 gallon (AST) aboveground storage tank of diesel
Unknown amount of R-409(A) refrigerant gas in the cooling system. (the chiller)

Hazardous waste inventory
no hazardous waste was observed

Documentation
Vehicle maintenance performed by Kent Avery.
Permits not current.
Packet left on site
Universal waste

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

Inspected By: Shane Barbar (Sign Name) Received By: Ron Mie (Sign Name) Title: Owner
Shane Barbar (Print Name) Ron Miersma (Print Name) Report Date: 3-May-2007

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# SUPPLEMENTAL INSPECTION REPORT



INSPECTION DATE: 3-May-2007

| FACILITY ID | FACILITY NAME: | FACILITY LOCATION: |
|---|---|---|
| FA0000390S | H and R Dairy | 14213 Bon View |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME Ron Miersma | TITLE Owner |

Correct the following violations within 30 days:
201- Hazardous material handler permit not current. CC23.0602
Violation: Your facility does not have a hazardous material handler permit.
Compliance Requirement: (Hazardous material handler permit) invoice will be mailed to facility. Pay invoice.

202- Business plan not established. CHSC 25503.5
203- Business plan not submitted. CHSC 25505
Violation: Your facility did not submit a business plan.
Compliance Requirement: Submit original and one copy of the business emergency / contingency plan to the address above. Keep one copy on site.

131- Training documentation not completed. CCR 66265.16
Violation: Your facility did not provide any type of safety training.
Compliance Requirement: Provide safety training to your employees. Submit a copy of your safety plan and ~~a copy the~~ documentation showing that the safety training took place.

Submit signed Certificate of Compliance along with requested documentation within 30 days to 620 S. "E" St., San Bernardino, CA 92415
Any questions, please call (909) 386-8445.

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

Inspected By: Shane Barba (Sign Name) — Shane Barbar (Print Name)
Received By: [signature] (Sign Name) — Ron Miersma (Print Name)
Title: Owner
Report Date: 3-May-2007

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# CERTIFICATE OF COMPLIANCE



**Return Certification within** 30 **Days of Receipt to Inspector** Shane Barbao

*In the Matter of Respondent:* Ron ~~Miersna~~ Miersma

*Violation(s) cited on:* 3-May-2007 *FA #::* FA0000395

*Facility Name:* H and R Dairy

*Site Address:* 14213 Bon View

*Certificate of Compliance Date:* 3-May-2007

*I certify under penalty of law that:*

- *Respondent has corrected the violations specified in the above-entitled action.*
- *I have personally examined any documentation attached to this certification to establish that the violations have been corrected.*
- *Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.*
- *I am authorized to file this certification on behalf of the Respondent.*
- *I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.*

| | |
|---|---|
| *Signature* | *Date* |
| *Printed or Typed Name* | *Title* |
| *Social Security/Federal ID Number* | *Drivers License/ID Number* |

*Attach the following documentation when returning the Certificate of Compliance:*

(1) Submit documentation showing that an employee safety program had taken place.
(2) Pay invoice for the hazardous materials handler permit. Invoice will be mailed to facility.
(3) Submit original and one copy of the business emergency/contingency plan. Keep one copy on site.

# PHOTO NARRATIVE



**PHOTO 1**

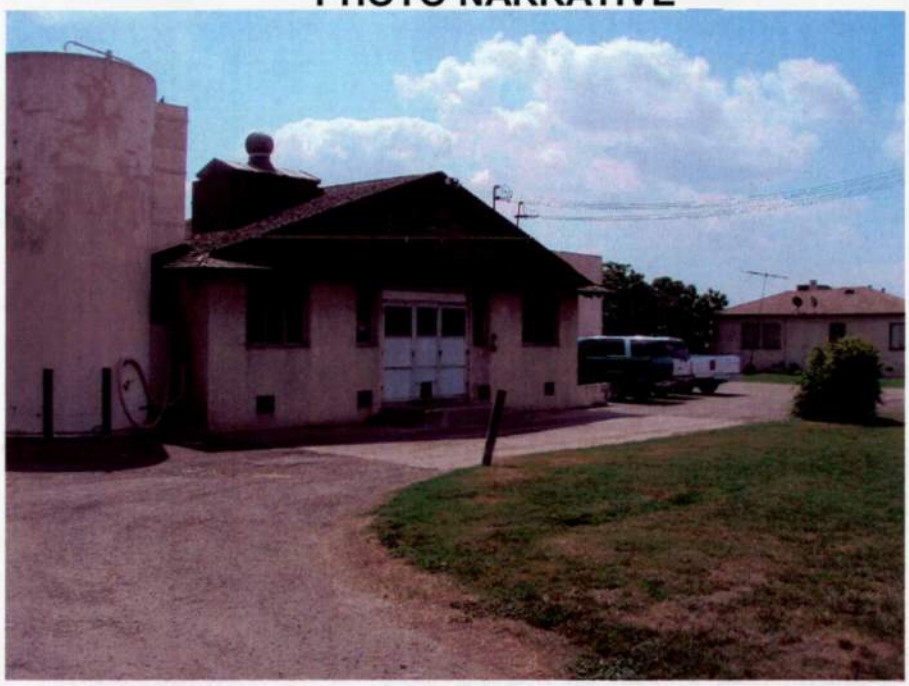

**PHOTO 2**

Facility/Case Name: **H&R Dairy** Facility ID #: **FA0000395**

Address: **14213 Bon View Ontario, CA 91710**

1) Description: **The front entrance to H&R Dairy.**

2) Description: **(2) Four hundred pound (plastic lined, cardboard) drums of chlorinate caustic. Area located at the west end of the facility.**

Date Taken: **03-May-2007**

Taken By: **Shane Barbao** Signature: Shane Barbao

Revised 10/12/2000

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

| | | | |
|---|---|---|---|
| Facility/Case Name: | **H&R Dairy** | Facility ID #: | **FA0000395** |
| Address: | **14213 Bon View Ontario, CA 91710** | | |
| 3) Description: | **Inventory from left to right. (2) four hundred pound (plastic lined, card board) drums of chlorinated caustic, (1) 55-gallon (white poly) drum of acid cleaner, and (2) 30-gallon (white poly) drums of sodium hypochlorite, 12.5%. Area located at the east end of the facility.** | | |
| 4) Description: | **(2) 55-gallon (black poly) drums of sodium hypochlorite, 12.5%. Area at the north end of the facility's yard.** | | |
| Date Taken: | **03-May-2007** | | |
| Taken By: | **Shane Barbao** | Signature: | Shane Barb |

Revised 10/12/2000

# PHOTO NARRATIVE



**PHOTO 5**

**PHOTO 6**

| | | | |
|---|---|---|---|
| Facility/Case Name: | **H&R Dairy** | Facility ID #: | **FA0000395** |
| Address: | **14213 Bon View Ontario, CA 91710** | | |
| 5) Description: | **(1) 500-gallon (red metal AST) tank of diesel. Area located at the northeast end of the facility.** | | |
| 6) Description: | **(7) 50-pound (white plastic bags) of copper sulfate. Area located at the south west end of the facility.** | | |
| Date Taken: | **03-May-2007** | | |
| Taken By: | **Shane Barbao** | Signature: | Shane Barbao |

Revised 10/12/2000

# HAZA DUS MATERIAL FIELD SERVIC
# COMPUTER DATABASE UPDATE AUTHORIZATION

UPDATE INVOICE MAILING CODE: (CIRCLE ONE) O F A

CURRENT INVOICE MAILING CODE: O

## O- OWNER INFORMATION

OWNER ID: OW0000314

NAME: ~~COSTA, DIMAS~~ ~~H and R Dairy~~ Ron Miersma

ADDRESS 1: ~~14451 BON VIEW AVE~~ 14213 Bon View Ave ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: 91710-9171 COUNTRY:

PHONE: 909-376-3373 EXT: FAX:

ALT PHONE: EXT: DRIVER LICENSE:

TAX ID: LAST UPDATED: 06/17/2002

### OWNER MAILING ADDRESS

CARE OF: Ron Miersma DBA: ~~COSTA, DIMAS~~ H and R Dairy

ADDRESS1: 14451 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ Ontario STATE: CA ZIP CODE: 91710 COUNTRY:

## F- FACILITY INFORMATION

FACILITY ID: FA0000395

NAME: ~~AG COSTA, DIMAS~~ H and R Dairy

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: ~~CHINO~~ ~~Chino~~ Ontario STATE: CA ZIP CODE: 91710-1710 CITY CODE: ~~CHINO~~ Ontario

SIC CODE: BUSINESS CODE: 2 BUSINESS TYPE: 3

CENSUS: SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: ~~05~~ 3

PHONE: EXT: FIRE JURISDICTION: CHINO VALLEY FIRE

ALT PHONE: EXT: FAX: LAST UPDATED: 11/09/2006

### FACILITY MAILING ADDRESS

BUSINESS NAME: ~~AG COSTA, DIMAS~~ H and R Dairy

CARE OF: Ron Miersma

ADDRESS 1: 14213 BON VIEW AVE ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91710-1710 COUNTRY:

EMAIL:

## A- A/R INFORMATION

ACCOUNT ID: AR0000397

RESPONSIBLE PARTY: Ron Miersma

CARE OF: H and R Dairy

ADDRESS 1: 14213 Bon View Ave ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91710 COUNTRY:

PHONE: 909-376-3379 EXT: DRIVER LICENSE:

ALT PHONE: EXT: LAST UPDATED: 04/05/2007

ALT PHONE: EXT: EXEMPT FROM BILLING: YES TAX ID:

ANNIVERSARY DATE: 04/30/1997 TOTAL DUE: 0.00 ACCOUNT STATUS: ACTIVE ACCOUNT

PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

| | | | | | |
|---|---|---|---|---|---|
| UPDATE/CLOSE/Z.O.B. | PT0008[illegible] | ACTIVE | 4210 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009816 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |
| UPDATE/CLOSE/Z.O.B. | PT0008930 | ACTIVE | 4420 | 05/01/1996 | 04/30/1997 |
| | PERMIT NUMBER. | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| PR0009817 | ACTIVE, BILLABLE | NA | NA | | |
| GHP OR UST ID | CURRENT STATUS(BILLING) | GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | | UPDATED P.E. |

ADD NEW P.E. 4221

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NUMBER OF EMP. 5 NUMBER OF UST'S 0 MFR #

DATE SUBMITTED: 3-May-2007 DATE ENTERED: FISCAL DATE:

SUBMITTED BY: Shane Barb ENTERED BY:

COMMENTS/REMARKS:

Please update the following information
- Owner Information
- Facility information
- A/R Information
- Close P.E. 4210 and 4425
- ADD P.E 4221
- Remove Ag listing
- Business owner change
- Business name change

Thanks Shane

TRACKING SHEET FOR BUSINESS PLANS

*Establishment #*

*Facility Name:*

*Facility Site Address:*

*City:*

*Fire Agency:*

| | | |
|---|---|---|
| 2 (# of copies) | | Sent to FD |
| **Business Plans Received** | 10/10/07 | 12/12/07 |
| **Results of Review(s)** | | |
| **Deficiency** | | __/__/__ |
| **Conditional Approval** | | __/__/__ |
| **Approval** | | __/__/__ |
| | | **Sent to FD** |
| **Revised Plans Received** | __/__/__ | __/__/__ |
| | __/__/__ | __/__/__ |

| Other Date | Action/Documentation (update, new plan, etc.) | Staff hours |
|---|---|---|
| 12/14/12 | BP - processed. LH | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |
| __/__/__ | | |

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

0009003

Facility Name Change

☐ Update/Assign PEs ☐ Referral to Team CERS ☑ Closure ☐ Invoice Reversal ☐ Demand Bill
☐ Update Non-CERS Fields ☐ 0202 ☑ Other Facility Name Change ☐ 5054 Attached

**OWNER INFORMATION** — **OWNER ID: OW0012146**

NAME: **GORDON, CRAIG**

ADDRESS: **16395 EUCLID Ave** ADDRESS 2:

CITY: **CHINO** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: FYI LAST UPDATED: **05/18/2017**

**FACILITY INFORMATION** — **FACILITY ID: FA0014875**

BUSINESS NAME: ~~GORDON HAY INC DAIRY #0~~ Southwest Dairy CERS ID: **10444234**

SITE ADDRESS: **14213 S BON VIEW AVE** ADDRESS 2:

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** FAX: **909-393-4408**

BUSINESS PHONE: **909-393-4408** EXT:

BUSINESS OPERATOR NAME: ~~Craig Gordon~~ Daric Ameye

OPERATOR PHONE: ~~909-393-0006~~ 909-754-4642 EXT: FYI LAST UPDATED: **06/04/2019**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **16395 S. Euclid Avenue** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **USA**

**BILLING CONTACT** — **ACCOUNT ID: AR0018064**

BILLING CONTACT NAME: ~~Craig Gordon~~ Daric Ameye

ADDRESS 1: ~~16395 Euclid Ave~~ 14213 S. Bon View ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: ~~909-393-4408~~ 909-754-4642 EXT: EMAIL: ~~Craig Gordon~~ southwestdairy@gmail.com

**ENVIRONMENTAL CONTACT**

NAME: **Craig Gordon** PHONE: **909-393-4408** EXT:

EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL * BUSINESS CODE: **INDIVIDUAL** * BUSINESS TYPE:

* SUPERVISORIAL DISTRICT: **004** * INSPECTION DISTRICT: **03** * FIRE JURISDICTION: **ONTARIO FIRE**

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **01/31/2013** FYI LAST BILLING: **12/16/2021**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**1-Motor Vehicle Fuel, 2-Fuel Distributor, 3-Farm, 4-Processor, 6-Other

**FOR OFFICE USE ONLY:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☒ EC Entry Complete | | ☐ QC Complete | | ☐ N/A ☐ Fiscal Entry Complete | | ☐ N/A ☐ Referral to Team CERS | |
| 5/12/22 | KR | | | | | | |
| Date | Initials | Date | Initials | Date | Initials | Date | Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

**5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2**

| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
|---|---|---|---|---|---|
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0025907 | ACTIVE | 4243-HAZARDOUS MATERIALS 4-10 ( | 02/01/2022 | 01/31/2023 |
| | | | GHP OR UST ID: PR0034614 | CURRENT STATUS(BILLING): ACTIVE, BILLABLE | UPDATED P.E. |
| ☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE | PT0039413 | INACTIVE | 4400-HAZWASTE GENERAL ACTIVIT' | 02/01/2019 | 01/31/2020 |
| | | | GHP OR UST ID: PR0051505 | CURRENT STATUS(BILLING): INACTIVE, NON-BILLABLE | UPDATED P.E. |

ADD NEW P.E.: NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E.

☐ UPDATE ☐ INACTIVATE ☐ ZERO OUT BALANCE

*NEW CUPA Admin P.E.

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 05/04/22 SUBMITTED BY: Erick Tilus

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection from 5/4/22, Southwest Dairy is leasing the facility from Craig Gordon. Gordon Hay Inc #3 is still the owner, but Daric Ameye operates Southwest dairy from this location.

- Maintain existing billing dates and anniversary.
- No changes in permits or operation.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

000900

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [x] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0012146

NAME: **GORDON, CRAIG**

ADDRESS: **16395 EUCLID Ave** ADDRESS 2:

CITY: **CHINO** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: FYI LAST UPDATED: **05/18/2017**

### FACILITY INFORMATION — FACILITY ID: FA0014875

BUSINESS NAME: **GORDON HAY INC DAIRY #3** CERS ID: **10444234**

SITE ADDRESS: **14213 S Bon View AVE** ADDRESS 2:

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** FAX: **909-393-4408**

BUSINESS PHONE: **909-393-4408** EXT:

BUSINESS OPERATOR NAME: **Craig Gordon**

OPERATOR PHONE: **909-228-9026** EXT: FYI LAST UPDATED: **03/04/2019**

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: **16395 S. Euclid Avenue** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **USA**

### BILLING CONTACT — ACCOUNT ID: AR0018064

BILLING CONTACT NAME: **Craig Gordon**

ADDRESS 1: **16395 Euclid Ave** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: **Craig Gordon** PHONE: **909-393-4408** EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: **INDIVIDUAL** BUSINESS TYPE:

SUPERVISORIAL DISTRICT: **004** INSPECTION DISTRICT: **03** FIRE JURISDICTION: **ONTARIO FIRE**

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **01/31/2013** FYI LAST BILLING: **12/17/2018**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| MAR 28 2019 CB | | | |
| Date / Initials | Date / Initials | Date / Initials | Date / Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| | | | 5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | | |
| ☒ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0025907<br>PERMIT NUMBER | ACTIVE<br>PERMIT STATUS | 4241-HAZARDOUS MATERIALS 1-3 C<br>ORIGINAL P.E. | 02/01/2019<br>EFFECTIVE DATE | 01/31/2020<br>EXPIRATION DATE |
| | | | PR0034614<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | 4243<br>UPDATED P.E. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | ☒ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | 5012<br>*NEW CUPA Admin P.E. |

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 3/28/2019 SUBMITTED BY: Matthew Valenzuela

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection on 3/25/19 this facility handles 4-10 chemicals above the reportable threshold.

-Update handler PE from 4241 to 4243
-Update admin PE from 5011 to 5012
-Demand bill for difference in permits.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

IN0135780
Reverse Lines 1 + 2. Updated PE's added.
Will demand.

☐ 5050 scanned and emailed to Fiscal 4/4/19 (AZ) Date Initials

☐ 5054 scanned and emailed to Fiscal Date Initials

Demand billed IN0135780
Due 6.1.19
4.16.19 (AZ)

# INTEROFFICE MEMO

**DATE:** 4/4/2019 **PHONE:** 909-387-5961

**FROM:** **Lisa Goodson**
Collections Officer, Fiscal Services Division **MAIL CODE:** 0451

**TO:** **Christine Tenorio, Fiscal Services and Collections Supervisor**

**SUBJECT: Request to APPROVE/DENY financial adjustments**

The facility listed below was incorrectly billed and/or penalized due to the following reason/s:

**FA0014875 - IN0135780 – GORDON HAY INC DAIRY #3**

- ☐ Incorrect permits billed prior to update to facility permit records based on inspection.
- ☐ Facility moved to another location within the County of San Bernardino prior to permit expiration.
- ☐ There was an address error in the system.
- ☐ Admin fee assessed after payment for permit fees and delinquent fees remitted.
- ☐ Business ceased operations prior to permit billing and/or permit requirement.
- ☐ Ownership change occurred prior to permit renewal.
- ☐ Other:

Completed

Christine Tenorio

Chief Trapp

CAO Analyst Approval

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

000900

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [x] Demand Bill

**OWNER INFORMATION** — **OWNER ID: OW0012146**

NAME: **GORDON, CRAIG**

ADDRESS: **16395 EUCLID Ave** ADDRESS 2:

CITY: **CHINO** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: FYI LAST UPDATED: **05/18/2017**

**FACILITY INFORMATION** — **FACILITY ID: FA0014875**

BUSINESS NAME: **GORDON HAY INC DAIRY #3** CERS ID: **10444234**

SITE ADDRESS: **14213 S Bon View AVE** ADDRESS 2:

CITY: **Ontario** STATE: **CA** ZIP CODE: **91762** FAX: **909-393-4408**

BUSINESS PHONE: **909-393-4408** EXT:

BUSINESS OPERATOR NAME: **Craig Gordon**

OPERATOR PHONE: **909-228-9026** EXT: FYI LAST UPDATED: **03/04/2019**

**FACILITY MAILING ADDRESS**

MAILING ADDRESS: **16395 S. Euclid Avenue** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **USA**

**BILLING CONTACT** — **ACCOUNT ID: AR0018064**

BILLING CONTACT NAME: **Craig Gordon**

ADDRESS 1: **16395 Euclid Ave** ADDRESS 2:

CITY: **Chino** STATE: **CA** ZIP CODE: **91708** COUNTRY: **US**

PHONE: **909-393-4408** EXT: EMAIL:

**ENVIRONMENTAL CONTACT**

NAME: **Craig Gordon** PHONE: **909-393-4408** EXT:

EMAIL:

**NON-CERS INFORMATION**

FACILITY EMAIL (OPTIONAL): Completed

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: **INDIVIDUAL** BUSINESS TYPE:

SUPERVISORIAL DISTRICT: **004** INSPECTION DISTRICT: **03** FIRE JURISDICTION: **ONTARIO FIRE**

FYI ACCOUNT STATUS: **ACTIVE ACCOUNT** FYI ANNIVERSARY DATE: **01/31/2013** FYI LAST BILLING: **12/17/2018**

FYI EXEMPT FROM BILLING: **NO** FYI TOTAL DUE: **0.00**

**Business Code**= 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type**=01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**FOR OFFICE USE ONLY:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| [ ] EC Entry Complete | | [ ] QC Complete | | N/A [ ] [ ] Fiscal Entry Complete | | N/A [ ] [ ] Referral to Team CERS | |
| Date | Initials | Date | Initials | Date | Initials | Date | Initials |

MAR 28 2019 CB

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

| | | | | | |
|---|---|---|---|---|---|
| | | | 5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | | |
| [X] UPDATE<br>[ ] INACTIVATE<br>[ ] ZERO OUT BALANCE | PT0025907<br>PERMIT NUMBER | ACTIVE<br>PERMIT STATUS | 4241-HAZARDOUS MATERIALS 1-3 C<br>ORIGINAL P.E. | 02/01/2019<br>EFFECTIVE DATE | 01/31/2020<br>EXPIRATION DATE |
| | | | PR0034614<br>GHP OR UST ID | ACTIVE, BILLABLE<br>CURRENT STATUS(BILLING) | 4243<br>UPDATED P.E. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADD NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | [X] UPDATE<br>[ ] INACTIVATE<br>[ ] ZERO OUT BALANCE |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | 5012<br>*NEW CUPA Admin P.E. |

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 3/28/2019 SUBMITTED BY: Matthew Valenzuela

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection on 3/25/19 this facility handles 4-10 chemicals above the reportable threshold.

-Update handler PE from 4241 to 4243
-Update admin PE from 5011 to 5012
-Demand bill for difference in permits.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

IN0135780
Reverse Lines 1 + 2. Updated PE's added.
Will demand.

[ ] 5050 scanned and emailed to Fiscal 4/4/19 (AL) Date Initials

[ ] 5054 scanned and emailed to Fiscal Completed Date Initials

# SAN BERNARDINO COUNTY CUPA
## FACILITY INFORMATION

- [x] Update/Assign PEs
- [ ] Update Non-CERS Fields
- [ ] Referral to Team CERS
- [ ] 0202
- [ ] Closure
- [ ] Other
- [ ] Invoice Reversal
- [ ] 5054 Attached
- [ ] Demand Bill

### OWNER INFORMATION — OWNER ID: OW0012146

NAME: GORDON, CRAIG

ADDRESS: 16395 EUCLID Ave ADDRESS 2:

CITY: CHINO STATE: CA ZIP CODE: 91708 COUNTRY: US

PHONE: 909-393-4408 EXT: FYI LAST UPDATED: 05/18/2017

### FACILITY INFORMATION — FACILITY ID: FA0014875

BUSINESS NAME: GORDON HAY INC DAIRY #3 CERS ID: 10444234

SITE ADDRESS: 14213 S Bon View AVE ADDRESS 2:

CITY: Ontario STATE: CA ZIP CODE: 91762 FAX: 909-393-4408

BUSINESS PHONE: 909-393-4408 EXT:

BUSINESS OPERATOR NAME: Craig Gordon

OPERATOR PHONE: 909-228-9026 EXT: FYI LAST UPDATED: 03/04/2019

#### FACILITY MAILING ADDRESS

MAILING ADDRESS: 16395 S. Euclid Avenue ADDRESS 2:

CITY: Chino STATE: CA ZIP CODE: 91708 COUNTRY: USA

### BILLING CONTACT — ACCOUNT ID: AR0018064

BILLING CONTACT NAME: Craig Gordon

ADDRESS 1: 16395 Euclid Ave ADDRESS 2:

CITY: Chino STATE: CA ZIP CODE: 91708 COUNTRY: US

PHONE: 909-393-4408 EXT: EMAIL:

### ENVIRONMENTAL CONTACT

NAME: Craig Gordon PHONE: 909-393-4408 EXT:

EMAIL:

### NON-CERS INFORMATION

FACILITY EMAIL (OPTIONAL):

LOCAL FACILITY PHONE (OPTIONAL): EXT:

CENSUS: MILITARY SCHOOL MEDICAL BUSINESS CODE: INDIVIDUAL BUSINESS TYPE:

SUPERVISORIAL DISTRICT: 004 INSPECTION DISTRICT: 03 FIRE JURISDICTION: ONTARIO FIRE

FYI ACCOUNT STATUS: ACTIVE ACCOUNT FYI ANNIVERSARY DATE: 01/31/2013 FYI LAST BILLING: 12/17/2018

FYI EXEMPT FROM BILLING: NO FYI TOTAL DUE: 253.00

**Business Code=** 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type=**01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

### FOR OFFICE USE ONLY:

| | | | |
|---|---|---|---|
| [ ] EC Entry Complete | [ ] QC Complete | N/A [ ] [ ] Fiscal Entry Complete | N/A [ ] [ ] Referral to Team CERS |
| APR 16 2019 CB | | | |
| Date / Initials | Date / Initials | Date / Initials | Date / Initials |

**PERMIT INFORMATION (CIRCLE THOSE THAT APPLY)**

**5012-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 2**

| | | | | | |
|---|---|---|---|---|---|
| ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE | PT0025907 | ACTIVE | 4243-HAZARDOUS MATERIALS 4-10 ( | 02/01/2019 | 01/31/2020 |
| | PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE |
| | | | PR0034614 | ACTIVE, BILLABLE | |
| | | | GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ADD NEW P.E. | 4400 | | | | | | ☐ UPDATE<br>☐ INACTIVATE<br>☐ ZERO OUT BALANCE |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | |
| | | | | | | | |
| | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | *NEW CUPA Admin P.E. |

NUMBER OF ACTIVE UST'S 0

DATE SUBMITTED: 4/12/2019 SUBMITTED BY: Matthew Valenzuela

**SPECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

**COMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection on 3/25/2019, hazardous waste violations must be added on to this facility.

Please add new nonbillable hazardous waste PE 4400.

**FOR FISCAL USE ONLY:** Fiscal comments / remarks / instruction area (for use between OFM Fiscal and Admin Fiscal)

☐ 5050 scanned and emailed to Fiscal _____ Date _____ Initials

☐ 5054 scanned and emailed to Fiscal _____ Date _____ Initials

NEW

File RBL

# F ARDOUS MATERIAL FIELD SE CES
## COMPUTER DATABASE UPDATE AUTHORIZATION (5050 Form)

☐ Quick Submit-Correct minor information without full verification.

*UPDATE INVOICE MAILING CODE: (CIRCLE ONE) (O) F A Add PE 4221 CURRENT INVOICE MAILING CODE

**O- OWNER INFORMATION** — **OWNER ID:** new

Legal Owner 0012146

*NAME: Craig Gordon

*ADDRESS 1: 16395 Euclid ADDRESS 2:

*CITY: Chino *STATE: CA *ZIP CODE: 91708 *COUNTRY: USA

*PHONE: 909-228-9026 EXT: FAX:

ALT PHONE: EXT: FYI LAST UPDATED:

**OWNER MAILING ADDRESS** ☒ Same as Owner

CARE OF: DBA:

ADDRESS1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

**F- FACILITY INFORMATION** — **FACILITY ID:** new #14875

*NAME: Gordon Hay Inc. Dairy #3

*ADDRESS 1: 14213 S. Bon View Ave. ADDRESS 2:

*CITY: Ontario *STATE: CA *ZIP CODE: 91762 *CITY CODE: Ontario

*PHONE: none EXT: ALT PHONE: EXT: FAX:

CENSUS: MILITARY SCHOOL MEDICAL *SUPERVISORIAL DISTRICT: 004 *INSPECTION DISTRICT: 03 NUMBER OF EMP.: 4

FIRE JURISDICTION: Ontario SIC CODE:

*BUSINESS CODE: 02 *BUSINESS TYPE: 06 FYI LAST UPDATED:

**FACILITY MAILING ADDRESS** ☒ Same as Facility ☐ Same as Owner Mailing Address

BUSINESS NAME:

CARE OF:

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

*EMAIL: ☒ NO EMAIL (insert comment 3899 with "NO EMAIL-Inspector Name)

**A- A/R INFORMATION** — **ACCOUNT ID:** new

RESPONSIBLE PARTY: ☒ Same as Owner Mailing Address ☐ Same as Facility Mailing Address

CARE OF: 0018064

ADDRESS 1: ADDRESS 2:

CITY: STATE: ZIP CODE: COUNTRY:

PHONE: EXT: ALT PHONE: EXT:

ALT PHONE 2: EXT: EXEMPT FROM BILLING: FYI LAST UPDATED:

ANNIVERSARY DATE: 1/31/2013 ACCOUNT STATUS: TOTAL DUE:

**Business Code**= 01-Corporation, 02-Individual, 03-Partnership, 04-Local Agency/District, 05-County Agency, 06-State Agency, 07-Federal Agency
**Business Type**=01-Gas Station, 02-Distributor, 03-Farm, 04-Processor, 05-Commercial, 06-Other

**The fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to **complete all fields** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

ERMIT INFORMATION (CIRCLE THOSE THAT APPLY)

☐ UPDATE
☐ INACTIVATE
☐ ZERO OUT BALANCE

| N/A | | N/A | | | |
|---|---|---|---|---|---|
| PERMIT NUMBER | PERMIT STATUS | ORIGINAL P.E. | EFFECTIVE DATE | EXPIRATION DATE | |
| NA | NA | | | | |
| GHP FOR UST(PH) | CURRENT STATUS FOR UST(PH) | GHP OR UST ID | CURRENT STATUS(BILLING) | UPDATED P.E. | |

ADD NEW P.E.

| | | | | | | |
|---|---|---|---|---|---|---|
| 4221 | | | | | | |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |
| PR0034616 | | | | | | |
| NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. | NEW P.E. |

NUMBER OF ACTIVE UST'S 0

s this an operating facility that does not require permits (keep AR active and add 0202 GHP record)? Yes (No)
Should this facility be inactivated upon verification that there is no balance due? Yes (No)
s this a new owner (a blue book comment is required if Q is yes and there is not a request for demand bill)? Yes (No)
Does this 5050 have attached documents? Yes (No)

ENTERED

DATE SUBMITTED: 12-12-12 DATE ENTERED: DEC 14 2012 FISCAL ENTRY DATE/ INITIAL:
SUBMITTED BY: Leslie Heaviside ENTERED BY: JGuerra ***Demand bill for updated PEs**: (Yes) No

**PECIAL INSTRUCTIONS:** Information in this location will not be entered into Envision.

RBC

**OMMENTS/REMARKS:** Only text in this area will be entered as a blue book comment. Please attach and label additional sheets needed for comments.

Per inspection: new dairy operating at this location (previously FA10971 H&R Dairy). Assign primarily handler PE.

**e fields that are marked with an asterisk must be completed or the form will be returned to the requestor**. The requestor is expected to **complete all ids** on this form to the best of his or her ability. Please use the Quick Submit process reasonably.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:1 AR:0.00

Craig Gordon
GORDON HAY INC DAIRY #3
14213 Bon View Ave
CHINO, CA 91762

This Unified Permit is hereby issued to:
GORDON HAY INC DAIRY #3
14213 S BON VIEW AVE
ONTARIO, CA 91762

**Permit is issued to Facility: FA0014875 for a period not to exceed one year from effective date.**

**Effective Date: 2/1/2015** **Expiration Date: 1/31/2016**

**CUPA Facility Type: 5011-CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0025907 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0034614 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

Mike Horton, Fire Marshal

THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY
UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT.
THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.

# CUPA PERMIT CONDITIONS

As a condition of the Certified Unified Program Agency (CUPA) permit to operate, the owner, operator, and permit holder shall comply with the following:

a. **Hazardous Materials Release Response Plans and Inventories Program (HMRRP):** California Health and Safety Code (CHSC) Division 20, Chapter 6.95, Article 1 and Title 19 California Code of Regulations (CCR).

b. **California Accidental Release Prevention Program (CalARP):** CHSC Division 20, Chapter 6.95, Article 2 and Title 19 CCR.

c. **Underground Storage Tanks (USTs):** CHSC Division 20, Chapters 6.5, 6.7 and Title 23 CCR, Chapter 16.

   (1) Monitoring, Response and Plot Plans shall be approved by the San Bernardino County CUPA.

   (2) The owner and operator are subject to all applicable requirements of Chapter 6.7 of the CHSC and the applicable regulations.

   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

   (4) Monitoring or programming for monitoring shall be conducted at the locations of the following UST equipment, if installed: monitoring system control panels; sensors monitoring tank annular spaces, sumps, dispenser pans, spill containers, or other secondary containment areas (e.g. double-walled piping); mechanical or electronic line leak detectors; and in-tank liquid level probes used for leak detection.
   Note: The UST ID Number is listed on the front of the permit for each UST

d. **Aboveground Petroleum Storage Act SPCC Plans:** CHSC Division 20, Chapter 6.67 and 40 CFR 112.

e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Fire Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part2, Chapter 1,Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4 Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

# SAN BERNARDINO COUNTY CUPA
# CERTIFIED UNIFIED PROGRAM AGENCY
# ANNUAL PERMIT

EP: AP:2 AR:0.00

**GORDON HAY INC DAIRY #3**
**16395 EUCLID AVE**
**CHINO, CA 91708**

**This Unified Permit is hereby issued to:**
**GORDON HAY INC DAIRY #3**
**14213 S BON VIEW AVE**
**ONTARIO, CA 91762**

**Permit is issued to Facility: FA0014875 for a period not to exceed one year from effective date.**

**Effective Date: 2/1/2014** **Expiration Date: 1/31/2015**

| Permit Number | Program Element | Related ID |
|---|---|---|
| PT0025907 | 4241 HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL | PR0034614 |
| PT0031387 | 5011 CUPA ANNUAL ADMIN PERMIT PROGRAM FEE-LEVEL 1 | PR0040273 |

**Permitted by:**
San Bernardino County CUPA
620 South "E" Street
San Bernardino, CA 92415-0153
(909) 386-8401

**Mike Horton, Fire Marshal**

**THIS PERMIT IS NOT TRANSFERABLE AND IS ISSUED CONDITIONALLY UPON ADHERENCE TO THE REQUIREMENTS LISTED ON THE BACK OF THIS PERMIT. THIS FORM MUST BE DISPLAYED CONSPICUOUSLY ON THE PREMISES.**

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   (3) This permit and permit conditions including the Monitoring, Response and Plot Plans shall be maintained on site.

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e. **Hazardous Waste Generator and Hazardous Waste Onsite Treatment:** CHSC Division 20, Chapter 6.5 and Title 22 CCR, Division 4.5, Chapters 10, 11, 12, 20 and 31.

f. **San Bernardino County Fire Protection District Code (SBCFPD FC), Hazardous Materials Management Plans and Inventories:** CHSC Division 12, Part 2, Chapter 1, Article 2, Section 13143.9, CHSC Division 20, Chapter 6.95, Article 1, Section 25504, **SBCFPD FC** Chapter 4, Section 407.5, Section 407.6, Chapter 50, Section 5001.5.1 and Section 5001.5.2.

g. **Unified Program Forms and Electronic Reporting:** CHSC Division 20, Chapter 6.11, Section 25404(e)(4) and Title 27 CCR.

CUPA
San Berna. , County Fire Department • Hazardous Ma ; Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (9 386-8460 • www.sbcfire.org

# CUPA COMPLIANCE INSPECTION REPORT

| | | |
|---|---|---|
| NAME: **SOUTHWEST DAIRY** | | FACILITY ID: **FA0014875** |
| ADDRESS: **14213 S BON VIEW AVE** | | CERS ID: **10444234** |
| CITY: **ONTARIO** | STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **5/4/2022** |

**Consent granted by:**

☒ **Photograph** ☒ **Inspect** **Name:** Daric Ameye **Title:** Operator

An inspection was conducted on 05/04/2022 to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Daric Amaye, Operator, was the escort during the inspection. Also present during the inspection was Ana Villanueva, Hazardous Materials Specialist with San Bernardino County Fire.

Southwest Dairy is a farm that produces milk. Throughout the production process, the facility handles specialized chemicals such as teat dip, velocity two detergent, acid cleaner EC, and chemclor.
Inventory:

The inventory observed at the facility during the inspection was consistent with that submitted via the California Environmental Reporting System (CERS) on 05/08/2019. CERS ID # 10444234

Document Review:

- CUPA program permits are current; expiration date of 01/31/23
- EPA ID # CAC003121794 was inactive at the time of the inspection. However, the facility is a handler only.
- The Hazardous Materials Business Plan was last updated via the CERS on 05/08/2019.

Complete and submit the Certificate of Compliance (CofC) provided along with all requested documentation, to the attention of Erick Tilus within 30 days of inspection.

Please contact Erick Tilus at (909) 386-8401 or by e-mail at etilus@sbcfire.org with any questions regarding this report.

If you have any questions regarding CERS, please call the CERS Help Desk at (909) 386-8432.

**Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). The following lines marked in the V column are violations that must be corrected.**

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | - | |
| H201 | Hazardous Material Handler Permit Current | SBCC | 23.0602(a) | |
| H202 | Hazardous Materials Business Plan Established and Implemented | CHSC | 25507 | |
| H203 | **Hazardous Materials Business Plan Submittal** | CHSC | 25505, 25508(a)(1) | X |
| Violation: | Failure to complete and electronically submit initially, annually or triennially, a business plan when storing/handling a hazardous material at or above reportable quantities. | | | |
| MINOR | OBSERVATION: Observed the hazardous materials business plan to not be electronically submitted or certified annually. | | | |
| | CORRECTIVE ACTION: Ensure to electronically submit a hazardous materials business plan annually. | | | |
| H204 | Immediately Report Any Release or Threatened Release of a Hazardous Material | | Multiple | |
| H205 | Facility Access for Inspection Granted | CHSC | 25511 | |
| H206 | Business Plan Annual Review/Certification | CHSC | 25508.2 | |
| H209 | Business Plan Update Within 30 days of Change | CHSC | 25508.1(a)-(f) | |
| H210 | Business Activities Page and/or Business Owner/Operator Identification Page | | Multiple | |
| H211 | Hazardous Materials Inventory | CHSC | Multiple | |
| H212 | Site Map | CHSC | Multiple | |
| H213 | Emergency Response Plan | | Multiple | |
| H214 | Training Program not Included and/or is Not Adequate | | Multiple | |
| H215 | Training Not Provided and/or Documented | CHSC | 25505(a)(4) | |
| H216 | Hazardous Materials Business Plan Readily Available | CHSC | 25505(c) | |
| H220 | Property Owner Notification | CHSC | 25505.1 | |

| | | | | |
|---|---|---|---|---|
| H221 | Property Owner Business Plan | CHSC | 25505.1 | |
| H222 | Agricultural Handler Emergency Resp Plan | CHSC | 25508(a)(1), 25507.1 | |
| H223 | Agricultural Handler Training Program | CHSC | 25508(a)(1), 25507.1 | |
| H224 | Remote Unstaffed Facility | CHSC | 25505,25506,25507.2,25 | |
| H225 | Agricultural Handlers Warning Signs-Signs Posted | | Multiple | |

| VIOLATION CODE | DESCRIPTION | SECTION | | V |
|---|---|---|---|---|
| **44** | **HAZARDOUS WASTE GENERATOR** | | - | |
| W101 | Hazardous Waste Generator CUPA Permit | SBCC | 23.0602 | |
| W102 | Facility Access for Inspection | CHSC | 25185 | |
| W103 | HWG: Hazardous Waste Determination | CCR | 66262.11 | |
| W104 | HWG: Identification Number | CCR | 66262.12 | |
| W108 | HWG: Recyclable Materials | CHSC | 25143.2, 25143.9 | |
| W110 | HWG: Hazardous Waste Labeling Standards | CCR | 66262.34(f) | |
| W111 | HWG: Hazardous Waste Tank Label | CCR | 66262.34(f) | |
| W117 | HWG: Empty Containers >5 Gallons | CCR | 66261.7 | |
| W121 | HWG: Quarantine Order | CHSC | 25187.6 | |
| W122 | HWG: Reusable Soiled Textile Materials | CHSC | 25144.6(b) | |
| W124 | HWG: Remote Consolidation Notification | CHSC | 25110.10(d) | |
| W125 | HWG: Preparation of the Hazardous Waste Manifest | CCR | 66262.20 | |
| W126 | HWG: Hazardous Waste Manifest Completeness | CCR | 66262.23(a) | |
| W127 | HWG: Hazardous Waste Manifest Not Sent to DTSC | | Multiple | |
| W128 | HWG: Hazardous Waste Disposal Documentation | CCR | 66262.40(a) | |
| W130 | HWG: Maintaining Records of Test Result for Three Years | CCR | 66262.40(c) | |
| W134 | HWG: Used Oil Certification Form | CHSC | Multiple | |
| W136 | HWG: Contamination of Used Oil | CHSC | 25250.7(a) | |
| W137 | HWG: Consolidated Manifest | CHSC | 25160.2 | |
| W138 | HWG: Used Oil Filter and Fuel Filter Handling Requirements | CCR | Multiple | |
| W139 | HWG: Lead Battery Disposal Documentation | CCR | 66266.81(a)(4)(B) | |
| W140 | HWG: Management of Spent Vehicle Lead-Acid Batteries | CCR | 66266.81(a)(1) | |
| W141 | HWG: Management of 11 or More Spent Vehicle Lead-Acid Batteries | CCR | 66266.81(a)(3) | |
| W142 | HWG: Damaged Lead Battery Handling | CCR | 66266.81(b) | |
| W145 | HWG: Improper Disposal of Hazardous Waste | CHSC | 25189.5(a) | |
| W148 | HWG: Hazardous Waste Not Transported by Registered Hauler | CHSC | 25163(a) | |
| W152 | HWG: Excluded Recyclable Materials Report | CHSC | 25143.10 | |
| W155 | HWG: Satellite Accumulation | CCR | 66262.34(e) | |
| W156 | HWG: Laboratory Accumulation Areas | CHSC | 25200.3.1(b) | |
| W157 | HWG: Laboratory Waste Treatment | CHSC | 25200.3.1 (c) | |
| W158 | HWG: Program Data Electronic Report | | Multiple | |
| W159 | HWG: Facility Information Reporting | SBCC | 23.0602,23.0712 | |
| W190 | HWG: Land Disposal Restriction | CCR | Multiple | |
| W206 | SQG: Facility Maintained to Prevent Fire/Explosion/Release | CCR | 66262.34(d)(2) | |
| W207 | SQG: Emergency Plan | CCR | 66262.34(d)(2) | |
| W213 | SQG: Time Exceeded for Hazardous Waste Conditional Accumulation (180 Days) | | Multiple | |
| W214 | SQG: Container in Poor Condition or Damaged | CCR | 66262.34(d)(2) | |
| W216 | SQG: Open Hazardous Waste Containers | CCR | 66262.34(d)(2) | |
| W218 | Generator of < 100 kg/mth: Accumulation Time Exceeded (180/270, or 90 Days for Acutely/Extremely) | | Multiple | |
| W227 | SQG: Hazardous Waste Manifest Exception Reporting | | Multiple | |
| W231 | SQG: Employee Training | CCR | 66262.34(d)(2) | |
| W238 | SQG: Weekly Hazardous Waste Storage Area Inspection | CCR | 66262.34(d)(2) | |
| W245 | SQG: Hazardous Waste Container Incompatible with Material Stored | CCR | 66262.34(d)(2) | |
| W249 | SQG: Aisle Space | CCR | 66262.34(d)(2) | |
| W268 | SQG: Incompatible Waste Storage | CCR | 66262.34(d)(2) | |
| W269 | SQG: Hazardous Waste Tank Spill Control/Overfill | CCR | 66262.34(d)(2) | |
| W270 | SQG: Daily Tank, Monitoring, and Discharge Inspection | CCR | 66262.34(d)(2) | |
| W271 | SQG: Weekly Hazardous Waste Tank Construction and System Fixture Inspection | CCR | 66262.34(d)(2) | |
| W272 | SQG: Hazardous Waste Facility Closure | CCR | 66262.34(d)(2) | |
| W273 | SQG: Tank 2ft Freeboard | CCR | 66262.34(d)(2) | |
| W280 | SQG: Emergency Coordinator | CCR | 66262.34(d)(2) | |
| W281 | SQG: Facility Emergency Equipment | CCR | 66262.34(d)(2) | |
| W282 | SQG: Emergency Equipment Maintenance | CCR | 66262.34(d)(2) | |

| | | | | |
|---|---|---|---|---|
| W306 | LQG: Facility Maintained To Prevent Fire/Explosion/Release | CCR | 66262.34(a)(4), 66265.31 | |
| W307 | LQG: Contingency Plan | CCR | 66262.34(a)(4), 66265.51 | |
| W308 | LQG: Contingency Plan Copies | CCR | 66262.34(a)(4), 66265.53 | |
| W309 | LQG: Contingency Plan Emergency Action Plan | CCR | 66262.34(a)(4), 66265.5: | |
| W313 | LQG: Hazardous Waste Accumulation Time Exceeded | | Multiple | |
| W314 | LQG: Container in Poor Condition or Damaged | CCR | 66262.34(a)(1), 66265.17 | |
| W316 | LQG: Open Hazardous Waste Container | CCR | 66262.34(a)(1), 66265.17 | |
| W318 | LQG: Weekly Hazardous Waste Storage Areas Inspection | CCR | 66262.34(a)(1), 66265.17 | |
| W320 | LQG: Hazardous Waste Tank Inspections | CCR | 66262.34(a)(1), 66265.19 | |
| W321 | LQG: Hazardous Waste Tank Cathodic Inspection | CCR | 66262.34(a)(1), 66265.19 | |
| W324 | LQG: Hazardous Waste Tank Equipment Replacement | CCR | 66265.192(m) | |
| W325 | LQG: Hazardous Waste Tank Release | CCR | 66265.196 | |
| W326 | LQG: Tank Closure Requirements and Documentation | CCR | Multiple | |
| W331 | LQG: Employee Hazardous Waste Training | CCR | 66262.34(a)(4), 66265.16 | |
| W332 | LQG: Source Reduction Evaluation Review and Plan | CCR | 67100.7, 67100.8 | |
| W333 | LQG: Summary Progress Report | CCR | 67100.9 | |
| W334 | LQG: Source Reduction Implementation | CCR | 67100.5 | |
| W345 | LQG: Hazardous Waste Container Incompatible with Material Stored | CCR | 66262.34(a)(1), 66265.17 | |
| W349 | LQG: Aisle Space | CCR | 66262.34(a)(4), 66265.35 | |
| W350 | LQG: New Hazardous Waste Tank System P.E. Certification | CCR | Multiple | |
| W351 | LQG: Reassessment for Hazardous Waste Tank System P.E. Certification | CCR | 66265.192(h) | |
| W352 | LQG: New Tank Assessment Standards | CCR | 66265.192(k) | |
| W353 | LQG: Hazardous Waste Tank Standards | CCR | 66262.34(a)(1), 66265.19 | |
| W354 | LQG: Secondary Containment | CCR | 66262.34(a)(1), 66265.19 | |
| W368 | LQG: Incompatible Waste Storage | CCR | Multiple | |
| W369 | LQG: Air Emissions for Waste in Containers | CCR | Multiple | |
| W371 | LQG: Air Emissions for Wastes in Tanks | CCR | 66262.34(a)(1), 66265.20 | |
| W378 | LQG: Hazardous Waste Manifest Exception Reporting | | Multiple | |
| W380 | LQG: Emergency Coordinator | CCR | 66262.34(a)(4), 66265.55 | |
| W381 | LQG: Facility Emergency Equipment | CCR | 66262.34(a)(4), 66265.32 | |
| W382 | LQG: Emergency Equipment Maintenance | CCR | 66262.34(a)(4), 66265.33 | |
| W501 | Certified Appliance Recycler: Certification | CHSC | 25211.4 | |
| W502 | Certified Appliance Recycler: Certification | CHSC | 25211.2, 25211.3 | |
| W503 | Certified Appliance Recycler: Materials that Require Special Handling (MRSH) properly managed | CHSC | 25212 | |
| W504 | Certified Appliance Recycler: Proper Removal of Materials that Require Special Handling (MRSH) | CHSC | 25211.3, 25212(a) | |
| W901 | Universal Waste Handler: Permit | SBCC | 23.0602 | |
| W902 | Universal Waste Handler: Labeling Requirements | CCR | 66273.34 | |
| W903 | Universal Waste Handler: Accumulation Time | CCR | 66273.35 | |
| W904 | Universal Waste Handler: Employee Training | CCR | 66273.36 | |
| W907 | Universal Waste: Accumulation of Aerosol Cans | CHSC | 25201.16(f) | |
| W908 | Universal Waste: Handling of Aerosol Cans | CHSC | 25201.16(e) | |
| W911 | Universal Waste Handler: Department Notification | CCR | 66273.32(c),(e) | |
| W912 | Universal Waste Handler: Annual Report | CCR | 66273.32(d),(f) | |
| W913 | Universal Waste Handler: Release | CCR | 66273.33.5; 66273.33.6 | |
| W914 | Universal Waste Handler: USEPA Notification | CCR | 66273.32(a) | |
| W915 | Universal Waste Handler: Exporting Notification | CCR | 66273.40(a)(2)- (4) | |
| W920 | Universal Waste Handler: Illegal Disposal | CCR | 66273.31(a) | |
| W923 | Large Quantity Universal Waste Handler DTSC ID Number | CCR | 66273.32(b) | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: LTR: |
|---|---|---|
| ERICK TILUS | | |
| INSPECTOR NAME | NAME | TITLE |
| | INSPECTION DATE: 05/04/2022 | REPORT DATE: 5/13/22 12:31 pm |

[X] **This report shall serve as a notice to comply for minor violations and a notice of violation for all other violations. THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN 30 DAYS UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.**

CUPA
San Berna. , County Fire Department • Hazardous Ma ; Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (, , 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return certification to inspector ERICK TILUS within 30 days of inspection unless otherwise specified.**

RESPONDENT: Daric Ameye

VIOLATION(S) CITED ON: 5/4/2022

FACILITY NAME: **SOUTHWEST DAIRY** FACILITY ID: **FA0014875**

SITE ADDRESS: **14213 S BON VIEW AVE** CERS ID: **10444234**

CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762**

## Summary of Violations:

**IMPORTANT- Attach all requested documentation when returning this certification.**

H203 CORRECTIVE ACTION: Ensure to electronically submit a hazardous materials business plan annually.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

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## PRELIMINARY FIELD INSPECTION REPORT

Page 1 of 1

| | | |
|---|---|---|
| | | INSPECTION DATE: 5/4/22 |
| FACILITY ID: FA0014875 | FACILITY NAME: SOUTHWEST DAIRY | FACILITY LOCATION: 14213 S. BON VIEW, ONTARIO, CA |
| Consent Granted by: ☒ Inspect ☒ Photograph | NAME: DARIC AMEYE | TITLE: OWNER/OPERATOR |

**The following is a preliminary list of violations observed at the time of inspection. The final report may list additional violations. Violations must be corrected within 30 days of inspection unless otherwise specified below.**

AN INSPECTION WAS CONDUCTED 5/4/22 TO DETERMINE COMPLIANCE WITH ~~HAZ~~ APPLICABLE HAZARDOUS MATERIALS AND HAZARDOUS WASTE LAWS AND REGULATIONS.

THE FINAL REPORT WILL BE PROVIDED WITHIN 65 DAYS OF THE INSPECTION.

* CORRECT THE FOLLOWING VIOLATIONS WITHIN 30 DAYS:
- H203: FAILURE TO ELECTRONICALLY SUBMIT A HAZARDOUS MATERIALS BUSINESS PLAN CHSC 25505, 25508(a)(1).

CONTACT ERICK TILLIS @ ETILLIS@SBCFIRE.ORG OR 909-386-8401 WITH ANY QUESTIONS REGARDING THIS INSPECTION.

Inspected By: CTillis (Sign Name) — ERICK TILLIS (Print Name)

Received By: (Sign Name) — DARIC AMEYE (Print Name)

Title: OPERATOR

Report Date: 05/04/22

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: Southwest Dairy

Facility ID #: FA0014875

Address: 14213 S. Bon View Ave, Ontario, CA 91761

*1) Description:* The front of the facility.

*2) Description:* (1) 55-gallon drum of T-Chlor 12.5 sodium hypochlorite solution.

Date Taken: **5/4/2022**

Taken By: **Erick Tilus**

Signature: E Tilus.

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

Facility/Case Name: Southwest Dairy Facility ID #: FA0014875

Address: 14213 S. Bon View Ave, Ontario, CA 91761

*3) Description:* (1) 55-gallon drum of Velocity Two chlorinated alkaline circulation cleaner.

*4) Description:* (1) 55-gallon drum of Acid Cleaner EC.

Date Taken: **5/4/2022**

Taken By: **Erick Tilus** Signature: E Tilus.

RECEIVED
Apr mv
~~MAR~~ 09 2019
SBCFIRE - HAZMAT

# CUPA
## CUPA COMPLIANCE INSPECTION REPORT

San Bernardino County Fire Department • Hazardous Materials Division
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| | | | |
|---|---|---|---|
| FACILITY NAME: | Gordon Hay Inc. | FACILIY ID: | FA 0014875 |
| FACILITY ADDRESS: | 14213 S Bon View Ave | CERS ID: | 1044442541 CERS Desk 909-386-8432 |
| ☐ INSPECTION ☐ PHOTOGRAPHS CONSENT GRANTED BY: | NAME: Bryan Vander Dussen | TITLE: | Manager |

*This inspection was conducted to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Refer to Title 19 and 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health and Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). (V) Violation, (C) – Compliant, (N) Not applicable or not addressed. ALL violations must be corrected within 30-days unless otherwise specified.*

| CODE | VIOLATION INFORMATION & CLASSIFICATION | | V | C | N | NARRATIVE |
|---|---|---|---|---|---|---|
| H201 | Hazardous Materials Handler Permit | SBCC 23.0602(a) | | X | | H211: |
| H202 | Business Plan Established and Implemented | CHSC 25507 | | X | | OBSERVATION: Observed one and four |
| H203 | Business Plan Submittal | CHSC 25505, 25508(a)(1) | | X | | 330 gallon tanks & 330 gallons each |
| H206 | Business Plan Annual Review and Certification | CHSC 25508(a)(1), 25506.2 | | X | | CORRECTIVE ACTION: Update inventory |
| H209 | Business Plan Update within 30-days of Change | CHSC 25508.1(a)-(f) | | X | | CERS by adding 330 gallons of one time use |
| H210 | Business Activities/Owner/Operator ID Page | CHSC 25508(a)(1) | | X | | and 330 gallons of post-use dip. Submit |
| H211 | Hazardous Materials Inventory | CHSC 25505, 25506, 25508 | X | | | signed document stating inventory is updated |
| H212 | Site Map | CHSC 25505(a)(2), 25508(a)(1) | | X | | within |
| H213 | Emergency Response Plan | CHSC 25505(a)(3), 25508(a)(1) | | X | | OBSERVATION: Observed (1) 55 gallon |
| H214 | Training Program | CCR 2655, 2656, CHSC 25505(a)(4), 25508(a)(1) | | X | | drum of used oil. |
| H215 | Training Documentation | CHSC 25505(a)(4) | | X | | CORRECTIVE ACTION: Obtain hazardous |
| W101 | Hazardous Waste Generator Permit | SBCC 23.0602 | X | | | waste generator permit. |
| W103 | Hazardous Waste Determination | CCR 66262.11 | | | X | |
| W104 | EPA ID Number | CCR 66262.12 | | | X | W213 |
| W110 | Hazardous Waste Labeling Standards | CCR 66262.34(f) | | | X | OBSERVATION: Observed (1) unlabeled 55 |
| W122 | Reusable Soiled Textile Materials | CHSC 25144.6(b) | | | X | gallon drum of used oil and (1) unlabeled |
| W128 | Hazardous Waste Disposal Documentation | CCR 66262.40(a) | | | X | 55 gallon drum of unknown waste. |
| W137 | Consolidated Manifest Standards | CHSC 25100.2 | | | | CORRECTIVE ACTION: Have waste |
| W138 | Used Oil and Fuel Filter Management | CCR 66266.130, CHSC 25250.22 | | | X | hauled off by certified waste and |
| W139 | Lead Battery Disposal Documentation | CCR 66266.81(a)(9)(B) | | | X | submit a copy of waste manifest |
| W145 | Improper Disposal of Hazardous Waste | CHSC 25189.5(a), 25201(a) | | | X | along with signed statement ~~[illegible]~~ mv |
| W159 | Facility Information Reporting | SBCC 23.0602, 23.0712 | | | X | stating that the waste has been |
| W206 | Facility Maintained to Prevent Release/Fire/Explosion | CCR 66262.34(d)(2) | | | X | removed. |
| W207 | Emergency Plan | CCR 66262.34(d)(2) | | | X | |
| W213 | Hazardous Waste Accumulation | CCR 66262.34(d), CHSC 25123.3(h)(1) | X | | | Personal Review: |
| W214 | Condition of Hazardous Waste Containers | CCR 66262.34(d)(2) | | | X | Equipment is serviced by Ross Avery. |
| W216 | Open Hazardous Waste Containers | CCR 66262.34(d)(2) | | | X | Uniforms serviced by Aramark. |
| W218 | EHS Waste Accumulation | CCR 66262.34(b)(1), CHSC 25123.3(h)(1)(c), 25123.3(u) | | | X | Business plan last submitted on 3/1/19 |
| W231 | Employee Training | CCR 66262.34(d)(2) | | | X | Hazardous safety training is being |
| W238 | Hazardous Waste Storage Area Weekly Inspection | CCR 66262.34(d)(2) | | | X | conducted. |
| | | | | | | Chemicals are supplied by |
| | | | | | | SO Cal Dairy Equipment. |

| Description of Facility: | Hazmat Inventory: |
|---|---|
| Facility is a dairy farm. Hazardous materials are stored and used as disinfectants and cleaners during milking process. | Consistent with CERS submitted 3/1/19, with exception of 55 gallon drum of used oil and (1) 55 gallon drum of unknown. |

*For assistance regarding this report, please contact the inspector below @ 909-386-8401 or email* MVallenzuela *@sbcfire.org.*

THIS REPORT SHALL SERVE AS A "NOTICE TO COMPLY" FOR MINOR VIOLATIONS AND A "NOTICE OF VIOLATION" FOR CLASS I & II VIOLATIONS. ALL VIOLATIONS MUST BE CORRECTED WITHIN 30-DAYS OF INSPECTION UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN FORMAL ENFORCEMENT LEGAL ACTION. WITHIN 30-DAYS, SIGN THE CERTIFICATION BELOW AND RETURN A COPY TO THE INSPECTOR ONCE ALL VIOLATIONS HAVE BEEN CORRECTED.

| CERTIFICATE OF COMPLIANCE: | Inspected by: | Received by: | |
|---|---|---|---|
| I certify under penalty of law that ALL violations have been corrected. I am authorized to file this certification on behalf of the Respondent and I am aware of the possibility of penalties, fines and imprisonment for false statements or knowing violations. | Inspector Signature: | Operator Signature: | Title: |
| Sign: Date: | Inspector Name (Print): MaVallenzuela | Operator Name (Print): Bryan Vander Dussen | Inspection Date: |
| Print: Title: | | | |

1/3/2019 GM

**GORDON HAY, INC.**
**16395 SO. EUCLID AVE**
**CHINO, CA 91708**
**909-393-448**

RECEIVED
MAR 09 2019
SBCFIRE - HAZMAT

April 1, 2019

San Bernardino County
Fire District
620 South E Street
San Bernardino, CA 92415

To Whom It May Concern

In regards to the CUPA Compliance Inspections Report for Facility # FA0014875 and CERS ID # 10444234
For the location of Gordon Hay Inc. 14213 S Bonview Ave Ontario, CA 91761

Attached you will find copies papers showing that the violations have been corrected.
1: removal of the 55 gallon used Oil
2: Facility map with the Teat Dip Storage Correction
3: 2 barrels had rain water in them no hazardous material and have been removed

If you should have any more concerns please contact Bryan @ 909-816-2709

Thank you

Debbie Gasper

Debbie Gasper
Gordon Hay, Inc.

Kent Avery Repair, Inc
2752 Scarborough Pl
Riverside, CA 92503

# Invoice

| Date | Invoice # |
|---|---|
| 3/30/2019 | 22574 |

| Bill To |
|---|
| Gordon Hay<br>16395 S Euclid Ave<br>Chino, CA 91708 |

| Due Date |
|---|
| 4/13/2019 |

| Project | |
|---|---|

| Description | Qty | Amount |
|---|---|---|
| Outside Service Provider, Ross Avery & Associates Inc., Service Date: 3/29/2019<br>Removed used engine oil from black 55 gallon open top drum at Dairy #3 on Bon View Ave, as per Brian Vanderham | | 369.00 |
| Oil Disposal Fee | 117 | 88.92 |

*This invoice is subject to Terms of Service. A percentage is donated to non-profit organizations.*

| | |
|---|---|
| Subtotal | $457.92 |
| Sales Tax (3.25%) | $0.00 |
| **Balance Due** | $457.92 |

**CUPA**
**CUPA COMPLIANCE INSPECTION REPORT**
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**620 South "E" Street, San Bernardino, CA 92415-0153**
**(909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org**

| | | | |
|---|---|---|---|
| **FACILITY NAME:** | Gordon Hay Inc. | **FACILIY ID:** | FA 0014825 |
| **FACILITY ADDRESS:** | 14213 S Bon View Ave. | **CERS ID:** | 10444234 CERS Desk 909-386-8432 |
| ☒ INSPECTION ☒ PHOTOGRAPHS **CONSENT GRANTED BY:** | **NAME:** Bryan Vander Dussen | **TITLE:** | Manager |

***This inspection was conducted to determine compliance with applicable hazardous materials and hazardous waste laws and regulations. Refer to Title 19 and 22 of the California Code of Regulations (CCR), Chapters 6.5, 6.67 and 6.95 of the California Health and Safety Code (CHSC), and Division 3 of Title 2 of the San Bernardino County Code (SBCC). (V) Violation, (C) – Compliant, (N) Not applicable or not addressed. ALL violations must be corrected within 30-days unless otherwise specified.***

| CODE | VIOLATION INFORMATION & CLASSIFICATION | | V | C | N | NARRATIVE |
|---|---|---|---|---|---|---|
| H201 | Hazardous Materials Handler Permit | SBCC 23.0602(a) | | X | | H211: |
| H202 | Business Plan Established and Implemented | CHSC 25507 | | X | | OBSERVATION: Observed pre and post |
| H203 | Business Plan Submittal | CHSC 25505, 25508(a)(1) | | X | | test dip tanks at 330 gallons each. |
| H206 | Business Plan Annual Review and Certification | CHSC 255508(a)(1), 25508.2 | | X | | CORRECTIVE ACTION: Update inventory via |
| H209 | Business Plan Update within 30-days of Change | CHSC 25508.1(a)-(f) | | X | | CERS by adding 330 gallons of pre test dip |
| H210 | Business Activities/Owner/Operator ID Page | CHSC 25508(a)(1) | | X | | and 330 gallons of post test dip. Submit |
| H211 | Hazardous Materials Inventory | CHSC 25505, 25506, 25508 | X | | | signed document stating inventory is updated. |
| H212 | Site Map | CHSC 25505(a)(2), 25508(a)(1) | | X | | W101 |
| H213 | Emergency Response Plan | CHSC 25505(a)(3), 25508(a)(1) | | X | | OBSERVATION: Observed (1) 55 gallon |
| H214 | Training Program | CCR 2658, 2659, CHSC 25505(a)(4), 25508(a)(1) | | X | | drum of used oil. |
| H215 | Training Documentation | CHSC 25505(a)(4) | | X | | CORRECTIVE ACTION: Obtain hazardous |
| W101 | Hazardous Waste Generator Permit | SBCC 23.0602 | X | | | waste generator permit. |
| W103 | Hazardous Waste Determination | CCR 66262.11 | | | X | |
| W104 | EPA ID Number | CCR 66262.12 | | | X | W213 |
| W110 | Hazardous Waste Labeling Standards | CCR 66262.34(f) | | | X | OBSERVATION: Observed (1) unlabeled 55 |
| W122 | Reusable Soiled Textile Materials | CHSC 25144.6(b) | | | X | gallon drum of used oil and (1) unlabeled |
| W128 | Hazardous Waste Disposal Documentation | CCR 66262.40(a) | | | X | 55 gallon drum of unknown waste. |
| W137 | Consolidated Manifest Standards | CHSC 25160.2 | | | X | CORRECTIVE ACTION: Have waste |
| W138 | Used Oil and Fuel Filter Management | CCR 66266.130, CHSC 25250.22 | | | X | hauled off by certified hauler and |
| W139 | Lead Battery Disposal Documentation | CCR 66266.81(a)(4)(B) | | | X | submit a copy of waste man. for |
| W145 | Improper Disposal of Hazardous Waste | CHSC 25189.5(a), 25201(a) | | | X | along with signed statement ~~that~~ mu |
| W159 | Facility Information Reporting | SBCC 23.0602, 23.0712 | | | X | stating that the waste has been |
| W206 | Facility Maintained to Prevent Release/Fire/Explosion | CCR 66262.34(d)(2) | | | X | removed. |
| W207 | Emergency Plan | CCR 66262.34(d)(2) | | | X | |
| W213 | Hazardous Waste Accumulation | CCR 66262.34(d), CHSC 25123.3(h)(1) | X | | | Document Review: |
| W214 | Condition of Hazardous Waste Containers | CCR 66262.34(d)(2) | | | X | Equipment is serviced by Ross Avery. |
| W216 | Open Hazardous Waste Containers | CCR 66262.34(d)(2) | | | X | Uniforms serviced by Aramark. |
| W218 | EHS Waste Accumulation | CCR 66262.34(b)(1), CHSC 25123.3(h)(1)(c), 25123.3(c) | | | X | Business plan last submitted on 3/1/19 |
| W231 | Employee Training | CCR 66262.34(d)(2) | | | X | Hazardous safety training is being |
| W238 | Hazardous Waste Storage Area Weekly Inspection | CCR 66262.34(d)(2) | | | X | conducted. |
| | | | | | | Chemicals are supplied by |
| | | | | | | So Cal Dairy Equipment. |

**Description of Facility:** Facility is a dairy farm. Hazardous materials are stored and used ~~and~~ as disinfectants and cleaners during milking process.

**Hazmat Inventory:** Consistent with CERS submittal 3/1/19, with exception of 55 gallon drum of used oil and (1) 55 gallon drum of unknown.

***For assistance regarding this report, please contact the inspector below @ 909-386-8401 or email MbVallenzuela @sbcfire.org.***

**THIS REPORT SHALL SERVE AS A "NOTICE TO COMPLY" FOR MINOR VIOLATIONS AND A "NOTICE OF VIOLATION" FOR CLASS I & II VIOLATIONS. ALL VIOLATIONS MUST BE CORRECTED WITHIN 30-DAYS OF INSPECTION UNLESS OTHERWISE SPECIFIED. FAILURE TO COMPLY MAY RESULT IN FORMAL ENFORCEMENT LEGAL ACTION. WITHIN 30-DAYS, SIGN THE CERTIFICATION BELOW AND RETURN A COPY TO THE INSPECTOR ONCE ALL VIOLATIONS HAVE BEEN CORRECTED.**

| CERTIFICATE OF COMPLIANCE: | Inspected by: | Received by: | |
|---|---|---|---|
| I certify under penalty of law that ALL violations have been corrected. I am authorized to file this certification on behalf of the Respondent and I am aware of the possibility of penalties, fines and imprisonment for false statements or knowing violations. | Inspector Signature: | Operator Signature: | Title: |
| Sign: Date: | Inspector Name (Print): Matt Vallenzuela | Operator Name (Print): Bryan Vander Dussen | Inspection Date: |
| Print: Title: | | | |

1/3/2019 GM

## Violations and Compliance Inform[illegible]

| | | |
|---|---|---|
| **H201** | *Failure to obtain and maintain a current CUPA Hazardous Materials Handler permit.* | *Comply by paying all applicable permit fees upon receipt of invoice and submitting all necessary information.* |
| **H202** | *Failure to adequately establish and implement a Business Plan when storing/handling a hazardous material at or above reportable quantities.* | *Comply by establishing and implementing the Business Plan.* |
| **H203** | *Failure to complete and electronically submit a Business Plan when storing/handling a hazardous material at or above reportable quantities.* | *Comply by submitting an accurate and complete Business Plan via the* ***California Environmental Reporting System (CERS).*** |
| **H206** | *Failure to annually review and electronically certify that the Business Plan is complete and accurate on or before the due date.* | *Comply by reviewing and certifying the Business Plan annually.* |
| **H209** | *Failure to electronically update Business Plan within 30 days of: a 100% or more increase in a reported quantity, any handling of a previously undisclosed, reportable hazardous materials, a change of business address, business ownership, or business name, a substantial change in the handler's operations that requires modification of the business plan.* | *Comply by submitting the updated Business Plan information via CERS.* |
| **H210** | *Failure to accurately complete and electronically submit the Business Activities Page and/or Business Owner Operator Identification Page.* | *Comply by submitting the Business Activities Page and/or Business Owner/Operator Identification Page as required.* |
| **H211** | *Failure to accurately complete and electronically submit hazardous materials inventory information for all reportable hazardous materials on site at or above reportable quantities.* | *Comply by submitting an accurate and complete hazardous materials inventory via CERS.* |
| **H212** | *Failure to accurately complete and electronically submit a site map with all required content.* | *Comply by submitting an accurate and complete site map via CERS.* |
| **H213** | *Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.* | *Comply by submitting a complete emergency response plan via CERS.* |
| **H214** | *Failure to establish and electronically submit an adequate training program and safety procedures in the event of a release or threatened release of a hazardous material.* | *Comply by submitting a complete training program via CERS.* |
| **H215** | *Failure to provide initial and annual training to all employees in safety procedures in the event of a release or threatened release of a hazardous material and/or failure to document and maintain training records for a minimum of three years.* | *Comply by submitting a signed statement indicating that initial and annual training is conducted and training records are maintained for at least three years.* |
| **W101** | *Failure to obtain and maintain a CUPA Hazardous Waste generator permit.* | *Comply by paying all applicable permit fees upon receipt of invoice and submitting all necessary information.* |
| **W103** | *Failure to make hazardous waste determination.* | *Comply by submitting a signed statement indicating the waste is non-hazardous based upon generator knowledge, laboratory analysis documentation, or manage the waste as hazardous waste and submit disposal records.* |
| **W104** | *Failure to obtain an EPA ID Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.* | *Comply by submitting form 1358 to DTSC.* |
| **W110** | *Failure to properly label hazardous waste containers with: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and accumulation start date.* | *Comply by labeling containers properly and submitting the signed Certificate of Compliance (CofC).* |
| **W122** | *Failure to properly manage reusable soiled textile materials prior to being sent for laundering.* | *Comply by properly managing reusable textile materials and submitting the signed CofC.* |
| **W128** | *Failure to keep disposal records for three years.* | *Comply by retaining hazardous waste disposal records and submitting the signed CofC.* |
| **W137** | *Failure to comply with consolidated manifesting procedures and retain records for three years.* | *Comply by following the consolidated manifesting requirements and submitting the signed CofC.* |
| **W138** | *Failure to properly manage used oil or fuel filters.* | *Comply by proper management of used oil filters, and by submitting the signed CofC.* |
| **W139** | *Failure to retain for at least 3 years a legible copy of each manifest or bill of lading which identifies spent lead-acid storage batteries shipped to a person who stores the batteries or who uses, reuses, recycles or reclaims the batteries or their components.* | *Comply by retaining records for 3 years and by submitting the signed CofC.* |
| **W145** | *Failure to dispose of hazardous waste at an authorized facility.* | *Comply by submitting a signed statement indicating that hazardous waste will be disposed of through a licensed facility.* |
| **W159** | *Failure to provide names, addresses and phone numbers of the business and owner; name and 24-hr phone number of the emergency contact; site address where hazardous waste is generated or produced, if different from the facility address; list of each type of hazardous waste generated; prepare a Contingency Plan.* | *Comply by meeting all stated requirements by submitting the information via CERS.* |
| **W206** | *Failure to maintain and operate the facility to minimize the possibility of a fire, explosion, or any release of hazardous waste substances to air, soil, or surface water which could threaten human health or the environment.* | *Comply by ensuring the above requirements are met and by submitting the CofC.* |
| **W207** | *Failure to post the following information next to the telephone: name and telephone number of the emergency coordinator; location of fire extinguishers and spill control material, and, if present, fire alarm; the telephone number of the fire department, unless the facility has a direct alarm.* | *Comply by meeting the requirements stated above and by submitting the CofC.* |
| **W213** | *Failure to manage hazardous waste within 180 days (or as otherwise required).* | *Comply by disposing of hazardous waste within the accumulation time limit, by submitting records and the CofC.* |
| **W214** | *Failure to accumulate hazardous waste in a container that is in good condition.* | *Comply by using a container that is in good condition and by submitting the CofC.* |
| **W216** | *Failure to keep closed a hazardous waste container unless it is in use.* | *Comply by closing the containers and by submitting the CofC.* |
| **W218** | *Failure to manage acute/extremely hazardous waste within 90 days after accumulating 1 kilogram.* | *Comply by managing the waste as required and by submitting disposal records and the CofC.* |
| **W231** | *Failure to train all employees on waste handling and emergency procedures. Comply by training employees and by submitting the CofC.* | |
| **W238** | *Failure to inspect hazardous waste storage areas at least weekly.* | *Comply by conducting weekly inspections and by submitting the CofC along with any other documentation requested by the inspector.* |

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: Gordon Hay Inc #3 Facility ID #: FA0014875

Address: 14213 S Bon View Ave Ontario, CA 91762

*1) Description:* Front of facility as seen from Bon View Ave. facing east.

*2) Description:* (1) 55-gallon drum of used oil located in storage shed on north side of facility.

Date Taken: **3/25/2019**

Taken By: **Matthew Valenzuela** Signature:

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

Facility/Case Name: Gordon Hay Inc #3 Facility ID #: FA0014875

Address: 14213 S Bon View Ave Ontario, CA 91762

*3) Description:* (2) 55-gallon drums of acid cleaner located in hazardous materials storage area.

*4) Description:* (1) 55 -gallon drum of LA Chemclor and (1) 55-gallon Velocity Two Detergent located in hazardous materials storage area.

Date Taken: **3/25/2019**

Taken By: **Matthew Valenzuela** Signature: Ma Valenzuela

Rev 06/29/2018

# PHOTO NARRATIVE



**PHOTO 5**

**PHOTO 6**

Facility/Case Name: Gordon Hay Inc #3 Facility ID #: FA0014875

Address: 14213 S Bon View Ave Ontario, CA 91762

*5) Description:* (1) 275-gallon tank of post teat dip located outside of building on the south side.

*6) Description:* (1) 275-gallon tank of pre teat dip located outside of building on the south side.

Date Taken: **3/25/2019**

Taken By: **Matthew Valenzuela** Signature:

Rev 06/29/2018

CUPA

San Be. ..dino County Fire Department • Hazardous Materials ..ision

620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

**CUPA COMPLIANCE INSPECTION REPORT**

| | |
|---|---|
| NAME: **GORDON HAY INC DAIRY #3** | FACILITY ID: **FA0014875** |
| ADDRESS: **14213 S BON VIEW AVE** | CERS ID:**10444234** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | INSPECTION DATE: **12/9/2015** |

Inspector was given permission to: ☐ photograph ☒ inspect

**Inspection Narrative (v020000)**

An inspection was conducted to determine compliance with hazardous waste generator and hazardous material handler laws and regulations. Consent to conduct the inspection and photograph the facility was given by Mario Hernandez, employee of the dairy.

The facility is a dairy. The facility stores hazardous materials as a result of dairy operations, using disinfectants and cleaners in the process of milking cows.

HAZARDOUS MATERIALS INVENTORY: Two 55 gallon drums of Acid Cleaner EC, three 55 gallon drums of Velocity Two detergent, three 55 gallon drums of LA Chemclor, one 500 gallon tank of Teat Dip, and one 500 gallon tank of diesel fuel.

DOCUMENTATION REVIEW: The Business Plan was last submitted on 4/30/14 to the CERS website. The EPA ID# is not required as no hazardous waste is generated at this facility.

Submit a signed Certificate of Compliance with required documentation to this office within 30 days.

If you have any questions, feel free to contact me at 909-754-0453 or dpianalto@sbcfire.org. If you have any questions regarding CERS, please call the CERS helpline at 909-386-8432.

**The following lines marked in the V column are violations that must be corrected. Marked items in the N column require additional information to determine compliance.**

| VIOLATION CODE | DESCRIPTION | SECTION | V | N |
|---|---|---|---|---|
| **42** | **HMRRP (HAZARDOUS MATERIALS HANDLER)** | | | |
| 0201 | Failure to obtain a CUPA Hazardous Materials Handler permit. | 23.0602(a) | | |
| 0202 | Failure to establish a Business Plan. | CAL. HEALTH & SAFETY CODE 25507 | | |
| 0203 | Failure to submit a Business Plan. | CAL. HEALTH & SAFETY CODE 25508 | X | |
| Violation: | Owner/Operator shall submit the hazardous materials inventory, emergency contacts, site plan and certification that the existing plan is current and up to date. | | | |
| Correction: | Using the California Environmental Reporting System (CERS), electronically submit the Business Plan to the statewide information management system. | | | |
| Observation: | The business plan was last submitted on 4/30/15 to the CERS website. Update and submit the plan within 30 days to meet annual submission requirements. Comply by date: **1/9/2016** | | | |
| 0204 | Failure to immediately report any release or threatened release of a hazardous material. | CAL. HEALTH & SAFETY CODE 25510 | | |
| 0205 | Failure to allow a hazardous materials handler inspection. | CAL. HEALTH & SAFETY CODE 25511 | | |
| 0206 | Failure to update the Business Plan | CAL. HEALTH & SAFETY CODE 25508.2 | | |
| 0209 | Failure to submit an amendment to the inventory form within 30 days of change. | CAL. HEALTH & SAFETY CODE 25508.1 | | |
| 1231 | Failure to submit a corrected Business Plan within 30 days after notification of deficiencies. | CAL. HEALTH & SAFETY CODE 25508 | | |
| 1232 | Failure to submit a Business Plan revision within 30 days of a substantial change in operation. | CAL. HEALTH & SAFETY CODE 25508.1 | | |

| INSPECTED BY: | RECEIVED BY: | Signature Date Time: LTR: |
|---|---|---|
| DWANE PIANALTO | | |
| NAME | INSPECTION DATE: 12/09/2015 NAME | PRINTED ON: 12/10/15 4:32 pm TITLE |

☒ **NOTICE OF VIOLATION: THE VIOLATIONS NOTED IN THIS REPORT MUST BE CORRECTED WITHIN THE SPECIFIED TIMEFRAME. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION.**

CUPA
San Bernardino County Fire Department • Hazardous Materials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# CERTIFICATE OF COMPLIANCE

**Return Certification within 31 Days of Reciept to Inspector DWANE PIANALTO**

RESPONDENT: Mario Hernandez

VIOLATION(S) CITED ON: 12/9/2015 CERTIFICATE OF COMPLIANCE DATE: 12/9/2015

| | |
|---|---|
| NAME: **GORDON HAY INC DAIRY #3** | FACILITY ID: **FA0014875** |
| ADDRESS: **14213 S BON VIEW AVE** | CERS ID:**10444234** |
| CITY: **ONTARIO** STATE: **CA** ZIP CODE: **91762** | |

**Attach the following documentation when returning the Certificate of Compliance:**

0203 Using the California Environmental Reporting System (CERS), electronically submit the Business Plan to the statewide information management system.The business plan was last submitted on 4/30/15 to the CERS website. Update and submit the plan within 30 days to meet annual submission requirements.

I certify under penalty of law that:

- Respondent has corrected violations specified in the above-entitled action.
- I have personally examined any documentation attached to this certification to establish that the violations have been corrected.
- Based on my examination of the attached documentation and inquiry of the individuals, who prepared or obtained them, I believe the information to be true, accurate and complete.
- I am authorized to file this certification on behalf of the Respondent.
- I am aware there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE DATE

PRINT NAME TITLE

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# ACCESS REQUEST to FACILITY RECORD IN CERS - SINGLE FACILITY*

For more information, see: http://www.sbcfire.org/hazmat/efile.aspx or call CERS help line (909) 386-8432

The purpose of the ACCESS REQUST is to ensure that only individuals designated by the facility owner/operator are authorized by the CUPA to access facility records and to create, edit, and submit electronic data on the owner's behalf to the statewide system, known as the California Environmental Reporting System (CERS). The initial business user authorized by the CUPA to have access to a facility on CERS is designated as a lead business user. Lead business users have the ability to add additional lead or standard business users, approve or reject other access requests, or delete other users for any facility for which they are listed as a lead user.

**AUTHORIZED LEAD BUSINESS USER**

| | |
|---|---|
| Name: Craig Gordon | Title: President |
| Email Address: Haydebi@aol.com | Contact Phone: 909-393-4408 |

| | | | | |
|---|---|---|---|---|
| OWNER NAME: Craig Gordon | OWNER EMAIL ADDRESS: Haydebi@aol.com | | | |
| OWNER MAILING ADDRESS: 16395 S. Euclid Ave | CITY: Chino | STATE: CA | ZIP CODE: 91708 | OWNER PHONE: 909-393-4408 |

**Fill out the following information for the facility**

| FACILITY ID *(e.g., FA0123456)* | FACILITY NAME *(e.g., CUPA AUTO)* | SITE ADDRESS *(e.g., 123 N. MAIN ST.)* | CITY *(e.g., ANYTOWN)* |
|---|---|---|---|
| FA0014875 | Gordon Hay Inc Dairy #3 | 14213. S. Con View Ave | Ontario |

☒ **I authorize the person and email address listed above to be a lead business user for the listed facility. This includes the ability to create, edit, and submit compliance data for the listed facility. I understand that as a lead business user this person may approve additional lead business users or standard business users, grant or reject facility access requests, and delete users from the facility listed on this authorization form.**

**Certification – I certify that I am the owner/operator or legal representative of the facility listed on this form. I understand that compliance documents prepared or submitted electronically are held to the same standard as their former paper equivalents.**

| | | |
|---|---|---|
| SIGNATURE OF OWNER/OPERATOR OR LEGALLY DESIGNATED REPRESENTATIVE | DATE: 3-31-14 | NAME OF DOCUMENT PREPARER: Craig Gordon |
| NAME OF SIGNER (print): Craig Gordon | TITLE OF SIGNER: President / owner | |

*Each facility record that is entered into CERS is assigned to a business/organization. Multiple facilities that have the same owner/operator and that will have the same users managing the facility record in CERS can be grouped together into a single "umbrella" business/organization. If you own or operate multiple facilities and if the same users will be managing all of the facilities in CERS, you may want them to be grouped into a single business/organization. For more information please contact the San Bernardino CERS help line at (909) 386-8432.

Return completed form by Mail: San Bernardino County Fire Department, Hazardous Materials Division, 620 South E Street, San Bernardino, CA 92415-0153 or Fax: (909) 386-8460 or Email: Efile@sbcfire.org

RECEIVED
APR 04 2014
S.B. CO. FIRE DEPT.

OFFICE USE Notes:

Form Revised 11/14/12 Completed by: [signature] Date: 04/04/14.

OFFICE USE ONLY: DATE STAMP

7011 2970 0004 2051 3851

# U.S. Postal Service™
# CERTIFIED MAIL™ RECEIPT
*(Domestic Mail Only; No Insurance Coverage Provided)*

For delivery information visit our website at www.usps.com®

OFFICIAL USE

12/13/12

| | |
|---|---|
| Postage | $ |
| Certified Fee | |
| Return Receipt Fee (Endorsement Required) | |
| Restricted Delivery Fee (Endorsement Required) | |

Postmark Here

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Craig Gordon
16395 Euclid
Chino, CA 90208

Str
or
Cit

PS Form 3800, August 2006

See Reverse for Instructions

## Certified Mail Provides:

- A mailing receipt
- A unique identifier for your mailpiece
- A record of delivery kept by the Postal Service for two years

***Important Reminders:***

- Certified Mail may ONLY be combined with First-Class Mail® or Priority Mail®.
- Certified Mail is *not* available for any class of international mail.
- NO INSURANCE COVERAGE IS PROVIDED with Certified Mail. For valuables, please consider Insured or Registered Mail.
- For an additional fee, a *Return Receipt* may be requested to provide proof of delivery. To obtain Return Receipt service, please complete and attach a Return Receipt (PS Form 3811) to the article and add applicable postage to cover the fee. Endorse mailpiece "Return Receipt Requested". To receive a fee waiver for a duplicate return receipt, a USPS® postmark on your Certified Mail receipt is required.
- For an additional fee, delivery may be restricted to the addressee or addressee's authorized agent. Advise the clerk or mark the mailpiece with the endorsement *"Restricted Delivery"*.
- If a postmark on the Certified Mail receipt is desired, please present the article at the post office for postmarking. If a postmark on the Certified Mail receipt is not needed, detach and affix label with postage and mail.

**IMPORTANT: Save this receipt and present it when making an inquiry.**

PS Form 3800, August 2006 *(Reverse)* PSN 7530-02-000-9047

# Track & Confirm

**You entered: 70112970000420513851**

**Status: Delivered**
**Your item was delivered at 11:13 am on December 15, 2012 in CHINO, CA 91710. Additional information for this item is stored in files offline.**

**You may request that the additional information be retrieved from the archives, and that we send you an e-mail when this retrieval is complete. Requests to retrieve additional information are generally processed momentarily.**

I would like to receive notification on this request

Restore

## Find Another Item

What's your label (or receipt) number?

Find



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CUPA
San Bern... ...no County Fire Department • Hazardous ... ...erials Division
620 South "E" Street, San Bernardino, CA 92415-0153 • (909) 386-8401 FAX (909) 386-8460 • www.sbcfire.org

# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

'A #: NEW Facility Name: Gordon Hay Inc. Dairy #3 Inspection Date: 12/12/12

Site Address: 14213 S. Bon View Ave. Phone #:

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by:
☒ Inspect ☒ Photograph Name: Carlos Gonzalez Title: Employee # Emp: 4 Packet left on site? ☒ Yes ☐ No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

**THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED**

## General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials ... erials handler permit needed
**Compliance requirement: Submit fees w**

☐ 104. EPA ID Number not obtained for waste g
**Compliance Requirement**: Obtain perma ... it your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or
**Compliance Requirement**: Facility must ... on certification below denotes compliance.

☐ 107. A Contingency Plan has not been establi

☒ 202. A Business Plan has not been establishe

☒ 203. A Business Plan has not been ☒ submi
**Compliance Requirement**: Submit the c ... lan to this Division. NOTE: You must keep a current co ... ailable at all times.

☐ 131. Training documentation not complete or
**Compliance Requirement**: Submit train

Pls mail, to: certified
Craig Gordon
16395 Euclid
Chino, CA 90708

## Container Storage and Labeling Requ

☐ 110. Hazardous waste containers are not lab ... ste

☐ 111. Hazardous waste label is incomplete. (C

☐ 112. Accumulation start date is missing from ... waste
**Compliance Requirement**: Hazardous waste label is to be applied to the tank/container. All ... lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste
**Compliance Requirement**: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

☐ 114. Hazardous waste container not sound. (CCR 66265.171) Does not generate waste

☐ 115. Hazardous waste container leaking. (CCR 66265.173(b)) Does not generate waste

☐ 116. Hazardous waste container open when not in use. (CCR 66265.173(a)) Does not generate waste
**Compliance Requirement**: Waste containers must be sound, not leaking and closed when not in use.

## Waste Management:

☐ 119. Hazardous waste managed unlawfully. (CHSC 25154) Does not generate waste
**Compliance Requirement**: Hazardous waste containers and aboveground tanks must be labeled, closed, and inspected (weekly or daily, as appropriate). Waste is to be removed by a licensed waste hauler within the allowed time periods.

☐ 128. Failure to retain **manifested** waste disposal records for 3 years. (CCR 66262.40(a)) Does not generate waste

☐ 137. Failure to retain **consolidated** waste disposal records for 3 years. (CHSC 25160.2(b)(3)) Does not generate waste
**Compliance Requirement**: Submit copies of waste disposal records for the past ----------

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate
**Compliance Requirement**: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. New dairy operating at previous location of H&R Dairy.

Inspected By: [signature] Sign Name Received By: Carlos Gonzalez Sign Name Title: Employee

Leslie Heaviside Print Name Carlos Gonzalez Print Name Report Date: 12/12/12

**Sign and submit the a copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.**

**I certify that I have met the compliance requirements of this Notice of Violation:** _____ Name _____ Date

*Form Revised 6/2/2011*

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# HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT

FA #: NEW 14875 Facility Name: Gordon Hay Inc. Dairy #3 Inspection Date: 12/12/12

Site Address: 14213 S. Bon View Ave. Phone #:

City: Ontario Zip Code: 91762 EPA ID #: N/A

Consent Granted by: ☒ Inspect ☒ Photograph Name: Carlos Gonzalez Title: Employee # Emp: 4 Packet left on site? ☒ Yes ☐ No

Refer to Title 19 and Title 22 of the California Code of Regulations (CCR), Chapter 6.5 and 6.95 of the California Health and Safety Code (CHSC) and Division 3 of Title 2 of the San Bernardino County Code (CC)

THE FOLLOWING SECTIONS ARE IN VIOLATION IF THEY ARE CHECKED

## General Requirements:

☒ 101. / 201. Hazardous Waste and/or Materials Permits not current. (CC 23.0602(a)) Hazardous Materials handler permit needed
Compliance requirement: Submit fees within 30 days of billing.

☐ 104. EPA ID Number not obtained for waste generation. (CCR 66262.12(a)) Does not generate waste
Compliance Requirement: Obtain permanent EPA ID Number by submitting Form 1358 to DTSC. Submit your EPA ID Number to this Division.

☐ 106. Facility not operated to prevent a spill or release. (CCR 66265.31) Containers closed
Compliance Requirement: Facility must conduct housekeeping & operate to prevent all spills. Signature on certification below denotes compliance.

☐ 107. A Contingency Plan has not been established. (CCR 66265.51(a))

☒ 202. A Business Plan has not been established. (CHSC 25503.5)

☒ 203. A Business Plan has not been ☒ submitted / ☐ updated. (CHSC 25505)
Compliance Requirement: Submit the original and one copy of the Business Emergency/Contingency Plan to this Division. NOTE: You must keep a current copy of your Business Emergency/Contingency Plan onsite and available at all times.

☐ 131. Training documentation not complete or available. (CCR 66262.34(d)(2)) On the job training.
Compliance Requirement: Submit training documentation as required.

## Container Storage and Labeling Requirements:

☐ 110. Hazardous waste containers are not labeled/marked. (CCR 66262.34(f)(3)) Does not generate waste

☐ 111. Hazardous waste label is incomplete. (CCR 66262.34(f)(3)) Does not generate waste

☐ 112. Accumulation start date is missing from tank/container. (CCR 66262.34(f)(2)) Does not generate waste
Compliance Requirement: Hazardous waste label is to be applied to the tank/container. All fields and lines are to be correctly completed.

☐ 113. Accumulation time exceeded. (CCR 66262.34) Does not generate waste
Compliance Requirement: Dispose of waste using a licensed waste hauler within 30 days. Submit copies of disposal documents to this Division.

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Compliance Requirement: Submit copies of waste disposal records for the past ----------

☐ 138. Unlawful management of used oil filters. (CCR 66266.130) Does not generate
Compliance Requirement: Label all used oil filter containers with "DRAINED USED OIL FILTERS" and the accumulation start date.

**Business Description:** Dairy - milk production. New dairy operating at previous location of H&R Dairy.

Inspected By: [signature] Sign Name Received By: Carlos Gonzalez Sign Name Title: Employee

Leslie Heaviside Print Name Carlos Gonzalez Print Name Report Date: 12/12/12

Sign and submit the a copy of this form within 30 days with the required documents listed in each "Compliance Requirement" section.

**I certify that I have met the compliance requirements of this Notice of Violation:** Name Date

*Form Revised 6/2/2011*

**CUPA**

**San Bernardino County Fire Department • Hazardous Materials Division**

**HAZARDOUS WASTE GENERATOR AND HAZARDOUS MATERIALS HANDLER INSPECTION REPORT**

| | | | | | |
|---|---|---|---|---|---|
| FA #: | NEW | Facility Name: | Gordon Hay Inc. Dairy #3 | Inspection Date: | 12/12/12 |
| Site Address: | 14213 S. Bon View Ave. | | | Phone #: | |
| City: | Ontario | Zip Code: | 91762 | EPA ID #: | N/A |

Hazardous Materials inventory:
(1) 55-gallon drum of teat dip
(1) 55-gallon drum of sodium hypochlorite
(2) 55-gallon drums of CIP cleaner
(2)) 55-gallon drums of acid cleaner
(2) 55-gallon drums of sodium hypochlorite used for chlorination of water onsite
(1) 500-gallon AST Diesel fuel
<55-gallons of new oil for equipment

No hazardous waste was observed at time of inspection. Gonzalez was unsure of whether equipment is serviced or repaired onsite. Verify that a mobile maintenance service is used to be exempt from hazardous waste generator requirements.

☒ NOTICE OF VIOLATION: THE VIOLATIONS NOTED ABOVE MUST BE CORRECTED WITHIN 30 DAYS. FAILURE TO COMPLY MAY RESULT IN LEGAL ACTION. THE CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED WITHIN THE TIME PERIOD NOTED ABOVE.

# PHOTO NARRATIVE



**PHOTO 1**

**PHOTO 2**

Facility/Case Name: **Gordon Hay Inc. Dairy #3** Facility ID #: **NEW**

Address: **14213 S. Bon View Ave., Ontario**

1) Description: **Signage located at front of dairy**

2) Description: **(L to R) (2) 55-gallon drums containing CIP cleaner, (1) 55-gallon drum containing sodium hypochlorite, (2) 55-gallon drums containing acid cleaner**

Date Taken: **December 12, 2012**

Taken By: **Leslie Heaviside** Signature: _____

# PHOTO NARRATIVE



**PHOTO 3**

**PHOTO 4**

| | | | |
|---|---|---|---|
| Facility/Case Name: | **Gordon Hay Inc. Dairy #3** | Facility ID #: | **NEW** |
| Address: | **14213 S. Bon View Ave., Ontario** | | |
| 3) Description: | **500-gallon AST containing Diesel fuel** | | |
| 4) Description: | **No photo** | | |
| Date Taken: | **December 12, 2012** | | |
| Taken By: | **Leslie Heaviside** | Signature: | |

## *TRACKING SHEET FOR BUSINESS PLANS*

***OFM - HAZMAT***

FACILITY LABEL

GORDON HAY INC DAIRY #3
14213 S BON VIEW AVE
ONTARIO FA0014875

rpt# 5066

DATE FILE CREATED 12-19-12

| OTHER DATE | ACTION/DOCUMENTATION (UPDATE, NEW PLAN, ETC) |
|---|---|
| ___/___/___ | |
| ___/___/___ | |
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|---|---|---|---|---|
| FA0000454 | G BOOTSMA & SON'S | 7721 EDISON AVE | ONTARIO | 02 |
| FA0017949 | GH Dairy #4 | 8061 Edison Ave | Ontario | 01 |
| FA0000522 | JORRITSMA DAIRY | 8061 EDISON AVE | ONTARIO | 02 |
| FA0000515 | JOE FERREIRA JR DAIRY | 14400 S GROVE AVE | ONTARIO | 02 |
| FA0014875 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | ONTARIO | 01 |
| FA0010971 | H & R DAIRY | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000395 | COSTA, DIMAS | 14213 BON VIEW AVE | ONTARIO | 02 |
| FA0000393 | COSTA VIEW FARM | 14451 BON VIEW | ONTARIO | 02 |

| | | | |
|---|---|---|---|
| RO0001227 | SD0001204 | CHINO | 14400 GROVE AVE |

EMAILED GRM TO SCAN FILES 02/13/2024 BP

**SAN BERNARDINO COUNTY FIRE DEPARTMENT**

**RECEIPT** 111504

DIVISION HazMat DATE 9-23-24

RECEIVED FROM Laura L. Cattanach $ 136.00

one Hundred thirty six DOLLARS

ESTABLISHMENT / ACCOUNTS / CONTRACT #

| DESCRIPTION | FUND-DEPT-ORG-REVENUE | GRC# | AMOUNT |
|---|---|---|---|
| Phase | | 0213 | |
| One | | | |
| Record | | | |
| Search | | | |
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| **GRAND TOTAL** | | | $136.00 |

PAYMENT TYPE Check , CHECK # 1281

(SIGNATURE) LGray TITLE OA II BOOK # 1229

01-20802-670 Rev. 7/11

| | | | | |
|---|---|---|---|---|
| FA0000410 | MARTIN DEHOOG DAIRY | 02 | 8311 EDISON AVE | ONTARIO |
| FA0000508 | JACK ALEWYN DAIRY | 02 | 8185 EDISON BLVD | ONTARIO |
| FA0017949 | GH Dairy #4 | 01 | 8061 Edison Ave | Ontario |
| FA0000522 | JORRITSMA DAIRY | 02 | 8061 EDISON AVE | ONTARIO |
| FA0000454 | G BOOTSMA & SON'S | 02 | 7721 EDISON AVE | ONTARIO |
| FA0010971 | H & R DAIRY | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0000395 | COSTA, DIMAS | 02 | 14213 BON VIEW AVE | ONTARIO |
| FA0014875 | SOUTHWEST DAIRY | 01 | 14213 S BON VIEW AVE | ONTARIO |
| FA0011003 | TIVA DAIRY | 01 | 7587 EDISON AVE | ONTARIO |
| FA0000673 | TWIN PALM DAIRY | 02 | 7587 EDISON AVE | ONTARIO |

Martin Dehoog Dairy

#279526 8/27/71 (34)

#5097 28 2

**SAN BERNARDINO COUNTY AIR POLLUTION CONTROL DISTRICT**

172 West Third Street, San Bernardino, California, 92401, Telephone 889-0111, Ext. 548, 549

# APPLICATION FOR AUTHORITY TO CONSTRUCT AND PERMIT TO OPERATE RULE 65 GASOLINE TANKS

add

**APPLICATION INSTRUCTIONS**

A. Use this form for gasoline tanks which are filled from tank truck or trailer. Gasoline is defined as any petroleum distillate with a Reid vapor pressure of 4 pounds or more.

B. File form in duplicate properly signed, for each group of 5 tanks or less, at same location.

C. Pay $10.00 filing fee for each tank listed, or

D. For transfer of ownership of any tank which has a valid permit at the time of the transfer, pay only a $10.00 filing fee for each tank.

E. Make checks payable to Air Pollution Control District.

INCOMPLETE APPLICATIONS NOT ACCEPTABLE

1. PERMIT NO.: A2407

1A. PERMIT TO BE ISSUED TO: Martin De Hoog Dairy (BUSINESS LICENSE NAME OF ORGANIZATION THAT IS TO RECEIVE PERMIT)

1B. ATT: Mr. Martin De Hoog

2A. MAILING ADDRESS: 8311 E. Edison Chino CA (NUMBER STREET CITY OR COMMUNITY STATE)

2B. ZIP CODE: 91710

3. LOC. NO.: 001

3A. ADDRESS OF TANK(S) LOCATION: 8311 East Edison, CHino (NUMBER STREET CITY OR COMMUNITY)

3B. STATION NUMBER: —

4. PERMIT APPLICATION REASON:
- New construction ☐ 1
- Tank replaced ☐ 2
- Tank added ☐ 3
- Ownership change ☐ 4
- Existing 1-1-71 ☑ 5

5. ESTIMATED DATE TANK PLACED IN SERVICE:

6. DATE OF OWNERSHIP CHANGE:

7. TYPE OF ORGANIZATION:
- Corporation ☐ 1
- Partnership ☐ 2
- Lessee or individual owner ☑ 3
- Gov't. agency ☐ 4

8. GENERAL NATURE OF BUSINESS:
- Retail service station ☐ 1
- Garage ☐ 2
- Bulk plant ☐ 3
- Consumer account ☑ 4

9. TANK INFORMATION - ENTER COMPLETE INFORMATION FOR EACH TANK:

| | A Tank Designation | B Tank Capacity (Gallons) | Inside dimension C Diameter (Inches) | D Length (Inches) | E*** Product Stored | Check fill type F Offset * | G Sub-Merged ** | Check tank type H Under-Ground | I Above Ground | J Port-able | Check control K Drop (Ft-In) | L Lift (Ft-In) | M Control Approved |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 500 | | | 2 | | | U | ✓ | | | NA | NA |
| 2 | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |

**APCD USE ONLY**

| 15. PERMIT NUMBER | 16. FEE |
|---|---|
| 01 | 15 |

10. SIGNATURE OF RESPONSIBLE MEMBER OF ORGANIZATION: Cornelius De Hoog

11. OFFICIAL TITLE OF SIGNER: Ranchhand

12. TYPED OR PRINTED NAME OF SIGNER: CORNELIUS DE HOOG

13. DATE: 8-16-71

14. PHONE NUMBER: 983-6849

FINAL APPROVAL OF ACTION

BRANCH SUPERVISOR

DATE

VALIDATION

*Offset Fill - Fill line between tank truck fill connection and underground tank has an abrupt mechanical bend.

**Submerged Fill - Fill pipe discharge opening submerged in tank at liquid level of 6 inches, or, for tank loaded from side, entirely submerged at liquid level of 18 inches.

NOTE: All gasoline tanks of 250 or more gallons capacity installed after Jan. 1, 1971, must be equipped with submerged fill.

***Code - 1 - Regular; 2 - Ethyl; 3 - Premium; 4 - No lead regular; 5 - Low lead regular; 6 - No lead premium; 7 - Low lead premium.

CONTRACTOR'S NAME:

Telephone:

APCD FORM # 04-11248-013

60000

# SCAQMD Facility Equipment List Report



Facility: 26950 MARTIN L. DE HOOG
Status: Active
MR: 1316 SIC: 0 Team: I
Last Inspection: 06/19/2020 On Hold: Suspended: TS: TS-09 Non-inspection: Potential Inactivations (From Quarter: 0100 - inspect in 2nd quarter, every year
Contact: UNKNOWN UNKNOWN (714) 9473559 RECLAIM: N TITLE V: N AIRS ID:
Assignment: 1844617
Location Address: 8311 EDISON AVE, CHINO 91710-9242 Sector:EB
Inspector: KP06 KEVIN PEROZO
Mailing Address: 8311 EDISON AVE, CHINO 91710-9242 Sector:EB
Inspection Date: 06/19/2020
Instruction:
Disposition: Non source, company operating, no permits required

| Application No. | Permit No. | Permit Issue Date | Permit Status | Equipment Category | | BCAT/CCAT Description | Application Date | Application Status |
|---|---|---|---|---|---|---|---|---|
| 908744 | 908744 | | INACTIVE | 248915 | BCAT | SERV STAT STORAGE & DISPENSING GASOLINE | 01/01/1900 | PERMIT TO OPERATE GRANTED |
| 908744 | 908744 | | INACTIVE | 70 | CCAT | CONTROL ETO STERILIZATION HOSPITAL | 01/01/1900 | PERMIT TO OPERATE GRANTED |

Inspector: _____ Date: _____ Reviewed By: _____ Date: _____

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, CA 91765

# PERMIT TO OPERATE


Permit No.
F87591
A/N 445901

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301.f) is not received by the expiration date, contact the District.

ID 145099

Legal Owner
or Operator: THREE D DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-7318

**Equipment Location:** 8485 EDISON AVE, ONTARIO, CA 91762-7242

**Equipment Description :**

CONFINED ANIMAL FEED OPERATION CONSISTING OF:

1. MILK COWS, DRY COWS, HEIFERS, AND CALVES
2. MILKING PARLOR
3. SCRAPE TYPE MANURE HANDLING SYSTEM
4. OPEN CORRALS WITH IN-CORRAL MOUNDS
5. TWO STORAGE PONDS
6. FEED STORAGE/COMMODITY BARNS
7. MIXER FEED WAGON/LONG HAY

**Conditions :**

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
3. THE MAXIMUM NUMBER OF MILKING COWS, DRY COWS, HEIFERS, AND CALVES AT THIS FACILITY SHALL NOT EXCEED 1170 ANIMALS IN ANY ONE DAY.
4. THE MAXIMUM NUMBER OF MILK-PRODUCING COWS AT THIS FACILITY SHALL NOT EXCEED 820 IN ANY ONE DAY.
5. THIS FACILITY IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

**FILE COPY**

RULE 1127 EMISSION REDUCTION FROM LIVESTOCK WASTE
RULE 1186 PM10 EMISSIONS FROM PAVED AND UNPAVED ROADS AND LIVESTOCK OPERATIONS

6. THE OPERATOR SHALL USE BEST MANAGEMENT PRACTICES AT ALL TIMES, IN ACCORDANCE WITH RULE 1127. FACILITY MAY BE EXEMPTED FROM ONE CORRAL CLEARING PER YEAR IF ALL THE REQUIREMENTS OF RULE 1127(J)(3) ARE MET. NOTIFICATION TO THE DISTRICT SHALL BE MADE BY CALLING 1 800 CUT SMOG.

7. MANURE DISPOSED OF WITHIN THE JURISDICTION OF THE DISTRICT SHALL ONLY BE REMOVED OR CONTRACTED TO BE REMOVED FROM THIS DAIRY TO:

   A. AN APPROVED MANURE PROCESSING OPERATION; OR

   B. AGRICULTURAL LAND WITHIN THE DISTRICT APPROVED BY LOCAL ORDINANCE AND/OR REGIONAL WATER QUALITY BOARD FOR THE SPREADIING OF MANURE; OR

   C. A COMBINATION OF DESTINATIONS IN A AND B.

8. THE OPERATOR SHALL MAINTAIN COPIES OF ALL MANURE MANIFESTS, TIPPING FEE INVOICES, MANURE MOISTURE TEST RECORDS, CORRAL CLEARING RECORDS, AND STOCKPILE REMOVAL RECORDS.

9. THE OPERATOR SHALL SUBMIT A WRITTEN ANNUAL REPORT BY JANUARY 15TH OF EACH YEAR AFTER JANUARY 1, 2007 PER THE REQUIREMENTS OF RULE 1127. THE REPORT SHALL BE SENT TO: SCAQMD, COMPLIANCE DIVISION, PO BOX 4941, DIAMOND BAR , CA 91765-0941.

10. THE OPERATOR SHALL:

   A. CEASE ALL HAY GRINDING ACTIVITIES BETWEEN 2-5 PM EACH DAY IF VISIBLE EMISSIONS EXTEND MORE THAN 50 FEET FROM A HAY GRINDING SOURCE, AND

   B. TREAT ALL UNPAVED ACCESS CONNECTIONS AND UNPAVED FEED LANE ACCESS AREAS WITH EITHER PAVEMENT, GRAVEL (MAINTAINED TO A DEPTH OF FOUR (4) INCHES), OR ASPHALTIC ROADBASE.

11. THE OPERATOR SHALL MAINTAIN RECORDS, IN A MANNER APPROVED BY THE DISTRICT, TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 3, 4, 7, AND 8. ALL RECORDS SHALL BE RETAINED AT THE FACILITY FOR AT LEAST THREE YEARS AND BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

**NOTICE**

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR COPY SHALL BE POSTED ON OR WITHIN 8 METERS OF THE EQUIPMENT.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT CANNOT BE CONSIDERED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF OTHER GOVERNMENT AGENCIES.

EXECUTIVE OFFICER

Dorris M. Bailey

By Dorris M.Bailey/CW02
2/11/2007

**FILE COPY**

# SCAQMD Facility Equipment List Report



Facility: 88197 SOUTHERN CALIFORNIA EDISON CO
Status: Active
MR:
SIC: 3833
Team: I
Last Inspection: 06/19/2020
On Hold:
Suspended:
TS: TS-12 Industrial Sources - Out of Business and Cha
Quarter: none - do not inspect
Contact: FRANK MELONE (818) 3029775
RECLAIM: N
TITLE V: N
AIRS ID:
Assignment: 1844616
Location Address: 8381 E EDISON AVE, CHINO 91710 Sector:EB
Inspector: KP06 KEVIN PEROZO
Mailing Address: P O BOX 800, ROSEMEAD 91770 Sector:CG
Inspection Date: 06/19/2020
Instruction:
Disposition: Out of Business

| Application No. | Permit No. | Permit Issue Date | Permit Status | Equipment Category | BCAT/CCAT Description | Application Date | Application Status |
|---|---|---|---|---|---|---|---|
| 256001 | | | | 040901 BCAT | I C E (50-500 HP) N-EM STAT DIESEL | 09/04/1991 | BANKING/ PLAN GRANTED, NON BILLABLE |

Inspector: _____ Date: _____ Reviewed By: _____ Date: _____

South Coast Air Quality Management District
P. O. Box 4944
Diamond Bar, CA 91765
(909) 396-2000

761.20

# APPLICATION FOR PERMIT TO CONSTRUCT AND PERMIT TO OPERATE
# FORM 400 - A

**Non-Title V Facilities:** This form must be accompanied by one or more 400-E-xx series form(s). Complete this side of form only.
**Title V Facilities:** Complete both sides of this form. Include additional forms as necessary.

| NC/NOV NUMBER: | |
|---|---|
| INSPECTOR | SECTOR |
| ISSUE DATE | |

## Section I - Company Information

LEGAL NAME OF OPERATOR: Michael De Hoog
☒ IRS OR ☐ S. S. NUMBER: 330124064

PERMIT TO BE ISSUED TO (SEE INSTRUCTIONS):

BUSINESS MAILING ADDRESS: 8381 Edison Ave Ontario CA 91762

PERMIT MAILING ADDRESS, IF DIFFERENT FROM BUSINESS MAILING ADDRESS:

TYPE OF ORGANIZATION
☐ Corporation ☐ Limited Partnership ☐ Government Entity
☒ Individual ☐ General Partnership ☐ Other (Fill in):

ARE YOU A SMALL BUSINESS? (SEE INSTRUCTIONS) ☒ Yes ☐ No

AVERAGE ANNUAL GROSS RECEIPTS $ 2,200,000
NUMBER OF EMPLOYEES 7

IS YOUR BUSINESS 51 % OR MORE WOMAN/MINORITY OWNED? ☐ Yes ☒ No

**THIS SECTION IS REQUIRED FOR ALL APPLICATIONS FOR NEW CONSTRUCTION OR MAJOR MODIFICATIONS.**

ARE ALL MAJOR SOURCES UNDER SAME OWNERSHIP IN CALIFORNIA IN COMPLIANCE WITH FEDERAL, STATE, AND LOCAL AIR POLLUTION CONTROL RULES? ☒ Yes ☐ No

ARE YOU THE OWNER OF THE EQUIPMENT UNDER THIS APPLICATION? ☒ Yes ☐ No ☐ IRS OR ☐ S. S. NUMBER OF OWNER

IF NO, ENTER THE LEGAL NAME OF OWNER

## Section II - Facility Information

EQUIPMENT ADDRESS/LOCATION: 8485 Edison Ave (NUMBER/STREET)
Ontario (CITY OR COMMUNITY) CA, 91762 (ZIP CODE)

FACILITY NAME: Three D Dairy
FACILITY ID NUMBER: 145099 7-12-05

PRINT NAME OF CONTACT PERSON: Joe DeHoog
TITLE OF CONTACT PERSON: Manager

TYPE OF BUSINESS AT THIS FACILITY: Dairy
PRIMARY SIC CODE FOR THIS FACILITY: 0241
NUMBER OF EMPLOYEES AT THIS FACILITY: 7

CONTACT PERSON'S TELEPHONE NUMBER: (909) 947-0944
CONTACT PERSON'S FAX NUMBER: (909) 947-0944
CONTACT PERSON'S E-MAIL ADDRESS: Gotmilkfor6@Juno.com

## Section III - Application Type

DESCRIPTION OF EQUIPMENT: DAIRY

PREVIOUS PERMIT #(S):

APPLICATION FOR (SEE INSTRUCTIONS):
☐ NEW CONSTRUCTION ☐ MODIFICATION ☐ CHANGE OF LOCATION
☒ EXISTING EQUIPMENT WITHOUT PERMIT ☐ CHANGE OF PERMITTEE ☐ CHANGE OF PERMIT CONDITION
☐ EXISTING EQUIPMENT WITH EXPIRED PERMIT

ARE YOU SUBMITTING MULTIPLE APPLICATIONS FOR EQUIPMENT IDENTICAL TO THAT DESCRIBED ABOVE? ☐ Yes ☐ No

☐ **APPLICATION FOR NON-TITLE V EQUIPMENT PERMIT. CHECK THE SUPPLEMENTAL SERIES 400-E-xx FORM(S) SUBMITTED WITH THIS 400-A FORM:**

| | | | |
|---|---|---|---|
| ____ 400-E-1 | • PARTICULATE MATTER ($PM_{10}$) CONTROL EQUIPMENT | ✓ 400-E-13 | • INTERNAL COMBUSTION EQUIPMENT |
| ____ 400-E-2 | • VOLATILE ORGANIC COMPOUND (VOC) CONTROL EQUIPMENT | ____ 400-E-14 | • OPEN PROCESS TANK |
| ____ 400-E-3 | • SCRUBBER | ____ 400-E-14a | • OPEN PROCESS TANK; PROCESS LINE |
| ____ 400-E-4 | • ABRASIVE BLASTING EQUIPMENT | ____ 400-E-15 | • PRINTING EQUIPMENT |
| ____ 400-E-6 | • DEGREASER | ____ 400-E-16 | • SOLID MATERIALS STORAGE EQUIPMENT |
| ____ 400-E-7 | • DRY CLEANING EQUIPMENT | ____ 400-E-17 | • SPRAY BOOTH/OPEN SPRAY |
| ____ 400-E-8 | • ETHYLENE OXIDE STERILIZER | ____ 400-E-17a | • POWDER SPRAY BOOTH |
| ____ 400-E-9 | • EXTERNAL COMBUSTION EQUIPMENT | ____ 400-E-18 | • STORAGE TANK (LIQUID & GASEOUS MAT'L) |
| ____ 400-E-10 | • FOOD BROILER/FRYER | ____ 400-E-19 | • WAVE SOLDER MACHINE |
| ____ 400-E-11 | • FUEL DISPENSING AND STORAGE EQUIPMENT | ____ 400-E-20 | • ASBESTOS REMOVAL EQUIPMENT |
| ____ 400-E-12 | • GAS TURBINE | ____ NONE | • ADDITIONAL INFORMATION SUBMITTED AS REQUESTED ON FORM 400-E-GI |

☐ **APPLICATION FOR TITLE V FACILITY PERMIT. PROVIDE INFORMATION REQUESTED ON REVERSE SIDE OF THIS FORM.**

**I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT.**
SIGNATURE OF RESPONSIBLE OFFICIAL OF FIRM: Joe DeHoog
TITLE OF RESPONSIBLE OFFICIAL OF FIRM:

TYPE OR PRINT NAME OF RESPONSIBLE OFFICIAL OF FIRM: Joe DeHoog
RESPONSIBLE OFFICIAL'S TELEPHONE NUMBER: (909) 947-0944
DATE SIGNED: 6/25/05

**I HEREBY CERTIFY THAT ALL INFORMATION CONTAINED HEREIN AND INFORMATION SUBMITTED WITH THIS APPLICATION IS TRUE AND CORRECT.**
SIGNATURE OF PREPARER, IF PREPARED BY PERSON OTHER THAN RESPONSIBLE OFFICIAL OF FIRM:
TITLE OF PREPARER:

TYPE OR PRINT NAME OF PREPARER, IF PREPARED BY PERSON OTHER THAN RESPONSIBLE OFFICIAL OF FIRM:
PREPARER'S TELEPHONE NUMBER: ( ) -
DATE SIGNED: / /

***TITLE V FACILITIES ONLY: COMPLETE OTHER SIDE***

| AQMD USE ONLY | APPLICATION/TRACKING # 446901 | PROJECT # | TYPE B C D | EQUIPMENT CATEGORY CODE: ___ ___ ___ ___ / ___ ___ | FEE SCHEDULE: $ | VALIDATION 7-6-05 |
|---|---|---|---|---|---|---|
| ENG. A R DATE | ENG. A R DATE | CLASS I III IV | ASSIGNMENT UNIT ENGINEER | ENF. SECT. | CHECK/MONEY ORDER # 7632 | AMOUNT $ 388.60 |

FORM 400-A, Rev. 10/97

116771

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, CA 91765

# PERMIT TO OPERATE


Permit No.
F87591
A/N 445901

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301.f) is not received by the expiration date, contact the District.

ID 145099

Legal Owner
or Operator: THREE D DAIRY
8381 EDISON AVE
ONTARIO, CA 91762-7318

**Equipment Location:** 8485 EDISON AVE, ONTARIO, CA 91762-7242

**Equipment Description :**

CONFINED ANIMAL FEED OPERATION CONSISTING OF:

1. MILK COWS, DRY COWS, HEIFERS, AND CALVES
2. MILKING PARLOR
3. SCRAPE TYPE MANURE HANDLING SYSTEM
4. OPEN CORRALS WITH IN-CORRAL MOUNDS
5. TWO STORAGE PONDS
6. FEED STORAGE/COMMODITY BARNS
7. MIXER FEED WAGON/LONG HAY

**Conditions :**

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.

3. THE MAXIMUM NUMBER OF MILKING COWS, DRY COWS, HEIFERS, AND CALVES AT THIS FACILITY SHALL NOT EXCEED 1170 ANIMALS IN ANY ONE DAY.

4. THE MAXIMUM NUMBER OF MILK-PRODUCING COWS AT THIS FACILITY SHALL NOT EXCEED 820 IN ANY ONE DAY.

5. THIS FACILITY IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

FILE COPY
South Coast Air Quality Management District
Certified Copy

RULE 1127 EMISSION REDUCTION FROM LIVESTOCK WASTE
RULE 1186 PM10 EMISSIONS FROM PAVED AND UNPAVED ROADS AND LIVESTOCK OPERATIONS

6. THE OPERATOR SHALL USE BEST MANAGEMENT PRACTICES AT ALL TIMES, IN ACCORDANCE WITH RULE 1127. FACILITY MAY BE EXEMPTED FROM ONE CORRAL CLEARING PER YEAR IF ALL THE REQUIREMENTS OF RULE 1127(J)(3) ARE MET. NOTIFICATION TO THE DISTRICT SHALL BE MADE BY CALLING 1 800 CUT SMOG.

7. MANURE DISPOSED OF WITHIN THE JURISDICTION OF THE DISTRICT SHALL ONLY BE REMOVED OR CONTRACTED TO BE REMOVED FROM THIS DAIRY TO:

   A. AN APPROVED MANURE PROCESSING OPERATION; OR

   B. AGRICULTURAL LAND WITHIN THE DISTRICT APPROVED BY LOCAL ORDINANCE AND/OR REGIONAL WATER QUALITY BOARD FOR THE SPREADIING OF MANURE; OR

   C. A COMBINATION OF DESTINATIONS IN A AND B.

8. THE OPERATOR SHALL MAINTAIN COPIES OF ALL MANURE MANIFESTS, TIPPING FEE INVOICES, MANURE MOISTURE TEST RECORDS, CORRAL CLEARING RECORDS, AND STOCKPILE REMOVAL RECORDS.

9. THE OPERATOR SHALL SUBMIT A WRITTEN ANNUAL REPORT BY JANUARY 15TH OF EACH YEAR AFTER JANUARY 1, 2007 PER THE REQUIREMENTS OF RULE 1127. THE REPORT SHALL BE SENT TO: SCAQMD, COMPLIANCE DIVISION, PO BOX 4941, DIAMOND BAR , CA 91765-0941.

10. THE OPERATOR SHALL:

    A. CEASE ALL HAY GRINDING ACTIVITIES BETWEEN 2-5 PM EACH DAY IF VISIBLE EMISSIONS EXTEND MORE THAN 50 FEET FROM A HAY GRINDING SOURCE, AND

    B. TREAT ALL UNPAVED ACCESS CONNECTIONS AND UNPAVED FEED LANE ACCESS AREAS WITH EITHER PAVEMENT, GRAVEL (MAINTAINED TO A DEPTH OF FOUR (4) INCHES), OR ASPHALTIC ROADBASE.

11. THE OPERATOR SHALL MAINTAIN RECORDS, IN A MANNER APPROVED BY THE DISTRICT, TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 3, 4, 7, AND 8. ALL RECORDS SHALL BE RETAINED AT THE FACILITY FOR AT LEAST THREE YEARS AND BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

**FILE COPY**
**South Coast Air Quality Management District**
**Certified Copy**

**NOTICE**

IN ACCORDANCE WITH RULE 206, THIS PERMIT TO OPERATE OR COPY SHALL BE POSTED ON OR WITHIN 8 METERS OF THE EQUIPMENT.

THIS PERMIT DOES NOT AUTHORIZE THE EMISSION OF AIR CONTAMINANTS IN EXCESS OF THOSE ALLOWED BY DIVISION 26 OF THE HEALTH AND SAFETY CODE OF THE STATE OF CALIFORNIA OR THE RULES OF THE AIR QUALITY MANAGEMENT DISTRICT. THIS PERMIT CANNOT BE CONSIDERED AS PERMISSION TO VIOLATE EXISTING LAWS, ORDINANCES, REGULATIONS OR STATUTES OF OTHER GOVERNMENT AGENCIES.

EXECUTIVE OFFICER

Dorris M Bailey

By Dorris M.Bailey/CW02
2/11/2007

**FILE COPY**
**South Coast Air Quality Management District**
**Certified Copy**

# SCAQMD Facility Equipment List Report



Facility: 145099 THREE D DAIRY
Status: Active
MR: SIC: 241 Team: I
Last Inspection: 06/28/2017 On Hold: N Suspended: N TS: TS-11 Industrial: Sector-based Inspections
Quarter: 0020 - inspect in 3rd quarter, every two years
Contact: JOE DEHOOG (909) 9470944 RECLAIM: N TITLE V: N AIRS ID:
Assignment: 1436252
Location Address: 8485 EDISON AVE, ONTARIO 91762-7242 Sector:EE
Inspector: MR01 MANUEL REGALA
Mailing Address: 8381 EDISON AVE, ONTARIO 91762-7318 Sector:EE
Inspection Date: 06/12/2014
Instruction:
Disposition: Operating in Compliance at time of inspection

| Application No. | Permit No. | Permit Issue Date | Permit Status | Equipment Category | BCAT/CCAT Description | Application Date | Application Status |
|---|---|---|---|---|---|---|---|
| 445901 | F87591 | 02/11/2007 | INACT_NR | 021000 BCAT | AGOPS DAIRY | 07/06/2005 | PERMIT TO OPERATE GRANTED |

Inspector: _____ Date: _____ Reviewed By: _____ Date: _____

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178

# PERMIT TO OPERATE


Permit No.
G55848
A/N 609889

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301(d)) is not received by the expiration date, contact the District.

ID 189218

**Legal Owner or Operator:**

TIVA DAIRY
14382 BETHANY AVE
CHINO, CA 91710

**Equipment Location:** 7587 EDISON AVE, ONTARIO, CA 91762

**Equipment Description :**

CONFINED ANIMAL FEED OPERATION CONSISTING OF:

1. MILK COWS, DRY COWS, HEIFERS, AND CALVES
2. MILKING PARLOR
3. SCRAPE TYPE MANURE HANDLING SYSTEM
4. OPEN CORRALS WITH IN-CORRAL MOUNDS
5. MANURE STOCK PILES
6. ONE (1) STORAGE PONDS
7. FEED STORAGE COMMODITY BARNS
8. MIXER FEED WAGON/LONG HAY

**Conditions :**

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN ACCORDANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.

2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.

3. THE MAXIMUM NUMBER OF MILKING COWS, DRY COWS, HEIFERS, AND CALVES AT THIS FACILITY SHALL NOT EXCEED 2200 ANIMALS IN ANY ONE DAY.

4. THE MAXIMUM NUMBER OF MILK-PRODUCING COWS AT THIS FACILITY SHALL NOT EXCEED 999 IN ANY ONE DAY.

FILE COPY
South Coast Air Quality Management District
Certified Copy

5. THIS FACILITY IS SUBJECT TO THE APPLICABLE REQUIREMENTS OF THE FOLLOWING RULES AND REGULATIONS:

   RULE 1127 EMISSION REDUCTION FROM LIVESTOCK WASTE
   RULE 1186 PM10 EMISSIONS FROM PAVED AND UNPAVED ROADS AND LIVESTOCK OPERATIONS

6. THE OPERATOR SHALL USE BEST MANAGEMENT PRACTICES AT ALL TIMES, IN ACCORDANCE WITH RULE 1127. FACILITY MAY BE EXEMPTED FROM ONE CORRAL CLEARING PER YEAR IF ALL THE REQUIREMENTS OF RULE 1127(J)(3) ARE MET. NOTIFICATION TO THE DISTRICT SHALL BE MADE BY CALLING 1-800-CUT-SMOG.

7. MANURE DISPOSED OF WITHIN THE JURISDICTION OF THE DISTRICT SHALL ONLY BE REMOVED OR CONTRACTED TO BE REMOVED FROM THIS DAIRY TO:

   A. AN APPROVED MANURE PROCESSING OPERATION; OR

   B. AGRICULTURAL LAND WITHIN THE DISTRICT APPROVED BY LOCAL ORDINANCE AND/OR REGIONAL WATER QUALITY BOARD FOR THE SPREADIING OF MANURE; OR

   C. A COMBINATION OF DESTINATIONS IN A AND B.

8. THE OPERATOR SHALL MAINTAIN COPIES OF ALL MANURE MANIFESTS, TIPPING FEE INVOICES, MANURE MOISTURE TEST RECORDS, CORRAL CLEARING RECORDS, AND STOCKPILE REMOVAL RECORDS.

9. THE OPERATOR SHALL SUBMIT A WRITTEN ANNUAL REPORT BY JANUARY 15TH OF EACH YEAR AFTER JANUARY 1, 2007 PER THE REQUIREMENTS OF RULE 1127. THE REPORT SHALL BE SENT TO: SCAQMD, COMPLIANCE DIVISION, PO BOX 4941, DIAMOND BAR , CA 91765-0941.

10. THE OPERATOR SHALL:

    A. CEASE ALL HAY GRINDING ACTIVITIES BETWEEN 2-5 PM EACH DAY IF VISIBLE EMISSIONS EXTEND MORE THAN 50 FEET FROM A HAY GRINDING SOURCE, AND

    B. TREAT ALL UNPAVED ACCESS CONNECTIONS AND UNPAVED FEED LANE ACCESS AREAS WITH EITHER PAVEMENT, GRAVEL (MAINTAINED TO A DEPTH OF FOUR (4) INCHES), OR ASPHALTIC ROADBASE.

11. THE OPERATOR SHALL MAINTAIN RECORDS, IN A MANNER APPROVED BY THE DISTRICT, TO DEMONSTRATE COMPLIANCE WITH CONDITIONS 3, 4, 7, AND 8. ALL RECORDS SHALL BE RETAINED AT THE FACILITY FOR AT LEAST THREE YEARS AND BE MADE AVAILABLE TO DISTRICT PERSONNEL UPON REQUEST.

FILE COPY
**South Coast Air Quality Management District**
**Certified Copy**

## NOTICE

In accordance with Rule 206, this Permit to Operate or copy shall be posted on or within 8 meters of the equipment.

This permit does not authorize the emission of air contaminants in excess of those allowed by Division 26 of the Health and Safety Code of the State of California or the applicable Rules and Regulations of the South Coast Air Quality Management District (SCAQMD). This permit cannot be considered as permission to violate existing laws, ordinances, regulations or statutes of other government agencies.

Executive Officer

BY LAKI TISOPULOS, PhD/JA08
1/24/2019

FILE COPY
**South Coast Air Quality Management District**
**Certified Copy**

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178

# PERMIT TO OPERATE


Permit No.
G56695
A/N 595834

This initial permit must be renewed ANNUALLY unless the equipment is moved, or changes ownership.
If the billing for the annual renewal fee (Rule 301(d)) is not received by the expiration date, contact the District.

ID 185096

**Legal Owner or Operator:** GH DAIRY #4
14651 GROVE AVE
ONTARIO, CA 91762-7704

**Equipment Location:** 8061 EDISON AVE, ONTARIO, CA 91762-7297

**Equipment Description :**

Confined Animal Facility (CAF), Dairy Operation, Consisting of:

1. Milk cows, dry cows and heifers
2. Milking parlor
3. Scrape type manure handling system
4. Open Corrals with in-corral mounds
5. One (1) Storage pond

**Conditions :**

1. Operation of this equipment shall be conducted in accordance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.
2. This equipment shall be properly maintained and kept in good operating condition at all times.
3. This facility shall only house a maximum of 800 milk cows, 200 dry cows, and 450 heifers (15-24 months), for a total head count of not to exceed 1450 cows on any one day.
4. The maximum number of milking cows at this facility shall not exceed 800 in any one day.
5. The operator shall maintain records that specify the monthly average number of animals maintained at this facility.
6. The operator shall submit an annual report to the executive officer in writing by January 15th of each year which shall include:
   A. The information required in condition no. 9,
   B. Animal population for the previous calendar year, broken out by number of milk cows, dry cows, and heifers (15-24 months),

FILE COPY
South Coast Air Quality Management District
Certified Copy

C. Amount of manure removed from the dairy in the previous calendar year broken out by the following destinations:

I. Agricultural lands within the jurisdiction of the south coast air quality management district;
II. Manure processing operation(s) within the jurisdiction of the south coast air quality management district, including the amount of manure that went to each manure processing operation; and/or
III. A location out of the jurisdiction of south coast air quality management district.

The report shall be sent to: SCAQMD, Compliance Division, PO Box 4941, Diamond Bar, CA 91765-0941.

7. This facility is subject to the applicable requirements of Rules 1127 and 1186.

8. The operator shall use best management practices at all times in accordance with Rule 1127 which shall include:

A. Clear corrals such that an even surface of compacted manure remains on top of the soil, and do not scrape down to soil level,
B. Indentify and eliminate water leaks from troughs and piping,
C. Pave feedlanes at least eight (8) feet on the corral side of the feedlane fence,
D. Clear any accumulated manure in excess of three (3) inches in height in each corral at least four (4) times per year with at least sixty (60) days between clearings,
E. Remove all on-dairy stockpiles within three (3) months of last corral clearing day and no more than three (3) months after date that previous stockpiles were last completely cleared.

9. Manure disposed of within the jurisdiction of the District shall only be removed or contracted to be removed from this dairy to:

A. An approved manure processing operation, or
B. Agricultural land within the district approved by local ordinance, and/or regional water quality board for the spreading of manure, or
C. Combination of destinations described in A and B.

10. No later than 30 days after operations begin the operator shall submit a Rule 1127 notification to the executive officer in writing which shall include:

A. Dairy farm operator's name,
B. Name of contact person,
C. Farm name,
D. Farm street address,
E. Mailing address, and
F. Telephone number for the contact person.

The notification shall be sent to: SCAQMD, Compliance Division, PO Box 4941, Diamond Bar, CA 91765-0941.

11. The operator shall:

FILE COPY
South Coast Air Quality Management District
Certified Copy

A. Cease all hay grinding activities between 2 p.m. and 5 p.m. if visible emissions extend more than 50 feet from a hay grinding source,

B. Treat unpaved access connections and unpaved feed lane access areas with either pavement, gravel (maintained to a depth of 4 inches), or asphaltic road-base.

12. The operator shall maintain records, in a manner approved by the District, to demonstrate compliance Rules 1127 and 1186. The records shall include:

A. Monthly average number of animals maintained at the facility,

B. Each clearing of accumulated manure as required by permit condition no. 7 D,

C. Each removal of on-dairy stockpiles as required by permit condition no. 7 E, including date(s) of removal, hauler (if applicable) and manure destination,

D. Manure manifests, tipping fee invoices, and manure moisture test records.

The records shall be retained at the facility for at least three years and be made available to district personnel upon request.

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South Coast Air Quality Management District
Certified Copy

## NOTICE

In accordance with Rule 206, this Permit to Operate or copy shall be posted on or within 8 meters of the equipment.

This permit does not authorize the emission of air contaminants in excess of those allowed by Division 26 of the Health and Safety Code of the State of California or the applicable Rules and Regulations of the South Coast Air Quality Management District (SCAQMD). This permit cannot be considered as permission to violate existing laws, ordinances, regulations or statutes of other government agencies.

Executive Officer

BY LAKI TISOPULOS, PhD/CW02
3/30/2019

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South Coast Air Quality Management District
Certified Copy

# APPENDIX F

Third Party Vendor Database Report

**Ontario Ranch II**
8061 Edison Avenue
Ontario, CA 91762

Inquiry Number: 7910061.1s
February 27, 2025

# The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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## GEOCHECK ADDENDUM

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E1527 - 21), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E2247 - 16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E1528 - 22) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

**TARGET PROPERTY INFORMATION**

**ADDRESS**

8061 EDISON AVENUE
ONTARIO, CA 91762

**COORDINATES**

| | |
|---|---|
| Latitude (North): | 33.9965990 - 33˚ 59' 47.75'' |
| Longitude (West): | 117.6313600 - 117˚ 37' 52.89'' |
| Universal Tranverse Mercator: | Zone 11 |
| UTM X (Meters): | 441691.2 |
| UTM Y (Meters): | 3761764.0 |
| Elevation: | 691 ft. above sea level |

**USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY**

| | |
|---|---|
| Target Property Map: | 50006194 PRADO DAM, CA |
| Version Date: | 2022 |
| Northeast Map: | 50005338 GUASTI, CA |
| Version Date: | 2021 |
| Southeast Map: | 50005749 CORONA NORTH, CA |
| Version Date: | 2022 |
| Northwest Map: | 50005381 ONTARIO, CA |
| Version Date: | 2021 |

**AERIAL PHOTOGRAPHY IN THIS REPORT**

| | |
|---|---|
| Portions of Photo from: | 20200424, 20200423 |
| Source: | USDA |

## MAPPED SITES SUMMARY

Target Property Address:
8061 EDISON AVENUE
ONTARIO, CA 91762

Click on Map ID to see full detail.

| MAP ID | SITE NAME | ADDRESS | DATABASE ACRONYMS | RELATIVE ELEVATION | DIST (ft. & mi.) DIRECTION |
|---|---|---|---|---|---|
| A1 | JORRITSMA & ANEMA DA | 8061 EDISON AVE | EMI, ENF, HWTS, San Bern. Co. Permit, CIWQS, CERS | | TP |
| A2 | JORRITSMA AND ANEMA | 8061 EDISON AVENUE | FINDS, ECHO | | TP |
| A3 | JORRITSMA DAIRY | 8061 EDISON AVE | WDS | | TP |
| A4 | GH DAIRY #4 | 8061 EDISON | ECHO | | TP |
| A5 | GH DAIRY #4 | 8061 EDISON | CERS | | TP |
| A6 | GH DAIRY #4 | 8061 EDISON | FINDS | | TP |
| B7 | THREE D DAIRY - HEIF | 8311 EDISON | FINDS | Higher | 1 ft. |
| B8 | LEGEND DAIRY FARMS - | 8311 EDISON AVENUE | ENF, San Bern. Co. Permit, CIWQS | Higher | 1 ft. |
| C9 | LEGEND DAIRY FARMS - | 8185 EDISON | ECHO | Higher | 1 ft. |
| B10 | LEGEND DAIRY FARMS - | 8311 EDISON | ECHO | Higher | 1 ft. |
| C11 | AG-JACK ALEWYN DAIRY | 8185 EDISON AVE | UST | Higher | 1 ft. |
| C12 | GORDON DAIRY #7 | 8185 EDISON | FINDS | Higher | 1 ft. |
| B13 | LEGEND DAIRY FARMS | 8311 EDISON | CERS | Higher | 1 ft. |
| C14 | LEGEND DAIRY FARMS - | 8185 EDISON AVENUE | ENF, CIWQS | Higher | 1 ft. |
| C15 | SOUTHWEST DAIRY INC | 8185 EDISON | CERS | Higher | 1 ft. |
| C16 | GORDON DAIRY #7 | 8185 EDISON | ECHO | Higher | 1 ft. |
| C17 | JACK ALEWYN DAIRY | 8185 EDISON BLVD | ENF, San Bern. Co. Permit | Higher | 1 ft. |
| D18 | GORDON DAIRY #3 | 14213 BON VIEW AVENU | ENF, San Bern. Co. Permit, CIWQS, CERS | Lower | 1 ft. |
| D19 | SOUTHWEST DAIRY | 14213 S BON VIEW AVE | San Bern. Co. Permit | Lower | 1 ft. |
| D20 | H & R DAIRY - BON VI | 14213 BON VIEW AVE | WDS | Lower | 1 ft. |
| D21 | GORDON DAIRY #3 | 14213 BON VIEW | CERS | Lower | 1 ft. |
| D22 | H & R DAIRY | 14213 BON VIEW AVENU | FINDS, ECHO | Lower | 1 ft. |
| D23 | GORDON DAIRY #3 | 14213 BON VIEW | FINDS | Lower | 1 ft. |
| D24 | GORDON DAIRY #3 | 14213 BON VIEW | ECHO | Lower | 1 ft. |
| D25 | GORDON HAY INC DAIRY | 14213 BON VIEW AVE | FINDS | Lower | 1 ft. |
| 26 | G H DAIRY #4B | 7721 EDISON AVENUE | ENF, San Bern. Co. Permit, CIWQS | Higher | 9, 0.002, WNW |
| 27 | LEGEND DAIRY FARMS - | 8381 EDISON AVENUE | AST, ENF, San Bern. Co. Permit, CIWQS, CERS | Higher | 10, 0.002, East |
| E28 | AG-TWIN PALM DAIRY | 7587 EDISON AVE | UST | Higher | 39, 0.007, West |
| E29 | TIVA DAIRY | 7587 EDISON AVE | EMI, San Bern. Co. Permit, CERS | Higher | 39, 0.007, West |
| E30 | PAUL HUIZENGA DAIRY | 7587 EDISON AVE | AST, EMI, ENF, CIWQS, CERS | Higher | 39, 0.007, West |
| C31 | JACK ALEWYN DAIRY | 8185 EDISON | SWEEPS UST, CA FID UST | Higher | 47, 0.009, ENE |
| 32 | THREE D DAIRY | 8485 EDISON AVE | HIST UST, WDS | Higher | 60, 0.011, East |
| F33 | LONGGO TRANS | 7960 EDISON AVE | RCRA NonGen / NLR, E MANIFEST | Higher | 94, 0.018, NNE |
| F34 | WESTLEY CARDOZA | 7990 EDISON AVE | RCRA NonGen / NLR | Higher | 95, 0.018, NE |
| 35 | VICTORS FARMS | 8040 EDISON AVE | RCRA NonGen / NLR | Higher | 95, 0.018, NE |
| G36 | AGROMIN OC ONTARIO G | 8292 EDISON AVE | RCRA NonGen / NLR | Higher | 102, 0.019, East |
| G37 | AGROMIN OC ONTARIO G | 8292 EDISON AVE | CERS HAZ WASTE, HAZNET | Higher | 102, 0.019, East |
| G38 | AGROMIN ONTARIO | 8292 EDISON AVE | RCRA NonGen / NLR, E MANIFEST | Higher | 102, 0.019, East |
| G39 | AGROMIN OC ONTARIO G | 8292 EDISON AVENUE | SWF/LF, CERS HAZ WASTE, NPDES, San Bern. Co.... | Higher | 102, 0.019, East |

## MAPPED SITES SUMMARY

Target Property Address:
8061 EDISON AVENUE
ONTARIO, CA 91762

Click on Map ID to see full detail.

| MAP ID | SITE NAME | ADDRESS | DATABASE ACRONYMS | RELATIVE ELEVATION | DIST (ft. & mi.) DIRECTION |
|---|---|---|---|---|---|
| G40 | AGROMIN OC ONTARIO G | 8292 EDISON AVE | HWTS, San Bern. Co. Permit | Higher | 102, 0.019, East |
| B41 | BREAKTHRU TRANSPORTS | 8270 EDISON AVE | RCRA NonGen / NLR | Higher | 113, 0.021, ENE |
| F42 | LONGGO TRANS | 7914 EDISON AVE | RCRA NonGen / NLR | Higher | 114, 0.022, North |
| 43 | ALEWYN DAIRY #3 | 14361 GROVE | ENF, San Bern. Co. Permit, CIWQS | Lower | 332, 0.063, SE |
| 44 | MAJESTIC FARMS #1 | 14333 WALKER | ENF, San Bern. Co. Permit, CIWQS | Lower | 345, 0.065, ESE |
| H45 | RLE DAIRY | 14049 GROVE AVE | San Bern. Co. Permit | Higher | 386, 0.073, NE |
| H46 | BROWN'S FAMILY DAIRY | 14016 S GROVE AVE | San Bern. Co. Permit | Higher | 569, 0.108, NE |
| I47 | JOE FERREIRA JR DAIR | 14400 S GROVE AVE | San Bern. Co. Permit | Lower | 634, 0.120, SSE |
| I48 | WHITEGOLD VENTURES L | 14400 GROVE AVE | RCRA NonGen / NLR, E MANIFEST | Lower | 634, 0.120, SSE |
| J49 | SAM SOUSA DAIRY | 7330 EDISON AVE | CERS HAZ WASTE, EMI, ENF, HWTS, San Bern. Co.... | Higher | 673, 0.127, West |
| J50 | KENT AVERY REPAIR IN | 7330 EDISON AVE | RCRA NonGen / NLR | Higher | 673, 0.127, West |
| J51 | MATERIAL RECOVERY SO | 7325 EDISON AVE | SWF/LF, LDS, NPDES, CERS | Higher | 682, 0.129, West |
| J52 | RESIDUALS RECOVERY G | 7325 EDISON RD. | SWF/LF | Higher | 682, 0.129, West |
| J53 | SNS DAIRY | 7371 EDISON AVE | San Bern. Co. Permit | Higher | 686, 0.130, West |
| K54 | PARK INDUSTRIES | 14306 BON VIEW AVE | RCRA NonGen / NLR | Lower | 810, 0.153, SW |
| K55 | GORDON HAY, INC | 14451 BON VIEW AVE | RCRA NonGen / NLR | Lower | 819, 0.155, SW |
| K56 | AG-COSTA VIEW FARM | 14451 BON VIEW | SWEEPS UST, CA FID UST, CERS | Lower | 819, 0.155, SW |
| K57 | GORDON HAY, INC | 14451 BON VIEW AVE | HIST UST, HWTS | Lower | 819, 0.155, SW |
| 58 | O & M DAIRY | 14474 GROVE AVE | San Bern. Co. Permit | Lower | 976, 0.185, SSE |
| L59 | GORZEMAN DAIRY #2 | 13948 WALKER | San Bern. Co. Permit | Higher | 1030, 0.195, ENE |
| K60 | DIMAS COSTA | 14451 BON VIEW | HIST UST, HWTS, HAZNET | Lower | 1065, 0.202, SW |
| L61 | GORZEMAN FAMILY DAIR | 13975 WALKER | San Bern. Co. Permit | Higher | 1104, 0.209, ENE |
| L62 | WE INC | 13955 WALKER AVE | RCRA NonGen / NLR | Higher | 1215, 0.230, ENE |
| 63 | WRECK AGE DEMOLITION | 13908 GROVE AVE | RCRA NonGen / NLR | Higher | 1265, 0.240, NNE |
| 64 | RECYCLED WOOD PRODUC | 13905 WALKER AVENUE | SWF/LF, NPDES, CIWQS | Higher | 1492, 0.283, ENE |
| 65 | PRIVATE RESIDENCE | PRIVATE RESIDENCE | LUST, Cortese | Lower | 1509, 0.286, SSE |
| 66 | REDWOOD PRODUCTS OF | 13814 S GROVE AVE | SWF/LF, CERS HAZ WASTE, CERS TANKS, LDS, EMI,... | Higher | 1691, 0.320, NNE |
| 67 | COMPOSTING PLANTONTA | 8605 SCHAEFER AVE | WMUDS/SWAT, WDS | Higher | 2531, 0.479, ENE |
| 68 | CAL-AERO FIELD / ACA | | ENVIROSTOR | Lower | 4685, 0.887, SSW |

# EXECUTIVE SUMMARY

**TARGET PROPERTY SEARCH RESULTS**

The target property was identified in the following records. For more information on this property see page 9 of the attached EDR Radius Map report:

| Site | Database(s) | EPA ID |
|---|---|---|
| JORRITSMA & ANEMA DA<br>8061 EDISON AVE<br>ONTARIO, CA 91762 | EMI<br>Facility Id: 145031<br><br>ENF<br>Status: Historical<br>Status: Historical<br>Facility Id: 234045<br><br>HWTS<br>San Bern. Co. Permit<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0017949<br>Facility Id: FA0000522<br><br>CIWQS<br>CERS | N/A |
| JORRITSMA AND ANEMA<br>8061 EDISON AVENUE<br>ONTARIO, CA 91761 | FINDS<br>Registry ID:: 110037259515<br>Registry ID:: 110071787266<br><br>ECHO<br>Registry ID: 110037259515 | N/A |
| JORRITSMA DAIRY<br>8061 EDISON AVE<br>CHINO, CA 91710 | WDS<br>Facility Status: A<br>Facility Id: 8 365551001 | N/A |
| GH DAIRY #4<br>8061 EDISON<br>ONTARIO, CA 91762 | ECHO<br>Registry ID: 110066693894 | N/A |
| GH DAIRY #4<br>8061 EDISON<br>ONTARIO, CA 91762 | CERS | N/A |
| GH DAIRY #4<br>8061 EDISON<br>ONTARIO, CA 91762 | FINDS<br>Registry ID:: 110066693894 | N/A |

# EXECUTIVE SUMMARY

**DATABASES WITH NO MAPPED SITES**

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

**STANDARD ENVIRONMENTAL RECORDS**

***Lists of Federal NPL (Superfund) sites***

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

***Lists of Federal Delisted NPL sites***

Delisted NPL ..... National Priority List Deletions

***Lists of Federal sites subject to CERCLA removals and CERCLA orders***

FEDERAL FACILITY ..... Federal Facility Site Information listing
SEMS ..... Superfund Enterprise Management System

***Lists of Federal CERCLA sites with NFRAP***

SEMS-ARCHIVE ..... Superfund Enterprise Management System Archive

***Lists of Federal RCRA facilities undergoing Corrective Action***

CORRACTS ..... Corrective Action Report

***Lists of Federal RCRA TSD facilities***

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

***Lists of Federal RCRA generators***

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-SQG ..... RCRA - Small Quantity Generators
RCRA-VSQG ..... RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

***Federal institutional controls / engineering controls registries***

LUCIS ..... Land Use Control Information System
US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROLS ..... Institutional Controls Sites List

***Federal ERNS list***

ERNS ..... Emergency Response Notification System

***Lists of state- and tribal (Superfund) equivalent sites***

RESPONSE ..... State Response Sites

# EXECUTIVE SUMMARY

***Lists of state and tribal leaking storage tanks***

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land
CPS-SLIC ---------- Statewide SLIC Cases

***Lists of state and tribal registered storage tanks***

FEMA UST ---------- Underground Storage Tank Listing
INDIAN UST ---------- Underground Storage Tanks on Indian Land

***Lists of state and tribal voluntary cleanup sites***

INDIAN VCP ---------- Voluntary Cleanup Priority Listing
VCP ---------- Voluntary Cleanup Program Properties

***Lists of state and tribal brownfield sites***

BROWNFIELDS ---------- Considered Brownfieds Sites Listing

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS ---------- A Listing of Brownfields Sites

***Local Lists of Landfill / Solid Waste Disposal Sites***

SWRCY ---------- Recycler Database
HAULERS ---------- Registered Waste Tire Haulers Listing
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
ODI ---------- Open Dump Inventory
IHS OPEN DUMPS ---------- Open Dumps on Indian Land

***Local Lists of Hazardous waste / Contaminated Sites***

US HIST CDL ---------- Delisted National Clandestine Laboratory Register
HIST Cal-Sites ---------- Historical Calsites Database
SCH ---------- School Property Evaluation Program
CDL ---------- Clandestine Drug Labs
Toxic Pits ---------- Toxic Pits Cleanup Act Sites
US CDL ---------- National Clandestine Laboratory Register

***Local Lists of Registered Storage Tanks***

CERS TANKS ---------- California Environmental Reporting System (CERS) Tanks

***Local Land Records***

LIENS ---------- Environmental Liens Listing
LIENS 2 ---------- CERCLA Lien Information
DEED ---------- Deed Restriction Listing

***Records of Emergency Release Reports***

HMIRS ---------- Hazardous Materials Information Reporting System

| | |
|---|---|
| CHMIRS | California Hazardous Material Incident Report System |
| LDS | Land Disposal Sites Listing |
| MCS | Military Cleanup Sites Listing |
| SPILLS 90 | SPILLS 90 data from FirstSearch |

***Other Ascertainable Records***

| | |
|---|---|
| FUDS | Formerly Used Defense Sites |
| DOD | Department of Defense Sites |
| SCRD DRYCLEANERS | State Coalition for Remediation of Drycleaners Listing |
| US FIN ASSUR | Financial Assurance Information |
| EPA WATCH LIST | EPA WATCH LIST |
| 2020 COR ACTION | 2020 Corrective Action Program List |
| TSCA | Toxic Substances Control Act |
| TRIS | Toxic Chemical Release Inventory System |
| SSTS | Section 7 Tracking Systems |
| ROD | Records Of Decision |
| RMP | Risk Management Plans |
| RAATS | RCRA Administrative Action Tracking System |
| PRP | Potentially Responsible Parties |
| PADS | PCB Activity Database System |
| ICIS | Integrated Compliance Information System |
| FTTS | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) |
| MLTS | Material Licensing Tracking System |
| COAL ASH DOE | Steam-Electric Plant Operation Data |
| COAL ASH EPA | Coal Combustion Residues Surface Impoundments List |
| PCB TRANSFORMER | PCB Transformer Registration Database |
| RADINFO | Radiation Information Database |
| HIST FTTS | FIFRA/TSCA Tracking System Administrative Case Listing |
| DOT OPS | Incident and Accident Data |
| CONSENT | Superfund (CERCLA) Consent Decrees |
| INDIAN RESERV | Indian Reservations |
| FUSRAP | Formerly Utilized Sites Remedial Action Program |
| UMTRA | Uranium Mill Tailings Sites |
| LEAD SMELTERS | Lead Smelter Sites |
| US AIRS | Aerometric Information Retrieval System Facility Subsystem |
| US MINES | Mines Master Index File |
| ABANDONED MINES | Abandoned Mines |
| MINES MRDS | Mineral Resources Data System |
| UXO | Unexploded Ordnance Sites |
| DOCKET HWC | Hazardous Waste Compliance Docket Listing |
| FUELS PROGRAM | EPA Fuels Program Registered Listing |
| PFAS NPL | Superfund Sites with PFAS Detections Information |
| PFAS FEDERAL SITES | Federal Sites PFAS Information |
| PFAS TSCA | PFAS Manufacture and Imports Information |
| PFAS TRIS | List of PFAS Added to the TRI |
| PFAS RCRA MANIFEST | PFAS Transfers Identified In the RCRA Database Listing |
| PFAS ATSDR | PFAS Contamination Site Location Listing |
| PFAS WQP | Ambient Environmental Sampling for PFAS |
| PFAS PROJECT | NORTHEASTERN UNIVERSITY PFAS PROJECT |
| PFAS NPDES | Clean Water Act Discharge Monitoring Information |
| PFAS ECHO | Facilities in Industries that May Be Handling PFAS Listing |
| PFAS ECHO FIRE TRAIN | Facilities in Industries that May Be Handling PFAS Listing |
| PFAS PT 139 AIRPORT | All Certified Part 139 Airports PFAS Information Listing |

# EXECUTIVE SUMMARY

| | |
|---|---|
| AQUEOUS FOAM NRC | Aqueous Foam Related Incidents Listing |
| BIOSOLIDS | ICIS-NPDES Biosolids Facility Data |
| UST FINDER | UST Finder Database |
| UST FINDER RELEASE | UST Finder Releases Database |
| PFAS | PFAS Investigation Site Location Listing |
| AQUEOUS FOAM | Former Fire Training Facility Assessments Listing |
| CA BOND EXP. PLAN | Bond Expenditure Plan |
| CHROME PLATING | Chrome Plating Facilities Listing |
| CUPA Listings | CUPA Resources List |
| DRYCLEANERS | Cleaner Facilities |
| Financial Assurance | Financial Assurance Information Listing |
| ICE | Inspection, Compliance and Enforcement |
| HIST CORTESE | Hazardous Waste & Substance Site List |
| HWP | EnviroStor Permitted Facilities Listing |
| HWT | Registered Hazardous Waste Transporter Database |
| HAZNET | Facility and Manifest Data |
| MINES | Mines Site Location Listing |
| MWMP | Medical Waste Management Program Listing |
| NPDES | NPDES Permits Listing |
| PEST LIC | Pesticide Regulation Licenses Listing |
| PROC | Certified Processors Database |
| Notify 65 | Proposition 65 Records |
| HAZMAT | Hazardous Material Facilities |
| UIC | UIC Listing |
| UIC GEO | UIC GEO (GEOTRACKER) |
| WASTEWATER PITS | Oil Wastewater Pits Listing |
| WIP | Well Investigation Program Case List |
| MILITARY PRIV SITES | MILITARY PRIV SITES (GEOTRACKER) |
| PROJECT | PROJECT (GEOTRACKER) |
| WDR | Waste Discharge Requirements Listing |
| NON-CASE INFO | NON-CASE INFO (GEOTRACKER) |
| OTHER OIL GAS | OTHER OIL & GAS (GEOTRACKER) |
| PROD WATER PONDS | PROD WATER PONDS (GEOTRACKER) |
| SAMPLING POINT | SAMPLING POINT (GEOTRACKER) |
| WELL STIM PROJ | Well Stimulation Project (GEOTRACKER) |

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

| | |
|---|---|
| EDR MGP | EDR Proprietary Manufactured Gas Plants |
| EDR Hist Auto | EDR Exclusive Historical Auto Stations |
| EDR Hist Cleaner | EDR Exclusive Historical Cleaners |

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

| | |
|---|---|
| RGA LF | Recovered Government Archive Solid Waste Facilities List |
| RGA LUST | Recovered Government Archive Leaking Underground Storage Tank |

**SURROUNDING SITES: SEARCH RESULTS**

Surrounding sites were identified in the following databases.

# EXECUTIVE SUMMARY

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

**STANDARD ENVIRONMENTAL RECORDS**

***Lists of state- and tribal hazardous waste facilities***

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 10/21/2024 has revealed that there is 1 ENVIROSTOR site within approximately 1 mile of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| CAL-AERO FIELD / ACA<br>Facility Id: 80000986<br>Status: Inactive - Needs Evaluation | | SSW 1/2 - 1 (0.887 mi.) | 68 | 236 |

***Lists of state and tribal landfills and solid waste disposal facilities***

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Integrated Waste Management Board's Solid Waste Information System (SWIS) database.

A review of the SWF/LF list, as provided by EDR, has revealed that there are 5 SWF/LF sites within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***AGROMIN OC ONTARIO G***<br>Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024<br>Facility ID: 36-AA-0505<br>Facility ID: 36-AA-0509<br>Operational Status: Active<br>Regulation Status: Notification | ***8292 EDISON AVENUE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G39*** | ***137*** |
| ***MATERIAL RECOVERY SO***<br>Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024 | ***7325 EDISON AVE*** | ***W 1/8 - 1/4 (0.129 mi.)*** | ***J51*** | ***191*** |

Facility ID: 36-AA-0496
Operational Status: Closed
Regulation Status: Notification

| | | | | |
|---|---|---|---|---|
| RESIDUALS RECOVERY G | 7325 EDISON RD. | W 1/8 - 1/4 (0.129 mi.) | J52 | 194 |

Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024
Facility ID: 36-AA-0483
Operational Status: Active
Regulation Status: Notification

| | | | | |
|---|---|---|---|---|
| ***RECYCLED WOOD PRODUC*** | ***13905 WALKER AVENUE*** | ***ENE 1/4 - 1/2 (0.283 mi.)*** | ***64*** | ***218*** |

Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024
Facility ID: 36-AA-0477
Operational Status: Active
Regulation Status: Notification

| | | | | |
|---|---|---|---|---|
| ***REDWOOD PRODUCTS OF*** | ***13814 S GROVE AVE*** | ***NNE 1/4 - 1/2 (0.320 mi.)*** | ***66*** | ***224*** |

Database: SWF/LF (SWIS), Date of Government Version: 11/04/2024
Facility ID: 36-AA-0507
Operational Status: Active
Regulation Status: Notification

### *Lists of state and tribal leaking storage tanks*

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there is 1 LUST site within approximately 0.5 miles of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***PRIVATE RESIDENCE*** | ***PRIVATE RESIDENCE*** | ***SSE 1/4 - 1/2 (0.286 mi.)*** | ***65*** | ***221*** |

Database: LUST, Date of Government Version: 02/24/2025
Status: Completed - Case Closed
Global Id: T0607175289

### *Lists of state and tribal registered storage tanks*

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, has revealed that there are 2 UST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| AG-JACK ALEWYN DAIRY | 8185 EDISON AVE | 0 - 1/8 (0.000 mi.) | C11 | 36 |

Database: UST, Date of Government Version: 11/26/2024
Facility Id: 87014228

| | | | | |
|---|---|---|---|---|
| AG-TWIN PALM DAIRY | 7587 EDISON AVE | W 0 - 1/8 (0.007 mi.) | E28 | 97 |

Database: UST, Date of Government Version: 11/26/2024

# EXECUTIVE SUMMARY

Facility Id: 88015451

AST: A listing of aboveground storage tank petroleum storage tank locations.

A review of the AST list, as provided by EDR, has revealed that there are 2 AST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LEGEND DAIRY FARMS -*** | ***8381 EDISON AVENUE*** | ***E 0 - 1/8 (0.002 mi.)*** | ***27*** | ***75*** |
| Database: AST, Date of Government Version: 07/06/2016 | | | | |
| ***PAUL HUIZENGA DAIRY*** | ***7587 EDISON AVE*** | ***W 0 - 1/8 (0.007 mi.)*** | ***E30*** | ***104*** |
| Database: AST, Date of Government Version: 07/06/2016 | | | | |

## ADDITIONAL ENVIRONMENTAL RECORDS

### *Local Lists of Landfill / Solid Waste Disposal Sites*

WMUDS/SWAT: The Waste Management Unit Database System is used for program tracking and inventory of waste management units. The source is the State Water Resources Control Board.

A review of the WMUDS/SWAT list, as provided by EDR, and dated 04/01/2000 has revealed that there is 1 WMUDS/SWAT site within approximately 0.5 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***COMPOSTING PLANTONTA*** | ***8605 SCHAEFER AVE*** | ***ENE 1/4 - 1/2 (0.479 mi.)*** | ***67*** | ***234*** |

### *Local Lists of Hazardous waste / Contaminated Sites*

CERS HAZ WASTE: List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

A review of the CERS HAZ WASTE list, as provided by EDR, and dated 10/15/2024 has revealed that there are 3 CERS HAZ WASTE sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***AGROMIN OC ONTARIO G*** | ***8292 EDISON AVE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G37*** | ***130*** |
| ***AGROMIN OC ONTARIO G*** | ***8292 EDISON AVENUE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G39*** | ***137*** |
| ***SAM SOUSA DAIRY*** | ***7330 EDISON AVE*** | ***W 1/8 - 1/4 (0.127 mi.)*** | ***J49*** | ***173*** |

# EXECUTIVE SUMMARY

***Local Lists of Registered Storage Tanks***

SWEEPS UST: Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

A review of the SWEEPS UST list, as provided by EDR, and dated 06/01/1994 has revealed that there are 2 SWEEPS UST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***JACK ALEWYN DAIRY***<br>Status: A<br>Tank Status: A<br>Comp Number: 40260 | ***8185 EDISON*** | ***ENE 0 - 1/8 (0.009 mi.)*** | ***C31*** | ***117*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***AG-COSTA VIEW FARM***<br>Status: A<br>Tank Status: A<br>Comp Number: 44727 | ***14451 BON VIEW*** | ***SW 1/8 - 1/4 (0.155 mi.)*** | ***K56*** | ***202*** |

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 3 HIST UST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***THREE D DAIRY*** | ***8485 EDISON AVE*** | ***E 0 - 1/8 (0.011 mi.)*** | ***32*** | ***118*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON HAY, INC***<br>Facility Id: 00000044727 | ***14451 BON VIEW AVE*** | ***SW 1/8 - 1/4 (0.155 mi.)*** | ***K57*** | ***208*** |
| ***DIMAS COSTA*** | ***14451 BON VIEW*** | ***SW 1/8 - 1/4 (0.202 mi.)*** | ***K60*** | ***211*** |

CA FID UST: The Facility Inventory Database contains active and inactive underground storage tank locations. The source is the State Water Resource Control Board.

A review of the CA FID UST list, as provided by EDR, and dated 10/31/1994 has revealed that there are 2 CA FID UST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***JACK ALEWYN DAIRY***<br>Facility Id: 36008971<br>Status: A | ***8185 EDISON*** | ***ENE 0 - 1/8 (0.009 mi.)*** | ***C31*** | ***117*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***AG-COSTA VIEW FARM*** | ***14451 BON VIEW*** | ***SW 1/8 - 1/4 (0.155 mi.)*** | ***K56*** | ***202*** |

# EXECUTIVE SUMMARY

Facility Id: 36009015
Status: A

***Other Ascertainable Records***

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 09/16/2024 has revealed that there are 13 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LONGGO TRANS***<br>EPA ID:: CAC003256171 | ***7960 EDISON AVE*** | ***NNE 0 - 1/8 (0.018 mi.)*** | ***F33*** | ***119*** |
| WESTLEY CARDOZA<br>EPA ID:: CAR000217141 | 7990 EDISON AVE | NE 0 - 1/8 (0.018 mi.) | F34 | 124 |
| VICTORS FARMS<br>EPA ID:: CAC003252196 | 8040 EDISON AVE | NE 0 - 1/8 (0.018 mi.) | 35 | 126 |
| AGROMIN OC ONTARIO G<br>EPA ID:: CAL000469601 | 8292 EDISON AVE | E 0 - 1/8 (0.019 mi.) | G36 | 128 |
| ***AGROMIN ONTARIO***<br>EPA ID:: CAL000457796 | ***8292 EDISON AVE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G38*** | ***133*** |
| BREAKTHRU TRANSPORTS<br>EPA ID:: CAC003088689 | 8270 EDISON AVE | ENE 0 - 1/8 (0.021 mi.) | B41 | 155 |
| LONGGO TRANS<br>EPA ID:: CAC003278161 | 7914 EDISON AVE | N 0 - 1/8 (0.022 mi.) | F42 | 157 |
| KENT AVERY REPAIR IN<br>EPA ID:: CAL000471801 | 7330 EDISON AVE | W 1/8 - 1/4 (0.127 mi.) | J50 | 189 |
| WE INC<br>EPA ID:: CAC003118028 | 13955 WALKER AVE | ENE 1/8 - 1/4 (0.230 mi.) | L62 | 213 |
| WRECK AGE DEMOLITION<br>EPA ID:: CAL000381231 | 13908 GROVE AVE | NNE 1/8 - 1/4 (0.240 mi.) | 63 | 215 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***WHITEGOLD VENTURES L***<br>EPA ID:: CAC002974181 | ***14400 GROVE AVE*** | ***SSE 0 - 1/8 (0.120 mi.)*** | ***I48*** | ***169*** |
| PARK INDUSTRIES<br>EPA ID:: CAC003238066 | 14306 BON VIEW AVE | SW 1/8 - 1/4 (0.153 mi.) | K54 | 198 |
| GORDON HAY, INC<br>EPA ID:: CAC003121794 | 14451 BON VIEW AVE | SW 1/8 - 1/4 (0.155 mi.) | K55 | 200 |

# EXECUTIVE SUMMARY

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 11/11/2024 has revealed that there are 5 FINDS sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| THREE D DAIRY - HEIF<br>Registry ID:: 110071370993<br>Registry ID:: 110066342513 | 8311 EDISON | 0 - 1/8 (0.000 mi.) | B7 | 30 |
| GORDON DAIRY #7<br>Registry ID:: 110071369294<br>Registry ID:: 110064884086 | 8185 EDISON | 0 - 1/8 (0.000 mi.) | C12 | 37 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***H & R DAIRY***<br>Registry ID:: 110044231836 | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D22*** | ***70*** |
| GORDON DAIRY #3<br>Registry ID:: 110066423604 | 14213 BON VIEW | 0 - 1/8 (0.000 mi.) | D23 | 71 |
| GORDON HAY INC DAIRY<br>Registry ID:: 110066348713 | 14213 BON VIEW AVE | 0 - 1/8 (0.000 mi.) | D25 | 71 |

ECHO: ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

A review of the ECHO list, as provided by EDR, and dated 12/21/2024 has revealed that there are 5 ECHO sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| LEGEND DAIRY FARMS -<br>Registry ID: 110071369294 | 8185 EDISON | 0 - 1/8 (0.000 mi.) | C9 | 36 |
| LEGEND DAIRY FARMS -<br>Registry ID: 110071370993 | 8311 EDISON | 0 - 1/8 (0.000 mi.) | B10 | 36 |
| GORDON DAIRY #7<br>Registry ID: 110064884086 | 8185 EDISON | 0 - 1/8 (0.000 mi.) | C16 | 52 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***H & R DAIRY***<br>Registry ID: 110044231836 | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D22*** | ***70*** |
| GORDON DAIRY #3<br>Registry ID: 110066423604 | 14213 BON VIEW | 0 - 1/8 (0.000 mi.) | D24 | 71 |

# EXECUTIVE SUMMARY

E MANIFEST: EPA established a national system for tracking hazardous waste shipments electronically. This system, known as ?e-Manifest,? will modernize the nation?s cradle-to-grave hazardous waste tracking process while saving valuable time, resources, and dollars for industry and states.

A review of the E MANIFEST list, as provided by EDR, and dated 09/16/2024 has revealed that there are 3 E MANIFEST sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LONGGO TRANS*** | ***7960 EDISON AVE*** | ***NNE 0 - 1/8 (0.018 mi.)*** | ***F33*** | ***119*** |
| ***AGROMIN ONTARIO*** | ***8292 EDISON AVE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G38*** | ***133*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***WHITEGOLD VENTURES L*** | ***14400 GROVE AVE*** | ***SSE 0 - 1/8 (0.120 mi.)*** | ***I48*** | ***169*** |

Cortese: The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

A review of the Cortese list, as provided by EDR, and dated 09/16/2024 has revealed that there is 1 Cortese site within approximately 0.5 miles of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***PRIVATE RESIDENCE*** | ***PRIVATE RESIDENCE*** | ***SSE 1/4 - 1/2 (0.286 mi.)*** | ***65*** | ***221*** |
| Cleanup Status: COMPLETED - CASE CLOSED | | | | |

ENF: A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

A review of the ENF list, as provided by EDR, and dated 10/15/2024 has revealed that there are 4 ENF sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LEGEND DAIRY FARMS -***<br>Status: Historical<br>Facility Id: 239652 | ***8311 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***B8*** | ***30*** |
| ***LEGEND DAIRY FARMS -***<br>Status: Historical<br>Status: Historical<br>Facility Id: 204958 | ***8185 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***C14*** | ***43*** |
| ***JACK ALEWYN DAIRY***<br>Status: Historical<br>Status: Historical<br>Facility Id: 204958 | ***8185 EDISON BLVD*** | ***0 - 1/8 (0.000 mi.)*** | ***C17*** | ***52*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON DAIRY #3***<br>Status: Historical<br>Status: Historical<br>Facility Id: 229393 | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D18*** | ***54*** |

# EXECUTIVE SUMMARY

San Bern. Co. Permit: San Bernardino County Fire Department Hazardous Materials Division.

A review of the San Bern. Co. Permit list, as provided by EDR, and dated 08/13/2024 has revealed that there are 19 San Bern. Co. Permit sites within approximately 0.25 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LEGEND DAIRY FARMS -***<br>Facility Status: INACTIVE<br>Facility Id: FA0000410 | ***8311 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***B8*** | ***30*** |
| ***JACK ALEWYN DAIRY***<br>Facility Status: INACTIVE<br>Facility Id: FA0000508 | ***8185 EDISON BLVD*** | ***0 - 1/8 (0.000 mi.)*** | ***C17*** | ***52*** |
| ***G H DAIRY #4B***<br>Facility Status: INACTIVE<br>Facility Id: FA0000454 | ***7721 EDISON AVENUE*** | ***WNW 0 - 1/8 (0.002 mi.)*** | ***26*** | ***72*** |
| ***LEGEND DAIRY FARMS -***<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0000565 | ***8381 EDISON AVENUE*** | ***E 0 - 1/8 (0.002 mi.)*** | ***27*** | ***75*** |
| ***TIVA DAIRY***<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0011003 | ***7587 EDISON AVE*** | ***W 0 - 1/8 (0.007 mi.)*** | ***E29*** | ***98*** |
| ***AGROMIN OC ONTARIO G***<br>Facility Status: ACTIVE<br>Facility Id: FA0018707 | ***8292 EDISON AVENUE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G39*** | ***137*** |
| ***AGROMIN OC ONTARIO G***<br>Facility Status: ACTIVE<br>Facility Id: FA0019159 | ***8292 EDISON AVE*** | ***E 0 - 1/8 (0.019 mi.)*** | ***G40*** | ***154*** |
| RLE DAIRY<br>Facility Status: INACTIVE<br>Facility Id: FA0000626 | 14049 GROVE AVE | NE 0 - 1/8 (0.073 mi.) | H45 | 168 |
| BROWN'S FAMILY DAIRY<br>Facility Status: INACTIVE<br>Facility Id: FA0000370 | 14016 S GROVE AVE | NE 0 - 1/8 (0.108 mi.) | H46 | 168 |
| ***SAM SOUSA DAIRY***<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0000634<br>Facility Id: FA0019415 | ***7330 EDISON AVE*** | ***W 1/8 - 1/4 (0.127 mi.)*** | ***J49*** | ***173*** |
| SNS DAIRY<br>Facility Status: INACTIVE<br>Facility Id: FA0000648 | 7371 EDISON AVE | W 1/8 - 1/4 (0.130 mi.) | J53 | 197 |
| GORZEMAN DAIRY #2<br>Facility Status: INACTIVE<br>Facility Id: FA0011060 | 13948 WALKER | ENE 1/8 - 1/4 (0.195 mi.) | L59 | 210 |
| GORZEMAN FAMILY DAIR<br>Facility Status: INACTIVE<br>Facility Id: FA0011061 | 13975 WALKER | ENE 1/8 - 1/4 (0.209 mi.) | L61 | 213 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON DAIRY #3*** | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D18*** | ***54*** |

| | | | | |
|---|---|---|---|---|
| Facility Status: INACTIVE<br>Facility Id: FA0010971<br>Facility Id: FA0000395 | | | | |
| SOUTHWEST DAIRY<br>Facility Status: ACTIVE<br>Facility Status: INACTIVE<br>Facility Id: FA0014875 | 14213 S BON VIEW AVE | 0 - 1/8 (0.000 mi.) | D19 | 64 |
| ***ALEWYN DAIRY #3***<br>Facility Status: INACTIVE<br>Facility Id: FA0000511 | ***14361 GROVE*** | ***SE 0 - 1/8 (0.063 mi.)*** | ***43*** | ***160*** |
| ***MAJESTIC FARMS #1***<br>Facility Status: INACTIVE<br>Facility Id: FA0011051 | ***14333 WALKER*** | ***ESE 0 - 1/8 (0.065 mi.)*** | ***44*** | ***163*** |
| JOE FERREIRA JR DAIR<br>Facility Status: INACTIVE<br>Facility Id: FA0000515 | 14400 S GROVE AVE | SSE 0 - 1/8 (0.120 mi.) | I47 | 169 |
| O & M DAIRY<br>Facility Status: INACTIVE<br>Facility Id: FA0010952<br>Facility Id: FA0000566 | 14474 GROVE AVE | SSE 1/8 - 1/4 (0.185 mi.) | 58 | 210 |

WDS: California Water Resources Control Board - Waste Discharge System.

A review of the WDS list, as provided by EDR, and dated 06/19/2007 has revealed that there is 1 WDS site within approximately 0.001 miles of the target property.

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| H & R DAIRY - BON VI<br>Facility Status: A<br>Facility Id: 8 365857001 | 14213 BON VIEW AVE | 0 - 1/8 (0.000 mi.) | D20 | 65 |

CIWQS: The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

A review of the CIWQS list, as provided by EDR, and dated 11/20/2024 has revealed that there are 3 CIWQS sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***LEGEND DAIRY FARMS -*** | ***8311 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***B8*** | ***30*** |
| ***LEGEND DAIRY FARMS -*** | ***8185 EDISON AVENUE*** | ***0 - 1/8 (0.000 mi.)*** | ***C14*** | ***43*** |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON DAIRY #3*** | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D18*** | ***54*** |

# EXECUTIVE SUMMARY

CERS: The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

A review of the CERS list, as provided by EDR, and dated 10/15/2024 has revealed that there are 4 CERS sites within approximately 0.001 miles of the target property.

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| LEGEND DAIRY FARMS | 8311 EDISON | 0 - 1/8 (0.000 mi.) | B13 | 38 |
| SOUTHWEST DAIRY INC | 8185 EDISON | 0 - 1/8 (0.000 mi.) | C15 | 47 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***GORDON DAIRY #3*** | ***14213 BON VIEW AVENU*** | ***0 - 1/8 (0.000 mi.)*** | ***D18*** | ***54*** |
| GORDON DAIRY #3 | 14213 BON VIEW | 0 - 1/8 (0.000 mi.) | D21 | 66 |

# EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 13 records.

| Site Name | Database(s) |
|---|---|
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| | CDL |
| SO CAL GAS/ONTARIO MGP | EDR MGP |
| ONTARIO RANCH HOLSTEINS #1 | ECHO |

# OVERVIEW MAP - 7910061.1S

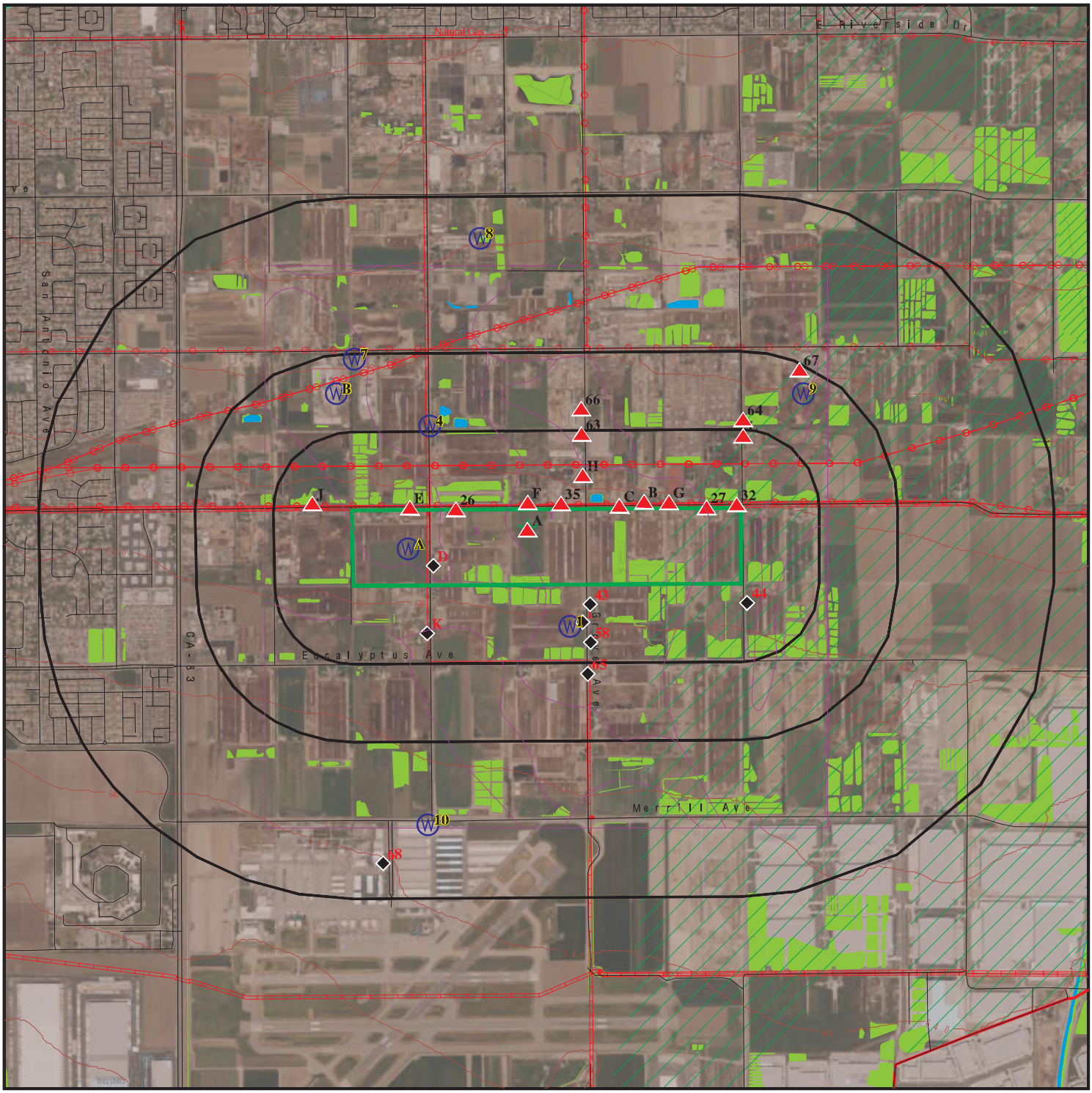


Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

County Boundary

Power transmission lines

Pipelines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Ontario Ranch II | CLIENT: Roux Associates |
| ADDRESS: 8061 Edison Avenue<br>Ontario CA 91762 | CONTACT: Ashley Whitaker |
| LAT/LONG: 33.996599 / 117.63136 | INQUIRY #: 7910061.1s |
| | DATE: February 27, 2025 2:35 pm |

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# DETAIL MAP - 7910061.1S

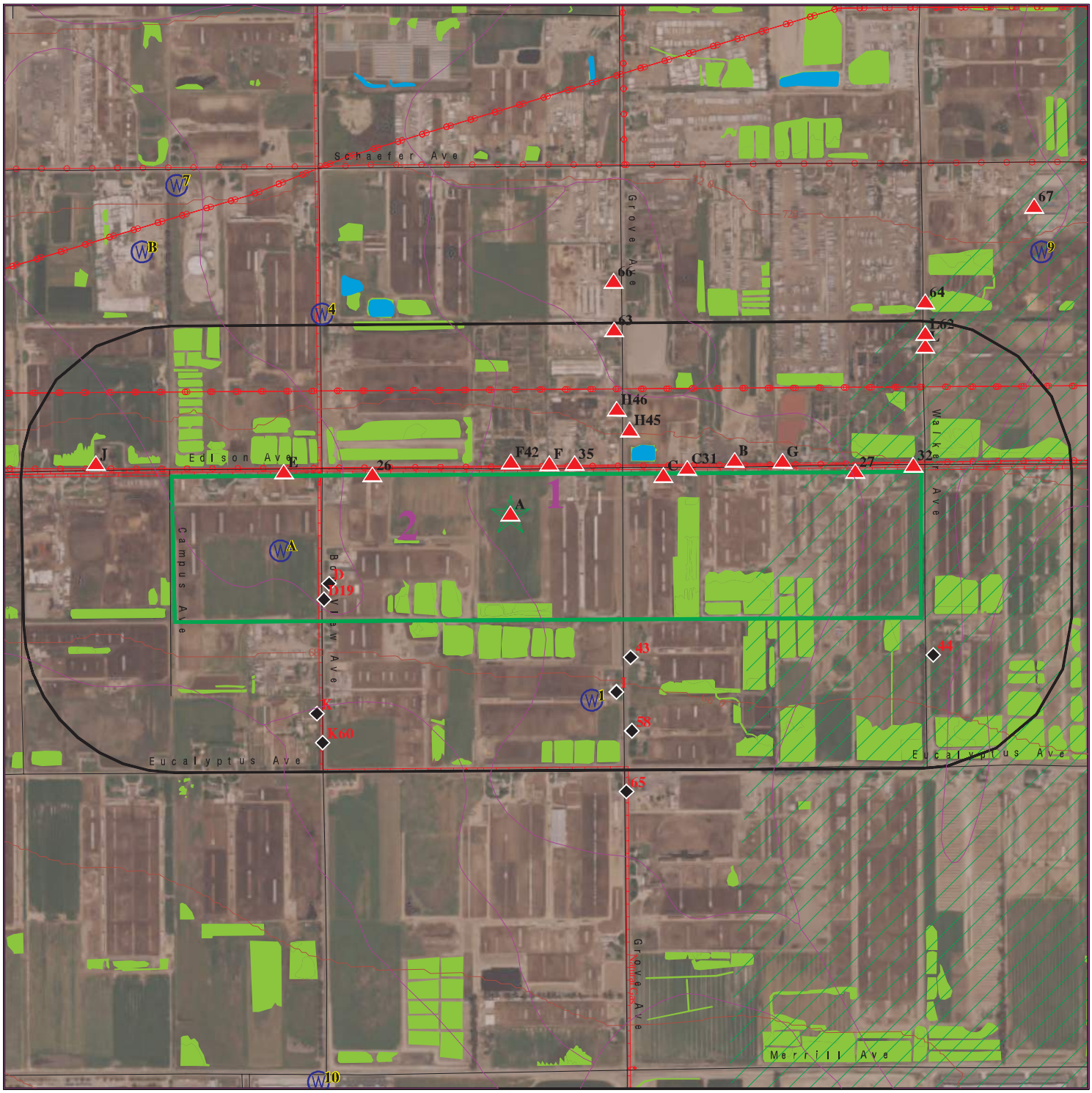


Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA

Power transmission lines

Pipelines

Special Flood Hazard Area (1%)

0.2% Annual Chance Flood Hazard

National Wetland Inventory

State Wetlands

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Ontario Ranch II | CLIENT: Roux Associates |
| ADDRESS: 8061 Edison Avenue<br>Ontario CA 91762 | CONTACT: Ashley Whitaker<br>INQUIRY #: 7910061.1s |
| LAT/LONG: 33.996599 / 117.63136 | DATE: February 27, 2025 2:35 pm |

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# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| **STANDARD ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Lists of Federal NPL (Superfund) sites*** | | | | | | | | |
| NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| Proposed NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| NPL LIENS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Lists of Federal Delisted NPL sites*** | | | | | | | | |
| Delisted NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Lists of Federal sites subject to CERCLA removals and CERCLA orders*** | | | | | | | | |
| FEDERAL FACILITY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| SEMS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of Federal CERCLA sites with NFRAP*** | | | | | | | | |
| SEMS-ARCHIVE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of Federal RCRA facilities undergoing Corrective Action*** | | | | | | | | |
| CORRACTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Lists of Federal RCRA TSD facilities*** | | | | | | | | |
| RCRA-TSDF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of Federal RCRA generators*** | | | | | | | | |
| RCRA-LQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-SQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-VSQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Federal institutional controls / engineering controls registries*** | | | | | | | | |
| LUCIS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US INST CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal ERNS list*** | | | | | | | | |
| ERNS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ***Lists of state- and tribal (Superfund) equivalent sites*** | | | | | | | | |
| RESPONSE | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Lists of state- and tribal hazardous waste facilities*** | | | | | | | | |
| ENVIROSTOR | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| ***Lists of state and tribal landfills and solid waste disposal facilities*** | | | | | | | | |
| SWF/LF | 0.500 | | 1 | 2 | 2 | NR | NR | 5 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| ***Lists of state and tribal leaking storage tanks*** | | | | | | | | |
| LUST | 0.500 | | 0 | 0 | 1 | NR | NR | 1 |
| INDIAN LUST | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| CPS-SLIC | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of state and tribal registered storage tanks*** | | | | | | | | |
| FEMA UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| UST | 0.250 | | 2 | 0 | NR | NR | NR | 2 |
| AST | 0.250 | | 2 | 0 | NR | NR | NR | 2 |
| INDIAN UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Lists of state and tribal voluntary cleanup sites*** | | | | | | | | |
| INDIAN VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Lists of state and tribal brownfield sites*** | | | | | | | | |
| BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| **ADDITIONAL ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Local Brownfield lists*** | | | | | | | | |
| US BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Landfill / Solid Waste Disposal Sites*** | | | | | | | | |
| WMUDS/SWAT | 0.500 | | 0 | 0 | 1 | NR | NR | 1 |
| SWRCY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| HAULERS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| INDIAN ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| DEBRIS REGION 9 | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| IHS OPEN DUMPS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Hazardous waste / Contaminated Sites*** | | | | | | | | |
| US HIST CDL | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| HIST Cal-Sites | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCH | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| CDL | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| CERS HAZ WASTE | 0.250 | | 2 | 1 | NR | NR | NR | 3 |
| Toxic Pits | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| US CDL | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ***Local Lists of Registered Storage Tanks*** | | | | | | | | |
| SWEEPS UST | 0.250 | | 1 | 1 | NR | NR | NR | 2 |
| HIST UST | 0.250 | | 1 | 2 | NR | NR | NR | 3 |
| CA FID UST | 0.250 | | 1 | 1 | NR | NR | NR | 2 |
| CERS TANKS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Local Land Records*** | | | | | | | | |
| LIENS | 0.001 | | 0 | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| LIENS 2 | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| DEED | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Records of Emergency Release Reports*** | | | | | | | | |
| HMIRS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| CHMIRS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| LDS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| MCS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| SPILLS 90 | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ***Other Ascertainable Records*** | | | | | | | | |
| RCRA NonGen / NLR | 0.250 | | 8 | 5 | NR | NR | NR | 13 |
| FUDS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| DOD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCRD DRYCLEANERS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US FIN ASSUR | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| EPA WATCH LIST | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| 2020 COR ACTION | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| TSCA | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| TRIS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| SSTS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ROD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| RMP | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| RAATS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| PRP | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| PADS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ICIS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| FTTS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| MLTS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| COAL ASH DOE | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| COAL ASH EPA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| PCB TRANSFORMER | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| RADINFO | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| HIST FTTS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| DOT OPS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| CONSENT | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| INDIAN RESERV | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUSRAP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| UMTRA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| LEAD SMELTERS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| US AIRS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| US MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ABANDONED MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| MINES MRDS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| FINDS | 0.001 | 2 | 5 | NR | NR | NR | NR | 7 |
| UXO | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ECHO | 0.001 | 2 | 5 | NR | NR | NR | NR | 7 |
| DOCKET HWC | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| FUELS PROGRAM | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS NPL | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS FEDERAL SITES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| PFAS TSCA | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS TRIS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS RCRA MANIFEST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS ATSDR | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS WQP | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS PROJECT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS NPDES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS ECHO | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS ECHO FIRE TRAIN | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PFAS PT 139 AIRPORT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AQUEOUS FOAM NRC | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| BIOSOLIDS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| UST FINDER | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| UST FINDER RELEASE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| E MANIFEST | 0.250 | | 3 | 0 | NR | NR | NR | 3 |
| PFAS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AQUEOUS FOAM | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| CA BOND EXP. PLAN | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| CHROME PLATING | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| Cortese | 0.500 | | 0 | 0 | 1 | NR | NR | 1 |
| CUPA Listings | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| DRYCLEANERS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| EMI | 0.001 | 1 | 0 | NR | NR | NR | NR | 1 |
| ENF | 0.001 | 1 | 4 | NR | NR | NR | NR | 5 |
| Financial Assurance | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| ICE | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| HIST CORTESE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| HWP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HWT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| HWTS | 0.001 | 1 | 0 | NR | NR | NR | NR | 1 |
| HAZNET | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| MWMP | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| NPDES | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| San Bern. Co. Permit | 0.250 | 1 | 14 | 5 | NR | NR | NR | 20 |
| PEST LIC | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| PROC | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| Notify 65 | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HAZMAT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| UIC | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| UIC GEO | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| WASTEWATER PITS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| WDS | 0.001 | 1 | 1 | NR | NR | NR | NR | 2 |
| WIP | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| MILITARY PRIV SITES | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| PROJECT | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| WDR | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| CIWQS | 0.001 | 1 | 3 | NR | NR | NR | NR | 4 |
| CERS | 0.001 | 2 | 4 | NR | NR | NR | NR | 6 |
| NON-CASE INFO | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| OTHER OIL GAS | 0.001 | | 0 | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| PROD WATER PONDS | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| SAMPLING POINT | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| WELL STIM PROJ | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| **EDR HIGH RISK HISTORICAL RECORDS** | | | | | | | | |
| ***EDR Exclusive Records*** | | | | | | | | |
| EDR MGP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| EDR Hist Auto | 0.125 | | 0 | NR | NR | NR | NR | 0 |
| EDR Hist Cleaner | 0.125 | | 0 | NR | NR | NR | NR | 0 |
| **EDR RECOVERED GOVERNMENT ARCHIVES** | | | | | | | | |
| ***Exclusive Recovered Govt. Archives*** | | | | | | | | |
| RGA LF | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| RGA LUST | 0.001 | | 0 | NR | NR | NR | NR | 0 |
| - Totals -- | | 12 | 57 | 17 | 5 | 1 | 0 | 92 |

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

| | | | |
|---|---|---|---|
| **A1** | **JORRITSMA & ANEMA DAIRY** | **EMI** | **S104761926** |
| **Target** | **8061 EDISON AVE** | **ENF** | **N/A** |
| **Property** | **ONTARIO, CA 91762** | **HWTS** | |
| | | **San Bern. Co. Permit** | |
| | **Site 1 of 6 in cluster A** | **CIWQS** | |
| | | **CERS** | |

**Actual:**
**691 ft.**

EMI:

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2006 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.962210134554823933 |
| Reactive Organic Gases Tons/Yr: | 2.768 |
| Carbon Monoxide Emissions Tons/Yr: | .001 |
| NOX - Oxides of Nitrogen Tons/Yr: | .002 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.232 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .6028176 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2007 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.962210134554823933 |
| Reactive Organic Gases Tons/Yr: | 2.768 |
| Carbon Monoxide Emissions Tons/Yr: | .001 |
| NOX - Oxides of Nitrogen Tons/Yr: | .002 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.232 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .6028176 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2008 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.635843114801030632 |
| Reactive Organic Gases Tons/Yr: | 2.54 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.28 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .626304 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2009 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 4.9957056971084999 |
| Reactive Organic Gases Tons/Yr: | 3.4900000000000002 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.1899999999999999 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.58226699999999998 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2010 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 6.8744632121385596 |
| Reactive Organic Gases Tons/Yr: | 4.8025000000000002 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.2103999999999999 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.59224871999999995 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2011 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 6.8744632121 |
| Reactive Organic Gases Tons/Yr: | 4.8025 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.2104 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.59224872 |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2012 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145031 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 4.8525622674 |
| Reactive Organic Gases Tons/Yr: | 3.39 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 0.8544 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.41805792 |

ENF:

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 234045 |
| Agency Name: | Jorritsma, James |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997681 |
| Place Longitude: | -117.629148 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365551001 |
| Reg Measure Id: | 211692 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/10/2013 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 01/09/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 351564 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 04/23/2008 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 04/23/2008 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Communication |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 234045 |
| Agency Name: | Jorritsma, James |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997681 |
| Place Longitude: | -117.629148 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365551001 |
| Reg Measure Id: | 211692 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/10/2013 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 01/09/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 222535 |
| Region: | 8 |
| Order / Resolution Number: | R8-1997-0044 |
| Enforcement Action Type: | Admin Civil Liability |
| Effective Date: | 05/19/1997 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | 6/4/1997 |
| Termination Date: | Not reported |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Enforcement - 8 365551001 |
| Description: | 13385-DISCHARGE OF WASTEWATER OFF PROPERTY. $6,750 SUSPENDED PROVIDED EMWP SUBMITTED & IMPLEMENTED BY 11/1/97. |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | 6/4/1997 |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 750 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 750 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 750 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 750 |

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 234045 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997681 |
| Place Longitude: | -117.629148 |
| SIC Code 1: | 241 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 12/24/2013 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 347601 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 05/14/2008 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 05/14/2008 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm..(05/14/2008) |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

HWTS:

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAL000319397 |
| Inactive Date: | 06/30/2013 |
| Create Date: | 05/08/2007 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 8061 EDISON AVE |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | ONTARIO, CA 917620000 |
| Owner Name: | JAMES JORRITSMA & GREG ANEMA |
| Owner Address: | 8061 EDISON AVE |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | ONTARIO, CA 917620000 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | GREG ANEMA |
| Contact Address: | 8061 EDISON AVE |
| Contact Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 917620000 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | PERMANENT |
| Category: | STATE |
| Latitude: | 33.997818 |
| Longitude: | -117.610259 |

NAICS:

| | |
|---|---|
| EPA ID: | CAL000319397 |
| Create Date: | 2007-05-08 14:05:53.117 |
| NAICS Code: | 11212 |
| NAICS Description: | Dairy Cattle and Milk Production |
| Issued EPA ID Date: | 2007-05-08 14:05:53.08700 |
| Inactive Date: | 2013-06-30 00:00:00 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Facility Name: | JORRITSMA & ANEMA DAIRY |
| Facility Address: | 8061 EDISON AVE |
| Facility Address 2: | Not reported |
| Facility City: | ONTARIO |
| Facility County: | Not reported |
| Facility State: | CA |
| Facility Zip: | 91762 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0017949 |
| Owner: | GH DAIRY (GERBEN HETTINGA) |
| Permit Number: | PT0038752 |
| Permit Category: | HAZARDOUS MATERIALS 4-10 CHEMICALS |
| Facility Status: | ACTIVE |
| Expiration Date: | 08/31/2024 |

| | |
|---|---|
| Name: | JORRITSMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000522 |
| Owner: | JORRITSMA, JAMES |
| Permit Number: | PT0008928 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2013 |

| | |
|---|---|
| Name: | JORRITSMA DAIRY |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000522 |
| Owner: | JORRITSMA, JAMES |
| Permit Number: | PT0008927 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2013 |

CIWQS:

| | |
|---|---|
| Name: | Gh Dairy #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Hettinga, Gerben |
| Agency Address: | 6939 Schaefer Avenue Suite D Box 301, Chino, CA 91710 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| WDID: | 8 365998001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/24/2013 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997681 |
| Longitude: | -117.629148 |

| | |
|---|---|
| Name: | Gh Dairy #4 |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Jorritsma, James |
| Agency Address: | 1115 Big Pine Lane, Norco, CA 92860 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | NPDES Permit |
| Order Number: | 82-133 |
| WDID: | 8 365551001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | 05/14/1982 |
| Effective Date: | 05/14/1982 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 05/10/1997 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997681 |
| Longitude: | -117.629148 |

CERS:

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 438861 |
| CERS ID: | 10741726 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 438861 |
| Site Name: | GH Dairy #4 |
| Violation Date: | 07-09-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to annually review and electronically certify that the |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| | business plan is complete and accurate on or before the annual due date. |
| Violation Notes: | Returned to compliance on 11/04/2019. OBSERVATION: The last Business Plan update submitted by this facility is dated 5/24/2018. CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |
| | |
| Site ID: | 438861 |
| Site Name: | GH Dairy #4 |
| Violation Date: | 07-09-2019 |
| Citation: | HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan. |
| Violation Notes: | Returned to compliance on 11/04/2019. OBSERVATION: Hazardous materials were observed on site during the inspection that are not listed in the most current CERS inventory or are listed in lesser quantities. Also, the emergency response plan submitted in CERS does not list the correct emergency contact number for the local CUPA. Revise the contact number to list either 909-386-8425 or 800-33-TOXIC and resubmit the plan. CORRECTIVE ACTION: Submit a signed statement that updated Business Plan elements have been submitted into CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |
| | |
| Site ID: | 438861 |
| Site Name: | GH Dairy #4 |
| Violation Date: | 05-06-2022 |
| Citation: | HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan. |
| Violation Notes: | OBSERVATION: Hazardous materials were observed on site during the inspection that are not listed in the most current CERS inventory. CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated in CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 07-09-2019 |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | ROUTINE HANDLER INSPECTION-GH DAIRY 4 |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HMRRP |
| Eval Source: | CERS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 05-06-2022 |
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | Not reported |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HMRRP |
| Eval Source: | CERS, |

Coordinates:

| | |
|---|---|
| Site ID: | 438861 |
| Facility Name: | GH Dairy #4 |
| Env Int Type Code: | HMBP |
| Program ID: | 10741726 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Center of a facility or station., |
| Latitude: | 33.996700 |
| Longitude: | -117.629260 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Patricia Mohr |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | Patricia L Mohr |
| Entity Title: | Not reported |
| Affiliation Address: | 14651 S Grove Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

**JORRITSMA & ANEMA DAIRY (Continued)** **S104761926**

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | GH Dairy |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | GERBEN HETTINGA |
| Entity Title: | Not reported |
| Affiliation Address: | 14651 S Grove Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | (909) 606-6455, |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Patricia Mohr |
| Entity Title: | Controller |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 14651 S Grove Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | GH Dairy |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (909) 606-6455, |

| | |
|---|---|
| Name: | JORRITSMA & ANEMA DAIRY |
| Address: | 8061 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762-7297 |
| Site ID: | 475022 |
| CERS ID: | 110037259515 |
| CERS Description: | US EPA Air Emission Inventory System (EIS) |

**A2 Target Property** | **JORRITSMA AND ANEMA DAIRY**
**8061 EDISON AVENUE**
**ONTARIO, CA 91761** | **FINDS** | **1011908263**
**ECHO** | **N/A**

**Site 2 of 6 in cluster A**

**Actual: 691 ft.**

FINDS:
Registry ID: 110037259515

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
THE EMISSION INVENTORY SYSTEM (EIS) MAINTAINS AN INVENTORY OF LARGE STATIONARY SOURCES AND VOLUNTARILY-REPORTED SMALLER SOURCES OF AIR POINT POLLUTANT EMITTERS. IT CONTAINS INFORMATION ABOUT FACILITY SITES AND THEIR PHYSICAL LOCATION, EMISSIONS UNITS, EMISSIONS PROCESSES, RELEASE POINTS, CONTROL APPROACHES, AND REGULATIONS. FACILITY INVENTORY DATA ARE KEPT SEPARATE FROM THE EMISSIONS DATA AND HAVE STABLE IDENTIFIERS TO IMPROVE CONTINUITY FROM YEAR TO YEAR AND TO HELP IDENTIFY DUPLICATE OR MISSING FACILITIES
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.
Registry ID: 110071787266

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1011908263
Registry ID: 110037259515

DFR URL:
Name: JORRITSMA & ANEMA DAIRY
Address: 8061 EDISON AVENUE
City,State,Zip: ONTARIO, CA 91762

---

**A3 Target Property** | **JORRITSMA DAIRY**
**8061 EDISON AVE**
**CHINO, CA 91710** | **WDS** | **S102006119**
**N/A**

**Site 3 of 6 in cluster A**

**Actual: 691 ft.**

WDS:
Name: JORRITSMA DAIRY
Address: 8061 EDISON AVE
City: CHINO
Facility ID: Santa Ana River 365551001
Facility Type: Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this

**JORRITSMA DAIRY (Continued)** **S102006119**

| | |
|---|---|
| | category. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | CAG018001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board |
| Subregion: | 8 |
| Facility Telephone: | Not reported |
| Facility Contact: | JAMES JORRITSMA |
| Agency Name: | JORRITSMA JAMES |
| Agency Address: | 1115 BIG PINE LANE |
| Agency City,St,Zip: | NORCO 92860 |
| Agency Contact: | JAMES JORRITSMA |
| Agency Telephone: | Not reported |
| Agency Type: | Private |
| SIC Code: | 241 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Primary Waste: | STORMS |
| Waste Type2: | N |
| Waste2: | Stormwater Runoff |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Secondary Waste: | Solid Wastes |
| Secondary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | No reclamation requirements associated with this facility. |
| POTW: | The facility is not a POTW. |
| Treat To Water: | Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance from a waste treatment facility. |
| Complexity: | Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds. |

**A4 Target Property** | **GH DAIRY #4** | **ECHO** | **1025935107**
**8061 EDISON** | **N/A**
**ONTARIO, CA 91762**

**Site 4 of 6 in cluster A**

**Actual: 691 ft.**

ECHO:

| | |
|---|---|
| Envid: | 1025935107 |
| Registry ID: | 110066693894 |
| DFR URL: | |
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |

---

**A5 Target Property** | **GH DAIRY #4** | **CERS** | **S123509543**
**8061 EDISON** | **N/A**
**ONTARIO, CA 91762**

**Site 5 of 6 in cluster A**

**Actual: 691 ft.**

CERS:

| | |
|---|---|
| Name: | GH DAIRY #4 |
| Address: | 8061 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 33147 |
| CERS ID: | 234045 |
| CERS Description: | Animal Wastewater Discharge |

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 01-07-2014 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 01-25-2018 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |
| Eval General Type: | Complaint Inspection |
| Eval Date: | 03-11-1993 |
| Violations Found: | No |
| Eval Type: | Complaint Inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 06-08-2004 |
| Violations Found: | No |

**GH DAIRY #4 (Continued)** **S123509543**

Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-18-2007
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-26-2014
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-07-1999
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-03-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-15-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards

**GH DAIRY #4 (Continued)** **S123509543**

Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-17-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-06-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-23-2002
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-26-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-12-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-02-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

**GH DAIRY #4 (Continued)** **S123509543**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-09-2013
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-03-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-06-1998
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-30-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-23-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-08-1987
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-21-1992
Violations Found: No

**GH DAIRY #4 (Continued)** **S123509543**

Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-21-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-03-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 33147
Site Name: GH Dairy #4
Site Address: 8061 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 04-23-2008
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Site ID: 33147
Site Name: GH Dairy #4
Site Address: 8061 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 05-14-2008
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Site ID: 33147
Site Name: GH Dairy #4
Site Address: 8061 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 05-19-1997

**GH DAIRY #4 (Continued)** **S123509543**

Enf Action Type: Administrative Enforcement with Penality
Enf Action Description: Administrative Enforcement with Civil Liability (Penality)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Affiliation:
Affiliation Type Desc: Owner and Operator
Entity Name: Hettinga, Gerben
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

---

**A6 Target Property** **GH DAIRY #4** **FINDS** **1023371521**
**8061 EDISON** **N/A**
**ONTARIO, CA 91762**

**Site 6 of 6 in cluster A**

**Actual: 691 ft.**

FINDS:
Registry ID: 110066693894

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different systems managed within CalEPA. The five systems are: California Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

**B7** **THREE D DAIRY - HEIFERS** **FINDS** **1023338917**
**8311 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 1 of 5 in cluster B**

**Relative:** **Higher**
**Actual:** **696 ft.**

FINDS:
Registry ID: 110071370993

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.
Registry ID: 110066342513

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different systems managed within CalEPA. The five systems are: California Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

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**B8** **LEGEND DAIRY FARMS - 8311 EDISON** **ENF** **S108536469**
**8311 EDISON AVENUE** **San Bern. Co. Permit** **N/A**
**< 1/8** **ONTARIO, CA 91762** **CIWQS**
**1 ft.**

**Site 2 of 5 in cluster B**

**Relative:** **Higher**
**Actual:** **696 ft.**

ENF:

| | |
|---|---|
| Name: | ONTARIO RANCH HOLSTEINS #3 |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | 8 |
| Facility Id: | 239652 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997735 |
| Place Longitude: | -117.623403 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

| | |
|---|---|
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Not reported |
| Facility Waste Type 2: | Not reported |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | Not reported |
| Program Category1: | Not reported |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | Not reported |
| WDID: | Not reported |
| Reg Measure Id: | Not reported |
| Reg Measure Type: | Not reported |
| Region: | Not reported |
| Order #: | Not reported |
| Npdes# CA#: | Not reported |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Not reported |
| Status Date: | Not reported |
| Effective Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Not reported |
| Individual/General: | Not reported |
| Fee Code: | Not reported |
| Direction/Voice: | Not reported |
| Enforcement Id(EID): | 345334 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 11/13/2007 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 11/13/2007 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

| | |
|---|---|
| Title: | Oral Comm for Martin De Hoog |
| Description: | Oral Communication |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8311 EDISON |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | 8 |
| Facility Id: | 239652 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997735 |
| Place Longitude: | -117.623403 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Not reported |
| Facility Waste Type 2: | Not reported |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | Not reported |
| Reg Measure Type: | Not reported |
| Region: | Not reported |
| Order #: | Not reported |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

| | |
|---|---|
| Npdes# CA#: | Not reported |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Not reported |
| Status Date: | Not reported |
| Effective Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | Not reported |
| Fee Code: | Not reported |
| Direction/Voice: | Not reported |
| Enforcement Id(EID): | 345334 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 2007-11-13 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 2007-11-13 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm for Martin De Hoog |
| Description: | Oral Communication |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | MARTIN DEHOOG DAIRY |
| Address: | 8311 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000410 |
| Owner: | DE HOOG, MARTIN L |
| Permit Number: | PT0018959 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 05/31/2014 |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

CIWQS:

| | |
|---|---|
| Name: | Legend Dairy Farms - 8311 Edison |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | De Hoog, Martin |
| Agency Address: | 8311 Edison Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 77-116 |
| WDID: | 8 365366001 |
| NPDES Number: | Not reported |
| Adoption Date: | 06/10/1977 |
| Effective Date: | 06/10/1977 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 06/06/1992 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997735 |
| Longitude: | -117.623403 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8311 Edison |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Haringa, Rudolph |
| Agency Address: | 14848 Grove Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366030001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 12/01/2016 |
| Termination Date: | 01/04/2024 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997735 |
| Longitude: | -117.623403 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8311 Edison |
| Address: | 8311 EDISON AVENUE |

**LEGEND DAIRY FARMS - 8311 EDISON (Continued)** **S108536469**

| | |
|---|---|
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Ronald Pietersma |
| Agency Address: | Po Box 2500, Chino, CA 91708 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366045001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/11/2024 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997735 |
| Longitude: | -117.623403 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8311 Edison |
| Address: | 8311 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Joe De Hoog |
| Agency Address: | 1281 South Almond Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee |
| Order Number: | R8-2013-0001 |
| WDID: | 8 366012001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 12/27/2013 |
| Termination Date: | 01/28/2016 |
| Expiration/Review Date: | 06/01/2018 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997735 |
| Longitude: | -117.623403 |

**C9** **LEGEND DAIRY FARMS - 8185 EDISON** **ECHO** **1027617524**
**8185 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 1 of 8 in cluster C**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

ECHO:

| | |
|---|---|
| Envid: | 1027617524 |
| Registry ID: | 110071369294 |
| DFR URL: | |
| Name: | LEGEND DAIRY FARMS - 8185 EDISON |
| Address: | 8185 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |

---

**B10** **LEGEND DAIRY FARMS - 8311 EDISON** **ECHO** **1027619217**
**8311 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 3 of 5 in cluster B**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

ECHO:

| | |
|---|---|
| Envid: | 1027619217 |
| Registry ID: | 110071370993 |
| DFR URL: | |
| Name: | LEGEND DAIRY FARMS - 8311 EDISON |
| Address: | 8311 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |

---

**C11** **AG-JACK ALEWYN DAIRY** **UST** **U003784997**
**8185 EDISON AVE** **N/A**
**< 1/8** **CHINO, CA 91762**
**1 ft.**

**Site 2 of 8 in cluster C**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

UST:

| | |
|---|---|
| Name: | AG-JACK ALEWYN DAIRY |
| Address: | 8185 EDISON AVE |
| City,State,Zip: | CHINO, CA 91762 |
| Facility ID: | 87014228 |
| Permitting Agency: | SAN BERNARDINO COUNTY |
| CERSID: | Not reported |
| Latitude: | 33.997163 |
| Longitude: | -117.625589 |
| Owner type: | Not reported |
| Facility type: | Not reported |
| Num of inuse ust: | Not reported |
| Num of closed ust: | Not reported |
| Num of oos ust: | Not reported |
| Epa region: | Not reported |
| Tribal lands: | Not reported |
| Tank owner name: | Not reported |
| Tank owner mailing address: | Not reported |
| Tank owner mailing city: | Not reported |
| Tank owner mailing zip: | Not reported |
| Tank owner mailing state: | Not reported |
| Tank operator name: | Not reported |

**AG-JACK ALEWYN DAIRY (Continued)** **U003784997**

| | |
|---|---|
| Tank operator mailing address: | Not reported |
| Tank operator mailing city: | Not reported |
| Tank operator mailing zip: | Not reported |
| Tank operator mailing state: | Not reported |
| Tankidnumber: | Not reported |
| Tank status: | Not reported |
| Tank configuration: | Not reported |
| Tank closure date: | Not reported |
| Tank installation date: | Not reported |
| Tank num of compartments: | Not reported |
| Tank contents: | Not reported |
| Tank capacity gallons: | Not reported |
| Tank type: | Not reported |
| Tank pc construction: | Not reported |
| Tank pwpiping construction: | Not reported |
| Tank piping type: | Not reported |
| Tank piping construction: | Not reported |
| Tank sacrificial anode: | Not reported |
| Tank cp impressed current: | Not reported |
| Tank cp shutoff: | Not reported |
| Tank alarms: | Not reported |
| Tank ball float: | Not reported |
| Tank spill bucket: | Not reported |

---

**C12** **GORDON DAIRY #7** **FINDS** **1023203419**
**8185 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 3 of 8 in cluster C**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

FINDS:
Registry ID: 110071369294

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

Registry ID: 110064884086

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different systems managed within CalEPA. The five systems are: California

**GORDON DAIRY #7 (Continued)** **1023203419**

Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

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**B13** **LEGEND DAIRY FARMS** **CERS** **S123502901**
**8311 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 4 of 5 in cluster B**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

CERS:

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS |
| Address: | 8311 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 162220 |
| CERS ID: | 239652 |
| CERS Description: | Animal Wastewater Discharge |

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 01-08-2001 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 02-16-2011 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 06-21-2012 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 10-31-2019 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |

**LEGEND DAIRY FARMS (Continued)** **S123502901**

Eval Date: 12-01-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-13-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-10-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-10-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-13-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-16-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-19-2013
Violations Found: No
Eval Type: RWQCB Type B compliance inspection

**LEGEND DAIRY FARMS (Continued)** **S123502901**

Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-27-2002
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-14-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-04-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-15-1998
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-20-1987
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-20-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS

**LEGEND DAIRY FARMS (Continued)** **S123502901**

Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-27-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-23-2008
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-30-2018
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-08-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-10-2009
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-13-2007
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection

**LEGEND DAIRY FARMS (Continued)** **S123502901**

Eval Date: 11-22-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 162220
Site Name: Legend Dairy Farms
Site Address: 8311 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 11-13-2007
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Affiliation:
Affiliation Type Desc: Operator
Entity Name: Haringa, Rudolph
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Owner and Operator
Entity Name: Joe De Hoog
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Owner and Operator
Entity Name: Ronald Pietersma
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

**C14** **LEGEND DAIRY FARMS - 8185 EDISON** **ENF** **S130549994**
**8185 EDISON AVENUE** **CIWQS** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 4 of 8 in cluster C**

**Relative:**
**Higher**

**Actual:**
**696 ft.**

ENF:

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8185 EDISON |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 204958 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.99581 |
| Place Longitude: | -117.62694 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Not reported |
| Facility Waste Type 2: | Not reported |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | Not reported |
| Reg Measure Type: | Not reported |
| Region: | Not reported |
| Order #: | Not reported |
| Npdes# CA#: | Not reported |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Not reported |

**LEGEND DAIRY FARMS - 8185 EDISON (Continued)** **S130549994**

| | |
|---|---|
| Status Date: | Not reported |
| Effective Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | Not reported |
| Fee Code: | Not reported |
| Direction/Voice: | Not reported |
| Enforcement Id(EID): | 451378 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Notice of Violation |
| Effective Date: | 2023-02-07 |
| Adoption/Issuance Date: | 02/07/2023 |
| Achieve Date: | Not reported |
| Termination Date: | 2023-03-10 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | NOV 02/07/2023 for Southwest Dairy Inc |
| Description: | Not reported |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8185 EDISON |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 204958 |
| Agency Name: | Alewyn, Jack |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.99581 |
| Place Longitude: | -117.62694 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |

**LEGEND DAIRY FARMS - 8185 EDISON (Continued)** **S130549994**

| | |
|---|---|
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | 8 365533001 |
| Reg Measure Id: | 211688 |
| Reg Measure Type: | Enrollee |
| Region: | Not reported |
| Order #: | R8-2013-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 2013-12-23 00:00:00 |
| Effective Date: | 03/08/1985 |
| Expiration/Review Date: | 2018-06-01 00:00:00 |
| Termination Date: | 12/18/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 343972 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 2008-02-27 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 2008-02-27 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |

**LEGEND DAIRY FARMS - 8185 EDISON (Continued)** **S130549994**

| | |
|---|---|
| Status: | Historical |
| Title: | Oral Comm 02/27/2008 |
| Description: | Oral Communication |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

CIWQS:

| | |
|---|---|
| Name: | Legend Dairy Farms - 8185 Edison |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Southwest Dairy Inc |
| Agency Address: | 8185 Edison Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366043001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 08/31/2021 |
| Termination Date: | 05/13/2022 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99581 |
| Longitude: | -117.62694 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8185 Edison |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Craig Gordon |
| Agency Address: | 2915 Kings River Lane, Ontario, CA 91761 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366007001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |

**LEGEND DAIRY FARMS - 8185 EDISON (Continued)** **S130549994**

| | |
|---|---|
| Effective Date: | 10/07/2013 |
| Termination Date: | 06/01/2021 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99581 |
| Longitude: | -117.62694 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8185 Edison |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Alewyn, Jack |
| Agency Address: | 9031 Eucalyptus Avenue, Ontario, CA 91762-7515 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 85-038 |
| WDID: | 8 365533001 |
| NPDES Number: | Not reported |
| Adoption Date: | 03/08/1985 |
| Effective Date: | 03/08/1985 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/04/2000 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99581 |
| Longitude: | -117.62694 |

---

**C15** **SOUTHWEST DAIRY INC** **CERS** **S127998773**
**8185 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 5 of 8 in cluster C**

**Relative: Higher**

**Actual: 696 ft.**

CERS:

| | |
|---|---|
| Name: | SOUTHWEST DAIRY INC |
| Address: | 8185 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 120257 |
| CERS ID: | 204958 |
| CERS Description: | Animal Wastewater Discharge |

Violations:

| | |
|---|---|
| Site ID: | 120257 |
| Site Name: | Southwest Dairy Inc |
| Violation Date: | 01-16-2023 |
| Citation: | California Water Code |

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

Violation Description: Not reported
Violation Notes: Failure to submit a complete 2022 Annual Report by the 1/15/2023 deadline.
Violation Division: Water Boards
Violation Program: ANIWSTCOWS
Violation Source: CIWQS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-16-2011
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-27-1997
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-28-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-07-2020
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-14-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-23-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-28-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-23-2008
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Initial Site Inspection
Eval Date: 12-09-2014
Violations Found: No
Eval Type: Prerequirement inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Initial Site Inspection
Eval Date: 01-13-2016
Violations Found: No
Eval Type: Prerequirement inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-26-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-08-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-21-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-17-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-26-2018
Violations Found: No
Eval Type: AGT SPCC inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-04-1988
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-14-1998
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-21-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

Eval Date: 11-03-2009
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-08-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-13-2007
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 120257
Site Name: Southwest Dairy Inc
Site Address: 8185 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 02-07-2023
Enf Action Type: Notice of Violation (Water)
Enf Action Description: Notice of Violation Letter (Informal)
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Site ID: 120257
Site Name: Southwest Dairy Inc
Site Address: 8185 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 02-27-2008
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Affiliation:
Affiliation Type Desc: Operator
Entity Name: Craig Gordon

**SOUTHWEST DAIRY INC (Continued)** **S127998773**

| | |
|---|---|
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Land Owner |
| Entity Name: | Alewyn, Jack |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Operator |
| Entity Name: | Southwest Dairy Inc |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**C16** **GORDON DAIRY #7** **ECHO** **1025487484**
**8185 EDISON** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 6 of 8 in cluster C**

**Relative:** **Higher**
**Actual:** **696 ft.**

ECHO:

| | |
|---|---|
| Envid: | 1025487484 |
| Registry ID: | 110064884086 |
| | |
| DFR URL: | |
| Name: | GORDON DAIRY #7 |
| Address: | 8185 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |

---

**C17** **JACK ALEWYN DAIRY** **ENF** **S104761888**
**8185 EDISON BLVD** **San Bern. Co. Permit** **N/A**
**< 1/8** **ONTARIO, CA 91761**
**1 ft.**

**Site 7 of 8 in cluster C**

**Relative:** **Higher**
**Actual:** **696 ft.**

ENF:

| | |
|---|---|
| Name: | GORDON DAIRY #7 |
| Address: | 8185 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 204958 |

**JACK ALEWYN DAIRY (Continued)** **S104761888**

| | |
|---|---|
| Agency Name: | Alewyn, Jack |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.99581 |
| Place Longitude: | -117.62694 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365533001 |
| Reg Measure Id: | 211688 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 12/23/2013 |
| Effective Date: | 03/08/1985 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 12/18/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |

**JACK ALEWYN DAIRY (Continued)** **S104761888**

| | |
|---|---|
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 343972 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 02/27/2008 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 02/27/2008 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm 02/27/2008 |
| Description: | Oral Communication |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | JACK ALEWYN DAIRY |
| Address: | 8185 EDISON BLVD |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000508 |
| Owner: | JACK & ELANE ALEWYN |
| Permit Number: | PT0003498 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2008 |

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**D18** **GORDON DAIRY #3** **ENF** **S108536445**
**14213 BON VIEW AVENUE** **San Bern. Co. Permit** **N/A**
**< 1/8** **ONTARIO, CA 91762** **CIWQS**
**1 ft.** **CERS**

**Site 1 of 8 in cluster D**

**Relative:**
**Lower**

**Actual:**
**684 ft.**

ENF:

| | |
|---|---|
| Name: | GORDON DAIRY #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 229393 |
| Agency Name: | Miersma, Ronald |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| # Of Agencies: | 1 |
| Place Latitude: | 33.99491 |
| Place Longitude: | -117.63565 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365857001 |
| Reg Measure Id: | 211818 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 2000 |
| Status: | Historical |
| Status Date: | 01/18/2013 |
| Effective Date: | 11/01/2000 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 01/17/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 383854 |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Third Party Action |
| Effective Date: | 09/26/2011 |
| Adoption/Issuance Date: | 09/26/2011 |
| Achieve Date: | Not reported |
| Termination Date: | 12/31/2011 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Administrative Order Issued by EPA on 09/26/2011 for Miersma, Ronald |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | 12/31/2011 |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | GORDON DAIRY #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 229393 |
| Agency Name: | Miersma, Ronald |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.99491 |
| Place Longitude: | -117.63565 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365857001 |
| Reg Measure Id: | 211818 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 2000 |
| Status: | Historical |
| Status Date: | 01/18/2013 |
| Effective Date: | 11/01/2000 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 01/17/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 344954 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 02/06/2008 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 02/06/2008 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Communication - 2/6/2008 |
| Description: | Oral Communication |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

**GORDON DAIRY #3 (Continued)** **S108536445**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | H & R DAIRY |
| Address: | 14213 BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0010971 |
| Owner: | RON MIERSMA |
| Permit Number: | PT0018909 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2012 |

| | |
|---|---|
| Name: | COSTA, DIMAS |
| Address: | 14213 BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000395 |
| Owner: | COSTA, DIMAS |
| Permit Number: | PT0008929 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | COSTA, DIMAS |
| Address: | 14213 BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000395 |
| Owner: | COSTA, DIMAS |
| Permit Number: | PT0008930 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

CIWQS:

| | |
|---|---|
| Name: | Gordon Dairy #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Craig Gordon |
| Agency Address: | 2915 Kings River Lane, Ontario, CA 91761 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366001001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/31/2013 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99491 |
| Longitude: | -117.63565 |

| | |
|---|---|
| Name: | Gordon Dairy #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Costa, Dimas |
| Agency Address: | 14451 Bon View Avenue, Chino, CA 91710 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | NPDES Permit |
| Order Number: | 90-046 |
| WDID: | 8 365692001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | 04/13/1990 |
| Effective Date: | 04/13/1990 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 04/09/2005 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99491 |
| Longitude: | -117.63565 |

| | |
|---|---|
| Name: | Gordon Dairy #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Rocha, Joe |
| Agency Address: | 514 West Philadelphia Street, Ontario, CA 91762-6443 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 90-04601 |
| WDID: | 8 365433001 |
| NPDES Number: | Not reported |
| Adoption Date: | 04/13/1990 |
| Effective Date: | 04/13/1990 |
| Termination Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Design Flow: | 0.0001 |
| Major/Minor: | Not reported |
| Complexity: | C |
| TTWQ: | 3 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Latitude: | 33.99491 |
| Longitude: | -117.63565 |

| | |
|---|---|
| Name: | Gordon Dairy #3 |
| Address: | 14213 BON VIEW AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Miersma, Ronald |
| Agency Address: | 14451 Bon View Avenue, Ontario, CA 91762-7978 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee |
| Order Number: | R8-2007-0001 |
| WDID: | 8 365857001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 11/01/2000 |
| Termination Date: | 01/17/2013 |
| Expiration/Review Date: | 09/06/2012 |
| Design Flow: | 0 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99491 |
| Longitude: | -117.63565 |

CERS:

| | |
|---|---|
| Name: | SOUTHWEST DAIRY INC. |
| Address: | 14213 BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 33989 |
| CERS ID: | 10444234 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 03-25-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 04/09/2019. OBSERVATION: Observed Pre and Post teat dip tanks at 330 gallons each that were not listed on the hazardous materials inventory via CERS. CORRECTIVE ACTION: Update the inventory via CERS by adding (1) 330-gallon tank of pre teat dip and (1) 330-gallon tank of post teat dip. Submit a signed document stating that the inventory has been updated. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 03-25-2019 |
| Citation: | Un-Specified |
| Violation Description: | Hazardous Waste Generator Program - Administration/Documentation - General Local Ordinance |
| Violation Notes: | Returned to compliance on 04/09/2019. OBSERVATION: Observed (1) 55-gallon drum of used oil. CORRECTIVE ACTION: Obtain hazardous waste generator permit. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HW |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 03-25-2019 |
| Citation: | HSC 6.5 25123.3(h)(1) - California Health and Safety Code, Chapter 6.5, Section(s) 25123.3(h)(1) |
| Violation Description: | Failure to send hazardous waste offsite for treatment, storage, or disposal within 180 days (or 270 days if waste is transported over 200 miles) for a generator who generates less than 1000 kilogram per month if all of the following conditions are met: (1) The quantity of hazardous waste accumulated onsite never exceeds 6,000 kilograms. (2) The generator complies with the requirements of 40 Code of Federal Regulations section 262.34(d), (e) and (f). (3) The generator does not hold acutely hazardous waste or extremely hazardous waste in an amount greater than one kilogram for more than 90 days. |
| Violation Notes: | Returned to compliance on 04/09/2019. OBSERVATION: Observed (1) unlabeled 55-gallon drum of used oil and (1) 55-gallon drum of unknown waste. CORRECTIVE ACTION: Have waste hauled off site by a certified hauler and submit a copy of waste manifest along with a signed statement stating that the waste has been removed. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HW |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 05-04-2022 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 06/30/2022. OBSERVATION: Observed the hazardous materials business plan to not be electronically submitted or certified annually. CORRECTIVE ACTION: Ensure to electronically submit a hazardous materials business plan annually. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 33989 |
| Site Name: | Southwest Dairy Inc. |
| Violation Date: | 12-09-2015 |
| Citation: | HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d) |

**GORDON DAIRY #3 (Continued)** **S108536445**

Violation Description: Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 11/22/2016. The business plan was last submitted on 4/30/15 to the CERS website. Update and submit the plan within 30 days to meet annual submission requirements.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-25-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-04-2022
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-09-2015
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Routine inspection
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-25-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Enforcement Action:
Site ID: 33989
Site Name: Southwest Dairy Inc.
Site Address: 14213 BON VIEW AVE
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 12-09-2015
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Enf Action Notes: | Not reported |
| Enf Action Division: | San Bernardino County Fire Department |
| Enf Action Program: | HMRRP |
| Enf Action Source: | CERS, |

Coordinates:

| | |
|---|---|
| Site ID: | 33989 |
| Facility Name: | Southwest Dairy Inc. |
| Env Int Type Code: | HMBP |
| Program ID: | 10444234 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Center of a facility or station., |
| Latitude: | 33.994910 |
| Longitude: | -117.635640 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 14213 Bon View Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Daric Ameye |
| Entity Title: | Owner/Operator |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | Daric Ameye |
| Entity Title: | Not reported |
| Affiliation Address: | 14213 Bon View Ave |
| Affiliation City: | Ontario |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | (909) 754-4642, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Daric Ameye |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (909) 754-4642, |

**GORDON DAIRY #3 (Continued)** **S108536445**

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Daric Ameye |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | Southwest Dairy Inc. |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

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**D19** **SOUTHWEST DAIRY** **San Bern. Co. Permit** **S112833937**
**14213 S BON VIEW AVE** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 2 of 8 in cluster D**

**Relative:**
**Lower**

**Actual:**
**683 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | SOUTHWEST DAIRY |
| Address: | 14213 S BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0014875 |
| Owner: | GORDON, CRAIG |
| Permit Number: | PT0025907 |
| Permit Category: | HAZARDOUS MATERIALS 4-10 CHEMICALS |
| Facility Status: | ACTIVE |
| Expiration Date: | 01/31/2025 |

| | |
|---|---|
| Name: | SOUTHWEST DAIRY |
| Address: | 14213 S BON VIEW AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0014875 |
| Owner: | GORDON, CRAIG |
| Permit Number: | PT0039413 |
| Permit Category: | HAZWASTE GENERAL ACTIVITY (NB) |
| Facility Status: | INACTIVE |

**SOUTHWEST DAIRY (Continued)** **S112833937**

Expiration Date: 01/31/2020

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**D20** **H & R DAIRY - BON VIEW** **WDS** **S105257098**
**14213 BON VIEW AVE** **N/A**
**< 1/8** **CHINO, CA 0**
**1 ft.**

**Site 3 of 8 in cluster D**

**Relative:** **Lower**
**Actual:** **683 ft.**

WDS:

| | |
|---|---|
| Name: | H & R DAIRY - BON VIEW |
| Address: | 14213 BON VIEW AVE |
| City: | CHINO |
| Facility ID: | Santa Ana River 365857001 |
| Facility Type: | Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this category. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | CAG018001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board |
| Subregion: | 8 |
| Facility Telephone: | 9096062996 |
| Facility Contact: | RON MIERSMA |
| Agency Name: | MIERSMA RONALD |
| Agency Address: | 6828 ARCHIBALD |
| Agency City,St,Zip: | CORONA 91720 |
| Agency Contact: | RONALD MIERSMA |
| Agency Telephone: | 9096062996 |
| Agency Type: | Private |
| SIC Code: | 241 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Primary Waste: | STORMS |
| Waste Type2: | D |
| Waste2: | Stormwater Runoff |
| Primary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Secondary Waste: | Solid Wastes |
| Secondary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | No reclamation requirements associated with this facility. |
| POTW: | The facility is not a POTW. |
| Treat To Water: | Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance |

**H & R DAIRY - BON VIEW (Continued)** **S105257098**

from a waste treatment facility.

Complexity: Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

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**D21** **GORDON DAIRY #3** **CERS** **S123499836**
**14213 BON VIEW** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 4 of 8 in cluster D**

**Relative: Lower**
**Actual: 684 ft.**

CERS:

| | |
|---|---|
| Name: | GORDON DAIRY #3 |
| Address: | 14213 BON VIEW |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 120256 |
| CERS ID: | 229393 |
| CERS Description: | Animal Wastewater Discharge |

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Followup Inspection |
| Eval Date: | 02-07-2012 |
| Violations Found: | No |
| Eval Type: | Follow-up inspection (enforcement) |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 02-23-1988 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 08-03-2016 |
| Violations Found: | No |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 10-10-2007 |
| Violations Found: | Yes |
| Eval Type: | RWQCB Type B compliance inspection |
| Eval Notes: | Not reported |
| Eval Division: | Water Boards |
| Eval Program: | ANIWSTCOWS |
| Eval Source: | CIWQS, |

**GORDON DAIRY #3 (Continued)** **S123499836**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-03-2009
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-13-1998
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-22-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-29-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-12-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-09-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-23-2010
Violations Found: No

**GORDON DAIRY #3 (Continued)** **S123499836**

Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-26-2014
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-16-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-26-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-20-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-17-2011
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-23-2018
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards

**GORDON DAIRY #3 (Continued)** **S123499836**

Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-02-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-17-1991
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 120256
Site Name: Gordon Dairy #3
Site Address: 14213 BON VIEW
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 02-06-2008
Enf Action Type: Oral Communication
Enf Action Description: Oral Communication
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Site ID: 120256
Site Name: Gordon Dairy #3
Site Address: 14213 BON VIEW
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 09-26-2011
Enf Action Type: Third Party Action
Enf Action Description: Third Party Action
Enf Action Notes: Not reported
Enf Action Division: Water Boards
Enf Action Program: ANIWSTCOWS
Enf Action Source: CIWQS,

Affiliation:
Affiliation Type Desc: Owner and Operator
Entity Name: Craig Gordon
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported

**GORDON DAIRY #3 (Continued)** **S123499836**

Affiliation Zip: Not reported
Affiliation Phone: ,

---

**D22** **H & R DAIRY** **FINDS** **1014869496**
**14213 BON VIEW AVENUE** **ECHO** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 5 of 8 in cluster D**

**Relative:**
**Lower**

**Actual:**
**684 ft.**

FINDS:
Registry ID: 110044231836

Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The Integrated Compliance Information System (ICIS) provides a database that, when complete, will contain integrated enforcement and compliance information across most of EPA's programs. The vision for ICIS is to replace EPA's independent databases that contain enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions and a subset of the Permit Compliance System (PCS), which supports the National Pollutant Discharge Elimination System (NPDES). This information is maintained in ICIS by EPA in the Regional offices and it at Headquarters. A future release of ICIS will completely replace PCS and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities that support compliance and enforcement programs, including incident tracking, compliance assistance, and compliance monitoring.
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
Envid: 1014869496
Registry ID: 110044231836

DFR URL:
Name: H & R DAIRY
Address: 14213 BON VIEW AVENUE
City,State,Zip: ONTARIO, CA 91762

**D23** **GORDON DAIRY #3** **FINDS** **1023346381**
**14213 BON VIEW** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 6 of 8 in cluster D**

**Relative:** FINDS:
**Lower** Registry ID: 110066423604

**Actual:**
**684 ft.** Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The National Pollutant Discharge Elimination System (NPDES) module of the Integrated Compliance Information System (ICIS). Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different systems managed within CalEPA. The five systems are: California Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

---

**D24** **GORDON DAIRY #3** **ECHO** **1025898597**
**14213 BON VIEW** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 7 of 8 in cluster D**

**Relative:** ECHO:
**Lower** Envid: 1025898597
Registry ID: 110066423604

**Actual:**
**684 ft.**

DFR URL:
Name: GORDON DAIRY #3
Address: 14213 BON VIEW
City,State,Zip: ONTARIO, CA 91762

---

**D25** **GORDON HAY INC DAIRY #3** **FINDS** **1023339497**
**14213 BON VIEW AVE** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**1 ft.**

**Site 8 of 8 in cluster D**

**Relative:** FINDS:
**Lower** Registry ID: 110066348713

**Actual:**
**684 ft.** Click Here for FRS Facility Detail Report:

Environmental Interest/Information System:
The California Environmental Protection Agency (CalEPA) has recently implemented a new data warehouse system (nSite). This data warehouse combines and merges facility and site information from five different

**GORDON HAY INC DAIRY #3 (Continued)** **1023339497**

systems managed within CalEPA. The five systems are: California Environmental Reporting System (CERS),EnviroStor, GeoTracker, California Integrated Water Quality System (CIWQS), andToxic Release Inventory (TRI).

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

---

**26**
**WNW**
**< 1/8**
**0.002 mi.**
**9 ft.**

**G H DAIRY #4B**
**7721 EDISON AVENUE**
**ONTARIO, CA 91762**

**ENF** **S104761802**
**San Bern. Co. Permit** **N/A**
**CIWQS**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

ENF:

| | |
|---|---|
| Name: | G H DAIRY #4B |
| Address: | 7721 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | 8 |
| Facility Id: | 226776 |
| Agency Name: | Bootsma, Garret |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997675 |
| Place Longitude: | -117.63613 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | 112112 |
| NAICS Desc 1: | Cattle Feedlots |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365290001 |
| Reg Measure Id: | 211627 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |

**G H DAIRY #4B (Continued)** **S104761802**

| | |
|---|---|
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 09/09/2016 |
| Effective Date: | 09/09/1999 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 08/23/2016 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 343844 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 02/26/2008 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 09/08/2009 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral comm - 2/26/2008 |
| Description: | Oral communication |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | G BOOTSMA & SON'S |
| Address: | 7721 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000454 |
| Owner: | BOOTSMA, GARRET |
| Permit Number: | PT0008932 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/2010 |

**G H DAIRY #4B (Continued)** **S104761802**

| | |
|---|---|
| Name: | G BOOTSMA & SON'S |
| Address: | 7721 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000454 |
| Owner: | BOOTSMA, GARRET |
| Permit Number: | PT0008931 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/2010 |

CIWQS:

| | |
|---|---|
| Name: | G H Dairy #4b |
| Address: | 7721 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Hettinga, Gerben |
| Agency Address: | 14651 South Grove Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTGRZ |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2013-0001 |
| WDID: | 8 366028001 |
| NPDES Number: | Not reported |
| Adoption Date: | Not reported |
| Effective Date: | 10/06/2016 |
| Termination Date: | 08/23/2019 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997675 |
| Longitude: | -117.63613 |

| | |
|---|---|
| Name: | G H Dairy #4b |
| Address: | 7721 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Bootsma, Garret |
| Agency Address: | 7721 Edison Avenue, Chino, CA 91710 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS, WDR |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee |
| Order Number: | R8-2013-0001 |
| WDID: | 8 365290001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 09/09/1999 |
| Termination Date: | 08/23/2016 |
| Expiration/Review Date: | 06/01/2018 |

**G H DAIRY #4B (Continued)** **S104761802**

| | |
|---|---|
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997675 |
| Longitude: | -117.63613 |

---

**27**
**East**
**< 1/8**
**0.002 mi.**
**10 ft.**

**LEGEND DAIRY FARMS - 8381 EDISON**
**8381 EDISON AVENUE**
**ONTARIO, CA 91762**

**AST** **S108536473**
**ENF** **N/A**
**San Bern. Co. Permit**
**CIWQS**
**CERS**

**Relative:**
**Higher**

**Actual:**
**698 ft.**

AST:

| | |
|---|---|
| Name: | MICHAEL DEHOOG DAIRY |
| Address: | 8381 EDISON AVE |
| City/Zip: | ONTARIO,91762 |
| Certified Unified Program Agencies: | Not reported |
| Owner: | MICHAEL DEHOOG DAIRY |
| Total Gallons: | Not reported |
| CERSID: | 10034761 |
| Facility ID: | FA0000565 |
| Business Name: | MICHAEL DEHOOG DAIRY |
| Phone: | (909) 947-0944 |
| Fax: | (909) 947-0944 |
| Mailing Address: | 8381 EDISON AVE |
| Mailing Address City: | ONTARIO |
| Mailing Address State: | CA |
| Mailing Address Zip Code: | 91762 |
| Operator Name: | Joe DeHoog |
| Operator Phone: | (909) 815-7074 |
| Owner Phone: | (909) 947-0944 |
| Owner Mail Address: | 8381 EDISON AV |
| Owner State: | CA |
| Owner Zip Code: | 91762 |
| Owner Country: | United States |
| Property Owner Name: | Not reported |
| Property Owner Phone: | Not reported |
| Property Owner Mailing Address: | Not reported |
| Property Owner City: | Not reported |
| Property Owner Stat : | Not reported |
| Property Owner Zip Code: | Not reported |
| Property Owner Country: | Not reported |
| EPAID: | Not reported |

ENF:

| | |
|---|---|
| Name: | MICHAEL DE HOOG DAIRY |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 12/24/2013 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Enforcement Id(EID): | 347354 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 09/10/1982 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 09/10/1982 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm... |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8381 EDISON |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | De Hoog, Michael |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | 8 365379001 |
| Reg Measure Id: | 211660 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | Not reported |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 1 |
| Status: | Historical |
| Status Date: | 2024-01-08 00:00:00 |
| Effective Date: | 09/10/1982 |
| Expiration/Review Date: | 2024-03-15 00:00:00 |
| Termination Date: | 01/04/2024 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | 2019-07-15 00:00:00 |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 15 - WDRs pending rescission |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 223705 |
| Region: | Not reported |
| Order / Resolution Number: | 90-065 |
| Enforcement Action Type: | Admin Civil Liability |
| Effective Date: | 1990-04-09 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 1990-04-16 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | ACLC 90-065 for Michael De Hoog |
| Description: | 13385 - ENTIRE ASSESSMENT SUSPENDED PROVIDED THAT WASTE MANAGEMENT PLAN IS IMPLEMENTED BY 10/10/90. |
| Program: | Not reported |
| Latest Milestone Completion Date: | 1990-04-16 00:00:00 |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | 10000 |
| Initial Assessed Amount: | 10000 |
| Liability $ Amount: | Not reported |
| Project $ Amount: | 10000 |
| Liability $ Paid: | Not reported |
| Project $ Completed: | 10000 |
| Total $ Paid/Completed Amount: | 10000 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8381 EDISON |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | De Hoog, Michael |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | 8 365379001 |
| Reg Measure Id: | 211660 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | Not reported |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 1 |
| Status: | Historical |
| Status Date: | 2024-01-08 00:00:00 |
| Effective Date: | 09/10/1982 |
| Expiration/Review Date: | 2024-03-15 00:00:00 |
| Termination Date: | 01/04/2024 |
| WDR Review - Amend: | Not reported |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| WDR Review - Revise/Renew: | 2019-07-15 00:00:00 |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 15 - WDRs pending rescission |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391900 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 2012-08-09 |
| Adoption/Issuance Date: | 08/09/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 2012-08-09 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/09/2012 for De Hoog, Michael |
| Description: | Not reported |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

| | |
|---|---|
| Name: | MICHAEL DE HOOG DAIRY |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | De Hoog, Michael |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365379001 |
| Reg Measure Id: | 211660 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | 8 |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 1 |
| Status: | Active |
| Status Date: | 07/16/2019 |
| Effective Date: | 09/10/1982 |
| Expiration/Review Date: | 03/15/2024 |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391900 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/09/2012 |
| Adoption/Issuance Date: | 08/09/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/09/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/09/2012 for De Hoog, Michael |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | MICHAEL DE HOOG DAIRY |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | De Hoog, Michael |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365379001 |
| Reg Measure Id: | 211660 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | 8 |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 1 |
| Status: | Active |
| Status Date: | 07/16/2019 |
| Effective Date: | 09/10/1982 |
| Expiration/Review Date: | 03/15/2024 |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 223705 |
| Region: | 8 |
| Order / Resolution Number: | 90-065 |
| Enforcement Action Type: | Admin Civil Liability |
| Effective Date: | 04/09/1990 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 04/16/1990 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | ACLC 90-065 for Michael De Hoog |
| Description: | 13385 - ENTIRE ASSESSMENT SUSPENDED PROVIDED THAT WASTE MANAGEMENT PLAN IS IMPLEMENTED BY 10/10/90. |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | 4/16/1990 |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 10000 |
| Initial Assessed Amount: | 10000 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 10000 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 10000 |
| Total $ Paid/Completed Amount: | 10000 |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS - 8381 EDISON |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 240561 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997391 |
| Place Longitude: | -117.622865 |
| SIC Code 1: | 241 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | Not reported |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 2013-12-24 00:00:00 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 2012-09-06 00:00:00 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 347354 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 1982-09-10 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 1982-09-10 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Comm... |
| Description: | Not reported |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS |
| Address: | 8381 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000565 |
| Owner: | Ronald C. Pietersma |
| Permit Number: | PT0003791 |
| Permit Category: | HAZARDOUS MATERIALS 4-10 CHEMICALS |
| Facility Status: | ACTIVE |
| Expiration Date: | 12/31/2024 |

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS |
| Address: | 8381 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000565 |
| Owner: | Ronald C. Pietersma |
| Permit Number: | PT0032862 |
| Permit Category: | APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT |
| Facility Status: | INACTIVE |
| Expiration Date: | 12/31/2022 |

CIWQS:

| | |
|---|---|
| Name: | Legend Dairy Farms - 8381 Edison |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | De Hoog, Michael |
| Agency Address: | 8381 Edison. Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 82-239 |
| WDID: | 8 365379001 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| NPDES Number: | Not reported |
| Adoption Date: | 09/10/1982 |
| Effective Date: | 09/10/1982 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 09/06/1997 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997391 |
| Longitude: | -117.622865 |

| | |
|---|---|
| Name: | Legend Dairy Farms - 8381 Edison |
| Address: | 8381 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Ronald Pietersma |
| Agency Address: | Po Box 2500, Chino, CA 91708 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366047001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/11/2024 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997391 |
| Longitude: | -117.622865 |

| | |
|---|---|
| Name: | Michael De Hoog Dairy |
| Address: | 8381 EDISON |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Michael DeHoog Dairy |
| Agency Address: | 8381 Edison Ave, Chino, CA 91710 |
| Place/Project Type: | Industrial |
| SIC/NAICS: | Not reported |
| Region: | 8 |
| Program: | INDSTW |
| Regulatory Measure Status: | Terminated |
| Regulatory Measure Type: | Storm water industrial |
| Order Number: | 2014-0057-DWQ |
| WDID: | 8 36I006432 |
| NPDES Number: | CAS000001 |
| Adoption Date: | Not reported |
| Effective Date: | 04/24/1992 |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Termination Date: | 03/14/2000 |
| Expiration/Review Date: | Not reported |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99775 |
| Longitude: | -117.62196 |

CERS:

| | |
|---|---|
| Name: | LEGEND DAIRY FARMS |
| Address: | 8381 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 134851 |
| CERS ID: | 10034761 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 10-11-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material. |
| Violation Notes: | Returned to compliance on 08/10/2020. OBSERVATION: This facility has not submitted a complete emergency response plan to CERS. Stored at facility is not a valid option for the training plan. CORRECTIVE ACTION: Submit a signed statement that a complete emergency response plan and training plan have been submitted to CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 10-11-2019 |
| Citation: | HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan. |
| Violation Notes: | Returned to compliance on 07/17/2020. OBSERVATION: At the time of the inspection, hazardous materials were observed on site that were not listed on the current CERS inventory or were listed in lesser quantities. CORRECTIVE ACTION: Submit a signed statement that the inventory has been updated via CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 08-26-2016 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. |
| Violation Notes: | Returned to compliance on 08/10/2020. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 07-28-2017 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 08/10/2020. NON INSPECTION RELATED VIOLATION |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 10-11-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. |
| Violation Notes: | Returned to compliance on 08/10/2020. OBSERVATION: The last business plan update submitted by this facility via CERS was dated 8/26/2017. CORRECTIVE ACTION: Submit a signed statement that the business plan has been updated via CERS. Your CERS ID number is 10034761. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 134851 |
| Site Name: | Legend Dairy Farms |
| Violation Date: | 10-28-2022 |
| Citation: | HSC 6.95 25508(a)(3) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(3) |
| Violation Description: | Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 11/17/2022. OBSERVATION: At the time of the inspection, the inventory observed on site was not consistent with that reported to CERS. CORRECTIVE ACTION: Ensure a complete and accurate Hazardous Materials Business Plan is submitted to CERS. Sign and return the Certificate of Compliance to the inspector within 30 days of the inspection indicating the Hazardous Materials Inventory is complete and accurate. |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 134851
Site Name: Legend Dairy Farms
Violation Date: 08-26-2016
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 08/10/2020.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-11-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 07-28-2017
Violations Found: Yes
Eval Type: Other, not routine, done by local agency
Eval Notes: CERS ENFORCEMENT PROJECT
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 07-28-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-26-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-MICHAEL DEHOOG DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-28-2022
Violations Found: Yes

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Other/Unknown
Eval Date: 07-28-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: CERS Enforcement Project Enter Violation
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-26-2016
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: ROUTINE APSA INSPECTION-MICHAEL DEHOOG DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Enforcement Action:
Site ID: 134851
Site Name: Legend Dairy Farms
Site Address: 8381 EDISON AVE
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 08-26-2016
Enf Action Type: Notice of Violation (Unified Program)
Enf Action Description: Notice of Violation Issued by the Inspector at the Time of Inspection
Enf Action Notes: Not reported
Enf Action Division: San Bernardino County Fire Department
Enf Action Program: HMRRP
Enf Action Source: CERS,

Coordinates:
Site ID: 134851
Facility Name: Legend Dairy Farms
Env Int Type Code: HMBP
Program ID: 10034761
Coord Name: Not reported
Ref Point Type Desc: Unknown,
Latitude: 33.991390
Longitude: -117.622559

Affiliation:
Affiliation Type Desc: Operator
Entity Name: RONALD C. PIETERSMA
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (909) 225-7672, |
| | |
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |
| | |
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Tina C. Reyes |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | PO Box 2500 |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91708 |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Ronald C. Pietersma |
| Entity Title: | Owner |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | RONALD C. PIETERSMA |
| Entity Title: | Not reported |
| Affiliation Address: | PO Box 2500 |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91708 |
| Affiliation Phone: | (909) 225-7672, |
| | |
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | LEGEND DAIRY FARMS |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Environmental Contact
Entity Name: RONALD C. PIETERSMA
Entity Title: Not reported
Affiliation Address: PO Box 2500
Affiliation City: Chino
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 91708
Affiliation Phone: ,

Affiliation Type Desc: Property Owner
Entity Name: Ronald C. Pietersma
Entity Title: Not reported
Affiliation Address: PO Box 2500
Affiliation City: Chino
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 91708
Affiliation Phone: (909) 225-7672,

Name: LEGEND DAIRY FARMS
Address: 8381 EDISON
City,State,Zip: ONTARIO, CA 91762
Site ID: 134850
CERS ID: 240561
CERS Description: Animal Wastewater Discharge

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-10-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-20-1990
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-09-2012
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-05-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-07-2011
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-05-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-1997
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-27-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-31-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-31-2019
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-03-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-16-2011
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-29-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-23-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-12-2014
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Other/Unknown
Eval Date: 08-22-2000
Violations Found: No

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval Type: Miscellaneous Inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-30-2018
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-18-2003
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-19-1997
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-22-2017
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-26-2007
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-10-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-10-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-03-1987
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-26-2007
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-01-2009
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-18-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 134850
Site Name: Legend Dairy Farms
Site Address: 8381 EDISON
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 04-09-1990
Enf Action Type: Administrative Enforcement with Penality
Enf Action Description: Administrative Enforcement with Civil Liability (Penality)

**LEGEND DAIRY FARMS - 8381 EDISON (Continued)** **S108536473**

| | |
|---|---|
| Enf Action Notes: | Not reported |
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |

| | |
|---|---|
| Site ID: | 134850 |
| Site Name: | Legend Dairy Farms |
| Site Address: | 8381 EDISON |
| Site City: | ONTARIO |
| Site Zip: | 91762 |
| Enf Action Date: | 08-09-2012 |
| Enf Action Type: | Oral Communication |
| Enf Action Description: | Oral Communication |
| Enf Action Notes: | Not reported |
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |

| | |
|---|---|
| Site ID: | 134850 |
| Site Name: | Legend Dairy Farms |
| Site Address: | 8381 EDISON |
| Site City: | ONTARIO |
| Site Zip: | 91762 |
| Enf Action Date: | 09-10-1982 |
| Enf Action Type: | Oral Communication |
| Enf Action Description: | Oral Communication |
| Enf Action Notes: | Not reported |
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Ronald Pietersma |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**E28** **AG-TWIN PALM DAIRY** **UST** **U003785069**
**West** **7587 EDISON AVE** **N/A**
**< 1/8** **CHINO, CA 91762**
**0.007 mi.**
**39 ft.** **Site 1 of 3 in cluster E**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

UST:

| | |
|---|---|
| Name: | AG-TWIN PALM DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | CHINO, CA 91762 |
| Facility ID: | 88015451 |
| Permitting Agency: | SAN BERNARDINO COUNTY |
| CERSID: | Not reported |
| Latitude: | 33.997087 |

**AG-TWIN PALM DAIRY (Continued)** **U003785069**

| | |
|---|---|
| Longitude: | -117.637638 |
| Owner type: | Not reported |
| Facility type: | Not reported |
| Num of inuse ust: | Not reported |
| Num of closed ust: | Not reported |
| Num of oos ust: | Not reported |
| Epa region: | Not reported |
| Tribal lands: | Not reported |
| Tank owner name: | Not reported |
| Tank owner mailing address: | Not reported |
| Tank owner mailing city: | Not reported |
| Tank owner mailing zip: | Not reported |
| Tank owner mailing state: | Not reported |
| Tank operator name: | Not reported |
| Tank operator mailing address: | Not reported |
| Tank operator mailing city: | Not reported |
| Tank operator mailing zip: | Not reported |
| Tank operator mailing state: | Not reported |
| Tankidnumber: | Not reported |
| Tank status: | Not reported |
| Tank configuration: | Not reported |
| Tank closure date: | Not reported |
| Tank installation date: | Not reported |
| Tank num of compartments: | Not reported |
| Tank contents: | Not reported |
| Tank capacity gallons: | Not reported |
| Tank type: | Not reported |
| Tank pc construction: | Not reported |
| Tank pwpiping construction: | Not reported |
| Tank piping type: | Not reported |
| Tank piping construction: | Not reported |
| Tank sacrificial anode: | Not reported |
| Tank cp impressed current: | Not reported |
| Tank cp shutoff: | Not reported |
| Tank alarms: | Not reported |
| Tank ball float: | Not reported |
| Tank spill bucket: | Not reported |

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**E29**
**West**
**< 1/8**
**0.007 mi.**
**39 ft.**

**TIVA DAIRY**
**7587 EDISON AVE**
**ONTARIO, CA 91762**

**Site 2 of 3 in cluster E**

**EMI** **S124441617**
**San Bern. Co. Permit** **N/A**
**CERS**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

EMI:

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2019 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 189218 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 49.13675 |

**TIVA DAIRY (Continued)** **S124441617**

| | |
|---|---|
| Reactive Organic Gases Tons/Yr: | 3.93094 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.78 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.857604 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2020 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 189218 |
| Air District Name: | SC |
| SIC Code: | 2419 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 49.125 |
| Reactive Organic Gases Tons/Yr: | 3.93 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.77 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.852786 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2021 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 189218 |
| Air District Name: | SC |
| SIC Code: | 2419 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 49.13671875 |
| Reactive Organic Gases Tons/Yr: | 3.9309375 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.78 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.857604 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2022 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 189218 |
| Air District Name: | SC |
| SIC Code: | 2419 |
| Air District Name: | SOUTH COAST AQMD |

**TIVA DAIRY (Continued)** **S124441617**

Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 49
Reactive Organic Gases Tons/Yr: 3.92
Carbon Monoxide Emissions Tons/Yr: Not reported
NOX - Oxides of Nitrogen Tons/Yr: Not reported
SOX - Oxides of Sulphur Tons/Yr: Not reported
Particulate Matter Tons/Yr: 1.77
Part. Matter 10 Micrometers and Smllr Tons/Yr:0.852786

San Bern. Co. Permit:
Name: TIVA DAIRY
Address: 7587 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0011003
Owner: DICKIE VANDERMEULEN
Permit Number: PT0018968
Permit Category: HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL
Facility Status: ACTIVE
Expiration Date: 05/31/2025

Name: TIVA DAIRY
Address: 7587 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0011003
Owner: DICKIE VANDERMEULEN
Permit Number: PT0029980
Permit Category: APSA FARM/CONSTRUCTION CONDITIONALLY EXEMPT
Facility Status: INACTIVE
Expiration Date: 05/31/2020

CERS:
Name: TIVA DAIRY
Address: 7587 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Site ID: 549491
CERS ID: 10052128
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 549491
Site Name: TiVa DAIRY
Violation Date: 04-22-2016
Citation: HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d)
Violation Description: Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 05/01/2019. This facility has not submitted a Site Map or the emergency response/training plans section into CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 549491

**TIVA DAIRY (Continued)** **S124441617**

Site Name: TiVa DAIRY
Violation Date: 04-22-2016
Citation: HSC 6.95 25508.1(a)-(e) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(e)
Violation Description: Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name.
Violation Notes: Returned to compliance on 05/01/2019. Hazardous materials were observed on site during the inspection that are listed in CERS in lesser quantities. Also, a secondary emergency contact must be provided to the facility information.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 549491
Site Name: TiVa DAIRY
Violation Date: 04-22-2016
Citation: HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2
Violation Description: Failure to annually review and electronically certify that the business plan is complete, accurate, and up-to-date.
Violation Notes: Returned to compliance on 05/01/2019. The last Business Plan update submitted by this facility is dated 3/19/2013.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 549491
Site Name: TiVa DAIRY
Violation Date: 05-01-2019
Citation: HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f)
Violation Description: Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan.
Violation Notes: Returned to compliance on 07/02/2019. OBSERVATION: Facility underwent a change of ownership, and has not been reported via CERS. Facility also needs to report current inventory. CORRECTIVE ACTION: Using CERS update owner information and inventory information.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 549491
Site Name: TiVa DAIRY
Violation Date: 05-01-2019
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a business plan when

**TIVA DAIRY (Continued)** **S124441617**

storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 07/02/2019. Observation: Failure to submit Business plan via the California Environmental Reporting System (CERS). CERS Identification Number- 10052128. Corrective action: Call the CERS help line on the number provided on the beginning of this report to acquire log in information. Once information is acquired, log into CERS, and submit all required elements.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-22-2016
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: ROUTINE APSA INSPECTION-HUIZENGA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-18-2023
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-22-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-HUIZENGA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-01-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Enforcement Action:
Site ID: 549491
Site Name: TiVa DAIRY
Site Address: 7587 EDISON AVE
Site City: ONTARIO
Site Zip: 91762
Enf Action Date: 04-22-2016

**TIVA DAIRY (Continued)** **S124441617**

| | |
|---|---|
| Enf Action Type: | Notice of Violation (Unified Program) |
| Enf Action Description: | Notice of Violation Issued by the Inspector at the Time of Inspection |
| Enf Action Notes: | Not reported |
| Enf Action Division: | San Bernardino County Fire Department |
| Enf Action Program: | HMRRP |
| Enf Action Source: | CERS, |

Coordinates:

| | |
|---|---|
| Site ID: | 549491 |
| Facility Name: | TiVa DAIRY |
| Env Int Type Code: | HMBP |
| Program ID: | 10052128 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Unknown, |
| Latitude: | 33.995739 |
| Longitude: | -117.638985 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | dickie vandermeulen |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | Dickie Vander Meulen |
| Entity Title: | Not reported |
| Affiliation Address: | 14382 Bethany Ave |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91710 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | dickie vandermeulen |
| Entity Title: | Partner |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Dickie Vander Meulen |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |

**TIVA DAIRY (Continued)** **S124441617**

| | |
|---|---|
| Affiliation Phone: | (951) 202-8787, |
| | |
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 14382 Bethany Ave |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91710 |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | DICKIE VANDERMEULEN |
| Entity Title: | Not reported |
| Affiliation Address: | 14382 Bethany Ave |
| Affiliation City: | Chino |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91710 |
| Affiliation Phone: | (951) 202-8787, |
| | |
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | TIVA DAIRY |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

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**E30** **PAUL HUIZENGA DAIRY** **AST** **S108536452**
**West** **7587 EDISON AVE** **EMI** **N/A**
**< 1/8** **ONTARIO, CA 91762** **ENF**
**0.007 mi.** **CIWQS**
**39 ft.** **Site 3 of 3 in cluster E** **CERS**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

AST:

| | |
|---|---|
| Name: | HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City/Zip: | ONTARIO,91762 |
| Certified Unified Program Agencies: | Not reported |
| Owner: | PAUL HUIZENGA |
| Total Gallons: | Not reported |
| CERSID: | 10052128 |
| Facility ID: | FA0011003 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Business Name: | HUIZENGA DAIRY |
| Phone: | (909) 597-4695 |
| Fax: | Not reported |
| Mailing Address: | 7587 EDISON AVE |
| Mailing Address City: | ONTARIO |
| Mailing Address State: | CA |
| Mailing Address Zip Code: | 91762 |
| Operator Name: | Paul Huizenga Dairy |
| Operator Phone: | (909) 597-5124 |
| Owner Phone: | (909) 597-4695 |
| Owner Mail Address: | 7587 EDISON AV |
| Owner State: | CA |
| Owner Zip Code: | Not reported |
| Owner Country: | United States |
| Property Owner Name: | Not reported |
| Property Owner Phone: | Not reported |
| Property Owner Mailing Address: | Not reported |
| Property Owner City: | Not reported |
| Property Owner Stat : | Not reported |
| Property Owner Zip Code: | Not reported |
| Property Owner Country: | Not reported |
| EPAID: | Not reported |

EMI:

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2006 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 5.300601202404809619 |
| Reactive Organic Gases Tons/Yr: | 3.703 |
| Carbon Monoxide Emissions Tons/Yr: | .001 |
| NOX - Oxides of Nitrogen Tons/Yr: | .005 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.872 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .9159696 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2007 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 5.300601202404809619 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Reactive Organic Gases Tons/Yr: | 3.703 |
| Carbon Monoxide Emissions Tons/Yr: | .001 |
| NOX - Oxides of Nitrogen Tons/Yr: | .005 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.872 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .9159696 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2008 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 5.410821643286573146 |
| Reactive Organic Gases Tons/Yr: | 3.78 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.94 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .949242 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2009 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.8892069853993707 |
| Reactive Organic Gases Tons/Yr: | 6.21 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.77 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.86606099999999997 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2010 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.9450329229888297 |
| Reactive Organic Gases Tons/Yr: | 6.2489999999999997 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.792 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.87682559999999998 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2011 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.906384197 |
| Reactive Organic Gases Tons/Yr: | 6.222 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.778 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.8699754 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2012 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 7.9594904094 |
| Reactive Organic Gases Tons/Yr: | 5.5605 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.428 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.6987204 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2013 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 7.762808879 |
| Reactive Organic Gases Tons/Yr: | 5.5605 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.428 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.6987204 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2014 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 54.216125 |
| Reactive Organic Gases Tons/Yr: | 4.33729 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 2.047 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.9862446 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2015 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 49.35055736 |
| Reactive Organic Gases Tons/Yr: | 4.17849986 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.8334 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.88333212 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2016 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 44.375 |
| Reactive Organic Gases Tons/Yr: | 3.55 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.65 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.79497 |

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2017 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145237 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 45 |
| Reactive Organic Gases Tons/Yr: | 3.6 |
| Carbon Monoxide Emissions Tons/Yr: | Not reported |
| NOX - Oxides of Nitrogen Tons/Yr: | Not reported |
| SOX - Oxides of Sulphur Tons/Yr: | Not reported |
| Particulate Matter Tons/Yr: | 1.68 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.809424 |

ENF:

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 247791 |
| Agency Name: | Huizenga, Paul |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Individual |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997653 |
| Place Longitude: | -117.639275 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365368001 |
| Reg Measure Id: | 211655 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/08/2019 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 01/07/2019 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391924 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/08/2012 |
| Adoption/Issuance Date: | 08/08/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/08/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Title: | Oral Com 08/08/2012 for Huizenga, Paul |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 247791 |
| Agency Name: | Huizenga, Paul |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Individual |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997653 |
| Place Longitude: | -117.639275 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365368001 |
| Reg Measure Id: | 211655 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/08/2019 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 01/07/2019 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391901 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/08/2012 |
| Adoption/Issuance Date: | 08/08/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/08/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/08/2012 for Huizenga, Paul |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 247791 |
| Agency Name: | Huizenga, Paul |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Individual |
| # Of Agencies: | 1 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Place Latitude: | 33.997653 |
| Place Longitude: | -117.639275 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365368001 |
| Reg Measure Id: | 211655 |
| Reg Measure Type: | Enrollee |
| Region: | 8 |
| Order #: | R8-2013-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 01/08/2019 |
| Effective Date: | 05/14/1982 |
| Expiration/Review Date: | 06/01/2018 |
| Termination Date: | 01/07/2019 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | Y |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 387729 |
| Region: | 8 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/08/2012 |
| Adoption/Issuance Date: | 08/08/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/08/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/08/2012 for Huizenga, Paul |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

| | |
|---|---|
| Name: | TIVA DAIRY |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 247791 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.997653 |
| Place Longitude: | -117.639275 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |
| Status Date: | 12/24/2013 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 347339 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 05/14/1982 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 05/14/1982 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral comm.. |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

CIWQS:

| | |
|---|---|
| Name: | Tiva Dairy |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

| | |
|---|---|
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Dickie Vander Meulen |
| Agency Address: | 14382 Bethany Avenue, Chino, CA 91710 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366036001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 03/04/2019 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997653 |
| Longitude: | -117.639275 |

| | |
|---|---|
| Name: | Tiva Dairy |
| Address: | 7587 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Huizenga, Paul |
| Agency Address: | 7587 Edison Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 82-134 |
| WDID: | 8 365368001 |
| NPDES Number: | Not reported |
| Adoption Date: | 05/14/1982 |
| Effective Date: | 05/14/1982 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 05/10/1997 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997653 |
| Longitude: | -117.639275 |

CERS:

| | |
|---|---|
| Name: | PAUL HUIZENGA DAIRY |
| Address: | 7587 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |

**PAUL HUIZENGA DAIRY (Continued)** **S108536452**

Site ID: 486428
CERS ID: 110041406047
CERS Description: US EPA Air Emission Inventory System (EIS)

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**C31 ENE < 1/8 0.009 mi. 47 ft.** | **JACK ALEWYN DAIRY 8185 EDISON CHINO, CA 91710** | **SWEEPS UST CA FID UST** | **S101618788 N/A**

**Site 8 of 8 in cluster C**

**Relative: Higher**

**Actual: 696 ft.**

SWEEPS UST:

| | |
|---|---|
| Name: | JACK ALEWYN DAIRY |
| Address: | 8185 EDISON |
| City: | CHINO |
| Status: | Active |
| Comp Number: | 40260 |
| Number: | 9 |
| Board Of Equalization: | Not reported |
| Referral Date: | 08-27-91 |
| Action Date: | 08-27-91 |
| Created Date: | 02-29-88 |
| Owner Tank Id: | 1 |
| SWRCB Tank Id: | 36-000-040260-000001 |
| Tank Status: | A |
| Capacity: | 250 |
| Active Date: | 07-01-85 |
| Tank Use: | M.V. FUEL |
| STG: | P |
| Content: | DIESEL |
| Number Of Tanks: | 1 |

CA FID UST:

| | |
|---|---|
| Facility ID: | 36008971 |
| Regulated By: | UTNKA |
| Regulated ID: | 00040260 |
| Cortese Code: | Not reported |
| SIC Code: | Not reported |
| Facility Phone: | 7145972081 |
| Mail To: | Not reported |
| Mailing Address: | 8185 EDISON |
| Mailing Address 2: | Not reported |
| Mailing City,St,Zip: | CHINO 91710 |
| Contact: | Not reported |
| Contact Phone: | Not reported |
| DUNs Number: | Not reported |
| NPDES Number: | Not reported |
| EPA ID: | Not reported |
| Comments: | Not reported |
| Status: | Active |

**32 East < 1/8 0.011 mi. 60 ft.** | **THREE D DAIRY 8485 EDISON AVE CHINO, CA 91710** | **HIST UST WDS** | **S104156088 N/A**

**Relative: Higher**

**Actual: 700 ft.**

HIST UST:

| | |
|---|---|
| Name: | JACK ALEWYN DAIRY |
| Address: | 8485 EDISON |
| City,State,Zip: | CHINO, CA 91710 |
| File Number: | 0002a03c |
| URL: | |
| Region: | Not reported |
| Facility ID: | Not reported |
| Facility Type: | Not reported |
| Other Type: | Not reported |
| Contact Name: | Not reported |
| Telephone: | Not reported |
| Owner Name: | Not reported |
| Owner Address: | Not reported |
| Owner City,St,Zip: | Not reported |
| Total Tanks: | Not reported |
| Tank Num: | Not reported |
| Container Num: | Not reported |
| Year Installed: | Not reported |
| Tank Capacity: | Not reported |
| Tank Used for: | Not reported |
| Type of Fuel: | Not reported |
| Container Construction Thickness: | Not reported |
| Leak Detection: | Not reported |

Click here for Geo Tracker PDF:

WDS:

| | |
|---|---|
| Name: | THREE D DAIRY |
| Address: | 8485 EDISON AVE |
| City: | CHINO |
| Facility ID: | Santa Ana River 365749001 |
| Facility Type: | Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this category. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | CAG018001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board |
| Subregion: | 8 |
| Facility Telephone: | Not reported |
| Facility Contact: | JOE DE HOOG |
| Agency Name: | DE HOOG JOE & MICHAEL |
| Agency Address: | 14350 WALKER AVENUE |
| Agency City,St,Zip: | CHINO 91710 |
| Agency Contact: | JOE DE HOOG |
| Agency Telephone: | Not reported |
| Agency Type: | Private |

**THREE D DAIRY (Continued)** **S104156088**

| | |
|---|---|
| SIC Code: | 241 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Primary Waste: | STORMS |
| Waste Type2: | N |
| Waste2: | Stormwater Runoff |
| Primary Waste Type: | Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category. |
| Secondary Waste: | Solid Wastes |
| Secondary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | No reclamation requirements associated with this facility. |
| POTW: | The facility is not a POTW. |
| Treat To Water: | Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance from a waste treatment facility. |
| Complexity: | Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds. |

---

**F33** **LONGGO TRANS** **RCRA NonGen / NLR** **1028894796**
**NNE** **7960 EDISON AVE** **E MANIFEST** **CAC003256171**
**< 1/8** **ONTARIO, CA 91762**
**0.018 mi.**
**94 ft.** **Site 1 of 3 in cluster F**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

RCRA Listings:

| | |
|---|---|
| Date Form Received by Agency: | 20231012 |
| Handler Name: | Longgo Trans |
| Handler Address: | 7960 Edison Ave |
| Handler City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAC003256171 |
| Contact Name: | CONNIE GAO |
| Contact Address: | 7960 EDISON AVE |
| Contact City,State,Zip: | ONTRAIO, CA 91762 |
| Contact Telephone: | 909-628-7868 |
| Contact Fax: | Not reported |
| Contact Email: | LONGGOTRANSAR@GMAIL.COM |
| Contact Title: | Not reported |
| EPA Region: | 09 |
| Land Type: | Not reported |
| Federal Waste Generator Description: | Not a generator, verified |
| Non-Notifier: | Not reported |

**LONGGO TRANS (Continued)** **1028894796**

| | | |
|---|---|---|
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | PO BOX 1578 |
| Mailing City,State,Zip: | | CHINO, CA 91708 |
| Owner Name: | Connie Gao | |
| Owner Type: | | Other |
| Operator Name: | Connie Gao | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20231012 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: CONNIE GAO | |
| Legal Status: | Other |

**LONGGO TRANS (Continued)** **1028894796**

| | |
|---|---|
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 7960 EDISON AVE |
| Owner/Operator City,State,Zip: | ONTRAIO, CA 91710 |
| Owner/Operator Telephone: | 626-758-8088 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: CONNIE GAO | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 7960 EDISON AVE |
| Owner/Operator City,State,Zip: | ONTRAIO, CA 91762 |
| Owner/Operator Telephone: | 909-628-7868 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20231012 |
| Handler Name: LONGGO TRANS | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 48411 |
| NAICS Description: | General Freight Trucking, Local |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

E MANIFEST:

| | |
|---|---|
| Manifest Tracking Number: | 007258294GBF |
| Last Updated Date: | 20231101 |
| Shipped Date: | 20231013 |
| Received Date: | 20231016 |
| Manifest Status: | Signed |
| Submission Type: | DataImage5Copy |
| Origin Type: | Service |
| Generator EPA ID: | CAC003256171 |

**LONGGO TRANS (Continued)** **1028894796**

| | |
|---|---|
| Generator Name: | Longgo Trans |
| Generator Location Street Number: | Not reported |
| Generator Location Street 1: | 7960 EDISON AVE |
| Generator Location Street 2: | Not reported |
| Generator Location City: | ONTARIO |
| Generator Location State: | CA |
| Generator Location Zip: | 91762 |
| Generator Mail Street Number: | Not reported |
| Generator Mail Street 1: | PO BOX 1578 |
| Generator Mail Street 2: | Not reported |
| Generator Mail City: | CHINO |
| Generator Mail Zip: | 91708 |
| Generator Mail State: | CA |
| Generator Contact Company Name: | Not reported |
| Designated Facility EPA ID: | CAT080013352 |
| Designated Facility Name: | World Oil Recycling |
| Designated Facility Mail Street Number: | 2000 |
| Designated Facility Mail Street 1: | CA90222 CA037US 2000 |
| Designated Facility Mail Street 2: | N. ALAMEDA STREET |
| Designated Facility Mail City: | COMPTON |
| Designated Facility Mail Zip: | 90222 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | 2000 |
| Designated Facility Location Street 1: | N. ALAMEDA STREET |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | COMPTON |
| Designated Facility Location Zip: | 90222-0000 |
| Designated Facility Location State: | CA |
| Designated Facility Contact Company Name: | Not reported |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

| | |
|---|---|
| Manifest Tracking Number: | 007258316GBF |
| Last Updated Date: | 20231106 |
| Shipped Date: | 20231020 |
| Received Date: | 20231026 |
| Manifest Status: | Signed |
| Submission Type: | DataImage5Copy |
| Origin Type: | Web |
| Generator EPA ID: | CAC003256171 |
| Generator Name: | Longgo Trans |
| Generator Location Street Number: | Not reported |
| Generator Location Street 1: | 7960 EDISON AVE |
| Generator Location Street 2: | Not reported |
| Generator Location City: | ONTARIO |
| Generator Location State: | CA |
| Generator Location Zip: | 91762 |
| Generator Mail Street Number: | Not reported |
| Generator Mail Street 1: | PO BOX 1578 |
| Generator Mail Street 2: | Not reported |
| Generator Mail City: | CHINO |
| Generator Mail Zip: | 91708 |
| Generator Mail State: | CA |
| Generator Contact Company Name: | Not reported |
| Designated Facility EPA ID: | AZR000520304 |
| Designated Facility Name: | Aa Sydcol Llc |
| Designated Facility Mail Street Number: | Not reported |

**LONGGO TRANS (Continued)** **1028894796**

| | |
|---|---|
| Designated Facility Mail Street 1: | Not reported |
| Designated Facility Mail Street 2: | 3155 GOLDEN WILLOW CT |
| Designated Facility Mail City: | YORBA LINDA |
| Designated Facility Mail Zip: | 92886-1303 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | Not reported |
| Designated Facility Location Street 1: | 2264 E 13TH ST |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | YUMA |
| Designated Facility Location Zip: | 85365-1858 |
| Designated Facility Location State: | AZ |
| Designated Facility Contact Company Name: | Not reported |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

Transporter:

| | |
|---|---|
| Manifest Tracking Number: | 007258316GBF |
| Transporter Line Number: | 1 |
| Transporter EPA ID: | CAR000293316 |
| Transporter Name: | Swift Oil & Vacuum Inc |

| | |
|---|---|
| Manifest Tracking Number: | 007258316GBF |
| Transporter Line Number: | 2 |
| Transporter EPA ID: | CAD980585293 |
| Transporter Name: | Industrial Waste Utilization Inc |

Waste Line:

| | |
|---|---|
| Manifest Tracking Number: | 007258316GBF |
| Waste Line Number: | 1 |
| U.S. DOT Hazardous Indicator: | N |
| U.S. DOT ID Number: | Not reported |
| U.S. DOT Description: | Not reported |
| Non-Hazardous Waste Description: | NON-RCRA HAZARDOUS WASTE SOLID (PAPER FILTERS & OIL) |
| Number of Containers: | 1 |
| Container Type Code: | DM |
| Container Type Description: | Metal drums, barrels, kegs |
| Waste Quantity: | 200 |
| Quantity Unit of Measure Code: | P |
| Quantity Unit of Measure Description: | Pounds |
| Waste Quantity, in Tons: | 0.1 |
| Acute Waste Quantity, in Tons: | 0 |
| Non-Acute Waste Quantity, in Tons: | 0.1 |
| Waste Quantity, in Kilograms: | 90.703 |
| Acute Waste Quantity, in Kilograms: | 0 |
| Non-Acute Waste Quantity, in Kilorgrams: | 90.703 |
| Management Method Code: | H141 |
| Management Method Description: | STORAGE, BULKING AND/OR TRANSFER OFF SITE |
| Waste Residue Indicator: | N |
| Quantity Discrepancy Indicator: | N |
| Waste Type Discrepancy Indicator: | N |
| Waste Density: | Not reported |
| Waste Density Unit of Measure Code: | Not reported |
| Waste Density Unit of Measure Description: | Not reported |
| Form Code: | Not reported |
| Form Code Description: | Not reported |
| Source Code: | Not reported |

**LONGGO TRANS (Continued)** **1028894796**

| | |
|---|---|
| Source Code Description: | Not reported |
| Waste Minimization Code: | Not reported |
| Waste Minimization Code Description: | Not reported |
| Consent Number: | Not reported |
| EPA Waste Indicator: | N |

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**F34 NE < 1/8 0.018 mi. 95 ft.** **WESTLEY CARDOZA** **RCRA NonGen / NLR** **1014465273**
**7990 EDISON AVE** **CAR000217141**
**ONTARIO, CA 91762**

**Site 2 of 3 in cluster F**

**Relative: Higher**

**Actual: 694 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20110314 |
| Handler Name: | | Westley Cardoza |
| Handler Address: | | 7990 Edison Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAR000217141 |
| Contact Name: | | WESTLEY N CARDOZA |
| Contact Address: | | PO BOX 6790 |
| Contact City,State,Zip: | | NORCO, CA 92860 |
| Contact Telephone: | | 909-772-7318 |
| Contact Fax: | | Not reported |
| Contact Email: | | CARDOZADEVILLE@YAHOO.COM |
| Contact Title: | | OWNER WWC TRANSPORT |
| EPA Region: | | 09 |
| Land Type: | | Private |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Handler Activities |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | PO BOX 6790 |
| Mailing City,State,Zip: | | NORCO, CA 92860 |
| Owner Name: | Westley Cardoza | |
| Owner Type: | | Private |
| Operator Name: | Westley Cardoza | |
| Operator Type: | | Private |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | Yes |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |

**WESTLEY CARDOZA (Continued)** **1014465273**

| | |
|---|---|
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20110314 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: WESTLEY CARDOZA | |
| Legal Status: | Private |
| Date Became Current: | 20060701 |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | PO BOX 6790 |
| Owner/Operator City,State,Zip: | NORCO, CA 92860 |
| Owner/Operator Telephone: | 509-772-7318 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |
| | |
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: WESTLEY CARDOZA | |
| Legal Status: | Private |
| Date Became Current: | 20060801 |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | Not reported |
| Owner/Operator City,State,Zip: | Not reported |
| Owner/Operator Telephone: | Not reported |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20110314 |
| Handler Name: WESTLEY CARDOZA | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |

**WESTLEY CARDOZA (Continued)** **1014465273**

| | |
|---|---|
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | Not reported |
| Electronic Manifest Broker: | Not reported |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 48411 |
| NAICS Description: | General Freight Trucking, Local |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

---

**35**
**NE**
**< 1/8**
**0.018 mi.**
**95 ft.**

**VICTORS FARMS**
**8040 EDISON AVE**
**ONTARIO, CA 91762**

**RCRA NonGen / NLR** **1028891097**
**CAC003252196**

**Relative:**
**Higher**

**Actual:**
**695 ft.**

RCRA Listings:

| | |
|---|---|
| Date Form Received by Agency: | 20230918 |
| Handler Name: | Victors Farms |
| Handler Address: | 8040 Edison Ave |
| Handler City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAC003252196 |
| Contact Name: | VICTOR FARMS |
| Contact Address: | 8040 EDISON AVE |
| Contact City,State,Zip: | ONTARIO, CA 91762 |
| Contact Telephone: | 951-218-6289 |
| Contact Fax: | Not reported |
| Contact Email: | MILLS.KEVIN@CLEANHARBORS.COM |
| Contact Title: | Not reported |
| EPA Region: | 09 |
| Land Type: | Not reported |
| Federal Waste Generator Description: | Not a generator, verified |
| Non-Notifier: | Not reported |
| Biennial Report Cycle: | Not reported |
| Accessibility: | Not reported |
| Active Site Indicator: | Not reported |
| State District Owner: | Not reported |
| State District: | Not reported |
| Mailing Address: | 8040 EDISON AVE |
| Mailing City,State,Zip: | ONTARIO, CA 91762 |
| Owner Name: | Victor Farms |
| Owner Type: | Other |
| Operator Name: | Victor Farms |
| Operator Type: | Other |
| Short-Term Generator Activity: | No |
| Importer Activity: | No |
| Mixed Waste Generator: | No |
| Transporter Activity: | No |

**VICTORS FARMS (Continued)** **1028891097**

| | |
|---|---|
| Transfer Facility Activity: | No |
| Recycler Activity with Storage: | No |
| Small Quantity On-Site Burner Exemption: | No |
| Smelting Melting and Refining Furnace Exemption: | No |
| Underground Injection Control: | No |
| Off-Site Waste Receipt: | No |
| Universal Waste Indicator: | No |
| Universal Waste Destination Facility: | No |
| Federal Universal Waste: | No |
| Active Site State-Reg Handler: | --- |
| Federal Facility Indicator: | Not reported |
| Hazardous Secondary Material Indicator: | N |
| Sub-Part K Indicator: | Not reported |
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20230918 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: VICTOR FARMS | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 8040 EDISON AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-218-6289 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: VICTOR FARMS | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 8040 EDISON AVE |

**VICTORS FARMS (Continued)** **1028891097**

Owner/Operator City,State,Zip: ONTARIO, CA 91762
Owner/Operator Telephone: 951-218-6289
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20230918
Handler Name: VICTORS FARMS
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 811430
NAICS Description: Footwear And Leather Goods Repair

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

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**G36** **AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPER** **RCRA NonGen / NLR** **1027217754**
**East** **8292 EDISON AVE** **CAL000469601**
**< 1/8** **ONTARIO, CA 91762**
**0.019 mi.**
**102 ft.** **Site 1 of 5 in cluster G**

**Relative:**
**Higher**

**Actual:**
**699 ft.**

RCRA Listings:
Date Form Received by Agency: 20220330
Handler Name: Agromin Oc Ontario Green Materials Composting Operation
Handler Address: 8292 Edison Ave
Handler City,State,Zip: ONTARIO, CA 91762
EPA ID: CAL000469601
Contact Name: MIKE ZWERNER
Contact Address: 201 KINETIC DR
Contact City,State,Zip: OXNARD, CA 93030
Contact Telephone: 805-807-0677
Contact Fax: 805-485-9222
Contact Email: Not reported
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **1027217754**

| | | |
|---|---|---|
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 201 KINETIC DR |
| Mailing City,State,Zip: | | OXNARD, CA 93030 |
| Owner Name: | Agromin Oc Llc | |
| Owner Type: | | Other |
| Operator Name: | Mike Zwerner | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20220411 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: MIKE ZWERNER | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **1027217754**

Owner/Operator Address: 201 KINETIC DR
Owner/Operator City,State,Zip: OXNARD, CA 93030
Owner/Operator Telephone: 805-807-0677
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: AGROMIN OC LLC
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 17121 NICHOLS LN
Owner/Operator City,State,Zip: HUNTINGTON BEACH, CA 92647
Owner/Operator Telephone: 805-485-9200
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20220330
Handler Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 325314
NAICS Description: Fertilizer (Mixing Only) Manufacturing

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

---

**G37** **AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPER** **CERS HAZ WASTE** **S128624015**
**East** **8292 EDISON AVE** **HAZNET** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**0.019 mi.**
**102 ft.** **Site 2 of 5 in cluster G**

**Relative:**
**Higher**
**Actual:**
**699 ft.**

CERS HAZ WASTE:
Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Address: 8292 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Site ID: 611660
CERS ID: 10896175

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **S128624015**

CERS Description: Hazardous Waste Generator

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: San Bernardino County Fire
Entity Title: Not reported
Affiliation Address: 620 South E Street
Affiliation City: San Bernardino
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92415-0153
Affiliation Phone: (909) 386-8401,

Affiliation Type Desc: Environmental Contact
Entity Name: DAVE GREEN
Entity Title: Not reported
Affiliation Address: 201 Kinetic Drive
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93030
Affiliation Phone: ,

Affiliation Type Desc: Legal Owner
Entity Name: Agromin OC, LLC.
Entity Title: Not reported
Affiliation Address: 201 Kinetic Drive
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 93030
Affiliation Phone: (805) 485-9200,

Affiliation Type Desc: Parent Corporation
Entity Name: Agromin OC
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **S128624015**

| | |
|---|---|
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Dave Green |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Dave Green |
| Entity Title: | COO |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |
| | |
| Affiliation Type Desc: | Operator |
| Entity Name: | Agromin OC, LLC. |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (805) 485-9200, |
| | |
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 201 Kinetic Drive |
| Affiliation City: | Oxnard |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 93030 |
| Affiliation Phone: | , |

HAZNET:

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91762 |
| Contact: | DAVE GREEN |
| Telephone: | 8054859200 |
| Mailing Name: | Not reported |
| Mailing Address: | 201 KINETIC DR |
| | |
| Year: | 2023 |

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **S128624015**

| | |
|---|---|
| Gepaid: | CAL000469601 |
| TSD EPA ID: | Not reported |
| CA Waste Code: | - |
| Disposal Method: | - |
| Tons: | Not reported |

---

**G38**
**East**
**< 1/8**
**0.019 mi.**
**102 ft.**

**AGROMIN ONTARIO**
**8292 EDISON AVE**
**ONTARIO, CA 91762**

**RCRA NonGen / NLR** **1026492994**
**E MANIFEST** **CAL000457796**

**Site 3 of 5 in cluster G**

**Relative:**
**Higher**

**Actual:**
**699 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20201027 |
| Handler Name: | | Agromin Ontario |
| Handler Address: | | 8292 Edison Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAL000457796 |
| Contact Name: | | GERMAN CERVANTES |
| Contact Address: | | 201 KINETIC DR |
| Contact City,State,Zip: | | OXNARD, CA 93030 |
| Contact Telephone: | | 805-207-7956 |
| Contact Fax: | | 806-485-9222 |
| Contact Email: | | GERMAN@AGROMIN.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 201 KINETIC DR |
| Mailing City,State,Zip: | | OXNARD, CA 93030 |
| Owner Name: | Bill Camarillo | |
| Owner Type: | | Other |
| Operator Name: | German Cervantes | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |

**AGROMIN ONTARIO (Continued)** **1026492994**

| | |
|---|---|
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20201106 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: GERMAN CERVANTES | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 201 KINETIC DR |
| Owner/Operator City,State,Zip: | OXNARD, CA 93030 |
| Owner/Operator Telephone: | 805-207-7956 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: BILL CAMARILLO | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 201 KINETIC DR |
| Owner/Operator City,State,Zip: | OXNARD, CA 93030 |
| Owner/Operator Telephone: | 805-485-9200 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20201027 |
| Handler Name: AGROMIN ONTARIO | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |

**AGROMIN ONTARIO (Continued)** **1026492994**

| | |
|---|---|
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | Not reported |
| Electronic Manifest Broker: | Not reported |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 325314 |
| NAICS Description: | Fertilizer (Mixing Only) Manufacturing |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

E MANIFEST:

| | |
|---|---|
| Manifest Tracking Number: | 030085021WAS |
| Last Updated Date: | 20231213 |
| Shipped Date: | 20231207 |
| Received Date: | 20231208 |
| Manifest Status: | Signed |
| Submission Type: | DataImage5Copy |
| Origin Type: | Web |
| Generator EPA ID: | CAL000457796 |
| Generator Name: | Agromin Ontario |
| Generator Location Street Number: | Not reported |
| Generator Location Street 1: | 8292 EDISON AVE |
| Generator Location Street 2: | Not reported |
| Generator Location City: | ONTARIO |
| Generator Location State: | CA |
| Generator Location Zip: | 91762 |
| Generator Mail Street Number: | Not reported |
| Generator Mail Street 1: | 201 KINETIC DR |
| Generator Mail Street 2: | Not reported |
| Generator Mail City: | OXNARD |
| Generator Mail Zip: | 93030 |
| Generator Mail State: | CA |
| Generator Contact Company Name: | Not reported |
| Designated Facility EPA ID: | CAL000330453 |
| Designated Facility Name: | Agritec Int Dba Cleantech Environmental |
| Designated Facility Mail Street Number: | 5820 |
| Designated Facility Mail Street 1: | Not reported |
| Designated Facility Mail Street 2: | MARTIN ROAD |
| Designated Facility Mail City: | IRWINDALE |
| Designated Facility Mail Zip: | 91706 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | 5820 |
| Designated Facility Location Street 1: | MARTIN ROAD |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | IRWINDALE |
| Designated Facility Location Zip: | 91706 |

**AGROMIN ONTARIO (Continued)** **1026492994**

| | |
|---|---|
| Designated Facility Location State: | CA |
| Designated Facility Contact Company Name: | Not reported |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

| | |
|---|---|
| Manifest Tracking Number: | 030047108WAS |
| Last Updated Date: | 20220303 |
| Shipped Date: | 20220225 |
| Received Date: | 20220228 |
| Manifest Status: | Signed |
| Submission Type: | DataImage5Copy |
| Origin Type: | Web |
| Generator EPA ID: | CAL000457796 |
| Generator Name: | Agromin Ontario |
| Generator Location Street Number: | Not reported |
| Generator Location Street 1: | 8292 EDISON AVE |
| Generator Location Street 2: | Not reported |
| Generator Location City: | ONTARIO |
| Generator Location State: | CA |
| Generator Location Zip: | 91762 |
| Generator Mail Street Number: | Not reported |
| Generator Mail Street 1: | 201 KINETIC DR |
| Generator Mail Street 2: | Not reported |
| Generator Mail City: | OXNARD |
| Generator Mail Zip: | 93030 |
| Generator Mail State: | CA |
| Generator Contact Company Name: | Not reported |
| Designated Facility EPA ID: | CAL000330453 |
| Designated Facility Name: | Agritec Int Dba Cleantech Environmental |
| Designated Facility Mail Street Number: | 5820 |
| Designated Facility Mail Street 1: | Not reported |
| Designated Facility Mail Street 2: | MARTIN ROAD |
| Designated Facility Mail City: | IRWINDALE |
| Designated Facility Mail Zip: | 91706 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | 5820 |
| Designated Facility Location Street 1: | MARTIN ROAD |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | IRWINDALE |
| Designated Facility Location Zip: | 91706 |
| Designated Facility Location State: | CA |
| Designated Facility Contact Company Name: | Not reported |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

State Waste:

| | |
|---|---|
| Manifest Tracking Number: | 030047108WAS |
| Waste Line Number: | 1 |
| State Waste Code Owner: | CA |
| State Waste Code: | 352 |
| State Waste: | Other organic solids |

Transporter:

| | |
|---|---|
| Manifest Tracking Number: | 030047108WAS |
| Transporter Line Number: | 1 |
| Transporter EPA ID: | CAR000330019 |

**AGROMIN ONTARIO (Continued)** **1026492994**

Transporter Name: Cleantech Environmental, Inc

Waste Line:

| | |
|---|---|
| Manifest Tracking Number: | 030047108WAS |
| Waste Line Number: | 1 |
| U.S. DOT Hazardous Indicator: | N |
| U.S. DOT ID Number: | Not reported |
| U.S. DOT Description: | Not reported |
| Non-Hazardous Waste Description: | NON-RCRA HAZARDOUS WASTE SOLID (OILY SOLID WASTE/USED METAL OIL FILTERS) |
| Number of Containers: | 1 |
| Container Type Code: | DM |
| Container Type Description: | Metal drums, barrels, kegs |
| Waste Quantity: | 200 |
| Quantity Unit of Measure Code: | P |
| Quantity Unit of Measure Description: | Pounds |
| Waste Quantity, in Tons: | 0.1 |
| Acute Waste Quantity, in Tons: | 0 |
| Non-Acute Waste Quantity, in Tons: | 0.1 |
| Waste Quantity, in Kilograms: | 90.703 |
| Acute Waste Quantity, in Kilograms: | 0 |
| Non-Acute Waste Quantity, in Kilorgrams: | 90.703 |
| Management Method Code: | H010 |
| Management Method Description: | METALS RECOVERY |
| Waste Residue Indicator: | N |
| Quantity Discrepancy Indicator: | N |
| Waste Type Discrepancy Indicator: | N |
| Waste Density: | Not reported |
| Waste Density Unit of Measure Code: | Not reported |
| Waste Density Unit of Measure Description: | Not reported |
| Form Code: | Not reported |
| Form Code Description: | Not reported |
| Source Code: | Not reported |
| Source Code Description: | Not reported |
| Waste Minimization Code: | Not reported |
| Waste Minimization Code Description: | Not reported |
| Consent Number: | Not reported |
| EPA Waste Indicator: | N |

---

**G39** **AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERA** **SWF/LF** **S126142007**
**East** **8292 EDISON AVENUE** **CERS HAZ WASTE** **N/A**
**< 1/8** **ONTARIO, CA 91762** **NPDES**
**0.019 mi.** **San Bern. Co. Permit**
**102 ft.** **Site 4 of 5 in cluster G** **CIWQS**
**CERS**

**Relative:**
**Higher**

**Actual:**
**699 ft.**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | AGROMIN ONTARIO GREEN MATERIAL COMPOST OPERATION |
| Address: | 8292 EDISON AVE. |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | STATE |
| Facility ID: | 36-AA-0505 |
| SWIS Number: | 36-AA-0505 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Activity: | Chipping and Grinding Facility/Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Facility |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | 10/21/2021 |
| Cease Operation Type: | Actual |
| Inspection Frequency: | Quarterly |
| Throughput: | 200 |
| Throughput Units: | Tons per day |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 63000 |
| Capacity Units: | Tons per year |
| Total Acreage: | 5 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 8292 Edison Ave. |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91762 |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Activity: | Green Material Composting Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 12500 |
| Throughput Units: | Cubic Yards |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 300000 |
| Capacity Units: | Cubic Yards per year |
| Total Acreage: | 5 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 8292 Edison Ave. |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91762 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Site Regulatory Status: | Notification |
| Latitude: | 33.99791 |
| Longitude: | -117.62399 |
| Is Archived: | No |
| Operator: | Agromin |
| Started On: | Not reported |
| Contact Name: | Bill Camarillo |
| Contact Title: | Not reported |
| Contact Email: | bill@agromin.com |
| Contact Phone: | (805) 485-9200 |
| Street Address: | 201 Kinetic Dr. |
| Operator City: | Oxnard |
| Operator State: | CA |
| Operator Zip: | 93030 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Owner: | Ag Concepts |
| Owner Address: | 7325 Edison Ave. |
| Owner City: | Ontario |
| Owner State: | CA |
| Owner Zip: | 91762 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.99791 |
| Longitude: | -117.62399 |
| Is Archived: | No |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (805) 485-9200 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Activity: | Chipping and Grinding Facility/Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Inactive |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Facility |

| | |
|---|---|
| SWIS Number: | 36-AA-0505 |
| Site Name: | Agromin Ontario Green Material Compost Operation |
| Activity: | Green Material Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OP |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | STATE |
| Facility ID: | 36-AA-0509 |
| SWIS Number: | 36-AA-0509 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Activity: | Green Material Composting Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 300000 |
| Throughput Units: | Cubic Yards per year |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 12500 |
| Capacity Units: | Cubic Yards |
| Total Acreage: | 5 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 8292 Edison Ave |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91762 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.99775 |
| Longitude: | -117.627 |
| Is Archived: | No |
| Operator: | Agromin OC |
| Started On: | 2/15/2022 |
| Contact Name: | Bill Camarillo |
| Contact Title: | Not reported |
| Contact Email: | bcamarillo@agromin.com |
| Contact Phone: | (805) 485-9200 |
| Street Address: | 201 Kinetic |
| Operator City: | Oxnard |
| Operator State: | CA |
| Operator Zip: | 93030 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Owner: | Ag Concepts |
| Owner Address: | 7325 Edison Ave. |
| Owner City: | Ontario |
| Owner State: | CA |
| Owner Zip: | 91762 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Site Regulatory Status: | Notification |
| Latitude: | 33.99775 |
| Longitude: | -117.627 |
| Is Archived: | No |
| Started On: | 2/15/2022 |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (805) 485-9200 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Activity: | Green Material Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0509 |
| Site Name: | Agromin OC Ontario Green Material Composting Op |
| Activity: | Green Material Composting Operation |
| Waste Type: | Wood Waste |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

CERS HAZ WASTE:

| | |
|---|---|
| Name: | AGROMIN - ONTARIO |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 569130 |
| CERS ID: | 10854592 |
| CERS Description: | Hazardous Waste Generator |

NPDES:

| | |
|---|---|
| Name: | AGROMIN GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 8 36I029489 |
| Regulatory Measure Type: | Industrial |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | Active |
| Status Date: | 11/15/2021 |
| Operator Name: | Agromin Ontario Chip and Grind Operation |
| Operator Address: | 201 Kinetic Drive |
| Operator City: | Oxnard |
| Operator State: | California |
| Operator Zip: | 93030 |

| | |
|---|---|
| Name: | AGROMIN GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Active |
| NPDES Number: | CAS000001 |
| Region: | 8 |
| Agency Number: | 0 |
| Regulatory Measure ID: | 536832 |
| Place ID: | Not reported |
| Order Number: | 97-03-DWQ |
| WDID: | 8 36I029489 |
| Regulatory Measure Type: | Enrollee |
| Program Type: | Industrial |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | 11/15/2021 |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | 201 Kinetic Drive |
| Discharge Name: | Agromin Ontario Chip and Grind Operation |
| Discharge City: | Oxnard |
| Discharge State: | California |
| Discharge Zip: | 93030 |
| Status: | Not reported |
| Status Date: | Not reported |
| Operator Name: | Not reported |
| Operator Address: | Not reported |
| Operator City: | Not reported |
| Operator State: | Not reported |
| Operator Zip: | Not reported |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVENUE |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 8 36I029779 |
| Regulatory Measure Type: | Industrial |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | Active |
| Status Date: | 05/27/2022 |
| Operator Name: | Agromin OC LLC |
| Operator Address: | 201 Kinetic Drive |
| Operator City: | Oxnard |
| Operator State: | California |
| Operator Zip: | 93030 |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Active |
| NPDES Number: | CAS000001 |
| Region: | 8 |
| Agency Number: | 0 |
| Regulatory Measure ID: | 547490 |
| Place ID: | Not reported |
| Order Number: | 97-03-DWQ |
| WDID: | 8 36I029779 |
| Regulatory Measure Type: | Enrollee |
| Program Type: | Industrial |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | 05/27/2022 |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | 201 Kinetic Drive |
| Discharge Name: | Agromin OC LLC |
| Discharge City: | Oxnard |
| Discharge State: | California |
| Discharge Zip: | 93030 |
| Status: | Not reported |
| Status Date: | Not reported |
| Operator Name: | Not reported |
| Operator Address: | Not reported |
| Operator City: | Not reported |
| Operator State: | Not reported |
| Operator Zip: | Not reported |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | AGROMIN - ONTARIO |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0018707 |
| Owner: | Agromin OC, LLC. |
| Permit Number: | PT0040408 |
| Permit Category: | HAZARDOUS MATERIALS 4-10 CHEMICALS |
| Facility Status: | ACTIVE |
| Expiration Date: | 01/31/2025 |

| | |
|---|---|
| Name: | AGROMIN - ONTARIO |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0018707 |
| Owner: | Agromin OC, LLC. |
| Permit Number: | PT0040409 |
| Permit Category: | SMALL QUANTITY GENERATOR |
| Facility Status: | ACTIVE |
| Expiration Date: | 01/31/2025 |

CIWQS:

| | |
|---|---|
| Name: | Agromin Oc Ontario Green Material Composting Operation |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Agromin OC LLC |
| Agency Address: | 201 Kinetic Drive, Oxnard, CA 93030 |
| Place/Project Type: | Industrial - Fertilizers, Mixing Only |
| SIC/NAICS: | 2875 |
| Region: | 8 |
| Program: | INDSTW |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Storm water industrial |
| Order Number: | 2014-0057-DWQ |
| WDID: | 8 36I029779 |
| NPDES Number: | CAS000001 |
| Adoption Date: | Not reported |
| Effective Date: | 05/27/2022 |
| Termination Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99793 |
| Longitude: | -117.62393 |

| | |
|---|---|
| Name: | Agromin Oc Ontario Green Materials Composting Operation |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Agromin OC, LLC |
| Agency Address: | 201 Kinetic Drive, Oxnard, CA 93030 |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Place/Project Type: | Composting Facility |
| SIC/NAICS: | 2875 |
| Region: | 8 |
| Program: | LNDISPOTH |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - WDR |
| Order Number: | 2015-0121-DWQ |
| WDID: | 8 363011001 |
| NPDES Number: | Not reported |
| Adoption Date: | Not reported |
| Effective Date: | 02/25/2022 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 08/03/2030 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | C |
| TTWQ: | 3 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.99793 |
| Longitude: | -117.62393 |

| | |
|---|---|
| Name: | Agromin Green Material Composting Operation |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Agromin Ontario Chip and Grind Operation |
| Agency Address: | 201 Kinetic Drive, Oxnard, CA 93030 |
| Place/Project Type: | Industrial - Fertilizers, Mixing Only |
| SIC/NAICS: | 2875 |
| Region: | 8 |
| Program: | INDSTW |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Storm water industrial |
| Order Number: | 2014-0057-DWQ |
| WDID: | 8 36I029489 |
| NPDES Number: | CAS000001 |
| Adoption Date: | Not reported |
| Effective Date: | 11/15/2021 |
| Termination Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 1 |
| Violations within 5 years: | 1 |
| Latitude: | 33.99792 |
| Longitude: | -117.62396 |

| | |
|---|---|
| Name: | Agromin-Ontario Green Materials Composting Operation |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Agromin-Burrtec LLC |
| Agency Address: | 201 Kinetic Drive, Oxnard, CA 93030 |
| Place/Project Type: | Composting Facility |
| SIC/NAICS: | 2875 |
| Region: | 8 |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Program: | LNDISPOTH |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - WDR |
| Order Number: | 2015-0121-DWQ |
| WDID: | 8 363010001 |
| NPDES Number: | Not reported |
| Adoption Date: | Not reported |
| Effective Date: | 02/25/2022 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 08/03/2030 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | C |
| TTWQ: | 3 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 34.000442 |
| Longitude: | -117.625308 |

CERS:

| | |
|---|---|
| Name: | AGROMIN ONTARIO GREEN MATERIALS COMPOSTING OPERATIONS |
| Address: | 8292 EDISON AVE. |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 869681 |
| CERS ID: | T10000017417 |
| CERS Description: | Land Disposal Site |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Regional Board Caseworker |
| Entity Name: | JOANNE LEE - SANTA ANA RWQCB (REGION 8) |
| Entity Title: | Not reported |
| Affiliation Address: | 3737 MAIN STREET, SUITE 500 |
| Affiliation City: | RIVERSIDE |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | AGROMIN - ONTARIO |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 569130 |
| CERS ID: | 10854592 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 569130 |
| Site Name: | Agromin - Ontario |
| Violation Date: | 08-19-2021 |
| Citation: | 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f) |
| Violation Description: | Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date. |
| Violation Notes: | Returned to compliance on 09/07/2021. OBSERVATION: Two 55 gallon drums |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

of used oil lacked hazardous waste labeling. Labels were provided during the inspection. CORRECTIVE ACTION: Properly label all hazardous waste containers and submit photographs demonstrating the used oil drums been properly labeled.

Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 569130
Site Name: Agromin - Ontario
Violation Date: 08-19-2021
Citation: HSC 6.95 25508(a)(3) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(3)
Violation Description: Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes: Returned to compliance on 08/24/2021. OBSERVATION: The CERS inventory submitted on 1/21/2021 needs to be updated to include the 240 gallon tank of clear diesel. CORRECTIVE ACTION: Submit an updated hazardous materials inventory in CERS to include the 240 gallon clear diesel tank.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 569130
Site Name: Agromin - Ontario
Violation Date: 08-19-2021
Citation: 40 CFR 1 265.172 - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 265.172
Violation Description: Failure to accumulate or store hazardous waste in container made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored.
Violation Notes: Returned to compliance on 09/07/2021. OBSERVATION: The facility did not have a container for the storage of oily absorbent waste. CORRECTIVE ACTION: Submit a signed statement indicating a properly labeled drum has been obtained for the storage of oily absorbent.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 569130
Site Name: Agromin - Ontario
Violation Date: 08-19-2021
Citation: HSC 6.5 25250.22 - California Health and Safety Code, Chapter 6.5, Section(s) 25250.22
Violation Description: Failure to properly manage used oil and/or fuel filters in accordance with the requirements.
Violation Notes: Returned to compliance on 09/07/2021. OBSERVATION: The facility did not have storage containers for the used oil filters. Obtain properly labeled steel drums for the storage of used oil filters. CORRECTIVE ACTION: Submit photographs demonstrating that the used oil and fuel filters are being properly managed.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

Evaluation:

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 08-19-2021 |
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | Not reported |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HW |
| Eval Source: | CERS, |

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 08-19-2021 |
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | Not reported |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HMRRP |
| Eval Source: | CERS, |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | California Wood Recycling |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (805) 485-9200, |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | DAVE GREEN |
| Entity Title: | Not reported |
| Affiliation Address: | 201 Kinetic Dr |
| Affiliation City: | Oxnard |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 93030 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | California Wood Recycling |
| Entity Title: | Not reported |
| Affiliation Address: | 201 Kinetic Dr |
| Affiliation City: | Oxnard |
| Affiliation State: | CA |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

Affiliation Country: United States
Affiliation Zip: 93030
Affiliation Phone: (805) 485-9200,

Affiliation Type Desc: Parent Corporation
Entity Name: CALIFORNIA WOOD RECYCLING; dba AGROMIN HORTICULTURAL PRODUCTS
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Document Preparer
Entity Name: Dave Green
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 201 Kinetic Dr
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93030
Affiliation Phone: ,

Affiliation Type Desc: Identification Signer
Entity Name: Dave Green
Entity Title: COO
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Address: 8292 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Site ID: 611660
CERS ID: 10896175
CERS Description: Chemical Storage Facilities

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2022
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Affiliation:

Affiliation Type Desc: CUPA District
Entity Name: San Bernardino County Fire
Entity Title: Not reported
Affiliation Address: 620 South E Street
Affiliation City: San Bernardino
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92415-0153
Affiliation Phone: (909) 386-8401,

Affiliation Type Desc: Environmental Contact
Entity Name: DAVE GREEN
Entity Title: Not reported
Affiliation Address: 201 Kinetic Drive
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93030
Affiliation Phone: ,

Affiliation Type Desc: Legal Owner
Entity Name: Agromin OC, LLC.
Entity Title: Not reported
Affiliation Address: 201 Kinetic Drive
Affiliation City: Oxnard
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 93030
Affiliation Phone: (805) 485-9200,

Affiliation Type Desc: Parent Corporation
Entity Name: Agromin OC
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

Affiliation Type Desc: Document Preparer
Entity Name: Dave Green
Entity Title: Not reported

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Dave Green |
| Entity Title: | COO |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Agromin OC, LLC. |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (805) 485-9200, |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 201 Kinetic Drive |
| Affiliation City: | Oxnard |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 93030 |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 619024 |
| CERS ID: | 902733 |
| CERS Description: | Industrial Facility Storm Water |

| | |
|---|---|
| Name: | AGROMIN GREEN MATERIAL COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 596629 |
| CERS ID: | 894520 |
| CERS Description: | Industrial Facility Storm Water |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Owner/Operator |
| Entity Name: | Agromin Ontario Chip and Grind Operation |
| Entity Title: | Operator |
| Affiliation Address: | 201 Kinetic Drive |
| Affiliation City: | Oxnard |

**AGROMIN OC ONTARIO GREEN MATERIAL COMPOSTING OPERATION (Continued)** **S126142007**

| | |
|---|---|
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 93030 |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATIONS |
| Address: | 8292 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 896008 |
| CERS ID: | T10000018575 |
| CERS Description: | Land Disposal Site |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Regional Board Caseworker |
| Entity Name: | JOANNE LEE - SANTA ANA RWQCB (REGION 8) |
| Entity Title: | Not reported |
| Affiliation Address: | 3737 MAIN STREET, SUITE 500 |
| Affiliation City: | RIVERSIDE |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**G40** **AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPER** **HWTS** **S128386036**
**East** **8292 EDISON AVE** **San Bern. Co. Permit** **N/A**
**< 1/8** **ONTARIO, CA 91762**
**0.019 mi.**
**102 ft.** **Site 5 of 5 in cluster G**

**Relative:**
**Higher**

**Actual:**
**699 ft.**

HWTS:

| | |
|---|---|
| Name: | AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION |
| Address: | 8292 EDISON AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAL000469601 |
| Inactive Date: | Not reported |
| Create Date: | 03/30/2022 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 201 KINETIC DR |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | OXNARD, CA 93030 |
| Owner Name: | AGROMIN OC LLC |
| Owner Address: | 17121 NICHOLS LN |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | HUNTINGTON BEACH, CA 92647 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | MIKE ZWERNER |
| Contact Address: | 201 KINETIC DR |
| Contact Address 2: | Not reported |
| City,State,Zip: | OXNARD, CA 93030 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Active |
| Facility Type: | PERMANENT |

**AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION (Continued)** **S128386036**

Category: STATE
Latitude: 33.99776525
Longitude: -117.6239478

San Bern. Co. Permit:
Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Address: 8292 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0019159
Owner: Agromin OC, LLC.
Permit Number: PT0041232
Permit Category: HAZARDOUS MATERIALS 4-10 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 05/31/2025

Name: AGROMIN OC ONTARIO GREEN MATERIALS COMPOSTING OPERATION
Address: 8292 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0019159
Owner: Agromin OC, LLC.
Permit Number: PT0041233
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: ACTIVE
Expiration Date: 05/31/2025

---

**B41** **BREAKTHRU TRANSPORTS** **RCRA NonGen / NLR** **1026482636**
**ENE** **8270 EDISON AVE** **CAC003088689**
**< 1/8** **ONTARIO, CA 91761**
**0.021 mi.**
**113 ft.** **Site 5 of 5 in cluster B**

**Relative:**
**Higher**

**Actual:**
**698 ft.**

RCRA Listings:
Date Form Received by Agency: 20201015
Handler Name: Breakthru Transports
Handler Address: 8270 Edison Ave
Handler City,State,Zip: ONTARIO, CA 91761
EPA ID: CAC003088689
Contact Name: JORGE VAZQUEZ
Contact Address: 9165 JADEITE AVE
Contact City,State,Zip: RANCHO CUCAMONGA, CA 91730
Contact Telephone: 909-565-7955
Contact Fax: 909-987-0462
Contact Email: BREAKTHRUTRANS@YAHOO.COM
Contact Title: Not reported
EPA Region: 09
Land Type: Not reported
Federal Waste Generator Description: Not a generator, verified
Non-Notifier: Not reported
Biennial Report Cycle: Not reported
Accessibility: Not reported
Active Site Indicator: Not reported
State District Owner: Not reported
State District: Not reported
Mailing Address: 9165 JADEITE AVE
Mailing City,State,Zip: RANCHO CUCAMONGA, CA 91730

**BREAKTHRU TRANSPORTS (Continued)** **1026482636**

| | | |
|---|---|---|
| Owner Name: | Jorge Vazquez | |
| Owner Type: | | Other |
| Operator Name: | Jorge Vazquez | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20201026 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: JORGE VAZQUEZ | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 9165 JADEITE AVE |
| Owner/Operator City,State,Zip: | RANCHO CUCAMONGA, CA 91730 |
| Owner/Operator Telephone: | 909-565-7955 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |

**BREAKTHRU TRANSPORTS (Continued)** **1026482636**

Owner/Operator Email: Not reported

Owner/Operator Indicator: Owner
Owner/Operator Name: JORGE VAZQUEZ
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: 9165 JADEITE AVE
Owner/Operator City,State,Zip: RANCHO CUCAMONGA, CA 91730
Owner/Operator Telephone: 909-565-7955
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20201015
Handler Name: BREAKTHRU TRANSPORTS
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 484210
NAICS Description: Used Household And Office Goods Moving

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

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**F42** **LONGGO TRANS** **RCRA NonGen / NLR** **1031050904**
**North** **7914 EDISON AVE** **CAC003278161**
**< 1/8** **ONTARIO, CA 91762**
**0.022 mi.**
**114 ft.** **Site 3 of 3 in cluster F**

**Relative:**
**Higher**

**Actual:**
**695 ft.**

RCRA Listings:
Date Form Received by Agency: 20240315
Handler Name: Longgo Trans
Handler Address: 7914 Edison Ave
Handler City,State,Zip: ONTARIO, CA 91762
EPA ID: CAC003278161
Contact Name: CONNIE GAO
Contact Address: 7914 EDISON AVE
Contact City,State,Zip: ONTARIO, CA 91762
Contact Telephone: 909-628-7868
Contact Fax: Not reported

**LONGGO TRANS (Continued)** **1031050904**

| | | |
|---|---|---|
| Contact Email: | | LONGGOTRANSAR@GMAIL.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 7914 EDISON AVE |
| Mailing City,State,Zip: | | ONTARIO, CA 91762 |
| Owner Name: | Connie Gao | |
| Owner Type: | | Other |
| Operator Name: | Connie Gao | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20240316 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

**LONGGO TRANS (Continued)** **1031050904**

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: CONNIE GAO | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 7914 EDISON AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 909-628-7868 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: CONNIE GAO | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 5772 TERRITORY LN |
| Owner/Operator City,State,Zip: | EASTVALE, CA 91710 |
| Owner/Operator Telephone: | 626-758-8088 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20240315 |
| Handler Name: LONGGO TRANS | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 541360 |
| NAICS Description: | Geophysical Surveying And Mapping Services |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

**43 SE < 1/8 0.063 mi. 332 ft.** | **ALEWYN DAIRY #3**
**14361 GROVE**
**ONTARIO, CA 91762** | **ENF**
**San Bern. Co. Permit**
**CIWQS** | **S104761898**
**N/A**

**Relative: Lower**

**Actual: 682 ft.**

ENF:

| | |
|---|---|
| Name: | GORDON DAIRY #6 |
| Address: | 14361 GROVE AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 204960 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.992964 |
| Place Longitude: | -117.628072 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | 332712 |
| Reg Measure Type: | NPDES Permits |
| Region: | 8 |
| Order #: | R8-2007-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Historical |

**ALEWYN DAIRY #3 (Continued)** **S104761898**

| | |
|---|---|
| Status Date: | 12/24/2013 |
| Effective Date: | 09/07/2007 |
| Expiration/Review Date: | 09/06/2012 |
| Termination Date: | 06/06/2013 |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | G |
| Fee Code: | Not reported |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 347119 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 10/08/1982 |
| Adoption/Issuance Date: | Not reported |
| Achieve Date: | Not reported |
| Termination Date: | 10/08/1982 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Commun.. |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | ALEWYN DAIRY #3 |
| Address: | 14361 GROVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000511 |
| Owner: | JACK & ELANE ALEWYN |
| Permit Number: | PT0003754 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/2013 |

CIWQS:

| | |
|---|---|
| Name: | Gordon Dairy #6 |
| Address: | 14361 GROVE AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Craig Gordon |
| Agency Address: | 2915 Kings River Lane, Ontario, CA 91761 |

**ALEWYN DAIRY #3 (Continued)** **S104761898**

| | |
|---|---|
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366006001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 06/13/2013 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.992964 |
| Longitude: | -117.628072 |

| | |
|---|---|
| Name: | Gordon Dairy #6 |
| Address: | 14361 GROVE AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Alewyn, Jack |
| Agency Address: | 9031 Eucalyptus Avenue, Ontario, CA 91762-7515 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS, NPDESWW |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | WDR |
| Order Number: | 82-260 |
| WDID: | 8 365311001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | 10/08/1982 |
| Effective Date: | 10/08/1982 |
| Termination Date: | 10/04/1997 |
| Expiration/Review Date: | 10/04/1997 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.992964 |
| Longitude: | -117.628072 |

**44 ESE < 1/8 0.065 mi. 345 ft.** | **MAJESTIC FARMS #1**
**14333 WALKER**
**ONTARIO, CA 91762** | **ENF**
**San Bern. Co. Permit**
**CIWQS** | **S108724299**
**N/A**

**Relative: Lower**

**Actual: 683 ft.**

ENF:

| | |
|---|---|
| Name: | ONTARIO RANCH HOLSTEINS #2 |
| Address: | 14333 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 239249 |
| Agency Name: | Not reported |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Not reported |
| # Of Agencies: | Not reported |
| Place Latitude: | 33.993203 |
| Place Longitude: | -117.618212 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Enf Action |
| Design Flow: | Not reported |
| Threat To Water Quality: | Not reported |
| Complexity: | Not reported |
| Pretreatment: | Not reported |
| Facility Waste Type: | Not reported |
| Facility Waste Type 2: | Not reported |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | Not reported |
| # Of Programs: | 1 |
| WDID: | Not reported |
| Reg Measure Id: | Not reported |
| Reg Measure Type: | Not reported |
| Region: | Not reported |
| Order #: | Not reported |
| Npdes# CA#: | Not reported |
| Major-Minor: | Not reported |
| Npdes Type: | Not reported |
| Reclamation: | Not reported |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Not reported |

**MAJESTIC FARMS #1 (Continued)** **S108724299**

| | |
|---|---|
| Status Date: | Not reported |
| Effective Date: | Not reported |
| Expiration/Review Date: | Not reported |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | Not reported |
| Fee Code: | Not reported |
| Direction/Voice: | Not reported |
| Enforcement Id(EID): | 391902 |
| Region: | Not reported |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 2012-08-09 |
| Adoption/Issuance Date: | 08/09/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 2012-08-09 00:00:00 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 08/09/2012 for Struikmans, Henry |
| Description: | Not reported |
| Program: | Not reported |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | Not reported |
| Total Assessment Amount: | Not reported |
| Initial Assessed Amount: | Not reported |
| Liability $ Amount: | Not reported |
| Project $ Amount: | Not reported |
| Liability $ Paid: | Not reported |
| Project $ Completed: | Not reported |
| Total $ Paid/Completed Amount: | Not reported |

| | |
|---|---|
| Name: | STRUIKMANS & SON DAIRY 2 |
| Address: | 14333 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 239249 |
| Agency Name: | Struikmans, Henry |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.993203 |
| Place Longitude: | -117.618212 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |

**MAJESTIC FARMS #1 (Continued)** **S108724299**

| | |
|---|---|
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0.0001 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365236002 |
| Reg Measure Id: | 211615 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | 8 |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | Not reported |
| Status: | Active |
| Status Date: | 07/11/2019 |
| Effective Date: | 06/09/1978 |
| Expiration/Review Date: | 03/15/2024 |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391902 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 08/09/2012 |
| Adoption/Issuance Date: | 08/09/2012 |
| Achieve Date: | Not reported |
| Termination Date: | 08/09/2012 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |

**MAJESTIC FARMS #1 (Continued)** **S108724299**

| | |
|---|---|
| Status: | Historical |
| Title: | Oral Com 08/09/2012 for Struikmans, Henry |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

San Bern. Co. Permit:

| | |
|---|---|
| Name: | MAJESTIC FARMS #1 |
| Address: | 14333 WALKER |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0011051 |
| Owner: | STRUIKMAN, NICHOLAS |
| Permit Number: | PT0019049 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 07/31/2009 |

CIWQS:

| | |
|---|---|
| Name: | Ontario Ranch Holsteins #2 |
| Address: | 14333 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Rudolph Haringa |
| Agency Address: | P.O. Box 7219, Norco, CA 92860 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366053001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 01/11/2024 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.993203 |
| Longitude: | -117.618212 |

| | |
|---|---|
| Name: | Ontario Ranch Holsteins #2 |
| Address: | 14333 WALKER AVENUE |

**MAJESTIC FARMS #1 (Continued)** **S108724299**

| | |
|---|---|
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Joe De Hoog |
| Agency Address: | 1281 South Almond Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 366038001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 02/06/2020 |
| Termination Date: | 02/06/2024 |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | Not reported |
| Major/Minor: | Major |
| Complexity: | Not reported |
| TTWQ: | Not reported |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.993203 |
| Longitude: | -117.618212 |

| | |
|---|---|
| Name: | Ontario Ranch Holsteins #2 |
| Address: | 14333 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Agency: | Struikmans, Henry |
| Agency Address: | 14333 Walker Avenue, Ontario, CA 91762 |
| Place/Project Type: | Animal Feeding Facility |
| SIC/NAICS: | 241 |
| Region: | 8 |
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Historical |
| Regulatory Measure Type: | NPDES Permit |
| Order Number: | 88-141 |
| WDID: | 8 365236002 |
| NPDES Number: | CAG018001 |
| Adoption Date: | 12/09/1988 |
| Effective Date: | 12/09/1988 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 12/06/2003 |
| Design Flow: | 0.0001 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.993203 |
| Longitude: | -117.618212 |

**H45 NE < 1/8 0.073 mi. 386 ft.** | **RLE DAIRY**
**14049 GROVE AVE**
**ONTARIO, CA 91761**
**Site 1 of 2 in cluster H** | **San Bern. Co. Permit** | **S104762090**
**N/A**

**Relative: Higher**
**Actual: 700 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | RLE DAIRY |
| Address: | 14049 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000626 |
| Owner: | ESPARZA, RUBEN L |
| Permit Number: | PT0008717 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | RLE DAIRY |
| Address: | 14049 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000626 |
| Owner: | ESPARZA, RUBEN L |
| Permit Number: | PT0008718 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

---

**H46 NE < 1/8 0.108 mi. 569 ft.** | **BROWN'S FAMILY DAIRY**
**14016 S GROVE AVE**
**ONTARIO, CA 91710**
**Site 2 of 2 in cluster H** | **San Bern. Co. Permit** | **S104761656**
**N/A**

**Relative: Higher**
**Actual: 703 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | BROWN'S FAMILY DAIRY |
| Address: | 14016 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91710 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000370 |
| Owner: | BROWN, RONALD |
| Permit Number: | PT0008922 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | BROWN'S FAMILY DAIRY |
| Address: | 14016 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91710 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000370 |
| Owner: | BROWN, RONALD |
| Permit Number: | PT0008923 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

**I47 SSE < 1/8 0.120 mi. 634 ft.** | **JOE FERREIRA JR DAIRY**
**14400 S GROVE AVE**
**ONTARIO, CA 91762**
**Site 1 of 2 in cluster I** | **San Bern. Co. Permit** | **S106910656**
**N/A**

**Relative: Lower**
**Actual: 679 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | JOE FERREIRA JR DAIRY |
| Address: | 14400 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000515 |
| Owner: | JOE & LEONTINA FERREIRA TRUST |
| Permit Number: | PT0003666 |
| Permit Category: | HAZMAT HANDLER - AGRICULTURAL(FE) |
| Facility Status: | INACTIVE |
| Expiration Date: | 02/28/1991 |

---

**I48 SSE < 1/8 0.120 mi. 634 ft.** | **WHITEGOLD VENTURES LP**
**14400 GROVE AVE**
**ONTARIO, CA 91762**
**Site 2 of 2 in cluster I** | **RCRA NonGen / NLR**
**E MANIFEST** | **1024754364**
**CAC002974181**

**Relative: Lower**
**Actual: 679 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20180803 |
| Handler Name: | | Whitegold Ventures Lp |
| Handler Address: | | 14400 Grove Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAC002974181 |
| Contact Name: | | LEONTINA FERREIRA |
| Contact Address: | | 14400 GROVE AVE |
| Contact City,State,Zip: | | ONTARIO, CA 91762 |
| Contact Telephone: | | 951-733-5948 |
| Contact Fax: | | Not reported |
| Contact Email: | | FAVILA@BURNS-ENVIRO.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Handler Activities |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 14400 GROVE AVE |
| Mailing City,State,Zip: | | ONTARIO, CA 91762 |
| Owner Name: | Whitegold Ventures Lp | |
| Owner Type: | | Other |
| Operator Name: | Leontina Ferreira | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |

**WHITEGOLD VENTURES LP (Continued)** **1024754364**

| | |
|---|---|
| Underground Injection Control: | No |
| Off-Site Waste Receipt: | No |
| Universal Waste Indicator: | Yes |
| Universal Waste Destination Facility: | Yes |
| Federal Universal Waste: | No |
| Active Site State-Reg Handler: | --- |
| Federal Facility Indicator: | Not reported |
| Hazardous Secondary Material Indicator: | N |
| Sub-Part K Indicator: | Not reported |
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20180831 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: WHITEGOLD VENTURES LP | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 14400 GROVE AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-733-5948 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: LEONTINA FERREIRA | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 14400 GROVE AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-733-5948 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |

**WHITEGOLD VENTURES LP (Continued)** **1024754364**

Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20180803
Handler Name: WHITEGOLD VENTURES LP
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: Not reported
Electronic Manifest Broker: Not reported

List of NAICS Codes and Descriptions:
NAICS Code: 56299
NAICS Description: All Other Waste Management Services

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

E MANIFEST:
Manifest Tracking Number: 003699389GBF
Last Updated Date: 20180926
Shipped Date: 20180805
Received Date: 20180808
Manifest Status: Signed
Submission Type: DataImage5Copy
Origin Type: Service
Generator EPA ID: CAC002974181
Generator Name: Whitegold Ventures Sp
Generator Location Street Number: Not reported
Generator Location Street 1: 14400 GROVE AVE
Generator Location Street 2: Not reported
Generator Location City: ONTARIO
Generator Location State: CA
Generator Location Zip: 91762
Generator Mail Street Number: Not reported
Generator Mail Street 1: 14400 GROVE AVE
Generator Mail Street 2: Not reported
Generator Mail City: ONTARIO
Generator Mail Zip: 91762
Generator Mail State: CA
Generator Contact Company Name: Not reported
Designated Facility EPA ID: CAD009007626
Designated Facility Name: Not reported
Designated Facility Mail Street Number: Not reported
Designated Facility Mail Street 1: Not reported
Designated Facility Mail Street 2: 1211 W. GLADSTONE STREET

**WHITEGOLD VENTURES LP (Continued)** **1024754364**

| | |
|---|---|
| Designated Facility Mail City: | AZUSA |
| Designated Facility Mail Zip: | 91702 |
| Designated Facility Mail State: | CA |
| Designated Facility Location Street Number: | Not reported |
| Designated Facility Location Street 1: | 1211 W. GLADSTONE STREET |
| Designated Facility Location Street 2: | Not reported |
| Designated Facility Location City: | AZUSA |
| Designated Facility Location Zip: | 91702 |
| Designated Facility Location State: | CA |
| Designated Facility Contact Company Name: | AZUSA LAND RECLAMATION CO INC |
| Manifest Residue Indicator: | N |
| Rejection Indicator: | N |

State Waste:

| | |
|---|---|
| Manifest Tracking Number: | 003699389GBF |
| Waste Line Number: | 1 |
| State Waste Code Owner: | CA |
| State Waste Code: | 151 |
| State Waste: | Asbestos-containing waste |

Transporter:

| | |
|---|---|
| Manifest Tracking Number: | 003699389GBF |
| Transporter Line Number: | 1 |
| Transporter EPA ID: | CAL000395969 |
| Transporter Name: | Burns Environmental Services |

| | |
|---|---|
| Manifest Tracking Number: | 003699389GBF |
| Transporter Line Number: | 2 |
| Transporter EPA ID: | CAR000181891 |
| Transporter Name: | Usa Waste Of Ca Inc Dba Bdc Special Wast |

Waste Line:

| | |
|---|---|
| Manifest Tracking Number: | 003699389GBF |
| Waste Line Number: | 1 |
| U.S. DOT Hazardous Indicator: | Y |
| U.S. DOT ID Number: | NA2212 |
| U.S. DOT Description: | Na2212, Waste Asbestos, 9, Iii, Rq |
| Non-Hazardous Waste Description: | Not reported |
| Number of Containers: | 40 |
| Container Type Code: | BA |
| Container Type Description: | Burlap, cloth, paper, or plastic bags |
| Waste Quantity: | 4 |
| Quantity Unit of Measure Code: | Y |
| Quantity Unit of Measure Description: | Cubic Yards |
| Waste Quantity, in Tons: | 3.36 |
| Acute Waste Quantity, in Tons: | 0 |
| Non-Acute Waste Quantity, in Tons: | 3.36 |
| Waste Quantity, in Kilograms: | 3047.6208 |
| Acute Waste Quantity, in Kilograms: | 0 |
| Non-Acute Waste Quantity, in Kilorgrams: | 3047.6208 |
| Management Method Code: | H132 |
| Management Method Description: | LANDFILL (WITH PRIOR TREATMENT AND/OR STABILIZATION) |
| Waste Residue Indicator: | N |
| Quantity Discrepancy Indicator: | N |
| Waste Type Discrepancy Indicator: | N |
| Waste Density: | Not reported |

**WHITEGOLD VENTURES LP (Continued)** **1024754364**

| | |
|---|---|
| Waste Density Unit of Measure Code: | Not reported |
| Waste Density Unit of Measure Description: | Not reported |
| Form Code: | Not reported |
| Form Code Description: | Not reported |
| Source Code: | Not reported |
| Source Code Description: | Not reported |
| Waste Minimization Code: | Not reported |
| Waste Minimization Code Description: | Not reported |
| Consent Number: | Not reported |
| EPA Waste Indicator: | Y |

---

**J49**
**West**
**1/8-1/4**
**0.127 mi.**
**673 ft.**

**Relative:**
**Higher**

**Actual:**
**695 ft.**

**SAM SOUSA DAIRY**
**7330 EDISON AVE**
**ONTARIO, CA 91762**

**Site 1 of 5 in cluster J**

**CERS HAZ WASTE** **S104762106**
**EMI** **N/A**
**ENF**
**HWTS**
**San Bern. Co. Permit**
**CIWQS**
**CERS**

CERS HAZ WASTE:

| | |
|---|---|
| Name: | KENT AVERY REPAIR INC. |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 614282 |
| CERS ID: | 10902508 |
| CERS Description: | Hazardous Waste Generator |

EMI:

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2006 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145210 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.794732321786430002 |
| Reactive Organic Gases Tons/Yr: | 6.144 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.709 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .8362137 |

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2007 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145210 |
| Air District Name: | SC |
| SIC Code: | 241 |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 8.794732321786430002 |
| Reactive Organic Gases Tons/Yr: | 6.144 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.709 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .8362137 |

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2008 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145210 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.879186945319209848 |
| Reactive Organic Gases Tons/Yr: | 2.71 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 1.36 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | .665448 |

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Year: | 2009 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 145210 |
| Air District Name: | SC |
| SIC Code: | 241 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | 3.2350415115946101 |
| Reactive Organic Gases Tons/Yr: | 2.2599999999999998 |
| Carbon Monoxide Emissions Tons/Yr: | 0 |
| NOX - Oxides of Nitrogen Tons/Yr: | 0 |
| SOX - Oxides of Sulphur Tons/Yr: | 0 |
| Particulate Matter Tons/Yr: | 0.67000000000000004 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.32783099999999998 |

ENF:

| | |
|---|---|
| Name: | OK CATTLE LLC |
| Address: | 7330 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA |
| Region: | 8 |
| Facility Id: | 255143 |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Agency Name: | Sam Sousa |
| Place Type: | Growing |
| Place Subtype: | Animal Feeding |
| Facility Type: | Agricultural |
| Agency Type: | Privately-Owned Business |
| # Of Agencies: | 1 |
| Place Latitude: | 33.997581 |
| Place Longitude: | -117.646761 |
| SIC Code 1: | 241 |
| SIC Desc 1: | Dairy Farms |
| SIC Code 2: | Not reported |
| SIC Desc 2: | Not reported |
| SIC Code 3: | Not reported |
| SIC Desc 3: | Not reported |
| NAICS Code 1: | Not reported |
| NAICS Desc 1: | Not reported |
| NAICS Code 2: | Not reported |
| NAICS Desc 2: | Not reported |
| NAICS Code 3: | Not reported |
| NAICS Desc 3: | Not reported |
| # Of Places: | 1 |
| Source Of Facility: | Reg Meas |
| Design Flow: | 0 |
| Threat To Water Quality: | 2 |
| Complexity: | C |
| Pretreatment: | X - Facility is not a POTW |
| Facility Waste Type: | Solid wastes, NEC |
| Facility Waste Type 2: | Stormwater runoff |
| Facility Waste Type 3: | Not reported |
| Facility Waste Type 4: | Not reported |
| Program: | ANIWSTCOWS |
| Program Category1: | ANIMALWASTE |
| Program Category2: | ANIMALWASTE |
| # Of Programs: | 1 |
| WDID: | 8 365766001 |
| Reg Measure Id: | 211751 |
| Reg Measure Type: | Enrollee - NPDES |
| Region: | 8 |
| Order #: | R8-2018-0001 |
| Npdes# CA#: | CAG018001 |
| Major-Minor: | Minor |
| Npdes Type: | Not reported |
| Reclamation: | N - No |
| Dredge Fill Fee: | Not reported |
| 301H: | Not reported |
| Application Fee Amt Received: | 2000 |
| Status: | Active |
| Status Date: | 07/08/2019 |
| Effective Date: | 08/08/2001 |
| Expiration/Review Date: | 03/15/2024 |
| Termination Date: | Not reported |
| WDR Review - Amend: | Not reported |
| WDR Review - Revise/Renew: | Not reported |
| WDR Review - Rescind: | Not reported |
| WDR Review - No Action Required: | Not reported |
| WDR Review - Pending: | Not reported |
| WDR Review - Planned: | Not reported |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Status Enrollee: | N |
| Individual/General: | I |
| Fee Code: | 10 - Confined animal feeding facility |
| Direction/Voice: | Passive |
| Enforcement Id(EID): | 391917 |
| Region: | 8 |
| Order / Resolution Number: | Not reported |
| Enforcement Action Type: | Oral Communication |
| Effective Date: | 04/09/2013 |
| Adoption/Issuance Date: | 04/09/2013 |
| Achieve Date: | Not reported |
| Termination Date: | 04/09/2013 |
| ACL Issuance Date: | Not reported |
| EPL Issuance Date: | Not reported |
| Status: | Historical |
| Title: | Oral Com 04/09/2013 for Sousa, Sam |
| Description: | Not reported |
| Program: | ANIWSTCOWS |
| Latest Milestone Completion Date: | Not reported |
| # Of Programs1: | 1 |
| Total Assessment Amount: | 0 |
| Initial Assessed Amount: | 0 |
| Liability $ Amount: | 0 |
| Project $ Amount: | 0 |
| Liability $ Paid: | 0 |
| Project $ Completed: | 0 |
| Total $ Paid/Completed Amount: | 0 |

HWTS:

| | |
|---|---|
| Name: | KENT AVERY REPAIR INC |
| Address: | 7330 EDISON AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAL000471801 |
| Inactive Date: | 06/30/2023 |
| Create Date: | 07/07/2022 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 2892 JAMES ST |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | CORONA, CA 92881 |
| Owner Name: | KENT AVERY REPAIR INC |
| Owner Address: | 2752 SCARBOROUGH PL |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | RIVERSIDE, CA 92503 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | KENT AVERY |
| Contact Address: | 2892 JAMES ST |
| Contact Address 2: | Not reported |
| City,State,Zip: | CORONA, CA 92881 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | Permanent |
| Category: | State |
| Latitude: | 33.997662310000003 |

**SAM SOUSA DAIRY (Continued)** **S104762106**

Longitude: -117.64345179999999

San Bern. Co. Permit:

Name: SAM SOUSA DAIRY
Address: 7330 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0000634
Owner: SOUSA, SAM
Permit Number: PT0008924
Permit Category: HAZARDOUS MATERIALS 1-3 CHEMICALS SPECIAL
Facility Status: ACTIVE
Expiration Date: 04/30/2025

Name: KENT AVERY REPAIR INC
Address: 7330 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0019415
Owner: MULTI-CORP RESOURCES, INC
Permit Number: PT0041546
Permit Category: HAZARDOUS MATERIALS 1-3 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 03/31/2025

Name: KENT AVERY REPAIR INC
Address: 7330 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0019415
Owner: MULTI-CORP RESOURCES, INC
Permit Number: PT0041547
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: ACTIVE
Expiration Date: 03/31/2025

Name: SAM SOUSA DAIRY
Address: 7330 EDISON AVE
City,State,Zip: ONTARIO, CA 91762
Region: SAN BERNARDINO
Facility ID: FA0000634
Owner: SOUSA, SAM
Permit Number: PT0008925
Permit Category: HAZWASTE GENERAL ACTIVITY (NB)
Facility Status: INACTIVE
Expiration Date: 04/30/2007

CIWQS:

Name: Ok Cattle Llc
Address: 7330 EDISON AVENUE
City,State,Zip: ONTARIO, CA 91762
Agency: Sam Sousa
Agency Address: 7330 Edison Avenue, Ontario, CA 91762
Place/Project Type: Animal Feeding Facility
SIC/NAICS: 241
Region: 8

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Program: | ANIWSTCOWS |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - NPDES |
| Order Number: | R8-2018-0001 |
| WDID: | 8 365766001 |
| NPDES Number: | CAG018001 |
| Adoption Date: | Not reported |
| Effective Date: | 08/08/2001 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 03/15/2024 |
| Design Flow: | 0 |
| Major/Minor: | Minor |
| Complexity: | C |
| TTWQ: | 2 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 33.997581 |
| Longitude: | -117.646761 |

CERS:

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 64237 |
| CERS ID: | 110041519684 |
| CERS Description: | US EPA Air Emission Inventory System (EIS) |

Violations:

| | |
|---|---|
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508.1(a)-(e) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(e) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. |
| Violation Notes: | Returned to compliance on 07/25/2017. Hazardous materials were observed on site during the inspection that are not listed in the most current Business Plan inventory. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2 |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete, accurate, and up-to-date. |
| Violation Notes: | Returned to compliance on 07/25/2017. The last Business Plan update submitted by this facility is dated 1/10/2008. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |

**SAM SOUSA DAIRY (Continued)** **S104762106**

Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY
Violation Date: 04-24-2016
Citation: 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f)
Violation Description: Failure to properly label hazardous waste accumulation containers with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date.
Violation Notes: Returned to compliance on 07/09/2019. Failure to label hazardous waste containers (CCR 66262.34(f)(3)) Any tank or container holding a hazardous waste must be properly labeled. Proper labeling includes the following information: the words Hazardous Waste, generator name and address, hazardous properties of the waste, composition & physical state of the waste, and the accumulation start date. Observed two 55-gallon drums of used oil missing hazardous waste labels. Compliance requirement: -Submit a signed statement that all containers of used oil have been removed and that no hazardous wastes will be stored on site.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY
Violation Date: 04-27-2016
Citation: HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d)
Violation Description: Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 07/25/2017. This facility has not submitted the Business Plan elements into CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY
Violation Date: 07-09-2019
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date.
Violation Notes: Returned to compliance on 08/08/2019. OBSERVATION: The last Business Plan update submitted by this facility is dated 2/21/2018. CORRECTIVE ACTION: Submit a signed statement that the Business Plan elements have been updated in CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY

**SAM SOUSA DAIRY (Continued)** **S104762106**

Violation Date: 06-03-2022
Citation: HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f)
Violation Description: Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan.
Violation Notes: OBSERVATION: A 55-gallon drum of motor oil was observed on site during the inspection that is not listed in the current CERS inventory. Also, ensure that the federal hazard categories are completed for each material listed in the inventory. CORRECTIVE ACTION: Submit a signed statement that the inventory has been revised in CERS to include the 55-gallon drum of motor oil and completed federal hazard categories.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-03-2022
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-SAM SOUZA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-09-2019
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-SAM SOUSA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

**SAM SOUSA DAIRY (Continued)** **S104762106**

Coordinates:

| | |
|---|---|
| Site ID: | 64237 |
| Facility Name: | SAM SOUSA DAIRY |
| Env Int Type Code: | FRS-AIR |
| Program ID: | 110041519684 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Unknown, |
| Latitude: | 33.997600 |
| Longitude: | -117.643360 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | SAM SOUSA DAIRY |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE. |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | SAM SOUSA |
| Entity Title: | OWNER |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | Sousa, Sam |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | (909) 627-9342, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (951) 203-5905, |

| | |
|---|---|
| Name: | KENT AVERY REPAIR INC. |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 614282 |
| CERS ID: | 10902508 |
| CERS Description: | Chemical Storage Facilities |

Coordinates:

| | |
|---|---|
| Site ID: | 614282 |
| Facility Name: | Kent Avery Repair Inc. |
| Env Int Type Code: | HMBP |
| Program ID: | 10902508 |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Coord Name: | Not reported |
| Ref Point Type Desc: | Center of a facility or station., |
| Latitude: | 33.997990 |
| Longitude: | -117.644850 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | Kent Avery |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 2892 James St |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92881 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Kent Avery |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | KENT AVERY REPAIR INC |
| Entity Title: | Not reported |
| Affiliation Address: | 2892 James St |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 92881 |
| Affiliation Phone: | (909) 229-2084, |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Entity Name: | KENT AVERY |
| Entity Title: | Not reported |
| Affiliation Address: | 2892 James St |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92881 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Ross Avery |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (951) 202-0001, |

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | Multi-Corp Resources, Inc. |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | SAM SOUSA DAIRY |
| Address: | 7330 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 64237 |
| CERS ID: | 10034818 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508.1(a)-(e) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(e) |
| Violation Description: | Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. |
| Violation Notes: | Returned to compliance on 07/25/2017. Hazardous materials were observed on site during the inspection that are not listed in the most current Business Plan inventory. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508.2 - California Health and Safety Code, Chapter 6.95, Section(s) 25508.2 |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete, accurate, and up-to-date. |
| Violation Notes: | Returned to compliance on 07/25/2017. The last Business Plan update submitted by this facility is dated 1/10/2008. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |
| | |
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-24-2016 |
| Citation: | 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f) |
| Violation Description: | Failure to properly label hazardous waste accumulation containers with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date. |
| Violation Notes: | Returned to compliance on 07/09/2019. Failure to label hazardous waste containers (CCR 66262.34(f)(3)) Any tank or container holding a hazardous waste must be properly labeled. Proper labeling includes the following information: the words Hazardous Waste, generator name and address, hazardous properties of the waste, composition & physical state of the waste, and the accumulation start date. Observed two 55-gallon drums of used oil missing hazardous waste labels. Compliance requirement: -Submit a signed statement that all containers of used oil have been removed and that no hazardous wastes will be stored on site. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HW |
| Violation Source: | CERS, |
| | |
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 04-27-2016 |
| Citation: | HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d) |
| Violation Description: | Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities. |
| Violation Notes: | Returned to compliance on 07/25/2017. This facility has not submitted the Business Plan elements into CERS. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HMRRP |
| Violation Source: | CERS, |
| | |
| Site ID: | 64237 |
| Site Name: | SAM SOUSA DAIRY |
| Violation Date: | 07-09-2019 |
| Citation: | HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1) |
| Violation Description: | Failure to annually review and electronically certify that the business plan is complete and accurate on or before the annual due date. |
| Violation Notes: | Returned to compliance on 08/08/2019. OBSERVATION: The last Business |

**SAM SOUSA DAIRY (Continued)** **S104762106**

Plan update submitted by this facility is dated 2/21/2018. CORRECTIVE ACTION: Submit a signed statement that the Business Plan elements have been updated in CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 64237
Site Name: SAM SOUSA DAIRY
Violation Date: 06-03-2022
Citation: HSC 6.95 25508.1(a)-(f) - California Health and Safety Code, Chapter 6.95, Section(s) 25508.1(a)-(f)
Violation Description: Failure to electronically update business plan within 30 days of any one of the following events: A 100 percent or more increase in the quantity of a previously disclosed material. Any handling of a previously undisclosed hazardous materials at or above reportable quantities. A change of business address, business ownership, or business name. A substantial change in the handler's operations that requires modification to any portion of the business plan.
Violation Notes: OBSERVATION: A 55-gallon drum of motor oil was observed on site during the inspection that is not listed in the current CERS inventory. Also, ensure that the federal hazard categories are completed for each material listed in the inventory. CORRECTIVE ACTION: Submit a signed statement that the inventory has been revised in CERS to include the 55-gallon drum of motor oil and completed federal hazard categories.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-03-2022
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-27-2016
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: ROUTINE HANDLER INSPECTION-SAM SOUZA DAIRY
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Eval General Type: | Compliance Evaluation Inspection |
| Eval Date: | 07-09-2019 |
| Violations Found: | Yes |
| Eval Type: | Routine done by local agency |
| Eval Notes: | ROUTINE HANDLER INSPECTION-SAM SOUSA DAIRY |
| Eval Division: | San Bernardino County Fire Department |
| Eval Program: | HMRRP |
| Eval Source: | CERS, |

Coordinates:

| | |
|---|---|
| Site ID: | 64237 |
| Facility Name: | SAM SOUSA DAIRY |
| Env Int Type Code: | FRS-AIR |
| Program ID: | 110041519684 |
| Coord Name: | Not reported |
| Ref Point Type Desc: | Unknown, |
| Latitude: | 33.997600 |
| Longitude: | -117.643360 |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | SAM SOUSA DAIRY |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Document Preparer |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Environmental Contact |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE. |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |

**SAM SOUSA DAIRY (Continued)** **S104762106**

| | |
|---|---|
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Facility Mailing Address |
| Entity Name: | Mailing Address |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | SAM SOUSA |
| Entity Title: | OWNER |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | Sousa, Sam |
| Entity Title: | Not reported |
| Affiliation Address: | 7330 EDISON AVE |
| Affiliation City: | ONTARIO |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 91762 |
| Affiliation Phone: | (909) 627-9342, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | SAM SOUSA |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (951) 203-5905, |

**J50 West 1/8-1/4 0.127 mi. 673 ft.** | **KENT AVERY REPAIR INC**
**7330 EDISON AVE**
**ONTARIO, CA 91762**

**Site 2 of 5 in cluster J** | **RCRA NonGen / NLR** | **1027467473**
**CAL000471801**

**Relative: Higher**

**Actual: 695 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20220707 |
| Handler Name: | | Kent Avery Repair Inc |
| Handler Address: | | 7330 Edison Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAL000471801 |
| Contact Name: | | KENT AVERY |
| Contact Address: | | 2892 JAMES ST |
| Contact City,State,Zip: | | CORONA, CA 92881 |
| Contact Telephone: | | 909-229-2084 |
| Contact Fax: | | Not reported |
| Contact Email: | | KENTAVERYREPAIR@YAHOO.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 2892 JAMES ST |
| Mailing City,State,Zip: | | CORONA, CA 92881 |
| Owner Name: | Kent Avery Repair Inc | |
| Owner Type: | | Other |
| Operator Name: | Kent Avery | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |

**KENT AVERY REPAIR INC (Continued)** **1027467473**

| | |
|---|---|
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20220718 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: KENT AVERY REPAIR INC | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 2752 SCARBOROUGH PL |
| Owner/Operator City,State,Zip: | RIVERSIDE, CA 92503 |
| Owner/Operator Telephone: | 909-229-2084 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: KENT AVERY | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 2892 JAMES ST |
| Owner/Operator City,State,Zip: | CORONA, CA 92881 |
| Owner/Operator Telephone: | 909-229-2084 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20220707 |
| Handler Name: KENT AVERY REPAIR INC | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

**KENT AVERY REPAIR INC (Continued)** **1027467473**

List of NAICS Codes and Descriptions:
NAICS Code: 811490
NAICS Description: Other Personal And Household Goods Repair And Maintenance

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

---

**J51 West 1/8-1/4 0.129 mi. 682 ft.** | **MATERIAL RECOVERY SOLUTIONS INC**
**7325 EDISON AVE**
**ONTARIO, CA 91762**
**Site 3 of 5 in cluster J** | **SWF/LF LDS NPDES CERS** | **S119777635 N/A**

**Relative: Higher**
**Actual: 694 ft.**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | ONTARIO AGRICULTURAL COMMODITIES/REGREEN |
| Address: | 7325 EDISON AVE. |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | STATE |
| Facility ID: | 36-AA-0496 |
| SWIS Number: | 36-AA-0496 |
| Point of Contact: | Megan Emslander |
| Is Archived: | Yes |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Closed |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0496 |
| Site Name: | Ontario Agricultural Commodities/Regreen |
| Site Operational Status: | Closed |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.99685 |
| Longitude: | -117.6444 |
| Is Archived: | Yes |
| Operator: | Ontario Agricultural Commodities |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |

**MATERIAL RECOVERY SOLUTIONS INC (Continued)** **S119777635**

| | |
|---|---|
| Contact Phone: | (951) 788-6042 |
| Street Address: | PO Box 79200 |
| Operator City: | Corona |
| Operator State: | CA |
| Operator Zip: | 92877 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0496 |
| Owner: | Golden Ontario Holdings |
| Owner Address: | Gary Dou 14240 Sapphire Hill Lane |
| Owner City: | Chino Hills |
| Owner State: | CA |
| Owner Zip: | 91709 |
| Site Name: | Ontario Agricultural Commodities/Regreen |
| Site Operational Status: | Closed |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.99685 |
| Longitude: | -117.6444 |
| Is Archived: | Yes |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (951) 788-6042 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0496 |
| Site Name: | Ontario Agricultural Commodities/Regreen |
| Activity: | Research Composting Operation |
| Waste Type: | Food Wastes |
| Site Is Archived: | Yes |
| Site Operational Status: | Closed |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | Yes |
| Activity Operational Status: | Closed |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0496 |
| Site Name: | Ontario Agricultural Commodities/Regreen |
| Activity: | Research Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | Yes |
| Site Operational Status: | Closed |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | Yes |
| Activity Operational Status: | Closed |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

**MATERIAL RECOVERY SOLUTIONS INC (Continued)** **S119777635**

LDS:

| | |
|---|---|
| Name: | RECYCLED WOOD PRODUCTS (RWP), ONTARIO 4 (IV) |
| Address: | 7325 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Global Id: | T10000020070 |
| Latitude: | 33.99707 |
| Longitude: | -117.6444 |
| Case Type: | Land Disposal Site |
| Status: | Open - Operating |
| Status Date: | 08/17/2022 |
| Lead Agency: | SANTA ANA RWQCB (REGION 8) |
| Caseworker: | JPL |
| Local Agency: | Not reported |
| RB Case Number: | 8 363012001 |
| LOC Case Number: | Not reported |
| File Location: | Not reported |
| Potential Media Affect: | Not reported |
| EDR Link ID: | T10000020070 |
| Potential Contaminants of Concern: | Not reported |
| EPA Region: | 9 |
| Coordinate Source: | Not reported |
| Quantity Released Gallons: | Not reported |
| Begin Date: | 06/11/2021 |
| Leak Reported Date: | Not reported |
| How Discovered: | Not reported |
| How Discovered Description: | Not reported |
| Discharge Source: | Not reported |
| Discharge Cause: | Not reported |
| Stop Method: | Not reported |
| Stop Description: | Not reported |
| No Further Action Date: | Not reported |
| CA Water Watershed Name: | Santa Ana River - Middle Santa Ana River - Chino (Split) (801.21) |
| Dwr Groundwater Subbasin Name: | Upper Santa Ana Valley - Chino (8-002.01) |
| Disadvantaged Community: | Not reported |
| CA Enviroscreen 3 Score: | 71-75% |
| CA Enviroscreen 4 Score: | 70-75% |
| Military DOD Site: | No |
| Facility Project Subtype: | Compost Facility |
| RWQCB Region: | SANTA ANA RWQCB (REGION 8) |
| Claim Number: | Not reported |
| Claim Status: | Not reported |
| Site History: | Not reported |

Click here to access the California GeoTracker records for this facility:

NPDES:

| | |
|---|---|
| Name: | MATERIAL RECOVERY SOLUTIONS INC |
| Address: | 7325 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |

**MATERIAL RECOVERY SOLUTIONS INC (Continued)** **S119777635**

| | |
|---|---|
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 8 36NNA000183 |
| Regulatory Measure Type: | Industrial |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | No Action Required |
| Status Date: | 07/08/2019 |
| Operator Name: | Material Recovery Solutions Inc |
| Operator Address: | 7325 Edison Ave |
| Operator City: | Ontario |
| Operator State: | California |
| Operator Zip: | 91762 |

CERS:

| | |
|---|---|
| Name: | RECYCLED WOOD PRODUCTS (RWP), ONTARIO 4 (IV) |
| Address: | 7325 EDISON AVENUE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Site ID: | 849250 |
| CERS ID: | T10000020070 |
| CERS Description: | Land Disposal Site |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Regional Board Caseworker |
| Entity Name: | JOANNE LEE - SANTA ANA RWQCB (REGION 8) |
| Entity Title: | Not reported |
| Affiliation Address: | 3737 MAIN STREET, SUITE 500 |
| Affiliation City: | RIVERSIDE |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**J52** **RESIDUALS RECOVERY GROUP, INC.** **SWF/LF** **S117347578**
**West** **7325 EDISON RD.** **N/A**
**1/8-1/4** **ONTARIO, CA 91762**
**0.129 mi.**
**682 ft.** **Site 4 of 5 in cluster J**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | RESIDUALS RECOVERY GROUP, INC. |
| Address: | 7325 EDISON RD. |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | STATE |
| Facility ID: | 36-AA-0483 |
| SWIS Number: | 36-AA-0483 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |

**RESIDUALS RECOVERY GROUP, INC. (Continued)** **S117347578**

| | |
|---|---|
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Activity: | Agricultural Material Composting Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 350 |
| Throughput Units: | Tons per day |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 70000 |
| Capacity Units: | Tons per year |
| Total Acreage: | 20 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 7325 Edison Rd. |
| City: | Ontario |
| State: | CA |

**RESIDUALS RECOVERY GROUP, INC. (Continued)** **S117347578**

| | |
|---|---|
| ZIP Code: | 91762 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.9966 |
| Longitude: | -117.6434 |
| Is Archived: | No |
| Operator: | Residuals Recovery Group, Inc. |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (909) 902-0408 |
| Street Address: | Allen Shelby P.O. Box 17482 |
| Operator City: | Anahiem Hills |
| Operator State: | CA |
| Operator Zip: | 92817 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Owner: | Golden Ontario Hills |
| Owner Address: | Gary Dou 14240 Sapphire Hill Ln. |
| Owner City: | Chino Hills |
| Owner State: | CA |
| Owner Zip: | 91709 |
| Site Name: | Residuals Recovery Group, Inc. |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 33.9966 |
| Longitude: | -117.6434 |
| Is Archived: | No |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (909) 591-6389 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Activity: | Agricultural Material Composting Operation |
| Waste Type: | Agricultural |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |

**RESIDUALS RECOVERY GROUP, INC. (Continued)** **S117347578**

| | |
|---|---|
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Activity: | Agricultural Material Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0483 |
| Site Name: | Residuals Recovery Group, Inc. |
| Activity: | Agricultural Material Composting Operation |
| Waste Type: | Manure |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

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**J53** **SNS DAIRY** **San Bern. Co. Permit** **S104762133**
**West** **7371 EDISON AVE** **N/A**
**1/8-1/4** **ONTARIO, CA 91761**
**0.130 mi.**
**686 ft.** **Site 5 of 5 in cluster J**

**Relative:**
**Higher**

**Actual:**
**694 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | SNS DAIRY |
| Address: | 7371 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000648 |
| Owner: | SAM SOUSA |
| Permit Number: | PT0008933 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | SNS DAIRY |
| Address: | 7371 EDISON AVE |
| City,State,Zip: | ONTARIO, CA 91761 |

**SNS DAIRY (Continued)** **S104762133**

Region: SAN BERNARDINO
Facility ID: FA0000648
Owner: SAM SOUSA
Permit Number: PT0008934
Permit Category: SPECIAL GENERATOR
Facility Status: INACTIVE
Expiration Date: 04/30/1997

---

**K54** **PARK INDUSTRIES** **RCRA NonGen / NLR** **1027695274**
**SW** **14306 BON VIEW AVE** **CAC003238066**
**1/8-1/4** **ONTARIO, CA 91762**
**0.153 mi.**
**810 ft.** **Site 1 of 5 in cluster K**

**Relative:**
**Lower**

**Actual:**
**675 ft.**

RCRA Listings:

| | | |
|---|---|---|
| Date Form Received by Agency: | | 20230619 |
| Handler Name: | | Park Industries |
| Handler Address: | | 14306 Bon View Ave |
| Handler City,State,Zip: | | ONTARIO, CA 91762 |
| EPA ID: | | CAC003238066 |
| Contact Name: | | LUIS ARBURUA |
| Contact Address: | | 14306 BON VIEW AVE |
| Contact City,State,Zip: | | ONTARIO, CA 91762 |
| Contact Telephone: | | 951-905-8155 |
| Contact Fax: | | Not reported |
| Contact Email: | | DAISY@ENVIROPROSCA.COM |
| Contact Title: | | Not reported |
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Not reported |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 14306 BON VIEW AVE |
| Mailing City,State,Zip: | | ONTARIO, CA 91762 |
| Owner Name: | Park Industries | |
| Owner Type: | | Other |
| Operator Name: | Luis Arburua | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |

**PARK INDUSTRIES (Continued)** **1027695274**

| | |
|---|---|
| Sub-Part K Indicator: | Not reported |
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20230619 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: LUIS ARBURUA | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 14306 BON VIEW AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-905-8155 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: PARK INDUSTRIES | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 14306 BON VIEW AVE |
| Owner/Operator City,State,Zip: | ONTARIO, CA 91762 |
| Owner/Operator Telephone: | 951-905-8155 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20230619 |
| Handler Name: PARK INDUSTRIES | |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |

**PARK INDUSTRIES (Continued)** **1027695274**

| | |
|---|---|
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 56299 |
| NAICS Description: | All Other Waste Management Services |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

---

**K55** **GORDON HAY, INC** **RCRA NonGen / NLR** **1026809423**
**SW** **14451 BON VIEW AVE** **CAC003121794**
**1/8-1/4** **ONTARIO, CA 91710**
**0.155 mi.**
**819 ft.** **Site 2 of 5 in cluster K**

**Relative:**
**Lower**

**Actual:**
**676 ft.**

RCRA Listings:

| | |
|---|---|
| Date Form Received by Agency: | 20210527 |
| Handler Name: | Gordon Hay, Inc |
| Handler Address: | 14451 Bon View Ave |
| Handler City,State,Zip: | ONTARIO, CA 91710 |
| EPA ID: | CAC003121794 |
| Contact Name: | DEBBIE GASPER |
| Contact Address: | 16395 S EUCLID AVE |
| Contact City,State,Zip: | CHINO, CA 91708 |
| Contact Telephone: | 909-393-4408 |
| Contact Fax: | Not reported |
| Contact Email: | HAYDEBI@AOL.COM |
| Contact Title: | Not reported |
| EPA Region: | 09 |
| Land Type: | Not reported |
| Federal Waste Generator Description: | Not a generator, verified |
| Non-Notifier: | Not reported |
| Biennial Report Cycle: | Not reported |
| Accessibility: | Not reported |
| Active Site Indicator: | Not reported |
| State District Owner: | Not reported |
| State District: | Not reported |
| Mailing Address: | 16395 S EUCLID AVE |
| Mailing City,State,Zip: | CHINO, CA 91708 |
| Owner Name: | Craig Gordon |
| Owner Type: | Other |
| Operator Name: | Debbie Gasper |
| Operator Type: | Other |
| Short-Term Generator Activity: | No |
| Importer Activity: | No |

**GORDON HAY, INC (Continued)** **1026809423**

| | |
|---|---|
| Mixed Waste Generator: | No |
| Transporter Activity: | No |
| Transfer Facility Activity: | No |
| Recycler Activity with Storage: | No |
| Small Quantity On-Site Burner Exemption: | No |
| Smelting Melting and Refining Furnace Exemption: | No |
| Underground Injection Control: | No |
| Off-Site Waste Receipt: | No |
| Universal Waste Indicator: | No |
| Universal Waste Destination Facility: | No |
| Federal Universal Waste: | No |
| Active Site State-Reg Handler: | --- |
| Federal Facility Indicator: | Not reported |
| Hazardous Secondary Material Indicator: | N |
| Sub-Part K Indicator: | Not reported |
| 2018 GPRA Permit Baseline: | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | No |
| Subject to Corrective Action Universe: | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | No |
| Corrective Action Priority Ranking: | No NCAPS ranking |
| Environmental Control Indicator: | No |
| Institutional Control Indicator: | No |
| Human Exposure Controls Indicator: | N/A |
| Groundwater Controls Indicator: | N/A |
| Significant Non-Complier Universe: | No |
| Unaddressed Significant Non-Complier Universe: | No |
| Addressed Significant Non-Complier Universe: | No |
| Significant Non-Complier With a Compliance Schedule Universe: | No |
| Financial Assurance Required: | Not reported |
| Handler Date of Last Change: | 20210601 |
| Recognized Trader-Importer: | No |
| Recognized Trader-Exporter: | No |
| Importer of Spent Lead Acid Batteries: | No |
| Exporter of Spent Lead Acid Batteries: | No |
| Recycler Activity Without Storage: | No |
| Manifest Broker: | No |
| Sub-Part P Indicator: | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: DEBBIE GASPER | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 16395 S EUCLID AVE |
| Owner/Operator City,State,Zip: | CHINO, CA 91708 |
| Owner/Operator Telephone: | 909-393-4408 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: CRAIG GORDON | |
| Legal Status: | Other |
| Date Became Current: | Not reported |

**GORDON HAY, INC (Continued)** **1026809423**

| | |
|---|---|
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 16395 S EUCLID AVE |
| Owner/Operator City,State,Zip: | CHINO, CA 91708 |
| Owner/Operator Telephone: | 909-393-4408 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20210527 |
| Handler Name: | GORDON HAY, INC |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | No |
| Electronic Manifest Broker: | No |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 11212 |
| NAICS Description: | Dairy Cattle And Milk Production |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

---

**K56** **AG-COSTA VIEW FARM** **SWEEPS UST** **S101591786**
**SW** **14451 BON VIEW** **CA FID UST** **N/A**
**1/8-1/4** **CHINO, CA 91710** **CERS**
**0.155 mi.**
**819 ft.** **Site 3 of 5 in cluster K**

**Relative:**
**Lower**

**Actual:**
**676 ft.**

SWEEPS UST:

| | |
|---|---|
| Name: | AG-COSTA VIEW FARM |
| Address: | 14451 BON VIEW |
| City: | CHINO |
| Status: | Active |
| Comp Number: | 44727 |
| Number: | 9 |
| Board Of Equalization: | Not reported |
| Referral Date: | 08-27-91 |
| Action Date: | 08-27-91 |
| Created Date: | 02-29-88 |
| Owner Tank Id: | 1 |
| SWRCB Tank Id: | 36-000-044727-000001 |
| Tank Status: | A |
| Capacity: | 550 |
| Active Date: | 07-01-85 |
| Tank Use: | M.V. FUEL |

**AG-COSTA VIEW FARM (Continued)** **S101591786**

STG: P
Content: LEADED
Number Of Tanks: 1

CA FID UST:
Facility ID: 36009015
Regulated By: UTNKA
Regulated ID: 00044727
Cortese Code: Not reported
SIC Code: Not reported
Facility Phone: 7145972360
Mail To: Not reported
Mailing Address: 14451 BON VIEW
Mailing Address 2: Not reported
Mailing City,St,Zip: CHINO 91710
Contact: Not reported
Contact Phone: Not reported
DUNs Number: Not reported
NPDES Number: Not reported
EPA ID: Not reported
Comments: Not reported
Status: Active

CERS:
Name: GORDON DAIRY #4
Address: 14451 BON VIEW
City,State,Zip: ONTARIO, CA 91710
Site ID: 33986
CERS ID: 241364
CERS Description: Animal Wastewater Discharge

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-19-2011
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-08-2004
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-13-2007
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS

**AG-COSTA VIEW FARM (Continued)** **S101591786**

Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-17-1991
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-03-2016
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-03-2009
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-21-1994
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-22-1992
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2003
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Followup Inspection

**AG-COSTA VIEW FARM (Continued)** **S101591786**

Eval Date: 03-30-1990
Violations Found: No
Eval Type: Follow-up inspection (enforcement)
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-22-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-29-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 10-12-2015
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-05-1993
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-07-1995
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-12-2013
Violations Found: No
Eval Type: RWQCB Type B compliance inspection

**AG-COSTA VIEW FARM (Continued)** **S101591786**

Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-17-1996
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-17-2011
Violations Found: Yes
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-19-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-09-2013
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-21-1988
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 02-16-2000
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS

**AG-COSTA VIEW FARM (Continued)** **S101591786**

Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-13-2014
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 05-08-2012
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Other/Unknown
Eval Date: 10-20-2011
Violations Found: Yes
Eval Type: Miscellaneous Inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-03-2008
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-27-2001
Violations Found: No
Eval Type: RWQCB Type B compliance inspection
Eval Notes: Not reported
Eval Division: Water Boards
Eval Program: ANIWSTCOWS
Eval Source: CIWQS,

Enforcement Action:
Site ID: 33986
Site Name: Gordon Dairy #4
Site Address: 14451 BON VIEW
Site City: ONTARIO
Site Zip: 91710
Enf Action Date: 09-26-2011
Enf Action Type: Third Party Action
Enf Action Description: Third Party Action
Enf Action Notes: Not reported

**AG-COSTA VIEW FARM (Continued)** **S101591786**

| | |
|---|---|
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |
| | |
| Site ID: | 33986 |
| Site Name: | Gordon Dairy #4 |
| Site Address: | 14451 BON VIEW |
| Site City: | ONTARIO |
| Site Zip: | 91710 |
| Enf Action Date: | 11-29-2004 |
| Enf Action Type: | Oral Communication |
| Enf Action Description: | Oral Communication |
| Enf Action Notes: | Not reported |
| Enf Action Division: | Water Boards |
| Enf Action Program: | ANIWSTCOWS |
| Enf Action Source: | CIWQS, |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Craig Gordon |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

---

**K57** **GORDON HAY, INC** **HIST UST** **U001568961**
**SW** **14451 BON VIEW AVE** **HWTS** **N/A**
**1/8-1/4** **ONTARIO, CA 91710**
**0.155 mi.**
**819 ft.** **Site 4 of 5 in cluster K**

**Relative:**
**Lower**

**Actual:**
**676 ft.**

HIST UST:

| | |
|---|---|
| Name: | SAME AS ABOVE |
| Address: | 14451 BON VIEW AVE |
| City,State,Zip: | CHINO, CA 91710 |
| File Number: | Not reported |
| URL: | Not reported |
| Region: | STATE |
| Facility ID: | 00000044727 |
| Facility Type: | Other |
| Other Type: | DAIRY |
| Contact Name: | Not reported |
| Telephone: | 7145972360 |
| Owner Name: | DIMAS COSTA |
| Owner Address: | 14451 BON VIEW |
| Owner City,St,Zip: | CHINO, CA 91710 |
| Total Tanks: | 0001 |
| | |
| Tank Num: | 001 |
| Container Num: | 1 |
| Year Installed: | 1970 |
| Tank Capacity: | 00000550 |
| Tank Used for: | PRODUCT |

**GORDON HAY, INC (Continued)** **U001568961**

| | |
|---|---|
| Type of Fuel: | REGULAR |
| Container Construction Thickness: | Not reported |
| Leak Detection: | Visual, Stock Inventor, None |

HWTS:

| | |
|---|---|
| Name: | GORDON HAY, INC |
| Address: | 14451 BON VIEW AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91710 |
| EPA ID: | CAC003121794 |
| Inactive Date: | 08/26/2021 |
| Create Date: | 05/27/2021 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 16395 S EUCLID AVE |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | CHINO, CA 91708 |
| Owner Name: | CRAIG GORDON |
| Owner Address: | 16395 S EUCLID AVE |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | CHINO, CA 91708 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | DEBBIE GASPER |
| Contact Address: | 16395 S EUCLID AVE |
| Contact Address 2: | Not reported |
| City,State,Zip: | CHINO, CA 91708 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | TEMPORARY |
| Category: | STATE |
| Latitude: | 33.99175598 |
| Longitude: | -117.63640702 |

NAICS:

| | |
|---|---|
| EPA ID: | CAC003121794 |
| Create Date: | 2021-05-27 09:19:20.870 |
| NAICS Code: | 11212 |
| NAICS Description: | Dairy Cattle and Milk Production |
| Issued EPA ID Date: | 2021-05-27 09:19:20.88300 |
| Inactive Date: | Not reported |
| Facility Name: | GORDON HAY, INC |
| Facility Address: | 14451 BON VIEW AVE |
| Facility Address 2: | Not reported |
| Facility City: | ONTARIO |
| Facility County: | Not reported |
| Facility State: | CA |
| Facility Zip: | 91710 |

**58 SSE 1/8-1/4 0.185 mi. 976 ft.** | **O & M DAIRY**
**14474 GROVE AVE**
**ONTARIO, CA 91762** | **San Bern. Co. Permit** | **S108536478**
**N/A**

**Relative: Lower**
**Actual: 676 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | O & M DAIRY |
| Address: | 14474 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0010952 |
| Owner: | TRAVIS MOUW |
| Permit Number: | PT0018888 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 07/31/2010 |

| | |
|---|---|
| Name: | MIERSMA #1 |
| Address: | 14474 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000566 |
| Owner: | MIERSMA HARRY |
| Permit Number: | PT0008719 |
| Permit Category: | SPECIAL HANDLER |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

| | |
|---|---|
| Name: | MIERSMA #1 |
| Address: | 14474 GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0000566 |
| Owner: | MIERSMA HARRY |
| Permit Number: | PT0008720 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 04/30/1997 |

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**L59 ENE 1/8-1/4 0.195 mi. 1030 ft.** | **GORZEMAN DAIRY #2**
**13948 WALKER**
**ONTARIO, CA 91762**
**Site 1 of 3 in cluster L** | **San Bern. Co. Permit** | **S108724305**
**N/A**

**Relative: Higher**
**Actual: 709 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | GORZEMAN DAIRY #2 |
| Address: | 13948 WALKER |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0011060 |
| Owner: | GORZEMAN GLENN |
| Permit Number: | PT0019075 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2010 |

**K60 SW 1/8-1/4 0.202 mi. 1065 ft.** | **DIMAS COSTA 14451 BON VIEW CHINO, CA 91710** | **HIST UST HWTS HAZNET** | **S112886421 N/A**

**Site 5 of 5 in cluster K**

**Relative: Lower**

**Actual: 673 ft.**

HIST UST:

| | |
|---|---|
| Name: | DIMAS COSTA |
| Address: | 14451 BON VIEW |
| City,State,Zip: | CHINO, CA 91710 |
| File Number: | 00029dae |
| URL: | |
| Region: | Not reported |
| Facility ID: | Not reported |
| Facility Type: | Not reported |
| Other Type: | Not reported |
| Contact Name: | Not reported |
| Telephone: | Not reported |
| Owner Name: | Not reported |
| Owner Address: | Not reported |
| Owner City,St,Zip: | Not reported |
| Total Tanks: | Not reported |
| Tank Num: | Not reported |
| Container Num: | Not reported |
| Year Installed: | Not reported |
| Tank Capacity: | Not reported |
| Tank Used for: | Not reported |
| Type of Fuel: | Not reported |
| Container Construction Thickness: | Not reported |
| Leak Detection: | Not reported |

Click here for Geo Tracker PDF:

HWTS:

| | |
|---|---|
| Name: | COSTA VIEW FARMS |
| Address: | 14451 BON VIEW |
| Address 2: | Not reported |
| City,State,Zip: | CHINO, CA 91710 |
| EPA ID: | CAC001380480 |
| Inactive Date: | 10/25/2000 |
| Create Date: | 10/27/1998 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | 14451 BON VIEW |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | CHINO, CA 917100000 |
| Owner Name: | DIMAS COSTA |
| Owner Address: | 14451 BON VIEW |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | CHINO, CA 917100000 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | DIMAS COSTA-OWNER |
| Contact Address: | 14451 BON VIEW |
| Contact Address 2: | Not reported |
| City,State,Zip: | CHINO, CA 917100000 |
| Contact Phone: | Not reported |

**DIMAS COSTA (Continued)** **S112886421**

| | |
|---|---|
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | TEMPORARY |
| Category: | STATE |
| Latitude: | 33.991074 |
| Longitude: | -117.636779 |

HAZNET:

| | |
|---|---|
| Name: | COSTA VIEW FARMS |
| Address: | 14451 BON VIEW |
| Address 2: | Not reported |
| City,State,Zip: | CHINO, CA 917100000 |
| Contact: | DIMAS COSTA-OWNER |
| Telephone: | 9095972360 |
| Mailing Name: | Not reported |
| Mailing Address: | 14451 BON VIEW |
| Year: | 1998 |
| Gepaid: | CAC001380480 |
| TSD EPA ID: | CAD028409019 |
| CA Waste Code: | 221 - Waste oil and mixed oil |
| Disposal Method: | T01 - Treatment, Tank |
| Tons: | 0.57 |

Additional Information:

| | |
|---|---|
| Year: | 1998 |
| Gen EPA ID: | CAC001380480 |
| Shipment Date: | 19981028 |
| Creation Date: | 12/10/1998 0:00:00 |
| Receipt Date: | 19981028 |
| Manifest ID: | 96692674 |
| Trans EPA ID: | CAR000018168 |
| Trans Name: | Not reported |
| Trans 2 EPA ID: | Not reported |
| Trans 2 Name: | Not reported |
| TSDF EPA ID: | CAD028409019 |
| Trans Name: | Not reported |
| TSDF Alt EPA ID: | Not reported |
| TSDF Alt Name: | Not reported |
| Waste Code Description: | 221 - Waste oil and mixed oil |
| RCRA Code: | Not reported |
| Meth Code: | T01 - Treatment, Tank |
| Quantity Tons: | 0.57 |
| Waste Quantity: | 150 |
| Quantity Unit: | G |
| Additional Code 1: | Not reported |
| Additional Code 2: | Not reported |
| Additional Code 3: | Not reported |
| Additional Code 4: | Not reported |
| Additional Code 5: | Not reported |

**L61 ENE 1/8-1/4 0.209 mi. 1104 ft.** | **GORZEMAN FAMILY DAIRY**
**13975 WALKER**
**ONTARIO, CA 91762**
**Site 2 of 3 in cluster L** | **San Bern. Co. Permit** | **S108724306**
**N/A**

**Relative: Higher**
**Actual: 710 ft.**

San Bern. Co. Permit:

| | |
|---|---|
| Name: | GORZEMAN FAMILY DAIRY |
| Address: | 13975 WALKER |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0011061 |
| Owner: | GORZEMAN, GLENN |
| Permit Number: | PT0019076 |
| Permit Category: | HAZMAT HANDLER 0-10 EMPLOYEES |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2010 |

| | |
|---|---|
| Name: | GORZEMAN FAMILY DAIRY |
| Address: | 13975 WALKER |
| City,State,Zip: | ONTARIO, CA 91762 |
| Region: | SAN BERNARDINO |
| Facility ID: | FA0011061 |
| Owner: | GORZEMAN, GLENN |
| Permit Number: | PT0019077 |
| Permit Category: | SPECIAL GENERATOR |
| Facility Status: | INACTIVE |
| Expiration Date: | 11/30/2010 |

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**L62 ENE 1/8-1/4 0.230 mi. 1215 ft.** | **WE INC**
**13955 WALKER AVE**
**ONTARIO, CA 91762**
**Site 3 of 3 in cluster L** | **RCRA NonGen / NLR** | **1026805839**
**CAC003118028**

**Relative: Higher**
**Actual: 711 ft.**

RCRA Listings:

| | |
|---|---|
| Date Form Received by Agency: | 20210504 |
| Handler Name: | We Inc |
| Handler Address: | 13955 Walker Ave |
| Handler City,State,Zip: | ONTARIO, CA 91762 |
| EPA ID: | CAC003118028 |
| Contact Name: | JO MARIE WESTSTEYN |
| Contact Address: | PO BOX 849 |
| Contact City,State,Zip: | NORCO, CA 92860 |
| Contact Telephone: | 951-377-7090 |
| Contact Fax: | Not reported |
| Contact Email: | WE-INC@HOTMAIL.COM |
| Contact Title: | Not reported |
| EPA Region: | 09 |
| Land Type: | Not reported |
| Federal Waste Generator Description: | Not a generator, verified |
| Non-Notifier: | Not reported |
| Biennial Report Cycle: | Not reported |
| Accessibility: | Not reported |
| Active Site Indicator: | Not reported |
| State District Owner: | Not reported |
| State District: | Not reported |
| Mailing Address: | PO BOX 849 |
| Mailing City,State,Zip: | NORCO, CA 92860 |
| Owner Name: | Jo Marie Weststeyn |

**WE INC (Continued)** **1026805839**

| | | |
|---|---|---|
| Owner Type: | | Other |
| Operator Name: | Jo Marie Weststeyn | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | No |
| Universal Waste Destination Facility: | | No |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20210514 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: JO MARIE WESTSTEYN | |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | PO BOX 849 |
| Owner/Operator City,State,Zip: | NORCO, CA 92860 |
| Owner/Operator Telephone: | 951-377-7090 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

**WE INC (Continued)** **1026805839**

Owner/Operator Indicator: Operator
Owner/Operator Name: JO MARIE WESTSTEYN
Legal Status: Other
Date Became Current: Not reported
Date Ended Current: Not reported
Owner/Operator Address: PO BOX 849
Owner/Operator City,State,Zip: NORCO, CA 92860
Owner/Operator Telephone: 951-377-7090
Owner/Operator Telephone Ext: Not reported
Owner/Operator Fax: Not reported
Owner/Operator Email: Not reported

Historic Generators:
Receive Date: 20210504
Handler Name: WE INC
Federal Waste Generator Description: Not a generator, verified
State District Owner: Not reported
Large Quantity Handler of Universal Waste: No
Recognized Trader Importer: No
Recognized Trader Exporter: No
Spent Lead Acid Battery Importer: No
Spent Lead Acid Battery Exporter: No
Current Record: Yes
Non Storage Recycler Activity: No
Electronic Manifest Broker: No

List of NAICS Codes and Descriptions:
NAICS Code: 112990
NAICS Description: All Other Animal Production

Facility Has Received Notices of Violations:
Violations: No Violations Found

Evaluation Action Summary:
Evaluations: No Evaluations Found

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**63 NNE 1/8-1/4 0.240 mi. 1265 ft.** | **WRECK AGE DEMOLITION INC** | **RCRA NonGen / NLR** | **1024836825**
**13908 GROVE AVE** | **CAL000381231**
**ONTARIO, CA 91762**

**Relative: Higher**
**Actual: 710 ft.**

RCRA Listings:
Date Form Received by Agency: 20121224
Handler Name: Wreck Age Demolition Inc
Handler Address: 13908 Grove Ave
Handler City,State,Zip: ONTARIO, CA 91762
EPA ID: CAL000381231
Contact Name: ISMAEL RODRIGUEZ
Contact Address: 3965 COAST OAK CIR
Contact City,State,Zip: CHINO HILLS, CA 91709
Contact Telephone: 909-393-6937
Contact Fax: 909-393-6945
Contact Email: NORMA.RODRIGUEZ@WRECKAGEDEMO.COM
Contact Title: Not reported

**WRECK AGE DEMOLITION INC (Continued)** **1024836825**

| | | |
|---|---|---|
| EPA Region: | | 09 |
| Land Type: | | Not reported |
| Federal Waste Generator Description: | | Not a generator, verified |
| Non-Notifier: | | Not reported |
| Biennial Report Cycle: | | Not reported |
| Accessibility: | | Not reported |
| Active Site Indicator: | | Handler Activities |
| State District Owner: | | Not reported |
| State District: | | Not reported |
| Mailing Address: | | 3965 COAST OAK CIR |
| Mailing City,State,Zip: | | CHINO HILLS, CA 91709-4941 |
| Owner Name: | Ismael Rodriguez Hernandez | |
| Owner Type: | | Other |
| Operator Name: | Ismael Rodriguez | |
| Operator Type: | | Other |
| Short-Term Generator Activity: | | No |
| Importer Activity: | | No |
| Mixed Waste Generator: | | No |
| Transporter Activity: | | No |
| Transfer Facility Activity: | | No |
| Recycler Activity with Storage: | | No |
| Small Quantity On-Site Burner Exemption: | | No |
| Smelting Melting and Refining Furnace Exemption: | | No |
| Underground Injection Control: | | No |
| Off-Site Waste Receipt: | | No |
| Universal Waste Indicator: | | Yes |
| Universal Waste Destination Facility: | | Yes |
| Federal Universal Waste: | | No |
| Active Site State-Reg Handler: | | --- |
| Federal Facility Indicator: | | Not reported |
| Hazardous Secondary Material Indicator: | | N |
| Sub-Part K Indicator: | | Not reported |
| 2018 GPRA Permit Baseline: | | Not on the Baseline |
| 2018 GPRA Renewals Baseline: | | Not on the Baseline |
| 202 GPRA Corrective Action Baseline: | | No |
| Subject to Corrective Action Universe: | | No |
| Non-TSDFs Where RCRA CA has Been Imposed Universe: | | No |
| Corrective Action Priority Ranking: | | No NCAPS ranking |
| Environmental Control Indicator: | | No |
| Institutional Control Indicator: | | No |
| Human Exposure Controls Indicator: | | N/A |
| Groundwater Controls Indicator: | | N/A |
| Significant Non-Complier Universe: | | No |
| Unaddressed Significant Non-Complier Universe: | | No |
| Addressed Significant Non-Complier Universe: | | No |
| Significant Non-Complier With a Compliance Schedule Universe: | | No |
| Financial Assurance Required: | | Not reported |
| Handler Date of Last Change: | | 20180906 |
| Recognized Trader-Importer: | | No |
| Recognized Trader-Exporter: | | No |
| Importer of Spent Lead Acid Batteries: | | No |
| Exporter of Spent Lead Acid Batteries: | | No |
| Recycler Activity Without Storage: | | No |
| Manifest Broker: | | No |
| Sub-Part P Indicator: | | No |

**WRECK AGE DEMOLITION INC (Continued)** **1024836825**

Handler - Owner Operator:

| | |
|---|---|
| Owner/Operator Indicator: | Owner |
| Owner/Operator Name: | ISMAEL RODRIGUEZ HERNANDEZ |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 3965 COAST OAK CIR |
| Owner/Operator City,State,Zip: | CHINO HILLS, CA 91709-4941 |
| Owner/Operator Telephone: | 909-393-6937 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

| | |
|---|---|
| Owner/Operator Indicator: | Operator |
| Owner/Operator Name: | ISMAEL RODRIGUEZ |
| Legal Status: | Other |
| Date Became Current: | Not reported |
| Date Ended Current: | Not reported |
| Owner/Operator Address: | 3965 COAST OAK CIR |
| Owner/Operator City,State,Zip: | CHINO HILLS, CA 91709 |
| Owner/Operator Telephone: | 909-393-6937 |
| Owner/Operator Telephone Ext: | Not reported |
| Owner/Operator Fax: | Not reported |
| Owner/Operator Email: | Not reported |

Historic Generators:

| | |
|---|---|
| Receive Date: | 20121224 |
| Handler Name: | WRECK AGE DEMOLITION INC |
| Federal Waste Generator Description: | Not a generator, verified |
| State District Owner: | Not reported |
| Large Quantity Handler of Universal Waste: | No |
| Recognized Trader Importer: | No |
| Recognized Trader Exporter: | No |
| Spent Lead Acid Battery Importer: | No |
| Spent Lead Acid Battery Exporter: | No |
| Current Record: | Yes |
| Non Storage Recycler Activity: | Not reported |
| Electronic Manifest Broker: | Not reported |

List of NAICS Codes and Descriptions:

| | |
|---|---|
| NAICS Code: | 811111 |
| NAICS Description: | General Automotive Repair |

Facility Has Received Notices of Violations:

| | |
|---|---|
| Violations: | No Violations Found |

Evaluation Action Summary:

| | |
|---|---|
| Evaluations: | No Evaluations Found |

**64 ENE 1/4-1/2 0.283 mi. 1492 ft.**

**RECYCLED WOOD PRODUCTS**
**13905 WALKER AVENUE**
**ONTARIO, CA 91761**

**SWF/LF NPDES CIWQS**

**S116497304 N/A**

**Relative: Higher**

**Actual: 714 ft.**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | RWP RECYCLED WOOD PRODUCTS ONTARIO 2 |
| Address: | 13905 WALKER AVE. |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | STATE |
| Facility ID: | 36-AA-0477 |
| SWIS Number: | 36-AA-0477 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Activity: | Green Material Composting Operation |
| Activity Is Archived: | No |
| Category: | Composting |
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 12500 |
| Throughput Units: | Cubic Yards per Day |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 50000 |
| Capacity Units: | Tons per year |
| Total Acreage: | 1 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |

**RECYCLED WOOD PRODUCTS (Continued)** **S116497304**

| | |
|---|---|
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 13905 Walker Ave. |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91761 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 34.00322 |
| Longitude: | -117.61928 |
| Is Archived: | No |
| Operator: | Recycled Wood Products |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | chris@rwpmulch.com |
| Contact Phone: | (909) 868-6882 |
| Street Address: | Chris Kiralla 1313 E. Phillips Blvd. |
| Operator City: | Pomona |
| Operator State: | CA |
| Operator Zip: | 91766 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Owner: | Cecilia Da Costa Family |
| Owner Address: | Jaoquim Da Costa 8551 Schaefer Ave. |
| Owner City: | Ontario |
| Owner State: | CA |
| Owner Zip: | 91761 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 34.00322 |
| Longitude: | -117.61928 |
| Is Archived: | No |
| Started On: | Not reported |
| Contact Name: | Not reported |

**RECYCLED WOOD PRODUCTS (Continued)** **S116497304**

| | |
|---|---|
| Contact Title: | Not reported |
| Contact Email: | Not reported |
| Contact Phone: | (909) 923-0058 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Activity: | Green Material Composting Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0477 |
| Site Name: | RWP Recycled Wood Products Ontario 2 |
| Activity: | Green Material Composting Operation |
| Waste Type: | Manure |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Composting |
| Activity Classification: | Solid Waste Operation |

NPDES:

| | |
|---|---|
| Name: | RECYCLED WOOD PRODUCTS |
| Address: | 13905 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Facility Status: | Not reported |
| NPDES Number: | Not reported |
| Region: | Not reported |
| Agency Number: | Not reported |
| Regulatory Measure ID: | Not reported |
| Place ID: | Not reported |
| Order Number: | Not reported |
| WDID: | 8 36IN603695 |
| Regulatory Measure Type: | Industrial |
| Program Type: | Not reported |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Expiration Date Of Regulatory Measure: | Not reported |
| Discharge Address: | Not reported |
| Discharge Name: | Not reported |

**RECYCLED WOOD PRODUCTS (Continued)** **S116497304**

| | |
|---|---|
| Discharge City: | Not reported |
| Discharge State: | Not reported |
| Discharge Zip: | Not reported |
| Status: | NOI Required |
| Status Date: | 05/03/2017 |
| Operator Name: | Recycled Wood Products |
| Operator Address: | 1313 East Phillips Boulevard |
| Operator City: | Pomona |
| Operator State: | California |
| Operator Zip: | 91766 |

CIWQS:

| | |
|---|---|
| Name: | Recycled Wood Products Ontario 2 |
| Address: | 13905 WALKER AVENUE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Agency: | Recycled Wood Products |
| Agency Address: | 1313 East Phillips Boulevard, Pomona, CA 91766 |
| Place/Project Type: | Composting Facility |
| SIC/NAICS: | Not reported |
| Region: | 8 |
| Program: | LNDISPOTH |
| Regulatory Measure Status: | Active |
| Regulatory Measure Type: | Enrollee - WDR |
| Order Number: | 2015-0121-DWQ |
| WDID: | 8 362979001 |
| NPDES Number: | Not reported |
| Adoption Date: | Not reported |
| Effective Date: | 05/09/2018 |
| Termination Date: | Not reported |
| Expiration/Review Date: | 08/03/2030 |
| Design Flow: | Not reported |
| Major/Minor: | Not reported |
| Complexity: | C |
| TTWQ: | 3 |
| Enforcement Actions within 5 years: | 0 |
| Violations within 5 years: | 0 |
| Latitude: | 34.00464 |
| Longitude: | -117.61945 |

---

**65** **PRIVATE RESIDENCE** **LUST** **S110655056**
**SSE** **PRIVATE RESIDENCE** **Cortese** **N/A**
**1/4-1/2** **CHINO, CA**
**0.286 mi.**
**1509 ft.**

**Relative:**
**Lower**

**Actual:**
**673 ft.**

LUST:

| | |
|---|---|
| Name: | PRIVATE RESIDENCE |
| Address: | PRIVATE RESIDENCE |
| City,State,Zip: | CHINO, CA |
| Lead Agency: | SANTA ANA RWQCB (REGION 8) |
| Case Type: | LUST Cleanup Site |

Geo Track:

| | |
|---|---|
| Global Id: | T0607175289 |
| Latitude: | 33.9899 |
| Longitude: | -117.628 |
| Status: | Completed - Case Closed |

**PRIVATE RESIDENCE (Continued)** **S110655056**

| | |
|---|---|
| Status Date: | 10/18/2006 |
| Case Worker: | Not reported |
| RB Case Number: | 083604041T |
| Local Agency: | SAN BERNARDINO COUNTY |
| File Location: | Not reported |
| Local Case Number: | Not reported |
| Potential Media Affect: | Soil |
| Potential Contaminants of Concern: | Diesel, Gasoline |
| EPA Region: | 9 |
| Coordinate Source: | Not reported |
| Quantity Released Gallons: | Not reported |
| Begin Date: | 01/13/2004 |
| Leak Reported Date: | 09/02/2005 |
| How Discovered: | Property Sale/Transaction |
| How Discovered Description: | Not reported |
| Discharge Source: | Other |
| Discharge Cause: | Unknown |
| Stop Method: | Close and Remove Tank |
| Stop Description: | Not reported |
| No Further Action Date: | 10/18/2006 |
| CA Water Watershed Name: | Santa Ana River - Middle Santa Ana River - Chino (Split) (801.21) |
| Dwr Groundwater Subbasin Name: | Upper Santa Ana Valley - Chino (8-002.01) |
| Disadvantaged Community: | Not reported |
| CA Enviroscreen 3 Score: | 76-80% |
| CA Enviroscreen 4 Score: | 70-75% |
| Military DOD Site: | No |
| Facility Project Subtype: | Not reported |
| RWQCB Region: | SANTA ANA RWQCB (REGION 8) |
| Claim Number: | Not reported |
| Claim Status: | Not reported |
| Site History: | Not reported |

LUST:

| | |
|---|---|
| Global Id: | T0607175289 |
| Contact Type: | Local Agency Caseworker |
| Contact Name: | CATHERINE RICHARDS |
| Organization Name: | SAN BERNARDINO COUNTY |
| Address: | 620 SOUTH E STREET |
| City: | SAN BERNARDINO |
| Email: | crichards@sbcfire.org |
| Phone Number: | 9093868419 |

LUST:

| | |
|---|---|
| Global Id: | T0607175289 |
| Action Type: | REMEDIATION |
| Date: | 04/27/2004 |
| Action: | Excavation |
| | |
| Global Id: | T0607175289 |
| Action Type: | ENFORCEMENT |
| Date: | 09/02/2005 |
| Action: | Meeting |
| | |
| Global Id: | T0607175289 |
| Action Type: | Other |
| Date: | 01/13/2004 |
| Action: | Leak Began |

**PRIVATE RESIDENCE (Continued)** **S110655056**

Global Id: T0607175289
Action Type: ENFORCEMENT
Date: 10/18/2006
Action: Closure/No Further Action Letter

Global Id: T0607175289
Action Type: Other
Date: 09/02/2005
Action: Leak Reported

Global Id: T0607175289
Action Type: RESPONSE
Date: 02/03/2006
Action: Soil and Water Investigation Report

Global Id: T0607175289
Action Type: Other
Date: 01/13/2004
Action: Leak Stopped

Global Id: T0607175289
Action Type: Other
Date: 01/13/2004
Action: Leak Discovery

LUST:
Global Id: T0607175289
Status: Open - Case Begin Date
Status Date: 01/13/2004

Global Id: T0607175289
Status: Open - Site Assessment
Status Date: 09/02/2005

Global Id: T0607175289
Status: Open - Verification Monitoring
Status Date: 09/02/2005

Global Id: T0607175289
Status: Open - Site Assessment
Status Date: 12/05/2005

Global Id: T0607175289
Status: Completed - Case Closed
Status Date: 10/18/2006

CORTESE:
Name: PRIVATE RESIDENCE
Address: PRIVATE RESIDENCE
City,State,Zip: CHINO, CA
Region: CORTESE
Envirostor Id: Not reported
Global ID: T0607175289
Site/Facility Type: LUST CLEANUP SITE
Cleanup Status: COMPLETED - CASE CLOSED

**PRIVATE RESIDENCE (Continued)** **S110655056**

| | |
|---|---|
| Status Date: | Not reported |
| Site Code: | Not reported |
| Latitude: | Not reported |
| Longitude: | Not reported |
| Owner: | Not reported |
| Enf Type: | Not reported |
| Swat R: | Not reported |
| Flag: | active |
| Order No: | Not reported |
| Waste Discharge System No: | Not reported |
| Effective Date: | Not reported |
| Region 2: | Not reported |
| WID Id: | Not reported |
| Solid Waste Id No: | Not reported |
| Waste Management Uit Name: | Not reported |
| File Name: | Active Open |

---

**66**
**NNE**
**1/4-1/2**
**0.320 mi.**
**1691 ft.**

**Relative:**
**Higher**

**Actual:**
**713 ft.**

**REDWOOD PRODUCTS OF CHINO INC**
**13814 S GROVE AVE**
**ONTARIO, CA 91761**

**SWF/LF** **S126397034**
**CERS HAZ WASTE** **N/A**
**CERS TANKS**
**LDS**
**EMI**
**HWTS**
**San Bern. Co. Permit**
**CERS**

SWF/LF (SWIS):

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S. GROVE AVE. |
| City,State,Zip: | ONTARIO, CA 91761 |
| Region: | STATE |
| Facility ID: | 36-AA-0507 |
| SWIS Number: | 36-AA-0507 |
| Point of Contact: | Megan Emslander |
| Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Operational Status: | Active |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |
| Regulation Status: | Notification |

Activity:

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Site Name: | Redwood Products |
| Activity: | Small Volume CDI Debris Processing Operation |
| Activity Is Archived: | No |
| Category: | Transfer/Processing |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Activity Classification: | Solid Waste Operation |
| WDR Number: | Not reported |
| WDR Landfill Class: | Not reported |
| Cease Operation: | Not reported |
| Cease Operation Type: | Not reported |
| Inspection Frequency: | Quarterly |
| Throughput: | 90 |
| Throughput Units: | Tons per day |
| Remaining Capacity: | Not reported |
| Remaining Capacity Date: | Not reported |
| Capacity: | 195 |
| Capacity Units: | Tons |
| Total Acreage: | 10 |
| Disposal Acreage: | Not reported |
| Permitted Elevation: | Not reported |
| Permitted Elevation Type: | Not reported |
| Permitted Depth: | Not reported |
| Permitted Depth Type: | Not reported |
| Point of Contact: | Megan Emslander |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Is Archived: | No |
| Is Closed Illegal Abandoned: | No |
| Is Site Inert Debris Engineered Fill: | No |
| Is Financial Assurances Responsible: | No |
| Absorbed On: | Not reported |
| Absorbed By: | Not reported |
| Closed Illegal Abandoned Category: | Not reported |
| EPA Federal Registry ID: | Not reported |
| County: | San Bernardino |
| ARB District: | South Coast |
| SWRCB Region: | Santa Ana |
| Local Government: | Ontario |
| Street Address: | 13814 S. Grove Ave. |
| City: | Ontario |
| State: | CA |
| ZIP Code: | 91761 |
| Reporting Agency Legal Name: | County of San Bernardino |
| Reporting Agency Department: | Div. of Environmental Health Services |
| Enforcing Agency Legal Name: | County of San Bernardino |
| Enforcing Agency Department: | Div. of Environmental Health Services |

Operator:

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Site Name: | Redwood Products |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 34.00223 |
| Longitude: | -117.62927 |
| Is Archived: | No |
| Operator: | Redwood Products of Chino, Inc. |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | marcie@redwoodchino.com |
| Contact Phone: | (909) 923-5656 |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Street Address: | Jaime Carlos P.O. Box 2662 |
| Operator City: | Corona |
| Operator State: | CA |
| Operator Zip: | 92878 |

Owner:

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Owner: | Jaime Carlos |
| Owner Address: | P.O. Box 2662 |
| Owner City: | Corona |
| Owner State: | CA |
| Owner Zip: | 92878 |
| Site Name: | Redwood Products |
| Site Operational Status: | Active |
| Site Type: | Non-Disposal Only |
| Site Regulatory Status: | Notification |
| Latitude: | 34.00223 |
| Longitude: | -117.62927 |
| Is Archived: | No |
| Started On: | Not reported |
| Contact Name: | Not reported |
| Contact Title: | Not reported |
| Contact Email: | marcie@redwoodchino.com |
| Contact Phone: | (909) 923-5656 |

Waste:

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Site Name: | Redwood Products |
| Activity: | Small Volume CDI Debris Processing Operation |
| Waste Type: | Green Materials |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Transfer/Processing |
| Activity Classification: | Solid Waste Operation |

| | |
|---|---|
| SWIS Number: | 36-AA-0507 |
| Site Name: | Redwood Products |
| Activity: | Small Volume CDI Debris Processing Operation |
| Waste Type: | Wood Waste |
| Site Is Archived: | No |
| Site Operational Status: | Active |
| Site Regulatory Status: | Notification |
| Site Type: | Non-Disposal Only |
| Point of Contact: | Megan Emslander |
| Activity Is Archived: | No |
| Activity Operational Status: | Active |
| Activity Regulatory Status: | Notification |
| Activity Category: | Transfer/Processing |
| Activity Classification: | Solid Waste Operation |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

CERS HAZ WASTE:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Site ID: | 572620 |
| CERS ID: | 10864990 |
| CERS Description: | Hazardous Waste Generator |

CERS TANKS:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Site ID: | 572620 |
| CERS ID: | 10864990 |
| CERS Description: | Aboveground Petroleum Storage |

LDS:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S. GROVE AVE. |
| City,State,Zip: | ONTARIO, CA 91761 |
| Global Id: | T10000017416 |
| Latitude: | 34.00219 |
| Longitude: | -117.6292 |
| Case Type: | Land Disposal Site |
| Status: | Open - Operating |
| Status Date: | 10/13/2021 |
| Lead Agency: | Not reported |
| Caseworker: | Not reported |
| Local Agency: | Not reported |
| RB Case Number: | Not reported |
| LOC Case Number: | Not reported |
| File Location: | Not reported |
| Potential Media Affect: | Not reported |
| EDR Link ID: | T10000017416 |
| Potential Contaminants of Concern: | Not reported |
| EPA Region: | 9 |
| Coordinate Source: | Not reported |
| Quantity Released Gallons: | Not reported |
| Begin Date: | 08/17/2021 |
| Leak Reported Date: | Not reported |
| How Discovered: | Not reported |
| How Discovered Description: | Not reported |
| Discharge Source: | Not reported |
| Discharge Cause: | Not reported |
| Stop Method: | Not reported |
| Stop Description: | Not reported |
| No Further Action Date: | Not reported |
| CA Water Watershed Name: | Not reported |
| Dwr Groundwater Subbasin Name: | Not reported |
| Disadvantaged Community: | Not reported |
| CA Enviroscreen 3 Score: | 71-75% |
| CA Enviroscreen 4 Score: | 70-75% |
| Military DOD Site: | No |
| Facility Project Subtype: | Compost Facility |
| RWQCB Region: | SANTA ANA RWQCB (REGION 8) |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Claim Number: | Not reported |
| Claim Status: | Not reported |
| Site History: | Not reported |

Click here to access the California GeoTracker records for this facility:

EMI:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS OF CHINO, INC |
| Address: | 13814 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Year: | 2022 |
| County Code: | 36 |
| Air Basin: | SC |
| Facility ID: | 193678 |
| Air District Name: | SC |
| SIC Code: | 5031 |
| Air District Name: | SOUTH COAST AQMD |
| Community Health Air Pollution Info System: | Not reported |
| Consolidated Emission Reporting Rule: | Not reported |
| Total Organic Hydrocarbon Gases Tons/Yr: | .3414911781445645987478 65 |
| Reactive Organic Gases Tons/Yr: | 0.3 |
| Carbon Monoxide Emissions Tons/Yr: | 0.82 |
| NOX - Oxides of Nitrogen Tons/Yr: | 3.82 |
| SOX - Oxides of Sulphur Tons/Yr: | 0.001713 |
| Particulate Matter Tons/Yr: | 0.25 |
| Part. Matter 10 Micrometers and Smllr Tons/Yr: | 0.2485 |

HWTS:

| | |
|---|---|
| Name: | REDWOOD PRODUCTS OF CHINO INC |
| Address: | 13814 S GROVE AVE |
| Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91761 |
| EPA ID: | CAL000457349 |
| Inactive Date: | 06/30/2021 |
| Create Date: | 10/06/2020 |
| Last Act Date: | Not reported |
| Mailing Name: | Not reported |
| Mailing Address: | PO BOX 2662 |
| Mailing Address 2: | Not reported |
| Mailing City,State,Zip: | CORONA, CA 92878 |
| Owner Name: | JAIME CARLOS |
| Owner Address: | 13814 S GROVE AVE |
| Owner Address 2: | Not reported |
| Owner City,State,Zip: | ONTARIO, CA 91761 |
| Owner Phone: | Not reported |
| Owner Fax: | Not reported |
| Contact Name: | ANDREW LOPEZ |
| Contact Address: | 13814 S GROVE AVE |
| Contact Address 2: | Not reported |
| City,State,Zip: | ONTARIO, CA 91761 |
| Contact Phone: | Not reported |
| Contact Fax: | Not reported |
| Facility Status: | Inactive |
| Facility Type: | PERMANENT |
| Category: | STATE |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

Latitude: 34.00172001
Longitude: -117.62886297

NAICS:
EPA ID: CAL000457349
Create Date: 2020-10-06 18:56:20.737
NAICS Code: 541614
NAICS Description: Process, Physical Distribution, and Logistics Consulting Services
Issued EPA ID Date: 2020-10-06 18:56:20.72700
Inactive Date: Not reported
Facility Name: REDWOOD PRODUCTS OF CHINO INC
Facility Address: 13814 S GROVE AVE
Facility Address 2: Not reported
Facility City: ONTARIO
Facility County: Not reported
Facility State: CA
Facility Zip: 91761

San Bern. Co. Permit:
Name: REDWOOD PRODUCTS
Address: 13814 S GROVE AVE
City,State,Zip: ONTARIO, CA 91761
Region: SAN BERNARDINO
Facility ID: FA0018759
Owner: Carlos, Jaime
Permit Number: PT0040533
Permit Category: HAZARDOUS MATERIALS 4-10 CHEMICALS
Facility Status: ACTIVE
Expiration Date: 04/30/2025

Name: REDWOOD PRODUCTS
Address: 13814 S GROVE AVE
City,State,Zip: ONTARIO, CA 91761
Region: SAN BERNARDINO
Facility ID: FA0018759
Owner: Carlos, Jaime
Permit Number: PT0040534
Permit Category: SMALL QUANTITY GENERATOR
Facility Status: ACTIVE
Expiration Date: 04/30/2025

Name: REDWOOD PRODUCTS
Address: 13814 S GROVE AVE
City,State,Zip: ONTARIO, CA 91761
Region: SAN BERNARDINO
Facility ID: FA0018759
Owner: Carlos, Jaime
Permit Number: PT0040532
Permit Category: APSA 1,320-10,000 GAL FAC CAPACITY
Facility Status: ACTIVE
Expiration Date: 04/30/2025

CERS:
Name: REDWOOD PRODUCTS
Address: 13814 S. GROVE AVE.
City,State,Zip: ONTARIO, CA 91761

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Site ID: | 898211 |
| CERS ID: | T10000017416 |
| CERS Description: | Land Disposal Site |

Affiliation:

| | |
|---|---|
| Affiliation Type Desc: | Regional Board Caseworker |
| Entity Name: | JOANNE LEE - SANTA ANA RWQCB (REGION 8) |
| Entity Title: | Not reported |
| Affiliation Address: | 3737 MAIN STREET, SUITE 500 |
| Affiliation City: | RIVERSIDE |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Name: | REDWOOD PRODUCTS |
| Address: | 13814 S GROVE AVE |
| City,State,Zip: | ONTARIO, CA 91761 |
| Site ID: | 572620 |
| CERS ID: | 10864990 |
| CERS Description: | Chemical Storage Facilities |

Violations:

| | |
|---|---|
| Site ID: | 572620 |
| Site Name: | Redwood Products |
| Violation Date: | 09-28-2021 |
| Citation: | HSC 6.67 25270.4.5(a) - California Health and Safety Code, Chapter 6.67, Section(s) 25270.4.5(a) |
| Violation Description: | Failure to prepare a Spill Prevention, Control, and Countermeasures (SPCC) Plan. |
| Violation Notes: | Returned to compliance on 11/01/2021. OBSERVATION: This facility stores over 1,320 gallons of petroleum based products on site. At the time of the inspection, facility had not prepared an SPCC Plan. CORRECTIVE ACTION: Prepare and implement an SPCC Plan. Submit a signed statement indicating that an SPCC plan has been prepared. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | APSA |
| Violation Source: | CERS, |

| | |
|---|---|
| Site ID: | 572620 |
| Site Name: | Redwood Products |
| Violation Date: | 09-28-2021 |
| Citation: | 22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f) |
| Violation Description: | Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date. |
| Violation Notes: | Returned to compliance on 11/01/2021. OBSERVATION: The used oil tote was found to be missing a hazardous waste label. CORRECTIVE ACTION: Properly label all hazardous waste containers and submit a photograph demonstrating that the container listed above has been properly labeled. |
| Violation Division: | San Bernardino County Fire Department |
| Violation Program: | HW |
| Violation Source: | CERS, |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

Site ID: 572620
Site Name: Redwood Products
Violation Date: 09-28-2021
Citation: HSC 6.95 25508(a)(3) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(3)
Violation Description: Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes: Returned to compliance on 11/01/2021. OBSERVATION: The hazardous materials inventory in CERS was found to be incomplete. There is also a hazard class error for the the inventory currently listed in CERS. CORRECTIVE ACTION: Submit an updated inventory to include the mobil fuel tank, the waste filters drum, waste absorbent drum, the drums and totes of dye, the parts washer and to update the maximum quantities of the diesel fuel and waste oil. Also update the inventory to correct the hazard class error.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Site ID: 572620
Site Name: Redwood Products
Violation Date: 09-28-2021
Citation: 40 CFR 1 265.31 - U.S. Code of Federal Regulations, Title 40, Chapter 1, Section(s) 265.31
Violation Description: Failure to maintain and operate the facility to minimize the possibility of a fire, explosion, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.
Violation Notes: Returned to compliance on 11/01/2021. OBSERVATION: Used oil spills were observed on and around the used oil tote. CORRECTIVE ACTION: Properly clean up the waste oil spill residues and manage spent absorbent and contaminated soil as a hazardous waste. Submit photos to this division demonstrating the spill has been properly removed and managed.
Violation Division: San Bernardino County Fire Department
Violation Program: HW
Violation Source: CERS,

Site ID: 572620
Site Name: Redwood Products
Violation Date: 09-28-2021
Citation: HSC 6.95 25508(a)(3) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(3)
Violation Description: Failure to report program data electronically.
Violation Notes: Returned to compliance on 11/01/2021. OBSERVATION: Update the business activities page to add a secondary contact and to remove the recycling of hazardous waste activity. CORRECTIVE ACTION: Update Business Activities Page and/or Business Owner/Operator Identification Page in CERS.
Violation Division: San Bernardino County Fire Department
Violation Program: HMRRP
Violation Source: CERS,

Evaluation:
Eval General Type: Compliance Evaluation Inspection

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

Eval Date: 09-28-2021
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: APSA
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-28-2021
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HMRRP
Eval Source: CERS,

Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-28-2021
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Bernardino County Fire Department
Eval Program: HW
Eval Source: CERS,

Affiliation:
Affiliation Type Desc: Environmental Contact
Entity Name: Andrew Lopez
Entity Title: Not reported
Affiliation Address: PO Box 2662
Affiliation City: Corona
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92878
Affiliation Phone: ,

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: PO Box 2662
Affiliation City: Corona
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 92878
Affiliation Phone: ,

Affiliation Type Desc: Document Preparer
Entity Name: Andrew Lopez
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: ,

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

| | |
|---|---|
| Affiliation Type Desc: | Identification Signer |
| Entity Name: | Andrew Lopez |
| Entity Title: | Manager |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | , |

| | |
|---|---|
| Affiliation Type Desc: | Legal Owner |
| Entity Name: | Jaime Carlos |
| Entity Title: | Not reported |
| Affiliation Address: | PO Box 2662 |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 92878 |
| Affiliation Phone: | (909) 923-5656, |

| | |
|---|---|
| Affiliation Type Desc: | Property Owner |
| Entity Name: | Jaime Carlos |
| Entity Title: | Not reported |
| Affiliation Address: | PO Box 2662 |
| Affiliation City: | Corona |
| Affiliation State: | CA |
| Affiliation Country: | United States |
| Affiliation Zip: | 92878 |
| Affiliation Phone: | (909) 923-5656, |

| | |
|---|---|
| Affiliation Type Desc: | CUPA District |
| Entity Name: | San Bernardino County Fire |
| Entity Title: | Not reported |
| Affiliation Address: | 620 South E Street |
| Affiliation City: | San Bernardino |
| Affiliation State: | CA |
| Affiliation Country: | Not reported |
| Affiliation Zip: | 92415-0153 |
| Affiliation Phone: | (909) 386-8401, |

| | |
|---|---|
| Affiliation Type Desc: | Operator |
| Entity Name: | Redwood Products |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |
| Affiliation Zip: | Not reported |
| Affiliation Phone: | (909) 923-5656, |

| | |
|---|---|
| Affiliation Type Desc: | Parent Corporation |
| Entity Name: | Redwood Products of chino Inc |
| Entity Title: | Not reported |
| Affiliation Address: | Not reported |
| Affiliation City: | Not reported |
| Affiliation State: | Not reported |
| Affiliation Country: | Not reported |

**REDWOOD PRODUCTS OF CHINO INC (Continued)** **S126397034**

Affiliation Zip: Not reported
Affiliation Phone: ,

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**67 ENE 1/4-1/2 0.479 mi. 2531 ft.** | **COMPOSTING PLANTONTARIO**
**8605 SCHAEFER AVE**
**ONTARIO, CA 91761** | **WMUDS/SWAT WDS** | **S104384492 N/A**

**Relative: Higher**
**Actual: 722 ft.**

WMUDS/SWAT:

| | |
|---|---|
| Edit Date: | Not reported |
| Complexity: | Not reported |
| Primary Waste: | SLDWST |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Secondary Waste: | Not reported |
| Secondary Waste Type: | Not reported |
| Base Meridian: | Not reported |
| NPID: | Not reported |
| Tonnage: | 0 |
| Regional Board ID: | Not reported |
| Municipal Solid Waste: | False |
| Superorder: | False |
| Open To Public: | False |
| Waste List: | False |
| Agency Type: | Private |
| Agency Name: | KELLOGG SUPPLY, INC. |
| Agency Department: | Not reported |
| Agency Address: | 350 W. SEPULVEDA BLVD. |
| Agency City,St,Zip: | CARSON CA 90745 |
| Agency Contact: | DEL PERRY |
| Agency Telephone: | 3108302206 |
| Land Owner Name: | Not reported |
| Land Owner Address: | Not reported |
| Land Owner City,St,Zip: | Not reported |
| Land Owner Contact: | Not reported |
| Land Owner Phone: | Not reported |
| Region: | 8 |
| Facility Type: | Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this category. |
| Facility Description: | Not reported |
| Facility Telephone: | Not reported |
| SWAT Facility Name: | Not reported |
| Primary SIC: | 2875 |
| Secondary SIC: | Not reported |
| Comments: | Not reported |
| Last Facility Editors: | Not reported |
| Waste Discharge System: | True |
| Solid Waste Assessment Test Program: | False |
| Toxic Pits Cleanup Act Program: | False |

**COMPOSTING PLANTONTARIO (Continued)** **S104384492**

| | |
|---|---|
| Resource Conservation Recovery Act: | False |
| Department of Defence: | False |
| Solid Waste Assessment Test Program: | Not reported |
| Threat to Water Quality: | Not reported |
| Sub Chapter 15: | True |
| Regional Board Project Officer: | Not reported |
| Number of WMUDS at Facility: | 0 |
| Section Range: | Not reported |
| RCRA Facility: | No |
| Waste Discharge Requirements: | H |
| Self-Monitoring Rept. Frequency: | Quarterly Submittal |
| Waste Discharge System ID: | 8 362319001 |
| Solid Waste Information ID: | Not reported |

WDS:

| | |
|---|---|
| Name: | COMPOSTING PLANTONTARIO |
| Address: | 8605 SCHAEFER AVE |
| City: | ONTARIO |
| Facility ID: | Santa Ana River 362319001 |
| Facility Type: | Agricultural - Facility that treats and/or disposes of the wastes associated with confined and concentrated animal feeding, confined animal feeding, confined animal holding, confined and concentrated aquatic animal production facilities, and aquaculture. the treatment and/or disposal of agricultural return water is included in this category. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | Not reported |
| Subregion: | 8 |
| Facility Telephone: | Not reported |
| Facility Contact: | DEL PERRY |
| Agency Name: | KELLOGG SUPPLY INC. |
| Agency Address: | 350 W. SEPULVEDA BLVD. |
| Agency City,St,Zip: | CARSON 90745 |
| Agency Contact: | DEL PERRY |
| Agency Telephone: | Not reported |
| Agency Type: | Private |
| SIC Code: | 2875 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Primary Waste: | SLDWST |
| Waste Type2: | Not reported |
| Waste2: | Solid Wastes |
| Primary Waste Type: | Nonhazardous Solid Wastes/Influent or Solid Wastes that contain nonhazardous putrescible and non putrescible solid, semisolid, and liquid wastes (E.G., garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid waste). |
| Secondary Waste: | Not reported |
| Secondary Waste Type: | Not reported |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | No reclamation requirements associated with this facility. |

**COMPOSTING PLANTONTARIO (Continued)** **S104384492**

| | |
|---|---|
| POTW: | The facility is not a POTW. |
| Treat To Water: | Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality. |
| Complexity: | Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds. |

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**68 SSW 1/2-1 0.887 mi. 4685 ft.** **CAL-AERO FIELD / ACADEMY** **ENVIROSTOR** **S107735994 N/A**

**CHINO, CA**

**Relative: Lower**

**Actual: 638 ft.**

ENVIROSTOR:

| | |
|---|---|
| Name: | CAL-AERO FIELD / ACADEMY |
| Address: | Not reported |
| City,State,Zip: | CHINO, CA |
| Facility ID: | 80000986 |
| Status: | Inactive - Needs Evaluation |
| Status Date: | 07/01/2005 |
| Site Code: | Not reported |
| Site Type: | Military Evaluation |
| Site Type Detailed: | FUDS |
| Acres: | 0 |
| NPL: | NO |
| Regulatory Agencies: | SMBRP |
| Lead Agency: | SMBRP |
| Program Manager: | Not reported |
| Supervisor: | Eileen Mananian |
| Division Branch: | Cleanup Cypress |
| Assembly: | 53 |
| Senate: | 22 |
| Special Program: | Not reported |
| Restricted Use: | NO |
| Site Mgmt Req: | NONE SPECIFIED |
| Funding: | DERA |
| Latitude: | 33.98111 |
| Longitude: | -117.6394 |
| APN: | NONE SPECIFIED |
| Past Use: | NONE SPECIFIED |
| Potential COC: | NONE SPECIFIED |
| Confirmed COC: | NONE SPECIFIED |
| Potential Description: | NONE SPECIFIED |
| Alias Name: | CA99799FA37100 |
| Alias Type: | Federal Facility ID |
| Alias Name: | J09CA7342 & J0CA7341 |
| Alias Type: | INPR |
| Alias Name: | 80000986 |
| Alias Type: | Envirostor ID Number |

Completed Info:

**CAL-AERO FIELD / ACADEMY (Continued)** **S107735994**

| | |
|---|---|
| Completed Area Name: | PROJECT WIDE |
| Completed Sub Area Name: | Not reported |
| Completed Document Type: | Inventory Project Report (INPR) |
| Completed Date: | 05/28/1999 |
| Comments: | Not reported |

| | |
|---|---|
| Completed Area Name: | PROJECT WIDE |
| Completed Sub Area Name: | Not reported |
| Completed Document Type: | Inventory Project Report (INPR) |
| Completed Date: | 05/28/1999 |
| Comments: | Not reported |

| | |
|---|---|
| Future Area Name: | Not reported |
| Future Sub Area Name: | Not reported |
| Future Document Type: | Not reported |
| Future Due Date: | Not reported |
| Schedule Area Name: | Not reported |
| Schedule Sub Area Name: | Not reported |
| Schedule Document Type: | Not reported |
| Schedule Due Date: | Not reported |
| Schedule Revised Date: | Not reported |

Count: 13 records.

ORPHAN SUMMARY

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|---|---|---|---|---|---|
| CHINO | S125845654 | | 3992 CITRUS GROVE | 91710 | CDL |
| CHINO | S107538626 | | GROVE AVE (15700 BLOCK) | 91710 | CDL |
| CHINO | S107539847 | | ON GROVE AVENUE (SOUTH OF PINE | 91710 | CDL |
| CHINO | S107537626 | | AT SOUTH END OF FERN AVE (CROS | 91710 | CDL |
| ONTARIO | S107538075 | | CLEAVELAND RD, S OF EDISON | 91761 | CDL |
| ONTARIO | S107538083 | | CLEVELAND ST, SOUTH OF EDISON | | CDL |
| ONTARIO | S107538082 | | CLEVELAND ST (SOUTH OF EDISON) | 91761 | CDL |
| ONTARIO | S107539773 | | ON CLEVELAND, 100 YARDS SO OF | 91761 | CDL |
| ONTARIO | 1009508586 | SO CAL GAS/ONTARIO MGP | CORNER OF CAMPUS, MARTLAND, MO | 91761 | EDR MGP |
| ONTARIO | S107538422 | | EDISON, 1/2 MI W OF ARCHIBALD | | CDL |
| ONTARIO | S107538468 | | EUCALYPTUS W OF BON VIEW | 91761 | CDL |
| ONTARIO | 1025945930 | ONTARIO RANCH HOLSTEINS #1 | 14848 GROVE | 91762 | ECHO |
| ONTARIO | S107541120 | | WALKER ST, SOUTH OF EDISON | 91761 | CDL |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

## STANDARD ENVIRONMENTAL RECORDS

***Lists of Federal NPL (Superfund) sites***

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: N/A
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: N/A
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

***Lists of Federal Delisted NPL sites***

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: N/A
Last EDR Contact: 02/04/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

***Lists of Federal sites subject to CERCLA removals and CERCLA orders***

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 12/18/2024
Date Made Active in Reports: 12/20/2024
Number of Days to Update: 2

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 12/18/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Quarterly

***Lists of Federal CERCLA sites with NFRAP***

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Quarterly

***Lists of Federal RCRA facilities undergoing Corrective Action***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

***Lists of Federal RCRA TSD facilities***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

***Lists of Federal RCRA generators***

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Very small quantity generators (VSQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

***Federal institutional controls / engineering controls registries***

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 11/11/2024
Date Data Arrived at EDR: 11/25/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 85

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/15/2024
Date Made Active in Reports: 02/11/2025
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/18/2025
Next Scheduled EDR Contact: 12/02/2024
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/15/2024
Date Made Active in Reports: 02/11/2025
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 02/18/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

***Federal ERNS list***

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/03/2024
Date Data Arrived at EDR: 12/11/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 69

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

***Lists of state- and tribal (Superfund) equivalent sites***

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

***Lists of state- and tribal hazardous waste facilities***

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

***Lists of state and tribal landfills and solid waste disposal facilities***

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/06/2024
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 86

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 02/04/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Quarterly

***Lists of state and tribal leaking storage tanks***

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land

A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/11/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 05/07/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: No Update Planned

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: No Update Planned

***Lists of state and tribal registered storage tanks***

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 08/12/2024
Date Data Arrived at EDR: 10/30/2024
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 76

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 11/26/2024
Date Data Arrived at EDR: 11/26/2024
Date Made Active in Reports: 02/20/2025
Number of Days to Update: 86

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 11/26/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Semi-Annually

MILITARY UST SITES: Military UST Sites (GEOTRACKER)
Military ust sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases
UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 11/25/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 01/07/2025
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/11/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 07/29/2024
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 05/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 90

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

***Lists of state and tribal voluntary cleanup sites***

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 07/08/2021
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

***Lists of state and tribal brownfield sites***

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/02/2024
Number of Days to Update: 76

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/09/2024
Date Data Arrived at EDR: 09/11/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/12/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Semi-Annually

***Local Lists of Landfill / Solid Waste Disposal Sites***

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 11/13/2024
Date Data Arrived at EDR: 11/15/2024
Date Made Active in Reports: 12/12/2024
Number of Days to Update: 27

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 02/07/2024
Date Data Arrived at EDR: 11/13/2024
Date Made Active in Reports: 11/19/2024
Number of Days to Update: 6

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 12/09/2024
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

***Local Lists of Hazardous waste / Contaminated Sites***

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 05/20/2024
Date Data Arrived at EDR: 08/19/2024
Date Made Active in Reports: 10/09/2024
Number of Days to Update: 51

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 03/21/2024
Date Made Active in Reports: 06/12/2024
Number of Days to Update: 83

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CERS HAZ WASTE: California Environmental Reporting System Hazardous Waste

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 05/20/2024
Date Data Arrived at EDR: 08/19/2024
Date Made Active in Reports: 10/09/2024
Number of Days to Update: 51

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Quarterly

***Local Lists of Registered Storage Tanks***

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 07/29/2024
Date Data Arrived at EDR: 07/30/2024
Date Made Active in Reports: 10/17/2024
Number of Days to Update: 79

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

CERS TANKS: California Environmental Reporting System (CERS) Tanks

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Local Land Records***

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 11/26/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 28

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Semi-Annually

***Records of Emergency Release Reports***

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 06/14/2024
Date Data Arrived at EDR: 06/17/2024
Date Made Active in Reports: 06/24/2024
Number of Days to Update: 7

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 08/01/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Other Ascertainable Records***

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 80

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 10/01/2024
Date Data Arrived at EDR: 11/12/2024
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 70

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 02/11/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 06/07/2021
Date Data Arrived at EDR: 07/13/2021
Date Made Active in Reports: 03/09/2022
Number of Days to Update: 239

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/07/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 12/30/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 07/30/2021
Date Data Arrived at EDR: 02/03/2023
Date Made Active in Reports: 02/10/2023
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/20/2024
Number of Days to Update: 94

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA Watch List

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 01/27/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: No Update Planned

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 06/14/2022
Date Made Active in Reports: 03/24/2023
Number of Days to Update: 283

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/12/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 02/11/2025
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 7

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/11/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 90

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 10/24/2024
Date Data Arrived at EDR: 11/01/2024
Date Made Active in Reports: 11/19/2024
Number of Days to Update: 18

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 03/10/2025
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

| | |
|---|---|
| Date of Government Version: 10/01/2024 | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 10/23/2024 | Telephone: 202-564-8600 |
| Date Made Active in Reports: 01/14/2025 | Last EDR Contact: 01/09/2025 |
| Number of Days to Update: 83 | Next Scheduled EDR Contact: 04/28/2025 |
| | Data Release Frequency: Varies |

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

| | |
|---|---|
| Date of Government Version: 04/17/1995 | Source: EPA |
| Date Data Arrived at EDR: 07/03/1995 | Telephone: 202-564-4104 |
| Date Made Active in Reports: 08/07/1995 | Last EDR Contact: 06/02/2008 |
| Number of Days to Update: 35 | Next Scheduled EDR Contact: 09/01/2008 |
| | Data Release Frequency: No Update Planned |

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

| | |
|---|---|
| Date of Government Version: 09/19/2023 | Source: EPA |
| Date Data Arrived at EDR: 10/03/2023 | Telephone: 202-564-6023 |
| Date Made Active in Reports: 10/19/2023 | Last EDR Contact: 02/03/2025 |
| Number of Days to Update: 16 | Next Scheduled EDR Contact: 05/12/2025 |
| | Data Release Frequency: Quarterly |

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

| | |
|---|---|
| Date of Government Version: 07/01/2024 | Source: EPA |
| Date Data Arrived at EDR: 10/02/2024 | Telephone: 202-566-0500 |
| Date Made Active in Reports: 01/10/2025 | Last EDR Contact: 01/02/2025 |
| Number of Days to Update: 100 | Next Scheduled EDR Contact: 04/14/2025 |
| | Data Release Frequency: Annually |

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

| | |
|---|---|
| Date of Government Version: 11/18/2016 | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 11/23/2016 | Telephone: 202-564-2501 |
| Date Made Active in Reports: 02/10/2017 | Last EDR Contact: 12/23/2024 |
| Number of Days to Update: 79 | Next Scheduled EDR Contact: 04/14/2025 |
| | Data Release Frequency: Quarterly |

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 10/12/2024
Date Data Arrived at EDR: 10/17/2024
Date Made Active in Reports: 11/19/2024
Number of Days to Update: 33

Source: Nuclear Regulatory Commission
Telephone: 301-415-0717
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 90

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 12/17/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 10/04/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/06/2024
Number of Days to Update: 51

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 09/30/2024
Date Data Arrived at EDR: 10/09/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 93

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/30/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 03/20/2023
Number of Days to Update: 11

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 12/12/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 12/30/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 03/03/2023
Date Data Arrived at EDR: 03/03/2023
Date Made Active in Reports: 06/09/2023
Number of Days to Update: 98

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 05/08/2024
Date Data Arrived at EDR: 08/14/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 14

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 12/19/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 19

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 02/03/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/01/2024
Date Data Arrived at EDR: 11/18/2024
Date Made Active in Reports: 02/11/2025
Number of Days to Update: 85

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 02/18/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data
Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 10/01/2024
Date Data Arrived at EDR: 10/02/2024
Date Made Active in Reports: 10/09/2024
Number of Days to Update: 7

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/02/2024
Date Data Arrived at EDR: 08/20/2024
Date Made Active in Reports: 10/09/2024
Number of Days to Update: 50

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing
Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines
An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/10/2024
Date Data Arrived at EDR: 12/11/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 69

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 02/26/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Quarterly

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 06/04/2024
Date Data Arrived at EDR: 11/22/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 88

Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/11/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/18/2025
Number of Days to Update: 90

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing
A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/06/2021
Date Data Arrived at EDR: 05/21/2021
Date Made Active in Reports: 08/11/2021
Number of Days to Update: 82

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 09/06/2023
Date Data Arrived at EDR: 09/13/2023
Date Made Active in Reports: 12/11/2023
Number of Days to Update: 89

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/06/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information
ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 12/21/2024
Date Data Arrived at EDR: 12/27/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 12/27/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 11/08/2024
Date Data Arrived at EDR: 11/08/2024
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 67

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 02/13/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Quarterly

PFAS NPL: Superfund Sites with PFAS Detections Information

EPA's Office of Land and Emergency Management and EPA Regional Offices maintain data describing what is known about site investigations, contamination, and remedial actions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) where PFAS is present in the environment.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 703-603-8895
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS FEDERAL SITES: Federal Sites PFAS Information

Several federal entities, such as the federal Superfund program, Department of Defense, National Aeronautics and Space Administration, Department of Transportation, and Department of Energy provided information for sites with known or suspected detections at federal facilities.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS TSCA: PFAS Manufacture and Imports Information

EPA issued the Chemical Data Reporting (CDR) Rule under the Toxic Substances Control Act (TSCA) and requires chemical manufacturers and facilities that manufacture or import chemical substances to report data to EPA. EPA publishes non-confidential business information (non-CBI) and includes descriptive information about each site, corporate parent, production volume, other manufacturing information, and processing and use information.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS TRIS: List of PFAS Added to the TRI

Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (NDAA) immediately added certain per- and polyfluoroalkyl substances (PFAS) to the list of chemicals covered by the Toxics Release Inventory (TRI) under Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) and provided a framework for additional PFAS to be added to TRI on an annual basis.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-566-0250
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS RCRA MANIFEST: PFAS Transfers Identified In the RCRA Database Listing

To work around the lack of PFAS waste codes in the RCRA database, EPA developed the PFAS Transfers dataset by mining e-Manifest records containing at least one of these common PFAS keywords: PFAS, PFOA, PFOS, PERFL, AFFF, GENX, GEN-X (plus the VT waste codes). These keywords were searched for in the following text fields: Manifest handling instructions (MANIFEST_HANDLING_INSTR), Non-hazardous waste description (NON_HAZ_WASTE_DESCRIPTION), DOT printed information (DOT_PRINTED_INFORMATION), Waste line handling instructions (WASTE_LINE_HANDLING_INSTR), Waste residue comments (WASTE_RESIDUE_COMMENTS).

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS ATSDR: PFAS Contamination Site Location Listing

PFAS contamination site locations from the Department of Health & Human Services, Center for Disease Control & Prevention. ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

Date of Government Version: 06/24/2020
Date Data Arrived at EDR: 03/17/2021
Date Made Active in Reports: 11/08/2022
Number of Days to Update: 601

Source: Department of Health & Human Services
Telephone: 202-741-5770
Last EDR Contact: 01/16/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

PFAS WQP: Ambient Environmental Sampling for PFAS

The Water Quality Portal (WQP) is a part of a modernized repository storing ambient sampling data for all environmental media and tissue samples. A wide range of federal, state, tribal and local governments, academic and non-governmental organizations and individuals submit project details and sampling results to this public repository. The information is commonly used for research and assessments of environmental quality.

Date of Government Version: 12/13/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS NPDES: Clean Water Act Discharge Monitoring Information

Any discharger of pollutants to waters of the United States from a point source must have a National Pollutant Discharge Elimination System (NPDES) permit. The process for obtaining limits involves the regulated entity (permittee) disclosing releases in a NPDES permit application and the permitting authority (typically the state but sometimes EPA) deciding whether to require monitoring or monitoring with limits. Caveats and Limitations: Less than half of states have required PFAS monitoring for at least one of their permittees and fewer states have established PFAS effluent limits for permittees. New rulemakings have been initiated that may increase the number of facilities monitoring for PFAS in the future.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/14/2025
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 01/02/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS PROJECT: NORTHEASTERN UNIVERSITY PFAS PROJECT

The PFAS Contamination Site Tracker records qualitative and quantitative data from each site in a chart, specifically examining discovery, contamination levels, government response, litigation, health impacts, media coverage, and community characteristics. All data presented in the chart were extracted from government websites, such as state health departments or the Environmental Protection Agency, and news articles.

Date of Government Version: 05/19/2023
Date Data Arrived at EDR: 04/05/2024
Date Made Active in Reports: 06/06/2024
Number of Days to Update: 62

Source: Social Science Environmental Health Research Institute
Telephone: N/A
Last EDR Contact: 12/05/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

PFAS ECHO: Facilities in Industries that May Be Handling PFAS Listing

Regulators and the public have expressed interest in knowing which regulated entities may be using PFAS. EPA has developed a dataset from various sources that show which industries may be handling PFAS. Approximately 120,000 facilities subject to federal environmental programs have operated or currently operate in industry sectors with processes that may involve handling and/or release of PFAS.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS ECHO FIRE TRAIN: Facilities in Industries that May Be Handling PFAS Listing

A list of fire training sites was added to the Industry Sectors dataset using a keyword search on the permitted facilitys name to identify sites where fire-fighting foam may have been used in training exercises. Additionally, you may view an example spreadsheet of the subset of fire training facility data, as well as the keywords used in selecting or deselecting a facility for the subset. as well as the keywords used in selecting or deselecting a facility for the subset. These keywords were tested to maximize accuracy in selecting facilities that may use fire-fighting foam in training exercises, however, due to the lack of a required reporting field in the data systems for designating fire training sites, this methodology may not identify all fire training sites or may potentially misidentify them.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PFAS PT 139 AIRPORT: All Certified Part 139 Airports PFAS Information Listing

Since July 1, 2006, all certified part 139 airports are required to have fire-fighting foam onsite that meet military specifications (MIL-F-24385) (14 CFR 139.317). To date, these military specification fire-fighting foams are fluorinated and have been historically used for training and extinguishing. The 2018 FAA Reauthorization Act has a provision stating that no later than October 2021, FAA shall not require the use of fluorinated AFFF. This provision does not prohibit the use of fluorinated AFFF at Part 139 civilian airports; it only prohibits FAA from mandating its use. The Federal Aviation Administration?s document AC 150/5210-6D - Aircraft Fire Extinguishing Agents provides guidance on Aircraft Fire Extinguishing Agents, which includes Aqueous Film Forming Foam (AFFF).

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-272-0167
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

AQUEOUS FOAM NRC: Aqueous Foam Related Incidents Listing

The National Response Center (NRC) serves as an emergency call center that fields initial reports for pollution and railroad incidents and forwards that information to appropriate federal/state agencies for response. The spreadsheets posted to the NRC website contain initial incident data that has not been validated or investigated by a federal/state response agency. Response center calls from 1990 to the most recent complete calendar year where there was indication of Aqueous Film Forming Foam (AFFF) usage are included in this dataset. NRC calls may reference AFFF usage in the ?Material Involved? or ?Incident Description? fields.

Date of Government Version: 12/30/2024
Date Data Arrived at EDR: 01/02/2025
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-267-2675
Last EDR Contact: 02/20/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PCS ENF: Enforcement data

No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29

Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

PCS: Permit Compliance System

PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 12/16/2016
Date Data Arrived at EDR: 01/06/2017
Date Made Active in Reports: 03/10/2017
Number of Days to Update: 63

Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: No Update Planned

BIOSOLIDS: ICIS-NPDES Biosolids Facility Data

The data reflects compliance information about facilities in the biosolids program.

Date of Government Version: 10/13/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 10/23/2024
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 202-564-4700
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

UST FINDER: UST Finder Database

EPA developed UST Finder, a web map application containing a comprehensive, state-sourced national map of underground storage tank (UST) and leaking UST (LUST) data. It provides the attributes and locations of active and closed USTs, UST facilities, and LUST sites from states and from Tribal lands and US territories . UST Finder contains information about proximity of UST facilities and LUST sites to: surface and groundwater public drinking water protection areas; estimated number of private domestic wells and number of people living nearby; and flooding and wildfires.

Date of Government Version: 06/08/2023
Date Data Arrived at EDR: 10/04/2023
Date Made Active in Reports: 01/18/2024
Number of Days to Update: 106

Source: Environmental Protection Agency
Telephone: 202-564-0394
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

UST FINDER RELEASE: UST Finder Releases Database

US EPA's UST Finder data is a national composite of leaking underground storage tanks. This data contains information about, and locations of, leaking underground storage tanks. Data was collected from state sources and standardized into a national profile by EPA's Office of Underground Storage Tanks, Office of Research and Development, and the Association of State and Territorial Solid Waste Management Officials.

Date of Government Version: 06/08/2023
Date Data Arrived at EDR: 10/31/2023
Date Made Active in Reports: 01/18/2024
Number of Days to Update: 79

Source: Environmental Protecton Agency
Telephone: 202-564-0394
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Semi-Annually

E MANIFEST: Hazardous Waste Electronic Manifest System

EPA established a national system for tracking hazardous waste shipments electronically. This system, known as ?e-Manifest,? will modernize the nation?s cradle-to-grave hazardous waste tracking process while saving valuable time, resources, and dollars for industry and states.

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/20/2024
Number of Days to Update: 94

Source: Environmental Protection Agency
Telephone: 833-501-6826
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

PFAS: PFAS Contamination Site Location Listing

A listing of PFAS sites included in the Envirostor and GeoTracker databases. Locations of potential sources of per - and polyfluoroalkyl substances (PFAS). This does not mean that PFAS has been produced, used, or discharged at these sites.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

AQUEOUS FOAM: Former Fire Training Facility Assessments Listing

Airports shown on this list are those believed to use Aqueous Film Forming Foam (AFFF), and certified by the Federal Aviation Administration (FAA) under Title 14, Code of Federal Regulations (CFR), Part 139 (14 CFR Part 139). This list was created by SWRCB using information available from the FAA. Location points shown are from the latitude and longitude listed on the FAA airport master record.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 916-341-5455
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CHROME PLATING: Chrome Plating Facilities Listing

This listing represents chrome plating facilities the California State Water Resources Control Board staff identified as possibly being a source of Per- and polyfluoroalkyl substance (PFAS) contamination. Sites and locations were identified by staff with the Division of Water Quality in the California State Water Board. Data was collected from the CA Air Resources Board 2013 and 2018 - Cr VI emission survey, CA Emission Inventory, CA HAZ Waste discharge database and by reviewing storm water permits. Former chrome plating sites are also included that are open site investigation or remediation cases with the Regional Water Quality Control Boards and the Department of Toxic Substances Control.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: State Water Resources Control Board
Telephone: 916-341-5455
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 09/16/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/02/2024
Number of Days to Update: 76

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

CUPA LIV-PLE: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 09/19/2024
Date Data Arrived at EDR: 11/05/2024
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 87

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

DRYCLEAN MOJAVE: Mojave Desert Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mojave Desert Air Quality Management District.

Date of Government Version: 08/21/2024
Date Data Arrived at EDR: 08/22/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 75

Source: Mojave Desert Air Quality Management District
Telephone: 760-245-1661
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN N SIERRA: Northern Sierra Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sierra Air Quality Management District,

Date of Government Version: 08/22/2024
Date Data Arrived at EDR: 08/22/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 75

Source: Northern Sierra Air Quality Management District
Telephone: 530-274-9350
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN MONTERY BAY: Monterey Bay Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Monterey Bay Air Quality Management District.

Date of Government Version: 09/09/2024
Date Data Arrived at EDR: 09/11/2024
Date Made Active in Reports: 11/26/2024
Number of Days to Update: 76

Source: Monterey Bay Air Quality Management District
Telephone: 831-647-9411
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN AMADOR: Amador Air District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Amador Air Quality Management District

Date of Government Version: 04/26/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 77

Source: Amador Air Quality Management District
Telephone: 209-257-0112
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN VENTURA: Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Ventura County Air Pollution Control District.

Date of Government Version: 08/26/2024
Date Data Arrived at EDR: 08/28/2024
Date Made Active in Reports: 11/14/2024
Number of Days to Update: 78

Source: Ventura County Air Pollution Control District
Telephone: 805-645-1421
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN EAST KERN: Eastern Kern Air Pollution Control District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Eastern Kern Air Pollution Control District.

Date of Government Version: 08/21/2024
Date Data Arrived at EDR: 08/22/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 75

Source: Eastern Kern Air Pollution Control District
Telephone: 661-862-9684
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN JOAQUIN: San Joaquin Valley Air Pollution Control District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Joaquin Valley Air Pollution Control District.

Date of Government Version: 08/22/2024
Date Data Arrived at EDR: 08/22/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 75

Source: San Joaquin Valley Air Pollution Control District
Telephone: 559-230-6001
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN GLENN: Glenn County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Glenn County Air Pollution Control District.

Date of Government Version: 08/26/2024
Date Data Arrived at EDR: 08/28/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 77

Source: Glenn County Air Pollution Control District
Telephone: 530-934-6500
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN BUTTE: Butte County Air Quality Management DistrictDrycleaner Facility Listing
Butte County Air Quality Management DistrictDrycleaner Facility Listing.

Date of Government Version: 09/10/2024
Date Data Arrived at EDR: 09/11/2024
Date Made Active in Reports: 11/25/2024
Number of Days to Update: 75

Source: Butte County Air Quality Management District
Telephone: 530-332-9400
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN FEATHER RVR: Feather River Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Feather River Air Quality Management District.

Date of Government Version: 03/08/2023
Date Data Arrived at EDR: 03/09/2023
Date Made Active in Reports: 06/05/2023
Number of Days to Update: 88

Source: Feather River Air Quality Management District
Telephone: 530-634-7659
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 05/29/2024
Date Data Arrived at EDR: 11/07/2024
Date Made Active in Reports: 11/22/2024
Number of Days to Update: 15

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

DRYCLEAN N SONOMA: Norther Sonoma County County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Northern Sonoma County Air Pollution Control District.,

Date of Government Version: 08/23/2024
Date Data Arrived at EDR: 08/26/2024
Date Made Active in Reports: 11/05/2024
Number of Days to Update: 71

Source: Santa Barbara County Air Pollution Control District
Telephone: 707-433-5911
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN GRANT: Grant Recipients List
Assembly Bill 998 (AB 998) established the Non-Toxic Dry Cleaning Incentive Program to provide financial assistance to the dry cleaning industry to switch from systems using perchloroethylene (Perc), an identified toxic air contaminant and potential human carcinogen, to non-toxic and non-smog forming alternatives.

Date of Government Version: 12/31/2021
Date Data Arrived at EDR: 01/26/2024
Date Made Active in Reports: 04/16/2024
Number of Days to Update: 81

Source: California Air Resources Board
Telephone: 916-323-0006
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

DRYCLEAN YOLO-SOLANO: Yolo-Solano Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Yolo-Solano Air Quality Management District.

Date of Government Version: 08/21/2024
Date Data Arrived at EDR: 08/26/2024
Date Made Active in Reports: 11/06/2024
Number of Days to Update: 72

Source: Yolo-Solano Air Quality Management District
Telephone: 530-757-3650
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN LAKE: Lake County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Lake County Air Quality Management District,

Date of Government Version: 02/15/2024
Date Data Arrived at EDR: 02/16/2024
Date Made Active in Reports: 05/02/2024
Number of Days to Update: 76

Source: Lake County Air Quality Management District
Telephone: 707-263-7000
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN DIEGO: San Diego County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Diego County Air Pollution Control District.

Date of Government Version: 08/21/2024
Date Data Arrived at EDR: 08/28/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 77

Source: San Diego County Air Pollution Control District
Telephone: 858-586-2616
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN MENDOCINO: Mendocino County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Mendocino County Air Quality Management District.

Date of Government Version: 08/26/2024
Date Data Arrived at EDR: 09/03/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 71

Source: Mendocino County Air Quality Management District
Telephone: 707-463-4354
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SACRAMENTO: Sacramento Metropolitan Air Quality Management DistrictDrycleaner Facility Listing
A listing of drycleaner facility locations, for the Sacramento Metropolitan Air Quality Management District.

Date of Government Version: 09/03/2024
Date Data Arrived at EDR: 09/05/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 69

Source: Sacramento Metropolitan Air Quality Management District
Telephone: 916-874-3958
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN IMPERIAL: Imperial County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Imperial County Air Pollution Control District

Date of Government Version: 10/02/2024
Date Data Arrived at EDR: 10/03/2024
Date Made Active in Reports: 12/20/2024
Number of Days to Update: 78

Source: Imperial County Air Pollution Control District
Telephone: 442-265-1800
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SAN LUIS OB: San Luis Obispo County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the San Luis Obispo County Air Pollution Control District.

Date of Government Version: 01/03/2024
Date Data Arrived at EDR: 01/04/2024
Date Made Active in Reports: 03/20/2024
Number of Days to Update: 76

Source: San Luis Obispo County Air Pollution Control District
Telephone: 805-781-5756
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN PLACER: Placer County Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Placer County Air Quality Management District.

Date of Government Version: 05/15/2023
Date Data Arrived at EDR: 05/17/2023
Date Made Active in Reports: 08/14/2023
Number of Days to Update: 89

Source: Placer County Air Quality Management District
Telephone: 530-745-2335
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN BAY AREA: Bay Area Air Quality Management District Drycleaner Facility Listing
Bay Area Air Quality Management District Drycleaner Facility Listing.

Date of Government Version: 02/20/2019
Date Data Arrived at EDR: 05/30/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1432

Source: Bay Area Air Quality Management District
Telephone: 415-516-1916
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN CALAVERAS: Calaveras County Environmental Management Agency Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Calaveras County Environmental Management Agency.

Date of Government Version: 06/17/2019
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1412

Source: Calaveras County Environmental Management Agency
Telephone: 209-754-6399
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/16/2019
Data Release Frequency: Varies

DRYCLEAN N COAST: North Coast Unified Air Quality Management District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the North Coast Unified Air Quality Management District.

Date of Government Version: 11/30/2016
Date Data Arrived at EDR: 04/19/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1473

Source: North Coast Unified Air Quality Management District
Telephone: 707-443-3093
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SANTA BARB: Santa Barbara County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Santa Barbara County Air Pollution Control District.

Date of Government Version: 02/19/2019
Date Data Arrived at EDR: 04/17/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1475

Source: Santa Barbara County Air Pollution Control District
Telephone: 805-961-8867
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN TEHAMA: Tehama County Air Pollution Control District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Tehama County Air Pollution Control District.

Date of Government Version: 04/24/2019
Date Data Arrived at EDR: 04/24/2019
Date Made Active in Reports: 05/01/2023
Number of Days to Update: 1468

Source: Tehama County Air Pollution Control District
Telephone: 530-527-3717
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing
A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 11/14/2024
Date Data Arrived at EDR: 11/15/2024
Date Made Active in Reports: 02/05/2025
Number of Days to Update: 82

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 08/28/2024
Date Data Arrived at EDR: 09/05/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 69

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Annually

DRYCLEAN SHASTA: Shasta County Air Quality Management District District Drycleaner Facility Listing
A listing of drycleaner facility locations, for the Shasta County Air Quality Management District.

Date of Government Version: 08/29/2024
Date Data Arrived at EDR: 09/05/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 69

Source: Shasta County Air Quality Management District
Telephone: 530-225-5674
Last EDR Contact: 08/21/2024
Next Scheduled EDR Contact: 09/11/2023
Data Release Frequency: Varies

EMI: Emissions Inventory Data
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2022
Date Data Arrived at EDR: 06/11/2024
Date Made Active in Reports: 09/03/2024
Number of Days to Update: 84

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/12/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Varies

ENF: Enforcement Action Listing
A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

FIN ASSURANCE 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 10/09/2024
Date Data Arrived at EDR: 10/10/2024
Date Made Active in Reports: 12/30/2024
Number of Days to Update: 81

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

FIN ASSURANCE 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/06/2024
Date Data Arrived at EDR: 11/08/2024
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 84

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Varies

ICE: Inspection, Compliance and Enforcement
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 11/08/2024
Date Data Arrived at EDR: 11/08/2024
Date Made Active in Reports: 02/03/2025
Number of Days to Update: 87

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 02/11/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List

The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing

Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/08/2024
Date Data Arrived at EDR: 11/08/2024
Date Made Active in Reports: 02/03/2025
Number of Days to Update: 87

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 02/11/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 09/30/2024
Date Data Arrived at EDR: 10/01/2024
Date Made Active in Reports: 12/13/2024
Number of Days to Update: 73

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 12/27/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Quarterly

HWTS: Hazardous Waste Tracking System

DTSC maintains the Hazardous Waste Tracking System that stores ID number information since the early 1980s and manifest data since 1993. The system collects both manifest copies from the generator and destination facility.

Date of Government Version: 07/19/2024
Date Data Arrived at EDR: 07/30/2024
Date Made Active in Reports: 08/28/2024
Number of Days to Update: 29

Source: Department of Toxic Substances Control
Telephone: 916-324-2444
Last EDR Contact: 01/02/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 07/02/2024
Date Made Active in Reports: 09/25/2024
Number of Days to Update: 85

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Annually

MINES: Mines Site Location Listing

A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 10/07/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/05/2024
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 87

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 02/04/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing

A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Quarterly

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/24/2025
Number of Days to Update: 83

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records

Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 09/05/2024
Date Data Arrived at EDR: 09/06/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 68

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: No Update Planned

SAN JOSE HAZMAT: Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/05/2020
Date Made Active in Reports: 01/26/2021
Number of Days to Update: 82

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Annually

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/25/2025
Number of Days to Update: 84

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 07/01/2021
Date Made Active in Reports: 09/29/2021
Number of Days to Update: 90

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 01/02/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: No Update Planned

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: No Update Planned

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 12/02/2024
Date Data Arrived at EDR: 12/03/2024
Date Made Active in Reports: 02/25/2025
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 12/03/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

CIWQS: California Integrated Water Quality System

The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/12/2025
Number of Days to Update: 84

Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data

The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 76

Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)

Non-Case Information sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)

Other Oil & Gas Projects sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 02/24/2025
Date Data Arrived at EDR: 02/24/2025
Date Made Active in Reports: 02/26/2025
Number of Days to Update: 2

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 02/24/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Varies

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**COUNTY RECORDS**

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 01/09/2019
Date Data Arrived at EDR: 01/11/2019
Date Made Active in Reports: 03/05/2019
Number of Days to Update: 53

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 12/26/2023
Date Data Arrived at EDR: 12/26/2023
Date Made Active in Reports: 03/19/2024
Number of Days to Update: 84

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 04/27/2023
Date Data Arrived at EDR: 04/27/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 77

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 09/25/2024
Date Data Arrived at EDR: 09/26/2024
Date Made Active in Reports: 12/12/2024
Number of Days to Update: 77

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/06/2020
Date Data Arrived at EDR: 04/23/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 78

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 10/21/2024
Date Data Arrived at EDR: 10/23/2024
Date Made Active in Reports: 01/13/2025
Number of Days to Update: 82

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 02/05/2024
Date Data Arrived at EDR: 02/08/2024
Date Made Active in Reports: 04/26/2024
Number of Days to Update: 78

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/08/2022
Date Data Arrived at EDR: 08/09/2022
Date Made Active in Reports: 09/01/2022
Number of Days to Update: 23

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 06/28/2021
Date Data Arrived at EDR: 12/21/2021
Date Made Active in Reports: 03/03/2022
Number of Days to Update: 72

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 12/19/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: No Update Planned

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/12/2021
Date Data Arrived at EDR: 08/12/2021
Date Made Active in Reports: 11/08/2021
Number of Days to Update: 88

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 10/09/2024
Date Data Arrived at EDR: 10/11/2024
Date Made Active in Reports: 12/30/2024
Number of Days to Update: 80

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

KERN COUNTY:

CUPA KERN: CUPA Facility List
A listing of sites included in the Kern County Hazardous Material Business Plan.

Date of Government Version: 01/27/2025
Date Data Arrived at EDR: 01/29/2025
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 2

Source: Kern County Public Health
Telephone: 661-321-3000
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 01/27/2025
Date Data Arrived at EDR: 01/29/2025
Date Made Active in Reports: 01/31/2025
Number of Days to Update: 2

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 12/03/2020
Date Data Arrived at EDR: 01/26/2021
Date Made Active in Reports: 04/14/2021
Number of Days to Update: 78

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 10/31/2024
Date Data Arrived at EDR: 11/01/2024
Date Made Active in Reports: 01/17/2025
Number of Days to Update: 77

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/31/2020
Date Data Arrived at EDR: 08/21/2020
Date Made Active in Reports: 11/09/2020
Number of Days to Update: 80

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: Key Areas of Concerns in Los Angeles County
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office. Date of Government Version: 3/30/2009 Exide Site area is a cleanup plan of lead-impacted soil surrounding the former Exide Facility as designated by the DTSC. Date of Government Version: 7/17/2017

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: N/A
Telephone: N/A
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 09/26/2024
Date Data Arrived at EDR: 10/01/2024
Date Made Active in Reports: 12/12/2024
Number of Days to Update: 72

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/04/2024
Date Data Arrived at EDR: 10/04/2024
Date Made Active in Reports: 12/23/2024
Number of Days to Update: 80

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 01/07/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 12/31/2023
Date Data Arrived at EDR: 10/03/2024
Date Made Active in Reports: 12/17/2024
Number of Days to Update: 75

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

LOS ANGELES AST: Active & Inactive AST Inventory
A listing of active & inactive above ground petroleum storage tank site locations, located in the City of Los Angeles.

Date of Government Version: 06/01/2019
Date Data Arrived at EDR: 06/25/2019
Date Made Active in Reports: 08/22/2019
Number of Days to Update: 58

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

LOS ANGELES CO LF METHANE: Methane Producing Landfills
This data was created on April 30, 2012 to represent known disposal sites in Los Angeles County that may produce and emanate methane gas. The shapefile contains disposal sites within Los Angeles County that once accepted degradable refuse material. Information used to create this data was extracted from a landfill survey performed by County Engineers (Major Waste System Map, 1973) as well as historical records from CalRecycle, Regional Water Quality Control Board, and Los Angeles County Department of Public Health

Date of Government Version: 05/14/2024
Date Data Arrived at EDR: 07/09/2024
Date Made Active in Reports: 09/27/2024
Number of Days to Update: 80

Source: Los Angeles County Department of Public Works
Telephone: 626-458-6973
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: No Update Planned

LOS ANGELES HM: Active & Inactive Hazardous Materials Inventory
A listing of active & inactive hazardous materials facility locations, located in the City of Los Angeles.

Date of Government Version: 09/01/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/02/2024
Number of Days to Update: 76

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

LOS ANGELES UST: Active & Inactive UST Inventory
A listing of active & inactive underground storage tank site locations and underground storage tank historical sites, located in the City of Los Angeles.

Date of Government Version: 09/01/2024
Date Data Arrived at EDR: 09/17/2024
Date Made Active in Reports: 12/02/2024
Number of Days to Update: 76

Source: Los Angeles Fire Department
Telephone: 213-978-3800
Last EDR Contact: 12/11/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation LA County List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 05/21/2024
Date Data Arrived at EDR: 07/16/2024
Date Made Active in Reports: 10/07/2024
Number of Days to Update: 83

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: No Update Planned

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 04/22/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/27/2019
Number of Days to Update: 65

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/17/2024
Date Made Active in Reports: 01/07/2025
Number of Days to Update: 82

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/10/2020
Date Data Arrived at EDR: 08/12/2020
Date Made Active in Reports: 10/23/2020
Number of Days to Update: 72

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/26/2018
Date Data Arrived at EDR: 10/04/2018
Date Made Active in Reports: 11/02/2018
Number of Days to Update: 29

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Semi-Annually

MENDOCINO COUNTY:

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/22/2021
Date Data Arrived at EDR: 11/18/2021
Date Made Active in Reports: 11/22/2021
Number of Days to Update: 4

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 10/08/2024
Date Data Arrived at EDR: 10/09/2024
Date Made Active in Reports: 10/31/2024
Number of Days to Update: 22

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 03/02/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 78

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 01/10/2025
Date Data Arrived at EDR: 01/14/2025
Date Made Active in Reports: 02/20/2025
Number of Days to Update: 37

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 09/05/2019
Date Data Arrived at EDR: 09/09/2019
Date Made Active in Reports: 10/31/2019
Number of Days to Update: 52

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 01/27/2025
Date Data Arrived at EDR: 01/27/2025
Date Made Active in Reports: 02/03/2025
Number of Days to Update: 7

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups Orange County
Petroleum and non-petroleum spills.

Date of Government Version: 10/31/2024
Date Data Arrived at EDR: 10/31/2024
Date Made Active in Reports: 01/24/2025
Number of Days to Update: 85

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/27/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 10/31/2024
Date Data Arrived at EDR: 10/31/2024
Date Made Active in Reports: 01/24/2025
Number of Days to Update: 85

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/27/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 08/06/2024
Date Data Arrived at EDR: 08/08/2024
Date Made Active in Reports: 10/29/2024
Number of Days to Update: 82

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 01/27/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 11/19/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 03/31/2019
Date Data Arrived at EDR: 04/23/2019
Date Made Active in Reports: 06/26/2019
Number of Days to Update: 64

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 06/11/2024
Date Data Arrived at EDR: 06/12/2024
Date Made Active in Reports: 06/27/2024
Number of Days to Update: 15

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 12/05/2024
Date Data Arrived at EDR: 12/05/2024
Date Made Active in Reports: 12/31/2024
Number of Days to Update: 26

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/21/2022
Date Made Active in Reports: 03/16/2023
Number of Days to Update: 85

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 11/07/2022
Date Data Arrived at EDR: 12/09/2022
Date Made Active in Reports: 03/01/2023
Number of Days to Update: 82

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 10/25/2024
Date Data Arrived at EDR: 10/29/2024
Date Made Active in Reports: 01/17/2025
Number of Days to Update: 80

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 08/13/2024
Date Data Arrived at EDR: 08/14/2024
Date Made Active in Reports: 08/20/2024
Number of Days to Update: 6

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 01/28/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 11/20/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 02/25/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/01/2023
Date Data Arrived at EDR: 01/31/2024
Date Made Active in Reports: 04/17/2024
Number of Days to Update: 77

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/22/2021
Date Data Arrived at EDR: 10/19/2021
Date Made Active in Reports: 01/13/2022
Number of Days to Update: 86

Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

SAN DIEGO CO SAM: Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 02/19/2025
Next Scheduled EDR Contact: 06/09/2025
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

CUPA SAN FRANCISCO CO: CUPA Facility Listing
Cupa facilities

Date of Government Version: 10/28/2024
Date Data Arrived at EDR: 10/30/2024
Date Made Active in Reports: 01/21/2025
Number of Days to Update: 83

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: No Update Planned

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 10/28/2024
Date Data Arrived at EDR: 10/30/2024
Date Made Active in Reports: 01/24/2025
Number of Days to Update: 86

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Quarterly

SAN FRANCISO COUNTY:

SAN FRANCISCO MAHER: Maher Ordinance Property Listing
a listing of properties that fall within a Maher Ordinance, for all of San Francisco

Date of Government Version: 10/15/2024
Date Data Arrived at EDR: 10/16/2024
Date Made Active in Reports: 01/06/2025
Number of Days to Update: 82

Source: San Francisco Planning
Telephone: 628-652-7483
Last EDR Contact: 01/14/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/04/2024
Next Scheduled EDR Contact: 03/24/2025
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/12/2024
Date Data Arrived at EDR: 11/13/2024
Date Made Active in Reports: 02/06/2025
Number of Days to Update: 85

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 02/20/2020
Date Data Arrived at EDR: 02/20/2020
Date Made Active in Reports: 04/24/2020
Number of Days to Update: 64

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/05/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 03/29/2019
Date Data Arrived at EDR: 03/29/2019
Date Made Active in Reports: 05/29/2019
Number of Days to Update: 61

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 02/26/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: No Update Planned

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 11/18/2024
Date Data Arrived at EDR: 11/19/2024
Date Made Active in Reports: 02/12/2025
Number of Days to Update: 85

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: No Update Planned

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

SITE MIT SANTA CRUZ: Site Mitigation Santa Cruz County List
Sites may become contaminated with toxic chemicals through illegal dumping or disposal, from leaking underground storage tanks, or through industrial or commercial activities.The goal of the site mitigation program is to protect the public health and the environment while facilitating completion of contaminated site clean-up projects in a timely manner.

Date of Government Version: 12/03/2018
Date Data Arrived at EDR: 06/23/2023
Date Made Active in Reports: 07/13/2023
Number of Days to Update: 20

Source: Santa Cruz Environmental Health Services
Telephone: 831-454-2761
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/04/2019
Date Data Arrived at EDR: 06/06/2019
Date Made Active in Reports: 08/13/2019
Number of Days to Update: 68

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/15/2021
Date Data Arrived at EDR: 09/16/2021
Date Made Active in Reports: 12/09/2021
Number of Days to Update: 84

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 07/02/2021
Date Data Arrived at EDR: 07/06/2021
Date Made Active in Reports: 07/14/2021
Number of Days to Update: 8

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 06/30/2021
Date Data Arrived at EDR: 06/30/2021
Date Made Active in Reports: 09/24/2021
Number of Days to Update: 86

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/10/2024
Next Scheduled EDR Contact: 03/31/2025
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 02/08/2022
Date Data Arrived at EDR: 02/10/2022
Date Made Active in Reports: 05/04/2022
Number of Days to Update: 83

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 01/03/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 11/05/2024
Date Data Arrived at EDR: 11/20/2024
Date Made Active in Reports: 02/13/2025
Number of Days to Update: 85

Source: Sutter County Environmental Health Services
Telephone: 530-822-7500
Last EDR Contact: 02/12/2025
Next Scheduled EDR Contact: 06/02/2025
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 08/27/2024
Date Data Arrived at EDR: 08/28/2024
Date Made Active in Reports: 11/12/2024
Number of Days to Update: 76

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 02/05/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 10/09/2024
Date Data Arrived at EDR: 10/11/2024
Date Made Active in Reports: 12/30/2024
Number of Days to Update: 80

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 10/07/2022
Date Data Arrived at EDR: 10/07/2022
Date Made Active in Reports: 12/21/2022
Number of Days to Update: 75

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 01/22/2025
Next Scheduled EDR Contact: 05/12/2025
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 01/08/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 07/02/2024
Date Data Arrived at EDR: 07/17/2024
Date Made Active in Reports: 07/23/2024
Number of Days to Update: 6

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/13/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/16/2024
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: No Update Planned

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 01/30/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: No Update Planned

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 07/02/2024
Date Data Arrived at EDR: 07/18/2024
Date Made Active in Reports: 07/23/2024
Number of Days to Update: 5

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 01/13/2025
Next Scheduled EDR Contact: 04/28/2025
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/27/2024
Date Data Arrived at EDR: 09/04/2024
Date Made Active in Reports: 11/13/2024
Number of Days to Update: 70

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/05/2024
Next Scheduled EDR Contact: 03/17/2025
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 09/18/2024
Date Data Arrived at EDR: 09/25/2024
Date Made Active in Reports: 12/13/2024
Number of Days to Update: 79

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 01/09/2025
Next Scheduled EDR Contact: 04/07/2025
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 10/17/2024
Date Data Arrived at EDR: 10/22/2024
Date Made Active in Reports: 01/10/2025
Number of Days to Update: 80

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 01/15/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Varies

**OTHER DATABASE(S)**

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 11/04/2024
Date Data Arrived at EDR: 11/05/2024
Date Made Active in Reports: 01/27/2025
Number of Days to Update: 83

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/04/2025
Next Scheduled EDR Contact: 05/19/2025
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 12/23/2024
Next Scheduled EDR Contact: 04/14/2025
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 11/30/2023
Date Made Active in Reports: 12/01/2023
Number of Days to Update: 1

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 01/23/2025
Next Scheduled EDR Contact: 05/05/2025
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/06/2025
Next Scheduled EDR Contact: 04/21/2025
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 11/30/2021
Date Made Active in Reports: 02/18/2022
Number of Days to Update: 80

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/06/2025
Next Scheduled EDR Contact: 05/26/2025
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 02/26/2025
Next Scheduled EDR Contact: 06/16/2025
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

**STREET AND ADDRESS INFORMATION**

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# GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

**TARGET PROPERTY ADDRESS**

ONTARIO RANCH II
8061 EDISON AVENUE
ONTARIO, CA 91762

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 33.996599 - 33˚ 59’ 47.76’’ |
| Longitude (West): | 117.63136 - 117˚ 37’ 52.90’’ |
| Universal Tranverse Mercator: | Zone 11 |
| UTM X (Meters): | 441691.2 |
| UTM Y (Meters): | 3761764.0 |
| Elevation: | 691 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 50006194 PRADO DAM, CA |
| Version Date: | 2022 |
| Northeast Map: | 50005338 GUASTI, CA |
| Version Date: | 2021 |
| Southeast Map: | 50005749 CORONA NORTH, CA |
| Version Date: | 2022 |
| Northwest Map: | 50005381 ONTARIO, CA |
| Version Date: | 2021 |

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

**TOPOGRAPHIC INFORMATION**

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General South

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**

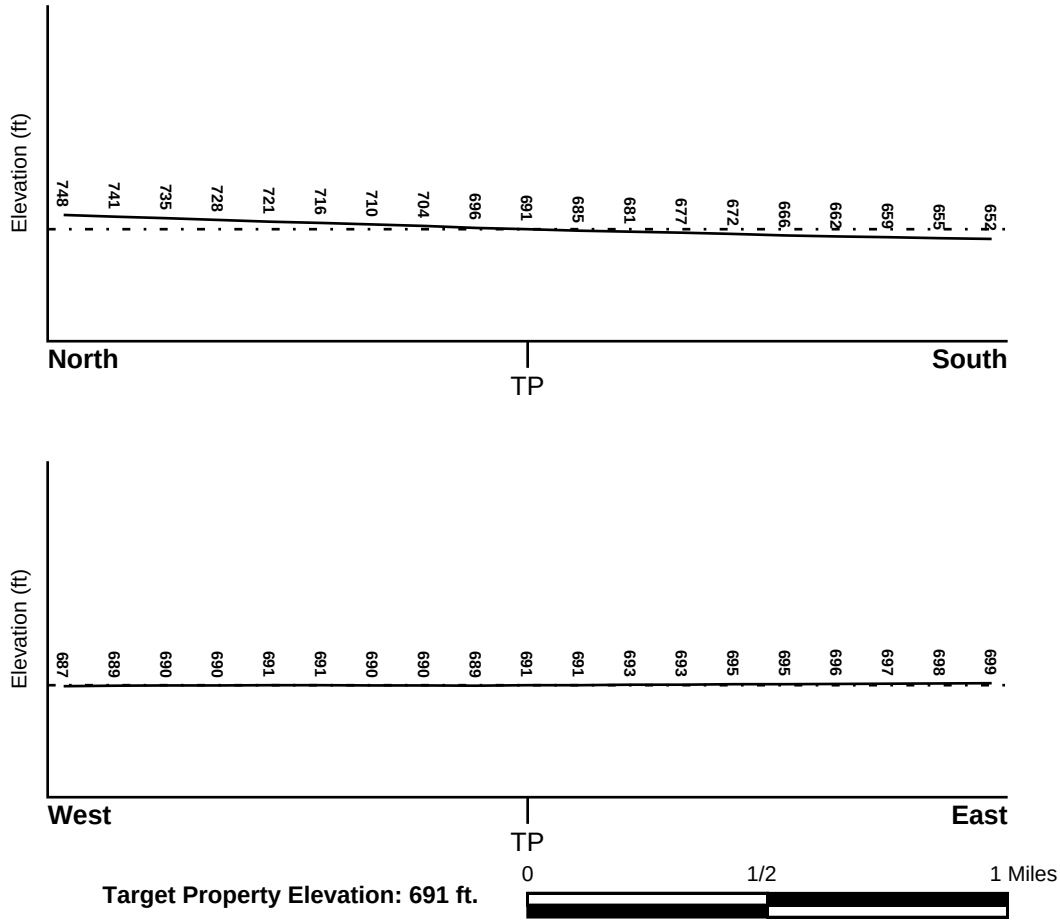


**Target Property Elevation: 691 ft.**

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**HYDROLOGIC INFORMATION**

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

**FEMA FLOOD ZONE**

| Flood Plain Panel at Target Property | FEMA Source Type |
|---|---|
| 06071C9335H | FEMA FIRM Flood data |

| Additional Panels in search area: | FEMA Source Type |
|---|---|
| 06037C1750F | FEMA FIRM Flood data |
| 06071C8620H | FEMA FIRM Flood data |
| 06071C8638H | FEMA FIRM Flood data |
| 06071C9375H | FEMA FIRM Flood data |

**NATIONAL WETLAND INVENTORY**

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| PRADO DAM | YES - refer to the Overview Map and Detail Map |

**HYDROGEOLOGIC INFORMATION**

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

***Site-Specific Hydrogeological Data*:***

| | |
|---|---|
| Search Radius: | 1.25 miles |
| Status: | Not found |

**AQUIFLOW®**

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

**GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

| | |
|---|---|
| Era: | Cenozoic |
| System: | Quaternary |
| Series: | Quaternary |
| Code: | Q *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 7910061.1s

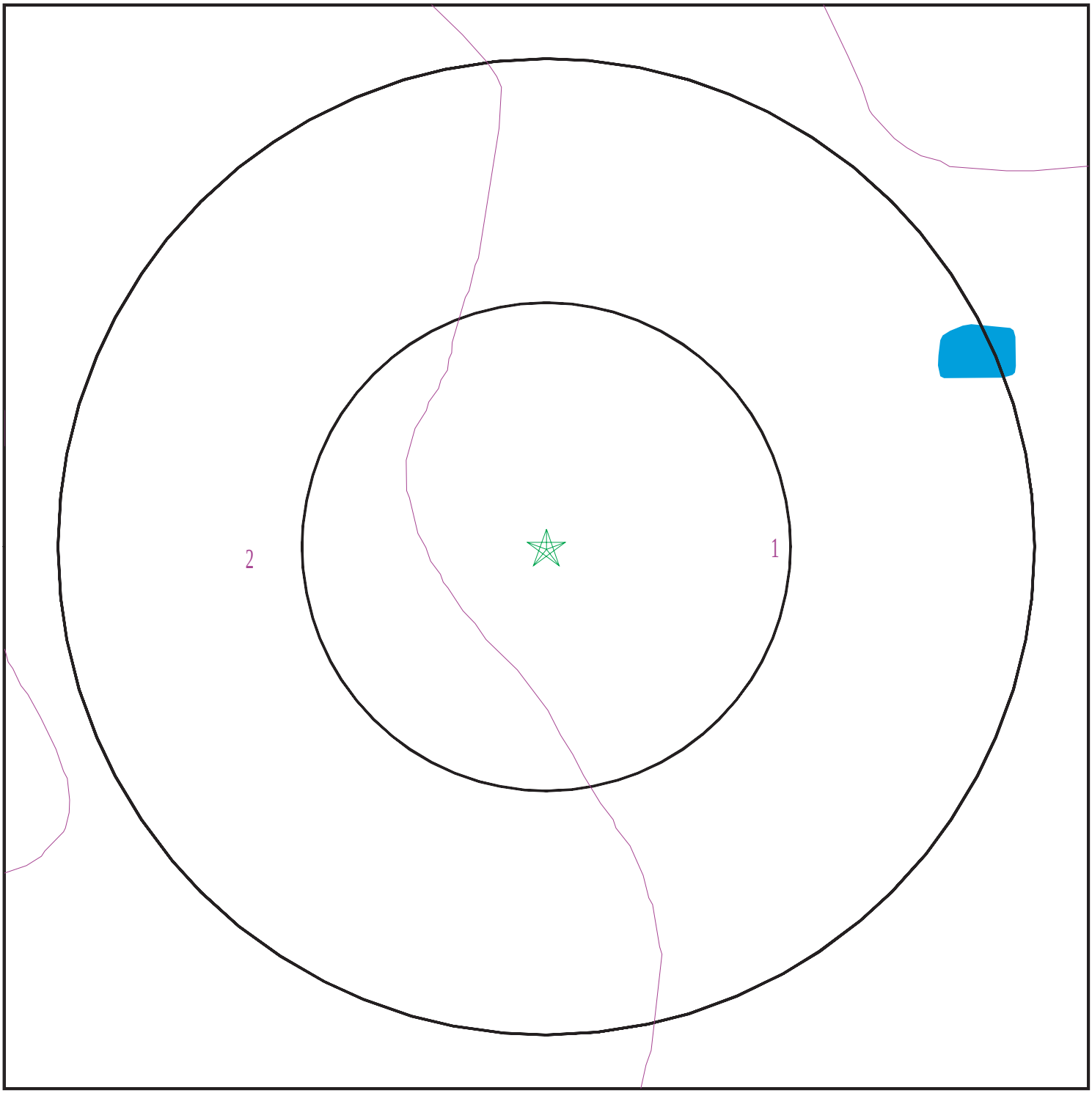


Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

| | | | |
|---|---|---|---|
| SITE NAME: | Ontario Ranch II | CLIENT: | Roux Associates |
| ADDRESS: | 8061 Edison Avenue<br>Ontario CA 91762 | CONTACT: | Ashley Whitaker |
| | | INQUIRY #: | 7910061.1s |
| LAT/LONG: | 33.996599 / 117.63136 | DATE: | February 27, 2025 2:36 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY**

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

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**Soil Map ID: 1**

Soil Component Name: TUJUNGA

Soil Surface Texture: gravelly loamy sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Somewhat excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 18 inches | gravelly loamy sand | Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand. | COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 141<br>Min: 42 | Max: 7.8<br>Min: 6.1 |
| 2 | 18 inches | 59 inches | loamy sand | Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand. | COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand. | Max: 141<br>Min: 42 | Max: 7.8<br>Min: 6.1 |

**Soil Map ID: 2**

Soil Component Name: HILMAR

Soil Surface Texture: loamy fine sand

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 22 inches | loamy fine sand | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt. | Max: 1.4 Min: 0.42 | Max: 8.4 Min: 7.9 |
| 2 | 22 inches | 59 inches | stratified loamy sand to loam | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt. | Max: 1.4 Min: 0.42 | Max: 8.4 Min: 7.9 |

**LOCAL / REGIONAL WATER AGENCY RECORDS**

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

## WELL SEARCH DISTANCE INFORMATION

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | Nearest PWS within 1 mile |
| State Database | 1.000 |

## FEDERAL USGS WELL INFORMATION

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

## FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No PWS System Found | | |

Note: PWS System location is not always the same as well location.

## STATE DATABASE WELL INFORMATION

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| 1 | CADWR0000031378 | 1/4 - 1/2 Mile SSE |
| A2 | CADWR0000009816 | 1/4 - 1/2 Mile West |
| A3 | CADWR0000004960 | 1/4 - 1/2 Mile West |
| 4 | CADDW2000005418 | 1/4 - 1/2 Mile NW |
| B5 | CADWR0000011113 | 1/2 - 1 Mile NW |
| B6 | CADWR0000009886 | 1/2 - 1 Mile NW |
| 7 | CADWR9000006371 | 1/2 - 1 Mile NW |
| 8 | CADWR0000020619 | 1/2 - 1 Mile North |
| 9 | CADWR0000007518 | 1/2 - 1 Mile ENE |
| 10 | CAEDF0000129348 | 1/2 - 1 Mile SSW |

# PHYSICAL SETTING SOURCE MAP - 7910061.1s

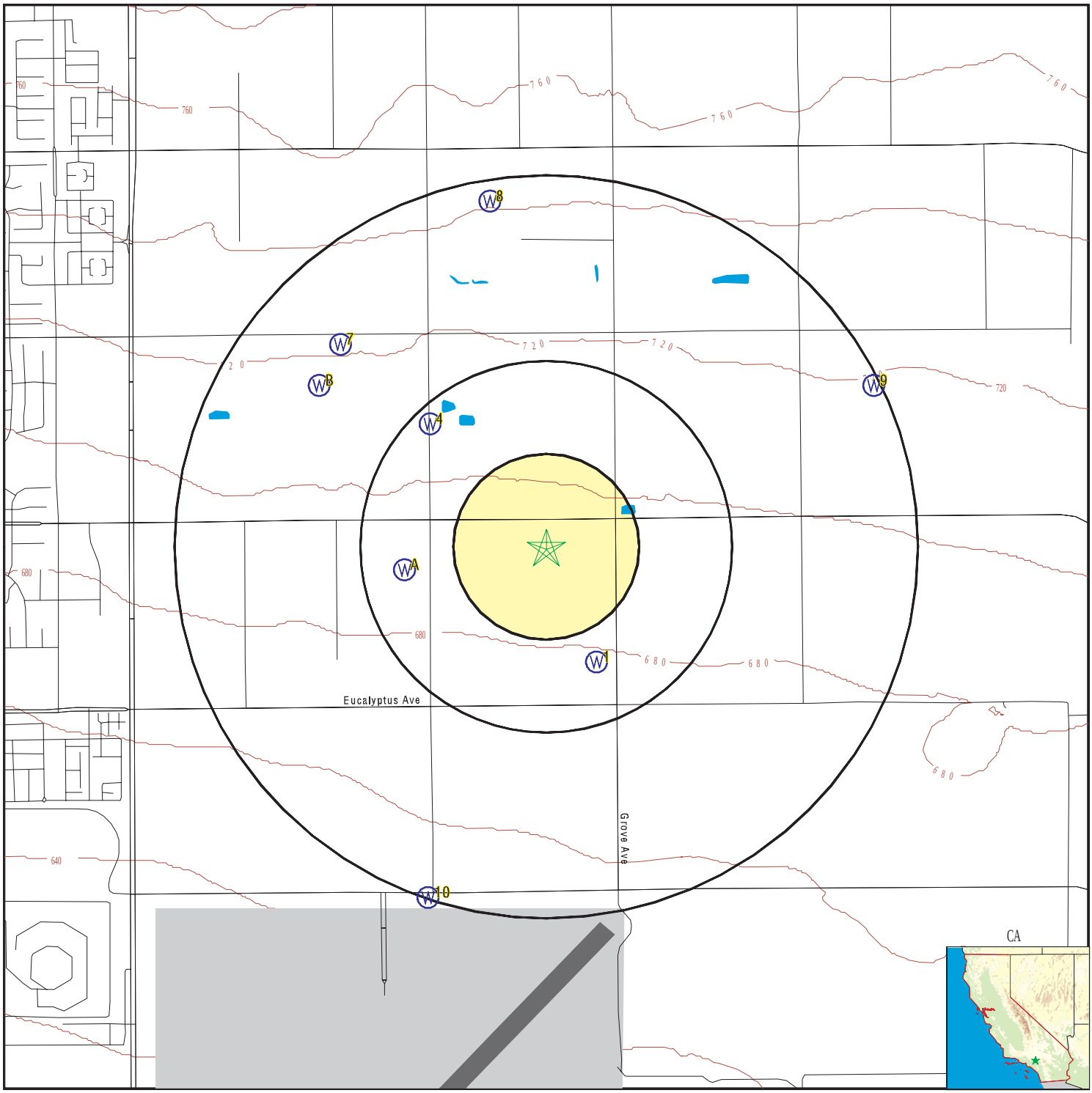


County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Airports
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location
HD Closest Hydrogeological Data
Oil, gas or related wells

N

| | | | |
|---|---|---|---|
| SITE NAME: | Ontario Ranch II | CLIENT: | Roux Associates |
| ADDRESS: | 8061 Edison Avenue<br>Ontario CA 91762 | CONTACT: | Ashley Whitaker |
| | | INQUIRY #: | 7910061.1s |
| LAT/LONG: | 33.996599 / 117.63136 | DATE: | February 27, 2025 2:36 pm |

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| Map ID<br>Direction<br>Distance<br>Elevation | Database | EDR ID Number |
|---|---|---|
| **1**<br>**SSE**<br>**1/4 - 1/2 Mile**<br>**Lower** | **CA WELLS** | **CADWR0000031378** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17R001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17R001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17R001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **A2**<br>**West**<br>**1/4 - 1/2 Mile**<br>**Lower** | **CA WELLS** | **CADWR0000009816** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17L001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17L001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17L001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **A3**<br>**West**<br>**1/4 - 1/2 Mile**<br>**Lower** | **CA WELLS** | **CADWR0000004960** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17L002S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17L002S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17L002S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **4**<br>**NW**<br>**1/4 - 1/2 Mile**<br>**Higher** | **CA WELLS** | **CADDW2000005418** |

**GAMA:**

| | | | |
|---|---|---|---|
| Well ID: | CA3610012_019_019 | Well Type: | MUNICIPAL |
| Source: | DDW | Other Names: | 3610012-019 |
| GAMA Pfas testing: | Not Reported | | |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DHS&samp_date=&global_id=&assigned_name=CA3610012_019_019&store_num= | | |
| GeoTracker Data: | Not Reported | | |

| Map ID<br>Direction<br>Distance<br>Elevation | Database | EDR ID Number |
|---|---|---|
| **B5**<br>**NW**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR0000011113** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17D001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17D001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17D001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **B6**<br>**NW**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR0000009886** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W17D002S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W17D002S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W17D002S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **7**<br>**NW**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR9000006371** |

| | | | |
|---|---|---|---|
| State Well #: | Not Reported | Station ID: | 48086 |
| Well Name: | CHINO-1208672 | Basin Name: | Chino |
| Well Use: | Observation | Well Type: | Single Well |
| Well Depth: | 565 | Well Completion Rpt #: | e042290 |

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| | | |
|---|---|---|
| **8**<br>**North**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR0000020619** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W08K001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W08K001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W08K001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

| Map ID<br>Direction<br>Distance<br>Elevation | Database | EDR ID Number |
|---|---|---|
| **9**<br>**ENE**<br>**1/2 - 1 Mile**<br>**Higher** | **CA WELLS** | **CADWR0000007518** |

| | | | |
|---|---|---|---|
| Well ID: | 02S07W16B001S | Well Type: | UNK |
| Source: | Department of Water Resources | | |
| Other Name: | 02S07W16B001S | GAMA PFAS Testing: | Not Reported |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=DWR&samp_date=&global_id=&assigned_name=02S07W16B001S&store_num= | | |
| GeoTracker Data: | Not Reported | | |

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| | | |
|---|---|---|
| **10**<br>**SSW**<br>**1/2 - 1 Mile**<br>**Lower** | **CA WELLS** | **CAEDF0000129348** |

| | | | |
|---|---|---|---|
| Well ID: | SL208634049-CAMW2 | Well Type: | MONITORING |
| Source: | EDF | Other Name: | CAMW2 |
| GAMA PFAS Testing: | Not Reported | | |
| Groundwater Quality Data: | https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/GamaDataDisplay.asp?dataset=EDF&samp_date=&global_id=SL208634049&assigned_name=CAMW2&store_num= | | |
| GeoTracker Data: | https://geotracker.waterboards.ca.gov/profile_report.asp?cmd=MWEDFResults&global_id=SL208634049&assigned_name=CAMW2 | | |

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

State Database: CA Radon

Radon Test Results

| Zipcode | Num Tests | > 4 pCi/L |
|---|---|---|
| 91762 | 19 | 0 |

Federal EPA Radon Zone for SAN BERNARDINO County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

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Federal Area Radon Information for Zip Code: 91762

Number of sites tested: 1

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 0.300 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | Not Reported | Not Reported | Not Reported | Not Reported |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

## HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005, 2010 and 2015 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

## HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

## OTHER STATE DATABASE INFORMATION

Groundwater Ambient Monitoring & Assessment Program
State Water Resources Control Board
Telephone: 916-341-5577
The GAMA Program is Californias comprehensive groundwater quality monitoring program. GAMA collects data by testing the untreated, raw water in different types of wells for naturally-occurring and man-made chemicals. The GAMA data includes Domestic, Monitoring and Municipal well types from the following sources, Department of Water Resources, Department of Heath Services, EDF, Agricultural Lands, Lawrence Livermore National Laboratory, Department of Pesticide Regulation, United States Geological Survey, Groundwater Ambient Monitoring and Assessment Program and Local Groundwater Projects.

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

Geothermal Wells Listing
Department of Conservation
Telephone: 916-445-9686
Geothermal well means a well constructed to extract or return water to the ground after it has been used for heating or cooling purposes. Geothermal wells in California (except for wells on federal leases which are administered by the Bureau of Land Management) are permitted, drilled, operated, and permanently sealed and closed (plugged and abandoned) under requirements and procedures administered by the Geothermal Section of the Department of Conservations Geologic Energy Management Division (CalGEM, formerly DOGGR).

California Oil and Gas Well Locations
Source: Dept of Conservation, Geologic Energy Management Division
Telephone: 916-323-1779
Oil and Gas well locations in the state.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

California Earthquake Fault Lines
Source: California Division of Mines and Geology
The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

RADON

State Database: CA Radon
Source: Department of Public Health
Telephone: 916-210-8558
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

**STREET AND ADDRESS INFORMATION**

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# APPENDIX G

Resumes

ROUX

# PROFESSIONAL PROFILE

## Mauricio H. Escobar, PG

### Vice President | Principal Geologist


**CONTACT INFORMATION**

Main: (310) 879-4900
Direct: (310) 879-4920
Email: mescobar@rouxinc.com
Website: www.rouxinc.com

5150 East Pacific Coast Highway
Suite 450
Long Beach, CA 90804


**EDUCATION**

Bachelor of Arts, Earth Science, 1995, University of California, Berkeley

OSHA 40-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER) Certified

Research Assistant to UC Berkeley Ph.D. Candidate Dawnika L. Blatter and Professor Ian S. E. Carmichael in Study of Continental Crustal Deformation from Subduction of the Cocos Plate in Western Mexico and Study of Upper Mantle Petrology in Central Mexico, January to April 1996

**PROFESSIONAL LICENSES**

Professional Geologist, State of California, No. 07506

**EXPERIENCE SUMMARY**

21 years of consulting experience: Principal Geologist with Roux Associates (2011 to Present); Senior Manager, Manager, and Senior Associate with ENVIRON International Corporation (2004 to 2011); Project Geologist with URS Corporation (2001 to 2004); Geologist with Hart Crowser (1998 to 2001).

**TECHNICAL SPECIALTIES**

Professional Geologist with over twenty years of experience designing, managing, and implementing environmental soil and groundwater investigations and remediation strategies for public and private clients. Experience as in-house consultant assisting with management of a $25MM yearly remediation portfolio for a Fortune 100 Company. Practice developing and implementing high-level strategies that consider legal and regulatory issues, communications and government relations, as well as technical challenges and costs. Significant assignments representing clients during Working Group meetings for Superfund sites and participation in technical committee meetings. Expertise in design and field implementation of in-situ chemical oxidation (ISCO) in hard rock and porous media-flow aquifers.

Substantial experience evaluating and remediating industrial, commercial and residential sites impacted with numerous contaminants in multiple media, including crude oil, fuels, volatile organic compounds, chromium VI, 1,4-dioxane, and PCBs. Extensive experience managing implementation of remediation programs that utilize and consider multiple technologies including soil vapor extraction, dual phase extraction, traditional pump and treat, in-well stripping, air sparging, chemical oxidation and reduction, thermal treatment, and natural attenuation. Experience managing large-scale remedial excavations involving the use of heavy earth moving equipment. Significant field experience using numerous drilling, soil sampling, groundwater sampling, and soil vapor sampling techniques.

**CONTINUING EDUCATION**

- Compounds of Emerging Concern in Groundwater, California Groundwater Resources Association, Concord, California, February 2012
- The Remediation Course, Princeton Groundwater, Las Vegas, Nevada, April 2010
- Vapor Intrusion Pathway: A Practical Guideline, Interstate Technology and Regulatory Council (ITRC) in conjunction with the California Department of Toxic Substances (DTSC) and California Water Boards, Long Beach, California, June 2009
- The Groundwater Pollution and Hydrology Course, Princeton Groundwater, Orlando, Florida, February 2007
- Hydrogeologic Analysis of Fractured Bedrock Systems, Midwest GeoSciences Group, University of Nevada Las Vegas and Nevada Test Site at Yucca Mountain, March 2006

**REPRESENTATIVE PROJECTS**

- **PRP Representation of Fortune 100 Company, Omega Chemical Superfund Site, Whittier, California.** Provide ongoing technical consulting to a Fortune 100 Company and major PRP at the Omega Chemical Superfund Site in Whittier, California. Active participant of the Omega PRP Group (OPOG) Technical Committee. Attend all pertinent technical meetings and provide Client with technical and strategic input that protects their best interests. Maintain constant interaction with the legal and finance teams as necessary to ensure the technical and legal strategies are in agreement and that adequate funding is reserved well in advance of regulatory commitments and OPOG cash calls. Pertinent technical issues include soil gas and vapor intrusion, and a regional groundwater plume. Regulatory oversight is provided by USEPA Region IX.

- **PRP Representation of Fortune 100 Company, BKK Corporation Class I Landfill Organized Group, West Covina, California.** Provide ongoing technical consulting to a Fortune 100 Company at the former BKK Corporation Class I Landfill site in West Covina, California. Participant in the BKK Technical Committee and attendant of pertinent technical meetings. Maintain constant communication with the Client's legal and finance teams and responsible for informing Client on the direction the Organized Group is headed. Responsible for identifying financial commitments made as part of technical decisions. Trusted with voicing opinions, concerns, and/or offering direction to the Group (if and when necessary), to ensure the Organized Group's direction is consistent with the Client's strategy. Pertinent technical issues include upgrades to the landfill infrastructure and groundwater remedial investigations in and around the landfill prism. Regulatory oversight is provided by the Department of Toxic Substances Control.
- **Portfolio Project Control - Fortune 100 Company, Torrance, California.** Three years of experience working as a full-time in-house consultant for a Fortune 100 Company assisting with management of all aspects of a complex multi-site portfolio. General role included communication with alliance partners, vendors, corporate finance, attorneys, public relations/communications, and procurement to track and facilitate progress of 9 major projects ($400,000 to $1 MM/year) and 3 mega projects ($3MM to $10MM+/year) that were unique in nature and complexity. Portfolio included former chemical sites, landfills, aerospace facilities, and other heavy use industrial facilities that were undergoing State and RCRA closure, as well as sites under CERCLA Superfund actions with PRP commitments. Charged with helping to develop, evaluate, and refine remedial strategies and lifecycle costs for sites that utilized various cleanup technologies such as application of oxidants and reducing agents, thermal oxidation, groundwater pump and treat, dual-phase and 2-PHASE™ extraction, soil vapor extraction, air sparging, and in-well air stripping. Major role included verifying adequate funding and maintaining documentation consistent with Sarbanes Oxley.
- **Strategy Expert Consulting - Fortune 100 Company, Los Angeles, California.** Ongoing third-party technical and strategic support to a Fortune 100 company for a major project involving former bulk storage and distribution facilities converted to open public space and residential uses. Site is undergoing remedial investigations and remedial alternatives evaluations under heavy regulatory and public scrutiny. Charged with providing opinions and recommendations as to the direction the current consultant and the regulatory agencies want to take the project and evaluating the conceptual site model and long term technical strategy. Active participant on technical team calls and ongoing direct communications with internal legal team.
- **Shipyard Decommissioning - Subsurface Assessment, Remedial Investigation, Demolition and Closure, Campbell Shipyard - Marco, Port of San Diego, California.** Lead geologist in the preparation of a comprehensive subsurface study of the former Campbell Shipyard property at the Port of San Diego, California. Over 200 borings were necessary to delineate the extent of impacted soils. Relevant environmental issues included a former coal works gasification plant immediately adjacent to the Site, a 2 to 4-foot thick lens of polynuclear aromatic hydrocarbon (PAH) laden sediment present throughout the Site below the water table, a former on-site diesel and kerosene tank farm, and numerous leaking fuel USTs. Responsibilities also included management of shipyard abandonment activities, such as abatement of asbestos and lead-based paint containing materials, demolition of on-site structures, crushing of asphalt and concrete into Class II base, and a comprehensive geophysical survey to locate all on-site utilities and buried structures. The work was performed under the regulatory oversight of the San Diego Regional Water Quality Control Board and the San Diego Unified Port District. Total cost of the work was approximately $1.3MM, implemented over a 15-month period.
- **Neutral Third-Party Oversight of Remediation Work, ITT Corporation and Home Depot, Glendale, California.** Provided third party oversight for a site undergoing major remediation of VOCs and chromium VI in soils and groundwater. The site was a former electronics manufacturing facility redeveloped as a major box retailer in Glendale, California. Services were provided on behalf of the former facility owners/operators and the current property owners, both of whom had differing interests and views on the remedial work being performed. Viewed all fieldwork and construction of remediation systems and attended quarterly meetings with consultants, attorneys, and clients to gauge progress, discuss ongoing work, and evaluate projected schedules for completion of remediation. Technical challenges to remediation included dewatering of 20-foot thick perched zone impacted with VOC contamination, despite a leaking slurry wall originally designed to prevent onsite migration from upgradient sources.
- **ISCO Demonstration Plan Using Permanganate, Wyle Laboratories, Riverside County, California.** Designed, managed, and implemented an ISCO Demonstration Plan using sodium permanganate injection at a former industrial manufacturing facility in Southern California. Main goals of the application were to demonstrate effective oxidation of trichloroethene (TCE) in alluvium and fractured granitic bedrock, evaluate potential mobilization of naturally occurring reduced metals, and evaluate the potential application of ISCO

at other areas of the Site, including off-site beneath residential homes. Twelve thousand gallons of 10% permanganate solution were delivered to the subsurface through 47 multi-depth permanent injection probes over a 22-day field event. TCE concentrations were reduced from a maximum of 30,000 microgram per liter (µg/L) to non-detect at the source area. Significantly, elevated hexavalent chromium [Cr(VI)] concentrations were observed in the area of injection and immediately downgradient. Following field observations, a Bench Scale Assessment (BSA) was conducted to evaluate potential significant sources of Cr(VI), evaluate the capacity of the aquifer to naturally attenuate Cr(VI), and provide data sufficient to estimate distance and time Cr(VI) would revert to its trivalent form. BSA and field data showed that principal source of Cr(VI) was from the raw product, with secondary contribution from chromium in the native rock, and deterioration of stainless steel well screens. Natural attenuation of Cr(VI) to background concentrations was estimated at 2 to 3 years post injection. Monitoring of the Demonstration Plan area for the 2+ years has proved those predictions accurate and a Remedial Action Plan (RAP) recommending full-scale on- and off-site treatment of TCE with permanganate was submitted to the California Department of Toxic Substances Control (DTSC). Total cost of the work was more than $1.0 million.

- **Remedial Excavation and ISCO Used to Facilitate Property Transfer, Sanmina, Inc., Irvine, California.** Managed and implemented an aggressive remedial strategy for a former electronics manufacturing facility in Southern California. The site had TCE concentrations in groundwater suggestive of dense non-aqueous phase liquid (DNAPL) and required expedited soil and groundwater remediation, in lieu of ongoing 2-PHASE™ and dual-phase extraction (DPE) efforts, to accommodate its divesture and redevelopment. Groundwater was generally encountered at 15 feet below ground surface (bgs) and contained TCE concentrations in the source area as high as 77,000 µg/L. The project was successfully completed by installing a 90-well dewatering system, excavating 13,000 cubic yards (cy) of soils, and removing 3,200 cy of TCE impacted soil along the axis of a residual TCE DNAPL mass; total depth of the excavation was 32 feet bgs. ISCO using sodium and potassium permanganate was used to remediate residual TCE-impacted soil and groundwater outside the area of excavation. Following implementation of the aggressive remedial strategy, TCE concentrations in groundwater were reduced by one to three orders of magnitude, suggesting the DNAPL had been removed and/or destroyed. The Orange County Health Care Agency (OCHCA) provided soils closure and the Santa Ana Regional Water Quality Control Board provided groundwater closure for the site 16 months after completion of remediation. The site was sold and redeveloped. Total cost of excavation and ISCO application was approximately $1.4 million.

- **Assessment, Remediation and Closure of Former Industrial Facility for Residential Re-development, Former Boeing Plant, Los Angeles, California.** Managed the assessment, remediation, and closure of a former asphalt batch plant and defense contractor facility on behalf of a residential developer. The work was performed simultaneously with planning and entitlement of the property, under the oversight of the County of Los Angeles Fire Department, Hazardous Materials Division. Unique challenges included the discovery of 15+ feet of buried asphalt debris and soils with elevated arsenic and chromium concentrations requiring off-site disposal. Developed site-specific cleanup thresholds for VOCs and heavy metals by preparing a limited human health risk assessment and incorporating Risk Based Screening Levels (RBSLs) developed by the San Francisco Regional Water Quality Control Board. The entire project was implemented in 15 months from initial assessment to site closure at a cost of $250,000.

- **Hydrocarbon Release Characterization and Remedial Investigation, Kinder Morgan Energy Partners, La Habra, California.** Designed, managed, and implemented a subsurface investigation with the primary focus of characterizing lateral and vertical distribution of hydrocarbon impacts to the groundwater and unsaturated zone. The release was related to a pipeline booster station flange rupture dating to the early 1980s. Fractured siltstone bedrock presented unique subsurface conditions and as a result, special consideration was given to drilling techniques and boring/well installations. The project involved 12 months of fieldwork for the installation of soil vapor probes, backhoe trenches, soil borings, and monitoring wells. Discovery of up to 15-feet of light non-aqueous phase liquids (LNAPL) resulted in amendments to the original work scope to provide for LNAPL removal and assessment of pneumatic and hydraulic properties of the soil/rock. A high vacuum DPE test was performed at selected wells to evaluate the feasibility of this technology for the removal of hydrocarbons. All work was conducted under the oversight of the Los Angeles Regional Water Quality Control Board in consideration of future residential development. Work was performed over a 2-year period at an approximate cost of $1.0 million.

- **Resource Conservation and Recovery Act (RCRA) Facility Investigation Work Plan for Bunker C Tank Farm Redevelopment, Long Beach, California.** Managed the preparation of a RCRA Facility Investigation Work Plan for a former power plant tank farm facility in Long Beach, California. The site was being planned for redevelopment with a retail box store and restaurant uses. The RFI Work Plan was prepared as part of a Corrective Action Consent Agreement between the

Client and the DTSC. The purpose of the RFI was to determine the nature and extent of releases at the site and to gather all the necessary data to support completion and implementation of a Corrective Measures Study (CMS).

- **Remedial Investigation of Former Transformer Washing Facility, General Electric and City of Los Angeles Redevelopment Agency, Los Angeles, California.** Prepared, managed, and implemented a Remedial Investigation Work Plan for a former transformer washing facility under the oversight of the DTSC. The field investigation was intended to evaluate and delineate the nature and extent of residual VOC, PCB, and dioxin impacts at the Site, to support decisions regarding the need for, and extent of, future removal or remedial actions. The field program showed that shallow soils at the site were significantly impacted with PCBs and deep soils and groundwater were significantly impacted with TCE and tetrachloroethene (PCE). ISCO Demonstration Plan Using Permanganate, Riverside County, California.
- **Remedial Investigation and Remedial Action Plan for Former Small Arms Firing Range, City of Huntington Beach Community Development Office, Huntington Beach, California.** Managed the preparation of a Remedial Investigation and RAP for the City of Huntington Beach in their effort to assess the extent of contamination and remedial options for a former public and police firing range. The project was performed under the oversight of the OCHCA. Relevant issues included soil berms and coal-tar treated wood posts impregnated with lead-shot, shallow landfill conditions (<5-feet), lack of a landfill cap, heavy hydrocarbon contamination, and landfill gas issues. The RAP included remedial options, costing, and an outline for implementation. Special consideration was given to the fact that the City intended to use the property for future Central Park recreational uses. The project was awarded on technical merit following a public bidding process that required the submittal of a formal proposal and interviews with City officials. Total cost of the project was $150,000, implemented over a 2-year period.

**PRESENTATIONS***

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# APPENDIX H

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# APPENDIX G1

## PRELIMINARY HYDROLOGY REPORT

# PRELIMINARY HYDROLOGY STUDY FOR ONTARIO RANCH

## CITY OF ONTARIO
## CALIFORNIA

***PREPARED FOR:***

**MICHAEL BAKER INTERNATIONAL**
5 HUTTON CENTRE DRIVE, SUITE 500
SANTA ANA, CA 92707

***PREPARED BY:***


JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552
FAX 951.304.3568


**MAY 12, 2025**

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

05/12/2025

| | | |
|---|---|---|
| Joseph L. Castaneda RCE 59835<br>Registered Civil Engineer | Date | Seal |

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## EXECUTIVE SUMMARY

This report has been prepared to support the conceptual design for the Ontario Ranch project, located in the City of Ontario. The project is located within the City of Ontario's Master Drainage Plan (MDP). The project proposes to construct four segments of the MDP storm drain facilities. These facilities are located in Walker Avenue, Grove Avenue, Bon View Avenue, and Campus Avenue between Eucalyptus Avenue and Edison Avenue. The purpose of this report is to provide documentation that the conceptual design for the project is in compliance with the Master Drainage Plan.

The project site is broken up into four main watersheds, each one tributary to a proposed mainline storm drain system. Each watershed area is documented in a separate section of this report. The following table documents the report sections and storm drain systems:

| Report Section | Storm Drain Facility Name | Street Location | City of Ontario Master Drainage Plan Facility Name |
|---|---|---|---|
| Section C | Walker Storm Drian System | Walker Avenue | WLKR-XII-1 |
| Section D | Grove Storm Drain System | Grove Avenue | GROV-XIII-1 |
| Section E | Bon View Storm Drain System | Bon View Avenue | BNVW-XIV-1 |
| Section F | Campus Storm Drain System | Campus Avenue | MERL-XIV-2 |

In order to demonstrate compliance, this report utilizes four compliance points for comparison, located at the downstream end of each proposed mainline storm drain system. The design flow rates from the Master Drainage Plan were compared to the proposed flow rates calculated within this report.

The findings of the analysis are that the Grove Storm Drain and Bon View Storm Drain have proposed flow rates lower than the MDP design flow rates. The Walker Storm Drain and Campus Storm Drain have flow rates less than 5% higher than the MDP design flow rates. This increase can be considered negligible and is within the acceptable hydrology error tolerance. Therefore, the conclusion is that project will be compliant with the Master Drainage Plan.

# SECTION A

# INTRODUCTION

## A.1 PURPOSE AND SCOPE

The purpose of this study is to perform a preliminary hydrology assessment of the conceptual design for the Ontario Ranch development. This report demonstrates that the project can be developed to mitigate increased runoff impacts and maintain consistency with the City of Ontario Master Drainage Plan (MDP) to the maximum extent practicable

The scope of the study includes the following:

1. Determine the design MDP flow rates for each mainline storm drain system.
2. Assess compliance requirements for each discharge point.
3. Analyze four distinct tributary areas based on ultimate discharge points.
4. Calculate required storage volumes and mitigated outflow rates.
5. Demonstrate regulatory compliance for each tributary area.
6. Preparation of a hydrology and hydraulics report, which consists of hydrological and analytical results and exhibits.

## A.2 PROJECT SITE AND DRAINAGE AREA OVERVIEW

Ontario Ranch is a proposed development in the City of Ontario, County of San Bernardino. The project site is bounded by Campus Avenue to the west, Walker Avenue to the east, Edison Avenue to the north, and Eucalyptus Avenue to the south. A Vicinity Map has been included as Figure 1. The overall project area is approximately 400 acres.

The project site is being developed with a residential development in the northern portion, commercial/industrial developments in the southern portion, and a park along the center which separates the residential and commercial/industrial areas. The following notes are provided about the land uses:

1. The MDP models Mixed Use land uses as Commercial, so a singular hatch representation has been used for both on the figures.
2. The residential areas are modeled as 11+ du/ac in the MDP, as apartments in the Fuscoe Report. The hydrology manuals calls this land use type as 10+ du/ac. All three labels have the same impervious fraction and runoff index values in the hydrology manual.

The City of Ontario Master Drainage Plan Land Use Map has been included in Excerpt D. A figure showing the MDP land uses and the project boundary has been included as Figure 2. A figure showing the proposed land use for Ontario Ranch has been included as Figure 3.

The existing condition within the project site boundary consists of dairy farms and undeveloped areas. The existing topography is relatively flat with a north-to-south sheet flow drainage pattern.

The project site is located within three City of Ontario Master Drainage Plan (MDP) areas: Area XII, Area XIII, and Area XIV. The MDP areas and project boundary are shown on Figure 4. The MDP area boundaries are shown on the MDP Hydrology Map and the MDP Planned Facilities Map, included as Excerpt B and Excerpt C.

The project proposes to construct portions of four MDP facilities: WLKR-XII-1 located in Walker Avenue, GROV-XIII-1 located in Grove Avenue, BNVW-XIV-1 located in Bon View Avenue, and MERL-XIV-2 located in Campus Avenue. This report is organized with four sections, one for each of the proposed MDP systems. The location of the proposed MDP facilities is shown on Figure 7. The MDP Planned Facilities Map is included as Excerpt C.

The City of Ontario Master Drainage Plan was completed by Hunsaker and Associates with updates in 2017 (Reference 2). The MDP was used to establish compliance information for the storm drain systems in Campus, Bon View, and Grove. Excerpts from the MDP are included in Excerpt B through Excerpt E.

In 2021, JLC Engineering prepared a report for the Merrill Commerce Center (MCC) which remodeled the MDP and assessed the Merrill Commerce Center Development (Reference 3). This report was approved in 2022. The MCC development is located to the south and east of the Ontario Ranch project site. The MCC report remodeled the MDP facilities, including the segment of the Walker storm drain located downstream of the Ontario Ranch project site. The MCC analysis of the MDP included revisions to the watershed boundaries. These revisions are shown on Figure 5. The MCC analysis of the MDP was used to establish compliance information for the storm drain system in Walker. Excerpts from the Merrill Commerce Center have been included in Expert F.

This report assumes that all downstream MDP mainline systems will be in place at the time Ontario Ranch begins constructions. The downstream systems are shown on Figure 7. The following table documents the downstream systems:

*Table A.1 Downstream Systems*

| Storm Drain System Name | Downstream System Name | Approval/Construction Status | Plans Location |
|---|---|---|---|
| Walker Storm Drian System | Line C per PM-20273 | Approved Constructed or In Construction | Excerpt H |
| Grove Storm Drain System | Line C per PM-20537 | Approved Constructed or In Construction | Excerpt I |
| Bon View Storm Drain System | Line D per PM-20161 | In Review or Approved | Excerpt J |
| Campus Storm Drain System | Line E per PM-20517 | In Review or Approved | Excerpt K |

The downstream systems for the Walker and Grove storm drains are approved and either constructed on in construction. The downstream systems for Bon View and Campus are currently either in review or approved, and it is expected that they will be in place at the time when Ontario Ranch is constructed.

## A.3 REGULATORY FRAMEWORK AND COMPLIANCE STRATEGY

In order to demonstrate compliance with the Master Drainage Plan, the proposed flow rate for each mainline storm drain system will be compared to the MDP design flow rate. The downstream end of each mainline system, at Eucalyptus Avenue, is being used as the compliance point for comparison. The compliance points are shown on Figure 8 and documented in the table below.

*Table A.1: Compliance Point Documentation*

| Storm Drain System Name | Street Location | City of Ontario Master Drainage Plan Facility Name | Compliance Source | Design Flow Rate ($ft^3/s$) |
|---|---|---|---|---|
| Walker Storm Drian System | Walker Avenue | WLKR-XII-1 | MDP-MCC* | 928 |
| Grove Storm Drain System | Grove Avenue | GROV-XIII-1 | MDP | 1050 |
| Bon View Storm Drain System | Bon View Avenue | BNVW-XIV-1 | MDP | 746 |
| Campus Storm Drain System | Campus Avenue | MERL-XIV-2 | MDP | 124 |

*MDP-MCC=Merrill Commerce Center analysis of the Master Drainage Plan

The flow rates noted in the table above were used to as the design flow rates for comparison with the proposed project outflow rates. This was done in order to demonstrate that the project is in compliance with the City of Ontario Master Drainage Plan.

The following method was used to establish mitigation criteria:

1. Establish the design flow rate per the Master Drainage Plan
2. Create a rational method model for the mainline system which includes all unmitigated tributary areas.
3. Create a rational method model and unit hydrograph model for the onsite area which will be mitigated. Perform a storage analysis to determine the mitigated flowrate leaving this area.
4. Calculate the sum the flow rates from Step 2 and Step 3 to calculate a proposed flow rate at the downstream end of proposed mainline system. This is a conservative

approach since it does not take into consideration any potential differences in timing between the two peak flow rates.

5. Evaluate how the proposed downstream flow rate compares to the design flow rate from the MDP.

# SECTION B

# METHODOLOGY

## B.1 HYDROLOGIC ANALYSIS METHOD

The analysis prepared for this report is broken into four separate analyses and sections based on the four mainline systems being assessed. A rational method analysis was prepared for each of the mainline systems which confluences the various areas tributary to the mainline system. The table below documents the different types of areas tributary to the mainline, listed approximately from north to south.

*Table B.1 Mainline System Tributary Areas*

| Area Description | Onsite or Offsite | Location in Mainline | Source for information |
|---|---|---|---|
| Area upstream of the project site | Offsite | Upstream end of the mainline, at Edison Avenue | City of Ontario MDP |
| Residential Area and Northern Portion of Park Area | Onsite | Northern portion | Fuscoe Engineering |
| Southern Portion of Park Area | Onsite | Middle portion | This report |
| Commercial Area, unmitigated | Onsite | Southern portion | This report |
| Commercial Area, mitigated | Onsite | Southern portion | This report |
| Street areas adjacent to project site | Offsite | Southern portion | This report |
| East/West MDP area (1) | Offsite | Southern portion | City of Ontario MDP |

(1) East/West MDP area is only applicable to the Walker and Campus storm drain systems.

The following method was used to create a rational method for each mainline system:

1. Define a flow rate and time of concentration at the upstream end of the mainline based on the City of Ontario Master Drainage Plan
2. Use a mix of pipe flow, confluences, and initial areas to add the following into the model throughout the system:
    a. Results from the rational method model for the onsite residential area. This will be a user defined entry.
    b. Create an initial area for the onsite park area
    c. Create an initial area for the unmitigated onsite commercial area.
    d. Create an initial area for the street areas adjacent to the project site, if not included in another area.

e. Values from the Master Drainage Plan for the area to the east/west of the mainline. This applies only to the Walker storm drain and Campus storm drain. This will be a user defined entry.

A rational method analysis and unit hydrograph analysis were prepared separately for the onsite commercial area which is being mitigated. A storage analysis was performed on these areas to determine the proposed mitigated outflow. The following process was used for the storage analysis:

1. Storage volumes for each basin were provided as part of the conceptual plan for the project site.
2. The unit hydrograph was assessed to determine the location and magnitude of the peak flow.
3. Two time steps were determined, one before the peak flow rate and one after the peak flow rate. The cumulative volume and flow rate at each time step were noted.
    a. The difference in cumulative volume between the two time steps was checked to ensure that the volume was less than or equal to the conceptual volumes for the basins.
    b. The higher of the two flow rates was used as the mitigated outflow rate.

A graphical representation of the above process has been included as Figure 10. A detailed basin routing analysis will be performed during final engineering when comprehensive data is available for the proposed design. This storage calculation does not take into account storage requirements needed for the storage and treatment of the water quality volume. The water quality treatment will be assessed by a future Water Quality Management Plan (WQMP). The storage analysis is based on a unit hydrograph calculation; therefore it is not possible to confluence the mitigated outflows into the mainline rational method analysis.

The onsite residential areas were assessed by Fuscoe Engineering. Excerpts from the Fuscoe Engineering analysis are included in Excerpt G. JLC recreated the models for the areas with the following notes:

1. All model data, including elevations, areas, flow lengths, land use, and soils were not changed.
2. Fuscoe Engineering models contained multiple streams that were not confluenced. JLC separated each stream into its own model.
3. The rainfall values were changed to match the rainfall values per the City of Ontario Master Drainage Plan. The Fuscoe Engineering models used rainfall from NOAA Atlas 14. This change was made to be in compliance with the Master Drainage Plan.

The onsite park and commercial areas were assessed using simple models consisting of initial areas, pipe flows, and add areas. The project does not have conceptual grading at this time or an onsite storm drain design, so the following assumptions were made:

1. The longest flow path was assumed.
2. Elevations were based on a slope of 1%. This is to ensure surfaces drain appropriately.
3. A single inlet was assumed for each area. The hydrology does not account for all potential inlets or storm drain laterals.

## B.2 HYDROLOGIC PARAMETERS

The San Bernardino County Hydrology Manual (Reference 1) and the MDP Hydrology (Reference 2) were used to develop the hydrological parameters for the hydrology analyses. The rational method and unit hydrograph method were used for the analyses and the computations were performed using the computer program developed by Civil Cadd/Civil Design.

Rainfall depths were obtained from the City of Ontario Master Drainage Plan analysis. The rainfall depths used in the hydrology calculations are as follows:

*Table B.2 Rainfall Information*

| Storm Event & Duration | Rainfall (inches) |
|---|---|
| 10-Year, 1-Hour | 0.8 |
| 100-Year, 1-Hour | 1.2 |
| Slope of Intensity | 0.6 |

The existing soil classification for the project site consists of Hydraulic Soil Groups “A”, “B”, and “C”, as shown in Excerpt A. Excerpt A is a Soils Map obtained from the National Resource Conservation Service Websoil Survey.

The hydrology calculations were performed for the 100-year storm event. And Antecedent Moisture Condition of II was used for the calculations to remain consistent with the City of Ontario Master Drainage Plan analysis.

A land cover type of “Commercial” was used for the commercial and street areas. A land cover type of “Park” was used for the proposed park area. The following table documents the land uses parameters:

*Table B.3 Land Use Information*

| Land Use | Runoff Index (for AMC II) | | | | Impervious Ratio | Pervious Ratio |
|---|---|---|---|---|---|---|
| | Soil A | Soil B | Soil C | Soil D | | |
| Commercial | 32 | 56 | 69 | 75 | 0.9 | 0.1 |
| Park | 32 | 56 | 69 | 75 | 0.15 | 0.85 |

# SECTION C

# WALKER AVENUE STORM DRAIN

## C.1 DRAINAGE AREA CHARACTERISTICS

The project proposes to construct the portion of the MDP system WLKR-XII-1 located on Walker Avenue between Eucalyptus Avenue and Edison Avenue. Within this report, the system is referred to as the Walker Ave Storm Drain or Walker Storm Drain system.

The tributary area to the Walker storm drain consists of the areas to the east and west of Walker Avenue and is bounded by Edison Avenue to the north and Eucalyptus Avenue to the south.

The onsite areas tributary to the Walker storm drain differs from the Master Drainage Plan areas within the project site. All changes to watershed boundary areas are located within the project site area. The project proposes mitigation measures and documentation to demonstrate that the project is consistent with the MDP at the downstream compliance points. Figure 6 shows the revised watershed boundaries. The following table documents the difference

*Table C.1 Walker Storm Drain Tributary Area*

| Land Cover | Area Increase or Decrease (acres) |
|---|---|
| Residential/Park (Fuscoe Report) | Increase 19.9 (from Grove) |
| Commercial | Increase 1.6 (from Grove)<br>Decrease 4.6 (to Grove) |

Overall, there is an increase of 16.9 acres of area that's being redirected to the Walker storm drain. The approved Merrill Commerce Center analysis of the MDP included area changes within the MCC project site, as shown on Figure 5. However, during final engineering for the Grove storm drain, this boundary was revised and 21.2 acres was diverted from the Walker watershed to the Grove watershed. This change was allowable since the area is tributary to a proposed basin which provides increased runoff mitigation. The mainline system in Walker per MCC, which is downstream of the proposed Walker storm drain per this report, is designed based on a flow rate that assumes this 21.2 acres of area in tributary.

The Walker storm drain discharges into the approved MDP system located in Eucalyptus Avenue. The downstream system is shown on Figure 7. The downstream storm drain is constructed or in construction based on approved storm drain improvement plans. The downstream storm drain is referred to as Line C per PM-20273. The storm drain improvement plans for the downstream system are included as Excerpt H.

## C.2 REGULATORY AND COMPLIANCE REQUIREMENTS

The compliance requirements for the Walker storm drain are based on Merrill Commerce Center analysis of the Master Drainage Plan (MCC-MDP). The walker storm drain discharges into a mainline system that was assessed and constructed as part of the Merrill Commerce Center. Based on the MCC-MDP analysis, the design flow rate for the Walker Storm drain at the intersection of Walker and Eucalyptus is 928 $ft^3/s$.

In order to assess compliance with the Master Drainage Plan, a rational method analysis was performed for the areas tributary to the mainline which are not being mitigated. A separate rational method analysis and unit hydrograph analysis were prepared for the onsite area which is being mitigated. A storage assessment was performed to determine storage requirements and the proposed mitigated outflow value.

## C.3 HYDROLOGIC ANALYSIS

A rational method analysis was prepared for the mainline system and the areas tributary to the mainline which are not being mitigated. This analysis includes the offsite MDP area to the east of Walker Avenue. The offsite area matches the watershed sub-boundary per the Master Drainage Plan, so area, flow rate, and time of concentration information from the MDP was entered using a user entry command into the model. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table C.2 Mainline Rational Method Results*

| Area | Peak Flow Rate ($ft^3/s$) | Time of Concentration (min) |
|---|---|---|
| Area D (excludes Area D2) | 940.8 | 31.7 |

*Results have been rounded to the nearest tenth

A rational method analysis was prepared for the onsite commercial area which will be mitigated before discharging into the mainline system. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table C.3 Onsite Rational Method Results*

| Area | Peak Flow Rate ($ft^3/s$) | Time of Concentration (min) |
|---|---|---|
| Area D2 | 53.0 | 10.4 |

*Results have been rounded to the nearest tenth

A unit hydrograph analysis was prepared for the onsite commercial area which will be mitigated. The area, runoff index value, impervious area ratio, and time of concentration from the rational method analysis were used for the unit hydrograph calculations. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table C.4 Onsite Unit Hydrograph Results*

| Area | Peak Flow Rate ($ft^3/s$) | Total Volume (ac-ft) |
|---|---|---|
| Area D2 | 48.6 | 7.8 |

*Results have been rounded to the nearest tenth

The hydrology map for the Walker Avenue storm drain is included as Exhibit A. The rerun Fuscoe engineering models, mainline rational method model, onsite commercial area rational method and unit hydrograph models are included in Appendix A.

## C.4 STORAGE AND COMPLIANCE ANALYSIS

The proposed basin has a storage capacity of approximately 2.5 ac-ft. Using this value, the unit hydrograph output data was assessed to determine how much runoff could be mitigated by the basin. Two time steps were picked, one on either side of the peak flow rate, which have a difference in volume approximately equal to the proposed basin volume. The following table documents the two time steps:

*Table C.5 Unit Hydrograph Values for Storage Analysis*

| Time (hour+min) | Volume (ac-ft) | Flow Rate ($ft^3/s$) | Peak Flow Rate ($ft^3/s$) | Volume Required (ac-ft) |
|---|---|---|---|---|
| **T1** | **V1** | **Q1** | 6.5 | 2.43 |
| 14+45 | 3.61 | 6.47 | | |
| **T2** | **V2** | **Q2** | | |
| 17+00 | 6.04 | 6.28 | | |

A more detailed basin analysis will be performed during final engineering. The above analysis does not take into account storage requirements for the water quality volume which will be addressed as part of a future WQMP.

In order to demonstrate compliance with the Master Drainage Plan, the proposed condition flow rate was compared to the MDP flow rate at the compliance point. The proposed downstream flow rate was calculated based on the sum of the mainline rational method analysis (excluding the onsite area to be mitigated) and the outflow from the mitigated onsite

area. This is a conservative approach as it does not account for potential timing differences between the peak flow rates. The proposed condition flow rate is 947.3 $ft^3/s$ (940.8+6.5).

The MDP design flow rate at the point of compliance is 928 $ft^3/s$ per the Merrill Commerce Center analysis of the Master Drainage Plan. The proposed condition flow rate of 947.3 $ft^3/s$ is 19.3 $ft^3/s$ higher than the design flow rate. This is approximately 2% of the design flow rate and can be considered negligible. Furthermore, this is within the acceptable range for hydrology error tolerances. The Regional Water Quality Board allows for 10% error on hydromodification criteria. The project site is mitigating the onsite area to the maximum extent practicable. During final engineering additional calculations will be performed to ensure no adverse impacts.

An exhibit was developed to document flow rates tributary to and along the mainline storm drain system. The Walker Avenue storm drain flow rate exhibit is included as Exhibit B. The proposed outflow values are shown on Figure 9.

## C.5 FINDINGS & RECOMMENDATIONS

The hydrology analysis evaluated the tributary area to the proposed Walker Avenue Storm Drain. The following findings and recommendations have been developed based on the findings of the analysis:

1. During development of the Merrill Commerce Center, the MCC project made modifications to the Master Drainage Plan hydrology. These revisions have been approved. Due to this, the MCC report was used for compliance comparison for the Walker storm drain.
2. The compliance point being used is located at the downstream end of the proposed Walker storm drain, at the intersection of Walker Avenue and Eucalyptus Avenue.
3. The Merrill Commerce Center analysis of the Master Drainage Plan found a flow rate of 928 $ft^3/s$ at the compliance point.
4. The proposed outflow rate from the project site is 947.3 $ft^3/s$ at the compliance point.
5. The project is mitigating outflow to the maximum extent practicable.
6. The proposed outflow is approximately 2% higher than the MDP design flow rate. This value can be considered negligible and within acceptable error tolerance.
7. During final engineering, additional calculations will be performed to ensure no adverse impacts from the increase in flow rate.

# SECTION D

# GROVE AVENUE STORM DRAIN

## D.1 DRAINAGE AREA CHARACTERISTICS

The project proposes to construct the portion of the MDP system GROV-XII-1 located on Grove Avenue between Eucalyptus Avenue and Edison Avenue. Within this report, the system is referred to as the Grove Ave Storm Drain or Grove Storm Drain system.

The tributary area to the grove storm drain consists of the areas to the east and west of Grove Avenue and is bounded by Edison Avenue to the north and Eucalyptus Avenue to the south.

The onsite areas tributary to the Grove storm drain differs from the Master Drainage Plan areas within the project site. All changes to watershed boundary areas are located within the project site area. The project proposes mitigation measures and documentation to demonstrate that the project is consistent with the MDP at the downstream compliance points. Figure 6 shows the revised watershed boundaries. The following table documents the difference

*Table D.1 Grove Storm Drain Tributary Area*

| Land Cover | Area Increase or Decrease (acres) |
|---|---|
| Residential and Park (Fuscoe Report) | Decrease 19.9 (to Walker) |
| Commercial | Decrease 1.6 (to Walker)<br>Increase 4.6 (from Walker)<br>Increase 4.8 (from Bon View) |

Overall this is a 12.1 acre decrease in the tributary area to the Grove Storm Drain.

The Grove storm drain discharges into the approved MDP system located in Grove Avenue. The downstream system is shown on Figure 7. The downstream storm drain is constructed or in construction based on approved storm drain improvement plans. The downstream storm drain is referred to as Line C per PM-20537. The storm drain improvement plans for the downstream system are included as Excerpt I.

## D.2 REGULATORY AND COMPLIANCE REQUIREMENTS

The compliance requirements for the Grove storm drain are based on the City of Ontario Master Drainage Plan. The Grove storm drain discharges into a mainline system that was assessed and constructed based on the MDP design. Based on the MDP analysis, the design flow rate for the Grove storm drain at the intersection of Grove and Eucalyptus is 1050 $ft^3/s$.

In order to assess compliance with the Master Drainage Plan, a rational method analysis was performed for the areas tributary to the mainline which are not being mitigated. A separate

rational method analysis and unit hydrograph analysis were prepared for the onsite area which is being mitigated. A storage assessment was performed to determine storage requirements and the proposed mitigated outflow value.

## D.3 HYDROLOGIC ANALYSIS

A rational method analysis was prepared for the mainline system and the areas tributary to the mainline which are not being mitigated. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table D.2 Mainline Rational Method Results*

| Area | Peak Flow Rate ($ft^3/s$) | Time of Concentration (min) |
|---|---|---|
| Area E (excludes Area E3 and Area E4) | 1001.9 | 33.5 |

*Results have been rounded to the nearest tenth

A rational method analysis was prepared for the onsite commercial area which will be mitigated before discharging into the mainline system. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table D.3 Onsite Rational Method Results*

| Area | Peak Flow Rate ($ft^3/s$) | Time of Concentration (min) |
|---|---|---|
| Area E3 | 67.5 | 10.3 |
| Area E4 | 77.0 | 10.6 |

*Results have been rounded to the nearest tenth

A unit hydrograph analysis was prepared for the onsite mitigated commercial area. The area, runoff index value, impervious area ratio, and time of concentration from the rational method analysis were used for the unit hydrograph calculations. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table D.4 Onsite Unit Hydrograph Results*

| Area | Peak Flow Rate ($ft^3/s$) | Total Volume (ac-ft) |
|---|---|---|
| Area E3 | 63.6 | 10.0 |
| Area E4 | 69.7 | 11.2 |

*Results have been rounded to the nearest tenth

The hydrology map for the Grove Avenue storm drain is included as Exhibit C. The rerun Fuscoe engineering models, mainline rational method model, onsite commercial area rational method and unit hydrograph models are included in Appendix B.

## D.4 STORAGE AND COMPLIANCE ANALYSIS

The project proposes two basins, one on the eastern side of Grove Avenue and one on the western side of Grove Avenue. Both basins have a proposed storage capacity of approximately 2.5 ac-ft. Rational method Area E3 is tributary to the eastern basin. Rational method Area E4 is tributary to the western basin. Using the proposed volumes, the unit hydrograph output data was assessed to determine how much runoff could be mitigated by each basin. Two time steps were picked, one on either side of the peak flow rate, which have a difference in volume approximately equal to the proposed basin volume. The following tables documents the two time steps:

*Table D.5 Unit Hydrograph Values for Storage Analysis – Eastern Basin (Area E3)*

| Time (hour+min) | Volume (ac-ft) | Flow Rate ($ft^3/s$) | Peak Flow Rate ($ft^3/s$) | Volume Required (ac-ft) |
|---|---|---|---|---|
| **T1** | **V1** | **Q1** | 10.8 | 2.42 |
| 15+20 | 5.12 | 10.72 | | |
| **T2** | **V2** | **Q2** | | |
| 16+40 | 7.54 | 10.58 | | |

*Table D.6 Unit Hydrograph Values for Storage Analysis – Western Basin (Area E4)*

| Time (hour+min) | Volume (ac-ft) | Flow Rate ($ft^3/s$) | Peak Flow Rate ($ft^3/s$) | Volume Required (ac-ft) |
|---|---|---|---|---|
| **T1** | **V1** | **Q1** | 12.9 | 2.28 |
| 15+40 | 6.03 | 12.22 | | |
| **T2** | **V2** | **Q2** | | |
| 16+35 | 8.31 | 12.83 | | |

A more detailed basin analysis will be performed during final engineering. The above analysis does not take into account storage requirements for the water quality volume which will be addressed as part of a future WQMP.

In order to demonstrate compliance with the Master Drainage Plan, the proposed condition flow rate was compared to the MDP flow rate at the compliance point. The proposed downstream flow rate was calculated based on the sum of the mainline rational method

analysis (excluding the onsite area to be mitigated) and the outflow from the mitigated onsite areas. This is a conservative approach as it does not account for potential timing differences between the peak flow rates. The proposed condition flow rate is 1025.6 $ft^3/s$ (1001.9+10.8+12.9).

The design flow rate at the point of compliance is 1050 $ft^3/s$ per the City of Ontario Master Drainage Plan. The proposed condition flow rate is less than the design flow rate. Therefore, the project is in compliance with the Master Drainage Plan

An exhibit was developed to document flow rates tributary to and along the mainline storm drain system. The Grove Avenue storm drain flow rate exhibit is included as Exhibit D. The proposed outflow values are shown on Figure 9.

## D.5 FINDINGS & RECOMMENDATIONS

The hydrology analysis evaluated the tributary area to the proposed Grove Avenue Storm Drain. The following findings and recommendations have been developed based on the findings of the analysis:

1. The City of Ontario Master Drainage Plan was used to determine compliance information.
2. The compliance point being used is located at the downstream end of the proposed Grove storm drain, at the intersection of Grove Avenue and Eucalyptus Avenue.
3. The City of Ontario Master Drainage Plan defines a design flow rate of 1050 $ft^3/s$ at the compliance point.
4. The proposed outflow rate from the project site is 1025.6 $ft^3/s$ at the compliance point.
5. The proposed outflow is less than the design flow rate at the compliance point.
6. The project is in compliance with the Master Drainage Plan.

# SECTION E

# BON VIEW AVENUE STORM DRAIN

## E.1 DRAINAGE AREA CHARACTERISTICS

The project proposes to construct the portion of the MDP system BNVW-XIV-1 located on Bon View Avenue between Eucalyptus Avenue and Edison Avenue. Within this report, the system is referred to as the Bon View Ave Storm Drain or Bon View Storm Drain system.

The tributary area to the Bon View storm drain consists of the areas to the east and west of Bon View Avenue and is bounded by Edison Avenue to the north and Eucalyptus Avenue to the south.

The onsite areas tributary to the Bon View storm drain differs from the Master Drainage Plan areas within the project site. All changes to watershed boundary areas are located within the project site area. The project proposes mitigation measures and documentation to demonstrate that the project is consistent with the MDP at the downstream compliance points. Figure 6 shows the revised watershed boundaries. The following table documents the difference

*Table E.1 Bon View Storm Drain Tributary Area*

| Land Cover | Area Increase or Decrease (acres) |
|---|---|
| Commercial | Decrease 4.8 acres (to Bon View) |

Overall, this is a decrease in the area tributary to the Bon View storm drain.

The Bon View storm drain discharges into the proposed MDP system located in Bon View Avenue. The downstream system is shown on Figure 7. The downstream storm drain is referred to as Line D per PM-20161. The storm drain improvement plans for the downstream system are included as Excerpt J. The storm drain plans are in review or approved. It is assumed that the downstream system will be constructed and in place prior to the construction of the Ontario Ranch project.

## E.2 REGULATORY AND COMPLIANCE REQUIREMENTS

The compliance requirements for the Bon View storm drain are based on the City of Ontario Master Drainage Plan. The Bon View storm drain discharges into a mainline system that was assessed and constructed based on the MDP design. Based on the MDP analysis, the design flow rate for the Bon View storm drain at the intersection of Bon View and Eucalyptus is 746 $ft^3/s$.

In order to assess compliance with the Master Drainage Plan, a rational method analysis was performed for the areas tributary to the mainline which are not being mitigated. A separate rational method analysis and unit hydrograph analysis were prepared for the onsite area which is being mitigated. A storage assessment was performed to determine storage requirements and the proposed mitigated outflow value.

## E.3 HYDROLOGIC ANALYSIS

A rational method analysis was prepared for the mainline system and the areas tributary to the mainline which are not being mitigated. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table E.2 Mainline Rational Method Results*

| Area | Peak Flow Rate ($ft^3/s$) | Time of Concentration (min) |
|---|---|---|
| Area F (excludes Area F2 and Area F3) | 719.6 | 29.0 |

*Results have been rounded to the nearest tenth

A rational method analysis was prepared for the onsite commercial area which will be mitigated before discharging into the mainline system. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table E.3 Onsite Rational Method Results*

| Area | Peak Flow Rate ($ft^3/s$) | Time of Concentration (min) |
|---|---|---|
| Area F2 | 68.3 | 10.6 |
| Area F3 | 30.0 | 9.0 |

*Results have been rounded to the nearest tenth

A unit hydrograph analysis was prepared for the onsite commercial area which will be mitigated. The area, runoff index value, impervious area ratio, and time of concentration from the rational method analysis were used for the unit hydrograph calculations. The analysis was performed for the 100-year storm event.

The results of the analysis are as follows:

*Table E.4 Onsite Unit Hydrograph Results*

| Area | Peak Flow Rate ($ft^3/s$) | Total Volume (ac-ft) |
|---|---|---|
| Area F2 | 60.2 | 9.7 |
| Area F3 | 29.3 | 4.2 |

*Results have been rounded to the nearest tenth

The hydrology map for the Bon View Avenue storm drain is included as Exhibit E. The rerun Fuscoe engineering models, mainline rational method model, onsite commercial area rational method and unit hydrograph models are included in Appendix C.

## E.4 STORAGE AND COMPLIANCE ANALYSIS

The project proposes two basins, one on the eastern side of Bon View Avenue and one on the western side of Bon View Avenue. The eastern basin has a proposed storage capacity of 4.1 ac-ft and the western basin has a proposed storage capacity of 2.5 ac-ft. Rational method Area F2 is tributary to the eastern basin. Rational method Area F3 is tributary to the western basin. Using these values, the unit hydrograph output data was assessed to determine how much runoff could be mitigated by each basin. Two time steps were picked, one on either side of the peak flow rate, which have a difference in volume approximately equal to the proposed basin volume. The following tables document the two time steps:

*TableE.5 Unit Hydrograph Values for Storage Analysis – Eastern Basin (Area F2)*

| Time (hour+min) | Volume (ac-ft) | Flow Rate ($ft^3/s$) | Peak Flow Rate ($ft^3/s$) | Volume Required (ac-ft) |
|---|---|---|---|---|
| **T1** | **V1** | **Q1** | 6.0 | 4.04 |
| 13+30 | 3.78 | 5.94 | | |
| **T2** | **V2** | **Q2** | | |
| 17+35 | 7.82 | 5.93 | | |

*Table E.6 Unit Hydrograph Values for Storage Analysis – Western Basin (Area F3)*

| Time (hour+min) | Volume (ac-ft) | Flow Rate ($ft^3/s$) | Peak Flow Rate ($ft^3/s$) | Volume Required (ac-ft) |
|---|---|---|---|---|
| **T1** | **V1** | **Q1** | 2.0 | 2.22 |
| 11+50 | 1.33 | 2.00 | | |
| **T2** | **V2** | **Q2** | | |
| 18+25 | 3.54 | 1.98 | | |

A more detailed basin analysis will be performed during final engineering. The above analysis does not take into account storage requirements for the water quality volume which will be addressed as part of a future WQMP.

In order to demonstrate compliance with the Master Drainage Plan, the proposed condition flow rate was compared to the MDP flow rate at the compliance point. The proposed downstream flow rate was calculated based on the sum of the mainline rational method analysis (excluding the onsite area to be mitigated) and the outflow from the mitigated onsite areas. This is a conservative approach as it does not account for potential timing differences between the peak flow rates. The proposed condition flow rate is 727.6 $ft^3/s$ (719.6+6.0+2.0).

The design flow rate at the point of compliance is 746.0 $ft^3/s$ per the City of Ontario Master Drainage Plan. The proposed condition flow rate is less than the design flow rate. Therefore, the project is in compliance with the Master Drainage Plan

An exhibit was developed to document flow rates tributary to and along the mainline storm drain system. The Bon View Avenue storm drain flow rate exhibit is included as Exhibit F. The proposed outflow values are shown on Figure 9.

## E.5 FINDINGS & RECOMMENDATIONS

The hydrology analysis evaluated the tributary area to the proposed Bon View Avenue Storm Drain. The following findings and recommendations have been developed based on the findings of the analysis:

1. The City of Ontario Master Drainage Plan was used to determine compliance information.
2. The compliance point being used is located at the downstream end of the proposed Bon View storm drain, at the intersection of Bon View Avenue and Eucalyptus Avenue.
3. The City of Ontario Master Drainage Plan defines a design flow rate of 746 $ft^3/s$ at the compliance point.
4. The proposed outflow rate from the project site is 727.6 $ft^3/s$ at the compliance point.
5. The proposed outflow is less than the design flow rate at the compliance point.
6. The project is in compliance with the Master Drainage Plan.

# SECTION F

# CAMPUS AVENUE STORM DRAIN

## F.1 DRAINAGE AREA CHARACTERISTICS

The project proposes to construct the portion of the MDP system MERL-XIV-2 located on Campus Avenue between Eucalyptus Avenue and Edison Avenue. Within this report, the system is referred to as the Campus Ave Storm Drain or Campus Storm Drain system.

The tributary area to the Campus storm drain consists of the areas to the east and west of Campus Avenue and is bounded by Edison Avenue to the north and Eucalyptus Avenue to the south.

The onsite areas tributary to the Campus storm drain do not differ from the Master Drainage Plan areas within the project site. This is shown on Figure 6.

The Campus storm drain discharges into the proposed MDP system located in Campus Avenue. The downstream system is shown on Figure 7. The downstream storm drain is referred to as Line E per PM-20517. The storm drain improvement plans for the downstream system are included as Excerpt K. The storm drain plans are in review or approved. It is assumed that the downstream system will be constructed and in place prior to the construction of the Ontario Ranch project.

## F.2 REGULATORY AND COMPLIANCE REQUIREMENTS

The compliance requirements for the Campus storm drain are based on the City of Ontario Master Drainage Plan. The Campus storm drain discharges into a mainline system that was assessed and constructed based on the MDP design. Based on the MDP analysis, the design flow rate for the Campus storm drain at the intersection of Campus and Eucalyptus is 124 $ft^3/s$.

In order to assess compliance with the Master Drainage Plan, a rational method analysis was performed for the areas tributary to the mainline which are not being mitigated. A separate rational method analysis and unit hydrograph analysis were prepared for the onsite area which is being mitigated. A storage assessment was performed to determine storage requirements and the proposed mitigated outflow value.

## F.3 HYDROLOGIC ANALYSIS

A rational method analysis was prepared for the mainline system and the areas tributary to the mainline which are not being mitigated. The tributary area includes offsite area to the west of Campus Avenue. The watershed boundary for this area does not match the boundary from the MDP, since the MDP area includes the onsite area. Initial areas were used to model

the offsite area. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table F.1 Mainline Rational Method Results*

| Area | Peak Flow Rate ($ft^3/s$) | Time of Concentration (min) |
|---|---|---|
| Area G (excludes Area G2) | 128.0 | 16.0 |

*Results have been rounded to the nearest tenth

A rational method analysis was prepared for the onsite commercial area which will be mitigated before discharging into the mainline system. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table F.2 Onsite Rational Method Results*

| Area | Peak Flow Rate ($ft^3/s$) | Time of Concentration (min) |
|---|---|---|
| Area G2 | 31.2 | 8.3 |

*Results have been rounded to the nearest tenth

A unit hydrograph analysis was prepared for the onsite commercial area which will be mitigated. The area, runoff index value, impervious area ratio, and time of concentration from the rational method analysis were used for the unit hydrograph calculations. The analysis was performed for the 100-year storm event. The results of the analysis are as follows:

*Table F.3 Onsite Unit Hydrograph Results*

| Area | Peak Flow Rate ($ft^3/s$) | Total Volume (ac-ft) |
|---|---|---|
| Area G2 | 30.8 | 4.2 |

*Results have been rounded to the nearest tenth

The hydrology map for the Campus Avenue storm drain is included as Exhibit G. The rerun Fuscoe engineering models, mainline rational method model, onsite commercial area rational method and unit hydrograph models are included in Appendix D.

## F.4 STORAGE AND COMPLIANCE ANALYSIS

The proposed basin has a storage capacity of approximately 3.5 ac-ft. Using this value, the unit hydrograph output data was assessed to determine how much runoff could be mitigated

by the basin. Two time steps were picked, one on either side of the peak flow rate, which have a difference in volume approximately equal to the proposed basin volume. The following table documents the two time steps:

*Table F.4 Unit Hydrograph Values for Storage Analysis*

| Time (hour+min) | Volume (ac-ft) | Flow Rate ($ft^3/s$) | Peak Flow Rate ($ft^3/s$) | Volume Required (ac-ft) |
|---|---|---|---|---|
| **T1** | **V1** | **Q1** | 1.5 | 2.98 |
| 8+20 | 0.84 | 1.5 | | |
| **T2** | **V2** | **Q2** | | |
| 20+10 | 3.82 | 1.49 | | |

A more detailed basin analysis will be performed during final engineering. The above analysis does not take into account storage requirements for the water quality volume which will be addressed as part of a future WQMP.

In order to demonstrate compliance with the Master Drainage Plan, the proposed condition flow rate was compared to the MDP flow rate at the compliance point. The proposed downstream flow rate was calculated based on the sum of the mainline rational method analysis (excluding the onsite area to be mitigated) and the outflow from the mitigated onsite area. This is a conservative approach as it does not account for potential timing differences between the peak flow rates. The proposed condition flow rate is 129.5 $ft^3/s$ (128.0+1.5).

The MDP design flow rate at the point of compliance is 124 $ft^3/s$ per the City of Ontario Master Drainage Plan. The proposed condition flow rate of 129.5 $ft^3/s$ is 5.5 $ft^3/s$ higher than the design flow rate. This is approximately 4% of the design flow rate and can be considered negligible. Furthermore, this is within the acceptable range for hydrology error tolerances. The Regional Water Quality Board allows for 10% error on hydromodification criteria The project site is mitigating the onsite area to the maximum extent practicable. During final engineering, an analysis of the downstream systems will be performed to ensure no adverse impacts.

An exhibit was developed to document flow rates tributary to and along the mainline storm drain system. The Campus Avenue storm drain flow rate exhibit is included as Exhibit H. The proposed outflow values are shown on Figure 9.

## F.5 FINDINGS & RECOMMENDATIONS

The hydrology analysis evaluated the tributary area to the proposed Campus Avenue Storm Drain. The following findings and recommendations have been developed based on the findings of the analysis:

1. The City of Ontario Master Drainage Plan was used to determine compliance information.
2. The compliance point being used is located at the downstream end of the proposed Campus storm drain, at the intersection of Campus Avenue and Eucalyptus Avenue.
3. The City of Ontario Master Drainage Plan defines a design flow rate of 124 $ft^3/s$ at the compliance point.
4. The proposed outflow rate from the project site is 129.5 $ft^3/s$ at the compliance point.
5. The project is mitigating outflow to the maximum extent practicable.
6. The proposed outflow is less than the design flow rate at the compliance point.
7. The project is in compliance with the Master Drainage Plan.
8. The proposed outflow is approximately 4% higher than the MDP design flow rate. This value can be considered negligible and within acceptable error tolerance.
9. During final engineering, additional calculations will be performed to ensure no adverse impacts from the increase in flow rate.

# SECTION G

# CONCLUSION AND REFERRENCES

## G.1 CONCLUSION AND SUMMARY

The hydrology report evaluated the tributary areas to the four proposed mainline systems that will be constructed as part of the Ontario Ranch project. The following summarizes the report:

1. Ontario Ranch is a proposed development which consists of Residential, Park, and Commercial areas. The project proposes to construct portions of four City of Ontario Master Drainage Plan systems, which are located within the project site.
2. The purpose of this report is to demonstrate that the conceptual design for the mainline systems and watersheds within the project site is consistent with the City of Ontario Master Drainage Plan.
3. In order to demonstrate compliance with the Master Drainage Plan, a proposed downstream flow rate for the project site was compared to the design flow rates from the Master Drainage Plan. The comparison point is located at the downstream end of each proposed storm drain.
4. The storm drain systems in Grove Avenue, Bon View Avenue, and Campus Avenue were compared to the design flow rate from the City of Ontario Master Drainage Plan.
5. The storm drain system in Walker Avenue was compared to the design flow rate from the Merrill Commerce Center analysis of the Master Drainage Plan. This approved report remodeled a port of the MDP, including the section located downstream of the Walker storm drain.
6. Each mainline has tributary areas consisting of unmitigated onsite residential area, unmitigated onsite park area, unmitigated onsite commercial area, and mitigated onsite park area. The Walker and Campus storm drain systems have additional tributary area from the offsite area across the street from the project site.
7. The residential area and northern potion of the park area were assessed by Fuscoe Engineering. These models were rerun as a part of this report with a revision to the rainfall information to match the rainfall used in the Master Drainage Plan.
8. Proposed onsite basins will mitigate increased runoff from a portion of the commercial area. The analysis in this report does not take into consideration storage requirements for water quality.
9. One rational method analysis was prepared for the systems tributary to the mainline storm drain, excluding the onsite area which was being mitigated. A separate rational method analysis and unit hydrograph analysis were prepared for the onsite area which is being mitigated. A storage analysis was prepared for each basin to determine the mitigated outflow rate.
10. The sum of the mainline rational method and mitigated basin outflow rate was used as the proposed downstream flow rate at the compliance point. This is a conservative approach as it does not take into account any timing differences between the two flow rates.

The MDP design flow rates and the project proposed outflow rates are shown on Figure 9. The following table documents the compliance for the project:

*Table G.1 Compliance Summary Table*

| Storm Drain System Name | Master Drainage Plan Facility Name | Compliance Source | MDP/ MDP-MCC Design Flow Rate ($ft^3/s$) | Proposed Flow Rate ($ft^3/s$) |
|---|---|---|---|---|
| Walker Storm Drian System | WLKR-XII-1 | MDP-MCC* | 928 | 947.3 |
| Grove Storm Drain System | GROV-XIII-1 | MDP | 1050 | 1025.6 |
| Bon View Storm Drain System | BNVW-XIV-1 | MDP | 746 | 727.6 |
| Campus Storm Drain System | MERL-XIV-2 | MDP | 124 | 129.5 |

*MDP-MCC=Merrill Commerce Center analysis of the Master Drainage Plan

The Walker Avenue storm drain has a proposed flow rate that is 2% higher than the MDP-MCC flow rate. This can be considered negligible and within acceptable error tolerance; therefore, the proposed flow rate can be considered within reasonable compliance.

The Grove Avenue Storm Drain has a proposed flow rate that is lower than the design flow rate. Therefore, the system is in compliance with the City of Ontario Master Drainage Plan.

The Bon View Avenue Storm Drain has a proposed flow rate that is lower than the design flow rate. Therefore, the system is in compliance with the City of Ontario Master Drainage Plan.

The Campus Avenue Storm Drain has a proposed flow rate that is 4% higher than the design flow rate. This can be considered negligible and within acceptable error tolerance; therefore, the proposed flow rate can be considered within reasonable compliance.

In conclusion, this report demonstrates that the conceptual design for the Ontario Ranch project is in compliance with the City of Ontario Master Drainage Plan.

## G.2 REFERENCES

1. San Bernardino Flood Control Hydrology Manual, August 1986.
2. Master Plan of Drainage, City of Ontario, June 2017
3. Merrill Avenue Commerce Center Hydrology and Hydraulics Study for Merrill Avenue Storm Drian System (WLKR-XII-1 and MERL-XI-1) PM-20273, JLC Engineering, February 2021, revised December 2021

# FIGURES

## FIGURE 1: VICINITY MAP

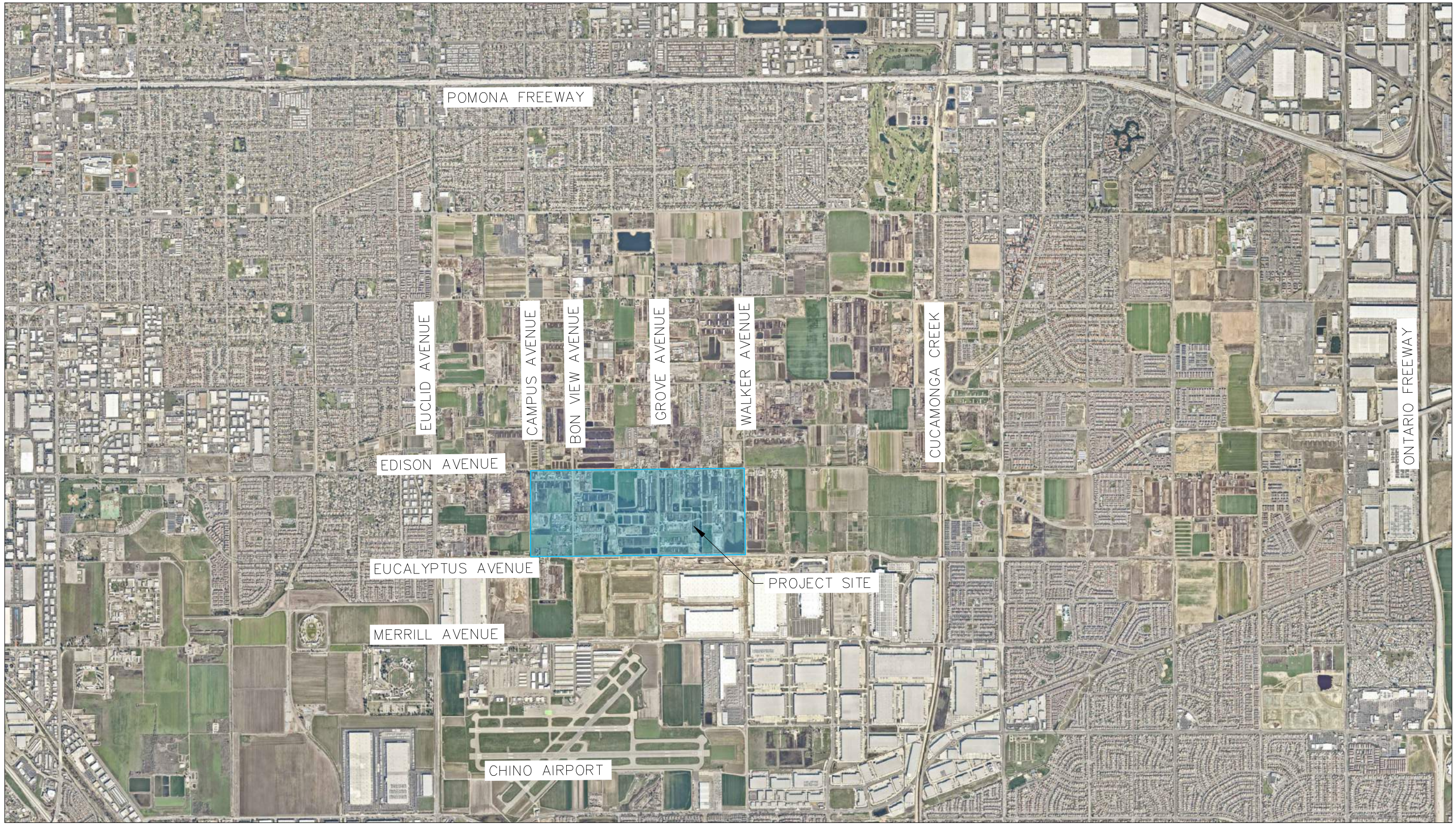


# FIGURE 1 - VICINITY MAP

GRAPHIC SCALE

3000' 0 1500' 3000' 6000'

1" = 3000'

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Drawing Name: O:\108.43.25\Engineering\Hydrology_Plan\Exhibits\Figure_1-Vicinity_Map.dwg
Last Opened: May 10, 2025 - 12:29pm by jacob

## FIGURE 2: MDP LAND USE MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# ONTARIO MDP LAND USE MAP

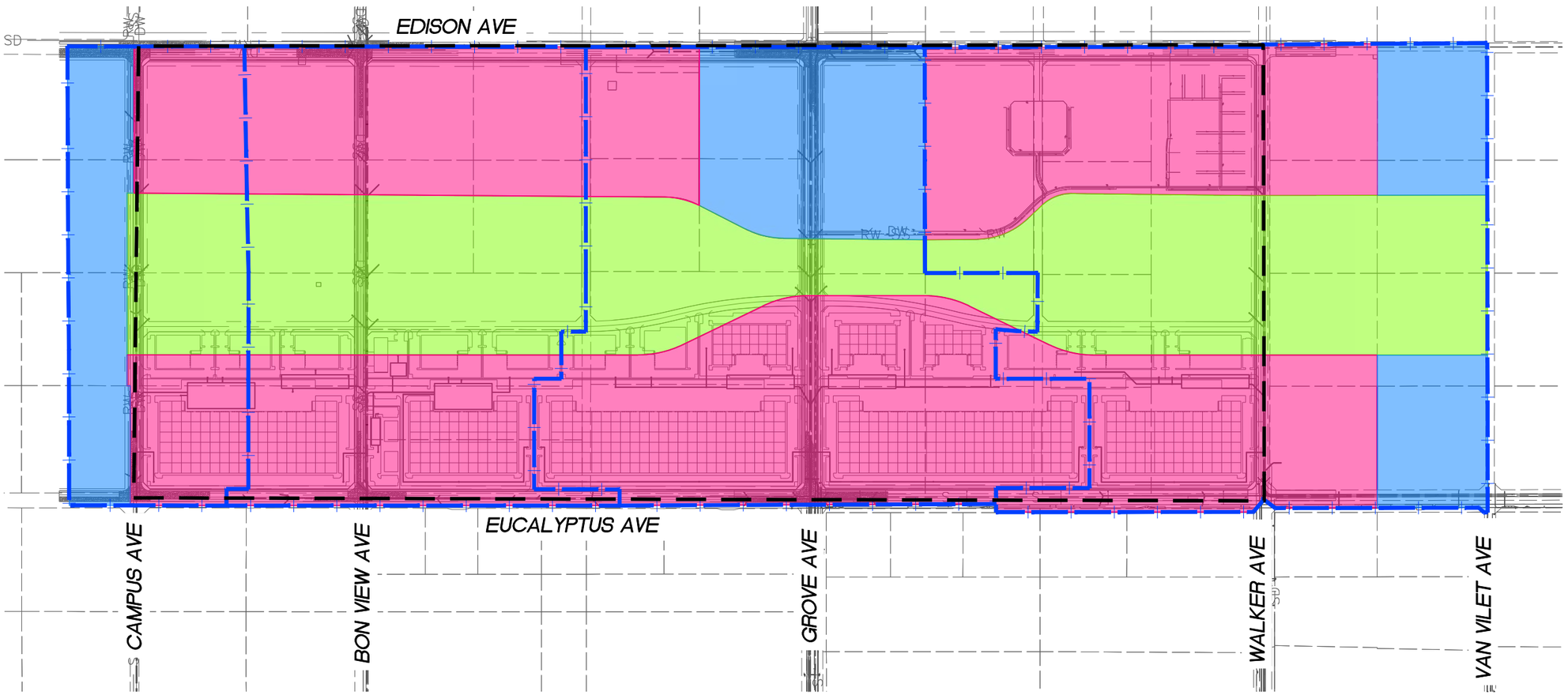


LEGEND:

- PROJECT BOUNDARY
- WATERSHED BOUNDARY
- RESIDENTIAL 10+/11+ DU/AC (80% IMPERVIOUS)
- PARK (15% IMPERVIOUS)
- COMMERCIAL/MIXED-USE (90% IMPERVIOUS)

DESIGN NOTES:

1. COMMERCIAL & MIXED USE LAND USES COMBINED SINCE MDP ANALYSIS USES COMMERCIAL DESIGNATION IN MODEL.
2. RESIDENTIAL MODELED AS 11+ DU/AC IN MDP, APARTMENTS IN FUSCOE REPORT. HYDROLOGY MANUAL CALLS THIS 10+ DU/AC. ALL HAVE SAME IMPERVIOUS FRACTION AND RUNOFF INDEX IN HYDROLOGY MANUAL

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FIGURE 2

ONTARIO RANCH

ONTARIO MDP LAND USE MAP

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Last Opened: May 10, 2025 - 2:08pm by jacob

## FIGURE 3: PROPOSED LAND USE MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# SITE SPECIFIC LAND USE MAP

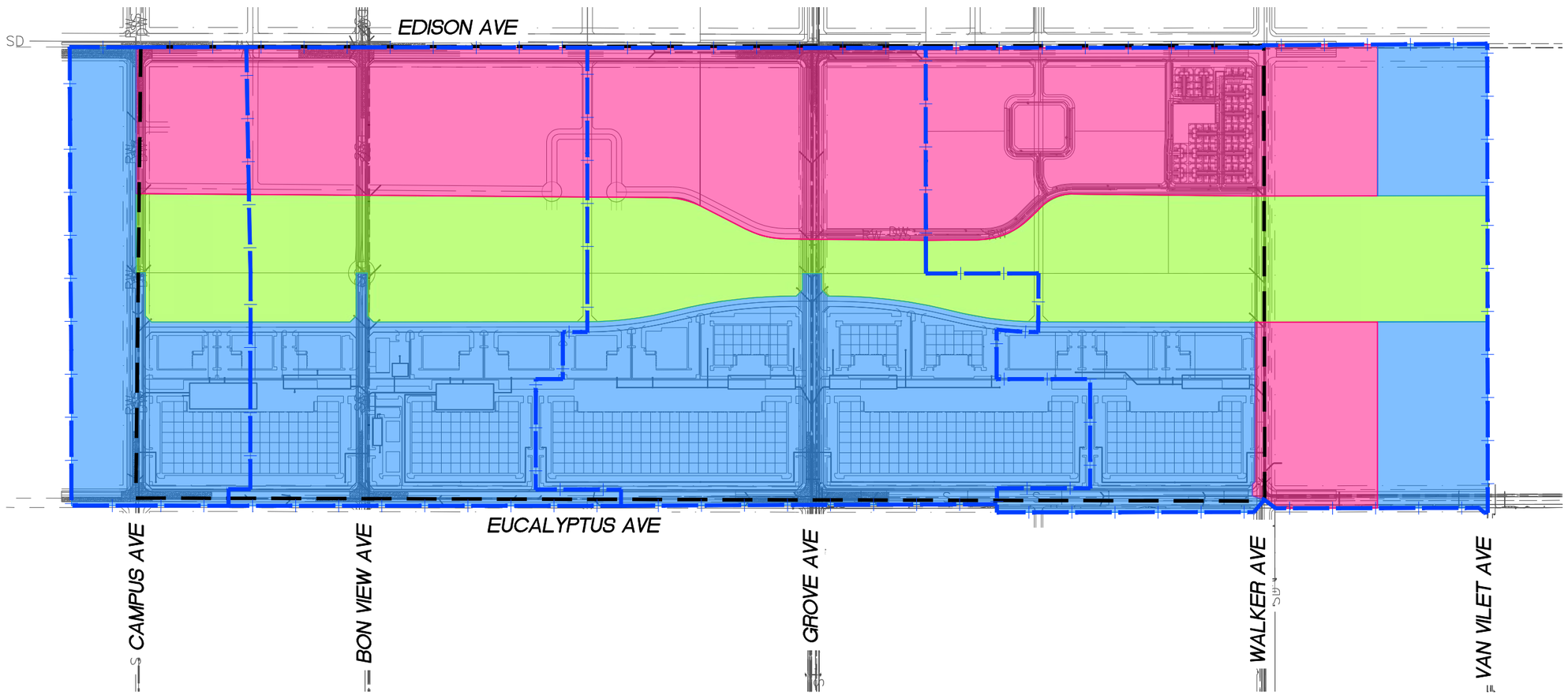


LEGEND:

- PROJECT BOUNDARY
- WATERSHED BOUNDARY
- RESIDENTIAL 10+/11+ DU/AC (80% IMPERVIOUS)
- PARK (15% IMPERVIOUS)
- COMMERCIAL/MIXED-USE (90% IMPERVIOUS)

DESIGN NOTES:

1. COMMERCIAL & MIXED USE LAND USES COMBINED SINCE MDP ANALYSIS USES COMMERCIAL DESIGNATION IN MODEL.
2. RESIDENTIAL MODELED AS 11+ DU/AC IN MDP, APARTMENTS IN FUSCOE REPORT. HYDROLOGY MANUAL CALLS THIS 10+ DU/AC. ALL HAVE SAME IMPERVIOUS FRACTION AND RUNOFF INDEX IN HYDROLOGY MANUAL

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FIGURE 3

ONTARIO RANCH

SITE SPECIFIC LAND USE MAP

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Last Opened: May 12, 2025 - 1:44pm by eperez

## FIGURE 4: MDP WATERSHED LOCATIONS MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# MDP WATERSHED LOCATIONS

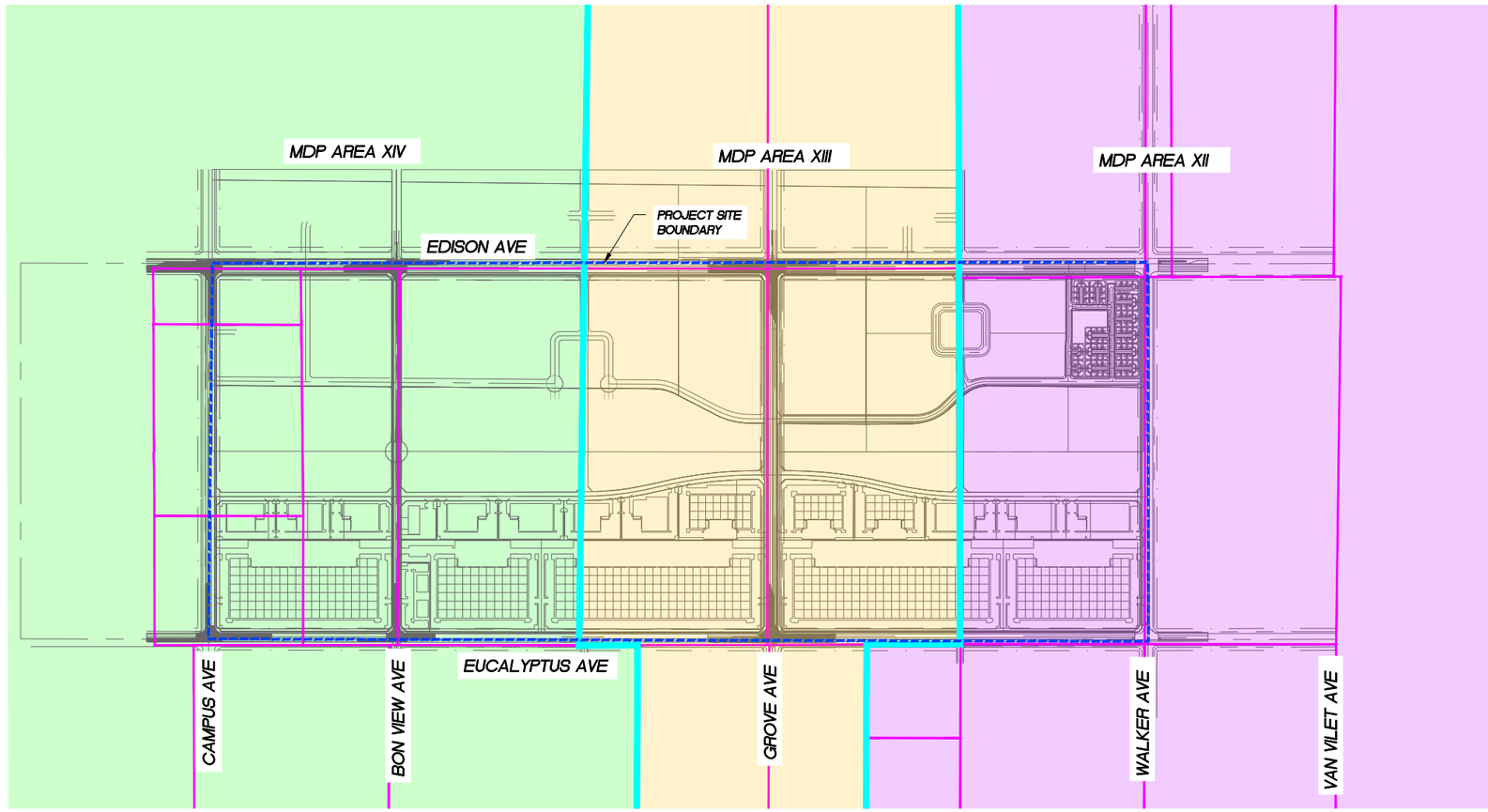


SCALE 1"=1000'

LEGEND:

- PROJECT SITE
- CITY OF ONTARIO MDP MAJOR WATERSHED BOUNDARY
- CITY OF ONTARIO MDP MINOR WATERSHED BOUNDARY
- MDP AREA XII
- MDP AREA XIII
- MDP AREA XIV

NOTES:

1. THE MDP WATERSHED LOCATIONS ARE SHOWN AS IS BASED ON THE CITY OF ONTARIO MDP.

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FIGURE 4

ONTARIO RANCH

MDP LOCATION MAP

## FIGURE 5: ADJUSTED MDP WATERSHED LOCATIONS MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# ADJUSTED MDP WATERSHED LOCATIONS

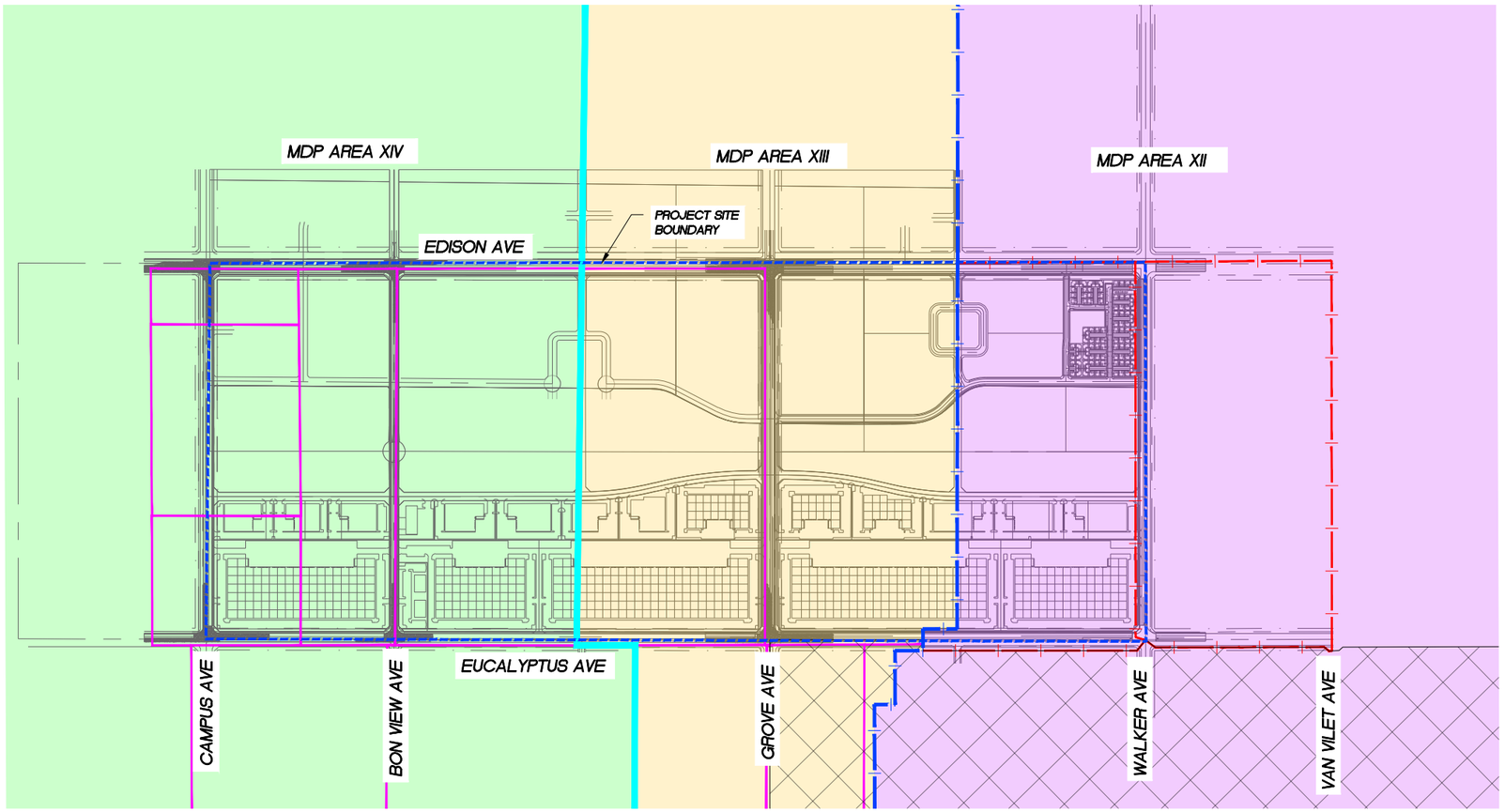


NOTES:

1. THE MDP WATERSHED LOCATIONS ARE SHOWN AS IS BASED ON THE CITY OF ONTARIO MDP WITH ADJUSTMENT TO AREA XII.
   1.1. AREA XII HAS ADJUSTMENTS BASED ON THE REVISED MDP AREAS DOCUMENTED IN THE APPROVED MCC H&H REPORT IN SUPPORT OF THE MERRILL AVENUE STORM DRAIN SYSTEM. SPECIFICALLY, THIS REPORT SUPPORTS THE BUILT (OR OTHERWISE IN-CONSTRUCTION) REACHES OF WLKR-XII-1. WLKR-XII-1 HAS APPROVED PLANS (PM-20273) UP TO WALKER AVE / EUCALYPTUS AVE INTERSECTION.

SCALE 1"=1000'

LEGEND:

- PROJECT SITE
- CITY OF ONTARIO MDP MAJOR WATERSHED BOUNDARY
- CITY OF ONTARIO MDP MINOR WATERSHED BOUNDARY
- REVISED MCC MDP MAJOR WATERSHED BOUNDARY AREA XII
- REVISED MCC MDP MINOR WATERSHED BOUNDARY AREA XII
- MDP AREA XII
- MDP AREA XIII
- MDP AREA XIV
- MCC PROJECT SITE

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FIGURE 5

ONTARIO RANCH

ADJUSTED MDP LOCATION MAP

## FIGURE 6: PROJECT ADJUSTED MDP WATERSHED LOCATIONS

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# ADJUSTED MDP WATERSHED LOCATIONS

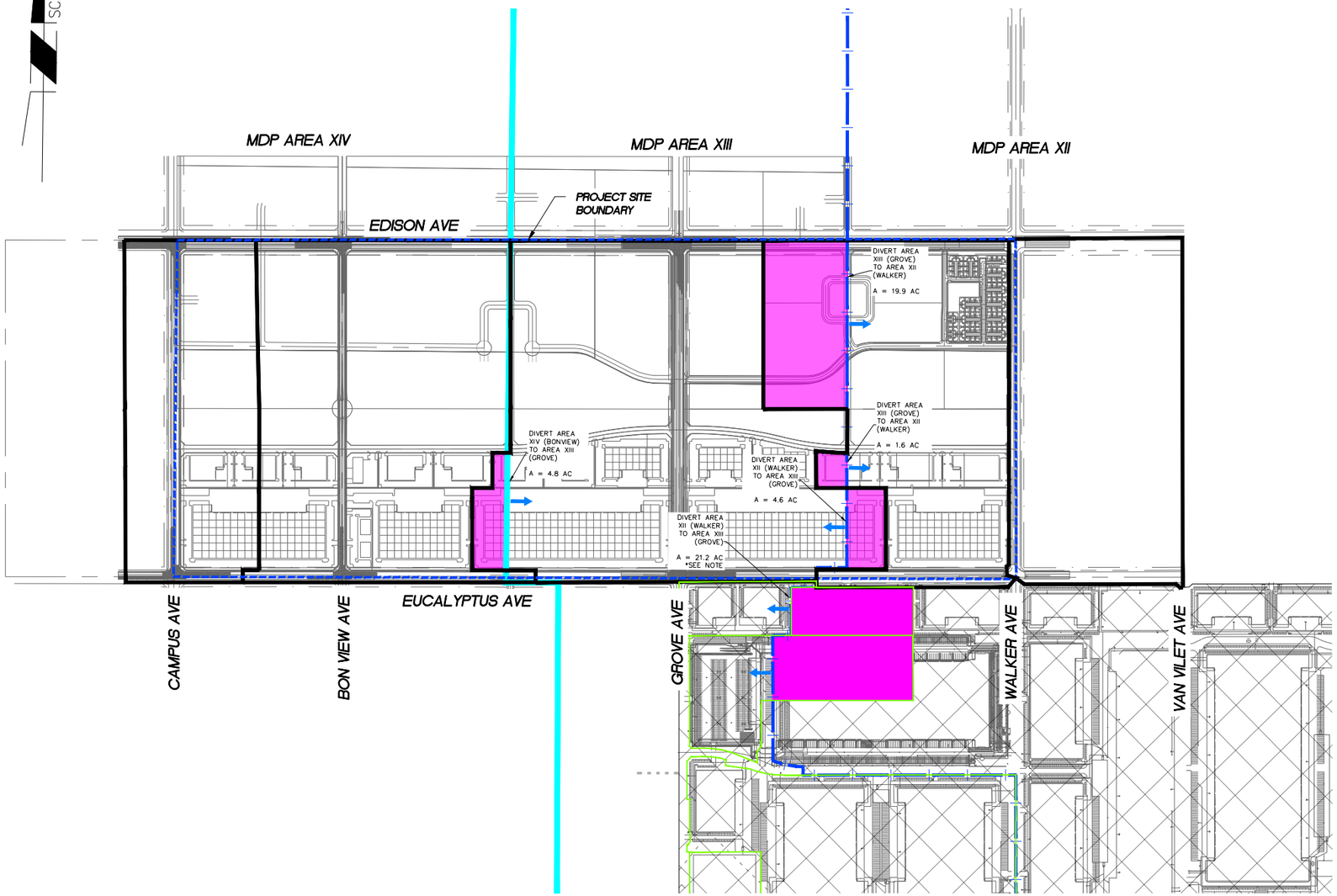


LEGEND:

- PROJECT SITE
- CITY OF ONTARIO MDP MAJOR WATERSHED BOUNDARY
- REVISED MCC MDP MAJOR WATERSHED BOUNDARY AREA XII
- ONTARIO RANCH POST-PROJECT WATERSHED BOUNDARY
- MCC/GROVE BASIN WATERSHED BOUNDARY
- MCC PROJECT SITE
- DIVERTED MDP AREA
- MDP AREA DIVERSION DIRECTION

NOTES:

1. THE MDP WATERSHED LOCATIONS ARE SHOWN AS IS BASED ON THE CITY OF ONTARIO MDP WITH ADJUSTMENT TO AREA XII.
   1.1. AREA XII HAS ADJUSTMENTS BASED ON THE REVISED MDP AREAS DOCUMENTED IN THE APPROVED MCC H&H REPORT IN SUPPORT OF THE MERRILL AVENUE STORM DRAIN SYSTEM. SPECIFICALLY, THIS REPORT SUPPORTS THE BUILT (OR OTHERWISE IN-CONSTRUCTION) REACHES OF WLKR-XII-1. WLKR-XII-1 HAS APPROVED PLANS (PM-20273) UP TO WALKER AVE / EUCALYPTUS AVE INTERSECTION.
2. OVERALL WATERSHED BOUNDARY ONTARIO RANCH SHOWN. DIVIDED BASED ON MDP MAINLINE THEY ARE TRIBUTARY TO.
3. APPROVED & CONSTRUCTED MCC SITE ONSITE HYDROLOGY BOUNDARY SHOWN. DEMONSTRATES THAT IN PRELIMINARY STAGES REVISED MDP BOUNDARY FOR MCC ALLOCATED PORTION OF SITE TO DRAIN TO AREA XII. HOWEVER, IN FINAL ENGINEERING PART OF THIS WAS SENT TO AREA XIII INSTEAD AND WAS ALLOWABLE SINCE PASSED THROUGH THE GROVE BASIN.
4. THERE IS NET DIVERSION FROM WALKER TO GROVE OF ~4.3 ACRES. THERE IS A NET DIVERSION FROM BON VIEW TO GROVE OF ~ 4.8 ACRES. GROVE RECEIVES ADDITIONAL AREA OF ~9.1 ACRES.


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FIGURE 6

ONTARIO RANCH

ADJUSTED MDP LOCATION MAP

## FIGURE 7: MDP STORM DRAIN SYSTEM MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# MDP STORM DRAIN SYSTEMS MAP

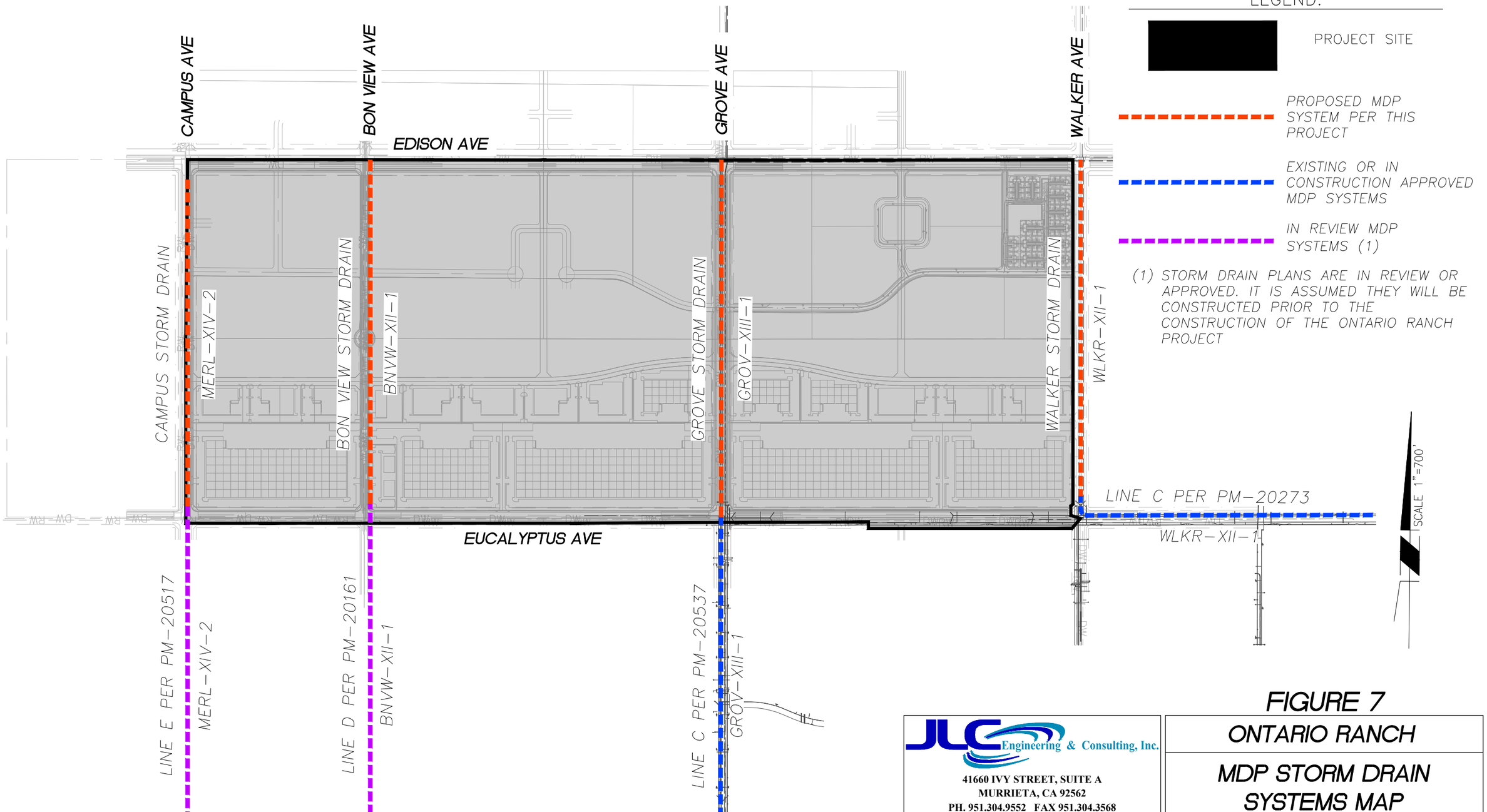


## FIGURE 7

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ONTARIO RANCH

MDP STORM DRAIN SYSTEMS MAP

Drawing Name: O:\108.43.25\Engineering\Hydrology_Plan\Exhibits\Figure_7_MDP_System_Map.dwg
Last Opened: May 10, 2025 – 1:06pm by Sophie

## FIGURE 8: MDP STORM DRAIN AND COMPLIANCE POINT MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# MDP STORM DRAIN AND COMPLIANCE POINT MAP

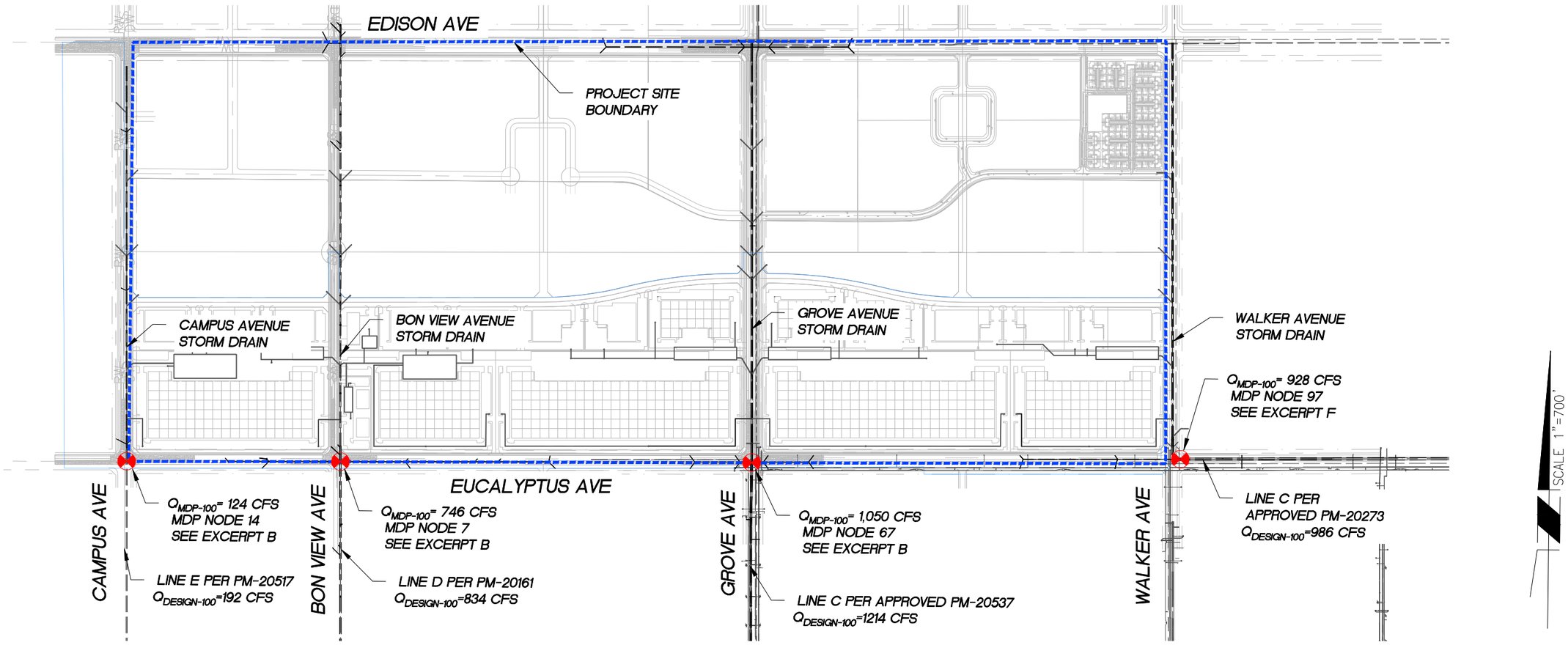


LEGEND:

PROJECT SITE

COMPLIANCE POINT

NOTES:

1. EACH COMPLIANCE POINT IS AT THE UPSTREAM END OF AN APPROVED SD PLAN OR SD PLAN IN ACTIVE REVIEW W/ CITY OF ONTARIO.
2. $Q_{DESIGN-100}$ INDICATES THE DESIGN FLOW RATE DEFINED AT UPSTREAM END OF SD TO ESTABLISH HGL FOR SYSTEM. DESIGN FLOW RATE FOR EACH SYSTEM VALID TO EUCALYPTUS INTERSECTION.
3. $Q_{MDP-100}$ INDICATES THE MDP FLOW RATE DEFINED AT COMPLIANCE POINT WHICH COINCIDES WITH NODE FROM MDP
4. NOTE THAT MAINLINES HAVE A DESIGN FLOW RATE HIGHER THAN $Q_{100}$ DEFINED BY MDP AT THE SAME POINT. THIS IS DUE TO MAINLINE SYSTEMS BEING MODELED WITH DOWNSTREAM

FIGURE 8

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ONTARIO RANCH

MDP SD AND COMPLIANCE POINT MAP

## FIGURE 9: PROPOSED OUTFLOW MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# PROPOSED OUTFLOW MAP

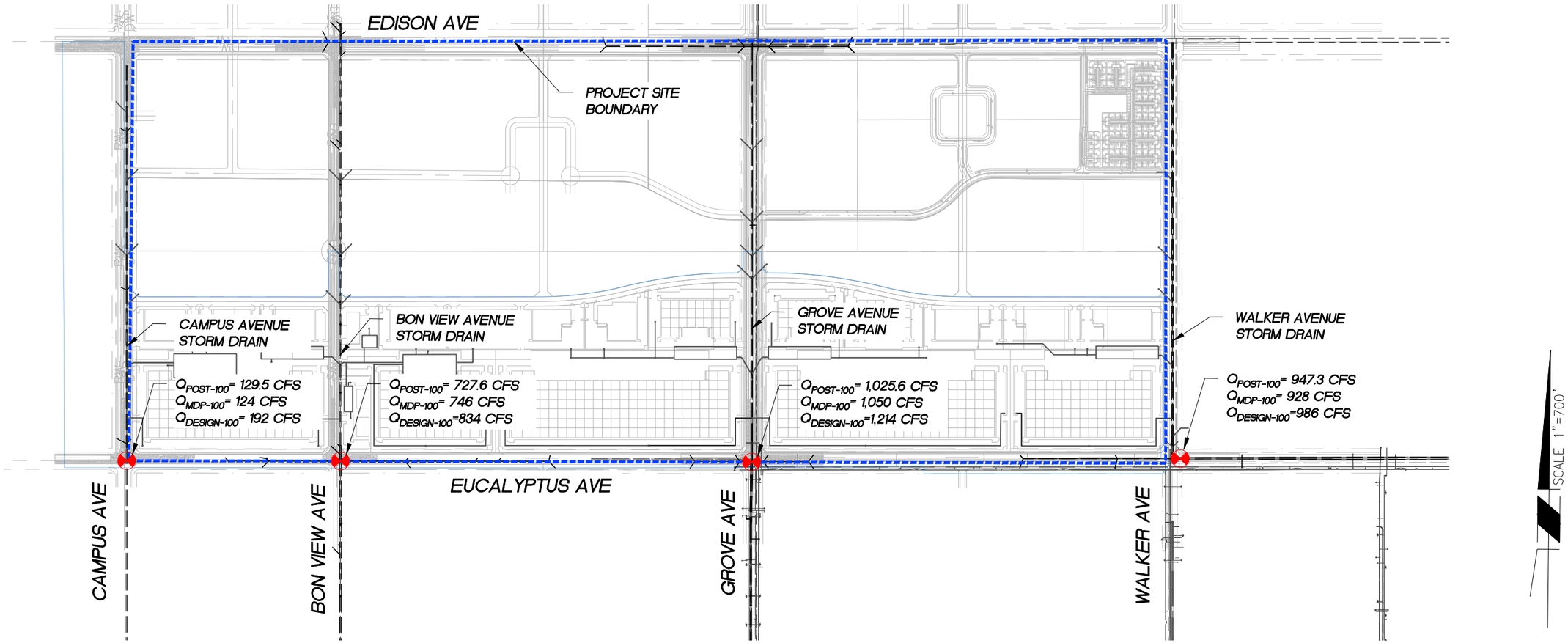


NOTES:

1. EACH COMPLIANCE POINT IS AT THE UPSTREAM END OF AN APPROVED SD PLAN OR SD PLAN IN ACTIVE REVIEW W/ CITY OF ONTARIO.
2. $Q_{DESIGN-100}$ INDICATES THE DESIGN FLOW RATE DEFINED AT UPSTREAM END OF SD TO ESTABLISH HGL FOR SYSTEM. DESIGN FLOW RATE FOR EACH SYSTEM VALID TO EUCALYPTUS INTERSECTION.
3. $Q_{MDP-100}$ INDICATES THE MDP FLOW RATE DEFINED AT COMPLIANCE POINT WHICH COINCIDES WITH NODE FROM MDP
4. $Q_{POST-100}$ INDICATES THE PROPOSED MITIGATED OUTFLOW FOR ONTARIO RANCH TO EACH MAINLINE SD.
5. NOTE THAT MAINLINES HAVE A DESIGN FLOW RATE HIGHER THAN $Q_{100}$ DEFINED BY MDP AT THE SAME POINT. THIS IS DUE TO MAINLINE SYSTEMS BEING MODELED WITH DOWNSTREAM MDP FLOWRATE DUE TO UNCERTAIN LOCATION OF FUTURE MAINLINE CONFLUENCE POINTS.

LEGEND:

PROJECT SITE

COMPLIANCE POINT

FIGURE 9

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ONTARIO RANCH

PROPOSED OUTFLOW MAP

**FIGURE 10: CONCEPTUAL GRAPHIC FOR STORAGE MITIGATION**

# FIGURE 10 - CONCEPTUAL ROUTING OF POST-PROJECT UNIT HYDROGRAPH

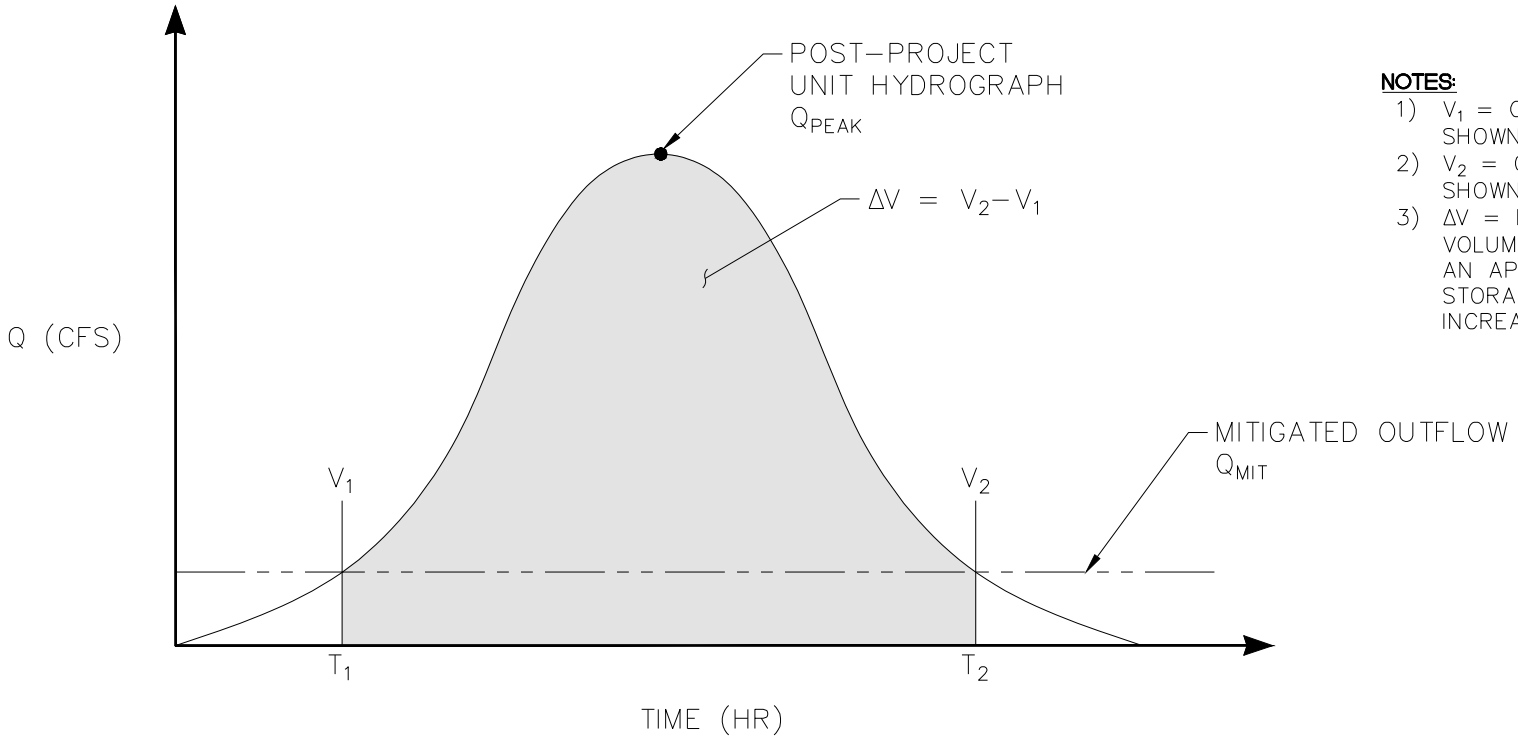


**NOTES:**

1) $V_1$ = CUMULATIVE VOLUME AT $T_1$ AS SHOWN ON CIVILD OUTPUT
2) $V_2$ = CUMULATIVE VOLUME AT $T_2$ AS SHOWN ON CIVILD OUTPUT
3) $\Delta V$ = DIFFERENCE IN CUMULATIVE VOLUME BETWEEN $T_1$ AND $T_2$ AND IS AN APPROXIMATION OF THE REQUIRED STORAGE VOLUME TO MITIGATE INCREASED RUNOFF

***ONSITE COMMERCIAL MITIGATED OUTFLOW - STORAGE ANALYSIS***

| MAINLINE SD | AREA NAME | $T_1$ (HR+MIN) | $T_2$ (HR+MIN) | $V_1$ (AC-FT) | $V_2$ (AC-FT) | $\Delta V$ (AC-FT) | $Q_{MIT}$ (CFS) |
|---|---|---|---|---|---|---|---|
| WALKER | D2 | 8+20 | 8+20 | 0.15 | 2.36 | 2.21 | 6.5 |
| GROVE | E4 | 15+40 | 16+40 | 6.03 | 8.31 | 2.28 | 12.9 |
| GROVE | E3 | 15+20 | 16+40 | 5.12 | 7.54 | 2.42 | 10.8 |
| BON VIEW | F3 | 11+50 | 18+25 | 1.33 | 3.54 | 2.22 | 2.0 |
| BON VIEW | F2 | 13+30 | 17+35 | 3.78 | 7.82 | 4.04 | 6.0 |
| CAMPUS | G2 | 8+20 | 20+10 | 0.84 | 3.82 | 2.98 | 1.5 |


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Last Opened: May 10, 2025 - 9:07pm by jacob

# APPENDICES

# APPENDIX A: WALKER AVE STORM DRAIN HYDROLOGY CALCULATIONS

# APPENDIX A.1: RATIONAL METHOD ANALYSIS, RERUN FUSCOE MODELS TO WALKER

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/05/25

---

PORTION OF MPD DA XII - UPSTREAM
PROPOSED DEV DA C
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

---

Program License Serial Number 6279

---

********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.196(In/Hr)
Initial subarea data:
Initial area flow distance = 974.000(Ft.)
Top (of initial area) elevation = 700.000(Ft.)
Bottom (of initial area) elevation = 693.000(Ft.)
Difference in elevation = 7.000(Ft.)
Slope = 0.00719 s(%)= 0.72
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.635 min.
Rainfall intensity = 2.919(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.840
Subarea runoff = 24.513(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 0.200
Initial area Fm value = 0.196(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       2.000 to Point/Station       3.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   693.000(Ft.)
End of street segment elevation =   689.000(Ft.)
Length of street segment  =   607.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     40.434(CFS)
Depth of flow =   0.650(Ft.), Average velocity =   3.180(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  24.914(Ft.)
Flow velocity =   3.18(Ft/s)
Travel time =    3.18 min.     TC =   16.82  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Rainfall intensity =      2.574(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.832
Subarea runoff =     31.701(CFS) for   16.260(Ac.)
Total runoff =     56.214(CFS)
Effective area this stream =       26.26(Ac.)
Total Study Area (Main Stream No. 1) =       26.26(Ac.)
Area averaged Fm value =    0.196(In/Hr)
Street flow at end of street =     56.214(CFS)
Half street flow at end of street =     28.107(CFS)
Depth of flow =   0.727(Ft.), Average velocity =   3.296(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    3.03(Ft.)
Flow width (from curb towards crown)=  28.781(Ft.)
End of computations, Total Study Area =           26.26 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
```

Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.200
Area averaged SCS curve number = 32.0

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/05/25

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PORTION OF MPD DA XII - DOWNSTREAM
PROPOSED DEV DA C
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 4.000 to Point/Station 5.000
**** INITIAL AREA EVALUATION ****

APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.196(In/Hr)
Initial subarea data:
Initial area flow distance = 933.000(Ft.)
Top (of initial area) elevation = 696.000(Ft.)
Bottom (of initial area) elevation = 691.000(Ft.)
Difference in elevation = 5.000(Ft.)
Slope = 0.00536 s(%)= 0.54
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.213 min.
Rainfall intensity = 2.848(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.838
Subarea runoff = 23.867(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 0.200
Initial area Fm value = 0.196(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station        6.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   691.000(Ft.)
End of street segment elevation =   689.000(Ft.)
Length of street segment  =   288.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     30.508(CFS)
Depth of flow =   0.594(Ft.), Average velocity =   3.026(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  22.113(Ft.)
Flow velocity =   3.03(Ft/s)
Travel time =    1.59 min.     TC =   15.80  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Rainfall intensity =      2.672(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.834
Subarea runoff =     13.113(CFS) for    6.590(Ac.)
Total runoff =     36.981(CFS)
Effective area this stream =       16.59(Ac.)
Total Study Area (Main Stream No. 1) =       16.59(Ac.)
Area averaged Fm value =    0.196(In/Hr)
Street flow at end of street =     36.981(CFS)
Half street flow at end of street =     18.490(CFS)
Depth of flow =   0.628(Ft.), Average velocity =   3.172(Ft/s)
Flow width (from curb towards crown)=  23.826(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        7.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
```

```
____________________________________________________________________
Top of street segment elevation =   689.000(Ft.)
End of street segment elevation =   687.000(Ft.)
Length of street segment  =   353.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  14.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     38.439(CFS)
Depth of flow =   0.639(Ft.), Average velocity =   3.379(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   3.38(Ft/s)
Travel time =    1.74 min.     TC =   17.54  min.
 Adding area flow to street
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Rainfall intensity =      2.510(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.791
Subarea runoff =      2.756(CFS) for    3.430(Ac.)
Total runoff =     39.737(CFS)
Effective area this stream =       20.02(Ac.)
Total Study Area (Main Stream No. 1) =       20.02(Ac.)
Area averaged Fm value =    0.304(In/Hr)
Street flow at end of street =     39.737(CFS)
Half street flow at end of street =     19.868(CFS)
Depth of flow =   0.646(Ft.), Average velocity =   3.423(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  18.000(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        9.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
____________________________________________________________________
Upstream point/station elevation =   675.000(Ft.)
Downstream point/station elevation =   666.750(Ft.)
```

```
Pipe length  =  1327.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    39.737(CFS)
Given pipe size =     42.00(In.)
Calculated individual pipe flow  =    39.737(CFS)
Normal flow depth in pipe =   21.02(In.)
Flow top width inside pipe =   42.00(In.)
Critical Depth =   23.53(In.)
Pipe flow velocity =      8.25(Ft/s)
Travel time through pipe =    2.68 min.
Time of concentration (TC) =    20.22 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        9.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     20.020(Ac.)
Runoff from this stream =     39.737(CFS)
Time of concentration =   20.22 min.
Rainfall intensity =     2.305(In/Hr)
Area averaged loss rate (Fm) =    0.3045(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3114
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        8.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Initial subarea data:
Initial area flow distance =   997.000(Ft.)
Top (of initial area) elevation =   689.000(Ft.)
Bottom (of initial area) elevation =   685.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00401  s(%)=       0.40
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   23.054 min.
Rainfall intensity =      2.130(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.549
Subarea runoff =     11.399(CFS)
Total initial stream area =        9.750(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.831(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station        9.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   685.000(Ft.)
End of street segment elevation =   683.000(Ft.)
Length of street segment  =   393.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     12.886(CFS)
Depth of flow =   0.487(Ft.), Average velocity =   2.180(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  16.743(Ft.)
Flow velocity =   2.18(Ft/s)
Travel time =    3.00 min.     TC =   26.06  min.
 Adding area flow to street
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Rainfall intensity =      1.979(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.522
Subarea runoff =      2.850(CFS) for    4.040(Ac.)
Total runoff =     14.249(CFS)
Effective area this stream =       13.79(Ac.)
Total Study Area (Main Stream No. 2) =       33.81(Ac.)
Area averaged Fm value =    0.831(In/Hr)
Street flow at end of street =     14.249(CFS)
Half street flow at end of street =      7.125(CFS)
Depth of flow =   0.500(Ft.), Average velocity =   2.234(Ft/s)
Flow width (from curb towards crown)=  17.428(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station        9.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
```

The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area = 13.790(Ac.)
Runoff from this stream = 14.249(CFS)
Time of concentration = 26.06 min.
Rainfall intensity = 1.979(In/Hr)
Area averaged loss rate (Fm) = 0.8311(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:

| Stream No. | Flow rate (CFS) | Area (Ac.) | TC (min) | Fm (In/Hr) | Rainfall Intensity (In/Hr) |
|---|---|---|---|---|---|
| 1 | 39.74 | 20.020 | 20.22 | 0.304 | 2.305 |
| 2 | 14.25 | 13.790 | 26.06 | 0.831 | 1.979 |

Qmax(1) =
1.000 * 1.000 * 39.737) +
1.283 * 0.776 * 14.249) + = 53.927
Qmax(2) =
0.837 * 1.000 * 39.737) +
1.000 * 1.000 * 14.249) + = 47.524

Total of 2 main streams to confluence:
Flow rates before confluence point:
40.737 15.249
Maximum flow rates at confluence using above data:
53.927 47.524
Area of streams before confluence:
20.020 13.790
Effective area values after confluence:
30.721 33.810

Results of confluence:
Total flow rate = 53.927(CFS)
Time of concentration = 20.222 min.
Effective stream area after confluence = 30.721(Ac.)
Study area average Pervious fraction(Ap) = 0.531
Study area average soil loss rate(Fm) = 0.519(In/Hr)
Study area total = 33.81(Ac.)
End of computations, Total Study Area = 33.81 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.531
Area averaged SCS curve number = 32.0

# APPENDIX A.2: RATIONAL METHOD ANALYSIS, WALKER MAINLINE, AREA D (EXCLUDES D2)

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/05/25

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WALKER SD TRIBUTARY AREA
OVERALL: JLC-MCC-MDP REV + ONTARIO RANCH

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 91.000 to Point/Station 91.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.4000 Max loss rate(Fm)= 0.391(In/Hr)
Rainfall intensity = 1.854(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 29.07 min. Rain intensity = 1.85(In/Hr)
Total area this stream = 687.62(Ac.)
Total Study Area (Main Stream No. 1) = 687.62(Ac.)
Total runoff = 789.47(CFS)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 91.000 to Point/Station 91.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 670.000(Ft.)
Downstream point/station elevation = 665.600(Ft.)
Pipe length = 872.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 789.468(CFS)
Nearest computed pipe diameter = 105.00(In.)

```
Calculated individual pipe flow  =   789.468(CFS)
Normal flow depth in pipe =   82.50(In.)
Flow top width inside pipe =   86.17(In.)
Critical Depth =   83.75(In.)
Pipe flow velocity =     15.58(Ft/s)
Travel time through pipe =    0.93 min.
Time of concentration (TC) =    30.00 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.000 to Point/Station       91.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    687.620(Ac.)
Runoff from this stream =    789.468(CFS)
Time of concentration =   30.00 min.
Rainfall intensity =     1.819(In/Hr)
Area averaged loss rate (Fm) =    0.3911(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       91.100
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 31.61
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Rainfall intensity =      2.574(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  16.82 min.  Rain intensity =       2.57(In/Hr)
Total area this stream =        26.26(Ac.)
Total Study Area (Main Stream No. 2) =      713.88(Ac.)
Total runoff =     56.21(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       91.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     26.260(Ac.)
Runoff from this stream =     56.214(CFS)
Time of concentration =   16.82 min.
Rainfall intensity =     2.574(In/Hr)
Area averaged loss rate (Fm) =    0.1960(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:
```

```
Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    789.47   687.620     30.00    0.391      1.819
2     56.21    26.260     16.82    0.196      2.574
Qmax(1) =
         1.000 *    1.000 *   789.468) +
         0.683 *    1.000 *    56.214) + =     827.836
Qmax(2) =
         1.529 *    0.561 *   789.468) +
         1.000 *    1.000 *    56.214) + =     732.905

Total of 2 main streams to confluence:
Flow rates before confluence point:
     790.468      57.214
Maximum flow rates at confluence using above data:
      827.836      732.905
Area of streams before confluence:
      687.620       26.260
Effective area values after confluence:
      713.880      411.815


Results of confluence:
Total flow rate =    827.836(CFS)
Time of concentration =    29.998 min.
Effective stream area after confluence  =    713.880(Ac.)
Study area average Pervious fraction(Ap) =  0.393
Study area average soil loss rate(Fm) =    0.384(In/Hr)
Study area total =     713.88(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.100 to Point/Station       91.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   665.600(Ft.)
Downstream point/station elevation =   663.100(Ft.)
Pipe length  =   510.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   827.836(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =   827.836(CFS)
Normal flow depth in pipe =   83.81(In.)
Flow top width inside pipe =   90.05(In.)
Critical Depth =   85.30(In.)
Pipe flow velocity =     15.63(Ft/s)
Travel time through pipe =    0.54 min.
Time of concentration (TC) =    30.54 min.


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Process from Point/Station       91.100 to Point/Station       91.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    713.880(Ac.)
Runoff from this stream =    827.836(CFS)
Time of concentration =   30.54 min.
Rainfall intensity =     1.799(In/Hr)
Area averaged loss rate (Fm) =    0.3839(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3926
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station       91.200
**** USER DEFINED FLOW INFORMATION AT A POINT ****
____________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.07
Pervious ratio(Ap) = 0.5310     Max loss rate(Fm)=     0.519(In/Hr)
Rainfall intensity =      2.305(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  20.22 min.  Rain intensity =       2.30(In/Hr)
Total area this stream =        30.72(Ac.)
Total Study Area (Main Stream No. 2) =      744.60(Ac.)
Total runoff =     53.93(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station       91.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     30.721(Ac.)
Runoff from this stream =     53.927(CFS)
Time of concentration =   20.22 min.
Rainfall intensity =     2.305(In/Hr)
Area averaged loss rate (Fm) =    0.5190(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5310
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    827.84   713.880     30.54    0.384      1.799
2     53.93    30.721     20.22    0.519      2.305
Qmax(1) =
         1.000 *    1.000 *   827.836) +
         0.717 *    1.000 *    53.927) + =     866.509
```

```
Qmax(2) =
         1.357 *    0.662 *   827.836) +
         1.000 *    1.000 *    53.927) + =     797.626

Total of 2 main streams to confluence:
Flow rates before confluence point:
     828.836      54.927
Maximum flow rates at confluence using above data:
      866.509      797.626
Area of streams before confluence:
      713.880       30.721
Effective area values after confluence:
      744.601      503.394


Results of confluence:
Total flow rate =    866.509(CFS)
Time of concentration =    30.541 min.
Effective stream area after confluence  =    744.601(Ac.)
Study area average Pervious fraction(Ap) =  0.398
Study area average soil loss rate(Fm) =    0.390(In/Hr)
Study area total =     744.60(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.200 to Point/Station       91.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   663.100(Ft.)
Downstream point/station elevation =   661.800(Ft.)
Pipe length  =   263.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   866.509(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =   866.509(CFS)
Normal flow depth in pipe =   87.19(In.)
Flow top width inside pipe =   85.20(In.)
Critical Depth =   87.08(In.)
Pipe flow velocity =     15.73(Ft/s)
Travel time through pipe =    0.28 min.
Time of concentration (TC) =    30.82 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.200 to Point/Station       91.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    744.601(Ac.)
Runoff from this stream =    866.509(CFS)
Time of concentration =   30.82 min.
Rainfall intensity =     1.790(In/Hr)
Area averaged loss rate (Fm) =    0.3895(In/Hr)
```

```
Area averaged Pervious ratio (Ap) = 0.3984
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.000 to Point/Station      402.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Initial subarea data:
Initial area flow distance =   930.000(Ft.)
Top (of initial area) elevation =   691.000(Ft.)
Bottom (of initial area) elevation =   683.000(Ft.)
Difference in elevation =     8.000(Ft.)
Slope =    0.00860  s(%)=       0.86
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.249 min.
Rainfall intensity =      2.374(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.585
Subarea runoff =     11.509(CFS)
Total initial stream area =        8.290(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.831(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      402.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    19.25 min.
Rainfall intensity =      2.374(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.634
Subarea runoff =      3.605(CFS) for    1.760(Ac.)
Total runoff =     15.114(CFS)
Effective area this stream =       10.05(Ac.)
Total Study Area (Main Stream No. 2) =      754.65(Ac.)
Area averaged Fm value =    0.703(In/Hr)
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station       91.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   679.000(Ft.)
Downstream point/station elevation =   661.800(Ft.)
Pipe length  =   120.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.114(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    15.114(CFS)
Normal flow depth in pipe =    8.53(In.)
Flow top width inside pipe =   14.86(In.)
Critical depth could not be calculated.
Pipe flow velocity =     20.97(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =    19.34 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station       91.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     10.050(Ac.)
Runoff from this stream =     15.114(CFS)
Time of concentration =   19.34 min.
Rainfall intensity =     2.367(In/Hr)
Area averaged loss rate (Fm) =    0.7027(In/Hr)
Area averaged Pervious ratio (Ap) = 0.7187
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min)  (In/Hr)     (In/Hr)


1    866.51   744.601     30.82    0.390      1.790
2     15.11    10.050     19.34    0.703      2.367
Qmax(1) =
         1.000 *    1.000 *   866.509) +
         0.653 *    1.000 *    15.114) + =     876.382
Qmax(2) =
         1.412 *    0.628 *   866.509) +
         1.000 *    1.000 *    15.114) + =     783.121

Total of 2 main streams to confluence:
Flow rates before confluence point:
     867.509      16.114
Maximum flow rates at confluence using above data:
      876.382      783.121
Area of streams before confluence:
      744.601       10.050
Effective area values after confluence:
```

754.651 477.414

Results of confluence:
Total flow rate = 876.382(CFS)
Time of concentration = 30.820 min.
Effective stream area after confluence = 754.651(Ac.)
Study area average Pervious fraction(Ap) = 0.403
Study area average soil loss rate(Fm) = 0.394(In/Hr)
Study area total = 754.65(Ac.)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 91.300 to Point/Station 91.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____
Upstream point/station elevation = 661.800(Ft.)
Downstream point/station elevation = 659.800(Ft.)
Pipe length = 401.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 876.382(CFS)
Nearest computed pipe diameter = 108.00(In.)
Calculated individual pipe flow = 876.382(CFS)
Normal flow depth in pipe = 87.94(In.)
Flow top width inside pipe = 84.01(In.)
Critical Depth = 87.50(In.)
Pipe flow velocity = 15.80(Ft/s)
Travel time through pipe = 0.42 min.
Time of concentration (TC) = 31.24 min.

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 91.400 to Point/Station 91.500
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____
Upstream point/station elevation = 659.800(Ft.)
Downstream point/station elevation = 658.200(Ft.)
Pipe length = 330.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 876.382(CFS)
Nearest computed pipe diameter = 111.00(In.)
Calculated individual pipe flow = 876.382(CFS)
Normal flow depth in pipe = 85.31(In.)
Flow top width inside pipe = 93.63(In.)
Critical Depth = 87.15(In.)
Pipe flow velocity = 15.82(Ft/s)
Travel time through pipe = 0.35 min.
Time of concentration (TC) = 31.59 min.

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Process from Point/Station 91.400 to Point/Station 91.500
**** CONFLUENCE OF MAIN STREAMS ****
_____
The following data inside Main Stream is listed:

```
In Main Stream number: 1
Stream flow area =    754.651(Ac.)
Runoff from this stream =    876.382(CFS)
Time of concentration =   31.59 min.
Rainfall intensity =     1.763(In/Hr)
Area averaged loss rate (Fm) =    0.3937(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4026
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      413.000 to Point/Station      414.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   250.000(Ft.)
Top (of initial area) elevation =   680.500(Ft.)
Bottom (of initial area) elevation =   678.000(Ft.)
Difference in elevation =     2.500(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.951 min.
Rainfall intensity =      4.374(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
Subarea runoff =      2.732(CFS)
Total initial stream area =        0.710(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      414.000 to Point/Station      416.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   674.000(Ft.)
Downstream point/station elevation =   671.000(Ft.)
Pipe length  =   660.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.732(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     2.732(CFS)
Normal flow depth in pipe =    8.61(In.)
Flow top width inside pipe =   14.83(In.)
Critical Depth =    7.96(In.)
Pipe flow velocity =      3.75(Ft/s)
Travel time through pipe =    2.93 min.
Time of concentration (TC) =     9.89 min.
```

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Process from Point/Station      414.000 to Point/Station      416.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.710(Ac.)
Runoff from this stream =      2.732(CFS)
Time of concentration =    9.89 min.
Rainfall intensity =     3.540(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      415.000 to Point/Station      416.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   500.000(Ft.)
Top (of initial area) elevation =   680.000(Ft.)
Bottom (of initial area) elevation =   675.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.172 min.
Rainfall intensity =      3.703(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.876
Subarea runoff =     17.036(CFS)
Total initial stream area =        5.250(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


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Process from Point/Station      415.000 to Point/Station      416.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      5.250(Ac.)
Runoff from this stream =     17.036(CFS)
Time of concentration =    9.17 min.
Rainfall intensity =     3.703(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
```

```
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1      2.73     0.710      9.89    0.098      3.540
2     17.04     5.250      9.17    0.098      3.703
Qmax(1) =
         1.000 *    1.000 *     2.732) +
         0.955 *    1.000 *    17.036) + =      18.999
Qmax(2) =
         1.047 *    0.928 *     2.732) +
         1.000 *    1.000 *    17.036) + =      19.691

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.732      17.036
Maximum flow rates at confluence using above data:
       18.999       19.691
Area of streams before confluence:
        0.710        5.250
Effective area values after confluence:
        5.960        5.909
Results of confluence:
Total flow rate =     19.691(CFS)
Time of concentration =     9.172 min.
Effective stream area after confluence =      5.909(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.098(In/Hr)
Study area total (this main stream) =       5.96(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      416.000 to Point/Station       91.500
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   672.500(Ft.)
Downstream point/station elevation =   658.200(Ft.)
Pipe length  =   686.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    19.691(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    19.691(CFS)
Normal flow depth in pipe =   15.02(In.)
Flow top width inside pipe =   18.95(In.)
Critical Depth =   19.08(In.)
Pipe flow velocity =     10.70(Ft/s)
Travel time through pipe =    1.07 min.
Time of concentration (TC) =    10.24 min.


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Process from Point/Station      416.000 to Point/Station       91.500
```

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**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      5.909(Ac.)
Runoff from this stream =     19.691(CFS)
Time of concentration =   10.24 min.
Rainfall intensity =     3.466(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    876.38   754.651     31.59    0.394      1.763
2     19.69     5.909     10.24    0.098      3.466
Qmax(1) =
         1.000 *    1.000 *   876.382) +
         0.494 *    1.000 *    19.691) + =     886.118
Qmax(2) =
         2.243 *    0.324 *   876.382) +
         1.000 *    1.000 *    19.691) + =     657.031

Total of 2 main streams to confluence:
Flow rates before confluence point:
     877.382      20.691
Maximum flow rates at confluence using above data:
      886.118      657.031
Area of streams before confluence:
      754.651        5.909
Effective area values after confluence:
      760.560      250.544


Results of confluence:
Total flow rate =    886.118(CFS)
Time of concentration =    31.591 min.
Effective stream area after confluence  =    760.560(Ac.)
Study area average Pervious fraction(Ap) =  0.400
Study area average soil loss rate(Fm) =    0.391(In/Hr)
Study area total =     760.56(Ac.)


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Process from Point/Station       91.500 to Point/Station       97.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =   658.200(Ft.)
Downstream point/station elevation =   657.600(Ft.)
Pipe length  =   114.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   886.118(CFS)
```

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Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =   886.118(CFS)
Normal flow depth in pipe =   86.44(In.)
Flow top width inside pipe =   86.34(In.)
Critical Depth =   88.00(In.)
Pipe flow velocity =     16.23(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    31.71 min.


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Process from Point/Station       91.500 to Point/Station       97.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    760.560(Ac.)
Runoff from this stream =    886.118(CFS)
Time of concentration =   31.71 min.
Rainfall intensity =     1.759(In/Hr)
Area averaged loss rate (Fm) =    0.3914(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4003
Program is now starting with Main Stream No. 2


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Process from Point/Station       97.000 to Point/Station       97.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4000     Max loss rate(Fm)=     0.391(In/Hr)
Rainfall intensity =      1.750(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  31.98 min.  Rain intensity =       1.75(In/Hr)
Total area this stream =        85.79(Ac.)
Total Study Area (Main Stream No. 2) =      846.40(Ac.)
Total runoff =     47.41(CFS)


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Process from Point/Station       97.000 to Point/Station       97.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     85.790(Ac.)
Runoff from this stream =     47.410(CFS)
Time of concentration =   31.98 min.
Rainfall intensity =     1.750(In/Hr)
Area averaged loss rate (Fm) =    0.3911(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4000
```

```
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    886.12   760.560     31.71    0.391      1.759
2     47.41    85.790     31.98    0.391      1.750
Qmax(1) =
         1.000 *    1.000 *   886.118) +
         1.007 *    0.991 *    47.410) + =     933.436
Qmax(2) =
         0.993 *    1.000 *   886.118) +
         1.000 *    1.000 *    47.410) + =     927.696

Total of 2 main streams to confluence:
Flow rates before confluence point:
     887.118      48.410
Maximum flow rates at confluence using above data:
      933.436      927.696
Area of streams before confluence:
      760.560       85.790
Effective area values after confluence:
      845.619      846.350


Results of confluence:
Total flow rate =    933.436(CFS)
Time of concentration =    31.708 min.
Effective stream area after confluence  =    845.619(Ac.)
Study area average Pervious fraction(Ap) =  0.400
Study area average soil loss rate(Fm) =    0.391(In/Hr)
Study area total =     846.35(Ac.)


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Process from Point/Station       97.000 to Point/Station       97.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    845.619(Ac.)
Runoff from this stream =    933.436(CFS)
Time of concentration =   31.71 min.
Rainfall intensity =     1.759(In/Hr)
Area averaged loss rate (Fm) =    0.3914(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4002
Program is now starting with Main Stream No. 2


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Process from Point/Station      417.000 to Point/Station      418.000
**** INITIAL AREA EVALUATION ****
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____________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   396.000(Ft.)
Top (of initial area) elevation =   677.000(Ft.)
Bottom (of initial area) elevation =   676.000(Ft.)
Difference in elevation =     1.000(Ft.)
Slope =    0.00253  s(%)=       0.25
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.002 min.
Rainfall intensity =      3.320(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.873
Subarea runoff =      5.656(CFS)
Total initial stream area =        1.950(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


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Process from Point/Station      418.000 to Point/Station      419.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________________
Upstream point/station elevation =   672.000(Ft.)
Downstream point/station elevation =   669.000(Ft.)
Pipe length  =   626.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.656(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     5.656(CFS)
Normal flow depth in pipe =   11.93(In.)
Flow top width inside pipe =   17.02(In.)
Critical Depth =   11.01(In.)
Pipe flow velocity =      4.55(Ft/s)
Travel time through pipe =    2.29 min.
Time of concentration (TC) =    13.30 min.


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Process from Point/Station      419.000 to Point/Station      419.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
```

```
Time of concentration =    13.30 min.
Rainfall intensity =      2.964(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.870
Subarea runoff =      7.035(CFS) for    2.970(Ac.)
Total runoff =     12.690(CFS)
Effective area this stream =        4.92(Ac.)
Total Study Area (Main Stream No. 2) =      851.32(Ac.)
Area averaged Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      419.000 to Point/Station       97.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      4.920(Ac.)
Runoff from this stream =     12.690(CFS)
Time of concentration =   13.30 min.
Rainfall intensity =     2.964(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    933.44   845.619     31.71    0.391      1.759
2     12.69     4.920     13.30    0.098      2.964
Qmax(1) =
         1.000 *    1.000 *   933.436) +
         0.580 *    1.000 *    12.690) + =     940.794
Qmax(2) =
         1.880 *    0.419 *   933.436) +
         1.000 *    1.000 *    12.690) + =     748.681

Total of 2 main streams to confluence:
Flow rates before confluence point:
     934.436      13.690
Maximum flow rates at confluence using above data:
      940.794      748.681
Area of streams before confluence:
      845.619        4.920
Effective area values after confluence:
      850.539      359.533


Results of confluence:
Total flow rate =    940.794(CFS)
Time of concentration =    31.708 min.
Effective stream area after confluence  =    850.539(Ac.)
```

```
Study area average Pervious fraction(Ap) =  0.399
Study area average soil loss rate(Fm) =    0.390(In/Hr)
Study area total =     850.54(Ac.)
End of computations, Total Study Area =          851.32 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.398
Area averaged SCS curve number =  32.0
```

# APPENDIX A.3: RATIONAL METHOD ANALYSIS, WALKER ONSITE MITIGATED, AREA D2

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/05/25

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ONTARIO RANCH 108.43.25
COMMERCIAL MITIGATED RATIONAL METHOD HYDROLOGY
AREA D2, 100 YEAR STORM EVENT
FN: RARD2100P

---

Program License Serial Number 6279

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********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 403.000 to Point/Station 404.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.098(In/Hr)
Initial subarea data:
Initial area flow distance = 650.000(Ft.)
Top (of initial area) elevation = 689.000(Ft.)
Bottom (of initial area) elevation = 682.000(Ft.)
Difference in elevation = 7.000(Ft.)
Slope = 0.01077 s(%)= 1.08
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.037 min.
Rainfall intensity = 3.508(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff = 9.792(CFS)
Total initial stream area = 3.190(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.098(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      404.000 to Point/Station      407.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   678.000(Ft.)
Downstream point/station elevation =   676.400(Ft.)
Pipe length  =   518.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.792(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =     9.792(CFS)
Normal flow depth in pipe =   15.93(In.)
Flow top width inside pipe =   22.68(In.)
Critical Depth =   13.43(In.)
Pipe flow velocity =      4.42(Ft/s)
Travel time through pipe =    1.95 min.
Time of concentration (TC) =    11.99 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      404.000 to Point/Station      407.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      3.190(Ac.)
Runoff from this stream =      9.792(CFS)
Time of concentration =   11.99 min.
Rainfall intensity =     3.154(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      405.000 to Point/Station      406.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   640.000(Ft.)
Top (of initial area) elevation =   687.500(Ft.)
Bottom (of initial area) elevation =   681.000(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.01016  s(%)=       1.02
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
```

```
Initial area time of concentration =   10.093 min.
Rainfall intensity =      3.497(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff =      9.453(CFS)
Total initial stream area =        3.090(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      406.000 to Point/Station      407.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   677.000(Ft.)
Downstream point/station elevation =   676.400(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.453(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     9.453(CFS)
Normal flow depth in pipe =   11.27(In.)
Flow top width inside pipe =   17.42(In.)
Critical Depth =   14.25(In.)
Pipe flow velocity =      8.12(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    10.17 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      406.000 to Point/Station      407.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.090(Ac.)
Runoff from this stream =      9.453(CFS)
Time of concentration =   10.17 min.
Rainfall intensity =     3.481(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1      9.79     3.190     11.99    0.098      3.154
2      9.45     3.090     10.17    0.098      3.481
Qmax(1) =
         1.000 *    1.000 *     9.792) +
         0.903 *    1.000 *     9.453) + =      18.331
Qmax(2) =
         1.107 *    0.848 *     9.792) +
         1.000 *    1.000 *     9.453) + =      18.649
```

```
Total of 2 main streams to confluence:
Flow rates before confluence point:
      10.792      10.453
Maximum flow rates at confluence using above data:
       18.331       18.649
Area of streams before confluence:
        3.190        3.090
Effective area values after confluence:
        6.280        5.796


Results of confluence:
Total flow rate =     18.649(CFS)
Time of concentration =    10.170 min.
Effective stream area after confluence  =      5.796(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.098(In/Hr)
Study area total =       6.28(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      407.000 to Point/Station      411.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   676.400(Ft.)
Downstream point/station elevation =   674.700(Ft.)
Pipe length  =    78.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    18.649(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    18.649(CFS)
Normal flow depth in pipe =   14.18(In.)
Flow top width inside pipe =   19.67(In.)
Critical Depth =   18.75(In.)
Pipe flow velocity =     10.80(Ft/s)
Travel time through pipe =    0.12 min.
Time of concentration (TC) =    10.29 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      407.000 to Point/Station      411.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      5.796(Ac.)
Runoff from this stream =     18.649(CFS)
Time of concentration =   10.29 min.
Rainfall intensity =     3.456(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      408.000 to Point/Station      411.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   690.000(Ft.)
Top (of initial area) elevation =   686.000(Ft.)
Bottom (of initial area) elevation =   679.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.01014  s(%)=       1.01
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.403 min.
Rainfall intensity =      3.434(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.874
Subarea runoff =     24.530(CFS)
Total initial stream area =        8.170(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      408.000 to Point/Station      411.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      8.170(Ac.)
Runoff from this stream =     24.530(CFS)
Time of concentration =   10.40 min.
Rainfall intensity =     3.434(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      409.000 to Point/Station      410.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
```

```
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   670.000(Ft.)
Top (of initial area) elevation =   688.000(Ft.)
Bottom (of initial area) elevation =   681.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.01045  s(%)=       1.04
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.221 min.
Rainfall intensity =      3.470(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff =      9.895(CFS)
Total initial stream area =        3.260(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      411.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   677.000(Ft.)
Downstream point/station elevation =   674.700(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.895(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     9.895(CFS)
Normal flow depth in pipe =    8.57(In.)
Flow top width inside pipe =   14.85(In.)
Critical Depth =   14.17(In.)
Pipe flow velocity =     13.65(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    10.27 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      410.000 to Point/Station      411.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      3.260(Ac.)
Runoff from this stream =      9.895(CFS)
Time of concentration =   10.27 min.
Rainfall intensity =     3.461(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
```

```
1     18.65     5.796     10.29    0.098      3.456
2     24.53     8.170     10.40    0.098      3.434
3      9.90     3.260     10.27    0.098      3.461
Qmax(1) =
         1.000 *    1.000 *    18.649) +
         1.007 *    0.989 *    24.530) +
         0.999 *    1.000 *     9.895) + =      52.958
Qmax(2) =
         0.993 *    1.000 *    18.649) +
         1.000 *    1.000 *    24.530) +
         0.992 *    1.000 *     9.895) + =      52.869
Qmax(3) =
         1.001 *    0.998 *    18.649) +
         1.008 *    0.987 *    24.530) +
         1.000 *    1.000 *     9.895) + =      52.935

Total of 3 main streams to confluence:
Flow rates before confluence point:
      19.649      25.530      10.895
Maximum flow rates at confluence using above data:
       52.958       52.869       52.935
Area of streams before confluence:
        5.796        8.170        3.260
Effective area values after confluence:
       17.138       17.226       17.107


Results of confluence:
Total flow rate =     52.958(CFS)
Time of concentration =    10.291 min.
Effective stream area after confluence  =     17.138(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.098(In/Hr)
Study area total =      17.23(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      411.000 to Point/Station      412.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   674.700(Ft.)
Downstream point/station elevation =   674.500(Ft.)
Pipe length  =    57.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    52.958(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    52.958(CFS)
Normal flow depth in pipe =   30.84(In.)
Flow top width inside pipe =   37.10(In.)
Critical Depth =   27.33(In.)
Pipe flow velocity =      7.00(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    10.43 min.
End of computations, Total Study Area =           17.71 (Ac.)
```

The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number = 32.0

# APPENDIX A.4: UNIT HYDROGRAPH ANALYSIS, WALKER ONSITE MITIGATED, AREA D2

U n i t  H y d r o g r a p h  A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0

Study date 05/05/25

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6279

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ONTARIO RANCH 108.43.25
COMMERCIAL MITIGATED UNIT HYDROGRAPH METHOD HYDROLOGY
AREA D2, 100-YEAR STORM EVENT
FN: UARD2P

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Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 100 | | |
| 17.71 | 1 | 1.20 |
| Rainfall data for year 100 | | |
| 17.71 | 6 | 3.00 |
| Rainfall data for year 100 | | |
| 17.71 | 24 | 6.00 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 32.0 | 32.0 | 17.71 | 1.000 | 0.978 | 0.100 | 0.098 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.098

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 1.77 | 0.100 | 32.0 | 32.0 | 21.25 | 0.022 |
| 15.94 | 0.900 | 98.0 | 98.0 | 0.20 | 0.960 |

Area-averaged catchment yield fraction, Y = 0.866
Area-averaged low loss fraction, Yb = 0.134
User entry of time of concentration = 0.174 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 17.71(Ac.)
Catchment Lag time = 0.139 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 59.8659
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.098(In/Hr)
Average low loss rate fraction (Yb) = 0.134 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 17.71(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.444(In)
30-minute factor = 0.999 Adjusted rainfall = 0.909(In)
1-hour factor = 0.999 Adjusted rainfall = 1.199(In)
3-hour factor = 1.000 Adjusted rainfall = 2.104(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| | (K = 214.18 (CFS)) | |
| 1 | 6.490 | 13.901 |

| | | |
|---|---|---|
| 2 | 41.475 | 74.931 |
| 3 | 81.584 | 85.905 |
| 4 | 95.476 | 29.755 |
| 5 | 98.649 | 6.796 |
| 6 | 100.000 | 2.893 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4438 | 0.4438 |
| 2 | 0.5855 | 0.1418 |
| 3 | 0.6886 | 0.1031 |
| 4 | 0.7726 | 0.0840 |
| 5 | 0.8448 | 0.0721 |
| 6 | 0.9087 | 0.0639 |
| 7 | 0.9665 | 0.0578 |
| 8 | 1.0195 | 0.0530 |
| 9 | 1.0687 | 0.0492 |
| 10 | 1.1147 | 0.0460 |
| 11 | 1.1580 | 0.0433 |
| 12 | 1.1990 | 0.0410 |
| 13 | 1.2492 | 0.0502 |
| 14 | 1.2975 | 0.0483 |
| 15 | 1.3441 | 0.0467 |
| 16 | 1.3893 | 0.0452 |
| 17 | 1.4331 | 0.0438 |
| 18 | 1.4757 | 0.0426 |
| 19 | 1.5171 | 0.0414 |
| 20 | 1.5575 | 0.0404 |
| 21 | 1.5969 | 0.0394 |
| 22 | 1.6354 | 0.0385 |
| 23 | 1.6730 | 0.0377 |
| 24 | 1.7099 | 0.0369 |
| 25 | 1.7460 | 0.0361 |
| 26 | 1.7814 | 0.0354 |
| 27 | 1.8162 | 0.0348 |
| 28 | 1.8503 | 0.0341 |
| 29 | 1.8839 | 0.0335 |
| 30 | 1.9168 | 0.0330 |
| 31 | 1.9493 | 0.0325 |
| 32 | 1.9812 | 0.0319 |
| 33 | 2.0127 | 0.0315 |
| 34 | 2.0437 | 0.0310 |
| 35 | 2.0743 | 0.0306 |
| 36 | 2.1044 | 0.0301 |
| 37 | 2.1341 | 0.0297 |
| 38 | 2.1634 | 0.0293 |
| 39 | 2.1924 | 0.0289 |
| 40 | 2.2209 | 0.0286 |
| 41 | 2.2492 | 0.0282 |
| 42 | 2.2770 | 0.0279 |
| 43 | 2.3046 | 0.0276 |
| 44 | 2.3319 | 0.0273 |
| 45 | 2.3588 | 0.0270 |

| | | |
|---|---|---|
| 46 | 2.3855 | 0.0267 |
| 47 | 2.4119 | 0.0264 |
| 48 | 2.4380 | 0.0261 |
| 49 | 2.4638 | 0.0258 |
| 50 | 2.4894 | 0.0256 |
| 51 | 2.5148 | 0.0253 |
| 52 | 2.5399 | 0.0251 |
| 53 | 2.5647 | 0.0249 |
| 54 | 2.5894 | 0.0246 |
| 55 | 2.6138 | 0.0244 |
| 56 | 2.6380 | 0.0242 |
| 57 | 2.6620 | 0.0240 |
| 58 | 2.6858 | 0.0238 |
| 59 | 2.7094 | 0.0236 |
| 60 | 2.7327 | 0.0234 |
| 61 | 2.7559 | 0.0232 |
| 62 | 2.7790 | 0.0230 |
| 63 | 2.8018 | 0.0228 |
| 64 | 2.8245 | 0.0227 |
| 65 | 2.8469 | 0.0225 |
| 66 | 2.8693 | 0.0223 |
| 67 | 2.8914 | 0.0222 |
| 68 | 2.9134 | 0.0220 |
| 69 | 2.9352 | 0.0218 |
| 70 | 2.9569 | 0.0217 |
| 71 | 2.9785 | 0.0215 |
| 72 | 2.9998 | 0.0214 |
| 73 | 3.0206 | 0.0208 |
| 74 | 3.0412 | 0.0206 |
| 75 | 3.0617 | 0.0205 |
| 76 | 3.0820 | 0.0203 |
| 77 | 3.1023 | 0.0202 |
| 78 | 3.1223 | 0.0201 |
| 79 | 3.1423 | 0.0200 |
| 80 | 3.1621 | 0.0198 |
| 81 | 3.1818 | 0.0197 |
| 82 | 3.2014 | 0.0196 |
| 83 | 3.2209 | 0.0195 |
| 84 | 3.2402 | 0.0193 |
| 85 | 3.2594 | 0.0192 |
| 86 | 3.2786 | 0.0191 |
| 87 | 3.2976 | 0.0190 |
| 88 | 3.3165 | 0.0189 |
| 89 | 3.3352 | 0.0188 |
| 90 | 3.3539 | 0.0187 |
| 91 | 3.3725 | 0.0186 |
| 92 | 3.3910 | 0.0185 |
| 93 | 3.4094 | 0.0184 |
| 94 | 3.4277 | 0.0183 |
| 95 | 3.4458 | 0.0182 |
| 96 | 3.4639 | 0.0181 |
| 97 | 3.4819 | 0.0180 |
| 98 | 3.4998 | 0.0179 |

| | | |
|---|---|---|
| 99 | 3.5176 | 0.0178 |
| 100 | 3.5354 | 0.0177 |
| 101 | 3.5530 | 0.0176 |
| 102 | 3.5705 | 0.0175 |
| 103 | 3.5880 | 0.0175 |
| 104 | 3.6054 | 0.0174 |
| 105 | 3.6227 | 0.0173 |
| 106 | 3.6399 | 0.0172 |
| 107 | 3.6570 | 0.0171 |
| 108 | 3.6741 | 0.0170 |
| 109 | 3.6910 | 0.0170 |
| 110 | 3.7079 | 0.0169 |
| 111 | 3.7247 | 0.0168 |
| 112 | 3.7415 | 0.0167 |
| 113 | 3.7582 | 0.0167 |
| 114 | 3.7747 | 0.0166 |
| 115 | 3.7913 | 0.0165 |
| 116 | 3.8077 | 0.0164 |
| 117 | 3.8241 | 0.0164 |
| 118 | 3.8404 | 0.0163 |
| 119 | 3.8566 | 0.0162 |
| 120 | 3.8728 | 0.0162 |
| 121 | 3.8889 | 0.0161 |
| 122 | 3.9050 | 0.0160 |
| 123 | 3.9209 | 0.0160 |
| 124 | 3.9368 | 0.0159 |
| 125 | 3.9527 | 0.0158 |
| 126 | 3.9685 | 0.0158 |
| 127 | 3.9842 | 0.0157 |
| 128 | 3.9998 | 0.0157 |
| 129 | 4.0154 | 0.0156 |
| 130 | 4.0310 | 0.0155 |
| 131 | 4.0464 | 0.0155 |
| 132 | 4.0619 | 0.0154 |
| 133 | 4.0772 | 0.0154 |
| 134 | 4.0925 | 0.0153 |
| 135 | 4.1078 | 0.0152 |
| 136 | 4.1229 | 0.0152 |
| 137 | 4.1381 | 0.0151 |
| 138 | 4.1531 | 0.0151 |
| 139 | 4.1682 | 0.0150 |
| 140 | 4.1831 | 0.0150 |
| 141 | 4.1980 | 0.0149 |
| 142 | 4.2129 | 0.0149 |
| 143 | 4.2277 | 0.0148 |
| 144 | 4.2425 | 0.0148 |
| 145 | 4.2572 | 0.0147 |
| 146 | 4.2718 | 0.0147 |
| 147 | 4.2864 | 0.0146 |
| 148 | 4.3010 | 0.0146 |
| 149 | 4.3155 | 0.0145 |
| 150 | 4.3300 | 0.0145 |
| 151 | 4.3444 | 0.0144 |

| | | |
|---|---|---|
| 152 | 4.3587 | 0.0144 |
| 153 | 4.3731 | 0.0143 |
| 154 | 4.3873 | 0.0143 |
| 155 | 4.4015 | 0.0142 |
| 156 | 4.4157 | 0.0142 |
| 157 | 4.4298 | 0.0141 |
| 158 | 4.4439 | 0.0141 |
| 159 | 4.4580 | 0.0140 |
| 160 | 4.4720 | 0.0140 |
| 161 | 4.4859 | 0.0140 |
| 162 | 4.4998 | 0.0139 |
| 163 | 4.5137 | 0.0139 |
| 164 | 4.5275 | 0.0138 |
| 165 | 4.5413 | 0.0138 |
| 166 | 4.5551 | 0.0137 |
| 167 | 4.5688 | 0.0137 |
| 168 | 4.5824 | 0.0137 |
| 169 | 4.5960 | 0.0136 |
| 170 | 4.6096 | 0.0136 |
| 171 | 4.6232 | 0.0135 |
| 172 | 4.6366 | 0.0135 |
| 173 | 4.6501 | 0.0135 |
| 174 | 4.6635 | 0.0134 |
| 175 | 4.6769 | 0.0134 |
| 176 | 4.6903 | 0.0133 |
| 177 | 4.7036 | 0.0133 |
| 178 | 4.7168 | 0.0133 |
| 179 | 4.7301 | 0.0132 |
| 180 | 4.7433 | 0.0132 |
| 181 | 4.7564 | 0.0132 |
| 182 | 4.7695 | 0.0131 |
| 183 | 4.7826 | 0.0131 |
| 184 | 4.7957 | 0.0131 |
| 185 | 4.8087 | 0.0130 |
| 186 | 4.8217 | 0.0130 |
| 187 | 4.8346 | 0.0129 |
| 188 | 4.8475 | 0.0129 |
| 189 | 4.8604 | 0.0129 |
| 190 | 4.8732 | 0.0128 |
| 191 | 4.8860 | 0.0128 |
| 192 | 4.8988 | 0.0128 |
| 193 | 4.9116 | 0.0127 |
| 194 | 4.9243 | 0.0127 |
| 195 | 4.9369 | 0.0127 |
| 196 | 4.9496 | 0.0126 |
| 197 | 4.9622 | 0.0126 |
| 198 | 4.9748 | 0.0126 |
| 199 | 4.9873 | 0.0125 |
| 200 | 4.9998 | 0.0125 |
| 201 | 5.0123 | 0.0125 |
| 202 | 5.0248 | 0.0125 |
| 203 | 5.0372 | 0.0124 |
| 204 | 5.0496 | 0.0124 |

| | | |
|---|---|---|
| 205 | 5.0620 | 0.0124 |
| 206 | 5.0743 | 0.0123 |
| 207 | 5.0866 | 0.0123 |
| 208 | 5.0989 | 0.0123 |
| 209 | 5.1111 | 0.0122 |
| 210 | 5.1233 | 0.0122 |
| 211 | 5.1355 | 0.0122 |
| 212 | 5.1477 | 0.0122 |
| 213 | 5.1598 | 0.0121 |
| 214 | 5.1719 | 0.0121 |
| 215 | 5.1840 | 0.0121 |
| 216 | 5.1960 | 0.0120 |
| 217 | 5.2080 | 0.0120 |
| 218 | 5.2200 | 0.0120 |
| 219 | 5.2320 | 0.0120 |
| 220 | 5.2439 | 0.0119 |
| 221 | 5.2558 | 0.0119 |
| 222 | 5.2677 | 0.0119 |
| 223 | 5.2795 | 0.0119 |
| 224 | 5.2914 | 0.0118 |
| 225 | 5.3032 | 0.0118 |
| 226 | 5.3149 | 0.0118 |
| 227 | 5.3267 | 0.0117 |
| 228 | 5.3384 | 0.0117 |
| 229 | 5.3501 | 0.0117 |
| 230 | 5.3618 | 0.0117 |
| 231 | 5.3734 | 0.0116 |
| 232 | 5.3850 | 0.0116 |
| 233 | 5.3966 | 0.0116 |
| 234 | 5.4082 | 0.0116 |
| 235 | 5.4197 | 0.0115 |
| 236 | 5.4312 | 0.0115 |
| 237 | 5.4427 | 0.0115 |
| 238 | 5.4542 | 0.0115 |
| 239 | 5.4657 | 0.0114 |
| 240 | 5.4771 | 0.0114 |
| 241 | 5.4885 | 0.0114 |
| 242 | 5.4999 | 0.0114 |
| 243 | 5.5112 | 0.0114 |
| 244 | 5.5225 | 0.0113 |
| 245 | 5.5338 | 0.0113 |
| 246 | 5.5451 | 0.0113 |
| 247 | 5.5564 | 0.0113 |
| 248 | 5.5676 | 0.0112 |
| 249 | 5.5788 | 0.0112 |
| 250 | 5.5900 | 0.0112 |
| 251 | 5.6012 | 0.0112 |
| 252 | 5.6123 | 0.0111 |
| 253 | 5.6235 | 0.0111 |
| 254 | 5.6346 | 0.0111 |
| 255 | 5.6457 | 0.0111 |
| 256 | 5.6567 | 0.0111 |
| 257 | 5.6678 | 0.0110 |

| | | |
|---|---|---|
| 258 | 5.6788 | 0.0110 |
| 259 | 5.6898 | 0.0110 |
| 260 | 5.7007 | 0.0110 |
| 261 | 5.7117 | 0.0110 |
| 262 | 5.7226 | 0.0109 |
| 263 | 5.7335 | 0.0109 |
| 264 | 5.7444 | 0.0109 |
| 265 | 5.7553 | 0.0109 |
| 266 | 5.7661 | 0.0108 |
| 267 | 5.7770 | 0.0108 |
| 268 | 5.7878 | 0.0108 |
| 269 | 5.7986 | 0.0108 |
| 270 | 5.8093 | 0.0108 |
| 271 | 5.8201 | 0.0107 |
| 272 | 5.8308 | 0.0107 |
| 273 | 5.8415 | 0.0107 |
| 274 | 5.8522 | 0.0107 |
| 275 | 5.8629 | 0.0107 |
| 276 | 5.8735 | 0.0107 |
| 277 | 5.8842 | 0.0106 |
| 278 | 5.8948 | 0.0106 |
| 279 | 5.9054 | 0.0106 |
| 280 | 5.9159 | 0.0106 |
| 281 | 5.9265 | 0.0106 |
| 282 | 5.9370 | 0.0105 |
| 283 | 5.9476 | 0.0105 |
| 284 | 5.9581 | 0.0105 |
| 285 | 5.9685 | 0.0105 |
| 286 | 5.9790 | 0.0105 |
| 287 | 5.9894 | 0.0104 |
| 288 | 5.9999 | 0.0104 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0104 | 0.0014 | 0.0090 |
| 2 | 0.0104 | 0.0014 | 0.0090 |
| 3 | 0.0105 | 0.0014 | 0.0091 |
| 4 | 0.0105 | 0.0014 | 0.0091 |
| 5 | 0.0105 | 0.0014 | 0.0091 |
| 6 | 0.0106 | 0.0014 | 0.0091 |
| 7 | 0.0106 | 0.0014 | 0.0092 |
| 8 | 0.0106 | 0.0014 | 0.0092 |
| 9 | 0.0107 | 0.0014 | 0.0092 |
| 10 | 0.0107 | 0.0014 | 0.0092 |
| 11 | 0.0107 | 0.0014 | 0.0093 |
| 12 | 0.0107 | 0.0014 | 0.0093 |
| 13 | 0.0108 | 0.0014 | 0.0093 |
| 14 | 0.0108 | 0.0014 | 0.0093 |
| 15 | 0.0108 | 0.0014 | 0.0094 |
| 16 | 0.0108 | 0.0014 | 0.0094 |
| 17 | 0.0109 | 0.0015 | 0.0094 |

| | | | |
|---|---|---|---|
| 18 | 0.0109 | 0.0015 | 0.0095 |
| 19 | 0.0110 | 0.0015 | 0.0095 |
| 20 | 0.0110 | 0.0015 | 0.0095 |
| 21 | 0.0110 | 0.0015 | 0.0095 |
| 22 | 0.0110 | 0.0015 | 0.0096 |
| 23 | 0.0111 | 0.0015 | 0.0096 |
| 24 | 0.0111 | 0.0015 | 0.0096 |
| 25 | 0.0111 | 0.0015 | 0.0097 |
| 26 | 0.0112 | 0.0015 | 0.0097 |
| 27 | 0.0112 | 0.0015 | 0.0097 |
| 28 | 0.0112 | 0.0015 | 0.0097 |
| 29 | 0.0113 | 0.0015 | 0.0098 |
| 30 | 0.0113 | 0.0015 | 0.0098 |
| 31 | 0.0114 | 0.0015 | 0.0098 |
| 32 | 0.0114 | 0.0015 | 0.0099 |
| 33 | 0.0114 | 0.0015 | 0.0099 |
| 34 | 0.0114 | 0.0015 | 0.0099 |
| 35 | 0.0115 | 0.0015 | 0.0100 |
| 36 | 0.0115 | 0.0015 | 0.0100 |
| 37 | 0.0116 | 0.0015 | 0.0100 |
| 38 | 0.0116 | 0.0015 | 0.0100 |
| 39 | 0.0116 | 0.0016 | 0.0101 |
| 40 | 0.0117 | 0.0016 | 0.0101 |
| 41 | 0.0117 | 0.0016 | 0.0102 |
| 42 | 0.0117 | 0.0016 | 0.0102 |
| 43 | 0.0118 | 0.0016 | 0.0102 |
| 44 | 0.0118 | 0.0016 | 0.0102 |
| 45 | 0.0119 | 0.0016 | 0.0103 |
| 46 | 0.0119 | 0.0016 | 0.0103 |
| 47 | 0.0120 | 0.0016 | 0.0104 |
| 48 | 0.0120 | 0.0016 | 0.0104 |
| 49 | 0.0120 | 0.0016 | 0.0104 |
| 50 | 0.0121 | 0.0016 | 0.0105 |
| 51 | 0.0121 | 0.0016 | 0.0105 |
| 52 | 0.0122 | 0.0016 | 0.0105 |
| 53 | 0.0122 | 0.0016 | 0.0106 |
| 54 | 0.0122 | 0.0016 | 0.0106 |
| 55 | 0.0123 | 0.0016 | 0.0107 |
| 56 | 0.0123 | 0.0016 | 0.0107 |
| 57 | 0.0124 | 0.0017 | 0.0107 |
| 58 | 0.0124 | 0.0017 | 0.0108 |
| 59 | 0.0125 | 0.0017 | 0.0108 |
| 60 | 0.0125 | 0.0017 | 0.0108 |
| 61 | 0.0126 | 0.0017 | 0.0109 |
| 62 | 0.0126 | 0.0017 | 0.0109 |
| 63 | 0.0127 | 0.0017 | 0.0110 |
| 64 | 0.0127 | 0.0017 | 0.0110 |
| 65 | 0.0128 | 0.0017 | 0.0111 |
| 66 | 0.0128 | 0.0017 | 0.0111 |
| 67 | 0.0129 | 0.0017 | 0.0112 |
| 68 | 0.0129 | 0.0017 | 0.0112 |
| 69 | 0.0130 | 0.0017 | 0.0112 |
| 70 | 0.0130 | 0.0017 | 0.0113 |

| | | | |
|---|---|---|---|
| 71 | 0.0131 | 0.0017 | 0.0113 |
| 72 | 0.0131 | 0.0018 | 0.0114 |
| 73 | 0.0132 | 0.0018 | 0.0114 |
| 74 | 0.0132 | 0.0018 | 0.0115 |
| 75 | 0.0133 | 0.0018 | 0.0115 |
| 76 | 0.0133 | 0.0018 | 0.0116 |
| 77 | 0.0134 | 0.0018 | 0.0116 |
| 78 | 0.0135 | 0.0018 | 0.0117 |
| 79 | 0.0135 | 0.0018 | 0.0117 |
| 80 | 0.0136 | 0.0018 | 0.0118 |
| 81 | 0.0137 | 0.0018 | 0.0118 |
| 82 | 0.0137 | 0.0018 | 0.0119 |
| 83 | 0.0138 | 0.0018 | 0.0119 |
| 84 | 0.0138 | 0.0018 | 0.0120 |
| 85 | 0.0139 | 0.0019 | 0.0121 |
| 86 | 0.0140 | 0.0019 | 0.0121 |
| 87 | 0.0140 | 0.0019 | 0.0122 |
| 88 | 0.0141 | 0.0019 | 0.0122 |
| 89 | 0.0142 | 0.0019 | 0.0123 |
| 90 | 0.0142 | 0.0019 | 0.0123 |
| 91 | 0.0143 | 0.0019 | 0.0124 |
| 92 | 0.0144 | 0.0019 | 0.0124 |
| 93 | 0.0145 | 0.0019 | 0.0125 |
| 94 | 0.0145 | 0.0019 | 0.0126 |
| 95 | 0.0146 | 0.0019 | 0.0127 |
| 96 | 0.0147 | 0.0020 | 0.0127 |
| 97 | 0.0148 | 0.0020 | 0.0128 |
| 98 | 0.0148 | 0.0020 | 0.0128 |
| 99 | 0.0149 | 0.0020 | 0.0129 |
| 100 | 0.0150 | 0.0020 | 0.0130 |
| 101 | 0.0151 | 0.0020 | 0.0131 |
| 102 | 0.0151 | 0.0020 | 0.0131 |
| 103 | 0.0152 | 0.0020 | 0.0132 |
| 104 | 0.0153 | 0.0020 | 0.0133 |
| 105 | 0.0154 | 0.0021 | 0.0134 |
| 106 | 0.0155 | 0.0021 | 0.0134 |
| 107 | 0.0156 | 0.0021 | 0.0135 |
| 108 | 0.0157 | 0.0021 | 0.0136 |
| 109 | 0.0158 | 0.0021 | 0.0137 |
| 110 | 0.0158 | 0.0021 | 0.0137 |
| 111 | 0.0160 | 0.0021 | 0.0138 |
| 112 | 0.0160 | 0.0021 | 0.0139 |
| 113 | 0.0162 | 0.0022 | 0.0140 |
| 114 | 0.0162 | 0.0022 | 0.0141 |
| 115 | 0.0164 | 0.0022 | 0.0142 |
| 116 | 0.0164 | 0.0022 | 0.0143 |
| 117 | 0.0166 | 0.0022 | 0.0144 |
| 118 | 0.0167 | 0.0022 | 0.0144 |
| 119 | 0.0168 | 0.0022 | 0.0146 |
| 120 | 0.0169 | 0.0023 | 0.0146 |
| 121 | 0.0170 | 0.0023 | 0.0148 |
| 122 | 0.0171 | 0.0023 | 0.0148 |
| 123 | 0.0173 | 0.0023 | 0.0150 |

| | | | |
|---|---|---|---|
| 124 | 0.0174 | 0.0023 | 0.0151 |
| 125 | 0.0175 | 0.0023 | 0.0152 |
| 126 | 0.0176 | 0.0024 | 0.0153 |
| 127 | 0.0178 | 0.0024 | 0.0154 |
| 128 | 0.0179 | 0.0024 | 0.0155 |
| 129 | 0.0181 | 0.0024 | 0.0157 |
| 130 | 0.0182 | 0.0024 | 0.0158 |
| 131 | 0.0184 | 0.0025 | 0.0159 |
| 132 | 0.0185 | 0.0025 | 0.0160 |
| 133 | 0.0187 | 0.0025 | 0.0162 |
| 134 | 0.0188 | 0.0025 | 0.0163 |
| 135 | 0.0190 | 0.0025 | 0.0165 |
| 136 | 0.0191 | 0.0026 | 0.0166 |
| 137 | 0.0193 | 0.0026 | 0.0168 |
| 138 | 0.0195 | 0.0026 | 0.0169 |
| 139 | 0.0197 | 0.0026 | 0.0171 |
| 140 | 0.0198 | 0.0026 | 0.0172 |
| 141 | 0.0201 | 0.0027 | 0.0174 |
| 142 | 0.0202 | 0.0027 | 0.0175 |
| 143 | 0.0205 | 0.0027 | 0.0177 |
| 144 | 0.0206 | 0.0028 | 0.0179 |
| 145 | 0.0214 | 0.0029 | 0.0185 |
| 146 | 0.0215 | 0.0029 | 0.0187 |
| 147 | 0.0218 | 0.0029 | 0.0189 |
| 148 | 0.0220 | 0.0029 | 0.0191 |
| 149 | 0.0223 | 0.0030 | 0.0193 |
| 150 | 0.0225 | 0.0030 | 0.0195 |
| 151 | 0.0228 | 0.0030 | 0.0198 |
| 152 | 0.0230 | 0.0031 | 0.0199 |
| 153 | 0.0234 | 0.0031 | 0.0203 |
| 154 | 0.0236 | 0.0031 | 0.0204 |
| 155 | 0.0240 | 0.0032 | 0.0208 |
| 156 | 0.0242 | 0.0032 | 0.0210 |
| 157 | 0.0246 | 0.0033 | 0.0213 |
| 158 | 0.0249 | 0.0033 | 0.0215 |
| 159 | 0.0253 | 0.0034 | 0.0220 |
| 160 | 0.0256 | 0.0034 | 0.0222 |
| 161 | 0.0261 | 0.0035 | 0.0226 |
| 162 | 0.0264 | 0.0035 | 0.0229 |
| 163 | 0.0270 | 0.0036 | 0.0234 |
| 164 | 0.0273 | 0.0036 | 0.0236 |
| 165 | 0.0279 | 0.0037 | 0.0242 |
| 166 | 0.0282 | 0.0038 | 0.0245 |
| 167 | 0.0289 | 0.0039 | 0.0251 |
| 168 | 0.0293 | 0.0039 | 0.0254 |
| 169 | 0.0301 | 0.0040 | 0.0261 |
| 170 | 0.0306 | 0.0041 | 0.0265 |
| 171 | 0.0315 | 0.0042 | 0.0273 |
| 172 | 0.0319 | 0.0043 | 0.0277 |
| 173 | 0.0330 | 0.0044 | 0.0286 |
| 174 | 0.0335 | 0.0045 | 0.0291 |
| 175 | 0.0348 | 0.0046 | 0.0301 |
| 176 | 0.0354 | 0.0047 | 0.0307 |

| | | | |
|---|---|---|---|
| 177 | 0.0369 | 0.0049 | 0.0319 |
| 178 | 0.0377 | 0.0050 | 0.0326 |
| 179 | 0.0394 | 0.0053 | 0.0341 |
| 180 | 0.0404 | 0.0054 | 0.0350 |
| 181 | 0.0426 | 0.0057 | 0.0369 |
| 182 | 0.0438 | 0.0058 | 0.0380 |
| 183 | 0.0467 | 0.0062 | 0.0404 |
| 184 | 0.0483 | 0.0064 | 0.0419 |
| 185 | 0.0410 | 0.0055 | 0.0355 |
| 186 | 0.0433 | 0.0058 | 0.0375 |
| 187 | 0.0492 | 0.0066 | 0.0426 |
| 188 | 0.0530 | 0.0071 | 0.0459 |
| 189 | 0.0639 | 0.0081 | 0.0558 |
| 190 | 0.0721 | 0.0081 | 0.0640 |
| 191 | 0.1031 | 0.0081 | 0.0950 |
| 192 | 0.1418 | 0.0081 | 0.1336 |
| 193 | 0.4438 | 0.0081 | 0.4356 |
| 194 | 0.0840 | 0.0081 | 0.0758 |
| 195 | 0.0578 | 0.0077 | 0.0501 |
| 196 | 0.0460 | 0.0061 | 0.0399 |
| 197 | 0.0502 | 0.0067 | 0.0435 |
| 198 | 0.0452 | 0.0060 | 0.0391 |
| 199 | 0.0414 | 0.0055 | 0.0359 |
| 200 | 0.0385 | 0.0051 | 0.0334 |
| 201 | 0.0361 | 0.0048 | 0.0313 |
| 202 | 0.0341 | 0.0046 | 0.0296 |
| 203 | 0.0325 | 0.0043 | 0.0281 |
| 204 | 0.0310 | 0.0041 | 0.0269 |
| 205 | 0.0297 | 0.0040 | 0.0257 |
| 206 | 0.0286 | 0.0038 | 0.0248 |
| 207 | 0.0276 | 0.0037 | 0.0239 |
| 208 | 0.0267 | 0.0036 | 0.0231 |
| 209 | 0.0258 | 0.0035 | 0.0224 |
| 210 | 0.0251 | 0.0034 | 0.0217 |
| 211 | 0.0244 | 0.0033 | 0.0212 |
| 212 | 0.0238 | 0.0032 | 0.0206 |
| 213 | 0.0232 | 0.0031 | 0.0201 |
| 214 | 0.0227 | 0.0030 | 0.0196 |
| 215 | 0.0222 | 0.0030 | 0.0192 |
| 216 | 0.0217 | 0.0029 | 0.0188 |
| 217 | 0.0208 | 0.0028 | 0.0180 |
| 218 | 0.0203 | 0.0027 | 0.0176 |
| 219 | 0.0200 | 0.0027 | 0.0173 |
| 220 | 0.0196 | 0.0026 | 0.0170 |
| 221 | 0.0192 | 0.0026 | 0.0167 |
| 222 | 0.0189 | 0.0025 | 0.0164 |
| 223 | 0.0186 | 0.0025 | 0.0161 |
| 224 | 0.0183 | 0.0024 | 0.0158 |
| 225 | 0.0180 | 0.0024 | 0.0156 |
| 226 | 0.0177 | 0.0024 | 0.0154 |
| 227 | 0.0175 | 0.0023 | 0.0151 |
| 228 | 0.0172 | 0.0023 | 0.0149 |
| 229 | 0.0170 | 0.0023 | 0.0147 |

| | | | |
|---|---|---|---|
| 230 | 0.0167 | 0.0022 | 0.0145 |
| 231 | 0.0165 | 0.0022 | 0.0143 |
| 232 | 0.0163 | 0.0022 | 0.0141 |
| 233 | 0.0161 | 0.0021 | 0.0140 |
| 234 | 0.0159 | 0.0021 | 0.0138 |
| 235 | 0.0157 | 0.0021 | 0.0136 |
| 236 | 0.0155 | 0.0021 | 0.0135 |
| 237 | 0.0154 | 0.0021 | 0.0133 |
| 238 | 0.0152 | 0.0020 | 0.0132 |
| 239 | 0.0150 | 0.0020 | 0.0130 |
| 240 | 0.0149 | 0.0020 | 0.0129 |
| 241 | 0.0147 | 0.0020 | 0.0127 |
| 242 | 0.0146 | 0.0019 | 0.0126 |
| 243 | 0.0144 | 0.0019 | 0.0125 |
| 244 | 0.0143 | 0.0019 | 0.0124 |
| 245 | 0.0141 | 0.0019 | 0.0122 |
| 246 | 0.0140 | 0.0019 | 0.0121 |
| 247 | 0.0139 | 0.0019 | 0.0120 |
| 248 | 0.0137 | 0.0018 | 0.0119 |
| 249 | 0.0136 | 0.0018 | 0.0118 |
| 250 | 0.0135 | 0.0018 | 0.0117 |
| 251 | 0.0134 | 0.0018 | 0.0116 |
| 252 | 0.0133 | 0.0018 | 0.0115 |
| 253 | 0.0132 | 0.0018 | 0.0114 |
| 254 | 0.0131 | 0.0017 | 0.0113 |
| 255 | 0.0129 | 0.0017 | 0.0112 |
| 256 | 0.0128 | 0.0017 | 0.0111 |
| 257 | 0.0127 | 0.0017 | 0.0110 |
| 258 | 0.0126 | 0.0017 | 0.0110 |
| 259 | 0.0125 | 0.0017 | 0.0109 |
| 260 | 0.0125 | 0.0017 | 0.0108 |
| 261 | 0.0124 | 0.0017 | 0.0107 |
| 262 | 0.0123 | 0.0016 | 0.0106 |
| 263 | 0.0122 | 0.0016 | 0.0106 |
| 264 | 0.0121 | 0.0016 | 0.0105 |
| 265 | 0.0120 | 0.0016 | 0.0104 |
| 266 | 0.0119 | 0.0016 | 0.0103 |
| 267 | 0.0119 | 0.0016 | 0.0103 |
| 268 | 0.0118 | 0.0016 | 0.0102 |
| 269 | 0.0117 | 0.0016 | 0.0101 |
| 270 | 0.0116 | 0.0016 | 0.0101 |
| 271 | 0.0115 | 0.0015 | 0.0100 |
| 272 | 0.0115 | 0.0015 | 0.0099 |
| 273 | 0.0114 | 0.0015 | 0.0099 |
| 274 | 0.0113 | 0.0015 | 0.0098 |
| 275 | 0.0113 | 0.0015 | 0.0098 |
| 276 | 0.0112 | 0.0015 | 0.0097 |
| 277 | 0.0111 | 0.0015 | 0.0096 |
| 278 | 0.0111 | 0.0015 | 0.0096 |
| 279 | 0.0110 | 0.0015 | 0.0095 |
| 280 | 0.0109 | 0.0015 | 0.0095 |
| 281 | 0.0109 | 0.0015 | 0.0094 |
| 282 | 0.0108 | 0.0014 | 0.0094 |

| | | | |
|---|---|---|---|
| 283 | 0.0107 | 0.0014 | 0.0093 |
| 284 | 0.0107 | 0.0014 | 0.0093 |
| 285 | 0.0106 | 0.0014 | 0.0092 |
| 286 | 0.0106 | 0.0014 | 0.0092 |
| 287 | 0.0105 | 0.0014 | 0.0091 |
| 288 | 0.0105 | 0.0014 | 0.0091 |

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Total soil rain loss = 0.73(In)
Total effective rainfall = 5.27(In)
Peak flow rate in flood hydrograph = 48.61(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))

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```
Time(h+m) Volume Ac.Ft   Q(CFS)  0       12.5      25.0      37.5      50.0
------------------------------------------------------------------------
  0+ 5       0.0009      0.13  Q         |         |         |         |
  0+10       0.0064      0.80  Q         |         |         |         |
  0+15       0.0173      1.58  VQ        |         |         |         |
  0+20       0.0300      1.85  VQ        |         |         |         |
  0+25       0.0433      1.92  VQ        |         |         |         |
  0+30       0.0567      1.95  VQ        |         |         |         |
  0+35       0.0702      1.96  VQ        |         |         |         |
  0+40       0.0837      1.96  VQ        |         |         |         |
  0+45       0.0972      1.97  VQ        |         |         |         |
  0+50       0.1108      1.97  VQ        |         |         |         |
  0+55       0.1244      1.98  VQ        |         |         |         |
  1+ 0       0.1381      1.98  VQ        |         |         |         |
  1+ 5       0.1518      1.99  VQ        |         |         |         |
  1+10       0.1655      1.99  VQ        |         |         |         |
  1+15       0.1792      2.00  VQ        |         |         |         |
  1+20       0.1931      2.00  VQ        |         |         |         |
  1+25       0.2069      2.01  |Q        |         |         |         |
  1+30       0.2208      2.02  |Q        |         |         |         |
  1+35       0.2347      2.02  |Q        |         |         |         |
  1+40       0.2487      2.03  |Q        |         |         |         |
  1+45       0.2627      2.03  |Q        |         |         |         |
  1+50       0.2767      2.04  |Q        |         |         |         |
  1+55       0.2908      2.04  |Q        |         |         |         |
  2+ 0       0.3049      2.05  |Q        |         |         |         |
  2+ 5       0.3191      2.06  |Q        |         |         |         |
  2+10       0.3333      2.06  |Q        |         |         |         |
  2+15       0.3475      2.07  |Q        |         |         |         |
  2+20       0.3618      2.08  |Q        |         |         |         |
  2+25       0.3762      2.08  |Q        |         |         |         |
  2+30       0.3906      2.09  |QV       |         |         |         |
  2+35       0.4050      2.09  |QV       |         |         |         |
  2+40       0.4194      2.10  |QV       |         |         |         |
```

```
2+45       0.4340      2.11  |QV       |         |         |         |
2+50       0.4485      2.11  |QV       |         |         |         |
2+55       0.4631      2.12  |QV       |         |         |         |
3+ 0       0.4778      2.13  |QV       |         |         |         |
3+ 5       0.4925      2.13  |QV       |         |         |         |
3+10       0.5072      2.14  |QV       |         |         |         |
3+15       0.5220      2.15  |QV       |         |         |         |
3+20       0.5368      2.15  |QV       |         |         |         |
3+25       0.5517      2.16  |QV       |         |         |         |
3+30       0.5667      2.17  |QV       |         |         |         |
3+35       0.5816      2.18  |QV       |         |         |         |
3+40       0.5967      2.18  |Q V      |         |         |         |
3+45       0.6118      2.19  |Q V      |         |         |         |
3+50       0.6269      2.20  |Q V      |         |         |         |
3+55       0.6421      2.20  |Q V      |         |         |         |
4+ 0       0.6573      2.21  |Q V      |         |         |         |
4+ 5       0.6726      2.22  |Q V      |         |         |         |
4+10       0.6880      2.23  |Q V      |         |         |         |
4+15       0.7033      2.24  |Q V      |         |         |         |
4+20       0.7188      2.24  |Q V      |         |         |         |
4+25       0.7343      2.25  |Q V      |         |         |         |
4+30       0.7499      2.26  |Q V      |         |         |         |
4+35       0.7655      2.27  |Q V      |         |         |         |
4+40       0.7811      2.28  |Q  V     |         |         |         |
4+45       0.7969      2.28  |Q  V     |         |         |         |
4+50       0.8127      2.29  |Q  V     |         |         |         |
4+55       0.8285      2.30  |Q  V     |         |         |         |
5+ 0       0.8444      2.31  |Q  V     |         |         |         |
5+ 5       0.8604      2.32  |Q  V     |         |         |         |
5+10       0.8764      2.33  |Q  V     |         |         |         |
5+15       0.8925      2.34  |Q  V     |         |         |         |
5+20       0.9086      2.34  |Q  V     |         |         |         |
5+25       0.9248      2.35  |Q  V     |         |         |         |
5+30       0.9411      2.36  |Q  V     |         |         |         |
5+35       0.9574      2.37  |Q  V     |         |         |         |
5+40       0.9738      2.38  |Q   V    |         |         |         |
5+45       0.9903      2.39  |Q   V    |         |         |         |
5+50       1.0068      2.40  |Q   V    |         |         |         |
5+55       1.0234      2.41  |Q   V    |         |         |         |
6+ 0       1.0401      2.42  |Q   V    |         |         |         |
6+ 5       1.0568      2.43  |Q   V    |         |         |         |
6+10       1.0736      2.44  |Q   V    |         |         |         |
6+15       1.0905      2.45  |Q   V    |         |         |         |
6+20       1.1074      2.46  |Q   V    |         |         |         |
6+25       1.1244      2.47  |Q   V    |         |         |         |
6+30       1.1415      2.48  |Q   V    |         |         |         |
6+35       1.1587      2.49  |Q   V    |         |         |         |
6+40       1.1759      2.50  | Q   V   |         |         |         |
6+45       1.1932      2.51  | Q   V   |         |         |         |
6+50       1.2106      2.52  | Q   V   |         |         |         |
6+55       1.2281      2.54  | Q   V   |         |         |         |
7+ 0       1.2456      2.55  | Q   V   |         |         |         |
7+ 5       1.2632      2.56  | Q   V   |         |         |         |
```

```
 7+10       1.2809      2.57  | Q   V   |         |         |         |
 7+15       1.2987      2.58  | Q   V   |         |         |         |
 7+20       1.3166      2.59  | Q   V   |         |         |         |
 7+25       1.3345      2.61  | Q   V   |         |         |         |
 7+30       1.3526      2.62  | Q   V   |         |         |         |
 7+35       1.3707      2.63  | Q    V  |         |         |         |
 7+40       1.3889      2.64  | Q    V  |         |         |         |
 7+45       1.4072      2.66  | Q    V  |         |         |         |
 7+50       1.4256      2.67  | Q    V  |         |         |         |
 7+55       1.4441      2.68  | Q    V  |         |         |         |
 8+ 0       1.4627      2.70  | Q    V  |         |         |         |
 8+ 5       1.4814      2.71  | Q    V  |         |         |         |
 8+10       1.5001      2.73  | Q    V  |         |         |         |
 8+15       1.5190      2.74  | Q    V  |         |         |         |
 8+20       1.5380      2.75  | Q    V  |         |         |         |
 8+25       1.5570      2.77  | Q     V |         |         |         |
 8+30       1.5762      2.78  | Q     V |         |         |         |
 8+35       1.5955      2.80  | Q     V |         |         |         |
 8+40       1.6149      2.81  | Q     V |         |         |         |
 8+45       1.6344      2.83  | Q     V |         |         |         |
 8+50       1.6540      2.85  | Q     V |         |         |         |
 8+55       1.6737      2.86  | Q     V |         |         |         |
 9+ 0       1.6935      2.88  | Q     V |         |         |         |
 9+ 5       1.7134      2.90  | Q     V |         |         |         |
 9+10       1.7335      2.91  | Q     V |         |         |         |
 9+15       1.7537      2.93  | Q      V|         |         |         |
 9+20       1.7740      2.95  | Q      V|         |         |         |
 9+25       1.7944      2.97  | Q      V|         |         |         |
 9+30       1.8150      2.98  | Q      V|         |         |         |
 9+35       1.8356      3.00  | Q      V|         |         |         |
 9+40       1.8565      3.02  | Q      V|         |         |         |
 9+45       1.8774      3.04  | Q      V|         |         |         |
 9+50       1.8985      3.06  | Q      V|         |         |         |
 9+55       1.9197      3.08  | Q      V|         |         |         |
10+ 0       1.9411      3.10  | Q      V|         |         |         |
10+ 5       1.9626      3.12  | Q       V         |         |         |
10+10       1.9842      3.14  | Q       V         |         |         |
10+15       2.0060      3.17  | Q       V         |         |         |
10+20       2.0280      3.19  | Q       V         |         |         |
10+25       2.0501      3.21  | Q       V         |         |         |
10+30       2.0724      3.23  | Q       V         |         |         |
10+35       2.0948      3.26  | Q       V         |         |         |
10+40       2.1174      3.28  | Q       V         |         |         |
10+45       2.1402      3.31  | Q       |V        |         |         |
10+50       2.1632      3.33  | Q       |V        |         |         |
10+55       2.1863      3.36  | Q       |V        |         |         |
11+ 0       2.2096      3.39  | Q       |V        |         |         |
11+ 5       2.2331      3.41  | Q       |V        |         |         |
11+10       2.2568      3.44  | Q       |V        |         |         |
11+15       2.2807      3.47  | Q       |V        |         |         |
11+20       2.3048      3.50  | Q       |V        |         |         |
11+25       2.3291      3.53  | Q       |V        |         |         |
11+30       2.3537      3.56  | Q       | V       |         |         |
```

```
11+35       2.3784      3.59  | Q       | V       |         |         |
11+40       2.4034      3.63  | Q       | V       |         |         |
11+45       2.4286      3.66  | Q       | V       |         |         |
11+50       2.4540      3.69  | Q       | V       |         |         |
11+55       2.4797      3.73  | Q       | V       |         |         |
12+ 0       2.5056      3.77  |  Q      | V       |         |         |
12+ 5       2.5319      3.81  |  Q      |  V      |         |         |
12+10       2.5586      3.88  |  Q      |  V      |         |         |
12+15       2.5859      3.96  |  Q      |  V      |         |         |
12+20       2.6135      4.01  |  Q      |  V      |         |         |
12+25       2.6414      4.05  |  Q      |  V      |         |         |
12+30       2.6696      4.10  |  Q      |  V      |         |         |
12+35       2.6982      4.15  |  Q      |  V      |         |         |
12+40       2.7271      4.19  |  Q      |   V     |         |         |
12+45       2.7563      4.24  |  Q      |   V     |         |         |
12+50       2.7858      4.29  |  Q      |   V     |         |         |
12+55       2.8158      4.35  |  Q      |   V     |         |         |
13+ 0       2.8461      4.40  |  Q      |   V     |         |         |
13+ 5       2.8768      4.46  |  Q      |   V     |         |         |
13+10       2.9079      4.52  |  Q      |   V     |         |         |
13+15       2.9394      4.58  |  Q      |    V    |         |         |
13+20       2.9714      4.64  |  Q      |    V    |         |         |
13+25       3.0038      4.71  |  Q      |    V    |         |         |
13+30       3.0367      4.78  |  Q      |    V    |         |         |
13+35       3.0702      4.85  |  Q      |    V    |         |         |
13+40       3.1041      4.93  |  Q      |    V    |         |         |
13+45       3.1386      5.01  |   Q     |     V   |         |         |
13+50       3.1737      5.10  |   Q     |     V   |         |         |
13+55       3.2094      5.19  |   Q     |     V   |         |         |
14+ 0       3.2458      5.28  |   Q     |     V   |         |         |
14+ 5       3.2828      5.38  |   Q     |     V   |         |         |
14+10       3.3206      5.49  |   Q     |      V  |         |         |
14+15       3.3592      5.60  |   Q     |      V  |         |         |
14+20       3.3987      5.72  |   Q     |      V  |         |         |
14+25       3.4390      5.85  |   Q     |      V  |         |         |
14+30       3.4802      5.99  |   Q     |      V  |         |         |
14+35       3.5225      6.14  |   Q     |       V |         |         |
14+40       3.5659      6.30  |    Q    |       V |         |         |
14+45       3.6104      6.47  |    Q    |       V |         |         |
14+50       3.6563      6.66  |    Q    |       V |         |         |
14+55       3.7036      6.86  |    Q    |        V|         |         |
15+ 0       3.7524      7.09  |    Q    |        V|         |         |
15+ 5       3.8030      7.34  |    Q    |        V|         |         |
15+10       3.8555      7.63  |     Q   |        V|         |         |
15+15       3.9102      7.94  |     Q   |         V         |         |
15+20       3.9674      8.31  |     Q   |         V         |         |
15+25       4.0265      8.59  |     Q   |         V         |         |
15+30       4.0840      8.35  |     Q   |         |V        |         |
15+35       4.1397      8.09  |     Q   |         |V        |         |
15+40       4.1984      8.52  |     Q   |         |V        |         |
15+45       4.2628      9.36  |      Q  |         |V        |         |
15+50       4.3361     10.64  |       Q |         | V       |         |
15+55       4.4234     12.67  |         Q         | V       |         |
```

```
16+ 0       4.5375     16.56  |         |  Q      |  V      |         |
16+ 5       4.7209     26.64  |         |         |Q  V     |         |
16+10       5.0556     48.60  |         |         |     V   |       Q |
16+15       5.3904     48.61  |         |         |      V  |       Q |
16+20       5.5623     24.97  |         |        Q|       V |         |
16+25       5.6553     13.50  |         Q         |        V|         |
16+30       5.7275     10.49  |       Q |         |        V|         |
16+35       5.7889      8.91  |      Q  |         |        V|         |
16+40       5.8455      8.22  |     Q   |         |         V         |
16+45       5.8978      7.59  |     Q   |         |         V         |
16+50       5.9466      7.08  |    Q    |         |         V         |
16+55       5.9924      6.65  |    Q    |         |         V         |
17+ 0       6.0356      6.28  |    Q    |         |         |V        |
17+ 5       6.0768      5.98  |   Q     |         |         |V        |
17+10       6.1161      5.71  |   Q     |         |         |V        |
17+15       6.1538      5.47  |   Q     |         |         |V        |
17+20       6.1901      5.27  |   Q     |         |         |V        |
17+25       6.2251      5.08  |   Q     |         |         | V       |
17+30       6.2590      4.92  |  Q      |         |         | V       |
17+35       6.2918      4.77  |  Q      |         |         | V       |
17+40       6.3237      4.63  |  Q      |         |         | V       |
17+45       6.3548      4.51  |  Q      |         |         | V       |
17+50       6.3850      4.39  |  Q      |         |         | V       |
17+55       6.4145      4.28  |  Q      |         |         | V       |
18+ 0       6.4434      4.19  |  Q      |         |         |  V      |
18+ 5       6.4715      4.09  |  Q      |         |         |  V      |
18+10       6.4988      3.97  |  Q      |         |         |  V      |
18+15       6.5254      3.85  |  Q      |         |         |  V      |
18+20       6.5513      3.76  |  Q      |         |         |  V      |
18+25       6.5767      3.69  | Q       |         |         |  V      |
18+30       6.6016      3.62  | Q       |         |         |  V      |
18+35       6.6261      3.56  | Q       |         |         |   V     |
18+40       6.6502      3.49  | Q       |         |         |   V     |
18+45       6.6739      3.44  | Q       |         |         |   V     |
18+50       6.6972      3.38  | Q       |         |         |   V     |
18+55       6.7201      3.33  | Q       |         |         |   V     |
19+ 0       6.7427      3.28  | Q       |         |         |   V     |
19+ 5       6.7649      3.23  | Q       |         |         |   V     |
19+10       6.7868      3.18  | Q       |         |         |   V     |
19+15       6.8085      3.14  | Q       |         |         |    V    |
19+20       6.8298      3.10  | Q       |         |         |    V    |
19+25       6.8509      3.06  | Q       |         |         |    V    |
19+30       6.8716      3.02  | Q       |         |         |    V    |
19+35       6.8922      2.98  | Q       |         |         |    V    |
19+40       6.9124      2.94  | Q       |         |         |    V    |
19+45       6.9325      2.91  | Q       |         |         |    V    |
19+50       6.9523      2.88  | Q       |         |         |    V    |
19+55       6.9719      2.84  | Q       |         |         |    V    |
20+ 0       6.9912      2.81  | Q       |         |         |    V    |
20+ 5       7.0104      2.78  | Q       |         |         |     V   |
20+10       7.0293      2.75  | Q       |         |         |     V   |
20+15       7.0481      2.72  | Q       |         |         |     V   |
20+20       7.0666      2.70  | Q       |         |         |     V   |
```

```
  20+25       7.0850      2.67  | Q       |         |         |     V   |
  20+30       7.1032      2.64  | Q       |         |         |     V   |
  20+35       7.1212      2.62  | Q       |         |         |     V   |
  20+40       7.1391      2.59  | Q       |         |         |     V   |
  20+45       7.1568      2.57  | Q       |         |         |     V   |
  20+50       7.1743      2.55  | Q       |         |         |     V   |
  20+55       7.1917      2.52  | Q       |         |         |     V   |
  21+ 0       7.2089      2.50  | Q       |         |         |      V  |
  21+ 5       7.2260      2.48  |Q        |         |         |      V  |
  21+10       7.2429      2.46  |Q        |         |         |      V  |
  21+15       7.2597      2.44  |Q        |         |         |      V  |
  21+20       7.2763      2.42  |Q        |         |         |      V  |
  21+25       7.2929      2.40  |Q        |         |         |      V  |
  21+30       7.3092      2.38  |Q        |         |         |      V  |
  21+35       7.3255      2.36  |Q        |         |         |      V  |
  21+40       7.3416      2.34  |Q        |         |         |      V  |
  21+45       7.3576      2.32  |Q        |         |         |      V  |
  21+50       7.3735      2.31  |Q        |         |         |      V  |
  21+55       7.3893      2.29  |Q        |         |         |       V |
  22+ 0       7.4050      2.27  |Q        |         |         |       V |
  22+ 5       7.4205      2.26  |Q        |         |         |       V |
  22+10       7.4360      2.24  |Q        |         |         |       V |
  22+15       7.4513      2.23  |Q        |         |         |       V |
  22+20       7.4665      2.21  |Q        |         |         |       V |
  22+25       7.4816      2.20  |Q        |         |         |       V |
  22+30       7.4967      2.18  |Q        |         |         |       V |
  22+35       7.5116      2.17  |Q        |         |         |       V |
  22+40       7.5264      2.15  |Q        |         |         |       V |
  22+45       7.5411      2.14  |Q        |         |         |       V |
  22+50       7.5558      2.13  |Q        |         |         |       V |
  22+55       7.5703      2.11  |Q        |         |         |       V |
  23+ 0       7.5848      2.10  |Q        |         |         |        V|
  23+ 5       7.5992      2.09  |Q        |         |         |        V|
  23+10       7.6135      2.07  |Q        |         |         |        V|
  23+15       7.6277      2.06  |Q        |         |         |        V|
  23+20       7.6418      2.05  |Q        |         |         |        V|
  23+25       7.6558      2.04  |Q        |         |         |        V|
  23+30       7.6698      2.03  |Q        |         |         |        V|
  23+35       7.6836      2.01  |Q        |         |         |        V|
  23+40       7.6974      2.00  |Q        |         |         |        V|
  23+45       7.7112      1.99  |Q        |         |         |        V|
  23+50       7.7248      1.98  |Q        |         |         |        V|
  23+55       7.7384      1.97  |Q        |         |         |        V|
  24+ 0       7.7519      1.96  |Q        |         |         |        V|
  24+ 5       7.7644      1.82  |Q        |         |         |        V|
  24+10       7.7723      1.14  Q         |         |         |        V|
  24+15       7.7747      0.36  Q         |         |         |        V|
  24+20       7.7754      0.09  Q         |         |         |        V|
  24+25       7.7755      0.03  Q         |         |         |         V
-----------------------------------------------------------------------
```

# APPENDIX B: GROVE AVENUE STORM DRAIN HYDROLOGY CALCULATIONS

# APPENDIX B.1: RATIONAL METHOD ANALYSIS, RERUN FUSCOE MODELS TO GROVE

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/06/25

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PORTION OF MDP DA XIII NODE 1 TO 2
PROPOSED DEV DA B
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

MOBILE HOME PARK subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2500 Max loss rate(Fm)= 0.244(In/Hr)
Initial subarea data:
Initial area flow distance = 934.000(Ft.)
Top (of initial area) elevation = 703.000(Ft.)
Bottom (of initial area) elevation = 695.000(Ft.)
Difference in elevation = 8.000(Ft.)
Slope = 0.00857 s(%)= 0.86
TC = k(0.336)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.425 min.
Rainfall intensity = 2.947(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.825
Subarea runoff = 24.319(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 0.250
Initial area Fm value = 0.244(In/Hr)

```
End of computations, Total Study Area =          10.00 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.250
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

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Rational Hydrology Study Date: 05/06/25

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PORTION OF MDP DA XIII NODE 3 TO 5
PROPOSED DEV DA B
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 3.000 to Point/Station 5.000
**** INITIAL AREA EVALUATION ****

APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.196(In/Hr)
Initial subarea data:
Initial area flow distance = 920.000(Ft.)
Top (of initial area) elevation = 696.000(Ft.)
Bottom (of initial area) elevation = 688.000(Ft.)
Difference in elevation = 8.000(Ft.)
Slope = 0.00870 s(%)= 0.87
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.829 min.
Rainfall intensity = 3.028(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.842
Subarea runoff = 25.492(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 0.200
Initial area Fm value = 0.196(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station        5.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     10.000(Ac.)
Runoff from this stream =     25.492(CFS)
Time of concentration =   12.83 min.
Rainfall intensity =     3.028(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Initial subarea data:
Initial area flow distance =   920.000(Ft.)
Top (of initial area) elevation =   696.000(Ft.)
Bottom (of initial area) elevation =   688.000(Ft.)
Difference in elevation =     8.000(Ft.)
Slope =    0.00870  s(%)=       0.87
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.829 min.
Rainfall intensity =      3.028(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.842
Subarea runoff =     25.492(CFS)
Total initial stream area =       10.000(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.196(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     10.000(Ac.)
Runoff from this stream =     25.492(CFS)
Time of concentration =   12.83 min.
```

```
Rainfall intensity =     3.028(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     25.49    10.000     12.83    0.196      3.028
2     25.49    10.000     12.83    0.196      3.028
Qmax(1) =
         1.000 *    1.000 *    25.492) +
         1.000 *    1.000 *    25.492) + =      50.983
Qmax(2) =
         1.000 *    1.000 *    25.492) +
         1.000 *    1.000 *    25.492) + =      50.983

Total of 2 main streams to confluence:
Flow rates before confluence point:
      26.492      26.492
Maximum flow rates at confluence using above data:
       50.983       50.983
Area of streams before confluence:
       10.000       10.000
Effective area values after confluence:
       20.000       20.000


Results of confluence:
Total flow rate =     50.983(CFS)
Time of concentration =    12.829 min.
Effective stream area after confluence  =     20.000(Ac.)
Study area average Pervious fraction(Ap) =  0.200
Study area average soil loss rate(Fm) =    0.196(In/Hr)
Study area total =      20.00(Ac.)
End of computations, Total Study Area =           20.00 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.200
Area averaged SCS curve number =  32.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/06/25

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PORTION OF MDP DA XIII NODE 6 TO 11
PROPOSED DEV DA B
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 6.000 to Point/Station 7.000
**** INITIAL AREA EVALUATION ****

APARTMENT subarea type
Decimal fraction soil group A = 0.950
Decimal fraction soil group B = 0.050
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 33.20
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.194(In/Hr)
Initial subarea data:
Initial area flow distance = 762.000(Ft.)
Top (of initial area) elevation = 693.000(Ft.)
Bottom (of initial area) elevation = 687.000(Ft.)
Difference in elevation = 6.000(Ft.)
Slope = 0.00787 s(%)= 0.79
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.136 min.
Rainfall intensity = 3.131(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.844
Subarea runoff = 16.729(CFS)
Total initial stream area = 6.330(Ac.)
Pervious area fraction = 0.200
Initial area Fm value = 0.194(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        8.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   687.000(Ft.)
End of street segment elevation =   685.000(Ft.)
Length of street segment  =   365.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     24.194(CFS)
Depth of flow =   0.575(Ft.), Average velocity =   2.614(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  21.157(Ft.)
Flow velocity =   2.61(Ft/s)
Travel time =    2.33 min.     TC =   14.46  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 0.790
Decimal fraction soil group B = 0.210
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 37.04
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.188(In/Hr)
Rainfall intensity =      2.818(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.839
Subarea runoff =     14.806(CFS) for    7.010(Ac.)
Total runoff =     31.535(CFS)
Effective area this stream =       13.34(Ac.)
Total Study Area (Main Stream No. 1) =       13.34(Ac.)
Area averaged Fm value =    0.191(In/Hr)
Street flow at end of street =     31.535(CFS)
Half street flow at end of street =     15.768(CFS)
Depth of flow =   0.621(Ft.), Average velocity =   2.790(Ft/s)
Flow width (from curb towards crown)=  23.452(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station       11.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
```

```
____________________________________________________________________
Upstream point/station elevation =   673.000(Ft.)
Downstream point/station elevation =   656.000(Ft.)
Pipe length  =   695.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    31.535(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    31.535(CFS)
Normal flow depth in pipe =   13.57(In.)
Flow top width inside pipe =   34.89(In.)
Critical Depth =   21.85(In.)
Pipe flow velocity =     12.92(Ft/s)
Travel time through pipe =    0.90 min.
Time of concentration (TC) =    15.36 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station       11.000
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     13.340(Ac.)
Runoff from this stream =     31.535(CFS)
Time of concentration =   15.36 min.
Rainfall intensity =     2.718(In/Hr)
Area averaged loss rate (Fm) =    0.1912(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station       11.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Initial subarea data:
Initial area flow distance =   805.000(Ft.)
Top (of initial area) elevation =   688.000(Ft.)
Bottom (of initial area) elevation =   684.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00497  s(%)=       0.50
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.602 min.
Rainfall intensity =      2.924(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.840
Subarea runoff =     14.927(CFS)
Total initial stream area =        6.080(Ac.)
```

```
Pervious area fraction = 0.200
Initial area Fm value =    0.196(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station       11.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.080(Ac.)
Runoff from this stream =     14.927(CFS)
Time of concentration =   13.60 min.
Rainfall intensity =     2.924(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       11.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Initial subarea data:
Initial area flow distance =   805.000(Ft.)
Top (of initial area) elevation =   690.000(Ft.)
Bottom (of initial area) elevation =   684.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00745  s(%)=       0.75
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.543 min.
Rainfall intensity =      3.069(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.843
Subarea runoff =     18.156(CFS)
Total initial stream area =        7.020(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.196(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       11.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      7.020(Ac.)
```

Runoff from this stream = 18.156(CFS)
Time of concentration = 12.54 min.
Rainfall intensity = 3.069(In/Hr)
Area averaged loss rate (Fm) = 0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:

| Stream No. | Flow rate (CFS) | Area (Ac.) | TC (min) | Fm (In/Hr) | Rainfall Intensity (In/Hr) |
|---|---|---|---|---|---|
| 1 | 31.54 | 13.340 | 15.36 | 0.191 | 2.718 |
| 2 | 14.93 | 6.080 | 13.60 | 0.196 | 2.924 |
| 3 | 18.16 | 7.020 | 12.54 | 0.196 | 3.069 |

```
Qmax(1) =
         1.000 *    1.000 *    31.535) +
         0.925 *    1.000 *    14.927) +
         0.878 *    1.000 *    18.156) + =      61.274
Qmax(2) =
         1.081 *    0.886 *    31.535) +
         1.000 *    1.000 *    14.927) +
         0.949 *    1.000 *    18.156) + =      62.361
Qmax(3) =
         1.139 *    0.817 *    31.535) +
         1.053 *    0.922 *    14.927) +
         1.000 *    1.000 *    18.156) + =      61.988
```

Total of 3 main streams to confluence:
Flow rates before confluence point:
32.535 15.927 19.156
Maximum flow rates at confluence using above data:
61.274 62.361 61.988
Area of streams before confluence:
13.340 6.080 7.020
Effective area values after confluence:
26.440 24.914 23.520

Results of confluence:
Total flow rate = 62.361(CFS)
Time of concentration = 13.602 min.
Effective stream area after confluence = 24.914(Ac.)
Study area average Pervious fraction(Ap) = 0.200
Study area average soil loss rate(Fm) = 0.193(In/Hr)
Study area total = 26.44(Ac.)
End of computations, Total Study Area = 26.44 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.200
Area averaged SCS curve number = 33.6

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/06/25

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PORTION OF MDP DA XIII NODE 12 TO 15
PROPOSED DEV DA B
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 12.000 to Point/Station 13.000
**** INITIAL AREA EVALUATION ****

PARK subarea
Decimal fraction soil group A = 0.280
Decimal fraction soil group B = 0.720
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 49.28
Pervious ratio(Ap) = 0.8500 Max loss rate(Fm)= 0.695(In/Hr)
Initial subarea data:
Initial area flow distance = 786.000(Ft.)
Top (of initial area) elevation = 684.000(Ft.)
Bottom (of initial area) elevation = 677.000(Ft.)
Difference in elevation = 7.000(Ft.)
Slope = 0.00891 s(%)= 0.89
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 17.872 min.
Rainfall intensity = 2.482(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.648
Subarea runoff = 10.724(CFS)
Total initial stream area = 6.670(Ac.)
Pervious area fraction = 0.850
Initial area Fm value = 0.695(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       15.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   677.000(Ft.)
End of street segment elevation =   673.000(Ft.)
Length of street segment  =   652.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     12.161(CFS)
Depth of flow =   0.467(Ft.), Average velocity =   2.308(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  15.756(Ft.)
Flow velocity =   2.31(Ft/s)
Travel time =    4.71 min.     TC =   22.58  min.
 Adding area flow to street
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Rainfall intensity =      2.157(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.589
Subarea runoff =      2.751(CFS) for    3.940(Ac.)
Total runoff =     13.475(CFS)
Effective area this stream =       10.61(Ac.)
Total Study Area (Main Stream No. 1) =       10.61(Ac.)
Area averaged Fm value =    0.746(In/Hr)
Street flow at end of street =     13.475(CFS)
Half street flow at end of street =      6.738(CFS)
Depth of flow =   0.480(Ft.), Average velocity =   2.366(Ft/s)
Flow width (from curb towards crown)=  16.419(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station       15.000
**** CONFLUENCE OF MAIN STREAMS ****
```

```
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     10.610(Ac.)
Runoff from this stream =     13.475(CFS)
Time of concentration =   22.58 min.
Rainfall intensity =     2.157(In/Hr)
Area averaged loss rate (Fm) =    0.7458(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       15.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Initial subarea data:
Initial area flow distance =   691.000(Ft.)
Top (of initial area) elevation =   689.000(Ft.)
Bottom (of initial area) elevation =   673.000(Ft.)
Difference in elevation =    16.000(Ft.)
Slope =    0.02315  s(%)=       2.32
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.022 min.
Rainfall intensity =      2.871(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.639
Subarea runoff =      5.507(CFS)
Total initial stream area =        3.000(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.831(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       15.000
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.000(Ac.)
Runoff from this stream =      5.507(CFS)
Time of concentration =   14.02 min.
Rainfall intensity =     2.871(In/Hr)
Area averaged loss rate (Fm) =    0.8311(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:
```

| Stream No. | Flow rate (CFS) | Area (Ac.) | TC (min) | Fm (In/Hr) | Rainfall Intensity (In/Hr) |
|---|---|---|---|---|---|
| 1 | 13.48 | 10.610 | 22.58 | 0.746 | 2.157 |
| 2 | 5.51 | 3.000 | 14.02 | 0.831 | 2.871 |

```
Qmax(1) =
         1.000 *    1.000 *    13.475) +
         0.650 *    1.000 *     5.507) + =      17.055
Qmax(2) =
         1.506 *    0.621 *    13.475) +
         1.000 *    1.000 *     5.507) + =      18.107

Total of 2 main streams to confluence:
Flow rates before confluence point:
      14.475       6.507
Maximum flow rates at confluence using above data:
       17.055       18.107
Area of streams before confluence:
       10.610        3.000
Effective area values after confluence:
       13.610        9.589


Results of confluence:
Total flow rate =     18.107(CFS)
Time of concentration =    14.022 min.
Effective stream area after confluence  =      9.589(Ac.)
Study area average Pervious fraction(Ap) =  0.850
Study area average soil loss rate(Fm) =    0.765(In/Hr)
Study area total =      13.61(Ac.)
End of computations, Total Study Area =           13.61 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.850
Area averaged SCS curve number =  40.5
```

## APPENDIX B.2: RATIONAL METHOD ANALYSIS, GROVE MAINLINE, AREA E (EXCLUDES E3 & E4)

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/08/25

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GROVE SD TRIBUTARY AREA
OVERALL: JLC-MCC-MDP REV + ONTARIO RANCH

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 66.000 to Point/Station 66.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.4000 Max loss rate(Fm)= 0.391(In/Hr)
Rainfall intensity = 1.776(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 31.21 min. Rain intensity = 1.78(In/Hr)
Total area this stream = 683.10(Ac.)
Total Study Area (Main Stream No. 1) = 683.10(Ac.)
Total runoff = 874.33(CFS)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 66.000 to Point/Station 66.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 665.200(Ft.)
Downstream point/station elevation = 660.400(Ft.)
Pipe length = 677.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 874.330(CFS)
Nearest computed pipe diameter = 102.00(In.)

```
Calculated individual pipe flow  =   874.330(CFS)
Normal flow depth in pipe =   80.81(In.)
Flow top width inside pipe =   82.76(In.)
Critical Depth =   87.74(In.)
Pipe flow velocity =     18.12(Ft/s)
Travel time through pipe =    0.62 min.
Time of concentration (TC) =    31.83 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       66.000 to Point/Station       66.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    683.100(Ac.)
Runoff from this stream =    874.330(CFS)
Time of concentration =   31.83 min.
Rainfall intensity =     1.755(In/Hr)
Area averaged loss rate (Fm) =    0.3911(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station       66.100
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Rainfall intensity =      3.028(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  12.83 min.  Rain intensity =       3.03(In/Hr)
Total area this stream =        20.00(Ac.)
Total Study Area (Main Stream No. 2) =      703.10(Ac.)
Total runoff =     50.98(CFS)


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Process from Point/Station        5.000 to Point/Station       66.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     20.000(Ac.)
Runoff from this stream =     50.983(CFS)
Time of concentration =   12.83 min.
Rainfall intensity =     3.028(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:
```

```
Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    874.33   683.100     31.83    0.391      1.755
2     50.98    20.000     12.83    0.196      3.028
Qmax(1) =
         1.000 *    1.000 *   874.330) +
         0.551 *    1.000 *    50.983) + =     902.405
Qmax(2) =
         1.933 *    0.403 *   874.330) +
         1.000 *    1.000 *    50.983) + =     732.096

Total of 2 main streams to confluence:
Flow rates before confluence point:
     875.330      51.983
Maximum flow rates at confluence using above data:
      902.405      732.096
Area of streams before confluence:
      683.100       20.000
Effective area values after confluence:
      703.100      295.300


Results of confluence:
Total flow rate =    902.405(CFS)
Time of concentration =    31.833 min.
Effective stream area after confluence  =    703.100(Ac.)
Study area average Pervious fraction(Ap) =  0.394
Study area average soil loss rate(Fm) =    0.386(In/Hr)
Study area total =     703.10(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       66.100 to Point/Station       66.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   660.400(Ft.)
Downstream point/station elevation =   657.200(Ft.)
Pipe length  =   458.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   902.405(CFS)
Nearest computed pipe diameter  =    105.00(In.)
Calculated individual pipe flow  =   902.405(CFS)
Normal flow depth in pipe =   80.25(In.)
Flow top width inside pipe =   89.13(In.)
Critical Depth =   88.84(In.)
Pipe flow velocity =     18.29(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    32.25 min.


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Process from Point/Station       66.100 to Point/Station       66.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    703.100(Ac.)
Runoff from this stream =    902.405(CFS)
Time of concentration =   32.25 min.
Rainfall intensity =     1.742(In/Hr)
Area averaged loss rate (Fm) =    0.3856(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3943
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       66.200
**** USER DEFINED FLOW INFORMATION AT A POINT ****
____________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 33.60
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.194(In/Hr)
Rainfall intensity =      2.924(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  13.60 min.  Rain intensity =       2.92(In/Hr)
Total area this stream =        26.44(Ac.)
Total Study Area (Main Stream No. 2) =      729.54(Ac.)
Total runoff =     62.36(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       66.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     26.440(Ac.)
Runoff from this stream =     62.361(CFS)
Time of concentration =   13.60 min.
Rainfall intensity =     2.924(In/Hr)
Area averaged loss rate (Fm) =    0.1936(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    902.40   703.100     32.25    0.386      1.742
2     62.36    26.440     13.60    0.194      2.924
Qmax(1) =
         1.000 *    1.000 *   902.405) +
         0.567 *    1.000 *    62.361) + =     937.767
```

```
Qmax(2) =
         1.872 *    0.422 *   902.405) +
         1.000 *    1.000 *    62.361) + =     774.697

Total of 2 main streams to confluence:
Flow rates before confluence point:
     903.405      63.361
Maximum flow rates at confluence using above data:
      937.767      774.697
Area of streams before confluence:
      703.100       26.440
Effective area values after confluence:
      729.540      322.986


Results of confluence:
Total flow rate =    937.767(CFS)
Time of concentration =    32.250 min.
Effective stream area after confluence  =    729.540(Ac.)
Study area average Pervious fraction(Ap) =  0.387
Study area average soil loss rate(Fm) =    0.379(In/Hr)
Study area total =     729.54(Ac.)


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Process from Point/Station       66.200 to Point/Station       66.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   657.200(Ft.)
Downstream point/station elevation =   655.700(Ft.)
Pipe length  =   214.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   937.767(CFS)
Nearest computed pipe diameter  =    105.00(In.)
Calculated individual pipe flow  =   937.767(CFS)
Normal flow depth in pipe =   83.06(In.)
Flow top width inside pipe =   85.37(In.)
Critical Depth =   90.23(In.)
Pipe flow velocity =     18.37(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    32.44 min.


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Process from Point/Station       66.200 to Point/Station       66.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    729.540(Ac.)
Runoff from this stream =    937.767(CFS)
Time of concentration =   32.44 min.
Rainfall intensity =     1.735(In/Hr)
Area averaged loss rate (Fm) =    0.3786(In/Hr)
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Area averaged Pervious ratio (Ap) = 0.3873
Program is now starting with Main Stream No. 2


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Process from Point/Station       15.000 to Point/Station       66.300
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 40.50
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.775(In/Hr)
Rainfall intensity =      2.871(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  14.02 min.  Rain intensity =       2.87(In/Hr)
Total area this stream =         9.59(Ac.)
Total Study Area (Main Stream No. 2) =      739.13(Ac.)
Total runoff =     18.11(CFS)


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Process from Point/Station       15.000 to Point/Station       66.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      9.589(Ac.)
Runoff from this stream =     18.107(CFS)
Time of concentration =   14.02 min.
Rainfall intensity =     2.871(In/Hr)
Area averaged loss rate (Fm) =    0.7752(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    937.77   729.540     32.44    0.379      1.735
2     18.11     9.589     14.02    0.775      2.871
Qmax(1) =
         1.000 *    1.000 *   937.767) +
         0.458 *    1.000 *    18.107) + =     946.064
Qmax(2) =
         1.837 *    0.432 *   937.767) +
         1.000 *    1.000 *    18.107) + =     762.546

Total of 2 main streams to confluence:
Flow rates before confluence point:
     938.767      19.107
Maximum flow rates at confluence using above data:
      946.064      762.546
Area of streams before confluence:
```

```
      729.540        9.589
Effective area values after confluence:
      739.129      324.890


Results of confluence:
Total flow rate =    946.064(CFS)
Time of concentration =    32.444 min.
Effective stream area after confluence  =    739.129(Ac.)
Study area average Pervious fraction(Ap) =  0.393
Study area average soil loss rate(Fm) =    0.384(In/Hr)
Study area total =     739.13(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       66.300 to Point/Station       66.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   655.700(Ft.)
Downstream point/station elevation =   655.000(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   946.064(CFS)
Nearest computed pipe diameter  =    114.00(In.)
Calculated individual pipe flow  =   946.064(CFS)
Normal flow depth in pipe =   87.56(In.)
Flow top width inside pipe =   96.23(In.)
Critical Depth =   89.86(In.)
Pipe flow velocity =     16.18(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =    32.59 min.


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Process from Point/Station       66.300 to Point/Station       66.400
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    739.129(Ac.)
Runoff from this stream =    946.064(CFS)
Time of concentration =   32.59 min.
Rainfall intensity =     1.731(In/Hr)
Area averaged loss rate (Fm) =    0.3837(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3933
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      601.000 to Point/Station      602.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.380
```

```
Decimal fraction soil group B = 0.620
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 46.88
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.719(In/Hr)
Initial subarea data:
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =   691.000(Ft.)
Bottom (of initial area) elevation =   681.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.229 min.
Rainfall intensity =      2.375(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.628
Subarea runoff =      8.631(CFS)
Total initial stream area =        5.790(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.719(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      602.000 to Point/Station      602.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.570
Decimal fraction soil group B = 0.430
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 42.32
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.089(In/Hr)
Time of concentration =    19.23 min.
Rainfall intensity =      2.375(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.690
Subarea runoff =      4.197(CFS) for    2.040(Ac.)
Total runoff =     12.828(CFS)
Effective area this stream =        7.83(Ac.)
Total Study Area (Main Stream No. 2) =      746.96(Ac.)
Area averaged Fm value =    0.555(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      602.000 to Point/Station       66.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   677.000(Ft.)
Downstream point/station elevation =   655.000(Ft.)
Pipe length  =   120.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.828(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =    12.828(CFS)
```

```
Normal flow depth in pipe =    8.43(In.)
Flow top width inside pipe =   10.98(In.)
Critical depth could not be calculated.
Pipe flow velocity =     21.76(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    19.32 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      602.000 to Point/Station       66.400
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.830(Ac.)
Runoff from this stream =     12.828(CFS)
Time of concentration =   19.32 min.
Rainfall intensity =     2.368(In/Hr)
Area averaged loss rate (Fm) =    0.5549(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6546
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      501.000 to Point/Station      502.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Initial subarea data:
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =   693.000(Ft.)
Bottom (of initial area) elevation =   683.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.229 min.
Rainfall intensity =      2.375(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.585
Subarea runoff =      8.060(CFS)
Total initial stream area =        5.800(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.831(In/Hr)


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Process from Point/Station      502.000 to Point/Station      502.000
**** SUBAREA FLOW ADDITION ****
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____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    19.23 min.
Rainfall intensity =      2.375(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.656
Subarea runoff =      4.099(CFS) for    2.000(Ac.)
Total runoff =     12.160(CFS)
Effective area this stream =        7.80(Ac.)
Total Study Area (Main Stream No. 3) =      754.76(Ac.)
Area averaged Fm value =    0.643(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station       66.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________
Upstream point/station elevation =   679.000(Ft.)
Downstream point/station elevation =   655.000(Ft.)
Pipe length  =   120.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.160(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =    12.160(CFS)
Normal flow depth in pipe =    7.85(In.)
Flow top width inside pipe =   11.41(In.)
Critical depth could not be calculated.
Pipe flow velocity =     22.34(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    19.32 min.


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Process from Point/Station      502.000 to Point/Station       66.400
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      7.800(Ac.)
Runoff from this stream =     12.160(CFS)
Time of concentration =   19.32 min.
Rainfall intensity =     2.369(In/Hr)
Area averaged loss rate (Fm) =    0.6431(In/Hr)
Area averaged Pervious ratio (Ap) = 0.6577
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
```

```
1    946.06   739.129     32.59    0.384      1.731
2     12.83     7.830     19.32    0.555      2.368
3     12.16     7.800     19.32    0.643      2.369
Qmax(1) =
         1.000 *    1.000 *   946.064) +
         0.648 *    1.000 *    12.828) +
         0.630 *    1.000 *    12.160) + =     962.044
Qmax(2) =
         1.474 *    0.593 *   946.064) +
         1.000 *    1.000 *    12.828) +
         1.000 *    1.000 *    12.160) + =     851.386
Qmax(3) =
         1.474 *    0.593 *   946.064) +
         1.000 *    1.000 *    12.828) +
         1.000 *    1.000 *    12.160) + =     851.358

Total of 3 main streams to confluence:
Flow rates before confluence point:
     947.064      13.828      13.160
Maximum flow rates at confluence using above data:
      962.044      851.386      851.358
Area of streams before confluence:
      739.129        7.830        7.800
Effective area values after confluence:
      754.759      453.794      453.739


Results of confluence:
Total flow rate =    962.044(CFS)
Time of concentration =    32.591 min.
Effective stream area after confluence  =    754.759(Ac.)
Study area average Pervious fraction(Ap) =  0.399
Study area average soil loss rate(Fm) =    0.388(In/Hr)
Study area total =     754.76(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       66.400 to Point/Station       66.500
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   655.000(Ft.)
Downstream point/station elevation =   652.400(Ft.)
Pipe length  =   602.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   962.044(CFS)
Nearest computed pipe diameter  =    117.00(In.)
Calculated individual pipe flow  =   962.044(CFS)
Normal flow depth in pipe =   90.75(In.)
Flow top width inside pipe =   97.62(In.)
Critical Depth =   90.22(In.)
Pipe flow velocity =     15.48(Ft/s)
Travel time through pipe =    0.65 min.
```

```
Time of concentration (TC) =    33.24 min.


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Process from Point/Station       66.500 to Point/Station       66.600
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   652.400(Ft.)
Downstream point/station elevation =   651.200(Ft.)
Pipe length  =   275.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   962.044(CFS)
Nearest computed pipe diameter  =    117.00(In.)
Calculated individual pipe flow  =   962.044(CFS)
Normal flow depth in pipe =   90.38(In.)
Flow top width inside pipe =   98.11(In.)
Critical Depth =   90.22(In.)
Pipe flow velocity =     15.55(Ft/s)
Travel time through pipe =    0.29 min.
Time of concentration (TC) =    33.53 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       66.500 to Point/Station       66.600
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    754.759(Ac.)
Runoff from this stream =    962.044(CFS)
Time of concentration =   33.53 min.
Rainfall intensity =     1.701(In/Hr)
Area averaged loss rate (Fm) =    0.3882(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3987
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      618.000 to Point/Station      619.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   250.000(Ft.)
Top (of initial area) elevation =   675.500(Ft.)
Bottom (of initial area) elevation =   673.000(Ft.)
Difference in elevation =     2.500(Ft.)
Slope =    0.01000  s(%)=       1.00
```

```
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.951 min.
Rainfall intensity =      4.374(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.885
Subarea runoff =      2.709(CFS)
Total initial stream area =        0.700(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      619.000 to Point/Station      621.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   669.000(Ft.)
Downstream point/station elevation =   665.600(Ft.)
Pipe length  =  1125.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.709(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     2.709(CFS)
Normal flow depth in pipe =    9.81(In.)
Flow top width inside pipe =   14.27(In.)
Critical Depth =    7.92(In.)
Pipe flow velocity =      3.19(Ft/s)
Travel time through pipe =    5.88 min.
Time of concentration (TC) =    12.84 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      619.000 to Point/Station      621.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.700(Ac.)
Runoff from this stream =      2.709(CFS)
Time of concentration =   12.84 min.
Rainfall intensity =     3.027(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      620.000 to Point/Station      621.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.770
Decimal fraction soil group B = 0.230
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 37.52
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.094(In/Hr)
Initial subarea data:
```

```
Initial area flow distance =   955.000(Ft.)
Top (of initial area) elevation =   683.000(Ft.)
Bottom (of initial area) elevation =   673.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01047  s(%)=       1.05
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.773 min.
Rainfall intensity =      3.188(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.874
Subarea runoff =     23.672(CFS)
Total initial stream area =        8.500(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.094(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      620.000 to Point/Station      621.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      8.500(Ac.)
Runoff from this stream =     23.672(CFS)
Time of concentration =   11.77 min.
Rainfall intensity =     3.188(In/Hr)
Area averaged loss rate (Fm) =    0.0939(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1      2.71     0.700     12.84    0.073      3.027
2     23.67     8.500     11.77    0.094      3.188
Qmax(1) =
         1.000 *    1.000 *     2.709) +
         0.948 *    1.000 *    23.672) + =      25.149
Qmax(2) =
         1.055 *    0.917 *     2.709) +
         1.000 *    1.000 *    23.672) + =      26.292

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.709      23.672
Maximum flow rates at confluence using above data:
       25.149       26.292
Area of streams before confluence:
        0.700        8.500
Effective area values after confluence:
        9.200        9.142
Results of confluence:
Total flow rate =     26.292(CFS)
Time of concentration =    11.773 min.
```

```
Effective stream area after confluence =      9.142(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.092(In/Hr)
Study area total (this main stream) =       9.20(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      621.000 to Point/Station       66.600
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   665.600(Ft.)
Downstream point/station elevation =   651.200(Ft.)
Pipe length  =   830.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    26.292(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    26.292(CFS)
Normal flow depth in pipe =   17.51(In.)
Flow top width inside pipe =   21.32(In.)
Critical Depth =   21.51(In.)
Pipe flow velocity =     10.71(Ft/s)
Travel time through pipe =    1.29 min.
Time of concentration (TC) =    13.06 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      621.000 to Point/Station       66.600
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      9.142(Ac.)
Runoff from this stream =     26.292(CFS)
Time of concentration =   13.06 min.
Rainfall intensity =     2.995(In/Hr)
Area averaged loss rate (Fm) =    0.0923(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      515.000 to Point/Station      516.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   250.000(Ft.)
Top (of initial area) elevation =   683.000(Ft.)
```

```
Bottom (of initial area) elevation =   680.500(Ft.)
Difference in elevation =     2.500(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.951 min.
Rainfall intensity =      4.374(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
Subarea runoff =      2.694(CFS)
Total initial stream area =        0.700(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      516.000 to Point/Station      518.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   676.500(Ft.)
Downstream point/station elevation =   670.000(Ft.)
Pipe length  =  1072.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.694(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.694(CFS)
Normal flow depth in pipe =    9.54(In.)
Flow top width inside pipe =    9.69(In.)
Critical Depth =    8.45(In.)
Pipe flow velocity =      4.02(Ft/s)
Travel time through pipe =    4.44 min.
Time of concentration (TC) =    11.39 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      516.000 to Point/Station      518.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 3 in normal stream number 1
Stream flow area =      0.700(Ac.)
Runoff from this stream =      2.694(CFS)
Time of concentration =   11.39 min.
Rainfall intensity =     3.252(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      517.000 to Point/Station      518.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
```

```
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   936.000(Ft.)
Top (of initial area) elevation =   683.500(Ft.)
Bottom (of initial area) elevation =   674.000(Ft.)
Difference in elevation =     9.500(Ft.)
Slope =    0.01015  s(%)=       1.01
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.752 min.
Rainfall intensity =      3.192(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.872
Subarea runoff =     23.250(CFS)
Total initial stream area =        8.350(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      517.000 to Point/Station      518.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 3 in normal stream number 2
Stream flow area =      8.350(Ac.)
Runoff from this stream =     23.250(CFS)
Time of concentration =   11.75 min.
Rainfall intensity =     3.192(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1      2.69     0.700     11.39    0.098      3.252
2     23.25     8.350     11.75    0.098      3.192
Qmax(1) =
         1.000 *    1.000 *     2.694) +
         1.020 *    0.969 *    23.250) + =      25.669
Qmax(2) =
         0.981 *    1.000 *     2.694) +
         1.000 *    1.000 *    23.250) + =      25.893

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.694      23.250
Maximum flow rates at confluence using above data:
       25.669       25.893
Area of streams before confluence:
        0.700        8.350
Effective area values after confluence:
        8.793        9.050
```

```
Results of confluence:
Total flow rate =     25.893(CFS)
Time of concentration =    11.752 min.
Effective stream area after confluence =      9.050(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.098(In/Hr)
Study area total (this main stream) =       9.05(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      518.000 to Point/Station       66.600
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   670.000(Ft.)
Downstream point/station elevation =   651.200(Ft.)
Pipe length  =   883.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    25.893(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    25.893(CFS)
Normal flow depth in pipe =   16.01(In.)
Flow top width inside pipe =   22.62(In.)
Critical Depth =   21.39(In.)
Pipe flow velocity =     11.63(Ft/s)
Travel time through pipe =    1.27 min.
Time of concentration (TC) =    13.02 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      518.000 to Point/Station       66.600
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      9.050(Ac.)
Runoff from this stream =     25.893(CFS)
Time of concentration =   13.02 min.
Rainfall intensity =     3.002(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      521.000 to Point/Station      522.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
```

```
Initial subarea data:
Initial area flow distance =   685.000(Ft.)
Top (of initial area) elevation =   682.000(Ft.)
Bottom (of initial area) elevation =   675.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.01022  s(%)=       1.02
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.358 min.
Rainfall intensity =      3.443(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.874
Subarea runoff =      4.546(CFS)
Total initial stream area =        1.510(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      522.000 to Point/Station      523.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    10.36 min.
Rainfall intensity =      3.443(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
Subarea runoff =      9.754(CFS) for    3.240(Ac.)
Total runoff =     14.300(CFS)
Effective area this stream =        4.75(Ac.)
Total Study Area (Main Stream No. 4) =      777.76(Ac.)
Area averaged Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      523.000 to Point/Station      523.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    10.36 min.
Rainfall intensity =      3.443(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
```

```
Subarea runoff =      8.550(CFS) for    2.840(Ac.)
Total runoff =     22.850(CFS)
Effective area this stream =        7.59(Ac.)
Total Study Area (Main Stream No. 4) =      780.60(Ac.)
Area averaged Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      523.000 to Point/Station       66.600
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      7.590(Ac.)
Runoff from this stream =     22.850(CFS)
Time of concentration =   10.36 min.
Rainfall intensity =     3.443(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    962.04   754.759     33.53    0.388      1.701
2     26.29     9.142     13.06    0.092      2.995
3     25.89     9.050     13.02    0.098      3.002
4     22.85     7.590     10.36    0.098      3.443
Qmax(1) =
         1.000 *    1.000 *   962.044) +
         0.554 *    1.000 *    26.292) +
         0.552 *    1.000 *    25.893) +
         0.479 *    1.000 *    22.850) + =    1001.869
Qmax(2) =
         1.985 *    0.390 *   962.044) +
         1.000 *    1.000 *    26.292) +
         0.998 *    1.000 *    25.893) +
         0.866 *    1.000 *    22.850) + =     816.030
Qmax(3) =
         1.990 *    0.388 *   962.044) +
         1.002 *    0.996 *    26.292) +
         1.000 *    1.000 *    25.893) +
         0.868 *    1.000 *    22.850) + =     815.246
Qmax(4) =
         2.326 *    0.309 *   962.044) +
         1.154 *    0.793 *    26.292) +
         1.152 *    0.796 *    25.893) +
         1.000 *    1.000 *    22.850) + =     761.890

Total of 4 main streams to confluence:
Flow rates before confluence point:
     963.044      27.292      26.893      23.850
```

```
Maximum flow rates at confluence using above data:
     1001.869      816.030      815.246      761.890
Area of streams before confluence:
      754.759        9.142        9.050        7.590
Effective area values after confluence:
      780.541      319.835      318.720      255.164


Results of confluence:
Total flow rate =   1001.869(CFS)
Time of concentration =    33.534 min.
Effective stream area after confluence  =    780.541(Ac.)
Study area average Pervious fraction(Ap) =  0.389
Study area average soil loss rate(Fm) =    0.379(In/Hr)
Study area total =     780.54(Ac.)
End of computations, Total Study Area =          780.60 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.389
Area averaged SCS curve number =  32.4
```

# APPENDIX B.3: RATIONAL METHOD ANALYSIS, GROVE ONSITE MITIGATED, AREA E3

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/06/25

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ONTARIO RANCH 108.43.25
ONSITE RATIONAL METHOD HYDROLOGY
AREA E3, 100 YEAR STORM EVENT
FN: RARE3100PEAST

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 503.000 to Point/Station 504.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.098(In/Hr)
Initial subarea data:
Initial area flow distance = 700.000(Ft.)
Top (of initial area) elevation = 687.000(Ft.)
Bottom (of initial area) elevation = 680.000(Ft.)
Difference in elevation = 7.000(Ft.)
Slope = 0.01000 s(%)= 1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.493 min.
Rainfall intensity = 3.416(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.874
Subarea runoff = 13.887(CFS)
Total initial stream area = 4.650(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.098(In/Hr)

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      504.000 to Point/Station      507.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   676.000(Ft.)
Downstream point/station elevation =   675.800(Ft.)
Pipe length  =    46.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.887(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    13.887(CFS)
Normal flow depth in pipe =   18.33(In.)
Flow top width inside pipe =   20.39(In.)
Critical Depth =   16.11(In.)
Pipe flow velocity =      5.39(Ft/s)
Travel time through pipe =    0.14 min.
Time of concentration (TC) =    10.64 min.


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Process from Point/Station      504.000 to Point/Station      507.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.650(Ac.)
Runoff from this stream =     13.887(CFS)
Time of concentration =   10.64 min.
Rainfall intensity =     3.389(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      505.000 to Point/Station      506.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   745.000(Ft.)
Top (of initial area) elevation =   689.500(Ft.)
Bottom (of initial area) elevation =   682.000(Ft.)
Difference in elevation =     7.500(Ft.)
Slope =    0.01007  s(%)=       1.01
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
```

```
Initial area time of concentration =   10.744 min.
Rainfall intensity =      3.368(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.874
Subarea runoff =     11.361(CFS)
Total initial stream area =        3.860(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      506.000 to Point/Station      507.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   678.000(Ft.)
Downstream point/station elevation =   675.800(Ft.)
Pipe length  =    65.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.361(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    11.361(CFS)
Normal flow depth in pipe =   11.74(In.)
Flow top width inside pipe =   12.37(In.)
Critical depth could not be calculated.
Pipe flow velocity =     11.03(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =    10.84 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      506.000 to Point/Station      507.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.860(Ac.)
Runoff from this stream =     11.361(CFS)
Time of concentration =   10.84 min.
Rainfall intensity =     3.350(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     13.89     4.650     10.64    0.098      3.389
2     11.36     3.860     10.84    0.098      3.350
Qmax(1) =
         1.000 *    1.000 *    13.887) +
         1.012 *    0.981 *    11.361) + =      25.165
Qmax(2) =
         0.988 *    1.000 *    13.887) +
         1.000 *    1.000 *    11.361) + =      25.084
```

```
Total of 2 main streams to confluence:
Flow rates before confluence point:
      14.887      12.361
Maximum flow rates at confluence using above data:
       25.165       25.084
Area of streams before confluence:
        4.650        3.860
Effective area values after confluence:
        8.436        8.510


Results of confluence:
Total flow rate =     25.165(CFS)
Time of concentration =    10.635 min.
Effective stream area after confluence  =      8.436(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.098(In/Hr)
Study area total =       8.51(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      507.000 to Point/Station      511.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   675.800(Ft.)
Downstream point/station elevation =   674.000(Ft.)
Pipe length  =   502.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    25.165(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    25.165(CFS)
Normal flow depth in pipe =   22.22(In.)
Flow top width inside pipe =   30.95(In.)
Critical Depth =   19.93(In.)
Pipe flow velocity =      5.92(Ft/s)
Travel time through pipe =    1.41 min.
Time of concentration (TC) =    12.05 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      507.000 to Point/Station      511.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      8.436(Ac.)
Runoff from this stream =     25.165(CFS)
Time of concentration =   12.05 min.
Rainfall intensity =     3.144(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      508.000 to Point/Station      511.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   670.000(Ft.)
Top (of initial area) elevation =   685.000(Ft.)
Bottom (of initial area) elevation =   678.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.01045  s(%)=       1.04
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.221 min.
Rainfall intensity =      3.470(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff =     28.350(CFS)
Total initial stream area =        9.340(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      508.000 to Point/Station      511.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      9.340(Ac.)
Runoff from this stream =     28.350(CFS)
Time of concentration =   10.22 min.
Rainfall intensity =     3.470(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      509.000 to Point/Station      510.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
```

```
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   440.000(Ft.)
Top (of initial area) elevation =   684.500(Ft.)
Bottom (of initial area) elevation =   680.000(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.01023  s(%)=       1.02
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.676 min.
Rainfall intensity =      3.829(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.877
Subarea runoff =      7.757(CFS)
Total initial stream area =        2.310(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      510.000 to Point/Station      511.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   676.000(Ft.)
Downstream point/station elevation =   674.000(Ft.)
Pipe length  =   216.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.757(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     7.757(CFS)
Normal flow depth in pipe =   11.81(In.)
Flow top width inside pipe =   17.10(In.)
Critical Depth =   12.95(In.)
Pipe flow velocity =      6.30(Ft/s)
Travel time through pipe =    0.57 min.
Time of concentration (TC) =     9.25 min.


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Process from Point/Station      510.000 to Point/Station      511.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      2.310(Ac.)
Runoff from this stream =      7.757(CFS)
Time of concentration =    9.25 min.
Rainfall intensity =     3.685(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
```

```
1     25.16     8.436     12.05    0.098      3.144
2     28.35     9.340     10.22    0.098      3.470
3      7.76     2.310      9.25    0.098      3.685
Qmax(1) =
         1.000 *    1.000 *    25.165) +
         0.903 *    1.000 *    28.350) +
         0.849 *    1.000 *     7.757) + =      57.358
Qmax(2) =
         1.107 *    0.848 *    25.165) +
         1.000 *    1.000 *    28.350) +
         0.940 *    1.000 *     7.757) + =      59.275
Qmax(3) =
         1.178 *    0.767 *    25.165) +
         1.064 *    0.905 *    28.350) +
         1.000 *    1.000 *     7.757) + =      57.782

Total of 3 main streams to confluence:
Flow rates before confluence point:
      26.165      29.350       8.757
Maximum flow rates at confluence using above data:
       57.358       59.275       57.782
Area of streams before confluence:
        8.436        9.340        2.310
Effective area values after confluence:
       20.086       18.806       17.234


Results of confluence:
Total flow rate =     59.275(CFS)
Time of concentration =    10.221 min.
Effective stream area after confluence  =     18.806(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.098(In/Hr)
Study area total =      20.09(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      511.000 to Point/Station      514.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   674.000(Ft.)
Downstream point/station elevation =   673.000(Ft.)
Pipe length  =    49.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    59.275(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    59.275(CFS)
Normal flow depth in pipe =   22.01(In.)
Flow top width inside pipe =   31.11(In.)
Critical Depth =   29.73(In.)
Pipe flow velocity =     14.08(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    10.28 min.
```

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      511.000 to Point/Station      514.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     18.806(Ac.)
Runoff from this stream =     59.275(CFS)
Time of concentration =   10.28 min.
Rainfall intensity =     3.459(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      512.000 to Point/Station      513.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   440.000(Ft.)
Top (of initial area) elevation =   684.500(Ft.)
Bottom (of initial area) elevation =   680.000(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.01023  s(%)=       1.02
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.676 min.
Rainfall intensity =      3.829(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.877
Subarea runoff =      8.966(CFS)
Total initial stream area =        2.670(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      513.000 to Point/Station      514.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   676.000(Ft.)
Downstream point/station elevation =   673.000(Ft.)
Pipe length  =   147.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.966(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     8.966(CFS)
```

```
Normal flow depth in pipe =   11.93(In.)
Flow top width inside pipe =   12.10(In.)
Critical Depth =   13.85(In.)
Pipe flow velocity =      8.57(Ft/s)
Travel time through pipe =    0.29 min.
Time of concentration (TC) =     8.96 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      513.000 to Point/Station      514.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.670(Ac.)
Runoff from this stream =      8.966(CFS)
Time of concentration =    8.96 min.
Rainfall intensity =     3.755(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     59.27    18.806     10.28    0.098      3.459
2      8.97     2.670      8.96    0.098      3.755
Qmax(1) =
         1.000 *    1.000 *    59.275) +
         0.919 *    1.000 *     8.966) + =      67.514
Qmax(2) =
         1.088 *    0.872 *    59.275) +
         1.000 *    1.000 *     8.966) + =      65.205

Total of 2 main streams to confluence:
Flow rates before confluence point:
      60.275       9.966
Maximum flow rates at confluence using above data:
       67.514       65.205
Area of streams before confluence:
       18.806        2.670
Effective area values after confluence:
       21.476       19.066


Results of confluence:
Total flow rate =     67.514(CFS)
Time of concentration =    10.279 min.
Effective stream area after confluence  =     21.476(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.098(In/Hr)
Study area total =      21.48(Ac.)
```

```
End of computations, Total Study Area =          22.83 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  32.0
```

# APPENDIX B.4: RATIONAL METHOD ANALYSIS, GROVE ONSITE MITIGATED, AREA E4

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/07/25

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ONTARIO RANCH 108.43.25
ONSITE RATIONAL METHOD HYDROLOGY
AREA E4, 100 YEAR STORM EVENT
FN: RARE4100PwEST

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 603.000 to Point/Station 606.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.073(In/Hr)
Initial subarea data:
Initial area flow distance = 670.000(Ft.)
Top (of initial area) elevation = 686.000(Ft.)
Bottom (of initial area) elevation = 679.000(Ft.)
Difference in elevation = 7.000(Ft.)
Slope = 0.01045 s(%)= 1.04
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.221 min.
Rainfall intensity = 3.470(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.881
Subarea runoff = 14.583(CFS)
Total initial stream area = 4.770(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.073(In/Hr)

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      603.000 to Point/Station      606.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.770(Ac.)
Runoff from this stream =     14.583(CFS)
Time of concentration =   10.22 min.
Rainfall intensity =     3.470(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      604.000 to Point/Station      605.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   525.000(Ft.)
Top (of initial area) elevation =   684.500(Ft.)
Bottom (of initial area) elevation =   679.000(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.01048  s(%)=       1.05
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.266 min.
Rainfall intensity =      3.681(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff =      8.376(CFS)
Total initial stream area =        2.580(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


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Process from Point/Station      605.000 to Point/Station      606.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   675.000(Ft.)
Downstream point/station elevation =   674.800(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.376(CFS)
Nearest computed pipe diameter  =     21.00(In.)
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Calculated individual pipe flow  =     8.376(CFS)
Normal flow depth in pipe =   15.14(In.)
Flow top width inside pipe =   18.84(In.)
Critical Depth =   12.90(In.)
Pipe flow velocity =      4.52(Ft/s)
Travel time through pipe =    0.20 min.
Time of concentration (TC) =     9.47 min.


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Process from Point/Station      605.000 to Point/Station      606.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.580(Ac.)
Runoff from this stream =      8.376(CFS)
Time of concentration =    9.47 min.
Rainfall intensity =     3.634(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     14.58     4.770     10.22    0.073      3.470
2      8.38     2.580      9.47    0.073      3.634
Qmax(1) =
         1.000 *    1.000 *    14.583) +
         0.954 *    1.000 *     8.376) + =      22.574
Qmax(2) =
         1.048 *    0.926 *    14.583) +
         1.000 *    1.000 *     8.376) + =      22.532

Total of 2 main streams to confluence:
Flow rates before confluence point:
      15.583       9.376
Maximum flow rates at confluence using above data:
       22.574       22.532
Area of streams before confluence:
        4.770        2.580
Effective area values after confluence:
        7.350        6.997


Results of confluence:
Total flow rate =     22.574(CFS)
Time of concentration =    10.221 min.
Effective stream area after confluence  =      7.350(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.073(In/Hr)
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Study area total =       7.35(Ac.)


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Process from Point/Station      606.000 to Point/Station      610.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   674.800(Ft.)
Downstream point/station elevation =   674.000(Ft.)
Pipe length  =   209.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.574(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    22.574(CFS)
Normal flow depth in pipe =   22.03(In.)
Flow top width inside pipe =   26.50(In.)
Critical Depth =   19.38(In.)
Pipe flow velocity =      5.84(Ft/s)
Travel time through pipe =    0.60 min.
Time of concentration (TC) =    10.82 min.


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Process from Point/Station      606.000 to Point/Station      610.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      7.350(Ac.)
Runoff from this stream =     22.574(CFS)
Time of concentration =   10.82 min.
Rainfall intensity =     3.354(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      607.000 to Point/Station      610.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.570
Decimal fraction soil group B = 0.430
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 42.32
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.089(In/Hr)
Initial subarea data:
Initial area flow distance =   505.000(Ft.)
Top (of initial area) elevation =   685.000(Ft.)
Bottom (of initial area) elevation =   680.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.00990  s(%)=       0.99
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```
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.227 min.
Rainfall intensity =      3.690(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.878
Subarea runoff =     12.898(CFS)
Total initial stream area =        3.980(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.089(In/Hr)


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Process from Point/Station      607.000 to Point/Station      610.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.980(Ac.)
Runoff from this stream =     12.898(CFS)
Time of concentration =    9.23 min.
Rainfall intensity =     3.690(In/Hr)
Area averaged loss rate (Fm) =    0.0894(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      608.000 to Point/Station      609.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.180
Decimal fraction soil group B = 0.820
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 51.68
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.079(In/Hr)
Initial subarea data:
Initial area flow distance =   565.000(Ft.)
Top (of initial area) elevation =   687.000(Ft.)
Bottom (of initial area) elevation =   681.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.01062  s(%)=       1.06
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.516 min.
Rainfall intensity =      3.622(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
Subarea runoff =      9.695(CFS)
Total initial stream area =        3.040(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.079(In/Hr)


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Process from Point/Station      609.000 to Point/Station      610.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   677.000(Ft.)
Downstream point/station elevation =   674.000(Ft.)
Pipe length  =    54.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.695(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     9.695(CFS)
Normal flow depth in pipe =    8.70(In.)
Flow top width inside pipe =   14.81(In.)
Critical Depth =   14.12(In.)
Pipe flow velocity =     13.15(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.58 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      609.000 to Point/Station      610.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      3.040(Ac.)
Runoff from this stream =      9.695(CFS)
Time of concentration =    9.58 min.
Rainfall intensity =     3.607(In/Hr)
Area averaged loss rate (Fm) =    0.0789(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     22.57     7.350     10.82    0.073      3.354
2     12.90     3.980      9.23    0.089      3.690
3      9.69     3.040      9.58    0.079      3.607
Qmax(1) =
         1.000 *    1.000 *    22.574) +
         0.907 *    1.000 *    12.898) +
         0.928 *    1.000 *     9.695) + =      43.270
Qmax(2) =
         1.102 *    0.853 *    22.574) +
         1.000 *    1.000 *    12.898) +
         1.024 *    0.963 *     9.695) + =      43.677
Qmax(3) =
         1.077 *    0.886 *    22.574) +
         0.977 *    1.000 *    12.898) +
         1.000 *    1.000 *     9.695) + =      43.836

Total of 3 main streams to confluence:
Flow rates before confluence point:
```

```
      23.574      13.898      10.695
Maximum flow rates at confluence using above data:
       43.270       43.677       43.836
Area of streams before confluence:
        7.350        3.980        3.040
Effective area values after confluence:
       14.370       13.176       13.533


Results of confluence:
Total flow rate =     43.836(CFS)
Time of concentration =     9.585 min.
Effective stream area after confluence  =     13.533(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.079(In/Hr)
Study area total =      14.37(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      610.000 to Point/Station      614.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   674.000(Ft.)
Downstream point/station elevation =   672.300(Ft.)
Pipe length  =   320.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    43.836(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    43.836(CFS)
Normal flow depth in pipe =   26.74(In.)
Flow top width inside pipe =   31.47(In.)
Critical Depth =   25.87(In.)
Pipe flow velocity =      7.79(Ft/s)
Travel time through pipe =    0.69 min.
Time of concentration (TC) =    10.27 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      610.000 to Point/Station      614.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     13.533(Ac.)
Runoff from this stream =     43.836(CFS)
Time of concentration =   10.27 min.
Rainfall intensity =     3.460(In/Hr)
Area averaged loss rate (Fm) =    0.0790(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      611.000 to Point/Station      614.000
```

```
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   675.000(Ft.)
Top (of initial area) elevation =   686.000(Ft.)
Bottom (of initial area) elevation =   679.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.01037  s(%)=       1.04
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.267 min.
Rainfall intensity =      3.461(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff =     15.770(CFS)
Total initial stream area =        5.210(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      611.000 to Point/Station      614.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      5.210(Ac.)
Runoff from this stream =     15.770(CFS)
Time of concentration =   10.27 min.
Rainfall intensity =     3.461(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      612.000 to Point/Station      613.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   440.000(Ft.)
```

```
Top (of initial area) elevation =   681.500(Ft.)
Bottom (of initial area) elevation =   677.000(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.01023  s(%)=       1.02
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.676 min.
Rainfall intensity =      3.829(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.877
Subarea runoff =      7.421(CFS)
Total initial stream area =        2.210(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      613.000 to Point/Station      614.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   673.000(Ft.)
Downstream point/station elevation =   672.300(Ft.)
Pipe length  =   224.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.421(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.421(CFS)
Normal flow depth in pipe =   14.72(In.)
Flow top width inside pipe =   19.23(In.)
Critical Depth =   12.09(In.)
Pipe flow velocity =      4.12(Ft/s)
Travel time through pipe =    0.91 min.
Time of concentration (TC) =     9.58 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      613.000 to Point/Station      614.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      2.210(Ac.)
Runoff from this stream =      7.421(CFS)
Time of concentration =    9.58 min.
Rainfall intensity =     3.608(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     43.84    13.533     10.27    0.079      3.460
2     15.77     5.210     10.27    0.098      3.461
3      7.42     2.210      9.58    0.098      3.608
```

```
Qmax(1) =
         1.000 *    1.000 *    43.836) +
         1.000 *    1.000 *    15.770) +
         0.958 *    1.000 *     7.421) + =      66.713
Qmax(2) =
         1.000 *    1.000 *    43.836) +
         1.000 *    1.000 *    15.770) +
         0.958 *    1.000 *     7.421) + =      66.712
Qmax(3) =
         1.044 *    0.933 *    43.836) +
         1.044 *    0.933 *    15.770) +
         1.000 *    1.000 *     7.421) + =      65.455

Total of 3 main streams to confluence:
Flow rates before confluence point:
      44.836      16.770       8.421
Maximum flow rates at confluence using above data:
       66.713       66.712       65.455
Area of streams before confluence:
       13.533        5.210        2.210
Effective area values after confluence:
       20.953       20.948       19.696


Results of confluence:
Total flow rate =     66.713(CFS)
Time of concentration =    10.270 min.
Effective stream area after confluence  =     20.953(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.086(In/Hr)
Study area total =      20.95(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      614.000 to Point/Station      617.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   672.300(Ft.)
Downstream point/station elevation =   671.900(Ft.)
Pipe length  =   122.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    66.713(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    66.713(CFS)
Normal flow depth in pipe =   35.48(In.)
Flow top width inside pipe =   36.75(In.)
Critical Depth =   30.16(In.)
Pipe flow velocity =      7.14(Ft/s)
Travel time through pipe =    0.28 min.
Time of concentration (TC) =    10.55 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      614.000 to Point/Station      617.000
```

```
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     20.953(Ac.)
Runoff from this stream =     66.713(CFS)
Time of concentration =   10.55 min.
Rainfall intensity =     3.404(In/Hr)
Area averaged loss rate (Fm) =    0.0857(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      615.000 to Point/Station      616.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   540.000(Ft.)
Top (of initial area) elevation =   687.000(Ft.)
Bottom (of initial area) elevation =   681.500(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.01019  s(%)=       1.02
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.424 min.
Rainfall intensity =      3.644(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.876
Subarea runoff =     10.850(CFS)
Total initial stream area =        3.400(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      616.000 to Point/Station      617.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =   677.500(Ft.)
Downstream point/station elevation =   671.900(Ft.)
Pipe length  =   155.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.850(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    10.850(CFS)
Normal flow depth in pipe =   10.96(In.)
Flow top width inside pipe =   13.31(In.)
Critical depth could not be calculated.
```

```
Pipe flow velocity =     11.30(Ft/s)
Travel time through pipe =    0.23 min.
Time of concentration (TC) =     9.65 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      616.000 to Point/Station      617.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.400(Ac.)
Runoff from this stream =     10.850(CFS)
Time of concentration =    9.65 min.
Rainfall intensity =     3.592(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     66.71    20.953     10.55    0.086      3.404
2     10.85     3.400      9.65    0.098      3.592
Qmax(1) =
         1.000 *    1.000 *    66.713) +
         0.946 *    1.000 *    10.850) + =      76.981
Qmax(2) =
         1.056 *    0.915 *    66.713) +
         1.000 *    1.000 *    10.850) + =      75.309

Total of 2 main streams to confluence:
Flow rates before confluence point:
      67.713      11.850
Maximum flow rates at confluence using above data:
       76.981       75.309
Area of streams before confluence:
       20.953        3.400
Effective area values after confluence:
       24.353       22.562


Results of confluence:
Total flow rate =     76.981(CFS)
Time of concentration =    10.555 min.
Effective stream area after confluence  =     24.353(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.087(In/Hr)
Study area total =      24.35(Ac.)
End of computations, Total Study Area =           25.19 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
```

Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number = 43.0

# APPENDIX B.5: UNIT HYDROGRAPH ANALYSIS, GROVE ONSITE MITIGATED, AREA E3

U n i t  H y d r o g r a p h  A n a l y s i s

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Study date 05/09/25

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6279

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ONTARIO RANCH 108.43.25
COMMERCIAL MITIGATED UNIT HYDROGRAPH METHOD HYDROLOGY
AREA E3, 100-YEAR STORM EVENT
FN: UARE3P
---

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 100 | | |
| 22.83 | 1 | 1.20 |
| Rainfall data for year 100 | | |
| 22.83 | 6 | 3.00 |
| Rainfall data for year 100 | | |
| 22.83 | 24 | 6.00 |

---
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 32.0 | 32.0 | 22.83 | 1.000 | 0.978 | 0.100 | 0.098 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.098

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 2.28 | 0.100 | 32.0 | 32.0 | 21.25 | 0.022 |
| 20.55 | 0.900 | 98.0 | 98.0 | 0.20 | 0.960 |

Area-averaged catchment yield fraction, Y = 0.866
Area-averaged low loss fraction, Yb = 0.134
User entry of time of concentration = 0.171 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 22.83(Ac.)
Catchment Lag time = 0.137 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 60.9162
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.098(In/Hr)
Average low loss rate fraction (Yb) = 0.134 (decimal)
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 22.83(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.444(In)
30-minute factor = 0.999 Adjusted rainfall = 0.908(In)
1-hour factor = 0.999 Adjusted rainfall = 1.199(In)
3-hour factor = 1.000 Adjusted rainfall = 2.104(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|
| | (K = 276.10 (CFS)) | |
| 1 | 6.713 | 18.534 |

| | | |
|---|---|---|
| 2 | 42.770 | 99.553 |
| 3 | 82.568 | 109.884 |
| 4 | 95.865 | 36.711 |
| 5 | 98.734 | 7.923 |
| 6 | 100.000 | 3.495 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4437 | 0.4437 |
| 2 | 0.5854 | 0.1418 |
| 3 | 0.6885 | 0.1031 |
| 4 | 0.7724 | 0.0840 |
| 5 | 0.8446 | 0.0721 |
| 6 | 0.9085 | 0.0639 |
| 7 | 0.9662 | 0.0578 |
| 8 | 1.0192 | 0.0530 |
| 9 | 1.0684 | 0.0492 |
| 10 | 1.1144 | 0.0460 |
| 11 | 1.1577 | 0.0433 |
| 12 | 1.1987 | 0.0410 |
| 13 | 1.2489 | 0.0502 |
| 14 | 1.2972 | 0.0483 |
| 15 | 1.3439 | 0.0467 |
| 16 | 1.3890 | 0.0452 |
| 17 | 1.4329 | 0.0438 |
| 18 | 1.4754 | 0.0426 |
| 19 | 1.5169 | 0.0414 |
| 20 | 1.5572 | 0.0404 |
| 21 | 1.5967 | 0.0394 |
| 22 | 1.6352 | 0.0385 |
| 23 | 1.6728 | 0.0377 |
| 24 | 1.7097 | 0.0369 |
| 25 | 1.7458 | 0.0361 |
| 26 | 1.7812 | 0.0354 |
| 27 | 1.8160 | 0.0348 |
| 28 | 1.8502 | 0.0341 |
| 29 | 1.8837 | 0.0336 |
| 30 | 1.9167 | 0.0330 |
| 31 | 1.9492 | 0.0325 |
| 32 | 1.9811 | 0.0320 |
| 33 | 2.0126 | 0.0315 |
| 34 | 2.0436 | 0.0310 |
| 35 | 2.0742 | 0.0306 |
| 36 | 2.1044 | 0.0301 |
| 37 | 2.1340 | 0.0297 |
| 38 | 2.1634 | 0.0293 |
| 39 | 2.1923 | 0.0289 |
| 40 | 2.2209 | 0.0286 |
| 41 | 2.2491 | 0.0282 |
| 42 | 2.2770 | 0.0279 |
| 43 | 2.3046 | 0.0276 |
| 44 | 2.3318 | 0.0273 |
| 45 | 2.3588 | 0.0270 |

| | | |
|---|---|---|
| 46 | 2.3854 | 0.0267 |
| 47 | 2.4118 | 0.0264 |
| 48 | 2.4379 | 0.0261 |
| 49 | 2.4638 | 0.0258 |
| 50 | 2.4894 | 0.0256 |
| 51 | 2.5147 | 0.0253 |
| 52 | 2.5398 | 0.0251 |
| 53 | 2.5647 | 0.0249 |
| 54 | 2.5893 | 0.0246 |
| 55 | 2.6137 | 0.0244 |
| 56 | 2.6379 | 0.0242 |
| 57 | 2.6619 | 0.0240 |
| 58 | 2.6857 | 0.0238 |
| 59 | 2.7093 | 0.0236 |
| 60 | 2.7327 | 0.0234 |
| 61 | 2.7559 | 0.0232 |
| 62 | 2.7789 | 0.0230 |
| 63 | 2.8017 | 0.0228 |
| 64 | 2.8244 | 0.0227 |
| 65 | 2.8469 | 0.0225 |
| 66 | 2.8692 | 0.0223 |
| 67 | 2.8914 | 0.0222 |
| 68 | 2.9134 | 0.0220 |
| 69 | 2.9352 | 0.0218 |
| 70 | 2.9569 | 0.0217 |
| 71 | 2.9784 | 0.0215 |
| 72 | 2.9998 | 0.0214 |
| 73 | 3.0205 | 0.0208 |
| 74 | 3.0412 | 0.0206 |
| 75 | 3.0616 | 0.0205 |
| 76 | 3.0820 | 0.0203 |
| 77 | 3.1022 | 0.0202 |
| 78 | 3.1223 | 0.0201 |
| 79 | 3.1422 | 0.0200 |
| 80 | 3.1621 | 0.0198 |
| 81 | 3.1818 | 0.0197 |
| 82 | 3.2013 | 0.0196 |
| 83 | 3.2208 | 0.0195 |
| 84 | 3.2402 | 0.0193 |
| 85 | 3.2594 | 0.0192 |
| 86 | 3.2785 | 0.0191 |
| 87 | 3.2975 | 0.0190 |
| 88 | 3.3164 | 0.0189 |
| 89 | 3.3352 | 0.0188 |
| 90 | 3.3539 | 0.0187 |
| 91 | 3.3725 | 0.0186 |
| 92 | 3.3909 | 0.0185 |
| 93 | 3.4093 | 0.0184 |
| 94 | 3.4276 | 0.0183 |
| 95 | 3.4458 | 0.0182 |
| 96 | 3.4639 | 0.0181 |
| 97 | 3.4819 | 0.0180 |
| 98 | 3.4998 | 0.0179 |

| | | |
|---|---|---|
| 99 | 3.5176 | 0.0178 |
| 100 | 3.5353 | 0.0177 |
| 101 | 3.5530 | 0.0176 |
| 102 | 3.5705 | 0.0175 |
| 103 | 3.5880 | 0.0175 |
| 104 | 3.6053 | 0.0174 |
| 105 | 3.6226 | 0.0173 |
| 106 | 3.6398 | 0.0172 |
| 107 | 3.6570 | 0.0171 |
| 108 | 3.6740 | 0.0170 |
| 109 | 3.6910 | 0.0170 |
| 110 | 3.7079 | 0.0169 |
| 111 | 3.7247 | 0.0168 |
| 112 | 3.7414 | 0.0167 |
| 113 | 3.7581 | 0.0167 |
| 114 | 3.7747 | 0.0166 |
| 115 | 3.7912 | 0.0165 |
| 116 | 3.8077 | 0.0164 |
| 117 | 3.8240 | 0.0164 |
| 118 | 3.8404 | 0.0163 |
| 119 | 3.8566 | 0.0162 |
| 120 | 3.8728 | 0.0162 |
| 121 | 3.8889 | 0.0161 |
| 122 | 3.9049 | 0.0160 |
| 123 | 3.9209 | 0.0160 |
| 124 | 3.9368 | 0.0159 |
| 125 | 3.9526 | 0.0158 |
| 126 | 3.9684 | 0.0158 |
| 127 | 3.9841 | 0.0157 |
| 128 | 3.9998 | 0.0157 |
| 129 | 4.0154 | 0.0156 |
| 130 | 4.0309 | 0.0155 |
| 131 | 4.0464 | 0.0155 |
| 132 | 4.0618 | 0.0154 |
| 133 | 4.0772 | 0.0154 |
| 134 | 4.0925 | 0.0153 |
| 135 | 4.1077 | 0.0152 |
| 136 | 4.1229 | 0.0152 |
| 137 | 4.1380 | 0.0151 |
| 138 | 4.1531 | 0.0151 |
| 139 | 4.1681 | 0.0150 |
| 140 | 4.1831 | 0.0150 |
| 141 | 4.1980 | 0.0149 |
| 142 | 4.2129 | 0.0149 |
| 143 | 4.2277 | 0.0148 |
| 144 | 4.2424 | 0.0148 |
| 145 | 4.2571 | 0.0147 |
| 146 | 4.2718 | 0.0147 |
| 147 | 4.2864 | 0.0146 |
| 148 | 4.3010 | 0.0146 |
| 149 | 4.3155 | 0.0145 |
| 150 | 4.3299 | 0.0145 |
| 151 | 4.3443 | 0.0144 |

| | | |
|---|---|---|
| 152 | 4.3587 | 0.0144 |
| 153 | 4.3730 | 0.0143 |
| 154 | 4.3873 | 0.0143 |
| 155 | 4.4015 | 0.0142 |
| 156 | 4.4157 | 0.0142 |
| 157 | 4.4298 | 0.0141 |
| 158 | 4.4439 | 0.0141 |
| 159 | 4.4579 | 0.0140 |
| 160 | 4.4719 | 0.0140 |
| 161 | 4.4859 | 0.0140 |
| 162 | 4.4998 | 0.0139 |
| 163 | 4.5137 | 0.0139 |
| 164 | 4.5275 | 0.0138 |
| 165 | 4.5413 | 0.0138 |
| 166 | 4.5550 | 0.0137 |
| 167 | 4.5687 | 0.0137 |
| 168 | 4.5824 | 0.0137 |
| 169 | 4.5960 | 0.0136 |
| 170 | 4.6096 | 0.0136 |
| 171 | 4.6231 | 0.0135 |
| 172 | 4.6366 | 0.0135 |
| 173 | 4.6501 | 0.0135 |
| 174 | 4.6635 | 0.0134 |
| 175 | 4.6769 | 0.0134 |
| 176 | 4.6902 | 0.0133 |
| 177 | 4.7035 | 0.0133 |
| 178 | 4.7168 | 0.0133 |
| 179 | 4.7300 | 0.0132 |
| 180 | 4.7432 | 0.0132 |
| 181 | 4.7564 | 0.0132 |
| 182 | 4.7695 | 0.0131 |
| 183 | 4.7826 | 0.0131 |
| 184 | 4.7956 | 0.0131 |
| 185 | 4.8086 | 0.0130 |
| 186 | 4.8216 | 0.0130 |
| 187 | 4.8346 | 0.0129 |
| 188 | 4.8475 | 0.0129 |
| 189 | 4.8604 | 0.0129 |
| 190 | 4.8732 | 0.0128 |
| 191 | 4.8860 | 0.0128 |
| 192 | 4.8988 | 0.0128 |
| 193 | 4.9115 | 0.0127 |
| 194 | 4.9242 | 0.0127 |
| 195 | 4.9369 | 0.0127 |
| 196 | 4.9495 | 0.0126 |
| 197 | 4.9622 | 0.0126 |
| 198 | 4.9747 | 0.0126 |
| 199 | 4.9873 | 0.0125 |
| 200 | 4.9998 | 0.0125 |
| 201 | 5.0123 | 0.0125 |
| 202 | 5.0247 | 0.0125 |
| 203 | 5.0372 | 0.0124 |
| 204 | 5.0496 | 0.0124 |

| | | |
|---|---|---|
| 205 | 5.0619 | 0.0124 |
| 206 | 5.0742 | 0.0123 |
| 207 | 5.0866 | 0.0123 |
| 208 | 5.0988 | 0.0123 |
| 209 | 5.1111 | 0.0122 |
| 210 | 5.1233 | 0.0122 |
| 211 | 5.1355 | 0.0122 |
| 212 | 5.1476 | 0.0122 |
| 213 | 5.1597 | 0.0121 |
| 214 | 5.1718 | 0.0121 |
| 215 | 5.1839 | 0.0121 |
| 216 | 5.1960 | 0.0120 |
| 217 | 5.2080 | 0.0120 |
| 218 | 5.2200 | 0.0120 |
| 219 | 5.2319 | 0.0120 |
| 220 | 5.2439 | 0.0119 |
| 221 | 5.2558 | 0.0119 |
| 222 | 5.2676 | 0.0119 |
| 223 | 5.2795 | 0.0119 |
| 224 | 5.2913 | 0.0118 |
| 225 | 5.3031 | 0.0118 |
| 226 | 5.3149 | 0.0118 |
| 227 | 5.3266 | 0.0117 |
| 228 | 5.3383 | 0.0117 |
| 229 | 5.3500 | 0.0117 |
| 230 | 5.3617 | 0.0117 |
| 231 | 5.3734 | 0.0116 |
| 232 | 5.3850 | 0.0116 |
| 233 | 5.3966 | 0.0116 |
| 234 | 5.4081 | 0.0116 |
| 235 | 5.4197 | 0.0115 |
| 236 | 5.4312 | 0.0115 |
| 237 | 5.4427 | 0.0115 |
| 238 | 5.4542 | 0.0115 |
| 239 | 5.4656 | 0.0114 |
| 240 | 5.4770 | 0.0114 |
| 241 | 5.4884 | 0.0114 |
| 242 | 5.4998 | 0.0114 |
| 243 | 5.5112 | 0.0114 |
| 244 | 5.5225 | 0.0113 |
| 245 | 5.5338 | 0.0113 |
| 246 | 5.5451 | 0.0113 |
| 247 | 5.5563 | 0.0113 |
| 248 | 5.5676 | 0.0112 |
| 249 | 5.5788 | 0.0112 |
| 250 | 5.5900 | 0.0112 |
| 251 | 5.6012 | 0.0112 |
| 252 | 5.6123 | 0.0111 |
| 253 | 5.6234 | 0.0111 |
| 254 | 5.6345 | 0.0111 |
| 255 | 5.6456 | 0.0111 |
| 256 | 5.6567 | 0.0111 |
| 257 | 5.6677 | 0.0110 |

| | | |
|---|---|---|
| 258 | 5.6787 | 0.0110 |
| 259 | 5.6897 | 0.0110 |
| 260 | 5.7007 | 0.0110 |
| 261 | 5.7116 | 0.0110 |
| 262 | 5.7226 | 0.0109 |
| 263 | 5.7335 | 0.0109 |
| 264 | 5.7444 | 0.0109 |
| 265 | 5.7553 | 0.0109 |
| 266 | 5.7661 | 0.0108 |
| 267 | 5.7769 | 0.0108 |
| 268 | 5.7877 | 0.0108 |
| 269 | 5.7985 | 0.0108 |
| 270 | 5.8093 | 0.0108 |
| 271 | 5.8200 | 0.0107 |
| 272 | 5.8308 | 0.0107 |
| 273 | 5.8415 | 0.0107 |
| 274 | 5.8522 | 0.0107 |
| 275 | 5.8628 | 0.0107 |
| 276 | 5.8735 | 0.0107 |
| 277 | 5.8841 | 0.0106 |
| 278 | 5.8947 | 0.0106 |
| 279 | 5.9053 | 0.0106 |
| 280 | 5.9159 | 0.0106 |
| 281 | 5.9265 | 0.0106 |
| 282 | 5.9370 | 0.0105 |
| 283 | 5.9475 | 0.0105 |
| 284 | 5.9580 | 0.0105 |
| 285 | 5.9685 | 0.0105 |
| 286 | 5.9790 | 0.0105 |
| 287 | 5.9894 | 0.0104 |
| 288 | 5.9998 | 0.0104 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0104 | 0.0014 | 0.0090 |
| 2 | 0.0104 | 0.0014 | 0.0090 |
| 3 | 0.0105 | 0.0014 | 0.0091 |
| 4 | 0.0105 | 0.0014 | 0.0091 |
| 5 | 0.0105 | 0.0014 | 0.0091 |
| 6 | 0.0106 | 0.0014 | 0.0091 |
| 7 | 0.0106 | 0.0014 | 0.0092 |
| 8 | 0.0106 | 0.0014 | 0.0092 |
| 9 | 0.0107 | 0.0014 | 0.0092 |
| 10 | 0.0107 | 0.0014 | 0.0092 |
| 11 | 0.0107 | 0.0014 | 0.0093 |
| 12 | 0.0107 | 0.0014 | 0.0093 |
| 13 | 0.0108 | 0.0014 | 0.0093 |
| 14 | 0.0108 | 0.0014 | 0.0093 |
| 15 | 0.0108 | 0.0014 | 0.0094 |
| 16 | 0.0108 | 0.0014 | 0.0094 |
| 17 | 0.0109 | 0.0015 | 0.0094 |

| | | | |
|---|---|---|---|
| 18 | 0.0109 | 0.0015 | 0.0095 |
| 19 | 0.0110 | 0.0015 | 0.0095 |
| 20 | 0.0110 | 0.0015 | 0.0095 |
| 21 | 0.0110 | 0.0015 | 0.0095 |
| 22 | 0.0110 | 0.0015 | 0.0096 |
| 23 | 0.0111 | 0.0015 | 0.0096 |
| 24 | 0.0111 | 0.0015 | 0.0096 |
| 25 | 0.0111 | 0.0015 | 0.0097 |
| 26 | 0.0112 | 0.0015 | 0.0097 |
| 27 | 0.0112 | 0.0015 | 0.0097 |
| 28 | 0.0112 | 0.0015 | 0.0097 |
| 29 | 0.0113 | 0.0015 | 0.0098 |
| 30 | 0.0113 | 0.0015 | 0.0098 |
| 31 | 0.0114 | 0.0015 | 0.0098 |
| 32 | 0.0114 | 0.0015 | 0.0099 |
| 33 | 0.0114 | 0.0015 | 0.0099 |
| 34 | 0.0114 | 0.0015 | 0.0099 |
| 35 | 0.0115 | 0.0015 | 0.0100 |
| 36 | 0.0115 | 0.0015 | 0.0100 |
| 37 | 0.0116 | 0.0015 | 0.0100 |
| 38 | 0.0116 | 0.0015 | 0.0100 |
| 39 | 0.0116 | 0.0016 | 0.0101 |
| 40 | 0.0117 | 0.0016 | 0.0101 |
| 41 | 0.0117 | 0.0016 | 0.0102 |
| 42 | 0.0117 | 0.0016 | 0.0102 |
| 43 | 0.0118 | 0.0016 | 0.0102 |
| 44 | 0.0118 | 0.0016 | 0.0102 |
| 45 | 0.0119 | 0.0016 | 0.0103 |
| 46 | 0.0119 | 0.0016 | 0.0103 |
| 47 | 0.0120 | 0.0016 | 0.0104 |
| 48 | 0.0120 | 0.0016 | 0.0104 |
| 49 | 0.0120 | 0.0016 | 0.0104 |
| 50 | 0.0121 | 0.0016 | 0.0105 |
| 51 | 0.0121 | 0.0016 | 0.0105 |
| 52 | 0.0122 | 0.0016 | 0.0105 |
| 53 | 0.0122 | 0.0016 | 0.0106 |
| 54 | 0.0122 | 0.0016 | 0.0106 |
| 55 | 0.0123 | 0.0016 | 0.0107 |
| 56 | 0.0123 | 0.0016 | 0.0107 |
| 57 | 0.0124 | 0.0017 | 0.0107 |
| 58 | 0.0124 | 0.0017 | 0.0108 |
| 59 | 0.0125 | 0.0017 | 0.0108 |
| 60 | 0.0125 | 0.0017 | 0.0108 |
| 61 | 0.0126 | 0.0017 | 0.0109 |
| 62 | 0.0126 | 0.0017 | 0.0109 |
| 63 | 0.0127 | 0.0017 | 0.0110 |
| 64 | 0.0127 | 0.0017 | 0.0110 |
| 65 | 0.0128 | 0.0017 | 0.0111 |
| 66 | 0.0128 | 0.0017 | 0.0111 |
| 67 | 0.0129 | 0.0017 | 0.0112 |
| 68 | 0.0129 | 0.0017 | 0.0112 |
| 69 | 0.0130 | 0.0017 | 0.0112 |
| 70 | 0.0130 | 0.0017 | 0.0113 |

| | | | |
|---|---|---|---|
| 71 | 0.0131 | 0.0017 | 0.0113 |
| 72 | 0.0131 | 0.0018 | 0.0114 |
| 73 | 0.0132 | 0.0018 | 0.0114 |
| 74 | 0.0132 | 0.0018 | 0.0115 |
| 75 | 0.0133 | 0.0018 | 0.0115 |
| 76 | 0.0133 | 0.0018 | 0.0116 |
| 77 | 0.0134 | 0.0018 | 0.0116 |
| 78 | 0.0135 | 0.0018 | 0.0117 |
| 79 | 0.0135 | 0.0018 | 0.0117 |
| 80 | 0.0136 | 0.0018 | 0.0118 |
| 81 | 0.0137 | 0.0018 | 0.0118 |
| 82 | 0.0137 | 0.0018 | 0.0119 |
| 83 | 0.0138 | 0.0018 | 0.0119 |
| 84 | 0.0138 | 0.0018 | 0.0120 |
| 85 | 0.0139 | 0.0019 | 0.0121 |
| 86 | 0.0140 | 0.0019 | 0.0121 |
| 87 | 0.0140 | 0.0019 | 0.0122 |
| 88 | 0.0141 | 0.0019 | 0.0122 |
| 89 | 0.0142 | 0.0019 | 0.0123 |
| 90 | 0.0142 | 0.0019 | 0.0123 |
| 91 | 0.0143 | 0.0019 | 0.0124 |
| 92 | 0.0144 | 0.0019 | 0.0124 |
| 93 | 0.0145 | 0.0019 | 0.0125 |
| 94 | 0.0145 | 0.0019 | 0.0126 |
| 95 | 0.0146 | 0.0019 | 0.0127 |
| 96 | 0.0147 | 0.0020 | 0.0127 |
| 97 | 0.0148 | 0.0020 | 0.0128 |
| 98 | 0.0148 | 0.0020 | 0.0128 |
| 99 | 0.0149 | 0.0020 | 0.0129 |
| 100 | 0.0150 | 0.0020 | 0.0130 |
| 101 | 0.0151 | 0.0020 | 0.0131 |
| 102 | 0.0151 | 0.0020 | 0.0131 |
| 103 | 0.0152 | 0.0020 | 0.0132 |
| 104 | 0.0153 | 0.0020 | 0.0133 |
| 105 | 0.0154 | 0.0021 | 0.0134 |
| 106 | 0.0155 | 0.0021 | 0.0134 |
| 107 | 0.0156 | 0.0021 | 0.0135 |
| 108 | 0.0157 | 0.0021 | 0.0136 |
| 109 | 0.0158 | 0.0021 | 0.0137 |
| 110 | 0.0158 | 0.0021 | 0.0137 |
| 111 | 0.0160 | 0.0021 | 0.0138 |
| 112 | 0.0160 | 0.0021 | 0.0139 |
| 113 | 0.0162 | 0.0022 | 0.0140 |
| 114 | 0.0162 | 0.0022 | 0.0141 |
| 115 | 0.0164 | 0.0022 | 0.0142 |
| 116 | 0.0164 | 0.0022 | 0.0143 |
| 117 | 0.0166 | 0.0022 | 0.0144 |
| 118 | 0.0167 | 0.0022 | 0.0144 |
| 119 | 0.0168 | 0.0022 | 0.0146 |
| 120 | 0.0169 | 0.0023 | 0.0146 |
| 121 | 0.0170 | 0.0023 | 0.0148 |
| 122 | 0.0171 | 0.0023 | 0.0148 |
| 123 | 0.0173 | 0.0023 | 0.0150 |

| | | | |
|---|---|---|---|
| 124 | 0.0174 | 0.0023 | 0.0151 |
| 125 | 0.0175 | 0.0023 | 0.0152 |
| 126 | 0.0176 | 0.0024 | 0.0153 |
| 127 | 0.0178 | 0.0024 | 0.0154 |
| 128 | 0.0179 | 0.0024 | 0.0155 |
| 129 | 0.0181 | 0.0024 | 0.0157 |
| 130 | 0.0182 | 0.0024 | 0.0158 |
| 131 | 0.0184 | 0.0025 | 0.0159 |
| 132 | 0.0185 | 0.0025 | 0.0160 |
| 133 | 0.0187 | 0.0025 | 0.0162 |
| 134 | 0.0188 | 0.0025 | 0.0163 |
| 135 | 0.0190 | 0.0025 | 0.0165 |
| 136 | 0.0191 | 0.0026 | 0.0166 |
| 137 | 0.0193 | 0.0026 | 0.0168 |
| 138 | 0.0195 | 0.0026 | 0.0169 |
| 139 | 0.0197 | 0.0026 | 0.0171 |
| 140 | 0.0198 | 0.0026 | 0.0172 |
| 141 | 0.0201 | 0.0027 | 0.0174 |
| 142 | 0.0202 | 0.0027 | 0.0175 |
| 143 | 0.0205 | 0.0027 | 0.0177 |
| 144 | 0.0206 | 0.0028 | 0.0179 |
| 145 | 0.0214 | 0.0029 | 0.0185 |
| 146 | 0.0215 | 0.0029 | 0.0187 |
| 147 | 0.0218 | 0.0029 | 0.0189 |
| 148 | 0.0220 | 0.0029 | 0.0191 |
| 149 | 0.0223 | 0.0030 | 0.0193 |
| 150 | 0.0225 | 0.0030 | 0.0195 |
| 151 | 0.0228 | 0.0030 | 0.0198 |
| 152 | 0.0230 | 0.0031 | 0.0199 |
| 153 | 0.0234 | 0.0031 | 0.0203 |
| 154 | 0.0236 | 0.0031 | 0.0204 |
| 155 | 0.0240 | 0.0032 | 0.0208 |
| 156 | 0.0242 | 0.0032 | 0.0210 |
| 157 | 0.0246 | 0.0033 | 0.0213 |
| 158 | 0.0249 | 0.0033 | 0.0215 |
| 159 | 0.0253 | 0.0034 | 0.0220 |
| 160 | 0.0256 | 0.0034 | 0.0222 |
| 161 | 0.0261 | 0.0035 | 0.0226 |
| 162 | 0.0264 | 0.0035 | 0.0229 |
| 163 | 0.0270 | 0.0036 | 0.0234 |
| 164 | 0.0273 | 0.0036 | 0.0236 |
| 165 | 0.0279 | 0.0037 | 0.0242 |
| 166 | 0.0282 | 0.0038 | 0.0245 |
| 167 | 0.0289 | 0.0039 | 0.0251 |
| 168 | 0.0293 | 0.0039 | 0.0254 |
| 169 | 0.0301 | 0.0040 | 0.0261 |
| 170 | 0.0306 | 0.0041 | 0.0265 |
| 171 | 0.0315 | 0.0042 | 0.0273 |
| 172 | 0.0320 | 0.0043 | 0.0277 |
| 173 | 0.0330 | 0.0044 | 0.0286 |
| 174 | 0.0336 | 0.0045 | 0.0291 |
| 175 | 0.0348 | 0.0046 | 0.0301 |
| 176 | 0.0354 | 0.0047 | 0.0307 |

| | | | |
|---|---|---|---|
| 177 | 0.0369 | 0.0049 | 0.0319 |
| 178 | 0.0377 | 0.0050 | 0.0326 |
| 179 | 0.0394 | 0.0053 | 0.0341 |
| 180 | 0.0404 | 0.0054 | 0.0350 |
| 181 | 0.0426 | 0.0057 | 0.0369 |
| 182 | 0.0438 | 0.0058 | 0.0380 |
| 183 | 0.0467 | 0.0062 | 0.0404 |
| 184 | 0.0483 | 0.0065 | 0.0419 |
| 185 | 0.0410 | 0.0055 | 0.0355 |
| 186 | 0.0433 | 0.0058 | 0.0375 |
| 187 | 0.0492 | 0.0066 | 0.0426 |
| 188 | 0.0530 | 0.0071 | 0.0459 |
| 189 | 0.0639 | 0.0081 | 0.0557 |
| 190 | 0.0721 | 0.0081 | 0.0640 |
| 191 | 0.1031 | 0.0081 | 0.0949 |
| 192 | 0.1418 | 0.0081 | 0.1336 |
| 193 | 0.4437 | 0.0081 | 0.4355 |
| 194 | 0.0840 | 0.0081 | 0.0758 |
| 195 | 0.0578 | 0.0077 | 0.0501 |
| 196 | 0.0460 | 0.0061 | 0.0399 |
| 197 | 0.0502 | 0.0067 | 0.0435 |
| 198 | 0.0452 | 0.0060 | 0.0391 |
| 199 | 0.0414 | 0.0055 | 0.0359 |
| 200 | 0.0385 | 0.0051 | 0.0334 |
| 201 | 0.0361 | 0.0048 | 0.0313 |
| 202 | 0.0341 | 0.0046 | 0.0296 |
| 203 | 0.0325 | 0.0043 | 0.0281 |
| 204 | 0.0310 | 0.0041 | 0.0269 |
| 205 | 0.0297 | 0.0040 | 0.0257 |
| 206 | 0.0286 | 0.0038 | 0.0248 |
| 207 | 0.0276 | 0.0037 | 0.0239 |
| 208 | 0.0267 | 0.0036 | 0.0231 |
| 209 | 0.0258 | 0.0035 | 0.0224 |
| 210 | 0.0251 | 0.0034 | 0.0217 |
| 211 | 0.0244 | 0.0033 | 0.0212 |
| 212 | 0.0238 | 0.0032 | 0.0206 |
| 213 | 0.0232 | 0.0031 | 0.0201 |
| 214 | 0.0227 | 0.0030 | 0.0196 |
| 215 | 0.0222 | 0.0030 | 0.0192 |
| 216 | 0.0217 | 0.0029 | 0.0188 |
| 217 | 0.0208 | 0.0028 | 0.0180 |
| 218 | 0.0203 | 0.0027 | 0.0176 |
| 219 | 0.0200 | 0.0027 | 0.0173 |
| 220 | 0.0196 | 0.0026 | 0.0170 |
| 221 | 0.0192 | 0.0026 | 0.0167 |
| 222 | 0.0189 | 0.0025 | 0.0164 |
| 223 | 0.0186 | 0.0025 | 0.0161 |
| 224 | 0.0183 | 0.0024 | 0.0158 |
| 225 | 0.0180 | 0.0024 | 0.0156 |
| 226 | 0.0177 | 0.0024 | 0.0154 |
| 227 | 0.0175 | 0.0023 | 0.0151 |
| 228 | 0.0172 | 0.0023 | 0.0149 |
| 229 | 0.0170 | 0.0023 | 0.0147 |

| | | | |
|---|---|---|---|
| 230 | 0.0167 | 0.0022 | 0.0145 |
| 231 | 0.0165 | 0.0022 | 0.0143 |
| 232 | 0.0163 | 0.0022 | 0.0141 |
| 233 | 0.0161 | 0.0021 | 0.0140 |
| 234 | 0.0159 | 0.0021 | 0.0138 |
| 235 | 0.0157 | 0.0021 | 0.0136 |
| 236 | 0.0155 | 0.0021 | 0.0135 |
| 237 | 0.0154 | 0.0021 | 0.0133 |
| 238 | 0.0152 | 0.0020 | 0.0132 |
| 239 | 0.0150 | 0.0020 | 0.0130 |
| 240 | 0.0149 | 0.0020 | 0.0129 |
| 241 | 0.0147 | 0.0020 | 0.0127 |
| 242 | 0.0146 | 0.0019 | 0.0126 |
| 243 | 0.0144 | 0.0019 | 0.0125 |
| 244 | 0.0143 | 0.0019 | 0.0124 |
| 245 | 0.0141 | 0.0019 | 0.0122 |
| 246 | 0.0140 | 0.0019 | 0.0121 |
| 247 | 0.0139 | 0.0019 | 0.0120 |
| 248 | 0.0137 | 0.0018 | 0.0119 |
| 249 | 0.0136 | 0.0018 | 0.0118 |
| 250 | 0.0135 | 0.0018 | 0.0117 |
| 251 | 0.0134 | 0.0018 | 0.0116 |
| 252 | 0.0133 | 0.0018 | 0.0115 |
| 253 | 0.0132 | 0.0018 | 0.0114 |
| 254 | 0.0131 | 0.0017 | 0.0113 |
| 255 | 0.0129 | 0.0017 | 0.0112 |
| 256 | 0.0128 | 0.0017 | 0.0111 |
| 257 | 0.0127 | 0.0017 | 0.0110 |
| 258 | 0.0126 | 0.0017 | 0.0110 |
| 259 | 0.0125 | 0.0017 | 0.0109 |
| 260 | 0.0125 | 0.0017 | 0.0108 |
| 261 | 0.0124 | 0.0017 | 0.0107 |
| 262 | 0.0123 | 0.0016 | 0.0106 |
| 263 | 0.0122 | 0.0016 | 0.0106 |
| 264 | 0.0121 | 0.0016 | 0.0105 |
| 265 | 0.0120 | 0.0016 | 0.0104 |
| 266 | 0.0119 | 0.0016 | 0.0103 |
| 267 | 0.0119 | 0.0016 | 0.0103 |
| 268 | 0.0118 | 0.0016 | 0.0102 |
| 269 | 0.0117 | 0.0016 | 0.0101 |
| 270 | 0.0116 | 0.0016 | 0.0101 |
| 271 | 0.0115 | 0.0015 | 0.0100 |
| 272 | 0.0115 | 0.0015 | 0.0099 |
| 273 | 0.0114 | 0.0015 | 0.0099 |
| 274 | 0.0113 | 0.0015 | 0.0098 |
| 275 | 0.0113 | 0.0015 | 0.0098 |
| 276 | 0.0112 | 0.0015 | 0.0097 |
| 277 | 0.0111 | 0.0015 | 0.0096 |
| 278 | 0.0111 | 0.0015 | 0.0096 |
| 279 | 0.0110 | 0.0015 | 0.0095 |
| 280 | 0.0109 | 0.0015 | 0.0095 |
| 281 | 0.0109 | 0.0015 | 0.0094 |
| 282 | 0.0108 | 0.0014 | 0.0094 |

| | | | |
|---|---|---|---|
| 283 | 0.0107 | 0.0014 | 0.0093 |
| 284 | 0.0107 | 0.0014 | 0.0093 |
| 285 | 0.0106 | 0.0014 | 0.0092 |
| 286 | 0.0106 | 0.0014 | 0.0092 |
| 287 | 0.0105 | 0.0014 | 0.0091 |
| 288 | 0.0105 | 0.0014 | 0.0091 |

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Total soil rain loss = 0.73(In)
Total effective rainfall = 5.27(In)
Peak flow rate in flood hydrograph = 63.63(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))

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Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
-----------------------------------------------------------------------
  0+ 5       0.0012      0.17  Q         |         |         |         |
  0+10       0.0085      1.07  Q         |         |         |         |
  0+15       0.0227      2.06  VQ        |         |         |         |
  0+20       0.0392      2.40  VQ        |         |         |         |
  0+25       0.0563      2.48  VQ        |         |         |         |
  0+30       0.0736      2.51  VQ        |         |         |         |
  0+35       0.0910      2.52  VQ        |         |         |         |
  0+40       0.1084      2.53  VQ        |         |         |         |
  0+45       0.1258      2.54  VQ        |         |         |         |
  0+50       0.1433      2.54  VQ        |         |         |         |
  0+55       0.1609      2.55  VQ        |         |         |         |
  1+ 0       0.1785      2.56  VQ        |         |         |         |
  1+ 5       0.1961      2.56  VQ        |         |         |         |
  1+10       0.2138      2.57  VQ        |         |         |         |
  1+15       0.2316      2.58  VQ        |         |         |         |
  1+20       0.2494      2.58  VQ        |         |         |         |
  1+25       0.2672      2.59  |Q        |         |         |         |
  1+30       0.2851      2.60  |Q        |         |         |         |
  1+35       0.3031      2.61  |Q        |         |         |         |
  1+40       0.3211      2.61  |Q        |         |         |         |
  1+45       0.3391      2.62  |Q        |         |         |         |
  1+50       0.3572      2.63  |Q        |         |         |         |
  1+55       0.3754      2.64  |Q        |         |         |         |
  2+ 0       0.3936      2.64  |Q        |         |         |         |
  2+ 5       0.4119      2.65  |Q        |         |         |         |
  2+10       0.4302      2.66  |Q        |         |         |         |
  2+15       0.4486      2.67  |Q        |         |         |         |
  2+20       0.4670      2.68  |Q        |         |         |         |
  2+25       0.4855      2.68  |Q        |         |         |         |
  2+30       0.5040      2.69  |QV       |         |         |         |
  2+35       0.5226      2.70  |QV       |         |         |         |
  2+40       0.5413      2.71  |QV       |         |         |         |
```

```
2+45       0.5600      2.72  |QV       |         |         |         |
2+50       0.5787      2.73  |QV       |         |         |         |
2+55       0.5976      2.73  |QV       |         |         |         |
3+ 0       0.6165      2.74  |QV       |         |         |         |
3+ 5       0.6354      2.75  |QV       |         |         |         |
3+10       0.6544      2.76  |QV       |         |         |         |
3+15       0.6735      2.77  |QV       |         |         |         |
3+20       0.6926      2.78  |QV       |         |         |         |
3+25       0.7118      2.79  |QV       |         |         |         |
3+30       0.7311      2.80  |QV       |         |         |         |
3+35       0.7504      2.80  |QV       |         |         |         |
3+40       0.7698      2.81  |Q V      |         |         |         |
3+45       0.7892      2.82  |Q V      |         |         |         |
3+50       0.8087      2.83  |Q V      |         |         |         |
3+55       0.8283      2.84  |Q V      |         |         |         |
4+ 0       0.8479      2.85  |Q V      |         |         |         |
4+ 5       0.8677      2.86  |Q V      |         |         |         |
4+10       0.8874      2.87  |Q V      |         |         |         |
4+15       0.9073      2.88  |Q V      |         |         |         |
4+20       0.9272      2.89  |Q V      |         |         |         |
4+25       0.9472      2.90  |Q V      |         |         |         |
4+30       0.9672      2.91  |Q V      |         |         |         |
4+35       0.9874      2.92  |Q V      |         |         |         |
4+40       1.0076      2.93  |Q  V     |         |         |         |
4+45       1.0279      2.94  |Q  V     |         |         |         |
4+50       1.0482      2.96  |Q  V     |         |         |         |
4+55       1.0686      2.97  |Q  V     |         |         |         |
5+ 0       1.0891      2.98  |Q  V     |         |         |         |
5+ 5       1.1097      2.99  |Q  V     |         |         |         |
5+10       1.1304      3.00  |Q  V     |         |         |         |
5+15       1.1511      3.01  |Q  V     |         |         |         |
5+20       1.1719      3.02  |Q  V     |         |         |         |
5+25       1.1928      3.03  |Q  V     |         |         |         |
5+30       1.2138      3.05  |Q  V     |         |         |         |
5+35       1.2349      3.06  |Q  V     |         |         |         |
5+40       1.2560      3.07  |Q   V    |         |         |         |
5+45       1.2772      3.08  |Q   V    |         |         |         |
5+50       1.2985      3.09  |Q   V    |         |         |         |
5+55       1.3199      3.11  |Q   V    |         |         |         |
6+ 0       1.3414      3.12  |Q   V    |         |         |         |
6+ 5       1.3630      3.13  |Q   V    |         |         |         |
6+10       1.3846      3.15  |Q   V    |         |         |         |
6+15       1.4064      3.16  |Q   V    |         |         |         |
6+20       1.4282      3.17  |Q   V    |         |         |         |
6+25       1.4502      3.18  |Q   V    |         |         |         |
6+30       1.4722      3.20  |Q   V    |         |         |         |
6+35       1.4943      3.21  |Q   V    |         |         |         |
6+40       1.5165      3.23  |Q    V   |         |         |         |
6+45       1.5388      3.24  |Q    V   |         |         |         |
6+50       1.5613      3.25  |Q    V   |         |         |         |
6+55       1.5838      3.27  |Q    V   |         |         |         |
7+ 0       1.6064      3.28  |Q    V   |         |         |         |
7+ 5       1.6291      3.30  |Q    V   |         |         |         |
```

```
 7+10       1.6519      3.31  |Q    V   |          |          |          |
 7+15       1.6749      3.33  |Q    V   |          |          |          |
 7+20       1.6979      3.35  |Q    V   |          |          |          |
 7+25       1.7211      3.36  |Q    V   |          |          |          |
 7+30       1.7443      3.38  |Q    V   |          |          |          |
 7+35       1.7677      3.39  |Q     V  |          |          |          |
 7+40       1.7912      3.41  |Q     V  |          |          |          |
 7+45       1.8148      3.43  |Q     V  |          |          |          |
 7+50       1.8385      3.44  |Q     V  |          |          |          |
 7+55       1.8623      3.46  |Q     V  |          |          |          |
 8+ 0       1.8863      3.48  |Q     V  |          |          |          |
 8+ 5       1.9104      3.50  |Q     V  |          |          |          |
 8+10       1.9346      3.51  | Q    V  |          |          |          |
 8+15       1.9589      3.53  | Q    V  |          |          |          |
 8+20       1.9833      3.55  | Q    V  |          |          |          |
 8+25       2.0079      3.57  | Q     V |          |          |          |
 8+30       2.0326      3.59  | Q     V |          |          |          |
 8+35       2.0575      3.61  | Q     V |          |          |          |
 8+40       2.0825      3.63  | Q     V |          |          |          |
 8+45       2.1076      3.65  | Q     V |          |          |          |
 8+50       2.1329      3.67  | Q     V |          |          |          |
 8+55       2.1583      3.69  | Q     V |          |          |          |
 9+ 0       2.1839      3.71  | Q     V |          |          |          |
 9+ 5       2.2096      3.73  | Q     V |          |          |          |
 9+10       2.2354      3.76  | Q     V |          |          |          |
 9+15       2.2615      3.78  | Q      V|          |          |          |
 9+20       2.2876      3.80  | Q      V|          |          |          |
 9+25       2.3140      3.82  | Q      V|          |          |          |
 9+30       2.3405      3.85  | Q      V|          |          |          |
 9+35       2.3671      3.87  | Q      V|          |          |          |
 9+40       2.3940      3.90  | Q      V|          |          |          |
 9+45       2.4210      3.92  | Q      V|          |          |          |
 9+50       2.4482      3.95  | Q      V|          |          |          |
 9+55       2.4755      3.97  | Q      V|          |          |          |
10+ 0       2.5031      4.00  | Q      V|          |          |          |
10+ 5       2.5308      4.03  | Q       V          |          |          |
10+10       2.5587      4.05  | Q       V          |          |          |
10+15       2.5868      4.08  | Q       V          |          |          |
10+20       2.6151      4.11  | Q       V          |          |          |
10+25       2.6436      4.14  | Q       V          |          |          |
10+30       2.6724      4.17  | Q       V          |          |          |
10+35       2.7013      4.20  | Q       V          |          |          |
10+40       2.7305      4.23  | Q       V          |          |          |
10+45       2.7598      4.26  | Q       |V         |          |          |
10+50       2.7894      4.30  | Q       |V         |          |          |
10+55       2.8193      4.33  | Q       |V         |          |          |
11+ 0       2.8493      4.37  | Q       |V         |          |          |
11+ 5       2.8796      4.40  | Q       |V         |          |          |
11+10       2.9102      4.44  | Q       |V         |          |          |
11+15       2.9410      4.47  | Q       |V         |          |          |
11+20       2.9721      4.51  | Q       |V         |          |          |
11+25       3.0034      4.55  | Q       |V         |          |          |
11+30       3.0351      4.59  | Q       | V        |          |          |
```

```
11+35       3.0670      4.63  | Q       | V       |         |         |
11+40       3.0992      4.68  | Q       | V       |         |         |
11+45       3.1317      4.72  | Q       | V       |         |         |
11+50       3.1645      4.76  | Q       | V       |         |         |
11+55       3.1976      4.81  | Q       | V       |         |         |
12+ 0       3.2310      4.86  | Q       | V       |         |         |
12+ 5       3.2649      4.91  | Q       |  V      |         |         |
12+10       3.2993      5.00  | Q       |  V      |         |         |
12+15       3.3345      5.10  | Q       |  V      |         |         |
12+20       3.3701      5.17  | Q       |  V      |         |         |
12+25       3.4061      5.23  | Q       |  V      |         |         |
12+30       3.4425      5.29  |  Q      |  V      |         |         |
12+35       3.4793      5.35  |  Q      |  V      |         |         |
12+40       3.5166      5.41  |  Q      |   V     |         |         |
12+45       3.5543      5.47  |  Q      |   V     |         |         |
12+50       3.5924      5.54  |  Q      |   V     |         |         |
12+55       3.6310      5.60  |  Q      |   V     |         |         |
13+ 0       3.6701      5.67  |  Q      |   V     |         |         |
13+ 5       3.7097      5.75  |  Q      |   V     |         |         |
13+10       3.7498      5.82  |  Q      |   V     |         |         |
13+15       3.7904      5.90  |  Q      |    V    |         |         |
13+20       3.8317      5.99  |  Q      |    V    |         |         |
13+25       3.8735      6.07  |  Q      |    V    |         |         |
13+30       3.9159      6.16  |  Q      |    V    |         |         |
13+35       3.9590      6.26  |  Q      |    V    |         |         |
13+40       4.0028      6.36  |  Q      |    V    |         |         |
13+45       4.0473      6.46  |  Q      |     V   |         |         |
13+50       4.0926      6.57  |  Q      |     V   |         |         |
13+55       4.1387      6.69  |  Q      |     V   |         |         |
14+ 0       4.1856      6.81  |  Q      |     V   |         |         |
14+ 5       4.2334      6.94  |  Q      |     V   |         |         |
14+10       4.2821      7.08  |   Q     |      V  |         |         |
14+15       4.3319      7.23  |   Q     |      V  |         |         |
14+20       4.3828      7.39  |   Q     |      V  |         |         |
14+25       4.4348      7.55  |   Q     |      V  |         |         |
14+30       4.4880      7.73  |   Q     |      V  |         |         |
14+35       4.5426      7.92  |   Q     |       V |         |         |
14+40       4.5986      8.13  |   Q     |       V |         |         |
14+45       4.6561      8.35  |   Q     |       V |         |         |
14+50       4.7153      8.59  |   Q     |       V |         |         |
14+55       4.7763      8.86  |    Q    |        V|         |         |
15+ 0       4.8393      9.16  |    Q    |        V|         |         |
15+ 5       4.9046      9.48  |    Q    |        V|         |         |
15+10       4.9724      9.84  |    Q    |        V|         |         |
15+15       5.0430     10.25  |    Q    |         V         |         |
15+20       5.1169     10.72  |     Q   |         V         |         |
15+25       5.1932     11.08  |     Q   |         V         |         |
15+30       5.2672     10.75  |     Q   |         |V        |         |
15+35       5.3390     10.42  |    Q    |         |V        |         |
15+40       5.4147     10.99  |     Q   |         |V        |         |
15+45       5.4980     12.09  |     Q   |         |V        |         |
15+50       5.5928     13.77  |      Q  |         | V       |         |
15+55       5.7058     16.41  |        Q|         | V       |         |
```

```
16+ 0       5.8540     21.52  |         | Q       |  V      |         |
16+ 5       6.0933     34.75  |         |        Q|   V     |         |
16+10       6.5315     63.63  |         |         |     V   |     Q   |
16+15       6.9600     62.21  |         |         |      V  |    Q    |
16+20       7.1764     31.43  |         |      Q  |       V |         |
16+25       7.2934     16.98  |        Q|         |        V|         |
16+30       7.3856     13.39  |      Q  |         |        V|         |
16+35       7.4645     11.46  |     Q   |         |        V|         |
16+40       7.5374     10.58  |     Q   |         |         V         |
16+45       7.6047      9.77  |    Q    |         |         V         |
16+50       7.6674      9.11  |    Q    |         |         V         |
16+55       7.7263      8.55  |   Q     |         |         V         |
17+ 0       7.7820      8.09  |   Q     |         |         |V        |
17+ 5       7.8350      7.69  |   Q     |         |         |V        |
17+10       7.8856      7.35  |   Q     |         |         |V        |
17+15       7.9342      7.05  |   Q     |         |         |V        |
17+20       7.9809      6.78  |  Q      |         |         |V        |
17+25       8.0260      6.55  |  Q      |         |         | V       |
17+30       8.0696      6.33  |  Q      |         |         | V       |
17+35       8.1119      6.14  |  Q      |         |         | V       |
17+40       8.1530      5.97  |  Q      |         |         | V       |
17+45       8.1930      5.81  |  Q      |         |         | V       |
17+50       8.2320      5.66  |  Q      |         |         | V       |
17+55       8.2700      5.52  |  Q      |         |         |  V      |
18+ 0       8.3071      5.39  |  Q      |         |         |  V      |
18+ 5       8.3434      5.27  |  Q      |         |         |  V      |
18+10       8.3786      5.11  | Q       |         |         |  V      |
18+15       8.4128      4.96  | Q       |         |         |  V      |
18+20       8.4462      4.85  | Q       |         |         |  V      |
18+25       8.4789      4.75  | Q       |         |         |  V      |
18+30       8.5110      4.66  | Q       |         |         |  V      |
18+35       8.5426      4.58  | Q       |         |         |   V     |
18+40       8.5736      4.50  | Q       |         |         |   V     |
18+45       8.6041      4.43  | Q       |         |         |   V     |
18+50       8.6341      4.36  | Q       |         |         |   V     |
18+55       8.6636      4.29  | Q       |         |         |   V     |
19+ 0       8.6927      4.22  | Q       |         |         |   V     |
19+ 5       8.7214      4.16  | Q       |         |         |   V     |
19+10       8.7496      4.10  | Q       |         |         |   V     |
19+15       8.7775      4.05  | Q       |         |         |    V    |
19+20       8.8050      3.99  | Q       |         |         |    V    |
19+25       8.8321      3.94  | Q       |         |         |    V    |
19+30       8.8589      3.89  | Q       |         |         |    V    |
19+35       8.8854      3.84  | Q       |         |         |    V    |
19+40       8.9115      3.79  | Q       |         |         |    V    |
19+45       8.9373      3.75  | Q       |         |         |    V    |
19+50       8.9628      3.71  | Q       |         |         |    V    |
19+55       8.9881      3.66  | Q       |         |         |    V    |
20+ 0       9.0130      3.62  | Q       |         |         |    V    |
20+ 5       9.0377      3.58  | Q       |         |         |     V   |
20+10       9.0621      3.55  | Q       |         |         |     V   |
20+15       9.0863      3.51  | Q       |         |         |     V   |
20+20       9.1102      3.47  |Q        |         |         |     V   |
```

```
  20+25       9.1339      3.44  |Q        |         |         |     V   |
  20+30       9.1574      3.41  |Q        |         |         |     V   |
  20+35       9.1806      3.37  |Q        |         |         |     V   |
  20+40       9.2036      3.34  |Q        |         |         |     V   |
  20+45       9.2264      3.31  |Q        |         |         |     V   |
  20+50       9.2490      3.28  |Q        |         |         |     V   |
  20+55       9.2714      3.25  |Q        |         |         |     V   |
  21+ 0       9.2936      3.22  |Q        |         |         |      V  |
  21+ 5       9.3156      3.19  |Q        |         |         |      V  |
  21+10       9.3374      3.17  |Q        |         |         |      V  |
  21+15       9.3590      3.14  |Q        |         |         |      V  |
  21+20       9.3805      3.12  |Q        |         |         |      V  |
  21+25       9.4017      3.09  |Q        |         |         |      V  |
  21+30       9.4229      3.07  |Q        |         |         |      V  |
  21+35       9.4438      3.04  |Q        |         |         |      V  |
  21+40       9.4646      3.02  |Q        |         |         |      V  |
  21+45       9.4852      3.00  |Q        |         |         |      V  |
  21+50       9.5057      2.97  |Q        |         |         |      V  |
  21+55       9.5261      2.95  |Q        |         |         |       V |
  22+ 0       9.5462      2.93  |Q        |         |         |       V |
  22+ 5       9.5663      2.91  |Q        |         |         |       V |
  22+10       9.5862      2.89  |Q        |         |         |       V |
  22+15       9.6059      2.87  |Q        |         |         |       V |
  22+20       9.6256      2.85  |Q        |         |         |       V |
  22+25       9.6451      2.83  |Q        |         |         |       V |
  22+30       9.6644      2.81  |Q        |         |         |       V |
  22+35       9.6837      2.79  |Q        |         |         |       V |
  22+40       9.7028      2.78  |Q        |         |         |       V |
  22+45       9.7218      2.76  |Q        |         |         |       V |
  22+50       9.7406      2.74  |Q        |         |         |       V |
  22+55       9.7594      2.72  |Q        |         |         |       V |
  23+ 0       9.7780      2.71  |Q        |         |         |        V|
  23+ 5       9.7965      2.69  |Q        |         |         |        V|
  23+10       9.8149      2.67  |Q        |         |         |        V|
  23+15       9.8333      2.66  |Q        |         |         |        V|
  23+20       9.8514      2.64  |Q        |         |         |        V|
  23+25       9.8695      2.63  |Q        |         |         |        V|
  23+30       9.8875      2.61  |Q        |         |         |        V|
  23+35       9.9054      2.60  |Q        |         |         |        V|
  23+40       9.9232      2.58  |Q        |         |         |        V|
  23+45       9.9409      2.57  |Q        |         |         |        V|
  23+50       9.9585      2.55  |Q        |         |         |        V|
  23+55       9.9760      2.54  |Q        |         |         |        V|
  24+ 0       9.9934      2.53  |Q        |         |         |        V|
  24+ 5      10.0095      2.35  |Q        |         |         |        V|
  24+10      10.0194      1.44  Q         |         |         |        V|
  24+15      10.0224      0.44  Q         |         |         |        V|
  24+20      10.0231      0.10  Q         |         |         |        V|
  24+25      10.0233      0.03  Q         |         |         |        V|
----------------------------------------------------------------------
```

# APPENDIX B.6: UNIT HYDROGRAPH ANALYSIS, GROVE ONSITE MITIGATED, AREA E4

U n i t  H y d r o g r a p h  A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0

Study date 05/09/25

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---

San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6279

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ONTARIO RANCH 108.43.25
COMMERCIAL MITIGATED UNIT HYDROGRAPH METHOD HYDROLOGY
AREA E4, 100-YEAR STORM EVENT
FN: UARE4P

---

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 100 | | |
| 25.19 | 1 | 1.20 |
| Rainfall data for year 100 | | |
| 25.19 | 6 | 3.00 |
| Rainfall data for year 100 | | |
| 25.19 | 24 | 6.00 |

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******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 43.0 | 43.0 | 25.19 | 1.000 | 0.887 | 0.100 | 0.089 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.089

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 2.52 | 0.100 | 43.0 | 43.0 | 13.26 | 0.113 |
| 22.67 | 0.900 | 98.0 | 98.0 | 0.20 | 0.960 |

Area-averaged catchment yield fraction, Y = 0.876
Area-averaged low loss fraction, Yb = 0.124
User entry of time of concentration = 0.176 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 25.19(Ac.)
Catchment Lag time = 0.141 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 59.2193
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.087(In/Hr)
Average low loss rate fraction (Yb) = 0.124 (decimal)
Note: user entry of the Fm value
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 25.19(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.444(In)
30-minute factor = 0.999 Adjusted rainfall = 0.908(In)
1-hour factor = 0.999 Adjusted rainfall = 1.199(In)
3-hour factor = 1.000 Adjusted rainfall = 2.104(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval 'S' Graph Unit Hydrograph
Number Mean values ((CFS))
---
(K = 304.64 (CFS))

| | | |
|---|---|---|
| 1 | 6.355 | 19.360 |
| 2 | 40.677 | 104.558 |
| 3 | 80.952 | 122.694 |
| 4 | 95.217 | 43.457 |
| 5 | 98.595 | 10.292 |
| 6 | 100.000 | 4.279 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4436 | 0.4436 |
| 2 | 0.5853 | 0.1417 |
| 3 | 0.6884 | 0.1031 |
| 4 | 0.7724 | 0.0840 |
| 5 | 0.8445 | 0.0721 |
| 6 | 0.9084 | 0.0639 |
| 7 | 0.9661 | 0.0578 |
| 8 | 1.0191 | 0.0530 |
| 9 | 1.0683 | 0.0492 |
| 10 | 1.1143 | 0.0460 |
| 11 | 1.1576 | 0.0433 |
| 12 | 1.1986 | 0.0410 |
| 13 | 1.2488 | 0.0502 |
| 14 | 1.2971 | 0.0483 |
| 15 | 1.3437 | 0.0467 |
| 16 | 1.3889 | 0.0452 |
| 17 | 1.4327 | 0.0438 |
| 18 | 1.4753 | 0.0426 |
| 19 | 1.5168 | 0.0414 |
| 20 | 1.5571 | 0.0404 |
| 21 | 1.5966 | 0.0394 |
| 22 | 1.6351 | 0.0385 |
| 23 | 1.6727 | 0.0377 |
| 24 | 1.7096 | 0.0369 |
| 25 | 1.7457 | 0.0361 |
| 26 | 1.7812 | 0.0354 |
| 27 | 1.8159 | 0.0348 |
| 28 | 1.8501 | 0.0342 |
| 29 | 1.8837 | 0.0336 |
| 30 | 1.9167 | 0.0330 |
| 31 | 1.9491 | 0.0325 |
| 32 | 1.9811 | 0.0320 |
| 33 | 2.0126 | 0.0315 |
| 34 | 2.0436 | 0.0310 |
| 35 | 2.0742 | 0.0306 |
| 36 | 2.1043 | 0.0302 |
| 37 | 2.1340 | 0.0297 |
| 38 | 2.1633 | 0.0293 |
| 39 | 2.1923 | 0.0289 |
| 40 | 2.2208 | 0.0286 |
| 41 | 2.2491 | 0.0282 |
| 42 | 2.2770 | 0.0279 |
| 43 | 2.3045 | 0.0276 |
| 44 | 2.3318 | 0.0273 |

| | | |
|---|---|---|
| 45 | 2.3587 | 0.0270 |
| 46 | 2.3854 | 0.0267 |
| 47 | 2.4118 | 0.0264 |
| 48 | 2.4379 | 0.0261 |
| 49 | 2.4638 | 0.0258 |
| 50 | 2.4893 | 0.0256 |
| 51 | 2.5147 | 0.0253 |
| 52 | 2.5398 | 0.0251 |
| 53 | 2.5647 | 0.0249 |
| 54 | 2.5893 | 0.0246 |
| 55 | 2.6137 | 0.0244 |
| 56 | 2.6379 | 0.0242 |
| 57 | 2.6619 | 0.0240 |
| 58 | 2.6857 | 0.0238 |
| 59 | 2.7093 | 0.0236 |
| 60 | 2.7327 | 0.0234 |
| 61 | 2.7559 | 0.0232 |
| 62 | 2.7789 | 0.0230 |
| 63 | 2.8017 | 0.0228 |
| 64 | 2.8244 | 0.0227 |
| 65 | 2.8469 | 0.0225 |
| 66 | 2.8692 | 0.0223 |
| 67 | 2.8913 | 0.0222 |
| 68 | 2.9133 | 0.0220 |
| 69 | 2.9352 | 0.0218 |
| 70 | 2.9568 | 0.0217 |
| 71 | 2.9784 | 0.0215 |
| 72 | 2.9998 | 0.0214 |
| 73 | 3.0205 | 0.0208 |
| 74 | 3.0411 | 0.0206 |
| 75 | 3.0616 | 0.0205 |
| 76 | 3.0820 | 0.0203 |
| 77 | 3.1022 | 0.0202 |
| 78 | 3.1223 | 0.0201 |
| 79 | 3.1422 | 0.0200 |
| 80 | 3.1620 | 0.0198 |
| 81 | 3.1817 | 0.0197 |
| 82 | 3.2013 | 0.0196 |
| 83 | 3.2208 | 0.0195 |
| 84 | 3.2401 | 0.0193 |
| 85 | 3.2594 | 0.0192 |
| 86 | 3.2785 | 0.0191 |
| 87 | 3.2975 | 0.0190 |
| 88 | 3.3164 | 0.0189 |
| 89 | 3.3352 | 0.0188 |
| 90 | 3.3539 | 0.0187 |
| 91 | 3.3724 | 0.0186 |
| 92 | 3.3909 | 0.0185 |
| 93 | 3.4093 | 0.0184 |
| 94 | 3.4276 | 0.0183 |
| 95 | 3.4458 | 0.0182 |
| 96 | 3.4639 | 0.0181 |
| 97 | 3.4819 | 0.0180 |

| | | |
|---|---|---|
| 98 | 3.4998 | 0.0179 |
| 99 | 3.5176 | 0.0178 |
| 100 | 3.5353 | 0.0177 |
| 101 | 3.5529 | 0.0176 |
| 102 | 3.5705 | 0.0175 |
| 103 | 3.5879 | 0.0175 |
| 104 | 3.6053 | 0.0174 |
| 105 | 3.6226 | 0.0173 |
| 106 | 3.6398 | 0.0172 |
| 107 | 3.6569 | 0.0171 |
| 108 | 3.6740 | 0.0170 |
| 109 | 3.6910 | 0.0170 |
| 110 | 3.7079 | 0.0169 |
| 111 | 3.7247 | 0.0168 |
| 112 | 3.7414 | 0.0167 |
| 113 | 3.7581 | 0.0167 |
| 114 | 3.7747 | 0.0166 |
| 115 | 3.7912 | 0.0165 |
| 116 | 3.8076 | 0.0164 |
| 117 | 3.8240 | 0.0164 |
| 118 | 3.8403 | 0.0163 |
| 119 | 3.8566 | 0.0162 |
| 120 | 3.8727 | 0.0162 |
| 121 | 3.8888 | 0.0161 |
| 122 | 3.9049 | 0.0160 |
| 123 | 3.9209 | 0.0160 |
| 124 | 3.9368 | 0.0159 |
| 125 | 3.9526 | 0.0158 |
| 126 | 3.9684 | 0.0158 |
| 127 | 3.9841 | 0.0157 |
| 128 | 3.9998 | 0.0157 |
| 129 | 4.0154 | 0.0156 |
| 130 | 4.0309 | 0.0155 |
| 131 | 4.0464 | 0.0155 |
| 132 | 4.0618 | 0.0154 |
| 133 | 4.0771 | 0.0154 |
| 134 | 4.0924 | 0.0153 |
| 135 | 4.1077 | 0.0152 |
| 136 | 4.1229 | 0.0152 |
| 137 | 4.1380 | 0.0151 |
| 138 | 4.1531 | 0.0151 |
| 139 | 4.1681 | 0.0150 |
| 140 | 4.1831 | 0.0150 |
| 141 | 4.1980 | 0.0149 |
| 142 | 4.2128 | 0.0149 |
| 143 | 4.2276 | 0.0148 |
| 144 | 4.2424 | 0.0148 |
| 145 | 4.2571 | 0.0147 |
| 146 | 4.2718 | 0.0147 |
| 147 | 4.2864 | 0.0146 |
| 148 | 4.3009 | 0.0146 |
| 149 | 4.3154 | 0.0145 |
| 150 | 4.3299 | 0.0145 |

| | | |
|---|---|---|
| 151 | 4.3443 | 0.0144 |
| 152 | 4.3587 | 0.0144 |
| 153 | 4.3730 | 0.0143 |
| 154 | 4.3873 | 0.0143 |
| 155 | 4.4015 | 0.0142 |
| 156 | 4.4156 | 0.0142 |
| 157 | 4.4298 | 0.0141 |
| 158 | 4.4439 | 0.0141 |
| 159 | 4.4579 | 0.0140 |
| 160 | 4.4719 | 0.0140 |
| 161 | 4.4859 | 0.0140 |
| 162 | 4.4998 | 0.0139 |
| 163 | 4.5136 | 0.0139 |
| 164 | 4.5275 | 0.0138 |
| 165 | 4.5412 | 0.0138 |
| 166 | 4.5550 | 0.0137 |
| 167 | 4.5687 | 0.0137 |
| 168 | 4.5823 | 0.0137 |
| 169 | 4.5960 | 0.0136 |
| 170 | 4.6095 | 0.0136 |
| 171 | 4.6231 | 0.0135 |
| 172 | 4.6366 | 0.0135 |
| 173 | 4.6500 | 0.0135 |
| 174 | 4.6635 | 0.0134 |
| 175 | 4.6768 | 0.0134 |
| 176 | 4.6902 | 0.0133 |
| 177 | 4.7035 | 0.0133 |
| 178 | 4.7168 | 0.0133 |
| 179 | 4.7300 | 0.0132 |
| 180 | 4.7432 | 0.0132 |
| 181 | 4.7563 | 0.0132 |
| 182 | 4.7695 | 0.0131 |
| 183 | 4.7826 | 0.0131 |
| 184 | 4.7956 | 0.0131 |
| 185 | 4.8086 | 0.0130 |
| 186 | 4.8216 | 0.0130 |
| 187 | 4.8345 | 0.0129 |
| 188 | 4.8475 | 0.0129 |
| 189 | 4.8603 | 0.0129 |
| 190 | 4.8732 | 0.0128 |
| 191 | 4.8860 | 0.0128 |
| 192 | 4.8988 | 0.0128 |
| 193 | 4.9115 | 0.0127 |
| 194 | 4.9242 | 0.0127 |
| 195 | 4.9369 | 0.0127 |
| 196 | 4.9495 | 0.0126 |
| 197 | 4.9621 | 0.0126 |
| 198 | 4.9747 | 0.0126 |
| 199 | 4.9873 | 0.0125 |
| 200 | 4.9998 | 0.0125 |
| 201 | 5.0123 | 0.0125 |
| 202 | 5.0247 | 0.0125 |
| 203 | 5.0371 | 0.0124 |

| | | |
|---|---|---|
| 204 | 5.0495 | 0.0124 |
| 205 | 5.0619 | 0.0124 |
| 206 | 5.0742 | 0.0123 |
| 207 | 5.0865 | 0.0123 |
| 208 | 5.0988 | 0.0123 |
| 209 | 5.1110 | 0.0122 |
| 210 | 5.1233 | 0.0122 |
| 211 | 5.1354 | 0.0122 |
| 212 | 5.1476 | 0.0122 |
| 213 | 5.1597 | 0.0121 |
| 214 | 5.1718 | 0.0121 |
| 215 | 5.1839 | 0.0121 |
| 216 | 5.1959 | 0.0120 |
| 217 | 5.2080 | 0.0120 |
| 218 | 5.2199 | 0.0120 |
| 219 | 5.2319 | 0.0120 |
| 220 | 5.2438 | 0.0119 |
| 221 | 5.2557 | 0.0119 |
| 222 | 5.2676 | 0.0119 |
| 223 | 5.2795 | 0.0119 |
| 224 | 5.2913 | 0.0118 |
| 225 | 5.3031 | 0.0118 |
| 226 | 5.3149 | 0.0118 |
| 227 | 5.3266 | 0.0117 |
| 228 | 5.3383 | 0.0117 |
| 229 | 5.3500 | 0.0117 |
| 230 | 5.3617 | 0.0117 |
| 231 | 5.3733 | 0.0116 |
| 232 | 5.3850 | 0.0116 |
| 233 | 5.3965 | 0.0116 |
| 234 | 5.4081 | 0.0116 |
| 235 | 5.4197 | 0.0115 |
| 236 | 5.4312 | 0.0115 |
| 237 | 5.4427 | 0.0115 |
| 238 | 5.4541 | 0.0115 |
| 239 | 5.4656 | 0.0114 |
| 240 | 5.4770 | 0.0114 |
| 241 | 5.4884 | 0.0114 |
| 242 | 5.4998 | 0.0114 |
| 243 | 5.5111 | 0.0114 |
| 244 | 5.5225 | 0.0113 |
| 245 | 5.5338 | 0.0113 |
| 246 | 5.5451 | 0.0113 |
| 247 | 5.5563 | 0.0113 |
| 248 | 5.5676 | 0.0112 |
| 249 | 5.5788 | 0.0112 |
| 250 | 5.5900 | 0.0112 |
| 251 | 5.6011 | 0.0112 |
| 252 | 5.6123 | 0.0111 |
| 253 | 5.6234 | 0.0111 |
| 254 | 5.6345 | 0.0111 |
| 255 | 5.6456 | 0.0111 |
| 256 | 5.6567 | 0.0111 |

| | | |
|---|---|---|
| 257 | 5.6677 | 0.0110 |
| 258 | 5.6787 | 0.0110 |
| 259 | 5.6897 | 0.0110 |
| 260 | 5.7007 | 0.0110 |
| 261 | 5.7116 | 0.0110 |
| 262 | 5.7226 | 0.0109 |
| 263 | 5.7335 | 0.0109 |
| 264 | 5.7444 | 0.0109 |
| 265 | 5.7552 | 0.0109 |
| 266 | 5.7661 | 0.0108 |
| 267 | 5.7769 | 0.0108 |
| 268 | 5.7877 | 0.0108 |
| 269 | 5.7985 | 0.0108 |
| 270 | 5.8093 | 0.0108 |
| 271 | 5.8200 | 0.0107 |
| 272 | 5.8308 | 0.0107 |
| 273 | 5.8415 | 0.0107 |
| 274 | 5.8522 | 0.0107 |
| 275 | 5.8628 | 0.0107 |
| 276 | 5.8735 | 0.0107 |
| 277 | 5.8841 | 0.0106 |
| 278 | 5.8947 | 0.0106 |
| 279 | 5.9053 | 0.0106 |
| 280 | 5.9159 | 0.0106 |
| 281 | 5.9264 | 0.0106 |
| 282 | 5.9370 | 0.0105 |
| 283 | 5.9475 | 0.0105 |
| 284 | 5.9580 | 0.0105 |
| 285 | 5.9685 | 0.0105 |
| 286 | 5.9789 | 0.0105 |
| 287 | 5.9894 | 0.0104 |
| 288 | 5.9998 | 0.0104 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0104 | 0.0013 | 0.0091 |
| 2 | 0.0104 | 0.0013 | 0.0091 |
| 3 | 0.0105 | 0.0013 | 0.0092 |
| 4 | 0.0105 | 0.0013 | 0.0092 |
| 5 | 0.0105 | 0.0013 | 0.0092 |
| 6 | 0.0106 | 0.0013 | 0.0092 |
| 7 | 0.0106 | 0.0013 | 0.0093 |
| 8 | 0.0106 | 0.0013 | 0.0093 |
| 9 | 0.0107 | 0.0013 | 0.0093 |
| 10 | 0.0107 | 0.0013 | 0.0093 |
| 11 | 0.0107 | 0.0013 | 0.0094 |
| 12 | 0.0107 | 0.0013 | 0.0094 |
| 13 | 0.0108 | 0.0013 | 0.0094 |
| 14 | 0.0108 | 0.0013 | 0.0094 |
| 15 | 0.0108 | 0.0013 | 0.0095 |
| 16 | 0.0108 | 0.0014 | 0.0095 |

| | | | |
|---|---|---|---|
| 17 | 0.0109 | 0.0014 | 0.0095 |
| 18 | 0.0109 | 0.0014 | 0.0096 |
| 19 | 0.0110 | 0.0014 | 0.0096 |
| 20 | 0.0110 | 0.0014 | 0.0096 |
| 21 | 0.0110 | 0.0014 | 0.0096 |
| 22 | 0.0110 | 0.0014 | 0.0097 |
| 23 | 0.0111 | 0.0014 | 0.0097 |
| 24 | 0.0111 | 0.0014 | 0.0097 |
| 25 | 0.0111 | 0.0014 | 0.0098 |
| 26 | 0.0112 | 0.0014 | 0.0098 |
| 27 | 0.0112 | 0.0014 | 0.0098 |
| 28 | 0.0112 | 0.0014 | 0.0098 |
| 29 | 0.0113 | 0.0014 | 0.0099 |
| 30 | 0.0113 | 0.0014 | 0.0099 |
| 31 | 0.0114 | 0.0014 | 0.0099 |
| 32 | 0.0114 | 0.0014 | 0.0100 |
| 33 | 0.0114 | 0.0014 | 0.0100 |
| 34 | 0.0114 | 0.0014 | 0.0100 |
| 35 | 0.0115 | 0.0014 | 0.0101 |
| 36 | 0.0115 | 0.0014 | 0.0101 |
| 37 | 0.0116 | 0.0014 | 0.0101 |
| 38 | 0.0116 | 0.0014 | 0.0102 |
| 39 | 0.0116 | 0.0014 | 0.0102 |
| 40 | 0.0117 | 0.0015 | 0.0102 |
| 41 | 0.0117 | 0.0015 | 0.0103 |
| 42 | 0.0117 | 0.0015 | 0.0103 |
| 43 | 0.0118 | 0.0015 | 0.0103 |
| 44 | 0.0118 | 0.0015 | 0.0104 |
| 45 | 0.0119 | 0.0015 | 0.0104 |
| 46 | 0.0119 | 0.0015 | 0.0104 |
| 47 | 0.0120 | 0.0015 | 0.0105 |
| 48 | 0.0120 | 0.0015 | 0.0105 |
| 49 | 0.0120 | 0.0015 | 0.0105 |
| 50 | 0.0121 | 0.0015 | 0.0106 |
| 51 | 0.0121 | 0.0015 | 0.0106 |
| 52 | 0.0122 | 0.0015 | 0.0106 |
| 53 | 0.0122 | 0.0015 | 0.0107 |
| 54 | 0.0122 | 0.0015 | 0.0107 |
| 55 | 0.0123 | 0.0015 | 0.0108 |
| 56 | 0.0123 | 0.0015 | 0.0108 |
| 57 | 0.0124 | 0.0015 | 0.0108 |
| 58 | 0.0124 | 0.0015 | 0.0109 |
| 59 | 0.0125 | 0.0016 | 0.0109 |
| 60 | 0.0125 | 0.0016 | 0.0110 |
| 61 | 0.0126 | 0.0016 | 0.0110 |
| 62 | 0.0126 | 0.0016 | 0.0110 |
| 63 | 0.0127 | 0.0016 | 0.0111 |
| 64 | 0.0127 | 0.0016 | 0.0111 |
| 65 | 0.0128 | 0.0016 | 0.0112 |
| 66 | 0.0128 | 0.0016 | 0.0112 |
| 67 | 0.0129 | 0.0016 | 0.0113 |
| 68 | 0.0129 | 0.0016 | 0.0113 |
| 69 | 0.0130 | 0.0016 | 0.0114 |

| | | | |
|---|---|---|---|
| 70 | 0.0130 | 0.0016 | 0.0114 |
| 71 | 0.0131 | 0.0016 | 0.0115 |
| 72 | 0.0131 | 0.0016 | 0.0115 |
| 73 | 0.0132 | 0.0016 | 0.0116 |
| 74 | 0.0132 | 0.0016 | 0.0116 |
| 75 | 0.0133 | 0.0017 | 0.0117 |
| 76 | 0.0133 | 0.0017 | 0.0117 |
| 77 | 0.0134 | 0.0017 | 0.0118 |
| 78 | 0.0135 | 0.0017 | 0.0118 |
| 79 | 0.0135 | 0.0017 | 0.0119 |
| 80 | 0.0136 | 0.0017 | 0.0119 |
| 81 | 0.0137 | 0.0017 | 0.0120 |
| 82 | 0.0137 | 0.0017 | 0.0120 |
| 83 | 0.0138 | 0.0017 | 0.0121 |
| 84 | 0.0138 | 0.0017 | 0.0121 |
| 85 | 0.0139 | 0.0017 | 0.0122 |
| 86 | 0.0140 | 0.0017 | 0.0122 |
| 87 | 0.0140 | 0.0017 | 0.0123 |
| 88 | 0.0141 | 0.0018 | 0.0123 |
| 89 | 0.0142 | 0.0018 | 0.0124 |
| 90 | 0.0142 | 0.0018 | 0.0125 |
| 91 | 0.0143 | 0.0018 | 0.0125 |
| 92 | 0.0144 | 0.0018 | 0.0126 |
| 93 | 0.0145 | 0.0018 | 0.0127 |
| 94 | 0.0145 | 0.0018 | 0.0127 |
| 95 | 0.0146 | 0.0018 | 0.0128 |
| 96 | 0.0147 | 0.0018 | 0.0128 |
| 97 | 0.0148 | 0.0018 | 0.0129 |
| 98 | 0.0148 | 0.0018 | 0.0130 |
| 99 | 0.0149 | 0.0019 | 0.0131 |
| 100 | 0.0150 | 0.0019 | 0.0131 |
| 101 | 0.0151 | 0.0019 | 0.0132 |
| 102 | 0.0151 | 0.0019 | 0.0132 |
| 103 | 0.0152 | 0.0019 | 0.0133 |
| 104 | 0.0153 | 0.0019 | 0.0134 |
| 105 | 0.0154 | 0.0019 | 0.0135 |
| 106 | 0.0155 | 0.0019 | 0.0135 |
| 107 | 0.0156 | 0.0019 | 0.0137 |
| 108 | 0.0157 | 0.0019 | 0.0137 |
| 109 | 0.0158 | 0.0020 | 0.0138 |
| 110 | 0.0158 | 0.0020 | 0.0139 |
| 111 | 0.0160 | 0.0020 | 0.0140 |
| 112 | 0.0160 | 0.0020 | 0.0140 |
| 113 | 0.0162 | 0.0020 | 0.0142 |
| 114 | 0.0162 | 0.0020 | 0.0142 |
| 115 | 0.0164 | 0.0020 | 0.0143 |
| 116 | 0.0164 | 0.0020 | 0.0144 |
| 117 | 0.0166 | 0.0021 | 0.0145 |
| 118 | 0.0167 | 0.0021 | 0.0146 |
| 119 | 0.0168 | 0.0021 | 0.0147 |
| 120 | 0.0169 | 0.0021 | 0.0148 |
| 121 | 0.0170 | 0.0021 | 0.0149 |
| 122 | 0.0171 | 0.0021 | 0.0150 |

| | | | |
|---|---|---|---|
| 123 | 0.0173 | 0.0022 | 0.0151 |
| 124 | 0.0174 | 0.0022 | 0.0152 |
| 125 | 0.0175 | 0.0022 | 0.0154 |
| 126 | 0.0176 | 0.0022 | 0.0154 |
| 127 | 0.0178 | 0.0022 | 0.0156 |
| 128 | 0.0179 | 0.0022 | 0.0157 |
| 129 | 0.0181 | 0.0023 | 0.0158 |
| 130 | 0.0182 | 0.0023 | 0.0159 |
| 131 | 0.0184 | 0.0023 | 0.0161 |
| 132 | 0.0185 | 0.0023 | 0.0162 |
| 133 | 0.0187 | 0.0023 | 0.0164 |
| 134 | 0.0188 | 0.0023 | 0.0165 |
| 135 | 0.0190 | 0.0024 | 0.0166 |
| 136 | 0.0191 | 0.0024 | 0.0167 |
| 137 | 0.0193 | 0.0024 | 0.0169 |
| 138 | 0.0195 | 0.0024 | 0.0170 |
| 139 | 0.0197 | 0.0025 | 0.0173 |
| 140 | 0.0198 | 0.0025 | 0.0174 |
| 141 | 0.0201 | 0.0025 | 0.0176 |
| 142 | 0.0202 | 0.0025 | 0.0177 |
| 143 | 0.0205 | 0.0025 | 0.0179 |
| 144 | 0.0206 | 0.0026 | 0.0181 |
| 145 | 0.0214 | 0.0027 | 0.0187 |
| 146 | 0.0215 | 0.0027 | 0.0189 |
| 147 | 0.0218 | 0.0027 | 0.0191 |
| 148 | 0.0220 | 0.0027 | 0.0193 |
| 149 | 0.0223 | 0.0028 | 0.0195 |
| 150 | 0.0225 | 0.0028 | 0.0197 |
| 151 | 0.0228 | 0.0028 | 0.0200 |
| 152 | 0.0230 | 0.0029 | 0.0202 |
| 153 | 0.0234 | 0.0029 | 0.0205 |
| 154 | 0.0236 | 0.0029 | 0.0207 |
| 155 | 0.0240 | 0.0030 | 0.0210 |
| 156 | 0.0242 | 0.0030 | 0.0212 |
| 157 | 0.0246 | 0.0031 | 0.0216 |
| 158 | 0.0249 | 0.0031 | 0.0218 |
| 159 | 0.0253 | 0.0032 | 0.0222 |
| 160 | 0.0256 | 0.0032 | 0.0224 |
| 161 | 0.0261 | 0.0033 | 0.0229 |
| 162 | 0.0264 | 0.0033 | 0.0231 |
| 163 | 0.0270 | 0.0034 | 0.0236 |
| 164 | 0.0273 | 0.0034 | 0.0239 |
| 165 | 0.0279 | 0.0035 | 0.0244 |
| 166 | 0.0282 | 0.0035 | 0.0247 |
| 167 | 0.0289 | 0.0036 | 0.0253 |
| 168 | 0.0293 | 0.0036 | 0.0257 |
| 169 | 0.0302 | 0.0038 | 0.0264 |
| 170 | 0.0306 | 0.0038 | 0.0268 |
| 171 | 0.0315 | 0.0039 | 0.0276 |
| 172 | 0.0320 | 0.0040 | 0.0280 |
| 173 | 0.0330 | 0.0041 | 0.0289 |
| 174 | 0.0336 | 0.0042 | 0.0294 |
| 175 | 0.0348 | 0.0043 | 0.0304 |

| | | | |
|---|---|---|---|
| 176 | 0.0354 | 0.0044 | 0.0310 |
| 177 | 0.0369 | 0.0046 | 0.0323 |
| 178 | 0.0377 | 0.0047 | 0.0330 |
| 179 | 0.0394 | 0.0049 | 0.0345 |
| 180 | 0.0404 | 0.0050 | 0.0354 |
| 181 | 0.0426 | 0.0053 | 0.0373 |
| 182 | 0.0438 | 0.0055 | 0.0384 |
| 183 | 0.0467 | 0.0058 | 0.0409 |
| 184 | 0.0483 | 0.0060 | 0.0423 |
| 185 | 0.0410 | 0.0051 | 0.0359 |
| 186 | 0.0433 | 0.0054 | 0.0379 |
| 187 | 0.0492 | 0.0061 | 0.0430 |
| 188 | 0.0530 | 0.0066 | 0.0464 |
| 189 | 0.0639 | 0.0072 | 0.0566 |
| 190 | 0.0721 | 0.0072 | 0.0649 |
| 191 | 0.1031 | 0.0072 | 0.0958 |
| 192 | 0.1417 | 0.0072 | 0.1345 |
| 193 | 0.4436 | 0.0072 | 0.4364 |
| 194 | 0.0840 | 0.0072 | 0.0767 |
| 195 | 0.0578 | 0.0072 | 0.0506 |
| 196 | 0.0460 | 0.0057 | 0.0403 |
| 197 | 0.0502 | 0.0062 | 0.0439 |
| 198 | 0.0452 | 0.0056 | 0.0396 |
| 199 | 0.0414 | 0.0052 | 0.0363 |
| 200 | 0.0385 | 0.0048 | 0.0337 |
| 201 | 0.0361 | 0.0045 | 0.0316 |
| 202 | 0.0342 | 0.0043 | 0.0299 |
| 203 | 0.0325 | 0.0040 | 0.0284 |
| 204 | 0.0310 | 0.0039 | 0.0272 |
| 205 | 0.0297 | 0.0037 | 0.0260 |
| 206 | 0.0286 | 0.0036 | 0.0250 |
| 207 | 0.0276 | 0.0034 | 0.0241 |
| 208 | 0.0267 | 0.0033 | 0.0233 |
| 209 | 0.0258 | 0.0032 | 0.0226 |
| 210 | 0.0251 | 0.0031 | 0.0220 |
| 211 | 0.0244 | 0.0030 | 0.0214 |
| 212 | 0.0238 | 0.0030 | 0.0208 |
| 213 | 0.0232 | 0.0029 | 0.0203 |
| 214 | 0.0227 | 0.0028 | 0.0198 |
| 215 | 0.0222 | 0.0028 | 0.0194 |
| 216 | 0.0217 | 0.0027 | 0.0190 |
| 217 | 0.0208 | 0.0026 | 0.0182 |
| 218 | 0.0203 | 0.0025 | 0.0178 |
| 219 | 0.0200 | 0.0025 | 0.0175 |
| 220 | 0.0196 | 0.0024 | 0.0171 |
| 221 | 0.0192 | 0.0024 | 0.0168 |
| 222 | 0.0189 | 0.0024 | 0.0165 |
| 223 | 0.0186 | 0.0023 | 0.0163 |
| 224 | 0.0183 | 0.0023 | 0.0160 |
| 225 | 0.0180 | 0.0022 | 0.0158 |
| 226 | 0.0177 | 0.0022 | 0.0155 |
| 227 | 0.0175 | 0.0022 | 0.0153 |
| 228 | 0.0172 | 0.0021 | 0.0151 |

| | | | |
|---|---|---|---|
| 229 | 0.0170 | 0.0021 | 0.0149 |
| 230 | 0.0167 | 0.0021 | 0.0147 |
| 231 | 0.0165 | 0.0021 | 0.0145 |
| 232 | 0.0163 | 0.0020 | 0.0143 |
| 233 | 0.0161 | 0.0020 | 0.0141 |
| 234 | 0.0159 | 0.0020 | 0.0139 |
| 235 | 0.0157 | 0.0020 | 0.0138 |
| 236 | 0.0155 | 0.0019 | 0.0136 |
| 237 | 0.0154 | 0.0019 | 0.0134 |
| 238 | 0.0152 | 0.0019 | 0.0133 |
| 239 | 0.0150 | 0.0019 | 0.0132 |
| 240 | 0.0149 | 0.0018 | 0.0130 |
| 241 | 0.0147 | 0.0018 | 0.0129 |
| 242 | 0.0146 | 0.0018 | 0.0127 |
| 243 | 0.0144 | 0.0018 | 0.0126 |
| 244 | 0.0143 | 0.0018 | 0.0125 |
| 245 | 0.0141 | 0.0018 | 0.0124 |
| 246 | 0.0140 | 0.0017 | 0.0123 |
| 247 | 0.0139 | 0.0017 | 0.0121 |
| 248 | 0.0137 | 0.0017 | 0.0120 |
| 249 | 0.0136 | 0.0017 | 0.0119 |
| 250 | 0.0135 | 0.0017 | 0.0118 |
| 251 | 0.0134 | 0.0017 | 0.0117 |
| 252 | 0.0133 | 0.0017 | 0.0116 |
| 253 | 0.0132 | 0.0016 | 0.0115 |
| 254 | 0.0131 | 0.0016 | 0.0114 |
| 255 | 0.0129 | 0.0016 | 0.0113 |
| 256 | 0.0128 | 0.0016 | 0.0112 |
| 257 | 0.0127 | 0.0016 | 0.0112 |
| 258 | 0.0126 | 0.0016 | 0.0111 |
| 259 | 0.0125 | 0.0016 | 0.0110 |
| 260 | 0.0125 | 0.0016 | 0.0109 |
| 261 | 0.0124 | 0.0015 | 0.0108 |
| 262 | 0.0123 | 0.0015 | 0.0107 |
| 263 | 0.0122 | 0.0015 | 0.0107 |
| 264 | 0.0121 | 0.0015 | 0.0106 |
| 265 | 0.0120 | 0.0015 | 0.0105 |
| 266 | 0.0119 | 0.0015 | 0.0104 |
| 267 | 0.0119 | 0.0015 | 0.0104 |
| 268 | 0.0118 | 0.0015 | 0.0103 |
| 269 | 0.0117 | 0.0015 | 0.0102 |
| 270 | 0.0116 | 0.0014 | 0.0102 |
| 271 | 0.0115 | 0.0014 | 0.0101 |
| 272 | 0.0115 | 0.0014 | 0.0100 |
| 273 | 0.0114 | 0.0014 | 0.0100 |
| 274 | 0.0113 | 0.0014 | 0.0099 |
| 275 | 0.0113 | 0.0014 | 0.0099 |
| 276 | 0.0112 | 0.0014 | 0.0098 |
| 277 | 0.0111 | 0.0014 | 0.0097 |
| 278 | 0.0111 | 0.0014 | 0.0097 |
| 279 | 0.0110 | 0.0014 | 0.0096 |
| 280 | 0.0109 | 0.0014 | 0.0096 |
| 281 | 0.0109 | 0.0014 | 0.0095 |

| | | | |
|---|---|---|---|
| 282 | 0.0108 | 0.0013 | 0.0095 |
| 283 | 0.0107 | 0.0013 | 0.0094 |
| 284 | 0.0107 | 0.0013 | 0.0094 |
| 285 | 0.0106 | 0.0013 | 0.0093 |
| 286 | 0.0106 | 0.0013 | 0.0093 |
| 287 | 0.0105 | 0.0013 | 0.0092 |
| 288 | 0.0105 | 0.0013 | 0.0092 |

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Total soil rain loss = 0.68(In)
Total effective rainfall = 5.32(In)
Peak flow rate in flood hydrograph = 69.65(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))

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| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 17.5 | 35.0 | 52.5 | 70.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0012 | 0.18 | Q | \| | \| | \| | \| |
| 0+10 | 0.0090 | 1.13 | Q | \| | \| | \| | \| |
| 0+15 | 0.0245 | 2.25 | VQ | \| | \| | \| | \| |
| 0+20 | 0.0428 | 2.66 | VQ | \| | \| | \| | \| |
| 0+25 | 0.0618 | 2.76 | VQ | \| | \| | \| | \| |
| 0+30 | 0.0811 | 2.80 | VQ | \| | \| | \| | \| |
| 0+35 | 0.1005 | 2.81 | VQ | \| | \| | \| | \| |
| 0+40 | 0.1199 | 2.82 | VQ | \| | \| | \| | \| |
| 0+45 | 0.1393 | 2.83 | VQ | \| | \| | \| | \| |
| 0+50 | 0.1589 | 2.83 | VQ | \| | \| | \| | \| |
| 0+55 | 0.1784 | 2.84 | VQ | \| | \| | \| | \| |
| 1+ 0 | 0.1981 | 2.85 | VQ | \| | \| | \| | \| |
| 1+ 5 | 0.2177 | 2.86 | VQ | \| | \| | \| | \| |
| 1+10 | 0.2375 | 2.86 | VQ | \| | \| | \| | \| |
| 1+15 | 0.2572 | 2.87 | VQ | \| | \| | \| | \| |
| 1+20 | 0.2771 | 2.88 | VQ | \| | \| | \| | \| |
| 1+25 | 0.2970 | 2.89 | \|Q | \| | \| | \| | \| |
| 1+30 | 0.3169 | 2.90 | \|Q | \| | \| | \| | \| |
| 1+35 | 0.3369 | 2.91 | \|Q | \| | \| | \| | \| |
| 1+40 | 0.3570 | 2.91 | \|Q | \| | \| | \| | \| |
| 1+45 | 0.3771 | 2.92 | \|Q | \| | \| | \| | \| |
| 1+50 | 0.3973 | 2.93 | \|Q | \| | \| | \| | \| |
| 1+55 | 0.4175 | 2.94 | \|Q | \| | \| | \| | \| |
| 2+ 0 | 0.4378 | 2.95 | \|Q | \| | \| | \| | \| |
| 2+ 5 | 0.4582 | 2.96 | \|Q | \| | \| | \| | \| |
| 2+10 | 0.4786 | 2.96 | \|Q | \| | \| | \| | \| |
| 2+15 | 0.4991 | 2.97 | \|Q | \| | \| | \| | \| |
| 2+20 | 0.5196 | 2.98 | \|Q | \| | \| | \| | \| |
| 2+25 | 0.5403 | 2.99 | \|Q | \| | \| | \| | \| |
| 2+30 | 0.5609 | 3.00 | \|QV | \| | \| | \| | \| |
| 2+35 | 0.5816 | 3.01 | \|QV | \| | \| | \| | \| |

```
2+40       0.6024      3.02  |QV       |         |         |         |
2+45       0.6233      3.03  |QV       |         |         |         |
2+50       0.6442      3.04  |QV       |         |         |         |
2+55       0.6652      3.05  |QV       |         |         |         |
3+ 0       0.6863      3.06  |QV       |         |         |         |
3+ 5       0.7074      3.07  |QV       |         |         |         |
3+10       0.7286      3.08  |QV       |         |         |         |
3+15       0.7498      3.09  |QV       |         |         |         |
3+20       0.7711      3.10  |QV       |         |         |         |
3+25       0.7925      3.11  |QV       |         |         |         |
3+30       0.8140      3.12  |QV       |         |         |         |
3+35       0.8355      3.13  |QV       |         |         |         |
3+40       0.8571      3.14  |Q V      |         |         |         |
3+45       0.8788      3.15  |Q V      |         |         |         |
3+50       0.9006      3.16  |Q V      |         |         |         |
3+55       0.9224      3.17  |Q V      |         |         |         |
4+ 0       0.9443      3.18  |Q V      |         |         |         |
4+ 5       0.9663      3.19  |Q V      |         |         |         |
4+10       0.9883      3.20  |Q V      |         |         |         |
4+15       1.0104      3.21  |Q V      |         |         |         |
4+20       1.0326      3.22  |Q V      |         |         |         |
4+25       1.0549      3.24  |Q V      |         |         |         |
4+30       1.0773      3.25  |Q V      |         |         |         |
4+35       1.0997      3.26  |Q V      |         |         |         |
4+40       1.1222      3.27  |Q  V     |         |         |         |
4+45       1.1448      3.28  |Q  V     |         |         |         |
4+50       1.1675      3.29  |Q  V     |         |         |         |
4+55       1.1903      3.31  |Q  V     |         |         |         |
5+ 0       1.2132      3.32  |Q  V     |         |         |         |
5+ 5       1.2361      3.33  |Q  V     |         |         |         |
5+10       1.2591      3.34  |Q  V     |         |         |         |
5+15       1.2822      3.36  |Q  V     |         |         |         |
5+20       1.3054      3.37  |Q  V     |         |         |         |
5+25       1.3287      3.38  |Q  V     |         |         |         |
5+30       1.3521      3.39  |Q  V     |         |         |         |
5+35       1.3756      3.41  |Q  V     |         |         |         |
5+40       1.3991      3.42  |Q   V    |         |         |         |
5+45       1.4228      3.44  |Q   V    |         |         |         |
5+50       1.4465      3.45  |Q   V    |         |         |         |
5+55       1.4704      3.46  |Q   V    |         |         |         |
6+ 0       1.4943      3.48  |Q   V    |         |         |         |
6+ 5       1.5184      3.49  |Q   V    |         |         |         |
6+10       1.5425      3.51  | Q  V    |         |         |         |
6+15       1.5668      3.52  | Q  V    |         |         |         |
6+20       1.5911      3.54  | Q  V    |         |         |         |
6+25       1.6156      3.55  | Q  V    |         |         |         |
6+30       1.6401      3.57  | Q  V    |         |         |         |
6+35       1.6648      3.58  | Q  V    |         |         |         |
6+40       1.6896      3.60  | Q   V   |         |         |         |
6+45       1.7144      3.61  | Q   V   |         |         |         |
6+50       1.7394      3.63  | Q   V   |         |         |         |
6+55       1.7645      3.64  | Q   V   |         |         |         |
7+ 0       1.7897      3.66  | Q   V   |         |         |         |
```

```
 7+ 5       1.8150      3.68  | Q   V   |          |          |          |
 7+10       1.8405      3.69  | Q   V   |          |          |          |
 7+15       1.8660      3.71  | Q   V   |          |          |          |
 7+20       1.8917      3.73  | Q   V   |          |          |          |
 7+25       1.9175      3.75  | Q   V   |          |          |          |
 7+30       1.9435      3.76  | Q   V   |          |          |          |
 7+35       1.9695      3.78  | Q    V  |          |          |          |
 7+40       1.9957      3.80  | Q    V  |          |          |          |
 7+45       2.0220      3.82  | Q    V  |          |          |          |
 7+50       2.0484      3.84  | Q    V  |          |          |          |
 7+55       2.0750      3.86  | Q    V  |          |          |          |
 8+ 0       2.1017      3.88  | Q    V  |          |          |          |
 8+ 5       2.1285      3.90  | Q    V  |          |          |          |
 8+10       2.1555      3.92  | Q    V  |          |          |          |
 8+15       2.1826      3.94  | Q    V  |          |          |          |
 8+20       2.2099      3.96  | Q    V  |          |          |          |
 8+25       2.2373      3.98  | Q     V |          |          |          |
 8+30       2.2648      4.00  | Q     V |          |          |          |
 8+35       2.2925      4.02  | Q     V |          |          |          |
 8+40       2.3204      4.04  | Q     V |          |          |          |
 8+45       2.3484      4.07  | Q     V |          |          |          |
 8+50       2.3766      4.09  | Q     V |          |          |          |
 8+55       2.4049      4.11  | Q     V |          |          |          |
 9+ 0       2.4334      4.14  | Q     V |          |          |          |
 9+ 5       2.4620      4.16  | Q     V |          |          |          |
 9+10       2.4909      4.19  | Q     V |          |          |          |
 9+15       2.5199      4.21  | Q      V|          |          |          |
 9+20       2.5490      4.24  | Q      V|          |          |          |
 9+25       2.5784      4.26  | Q      V|          |          |          |
 9+30       2.6079      4.29  | Q      V|          |          |          |
 9+35       2.6376      4.31  | Q      V|          |          |          |
 9+40       2.6675      4.34  | Q      V|          |          |          |
 9+45       2.6976      4.37  | Q      V|          |          |          |
 9+50       2.7279      4.40  | Q      V|          |          |          |
 9+55       2.7584      4.43  | Q      V|          |          |          |
10+ 0       2.7891      4.46  | Q      V|          |          |          |
10+ 5       2.8200      4.49  | Q       V          |          |          |
10+10       2.8511      4.52  | Q       V          |          |          |
10+15       2.8825      4.55  | Q       V          |          |          |
10+20       2.9140      4.58  | Q       V          |          |          |
10+25       2.9458      4.61  | Q       V          |          |          |
10+30       2.9778      4.65  | Q       V          |          |          |
10+35       3.0101      4.68  | Q       V          |          |          |
10+40       3.0426      4.72  | Q       V          |          |          |
10+45       3.0753      4.75  | Q       |V         |          |          |
10+50       3.1083      4.79  | Q       |V         |          |          |
10+55       3.1415      4.83  | Q       |V         |          |          |
11+ 0       3.1750      4.87  | Q       |V         |          |          |
11+ 5       3.2088      4.90  | Q       |V         |          |          |
11+10       3.2429      4.95  | Q       |V         |          |          |
11+15       3.2772      4.99  | Q       |V         |          |          |
11+20       3.3119      5.03  | Q       |V         |          |          |
11+25       3.3468      5.07  | Q       |V         |          |          |
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11+30       3.3820      5.12  | Q       | V       |         |         |
11+35       3.4176      5.16  | Q       | V       |         |         |
11+40       3.4535      5.21  | Q       | V       |         |         |
11+45       3.4897      5.26  |  Q      | V       |         |         |
11+50       3.5262      5.31  |  Q      | V       |         |         |
11+55       3.5631      5.36  |  Q      | V       |         |         |
12+ 0       3.6004      5.41  |  Q      | V       |         |         |
12+ 5       3.6381      5.47  |  Q      |  V      |         |         |
12+10       3.6765      5.57  |  Q      |  V      |         |         |
12+15       3.7157      5.68  |  Q      |  V      |         |         |
12+20       3.7553      5.76  |  Q      |  V      |         |         |
12+25       3.7955      5.83  |  Q      |  V      |         |         |
12+30       3.8360      5.89  |  Q      |  V      |         |         |
12+35       3.8771      5.96  |  Q      |  V      |         |         |
12+40       3.9186      6.03  |  Q      |   V     |         |         |
12+45       3.9605      6.10  |  Q      |   V     |         |         |
12+50       4.0030      6.17  |  Q      |   V     |         |         |
12+55       4.0460      6.24  |  Q      |   V     |         |         |
13+ 0       4.0896      6.32  |  Q      |   V     |         |         |
13+ 5       4.1337      6.40  |  Q      |   V     |         |         |
13+10       4.1784      6.49  |  Q      |   V     |         |         |
13+15       4.2237      6.58  |  Q      |    V    |         |         |
13+20       4.2696      6.67  |  Q      |    V    |         |         |
13+25       4.3162      6.77  |  Q      |    V    |         |         |
13+30       4.3635      6.87  |  Q      |    V    |         |         |
13+35       4.4115      6.97  |  Q      |    V    |         |         |
13+40       4.4603      7.08  |   Q     |    V    |         |         |
13+45       4.5099      7.20  |   Q     |     V   |         |         |
13+50       4.5603      7.32  |   Q     |     V   |         |         |
13+55       4.6116      7.45  |   Q     |     V   |         |         |
14+ 0       4.6639      7.59  |   Q     |     V   |         |         |
14+ 5       4.7171      7.73  |   Q     |     V   |         |         |
14+10       4.7714      7.89  |   Q     |      V  |         |         |
14+15       4.8269      8.05  |   Q     |      V  |         |         |
14+20       4.8836      8.23  |   Q     |      V  |         |         |
14+25       4.9415      8.41  |   Q     |      V  |         |         |
14+30       5.0008      8.61  |   Q     |      V  |         |         |
14+35       5.0616      8.82  |    Q    |       V |         |         |
14+40       5.1239      9.05  |    Q    |       V |         |         |
14+45       5.1879      9.30  |    Q    |       V |         |         |
14+50       5.2538      9.57  |    Q    |       V |         |         |
14+55       5.3218      9.86  |    Q    |        V|         |         |
15+ 0       5.3920     10.19  |    Q    |        V|         |         |
15+ 5       5.4646     10.55  |     Q   |        V|         |         |
15+10       5.5401     10.96  |     Q   |        V|         |         |
15+15       5.6187     11.41  |     Q   |         V         |         |
15+20       5.7008     11.93  |     Q   |         V         |         |
15+25       5.7858     12.33  |      Q  |         V         |         |
15+30       5.8685     12.01  |     Q   |         |V        |         |
15+35       5.9485     11.62  |     Q   |         |V        |         |
15+40       6.0327     12.22  |     Q   |         |V        |         |
15+45       6.1252     13.43  |      Q  |         |V        |         |
15+50       6.2304     15.29  |       Q |         | V       |         |
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15+55       6.3558     18.21  |         Q         | V       |         |
16+ 0       6.5191     23.70  |         |  Q      |  V      |         |
16+ 5       6.7799     37.87  |         |         |Q  V     |         |
16+10       7.2529     68.68  |         |         |    V    |        Q|
16+15       7.7326     69.65  |         |         |      V  |        Q|
16+20       7.9821     36.24  |         |         Q       V |         |
16+25       8.1176     19.67  |         |Q        |        V|         |
16+30       8.2219     15.15  |       Q |         |        V|         |
16+35       8.3103     12.83  |      Q  |         |        V|         |
16+40       8.3918     11.84  |     Q   |         |         V         |
16+45       8.4671     10.93  |     Q   |         |         V         |
16+50       8.5373     10.20  |    Q    |         |         V         |
16+55       8.6032      9.57  |    Q    |         |         V         |
17+ 0       8.6655      9.04  |    Q    |         |         |V        |
17+ 5       8.7247      8.60  |   Q     |         |         |V        |
17+10       8.7813      8.21  |   Q     |         |         |V        |
17+15       8.8355      7.87  |   Q     |         |         |V        |
17+20       8.8877      7.58  |   Q     |         |         |V        |
17+25       8.9380      7.31  |   Q     |         |         | V       |
17+30       8.9868      7.07  |   Q     |         |         | V       |
17+35       9.0340      6.86  |  Q      |         |         | V       |
17+40       9.0799      6.66  |  Q      |         |         | V       |
17+45       9.1245      6.48  |  Q      |         |         | V       |
17+50       9.1680      6.32  |  Q      |         |         | V       |
17+55       9.2104      6.16  |  Q      |         |         | V       |
18+ 0       9.2519      6.02  |  Q      |         |         |  V      |
18+ 5       9.2924      5.88  |  Q      |         |         |  V      |
18+10       9.3317      5.71  |  Q      |         |         |  V      |
18+15       9.3698      5.54  |  Q      |         |         |  V      |
18+20       9.4071      5.41  |  Q      |         |         |  V      |
18+25       9.4436      5.30  |  Q      |         |         |  V      |
18+30       9.4795      5.20  | Q       |         |         |  V      |
18+35       9.5147      5.11  | Q       |         |         |   V     |
18+40       9.5493      5.02  | Q       |         |         |   V     |
18+45       9.5833      4.94  | Q       |         |         |   V     |
18+50       9.6168      4.86  | Q       |         |         |   V     |
18+55       9.6497      4.79  | Q       |         |         |   V     |
19+ 0       9.6822      4.71  | Q       |         |         |   V     |
19+ 5       9.7142      4.64  | Q       |         |         |   V     |
19+10       9.7457      4.58  | Q       |         |         |   V     |
19+15       9.7768      4.51  | Q       |         |         |    V    |
19+20       9.8075      4.45  | Q       |         |         |    V    |
19+25       9.8377      4.40  | Q       |         |         |    V    |
19+30       9.8676      4.34  | Q       |         |         |    V    |
19+35       9.8971      4.28  | Q       |         |         |    V    |
19+40       9.9263      4.23  | Q       |         |         |    V    |
19+45       9.9551      4.18  | Q       |         |         |    V    |
19+50       9.9836      4.13  | Q       |         |         |    V    |
19+55      10.0117      4.09  | Q       |         |         |    V    |
20+ 0      10.0395      4.04  | Q       |         |         |    V    |
20+ 5      10.0671      4.00  | Q       |         |         |     V   |
20+10      10.0943      3.96  | Q       |         |         |     V   |
20+15      10.1213      3.91  | Q       |         |         |     V   |
```

```
  20+20      10.1480      3.87  | Q       |         |         |     V   |
  20+25      10.1744      3.84  | Q       |         |         |     V   |
  20+30      10.2005      3.80  | Q       |         |         |     V   |
  20+35      10.2264      3.76  | Q       |         |         |     V   |
  20+40      10.2521      3.73  | Q       |         |         |     V   |
  20+45      10.2775      3.69  | Q       |         |         |     V   |
  20+50      10.3027      3.66  | Q       |         |         |     V   |
  20+55      10.3277      3.63  | Q       |         |         |     V   |
  21+ 0      10.3524      3.59  | Q       |         |         |      V  |
  21+ 5      10.3770      3.56  | Q       |         |         |      V  |
  21+10      10.4013      3.53  | Q       |         |         |      V  |
  21+15      10.4254      3.50  | Q       |         |         |      V  |
  21+20      10.4494      3.47  |Q        |         |         |      V  |
  21+25      10.4731      3.45  |Q        |         |         |      V  |
  21+30      10.4967      3.42  |Q        |         |         |      V  |
  21+35      10.5200      3.39  |Q        |         |         |      V  |
  21+40      10.5432      3.37  |Q        |         |         |      V  |
  21+45      10.5662      3.34  |Q        |         |         |      V  |
  21+50      10.5891      3.32  |Q        |         |         |      V  |
  21+55      10.6118      3.29  |Q        |         |         |       V |
  22+ 0      10.6343      3.27  |Q        |         |         |       V |
  22+ 5      10.6566      3.25  |Q        |         |         |       V |
  22+10      10.6788      3.22  |Q        |         |         |       V |
  22+15      10.7008      3.20  |Q        |         |         |       V |
  22+20      10.7227      3.18  |Q        |         |         |       V |
  22+25      10.7445      3.16  |Q        |         |         |       V |
  22+30      10.7661      3.14  |Q        |         |         |       V |
  22+35      10.7875      3.12  |Q        |         |         |       V |
  22+40      10.8088      3.09  |Q        |         |         |       V |
  22+45      10.8300      3.08  |Q        |         |         |       V |
  22+50      10.8511      3.06  |Q        |         |         |       V |
  22+55      10.8720      3.04  |Q        |         |         |       V |
  23+ 0      10.8928      3.02  |Q        |         |         |        V|
  23+ 5      10.9134      3.00  |Q        |         |         |        V|
  23+10      10.9339      2.98  |Q        |         |         |        V|
  23+15      10.9544      2.96  |Q        |         |         |        V|
  23+20      10.9746      2.95  |Q        |         |         |        V|
  23+25      10.9948      2.93  |Q        |         |         |        V|
  23+30      11.0149      2.91  |Q        |         |         |        V|
  23+35      11.0348      2.90  |Q        |         |         |        V|
  23+40      11.0547      2.88  |Q        |         |         |        V|
  23+45      11.0744      2.86  |Q        |         |         |        V|
  23+50      11.0940      2.85  |Q        |         |         |        V|
  23+55      11.1135      2.83  |Q        |         |         |        V|
  24+ 0      11.1329      2.82  |Q        |         |         |        V|
  24+ 5      11.1510      2.63  |Q        |         |         |        V|
  24+10      11.1624      1.66  Q         |         |         |        V|
  24+15      11.1661      0.53  Q         |         |         |        V|
  24+20      11.1670      0.13  Q         |         |         |        V|
  24+25      11.1673      0.04  Q         |         |         |         V
-----------------------------------------------------------------------
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# APPENDIX C: BON VIEW AVENUE STORM DRAIN HYDROLOGY CALCULATIONS

# APPENDIX C.1: RATIONAL METHOD ANALYSIS, RERUN FUSCOE MODELS TO BON VIEW

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/07/25

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PORTION OF MPD DA XIV UPSTREAM
PROPOSED DEV DA A2
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 1.000 to Point/Station 6.000
**** INITIAL AREA EVALUATION ****

APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.196(In/Hr)
Initial subarea data:
Initial area flow distance = 768.000(Ft.)
Top (of initial area) elevation = 694.000(Ft.)
Bottom (of initial area) elevation = 687.000(Ft.)
Difference in elevation = 7.000(Ft.)
Slope = 0.00911 s(%)= 0.91
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.823 min.
Rainfall intensity = 3.180(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.845
Subarea runoff = 17.566(CFS)
Total initial stream area = 6.540(Ac.)
Pervious area fraction = 0.200
Initial area Fm value = 0.196(In/Hr)

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Process from Point/Station        6.000 to Point/Station        9.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   687.000(Ft.)
End of street segment elevation =   684.000(Ft.)
Length of street segment  =   331.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     25.197(CFS)
Depth of flow =   0.541(Ft.), Average velocity =   3.193(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  19.479(Ft.)
Flow velocity =   3.19(Ft/s)
Travel time =    1.73 min.     TC =   13.55  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Rainfall intensity =      2.930(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.840
Subarea runoff =     15.068(CFS) for    6.720(Ac.)
Total runoff =     32.634(CFS)
Effective area this stream =       13.26(Ac.)
Total Study Area (Main Stream No. 1) =       13.26(Ac.)
Area averaged Fm value =    0.196(In/Hr)
Street flow at end of street =     32.634(CFS)
Half street flow at end of street =     16.317(CFS)
Depth of flow =   0.583(Ft.), Average velocity =   3.401(Ft/s)
Flow width (from curb towards crown)=  21.553(Ft.)


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Process from Point/Station        6.000 to Point/Station        9.000
**** CONFLUENCE OF MAIN STREAMS ****
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____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     13.260(Ac.)
Runoff from this stream =     32.634(CFS)
Time of concentration =   13.55 min.
Rainfall intensity =     2.930(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        8.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.147(In/Hr)
Initial subarea data:
Initial area flow distance =   970.000(Ft.)
Top (of initial area) elevation =   693.000(Ft.)
Bottom (of initial area) elevation =   690.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.00309  s(%)=       0.31
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.113 min.
Rainfall intensity =      2.641(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.850
Subarea runoff =     22.335(CFS)
Total initial stream area =        9.950(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.147(In/Hr)


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Process from Point/Station        8.000 to Point/Station        9.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
____________________________________________________________________
Top of street segment elevation =   690.000(Ft.)
End of street segment elevation =   684.000(Ft.)
Length of street segment  =   608.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
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Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     37.905(CFS)
Depth of flow =   0.601(Ft.), Average velocity =   3.644(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  22.471(Ft.)
Flow velocity =   3.64(Ft/s)
Travel time =    2.78 min.     TC =   18.89  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 0.230
Decimal fraction soil group B = 0.770
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.48
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.161(In/Hr)
Rainfall intensity =      2.400(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.842
Subarea runoff =     30.942(CFS) for   16.420(Ac.)
Total runoff =     53.277(CFS)
Effective area this stream =       26.37(Ac.)
Total Study Area (Main Stream No. 2) =       39.63(Ac.)
Area averaged Fm value =    0.155(In/Hr)
Street flow at end of street =     53.277(CFS)
Half street flow at end of street =     26.639(CFS)
Depth of flow =   0.664(Ft.), Average velocity =   3.963(Ft/s)
Flow width (from curb towards crown)=  25.634(Ft.)


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Process from Point/Station        8.000 to Point/Station        9.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     26.370(Ac.)
Runoff from this stream =     53.277(CFS)
Time of concentration =   18.89 min.
Rainfall intensity =     2.400(In/Hr)
Area averaged loss rate (Fm) =    0.1555(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     32.63    13.260     13.55    0.196      2.930
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```
2     53.28    26.370     18.89    0.155      2.400
Qmax(1) =
         1.000 *    1.000 *    32.634) +
         1.236 *    0.717 *    53.277) + =      79.863
Qmax(2) =
         0.806 *    1.000 *    32.634) +
         1.000 *    1.000 *    53.277) + =      79.589

Total of 2 main streams to confluence:
Flow rates before confluence point:
      33.634      54.277
Maximum flow rates at confluence using above data:
       79.863       79.589
Area of streams before confluence:
       13.260       26.370
Effective area values after confluence:
       32.173       39.630


Results of confluence:
Total flow rate =     79.863(CFS)
Time of concentration =    13.551 min.
Effective stream area after confluence  =     32.173(Ac.)
Study area average Pervious fraction(Ap) =  0.200
Study area average soil loss rate(Fm) =    0.169(In/Hr)
Study area total =      39.63(Ac.)
End of computations, Total Study Area =           39.63 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.200
Area averaged SCS curve number =  45.7
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/07/25

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PORTION OF MPD DA XIV DOWNSTREAM
PROPOSED DEV DA A2
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

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Process from Point/Station 4.000 to Point/Station 12.000
**** INITIAL AREA EVALUATION ****

PARK subarea
Decimal fraction soil group A = 0.370
Decimal fraction soil group B = 0.630
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 47.12
Pervious ratio(Ap) = 0.8500 Max loss rate(Fm)= 0.717(In/Hr)
Initial subarea data:
Initial area flow distance = 805.000(Ft.)
Top (of initial area) elevation = 684.000(Ft.)
Bottom (of initial area) elevation = 678.000(Ft.)
Difference in elevation = 6.000(Ft.)
Slope = 0.00745 s(%)= 0.75
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.698 min.
Rainfall intensity = 2.415(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.633
Subarea runoff = 10.534(CFS)
Total initial stream area = 6.890(Ac.)
Pervious area fraction = 0.850
Initial area Fm value = 0.717(In/Hr)

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Process from Point/Station        4.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      6.890(Ac.)
Runoff from this stream =     10.534(CFS)
Time of concentration =   18.70 min.
Rainfall intensity =     2.415(In/Hr)
Area averaged loss rate (Fm) =    0.7166(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Program is now starting with Main Stream No. 2


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Process from Point/Station       10.000 to Point/Station       11.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.624(In/Hr)
Initial subarea data:
Initial area flow distance =   919.000(Ft.)
Top (of initial area) elevation =   684.000(Ft.)
Bottom (of initial area) elevation =   682.000(Ft.)
Difference in elevation =     2.000(Ft.)
Slope =    0.00218  s(%)=       0.22
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   25.219 min.
Rainfall intensity =      2.019(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.622
Subarea runoff =      7.431(CFS)
Total initial stream area =        5.920(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.624(In/Hr)


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Process from Point/Station       11.000 to Point/Station       12.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   682.000(Ft.)
End of street segment elevation =   678.000(Ft.)
Length of street segment  =   475.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
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Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     11.187(CFS)
Depth of flow =   0.437(Ft.), Average velocity =   2.552(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  14.282(Ft.)
Flow velocity =   2.55(Ft/s)
Travel time =    3.10 min.     TC =   28.32  min.
 Adding area flow to street
PARK subarea
Decimal fraction soil group A = 0.390
Decimal fraction soil group B = 0.610
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 46.64
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.721(In/Hr)
Rainfall intensity =      1.883(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.575
Subarea runoff =      7.358(CFS) for    7.730(Ac.)
Total runoff =     14.789(CFS)
Effective area this stream =       13.65(Ac.)
Total Study Area (Main Stream No. 2) =       20.54(Ac.)
Area averaged Fm value =    0.679(In/Hr)
Street flow at end of street =     14.789(CFS)
Half street flow at end of street =      7.395(CFS)
Depth of flow =   0.472(Ft.), Average velocity =   2.729(Ft/s)
Flow width (from curb towards crown)=  15.994(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       11.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     13.650(Ac.)
Runoff from this stream =     14.789(CFS)
Time of concentration =   28.32 min.
Rainfall intensity =     1.883(In/Hr)
Area averaged loss rate (Fm) =    0.6790(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:
```

| Stream No. | Flow rate (CFS) | Area (Ac.) | TC (min) | Fm (In/Hr) | Rainfall Intensity (In/Hr) |
|---|---|---|---|---|---|
| 1 | 10.53 | 6.890 | 18.70 | 0.717 | 2.415 |
| 2 | 14.79 | 13.650 | 28.32 | 0.679 | 1.883 |

```
Qmax(1) =
         1.000 *    1.000 *    10.534) +
         1.442 *    0.660 *    14.789) + =      24.619
Qmax(2) =
         0.686 *    1.000 *    10.534) +
         1.000 *    1.000 *    14.789) + =      22.021

Total of 2 main streams to confluence:
Flow rates before confluence point:
      11.534      15.789
Maximum flow rates at confluence using above data:
       24.619       22.021
Area of streams before confluence:
        6.890       13.650
Effective area values after confluence:
       15.902       20.540


Results of confluence:
Total flow rate =     24.619(CFS)
Time of concentration =    18.698 min.
Effective stream area after confluence  =     15.902(Ac.)
Study area average Pervious fraction(Ap) =  0.850
Study area average soil loss rate(Fm) =    0.692(In/Hr)
Study area total =      20.54(Ac.)
End of computations, Total Study Area =           20.54 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.850
Area averaged SCS curve number =  49.5
```

## APPENDIX C.2: RATIONAL METHOD ANALYSIS, BON VIEW MAINLINE, AREA F (EXCLUDES F2 & F3)

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/08/25

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BON VIEW SD TRIBUTARY AREA
OVERALL: JLC-MCC-MDP REV + ONTARIO RANCH

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 6.000 to Point/Station 6.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 54.00
Pervious ratio(Ap) = 0.5000 Max loss rate(Fm)= 0.380(In/Hr)
Rainfall intensity = 1.976(In/Hr) for a 100.0 year storm
User specified values are as follows:
TC = 26.13 min. Rain intensity = 1.98(In/Hr)
Total area this stream = 430.90(Ac.)
Total Study Area (Main Stream No. 1) = 430.90(Ac.)
Total runoff = 617.51(CFS)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 6.000 to Point/Station 6.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 659.200(Ft.)
Downstream point/station elevation = 654.800(Ft.)
Pipe length = 868.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 617.510(CFS)
Nearest computed pipe diameter = 96.00(In.)

```
Calculated individual pipe flow  =   617.510(CFS)
Normal flow depth in pipe =   74.81(In.)
Flow top width inside pipe =   79.63(In.)
Critical Depth =   75.83(In.)
Pipe flow velocity =     14.70(Ft/s)
Travel time through pipe =    0.98 min.
Time of concentration (TC) =    27.11 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        6.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    430.900(Ac.)
Runoff from this stream =    617.510(CFS)
Time of concentration =   27.11 min.
Rainfall intensity =     1.933(In/Hr)
Area averaged loss rate (Fm) =    0.3800(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station        6.100
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 46.95
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.169(In/Hr)
Rainfall intensity =      2.930(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  13.55 min.  Rain intensity =       2.93(In/Hr)
Total area this stream =        39.63(Ac.)
Total Study Area (Main Stream No. 2) =      470.53(Ac.)
Total runoff =     79.86(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        9.000 to Point/Station        6.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     39.630(Ac.)
Runoff from this stream =     79.863(CFS)
Time of concentration =   13.55 min.
Rainfall intensity =     2.930(In/Hr)
Area averaged loss rate (Fm) =    0.1690(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:
```

```
Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    617.51   430.900     27.11    0.380      1.933
2     79.86    39.630     13.55    0.169      2.930
Qmax(1) =
         1.000 *    1.000 *   617.510) +
         0.639 *    1.000 *    79.863) + =     668.522
Qmax(2) =
         1.642 *    0.500 *   617.510) +
         1.000 *    1.000 *    79.863) + =     586.749

Total of 2 main streams to confluence:
Flow rates before confluence point:
     618.510      80.863
Maximum flow rates at confluence using above data:
      668.522      586.749
Area of streams before confluence:
      430.900       39.630
Effective area values after confluence:
      470.530      254.985


Results of confluence:
Total flow rate =    668.522(CFS)
Time of concentration =    27.114 min.
Effective stream area after confluence  =    470.530(Ac.)
Study area average Pervious fraction(Ap) =  0.475
Study area average soil loss rate(Fm) =    0.362(In/Hr)
Study area total =     470.53(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.100 to Point/Station        6.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   654.800(Ft.)
Downstream point/station elevation =   652.500(Ft.)
Pipe length  =   468.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   668.522(CFS)
Nearest computed pipe diameter  =     99.00(In.)
Calculated individual pipe flow  =   668.522(CFS)
Normal flow depth in pipe =   78.00(In.)
Flow top width inside pipe =   80.94(In.)
Critical Depth =   78.27(In.)
Pipe flow velocity =     14.79(Ft/s)
Travel time through pipe =    0.53 min.
Time of concentration (TC) =    27.64 min.


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Process from Point/Station        6.100 to Point/Station        6.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    470.530(Ac.)
Runoff from this stream =    668.522(CFS)
Time of concentration =   27.64 min.
Rainfall intensity =     1.910(In/Hr)
Area averaged loss rate (Fm) =    0.3622(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4747
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station        6.200
**** USER DEFINED FLOW INFORMATION AT A POINT ****
____________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 49.50
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.693(In/Hr)
Rainfall intensity =      2.415(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  18.70 min.  Rain intensity =       2.42(In/Hr)
Total area this stream =        20.54(Ac.)
Total Study Area (Main Stream No. 2) =      491.07(Ac.)
Total runoff =     24.62(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station        6.200
**** CONFLUENCE OF MAIN STREAMS ****
____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     20.540(Ac.)
Runoff from this stream =     24.619(CFS)
Time of concentration =   18.70 min.
Rainfall intensity =     2.415(In/Hr)
Area averaged loss rate (Fm) =    0.6932(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    668.52   470.530     27.64    0.362      1.910
2     24.62    20.540     18.70    0.693      2.415
Qmax(1) =
         1.000 *    1.000 *   668.522) +
         0.707 *    1.000 *    24.619) + =     685.923
```

```
Qmax(2) =
         1.326 *    0.676 *   668.522) +
         1.000 *    1.000 *    24.619) + =     624.341

Total of 2 main streams to confluence:
Flow rates before confluence point:
     669.522      25.619
Maximum flow rates at confluence using above data:
      685.923      624.341
Area of streams before confluence:
      470.530       20.540
Effective area values after confluence:
      491.070      338.830


Results of confluence:
Total flow rate =    685.923(CFS)
Time of concentration =    27.641 min.
Effective stream area after confluence  =    491.070(Ac.)
Study area average Pervious fraction(Ap) =  0.490
Study area average soil loss rate(Fm) =    0.376(In/Hr)
Study area total =     491.07(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.200 to Point/Station        6.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   652.500(Ft.)
Downstream point/station elevation =   650.900(Ft.)
Pipe length  =   312.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   685.923(CFS)
Nearest computed pipe diameter  =     99.00(In.)
Calculated individual pipe flow  =   685.923(CFS)
Normal flow depth in pipe =   78.38(In.)
Flow top width inside pipe =   80.41(In.)
Critical Depth =   79.20(In.)
Pipe flow velocity =     15.11(Ft/s)
Travel time through pipe =    0.34 min.
Time of concentration (TC) =    27.99 min.


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Process from Point/Station        6.200 to Point/Station        6.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    491.070(Ac.)
Runoff from this stream =    685.923(CFS)
Time of concentration =   27.99 min.
Rainfall intensity =     1.896(In/Hr)
Area averaged loss rate (Fm) =    0.3761(In/Hr)
```

```
Area averaged Pervious ratio (Ap) = 0.4904
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      701.000 to Point/Station      702.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.624(In/Hr)
Initial subarea data:
Initial area flow distance =   590.000(Ft.)
Top (of initial area) elevation =   684.000(Ft.)
Bottom (of initial area) elevation =   678.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.01017  s(%)=       1.02
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.518 min.
Rainfall intensity =      2.701(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.692
Subarea runoff =      7.628(CFS)
Total initial stream area =        4.080(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.624(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      702.000 to Point/Station      702.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Time of concentration =    15.52 min.
Rainfall intensity =      2.701(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.772
Subarea runoff =      7.497(CFS) for    3.170(Ac.)
Total runoff =     15.126(CFS)
Effective area this stream =        7.25(Ac.)
Total Study Area (Main Stream No. 2) =      498.32(Ac.)
Area averaged Fm value =    0.383(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      702.000 to Point/Station        6.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   674.000(Ft.)
Downstream point/station elevation =   650.900(Ft.)
Pipe length  =   120.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.126(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =    15.126(CFS)
Normal flow depth in pipe =    9.50(In.)
Flow top width inside pipe =    9.74(In.)
Critical depth could not be calculated.
Pipe flow velocity =     22.67(Ft/s)
Travel time through pipe =    0.09 min.
Time of concentration (TC) =    15.61 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      702.000 to Point/Station        6.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.250(Ac.)
Runoff from this stream =     15.126(CFS)
Time of concentration =   15.61 min.
Rainfall intensity =     2.692(In/Hr)
Area averaged loss rate (Fm) =    0.3832(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5221
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      703.000 to Point/Station      704.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.624(In/Hr)
Initial subarea data:
Initial area flow distance =  1000.000(Ft.)
Top (of initial area) elevation =   687.000(Ft.)
Bottom (of initial area) elevation =   677.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.229 min.
Rainfall intensity =      2.375(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.664
Subarea runoff =     13.303(CFS)
Total initial stream area =        8.440(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.624(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      704.000 to Point/Station        6.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   673.000(Ft.)
Downstream point/station elevation =   650.900(Ft.)
Pipe length  =    86.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.303(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =    13.303(CFS)
Normal flow depth in pipe =    7.65(In.)
Flow top width inside pipe =   11.54(In.)
Critical depth could not be calculated.
Pipe flow velocity =     25.14(Ft/s)
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    19.29 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      704.000 to Point/Station        6.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      8.440(Ac.)
Runoff from this stream =     13.303(CFS)
Time of concentration =   19.29 min.
Rainfall intensity =     2.371(In/Hr)
Area averaged loss rate (Fm) =    0.6239(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)    (Ac.)       (min) (In/Hr)     (In/Hr)


1    685.92   491.070     27.99    0.376      1.896
2     15.13     7.250     15.61    0.383      2.692
3     13.30     8.440     19.29    0.624      2.371
Qmax(1) =
         1.000 *    1.000 *   685.923) +
         0.655 *    1.000 *    15.126) +
         0.728 *    1.000 *    13.303) + =     705.524
Qmax(2) =
         1.523 *    0.558 *   685.923) +
         1.000 *    1.000 *    15.126) +
```

```
         1.184 *    0.809 *    13.303) + =     610.601
Qmax(3) =
         1.312 *    0.689 *   685.923) +
         0.861 *    1.000 *    15.126) +
         1.000 *    1.000 *    13.303) + =     646.606

Total of 3 main streams to confluence:
Flow rates before confluence point:
     686.923      16.126      14.303
Maximum flow rates at confluence using above data:
      705.524      610.601      646.606
Area of streams before confluence:
      491.070        7.250        8.440
Effective area values after confluence:
      506.760      287.922      354.100


Results of confluence:
Total flow rate =    705.524(CFS)
Time of concentration =    27.985 min.
Effective stream area after confluence  =    506.760(Ac.)
Study area average Pervious fraction(Ap) =  0.497
Study area average soil loss rate(Fm) =    0.380(In/Hr)
Study area total =     506.76(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.300 to Point/Station        6.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   650.900(Ft.)
Downstream point/station elevation =   649.000(Ft.)
Pipe length  =   381.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   705.524(CFS)
Nearest computed pipe diameter  =    102.00(In.)
Calculated individual pipe flow  =   705.524(CFS)
Normal flow depth in pipe =   78.00(In.)
Flow top width inside pipe =   86.53(In.)
Critical Depth =   79.93(In.)
Pipe flow velocity =     15.16(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    28.40 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.400 to Point/Station        6.500
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   649.000(Ft.)
Downstream point/station elevation =   647.300(Ft.)
Pipe length  =   342.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   705.524(CFS)
Nearest computed pipe diameter  =    102.00(In.)
```

```
Calculated individual pipe flow  =   705.524(CFS)
Normal flow depth in pipe =   78.09(In.)
Flow top width inside pipe =   86.42(In.)
Critical Depth =   79.93(In.)
Pipe flow velocity =     15.14(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =    28.78 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.400 to Point/Station        6.500
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    506.760(Ac.)
Runoff from this stream =    705.524(CFS)
Time of concentration =   28.78 min.
Rainfall intensity =     1.865(In/Hr)
Area averaged loss rate (Fm) =    0.3803(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4969
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      731.000 to Point/Station      732.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.570
Decimal fraction soil group B = 0.010
Decimal fraction soil group C = 0.420
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 47.78
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.084(In/Hr)
Initial subarea data:
Initial area flow distance =   651.000(Ft.)
Top (of initial area) elevation =   675.500(Ft.)
Bottom (of initial area) elevation =   669.000(Ft.)
Difference in elevation =     6.500(Ft.)
Slope =    0.00998  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.196 min.
Rainfall intensity =      3.475(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.878
Subarea runoff =     11.264(CFS)
Total initial stream area =        3.690(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.084(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      732.000 to Point/Station        6.500
```

```
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =   665.000(Ft.)
Downstream point/station elevation =   647.300(Ft.)
Pipe length  =   305.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.264(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    11.264(CFS)
Normal flow depth in pipe =    9.46(In.)
Flow top width inside pipe =   14.48(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.82(Ft/s)
Travel time through pipe =    0.37 min.
Time of concentration (TC) =    10.56 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      732.000 to Point/Station        6.500
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.690(Ac.)
Runoff from this stream =     11.264(CFS)
Time of concentration =   10.56 min.
Rainfall intensity =     3.402(In/Hr)
Area averaged loss rate (Fm) =    0.0836(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    705.52   506.760     28.78    0.380      1.865
2     11.26     3.690     10.56    0.084      3.402
Qmax(1) =
         1.000 *    1.000 *   705.524) +
         0.537 *    1.000 *    11.264) + =     711.570
Qmax(2) =
         2.036 *    0.367 *   705.524) +
         1.000 *    1.000 *    11.264) + =     538.474

Total of 2 main streams to confluence:
Flow rates before confluence point:
     706.524      12.264
Maximum flow rates at confluence using above data:
      711.570      538.474
Area of streams before confluence:
      506.760        3.690
Effective area values after confluence:
      510.450      189.698
```

```
Results of confluence:
Total flow rate =    711.570(CFS)
Time of concentration =    28.781 min.
Effective stream area after confluence  =    510.450(Ac.)
Study area average Pervious fraction(Ap) =  0.494
Study area average soil loss rate(Fm) =    0.378(In/Hr)
Study area total =     510.45(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.500 to Point/Station        7.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   647.300(Ft.)
Downstream point/station elevation =   645.700(Ft.)
Pipe length  =   224.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   711.570(CFS)
Nearest computed pipe diameter  =     96.00(In.)
Calculated individual pipe flow  =   711.570(CFS)
Normal flow depth in pipe =   72.75(In.)
Flow top width inside pipe =   82.25(In.)
Critical Depth =   80.78(In.)
Pipe flow velocity =     17.41(Ft/s)
Travel time through pipe =    0.21 min.
Time of concentration (TC) =    29.00 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.500 to Point/Station        7.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    510.450(Ac.)
Runoff from this stream =    711.570(CFS)
Time of concentration =   29.00 min.
Rainfall intensity =     1.856(In/Hr)
Area averaged loss rate (Fm) =    0.3782(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4940
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      734.000 to Point/Station      735.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.450
Decimal fraction soil group B = 0.550
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 45.20
```

```
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.086(In/Hr)
Initial subarea data:
Initial area flow distance =   446.000(Ft.)
Top (of initial area) elevation =   677.500(Ft.)
Bottom (of initial area) elevation =   673.000(Ft.)
Difference in elevation =     4.500(Ft.)
Slope =    0.01009  s(%)=       1.01
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.746 min.
Rainfall intensity =      3.810(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.880
Subarea runoff =      3.419(CFS)
Total initial stream area =        1.020(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.086(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      735.000 to Point/Station        7.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.760
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.240
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 40.88
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.091(In/Hr)
Time of concentration =     8.75 min.
Rainfall intensity =      3.810(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.879
Subarea runoff =     13.524(CFS) for    4.040(Ac.)
Total runoff =     16.943(CFS)
Effective area this stream =        5.06(Ac.)
Total Study Area (Main Stream No. 2) =      515.51(Ac.)
Area averaged Fm value =    0.090(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      735.000 to Point/Station        7.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      5.060(Ac.)
Runoff from this stream =     16.943(CFS)
Time of concentration =    8.75 min.
Rainfall intensity =     3.810(In/Hr)
Area averaged loss rate (Fm) =    0.0900(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:
```

| Stream No. | Flow rate (CFS) | Area (Ac.) | TC (min) | Fm (In/Hr) | Rainfall Intensity (In/Hr) |
|---|---|---|---|---|---|
| 1 | 711.57 | 510.450 | 29.00 | 0.378 | 1.856 |
| 2 | 16.94 | 5.060 | 8.75 | 0.090 | 3.810 |

```
Qmax(1) =
         1.000 *    1.000 *   711.570) +
         0.475 *    1.000 *    16.943) + =     719.614
Qmax(2) =
         2.322 *    0.302 *   711.570) +
         1.000 *    1.000 *    16.943) + =     515.311

Total of 2 main streams to confluence:
Flow rates before confluence point:
     712.570      17.943
Maximum flow rates at confluence using above data:
      719.614      515.311
Area of streams before confluence:
      510.450        5.060
Effective area values after confluence:
      515.510      159.037


Results of confluence:
Total flow rate =    719.614(CFS)
Time of concentration =    28.995 min.
Effective stream area after confluence  =    515.510(Ac.)
Study area average Pervious fraction(Ap) =  0.490
Study area average soil loss rate(Fm) =    0.375(In/Hr)
Study area total =     515.51(Ac.)
End of computations, Total Study Area =          515.51 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.490
Area averaged SCS curve number =  53.2
```

## APPENDIX C.3: RATIONAL METHOD ANALYSIS, BON VIEW ONSITE MITIGATED, AREA F2

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/07/25

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ONTARIO RANCH 108.43.25
ONSITE RATIONAL METHOD HYDROLOGY
AREA F2, 100 YEAR STORM EVENT
FN: RARF2100PEAST

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Program License Serial Number 6279

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 711.000 to Point/Station 712.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.250
Decimal fraction soil group B = 0.750
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 50.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.081(In/Hr)
Initial subarea data:
Initial area flow distance = 238.000(Ft.)
Top (of initial area) elevation = 676.500(Ft.)
Bottom (of initial area) elevation = 674.000(Ft.)
Difference in elevation = 2.500(Ft.)
Slope = 0.01050 s(%)= 1.05
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.749 min.
Rainfall intensity = 4.452(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.884
Subarea runoff = 2.478(CFS)
Total initial stream area = 0.630(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.081(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      712.000 to Point/Station      714.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   670.000(Ft.)
Downstream point/station elevation =   668.200(Ft.)
Pipe length  =   603.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.478(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     2.478(CFS)
Normal flow depth in pipe =    9.27(In.)
Flow top width inside pipe =   14.58(In.)
Critical Depth =    7.56(In.)
Pipe flow velocity =      3.11(Ft/s)
Travel time through pipe =    3.23 min.
Time of concentration (TC) =     9.98 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      712.000 to Point/Station      714.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      0.630(Ac.)
Runoff from this stream =      2.478(CFS)
Time of concentration =    9.98 min.
Rainfall intensity =     3.521(In/Hr)
Area averaged loss rate (Fm) =    0.0810(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      713.000 to Point/Station      714.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   461.000(Ft.)
Top (of initial area) elevation =   678.000(Ft.)
Bottom (of initial area) elevation =   673.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.01085  s(%)=       1.08
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.736 min.
Rainfall intensity =      3.813(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.877
Subarea runoff =     14.345(CFS)
Total initial stream area =        4.290(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      713.000 to Point/Station      714.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      4.290(Ac.)
Runoff from this stream =     14.345(CFS)
Time of concentration =    8.74 min.
Rainfall intensity =     3.813(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1      2.48     0.630      9.98    0.081      3.521
2     14.35     4.290      8.74    0.098      3.813
Qmax(1) =
         1.000 *    1.000 *     2.478) +
         0.921 *    1.000 *    14.345) + =      15.696
Qmax(2) =
         1.085 *    0.876 *     2.478) +
         1.000 *    1.000 *    14.345) + =      16.700

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.478      14.345
Maximum flow rates at confluence using above data:
       15.696       16.700
Area of streams before confluence:
        0.630        4.290
Effective area values after confluence:
        4.920        4.842
Results of confluence:
Total flow rate =     16.700(CFS)
Time of concentration =     8.736 min.
Effective stream area after confluence =      4.842(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.096(In/Hr)
Study area total (this main stream) =       4.92(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      714.000 to Point/Station      721.000
```

```
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =   668.200(Ft.)
Downstream point/station elevation =   665.000(Ft.)
Pipe length  =  1024.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    16.700(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    16.700(CFS)
Normal flow depth in pipe =   21.33(In.)
Flow top width inside pipe =   22.00(In.)
Critical Depth =   17.11(In.)
Pipe flow velocity =      4.96(Ft/s)
Travel time through pipe =    3.44 min.
Time of concentration (TC) =    12.18 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      714.000 to Point/Station      721.000
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.842(Ac.)
Runoff from this stream =     16.700(CFS)
Time of concentration =   12.18 min.
Rainfall intensity =     3.124(In/Hr)
Area averaged loss rate (Fm) =    0.0956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      715.000 to Point/Station      716.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   513.000(Ft.)
Top (of initial area) elevation =   681.000(Ft.)
Bottom (of initial area) elevation =   676.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.00975  s(%)=       0.97
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.314 min.
Rainfall intensity =      3.669(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff =      9.450(CFS)
```

```
Total initial stream area =        2.920(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      716.000 to Point/Station      721.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   672.000(Ft.)
Downstream point/station elevation =   665.000(Ft.)
Pipe length  =   189.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.450(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     9.450(CFS)
Normal flow depth in pipe =    9.79(In.)
Flow top width inside pipe =   14.29(In.)
Critical Depth =   14.03(In.)
Pipe flow velocity =     11.15(Ft/s)
Travel time through pipe =    0.28 min.
Time of concentration (TC) =     9.60 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      716.000 to Point/Station      721.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.920(Ac.)
Runoff from this stream =      9.450(CFS)
Time of concentration =    9.60 min.
Rainfall intensity =     3.604(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      717.000 to Point/Station      718.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   477.000(Ft.)
Top (of initial area) elevation =   684.000(Ft.)
Bottom (of initial area) elevation =   679.000(Ft.)
```

```
Difference in elevation =     5.000(Ft.)
Slope =    0.01048  s(%)=       1.05
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.916 min.
Rainfall intensity =      3.767(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff =      9.074(CFS)
Total initial stream area =        2.730(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      718.000 to Point/Station      721.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   675.000(Ft.)
Downstream point/station elevation =   665.000(Ft.)
Pipe length  =    35.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.074(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     9.074(CFS)
Normal flow depth in pipe =    5.84(In.)
Flow top width inside pipe =   12.00(In.)
Critical depth could not be calculated.
Pipe flow velocity =     23.96(Ft/s)
Travel time through pipe =    0.02 min.
Time of concentration (TC) =     8.94 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      718.000 to Point/Station      721.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      2.730(Ac.)
Runoff from this stream =      9.074(CFS)
Time of concentration =    8.94 min.
Rainfall intensity =     3.761(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      719.000 to Point/Station      720.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.610
Decimal fraction soil group B = 0.390
Decimal fraction soil group C = 0.000
```

```
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 41.36
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.090(In/Hr)
Initial subarea data:
Initial area flow distance =   582.000(Ft.)
Top (of initial area) elevation =   684.000(Ft.)
Bottom (of initial area) elevation =   678.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.01031  s(%)=       1.03
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.687 min.
Rainfall intensity =      3.584(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.877
Subarea runoff =     23.393(CFS)
Total initial stream area =        7.440(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.090(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      720.000 to Point/Station      721.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   674.000(Ft.)
Downstream point/station elevation =   665.000(Ft.)
Pipe length  =    19.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    23.393(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =    23.393(CFS)
Normal flow depth in pipe =    9.38(In.)
Flow top width inside pipe =    9.92(In.)
Critical depth could not be calculated.
Pipe flow velocity =     35.54(Ft/s)
Travel time through pipe =    0.01 min.
Time of concentration (TC) =     9.70 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      720.000 to Point/Station      721.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      7.440(Ac.)
Runoff from this stream =     23.393(CFS)
Time of concentration =    9.70 min.
Rainfall intensity =     3.582(In/Hr)
Area averaged loss rate (Fm) =    0.0904(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
```

```
1     16.70     4.842     12.18    0.096      3.124
2      9.45     2.920      9.60    0.073      3.604
3      9.07     2.730      8.94    0.073      3.761
4     23.39     7.440      9.70    0.090      3.582
Qmax(1) =
         1.000 *    1.000 *    16.700) +
         0.864 *    1.000 *     9.450) +
         0.827 *    1.000 *     9.074) +
         0.869 *    1.000 *    23.393) + =      52.701
Qmax(2) =
         1.158 *    0.788 *    16.700) +
         1.000 *    1.000 *     9.450) +
         0.958 *    1.000 *     9.074) +
         1.006 *    0.990 *    23.393) + =      56.686
Qmax(3) =
         1.210 *    0.734 *    16.700) +
         1.044 *    0.932 *     9.450) +
         1.000 *    1.000 *     9.074) +
         1.051 *    0.922 *    23.393) + =      55.780
Qmax(4) =
         1.151 *    0.796 *    16.700) +
         0.994 *    1.000 *     9.450) +
         0.952 *    1.000 *     9.074) +
         1.000 *    1.000 *    23.393) + =      56.725

Total of 4 main streams to confluence:
Flow rates before confluence point:
      17.700      10.450      10.074      24.393
Maximum flow rates at confluence using above data:
       52.701       56.686       55.780       56.725
Area of streams before confluence:
        4.842        2.920        2.730        7.440
Effective area values after confluence:
       17.932       16.830       15.866       16.945


Results of confluence:
Total flow rate =     56.725(CFS)
Time of concentration =     9.696 min.
Effective stream area after confluence  =     16.945(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.086(In/Hr)
Study area total =      17.93(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      721.000 to Point/Station      725.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   665.000(Ft.)
Downstream point/station elevation =   664.200(Ft.)
```

```
Pipe length  =   246.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    56.725(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    56.725(CFS)
Normal flow depth in pipe =   34.03(In.)
Flow top width inside pipe =   32.94(In.)
Critical Depth =   28.32(In.)
Pipe flow velocity =      6.80(Ft/s)
Travel time through pipe =    0.60 min.
Time of concentration (TC) =    10.30 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      721.000 to Point/Station      725.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     16.945(Ac.)
Runoff from this stream =     56.725(CFS)
Time of concentration =   10.30 min.
Rainfall intensity =     3.455(In/Hr)
Area averaged loss rate (Fm) =    0.0864(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      722.000 to Point/Station      723.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   181.000(Ft.)
Top (of initial area) elevation =   681.000(Ft.)
Bottom (of initial area) elevation =   679.000(Ft.)
Difference in elevation =     2.000(Ft.)
Slope =    0.01105  s(%)=       1.10
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.988 min.
Rainfall intensity =      4.783(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.886
Subarea runoff =      6.612(CFS)
Total initial stream area =        1.560(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      723.000 to Point/Station      724.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   675.000(Ft.)
Downstream point/station elevation =   674.500(Ft.)
Pipe length  =    41.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.612(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.612(CFS)
Normal flow depth in pipe =   11.41(In.)
Flow top width inside pipe =   12.80(In.)
Critical Depth =   12.41(In.)
Pipe flow velocity =      6.60(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =     6.09 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      724.000 to Point/Station      725.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   674.500(Ft.)
Downstream point/station elevation =   664.200(Ft.)
Pipe length  =    96.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.612(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     6.612(CFS)
Normal flow depth in pipe =    6.47(In.)
Flow top width inside pipe =   11.96(In.)
Critical depth could not be calculated.
Pipe flow velocity =     15.32(Ft/s)
Travel time through pipe =    0.10 min.
Time of concentration (TC) =     6.20 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      724.000 to Point/Station      725.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.560(Ac.)
Runoff from this stream =      6.612(CFS)
Time of concentration =    6.20 min.
Rainfall intensity =     4.686(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
```

```
1     56.72    16.945     10.30    0.086      3.455
2      6.61     1.560      6.20    0.073      4.686
Qmax(1) =
         1.000 *    1.000 *    56.725) +
         0.733 *    1.000 *     6.612) + =      61.572
Qmax(2) =
         1.366 *    0.602 *    56.725) +
         1.000 *    1.000 *     6.612) + =      53.215

Total of 2 main streams to confluence:
Flow rates before confluence point:
      57.725       7.612
Maximum flow rates at confluence using above data:
       61.572       53.215
Area of streams before confluence:
       16.945        1.560
Effective area values after confluence:
       18.505       11.754


Results of confluence:
Total flow rate =     61.572(CFS)
Time of concentration =    10.299 min.
Effective stream area after confluence  =     18.505(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.085(In/Hr)
Study area total =      18.51(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      725.000 to Point/Station      729.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   664.200(Ft.)
Downstream point/station elevation =   663.800(Ft.)
Pipe length  =   113.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    61.572(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    61.572(CFS)
Normal flow depth in pipe =   32.06(In.)
Flow top width inside pipe =   40.73(In.)
Critical Depth =   28.93(In.)
Pipe flow velocity =      7.32(Ft/s)
Travel time through pipe =    0.26 min.
Time of concentration (TC) =    10.56 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      725.000 to Point/Station      729.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
```

```
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     18.505(Ac.)
Runoff from this stream =     61.572(CFS)
Time of concentration =   10.56 min.
Rainfall intensity =     3.404(In/Hr)
Area averaged loss rate (Fm) =    0.0853(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      726.000 to Point/Station      727.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   355.000(Ft.)
Top (of initial area) elevation =   675.000(Ft.)
Bottom (of initial area) elevation =   671.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.01127  s(%)=       1.13
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.809 min.
Rainfall intensity =      4.079(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.878
Subarea runoff =      7.918(CFS)
Total initial stream area =        2.210(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      727.000 to Point/Station      728.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   667.000(Ft.)
Downstream point/station elevation =   665.800(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.918(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     7.918(CFS)
Normal flow depth in pipe =    9.32(In.)
Flow top width inside pipe =   14.55(In.)
Critical Depth =   13.32(In.)
Pipe flow velocity =      9.89(Ft/s)
Travel time through pipe =    0.07 min.
```

```
Time of concentration (TC) =     7.88 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      728.000 to Point/Station      729.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   665.800(Ft.)
Downstream point/station elevation =   663.800(Ft.)
Pipe length  =   113.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.918(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     7.918(CFS)
Normal flow depth in pipe =   11.34(In.)
Flow top width inside pipe =   12.88(In.)
Critical Depth =   13.32(In.)
Pipe flow velocity =      7.95(Ft/s)
Travel time through pipe =    0.24 min.
Time of concentration (TC) =     8.11 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      728.000 to Point/Station      729.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.210(Ac.)
Runoff from this stream =      7.918(CFS)
Time of concentration =    8.11 min.
Rainfall intensity =     3.986(In/Hr)
Area averaged loss rate (Fm) =    0.0978(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     61.57    18.505     10.56    0.085      3.404
2      7.92     2.210      8.11    0.098      3.986
Qmax(1) =
         1.000 *    1.000 *    61.572) +
         0.850 *    1.000 *     7.918) + =      68.304
Qmax(2) =
         1.175 *    0.769 *    61.572) +
         1.000 *    1.000 *     7.918) + =      63.545

Total of 2 main streams to confluence:
Flow rates before confluence point:
      62.572       8.918
Maximum flow rates at confluence using above data:
       68.304       63.545
```

```
Area of streams before confluence:
       18.505        2.210
Effective area values after confluence:
       20.715       16.433


Results of confluence:
Total flow rate =     68.304(CFS)
Time of concentration =    10.556 min.
Effective stream area after confluence  =     20.715(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.087(In/Hr)
Study area total =      20.72(Ac.)
End of computations, Total Study Area =           21.78 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  43.7
```

# APPENDIX C.4: RATIONAL METHOD ANALYSIS, BON VIEW ONSITE MITIGATED, AREA F3

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/07/25

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ONTARIO RANCH 108.43.25
ONSITE RATIONAL METHOD HYDROLOGY
AREA F3, 100 YEAR STORM EVENT
FN: RARF3100PWEST

---

Program License Serial Number 6279

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********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 706.000 to Point/Station 707.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 56.00
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.073(In/Hr)
Initial subarea data:
Initial area flow distance = 565.000(Ft.)
Top (of initial area) elevation = 680.600(Ft.)
Bottom (of initial area) elevation = 675.000(Ft.)
Difference in elevation = 5.600(Ft.)
Slope = 0.00991 s(%)= 0.99
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.649 min.
Rainfall intensity = 3.592(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff = 12.320(CFS)
Total initial stream area = 3.890(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.073(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      707.000 to Point/Station      710.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   671.000(Ft.)
Downstream point/station elevation =   669.500(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.320(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    12.320(CFS)
Normal flow depth in pipe =   10.37(In.)
Flow top width inside pipe =   13.86(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.61(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =     9.68 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      707.000 to Point/Station      710.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      3.890(Ac.)
Runoff from this stream =     12.320(CFS)
Time of concentration =    9.68 min.
Rainfall intensity =     3.585(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      708.000 to Point/Station      709.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.300
Decimal fraction soil group B = 0.550
Decimal fraction soil group C = 0.150
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.75
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.080(In/Hr)
Initial subarea data:
Initial area flow distance =   465.000(Ft.)
Top (of initial area) elevation =   678.600(Ft.)
Bottom (of initial area) elevation =   674.000(Ft.)
Difference in elevation =     4.600(Ft.)
Slope =    0.00989  s(%)=       0.99
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
```

```
Initial area time of concentration =    8.929 min.
Rainfall intensity =      3.764(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.881
Subarea runoff =     18.034(CFS)
Total initial stream area =        5.440(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.080(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      709.000 to Point/Station      710.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   670.000(Ft.)
Downstream point/station elevation =   669.500(Ft.)
Pipe length  =    20.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    18.034(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    18.034(CFS)
Normal flow depth in pipe =   13.20(In.)
Flow top width inside pipe =   20.30(In.)
Critical Depth =   18.56(In.)
Pipe flow velocity =     11.34(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =     8.96 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      709.000 to Point/Station      710.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      5.440(Ac.)
Runoff from this stream =     18.034(CFS)
Time of concentration =    8.96 min.
Rainfall intensity =     3.756(In/Hr)
Area averaged loss rate (Fm) =    0.0800(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     12.32     3.890      9.68    0.073      3.585
2     18.03     5.440      8.96    0.080      3.756
Qmax(1) =
         1.000 *    1.000 *    12.320) +
         0.953 *    1.000 *    18.034) + =      29.514
Qmax(2) =
         1.049 *    0.925 *    12.320) +
         1.000 *    1.000 *    18.034) + =      29.989
```

```
Total of 2 main streams to confluence:
Flow rates before confluence point:
      13.320      19.034
Maximum flow rates at confluence using above data:
       29.514       29.989
Area of streams before confluence:
        3.890        5.440
Effective area values after confluence:
        9.330        9.039


Results of confluence:
Total flow rate =     29.989(CFS)
Time of concentration =     8.958 min.
Effective stream area after confluence  =      9.039(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.077(In/Hr)
Study area total =       9.33(Ac.)
End of computations, Total Study Area =            9.33 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  52.9
```

# APPENDIX C.5: UNIT HYDROGRAPH ANALYSIS, BON VIEW ONSITE MITIGATED, AREA F2

U n i t  H y d r o g r a p h  A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0

Study date 05/09/25

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6279

---

ONTARIO RANCH 108.43.25
COMMERCIAL MITIGATED UNIT HYDROGRAPH METHOD HYDROLOGY
AREA F2, 100-YEAR STORM EVENT
FN: UARF2P

---

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 100 | | |
| 21.78 | 1 | 1.20 |
| Rainfall data for year 100 | | |
| 21.78 | 6 | 3.00 |
| Rainfall data for year 100 | | |
| 21.78 | 24 | 6.00 |

---

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 43.7 | 43.7 | 21.78 | 1.000 | 0.880 | 0.100 | 0.088 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.088

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 2.18 | 0.100 | 43.7 | 43.7 | 12.88 | 0.120 |
| 19.60 | 0.900 | 98.0 | 98.0 | 0.20 | 0.960 |

Area-averaged catchment yield fraction, Y = 0.876
Area-averaged low loss fraction, Yb = 0.124
User entry of time of concentration = 0.176 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 21.78(Ac.)
Catchment Lag time = 0.141 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 59.2193
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.087(In/Hr)
Average low loss rate fraction (Yb) = 0.124 (decimal)
Note: user entry of the Fm value
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 21.78(Ac.) (Ref: fig. E-4)

5-minute factor = 0.999 Adjusted rainfall = 0.444(In)
30-minute factor = 0.999 Adjusted rainfall = 0.909(In)
1-hour factor = 0.999 Adjusted rainfall = 1.199(In)
3-hour factor = 1.000 Adjusted rainfall = 2.104(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|

---
(K = 263.40 (CFS))

| | | |
|---|---|---|
| 1 | 6.355 | 16.740 |
| 2 | 40.677 | 90.404 |
| 3 | 80.952 | 106.085 |
| 4 | 95.217 | 37.574 |
| 5 | 98.595 | 8.899 |
| 6 | 100.000 | 3.700 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4437 | 0.4437 |
| 2 | 0.5854 | 0.1418 |
| 3 | 0.6885 | 0.1031 |
| 4 | 0.7725 | 0.0840 |
| 5 | 0.8446 | 0.0721 |
| 6 | 0.9085 | 0.0639 |
| 7 | 0.9663 | 0.0578 |
| 8 | 1.0193 | 0.0530 |
| 9 | 1.0685 | 0.0492 |
| 10 | 1.1145 | 0.0460 |
| 11 | 1.1578 | 0.0433 |
| 12 | 1.1988 | 0.0410 |
| 13 | 1.2489 | 0.0502 |
| 14 | 1.2973 | 0.0483 |
| 15 | 1.3439 | 0.0467 |
| 16 | 1.3891 | 0.0452 |
| 17 | 1.4329 | 0.0438 |
| 18 | 1.4755 | 0.0426 |
| 19 | 1.5169 | 0.0414 |
| 20 | 1.5573 | 0.0404 |
| 21 | 1.5967 | 0.0394 |
| 22 | 1.6352 | 0.0385 |
| 23 | 1.6729 | 0.0377 |
| 24 | 1.7097 | 0.0369 |
| 25 | 1.7459 | 0.0361 |
| 26 | 1.7813 | 0.0354 |
| 27 | 1.8160 | 0.0348 |
| 28 | 1.8502 | 0.0341 |
| 29 | 1.8837 | 0.0336 |
| 30 | 1.9167 | 0.0330 |
| 31 | 1.9492 | 0.0325 |
| 32 | 1.9812 | 0.0320 |
| 33 | 2.0126 | 0.0315 |
| 34 | 2.0436 | 0.0310 |
| 35 | 2.0742 | 0.0306 |
| 36 | 2.1044 | 0.0301 |
| 37 | 2.1341 | 0.0297 |
| 38 | 2.1634 | 0.0293 |
| 39 | 2.1923 | 0.0289 |
| 40 | 2.2209 | 0.0286 |
| 41 | 2.2491 | 0.0282 |
| 42 | 2.2770 | 0.0279 |
| 43 | 2.3046 | 0.0276 |
| 44 | 2.3318 | 0.0273 |

| | | |
|---|---|---|
| 45 | 2.3588 | 0.0270 |
| 46 | 2.3855 | 0.0267 |
| 47 | 2.4118 | 0.0264 |
| 48 | 2.4379 | 0.0261 |
| 49 | 2.4638 | 0.0258 |
| 50 | 2.4894 | 0.0256 |
| 51 | 2.5147 | 0.0253 |
| 52 | 2.5398 | 0.0251 |
| 53 | 2.5647 | 0.0249 |
| 54 | 2.5893 | 0.0246 |
| 55 | 2.6137 | 0.0244 |
| 56 | 2.6379 | 0.0242 |
| 57 | 2.6619 | 0.0240 |
| 58 | 2.6857 | 0.0238 |
| 59 | 2.7093 | 0.0236 |
| 60 | 2.7327 | 0.0234 |
| 61 | 2.7559 | 0.0232 |
| 62 | 2.7789 | 0.0230 |
| 63 | 2.8018 | 0.0228 |
| 64 | 2.8244 | 0.0227 |
| 65 | 2.8469 | 0.0225 |
| 66 | 2.8692 | 0.0223 |
| 67 | 2.8914 | 0.0222 |
| 68 | 2.9134 | 0.0220 |
| 69 | 2.9352 | 0.0218 |
| 70 | 2.9569 | 0.0217 |
| 71 | 2.9784 | 0.0215 |
| 72 | 2.9998 | 0.0214 |
| 73 | 3.0206 | 0.0208 |
| 74 | 3.0412 | 0.0206 |
| 75 | 3.0617 | 0.0205 |
| 76 | 3.0820 | 0.0203 |
| 77 | 3.1022 | 0.0202 |
| 78 | 3.1223 | 0.0201 |
| 79 | 3.1422 | 0.0200 |
| 80 | 3.1621 | 0.0198 |
| 81 | 3.1818 | 0.0197 |
| 82 | 3.2014 | 0.0196 |
| 83 | 3.2208 | 0.0195 |
| 84 | 3.2402 | 0.0193 |
| 85 | 3.2594 | 0.0192 |
| 86 | 3.2785 | 0.0191 |
| 87 | 3.2975 | 0.0190 |
| 88 | 3.3164 | 0.0189 |
| 89 | 3.3352 | 0.0188 |
| 90 | 3.3539 | 0.0187 |
| 91 | 3.3725 | 0.0186 |
| 92 | 3.3910 | 0.0185 |
| 93 | 3.4093 | 0.0184 |
| 94 | 3.4276 | 0.0183 |
| 95 | 3.4458 | 0.0182 |
| 96 | 3.4639 | 0.0181 |
| 97 | 3.4819 | 0.0180 |

| | | |
|---|---|---|
| 98 | 3.4998 | 0.0179 |
| 99 | 3.5176 | 0.0178 |
| 100 | 3.5353 | 0.0177 |
| 101 | 3.5530 | 0.0176 |
| 102 | 3.5705 | 0.0175 |
| 103 | 3.5880 | 0.0175 |
| 104 | 3.6053 | 0.0174 |
| 105 | 3.6226 | 0.0173 |
| 106 | 3.6398 | 0.0172 |
| 107 | 3.6570 | 0.0171 |
| 108 | 3.6740 | 0.0170 |
| 109 | 3.6910 | 0.0170 |
| 110 | 3.7079 | 0.0169 |
| 111 | 3.7247 | 0.0168 |
| 112 | 3.7415 | 0.0167 |
| 113 | 3.7581 | 0.0167 |
| 114 | 3.7747 | 0.0166 |
| 115 | 3.7912 | 0.0165 |
| 116 | 3.8077 | 0.0164 |
| 117 | 3.8241 | 0.0164 |
| 118 | 3.8404 | 0.0163 |
| 119 | 3.8566 | 0.0162 |
| 120 | 3.8728 | 0.0162 |
| 121 | 3.8889 | 0.0161 |
| 122 | 3.9049 | 0.0160 |
| 123 | 3.9209 | 0.0160 |
| 124 | 3.9368 | 0.0159 |
| 125 | 3.9526 | 0.0158 |
| 126 | 3.9684 | 0.0158 |
| 127 | 3.9841 | 0.0157 |
| 128 | 3.9998 | 0.0157 |
| 129 | 4.0154 | 0.0156 |
| 130 | 4.0309 | 0.0155 |
| 131 | 4.0464 | 0.0155 |
| 132 | 4.0618 | 0.0154 |
| 133 | 4.0772 | 0.0154 |
| 134 | 4.0925 | 0.0153 |
| 135 | 4.1077 | 0.0152 |
| 136 | 4.1229 | 0.0152 |
| 137 | 4.1380 | 0.0151 |
| 138 | 4.1531 | 0.0151 |
| 139 | 4.1681 | 0.0150 |
| 140 | 4.1831 | 0.0150 |
| 141 | 4.1980 | 0.0149 |
| 142 | 4.2129 | 0.0149 |
| 143 | 4.2277 | 0.0148 |
| 144 | 4.2424 | 0.0148 |
| 145 | 4.2571 | 0.0147 |
| 146 | 4.2718 | 0.0147 |
| 147 | 4.2864 | 0.0146 |
| 148 | 4.3010 | 0.0146 |
| 149 | 4.3155 | 0.0145 |
| 150 | 4.3299 | 0.0145 |

| | | |
|---|---|---|
| 151 | 4.3443 | 0.0144 |
| 152 | 4.3587 | 0.0144 |
| 153 | 4.3730 | 0.0143 |
| 154 | 4.3873 | 0.0143 |
| 155 | 4.4015 | 0.0142 |
| 156 | 4.4157 | 0.0142 |
| 157 | 4.4298 | 0.0141 |
| 158 | 4.4439 | 0.0141 |
| 159 | 4.4579 | 0.0140 |
| 160 | 4.4719 | 0.0140 |
| 161 | 4.4859 | 0.0140 |
| 162 | 4.4998 | 0.0139 |
| 163 | 4.5137 | 0.0139 |
| 164 | 4.5275 | 0.0138 |
| 165 | 4.5413 | 0.0138 |
| 166 | 4.5550 | 0.0137 |
| 167 | 4.5687 | 0.0137 |
| 168 | 4.5824 | 0.0137 |
| 169 | 4.5960 | 0.0136 |
| 170 | 4.6096 | 0.0136 |
| 171 | 4.6231 | 0.0135 |
| 172 | 4.6366 | 0.0135 |
| 173 | 4.6501 | 0.0135 |
| 174 | 4.6635 | 0.0134 |
| 175 | 4.6769 | 0.0134 |
| 176 | 4.6902 | 0.0133 |
| 177 | 4.7035 | 0.0133 |
| 178 | 4.7168 | 0.0133 |
| 179 | 4.7300 | 0.0132 |
| 180 | 4.7432 | 0.0132 |
| 181 | 4.7564 | 0.0132 |
| 182 | 4.7695 | 0.0131 |
| 183 | 4.7826 | 0.0131 |
| 184 | 4.7956 | 0.0131 |
| 185 | 4.8087 | 0.0130 |
| 186 | 4.8216 | 0.0130 |
| 187 | 4.8346 | 0.0129 |
| 188 | 4.8475 | 0.0129 |
| 189 | 4.8604 | 0.0129 |
| 190 | 4.8732 | 0.0128 |
| 191 | 4.8860 | 0.0128 |
| 192 | 4.8988 | 0.0128 |
| 193 | 4.9115 | 0.0127 |
| 194 | 4.9242 | 0.0127 |
| 195 | 4.9369 | 0.0127 |
| 196 | 4.9496 | 0.0126 |
| 197 | 4.9622 | 0.0126 |
| 198 | 4.9747 | 0.0126 |
| 199 | 4.9873 | 0.0125 |
| 200 | 4.9998 | 0.0125 |
| 201 | 5.0123 | 0.0125 |
| 202 | 5.0247 | 0.0125 |
| 203 | 5.0372 | 0.0124 |

| | | |
|---|---|---|
| 204 | 5.0496 | 0.0124 |
| 205 | 5.0619 | 0.0124 |
| 206 | 5.0743 | 0.0123 |
| 207 | 5.0866 | 0.0123 |
| 208 | 5.0988 | 0.0123 |
| 209 | 5.1111 | 0.0122 |
| 210 | 5.1233 | 0.0122 |
| 211 | 5.1355 | 0.0122 |
| 212 | 5.1476 | 0.0122 |
| 213 | 5.1598 | 0.0121 |
| 214 | 5.1719 | 0.0121 |
| 215 | 5.1839 | 0.0121 |
| 216 | 5.1960 | 0.0120 |
| 217 | 5.2080 | 0.0120 |
| 218 | 5.2200 | 0.0120 |
| 219 | 5.2319 | 0.0120 |
| 220 | 5.2439 | 0.0119 |
| 221 | 5.2558 | 0.0119 |
| 222 | 5.2676 | 0.0119 |
| 223 | 5.2795 | 0.0119 |
| 224 | 5.2913 | 0.0118 |
| 225 | 5.3031 | 0.0118 |
| 226 | 5.3149 | 0.0118 |
| 227 | 5.3266 | 0.0117 |
| 228 | 5.3384 | 0.0117 |
| 229 | 5.3501 | 0.0117 |
| 230 | 5.3617 | 0.0117 |
| 231 | 5.3734 | 0.0116 |
| 232 | 5.3850 | 0.0116 |
| 233 | 5.3966 | 0.0116 |
| 234 | 5.4081 | 0.0116 |
| 235 | 5.4197 | 0.0115 |
| 236 | 5.4312 | 0.0115 |
| 237 | 5.4427 | 0.0115 |
| 238 | 5.4542 | 0.0115 |
| 239 | 5.4656 | 0.0114 |
| 240 | 5.4770 | 0.0114 |
| 241 | 5.4884 | 0.0114 |
| 242 | 5.4998 | 0.0114 |
| 243 | 5.5112 | 0.0114 |
| 244 | 5.5225 | 0.0113 |
| 245 | 5.5338 | 0.0113 |
| 246 | 5.5451 | 0.0113 |
| 247 | 5.5564 | 0.0113 |
| 248 | 5.5676 | 0.0112 |
| 249 | 5.5788 | 0.0112 |
| 250 | 5.5900 | 0.0112 |
| 251 | 5.6012 | 0.0112 |
| 252 | 5.6123 | 0.0111 |
| 253 | 5.6234 | 0.0111 |
| 254 | 5.6345 | 0.0111 |
| 255 | 5.6456 | 0.0111 |
| 256 | 5.6567 | 0.0111 |

| | | |
|---|---|---|
| 257 | 5.6677 | 0.0110 |
| 258 | 5.6787 | 0.0110 |
| 259 | 5.6897 | 0.0110 |
| 260 | 5.7007 | 0.0110 |
| 261 | 5.7117 | 0.0110 |
| 262 | 5.7226 | 0.0109 |
| 263 | 5.7335 | 0.0109 |
| 264 | 5.7444 | 0.0109 |
| 265 | 5.7553 | 0.0109 |
| 266 | 5.7661 | 0.0108 |
| 267 | 5.7769 | 0.0108 |
| 268 | 5.7877 | 0.0108 |
| 269 | 5.7985 | 0.0108 |
| 270 | 5.8093 | 0.0108 |
| 271 | 5.8201 | 0.0107 |
| 272 | 5.8308 | 0.0107 |
| 273 | 5.8415 | 0.0107 |
| 274 | 5.8522 | 0.0107 |
| 275 | 5.8629 | 0.0107 |
| 276 | 5.8735 | 0.0107 |
| 277 | 5.8841 | 0.0106 |
| 278 | 5.8947 | 0.0106 |
| 279 | 5.9053 | 0.0106 |
| 280 | 5.9159 | 0.0106 |
| 281 | 5.9265 | 0.0106 |
| 282 | 5.9370 | 0.0105 |
| 283 | 5.9475 | 0.0105 |
| 284 | 5.9580 | 0.0105 |
| 285 | 5.9685 | 0.0105 |
| 286 | 5.9790 | 0.0105 |
| 287 | 5.9894 | 0.0104 |
| 288 | 5.9998 | 0.0104 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0104 | 0.0013 | 0.0091 |
| 2 | 0.0104 | 0.0013 | 0.0092 |
| 3 | 0.0105 | 0.0013 | 0.0092 |
| 4 | 0.0105 | 0.0013 | 0.0092 |
| 5 | 0.0105 | 0.0013 | 0.0092 |
| 6 | 0.0106 | 0.0013 | 0.0092 |
| 7 | 0.0106 | 0.0013 | 0.0093 |
| 8 | 0.0106 | 0.0013 | 0.0093 |
| 9 | 0.0107 | 0.0013 | 0.0093 |
| 10 | 0.0107 | 0.0013 | 0.0093 |
| 11 | 0.0107 | 0.0013 | 0.0094 |
| 12 | 0.0107 | 0.0013 | 0.0094 |
| 13 | 0.0108 | 0.0013 | 0.0094 |
| 14 | 0.0108 | 0.0013 | 0.0095 |
| 15 | 0.0108 | 0.0013 | 0.0095 |
| 16 | 0.0108 | 0.0013 | 0.0095 |

| | | | |
|---|---|---|---|
| 17 | 0.0109 | 0.0013 | 0.0095 |
| 18 | 0.0109 | 0.0014 | 0.0096 |
| 19 | 0.0110 | 0.0014 | 0.0096 |
| 20 | 0.0110 | 0.0014 | 0.0096 |
| 21 | 0.0110 | 0.0014 | 0.0097 |
| 22 | 0.0110 | 0.0014 | 0.0097 |
| 23 | 0.0111 | 0.0014 | 0.0097 |
| 24 | 0.0111 | 0.0014 | 0.0097 |
| 25 | 0.0111 | 0.0014 | 0.0098 |
| 26 | 0.0112 | 0.0014 | 0.0098 |
| 27 | 0.0112 | 0.0014 | 0.0098 |
| 28 | 0.0112 | 0.0014 | 0.0098 |
| 29 | 0.0113 | 0.0014 | 0.0099 |
| 30 | 0.0113 | 0.0014 | 0.0099 |
| 31 | 0.0114 | 0.0014 | 0.0099 |
| 32 | 0.0114 | 0.0014 | 0.0100 |
| 33 | 0.0114 | 0.0014 | 0.0100 |
| 34 | 0.0114 | 0.0014 | 0.0100 |
| 35 | 0.0115 | 0.0014 | 0.0101 |
| 36 | 0.0115 | 0.0014 | 0.0101 |
| 37 | 0.0116 | 0.0014 | 0.0101 |
| 38 | 0.0116 | 0.0014 | 0.0102 |
| 39 | 0.0116 | 0.0014 | 0.0102 |
| 40 | 0.0117 | 0.0014 | 0.0102 |
| 41 | 0.0117 | 0.0015 | 0.0103 |
| 42 | 0.0117 | 0.0015 | 0.0103 |
| 43 | 0.0118 | 0.0015 | 0.0103 |
| 44 | 0.0118 | 0.0015 | 0.0104 |
| 45 | 0.0119 | 0.0015 | 0.0104 |
| 46 | 0.0119 | 0.0015 | 0.0104 |
| 47 | 0.0120 | 0.0015 | 0.0105 |
| 48 | 0.0120 | 0.0015 | 0.0105 |
| 49 | 0.0120 | 0.0015 | 0.0106 |
| 50 | 0.0121 | 0.0015 | 0.0106 |
| 51 | 0.0121 | 0.0015 | 0.0106 |
| 52 | 0.0122 | 0.0015 | 0.0107 |
| 53 | 0.0122 | 0.0015 | 0.0107 |
| 54 | 0.0122 | 0.0015 | 0.0107 |
| 55 | 0.0123 | 0.0015 | 0.0108 |
| 56 | 0.0123 | 0.0015 | 0.0108 |
| 57 | 0.0124 | 0.0015 | 0.0109 |
| 58 | 0.0124 | 0.0015 | 0.0109 |
| 59 | 0.0125 | 0.0015 | 0.0109 |
| 60 | 0.0125 | 0.0015 | 0.0110 |
| 61 | 0.0126 | 0.0016 | 0.0110 |
| 62 | 0.0126 | 0.0016 | 0.0111 |
| 63 | 0.0127 | 0.0016 | 0.0111 |
| 64 | 0.0127 | 0.0016 | 0.0111 |
| 65 | 0.0128 | 0.0016 | 0.0112 |
| 66 | 0.0128 | 0.0016 | 0.0112 |
| 67 | 0.0129 | 0.0016 | 0.0113 |
| 68 | 0.0129 | 0.0016 | 0.0113 |
| 69 | 0.0130 | 0.0016 | 0.0114 |

| | | | |
|---|---|---|---|
| 70 | 0.0130 | 0.0016 | 0.0114 |
| 71 | 0.0131 | 0.0016 | 0.0115 |
| 72 | 0.0131 | 0.0016 | 0.0115 |
| 73 | 0.0132 | 0.0016 | 0.0116 |
| 74 | 0.0132 | 0.0016 | 0.0116 |
| 75 | 0.0133 | 0.0016 | 0.0117 |
| 76 | 0.0133 | 0.0017 | 0.0117 |
| 77 | 0.0134 | 0.0017 | 0.0118 |
| 78 | 0.0135 | 0.0017 | 0.0118 |
| 79 | 0.0135 | 0.0017 | 0.0119 |
| 80 | 0.0136 | 0.0017 | 0.0119 |
| 81 | 0.0137 | 0.0017 | 0.0120 |
| 82 | 0.0137 | 0.0017 | 0.0120 |
| 83 | 0.0138 | 0.0017 | 0.0121 |
| 84 | 0.0138 | 0.0017 | 0.0121 |
| 85 | 0.0139 | 0.0017 | 0.0122 |
| 86 | 0.0140 | 0.0017 | 0.0122 |
| 87 | 0.0140 | 0.0017 | 0.0123 |
| 88 | 0.0141 | 0.0017 | 0.0123 |
| 89 | 0.0142 | 0.0018 | 0.0124 |
| 90 | 0.0142 | 0.0018 | 0.0125 |
| 91 | 0.0143 | 0.0018 | 0.0125 |
| 92 | 0.0144 | 0.0018 | 0.0126 |
| 93 | 0.0145 | 0.0018 | 0.0127 |
| 94 | 0.0145 | 0.0018 | 0.0127 |
| 95 | 0.0146 | 0.0018 | 0.0128 |
| 96 | 0.0147 | 0.0018 | 0.0128 |
| 97 | 0.0148 | 0.0018 | 0.0129 |
| 98 | 0.0148 | 0.0018 | 0.0130 |
| 99 | 0.0149 | 0.0018 | 0.0131 |
| 100 | 0.0150 | 0.0019 | 0.0131 |
| 101 | 0.0151 | 0.0019 | 0.0132 |
| 102 | 0.0151 | 0.0019 | 0.0133 |
| 103 | 0.0152 | 0.0019 | 0.0134 |
| 104 | 0.0153 | 0.0019 | 0.0134 |
| 105 | 0.0154 | 0.0019 | 0.0135 |
| 106 | 0.0155 | 0.0019 | 0.0136 |
| 107 | 0.0156 | 0.0019 | 0.0137 |
| 108 | 0.0157 | 0.0019 | 0.0137 |
| 109 | 0.0158 | 0.0020 | 0.0138 |
| 110 | 0.0158 | 0.0020 | 0.0139 |
| 111 | 0.0160 | 0.0020 | 0.0140 |
| 112 | 0.0160 | 0.0020 | 0.0141 |
| 113 | 0.0162 | 0.0020 | 0.0142 |
| 114 | 0.0162 | 0.0020 | 0.0142 |
| 115 | 0.0164 | 0.0020 | 0.0144 |
| 116 | 0.0164 | 0.0020 | 0.0144 |
| 117 | 0.0166 | 0.0021 | 0.0145 |
| 118 | 0.0167 | 0.0021 | 0.0146 |
| 119 | 0.0168 | 0.0021 | 0.0147 |
| 120 | 0.0169 | 0.0021 | 0.0148 |
| 121 | 0.0170 | 0.0021 | 0.0149 |
| 122 | 0.0171 | 0.0021 | 0.0150 |

| | | | |
|---|---|---|---|
| 123 | 0.0173 | 0.0021 | 0.0152 |
| 124 | 0.0174 | 0.0022 | 0.0152 |
| 125 | 0.0175 | 0.0022 | 0.0154 |
| 126 | 0.0176 | 0.0022 | 0.0155 |
| 127 | 0.0178 | 0.0022 | 0.0156 |
| 128 | 0.0179 | 0.0022 | 0.0157 |
| 129 | 0.0181 | 0.0022 | 0.0159 |
| 130 | 0.0182 | 0.0023 | 0.0159 |
| 131 | 0.0184 | 0.0023 | 0.0161 |
| 132 | 0.0185 | 0.0023 | 0.0162 |
| 133 | 0.0187 | 0.0023 | 0.0164 |
| 134 | 0.0188 | 0.0023 | 0.0165 |
| 135 | 0.0190 | 0.0024 | 0.0167 |
| 136 | 0.0191 | 0.0024 | 0.0168 |
| 137 | 0.0193 | 0.0024 | 0.0170 |
| 138 | 0.0195 | 0.0024 | 0.0171 |
| 139 | 0.0197 | 0.0024 | 0.0173 |
| 140 | 0.0198 | 0.0025 | 0.0174 |
| 141 | 0.0201 | 0.0025 | 0.0176 |
| 142 | 0.0202 | 0.0025 | 0.0177 |
| 143 | 0.0205 | 0.0025 | 0.0179 |
| 144 | 0.0206 | 0.0026 | 0.0181 |
| 145 | 0.0214 | 0.0026 | 0.0187 |
| 146 | 0.0215 | 0.0027 | 0.0189 |
| 147 | 0.0218 | 0.0027 | 0.0191 |
| 148 | 0.0220 | 0.0027 | 0.0193 |
| 149 | 0.0223 | 0.0028 | 0.0196 |
| 150 | 0.0225 | 0.0028 | 0.0197 |
| 151 | 0.0228 | 0.0028 | 0.0200 |
| 152 | 0.0230 | 0.0028 | 0.0202 |
| 153 | 0.0234 | 0.0029 | 0.0205 |
| 154 | 0.0236 | 0.0029 | 0.0207 |
| 155 | 0.0240 | 0.0030 | 0.0210 |
| 156 | 0.0242 | 0.0030 | 0.0212 |
| 157 | 0.0246 | 0.0030 | 0.0216 |
| 158 | 0.0249 | 0.0031 | 0.0218 |
| 159 | 0.0253 | 0.0031 | 0.0222 |
| 160 | 0.0256 | 0.0032 | 0.0224 |
| 161 | 0.0261 | 0.0032 | 0.0229 |
| 162 | 0.0264 | 0.0033 | 0.0231 |
| 163 | 0.0270 | 0.0033 | 0.0236 |
| 164 | 0.0273 | 0.0034 | 0.0239 |
| 165 | 0.0279 | 0.0035 | 0.0244 |
| 166 | 0.0282 | 0.0035 | 0.0247 |
| 167 | 0.0289 | 0.0036 | 0.0254 |
| 168 | 0.0293 | 0.0036 | 0.0257 |
| 169 | 0.0301 | 0.0037 | 0.0264 |
| 170 | 0.0306 | 0.0038 | 0.0268 |
| 171 | 0.0315 | 0.0039 | 0.0276 |
| 172 | 0.0320 | 0.0040 | 0.0280 |
| 173 | 0.0330 | 0.0041 | 0.0289 |
| 174 | 0.0336 | 0.0042 | 0.0294 |
| 175 | 0.0348 | 0.0043 | 0.0305 |

| | | | |
|---|---|---|---|
| 176 | 0.0354 | 0.0044 | 0.0310 |
| 177 | 0.0369 | 0.0046 | 0.0323 |
| 178 | 0.0377 | 0.0047 | 0.0330 |
| 179 | 0.0394 | 0.0049 | 0.0345 |
| 180 | 0.0404 | 0.0050 | 0.0354 |
| 181 | 0.0426 | 0.0053 | 0.0373 |
| 182 | 0.0438 | 0.0054 | 0.0384 |
| 183 | 0.0467 | 0.0058 | 0.0409 |
| 184 | 0.0483 | 0.0060 | 0.0423 |
| 185 | 0.0410 | 0.0051 | 0.0359 |
| 186 | 0.0433 | 0.0054 | 0.0379 |
| 187 | 0.0492 | 0.0061 | 0.0431 |
| 188 | 0.0530 | 0.0066 | 0.0465 |
| 189 | 0.0639 | 0.0072 | 0.0566 |
| 190 | 0.0721 | 0.0072 | 0.0649 |
| 191 | 0.1031 | 0.0072 | 0.0958 |
| 192 | 0.1418 | 0.0072 | 0.1345 |
| 193 | 0.4437 | 0.0072 | 0.4364 |
| 194 | 0.0840 | 0.0072 | 0.0767 |
| 195 | 0.0578 | 0.0072 | 0.0506 |
| 196 | 0.0460 | 0.0057 | 0.0403 |
| 197 | 0.0502 | 0.0062 | 0.0440 |
| 198 | 0.0452 | 0.0056 | 0.0396 |
| 199 | 0.0414 | 0.0051 | 0.0363 |
| 200 | 0.0385 | 0.0048 | 0.0337 |
| 201 | 0.0361 | 0.0045 | 0.0317 |
| 202 | 0.0341 | 0.0042 | 0.0299 |
| 203 | 0.0325 | 0.0040 | 0.0284 |
| 204 | 0.0310 | 0.0038 | 0.0272 |
| 205 | 0.0297 | 0.0037 | 0.0260 |
| 206 | 0.0286 | 0.0035 | 0.0250 |
| 207 | 0.0276 | 0.0034 | 0.0242 |
| 208 | 0.0267 | 0.0033 | 0.0234 |
| 209 | 0.0258 | 0.0032 | 0.0226 |
| 210 | 0.0251 | 0.0031 | 0.0220 |
| 211 | 0.0244 | 0.0030 | 0.0214 |
| 212 | 0.0238 | 0.0029 | 0.0208 |
| 213 | 0.0232 | 0.0029 | 0.0203 |
| 214 | 0.0227 | 0.0028 | 0.0199 |
| 215 | 0.0222 | 0.0027 | 0.0194 |
| 216 | 0.0217 | 0.0027 | 0.0190 |
| 217 | 0.0208 | 0.0026 | 0.0182 |
| 218 | 0.0203 | 0.0025 | 0.0178 |
| 219 | 0.0200 | 0.0025 | 0.0175 |
| 220 | 0.0196 | 0.0024 | 0.0172 |
| 221 | 0.0192 | 0.0024 | 0.0169 |
| 222 | 0.0189 | 0.0023 | 0.0166 |
| 223 | 0.0186 | 0.0023 | 0.0163 |
| 224 | 0.0183 | 0.0023 | 0.0160 |
| 225 | 0.0180 | 0.0022 | 0.0158 |
| 226 | 0.0177 | 0.0022 | 0.0155 |
| 227 | 0.0175 | 0.0022 | 0.0153 |
| 228 | 0.0172 | 0.0021 | 0.0151 |

| | | | |
|---|---|---|---|
| 229 | 0.0170 | 0.0021 | 0.0149 |
| 230 | 0.0167 | 0.0021 | 0.0147 |
| 231 | 0.0165 | 0.0020 | 0.0145 |
| 232 | 0.0163 | 0.0020 | 0.0143 |
| 233 | 0.0161 | 0.0020 | 0.0141 |
| 234 | 0.0159 | 0.0020 | 0.0139 |
| 235 | 0.0157 | 0.0019 | 0.0138 |
| 236 | 0.0155 | 0.0019 | 0.0136 |
| 237 | 0.0154 | 0.0019 | 0.0135 |
| 238 | 0.0152 | 0.0019 | 0.0133 |
| 239 | 0.0150 | 0.0019 | 0.0132 |
| 240 | 0.0149 | 0.0018 | 0.0130 |
| 241 | 0.0147 | 0.0018 | 0.0129 |
| 242 | 0.0146 | 0.0018 | 0.0128 |
| 243 | 0.0144 | 0.0018 | 0.0126 |
| 244 | 0.0143 | 0.0018 | 0.0125 |
| 245 | 0.0141 | 0.0017 | 0.0124 |
| 246 | 0.0140 | 0.0017 | 0.0123 |
| 247 | 0.0139 | 0.0017 | 0.0122 |
| 248 | 0.0137 | 0.0017 | 0.0120 |
| 249 | 0.0136 | 0.0017 | 0.0119 |
| 250 | 0.0135 | 0.0017 | 0.0118 |
| 251 | 0.0134 | 0.0017 | 0.0117 |
| 252 | 0.0133 | 0.0016 | 0.0116 |
| 253 | 0.0132 | 0.0016 | 0.0115 |
| 254 | 0.0131 | 0.0016 | 0.0114 |
| 255 | 0.0129 | 0.0016 | 0.0113 |
| 256 | 0.0128 | 0.0016 | 0.0113 |
| 257 | 0.0127 | 0.0016 | 0.0112 |
| 258 | 0.0126 | 0.0016 | 0.0111 |
| 259 | 0.0125 | 0.0016 | 0.0110 |
| 260 | 0.0125 | 0.0015 | 0.0109 |
| 261 | 0.0124 | 0.0015 | 0.0108 |
| 262 | 0.0123 | 0.0015 | 0.0108 |
| 263 | 0.0122 | 0.0015 | 0.0107 |
| 264 | 0.0121 | 0.0015 | 0.0106 |
| 265 | 0.0120 | 0.0015 | 0.0105 |
| 266 | 0.0119 | 0.0015 | 0.0105 |
| 267 | 0.0119 | 0.0015 | 0.0104 |
| 268 | 0.0118 | 0.0015 | 0.0103 |
| 269 | 0.0117 | 0.0014 | 0.0102 |
| 270 | 0.0116 | 0.0014 | 0.0102 |
| 271 | 0.0115 | 0.0014 | 0.0101 |
| 272 | 0.0115 | 0.0014 | 0.0101 |
| 273 | 0.0114 | 0.0014 | 0.0100 |
| 274 | 0.0113 | 0.0014 | 0.0099 |
| 275 | 0.0113 | 0.0014 | 0.0099 |
| 276 | 0.0112 | 0.0014 | 0.0098 |
| 277 | 0.0111 | 0.0014 | 0.0097 |
| 278 | 0.0111 | 0.0014 | 0.0097 |
| 279 | 0.0110 | 0.0014 | 0.0096 |
| 280 | 0.0109 | 0.0014 | 0.0096 |
| 281 | 0.0109 | 0.0013 | 0.0095 |

| | | | |
|---|---|---|---|
| 282 | 0.0108 | 0.0013 | 0.0095 |
| 283 | 0.0107 | 0.0013 | 0.0094 |
| 284 | 0.0107 | 0.0013 | 0.0094 |
| 285 | 0.0106 | 0.0013 | 0.0093 |
| 286 | 0.0106 | 0.0013 | 0.0093 |
| 287 | 0.0105 | 0.0013 | 0.0092 |
| 288 | 0.0105 | 0.0013 | 0.0092 |

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Total soil rain loss = 0.67(In)
Total effective rainfall = 5.33(In)
Peak flow rate in flood hydrograph = 60.23(CFS)

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))

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```
Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
-----------------------------------------------------------------------
  0+ 5       0.0011      0.15  Q         |         |         |         |
  0+10       0.0078      0.98  Q         |         |         |         |
  0+15       0.0212      1.95  VQ        |         |         |         |
  0+20       0.0371      2.30  VQ        |         |         |         |
  0+25       0.0535      2.39  VQ        |         |         |         |
  0+30       0.0702      2.43  VQ        |         |         |         |
  0+35       0.0869      2.43  VQ        |         |         |         |
  0+40       0.1037      2.44  VQ        |         |         |         |
  0+45       0.1206      2.45  VQ        |         |         |         |
  0+50       0.1375      2.45  VQ        |         |         |         |
  0+55       0.1544      2.46  VQ        |         |         |         |
  1+ 0       0.1714      2.47  VQ        |         |         |         |
  1+ 5       0.1884      2.47  VQ        |         |         |         |
  1+10       0.2055      2.48  VQ        |         |         |         |
  1+15       0.2226      2.49  VQ        |         |         |         |
  1+20       0.2398      2.49  VQ        |         |         |         |
  1+25       0.2570      2.50  |Q        |         |         |         |
  1+30       0.2743      2.51  |Q        |         |         |         |
  1+35       0.2916      2.51  |Q        |         |         |         |
  1+40       0.3089      2.52  |Q        |         |         |         |
  1+45       0.3263      2.53  |Q        |         |         |         |
  1+50       0.3438      2.54  |Q        |         |         |         |
  1+55       0.3613      2.54  |Q        |         |         |         |
  2+ 0       0.3789      2.55  |Q        |         |         |         |
  2+ 5       0.3965      2.56  |Q        |         |         |         |
  2+10       0.4142      2.57  |Q        |         |         |         |
  2+15       0.4319      2.57  |Q        |         |         |         |
  2+20       0.4497      2.58  |Q        |         |         |         |
  2+25       0.4675      2.59  |Q        |         |         |         |
  2+30       0.4854      2.60  |QV       |         |         |         |
  2+35       0.5033      2.60  |QV       |         |         |         |
```

```
2+40       0.5213      2.61  |QV       |         |         |         |
2+45       0.5394      2.62  |QV       |         |         |         |
2+50       0.5575      2.63  |QV       |         |         |         |
2+55       0.5756      2.64  |QV       |         |         |         |
3+ 0       0.5938      2.65  |QV       |         |         |         |
3+ 5       0.6121      2.65  |QV       |         |         |         |
3+10       0.6305      2.66  |QV       |         |         |         |
3+15       0.6489      2.67  |QV       |         |         |         |
3+20       0.6673      2.68  |QV       |         |         |         |
3+25       0.6858      2.69  |QV       |         |         |         |
3+30       0.7044      2.70  |QV       |         |         |         |
3+35       0.7230      2.71  |QV       |         |         |         |
3+40       0.7417      2.71  |Q V      |         |         |         |
3+45       0.7605      2.72  |Q V      |         |         |         |
3+50       0.7793      2.73  |Q V      |         |         |         |
3+55       0.7982      2.74  |Q V      |         |         |         |
4+ 0       0.8171      2.75  |Q V      |         |         |         |
4+ 5       0.8361      2.76  |Q V      |         |         |         |
4+10       0.8552      2.77  |Q V      |         |         |         |
4+15       0.8744      2.78  |Q V      |         |         |         |
4+20       0.8936      2.79  |Q V      |         |         |         |
4+25       0.9129      2.80  |Q V      |         |         |         |
4+30       0.9322      2.81  |Q V      |         |         |         |
4+35       0.9516      2.82  |Q V      |         |         |         |
4+40       0.9711      2.83  |Q  V     |         |         |         |
4+45       0.9907      2.84  |Q  V     |         |         |         |
4+50       1.0103      2.85  |Q  V     |         |         |         |
4+55       1.0300      2.86  |Q  V     |         |         |         |
5+ 0       1.0498      2.87  |Q  V     |         |         |         |
5+ 5       1.0696      2.88  |Q  V     |         |         |         |
5+10       1.0896      2.89  |Q  V     |         |         |         |
5+15       1.1096      2.90  |Q  V     |         |         |         |
5+20       1.1296      2.92  |Q  V     |         |         |         |
5+25       1.1498      2.93  |Q  V     |         |         |         |
5+30       1.1700      2.94  |Q  V     |         |         |         |
5+35       1.1903      2.95  |Q  V     |         |         |         |
5+40       1.2107      2.96  |Q   V    |         |         |         |
5+45       1.2312      2.97  |Q   V    |         |         |         |
5+50       1.2518      2.98  |Q   V    |         |         |         |
5+55       1.2724      3.00  |Q   V    |         |         |         |
6+ 0       1.2931      3.01  |Q   V    |         |         |         |
6+ 5       1.3139      3.02  |Q   V    |         |         |         |
6+10       1.3348      3.03  |Q   V    |         |         |         |
6+15       1.3558      3.05  |Q   V    |         |         |         |
6+20       1.3769      3.06  |Q   V    |         |         |         |
6+25       1.3980      3.07  |Q   V    |         |         |         |
6+30       1.4193      3.09  |Q   V    |         |         |         |
6+35       1.4406      3.10  |Q   V    |         |         |         |
6+40       1.4620      3.11  |Q    V   |         |         |         |
6+45       1.4836      3.13  |Q    V   |         |         |         |
6+50       1.5052      3.14  |Q    V   |         |         |         |
6+55       1.5269      3.15  |Q    V   |         |         |         |
7+ 0       1.5487      3.17  |Q    V   |         |         |         |
```

```
 7+ 5       1.5706      3.18  |Q    V   |          |          |          |
 7+10       1.5926      3.20  |Q    V   |          |          |          |
 7+15       1.6148      3.21  |Q    V   |          |          |          |
 7+20       1.6370      3.23  |Q    V   |          |          |          |
 7+25       1.6593      3.24  |Q    V   |          |          |          |
 7+30       1.6817      3.26  |Q    V   |          |          |          |
 7+35       1.7043      3.27  |Q     V  |          |          |          |
 7+40       1.7269      3.29  |Q     V  |          |          |          |
 7+45       1.7497      3.30  |Q     V  |          |          |          |
 7+50       1.7726      3.32  |Q     V  |          |          |          |
 7+55       1.7956      3.34  |Q     V  |          |          |          |
 8+ 0       1.8187      3.35  |Q     V  |          |          |          |
 8+ 5       1.8419      3.37  |Q     V  |          |          |          |
 8+10       1.8652      3.39  |Q     V  |          |          |          |
 8+15       1.8887      3.41  |Q     V  |          |          |          |
 8+20       1.9123      3.43  |Q     V  |          |          |          |
 8+25       1.9360      3.44  |Q      V |          |          |          |
 8+30       1.9598      3.46  |Q      V |          |          |          |
 8+35       1.9838      3.48  |Q      V |          |          |          |
 8+40       2.0079      3.50  |Q      V |          |          |          |
 8+45       2.0322      3.52  | Q     V |          |          |          |
 8+50       2.0565      3.54  | Q     V |          |          |          |
 8+55       2.0810      3.56  | Q     V |          |          |          |
 9+ 0       2.1057      3.58  | Q     V |          |          |          |
 9+ 5       2.1305      3.60  | Q     V |          |          |          |
 9+10       2.1554      3.62  | Q     V |          |          |          |
 9+15       2.1805      3.64  | Q      V|          |          |          |
 9+20       2.2058      3.67  | Q      V|          |          |          |
 9+25       2.2312      3.69  | Q      V|          |          |          |
 9+30       2.2567      3.71  | Q      V|          |          |          |
 9+35       2.2824      3.73  | Q      V|          |          |          |
 9+40       2.3083      3.76  | Q      V|          |          |          |
 9+45       2.3344      3.78  | Q      V|          |          |          |
 9+50       2.3606      3.81  | Q      V|          |          |          |
 9+55       2.3870      3.83  | Q      V|          |          |          |
10+ 0       2.4135      3.86  | Q      V|          |          |          |
10+ 5       2.4403      3.88  | Q       V          |          |          |
10+10       2.4672      3.91  | Q       V          |          |          |
10+15       2.4943      3.94  | Q       V          |          |          |
10+20       2.5216      3.96  | Q       V          |          |          |
10+25       2.5491      3.99  | Q       V          |          |          |
10+30       2.5768      4.02  | Q       V          |          |          |
10+35       2.6047      4.05  | Q       V          |          |          |
10+40       2.6328      4.08  | Q       V          |          |          |
10+45       2.6612      4.11  | Q       |V         |          |          |
10+50       2.6897      4.14  | Q       |V         |          |          |
10+55       2.7185      4.18  | Q       |V         |          |          |
11+ 0       2.7475      4.21  | Q       |V         |          |          |
11+ 5       2.7767      4.24  | Q       |V         |          |          |
11+10       2.8062      4.28  | Q       |V         |          |          |
11+15       2.8359      4.32  | Q       |V         |          |          |
11+20       2.8659      4.35  | Q       |V         |          |          |
11+25       2.8961      4.39  | Q       |V         |          |          |
```

```
11+30       2.9266      4.43  | Q       | V       |         |         |
11+35       2.9574      4.47  | Q       | V       |         |         |
11+40       2.9884      4.51  | Q       | V       |         |         |
11+45       3.0198      4.55  | Q       | V       |         |         |
11+50       3.0514      4.59  | Q       | V       |         |         |
11+55       3.0833      4.64  | Q       | V       |         |         |
12+ 0       3.1156      4.68  | Q       | V       |         |         |
12+ 5       3.1482      4.74  | Q       |  V      |         |         |
12+10       3.1814      4.82  | Q       |  V      |         |         |
12+15       3.2153      4.92  | Q       |  V      |         |         |
12+20       3.2496      4.99  | Q       |  V      |         |         |
12+25       3.2844      5.04  | Q       |  V      |         |         |
12+30       3.3195      5.10  | Q       |  V      |         |         |
12+35       3.3550      5.16  | Q       |  V      |         |         |
12+40       3.3909      5.21  | Q       |   V     |         |         |
12+45       3.4272      5.27  |  Q      |   V     |         |         |
12+50       3.4640      5.34  |  Q      |   V     |         |         |
12+55       3.5012      5.40  |  Q      |   V     |         |         |
13+ 0       3.5389      5.47  |  Q      |   V     |         |         |
13+ 5       3.5770      5.54  |  Q      |   V     |         |         |
13+10       3.6157      5.62  |  Q      |   V     |         |         |
13+15       3.6549      5.69  |  Q      |    V    |         |         |
13+20       3.6947      5.77  |  Q      |    V    |         |         |
13+25       3.7350      5.86  |  Q      |    V    |         |         |
13+30       3.7759      5.94  |  Q      |    V    |         |         |
13+35       3.8175      6.03  |  Q      |    V    |         |         |
13+40       3.8597      6.13  |  Q      |    V    |         |         |
13+45       3.9026      6.23  |  Q      |     V   |         |         |
13+50       3.9462      6.34  |  Q      |     V   |         |         |
13+55       3.9906      6.45  |  Q      |     V   |         |         |
14+ 0       4.0358      6.56  |  Q      |     V   |         |         |
14+ 5       4.0819      6.69  |  Q      |     V   |         |         |
14+10       4.1289      6.82  |  Q      |      V  |         |         |
14+15       4.1769      6.97  |  Q      |      V  |         |         |
14+20       4.2259      7.12  |   Q     |      V  |         |         |
14+25       4.2760      7.28  |   Q     |      V  |         |         |
14+30       4.3273      7.45  |   Q     |      V  |         |         |
14+35       4.3799      7.63  |   Q     |       V |         |         |
14+40       4.4338      7.83  |   Q     |       V |         |         |
14+45       4.4892      8.04  |   Q     |       V |         |         |
14+50       4.5463      8.28  |   Q     |       V |         |         |
14+55       4.6050      8.53  |   Q     |        V|         |         |
15+ 0       4.6658      8.82  |    Q    |        V|         |         |
15+ 5       4.7286      9.13  |    Q    |        V|         |         |
15+10       4.7939      9.48  |    Q    |        V|         |         |
15+15       4.8619      9.87  |    Q    |         V         |         |
15+20       4.9330     10.32  |    Q    |         V         |         |
15+25       5.0065     10.67  |     Q   |         V         |         |
15+30       5.0781     10.39  |    Q    |         |V        |         |
15+35       5.1473     10.06  |    Q    |         |V        |         |
15+40       5.2202     10.58  |     Q   |         |V        |         |
15+45       5.3002     11.62  |     Q   |         |V        |         |
15+50       5.3913     13.22  |      Q  |         | V       |         |
```

```
15+55       5.4998     15.75  |       Q |         | V       |         |
16+ 0       5.6409     20.50  |         |Q        |  V      |         |
16+ 5       5.8664     32.75  |         |       Q |   V     |         |
16+10       6.2755     59.40  |         |         |    V    |  Q      |
16+15       6.6903     60.23  |         |         |      V  |   Q     |
16+20       6.9061     31.34  |         |      Q  |       V |         |
16+25       7.0233     17.01  |        Q|         |        V|         |
16+30       7.1136     13.11  |      Q  |         |        V|         |
16+35       7.1901     11.10  |     Q   |         |        V|         |
16+40       7.2606     10.24  |    Q    |         |         V         |
16+45       7.3258      9.46  |    Q    |         |         V         |
16+50       7.3865      8.82  |    Q    |         |         V         |
16+55       7.4435      8.28  |   Q     |         |         V         |
17+ 0       7.4974      7.82  |   Q     |         |         |V        |
17+ 5       7.5486      7.44  |   Q     |         |         |V        |
17+10       7.5976      7.11  |   Q     |         |         |V        |
17+15       7.6445      6.81  |  Q      |         |         |V        |
17+20       7.6897      6.56  |  Q      |         |         |V        |
17+25       7.7332      6.33  |  Q      |         |         | V       |
17+30       7.7754      6.12  |  Q      |         |         | V       |
17+35       7.8163      5.93  |  Q      |         |         | V       |
17+40       7.8560      5.76  |  Q      |         |         | V       |
17+45       7.8946      5.61  |  Q      |         |         | V       |
17+50       7.9322      5.46  |  Q      |         |         | V       |
17+55       7.9690      5.33  |  Q      |         |         | V       |
18+ 0       8.0048      5.21  | Q       |         |         |  V      |
18+ 5       8.0398      5.09  | Q       |         |         |  V      |
18+10       8.0739      4.94  | Q       |         |         |  V      |
18+15       8.1069      4.79  | Q       |         |         |  V      |
18+20       8.1391      4.68  | Q       |         |         |  V      |
18+25       8.1707      4.59  | Q       |         |         |  V      |
18+30       8.2018      4.50  | Q       |         |         |  V      |
18+35       8.2322      4.42  | Q       |         |         |   V     |
18+40       8.2622      4.35  | Q       |         |         |   V     |
18+45       8.2916      4.28  | Q       |         |         |   V     |
18+50       8.3206      4.21  | Q       |         |         |   V     |
18+55       8.3491      4.14  | Q       |         |         |   V     |
19+ 0       8.3772      4.08  | Q       |         |         |   V     |
19+ 5       8.4049      4.02  | Q       |         |         |   V     |
19+10       8.4322      3.96  | Q       |         |         |   V     |
19+15       8.4591      3.91  | Q       |         |         |    V    |
19+20       8.4856      3.85  | Q       |         |         |    V    |
19+25       8.5118      3.80  | Q       |         |         |    V    |
19+30       8.5376      3.75  | Q       |         |         |    V    |
19+35       8.5632      3.71  | Q       |         |         |    V    |
19+40       8.5884      3.66  | Q       |         |         |    V    |
19+45       8.6133      3.62  | Q       |         |         |    V    |
19+50       8.6380      3.58  | Q       |         |         |    V    |
19+55       8.6623      3.54  | Q       |         |         |    V    |
20+ 0       8.6864      3.50  |Q        |         |         |    V    |
20+ 5       8.7102      3.46  |Q        |         |         |     V   |
20+10       8.7338      3.42  |Q        |         |         |     V   |
20+15       8.7571      3.39  |Q        |         |         |     V   |
```

```
 20+20       8.7802      3.35  |Q         |         |         |     V   |
 20+25       8.8031      3.32  |Q         |         |         |     V   |
 20+30       8.8257      3.29  |Q         |         |         |     V   |
 20+35       8.8481      3.26  |Q         |         |         |     V   |
 20+40       8.8703      3.22  |Q         |         |         |     V   |
 20+45       8.8923      3.19  |Q         |         |         |     V   |
 20+50       8.9142      3.17  |Q         |         |         |     V   |
 20+55       8.9358      3.14  |Q         |         |         |     V   |
 21+ 0       8.9572      3.11  |Q         |         |         |      V  |
 21+ 5       8.9784      3.08  |Q         |         |         |      V  |
 21+10       8.9995      3.06  |Q         |         |         |      V  |
 21+15       9.0204      3.03  |Q         |         |         |      V  |
 21+20       9.0411      3.01  |Q         |         |         |      V  |
 21+25       9.0616      2.98  |Q         |         |         |      V  |
 21+30       9.0820      2.96  |Q         |         |         |      V  |
 21+35       9.1022      2.94  |Q         |         |         |      V  |
 21+40       9.1223      2.91  |Q         |         |         |      V  |
 21+45       9.1422      2.89  |Q         |         |         |      V  |
 21+50       9.1619      2.87  |Q         |         |         |      V  |
 21+55       9.1816      2.85  |Q         |         |         |       V |
 22+ 0       9.2010      2.83  |Q         |         |         |       V |
 22+ 5       9.2204      2.81  |Q         |         |         |       V |
 22+10       9.2396      2.79  |Q         |         |         |       V |
 22+15       9.2587      2.77  |Q         |         |         |       V |
 22+20       9.2776      2.75  |Q         |         |         |       V |
 22+25       9.2964      2.73  |Q         |         |         |       V |
 22+30       9.3151      2.71  |Q         |         |         |       V |
 22+35       9.3337      2.70  |Q         |         |         |       V |
 22+40       9.3521      2.68  |Q         |         |         |       V |
 22+45       9.3704      2.66  |Q         |         |         |       V |
 22+50       9.3886      2.64  |Q         |         |         |       V |
 22+55       9.4067      2.63  |Q         |         |         |       V |
 23+ 0       9.4247      2.61  |Q         |         |         |        V|
 23+ 5       9.4426      2.60  |Q         |         |         |        V|
 23+10       9.4604      2.58  |Q         |         |         |        V|
 23+15       9.4780      2.56  |Q         |         |         |        V|
 23+20       9.4956      2.55  |Q         |         |         |        V|
 23+25       9.5131      2.53  |Q         |         |         |        V|
 23+30       9.5304      2.52  |Q         |         |         |        V|
 23+35       9.5477      2.51  |Q         |         |         |        V|
 23+40       9.5648      2.49  |Q         |         |         |        V|
 23+45       9.5819      2.48  |Q         |         |         |        V|
 23+50       9.5989      2.46  |Q         |         |         |        V|
 23+55       9.6157      2.45  |Q         |         |         |        V|
 24+ 0       9.6325      2.44  |Q         |         |         |        V|
 24+ 5       9.6482      2.27  |Q         |         |         |        V|
 24+10       9.6581      1.44  Q          |         |         |        V|
 24+15       9.6612      0.46  Q          |         |         |        V|
 24+20       9.6620      0.12  Q          |         |         |        V|
 24+25       9.6623      0.03  Q          |         |         |         V
-----------------------------------------------------------------------
```

# APPENDIX C.6: UNIT HYDROGRAPH ANALYSIS, BON VIEW ONSITE MITIGATED, AREA F3

U n i t  H y d r o g r a p h  A n a l y s i s

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Study date 05/09/25

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6279

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ONTARIO RANCH 108.43.25
COMMERCIAL MITIGATED UNIT HYDROGRAPH METHOD HYDROLOGY
AREA F3, 100-YEAR STORM EVENT
FN: UARF3P
---

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 100 | | |
| 9.33 | 1 | 1.20 |
| Rainfall data for year 100 | | |
| 9.33 | 6 | 3.00 |
| Rainfall data for year 100 | | |
| 9.33 | 24 | 6.00 |

---
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 52.9 | 52.9 | 9.33 | 1.000 | 0.774 | 0.100 | 0.077 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.077

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 0.93 | 0.100 | 52.9 | 52.9 | 8.90 | 0.226 |
| 8.40 | 0.900 | 98.0 | 98.0 | 0.20 | 0.960 |

Area-averaged catchment yield fraction, Y = 0.887
Area-averaged low loss fraction, Yb = 0.113
User entry of time of concentration = 0.149 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 9.33(Ac.)
Catchment Lag time = 0.119 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 69.7700
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.077(In/Hr)
Average low loss rate fraction (Yb) = 0.113 (decimal)
Note: user entry of the Fm value
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 9.33(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.444(In)
30-minute factor = 1.000 Adjusted rainfall = 0.909(In)
1-hour factor = 1.000 Adjusted rainfall = 1.199(In)
3-hour factor = 1.000 Adjusted rainfall = 2.105(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Interval 'S' Graph Unit Hydrograph
Number Mean values ((CFS))
---
(K = 112.83 (CFS))

| | | |
|---|---|---|
| 1 | 8.722 | 9.841 |
| 2 | 53.219 | 50.208 |
| 3 | 89.172 | 40.568 |
| 4 | 97.881 | 9.826 |
| 5 | 99.445 | 1.765 |
| 6 | 100.000 | 0.626 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4439 | 0.4439 |
| 2 | 0.5858 | 0.1418 |
| 3 | 0.6889 | 0.1031 |
| 4 | 0.7729 | 0.0840 |
| 5 | 0.8451 | 0.0722 |
| 6 | 0.9090 | 0.0639 |
| 7 | 0.9668 | 0.0578 |
| 8 | 1.0199 | 0.0530 |
| 9 | 1.0691 | 0.0492 |
| 10 | 1.1151 | 0.0460 |
| 11 | 1.1584 | 0.0433 |
| 12 | 1.1995 | 0.0410 |
| 13 | 1.2496 | 0.0502 |
| 14 | 1.2979 | 0.0483 |
| 15 | 1.3446 | 0.0466 |
| 16 | 1.3897 | 0.0451 |
| 17 | 1.4335 | 0.0438 |
| 18 | 1.4761 | 0.0425 |
| 19 | 1.5175 | 0.0414 |
| 20 | 1.5578 | 0.0404 |
| 21 | 1.5972 | 0.0394 |
| 22 | 1.6357 | 0.0385 |
| 23 | 1.6733 | 0.0376 |
| 24 | 1.7102 | 0.0368 |
| 25 | 1.7463 | 0.0361 |
| 26 | 1.7817 | 0.0354 |
| 27 | 1.8164 | 0.0347 |
| 28 | 1.8505 | 0.0341 |
| 29 | 1.8841 | 0.0335 |
| 30 | 1.9170 | 0.0330 |
| 31 | 1.9495 | 0.0324 |
| 32 | 1.9814 | 0.0319 |
| 33 | 2.0129 | 0.0314 |
| 34 | 2.0439 | 0.0310 |
| 35 | 2.0744 | 0.0305 |
| 36 | 2.1045 | 0.0301 |
| 37 | 2.1342 | 0.0297 |
| 38 | 2.1635 | 0.0293 |
| 39 | 2.1925 | 0.0289 |
| 40 | 2.2210 | 0.0286 |
| 41 | 2.2493 | 0.0282 |
| 42 | 2.2771 | 0.0279 |
| 43 | 2.3047 | 0.0276 |
| 44 | 2.3320 | 0.0273 |

| | | |
|---|---|---|
| 45 | 2.3589 | 0.0270 |
| 46 | 2.3856 | 0.0267 |
| 47 | 2.4120 | 0.0264 |
| 48 | 2.4381 | 0.0261 |
| 49 | 2.4639 | 0.0258 |
| 50 | 2.4895 | 0.0256 |
| 51 | 2.5149 | 0.0253 |
| 52 | 2.5400 | 0.0251 |
| 53 | 2.5648 | 0.0249 |
| 54 | 2.5895 | 0.0246 |
| 55 | 2.6139 | 0.0244 |
| 56 | 2.6381 | 0.0242 |
| 57 | 2.6621 | 0.0240 |
| 58 | 2.6859 | 0.0238 |
| 59 | 2.7094 | 0.0236 |
| 60 | 2.7328 | 0.0234 |
| 61 | 2.7560 | 0.0232 |
| 62 | 2.7790 | 0.0230 |
| 63 | 2.8019 | 0.0228 |
| 64 | 2.8245 | 0.0227 |
| 65 | 2.8470 | 0.0225 |
| 66 | 2.8693 | 0.0223 |
| 67 | 2.8915 | 0.0222 |
| 68 | 2.9135 | 0.0220 |
| 69 | 2.9353 | 0.0218 |
| 70 | 2.9570 | 0.0217 |
| 71 | 2.9785 | 0.0215 |
| 72 | 2.9999 | 0.0214 |
| 73 | 3.0207 | 0.0208 |
| 74 | 3.0413 | 0.0206 |
| 75 | 3.0618 | 0.0205 |
| 76 | 3.0821 | 0.0203 |
| 77 | 3.1023 | 0.0202 |
| 78 | 3.1224 | 0.0201 |
| 79 | 3.1424 | 0.0200 |
| 80 | 3.1622 | 0.0198 |
| 81 | 3.1819 | 0.0197 |
| 82 | 3.2015 | 0.0196 |
| 83 | 3.2209 | 0.0195 |
| 84 | 3.2403 | 0.0193 |
| 85 | 3.2595 | 0.0192 |
| 86 | 3.2786 | 0.0191 |
| 87 | 3.2976 | 0.0190 |
| 88 | 3.3165 | 0.0189 |
| 89 | 3.3353 | 0.0188 |
| 90 | 3.3540 | 0.0187 |
| 91 | 3.3726 | 0.0186 |
| 92 | 3.3911 | 0.0185 |
| 93 | 3.4095 | 0.0184 |
| 94 | 3.4277 | 0.0183 |
| 95 | 3.4459 | 0.0182 |
| 96 | 3.4640 | 0.0181 |
| 97 | 3.4820 | 0.0180 |

| | | |
|---|---|---|
| 98 | 3.4999 | 0.0179 |
| 99 | 3.5177 | 0.0178 |
| 100 | 3.5354 | 0.0177 |
| 101 | 3.5531 | 0.0176 |
| 102 | 3.5706 | 0.0175 |
| 103 | 3.5881 | 0.0175 |
| 104 | 3.6055 | 0.0174 |
| 105 | 3.6228 | 0.0173 |
| 106 | 3.6400 | 0.0172 |
| 107 | 3.6571 | 0.0171 |
| 108 | 3.6741 | 0.0170 |
| 109 | 3.6911 | 0.0170 |
| 110 | 3.7080 | 0.0169 |
| 111 | 3.7248 | 0.0168 |
| 112 | 3.7416 | 0.0167 |
| 113 | 3.7582 | 0.0167 |
| 114 | 3.7748 | 0.0166 |
| 115 | 3.7913 | 0.0165 |
| 116 | 3.8078 | 0.0164 |
| 117 | 3.8242 | 0.0164 |
| 118 | 3.8405 | 0.0163 |
| 119 | 3.8567 | 0.0162 |
| 120 | 3.8729 | 0.0162 |
| 121 | 3.8890 | 0.0161 |
| 122 | 3.9050 | 0.0160 |
| 123 | 3.9210 | 0.0160 |
| 124 | 3.9369 | 0.0159 |
| 125 | 3.9528 | 0.0158 |
| 126 | 3.9685 | 0.0158 |
| 127 | 3.9843 | 0.0157 |
| 128 | 3.9999 | 0.0157 |
| 129 | 4.0155 | 0.0156 |
| 130 | 4.0310 | 0.0155 |
| 131 | 4.0465 | 0.0155 |
| 132 | 4.0619 | 0.0154 |
| 133 | 4.0773 | 0.0154 |
| 134 | 4.0926 | 0.0153 |
| 135 | 4.1078 | 0.0152 |
| 136 | 4.1230 | 0.0152 |
| 137 | 4.1381 | 0.0151 |
| 138 | 4.1532 | 0.0151 |
| 139 | 4.1682 | 0.0150 |
| 140 | 4.1832 | 0.0150 |
| 141 | 4.1981 | 0.0149 |
| 142 | 4.2130 | 0.0149 |
| 143 | 4.2278 | 0.0148 |
| 144 | 4.2426 | 0.0148 |
| 145 | 4.2573 | 0.0147 |
| 146 | 4.2719 | 0.0147 |
| 147 | 4.2865 | 0.0146 |
| 148 | 4.3011 | 0.0146 |
| 149 | 4.3156 | 0.0145 |
| 150 | 4.3300 | 0.0145 |

| | | |
|---|---|---|
| 151 | 4.3445 | 0.0144 |
| 152 | 4.3588 | 0.0144 |
| 153 | 4.3731 | 0.0143 |
| 154 | 4.3874 | 0.0143 |
| 155 | 4.4016 | 0.0142 |
| 156 | 4.4158 | 0.0142 |
| 157 | 4.4299 | 0.0141 |
| 158 | 4.4440 | 0.0141 |
| 159 | 4.4581 | 0.0140 |
| 160 | 4.4721 | 0.0140 |
| 161 | 4.4860 | 0.0140 |
| 162 | 4.4999 | 0.0139 |
| 163 | 4.5138 | 0.0139 |
| 164 | 4.5276 | 0.0138 |
| 165 | 4.5414 | 0.0138 |
| 166 | 4.5551 | 0.0137 |
| 167 | 4.5688 | 0.0137 |
| 168 | 4.5825 | 0.0137 |
| 169 | 4.5961 | 0.0136 |
| 170 | 4.6097 | 0.0136 |
| 171 | 4.6232 | 0.0135 |
| 172 | 4.6367 | 0.0135 |
| 173 | 4.6502 | 0.0135 |
| 174 | 4.6636 | 0.0134 |
| 175 | 4.6770 | 0.0134 |
| 176 | 4.6903 | 0.0133 |
| 177 | 4.7036 | 0.0133 |
| 178 | 4.7169 | 0.0133 |
| 179 | 4.7301 | 0.0132 |
| 180 | 4.7433 | 0.0132 |
| 181 | 4.7565 | 0.0132 |
| 182 | 4.7696 | 0.0131 |
| 183 | 4.7827 | 0.0131 |
| 184 | 4.7957 | 0.0131 |
| 185 | 4.8088 | 0.0130 |
| 186 | 4.8217 | 0.0130 |
| 187 | 4.8347 | 0.0129 |
| 188 | 4.8476 | 0.0129 |
| 189 | 4.8605 | 0.0129 |
| 190 | 4.8733 | 0.0128 |
| 191 | 4.8861 | 0.0128 |
| 192 | 4.8989 | 0.0128 |
| 193 | 4.9116 | 0.0127 |
| 194 | 4.9243 | 0.0127 |
| 195 | 4.9370 | 0.0127 |
| 196 | 4.9497 | 0.0126 |
| 197 | 4.9623 | 0.0126 |
| 198 | 4.9749 | 0.0126 |
| 199 | 4.9874 | 0.0125 |
| 200 | 4.9999 | 0.0125 |
| 201 | 5.0124 | 0.0125 |
| 202 | 5.0249 | 0.0125 |
| 203 | 5.0373 | 0.0124 |

| | | |
|---|---|---|
| 204 | 5.0497 | 0.0124 |
| 205 | 5.0620 | 0.0124 |
| 206 | 5.0744 | 0.0123 |
| 207 | 5.0867 | 0.0123 |
| 208 | 5.0989 | 0.0123 |
| 209 | 5.1112 | 0.0122 |
| 210 | 5.1234 | 0.0122 |
| 211 | 5.1356 | 0.0122 |
| 212 | 5.1477 | 0.0122 |
| 213 | 5.1599 | 0.0121 |
| 214 | 5.1720 | 0.0121 |
| 215 | 5.1840 | 0.0121 |
| 216 | 5.1961 | 0.0120 |
| 217 | 5.2081 | 0.0120 |
| 218 | 5.2201 | 0.0120 |
| 219 | 5.2320 | 0.0120 |
| 220 | 5.2440 | 0.0119 |
| 221 | 5.2559 | 0.0119 |
| 222 | 5.2677 | 0.0119 |
| 223 | 5.2796 | 0.0119 |
| 224 | 5.2914 | 0.0118 |
| 225 | 5.3032 | 0.0118 |
| 226 | 5.3150 | 0.0118 |
| 227 | 5.3267 | 0.0117 |
| 228 | 5.3385 | 0.0117 |
| 229 | 5.3502 | 0.0117 |
| 230 | 5.3618 | 0.0117 |
| 231 | 5.3735 | 0.0116 |
| 232 | 5.3851 | 0.0116 |
| 233 | 5.3967 | 0.0116 |
| 234 | 5.4082 | 0.0116 |
| 235 | 5.4198 | 0.0115 |
| 236 | 5.4313 | 0.0115 |
| 237 | 5.4428 | 0.0115 |
| 238 | 5.4543 | 0.0115 |
| 239 | 5.4657 | 0.0114 |
| 240 | 5.4771 | 0.0114 |
| 241 | 5.4885 | 0.0114 |
| 242 | 5.4999 | 0.0114 |
| 243 | 5.5113 | 0.0114 |
| 244 | 5.5226 | 0.0113 |
| 245 | 5.5339 | 0.0113 |
| 246 | 5.5452 | 0.0113 |
| 247 | 5.5565 | 0.0113 |
| 248 | 5.5677 | 0.0112 |
| 249 | 5.5789 | 0.0112 |
| 250 | 5.5901 | 0.0112 |
| 251 | 5.6013 | 0.0112 |
| 252 | 5.6124 | 0.0111 |
| 253 | 5.6235 | 0.0111 |
| 254 | 5.6346 | 0.0111 |
| 255 | 5.6457 | 0.0111 |
| 256 | 5.6568 | 0.0111 |

| | | |
|---|---|---|
| 257 | 5.6678 | 0.0110 |
| 258 | 5.6788 | 0.0110 |
| 259 | 5.6898 | 0.0110 |
| 260 | 5.7008 | 0.0110 |
| 261 | 5.7118 | 0.0110 |
| 262 | 5.7227 | 0.0109 |
| 263 | 5.7336 | 0.0109 |
| 264 | 5.7445 | 0.0109 |
| 265 | 5.7554 | 0.0109 |
| 266 | 5.7662 | 0.0108 |
| 267 | 5.7770 | 0.0108 |
| 268 | 5.7878 | 0.0108 |
| 269 | 5.7986 | 0.0108 |
| 270 | 5.8094 | 0.0108 |
| 271 | 5.8202 | 0.0107 |
| 272 | 5.8309 | 0.0107 |
| 273 | 5.8416 | 0.0107 |
| 274 | 5.8523 | 0.0107 |
| 275 | 5.8629 | 0.0107 |
| 276 | 5.8736 | 0.0107 |
| 277 | 5.8842 | 0.0106 |
| 278 | 5.8948 | 0.0106 |
| 279 | 5.9054 | 0.0106 |
| 280 | 5.9160 | 0.0106 |
| 281 | 5.9266 | 0.0106 |
| 282 | 5.9371 | 0.0105 |
| 283 | 5.9476 | 0.0105 |
| 284 | 5.9581 | 0.0105 |
| 285 | 5.9686 | 0.0105 |
| 286 | 5.9791 | 0.0105 |
| 287 | 5.9895 | 0.0104 |
| 288 | 5.9999 | 0.0104 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0104 | 0.0012 | 0.0092 |
| 2 | 0.0104 | 0.0012 | 0.0093 |
| 3 | 0.0105 | 0.0012 | 0.0093 |
| 4 | 0.0105 | 0.0012 | 0.0093 |
| 5 | 0.0105 | 0.0012 | 0.0093 |
| 6 | 0.0106 | 0.0012 | 0.0094 |
| 7 | 0.0106 | 0.0012 | 0.0094 |
| 8 | 0.0106 | 0.0012 | 0.0094 |
| 9 | 0.0107 | 0.0012 | 0.0094 |
| 10 | 0.0107 | 0.0012 | 0.0095 |
| 11 | 0.0107 | 0.0012 | 0.0095 |
| 12 | 0.0107 | 0.0012 | 0.0095 |
| 13 | 0.0108 | 0.0012 | 0.0096 |
| 14 | 0.0108 | 0.0012 | 0.0096 |
| 15 | 0.0108 | 0.0012 | 0.0096 |
| 16 | 0.0108 | 0.0012 | 0.0096 |

| | | | |
|---|---|---|---|
| 17 | 0.0109 | 0.0012 | 0.0097 |
| 18 | 0.0109 | 0.0012 | 0.0097 |
| 19 | 0.0110 | 0.0012 | 0.0097 |
| 20 | 0.0110 | 0.0012 | 0.0097 |
| 21 | 0.0110 | 0.0012 | 0.0098 |
| 22 | 0.0110 | 0.0012 | 0.0098 |
| 23 | 0.0111 | 0.0013 | 0.0098 |
| 24 | 0.0111 | 0.0013 | 0.0098 |
| 25 | 0.0111 | 0.0013 | 0.0099 |
| 26 | 0.0112 | 0.0013 | 0.0099 |
| 27 | 0.0112 | 0.0013 | 0.0099 |
| 28 | 0.0112 | 0.0013 | 0.0100 |
| 29 | 0.0113 | 0.0013 | 0.0100 |
| 30 | 0.0113 | 0.0013 | 0.0100 |
| 31 | 0.0114 | 0.0013 | 0.0101 |
| 32 | 0.0114 | 0.0013 | 0.0101 |
| 33 | 0.0114 | 0.0013 | 0.0101 |
| 34 | 0.0114 | 0.0013 | 0.0102 |
| 35 | 0.0115 | 0.0013 | 0.0102 |
| 36 | 0.0115 | 0.0013 | 0.0102 |
| 37 | 0.0116 | 0.0013 | 0.0103 |
| 38 | 0.0116 | 0.0013 | 0.0103 |
| 39 | 0.0116 | 0.0013 | 0.0103 |
| 40 | 0.0117 | 0.0013 | 0.0103 |
| 41 | 0.0117 | 0.0013 | 0.0104 |
| 42 | 0.0117 | 0.0013 | 0.0104 |
| 43 | 0.0118 | 0.0013 | 0.0105 |
| 44 | 0.0118 | 0.0013 | 0.0105 |
| 45 | 0.0119 | 0.0013 | 0.0105 |
| 46 | 0.0119 | 0.0013 | 0.0106 |
| 47 | 0.0120 | 0.0014 | 0.0106 |
| 48 | 0.0120 | 0.0014 | 0.0106 |
| 49 | 0.0120 | 0.0014 | 0.0107 |
| 50 | 0.0121 | 0.0014 | 0.0107 |
| 51 | 0.0121 | 0.0014 | 0.0108 |
| 52 | 0.0122 | 0.0014 | 0.0108 |
| 53 | 0.0122 | 0.0014 | 0.0108 |
| 54 | 0.0122 | 0.0014 | 0.0109 |
| 55 | 0.0123 | 0.0014 | 0.0109 |
| 56 | 0.0123 | 0.0014 | 0.0109 |
| 57 | 0.0124 | 0.0014 | 0.0110 |
| 58 | 0.0124 | 0.0014 | 0.0110 |
| 59 | 0.0125 | 0.0014 | 0.0111 |
| 60 | 0.0125 | 0.0014 | 0.0111 |
| 61 | 0.0126 | 0.0014 | 0.0112 |
| 62 | 0.0126 | 0.0014 | 0.0112 |
| 63 | 0.0127 | 0.0014 | 0.0112 |
| 64 | 0.0127 | 0.0014 | 0.0113 |
| 65 | 0.0128 | 0.0014 | 0.0113 |
| 66 | 0.0128 | 0.0014 | 0.0114 |
| 67 | 0.0129 | 0.0015 | 0.0114 |
| 68 | 0.0129 | 0.0015 | 0.0114 |
| 69 | 0.0130 | 0.0015 | 0.0115 |

| | | | |
|---|---|---|---|
| 70 | 0.0130 | 0.0015 | 0.0115 |
| 71 | 0.0131 | 0.0015 | 0.0116 |
| 72 | 0.0131 | 0.0015 | 0.0116 |
| 73 | 0.0132 | 0.0015 | 0.0117 |
| 74 | 0.0132 | 0.0015 | 0.0117 |
| 75 | 0.0133 | 0.0015 | 0.0118 |
| 76 | 0.0133 | 0.0015 | 0.0118 |
| 77 | 0.0134 | 0.0015 | 0.0119 |
| 78 | 0.0135 | 0.0015 | 0.0119 |
| 79 | 0.0135 | 0.0015 | 0.0120 |
| 80 | 0.0136 | 0.0015 | 0.0120 |
| 81 | 0.0137 | 0.0015 | 0.0121 |
| 82 | 0.0137 | 0.0015 | 0.0122 |
| 83 | 0.0138 | 0.0016 | 0.0122 |
| 84 | 0.0138 | 0.0016 | 0.0123 |
| 85 | 0.0139 | 0.0016 | 0.0123 |
| 86 | 0.0140 | 0.0016 | 0.0124 |
| 87 | 0.0140 | 0.0016 | 0.0125 |
| 88 | 0.0141 | 0.0016 | 0.0125 |
| 89 | 0.0142 | 0.0016 | 0.0126 |
| 90 | 0.0142 | 0.0016 | 0.0126 |
| 91 | 0.0143 | 0.0016 | 0.0127 |
| 92 | 0.0144 | 0.0016 | 0.0127 |
| 93 | 0.0145 | 0.0016 | 0.0128 |
| 94 | 0.0145 | 0.0016 | 0.0129 |
| 95 | 0.0146 | 0.0017 | 0.0130 |
| 96 | 0.0147 | 0.0017 | 0.0130 |
| 97 | 0.0148 | 0.0017 | 0.0131 |
| 98 | 0.0148 | 0.0017 | 0.0131 |
| 99 | 0.0149 | 0.0017 | 0.0132 |
| 100 | 0.0150 | 0.0017 | 0.0133 |
| 101 | 0.0151 | 0.0017 | 0.0134 |
| 102 | 0.0151 | 0.0017 | 0.0134 |
| 103 | 0.0152 | 0.0017 | 0.0135 |
| 104 | 0.0153 | 0.0017 | 0.0136 |
| 105 | 0.0154 | 0.0017 | 0.0137 |
| 106 | 0.0155 | 0.0018 | 0.0137 |
| 107 | 0.0156 | 0.0018 | 0.0138 |
| 108 | 0.0157 | 0.0018 | 0.0139 |
| 109 | 0.0158 | 0.0018 | 0.0140 |
| 110 | 0.0158 | 0.0018 | 0.0141 |
| 111 | 0.0160 | 0.0018 | 0.0142 |
| 112 | 0.0160 | 0.0018 | 0.0142 |
| 113 | 0.0162 | 0.0018 | 0.0143 |
| 114 | 0.0162 | 0.0018 | 0.0144 |
| 115 | 0.0164 | 0.0019 | 0.0145 |
| 116 | 0.0164 | 0.0019 | 0.0146 |
| 117 | 0.0166 | 0.0019 | 0.0147 |
| 118 | 0.0167 | 0.0019 | 0.0148 |
| 119 | 0.0168 | 0.0019 | 0.0149 |
| 120 | 0.0169 | 0.0019 | 0.0150 |
| 121 | 0.0170 | 0.0019 | 0.0151 |
| 122 | 0.0171 | 0.0019 | 0.0152 |

| | | | |
|---|---|---|---|
| 123 | 0.0173 | 0.0020 | 0.0153 |
| 124 | 0.0174 | 0.0020 | 0.0154 |
| 125 | 0.0175 | 0.0020 | 0.0156 |
| 126 | 0.0176 | 0.0020 | 0.0156 |
| 127 | 0.0178 | 0.0020 | 0.0158 |
| 128 | 0.0179 | 0.0020 | 0.0159 |
| 129 | 0.0181 | 0.0020 | 0.0160 |
| 130 | 0.0182 | 0.0021 | 0.0161 |
| 131 | 0.0184 | 0.0021 | 0.0163 |
| 132 | 0.0185 | 0.0021 | 0.0164 |
| 133 | 0.0187 | 0.0021 | 0.0166 |
| 134 | 0.0188 | 0.0021 | 0.0167 |
| 135 | 0.0190 | 0.0021 | 0.0169 |
| 136 | 0.0191 | 0.0022 | 0.0170 |
| 137 | 0.0193 | 0.0022 | 0.0172 |
| 138 | 0.0195 | 0.0022 | 0.0173 |
| 139 | 0.0197 | 0.0022 | 0.0175 |
| 140 | 0.0198 | 0.0022 | 0.0176 |
| 141 | 0.0201 | 0.0023 | 0.0178 |
| 142 | 0.0202 | 0.0023 | 0.0179 |
| 143 | 0.0205 | 0.0023 | 0.0182 |
| 144 | 0.0206 | 0.0023 | 0.0183 |
| 145 | 0.0214 | 0.0024 | 0.0190 |
| 146 | 0.0215 | 0.0024 | 0.0191 |
| 147 | 0.0218 | 0.0025 | 0.0194 |
| 148 | 0.0220 | 0.0025 | 0.0195 |
| 149 | 0.0223 | 0.0025 | 0.0198 |
| 150 | 0.0225 | 0.0025 | 0.0199 |
| 151 | 0.0228 | 0.0026 | 0.0203 |
| 152 | 0.0230 | 0.0026 | 0.0204 |
| 153 | 0.0234 | 0.0026 | 0.0207 |
| 154 | 0.0236 | 0.0027 | 0.0209 |
| 155 | 0.0240 | 0.0027 | 0.0213 |
| 156 | 0.0242 | 0.0027 | 0.0215 |
| 157 | 0.0246 | 0.0028 | 0.0218 |
| 158 | 0.0249 | 0.0028 | 0.0221 |
| 159 | 0.0253 | 0.0029 | 0.0225 |
| 160 | 0.0256 | 0.0029 | 0.0227 |
| 161 | 0.0261 | 0.0030 | 0.0232 |
| 162 | 0.0264 | 0.0030 | 0.0234 |
| 163 | 0.0270 | 0.0030 | 0.0239 |
| 164 | 0.0273 | 0.0031 | 0.0242 |
| 165 | 0.0279 | 0.0032 | 0.0247 |
| 166 | 0.0282 | 0.0032 | 0.0250 |
| 167 | 0.0289 | 0.0033 | 0.0257 |
| 168 | 0.0293 | 0.0033 | 0.0260 |
| 169 | 0.0301 | 0.0034 | 0.0267 |
| 170 | 0.0305 | 0.0035 | 0.0271 |
| 171 | 0.0314 | 0.0036 | 0.0279 |
| 172 | 0.0319 | 0.0036 | 0.0283 |
| 173 | 0.0330 | 0.0037 | 0.0292 |
| 174 | 0.0335 | 0.0038 | 0.0297 |
| 175 | 0.0347 | 0.0039 | 0.0308 |

| | | | |
|---|---|---|---|
| 176 | 0.0354 | 0.0040 | 0.0314 |
| 177 | 0.0368 | 0.0042 | 0.0327 |
| 178 | 0.0376 | 0.0043 | 0.0334 |
| 179 | 0.0394 | 0.0045 | 0.0349 |
| 180 | 0.0404 | 0.0046 | 0.0358 |
| 181 | 0.0425 | 0.0048 | 0.0377 |
| 182 | 0.0438 | 0.0050 | 0.0388 |
| 183 | 0.0466 | 0.0053 | 0.0414 |
| 184 | 0.0483 | 0.0055 | 0.0428 |
| 185 | 0.0410 | 0.0046 | 0.0364 |
| 186 | 0.0433 | 0.0049 | 0.0384 |
| 187 | 0.0492 | 0.0056 | 0.0436 |
| 188 | 0.0530 | 0.0060 | 0.0470 |
| 189 | 0.0639 | 0.0064 | 0.0575 |
| 190 | 0.0722 | 0.0064 | 0.0657 |
| 191 | 0.1031 | 0.0064 | 0.0967 |
| 192 | 0.1418 | 0.0064 | 0.1354 |
| 193 | 0.4439 | 0.0064 | 0.4375 |
| 194 | 0.0840 | 0.0064 | 0.0776 |
| 195 | 0.0578 | 0.0064 | 0.0514 |
| 196 | 0.0460 | 0.0052 | 0.0408 |
| 197 | 0.0502 | 0.0057 | 0.0445 |
| 198 | 0.0451 | 0.0051 | 0.0400 |
| 199 | 0.0414 | 0.0047 | 0.0367 |
| 200 | 0.0385 | 0.0044 | 0.0341 |
| 201 | 0.0361 | 0.0041 | 0.0320 |
| 202 | 0.0341 | 0.0039 | 0.0303 |
| 203 | 0.0324 | 0.0037 | 0.0288 |
| 204 | 0.0310 | 0.0035 | 0.0275 |
| 205 | 0.0297 | 0.0034 | 0.0263 |
| 206 | 0.0286 | 0.0032 | 0.0253 |
| 207 | 0.0276 | 0.0031 | 0.0245 |
| 208 | 0.0267 | 0.0030 | 0.0236 |
| 209 | 0.0258 | 0.0029 | 0.0229 |
| 210 | 0.0251 | 0.0028 | 0.0223 |
| 211 | 0.0244 | 0.0028 | 0.0217 |
| 212 | 0.0238 | 0.0027 | 0.0211 |
| 213 | 0.0232 | 0.0026 | 0.0206 |
| 214 | 0.0227 | 0.0026 | 0.0201 |
| 215 | 0.0222 | 0.0025 | 0.0196 |
| 216 | 0.0217 | 0.0025 | 0.0192 |
| 217 | 0.0208 | 0.0023 | 0.0184 |
| 218 | 0.0203 | 0.0023 | 0.0180 |
| 219 | 0.0200 | 0.0023 | 0.0177 |
| 220 | 0.0196 | 0.0022 | 0.0174 |
| 221 | 0.0192 | 0.0022 | 0.0171 |
| 222 | 0.0189 | 0.0021 | 0.0168 |
| 223 | 0.0186 | 0.0021 | 0.0165 |
| 224 | 0.0183 | 0.0021 | 0.0162 |
| 225 | 0.0180 | 0.0020 | 0.0160 |
| 226 | 0.0177 | 0.0020 | 0.0157 |
| 227 | 0.0175 | 0.0020 | 0.0155 |
| 228 | 0.0172 | 0.0019 | 0.0153 |

| | | | |
|---|---|---|---|
| 229 | 0.0170 | 0.0019 | 0.0151 |
| 230 | 0.0167 | 0.0019 | 0.0148 |
| 231 | 0.0165 | 0.0019 | 0.0147 |
| 232 | 0.0163 | 0.0018 | 0.0145 |
| 233 | 0.0161 | 0.0018 | 0.0143 |
| 234 | 0.0159 | 0.0018 | 0.0141 |
| 235 | 0.0157 | 0.0018 | 0.0139 |
| 236 | 0.0155 | 0.0018 | 0.0138 |
| 237 | 0.0154 | 0.0017 | 0.0136 |
| 238 | 0.0152 | 0.0017 | 0.0135 |
| 239 | 0.0150 | 0.0017 | 0.0133 |
| 240 | 0.0149 | 0.0017 | 0.0132 |
| 241 | 0.0147 | 0.0017 | 0.0130 |
| 242 | 0.0146 | 0.0016 | 0.0129 |
| 243 | 0.0144 | 0.0016 | 0.0128 |
| 244 | 0.0143 | 0.0016 | 0.0127 |
| 245 | 0.0141 | 0.0016 | 0.0125 |
| 246 | 0.0140 | 0.0016 | 0.0124 |
| 247 | 0.0139 | 0.0016 | 0.0123 |
| 248 | 0.0137 | 0.0016 | 0.0122 |
| 249 | 0.0136 | 0.0015 | 0.0121 |
| 250 | 0.0135 | 0.0015 | 0.0120 |
| 251 | 0.0134 | 0.0015 | 0.0119 |
| 252 | 0.0133 | 0.0015 | 0.0118 |
| 253 | 0.0132 | 0.0015 | 0.0117 |
| 254 | 0.0131 | 0.0015 | 0.0116 |
| 255 | 0.0129 | 0.0015 | 0.0115 |
| 256 | 0.0128 | 0.0015 | 0.0114 |
| 257 | 0.0127 | 0.0014 | 0.0113 |
| 258 | 0.0126 | 0.0014 | 0.0112 |
| 259 | 0.0125 | 0.0014 | 0.0111 |
| 260 | 0.0125 | 0.0014 | 0.0110 |
| 261 | 0.0124 | 0.0014 | 0.0110 |
| 262 | 0.0123 | 0.0014 | 0.0109 |
| 263 | 0.0122 | 0.0014 | 0.0108 |
| 264 | 0.0121 | 0.0014 | 0.0107 |
| 265 | 0.0120 | 0.0014 | 0.0107 |
| 266 | 0.0119 | 0.0013 | 0.0106 |
| 267 | 0.0119 | 0.0013 | 0.0105 |
| 268 | 0.0118 | 0.0013 | 0.0104 |
| 269 | 0.0117 | 0.0013 | 0.0104 |
| 270 | 0.0116 | 0.0013 | 0.0103 |
| 271 | 0.0115 | 0.0013 | 0.0102 |
| 272 | 0.0115 | 0.0013 | 0.0102 |
| 273 | 0.0114 | 0.0013 | 0.0101 |
| 274 | 0.0113 | 0.0013 | 0.0100 |
| 275 | 0.0113 | 0.0013 | 0.0100 |
| 276 | 0.0112 | 0.0013 | 0.0099 |
| 277 | 0.0111 | 0.0013 | 0.0099 |
| 278 | 0.0111 | 0.0013 | 0.0098 |
| 279 | 0.0110 | 0.0012 | 0.0098 |
| 280 | 0.0109 | 0.0012 | 0.0097 |
| 281 | 0.0109 | 0.0012 | 0.0096 |

| | | | |
|---|---|---|---|
| 282 | 0.0108 | 0.0012 | 0.0096 |
| 283 | 0.0107 | 0.0012 | 0.0095 |
| 284 | 0.0107 | 0.0012 | 0.0095 |
| 285 | 0.0106 | 0.0012 | 0.0094 |
| 286 | 0.0106 | 0.0012 | 0.0094 |
| 287 | 0.0105 | 0.0012 | 0.0093 |
| 288 | 0.0105 | 0.0012 | 0.0093 |

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Total soil rain loss = 0.61(In)
Total effective rainfall = 5.39(In)
Peak flow rate in flood hydrograph = 29.33(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))

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| Time(h+m) | Volume Ac.Ft | Q(CFS) | 0 | 7.5 | 15.0 | 22.5 | 30.0 |
|---|---|---|---|---|---|---|---|
| 0+ 5 | 0.0006 | 0.09 | Q | \| | \| | \| | \| |
| 0+10 | 0.0045 | 0.56 | Q | \| | \| | \| | \| |
| 0+15 | 0.0109 | 0.93 | VQ | \| | \| | \| | \| |
| 0+20 | 0.0179 | 1.02 | VQ | \| | \| | \| | \| |
| 0+25 | 0.0251 | 1.04 | VQ | \| | \| | \| | \| |
| 0+30 | 0.0324 | 1.05 | VQ | \| | \| | \| | \| |
| 0+35 | 0.0396 | 1.06 | VQ | \| | \| | \| | \| |
| 0+40 | 0.0469 | 1.06 | VQ | \| | \| | \| | \| |
| 0+45 | 0.0542 | 1.06 | VQ | \| | \| | \| | \| |
| 0+50 | 0.0616 | 1.06 | VQ | \| | \| | \| | \| |
| 0+55 | 0.0689 | 1.07 | VQ | \| | \| | \| | \| |
| 1+ 0 | 0.0763 | 1.07 | VQ | \| | \| | \| | \| |
| 1+ 5 | 0.0837 | 1.07 | VQ | \| | \| | \| | \| |
| 1+10 | 0.0911 | 1.08 | VQ | \| | \| | \| | \| |
| 1+15 | 0.0985 | 1.08 | VQ | \| | \| | \| | \| |
| 1+20 | 0.1059 | 1.08 | \|Q | \| | \| | \| | \| |
| 1+25 | 0.1134 | 1.08 | \|Q | \| | \| | \| | \| |
| 1+30 | 0.1209 | 1.09 | \|Q | \| | \| | \| | \| |
| 1+35 | 0.1284 | 1.09 | \|Q | \| | \| | \| | \| |
| 1+40 | 0.1359 | 1.09 | \|Q | \| | \| | \| | \| |
| 1+45 | 0.1435 | 1.10 | \|Q | \| | \| | \| | \| |
| 1+50 | 0.1511 | 1.10 | \|Q | \| | \| | \| | \| |
| 1+55 | 0.1587 | 1.10 | \|Q | \| | \| | \| | \| |
| 2+ 0 | 0.1663 | 1.11 | \|Q | \| | \| | \| | \| |
| 2+ 5 | 0.1739 | 1.11 | \|Q | \| | \| | \| | \| |
| 2+10 | 0.1816 | 1.11 | \|Q | \| | \| | \| | \| |
| 2+15 | 0.1893 | 1.12 | \|Q | \| | \| | \| | \| |
| 2+20 | 0.1970 | 1.12 | \|Q | \| | \| | \| | \| |
| 2+25 | 0.2048 | 1.12 | \|Q | \| | \| | \| | \| |
| 2+30 | 0.2125 | 1.13 | \|QV | \| | \| | \| | \| |
| 2+35 | 0.2203 | 1.13 | \|QV | \| | \| | \| | \| |

```
2+40       0.2281      1.13  |QV       |         |         |         |
2+45       0.2359      1.14  |QV       |         |         |         |
2+50       0.2438      1.14  |QV       |         |         |         |
2+55       0.2517      1.14  |QV       |         |         |         |
3+ 0       0.2596      1.15  |QV       |         |         |         |
3+ 5       0.2675      1.15  |QV       |         |         |         |
3+10       0.2755      1.16  |QV       |         |         |         |
3+15       0.2834      1.16  |QV       |         |         |         |
3+20       0.2915      1.16  |QV       |         |         |         |
3+25       0.2995      1.17  |QV       |         |         |         |
3+30       0.3075      1.17  |QV       |         |         |         |
3+35       0.3156      1.17  |Q V      |         |         |         |
3+40       0.3237      1.18  |Q V      |         |         |         |
3+45       0.3319      1.18  |Q V      |         |         |         |
3+50       0.3401      1.19  |Q V      |         |         |         |
3+55       0.3482      1.19  |Q V      |         |         |         |
4+ 0       0.3565      1.19  |Q V      |         |         |         |
4+ 5       0.3647      1.20  |Q V      |         |         |         |
4+10       0.3730      1.20  |Q V      |         |         |         |
4+15       0.3813      1.21  |Q V      |         |         |         |
4+20       0.3896      1.21  |Q V      |         |         |         |
4+25       0.3980      1.21  |Q V      |         |         |         |
4+30       0.4064      1.22  |Q V      |         |         |         |
4+35       0.4148      1.22  |Q V      |         |         |         |
4+40       0.4233      1.23  |Q  V     |         |         |         |
4+45       0.4318      1.23  |Q  V     |         |         |         |
4+50       0.4403      1.24  |Q  V     |         |         |         |
4+55       0.4489      1.24  |Q  V     |         |         |         |
5+ 0       0.4574      1.25  |Q  V     |         |         |         |
5+ 5       0.4661      1.25  |Q  V     |         |         |         |
5+10       0.4747      1.26  |Q  V     |         |         |         |
5+15       0.4834      1.26  |Q  V     |         |         |         |
5+20       0.4921      1.27  |Q  V     |         |         |         |
5+25       0.5008      1.27  |Q  V     |         |         |         |
5+30       0.5096      1.28  |Q  V     |         |         |         |
5+35       0.5184      1.28  |Q  V     |         |         |         |
5+40       0.5273      1.29  |Q   V    |         |         |         |
5+45       0.5362      1.29  |Q   V    |         |         |         |
5+50       0.5451      1.30  |Q   V    |         |         |         |
5+55       0.5541      1.30  |Q   V    |         |         |         |
6+ 0       0.5630      1.31  |Q   V    |         |         |         |
6+ 5       0.5721      1.31  |Q   V    |         |         |         |
6+10       0.5811      1.32  |Q   V    |         |         |         |
6+15       0.5902      1.32  |Q   V    |         |         |         |
6+20       0.5994      1.33  |Q   V    |         |         |         |
6+25       0.6086      1.33  |Q   V    |         |         |         |
6+30       0.6178      1.34  |Q   V    |         |         |         |
6+35       0.6271      1.34  |Q   V    |         |         |         |
6+40       0.6364      1.35  |Q    V   |         |         |         |
6+45       0.6457      1.36  |Q    V   |         |         |         |
6+50       0.6551      1.36  |Q    V   |         |         |         |
6+55       0.6645      1.37  |Q    V   |         |         |         |
7+ 0       0.6740      1.38  |Q    V   |         |         |         |
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 7+ 5       0.6835      1.38  |Q    V   |         |         |         |
 7+10       0.6931      1.39  |Q    V   |         |         |         |
 7+15       0.7027      1.39  |Q    V   |         |         |         |
 7+20       0.7123      1.40  |Q    V   |         |         |         |
 7+25       0.7220      1.41  |Q    V   |         |         |         |
 7+30       0.7317      1.41  |Q    V   |         |         |         |
 7+35       0.7415      1.42  |Q     V  |         |         |         |
 7+40       0.7514      1.43  |Q     V  |         |         |         |
 7+45       0.7612      1.43  |Q     V  |         |         |         |
 7+50       0.7712      1.44  |Q     V  |         |         |         |
 7+55       0.7812      1.45  |Q     V  |         |         |         |
 8+ 0       0.7912      1.46  |Q     V  |         |         |         |
 8+ 5       0.8013      1.46  |Q     V  |         |         |         |
 8+10       0.8114      1.47  |Q     V  |         |         |         |
 8+15       0.8216      1.48  |Q     V  |         |         |         |
 8+20       0.8318      1.49  |Q     V  |         |         |         |
 8+25       0.8421      1.49  |Q      V |         |         |         |
 8+30       0.8525      1.50  | Q     V |         |         |         |
 8+35       0.8629      1.51  | Q     V |         |         |         |
 8+40       0.8734      1.52  | Q     V |         |         |         |
 8+45       0.8839      1.53  | Q     V |         |         |         |
 8+50       0.8945      1.54  | Q     V |         |         |         |
 8+55       0.9051      1.55  | Q     V |         |         |         |
 9+ 0       0.9158      1.55  | Q     V |         |         |         |
 9+ 5       0.9266      1.56  | Q     V |         |         |         |
 9+10       0.9374      1.57  | Q     V |         |         |         |
 9+15       0.9483      1.58  | Q      V|         |         |         |
 9+20       0.9593      1.59  | Q      V|         |         |         |
 9+25       0.9703      1.60  | Q      V|         |         |         |
 9+30       0.9814      1.61  | Q      V|         |         |         |
 9+35       0.9926      1.62  | Q      V|         |         |         |
 9+40       1.0038      1.63  | Q      V|         |         |         |
 9+45       1.0151      1.64  | Q      V|         |         |         |
 9+50       1.0265      1.65  | Q      V|         |         |         |
 9+55       1.0380      1.66  | Q      V|         |         |         |
10+ 0       1.0495      1.68  | Q       V         |         |         |
10+ 5       1.0611      1.69  | Q       V         |         |         |
10+10       1.0728      1.70  | Q       V         |         |         |
10+15       1.0846      1.71  | Q       V         |         |         |
10+20       1.0965      1.72  | Q       V         |         |         |
10+25       1.1084      1.73  | Q       V         |         |         |
10+30       1.1204      1.75  | Q       V         |         |         |
10+35       1.1326      1.76  | Q       V         |         |         |
10+40       1.1448      1.77  | Q       V         |         |         |
10+45       1.1571      1.79  | Q       |V        |         |         |
10+50       1.1695      1.80  | Q       |V        |         |         |
10+55       1.1820      1.81  | Q       |V        |         |         |
11+ 0       1.1946      1.83  | Q       |V        |         |         |
11+ 5       1.2073      1.84  | Q       |V        |         |         |
11+10       1.2201      1.86  | Q       |V        |         |         |
11+15       1.2330      1.87  | Q       |V        |         |         |
11+20       1.2460      1.89  | Q       |V        |         |         |
11+25       1.2592      1.91  | Q       | V       |         |         |
```

```
11+30       1.2724      1.92  | Q       | V       |         |         |
11+35       1.2858      1.94  | Q       | V       |         |         |
11+40       1.2993      1.96  | Q       | V       |         |         |
11+45       1.3129      1.98  | Q       | V       |         |         |
11+50       1.3267      2.00  | Q       | V       |         |         |
11+55       1.3405      2.02  | Q       | V       |         |         |
12+ 0       1.3546      2.04  | Q       | V       |         |         |
12+ 5       1.3687      2.06  | Q       |  V      |         |         |
12+10       1.3832      2.10  | Q       |  V      |         |         |
12+15       1.3980      2.14  | Q       |  V      |         |         |
12+20       1.4129      2.17  | Q       |  V      |         |         |
12+25       1.4280      2.19  | Q       |  V      |         |         |
12+30       1.4433      2.22  | Q       |  V      |         |         |
12+35       1.4587      2.24  | Q       |  V      |         |         |
12+40       1.4743      2.27  |  Q      |   V     |         |         |
12+45       1.4901      2.29  |  Q      |   V     |         |         |
12+50       1.5061      2.32  |  Q      |   V     |         |         |
12+55       1.5223      2.35  |  Q      |   V     |         |         |
13+ 0       1.5387      2.38  |  Q      |   V     |         |         |
13+ 5       1.5553      2.41  |  Q      |   V     |         |         |
13+10       1.5721      2.44  |  Q      |    V    |         |         |
13+15       1.5892      2.48  |  Q      |    V    |         |         |
13+20       1.6065      2.51  |  Q      |    V    |         |         |
13+25       1.6240      2.55  |  Q      |    V    |         |         |
13+30       1.6419      2.59  |  Q      |    V    |         |         |
13+35       1.6599      2.63  |  Q      |    V    |         |         |
13+40       1.6783      2.67  |  Q      |     V   |         |         |
13+45       1.6970      2.71  |  Q      |     V   |         |         |
13+50       1.7160      2.76  |  Q      |     V   |         |         |
13+55       1.7353      2.81  |  Q      |     V   |         |         |
14+ 0       1.7550      2.86  |  Q      |     V   |         |         |
14+ 5       1.7751      2.91  |  Q      |     V   |         |         |
14+10       1.7956      2.97  |  Q      |      V  |         |         |
14+15       1.8165      3.03  |   Q     |      V  |         |         |
14+20       1.8379      3.10  |   Q     |      V  |         |         |
14+25       1.8597      3.17  |   Q     |      V  |         |         |
14+30       1.8821      3.25  |   Q     |      V  |         |         |
14+35       1.9050      3.33  |   Q     |       V |         |         |
14+40       1.9285      3.42  |   Q     |       V |         |         |
14+45       1.9527      3.51  |   Q     |       V |         |         |
14+50       1.9776      3.62  |   Q     |       V |         |         |
14+55       2.0033      3.73  |   Q     |        V|         |         |
15+ 0       2.0298      3.86  |    Q    |        V|         |         |
15+ 5       2.0573      3.99  |    Q    |        V|         |         |
15+10       2.0859      4.15  |    Q    |        V|         |         |
15+15       2.1157      4.32  |    Q    |         V         |         |
15+20       2.1469      4.53  |     Q   |         V         |         |
15+25       2.1789      4.66  |     Q   |         V         |         |
15+30       2.2095      4.44  |    Q    |         |V        |         |
15+35       2.2395      4.35  |    Q    |         |V        |         |
15+40       2.2717      4.67  |     Q   |         |V        |         |
15+45       2.3073      5.17  |     Q   |         | V       |         |
15+50       2.3483      5.96  |      Q  |         | V       |         |
```

```
15+55       2.3976      7.15  |        Q|         | V       |         |
16+ 0       2.4632      9.53  |         | Q       |  V      |         |
16+ 5       2.5721     15.81  |         |         |Q  V     |         |
16+10       2.7741     29.33  |         |         |     V   |        Q|
16+15       2.9372     23.69  |         |         |       V |Q        |
16+20       3.0111     10.73  |         |   Q     |       V |         |
16+25       3.0538      6.19  |       Q |         |        V|         |
16+30       3.0896      5.20  |     Q   |         |        V|         |
16+35       3.1221      4.72  |     Q   |         |        V|         |
16+40       3.1520      4.35  |    Q    |         |         V         |
16+45       3.1797      4.02  |    Q    |         |         V         |
16+50       3.2055      3.75  |   Q     |         |         V         |
16+55       3.2298      3.53  |   Q     |         |         V         |
17+ 0       3.2528      3.34  |   Q     |         |         |V        |
17+ 5       3.2747      3.18  |   Q     |         |         |V        |
17+10       3.2956      3.04  |   Q     |         |         |V        |
17+15       3.3158      2.92  |  Q      |         |         |V        |
17+20       3.3351      2.81  |  Q      |         |         |V        |
17+25       3.3539      2.72  |  Q      |         |         | V       |
17+30       3.3720      2.63  |  Q      |         |         | V       |
17+35       3.3895      2.55  |  Q      |         |         | V       |
17+40       3.4066      2.48  |  Q      |         |         | V       |
17+45       3.4233      2.41  |  Q      |         |         | V       |
17+50       3.4395      2.35  |  Q      |         |         | V       |
17+55       3.4553      2.30  |  Q      |         |         |  V      |
18+ 0       3.4707      2.24  | Q       |         |         |  V      |
18+ 5       3.4858      2.19  | Q       |         |         |  V      |
18+10       3.5004      2.12  | Q       |         |         |  V      |
18+15       3.5146      2.06  | Q       |         |         |  V      |
18+20       3.5286      2.02  | Q       |         |         |  V      |
18+25       3.5422      1.98  | Q       |         |         |  V      |
18+30       3.5556      1.94  | Q       |         |         |  V      |
18+35       3.5687      1.91  | Q       |         |         |   V     |
18+40       3.5816      1.88  | Q       |         |         |   V     |
18+45       3.5943      1.85  | Q       |         |         |   V     |
18+50       3.6068      1.82  | Q       |         |         |   V     |
18+55       3.6192      1.79  | Q       |         |         |   V     |
19+ 0       3.6313      1.76  | Q       |         |         |   V     |
19+ 5       3.6432      1.74  | Q       |         |         |   V     |
19+10       3.6550      1.71  | Q       |         |         |   V     |
19+15       3.6666      1.69  | Q       |         |         |    V    |
19+20       3.6781      1.66  | Q       |         |         |    V    |
19+25       3.6894      1.64  | Q       |         |         |    V    |
19+30       3.7006      1.62  | Q       |         |         |    V    |
19+35       3.7116      1.60  | Q       |         |         |    V    |
19+40       3.7225      1.58  | Q       |         |         |    V    |
19+45       3.7333      1.56  | Q       |         |         |    V    |
19+50       3.7440      1.55  | Q       |         |         |    V    |
19+55       3.7545      1.53  | Q       |         |         |    V    |
20+ 0       3.7649      1.51  | Q       |         |         |    V    |
20+ 5       3.7752      1.50  |Q        |         |         |     V   |
20+10       3.7854      1.48  |Q        |         |         |     V   |
20+15       3.7955      1.46  |Q        |         |         |     V   |
```

```
  20+20       3.8055      1.45  |Q         |          |          |     V   |
  20+25       3.8153      1.44  |Q         |          |          |     V   |
  20+30       3.8251      1.42  |Q         |          |          |     V   |
  20+35       3.8348      1.41  |Q         |          |          |     V   |
  20+40       3.8444      1.39  |Q         |          |          |     V   |
  20+45       3.8540      1.38  |Q         |          |          |     V   |
  20+50       3.8634      1.37  |Q         |          |          |     V   |
  20+55       3.8727      1.36  |Q         |          |          |      V  |
  21+ 0       3.8820      1.35  |Q         |          |          |      V  |
  21+ 5       3.8912      1.33  |Q         |          |          |      V  |
  21+10       3.9003      1.32  |Q         |          |          |      V  |
  21+15       3.9093      1.31  |Q         |          |          |      V  |
  21+20       3.9183      1.30  |Q         |          |          |      V  |
  21+25       3.9272      1.29  |Q         |          |          |      V  |
  21+30       3.9360      1.28  |Q         |          |          |      V  |
  21+35       3.9447      1.27  |Q         |          |          |      V  |
  21+40       3.9534      1.26  |Q         |          |          |      V  |
  21+45       3.9620      1.25  |Q         |          |          |      V  |
  21+50       3.9706      1.24  |Q         |          |          |      V  |
  21+55       3.9791      1.23  |Q         |          |          |       V |
  22+ 0       3.9875      1.22  |Q         |          |          |       V |
  22+ 5       3.9959      1.22  |Q         |          |          |       V |
  22+10       4.0042      1.21  |Q         |          |          |       V |
  22+15       4.0124      1.20  |Q         |          |          |       V |
  22+20       4.0206      1.19  |Q         |          |          |       V |
  22+25       4.0288      1.18  |Q         |          |          |       V |
  22+30       4.0369      1.17  |Q         |          |          |       V |
  22+35       4.0449      1.17  |Q         |          |          |       V |
  22+40       4.0529      1.16  |Q         |          |          |       V |
  22+45       4.0608      1.15  |Q         |          |          |       V |
  22+50       4.0687      1.14  |Q         |          |          |       V |
  22+55       4.0765      1.14  |Q         |          |          |       V |
  23+ 0       4.0843      1.13  |Q         |          |          |        V|
  23+ 5       4.0921      1.12  |Q         |          |          |        V|
  23+10       4.0997      1.12  |Q         |          |          |        V|
  23+15       4.1074      1.11  |Q         |          |          |        V|
  23+20       4.1150      1.10  |Q         |          |          |        V|
  23+25       4.1225      1.10  |Q         |          |          |        V|
  23+30       4.1301      1.09  |Q         |          |          |        V|
  23+35       4.1375      1.08  |Q         |          |          |        V|
  23+40       4.1450      1.08  |Q         |          |          |        V|
  23+45       4.1523      1.07  |Q         |          |          |        V|
  23+50       4.1597      1.07  |Q         |          |          |        V|
  23+55       4.1670      1.06  |Q         |          |          |        V|
  24+ 0       4.1743      1.06  |Q         |          |          |        V|
  24+ 5       4.1809      0.96  |Q         |          |          |        V|
  24+10       4.1843      0.49  Q          |          |          |        V|
  24+15       4.1850      0.11  Q          |          |          |        V|
  24+20       4.1852      0.02  Q          |          |          |        V|
  24+25       4.1852      0.01  Q          |          |          |        V|
----------------------------------------------------------------------------
```

# APPENDIX D: CAMPUS AVENUE STORM DRAIN HYDROLOGY CALCULATIONS

# APPENDIX D.1: RATIONAL METHOD ANALYSIS, RERUN FUSCOE MODELS TO CAMPUS

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/08/25

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PORTION OF MPD DA XIV UPSTREAM
PROPOSED DEC DA A1
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

---

Program License Serial Number 6279

---

********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.196(In/Hr)
Initial subarea data:
Initial area flow distance = 771.000(Ft.)
Top (of initial area) elevation = 694.000(Ft.)
Bottom (of initial area) elevation = 685.000(Ft.)
Difference in elevation = 9.000(Ft.)
Slope = 0.01167 s(%)= 1.17
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.270 min.
Rainfall intensity = 3.273(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.846
Subarea runoff = 18.140(CFS)
Total initial stream area = 6.550(Ac.)
Pervious area fraction = 0.200
Initial area Fm value = 0.196(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       2.000 to Point/Station       3.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   685.000(Ft.)
End of street segment elevation =   683.000(Ft.)
Length of street segment  =   293.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     25.474(CFS)
Depth of flow =   0.565(Ft.), Average velocity =   2.876(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.680(Ft.)
Flow velocity =   2.88(Ft/s)
Travel time =    1.70 min.     TC =   12.97  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 0.720
Decimal fraction soil group B = 0.280
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 38.72
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.186(In/Hr)
Rainfall intensity =      3.008(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.843
Subarea runoff =     14.473(CFS) for    6.310(Ac.)
Total runoff =     32.613(CFS)
Effective area this stream =       12.86(Ac.)
Total Study Area (Main Stream No. 1) =       12.86(Ac.)
Area averaged Fm value =    0.191(In/Hr)
Street flow at end of street =     32.613(CFS)
Half street flow at end of street =     16.307(CFS)
Depth of flow =   0.607(Ft.), Average velocity =   3.056(Ft/s)
Flow width (from curb towards crown)=  22.769(Ft.)
End of computations, Total Study Area =           12.86 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.
```

```
Area averaged pervious area fraction(Ap) = 0.200
Area averaged SCS curve number =  35.3
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/08/25

---

PORTION OF MPD DA XIV DOWNSTREAM
PROPOSED DEC DA A1
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

---

Program License Serial Number 6279

---

********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 4.000 to Point/Station 5.000
**** INITIAL AREA EVALUATION ****

PARK subarea
Decimal fraction soil group A = 0.130
Decimal fraction soil group B = 0.870
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 52.88
Pervious ratio(Ap) = 0.8500 Max loss rate(Fm)= 0.658(In/Hr)
Initial subarea data:
Initial area flow distance = 791.000(Ft.)
Top (of initial area) elevation = 684.000(Ft.)
Bottom (of initial area) elevation = 678.000(Ft.)
Difference in elevation = 6.000(Ft.)
Slope = 0.00759 s(%)= 0.76
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 18.502 min.
Rainfall intensity = 2.431(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.656
Subarea runoff = 11.184(CFS)
Total initial stream area = 7.010(Ac.)
Pervious area fraction = 0.850
Initial area Fm value = 0.658(In/Hr)

```
End of computations, Total Study Area =           7.01 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.850
Area averaged SCS curve number =  52.9
```

# APPENDIX D.2: RATIONAL METHOD ANALYSIS, CAMPUS MAINLINE, AREA G (EXCLUDES G2)

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/08/25

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CAMPUS SD TRIBUTARY AREA
OVERALL: JLC-MCC-MDP REV + ONTARIO RANCH

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Program License Serial Number 6279

---

********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 814.000 to Point/Station 815.000
**** INITIAL AREA EVALUATION ****
_____
COMMERCIAL subarea type
Decimal fraction soil group A = 0.110
Decimal fraction soil group B = 0.890
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 53.36
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.077(In/Hr)
Initial subarea data:
Initial area flow distance = 480.000(Ft.)
Top (of initial area) elevation = 694.000(Ft.)
Bottom (of initial area) elevation = 689.000(Ft.)
Difference in elevation = 5.000(Ft.)
Slope = 0.01042 s(%)= 1.04
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.950 min.
Rainfall intensity = 3.758(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff = 12.690(CFS)
Total initial stream area = 3.830(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.077(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      815.000 to Point/Station       12.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   685.000(Ft.)
Downstream point/station elevation =   664.700(Ft.)
Pipe length  =   100.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.690(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =    12.690(CFS)
Normal flow depth in pipe =    8.05(In.)
Flow top width inside pipe =   11.28(In.)
Critical depth could not be calculated.
Pipe flow velocity =     22.66(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.02 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station       12.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   664.700(Ft.)
Downstream point/station elevation =   661.500(Ft.)
Pipe length  =   429.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.690(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    12.690(CFS)
Normal flow depth in pipe =   15.98(In.)
Flow top width inside pipe =   17.91(In.)
Critical Depth =   15.93(In.)
Pipe flow velocity =      6.46(Ft/s)
Travel time through pipe =    1.11 min.
Time of concentration (TC) =    10.13 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station       12.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      3.830(Ac.)
Runoff from this stream =     12.690(CFS)
Time of concentration =   10.13 min.
Rainfall intensity =     3.489(In/Hr)
Area averaged loss rate (Fm) =    0.0768(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       12.100
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 35.30
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.191(In/Hr)
Rainfall intensity =      3.008(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  12.97 min.  Rain intensity =       3.01(In/Hr)
Total area this stream =        12.86(Ac.)
Total Study Area (Main Stream No. 2) =       16.69(Ac.)
Total runoff =     32.61(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        3.000 to Point/Station       12.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     12.860(Ac.)
Runoff from this stream =     32.613(CFS)
Time of concentration =   12.97 min.
Rainfall intensity =     3.008(In/Hr)
Area averaged loss rate (Fm) =    0.1912(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     12.69     3.830     10.13    0.077      3.489
2     32.61    12.860     12.97    0.191      3.008
Qmax(1) =
         1.000 *    1.000 *    12.690) +
         1.171 *    0.781 *    32.613) + =      42.510
Qmax(2) =
         0.859 *    1.000 *    12.690) +
         1.000 *    1.000 *    32.613) + =      43.515

Total of 2 main streams to confluence:
Flow rates before confluence point:
      13.690      33.613
Maximum flow rates at confluence using above data:
       42.510       43.515
Area of streams before confluence:
        3.830       12.860
Effective area values after confluence:
       13.874       16.690
```

```
Results of confluence:
Total flow rate =     43.515(CFS)
Time of concentration =    12.970 min.
Effective stream area after confluence  =     16.690(Ac.)
Study area average Pervious fraction(Ap) =  0.177
Study area average soil loss rate(Fm) =    0.165(In/Hr)
Study area total =      16.69(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.100 to Point/Station       12.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   661.500(Ft.)
Downstream point/station elevation =   658.000(Ft.)
Pipe length  =   472.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    43.515(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    43.515(CFS)
Normal flow depth in pipe =   25.83(In.)
Flow top width inside pipe =   27.22(In.)
Critical Depth =   26.27(In.)
Pipe flow velocity =      8.73(Ft/s)
Travel time through pipe =    0.90 min.
Time of concentration (TC) =    13.87 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.100 to Point/Station       12.200
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     16.690(Ac.)
Runoff from this stream =     43.515(CFS)
Time of concentration =   13.87 min.
Rainfall intensity =     2.889(In/Hr)
Area averaged loss rate (Fm) =    0.1650(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1771
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      815.000 to Point/Station      816.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
```

```
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   900.000(Ft.)
Top (of initial area) elevation =   689.000(Ft.)
Bottom (of initial area) elevation =   680.000(Ft.)
Difference in elevation =     9.000(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.603 min.
Rainfall intensity =      3.216(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.879
Subarea runoff =     22.373(CFS)
Total initial stream area =        7.910(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      816.000 to Point/Station      816.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Time of concentration =    11.60 min.
Rainfall intensity =      3.216(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.879
Subarea runoff =     11.285(CFS) for    3.990(Ac.)
Total runoff =     33.658(CFS)
Effective area this stream =       11.90(Ac.)
Total Study Area (Main Stream No. 2) =       28.59(Ac.)
Area averaged Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      816.000 to Point/Station       12.200
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   676.000(Ft.)
Downstream point/station elevation =   658.000(Ft.)
Pipe length  =   100.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    33.658(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    33.658(CFS)
Normal flow depth in pipe =   11.70(In.)
Flow top width inside pipe =   17.17(In.)
Critical depth could not be calculated.
Pipe flow velocity =     27.72(Ft/s)
```

```
Travel time through pipe =    0.06 min.
Time of concentration (TC) =    11.66 min.


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Process from Point/Station      816.000 to Point/Station       12.200
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     11.900(Ac.)
Runoff from this stream =     33.658(CFS)
Time of concentration =   11.66 min.
Rainfall intensity =     3.206(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station       12.200
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 52.90
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.658(In/Hr)
Rainfall intensity =      2.431(In/Hr) for a   100.0 year storm
User specified values are as follows:
TC =  18.50 min.  Rain intensity =       2.43(In/Hr)
Total area this stream =         7.01(Ac.)
Total Study Area (Main Stream No. 3) =       35.60(Ac.)
Total runoff =     11.18(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        5.000 to Point/Station       12.200
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      7.010(Ac.)
Runoff from this stream =     11.184(CFS)
Time of concentration =   18.50 min.
Rainfall intensity =     2.431(In/Hr)
Area averaged loss rate (Fm) =    0.6578(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)
```

```
1     43.51    16.690     13.87    0.165      2.889
2     33.66    11.900     11.66    0.073      3.206
3     11.18     7.010     18.50    0.658      2.431
Qmax(1) =
         1.000 *    1.000 *    43.515) +
         0.899 *    1.000 *    33.658) +
         1.259 *    0.750 *    11.184) + =      84.324
Qmax(2) =
         1.116 *    0.841 *    43.515) +
         1.000 *    1.000 *    33.658) +
         1.437 *    0.630 *    11.184) + =      84.634
Qmax(3) =
         0.832 *    1.000 *    43.515) +
         0.753 *    1.000 *    33.658) +
         1.000 *    1.000 *    11.184) + =      72.705

Total of 3 main streams to confluence:
Flow rates before confluence point:
      44.515      34.658      12.184
Maximum flow rates at confluence using above data:
       84.324       84.634       72.705
Area of streams before confluence:
       16.690       11.900        7.010
Effective area values after confluence:
       33.846       30.353       35.600


Results of confluence:
Total flow rate =     84.634(CFS)
Time of concentration =    11.663 min.
Effective stream area after confluence  =     30.353(Ac.)
Study area average Pervious fraction(Ap) =  0.284
Study area average soil loss rate(Fm) =    0.231(In/Hr)
Study area total =      35.60(Ac.)


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Process from Point/Station       12.200 to Point/Station       12.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   658.000(Ft.)
Downstream point/station elevation =   655.600(Ft.)
Pipe length  =   750.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    84.634(CFS)
Nearest computed pipe diameter  =     51.00(In.)
Calculated individual pipe flow  =    84.634(CFS)
Normal flow depth in pipe =   37.31(In.)
Flow top width inside pipe =   45.20(In.)
Critical Depth =   32.87(In.)
Pipe flow velocity =      7.60(Ft/s)
Travel time through pipe =    1.64 min.
Time of concentration (TC) =    13.31 min.
```

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Process from Point/Station       12.200 to Point/Station       12.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     30.353(Ac.)
Runoff from this stream =     84.634(CFS)
Time of concentration =   13.31 min.
Rainfall intensity =     2.962(In/Hr)
Area averaged loss rate (Fm) =    0.2314(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2838
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      801.000 to Point/Station      802.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.624(In/Hr)
Initial subarea data:
Initial area flow distance =   550.000(Ft.)
Top (of initial area) elevation =   684.500(Ft.)
Bottom (of initial area) elevation =   679.000(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   15.139 min.
Rainfall intensity =      2.742(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.695
Subarea runoff =      7.739(CFS)
Total initial stream area =        4.060(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.624(In/Hr)


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Process from Point/Station      802.000 to Point/Station      802.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
```

```
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Time of concentration =    15.14 min.
Rainfall intensity =      2.742(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.727
Subarea runoff =      2.089(CFS) for    0.870(Ac.)
Total runoff =      9.828(CFS)
Effective area this stream =        4.93(Ac.)
Total Study Area (Main Stream No. 2) =       40.53(Ac.)
Area averaged Fm value =    0.527(In/Hr)


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Process from Point/Station      802.000 to Point/Station       12.300
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   675.000(Ft.)
Downstream point/station elevation =   655.600(Ft.)
Pipe length  =   100.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.828(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     9.828(CFS)
Normal flow depth in pipe =    6.88(In.)
Flow top width inside pipe =   11.87(In.)
Critical depth could not be calculated.
Pipe flow velocity =     21.09(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    15.22 min.


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Process from Point/Station      802.000 to Point/Station       12.300
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      4.930(Ac.)
Runoff from this stream =      9.828(CFS)
Time of concentration =   15.22 min.
Rainfall intensity =     2.733(In/Hr)
Area averaged loss rate (Fm) =    0.5267(In/Hr)
Area averaged Pervious ratio (Ap) = 0.7176
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     84.63    30.353     13.31    0.231      2.962
2      9.83     4.930     15.22    0.527      2.733
Qmax(1) =
         1.000 *    1.000 *    84.634) +
         1.104 *    0.874 *     9.828) + =      94.120
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```
Qmax(2) =
         0.916 *    1.000 *    84.634) +
         1.000 *    1.000 *     9.828) + =      87.361

Total of 2 main streams to confluence:
Flow rates before confluence point:
      85.634      10.828
Maximum flow rates at confluence using above data:
       94.120       87.361
Area of streams before confluence:
       30.353        4.930
Effective area values after confluence:
       34.664       35.283


Results of confluence:
Total flow rate =     94.120(CFS)
Time of concentration =    13.307 min.
Effective stream area after confluence  =     34.664(Ac.)
Study area average Pervious fraction(Ap) =  0.344
Study area average soil loss rate(Fm) =    0.273(In/Hr)
Study area total =      35.28(Ac.)


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Process from Point/Station       12.300 to Point/Station       12.400
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   655.600(Ft.)
Downstream point/station elevation =   653.600(Ft.)
Pipe length  =   780.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    94.120(CFS)
Nearest computed pipe diameter  =     54.00(In.)
Calculated individual pipe flow  =    94.120(CFS)
Normal flow depth in pipe =   41.81(In.)
Flow top width inside pipe =   45.15(In.)
Critical Depth =   34.17(In.)
Pipe flow velocity =      7.12(Ft/s)
Travel time through pipe =    1.83 min.
Time of concentration (TC) =    15.13 min.


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Process from Point/Station       12.400 to Point/Station       12.500
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   653.600(Ft.)
Downstream point/station elevation =   652.000(Ft.)
Pipe length  =   311.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    94.120(CFS)
Nearest computed pipe diameter  =     48.00(In.)
Calculated individual pipe flow  =    94.120(CFS)
Normal flow depth in pipe =   36.05(In.)
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Flow top width inside pipe =   41.51(In.)
Critical Depth =   35.29(In.)
Pipe flow velocity =      9.29(Ft/s)
Travel time through pipe =    0.56 min.
Time of concentration (TC) =    15.69 min.


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Process from Point/Station       12.400 to Point/Station       12.500
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     34.664(Ac.)
Runoff from this stream =     94.120(CFS)
Time of concentration =   15.69 min.
Rainfall intensity =     2.683(In/Hr)
Area averaged loss rate (Fm) =    0.2727(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3444
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      810.000 to Point/Station      811.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   700.000(Ft.)
Top (of initial area) elevation =   675.000(Ft.)
Bottom (of initial area) elevation =   668.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.493 min.
Rainfall intensity =      3.416(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.886
Subarea runoff =     10.951(CFS)
Total initial stream area =        3.620(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


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Process from Point/Station      811.000 to Point/Station       12.500
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
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Upstream point/station elevation =   668.000(Ft.)
Downstream point/station elevation =   652.000(Ft.)
Pipe length  =   275.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.951(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    10.951(CFS)
Normal flow depth in pipe =    9.27(In.)
Flow top width inside pipe =   14.58(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.75(Ft/s)
Travel time through pipe =    0.33 min.
Time of concentration (TC) =    10.83 min.


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Process from Point/Station      811.000 to Point/Station       12.500
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.620(Ac.)
Runoff from this stream =     10.951(CFS)
Time of concentration =   10.83 min.
Rainfall intensity =     3.353(In/Hr)
Area averaged loss rate (Fm) =    0.0548(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min)  (In/Hr)     (In/Hr)


1     94.12    34.664     15.69    0.273      2.683
2     10.95     3.620     10.83    0.055      3.353
Qmax(1) =
         1.000 *    1.000 *    94.120) +
         0.797 *    1.000 *    10.951) + =     102.849
Qmax(2) =
         1.278 *    0.690 *    94.120) +
         1.000 *    1.000 *    10.951) + =      93.922

Total of 2 main streams to confluence:
Flow rates before confluence point:
      95.120      11.951
Maximum flow rates at confluence using above data:
      102.849       93.922
Area of streams before confluence:
       34.664        3.620
Effective area values after confluence:
       38.284       27.539


Results of confluence:
```

```
Total flow rate =    102.849(CFS)
Time of concentration =    15.690 min.
Effective stream area after confluence  =     38.284(Ac.)
Study area average Pervious fraction(Ap) =  0.321
Study area average soil loss rate(Fm) =    0.252(In/Hr)
Study area total =      38.28(Ac.)


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Process from Point/Station       12.500 to Point/Station       14.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   652.000(Ft.)
Downstream point/station elevation =   651.200(Ft.)
Pipe length  =   161.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   102.849(CFS)
Nearest computed pipe diameter  =     51.00(In.)
Calculated individual pipe flow  =   102.849(CFS)
Normal flow depth in pipe =   36.56(In.)
Flow top width inside pipe =   45.95(In.)
Critical Depth =   36.34(In.)
Pipe flow velocity =      9.44(Ft/s)
Travel time through pipe =    0.28 min.
Time of concentration (TC) =    15.97 min.


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Process from Point/Station       12.500 to Point/Station       14.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     38.284(Ac.)
Runoff from this stream =    102.849(CFS)
Time of concentration =   15.97 min.
Rainfall intensity =     2.655(In/Hr)
Area averaged loss rate (Fm) =    0.2521(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3213
Program is now starting with Main Stream No. 2


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Process from Point/Station      817.000 to Point/Station      818.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.100
Decimal fraction soil group C = 0.900
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 67.70
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.057(In/Hr)
Initial subarea data:
```

```
Initial area flow distance =   750.000(Ft.)
Top (of initial area) elevation =   676.500(Ft.)
Bottom (of initial area) elevation =   669.000(Ft.)
Difference in elevation =     7.500(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.787 min.
Rainfall intensity =      3.360(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.885
Subarea runoff =     23.605(CFS)
Total initial stream area =        7.940(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.057(In/Hr)


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Process from Point/Station      818.000 to Point/Station       14.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   665.000(Ft.)
Downstream point/station elevation =   651.200(Ft.)
Pipe length  =    77.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    23.605(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    23.605(CFS)
Normal flow depth in pipe =   10.76(In.)
Flow top width inside pipe =   13.51(In.)
Critical depth could not be calculated.
Pipe flow velocity =     25.08(Ft/s)
Travel time through pipe =    0.05 min.
Time of concentration (TC) =    10.84 min.


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Process from Point/Station      818.000 to Point/Station       14.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      7.940(Ac.)
Runoff from this stream =     23.605(CFS)
Time of concentration =   10.84 min.
Rainfall intensity =     3.350(In/Hr)
Area averaged loss rate (Fm) =    0.0568(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


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Process from Point/Station      812.000 to Point/Station      813.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
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```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   570.000(Ft.)
Top (of initial area) elevation =   673.700(Ft.)
Bottom (of initial area) elevation =   668.000(Ft.)
Difference in elevation =     5.700(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.665 min.
Rainfall intensity =      3.589(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.886
Subarea runoff =      4.262(CFS)
Total initial stream area =        1.340(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


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Process from Point/Station      813.000 to Point/Station      813.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.480
Decimal fraction soil group C = 0.520
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 62.76
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.064(In/Hr)
Time of concentration =     9.67 min.
Rainfall intensity =      3.589(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.885
Subarea runoff =      4.600(CFS) for    1.450(Ac.)
Total runoff =      8.862(CFS)
Effective area this stream =        2.79(Ac.)
Total Study Area (Main Stream No. 3) =       54.88(Ac.)
Area averaged Fm value =    0.060(In/Hr)


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Process from Point/Station      813.000 to Point/Station       14.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   664.000(Ft.)
Downstream point/station elevation =   651.200(Ft.)
Pipe length  =    39.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.862(CFS)
Nearest computed pipe diameter  =      9.00(In.)
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Calculated individual pipe flow  =     8.862(CFS)
Normal flow depth in pipe =    6.90(In.)
Flow top width inside pipe =    7.61(In.)
Critical depth could not be calculated.
Pipe flow velocity =     24.38(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =     9.69 min.


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Process from Point/Station      813.000 to Point/Station       14.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      2.790(Ac.)
Runoff from this stream =      8.862(CFS)
Time of concentration =    9.69 min.
Rainfall intensity =     3.583(In/Hr)
Area averaged loss rate (Fm) =    0.0596(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    102.85    38.284     15.97    0.252      2.655
2     23.60     7.940     10.84    0.057      3.350
3      8.86     2.790      9.69    0.060      3.583
Qmax(1) =
         1.000 *    1.000 *   102.849) +
         0.789 *    1.000 *    23.605) +
         0.737 *    1.000 *     8.862) + =     127.995
Qmax(2) =
         1.290 *    0.678 *   102.849) +
         1.000 *    1.000 *    23.605) +
         0.934 *    1.000 *     8.862) + =     121.867
Qmax(3) =
         1.386 *    0.607 *   102.849) +
         1.071 *    0.894 *    23.605) +
         1.000 *    1.000 *     8.862) + =     117.965

Total of 3 main streams to confluence:
Flow rates before confluence point:
     103.849      24.605       9.862
Maximum flow rates at confluence using above data:
      127.995      121.867      117.965
Area of streams before confluence:
       38.284        7.940        2.790
Effective area values after confluence:
       49.014       36.704       33.118
```

Results of confluence:
Total flow rate = 127.995(CFS)
Time of concentration = 15.974 min.
Effective stream area after confluence = 49.014(Ac.)
Study area average Pervious fraction(Ap) = 0.273
Study area average soil loss rate(Fm) = 0.209(In/Hr)
Study area total = 49.01(Ac.)
End of computations, Total Study Area = 54.88 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.275
Area averaged SCS curve number = 53.6

# APPENDIX D.3: RATIONAL METHOD ANALYSIS, CAMPUS ONSITE MITIGATED, AREA G2

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2014 Version 9.0
Rational Hydrology Study Date: 05/07/25

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ONTARIO RANCH 108.43.25
ONSITE RATIONAL METHOD HYDROLOGY
AREA G2, 100 YEAR STORM EVENT
FN: RARG2100P

---

Program License Serial Number 6279

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********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.200 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 803.000 to Point/Station 804.000
**** INITIAL AREA EVALUATION ****

COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.940
Decimal fraction soil group C = 0.060
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 56.78
Pervious ratio(Ap) = 0.1000 Max loss rate(Fm)= 0.072(In/Hr)
Initial subarea data:
Initial area flow distance = 550.000(Ft.)
Top (of initial area) elevation = 679.500(Ft.)
Bottom (of initial area) elevation = 674.000(Ft.)
Difference in elevation = 5.500(Ft.)
Slope = 0.01000 s(%)= 1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 9.528 min.
Rainfall intensity = 3.620(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff = 8.396(CFS)
Total initial stream area = 2.630(Ac.)
Pervious area fraction = 0.100
Initial area Fm value = 0.072(In/Hr)

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      804.000 to Point/Station      809.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   670.000(Ft.)
Downstream point/station elevation =   667.500(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.396(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     8.396(CFS)
Normal flow depth in pipe =    8.24(In.)
Flow top width inside pipe =   11.13(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.60(Ft/s)
Travel time through pipe =    0.03 min.
Time of concentration (TC) =     9.56 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      804.000 to Point/Station      809.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      2.630(Ac.)
Runoff from this stream =      8.396(CFS)
Time of concentration =    9.56 min.
Rainfall intensity =     3.612(In/Hr)
Area averaged loss rate (Fm) =    0.0724(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      805.000 to Point/Station      806.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.073(In/Hr)
Initial subarea data:
Initial area flow distance =   300.000(Ft.)
Top (of initial area) elevation =   677.000(Ft.)
Bottom (of initial area) elevation =   674.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.01000  s(%)=       1.00
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
```

```
Initial area time of concentration =    7.477 min.
Rainfall intensity =      4.186(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.884
Subarea runoff =      4.553(CFS)
Total initial stream area =        1.230(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.073(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      806.000 to Point/Station      809.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   670.000(Ft.)
Downstream point/station elevation =   667.500(Ft.)
Pipe length  =    30.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.553(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     4.553(CFS)
Normal flow depth in pipe =    7.03(In.)
Flow top width inside pipe =    7.44(In.)
Critical depth could not be calculated.
Pipe flow velocity =     12.31(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     7.52 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      806.000 to Point/Station      809.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.230(Ac.)
Runoff from this stream =      4.553(CFS)
Time of concentration =    7.52 min.
Rainfall intensity =     4.173(In/Hr)
Area averaged loss rate (Fm) =    0.0734(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      807.000 to Point/Station      808.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.180
Decimal fraction soil group C = 0.820
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 66.66
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.058(In/Hr)
```

```
Initial subarea data:
Initial area flow distance =   390.000(Ft.)
Top (of initial area) elevation =   676.000(Ft.)
Bottom (of initial area) elevation =   672.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.01026  s(%)=       1.03
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.262 min.
Rainfall intensity =      3.943(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.887
Subarea runoff =     18.949(CFS)
Total initial stream area =        5.420(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.058(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      808.000 to Point/Station      809.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   668.000(Ft.)
Downstream point/station elevation =   667.500(Ft.)
Pipe length  =    38.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    18.949(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    18.949(CFS)
Normal flow depth in pipe =   15.23(In.)
Flow top width inside pipe =   23.11(In.)
Critical Depth =   18.81(In.)
Pipe flow velocity =      9.02(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     8.33 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      808.000 to Point/Station      809.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      5.420(Ac.)
Runoff from this stream =     18.949(CFS)
Time of concentration =    8.33 min.
Rainfall intensity =     3.923(In/Hr)
Area averaged loss rate (Fm) =    0.0583(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1      8.40     2.630      9.56    0.072      3.612
```

```
2      4.55     1.230      7.52    0.073      4.173
3     18.95     5.420      8.33    0.058      3.923
Qmax(1) =
         1.000 *    1.000 *     8.396) +
         0.863 *    1.000 *     4.553) +
         0.920 *    1.000 *    18.949) + =      29.750
Qmax(2) =
         1.158 *    0.786 *     8.396) +
         1.000 *    1.000 *     4.553) +
         1.065 *    0.902 *    18.949) + =      30.401
Qmax(3) =
         1.088 *    0.871 *     8.396) +
         0.939 *    1.000 *     4.553) +
         1.000 *    1.000 *    18.949) + =      31.183

Total of 3 main streams to confluence:
Flow rates before confluence point:
       9.396       5.553      19.949
Maximum flow rates at confluence using above data:
       29.750       30.401       31.183
Area of streams before confluence:
        2.630        1.230        5.420
Effective area values after confluence:
        9.280        8.187        8.942


Results of confluence:
Total flow rate =     31.183(CFS)
Time of concentration =     8.333 min.
Effective stream area after confluence  =      8.942(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.064(In/Hr)
Study area total =       9.28(Ac.)
End of computations, Total Study Area =            9.28 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged SCS curve number =  62.4
```

# APPENDIX D.4: UNIT HYDROGRAPH ANALYSIS, CAMPUS ONSITE MITIGATED, AREA G2

U n i t  H y d r o g r a p h  A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2014, Version 9.0

Study date 05/09/25

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San Bernardino County Synthetic Unit Hydrology Method
Manual date - August 1986

Program License Serial Number 6279

---
ONTARIO RANCH 108.43.25
COMMERCIAL MITIGATED UNIT HYDROGRAPH METHOD HYDROLOGY
AREA G2, 100-YEAR STORM EVENT
FN: UARG2P
---

Storm Event Year = 100

Antecedent Moisture Condition = 2

English (in-lb) Input Units Used

English Rainfall Data (Inches) Input Values Used

English Units used in output format

Area averaged rainfall intensity isohyetal data:

| Sub-Area (Ac.) | Duration (hours) | Isohyetal (In) |
|---|---|---|
| Rainfall data for year 100 | | |
| 9.28 | 1 | 1.20 |
| Rainfall data for year 100 | | |
| 9.28 | 6 | 3.00 |
| Rainfall data for year 100 | | |
| 9.28 | 24 | 6.00 |

---
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

******** Area-averaged max loss rate, Fm ********

| SCS curve No.(AMCII) | SCS curve NO.(AMC 2) | Area (Ac.) | Area Fraction | Fp(Fig C6) (In/Hr) | Ap (dec.) | Fm (In/Hr) |
|---|---|---|---|---|---|---|
| 62.4 | 62.4 | 9.28 | 1.000 | 0.646 | 0.100 | 0.065 |

Area-averaged adjusted loss rate Fm (In/Hr) = 0.065

********* Area-Averaged low loss rate fraction, Yb **********

| Area (Ac.) | Area Fract | SCS CN (AMC2) | SCS CN (AMC2) | S | Pervious Yield Fr |
|---|---|---|---|---|---|
| 0.93 | 0.100 | 62.4 | 62.4 | 6.03 | 0.354 |
| 8.35 | 0.900 | 98.0 | 98.0 | 0.20 | 0.960 |

Area-averaged catchment yield fraction, Y = 0.900
Area-averaged low loss fraction, Yb = 0.100
User entry of time of concentration = 0.139 (hours)
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Watershed area = 9.28(Ac.)
Catchment Lag time = 0.111 hours
Unit interval = 5.000 minutes
Unit interval percentage of lag time = 74.9940
Hydrograph baseflow = 0.00(CFS)
Average maximum watershed loss rate(Fm) = 0.064(In/Hr)
Average low loss rate fraction (Yb) = 0.100 (decimal)
Note: user entry of the Fm value
VALLEY DEVELOPED S-Graph Selected
Computed peak 5-minute rainfall = 0.444(In)
Computed peak 30-minute rainfall = 0.909(In)
Specified peak 1-hour rainfall = 1.200(In)
Computed peak 3-hour rainfall = 2.105(In)
Specified peak 6-hour rainfall = 3.000(In)
Specified peak 24-hour rainfall = 6.000(In)

Rainfall depth area reduction factors:
Using a total area of 9.28(Ac.) (Ref: fig. E-4)

5-minute factor = 1.000 Adjusted rainfall = 0.444(In)
30-minute factor = 1.000 Adjusted rainfall = 0.909(In)
1-hour factor = 1.000 Adjusted rainfall = 1.199(In)
3-hour factor = 1.000 Adjusted rainfall = 2.105(In)
6-hour factor = 1.000 Adjusted rainfall = 3.000(In)
24-hour factor = 1.000 Adjusted rainfall = 6.000(In)
---

U n i t H y d r o g r a p h
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

| Interval Number | 'S' Graph Mean values | Unit Hydrograph ((CFS)) |
|---|---|---|

---
(K = 112.23 (CFS))

| | | |
|---|---|---|
| 1 | 10.006 | 11.230 |
| 2 | 58.771 | 54.730 |
| 3 | 91.994 | 37.285 |
| 4 | 98.466 | 7.264 |
| 5 | 100.000 | 1.721 |

| Peak Unit Number | Adjusted mass rainfall (In) | Unit rainfall (In) |
|---|---|---|
| 1 | 0.4439 | 0.4439 |
| 2 | 0.5858 | 0.1418 |
| 3 | 0.6889 | 0.1031 |
| 4 | 0.7729 | 0.0840 |
| 5 | 0.8451 | 0.0722 |
| 6 | 0.9090 | 0.0639 |
| 7 | 0.9668 | 0.0578 |
| 8 | 1.0199 | 0.0530 |
| 9 | 1.0691 | 0.0492 |
| 10 | 1.1151 | 0.0460 |
| 11 | 1.1584 | 0.0433 |
| 12 | 1.1995 | 0.0410 |
| 13 | 1.2496 | 0.0502 |
| 14 | 1.2979 | 0.0483 |
| 15 | 1.3446 | 0.0466 |
| 16 | 1.3897 | 0.0451 |
| 17 | 1.4335 | 0.0438 |
| 18 | 1.4761 | 0.0425 |
| 19 | 1.5175 | 0.0414 |
| 20 | 1.5578 | 0.0404 |
| 21 | 1.5972 | 0.0394 |
| 22 | 1.6357 | 0.0385 |
| 23 | 1.6733 | 0.0376 |
| 24 | 1.7102 | 0.0368 |
| 25 | 1.7463 | 0.0361 |
| 26 | 1.7817 | 0.0354 |
| 27 | 1.8164 | 0.0347 |
| 28 | 1.8505 | 0.0341 |
| 29 | 1.8841 | 0.0335 |
| 30 | 1.9170 | 0.0330 |
| 31 | 1.9495 | 0.0324 |
| 32 | 1.9814 | 0.0319 |
| 33 | 2.0129 | 0.0314 |
| 34 | 2.0439 | 0.0310 |
| 35 | 2.0744 | 0.0305 |
| 36 | 2.1045 | 0.0301 |
| 37 | 2.1342 | 0.0297 |
| 38 | 2.1635 | 0.0293 |
| 39 | 2.1925 | 0.0289 |
| 40 | 2.2210 | 0.0286 |
| 41 | 2.2493 | 0.0282 |
| 42 | 2.2772 | 0.0279 |
| 43 | 2.3047 | 0.0276 |
| 44 | 2.3320 | 0.0273 |
| 45 | 2.3589 | 0.0270 |

| | | |
|---|---|---|
| 46 | 2.3856 | 0.0267 |
| 47 | 2.4120 | 0.0264 |
| 48 | 2.4381 | 0.0261 |
| 49 | 2.4639 | 0.0258 |
| 50 | 2.4895 | 0.0256 |
| 51 | 2.5149 | 0.0253 |
| 52 | 2.5400 | 0.0251 |
| 53 | 2.5648 | 0.0249 |
| 54 | 2.5895 | 0.0246 |
| 55 | 2.6139 | 0.0244 |
| 56 | 2.6381 | 0.0242 |
| 57 | 2.6621 | 0.0240 |
| 58 | 2.6859 | 0.0238 |
| 59 | 2.7094 | 0.0236 |
| 60 | 2.7328 | 0.0234 |
| 61 | 2.7560 | 0.0232 |
| 62 | 2.7790 | 0.0230 |
| 63 | 2.8019 | 0.0228 |
| 64 | 2.8245 | 0.0227 |
| 65 | 2.8470 | 0.0225 |
| 66 | 2.8693 | 0.0223 |
| 67 | 2.8915 | 0.0222 |
| 68 | 2.9135 | 0.0220 |
| 69 | 2.9353 | 0.0218 |
| 70 | 2.9570 | 0.0217 |
| 71 | 2.9785 | 0.0215 |
| 72 | 2.9999 | 0.0214 |
| 73 | 3.0207 | 0.0208 |
| 74 | 3.0413 | 0.0206 |
| 75 | 3.0618 | 0.0205 |
| 76 | 3.0821 | 0.0203 |
| 77 | 3.1023 | 0.0202 |
| 78 | 3.1224 | 0.0201 |
| 79 | 3.1424 | 0.0200 |
| 80 | 3.1622 | 0.0198 |
| 81 | 3.1819 | 0.0197 |
| 82 | 3.2015 | 0.0196 |
| 83 | 3.2209 | 0.0195 |
| 84 | 3.2403 | 0.0193 |
| 85 | 3.2595 | 0.0192 |
| 86 | 3.2786 | 0.0191 |
| 87 | 3.2976 | 0.0190 |
| 88 | 3.3165 | 0.0189 |
| 89 | 3.3353 | 0.0188 |
| 90 | 3.3540 | 0.0187 |
| 91 | 3.3726 | 0.0186 |
| 92 | 3.3911 | 0.0185 |
| 93 | 3.4095 | 0.0184 |
| 94 | 3.4277 | 0.0183 |
| 95 | 3.4459 | 0.0182 |
| 96 | 3.4640 | 0.0181 |
| 97 | 3.4820 | 0.0180 |
| 98 | 3.4999 | 0.0179 |

| | | |
|---|---|---|
| 99 | 3.5177 | 0.0178 |
| 100 | 3.5354 | 0.0177 |
| 101 | 3.5531 | 0.0176 |
| 102 | 3.5706 | 0.0175 |
| 103 | 3.5881 | 0.0175 |
| 104 | 3.6055 | 0.0174 |
| 105 | 3.6228 | 0.0173 |
| 106 | 3.6400 | 0.0172 |
| 107 | 3.6571 | 0.0171 |
| 108 | 3.6741 | 0.0170 |
| 109 | 3.6911 | 0.0170 |
| 110 | 3.7080 | 0.0169 |
| 111 | 3.7248 | 0.0168 |
| 112 | 3.7416 | 0.0167 |
| 113 | 3.7582 | 0.0167 |
| 114 | 3.7748 | 0.0166 |
| 115 | 3.7914 | 0.0165 |
| 116 | 3.8078 | 0.0164 |
| 117 | 3.8242 | 0.0164 |
| 118 | 3.8405 | 0.0163 |
| 119 | 3.8567 | 0.0162 |
| 120 | 3.8729 | 0.0162 |
| 121 | 3.8890 | 0.0161 |
| 122 | 3.9050 | 0.0160 |
| 123 | 3.9210 | 0.0160 |
| 124 | 3.9369 | 0.0159 |
| 125 | 3.9528 | 0.0158 |
| 126 | 3.9685 | 0.0158 |
| 127 | 3.9843 | 0.0157 |
| 128 | 3.9999 | 0.0157 |
| 129 | 4.0155 | 0.0156 |
| 130 | 4.0310 | 0.0155 |
| 131 | 4.0465 | 0.0155 |
| 132 | 4.0619 | 0.0154 |
| 133 | 4.0773 | 0.0154 |
| 134 | 4.0926 | 0.0153 |
| 135 | 4.1078 | 0.0152 |
| 136 | 4.1230 | 0.0152 |
| 137 | 4.1381 | 0.0151 |
| 138 | 4.1532 | 0.0151 |
| 139 | 4.1682 | 0.0150 |
| 140 | 4.1832 | 0.0150 |
| 141 | 4.1981 | 0.0149 |
| 142 | 4.2130 | 0.0149 |
| 143 | 4.2278 | 0.0148 |
| 144 | 4.2426 | 0.0148 |
| 145 | 4.2573 | 0.0147 |
| 146 | 4.2719 | 0.0147 |
| 147 | 4.2865 | 0.0146 |
| 148 | 4.3011 | 0.0146 |
| 149 | 4.3156 | 0.0145 |
| 150 | 4.3300 | 0.0145 |
| 151 | 4.3445 | 0.0144 |

| | | |
|---|---|---|
| 152 | 4.3588 | 0.0144 |
| 153 | 4.3731 | 0.0143 |
| 154 | 4.3874 | 0.0143 |
| 155 | 4.4016 | 0.0142 |
| 156 | 4.4158 | 0.0142 |
| 157 | 4.4299 | 0.0141 |
| 158 | 4.4440 | 0.0141 |
| 159 | 4.4581 | 0.0140 |
| 160 | 4.4721 | 0.0140 |
| 161 | 4.4860 | 0.0140 |
| 162 | 4.4999 | 0.0139 |
| 163 | 4.5138 | 0.0139 |
| 164 | 4.5276 | 0.0138 |
| 165 | 4.5414 | 0.0138 |
| 166 | 4.5551 | 0.0137 |
| 167 | 4.5688 | 0.0137 |
| 168 | 4.5825 | 0.0137 |
| 169 | 4.5961 | 0.0136 |
| 170 | 4.6097 | 0.0136 |
| 171 | 4.6232 | 0.0135 |
| 172 | 4.6367 | 0.0135 |
| 173 | 4.6502 | 0.0135 |
| 174 | 4.6636 | 0.0134 |
| 175 | 4.6770 | 0.0134 |
| 176 | 4.6903 | 0.0133 |
| 177 | 4.7036 | 0.0133 |
| 178 | 4.7169 | 0.0133 |
| 179 | 4.7301 | 0.0132 |
| 180 | 4.7433 | 0.0132 |
| 181 | 4.7565 | 0.0132 |
| 182 | 4.7696 | 0.0131 |
| 183 | 4.7827 | 0.0131 |
| 184 | 4.7957 | 0.0131 |
| 185 | 4.8088 | 0.0130 |
| 186 | 4.8217 | 0.0130 |
| 187 | 4.8347 | 0.0129 |
| 188 | 4.8476 | 0.0129 |
| 189 | 4.8605 | 0.0129 |
| 190 | 4.8733 | 0.0128 |
| 191 | 4.8861 | 0.0128 |
| 192 | 4.8989 | 0.0128 |
| 193 | 4.9116 | 0.0127 |
| 194 | 4.9243 | 0.0127 |
| 195 | 4.9370 | 0.0127 |
| 196 | 4.9497 | 0.0126 |
| 197 | 4.9623 | 0.0126 |
| 198 | 4.9749 | 0.0126 |
| 199 | 4.9874 | 0.0125 |
| 200 | 4.9999 | 0.0125 |
| 201 | 5.0124 | 0.0125 |
| 202 | 5.0249 | 0.0125 |
| 203 | 5.0373 | 0.0124 |
| 204 | 5.0497 | 0.0124 |

| | | |
|---|---|---|
| 205 | 5.0620 | 0.0124 |
| 206 | 5.0744 | 0.0123 |
| 207 | 5.0867 | 0.0123 |
| 208 | 5.0989 | 0.0123 |
| 209 | 5.1112 | 0.0122 |
| 210 | 5.1234 | 0.0122 |
| 211 | 5.1356 | 0.0122 |
| 212 | 5.1477 | 0.0122 |
| 213 | 5.1599 | 0.0121 |
| 214 | 5.1720 | 0.0121 |
| 215 | 5.1840 | 0.0121 |
| 216 | 5.1961 | 0.0120 |
| 217 | 5.2081 | 0.0120 |
| 218 | 5.2201 | 0.0120 |
| 219 | 5.2320 | 0.0120 |
| 220 | 5.2440 | 0.0119 |
| 221 | 5.2559 | 0.0119 |
| 222 | 5.2677 | 0.0119 |
| 223 | 5.2796 | 0.0119 |
| 224 | 5.2914 | 0.0118 |
| 225 | 5.3032 | 0.0118 |
| 226 | 5.3150 | 0.0118 |
| 227 | 5.3267 | 0.0117 |
| 228 | 5.3385 | 0.0117 |
| 229 | 5.3502 | 0.0117 |
| 230 | 5.3618 | 0.0117 |
| 231 | 5.3735 | 0.0116 |
| 232 | 5.3851 | 0.0116 |
| 233 | 5.3967 | 0.0116 |
| 234 | 5.4083 | 0.0116 |
| 235 | 5.4198 | 0.0115 |
| 236 | 5.4313 | 0.0115 |
| 237 | 5.4428 | 0.0115 |
| 238 | 5.4543 | 0.0115 |
| 239 | 5.4657 | 0.0114 |
| 240 | 5.4771 | 0.0114 |
| 241 | 5.4885 | 0.0114 |
| 242 | 5.4999 | 0.0114 |
| 243 | 5.5113 | 0.0114 |
| 244 | 5.5226 | 0.0113 |
| 245 | 5.5339 | 0.0113 |
| 246 | 5.5452 | 0.0113 |
| 247 | 5.5565 | 0.0113 |
| 248 | 5.5677 | 0.0112 |
| 249 | 5.5789 | 0.0112 |
| 250 | 5.5901 | 0.0112 |
| 251 | 5.6013 | 0.0112 |
| 252 | 5.6124 | 0.0111 |
| 253 | 5.6235 | 0.0111 |
| 254 | 5.6346 | 0.0111 |
| 255 | 5.6457 | 0.0111 |
| 256 | 5.6568 | 0.0111 |
| 257 | 5.6678 | 0.0110 |

| | | |
|---|---|---|
| 258 | 5.6788 | 0.0110 |
| 259 | 5.6898 | 0.0110 |
| 260 | 5.7008 | 0.0110 |
| 261 | 5.7118 | 0.0110 |
| 262 | 5.7227 | 0.0109 |
| 263 | 5.7336 | 0.0109 |
| 264 | 5.7445 | 0.0109 |
| 265 | 5.7554 | 0.0109 |
| 266 | 5.7662 | 0.0108 |
| 267 | 5.7770 | 0.0108 |
| 268 | 5.7878 | 0.0108 |
| 269 | 5.7986 | 0.0108 |
| 270 | 5.8094 | 0.0108 |
| 271 | 5.8202 | 0.0107 |
| 272 | 5.8309 | 0.0107 |
| 273 | 5.8416 | 0.0107 |
| 274 | 5.8523 | 0.0107 |
| 275 | 5.8629 | 0.0107 |
| 276 | 5.8736 | 0.0107 |
| 277 | 5.8842 | 0.0106 |
| 278 | 5.8948 | 0.0106 |
| 279 | 5.9054 | 0.0106 |
| 280 | 5.9160 | 0.0106 |
| 281 | 5.9266 | 0.0106 |
| 282 | 5.9371 | 0.0105 |
| 283 | 5.9476 | 0.0105 |
| 284 | 5.9581 | 0.0105 |
| 285 | 5.9686 | 0.0105 |
| 286 | 5.9791 | 0.0105 |
| 287 | 5.9895 | 0.0104 |
| 288 | 5.9999 | 0.0104 |

| Unit Period (number) | Unit Rainfall (In) | Unit Soil-Loss (In) | Effective Rainfall (In) |
|---|---|---|---|
| 1 | 0.0104 | 0.0010 | 0.0094 |
| 2 | 0.0104 | 0.0010 | 0.0094 |
| 3 | 0.0105 | 0.0011 | 0.0094 |
| 4 | 0.0105 | 0.0011 | 0.0094 |
| 5 | 0.0105 | 0.0011 | 0.0095 |
| 6 | 0.0106 | 0.0011 | 0.0095 |
| 7 | 0.0106 | 0.0011 | 0.0095 |
| 8 | 0.0106 | 0.0011 | 0.0095 |
| 9 | 0.0107 | 0.0011 | 0.0096 |
| 10 | 0.0107 | 0.0011 | 0.0096 |
| 11 | 0.0107 | 0.0011 | 0.0096 |
| 12 | 0.0107 | 0.0011 | 0.0097 |
| 13 | 0.0108 | 0.0011 | 0.0097 |
| 14 | 0.0108 | 0.0011 | 0.0097 |
| 15 | 0.0108 | 0.0011 | 0.0097 |
| 16 | 0.0108 | 0.0011 | 0.0098 |
| 17 | 0.0109 | 0.0011 | 0.0098 |

| | | | |
|---|---|---|---|
| 18 | 0.0109 | 0.0011 | 0.0098 |
| 19 | 0.0110 | 0.0011 | 0.0099 |
| 20 | 0.0110 | 0.0011 | 0.0099 |
| 21 | 0.0110 | 0.0011 | 0.0099 |
| 22 | 0.0110 | 0.0011 | 0.0099 |
| 23 | 0.0111 | 0.0011 | 0.0100 |
| 24 | 0.0111 | 0.0011 | 0.0100 |
| 25 | 0.0111 | 0.0011 | 0.0100 |
| 26 | 0.0112 | 0.0011 | 0.0100 |
| 27 | 0.0112 | 0.0011 | 0.0101 |
| 28 | 0.0112 | 0.0011 | 0.0101 |
| 29 | 0.0113 | 0.0011 | 0.0102 |
| 30 | 0.0113 | 0.0011 | 0.0102 |
| 31 | 0.0114 | 0.0011 | 0.0102 |
| 32 | 0.0114 | 0.0011 | 0.0102 |
| 33 | 0.0114 | 0.0011 | 0.0103 |
| 34 | 0.0114 | 0.0011 | 0.0103 |
| 35 | 0.0115 | 0.0012 | 0.0103 |
| 36 | 0.0115 | 0.0012 | 0.0104 |
| 37 | 0.0116 | 0.0012 | 0.0104 |
| 38 | 0.0116 | 0.0012 | 0.0104 |
| 39 | 0.0116 | 0.0012 | 0.0105 |
| 40 | 0.0117 | 0.0012 | 0.0105 |
| 41 | 0.0117 | 0.0012 | 0.0105 |
| 42 | 0.0117 | 0.0012 | 0.0106 |
| 43 | 0.0118 | 0.0012 | 0.0106 |
| 44 | 0.0118 | 0.0012 | 0.0106 |
| 45 | 0.0119 | 0.0012 | 0.0107 |
| 46 | 0.0119 | 0.0012 | 0.0107 |
| 47 | 0.0120 | 0.0012 | 0.0108 |
| 48 | 0.0120 | 0.0012 | 0.0108 |
| 49 | 0.0120 | 0.0012 | 0.0108 |
| 50 | 0.0121 | 0.0012 | 0.0109 |
| 51 | 0.0121 | 0.0012 | 0.0109 |
| 52 | 0.0122 | 0.0012 | 0.0109 |
| 53 | 0.0122 | 0.0012 | 0.0110 |
| 54 | 0.0122 | 0.0012 | 0.0110 |
| 55 | 0.0123 | 0.0012 | 0.0111 |
| 56 | 0.0123 | 0.0012 | 0.0111 |
| 57 | 0.0124 | 0.0012 | 0.0111 |
| 58 | 0.0124 | 0.0012 | 0.0112 |
| 59 | 0.0125 | 0.0013 | 0.0112 |
| 60 | 0.0125 | 0.0013 | 0.0113 |
| 61 | 0.0126 | 0.0013 | 0.0113 |
| 62 | 0.0126 | 0.0013 | 0.0113 |
| 63 | 0.0127 | 0.0013 | 0.0114 |
| 64 | 0.0127 | 0.0013 | 0.0114 |
| 65 | 0.0128 | 0.0013 | 0.0115 |
| 66 | 0.0128 | 0.0013 | 0.0115 |
| 67 | 0.0129 | 0.0013 | 0.0116 |
| 68 | 0.0129 | 0.0013 | 0.0116 |
| 69 | 0.0130 | 0.0013 | 0.0117 |
| 70 | 0.0130 | 0.0013 | 0.0117 |

| | | | |
|---|---|---|---|
| 71 | 0.0131 | 0.0013 | 0.0118 |
| 72 | 0.0131 | 0.0013 | 0.0118 |
| 73 | 0.0132 | 0.0013 | 0.0119 |
| 74 | 0.0132 | 0.0013 | 0.0119 |
| 75 | 0.0133 | 0.0013 | 0.0120 |
| 76 | 0.0133 | 0.0013 | 0.0120 |
| 77 | 0.0134 | 0.0013 | 0.0121 |
| 78 | 0.0135 | 0.0014 | 0.0121 |
| 79 | 0.0135 | 0.0014 | 0.0122 |
| 80 | 0.0136 | 0.0014 | 0.0122 |
| 81 | 0.0137 | 0.0014 | 0.0123 |
| 82 | 0.0137 | 0.0014 | 0.0123 |
| 83 | 0.0138 | 0.0014 | 0.0124 |
| 84 | 0.0138 | 0.0014 | 0.0124 |
| 85 | 0.0139 | 0.0014 | 0.0125 |
| 86 | 0.0140 | 0.0014 | 0.0126 |
| 87 | 0.0140 | 0.0014 | 0.0126 |
| 88 | 0.0141 | 0.0014 | 0.0127 |
| 89 | 0.0142 | 0.0014 | 0.0128 |
| 90 | 0.0142 | 0.0014 | 0.0128 |
| 91 | 0.0143 | 0.0014 | 0.0129 |
| 92 | 0.0144 | 0.0014 | 0.0129 |
| 93 | 0.0145 | 0.0015 | 0.0130 |
| 94 | 0.0145 | 0.0015 | 0.0131 |
| 95 | 0.0146 | 0.0015 | 0.0131 |
| 96 | 0.0147 | 0.0015 | 0.0132 |
| 97 | 0.0148 | 0.0015 | 0.0133 |
| 98 | 0.0148 | 0.0015 | 0.0133 |
| 99 | 0.0149 | 0.0015 | 0.0134 |
| 100 | 0.0150 | 0.0015 | 0.0135 |
| 101 | 0.0151 | 0.0015 | 0.0136 |
| 102 | 0.0151 | 0.0015 | 0.0136 |
| 103 | 0.0152 | 0.0015 | 0.0137 |
| 104 | 0.0153 | 0.0015 | 0.0138 |
| 105 | 0.0154 | 0.0015 | 0.0139 |
| 106 | 0.0155 | 0.0016 | 0.0139 |
| 107 | 0.0156 | 0.0016 | 0.0140 |
| 108 | 0.0157 | 0.0016 | 0.0141 |
| 109 | 0.0158 | 0.0016 | 0.0142 |
| 110 | 0.0158 | 0.0016 | 0.0143 |
| 111 | 0.0160 | 0.0016 | 0.0144 |
| 112 | 0.0160 | 0.0016 | 0.0144 |
| 113 | 0.0162 | 0.0016 | 0.0145 |
| 114 | 0.0162 | 0.0016 | 0.0146 |
| 115 | 0.0164 | 0.0016 | 0.0147 |
| 116 | 0.0164 | 0.0016 | 0.0148 |
| 117 | 0.0166 | 0.0017 | 0.0149 |
| 118 | 0.0167 | 0.0017 | 0.0150 |
| 119 | 0.0168 | 0.0017 | 0.0151 |
| 120 | 0.0169 | 0.0017 | 0.0152 |
| 121 | 0.0170 | 0.0017 | 0.0153 |
| 122 | 0.0171 | 0.0017 | 0.0154 |
| 123 | 0.0173 | 0.0017 | 0.0156 |

| | | | |
|---|---|---|---|
| 124 | 0.0174 | 0.0017 | 0.0156 |
| 125 | 0.0175 | 0.0018 | 0.0158 |
| 126 | 0.0176 | 0.0018 | 0.0159 |
| 127 | 0.0178 | 0.0018 | 0.0160 |
| 128 | 0.0179 | 0.0018 | 0.0161 |
| 129 | 0.0181 | 0.0018 | 0.0163 |
| 130 | 0.0182 | 0.0018 | 0.0164 |
| 131 | 0.0184 | 0.0018 | 0.0165 |
| 132 | 0.0185 | 0.0019 | 0.0166 |
| 133 | 0.0187 | 0.0019 | 0.0168 |
| 134 | 0.0188 | 0.0019 | 0.0169 |
| 135 | 0.0190 | 0.0019 | 0.0171 |
| 136 | 0.0191 | 0.0019 | 0.0172 |
| 137 | 0.0193 | 0.0019 | 0.0174 |
| 138 | 0.0195 | 0.0020 | 0.0175 |
| 139 | 0.0197 | 0.0020 | 0.0177 |
| 140 | 0.0198 | 0.0020 | 0.0178 |
| 141 | 0.0201 | 0.0020 | 0.0181 |
| 142 | 0.0202 | 0.0020 | 0.0182 |
| 143 | 0.0205 | 0.0021 | 0.0184 |
| 144 | 0.0206 | 0.0021 | 0.0186 |
| 145 | 0.0214 | 0.0021 | 0.0192 |
| 146 | 0.0215 | 0.0022 | 0.0194 |
| 147 | 0.0218 | 0.0022 | 0.0196 |
| 148 | 0.0220 | 0.0022 | 0.0198 |
| 149 | 0.0223 | 0.0022 | 0.0201 |
| 150 | 0.0225 | 0.0023 | 0.0202 |
| 151 | 0.0228 | 0.0023 | 0.0205 |
| 152 | 0.0230 | 0.0023 | 0.0207 |
| 153 | 0.0234 | 0.0023 | 0.0210 |
| 154 | 0.0236 | 0.0024 | 0.0212 |
| 155 | 0.0240 | 0.0024 | 0.0216 |
| 156 | 0.0242 | 0.0024 | 0.0218 |
| 157 | 0.0246 | 0.0025 | 0.0222 |
| 158 | 0.0249 | 0.0025 | 0.0224 |
| 159 | 0.0253 | 0.0025 | 0.0228 |
| 160 | 0.0256 | 0.0026 | 0.0230 |
| 161 | 0.0261 | 0.0026 | 0.0235 |
| 162 | 0.0264 | 0.0026 | 0.0237 |
| 163 | 0.0270 | 0.0027 | 0.0243 |
| 164 | 0.0273 | 0.0027 | 0.0245 |
| 165 | 0.0279 | 0.0028 | 0.0251 |
| 166 | 0.0282 | 0.0028 | 0.0254 |
| 167 | 0.0289 | 0.0029 | 0.0260 |
| 168 | 0.0293 | 0.0029 | 0.0264 |
| 169 | 0.0301 | 0.0030 | 0.0271 |
| 170 | 0.0305 | 0.0031 | 0.0275 |
| 171 | 0.0314 | 0.0032 | 0.0283 |
| 172 | 0.0319 | 0.0032 | 0.0287 |
| 173 | 0.0330 | 0.0033 | 0.0297 |
| 174 | 0.0335 | 0.0034 | 0.0302 |
| 175 | 0.0347 | 0.0035 | 0.0313 |
| 176 | 0.0354 | 0.0036 | 0.0319 |

| | | | |
|---|---|---|---|
| 177 | 0.0368 | 0.0037 | 0.0331 |
| 178 | 0.0376 | 0.0038 | 0.0339 |
| 179 | 0.0394 | 0.0040 | 0.0354 |
| 180 | 0.0404 | 0.0040 | 0.0363 |
| 181 | 0.0425 | 0.0043 | 0.0383 |
| 182 | 0.0438 | 0.0044 | 0.0394 |
| 183 | 0.0466 | 0.0047 | 0.0420 |
| 184 | 0.0483 | 0.0048 | 0.0435 |
| 185 | 0.0410 | 0.0041 | 0.0369 |
| 186 | 0.0433 | 0.0043 | 0.0390 |
| 187 | 0.0492 | 0.0049 | 0.0443 |
| 188 | 0.0530 | 0.0053 | 0.0477 |
| 189 | 0.0639 | 0.0053 | 0.0586 |
| 190 | 0.0722 | 0.0053 | 0.0668 |
| 191 | 0.1031 | 0.0053 | 0.0978 |
| 192 | 0.1418 | 0.0053 | 0.1365 |
| 193 | 0.4439 | 0.0053 | 0.4386 |
| 194 | 0.0840 | 0.0053 | 0.0787 |
| 195 | 0.0578 | 0.0053 | 0.0525 |
| 196 | 0.0460 | 0.0046 | 0.0414 |
| 197 | 0.0502 | 0.0050 | 0.0451 |
| 198 | 0.0451 | 0.0045 | 0.0406 |
| 199 | 0.0414 | 0.0042 | 0.0373 |
| 200 | 0.0385 | 0.0039 | 0.0346 |
| 201 | 0.0361 | 0.0036 | 0.0325 |
| 202 | 0.0341 | 0.0034 | 0.0307 |
| 203 | 0.0324 | 0.0033 | 0.0292 |
| 204 | 0.0310 | 0.0031 | 0.0279 |
| 205 | 0.0297 | 0.0030 | 0.0267 |
| 206 | 0.0286 | 0.0029 | 0.0257 |
| 207 | 0.0276 | 0.0028 | 0.0248 |
| 208 | 0.0267 | 0.0027 | 0.0240 |
| 209 | 0.0258 | 0.0026 | 0.0233 |
| 210 | 0.0251 | 0.0025 | 0.0226 |
| 211 | 0.0244 | 0.0024 | 0.0220 |
| 212 | 0.0238 | 0.0024 | 0.0214 |
| 213 | 0.0232 | 0.0023 | 0.0209 |
| 214 | 0.0227 | 0.0023 | 0.0204 |
| 215 | 0.0222 | 0.0022 | 0.0199 |
| 216 | 0.0217 | 0.0022 | 0.0195 |
| 217 | 0.0208 | 0.0021 | 0.0187 |
| 218 | 0.0203 | 0.0020 | 0.0183 |
| 219 | 0.0200 | 0.0020 | 0.0180 |
| 220 | 0.0196 | 0.0020 | 0.0176 |
| 221 | 0.0192 | 0.0019 | 0.0173 |
| 222 | 0.0189 | 0.0019 | 0.0170 |
| 223 | 0.0186 | 0.0019 | 0.0167 |
| 224 | 0.0183 | 0.0018 | 0.0164 |
| 225 | 0.0180 | 0.0018 | 0.0162 |
| 226 | 0.0177 | 0.0018 | 0.0159 |
| 227 | 0.0175 | 0.0018 | 0.0157 |
| 228 | 0.0172 | 0.0017 | 0.0155 |
| 229 | 0.0170 | 0.0017 | 0.0153 |

| | | | |
|---|---|---|---|
| 230 | 0.0167 | 0.0017 | 0.0151 |
| 231 | 0.0165 | 0.0017 | 0.0149 |
| 232 | 0.0163 | 0.0016 | 0.0147 |
| 233 | 0.0161 | 0.0016 | 0.0145 |
| 234 | 0.0159 | 0.0016 | 0.0143 |
| 235 | 0.0157 | 0.0016 | 0.0141 |
| 236 | 0.0155 | 0.0016 | 0.0140 |
| 237 | 0.0154 | 0.0015 | 0.0138 |
| 238 | 0.0152 | 0.0015 | 0.0137 |
| 239 | 0.0150 | 0.0015 | 0.0135 |
| 240 | 0.0149 | 0.0015 | 0.0134 |
| 241 | 0.0147 | 0.0015 | 0.0132 |
| 242 | 0.0146 | 0.0015 | 0.0131 |
| 243 | 0.0144 | 0.0014 | 0.0130 |
| 244 | 0.0143 | 0.0014 | 0.0128 |
| 245 | 0.0141 | 0.0014 | 0.0127 |
| 246 | 0.0140 | 0.0014 | 0.0126 |
| 247 | 0.0139 | 0.0014 | 0.0125 |
| 248 | 0.0137 | 0.0014 | 0.0124 |
| 249 | 0.0136 | 0.0014 | 0.0123 |
| 250 | 0.0135 | 0.0014 | 0.0121 |
| 251 | 0.0134 | 0.0013 | 0.0120 |
| 252 | 0.0133 | 0.0013 | 0.0119 |
| 253 | 0.0132 | 0.0013 | 0.0118 |
| 254 | 0.0131 | 0.0013 | 0.0117 |
| 255 | 0.0129 | 0.0013 | 0.0116 |
| 256 | 0.0128 | 0.0013 | 0.0116 |
| 257 | 0.0127 | 0.0013 | 0.0115 |
| 258 | 0.0126 | 0.0013 | 0.0114 |
| 259 | 0.0125 | 0.0013 | 0.0113 |
| 260 | 0.0125 | 0.0012 | 0.0112 |
| 261 | 0.0124 | 0.0012 | 0.0111 |
| 262 | 0.0123 | 0.0012 | 0.0110 |
| 263 | 0.0122 | 0.0012 | 0.0110 |
| 264 | 0.0121 | 0.0012 | 0.0109 |
| 265 | 0.0120 | 0.0012 | 0.0108 |
| 266 | 0.0119 | 0.0012 | 0.0107 |
| 267 | 0.0119 | 0.0012 | 0.0107 |
| 268 | 0.0118 | 0.0012 | 0.0106 |
| 269 | 0.0117 | 0.0012 | 0.0105 |
| 270 | 0.0116 | 0.0012 | 0.0105 |
| 271 | 0.0115 | 0.0012 | 0.0104 |
| 272 | 0.0115 | 0.0012 | 0.0103 |
| 273 | 0.0114 | 0.0011 | 0.0103 |
| 274 | 0.0113 | 0.0011 | 0.0102 |
| 275 | 0.0113 | 0.0011 | 0.0101 |
| 276 | 0.0112 | 0.0011 | 0.0101 |
| 277 | 0.0111 | 0.0011 | 0.0100 |
| 278 | 0.0111 | 0.0011 | 0.0100 |
| 279 | 0.0110 | 0.0011 | 0.0099 |
| 280 | 0.0109 | 0.0011 | 0.0098 |
| 281 | 0.0109 | 0.0011 | 0.0098 |
| 282 | 0.0108 | 0.0011 | 0.0097 |

| | | | |
|---|---|---|---|
| 283 | 0.0107 | 0.0011 | 0.0097 |
| 284 | 0.0107 | 0.0011 | 0.0096 |
| 285 | 0.0106 | 0.0011 | 0.0096 |
| 286 | 0.0106 | 0.0011 | 0.0095 |
| 287 | 0.0105 | 0.0011 | 0.0095 |
| 288 | 0.0105 | 0.0010 | 0.0094 |

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Total soil rain loss = 0.54(In)
Total effective rainfall = 5.46(In)
Peak flow rate in flood hydrograph = 30.80(CFS)

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24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

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Hydrograph in 5 Minute intervals ((CFS))

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Time(h+m) Volume Ac.Ft   Q(CFS)  0       10.0      20.0      30.0      40.0
-----------------------------------------------------------------------
  0+ 5       0.0007      0.11  Q         |         |         |         |
  0+10       0.0050      0.62  Q         |         |         |         |
  0+15       0.0117      0.97  Q         |         |         |         |
  0+20       0.0188      1.04  VQ        |         |         |         |
  0+25       0.0261      1.06  VQ        |         |         |         |
  0+30       0.0334      1.06  VQ        |         |         |         |
  0+35       0.0408      1.07  VQ        |         |         |         |
  0+40       0.0481      1.07  VQ        |         |         |         |
  0+45       0.0555      1.07  VQ        |         |         |         |
  0+50       0.0629      1.07  VQ        |         |         |         |
  0+55       0.0703      1.08  VQ        |         |         |         |
  1+ 0       0.0778      1.08  VQ        |         |         |         |
  1+ 5       0.0852      1.08  VQ        |         |         |         |
  1+10       0.0927      1.09  VQ        |         |         |         |
  1+15       0.1002      1.09  VQ        |         |         |         |
  1+20       0.1077      1.09  |Q        |         |         |         |
  1+25       0.1152      1.09  |Q        |         |         |         |
  1+30       0.1228      1.10  |Q        |         |         |         |
  1+35       0.1304      1.10  |Q        |         |         |         |
  1+40       0.1380      1.10  |Q        |         |         |         |
  1+45       0.1456      1.11  |Q        |         |         |         |
  1+50       0.1533      1.11  |Q        |         |         |         |
  1+55       0.1609      1.11  |Q        |         |         |         |
  2+ 0       0.1686      1.12  |Q        |         |         |         |
  2+ 5       0.1763      1.12  |Q        |         |         |         |
  2+10       0.1841      1.12  |Q        |         |         |         |
  2+15       0.1918      1.13  |Q        |         |         |         |
  2+20       0.1996      1.13  |Q        |         |         |         |
  2+25       0.2074      1.13  |Q        |         |         |         |
  2+30       0.2153      1.14  |QV       |         |         |         |
  2+35       0.2231      1.14  |QV       |         |         |         |
  2+40       0.2310      1.14  |QV       |         |         |         |
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2+45       0.2389      1.15  |QV       |         |         |         |
2+50       0.2468      1.15  |QV       |         |         |         |
2+55       0.2548      1.15  |QV       |         |         |         |
3+ 0       0.2628      1.16  |QV       |         |         |         |
3+ 5       0.2708      1.16  |QV       |         |         |         |
3+10       0.2788      1.17  |QV       |         |         |         |
3+15       0.2869      1.17  |QV       |         |         |         |
3+20       0.2949      1.17  |QV       |         |         |         |
3+25       0.3031      1.18  |QV       |         |         |         |
3+30       0.3112      1.18  |QV       |         |         |         |
3+35       0.3194      1.19  |Q V      |         |         |         |
3+40       0.3275      1.19  |Q V      |         |         |         |
3+45       0.3358      1.19  |Q V      |         |         |         |
3+50       0.3440      1.20  |Q V      |         |         |         |
3+55       0.3523      1.20  |Q V      |         |         |         |
4+ 0       0.3606      1.21  |Q V      |         |         |         |
4+ 5       0.3689      1.21  |Q V      |         |         |         |
4+10       0.3773      1.21  |Q V      |         |         |         |
4+15       0.3856      1.22  |Q V      |         |         |         |
4+20       0.3941      1.22  |Q V      |         |         |         |
4+25       0.4025      1.23  |Q V      |         |         |         |
4+30       0.4110      1.23  |Q V      |         |         |         |
4+35       0.4195      1.24  |Q V      |         |         |         |
4+40       0.4280      1.24  |Q  V     |         |         |         |
4+45       0.4366      1.24  |Q  V     |         |         |         |
4+50       0.4452      1.25  |Q  V     |         |         |         |
4+55       0.4538      1.25  |Q  V     |         |         |         |
5+ 0       0.4625      1.26  |Q  V     |         |         |         |
5+ 5       0.4712      1.26  |Q  V     |         |         |         |
5+10       0.4799      1.27  |Q  V     |         |         |         |
5+15       0.4887      1.27  |Q  V     |         |         |         |
5+20       0.4975      1.28  |Q  V     |         |         |         |
5+25       0.5063      1.28  |Q  V     |         |         |         |
5+30       0.5152      1.29  |Q  V     |         |         |         |
5+35       0.5241      1.29  |Q  V     |         |         |         |
5+40       0.5330      1.30  |Q   V    |         |         |         |
5+45       0.5420      1.30  |Q   V    |         |         |         |
5+50       0.5510      1.31  |Q   V    |         |         |         |
5+55       0.5600      1.31  |Q   V    |         |         |         |
6+ 0       0.5691      1.32  |Q   V    |         |         |         |
6+ 5       0.5782      1.32  |Q   V    |         |         |         |
6+10       0.5874      1.33  |Q   V    |         |         |         |
6+15       0.5966      1.33  |Q   V    |         |         |         |
6+20       0.6058      1.34  |Q   V    |         |         |         |
6+25       0.6151      1.35  |Q   V    |         |         |         |
6+30       0.6244      1.35  |Q   V    |         |         |         |
6+35       0.6337      1.36  |Q    V   |         |         |         |
6+40       0.6431      1.36  |Q    V   |         |         |         |
6+45       0.6525      1.37  |Q    V   |         |         |         |
6+50       0.6620      1.38  |Q    V   |         |         |         |
6+55       0.6715      1.38  |Q    V   |         |         |         |
7+ 0       0.6811      1.39  |Q    V   |         |         |         |
7+ 5       0.6907      1.39  |Q    V   |         |         |         |
```

```
 7+10       0.7003      1.40  |Q    V   |         |         |         |
 7+15       0.7100      1.41  |Q    V   |         |         |         |
 7+20       0.7198      1.41  |Q    V   |         |         |         |
 7+25       0.7296      1.42  |Q    V   |         |         |         |
 7+30       0.7394      1.43  |Q     V  |         |         |         |
 7+35       0.7493      1.43  |Q     V  |         |         |         |
 7+40       0.7592      1.44  |Q     V  |         |         |         |
 7+45       0.7692      1.45  |Q     V  |         |         |         |
 7+50       0.7792      1.46  |Q     V  |         |         |         |
 7+55       0.7893      1.46  |Q     V  |         |         |         |
 8+ 0       0.7994      1.47  |Q     V  |         |         |         |
 8+ 5       0.8096      1.48  |Q     V  |         |         |         |
 8+10       0.8198      1.49  |Q     V  |         |         |         |
 8+15       0.8301      1.49  |Q     V  |         |         |         |
 8+20       0.8404      1.50  |Q     V  |         |         |         |
 8+25       0.8508      1.51  |Q      V |         |         |         |
 8+30       0.8613      1.52  |Q      V |         |         |         |
 8+35       0.8718      1.53  |Q      V |         |         |         |
 8+40       0.8824      1.53  |Q      V |         |         |         |
 8+45       0.8930      1.54  |Q      V |         |         |         |
 8+50       0.9037      1.55  |Q      V |         |         |         |
 8+55       0.9144      1.56  |Q      V |         |         |         |
 9+ 0       0.9252      1.57  |Q      V |         |         |         |
 9+ 5       0.9361      1.58  |Q      V |         |         |         |
 9+10       0.9470      1.59  |Q      V |         |         |         |
 9+15       0.9580      1.60  |Q       V|         |         |         |
 9+20       0.9691      1.61  |Q       V|         |         |         |
 9+25       0.9802      1.62  |Q       V|         |         |         |
 9+30       0.9914      1.63  |Q       V|         |         |         |
 9+35       1.0027      1.64  |Q       V|         |         |         |
 9+40       1.0141      1.65  |Q       V|         |         |         |
 9+45       1.0255      1.66  |Q       V|         |         |         |
 9+50       1.0370      1.67  |Q       V|         |         |         |
 9+55       1.0486      1.68  |Q       V|         |         |         |
10+ 0       1.0602      1.69  |Q        V         |         |         |
10+ 5       1.0719      1.70  |Q        V         |         |         |
10+10       1.0837      1.72  |Q        V         |         |         |
10+15       1.0956      1.73  |Q        V         |         |         |
10+20       1.1076      1.74  |Q        V         |         |         |
10+25       1.1197      1.75  |Q        V         |         |         |
10+30       1.1318      1.76  |Q        V         |         |         |
10+35       1.1441      1.78  |Q        V         |         |         |
10+40       1.1564      1.79  |Q        V         |         |         |
10+45       1.1688      1.80  |Q        |V        |         |         |
10+50       1.1814      1.82  |Q        |V        |         |         |
10+55       1.1940      1.83  |Q        |V        |         |         |
11+ 0       1.2067      1.85  |Q        |V        |         |         |
11+ 5       1.2195      1.86  |Q        |V        |         |         |
11+10       1.2325      1.88  |Q        |V        |         |         |
11+15       1.2455      1.89  |Q        |V        |         |         |
11+20       1.2587      1.91  |Q        |V        |         |         |
11+25       1.2719      1.93  |Q        | V       |         |         |
11+30       1.2853      1.94  |Q        | V       |         |         |
```

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11+35       1.2988      1.96  |Q        | V       |         |         |
11+40       1.3124      1.98  |Q        | V       |         |         |
11+45       1.3262      2.00  |Q        | V       |         |         |
11+50       1.3401      2.02  | Q       | V       |         |         |
11+55       1.3541      2.04  | Q       | V       |         |         |
12+ 0       1.3683      2.06  | Q       | V       |         |         |
12+ 5       1.3826      2.08  | Q       |  V      |         |         |
12+10       1.3973      2.13  | Q       |  V      |         |         |
12+15       1.4122      2.16  | Q       |  V      |         |         |
12+20       1.4273      2.19  | Q       |  V      |         |         |
12+25       1.4425      2.21  | Q       |  V      |         |         |
12+30       1.4579      2.24  | Q       |  V      |         |         |
12+35       1.4735      2.26  | Q       |  V      |         |         |
12+40       1.4893      2.29  | Q       |   V     |         |         |
12+45       1.5053      2.32  | Q       |   V     |         |         |
12+50       1.5214      2.35  | Q       |   V     |         |         |
12+55       1.5378      2.37  | Q       |   V     |         |         |
13+ 0       1.5543      2.41  | Q       |   V     |         |         |
13+ 5       1.5711      2.44  | Q       |   V     |         |         |
13+10       1.5881      2.47  | Q       |    V    |         |         |
13+15       1.6054      2.50  | Q       |    V    |         |         |
13+20       1.6228      2.54  | Q       |    V    |         |         |
13+25       1.6406      2.57  | Q       |    V    |         |         |
13+30       1.6586      2.61  | Q       |    V    |         |         |
13+35       1.6769      2.65  | Q       |    V    |         |         |
13+40       1.6954      2.70  | Q       |     V   |         |         |
13+45       1.7143      2.74  | Q       |     V   |         |         |
13+50       1.7335      2.79  | Q       |     V   |         |         |
13+55       1.7531      2.84  | Q       |     V   |         |         |
14+ 0       1.7730      2.89  | Q       |     V   |         |         |
14+ 5       1.7933      2.95  | Q       |      V  |         |         |
14+10       1.8140      3.01  |  Q      |      V  |         |         |
14+15       1.8351      3.07  |  Q      |      V  |         |         |
14+20       1.8567      3.14  |  Q      |      V  |         |         |
14+25       1.8788      3.21  |  Q      |      V  |         |         |
14+30       1.9015      3.29  |  Q      |       V |         |         |
14+35       1.9246      3.37  |  Q      |       V |         |         |
14+40       1.9485      3.46  |  Q      |       V |         |         |
14+45       1.9729      3.55  |  Q      |       V |         |         |
14+50       1.9981      3.66  |  Q      |       V |         |         |
14+55       2.0241      3.77  |  Q      |        V|         |         |
15+ 0       2.0510      3.91  |  Q      |        V|         |         |
15+ 5       2.0788      4.04  |   Q     |        V|         |         |
15+10       2.1078      4.21  |   Q     |        V|         |         |
15+15       2.1380      4.38  |   Q     |         V         |         |
15+20       2.1696      4.59  |   Q     |         V         |         |
15+25       2.2020      4.71  |   Q     |         V         |         |
15+30       2.2327      4.45  |   Q     |         |V        |         |
15+35       2.2630      4.40  |   Q     |         |V        |         |
15+40       2.2957      4.76  |   Q     |         |V        |         |
15+45       2.3320      5.27  |    Q    |         | V       |         |
15+50       2.3742      6.13  |     Q   |         | V       |         |
15+55       2.4249      7.36  |      Q  |         | V       |         |
```

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16+ 0       2.4930      9.89  |        Q|          |  V      |         |
16+ 5       2.6075     16.63  |         |     Q    |   V     |         |
16+10       2.8196     30.80  |         |          |     V   Q         |
16+15       2.9740     22.41  |         |          | Q     V |         |
16+20       3.0407      9.69  |        Q|          |       V |         |
16+25       3.0824      6.06  |     Q   |          |        V|         |
16+30       3.1168      4.99  |   Q     |          |        V|         |
16+35       3.1492      4.71  |   Q     |          |        V|         |
16+40       3.1791      4.34  |   Q     |          |         V         |
16+45       3.2068      4.02  |   Q     |          |         V         |
16+50       3.2327      3.75  |  Q      |          |         V         |
16+55       3.2570      3.53  |  Q      |          |         V         |
17+ 0       3.2801      3.35  |  Q      |          |         |V        |
17+ 5       3.3021      3.19  |  Q      |          |         |V        |
17+10       3.3231      3.06  |  Q      |          |         |V        |
17+15       3.3434      2.93  | Q       |          |         |V        |
17+20       3.3628      2.83  | Q       |          |         |V        |
17+25       3.3816      2.73  | Q       |          |         | V       |
17+30       3.3999      2.65  | Q       |          |         | V       |
17+35       3.4175      2.57  | Q       |          |         | V       |
17+40       3.4347      2.49  | Q       |          |         | V       |
17+45       3.4514      2.43  | Q       |          |         | V       |
17+50       3.4677      2.37  | Q       |          |         | V       |
17+55       3.4837      2.31  | Q       |          |         |  V      |
18+ 0       3.4992      2.26  | Q       |          |         |  V      |
18+ 5       3.5144      2.20  | Q       |          |         |  V      |
18+10       3.5291      2.13  | Q       |          |         |  V      |
18+15       3.5434      2.08  | Q       |          |         |  V      |
18+20       3.5574      2.03  | Q       |          |         |  V      |
18+25       3.5711      1.99  |Q        |          |         |  V      |
18+30       3.5846      1.96  |Q        |          |         |  V      |
18+35       3.5978      1.92  |Q        |          |         |   V     |
18+40       3.6108      1.89  |Q        |          |         |   V     |
18+45       3.6236      1.86  |Q        |          |         |   V     |
18+50       3.6362      1.83  |Q        |          |         |   V     |
18+55       3.6486      1.80  |Q        |          |         |   V     |
19+ 0       3.6609      1.77  |Q        |          |         |   V     |
19+ 5       3.6729      1.75  |Q        |          |         |   V     |
19+10       3.6848      1.72  |Q        |          |         |   V     |
19+15       3.6965      1.70  |Q        |          |         |    V    |
19+20       3.7080      1.68  |Q        |          |         |    V    |
19+25       3.7194      1.66  |Q        |          |         |    V    |
19+30       3.7307      1.63  |Q        |          |         |    V    |
19+35       3.7418      1.61  |Q        |          |         |    V    |
19+40       3.7528      1.59  |Q        |          |         |    V    |
19+45       3.7637      1.58  |Q        |          |         |    V    |
19+50       3.7744      1.56  |Q        |          |         |    V    |
19+55       3.7850      1.54  |Q        |          |         |    V    |
20+ 0       3.7955      1.52  |Q        |          |         |    V    |
20+ 5       3.8059      1.51  |Q        |          |         |     V   |
20+10       3.8161      1.49  |Q        |          |         |     V   |
20+15       3.8263      1.48  |Q        |          |         |     V   |
20+20       3.8364      1.46  |Q        |          |         |     V   |
```

```
  20+25       3.8463      1.45  |Q        |         |         |     V   |
  20+30       3.8562      1.43  |Q        |         |         |     V   |
  20+35       3.8660      1.42  |Q        |         |         |     V   |
  20+40       3.8757      1.41  |Q        |         |         |     V   |
  20+45       3.8852      1.39  |Q        |         |         |     V   |
  20+50       3.8947      1.38  |Q        |         |         |     V   |
  20+55       3.9042      1.37  |Q        |         |         |      V  |
  21+ 0       3.9135      1.36  |Q        |         |         |      V  |
  21+ 5       3.9228      1.34  |Q        |         |         |      V  |
  21+10       3.9320      1.33  |Q        |         |         |      V  |
  21+15       3.9411      1.32  |Q        |         |         |      V  |
  21+20       3.9501      1.31  |Q        |         |         |      V  |
  21+25       3.9591      1.30  |Q        |         |         |      V  |
  21+30       3.9679      1.29  |Q        |         |         |      V  |
  21+35       3.9768      1.28  |Q        |         |         |      V  |
  21+40       3.9855      1.27  |Q        |         |         |      V  |
  21+45       3.9942      1.26  |Q        |         |         |      V  |
  21+50       4.0028      1.25  |Q        |         |         |      V  |
  21+55       4.0114      1.24  |Q        |         |         |       V |
  22+ 0       4.0199      1.23  |Q        |         |         |       V |
  22+ 5       4.0283      1.23  |Q        |         |         |       V |
  22+10       4.0367      1.22  |Q        |         |         |       V |
  22+15       4.0450      1.21  |Q        |         |         |       V |
  22+20       4.0533      1.20  |Q        |         |         |       V |
  22+25       4.0615      1.19  |Q        |         |         |       V |
  22+30       4.0696      1.18  |Q        |         |         |       V |
  22+35       4.0777      1.18  |Q        |         |         |       V |
  22+40       4.0858      1.17  |Q        |         |         |       V |
  22+45       4.0938      1.16  |Q        |         |         |       V |
  22+50       4.1017      1.15  |Q        |         |         |       V |
  22+55       4.1096      1.15  |Q        |         |         |       V |
  23+ 0       4.1175      1.14  |Q        |         |         |        V|
  23+ 5       4.1253      1.13  |Q        |         |         |        V|
  23+10       4.1330      1.13  |Q        |         |         |        V|
  23+15       4.1408      1.12  |Q        |         |         |        V|
  23+20       4.1484      1.11  |Q        |         |         |        V|
  23+25       4.1560      1.11  |Q        |         |         |        V|
  23+30       4.1636      1.10  |Q        |         |         |        V|
  23+35       4.1712      1.09  |Q        |         |         |        V|
  23+40       4.1786      1.09  |Q        |         |         |        V|
  23+45       4.1861      1.08  |Q        |         |         |        V|
  23+50       4.1935      1.08  |Q        |         |         |        V|
  23+55       4.2009      1.07  |Q        |         |         |        V|
  24+ 0       4.2082      1.06  |Q        |         |         |        V|
  24+ 5       4.2148      0.95  Q         |         |         |        V|
  24+10       4.2178      0.44  Q         |         |         |        V|
  24+15       4.2184      0.08  Q         |         |         |        V|
  24+20       4.2185      0.02  Q         |         |         |        V|
---------------------------------------------------------------------------
```

## EXCERPTS

## EXCERPT A: NRCS HYDRAULIC SOILS MAP

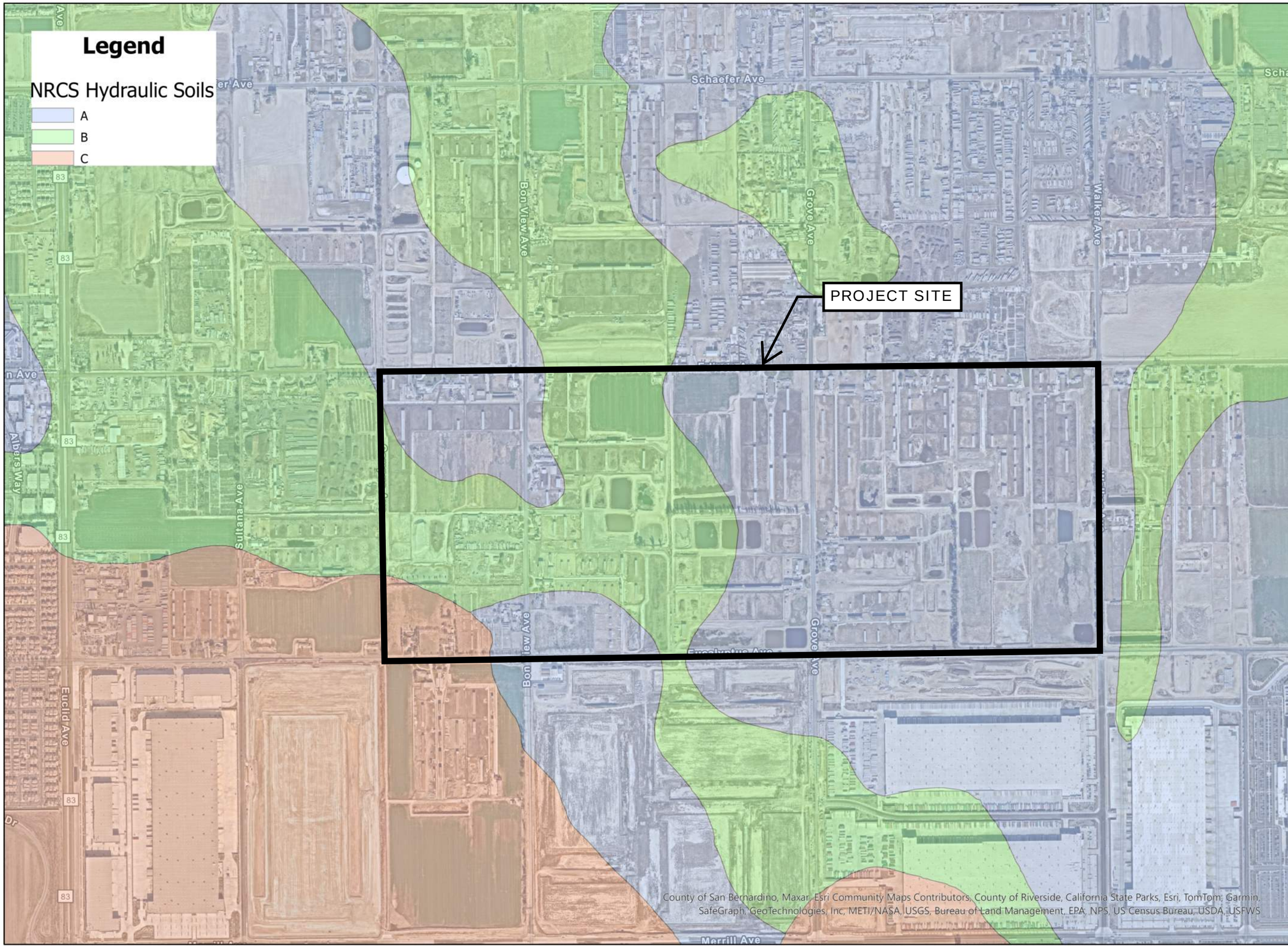


TITLE

# NRCS HYDRAULIC SOILS MAP

PROJECT

**ONTARIO RANCH**

Ontario, CA

SCALE 1:10,000

DATE 5/12/25

FILE NAME:

JLC Engineering & Consulting, Inc.
MURRIETA, CA 92562
Office 951.304.9552 Fax 951.304.3568

EXCERPT

**A**

## EXCERPT B: CITY OF ONTARIO MASTER DRAINAGE PLAN HYDROLOGY MAP

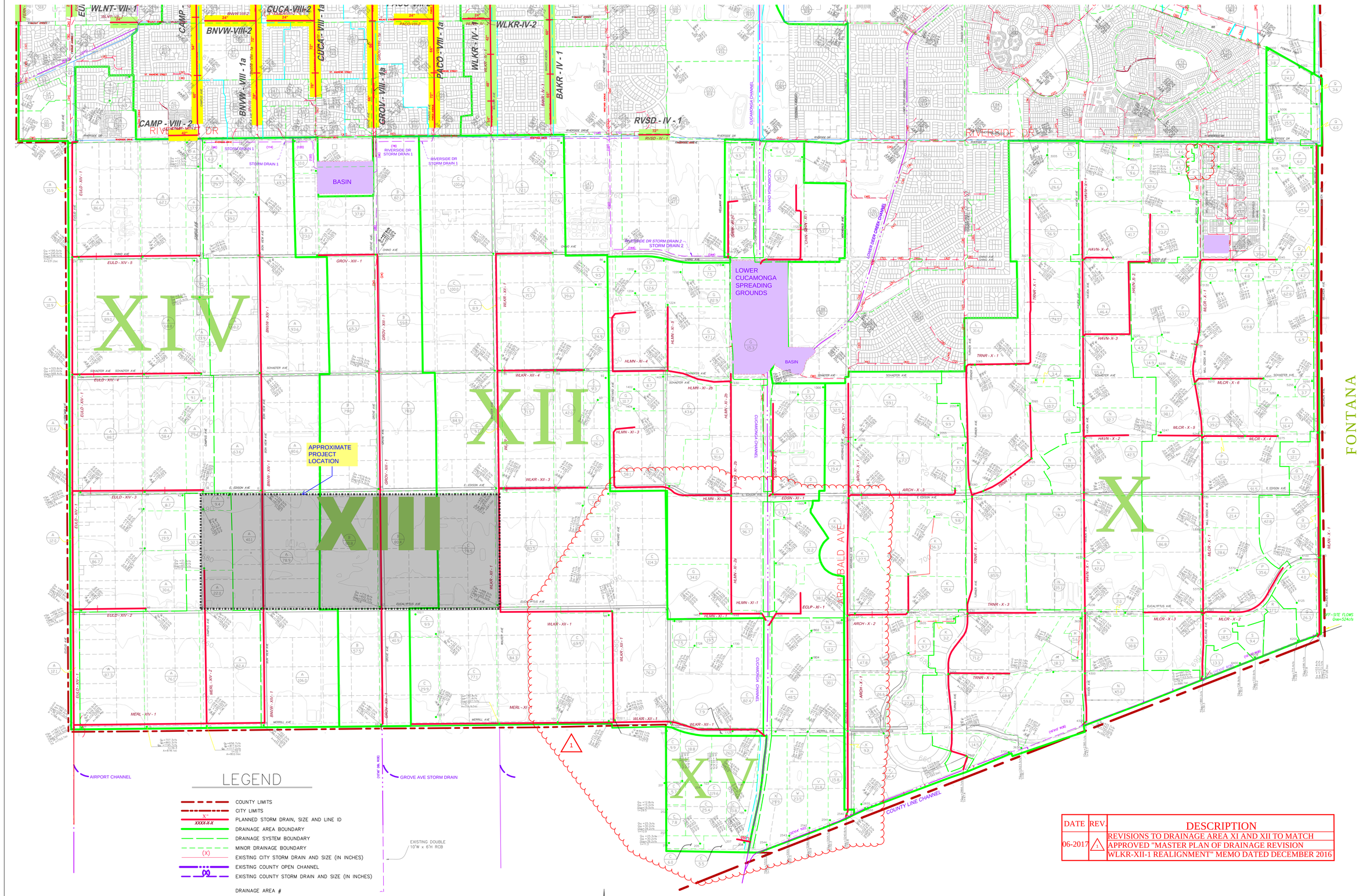


## LEGEND

- COUNTY LIMITS
- CITY LIMITS
- X" / XXXX-X-X — PLANNED STORM DRAIN, SIZE AND LINE ID
- DRAINAGE AREA BOUNDARY
- DRAINAGE SYSTEM BOUNDARY
- MINOR DRAINAGE BOUNDARY
- (X) — EXISTING CITY STORM DRAIN AND SIZE (IN INCHES)
- EXISTING COUNTY OPEN CHANNEL
- (X) — EXISTING COUNTY STORM DRAIN AND SIZE (IN INCHES)
- DRAINAGE AREA #

DRAINAGE SYSTEM NAME — WLKR - XII - 3 — SYSTEM IDENTIFICATION

DRAINAGE AREA NUMBER — LINE NUMBER

X / X.X — AREA DESIGNATION / AREA ACREAGE (IN ACRES)

$Q_{10}$ =861.0cfs
$Q_{25}$ =981.1cfs
$Q_{100}$=1213.7cfs — PEAK FLOW RATE

t=36.1
A=942.7ac — TIME OF CONCENTRATION / AREA

SCALE: 1" = 800'

800 400 0 800 2400
GRAPHIC SCALE 1"=800'

| DATE | REV. | DESCRIPTION |
|---|---|---|
| 06-2017 | 1 | REVISIONS TO DRAINAGE AREA XI AND XII TO MATCH APPROVED "MASTER PLAN OF DRAINAGE REVISION WLKR-XII-1 REALIGNMENT" MEMO DATED DECEMBER 2016 |

MARCH 2012

REVISIONS
5-20-2017: REVISED TO MERGE DRAINAGE AREA XII AND XIII.

HUNSAKER & ASSOCIATES IRVINE, INC
PLANNING ▪ ENGINEERING ▪ SURVEYING
Three Hughes Irvine, CA 92618 ▪ PH: (949) 583-1010 FX: (949) 583-0759

CITY OF ONTARIO
MASTER PLAN OF DRAINAGE
HYDROLOGY MAP
NEW MODEL COLONY

SHEET 3 OF 3

PLOTTED 12/12/2017 1:53 PM \\TUSFS1\HFIProject\140152\Eng\140152-0000\Hm\Hydrology Report\MPD Update\Civil 3D Files\New Model Hydrology Map Update.dwg

## EXCERPT C: CITY OF ONTARIO MASTER DRAINAGE PLAN PLANNED FACILITIES MAP

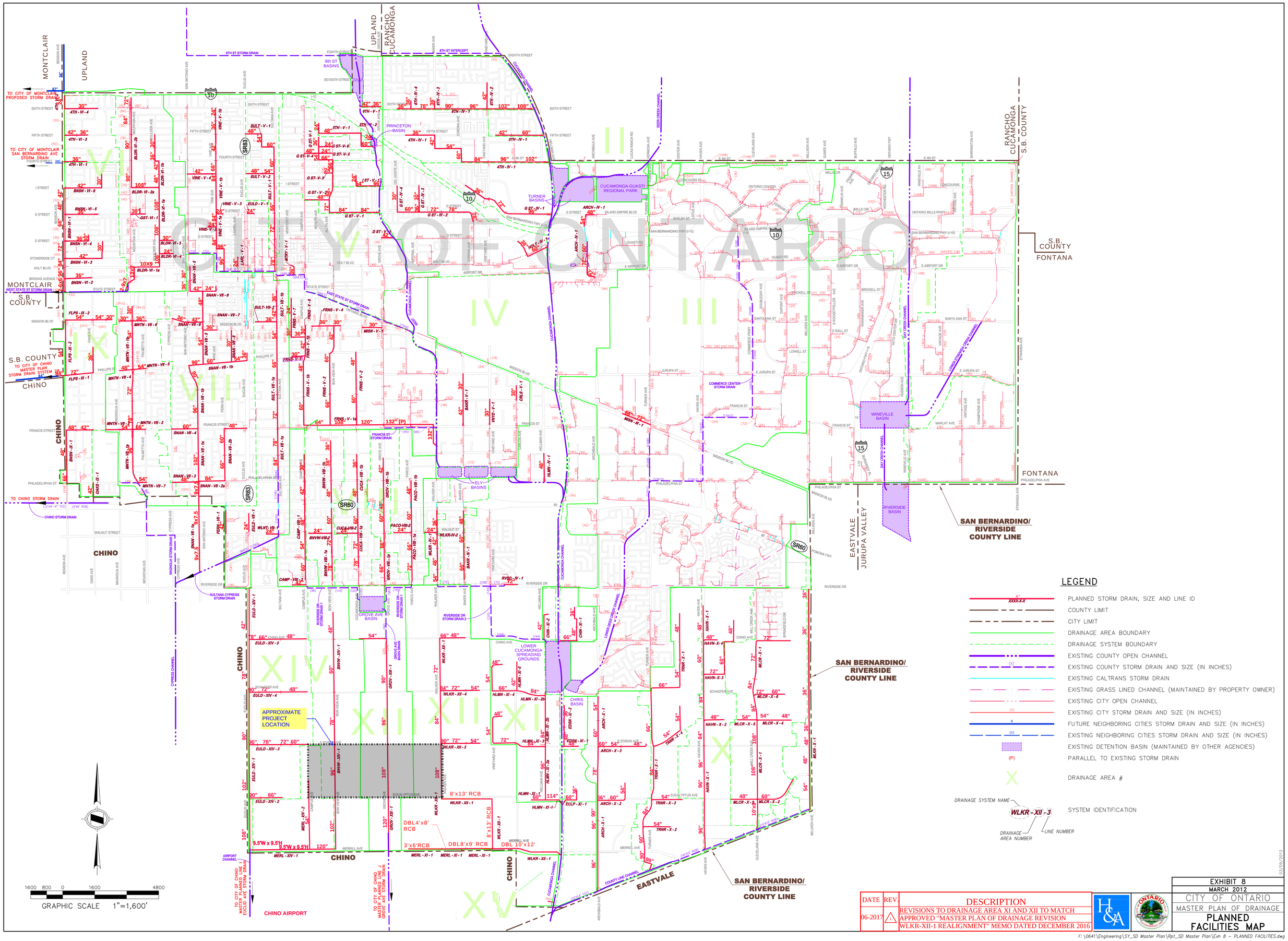


| DATE | REV. | DESCRIPTION |
|---|---|---|
| 06-2017 | 1 | REVISIONS TO DRAINAGE AREA XI AND XII TO MATCH APPROVED "MASTER PLAN OF DRAINAGE REVISION WLKR-XII-1 REALIGNMENT" MEMO DATED DECEMBER 2016 |

EXHIBIT 8
MARCH 2012
CITY OF ONTARIO
MASTER PLAN OF DRAINAGE
PLANNED FACILITIES MAP

F:\0641\Engineering\SY_SD Master Plan\Rpt_SD Master Plan\Exh 8 - PLANNED FACILITIES.dwg

## EXCERPT D: CITY OF ONTARIO MASTER DRAINAGE PLAN LAND USE MAP

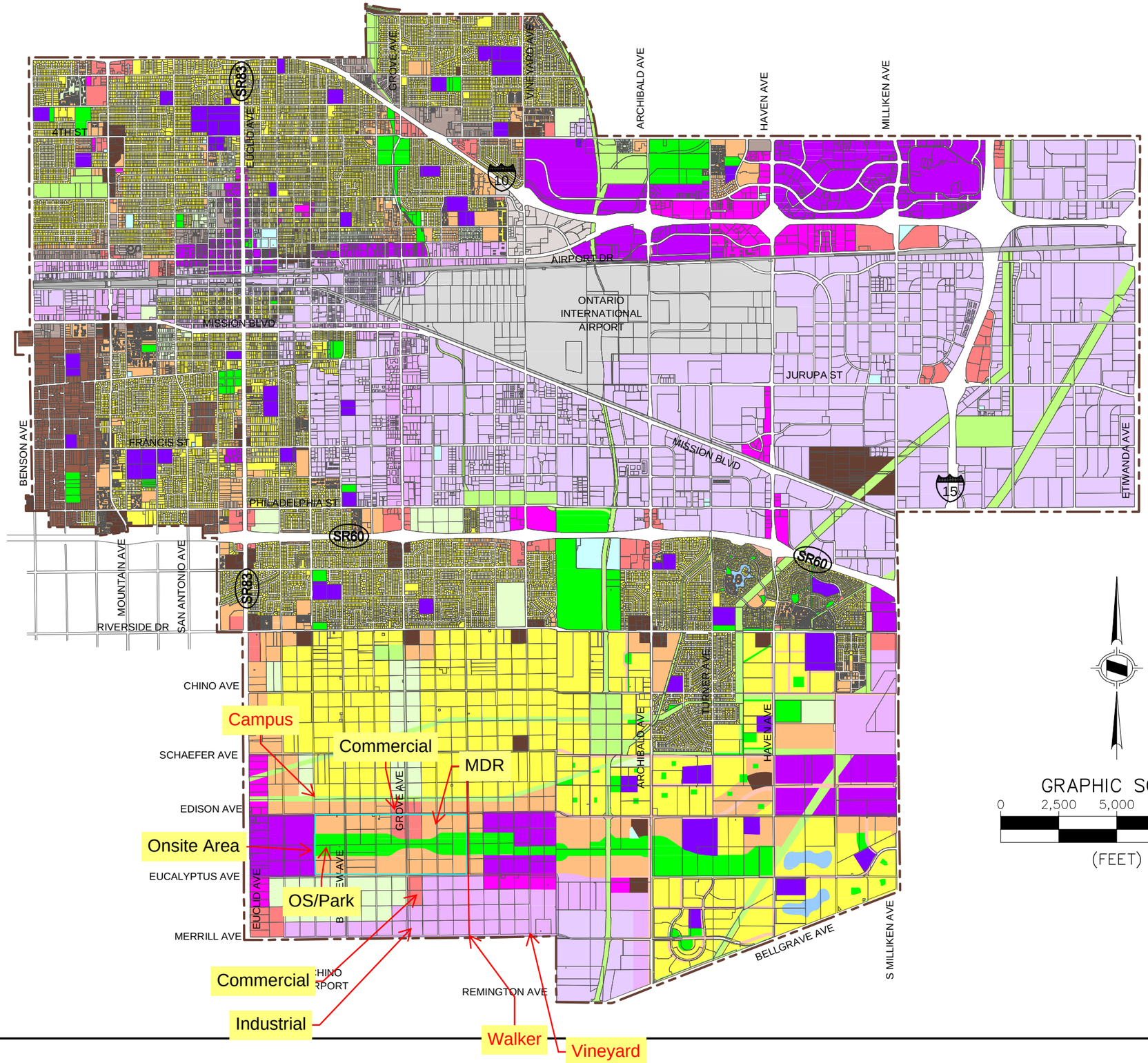


GRAPHIC SCALE

0 2,500 5,000 10,000

(FEET)

## Residential

- Rural
- Low Density
- Low - Medium Density
- Medium Density
- High Density

## Retail/Service

- Neighborhood Commercial
- General Commercial
- Office Commercial
- Hospitality

## Employment

- Business Park
- Industrial

## Other

- Open Space - Non Recreation
- Open Space - Parkland
- Open Space - Water
- Public Facility
- Public School
- Airport
- Rail
- Landfill

## Mixed Use

- Mixed Use

*ADOPTED BY CITY COUNCIL ON JANUARY 27, 2010

03/10/2012

F:\0641\Engineering\SY_SD Master Plan\Rpt_SD Master Plan\Exh 4 – LUSE PLAN.dwg 3/15/2012 11:44 AM Joanna Swidtkowska

# EXHIBIT 4

MARCH 2012

CITY OF ONTARIO
MASTER PLAN OF DRAINAGE

# LAND USE PLAN

# EXCERPT E: CITY OF ONTARIO MASTER DRAINAGE PLAN CALCULATIONS

```
            San Bernardino County Rational Hydrology Program

                (Hydrology Manual Date - August 1986)
 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2014 Version 9.0
      Rational Hydrology Study        Date: 05/18/17
----------------------------------------------------------------------
City of Ontario Master Plan of Drainage
100-Yr Study
Area C

----------------------------------------------------------------------


Program License Serial Number 6385

----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

----------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.200 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       81.000 to Point/Station       82.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.590
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.410
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 47.17
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.421(In/Hr)
Initial subarea data:
Initial area flow distance =   998.000(Ft.)
Top (of initial area) elevation =   775.000(Ft.)
Bottom (of initial area) elevation =   767.000(Ft.)
Difference in elevation =     8.000(Ft.)
Slope =    0.00802  s(%)=       0.80
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.174 min.
Rainfall intensity =      2.635(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.756
Subarea runoff =     19.326(CFS)
Total initial stream area =        9.700(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.421(In/Hr)


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Process from Point/Station       82.000 to Point/Station       83.000
```

```
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
_____________________________________________________________________
Top of street segment elevation =   767.000(Ft.)
End of street segment elevation =   750.000(Ft.)
Length of street segment  =  1686.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  65.000(Ft.)
Distance from crown to crossfall grade break  =  60.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     29.610(CFS)
Depth of flow =   0.535(Ft.), Average velocity =   3.455(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.393(Ft.)
Flow velocity =   3.45(Ft/s)
Travel time =    8.13 min.     TC =   24.31  min.
 Adding area flow to street
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.790
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.210
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 39.77
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.459(In/Hr)
Rainfall intensity =      2.064(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.706
Subarea runoff =     20.423(CFS) for   17.600(Ac.)
Total runoff =     39.749(CFS)
Effective area this stream =       27.30(Ac.)
Total Study Area (Main Stream No. 1) =       27.30(Ac.)
Area averaged Fm value =    0.446(In/Hr)
Street flow at end of street =     39.749(CFS)
Half street flow at end of street =     19.874(CFS)
Depth of flow =   0.584(Ft.), Average velocity =   3.714(Ft/s)
Flow width (from curb towards crown)=  22.856(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       83.000 to Point/Station       84.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =   750.000(Ft.)
Downstream point/station elevation =   747.700(Ft.)
Pipe length  =  1333.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    39.749(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    39.749(CFS)
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Normal flow depth in pipe =   32.72(In.)
Flow top width inside pipe =   34.85(In.)
Critical Depth =   23.53(In.)
Pipe flow velocity =      4.94(Ft/s)
Travel time through pipe =    4.49 min.
Time of concentration (TC) =    28.80 min.


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Process from Point/Station       84.000 to Point/Station       84.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.489(In/Hr)
Time of concentration =    28.80 min.
Rainfall intensity =      1.864(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.670
Subarea runoff =     84.317(CFS) for   72.100(Ac.)
Total runoff =    124.066(CFS)
Effective area this stream =       99.40(Ac.)
Total Study Area (Main Stream No. 1) =       99.40(Ac.)
Area averaged Fm value =    0.477(In/Hr)


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Process from Point/Station       84.000 to Point/Station       84.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4700     Max loss rate(Fm)=     0.460(In/Hr)
Time of concentration =    28.80 min.
Rainfall intensity =      1.864(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.674
Subarea runoff =    127.148(CFS) for  100.600(Ac.)
Total runoff =    251.214(CFS)
Effective area this stream =      200.00(Ac.)
Total Study Area (Main Stream No. 1) =      200.00(Ac.)
Area averaged Fm value =    0.468(In/Hr)


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Process from Point/Station       84.000 to Point/Station       85.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   747.700(Ft.)
Downstream point/station elevation =   722.700(Ft.)
Pipe length  =  2630.00(Ft.)   Manning's N = 0.013
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```
No. of pipes = 1  Required pipe flow  =   251.214(CFS)
Nearest computed pipe diameter  =     60.00(In.)
Calculated individual pipe flow  =   251.214(CFS)
Normal flow depth in pipe =   48.56(In.)
Flow top width inside pipe =   47.14(In.)
Critical Depth =   53.16(In.)
Pipe flow velocity =     14.74(Ft/s)
Travel time through pipe =    2.97 min.
Time of concentration (TC) =    31.77 min.


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Process from Point/Station       85.000 to Point/Station       85.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5900     Max loss rate(Fm)=     0.577(In/Hr)
Time of concentration =    31.77 min.
Rainfall intensity =      1.757(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.642
Subarea runoff =     87.022(CFS) for  100.000(Ac.)
Total runoff =    338.236(CFS)
Effective area this stream =      300.00(Ac.)
Total Study Area (Main Stream No. 1) =      300.00(Ac.)
Area averaged Fm value =    0.504(In/Hr)


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Process from Point/Station       85.000 to Point/Station       85.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5200     Max loss rate(Fm)=     0.508(In/Hr)
Time of concentration =    31.77 min.
Rainfall intensity =      1.757(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.642
Subarea runoff =     10.002(CFS) for    8.900(Ac.)
Total runoff =    348.239(CFS)
Effective area this stream =      308.90(Ac.)
Total Study Area (Main Stream No. 1) =      308.90(Ac.)
Area averaged Fm value =    0.505(In/Hr)


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Process from Point/Station       85.000 to Point/Station       85.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    308.900(Ac.)
Runoff from this stream =    348.239(CFS)
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```
Time of concentration =   31.77 min.
Rainfall intensity =     1.757(In/Hr)
Area averaged loss rate (Fm) =    0.5046(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5199


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Process from Point/Station       86.000 to Point/Station       87.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.240
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.760
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 60.12
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.339(In/Hr)
Initial subarea data:
Initial area flow distance =   764.000(Ft.)
Top (of initial area) elevation =   750.000(Ft.)
Bottom (of initial area) elevation =   740.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01309  s(%)=       1.31
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.177 min.
Rainfall intensity =      2.980(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.798
Subarea runoff =     22.579(CFS)
Total initial stream area =        9.500(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.339(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       87.000 to Point/Station       88.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   740.000(Ft.)
End of street segment elevation =   724.700(Ft.)
Length of street segment  =  1880.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  13.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     42.202(CFS)
Depth of flow =   0.599(Ft.), Average velocity =   3.913(Ft/s)
Note:  depth of flow exceeds top of street crown.
```

```
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   3.91(Ft/s)
Travel time =    8.01 min.     TC =   21.18  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.3900     Max loss rate(Fm)=     0.214(In/Hr)
Rainfall intensity =      2.241(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.800
Subarea runoff =     39.120(CFS) for   24.900(Ac.)
Total runoff =     61.699(CFS)
Effective area this stream =       34.40(Ac.)
Total Study Area (Main Stream No. 1) =      343.30(Ac.)
Area averaged Fm value =    0.248(In/Hr)
Street flow at end of street =     61.699(CFS)
Half street flow at end of street =     30.849(CFS)
Depth of flow =   0.682(Ft.), Average velocity =   4.475(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.78(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station       88.000 to Point/Station       89.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   724.700(Ft.)
Downstream point/station elevation =   724.000(Ft.)
Pipe length  =   695.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    61.699(CFS)
Nearest computed pipe diameter  =     54.00(In.)
Calculated individual pipe flow  =    61.699(CFS)
Normal flow depth in pipe =   43.69(In.)
Flow top width inside pipe =   42.45(In.)
Critical Depth =   27.38(In.)
Pipe flow velocity =      4.47(Ft/s)
Travel time through pipe =    2.59 min.
Time of concentration (TC) =    23.77 min.


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Process from Point/Station       89.000 to Point/Station       89.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 64.14
Pervious ratio(Ap) = 0.5200     Max loss rate(Fm)=     0.323(In/Hr)
Time of concentration =    23.77 min.
Rainfall intensity =      2.091(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.776
```

```
Subarea runoff =     58.392(CFS) for   39.600(Ac.)
Total runoff =    120.091(CFS)
Effective area this stream =       74.00(Ac.)
Total Study Area (Main Stream No. 1) =      382.90(Ac.)
Area averaged Fm value =    0.288(In/Hr)


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Process from Point/Station       89.000 to Point/Station       90.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   724.000(Ft.)
Downstream point/station elevation =   722.900(Ft.)
Pipe length  =  1105.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   120.091(CFS)
Nearest computed pipe diameter  =     72.00(In.)
Calculated individual pipe flow  =   120.091(CFS)
Normal flow depth in pipe =   53.34(In.)
Flow top width inside pipe =   63.09(In.)
Critical Depth =   35.49(In.)
Pipe flow velocity =      5.35(Ft/s)
Travel time through pipe =    3.44 min.
Time of concentration (TC) =    27.22 min.


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Process from Point/Station       90.000 to Point/Station       90.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 34.05
Pervious ratio(Ap) = 0.6800     Max loss rate(Fm)=     0.656(In/Hr)
Time of concentration =    27.22 min.
Rainfall intensity =      1.928(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.681
Subarea runoff =     70.543(CFS) for   71.100(Ac.)
Total runoff =    190.634(CFS)
Effective area this stream =      145.10(Ac.)
Total Study Area (Main Stream No. 1) =      454.00(Ac.)
Area averaged Fm value =    0.468(In/Hr)


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Process from Point/Station       90.000 to Point/Station       85.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   722.900(Ft.)
Downstream point/station elevation =   722.700(Ft.)
Pipe length  =   200.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   190.634(CFS)
Nearest computed pipe diameter  =     84.00(In.)
Calculated individual pipe flow  =   190.634(CFS)
Normal flow depth in pipe =   64.97(In.)
Flow top width inside pipe =   70.33(In.)
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Critical Depth =   43.12(In.)
Pipe flow velocity =      5.97(Ft/s)
Travel time through pipe =    0.56 min.
Time of concentration (TC) =    27.78 min.


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Process from Point/Station       85.000 to Point/Station       85.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =    145.100(Ac.)
Runoff from this stream =    190.634(CFS)
Time of concentration =   27.78 min.
Rainfall intensity =     1.905(In/Hr)
Area averaged loss rate (Fm) =    0.4685(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5748
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    348.24   308.900     31.77    0.505      1.757
2    190.63   145.100     27.78    0.468      1.905
Qmax(1) =
         1.000 *    1.000 *   348.239) +
         0.897 *    1.000 *   190.634) + =     519.270
Qmax(2) =
         1.118 *    0.874 *   348.239) +
         1.000 *    1.000 *   190.634) + =     530.938

Total of 2 streams to confluence:
Flow rates before confluence point:
     348.239     190.634
Maximum flow rates at confluence using above data:
      519.270      530.938
Area of streams before confluence:
      308.900      145.100
Effective area values after confluence:
      454.000      415.120
Results of confluence:
Total flow rate =    530.938(CFS)
Time of concentration =    27.775 min.
Effective stream area after confluence =    415.120(Ac.)
Study area average Pervious fraction(Ap) =  0.537
Study area average soil loss rate(Fm) =    0.493(In/Hr)
Study area total (this main stream) =     454.00(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       85.000 to Point/Station       91.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   722.700(Ft.)
Downstream point/station elevation =   697.000(Ft.)
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```
Pipe length  =  2645.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   530.938(CFS)
Nearest computed pipe diameter  =     81.00(In.)
Calculated individual pipe flow  =   530.938(CFS)
Normal flow depth in pipe =   61.78(In.)
Flow top width inside pipe =   68.92(In.)
Critical Depth =   71.70(In.)
Pipe flow velocity =     18.14(Ft/s)
Travel time through pipe =    2.43 min.
Time of concentration (TC) =    30.21 min.


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Process from Point/Station       91.000 to Point/Station       91.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4600     Max loss rate(Fm)=     0.450(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =    503.705(CFS)
therefore the upstream flow rate of Q =    530.938(CFS) is being used
Time of concentration =    30.21 min.
Rainfall intensity =      1.811(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.655
Subarea runoff =      0.000(CFS) for    9.100(Ac.)
Total runoff =    530.938(CFS)
Effective area this stream =      424.22(Ac.)
Total Study Area (Main Stream No. 1) =      463.10(Ac.)
Area averaged Fm value =    0.492(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       91.000 to Point/Station       91.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4500     Max loss rate(Fm)=     0.440(In/Hr)
Time of concentration =    30.21 min.
Rainfall intensity =      1.811(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.660
Subarea runoff =     77.558(CFS) for   84.900(Ac.)
Total runoff =    608.495(CFS)
Effective area this stream =      509.12(Ac.)
Total Study Area (Main Stream No. 1) =      548.00(Ac.)
Area averaged Fm value =    0.483(In/Hr)


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Process from Point/Station       91.000 to Point/Station       91.000
**** CONFLUENCE OF MINOR STREAMS ****
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____________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    509.120(Ac.)
Runoff from this stream =    608.495(CFS)
Time of concentration =   30.21 min.
Rainfall intensity =     1.811(In/Hr)
Area averaged loss rate (Fm) =    0.4834(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5215


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Process from Point/Station       92.000 to Point/Station       93.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.050
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.950
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 67.15
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.288(In/Hr)
Initial subarea data:
Initial area flow distance =   780.000(Ft.)
Top (of initial area) elevation =   730.000(Ft.)
Bottom (of initial area) elevation =   720.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01282  s(%)=       1.28
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.342 min.
Rainfall intensity =      2.958(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.812
Subarea runoff =     22.345(CFS)
Total initial stream area =        9.300(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.288(In/Hr)


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Process from Point/Station       93.000 to Point/Station       94.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
____________________________________________________________________
Top of street segment elevation =   720.000(Ft.)
End of street segment elevation =   701.000(Ft.)
Length of street segment  =  1920.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  13.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
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 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     42.026(CFS)
Depth of flow =   0.581(Ft.), Average velocity =   4.144(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   4.14(Ft/s)
Travel time =    7.72 min.     TC =   21.06  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 49.51
Pervious ratio(Ap) = 0.4100     Max loss rate(Fm)=     0.334(In/Hr)
Rainfall intensity =      2.249(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.771
Subarea runoff =     39.213(CFS) for   26.200(Ac.)
Total runoff =     61.557(CFS)
Effective area this stream =       35.50(Ac.)
Total Study Area (Main Stream No. 1) =      583.50(Ac.)
Area averaged Fm value =    0.322(In/Hr)
Street flow at end of street =     61.557(CFS)
Half street flow at end of street =     30.779(CFS)
Depth of flow =   0.654(Ft.), Average velocity =   4.820(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station       94.000 to Point/Station       95.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   701.000(Ft.)
Downstream point/station elevation =   699.000(Ft.)
Pipe length  =   700.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    61.557(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    61.557(CFS)
Normal flow depth in pipe =   35.06(In.)
Flow top width inside pipe =   37.33(In.)
Critical Depth =   28.93(In.)
Pipe flow velocity =      6.66(Ft/s)
Travel time through pipe =    1.75 min.
Time of concentration (TC) =    22.81 min.


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Process from Point/Station       95.000 to Point/Station       95.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.4600     Max loss rate(Fm)=     0.252(In/Hr)
Time of concentration =    22.81 min.
Rainfall intensity =      2.144(In/Hr) for a   100.0 year storm
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Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.781
Subarea runoff =     68.139(CFS) for   42.000(Ac.)
Total runoff =    129.697(CFS)
Effective area this stream =       77.50(Ac.)
Total Study Area (Main Stream No. 1) =      625.50(Ac.)
Area averaged Fm value =    0.284(In/Hr)


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Process from Point/Station       95.000 to Point/Station       96.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   699.000(Ft.)
Downstream point/station elevation =   697.200(Ft.)
Pipe length  =  1100.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =   129.697(CFS)
Nearest computed pipe diameter  =     69.00(In.)
Calculated individual pipe flow  =   129.697(CFS)
Normal flow depth in pipe =   55.31(In.)
Flow top width inside pipe =   55.03(In.)
Critical Depth =   37.46(In.)
Pipe flow velocity =      5.82(Ft/s)
Travel time through pipe =    3.15 min.
Time of concentration (TC) =    25.97 min.


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Process from Point/Station       96.000 to Point/Station       96.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 41.47
Pervious ratio(Ap) = 0.3600     Max loss rate(Fm)=     0.325(In/Hr)
Time of concentration =    25.97 min.
Rainfall intensity =      1.984(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.762
Subarea runoff =     95.559(CFS) for   71.500(Ac.)
Total runoff =    225.256(CFS)
Effective area this stream =      149.00(Ac.)
Total Study Area (Main Stream No. 1) =      697.00(Ac.)
Area averaged Fm value =    0.304(In/Hr)


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Process from Point/Station       96.000 to Point/Station       91.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   697.200(Ft.)
Downstream point/station elevation =   697.000(Ft.)
Pipe length  =   200.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   225.256(CFS)
Nearest computed pipe diameter  =     90.00(In.)
Calculated individual pipe flow  =   225.256(CFS)
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Normal flow depth in pipe =   68.53(In.)
Flow top width inside pipe =   76.71(In.)
Critical Depth =   46.05(In.)
Pipe flow velocity =      6.24(Ft/s)
Travel time through pipe =    0.53 min.
Time of concentration (TC) =    26.50 min.


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Process from Point/Station       91.000 to Point/Station       91.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =    149.000(Ac.)
Runoff from this stream =    225.256(CFS)
Time of concentration =   26.50 min.
Rainfall intensity =     1.959(In/Hr)
Area averaged loss rate (Fm) =    0.3037(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4057
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    608.50   509.120     30.21    0.483      1.811
2    225.26   149.000     26.50    0.304      1.959
Qmax(1) =
         1.000 *    1.000 *   608.495) +
         0.911 *    1.000 *   225.256) + =     813.615
Qmax(2) =
         1.111 *    0.877 *   608.495) +
         1.000 *    1.000 *   225.256) + =     818.589

Total of 2 streams to confluence:
Flow rates before confluence point:
     608.495     225.256
Maximum flow rates at confluence using above data:
      813.615      818.589
Area of streams before confluence:
      509.120      149.000
Effective area values after confluence:
      658.120      595.656
Results of confluence:
Total flow rate =    818.589(CFS)
Time of concentration =    26.500 min.
Effective stream area after confluence =    595.656(Ac.)
Study area average Pervious fraction(Ap) =  0.495
Study area average soil loss rate(Fm) =    0.443(In/Hr)
Study area total (this main stream) =     658.12(Ac.)


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Process from Point/Station       91.000 to Point/Station       97.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
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Upstream point/station elevation =   697.000(Ft.)
Downstream point/station elevation =   685.000(Ft.)
Pipe length  =  2637.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   818.589(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =   818.589(CFS)
Normal flow depth in pipe =   85.88(In.)
Flow top width inside pipe =   87.18(In.)
Critical Depth =   84.80(In.)
Pipe flow velocity =     15.09(Ft/s)
Travel time through pipe =    2.91 min.
Time of concentration (TC) =    29.41 min.


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Process from Point/Station       97.000 to Point/Station       97.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 45.69
Pervious ratio(Ap) = 0.4000     Max loss rate(Fm)=     0.344(In/Hr)
Time of concentration =    29.41 min.
Rainfall intensity =      1.841(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.689
Subarea runoff =     43.263(CFS) for   83.500(Ac.)
Total runoff =    861.852(CFS)
Effective area this stream =      679.16(Ac.)
Total Study Area (Main Stream No. 1) =      780.50(Ac.)
Area averaged Fm value =    0.431(In/Hr)


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Process from Point/Station       97.000 to Point/Station       97.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5300     Max loss rate(Fm)=     0.518(In/Hr)
Time of concentration =    29.41 min.
Rainfall intensity =      1.841(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.685
Subarea runoff =     93.423(CFS) for   78.500(Ac.)
Total runoff =    955.274(CFS)
Effective area this stream =      757.66(Ac.)
Total Study Area (Main Stream No. 1) =      859.00(Ac.)
Area averaged Fm value =    0.440(In/Hr)


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Process from Point/Station       97.000 to Point/Station     1708.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
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Upstream point/station elevation =   685.000(Ft.)
Downstream point/station elevation =   650.000(Ft.)
Pipe length  =  2549.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   955.274(CFS)
Nearest computed pipe diameter  =     93.00(In.)
Calculated individual pipe flow  =   955.274(CFS)
Normal flow depth in pipe =   74.06(In.)
Flow top width inside pipe =   74.90(In.)
Critical Depth =   87.99(In.)
Pipe flow velocity =     23.72(Ft/s)
Travel time through pipe =    1.79 min.
Time of concentration (TC) =    31.20 min.


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Process from Point/Station     1708.000 to Point/Station     1708.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    757.656(Ac.)
Runoff from this stream =    955.274(CFS)
Time of concentration =   31.20 min.
Rainfall intensity =     1.776(In/Hr)
Area averaged loss rate (Fm) =    0.4396(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4884


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Process from Point/Station     1700.000 to Point/Station     1701.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.890
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.110
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 36.07
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.095(In/Hr)
Initial subarea data:
Initial area flow distance =   907.000(Ft.)
Top (of initial area) elevation =   697.500(Ft.)
Bottom (of initial area) elevation =   693.100(Ft.)
Difference in elevation =     4.400(Ft.)
Slope =    0.00485  s(%)=       0.49
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.451 min.
Rainfall intensity =      2.943(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.871
Subarea runoff =     20.071(CFS)
Total initial stream area =        7.830(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.095(In/Hr)


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Process from Point/Station     1701.000 to Point/Station     1702.000
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**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
_____________________________________________________________________
Top of street segment elevation =   693.100(Ft.)
End of street segment elevation =   689.120(Ft.)
Length of street segment  =   382.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  30.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     30.694(CFS)
Depth of flow =   0.538(Ft.), Average velocity =   3.529(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.549(Ft.)
Flow velocity =   3.53(Ft/s)
Travel time =    1.80 min.     TC =   15.25  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.630
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.370
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 45.69
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.086(In/Hr)
Rainfall intensity =      2.729(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.870
Subarea runoff =     21.139(CFS) for    9.520(Ac.)
Total runoff =     41.210(CFS)
Effective area this stream =       17.35(Ac.)
Total Study Area (Main Stream No. 1) =      876.35(Ac.)
Area averaged Fm value =    0.090(In/Hr)
Street flow at end of street =     41.210(CFS)
Half street flow at end of street =     20.605(CFS)
Depth of flow =   0.587(Ft.), Average velocity =   3.794(Ft/s)
Flow width (from curb towards crown)=  23.030(Ft.)


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Process from Point/Station     1702.000 to Point/Station     1704.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
_____________________________________________________________________
Top of street segment elevation =   689.120(Ft.)
End of street segment elevation =   685.500(Ft.)
Length of street segment  =   817.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  30.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
```

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Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     56.262(CFS)
Depth of flow =   0.746(Ft.), Average velocity =   2.853(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    3.96(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  30.000(Ft.)
Flow velocity =   2.85(Ft/s)
Travel time =    4.77 min.     TC =   20.03  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4200     Max loss rate(Fm)=     0.411(In/Hr)
Rainfall intensity =      2.318(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.797
Subarea runoff =     29.918(CFS) for   21.170(Ac.)
Total runoff =     71.128(CFS)
Effective area this stream =       38.52(Ac.)
Total Study Area (Main Stream No. 1) =      897.52(Ac.)
Area averaged Fm value =    0.266(In/Hr)
Street flow at end of street =     71.128(CFS)
Half street flow at end of street =     35.564(CFS)
Depth of flow =   0.797(Ft.), Average velocity =   3.045(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    6.54(Ft.)
Flow width (from curb towards crown)=  30.000(Ft.)


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Process from Point/Station     1704.000 to Point/Station     1706.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   679.500(Ft.)
Downstream point/station elevation =   671.500(Ft.)
Pipe length  =   611.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    71.128(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    71.128(CFS)
Normal flow depth in pipe =   27.52(In.)
Flow top width inside pipe =   30.56(In.)
Critical Depth =   32.06(In.)
Pipe flow velocity =     12.27(Ft/s)
Travel time through pipe =    0.83 min.
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Time of concentration (TC) =    20.86 min.


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Process from Point/Station     1706.000 to Point/Station     1706.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4800     Max loss rate(Fm)=     0.469(In/Hr)
Time of concentration =    20.86 min.
Rainfall intensity =      2.262(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.770
Subarea runoff =     24.075(CFS) for   16.120(Ac.)
Total runoff =     95.202(CFS)
Effective area this stream =       54.64(Ac.)
Total Study Area (Main Stream No. 1) =      913.64(Ac.)
Area averaged Fm value =    0.326(In/Hr)


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Process from Point/Station     1706.000 to Point/Station     1708.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   671.500(Ft.)
Downstream point/station elevation =   666.500(Ft.)
Pipe length  =   970.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    95.202(CFS)
Nearest computed pipe diameter  =     48.00(In.)
Calculated individual pipe flow  =    95.202(CFS)
Normal flow depth in pipe =   36.38(In.)
Flow top width inside pipe =   41.13(In.)
Critical Depth =   35.51(In.)
Pipe flow velocity =      9.31(Ft/s)
Travel time through pipe =    1.74 min.
Time of concentration (TC) =    22.59 min.


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Process from Point/Station     1708.000 to Point/Station     1708.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    22.59 min.
Rainfall intensity =      2.156(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.787
Subarea runoff =     27.785(CFS) for   17.810(Ac.)
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Total runoff =    122.987(CFS)
Effective area this stream =       72.45(Ac.)
Total Study Area (Main Stream No. 1) =      931.45(Ac.)
Area averaged Fm value =    0.270(In/Hr)


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Process from Point/Station     1708.000 to Point/Station     1708.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     72.450(Ac.)
Runoff from this stream =    122.987(CFS)
Time of concentration =   22.59 min.
Rainfall intensity =     2.156(In/Hr)
Area averaged loss rate (Fm) =    0.2700(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2781


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Process from Point/Station     1710.000 to Point/Station     1711.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   787.000(Ft.)
Top (of initial area) elevation =   702.500(Ft.)
Bottom (of initial area) elevation =   698.500(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00508  s(%)=       0.51
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.591 min.
Rainfall intensity =      3.062(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.871
Subarea runoff =     13.474(CFS)
Total initial stream area =        5.050(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


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Process from Point/Station     1711.000 to Point/Station     1712.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   698.500(Ft.)
End of street segment elevation =   694.900(Ft.)
Length of street segment  =   239.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  30.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
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Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     25.950(CFS)
Depth of flow =   0.485(Ft.), Average velocity =   3.892(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  17.907(Ft.)
Flow velocity =   3.89(Ft/s)
Travel time =    1.02 min.     TC =   13.61  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Rainfall intensity =      2.922(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.870
Subarea runoff =     24.831(CFS) for   10.020(Ac.)
Total runoff =     38.305(CFS)
Effective area this stream =       15.07(Ac.)
Total Study Area (Main Stream No. 1) =      946.52(Ac.)
Area averaged Fm value =    0.098(In/Hr)
Street flow at end of street =     38.305(CFS)
Half street flow at end of street =     19.153(CFS)
Depth of flow =   0.544(Ft.), Average velocity =   4.282(Ft/s)
Flow width (from curb towards crown)=  20.848(Ft.)


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Process from Point/Station     1712.000 to Point/Station     1714.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   688.900(Ft.)
Downstream point/station elevation =   684.300(Ft.)
Pipe length  =   723.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    38.305(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    38.305(CFS)
Normal flow depth in pipe =   24.66(In.)
Flow top width inside pipe =   28.69(In.)
Critical Depth =   24.72(In.)
Pipe flow velocity =      8.05(Ft/s)
Travel time through pipe =    1.50 min.
Time of concentration (TC) =    15.11 min.
```

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Process from Point/Station     1714.000 to Point/Station     1714.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    15.11 min.
Rainfall intensity =      2.745(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.868
Subarea runoff =     50.169(CFS) for   22.070(Ac.)
Total runoff =     88.474(CFS)
Effective area this stream =       37.14(Ac.)
Total Study Area (Main Stream No. 1) =      968.59(Ac.)
Area averaged Fm value =    0.098(In/Hr)


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Process from Point/Station     1714.000 to Point/Station     1716.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   684.300(Ft.)
Downstream point/station elevation =   681.800(Ft.)
Pipe length  =   689.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    88.474(CFS)
Nearest computed pipe diameter  =     51.00(In.)
Calculated individual pipe flow  =    88.474(CFS)
Normal flow depth in pipe =   36.80(In.)
Flow top width inside pipe =   45.72(In.)
Critical Depth =   33.67(In.)
Pipe flow velocity =      8.08(Ft/s)
Travel time through pipe =    1.42 min.
Time of concentration (TC) =    16.53 min.


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Process from Point/Station     1716.000 to Point/Station     1716.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4700     Max loss rate(Fm)=     0.460(In/Hr)
Time of concentration =    16.53 min.
Rainfall intensity =      2.600(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.821
Subarea runoff =     35.433(CFS) for   20.890(Ac.)
Total runoff =    123.907(CFS)
Effective area this stream =       58.03(Ac.)
Total Study Area (Main Stream No. 1) =      989.48(Ac.)
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Area averaged Fm value =    0.228(In/Hr)


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Process from Point/Station     1716.000 to Point/Station     1708.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   681.800(Ft.)
Downstream point/station elevation =   666.500(Ft.)
Pipe length  =  1015.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   123.907(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =   123.907(CFS)
Normal flow depth in pipe =   31.41(In.)
Flow top width inside pipe =   41.32(In.)
Critical Depth =   40.04(In.)
Pipe flow velocity =     15.04(Ft/s)
Travel time through pipe =    1.12 min.
Time of concentration (TC) =    17.66 min.


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Process from Point/Station     1708.000 to Point/Station     1708.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    17.66 min.
Rainfall intensity =      2.500(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.831
Subarea runoff =     43.038(CFS) for   22.340(Ac.)
Total runoff =    166.945(CFS)
Effective area this stream =       80.37(Ac.)
Total Study Area (Main Stream No. 1) =     1011.82(Ac.)
Area averaged Fm value =    0.192(In/Hr)


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Process from Point/Station     1708.000 to Point/Station     1708.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 3
Stream flow area =     80.370(Ac.)
Runoff from this stream =    166.945(CFS)
Time of concentration =   17.66 min.
Rainfall intensity =     2.500(In/Hr)
Area averaged loss rate (Fm) =    0.1918(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1962
Summary of stream data:
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Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    955.27   757.656     31.20    0.440      1.776
2    122.99    72.450     22.59    0.270      2.156
3    166.94    80.370     17.66    0.192      2.500
Qmax(1) =
         1.000 *    1.000 *   955.274) +
         0.799 *    1.000 *   122.987) +
         0.687 *    1.000 *   166.945) + =    1168.120
Qmax(2) =
         1.284 *    0.724 *   955.274) +
         1.000 *    1.000 *   122.987) +
         0.851 *    1.000 *   166.945) + =    1153.236
Qmax(3) =
         1.541 *    0.566 *   955.274) +
         1.182 *    0.782 *   122.987) +
         1.000 *    1.000 *   166.945) + =    1113.691

Total of 3 streams to confluence:
Flow rates before confluence point:
     955.274     122.987     166.945
Maximum flow rates at confluence using above data:
     1168.120     1153.236     1113.691
Area of streams before confluence:
      757.656       72.450       80.370
Effective area values after confluence:
      910.476      701.405      565.747
Results of confluence:
Total flow rate =   1168.120(CFS)
Time of concentration =    31.203 min.
Effective stream area after confluence =    910.476(Ac.)
Study area average Pervious fraction(Ap) =  0.446
Study area average soil loss rate(Fm) =    0.404(In/Hr)
Study area total (this main stream) =     910.48(Ac.)


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Process from Point/Station     1708.000 to Point/Station     1722.100
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   666.500(Ft.)
Downstream point/station elevation =   643.400(Ft.)
Pipe length  =  2500.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1168.120(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =  1168.120(CFS)
Normal flow depth in pipe =   86.06(In.)
Flow top width inside pipe =   86.90(In.)
Critical Depth =   97.79(In.)
Pipe flow velocity =     21.50(Ft/s)
Travel time through pipe =    1.94 min.
Time of concentration (TC) =    33.14 min.
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Process from Point/Station     1708.000 to Point/Station     1722.100
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    910.476(Ac.)
Runoff from this stream =   1168.120(CFS)
Time of concentration =   33.14 min.
Rainfall intensity =     1.713(In/Hr)
Area averaged loss rate (Fm) =    0.4043(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4459
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1   1168.12   910.476     33.14    0.404      1.713
Qmax(1) =
         1.000 *    1.000 *  1168.120) + =    1168.120

Total of 1 main streams to confluence:
Flow rates before confluence point:
    1169.120
Maximum flow rates at confluence using above data:
     1168.120
Area of streams before confluence:
      910.476
Effective area values after confluence:
      910.476


Results of confluence:
Total flow rate =   1168.120(CFS)
Time of concentration =    33.141 min.
Effective stream area after confluence  =    910.476(Ac.)
Study area average Pervious fraction(Ap) =  0.446
Study area average soil loss rate(Fm) =    0.404(In/Hr)
Study area total =     910.48(Ac.)


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Process from Point/Station      102.100 to Point/Station      102.200
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Initial subarea data:
Initial area flow distance =   550.000(Ft.)
Top (of initial area) elevation =   677.000(Ft.)
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Bottom (of initial area) elevation =   667.000(Ft.)
Difference in elevation =    10.000(Ft.)
Slope =    0.01818  s(%)=       1.82
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.455 min.
Rainfall intensity =      3.889(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.877
Subarea runoff =     33.778(CFS)
Total initial stream area =        9.900(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.098(In/Hr)


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Process from Point/Station      102.200 to Point/Station      102.300
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   667.000(Ft.)
End of street segment elevation =   655.000(Ft.)
Length of street segment  =  1850.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  22.000(Ft.)
Distance from crown to crossfall grade break  =  18.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     61.991(CFS)
Depth of flow =   0.710(Ft.), Average velocity =   3.799(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    2.15(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  22.000(Ft.)
Flow velocity =   3.80(Ft/s)
Travel time =    8.12 min.     TC =   16.57  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.338
Decimal fraction soil group B = 0.251
Decimal fraction soil group C = 0.411
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 53.23
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.077(In/Hr)
Rainfall intensity =      2.597(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.872
Subarea runoff =     56.306(CFS) for   29.900(Ac.)
Total runoff =     90.084(CFS)
Effective area this stream =       39.80(Ac.)
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Total Study Area (Main Stream No. 1) =     1051.62(Ac.)
Area averaged Fm value =    0.082(In/Hr)
Street flow at end of street =     90.084(CFS)
Half street flow at end of street =     45.042(CFS)
Depth of flow =   0.817(Ft.), Average velocity =   4.080(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    7.52(Ft.)
Flow width (from curb towards crown)=  22.000(Ft.)


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Process from Point/Station      102.300 to Point/Station      102.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   647.450(Ft.)
Downstream point/station elevation =   646.100(Ft.)
Pipe length  =  1340.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    90.084(CFS)
Nearest computed pipe diameter  =     63.00(In.)
Calculated individual pipe flow  =    90.084(CFS)
Normal flow depth in pipe =   49.31(In.)
Flow top width inside pipe =   51.96(In.)
Critical Depth =   31.84(In.)
Pipe flow velocity =      4.95(Ft/s)
Travel time through pipe =    4.51 min.
Time of concentration (TC) =    21.08 min.


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Process from Point/Station      102.300 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.824
Decimal fraction soil group B = 0.020
Decimal fraction soil group C = 0.156
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 38.25
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.093(In/Hr)
Time of concentration =    21.08 min.
Rainfall intensity =      2.248(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.864
Subarea runoff =    136.990(CFS) for   77.100(Ac.)
Total runoff =    227.074(CFS)
Effective area this stream =      116.90(Ac.)
Total Study Area (Main Stream No. 1) =     1128.72(Ac.)
Area averaged Fm value =    0.089(In/Hr)


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Process from Point/Station      102.000 to Point/Station      101.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   646.100(Ft.)
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Downstream point/station elevation =   644.900(Ft.)
Pipe length  =  1190.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   227.074(CFS)
Nearest computed pipe diameter  =     90.00(In.)
Calculated individual pipe flow  =   227.074(CFS)
Normal flow depth in pipe =   68.81(In.)
Flow top width inside pipe =   76.37(In.)
Critical Depth =   46.34(In.)
Pipe flow velocity =      6.27(Ft/s)
Travel time through pipe =    3.16 min.
Time of concentration (TC) =    24.24 min.


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Process from Point/Station      102.000 to Point/Station      101.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.898
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.102
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 35.77
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.095(In/Hr)
Time of concentration =    24.24 min.
Rainfall intensity =      2.067(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.860
Subarea runoff =    130.562(CFS) for   84.300(Ac.)
Total runoff =    357.636(CFS)
Effective area this stream =      201.20(Ac.)
Total Study Area (Main Stream No. 1) =     1213.02(Ac.)
Area averaged Fm value =    0.092(In/Hr)


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Process from Point/Station      101.000 to Point/Station      100.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   644.900(Ft.)
Downstream point/station elevation =   643.630(Ft.)
Pipe length  =  1350.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   357.636(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =   357.636(CFS)
Normal flow depth in pipe =   82.69(In.)
Flow top width inside pipe =   91.50(In.)
Critical Depth =   55.52(In.)
Pipe flow velocity =      6.84(Ft/s)
Travel time through pipe =    3.29 min.
Time of concentration (TC) =    27.53 min.


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Process from Point/Station      101.000 to Point/Station      100.000
**** SUBAREA FLOW ADDITION ****
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_____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    27.53 min.
Rainfall intensity =      1.915(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.856
Subarea runoff =     86.812(CFS) for   69.900(Ac.)
Total runoff =    444.448(CFS)
Effective area this stream =      271.10(Ac.)
Total Study Area (Main Stream No. 1) =     1282.92(Ac.)
Area averaged Fm value =    0.093(In/Hr)


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Process from Point/Station      101.000 to Point/Station      100.000
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =    271.100(Ac.)
Runoff from this stream =    444.448(CFS)
Time of concentration =   27.53 min.
Rainfall intensity =     1.915(In/Hr)
Area averaged loss rate (Fm) =    0.0934(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min)  (In/Hr)     (In/Hr)


1   1168.12   910.476     33.14    0.404      1.713
2    444.45   271.100     27.53    0.093      1.915
Qmax(1) =
         1.000 *    1.000 *  1168.120) +
         0.889 *    1.000 *   444.448) + =    1563.374
Qmax(2) =
         1.154 *    0.831 *  1168.120) +
         1.000 *    1.000 *   444.448) + =    1564.331

Total of 2 main streams to confluence:
Flow rates before confluence point:
    1169.120     445.448
Maximum flow rates at confluence using above data:
     1563.374     1564.331
Area of streams before confluence:
      910.476      271.100
Effective area values after confluence:
     1181.576     1027.480
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Results of confluence:
Total flow rate =   1564.331(CFS)
Time of concentration =    27.532 min.
Effective stream area after confluence  =   1027.480(Ac.)
Study area average Pervious fraction(Ap) =  0.366
Study area average soil loss rate(Fm) =    0.333(In/Hr)
Study area total =    1181.58(Ac.)


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Process from Point/Station     1722.100 to Point/Station     1722.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   643.400(Ft.)
Downstream point/station elevation =   642.200(Ft.)
Pipe length  =  1190.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1564.331(CFS)
Nearest computed pipe diameter  =    183.00(In.)
Calculated individual pipe flow  =  1564.331(CFS)
Normal flow depth in pipe =  144.75(In.)
Flow top width inside pipe =  148.82(In.)
Critical Depth =  102.22(In.)
Pipe flow velocity =     10.09(Ft/s)
Travel time through pipe =    1.97 min.
Time of concentration (TC) =    29.50 min.


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Process from Point/Station     1722.000 to Point/Station     1722.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =   1510.533(CFS)
therefore the upstream flow rate of Q =   1564.331(CFS) is being used
Time of concentration =    29.50 min.
Rainfall intensity =      1.837(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.745
Subarea runoff =      0.000(CFS) for   76.220(Ac.)
Total runoff =   1564.331(CFS)
Effective area this stream =     1103.70(Ac.)
Total Study Area (Main Stream No. 1) =     1359.14(Ac.)
Area averaged Fm value =    0.317(In/Hr)


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Process from Point/Station     1722.000 to Point/Station     1724.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
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Upstream point/station elevation =   649.400(Ft.)
Downstream point/station elevation =   643.000(Ft.)
Pipe length  =  1335.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1564.331(CFS)
Nearest computed pipe diameter  =    135.00(In.)
Calculated individual pipe flow  =  1564.331(CFS)
Normal flow depth in pipe =  110.44(In.)
Flow top width inside pipe =  104.17(In.)
Critical Depth =  110.43(In.)
Pipe flow velocity =     17.98(Ft/s)
Travel time through pipe =    1.24 min.
Time of concentration (TC) =    30.74 min.


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Process from Point/Station     1724.000 to Point/Station     1724.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 46.02
Pervious ratio(Ap) = 0.4300     Max loss rate(Fm)=     0.368(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =   1472.382(CFS)
therefore the upstream flow rate of Q =   1564.331(CFS) is being used
Time of concentration =    30.74 min.
Rainfall intensity =      1.793(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.741
Subarea runoff =      0.000(CFS) for    4.920(Ac.)
Total runoff =   1564.331(CFS)
Effective area this stream =     1108.62(Ac.)
Total Study Area (Main Stream No. 1) =     1364.06(Ac.)
Area averaged Fm value =    0.317(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1724.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =   1108.620(Ac.)
Runoff from this stream =   1564.331(CFS)
Time of concentration =   30.74 min.
Rainfall intensity =     1.793(In/Hr)
Area averaged loss rate (Fm) =    0.3169(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3485


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1726.000 to Point/Station     1728.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.390
```

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.610
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 54.57
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.075(In/Hr)
Initial subarea data:
Initial area flow distance =   810.000(Ft.)
Top (of initial area) elevation =   685.000(Ft.)
Bottom (of initial area) elevation =   670.400(Ft.)
Difference in elevation =    14.600(Ft.)
Slope =    0.01802  s(%)=       1.80
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.888 min.
Rainfall intensity =      3.540(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.881
Subarea runoff =     23.450(CFS)
Total initial stream area =        7.520(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.075(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1728.000 to Point/Station     1730.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   670.400(Ft.)
End of street segment elevation =   665.200(Ft.)
Length of street segment  =   541.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  30.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     30.983(CFS)
Depth of flow =   0.546(Ft.), Average velocity =   3.431(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.949(Ft.)
Flow velocity =   3.43(Ft/s)
Travel time =    2.63 min.     TC =   12.52  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.330
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.670
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.79
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.072(In/Hr)
Rainfall intensity =      3.073(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.878
Subarea runoff =     14.963(CFS) for    6.710(Ac.)
Total runoff =     38.413(CFS)
Effective area this stream =       14.23(Ac.)
Total Study Area (Main Stream No. 1) =     1378.29(Ac.)
Area averaged Fm value =    0.074(In/Hr)
Street flow at end of street =     38.413(CFS)
Half street flow at end of street =     19.206(CFS)
Depth of flow =   0.582(Ft.), Average velocity =   3.617(Ft/s)
Flow width (from curb towards crown)=  22.766(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1730.000 to Point/Station     1730.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 70.23
Pervious ratio(Ap) = 0.4700     Max loss rate(Fm)=     0.249(In/Hr)
Time of concentration =    12.52 min.
Rainfall intensity =      3.073(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.871
Subarea runoff =      5.644(CFS) for    2.220(Ac.)
Total runoff =     44.057(CFS)
Effective area this stream =       16.45(Ac.)
Total Study Area (Main Stream No. 1) =     1380.51(Ac.)
Area averaged Fm value =    0.097(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1730.000 to Point/Station     1730.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    12.52 min.
Rainfall intensity =      3.073(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =     28.633(CFS) for   10.540(Ac.)
Total runoff =     72.690(CFS)
Effective area this stream =       26.99(Ac.)
Total Study Area (Main Stream No. 1) =     1391.05(Ac.)
Area averaged Fm value =    0.081(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1730.000 to Point/Station     1732.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_______________________________________________________________________
Upstream point/station elevation =   661.450(Ft.)
Downstream point/station elevation =   656.790(Ft.)
Pipe length  =   491.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    72.690(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    72.690(CFS)
Normal flow depth in pipe =   29.02(In.)
Flow top width inside pipe =   34.04(In.)
Critical Depth =   32.39(In.)
Pipe flow velocity =     10.98(Ft/s)
Travel time through pipe =    0.75 min.
Time of concentration (TC) =    13.26 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1732.000 to Point/Station     1732.000
**** SUBAREA FLOW ADDITION ****
_______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.320
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.680
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 57.16
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.072(In/Hr)
Time of concentration =    13.26 min.
Rainfall intensity =      2.968(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =     34.315(CFS) for   14.140(Ac.)
Total runoff =    107.005(CFS)
Effective area this stream =       41.13(Ac.)
Total Study Area (Main Stream No. 1) =     1405.19(Ac.)
Area averaged Fm value =    0.078(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1732.000 to Point/Station     1732.000
**** SUBAREA FLOW ADDITION ****
_______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    13.26 min.
Rainfall intensity =      2.968(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.877
Subarea runoff =     19.169(CFS) for    7.310(Ac.)
Total runoff =    126.173(CFS)
Effective area this stream =       48.44(Ac.)
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Total Study Area (Main Stream No. 1) =     1412.50(Ac.)
Area averaged Fm value =    0.074(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1732.000 to Point/Station     1734.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   656.790(Ft.)
Downstream point/station elevation =   652.050(Ft.)
Pipe length  =   511.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   126.173(CFS)
Nearest computed pipe diameter  =     48.00(In.)
Calculated individual pipe flow  =   126.173(CFS)
Normal flow depth in pipe =   36.00(In.)
Flow top width inside pipe =   41.57(In.)
Critical Depth =   40.43(In.)
Pipe flow velocity =     12.48(Ft/s)
Travel time through pipe =    0.68 min.
Time of concentration (TC) =    13.94 min.


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Process from Point/Station     1734.000 to Point/Station     1734.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.420
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 47.54
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.084(In/Hr)
Time of concentration =    13.94 min.
Rainfall intensity =      2.880(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =     32.530(CFS) for   14.450(Ac.)
Total runoff =    158.703(CFS)
Effective area this stream =       62.89(Ac.)
Total Study Area (Main Stream No. 1) =     1426.95(Ac.)
Area averaged Fm value =    0.076(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1734.000 to Point/Station     1734.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 70.22
Pervious ratio(Ap) = 0.4700     Max loss rate(Fm)=     0.249(In/Hr)
Time of concentration =    13.94 min.
Rainfall intensity =      2.880(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
```

```
Subarea runoff =      8.053(CFS) for    3.400(Ac.)
Total runoff =    166.757(CFS)
Effective area this stream =       66.29(Ac.)
Total Study Area (Main Stream No. 1) =     1430.35(Ac.)
Area averaged Fm value =    0.085(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1734.000 to Point/Station     1734.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    13.94 min.
Rainfall intensity =      2.880(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
Subarea runoff =     19.123(CFS) for    7.520(Ac.)
Total runoff =    185.880(CFS)
Effective area this stream =       73.81(Ac.)
Total Study Area (Main Stream No. 1) =     1437.87(Ac.)
Area averaged Fm value =    0.082(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1734.000 to Point/Station     1736.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   652.050(Ft.)
Downstream point/station elevation =   648.150(Ft.)
Pipe length  =   412.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   185.880(CFS)
Nearest computed pipe diameter  =     54.00(In.)
Calculated individual pipe flow  =   185.880(CFS)
Normal flow depth in pipe =   42.94(In.)
Flow top width inside pipe =   43.59(In.)
Critical Depth =   47.21(In.)
Pipe flow velocity =     13.71(Ft/s)
Travel time through pipe =    0.50 min.
Time of concentration (TC) =    14.44 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1736.000 to Point/Station     1736.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.630
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.370
Decimal fraction soil group D = 0.000
```

```
SCS curve number for soil(AMC 2)  = 45.69
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.086(In/Hr)
Time of concentration =    14.44 min.
Rainfall intensity =      2.820(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
Subarea runoff =     24.682(CFS) for   11.660(Ac.)
Total runoff =    210.562(CFS)
Effective area this stream =       85.47(Ac.)
Total Study Area (Main Stream No. 1) =     1449.53(Ac.)
Area averaged Fm value =    0.083(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1736.000 to Point/Station     1736.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    14.44 min.
Rainfall intensity =      2.820(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
Subarea runoff =     12.842(CFS) for    5.160(Ac.)
Total runoff =    223.404(CFS)
Effective area this stream =       90.63(Ac.)
Total Study Area (Main Stream No. 1) =     1454.69(Ac.)
Area averaged Fm value =    0.081(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1736.000 to Point/Station     1724.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   648.150(Ft.)
Downstream point/station elevation =   643.000(Ft.)
Pipe length  =   481.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   223.404(CFS)
Nearest computed pipe diameter  =     57.00(In.)
Calculated individual pipe flow  =   223.404(CFS)
Normal flow depth in pipe =   44.34(In.)
Flow top width inside pipe =   47.38(In.)
Critical Depth =   50.72(In.)
Pipe flow velocity =     15.09(Ft/s)
Travel time through pipe =    0.53 min.
Time of concentration (TC) =    14.98 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1724.000
**** SUBAREA FLOW ADDITION ****
```

```
____________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.600
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 46.80
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.085(In/Hr)
Time of concentration =    14.98 min.
Rainfall intensity =      2.760(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =     19.409(CFS) for   10.110(Ac.)
Total runoff =    242.813(CFS)
Effective area this stream =      100.74(Ac.)
Total Study Area (Main Stream No. 1) =     1464.80(Ac.)
Area averaged Fm value =    0.081(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1724.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 70.21
Pervious ratio(Ap) = 0.4600     Max loss rate(Fm)=     0.243(In/Hr)
Time of concentration =    14.98 min.
Rainfall intensity =      2.760(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.872
Subarea runoff =      6.250(CFS) for    2.760(Ac.)
Total runoff =    249.063(CFS)
Effective area this stream =      103.50(Ac.)
Total Study Area (Main Stream No. 1) =     1467.56(Ac.)
Area averaged Fm value =    0.086(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1724.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    14.98 min.
Rainfall intensity =      2.760(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =     14.289(CFS) for    5.870(Ac.)
Total runoff =    263.352(CFS)
Effective area this stream =      109.37(Ac.)
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Total Study Area (Main Stream No. 1) =     1473.43(Ac.)
Area averaged Fm value =    0.084(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1724.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =    109.370(Ac.)
Runoff from this stream =    263.352(CFS)
Time of concentration =   14.98 min.
Rainfall intensity =     2.760(In/Hr)
Area averaged loss rate (Fm) =    0.0841(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1281
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1   1564.33  1108.620     30.74    0.317      1.793
2    263.35   109.370     14.98    0.084      2.760
Qmax(1) =
         1.000 *    1.000 *  1564.331) +
         0.639 *    1.000 *   263.352) + =    1732.505
Qmax(2) =
         1.655 *    0.487 *  1564.331) +
         1.000 *    1.000 *   263.352) + =    1525.003

Total of 2 streams to confluence:
Flow rates before confluence point:
    1564.331     263.352
Maximum flow rates at confluence using above data:
     1732.505     1525.003
Area of streams before confluence:
     1108.620      109.370
Effective area values after confluence:
     1217.990      649.541
Results of confluence:
Total flow rate =   1732.505(CFS)
Time of concentration =    30.735 min.
Effective stream area after confluence =   1217.990(Ac.)
Study area average Pervious fraction(Ap) =  0.329
Study area average soil loss rate(Fm) =    0.296(In/Hr)
Study area total (this main stream) =    1217.99(Ac.)


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Process from Point/Station     1724.000 to Point/Station     1738.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   643.000(Ft.)
Downstream point/station elevation =   641.900(Ft.)
Pipe length  =   784.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1732.505(CFS)
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```
Nearest computed pipe diameter  =    177.00(In.)
Calculated individual pipe flow  =  1732.505(CFS)
Normal flow depth in pipe =  143.81(In.)
Flow top width inside pipe =  138.17(In.)
Critical Depth =  108.83(In.)
Pipe flow velocity =     11.65(Ft/s)
Travel time through pipe =    1.12 min.
Time of concentration (TC) =    31.86 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1738.000 to Point/Station     1738.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 70.02
Pervious ratio(Ap) = 0.4100     Max loss rate(Fm)=     0.218(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =   1602.926(CFS)
therefore the upstream flow rate of Q =   1732.505(CFS) is being used
Time of concentration =    31.86 min.
Rainfall intensity =      1.754(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.748
Subarea runoff =      0.000(CFS) for    3.020(Ac.)
Total runoff =   1732.505(CFS)
Effective area this stream =     1221.01(Ac.)
Total Study Area (Main Stream No. 1) =     1476.45(Ac.)
Area averaged Fm value =    0.296(In/Hr)
End of computations, Total Study Area =         1476.45 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.345
Area averaged SCS curve number =  39.9
```

```
____________________________________________________________________________
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                           Analysis prepared by:

                           HUNSAKER & ASSOCIATES
                                 Irvine,Inc
                     Planning * Engineering * Surveying
          Three Hughes * Irvine, California 92618 * (949)583-1010

 ************************** DESCRIPTION OF STUDY **************************
* W.O. #915-1, ONTARIO MPD                                                 *
* 100-YR STUDY                                                             *
* GROVE AVE. AREA 'B'                                                      *
 ***************************************************************************

  FILE NAME: GROVE_M.DAT
  TIME/DATE OF STUDY: 13:01 08/09/2011
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2000

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   65.0     60.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  2   54.0     49.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  3   47.0     42.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  4   42.0     37.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  5   38.0     33.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  6   32.0     27.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  7   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  8   20.0     15.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  9   18.0     13.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
    WATERSHED LAG = 0.80 * Tc
    USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF
    2 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH
    FOR DEVELOPMENTS OF 3-4 UNITS/ACRE AND MORE.
    SIERRA MADRE DEPTH-AREA FACTORS USED.
                        AREA-AVERAGED
         DURATION    RAINFALL(INCH)
         5-MINUTES         0.44
        30-MINUTES         0.91
         1-HOUR            1.20
         3-HOUR            2.10
         6-HOUR            3.00
        24-HOUR            6.00
 *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   912.00
  ELEVATION DATA: UPSTREAM(FEET) =    780.00  DOWNSTREAM(FEET) =    770.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.654
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.796
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       10.00      0.57     0.500    69   14.65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA RUNOFF(CFS) =     22.62
  TOTAL AREA(ACRES) =     10.00   PEAK FLOW RATE(CFS) =     22.62

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  9 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  770.00  DOWNSTREAM ELEVATION(FEET) =  750.00
  STREET LENGTH(FEET) =  1838.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  13.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.94
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.52
  STREET FLOW TRAVEL TIME(MIN.) =   7.25   Tc(MIN.) =   21.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.196
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       19.20      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        3.80      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.91
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =   23.00      SUBAREA RUNOFF(CFS) =   36.07
  EFFECTIVE AREA(ACRES) =     33.00    AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.80  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =       33.0        PEAK FLOW RATE(CFS) =      53.30

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  4.67   DEPTH*VELOCITY(FT*FT/SEC.) =   3.01
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =    2750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   750.00  DOWNSTREAM(FEET) =   748.00
  FLOW LENGTH(FEET) =  1318.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  36.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.94
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      53.30
  PIPE TRAVEL TIME(MIN.) =   4.45    Tc(MIN.) =   26.35
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     63.00 =    4068.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.35
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.966
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       18.90      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       13.40      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        5.50      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.89
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =   37.80      SUBAREA RUNOFF(CFS) =   56.29
  EFFECTIVE AREA(ACRES) =     70.80   AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.84  AREA-AVERAGED Ap =  0.42
  TOTAL AREA(ACRES) =       70.8       PEAK FLOW RATE(CFS) =     102.74

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.35
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.966
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        9.00      0.98     0.100    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       42.10      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       26.30      0.98     0.500    32
  COMMERCIAL                 C        0.90      0.57     0.100    69
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        3.80      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.298
  SUBAREA AREA(ACRES) =   82.10      SUBAREA RUNOFF(CFS) =  124.54
  EFFECTIVE AREA(ACRES) =    152.90   AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.89  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =      152.9       PEAK FLOW RATE(CFS) =     227.27

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =  16
----------------------------------------------------------------------------
  >>>>>USER SPECIFIED CONSTANT SOURCE FLOW AT NODE<<<<<
============================================================================
  USER-SPECIFIED CONSTANT SOURCE FLOW =   300.00(CFS)
  USER-SPECIFIED AREA ASSOCIATED TO SOURCE FLOW =   248.90(ACRES)
  * CUMULATIVE SOURCE FLOW DATA: FLOW(CFS) =   300.00  AREA(AC.) =   248.90
  * SUMMED DATA: FLOW(CFS) =   527.27    TOTAL AREA(ACRES) =   401.80

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     65.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   748.00  DOWNSTREAM(FEET) =   720.00
  FLOW LENGTH(FEET) =  2635.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  81.0 INCH PIPE IS  61.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.00
  ESTIMATED PIPE DIAMETER(INCH) =  81.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     527.27
  PIPE TRAVEL TIME(MIN.) =   2.44    Tc(MIN.) =   28.79
  * TOTAL SOURCE FLOW(CFS) =     300.00
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     65.00 =    6703.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     65.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   28.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.864
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        9.80      0.98     0.100    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       26.50      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       15.30      0.98     0.500    32
  PUBLIC PARK                A        4.80      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C        0.50      0.57     0.200    69
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        8.40      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.90
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.342
  SUBAREA AREA(ACRES) =   65.30      SUBAREA RUNOFF(CFS) =   91.57
  EFFECTIVE AREA(ACRES) =    218.20   AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.89  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =      218.2       PEAK FLOW RATE(CFS) =     304.84

  * SOURCE FLOW DATA: FLOW(CFS) =     300.00     AREA(ACRES) =      248.9
  * SUMMED DATA: FLOW(CFS) =     604.84    TOTAL AREA(ACRES) =      467.1

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     65.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   28.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.864
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       36.90      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       17.00      0.98     0.500    32
  PUBLIC PARK                A        5.10      0.98     0.850    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.343
  SUBAREA AREA(ACRES) =   59.00      SUBAREA RUNOFF(CFS) =   81.25
  EFFECTIVE AREA(ACRES) =    277.20   AREA-AVERAGED Fm(INCH/HR) =  0.32
  AREA-AVERAGED Fp(INCH/HR) =  0.91  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =      277.2       PEAK FLOW RATE(CFS) =     386.09

  * SOURCE FLOW DATA: FLOW(CFS) =     300.00     AREA(ACRES) =      248.9
  * SUMMED DATA: FLOW(CFS) =     686.09    TOTAL AREA(ACRES) =      526.1

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   720.00  DOWNSTREAM(FEET) =   695.00
  FLOW LENGTH(FEET) =  2650.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  90.0 INCH PIPE IS  71.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.25
  ESTIMATED PIPE DIAMETER(INCH) =  90.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     686.09
  PIPE TRAVEL TIME(MIN.) =   2.42    Tc(MIN.) =   31.21
  * TOTAL SOURCE FLOW(CFS) =     300.00
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     66.00 =    9353.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   31.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.776
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        8.50      0.98     0.100    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       14.90      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       19.50      0.98     0.500    32
  PUBLIC PARK                A        4.60      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       22.20      0.57     0.200    69
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        9.30      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.84
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.336
  SUBAREA AREA(ACRES) =   79.00      SUBAREA RUNOFF(CFS) =  106.30
  EFFECTIVE AREA(ACRES) =    356.20   AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.89  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =      356.2       PEAK FLOW RATE(CFS) =     470.41

  * SOURCE FLOW DATA: FLOW(CFS) =     300.00     AREA(ACRES) =      248.9
  * SUMMED DATA: FLOW(CFS) =     770.41    TOTAL AREA(ACRES) =      605.1
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   31.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.776
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        8.40      0.98     0.100    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       19.30      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       26.00      0.98     0.500    32
  PUBLIC PARK                A        3.20      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       19.00      0.57     0.200    69
  PUBLIC PARK                C        2.10      0.57     0.850    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.89
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.333
  SUBAREA AREA(ACRES) =   78.00      SUBAREA RUNOFF(CFS) =  103.92
  EFFECTIVE AREA(ACRES) =    434.20   AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.89  AREA-AVERAGED Ap =  0.34
  TOTAL AREA(ACRES) =      434.2       PEAK FLOW RATE(CFS) =     574.33

  * SOURCE FLOW DATA: FLOW(CFS) =     300.00     AREA(ACRES) =      248.9
  * SUMMED DATA: FLOW(CFS) =     874.33    TOTAL AREA(ACRES) =      683.1

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   695.00  DOWNSTREAM(FEET) =   673.50
  FLOW LENGTH(FEET) =  2642.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 102.0 INCH PIPE IS  79.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.40
  ESTIMATED PIPE DIAMETER(INCH) = 102.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     874.33
  PIPE TRAVEL TIME(MIN.) =   2.39    Tc(MIN.) =   33.61
  * TOTAL SOURCE FLOW(CFS) =     300.00
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     67.00 =   11995.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.699
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       15.70      0.98     0.100    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       32.60      0.98     0.200    32
  PUBLIC PARK                A       10.70      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       10.40      0.57     0.200    69
  PUBLIC PARK                C       11.40      0.57     0.850    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.81
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.358
  SUBAREA AREA(ACRES) =   80.80      SUBAREA RUNOFF(CFS) =  102.48
  EFFECTIVE AREA(ACRES) =    515.00   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.88  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =      515.0       PEAK FLOW RATE(CFS) =     646.72

  * SOURCE FLOW DATA: FLOW(CFS) =     300.00     AREA(ACRES) =      248.9
  * SUMMED DATA: FLOW(CFS) =     946.72    TOTAL AREA(ACRES) =      763.9

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.699
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       16.90      0.98     0.100    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       50.60      0.98     0.200    32
  PUBLIC PARK                A       12.90      0.98     0.850    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.283
  SUBAREA AREA(ACRES) =   80.40      SUBAREA RUNOFF(CFS) =  102.96
  EFFECTIVE AREA(ACRES) =    595.40   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.89  AREA-AVERAGED Ap =  0.34
  TOTAL AREA(ACRES) =      595.4       PEAK FLOW RATE(CFS) =     749.69

  * SOURCE FLOW DATA: FLOW(CFS) =     300.00     AREA(ACRES) =      248.9
  * SUMMED DATA: FLOW(CFS) =    1049.69    TOTAL AREA(ACRES) =      844.3

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     68.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   673.50  DOWNSTREAM(FEET) =   655.90
  FLOW LENGTH(FEET) =  2641.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 114.0 INCH PIPE IS  87.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.92
  ESTIMATED PIPE DIAMETER(INCH) = 114.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    1049.69
  PIPE TRAVEL TIME(MIN.) =   2.46    Tc(MIN.) =   36.06
  * TOTAL SOURCE FLOW(CFS) =     300.00
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     68.00 =   14636.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     68.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   36.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.629
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       16.00      0.98     0.200    32
  COMMERCIAL                 B        5.00      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       16.90      0.57     0.200    69
  COMMERCIAL                 C       19.60      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.157
  SUBAREA AREA(ACRES) =   57.50      SUBAREA RUNOFF(CFS) =   78.42
  EFFECTIVE AREA(ACRES) =    652.90   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.88  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =      652.9       PEAK FLOW RATE(CFS) =     790.37

  * SOURCE FLOW DATA: FLOW(CFS) =     300.00     AREA(ACRES) =      248.9
  * SUMMED DATA: FLOW(CFS) =    1090.37    TOTAL AREA(ACRES) =      901.8

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     68.00 IS CODE =  71
----------------------------------------------------------------------------
  >>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<<<<<
  >>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<<<<<
============================================================================
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.28; Ybar = 0.31
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
  3HR = 1.00; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      652.9
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     68.00 =   14636.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0300; Lca/L=0.4,n=.0269; Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     232.33
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    854.97
  TOTAL PEAK FLOW RATE(CFS) =   1154.97 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =   1090.37
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =   1090.37)
  PEAK FLOW RATE(CFS) USED =   1154.97
  TOTAL SOURCE FLOW(CFS) =     300.00
  TOTAL AREA ASSOCIATED TO SOURCE FLOW(ACRES) =      248.9

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     68.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   36.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.629
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       17.60      0.98     0.100    32
  COMMERCIAL                 B        8.50      0.75     0.100    56
  COMMERCIAL                 C       14.80      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.78
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   40.90
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.27; Ybar = 0.30
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
  3HR = 1.00; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      693.8
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     68.00 =   14636.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0300; Lca/L=0.4,n=.0269; Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     250.59
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     913.69
  TOTAL AREA(ACRES) =      693.8       PEAK FLOW RATE(CFS) =     913.69

  * SOURCE FLOW DATA: FLOW(CFS) =     300.00     AREA(ACRES) =      248.9
  * SUMMED DATA: FLOW(CFS) =    1213.69    TOTAL AREA(ACRES) =      942.7
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =      693.8  TC(MIN.) =     36.06
  AREA-AVERAGED Fm(INCH/HR)=  0.27   Ybar =  0.30
  PEAK FLOW RATE(CFS)   =    913.69
  * CUMULATIVE SOURCE FLOW DATA: FLOW(CFS) =     300.00  AREA(AC.) =
248.9
  * SUMMED DATA: FLOW(CFS) =    1213.69    TOTAL AREA(ACRES) =      942.7
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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____________________________________________________________________________
****************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                           Analysis prepared by:

                           HUNSAKER & ASSOCIATES
                                 Irvine,Inc
                     Planning * Engineering * Surveying
          Three Hughes * Irvine, California 92618 * (949)583-1010

 ************************** DESCRIPTION OF STUDY **************************
* W.O. #915-1, ONTARIO MPD                                                 *
* 100-YR STUDY                                                             *
* EUCLID, CAMPUS & BONVIEW AVENUE                                          *
 ***************************************************************************

  FILE NAME: EUCLID_M.DAT
  TIME/DATE OF STUDY: 13:40 08/11/2011
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *USER-DEFINED LOGARITHMIC INTERPOLATION USED FOR RAINFALL*

  SLOPE OF INTENSITY DURATION CURVE(LOG(I;IN/HR) vs. LOG(Tc;MIN)) = 0.6000
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.2000

  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  ================  ======  ===== ====== ===== =======
  1   65.0     60.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  2   54.0     49.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  3   47.0     42.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  4   42.0     37.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  5   38.0     33.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  6   32.0     27.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  7   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  8   20.0     15.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  9   18.0     13.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*
  *USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

  UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:
    WATERSHED LAG = 0.80 * Tc
    USED "VALLEY UNDEVELOPED" S-GRAPH FOR DEVELOPMENTS OF
    2 UNITS/ACRE AND LESS; AND "VALLEY DEVELOPED" S-GRAPH
    FOR DEVELOPMENTS OF 3-4 UNITS/ACRE AND MORE.
    SIERRA MADRE DEPTH-AREA FACTORS USED.
                        AREA-AVERAGED
          DURATION    RAINFALL(INCH)
          5-MINUTES         0.44
         30-MINUTES         0.91
          1-HOUR            1.20
          3-HOUR            2.10
          6-HOUR            3.00
         24-HOUR            6.00
 *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD*


****************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   775.00
  ELEVATION DATA: UPSTREAM(FEET) =    783.00  DOWNSTREAM(FEET) =    776.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.273
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.840
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        0.80      0.98     0.500    32   14.27
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        5.50      0.57     0.500    69   14.27
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.62
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA RUNOFF(CFS) =     14.35
  TOTAL AREA(ACRES) =      6.30   PEAK FLOW RATE(CFS) =     14.35

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  9 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  776.00  DOWNSTREAM ELEVATION(FEET) =  765.00
  STREET LENGTH(FEET) =  1029.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  13.00
```

```
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.61
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.54
  STREET FLOW TRAVEL TIME(MIN.) =   4.07   Tc(MIN.) =   18.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.444
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       20.20      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        9.50      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.84
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =   29.70      SUBAREA RUNOFF(CFS) =   54.04
  EFFECTIVE AREA(ACRES) =     36.00    AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.80  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =       36.0        PEAK FLOW RATE(CFS) =      66.14

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  19.15
  FLOW VELOCITY(FEET/SEC.) =  5.06   DEPTH*VELOCITY(FT*FT/SEC.) =   3.49
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1029.0 FT WITH ELEVATION-DROP =  11.0 FT, IS   61.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE      3.00
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =    1804.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE      4.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   765.00  DOWNSTREAM(FEET) =   750.00
  FLOW LENGTH(FEET) =  1367.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.69
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      66.14
  PIPE TRAVEL TIME(MIN.) =   2.13    Tc(MIN.) =   20.47
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      4.00 =    3171.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.288
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       48.90      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        1.00      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =   49.90      SUBAREA RUNOFF(CFS) =   81.03
  EFFECTIVE AREA(ACRES) =     85.90   AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.90  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =       85.9       PEAK FLOW RATE(CFS) =     142.11

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      4.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.288
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       39.00      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =   39.00      SUBAREA RUNOFF(CFS) =   63.18
  EFFECTIVE AREA(ACRES) =    124.90   AREA-AVERAGED Fm(INCH/HR) =  0.46
  AREA-AVERAGED Fp(INCH/HR) =  0.92  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =      124.9       PEAK FLOW RATE(CFS) =     205.29

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   750.00  DOWNSTREAM(FEET) =   717.00
  FLOW LENGTH(FEET) =  2637.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  43.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.96
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     205.29
  PIPE TRAVEL TIME(MIN.) =   2.94    Tc(MIN.) =   23.41
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      5.00 =    5808.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   23.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       31.80      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       35.20      0.57     0.500    69
  PUBLIC PARK                C        1.20      0.57     0.850    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.506
  SUBAREA AREA(ACRES) =   68.20      SUBAREA RUNOFF(CFS) =  106.12
  EFFECTIVE AREA(ACRES) =    193.10   AREA-AVERAGED Fm(INCH/HR) =  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =      193.1       PEAK FLOW RATE(CFS) =     291.53

******************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      5.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   23.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.111
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                A        3.50      0.98     0.850    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       40.50      0.98     0.500    32
  PUBLIC PARK                C        3.50      0.57     0.850    69
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       46.10      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.526
  SUBAREA AREA(ACRES) =   93.60      SUBAREA RUNOFF(CFS) =  144.17
  EFFECTIVE AREA(ACRES) =    286.70   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.51
  TOTAL AREA(ACRES) =      286.7       PEAK FLOW RATE(CFS) =     435.70

******************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   717.00  DOWNSTREAM(FEET) =   692.00
  FLOW LENGTH(FEET) =  2642.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  75.0 INCH PIPE IS  61.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.19
  ESTIMATED PIPE DIAMETER(INCH) =  75.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     435.70
  PIPE TRAVEL TIME(MIN.) =   2.72    Tc(MIN.) =   26.13
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      6.00 =    8450.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      6.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   26.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       14.10      0.98     0.200    32
  PUBLIC PARK                A        3.70      0.98     0.850    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        7.00      0.98     0.500    32
  PUBLIC PARK                C        3.80      0.57     0.850    69
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       35.00      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.475
  SUBAREA AREA(ACRES) =   63.60      SUBAREA RUNOFF(CFS) =   94.24
  EFFECTIVE AREA(ACRES) =    350.30   AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.80  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =      350.3       PEAK FLOW RATE(CFS) =     495.19

******************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      6.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   26.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        1.40      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       11.20      0.98     0.500    32
  PUBLIC PARK                C        5.60      0.57     0.850    69
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       16.10      0.57     0.200    69
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       46.30      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.459
  SUBAREA AREA(ACRES) =   80.60      SUBAREA RUNOFF(CFS) =  122.32
  EFFECTIVE AREA(ACRES) =    430.90   AREA-AVERAGED Fm(INCH/HR) =  0.38
  AREA-AVERAGED Fp(INCH/HR) =  0.77  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =      430.9       PEAK FLOW RATE(CFS) =     617.51

******************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE      7.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   692.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) =  2643.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  90.0 INCH PIPE IS  68.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.09
  ESTIMATED PIPE DIAMETER(INCH) =  90.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     617.51
  PIPE TRAVEL TIME(MIN.) =   2.58    Tc(MIN.) =   28.71
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      7.00 =   11093.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      7.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   28.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.868
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                A        3.80      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       13.00      0.98     0.200    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        5.80      0.75     0.200    56
  PUBLIC PARK                C       10.20      0.57     0.850    69
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C        7.30      0.57     0.200    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.427
  SUBAREA AREA(ACRES) =   40.10      SUBAREA RUNOFF(CFS) =   56.34
  EFFECTIVE AREA(ACRES) =    471.00   AREA-AVERAGED Fm(INCH/HR) =  0.38
  AREA-AVERAGED Fp(INCH/HR) =  0.77  AREA-AVERAGED Ap =  0.49
  TOTAL AREA(ACRES) =      471.0       PEAK FLOW RATE(CFS) =     631.79

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      7.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   28.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.868
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                A        3.70      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        3.50      0.98     0.200    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B       11.60      0.75     0.200    56
  PUBLIC PARK                C       22.10      0.57     0.850    69
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       38.00      0.57     0.200    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.413
  SUBAREA AREA(ACRES) =   78.90      SUBAREA RUNOFF(CFS) =  114.24
  EFFECTIVE AREA(ACRES) =    549.90   AREA-AVERAGED Fm(INCH/HR) =  0.36
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.48
  TOTAL AREA(ACRES) =      549.9       PEAK FLOW RATE(CFS) =     746.02

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   670.00  DOWNSTREAM(FEET) =   650.00
  FLOW LENGTH(FEET) =  2592.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  96.0 INCH PIPE IS  77.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.24
  ESTIMATED PIPE DIAMETER(INCH) =  96.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     746.02
  PIPE TRAVEL TIME(MIN.) =   2.51    Tc(MIN.) =   31.21
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      8.00 =   13685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   31.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.776
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        2.20      0.98     0.200    32
  COMMERCIAL                 B       27.50      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B       63.70      0.75     0.200    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       12.60      0.57     0.200    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.73
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.174
  SUBAREA AREA(ACRES) =  106.00      SUBAREA RUNOFF(CFS) =  157.34
  EFFECTIVE AREA(ACRES) =    655.90   AREA-AVERAGED Fm(INCH/HR) =  0.32
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =      655.9       PEAK FLOW RATE(CFS) =     858.09

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      8.00 IS CODE =  71
----------------------------------------------------------------------------
  >>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<<<<<
  >>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<<<<<
==============================================================================
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.52; LAG(HR) = 0.42; Fm(INCH/HR) = 0.32; Ybar = 0.34
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
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  DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
  3HR = 1.00; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      655.9
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      8.00 =   13685.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0281; Lca/L=0.4,n=.0252; Lca/L=0.5,n=.0231;Lca/L=0.6,n=.0216
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     223.69
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    922.15
  TOTAL PEAK FLOW RATE(CFS) =    922.15 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    858.09
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    858.09)
  PEAK FLOW RATE(CFS) USED =    922.15

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE     15.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   650.00  DOWNSTREAM(FEET) =   645.00
  FLOW LENGTH(FEET) =  1277.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 120.0 INCH PIPE IS  92.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.21
  ESTIMATED PIPE DIAMETER(INCH) = 120.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     922.15
  PIPE TRAVEL TIME(MIN.) =   1.50    Tc(MIN.) =   32.71
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     15.00 =   14962.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =     922.15    Tc(MIN.) =   32.71
  AREA-AVERAGED Fm(INCH/HR) =  0.32   Ybar = 0.34
  TOTAL AREA(ACRES) =      655.9

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   735.00
  ELEVATION DATA: UPSTREAM(FEET) =    694.00  DOWNSTREAM(FEET) =    690.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.085
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.139
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        0.40      0.98     0.100    32   12.08
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        5.90      0.98     0.200    32   12.88
  COMMERCIAL                 C        3.10      0.57     0.100    69   12.08
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.89
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.163
  SUBAREA RUNOFF(CFS) =     25.32
  TOTAL AREA(ACRES) =      9.40   PEAK FLOW RATE(CFS) =     25.32

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  690.00  DOWNSTREAM ELEVATION(FEET) =  678.00
  STREET LENGTH(FEET) =  1343.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  37.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.54
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   28.30
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.69
  STREET FLOW TRAVEL TIME(MIN.) =   5.78   Tc(MIN.) =   17.86
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.483
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        5.20      0.98     0.200    32
  PUBLIC PARK                A        1.50      0.98     0.850    32
  COMMERCIAL                 C       11.60      0.57     0.100    69
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C        1.30      0.57     0.200    69
  PUBLIC PARK                C       12.70      0.57     0.850    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.450
  SUBAREA AREA(ACRES) =   32.30      SUBAREA RUNOFF(CFS) =   63.92
  EFFECTIVE AREA(ACRES) =     41.70    AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =       41.7        PEAK FLOW RATE(CFS) =      83.69

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  36.39
  FLOW VELOCITY(FEET/SEC.) =  4.17   DEPTH*VELOCITY(FT*FT/SEC.) =   3.24
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1343.0 FT WITH ELEVATION-DROP =  12.0 FT, IS   75.5 CFS,
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        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     13.00
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE     13.00 =    2078.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   678.00  DOWNSTREAM(FEET) =   670.00
  FLOW LENGTH(FEET) =   910.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.57
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      83.69
  PIPE TRAVEL TIME(MIN.) =   1.43    Tc(MIN.) =   19.30
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE     14.00 =    2988.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.370
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        6.10      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        9.30      0.75     0.200    56
  COMMERCIAL                 C        1.70      0.57     0.100    69
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C        4.90      0.57     0.200    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.165
  SUBAREA AREA(ACRES) =   22.00      SUBAREA RUNOFF(CFS) =   44.68
  EFFECTIVE AREA(ACRES) =     63.70   AREA-AVERAGED Fm(INCH/HR) =  0.20
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =       63.7       PEAK FLOW RATE(CFS) =     124.15

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   670.00  DOWNSTREAM(FEET) =   645.00
  FLOW LENGTH(FEET) =  2595.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.09
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     124.15
  PIPE TRAVEL TIME(MIN.) =   3.58    Tc(MIN.) =   22.87
  LONGEST FLOWPATH FROM NODE     11.00 TO NODE     15.00 =    5583.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.140
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B       61.10      0.75     0.200    56
  COMMERCIAL                 B       21.30      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.174
  SUBAREA AREA(ACRES) =   82.40      SUBAREA RUNOFF(CFS) =  149.06
  EFFECTIVE AREA(ACRES) =    146.10   AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.70  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =      146.1       PEAK FLOW RATE(CFS) =     260.03

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.87
  RAINFALL INTENSITY(INCH/HR) =   2.14
  AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.70
  AREA-AVERAGED Ap =  0.23
  EFFECTIVE STREAM AREA(ACRES) =     146.10
  TOTAL STREAM AREA(ACRES) =     146.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     260.03
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1       922.15   32.71      655.90        1.00
     2       260.03   22.87      146.10       11.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.29; Ybar = 0.31
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
  3HR = 0.99; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      802.0
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     15.00 =   14962.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0272; Lca/L=0.4,n=.0244; Lca/L=0.5,n=.0224;Lca/L=0.6,n=.0209
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     283.63
```

```
  PEAK FLOW RATE(CFS) =    1117.23

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   645.00  DOWNSTREAM(FEET) =   639.40
  FLOW LENGTH(FEET) =  1392.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 126.0 INCH PIPE IS 101.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.92
  ESTIMATED PIPE DIAMETER(INCH) = 126.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    1117.23
  PIPE TRAVEL TIME(MIN.) =   1.55    Tc(MIN.) =   34.27
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     16.00 =   16354.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   34.27
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.679
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       20.10      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B       56.00      0.75     0.200    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.174
  SUBAREA AREA(ACRES) =   76.10
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.57; LAG(HR) = 0.46; Fm(INCH/HR) = 0.28; Ybar = 0.30
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
  3HR = 0.99; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      878.1
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     16.00 =   16354.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0264; Lca/L=0.4,n=.0237; Lca/L=0.5,n=.0217;Lca/L=0.6,n=.0203
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     315.88
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1195.68
  TOTAL AREA(ACRES) =      878.1       PEAK FLOW RATE(CFS) =    1195.68

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     17.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   639.40  DOWNSTREAM(FEET) =   633.60
  FLOW LENGTH(FEET) =  1455.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 132.0 INCH PIPE IS 101.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.27
  ESTIMATED PIPE DIAMETER(INCH) = 132.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    1195.68
  PIPE TRAVEL TIME(MIN.) =   1.59    Tc(MIN.) =   35.85
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     17.00 =   17809.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     17.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   35.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.634
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       69.60      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B       17.70      0.75     0.200    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.120
  SUBAREA AREA(ACRES) =   87.30
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.26; Ybar = 0.28
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
  3HR = 0.99; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      965.4
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     17.00 =   17809.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0257; Lca/L=0.4,n=.0230; Lca/L=0.5,n=.0211;Lca/L=0.6,n=.0197
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     354.37
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1270.95
  TOTAL AREA(ACRES) =      965.4       PEAK FLOW RATE(CFS) =    1270.95

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     48.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   633.60  DOWNSTREAM(FEET) =   633.00
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 132.0 INCH PIPE IS 103.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.87
  ESTIMATED PIPE DIAMETER(INCH) = 132.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    1270.95
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   36.00
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     48.00 =   17949.00 FEET.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE     48.00 TO NODE     48.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   688.00
  ELEVATION DATA: UPSTREAM(FEET) =    787.00  DOWNSTREAM(FEET) =    779.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.111
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.493
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 A        5.60      0.98     0.100    32   10.11
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     17.11
  TOTAL AREA(ACRES) =      5.60   PEAK FLOW RATE(CFS) =     17.11

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  779.00  DOWNSTREAM ELEVATION(FEET) =  760.00
  STREET LENGTH(FEET) =  1980.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  37.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.50
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   21.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.03
  STREET FLOW TRAVEL TIME(MIN.) =   9.47   Tc(MIN.) =   19.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.350
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       17.90      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =   17.90      SUBAREA RUNOFF(CFS) =   30.00
  EFFECTIVE AREA(ACRES) =     23.50    AREA-AVERAGED Fm(INCH/HR) =  0.39
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       23.5        PEAK FLOW RATE(CFS) =      41.35

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  23.25
  FLOW VELOCITY(FEET/SEC.) =  3.70   DEPTH*VELOCITY(FT*FT/SEC.) =   2.30
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     23.00 =    2668.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     24.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   760.00  DOWNSTREAM(FEET) =   753.00
  FLOW LENGTH(FEET) =  1230.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  25.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.60
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.35
  PIPE TRAVEL TIME(MIN.) =   2.70    Tc(MIN.) =   22.28
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     24.00 =    3898.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     24.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.174
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        5.90      0.98     0.100    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        9.20      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       47.00      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.418
  SUBAREA AREA(ACRES) =   62.10      SUBAREA RUNOFF(CFS) =   98.78
  EFFECTIVE AREA(ACRES) =     85.60   AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =       85.6       PEAK FLOW RATE(CFS) =     136.42

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   753.00  DOWNSTREAM(FEET) =   751.20
  FLOW LENGTH(FEET) =  1525.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  72.0 INCH PIPE IS  58.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.57
  ESTIMATED PIPE DIAMETER(INCH) =  72.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     136.42
  PIPE TRAVEL TIME(MIN.) =   4.57    Tc(MIN.) =   26.84
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     25.00 =    5423.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   26.84
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.944
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       55.50      0.98     0.200    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       15.30      0.57     0.200    69
  COMMERCIAL                 A       14.88      0.98     0.100    32
  COMMERCIAL                 C        0.92      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.89
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.182
  SUBAREA AREA(ACRES) =   86.60      SUBAREA RUNOFF(CFS) =  138.89
  EFFECTIVE AREA(ACRES) =    172.20   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.30
  TOTAL AREA(ACRES) =      172.2       PEAK FLOW RATE(CFS) =     257.58

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     29.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   751.20  DOWNSTREAM(FEET) =   751.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  84.0 INCH PIPE IS  66.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.83
  ESTIMATED PIPE DIAMETER(INCH) =  84.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     257.58
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   27.07
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     29.00 =    5528.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.07
  RAINFALL INTENSITY(INCH/HR) =   1.93
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.95
  AREA-AVERAGED Ap =  0.30
  EFFECTIVE STREAM AREA(ACRES) =     172.20
  TOTAL STREAM AREA(ACRES) =     172.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     257.58

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     27.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  ELEVATION DATA: UPSTREAM(FEET) =    805.00  DOWNSTREAM(FEET) =    800.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.789
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.489
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        5.06      0.98     0.500    32   17.79
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA RUNOFF(CFS) =      9.11
  TOTAL AREA(ACRES) =      5.06   PEAK FLOW RATE(CFS) =      9.11

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   17.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.489
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        5.42      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =    5.42      SUBAREA RUNOFF(CFS) =    9.76
  EFFECTIVE AREA(ACRES) =     10.48   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =       10.5       PEAK FLOW RATE(CFS) =      18.88

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  6 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) =  800.00  DOWNSTREAM ELEVATION(FEET) =  785.00
```

```
  STREET LENGTH(FEET) =  1760.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  27.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   25.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.43
  STREET FLOW TRAVEL TIME(MIN.) =   8.01   Tc(MIN.) =   25.80
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.991
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       15.47      0.98     0.100    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        7.16      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       15.04      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.279
  SUBAREA AREA(ACRES) =   37.67      SUBAREA RUNOFF(CFS) =   58.29
  EFFECTIVE AREA(ACRES) =     48.15    AREA-AVERAGED Fm(INCH/HR) =  0.32
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =       48.2        PEAK FLOW RATE(CFS) =      72.47

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  33.67
  FLOW VELOCITY(FEET/SEC.) =  3.99   DEPTH*VELOCITY(FT*FT/SEC.) =   2.99
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1760.0 FT WITH ELEVATION-DROP =  15.0 FT, IS   81.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     28.00
  LONGEST FLOWPATH FROM NODE     26.00 TO NODE     28.00 =    2760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     29.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   785.00  DOWNSTREAM(FEET) =   751.00
  FLOW LENGTH(FEET) =  2580.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.72
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      72.47
  PIPE TRAVEL TIME(MIN.) =   3.67    Tc(MIN.) =   29.47
  LONGEST FLOWPATH FROM NODE     26.00 TO NODE     29.00 =    5340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   29.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.838
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        9.22      0.98     0.100    32
  COMMERCIAL                 C        1.68      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.91
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   10.90      SUBAREA RUNOFF(CFS) =   17.14
  EFFECTIVE AREA(ACRES) =     59.05   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.28
  TOTAL AREA(ACRES) =       59.1       PEAK FLOW RATE(CFS) =      82.99

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     29.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.47
  RAINFALL INTENSITY(INCH/HR) =   1.84
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.97
  AREA-AVERAGED Ap =  0.28
  EFFECTIVE STREAM AREA(ACRES) =      59.05
  TOTAL STREAM AREA(ACRES) =      59.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      82.99

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      257.58   27.07    1.935  0.95( 0.28) 0.30     172.2      21.00
      2       82.99   29.47    1.838  0.97( 0.28) 0.28      59.1      26.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      338.50   27.07    1.935  0.95( 0.28) 0.29     226.4      21.00
      2      325.55   29.47    1.838  0.96( 0.28) 0.29     231.2      26.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     338.50    Tc(MIN.) =    27.07
  EFFECTIVE AREA(ACRES) =     226.43   AREA-AVERAGED Fm(INCH/HR) =  0.28
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.29
  TOTAL AREA(ACRES) =      231.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     29.00 =    5528.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     35.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   751.00  DOWNSTREAM(FEET) =   718.50
  FLOW LENGTH(FEET) =  2645.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  66.0 INCH PIPE IS  51.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.92
  ESTIMATED PIPE DIAMETER(INCH) =  66.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     338.50
  PIPE TRAVEL TIME(MIN.) =   2.60    Tc(MIN.) =   29.67
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     35.00 =    8173.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   29.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.831
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C       11.10      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   11.10      SUBAREA RUNOFF(CFS) =   17.73
  EFFECTIVE AREA(ACRES) =    237.53   AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.29
  TOTAL AREA(ACRES) =      242.4       PEAK FLOW RATE(CFS) =     338.50
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.67
  RAINFALL INTENSITY(INCH/HR) =   1.83
  AREA-AVERAGED Fm(INCH/HR) =  0.27
  AREA-AVERAGED Fp(INCH/HR) =  0.95
  AREA-AVERAGED Ap =  0.29
  EFFECTIVE STREAM AREA(ACRES) =     237.53
  TOTAL STREAM AREA(ACRES) =     242.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     338.50

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   937.00
  ELEVATION DATA: UPSTREAM(FEET) =    760.00  DOWNSTREAM(FEET) =    750.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.893
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.769
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        7.50      0.98     0.500    32   14.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA RUNOFF(CFS) =     15.40
  TOTAL AREA(ACRES) =      7.50   PEAK FLOW RATE(CFS) =     15.40

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  750.00  DOWNSTREAM ELEVATION(FEET) =  722.00
  STREET LENGTH(FEET) =  1670.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  37.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.92
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   17.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.09
  STREET FLOW TRAVEL TIME(MIN.) =   6.80   Tc(MIN.) =   21.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.209
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        6.50      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        7.40      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
```

```
  SUBAREA AREA(ACRES) =   13.90      SUBAREA RUNOFF(CFS) =   22.90
  EFFECTIVE AREA(ACRES) =     21.40    AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =       21.4        PEAK FLOW RATE(CFS) =      34.52

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  19.42
  FLOW VELOCITY(FEET/SEC.) =  4.36   DEPTH*VELOCITY(FT*FT/SEC.) =   2.38
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     32.00 =    2607.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   722.00  DOWNSTREAM(FEET) =   720.50
  FLOW LENGTH(FEET) =  1270.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.02
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      34.52
  PIPE TRAVEL TIME(MIN.) =   5.26    Tc(MIN.) =   26.96
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =    3877.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.96
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.939
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       58.00      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       10.80      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.91
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA AREA(ACRES) =   68.80      SUBAREA RUNOFF(CFS) =   91.89
  EFFECTIVE AREA(ACRES) =     90.20   AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.89  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =       90.2       PEAK FLOW RATE(CFS) =     121.22

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     34.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   720.50  DOWNSTREAM(FEET) =   718.70
  FLOW LENGTH(FEET) =  1525.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  69.0 INCH PIPE IS  55.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.41
  ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     121.22
  PIPE TRAVEL TIME(MIN.) =   4.70    Tc(MIN.) =   31.66
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     34.00 =    5402.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     34.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   31.66
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.761
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       58.70      0.57     0.200    69
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        4.50      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       25.80      0.57     0.500    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.58
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.287
  SUBAREA AREA(ACRES) =   89.00      SUBAREA RUNOFF(CFS) =  127.73
  EFFECTIVE AREA(ACRES) =    179.20   AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.78  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =      179.2       PEAK FLOW RATE(CFS) =     234.48

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   718.70  DOWNSTREAM(FEET) =   718.50
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  81.0 INCH PIPE IS  64.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.65
  ESTIMATED PIPE DIAMETER(INCH) =  81.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     234.48
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   31.88
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     35.00 =    5507.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.88
  RAINFALL INTENSITY(INCH/HR) =   1.75
  AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.78
  AREA-AVERAGED Ap =  0.39
```

```
  EFFECTIVE STREAM AREA(ACRES) =     179.20
  TOTAL STREAM AREA(ACRES) =     179.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     234.48

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      338.50   29.67    1.831  0.95( 0.27) 0.29     237.5      21.00
      1      325.55   32.09    1.747  0.95( 0.27) 0.29     242.4      26.00
      2      234.48   31.88    1.754  0.78( 0.31) 0.39     179.2      30.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      568.37   29.67    1.831  0.87( 0.29) 0.33     404.3      21.00
      2      561.11   31.88    1.754  0.86( 0.29) 0.33     421.1      30.00
      3      558.96   32.09    1.747  0.86( 0.29) 0.33     421.6      26.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     568.37    Tc(MIN.) =    29.67
  EFFECTIVE AREA(ACRES) =     404.30   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =      421.6
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     35.00 =    8173.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   718.50  DOWNSTREAM(FEET) =   688.00
  FLOW LENGTH(FEET) =  2640.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  81.0 INCH PIPE IS  63.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.81
  ESTIMATED PIPE DIAMETER(INCH) =  81.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     568.37
  PIPE TRAVEL TIME(MIN.) =   2.34    Tc(MIN.) =   32.01
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     41.00 =   10813.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   32.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.749
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C       11.60      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   11.60      SUBAREA RUNOFF(CFS) =   17.67
  EFFECTIVE AREA(ACRES) =    415.90   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =      433.2       PEAK FLOW RATE(CFS) =     568.37
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   32.01
  RAINFALL INTENSITY(INCH/HR) =   1.75
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.86
  AREA-AVERAGED Ap =  0.32
  EFFECTIVE STREAM AREA(ACRES) =     415.90
  TOTAL STREAM AREA(ACRES) =     433.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     568.37

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   719.00
  ELEVATION DATA: UPSTREAM(FEET) =    722.00  DOWNSTREAM(FEET) =    715.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.365
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.256
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        3.60      0.98     0.200    32   11.36
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        2.60      0.98     0.500    32   13.64
  PUBLIC PARK                A        2.90      0.98     0.850    32   16.94
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.493
  SUBAREA RUNOFF(CFS) =     22.73
  TOTAL AREA(ACRES) =      9.10   PEAK FLOW RATE(CFS) =     22.73

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     38.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  4 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  715.00  DOWNSTREAM ELEVATION(FEET) =  695.00
  STREET LENGTH(FEET) =  1996.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  37.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.76
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.65
    HALFSTREET FLOOD WIDTH(FEET) =   24.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.91
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.56
  STREET FLOW TRAVEL TIME(MIN.) =   8.50   Tc(MIN.) =   19.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.329
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       18.10      0.98     0.200    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        7.90      0.98     0.500    32
  PUBLIC PARK                A        2.60      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C        1.00      0.57     0.200    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.337
  SUBAREA AREA(ACRES) =   29.60      SUBAREA RUNOFF(CFS) =   53.37
  EFFECTIVE AREA(ACRES) =     38.70    AREA-AVERAGED Fm(INCH/HR) =  0.36
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =       38.7        PEAK FLOW RATE(CFS) =      68.51

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  30.61
  FLOW VELOCITY(FEET/SEC.) =  4.23   DEPTH*VELOCITY(FT*FT/SEC.) =   3.04
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1996.0 FT WITH ELEVATION-DROP =  20.0 FT, IS   59.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     38.00
  LONGEST FLOWPATH FROM NODE     36.00 TO NODE     38.00 =    2715.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     39.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   695.00  DOWNSTREAM(FEET) =   692.00
  FLOW LENGTH(FEET) =  1310.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.11
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      68.51
  PIPE TRAVEL TIME(MIN.) =   3.57    Tc(MIN.) =   23.44
  LONGEST FLOWPATH FROM NODE     36.00 TO NODE     39.00 =    4025.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.109
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                A        5.00      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A       30.70      0.98     0.200    32
  PUBLIC PARK                C        3.10      0.57     0.850    69
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       19.60      0.57     0.200    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.82
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.290
  SUBAREA AREA(ACRES) =   58.40      SUBAREA RUNOFF(CFS) =   98.40
  EFFECTIVE AREA(ACRES) =     97.10   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.89  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =       97.1       PEAK FLOW RATE(CFS) =     159.24

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   692.00  DOWNSTREAM(FEET) =   688.30
  FLOW LENGTH(FEET) =  1490.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  69.0 INCH PIPE IS  50.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.78
  ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     159.24
  PIPE TRAVEL TIME(MIN.) =   3.19    Tc(MIN.) =   26.63
  LONGEST FLOWPATH FROM NODE     36.00 TO NODE     40.00 =    5515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     40.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.954
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                A        0.90      0.98     0.850    32
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       A        4.70      0.98     0.200    32
  PUBLIC PARK                C       11.50      0.57     0.850    69
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       C       29.50      0.57     0.200    69
```

```
  COMMERCIAL                  C       41.50      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.60
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.244
  SUBAREA AREA(ACRES) =   88.10      SUBAREA RUNOFF(CFS) =  143.30
  EFFECTIVE AREA(ACRES) =    185.20   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.77  AREA-AVERAGED Ap =  0.29
  TOTAL AREA(ACRES) =      185.2       PEAK FLOW RATE(CFS) =     288.95

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   688.30  DOWNSTREAM(FEET) =   688.00
  FLOW LENGTH(FEET) =   137.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  87.0 INCH PIPE IS  66.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.57
  ESTIMATED PIPE DIAMETER(INCH) =  87.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     288.95
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =   26.90
  LONGEST FLOWPATH FROM NODE     36.00 TO NODE     41.00 =    5652.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.90
  RAINFALL INTENSITY(INCH/HR) =   1.94
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.77
  AREA-AVERAGED Ap =  0.29
  EFFECTIVE STREAM AREA(ACRES) =     185.20
  TOTAL STREAM AREA(ACRES) =     185.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     288.95

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      568.37   32.01    1.749  0.86( 0.28) 0.32     415.9      21.00
      1      561.11   34.23    1.681  0.86( 0.28) 0.33     432.7      30.00
      1      558.96   34.43    1.675  0.86( 0.28) 0.33     433.2      26.00
      2      288.95   26.90    1.942  0.77( 0.22) 0.29     185.2      36.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      829.09   26.90    1.942  0.83( 0.26) 0.31     534.7      36.00
      2      825.02   32.01    1.749  0.84( 0.26) 0.31     601.1      21.00
      3      806.21   34.23    1.681  0.84( 0.26) 0.31     617.9      30.00
      4      803.06   34.43    1.675  0.84( 0.26) 0.31     618.4      26.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     829.09    Tc(MIN.) =    26.90
  EFFECTIVE AREA(ACRES) =     534.68   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =      618.4
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     41.00 =   10813.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   688.00  DOWNSTREAM(FEET) =   665.00
  FLOW LENGTH(FEET) =  2655.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 102.0 INCH PIPE IS  74.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.81
  ESTIMATED PIPE DIAMETER(INCH) = 102.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     829.09
  PIPE TRAVEL TIME(MIN.) =   2.35    Tc(MIN.) =   29.25
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     47.00 =   13468.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   29.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.847
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        4.00      0.75     0.100    56
  COMMERCIAL                  C        8.00      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   12.00      SUBAREA RUNOFF(CFS) =   19.27
  EFFECTIVE AREA(ACRES) =    546.68   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =      630.4       PEAK FLOW RATE(CFS) =     829.09
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.25
  RAINFALL INTENSITY(INCH/HR) =   1.85
  AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.83
```

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  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =     546.68
  TOTAL STREAM AREA(ACRES) =     630.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     829.09

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     43.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  ELEVATION DATA: UPSTREAM(FEET) =    694.00  DOWNSTREAM(FEET) =    690.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.537
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.809
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 C        8.70      0.57     0.100    69   14.54
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     21.55
  TOTAL AREA(ACRES) =      8.70   PEAK FLOW RATE(CFS) =     21.55

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  7 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  690.00  DOWNSTREAM ELEVATION(FEET) =  680.00
  STREET LENGTH(FEET) =   890.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 24.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.01
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.62
    HALFSTREET FLOOD WIDTH(FEET) =   22.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.44
  STREET FLOW TRAVEL TIME(MIN.) =   3.76   Tc(MIN.) =   18.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.447
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 C       19.90      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.57
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   19.90      SUBAREA RUNOFF(CFS) =   42.82
  EFFECTIVE AREA(ACRES) =     28.60    AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.57  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       28.6        PEAK FLOW RATE(CFS) =      61.54

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  24.50
  FLOW VELOCITY(FEET/SEC.) =  4.48   DEPTH*VELOCITY(FT*FT/SEC.) =   3.03
  LONGEST FLOWPATH FROM NODE     42.00 TO NODE     44.00 =    1890.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     45.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  7 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  680.00  DOWNSTREAM ELEVATION(FEET) =  667.60
  STREET LENGTH(FEET) =  1365.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 24.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      89.99
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.77
    HALFSTREET FLOOD WIDTH(FEET) =   29.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.68
  STREET FLOW TRAVEL TIME(MIN.) =   4.77   Tc(MIN.) =   23.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.130
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       18.60      0.75     0.100    56
  COMMERCIAL                 C       12.00      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.68
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   30.60      SUBAREA RUNOFF(CFS) =   56.79
  EFFECTIVE AREA(ACRES) =     59.20    AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.62  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       59.2        PEAK FLOW RATE(CFS) =     110.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  31.64
  FLOW VELOCITY(FEET/SEC.) =  5.06   DEPTH*VELOCITY(FT*FT/SEC.) =   4.15
```

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  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1365.0 FT WITH ELEVATION-DROP =  12.4 FT, IS   77.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     45.00
  LONGEST FLOWPATH FROM NODE     42.00 TO NODE     45.00 =    3255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   667.60  DOWNSTREAM(FEET) =   665.20
  FLOW LENGTH(FEET) =  1435.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  49.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.05
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     110.15
  PIPE TRAVEL TIME(MIN.) =   3.95    Tc(MIN.) =   27.01
  LONGEST FLOWPATH FROM NODE     42.00 TO NODE     46.00 =    4690.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   27.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.937
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       29.30      0.75     0.100    56
  COMMERCIAL                 C       57.40      0.57     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   86.70      SUBAREA RUNOFF(CFS) =  146.24
  EFFECTIVE AREA(ACRES) =    145.90   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.63  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =      145.9       PEAK FLOW RATE(CFS) =     246.12

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   665.20  DOWNSTREAM(FEET) =   665.00
  FLOW LENGTH(FEET) =   147.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  90.0 INCH PIPE IS  67.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.90
  ESTIMATED PIPE DIAMETER(INCH) =  90.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     246.12
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   27.37
  LONGEST FLOWPATH FROM NODE     42.00 TO NODE     47.00 =    4837.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.37
  RAINFALL INTENSITY(INCH/HR) =   1.92
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.63
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =     145.90
  TOTAL STREAM AREA(ACRES) =     145.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     246.12

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      829.09   29.25    1.847  0.83( 0.25) 0.31     546.7      36.00
      1      825.02   34.36    1.677  0.84( 0.26) 0.31     613.1      21.00
      1      806.21   36.59    1.615  0.83( 0.26) 0.31     629.9      30.00
      1      803.06   36.85    1.608  0.83( 0.26) 0.31     630.4      26.00
      2      246.12   27.37    1.922  0.63( 0.06) 0.10     145.9      42.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1     1058.50   27.37    1.922  0.81( 0.21) 0.26     657.4      42.00
      2     1065.27   29.25    1.847  0.82( 0.21) 0.26     692.6      36.00
      3     1038.67   34.36    1.677  0.82( 0.22) 0.27     759.0      21.00
      4     1011.67   36.59    1.615  0.82( 0.22) 0.27     775.8      30.00
      5     1007.61   36.85    1.608  0.82( 0.22) 0.27     776.2      26.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1065.27    Tc(MIN.) =    29.25
  EFFECTIVE AREA(ACRES) =     692.58   AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.82  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =      776.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     47.00 =   13468.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  71
----------------------------------------------------------------------------
  >>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<<<<<
  >>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<<<<<
============================================================================
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.57; LAG(HR) = 0.46; Fm(INCH/HR) = 0.22; Ybar = 0.25
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
```

```
  3HR = 0.99; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      776.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     47.00 =   13468.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0309; Lca/L=0.4,n=.0277; Lca/L=0.5,n=.0254;Lca/L=0.6,n=.0237
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     298.04
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =   1097.00
  TOTAL PEAK FLOW RATE(CFS) =   1097.00 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =   1065.27
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =   1065.27)
  PEAK FLOW RATE(CFS) USED =   1097.00

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     48.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   665.00  DOWNSTREAM(FEET) =   633.00
  FLOW LENGTH(FEET) =  2630.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 102.0 INCH PIPE IS  81.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.53
  ESTIMATED PIPE DIAMETER(INCH) = 102.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =    1097.00
  PIPE TRAVEL TIME(MIN.) =   1.95    Tc(MIN.) =   36.31
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     48.00 =   16098.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     48.00 TO NODE     48.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   36.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.622
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       12.10      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   12.10
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.61; LAG(HR) = 0.48; Fm(INCH/HR) = 0.22; Ybar = 0.25
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;
  3HR = 0.99; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      788.3
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     48.00 =   16098.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0221
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     303.46
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1060.48
  TOTAL AREA(ACRES) =      788.3       PEAK FLOW RATE(CFS) =    1097.00

  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE     48.00 TO NODE     48.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     1097.00    Tc(MIN.) =   36.31
  AREA-AVERAGED Fm(INCH/HR) =  0.22    Ybar = 0.25
  TOTAL AREA(ACRES) =      788.3
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     48.00 =   16098.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     1270.95    Tc(MIN.) =   36.00
  AREA-AVERAGED Fm(INCH/HR) =  0.26    Ybar = 0.28
  TOTAL AREA(ACRES) =      965.4
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     48.00 =   17949.00 FEET.

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 2.10;6H= 3.00;24H= 6.00
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.24; Ybar = 0.27
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;
  3HR = 0.99; 6HR = 0.99; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     1753.7
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE     48.00 =   17949.00 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0256; Lca/L=0.4,n=.0230; Lca/L=0.5,n=.0211;Lca/L=0.6,n=.0197
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     655.41
  PEAK FLOW RATE(CFS) =    2234.49
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =     1753.7  TC(MIN.) =     36.00
  AREA-AVERAGED Fm(INCH/HR)=  0.24   Ybar =  0.27
  PEAK FLOW RATE(CFS)   =   2234.49
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

## EXCERPT F: EXCERPTS FROM MERRILL COMMERCE CENTER REPORT

# MERRILL COMMERCE CENTER HYDROLOGY AND HYDRAULICS STUDY FOR MERRILL AVENUE STORM DRAIN SYSTEM (WLKR-XII-1 AND MERL-XI-1) PM-20273

## REPORT 1 OF 2
## HYDROLOGY AND MAINLINE HYDRAULICS

**CITY OF ONTARIO**
**CALIFORNIA**

***PREPARED FOR:***

**WESTLAND GROUP, INC.**
4150 CONCOURS, ONTARIO CA

***PREPARED BY:***


JLC Engineering & Consulting, Inc.

41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552
FAX 951.304.3568


**FEBRUARY 25, 2021**
**REVISED: MAY 5, 2021, JUNE 2, 2021, OCTOBER 11, 2021, DECEMBER 02, 2021, JUNE 20, 2022, SEPTEMBER 20, 2022, NOVEMBER 29, 2022**

This report has been prepared by or under the direction of the following registered civil engineer who attests to the technical information contained herein. The registered civil engineer has also judged the qualifications of any technical specialists providing engineering data upon which recommendations, conclusions, and decisions are based.

11/29/2022

| | | |
|---|---|---|
| Joseph L. Castaneda RCE 59835<br>Registered Civil Engineer | Date | Seal |

# CITY OF ONTARIO MASTER DRAINAGE PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

# ULTIMATE CONDITION HYDROLOGY MAP

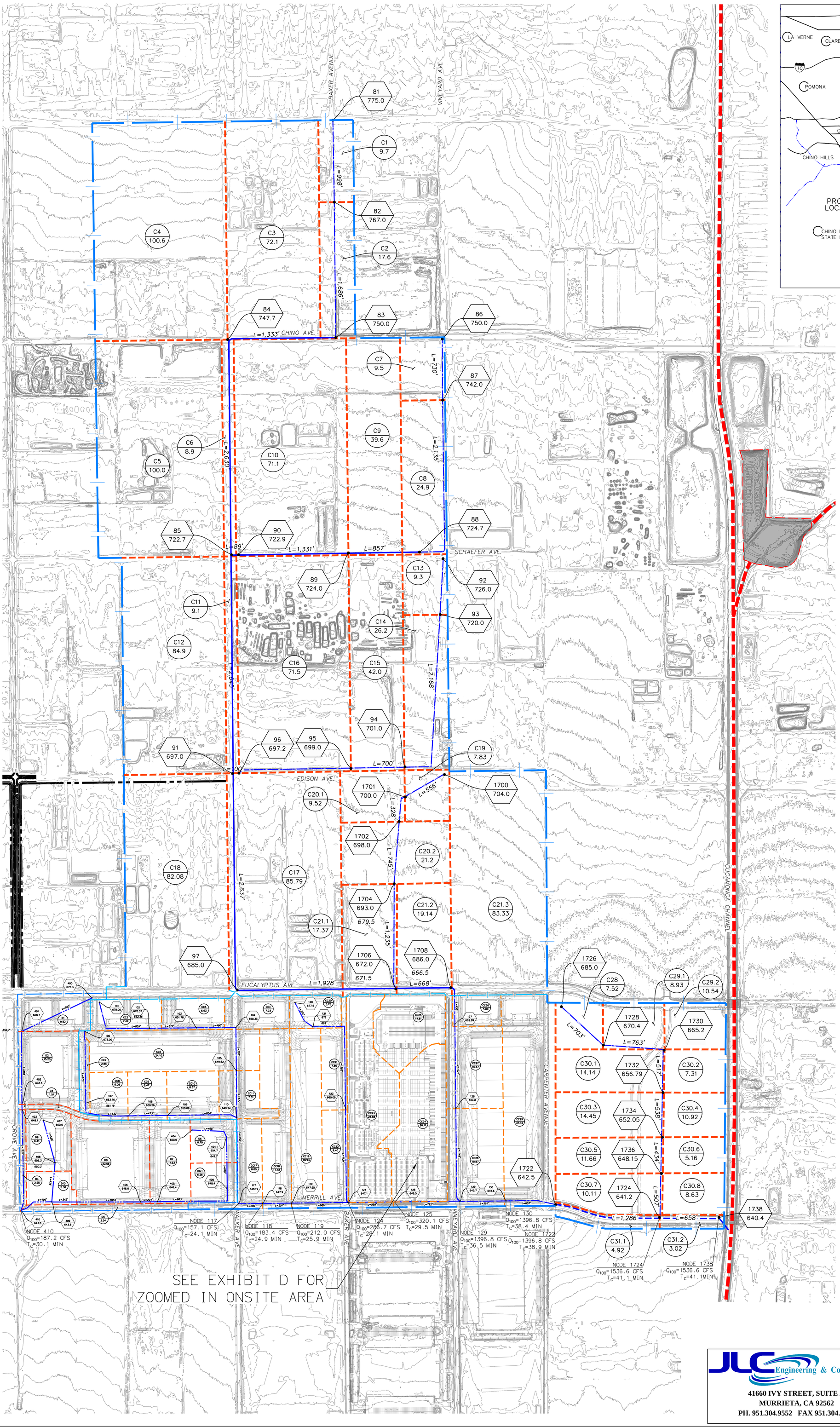


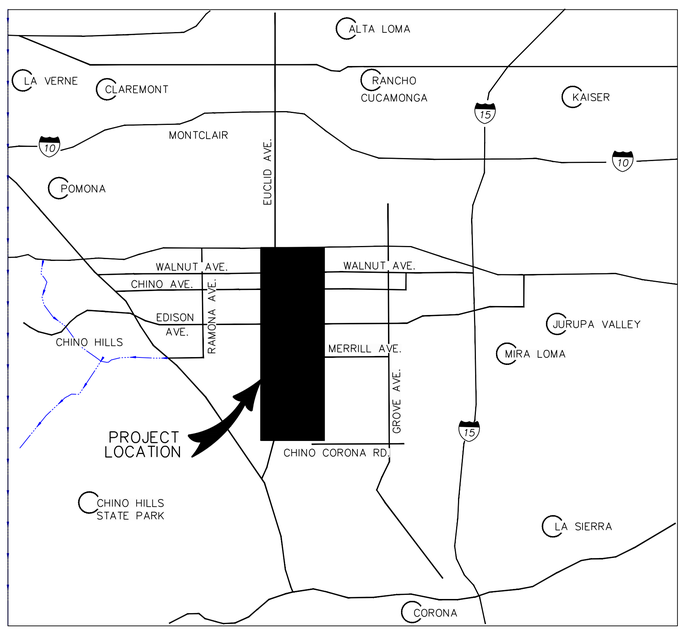


VICINITY MAP
N.T.S.
TXN – RXW SECTION X

| RATIONAL METHOD AND UNIT HYDROGRAPH RESULTS FOR NODES ALONG MERRILL AVENUE – MERRILL AVE SD | | | |
|---|---|---|---|
| | AREA C AND AREA CC | | |
| | RATIONAL METHOD RESULTS | | UNIT HYDROGRAPH RESULTS (100-YEAR, 24-HOUR STORM EVENT) |
| NODE | $Q_{100}$ (CFS) | $T_C$ (MIN) | PEAK $Q_{100}$ (CFS) |
| 117 | 157.1 | 24.1 | N/A |
| 118 | 183.4 | 24.9 | |
| 119 | 212.0 | 25.9 | |
| 124 | 286.7 | 28.1 | |
| 125 | 320.1 | 29.5 | |
| 129 | 1396.8 | 36.5 | |
| 130 | 1396.8 | 38.4 | |
| 1722 | 1396.8 | 38.9 | |
| 1724 | 1536.6 | 41.1 | |
| 1738 | 1536.6 | 42.1 | 1651.1 |

| RATIONAL METHOD AND UNIT HYDROGRAPH RESULTS FOR NODE ALONG MERRILL AVENUE – GROVE AVE SD | | | |
|---|---|---|---|
| NODE | RATIONAL METHOD RESULTS | | UNIT HYDROGRAPH RESULTS (100-YEAR, 24-HOUR STORM) |
| | $Q_{100}$ (CFS) | $T_C$ (MIN) | PEAK $Q_{100}$ (CFS) |
| 410 | 187.2 | 30.1 | 161.3 |

LEGEND:

- XXX.X / XXXX — NODE/CONCENTRATION POINT / FLOWLINE ELEVATION
- XXXX.X — APPROXIMATE INVERT ELEVATION
- XXX / X.X — SUB AREA / ACRES
- L=XXX' — FLOW DISTANCE
- FLOW PATH
- WATERSHED SUB-BOUNDARY
- WATERSHED BOUNDARY
- CUCAMONGA CHANNEL

GRAPHIC SCALE
400' 0 200' 400' 800'
1" = 400'


JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568


EXHIBIT "C"

CITY OF ONTARIO MASTER DRAINAGE PLAN

ULTIMATE CONDITION HYDROLOGY MAP


Drawing Name: O:\265.13.20\Engineering\Hydrology_Plan\Exhibits\EXHIBIT-C-D-MERRILL-GROVE-ALT-2.dwg
Last Opened: Nov 17, 2021 - 8:04pm by stanner

# CITY OF ONTARIO MASTER DRAINAGE PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

# ULTIMATE CONDITION HYDROLOGY MAP

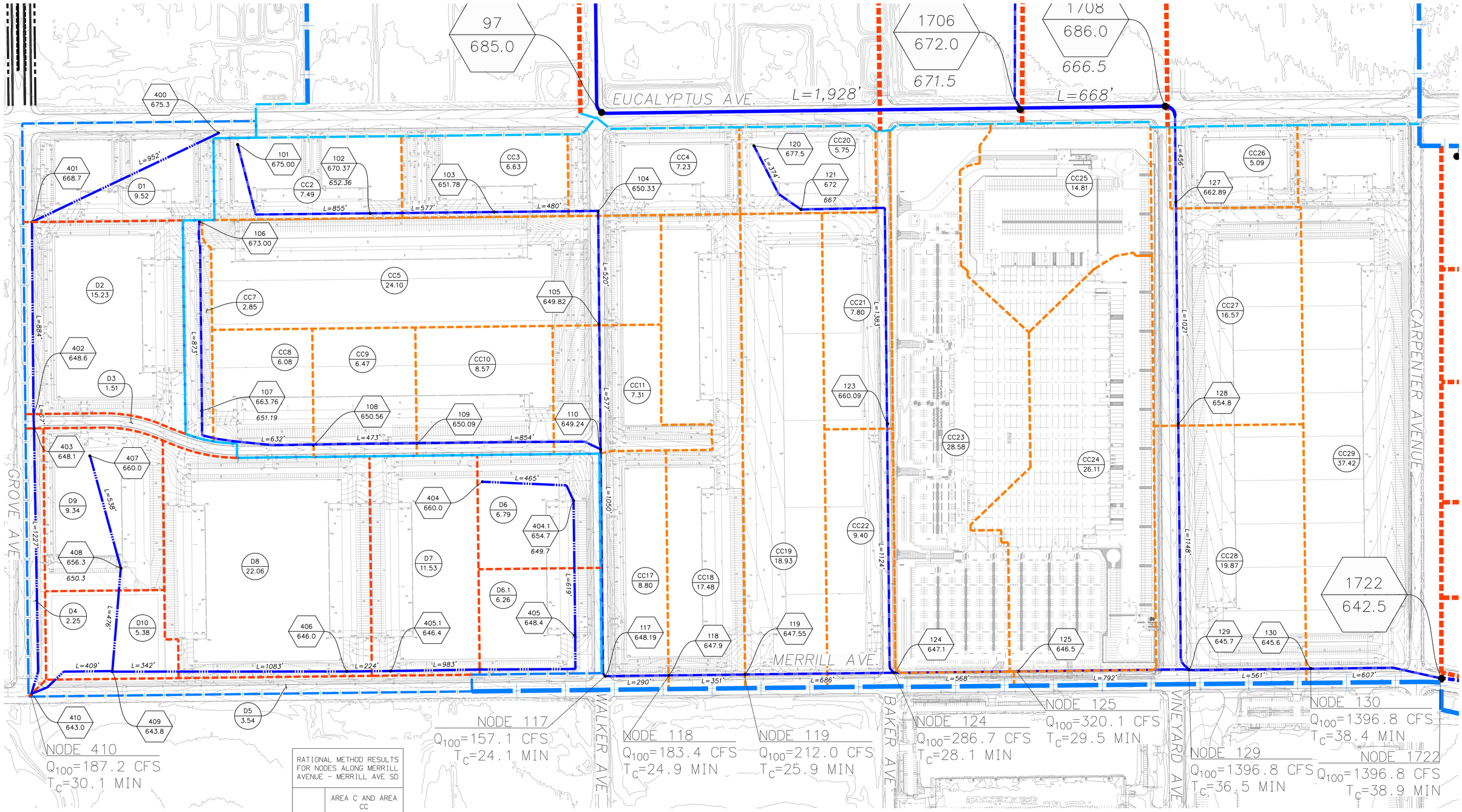


| RATIONAL METHOD AND UNIT HYDROGRAPH RESULTS FOR NODE ALONG MERRILL AVENUE - GROVE AVE SD | | | |
|---|---|---|---|
| NODE | RATIONAL METHOD RESULTS | | UNIT HYDROGRAPH RESULTS (100-YEAR, 24-HOUR STORM) |
| | $Q_{100}$ (CFS) | $T_C$ (MIN) | PEAK $Q_{100}$ (CFS) |
| 410 | 187.2 | 30.1 | 161.3 |

| RATIONAL METHOD RESULTS FOR NODES ALONG MERRILL AVENUE - MERRILL AVE SD | | |
|---|---|---|
| | AREA C AND AREA CC | |
| NODE | $Q_{100}$ (CFS) | $T_C$ (MIN) |
| 117 | 157.1 | 24.1 |
| 118 | 183.4 | 24.9 |
| 119 | 212.0 | 25.9 |
| 124 | 286.7 | 28.1 |
| 125 | 320.1 | 29.5 |
| 129 | 1396.8 | 36.5 |
| 130 | 1396.8 | 38.4 |
| 1722 | 1396.8 | 38.9 |

LEGEND:

- XXX.X / XXXX — NODE/CONCENTRATION POINT / FLOWLINE ELEVATION
- XXXX.X — APPROXIMATE INVERT ELEVATION
- XXX / X.X — SUB AREA / ACRES
- L=XXX' — FLOW DISTANCE
- FLOW PATH
- MERRILL AREA CC WATERSHED SUB-BOUNDARY
- MERRILL AREA CC WATERSHED BOUNDARY
- GROVE WATERSHED SUB-BOUNDARY
- GROVE WATERSHED BOUNDARY

GRAPHIC SCALE
150' 0 75' 150' 300'
1" = 150'


JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568


EXHIBIT "D"

CITY OF ONTARIO MASTER DRAINAGE PLAN

ULTIMATE CONDITION HYDROLOGY MAP


Drawing Name: O:\265.13.20\Engineering\Hydrology_Plan\Exhibits\EXHIBIT-C-D-MERRILL-GROVE-ALT-2.dwg
Last Opened: Nov 17, 2021 - 8:06pm by sjones

# CITY OF ONTARIO MASTER DRAINAGE PLAN

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

# MAINLINE STORM DRAIN FACILITIES MAP

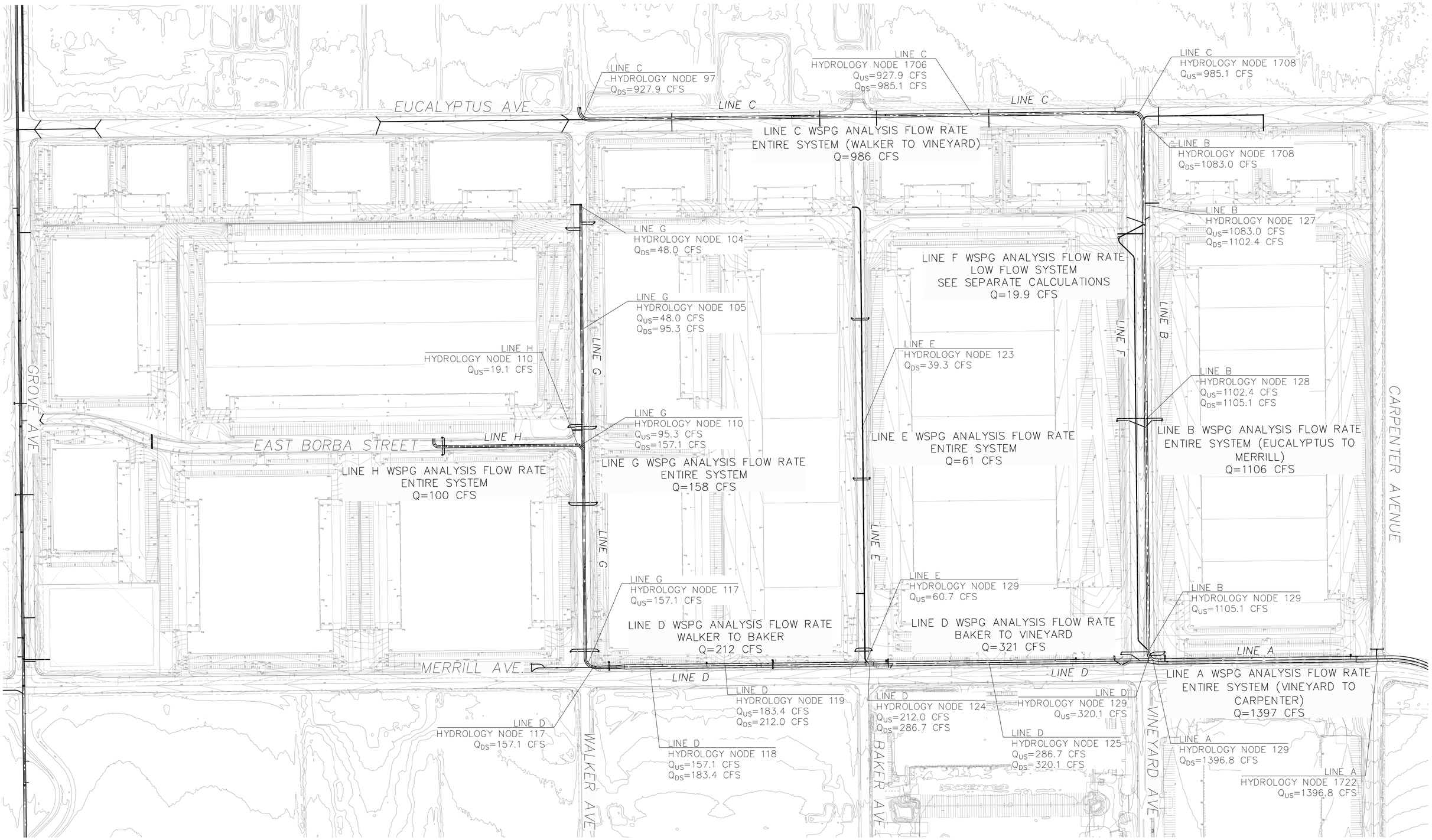


LEGEND:

LINE A
HYDROLOGY NODE XX
$Q_{US}$= XX CFS
$Q_{DS}$= XX CFS

FACILITY NAME
HYDROLOGY NODE
UPSTREAM FLOW RATE PER HYDROLOGY ANALYSIS FOR 100-YEAR
DOWNSTREAM FLOW RATE PER HYDROLOGY ANALYSIS FOR 100-YEAR

N

GRAPHIC SCALE
150' 0 75' 150' 300'
1" = 150'


JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568


EXHIBIT "H"
CITY OF ONTARIO
MASTER DRAINAGE PLAN

MAINLINE STORM DRAIN
FACILITIES MAP


Drawing Name: Q:\265-13.20\Engineering\Hydrology_Plan\Exhibits\EXHIBIT-H-MAINLINE-FLOW-RATES.dwg
Last Opened: Nov 20, 2022 - 9:01pm by stanop

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            San Bernardino County Rational Hydrology Program

                (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2014 Version 9.0
      Rational Hydrology Study        Date: 10/01/21
----------------------------------------------------------------------
CITY OF ONTARIO MASTER PLAN OF DRAINAGE
100 YEAR STUDY
AREA C & AREA CC TRIBUTARY TO MERRILL AVENUE STORM DRAIN
ALTERNATIVE 2
----------------------------------------------------------------------


Program License Serial Number 6279

----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

----------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.200 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       81.000 to Point/Station       82.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.590
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.410
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 47.17
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.421(In/Hr)
Initial subarea data:
Initial area flow distance =   998.000(Ft.)
Top (of initial area) elevation =   775.000(Ft.)
Bottom (of initial area) elevation =   767.000(Ft.)
Difference in elevation =     8.000(Ft.)
Slope =    0.00802  s(%)=       0.80
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.174 min.
Rainfall intensity =      2.635(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.756
Subarea runoff =     19.326(CFS)
Total initial stream area =        9.700(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.421(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       82.000 to Point/Station       83.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
```

```
Top of street segment elevation =   767.000(Ft.)
End of street segment elevation =   750.000(Ft.)
Length of street segment  =  1686.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  65.000(Ft.)
Distance from crown to crossfall grade break  =  60.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     29.610(CFS)
Depth of flow =   0.535(Ft.), Average velocity =   3.455(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.393(Ft.)
Flow velocity =   3.45(Ft/s)
Travel time =    8.13 min.     TC =   24.31  min.
 Adding area flow to street
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.790
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.210
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 39.77
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.459(In/Hr)
Rainfall intensity =      2.064(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.706
Subarea runoff =     20.423(CFS) for   17.600(Ac.)
Total runoff =     39.749(CFS)
Effective area this stream =       27.30(Ac.)
Total Study Area (Main Stream No. 1) =       27.30(Ac.)
Area averaged Fm value =    0.446(In/Hr)
Street flow at end of street =     39.749(CFS)
Half street flow at end of street =     19.874(CFS)
Depth of flow =   0.584(Ft.), Average velocity =   3.714(Ft/s)
Flow width (from curb towards crown)=  22.856(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       83.000 to Point/Station       84.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   750.000(Ft.)
Downstream point/station elevation =   747.700(Ft.)
Pipe length  =  1333.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    39.749(CFS)
Nearest computed pipe diameter  =     42.00(In.)
Calculated individual pipe flow  =    39.749(CFS)
Normal flow depth in pipe =   32.72(In.)
Flow top width inside pipe =   34.85(In.)
Critical Depth =   23.53(In.)
Pipe flow velocity =      4.94(Ft/s)
Travel time through pipe =    4.49 min.
```

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Time of concentration (TC) =    28.80 min.


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Process from Point/Station       84.000 to Point/Station       84.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.489(In/Hr)
Time of concentration =    28.80 min.
Rainfall intensity =      1.864(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.670
Subarea runoff =     84.317(CFS) for   72.100(Ac.)
Total runoff =    124.066(CFS)
Effective area this stream =       99.40(Ac.)
Total Study Area (Main Stream No. 1) =       99.40(Ac.)
Area averaged Fm value =    0.477(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       84.000 to Point/Station       84.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4700     Max loss rate(Fm)=     0.460(In/Hr)
Time of concentration =    28.80 min.
Rainfall intensity =      1.864(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.674
Subarea runoff =    127.148(CFS) for  100.600(Ac.)
Total runoff =    251.214(CFS)
Effective area this stream =      200.00(Ac.)
Total Study Area (Main Stream No. 1) =      200.00(Ac.)
Area averaged Fm value =    0.468(In/Hr)


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Process from Point/Station       84.000 to Point/Station       85.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   747.700(Ft.)
Downstream point/station elevation =   722.700(Ft.)
Pipe length  =  2630.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   251.214(CFS)
Nearest computed pipe diameter  =     60.00(In.)
Calculated individual pipe flow  =   251.214(CFS)
Normal flow depth in pipe =   48.56(In.)
Flow top width inside pipe =   47.14(In.)
Critical Depth =   53.16(In.)
Pipe flow velocity =     14.74(Ft/s)
Travel time through pipe =    2.97 min.
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Time of concentration (TC) =    31.77 min.

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Process from Point/Station       85.000 to Point/Station       85.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5900     Max loss rate(Fm)=     0.577(In/Hr)
Time of concentration =    31.77 min.
Rainfall intensity =      1.757(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.642
Subarea runoff =     87.022(CFS) for  100.000(Ac.)
Total runoff =    338.236(CFS)
Effective area this stream =      300.00(Ac.)
Total Study Area (Main Stream No. 1) =      300.00(Ac.)
Area averaged Fm value =    0.504(In/Hr)


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Process from Point/Station       85.000 to Point/Station       85.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5200     Max loss rate(Fm)=     0.508(In/Hr)
Time of concentration =    31.77 min.
Rainfall intensity =      1.757(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.642
Subarea runoff =     10.002(CFS) for    8.900(Ac.)
Total runoff =    348.239(CFS)
Effective area this stream =      308.90(Ac.)
Total Study Area (Main Stream No. 1) =      308.90(Ac.)
Area averaged Fm value =    0.505(In/Hr)


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Process from Point/Station       85.000 to Point/Station       85.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    308.900(Ac.)
Runoff from this stream =    348.239(CFS)
Time of concentration =   31.77 min.
Rainfall intensity =     1.757(In/Hr)
Area averaged loss rate (Fm) =    0.5046(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5199


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Process from Point/Station       86.000 to Point/Station       87.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
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Decimal fraction soil group A = 0.240
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.760
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 60.12
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.339(In/Hr)
Initial subarea data:
Initial area flow distance =   730.000(Ft.)
Top (of initial area) elevation =   750.000(Ft.)
Bottom (of initial area) elevation =   742.000(Ft.)
Difference in elevation =     8.000(Ft.)
Slope =    0.01096  s(%)=       1.10
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.407 min.
Rainfall intensity =      2.949(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.797
Subarea runoff =     22.315(CFS)
Total initial stream area =        9.500(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.339(In/Hr)


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Process from Point/Station       87.000 to Point/Station       88.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   742.000(Ft.)
End of street segment elevation =   724.700(Ft.)
Length of street segment  =  2135.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  13.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     40.720(CFS)
Depth of flow =   0.593(Ft.), Average velocity =   3.853(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   3.85(Ft/s)
Travel time =    9.23 min.     TC =   22.64  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.3900     Max loss rate(Fm)=     0.214(In/Hr)
Rainfall intensity =      2.153(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.796
Subarea runoff =     36.667(CFS) for   24.900(Ac.)
Total runoff =     58.982(CFS)
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Effective area this stream =       34.40(Ac.)
Total Study Area (Main Stream No. 1) =      343.30(Ac.)
Area averaged Fm value =    0.248(In/Hr)
Street flow at end of street =     58.982(CFS)
Half street flow at end of street =     29.491(CFS)
Depth of flow =   0.667(Ft.), Average velocity =   4.460(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.01(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station       88.000 to Point/Station       89.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   724.700(Ft.)
Downstream point/station elevation =   724.000(Ft.)
Pipe length  =   857.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    58.982(CFS)
Nearest computed pipe diameter  =     57.00(In.)
Calculated individual pipe flow  =    58.982(CFS)
Normal flow depth in pipe =   42.61(In.)
Flow top width inside pipe =   49.52(In.)
Critical Depth =   26.32(In.)
Pipe flow velocity =      4.15(Ft/s)
Travel time through pipe =    3.44 min.
Time of concentration (TC) =    26.08 min.


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Process from Point/Station       89.000 to Point/Station       89.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 64.14
Pervious ratio(Ap) = 0.5200     Max loss rate(Fm)=     0.323(In/Hr)
Time of concentration =    26.08 min.
Rainfall intensity =      1.978(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.769
Subarea runoff =     53.571(CFS) for   39.600(Ac.)
Total runoff =    112.554(CFS)
Effective area this stream =       74.00(Ac.)
Total Study Area (Main Stream No. 1) =      382.90(Ac.)
Area averaged Fm value =    0.288(In/Hr)


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Process from Point/Station       89.000 to Point/Station       90.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   724.000(Ft.)
Downstream point/station elevation =   722.900(Ft.)
Pipe length  =  1331.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   112.554(CFS)
Nearest computed pipe diameter  =     72.00(In.)
Calculated individual pipe flow  =   112.554(CFS)
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Normal flow depth in pipe =   54.66(In.)
Flow top width inside pipe =   61.58(In.)
Critical Depth =   34.37(In.)
Pipe flow velocity =      4.89(Ft/s)
Travel time through pipe =    4.54 min.
Time of concentration (TC) =    30.62 min.


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Process from Point/Station       90.000 to Point/Station       90.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 34.05
Pervious ratio(Ap) = 0.6800     Max loss rate(Fm)=     0.656(In/Hr)
Time of concentration =    30.62 min.
Rainfall intensity =      1.797(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.665
Subarea runoff =     60.890(CFS) for   71.100(Ac.)
Total runoff =    173.444(CFS)
Effective area this stream =      145.10(Ac.)
Total Study Area (Main Stream No. 1) =      454.00(Ac.)
Area averaged Fm value =    0.468(In/Hr)


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Process from Point/Station       90.000 to Point/Station       85.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   722.900(Ft.)
Downstream point/station elevation =   722.700(Ft.)
Pipe length  =    89.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   173.444(CFS)
Nearest computed pipe diameter  =     69.00(In.)
Calculated individual pipe flow  =   173.444(CFS)
Normal flow depth in pipe =   54.66(In.)
Flow top width inside pipe =   56.00(In.)
Critical Depth =   43.61(In.)
Pipe flow velocity =      7.86(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    30.81 min.


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Process from Point/Station       85.000 to Point/Station       85.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =    145.100(Ac.)
Runoff from this stream =    173.444(CFS)
Time of concentration =   30.81 min.
Rainfall intensity =     1.790(In/Hr)
Area averaged loss rate (Fm) =    0.4685(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5748
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
```

```
 No.    (CFS)   (Ac.)       (min)  (In/Hr)     (In/Hr)


1    348.24   308.900     31.77    0.505      1.757
2    173.44   145.100     30.81    0.468      1.790
Qmax(1) =
         1.000 *    1.000 *   348.239) +
         0.975 *    1.000 *   173.444) + =     517.375
Qmax(2) =
         1.026 *    0.970 *   348.239) +
         1.000 *    1.000 *   173.444) + =     519.954

Total of 2 streams to confluence:
Flow rates before confluence point:
     348.239     173.444
Maximum flow rates at confluence using above data:
      517.375      519.954
Area of streams before confluence:
      308.900      145.100
Effective area values after confluence:
      454.000      444.618
Results of confluence:
Total flow rate =    519.954(CFS)
Time of concentration =    30.810 min.
Effective stream area after confluence =    444.618(Ac.)
Study area average Pervious fraction(Ap) =  0.537
Study area average soil loss rate(Fm) =    0.493(In/Hr)
Study area total (this main stream) =     454.00(Ac.)


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Process from Point/Station       85.000 to Point/Station       91.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   722.700(Ft.)
Downstream point/station elevation =   697.000(Ft.)
Pipe length  =  2645.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   519.954(CFS)
Nearest computed pipe diameter  =     81.00(In.)
Calculated individual pipe flow  =   519.954(CFS)
Normal flow depth in pipe =   60.66(In.)
Flow top width inside pipe =   70.26(In.)
Critical Depth =   71.19(In.)
Pipe flow velocity =     18.10(Ft/s)
Travel time through pipe =    2.44 min.
Time of concentration (TC) =    33.25 min.


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Process from Point/Station       91.000 to Point/Station       91.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4600     Max loss rate(Fm)=     0.450(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =    497.350(CFS)
therefore the upstream flow rate of Q =    519.954(CFS) is being used
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```
Time of concentration =    33.25 min.
Rainfall intensity =      1.710(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.641
Subarea runoff =      0.000(CFS) for    9.100(Ac.)
Total runoff =    519.954(CFS)
Effective area this stream =      453.72(Ac.)
Total Study Area (Main Stream No. 1) =      463.10(Ac.)
Area averaged Fm value =    0.492(In/Hr)


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Process from Point/Station       91.000 to Point/Station       91.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4500     Max loss rate(Fm)=     0.440(In/Hr)
Time of concentration =    33.25 min.
Rainfall intensity =      1.710(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.645
Subarea runoff =     74.447(CFS) for   84.900(Ac.)
Total runoff =    594.401(CFS)
Effective area this stream =      538.62(Ac.)
Total Study Area (Main Stream No. 1) =      548.00(Ac.)
Area averaged Fm value =    0.484(In/Hr)


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Process from Point/Station       91.000 to Point/Station       91.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    538.618(Ac.)
Runoff from this stream =    594.401(CFS)
Time of concentration =   33.25 min.
Rainfall intensity =     1.710(In/Hr)
Area averaged loss rate (Fm) =    0.4840(In/Hr)
Area averaged Pervious ratio (Ap) = 0.5224


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Process from Point/Station       92.000 to Point/Station       93.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
RESIDENTIAL(5 - 7 dwl/acre)
Decimal fraction soil group A = 0.050
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.950
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 67.15
Pervious ratio(Ap) = 0.5000     Max loss rate(Fm)=     0.288(In/Hr)
Initial subarea data:
Initial area flow distance =   687.000(Ft.)
Top (of initial area) elevation =   726.000(Ft.)
Bottom (of initial area) elevation =   720.000(Ft.)
Difference in elevation =     6.000(Ft.)
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Slope =    0.00873  s(%)=       0.87
TC = k(0.389)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.693 min.
Rainfall intensity =      2.912(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.811
Subarea runoff =     21.962(CFS)
Total initial stream area =        9.300(Ac.)
Pervious area fraction = 0.500
Initial area Fm value =    0.288(In/Hr)


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Process from Point/Station       93.000 to Point/Station       94.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   720.000(Ft.)
End of street segment elevation =   701.000(Ft.)
Length of street segment  =  2168.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  13.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     40.078(CFS)
Depth of flow =   0.584(Ft.), Average velocity =   3.921(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   3.92(Ft/s)
Travel time =    9.22 min.     TC =   22.91  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 49.51
Pervious ratio(Ap) = 0.4100     Max loss rate(Fm)=     0.334(In/Hr)
Rainfall intensity =      2.138(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.764
Subarea runoff =     36.064(CFS) for   26.200(Ac.)
Total runoff =     58.025(CFS)
Effective area this stream =       35.50(Ac.)
Total Study Area (Main Stream No. 1) =      583.50(Ac.)
Area averaged Fm value =    0.322(In/Hr)
Street flow at end of street =     58.025(CFS)
Half street flow at end of street =     29.013(CFS)
Depth of flow =   0.655(Ft.), Average velocity =   4.539(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station       94.000 to Point/Station       95.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   701.000(Ft.)
Downstream point/station elevation =   699.000(Ft.)
Pipe length  =   700.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    58.025(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    58.025(CFS)
Normal flow depth in pipe =   33.28(In.)
Flow top width inside pipe =   39.50(In.)
Critical Depth =   28.09(In.)
Pipe flow velocity =      6.62(Ft/s)
Travel time through pipe =    1.76 min.
Time of concentration (TC) =    24.67 min.


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Process from Point/Station       95.000 to Point/Station       95.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.4600     Max loss rate(Fm)=     0.252(In/Hr)
Time of concentration =    24.67 min.
Rainfall intensity =      2.045(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.775
Subarea runoff =     64.815(CFS) for   42.000(Ac.)
Total runoff =    122.840(CFS)
Effective area this stream =       77.50(Ac.)
Total Study Area (Main Stream No. 1) =      625.50(Ac.)
Area averaged Fm value =    0.284(In/Hr)


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Process from Point/Station       95.000 to Point/Station       96.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   699.000(Ft.)
Downstream point/station elevation =   697.200(Ft.)
Pipe length  =  1349.00(Ft.)   Manning's N = 0.015
No. of pipes = 1  Required pipe flow  =   122.840(CFS)
Nearest computed pipe diameter  =     72.00(In.)
Calculated individual pipe flow  =   122.840(CFS)
Normal flow depth in pipe =   54.19(In.)
Flow top width inside pipe =   62.14(In.)
Critical Depth =   35.94(In.)
Pipe flow velocity =      5.38(Ft/s)
Travel time through pipe =    4.18 min.
Time of concentration (TC) =    28.85 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       96.000 to Point/Station       96.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
```

```
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 41.47
Pervious ratio(Ap) = 0.3600     Max loss rate(Fm)=     0.325(In/Hr)
Time of concentration =    28.85 min.
Rainfall intensity =      1.862(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.753
Subarea runoff =     86.113(CFS) for   71.500(Ac.)
Total runoff =    208.953(CFS)
Effective area this stream =      149.00(Ac.)
Total Study Area (Main Stream No. 1) =      697.00(Ac.)
Area averaged Fm value =    0.304(In/Hr)


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Process from Point/Station       96.000 to Point/Station       91.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   697.200(Ft.)
Downstream point/station elevation =   697.000(Ft.)
Pipe length  =   100.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   208.953(CFS)
Nearest computed pipe diameter  =     75.00(In.)
Calculated individual pipe flow  =   208.953(CFS)
Normal flow depth in pipe =   60.75(In.)
Flow top width inside pipe =   58.85(In.)
Critical Depth =   46.88(In.)
Pipe flow velocity =      7.85(Ft/s)
Travel time through pipe =    0.21 min.
Time of concentration (TC) =    29.06 min.


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Process from Point/Station       91.000 to Point/Station       91.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =    149.000(Ac.)
Runoff from this stream =    208.953(CFS)
Time of concentration =   29.06 min.
Rainfall intensity =     1.854(In/Hr)
Area averaged loss rate (Fm) =    0.3037(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4057
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    594.40   538.618     33.25    0.484      1.710
2    208.95   149.000     29.06    0.304      1.854
Qmax(1) =
         1.000 *    1.000 *   594.401) +
         0.907 *    1.000 *   208.953) + =     783.994
Qmax(2) =
         1.117 *    0.874 *   594.401) +
         1.000 *    1.000 *   208.953) + =     789.468

Total of 2 streams to confluence:
```

```
Flow rates before confluence point:
     594.401     208.953
Maximum flow rates at confluence using above data:
      783.994      789.468
Area of streams before confluence:
      538.618      149.000
Effective area values after confluence:
      687.618      619.883
Results of confluence:
Total flow rate =    789.468(CFS)
Time of concentration =    29.065 min.
Effective stream area after confluence =    619.883(Ac.)
Study area average Pervious fraction(Ap) =  0.497
Study area average soil loss rate(Fm) =    0.445(In/Hr)
Study area total (this main stream) =     687.62(Ac.)


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Process from Point/Station       91.000 to Point/Station       97.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   697.000(Ft.)
Downstream point/station elevation =   685.000(Ft.)
Pipe length  =  2637.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   789.468(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =   789.468(CFS)
Normal flow depth in pipe =   83.06(In.)
Flow top width inside pipe =   91.02(In.)
Critical Depth =   83.36(In.)
Pipe flow velocity =     15.05(Ft/s)
Travel time through pipe =    2.92 min.
Time of concentration (TC) =    31.98 min.


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Process from Point/Station       97.000 to Point/Station       97.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 45.69
Pervious ratio(Ap) = 0.4000     Max loss rate(Fm)=     0.344(In/Hr)
Time of concentration =    31.98 min.
Rainfall intensity =      1.750(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.678
Subarea runoff =     47.405(CFS) for   85.790(Ac.)
Total runoff =    836.873(CFS)
Effective area this stream =      705.67(Ac.)
Total Study Area (Main Stream No. 1) =      782.79(Ac.)
Area averaged Fm value =    0.433(In/Hr)


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Process from Point/Station       97.000 to Point/Station       97.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
```

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USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.5300     Max loss rate(Fm)=     0.518(In/Hr)
Time of concentration =    31.98 min.
Rainfall intensity =      1.750(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.673
Subarea runoff =     91.014(CFS) for   82.080(Ac.)
Total runoff =    927.886(CFS)
Effective area this stream =      787.75(Ac.)
Total Study Area (Main Stream No. 1) =      864.87(Ac.)
Area averaged Fm value =    0.442(In/Hr)


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Process from Point/Station       97.000 to Point/Station     1706.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   685.000(Ft.)
Downstream point/station elevation =   671.500(Ft.)
Pipe length  =  1928.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   927.886(CFS)
Nearest computed pipe diameter  =    105.00(In.)
Calculated individual pipe flow  =   927.886(CFS)
Normal flow depth in pipe =   82.31(In.)
Flow top width inside pipe =   86.43(In.)
Critical Depth =   89.82(In.)
Pipe flow velocity =     18.35(Ft/s)
Travel time through pipe =    1.75 min.
Time of concentration (TC) =    33.74 min.


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Process from Point/Station     1706.000 to Point/Station     1706.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =    787.753(Ac.)
Runoff from this stream =    927.886(CFS)
Time of concentration =   33.74 min.
Rainfall intensity =     1.695(In/Hr)
Area averaged loss rate (Fm) =    0.4415(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4899


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Process from Point/Station     1700.000 to Point/Station     1701.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.890
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.110
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 36.07
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.095(In/Hr)
Initial subarea data:
Initial area flow distance =   556.000(Ft.)
Top (of initial area) elevation =   704.000(Ft.)
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Bottom (of initial area) elevation =   700.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00719  s(%)=       0.72
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.221 min.
Rainfall intensity =      3.470(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.875
Subarea runoff =     23.786(CFS)
Total initial stream area =        7.830(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.095(In/Hr)


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Process from Point/Station     1701.000 to Point/Station     1702.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   700.000(Ft.)
End of street segment elevation =   698.000(Ft.)
Length of street segment  =   328.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  30.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     35.824(CFS)
Depth of flow =   0.611(Ft.), Average velocity =   2.996(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  24.193(Ft.)
Flow velocity =   3.00(Ft/s)
Travel time =    1.82 min.     TC =   12.05  min.
 Adding area flow to street
COMMERCIAL subarea type
Decimal fraction soil group A = 0.630
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.370
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 45.69
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.086(In/Hr)
Rainfall intensity =      3.145(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
Subarea runoff =     23.911(CFS) for    9.520(Ac.)
Total runoff =     47.697(CFS)
Effective area this stream =       17.35(Ac.)
Total Study Area (Main Stream No. 1) =      882.22(Ac.)
Area averaged Fm value =    0.090(In/Hr)
Street flow at end of street =     47.697(CFS)
Half street flow at end of street =     23.848(CFS)
Depth of flow =   0.667(Ft.), Average velocity =   3.215(Ft/s)
Warning: depth of flow exceeds top of curb
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Distance that curb overflow reaches into property =    0.00(Ft.)
Flow width (from curb towards crown)=  27.001(Ft.)


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Process from Point/Station     1702.000 to Point/Station     1704.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   698.000(Ft.)
End of street segment elevation =   693.000(Ft.)
Length of street segment  =   745.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  30.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     65.955(CFS)
Depth of flow =   0.736(Ft.), Average velocity =   3.464(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    3.46(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  30.000(Ft.)
Flow velocity =   3.46(Ft/s)
Travel time =    3.58 min.     TC =   15.63  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4200     Max loss rate(Fm)=     0.411(In/Hr)
Rainfall intensity =      2.690(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.811
Subarea runoff =     36.316(CFS) for   21.170(Ac.)
Total runoff =     84.013(CFS)
Effective area this stream =       38.52(Ac.)
Total Study Area (Main Stream No. 1) =      903.39(Ac.)
Area averaged Fm value =    0.266(In/Hr)
Street flow at end of street =     84.013(CFS)
Half street flow at end of street =     42.006(CFS)
Depth of flow =   0.788(Ft.), Average velocity =   3.705(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    6.07(Ft.)
Flow width (from curb towards crown)=  30.000(Ft.)


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Process from Point/Station     1704.000 to Point/Station     1706.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
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Upstream point/station elevation =   679.500(Ft.)
Downstream point/station elevation =   671.500(Ft.)
Pipe length  =  1235.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    84.013(CFS)
Nearest computed pipe diameter  =     45.00(In.)
Calculated individual pipe flow  =    84.013(CFS)
Normal flow depth in pipe =   32.25(In.)
Flow top width inside pipe =   40.56(In.)
Critical Depth =   33.86(In.)
Pipe flow velocity =      9.92(Ft/s)
Travel time through pipe =    2.08 min.
Time of concentration (TC) =    17.71 min.


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Process from Point/Station     1706.000 to Point/Station     1706.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     38.520(Ac.)
Runoff from this stream =     84.013(CFS)
Time of concentration =   17.71 min.
Rainfall intensity =     2.496(In/Hr)
Area averaged loss rate (Fm) =    0.2662(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2759
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min)  (In/Hr)     (In/Hr)


1    927.89   787.753     33.74    0.442      1.695
2     84.01    38.520     17.71    0.266      2.496
Qmax(1) =
         1.000 *    1.000 *   927.886) +
         0.641 *    1.000 *    84.013) + =     981.734
Qmax(2) =
         1.639 *    0.525 *   927.886) +
         1.000 *    1.000 *    84.013) + =     881.996

Total of 2 streams to confluence:
Flow rates before confluence point:
     927.886      84.013
Maximum flow rates at confluence using above data:
      981.734      881.996
Area of streams before confluence:
      787.753       38.520
Effective area values after confluence:
      826.273      451.982
Results of confluence:
Total flow rate =    981.734(CFS)
Time of concentration =    33.735 min.
Effective stream area after confluence =    826.273(Ac.)
Study area average Pervious fraction(Ap) =  0.480
Study area average soil loss rate(Fm) =    0.433(In/Hr)
Study area total (this main stream) =     826.27(Ac.)


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Process from Point/Station     1706.000 to Point/Station     1706.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.4800     Max loss rate(Fm)=     0.469(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =    957.535(CFS)
therefore the upstream flow rate of Q =    981.734(CFS) is being used
Time of concentration =    33.74 min.
Rainfall intensity =      1.695(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.670
Subarea runoff =      0.000(CFS) for   17.370(Ac.)
Total runoff =    981.734(CFS)
Effective area this stream =      843.64(Ac.)
Total Study Area (Main Stream No. 1) =      920.76(Ac.)
Area averaged Fm value =    0.434(In/Hr)


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Process from Point/Station     1706.000 to Point/Station     1706.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.098(In/Hr)
Time of concentration =    33.74 min.
Rainfall intensity =      1.695(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.673
Subarea runoff =      3.318(CFS) for   19.140(Ac.)
Total runoff =    985.052(CFS)
Effective area this stream =      862.78(Ac.)
Total Study Area (Main Stream No. 1) =      939.90(Ac.)
Area averaged Fm value =    0.427(In/Hr)


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Process from Point/Station     1706.000 to Point/Station     1708.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________
Upstream point/station elevation =   671.500(Ft.)
Downstream point/station elevation =   666.500(Ft.)
Pipe length  =   668.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   985.052(CFS)
Nearest computed pipe diameter  =    105.00(In.)
Calculated individual pipe flow  =   985.052(CFS)
Normal flow depth in pipe =   84.56(In.)
Flow top width inside pipe =   83.14(In.)
Critical Depth =   91.96(In.)
Pipe flow velocity =     19.00(Ft/s)
Travel time through pipe =    0.59 min.
Time of concentration (TC) =    34.32 min.


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Process from Point/Station     1708.000 to Point/Station     1708.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.1960     Max loss rate(Fm)=     0.192(In/Hr)
Time of concentration =    34.32 min.
Rainfall intensity =      1.678(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.682
Subarea runoff =     97.922(CFS) for   83.330(Ac.)
Total runoff =   1082.974(CFS)
Effective area this stream =      946.11(Ac.)
Total Study Area (Main Stream No. 1) =     1023.23(Ac.)
Area averaged Fm value =    0.406(In/Hr)


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Process from Point/Station     1708.000 to Point/Station      127.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________
Upstream point/station elevation =   666.500(Ft.)
Downstream point/station elevation =   662.890(Ft.)
Pipe length  =   456.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1082.974(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =  1082.974(CFS)
Normal flow depth in pipe =   86.16(In.)
Flow top width inside pipe =   86.76(In.)
Critical Depth =   95.43(In.)
Pipe flow velocity =     19.90(Ft/s)
Travel time through pipe =    0.38 min.
Time of concentration (TC) =    34.70 min.


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Process from Point/Station      127.000 to Point/Station      127.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    34.70 min.
Rainfall intensity =      1.667(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.684
Subarea runoff =     12.032(CFS) for   14.810(Ac.)
Total runoff =   1095.005(CFS)
Effective area this stream =      960.92(Ac.)
Total Study Area (Main Stream No. 1) =     1038.04(Ac.)
Area averaged Fm value =    0.401(In/Hr)


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Process from Point/Station      127.000 to Point/Station      127.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    34.70 min.
Rainfall intensity =      1.667(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.685
Subarea runoff =      7.384(CFS) for    5.090(Ac.)
Total runoff =   1102.389(CFS)
Effective area this stream =      966.01(Ac.)
Total Study Area (Main Stream No. 1) =     1043.13(Ac.)
Area averaged Fm value =    0.399(In/Hr)


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Process from Point/Station      127.000 to Point/Station      128.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________
Upstream point/station elevation =   662.890(Ft.)
Downstream point/station elevation =   654.800(Ft.)
Pipe length  =  1021.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1102.389(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =  1102.389(CFS)
Normal flow depth in pipe =   87.75(In.)
Flow top width inside pipe =   84.31(In.)
Critical Depth =   96.02(In.)
Pipe flow velocity =     19.92(Ft/s)
Travel time through pipe =    0.85 min.
Time of concentration (TC) =    35.56 min.


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Process from Point/Station      128.000 to Point/Station      128.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    35.56 min.
Rainfall intensity =      1.643(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.685
Subarea runoff =      2.687(CFS) for   16.570(Ac.)
Total runoff =   1105.076(CFS)
Effective area this stream =      982.58(Ac.)
Total Study Area (Main Stream No. 1) =     1059.70(Ac.)
Area averaged Fm value =    0.393(In/Hr)
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Process from Point/Station      128.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   654.800(Ft.)
Downstream point/station elevation =   645.700(Ft.)
Pipe length  =  1148.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1105.076(CFS)
Nearest computed pipe diameter  =    108.00(In.)
Calculated individual pipe flow  =  1105.076(CFS)
Normal flow depth in pipe =   87.94(In.)
Flow top width inside pipe =   84.01(In.)
Critical Depth =   96.10(In.)
Pipe flow velocity =     19.92(Ft/s)
Travel time through pipe =    0.96 min.
Time of concentration (TC) =    36.52 min.


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Process from Point/Station      128.000 to Point/Station      129.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =    982.583(Ac.)
Runoff from this stream =   1105.076(CFS)
Time of concentration =   36.52 min.
Rainfall intensity =     1.616(In/Hr)
Area averaged loss rate (Fm) =    0.3929(In/Hr)
Area averaged Pervious ratio (Ap) = 0.4344
Program is now starting with Main Stream No. 2


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Process from Point/Station      101.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   855.000(Ft.)
Top (of initial area) elevation =   675.000(Ft.)
Bottom (of initial area) elevation =   670.370(Ft.)
Difference in elevation =     4.630(Ft.)
Slope =    0.00542  s(%)=       0.54
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.851 min.
Rainfall intensity =      3.025(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.884
Subarea runoff =     20.021(CFS)
Total initial stream area =        7.490(Ac.)
Pervious area fraction = 0.100
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Initial area Fm value =    0.055(In/Hr)


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Process from Point/Station      102.000 to Point/Station      103.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   652.360(Ft.)
Downstream point/station elevation =   651.780(Ft.)
Pipe length  =   577.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.021(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    20.021(CFS)
Normal flow depth in pipe =   27.94(In.)
Flow top width inside pipe =   30.02(In.)
Critical Depth =   17.24(In.)
Pipe flow velocity =      3.40(Ft/s)
Travel time through pipe =    2.83 min.
Time of concentration (TC) =    15.68 min.


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Process from Point/Station      103.000 to Point/Station      103.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    15.68 min.
Rainfall intensity =      2.685(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.882
Subarea runoff =     13.402(CFS) for    6.630(Ac.)
Total runoff =     33.423(CFS)
Effective area this stream =       14.12(Ac.)
Total Study Area (Main Stream No. 2) =     1073.82(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      103.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   651.780(Ft.)
Downstream point/station elevation =   650.330(Ft.)
Pipe length  =   480.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    33.423(CFS)
Nearest computed pipe diameter  =     36.00(In.)
Calculated individual pipe flow  =    33.423(CFS)
Normal flow depth in pipe =   27.00(In.)
Flow top width inside pipe =   31.18(In.)
Critical Depth =   22.53(In.)
Pipe flow velocity =      5.88(Ft/s)
Travel time through pipe =    1.36 min.
Time of concentration (TC) =    17.04 min.
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Process from Point/Station      104.000 to Point/Station      104.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    17.04 min.
Rainfall intensity =      2.554(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.881
Subarea runoff =     14.600(CFS) for    7.230(Ac.)
Total runoff =     48.023(CFS)
Effective area this stream =       21.35(Ac.)
Total Study Area (Main Stream No. 2) =     1081.05(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   650.330(Ft.)
Downstream point/station elevation =   649.820(Ft.)
Pipe length  =   520.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    48.023(CFS)
Nearest computed pipe diameter  =     51.00(In.)
Calculated individual pipe flow  =    48.023(CFS)
Normal flow depth in pipe =   38.11(In.)
Flow top width inside pipe =   44.33(In.)
Critical Depth =   24.46(In.)
Pipe flow velocity =      4.22(Ft/s)
Travel time through pipe =    2.05 min.
Time of concentration (TC) =    19.09 min.


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Process from Point/Station      105.000 to Point/Station      105.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    19.09 min.
Rainfall intensity =      2.386(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.879
Subarea runoff =     47.317(CFS) for   24.100(Ac.)
Total runoff =     95.341(CFS)
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Effective area this stream =       45.45(Ac.)
Total Study Area (Main Stream No. 2) =     1105.15(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      105.000 to Point/Station      110.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   649.820(Ft.)
Downstream point/station elevation =   649.240(Ft.)
Pipe length  =   577.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    95.341(CFS)
Nearest computed pipe diameter  =     66.00(In.)
Calculated individual pipe flow  =    95.341(CFS)
Normal flow depth in pipe =   48.75(In.)
Flow top width inside pipe =   58.00(In.)
Critical Depth =   32.33(In.)
Pipe flow velocity =      5.07(Ft/s)
Travel time through pipe =    1.90 min.
Time of concentration (TC) =    20.99 min.


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Process from Point/Station      110.000 to Point/Station      110.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    20.99 min.
Rainfall intensity =      2.254(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.878
Subarea runoff =      9.073(CFS) for    7.310(Ac.)
Total runoff =    104.414(CFS)
Effective area this stream =       52.76(Ac.)
Total Study Area (Main Stream No. 2) =     1112.46(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      105.000 to Point/Station      110.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =     52.760(Ac.)
Runoff from this stream =    104.414(CFS)
Time of concentration =   20.99 min.
Rainfall intensity =     2.254(In/Hr)
Area averaged loss rate (Fm) =    0.0548(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


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Process from Point/Station      106.000 to Point/Station      107.000
**** INITIAL AREA EVALUATION ****
____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   873.000(Ft.)
Top (of initial area) elevation =   673.000(Ft.)
Bottom (of initial area) elevation =   663.760(Ft.)
Difference in elevation =     9.240(Ft.)
Slope =    0.01058  s(%)=       1.06
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.333 min.
Rainfall intensity =      3.262(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.885
Subarea runoff =      8.226(CFS)
Total initial stream area =        2.850(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


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Process from Point/Station      107.000 to Point/Station      108.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
____________________________________________________________________
Upstream point/station elevation =   651.190(Ft.)
Downstream point/station elevation =   650.560(Ft.)
Pipe length  =   623.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.226(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =     8.226(CFS)
Normal flow depth in pipe =   18.87(In.)
Flow top width inside pipe =   24.77(In.)
Critical Depth =   11.81(In.)
Pipe flow velocity =      2.77(Ft/s)
Travel time through pipe =    3.75 min.
Time of concentration (TC) =    15.08 min.


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Process from Point/Station      108.000 to Point/Station      108.000
**** SUBAREA FLOW ADDITION ****
____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    15.08 min.
Rainfall intensity =      2.748(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.882
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Subarea runoff =     13.422(CFS) for    6.080(Ac.)
Total runoff =     21.648(CFS)
Effective area this stream =        8.93(Ac.)
Total Study Area (Main Stream No. 2) =     1121.39(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      108.000 to Point/Station      109.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   650.560(Ft.)
Downstream point/station elevation =   650.090(Ft.)
Pipe length  =   473.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    21.648(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    21.648(CFS)
Normal flow depth in pipe =   27.16(In.)
Flow top width inside pipe =   35.86(In.)
Critical Depth =   17.55(In.)
Pipe flow velocity =      3.51(Ft/s)
Travel time through pipe =    2.25 min.
Time of concentration (TC) =    17.32 min.


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Process from Point/Station      109.000 to Point/Station      109.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    17.32 min.
Rainfall intensity =      2.529(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.880
Subarea runoff =     12.639(CFS) for    6.470(Ac.)
Total runoff =     34.287(CFS)
Effective area this stream =       15.40(Ac.)
Total Study Area (Main Stream No. 2) =     1127.86(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      109.000 to Point/Station      109.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    17.32 min.
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Rainfall intensity =      2.529(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.880
Subarea runoff =     19.080(CFS) for    8.570(Ac.)
Total runoff =     53.367(CFS)
Effective area this stream =       23.97(Ac.)
Total Study Area (Main Stream No. 2) =     1136.43(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      109.000 to Point/Station      110.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   650.090(Ft.)
Downstream point/station elevation =   649.240(Ft.)
Pipe length  =   854.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    53.367(CFS)
Nearest computed pipe diameter  =     54.00(In.)
Calculated individual pipe flow  =    53.367(CFS)
Normal flow depth in pipe =   38.63(In.)
Flow top width inside pipe =   48.74(In.)
Critical Depth =   25.40(In.)
Pipe flow velocity =      4.39(Ft/s)
Travel time through pipe =    3.24 min.
Time of concentration (TC) =    20.57 min.


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Process from Point/Station      109.000 to Point/Station      110.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =     23.970(Ac.)
Runoff from this stream =     53.367(CFS)
Time of concentration =   20.57 min.
Rainfall intensity =     2.281(In/Hr)
Area averaged loss rate (Fm) =    0.0548(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1    104.41    52.760     20.99    0.055      2.254
2     53.37    23.970     20.57    0.055      2.281
Qmax(1) =
         1.000 *    1.000 *   104.414) +
         0.988 *    1.000 *    53.367) + =     157.124
Qmax(2) =
         1.012 *    0.980 *   104.414) +
         1.000 *    1.000 *    53.367) + =     156.974

Total of 2 streams to confluence:
Flow rates before confluence point:
     104.414      53.367
Maximum flow rates at confluence using above data:
      157.124      156.974
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Area of streams before confluence:
       52.760       23.970
Effective area values after confluence:
       76.730       75.678
Results of confluence:
Total flow rate =    157.124(CFS)
Time of concentration =    20.987 min.
Effective stream area after confluence =     76.730(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.055(In/Hr)
Study area total (this main stream) =      76.73(Ac.)


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Process from Point/Station      110.000 to Point/Station      117.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   649.240(Ft.)
Downstream point/station elevation =   648.190(Ft.)
Pipe length  =  1050.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   157.124(CFS)
Nearest computed pipe diameter  =     78.00(In.)
Calculated individual pipe flow  =   157.124(CFS)
Normal flow depth in pipe =   60.56(In.)
Flow top width inside pipe =   64.99(In.)
Critical Depth =   39.91(In.)
Pipe flow velocity =      5.68(Ft/s)
Travel time through pipe =    3.08 min.
Time of concentration (TC) =    24.07 min.


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Process from Point/Station      117.000 to Point/Station      117.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =    155.589(CFS)
therefore the upstream flow rate of Q =    157.124(CFS) is being used
Time of concentration =    24.07 min.
Rainfall intensity =      2.076(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =      0.000(CFS) for    8.800(Ac.)
Total runoff =    157.124(CFS)
Effective area this stream =       85.53(Ac.)
Total Study Area (Main Stream No. 2) =     1145.23(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      117.000 to Point/Station      118.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
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Upstream point/station elevation =   648.190(Ft.)
Downstream point/station elevation =   647.900(Ft.)
Pipe length  =   290.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   157.124(CFS)
Nearest computed pipe diameter  =     78.00(In.)
Calculated individual pipe flow  =   157.124(CFS)
Normal flow depth in pipe =   60.56(In.)
Flow top width inside pipe =   64.99(In.)
Critical Depth =   39.91(In.)
Pipe flow velocity =      5.68(Ft/s)
Travel time through pipe =    0.85 min.
Time of concentration (TC) =    24.92 min.


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Process from Point/Station      118.000 to Point/Station      118.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    24.92 min.
Rainfall intensity =      2.033(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =     26.295(CFS) for   17.480(Ac.)
Total runoff =    183.419(CFS)
Effective area this stream =      103.01(Ac.)
Total Study Area (Main Stream No. 2) =     1162.71(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      118.000 to Point/Station      119.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   647.900(Ft.)
Downstream point/station elevation =   647.550(Ft.)
Pipe length  =   351.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   183.419(CFS)
Nearest computed pipe diameter  =     84.00(In.)
Calculated individual pipe flow  =   183.419(CFS)
Normal flow depth in pipe =   62.81(In.)
Flow top width inside pipe =   72.96(In.)
Critical Depth =   42.33(In.)
Pipe flow velocity =      5.94(Ft/s)
Travel time through pipe =    0.99 min.
Time of concentration (TC) =    25.90 min.


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Process from Point/Station      119.000 to Point/Station      119.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
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COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    25.90 min.
Rainfall intensity =      1.986(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.875
Subarea runoff =     28.576(CFS) for   18.930(Ac.)
Total runoff =    211.995(CFS)
Effective area this stream =      121.94(Ac.)
Total Study Area (Main Stream No. 2) =     1181.64(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      119.000 to Point/Station      124.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   647.550(Ft.)
Downstream point/station elevation =   647.100(Ft.)
Pipe length  =   686.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   211.995(CFS)
Nearest computed pipe diameter  =     93.00(In.)
Calculated individual pipe flow  =   211.995(CFS)
Normal flow depth in pipe =   75.19(In.)
Flow top width inside pipe =   73.19(In.)
Critical Depth =   44.25(In.)
Pipe flow velocity =      5.19(Ft/s)
Travel time through pipe =    2.20 min.
Time of concentration (TC) =    28.11 min.


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Process from Point/Station      119.000 to Point/Station      124.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =    121.940(Ac.)
Runoff from this stream =    211.995(CFS)
Time of concentration =   28.11 min.
Rainfall intensity =     1.891(In/Hr)
Area averaged loss rate (Fm) =    0.0548(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000


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Process from Point/Station      120.000 to Point/Station      121.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
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Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Initial subarea data:
Initial area flow distance =   374.000(Ft.)
Top (of initial area) elevation =   677.500(Ft.)
Bottom (of initial area) elevation =   672.000(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.01471  s(%)=       1.47
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.560 min.
Rainfall intensity =      4.159(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.888
Subarea runoff =     21.238(CFS)
Total initial stream area =        5.750(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.055(In/Hr)


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Process from Point/Station      121.000 to Point/Station      123.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   667.000(Ft.)
Downstream point/station elevation =   660.090(Ft.)
Pipe length  =  1383.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    21.238(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    21.238(CFS)
Normal flow depth in pipe =   21.42(In.)
Flow top width inside pipe =   21.86(In.)
Critical Depth =   19.34(In.)
Pipe flow velocity =      6.27(Ft/s)
Travel time through pipe =    3.67 min.
Time of concentration (TC) =    11.23 min.


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Process from Point/Station      123.000 to Point/Station      123.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    11.23 min.
Rainfall intensity =      3.279(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.885
Subarea runoff =     18.081(CFS) for    7.800(Ac.)
Total runoff =     39.319(CFS)
Effective area this stream =       13.55(Ac.)
Total Study Area (Main Stream No. 2) =     1195.19(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      123.000 to Point/Station      124.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_______________________________________________________________________
Upstream point/station elevation =   660.090(Ft.)
Downstream point/station elevation =   647.100(Ft.)
Pipe length  =  1124.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    39.319(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    39.319(CFS)
Normal flow depth in pipe =   22.08(In.)
Flow top width inside pipe =   26.45(In.)
Critical Depth =   25.38(In.)
Pipe flow velocity =     10.15(Ft/s)
Travel time through pipe =    1.84 min.
Time of concentration (TC) =    13.08 min.


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Process from Point/Station      124.000 to Point/Station      124.000
**** SUBAREA FLOW ADDITION ****
_______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    13.08 min.
Rainfall intensity =      2.993(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.884
Subarea runoff =     21.371(CFS) for    9.400(Ac.)
Total runoff =     60.690(CFS)
Effective area this stream =       22.95(Ac.)
Total Study Area (Main Stream No. 2) =     1204.59(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      123.000 to Point/Station      124.000
**** CONFLUENCE OF MINOR STREAMS ****
_______________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =     22.950(Ac.)
Runoff from this stream =     60.690(CFS)
Time of concentration =   13.08 min.
Rainfall intensity =     2.993(In/Hr)
Area averaged loss rate (Fm) =    0.0548(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min)  (In/Hr)     (In/Hr)


1    211.99   121.940     28.11    0.055      1.891
2     60.69    22.950     13.08    0.055      2.993
Qmax(1) =
         1.000 *    1.000 *   211.995) +
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         0.625 *    1.000 *    60.690) + =     249.932
Qmax(2) =
         1.600 *    0.465 *   211.995) +
         1.000 *    1.000 *    60.690) + =     218.520

Total of 2 streams to confluence:
Flow rates before confluence point:
     211.995      60.690
Maximum flow rates at confluence using above data:
      249.932      218.520
Area of streams before confluence:
      121.940       22.950
Effective area values after confluence:
      144.890       79.698
Results of confluence:
Total flow rate =    249.932(CFS)
Time of concentration =    28.105 min.
Effective stream area after confluence =    144.890(Ac.)
Study area average Pervious fraction(Ap) =  0.100
Study area average soil loss rate(Fm) =    0.055(In/Hr)
Study area total (this main stream) =     144.89(Ac.)


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Process from Point/Station      124.000 to Point/Station      124.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    28.11 min.
Rainfall intensity =      1.891(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
Subarea runoff =     36.817(CFS) for   28.580(Ac.)
Total runoff =    286.749(CFS)
Effective area this stream =      173.47(Ac.)
Total Study Area (Main Stream No. 2) =     1233.17(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      124.000 to Point/Station      125.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   647.100(Ft.)
Downstream point/station elevation =   646.500(Ft.)
Pipe length  =   568.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   286.749(CFS)
Nearest computed pipe diameter  =     96.00(In.)
Calculated individual pipe flow  =   286.749(CFS)
Normal flow depth in pipe =   75.94(In.)
Flow top width inside pipe =   78.06(In.)
Critical Depth =   51.23(In.)
Pipe flow velocity =      6.72(Ft/s)
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Travel time through pipe =    1.41 min.
Time of concentration (TC) =    29.51 min.


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Process from Point/Station      125.000 to Point/Station      125.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    29.51 min.
Rainfall intensity =      1.837(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =     33.333(CFS) for   26.110(Ac.)
Total runoff =    320.082(CFS)
Effective area this stream =      199.58(Ac.)
Total Study Area (Main Stream No. 2) =     1259.28(Ac.)
Area averaged Fm value =    0.055(In/Hr)


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Process from Point/Station      125.000 to Point/Station      129.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   646.500(Ft.)
Downstream point/station elevation =   645.700(Ft.)
Pipe length  =   792.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   320.082(CFS)
Nearest computed pipe diameter  =    102.00(In.)
Calculated individual pipe flow  =   320.082(CFS)
Normal flow depth in pipe =   78.56(In.)
Flow top width inside pipe =   85.82(In.)
Critical Depth =   53.31(In.)
Pipe flow velocity =      6.83(Ft/s)
Travel time through pipe =    1.93 min.
Time of concentration (TC) =    31.45 min.


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Process from Point/Station      125.000 to Point/Station      129.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =    199.580(Ac.)
Runoff from this stream =    320.082(CFS)
Time of concentration =   31.45 min.
Rainfall intensity =     1.768(In/Hr)
Area averaged loss rate (Fm) =    0.0548(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
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 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1   1105.08   982.583     36.52    0.393      1.616
2    320.08   199.580     31.45    0.055      1.768
Qmax(1) =
         1.000 *    1.000 *  1105.076) +
         0.911 *    1.000 *   320.082) + =    1396.821
Qmax(2) =
         1.124 *    0.861 *  1105.076) +
         1.000 *    1.000 *   320.082) + =    1389.692

Total of 2 main streams to confluence:
Flow rates before confluence point:
    1106.076     321.082
Maximum flow rates at confluence using above data:
     1396.821     1389.692
Area of streams before confluence:
      982.583      199.580
Effective area values after confluence:
     1182.163     1045.732


Results of confluence:
Total flow rate =   1396.821(CFS)
Time of concentration =    36.518 min.
Effective stream area after confluence  =   1182.163(Ac.)
Study area average Pervious fraction(Ap) =  0.378
Study area average soil loss rate(Fm) =    0.336(In/Hr)
Study area total =    1182.16(Ac.)


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Process from Point/Station      129.000 to Point/Station      129.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =   1390.472(CFS)
therefore the upstream flow rate of Q =   1396.821(CFS) is being used
Time of concentration =    36.52 min.
Rainfall intensity =      1.616(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.716
Subarea runoff =      0.000(CFS) for   19.870(Ac.)
Total runoff =   1396.821(CFS)
Effective area this stream =     1202.03(Ac.)
Total Study Area (Main Stream No. 1) =     1279.15(Ac.)
Area averaged Fm value =    0.331(In/Hr)


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Process from Point/Station      129.000 to Point/Station      130.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =   645.700(Ft.)
Downstream point/station elevation =   645.600(Ft.)
Pipe length  =   561.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1396.821(CFS)
Nearest computed pipe diameter  =    240.00(In.)
Calculated individual pipe flow  =  1396.821(CFS)
Normal flow depth in pipe =  195.75(In.)
Flow top width inside pipe =  186.14(In.)
Critical Depth =   88.50(In.)
Pipe flow velocity =      5.09(Ft/s)
Travel time through pipe =    1.84 min.
Time of concentration (TC) =    38.36 min.


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Process from Point/Station      130.000 to Point/Station      130.000
**** SUBAREA FLOW ADDITION ****
_____________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =   1390.716(CFS)
therefore the upstream flow rate of Q =   1396.821(CFS) is being used
Time of concentration =    38.36 min.
Rainfall intensity =      1.570(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.715
Subarea runoff =      0.000(CFS) for   37.420(Ac.)
Total runoff =   1396.821(CFS)
Effective area this stream =     1239.45(Ac.)
Total Study Area (Main Stream No. 1) =     1316.57(Ac.)
Area averaged Fm value =    0.323(In/Hr)


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Process from Point/Station      130.000 to Point/Station     1722.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =   645.600(Ft.)
Downstream point/station elevation =   642.500(Ft.)
Pipe length  =   607.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1396.821(CFS)
Nearest computed pipe diameter  =    129.00(In.)
Calculated individual pipe flow  =  1396.821(CFS)
Normal flow depth in pipe =  102.94(In.)
Flow top width inside pipe =  103.59(In.)
Critical Depth =  105.52(In.)
Pipe flow velocity =     18.00(Ft/s)
Travel time through pipe =    0.56 min.
Time of concentration (TC) =    38.92 min.
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Process from Point/Station     1722.000 to Point/Station     1724.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   642.500(Ft.)
Downstream point/station elevation =   641.200(Ft.)
Pipe length  =  1286.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1396.821(CFS)
Nearest computed pipe diameter  =    174.00(In.)
Calculated individual pipe flow  =  1396.821(CFS)
Normal flow depth in pipe =  140.63(In.)
Flow top width inside pipe =  137.02(In.)
Critical Depth =   97.74(In.)
Pipe flow velocity =      9.78(Ft/s)
Travel time through pipe =    2.19 min.
Time of concentration (TC) =    41.11 min.


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Process from Point/Station     1724.000 to Point/Station     1724.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 46.02
Pervious ratio(Ap) = 0.4300     Max loss rate(Fm)=     0.368(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =   1324.396(CFS)
therefore the upstream flow rate of Q =   1396.821(CFS) is being used
Time of concentration =    41.11 min.
Rainfall intensity =      1.506(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.707
Subarea runoff =      0.000(CFS) for    4.920(Ac.)
Total runoff =   1396.821(CFS)
Effective area this stream =     1244.37(Ac.)
Total Study Area (Main Stream No. 1) =     1321.49(Ac.)
Area averaged Fm value =    0.323(In/Hr)


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Process from Point/Station     1724.000 to Point/Station     1724.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =   1244.373(Ac.)
Runoff from this stream =   1396.821(CFS)
Time of concentration =   41.11 min.
Rainfall intensity =     1.506(In/Hr)
Area averaged loss rate (Fm) =    0.3230(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3653


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Process from Point/Station     1726.000 to Point/Station     1728.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.390
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Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.610
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 54.57
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.075(In/Hr)
Initial subarea data:
Initial area flow distance =   703.000(Ft.)
Top (of initial area) elevation =   685.000(Ft.)
Bottom (of initial area) elevation =   670.400(Ft.)
Difference in elevation =    14.600(Ft.)
Slope =    0.02077  s(%)=       2.08
TC = k(0.304)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.082 min.
Rainfall intensity =      3.725(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.882
Subarea runoff =     24.704(CFS)
Total initial stream area =        7.520(Ac.)
Pervious area fraction = 0.100
Initial area Fm value =    0.075(In/Hr)


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Process from Point/Station     1728.000 to Point/Station     1730.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   670.400(Ft.)
End of street segment elevation =   665.200(Ft.)
Length of street segment  =   763.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  30.000(Ft.)
Distance from crown to crossfall grade break  =  20.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  10.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.000(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     33.652(CFS)
Depth of flow =   0.589(Ft.), Average velocity =   3.076(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  23.116(Ft.)
Flow velocity =   3.08(Ft/s)
Travel time =    4.13 min.     TC =   13.22  min.
 Adding area flow to street
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 60.13
Pervious ratio(Ap) = 0.1900     Max loss rate(Fm)=     0.129(In/Hr)
Rainfall intensity =      2.974(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.868
Subarea runoff =     17.789(CFS) for    8.930(Ac.)
Total runoff =     42.492(CFS)
Effective area this stream =       16.45(Ac.)
Total Study Area (Main Stream No. 1) =     1337.94(Ac.)
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Area averaged Fm value =    0.104(In/Hr)
Street flow at end of street =     42.492(CFS)
Half street flow at end of street =     21.246(CFS)
Depth of flow =   0.632(Ft.), Average velocity =   3.258(Ft/s)
Flow width (from curb towards crown)=  25.286(Ft.)


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Process from Point/Station     1730.000 to Point/Station     1730.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    13.22 min.
Rainfall intensity =      2.974(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.874
Subarea runoff =     27.696(CFS) for   10.540(Ac.)
Total runoff =     70.188(CFS)
Effective area this stream =       26.99(Ac.)
Total Study Area (Main Stream No. 1) =     1348.48(Ac.)
Area averaged Fm value =    0.085(In/Hr)


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Process from Point/Station     1730.000 to Point/Station     1732.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   661.450(Ft.)
Downstream point/station elevation =   656.790(Ft.)
Pipe length  =   517.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    70.188(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    70.188(CFS)
Normal flow depth in pipe =   28.78(In.)
Flow top width inside pipe =   34.30(In.)
Critical Depth =   31.90(In.)
Pipe flow velocity =     10.69(Ft/s)
Travel time through pipe =    0.81 min.
Time of concentration (TC) =    14.02 min.


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Process from Point/Station     1732.000 to Point/Station     1732.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.320
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.680
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 57.16
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.072(In/Hr)
Time of concentration =    14.02 min.
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Rainfall intensity =      2.871(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.875
Subarea runoff =     33.095(CFS) for   14.140(Ac.)
Total runoff =    103.283(CFS)
Effective area this stream =       41.13(Ac.)
Total Study Area (Main Stream No. 1) =     1362.62(Ac.)
Area averaged Fm value =    0.080(In/Hr)


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Process from Point/Station     1732.000 to Point/Station     1732.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    14.02 min.
Rainfall intensity =      2.871(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.876
Subarea runoff =     18.525(CFS) for    7.310(Ac.)
Total runoff =    121.808(CFS)
Effective area this stream =       48.44(Ac.)
Total Study Area (Main Stream No. 1) =     1369.93(Ac.)
Area averaged Fm value =    0.077(In/Hr)


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Process from Point/Station     1732.000 to Point/Station     1734.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   656.790(Ft.)
Downstream point/station elevation =   652.050(Ft.)
Pipe length  =   538.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   121.808(CFS)
Nearest computed pipe diameter  =     48.00(In.)
Calculated individual pipe flow  =   121.808(CFS)
Normal flow depth in pipe =   35.72(In.)
Flow top width inside pipe =   41.89(In.)
Critical Depth =   39.83(In.)
Pipe flow velocity =     12.15(Ft/s)
Travel time through pipe =    0.74 min.
Time of concentration (TC) =    14.76 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1734.000 to Point/Station     1734.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.580
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.420
Decimal fraction soil group D = 0.000
```

```
SCS curve number for soil(AMC 2)  = 47.54
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.084(In/Hr)
Time of concentration =    14.76 min.
Rainfall intensity =      2.784(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.875
Subarea runoff =     31.317(CFS) for   14.450(Ac.)
Total runoff =    153.126(CFS)
Effective area this stream =       62.89(Ac.)
Total Study Area (Main Stream No. 1) =     1384.38(Ac.)
Area averaged Fm value =    0.078(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1734.000 to Point/Station     1734.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 69.38
Pervious ratio(Ap) = 0.2150     Max loss rate(Fm)=     0.117(In/Hr)
Time of concentration =    14.76 min.
Rainfall intensity =      2.784(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =     26.212(CFS) for   10.920(Ac.)
Total runoff =    179.338(CFS)
Effective area this stream =       73.81(Ac.)
Total Study Area (Main Stream No. 1) =     1395.30(Ac.)
Area averaged Fm value =    0.084(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1734.000 to Point/Station     1736.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   652.050(Ft.)
Downstream point/station elevation =   648.150(Ft.)
Pipe length  =   434.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   179.338(CFS)
Nearest computed pipe diameter  =     54.00(In.)
Calculated individual pipe flow  =   179.338(CFS)
Normal flow depth in pipe =   42.56(In.)
Flow top width inside pipe =   44.13(In.)
Critical Depth =   46.53(In.)
Pipe flow velocity =     13.35(Ft/s)
Travel time through pipe =    0.54 min.
Time of concentration (TC) =    15.30 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1736.000 to Point/Station     1736.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.630
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.370
Decimal fraction soil group D = 0.000
```

```
SCS curve number for soil(AMC 2)  = 45.69
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.086(In/Hr)
Time of concentration =    15.30 min.
Rainfall intensity =      2.724(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.872
Subarea runoff =     23.728(CFS) for   11.660(Ac.)
Total runoff =    203.066(CFS)
Effective area this stream =       85.47(Ac.)
Total Study Area (Main Stream No. 1) =     1406.96(Ac.)
Area averaged Fm value =    0.084(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1736.000 to Point/Station     1736.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 69.00
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.055(In/Hr)
Time of concentration =    15.30 min.
Rainfall intensity =      2.724(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.873
Subarea runoff =     12.396(CFS) for    5.160(Ac.)
Total runoff =    215.462(CFS)
Effective area this stream =       90.63(Ac.)
Total Study Area (Main Stream No. 1) =     1412.12(Ac.)
Area averaged Fm value =    0.083(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1736.000 to Point/Station     1724.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   648.150(Ft.)
Downstream point/station elevation =   641.200(Ft.)
Pipe length  =   507.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   215.462(CFS)
Nearest computed pipe diameter  =     54.00(In.)
Calculated individual pipe flow  =   215.462(CFS)
Normal flow depth in pipe =   41.44(In.)
Flow top width inside pipe =   45.63(In.)
Critical Depth =   49.57(In.)
Pipe flow velocity =     16.45(Ft/s)
Travel time through pipe =    0.51 min.
Time of concentration (TC) =    15.82 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1724.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
COMMERCIAL subarea type
Decimal fraction soil group A = 0.600
```

```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.400
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 46.80
Pervious ratio(Ap) = 0.1000     Max loss rate(Fm)=     0.085(In/Hr)
Time of concentration =    15.82 min.
Rainfall intensity =      2.671(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.872
Subarea runoff =     19.172(CFS) for   10.110(Ac.)
Total runoff =    234.634(CFS)
Effective area this stream =      100.74(Ac.)
Total Study Area (Main Stream No. 1) =     1422.23(Ac.)
Area averaged Fm value =    0.083(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1724.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 69.39
Pervious ratio(Ap) = 0.2150     Max loss rate(Fm)=     0.117(In/Hr)
Time of concentration =    15.82 min.
Rainfall intensity =      2.671(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.871
Subarea runoff =     19.838(CFS) for    8.630(Ac.)
Total runoff =    254.471(CFS)
Effective area this stream =      109.37(Ac.)
Total Study Area (Main Stream No. 1) =     1430.86(Ac.)
Area averaged Fm value =    0.085(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1724.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =    109.370(Ac.)
Runoff from this stream =    254.471(CFS)
Time of concentration =   15.82 min.
Rainfall intensity =     2.671(In/Hr)
Area averaged loss rate (Fm) =    0.0854(In/Hr)
Area averaged Pervious ratio (Ap) = 0.1279
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1   1396.82  1244.373     41.11    0.323      1.506
2    254.47   109.370     15.82    0.085      2.671
Qmax(1) =
         1.000 *    1.000 *  1396.821) +
         0.549 *    1.000 *   254.471) + =    1536.613
Qmax(2) =
         1.985 *    0.385 *  1396.821) +
```

```
         1.000 *    1.000 *   254.471) + =    1321.290

Total of 2 streams to confluence:
Flow rates before confluence point:
    1396.821     254.471
Maximum flow rates at confluence using above data:
     1536.613     1321.290
Area of streams before confluence:
     1244.373      109.370
Effective area values after confluence:
     1353.743      588.108
Results of confluence:
Total flow rate =   1536.613(CFS)
Time of concentration =    41.110 min.
Effective stream area after confluence =   1353.743(Ac.)
Study area average Pervious fraction(Ap) =  0.346
Study area average soil loss rate(Fm) =    0.304(In/Hr)
Study area total (this main stream) =    1353.74(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1724.000 to Point/Station     1738.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________
Upstream point/station elevation =   641.200(Ft.)
Downstream point/station elevation =   640.400(Ft.)
Pipe length  =   658.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =  1536.613(CFS)
Nearest computed pipe diameter  =    174.00(In.)
Calculated individual pipe flow  =  1536.613(CFS)
Normal flow depth in pipe =  141.00(In.)
Flow top width inside pipe =  136.43(In.)
Critical Depth =  102.77(In.)
Pipe flow velocity =     10.72(Ft/s)
Travel time through pipe =    1.02 min.
Time of concentration (TC) =    42.13 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station     1738.000 to Point/Station     1738.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________
Soil classification AP and SCS  values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2)  = 70.02
Pervious ratio(Ap) = 0.4100     Max loss rate(Fm)=     0.218(In/Hr)
The area added to the existing stream causes a
a lower flow rate of Q =   1440.779(CFS)
therefore the upstream flow rate of Q =   1536.613(CFS) is being used
Time of concentration =    42.13 min.
Rainfall intensity =      1.484(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.716
Subarea runoff =      0.000(CFS) for    3.020(Ac.)
Total runoff =   1536.613(CFS)
Effective area this stream =     1356.76(Ac.)
Total Study Area (Main Stream No. 1) =     1433.88(Ac.)
Area averaged Fm value =    0.304(In/Hr)
End of computations, Total Study Area =         1433.88 (Ac.)
```

The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.355
Area averaged SCS curve number = 46.8

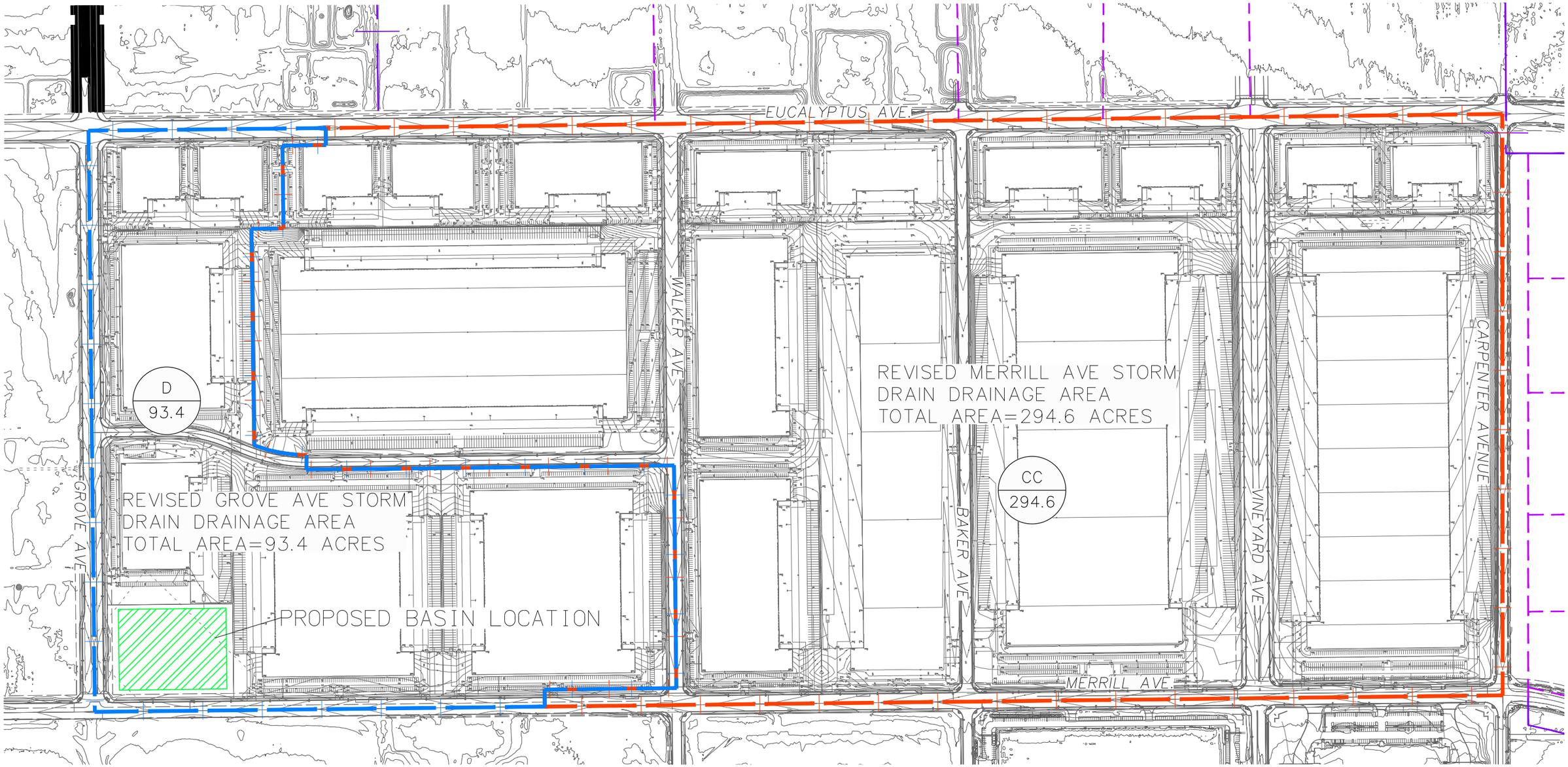


LEGEND:

XXX / X.X — SUB AREA / ACRES

MERRILL AVENUE STORM DRAIN WATERSHED BOUNDARY

GROVE AVENUE STORM DRAIN WATERSHED BOUNDARY

GRAPHIC SCALE

450' 0 225' 450' 900'

1" = 450'

N

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

# FIGURE 5

## CITY OF ONTARIO MASTER DRAINAGE PLAN

## GROVE SD AND MERRILL SD DRAINAGE AREAS

Drawing Name: G:\205-13-201\Engineering\Hydrology_Plan\Exhibits\FIGURE-5-ALTERNATIVE 2.dwg
Last Updated: Nov 11, 2021 - 3:46pm by dsteele

# EXCERPT G: EXCERPTS FROM FUSCOE ENGINEERING REPORT

PRELIMINARY HYDROLOGY REPORT

# CENTER PARK SPECIFIC PLAN

*Edison Avenue to the North, Walker Avenue to the East*
*Ontario, CA*

*Prepared for:*
*ONTARIO RANCH VENTURES I, LP &*
*ONTARIO RANCH VENTURES II, LP*

*C/O: RCCD*
*8101 E. Kaiser Blvd, Suite 140*
*Anaheim, CA 92808*

Project Manager: Carolina Gonzalez


Prepared By
Moyenuddin Sirajee, PE
909.581.0676


REGISTERED PROFESSIONAL ENGINEER
MOYENUDDIN A. SIRAJEE
No.C 63867
EXP.09/30/24
CIVIL
STATE OF CALIFORNIA

Date Prepared: 09.09.24

Project Number: 3036-015


**FUSCOE ENGINEERING, INC.**
3257 E Guasti Rd. Suite 300
Ontario, CA 91761

www.fuscoe.com

# PRELIMINARY HYDROLOGY REPORT

## CENTER PARK SPECIFIC PLAN

Located by Edison Avenue to the north, Walker Avenue to the east in the City of Ontario, County of San Bernardino, California

Prepared for:

ONTARIO RANCH VENTURES I, LP &
ONTARIO RANCH VENTURES II, LP
C/O: RCCD
8101 E. Kaiser Blvd, Suite 140
Anaheim, CA 92808
510.316.6121

Prepared by:

FUSCOE ENGINEERING, INC.
3257 E Guasti Rd. Suite 300
Ontario, CA 91761
909.581.0676

Date Prepared: August 2024

# APPENDIX 1

# RATIONAL METHOD (Q100): POST SPECIFIC PLAN

# PROPOSED CONDITIONS
# Q100

```
                San Bernardino County Rational Hydrology Program

                    (Hydrology Manual Date - August 1986)

 CIVILCADD/CIVILDESIGN  Engineering Software, (c) 1989-2005 Version 7.1
        Rational Hydrology Study        Date: 07/23/24
----------------------------------------------------------------------
PORTION OF MPD DA XIV
PROPOSED DEV DA A1
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING
----------------------------------------------------------------------


Program License Serial Number 6049

----------------------------------------------------------------------
 *********   Hydrology Study Control Information **********

----------------------------------------------------------------------
Rational hydrology study storm event year is   100.0
Computed rainfall intensity:
Storm year =   100.00   1 hour rainfall =     1.410 (In.)
Slope used for rainfall intensity curve b =  0.6000
Soil antecedent moisture condition (AMC) = 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        1.000 to Point/Station        2.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Initial subarea data:
Initial area flow distance =   771.000(Ft.)
Top (of initial area) elevation =   694.000(Ft.)
Bottom (of initial area) elevation =   685.000(Ft.)
Difference in elevation =     9.000(Ft.)
Slope =    0.01167  s(%)=       1.17
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   11.270 min.
Rainfall intensity =      3.845(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.854
Subarea runoff =     21.516(CFS)
Total initial stream area =        6.550(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.196(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        2.000 to Point/Station        3.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   685.000(Ft.)
End of street segment elevation =   683.000(Ft.)
Length of street segment  =   293.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
```

```
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     30.234(CFS)
Depth of flow =   0.594(Ft.), Average velocity =   3.000(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  22.109(Ft.)
Flow velocity =   3.00(Ft/s)
Travel time =    1.63 min.     TC =   12.90  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 0.720
Decimal fraction soil group B = 0.280
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 38.72
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.186(In/Hr)
Rainfall intensity =      3.546(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.852
Subarea runoff =     17.323(CFS) for    6.310(Ac.)
Total runoff =     38.839(CFS)
Effective area this stream =       12.86(Ac.)
Total Study Area (Main Stream No. 1) =       12.86(Ac.)
Area averaged Fm value =    0.191(In/Hr)
Street flow at end of street =     38.839(CFS)
Half street flow at end of street =     19.420(CFS)
Depth of flow =   0.639(Ft.), Average velocity =   3.190(Ft/s)
Flow width (from curb towards crown)=  24.363(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.130
Decimal fraction soil group B = 0.870
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 52.88
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.658(In/Hr)
Initial subarea data:
Initial area flow distance =   791.000(Ft.)
Top (of initial area) elevation =   684.000(Ft.)
Bottom (of initial area) elevation =   678.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00759  s(%)=       0.76
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   18.502 min.
Rainfall intensity =      2.856(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.693
Subarea runoff =     13.868(CFS)
Total initial stream area =        7.010(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.658(In/Hr)
End of computations, Total Study Area =           19.87 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.429
Area averaged SCS curve number =  41.5
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/23/24

---

PORTION OF MPD DA XIV
PROPOSED DEV DA A2
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

---

Program License Serial Number 6049

---

********* Hydrology Study Control Information **********

---

Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.410 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 1.000 to Point/Station 6.000
**** INITIAL AREA EVALUATION ****

---

APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.196(In/Hr)
Initial subarea data:
Initial area flow distance = 768.000(Ft.)
Top (of initial area) elevation = 694.000(Ft.)
Bottom (of initial area) elevation = 687.000(Ft.)
Difference in elevation = 7.000(Ft.)
Slope = 0.00911 s(%)= 0.91
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 11.823 min.
Rainfall intensity = 3.736(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.853
Subarea runoff = 20.842(CFS)
Total initial stream area = 6.540(Ac.)
Pervious area fraction = 0.200
Initial area Fm value = 0.196(In/Hr)

++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station 6.000 to Point/Station 9.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

---

Top of street segment elevation = 687.000(Ft.)
End of street segment elevation = 684.000(Ft.)
Length of street segment = 331.000(Ft.)
Height of curb above gutter flowline = 8.0(In.)
Width of half street (curb to crown) = 32.000(Ft.)
Distance from crown to crossfall grade break = 30.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line = 12.000(Ft.)

```
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     29.918(CFS)
Depth of flow =   0.568(Ft.), Average velocity =   3.330(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  20.835(Ft.)
Flow velocity =   3.33(Ft/s)
Travel time =    1.66 min.     TC =   13.48  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Rainfall intensity =      3.454(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.849
Subarea runoff =     18.041(CFS) for    6.720(Ac.)
Total runoff =     38.883(CFS)
Effective area this stream =       13.26(Ac.)
Total Study Area (Main Stream No. 1) =       13.26(Ac.)
Area averaged Fm value =    0.196(In/Hr)
Street flow at end of street =     38.883(CFS)
Half street flow at end of street =     19.442(CFS)
Depth of flow =   0.613(Ft.), Average velocity =   3.551(Ft/s)
Flow width (from curb towards crown)=  23.072(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        9.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     13.260(Ac.)
Runoff from this stream =     38.883(CFS)
Time of concentration =   13.48 min.
Rainfall intensity =     3.454(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        7.000 to Point/Station        8.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.147(In/Hr)
Initial subarea data:
Initial area flow distance =   970.000(Ft.)
Top (of initial area) elevation =   693.000(Ft.)
Bottom (of initial area) elevation =   690.000(Ft.)
Difference in elevation =     3.000(Ft.)
Slope =    0.00309  s(%)=       0.31
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   16.113 min.
Rainfall intensity =      3.103(In/Hr) for a   100.0 year storm
```

```
Effective runoff coefficient used for area (Q=KCIA) is C = 0.857
Subarea runoff =     26.474(CFS)
Total initial stream area =        9.950(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.147(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station        9.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   690.000(Ft.)
End of street segment elevation =   684.000(Ft.)
Length of street segment  =   608.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     45.040(CFS)
Depth of flow =   0.632(Ft.), Average velocity =   3.802(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  24.025(Ft.)
Flow velocity =   3.80(Ft/s)
Travel time =    2.67 min.     TC =   18.78  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 0.230
Decimal fraction soil group B = 0.770
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 50.48
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.161(In/Hr)
Rainfall intensity =      2.831(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.851
Subarea runoff =     37.020(CFS) for   16.420(Ac.)
Total runoff =     63.494(CFS)
Effective area this stream =       26.37(Ac.)
Total Study Area (Main Stream No. 2) =       39.63(Ac.)
Area averaged Fm value =    0.155(In/Hr)
Street flow at end of street =     63.494(CFS)
Half street flow at end of street =     31.747(CFS)
Depth of flow =   0.708(Ft.), Average velocity =   4.004(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    2.06(Ft.)
Flow width (from curb towards crown)=  27.812(Ft.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station        9.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     26.370(Ac.)
Runoff from this stream =     63.494(CFS)
Time of concentration =   18.78 min.
Rainfall intensity =     2.831(In/Hr)
Area averaged loss rate (Fm) =    0.1555(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
```

```
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     38.88    13.260     13.48    0.196      3.454
2     63.49    26.370     18.78    0.155      2.831
Qmax(1) =
           1.000 *    1.000 *    38.883) +
           1.233 *    0.718 *    63.494) + =      95.075
Qmax(2) =
           0.809 *    1.000 *    38.883) +
           1.000 *    1.000 *    63.494) + =      94.943

Total of 2 main streams to confluence:
Flow rates before confluence point:
      39.883      64.494
Maximum flow rates at confluence using above data:
       95.075       94.943
Area of streams before confluence:
       13.260       26.370
Effective area values after confluence:
       32.190       39.630


Results of confluence:
Total flow rate =     95.075(CFS)
Time of concentration =    13.480 min.
Effective stream area after confluence  =     32.190(Ac.)
Study area average Pervious fraction(Ap) =  0.200
Study area average soil loss rate(Fm) =    0.169(In/Hr)
Study area total =      39.63(Ac.)


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Process from Point/Station        4.000 to Point/Station       12.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.370
Decimal fraction soil group B = 0.630
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 47.12
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.717(In/Hr)
Initial subarea data:
Initial area flow distance =   805.000(Ft.)
Top (of initial area) elevation =   684.000(Ft.)
Bottom (of initial area) elevation =   678.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00745  s(%)=       0.75
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   18.698 min.
Rainfall intensity =      2.838(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.673
Subarea runoff =     13.156(CFS)
Total initial stream area =        6.890(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.717(In/Hr)


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Process from Point/Station        4.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      6.890(Ac.)
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```
Runoff from this stream =     13.156(CFS)
Time of concentration =   18.70 min.
Rainfall intensity =     2.838(In/Hr)
Area averaged loss rate (Fm) =    0.7166(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Program is now starting with Main Stream No. 2


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Process from Point/Station       10.000 to Point/Station       11.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 56.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.624(In/Hr)
Initial subarea data:
Initial area flow distance =   919.000(Ft.)
Top (of initial area) elevation =   684.000(Ft.)
Bottom (of initial area) elevation =   682.000(Ft.)
Difference in elevation =     2.000(Ft.)
Slope =    0.00218  s(%)=       0.22
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   25.219 min.
Rainfall intensity =      2.372(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.663
Subarea runoff =      9.313(CFS)
Total initial stream area =        5.920(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.624(In/Hr)


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Process from Point/Station       11.000 to Point/Station       12.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   682.000(Ft.)
End of street segment elevation =   678.000(Ft.)
Length of street segment  =   475.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     14.208(CFS)
Depth of flow =   0.466(Ft.), Average velocity =   2.703(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  15.738(Ft.)
Flow velocity =   2.70(Ft/s)
Travel time =    2.93 min.     TC =   28.15  min.
 Adding area flow to street
PARK subarea
Decimal fraction soil group A = 0.390
Decimal fraction soil group B = 0.610
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 46.64
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.721(In/Hr)
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Rainfall intensity =      2.220(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.625
Subarea runoff =      9.624(CFS) for    7.730(Ac.)
Total runoff =     18.937(CFS)
Effective area this stream =       13.65(Ac.)
Total Study Area (Main Stream No. 2) =       60.17(Ac.)
Area averaged Fm value =    0.679(In/Hr)
Street flow at end of street =     18.937(CFS)
Half street flow at end of street =      9.468(CFS)
Depth of flow =   0.505(Ft.), Average velocity =   2.897(Ft/s)
Flow width (from curb towards crown)=  17.655(Ft.)


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Process from Point/Station       11.000 to Point/Station       12.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     13.650(Ac.)
Runoff from this stream =     18.937(CFS)
Time of concentration =   28.15 min.
Rainfall intensity =     2.220(In/Hr)
Area averaged loss rate (Fm) =    0.6790(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     13.16     6.890     18.70    0.717      2.838
2     18.94    13.650     28.15    0.679      2.220
Qmax(1) =
           1.000 *    1.000 *    13.156) +
           1.401 *    0.664 *    18.937) + =      30.775
Qmax(2) =
           0.709 *    1.000 *    13.156) +
           1.000 *    1.000 *    18.937) + =      28.262

Total of 2 main streams to confluence:
Flow rates before confluence point:
      14.156      19.937
Maximum flow rates at confluence using above data:
       30.775       28.262
Area of streams before confluence:
        6.890       13.650
Effective area values after confluence:
       15.957       20.540


Results of confluence:
Total flow rate =     30.775(CFS)
Time of concentration =    18.698 min.
Effective stream area after confluence  =     15.957(Ac.)
Study area average Pervious fraction(Ap) =  0.850
Study area average soil loss rate(Fm) =    0.692(In/Hr)
Study area total =      20.54(Ac.)
End of computations, Total Study Area =           60.17 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.422
Area averaged SCS curve number =  47.0
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/24/24

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PORTION OF MPD DA XIII
PROPOSED DEV DA B
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6049

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.410 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

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Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

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MOBILE HOME PARK subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2500 Max loss rate(Fm)= 0.244(In/Hr)
Initial subarea data:
Initial area flow distance = 934.000(Ft.)
Top (of initial area) elevation = 703.000(Ft.)
Bottom (of initial area) elevation = 695.000(Ft.)
Difference in elevation = 8.000(Ft.)
Slope = 0.00857 s(%)= 0.86
TC = k(0.336)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.425 min.
Rainfall intensity = 3.462(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.836
Subarea runoff = 28.960(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 0.250
Initial area Fm value = 0.244(In/Hr)

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Process from Point/Station 3.000 to Point/Station 5.000
**** INITIAL AREA EVALUATION ****

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APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.196(In/Hr)
Initial subarea data:
Initial area flow distance = 920.000(Ft.)
Top (of initial area) elevation = 696.000(Ft.)

```
Bottom (of initial area) elevation =   688.000(Ft.)
Difference in elevation =     8.000(Ft.)
Slope =    0.00870  s(%)=       0.87
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.829 min.
Rainfall intensity =      3.558(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.851
Subarea runoff =     30.261(CFS)
Total initial stream area =       10.000(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.196(In/Hr)


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Process from Point/Station        3.000 to Point/Station        5.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     10.000(Ac.)
Runoff from this stream =     30.261(CFS)
Time of concentration =   12.83 min.
Rainfall intensity =     3.558(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Program is now starting with Main Stream No. 2


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Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Initial subarea data:
Initial area flow distance =   920.000(Ft.)
Top (of initial area) elevation =   696.000(Ft.)
Bottom (of initial area) elevation =   688.000(Ft.)
Difference in elevation =     8.000(Ft.)
Slope =    0.00870  s(%)=       0.87
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.829 min.
Rainfall intensity =      3.558(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.851
Subarea runoff =     30.261(CFS)
Total initial stream area =       10.000(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.196(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        4.000 to Point/Station        5.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     10.000(Ac.)
Runoff from this stream =     30.261(CFS)
Time of concentration =   12.83 min.
Rainfall intensity =     3.558(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:
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```
Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     30.26    10.000     12.83    0.196      3.558
2     30.26    10.000     12.83    0.196      3.558
Qmax(1) =
           1.000 *    1.000 *    30.261) +
           1.000 *    1.000 *    30.261) + =      60.522
Qmax(2) =
           1.000 *    1.000 *    30.261) +
           1.000 *    1.000 *    30.261) + =      60.522

Total of 2 main streams to confluence:
Flow rates before confluence point:
      31.261      31.261
Maximum flow rates at confluence using above data:
       60.522       60.522
Area of streams before confluence:
       10.000       10.000
Effective area values after confluence:
       20.000       20.000


Results of confluence:
Total flow rate =     60.522(CFS)
Time of concentration =    12.829 min.
Effective stream area after confluence  =     20.000(Ac.)
Study area average Pervious fraction(Ap) =  0.200
Study area average soil loss rate(Fm) =    0.196(In/Hr)
Study area total =      20.00(Ac.)


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Process from Point/Station        6.000 to Point/Station        7.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 0.950
Decimal fraction soil group B = 0.050
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 33.20
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.194(In/Hr)
Initial subarea data:
Initial area flow distance =   762.000(Ft.)
Top (of initial area) elevation =   693.000(Ft.)
Bottom (of initial area) elevation =   687.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00787  s(%)=       0.79
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.136 min.
Rainfall intensity =      3.678(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.853
Subarea runoff =     19.850(CFS)
Total initial stream area =        6.330(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.194(In/Hr)


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Process from Point/Station        7.000 to Point/Station        8.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   687.000(Ft.)
End of street segment elevation =   685.000(Ft.)
Length of street segment  =   365.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
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Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     28.804(CFS)
Depth of flow =   0.605(Ft.), Average velocity =   2.728(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  22.643(Ft.)
Flow velocity =   2.73(Ft/s)
Travel time =    2.23 min.     TC =   14.37  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 0.790
Decimal fraction soil group B = 0.210
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 37.04
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.188(In/Hr)
Rainfall intensity =      3.324(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.848
Subarea runoff =     17.767(CFS) for    7.010(Ac.)
Total runoff =     37.617(CFS)
Effective area this stream =       13.34(Ac.)
Total Study Area (Main Stream No. 1) =       43.34(Ac.)
Area averaged Fm value =    0.191(In/Hr)
Street flow at end of street =     37.617(CFS)
Half street flow at end of street =     18.809(CFS)
Depth of flow =   0.654(Ft.), Average velocity =   2.914(Ft/s)
Flow width (from curb towards crown)=  25.107(Ft.)


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Process from Point/Station        8.000 to Point/Station       11.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =   673.000(Ft.)
Downstream point/station elevation =   656.000(Ft.)
Pipe length  =   695.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    37.617(CFS)
Given pipe size =     36.00(In.)
Calculated individual pipe flow  =    37.617(CFS)
Normal flow depth in pipe =   14.95(In.)
Flow top width inside pipe =   35.48(In.)
Critical Depth =   23.93(In.)
Pipe flow velocity =     13.56(Ft/s)
Travel time through pipe =    0.85 min.
Time of concentration (TC) =    15.22 min.


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Process from Point/Station        8.000 to Point/Station       11.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     13.340(Ac.)
Runoff from this stream =     37.617(CFS)
Time of concentration =   15.22 min.
Rainfall intensity =     3.211(In/Hr)
Area averaged loss rate (Fm) =    0.1912(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
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Program is now starting with Main Stream No. 2


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Process from Point/Station        9.000 to Point/Station       11.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Initial subarea data:
Initial area flow distance =   805.000(Ft.)
Top (of initial area) elevation =   688.000(Ft.)
Bottom (of initial area) elevation =   684.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00497  s(%)=       0.50
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   13.602 min.
Rainfall intensity =      3.435(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.849
Subarea runoff =     17.727(CFS)
Total initial stream area =        6.080(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.196(In/Hr)


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Process from Point/Station        9.000 to Point/Station       11.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      6.080(Ac.)
Runoff from this stream =     17.727(CFS)
Time of concentration =   13.60 min.
Rainfall intensity =     3.435(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       10.000 to Point/Station       11.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Initial subarea data:
Initial area flow distance =   805.000(Ft.)
Top (of initial area) elevation =   690.000(Ft.)
Bottom (of initial area) elevation =   684.000(Ft.)
Difference in elevation =     6.000(Ft.)
Slope =    0.00745  s(%)=       0.75
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.543 min.
Rainfall intensity =      3.606(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.851
Subarea runoff =     21.550(CFS)
Total initial stream area =        7.020(Ac.)
Pervious area fraction = 0.200
```

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Initial area Fm value =    0.196(In/Hr)


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Process from Point/Station       10.000 to Point/Station       11.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      7.020(Ac.)
Runoff from this stream =     21.550(CFS)
Time of concentration =   12.54 min.
Rainfall intensity =     3.606(In/Hr)
Area averaged loss rate (Fm) =    0.1956(In/Hr)
Area averaged Pervious ratio (Ap) = 0.2000
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     37.62    13.340     15.22    0.191      3.211
2     17.73     6.080     13.60    0.196      3.435
3     21.55     7.020     12.54    0.196      3.606
Qmax(1) =
           1.000 *    1.000 *    37.617) +
           0.931 *    1.000 *    17.727) +
           0.884 *    1.000 *    21.550) + =      73.171
Qmax(2) =
           1.074 *    0.894 *    37.617) +
           1.000 *    1.000 *    17.727) +
           0.950 *    1.000 *    21.550) + =      74.306
Qmax(3) =
           1.131 *    0.824 *    37.617) +
           1.053 *    0.922 *    17.727) +
           1.000 *    1.000 *    21.550) + =      73.817

Total of 3 main streams to confluence:
Flow rates before confluence point:
      38.617      18.727      22.550
Maximum flow rates at confluence using above data:
       73.171       74.306       73.817
Area of streams before confluence:
       13.340        6.080        7.020
Effective area values after confluence:
       26.440       25.022       23.620


Results of confluence:
Total flow rate =     74.306(CFS)
Time of concentration =    13.602 min.
Effective stream area after confluence  =     25.022(Ac.)
Study area average Pervious fraction(Ap) =  0.200
Study area average soil loss rate(Fm) =    0.193(In/Hr)
Study area total =      26.44(Ac.)


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Process from Point/Station       12.000 to Point/Station       13.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 0.280
Decimal fraction soil group B = 0.720
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 49.28
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.695(In/Hr)
Initial subarea data:
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Initial area flow distance =   786.000(Ft.)
Top (of initial area) elevation =   684.000(Ft.)
Bottom (of initial area) elevation =   677.000(Ft.)
Difference in elevation =     7.000(Ft.)
Slope =    0.00891  s(%)=       0.89
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   17.872 min.
Rainfall intensity =      2.916(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.685
Subarea runoff =     13.331(CFS)
Total initial stream area =        6.670(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.695(In/Hr)


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Process from Point/Station       13.000 to Point/Station       15.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   677.000(Ft.)
End of street segment elevation =   673.000(Ft.)
Length of street segment  =   652.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     15.357(CFS)
Depth of flow =   0.498(Ft.), Average velocity =   2.442(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  17.299(Ft.)
Flow velocity =   2.44(Ft/s)
Travel time =    4.45 min.     TC =   22.32  min.
 Adding area flow to street
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Rainfall intensity =      2.552(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.637
Subarea runoff =      3.916(CFS) for    3.940(Ac.)
Total runoff =     17.247(CFS)
Effective area this stream =       10.61(Ac.)
Total Study Area (Main Stream No. 1) =       67.05(Ac.)
Area averaged Fm value =    0.746(In/Hr)
Street flow at end of street =     17.247(CFS)
Half street flow at end of street =      8.623(CFS)
Depth of flow =   0.513(Ft.), Average velocity =   2.518(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station       13.000 to Point/Station       15.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
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In Main Stream number: 1
Stream flow area =     10.610(Ac.)
Runoff from this stream =     17.247(CFS)
Time of concentration =   22.32 min.
Rainfall intensity =     2.552(In/Hr)
Area averaged loss rate (Fm) =    0.7458(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       14.000 to Point/Station       15.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Initial subarea data:
Initial area flow distance =   691.000(Ft.)
Top (of initial area) elevation =   689.000(Ft.)
Bottom (of initial area) elevation =   673.000(Ft.)
Difference in elevation =    16.000(Ft.)
Slope =    0.02315  s(%)=       2.32
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.022 min.
Rainfall intensity =      3.373(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.678
Subarea runoff =      6.863(CFS)
Total initial stream area =        3.000(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.831(In/Hr)


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Process from Point/Station       14.000 to Point/Station       15.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.000(Ac.)
Runoff from this stream =      6.863(CFS)
Time of concentration =   14.02 min.
Rainfall intensity =     3.373(In/Hr)
Area averaged loss rate (Fm) =    0.8311(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     17.25    10.610     22.32    0.746      2.552
2      6.86     3.000     14.02    0.831      3.373
Qmax(1) =
           1.000 *    1.000 *    17.247) +
           0.677 *    1.000 *     6.863) + =      21.893
Qmax(2) =
           1.455 *    0.628 *    17.247) +
           1.000 *    1.000 *     6.863) + =      22.622

Total of 2 main streams to confluence:
Flow rates before confluence point:
      18.247       7.863
Maximum flow rates at confluence using above data:
       21.893       22.622
```

```
Area of streams before confluence:
       10.610        3.000
Effective area values after confluence:
       13.610        9.665


Results of confluence:
Total flow rate =     22.622(CFS)
Time of concentration =    14.022 min.
Effective stream area after confluence  =      9.665(Ac.)
Study area average Pervious fraction(Ap) =  0.850
Study area average soil loss rate(Fm) =    0.765(In/Hr)
Study area total =      13.61(Ac.)
End of computations, Total Study Area =           70.05 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.333
Area averaged SCS curve number =  34.3
```

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 07/24/24

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PORTION OF MPD DA XII
PROPOSED DEV DA C
RATIONAL, 100 YEAR EVENT
FUSCOE ENGINEERING

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Program License Serial Number 6049

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********* Hydrology Study Control Information **********

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Rational hydrology study storm event year is 100.0
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 1.410 (In.)
Slope used for rainfall intensity curve b = 0.6000
Soil antecedent moisture condition (AMC) = 2

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Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

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APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2) = 32.00
Pervious ratio(Ap) = 0.2000 Max loss rate(Fm)= 0.196(In/Hr)
Initial subarea data:
Initial area flow distance = 974.000(Ft.)
Top (of initial area) elevation = 700.000(Ft.)
Bottom (of initial area) elevation = 693.000(Ft.)
Difference in elevation = 7.000(Ft.)
Slope = 0.00719 s(%)= 0.72
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.635 min.
Rainfall intensity = 3.430(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.849
Subarea runoff = 29.111(CFS)
Total initial stream area = 10.000(Ac.)
Pervious area fraction = 0.200
Initial area Fm value = 0.196(In/Hr)

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Process from Point/Station 2.000 to Point/Station 3.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

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Top of street segment elevation = 693.000(Ft.)
End of street segment elevation = 689.000(Ft.)
Length of street segment = 607.000(Ft.)
Height of curb above gutter flowline = 8.0(In.)
Width of half street (curb to crown) = 32.000(Ft.)
Distance from crown to crossfall grade break = 30.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line = 12.000(Ft.)

```
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     48.156(CFS)
Depth of flow =   0.689(Ft.), Average velocity =   3.256(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    1.14(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  26.891(Ft.)
Flow velocity =   3.26(Ft/s)
Travel time =    3.11 min.     TC =   16.74  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Rainfall intensity =      3.033(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.842
Subarea runoff =     37.939(CFS) for   16.260(Ac.)
Total runoff =     67.051(CFS)
Effective area this stream =       26.26(Ac.)
Total Study Area (Main Stream No. 1) =       26.26(Ac.)
Area averaged Fm value =    0.196(In/Hr)
Street flow at end of street =     67.051(CFS)
Half street flow at end of street =     33.525(CFS)
Depth of flow =   0.769(Ft.), Average velocity =   3.369(Ft/s)
Warning: depth of flow exceeds top of curb
Distance that curb overflow reaches into property =    5.13(Ft.)
Flow width (from curb towards crown)=  30.880(Ft.)


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Process from Point/Station        4.000 to Point/Station        5.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Initial subarea data:
Initial area flow distance =   933.000(Ft.)
Top (of initial area) elevation =   696.000(Ft.)
Bottom (of initial area) elevation =   691.000(Ft.)
Difference in elevation =     5.000(Ft.)
Slope =    0.00536  s(%)=       0.54
TC = k(0.324)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   14.213 min.
Rainfall intensity =      3.346(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.847
Subarea runoff =     28.352(CFS)
Total initial stream area =       10.000(Ac.)
Pervious area fraction = 0.200
Initial area Fm value =    0.196(In/Hr)


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Process from Point/Station        5.000 to Point/Station        6.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
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Top of street segment elevation =   691.000(Ft.)
End of street segment elevation =   689.000(Ft.)
Length of street segment  =   288.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  32.000(Ft.)
Distance from crown to crossfall grade break  =  30.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     36.312(CFS)
Depth of flow =   0.625(Ft.), Average velocity =   3.158(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  23.658(Ft.)
Flow velocity =   3.16(Ft/s)
Travel time =    1.52 min.     TC =   15.73  min.
 Adding area flow to street
APARTMENT subarea type
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.2000     Max loss rate(Fm)=     0.196(In/Hr)
Rainfall intensity =      3.148(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.844
Subarea runoff =     15.730(CFS) for    6.590(Ac.)
Total runoff =     44.082(CFS)
Effective area this stream =       16.59(Ac.)
Total Study Area (Main Stream No. 1) =       42.85(Ac.)
Area averaged Fm value =    0.196(In/Hr)
Street flow at end of street =     44.082(CFS)
Half street flow at end of street =     22.041(CFS)
Depth of flow =   0.662(Ft.), Average velocity =   3.313(Ft/s)
Flow width (from curb towards crown)=  25.498(Ft.)


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Process from Point/Station        6.000 to Point/Station        7.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   689.000(Ft.)
End of street segment elevation =   687.000(Ft.)
Length of street segment  =   353.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  14.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     46.099(CFS)
Depth of flow =   0.681(Ft.), Average velocity =   3.577(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    0.71(Ft.)
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Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   3.58(Ft/s)
Travel time =    1.64 min.     TC =   17.38  min.
 Adding area flow to street
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Rainfall intensity =      2.966(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.808
Subarea runoff =      3.867(CFS) for    3.430(Ac.)
Total runoff =     47.949(CFS)
Effective area this stream =       20.02(Ac.)
Total Study Area (Main Stream No. 1) =       46.28(Ac.)
Area averaged Fm value =    0.304(In/Hr)
Street flow at end of street =     47.949(CFS)
Half street flow at end of street =     23.975(CFS)
Depth of flow =   0.693(Ft.), Average velocity =   3.588(Ft/s)
Warning: depth of flow exceeds top of curb
Note:  depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property =    1.34(Ft.)
Flow width (from curb towards crown)=  18.000(Ft.)


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Process from Point/Station        7.000 to Point/Station        9.000
**** PIPEFLOW TRAVEL TIME (User specified size) ****
______________________________________________________________________
Upstream point/station elevation =   675.000(Ft.)
Downstream point/station elevation =   666.750(Ft.)
Pipe length  =  1327.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    47.949(CFS)
Given pipe size =     42.00(In.)
Calculated individual pipe flow  =    47.949(CFS)
Normal flow depth in pipe =   23.55(In.)
Flow top width inside pipe =   41.69(In.)
Critical Depth =   25.95(In.)
Pipe flow velocity =      8.63(Ft/s)
Travel time through pipe =    2.56 min.
Time of concentration (TC) =    19.94 min.


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Process from Point/Station        7.000 to Point/Station        9.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     20.020(Ac.)
Runoff from this stream =     47.949(CFS)
Time of concentration =   19.94 min.
Rainfall intensity =     2.731(In/Hr)
Area averaged loss rate (Fm) =    0.3045(In/Hr)
Area averaged Pervious ratio (Ap) = 0.3114
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        6.000 to Point/Station        8.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
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Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Initial subarea data:
Initial area flow distance =   997.000(Ft.)
Top (of initial area) elevation =   689.000(Ft.)
Bottom (of initial area) elevation =   685.000(Ft.)
Difference in elevation =     4.000(Ft.)
Slope =    0.00401  s(%)=       0.40
TC = k(0.483)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   23.054 min.
Rainfall intensity =      2.503(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.601
Subarea runoff =     14.670(CFS)
Total initial stream area =        9.750(Ac.)
Pervious area fraction = 0.850
Initial area Fm value =    0.831(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station        9.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________
Top of street segment elevation =   685.000(Ft.)
End of street segment elevation =   683.000(Ft.)
Length of street segment  =   393.000(Ft.)
Height of curb above gutter flowline  =    8.0(In.)
Width of half street (curb to crown)  =  18.000(Ft.)
Distance from crown to crossfall grade break  =  16.000(Ft.)
Slope from gutter to grade break (v/hz) =   0.020
Slope from grade break to crown (v/hz)  =   0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line  =  12.000(Ft.)
Slope from curb to property line (v/hz) =   0.020
Gutter width =   2.000(Ft.)
Gutter hike from flowline =  2.300(In.)
 Manning's N in gutter =  0.0150
 Manning's N from gutter to grade break =  0.0150
 Manning's N from grade break to crown =  0.0150
Estimated mean flow rate at midpoint of street =     16.752(CFS)
Depth of flow =   0.521(Ft.), Average velocity =   2.353(Ft/s)
Note:  depth of flow exceeds top of street crown.
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width =  18.000(Ft.)
Flow velocity =   2.35(Ft/s)
Travel time =    2.78 min.     TC =   25.84  min.
 Adding area flow to street
PARK subarea
Decimal fraction soil group A = 1.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
SCS curve number for soil(AMC 2)  = 32.00
Pervious ratio(Ap) = 0.8500     Max loss rate(Fm)=     0.831(In/Hr)
Rainfall intensity =      2.337(In/Hr) for a   100.0 year storm
Effective runoff coefficient used for area,(total area with modified
rational method)(Q=KCIA) is C = 0.580
Subarea runoff =      4.025(CFS) for    4.040(Ac.)
Total runoff =     18.695(CFS)
Effective area this stream =       13.79(Ac.)
Total Study Area (Main Stream No. 2) =       60.07(Ac.)
Area averaged Fm value =    0.831(In/Hr)
Street flow at end of street =     18.695(CFS)
Half street flow at end of street =      9.348(CFS)
Depth of flow =   0.535(Ft.), Average velocity =   2.458(Ft/s)
Note:  depth of flow exceeds top of street crown.
Flow width (from curb towards crown)=  18.000(Ft.)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station        8.000 to Point/Station        9.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     13.790(Ac.)
Runoff from this stream =     18.695(CFS)
Time of concentration =   25.84 min.
Rainfall intensity =     2.337(In/Hr)
Area averaged loss rate (Fm) =    0.8311(In/Hr)
Area averaged Pervious ratio (Ap) = 0.8500
Summary of stream data:

Stream Flow rate    Area    TC     Fm       Rainfall Intensity
 No.    (CFS)   (Ac.)       (min) (In/Hr)     (In/Hr)


1     47.95    20.020     19.94    0.304      2.731
2     18.70    13.790     25.84    0.831      2.337
Qmax(1) =
           1.000 *    1.000 *    47.949) +
           1.261 *    0.772 *    18.695) + =      66.143
Qmax(2) =
           0.838 *    1.000 *    47.949) +
           1.000 *    1.000 *    18.695) + =      58.873

Total of 2 main streams to confluence:
Flow rates before confluence point:
      48.949      19.695
Maximum flow rates at confluence using above data:
       66.143       58.873
Area of streams before confluence:
       20.020       13.790
Effective area values after confluence:
       30.662       33.810


Results of confluence:
Total flow rate =     66.143(CFS)
Time of concentration =    19.939 min.
Effective stream area after confluence  =     30.662(Ac.)
Study area average Pervious fraction(Ap) =  0.531
Study area average soil loss rate(Fm) =    0.519(In/Hr)
Study area total =      33.81(Ac.)
End of computations, Total Study Area =           60.07 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.386
Area averaged SCS curve number =  32.0
```

# APPENDIX 2

# HYDROLOGY MAPS

# HYDROLOGY MAP POST- SPECIFIC PLAN

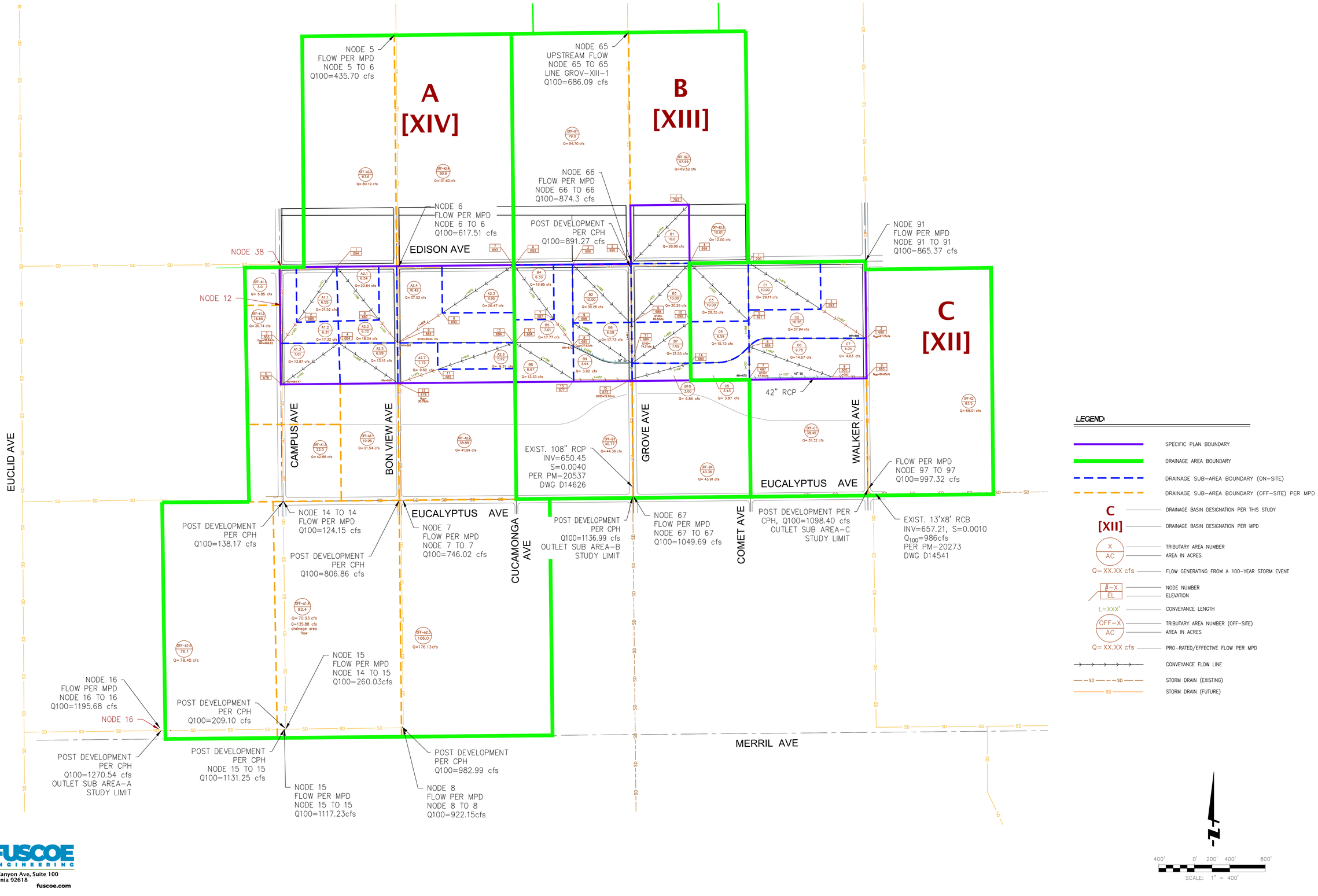



FUSCOE ENGINEERING
15535 Sand Canyon Ave, Suite 100
Irvine, California 92618
949.474.1960 fuscoe.com

## EXCERPT H: STORM DRAIN IMPROVEMENT PLANS FOR LINE C, PM-20273

# STORM DRAIN IMPROVEMENT PLAN
## FOR PM 20273
## EUCALYPTUS AVENUE, VINEYARD AVENUE AND BAKER AVENUE
## IN THE CITY OF ONTARIO

Recommended by HARRIS for APPROVAL by City
By: [signature] 02/06/2025
For Delta Rev#5 only

1/23/2025
Eng Dept
Harris PC#1
Revision#5
No further comments

## CITY OF ONTARIO GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE CURRENT CITY OF ONTARIO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS AND CURRENT STANDARD SPECIFICATIONS AND STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION AND CALTRANS PERMIT UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS/HER OPERATIONS, WHETHER OR NOT THE FACILITY IS SHOWN ON THESE PLANS.
3. ALL OBSTRUCTIONS WITHIN THE AREA TO BE IMPROVED SHALL BE REMOVED AND/OR RELOCATED AT THE DIRECTION OF THE CITY ENGINEER. UTILITIES ARE TO BE RELOCATED BY THEIR RESPECTIVE OWNERS UNLESS NOTED OTHERWISE. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
4. UTILITY LINE LOCATIONS WERE TAKEN FROM AVAILABLE RECORD DATA AND WERE NOT LOCATED IN THE FIELD, UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
5. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409(B) OF THE CALIFORNIA LABOR CODE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STATE DIVISION OF INDUSTRIAL SAFETY.
6. STATE LAW (SB 3019) REQUIRES THE CONTRACTOR TO CONTACT UNDERGROUND SERVICE ALERT AND OBTAIN AN IDENTIFICATION NUMBER PRIOR TO THE ISSUANCE OF CITY'S ENCROACHMENT PERMITS. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT AT 1-800-422-4133 A MINIMUM OF 48-HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.
7. PRIOR TO THE START OF ANY WORK THE CONTRACTOR SHALL OBTAIN A BUSINESS LICENSE FROM THE CITY OF ONTARIO. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE ENGINEERING DEPARTMENT NO LESS THAN 48 HOURS PRIOR TO START OF ANY CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
8. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT 48 HOURS PRIOR TO TIME OF CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR IS REFERRED TO SECTION 7-10.3 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
9. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH DURING HIS OPERATIONS HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED. RENEWAL OF TRAFFIC STRIPING AND MARKINGS SHALL BE DONE USING REFLECTIVE THERMO-PLASTIC MARKINGS IN CONFORMANCE WITH SECTION 84 & 85 OF THE CALTRANS STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER. ALL REGULATORY, WARNING, AND GUIDE SIGNS SHALL HAVE 3M DIAMOND, VIP GRADE SHEETING WITH SERIES 1160 PROTECTIVE OVERLAY FILM.
10. THE LAND SURVEYORS ACT, SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE, AND SECTIONS 732.5, 1492-5, 1810-5 OF THE STREETS AND HIGHWAY CODE REQUIRE THAT SURVEY MONUMENTS SHALL BE PROTECTED AND PERPETUATED.

    "IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR OTHERS PERFORMING THE CONSTRUCTION WORK TO RETAIN A QUALIFIED REGISTERED CIVIL ENGINEER AND/OR LICENSED LAND SURVEYOR PRIOR TO THE START OF CONSTRUCTION TO LOCATE, REFERENCE AND FILE THE NECESSARY CORNER RECORDS WITH THE COUNTY SURVEYOR'S OFFICE FOR SURVEY CONTROL POINTS/MONUMENTS THAT EXIST AS SHOWN ON RECORDED TRACT MAPS, PARCEL MAPS, RECORDS OF SURVEYS AND HIGHWAY MAPS, AND MAY BE DISTRIBUTED OR DAMAGED BY THE PROPOSED CONSTRUCTION"

    AFTER THE COMPLETION OF THE PROPOSED CONSTRUCTION, SAID MONUMENTS AND/OR CONTROL SURVEY POINTS SHALL BE RESET TO THE NEW SURFACE IN ACCORDANCE WITH THE CURRENT PROFESSIONAL LAND SURVEYING PRACTICES. CORNER RECORDS SHALL BE FILED WITH THE COUNTY SURVEYOR FOR ALL THE NEW MONUMENTS SET.
11. THE DEVELOPER SHALL PROVIDE THE CITY WITH A COMPLETED SET OF "AS BUILT", MYLAR DRAWINGS PRIOR TO THE FINAL INSPECTION.
12. A CITY ACCEPTED/APPROVED SET OF PLANS SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
13. A PRE-CONSTRUCTION MEETING SHALL OCCUR PRIOR TO CONSTRUCTION. ATTENDEES SHALL INCLUDE A CITY REPRESENTATIVE AND THE CONTRACTOR WHO WILL PERFORM THE WORK. "CUT-SHEETS" SHALL BE PROVIDED TO THE CITY AT THIS MEETING FOR ITS REVIEW.
14. CITY ACCEPTANCE OF PLANS DOES NOT RELIEVE THE DEVELOPER FROM RESPONSIBILITY FOR THE CORRECTION OF ERROR AND OMISSION DISCOVERED DURING CONSTRUCTION. UPON REQUEST OF THE CITY INSPECTOR, THE REQUIRED PLAN REVISIONS SHALL BE PROMPTLY SUBMITTED TO THE CITY ENGINEER FOR REVIEW.
15. ANY REQUIRED RIGHT-OF-WAY OR EASEMENT SHALL BE DEDICATED TO AND ACCEPTED BY THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE IMPROVEMENTS WITHIN THE REQUIRED RIGHT-OF-WAY OR EASEMENT.
16. WHERE UTILITIES NEED TO BE SUPPORTED, SAID SUPPORTS SHALL BE IN ACCORDANCE WITH A.P.W.A. STANDARD 224-1 UNLESS OTHERWISE INDICATED.
17. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING SEWER MAIN(S) AND NOTIFY THE DESIGN ENGINEER OF ANY VARIATION FROM DESIGN.
18. THE PIPE SHOWN HEREON SHALL BE INSTALLED IN ACCORDANCE WITH CASE III BEDDING AS SHOWN ON L.A.C.D.P.W. STANDARD 3080-2, UNLESS OTHERWISE SHOWN. "W" VALUE SHALL BE AS SPECIFIED ON L.A.C.D.P.W. STANDARD 3080-2 FOR CASE III BEDDING, NOTES 3 (A), 3 (B), AND 3 (C). IF THE "W" VALUE AT THE TOP OF THE PIPE IS EXCEEDED, THE BEDDING SHALL BE MODIFIED AND/OR PIPE OF ADDITIONAL STRENGTH SHALL BE PROVIDED. ALL PROPOSED MODIFICATIONS TO THIS REQUIREMENT SHALL BE APPROVED BY THE CITY ENGINEER.
19. MINIMUM COVER OF STORM DRAIN MAIN SHALL BE 7 FEET FROM THE FINISHED SURFACE PER STANDARD DRAWING 1302-1304.
20. STORM DRAIN MAIN STATIONING IS PER PIPE CENTERLINE.
21. STREET CENTERLINE STATIONING IS PER THE STREET IMPROVEMENT PLANS AND PROVIDED FOR REFERENCE.
22. CONTRACTOR SHALL NOT BACKFILL TRENCH UNTIL THE CITY INSPECTOR HAS OBTAINED AS-BUILT STATIONING ON ALL STRUCTURES.
23. UPON COMPLETION OF CONSTRUCTION OF ALL STORM DRAIN LINES AND PRIOR TO PAVING, THE DEVELOPER SHALL HIRE A CITY APPROVED VIDEO COMPANY TO VIDEO TAPE THE PIPELINES. CITY SHALL REVIEW SAID VIDEOTAPES FOR POTENTIAL CONSTRUCTION DEFECTS PRIOR TO ACCEPTANCE OF THE PROJECT.

## CIVIL ENGINEERS NOTICE TO CONTRACTOR

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTION AND ANY MEASURES TO PROTECT THE UTILITIES AND STRUCTURES SHOWN AND OTHER LINES OR STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO, THESE UTILITY LINES OR STRUCTURES.
2. THE CONTRACTOR AGREES THAT HE WILL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY AND NOT BE LIMITED TO A NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER, OR ANY PUBLIC AGENCY.
3. THE ESTIMATES OF IMPROVEMENT QUANTITIES AS SHOWN HEREON ARE PROVIDED ONLY FOR THE PURPOSE OF SATISFYING DISTRICT PLAN INFORMATION REQUIREMENTS. THE CONTRACTOR SHALL PERFORM AN INDEPENDENT ESTIMATE OF ALL IMPROVEMENT QUANTITIES AND SHALL USE SAME AS A BASIS FOR HIS BID(S) AND CONTRACT(S).
4. CONTRACTOR TO VERIFY CLEARANCE AT ALL UTILITY CROSSINGS. IF INTERFERENCE OCCURS, OTHER THAN NOTED ON PLAN, CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR POSSIBLE REDESIGN. IF REDESIGN IS NOT FEASIBLE, CONTRACTOR TO RELOCATE UTILITY AT NO EXPENSE TO ENGINEER.
5. CONTRACTOR SHALL TAKE EXTREME CARE DURING STORM DRAIN CONSTRUCTION AND IS RESPONSIBLE FOR TRENCHING AND SHORING. CONTRACTOR SHALL SUBMIT A DETAILED SHORING PLAN PER SECTION 7-10.4.2.2 OF SPPWC AND A PERMIT FROM STATE DIVISION OF INDUSTRIAL SAFETY PRIOR TO COMMENCING WORK. CONTRACTOR SHALL VERIFY PAVEMENT ELEVATION AT RIM PRIOR TO SETTING CONE.

811 Know what's below. Call 811 before you dig.

02/29/2024 OMUC UTILITIES ENGINEERING HAS NO FURTHER COMMENTS. RECOMMEND FOR APPROVAL
PC3 #9977 | PR: UC_KJG | QCR: JFK

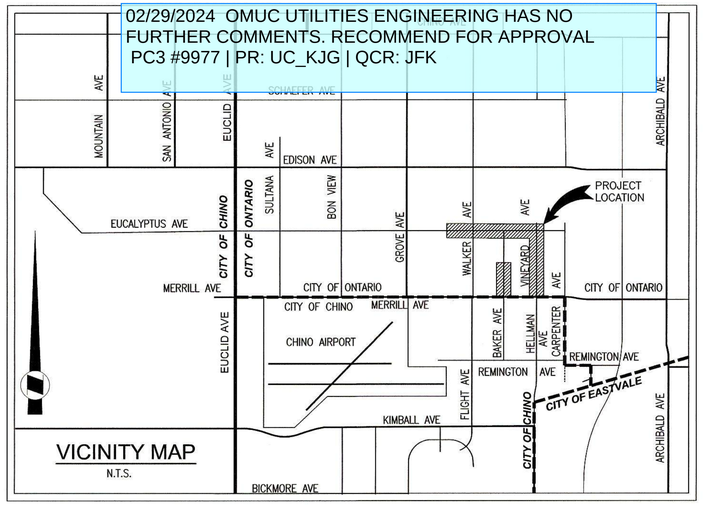


VICINITY MAP
N.T.S.

## INDEX OF DRAWINGS


| INDEX NO. | DESCRIPTION |
|---|---|
| SHEET 1 | TITLE SHEET |
| SHEET 2 | INDEX SYSTEM MAP |
| SHEET 3 | VINEYARD AVE – FROM MERRILL AVE TO 1000' N/O MERRILL AVE |
| SHEET 4 | VINEYARD AVE – FROM 1000' N/O MERRILL AVE TO 635' S/O EUCALYPTUS AVE |
| SHEET 5 | VINEYARD AVE – FROM 6353' S/O EUCALYPTUS AVE TO EUCALYPTUS AVE |
| SHEET 6 | EUCALYPTUS AVE – FROM EUCALYPTUS AVE TO 600' E/O VINEYARD AVE |
| SHEET 7–8 | VINEYARD AVE – LATERAL PROFILES & DETAILS |
| SHEET 9 | EUCALYPTUS AVE – FROM EUCALYPTUS AVE TO 920' W/O VINEYARD AVE |
| SHEET 10 | EUCALYPTUS AVE – FROM 920' W/O VINEYARD AVE TO 500' W/O BAKER AVE |
| SHEET 11 | EUCALYPTUS AVE – FROM 500' W/O BAKER AVE TO WALKER AVE |
| SHEET 12 | EUCALYPTUS AVE – FROM WALKER AVE TO 750' W/O WALKER AVE |
| SHEET 13 | EUCALYPTUS AVE – FROM 750' W/O WALKER AVE TO 950' W/O WALKER AVE |
| SHEET 14 | BAKER AVE – LATERAL PROFILES & DETAILS |
| SHEET 15 | BAKER AVE – MERRILL AVE TO 1056' N/O MERRILL AVE |
| SHEET 16 | BAKER AVE – 1056' N/O MERRILL AVE TO 1700' N/O MERRILL AVE |
| SHEET 17 | BAKER AVE – LATERAL PROFILES & DETAILS |
| SHEET 18 | VINEYARD AVE – LINE F PROFILE |
| SHEET 19–26 | DETAILS |


## REFERENCE DRAWINGS

| DESCRIPTION | REFERENCE | |
|---|---|---|
| PR 12" DOMESTIC WATER BAKER AVE | PM-20273 | DOMESTIC WATER IMPROVEMENT PLAN |
| PR 16" DOMESTIC WATER VINEYARD AVE | PM-20273 | DOMESTIC WATER IMPROVEMENT PLAN |
| PR 16" DOMESTIC WATER MERRILL AVE | PM-20273 | DOMESTIC WATER IMPROVEMENT PLAN |
| PR 16" RECYCLED WATER MERRILL AVE | PM-20273 | RECYCLED WATER IMPROVEMENT PLAN |
| PR 8" RECYCLED WATER VINEYARD AVE | PM-20273 | RECYCLED WATER IMPROVEMENT PLAN |
| PR DBLE 12'X12' RCB SD MERRILL AVE | PM-20273 | STORM DRAIN LINE A IMPROVEMENT PLAN |
| PR DBLE 9'X9' RCB SD MERRILL AVE | PM-20273 | STORM DRAIN LINE D IMPROVEMENT PLAN |

## CONSTRUCTION NOTES

| ITEM | DESCRIPTION | PUBLIC QUANTITY | | PRIVATE QUANTITY | |
|---|---|---|---|---|---|
| 1 | CONSTRUCT PRECAST 13'X8' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'X8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25 (IF CAST-IN-PLACE IS USED, BOTTOM OF RCB IS TO BE "SLOPED") | ~~5300~~ 5325 | LF | | |
| 2 | CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN | 5000 | LF | | |
| 3 | CONSTRUCT 10' DIA. CDS UNIT PER DETAIL, SHEET 19 | 1 | EA | | |
| 4 | CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN | ~~1950~~ 2020 | LF | | |
| 5 | CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT PER CITY STANDARD #3018 | 25 | EA | | |
| 6 | CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS. | 25 | EA | | |
| 7 | CONSTRUCT 36" STORM DRAIN MANHOLE WITHOUT REDUCER PER SPPWC STD. 326-2, PER DETAIL ON SHEET 20 | 13 | EA | | |
| 8 | CONSTRUCT CONNECTOR PIPE SCREEN ON 18" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED) PER CITY OF ONTARIO STANDARD #3017 | 10 | EA | | |
| 9 | INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19 | 10 | EA | | |
| 10 | CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21 | 26 ~~24~~ | EA | | |
| 11 | CONSTRUCT JUNCTION STRUCTURE NO. 1 CASE 1, PER CITY OF ONTARIO STD. DWG. NO. 3010 | 6 | EA | | |
| 12 | CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL 12 ON SHEET 24 | 4 ~~2~~ | EA | | |
| 13 | CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19 | 26 | EA | | |
| 14 | CONSTRUCT CONCRETE PIPE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 20 | 1 | EA | 2 | EA |
| 15 | CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009 | 18 | EA | | |
| ~~16~~ | ~~CONSTRUCT CONCRETE PROTECTION PER CITY OF ONTARIO STD. DWG. NO. 2102, L=150, CASE 1~~ | ~~150~~ | ~~LF~~ | | |
| 17 | CONSTRUCT 12" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2 (PRIVATELY MAINTAINED) | | | 676 | LF |
| 18 | CONSTRUCT 12" RCP 45° BEND (PRIVATELY MAINTAINED) | | | 1 | EA |
| 19 | REMOVE EXISTING CONCRETE BULKHEAD | 2 | EA | | |
| 20 | CONSTRUCT MANHOLE PIPE-TO-PIPE (LARGE SIDE INLET) PER SPPWC STD. PLAN NO. 322-3, PER DETAIL ON SHEET 22 & 23 | 4 | EA | | |
| 21 | CONSTRUCT PRECAST 13'X12' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'X8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25 (IF CAST-IN-PLACE IS USED, BOTTOM OF RCB IS TO BE "SLOPED") | 8 | LF | | |
| 22 | CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 20 | 18 | EA | | |
| 23 | CONSTRUCT MANHOLE PIPE-TO-PIPE (LARGE SIDE INLET) PER SPPWC STD. PLAN NO. 322-3, PER DETAIL ON SHEET 22 & 23 | 1 | EA | | |
| 24 | CONSTRUCT EDGE BEAM PER DETAIL ON SHEET 26 | 1 | EA | | |
| 25 | CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN | 960 | LF | | |

INSTALL CATCH BASIN CONNECTOR PIPE SCREEN PER CITY OF ONTARIO STANDARD #3017

02/05/25 **OMUC UTILITIES ENGINEERING HAS NO FURTHER COMMENTS. - REVISION 5**
PC1 | PR: UC_KJG | QCR:EW

2/27/2024
Eng Dept
Harris PC#3
Delta #4
No further comments

3 AT THE REQUEST OF THE CONTRACTOR, ADJUST INVERT OF LATERAL E-8 TO MATCH UP WITH ONSITE CONNECTION . THIS DELTA AFFECTS 3 SHEETS, 1, 14, AND 15

4 -AT THE REQUEST OF THE ENGINEER, ADJUST LATERALS C-12 AND C-13 TO NEW CATCH BASIN LOCATION.
-AT THE REQUEST OF THE ENGINEER, ADD TWO TEMPORARY 36" RISERS ON WALKER AVENUE, NORTH OF EUCALYPTUS AVENUE TO CATCH THE WATER FROM THE ADDED SWALES.
THIS DELTA AFFECTS 5 SHEETS, 1, 2, and 11-13

5 AT THE REQUEST OF THE ENGINEER, REMOVE CONCRETE PROTECTION CONSTRUCTION NOTE, ADD 1.5" SPECIAL COVER TO LATERAL B-4. THIS DELTA AFFECTS 2 SHEETS, 1, AND 6

1 AT THE REQUEST OF THE CONTRACTOR, THE 10' DIAMETER CDS UNIT ON VINEYARD AVENUE WAS SHIFTED INTO THE PARKWAY TO ACCOMODATE ONSITE WALL. THIS DELTA AFFECTS 4 SHEETS, 1, 4, 5, AND 18

2 AT THE REQUEST OF THE CONTRACTOR, ADJUST CONNECTION OF LATERAL B-8 & B-9 TO RCB, AND AT THE REQUEST OF THE ENGINEER, SHIFT CDS "C" FIVE FEET EAST TO AVOID CONFLICT WITH SCREEN WALL. THIS DELTA AF[illegible]

APPROVED Sep 01, 2023 BY [signature] 4

## OWNER/DEVELOPER:
PROLOGIS, L.P.
3546 CONCOURS STREET, SUITE 100
ONTARIO, CA 91764

CONTACT: SAM CHO, DEVELOPMENT MANAGER
PHONE: (909) 673-8700

## CIVIL ENGINEER
WESTLAND GROUP INC.
4150 CONCOURS STREET, SUITE 100
ONTARIO, CA 91764

CONTACT: SIARA MACKINNEY, PE, MS, QSD
PHONE: (909)-989-9789

## GEOTECHNICAL ENGINEER:
SOUTHERN CALIFORNIA GEOTECHNICAL
22885 EAST SAVI RANCH PARKWAY, SUITE E
YORBA LINDA, CA 92887

CONTACT: GREGORY K. MITCHELL
PHONE: (714) 685-1115

## STRUCTURAL ENGINEER:
RENDE CONSULTING GROUP INC.
22431 ANTONIO PARKWAY, SUITE B160-470
RANCHO SANTA MARGARITA, CA 92688

CONTACT: GREGORY L. RENDE
PHONE: (949)-713-6780

## UTILITY PURVEYORS:
CITY OF ONTARIO, MUNICIPAL UTILITIES AGENCY
DAYTIME PH: (909) 395-2678
24-HOUR EMERGENCY: (909) 986-6711

CITY OF ONTARIO, COMMUNITY & PUBLIC SERVICES AGENCY
DAYTIME PH: (909) 395-2633
24-HOUR EMERGENCY: (909) 986-6711

INLAND EMPIRE UTILITY AGENCY
DAYTIME PH: (909) 944-6000
24-HOUR EMERGENCY: (909) 987-2591

SOUTHERN CALIFORNIA GAS COMPANY
DAYTIME PH: (800) 423-1391
24-HOUR EMERGENCY: (800) 423-1391

TIME WARNER CABLE / WEST COAST COMMUNICATIONS
24-HOUR EMERGENCY: (888) 892-2253

VERIZON
24-HOUR EMERGENCY: (800) 483-2000

## BASIS OF BEARING
BEARINGS ARE BASED UPON THE CENTERLINE OF MERRILL AVENUE BETWEEN BAKER AVENUE AND VINEYARD AVENUE BEING N89°26'19"E AS SHOWN ON RECORD OF SURVEY 92/97 RECORDED AS INSTRUMENT NO. 1991-447293 OF OFFICIAL RECORDS OF THE COUNTY OF SAN BERNARDINO.

## LEGAL DESCRIPTION
PARCEL MAP NO. 20273
IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA BEING A SUBDIVISION OF LOTS 1 THROUGH 32, INCLUSIVE, OF SECTION 21, TOGETHER WITH LOTS 7 THROUGH 10, INCLUSIVE, AND LOTS 23 THROUGH 26, INCLUSIVE, OF SECTION 22, BOTH IN TOWNSHIP 2 SOUTH, RANGE 7 WEST, SAN BERNARDINO MERIDIAN, ACCORDING TO THE MAP OF SUBDIVISION OF PART OF RANCHO SANTA ANA DEL CHINO, RECORDED IN BOOK 6 OF MAPS, PAGE 15, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

## LEGEND OF ABBREVIATIONS & SYMBOLS

| | | | |
|---|---|---|---|
| BC | BEGIN CURVE | CMP | CORRUGATED METAL PIPE |
| CB | CATCH BASIN | ℄ OR P/L OR PL | PROPERTY LINE |
| C&G | CURB AND GUTTER | PROP | PROPOSED |
| ℄ OR C/L OR CL | CENTERLINE | RCB | REINFORCED CONCRETE BOX |
| CP | CONNECTOR PIPE | RCP | REINFORCED CONCRETE PIPE |
| EC | END CURVE | RW | RECYCLED WATER |
| EX, EXIST. | EXISTING | R/W, ROW | RIGHT OF WAY |
| FL | FLOWLINE | ST | STREET |
| FS | FINISH SURFACE | STA | STATION |
| FUT | FUTURE | TC | TOP OF CURB |
| GAS | GAS | TYP | TYPICAL |
| GB | GRADE BREAK | TSP | TEMPORARY STANDPIPE |
| INT | INTERSECTION | SD | STORM DRAIN |
| INV | INVERT | SPPWC | STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION |
| LP | LOW POINT | SS | SEWER |
| MH | MANHOLE | DW | DOMESTIC WATER |
| MWS | MODULAR WETLAND SYSTEM | WQ | WATER QUALITY |

(100) EXISTING CONTOURS
100 PROP. CONTOUR
EXIST. EASEMENT
2% SLOPE
CENTERLINE
FLOWLINE
FIRE HYDRANT
SIGN
STREET LIGHT
BOUNDARY LINE
FENCE LINE

RECOMMENDED FOR ACCEPTANCE
[signature] 1/23/2023
TECK, C. LOH, P.E. DATE
HARRIS AND ASSOCIATES

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |
| 1 | 6-16-23 | WLG | |
| 2 | 7-25-23 | WLG | |
| 3 | 10-17-23 | WLG | |
| 4 | 11-8-23 | WLG | |
| 5 | 12/18/24 | WLG | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**
RECOMMENDED BY: BRYAN CIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA RAE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**
**EUCALYPTUS AVE, VINEYARD AVE AND BAKER AVE**
**TITLE SHEET**

PM-20273

SHEET 1 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14531

01/11/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\01_2020-263_SD.dwg
Last Opened: Jan 11, 2023 - 4:10pm by: Brent.King

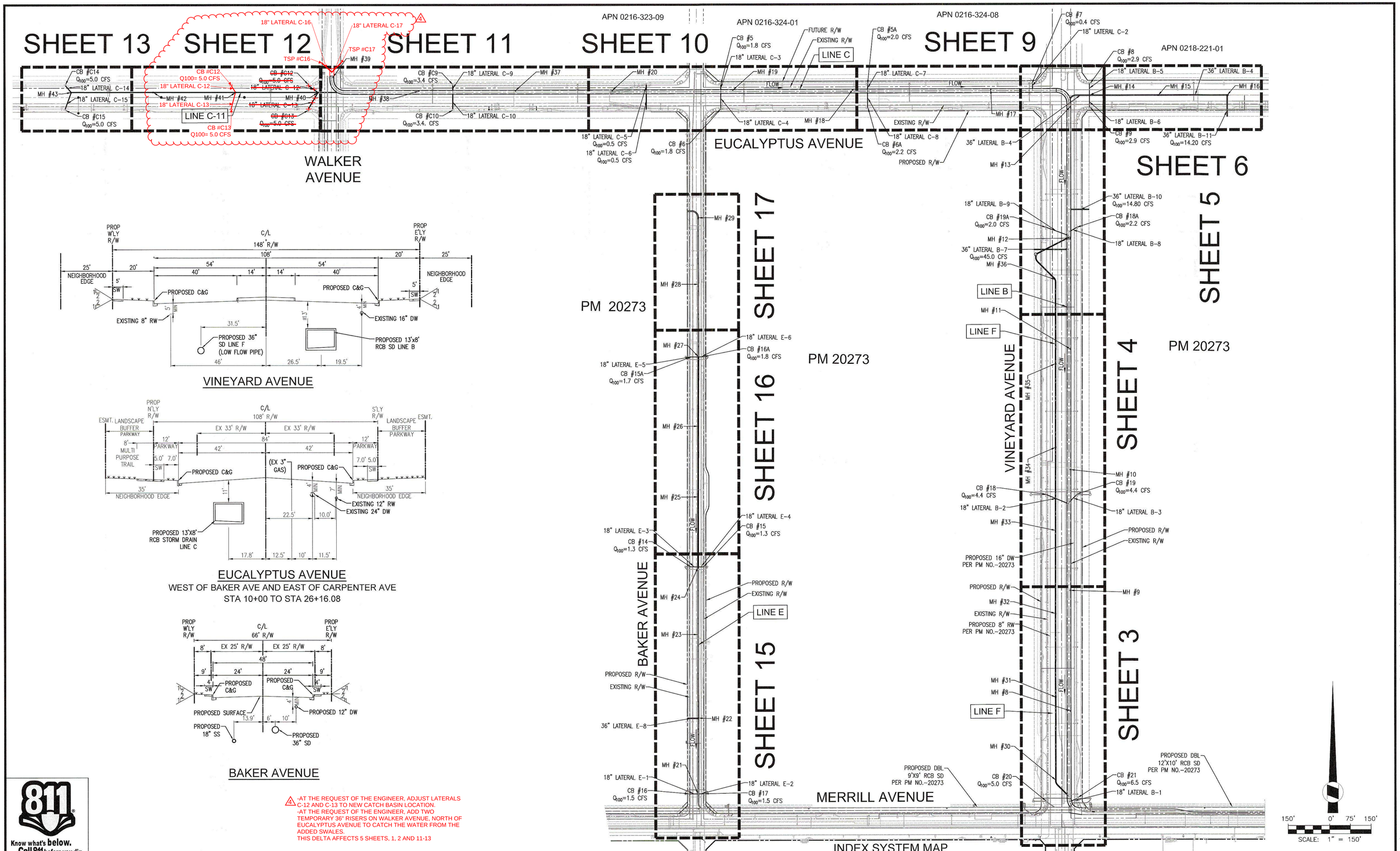





VINEYARD AVENUE




EUCALYPTUS AVENUE

WEST OF BAKER AVE AND EAST OF CARPENTER AVE

STA 10+00 TO STA 26+16.08




BAKER AVENUE

-AT THE REQUEST OF THE ENGINEER, ADJUST LATERALS C-12 AND C-13 TO NEW CATCH BASIN LOCATION.
-AT THE REQUEST OF THE ENGINEER, ADD TWO TEMPORARY 36" RISERS ON WALKER AVENUE, NORTH OF EUCALYPTUS AVENUE TO CATCH THE WATER FROM THE ADDED SWALES.
THIS DELTA AFFECTS 5 SHEETS, 1, 2 AND 11-13

811 Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |
| 1 | 11-8-23 | WLG | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**

**INDEX SYSTEM MAP**

PM-20273

SHEET 2 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14532

01/09/2023

Drawing Name: P:\Year 2022\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donohue\06 Engineering\Sheets\OFF-SITE\Storm Drain\02_2020-263_SD-1ISM.dwg
Last Opened: Jan 09, 2023 - 3:21pm by: Brent.King

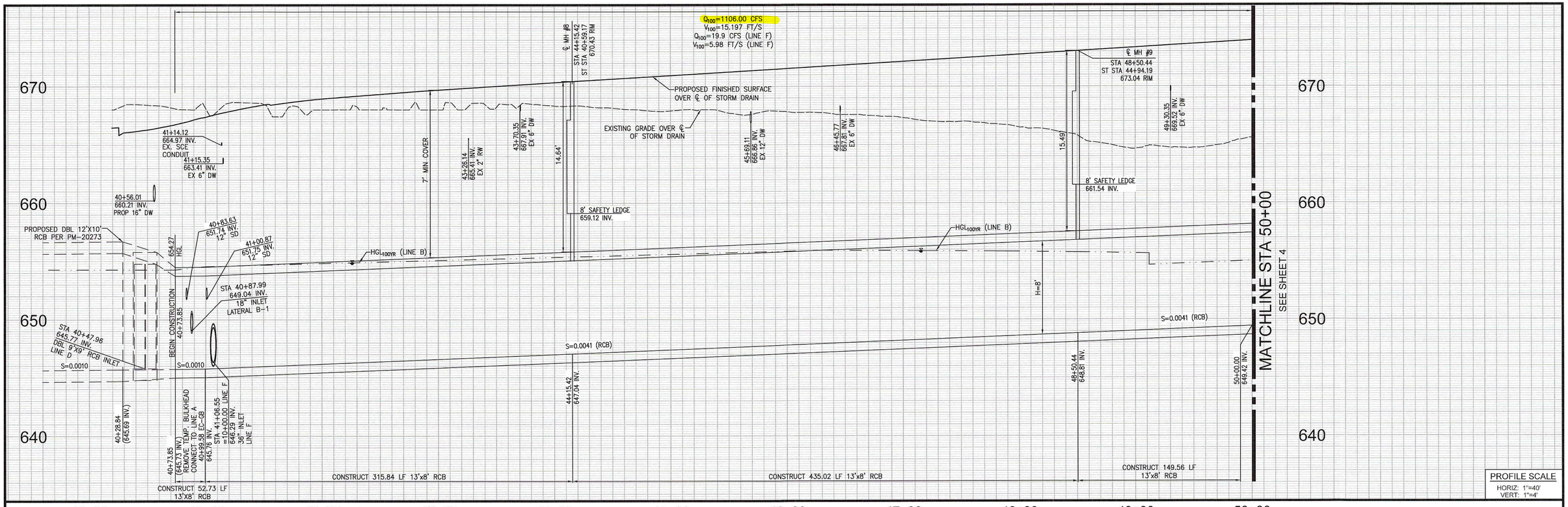


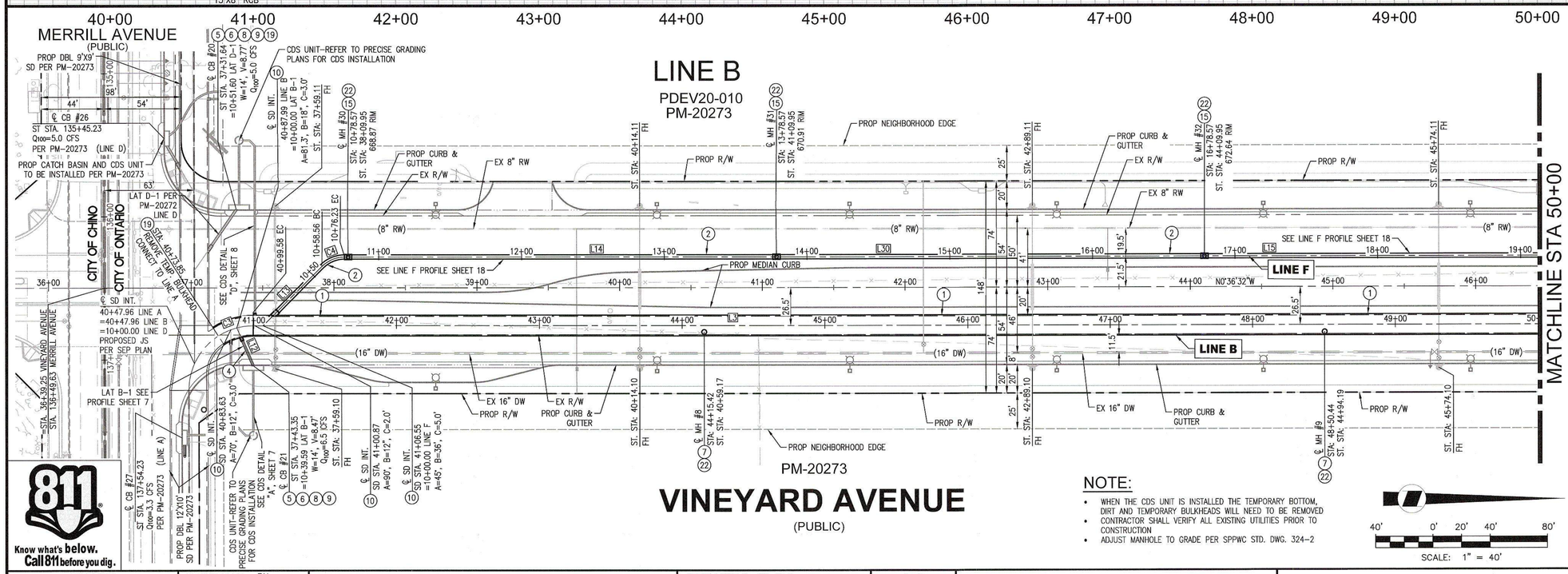


## CONSTRUCTION NOTES

1. CONSTRUCT PRECAST 13'X8' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'X8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25 (IF CAST-IN-PLACE IS USED, BOTTOM OF RCB IS TO BE "SLOPED")
2. CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT 36" STORM DRAIN MANHOLE WITHOUT REDUCER PER SPPWC STD. 326-2, PER DETAIL ON SHEET 20
8. CONSTRUCT CONNECTOR PIPE SCREEN ON 12" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED)
9. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
15. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009
19. REMOVE EXISTING CONCRETE BULKHEAD
22. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 20

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
|---|---|---|---|
| C3 | 032°45'39" | 25.73' | 45.00 |
| C4 | 045°00'00" | 17.67' | 22.50 |
| L3 | N0°36'32"W | 2016.84' | |
| L12 | N65°57'51"E | 19.31' | |
| L13 | N45°36'32"W | 44.37' | |
| L14 | N0°36'32"W | 295.33' | |
| L15 | N0°36'32"W | 295.33' | |
| L30 | N0°36'32"W | 295.33' | |

## NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRIAN CURLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1," SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER — SIARA ROSE MACKINNEY — No.85559 Exp. 9/30/2022 — CIVIL — STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
VINEYARD AVENUE
FROM MERRILL AVE TO 1000 NORTH OF MERRILL AVE

PM-20273

SHEET 3 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14533

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\03-6_2020-263_SD_VINEYARD.dwg
Last Opened: Jan 09, 2023 - 10:50am by: Brent.King

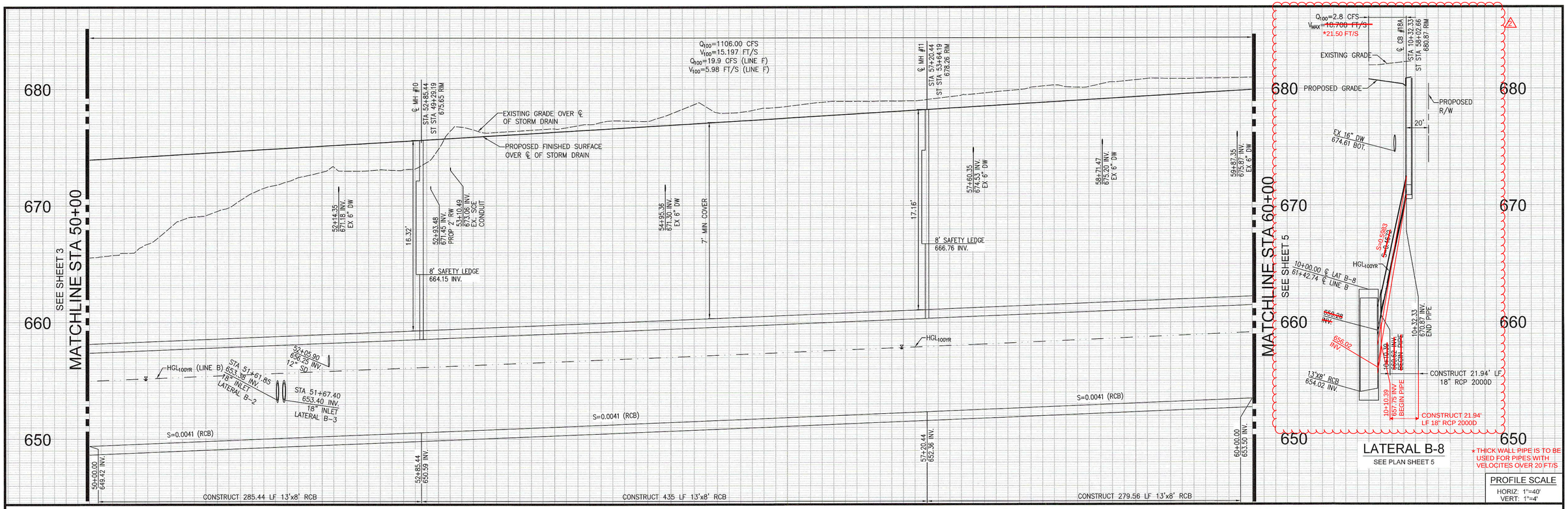


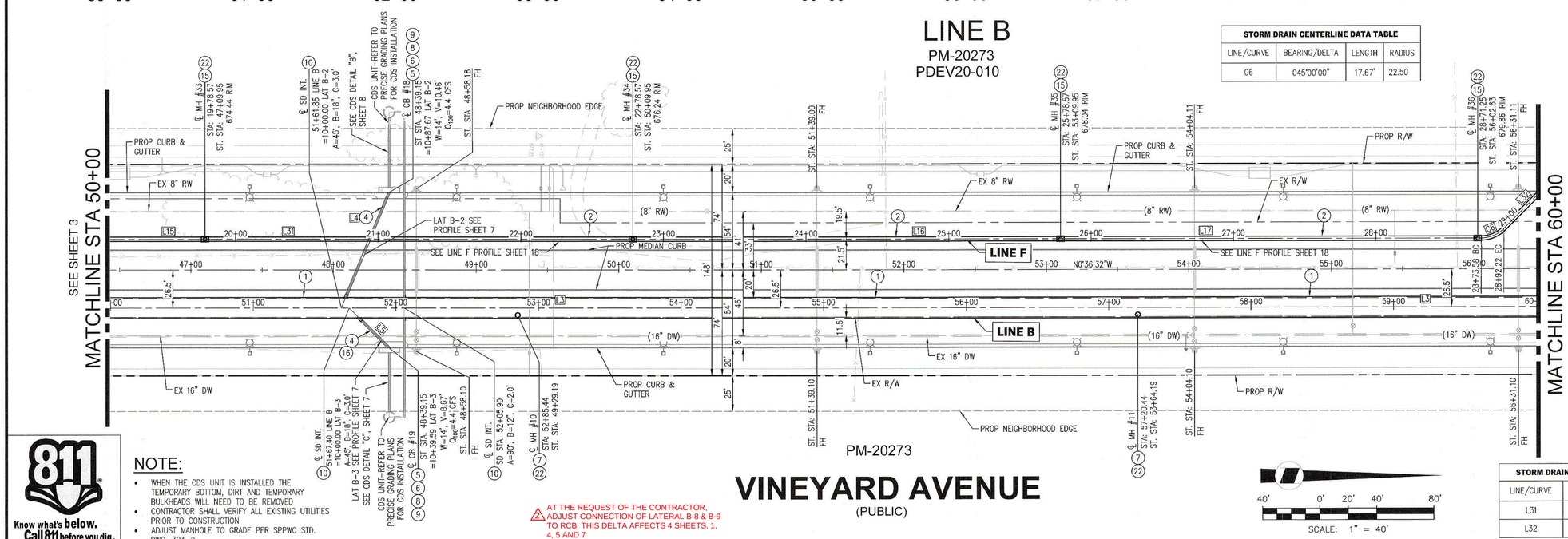


**STORM DRAIN CENTERLINE DATA TABLE**

| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
|---|---|---|---|
| C6 | 045°00'00" | 17.67' | 22.50 |

## CONSTRUCTION NOTES

1. CONSTRUCT PRECAST 13'X8' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'X8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25 (IF CAST-IN-PLACE IS USED, BOTTOM OF RCB IS TO BE "SLOPED")
2. CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT 36" STORM DRAIN MANHOLE WITHOUT REDUCER PER SPPWC STD. 326-2, PER DETAIL ON SHEET 20
8. CONSTRUCT CONNECTOR PIPE SCREEN ON 12" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED)
9. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
15. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009
16. CONSTRUCT CONCRETE PROTECTION PER CITY OF ONTARIO STD. DWG. NO. 2102, L=150, CASE 1
22. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 20

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE/CURVE | BEARING/DELTA | LENGTH |
|---|---|---|
| L3 | N0°36'32"W | 2016.84' |
| L4 | N68°06'32"W | 77.64' |
| L5 | N44°23'28"E | 27.40' |
| L15 | N0°36'32"W | 295.33' |
| L16 | N0°36'32"W | 295.33' |
| L17 | N0°36'32"W | 288.01' |

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE/CURVE | BEARING/DELTA | LENGTH |
|---|---|---|
| L31 | N0°36'32"W | 295.33' |
| L32 | N45°36'32"W | 82.48' |

811 Know what's below. Call 811 before you dig.

## NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |
| 2 | 7-25-23 | WLG | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN ARNEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA REBE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
VINEYARD AVENUE
FROM 1000' NORTH OF MERRILL AVE TO 635' SOUTH OF EUCALYPTUS AVE

PM-20273

SHEET 4 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14531

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\03-6_2020-263_SD_VINEYARD.dwg
Last Opened: Jan 09, 2023 - 10:51am By: Brent.King

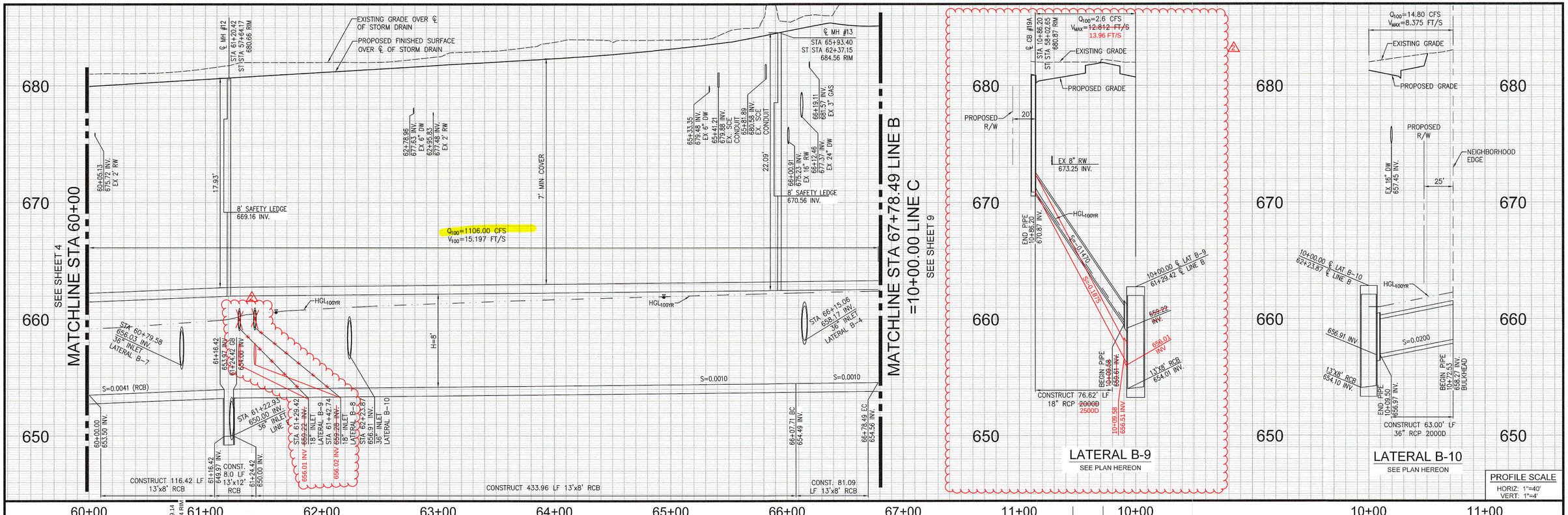


## LOW FLOW TRANSITION STRUCTURE DETAIL

N.T.S.

| STORM DRAIN CENTERLINE DATA TABLE | | | |
|---|---|---|---|
| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
| C1 | 090°07'13" | 70.78' | 45.00 |
| C5 | 045°00'00" | ~~47.67'~~ | ~~22.50'~~ 35.34 - 45.00 |
| L11 | N89°21'57"E | 114.21' | |
| L19 | ~~N62°23'28"E~~ | ~~417.02'~~ | N54°47'14"E - 90.32' |
| L22 | N59°23'28"E | 21.94' | |
| L26 | N89°23'28"E | 63.00' | |
| L27 | N70°36'32"W | 76.62' | |
| L28 | N0°36'32"W | 8.00' | |
| L29 | N0°36'32"W | 483.29' | |
| L32 | N45°36'32"W | ~~62.40'~~ | 28.96 |
| L35 | N0°36'32"W | ~~5.68'~~ | 27.61 |

## CONSTRUCTION NOTES

1. CONSTRUCT PRECAST 13'X8' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'X8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25 (IF CAST-IN-PLACE IS USED, BOTTOM OF RCB IS TO BE "SLOPED")
2. CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
3. CONSTRUCT 10' DIA. CDS UNIT PER DETAIL, SHEET 19
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT 36" STORM DRAIN MANHOLE WITHOUT REDUCER PER SPPWC STD. 326-2, PER DETAIL ON SHEET 20
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
13. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19
21. CONSTRUCT PRECAST 13'X12' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'X8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25
22. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 20
24. CONSTRUCT EDGE BEAM PER DETAIL ON SHEET 26

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

## NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2
- CDS IS IS LOCATED IN THE STREET/CITY RIGHT OF WAY AND WILL BE MAINTAINED BY THE CITY OF ONTARIO

1 AT THE REQUEST OF THE CONTRACTOR, THE 10' DIAMETER CDS UNIT ON VINEYARD AVENUE WAS SHIFTED INTO THE PARKWAY TO ACCOMODATE ONSITE WALL. THIS DELTA AFFECTS 4 SHEETS, 1, 4, 5, AND 18

2 AT THE REQUEST OF THE CONTRACTOR, ADJUST CONNECTION OF LATERAL B-8 & B-9 TO RCB, THIS DELTA AFFECTS 4 SHEETS, 1, 4, 5 AND 7

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |
| 1 | 6-16-23 | WLG | |
| 2 | 7-25-23 | WLG | |

DESIGNED BY: BK DATE: 2/2/2022
DRAWN BY: BK DATE: 2/2/2022
CHECKED BY: DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2023 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

# STORM DRAIN IMPROVEMENT PLAN & PROFILE

VINEYARD AVENUE

FROM 635' SOUTH OF EUCALYPTUS TO EUCALYPTUS AVE

PM-20273

SHEET 5 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14535

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm
Drain\03-6_2020-263_SD_VINEYARD.dwg
Last Opened: Jan 09, 2023 - 1:09pm by: Brent.King

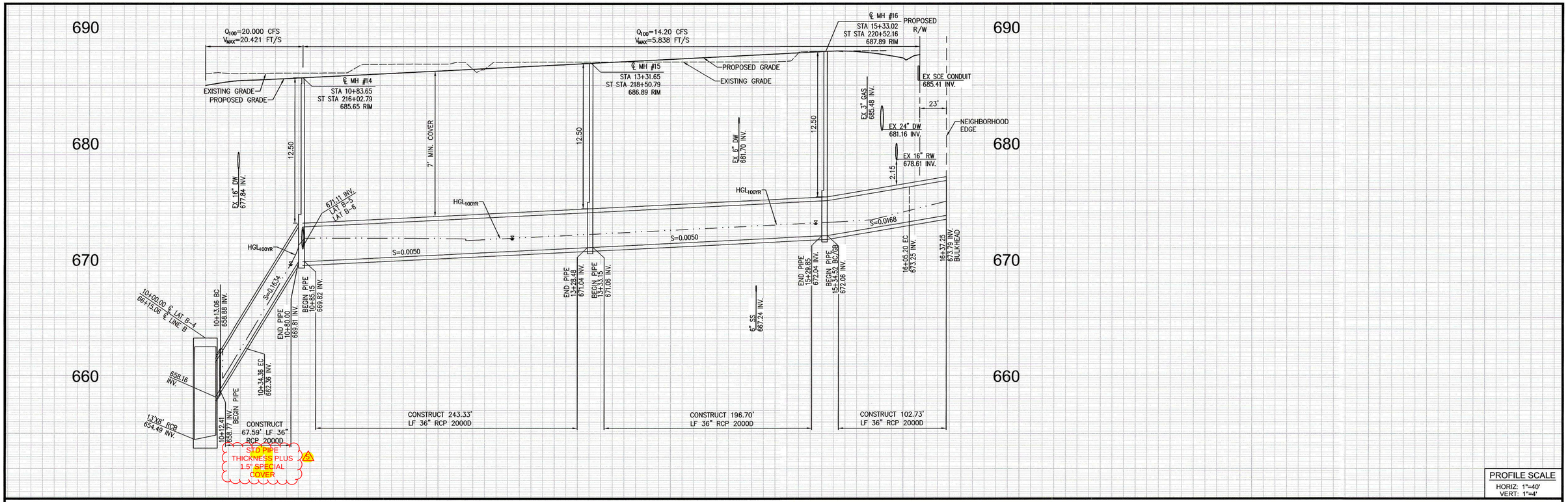


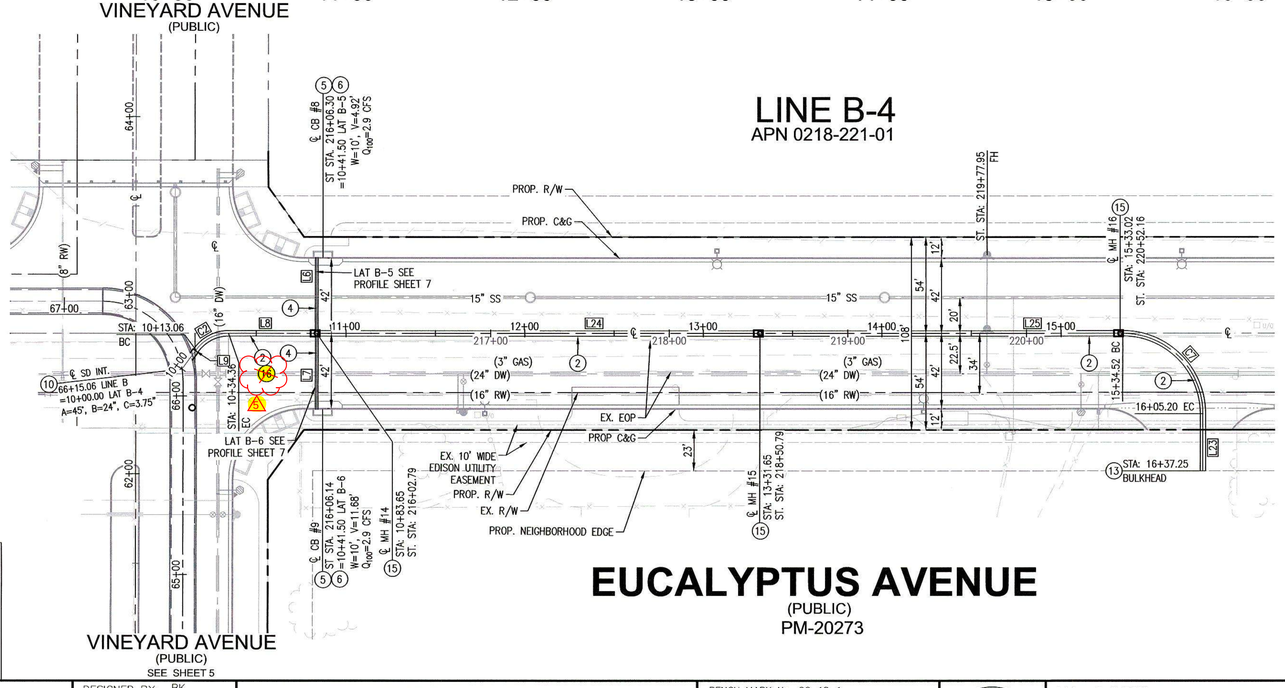


| STORM DRAIN CENTERLINE DATA TABLE | | |
|---|---|---|
| LINE/CURVE | BEARING/DELTA | LENGTH |
| L6 | N0°39'46"W | 41.49' |
| L7 | N0°40'03"W | 41.50' |
| L8 | N89°20'14"E | 47.09' |
| L9 | N35°06'55"E | 0.65' |
| L23 | S0°40'03"E | 32.04' |
| L24 | S89°19'58"W | 243.33' |
| L25 | N89°19'58"E | 196.70' |

| STORM DRAIN CENTERLINE DATA TABLE | | | |
|---|---|---|---|
| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
| C2 | 054°13'19" | 21.29' | 22.50 |
| C7 | 090°00'00" | 70.69' | 45.00 |

## CONSTRUCTION NOTES

(2) CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(4) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.

(10) CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21

(11) CONSTRUCT JUNCTION STRUCTURE NO. 1 CASE 1, PER CITY OF ONTARIO STD. DWG. NO. 3010

(13) CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19

(15) CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009

(16) ~~CONSTRUCT CONCRETE PROTECTION PER CITY OF ONTARIO STD. DWG. NO. 2102, L=150, CASE 1~~

(5) AT THE REQUEST OF THE ENGINEER, REMOVE CONCRETE PROTECTION CONSTRUCTION NOTE, ADD 1.5" SPECIAL COVER TO LATERAL B-4. THIS DELTA AFFECTS 2 SHEETS, 1, AND 6

## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |
| 5 | 12/18/24 | WLG | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF EOR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SHAR REZE MOHAMMADI — No.85559 Exp. 9/30/2024 — CIVIL — STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
VINEYARD AVENUE
FROM EUCALYPTUS AVE TO 600' E/O VINEYARD AVE

PM-20273

SHEET 6 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14536

01/11/2023

Drawing Name: P:\Year_2020\2020-283 Merrill Commerce Center Phase I - Prologis - Tom Donohue\06 Engineering\Sheets\OFF-SITE\Storm
Drain\03-6_2020-283_SD_VINEYARD.dwg
Last Opened: Jan 11, 2023 - 4:07pm by: BrentKing

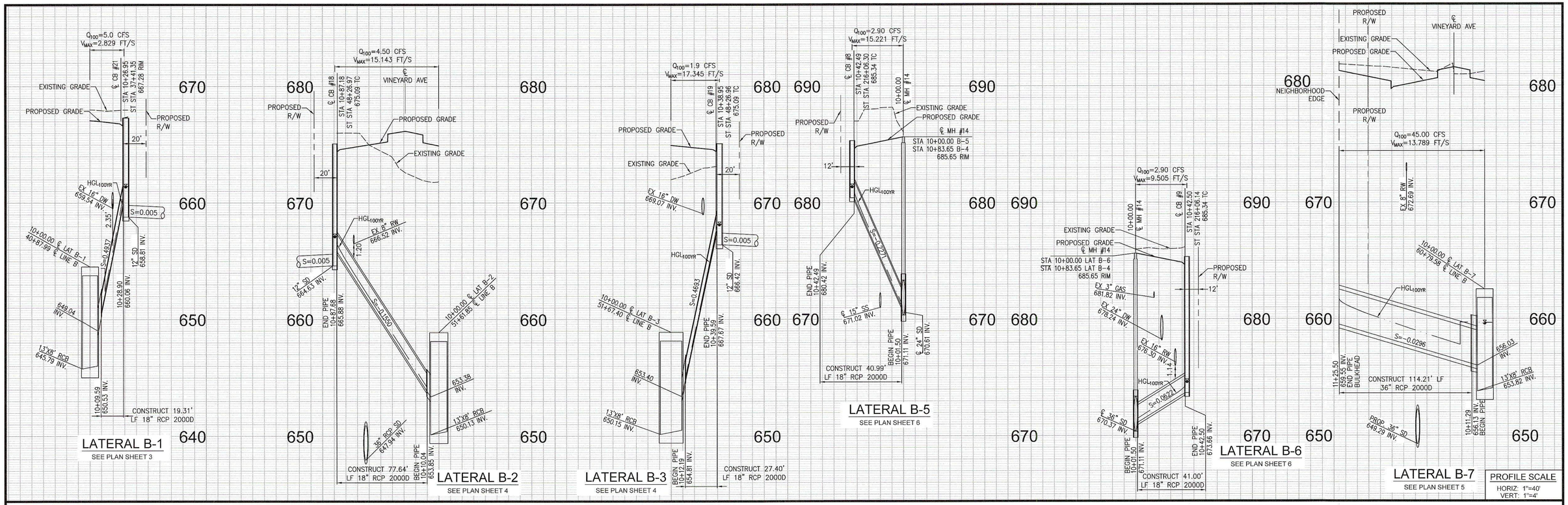


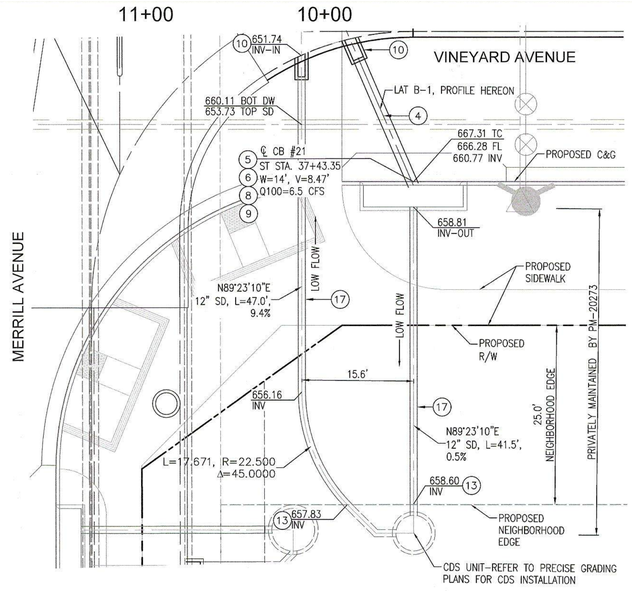


## CDS DETAIL "A"
## (PRIVATELY MAINTAINED)

SCALE: 1"=10'
SEE SHEET 3

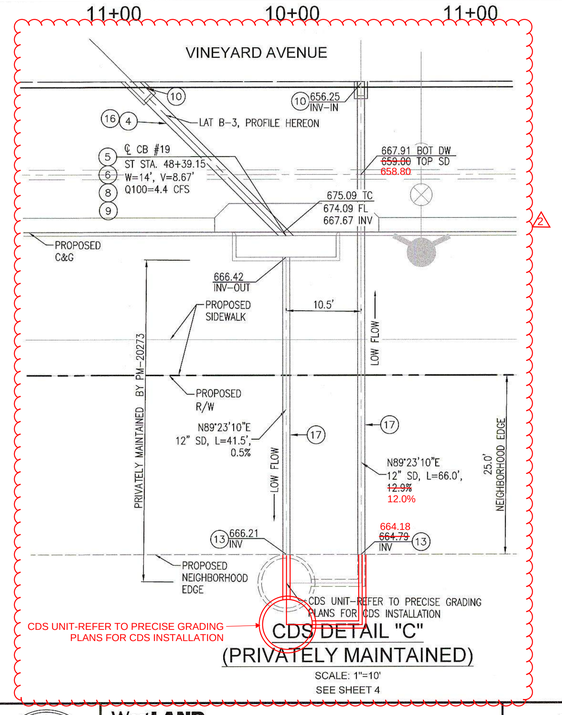


## CDS DETAIL "C"
## (PRIVATELY MAINTAINED)

SCALE: 1"=10'
SEE SHEET 4

## CONSTRUCTION NOTES

4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
8. CONSTRUCT CONNECTOR PIPE SCREEN ON 12" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED)
9. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
13. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19
16. CONSTRUCT CONCRETE PROTECTION PER CITY OF ONTARIO STD. DWG. NO. 2102, L=150, CASE 1
17. CONSTRUCT 12" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2 (PRIVATELY MAINTAINED)

## NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

2 AT THE REQUEST OF THE ENGINEER, SHIFT CDS "C" FIVE FEET EAST TO AVOID CONFLICT WITH SCREEN WALL, THIS DELTA AFFECTS 4 SHEETS, 1, 4, 5 AND 7

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |
| 2 | 7-25-23 | WLG | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF EOR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SIARA REE MACKINNEY — No.85559 Exp. 9/30/2022 — CIVIL — STATE OF CALIFORNIA


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-8789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23


**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
VINEYARD AVENUE

LATERAL PROFILES AND DETAILS

PM-20273

SHEET 7 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14637

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donohue\06 Engineering\Sheets\OFF-SITE\Storm Drain\03-6_2020-263_SD_VINEYARD.dwg
Last Opened: Jan 09, 2023 - 10:56am by: Brent.King

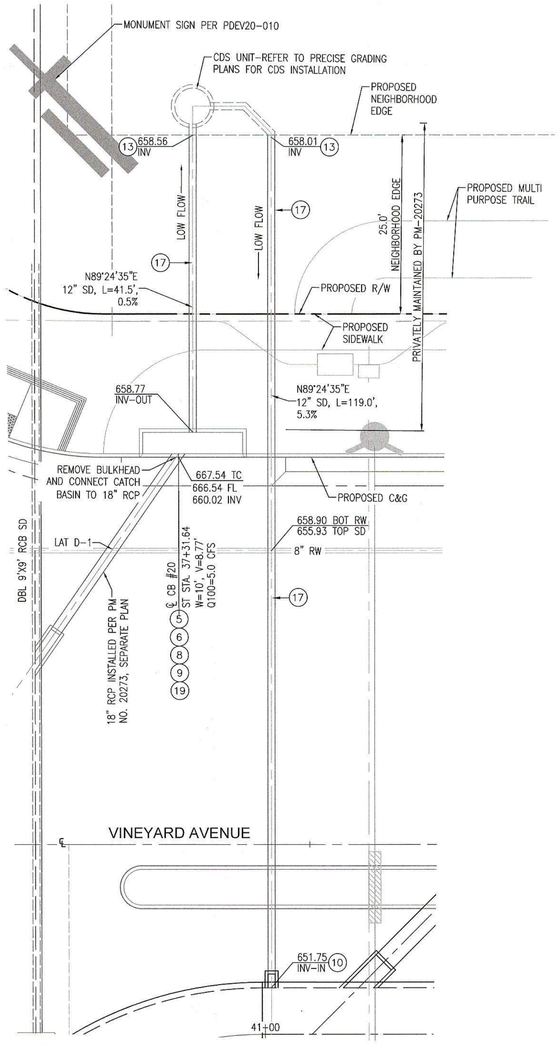


CDS DETAIL "D"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 3

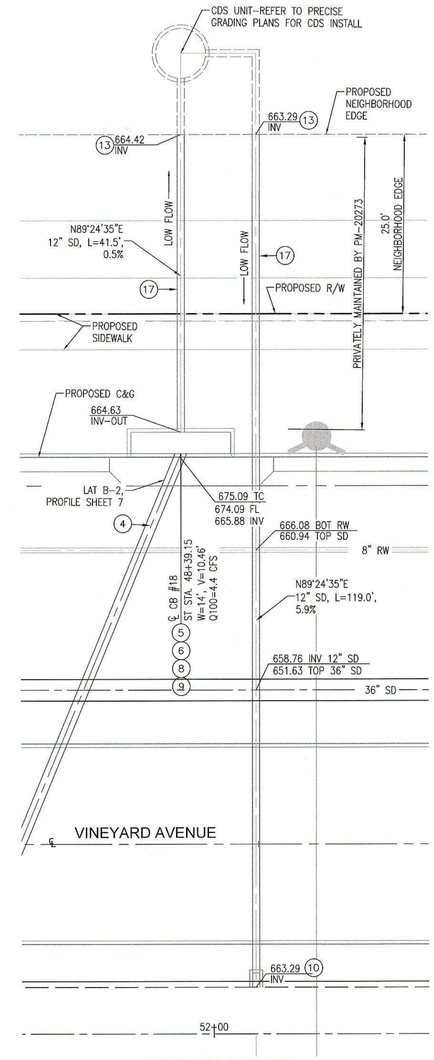


CDS DETAIL "B"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 4

## CONSTRUCTION NOTES

4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
8. CONSTRUCT CONNECTOR PIPE SCREEN ON 12" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED)
9. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
13. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19
17. CONSTRUCT 12" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2 (PRIVATELY MAINTAINED)
19. REMOVE EXISTING CONCRETE BULKHEAD

## NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION

10' 0' 5' 10' 20'
SCALE: 1" = 10'

811 Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN KIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1," SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**
VINEYARD AVENUE

LATERAL PROFILES AND DETAILS

PM-20273

SHEET 8 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14538

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\07_2020-263_SD_VINEYARD.dwg
Last Opened: Jan 09, 2023 - 4:35pm by: Brent.King

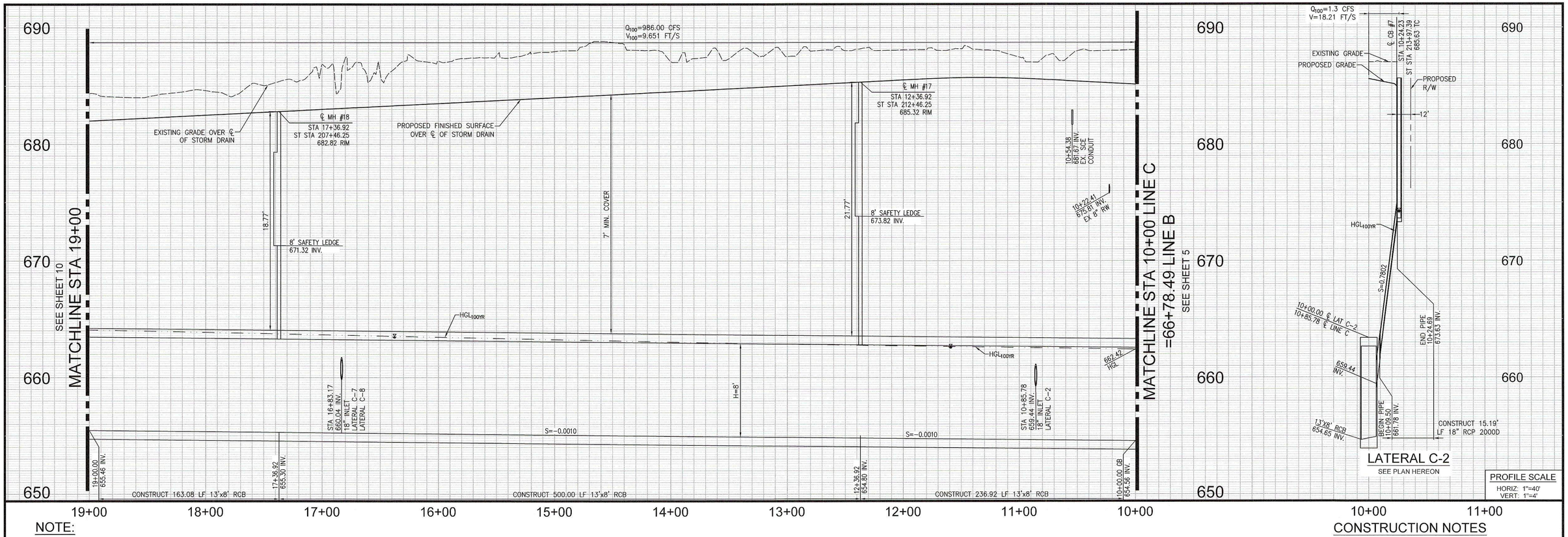


## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

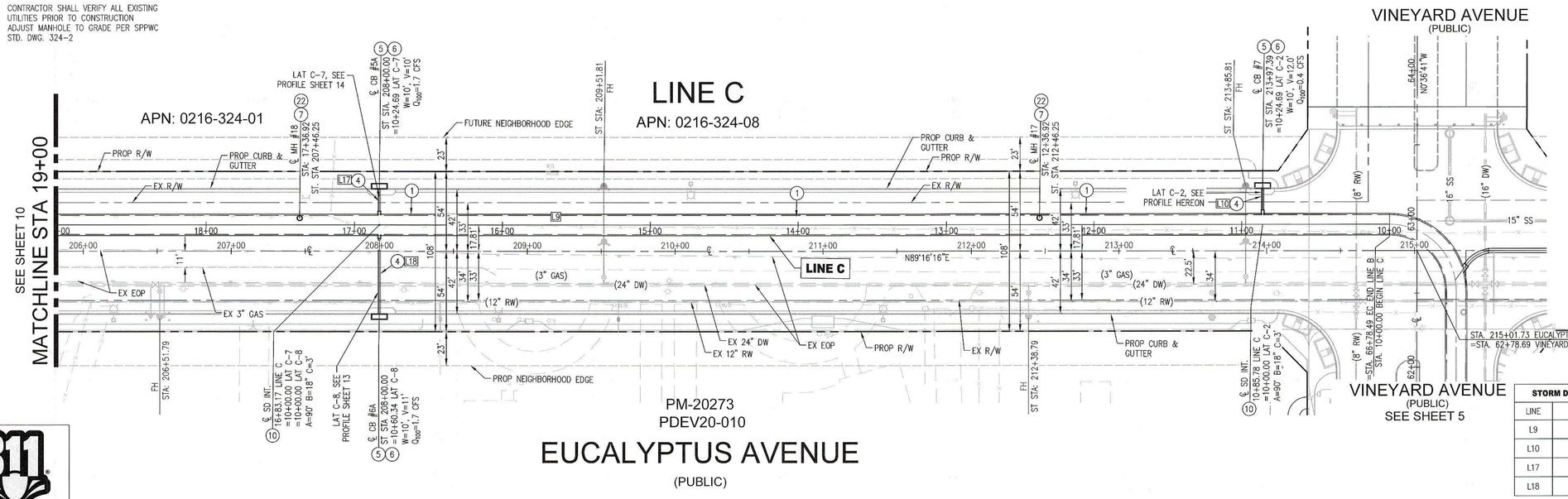


## CONSTRUCTION NOTES

1. CONSTRUCT PRECAST 13'X8' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'X8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25 (IF CAST-IN-PLACE IS USED, BOTTOM OF RCB IS TO BE "SLOPED")
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT 36" STORM DRAIN MANHOLE WITHOUT REDUCER PER SPPWC STD. 326-2, PER DETAIL ON SHEET 20
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
13. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19
14. CONSTRUCT CONCRETE PIPE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 20
22. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 20

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE | BEARING | LENGTH |
|---|---|---|
| L9 | N89°16'16"E | 2575.23' |
| L10 | N0°43'44"W | 15.19' |
| L17 | N0°43'44"W | 15.69' |
| L18 | N0°43'44"W | 51.31' |

40' 0' 20' 40' 80'
SCALE: 1" = 40'

811 Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**
RECOMMENDED BY: BRYAN LIRIANO, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN AND PROFILE**
EUCALYPTUS AVENUE
FROM EUCALYPTUS AVE TO 920'
WEST OF VINEYARD AVE

PM-20273

SHEET 9 OF 26
CONTRACT
ACCOUNT
DWG. NO. D1452A

01/09/2023

Drawing Name: P:\Year_2020\0220-263 Merrill Commerce Center Phase I - Prologis - Tom Donohue\06 Engineering\Sheets\OFF-SITE\Storm Drain\07-09-2020-263_SD_EUCALYPTUS.dwg
Last Opened: Jan 09, 2023 - 4:09pm by: Brent.King

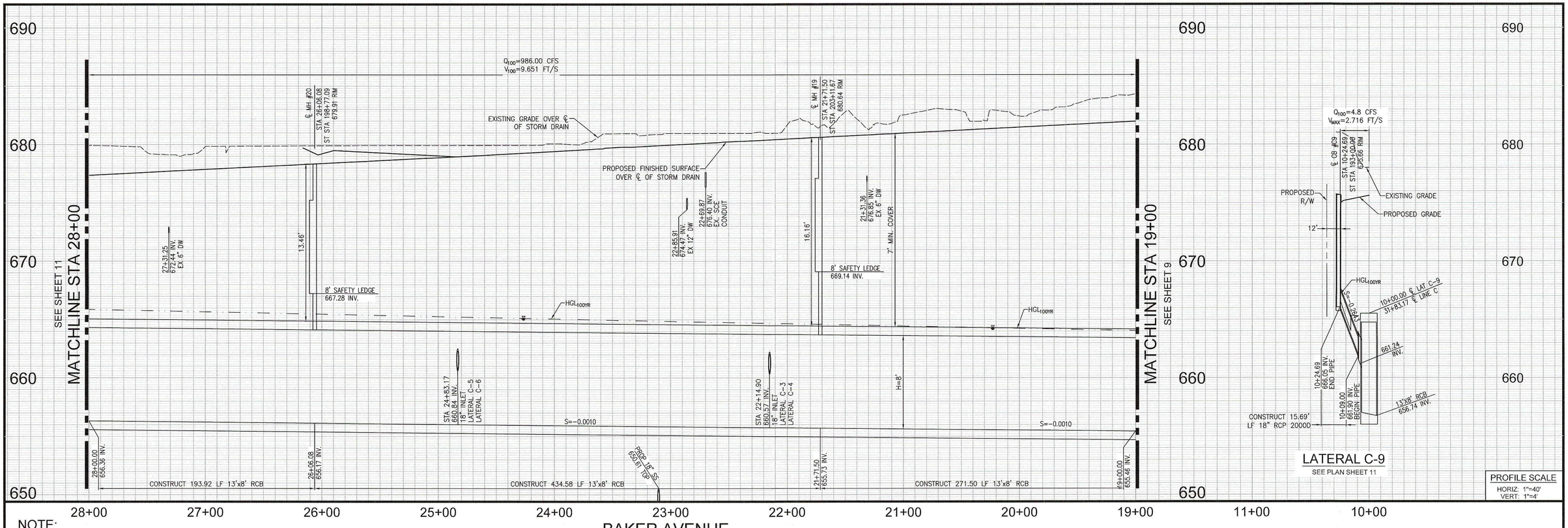


## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

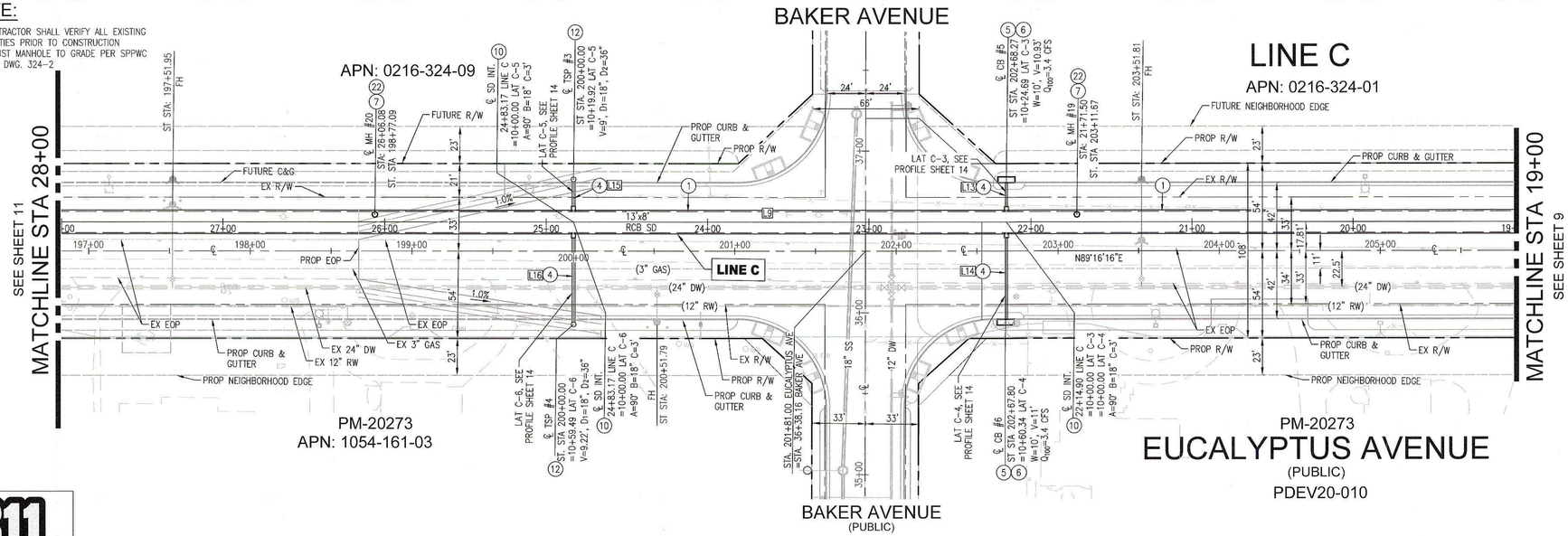


## CONSTRUCTION NOTES

1. CONSTRUCT PRECAST 13'X8' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'X8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25 (IF CAST-IN-PLACE IS USED, BOTTOM OF RCB IS TO BE "SLOPED")
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT 36" STORM DRAIN MANHOLE WITHOUT REDUCER PER SPPWC STD. 326-2, PER DETAIL ON SHEET 20
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
12. CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL 12 ON SHEET 24
22. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 20

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE | BEARING | LENGTH |
|---|---|---|
| L9 | S89°16'16"W | 2575.23' |
| L13 | N0°43'44"W | 15.34' |
| L14 | S0°43'44"E | 51.02' |
| L15 | N0°43'44"W | 15.35' |
| L16 | S0°43'44"E | 52.22' |

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB, APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SIARA ROSE MACKINNEY — No. 85559 Exp. 9/30/2024 — CIVIL — STATE OF CALIFORNIA


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23


**STORM DRAIN IMPROVEMENT PLAN AND PROFILE**
EUCALYPTUS AVENUE
FROM 920' WEST OF VINEYARD AVE
TO 500' WEST OF BAKER AVE

PM-20273

SHEET 10 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14540

01/09/2023

Drawing Name: P:\Year_2020\2020-283 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\07-09_2020-283_SD_EUCALYPTUS.dwg
Last Opened: Jan 09, 2023 - 4:10pm by: Brent.King

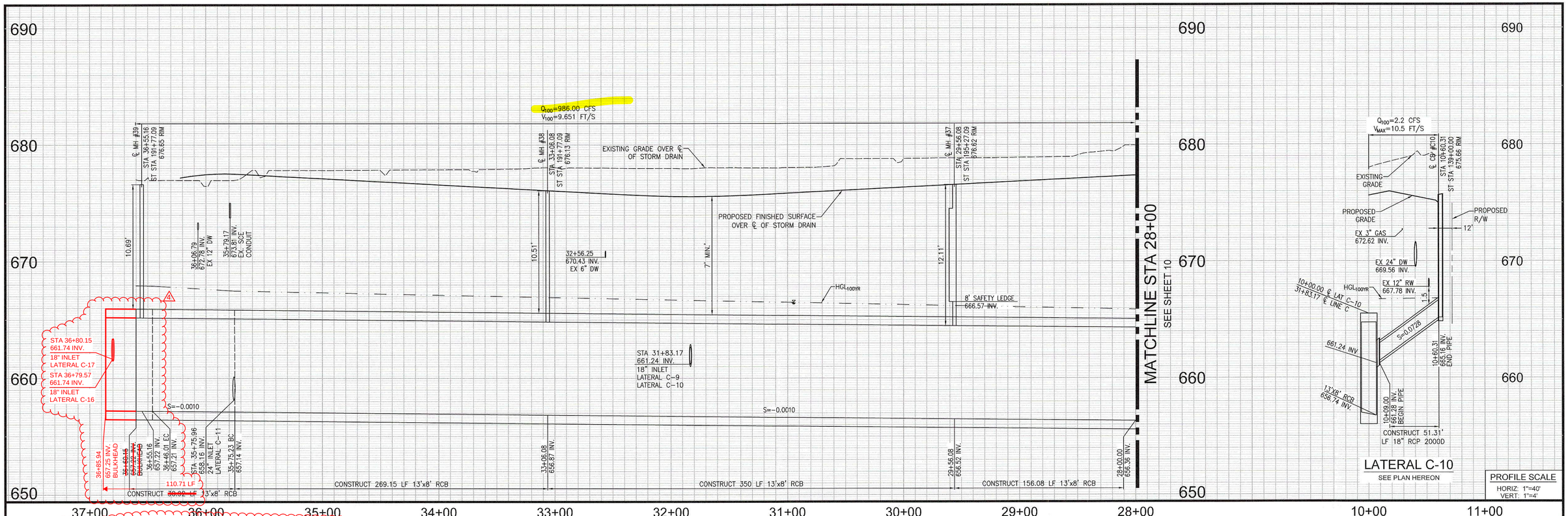


## CONSTRUCTION NOTES

1. CONSTRUCT PRECAST 13'x8' RCB PER CALTRANS STD. D83A & D83B, ALTERNATE CONSTRUCT CAST-IN-PLACE 13'x8' RCB PER CALTRANS STD. D80 & D82. TRENCH EXCAVATION, BEDDING & BACKFILL PER CALTRANS STD. A62G, PER DETAIL ON SHEETS 21 – 25 (IF CAST-IN-PLACE IS USED, BOTTOM OF RCB IS TO BE "SLOPED")
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, ~~INSTALL ALWETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT~~ PER CITY STANDARD #3018, INSTALL CATCH BASIN CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STANDARD #3017 4
6. CONSTRUCT LOCAL ~~DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO~~ STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT 36" STORM DRAIN MANHOLE WITHOUT REDUCER PER SPPWC STD. 326-2, PER DETAIL ON SHEET 20
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
13. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19
22. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330-2, DETAIL ON SHEET 20
12. CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL 12 ON SHEET 24 4

## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

4 -AT THE REQUEST OF THE ENGINEER, ADD TWO TEMPORARY 36" RISERS ON WALKER AVENUE, NORTH OF EUCALYPTUS AVENUE TO CATCH THE WATER FROM THE ADDED SWALES.
THIS DELTA AFFECTS 5 SHEETS, 1, 2 AND 11-13

**STORM DRAIN CENTERLINE DATA TABLE**

| CURVE | DELTA | LENGTH | RADIUS | TANGENT |
|---|---|---|---|---|
| C1 | 090°07'16.5" | 70.78' | 45.00' | 45.10' |

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE | BEARING | LENGTH |
|---|---|---|
| L9 | S89°16'16"W | 2575.23' |
| L19 | N0°43'44"W | 15.69' |
| L20 | S0°43'44"E | 51.31' |
| L31 | N0°36'28"W | ~~44.44'~~ 39.93' 4 |
| L36 | N44°23'32"E | 33.37' 4 |
| L37 | N48°15'14"W | 35.70' |

SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |
| 4 | 11-8-23 | WLG | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LOSLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA RENE MACKINNEY No. 85559 Exp. 6/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN AND PROFILE**
EUCALYPTUS AVENUE
FROM 500' WEST OF BAKER AVE TO WALKER AVE

PM-20273

SHEET 11 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14841

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I – Prologis – Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\07-09_2020-263_SD_EUCALYPTUS.dwg
Last Opened: Jan 09, 2023 – 5:00pm by: Brent.King

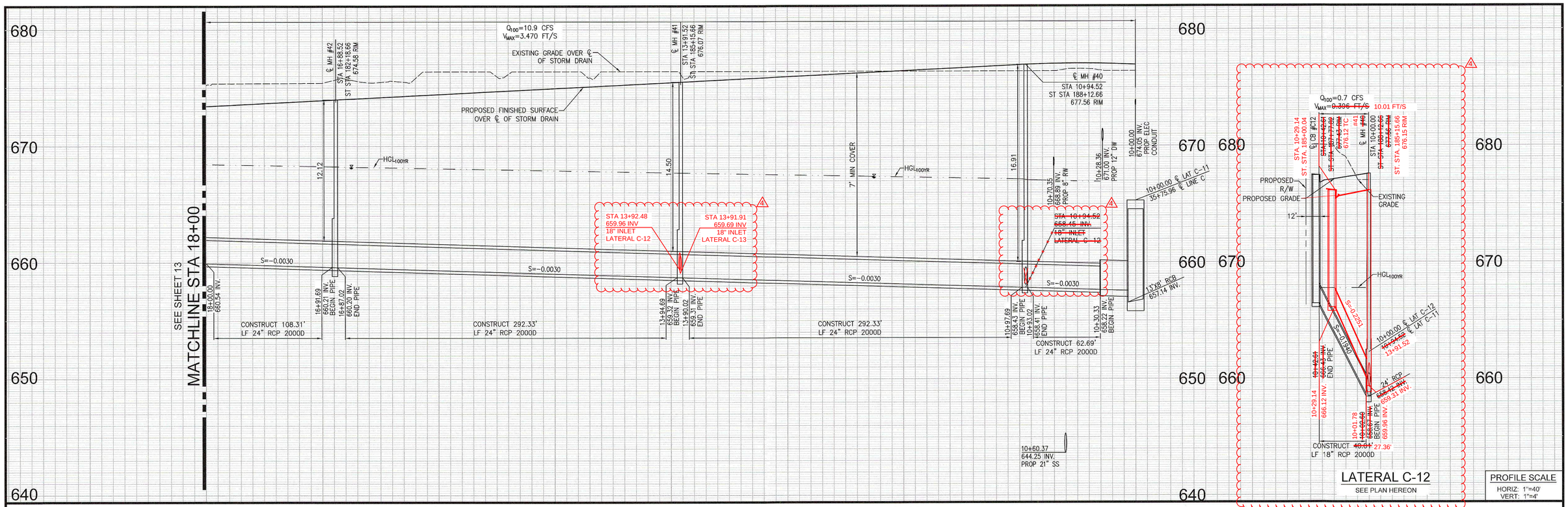


## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

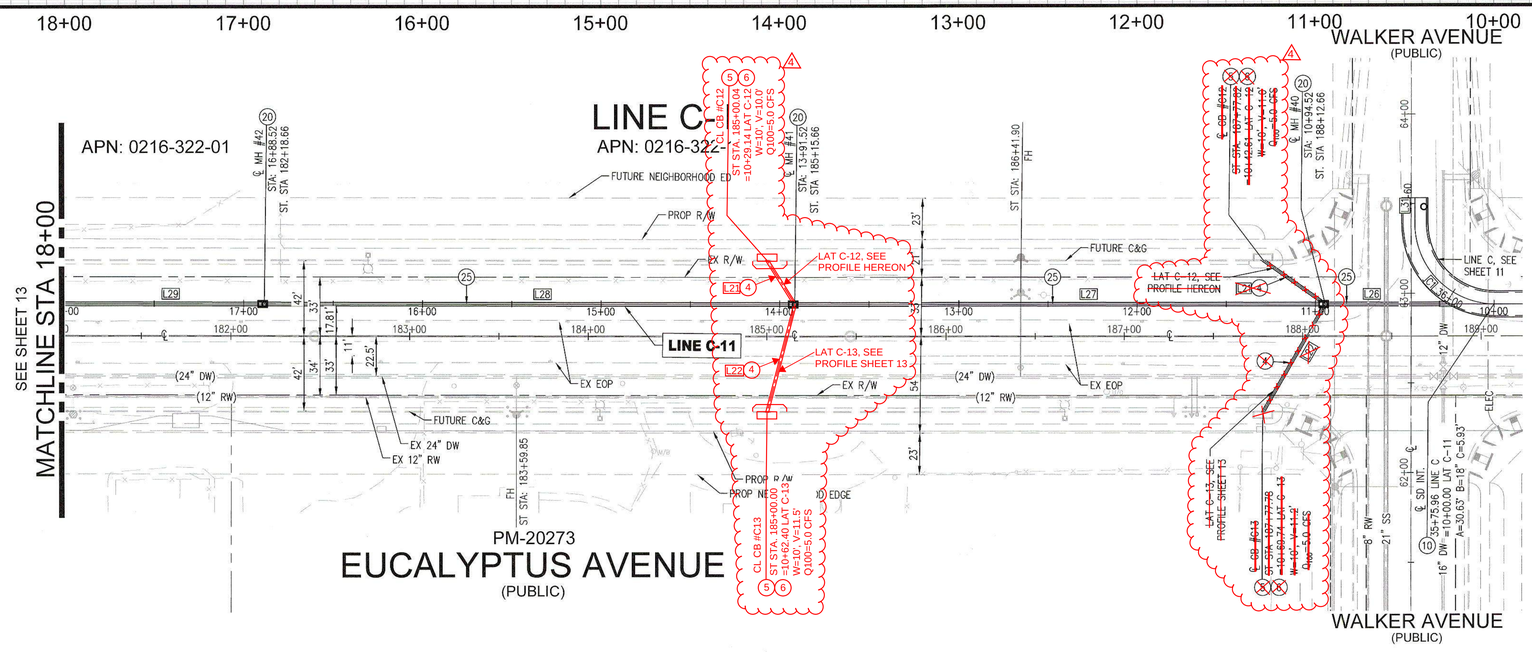


## CONSTRUCTION NOTES

(4) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, ~~INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT~~ PER CITY STANDARD #3018. INSTALL CATCH BASIN CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STANDARD #3017

(6) CONSTRUCT LOCAL ~~DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO~~ STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.

(10) CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21

(20) CONSTRUCT MANHOLE PIPE-TO-PIPE PER SPPWC STD. PLAN NO. 321-2, PER DETAIL ON SHEET 20

(25) CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

△4 AT THE REQUEST OF THE ENGINEER, ADJUST LATERALS C-12 AND C-13 TO NEW CATCH BASIN LOCATION. THIS DELTA AFFECTS 5 SHEETS, 1, 2 AND 11-13

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE | BEARING | LENGTH | | |
|---|---|---|---|---|
| L21 | ~~N56°23'47"W~~ | ~~40.01'~~ | N23°01'58"W | 27.36' |
| L22 | ~~S20°22'37"W~~ | ~~58.01'~~ | S13°54'15"W | 60.85' |
| L26 | S89°22'39"W | 62.69' | | |
| L27 | S89°22'24"W | 292.33' | | |
| L28 | S89°22'24"W | 292.33' | | |
| L29 | S89°22'23"W | 292.34' | | |

SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |
| 4 | 11-8-23 | WLG | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LINEN, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF EOR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No. 85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN AND PROFILE**
EUCALYPTUS AVENUE
FROM WALKER AVE TO 750' WEST OF WALKER AVE

PM-20273

SHEET 12 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14342

01/10/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm
Drain\07-09_2020-263_SD_EUCALYPTUS.dwg
Last Opened: Jan 10, 2023 - 1:37pm by: Brent.King

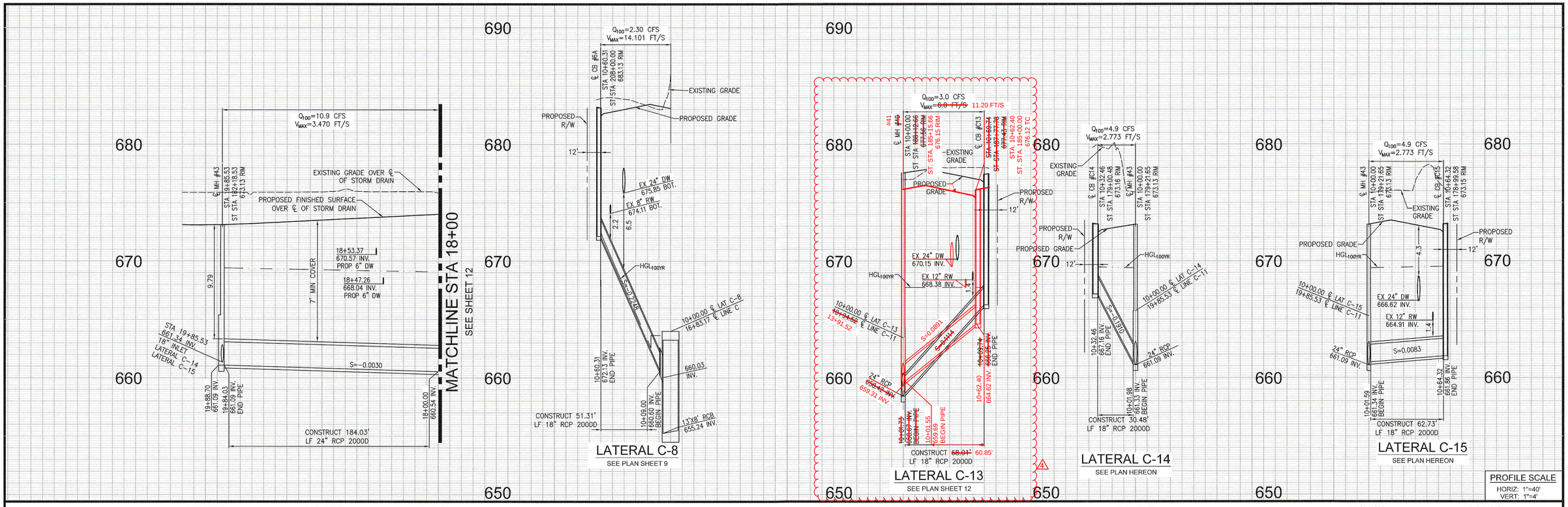


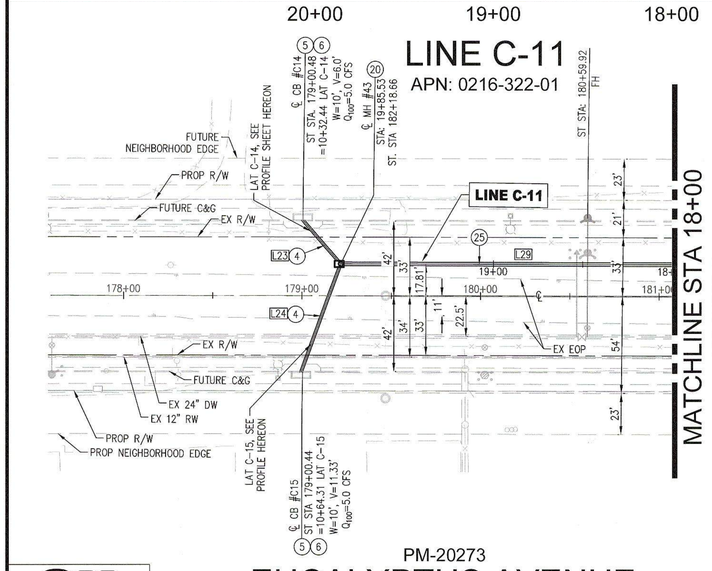


PM-20273

# EUCALYPTUS AVENUE

(PUBLIC)

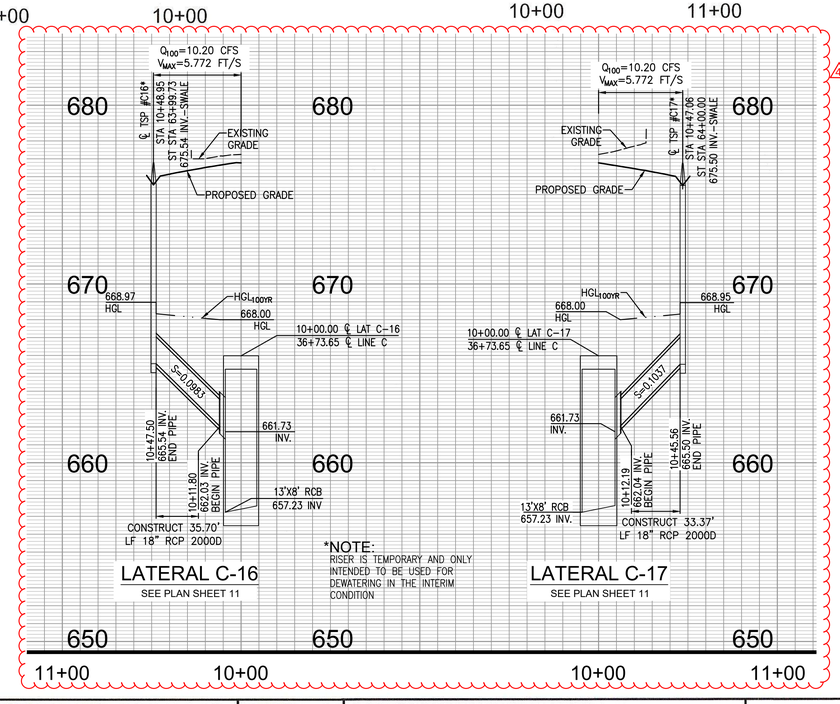


## CONSTRUCTION NOTES

(4) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN. ~~INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT.~~ PER CITY STANDARD #301B. INSTALL CATCH BASIN CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STANDARD #3017.

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.

(20) CONSTRUCT MANHOLE PIPE-TO-PIPE PER SPPWC STD. PLAN NO. 321-2, PER DETAIL ON SHEET 20

(25) CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(4) -AT THE REQUEST OF THE ENGINEER, ADJUST LATERALS C-12 AND C-13 TO NEW CATCH BASIN LOCATION.
-AT THE REQUEST OF THE ENGINEER, ADD TWO TEMPORARY 36" RISERS ON WALKER AVENUE, NORTH OF EUCALYPTUS AVENUE TO CATCH THE WATER FROM THE ADDED SWALES.
THIS DELTA AFFECTS 4 SHEETS, 1, 14, AND 15

| STORM DRAIN CENTERLINE DATA TABLE | | |
|---|---|---|
| LINE | BEARING | LENGTH |
| L23 | N41°21'33"W | 30.48' |
| L24 | S19°26'12"W | 62.73' |
| L29 | S89°22'23"W | 292.34' |

SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |
| (4) | 11-8-23 | WLG | |

DESIGNED BY: BK DATE: 2/2/2022
DRAWN BY: BK DATE: 2/2/2022
CHECKED BY: DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN SHIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN AND PROFILE**
EUCALYPTUS AVENUE
FROM 750' WEST OF WALKER AVE
TO 950' WEST OF WALKER AVE

PM-20273

SHEET 13 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14543

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm
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Last Opened: Jan 09, 2023 - 5:06pm by: Brent.King

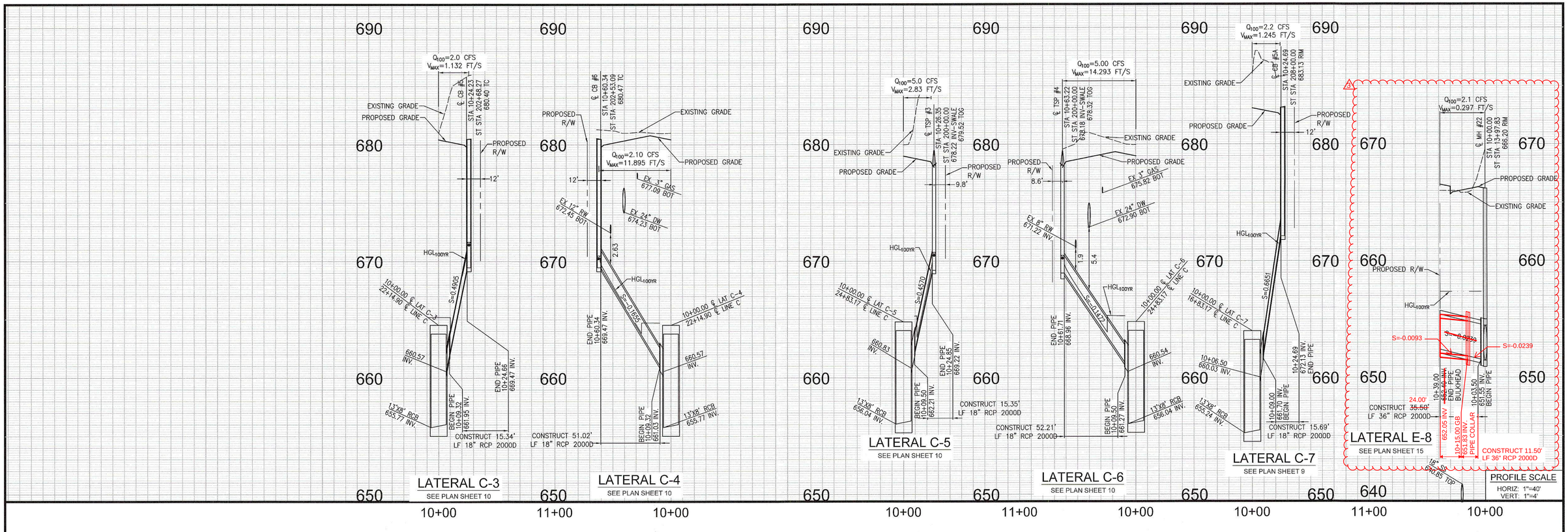


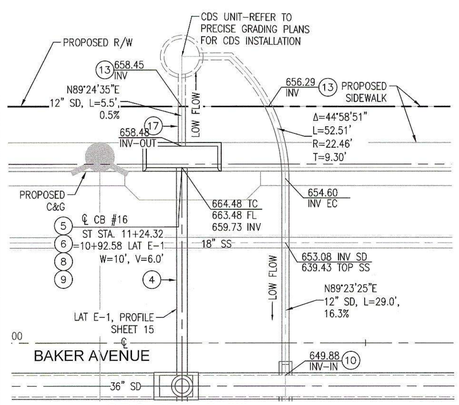


CDS DETAIL "I"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 15

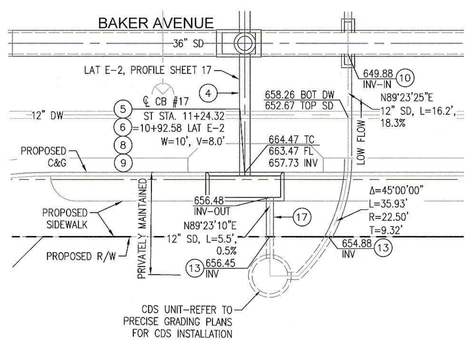


CDS DETAIL "J"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 15

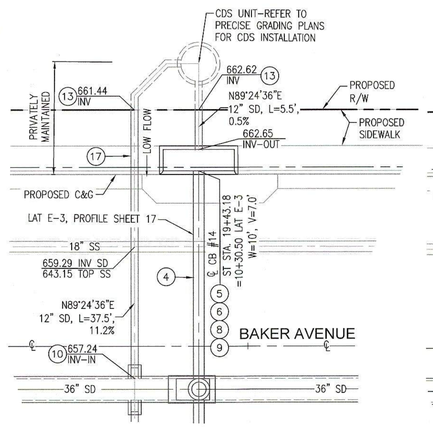


CDS DETAIL "K"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 15

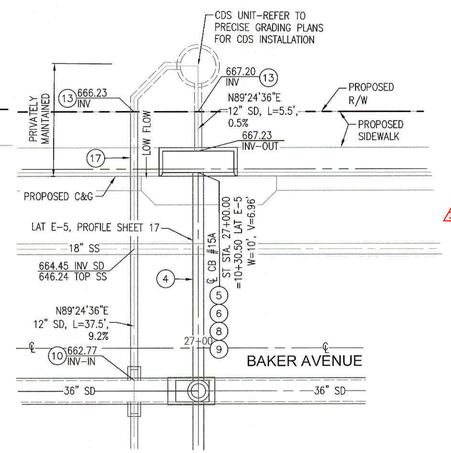


CDS DETAIL "M"
(PRIVATELY MAINTAINED)
SCALE: 1"=10'
SEE SHEET 16

## CONSTRUCTION NOTES

4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
8. CONSTRUCT CONNECTOR PIPE SCREEN ON 12" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED)
9. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19
10. CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21
13. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19
17. CONSTRUCT 12" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2 (PRIVATELY MAINTAINED)
14. CONSTRUCT CONCRETE PIPE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 20

3 AT THE REQUEST OF THE CONTRACTOR, ADJUST INVERT OF LATERAL E-8 TO MATCH UP WITH ONSITE CONNECTION . THIS DELTA AFFECTS 3 SHEETS, 1, 14, AND 15

10' 0' 5' 10'
SCALE: 1" = 10'

Know what's below. Call 811 before you dig.

NOTE:
CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |
| 3 | 10-17-23 | WLG | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**
RECOMMENDED BY: BRIAN LINLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA RAE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN AND PROFILE**
BAKER AVENUE
LATERAL PROFILES

PM-20273

SHEET 14 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14541

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donohue\06 Engineering\Sheets\OFF-SITE\Storm Drain\07-09_2020-263_SD_EUCALYPTUS.dwg
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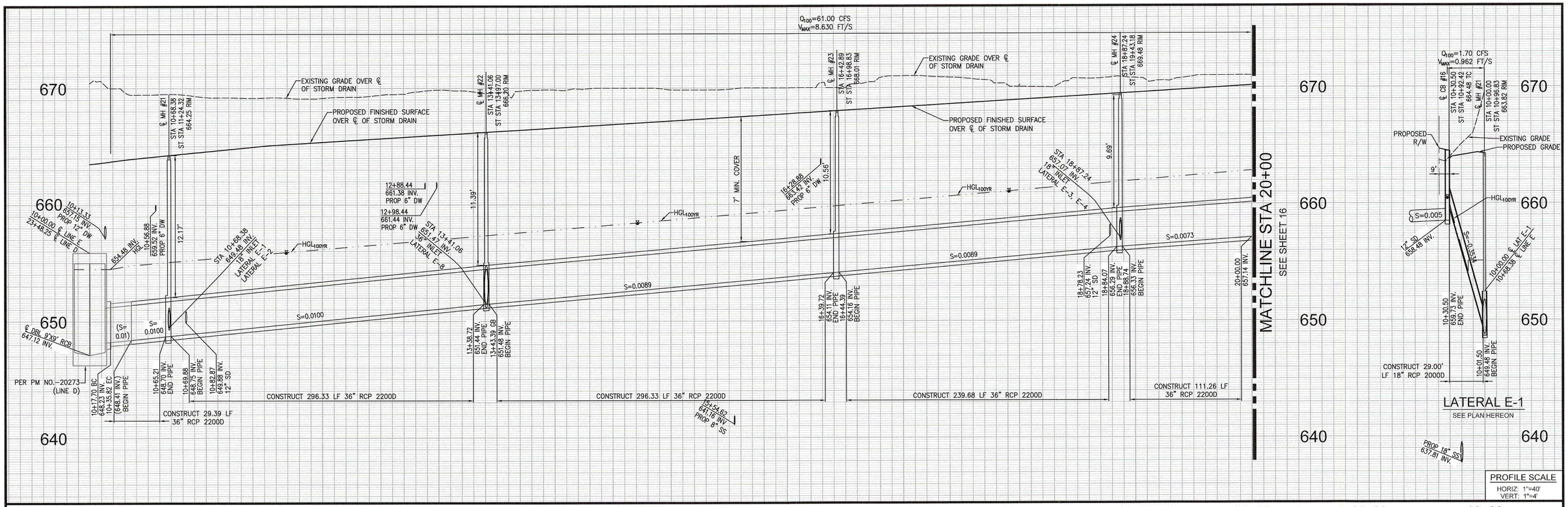


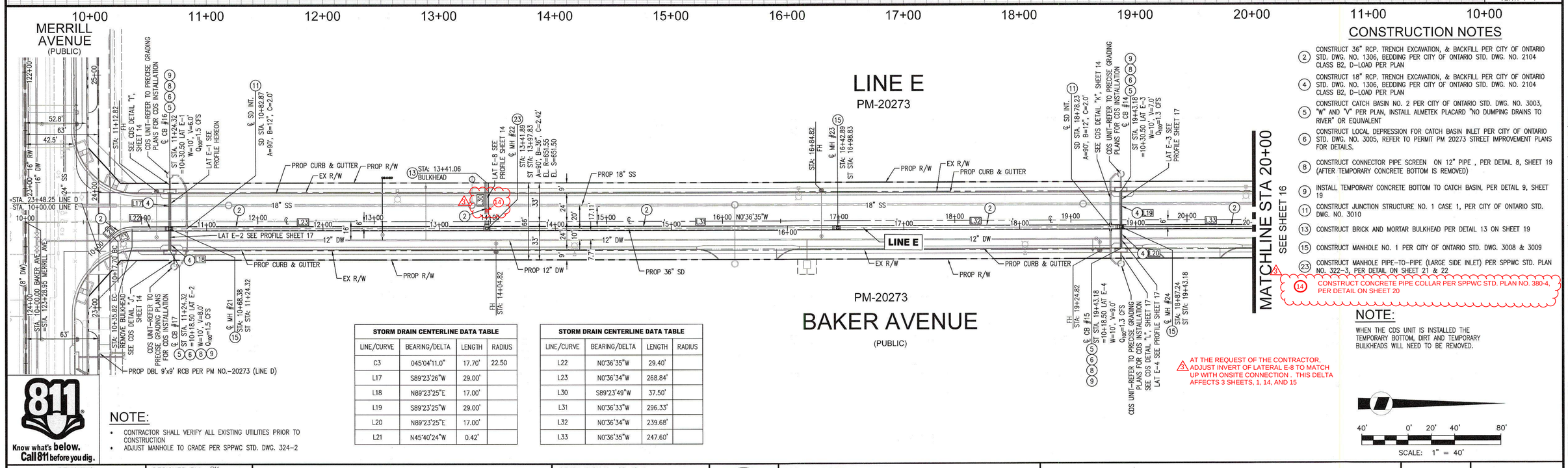


| STORM DRAIN CENTERLINE DATA TABLE | | | |
|---|---|---|---|
| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
| C3 | 045°04'11.0" | 17.70' | 22.50 |
| L17 | S89°23'26"W | 29.00' | |
| L18 | N89°23'25"E | 17.00' | |
| L19 | S89°23'25"W | 29.00' | |
| L20 | N89°23'25"E | 17.00' | |
| L21 | N45°40'24"W | 0.42' | |

| STORM DRAIN CENTERLINE DATA TABLE | | | |
|---|---|---|---|
| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
| L22 | N0°36'35"W | 29.40' | |
| L23 | N0°36'34"W | 268.84' | |
| L30 | S89°23'49"W | 37.50' | |
| L31 | N0°36'33"W | 296.33' | |
| L32 | N0°36'34"W | 239.68' | |
| L33 | N0°36'35"W | 247.60' | |

## CONSTRUCTION NOTES

(2) CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(4) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.

(8) CONSTRUCT CONNECTOR PIPE SCREEN ON 12" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED)

(9) INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19

(11) CONSTRUCT JUNCTION STRUCTURE NO. 1 CASE 1, PER CITY OF ONTARIO STD. DWG. NO. 3010

(13) CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19

(15) CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009

(23) CONSTRUCT MANHOLE PIPE-TO-PIPE (LARGE SIDE INLET) PER SPPWC STD. PLAN NO. 322-3, PER DETAIL ON SHEET 21 & 22

(14) CONSTRUCT CONCRETE PIPE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 20

## NOTE:

WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.

(3) AT THE REQUEST OF THE CONTRACTOR, ADJUST INVERT OF LATERAL E-8 TO MATCH UP WITH ONSITE CONNECTION . THIS DELTA AFFECTS 3 SHEETS, 1, 14, AND 15

## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

811 Know what's below. Call 811 before you dig.

40' 0' 20' 40' 80'
SCALE: 1" = 40'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN TIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA RAE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
BAKER AVENUE
FROM MERRILL AVE TO 1,056' NORTH OF MERRILL AVE

PM-20273

SHEET 15 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14515

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\10-12_2020-263_SD_BAKER.dwg
Last Opened: Jan 09, 2023 - 1:58pm by: Brent.King

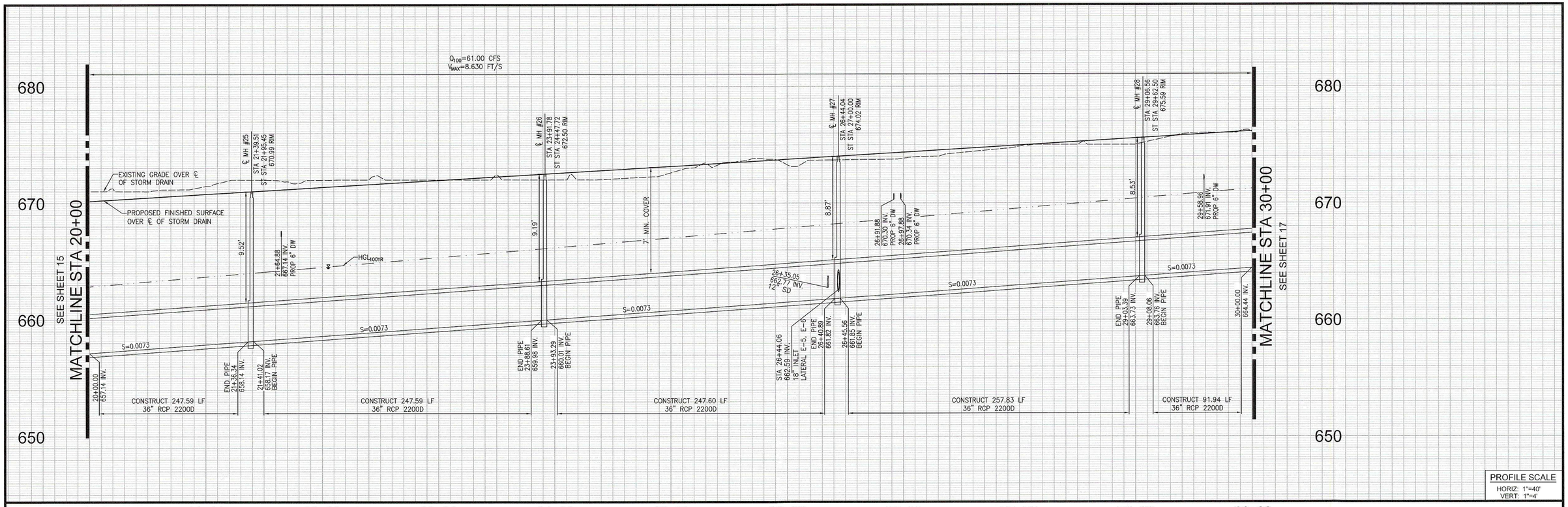


PROFILE SCALE
HORIZ: 1"=40'
VERT: 1"=4'

## CONSTRUCTION NOTES

2. CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.
8. CONSTRUCT CONNECTOR PIPE SCREEN ON 12" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED)
9. INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19
11. CONSTRUCT JUNCTION STRUCTURE NO. 1 CASE 1, PER CITY OF ONTARIO STD. DWG. NO. 3010
15. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009

## NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

40' 0' 20' 40' 80'
SCALE: 1" = 40'

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
|---|---|---|---|
| L25 | N89°23'25"E | 28.83' | |
| L33 | N0°36'35"W | 247.60' | |
| L34 | N0°36'35"W | 247.60' | |
| L35 | N0°36'35"W | 247.61' | |
| L36 | N0°36'35"W | 257.83' | |

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
|---|---|---|---|
| L37 | N0°36'33"W | 234.25' | |
| L39 | N89°23'25"E | 17.00' | |

811 Know what's below. Call 811 before you dig.

REVISIONS

| MARK | DATE | BY | APPROVED/RCE NO |
|---|---|---|---|
| | | | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRIAN LINLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA REBE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
BAKER AVENUE
FROM 1056' NORTH OF MERRILL AVE
TO 2,056' NORTH OF MERRILL AVE

PM-20273

SHEET 16 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14416

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donohue\06 Engineering\Sheets\OFF-SITE\Storm Drain\10-12_2020-263_SD_BAKER.dwg
Last Opened: Jan 09, 2023 - 11:59pm by: Brent.King

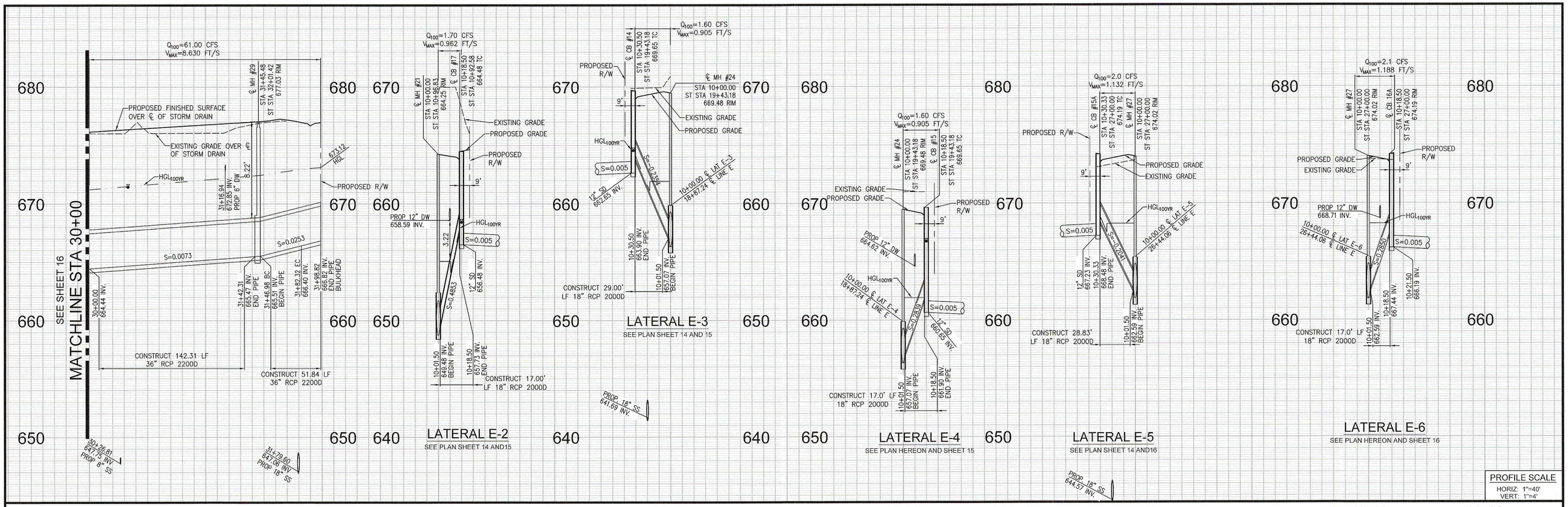


## CONSTRUCTION NOTES

(2) CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(4) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20273 STREET IMPROVEMENT PLANS FOR DETAILS.

(8) CONSTRUCT CONNECTOR PIPE SCREEN ON 12" PIPE , PER DETAIL 8, SHEET 19 (AFTER TEMPORARY CONCRETE BOTTOM IS REMOVED)

(9) INSTALL TEMPORARY CONCRETE BOTTOM TO CATCH BASIN, PER DETAIL 9, SHEET 19

(10) CONSTRUCT JUNCTION STRUCTURE PIPE TO RCB PER SPPWC STD. 333-2, PER DETAIL ON SHEET 21

(13) CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 13 ON SHEET 19

(14) CONSTRUCT CONCRETE PIPE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 20

(15) CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009

(17) CONSTRUCT 12" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2 (PRIVATELY MAINTAINED)

(18) CONSTRUCT 12" RCP 45° BEND (PRIVATELY MAINTAINED)

(23) CONSTRUCT MANHOLE PIPE-TO-PIPE (LARGE SIDE INLET) PER SPPWC STD. PLAN NO. 322-3, PER DETAIL ON SHEET 22 & 23

## NOTE:

- WHEN THE CDS UNIT IS INSTALLED THE TEMPORARY BOTTOM, DIRT AND TEMPORARY BULKHEADS WILL NEED TO BE REMOVED.
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

**STORM DRAIN CENTERLINE DATA TABLE**

| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
|---|---|---|---|
| C4 | 090°00'00.0" | 35.34' | 22.50 |
| L37 | N0°36'33"W | 234.25' | |
| L38 | N89°23'25"E | 16.50' | |

811 Know what's below. Call 811 before you dig.

REVISIONS

| MARK | DATE | BY | APPROVED/RCE NO |
|---|---|---|---|
| | | | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LINLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA RAE MACKINNEY No. 85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
BAKER AVENUE
FROM 2,056' NORTH OF MERRILL AVE
TO 2,226' NORTH OF MERRILL AVE

PM-20273

SHEET 17 OF 26
CONTRACT
ACCOUNT
DWG. NO. D1447

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\10-12_2020-263_SD_BAKER.dwg
Last Opened: Jan 09, 2023 - 2:00pm by: Brent.King

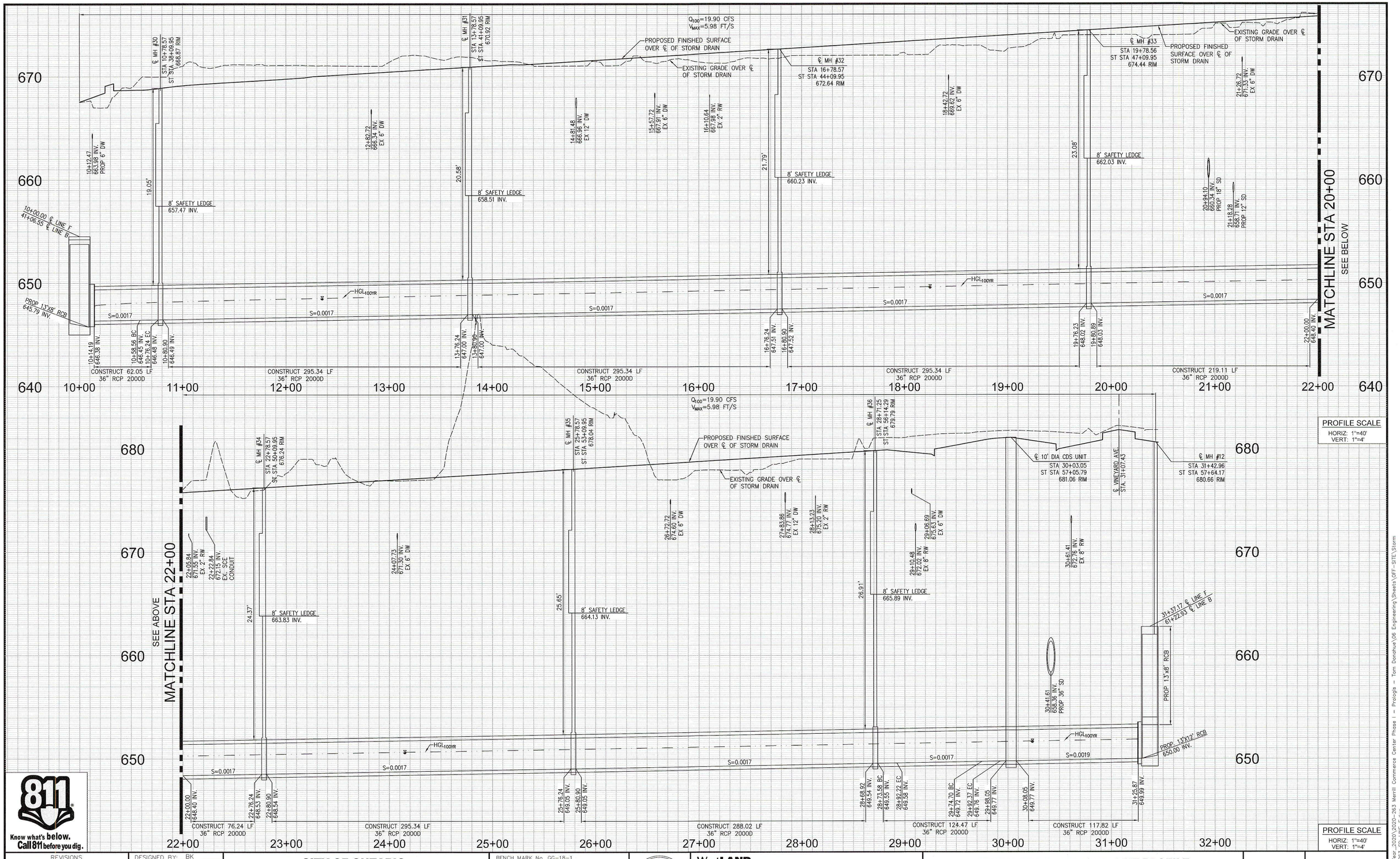


Know what's **below.** Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRIAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SIARA ROSE MACKINNEY — No. 85559 Exp. 9/30/2022 — CIVIL — STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PROFILE**
VINEYARD AVENUE
LINE 'F' PROFILE

PM-20273

SHEET 18 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14818

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\18-19_2020-263_SD_LINE_F.dwg
Last Opened: Jan 09, 2023 - 2:11pm by: Brent.King

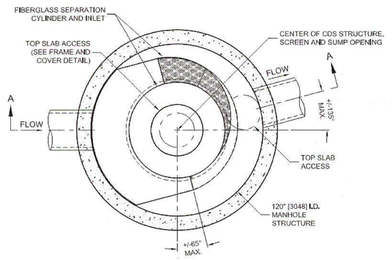


**PLAN VIEW B-B**
N.T.S.

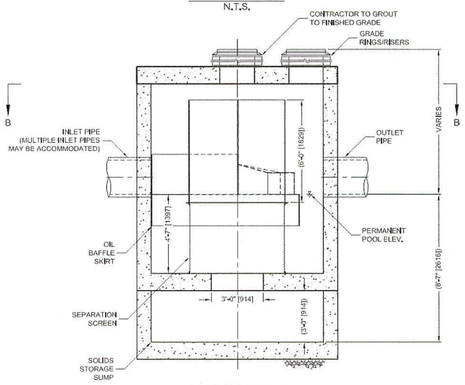


**ELEVATION A-A**
N.T.S.

## CDS5640-10-C DESIGN NOTES

CDS5640-10-C RATED TREATMENT CAPACITY IS 9.0 CFS [254.9 L/s], OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 50.0 CFS [1416 L/s]. IF THE SITE CONDITIONS EXCEED 50.0 CFS [1416 L/s], AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STANDARD CDS5640-10-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

| CONFIGURATION DESCRIPTION |
|---|
| GRATED INLET ONLY (NO INLET PIPE) |
| GRATED INLET WITH INLET PIPE OR PIPES |
| CURB INLET ONLY (NO INLET PIPE) |
| CURB INLET WITH INLET PIPE OR PIPES |
| SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION) |
| SEDIMENT WEIR FOR NJDEP / NJCAT CONFORMING UNITS |

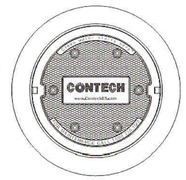


**FRAME AND COVER**
(DIAMETER VARIES)
N.T.S.

**SITE SPECIFIC DATA REQUIREMENTS**

| | | | |
|---|---|---|---|
| STRUCTURE ID | | | |
| WATER QUALITY FLOW RATE (CFS OR L/s) | | | * |
| PEAK FLOW RATE (CFS OR L/s) | | | * |
| RETURN PERIOD OF PEAK FLOW (YRS) | | | * |
| SCREEN APERTURE (2400 OR 4700) | | | * |
| PIPE DATA: | I.E. | MATERIAL | DIAMETER |
| INLET PIPE 1 | * | * | * |
| INLET PIPE 2 | * | * | * |
| OUTLET PIPE | * | * | * |
| RIM ELEVATION | | | * |
| ANTI-FLOTATION BALLAST | | WIDTH | HEIGHT |
| | | * | * |
| NOTES/SPECIAL REQUIREMENTS: | | | |

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS, ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION, ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH® ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS5640-10-C
INLINE CDS
STANDARD DETAIL

INSTSPWWATERQUALITY/CDS/STANDARD DWG/INLINE CDS4-12WQ CDS5640-10-C.DWG Jan 13, 2014 4:57 PM

## CONNECTOR PIPE SCREEN (CPS)
U 4.7

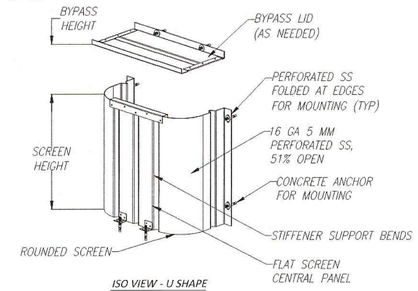


ISO VIEW - U SHAPE

| CPS U WITH 4.7 FT SCREEN LENGTH | |
|---|---|
| CPS HEIGHT (IN) | SCREEN FLOW (CFS) |
| 12 | 6.67 |
| 18 | 12.26 |
| 24 | 18.88 |
| 30 | 26.40 |
| 36 | 34.71 |

NOTE: BYPASS FLOW RATES VARY WITH VAULT DEPTH AND BYPASS HEIGHT. CONTACT BIO CLEAN FOR ADDITIONAL INFORMATION.

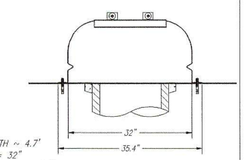


TOTAL SCREEN LENGTH = 4.7'
SPAN LENGTH = 32"
COMPATIBLE WITH PIPES UP TO Ø24"

TOP SECTION VIEW - U SHAPE

GENERAL NOTES
1. BIO CLEAN TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS, AND CAPACITIES ARE SUBJECT TO CHANGE.
3. THIS CPS UNIT IS DESIGNED FOR TREATMENT FLOWS THROUGH THE SCREEN. FLOWS GREATER THAN THE TREATMENT FLOW RATE WILL BYPASS OVER THE SCREEN.
4. A BYPASS LID IS REQUIRED WHEN THE OUTLET PIPE IS DIRECTLY BELOW THE CURB OPENING.
5. CPS IS COMPRISED OF 304 STAINLESS STEEL. THICKNESS IS 16 GAUGE. SCREEN PERFORATIONS ARE 5 MILLIMETERS IN DIAMETER. THE SCREEN AREA IS 51% OPEN SPACE.

INSTALLATION NOTES
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS REQUIRED TO INSTALL THE CPS UNIT AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. POSITION THE CPS SO IT IS EVENLY SPACED AROUND THE CONNECTOR PIPE, ENSURING A MIN. OF 4" SPACING AWAY FROM ANY CORNERS. SCREEN BOTTOM SHALL BE FLUSH WITH THE CATCH BASIN FLOOR, OR WITH GAPS NO GREATER THAN 5 MM.
3. IF A BYPASS LID IS REQUIRED, VERIFY THE BYPASS HEIGHT NEEDED AND MARK THAT LOCATION ON THE WALL DIRECTLY ABOVE THE BASE UPRIGHTS. LIFT THE LID IN PLACE AND MARK THE HOLE LOCATIONS FOR THE LID MOUNTING BRACKETS. SECURE THE LID WITH STAINLESS STEEL NUTS.

| | | | |
|---|---|---|---|
| WARRANTY: 3 YEAR MANUFACTURER'S | | MEETS FULL CAPTURE REQUIREMENTS | |
| BIO CLEAN ENVIRONMENTAL SERVICES, INC. 398 VIA EL CENTRO, OCEANSIDE CA 92058 PHONE: 760-433-7640 | | REVISIONS: | DATE: |
| | | REVISIONS: | DATE: |
| DATE: 1/17/2020 | SCALE: NTS | REVISIONS: | DATE: |
| DRAFTER: G.M.S. | UNITS = INCHES | REVISIONS: | DATE: |

Bio Clean
A Forterra Company

8 PIPE CONNECTOR SCREEN DETAIL

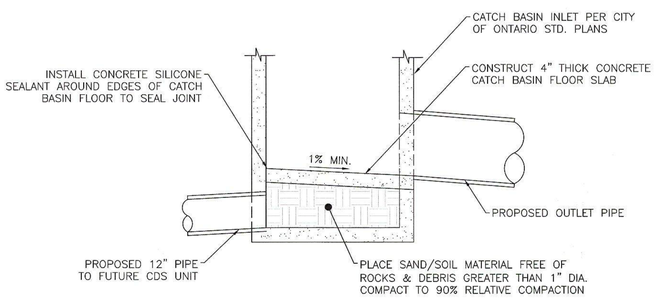


9 CATCH BASIN - TEMPORARY FLOOR CONSTRUCTION DETAIL

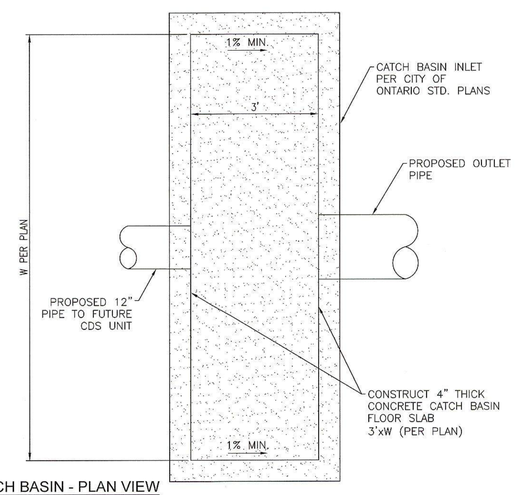


CATCH BASIN - PLAN VIEW

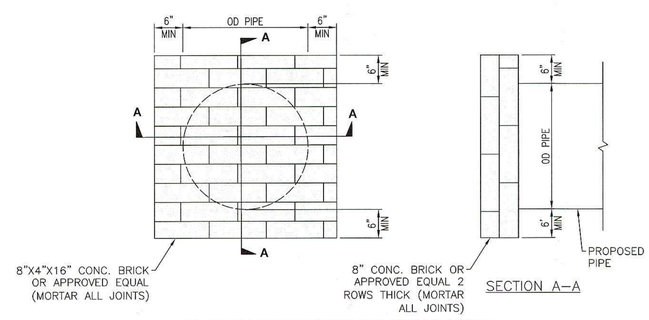


13 BRICK AND MORTAR BULKHEAD DETAIL

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER — SIARA REE MACKINNEY — No. 85559 — Exp. 9/30/2023 — CIVIL — STATE OF CALIFORNIA

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4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**

DETAILS

PM-20273

SHEET 19 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14919

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\13_2020-263_SD_DET Line B-E.dwg
Last Opened: Jan 09, 2023 - 2:27pm by: Brent.King

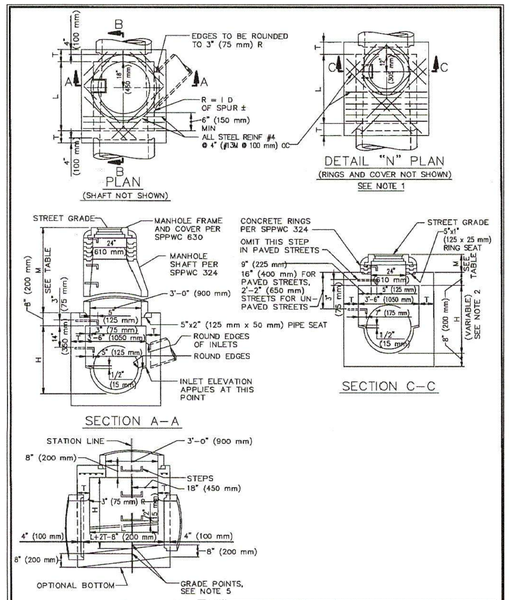


| SECTION | TABLE OF VALUES FOR M (SEE NOTE 1) | | | |
|---|---|---|---|---|
| | PAVED STREET | | UNPAVED STREET | |
| | MAX | MIN | MAX | MIN |
| A–A | | 2'-10 1/2" (867 mm) | | 3'-6" (1060 mm) |
| C–C | 11" (282 mm) | 8 1/2" (217 mm) | 16" (410 mm) | 15" (380 mm) |

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

**MANHOLE PIPE–TO–PIPE (ONE OR BOTH MAIN LINE IDS 33" (825 mm) OR SMALLER)**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 321–2

SHEET 1 OF 3

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" (867 mm) FOR PAVED STREETS OR 3'-6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT SHAFT PER SECTION C–C AND DETAIL "N". DEPTH M MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 8" (150 mm) WHEN LARGER VALUES OF M WOULD REDUCE H IN SECTION C–C TO 3'-6" (1060 mm) OR LESS.
2. H (IN SECTION A–A AND B–B) SHALL NOT BE LESS THAN 4'-0" (1.2 m), BUT MAY BE INCREASED PROVIDED THAT THE VALUE OF M SHALL NOT BE LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR H (IN SECTION C–C) SEE NOTE 1.
3. L SHALL BE 4'-0" (1.2 m) UNLESS OTHERWISE SHOWN. L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION OF THE SPUR MUST BE APPROVED BY THE ENGINEER.
4. T SHALL BE 8" (200 mm) FOR VALUES OF H UP TO AND INCLUDING 8'-0" (2.4 m) AND 10" (250 mm) FOR VALUES OF H OVER 8'-0" (2.4 m).
5. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES. SEE NOTE 3.
6. REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN 8" (200 mm).
10. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE LEDGE AT THE SIDE OF THE MANHOLE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE PIPE–TO–PIPE (ONE OR BOTH MAIN LINE IDS = 33" (825 mm) OR SMALLER)

STANDARD PLAN 321–2

SHEET 2 OF 3

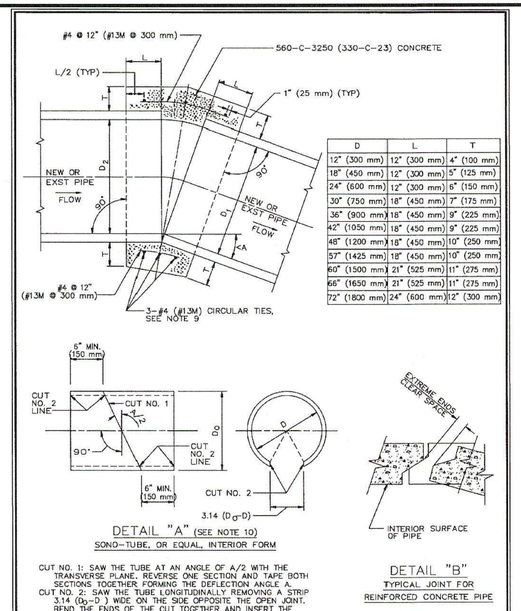


| D | L | T |
|---|---|---|
| 12" (300 mm) | 12" (300 mm) | 4" (100 mm) |
| 18" (450 mm) | 12" (300 mm) | 5" (125 mm) |
| 24" (600 mm) | 12" (300 mm) | 6" (150 mm) |
| 30" (750 mm) | 18" (450 mm) | 7" (175 mm) |
| 36" (900 mm) | 18" (450 mm) | 9" (225 mm) |
| 42" (1050 mm) | 18" (450 mm) | 9" (225 mm) |
| 48" (1200 mm) | 18" (450 mm) | 10" (250 mm) |
| 57" (1425 mm) | 18" (450 mm) | 10" (250 mm) |
| 60" (1500 mm) | 21" (525 mm) | 11" (275 mm) |
| 66" (1650 mm) | 21" (525 mm) | 11" (275 mm) |
| 72" (1800 mm) | 24" (600 mm) | 12" (300 mm) |

CUT NO. 1: SAW THE TUBE AT AN ANGLE OF A/2 WITH THE TRANSVERSE PLANE. REVERSE ONE SECTION AND TAPE BOTH SECTIONS TOGETHER FORMING THE DEFLECTION ANGLE A.
CUT NO. 2: SAW THE TUBE LONGITUDINALLY REMOVING A STRIP 3.14 (D2–D1) WIDE ON THE SIDE OPPOSITE THE OPEN JOINT. BEND THE ENDS OF THE CUT TOGETHER AND INSERT THE TUBE IN THE PIPE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 1997, 1998, 2009

**CONCRETE COLLAR FOR RCB 12" (300 mm) THROUGH 72" (1800 mm)**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 380–4

SHEET 1 OF 2

NOTES

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 10%.
2. FOR CURVE JOINTS (SEE DETAIL B, SHEET 1)
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS GREATER THAN 1" (25 mm), BUT IS LESS THAN 3" (75 mm) A CONCRETE COVER IS REQUIRED IN ACCORDANCE WITH SSPWC 306–1.2.4.
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS EQUAL TO OR GREATER THAN 3" (75 mm), BUT LESS THAN 6" (150 mm), A CONCRETE COLLAR IS REQUIRED. IF THE CLEAR SPACE IS 6" (150 mm) OR GREATER, A TRANSITION STRUCTURE IS REQUIRED.
3. CONCRETE COLLAR SHALL NOT BE USED FOR A SIZE CHANGE ON THE MAIN LINE.
4. CONNECTOR PIPES
   A. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE. D=D1 OR D2, WHICHEVER IS GREATER.
   B. WHEN D1 IS EQUAL TO OR LESS THAN D2, JOIN INVERTS AND WHEN D1 IS GREATER THAN D2, JOIN SOFFITS.
5. FOR PIPE LARGER THAN 72" (1800 mm) SPECIAL COLLAR DETAILS ARE REQUIRED.
6. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
7. REINFORCEMENT SHALL CONFORM TO ASTM A 615 (A 615 M) GRADE 40 (300).
8. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE D+(2X WALL THICKNESS) + T.
9. REINFORCING SHALL BE USED WHERE THE PIPE DIAMETER IS GREATER THAN 21" (525 mm) AND ON ALL PIPES WHERE THE SPACES BETWEEN THE EXTREME OUTER ENDS IS 3" (75 mm) OR LARGER.

CIRCULAR TIES:

| PIPE DIAMETER | NO. OF CIRCULAR TIES |
|---|---|
| 21" (525 mm) OR LESS | 3 |
| 24" (600 mm) TO 30" (750 mm) | 3 |
| 33" (825 mm) TO 57" (1425 mm) | 4 |
| 60" (1500 mm) TO 72" (1800 mm) | 5 |

WHERE THE SPACE BETWEEN PIPE ENDS EXCEEDS 3" (75 mm), THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6" (150 mm) O.C.

10. WHERE THE PIPE IS 21" (525 mm) OR LESS IN DIAMETER AN INTERIOR FORM OF UNSEALED SONO–TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A). WHEN THE PIPE IS 24" (600 mm) OR LARGER A REMOVABLE INTERIOR FORM SHALL BE USED OR THE INTERIOR JOINT SHALL BE COMPLETELY FILLED WITH MORTAR AND NEATLY POINTED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

CONCRETE COLLAR FOR RCB 12" (300 mm) THROUGH 72" (1800 mm)

STANDARD PLAN 380–4

SHEET 2 OF 2

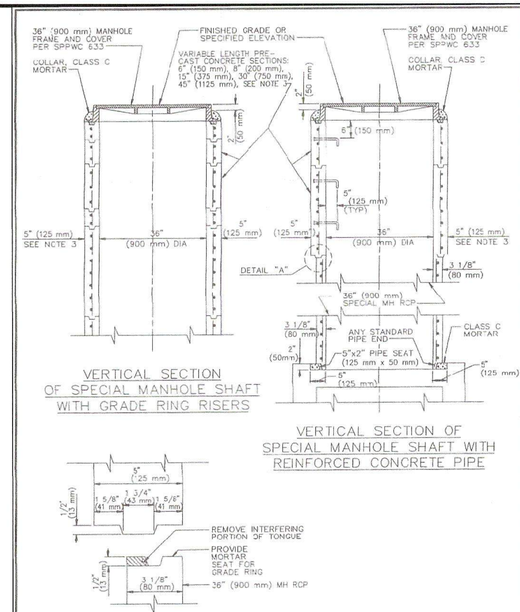


STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

**MANHOLE SHAFT 36"(900 mm) WITHOUT REDUCER**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 326–2

SHEET 1 OF 2

NOTES

1. UNLESS OTHERWISE INDICATED THIS STRUCTURE SHALL CONFORM TO ASTM C 478 (ASTM C 478M). ALL STEEL SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES AND ALL CONCRETE SHALL BE PER SSPWC.
2. WHERE A 36" (900 mm) MANHOLE IS CONSTRUCTED WITH 36" (900 mm) MANHOLE RCP, THE RCP SECTION SHALL CONTAIN A CIRCULAR CAGE AND HAVE A LOAD CARRYING CAPACITY OF AT LEAST 1000D (50D). SPECIAL MANHOLE SHAFT SHALL BE PER THIS STANDARD AND 36" (900 mm) MANHOLE FRAME AND COVER SHALL BE PER SPPWC 633.
3. THE MANHOLE SHAFT AND RINGS MAY BE PLAIN CONCRETE. FOR PLAIN CONCRETE SECTIONS THE MINIMUM THICKNESS SHALL BE 6" (150 mm).
4. ALL JOINTS SHALL BE SEALED BY FILLING THE ANNULAR SPACES WITH CLASS C MORTAR. THE INSIDE OF THE SHAFT AT EACH JOINT SHALL BE WIPED CLEAN OF EXCESS MORTAR.
5. PROTECTIVE PLASTIC LINER (T LOCK) OR ENGINEER–APPROVED COATINGS WHERE REQUIRED BY THE PLANS SHALL BE IN ACCORDANCE WITH SSPWC AND THE MANUFACTURER'S DIRECTIONS.
6. STEPS SHALL CONFORM TO SPPWC 635 OR 636. THE TOP STEP SHALL BE PLACED 6" (150 mm) BENEATH THE MANHOLE COVER FRAME. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC.
7. THE PRECAST CONCRETE MANHOLE STRUCTURES WILL BE INSPECTED BY THE ENGINEER WHO WILL INDICATE ACCEPTANCE FOR SHIPMENT TO THE JOB BY MARKING THE STRUCTURES WITH THE AGENCY'S STAMP.
8. THE VERTICAL SIDES OF THE MANHOLE SHAFT SHALL BE LOCATED ABOVE AND IN LINE WITH THE SIDE OF THE STORM DRAIN CONDUIT.
9. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC 330 IF DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
10. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

633 36" (900 mm) MANHOLE FRAME AND COVER
635 STEEL STEP
636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE SHAFT 36"(900 mm) WITHOUT REDUCER

STANDARD PLAN 326–2

SHEET 2 OF 2

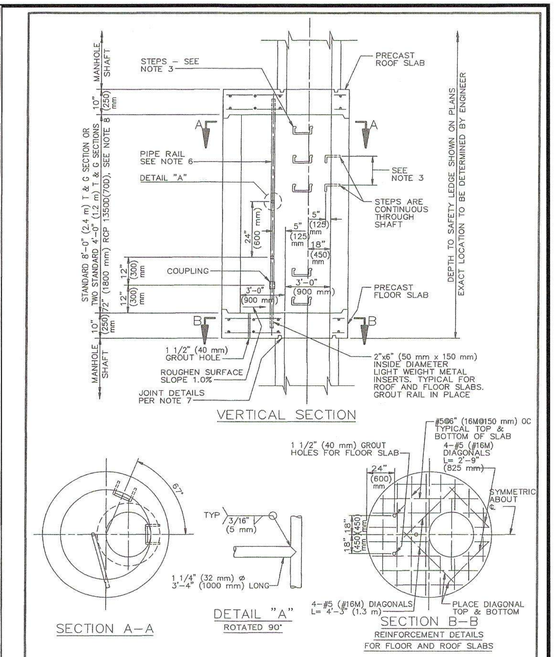


STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

**MANHOLE SHAFT SAFETY LEDGE**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 330–2

SHEET 1 OF 2

NOTES

1. MANHOLE SHAFT SAFETY LEDGE WILL BE NOTED ON THE PLANS WHEN REQUIRED. IT IS TO BE CONSTRUCTED WHEN DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
2. A SAFETY LEDGE SHALL NOT BE USED IF A PRESSURE MANHOLE IS REQUIRED.
3. STEPS SHALL CONFORM TO SPPWC 635 OR 636 AND SHALL BE ANCHORED 4" (100 mm) IN THE WALL OF THE STRUCTURE. STEPS SHALL BE PLACED TO MATCH THE SPACING OF THE MANHOLE SHAFT.
4. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300) AND SHALL TERMINATE 2" (50 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
5. GROUT HOLES, PIPE AND FITTINGS SHALL BE PROVIDED IN THE FLOOR SLAB. PRESSURE GROUTING SHALL BE USED TO FILL VOIDS AND TO SECURE UNIFORM BEARING. THE GROUT SHALL BE NEAT CEMENT GROUT AND GROUTING PRESSURES SHALL BE AS DETERMINED IN THE FIELD BY THE ENGINEER.
6. PIPE RAIL SHALL BE FABRICATED OF 1 1/4" (32 mm) STANDARD GALVANIZED PIPE COMPOSED OF TWO SECTIONS 7'-6" (2.25 m) & 18" (450 mm) IN LENGTH JOINED BY A GALVANIZED COUPLING. THE COUPLING SHALL BE THREADED A MINIMUM OF 2" (50 mm) ON EACH PIPE LENGTH.
7. ROOF AND FLOOR SLABS SHALL BE PRECAST AND KEYED FOR REINFORCED CONCRETE PIPE SECTIONS AS SHOWN. ALL JOINTS SHALL BE FILLED WITH CLASS C MORTAR AND NEATLY POINTED OR WIPED ON THE INSIDE.
8. 72" (1800 mm) RCP SHALL BE PROVIDED WITH TWO CIRCULAR CAGES OF REINFORCEMENT.
9. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
635 STEEL STEP
636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

MANHOLE SHAFT SAFETY LEDGE

STANDARD PLAN 330–2

SHEET 2 OF 2

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG–18–1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG–18–1." SET ON TOP OF CURB. APPROX 5' +/– SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**

DETAILS

PM-20273

SHEET 20 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14550

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I – Prologis – Tom Donohue\06 Engineering\Sheets\OFF-SITE\Storm Drain\13_2020-263_SD_DET Line B-E.dwg
Last Opened: Jan 09, 2023 – 2:27pm by: Brent.King

| District | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

REGISTERED CIVIL ENGINEER

May 31, 2018

PLANS APPROVAL DATE

Carl W. Dunn No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA REGISTERED PROFESSIONAL ENGINEER

*THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.*

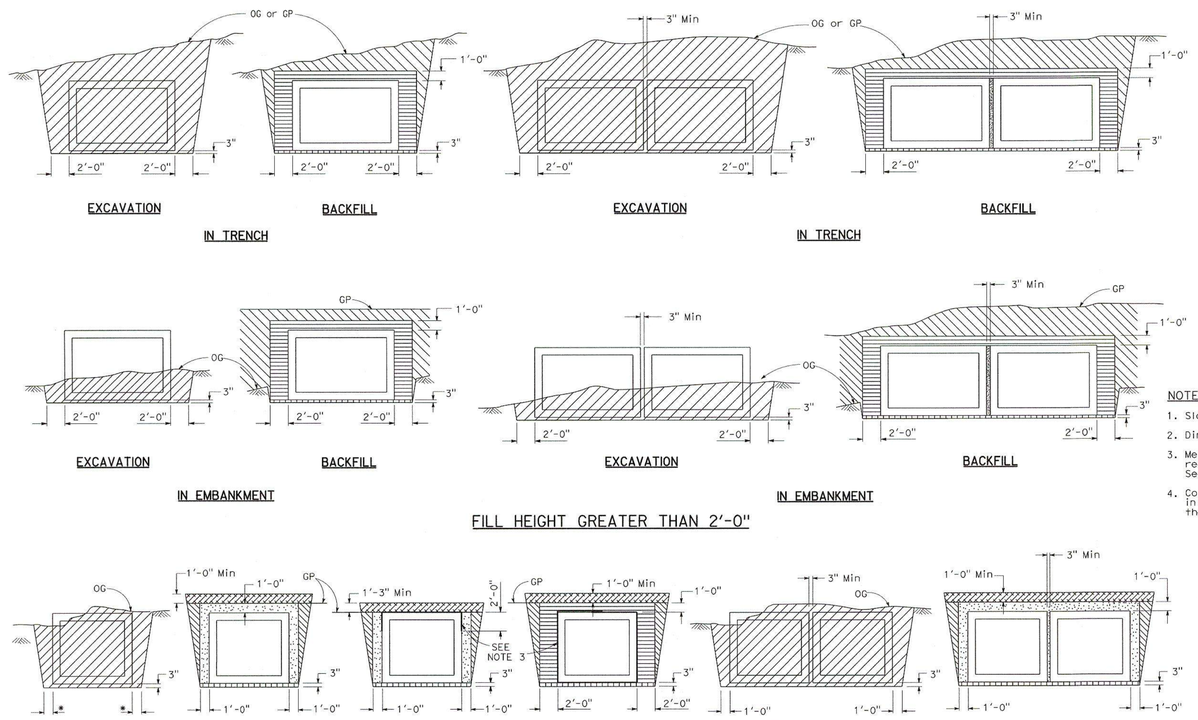


* 1'-0" Where Method 1 or 2 Backfill is used.
2'-0" Where Method 3 Backfill is used.

LEGEND:

- STRUCTURE EXCAVATION (CULVERT)
- STRUCTURE BACKFILL (CULVERT) 95% RELATIVE COMPACTION
- ROADWAY EMBANKMENT
- SLURRY CEMENT BACKFILL
- SAND BEDDING (CULVERT)
- ROADWAY PAVEMENT STRUCTURE

NOTES:

1. Slope or shore excavation sides as necessary.
2. Dimensions shown are minimum.
3. Method 2 and 3 for single or multiple boxes requires an approved external sealing band. See Standard Plan D83A.
4. Construction of Roadway Pavement Structure in Method 2 or Method 3 shall not disturb the external sealing band installation.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

# EXCAVATION AND BACKFILL PRECAST REINFORCED CONCRETE BOX CULVERT

NO SCALE

**A62G**

1-29-18

**2018 STANDARD PLAN A62G**

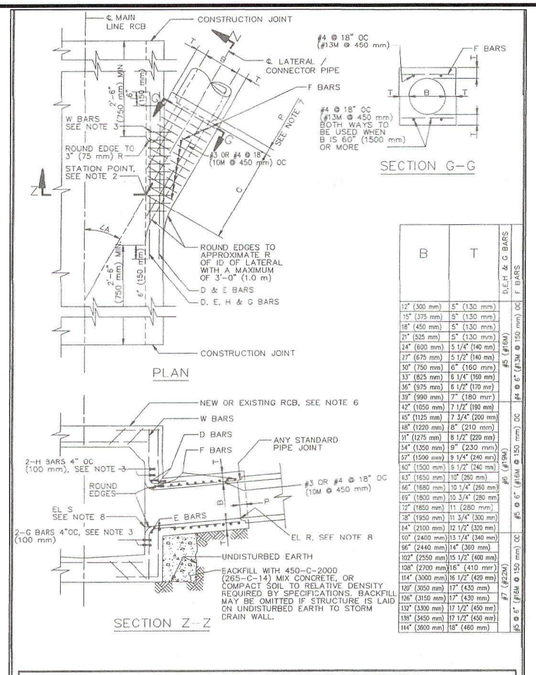


| B | T | D, E, H & G BARS | F BARS |
|---|---|---|---|
| 12" (300 mm) | 5" (130 mm) | | |
| 15" (375 mm) | 5" (130 mm) | | |
| 18" (450 mm) | 5" (130 mm) | | |
| 21" (525 mm) | 5" (130 mm) | | |
| 24" (600 mm) | 5 1/4" (140 mm) | | |
| 27" (675 mm) | 5 1/2" (140 mm) | | |
| 30" (750 mm) | 6" (160 mm) | | |
| 33" (825 mm) | 6 1/4" (160 mm) | | |
| 36" (975 mm) | 6 1/2" (170 mm) | | |
| 39" (990 mm) | 7" (180 mm) | | |
| 42" (1050 mm) | 7 1/2" (190 mm) | | |
| 45" (1125 mm) | 7 3/4" (200 mm) | | |
| 48" (1220 mm) | 8" (210 mm) | | |
| 51" (1275 mm) | 8 1/2" (220 mm) | | |
| 54" (1350 mm) | 9" (230 mm) | | |
| 57" (1500 mm) | 9 1/4" (240 mm) | | |
| 60" (1500 mm) | 9 1/2" (240 mm) | | |
| 63" (1650 mm) | 10" (250 mm) | | |
| 66" (1680 mm) | 10 1/4" (250 mm) | | |
| 69" (1800 mm) | 10 3/4" (280 mm) | | |
| 72" (1850 mm) | 11 (280 mm) | | |
| 78" (1950 mm) | 11 3/4" (300 mm) | | |
| 84" (2100 mm) | 12 1/2" (320 mm) | | |
| 90" (2400 mm) | 13 1/4" (340 mm) | | |
| 96" (2440 mm) | 14" (360 mm) | | |
| 102" (2550 mm) | 15 1/2" (400 mm) | | |
| 108" (2700 mm) | 16" (410 mm) | | |
| 114" (3000 mm) | 16 1/2" (420 mm) | | |
| 120" (3050 mm) | 17" (430 mm) | | |
| 126" (3150 mm) | 17" (430 mm) | | |
| 132" (3300 mm) | 17 1/2" (450 mm) | | |
| 138" (3450 mm) | 17 1/2" (450 mm) | | |
| 144" (3600 mm) | 18" (460 mm) | | |

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1994 REV. 1996, 2009

## JUNCTION STRUCTURE – PIPE TO RCB

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 333–2 SHEET 1 OF 2

NOTES

1. VALUES FOR A, B AND C SHALL BE SHOWN ON THE PLANS. *ELEVATION R AND ELEVATION S SHALL BE SHOWN WHEN REQUIRED PER* NOTE 8.
2. STATIONS SPECIFIED ON THE PLANS APPLY AT THE INTERSECTION OF CENTERLINES OF MAIN LINE AND LATERALS, EXCEPT THAT STATIONS FOR CATCH BASIN CONNECTOR PIPES APPLY AT INSIDE WALL OF STRUCTURE.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 40, (ASTM A 615M, GRADE 300), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
   a. W BARS ARE OF SIZE AND SPACING SPECIFIED FOR WALL STEEL ON PLANS, AND SHALL BE CUT IN CENTER OF OPENING AND BENT INTO TOP AND BOTTOM OF JUNCTION STRUCTURE.
   b. OMIT H BARS WHEN SOFFIT OF SPUR IS 12" (300 mm) OR LESS BELOW SOFFIT OF MAIN LINE, AND OMIT G BARS WHEN INVERT OF SPUR IS 12" (300 mm) OR LESS ABOVE FLOOR OF MAIN LINE.
4. JUNCTION STRUCTURE SHALL BE POURED MONOLITHICALLY WITH MAIN LINE, MANHOLE OR TRANSITION STRUCTURE.
5. FLOOR OF STRUCTURE SHALL BE STEEL–TROWELED TO THE SPRING LINE.
6. WHEN CONNECTING TO EXISTING RCB, BREAKOUT LIMITS AND DETAILS SHALL BE SHOWN ON THE PLANS.
7. EMBEDMENT, P, SHALL BE 5" (130 mm) FOR B = 96" (2400 mm) OR LESS 8" (200 mm) FOR B OVER 96" (2400 mm).
8. IF ELEVATION R AND ELEVATION S ARE NOT SHOWN ON THE PLANS *THEN THE INLET OPENING SHALL FALL 6" (150 mm) BELOW* THE SOFFIT OF THE MAIN LINE WITH THE INLET PIPE LAID ON A STRAIGHT GRADE FROM MAIN LINE TO CATCH BASIN OR TO GRADE BREAK IN INLET LINE. ELEVATION S SHALL BE SHOWN ON THE PLANS IF THE INLET OPENING FALLS MORE THAN 6" (150 mm) BELOW THE SOFFIT OF THE MAIN LINE WITH THE INLET PIPE LAID ON A STRAIGHT GRADE AS STATED ABOVE.
   ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY WHEN A STUB IS TO BE PROVIDED FOR A FUTURE CONNECTION.
9. LATERALS OR CONNECTOR PIPES 24" (600 mm) OR LESS IN DIAMETER SHALL BE NO MORE THAN 5' (1.5 m) ABOVE THE INVERT. LATERALS OR CONNECTOR PIPES 27" (675 mm) OR LARGER IN DIAMETER SHALL BE NO MORE THAN 18" (450 mm) ABOVE THE INVERT, WITH THE EXCEPTION THAT CATCH BASIN CONNECTOR PIPES LESS THAN 50' (15 m) IN LENGTH SHALL NOT BE MORE THAN 5' (1.5 m) ABOVE THE INVERT.
10. THE NEED FOR AN EDGE BEAM AND/OR ADDITIONAL REINFORCEMENT SHALL BE INVESTIGATED BY THE ENGINEER FOR ANY ONE OF THE FOLLOWING CONDITIONS:
   a. ANGLE A IS LESS THAN 30°
   b. TOP OF INLET PIPE IS LESS THAN 6" (150 mm) BELOW THE SOFFIT
   c. FLOW LINE OF INLET PIPE IS LESS THAN 7" (180 mm) ABOVE THE THE FLOOR OF THE RCB AT THE INSIDE FACE

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

JUNCTION STRUCTURE – PIPE TO RCB

STANDARD PLAN 333–2 SHEET 2 OF 2

Know what's **below.** Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |
| | | | |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG–18–1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG–18–1." SET ON TOP OF CURB. APPROX 5' +/– SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

**WestLAND Group, Inc.** Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**

DETAILS

PM-20273

SHEET 21 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14551

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I – Prologis – Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\13_2020-263_SD_DET Line B-E.dwg
Last Opened: Jan 09, 2023 – 2:27pm by: Brent.King

| SPAN, S | | 4′ | | | | 5′ | | | | 6′ | | | | 7′ | | | | 8′ | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEIGHT, H | | 2′ | 3′ | 4′ | | 2′ | 3′ | 4′ | 5′ | 3′ | 4′ | 5′ | 6′ | 3′ | 4′ | 5′ | 6′ | 7′ | 4′ | 5′ | 6′ |
| MAXIMUM EARTH COVER | | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ |
| Conc | ROOF $T_1$ | 7″ | 7½″ | 7″ | 7½″ | 7″ | 7½″ | 8″ | 7½″ | 8″ | 7½″ | 8″ | 7½″ | 8″ | 9″ | 8″ | 9″ | 8″ | 9″ | 8″ | 10″ |
| Conc | WALLS $T_2$ | 6″ | 6″ | 6½″ | 6½″ | 7″ | 7½″ | 6″ | 6″ | 6½″ | 6½″ | 7″ | 7″ | 6½″ | 8″ | 7″ | 7″ | 7½″ | 8″ | 8″ | 9½″ |
| Conc | INVERT $T_3$ | 7″ | 7½″ | 7″ | 7½″ | 7″ | 7½″ | 7½″ | 8″ | 7½″ | 8″ | 7½″ | 8″ | 8″ | 9″ | 8″ | 9″ | 8″ | 9½″ | 8″ | 10½″ |
| Reinf | SPACING | 7″ | 6″ | 7″ | 6″ | 7″ | 6″ | 8½″ | 6″ | 8½″ | 5½″ | 8″ | 5½″ | 8″ | 5″ | 7½″ | 5″ | 7″ | 5″ | 7″ | 4½″ |
| Reinf | "a" SIZE BAR | #6 | #6 | #6 | #6 | #6 | #6 | #7 | #7 | #7 | #7 | #7 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 |
| Reinf | "e" SIZE BAR | #4 | #4 | #5 | #6 | #5 | #6 | #4 | #4 | #5 | #5 | #5 | #6 | #6 | #4 | #5 | #6 | #6 | #7 | #6 | #7 |
| QUANTITIES | CONCRETE CF/LF | 7.8 | 8.3 | 9.2 | 9.6 | 10.7 | 11.6 | 9.5 | 10.0 | 10.9 | 11.4 | 12.4 | 12.9 | 14.1 | 15.1 | 13.1 | 14.3 | 14.2 | 15.4 | 15.9 | 18.0 |
| QUANTITIES | REINFORCEMENT LB/LF | 47.7 | 51.1 | 57.8 | 71.4 | 63.5 | 80.8 | 57.8 | 73.7 | 66.6 | 92.5 | 83.0 | 111 | 101 | 114 | 77.6 | 94.7 | 96.6 | 114 | 110 | 126 |
| *** SOIL PRESSURE (ksf) | | 2.4 | 4.5 | 2.4 | 4.5 | 2.5 | 4.6 | 2.4 | 4.5 | 2.4 | 4.5 | 2.5 | 4.6 | 2.5 | 4.6 | 2.4 | 4.6 | 2.5 | 4.6 | 2.5 | 4.7 |

| SPAN, S | | 7′ | | | | | 8′ | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HEIGHT, H | | 3′ | 4′ | 5′ | 6′ | 7′ | 4′ | 5′ | 6′ | 7′ | 8′ |
| MAXIMUM EARTH COVER | | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ |
| Conc | ROOF $T_1$ | 8″ | 10″ | 8″ | 10″ | 8″ | 10½″ | 8½″ | 11½″ | 8½″ | 11½″ |
| Conc | WALLS $T_2$ | 7″ | 8″ | 7½″ | 9½″ | 8½″ | 11″ | 6½″ | 7½″ | 7″ | 8½″ |
| Conc | INVERT $T_3$ | 8″ | 10½″ | 8″ | 10½″ | 8″ | 10½″ | 8½″ | 11½″ | 8½″ | 11½″ |
| Reinf | SPACING | 6″ | 4½″ | 6″ | 4½″ | 6″ | 5½″ | 6″ | 5½″ | 5½″ | 5″ |
| Reinf | "a" SIZE BAR | #7 | #6 | #7 | #6 | #7 | #7 | #7 | #7 | #7 | #7 |
| Reinf | "e" SIZE BAR | #6 | #7 | #6 | #7 | #6 | #7 | #7 | #7 | #7 | #7 |
| QUANTITIES | CONCRETE CF/LF | 14.0 | 17.5 | 15.1 | 19.1 | 16.7 | 21.3 | 18.8 | 24.5 | 21.8 | 28.3 |
| QUANTITIES | REINFORCEMENT LB/LF | 102 | 106 | 115 | 124 | 134 | 166 | 160 | 181 | 173 | 196 |
| *** SOIL PRESSURE (ksf) | | 2.4 | 4.6 | 2.4 | 4.6 | 2.5 | 4.7 | 2.5 | 4.7 | 2.6 | 4.8 |

| SPAN, S | | 10′ | | | | | | 12′ | | | | | | 14′ | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEIGHT, H | | 5′ | 6′ | 7′ | 8′ | 9′ | 10′ | 6′ | 7′ | 8′ | 9′ | 10′ | 11′ | 12′ | 7′ | 8′ | 9′ | 10′ | 11′ | 12′ | 13′ | 14′ |
| MAXIMUM EARTH COVER | | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ |
| Conc | ROOF $T_1$ | 9½″ | 12″ | 9½″ | 12″ | 9½″ | 12″ | 9½″ | 12″ | 9½″ | 12″ | 9½″ | 12″ | 10½″ | 14½″ | 10½″ | 14½″ | 10½″ | 14½″ | 10½″ | 14½″ | 10½″ | 14½″ |
| Conc | WALLS $T_2$ | 8½″ | 8½″ | 8½″ | 9½″ | 9″ | 10½″ | 9″ | 12″ | 10″ | 13½″ | 11″ | 15″ | 9″ | 10½″ | 9″ | 10½″ | 9½″ | 12″ | 10″ | 13½″ | 11″ | 15″ |
| Conc | INVERT $T_3$ | 10″ | 12½″ | 10″ | 12½″ | 10″ | 12½″ | 10″ | 13″ | 10″ | 13″ | 10″ | 13″ | 11″ | 14½″ | 11″ | 15″ | 11″ | 15″ | 11½″ | 15″ | 11½″ | 15½″ |
| Reinf | SPACING | 11″ | 12″ | 12″ | 12″ | 11″ | 11″ | 10″ | 11″ | 10″ | 10″ | 11″ | 10″ | 9″ | 10″ | 9″ | 10″ | 9″ | 10″ | 8″ | 10″ | 8″ | 9″ |
| Reinf | **"a" SIZE BAR | #7 | #8 | #7 | #8 | #7 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 |
| Reinf | SIZE BAR | #7 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #7 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 |
| Reinf | "b" DIMENSION "B" ft-inch | 2-11 | 2-11 | 2-11 | 3-0 | 2-11 | 3-9 | 2-11 | 3-9 | 2-11 | 3-9 | 2-11 | 3-9 | 3-1 | 3-2 | 3-9 | 3-9 | 3-9 | 3-9 | 3-7 | 3-9 | 3-7 | 4-4 |
| Reinf | DIMENSION "Bw" ft-inch | 4-10 | 5-0 | 4-10 | 5-0 | 4-10 | 5-0 | 4-10 | 5-0 | 4-10 | 5-0 | 4-7 | 4-7 | 6-0 | 5-10 | 6-2 | 6-7 | 6-2 | 6-7 | 4-11 | 4-11 | 4-11 | 4-11 |
| Reinf | "c" SIZE BAR # | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #7 | #7 | #7 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #7 |
| Reinf | DIMENSION "C" ft-inch | 3-4 | 3-6 | 4-4 | 4-8 | 7-7 | 4-8 | 8-2 | 4-8 | 7-7 | 5-2 | 7-7 | 5-11 | 4-4 | 3-10 | 8-1 | 5-7 | 8-1 | 5-7 | 8-1 | 5-7 | 8-1 | 6-4 |
| Reinf | **"e" SIZE BAR | #4 | #4 | #4 | #5 | #6 | #6 | #6 | #7 | #7 | #7 | #8 | #8 | #4 | #4 | #4 | #4 | #4 | #5 | #4 | #5 | #5 | #5 |
| QUANTITIES | CONCRETE CF/LF | 25.1 | 30.4 | 27.1 | 33.1 | 29.2 | 36.2 | 30.7 | 41 | 34 | 45.8 | 37.6 | 51 | 33.2 | 43.7 | 34.7 | 46.1 | 37 | 50.4 | 39.5 | 55.3 | 43.7 | 60.6 |
| QUANTITIES | REINFORCEMENT LB/LF | 271 | 296 | 278 | 333 | 341 | 366 | 359 | 406 | 428 | 469 | 487 | 530 | 322 | 371 | 379 | 417 | 390 | 449 | 430 | 477 | 499 | 500 |
| *** SOIL PRESSURE (ksf) | | 3.7 | 4.7 | 3.8 | 4.7 | 3.8 | 4.8 | 3.8 | 4.8 | 3.9 | 4.9 | 3.9 | 5.0 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.9 | 3.6 | 4.9 | 3.7 | 5.0 |

| SPAN, S | | 14′ | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEIGHT, H | | 7′ | 8′ | 9′ | 10′ | 11′ | 12′ | 13′ | 14′ | | | | | | | | |
| MAXIMUM EARTH COVER | | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ | 10′ | 20′ |
| Conc | ROOF $T_1$ | 12″ | 16½″ | 12″ | 16½″ | 12″ | 16½″ | 12″ | 16½″ | 12″ | 16½″ | 12″ | 16½″ | 12″ | 16½″ | 12″ | 16½″ |
| Conc | WALLS $T_2$ | 9½″ | 11″ | 9½″ | 12″ | 10″ | 13½″ | 11″ | 15″ | 12½″ | 16½″ | 13½″ | 18″ | 15″ | 19½″ | 16½″ | 21½″ |
| Conc | INVERT $T_3$ | 12½″ | 17″ | 12½″ | 17″ | 12½″ | 17″ | 12½″ | 17″ | 12½″ | 17″ | 12½″ | 17″ | 13″ | 17½″ | 13″ | 18″ |
| Reinf | SPACING | 10″ | 9″ | 10″ | 9″ | 10″ | 8″ | 10″ | 8″ | 9″ | 8″ | 8″ | 10″ | 10″ | 10″ | 10″ | 9″ |
| Reinf | **"a" SIZE BAR | #7 | #8 | #7 | #8 | #7 | #7 | #7 | #7 | #7 | #8 | #7 | #8 | #7 | #8 | #7 | #8 |
| Reinf | SIZE BAR | #7 | #7 | #7 | #7 | #7 | #7 | #8 | #7 | #8 | #7 | #7 | #8 | #7 | #8 | #8 | #8 |
| Reinf | "b" DIMENSION "B" ft-inch | 4-3 | 4-2 | 6-9 | 6-9 | 5-10 | 5-10 | 6-0 | 6-4 | 8-11 | 6-4 | 8-11 | 7-0 | 8-11 | 7-7 | 8-11 | 7-9 |
| Reinf | DIMENSION "Bw" ft-inch | 6-5 | 7-0 | 7-0 | 8-4 | 7-0 | 8-4 | 6-0 | 6-0 | 6-0 | 6-0 | 6-0 | 6-0 | 5-0 | 6-0 | 4-6 | 6-0 |
| Reinf | "c" SIZE BAR # | #7 | #7 | #7 | #7 | #7 | #8 | #8 | #8 | #8 | #8 | #8 | #8 | #8 | #8 | #8 | #8 |
| Reinf | DIMENSION "C" ft-inch | 7-0 | 8-11 | 7-0 | 8-11 | 7-0 | 8-11 | 7-7 | 8-11 | 7-9 | 8-11 | 8-1 | 9-5 | 8-1 | 9-10 | 8-3 | 9-10 |
| Reinf | **"e" SIZE BAR | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #5 | #5 | #5 | #5 | #5 | #6 | #7 | #7 | #7 |
| QUANTITIES | CONCRETE CF/LF | 65.6 | 51.7 | 71.8 | 55.8 | 77.7 | 60.9 | 84.2 | 66.9 | 91.8 | 73.4 | 101 | 79.8 | 110 | 87.3 | 120 | 95.3 |
| QUANTITIES | REINFORCEMENT LB/LF | 608 | 526 | 632 | 633 | 651 | 630 | 717 | 688 | 737 | 747 | 861 | 827 | 901 | 893 | 1,000 | 1,000 |
| *** SOIL PRESSURE (ksf) | | 4.9 | 3.5 | 5.0 | 3.6 | 5.1 | 3.6 | 5.1 | 3.7 | 5.2 | 3.7 | 5.3 | 3.8 | 5.4 | 3.8 | 5.5 | 3.9 |

| "d" BARS, FOR EARTH COVERS UP TO AND INCLUDING 10′-0″ | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SPAN | 4′ | 5′ | 6′ | 7′ | 8′ | 10′ | 12′ | 14′ |
| NUMBER | 7 | 8 | 9 | 10 | 11 | 12 | 15 | 20 |

* See Note 5
** See Note 6
*** See Note 10

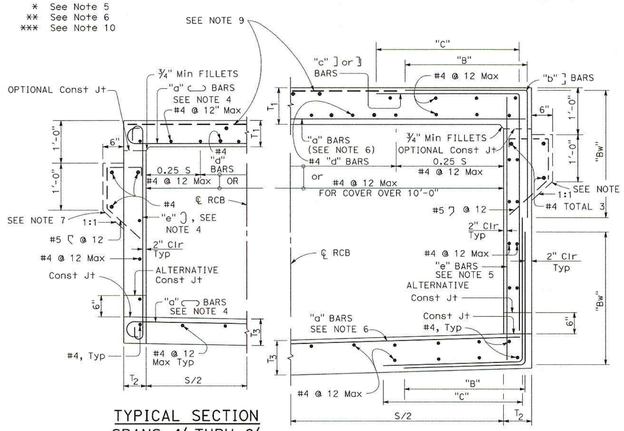


TYPICAL SECTION
SPANS 4′ THRU 8′

TYPICAL SECTION
SPANS 10′ THRU 14′

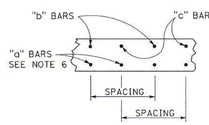


ROOF SECTION
SPANS 10′ THRU 14′
INVERT SIMILAR

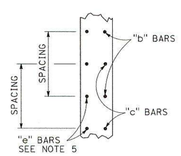


WALL SECTION
SPANS 10′ THRU 14′

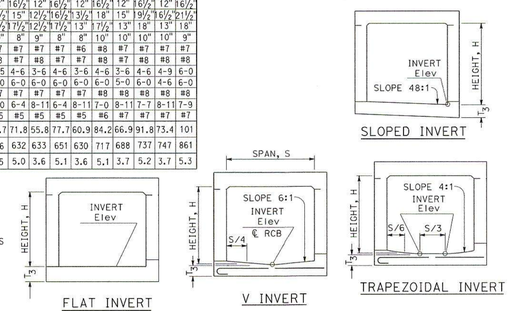


SLOPED INVERT

FLAT INVERT

V INVERT

TRAPEZOIDAL INVERT

ALTERNATIVE INVERTS

NOTES:

1. For boxes with span or height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. Quantities are approximate and for design purposes only.
3. For boxes with span or height or cover greater than those shown in tables, a special design is required.
4. It is permissible to eliminate the 180° hooks on every other bar.
5. "e" bars are at half spacing (spans 10′ - 14′ only).
6. "a" bars are at half spacing (spans 10′ - 14′ only).
7. Provide paving notch when top is exposed and when pavement is concrete, and adjust quantities.
8. For design and details not shown, see Standard Plan D82.
9. For exposed top, provide #4 @ 12 each way, lap "c" bars 2′-0″ or use full span length.
10. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**CAST-IN-PLACE REINFORCED CONCRETE SINGLE BOX CULVERT**

NO SCALE

**D80**

1-29-18

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

REGISTERED CIVIL ENGINEER
May 31, 2018
PLANS APPROVAL DATE
Carl W. Dunn No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA
REGISTERED PROFESSIONAL ENGINEER
*THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.*

**2018 STANDARD PLAN D80**

221

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK DATE: 2/2/2022
DRAWN BY: BK DATE: 2/2/2022
CHECKED BY: DATE:

**CITY OF ONTARIO**
RECOMMENDED BY: BRIAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273′ (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5″ BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5′ +/- SOUTH OF EOR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA RAE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**

DETAILS

PM-20273

SHEET 22 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14552

01/09/2023

Drawing Name: P:\Year_2020\2020-283 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\13_2020-283_SD_DET Line B-E.dwg
Last Opened: Jan 09, 2023 - 2:27pm by: BrentKing

## DESIGN NOTES:

Design Specifications:
AASHTO LRFD Bridge Design Specifications, 6th Edition with California Amendments.

Loading:
Live load: (AASHTO LRFD 3.6.1.2)
HL-93 consists of design truck or design tandem and design lane load.

Impact Factor: (Apply to roof slab only)
$IM = 33(1.0-0.125D_E) \geq 0\%$ (AASHTO LRFD 3.6.2.2)
$D_E$ = minimum depth of earth cover

Earth load:
Earth pressure for two conditions:
140 pcf vertical, 42 pcf horizontal
140 pcf vertical, 140 pcf horizontal

Load Factors:
AASHTO LRFD Table 3.4.1.1 & Table 3.4.1.2

Unit stresses:
$f'_c$ = 3600 psi
$f_y$ = 60,000 psi

Distribution "d" bars:
Up to and including 10'-0" cover
Express as a percentage of main positive reinforcement required: $\frac{100}{\sqrt{S}}$, Max 50%,
Over 10'-0" cover,
# 4 @ 12 maximum

Shear:
$V_c = \{2.14\sqrt{f'_c}+4600\frac{A_s}{bd_e}\frac{Vud_e}{Mu}\}b.d_e \leq 4.0\sqrt{f'_c}b.d_e$ (Pounds)
$V_c$ shall not be less than $3.00\sqrt{f'_c}b.d_e$ for frame members and $2.5\sqrt{f'_c}b.d_e$ for simply supported members.

Exclusion:
Compressive reinforcement and negative moment reduction (for continuity) do not apply.
Axial loading on members has not been considered.

## CONSTRUCTION NOTES:

Construction loads:
Strutting required as shown on Standard Plan D88.
Strutting may be required on culvert extensions when existing parapet is removed.

Expansion joints:
Invert:
No expansion joints shall be permitted.

Roof and Walls:
When cover is less than span length-
Place ½" premolded expansion joint filler at 30'-0" ± centers outside the paved roadway lanes and place Bridge Detail 3-2, Standard Plan B0-3, at 30'-0" centers under paved roadway lanes.
When cover is more than span length-
Place ½" premolded expansion joint filler at 30'-0" ± centers and additional ½" premolded expansion joints at locations of change in foundation character, as directed by the Engineer.

Construction joints:
Temporary joints may be permitted if normal (or radial) to ℄ of RCB. Otherwise, the contractor is to submit a proposal for consideration.

Cutoff walls:
4'-0" cutoff walls are to be provided at inlet and/or outlet unless adjacent channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant.

Earthwork:
See Standard Plan A62E.

Backfill:
See Standard Specifications, except that the difference in level of backfill (against outside walls) shall not exceed 2'-0".

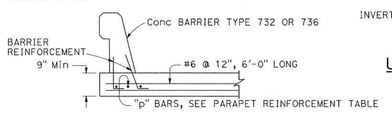


BARRIER SECTION (30'-0" MINIMUM)

## GENERAL NOTES:

Designation:
Standard single or multiple box culverts are shown on plans as span times height with maximum cover over roof thus: 8' x 5' RCB with 10' or double 10' x 5' RCB with 20', followed by alternatives.

Alternatives:
Single cell: Invert will be sloped unless "trapezoidal invert", "flat invert" or "V invert" is included in designation.
Multiple cell: Invert will be vee unless "flat invert" is specified. Ends of culvert will be rounded unless "square ends" are designated. Parapets will be as shown unless designated in plans. Such designations may be different for inlet and outlet ends.

Quantities:
Quantities do not include the following:
- Concrete for parapet, paving notches and cut-off wall.
- Reinforcement for 2X splices, parapets, paving notches, cut-off wall and additional required bars for exposed top slab (D-80, Note 9).

Reinforcement placement:
Main reinforcement is to be placed transversely or, for curved culverts, radially. When radial, reinforcing spacing of the "a", "f" and "g" bars is measured along the centerline. Stagger splices not shown. Hooks may be rotated or tilted, as necessary, for clearance.

Special reinforcement coverage:
Box standard plans are not to be used for culverts in a corrosive environment or where there is a severe abrasive flow condition or in freeze-thaw locations.

Special design:
Required for culverts with conditions, loads, design bearing pressures or sizes greater than those given on this plan or Standard Plans D80 & D81. Also required for multiple cell culverts with unequal spans. For culverts with railroad loading, see the current AREMA design specification.

3 or more cells:
For culverts with more than two cells, use dimensions and reinforcement for the standard "double box culvert" and adjust quantities accordingly.

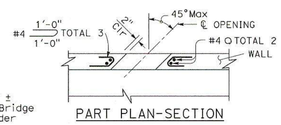


PART PLAN-SECTION

BRIDGE DETAIL 3-2 Std PLAN B0-3, NO EXPANSION JOINT WITHIN 4'-0" OF ℄ OPENING

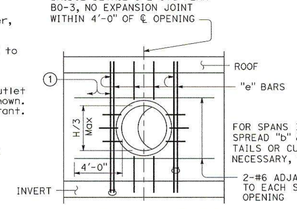


LONGITUDINAL SECTION

UTILITY OPENING-WALL

H=Height of box

(1) Adjacent to each side of the opening, place additional bars equivalent to half the interrupted main reinforcement.

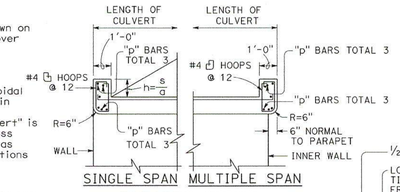


SINGLE SPAN MULTIPLE SPAN

PARAPET DETAIL

s = Clear span (ft)
a = 12 cosine skew angle
h = Height, 1'-0" Min

| PARAPET "p" BARS | | | |
|---|---|---|---|
| SPAN \ SKEW ANGLE | 0° TO 15° | 16° TO 30° | 31° TO 45° |
| 4' | #4 | #4 | #4 |
| 6' | #4 | #4 | #5 |
| 8' | #4 | #5 | #6 |
| 10' | #5 | #6 | #7 |
| 12' | #6 | #7 | #8 |
| 14' | #7 | #8 | #9 |

PARAPET REINFORCEMENT

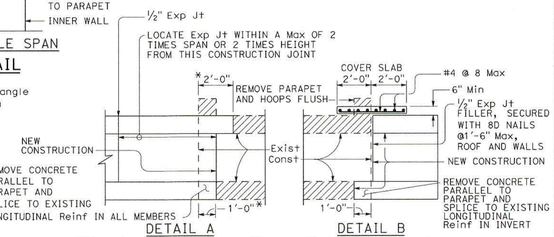


DETAIL A

20° maximum skew as shown. If existing longitudinal and transverse reinforcing bars in top slab are lap spliced with new longitudinal and transverse reinforcing bars, the 20° skew may be exceeded. Lap splicing may require removal of top slab in excess of 2'-0" shown.

DETAIL B

Single cell only, no skew allowed, 1'-0" minimum cover.

* Measured perpendicular to parapet

CULVERT EXTENSION

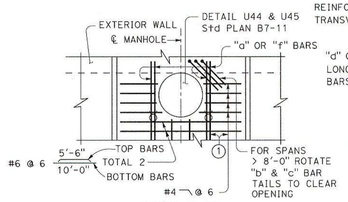


PART PLAN

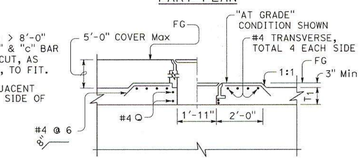


PART LONGITUDINAL SECTION

MANHOLE

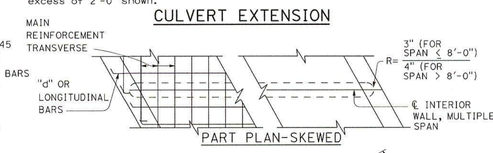


PART PLAN-SKEWED

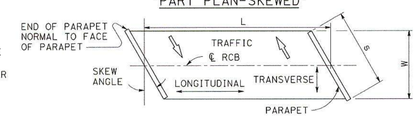


RCB TERMINOLOGY

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS**

NO SCALE

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

REGISTERED CIVIL ENGINEER
May 31, 2018
PLANS APPROVAL DATE
Cari W. Dunn
No. C59976
Exp. 6-30-18
CIVIL
STATE OF CALIFORNIA
REGISTERED PROFESSIONAL ENGINEER

*THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.*

**D82**

1-29-18

**2018 STANDARD PLAN D82**

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIAR REE MOJARO No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**

DETAILS

PM-20273

SHEET 23 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14553

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\13_2020-263_SD_DET Line B-E.dwg
Last Opened: Jan 09, 2023 - 2:27pm by: Brent.King

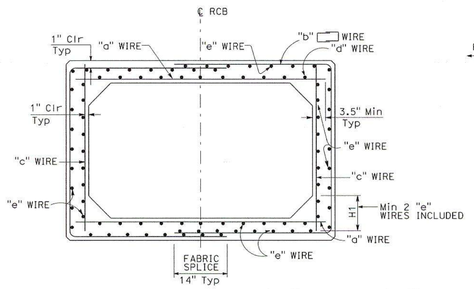


TYPICAL SECTION - SPANS 4'-0" THRU 12'-0"

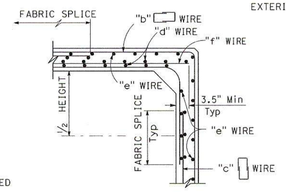


ALTERNATIVE DETAILING OPTION

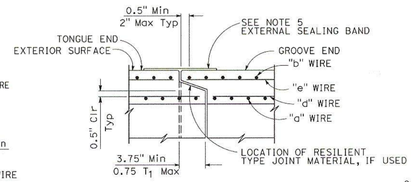


END JOINT DETAIL

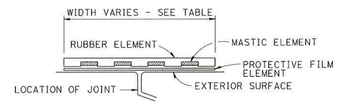


EXTERNAL SEALING BAND SCHEMATIC

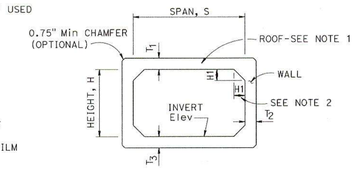


SCHEMATIC

| TABLE | |
|---|---|
| SPAN | EXTERNAL SEALING BAND WIDTH |
| 4'-6' | 9" |
| 7'-8' | 11" |
| 10'-12' | 13" |

| Dist | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

REGISTERED CIVIL ENGINEER
May 31, 2018
PLANS APPROVAL DATE
Carl W. Dunn No. C59976 Exp. 6-30-18 CIVIL STATE OF CALIFORNIA
REGISTERED PROFESSIONAL ENGINEER
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

| SPAN, S | | | 4' | | 3' | | 4' | | 2' | | 3' | | 4' | | 5' | | 3' | | 4' | | 5' | | 6' | | 3' | | 4' | | 5' | | 6' | | 7' | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEIGHT, H | | | 2' | | 3' | | 4' | | 2' | | 3' | | 4' | | 5' | | 3' | | 4' | | 5' | | 6' | | 3' | | 4' | | 5' | | 6' | | 7' | |
| MAXIMUM EARTH COVER | | | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' |
| CONCRETE (INCH) | ROOF | $T_1$ | 5.5" | 5.5" | 5.5" | 5.5" | 5.5" | 5.5" | 6" | 6" | 6" | 6" | 6" | 6" | 6" | 6" | 7" | 7" | 7" | 7" | 7" | 7" | 7" | 7" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" |
| | SIDE WALL | $T_2$ | 5.5" | 5.5" | 5.5" | 5.5" | 5.5" | 5.5" | 6" | 6" | 6" | 6" | 6" | 6" | 6" | 6" | 7" | 7" | 7" | 7" | 7" | 7" | 7" | 7" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" |
| | INVERT | $T_3$ | 5.5" | 5.5" | 5.5" | 5.5" | 5.5" | 5.5" | 6" | 6" | 6" | 6" | 6" | 6" | 6" | 6" | 7" | 7" | 7" | 7" | 7" | 7" | 7" | 7" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" | 8" |
| MINIMUM WELDED WIRE FABRIC ($inch^2/ft$) | | "a" | .33 | .47 | .34 | .49 | .34 | .50 | .40 | .62 | .41 | .62 | .42 | .64 | .43 | .64 | .44 | .67 | .45 | .70 | .46 | .71 | .47 | .72 | .47 | .72 | .48 | .75 | .50 | .78 | .50 | .79 | .51 | .80 |
| | | "b" | .23 | .28 | .23 | .25 | .21 | .23 | .26 | .36 | .24 | .36 | .24 | .33 | .24 | .30 | .28 | .44 | .27 | .40 | .27 | .37 | .27 | .38 | .33 | .52 | .31 | .48 | .30 | .45 | .30 | .43 | .30 | .48 |
| | | "c" | .11 | .11 | .11 | .12 | .18 | .24 | .11 | .11 | .11 | .11 | .13 | .23 | .24 | .34 | .11 | .11 | .11 | .12 | .19 | .27 | .27 | .42 | .11 | .11 | .11 | .11 | .13 | .20 | .26 | .31 | .30 | .50 |
| | | "d" | .16 | .11 | .16 | .11 | .16 | .11 | .17 | .11 | .18 | .11 | .18 | .11 | .18 | .11 | .17 | .11 | .18 | .11 | .18 | .11 | .18 | .11 | .17 | .11 | .17 | .11 | .18 | .11 | .18 | .11 | .18 | .11 |
| | | "e" | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 |
| | | "f" | .22 | .36 | .23 | .37 | .22 | .26 | .29 | .51 | .30 | .51 | .29 | .41 | .26 | .30 | .33 | .56 | .34 | .58 | .27 | .44 | .21 | .30 | .36 | .61 | .37 | .64 | .37 | .57 | .25 | .48 | .21 | .30 |
| * QUANTITY | Conc | CY/LF | .31 | | .34 | | .38 | | .37 | | .41 | | .44 | | .48 | | .51 | | .56 | | .60 | | .64 | | .63 | | .68 | | .73 | | .78 | | .83 | |
| | Reinf | LB/LF | 35 | 41 | 39 | 45 | 45 | 51 | 49 | 58 | 49 | 62 | 54 | 69 | 62 | 78 | 60 | 79 | 64 | 83 | 72 | 93 | 80 | 107 | 72 | 98 | 76 | 102 | 81 | 110 | 92 | 120 | 101 | 143 |
| ** SOIL PRESSURE (ksf) | | | 2.3 | 4.4 | 2.4 | 4.5 | 2.4 | 4.5 | 3.1 | 4.4 | 3.1 | 4.5 | 3.1 | 4.5 | 3.2 | 4.5 | 2.7 | 4.5 | 2.8 | 4.5 | 2.8 | 4.6 | 2.8 | 4.6 | 2.5 | 4.5 | 2.5 | 4.6 | 2.5 | 4.6 | 2.5 | 4.6 | 2.6 | 4.6 |

| SPAN, S | | | 8' | | | | | | | | 10' | | | | | | | | | | | | 12' | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEIGHT, H | | | 4' | | 5' | | 6' | | 7' | | 8' | | 5' | | 6' | | 7' | | 8' | | 9' | | 10' | | 6' | | 7' | | 8' | | 9' | | 10' | | 11' | | 12' | |
| MAXIMUM EARTH COVER | | | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' |
| CONCRETE (INCH) | ROOF | $T_1$ | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" |
| | SIDE WALL | $T_2$ | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" |
| | INVERT | $T_3$ | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 8.5" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 10" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" | 12" |
| MINIMUM WELDED WIRE FABRIC ($inch^2/ft$) | | "a" | .55 | .87 | .56 | .90 | .57 | .92 | .58 | .93 | .58 | .94 | .66 | 1.07 | .67 | 1.10 | .69 | 1.13 | .70 | 1.14 | .70 | 1.16 | .71 | 1.16 | .73 | 1.21 | 1.21 | 1.24 | .77 | 1.27 | 1.24 | 1.29 | 1.27 | 1.31 | .78 | 1.32 | 1.29 | 1.32 |
| | | "b" | .37 | .59 | .35 | .55 | .33 | .52 | .33 | .52 | .36 | .57 | .45 | .74 | .43 | .70 | .41 | .67 | .40 | .64 | .43 | .67 | .48 | .67 | .51 | .85 | .85 | .81 | .49 | .77 | .81 | .74 | .77 | .77 | .53 | .79 | .74 | .79 |
| | | "c" | .11 | .11 | .11 | .11 | .20 | .31 | .31 | .42 | .38 | .62 | .11 | .11 | .11 | .11 | .22 | .31 | .36 | .42 | .40 | .62 | .54 | .86 | .11 | .11 | .11 | .11 | .23 | .30 | .37 | .42 | .42 | .60 | .54 | .82 | .42 | 1.06 |
| | | "d" | .19 | .11 | .19 | .11 | .20 | .11 | .20 | .11 | .20 | .11 | .20 | .11 | .20 | .11 | .21 | .11 | .21 | .11 | .21 | .11 | .21 | .11 | .20 | .11 | .20 | .11 | .21 | .11 | .22 | .11 | .22 | .11 | .22 | .11 | .22 | .11 |
| | | "e" | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 | .11 |
| | | "f" | .44 | .76 | .45 | .79 | .37 | .61 | .27 | .52 | .20 | .31 | .55 | .96 | .56 | .99 | .47 | .81 | .34 | .73 | .31 | .53 | .16 | .30 | .62 | 1.10 | 1.10 | 1.13 | .64 | .97 | 1.13 | .87 | .97 | .71 | .40 | .50 | .87 | .26 |
| * QUANTITY | Conc | CY/LF | .78 | | .83 | | .88 | | .94 | | .99 | | 1.10 | | 1.17 | | 1.23 | | 1.29 | | 1.35 | | 1.41 | | 1.56 | | 1.63 | | 1.70 | | 1.78 | | 1.85 | | 1.93 | | 2.00 | |
| | Reinf | LB/LF | 93 | 129 | 97 | 133 | 105 | 148 | 117 | 161 | 131 | 189 | 133 | 191 | 138 | 196 | 148 | 212 | 191 | 225 | 176 | 253 | 201 | 282 | 174 | 255 | 179 | 261 | 191 | 279 | 207 | 293 | 223 | 323 | 249 | 357 | 281 | 393 |
| ** SOIL PRESSURE (ksf) | | | 2.5 | 4.6 | 2.5 | 4.6 | 2.5 | 4.6 | 2.5 | 4.6 | 2.5 | 4.6 | 3.8 | 4.6 | 3.8 | 4.7 | 3.8 | 4.7 | 4.6 | 4.7 | 3.9 | 4.7 | 3.9 | 4.8 | 3.6 | 4.7 | 3.7 | 4.7 | 3.7 | 4.8 | 3.7 | 4.8 | 3.7 | 4.8 | 3.8 | 4.9 | 3.8 | 4.9 |

* See Note 3 ** See Note 6

NOTES:

1. The inside and outside surfaces of the RCB roof shall be marked "TOP".
2. H1 minimum shall equal the wall thickness. H1 maximum shall be 8" for spans through 8' and 14" for spans over 8'.
3. Quantities are approximate and for design purposes only.
4. For design and details not shown see Standard Plan D83B.
5. For external sealing band applications see Standard Plan A62G.
6. Soil pressures shown are factored per AASHTO LRFD and include soil weight of fill over box, self weight of box and live load where applicable.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**PRECAST REINFORCED CONCRETE BOX CULVERT**

NO SCALE

**D83A**

1-29-18

**2018 STANDARD PLAN D83A**

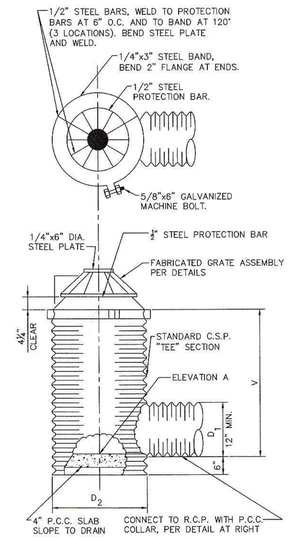


**NOTES:**

1. V, $D_1$, $D_2$ AND ELEVATION "A" SHALL BE SHOWN ON THE CONSTRUCTION PLANS.
2. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT C.S.P. OF SIZE "$D_2$".
3. GRATE ASSEMBLY SHALL BE GALVANIZED AFTER FABRICATION.
4. R.C.P. SHALL BE SIZED TO FIT FUTURE CATCH BASIN DESIGN.
5. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT THE OUTSIDE DIAMETER OF STANDARD JUNCTION STRUCTURE SHAFT IF INDICATED ON CONSTRUCTION PLANS.

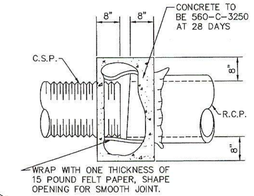


**COLLAR DETAIL**

12 TYPICAL TEMPORARY STANDPIPE DETAIL



Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**

DETAILS

PM-20273

SHEET 24 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14534

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\13_2020-263_SD_DET Line B-E.dwg
Last Opened: Jan 09, 2023 - 2:27pm by: Brent.King

| Dist | COUNTY | ROUTE | POST-MILES TOTAL PROJECT | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| | | | | | |

REGISTERED CIVIL ENGINEER

May 31, 2018
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Carl W. Dunn — No. C59976 — Exp. 6-30-18 — CIVIL — STATE OF CALIFORNIA

*THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.*

## DESIGN NOTES:

Specifications:

AASHTO LRFD Bridge Design Specifications, 4th Edition with California Amendments.

Earth load:

Earth pressures for two conditions:
140 pcf Vert, 42 pcf Horiz
140 pcf Vert, 140 pcf Horiz

Unit stresses:

$f'c = 5.0$ ksi
$fy = 65.0$ ksi for weld wire fabric
$n = 7$

Shear:

Based on

$V_c = \{2.14\sqrt{f'_c} + 4600 \frac{A_s}{b d_e} \frac{V_u d_e}{M_u}\} b.d_e \leq 4.0\sqrt{f'_c} b.d_e$ (Pounds)

$V_c$ shall not be less than $3.00\sqrt{f'_c} b.d_e$ for frame members and $2.5\sqrt{f'_c} b.d_e$ for simply supported members.

Exclusion:

Axial loading on the members has not been considered.

## GENERAL NOTES:

Designation:

Standard single or multiple precast box culverts are shown on the plans as span times height with maximum cover over roof thus: 8' x 5' RCB with 10'-0" or double 10' x 5' RCB with 20'-0", followed by alternatives.

Alternatives:

Single cell:

Standard dimensions of AASHTO Material Specification 'M259' or 'M273'.

Multiple cell:

Constructed by placing single cells adjacent to each other. Inlet and outlet ends of culvert will be rounded unless square ends are designated. Parapet will be shown unless designated in plans. Such designation may be different for inlet and outlet ends.

Limitations:

Where the overfill is less than 12", Precast RCB culverts are not to be used. Precast RCB culverts are not to be used in siphon or pressurized installations unless appropriate "watertight" jointing is provided.

Special reinforcement coverage:

Precast RCB culvert standard plans are not to be used in a corrosive environment or where there is a severe abrasive flow condition or freeze-thaw locations.

Special design:

Required for culvert with different conditions, loads or design bearing pressures greater than those given on these plans. Required for culverts where end details need higher skew angles, higher parapets or barrier sections.

## CONSTRUCTION NOTES:

Cutoff walls:

4'-0" Cutoff walls are to be provided at inlet and/or outlet unless channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant. See Standard Plans D84, D85 and D86A.

Wingwalls:

Wingwalls shall be cast-in-place and shall conform to standard plan details for box culvert wingwalls. See Standard Plans D84, D85 and D86A.

Earthwork:

See Standard Plan A62G.

Construction loads:

Strutting may be required near temporary ends. For construction loads on culverts, See Standard Plan D88.

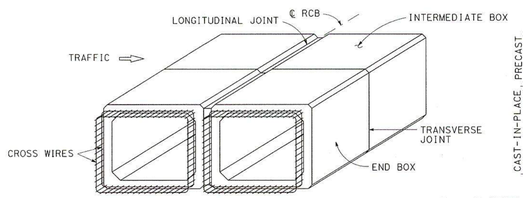


PRECAST RCB TERMINOLOGY

NOTE: Inner and outer reinforcement to be exposed as required to tie to cast-in-place construction. A minimum of two cross wires shall be exposed on all sides.

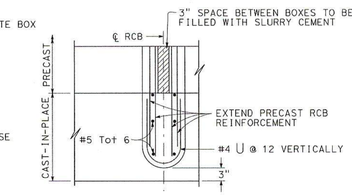


PARTIAL PLAN INTERIOR WALL MULTICELL CULVERT

| PARAPET "P" BARS | | | |
|---|---|---|---|
| SPAN \ SKEW ANGLE | 0° TO 15° | 16° TO 30° | 31° TO 45° |
| 4'-0" | #5 | #5 | #5 |
| 5'-0" | #5 | #5 | #6 |
| 6'-0" | #6 | #6 | #6 |
| 7'-0" | #7 | #7 | #7 |
| 8'-0" | #7 | #7 | #8 |
| 10'-0" | #8 | #8 | #9 |
| 12'-0" | #9 | #9 | #10 |

BARRIER PARAPET REINFORCEMENT

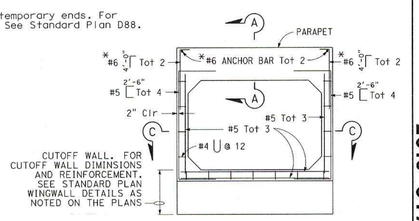


CAST-IN-PLACE END ELEVATION

* Reinforcing required for barrier parapet application only.

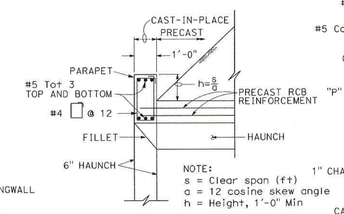


NOTE:
s = Clear span (ft)
a = 12 cosine skew angle
h = Height, 1'-0" Min

SECTION A-A
(Standard Height Parapet)

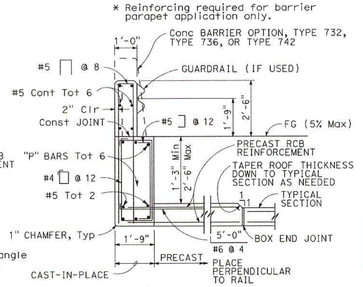


SECTION A-A
(Barrier Parapet)

TYPICAL CULVERT END DETAILS

For wall and invert reinforcement not shown, See "End Elevation" detail.

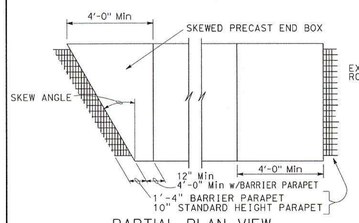


PARTIAL PLAN VIEW

For illustrative purposes only.
For correct skew direction see plans.

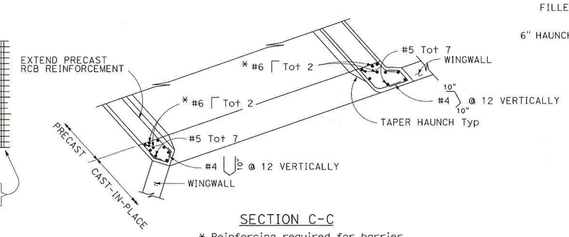


SECTION C-C

* Reinforcing required for barrier parapet application only.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**PRECAST REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS**

NO SCALE

**D83B**

1-29-18

**2018 STANDARD PLAN D83B**

225

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 2/6/23
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 2-7-23

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SIARA REE MACKINNEY — No.85559 — Exp. 9/30/2022 — CIVIL — STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 1/11/23

**STORM DRAIN IMPROVEMENT PLAN**

DETAILS

PM-20273

SHEET 25 OF 26
CONTRACT
ACCOUNT
DWG. NO. D14565

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm Drain\13_2020-263_SD_DET Line B-E.dwg
Last Opened: Jan 09, 2023 - 2:28pm by: Brent.King

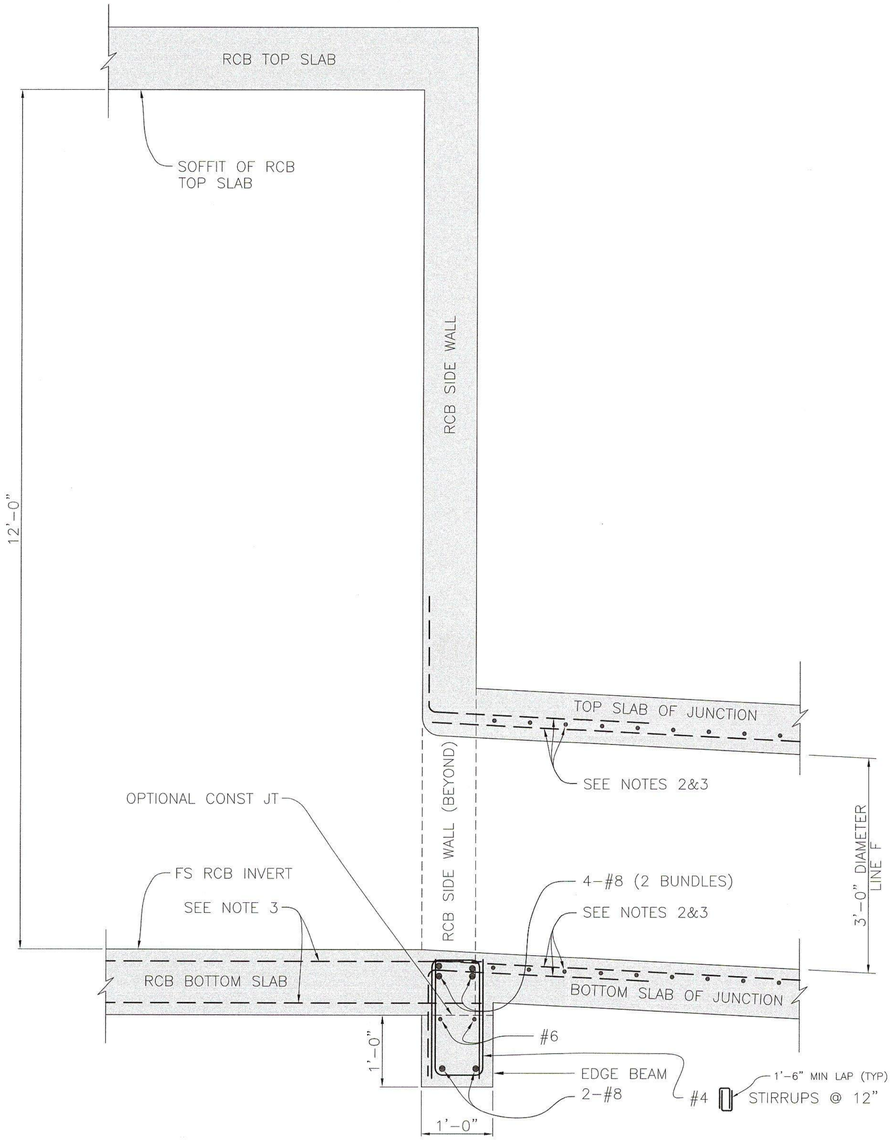


SUPPLEMENTAL
SECTION Z-Z
TO SPPWC STD PLAN 333-2
NO SCALE

NOTES:

1. CLEAR COVER TO ALL BAR REINFORCEMENT IS 2", UNLESS OTHERWISE SHOWN HEREON OR ON THE REFERENCED STANDARD PLANS.
2. CONSTRUCT JUNCTION STRUCTURE (WITH ALL BAR REINFORCEMENT PROPERLY EXTENDED) PER SPPWC STANDARD PLAN 333-2, AS MODIFIED HEREON.
3. FOR BAR REINFORCEMENT AND ADDITIONAL INFORMATION NOT SHOWN, SEE SPPWC STANDARD PLAN 333-2 AND CALTRANS STANDARD PLAN D80 (NOT ALL BARS SHOWN).
4. EDGE BEAM EXTENDS FOR THE FULL LENGTH OF THE 13'X12' RCB (BETWEEN END WALLS), AND ITS LONGITUDINAL REINFORCEMENT EXTENDS INTO THE END WALLS AND TO WITHIN 2" CLEAR OF THE REAR FACE OF EACH END WALL.

REGISTERED PROFESSIONAL ENGINEER
GREGORY L. REND
No. 54529
CIVIL
STATE OF CALIFORNIA

City of Ontario
PM-20273 Storm Drain Line B
Edge Beam Details for
Junction Structure at STA 61+22.93
September 30, 2022

811 Know what's below. Call 811 before you dig.

RECOMMENDED FOR ACCEPTANCE
4LEAF, INC.
Davison Chanda C-83946
01/31/2023
DATE

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 2/2/2022
DRAWN BY: BK
DATE: 2/2/2022
CHECKED BY:
DATE:

**CITY OF ONTARIO**
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — 2/6/23 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — 2-7-23 DATE

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD '88) LEVELED 2018
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REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No.85559 Exp. 9/30/2022 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — 2/2/23 DATE

**STORM DRAIN IMPROVEMENT PLAN**

DETAILS

PM-20273

SHEET 26 OF 26
CONTRACT
ACCOUNT
DWG. NO. D1453L0

01/09/2023

Drawing Name: P:\Year_2020\2020-263 Merrill Commerce Center Phase I - Prologis - Tom Donahue\06 Engineering\Sheets\OFF-SITE\Storm
Date: Jan 09, 2023 - 2:17pm Layout: E-dwg
Last Opened: Jan 09, 2023 - 5:32pm by: Brent.King

## EXCERPT I: STORM DRAIN IMPROVEMENT PLANS FOR LINE C, PM-20537

# STORM DRAIN IMPROVEMENT PLAN

## FOR PM 20537
## GROVE AVENUE
## IN THE CITY OF ONTARIO

## CITY OF ONTARIO GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE CURRENT CITY OF ONTARIO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS AND CURRENT STANDARD SPECIFICATIONS AND STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION AND CALTRANS PERMIT UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS/HER OPERATIONS, WHETHER OR NOT THE FACILITY IS SHOWN ON THESE PLANS.
3. ALL OBSTRUCTIONS WITHIN THE AREA TO BE IMPROVED SHALL BE REMOVED AND/OR RELOCATED AT THE DIRECTION OF THE CITY ENGINEER. UTILITIES ARE TO BE RELOCATED BY THEIR RESPECTIVE OWNERS UNLESS NOTED OTHERWISE. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
4. UTILITY LINE LOCATIONS WERE TAKEN FROM AVAILABLE RECORD DATA AND WERE NOT LOCATED IN THE FIELD, UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
5. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409(B) OF THE CALIFORNIA LABOR CODE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STATE DIVISION OF INDUSTRIAL SAFETY.
6. STATE LAW (SB 3019) REQUIRES THE CONTRACTOR TO CONTACT UNDERGROUND SERVICE ALERT AND OBTAIN AN IDENTIFICATION NUMBER PRIOR TO THE ISSUANCE OF CITY'S ENCROACHMENT PERMITS. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT AT 1-800-422-4133 A MINIMUM OF 48-HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.
7. PRIOR TO THE START OF ANY WORK THE CONTRACTOR SHALL OBTAIN A BUSINESS LICENSE FROM THE CITY OF ONTARIO. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE ENGINEERING DEPARTMENT NO LESS THAN 48 HOURS PRIOR TO START OF ANY CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
8. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT 48 HOURS PRIOR TO TIME OF CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR IS REFERRED TO SECTION 7-10.3 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
9. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH DURING HIS OPERATIONS HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED. RENEWAL OF TRAFFIC STRIPING AND MARKINGS SHALL BE DONE USING REFLECTIVE THERMO-PLASTIC MARKINGS IN CONFORMANCE WITH SECTION 84 & 85 OF THE CALTRANS STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER. ALL REGULATORY, WARNING, AND GUIDE SIGNS SHALL HAVE 3M DIAMOND, VIP GRADE SHEETING WITH SERIES 1160 PROTECTIVE OVERLAY FILM.
10. THE LAND SURVEYORS ACT, SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE, AND SECTIONS 732.5, 1492-5, 1810-5 OF THE STREETS AND HIGHWAY CODE REQUIRE THAT SURVEY MONUMENTS SHALL BE PROTECTED AND PERPETUATED.

    "IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR OTHERS PERFORMING THE CONSTRUCTION WORK TO RETAIN A QUALIFIED REGISTERED CIVIL ENGINEER AND/OR LICENSED LAND SURVEYOR PRIOR TO THE START OF CONSTRUCTION TO LOCATE, REFERENCE AND FILE THE NECESSARY CORNER RECORDS WITH THE COUNTY SURVEYOR'S OFFICE FOR SURVEY CONTROL POINTS/MONUMENTS THAT EXIST AS SHOWN ON RECORDED TRACT MAPS, PARCEL MAPS, RECORDS OF SURVEYS AND HIGHWAY MAPS, AND MAY BE DISTRIBUTED OR DAMAGED BY THE PROPOSED CONSTRUCTION"

    AFTER THE COMPLETION OF THE PROPOSED CONSTRUCTION, SAID MONUMENTS AND/OR CONTROL SURVEY POINTS SHALL BE RESET TO THE NEW SURFACE IN ACCORDANCE WITH THE CURRENT PROFESSIONAL LAND SURVEYING PRACTICES. CORNER RECORDS SHALL BE FILED WITH THE COUNTY SURVEYOR FOR ALL THE NEW MONUMENTS SET.
11. THE DEVELOPER SHALL PROVIDE THE CITY WITH A COMPLETED SET OF "AS BUILT", MYLAR DRAWINGS PRIOR TO THE FINAL INSPECTION.
12. A CITY ACCEPTED/APPROVED SET OF PLANS SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
13. A PRE-CONSTRUCTION MEETING SHALL OCCUR PRIOR TO CONSTRUCTION. ATTENDEES SHALL INCLUDE A CITY REPRESENTATIVE AND THE CONTRACTOR WHO WILL PERFORM THE WORK. "CUT-SHEETS" SHALL BE PROVIDED TO THE CITY AT THIS MEETING FOR ITS REVIEW.
14. CITY ACCEPTANCE OF PLANS DOES NOT RELIEVE THE DEVELOPER FROM RESPONSIBILITY FOR THE CORRECTION OF ERROR AND OMISSION DISCOVERED DURING CONSTRUCTION. UPON REQUEST OF THE CITY INSPECTOR, THE REQUIRED PLAN REVISIONS SHALL BE PROMPTLY SUBMITTED TO THE CITY ENGINEER FOR REVIEW.
15. ANY REQUIRED RIGHT-OF-WAY OR EASEMENT SHALL BE DEDICATED TO AND ACCEPTED BY THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE IMPROVEMENTS WITHIN THE REQUIRED RIGHT-OF-WAY OR EASEMENT.
16. WHERE UTILITIES NEED TO BE SUPPORTED, SAID SUPPORTS SHALL BE IN ACCORDANCE WITH A.P.W.A. STANDARD 224-1 UNLESS OTHERWISE INDICATED.
17. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING SEWER MAIN(S) AND NOTIFY THE DESIGN ENGINEER OF ANY VARIATION FROM DESIGN.
18. THE PIPE SHOWN HEREON SHALL BE INSTALLED IN ACCORDANCE WITH CASE III BEDDING AS SHOWN ON L.A.C.D.P.W. STANDARD 3080-2, UNLESS OTHERWISE SHOWN. "W" VALUE SHALL BE AS SPECIFIED ON L.A.C.D.P.W. STANDARD 3080-2 FOR CASE III BEDDING, NOTES 3 (A), 3 (B), AND 3 (C). IF THE "W" VALUE AT THE TOP OF THE PIPE IS EXCEEDED, THE BEDDING SHALL BE MODIFIED AND/OR PIPE OF ADDITIONAL STRENGTH SHALL BE PROVIDED. ALL PROPOSED MODIFICATIONS TO THIS REQUIREMENT SHALL BE APPROVED BY THE CITY ENGINEER.
19. MINIMUM COVER OF STORM DRAIN MAIN SHALL BE 7 FEET FROM THE FINISHED SURFACE PER STANDARD DRAWING 1302-1304.
20. STORM DRAIN MAIN STATIONING IS PER PIPE CENTERLINE.
21. STREET CENTERLINE STATIONING IS PER THE STREET IMPROVEMENT PLANS AND PROVIDED FOR REFERENCE.
22. CONTRACTOR SHALL NOT BACKFILL TRENCH UNTIL THE CITY INSPECTOR HAS OBTAINED AS-BUILT STATIONING ON ALL STRUCTURES.
23. UPON COMPLETION OF CONSTRUCTION OF ALL STORM DRAIN LINES AND PRIOR TO PAVING, THE DEVELOPER SHALL HIRE A CITY APPROVED VIDEO COMPANY TO VIDEO TAPE THE PIPELINES. CITY SHALL REVIEW SAID VIDEOTAPES FOR POTENTIAL CONSTRUCTION DEFECTS PRIOR TO ACCEPTANCE OF THE PROJECT.

## CIVIL ENGINEERS NOTICE TO CONTRACTOR

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTION AND ANY MEASURES TO PROTECT THE UTILITIES AND STRUCTURES SHOWN AND OTHER LINES OR STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO, THESE UTILITY LINES OR STRUCTURES.
2. THE CONTRACTOR AGREES THAT HE WILL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY AND NOT BE LIMITED TO A NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER, OR ANY PUBLIC AGENCY.
3. THE ESTIMATES OF IMPROVEMENT QUANTITIES AS SHOWN HEREON ARE PROVIDED ONLY FOR THE PURPOSE OF SATISFYING CITY PLAN INFORMATION REQUIREMENTS. THE CONTRACTOR SHALL PERFORM AN INDEPENDENT ESTIMATE OF ALL IMPROVEMENT QUANTITIES AND SHALL USE SAME AS A BASIS FOR HIS BID(S) AND CONTRACT(S).
4. CONTRACTOR TO VERIFY CLEARANCE AT ALL UTILITY CROSSINGS. IF INTERFERENCE OCCURS, OTHER THAN NOTED ON PLAN, CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR POSSIBLE REDESIGN. IF REDESIGN IS NOT FEASIBLE, CONTRACTOR TO RELOCATE UTILITY AT NO EXPENSE TO ENGINEER.
5. CONTRACTOR SHALL TAKE EXTREME CARE DURING UNDERGROUND CONSTRUCTION AND IS RESPONSIBLE FOR TRENCHING AND SHORING. CONTRACTOR SHALL SUBMIT A DETAILED SHORING PLAN PER SECTION 7-10.4.2.2 OF SPPWC AND A PERMIT FROM STATE DIVISION OF INDUSTRIAL SAFETY PRIOR TO COMMENCING WORK.
6. CONTRACTOR SHALL VERIFY PAVEMENT ELEVATION AT RIM PRIOR TO SETTING CONE.

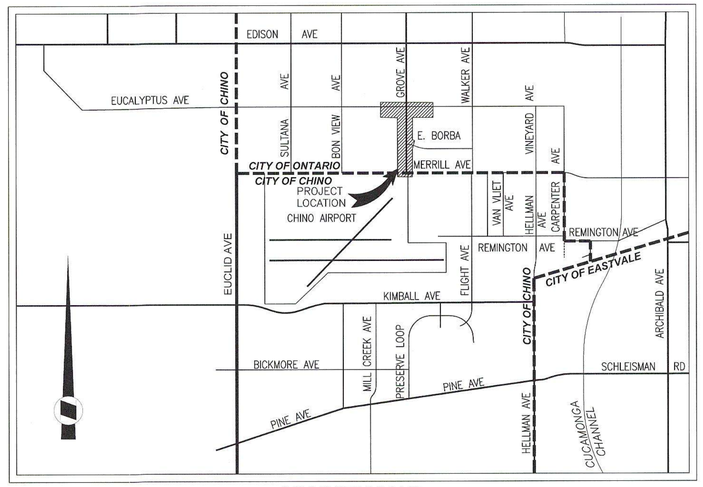


## VICINITY MAP

N.T.S.

## INDEX OF DRAWINGS

| INDEX NO. | DESCRIPTION |
|---|---|
| SHEET 1 | TITLE SHEET |
| SHEET 2 | INDEX/SYSTEM MAP |
| SHEET 3 | GROVE AVE – FROM MERRILL AVE. TO 1000' NORTH OF MERRILL AVE. |
| SHEET 4 | GROVE AVE – FROM 1000' NORTH OF MERRILL AVE. TO 1900' NORTH OF MERRILL AVE. |
| SHEET 5 | GROVE AVE – FROM 750' SOUTH OF EUCALYPTUS AVE. TO 130' NORTH OF EUCALYPTUS AVE. |
| SHEET 6 | EUCALYPTUS AVE – FROM GROVE AVE. TO 700' WEST OF GROVE AVE. |
| SHEET 7 | EUCALYPTUS AVE – FROM GROVE AVE. TO 400' EAST OF GROVE AVE. |
| SHEET 8 | GROVE AVE – LATERALS C-1 & C-1A |
| SHEET 9–10 | LATERAL PROFILES |
| SHEET 12–14 | DETAILS |
| SHEET 15–16 | STRUCTURE DETAIL |
| SHEET 17 | MODIFIED CONCRETE COLLAR DETAIL |

## OWNER/DEVELOPER:

PROLOGIS
3546 CONCOURS ST., SUITE 100
ONTARIO CALIFORNIA 91764

CONTACT: SAM CHO
PHONE: (909) 673.8721
EMAIL: SCHO@PROLOGIS.COM

## CIVIL ENGINEER

WESTLAND GROUP INC.
4150 CONCOURS STREET, SUITE 100
ONTARIO, CA 91764

CONTACT: SIARA R. MACKINNEY P.E.
PHONE: (909)-403-5647

## GEOTECHNICAL ENGINEER:

SOUTHERN CALIFORNIA GEOTECHNICAL
22885 EAST SAVI RANCH PARKWAY, SUITE E
YORBA LINDA, CA 92887

CONTACT: GREGORY K. MITCHELL
PHONE: (714) 685-1115

## UTILITY PURVEYORS:

CITY OF CHINO, PUBLIC WORKS
DAYTIME PH: (909) 364-2800
24-HOUR EMERGENCY: (909) 364-2860

CITY OF ONTARIO, MUNICIPAL UTILITIES AGENCY
DAYTIME PH: (909) 395-2678
24-HOUR EMERGENCY: (909) 986-6711

CITY OF ONTARIO, COMMUNITY & PUBLIC SERVICES AGENCY
DAYTIME PH: (909) 395-2633
24-HOUR EMERGENCY: (909) 986-6711

INLAND EMPIRE UTILITY AGENCY
DAYTIME PH: (909) 944-6000
24-HOUR EMERGENCY: (909) 987-2591

SOUTHERN CALIFORNIA EDISON
24-HOUR EMERGENCY: (800) 611-1911

SOUTHERN CALIFORNIA GAS COMPANY
DAYTIME PH: (800) 423-1391
24-HOUR EMERGENCY: (800) 423-1391

TIME WARNER CABLE / WEST COAST COMMUNICATIONS
24-HOUR EMERGENCY: (888) 892-2253

VERIZON
24-HOUR EMERGENCY: (800) 483-2000

## CONSTRUCTION NOTES

| ITEM | DESCRIPTION | PUBLIC QUANTITY | |
|---|---|---|---|
| 1 | CONSTRUCT 108" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 120 | LF |
| 2 | CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 910 | LF |
| 3 | CONSTRUCT JUNCTION STRUCTURE PER CITY OF ONTARIO STD. DWG. NO. 3010, CASE 1 | 7 | EA |
| 4 | CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. NO. 3008 & 3009 | 14 | EA |
| 5 | CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN | 18 | EA |
| 6 | CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005 | 18 | EA |
| 7 | CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017 | 18 | EA |
| 8 | INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT | 18 | EA |
| 9 | CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 9 ON SHEET 14 | 2 | EA |
| 10 | CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 1,100 | LF |
| 11 | REMOVE BRICK AND MORTAR PLUG | 1 | EA |
| 12 | CONSTRUCT 120" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 2,500 | LF |
| 13 | CONSTRUCT MANHOLE PIPE TO PIPE (LARGE SIDE INLET) PER SPPWC STD. 322-3, DETAIL ON SHEET 12 | 3 | EA |
| 14 | CONSTRUCT 36" TEMPORARY CSP STANDPIPE (14 GAUGE) PER DETAIL 1 ON SHEET 12 | 4 | EA |
| 15 | REMOVE EXISTING 24" RCP PIPE | 93 | LF |
| 16 | REMOVE EXISTING 42" RCP PIPE | 85 | LF |
| 17 | REMOVE EXISTING STORM DRAIN MANHOLE | 1 | EA |
| 18 | REMOVE EXISTING CATCH BASIN PER SEPARATE GROVE AVENUE IMPROVEMENT PLAN | 4 | EA |
| 19 | CONSTRUCT 66" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 75 | LF |
| 20 | CONNECT TO EXISTING 120" RCP PIPE PER SPPWC STD. 335-2, PER DETAIL ON SHEET 13 | 1 | EA |
| 21 | CONSTRUCT TRANSITION STRUCTURE PIPE TO RCB PER SPPWC STD. 342-2, PER DETAIL ON SHEET 14 | 2 | EA |
| 22 | CONSTRUCT MODIFIED CONCRETE COLLAR PER SPPWC STD. 380-2 AS MODIFIED PER DETAIL ON SHEET 17 | 1 | EA |
| 23 | CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC STD. 330-2, PER DETAIL ON SHEET 14 | 3 | EA |
| 24 | REMOVE EXISTING 120" RCP PIPE | 12 | LF |
| 25 | CONSTRUCT 10' DIA. CDS UNIT PER DETAIL, SHEET 14 | 1 | EA |
| 26 | CONSTRUCT DIVERGENT STRUCTURE PER DETAIL ON SHEET 15 | 1 | EA |
| 27 | CONSTRUCT 42" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 100 | LF |
| 28 | CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 55 | LF |
| 29 | CONSTRUCT 30" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 125 | LF |
| 30 | CONSTRUCT 48" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN | 25 | LF |

## REFERENCE DRAWINGS

| DESCRIPTION | REFERENCE | |
|---|---|---|
| PROPOSED RECYCLED WATER | PM-20537 | RECYCLED WATER IMPROVEMENT PLAN |
| PROPOSED SANITARY SEWER | PM-20537 | SANITARY SEWER IMPROVEMENT PLAN |
| STREET IMPROVEMENT PLAN | PM-20537 | STREET IMPROVEMENT PLAN |
| PROPOSED DOMESTIC WATER | PM-20537 | DOMESTIC WATER IMPROVEMENT PLAN |
| EXISTING STORM DRAIN | AA-5861SD | STORM DRAIN IMPROVEMENT PLAN |

## LEGEND OF ABBREVIATIONS & SYMBOLS

| | | | | | |
|---|---|---|---|---|---|
| BC | BEGIN CURVE | FS | FINISHED SURFACE | RCB | REINFORCED CONCRETE BOX |
| BCR | BEGIN CURB RETURN | FT/S | FEET PER SECOND | RCP | REINFORCED CONCRETE PIPE |
| BNDY | BOUNDARY | GB | GRADE BREAK | RT | RIGHT |
| C+G | CURB AND GUTTER | HDPE | HIGH DENSITY POLYETHYLENE | RW | RECYCLED WATER |
| CB | CATCH BASIN | HGL | HYDRAULIC GRADE LINE | R/W | RIGHT OF WAY |
| CFS | CUBIC FEET PER SECOND | HP | HIGH POINT | SL | STREET LIGHT |
| CSP | CORRUGATED STEEL PIPE | INT | INTERIM | SP | STAND PIPE (RCP) |
| ℄ OR C/L OR CL | CENTERLINE | INV | INVERT | STA | STATION |
| DBL | DOUBLE | LT | LEFT | TC | TOP OF CURB |
| EA | EACH | LAT | LATERAL | TSP | TEMPORARY STAND PIPE |
| EC | END CURVE | LF | LINEAR FEET | TYP | TYPICAL |
| ECR | END CURB RETURN | LP | LOW POINT | ULT | ULTIMATE |
| ELEV | ELEVATION | MIN | MINIMUM | SD | STORM DRAIN |
| EP | EDGE OF PAVEMENT | PCC | POINT OF COMPOUND CURVE | SPPWC | STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION |
| ESMT | EASEMENT | ℙ OR P/L OR PL | PROPERTY LINE | SS | SANITARY SEWER |
| EX, EXIST. | EXISTING | PRC | POINT OF REVERSE CURVE | DW | DOMESTIC WATER |
| FH | FIRE HYDRANT | PVC | POLYVINYL CHLORIDE | | |
| FL | FLOW LINE | | | | |

(100) EXISTING CONTOURS
100 PROP. CONTOUR
EXIST. EASEMENT
2% FLOW RATE
CENTERLINE
FIRE HYDRANT
SIGN
STREET LIGHT
BOUNDARY LINE
FENCE LINE
PROPOSED STORM DRAIN MH
PROPOSED CATCH BASIN
PROPOSED STORM DRAIN

## BASIS OF BEARING

BEARINGS ARE BASED UPON THE CENTERLINE OF MERRILL AVENUE BETWEEN BAKER AVENUE AND VINEYARD AVENUE BEING N89°26'19"E AS SHOWN ON RECORD OF SURVEY 92/97 RECORDED AS INSTRUMENT NO. 1991-447293 OF OFFICIAL RECORDS OF THE COUNTY OF SAN BERNARDINO.

## LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

LOTS 1, 2, 3, 16, 17, 18, 19, 20, 21, 34, 35 AND 36 IN SECTION 19, TOWNSHIP 2 SOUTH, RANGE 7 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACCORDING TO MAP OF SUBDIVISION OF PART OF THE RANCHO SANTA ANA DEL CHINO, RECORDED IN BOOK 6, PAGE 15 OF MAPS, RECORDS OF SAID COUNTY.

Know what's below. Call 811 before you dig.

RECOMMENDED FOR ACCEPTANCE

TECK, C. LOH, P.E.
HARRIS AND ASSOCIATES — DATE 3/20/2024

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK DATE: 8/30/2023
DRAWN BY: BK DATE: 8/30/2023
CHECKED BY: DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRIAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No. 85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660


SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

**STORM DRAIN IMPROVEMENT PLAN**
GROVE AVENUE

**TITLE SHEET**

PM-20537

SHEET 1 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14022

02/28/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pong\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\01_2021-315_S0.dwg
Last Opened: Feb 28, 2024 - 12:55pm by: BrentLKing

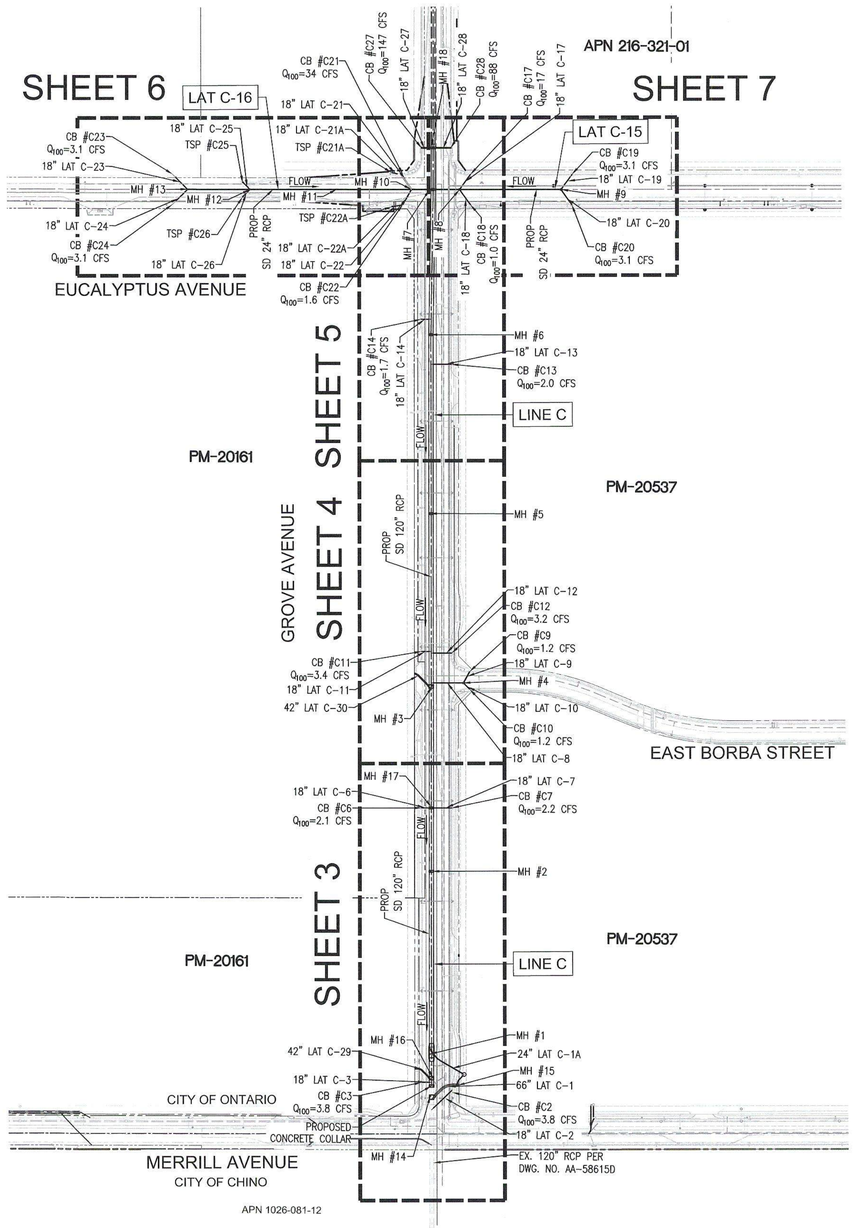


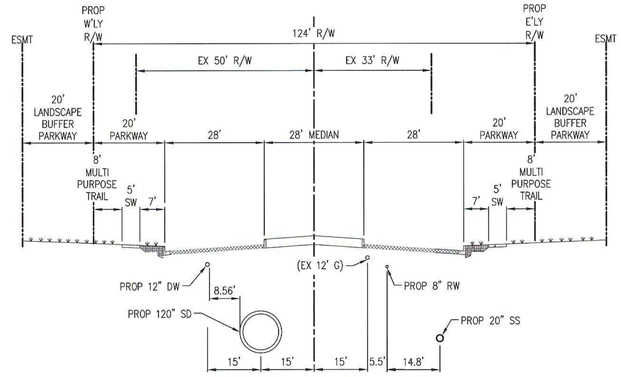


## GROVE AVE

MERRILL AVE TO EUCALYPTUS AVE

1"=20'

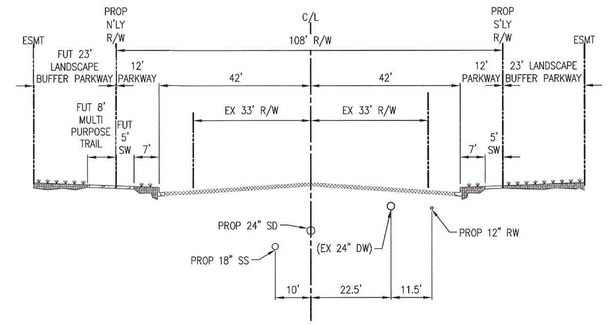


## EUCALYPTUS AVE

EAST OF GROVE AVE

1"=20'

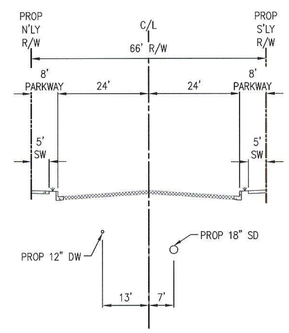


## EAST BORBA STREET

1"=20'

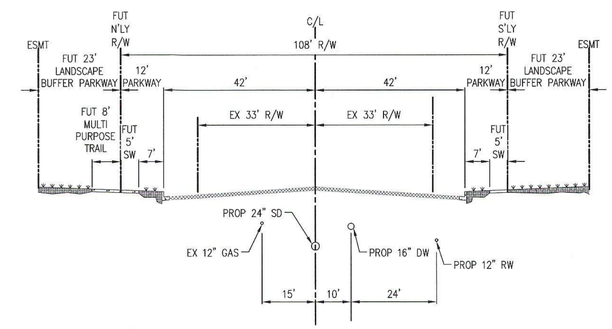


## EUCALYPTUS AVE

WEST OF GROVE AVE

1"=20'

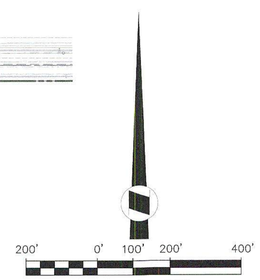


## INDEX / SYSTEM MAP

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER — SIARA ROSE MACKINNEY — No. 85559 — Exp. 9/30/2024 — CIVIL — STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

**STORM DRAIN IMPROVEMENT PLAN**

**INDEX / SYSTEM MAP**

PM-20537

SHEET 2 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14623

02/28/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\02_2021-315_SD-USM.dwg
Last Opened: Feb 28, 2024 - 1:14pm by: Brent.King

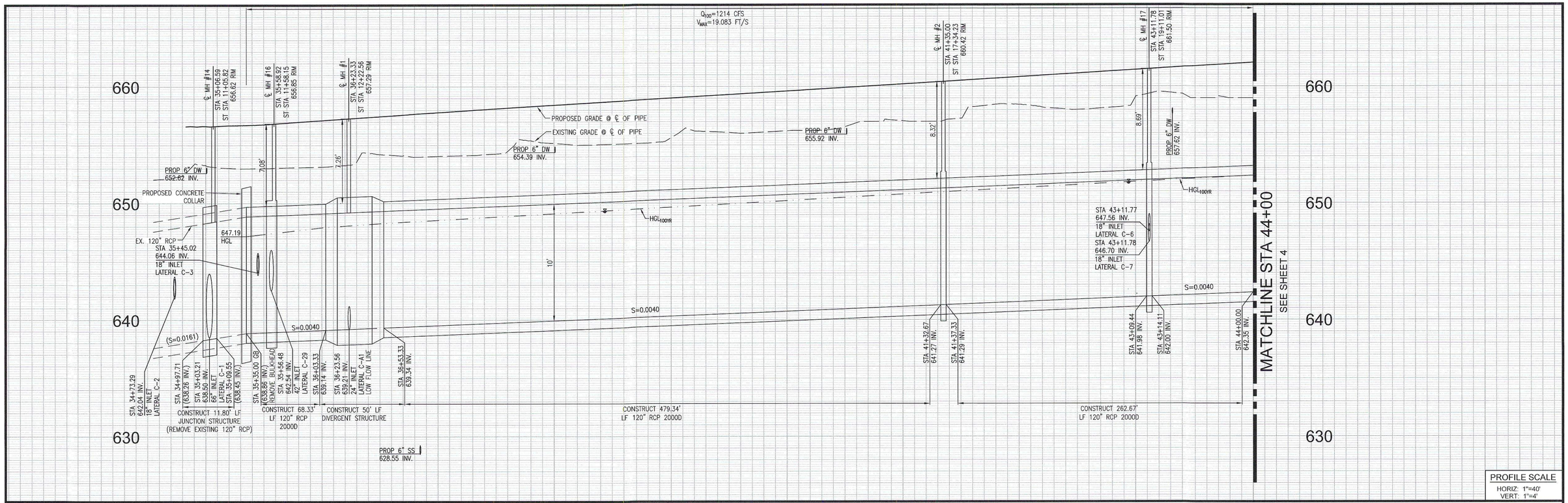


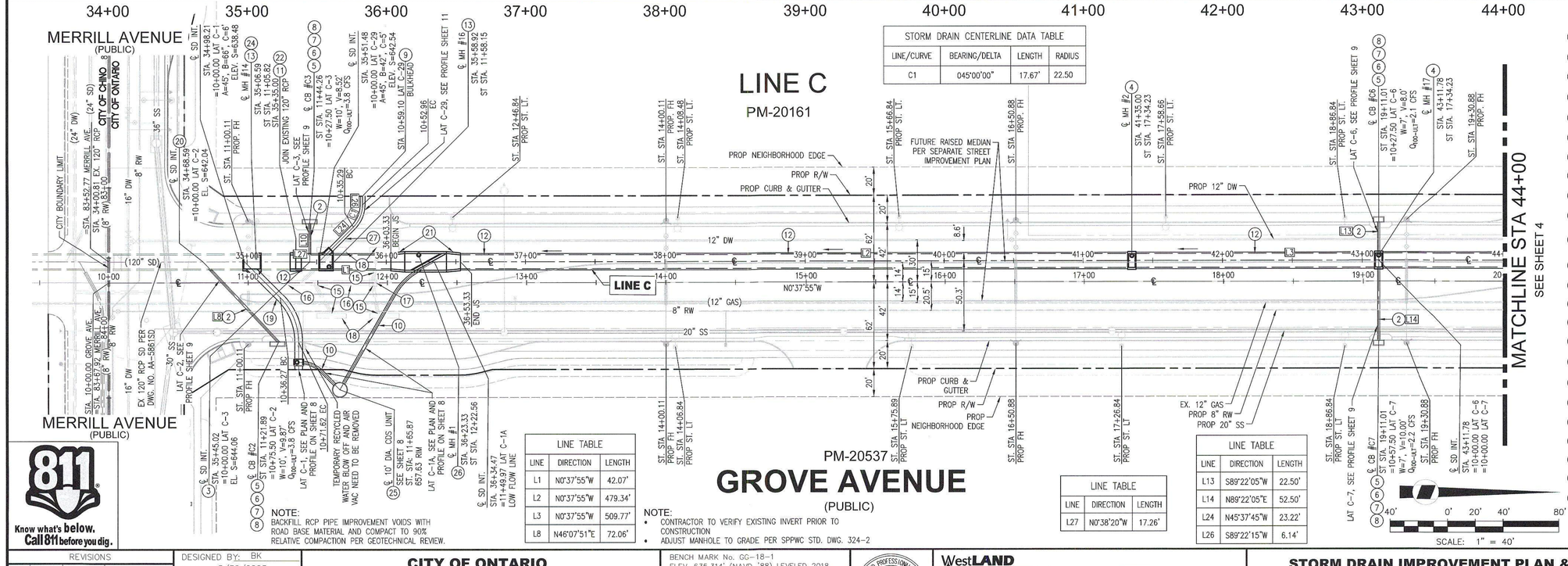


| STORM DRAIN CENTERLINE DATA TABLE | | | |
|---|---|---|---|
| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
| C1 | 045°00'00" | 17.67' | 22.50 |

| LINE TABLE | | |
|---|---|---|
| LINE | DIRECTION | LENGTH |
| L1 | N0°37'55"W | 42.07' |
| L2 | N0°37'55"W | 479.34' |
| L3 | N0°37'55"W | 509.77' |
| L8 | N46°07'51"E | 72.06' |

| LINE TABLE | | |
|---|---|---|
| LINE | DIRECTION | LENGTH |
| L27 | N0°38'20"W | 17.26' |

| LINE TABLE | | |
|---|---|---|
| LINE | DIRECTION | LENGTH |
| L13 | S89°22'05"W | 22.50' |
| L14 | N89°22'05"E | 52.50' |
| L24 | N45°37'45"W | 23.22' |
| L26 | S89°22'15"W | 6.14' |

NOTE:
BACKFILL RCP PIPE IMPROVEMENT VOIDS WITH ROAD BASE MATERIAL AND COMPACT TO 90% RELATIVE COMPACTION PER GEOTECHNICAL REVIEW.

NOTE:
- CONTRACTOR TO VERIFY EXISTING INVERT PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

## CONSTRUCTION NOTES

2. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN
3. CONSTRUCT JUNCTION STRUCTURE PER CITY OF ONTARIO STD. DWG. NO. 3010, CASE 1
4. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. NO. 3008 & 3009
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005
7. CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017
8. INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT
9. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 9 ON SHEET 14
10. CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN
11. REMOVE BRICK AND MORTAR PLUG
12. CONSTRUCT 120" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN
13. CONSTRUCT MANHOLE PIPE TO PIPE (LARGE SIDE INLET) PER SPPWC STD. 322-3, DETAIL ON SHEET 12
15. REMOVE EXISTING 24" RCP PIPE
16. REMOVE EXISTING 42" RCP PIPE
17. REMOVE EXISTING STORM DRAIN MANHOLE
18. REMOVE EXISTING CATCH BASIN PER SEPARATE GROVE AVENUE IMPROVEMENT PLAN
19. CONSTRUCT 66" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN
20. CONNECT TO EXISTING 120" RCP PIPE PER SPPWC STD. 335-2, PER DETAIL ON SHEET 13
21. CONSTRUCT TRANSITION STRUCTURE PIPE TO RCB PER SPPWC STD. 342-2, PER DETAIL ON SHEET 14
22. CONSTRUCT MODIFIED CONCRETE COLLAR PER SPPWC STD. 380-2 AS MODIFIED PER DETAIL ON SHEET 17
24. REMOVE EXISTING 120" RCP PIPE
25. CONSTRUCT 10' DIA. CDS UNIT PER DETAIL, SHEET 14
26. CONSTRUCT DIVERGENT STRUCTURE PER DETAIL ON SHEET 15
27. CONSTRUCT 42" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

811 Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLE, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SIARA ROSE MACKINNEY — No. 85559 — Exp. 6/30/2024 — CIVIL — STATE OF CALIFORNIA

**WestLAND Group, Inc.** Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

# STORM DRAIN IMPROVEMENT PLAN & PROFILE
GROVE AVENUE
FROM MERRILL AVE. TO 1000' NORTH OF MERRILL AVE.

PM-20537

SHEET 3 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14024

01/09/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\03-06_2021-315_SD_GROVE.dwg
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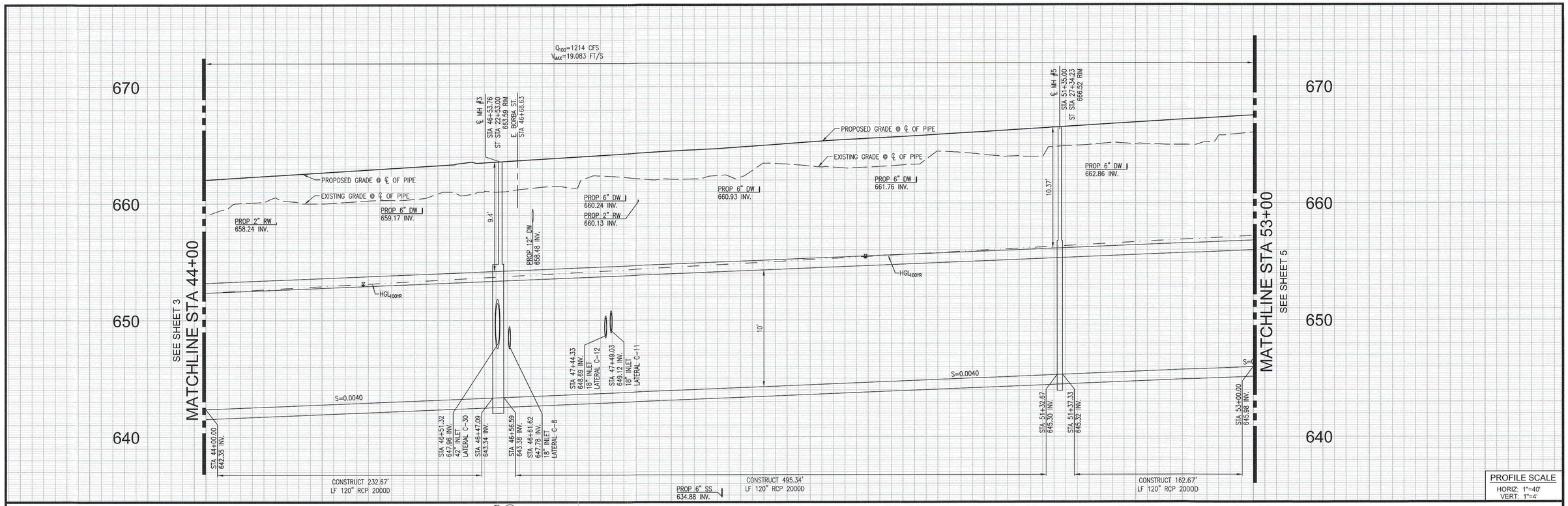


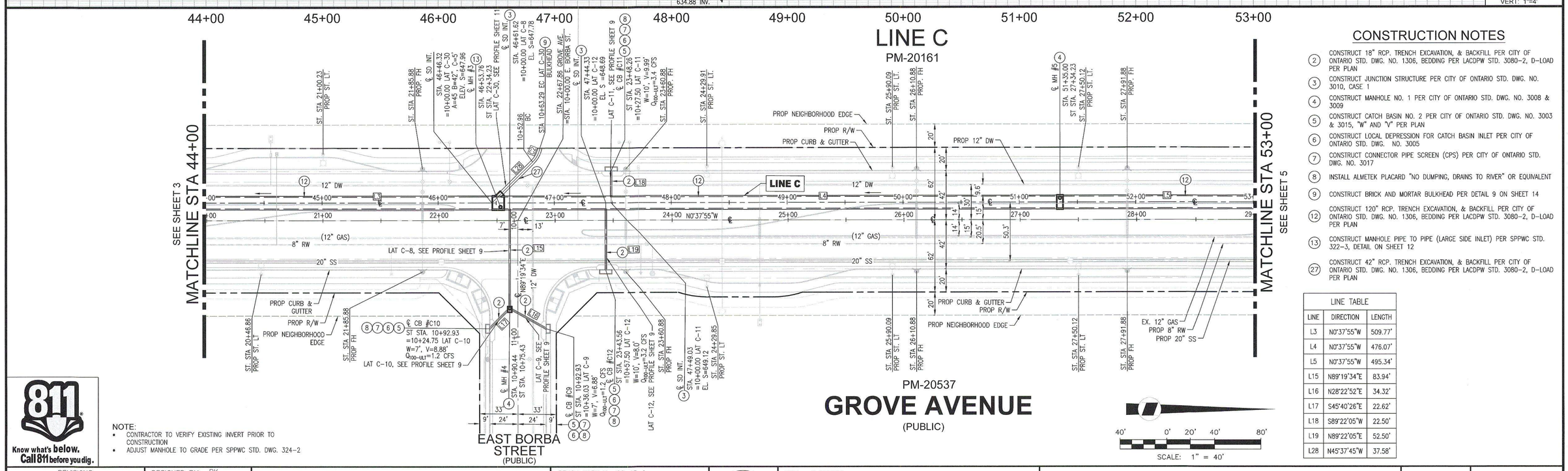


## CONSTRUCTION NOTES

(2) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(3) CONSTRUCT JUNCTION STRUCTURE PER CITY OF ONTARIO STD. DWG. NO. 3010, CASE 1

(4) CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. NO. 3008 & 3009

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005

(7) CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017

(8) INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT

(9) CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 9 ON SHEET 14

(12) CONSTRUCT 120" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(13) CONSTRUCT MANHOLE PIPE TO PIPE (LARGE SIDE INLET) PER SPPWC STD. 322-3, DETAIL ON SHEET 12

(27) CONSTRUCT 42" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

### LINE TABLE

| LINE | DIRECTION | LENGTH |
|---|---|---|
| L3 | N0°37'55"W | 509.77' |
| L4 | N0°37'55"W | 476.07' |
| L5 | N0°37'55"W | 495.34' |
| L15 | N89°19'34"E | 83.94' |
| L16 | N28°22'52"E | 34.32' |
| L17 | S45°40'26"E | 22.62' |
| L18 | S89°22'05"W | 22.50' |
| L19 | N89°22'05"E | 52.50' |
| L28 | N45°37'45"W | 37.58' |

811 Know what's below. Call 811 before you dig.

NOTE:
- CONTRACTOR TO VERIFY EXISTING INVERT PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA IRENE MACKINNEY No. 85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660


SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
GROVE AVENUE
FROM 1000' NORTH OF MERRILL AVE. TO 1900' NORTH OF MERRILL AVE.

PM-20537

SHEET 4 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14025

01/08/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\03-06_2023_35_59_GROVE.dwg
Last Updated: Jan 08, 2024 - 4:42pm by: Brent King

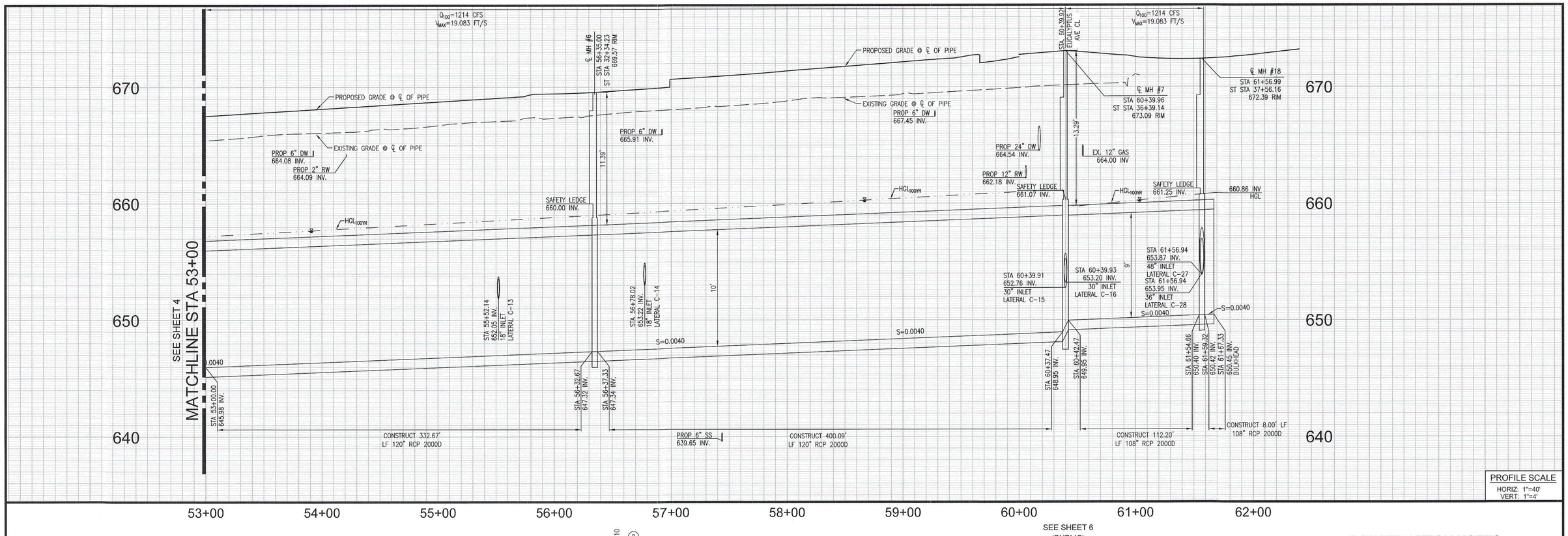


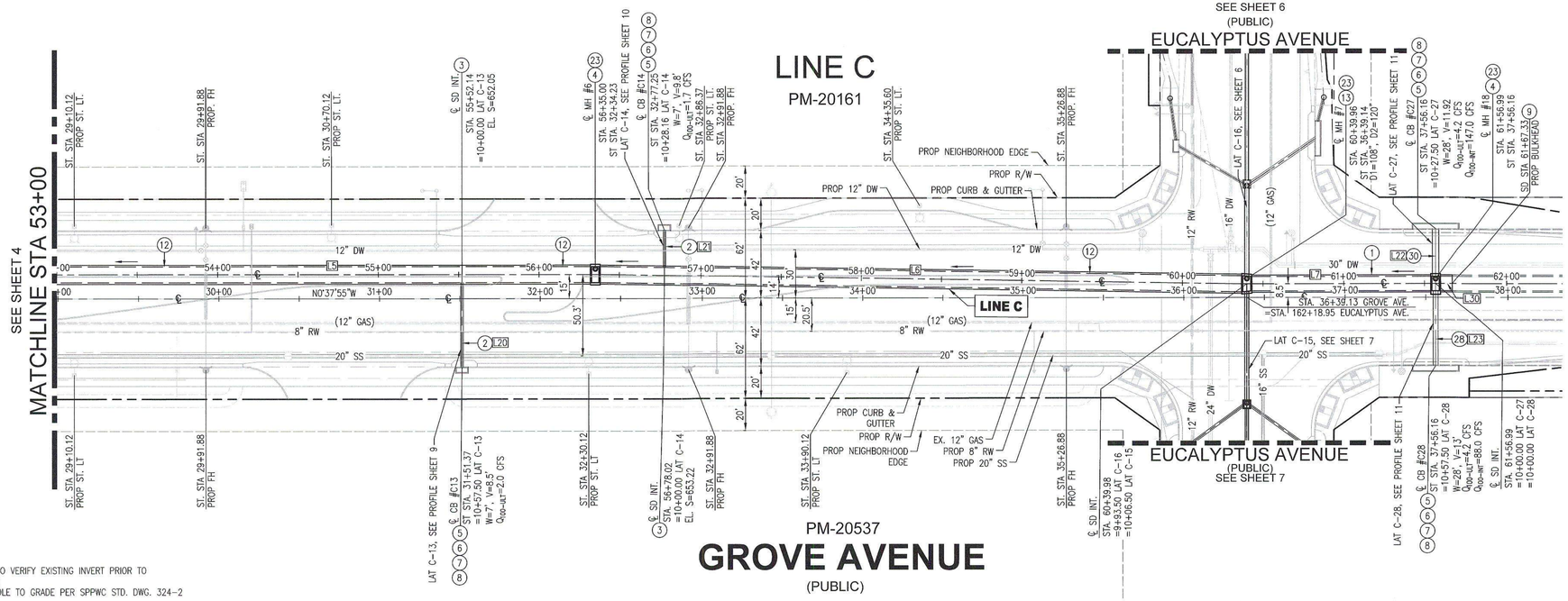


## CONSTRUCTION NOTES

1. CONSTRUCT 108" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN
2. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN
3. CONSTRUCT JUNCTION STRUCTURE PER CITY OF ONTARIO STD. DWG. NO. 3010, CASE 1
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12. CONSTRUCT 120" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN
13. CONSTRUCT MANHOLE PIPE TO PIPE (LARGE SIDE INLET) PER SPPWC STD. 322-3, DETAIL ON SHEET 12
23. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC STD. 330-2, PER DETAIL ON SHEET 14
28. CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN
30. CONSTRUCT 48" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

| LINE TABLE | | |
|---|---|---|
| LINE | DIRECTION | LENGTH |
| L5 | N0°37'55"W | 495.34' |
| L6 | N0°17'56"E | 400.14' |
| L7 | N0°36'25"W | 112.20' |
| L20 | N89°22'05"E | 52.50' |
| L21 | S89°22'05"W | 23.16' |
| L22 | S89°24'00"W | 29.50' |
| L23 | N89°23'40"E | 46.50' |
| L30 | N0°36'25"W | 8.00' |

811 Know what's below. Call 811 before you dig.

NOTE:
- CONTRACTOR TO VERIFY EXISTING INVERT PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

40' 0' 20' 40' 80'
SCALE: 1" = 40'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — 3/21/24 DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — 3-21-24 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No. 85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — 3/14/24 DATE

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
GROVE AVENUE
FROM 750' SOUTH OF EUCALYPTUS AVE. TO 130' NORTH OF EUCALYPTUS AVE.

PM-20537

SHEET 5 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14026

02/28/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\03-06_2021-315_SD_GROVE.dwg
Last Opened: Feb 28, 2024 - 1:50pm by: Brent.King

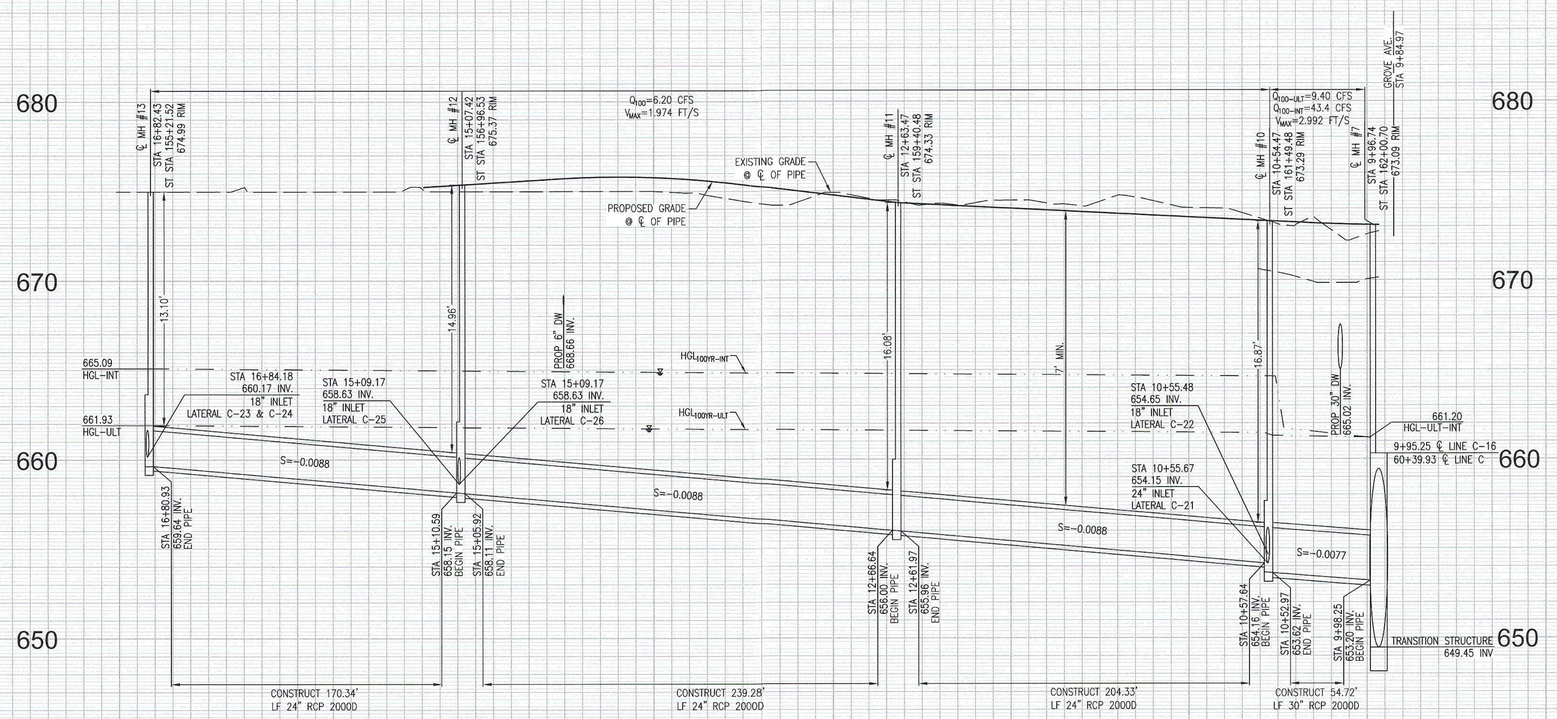


PROFILE SCALE
HORIZ: 1"=40'
VERT: 1"=4'

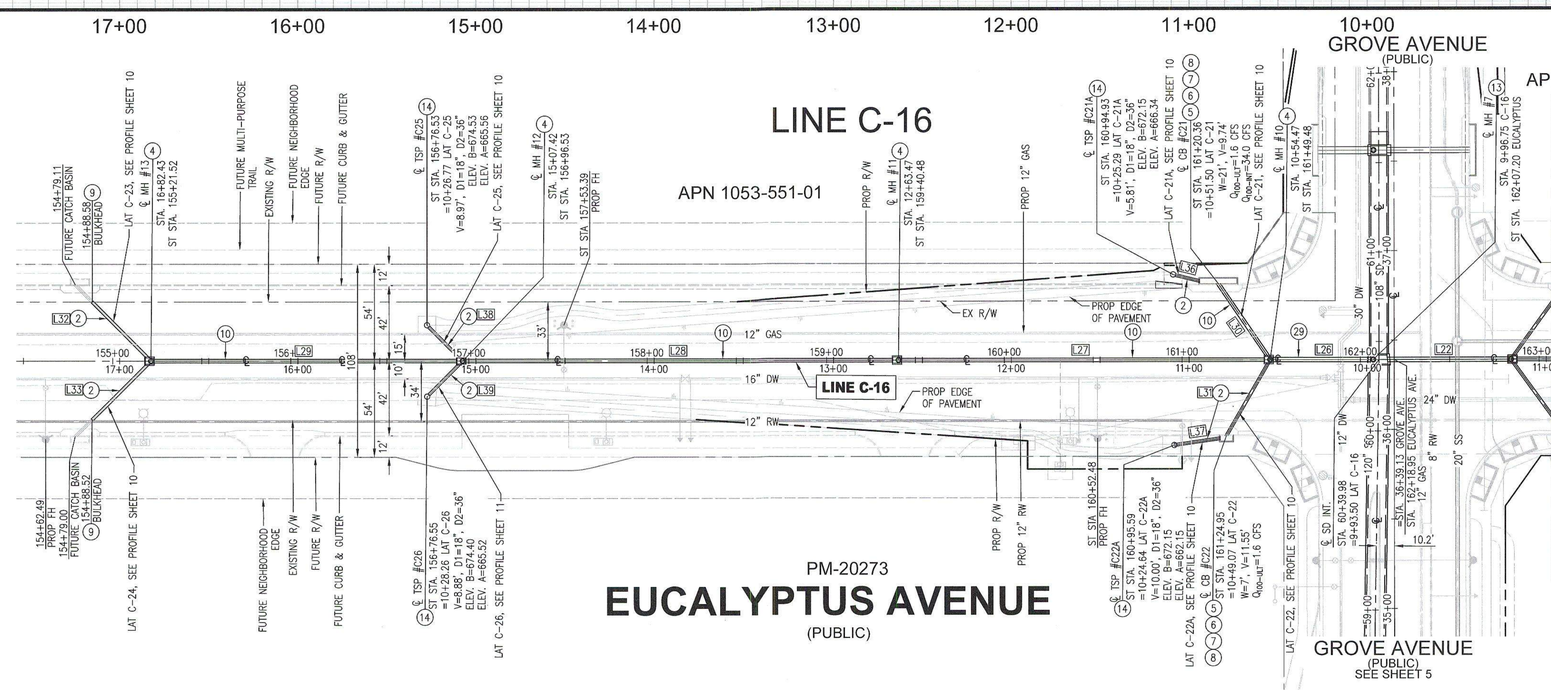


## CONSTRUCTION NOTES

(2) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(4) CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. NO. 3008 & 3009

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005

(7) CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017

(8) INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT

(9) CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 9 ON SHEET 14

(10) CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(13) CONSTRUCT MANHOLE PIPE TO PIPE (LARGE SIDE INLET) PER SPPWC STD. 322-3, DETAIL ON SHEET 12

(14) CONSTRUCT 36" TEMPORARY CSP STANDPIPE (14 GAUGE) PER DETAIL 1 ON SHEET 12

(29) CONSTRUCT 30" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

LINE TABLE

| LINE | DIRECTION | LENGTH |
|---|---|---|
| L22 | N89°22'23"E | 67.56' |
| L26 | S89°27'10"W | 54.72' |
| L27 | S89°27'10"W | 204.33' |
| L28 | S89°27'12"W | 239.28' |
| L29 | S89°27'12"W | 170.34' |
| L30 | N34°58'11"W | 49.38' |
| L31 | S29°26'27"W | 47.05' |
| L32 | N45°29'42"W | 44.16' |
| L33 | S44°27'10"W | 44.19' |
| L36 | S76°51'20"E | 13.87' |
| L37 | N81°15'17"E | 24.64' |
| L38 | S45°34'25"E | 24.30' |
| L39 | S44°25'41"W | 24.28' |

PM-20273

# EUCALYPTUS AVENUE

(PUBLIC)

40' 0' 20' 40' 80'
SCALE: 1" = 40'

811 Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRIAN LINLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/14/24

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF EGR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
EUCALYPTUS AVENUE
FROM GROVE AVE. TO 700' WEST OF GROVE AVE.

PM-20537

SHEET 6 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14027

02/28/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN.dwg
Layout Name: PROFILE C-16
Last Opened: Feb 28, 2024 - 1:52pm by: Brent.King

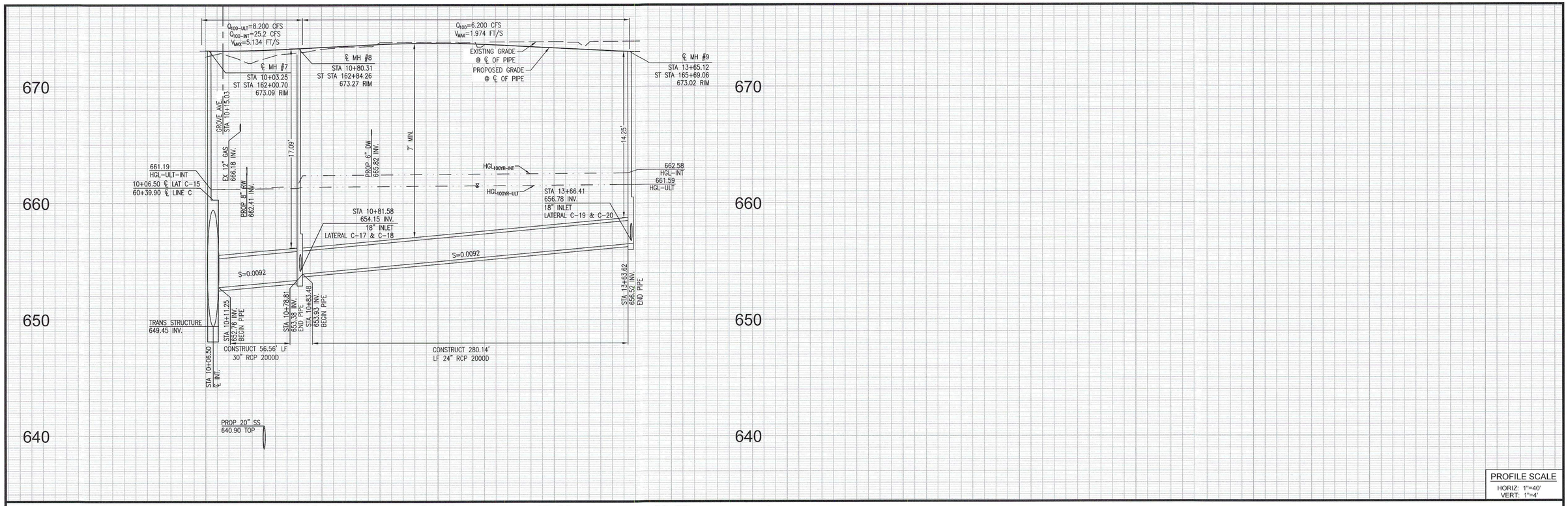


PROFILE SCALE
HORIZ: 1"=40'
VERT: 1"=4'

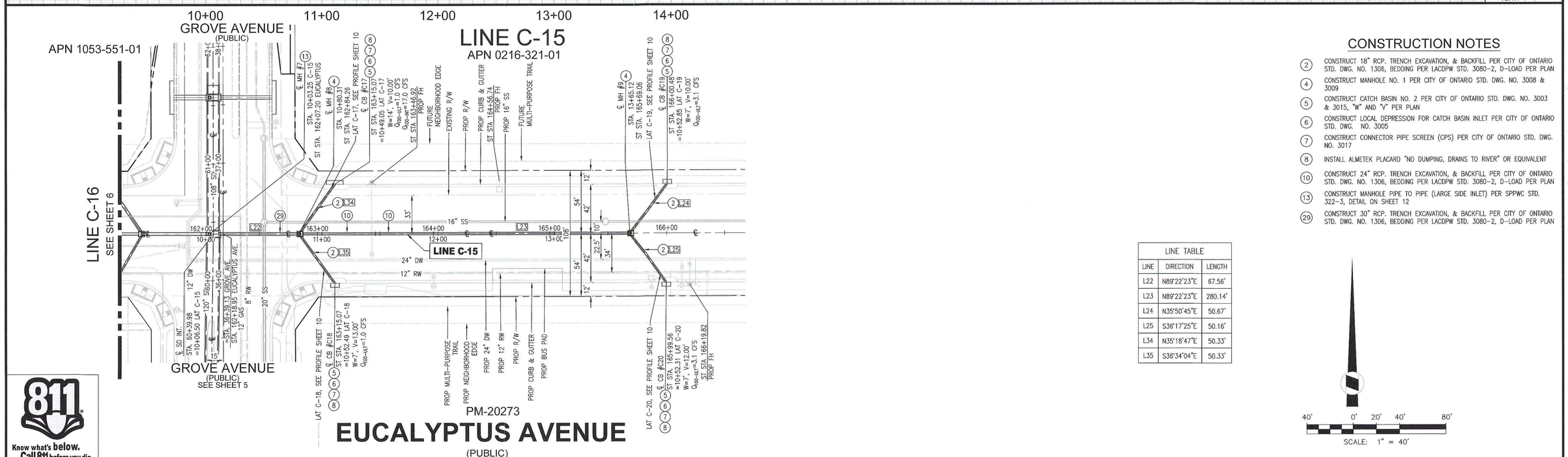


## CONSTRUCTION NOTES

(2) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(4) CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. NO. 3008 & 3009

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003 & 3015, "W" AND "V" PER PLAN

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005

(7) CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017

(8) INSTALL ALMETEK PLACARD "NO DUMPING, DRAINS TO RIVER" OR EQUIVALENT

(10) CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(13) CONSTRUCT MANHOLE PIPE TO PIPE (LARGE SIDE INLET) PER SPPWC STD. 322-3, DETAIL ON SHEET 12

(29) CONSTRUCT 30" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

| LINE TABLE | | |
|---|---|---|
| LINE | DIRECTION | LENGTH |
| L22 | N89°22'23"E | 67.56' |
| L23 | N89°22'23"E | 280.14' |
| L24 | N35°50'45"E | 50.67' |
| L25 | S36°17'25"E | 50.16' |
| L34 | N35°18'47"E | 50.33' |
| L35 | S36°34'04"E | 50.33' |

40' 0' 20' 40' 80'
SCALE: 1" = 40'

811 Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: Siara R. Mackinney, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
EUCALYPTUS AVENUE
FROM GROVE AVE. TO 400' EAST OF GROVE AVE.

PM-20537

SHEET 7 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14028

02/28/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\06_2021-315_SD_EUCA.dwg
Last Opened: Feb 26, 2024 - 10:50am by: Brent.King

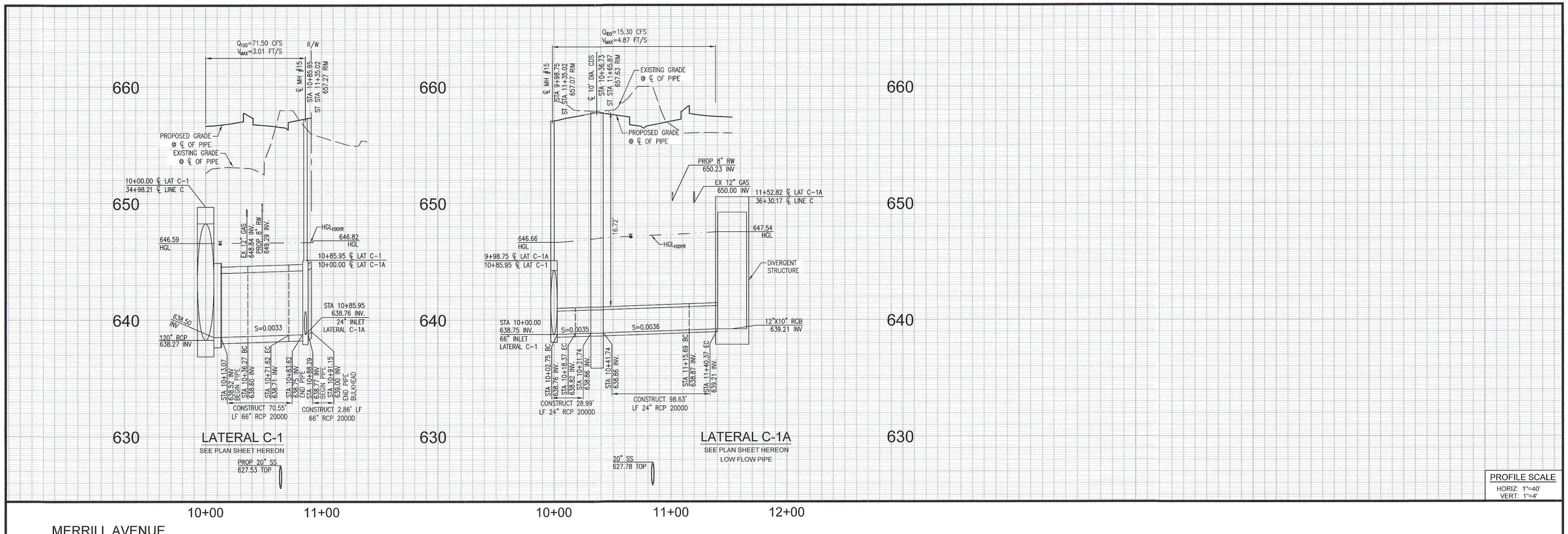


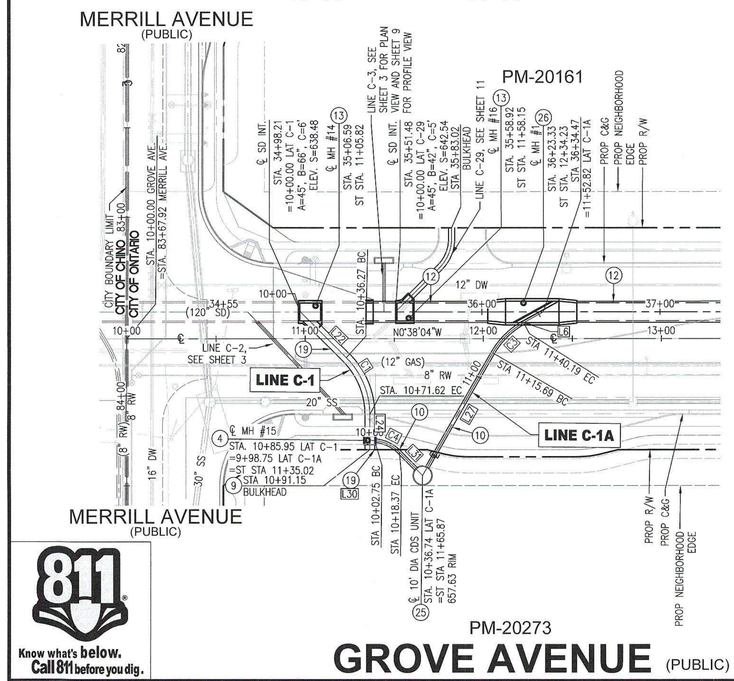


| STORM DRAIN CENTERLINE DATA TABLE | | | |
|---|---|---|---|
| LINE/CURVE | BEARING/DELTA | LENGTH | RADIUS |
| C1 | 044°59'59" | 35.34' | 45.00 |
| C3 | 031°11'24" | 24.50' | 45.00 |
| C4 | 039°46'11" | 15.62' | 22.50 |
| L6 | S29°26'31"E | 0.18' | |
| L22 | N44°22'07"E | 23.20' | |
| L24 | N89°22'05"E | 12.00' | |
| L27 | S60°37'55"E | 73.94' | |
| L30 | N89°22'05"E | 2.86' | |
| L31 | S44°22'05"W | 13.37' | |

NOTE:
- CONTRACTOR TO VERIFY EXISTING INVERT PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

## CONSTRUCTION NOTES

(4) CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. NO. 3008 & 3009

(9) CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 9 ON SHEET 14

(10) CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(12) CONSTRUCT 120" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(13) CONSTRUCT MANHOLE PIPE TO PIPE (LARGE SIDE INLET) PER SPPWC STD. 322-3, DETAIL ON SHEET 12

(19) CONSTRUCT 66" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2, D-LOAD PER PLAN

(25) CONSTRUCT 10' DIA. CDS UNIT PER DETAIL, SHEET 14

(26) CONSTRUCT DIVERGENT STRUCTURE PER DETAIL ON SHEET 15

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRIAN LEE, P.E., ASSISTANT CITY ENGINEER — 3/14/24 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — 3-21-24 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SIARA ROSE MACKINNEY — No. 85559 — Exp. 9/30/2024 — CIVIL — STATE OF CALIFORNIA


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: Siara R. MacKinney, P.E. — 85559 R.C.E. NO. — 3/14/24 DATE


**STORM DRAIN IMPROVEMENT PLAN & PROFILE**
GROVE AVENUE
LATERALS C-1 & C-1A

PM-20537

SHEET 8 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14029

02/21/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pong\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\D14029_PM20537.dwg
Last Updated: Feb 21, 2024 - 2:22pm by: Brent King

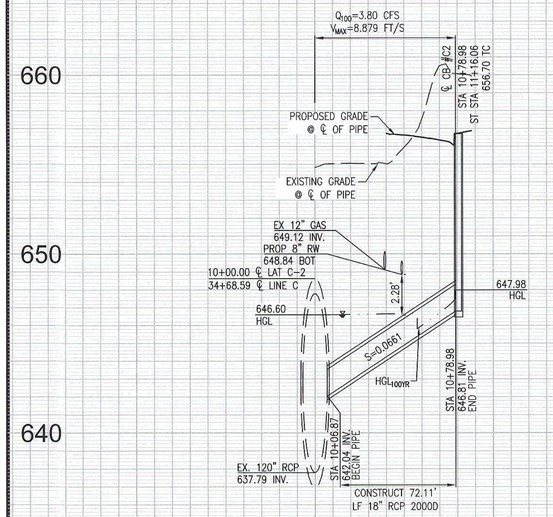


LATERAL C-2

SEE PLAN SHEET 3

10+00

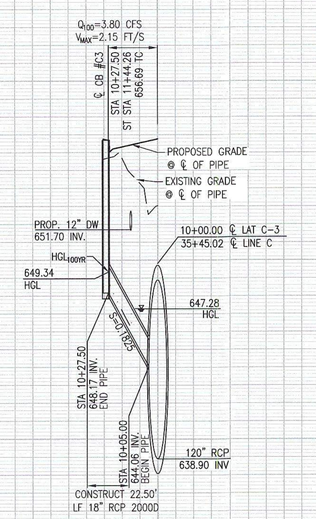


LATERAL C-3

SEE PLAN SHEET 3

10+00

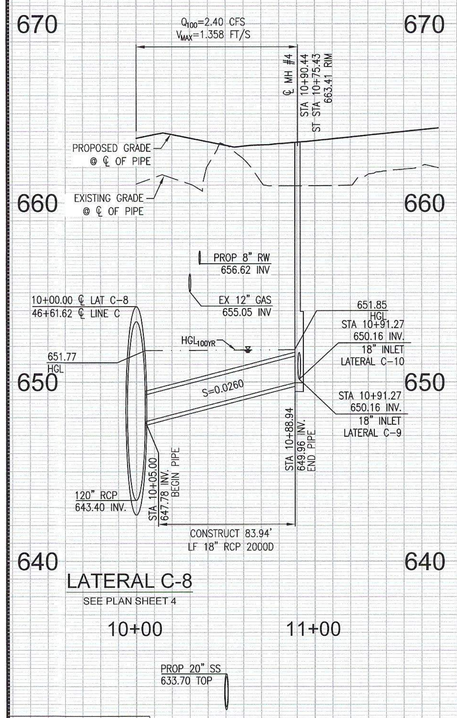


LATERAL C-8

SEE PLAN SHEET 4

10+00 11+00

PROP 20" SS
633.70 TOP

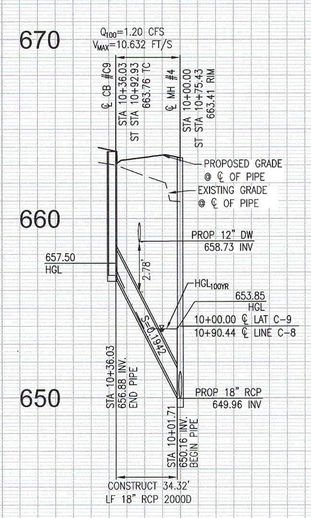


LATERAL C-9

SEE PLAN SHEET 4

10+00

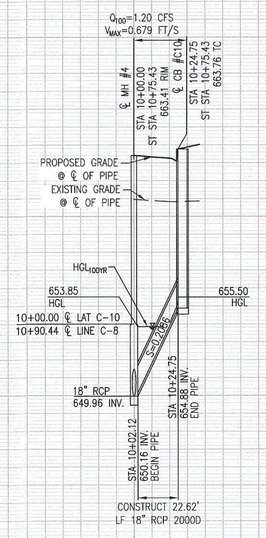


LATERAL C-10

SEE PLAN SHEET 4

10+00

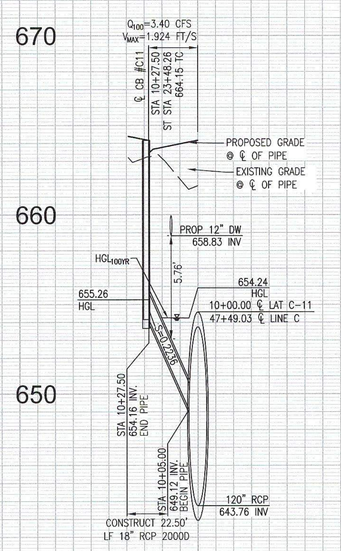


LATERAL C-11

SEE PLAN SHEET 4

10+00

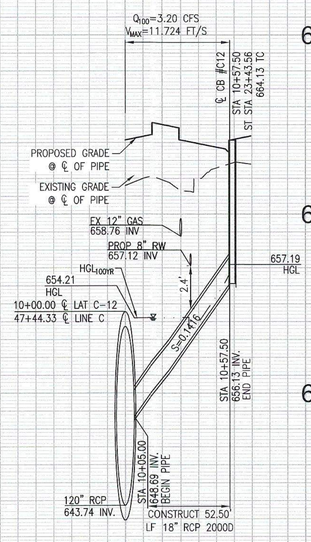


LATERAL C-12

SEE PLAN SHEET 4

10+00

PROP 20" SS
634.09 TOP

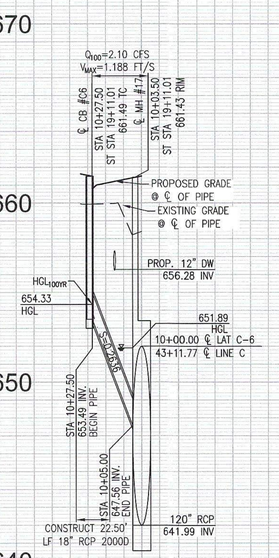


LATERAL C-6

SEE PLAN SHEET 3

10+00

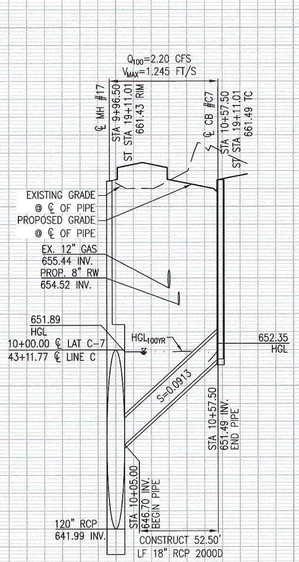


LATERAL C-7

SEE PLAN SHEET 3

10+00

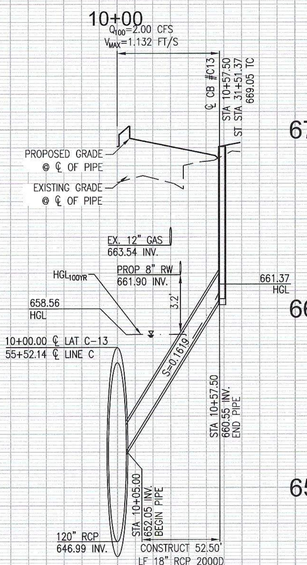


LATERAL C-13

SEE PLAN SHEET 5

PROP 20" SS
638.43 TOP

10+00

Know what's **below.**
**Call 811** before you dig.

PROFILE SCALE
HORIZ: 1"=40'
VERT: 1"=4'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY: SRM
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
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REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/19/24


**STORM DRAIN IMPROVEMENT PROFILE**

LATERAL PROFILES

PM-20537

SHEET 9 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14030

02/21/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pong\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\09_2021-315_SD_LATPROF.dwg
Last Opened: Feb 21, 2024 - 3:14pm by: Brent.King

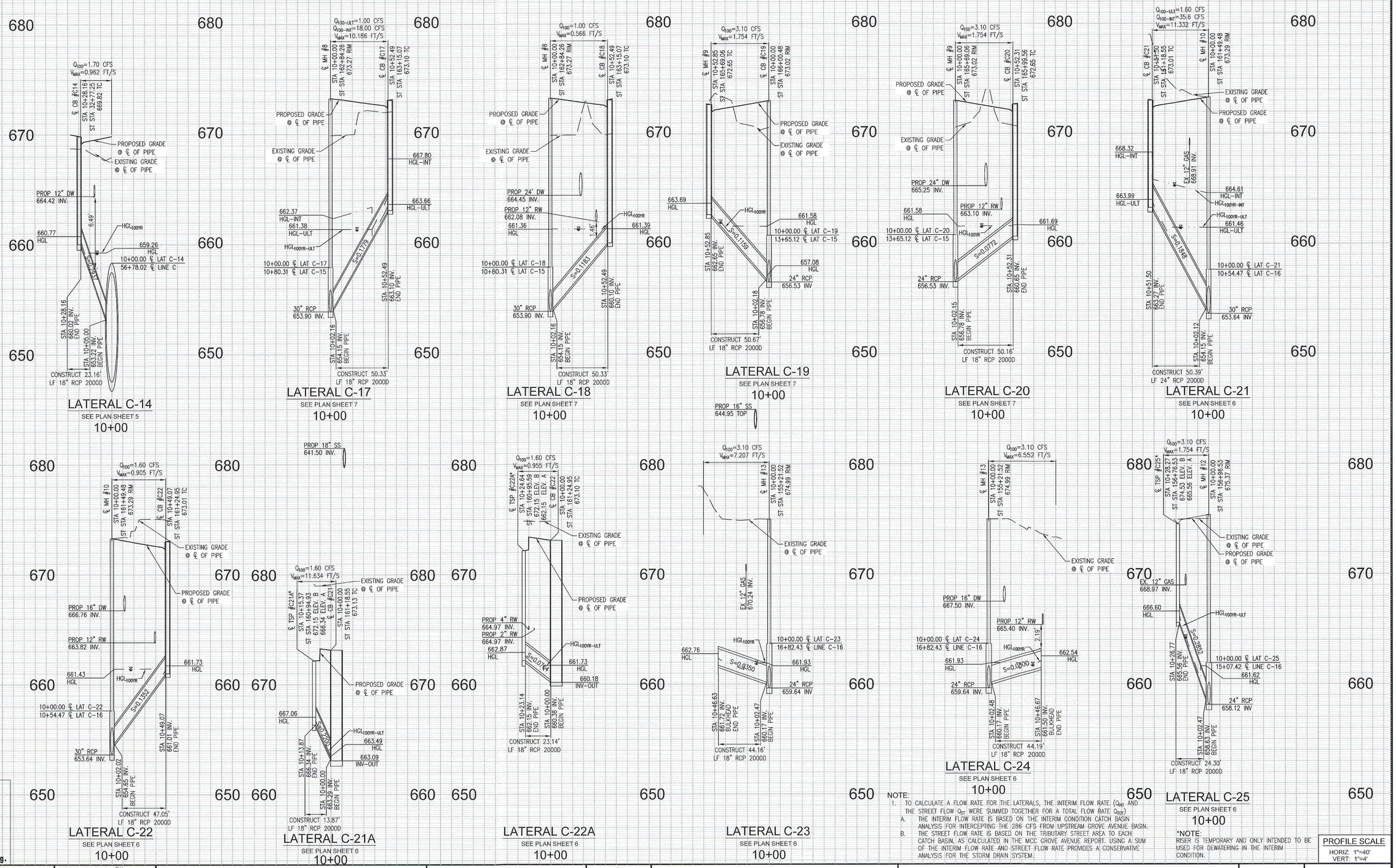


NOTE:

1. TO CALCULATE A FLOW RATE FOR THE LATERALS, THE INTERIM FLOW RATE ($Q_{INT}$) AND THE STREET FLOW ($Q_{ST}$) WERE SUMMED TOGETHER FOR A TOTAL FLOW RATE ($Q_{TOT}$).
   A. THE INTERIM FLOW RATE IS BASED ON THE INTERIM CONDITION CATCH BASIN ANALYSIS FOR INTERCEPTING THE 286 CFS FROM UPSTREAM GROVE AVENUE BASIN.
   B. THE STREET FLOW RATE IS BASED ON THE TRIBUTARY STREET AREA TO EACH CATCH BASIN, AS CALCULATED IN THE MCC GROVE AVENUE REPORT. USING A SUM OF THE INTERIM FLOW RATE AND STREET FLOW RATE PROVIDES A CONSERVATIVE ANALYSIS FOR THE STORM DRAIN SYSTEM.

*NOTE:
RISER IS TEMPORARY AND ONLY INTENDED TO BE USED FOR DEWATERING IN THE INTERIM CONDITION.

PROFILE SCALE
HORIZ: 1"=40'
VERT: 1"=4'

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY: SRM
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: Siara R. MacKinney, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

**STORM DRAIN IMPROVEMENT PROFILE**

LATERAL PROFILES

PM-20537

SHEET 10 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14031

02/28/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM
Layout Name: 25-LATERAL PROFILES
Last Opened: Feb 28, 2024 - 10:47am by: Brent.King

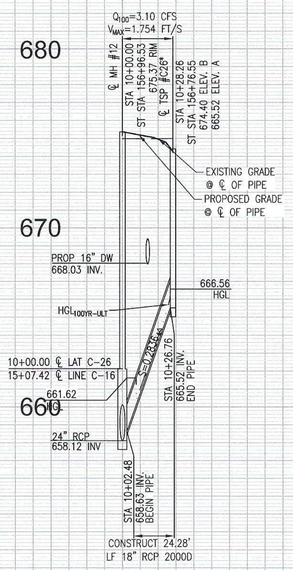


## LATERAL C-26

SEE PLAN SHEET 6

10+00

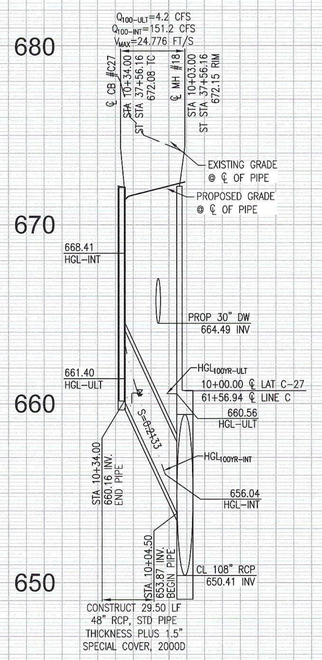


## LATERAL C-27

SEE PLAN SHEET 5

10+00

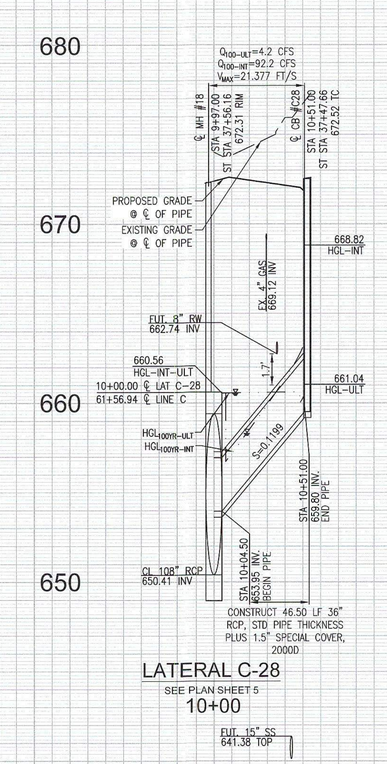


## LATERAL C-28

SEE PLAN SHEET 5

10+00

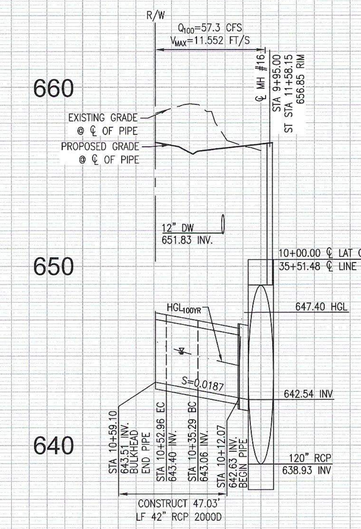


## LATERAL C-29

SEE PLAN SHEET 3

10+00

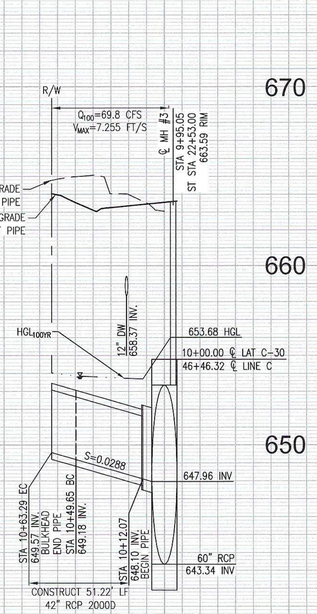


## LATERAL C-30

SEE PLAN SHEET 4

10+00

*NOTE:
RISER IS TEMPORARY AND ONLY INTENDED TO BE USED FOR DEWATERING IN THE INTERIM CONDITION.

NOTE:
1. TO CALCULATE A FLOW RATE FOR THE LATERALS, THE INTERIM FLOW RATE ($Q_{INT}$ AND THE STREET FLOW $Q_{ST}$ WERE SUMMED TOGETHER FOR A TOTAL FLOW RATE $Q_{TOT}$)
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811 Know what's below. Call 811 before you dig.

PROFILE SCALE
HORIZ: 1"=40'
VERT: 1"=4'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY: SRM
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN JIRLE, P.E., ASSISTANT CITY ENGINEER — DATE 3/14/24
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA


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4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/14/24


**STORM DRAIN IMPROVEMENT PROFILE**

LATERAL PROFILES

PM-20537

SHEET 11 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14032

02/28/2024


Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pong\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\09_2021-315_LATPROF.dwg
Last Opened: Feb 28, 2024 - 10:06am by: BrentKing

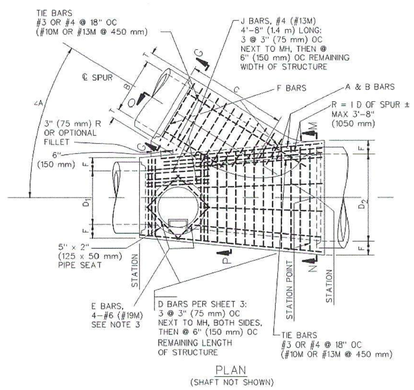


PLAN
(SHAFT NOT SHOWN)

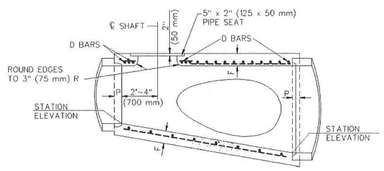


LONGITUDINAL SECTION

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY: THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE
APPROVED:
REV. 1998, 2006, 2021

**MANHOLE – PIPE TO PIPE (LARGE SIDE INLET)**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 322-3
SHEET 1 OF 4

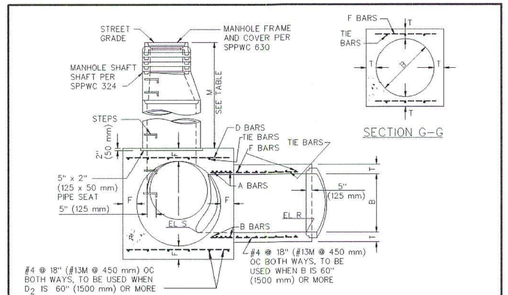


SECTION N-M-P-O




SECTION G-G

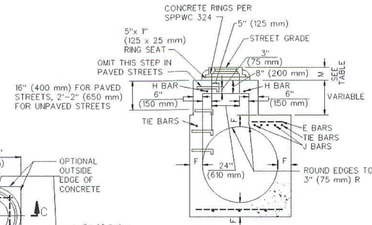


SECTION C-C

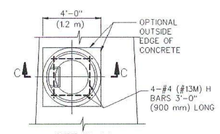


DETAIL N
MONOLITHIC MANHOLE SHAFT
(RINGS AND COVER NOT SHOWN)
SEE NOTE 2

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE – PIPE TO PIPE (LARGE SIDE INLET)**

STANDARD PLAN 322-3
SHEET 2 OF 4

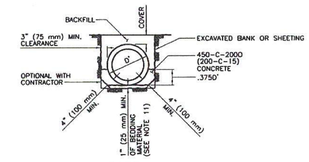


CASE 1

NOTE:
CASE I BEDDING (LOAD FACTOR 2.1)
SHALL BE USED WHERE SPECIFIED ON THE PLANS OR WHERE REQUIRED AS AN ALTERNATIVE TO CASE 2 OR CASE 3 BEDDING AS PROVIDED HEREON AND ON SH. 2. CASE 4 BEDDING SHALL BE USED INSTEAD OF CASE I AGAINST SHEETING OR UNSTABLE TRENCH SIDES IF SO REQUIRED BY THE ENGINEER.

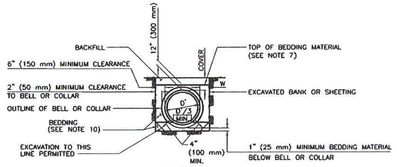


CASE 2
VITRIFIED CLAY AND PLAIN CONCRETE PIPE

NOTES:
CASE 2 BEDDING & BACKFILL AROUND PIPE (LOAD FACTOR 1.8)
(a) W AT SPRING LINE SHALL NOT BE LESS THAN 6" (150 mm) FOR ANY DEPTH OF TRENCH. THIS DIMENSION MAY INCLUDE THE THICKNESS OF ANY SHEETING.
(b) WHERE COVER IS GREATER THAN 8'-0" (2.5 m), W MEASURED AT TOP OF PIPE SHALL NOT BE GREATER THAN 8" (200 mm) UNLESS THE CONTRACTOR AT ITS OWN EXPENSE PROVIDES CASE I BEDDING OR STRONGER PIPE. THE STATED 8" (200 mm) INCLUDES THE THICKNESS OF ANY SHEETING.
(c) SCREED BEDDING MATERIAL TO FIT CURVATURE AND GRADE OF PIPE. TYPE OF SCREED AND THE METHOD OF USE TO BE APPROVED BY THE ENGINEER.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

**PIPE BEDDING IN TRENCHES**

APPROVED Thomas P. Stimmler 5/31/1992
DIRECTOR OF PUBLIC WORKS DATE
1995, 1999, 2007
REVISIONS

STANDARD PLAN 3080-3
SHEET 1 OF 3

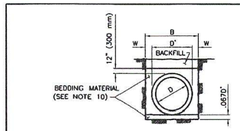


CASE 6

NOTES:
CASE 6 BEDDING (LOAD FACTOR 1.5)
(a) NOTES (a), (b), AND (c) FROM CASE 3 SHALL APPLY.
(b) WHERE SUBGRADE IS COMPOSED OF OTHER THAN GRANULAR OR SANDY MATERIAL, THE TRENCH SHALL BE EXCAVATED TO DEPTH OF AT LEAST 3" (75 mm) BELOW THE PIPE AND BACKFILLED WITH BEDDING MATERIAL OR OTHER MATERIALS AS MAY BE SPECIFIED OR OTHERWISE APPROVED BY THE AGENCY.

NOTES
1. USE CASE 3 FOR RCP, CASE 2 FOR VITRIFIED CLAY, AND PLAIN CONCRETE PIPE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE PLANS. SEE PLANS FOR BEDDING DETAILS FOR PIPE OF OTHER MATERIALS.
2. BEDDING MATERIAL SHALL CONFORM TO TABLE 3080-3.1

| TABLE 3080-3.1 | |
|---|---|
| PARTICLE SIZE (MAX.) | 3/4" |
| % PASSING NO. 4 SIEVE (MIN.) | 50 |
| % PASSING NO. 16 SIEVE (MIN.) | 15 |
| SAND EQUIVALENT (MIN.) | 20 |

3. CONCRETE BACKFILL SHALL BE POURED FROM WALL TO WALL OF THE TRENCH AND FROM THE BOTTOM OF THE TRENCH TO A MINIMUM DEPTH OF 4" (100 mm) OVER THE TOP OF THE PIPE.
4. CONCRETE BACKFILL SHALL BE PROVIDED FOR RCP 21" (525 mm) IN DIAMETER OR LESS WHERE THE COVER IS EQUAL TO OR LESS THAN 24" (600 mm), FOR RCP GREATER THAN 21" (525 mm) IN DIAMETER BUT LESS THAN 39" (975 mm) WHERE THE COVER IS LESS THAN 15" (375 mm) AND FOR RCP 39" (975 mm) OR GREATER WHERE THE COVER IS LESS THAN 12" (300 mm). CONCRETE BACKFILL SHALL CONFORM TO NOTE 3.
5. 3-EDGE BEARING TEST LOAD FACTOR (D-LOAD) = 1.0.
6. DIMENSIONS SHOWN ON THIS STANDARD PLAN FOR ENGLISH AND METRIC UNITS ARE NOT EQUIVALENT. IF METRIC UNITS ARE USED, ALL UNITS SHALL BE METRIC. IF ENGLISH UNITS ARE USED, ALL UNITS SHALL BE ENGLISH.
7. TOP OF BEDDING MATERIAL AS SHOWN, UNLESS OTHERWISE SHOWN ON THE PLANS OR SPECIFIED IN THE SPECIAL PROVISIONS.
8. D-LOADS FOR RCP TO BE PLACED IN ACCORDANCE WITH THIS STANDARD PLAN MUST BE DESIGNED FOR AN EMBANKMENT CONDITION, EVEN WHEN PLACED IN A TRENCH.
9. FOR WORK WITHIN THE JURISDICTION OF THE U.S. ARMY CORPS OF ENGINEERS, REFER TO PERMIT REQUIREMENTS.
10. BEDDING MATERIAL BELOW THE PIPE SHALL BE LOOSELY PLACED TO AVOID STRESS CONCENTRATIONS AT THE BOTTOM OF THE PIPE. BEDDING MATERIAL BELOW THE SPRING LINE, UNLESS CONCRETE, SHALL BE COMPACTED AFTER PLACEMENT OF THE PIPE.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

**PIPE BEDDING IN TRENCHES**

STANDARD PLAN 3080-3
SHEET 3 OF 3

| TABLE OF BAR SIZES | | |
|---|---|---|
| D2 OR B | A & B | D OR F |
| 12"–39" (300 – 975 mm) | #5 @ 3" (#16M @ 75 mm) | #4 @ 6" (#13M @ 150 mm) |
| 42"–84" (1050 – 2100 mm) | #6 @ 3" (#19M @ 75 mm) | #5 @ 6" (#16M @ 150 mm) |
| 90"–144" (2250 – 3600 mm) | #7 @ 3" (#22M @ 75 mm) | #6 @ 6" (#19M @ 150 mm) |

| TABLE OF VALUES FOR M (SEE NOTE 2) | | | | |
|---|---|---|---|---|
| SECTION | PAVED STREET | | UNPAVED STREET | |
| | MAX | MIN | MAX | MIN |
| N-M-P-O | | 2' 10-1/2" (867 mm) | | 1060 mm (3'-6") |
| C-C | 11" (282 mm) | 8-1/2" (217 mm) | 16" (410 mm) | 15" (380 mm) |

| TABLE OF VALUES FOR F | |
|---|---|
| D2 | F |
| 36" (900 mm) | 6-1/2" (165 mm) |
| 39" (975 mm) | 7" (180 mm) |
| 42" (1050 mm) | 7-1/2" (190 mm) |
| 45" (1125 mm) | 7-3/4" (195 mm) |
| 48" (1200 mm) | 8" (205 mm) |
| 51" (1275 mm) | 8-1/2" (215 mm) |
| 54" (1350 mm) | 9" (230 mm) |
| 57" (1425 mm) | 9-1/4" (235 mm) |
| 60" (1500 mm) | 9-1/2" (240 mm) |
| 63" (1575 mm) | 10" (255 mm) |
| 66" (1650 mm) | 10-1/4" (260 mm) |
| 69" (1725 mm) | 10-3/4" (275 mm) |
| 72" (1800 mm) | 11" (280 mm) |
| 78" (1950 mm) | 11-3/4" (300 mm) |
| 84" (2100 mm) | 12-1/2" (320 mm) |
| 90" (2250 mm) | 13-1/4" (335 mm) |
| 96" (2400 mm) | 14" (355 mm) |
| 102" (2550 mm) | 15-1/2" (395 mm) |
| 108" (2700 mm) | 16" (405 mm) |
| 114" (2850 mm) | 16-1/2" (420 mm) |
| 120" (3000 mm) | 17" (430 mm) |
| 126" (3150 mm) | 17" (430 mm) |
| 132" (3300 mm) | 17-1/2" (445 mm) |
| 138" (3450 mm) | 17-1/2" (445 mm) |
| 144" (3600 mm) | 18" (455 mm) |

| TABLE OF VALUES FOR T | |
|---|---|
| B | T |
| 12" (300 mm) | 4" (100 mm) |
| 15" (375 mm) | 4-1/4" (110 mm) |
| 18" (450 mm) | 4-1/2" (115 mm) |
| 21" (525 mm) | 5" (125 mm) |
| 24" (600 mm) | 5-1/4" (135 mm) |
| 27" (675 mm) | 5-1/2" (140 mm) |
| 30" (750 mm) | 6" (150 mm) |
| 33" (825 mm) | 6-1/4" (160 mm) |
| 36" (900 mm) | 6-1/2" (165 mm) |
| 39" (975 mm) | 7" (180 mm) |
| 42" (1050 mm) | 7-1/2" (190 mm) |
| 45" (1125 mm) | 7-3/4" (195 mm) |
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| 78" (1950 mm) | 11-3/4" (300 mm) |
| 84" (2100 mm) | 12-1/2" (320 mm) |
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| 96" (2400 mm) | 14" (355 mm) |
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| 126" (3150 mm) | 17" (430 mm) |
| 132" (3300 mm) | 17-1/2" (445 mm) |
| 138" (3450 mm) | 17-1/2" (445 mm) |
| 144" (3600 mm) | 18" (455 mm) |

NOTES

1. VALUES FOR A, B, C, D1, D2, ELEVATION R AND ELEVATION S ARE SHOWN ON THE PLANS. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.
2. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" (867 mm) FOR PAVED STREETS OR 3'-6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C-C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C-C. WHEN DIAMETER D1 IS 48" (1200 mm) OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 3.
3. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTERLINE OF STORM DRAIN WHEN DIAMETER D1 IS 48" (1200 mm) OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE.
4. LENGTH OF MANHOLE MAY BE INCREASED AT OPTION TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION F SPUR MUST BE APPROVED BY THE ENGINEER.
5. P SHALL BE 5" (125 mm) FOR D2=96" (2400 mm) OR LESS AND 8" (200 mm) FOR D2 OVER 96" (2400 mm).
6. REINFORCEMENT SHALL CONFORM TO ASTM A 615M, GRADE 300 (ASTM A 615, GRADE 40), AND SHALL TERMINATE 1-1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. FLOOR OF MANHOLE SHALL BE STEEL-TROWLED TO SPRING LINE.
8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES OF F SHOWN ON TABLE, SHEET 1.
10. IF LATERALS ENTER ON BOTH SIDES OF MANHOLE, SHAFT SHALL BE LOCATED ON SIDE RECEIVING THE SMALLER LATERAL.
11. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" TO 15" (350 TO 375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE INVERT.
12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
    - o THIS STANDARD PLAN IS USED WHEN SPPWC 320 IS INADEQUATE.
    - o MAIN LINE = 900 mm (36") INSIDE DIAMETER OR LARGER.
    - o LATERAL = 300 mm (12") TO 3600 mm (144") INSIDE DIAMETER; HOWEVER, THE INSIDE DIAMETER SHALL NOT EXCEED THE INSIDE DIAMETER OF THE MAIN LINE.
13. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT – 900 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 326.
16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.
17. WHERE A PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.
18. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
    - 324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
    - 326 MANHOLE SHAFT – 900 mm (36") WITHOUT REDUCER
    - 328 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER
    - 329 PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER
    - 630 610 mm (24") MANHOLE FRAME AND COVER
    - 633 914 mm (36") MANHOLE FRAME AND COVER
    - 635 STEEL STEP
    - 636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE – PIPE TO PIPE (LARGE SIDE INLET)**

STANDARD PLAN 322-3
SHEET 3 OF 4

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE – PIPE TO PIPE (LARGE SIDE INLET)**

STANDARD PLAN 322-3
SHEET 4 OF 4

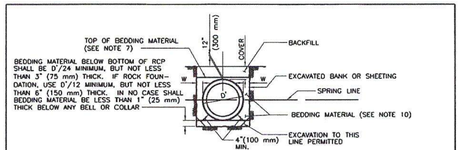


CASE 3
REINFORCED CONCRETE PIPE

NOTES:
CASE 3 BEDDING & BACKFILL AROUND RCP (LOAD FACTOR 2.2 TO 2.5)
(a) W AT SPRING LINE SHALL NOT BE LESS THAN THE FOLLOWING: 6" (150 mm) FOR RCP 60" (1500 mm) OR LESS IN DIAMETER, 10" (250 mm) FOR RCP 63" (1575 mm) TO 108" (2700 mm) INCLUSIVE IN DIAMETER, AND 12" (300 mm) FOR PIPE LARGER THAN 108" (2700 mm) IN DIAMETER. THESE DIMENSIONS MAY INCLUDE THE THICKNESS OF ANY SHEETING.
(b) WHERE COVER IS GREATER THAN 10'-0" (3 m), W MEASURED AT TOP OF PIPE SHALL NOT BE GREATER THAN 10" (250 mm) FOR RCP 108" (2700 mm) IN DIAMETER OR LESS, OR 12" (300 mm) FOR RCP OVER 108" (2700 mm) IN DIAMETER. THESE DIMENSIONS INCLUDE THE THICKNESS OF ANY SHEETING.
(c) SCREED BEDDING MATERIAL TO FIT CURVATURE AND GRADE OF RCP. TYPE OF SCREED AND THE METHOD OF USE TO BE APPROVED BY THE ENGINEER.
(d) BEDDING MATERIAL BELOW THE SPRING LINE FOR RCP 54" (1350 mm) OR LARGER SHALL BE COMPACTED BEFORE PLACING BEDDING MATERIAL ABOVE THE SPRING LINE.

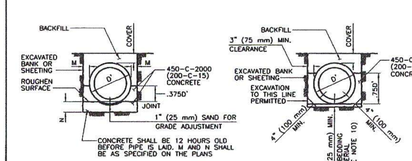


CASE 4

NOTE:
CASE 4 BEDDING (LOAD FACTOR 3.0)
WHERE REQUIRED BY THE ENGINEER AS AN ALTERNATIVE TO CASE 1 OR CASE 5 TO MEET CONDITIONS ARISING DURING CONSTRUCTION.

CASE 5

NOTE:
CASE 5 BEDDING (LOAD FACTOR 2.7)
SHALL BE USED WHERE SPECIFIED ON THE PLANS. CASE 4 BEDDING SHALL BE USED INSTEAD OF CASE 5 AGAINST SHEETING OR UNSTABLE TRENCH WALLS IF SO REQUIRED BY THE ENGINEER.

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

**PIPE BEDDING IN TRENCHES**

STANDARD PLAN 3080-3
SHEET 2 OF 3

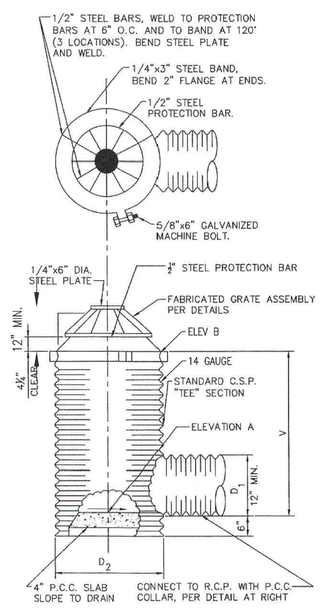


**NOTES:**
1. V, $D_1$, $D_2$ AND ELEVATION "A" SHALL BE SHOWN ON THE CONSTRUCTION PLANS.
2. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT C.S.P. OF SIZE "$D_2$".
3. GRATE ASSEMBLY SHALL BE GALVANIZED AFTER FABRICATION.
4. R.C.P. SHALL BE SIZED TO FIT FUTURE CATCH BASIN DESIGN.
5. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT THE OUTSIDE DIAMETER OF STANDARD JUNCTION STRUCTURE SHAFT IF INDICATED ON CONSTRUCTION PLANS.

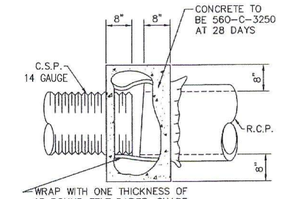


**COLLAR DETAIL**

14 TEMPORARY CSP STANDPIPE DETAIL
DETAIL 1

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN HALEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SIGNATURE NOT VALID UNLESS SEALED — No.85559 Exp. 9/30/2024 — CIVIL — STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

**STORM DRAIN IMPROVEMENT PLAN**
GROVE AVENUE
**DETAILS**

PM-20537

SHEET 12 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14083

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 – Prologis – Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\12_2021-315_SD-DETAILS.dwg
Last Opened: Feb 27, 2024 - 12:40pm by: Brent.King

02/27/2024

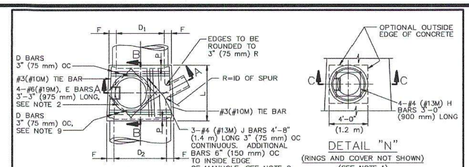


PLAN
(SHAFT NOT SHOWN)




DETAIL "N"
(RINGS AND COVER NOT SHOWN)
(SEE NOTE 1)

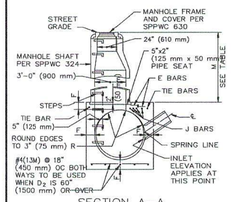


SECTION A-A

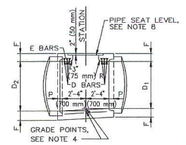


SECTION B-B

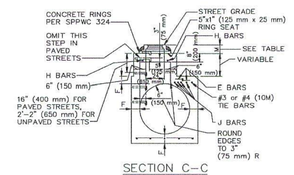


SECTION C-C

| TABLE OF VALUES FOR F | |
|---|---|
| $D_2$ | F |
| 36" (900 mm) | 6 1/2" (165 mm) |
| 39" (975 mm) | 7" (180 mm) |
| 42" (1050 mm) | 7 1/2" (190 mm) |
| 45" (1125 mm) | 7 3/4" (195 mm) |
| 48" (1200 mm) | 8" (205 mm) |
| 51" (1275 mm) | 8 1/2" (215 mm) |
| 54" ( 1350 mm) | 9" (230 mm) |
| 57" (1425 mm) | 9 1/4" (235 mm) |
| 60" (1500 mm) | 9 1/2" (240 mm) |
| 63" (1575 mm) | 10" (255 mm) |
| 66" ( 1650 mm) | 10 1/4" (260 mm) |
| 69" (1725 mm) | 10 3/4" (275 mm) |
| 72" (1800 mm) | 11" (280 mm) |
| 78" (1950 mm) | 11 3/4" (300 mm) |
| 84" (2100 mm) | 12 1/2" (320 mm) |
| 90" (2250 mm) | 13 1/4" (335 mm) |
| 96" (2400 mm) | 14" (355 mm) |
| 102" (2550 mm) | 15 1/2" (395 mm) |
| 108" (2700 mm) | 16" (405 mm) |
| 114" (2850 mm) | 16 1/2" (420 mm) |
| 120" (3000 mm) | 17" (430 mm) |
| 126" (3150 mm) | 17" (430 mm) |
| 132" (3300 mm) | 17 1/2" (445 mm) |
| 138" (3450 mm) | 17 1/2" (445 mm) |
| 144" (3600 mm) | 18" (455 mm) |

| TABLE OF VALUES FOR M (SEE NOTE 1) | | | | |
|---|---|---|---|---|
| SECTION | PAVED STREET | | UNPAVED STREET | |
| | MAX | MIN | MAX | MIN |
| A-A | | 2'-10 1/2" (867 mm) | | 3'-6" (1060 mm) |
| C-C | 11" (282 mm) | 8 1/2" (217 mm) | 16" (410 mm) | 15" (380 mm) |

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" (867 mm) FOR PAVED STREETS OR 3'-6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C-C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C-C. WHEN DIAMETER $D_1$ IS 48" (1200 mm) OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 2.
2. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTER LINE OF STORM DRAIN WHEN DIAMETER $D_1$ IS 48" (1200 mm) OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE AND OMIT J BARS.
3. L AND P SHALL HAVE THE FOLLOWING VALUES UNLESS OTHERWISE SHOWN ON THE PROJECT DRAWINGS:
   A. $D_2$=96" (2400 mm) OR LESS, L=5'-6" (1.7 m), P=5" (130 mm)
   B. $D_2$ OVER 96" (2400 mm), L=6'-0" (1.8 m), P=8" (210 mm)
   L MAY BE INCREASED OR LOCATION OF MANHOLE SHIFTED TO MEET PIPE ENDS. WHEN L GREATER THAN THAT SHOWN ABOVE IS SPECIFIED, D BARS SHALL BE CONTINUED 6" (150 mm) OC.
4. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES.
5. REINFORCEMENT SHALL CONFORM TO ASTM A 615M, GRADE 300 (ASTM A 615, GRADE 40), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
6. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
7. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
8. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES FOR F SHOWN ON SHEET 2.
9. D BARS SHALL BE #4 (#13M) FOR $D_2$=39" (975 mm) OR LESS, #5 (#16M) FOR $D_2$= 42" (1050 mm) TO 84" (2100 mm) INCLUSIVE AND #6 (#19M) FOR $D_2$= 90" (2250 mm) OR OVER.
10. CENTERLINE OF INLET PIPE SHALL INTERSECT INSIDE FACE OF CONE AT SPRING LINE UNLESS OTHERWISE SHOWN.
11. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE INVERT.
12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
   A. MAIN LINE = 36" (900 mm) INSIDE DIAMETER OR LARGER. EXCEPT IF THE MAIN LINE RCP DOWNSTREAM OF MANHOLE IS 36" (900 mm) TO 42" (1050 mm) INSIDE DIAMETER AND THE MAIN LINE RCP UPSTREAM IS 33" (825 mm) OR LESS SPPWC 321 SHALL BE USED.
   B. THE OUTSIDE DIAMETER OF THE LATERAL MUST BE LESS THAN OR EQUAL TO 1/2 THE INSIDE DIAMETER OF THE MAIN LINE. IF THE UPSTREAM AND DOWNSTREAM DIAMETERS OF THE MANHOLE ARE NOT THE SAME, THE GOVERNING INSIDE DIAMETER OF THE MAIN LINE SHALL BE CONSIDERED TO BE THAT WHERE THE EXTENDED CENTERLINE OF THE LATERAL ENTERS THE MANHOLE.
   C. IN NO INSTANCE SHALL THE INSIDE DIAMETER OF THE LATERAL TO THE MANHOLE BE GREATER THAN 30" (750 mm).
13. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 326.
16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.
17. WHERE A PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.
18. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
   324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
   326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
   328 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC
   329 PRESSURE MANHOLE SHAFT 36" (914 mm) WITHOUT REDUCER
   630 24" (610 mm) MANHOLE FRAME AND COVER
   633 36" (914 mm) MANHOLE FRAME AND COVER
   635 STEEL STEP
   636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PROMULGATED BY THE PUBLIC WORKS STANDARDS, INC. GREENBOOK COMMITTEE 1962 REV. 1996, 2009
MANHOLE PIPE-TO-PIPE
MAIN LINE ID=36" (900 mm) OR LARGER
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
STANDARD PLAN 320-2
SHEET 1 OF 4

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
MANHOLE PIPE-TO-PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER
STANDARD PLAN 320-2
SHEET 2 OF 4

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
MANHOLE PIPE-TO-PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER
STANDARD PLAN 320-2
SHEET 3 OF 4

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
MANHOLE PIPE-TO-PIPE
MAIN LINE ID = 36" (900 mm) OR LARGER
STANDARD PLAN 320-2
SHEET 4 OF 4

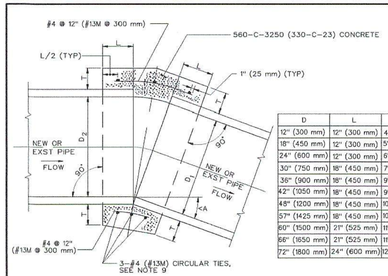


| D | L | T |
|---|---|---|
| 12" (300 mm) | 12" (300 mm) | 4" (100 mm) |
| 18" (450 mm) | 12" (300 mm) | 5" (125 mm) |
| 24" (600 mm) | 12" (300 mm) | 6" (150 mm) |
| 30" (750 mm) | 18" (450 mm) | 7" (175 mm) |
| 36" (900 mm) | 18" (450 mm) | 9" (225 mm) |
| 42" (1050 mm) | 18" (450 mm) | 9" (225 mm) |
| 48" (1200 mm) | 18" (450 mm) | 10" (250 mm) |
| 57" (1425 mm) | 18" (450 mm) | 10" (250 mm) |
| 60" (1500 mm) | 21" (525 mm) | 11" (275 mm) |
| 66" (1650 mm) | 21" (525 mm) | 11" (275 mm) |
| 72" (1800 mm) | 24" (600 mm) | 12" (300 mm) |

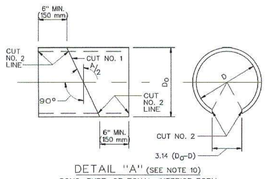


DETAIL "A" (SEE NOTE 10)
SONO-TUBE, OR EQUAL, INTERIOR FORM

CUT NO. 1: SAW THE TUBE AT AN ANGLE OF A/2 WITH THE TRANSVERSE PLANE. REVERSE ONE SECTION AND TAPE BOTH SECTIONS TOGETHER FORMING THE DEFLECTION ANGLE A. CUT NO. 2: SAW THE TUBE LONGITUDINALLY REMOVING A STRIP 3.14 (Dg-D ) WIDE ON THE SIDE OPPOSITE THE OPEN JOINT. BEND THE ENDS OF THE CUT TOGETHER AND INSERT THE TUBE IN THE PIPE.

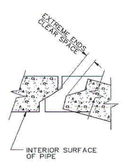


DETAIL "B"
TYPICAL JOINT FOR REINFORCED CONCRETE PIPE

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PROMULGATED BY THE PUBLIC WORKS STANDARDS, INC. GREENBOOK COMMITTEE 1962 REV: 1996, 1997, 1999, 2009
CONCRETE COLLAR FOR RCP
12" (300 mm) THROUGH 72" (1800 mm)
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
STANDARD PLAN 380-4
SHEET 1 OF 2

NOTES

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 10%.
2. FOR CURVE JOINTS (SEE DETAIL B, SHEET 1)
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS GREATER THAN 1" (25 mm), BUT IS LESS THAN 3" (75 mm) A CONCRETE COVER IS REQUIRED IN ACCORDANCE WITH SSPWC 306-7.3.2.1.
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS EQUAL TO OR GREATER THAN 3" (75 mm), BUT LESS THAN 6" (150 mm), A CONCRETE COLLAR IS REQUIRED. IF THE CLEAR SPACE IS 6" (150 mm) OR GREATER, A TRANSITION STRUCTURE IS REQUIRED.
3. CONCRETE COLLAR SHALL NOT BE USED FOR A SIZE CHANGE ON THE MAIN LINE.
4. CONNECTOR PIPES
   A. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE. D=$D_1$ OR $D_2$ WHICHEVER IS GREATER.
   B. WHEN $D_1$ IS EQUAL TO OR LESS THAN $D_2$ JOIN INVERTS AND WHEN $D_1$ IS GREATER THAN $D_2$ JOIN SOFFITS.
5. FOR PIPE LARGER THAN 72" (1800 mm) SPECIAL COLLAR DETAILS ARE REQUIRED.
6. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
7. REINFORCEMENT SHALL CONFORM TO ASTM A 615 (A 615 M) GRADE 40 (300).
8. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE D=(2X WALL THICKNESS) + T.
9. REINFORCING SHALL BE USED WHERE THE PIPE DIAMETER IS GREATER THAN 21" (525 mm) AND ON ALL PIPES WHERE THE SPACES BETWEEN THE EXTREME OUTER ENDS IS 3" (75 mm) OR LARGER.

CIRCULAR TIES:

| PIPE DIAMETER | NO. OF CIRCULAR TIES |
|---|---|
| 21" (525 mm) OR LESS | 3 |
| 24" (600 mm) TO 30" (750 mm) | 3 |
| 33" (825 mm) TO 57" (1425 mm) | 4 |
| 60" (1500 mm) TO 72" (1800 mm) | 5 |

WHERE THE SPACE BETWEEN PIPE ENDS EXCEEDS 3" (75 mm), THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6" (150 mm) O.C.

10. WHERE THE PIPE IS 21" (525 mm) OR LESS IN DIAMETER AN INTERIOR FORM OF UNSEALED SONO-TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A). WHEN THE PIPE IS 24" (600 mm) OR LARGER A REMOVABLE INTERIOR FORM SHALL BE USED OR THE INTERIOR JOINT SHALL BE COMPLETELY FILLED WITH MORTAR AND NEATLY POINTED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
CONCRETE COLLAR FOR RCP
12" (300 mm) THROUGH 72" (1800 mm)
STANDARD PLAN 380-4
SHEET 2 OF 2

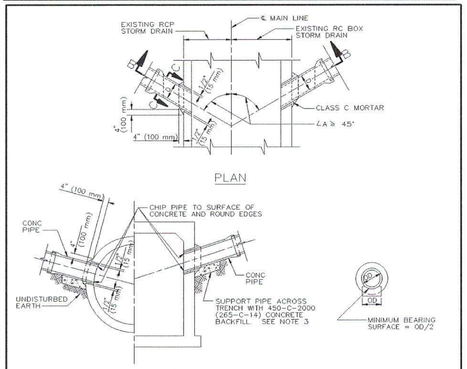


PLAN

SECTION B-B

SECTION C-C

CASE 1
PLAIN CONCRETE PIPE
D = 24" (600 mm) MAX.

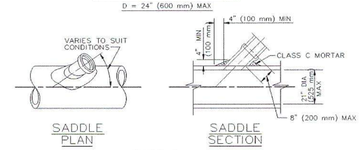


SADDLE PLAN

SADDLE SECTION

CASE 2
SADDLE CONNECTION

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PROMULGATED BY THE PUBLIC WORKS STANDARDS, INC. GREENBOOK COMMITTEE 1962 REV: 1996, 2009
PIPE CONNECTIONS TO EXISTING STORM DRAINS
USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION
STANDARD PLAN 335-2
SHEET 1 OF 3

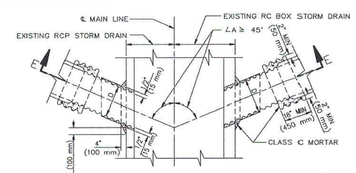


PLAN

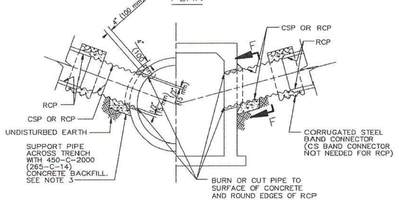


SECTION E-E

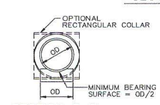


SECTION F-F

| DIAMETER OF CSP | MIN GAGE |
|---|---|
| 15" (375 mm) – 21" (525 mm) | 16 |
| 24" (600 mm) | 14 |

CASE 3
RCP OR CSP
D = 24" (600 mm) MAX.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PIPE CONNECTIONS TO EXISTING STORM DRAINS
STANDARD PLAN 335-2
SHEET 2 OF 3

NOTES

CASE 1 AND CASE 3

1. OUTSIDE DIAMETER OF THE CONNECTOR PIPE SHALL NOT BE GREATER THAN 1/2 THE INSIDE DIAMETER OF THE RCP MAIN LINE.
2. INSIDE DIAMETER D OF THE CONNECTOR PIPE SHALL NOT BE GREATER THAN 24" (600 mm).
3. THE MINIMUM OPENING INTO THE EXISTING STORM DRAIN SHALL BE THE OUTSIDE DIAMETER OF THE CONNECTING PIPE PLUS 1" (30 mm). THE CONCRETE BACKFILL SUPPORTING THE CONNECTING PIPE MAY BE OMITTED IF THE PIPE IS LAID ON UNDISTURBED EARTH TO STORM DRAIN WALL.
4. ALL CSP AND FITTINGS SHALL BE GALVANIZED. BAND CONNECTORS MAY BE 2 GAGES LIGHTER THAN THE PIPE, BUT WITH A MINIMUM GAGE OF 16. THEY SHALL BE CONNECTED AT THE ENDS BY ANGLES HAVING MINIMUM DIMENSIONS OF 2"x2"x3/16" (50 mm x 50 mm x 5 mm) AND 5 1/2" (140 mm) BOLTS.
5. WHEN JOINING A RCP CONNECTOR PIPE TO A CSP CONNECTOR PIPE, THE INSIDE DIAMETER D OF THE CSP SHALL BE AT LEAST EQUAL TO BUT NOT MORE THAN 3" (75 mm) GREATER THAN THAT OF THE RCP.
6. CONNECTOR PIPES SHALL BE NOT MORE THAN 5' (1.5 m) ABOVE THE INVERT.
7. CONNECTOR PIPES SHALL ENTER MAIN LINE RCP RADIALLY.
8. WHEN CONNECTING TO A RCB, SPPWC 333 SHALL BE USED IF THE TOP OF THE CONNECTOR PIPE IS LESS THAN 12" (300 mm) BELOW THE SOFFIT OF THE RCB OR THE FLOW LINE OF THE PIPE IS LESS THAN 13" (330 mm) ABOVE THE FLOOR OF THE RCB AT THE INSIDE FACE.

CASE 2

9. SADDLE CONNECTIONS SHALL BE USED WHEN CONNECTING TO PIPES 21" (525 mm) OR LESS IN DIAMETER WITHOUT THE USE OF JUNCTION STRUCTURES OR PRECAST Y BRANCHES.
10. TRIM OR CUT SADDLE TO FIT SNUGLY OVER THE OUTSIDE OF THE MAIN PIPE SO ITS AXIS WILL BE ON THE LINE AND GRADE OF THE CONNECTING PIPE.
11. THE OPENING INTO THE PIPE SHALL BE CUT AND TRIMMED TO FIT THE SADDLE SO THAT NO PART WILL PROJECT WITHIN THE BORE OF THE SADDLE PIPE.
12. THE CONNECTOR PIPE SHALL BE SUPPORTED AS SHOWN IN CASE 1 AND CASE 3.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION
PIPE CONNECTIONS TO EXISTING STORM DRAINS
STANDARD PLAN 335-2
SHEET 3 OF 3

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

CITY OF ONTARIO
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIAR RAE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

STORM DRAIN IMPROVEMENT PLAN
GROVE AVENUE
DETAILS

PM-20537

SHEET 13 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14034

02/27/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 – Prologis – Eddie Pang\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN PLAN-2021-315.DWG
Last Opened: Feb 27, 2024 - 12:44pm by: Brent.King

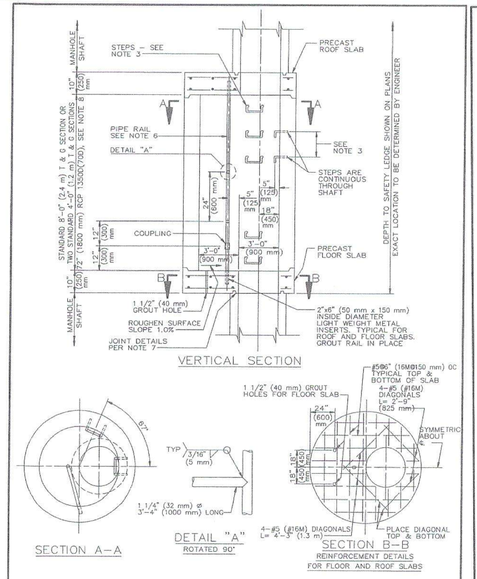


STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1995, 2009

**MANHOLE SHAFT SAFETY LEDGE**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 330–2

SHEET 1 OF 2

NOTES

1. MANHOLE SHAFT SAFETY LEDGE WILL BE NOTED ON THE PLANS WHEN REQUIRED. IT IS TO BE CONSTRUCTED WHEN DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
2. A SAFETY LEDGE SHALL NOT BE USED IF A PRESSURE MANHOLE IS REQUIRED.
3. STEPS SHALL CONFORM TO SPPWC 635 OR 636 AND SHALL BE ANCHORED 4" (100 mm) IN THE WALL OF THE STRUCTURE. STEPS SHALL BE PLACED TO MATCH THE SPACING OF THE MANHOLE SHAFT.
4. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300) AND SHALL TERMINATE 2" (50 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
5. GROUT HOLES, PIPE AND FITTINGS SHALL BE PROVIDED IN THE FLOOR SLAB. PRESSURE GROUTING SHALL BE USED TO FILL VOIDS AND TO SECURE UNIFORM BEARING. THE GROUT SHALL BE NEAT CEMENT GROUT AND GROUTING PRESSURES SHALL BE AS DETERMINED IN THE FIELD BY THE ENGINEER.
6. PIPE RAIL SHALL BE FABRICATED OF 1 1/4" (32 mm) STANDARD GALVANIZED PIPE COMPOSED OF TWO SECTIONS 7'–6" (2.25 m) & 18" (450 mm) IN LENGTH JOINED BY A GALVANIZED COUPLING. THE COUPLING SHALL BE THREADED A MINIMUM OF 2" (50 mm) ON EACH PIPE LENGTH.
7. ROOF AND FLOOR SLABS SHALL BE PRECAST AND KEYED FOR REINFORCED CONCRETE PIPE SECTIONS AS SHOWN. ALL JOINTS SHALL BE FILLED WITH CLASS C MORTAR AND NEATLY POINTED OR WIPED ON THE INSIDE.
8. 72" (1800 mm) RCP SHALL BE PROVIDED WITH TWO CIRCULAR CAGES OF REINFORCEMENT.
9. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

   324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
   326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
   635 STEEL STEP
   636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE SHAFT SAFETY LEDGE**

STANDARD PLAN 330–2

SHEET 2 OF 2

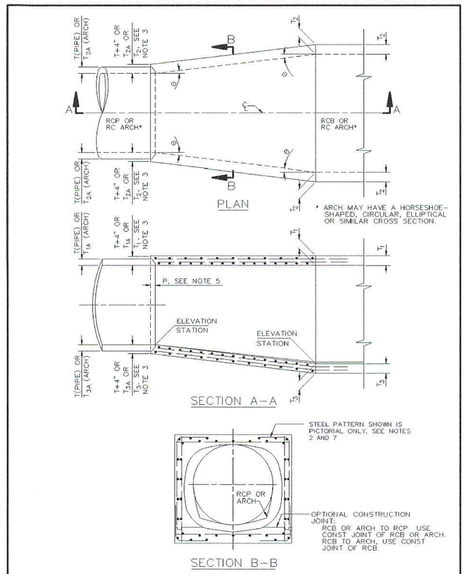


STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1995, 2009

**TRANSITION STRUCTURE RCB TO PIPE**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 342–2

SHEET 1 OF 2

NOTES

1. THE HORIZONTAL ANGLE OF DIVERGENCE OR CONVERGENCE, θ, SHALL NOT EXCEED 5° 45'.
2. REINFORCING STEEL BAR SIZES, SPACING, PATTERN AND COVER OVER THE STEEL SHALL BE AS FOLLOWS:
   RCB TO RCP AND RCB TO ARCH – THAT OF RCB SECTION.
   ARCH TO RCP – THAT OF ARCH SECTION.
   ARCH TO ARCH – THAT OF ARCH SECTION HAVING THE THICKER WALLS. THE BAR LENGTHS SHALL VARY UNIFORMLY THROUGHOUT THE TRANSITION.
3. THE CONCRETE THICKNESS SHALL BE AS FOLLOWS:
   RCB TO RCP AND ARCH TO RCP – THAT OF ARCH OR RCB SECTION UNLESS THE WALL THICKNESS OF THE RCP PLUS 100 mm (4") GREATER, IN WHICH CASE THE CONCRETE THICKNESS SHALL VARY UNIFORMLY FROM THAT OF THE ARCH OR RCB SECTION TO THAT OF THE RCP WALL PLUS 100 mm (4").

   RCB TO ARCH AND ARCH TO ARCH – THAT OF THE ADJOINING RCB OR ARCH SECTION AT EACH END OF THE TRANSITION AND SHALL VARY UNIFORMLY BETWEEN THE TWO ENDS.
4. THE INTERIOR SURFACE SHALL BE SMOOTH AND VARY UNIFORMLY BETWEEN THE TWO ADJOINING SECTIONS.
5. AT RCP JUNCTURE, EMBEDMENT P SHALL BE 130 mm (5") FOR PIPE SIZE OF 2400 mm (96") OR LESS, AND 200 mm (8") FOR PIPE SIZES OVER 2400 mm (96").
6. $f'_c$ = 28 MPa (4000 PSI) AT 28 DAYS AND THE CONCRETE SHALL BE THE SAME MIX AS THE ADJACENT RCB.
7. ALL STEEL, EXCEPT LONGITUDINAL STEEL SHALL BE GRADE 400 (60) BILLET STEEL CONFORMING TO ASTM A 615 M (A 615) AND SHALL TERMINATE 40 mm (1 1/2") CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
8. KEYED CONSTRUCTION JOINTS OF THE SAME DIMENSIONS AS THOSE OF THE RCB OR ARCH SECTION MAY BE CARRIED THROUGH THE TRANSITION STRUCTURE AT THE CONTRACTOR'S OPTION. SEE SECTION B–B.
9. THE TRANSITION STRUCTURE SHALL BE CONSTRUCTED IN ACCORDANCE THE STRUCTURAL NOTES APPLYING TO RCB OR ARCH STRUCTURES SHOWN ON THE PLANS.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**TRANSITION STRUCTURE RCB TO PIPE**

STANDARD PLAN 342–2

SHEET 2 OF 2

U:\COMMON\CAD\TREATMENT\22-CDS\40 STANDARD DRAWINGS\CDS-N.DWG 6/9/2011 12:31 PM

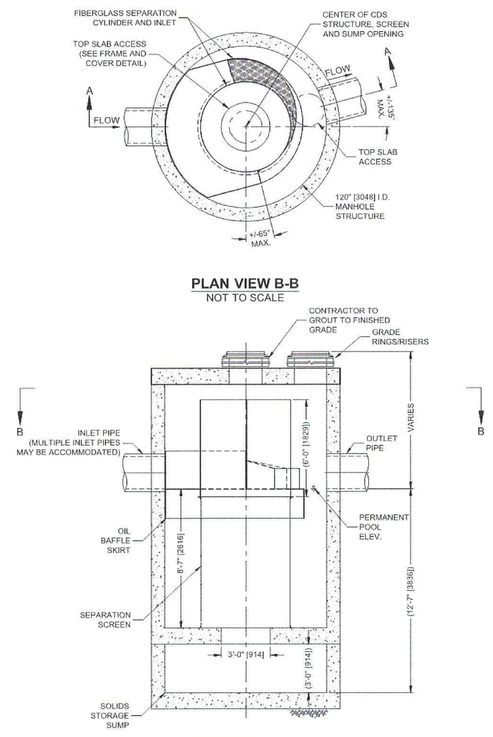


## CDS5678-10-C DESIGN NOTES

CDS5678-10-C RATED TREATMENT CAPACITY IS 25.0 CFS [708.0 L/s], OR PER LOCAL REGULATIONS. IF THE SITE CONDITIONS EXCEED MAXIMUM HYDRAULIC CAPACITY, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

CDS5678-10-C STANDARD CONFIGURATION IS SHOWN.

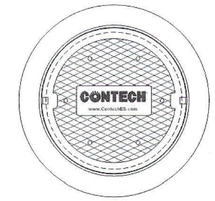


**FRAME AND COVER**
(DIAMETER VARIES)
NOT TO SCALE

## SITE SPECIFIC DATA REQUIREMENTS

| | | | |
|---|---|---|---|
| STRUCTURE ID | | | |
| WATER QUALITY FLOW RATE (CFS OR L/s) | | | * |
| PEAK FLOW RATE (CFS OR L/s) | | | * |
| RETURN PERIOD OF PEAK FLOW (YRS) | | | * |
| SCREEN APERTURE (2400 OR 4700) | | | * |
| PIPE DATA: | I.E. | MATERIAL | DIAMETER |
| INLET PIPE 1 | * | * | * |
| INLET PIPE 2 | * | * | * |
| OUTLET PIPE | * | * | * |
| RIM ELEVATION | | | * |
| ANTI-FLOTATION BALLAST | WIDTH | HEIGHT | |
| | * | * | |
| NOTES/SPECIAL REQUIREMENTS: | | | |

* PER ENGINEER OF RECORD

GENERAL NOTES

1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

CDS5678-10-C
ONLINE CDS
STANDARD DETAIL

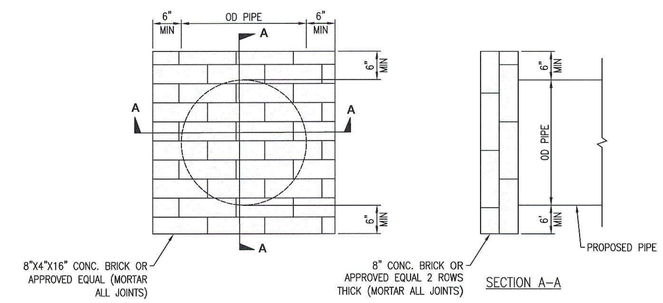


9 BRICK AND MORTAR BULKHEAD DETAIL
N.T.S.

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG–18–1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG–18–1." SET ON TOP OF CURB. APPROX 5' +/– SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No.85559 Exp. 9/30/2024 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: Siara R. MacKinney, P.E. — R.C.E. NO. 85559 — DATE 3/14/24

**STORM DRAIN IMPROVEMENT PLAN**
GROVE AVENUE

**DETAILS**

PM-20537

SHEET 14 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14635

02/27/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 – Prologis – Eddie Pong\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\PM-20537-D14635.dwg
Date/Time: Feb 27, 2024 - 12:47pm by: Brent.King
Last Opened: Feb 27, 2024 - 12:47pm

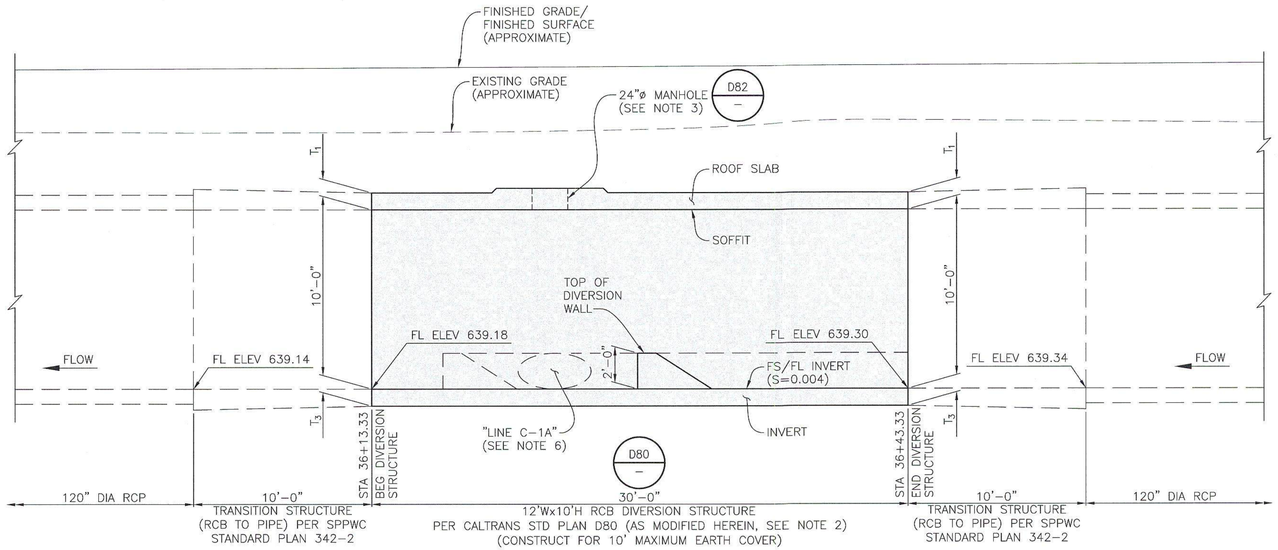


## LONGITUDINAL SECTION ALONG ℄ "LINE C"

¼" =1'-0"

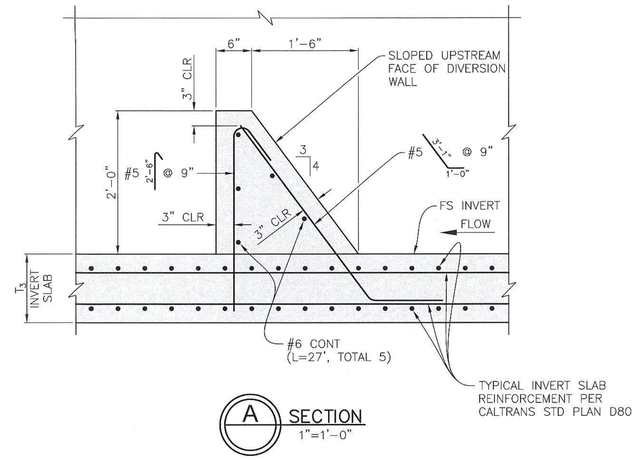


A SECTION
1"=1'-0"

## CONCRETE TYPE LEGEND:

INDICATES BAR-REINFORCED STRUCTURAL CONCRETE CONFORMING TO THE REQUIREMENTS FOR "MODERATE EXPOSURE" IN TABLE 201-1.1.3 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (2021 EDITION).

## NOTES:

1. FOR HORIZONTAL AND VERTICAL ALIGNMENT INFORMATION NOT SHOWN, SEE THE PLAN AND PROFILE SHEETS AND IMPROVEMENT PLANS FOR THE ADJOINING RCB's.
2. MODIFICATIONS TO CALTRANS STANDARD PLAN No. D80 ARE LIMITED TO THE ADDITION OF THE REINFORCED CONCRETE DIVERSION WALL ANCHORED TO THE REINFORCED CONCRETE INVERT SLAB.
3. MANHOLE RISERS, RINGS, FRAME AND COVER PER CITY OF ONTARIO STANDARD DRAWINGS.
4. CONSTRUCT RCB WITH IN ACCORDANCE WITH THE "FLAT INVERT" ALTERNATIVE PER CALTRANS STD PLAN D80.
5. FOR T1, T2, T3, BAR REINFORCEMENT AND INFORMATION NOT SHOWN, SEE CALTRANS STD PLAN D80.
6. CONNECTION OF LATERAL "LINE C-1A" TO RCB DIVERSION STRUCTURE SHALL BE CONSTRUCTED PER SPPWC STANDARD PLAN No. 333-2 AND THE FOLLOWING VALUES:
   B = 24" / C = 5'-0" / ELEVATION "S" = 639.21 / ELEVATION "R" = 639.19
7. ANY LAP SPLICES IN BAR REINFORCEMENT MUST BE A MINIMUM OF 60 BAR DIAMETERS IN LENGTH.
8. FOR CALTRANS STANDARD PLAN D80 AND D82, SEE SHEET 16.

## LEGEND:

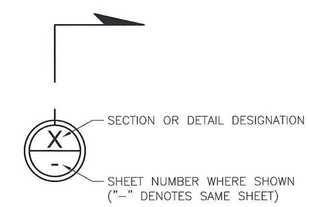


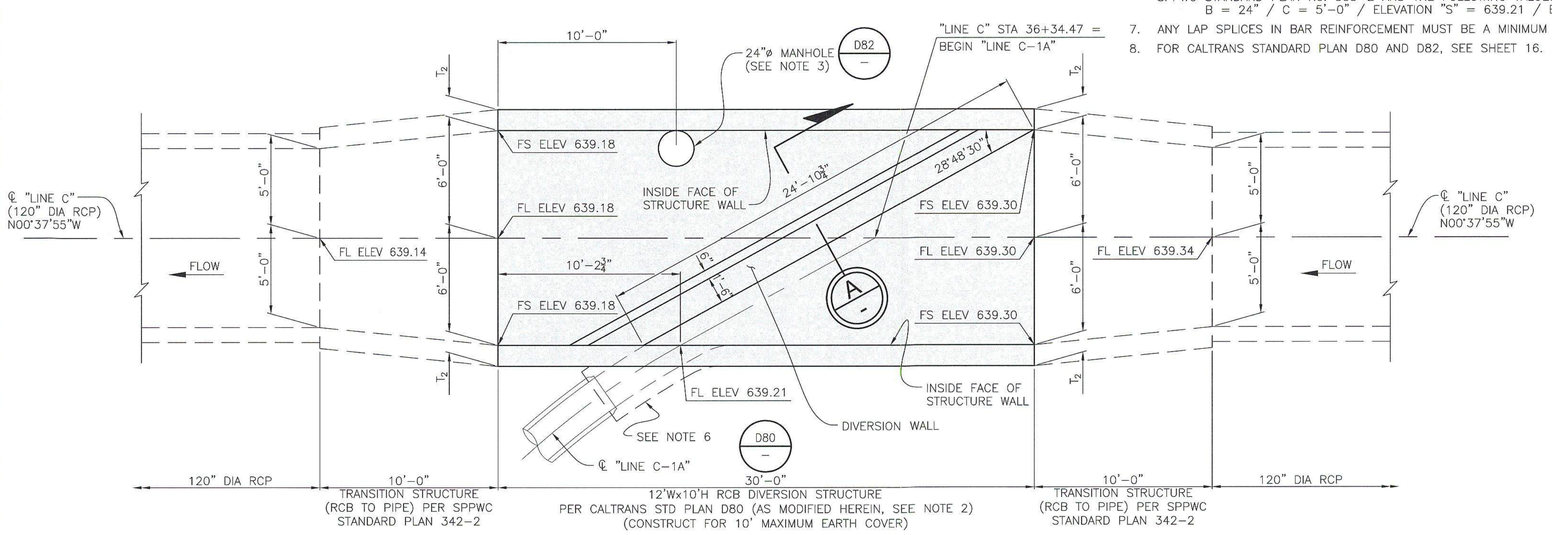


## PLAN

¼" =1'-0"

## 2023 CALTRANS STANDARD PLAN REFERENCE KEY:

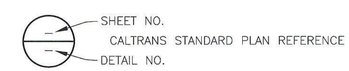


## 2023 CALTRANS STANDARD PLANS LIST:

| | |
|---|---|
| D80 | CAST-IN-PLACE REINFORCED CONCRETE SINGLE BOX CULVERT |
| D82 | CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT – MISCELLANEOUS DETAILS |

## GENERAL NOTES:

**DESIGN:**

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION, WITH INTERIMS AND THE (APRIL 2019) CALIFORNIA AMENDMENTS.
LIVE LOAD: HL-93 DESIGN TRUCK OR DESIGN TANDEM
P15 PERMIT DESIGN VEHICLE
IMPACT FACTOR: (APPLIES TO ROOF SLAB ONLY)
$IM = 33(1.0-0.125D_E) \geq 0\%$ (AASHTO LRFD 3.6.2.2)
$D_E$ = MINIMUM DEPTH OF EARTH COVER
EARTH LOAD: EARTH PRESSURE FOR TWO CONDITIONS:
140 pcf VERTICAL, 36 pcf HORIZONTAL
140 pcf VERTICAL, 120 pcf HORIZONTAL
REINFORCED CONCRETE:
f'c = 3,600 psi, fy = 60,000 psi

**CONSTRUCTION:**

CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE 2021 EDITION OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

811 Know what's below. Call 811 before you dig.

RECOMMENDED FOR ACCEPTANCE
KHUONG LE C-95173 — 12/12/2023
4LEAF, INC. — DATE

WARNING 1" IF THIS LINE IS NOT 1" LONG, THEN DWG IS NOT TO SCALE.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: GLR
DATE: June, 2023
DRAWN BY: GLR
DATE: June, 2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**
RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE 3/21/24
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE 3-21-24

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER GREGORY L. RENDE No. 54529 CIVIL STATE OF CALIFORNIA

RENDE CONSULTING GROUP
22431 ANTONIO PARKWAY - SUITE B160-470
RANCHO SANTA MARGARITA, CA 92688
- 949-713-6780 -
SIGNATURE: GREGORY L. RENDE, P.E. — R.C.E. NO. 54529 — DATE 10-27-2023

**STORM DRAIN IMPROVEMENT PLAN**
GROVE AVENUE
SD "LINE C" DIVERSION STRUCTURE AT "LATERAL C-1A"
**STRUCTURE LAYOUT**

PM-20537

SHEET 15 OF 17
CONTRACT
ACCOUNT
DWG. NO. D140036

11/03/2023

Drawing Name: C:\RCG Projects\WestLAND\Grove SD CDS Diversion Structure\CADD\div\RCG Structural Sheets - Grove SD Diversion.dwg
Last Opened: Nov 03, 2023 - 9:37am by: greg

| SPAN, S | | 4' | | | 5' | | | 6' | | | 7' | | | 8' | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEIGHT, H | | 2' | 3' | 4' | 2' | 3' | 4' | 5' | 6' | 7' | 3' | 4' | 5' | 6' | 7' | 8' |
| MAXIMUM EARTH COVER | | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' |
| Conc | ROOF | 7½" | 7" | 8" | 7" | 8" | 8" | 8" | 8" | 8" | 8½" | 9" | 8" | 9" | 8" | 9" |
| | WALLS $t_2$ | 6" | 6" | 6" | 6" | 7" | 7" | 6" | 6" | 6½" | 6½" | 7" | 7" | 7" | 7" | 7½" |
| | INVERT | 7" | 7" | 7" | 7½" | 7" | 7½" | 7½" | 7½" | 7½" | 8½" | 8" | 8" | 8" | 8" | 8" |
| Reinf | "a" SIZE BAR | #5 | #5 | #5 | #4 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #5 |
| | "a" SPACING | 6" | 5" | 6" | 5" | 5" | 5" | 5½" | 4½" | 5" | 4½" | 5" | 5" | 5" | 4½" | 4½" |
| | "b" SIZE BAR | #4 | #5 | #4 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #5 | #6 |
| | "b" SPACING | 5½" | 6" | 6" | 6" | 6" | 4½" | 5" | 4½" | 6" | 5½" | 5" | 5" | 5½" | 5" | 4½" |
| | "e" SIZE BAR | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 |
| | "e" SPACING | 33½" | 33½" | 33½" | 33½" | 9" | 7" | 33½" | 33½" | 33½" | 12" | 11" | 9" | 8½" | 6½" | 6" |
| DIMENSION "B" ft-inch | | 2-2 | 2-0 | 2-4 | 2-1 | 2-1 | 2-7 | 2-4 | 2-9 | 2-12 | 3-4 | 3-1 | 2-11 | 3-6 | 3-3 | 3-1 |
| BOLD VALUES = QUANTITIES | CONCRETE CF/LF | 8.0 | 7.8 | 9.3 | 9.0 | 11.1 | 10.9 | 9.8 | 10.0 | 11.1 | 11.4 | 12.4 | 13.9 | 13.8 | 17.0 | 13.1 |
| | REINFORCEMENT LB/LF | 79 | 84 | 84 | 96 | 104 | 127 | 107 | 110 | 112 | 114 | 123 | 128 | 154 | 140 | 126 |
| | ** SOIL PRESSURE (ksf), Ser | 2.4 | 3.5 | 2.4 | 3.5 | 2.4 | 3.5 | 2.1 | 3.5 | 2.1 | 3.5 | 2.1 | 3.6 | 2.1 | 3.6 | 1.9 |
| | ** SOIL PRESSURE (ksf), Str | 3.9 | 4.5 | 3.0 | 4.5 | 3.9 | 4.6 | 3.5 | 4.5 | 3.3 | 4.5 | 3.3 | 4.6 | 3.4 | 4.7 | 2.9 |

| SPAN, S | | 10' | | | 12' | | | 14' | | |
|---|---|---|---|---|---|---|---|---|---|---|
| HEIGHT, H | | 5' | 6' | 7' | 7' | 8' | 9' | 10' | 11' | 12' |
| MAXIMUM EARTH COVER | | 10' | 20' | 10' | 20' | 10' | 20' | 10' | 20' | 10' |
| Conc | ROOF | 10" | 15" | 9½" | 14" | 9½" | 13½" | 9½" | 14" | 10" |
| | WALLS $t_2$ | 8½" | 10" | 8½" | 11½" | 8" | 12½" | 8" | 11½" | 8" |
| | INVERT | 10" | 15" | 10" | 15" | 10" | 15½" | 10" | 16" | 10½" |
| Reinf | "a" SIZE BAR | #6 | #7 | #6 | #7 | #6 | #7 | #6 | #8 | #6 |
| | "a" SPACING | 4½" | 5" | 4½" | 5" | 5" | 5" | 4½" | 5" | 4½" |
| | "b" SIZE BAR | #5 | #5 | #6 | #6 | #6 | #7 | #6 | #7 | #6 |
| | "b" SPACING | 4½" | 4½" | 5" | 5" | 4½" | 5" | 4½" | 4½" | 4½" |
| | "e" SIZE BAR | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 | #4 |
| | "e" SPACING | 9½" | 11½" | 8½" | 6" | 11½" | 9½" | 8" | 6" | 11½" |
| DIMENSION "B" ft-inch | | 3-10 | 3-3 | 4-0 | 3-6 | 4-9 | 4-5 | 4-9 | 4-1 | 4-7 |
| BOLD VALUES = QUANTITIES | CONCRETE CF/LF | 26.1 | 37.5 | 27.1 | 40.3 | 30.6 | 43.3 | 34.7 | 49.0 | 38.0 |
| | REINFORCEMENT LB/LF | 251 | 284 | 285 | 318 | 307 | 338 | 375 | 413 | 418 |
| | ** SOIL PRESSURE (ksf), Ser | 2.0 | 3.7 | 2.0 | 3.7 | 2.0 | 3.8 | 2.0 | 3.8 | 2.1 |
| | ** SOIL PRESSURE (ksf), Str | 2.5 | 4.8 | 2.5 | 4.8 | 2.6 | 4.9 | 2.6 | 4.9 | 2.7 |

** SEE NOTE 7

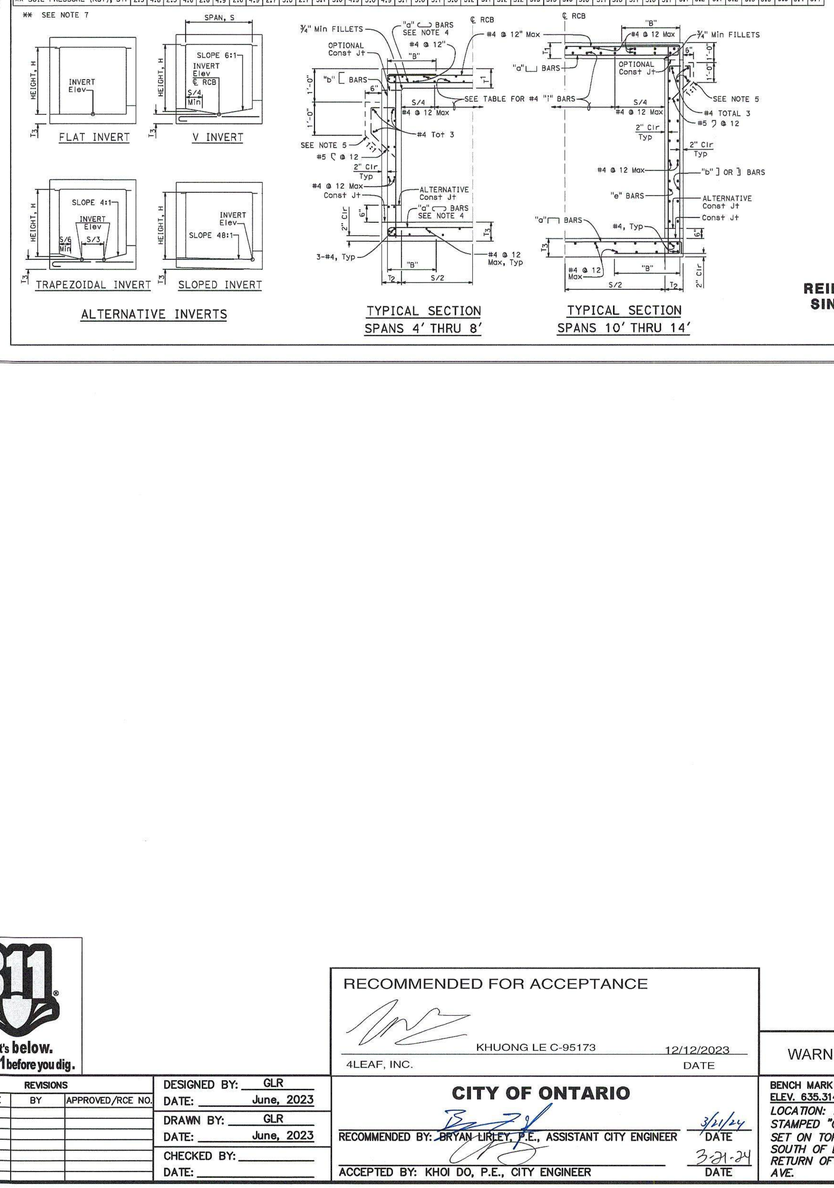


ALTERNATIVE INVERTS

| DIst | COUNTY | ROUTE | POST MILES TOTAL PROJECT | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|

REGISTERED CIVIL ENGINEER

May 1, 2023
PLANS APPROVAL DATE

Cori V. Sun
C 42973
Exp. 3-31-24
CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTES:

1. For boxes with span or height less than any of those shown in table, use next greater size box concrete dimensions and reinforcement. Make necessary changes in bar lengths and quantities.
2. Quantities are approximate and for design purposes only.
3. For boxes with span or height or cover greater than those shown in tables, a special design is required.
4. It is permissible to eliminate the 180° hooks on every other bar.
5. Provide paving notch when top is exposed and when pavement is concrete, and adjust quantities.
6. For design and details not shown, see Standard Plan D88.
7. Soil pressures shown are factored per AASHTO LRFD BDS and include soil weight of fill over box, self weight of box, and live load where applicable.
8. Stagger rebars for wall thickness less than 8".

| "I" BARS, FOR EARTH COVERS UP TO AND INCLUDING 10'-0" | | | | | | | |
|---|---|---|---|---|---|---|---|
| SPAN | 4' | 5' | 6' | 7' | 8' | 10' | 12' | 14' |
| NUMBER | 7 | 8 | 9 | 10 | 11 | 12 | 15 | 20 |

NOTE: For earth cover over 10'-0", use #4 @ 12 Max spacing for "I" bars.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**CAST-IN-PLACE REINFORCED CONCRETE SINGLE BOX CULVERT**

NO SCALE

**D80**

2-8-23

2023 STANDARD PLAN D80

234

DESIGN NOTES:

Design Specifications:
AASHTO LRFD Bridge Design Specifications, 8th Edition and CA Amendments.

Loading:
Live loads (AASHTO LRFD 3.6.1.2) and CA Amendments 3.6.1.8:
HL-93 design truck or design tandem
P15 Permit Design Vehicle

Impact Factor (Apply to roof slab only)
$IM = 33(1.0-0.125D_E) \geq 0\%$ (AASHTO LRFD 3.6.2.2)
$D_E$ = minimum depth of earth cover

Earth load:
Earth pressure for two conditions:
140 pcf vertical, 36 pcf horizontal
140 pcf vertical, 120 pcf horizontal

Load Factors:
AASHTO-CA BDS-8 Table 3.4.1.1 & Table 3.4.1.2

Unit stresses:
$f_c$ = 3600 psi
$f_y$ = 60,000 psi

Distribution "I" bars:
Up to and including 10'-0" cover
Express as a percentage of main positive reinforcement required. $\frac{100}{\sqrt{S}}$, Max 50%,
S = span
Over 10'-0" cover, # 4 @ 12 maximum

Shear:
For Slabs less than 16" thick and fill ≥ 2'-0"
$V_c = (0.0676\sqrt{f'c} + \frac{6A \cdot V_u d_v}{B_w \cdot M_u})b_w d_v \leq 0.126\sqrt{f'c}b_w d_v$ (Kips)
$V_c$ shall not be less than $0.0948\lambda\sqrt{f'c}b_w d_v$ for frame
For all other members
$Vc = 0.0316\beta\lambda\sqrt{f'c}b_w d_v$ (Kips)
$\beta$ = 2.0 for members less than 16" thick
= based on iterative $\theta$ and $\beta$ method for all other cases

Control of cracking by distribution of reinforcement:
Class 2 exposure environment Service Limit State

CONSTRUCTION NOTES:

Construction loads:
Strutting required as shown on Standard Plan D88.
Strutting may be required on culvert extensions when existing parapet is removed.

Expansion joints:
Invert:
No expansion joints shall be permitted.

Roof and Walls:
When cover is less than span length-
Place ½" premolded expansion joint filler at 30'-0" ± centers outside the paved roadway lanes and place Bridge Detail 3-2, Standard Plan BD-3, at 30'-0" centers under paved roadway lanes.
When cover is more than span length-
Place ½" premolded expansion joint filler at 30'-0"± centers and additional ½" premolded expansion joints at locations of change in foundation character, as directed by the Engineer.

Construction joints:
Temporary joints may be permitted if normal (or radial) to ℄ of RCB. Otherwise, the contractor is to submit a proposal for consideration.

Cutoff walls:
4'-0" cutoff walls are to be provided at inlet and/or outlet unless adjacent channel is lined and unless otherwise shown. These walls are to be extended if scour conditions warrant.

Earthwork:
See Standard Plan A62E.

Backfill:
See Standard Specifications, except that the difference in level of backfill (against outside walls) shall not exceed 2'-0".

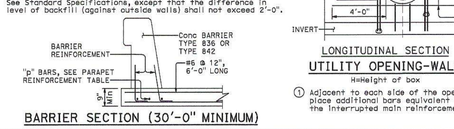


BARRIER SECTION (30'-0" MINIMUM)

GENERAL NOTES:

Designation:
Standard single or multiple box culverts are shown on plans as span times height with maximum cover over roof thus: 8' x 5' RCB with 10' or double 10' x 5' RCB with 20', followed by alternatives.

Alternatives:
Single cell invert will be sloped unless "trapezoidal invert", "flat invert", or "V invert" is included in designation.
Multiple cell invert will be vee unless "flat invert" is specified. Ends of culvert will be rounded unless "square ends" are designated. Parapets will be as shown unless designated in plans. Such designations may be different for inlet and outlet ends.

Quantities:
Quantities do not include the following:
• Concrete for parapet, paving notches, and cut-off wall.
• Reinforcement for 2% splices, parapets, paving notches, cut-off wall, and additional required bars for exposed top slab.

Reinforcement placement:
Main reinforcement is to be placed transversely or, for curved culverts, radially. When radial, reinforcing spacing of the "a" and "f" bars is measured along the centerline. Stagger splices not shown. Hooks may be rotated or tilted, as necessary, for clearance.

Special reinforcement coverage:
Box standard plans are not to be used for culverts in a corrosive environment or where there is a severe abrasive flow condition or in freeze-thaw locations.

Special design:
Required for culverts with conditions, loads, design bearing pressures, or sizes greater than those given on this plan and Standard Plans D80 and D81. Also required for multiple cell culverts with unequal spans. For culverts with railroad loading, see the current AREMA design specification.

Three or more cells:
For culverts with more than two cells, use dimensions and reinforcement for the standard "double box culvert". Reduce spacing of "f" bars and "b" bars by ½" and adjust quantities accordingly.

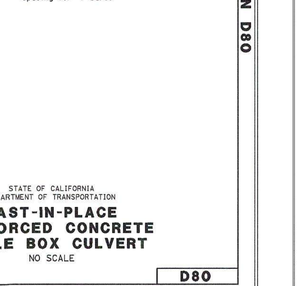


SINGLE SPAN MULTIPLE SPAN

PARAPET DETAIL

| PARAPET "p" BARS | | |
|---|---|---|
| SKEW ANGLE | | |
| SPAN | 0° TO 15° | 16° TO 30° | 31° TO 45° |
| 4'-0" | #4 | #4 | #4 |
| 6'-0" | #4 | #4 | #5 |
| 8'-0" | #4 | #5 | #6 |
| 10'-0" | #5 | #6 | #7 |
| 12'-0" | #6 | #7 | #8 |
| 14'-0" | #7 | #8 | #9 |

PARAPET REINFORCEMENT

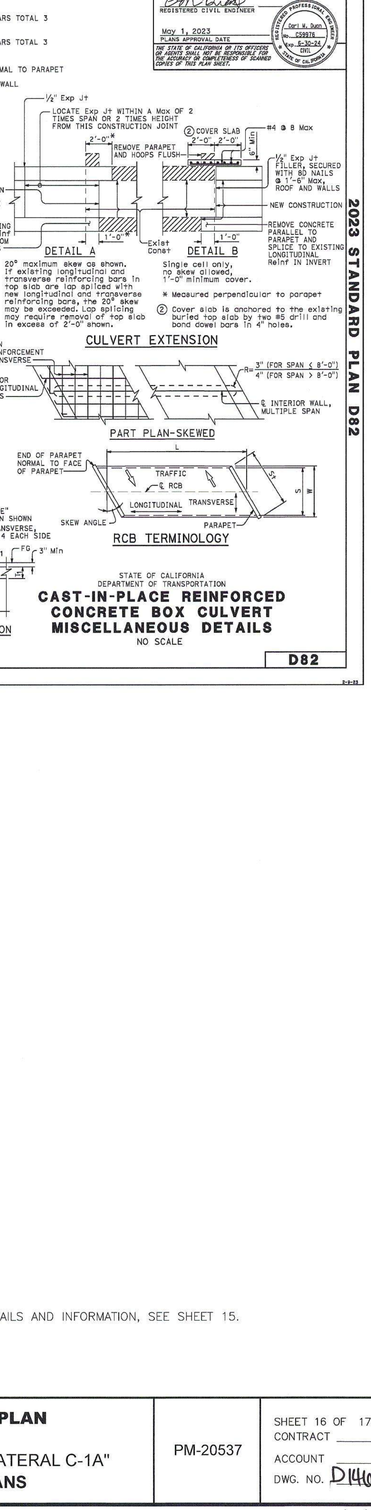


STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

**CAST-IN-PLACE REINFORCED CONCRETE BOX CULVERT MISCELLANEOUS DETAILS**

NO SCALE

**D82**

2-8-23

2023 STANDARD PLAN D82

236

Know what's below. Call 811 before you dig.

RECOMMENDED FOR ACCEPTANCE

KHUONG LE C-95173 — 12/12/2023
4LEAF, INC. — DATE

WARNING 1" IF THIS LINE IS NOT 1" LONG, THEN DWG IS NOT TO SCALE.

NOTES:

1. FOR ADDITIONAL DETAILS AND INFORMATION, SEE SHEET 15.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: GLR
DATE: June, 2023
DRAWN BY: GLR
DATE: June, 2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — 3/21/24 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — 3-21-24 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER GREGORY L. RENDE No. 54529 CIVIL STATE OF CALIFORNIA

RENDE CONSULTING GROUP
22431 ANTONIO PARKWAY - SUITE B160-470
RANCHO SANTA MARGARITA, CA 92688
- 949-713-6780 -

SIGNATURE: GREGORY L. RENDE, P.E. — 54529 R.C.E. NO. — 10-27-2023 DATE

**STORM DRAIN IMPROVEMENT PLAN**
GROVE AVENUE
SD "LINE C" DIVERSION STRUCTURE AT "LATERAL C-1A"
**2023 CALTRANS STANDARD PLANS**

PM-20537

SHEET 16 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14037

11/03/2023

Drawing Name: G:\RCG Projects\WestLAND\Grove SD CDS Diversion Structure\CADD\dlv\RCG Structural Sheets - Grove SD Diversion.dwg
Last Opened: Nov 03, 2023 9:32am by: greg

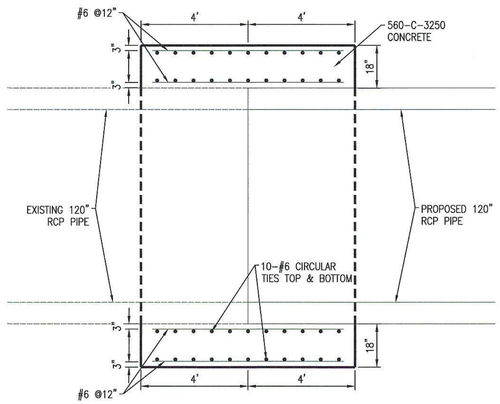


22 MODIFIED CONCRETE COLLAR DETAIL
N.T.S.
(BASED ON SPPWC 380-4, DETAIL ON SHEET 13)
NOTE: USE ASTM A615 GRADE 60 BAR REINFORCEMENT

Know what's below. Call 811 before you dig.

RECOMMENDED FOR ACCEPTANCE

KHUONG LE C-95173 — 12/12/2023
4LEAF, INC. — DATE

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: 8/30/2023
DRAWN BY: BK
DATE: 8/30/2023
CHECKED BY:
DATE:

**CITY OF ONTARIO**

RECOMMENDED BY: BRYAN LIRNEY, P.E., ASSISTANT CITY ENGINEER — 3/21/24 DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — 3-21-24 DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD '88) LEVELED 2018
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1," SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF EGR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

REGISTERED PROFESSIONAL ENGINEER — SIARA REE MACKINNEY — No.85559 — Exp. 9/30/2024 — CIVIL — STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — 3/14/24 DATE

**STORM DRAIN IMPROVEMENT PLAN**
GROVE AVENUE

**MODIFIED CONCRETE COLLAR DETAIL**

PM-20537

SHEET 17 OF 17
CONTRACT
ACCOUNT
DWG. NO. D14638

02/27/2024

Drawing Name: P:\Year_2021\2021-315 Merrill Commerce Center Phase 2 - Prologis - Eddie Pong\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\GROVE STORM DRAIN\2-2023-12-PALS.dwg
Date/Time: Feb 27, 2024 - 12:46pm by: Brent.King
Last Opened: Feb 27, 2024 - 12:46pm by: Brent.King

## EXCERPT J: STORM DRAIN IMPROVEMENT PLANS FOR LINE D, PM-20161

# STORM DRAIN IMPROVEMENT PLAN

## FOR PM 20161

## BON VIEW AVENUE AND EUCALYPTUS AVENUE

## IN THE CITY OF ONTARIO

## CITY OF ONTARIO GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE CURRENT CITY OF ONTARIO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS AND CURRENT STANDARD SPECIFICATIONS AND STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION AND CALTRANS PERMIT UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS/HER OPERATIONS, WHETHER OR NOT THE FACILITY IS SHOWN ON THESE PLANS.
3. ALL OBSTRUCTIONS WITHIN THE AREA TO BE IMPROVED SHALL BE REMOVED AND/OR RELOCATED AT THE DIRECTION OF THE CITY ENGINEER. UTILITIES ARE TO BE RELOCATED BY THEIR RESPECTIVE OWNERS UNLESS NOTED OTHERWISE. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
4. UTILITY LINE LOCATIONS WERE TAKEN FROM AVAILABLE RECORD DATA AND WERE NOT LOCATED IN THE FIELD, UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
5. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409(B) OF THE CALIFORNIA LABOR CODE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STATE DIVISION OF INDUSTRIAL SAFETY.
6. STATE LAW (SB 3019) REQUIRES THE CONTRACTOR TO CONTACT UNDERGROUND SERVICE ALERT AND OBTAIN AN IDENTIFICATION NUMBER PRIOR TO THE ISSUANCE OF CITY'S ENCROACHMENT PERMITS. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT AT 1-800-422-4133 A MINIMUM OF 48-HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.
7. PRIOR TO THE START OF ANY WORK THE CONTRACTOR SHALL OBTAIN A BUSINESS LICENSE FROM THE CITY OF ONTARIO. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM THE ENGINEERING DEPARTMENT NO LESS THAN 48 HOURS PRIOR TO START OF ANY CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
8. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT 48 HOURS PRIOR TO TIME OF CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY. THE CONTRACTOR IS REFERRED TO SECTION 7-10.3 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
9. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH DURING HIS OPERATIONS HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED. RENEWAL OF TRAFFIC STRIPING AND MARKINGS SHALL BE DONE USING REFLECTIVE THERMO-PLASTIC MARKINGS IN CONFORMANCE WITH SECTION 84 & 85 OF THE CALTRANS STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER. ALL REGULATORY, WARNING, AND GUIDE SIGNS SHALL HAVE 3M DIAMOND, VIP GRADE SHEETING WITH SERIES 1160 PROTECTIVE OVERLAY FILM.
10. THE LAND SURVEYORS ACT, SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE, AND SECTIONS 732.5, 1492-5, 1810-5 OF THE STREETS AND HIGHWAY CODE REQUIRE THAT SURVEY MONUMENTS SHALL BE PROTECTED AND PERPETUATED.

    "IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR OTHERS PERFORMING THE CONSTRUCTION WORK TO RETAIN A QUALIFIED REGISTERED CIVIL ENGINEER AND/OR LICENSED LAND SURVEYOR PRIOR TO THE START OF CONSTRUCTION TO LOCATE, REFERENCE AND FILE THE NECESSARY CORNER RECORDS WITH THE COUNTY SURVEYOR'S OFFICE FOR SURVEY CONTROL POINTS/MONUMENTS THAT EXIST AS SHOWN ON RECORDED TRACT MAPS, PARCEL MAPS, RECORDS OF SURVEYS AND HIGHWAY MAPS, AND MAY BE DISTRIBUTED OR DAMAGED BY THE PROPOSED CONSTRUCTION"

    AFTER THE COMPLETION OF THE PROPOSED CONSTRUCTION, SAID MONUMENTS AND/OR CONTROL SURVEY POINTS SHALL BE RESET TO THE NEW SURFACE IN ACCORDANCE WITH THE CURRENT PROFESSIONAL LAND SURVEYING PRACTICES. CORNER RECORDS SHALL BE FILED WITH THE COUNTY SURVEYOR FOR ALL THE NEW MONUMENTS SET.
11. THE DEVELOPER SHALL PROVIDE THE CITY WITH A COMPLETED SET OF "AS BUILT", MYLAR DRAWINGS PRIOR TO THE FINAL INSPECTION.
12. A CITY ACCEPTED/APPROVED SET OF PLANS SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
13. A PRE-CONSTRUCTION MEETING SHALL OCCUR PRIOR TO CONSTRUCTION. ATTENDEES SHALL INCLUDE A CITY REPRESENTATIVE AND THE CONTRACTOR WHO WILL PERFORM THE WORK. "CUT-SHEETS" SHALL BE PROVIDED TO THE CITY AT THIS MEETING FOR ITS REVIEW.
14. CITY ACCEPTANCE OF PLANS DOES NOT RELIEVE THE DEVELOPER FROM RESPONSIBILITY FOR THE CORRECTION OF ERROR AND OMISSION DISCOVERED DURING CONSTRUCTION. UPON REQUEST OF THE CITY INSPECTOR, THE REQUIRED PLAN REVISIONS SHALL BE PROMPTLY SUBMITTED TO THE CITY ENGINEER FOR REVIEW.
15. ANY REQUIRED RIGHT-OF-WAY OR EASEMENT SHALL BE DEDICATED TO AND ACCEPTED BY THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE IMPROVEMENTS WITHIN THE REQUIRED RIGHT-OF-WAY OR EASEMENT.
16. WHERE UTILITIES NEED TO BE SUPPORTED, SAID SUPPORTS SHALL BE IN ACCORDANCE WITH A.P.W.A. STANDARD 224-1 UNLESS OTHERWISE INDICATED.
17. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING SEWER MAIN(S) AND NOTIFY THE DESIGN ENGINEER OF ANY VARIATION FROM DESIGN.
18. THE PIPE SHOWN HEREON SHALL BE INSTALLED IN ACCORDANCE WITH CASE III BEDDING AS SHOWN ON L.A.C.D.P.W. STANDARD 3080-2, UNLESS OTHERWISE SHOWN. "W" VALUE SHALL BE AS SPECIFIED ON L.A.C.D.P.W. STANDARD 3080-2 FOR CASE III BEDDING, NOTES 3 (A), 3 (B), AND 3 (C). IF THE "W" VALUE AT THE TOP OF THE PIPE IS EXCEEDED, THE BEDDING SHALL BE MODIFIED AND/OR PIPE OF ADDITIONAL STRENGTH SHALL BE PROVIDED. ALL PROPOSED MODIFICATIONS TO THIS REQUIREMENT SHALL BE APPROVED BY THE CITY ENGINEER.
19. MINIMUM COVER OF STORM DRAIN MAIN SHALL BE 7 FEET FROM THE FINISHED SURFACE PER STANDARD DRAWING 1302-1304.
20. STORM DRAIN MAIN STATIONING IS PER PIPE CENTERLINE.
21. STREET CENTERLINE STATIONING IS PER THE STREET IMPROVEMENT PLANS AND PROVIDED FOR REFERENCE.
22. CONTRACTOR SHALL NOT BACKFILL TRENCH UNTIL THE CITY INSPECTOR HAS OBTAINED AS-BUILT STATIONING ON ALL STRUCTURES.
23. UPON COMPLETION OF CONSTRUCTION OF ALL STORM DRAIN LINES AND PRIOR TO PAVING, THE DEVELOPER SHALL HIRE A CITY APPROVED VIDEO COMPANY TO VIDEO TAPE THE PIPELINES. CITY SHALL REVIEW SAID VIDEOTAPES FOR POTENTIAL CONSTRUCTION DEFECTS PRIOR TO ACCEPTANCE OF THE PROJECT.

## CIVIL ENGINEERS NOTICE TO CONTRACTOR

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTION AND ANY MEASURES TO PROTECT THE UTILITIES AND STRUCTURES SHOWN AND OTHER LINES OR STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO, THESE UTILITY LINES OR STRUCTURES.
2. THE CONTRACTOR AGREES THAT HE WILL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY AND NOT BE LIMITED TO A NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER, OR ANY PUBLIC AGENCY.
3. THE ESTIMATES OF IMPROVEMENT QUANTITIES AS SHOWN HEREON ARE PROVIDED ONLY FOR THE PURPOSE OF SATISFYING CITY PLAN INFORMATION REQUIREMENTS. THE CONTRACTOR SHALL PERFORM AN INDEPENDENT ESTIMATE OF ALL IMPROVEMENT QUANTITIES AND SHALL USE SAME AS A BASIS FOR HIS BID(S) AND CONTRACT(S).
4. CONTRACTOR TO VERIFY CLEARANCE AT ALL UTILITY CROSSINGS. IF INTERFERENCE OCCURS, OTHER THAN NOTED ON PLAN, CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR POSSIBLE REDESIGN. IF REDESIGN IS NOT FEASIBLE, CONTRACTOR TO RELOCATE UTILITY AT NO EXPENSE TO ENGINEER.
5. CONTRACTOR SHALL TAKE EXTREME CARE DURING UNDERGROUND CONSTRUCTION AND IS RESPONSIBLE FOR TRENCHING AND SHORING. CONTRACTOR SHALL SUBMIT A DETAILED SHORING PLAN PER SECTION 7-10.4.2.2 OF SPPWC AND A PERMIT FROM STATE DIVISION OF INDUSTRIAL SAFETY PRIOR TO COMMENCING WORK.
6. CONTRACTOR SHALL VERIFY PAVEMENT ELEVATION AT RIM PRIOR TO SETTING CONE.

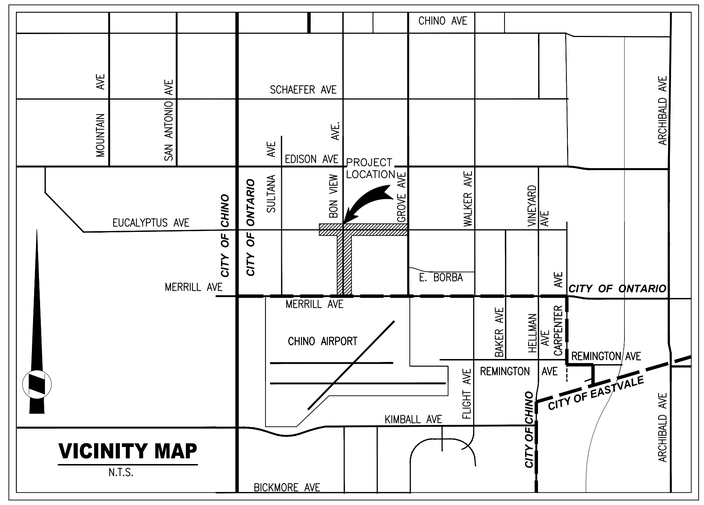


**VICINITY MAP**
N.T.S.

## OWNER/DEVELOPER:

PROLOGIS, L.P.
3546 CONCOURS STREET, SUITE 100
ONTARIO, CA 91764

CONTACT: SAM CHO, DEVELOPMENT MANAGER
PHONE: (909) 673-8700

## CIVIL ENGINEER

WESTLAND GROUP INC.
4150 CONCOURS STREET, SUITE 100
ONTARIO, CA 91764

CONTACT: SIARA MACKINNEY, PE, MS, QSD
PHONE: (909)-989-9789

## GEOTECHNICAL ENGINEER:

SOUTHERN CALIFORNIA GEOTECHNICAL
22885 EAST SAVI RANCH PARKWAY, SUITE E
YORBA LINDA, CA 92887

CONTACT: GREGORY K. MITCHELL
PHONE: (714) 685-1115

## CONSTRUCTION NOTES

| ITEM | DESCRIPTION | PUBLIC QUANTITY | |
|---|---|---|---|
| 1 | CONSTRUCT 102" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN | 2620 | LF |
| 2 | CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009 | 4 | EA |
| 3 | CONSTRUCT JUNCTION STRUCTURE NO. 1 PER CITY OF ONTARIO STD. DWG. 3010, CASE 1 | 4 | EA |
| 4 | CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN | 550 | LF |
| 5 | CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL ON SHEET 11 | 10 | EA |
| 6 | CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" PER CITY OF ONTARIO STD. DWG. NO. 3018 | 8 | EA |
| 7 | CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20161 STREET IMPROVEMENT PLANS FOR DETAILS | 9 | EA |
| 8 | CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017 | 9 | EA |
| 9 | CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL ON SHEET 11 | 4 | EA |
| 10 | REMOVE EXISTING CONCRETE BULKHEAD | 3 | EA |
| 11 | CONSTRUCT MANHOLE PIPE-TO-PIPE PER SPPWC STD. PLAN NO. 321-2, PER DETAIL ON SHEET 11 | 10 | EA |
| 12 | CONSTRUCT 24" RCP, TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN | 1560 | LF |
| 13 | CONSTRUCT CONCRETE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 11 | 2 | EA |
| 14 | NOT USED | – | – |
| 15 | REMOVE EXISTING 18" RCP | 30 | LF |
| 16 | CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC STD. PLAN NO. 330-2, PER DETAIL ON SHEET 11 | 8 | EA |
| 17 | EXISTING 36" TEMPORARY CSP STANDPIPE TO BE REMOVED | 4 | EA |
| 18 | CONSTRUCT MANHOLE PIPE-TO-PIPE (LARGE SIDE INLET) PER SPPWC STD. DWG. NO. 322-3, PER DETAIL ON SHEET 12 | 4 | EA |
| 19 | CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN | 50 | LF |
| 20 | CONSTRUCT JUNCTION STRUCTURE NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3012 | 2 | EA |
| 21 | CONSTRUCT 42" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN | 545 | LF |
| 22 | CONSTRUCT MODIFIED CONCRETE COLLAR PER SPPWC STD. 380-2 AS MODIFIED PER DETAIL ON SHEET 12 | 1 | EA |
| 23 | CONSTRUCT CATCH BASIN WITH MANHOLE IN STREET PER SPPWC STD. PLAN NO. 307-4, PER DETAIL ON SHEET 12 | 1 | EA |

## INDEX OF DRAWINGS


| INDEX NO. | DESCRIPTION |
|---|---|
| SHEET 1 | TITLE SHEET |
| SHEET 2 | SHEET INDEX |
| SHEET 3 | BON VIEW AVENUE – FROM MERRILL AVE TO 950' NORTH OF MERRILL AVE |
| SHEET 4 | BON VIEW AVENUE – FROM 950' NORTH OF MERRILL AVE TO 800' SOUTH OF EUCALYPTUS AVE |
| SHEET 5 | BON VIEW AVENUE – FROM 800' SOUTH OF EUCALYPTUS AVE TO 100' NORTH OF EUCALYPTUS AVE |
| SHEET 6 | EUCALYPTUS AVENUE – BON VIEW AVE TO 300' EAST OF BON VIEW AVE |
| SHEET 7 | EUCALYPTUS AVENUE – FROM BON VIEW AVE TO 950' EAST OF BON VIEW AVE |
| SHEET 8 | EUCALYPTUS AVENUE – FROM 950' EAST OF BON VIEW AVE TO 1400' EAST OF BON VIEW AVE |
| SHEET 9 | LATERAL PROFILES |
| SHEET 10 | LATERAL PROFILES |
| SHEET 11 | DETAILS |
| SHEET 12 | DETAILS |


## UTILITY PURVEYORS:

CITY OF ONTARIO, MUNICIPAL UTILITIES AGENCY
DAYTIME PH: (909) 395-2678
24-HOUR EMERGENCY: (909) 986-6711

CITY OF ONTARIO, COMMUNITY & PUBLIC SERVICES AGENCY
DAYTIME PH: (909) 395-2633
24-HOUR EMERGENCY: (909) 986-6711

INLAND EMPIRE UTILITY AGENCY
DAYTIME PH: (909) 944-6000
24-HOUR EMERGENCY: (909) 987-2591

SOUTHERN CALIFORNIA EDISON
24-HOUR EMERGENCY: (800) 611-1911

SOUTHERN CALIFORNIA GAS COMPANY
DAYTIME PH: (800) 423-1391
24-HOUR EMERGENCY: (800) 423-1391

TIME WARNER CABLE / WEST COAST COMMUNICATIONS
24-HOUR EMERGENCY: (888) 892-2253

VERIZON
24-HOUR EMERGENCY: (800) 483-2000

## REFERENCE DRAWINGS

| | |
|---|---|
| SANITARY SEWER | PM-20016, PM-20161, PM-20517 & PM-20537 SANITARY SEWER IMPROVEMENT PLAN |
| DOMESTIC WATER | PM-20016, PM-20161, PM-20517 & PM-20537 DOMESTIC WATER IMPROVEMENT PLAN |
| STORM DRAIN | PM-20016, PM-20161, PM-20517 & PM-20537 STORM DRAIN IMPROVEMENT PLAN |
| STREET IMPROVEMENT | PM-20016, PM-20161, PM-20517 & PM-20537 STREET IMPROVEMENT PLAN |
| RECYCLED WATER | PM-20016, PM-20161, PM-20517 & PM-20537 RECYCLED WATER IMPROVEMENT PLAN |

## LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

LOTS 1, 2, 3, 16, 17, 18, 19, 20, 21, 31, 32, 34, 35 AND 36 IN SECTION 19, TOWNSHIP 2 SOUTH, RANGE 7 WEST, SAN BERNARDINO BASE AND MERIDIAN, IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACCORDING TO MAP OF SUBDIVISION OF PART OF THE RANCHO SANTA ANA DEL CHINO, RECORDED IN BOOK 6, PAGE 15 OF MAPS, RECORDS OF SAID COUNTY.

## BASIS OF BEARING

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM (CCS83), ZONE 5, NORTH AMERICAN DATUM 1983 (NAD83) BASED LOCALLY ON CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS) "LORS" AND "EWPP" AS SHOWN HEREON (BASIS OF BEARINGS: S 81°29'26" E). ALL BEARINGS SHOWN HEREON ARE GRID BEARINGS.

## LEGEND OF ABBREVIATIONS & SYMBOLS

| | | | | | |
|---|---|---|---|---|---|
| BC | BEGIN CURVE | FS | FINISHED SURFACE | RCB | REINFORCED CONCRETE BOX |
| BCR | BEGIN CURB RETURN | FT/S | FEET PER SECOND | RCP | REINFORCED CONCRETE PIPE |
| BNDY | BOUNDARY | GB | GRADE BREAK | RT | RIGHT |
| C+G | CURB AND GUTTER | HDPE | HIGH DENSITY POLYETHYLENE | RW | RECYCLED WATER |
| CB | CATCH BASIN | HGL | HYDRAULIC GRADE LINE | R/W | RIGHT OF WAY |
| CFS | CUBIC FEET PER SECOND | HP | HIGH POINT | SL | STREET LIGHT |
| CSP | CORRUGATED STEEL PIPE | INT | INTERIM | SP | STAND PIPE (RCP) |
| ℄ OR C/L OR CL | CENTERLINE | INV | INVERT | STA | STATION |
| DBL | DOUBLE | LT | LEFT | TC | TOP OF CURB |
| EA | EACH | LAT | LATERAL | TSP | TEMPORARY STAND PIPE |
| EC | END CURVE | LF | LINEAR FEET | TYP | TYPICAL |
| ECR | END CURB RETURN | LP | LOW POINT | ULT | ULTIMATE |
| ELEV | ELEVATION | MIN | MINIMUM | SD | STORM DRAIN |
| EP | EDGE OF PAVEMENT | PCC | POINT OF COMPOUND CURVE | SPPWC | STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION |
| ESMT | EASEMENT | ℄ OR P/L OR PL | PROPERTY LINE | | |
| EX, EXIST. | EXISTING | PRC | POINT OF REVERSE CURVE | SS | SANITARY SEWER |
| FH | FIRE HYDRANT | PVC | POLYVINYL CHLORIDE | DW | DOMESTIC WATER |
| FL | FLOW LINE | | | | |

(100) EXISTING CONTOURS
100 PROP. CONTOUR
EXIST. EASEMENT
2% FLOW RATE
CENTERLINE
FIRE HYDRANT
SIGN
STREET LIGHT
BOUNDARY LINE
FENCE LINE
PROPOSED STORM DRAIN MH
PROPOSED CATCH BASIN
PROPOSED STORM DRAIN

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

811 Know what's below. Call 811 before you dig.

RECOMMENDED FOR ACCEPTANCE

TECK, C. LOH, P.E.
HARRIS AND ASSOCIATES DATE

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/6/2024
DRAWN BY: BK
DATE: 8/6/2024
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB, APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. DATE


STORM DRAIN IMPROVEMENT PLAN
BON VIEW AVENUE AND EUCALYPTUS AVENUE
TITLE SHEET

PM-20161

SHEET 1 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/11/2024

Drawing Name: P:\Year_2023\2023-038-REDA-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\01_2023-038_SD_TS.dwg

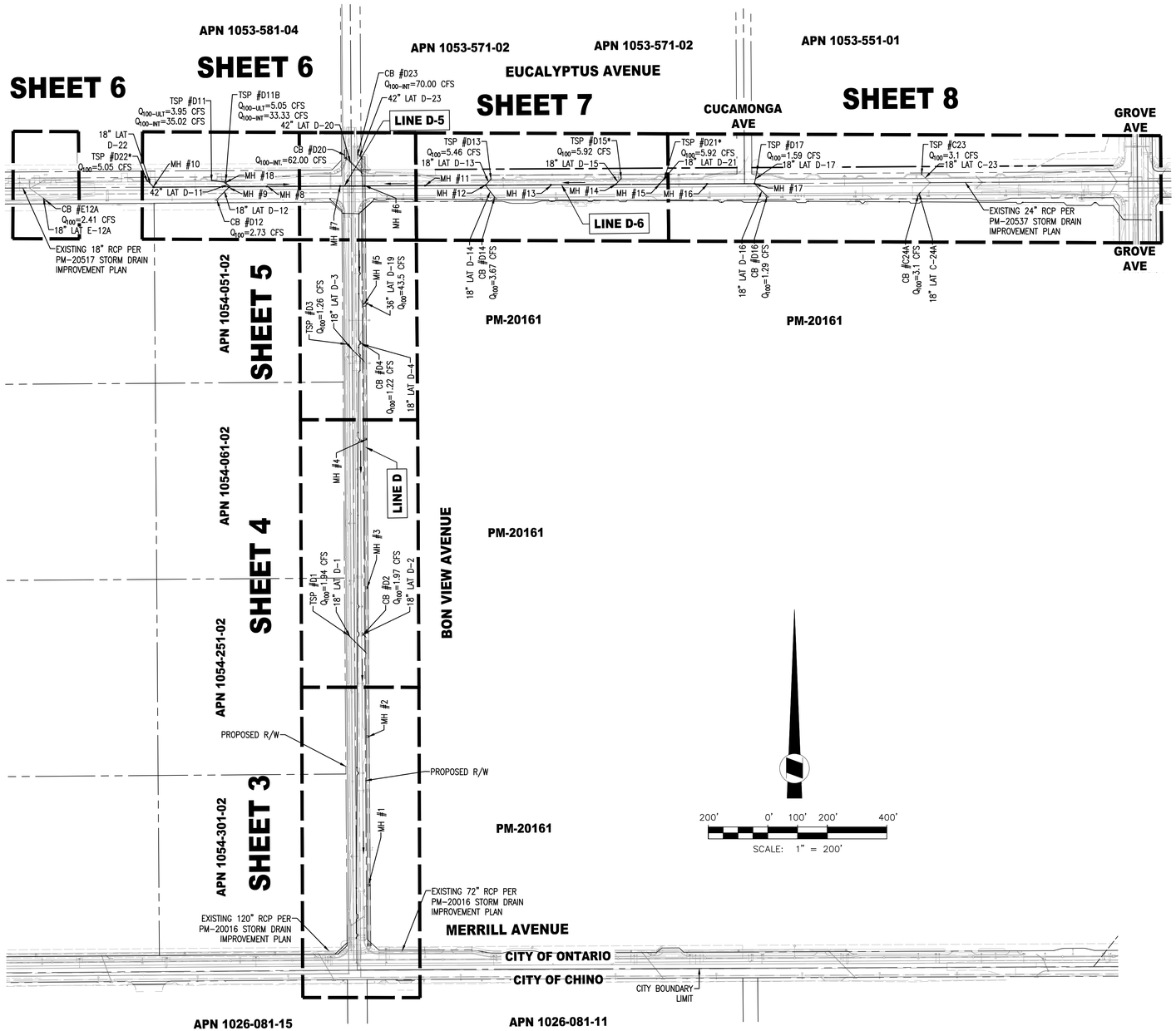


## INDEX/ SYSTEM MAP

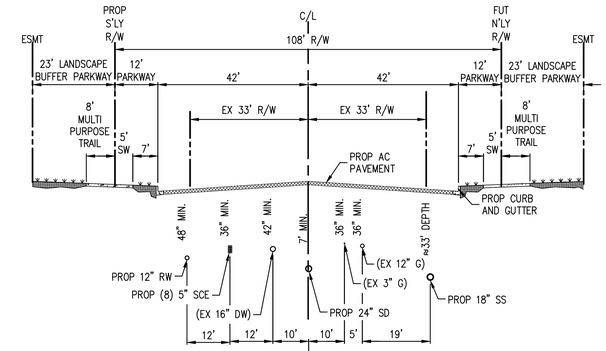


## EUCALYPTUS AVE

**EAST OF BON VIEW AVE**

**1"=20'**

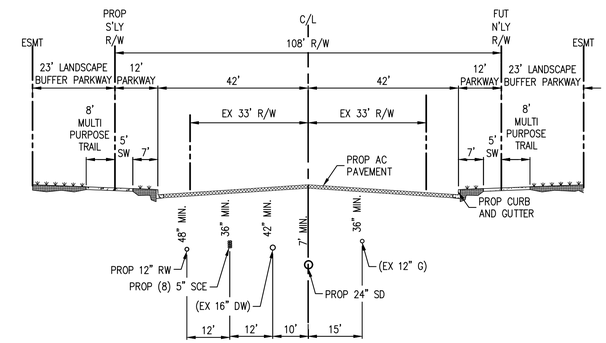


## EUCALYPTUS AVE

**WEST OF GROVE AVE**

**1"=20'**

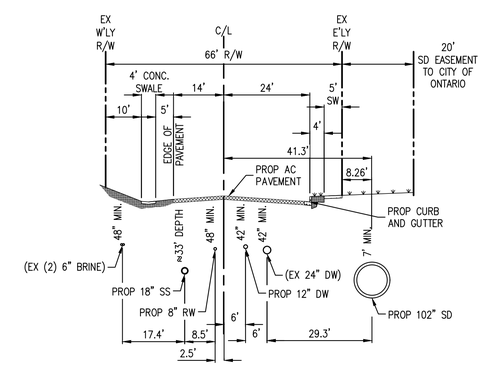


## BON VIEW AVE

**BETWEEN MERRILL AVE AND EUCALYPTUS AVE**

**1"=20'**

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/6/2024
DRAWN BY: BK
DATE: 8/6/2024
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

*BENCH MARK No. GG-18-1*
*ELEV. 635.314' (NAVD88) LEVELED 2018*
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — DATE


STORM DRAIN IMPROVEMENT PLAN

**INDEX/ SYSTEM MAP AND SECTIONS**

PM-20161

SHEET 2 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/11/2024

Drawing Name: P:\Year_2023\2023-038-REDA-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\02_2023-038_SD_SHEET INDEX.dwg

CITY OF ONTARIO

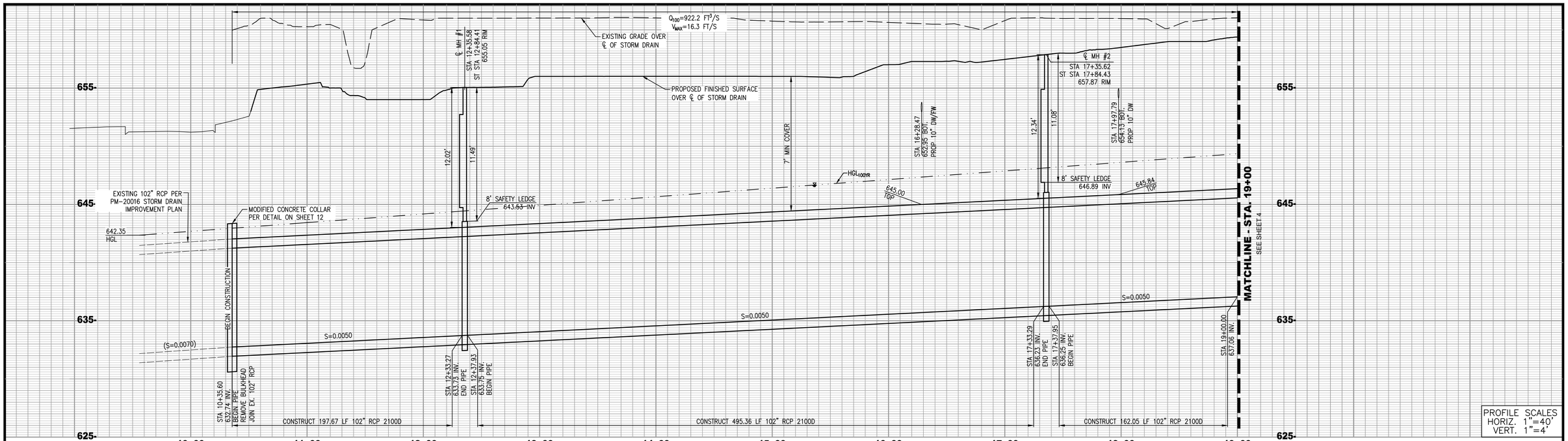


PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

## CONSTRUCTION NOTES

1. CONSTRUCT 102" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
2. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009
10. REMOVE EXISTING CONCRETE BULKHEAD
16. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC STD. PLAN NO. 330-2, PER DETAIL ON SHEET 11
22. CONSTRUCT MODIFIED CONCRETE COLLAR PER SPPWC STD. 380-2 AS MODIFIED PER DETAIL ON SHEET 11

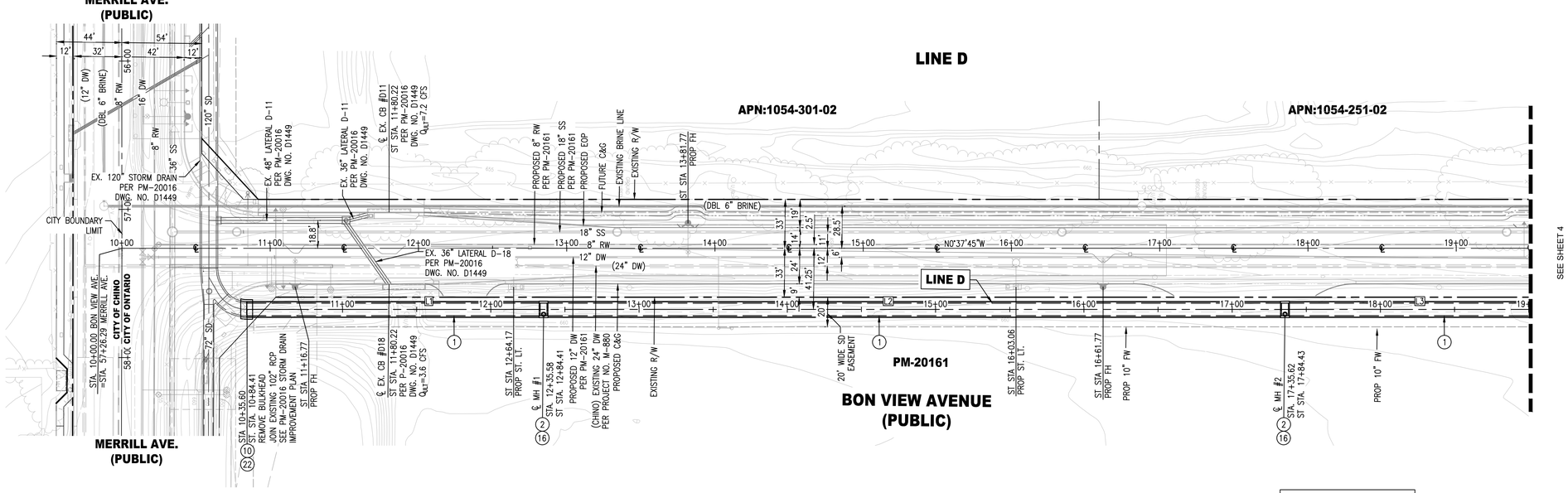


| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L1 | N00°37'45"W | 197.67' |
| L2 | N00°37'45"W | 495.36' |
| L3 | N00°37'45"W | 495.34' |

**NOTE:**

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

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REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

40' 0' 20' 40' 80'
SCALE: 1" = 40'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/6/2024
DRAWN BY: BK
DATE: 8/6/2024
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
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LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE

# STORM DRAIN IMPROVEMENT PLAN

**BON VIEW AVENUE**

**FROM MERRILL AVE TO 950' NORTH OF MERRILL AVE**

PM-20161

SHEET OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/07/2024

Drawing Name: P:\Year_2023\2023-038-REDA-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\03-05_2023-038_SD_BON VIEW.dwg

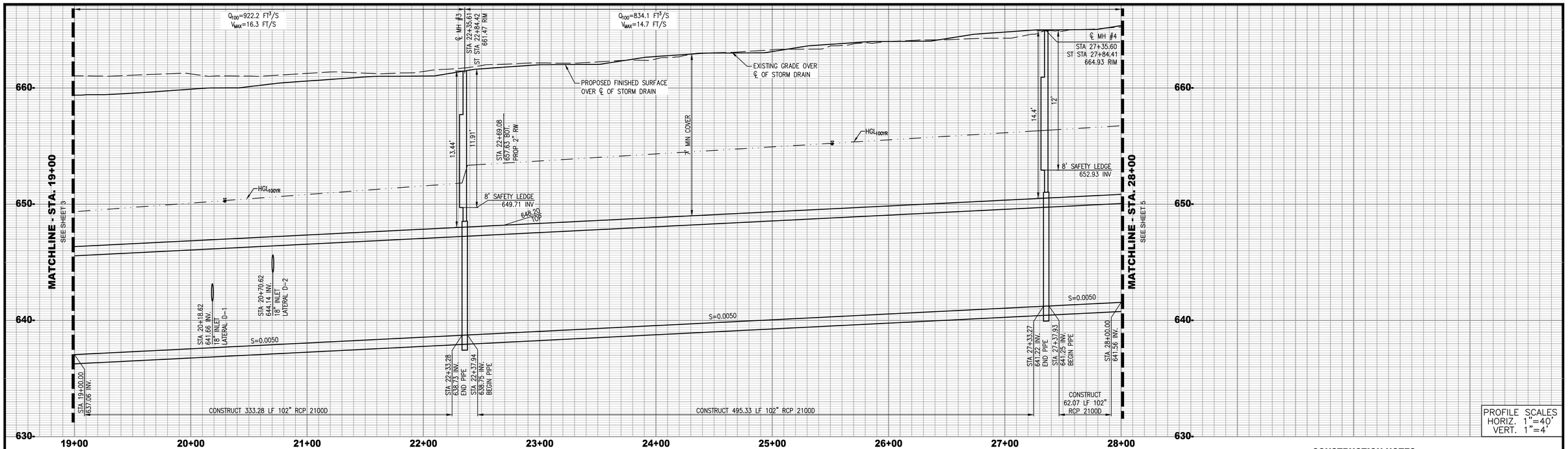


PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

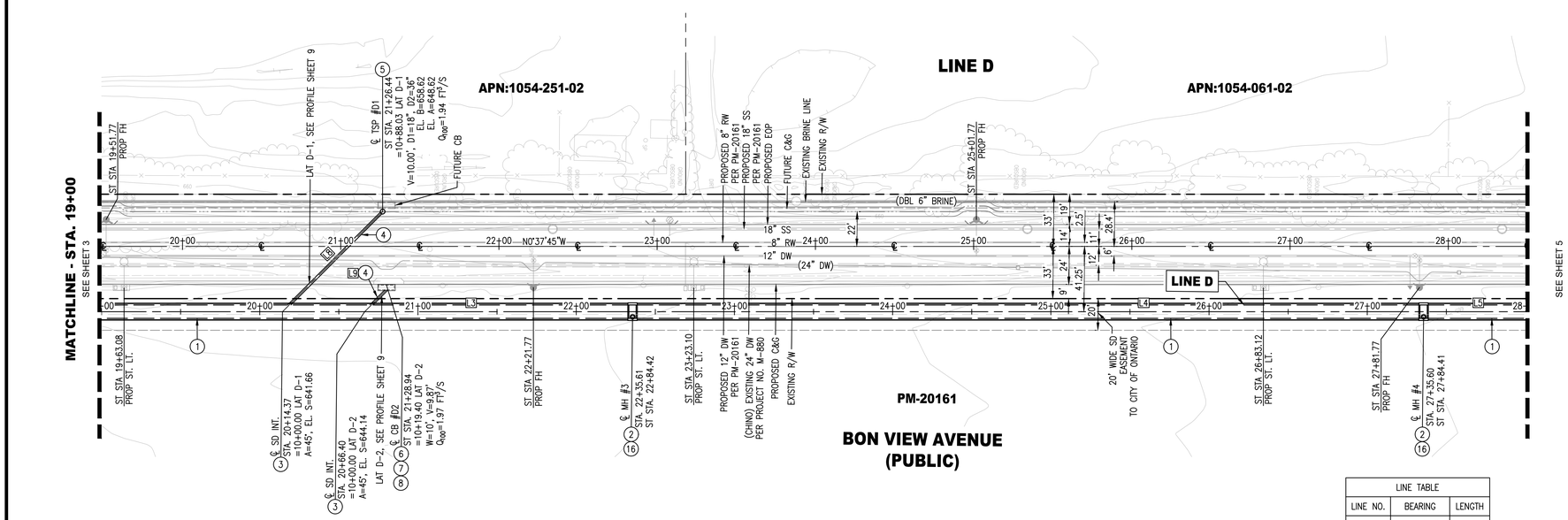


## CONSTRUCTION NOTES

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7. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20161 STREET IMPROVEMENT PLANS FOR DETAILS
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16. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC STD. PLAN NO. 330-2, PER DETAIL ON SHEET 11

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L3 | N00°37'45"W | 495.34' |
| L4 | N00°37'45"W | 495.33' |
| L5 | N00°37'45"W | 495.34' |
| L8 | N45°37'44"W | 81.94' |
| L9 | N45°37'44"W | 13.44' |

REGISTERED PROFESSIONAL ENGINEER
SIARA ROSE MACKINNEY
No.85559
Exp. 9/30/2026
CIVIL
STATE OF CALIFORNIA

40' 0' 20' 40' 80'
SCALE: 1" = 40'

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/6/2024
DRAWN BY: BK
DATE: 8/6/2024
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — DATE


# STORM DRAIN IMPROVEMENT PLAN

**BON VIEW AVENUE**

**FROM 950' NORTH OF MERRILL AVE TO 800' SOUTH OF EUCALYPTUS AVE**

PM-20161

SHEET 4 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/07/2024

Drawing Name: P:\Year_2023\2023-038-REDA-SOLO\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\03-05_2023-038_SD_BON VIEW.dwg

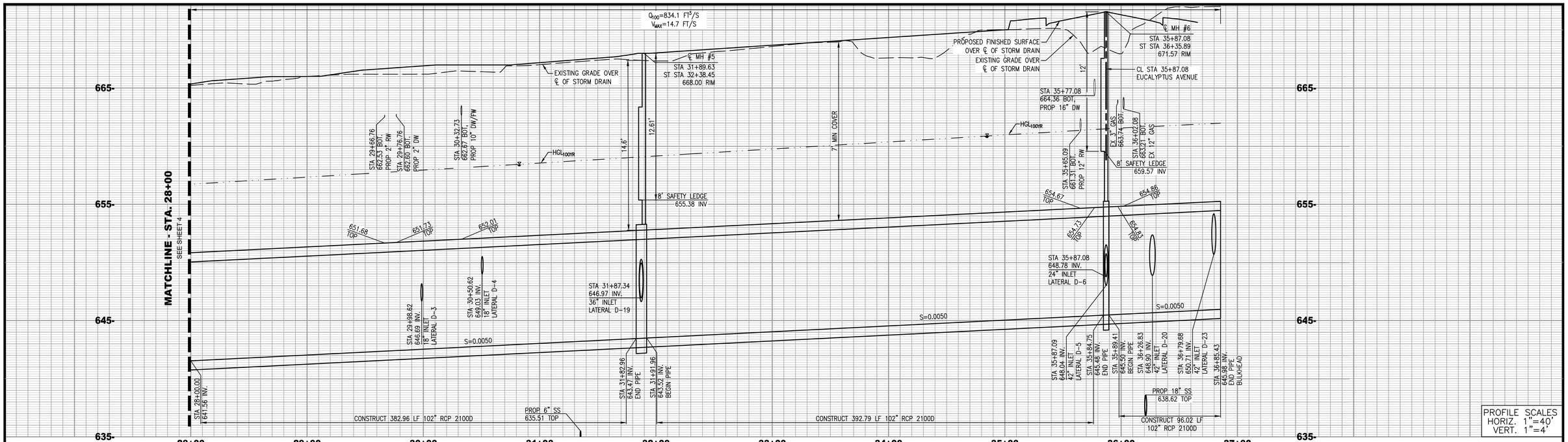


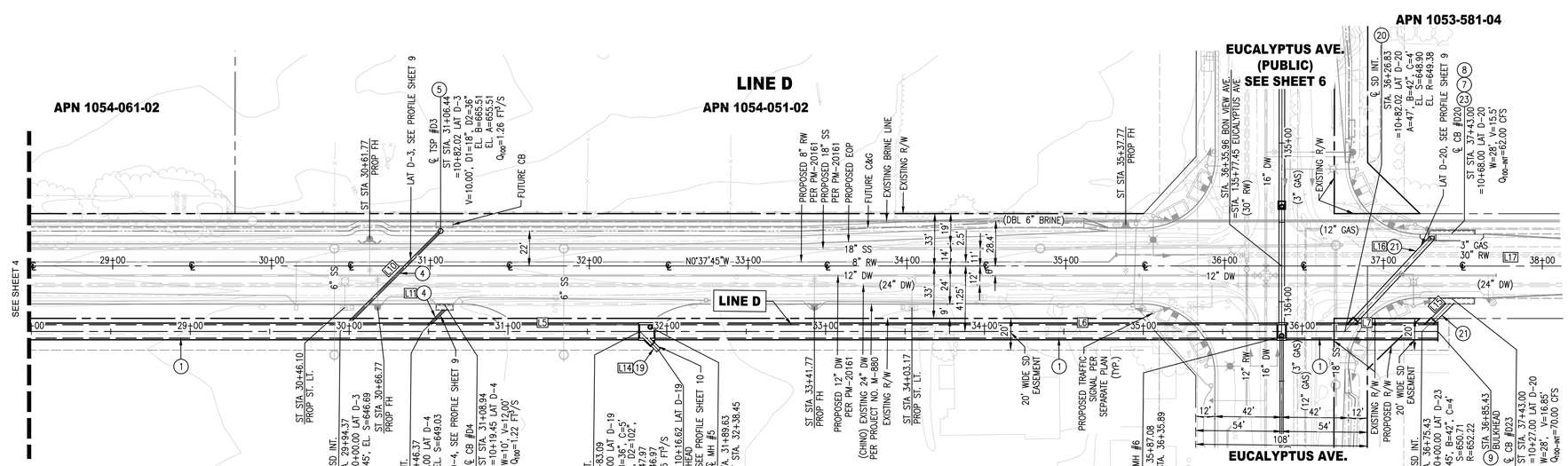


| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L15 | N45°37'45"W | 15.01' |
| L16 | S47°37'55"E | 73.52' |
| L14 | N44°22'15"E | 5.61' |
| L5 | N00°37'45"W | 495.34' |
| L6 | N00°37'45"W | 346.83' |
| L7 | N00°37'45"W | 96.01' |
| L10 | N45°37'44"W | 81.94' |
| L11 | N45°37'44"W | 13.43' |
| L17 | N00°35'51"W | 32.46' |

## CONSTRUCTION NOTES

1. CONSTRUCT 102" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
2. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009
3. CONSTRUCT JUNCTION STRUCTURE NO. 1 PER CITY OF ONTARIO STD. DWG. 3010, CASE 1
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
5. CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL ON SHEET 11
6. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" PER CITY OF ONTARIO STD. DWG. NO. 3018
7. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20161 STREET IMPROVEMENT PLANS FOR DETAILS
8. CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017
9. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL ON SHEET 11
16. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC STD. PLAN NO. 330-2, PER DETAIL ON SHEET 11
18. CONSTRUCT MANHOLE PIPE-TO-PIPE (LARGE SIDE INLET) PER SPPWC STD. DWG. NO. 322-3, PER DETAIL ON SHEET 12
19. CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
20. CONSTRUCT JUNCTION STRUCTURE NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3012
21. CONSTRUCT 42" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
23. CONSTRUCT CATCH BASIN WITH MANHOLE IN STREET PER SPPWC STD. PLAN. NO. 307-4, PER DETAIL ON SHEET 12

Know what's below. Call 811 before you dig.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

40' 0' 20' 40' 80'
SCALE: 1" = 40'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/6/2024
DRAWN BY: BK
DATE: 8/6/2024
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1," SET ON TOP OF CURB, APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE


# STORM DRAIN IMPROVEMENT PLAN

**BON VIEW AVENUE**

**FROM 800' SOUTH OF EUCALYPTUS AVE TO 100' NORTH OF EUCALYPTUS AVE**

PM-20161

SHEET OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/11/2024

Drawing Name: P:\Year_2023\2023-038-REDA-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\03-05_2023-038_SD_BON VIEW.dwg

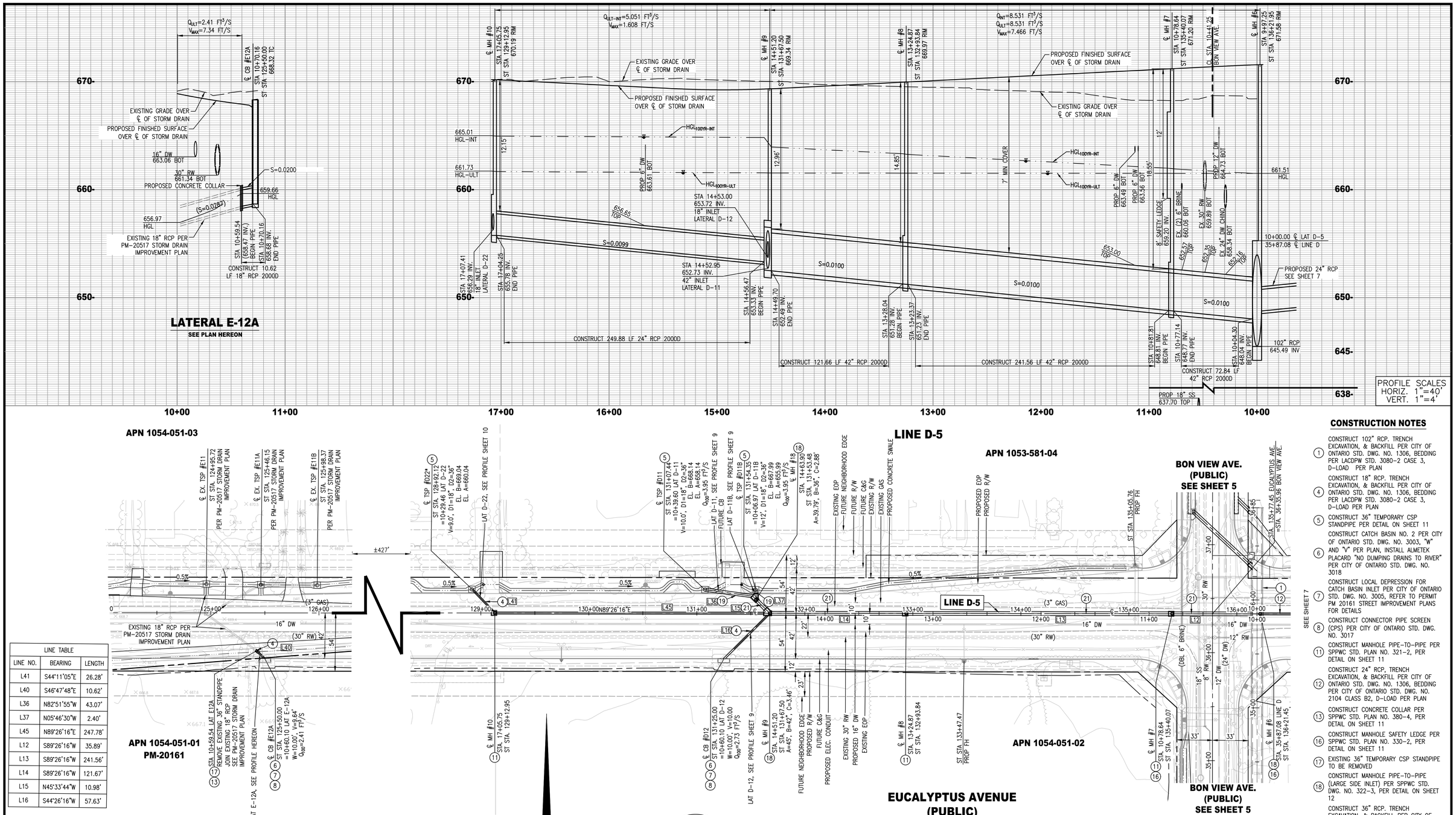


| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L41 | S44°11'05"E | 26.28' |
| L40 | S46°47'48"E | 10.62' |
| L36 | N82°51'55"W | 43.07' |
| L37 | N05°46'30"W | 2.40' |
| L45 | N89°26'16"E | 247.78' |
| L12 | S89°26'16"W | 35.89' |
| L13 | S89°26'16"W | 241.56' |
| L14 | S89°26'16"W | 121.67' |
| L15 | N45°33'44"W | 10.98' |
| L16 | S44°26'16"W | 57.63' |

## CONSTRUCTION NOTES

1. CONSTRUCT 102" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
5. CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL ON SHEET 11
6. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" PER CITY OF ONTARIO STD. DWG. NO. 3018
7. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20161 STREET IMPROVEMENT PLANS FOR DETAILS
8. CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017
11. CONSTRUCT MANHOLE PIPE-TO-PIPE PER SPPWC STD. PLAN NO. 321-2, PER DETAIL ON SHEET 11
12. CONSTRUCT 24" RCP, TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
13. CONSTRUCT CONCRETE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 11
16. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC STD. PLAN NO. 330-2, PER DETAIL ON SHEET 11
17. EXISTING 36" TEMPORARY CSP STANDPIPE TO BE REMOVED
18. CONSTRUCT MANHOLE PIPE-TO-PIPE (LARGE SIDE INLET) PER SPPWC STD. DWG. NO. 322-3, PER DETAIL ON SHEET 12
19. CONSTRUCT 36" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
21. CONSTRUCT 42" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN

**NOTE:**

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

***NOTE:**
RISER IS TEMPORARY AND ONLY INTENDED TO BE USED FOR DEWATERING IN THE INTERIM CONDITION

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/6/2024
DRAWN BY: BK
DATE: 8/6/2024
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1," SET ON TOP OF CURB, APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE


# STORM DRAIN IMPROVEMENT PLAN

**EUCALYPTUS AVENUE**

**BON VIEW AVE TO 300' EAST OF BON VIEW AVE**

PM-20161

SHEET 6 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/11/2024

Drawing Name: P:\Year_2023\2023-038-REDA-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\06-08_2023-038_SD_EUCALYPTUS.dwg

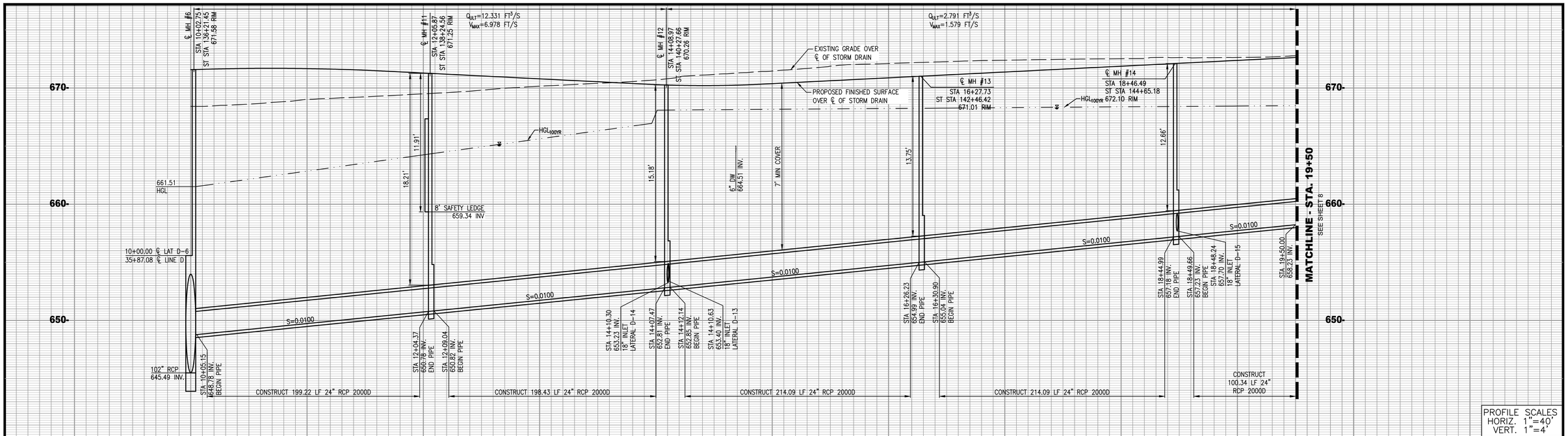


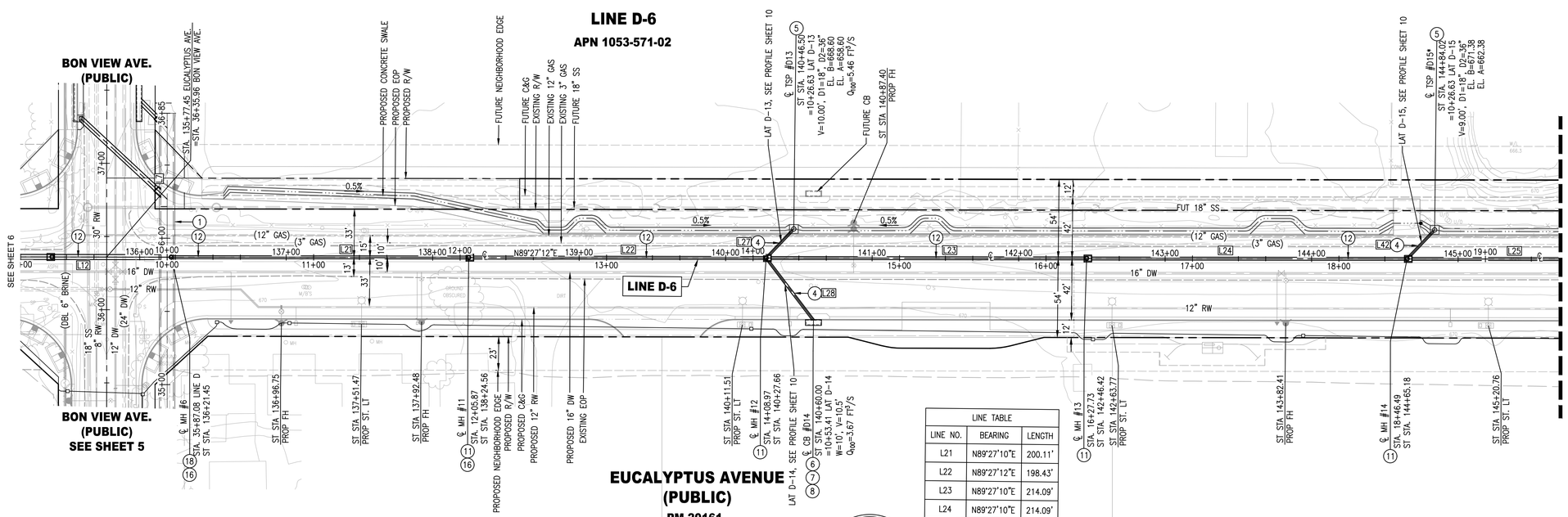


## CONSTRUCTION NOTES

1. CONSTRUCT 102" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
2. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009
4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
5. CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL ON SHEET 11
6. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" PER CITY OF ONTARIO STD. DWG. NO. 3018
7. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20161 STREET IMPROVEMENT PLANS FOR DETAILS
8. CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017
11. CONSTRUCT MANHOLE PIPE-TO-PIPE PER SPPWC STD. PLAN NO. 321-2, PER DETAIL ON SHEET 11
12. CONSTRUCT 24" RCP, TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
16. CONSTRUCT MANHOLE SAFETY LEDGE PER SPPWC STD. PLAN NO. 330-2, PER DETAIL ON SHEET 11
18. CONSTRUCT MANHOLE PIPE-TO-PIPE (LARGE SIDE INLET) PER SPPWC STD. DWG. NO. 322-3, PER DETAIL ON SHEET 12

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L21 | N89°27'10"E | 200.11' |
| L22 | N89°27'12"E | 198.43' |
| L23 | N89°27'10"E | 214.09' |
| L24 | N89°27'10"E | 214.09' |
| L25 | N89°27'10"E | 141.63' |
| L27 | N42°56'51"E | 23.46' |
| L28 | S37°48'59"E | 51.21' |
| L12 | S89°26'16"W | 35.89' |
| L7 | N00°37'45"W | 96.01' |

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L42 | S42°56'02"W | 23.45' |

**NOTE:**

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

***NOTE:**

RISER IS TEMPORARY AND ONLY INTENDED TO BE USED FOR DEWATERING IN THE INTERIM CONDITION

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

40' 0' 20' 40' 80'
SCALE: 1" = 40'

811 Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: 8/6/2024
DRAWN BY: BK
DATE: 8/6/2024
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — DATE


# STORM DRAIN IMPROVEMENT PLAN

**EUCALYPTUS AVENUE**

**FROM BON VIEW AVE TO 950' EAST OF BON VIEW AVE**

PM-20161

SHEET 7 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/07/2024

Drawing Name: P:\Year_2023\2023-038-REDA-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\06-08_2023-038_SD_EUCALYPTUS.dwg

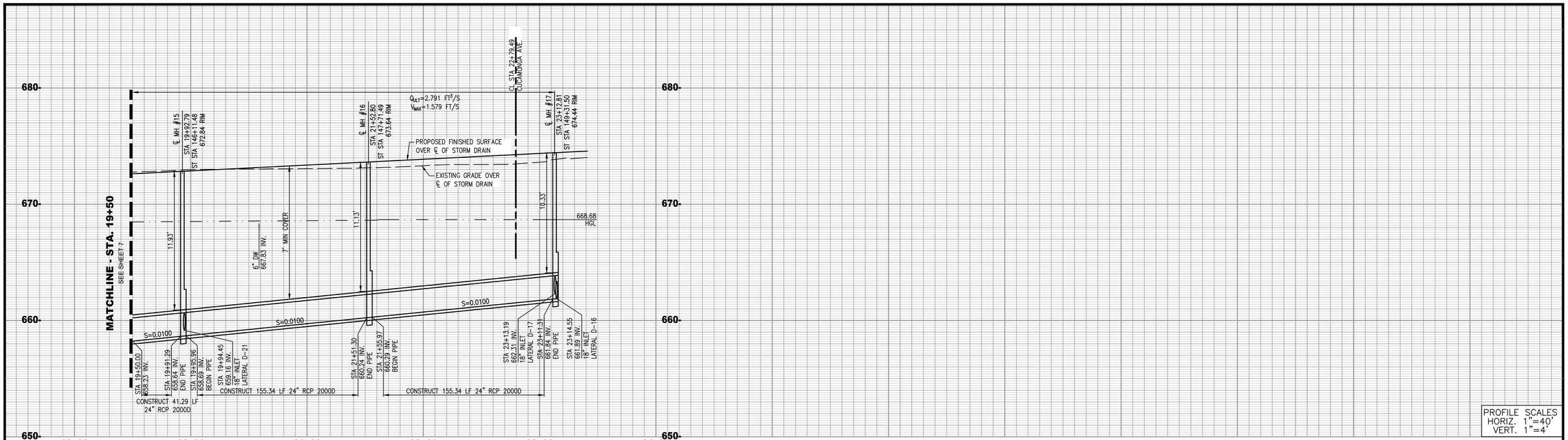


PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

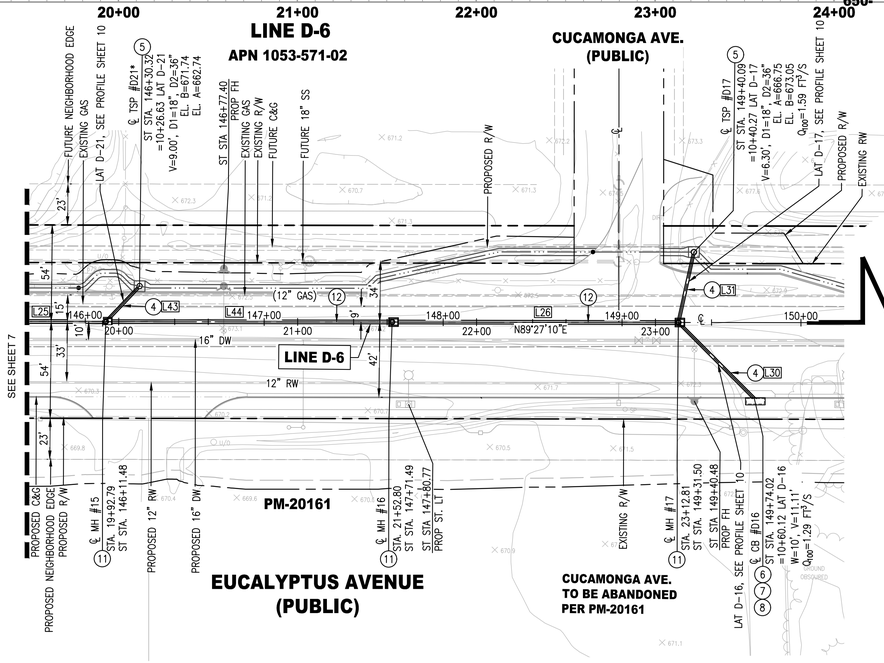


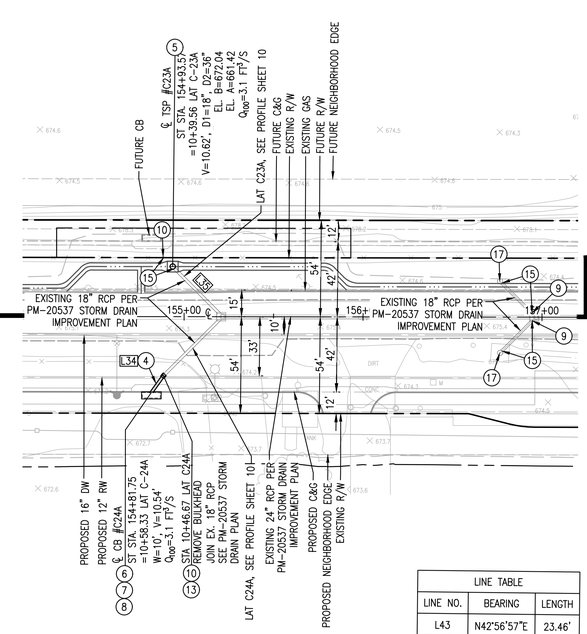


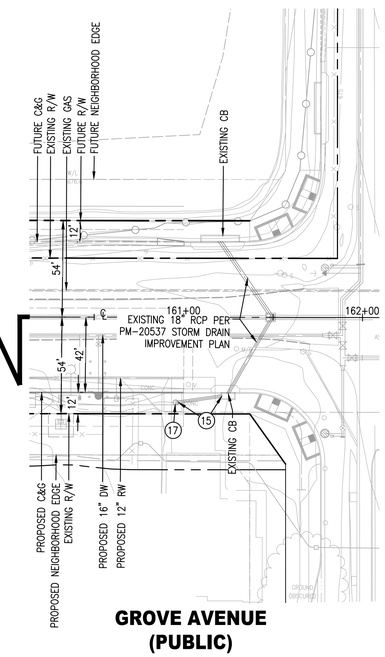


## CONSTRUCTION NOTES

4. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER LACDPW STD. 3080-2 CASE 3, D-LOAD PER PLAN
5. CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL ON SHEET 11
6. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" PER CITY OF ONTARIO STD. DWG. NO. 3018
7. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20161 STREET IMPROVEMENT PLANS FOR DETAILS
8. CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017
9. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL ON SHEET 11
10. REMOVE EXISTING CONCRETE BULKHEAD
11. CONSTRUCT MANHOLE PIPE-TO-PIPE PER SPPWC STD. PLAN NO. 321-2, PER DETAIL ON SHEET 11
12. CONSTRUCT 24" RCP, TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
13. CONSTRUCT CONCRETE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 11
15. REMOVE EXISTING 18" RCP
17. EXISTING 36" TEMPORARY CSP STANDPIPE TO BE REMOVED

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L43 | N42°56'57"E | 23.46' |
| L44 | N89°27'10"E | 155.34' |
| L34 | S34°51'06"W | 11.54' |
| L35 | N45°29'42"W | 35.59' |
| L25 | N89°27'10"E | 141.63' |
| L26 | N89°27'10"E | 155.34' |
| L30 | S45°33'44"E | 57.65' |
| L31 | N11°46'14"E | 36.98' |

40' 0' 20' 40' 80'
SCALE: 1" = 40'

811 Know what's below. Call 811 before you dig.

**NOTE:**
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

***NOTE:**
RISER IS TEMPORARY AND ONLY INTENDED TO BE USED FOR DEWATERING IN THE INTERIM CONDITION

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |
| | | | |

DESIGNED BY: BK
DATE: 8/6/2024
DRAWN BY: BK
DATE: 8/6/2024
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

*BENCH MARK No. GG-18-1*
*ELEV. 635.314' (NAVD88) LEVELED 2018*
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*


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PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — DATE


# STORM DRAIN IMPROVEMENT PLAN
## EUCALYPTUS AVENUE
### FROM 950' EAST OF BON VIEW AVE TO 1400' EAST OF BON VIEW AVE

PM-20161

SHEET 8 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/11/2024

Drawing Name: P:\Year_2023\2023-039-REDA-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\06-08_2023-038_SD_EUCALYPTUS.dwg

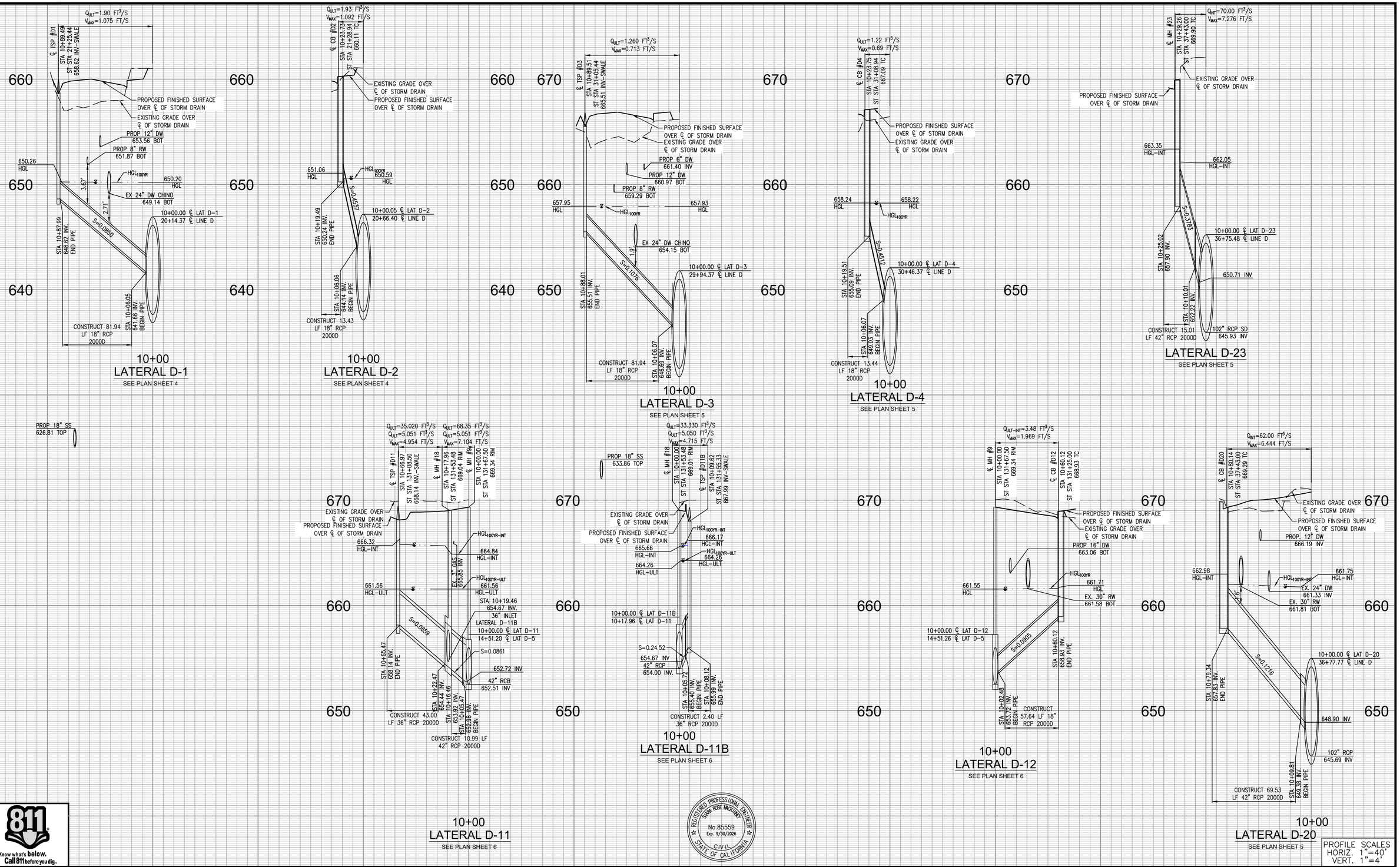


Know what's below. Call 811 before you dig.

REGISTERED PROFESSIONAL ENGINEER SIARA REE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

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4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE

# STORM DRAIN IMPROVEMENT PLAN AND PROFILE
# BON VIEW AVENUE AND EUCALYPTUS AVENUE

PM-20161

SHEET 9 OF 12
CONTRACT
ACCOUNT
DWG. NO.

Drawing Name: P:\Year_2023\2023-038-REDA-SOL\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\09_2023-038_SD_LATPROF.dwg

11/11/2024

CITY OF ONTARIO

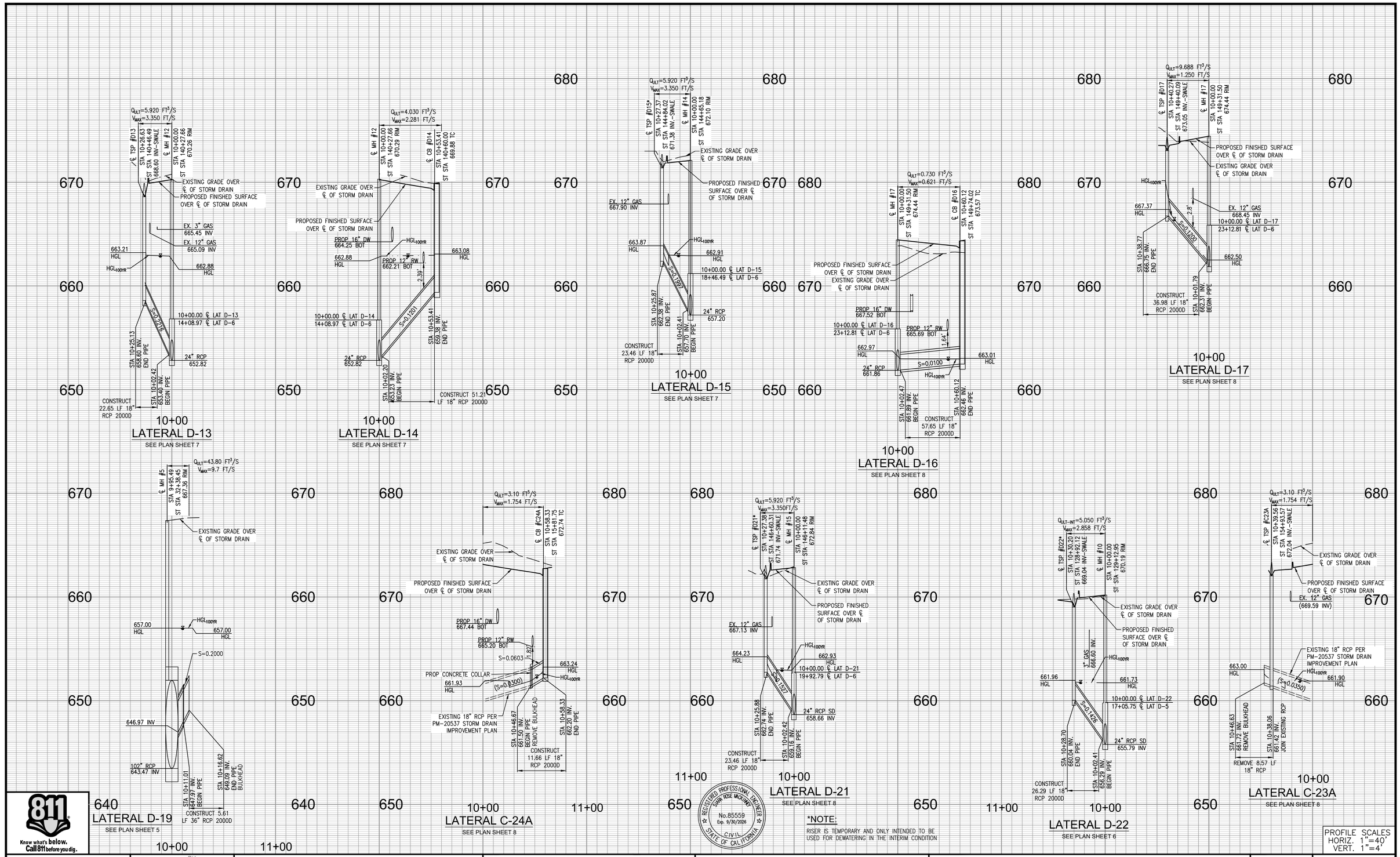


| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

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SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE

# STORM DRAIN IMPROVEMENT PLAN AND PROFILE
## BON VIEW AVENUE AND EUCALYPTUS AVENUE

PM-20161

SHEET 10 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/07/2024

Drawing Name: P:\Year_2023\2023-038-RED4-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\09_2023-038_SD_LATPROF.dwg

CITY OF ONTARIO

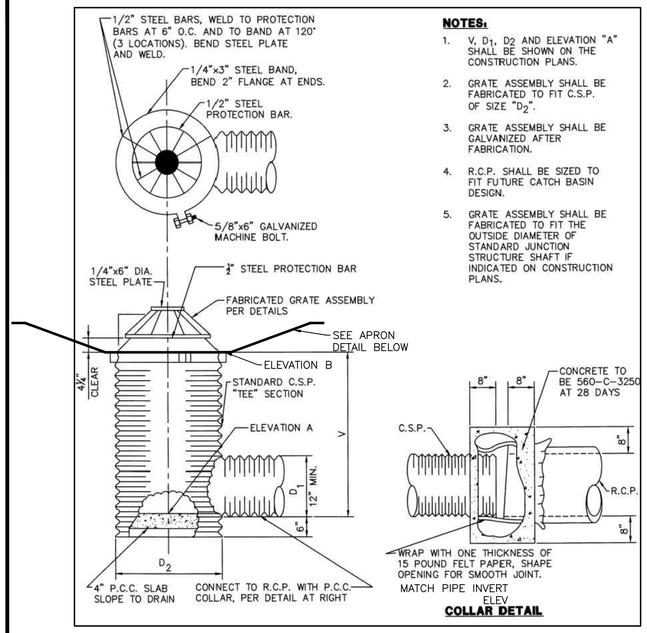


**NOTES:**

1. V, $D_1$, $D_2$ AND ELEVATION "A" SHALL BE SHOWN ON THE CONSTRUCTION PLANS.
2. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT C.S.P. OF SIZE "$D_2$".
3. GRATE ASSEMBLY SHALL BE GALVANIZED AFTER FABRICATION.
4. R.C.P. SHALL BE SIZED TO FIT FUTURE CATCH BASIN DESIGN.
5. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT THE OUTSIDE DIAMETER OF STANDARD JUNCTION STRUCTURE SHAFT IF INDICATED ON CONSTRUCTION PLANS.

(5) TEMPORARY CSP STANDPIPE DETAIL
DETAIL 1

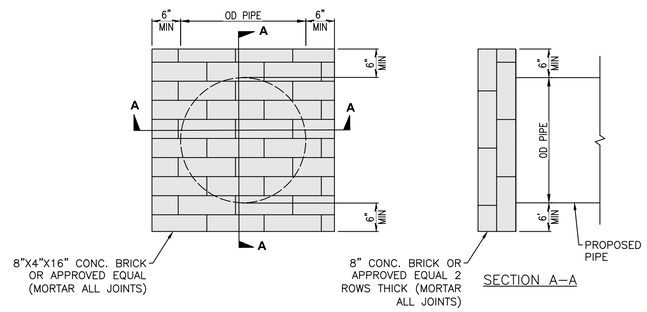


(9) BRICK AND MORTAR BULKHEAD DETAIL
DETAIL 2

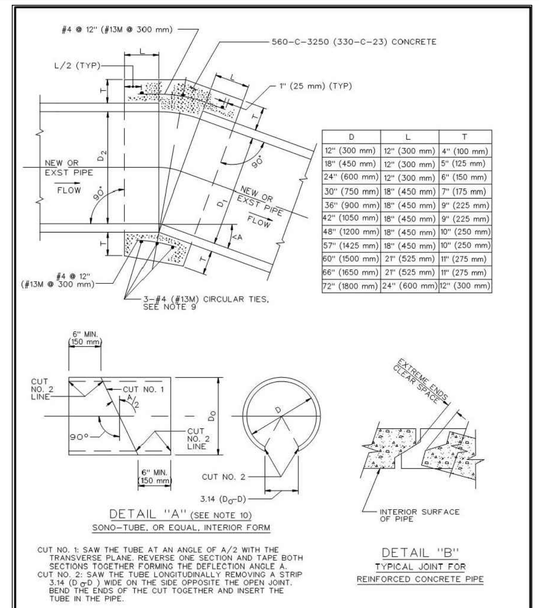


| D | L | T |
|---|---|---|
| 12" (300 mm) | 12" (300 mm) | 4" (100 mm) |
| 18" (450 mm) | 12" (300 mm) | 5" (125 mm) |
| 24" (600 mm) | 12" (300 mm) | 6" (150 mm) |
| 30" (750 mm) | 18" (450 mm) | 7" (175 mm) |
| 36" (900 mm) | 18" (450 mm) | 9" (225 mm) |
| 42" (1050 mm) | 18" (450 mm) | 9" (225 mm) |
| 48" (1200 mm) | 18" (450 mm) | 10" (250 mm) |
| 57" (1425 mm) | 18" (450 mm) | 10" (250 mm) |
| 60" (1500 mm) | 21" (525 mm) | 11" (275 mm) |
| 66" (1650 mm) | 21" (525 mm) | 11" (275 mm) |
| 72" (1800 mm) | 24" (600 mm) | 12" (300 mm) |

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 1997, 1999, 2009

**CONCRETE COLLAR FOR RCP**
**12" (300 mm) THROUGH 72" (1800 mm)**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN **380-4**
SHEET 1 OF 2

NOTES

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 10%.
2. FOR CURVE JOINTS (SEE DETAIL B, SHEET 1)
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS GREATER THAN 1" (25 mm), BUT IS LESS THAN 3" (75 mm) A CONCRETE COVER IS REQUIRED IN ACCORDANCE WITH SSPWC 306-7.3.2.1.
   IF THE EXTREME ENDS OF THE PIPE LEAVE A CLEAR SPACE THAT IS EQUAL TO OR GREATER THAN 3" (75 mm), BUT LESS THAN 6" (150 mm), A CONCRETE COLLAR IS REQUIRED. IF THE CLEAR SPACE IS 6" (150 mm) OR GREATER, A TRANSITION STRUCTURE IS REQUIRED.
3. CONCRETE COLLAR SHALL NOT BE USED FOR A SIZE CHANGE ON THE MAIN LINE.
4. CONNECTOR PIPES
   A. WHERE PIPES OF DIFFERENT DIAMETERS ARE JOINED WITH A CONCRETE COLLAR, L AND T SHALL BE THOSE OF THE LARGER PIPE. $D=D_1$ OR $D_2$ WHICHEVER IS GREATER.
   B. WHEN $D_1$ IS EQUAL TO OR LESS THAN $D_2$ JOIN INVERTS AND WHEN $D_1$ IS GREATER THAN $D_2$ JOIN SOFFITS.
5. FOR PIPE LARGER THAN 72" (1800 mm) SPECIAL COLLAR DETAILS ARE REQUIRED.
6. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
7. REINFORCEMENT SHALL CONFORM TO ASTM A 615 (A 615 M) GRADE 40 (300).
8. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE D+(2X WALL THICKNESS) + T.
9. REINFORCING SHALL BE USED WHERE THE PIPE DIAMETER IS GREATER THAN 21" (525 mm) AND ON ALL PIPES WHERE THE SPACES BETWEEN THE EXTREME OUTER ENDS IS 3" (75 mm) OR LARGER.

CIRCULAR TIES:

| PIPE DIAMETER | NO. OF CIRCULAR TIES |
|---|---|
| 21" (525 mm) OR LESS | 3 |
| 24" (600 mm) TO 30" (750 mm) | 3 |
| 33" (825 mm) TO 57" (1425 mm) | 4 |
| 60" (1500 mm) TO 72" (1800 mm) | 5 |

WHERE THE SPACE BETWEEN PIPE ENDS EXCEEDS 3" (75 mm), THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6" (150 mm) O.C.

10. WHERE THE PIPE IS 21" (525 mm) OR LESS IN DIAMETER AN INTERIOR FORM OF UNSEALED SONO-TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A). WHEN THE PIPE IS 24" (600 mm) OR LARGER A REMOVABLE INTERIOR FORM SHALL BE USED OR THE INTERIOR JOINT SHALL BE COMPLETELY FILLED WITH MORTAR AND NEATLY POINTED.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**CONCRETE COLLAR FOR RCP**
**12" (300 mm) THROUGH 72" (1800 mm)**

STANDARD PLAN **380-4**
SHEET 2 OF 2

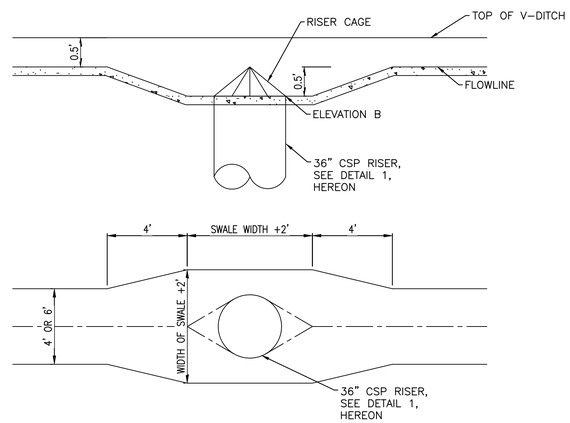


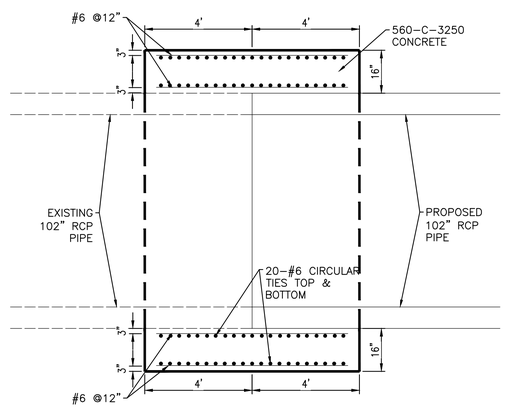


(22) MODIFIED CONCRETE COLLAR DETAIL
N.T.S.
(BASED ON SPPWC 380-4, DETAIL ON SHEET 13)
NOTE: USE ASTM A615 GRADE 60 BAR REINFORCEMENT

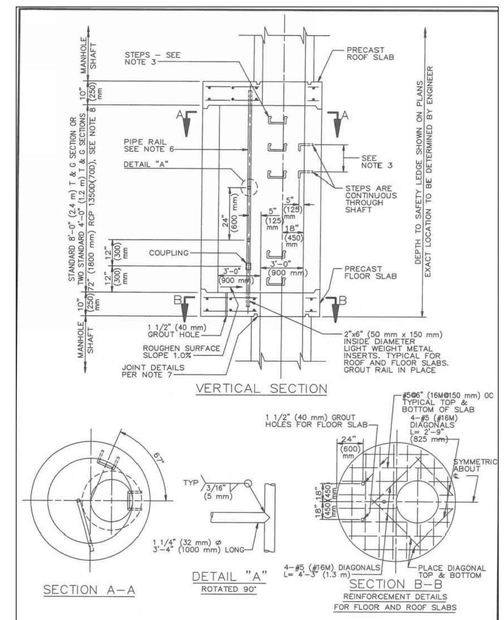


STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

**MANHOLE SHAFT SAFETY LEDGE**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN **330-2**
SHEET 1 OF 2

NOTES

1. MANHOLE SHAFT SAFETY LEDGE WILL BE NOTED ON THE PLANS WHEN REQUIRED. IT IS TO BE CONSTRUCTED WHEN DEPTH OF MANHOLE TO INVERT IS GREATER THAN 20' (6 m) AND MANHOLE SHAFT IS GREATER THAN 10' (3 m).
2. A SAFETY LEDGE SHALL NOT BE USED IF A PRESSURE MANHOLE IS REQUIRED.
3. STEPS SHALL CONFORM TO SPPWC 635 OR 636 AND SHALL BE ANCHORED 4" (100 mm) IN THE WALL OF THE STRUCTURE. STEPS SHALL BE PLACED TO MATCH THE SPACING OF THE MANHOLE SHAFT.
4. REINFORCEMENT SHALL BE PER ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300) AND SHALL TERMINATE 2" (50 mm) CLEAR OF CONCRETE SURFACE UNLESS OTHERWISE SHOWN.
5. GROUT HOLES, PIPE AND FITTINGS SHALL BE PROVIDED IN THE FLOOR SLAB. PRESSURE GROUTING SHALL BE USED TO FILL VOIDS AND TO SECURE UNIFORM BEARING. THE GROUT SHALL BE NEAT CEMENT GROUT AND GROUTING PRESSURES SHALL BE AS DETERMINED IN THE FIELD BY THE ENGINEER.
6. PIPE RAIL SHALL BE FABRICATED OF 1 1/4" (32 mm) STANDARD GALVANIZED PIPE COMPOSED OF TWO SECTIONS 7'-6" (2.25 m) & 18" (450 mm) IN LENGTH JOINED BY A GALVANIZED COUPLING. THE COUPLING SHALL BE THREADED A MINIMUM OF 2" (50 mm) ON EACH PIPE LENGTH.
7. ROOF AND FLOOR SLABS SHALL BE PRECAST AND KEYED FOR REINFORCED CONCRETE PIPE SECTIONS AS SHOWN. ALL JOINTS SHALL BE FILLED WITH CLASS C MORTAR AND NEATLY POINTED OR WIPED ON THE INSIDE.
8. 72" (1800 mm) RCP SHALL BE PROVIDED WITH TWO CIRCULAR CAGES OF REINFORCEMENT.
9. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:

   324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
   326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
   635 STEEL STEP
   636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE SHAFT SAFETY LEDGE**

STANDARD PLAN **330-2**
SHEET 2 OF 2

811 Know what's below. Call 811 before you dig.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 Exp. 9/30/2026 CIVIL STATE OF CALIFORNIA

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.314' (NAVD88) LEVELED 2018
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1," SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — DATE

BON VIEW AVENUE AND EUCALYPTUS AVENUE
DETAILS

PM-20161

SHEET 11 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/11/2024

Drawing Name: P:\Year_2023\2023-038-REDA-SOLC\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\11_2023-038_SD_DETAIL.dwg

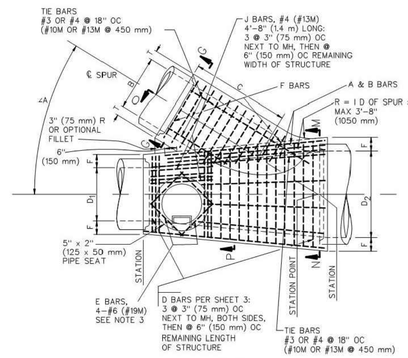


PLAN
(SHAFT NOT SHOWN)

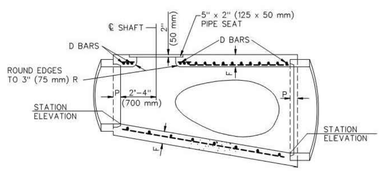


LONGITUDINAL SECTION

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY: THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992
REV. 1996, 2006, 2021

**MANHOLE – PIPE TO PIPE (LARGE SIDE INLET)**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 322-3
SHEET 1 OF 4

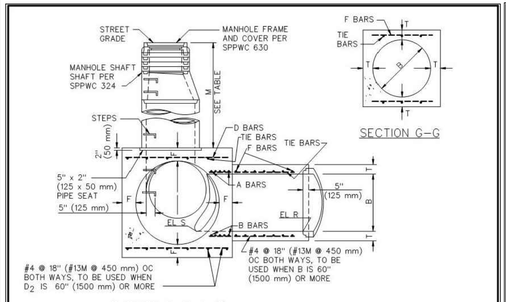


SECTION N–M–P–O




SECTION G–G

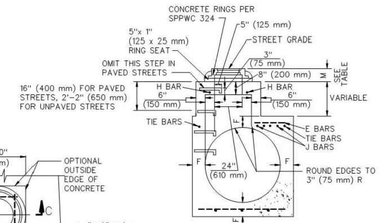


SECTION C–C

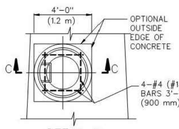


DETAIL N
MONOLITHIC MANHOLE SHAFT
(RINGS AND COVER NOT SHOWN)
SEE NOTE 2

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE – PIPE TO PIPE (LARGE SIDE INLET)**

STANDARD PLAN 322-3
SHEET 2 OF 4

| TABLE OF BAR SIZES | | |
|---|---|---|
| D2 OR B | A & B | D OR F |
| 12"–39" (300 – 975 mm) | #5 @ 3" (#16M @ 75 mm) | #4 @ 6" (#13M @ 150 mm) |
| 42"–84" (1050 – 2100 mm) | #6 @ 3" (#19M @ 75 mm) | #5 @ 6" (#16M @ 150 mm) |
| 90"–144" (2250 – 3600 mm) | #7 @ 3" (#22M @ 75 mm) | #6 @ 6" (#19M @ 150 mm) |

| TABLE OF VALUES FOR M (SEE NOTE 2) | | | | |
|---|---|---|---|---|
| SECTION | PAVED STREET | | UNPAVED STREET | |
| | MAX | MIN | MAX | MIN |
| N–M–P–O | | 2' 10–1/2" (867 mm) | | 1060 mm (3'–6") |
| C–C | 11" (282 mm) | 8–1/2" (217 mm) | 16" (410 mm) | 15" (380 mm) |

| TABLE OF VALUES FOR F | |
|---|---|
| D2 | F |
| 36" (900 mm) | 6–1/2" (165 mm) |
| 39" (975 mm) | 7" (180 mm) |
| 42" (1050 mm) | 7–1/2" (190 mm) |
| 45" (1125 mm) | 7–3/4" (195 mm) |
| 48" (1200 mm) | 8" (205 mm) |
| 51" (1275 mm) | 8–1/2" (215 mm) |
| 54" (1350 mm) | 9" (230 mm) |
| 57" (1425 mm) | 9–1/4" (235 mm) |
| 60" (1500 mm) | 9–1/2" (240 mm) |
| 63" (1575 mm) | 10" (255 mm) |
| 66" (1650 mm) | 10–1/4" (260 mm) |
| 69" (1725 mm) | 10–3/4" (275 mm) |
| 72" (1800 mm) | 11" (280 mm) |
| 78" (1950 mm) | 11–3/4" (300 mm) |
| 84" (2100 mm) | 12–1/2" (320 mm) |
| 90" (2250 mm) | 13–1/4" (335 mm) |
| 96" (2400 mm) | 14" (355 mm) |
| 102" (2550 mm) | 15–1/2" (395 mm) |
| 108" (2700 mm) | 16" (405 mm) |
| 114" (2850 mm) | 16–1/2" (420 mm) |
| 120" (3000 mm) | 17" (430 mm) |
| 126" (3150 mm) | 17" (430 mm) |
| 132" (3300 mm) | 17–1/2" (445 mm) |
| 138" (3450 mm) | 17–1/2" (445 mm) |
| 144" (3600 mm) | 18" (455 mm) |

| TABLE OF VALUES FOR T | |
|---|---|
| B | T |
| 12" (300 mm) | 4" (100 mm) |
| 15" (375 mm) | 4–1/4" (110 mm) |
| 18" (450 mm) | 4–1/2" (115 mm) |
| 21" (525 mm) | 5" (125 mm) |
| 24" (600 mm) | 5–1/4" (135 mm) |
| 27" (675 mm) | 5–1/2" (140 mm) |
| 30" (750 mm) | 6" (150 mm) |
| 33" (825 mm) | 6–1/4" (160 mm) |
| 36" (900 mm) | 6–1/2" (165 mm) |
| 39" (975 mm) | 7" (180 mm) |
| 42" (1050 mm) | 7–1/2" (190 mm) |
| 45" (1125 mm) | 7–3/4" (195 mm) |
| 48" (1200 mm) | 8" (205 mm) |
| 51" (1275 mm) | 8–1/2" (215 mm) |
| 54" (1350 mm) | 9" (230 mm) |
| 57" (1425 mm) | 9–1/4" (235 mm) |
| 60" (1500 mm) | 9–1/2" (240 mm) |
| 63" (1575 mm) | 10" (255 mm) |
| 66" (1650 mm) | 10–1/4" (260 mm) |
| 69" (1725 mm) | 10–3/4" (275 mm) |
| 72" (1800 mm) | 11" (280 mm) |
| 78" (1950 mm) | 11–3/4" (300 mm) |
| 84" (2100 mm) | 12–1/2" (320 mm) |
| 90" (2250 mm) | 13–1/4" (335 mm) |
| 96" (2400 mm) | 14" (355 mm) |
| 102" (2550 mm) | 15–1/2" (395 mm) |
| 108" (2700 mm) | 16" (405 mm) |
| 114" (2850 mm) | 16–1/2" (420 mm) |
| 120" (3000 mm) | 17" (430 mm) |
| 126" (3150 mm) | 17" (430 mm) |
| 132" (3300 mm) | 17–1/2" (445 mm) |
| 138" (3450 mm) | 17–1/2" (445 mm) |
| 144" (3600 mm) | 18" (455 mm) |

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE – PIPE TO PIPE (LARGE SIDE INLET)**

STANDARD PLAN 322-3
SHEET 3 OF 4

NOTES

1. VALUES FOR A, B, C, D1, D2, ELEVATION R AND ELEVATION S ARE SHOWN ON THE PLANS. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.
2. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'–10 1/2" (867 mm) FOR PAVED STREETS OR 3'–6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT MONOLITHIC SHAFT PER SECTION C–C AND DETAIL "N". SHAFT FOR ANY DEPTH OF MANHOLE MAY BE CONSTRUCTED PER SECTION C–C. WHEN DIAMETER D1 IS 48" (1200 mm) OR LESS, CENTER OF SHAFT MAY BE LOCATED PER NOTE 3.
3. CENTER OF MANHOLE SHAFT SHALL BE LOCATED OVER CENTERLINE OF STORM DRAIN WHEN DIAMETER D1 IS 48" (1200 mm) OR LESS, IN WHICH CASE PLACE E BARS SYMMETRICALLY AROUND SHAFT AT 45° WITH CENTERLINE.
4. LENGTH OF MANHOLE MAY BE INCREASED AT OPTION TO MEET PIPE ENDS, BUT ANY CHANGE IN LOCATION F SPUR MUST BE APPROVED BY THE ENGINEER.
5. P SHALL BE 5" (125 mm) FOR D2=96" (2400 mm) OR LESS AND 8" (200 mm) FOR D2 OVER 96" (2400 mm).
6. REINFORCEMENT SHALL CONFORM TO ASTM A 615M, GRADE 300 (ASTM A 615, GRADE 40), AND SHALL TERMINATE 1–1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. FLOOR OF MANHOLE SHALL BE STEEL–TROWLED TO SPRING LINE.
8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN THE TABULAR VALUES OF F SHOWN ON TABLE, SHEET 1.
10. IF LATERALS ENTER ON BOTH SIDES OF MANHOLE, SHAFT SHALL BE LOCATED ON SIDE RECEIVING THE SMALLER LATERAL.
11. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" TO 15" (350 TO 375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE INVERT.
12. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
    - o THIS STANDARD PLAN IS USED WHEN SPPWC 320 IS INADEQUATE.
    - o MAIN LINE = 900 mm (36") INSIDE DIAMETER OR LARGER.
    - o LATERAL = 300 mm (12") TO 3600 mm (144") INSIDE DIAMETER; HOWEVER, THE INSIDE DIAMETER SHALL NOT EXCEED THE INSIDE DIAMETER OF THE MAIN LINE.
13. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.
14. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.
15. WHERE A MANHOLE SHAFT – 900 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 326.
16. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.
17. WHERE A PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.
18. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
    - 324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
    - 326 MANHOLE SHAFT – 900 mm (36") WITHOUT REDUCER
    - 328 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER
    - 329 PRESSURE MANHOLE SHAFT – 914 mm (36") WITHOUT REDUCER
    - 630 610 mm (24") MANHOLE FRAME AND COVER
    - 633 914 mm (36") MANHOLE FRAME AND COVER
    - 635 STEEL STEP
    - 636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE – PIPE TO PIPE (LARGE SIDE INLET)**

STANDARD PLAN 322-3
SHEET 4 OF 4

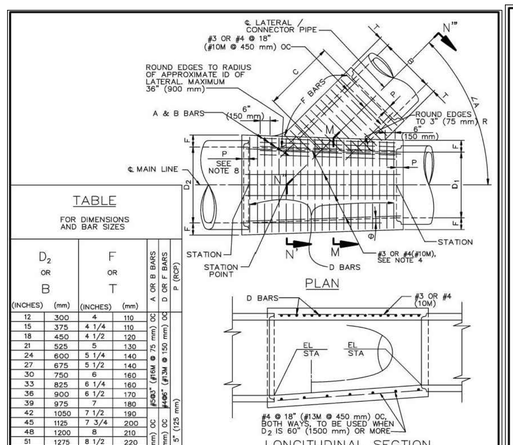


PLAN

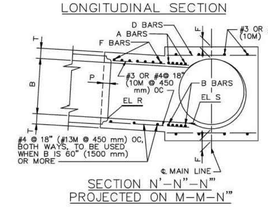


LONGITUDINAL SECTION

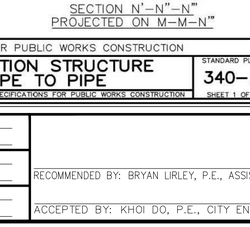


SECTION N'–N"–N.'"
PROJECTED ON M–M–N'"

| TABLE | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FOR DIMENSIONS AND BAR SIZES | | | | | | | | | | | | | | | | |
| $D_2$ OR B | | F OR T | | A OR B BARS | D OR F BARS | P (MIN) | | | | | | | | | | |
| (INCHES) | (mm) | (INCHES) | (mm) | | | | | | | | | | | | | |
| 12 | 300 | | 110 | OC | OC | 5" (125 mm) | #4@3" (#13M @ 75 mm) OC | #4@6" (#13M @ 150 mm) OC | #4@3" (#13M @ 75 mm) OC | #4@6" (#13M @ 150 mm) OC | #4@3" (#13M @ 75 mm) OC | #4@6" (#13M @ 150 mm) OC | #4@3" (#13M @ 75 mm) OC | #4@6" (#13M @ 150 mm) OC | #4@3" (#13M @ 75 mm) OC | #4@6" (#13M @ 150 mm) OC |
| 15 | 375 | 4 1/4 | 110 | | | | | | | | | | | | | |
| 18 | 450 | 4 1/2 | 120 | | | | | | | | | | | | | |
| 21 | 525 | 5 | 130 | | | | | | | | | | | | | |
| 24 | 600 | 5 1/4 | 140 | | | | | | | | | | | | | |
| 27 | 675 | 5 1/2 | 140 | | | | | | | | | | | | | |
| 30 | 750 | 6 | 160 | | | | | | | | | | | | | |
| 33 | 825 | 6 1/4 | 160 | | | | | | | | | | | | | |
| 36 | 900 | 6 1/2 | 170 | | | | | | | | | | | | | |
| 39 | 975 | 7 | 180 | | | | | | | | | | | | | |
| 42 | 1050 | 7 1/2 | 190 | | | | | | | | | | | | | |
| 45 | 1125 | 7 3/4 | 200 | | | | | | | | | | | | | |
| 48 | 1200 | 8 | 210 | | | | | | | | | | | | | |
| 51 | 1275 | 8 1/2 | 220 | | | | | | | | | | | | | |
| 54 | 1350 | 9 | 230 | | | | | | | | | | | | | |
| 57 | 1425 | 9 1/4 | 240 | | | | | | | | | | | | | |
| 60 | 1500 | 9 1/2 | 250 | | | | | | | | | | | | | |
| 63 | 1575 | 10 | 260 | | | | | | | | | | | | | |
| 66 | 1650 | 10 1/4 | 260 | | | | | | | | | | | | | |
| 69 | 1725 | 10 3/4 | 280 | | | | | | | | | | | | | |
| 72 | 1800 | 11 | 280 | | | | | | | | | | | | | |
| 78 | 1950 | 11 3/4 | 300 | | | | | | | | | | | | | |
| 84 | 2100 | 12 1/2 | 320 | | | | | | | | | | | | | |
| 90 | 2250 | 13 1/4 | 340 | | | | | | | | | | | | | |
| 96 | 2400 | 14 | 360 | | | | | | | | | | | | | |
| 102 | 2550 | 15 1/2 | 400 | | | | | | | | | | | | | |
| 108 | 2700 | 16 | 410 | | | | | | | | | | | | | |
| 114 | 2850 | 16 1/2 | 420 | | | | | | | | | | | | | |
| 120 | 3000 | 17 | 440 | | | | | | | | | | | | | |
| 126 | 3150 | 17 | 440 | | | | | | | | | | | | | |
| 132 | 3300 | 17 1/2 | 450 | | | | | | | | | | | | | |
| 138 | 3450 | 17 1/2 | 450 | | | | | | | | | | | | | |
| 144 | 3600 | 18 | 460 | | | | | | | | | | | | | |

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992
REV. 1995, 2009

**TRANSITION STRUCTURE PIPE TO PIPE**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 340-2
SHEET 1 OF 2

NOTES

1. THE HORIZONTAL ANGLE OF CONVERGENCE OR DIVERGENCE, θ, SHALL NOT EXCEED 5° 45'.
2. VALUES FOR A, B, C, $D_1$ AND $D_2$ ARE SHOWN ON THE PLANS. ELEVATION R AND ELEVATION S ARE SHOWN WHEN REQUIRED BY NOTE 10.
3. FLOOR OF STRUCTURE SHALL BE STEEL TROWELED TO SPRING LINE.
4. REINFORCEMENT STEEL SHALL CONFORM TO ASTM A 615 (A 615 M), GRADE 300 (40), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN, LONGITUDINAL BARS SHALL BE #3 OR #4 @ 18" (#10M @ 450 mm) OC OR LESS.
5. ELEVATION S APPLIES AT INSIDE WALL OF STRUCTURE.
6. TRANSITION STRUCTURE SHALL BE POURED IN ONE CONTINUOUS OPERATION, EXCEPT THAT THE CONTRACTOR SHALL HAVE THE OPTION OF PLACING AT THE SPRING LINE A CONSTRUCTION JOINT LONGITUDINAL KEYWAY.
7. THE LENGTH OF THE STRUCTURE MAY BE INCREASED AT THE OPTION OF THE CONTRACTOR TO MEET RCP ENDS, USING D BARS, LONGITUDINAL AND BOTTOM REINFORCEMENT IN EXTENDED PORTION OF SAME DIAMETER AND SPACING AS SPECIFIED IN THE TABLE, BUT ANY CHANGE IN THE LOCATION OF SPUR MUST BE APPROVED BY THE ENGINEER.
8. EMBEDMENT P SHALL BE AS SPECIFIED IN THE TABLE, UNLESS OTHERWISE SHOWN ON THE PLANS.
9. WHEN THERE IS NO SPUR REQUIRED, A & B BARS SHALL BE OMITTED.
10. WHEN ELEVATION R AND ELEVATION S ARE NOT SHOWN ON PLANS, INLET PIPE SHALL ENTER MAIN LINE RADIALLY. WHEN INLET PIPE ENTERS MAIN LINE OTHER THAN RADIALLY, ELEVATION S SHALL BE SHOWN ON PLANS, AND INLET PIPE SHALL BE LAID ON A STRAIGHT GRADE FROM ELEVATION S TO CATCH BASIN OR GRADE BREAK IN INLET LINE. ELEVATION R SHALL BE SHOWN ON THE PLANS ONLY WHEN STUB IS TO BE PROVIDED IN MAIN LINE FOR FUTURE CONSTRUCTION OF INLET PIPE.
11. THE MAXIMUM COVER ABOVE THIS STRUCTURE SHALL BE 25' (7.5 m). IF THE COVER EXCEEDS 25' (7.5 m) A SPECIAL STRUCTURE SHALL BE DESIGNED FOR THE COVER AND DETAILED ON THE PLANS.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**TRANSITION STRUCTURE PIPE TO PIPE**

STANDARD PLAN 340-2
SHEET 2 OF 2

4LEAF, INC.

APPROVED BY _____ DATE _____

REGISTERED PROFESSIONAL ENGINEER
JOHN ROSE MCKINNEY
No.85559
Exp. 9/30/2026
CIVIL
STATE OF CALIFORNIA

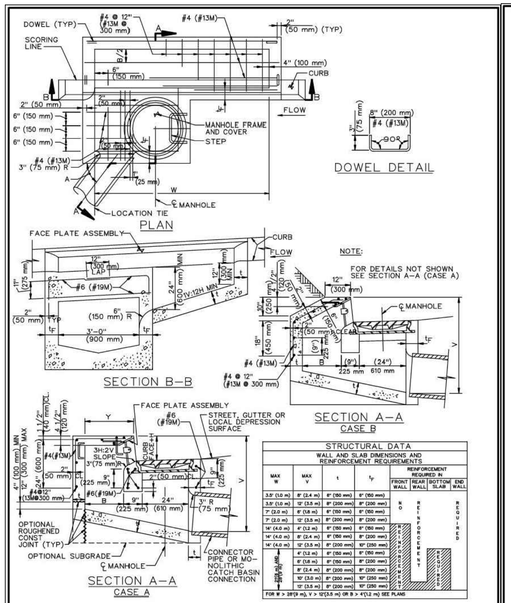


STRUCTURAL DATA
WALL AND SLAB DIMENSIONS AND REINFORCEMENT REQUIREMENTS

| MAX W | MAX Y | t | $t_F$ | REINFORCEMENT REQUIRED IN: FRONT WALL | REAR WALL | BOTTOM SLAB | END WALL |
|---|---|---|---|---|---|---|---|
| 3.0' (1.0 m) | 6' (2.4 m) | 6" (150 mm) | 9" (150 mm) | | | | |
| 3.5' (1.0 m) | 6' (1.5 m) | 6" (150 mm) | 9" (200 mm) | | | | |
| 7' (2.0 m) | 6' (1.5 m) | 6" (150 mm) | 9" (150 mm) | | | | |
| 7' (2.0 m) | 10' (3.0 m) | 6" (150 mm) | 9" (200 mm) | | | | |
| 14' (4.0 m) | 6' (1.5 m) | 6" (150 mm) | 9" (150 mm) | | | | |
| 14' (4.0 m) | 10' (3.0 m) | 6" (150 mm) | 9" (200 mm) | | | | |
| 14' (4.0 m) | 14' (4.0 m) | 6" (150 mm) | 9" (250 mm) | | | | |
| 14' (4.0 m) | 10' (3.0 m) | 6" (150 mm) | 10" (250 mm) | | | | |
| | 6' (1.5 m) | 6" (150 mm) | 9" (150 mm) | | | | |
| | 6' (1.5 m) | 6" (150 mm) | 9" (200 mm) | | | | |
| | 6' (1.5 m) | 6" (150 mm) | 9" (250 mm) | | | | |
| | 10' (3.0 m) | 6" (150 mm) | 9" (200 mm) | | | | |
| | 10' (3.0 m) | 6" (150 mm) | 9" (250 mm) | | | | |
| | 10' (3.0 m) | 6" (150 mm) | 10" (250 mm) | | | | |
| | 10' (3.0 m) | 6" (150 mm) | 10" (300 mm) | | | | |

FOR W > 28'(8 m), Y > 10'(3 m) OR B > 4'(1.2 m) SEE PLANS

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1984
REV. 1992, 1996, 2006, 2021

**CURB OPENING CATCH BASIN WITH MANHOLE IN STREET**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN 307-4
SHEET 1 OF 2

NOTES:

1. WHERE THE BASIN IS TO BE CONSTRUCTED WITHIN THE LIMITS OF EXISTING OR PROPOSED SIDEWALK OR IS CONTIGUOUS TO SUCH SIDEWALK, THE TOP SLAB OF THE BASIN MAY BE POURED EITHER MONOLITHIC WITH THE SIDEWALK OR SEPARATELY, USING THE SAME CLASS OF CONCRETE AS IN THE BASIN. WHEN POURED MONOLITHICALLY, THE SIDEWALK SHALL BE PROVIDED WITH A WEAKENED PLANE OR A 1" (25 mm) DEEP SAWCUT CONTINUOUSLY AROUND THE EXTERNAL PERIMETER OF THE CATCH BASIN WALLS, INCLUDING ACROSS THE FULL WIDTH OF THE SIDEWALK. SURFACE OF ALL EXPOSED CONCRETE SHALL CONFORM IN SLOPE, GRADE, COLOR, FINISH, AND SCORING TO EXISTING OR PROPOSED CURB AND WALK ADJACENT TO THE BASIN.
2. ALL CURVED CONCRETE SURFACES SHALL BE FORMED BY CURVED FORMS, AND SHALL NOT BE SHAPED BY PLASTERING.
3. FLOOR OF BASIN SHALL BE GIVEN A STEEL TROWEL FINISH, FLOOR OF MANHOLE CHAMBER SHALL HAVE A LONGITUDINAL AND LATERAL SLOPE OF 1V:12H MINIMUM AND 1V:3H MAXIMUM SLOPE FLOOR FROM ALL DIRECTIONS TO THE OUTLET.
4. CATCH BASIN SHALL BE CASE A UNLESS OTHERWISE SPECIFIED.
5. DIMENSIONS:
   - W = 7' (2 m)
   - B = 20" (500 mm)
   - Y = 24" (600 mm )
   - V = THE DIFFERENCE IN ELEVATION BETWEEN THE TOP OF THE CURB AND THE INVERT OF THE CATCH BASIN AT THE OUTLET = 4.5' (1.35 m).
   - $V_1$= THE DIFFERENCE IN ELEVATION BETWEEN THE TOP OF THE CURB AND THE INVERT OF THE INLET, NOTED ON THE PLANS.
   - H = NOTED ON THE PLANS.
   - A = THE ANGLE, IN DEGREES, INTERCEPTED BY THE CENTERLINE OF THE CONNECTOR PIPE AND THE CATCH BASIN WALL TO WHICH THE CONNECTOR PIPE IS ATTACHED.
6. PLACE CONNECTOR PIPES AS INDICATED ON THE PLANS. UNLESS OTHERWISE SPECIFIED, THE CONNECTOR PIPE SHALL BE LOCATED AT THE DOWNSTREAM END OF THE BASIN. WHERE THE CONNECTOR PIPE IS SHOWN AT A CORNER, THE CENTERLINE OF THE PIPE SHALL INTERSECT THE INSIDE CORNER OF THE BASIN. THE PIPE MAY BE CUT AND TRIMMED AT A SKEW NECESSARY TO ENSURE MINIMUM 3" (75 mm) PIPE EMBEDMENT, ALL AROUND, WITHIN THE CATCH BASIN WALL. AND 3" (75 mm) RADIUS OF ROUNDING OF STRUCTURE CONCRETE, ALL AROUND, ADJACENT TO PIPE ENDS. A MONOLITHIC CATCH BASIN CONNECTION SHALL BE USED TO JOIN THE CONNECTOR PIPE TO THE CATCH BASIN WHENEVER ANGLE "A" IS LESS THAN 70° OR GREATER THAN 110°, OR WHENEVER THE CONNECTOR PIPE IS LOCATED IN A CORNER. THE OPTIONAL USE OF A MONOLITHIC CATCH BASIN CONNECTION IN ANY CASE IS PERMITTED. MONOLITHIC CATCH BASIN CONNECTIONS MAY BE CONSTRUCTED TO AVOID CUTTING STANDARD LENGTHS OF PIPE.
7. STEPS SHALL BE LOCATED AS SHOWN. IF THE CONNECTOR PIPE INTERFERES WITH THE STEPS, THEY SHALL BE LOCATED ON THE FRONT WALL OF THE MANHOLE CHAMBER OR THE DOWNSTREAM WALL OF THE MANHOLE CHAMBER AND THE MANHOLE MOVED DOWNSTREAM 12" (300 mm). STEPS SHALL BE SPACED 12" (300 mm) APART. THE TOP STEP SHALL BE 7" (175 mm) BELOW THE TOP OF THE MANHOLE AND PROJECT 2–1/2" (65 mm). ALL OTHER STEPS SHALL PROJECT 5" (130 mm).
8. DOWELS ARE REQUIRED AT EACH CORNER AND AT 7' (2.0 m) ON CENTER (MAXIMUM) ALONG THE BACKWALL.
9. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
   - 308 MONOLITHIC CATCH BASIN CONNECTION
   - 309 CATCH BASIN REINFORCEMENT
   - 310 CATCH BASIN FACE PLATE ASSEMBLY AND PROTECTION BAR
   - 630 24" (610 mm) MANHOLE FRAME AND COVER
   - 635 STEEL STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**CURB OPENING CATCH BASIN WITH MANHOLE IN STREET**

STANDARD PLAN 307-4
SHEET 2 OF 2

Know what's below. Call 811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

*BENCH MARK No. GG-18-1*
*ELEV. 635.314' (NAVD88) LEVELED 2018*
*LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.*

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
4150 CONCOURS, ONTARIO, CA 91764
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — DATE

BON VIEW AVENUE AND EUCALYPTUS AVENUE
DETAILS

PM-20161

SHEET 12 OF 12
CONTRACT
ACCOUNT
DWG. NO.

11/11/2024

Drawing Name: P:\Year_2023\2023-038-RDA-SOLCVL06 Engineering\Sheets\OFF-SITE\STORM DRAIN\11_2023-038_SD_DETAIL.dwg

## EXCERPT K: STORM DRAIN IMPROVEMENT PLANS FOR LINE E, PM-20517

# STORM DRAIN IMPROVEMENT PLANS
## FOR
## PARCEL MAP 20517
## CAMPUS AVENUE & EUCALYPTUS AVENUE
## IN THE CITY OF ONTARIO

## GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN STRICT CONFORMANCE WITH THE CURRENT CITY OF ONTARIO STANDARD SPECIFICATIONS AND STANDARD DRAWINGS AND CURRENT STANDARD SPECIFICATIONS AND STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
2. ANY CONTRACTOR PERFORMING WORK ON THIS PROJECT SHALL FAMILIARIZE HIMSELF/HERSELF WITH THE SITE AND SHALL BE SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING FACILITIES RESULTING DIRECTLY OR INDIRECTLY FROM HIS/HER OPERATIONS, WHETHER OR NOT THE FACILITY IS SHOWN ON THESE PLANS.
3. ALL OBSTRUCTIONS WITHIN THE AREA TO BE IMPROVED SHALL BE REMOVED AND/OR RELOCATED AT THE DIRECTION OF THE CITY ENGINEER. UTILITIES ARE TO BE RELOCATED BY THEIR RESPECTIVE OWNERS UNLESS NOTED OTHERWISE. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
4. UTILITY LINE LOCATIONS WERE TAKEN FROM AVAILABLE RECORD DATA AND WERE NOT LOCATED IN THE FIELD, UNLESS OTHERWISE NOTED ON THE PLAN. THE CONTRACTOR IS REFERRED TO SECTION 5 OF THE STANDARD SPECIFICATIONS, FOR PUBLIC WORKS CONSTRUCTION.
5. IN CASE OF ANY ACCIDENTS INVOLVING SAFETY MATTERS COVERED BY SECTION 6409(B) OF THE CALIFORNIA LABOR CODE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE STATE DIVISION OF INDUSTRIAL SAFETY.
6. STATE LAW (SB 3019) REQUIRES THE CONTRACTOR TO CONTACT UNDERGROUND SERVICE ALERT AND OBTAIN AN IDENTIFICATION NUMBER PRIOR TO THE ISSUANCE OF CITY'S ENCROACHMENT PERMITS. THE CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT AT 1-800-422-4133 A MINIMUM OF 48-HOURS IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.
7. PRIOR TO THE START OF ANY WORK THE CONTRACTOR SHALL OBTAIN A BUSINESS LICENSE FROM THE CITY OF ONTARIO. THE CONTRACTOR SHALL ALSO OBTAIN AN ENCROACHMENT PERMIT FROM THE ENGINEERING DEPARTMENT NO LESS THAN 48 HOURS PRIOR TO START OF ANY CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
8. THE CONTRACTOR SHALL OBTAIN A TRAFFIC CONTROL PERMIT 48 HOURS PRIOR TO TIME OF CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY.
9. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH DURING HIS OPERATIONS HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED. RENEWAL OF TRAFFIC STRIPING AND MARKINGS SHALL BE DONE USING REFLECTIVE THERMO-PLASTIC MARKINGS IN CONFORMANCE WITH SECTION 84 & 85 OF THE CALTRANS STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER. ALL REGULATORY, WARNING, AND GUIDE SIGNS SHALL HAVE 3M DIAMOND, VIP GRADE SHEETING WITH SERIES 1160 PROTECTIVE OVERLAY FILM.
10. THE LAND SURVEYORS ACT, SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE, AND SECTIONS 732.5, 1492-5, 1810-5 OF THE STREETS AND HIGHWAY CODE REQUIRE THAT SURVEY MONUMENTS SHALL BE PROTECTED AND PERPETUATED.

    "IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR OTHERS PERFORMING THE CONSTRUCTION WORK TO RETAIN A QUALIFIED REGISTERED CIVIL ENGINEER AND/OR LICENSED LAND SURVEYOR PRIOR TO THE START OF CONSTRUCTION TO LOCATE, REFERENCE AND FILE THE NECESSARY CORNER RECORDS WITH THE COUNTY SURVEYOR'S OFFICE FOR SURVEY CONTROL POINTS/MONUMENTS THAT EXIST AS SHOWN ON RECORDED TRACT MAPS, PARCEL MAPS, RECORDS OF SURVEYS AND HIGHWAY MAPS, AND MAY BE DISTRIBUTED OR DAMAGED BY THE PROPOSED CONSTRUCTION"

    AFTER THE COMPLETION OF THE PROPOSED CONSTRUCTION, SAID MONUMENTS AND/OR CONTROL SURVEY POINTS SHALL BE RESET TO THE NEW SURFACE IN ACCORDANCE WITH THE CURRENT PROFESSIONAL LAND SURVEYING PRACTICES. CORNER RECORDS SHALL BE FILED WITH THE COUNTY SURVEYOR FOR ALL THE NEW MONUMENTS SET.
11. THE DEVELOPER SHALL PROVIDE THE CITY WITH A COMPLETED SET OF "AS BUILT", MYLAR DRAWINGS PRIOR TO THE FINAL INSPECTION.
12. A CITY ACCEPTED/APPROVED SET OF PLANS SHALL BE KEPT ON THE JOB SITE AT ALL TIMES.
13. A PRE-CONSTRUCTION MEETING SHALL OCCUR PRIOR TO CONSTRUCTION. ATTENDEES SHALL INCLUDE A CITY REPRESENTATIVE AND THE CONTRACTOR WHO WILL PERFORM THE WORK. "CUT-SHEETS" SHALL BE PROVIDED TO THE CITY AT THIS MEETING FOR ITS REVIEW.
14. CITY ACCEPTANCE OF PLANS DOES NOT RELIEVE THE DEVELOPER FROM RESPONSIBILITY FOR THE CORRECTION OF ERROR AND OMISSION DISCOVERED DURING CONSTRUCTION. UPON REQUEST OF THE CITY INSPECTOR, THE REQUIRED PLAN REVISIONS SHALL BE PROMPTLY SUBMITTED TO THE CITY ENGINEER FOR REVIEW.
15. ANY REQUIRED RIGHT-OF-WAY OR EASEMENT SHALL BE DEDICATED TO AND ACCEPTED BY THE CITY PRIOR TO COMMENCEMENT OF CONSTRUCTION OF THE IMPROVEMENTS WITHIN THE REQUIRED RIGHT-OF-WAY OR EASEMENT.
16. WHERE UTILITIES NEED TO BE SUPPORTED, SAID SUPPORTS SHALL BE IN ACCORDANCE WITH A.P.W.A. STANDARD 224-1 UNLESS OTHERWISE INDICATED.
17. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION OF EXISTING SEWER MAIN(S) AND NOTIFY THE DESIGN ENGINEER OF ANY VARIATION FROM DESIGN.
18. THE PIPE SHOWN HEREON SHALL BE INSTALLED IN ACCORDANCE WITH CASE III BEDDING AS SHOWN ON L.A.C.D.P.W. STANDARD 3080-2, UNLESS OTHERWISE SHOWN. "W" VALUE SHALL BE AS SPECIFIED ON L.A.C.D.P.W. STANDARD 3080-2 FOR CASE III BEDDING, NOTES 3 (A), 3 (B), AND 3 (C). IF THE "W" VALUE AT THE TOP OF THE PIPE IS EXCEEDED, THE BEDDING SHALL BE MODIFIED AND/OR PIPE OF ADDITIONAL STRENGTH SHALL BE PROVIDED. ALL PROPOSED MODIFICATIONS TO THIS REQUIREMENT SHALL BE APPROVED BY THE CITY ENGINEER.
19. MINIMUM COVER OF STORM DRAIN MAIN SHALL BE 7 FEET FROM THE FINISHED SURFACE PER STANDARD DRAWING 1302-1304.
20. STORM DRAIN MAIN STATIONING IS PER PIPE CENTERLINE.
21. STREET CENTERLINE STATIONING IS PER THE STREET IMPROVEMENT PLANS AND PROVIDED FOR REFERENCE.
22. CONTRACTOR SHALL NOT BACKFILL TRENCH UNTIL THE CITY INSPECTOR HAS OBTAINED AS-BUILT STATIONING ON ALL STRUCTURES.
23. UPON COMPLETION OF CONSTRUCTION OF ALL STORM DRAIN LINES AND PRIOR TO PAVING, THE DEVELOPER SHALL HIRE A CITY APPROVED VIDEO COMPANY TO VIDEO TAPE THE PIPELINES. CITY SHALL REVIEW SAID VIDEOTAPES FOR POTENTIAL CONSTRUCTION DEFECTS PRIOR TO ACCEPTANCE OF THE PROJECT.

## CIVIL ENGINEERS NOTICE TO CONTRACTOR

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF MY KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTION AND ANY MEASURES TO PROTECT THE UTILITIES AND STRUCTURES SHOWN AND OTHER LINES OR STRUCTURES NOT OF RECORD OR NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF, AND ANY DAMAGE TO, THESE UTILITY LINES OR STRUCTURES.

## OWNER/DEVELOPER:

REDA
4100 MACARTHUR, SUITE 120
NEWPORT BEACH, CA 92660

CONTACT: JEFF JOHNSTON
PHONE: (949) 945-6809
EMAIL: JJOHNSTON@REDALLC.COM

## CIVIL ENGINEER

WESTLAND GROUP INC.
4150 CONCOURS, SUITE 100
ONTARIO, CA 91764
TEL (909)-989-9789

CONTACT: SIARA R. MACKINNEY, PE, QSD
PHONE: (909) 989-9789

## GEOTECHNICAL ENGINEER:

SOUTHERN CALIFORNIA GEOTECHNICAL
22885 EAST SAVI RANCH PARKWAY, SUITE E
YORBA LINDA, CA 92887

CONTACT: GREGORY K. MITCHELL
PHONE: (714) 685-1115

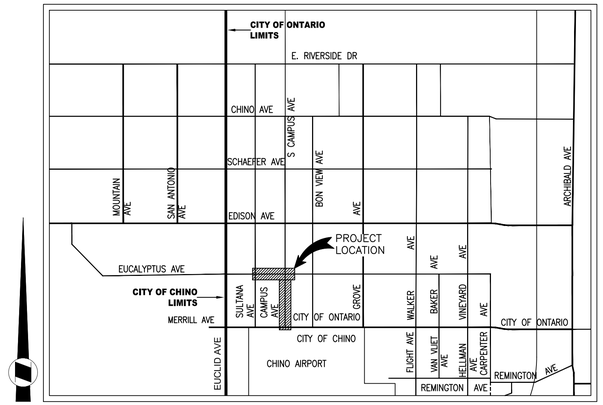


## VICINITY MAP
N.T.S.

## UTILITY PURVEYORS:

CITY OF ONTARIO, MUNICIPAL UTILITIES AGENCY
DAYTIME PH: (909) 395-2678
24-HOUR EMERGENCY: (909) 986-6711

CITY OF ONTARIO, COMMUNITY & PUBLIC SERVICES AGENCY
DAYTIME PH: (909) 395-2633
24-HOUR EMERGENCY: (909) 986-6711

INLAND EMPIRE UTILITY AGENCY
DAYTIME PH: (909) 944-6000
24-HOUR EMERGENCY: (909) 987-2591

SOUTHERN CALIFORNIA EDISON
24-HOUR EMERGENCY: (800) 611-1911

SOUTHERN CALIFORNIA GAS COMPANY
DAYTIME PH: (800) 423-1391
24-HOUR EMERGENCY: (800) 423-1391

TIME WARNER CABLE / WEST COAST COMMUNICATIONS
24-HOUR EMERGENCY: (888) 892-2253

VERIZON
24-HOUR EMERGENCY: (800) 483-2000

## CONSTRUCTION NOTES

| ITEM | DESCRIPTION | PUBLIC QUANTITIES | |
|---|---|---|---|
| 1 | CONSTRUCT 60" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN | 2619 | LF |
| 2 | CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN | 516 | LF |
| 3 | CONSTRUCT JUNCTION STRUCTURE NO. 1, CASE 1, PER CITY OF ONTARIO STD. DWG. 3010. | 2 | EA |
| 4 | CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL 4 ON SHEET 9 | 6 | EA |
| 5 | CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT | 4 | EA |
| 6 | CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20517 STREET IMPROVEMENT PLANS FOR DETAILS. | 4 | EA |
| 7 | CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017 | 4 | EA |
| 8 | CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 8, ON SHEET 9 | 3 | EA |
| 9 | REMOVE EXISTING CONCRETE BULKHEAD | 1 | EA |
| 10 | CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009 | 7 | EA |
| 11 | CONSTRUCT MANHOLE PIPE-TO-PIPE PER SPPWC STD. PLAN NO. 321-2, PER DETAIL ON SHEET 9 | 3 | EA |
| 12 | CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN | 416 | LF |
| 13 | CONSTRUCT CONCRETE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 9 | 1 | EA |

## INDEX OF DRAWINGS


| INDEX NO. | DESCRIPTION |
|---|---|
| SHEET 1 | TITLE SHEET |
| SHEET 2 | STORM DRAIN SYSTEM MAP INDEX MAP AND SECTIONS |
| SHEET 3 | CAMPUS AVENUE-FROM MERRILL AVENUE TO 950' NORTH OF MERRILL AVENUE |
| SHEET 4 | CAMPUS AVENUE-FROM 950' NORTH OF MERRILL AVENUE TO 800' SOUTH OF EUCALYPTUS AVENUE |
| SHEET 5 | CAMPUS AVENUE-FROM 800' SOUTH OF EUCALYPTUS AVENUE TO 100' NORTH OF EUCALYPTUS AVENUE |
| SHEET 6 | EUCALYPTUS AVENUE-FROM 250' WEST OF CAMPUS AVENUE TO 300' EAST OF CAMPUS AVENUE |
| SHEET 7 | EUCALYPTUS AVENUE-FROM SULTANA AVENUE TO 300' EAST OF SULTANA AVENUE |
| SHEET 8 | LATERAL PROFILES |
| SHEET 9 | DETAILS |


## REFERENCE DRAWINGS

| | |
|---|---|
| SANITARY SEWER | PM-20016 & PM-20517 SANITARY SEWER IMPROVEMENT PLAN |
| DOMESTIC WATER | PM-20016 & PM-20517 DOMESTIC WATER IMPROVEMENT PLAN |
| STORM DRAIN | PM-20016 & PM-20517 STORM DRAIN IMPROVEMENT PLAN |
| STREET IMPROVEMENT | PM-20016 & PM-20517 STREET IMPROVEMENT PLAN |
| RECYCLED WATER | PM-20016 & PM-20517 RECYCLED WATER IMPROVEMENT PLAN |

## LEGAL DESCRIPTION

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

LOTS 7, 8, 9, 10, 23, 24, 25, AND 26, IN SECTION 20, TOWNSHIP 2 SOUTH, RANGE 7 WEST, SAN BERNARDINO BASE AND MERIDIAN, ACCORDING TO THE MAP OF SUBDIVISION OF RANCHO SANTA ANA DEL CHINO, AS PER PLAT RECORDED IN BOOK 6, PAGE 15 OF MAPS, IN THE OFFICE OF THE COUNTY OF SAN BERNARDINO COUNTY.

## BASIS OF BEARING

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM (CCS83), ZONE 5, NORTH AMERICAN DATUM 1983 (NAD83) BASED LOCALLY ON CONTINUOUSLY OPERATING REFERENCE STATIONS (CORS) "LORS" AND "EWPP" (BASIS OF BEARINGS: S 81°29'26" E). ALL BEARINGS SHOWN HEREON ARE REPRESENTED HEREON BY THE CENTERLINE OF EUCLID AVENUE BEING NORTH 0°25'42" WEST

REGISTERED PROFESSIONAL ENGINEER
SIARA ROSE MACKINNEY
No.85559
CIVIL
STATE OF CALIFORNIA

## LEGEND OF ABBREVIATIONS & SYMBOLS

| | | | |
|---|---|---|---|
| BC | BEGIN CURVE | CMP | CORRUGATED METAL PIPE |
| CB | CATCH BASIN | ℄ OR P/L OR PL | PROPERTY LINE |
| C&G | CURB AND GUTTER | PROP | PROPOSED |
| ℄ OR C/L OR CL | CENTERLINE | RCB | REINFORCED CONCRETE BOX |
| CP | CONNECTOR PIPE | RCP | REINFORCED CONCRETE PIPE |
| EC | END CURVE | RW | RECYCLED WATER |
| EX, EXIST. | EXISTING | R/W, ROW | RIGHT OF WAY |
| FL | FLOWLINE | ST | STREET |
| FS | FINISH SURFACE | STA | STATION |
| FUT | FUTURE | TC | TOP OF CURB |
| GAS | GAS | TYP | TYPICAL |
| GB | GRADE BREAK | TSP | TEMPORARY STANDPIPE |
| INT | INTERSECTION | SD | STORM DRAIN |
| INV | INVERT | SPPWC | STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION |
| LP | LOW POINT | SS | SEWER |
| MH | MANHOLE | DW | DOMESTIC WATER |
| MWS | MODULAR WETLAND SYSTEM | WQ | WATER QUALITY |

| | |
|---|---|
| (100) | EXISTING CONTOURS |
| 100 | PROP. CONTOUR |
| | EXIST. EASEMENT |
| 2% | SLOPE |
| | CENTERLINE |
| | FLOWLINE |
| | FIRE HYDRANT |
| | SIGN |
| | STREET LIGHT |
| | BOUNDARY LINE |
| | FENCE LINE |

811 Know what's below. Call 811 before you dig.

RECOMMENDED FOR ACCEPTANCE

TECK, C. LOH, P.E.
HARRIS AND ASSOCIATES DATE

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER DATE

ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER DATE

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD88) 2017
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
8885 HAVEN AVE., SUITE 100, RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660


SIGNATURE: SIARA R. MACKINNEY, P.E. 85559 R.C.E. NO. 05/30/2024 DATE

**CAMPUS AVENUE AND EUCALYPTUS AVENUE**
**TITLE SHEET**

PM-20517

SHEET 1 OF 9
CONTRACT
ACCOUNT
DWG. NO.

02/19/2025

Drawing Name: P:\Year_2023\2023-037-REDA-CRBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\01_2023-037_SD_TITLE SHEET.dwg

CITY OF ONTARIO ENGINEERING

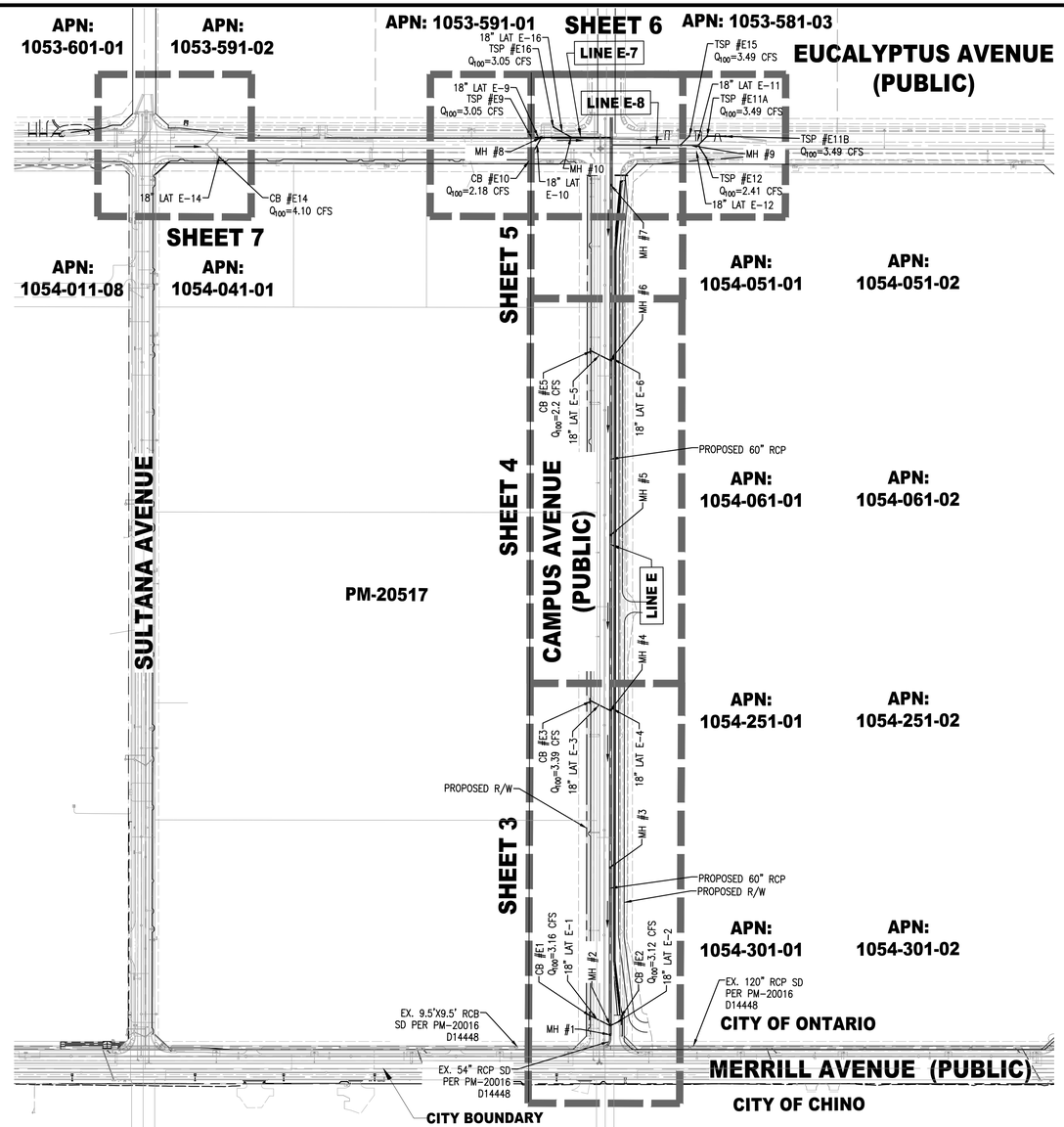


## STORM DRAIN SYSTEM MAP/ INDEX MAP

SCALE 1" = 200'

200 0 200 400
scale 1"= 200' feet

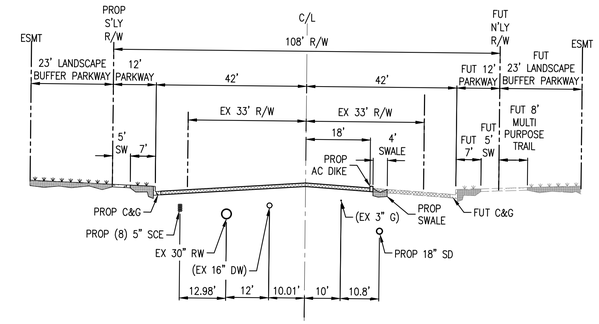


## EUCALYPTUS AVE (PUBLIC)

AT CAMPUS AVE
1"=20'

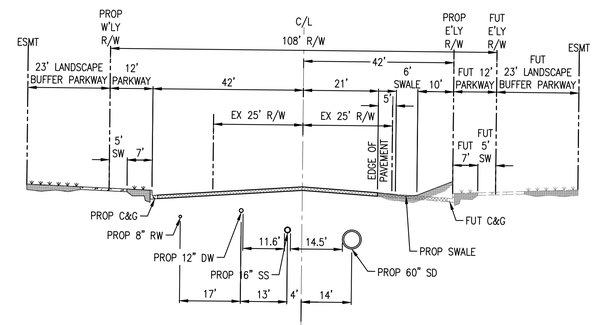


## CAMPUS AVE (PUBLIC)

BETWEEN MERRILL AVE
AND EUCALYPTUS AVE
1"=20'

Know what's below. Call 811 before you dig.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 CIVIL STATE OF CALIFORNIA

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |
| | | | |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD88) 2017
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

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8885 HAVEN AVE., SUITE 100, RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 05/30/2024

# CAMPUS AVENUE AND EUCALYPTUS AVENUE

## STORM DRAIN SYSTEM MAP INDEX MAP AND SECTIONS

PM-20517

SHEET 2 OF 9
CONTRACT
ACCOUNT
DWG. NO.

02/19/2025

Drawing Name: P:\Year_2023\2023-037-REDA-ORBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\02_2023-037_SD_SHEET INDEX.dwg

CITY OF ONTARIO

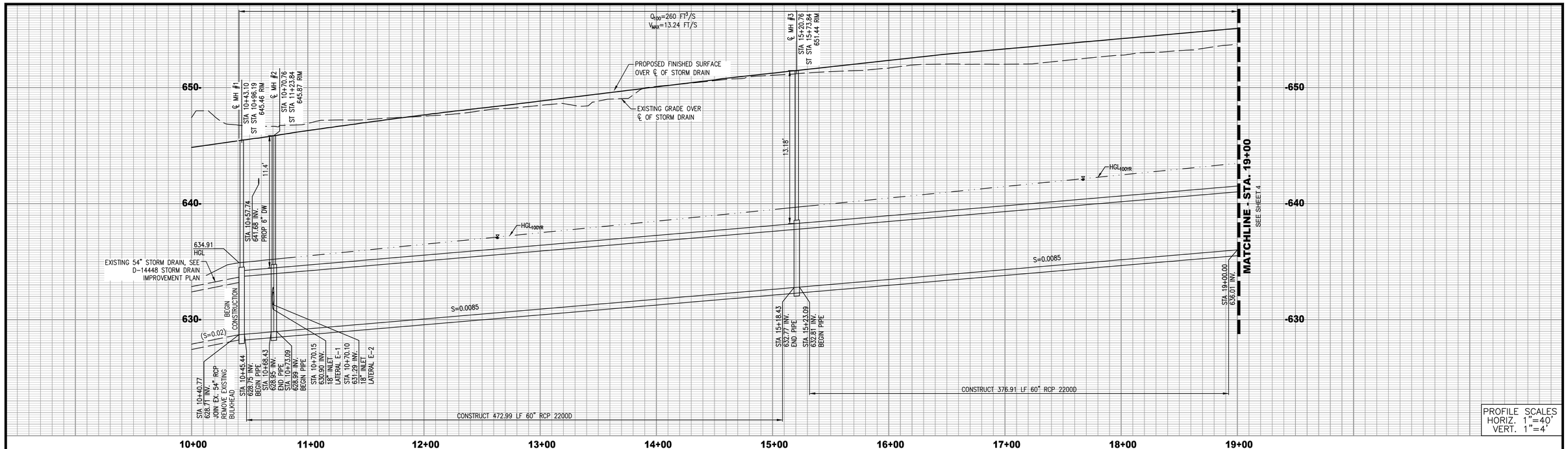


PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

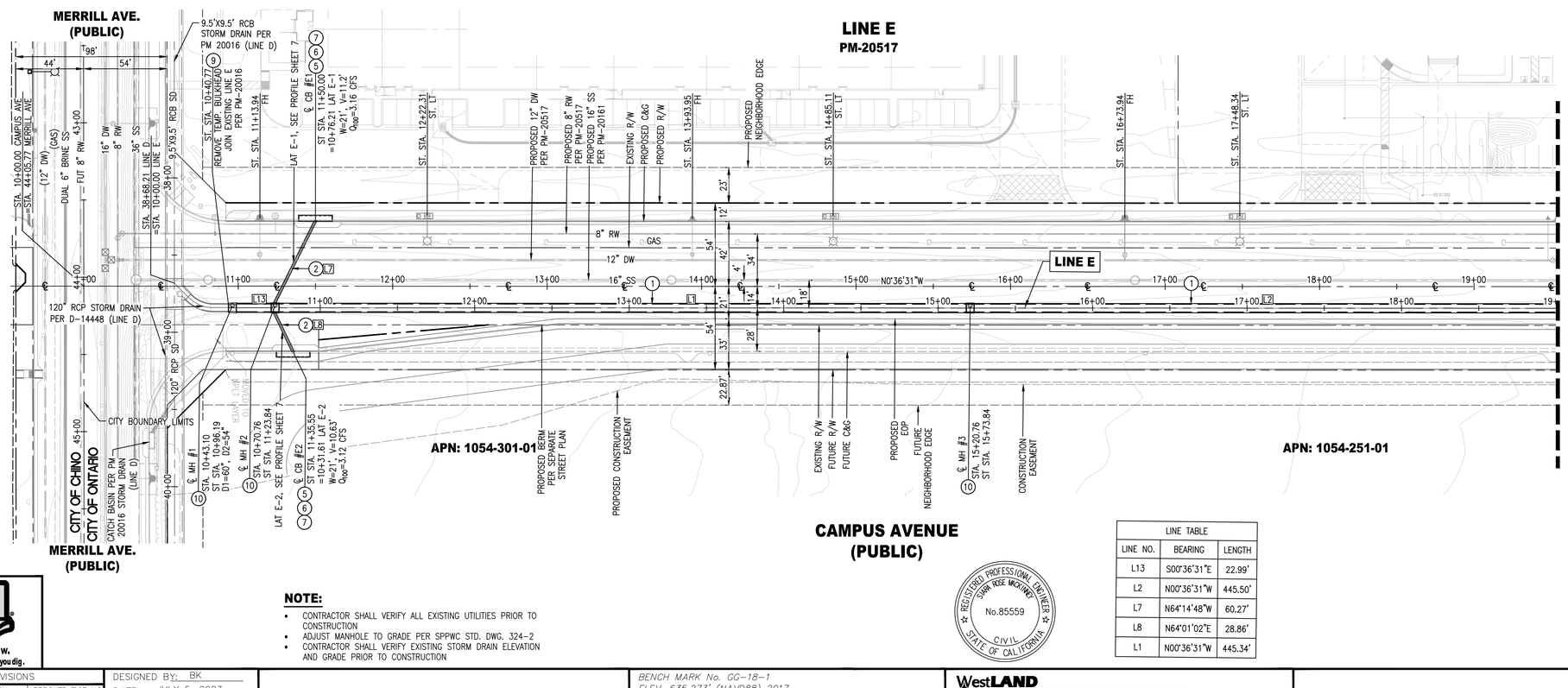


## CONSTRUCTION NOTES

1. CONSTRUCT 60" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
2. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20517 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017
8. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 8, ON SHEET 9
9. REMOVE EXISTING CONCRETE BULKHEAD
10. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009

Know what's below. Call 811 before you dig.

## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2
- CONTRACTOR SHALL VERIFY EXISTING STORM DRAIN ELEVATION AND GRADE PRIOR TO CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 CIVIL STATE OF CALIFORNIA

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L13 | S00°36'31"E | 22.99' |
| L2 | N00°36'31"W | 445.50' |
| L7 | N64°14'48"W | 60.27' |
| L8 | N64°01'02"E | 28.86' |
| L1 | N00°36'31"W | 445.34' |

40' 0' 20' 40' 80'
SCALE: 1" = 40'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.223' (NAVD88) 2017
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
8885 HAVEN AVE., SUITE 100, RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 05/30/2024

# CAMPUS AVENUE AND EUCALYPTUS AVENUE
## CAMPUS AVENUE
### FROM MERRILL AVENUE TO 950' NORTH OF MERRILL AVENUE

PM-20517

SHEET 3 OF 9
CONTRACT
ACCOUNT
DWG. NO.

02/19/2025

Drawing Name: P:\Year_2023\2023-037-REDA-ORBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\03-05_2023-037-SD_CAMPUS.dwg

MATCHLINE - STA. 19+00

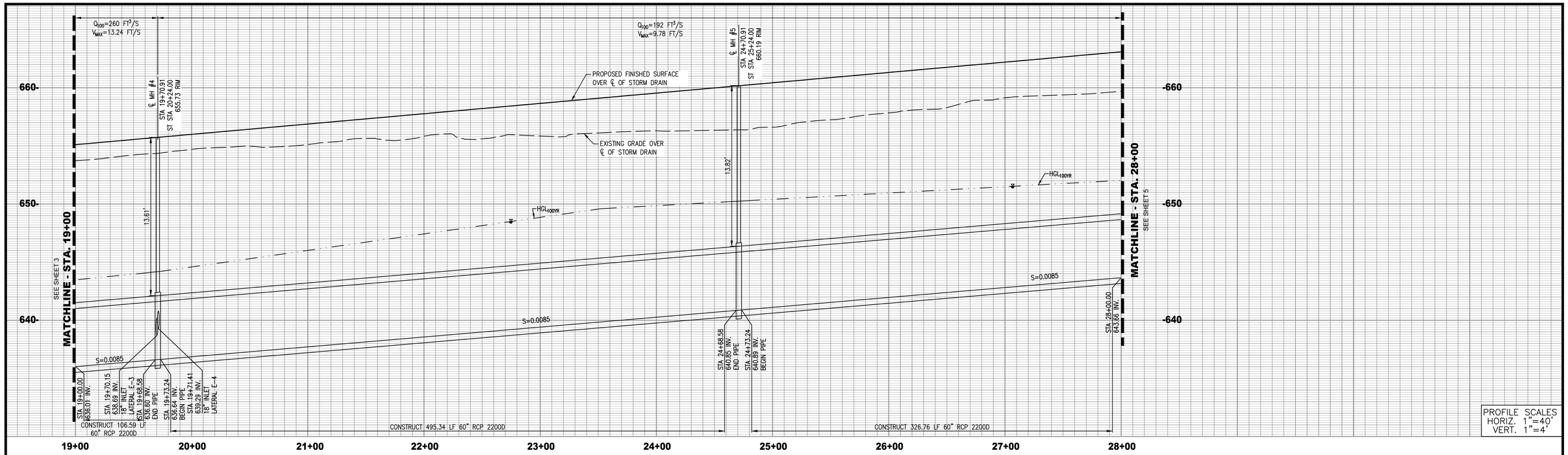


## LINE E

**PM-20517**

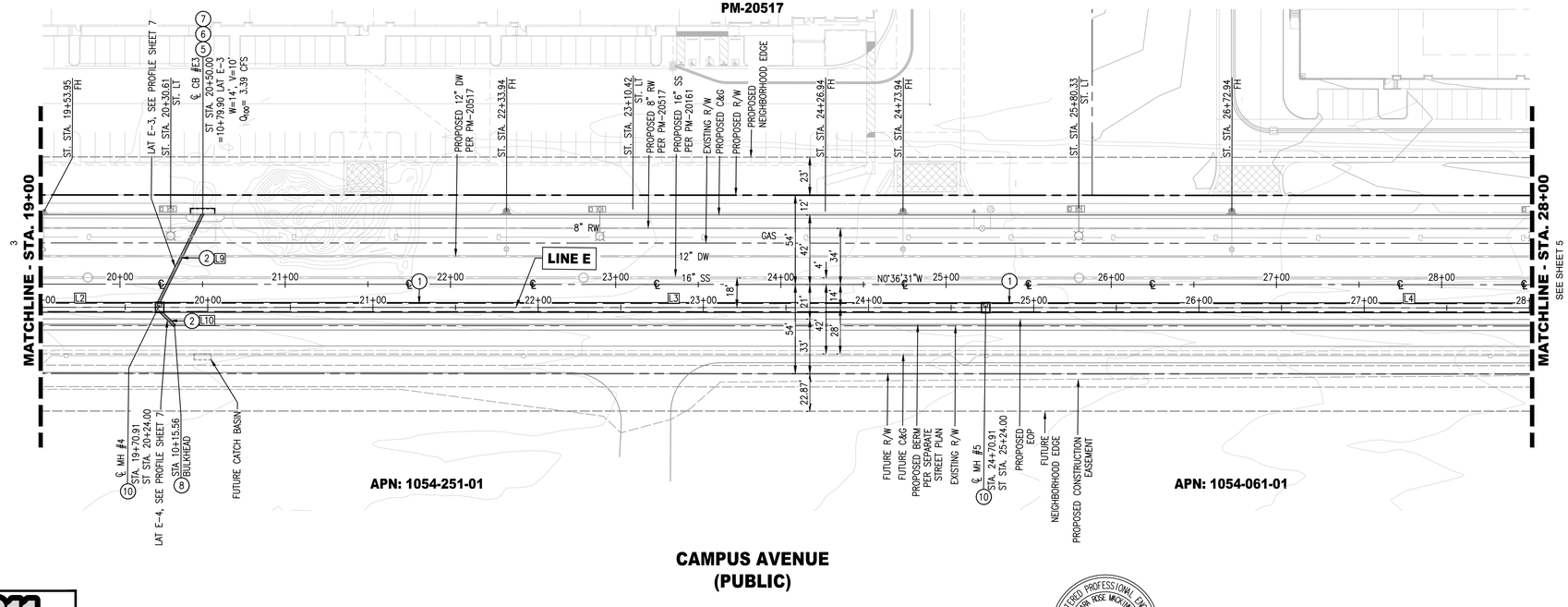


## CONSTRUCTION NOTES

1. CONSTRUCT 60" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
2. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20517 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017
8. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 8, ON SHEET 9
10. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L2 | N00°36'31"W | 445.50' |
| L3 | N00°36'31"W | 495.34' |
| L4 | N00°36'31"W | 495.34' |
| L9 | N64°14'48"W | 60.27' |
| L10 | N44°23'29"E | 12.37' |

Know what's below. Call 811 before you dig.

**NOTE:**

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

REGISTERED PROFESSIONAL ENGINEER SIARA REBE MACKINNEY No.85559 CIVIL STATE OF CALIFORNIA

40' 0' 20' 40' 80'
SCALE: 1" = 40'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD88) 2017
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

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8885 HAVEN AVE., SUITE 100, RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — 05/30/2024 DATE

# CAMPUS AVENUE AND EUCALYPTUS AVENUE

**CAMPUS AVENUE FROM 950' NORTH OF MERRILL AVENUE TO 800' SOUTH OF EUCALYPTUS AVENUE**

PM-20517

SHEET 4 OF 9
CONTRACT
ACCOUNT
DWG. NO.

02/19/2025

Drawing Name: P:\Year_2023\2023-037-REDA-ORBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\03-05_2023-037_SD_CAMPUS.dwg

SEE SHEET 4 FOR PLAN

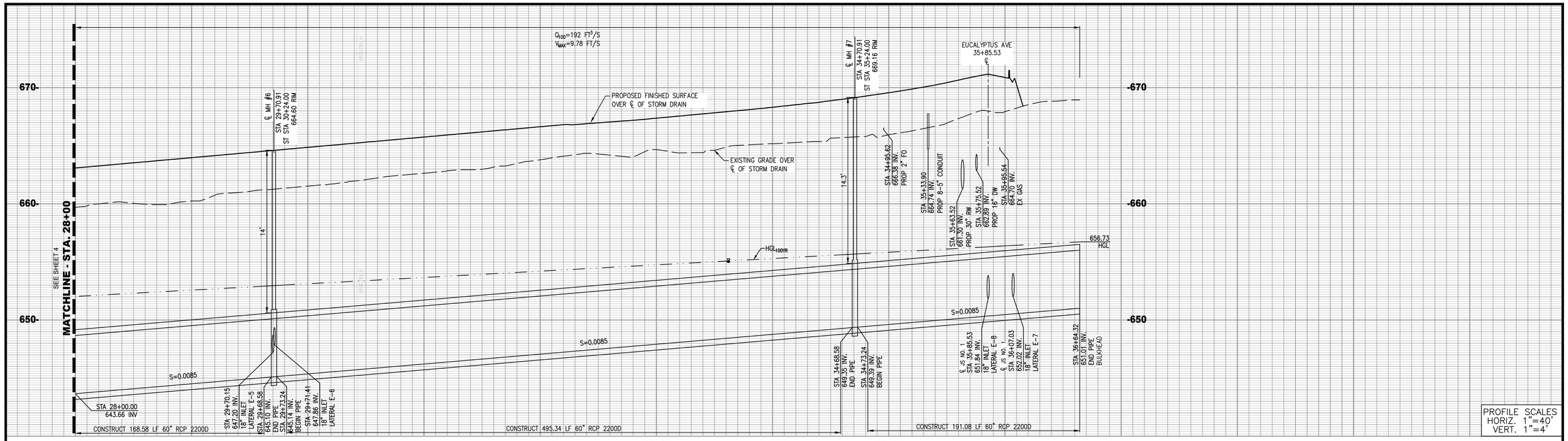


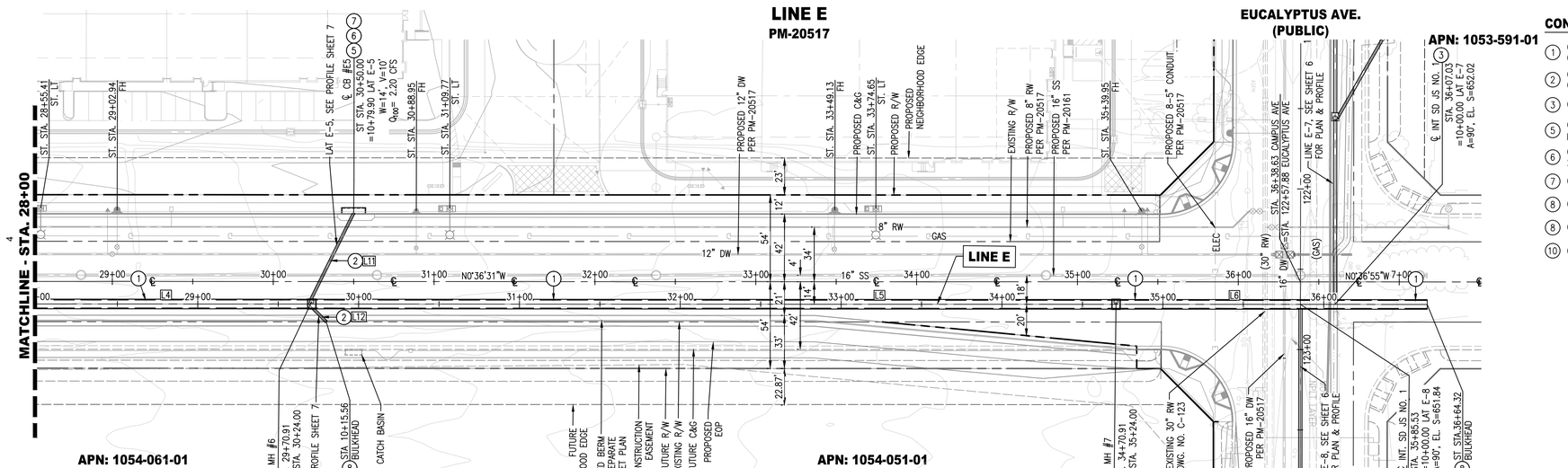


## CONSTRUCTION NOTES

1. CONSTRUCT 60" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
2. CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN
3. CONSTRUCT JUNCTION STRUCTURE NO. 1, CASE 1, PER CITY OF ONTARIO STD. DWG. 3010.
5. CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT
6. CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20517 STREET IMPROVEMENT PLANS FOR DETAILS.
7. CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. 3017
8. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 8, ON SHEET 9
8. CONSTRUCT BRICK AND MORTAR BULKHEAD PER DETAIL 8, ON SHEET 9
10. CONSTRUCT MANHOLE NO. 1 PER CITY OF ONTARIO STD. DWG. 3008 & 3009

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L4 | N00°36'31"W | 495.34' |
| L5 | N00°36'31"W | 495.34' |
| L6 | N00°36'31"W | 191.08' |
| L11 | N64°14'48"W | 60.27' |
| L12 | N44°23'29"E | 12.02' |

811 Know what's below. Call811 before you dig.

**NOTE:**

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 CIVIL STATE OF CALIFORNIA

40' 0' 20' 40' 80'
SCALE: 1" = 40'

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
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RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD88) 2017
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.


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PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — 05/30/2024 DATE


# CAMPUS AVENUE AND EUCALYPTUS AVENUE

## CAMPUS AVENUE FROM 800' SOUTH OF EUCALYPTUS AVENUE TO 100' NORTH OF EUCALYPTUS AVENUE

PM-20517

SHEET 5 OF 9
CONTRACT
ACCOUNT
DWG. NO.

Drawing Name: P:\Year_2023\2023-037-REDA-ORBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\03-05_2023-037_SD_CAMPUS.dwg

SEE SHEET 4 FOR CONTINUEMENT PLAN

02/19/2025

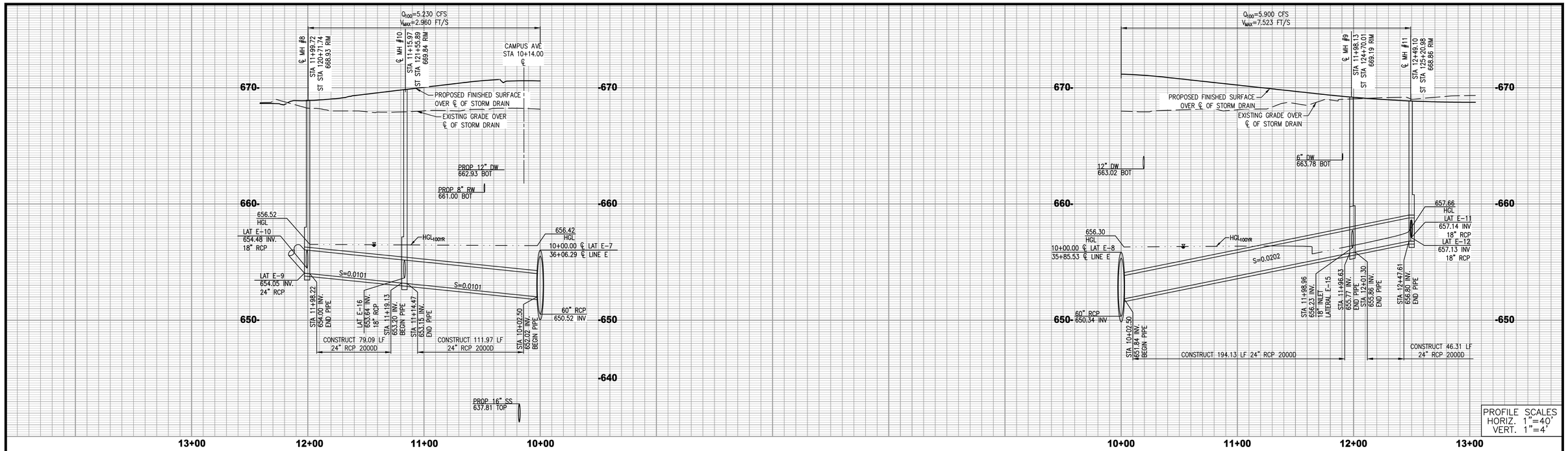


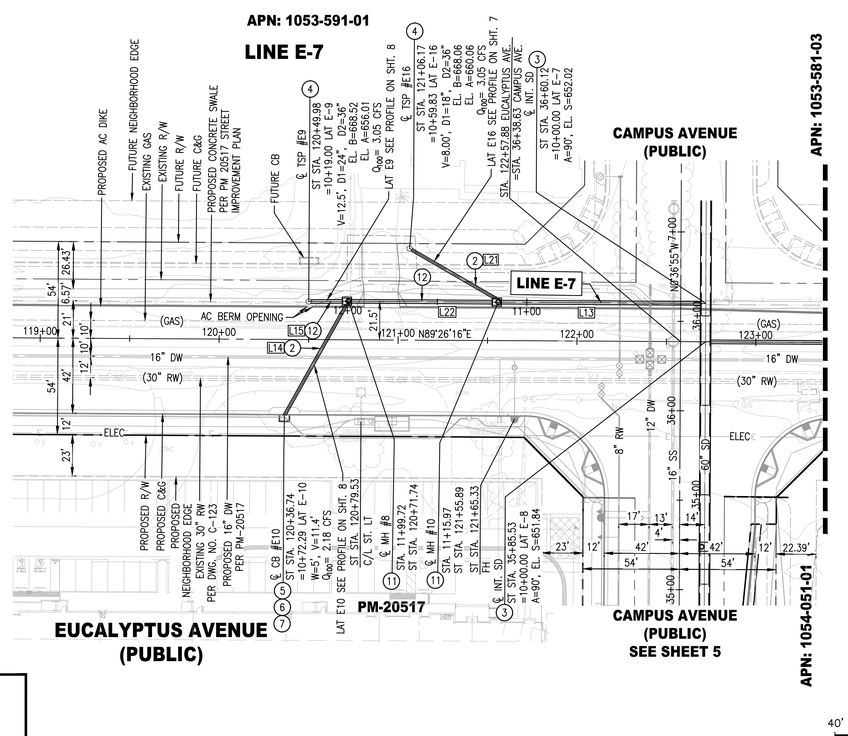


## CONSTRUCTION NOTES

(2) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(3) CONSTRUCT JUNCTION STRUCTURE NO. 1, CASE 1, PER CITY OF ONTARIO STD. DWG. 3010.

(4) CONSTRUCT 36" TEMPORARY CSP STANDPIPE PER DETAIL 4 ON SHEET 9

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20517 STREET IMPROVEMENT PLANS FOR DETAILS.

(7) CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017

(11) CONSTRUCT MANHOLE PIPE-TO-PIPE PER SPPWC STD. PLAN NO. 321-2, PER DETAIL ON SHEET 9

(12) CONSTRUCT 24" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L13 | S89°26'16"W | 114.47' |
| L14 | S28°23'31"W | 70.29' |
| L15 | S88°40'50"W | 17.50' |
| L21 | N60°49'37"W | 54.80' |
| L22 | S89°26'16"W | 79.08' |

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L16 | N44°26'16"E | 32.91' |
| L17 | S33°37'46"E | 39.42' |
| L18 | N89°26'16"E | 194.38' |
| L23 | N89°50'44"E | 49.23' |
| L24 | N44°26'16"E | 33.69' |
| L25 | N89°26'16"E | 46.31' |

**NOTE:**

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

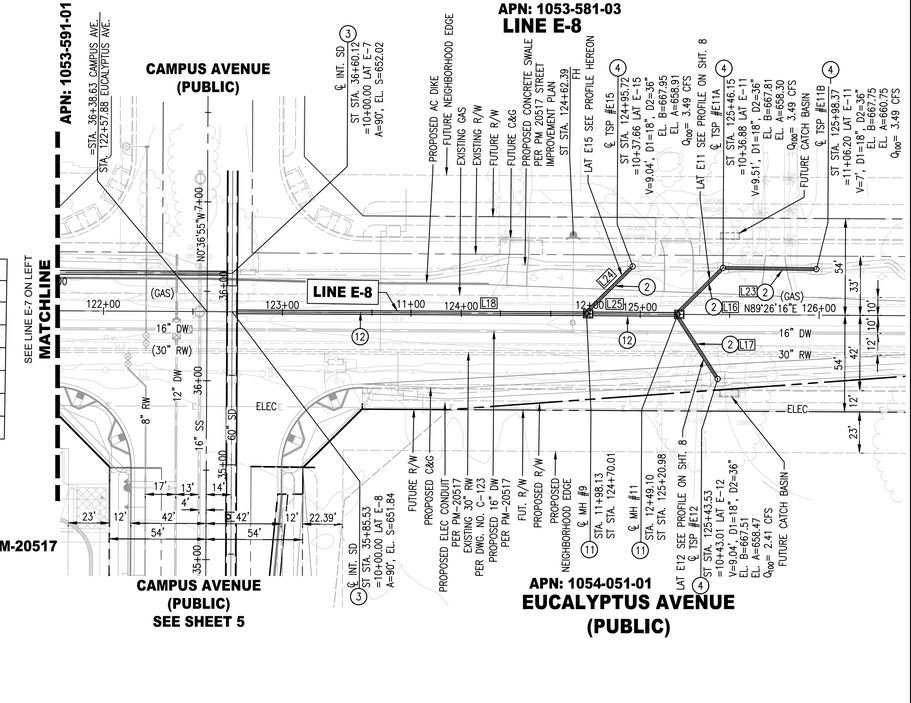


SEE LINE E-8 ON RIGHT

SEE LINE E-7 ON LEFT
MATCHLINE

40' 0' 20' 40' 80'
SCALE: 1" = 40'

REGISTERED PROFESSIONAL ENGINEER
SIARA ROSE MACKINNEY
No.85559
CIVIL
STATE OF CALIFORNIA

Know what's below. Call811 before you dig.

| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD88) 2017
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.


WestLAND Group, Inc. Engineering • Geospatial • Land Planning
8885 HAVEN AVE., SUITE 100, RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660


Siara R. MacKinney
SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — 05/30/2024 DATE

# CAMPUS AVENUE AND EUCALYPTUS AVENUE

## EUCALYPTUS AVENUE

## FROM 250' WEST OF CAMPUS AVENUE TO 300' EAST OF CAMPUS AVENUE

PM-20517

SHEET 6 OF 9
CONTRACT
ACCOUNT
DWG. NO.

02/19/2025

Drawing Name: P:\Year_2023\2023-037-REDA-ORBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\06-07_2023-037_SD_EUCALYPTUS.dwg

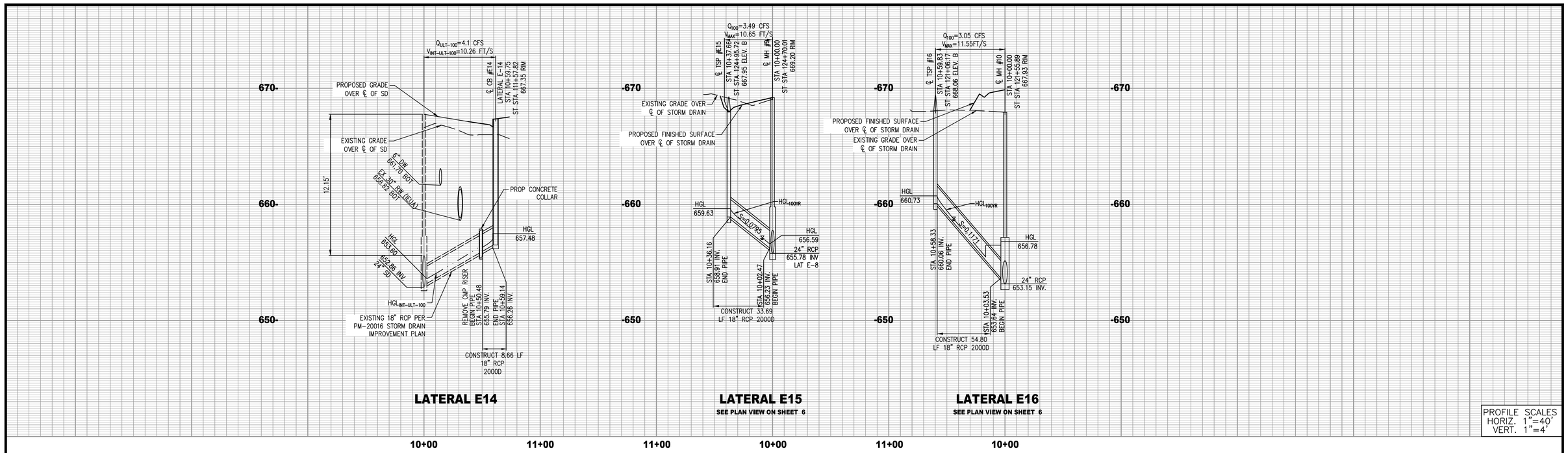


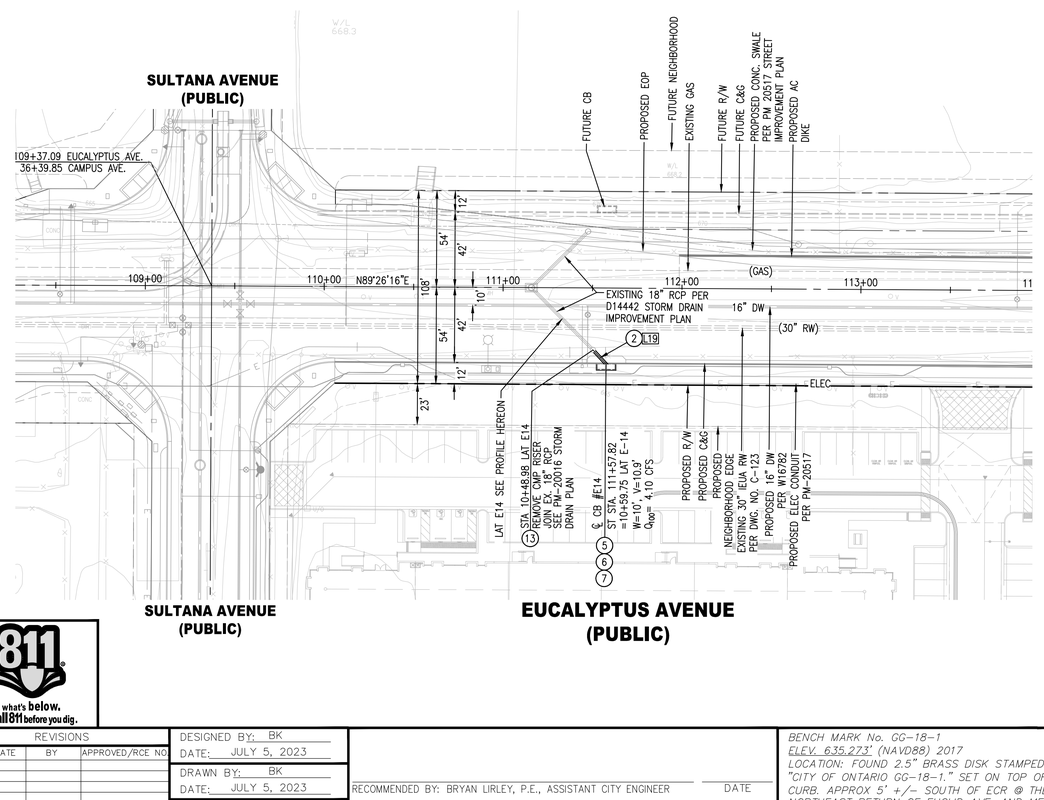


## CONSTRUCTION NOTES

(2) CONSTRUCT 18" RCP. TRENCH EXCAVATION, & BACKFILL PER CITY OF ONTARIO STD. DWG. NO. 1306, BEDDING PER CITY OF ONTARIO STD. DWG. NO. 2104 CLASS B2, D-LOAD PER PLAN

(5) CONSTRUCT CATCH BASIN NO. 2 PER CITY OF ONTARIO STD. DWG. NO. 3003, "W" AND "V" PER PLAN, INSTALL ALMETEK PLACARD "NO DUMPING DRAINS TO RIVER" OR EQUIVALENT

(6) CONSTRUCT LOCAL DEPRESSION FOR CATCH BASIN INLET PER CITY OF ONTARIO STD. DWG. NO. 3005, REFER TO PERMIT PM 20517 STREET IMPROVEMENT PLANS FOR DETAILS.

(7) CONSTRUCT CONNECTOR PIPE SCREEN (CPS) PER CITY OF ONTARIO STD. DWG. NO. 3017

(13) CONSTRUCT CONCRETE COLLAR PER SPPWC STD. PLAN NO. 380-4, PER DETAIL ON SHEET 9

| LINE TABLE | | |
|---|---|---|
| LINE NO. | BEARING | LENGTH |
| L19 | S43°40'50"E | 10.77' |

## NOTE:

- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION
- ADJUST MANHOLE TO GRADE PER SPPWC STD. DWG. 324-2

40' 0' 20' 40' 80'
SCALE: 1" = 40'

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| REVISIONS | | | |
|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO |

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BENCH MARK No. GG-18-1
ELEV. 635.273' (NAVD88) 2017
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

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8885 HAVEN AVE., SUITE 100, RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660
SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 05/30/2024

# CAMPUS AVENUE AND EUCALYPTUS AVENUE
## EUCALYPTUS AVENUE
## FROM SULTANA AVENUE TO 300' EAST OF SULTANA AVENUE

PM-20517

SHEET 7 OF 9
CONTRACT
ACCOUNT
DWG. NO.

02/19/2025

Drawing Name: P:\Year_2023\2023-037-REDA-ORBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\06-07_2023-037_SD_EUCALYPTUS.dwg

CITY OF ONTARIO IMPROVEMENT PLAN

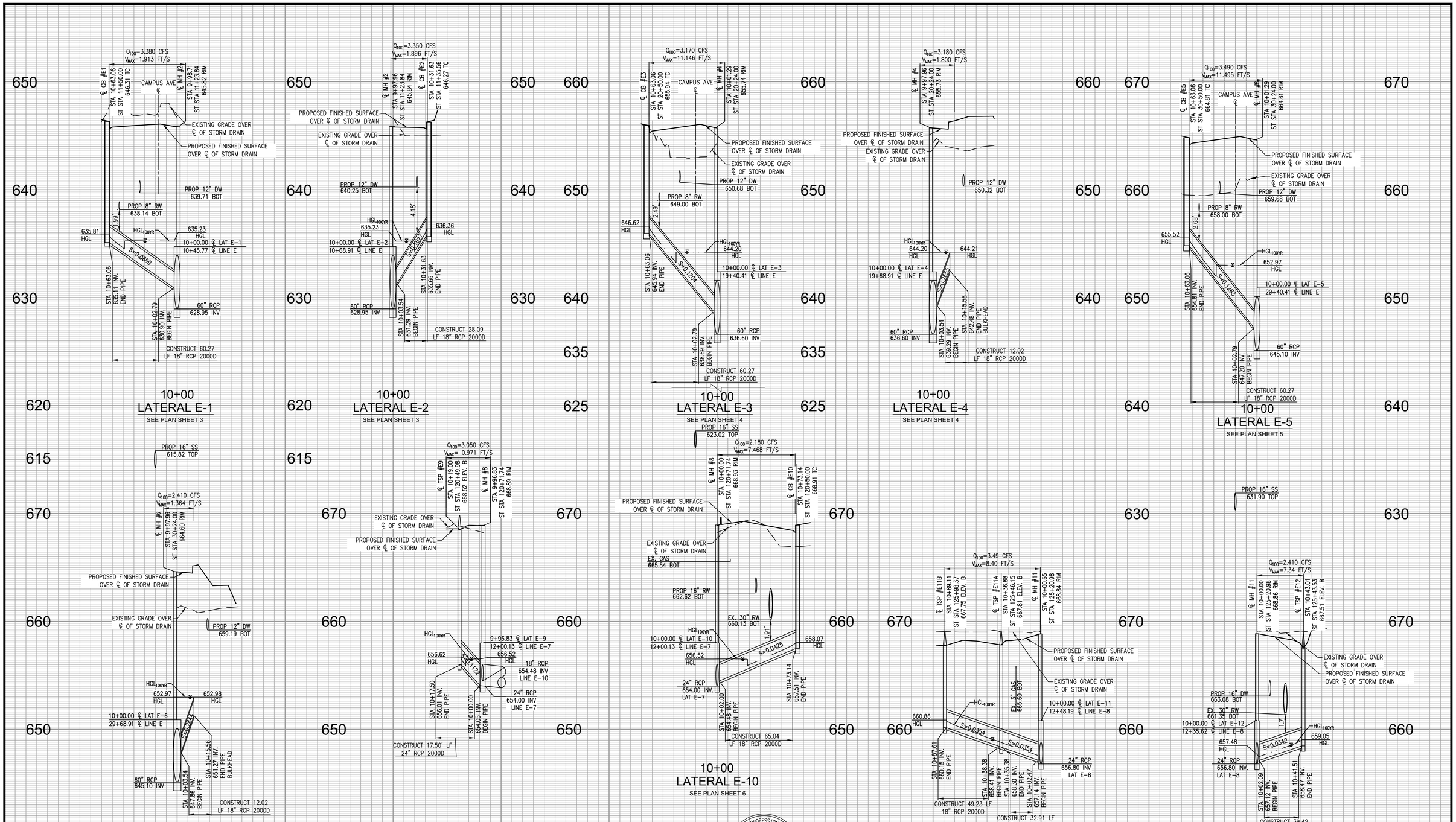


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|---|---|---|---|
| MARK | DATE | BY | APPROVED/RCE NO. |

DESIGNED BY: BK
DATE: JULY 5, 2023
DRAWN BY: BK
DATE: JULY 5, 2023
CHECKED BY:
DATE:

RECOMMENDED BY: BRYAN LIRLEY, P.E., ASSISTANT CITY ENGINEER — DATE
ACCEPTED BY: KHOI DO, P.E., CITY ENGINEER — DATE

BENCH MARK No. GG-18-1
ELEV. 635.223' (NAVD88) 2017
LOCATION: FOUND 2.5" BRASS DISK STAMPED "CITY OF ONTARIO GG-18-1." SET ON TOP OF CURB. APPROX 5' +/- SOUTH OF ECR @ THE NORTHEAST RETURN OF EUCLID AVE. AND MERRILL AVE.

REGISTERED PROFESSIONAL ENGINEER SIARA ROSE MACKINNEY No.85559 CIVIL STATE OF CALIFORNIA

WestLAND Group, Inc. Engineering • Geospatial • Land Planning
8885 HAVEN AVE., SUITE 100, RANCHO CUCAMONGA, CA 91730
PHONE: (909) 989-9789 FAX: (909) 989-9660

SIGNATURE: SIARA R. MACKINNEY, P.E. — 85559 R.C.E. NO. — DATE

# CAMPUS AVENUE AND EUCALYPTUS AVENUE
## LATERAL PROFILES

PM-20517

SHEET 8 OF 9
CONTRACT
ACCOUNT
DWG. NO.

02/19/2025

Drawing Name: P:\Year_2023\2023-037-RFDA-ORBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\08_2023-037_SD_LATPROF.dwg

APPROVED
OCT 03 2018
BY ENGINEERING DEPT

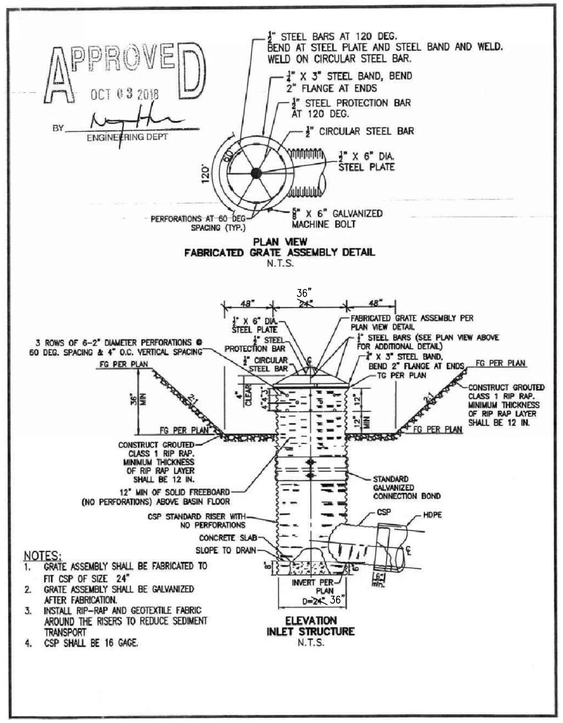


NOTES:
1. GRATE ASSEMBLY SHALL BE FABRICATED TO FIT CSP OF SIZE 24"
2. GRATE ASSEMBLY SHALL BE GALVANIZED AFTER FABRICATION.
3. INSTALL RIP-RAP AND GEOTEXTILE FABRIC AROUND THE RISERS TO REDUCE SEDIMENT TRANSPORT
4. CSP SHALL BE 16 GAGE.

4 **TEMPORARY CSP STANDPIPE DETAIL**

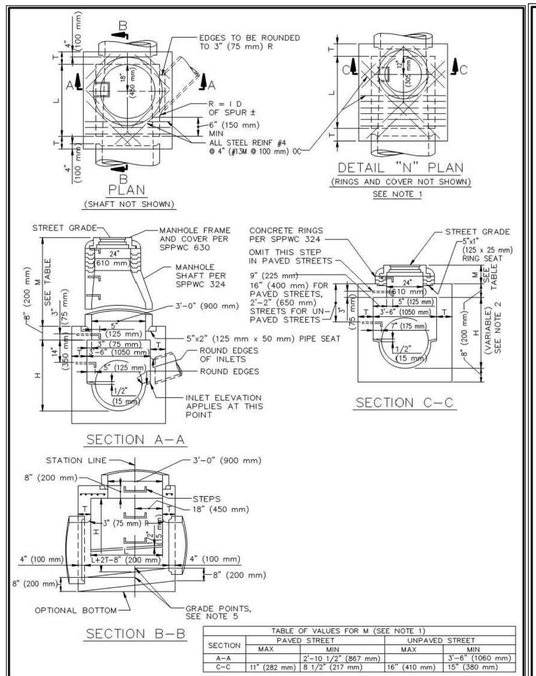


TABLE OF VALUES FOR M (SEE NOTE 1)

| SECTION | PAVED STREET | | UNPAVED STREET | |
|---|---|---|---|---|
| | MAX | MIN | MAX | MIN |
| A-A | | 2'-10 1/2" (867 mm) | | 3'-6" (1060 mm) |
| C-C | 11" (282 mm) | 8 1/2" (217 mm) | 16" (410 mm) | 15" (380 mm) |

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

PROMULGATED BY THE PUBLIC WORKS STANDARDS INC. GREENBOOK COMMITTEE 1992 REV. 1996, 2009

**MANHOLE PIPE-TO-PIPE (ONE OR BOTH MAIN LINE IDS 33" (825 mm) OR SMALLER)**

USE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

STANDARD PLAN **321-2** SHEET 1 OF 3

NOTES

1. WHEN DEPTH M FROM STREET GRADE TO THE TOP OF THE BOX IS LESS THAN 2'-10 1/2" (867 mm) FOR PAVED STREETS OR 3'-6" (1060 mm) FOR UNPAVED STREETS, CONSTRUCT SHAFT PER SECTION C-C AND DETAIL "N". DEPTH M MAY BE REDUCED TO AN ABSOLUTE LIMIT OF 6" (150 mm) WHEN LARGER VALUES OF M WOULD REDUCE H IN SECTION C-C TO 3'-6" (1060 mm) OR LESS.
2. H (IN SECTION A-A AND B-B) SHALL NOT BE LESS THAN 4'-0" (1.2 m), BUT MAY BE INCREASED PROVIDED THAT THE VALUE OF M SHALL NOT BE LESS THAN THE MINIMUM SPECIFIED AND THAT THE REDUCER SHALL BE USED. FOR H (IN SECTION C-C) SEE NOTE 1.
3. L SHALL BE 4'-0" (1.2 m) UNLESS OTHERWISE SHOWN. L MAY BE INCREASED OR LOCATION OF THE SPUR MUST BE APPROVED BY THE ENGINEER.
4. T SHALL BE 8" (200 mm) FOR VALUES OF H UP TO AND INCLUDING 8'-0" (2.4 m) AND 10" (250 mm) FOR VALUES OF H OVER 8'-0" (2.4 m).
5. STATIONS OF MANHOLES SHOWN ON PLANS APPLY AT CENTERLINE OF SHAFT. ELEVATIONS ARE SHOWN AT CENTERLINE OF SHAFT AND REFER TO THE PROLONGED INVERT GRADE LINES. SEE NOTE 3.
6. REINFORCEMENT SHALL CONFORM TO ASTM A 615, GRADE 40 (ASTM A 615M, GRADE 300), AND SHALL TERMINATE 1 1/2" (40 mm) CLEAR OF CONCRETE SURFACES UNLESS OTHERWISE SHOWN.
7. FLOOR OF MANHOLE SHALL BE STEEL TROWELED TO SPRING LINE.
8. BODY OF MANHOLE SHALL BE POURED IN ONE CONTINUOUS OPERATION EXCEPT THAT A CONSTRUCTION JOINT WITH A LONGITUDINAL KEYWAY MAY BE PLACED AT SPRING LINE.
9. THICKNESS OF THE DECK SHALL VARY WHEN NECESSARY TO PROVIDE A LEVEL SEAT BUT SHALL NOT BE LESS THAN 8" (200 mm).
10. STEPS SHALL CONFORM TO SPPWC 635 OR 636. UNLESS OTHERWISE SHOWN, STEPS SHALL BE UNIFORMLY SPACED 14" (350 mm) TO 15" (375 mm) OC. THE LOWEST STEP SHALL NOT BE MORE THAN 24" (600 mm) ABOVE THE LEDGE AT THE SIDE OF THE MANHOLE.

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE PIPE-TO-PIPE (ONE OR BOTH MAIN LINE IDS = 33" (825 mm) OR SMALLER)**

STANDARD PLAN **321-2** SHEET 2 OF 3

11. THE FOLLOWING CRITERIA SHALL BE USED FOR THIS MANHOLE:
    A. MAIN LINE = 33" (825 mm) INSIDE DIAMETER OR LESS. (EXCEPTION – IF THE MAIN LINE RCP DOWNSTREAM OF THE MANHOLE IS 36" (900 mm) TO 42" (1050 mm) INSIDE DIAMETER AND THE MAIN LINE RCP UPSTREAM IS 33" (825 mm) OR LESS.) SPPWC 320 OR 322 IS NOT APPLICABLE WHERE THE MAIN LINE CONDUIT IS LESS THAN 36" (900 mm) IN DIAMETER.
    B. SEE SECTION A – A. THE MAXIMUM SIZE LATERAL THAT MAY BE CONNECTED TO THIS MANHOLE IS SUCH THAT THE DISTANCE FROM THE OUTSIDE (TOP) OF THE LATERAL TO THE BOTTOM OF THE 8" (200 mm) THICK TOP OF THE MANHOLE CHAMBER, MEASURED VERTICALLY FROM THE END OF THE RCP, SHALL BE A MINIMUM OF 6" (150 mm).
    C. IF THE SIZE OF THE LATERAL IS SUCH THAT THE ABOVE-SPECIFIED MINIMUM DISTANCES CANNOT BE MAINTAINED, THEN ONE OF THE FOLLOWING ALTERNATE SOLUTIONS MUST BE USED.
        1. PROVIDE A SPECIAL STRUCTURE.
        2. PROVIDE TWO STANDARD STRUCTURES, CONSISTING OF THIS MANHOLE PLACED UPSTREAM OR DOWNSTREAM FROM THE APPLICABLE JUNCTION STRUCTURE OR TRANSITION STRUCTURE.
12. MANHOLE FRAME AND COVER SHALL CONFORM TO SPPWC 630 UNLESS OTHERWISE SHOWN.
13. MANHOLE SHAFT SHALL CONFORM TO SPPWC 324 UNLESS OTHERWISE SHOWN.
14. WHERE A MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 336.
15. WHERE A PRESSURE MANHOLE SHAFT – WITH ECCENTRIC REDUCER IS SPECIFIED REFER TO SPPWC 328.
16. WHERE A PRESSURE MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER IS SPECIFIED REFER TO SPPWC 329.
17. THE FOLLOWING SPPWC ARE INCORPORATED HEREIN:
    324 MANHOLE SHAFT – WITH ECCENTRIC REDUCER
    326 MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
    328 PRESSURE MANHOLE SHAFT – WITH ECCENTRIC
    329 PRESSURE MANHOLE SHAFT – 36" (900 mm) WITHOUT REDUCER
    630 24" (610 mm) MANHOLE FRAME AND COVER
    633 36" (900 mm) MANHOLE FRAME AND COVER
    635 STEEL STEP
    636 POLYPROPYLENE PLASTIC STEP

STANDARD PLANS FOR PUBLIC WORKS CONSTRUCTION

**MANHOLE PIPE-TO-PIPE (ONE OR BOTH MAIN LINE IDS = 33" (825 mm) OR SMALLER)**

STANDARD PLAN **321-2** SHEET 3 OF 3

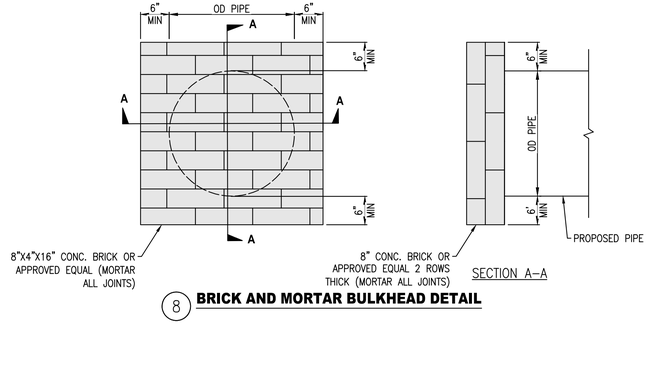


8 **BRICK AND MORTAR BULKHEAD DETAIL**

Know what's below. Call 811 before you dig.

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| REVISIONS | | | |
|---|---|---|---|
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BENCH MARK No. GG-18-1
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SIGNATURE: SIARA R. MACKINNEY, P.E. — R.C.E. NO. 85559 — DATE 05/30/2024


**CAMPUS AVENUE AND EUCALYPTUS AVENUE DETAILS**

PM-20517

SHEET 9 OF 9
CONTRACT
ACCOUNT
DWG. NO.

02/19/2025

Drawing Name: P:\Year_2023\2023-037-REDA-ORBP Phase II\06 Engineering\Sheets\OFF-SITE\STORM DRAIN\09_2023-037_SD_DET.dwg

S:\PROJ\RAIN IMPROVEMENT PLAN

## EXHIBITS

## EXHIBIT A: WALKER AVENUE HYDROLOGY MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

# WALKER AVENUE HYDROLOGY MAP

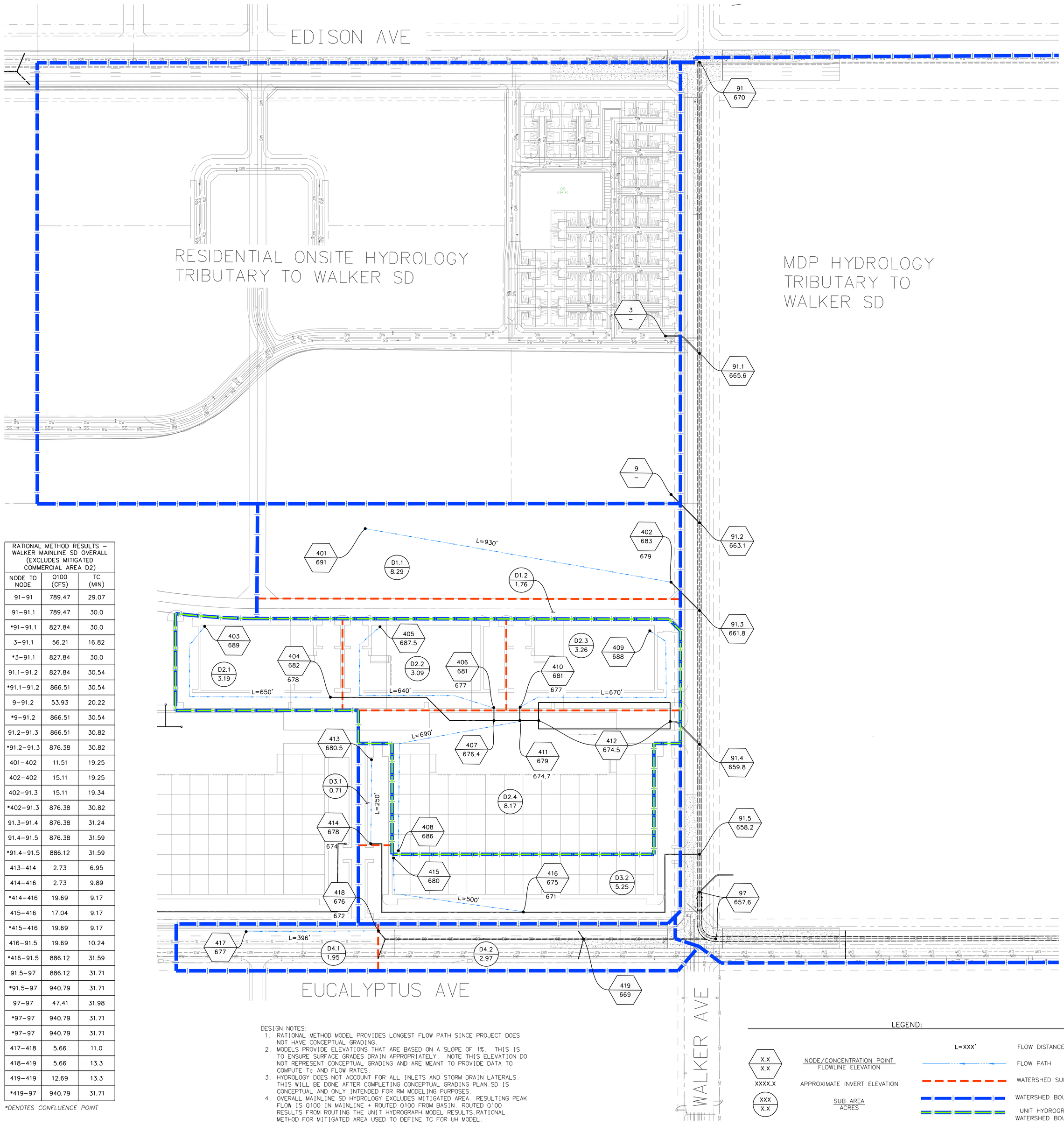


| RATIONAL METHOD RESULTS – WALKER MAINLINE SD OVERALL (EXCLUDES MITIGATED COMMERCIAL AREA D2) | | |
|---|---|---|
| NODE TO NODE | Q100 (CFS) | TC (MIN) |
| 91–91 | 789.47 | 29.07 |
| 91–91.1 | 789.47 | 30.0 |
| *91–91.1 | 827.84 | 30.0 |
| 3–91.1 | 56.21 | 16.82 |
| *3–91.1 | 827.84 | 30.0 |
| 91.1–91.2 | 827.84 | 30.54 |
| *91.1–91.2 | 866.51 | 30.54 |
| 9–91.2 | 53.93 | 20.22 |
| *9–91.2 | 866.51 | 30.54 |
| 91.2–91.3 | 866.51 | 30.82 |
| *91.2–91.3 | 876.38 | 30.82 |
| 401–402 | 11.51 | 19.25 |
| 402–402 | 15.11 | 19.25 |
| 402–91.3 | 15.11 | 19.34 |
| *402–91.3 | 876.38 | 30.82 |
| 91.3–91.4 | 876.38 | 31.24 |
| 91.4–91.5 | 876.38 | 31.59 |
| *91.4–91.5 | 886.12 | 31.59 |
| 413–414 | 2.73 | 6.95 |
| 414–416 | 2.73 | 9.89 |
| *414–416 | 19.69 | 9.17 |
| 415–416 | 17.04 | 9.17 |
| *415–416 | 19.69 | 9.17 |
| 416–91.5 | 19.69 | 10.24 |
| *416–91.5 | 886.12 | 31.59 |
| 91.5–97 | 886.12 | 31.71 |
| *91.5–97 | 940.79 | 31.71 |
| 97–97 | 47.41 | 31.98 |
| *97–97 | 940.79 | 31.71 |
| *97–97 | 940.79 | 31.71 |
| 417–418 | 5.66 | 11.0 |
| 418–419 | 5.66 | 13.3 |
| 419–419 | 12.69 | 13.3 |
| *419–97 | 940.79 | 31.71 |

*DENOTES CONFLUENCE POINT

| RATIONAL METHOD RESULTS – MITIGATED COMMERCIAL ONSITE AREA D2 | | |
|---|---|---|
| NODE TO NODE | Q100 (CFS) | TC (MIN) |
| 403–404 | 9.79 | 10.04 |
| 404–407 | 9.79 | 11.99 |
| *404–407 | 18.65 | 10.17 |
| 405–406 | 9.45 | 10.09 |
| 406–407 | 9.45 | 10.17 |
| *406–407 | 18.65 | 10.17 |
| 407–411 | 18.65 | 10.29 |
| *407–411 | 52.96 | 10.29 |
| 408–411 | 24.53 | 10.4 |
| *408–411 | 52.96 | 10.29 |
| 409–410 | 9.9 | 10.22 |
| 410–411 | 9.9 | 10.27 |
| *410–411 | 52.96 | 10.29 |
| 411–412 | 52.96 | 10.43 |

*DENOTES CONFLUENCE POINT

DESIGN NOTES:

1. RATIONAL METHOD MODEL PROVIDES LONGEST FLOW PATH SINCE PROJECT DOES NOT HAVE CONCEPTUAL GRADING.
2. MODELS PROVIDE ELEVATIONS THAT ARE BASED ON A SLOPE OF 1%. THIS IS TO ENSURE SURFACE GRADES DRAIN APPROPRIATELY. NOTE THIS ELEVATION DO NOT REPRESENT CONCEPTUAL GRADING AND ARE MEANT TO PROVIDE DATA TO COMPUTE Tc AND FLOW RATES.
3. HYDROLOGY DOES NOT ACCOUNT FOR ALL INLETS AND STORM DRAIN LATERALS. THIS WILL BE DONE AFTER COMPLETING CONCEPTUAL GRADING PLAN.SD IS CONCEPTUAL AND ONLY INTENDED FOR RM MODELING PURPOSES.
4. OVERALL MAINLINE SD HYDROLOGY EXCLUDES MITIGATED AREA. RESULTING PEAK FLOW IS Q100 IN MAINLINE + ROUTED Q100 FROM BASIN. ROUTED Q100 RESULTS FROM ROUTING THE UNIT HYDROGRAPH MODEL RESULTS.RATIONAL METHOD FOR MITIGATED AREA USED TO DEFINE TC FOR UH MODEL.

LEGEND:

| | |
|---|---|
| X.X / X.X | NODE/CONCENTRATION POINT / FLOWLINE ELEVATION |
| XXXX.X | APPROXIMATE INVERT ELEVATION |
| XXX / X.X | SUB AREA / ACRES |
| L=XXX' | FLOW DISTANCE |
| | FLOW PATH |
| | WATERSHED SUB-BOUNDARY |
| | WATERSHED BOUNDARY |
| | UNIT HYDROGRAPH WATERSHED BOUNDARY |

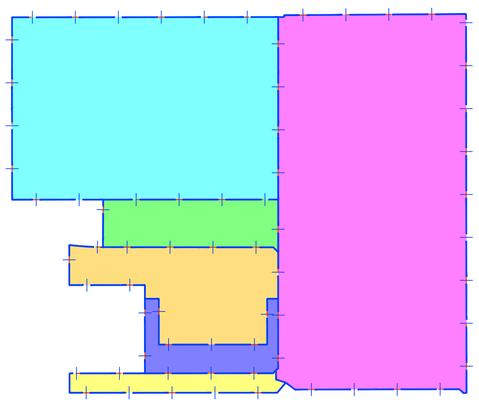

HYDROLOGY INDEX MAP

| HYDROLOGY INDEX MAP TABLE FOR MAINLINE RM MODEL | | | | | |
|---|---|---|---|---|---|
| HATCH | AREA LABEL | LAND USE | MODELED BY | IS MITIGATED ? | MODEL ELEMENT |
| | RES. AREA | RES | FUSCOE | NO | USER DEFINED |
| | MDP AREA | COMM/RES/PARK | JLC (MCC MDP) | NO | USER DEFINED |
| | D1 | PARK | JLC | NO | INITIAL AREA |
| | D2 | COMM | JLC | YES | USER DEFINED |
| | D3 | COMM | JLC | NO | INITIAL AREA |
| | D4 | COMM | JLC | NO | INITIAL AREA |

*NOTE: INITIAL MODEL ENTRY IS USER DEFINED FOR ALL MDP AREA TO THE NORTH.
*NOTE: MDP AREAS MODELED AS USER DEFINED BASED ON MDP MODEL OUTPUT.
*NOTE: ONSITE COMMERICIAL MITIGATED AREA MODELED AS USER DEFINED; HAS ITS OWN RM OUTPUT

SCALE 1"=100'

EXHIBIT "A"

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

ONTARIO RANCH

WALKER AVENUE HYDROLOGY MAP

## EXHIBIT B: WALKER AVENUE FLOW RATE MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# WALKER STORM DRAIN FLOW RATE MAP

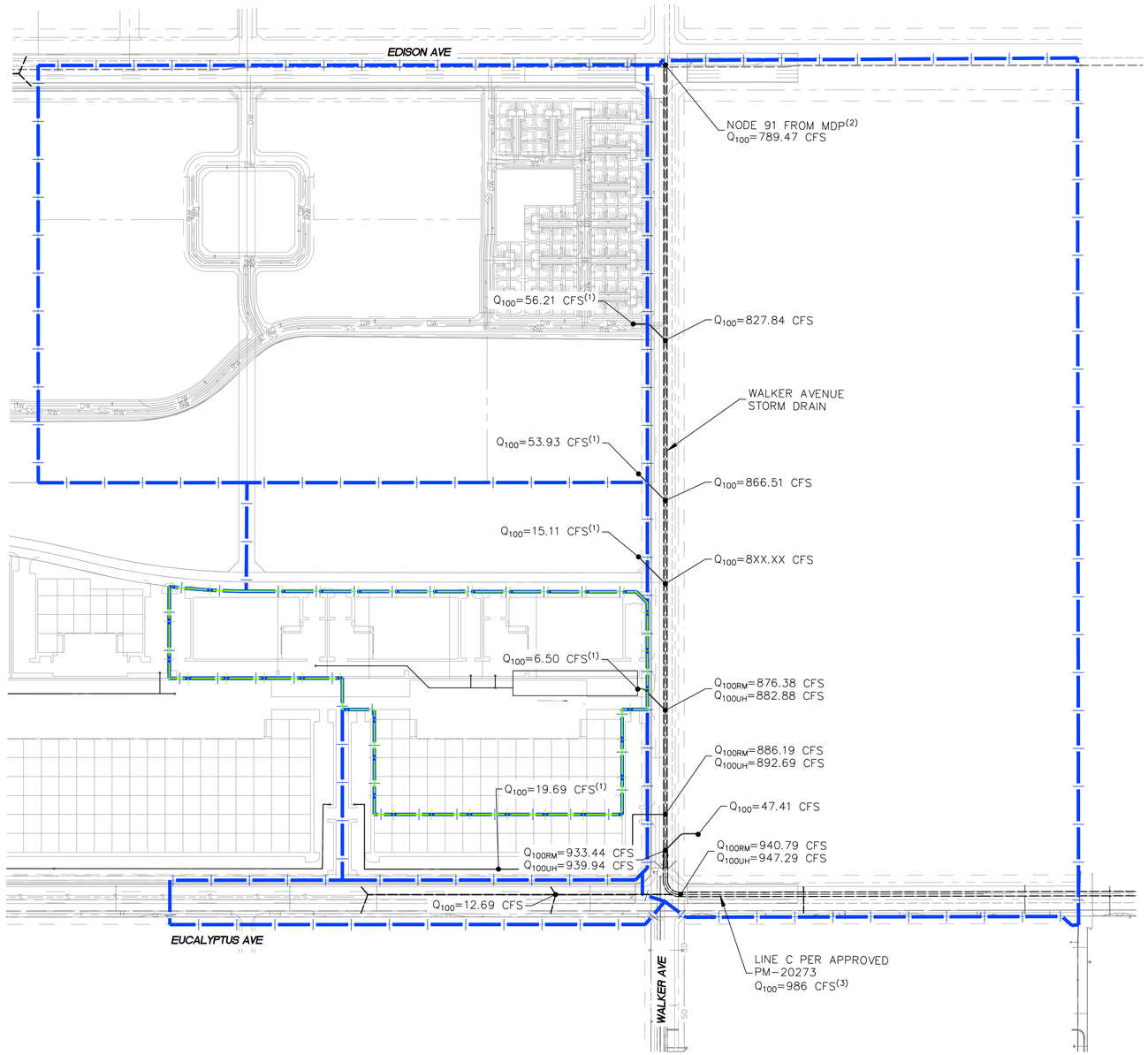


DESIGN NOTES:

1) LATERAL LOCATIONS FOR THE WALKER AVENUE STORM DRAIN ARE NOT FINAL.

2) $Q_{100}$ IS BASED ON THE REVISED MASTER DRAINAGE PLAN (MDP) FROM THE APPROVED JLC ENGINEERING REPORT FOR MCC. SEE EXCERPT B.

3) LINE C IS SIZED FOR THE UPSTREAM FLOW OF 986 CFS. HOWEVER, THE REVISED MCC MDP ALLOCATES 928 CFS TO LINE C (NODE 97 IN MCC MDP). SEE EXCERPT B.

LEGEND:

WATERSHED BOUNDARY

UNIT HYDROGRAPH WATERSHED BOUNDARY

$Q_{100}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS

$Q_{100RM}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS EXCLUDING ONSITE UNIT HYDROGRAPH PEAK FLOW

$Q_{100UH}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS INCLUDING ONSITE UNIT HYDROGRAPH PEAK FLOW

SCALE 1"=200'

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "B"

ONTARIO RANCH

WALKER STORM DRAIN FLOW RATE MAP

Drawing Name: O:\108.43.25\Engineering\Hydrology_Plan\Exhibits\Compliance_Map_Walker.dwg
Last Opened: May 10, 2025 - 10:27pm by jacob

## EXHIBIT C: GROVE AVENUE HYDROLOGY MAP

# ONTARIO RANCH

*IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA*

# GROVE AVENUE HYDROLOGY MAP

DESIGN NOTES:
1. RATIONAL METHOD MODEL PROVIDES LONGEST FLOW PATH SINCE PROJECT DOES NOT HAVE CONCEPTUAL GRADING.
2. MODELS PROVIDE ELEVATIONS THAT ARE BASED ON A SLOPE OF 1%. THIS IS TO ENSURE SURFACE GRADES DRAIN APPROPRIATELY. NOTE THIS ELEVATION DO NOT REPRESENT CONCEPTUAL GRADING AND ARE MEANT TO PROVIDE DATA TO COMPUTE Tc AND FLOW RATES.
3. HYDROLOGY DOES NOT ACCOUNT FOR ALL INLETS AND STORM DRAIN LATERALS. THIS WILL BE DONE AFTER COMPLETING CONCEPTUAL GRADING PLAN.SD IS CONCEPTUAL AND ONLY INTENDED FOR RM MODELING PURPOSES.
4. OVERALL MAINLINE SD HYDROLOGY EXCLUDES MITIGATED AREA. RESULTING PEAK FLOW IS Q100 IN MAINLINE + ROUTED Q100 FROM BASIN. ROUTED Q100 RESULTS FROM ROUTING THE UNIT HYDROGRAPH MODEL RESULTS.RATIONAL METHOD FOR MITIGATED AREA USED TO DEFINE TC FOR UH MODEL.

RATIONAL METHOD RESULTS – MITIGATED COMMERCIAL ONSITE AREA E3

| NODE TO NODE | Q100 (CFS) | TC (MIN) |
|---|---|---|
| 503-504 | 13.89 | 10.49 |
| 504-507 | 13.89 | 10.64 |
| *504-507 | 25.16 | 10.64 |
| 505-506 | 11.36 | 10.74 |
| 506-507 | 11.36 | 10.84 |
| *506-507 | 25.16 | 10.64 |
| 507-511 | 25.16 | 12.05 |
| *507-511 | 59.28 | 10.22 |
| 508-511 | 28.35 | 10.22 |
| *508-511 | 59.28 | 10.22 |
| 509-510 | 7.76 | 8.68 |
| 510-511 | 7.76 | 9.25 |
| *510-511 | 59.28 | 10.22 |
| 511-514 | 59.28 | 10.28 |
| *511-514 | 67.51 | 10.28 |
| 512-513 | 8.97 | 8.68 |
| 513-514 | 8.97 | 8.96 |
| *513-514 | 67.51 | 10.28 |

*DENOTES CONFLUENCE POINT

RATIONAL METHOD RESULTS – MITIGATED COMMERCIAL ONSITE AREA E4

| NODE TO NODE | Q100 (CFS) | TC (MIN) |
|---|---|---|
| 603-606 | 14.58 | 10.22 |
| *603-606 | 22.57 | 10.22 |
| 604-605 | 8.38 | 9.27 |
| 605-606 | 8.38 | 9.47 |
| *605-606 | 22.57 | 10.22 |
| 606-610 | 22.57 | 10.82 |
| *606-610 | 43.84 | 9.59 |
| 607-610 | 12.9 | 9.23 |
| *607-610 | 43.84 | 9.59 |
| 608-609 | 9.7 | 9.52 |
| 609-610 | 9.7 | 9.58 |
| *609-610 | 43.84 | 9.59 |
| 610-614 | 43.84 | 10.27 |
| *610-614 | 66.71 | 10.27 |
| 611-614 | 15.77 | 10.27 |
| *611-614 | 66.71 | 10.27 |
| 612-613 | 7.42 | 8.68 |
| 613-614 | 7.42 | 9.58 |
| *613-614 | 66.71 | 10.27 |
| 614-617 | 66.71 | 10.55 |
| *614-617 | 76.98 | 10.56 |
| 615-616 | 10.85 | 9.42 |
| 616-617 | 10.85 | 9.65 |
| *616-617 | 76.98 | 10.56 |

*DENOTES CONFLUENCE POINT

RATIONAL METHOD RESULTS – GROVE MAINLINE SD OVERALL (EXCLUDES MITIGATED COMMERCIAL AREA E3, E4)

| NODE TO NODE | Q100 (CFS) | TC (MIN) |
|---|---|---|
| 66-66 | 874.33 | 31.21 |
| 66-66.1 | 874.33 | 31.83 |
| *66-66.1 | 902.4 | 31.83 |
| 5-66.1 | 50.98 | 12.83 |
| *5-66.1 | 902.4 | 31.83 |
| 66.1-66.2 | 902.4 | 32.25 |
| *66.1-66.2 | 937.77 | 32.25 |
| 11-66.2 | 62.36 | 13.6 |
| *11-66.2 | 937.77 | 32.25 |
| 66.2-66.3 | 937.77 | 32.44 |
| *66.2-66.3 | 946.06 | 32.44 |
| 15-66.3 | 18.11 | 14.02 |
| *15-66.3 | 946.06 | 32.44 |
| 66.3-66.4 | 946.06 | 32.59 |
| *66.3-66.4 | 962.04 | 32.59 |
| 601-602 | 8.63 | 19.23 |
| 602-602 | 12.83 | 19.23 |
| 602-66.4 | 12.83 | 19.32 |
| *602-66.4 | 962.04 | 32.59 |
| 501-502 | 8.06 | 19.23 |
| 502-502 | 12.16 | 19.23 |
| 502-66.4 | 12.16 | 19.32 |
| *502-66.4 | 962.04 | 32.59 |
| 66.4-66.5 | 962.04 | 33.24 |
| 66.5-66.6 | 962.04 | 33.53 |
| *66.5-66.6 | 1001.87 | 33.53 |
| 618-619 | 2.71 | 6.95 |
| 619-621 | 2.71 | 12.84 |
| *619-621 | 26.29 | 11.77 |
| 620-621 | 23.67 | 11.77 |
| *620-621 | 26.29 | 11.77 |
| 621-66.6 | 26.29 | 13.06 |
| *621-66.6 | 1001.87 | 33.53 |
| 515-516 | 2.69 | 6.95 |
| 516-518 | 2.69 | 11.39 |
| *516-518 | 25.89 | 11.75 |
| 517-518 | 23.25 | 11.75 |
| *517-518 | 25.89 | 11.75 |
| 518-66.6 | 25.89 | 13.02 |
| *518-66.6 | 1001.87 | 33.53 |
| 521-522 | 4.55 | 10.36 |
| 522-523 | 14.3 | 10.36 |
| 523-523 | 22.85 | 10.36 |
| *523-66.6 | 1001.87 | 33.53 |

*DENOTES CONFLUENCE POINT

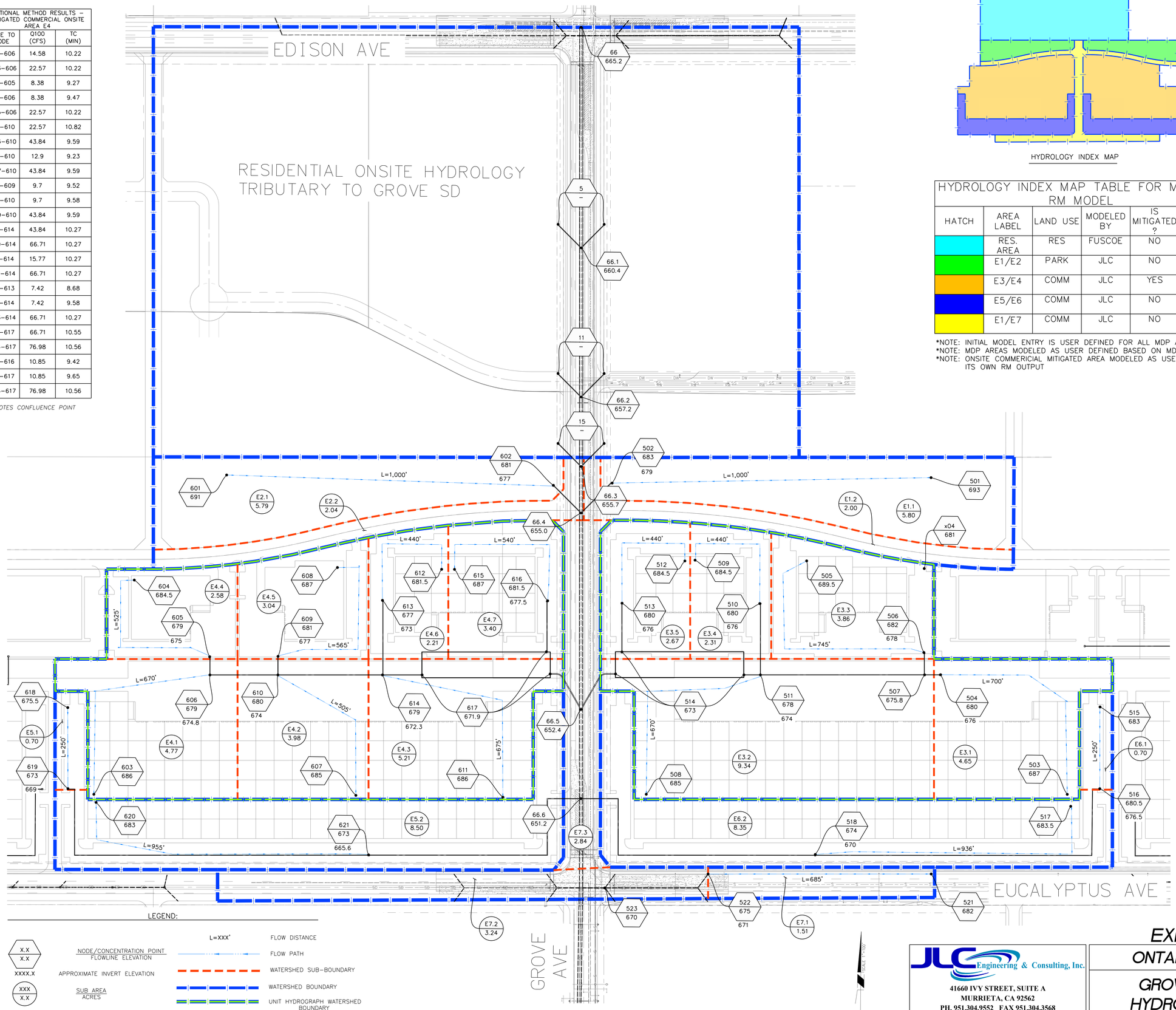


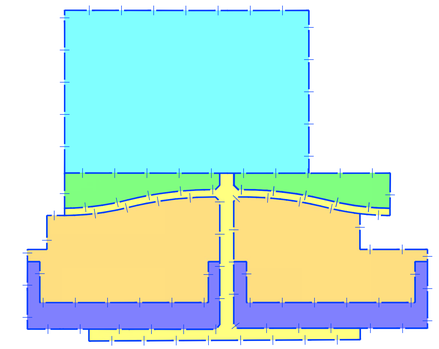

HYDROLOGY INDEX MAP

HYDROLOGY INDEX MAP TABLE FOR MAINLINE RM MODEL

| HATCH | AREA LABEL | LAND USE | MODELED BY | IS MITIGATED ? | MODEL ELEMENT |
|---|---|---|---|---|---|
| | RES. AREA | RES | FUSCOE | NO | USER DEFINED |
| | E1/E2 | PARK | JLC | NO | INITIAL AREA |
| | E3/E4 | COMM | JLC | YES | USER DEFINED |
| | E5/E6 | COMM | JLC | NO | INITIAL AREA |
| | E1/E7 | COMM | JLC | NO | INITIAL AREA |

*NOTE: INITIAL MODEL ENTRY IS USER DEFINED FOR ALL MDP AREA TO THE NORTH.
*NOTE: MDP AREAS MODELED AS USER DEFINED BASED ON MDP MODEL OUTPUT.
*NOTE: ONSITE COMMERCIAL MITIGATED AREA MODELED AS USER DEFINED; HAS ITS OWN RM OUTPUT

LEGEND:

| | |
|---|---|
| X.X / X.X | NODE/CONCENTRATION POINT / FLOWLINE ELEVATION |
| XXXX.X | APPROXIMATE INVERT ELEVATION |
| XXX / X.X | SUB AREA / ACRES |
| L=XXX' | FLOW DISTANCE |
| | FLOW PATH |
| | WATERSHED SUB-BOUNDARY |
| | WATERSHED BOUNDARY |
| | UNIT HYDROGRAPH WATERSHED BOUNDARY |

SCALE 1"=100'

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "C"
ONTARIO RANCH
GROVE AVENUE HYDROLOGY MAP

Drawing Name: O:\108.43.25\Engineering\Hydrology_Plan\Exhibits\OnsiteHydrologyMap_Grove.dwg
Last Opened: May 12, 2025 – 12:17pm by eperez

## EXHIBIT D: GROVE AVENUE FLOW RATE MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# GROVE STORM DRAIN FLOW RATE MAP

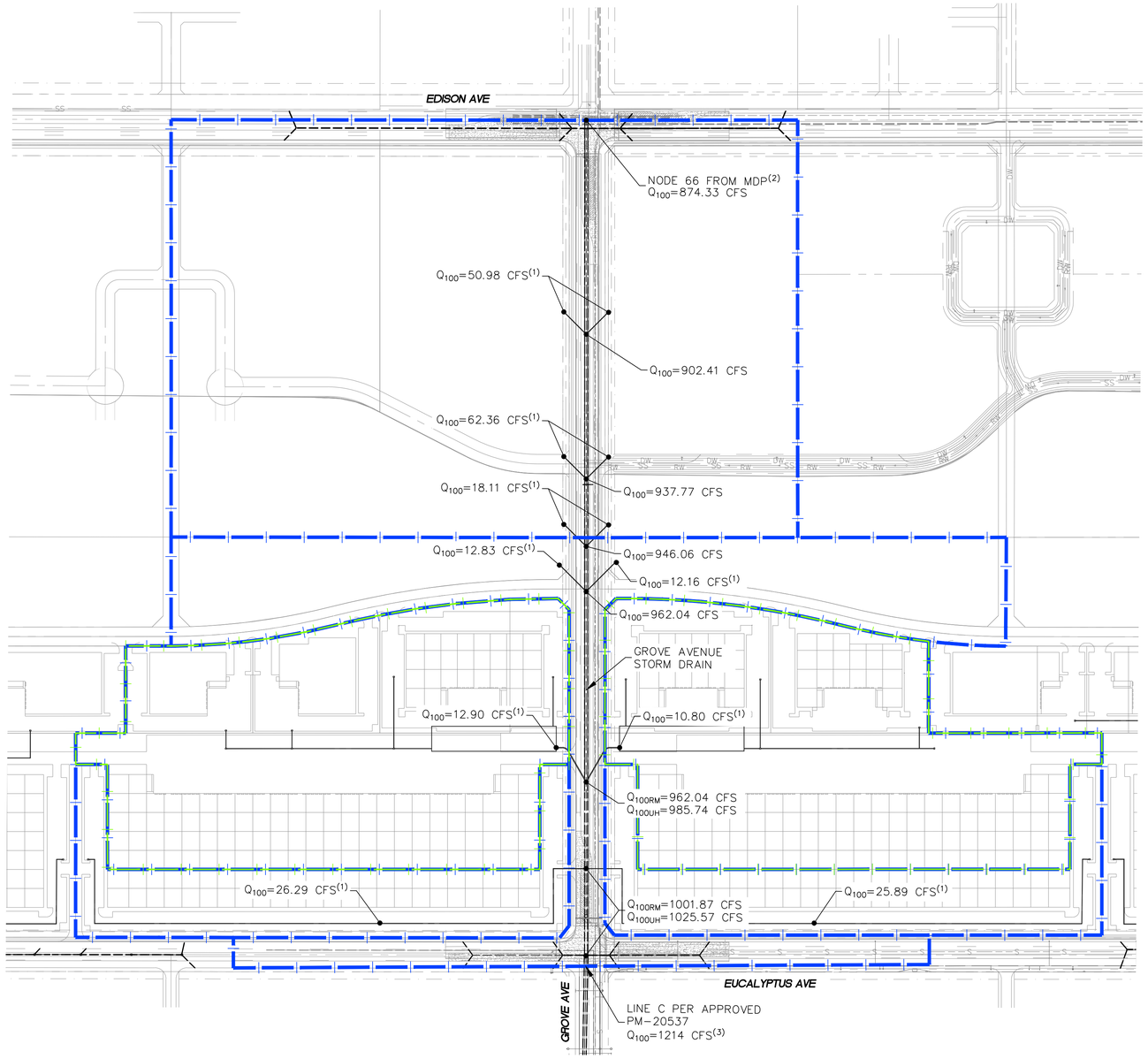


DESIGN NOTES:

1) LATERAL LOCATIONS FOR THE GROVE AVENUE STORM DRAIN ARE NOT FINAL.

2) $Q_{100}$ IS BASED ON THE ONTARIO MASTER DRAINAGE PLAN (MDP). SEE EXCERPT A.

3) LINE C IS SIZED FOR THE UPSTREAM FLOW OF 1,214 CFS. HOWEVER, THE ONTARIO MDP ALLOCATES 1,050 CFS TO LINE C (NODE 67 IN MDP). SEE EXCERPT A.

LEGEND:

WATERSHED BOUNDARY

UNIT HYDROGRAPH WATERSHED BOUNDARY

$Q_{100}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS

$Q_{100RM}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS EXCLUDING ONSITE UNIT HYDROGRAPH PEAK FLOW

$Q_{100UH}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS INCLUDING ONSITE UNIT HYDROGRAPH PEAK FLOW

SCALE 1"=200'

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41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "D"

ONTARIO RANCH

GROVE STORM DRAIN FLOW RATE MAP

Drawing Name: O:\108.43.25\Engineering\Hydrology_Plan\Exhibits\Flow_Rate_Map_Grove.dwg
Last Opened: May 10, 2025 - 10:36pm by jacob

## EXHIBIT E: BONE VIEW AVENUE HYDROLOGY MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

# BON VIEW AVENUE HYDROLOGY MAP

| RATIONAL METHOD RESULTS – BON VIEW MAINLINE SD OVERALL (EXCLUDES MITIGATED COMMERCIAL AREA F2, F3) | | |
|---|---|---|
| NODE TO NODE | Q100 (CFS) | TC (MIN) |
| 6–6 | 617.51 | 26.13 |
| 6–6.1 | 617.51 | 27.11 |
| *6–6.1 | 668.52 | 27.11 |
| 9–6.1 | 79.86 | 13.55 |
| *9–6.1 | 668.52 | 27.11 |
| 6.1–6.2 | 668.52 | 27.64 |
| *6.1–6.2 | 685.92 | 27.64 |
| 12–6.2 | 24.62 | 18.7 |
| *12–6.2 | 685.92 | 27.64 |
| 6.2–6.3 | 685.92 | 27.99 |
| *6.2–6.3 | 705.52 | 27.98 |
| 701–702 | 7.63 | 15.52 |
| 702–702 | 15.13 | 15.52 |
| 702–6.3 | 15.13 | 15.61 |
| *702–6.3 | 705.52 | 27.98 |
| 703–704 | 13.3 | 19.23 |
| 704–6.3 | 13.3 | 19.29 |
| *704–6.3 | 705.52 | 27.98 |
| 6.3–6.4 | 705.52 | 28.4 |
| 6.4–6.5 | 705.52 | 28.78 |
| *6.4–6.5 | 711.57 | 28.78 |
| 731–732 | 11.26 | 10.2 |
| 732–6.5 | 11.26 | 10.56 |
| *732–6.5 | 711.57 | 28.78 |
| 6.5–7 | 711.57 | 29.0 |
| *6.5–7 | 719.61 | 29.0 |
| 734–735 | 3.42 | 8.75 |
| 735–7 | 16.94 | 8.75 |
| *735–7 | 719.61 | 29.0 |

*DENOTES CONFLUENCE POINT

| RATIONAL METHOD RESULTS – MITIGATED COMMERCIAL ONSITE AREA F2 | | |
|---|---|---|
| NODE TO NODE | Q100 (CFS) | TC (MIN) |
| 711–712 | 2.48 | 6.75 |
| 712–714 | 2.48 | 9.98 |
| *712–714 | 16.7 | 8.74 |
| 713–714 | 14.34 | 8.74 |
| *713–714 | 16.7 | 8.74 |
| 714–721 | 16.7 | 12.18 |
| *714–721 | 56.72 | 9.7 |
| 715–716 | 9.45 | 9.31 |
| 716–721 | 9.45 | 9.6 |
| *716–721 | 56.72 | 9.7 |
| 717–718 | 9.07 | 8.92 |
| 718–721 | 9.07 | 8.94 |
| *718–721 | 56.72 | 9.7 |
| 719–720 | 23.39 | 9.69 |
| 720–721 | 23.39 | 9.7 |
| *720–721 | 56.72 | 9.7 |
| 721–725 | 56.72 | 10.3 |
| *721–725 | 61.57 | 10.3 |
| 722–723 | 6.61 | 5.99 |
| 723–724 | 6.61 | 6.09 |
| 724–725 | 6.61 | 6.2 |
| *724–725 | 61.57 | 10.3 |
| 725–729 | 61.57 | 10.56 |
| *725–729 | 68.3 | 10.56 |
| 726–727 | 7.92 | 7.81 |
| 727–728 | 7.92 | 7.88 |
| 728–729 | 7.92 | 8.11 |
| *728–729 | 68.3 | 10.56 |

*DENOTES CONFLUENCE POINT

| RATIONAL METHOD RESULTS – MITIGATED COMMERCIAL ONSITE AREA F3 | | |
|---|---|---|
| NODE TO NODE | Q100 (CFS) | TC (MIN) |
| 706–707 | 12.32 | 9.65 |
| 707–710 | 12.32 | 9.68 |
| *707–710 | 29.99 | 8.96 |
| 708–709 | 18.03 | 8.93 |
| 709–710 | 18.03 | 8.96 |
| *709–710 | 29.99 | 8.96 |

*DENOTES CONFLUENCE POINT

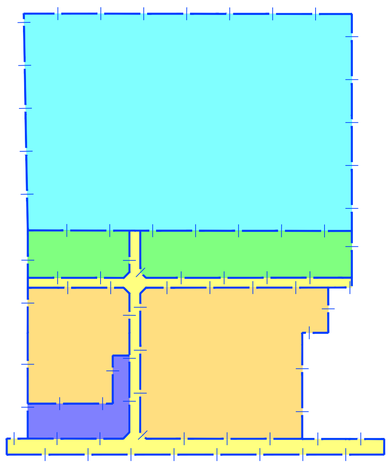

HYDROLOGY INDEX MAP

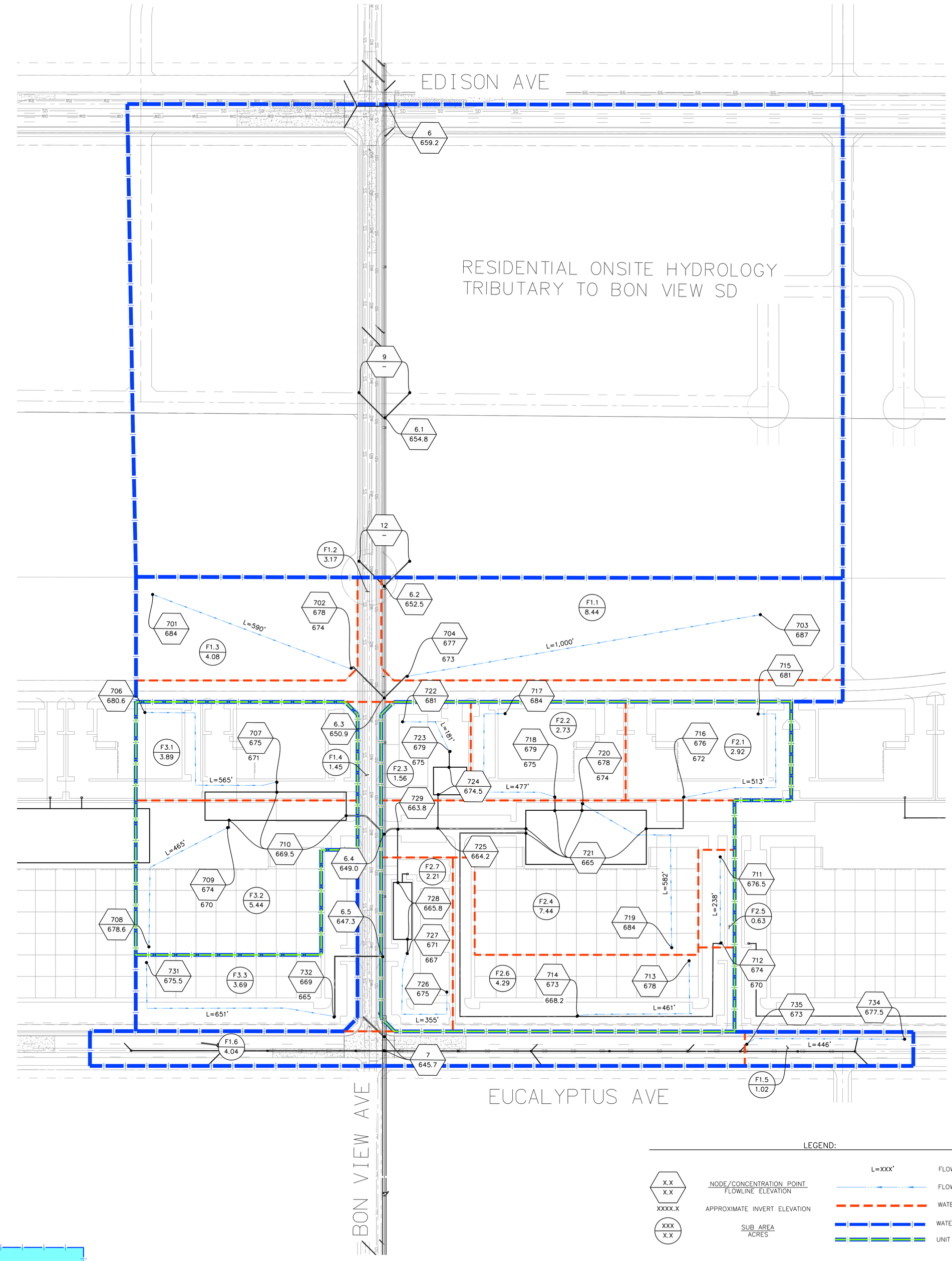


LEGEND:

| | |
|---|---|
| X.X / X.X — NODE/CONCENTRATION POINT / FLOWLINE ELEVATION | L=XXX' — FLOW DISTANCE |
| XXXX.X — APPROXIMATE INVERT ELEVATION | FLOW PATH |
| XXX / X.X — SUB AREA / ACRES | WATERSHED SUB-BOUNDARY |
| | WATERSHED BOUNDARY |
| | UNIT HYDROGRAPH WATERSHED BOUNDARY |

DESIGN NOTES:

1. RATIONAL METHOD MODEL PROVIDES LONGEST FLOW PATH SINCE PROJECT DOES NOT HAVE CONCEPTUAL GRADING.
2. MODELS PROVIDE ELEVATIONS THAT ARE BASED ON A SLOPE OF 1%. THIS IS TO ENSURE SURFACE GRADES DRAIN APPROPRIATELY. NOTE THIS ELEVATION DO NOT REPRESENT CONCEPTUAL GRADING AND ARE MEANT TO PROVIDE DATA TO COMPUTE Tc AND FLOW RATES.
3. HYDROLOGY DOES NOT ACCOUNT FOR ALL INLETS AND STORM DRAIN LATERALS. THIS WILL BE DONE AFTER COMPLETING CONCEPTUAL GRADING PLAN.SD IS CONCEPTUAL AND ONLY INTENDED FOR RM MODELING PURPOSES.
4. OVERALL MAINLINE SD HYDROLOGY EXCLUDES MITIGATED AREA. RESULTING PEAK FLOW IS Q100 IN MAINLINE + ROUTED Q100 FROM BASIN. ROUTED Q100 RESULTS FROM ROUTING THE UNIT HYDROGRAPH MODEL RESULTS.RATIONAL METHOD FOR MITIGATED AREA USED TO DEFINE TC FOR UH MODEL.

| HYDROLOGY INDEX MAP TABLE FOR MAINLINE RM MODEL | | | | | |
|---|---|---|---|---|---|
| HATCH | AREA LABEL | LAND USE | MODELED BY | IS MITIGATED ? | MODEL ELEMENT |
| | RES. AREA | RES | FUSCOE | NO | USER DEFINED |
| | F1 | PARK | JLC | NO | INITIAL AREA |
| | F2/F3 | COMM | JLC | YES | USER DEFINED |
| | F3 | COMM | JLC | NO | INITIAL AREA |
| | F1 | COMM | JLC | NO | INITIAL AREA |

*NOTE: INITIAL MODEL ENTRY IS USER DEFINED FOR ALL MDP AREA TO THE NORTH.
*NOTE: MDP AREAS MODELED AS USER DEFINED BASED ON MDP MODEL OUTPUT.
*NOTE: ONSITE COMMERICIAL MITIGATED AREA MODELED AS USER DEFINED; HAS ITS OWN RM OUTPUT

SCALE 1"=100'

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "E"

ONTARIO RANCH

BON VIEW AVENUE HYDROLOGY MAP

Drawing Name: O:\108.43.25\Engineering\Hydrology_Plan\Exhibits\OnsiteHydrologyMap_BonView.dwg
Last Opened: May 12, 2025 – 12:12pm by eperez

## EXHIBIT F: BON VIEW AVENUE FLOW RATE MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# BON VIEW STORM DRAIN FLOW RATE MAP

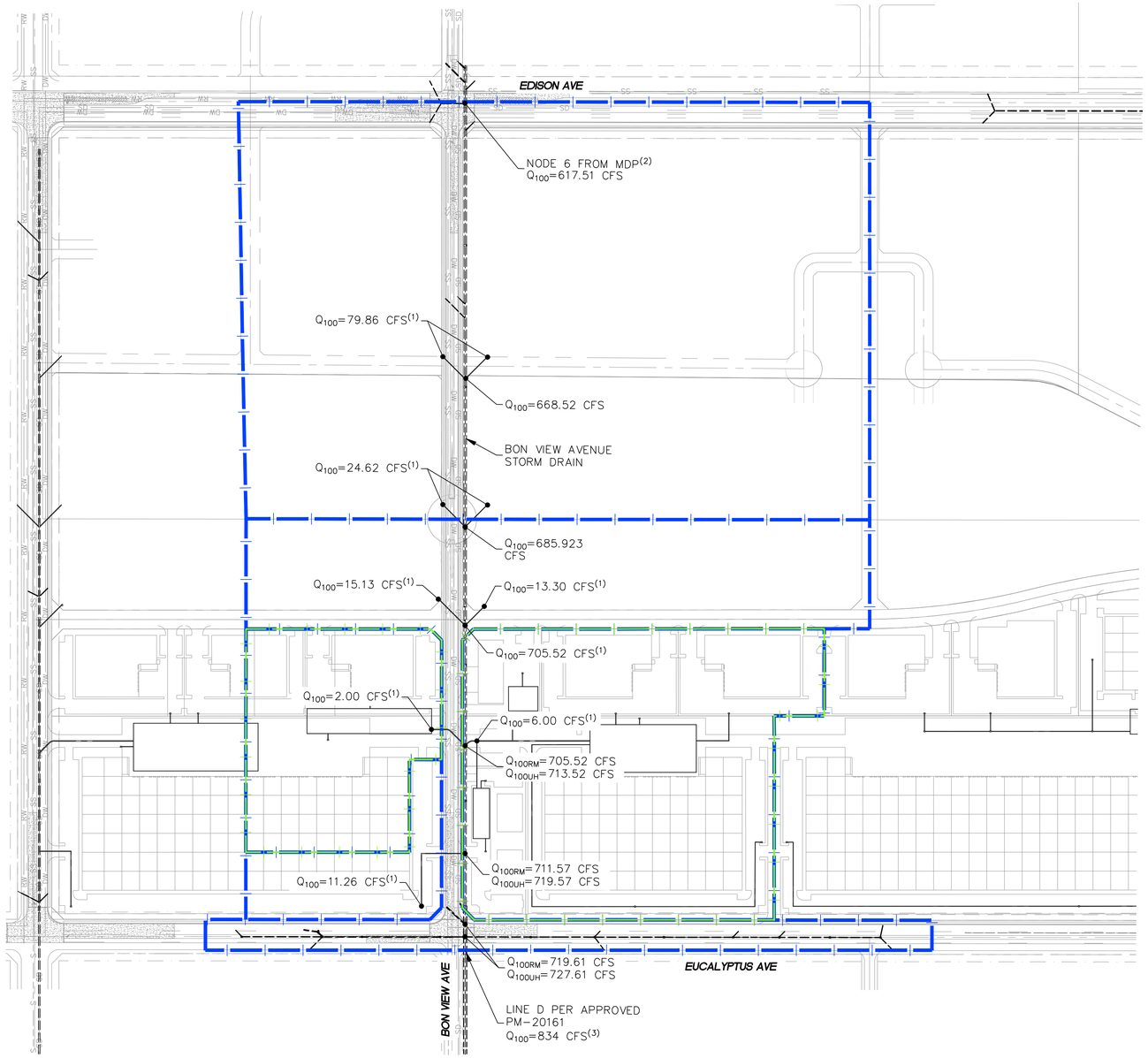


DESIGN NOTES:

1) LATERAL LOCATIONS FOR THE BON VIEW AVENUE STORM DRAIN ARE NOT FINAL.

2) $Q_{100}$ IS BASED ON THE ONTARIO MASTER DRAINAGE PLAN (MDP). SEE EXCERPT A.

3) LINE D IS SIZED FOR THE UPSTREAM FLOW OF 834 CFS. HOWEVER, THE ONTARIO MDP ALLOCATES 746 CFS TO LINE D (NODE 7 IN MDP). SEE EXCERPT A.

LEGEND:

WATERSHED BOUNDARY

UNIT HYDROGRAPH WATERSHED BOUNDARY

$Q_{100}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS

$Q_{100RM}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS EXCLUDING ONSITE UNIT HYDROGRAPH PEAK FLOW

$Q_{100UH}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS INCLUDING ONSITE UNIT HYDROGRAPH PEAK FLOW

SCALE 1"=200'

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "F"

ONTARIO RANCH

BON VIEW STORM DRAIN FLOW RATE MAP

Drawing Name: C:\108.43.25\Engineering\Hydrology-Plan\Exhibits\Flow-Rate-Map-BonView.dwg
Last Opened: May 10, 2025 - 10:34pm by jacob

## EXHIBIT G: CAMPUS AVENUE HYDROLOGY MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA

# CAMPUS AVENUE HYDROLOGY MAP

| RATIONAL METHOD RESULTS – CAMPUS MAINLINE SD OVERALL (EXCLUDES MITIGATED COMMERCIAL AREA G2) | | |
|---|---|---|
| NODE TO NODE | Q100 (CFS) | TC (MIN) |
| 814–815 | 12.69 | 8.95 |
| 815–12 | 12.69 | 9.02 |
| 12–12.1 | 12.69 | 10.13 |
| *12–12.1 | 43.52 | 12.97 |
| 3–12.1 | 32.61 | 12.97 |
| *3–12.1 | 43.52 | 12.97 |
| 12.1–12.2 | 43.52 | 13.87 |
| *12.1–12.2 | 84.63 | 11.66 |
| 815–816 | 22.37 | 11.6 |
| 816–816 | 33.66 | 11.6 |
| 816–12.2 | 33.66 | 11.66 |
| *816–12.2 | 84.63 | 11.66 |
| 5–12.2 | 11.18 | 18.5 |
| *5–12.2 | 84.63 | 11.66 |
| 12.2–12.3 | 84.63 | 13.31 |
| *12.2–12.3 | 94.12 | 13.31 |
| 801–802 | 7.74 | 15.14 |
| 802–802 | 9.83 | 15.14 |
| 802–12.3 | 9.83 | 15.22 |
| *802–12.3 | 94.12 | 13.31 |
| 12.3–12.4 | 94.12 | 15.13 |
| 12.4–12.5 | 94.12 | 15.69 |
| *12.4–12.5 | 102.85 | 15.69 |
| 810–811 | 10.95 | 10.49 |
| 811–12.5 | 10.95 | 10.83 |
| *811–12.5 | 102.85 | 15.69 |
| 12.5–14 | 102.85 | 15.97 |
| *12.5–14 | 128.0 | 15.97 |
| 817–818 | 23.6 | 10.79 |
| 818–14 | 23.6 | 10.84 |
| *818–14 | 128.0 | 15.97 |
| 812–813 | 4.26 | 9.66 |
| 813–813 | 8.86 | 9.67 |
| 813–14 | 8.86 | 9.69 |
| *813–14 | 128.0 | 15.97 |

*DENOTES CONFLUENCE POINT

| RATIONAL METHOD RESULTS – MITIGATED COMMERCIAL ONSITE AREA G2 | | |
|---|---|---|
| NODE TO NODE | Q100 (CFS) | TC (MIN) |
| 803–804 | 8.4 | 9.53 |
| 804–809 | 8.4 | 9.56 |
| *804–809 | 31.18 | 8.33 |
| 805–806 | 4.55 | 7.48 |
| 806–809 | 4.55 | 7.52 |
| *806–809 | 31.18 | 8.33 |
| 807–808 | 18.95 | 8.26 |
| 808–809 | 18.95 | 8.33 |
| *808–809 | 31.18 | 8.33 |

*DENOTES CONFLUENCE POINT

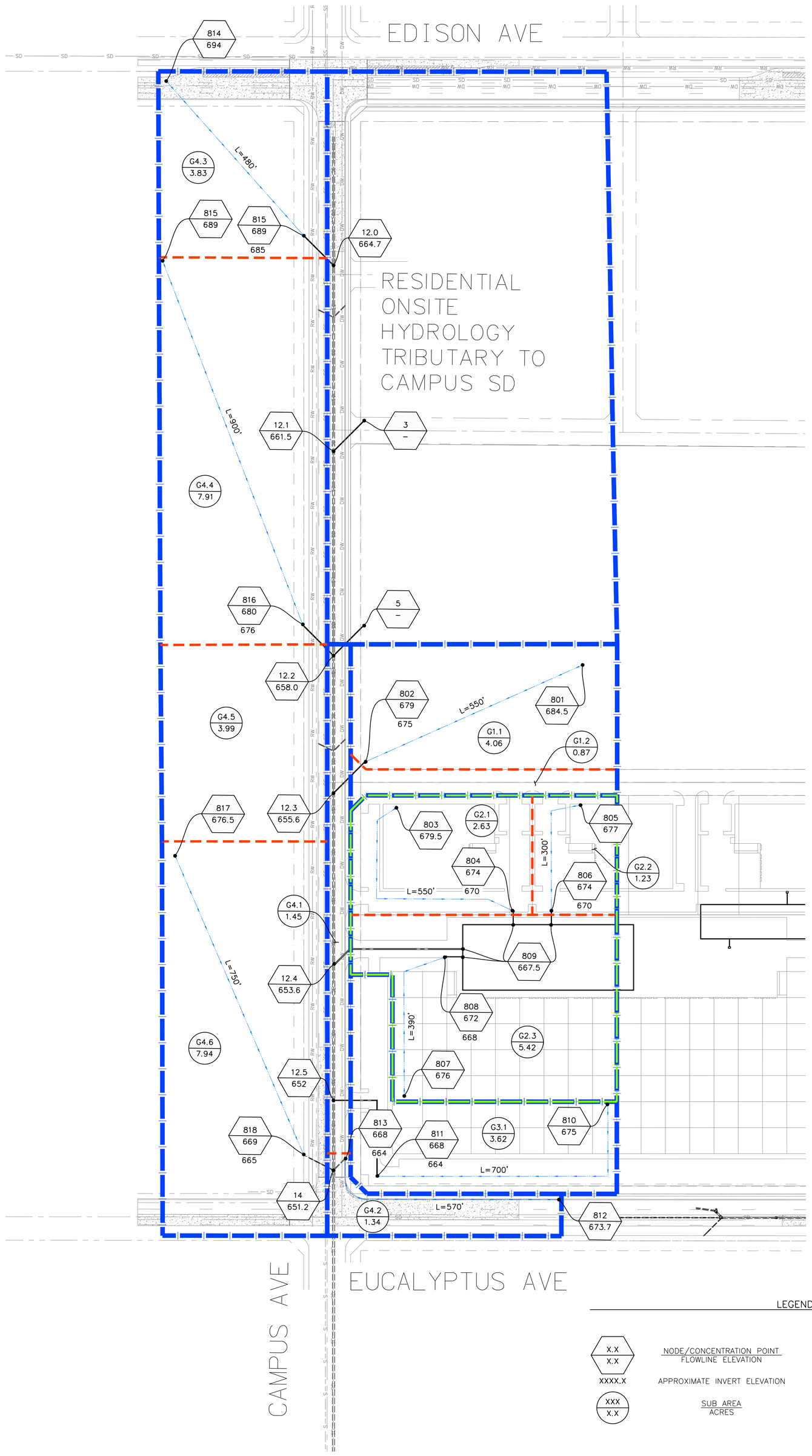


LEGEND:

| | |
|---|---|
| X.X / X.X | NODE/CONCENTRATION POINT / FLOWLINE ELEVATION |
| XXXX.X | APPROXIMATE INVERT ELEVATION |
| XXX / X.X | SUB AREA / ACRES |
| L=XXX' | FLOW DISTANCE |
| | FLOW PATH |
| | WATERSHED SUB-BOUNDARY |
| | WATERSHED BOUNDARY |
| | UNIT HYDROGRAPH WATERSHED BOUNDARY |

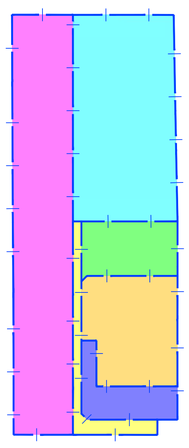

HYDROLOGY INDEX MAP

| HYDROLOGY INDEX MAP TABLE FOR MAINLINE RM MODEL | | | | | |
|---|---|---|---|---|---|
| HATCH | AREA LABEL | LAND USE | MODELED BY | IS MITIGATED ? | MODEL ELEMENT |
| | RES. AREA | RES | FUSCOE | NO | USER DEFINED |
| | MDP AREA | COMM | JLC (MCC MDP) | NO | INITIAL AREA |
| | G1 | PARK | JLC | NO | INITIAL AREA |
| | G2 | COMM | JLC | YES | USER DEFINED |
| | G3 | COMM | JLC | NO | INITIAL AREA |
| | G4 | COMM | JLC | NO | INITIAL AREA |

*NOTE: INITIAL MODEL ENTRY IS USER DEFINED FOR ALL MDP AREA TO THE NORTH.
*NOTE: MDP AREAS MODELED AS USER DEFINED BASED ON MDP MODEL OUTPUT.
*NOTE: ONSITE COMMERICIAL MITIGATED AREA MODELED AS USER DEFINED; HAS ITS OWN RM OUTPUT

DESIGN NOTES:
1. RATIONAL METHOD MODEL PROVIDES LONGEST FLOW PATH SINCE PROJECT DOES NOT HAVE CONCEPTUAL GRADING.
2. MODELS PROVIDE ELEVATIONS THAT ARE BASED ON A SLOPE OF 1%. THIS IS TO ENSURE SURFACE GRADES DRAIN APPROPRIATELY. NOTE THIS ELEVATION DO NOT REPRESENT CONCEPTUAL GRADING AND ARE MEANT TO PROVIDE DATA TO COMPUTE Tc AND FLOW RATES.
3. HYDROLOGY DOES NOT ACCOUNT FOR ALL INLETS AND STORM DRAIN LATERALS. THIS WILL BE DONE AFTER COMPLETING CONCEPTUAL GRADING PLAN.SD IS CONCEPTUAL AND ONLY INTENDED FOR RM MODELING PURPOSES.
4. OVERALL MAINLINE SD HYDROLOGY EXCLUDES MITIGATED AREA. RESULTING PEAK FLOW IS Q100 IN MAINLINE + ROUTED Q100 FROM BASIN. ROUTED Q100 RESULTS FROM ROUTING THE UNIT HYDROGRAPH MODEL RESULTS.RATIONAL METHOD FOR MITIGATED AREA USED TO DEFINE TC FOR UH MODEL.

SCALE 1"=100'

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "G"

ONTARIO RANCH

CAMPUS AVENUE HYDROLOGY MAP

Drawing Name: O:\108.43.25\Engineering\Hydrology_Plan\Exhibits\OnsiteHydrologyMap_Campus.dwg
Last Opened: May 12, 2025 – 1:22pm by eperez

## EXHIBIT H: CAMPUS AVENUE FLOW RATE MAP

# ONTARIO RANCH

IN THE CITY OF ONTARIO, COUNTY OF SAN BERNARDINO STATE OF CALIFORNIA

# CAMPUS STORM DRAIN FLOW RATE MAP

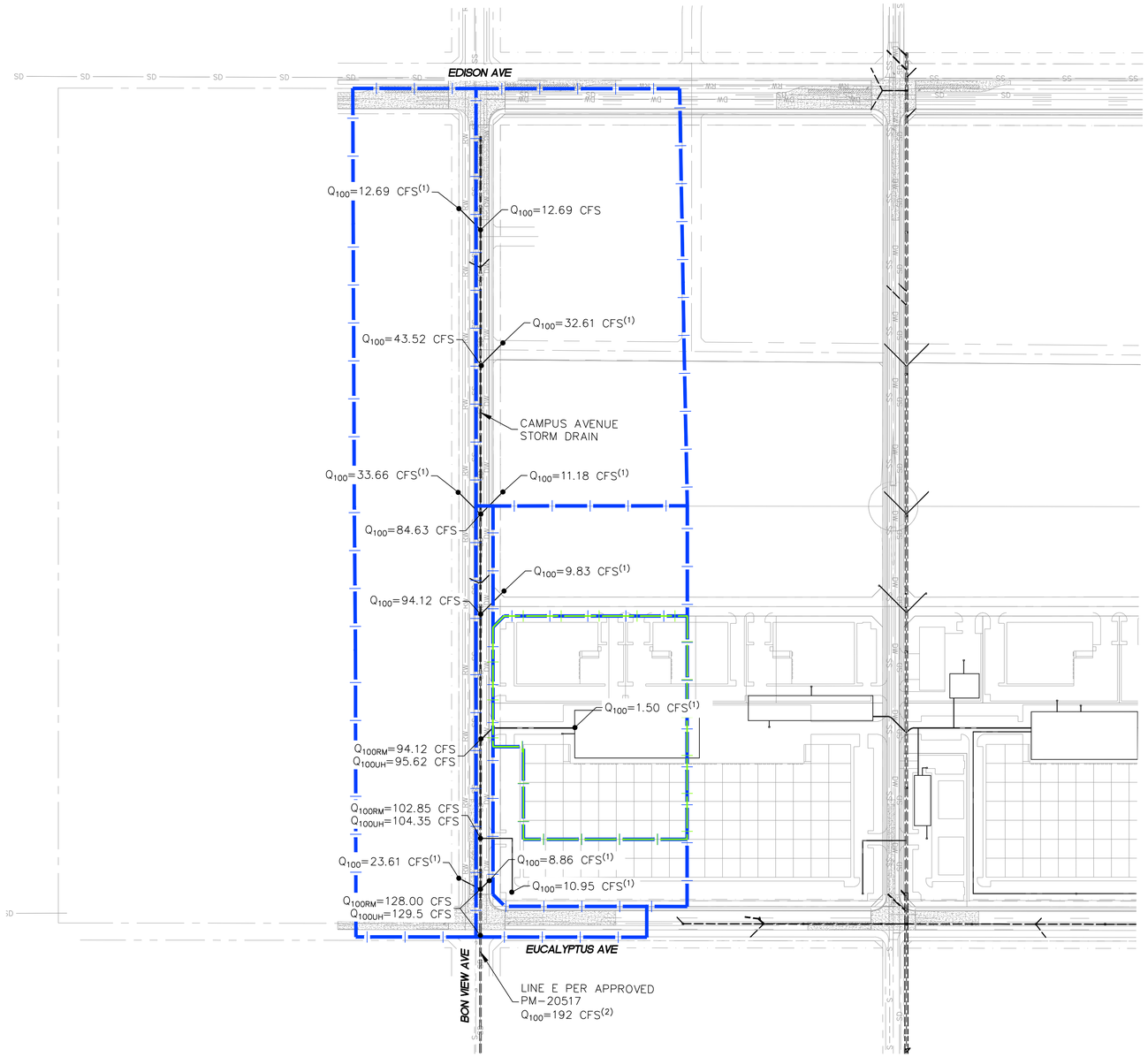


DESIGN NOTES:

1) LATERAL LOCATIONS FOR THE BON VIEW AVENUE STORM DRAIN ARE NOT FINAL.

2) LINE D IS SIZED FOR THE UPSTREAM FLOW OF 192 CFS. HOWEVER, THE ONTARIO MDP ALLOCATES 124 CFS TO LINE E (NODE 14 IN MDP). SEE EXCERPT A.

LEGEND:

WATERSHED BOUNDARY

UNIT HYDROGRAPH WATERSHED BOUNDARY

$Q_{100}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS

$Q_{100RM}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS EXCLUDING ONSITE UNIT HYDROGRAPH PEAK FLOW

$Q_{100UH}$ – PEAK 100-YEAR RATIONAL METHOD FLOWS INCLUDING ONSITE UNIT HYDROGRAPH PEAK FLOW

SCALE 1"=200'

JLC Engineering & Consulting, Inc.
41660 IVY STREET, SUITE A
MURRIETA, CA 92562
PH. 951.304.9552 FAX 951.304.3568

EXHIBIT "H"

ONTARIO RANCH

CAMPUS STORM DRAIN FLOW RATE MAP

# APPENDIX G2

## PRELIMINARY WATER QUALITY MANAGEMENT PLAN

# Preliminary Water Quality Management Plan (PWQMP)

For compliance with Santa Ana Regional Water Quality Control Board
Order Number R8-2010-0036 (NPDES Permit No. CAS618036)

| | |
|---|---|
| **Project Name:** | Center Park Specific Plan |
| **Ontario Project #:** | |
| **Applicant Name:** | Ontario Ranch Ventures I, LP & Ontario Ranch Ventures II, LP |
| **Applicant Address:** | C/O RCCD, 8101 E. Kaiser Blvd, Suite 140, Anaheim, CA 92808 |
| **Project Address:** | In between Campus & Walker Ave., south of Edison Ave. |
| **Project Size (acres):** | 210 acre |
| **Project Description:** | Specific Plan with Land use changes for 14 Planning areas. Land use changes consist of Medium Density Residential; Mixed use residential, Retail, Office; Open Spaces for Recreational and Non-Recreational uses. |

**Submittal Date: _____**

# Preliminary Water Quality Management Plan (PWQMP)

## 1. Introduction

The Preliminary Water Quality Management Plan (PWQMP) is a planning tool to improve integration of required water quality elements, stormwater management, water conservation, rainwater harvesting and re-use, and flood management in land use planning and the City's development process. The Preliminary WQMP will assist project applicants and planners in properly designing and laying out project sites so that water quality may be incorporated in the most effective manner and at the lowest cost for the developer.

The San Bernardino County Municipal Separate Storm Sewer System Permit (MS4 Permit) requires project-specific Water Quality Management plans (WQMP) to be prepared for all priority new development and significant redevelopment projects listed in Section 2 of this document. The MS4 Permit stipulates that the City of Ontario require priority project applicants to submit a Preliminary project-specific WQMP, as early as possible, during the environmental review or planning phase of a development project and that the Preliminary WQMP be approved prior to the issuance of land use entitlement.

## 2. Priority Projects (requiring a Preliminary WQMP)

Land Use entitlement shall not be issued for any of the listed projects, below, until a Preliminary WQMP has been approved by the City's Engineering Department. For construction projects not going through entitlement, a Preliminary and Final project specific WQMP shall be approved, prior to the issuance of construction permits:

Check the appropriate project category below, for this project:

| ***Check below*** | **Project Categories** |
|---|---|
| | 1. All significant re-development projects. Significant re-development is defined as the addition or replacement of 5,000 or more square feet of impervious surface on an already developed site subject to discretionary approval of the Permittee. Redevelopment does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, original purpose of the facility, or emergency redevelopment activity required to protect public health and safety. Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing developed site, and the existing development was not subject to WQMP requirements, the numeric sizing criteria discussed below applies only to the addition or replacement, and not to the entire developed site. Where redevelopment results in an increase of fifty percent or more of the impervious surfaces of a previously existing developed site, the numeric sizing criteria applies to the entire development (new and existing). |
| ✔ | 2. New development projects that create 10,000 square feet or more of impervious surface (collectively over the entire project site) including commercial, industrial, residential housing subdivisions (i.e., detached single family home subdivisions, multi-family attached subdivisions or townhomes, condominiums, apartments, etc.), mixed-use, and public projects. This category includes development projects on public and private land, which fall under the planning and building authority of the permitting agency. |

| *Check below* | **Project Categories** |
|---|---|
| | 3. Automotive repair shops (with SIC codes 5013, 5014, 5541, 7532- 7534, 7536-7539). |
| | 4. Restaurants and Food Service Establishments where the land area of development is 5,000 square feet or more. |
| | 5. Developments of 2,500 square feet of impervious surface or more adjacent to (within 200 feet) or discharging directly into environmentally sensitive areas (ESA's) such as areas designated in the Ocean Plan as areas of special biological significance or waterbodies listed on the CWA Section 303(d) list of impaired waters. |
| | 6. Parking lots of 5,000 square feet or more exposed to storm water. Parking lot is defined as land area or facility for the temporary storage of motor vehicles. |
| | 7. Retail Gasoline Outlets (RGOs) that are either 5,000 sq ft or more or have a projected average daily traffic of 100 or more vehicles per day. |
| | 8. *This project is not covered under any of the categories listed above. |

* If the development is not covered under any of the project categories listed in Section 2, the project is not required to design and install Site Design/LID BMPs or Treatment Control BMPs to treat the design storm event (Design Capture Volume) described in Section 4.

## 3. Preliminary WQMP Objectives

Through a combination of Site Design/LID BMPs (where feasible), Source Control, and/or Treatment Control BMPs, project-specific WQMPs shall address all identified pollutants and hydrologic conditions of concern from new development and significant re-development projects for the categories of projects (priority projects) listed in Section 2. Under each type of BMP, listed below, please indicate which BMPs are planned to be implemented and included in the Final WQMP for the project:

### A. Site Design/LID (Low Impact Design) for Reducing Stormwater Runoff:

The MS4 Permit requires each priority development project to infiltrate, harvest and use, evapotranspire, or bio-treat the runoff from a 2-yr, 24-hour storm event (Design Capture Volume). If site conditions do not permit infiltration, harvest and use, evapotranspiration, and/or bio-treatment of the entire Design Capture Volume, at the project site, Site Design/LID techniques are required to be implemented to the Maximum Extent Practicable, at the project site, and the remainder of the DCV shall be infiltrated, harvested, bio-treated or treated by alternative measures. Project applicants shall submit a Preliminary WQMP that documents the LID/Site Design BMPs, proposed for the project. Please indicate, in the table below, which Site Design/LID BMPs will be utilized on this project to accomplish this requirement:

| Site Design/LID Practice | Planned | Not Planned |
|---|---|---|
| Provide at least the minimum effective area required for LID BMPs, to comply with the WQMP (see Table 3-1 below). | | ✔ |
| Grade parking lot areas/drive aisles/roof drains to sheet flow runoff into landscaped swales, via curb cuts or zero-face curbs or otherwise disconnect direct drainage from MS4. | ✔ | |
| Design landscaped areas as swales and grade to accept runoff from building roofs, parking lots and project roadways. | | ✔ |
| Install surface retention basins or infiltration trenches to receive impervious area runoff. | ✔ | |
| Install pervious pavement in parking stalls, alleys, driveways, gutters, walkways, trails or patios. | | ✔ |
| Install underground stormwater retention chambers where downstream landscaped areas are limited. | ✔ | |
| Install approved Stormwater Drywells in detention areas. | | ✓ |
| Construct streets, sidewalks, and parking lot stalls to the minimum widths necessary. | ✔ | |
| Install on-site Biotreatment basins/trenches with underdrains, where soil type is poorly draining. | | ✔ |
| Install "Engineered Soil" to increase uptake/soil storage capacity and/or evapotranspiration. | | ✔ |
| Install Rainwater Harvesting/Use Equipment. | | ✓ |
| Regional LID BMP facilities are installed, off-site, with the capacity and conveyances to accept post-development storm water runoff from this project and reserved capacity allocation credits have been assigned to the project, in a Certificate or other legally binding document, attached herein | ✔ | |

Table 3-1 Minimum Effective Area[1] Required for LID BMPs (surface + subsurface facilities) for Project WQMP to Demonstrate Infeasibility[2] (% of site)

| Project Type | New Development | Re-Development |
|---|---|---|
| SF/MF Residential < 7 du/ac | 10% | 5% |
| SF/MF Residential < 7 - 18 du/ac | 7% | 3.5% |
| SF/MF Residential > 18 du/ac | 5% | 2.5% |
| Mixed Use, Commercial/Industrial w/FAR< 1.0 | 10% | 5% |
| Mixed Use, Commercial/Industrial w/FAR 1.0-2.0 | 7% | 3.5% |
| Mixed Use, Commercial/Industrial w/FAR> 2.0 | 5% | 2.5% |
| Podium (parking under > 75% of project) | 3% | 1.5% |
| Zoning allowing development to property lines | 2% | 1% |
| Transit Oriented Development[3] | 5% | 2.5% |
| Parking | 5% | 2.5% |

[1] "Effective area" is defined as land area which 1) is suitable for a retention/infiltration BMP (based on infeasibility criteria) and 2) is located down-gradient from building roof or paved areas, so that it may receive gravity flow runoff.
[2] Criteria only required if the project WQMP seeks to demonstrate that the full DCV cannot be feasibly managed on-site.
[3] Transit oriented development is defined as a project with development center within one half mile of a mass transit center.
Key: du/ac = dwelling units/acre, FAR = Floor Area Ratio = ratio of gross floor area of building to gross lot area, MF = Multi Family, SF = Single Family

**B. Source Control BMPs –** The following BMPs are designed to control stormwater pollutants and runoff water at the location where it is generated. Please indicate which of the listed BMPs are planned to be implemented for the project:

| Source Control BMPs | Planned | Not Planned |
|---|---|---|
| Minimize non-stormwater site runoff through efficient irrigation system design and controllers. | ✔ | |
| Minimize trash and debris in storm runoff through a regular parking lot, storage yard and roadway sweeping program. | ✔ | |
| Provide proper covers/roofs and secondary containment for outside material storage & work areas. | | ✔ |
| Provide solid roofs over all trash enclosures. | ✓ | |
| Site Owner(s)/Property Manager/HOA or POA will be familiar with the project WQMP and stormwater BMPs. | ✔ | |
| Owner or HOA or POA to provide Education/Training of site occupants and employees on stormwater BMPs. | ✔ | |
| Install stormwater placards/stenciled messages with a "No Dumping" message on all on-site/off-site storm drain inlets. | ✔ | |
| Provide contained equipment/vehicle wash rack areas that discharge to sanitary sewer. | | ✔ |

**C. Treatment Control BMPs –** The following BMPs are designed to control stormwater pollutants where it is not feasible to install on-site or off-site Site Design/LID BMPs, with the requisite capacity to treat the Design Capture Volume for identified Pollutants of Concern or where pretreatment of stormwater runoff is required, ahead of infiltration BMPs. Please indicate which of the listed BMPs are planned to be implemented for the project:

| Treatment Control BMP | Planned | Not Planned |
|---|---|---|
| Gravity Separator devices for pretreatment of sediment, trash/litter or Oil & Grease | ✔ | |
| Proprietary Biofiltration vaults/devices | | ✓ |
| Media Cartridge Filtration Vaults | | ✓ |
| Proprietary Filter Inserts for on-site storm drain inlets or retention basin/trench overflow drains | | ✔ |

4. **Volume-based calculation (approximate) for sizing on-site or off-site Stormwater Retention/Infiltration, Harvest & Re-Use or Biotreatment facilities**

1) After calculating the "Watershed Imperviousness Ratio", i, which is equal to the percent of impervious area in each Drainage Management Area, divided by 100, calculate the composite runoff coefficient $C_{BMP}$ for the Drainage Area above using the following equation:

$$C_{BMP} = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$$

where: $C_{BMP}$ = composite runoff coefficient; and,

**i** = watershed imperviousness ratio.

3) Determine the area-averaged "6-hour Mean Storm Rainfall", $P_6$, for the Drainage Area. This is calculated by multiplying the area averaged 2-year 1-hour value (0.5"-0.6") by the appropriate regression coefficient (1.4807). The 2-yr, 1-hr value for southern Ontario is approximately to 0.5" ($P_6$ = 0.5*1.4807 = 0.74 and northern Ontario is approximately 0.6" in/hr ($P_6$ = 0.6*1.4807 = 0.89).

4) Determine the appropriate drawdown time. Use the regression constant a = 1.582 for 24 hours and a = 1.963 for 48 hours. *Note: Regression constants are provided for both 24 hour and 48-hour drawdown times; however, 48-hour drawdown times should be used in most areas of California. Drawdown times in excess of 48 hours should be used with caution as vector breeding can be a problem after water has stood in excess of 72 hours. (Use of the 24-hour drawdown time should be limited to drainage areas with coarse soils (Class 'A' soils that readily drain.)*

5) Calculate the "Maximized Detention Volume", $P_0$, using the following equation:

$$P_0 = a \cdot C_{BMP} \cdot P_6$$

where: $P_0$ = Maximized Detention Volume, in inches

**a** = 1.582 for 24 hour and a = 1.963 for 48-hour drawdown,

$C_{BMP}$ = composite runoff coefficient; and,

$P_6$ = 6-hour Mean Storm Rainfall, in inches

6) Calculate the "Target Capture Volume", $V_0$, using the following equation:

$$V_0 = (P_0 \cdot A) / 12$$

where: $V_0$ = Target Capture Volume, in acre-feet

$P_0$ = Maximized Detention Volume, in inches; and,

**A** = BMP Drainage Area, in acres

**Project Volume-based calculation (approximate) for planned on-site or off-site Stormwater Retention/Infiltration, Harvest & Re-Use or Biotreatment facilities:**

| Variable | Factor/Formula | DA5 DMA A | DA7A DMA A | DA7B DMA A | DA8 DMA A |
|---|---|---|---|---|---|
| Impervious surface/total surface, ratio | (i) | 0.847 | 0.811 | 0.813 | 0.809 |
| $C_{BMP}$= runoff coefficient | $0.858i^3 - 0.78i^2 + 0.774i + 0.04$ | 0.658 | 0.613 | 0.615 | 0.610 |
| $P_6$ | **$P_6$ = 2-yr,1-hr depth*1.4807 = | 0.865 | 0.865 | 0.865 | 0.865 |
| Detention Volume (acre inches) | $P_0 = a * C_{BMP} * P_6$ = | 1.117 | 1.040 | 1.043 | 1.036 |
| Drawdown rate of basin/trench (a) | 1.963 for 48-hr drawdown = | 1.963 | 1.963 | 1.963 | 1.963 |
| Project Total Area (acre) | (A) | 8.27 | 12.86 | 13.26 | 26.37 |
| Design Capture Volume in cu. ft. | $V_0 = [(P_0 * A)/12] *43560$ = | 33,536 | 48,553 | 50216 | 99,177 |
| Retention Volume provided in cubic feet. | Retention capacity of basins, trenches, underground storage or biotreatment basin | 34,504 | 49,136 | 50,886 | 99,821 |

| Variable | Factor/Formula | DA9 DMA A | DA10 DMA A | DA11 DMA A | DA12 DMA A |
|---|---|---|---|---|---|
| Impervious surface/total surface, ratio | (i) | 0.805 | 0.843 | 0.844 | 0.804 |
| $C_{BMP}$= runoff coefficient | $0.858i^3 - 0.78i^2 + 0.774i + 0.04$ | 0.606 | 0.652 | 0.653 | 0.605 |
| $P_6$ | **$P_6$ = 2-yr,1-hr depth*1.4807 = | 0.865 | 0.865 | 0.865 | 0.865 |
| Detention Volume (acre inches) | $P_0 = a * C_{BMP} * P_6$ = | 1.029 | 1.107 | 1.109 | 1.026 |
| Drawdown rate of basin/trench (a) | 1.963 for 48-hr drawdown = | 1.963 | 1.963 | 1.963 | 1.963 |
| Project Total Area (acre) | (A) | 13.34 | 16.07 | 17.04 | 16.56 |
| Design Capture Volume in cu. ft. | $V_0 = [(P_0 * A)/12] *43560$ = | 49,811 | 64,592 | 68,602 | 61,697 |
| Retention Volume provided in cubic feet. | Retention capacity of basins, trenches, underground storage or biotreatment basin | 50,147 | 65,711 | 69,302 | # 62,132/ Offsite Biotreatment |

| Variable | Factor/Formula | DA13 DMA A | DA14A DMA A | DA14B DMA A | DA15 DMA A |
|---|---|---|---|---|---|
| Impervious surface/total surface, ratio | (i) | 0.809 | 0.180 | 0.190 | 0.170 |
| $C_{BMP}$= runoff coefficient | $0.858i^3 - 0.78i^2 + 0.774i + 0.04$ | 0.610 | 0.159 | 0.165 | 0.153 |
| $P_6$ | **$P_6$ = 2-yr,1-hr depth*1.4807 = | 0.865 | 0.865 | 0.865 | 0.865 |
| Detention Volume (acre inches) | $P_0 = a * C_{BMP} * P_6$ = | 1.036 | 0.270 | 0.280 | 0.26 |
| Drawdown rate of basin/trench (a) | 1.963 for 48-hr drawdown = | 1.963 | 1.963 | 1.963 | 1.963 |
| Project Total Area (acre) | (A) | 26.26 | 7.01 | 6.89 | 13.66 |
| Design Capture Volume in cu. ft. | $V_0 = [(P_0 * A)/12] *43560$ = | 98,742 | 6,877 | 6,991 | 12,906 |
| Retention Volume provided in cubic feet. | Retention capacity of basins, trenches, underground storage or biotreatment basin | #98,956/ Offsite Biotreatment | 6,942 | 7,129 | 13,076 |

| Variable | Factor/Formula | DA16 DMA A | DA17A DMA A | DA17B DMA A | DA18 DMA A |
|---|---|---|---|---|---|
| Impervious surface/total surface, ratio | (i) | 0.161 | 0.191 | 0.150 | 0.170 |
| $C_{BMP}$= runoff coefficient | $0.858i^3 - 0.78i^2 + 0.774i + 0.04$ | 0.148 | 0.165 | 0.141 | 0.153 |
| $P_6$ | **$P_6$ = 2-yr,1-hr depth*1.4807 = | 0.865 | 0.865 | 0.865 | 0.865 |
| Detention Volume (acre inches) | $P_0 = a * C_{BMP} * P_6$ = | 0.252 | 0.280 | 0.240 | 0.260 |
| Drawdown rate of basin/trench (a) | 1.963 for 48-hr drawdown = | 1.963 | 1.963 | 1.963 | 1.963 |
| Project Total Area (acre) | (A) | 10.61 | 3.00 | 3.43 | 13.79 |
| Design Capture Volume in cu. ft. | $V_0 = [(P_0 * A)/12] *43560$ = | 9,692 | 3049 | 2992 | 13,016 |
| Retention Volume provided in cubic feet. | Retention capacity of basins, trenches, underground storage or biotreatment basin | 9,704 | 3120 | #3120/ Offsite Biotreatment | #13,400/ Offsite Biotreatment |

| Variable | Factor/Formula | DA22 DMA A | DA DMA A | DA DMA A | DA DMA A |
|---|---|---|---|---|---|
| Impervious surface/total surface, ratio | (i) | 0.188 | | | |
| $C_{BMP}$= runoff coefficient | $0.858i^3 - 0.78i^2 + 0.774i + 0.04$ | 0.164 | | | |
| $P_6$ | **$P_6$ = 2-yr,1-hr depth*1.4807 = | 0.865 | | | |
| Detention Volume (acre inches) | $P_0 = a * C_{BMP} * P_6$ = | 0.278 | | | |
| Drawdown rate of basin/trench (a) | 1.963 for 48-hr drawdown = | 1.963 | | | |
| Project Total Area (acre) | (A) | 1.73 | | | |
| Design Capture Volume in cu. ft. | $V_0 = [(P_0 * A)/12] *43560$ = | 1,751 | | | |
| Retention Volume provided in cubic feet. | Retention capacity of basins, trenches, underground storage or biotreatment basin | 2,102 | | | |

**For $P_6$ value, use site coordinates and NOAA website to determine project's average 2-yr, 1-hr rainfall depth, at: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html .

# In case of available "Storm Water Treatment Capacity" credit for Mill Creek Wetland watershed, the developer will have the option to use "Offsite Biotreatment Facility (i.e. Mill Creek Wetland)" for the tributary area DCV and not to build any onsite infiltration Basin.

**5. Flow-Based calculation (approximate) for sizing on-site or off-site Biotreatment facilities and proprietary treatment technology BMPs:**

1) After calculating the "Watershed Imperviousness Ratio", i, which is equal to the percent of impervious area in each Drainage Management Area divided by 100, calculate the composite runoff coefficient $C_{BMP}$ for the Drainage Area above using the following equation:

$$C_{BMP} = 0.858i^3 - 0.78i^2 + 0.774i + 0.04$$

where: $C_{BMP}$ = composite runoff coefficient; and,

**i** = watershed imperviousness ratio.

2) Determine BMP design rainfall intensity, **$I_{BMP}$**, using the project site geo-coordinates and the NOAA website to determine project's average 2-yr, 1-hr rainfall intensity, at: http://hdsc.nws.noaa.gov/hdsc/pfds/sa/sca_pfds.html .Multiply this value by 0.2787 (regression coefficient for Ontario) and a minimum safety factor of 2.

4) Calculate the target BMP flowrate, Q, using the following formula (for each DMA <50 acres*):

$$Q = C_{BMP} \cdot I_{BMP} \cdot A$$

Where: **Q** = flow in cfs (Cubic feet per second)
**$I_{BMP}$** = BMP design rainfall intensity, in/hr
**A** = Drainage Area in acres

*For DMAs >50 acres, with $C_{BMP}$ <0.5, the project applicant shall use the unit hydrograph method specified in the San Bernardino County Hydrology Manual, using the design storm pattern with rainfall return frequency such that the peak 1-hr rainfall intensity equals the 85th percentile 1-hr rainfall, multiplied by 2.

**Project Flow-based calculation (approximate) for planned on-site or off-site flow-based Biotreatment facilities or Stormwater Treatment BMPs:**

| Variable | Factor/Formula | DA1 DMA A | DA1 DMA B | DA2 DMA A | DA2 DMA B |
|---|---|---|---|---|---|
| Impervious surface/ total surface, ratio | (i) | | | | |
| $C_{BMP}$= composite runoff coefficient | $0.858i^3 + 0.78i^2 + 0.774i + 0.04$ | | | | |
| $I_{BMP}$ | $I_{BMP}$ = 2-yr,1-hr storm intensity*0.2787*safety factor | | | | |
| Drainage area (ac) | A = DMA sq ft/43,560 | | | | |
| Target BMP flowrate | Q = $C_{BPM}$* $I_{BMP}$ * A | | | | |

**6. Hydrologic Conditions of Concern (HCOC) and use of the on-line San Bernardino County HCOC Map for determining necessary mitigation steps necessary if there are HCOCs downstream of a project:**

Project applicants may access the on-line HCOC Map at: http://permitrack.sbcounty.gov/WAP/. The map will indicate any hydrology concerns with downstream waterways that are hydraulically connected to the project and will indicate if there are any approved regional projects downstream that could be utilized for off-site mitigation of HCOCs. Please indicate here if the project will or will not be able to retain/infilter, harvest and use or biotreat and detain the DCV, on-site, as calculated in Section 4 and if there are HCOCs identified downstream of the project:

| | | | | |
|---|---|---|---|---|
| Retain or Harvest/Use the DCV on site? | Yes | | No | ✔ |
| Biotreat the DCV but not infilter the runoff? | Yes | | No | ✔ |
| HCOCs identified downstream of site? | Yes | ✔ | No | |

If the entire DCV will not be retained on site, the DCV is biotreated but not infiltered or additional detention capacity is needed to address identified HCOCs, downstream of the site, please list here, what additional mitigation measures will be utilized (on-site or off-site) to address HCOCs (see Section 4.2.1-4.2.3 of the SB County WQMP Technical Guidance):

_____

_____

**7. Site Plan and Conceptual Grading/Drainage Plan requirements for submission with the Preliminary WQMP:**

Provide a Site Plan and Conceptual Grading/Drainage Plan along with this Preliminary WQMP, which conceptually shows the proposed locations of buildings, homes, parking lots, parks, new paved roadways, landscaped areas, drainage patterns and drainage sub-areas, methods of conveyance, proposed retention/infiltration, harvest & use or biotreatment facilities that are planned for installation. Where it is determined to be infeasible to capture and detain design storm runoff volumes, on-site, please include other design features, as described in Section 3, above. Include numbered or lettered notes on the Site Plan with a legend detailing other BMPs, as described in Section 3.

**8. BMP Maintenance and Funding Mechanism & Description:**

_____

_____

**9. Acknowledgment:**

As the property owner or developer, I understand that this project is required to install and implement permanent LID Storm Water Best Management Practices pursuant to the requirements of the San Bernardino County MS4 Permit and to document those BMPs in the submittal of a Water Quality Management Plan, which is binding on any current or successive owners of this property.

| Yes | | No | |
|---|---|---|---|

**10. Exemption Signature:**

As the property owner or developer, I understand that this project is not required by the San Bernardino County MS4 Permit to install and implement permanent LID Storm Water Best Management Practices and will not be required to submit a Water Quality Management Plan.

_____ _____

Signature of Owner or Developer Date

# SITE PLAN AND DRAINAGE PLAN

- Vicinity Map
- Site Plan, Drainage Flow and LID BMP Plan

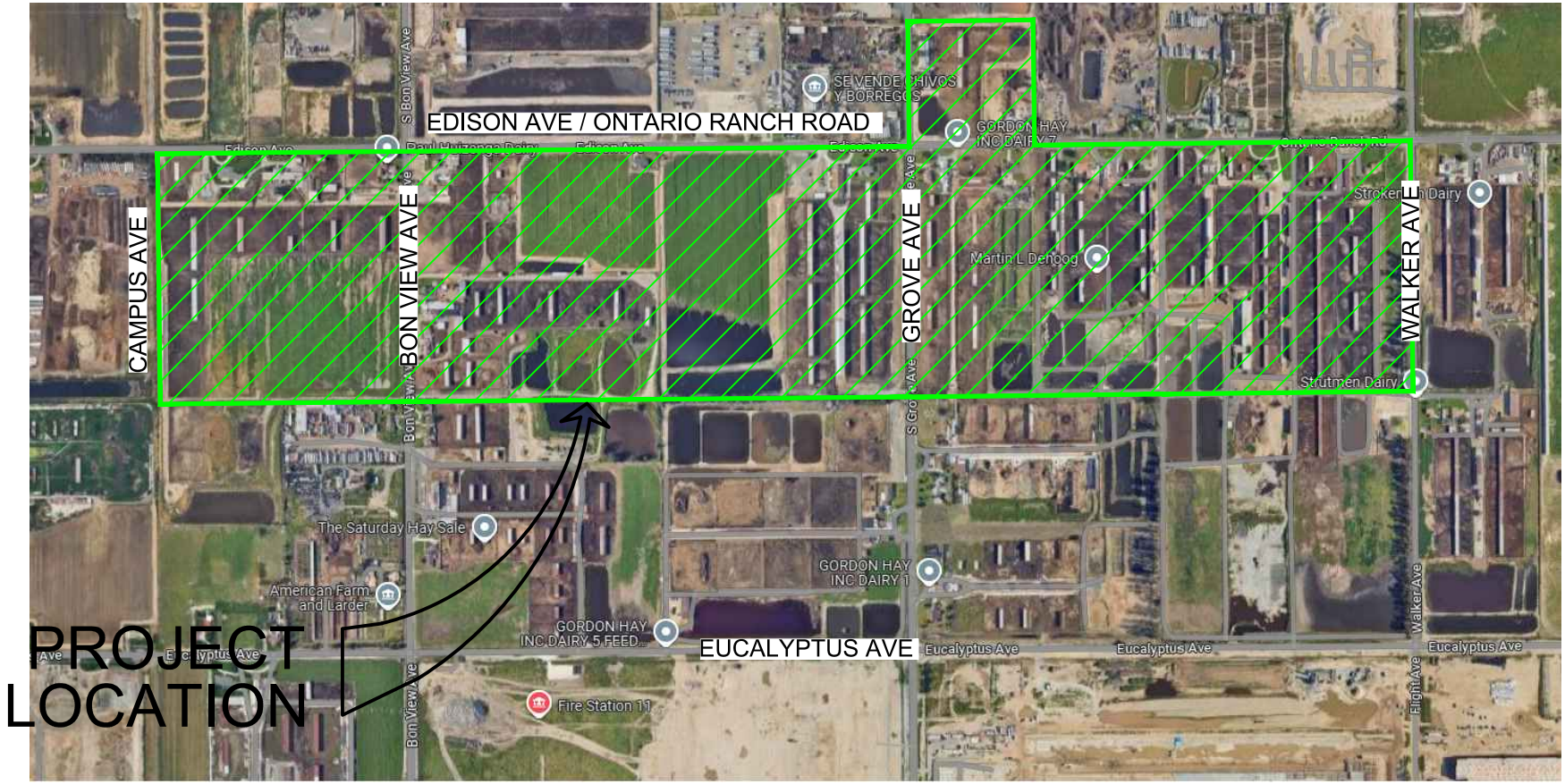


# VICINITY MAP

NOT TO SCALE

# WQMP SITE PLAN
# AND CONCEPTUAL DRAINAGE PLAN
# CENTER PARK SPECIFIC PLAN

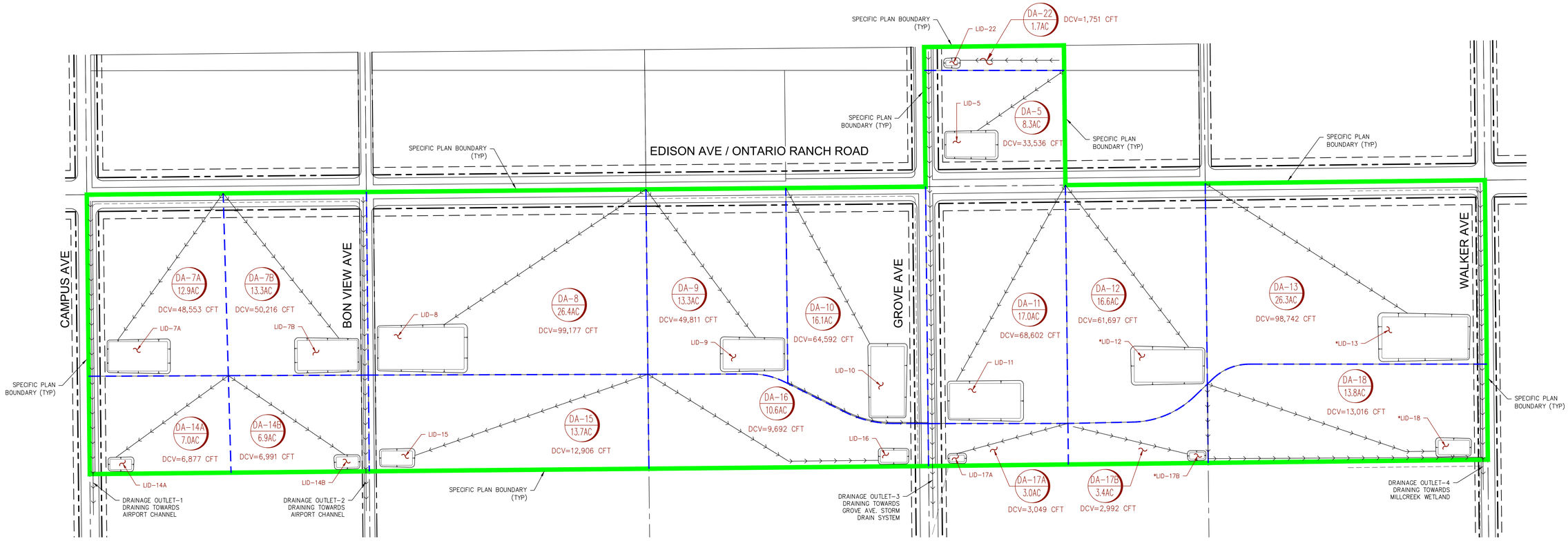


| PROPOSED LAND USE | |
|---|---|
| PLANNING AREA NO. | LAND USE |
| 5 | MIXED USE RESIDENTIAL |
| 5 | MIXED USE RETAIL |
| 5 | MIXED USE OFFICE |
| 7 | MDR (11.1 - 25.0 DU/AC) |
| 8 | MDR (11.1 - 25.0 DU/AC) |
| 9 | MDR (11.1 - 25.0 DU/AC) |
| 10 | MIXED USE RESIDENTIAL |
| 10 | MIXED USE RETAIL |
| 10 | MIXED USE OFFICE |
| 11 | MIXED USE RESIDENTIAL |
| 11 | MIXED USE RETAIL |
| 11 | MIXED USE OFFICE |
| 12 | MDR (11.1 - 25.0 DU/AC) |
| 13 | MDR (11.1 - 25.0 DU/AC) |
| 14 | OS-R (PARKLAND) |
| 15 | OS-R (PARKLAND) |
| 16 | OS-R (PARKLAND) |
| 17 | OS-R (PARKLAND) |
| 18 | OS-R (PARKLAND) |
| 22 | OS-NR (Non-Recreation) |

## DRAINAGE AREA AND LID SCHEDULE

| DA ID | AREA (SF) | PLANNING AREA NO. | AVERAGE IMPERVIOUS % | DCV (CFT) | LID ID | MAX. STORAGE DEPTH (FT) | BOTTOM LENGTH OF INFILTRATION BASIN | BOTTOM WIDTH OF INFILTRATION BASIN | PROPOSED INFILTRATION BASIN CAPACITY |
|---|---|---|---|---|---|---|---|---|---|
| DA-5 | 360,292 | 5 | 84.75% | 33,536 | LID-5 | 1.2 | 235 | 114 | 33,929 |
| DA-7A | 560,296 | 7 | 81.12% | 48,553 | LID-7A | 1.2 | 279 | 140 | 49,136 |
| DA-7B | 577,556 | 7 | 81.29% | 50,216 | LID-7B | 1.2 | 284 | 142 | 50,886 |
| DA-8 | 1,148,771 | 8 | 80.93% | 99,177 | LID-8 | 1.2 | 403 | 200 | 99,821 |
| DA-9 | 581,167 | 9 | 80.56% | 49,811 | LID-9 | 1.2 | 285 | 140 | 50,147 |
| DA-10 | 700,149 | 10 | 84.30% | 65,030 | LID-10 | 1.2 | 329 | 159 | 65711 |
| DA-11 | 742,445 | 11 | 84.38% | 68,602 | LID-11 | 1.2 | 335 | 165 | 69302 |
| DA-12 | 721,403 | 12 | 80.45% | 61,697 | *LID-12 | 1.2 | 323 | 153 | 62132 |
| DA-13 | 1,143,731 | 13 | 80.93% | 98,742 | *LID-13 | 1.2 | 406 | 196 | 98,956 |
| DA-14A | 305,309 | 14 | 18.03% | 6,877 | LID-14A | 1.2 | 103 | 49 | 6,942 |
| DA-14B | 299,932 | 14 | 19.00% | 6,991 | LID-14B | 1.2 | 104 | 50 | 7,129 |
| DA-15 | 594,886 | 15 | 17.02% | 12,906 | LID-15 | 1.2 | 147 | 67 | 13,076 |
| DA-16 | 462,097 | 16 | 16.15% | 9,692 | LID-16 | 1.2 | 126 | 57 | 9,704 |
| DA-17A | 130,481 | 17 | 19.07% | 3,049 | LID-17A | 1.2 | 70 | 30 | 3,120 |
| DA-17B | 149,531 | 17 | 15.00% | 2,992 | *LID-17B | 1.2 | 70 | 30 | 3,120 |
| DA-18 | 600,659 | 18 | 16.99% | 13,016 | *LID-18 | 1.2 | 148 | 68 | 13,400 |
| DA-22 | 75,532 | 22 | 18.85% | 1,751 | LID-22 | 1.2 | 55 | 25 | 2,102 |

*IN CASE OF AVAILABLE "STORM WATER TREATMENT CAPACITY" CREDIT FOR MILL CREEK WETLAND WATERSHED, THE DEVELOPER WILL HAVE THE OPTION TO USE "OFFSITE BIOTREATMENT FACILITY (I.E. MILL CREEK WETLAND)" FOR THE RESPECTIVE TRIBUTARY AREA'S DCV AND NOT TO BUILD ANY ONSITE INFILTRATION FACILITY.

*LEGEND:*

- SPECIFIC PLAN BOUNDARY
- DRAINAGE AREA BOUNDARY
- DA-1 / XAC / DCV=X — DRAINAGE AREA NUMBER; AREA IN ACRES; DCV IN CU-FT
- DRAINAGE FLOW (CONCEPTUAL)
- INFILTRATION BASIN FOOTPRINT (CONCEPTUAL)

N

200' 0' 100' 200' 400'

SCALE: 1" = 200'


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FULL CIRCLE THINKING
15535 Sand Canyon Ave 949.474.1960
Suite 100
Irvine, California 92618 fuscoe.com

# APPENDIX H

## ACOUSTICAL ASSESSMENT

# Acoustical Assessment

# Center Park Specific Plan Project

**Prepared for:**

City of Ontario
Rafael Torres
Assistant Planner
303 East N Street
Ontario, California 91764
909.395.297

**Prepared by:**

Kimley-Horn and Associates, Inc.
1100 W. Town and Country Road, Suite 700
Orange, California 92868
714.939.1030

May 2025

Kimley»Horn

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## Appendices

Appendix A: Noise Data

# LIST OF ABBREVIATED TERMS

| | |
|---|---|
| AH | Affordable Housing |
| AG | Agriculture |
| AB | Assembly Bill |
| APN | Assessor Parcel Number |
| ADT | average daily traffic |
| dBA | A-weighted decibel |
| CalEEMod | California Emissions Estimator Model |
| CEQA | California Environmental Quality Act |
| Caltrans | California Department of Transportation |
| CNO | Chino Airport |
| CNEL | Community Equivalent Noise Level |
| Ldn | day-night noise level |
| dB | decibel |
| DU | dwelling units |
| EMFAC | EMission FACtor |
| $L_{eq}$ | equivalent noise |
| FHWA | Federal Highway Administration |
| FTA | Federal Transit Administration |
| FSEIR | Final Supplemental Environmental Impact Report |
| HVAC | Heating, ventilation, and air conditioning |
| HZ | Hertz |
| in/sec | Inches-per-second |
| I-10 | Interstate 10 |
| I-15 | Interstate 15 |
| LOR | Laws, ordinances and regulations |
| MDR | Medium Density Residential |
| µPa | Micro-pascals |
| MM | Mitigation Measure |
| MU – Great Park | Mixed-Use – Great Park |
| OS – R | Open Space – Recreation |
| PPV | Peak particle velocity |
| PAs | Planning Areas |
| RCNM | Roadway Construction Noise Model |
| RMS | Root mean square |
| SB | Senate Bill |
| SP | Specific Plan |
| SF | Square feet |
| SR-60 | State Route 60 |
| SR-91 | State Route 91 |
| TOP 2050 | The Ontario Plan 2050 |
| VdB | vibration decibels |

# 1.0 INTRODUCTION

This report documents the results of an Acoustical Assessment completed for the Center Park Specific Plan Project (Project). The purpose of this Acoustical Assessment is to evaluate the potential construction and operational noise and vibration levels associated with the Project and the level of impact the Project would have on the environment. A comparative analysis has been undertaken to determine whether the Project would result in any new or substantially more severe significant environmental impacts as compared to the conclusions discussed in The Ontario Plan (TOP) 2050, certified Final Supplemental Environmental Impact Report (FSEIR), pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15183 (Projects Consistent with a Community Plan, General Plan, or Zoning). Applicable mitigation measures from the FSEIR have been incorporated into this analysis.

## 1.1 Project Location

The Project site is comprised of 29 parcels totaling 257.34 acres within Ontario Ranch, City of Ontario (City), San Bernardino County (County), California; see **Figure 1: Regional Location Map.** The Assessor Parcel Numbers (APNs) comprising the Project site are 1053-301-01, -02; 1053-311-01, -02; 1053-321-01, -02, -03; 1053 331 01, 02, -03, -04; 1053-341-01, -02; 1053-351-01, -02; 1053-361-01, -02, -03; 1053-371-01, -02; 0216-311-01, -02, -09; 0216-321-03, -08; 0216-322-03, -04, -10; see **Figure 2: Project Site Assessor Parcel Numbers**. The Project site is bounded by a Southern California Edison (SCE) Easement to the north, Walker Avenue to the east, Eucalyptus Avenue to the south, and Campus Avenue to the west; see **Figure 3: Local Vicinity Map**. Land uses surrounding the Project site include a nursery, crop farms, rural residential uses, and dairy farm operations.

Regional access to the Project site is provided by State Route 60 (SR-60) located approximately 2.1 miles to the north, Interstate 15 (I-15) located approximately 4.0 miles to the east, State Route 71 (SR-71), which connects to State Route 91 (SR-91) to the south, located approximately 3.5 miles to the southwest, and Euclid Avenue, which connects SR-71, SR-60, and Interstate 10 (I-10) to the north, located approximately 0.8 mile to the west.

TOP 2050 designates the Project site land use as Medium Density Residential (MDR), Mixed-Use – Great Park (MU – Great Park), Open Space – Recreation (OS – R), and Open Space – Non-Recreation (OS – NR); see **Figure 4: Existing Land Use and Zoning**. The MDR designation permits single-family and multi-family residential uses. The MU – Great Park designation permits commercial, office, and multi-family residential uses. The OS – R designation permits recreational uses. The OS – NR designation permits utility easements and drainage channels and prohibits building development. TOP 2050 zones the Project site as Specific Plan (SP) with an Agriculture (AG) and Chino Airport (CNO) Overlay zoning overlay. The AG overlay requires a transition buffer area between the existing agricultural uses and the proposed urban uses. In addition, the Project site areas designated MDR or MU – Great Park have an Affordable Housing (AH) zoning overlay to increase affordable housing opportunities in compliance with the City's Housing Element and State Housing Element law.

### Project Description

The proposed SP would implement the TOP 2050 vision, establish development standards and procedures, become the governing zoning standards for the Project site, permit a maximum of 802

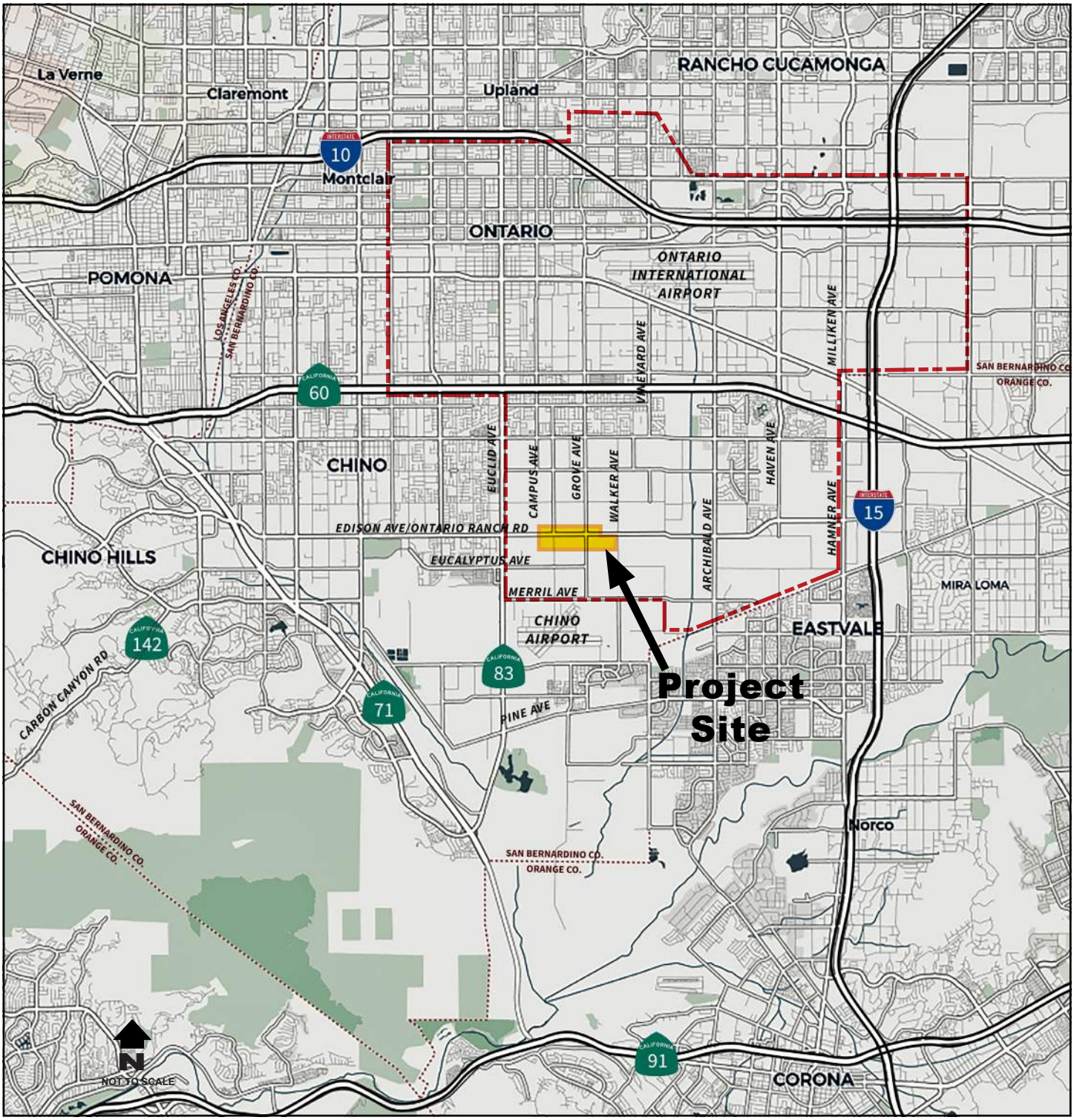


*Source: CenterPark Specific Plan Exhibit 1-1 Regional Location Map, 2024.*

**Figure 1:** Regional Location Map
*Center Park Specific Plan Project*

Not to scale

Kimley»Horn

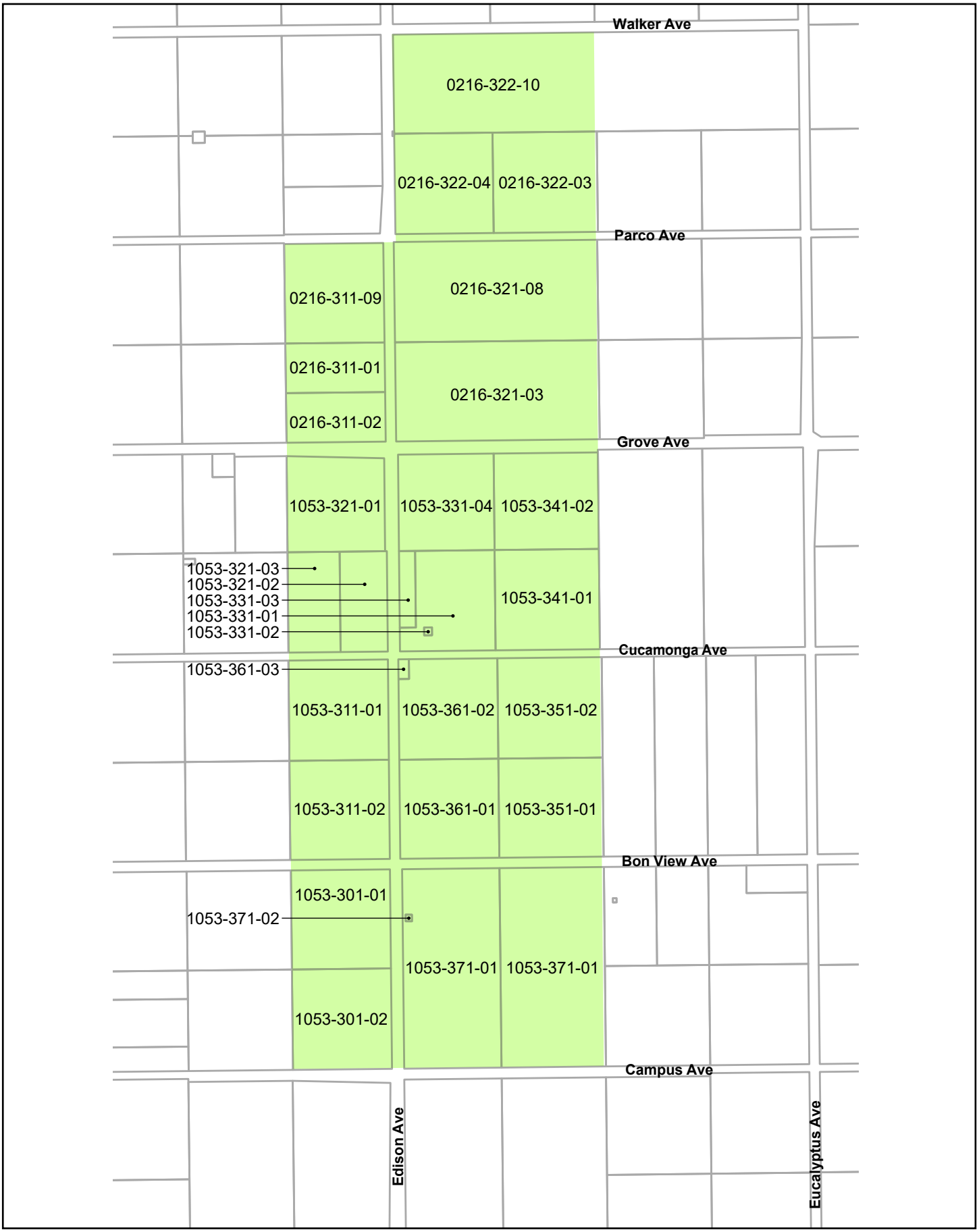


*Source: CenterPark Specific Plan Exhibit 3-1 Assessor's Parcel Numbers, 2024.*

**Figure 2:** Project Site Assessor Parcel Numbers
*Center Park Specific Plan Project*

Not to scale

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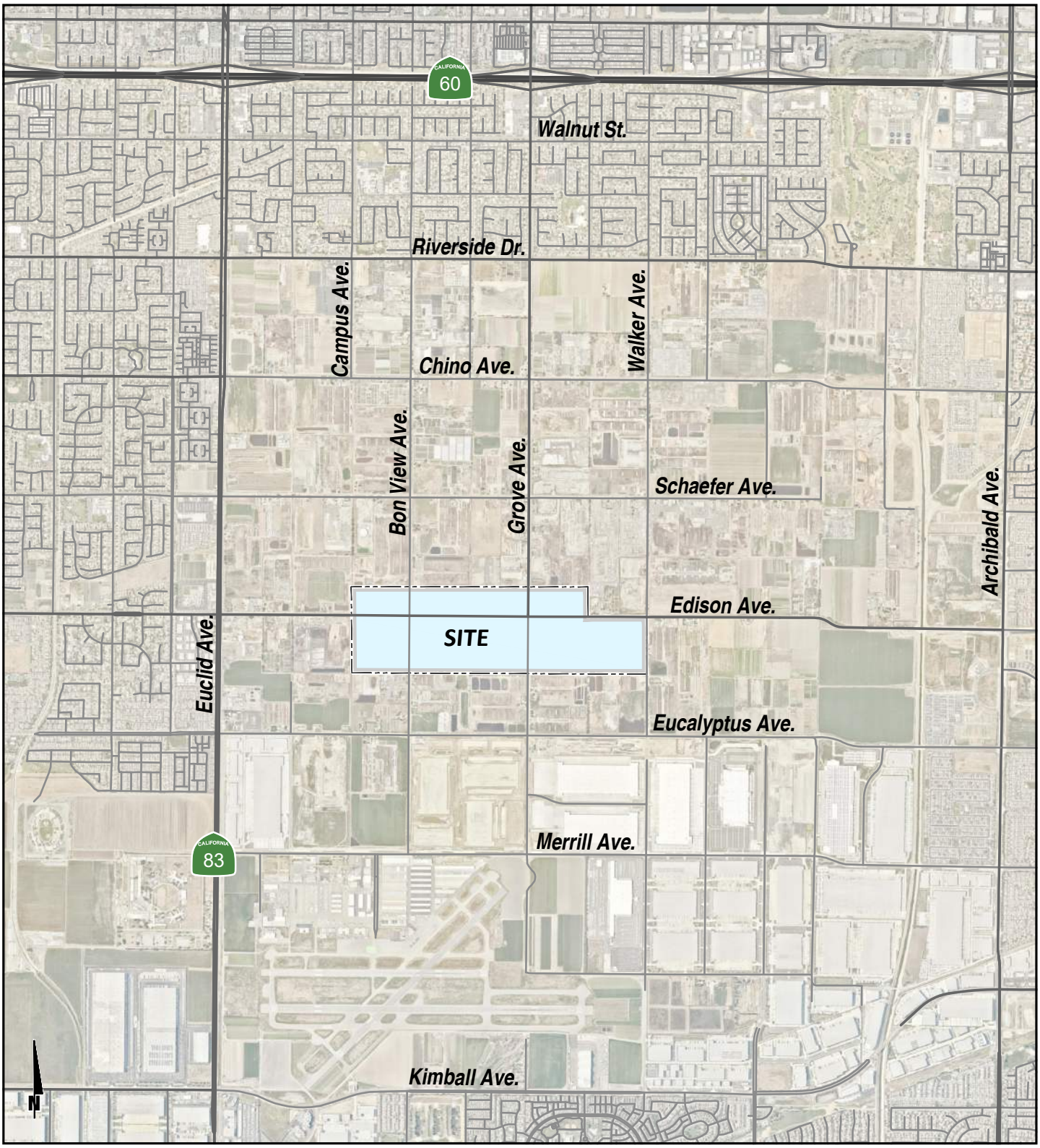


*Source: Center Park Specific Plan Traffic Analysis, Exhibit 1-1 Location Map, 2025.*

**Figure 3:** Local Vicinity Map
*Center Park Specific Plan Project*

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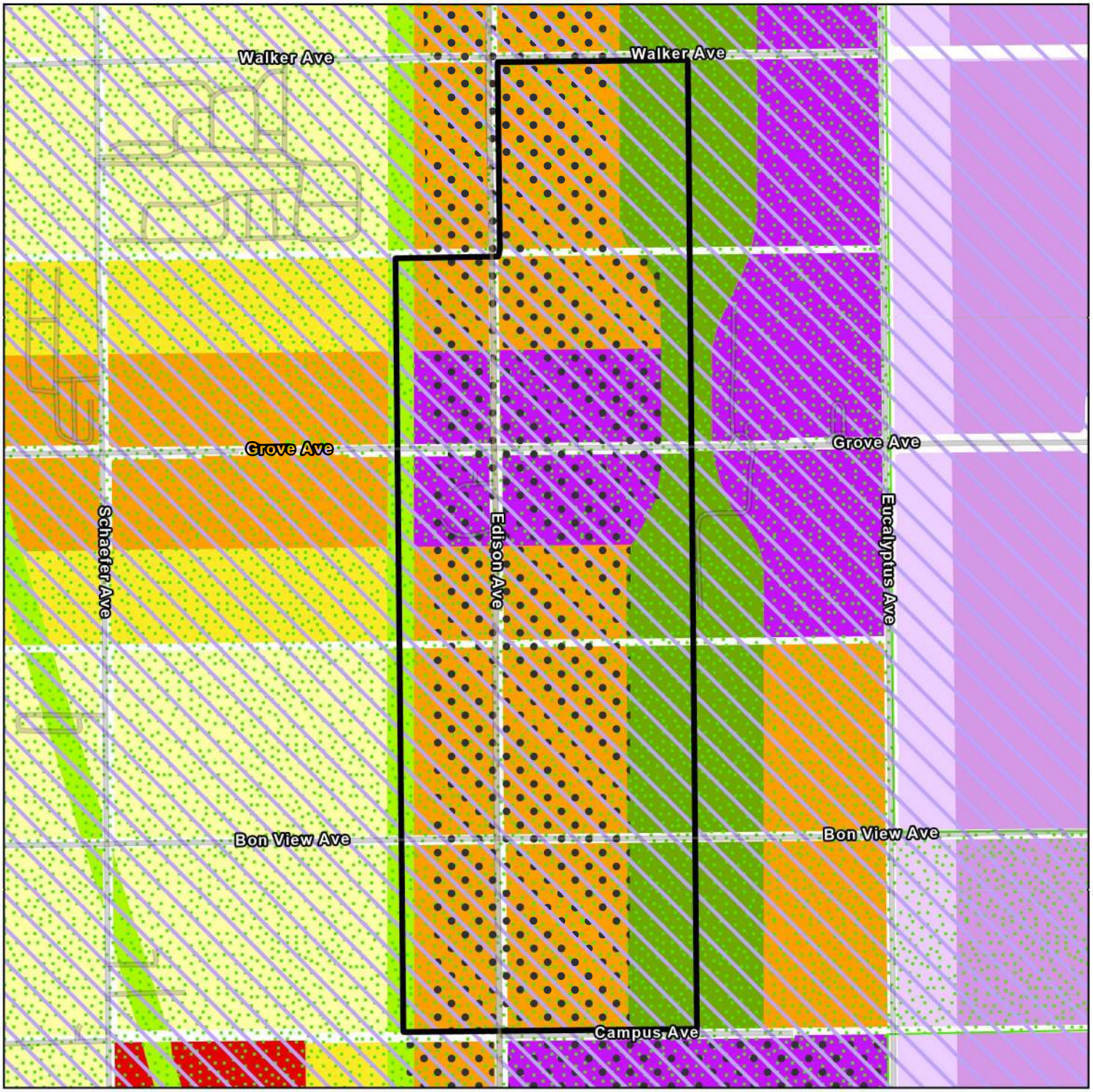


Project Site

**TOP 2050 Land Use Designations**

- RR Rural Residential
- LDR Low Density Residential
- LMDR Low Medium Density Residential
- MDR Medium Density Residential
- HDR High Density Residential
- MU Mixed Use
- NC Neighborhood Commercial
- GC General Commercial
- OC Office Commercial
- HOS Hospitality
- BP Business Park
- IND Industrial
- OS-NR Open Space - Non-Rec
- OS-R Open Space - Recreation
- OS-W Open Space - Water
- PF Public Facility
- PS Public School
- ARPT Airport
- LF Landfill
- Rail

**Zoning Overlay**

- CNO (Chino Airport) Overlay
- AH Affordable Housing
- AG Agricultural

*Source: City of Ontario The Ontario Plan 2050, 2024.*

**Figure 4:** Existing Land Use and Zoning
*Center Park Specific Plan Project*

Not to scale

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single-family dwelling units (DUs), 3,491 multi-family DUs, 250,920 square feet (SF) of commercial space, 55.98 acres of recreational open space, and 11.28 acres of non-recreational open space. The Project site is currently developed by ruderal vegetation, rural residences, and agricultural uses such as livestock raising, field crop farming, and dairy farm operations. The Project would remove all on-site uses and improvements to implement the proposed Project.

The proposed SP would divide the Project site into 22 planning areas (PAs); see **Figure 5: Land Use Plan**. The Project site land use designations would remain consistent with TOP 2050. The proposed SP would serve as the Project site zoning designation, consistent with TOP 2050. The Project would be classified as a Tier 2 affordable housing project, which designates at least 25 percent of the DUs as affordable housing. The Project would be developed in two phases; see **Figure 6: Project Phasing Plan**. Phase I would be developed by the private Applicant. Phase II would be dedicated to the City and would be developed at an unknown, later date following Phase I. This analysis conservatively evaluates the maximum Project development potential, with Phase II being evaluated at the programmatic level.

Phase I

Phase I would develop 256 single-family DUs, 768 multi-family DUs, 19.64 acres of recreational open space, and 3.38 acres of non-recreational open space within PAs 6, 12, 13, 17, 18, and 22; see **Table 1: Maximum Phase I Buildout**. The recreational open space would be designated as part of the City's Grand Park, a planned regional park within the Ontario Ranch area. The developer would construct the recreational open space in accordance with the City's Recreation and Parks Master Plan. The Applicant would submit a Development Plan and Tentative Parcel Map for the Phase I Project site following Project approval. Phase I is anticipated to begin construction as early as 2025 and be operational as early as 2029. For purposes of this analysis, it is conservatively assumed that Phase I would be operational as soon as construction is completed in 2027. This is a worst-case assumption as Phase I occupancy would be dependent on market conditions and permit approvals.

**Table 1: Maximum Phase I Buildout**

| Planning Area | Land Use | TOP 2050 Acreage (AC) | Maximum Residential Density (DU/AC)[1] | Maximum Residential (DU) |
|---|---|---|---|---|
| 6 | MDR | 7.33 | -- | 161 |
| 12 | MDR | 15.46 | 22.0 | 340 |
| 13 | MDR | 23.75 | 22.0 | 523 |
| 17 | OS – R | 6.20 | -- | -- |
| 18 | OS – R | 13.44 | -- | -- |
| 22 | OS – NR | 3.38 | -- | -- |
| | **Phase I Total** | **69.56** | **--** | **1,024** |

AC = acres; DU/AC = dwelling units/ acre; DU = dwelling unit; SF = square feet; MDR = Medium Density Residential; OS – R = Open Space – Recreation; and OS – NR = Open Space – Non-Recreation

1. Maximum residential density per The Ontario Plan 2050, Final Supplemental Environmental Impact Report.

Phase II

Phase II would develop 546 single-family DUs, 2,723 multi-family DUs, 250,920 SF of commercial space, 36.34 acres of recreational open space, and 7.9 acres of non-recreational open space within PAs 1 through 5, 7 through 11, 14 through 16, and 19 through 2; see **Table 2: Maximum Phase II Buildout**. The recreational open space would be designated as part of the City's Grand Park, a

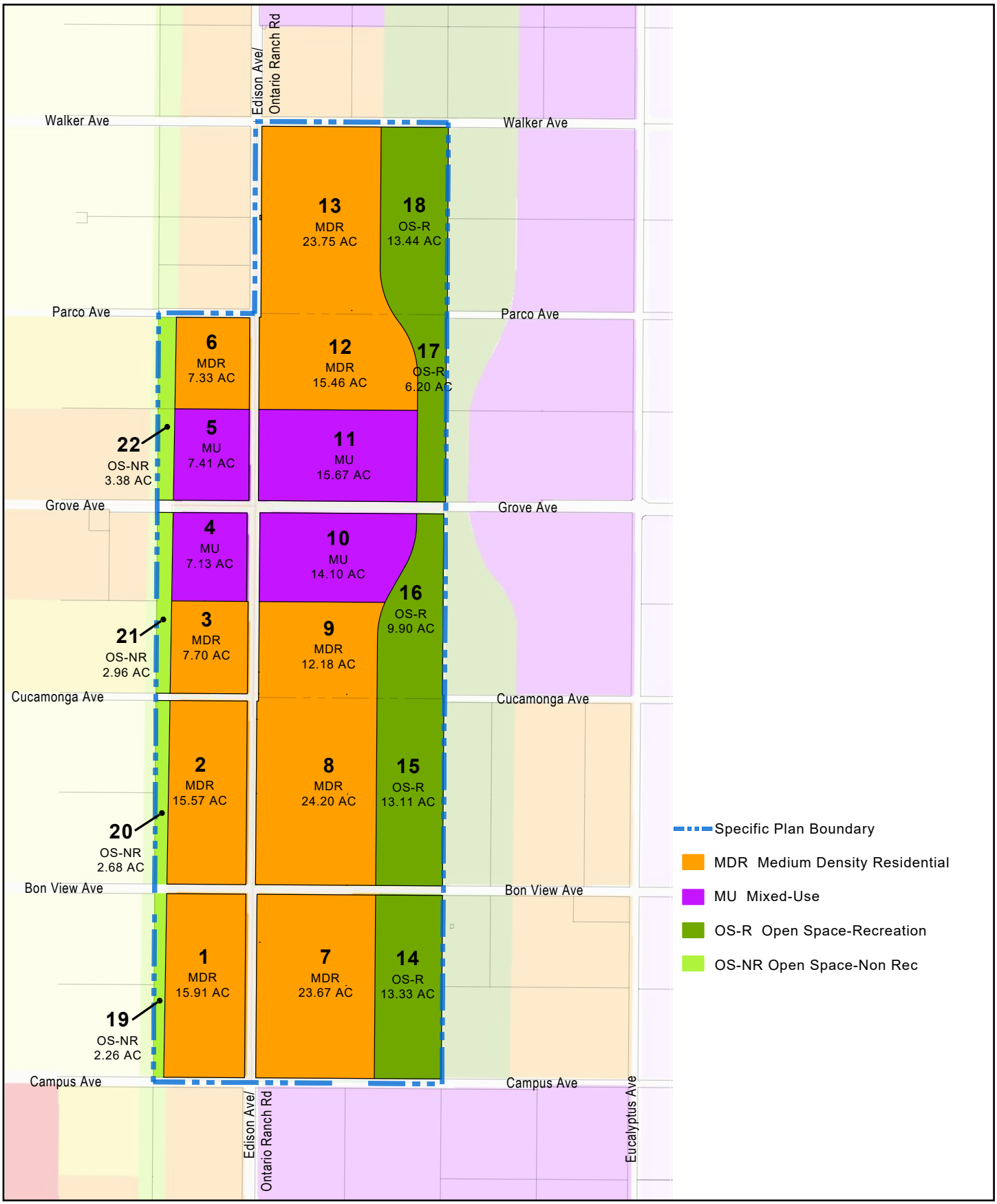


*Source: CenterPark Specific Plan Exhibit 1-3 Land Use Plan, 2024.*

**Figure 5:** Land Use Plan
*Center Park Specific Plan Project*

Not to scale

Kimley»Horn

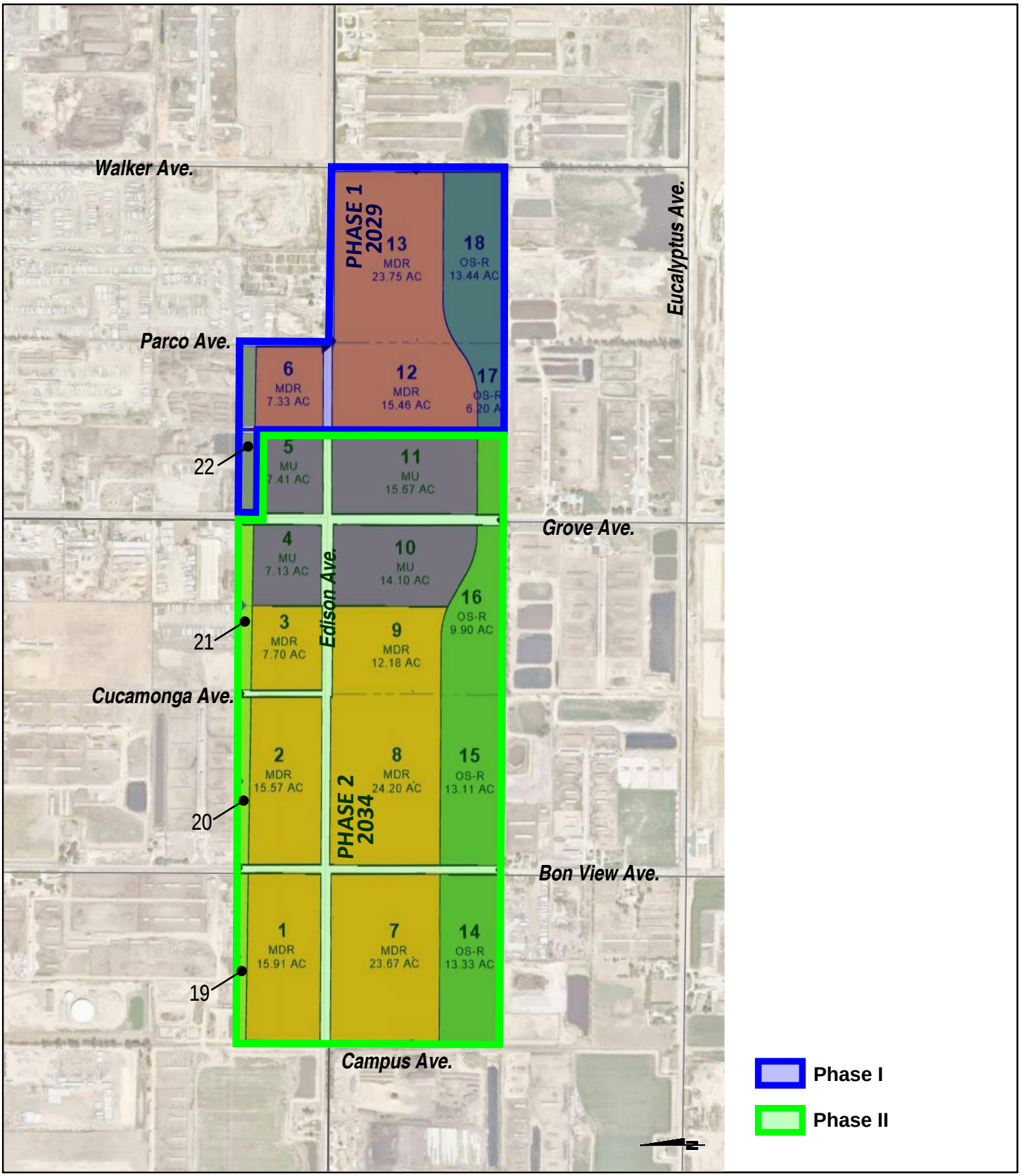


*Source: CenterPark Specific Plan Traffic Analysis, Exhibit 1-2 Preliminary Land Use Plan and Phasing Plan, 2025.*

**Figure 6:** Project Phasing Plan
*Center Park Specific Plan*

Not to scale

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planned regional park within the Ontario Ranch area. The developer would construct the recreational open space in accordance with the City's Recreation and Parks Master Plan. For construction phasing purposes, Phase II is anticipated to begin construction as early as 2026 and be operational as early as 2034. It is conservatively assumed that Phase II would be operational as soon as construction is completed in 2030. This is a worst-case assumption as Phase II construction and occupancy would be dependent on market conditions and permit approvals.

**Table 2: Maximum Phase II Buildout**

| Planning Area | Land Use | TOP 2050 Acreage (AC) | Maximum Residential Density (DU/AC)[1] | Maximum Residential (DU) | Maximum Retail (SF) | Maximum Office (SF) |
|---|---|---|---|---|---|---|
| 1 | MDR | 15.91 | 22.0 | 350 | -- | -- |
| 2 | MDR | 15.57 | 22.0 | 343 | -- | -- |
| 3 | MDR | 7.70 | 22.0 | 169 | -- | -- |
| 4 | MU – Residential | 4.99 | 35.0 | 175 | -- | -- |
| 4 | MU – Retail | 1.43 | -- | -- | 18,635 | -- |
| 4 | MU – Office | 0.71 | -- | -- | -- | 21,741 |
| 5 | MU – Residential | 5.19 | 35.0 | 182 | -- | -- |
| 5 | MU – Retail | 1.48 | -- | -- | 19,367 | -- |
| 5 | MU – Office | 0.74 | -- | -- | -- | 22,595 |
| 7 | MDR | 23.67 | 22.0 | 521 | -- | -- |
| 8 | MDR | 24.20 | 22.0 | 532 | -- | -- |
| 9 | MDR | 12.18 | 22.0 | 268 | -- | -- |
| 10 | MU - Residential | 9.87 | 35.0 | 345 | -- | -- |
| 10 | MU – Retail | 2.82 | -- | -- | 36,852 | -- |
| 10 | MU – Office | 1.41 | -- | -- | -- | 42,994 |
| 11 | MU – Residential | 10.97 | 35.0 | 384 | -- | -- |
| 11 | MU – Retail | 3.13 | -- | -- | 40,955 | -- |
| 11 | MU – Office | 1.57 | -- | -- | -- | 47,781 |
| 14 | OS – R | 13.33 | -- | -- | -- | -- |
| 15 | OS – R | 13.11 | -- | -- | -- | -- |
| 16 | OS – R | 9.90 | -- | -- | -- | -- |
| 19 | OS – NR | 2.26 | -- | -- | -- | -- |
| 20 | OS – NR | 2.68 | -- | -- | -- | -- |
| 21 | OS – NR | 2.96 | -- | -- | -- | -- |
| | **Phase II Total** | **187.79** | **--** | **3,269** | **115,809** | **135,111** |

AC = acres; DU/AC = dwelling units/ acre; DU = dwelling unit; SF = square feet; MDR = Medium Density Residential; MU = Mixed-Use; OS – R = Open Space – Recreation; OS – NR = Open Space – Non-Recreation

1. Maximum residential density per The Ontario Plan 2050, Final Supplemental Environmental Impact Report.

Circulation

The Project would include a Circulation Plan to facilitate the movement of vehicles, pedestrians, and cyclists within the Project area. Local access to the Project site would be provided via Campus Avenue, Bon View Avenue, Cucamonga Avenue, Grove Avenue, Parco Avenue, Walker Avenue, and Edison Avenue/Ontario Ranch Road. Pedestrian circulation would be provided throughout the Project area via a paved sidewalk system that would interconnect with the roadway right-of-way. TOP 2050 proposed Class II bicycle lanes transversing in a north/south direction along the west side of Walker Avenue. The City's Recreation and Parks Master Plan proposed Class I bicycle lanes transversing in an east/west direction along the Project site's southern property line. The Project

would be connected to off-site areas through the City's master planned multipurpose trails/bikeways located along the neighborhood edges of the Project site. An Omnitrans Bus Rapid Transit (BRT) Corridor is proposed along Edison Avenue/Ontario Ranch Road as a part of future development.

On-site and Off-site Improvements

Roadway and utility infrastructure improvements (i.e., storm drains, sewer, potable water, recycled water, fiber optics, and underground electricity) would be constructed prior to the issuance of building occupancy permits. The developer would construct the improvements in accordance with the City's Master Plans, City's Ordinances, and proposed Specific Plan provisions or with the City Engineer's approval. Phasing and construction of the improvements would be determined by the City Engineer and Project requirements.

The Project would include landscaping along roadway frontages and between the pedestrian sidewalk and roadway. Landscaping would be developed in accordance with the City's development code and proposed Specific Plan provisions. Landscape and Construction Irrigation Documentation Plans would be submitted to the City prior to the issuance of building permits. The Project would comply with City Ordinance 2689, which requires the use of recycled water for all approved uses, including but not limited to landscape irrigation.

# 2.0 ACOUSTIC FUNDAMENTALS

## 2.1 Sound and Environmental Noise

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g., air) to human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).[1]

Noise is defined as loud, unexpected, or annoying sound.[2] The fundamental model consists of a noise source, a receptor, and the propagation path between the two.[3] The loudness of the noise source, obstructions, or atmospheric factors affecting the propagation path, determine the perceived sound level and noise characteristics at the receptor. Acoustics deal primarily with the propagation and control of sound.[4] A typical noise environment consists of ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this ambient noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to continuous noise from traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 micro-pascals (μPa) as a point of reference, defined as 0 db.[5] Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness. **Table 3: Typical Noise Levels** provides typical noise levels.

**Table 3: Typical Noise Levels**

| Common Outdoor Activities | Noise Level (dBA) | Common Indoor Activities |
|---|---|---|
| | **– 110 –** | Rock Band |
| Jet fly-over at 1,000 feet | | |
| | **– 100 –** | |
| Gas lawnmower at 3 feet | | |
| | **– 90 –** | |
| Diesel truck at 50 feet at 50 miles per hour | | Food blender at 3 feet |
| | **– 80 –** | Garbage disposal at 3 feet |
| Noisy urban area, daytime | | |
| Gas lawnmower, 100 feet | **– 70 –** | Vacuum cleaner at 10 feet |
| Commercial area | | Normal Speech at 3 feet |
| Heavy traffic at 300 feet | **– 60 –** | |
| | | Large business office |
| Quiet urban daytime | **– 50 –** | Dishwasher in next room |

[1] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/tens-sep2013-a11y.pdf, accessed January 2025.
[2] Cyril M. Harris, *Noise Control in Buildings: A Practical Guide for Architects and Engineers,* 1994.
[3] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.
[4] Ibid.
[5] Ibid.

| Table 3: Typical Noise Levels | | |
|---|---|---|
| **Common Outdoor Activities** | **Noise Level (dBA)** | **Common Indoor Activities** |
| Quiet urban nighttime | **– 40 –** | Theater, large conference room (background) |
| Quiet suburban nighttime | | |
| | **– 30 –** | Library |
| Quiet rural nighttime | | Bedroom at night, concert hall (background) |
| | **– 20 –** | |
| | | Broadcast/recording studio |
| | **– 10 –** | |
| Lowest threshold of human hearing | **– 0 –** | Lowest threshold of human hearing |
| Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013. | | |

## Noise Descriptions

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs.[6] The equivalent noise level ($L_{eq}$) represents the equivalent continuous sound pressure level over the measurement period, while the day-night noise level ($L_{dn}$) and Community Equivalent Noise Level (CNEL) are measures of sound energy during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of $L_{eq}$ that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in **Table 4: Definitions of Acoustical Terms**.

| Table 4: Definitions of Acoustical Terms | |
|---|---|
| **Term** | **Definitions** |
| Decibel (dB) | A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20. |
| Sound Pressure Level | Sound pressure is the sound force per unit area, usually expressed in μPa (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in dB as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g. 20 μPa). Sound pressure level is the quantity that is directly measured by a sound level meter. |
| Frequency (Hz) | The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz. |
| A-Weighted Sound Level (dBA) | The sound pressure level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. |
| Equivalent Noise Level ($L_{eq}$) | The average acoustic energy content of noise for a stated period of time. Thus, the $L_{eq}$ of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, |

[6] Ibid.

| **Table 4: Definitions of Acoustical Terms** | |
|---|---|
| **Term** | **Definitions** |
| | regardless of whether the noise occurs during the day or the night. |
| Maximum Noise Level ($L_{max}$) Minimum Noise Level ($L_{min}$) | The maximum and minimum dBA during the measurement period. |
| Exceeded Noise Levels ($L_{01}$, $L_{10}$, $L_{50}$, $L_{90}$) | The dBA values that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period. |
| Day-Night Noise Level ($L_{dn}$) | A 24-hour average $L_{eq}$ with a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity at nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour $L_{eq}$ would result in a measurement of 66.4 dBA $L_{dn}$. |
| Community Noise Equivalent Level (CNEL) | A 24-hour average $L_{eq}$ with a 5-dBA weighting during the hours of 7:00 a.m. to 10:00 a.m. and a 10-dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour $L_{eq}$ would result in a measurement of 66.7 dBA CNEL. |
| Ambient Noise Level | The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location. |
| Intrusive | That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level. |
| Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013. | |

The A-weighted decibel (dBA) sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA.[7] Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source, the character of the ground surface (e.g., hard or soft), and the presence or absence of structures (e.g., walls or buildings) or topography, and how well model inputs reflect these conditions.

## A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content.[8] However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA and the way the human ear perceives sound. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

[7] Ibid.
[8] Cyril M. Harris, *Noise Control in Buildings: A Practical Guide for Architects and Engineers*, 1994.

## Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10.[9] When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound.[10] When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.[11] Under the dB scale, three sources of equal loudness together would produce an increase of approximately 5 dBA.[12]

## Sound Propagation and Attenuation

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics.[13] No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed when soft ground conditions exist between the source and receptor locations.[14] For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed in this report.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm can reduce noise levels by 5 to 15 dBA.[15] The way older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows.

## Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median

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[9] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol,* September 2013.
[10] Federal Highway Administration, *Noise* Fundamentals*,* 2017, https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm, accessed August 2024.
[11] Ibid.
[12] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.
[13] Ibid.
[14] Federal Highway Administration, *FHWA Traffic Noise Model User's Guide*, January 1998.
[15] Federal Highway Administration, *Highway Traffic and Construction Noise - Problem and Response***,** April 2006.

noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA.[16] Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA.[17] Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted:[18]

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A minimum 5-dBA change is required before any noticeable change in community response would be expected. A 5-dBA increase is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

## Effects of Noise on People

**Hearing Loss.** While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.[19]

**Annoyance.** Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The $L_{dn}$ as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA $L_{dn}$ is the threshold at which a substantial percentage of people begin to report annoyance.[20]

[16] Compiled from James P. Cowan, *Handbook of Environmental Acoustics,* 1994, and Cyril M. Harris, *Handbook of Noise Control*, 1979.
[17] Ibid.
[18] Compiled from California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, and Federal Highway Administration, *Noise Fundamentals,* 2017.
[19] U.S. Department of Labor, *Occupational Safety and Health Standards, 29 CFR 1910 (Occupational Noise Exposure)*.
[20] Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.

## 2.2 Ground-Borne Vibration

Sources of ground-borne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions or heavy equipment used during construction). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero.[21] Several different methods are typically used to quantify vibration amplitude. One is vibration decibels (VdB) (the vibration velocity level in decibel scale). Other methods are the peak particle velocity (PPV) and the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave and expressed in terms of inches-per-second (in/sec). The RMS velocity is defined as the average of the squared amplitude of the signal and is expressed in terms of VdB.[22] The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

**Table 5: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations** displays the reactions of people and the effects on buildings produced by continuous vibration levels. The human annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where ground-borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible.[23] Common sources for ground-borne vibration are planes, trains, and construction activities such as earth-moving, which requires the use of heavy-duty earth moving equipment.[24] For the purposes of this analysis, a PPV descriptor with units of in/sec was used to evaluate construction-generated vibration for building damage and human complaints.

**Table 5: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations**

| Maximum PPV (in/sec) | Caltrans Vibration Annoyance Potential Criteria | Caltrans Vibration Damage Potential Threshold Criteria | FTA Vibration Damage Criteria |
|---|---|---|---|
| 0.008 | -- | Extremely fragile historic buildings, ruins, ancient monuments | -- |
| 0.08 | Readily Perceptible | -- | -- |
| 0.1 | Begins to Annoy | Fragile buildings | -- |
| 0.12 | -- | -- | Buildings extremely susceptible to vibration damage |

[21] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018.
[22] Ibid.
[23] Ibid.
[24] Ibid.

**Table 5: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations**

| Maximum PPV (in/sec) | Caltrans Vibration Annoyance Potential Criteria | Caltrans Vibration Damage Potential Threshold Criteria | FTA Vibration Damage Criteria |
|---|---|---|---|
| 0.2 | Annoying | -- | Non-engineered timber and masonry buildings |
| 0.25 | -- | Historic and some old buildings | -- |
| 0.3 | -- | Older residential structures | Engineered concrete and masonry |
| 0.4 | Unpleasant | -- | -- |
| 0.5 | -- | New residential structures, Modern industrial/commercial buildings | Reinforced-concrete, steel or timber (no plaster) |

1. Caltrans refers to the California Department of Transportation. FTA refers to the Federal Transit Administration.

Source: California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2020 and Federal Transit administration, *Transit Noise and Vibration Assessment Manual*, 2018.

## 2.3 Ground-Borne Noise

Ground-borne noise specifically refers to the rumbling noise emanating from the motion of building room surfaces due to the vibration of floors and walls; it is perceptible only inside buildings.[25] The relationship between ground-borne vibration and ground-borne noise depends on the frequency content of the vibration and the acoustical absorption characteristics of the receiving room. For typical buildings, ground-borne vibration that causes low frequency noise (i.e., the vibration spectrum peak is less than 30 Hz) results in a ground-borne noise level that is approximately 50 decibels lower than the velocity level. For ground-borne vibration that causes mid-frequency noise (i.e., the vibration spectrum peak is between 30 and 60 Hz), the ground-borne noise level will be approximately 35 dB lower than the velocity level. For ground-borne vibration that cause high-frequency noise (i.e., the vibration spectrum peak is greater than 60 Hz), the ground-borne noise level will be approximately 20 dB lower than the velocity level.[26] The Federal Transit Administration (FTA) provides a ground-borne noise threshold of 43 dBA for infrequent vibration events in Category 2 buildings such as residences and buildings where people normally sleep. For frequent and occasional vibratory events, the FTA established ground-borne noise thresholds of 35 dBA and 38 dBA, respectively.[27]

[25] Ibid.
[26] Ibid.
[27] Ibid.

# 3.0 REGULATORY SETTING

To limit population exposure to physically or psychologically damaging, as well as intrusive, noise levels, the federal government, the State, various county governments, and most municipalities in the State have established standards and ordinances to control noise.

## 3.1 Federal

### Federal Transit Administration Noise and Vibration Guidance

The FTA has published the Transit Noise and Vibration Impact Assessment Manual (FTA Transit Noise and Vibration Manual) to provide guidance on procedures for assessing impacts at different stages of transit project development.[28] The report covers both construction and operational noise impacts and describes a range of measures for controlling excessive noise and vibration. In general, the primary concern regarding vibration relates to potential physical damage from construction. The guidance document establishes criteria for evaluating the potential for damage to various structural categories from vibration.

## 3.2 State of California

### California Government Code

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services.[29] The guidelines rank noise land use compatibility in terms of "normally acceptable", "conditionally acceptable", "normally unacceptable", and "clearly unacceptable" noise levels expressed in CNEL for various land use types. Single-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries, and churches are "normally acceptable" up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

### Title 24 – Building Code

The State's noise insulation standards are codified in the California Code of Regulations, Title 24: Part 1, Building Standards Administrative Code, and Part 2, California Building Code. These noise standards are applied to new construction in California for interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, hotel rooms, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 65 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new multi-family residential buildings and habitable rooms (including hotels), the

[28] Ibid.

[29] State of California Governor's Office of Planning and Research, *General Plan Guidelines, Appendix D: Noise Element Guidelines*, page 374, 2017, https://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf, accessed January 2025.

acceptable interior noise limit for new construction is 45 dBA CNEL.

## 3.3 Local

### City of Ontario General Plan

The City of Ontario General Plan (TOP 2050) is a policy plan that guides the City's long-term development. The TOP 2050 Land Use Element and Safety Element establish goals, policies, and land use guidelines to protect residents, workers, and visitors from excessive noise levels.

Land Use Element

The following goals and policies from the Land Use Element are applicable to the Project:

**Goal LU-2** **Compatibility between a wide range of uses and resultant urban patterns and forms.**

**Policy LU-2.2** **Buffers.** We require new uses to provide mitigation or buffers between existing uses where potential adverse impacts could occur. Additional mitigation is required when new uses could negatively impact environmental justice areas.

**Policy LU-2.4** **Regulation of Nuisances**. We regulate the location, concentration, and operation of potential nuisances

**Policy LU-2.8** **Transitional Areas**. We require development in transitional areas to protect the quality of life of current residents.

The City uses the Noise Level Exposure and Land Use Compatibly Guidelines (shown in **Table 6: Noise Level Exposure and Land Use Compatibility Guidelines** below) when siting new developments.

**Table 6: Noise Level Exposure and Land Use Compatibility Guidelines**

| Land Use Categories | | Community Noise Equivalent Level (CNEL) | | | |
|---|---|---|---|---|---|
| **Category** | **Uses** | **Clearly Acceptable[1]** | **Normally Acceptable[2]** | **Normally Unacceptable[3]** | **Clearly Unacceptable[4]** |
| Residential/ Lodging | Single Family/Duplex | <60 | 60-65 | 65-70 | 70-85 |
| | Multi-Family | <60 | 60-65 | 65-75 | 75-85 |
| | Mobile Homes | <60 | 60-65 | - | 65-85 |
| | Hotel/Motel | <65 | 65-70 | 70-80 | 80-85 |
| Public/ Institutional | Schools/Hospitals | <60 | 60-65 | 65-70 | 70-85 |
| | Churches/Libraries | <60 | 60-65 | 65-70 | 70-85 |
| | Auditoriums/Concert Halls | <55 | 55-60 | 60-70 | 70-85 |
| Commercial | Offices | <65 | 65-75 | 75-80 | 80-85 |
| | Retail | <70 | 70-75 | 75-80 | 80-85 |
| Industrial | Manufacturing | <70 | 70-75 | 75-85 | - |
| | Warehousing | <70 | 70-80 | 80-85 | - |
| Recreational/ Open Space | Parks/Playgrounds | <65 | 65-70 | 70-75 | 75-85 |
| | Golf Course/Riding Stables | <65 | 65-70 | 70-75 | 75-85 |
| | Outdoor Spectator | <60 | 60-65 | 65-70 | |

**Table 6: Noise Level Exposure and Land Use Compatibility Guidelines**

| Land Use Categories | | Community Noise Equivalent Level (CNEL) | | | |
|---|---|---|---|---|---|
| **Category** | **Uses** | **Clearly Acceptable[1]** | **Normally Acceptable[2]** | **Normally Unacceptable[3]** | **Clearly Unacceptable[4]** |
| | Sports | | | | |
| | Outdoor Music Shells/Amphitheaters | - | <60 | 60-65 | 65-85 |
| | Livestock/Wildlife Preserves | <70 | - | 70-75 | 75-85 |
| | Crop Agriculture | <85 | - | - | - |

1. No special noise insulation required, assuming buildings of normal conventional construction.
2. Acoustical reports will be required for major new residential construction. Conventional construction with closed windows and fresh air supply systems of air conditions will normally suffice.
3. New construction should be discouraged. Noise/aviation easements required for all new construction. If new construction does proceed, a detailed analysis of noise reduction requirements must be made, and necessary noise insulation features included.
4. No new construction should be permitted.

Source: City of Ontario, *The Ontario Plan 2025, Land Use Element, LU-07 Noise Level Exposure and Land Use Compatibility Guidelines*, https://content.ontarioca.gov/sites/default/files/2024-12/Figure%20LU-07%20Noise%20Level%20Exposure%20and%20Land%20Use%20Compatibility%20Guidelines.pdf, accessed February 2025.

Safety Element

The following goals and policies from the Safety Element are applicable to the Project:

**Goal S4** **An environment where noise does not adversely affect the public's health, safety, and welfare.**

**Policy S4-1** **Noise Mitigation.** Utilize the City's Noise Ordinance, building codes and subdivision and development codes to mitigate noise impacts.

**Policy S4-2** **Coordination with Transportation Authorities.** Collaborate with airport owners, FAA, Caltrans, SANBAG, SCAG, neighboring jurisdictions, and other transportation providers in the preparation and maintenance of, and updates to transportation related plans to minimize noise impacts and provide appropriate mitigation measures.

**Policy S4-4** **Truck Traffic.** Manage truck traffic to minimize noise impacts on sensitive land uses.

**Policy S4-5** **Roadway Design.** Design streets and highways to minimize noise impacts.

**Policy S4-6** **Airport Noise Compatibility.** Utilize the Airport Land Use Compatibility to prevent the construction of new noise-sensitive land uses within the airport noise impact zones.

## City of Ontario Municipal Code

The City of Ontario Municipal Code (Municipal Code) Title 5: Public Welfare, Morals, and Conduct, Chapter 29: Noise establishes noise limits and regulates short-term, excessive noise sources.

**Municipal Code Section 5-29.04** establishes exterior noise limits (shown in **Table 7: City of Ontario Exterior Noise Standards**).

| **Table 7: City of Ontario Exterior Noise Standards** | | |
|---|---|---|
| **Land Use** | **Allowed Equivalent Noise Level ($L_{eq}$)** | |
| | **7:00 a.m. to 10:00 p.m.** | **10:00 p.m. to 7:00 a.m.** |
| Single-Family Residential | 65 dBA | 45 dBA |
| Multi-Family Residential, Mobile Home Parks | 65 dBA | 50 dBA |
| Commercial Property | 65 dBA | 60 dBA |
| Residential Portion of Mixed Use | 70 dBA | 70 dBA |
| Manufacturing and Industrial, Other Uses | 70 dBA | 70 dBA |
| Source: City of Ontario, *Municipal Code, Title 5: Public Welfare, Morals, and Conduct, Chapter 29: Noise, Section 5-29.04: Exterior Noise Standards*, https://codelibrary.amlegal.com/codes/ontarioca/latest/ontario_ca/0-0-0-41849, accessed January 2025. | | |

The noise limits summarized in **Table 7** are subject to the following:

- Noise exceeding the noise standard for any 15-minute period is prohibited.
- Noise exceeding a maximum instantaneous (single-instance) noise level equal to the value of the noise standard plus 20 dBA for any period of time (measured using an A-weighted slow response) is prohibited.
- In the event the ambient noise level exceeds the noise standard, the maximum allowable noise level shall be increased to reflect the maximum ambient noise level.
- The residential portion of mixed-use standard shall apply to that residential property portion falling within 100 feet of a commercial property or use, if the noise originates from that commercial property or use.
- If the measurement location is on a boundary between two different noise zones, the lower noise level standard applicable to the noise zone shall apply.

**Municipal Code Section 5-29.06(e)** exempts the following noise sources from the City's exterior noise regulations:

- Any activity conducted on public property by any public entity, including sporting and recreational activities that are sponsored or permitted by the City or any school district within the City's jurisdictional boundaries;
- occasional outdoor gatherings and entertainment events that are approved by the appropriate public entity, specifically the planning commission or City Council;
- or activity associated with the construction, repair, remodeling, demolition or grading of a public right-of-way.

**Municipal Code Section 5-29.09** restricts construction-related noise that disturbs a person of normal sensitivity or a police or code enforcement officer, to the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday and 9:00 a.m. and 6:00 p.m., Saturday and Sunday.

**Municipal Code Section 5-29.13** requires the following for special events that would use sound amplifying equipment:

- A permit application must be submitted to the Police Chief at least 16 days and no more than 120 days prior to the date on which the sound amplifying equipment is intended to be used;
- the permit application must include illustrations that visualize the dimensions, location, and orientation of the sound amplifying equipment.

- a statement by the applicant that they are willing and able to comply with the noise provisions within the chapter and permit conditions;
- the sound volume may not be audible at a distance greater than 100 feet from the sound amplifying equipment that it creates a disturbance to persons within the audibility range;
- sound amplifying equipment activities are prohibited between the hours of 8:00 p.m. and 8:00 a.m. every day.

# 4.0 EXISTING CONDITIONS

## 4.1 Existing Noise Sources

The Project area is currently impacted by various noise sources. Mobile noise sources are the most common and prominent noise sources within the Project area. The primary station noise sources within the Project area are associated with the surrounding residential, commercial, and agriculture uses. Such stationary noise sources include mechanical equipment (e.g., heating, ventilation, and air conditioning [HVAC] equipment), automobile-related noise (i.e., idling vehicles, opening and closing doors, cars parking, and cars starting), music playing, crop and dairy farming equipment, animal-related noise (i.e., dogs barking, cows mooing, and goats bleating), and people talking. The noise associated with these sources may represent a single-event noise occurrence or short-term noise.

## 4.2 Noise Measurements

To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted six short-term (15-minute) measurements on November 20, 2024; see **Appendix A: Noise Data** for additional details regarding how the ambient noise measurements were taken. The noise measurement sites were selected to be representative of the existing ambient noise levels at the noise-sensitive uses immediately adjacent to and within the Project site. The 15-minute daytime measurements were taken between 9:16 a.m. and 11:21 a.m. Short-term $L_{eq}$ measurements are considered representative of the noise levels throughout the day. The noise measurement locations are shown on **Figure 7: Noise Measurement Locations**. The average noise levels measured at each location are listed in **Table 8: Existing Noise Measurement Locations and Measurements.**

**Table 8: Existing Noise Measurement Locations and Measurements**

| Site | Location | Measurement Period | Duration | Daytime Average (dBA $L_{eq}$) |
|---|---|---|---|---|
| ST-1 | 7469 Edison Avenue | 9:16 a.m. – 9:31 a.m. | 15 minutes | 76.4 |
| ST-2 | 8061 Edison Avenue | 9:39 a.m. – 9:54 a.m. | 15 minutes | 72.8 |
| ST-3 | 8314 Edison Avenue | 9:59 a.m. – 10:14 a.m. | 15 minutes | 74.8 |
| ST-4 | 14300 Walker Avenue | 10:24 a.m. – 10:39 a.m. | 15 minutes | 65.3 |
| ST-5 | 14361 Grove Avenue | 10:45 a.m. – 11: 00 a.m. | 15 minutes | 70.8 |
| ST-6 | 14316 Bon View Avenue | 11:06 a.m. – 11:21 a.m. | 15 minutes | 66.8 |

Source: Noise measurements taken by Kimley-Horn and Associates, November 20, 2024. See **Appendix A** for the noise measurement results.

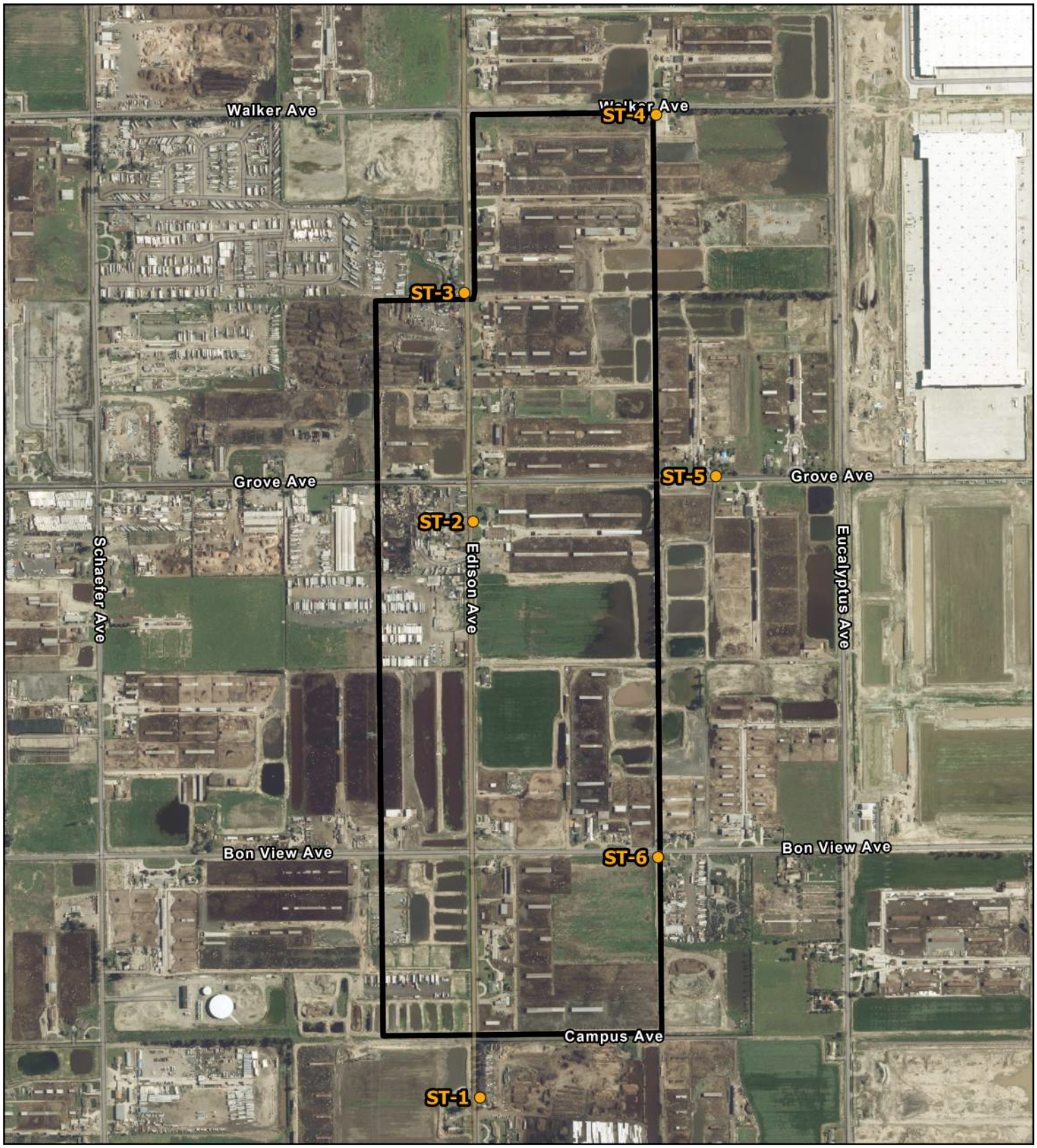


Project Site

Noise Measurement Locations

*Source: Kimley-Horn and Associates, Inc. 2025; ESRI World Imagery, 2025.*

**Figure 7: Noise Measurement Locations**

*Center Park Specific Plan Project*

Not to scale

Kimley»Horn

## 4.3 Sensitive Receptors

Noise sensitive receptors typically include residences, dormitories, hotels, transient lodging, houses of worship, hospitals, schools, and places of assembly. Sensitive receptors nearest the Project site are listed in **Table 9: Sensitive Receptors** and shown on **Figure 8: Sensitive Receptor Locations**.

**Table 9: Sensitive Receptors**

| Receptor Description[1] | Distance and Direction from the Project | |
|---|---|---|
| | Phase I[2] | Phase II[3] |
| 1- Residential Uses (represented by ST-3) | 36 feet to the north | 710 feet to the east |
| 2- Residential Uses (represented by ST-6) | 3,172 feet to the southwest | 53 feet to the south |
| 3- On-site Residential Uses[4] (represented by ST-2) | 55 feet to the west | N/A |
| 4- Future Phase I Residential Uses[5] (represented by ST-3) | N/A | 55 feet to the east |
| 5- Residential Uses (represented by ST-4) | 348 feet to the southeast | 1,815 feet to the southeast |
| 6- Residential Uses (represented by ST-4) | 172 feet to the east | 2,134 feet to the east |
| 7- Residential Uses (represented by ST-2) | 590 feet to the northwest | 223 feet to the north |
| 8- Residential Uses (represented by ST-5) | 590 feet to the southwest | 357 feet to the south |
| 9- Residential Uses (represented by ST-1) | 5,070 feet to the west | 460 feet to the west |
| 10- Residential Uses (represented by ST-1) | 3,220 feet to the northwest | 574 feet to the north |
| 11- Residential Uses (represented by ST-3) | 1,207 feet to the northeast | 1,837 feet to the northeast |

N/A = not applicable

1. Refer to **Table 8** for representative ambient noise measurements.
2. Distance measured from the Phase I Project site property line to the nearest sensitive receptor property line.
3. Distance measured from the Phase II Project site property line to the nearest sensitive receptor property line.
4. The City would demolish the existing sensitive receptor structures within the Phase II Project site at a future date after construction of Phase I has begun; therefore, the existing sensitive receptors would be exposed to the construction noise associated with the proposed Phase I development.
5. The proposed Phase I Project would develop residential uses that would be exposed to the construction noise associated with the future Phase II development by the City.

Source: Google Earth, 2025.

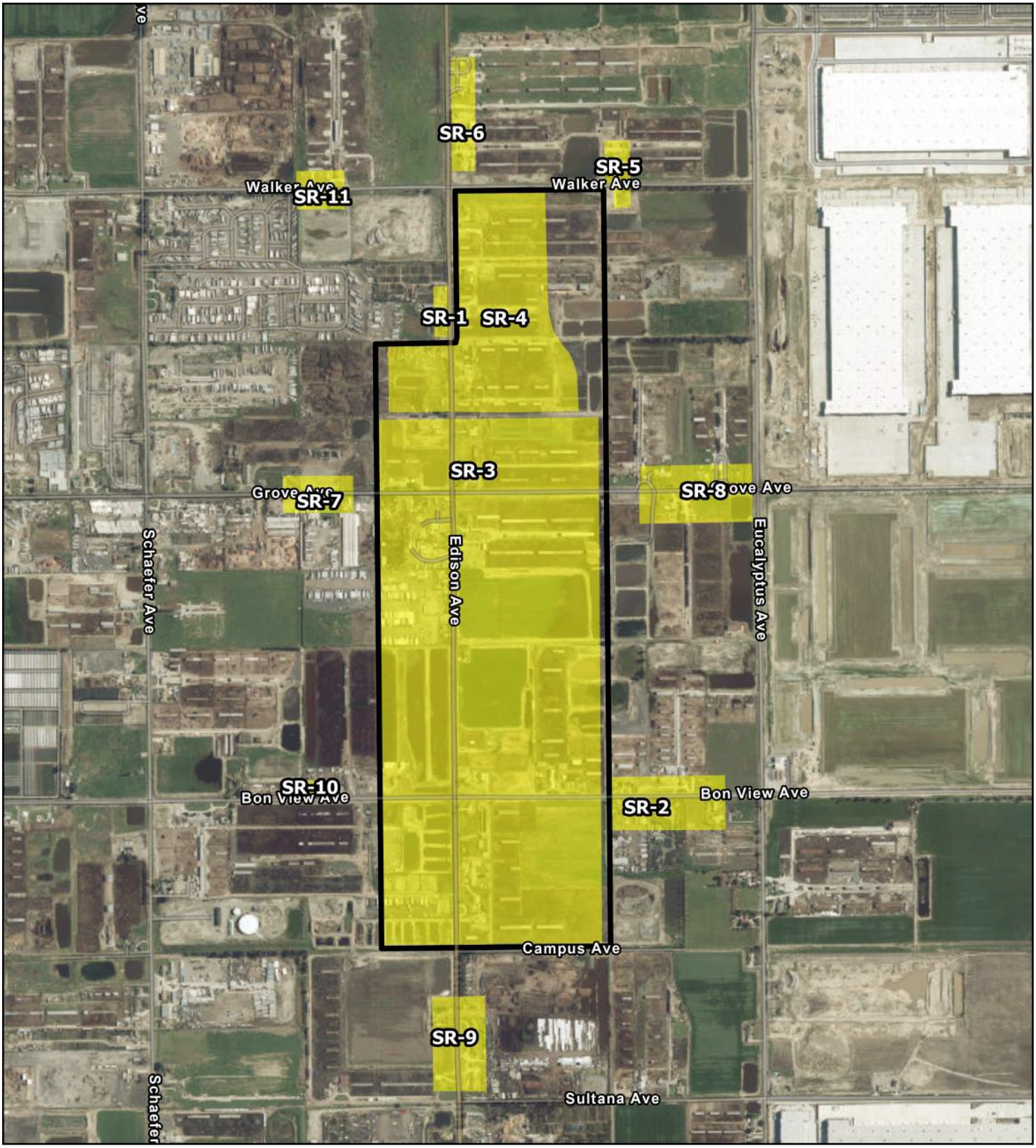


Project Site

Sensitive Receptor Locations

*Source: Kimley-Horn and Associates, Inc. 2025; ESRI World Imagery, 2025.*

**Figure 8: Sensitive Receptor Locations**

*Center Park Specific Plan Project*

Not to scale

Kimley»Horn

# 5.0 SIGNIFICANFCE CRITERIA AND METHODOLOGY

## 5.1 CEQA Thresholds

CEQA Guidelines Appendix G contains analysis guidelines related to noise impacts. The City has determined to use these guidelines as thresholds of significance for this analysis. A project would create a significant environmental impact if it would:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generate excessive ground-borne vibration or ground-borne noise levels; and
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels.

**Construction Noise**

The City has not established quantitative construction noise standards. Construction noise impacts are conservatively evaluated based on the FTA's threshold of 80 dBA (8-hour $L_{eq}$) for residential uses and an ambient noise level increase of 5 dBA. Municipal Code Section 5-29.09 restricts construction to the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday and 9:00 a.m. to 6:00 p.m., Saturday and Sunday.

**Operational Noise**

Stationary Sources

On-site stationary sources noise impacts are evaluated based on the exterior noise standards established in the Municipal Code Section 5-29.04; refer to **Table 7**.

Mobile Source

Off-site mobile noise impacts are evaluated based on the following significance criterion established in TOP 2050.[30]

- Greater than 1.5 dBA increase for ambient noise environments of 65 dBA CNEL and higher;
- Greater than 3 dBA increase for ambient noise environments of 60 - 64 CNEL; and
- Greater than 5 dBA increase for ambient noise environments of less than 60 dBA CNEL.

**Vibration**

Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Project construction could result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used, the

[30] City of Ontario, *The Ontario Plan 2050, Final Supplemental Environmental Impact Report, 2022*, https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf, accessed February 2025.

location of that equipment relative to the receptor, and the operations involved.

The City has not established vibration damage criteria. Therefore, this analysis uses the California Department of Transportation's (Caltrans') vibration threshold for ground-borne vibration. The Caltrans *Transportation and Construction Vibration Manual* includes vibration thresholds for structures and human annoyance. The structural damage for older residential buildings and human annoyance threshold is 0.3 in/sec PPV and 0.4 in/sec PPV, respectively. [31]

## 5.2 Methodology

### Construction

Construction noise levels were based on typical noise levels generated by construction equipment published by the FTA and FHWA. Construction noise is assessed in dBA $L_{eq}$. This unit is appropriate because $L_{eq}$ can be used to describe the noise level from the operation of each piece of equipment separately, and the levels can be combined to represent the noise level from all equipment operating concurrently during a given period.

Construction noise was modeled using the FHWA Roadway Construction Noise Model (RCNM). Reference noise levels are used to estimate operational noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point noise sources). Noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

### Operations

The analysis of the Existing and Existing With Project noise environments is based on noise prediction modeling and empirical observations. Reference noise level data are used to estimate the Project operational noise impacts from stationary sources. Noise levels were collected from published sources from similar types of activities and used to estimate noise levels expected from Project stationary sources. The reference noise levels are used to represent a worst-case noise environment as noise level from stationary sources can vary throughout the day. The off-site mobile traffic noise levels in the Project area were calculated using the FHWA-RD-77-108.

### Vibration

Ground-borne vibration levels associated with construction activities for the Project were evaluated utilizing typical ground-borne vibration levels associated with construction equipment, obtained from FTA published data for construction equipment. Potential ground-borne vibration impacts related to building/structure damage and interference with sensitive existing operations were evaluated, considering the distance from construction activities to nearby land uses and typically applied criteria for structural damage.

Construction vibration levels were calculated using the following formula:

[31] California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2020.

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where: $PPV_{equip}$ = the peak particle velocity in in/sec of the equipment adjusted for the distance

$PPV_{ref}$ = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.

D = the distance from the equipment to the receiver

# 6.0 POTENTIAL IMPACTS AND MITIGATION

## 6.1 Project-Level Impacts

**Threshold 6.1 Would the Project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?**

### Phase I – Proposed Development

**Construction Noise**

On-site Construction

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the receptors near the construction area.

Phase I construction activities would include demolition, site preparation, grading, infrastructure improvements, building construction, paving, and architectural coating applications. Such activities would require dozers, excavators, and concrete saws during demolition; dozers and tractors during site preparation; graders, excavators, tractors, dozers, and scrapers during grading; forklifts, cranes, generators, tractors, and welders during building construction; pavers, rollers, and paving equipment during paving; and air compressors during architectural coating applications. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute, such as dropping large pieces of equipment or the hydraulic movement of machinery lifts. The sensitive receptor nearest the Phase I Project site is Sensitive Receptor 1 located approximately 74 feet to the east. **Table 10: Typical Construction Equipment Noise Levels for Phase I** includes the typical noise levels associated with individual construction equipment at 74 feet.

**Table 10: Typical Construction Equipment Noise Levels for Phase I**

| Equipment | Typical Noise Level at 50 feet from the Source (dBA $L_{max}$) | Typical Noise Level at 74 feet from the Source[1] (dBA $L_{max}$) |
|---|---|---|
| Air Compressor | 81 | 78 |
| Backhoe | 80 | 77 |
| Compactor | 82 | 79 |
| Concrete Mixer | 85 | 82 |
| Concrete Pump | 82 | 79 |
| Concrete Vibrator | 76 | 73 |
| Crane, Derrick | 88 | 85 |
| Crane, Mobile | 83 | 80 |
| Dozer | 85 | 82 |

| **Table 10: Typical Construction Equipment Noise Levels for Phase I** | | |
|---|---|---|
| **Equipment** | **Typical Noise Level at 50 feet from the Source (dBA $L_{max}$)** | **Typical Noise Level at 74 feet from the Source[1] (dBA $L_{max}$)** |
| Generator | 81 | 78 |
| Graders | 85 | 82 |
| Loader | 85 | 82 |
| Pavers | 89 | 86 |
| Roller | 74 | 71 |
| Saw | 76 | 73 |
| Scraper | 89 | 86 |
| Shovel | 82 | 79 |
| Truck | 88 | 85 |
| 1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20Log(d_1/d_2)$. Where: $dBA_2$ = estimated noise level at receptor; $dBA_1$ = reference noise level; $d_1$ = reference distance; $d_2$ = receptor location distance. | | |
| Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018. | | |

The FHWA's RCNM was used to calculate the construction noise levels at the nearest sensitive receptors. Noise levels at other receptors surrounding the construction area would be located further away and would experience lower construction noise levels than the modeled receptors. Noise levels were based on the equipment used, distance to the nearest receptor, and acoustical use factor for equipment. When calculating construction noise, the loudest piece of anticipated equipment is conservatively assumed to operate at the property line nearest the modeled receptor while all other equipment anticipated for each individual construction phase is assumed to operate at staggering distances throughout the construction area. This methodology accounts for equipment operating throughout the Project site and not at a fixed location for extended periods of time.[32] Phase I construction would be subject to the FSEIR Mitigation Measure (MM) NOI 12-4, which requires development projects near sensitive receptors to use the best available equipment noise control techniques (e.g., mufflers and shrouds) and erect temporary noise barriers. The FHWA guidance states that muffler systems can reduce RCNM reference noise levels by a minimum of 10 dBA.[33] The noise barrier would contain no gaps and would block the line-of-sight between the Phase I construction activities and the noise-sensitive uses to the north, east, south, and west. The RCNM guidance states that a solid barrier without gaping would reduce the RCNM reference noise levels by a minimum of 8 dBA.[34] See **Appendix A** for the construction noise modeling assumptions. The City has not established quantitative construction noise standards. This analysis conservatively uses the FTA's residential threshold of 80 dBA $L_{eq}$ as the significance criteria to evaluate the construction-related noise impact.[35]

**Table 11: Phase I Construction Noise Levels** summarizes the maximum Phase I construction noise levels at the sensitive receptors nearest the proposed Phase I Project

[32] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.

[33] Federal Highway Administration, *Special Report - Measurement, Prediction, and Mitigation, Chapter 4 Mitigation*, 2017, https://www.fhwa.dot.gov/environment/noise/construction_noise/special_report/hcn04.cfm, accessed March 2025.

[34] Federal Highway Administration, *Roadway Construction Noise Model User Guide, Appendix A: Best Practices for Calculating Estimated Shielding for Use in RCNM,* https://www.fhwa.dot.gov/Environment/noise/construction_noise/rcnm/rcnm10.cfm#appa, accessed March 2025.

[35] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Table 7-3, Page 179, September 2018.

**Table 11: Phase I Construction Noise Levels**

| Sensitive Receptor | Maximum Noise Level (dBA $L_{eq}$)[1] | Noise Threshold (dBA $L_{eq}$)[2] | Noise Threshold Exceeded? | Ambient Noise Level (dBA $L_{eq}$) | Construction Noise Level Over Ambient (dBA $L_{eq}$) | Difference Exceeds 5 dBA?[3] (dBA $L_{eq}$) |
|---|---|---|---|---|---|---|
| 1- Residential Uses | 66.0 | 80 | No | 74.8 | -- | No |
| 2- Residential Uses | 37.7 | | No | 66.8 | -- | No |
| 3- Residential Uses[4] | 62.6 | | No | 72.8 | -- | No |
| 5- Residential Uses | 60.3 | | No | 65.3 | -- | No |
| 6- Residential Uses | 58.9 | | No | 65.3 | -- | No |
| 7- Residential Uses | 48.5 | | No | 72.8 | -- | No |
| 8- Residential Uses | 50.2 | | No | 70.8 | -- | No |
| 9- Residential Uses | 34.0 | | No | 76.4 | -- | No |
| 10- Residential Uses | 37.7 | | No | 76.4 | -- | No |
| 11- Residential Uses | 45.4 | | No | 74.8 | -- | No |

dBA = A-weighted decibels, $L_{eq}$ = equivalent noise level

1. Noise levels assume a minimum 18 dBA reduction from FSEIR MM 12-4.
2. The City does not have a quantitative noise threshold for construction. The FTA's construction noise threshold is conservatively used for this analysis (FTA, *Transit Noise and Vibration Impact Assessment Manual*, September 2018).
3. A noise level increase of 5 dBA is considered perceptible and readily noticeable.
4. As Phase II is speculative, it is conservatively assumed the sensitive receptors within the Phase II Project site would be demolished during the Phase I infrastructure improvements construction phase.

Source: Federal Highway Administration, *Roadway Construction Noise Model, 2006*. Refer to **Appendix A** for the noise modeling results.

site.[36] As shown in **Table 11**, the maximum Phase I construction noise levels would not exceed the FTA's residential significance criterion of 80 dBA $L_{eq}$ or substantially increase the ambient noise levels at the nearest sensitive receptors. Construction-related noise would be temporary and would cease with construction. Thus, Phase I construction activities would not result in a permanent increase in ambient noise levels in the area. Furthermore, construction activities would be restricted to the hours of 7:00 a.m. to 6:00 p.m. on weekdays and 9:00 a.m. to 6:00 p.m. on weekends. The City's permitted construction hours recognize that construction activities undertaken during daytime hours are a typical part of living in an urban environment and do not cause a significant impact. Impacts would be less than significant, and no mitigation is required.

Off-Site Construction Traffic

In addition to the on-site construction noise, Phase I construction would generate mobile noise from delivery and haul trucks and construction workers traveling to and from the Phase I Project site. Construction workers are expected to arrive at the Phase I Project site before construction starts and leave when construction ends, and thus, would not overlap with the delivery and haul truck trips

According to modeling assumptions included in the Air Quality Assessment prepared by Kimley-Horn in April 2025, the construction phases with the highest assumed number of trucks would be building construction and infrastructure improvements, where there would be up to 110 daily vendor truck trips. A truck pass-by event would generate noise levels of up to 70 dBA $L_{eq}$ at 50 feet.[37] Assuming the 110 daily trucks would arrive throughout an eight-hour work day, on average up to 14 trucks would arrive at the site hourly. Assuming that all 14 hourly trucks would pass through the same roadway segment within a 15-minute period, the estimated noise level would be 62.0 dBA $L_{eq}$ at 50 feet from the roadway centerline. As a worst-case, assuming all 110 daily trucks could pass through the same roadway segment within a 15-minute period, the estimated noise level from building construction and infrastructure improvements haul truck trips would be 71.0 dBA $L_{eq}$ at 50 feet from the roadway centerline. This worst-case noise level would not exceed the FTA's residential significance criterion of 80 dBA $L_{eq}$ for construction activities. Additionally, delivery and haul trucks associated with Phase I construction would be subject to the FSEIR MM 12-4, which limits, to the extent feasible, construction traffic to approved haul routes established by the City's Engineering Department. Impacts would be less than significant, and no mitigation is required.

**Operational Noise**

Phase I would develop residential, recreational open space, and non-recreational open space uses within PAs 6, 12, 13, 17, 18, and 22. Based on the City's Conceptual Great Park Master Plan, it is assumed that PAs 17 and 18 would include recreational and commercial uses. No building development would occur within PA 22 consistent with the OS – NR land use designation.

Phase I implementation would create new noise sources within the Phase I Project area that would potentially impact existing sensitive receptors. The primary noise sources associated with Phase I operations include mechanical equipment (e.g., HVAC equipment), trash and recycling pick-up, recreational activities (i.e., recreational park crowds and special events), parking areas (i.e., car door

[36] See **Appendix A** for the estimated construction noise level for all of the individual and overlapping construction phases.
[37] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

slamming, car radios, engine start-up, and car pass-by), and on-site traffic.

At this stage of the planning process, the Phase I Project site plan is not yet available. As such, reasonable assumptions have been made regarding potential noise sources and as a conservative measure, it is assumed herein that anticipated noise sources would operate at the nearest potential location to the nearest sensitive receptors. This is a conservative, worst-case estimation as this does not account for the minimum setback standards.

Mechanical Equipment

Mechanical equipment (e.g., HVAC equipment) would be located on the rooftop of the buildings within the MDR (PAs, 6, 12, and 13) OS – R (PAs 17 and 18) land uses. It is assumed the HVAC equipment within the residential and recreational buildings would operate during daytime hours (i.e., 7:00 a.m. to 10:00 p.m.). Mechanical equipment (e.g., HVAC equipment) typically generates noise levels of approximately 52 dBA at 50 feet.[38] It is conservatively assumed that an HVAC unit would operate at the property line nearest the sensitive receptor. **Table 12: Phase I Mechanical Equipment Noise** shows the HVAC noise levels at the nearest sensitive receptors without accounting for shielding provided by potential screening or architectural features would not exceed the City daytime noise standard. Impacts would be less than significant, and no mitigation is required.

**Table 12: Phase I Mechanical Equipment Noise**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|
| 1 – Residential Uses (east) | 48.6 | 65 | No |
| 2 – Residential Uses (southwest) | 15.8 | 65 | No |
| 5 – Residential Uses (southeast) | 41.6 | 65 | No |
| 6 – Residential Uses (east) | 40.2 | 65 | No |
| 7 – Residential Uses (northwest) | 27.1 | 65 | No |
| 8 – Residential Uses (southwest) | 29.3 | 65 | No |
| 9 – Residential Uses (west) | 11.9 | 65 | No |
| 10 – Residential Uses (northwest) | 15.8 | 65 | No |
| 11 – Residential Uses (northeast) | 23.8 | 65 | No |

dBA = A-weighted decibels
1. Pursuant to Municipal Code Section 5-29.04, the exterior single-family residential use daytime noise standard is 65 dBA.

Open Space

The Project would include common open space areas for residents. Per Assembly Bill 1307, Public Resources Code Section 21085, the noise generated by residential occupants, their guests, and wireless devices would not have a significant effect on the environment. Impacts would be less than significant, and no mitigation is required.

Trash and Recycling Pick-up

Trash and recycling would be picked up along drive aisles within the Phase I Project site during day-time hours (i.e., from 7:00 a.m. to 10:00 p.m.). Trash and recycling pick-up activity servicing the Phase I Project area currently occurs under existing conditions and would not be a new noise source. However, trash and recycling pick-up activity noise levels have been conservatively estimated based

[38] Ibid.

on the potential drive aisle along the Phase I Project site property line nearest the sensitive receptor. Trash and recycling pickup activities generate noise levels of approximately 85 dBA at approximately 3.3 feet.[39] **Table 13: Phase I Truck and Recycling Pick-up Noise Levels** shows the trash and recycling pick-up noise levels at the nearest sensitive receptors would not exceed the City daytime noise standard. Impacts would be less than significant, and no mitigation is required.

**Table 13: Phase I Truck and Recycling Pick-up Noise Levels**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|
| 1 – Residential Uses (east) | 58.0 | 65 | No |
| 2 – Residential Uses (southwest) | 25.2 | 65 | No |
| 5 – Residential Uses (southeast) | 51.0 | 65 | No |
| 6 – Residential Uses (east) | 49.6 | 65 | No |
| 7 – Residential Uses (northwest) | 36.8 | 65 | No |
| 8 – Residential Uses (southwest) | 38.7 | 65 | No |
| 9 – Residential Uses (west) | 21.3 | 65 | No |
| 10 – Residential Uses (northwest) | 25.2 | 65 | No |
| 11 – Residential Uses (northeast) | 33.4 | 65 | No |

dBA = A-weighted decibels
1. Pursuant to Municipal Code Section 5-29.04, the exterior single-family residential use daytime noise standard is 65 dBA.

Recreational Park

The MDR (PAs 6, 12, and 13) and OS – R (PAs 17 and 18) land uses would include recreational parks. As it is speculative to assume the recreational park operational hours, it is conservatively assumed that residents and guests could visit the recreational areas, which could include playgrounds, at any time of day. Assuming that approximately 20 people would visit the neighborhood parks at any given time (ten children and ten adults [half female and half male] with half of the individuals are speaking loudly), the recreational areas would generate noise levels of approximately 69.6 dBA at 3 feet.[40] It is conservatively assumed recreational activity would occur at the property line nearest the sensitive receptor. **Table 14: Phase I Recreational Park Noise Levels** shows the recreational activity noise levels would not exceed the City daytime or nighttime noise standards. Impacts would be less than significant, and no mitigation is required.

**Table 14: Phase I Recreational Park Noise Levels**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? | Nighttime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|---|---|
| 1 – Residential Uses (north) | 41.8 | 65 | No | 45 | No |
| 2 – Residential Uses (southwest) | 9.0 | 65 | No | 45 | No |
| 5 – Residential Uses (southeast) | 34.8 | 65 | No | 45 | No |
| 6 – Residential Uses (northeast) | 33.4 | 65 | No | 45 | No |
| 7 – Residential Uses (northwest) | 20.3 | 65 | No | 45 | No |
| 8 – Residential Uses (southwest) | 22.5 | 65 | No | 45 | No |
| 9 – Residential Uses (northwest) | 5.0 | 65 | No | 45 | No |
| 10 – Residential Uses (northwest) | 8.9 | 65 | No | 45 | No |
| 11 – Residential Uses (northeast) | 16.9 | 65 | No | 45 | No |

dBA = A-weighted decibels
1. Pursuant to Municipal Code Section 5-29.04, the exterior single-family residential use daytime noise standard is 65 dBA and nighttime noise standard is 45 dBA.

[39] Kariel, H. G., Noise in Rural Recreational Environments, Canadian Acoustics 19(5), 3-10, 1991.
[40] American Journal of Audiology, Volume 7, Page 3, 1998.

Special Events

The OS – R (PAs 17 and 18) land use is assumed to include recreational open space that would allow for special events such as festivals, concerts, sporting events, or outdoor gatherings that would require speakers to be brought on-site. The frequency of said special events is uncertain; however, all special events would be required to comply with the Municipal Code Section 5-29.13, which requires special events to submit a permit application to the Police Chief that acknowledges that sound from speakers would not create an audible disturbance at a distance further than 100 feet and includes illustrations of the speaker orientation and location. Therefore, speakers brought on-site for special events would be located and oriented away from the nearest sensitive receptors to not cause a noise impact. In addition, speaker use would be prohibited between the hours of 8:00 p.m. and 8:00 a.m. every day. Impacts would be less than significant, and no mitigation is required.

Parking

The single-family residential buildings would include private attached garages. The multi-family residential buildings would include subterranean parking garages. The Phase I Project area would include on-street parking along internal roadways for residential guests. Noises associated with parking activities include vehicles starting and stopping, vehicle doors closing, car horns and car alarms, loading and unloading, car radios, and conversations. Parking activity noise levels can reach 63 dBA $L_{eq}$ and are short-term in nature.[41] The residential and commercial parking spaces would be enclosed and would not result in measurable increases in ambient noise levels within the Phase I Project area. On-street and surface parking lot parking spaces would be dispersed throughout the interior of the Phase I Project area and shielded by the Phase I buildings and traffic along surrounding roadways. In addition, parking lot noise currently occurs under existing conditions within the Phase I Project area. Impacts would be less than significant, and no mitigation is required.

On-site Traffic

Passenger vehicles would access the Phase I Project site through internal drive isles. On-site traffic noise levels were calculated using the methodology described in the FHWA Traffic Noise Model Technical Manual (1998) and calculations were validated with the results from the FHWA's Traffic Noise Model Version 2.5. According to the Traffic Analysis, the Project would generate 8,270 daily vehicle trips and 687 daytime peak hour auto trips. Based on 687 daytime peak hour auto trips, on-site travel would generate noise levels of 58.0 dBA $L_{eq}$ at 50 feet from the roadway centerline. The on-site traffic noise levels were calculated assuming all 687 daytime vehicle trips would travel simultaneously along the drive aisle nearest the sensitive receptor and without accounting for shielding provided by intervening structures. **Table 15: Phase I On-site Traffic Noise Levels** shows that the on-site traffic noise levels would not exceed the City daytime noise standard.[42] Impacts would be less than significant, and no mitigation is required.

[41] Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.

[42] Due to the nature of the proposed uses, peak daytime volumes would not occur during nighttime hours and on-site traffic noise impacts during nighttime hours is not anticipated.

| Table 15: Phase I On-site Traffic Noise Levels | | | |
|---|---|---|---|
| **Sensitive Receptor** | **Noise Level at Receptor (dBA)** | **Daytime Noise Standard[1] (dBA)** | **Exceeds Standard?** |
| 1 – Residential Uses (east) | 54.6 | 65 | No |
| 2 – Residential Uses (southwest) | 21.8 | 65 | No |
| 5 – Residential Uses (southeast) | 47.6 | 65 | No |
| 6 – Residential Uses (east) | 46.2 | 65 | No |
| 7 – Residential Uses (northwest) | 33.4 | 65 | No |
| 8 – Residential Uses (southwest) | 35.3 | 65 | No |
| 9 – Residential Uses (west) | 17.9 | 65 | No |
| 10 – Residential Uses (northwest) | 21.8 | 65 | No |
| 11 – Residential Uses (northeast) | 30.0 | 65 | No |

dBA = A-weighted decibels
1. Pursuant to Municipal Code Section 5-29.04, the exterior daytime noise standard for single-family residential uses is 65.

## Phase II – Future Development

### Construction Noise

On-site Construction

Phase II construction activities are analyzed as a worst-case scenario, are assumed to be similar to Phase I, and would include demolition, site preparation, grading, infrastructure improvements, building construction, paving, and architectural coating applications. Such activities would require dozers and tractors during site preparation; excavators, graders, and dozers during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, and paving equipment during paving; and air compressors during architectural coating. The nearest sensitive receptor to the Phase II Project site is Sensitive Receptor 2 located approximately 78 feet to the south. **Table 16: Typical Construction Equipment Noise Level for Phase II** includes the typical noise levels associated with individual construction equipment at 78 feet.

| Table 16: Typical Construction Equipment Noise Level for Phase II | | |
|---|---|---|
| **Equipment** | **Typical Noise Level at 50 feet from the Source (dBA $L_{max}$)** | **Typical Noise Level at 74 feet from the Source[1] (dBA $L_{max}$)** |
| Air Compressor | 81 | 78 |
| Backhoe | 80 | 77 |
| Compactor | 82 | 79 |
| Concrete Mixer | 85 | 82 |
| Concrete Pump | 82 | 79 |
| Concrete Vibrator | 76 | 73 |
| Crane, Derrick | 88 | 85 |
| Crane, Mobile | 83 | 80 |
| Dozer | 85 | 82 |
| Generator | 81 | 78 |
| Graders | 85 | 82 |
| Loader | 85 | 82 |
| Pavers | 89 | 86 |
| Roller | 74 | 71 |
| Saw | 76 | 73 |

| Table 16: Typical Construction Equipment Noise Level for Phase II | | |
|---|---|---|
| **Equipment** | **Typical Noise Level at 50 feet from the Source (dBA $L_{max}$)** | **Typical Noise Level at 74 feet from the Source[1] (dBA $L_{max}$)** |
| Scraper | 89 | 86 |
| Shovel | 82 | 79 |
| Truck | 88 | 85 |

1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20Log(d_1/d_2)$.
   Where: $dBA_2$ = estimated noise level at receptor; $dBA_1$ = reference noise level; $d_1$ = reference distance; $d_2$ = receptor location distance.

The FHWA's RCNM was used to calculate the construction noise levels at the nearest sensitive receptors. Noise levels at other receptors surrounding the construction area would be located further away and would experience lower construction noise levels than the modeled receptors. Noise levels were based on the equipment used, distance to the nearest receptor, and acoustical use factor for equipment. When calculating construction noise, the loudest piece of anticipated equipment is conservatively assumed to operate at the property line nearest to the modeled receptor while all other equipment anticipated for each individual construction phase is assumed to operate at staggering distances throughout the construction area. This methodology accounts for equipment operating throughout the Project site and not at a fixed location for extended periods of time.[43] Phase I construction would be subject to the FSEIR MM NOI 12-4, which requires development projects near sensitive receptors to use the best available equipment noise control techniques (e.g., mufflers and shrouds) and erect temporary noise barriers. The FHWA guidance states that muffler systems can reduce RCNM reference noise levels by a minimum of 10 dBA.[44] The noise barrier would contain no gaps and would block the line-of-sight between the Phase I construction activities and the noise-sensitive uses to the north, east, south, and west. The RCNM guidance states that a solid barrier without gaping would reduce the RCNM reference noise levels by a minimum of 8 dBA.[45] See **Appendix A** for the construction noise modeling assumptions. This analysis uses the FTA's residential threshold of 80 dBA $L_{eq}$ as the significance criteria to evaluate the construction-related noise impact.[46]

**Table 17: Phase II Construction Noise Levels** summarizes the maximum Phase II construction noise levels at the sensitive receptors nearest the proposed Phase II Project site.[47] As shown in **Table 17**, the maximum Phase II construction noise levels would not exceed the FTA's residential significance criterion of 80 dBA $L_{eq}$ or substantially increase the ambient noise levels at the nearest sensitive receptors. Construction-related noise would be temporary and would cease with construction. Thus, Phase II construction activities would not result in a permanent increase in ambient noise levels in the area. Furthermore, construction activities would be restricted to the hours of 7:00 a.m. to 6:00 p.m. on weekdays and 9:00 a.m. to 6:00 p.m. on weekends. The City's

[43] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.
[44] Federal Highway Administration, *Special Report - Measurement, Prediction, and Mitigation, Chapter 4 Mitigation*, 2017, https://www.fhwa.dot.gov/environment/noise/construction_noise/special_report/hcn04.cfm, accessed March 2025.
[45] Federal Highway Administration, *Roadway Construction Noise Model User Guide, Appendix A: Best Practices for Calculating Estimated Shielding for Use in RCNM,* https://www.fhwa.dot.gov/Environment/noise/construction_noise/rcnm/rcnm10.cfm#appa, accessed March 2025.
[46] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, Table 7-3, Page 179, September 2018.
[47] See **Appendix A** for the estimated construction noise level for all of the individual and overlapping construction phases.

**Table 17: Phase II Construction Noise Levels**

| Sensitive Receptor | Maximum Noise Level (dBA $L_{eq}$)[1] | Noise Threshold (dBA $L_{eq}$)[2] | Noise Threshold Exceeded? | Ambient Noise Level (dBA $L_{eq}$) | Construction - Ambient Noise Level Difference (dBA $L_{eq}$) | Difference Exceeds 5 dBA?[3](dBA $L_{eq}$) |
|---|---|---|---|---|---|---|
| 1- Residential Uses | 50.7 | 80 | No | 74.8 | -- | No |
| 2- Residential Uses | 66.6 | | No | 66.8 | -- | No |
| 4- Future Phase I Residential Uses[4] | 69.2 | | No | 72.8 | -- | No |
| 5- Residential Uses | 43.4 | | No | 65.3 | -- | No |
| 6- Residential Uses | 42.2 | | No | 65.3 | -- | No |
| 7- Residential Uses | 58.1 | | No | 72.8 | -- | No |
| 8- Residential Uses | 53.5 | | No | 70.8 | -- | No |
| 9- Residential Uses | 53.9 | | No | 76.4 | -- | No |
| 10- Residential Uses | 52.3 | | No | 76.4 | -- | No |
| 11- Residential Uses | 43.2 | | No | 74.8 | -- | No |

dBA = A-weighted decibels, $L_{eq}$ = equivalent noise level

1. Noise levels assume a minimum 18 dBA reduction from FSEIR MM 12-4.
2. The City does not have a quantitative noise threshold for construction. The FTA's construction noise threshold is conservatively used for this analysis (FTA, *Transit Noise and Vibration Impact Assessment Manual*, September 2018).
3. A noise level increase of 5 dBA is considered perceptible and readily noticeable.
4. As Phase II is speculative, it is conservatively assumed the sensitive receptors developed by Phase I would be exposed to the noise associated with Phase II construction activities.

Source: Federal Highway Administration, *Roadway Construction Noise Model, 2006*. Refer to **Appendix A** for the noise modeling results.

permitted construction hours recognize that construction activities undertaken during daytime hours are a typical part of living in an urban environment and do not cause a significant impact. Impacts would be less than significant, and no mitigation is required.

Off-site Construction Traffic

In addition to the on-site construction noise, Phase II construction would generate mobile noise from delivery and haul trucks and construction workers traveling to and from the Phase II Project site. Construction workers are expected to arrive at the Phase II Project site before construction starts and leave when construction ends, and thus, would not overlap with the delivery and haul truck trips.

According to modeling assumptions included in the Air Quality Assessment prepared by Kimley-Horn in April 2025, the construction phases with the highest assumed number of trucks would be building construction and infrastructure improvements, where there would be up to 391 daily vendor truck trips. A truck pass-by event would generate noise levels of up to 70 dBA $L_{eq}$ at 50 feet. [48] Assuming the 391 daily trucks would arrive throughout an eight-hour work day, on average up to 14 trucks would arrive at the site hourly. Assuming that all 49 hourly trucks would pass through the same roadway segment within a 15-minute period, the estimated noise level would be 67.4 dBA $L_{eq}$ at 50 feet from the roadway centerline. As a worst-case, assuming all 391 daily trucks could pass through the same roadway segment within a 15-minute period, the estimated noise level from building construction and infrastructure improvements haul truck trips would be 76.5 dBA $L_{eq}$ at 50 feet from the roadway centerline. This worst-case noise level would not exceed the FTA's residential significance criterion of 80 dBA $L_{eq}$ for construction activities. Additionally, delivery and haul trucks associated with Phase II construction would be subject to the FSEIR MM 12-4, which limits, to the extent feasible, construction traffic to approved haul routes established by the City's Engineering Department. Impacts would be less than significant, and no mitigation is required.

**Operational Noise**

Phase II would develop residential, commercial, recreational open space, non-recreational open space uses within PAs 1 through 5, 7 through 11, 14 through 16, and 19 through 21. Based on the City's Conceptual Great Park Master Plan, it is assumed that PAs 14 through 16 would include recreational and commercial uses. No building development would occur within PA 19 through 21 consistent with the OS – NR land use designation.

Phase II implementation would create new noise sources within the Phase II Project area that would potentially impact existing sensitive receptors. The primary noise sources associated with Phase II operations include mechanical equipment (e.g., HVAC equipment), trash and recycling pick-up, recreational activities (i.e., recreational park crowds and special events), parking areas, drive-thru lane operations, truck deliveries and on-site traffic.

As Phase II development is currently not proposed, the Phase II Project site plan is not yet available. As such, reasonable assumptions have been made regarding potential noise sources and as a conservative measure, it is assumed herein that anticipated noise sources would operate at the nearest potential location to the nearest sensitive receptors. This is a conservative, worst-case

[48] Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

estimation as this does not account for the minimum setback standards.

Mechanical Equipment

Mechanical equipment (e.g., HVAC equipment) would be located on the rooftop of the buildings within the MDR (PAs 1 through 3 and 7 through 9), MU – Great Park (PAs 4,5, 10, and 11), and OS – R (PA 14, 15, and 16). As the allowable commercial operational hours are unknown, it is conservatively assumed that the HVAC equipment within the commercial buildings would operate 24 hours per day, while the HVAC equipment within the residential and recreational buildings would operate during daytime hours (i.e., 7:00 a.m. to 10:00 p.m.). Mechanical equipment (e.g., HVAC equipment) typically generates noise levels of approximately 52 dBA at 50 feet.[49] It is conservatively assumed the nearest potential location for the HVAC equipment would be located at the MDR, MU – Great Park, and OS – R land uses property line. It is conservatively assumed that an HVAC unit would operate at the property line nearest the sensitive receptor. **Table 18: Phase II Mechanical Equipment Noise Levels** shows the HVAC noise levels at the nearest sensitive receptors without accounting for shielding provided by potential screening or architectural features would not exceed the City daytime or nighttime noise standard. Impacts would be less than significant, and no mitigation is required.

**Table 18: Phase II Mechanical Equipment Noise Levels**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? | Nighttime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|---|---|
| 1 – Residential Uses (east) | 28.7 | 65 | No | 45 | No |
| 2 – Residential Uses (south) | 48.1[2] | 65 | No | 45 | No[2] |
| 5 – Residential Uses (southeast) | 20.6 | 65 | No | 45 | No |
| 6 – Residential Uses (east) | 19.3 | 65 | No | 45 | No |
| 7 – Residential Uses (north) | 36.4 | 65 | No | 45 | No |
| 8 – Residential Uses (south) | 31.9 | 65 | No | 45 | No |
| 9 – Residential Uses (west) | 32.3 | 65 | No | 45 | No |
| 10 – Residential Uses (north) | 30.1 | 65 | No | 45 | No |
| 11 – Residential Uses (northeast) | 20.3 | 65 | No | 45 | No |

dBA = A-weighted decibels

1. Pursuant to Municipal Code Section 5-29.04, the exterior single-family residential use daytime noise standard is 65 dBA and nighttime noise standard is 45 dBA.
2. The commercial HVAC units would be located as near as 1,935 feet from Sensitive Receptor 2, therefore, the noise generated by the commercial HVAC units would not exceed the nighttime noise standard at Sensitive Receptor 2.

Open Space

The Project would include common open space areas for residents. Per Assembly Bill 1307, Public Resources Code Section 21085, the noise generated by residential occupants, their guests, and wireless devices would not have a significant effect on the environment. Impacts would be less than significant, and no mitigation is required.

Trash and Recycling Pick-up

Trash and recycling would be picked up along drive aisles within the Phase II Project site during day-time hours (i.e., from 7:00 a.m. to 10:00 p.m.). Trash and recycling pick-up activity servicing the Phase II Project area currently occurs under existing conditions and would not be a new noise source. However, trash and recycling pick-up activity noise levels have been conservatively

[49] Ibid.

estimated based on the potential drive aisle along the Phase II Project site property line nearest the sensitive receptor. Trash and recycling trucks and pickup activities generate noise levels of approximately 85 dBA at approximately 3.3 feet.[50] **Table 19: Phase II Truck and Recycling Pick-up Noise Levels** shows the trash and recycling pick-up noise levels at the nearest sensitive receptors would not exceed the City daytime noise standard. Impacts would be less than significant, and no mitigation is required.

**Table 19: Phase II Truck and Recycling Pick-up Noise Levels**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|
| 1 – Residential Uses (east) | 38.0 | 65 | No |
| 2 – Residential Uses (south) | 57.5 | 65 | No |
| 5 – Residential Uses (southeast) | 30.0 | 65 | No |
| 6 – Residential Uses (east) | 28.7 | 65 | No |
| 7 – Residential Uses (north) | 47.2 | 65 | No |
| 8 – Residential Uses (south) | 41.3 | 65 | No |
| 9 – Residential Uses (west) | 41.7 | 65 | No |
| 10 – Residential Uses (north) | 40.0 | 65 | No |
| 11 – Residential Uses (northeast) | 29.8 | 65 | No |

dBA = A-weighted decibels
1. Pursuant to Municipal Code Section 5-29.04, the exterior single-family residential use daytime noise standard is 65 dBA.

Drive-Thru Lanes

The MU – Great Park (PA 4, 5, 10, and 11) land use would include drive-thru restaurants. Drive-thru lane operations would generate noise from amplified speech from the speaker intercoms, idling vehicles, and vehicles circulating through the drive-thru lanes. Active drive-thru operations generate noise levels of approximately 64 dBA at a distance of 20 feet.[51] It is conservatively assumed that drive-thru lanes would operate at the property line nearest the sensitive receptor during daytime and nighttime hours. **Table 20: Phase II Drive-Thru Lanes Noise Levels** shows the drive-thru lane noise levels at the nearest sensitive receptors would not exceed the City daytime or nighttime noise standard. In addition, noise generated by drive-thru lane operations would fluctuate depending on the time of day and would be lower than the level listed above during non-peak hours. Furthermore, the menu boards and speaker intercoms would be located even further from the sensitive receptor than the drive-thru lane. Impacts would be less than significant, and no mitigation is required.

**Table 20: Phase II Drive-Thru Lanes Noise Levels**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? | Nighttime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|---|---|
| 1 – Residential Uses (east) | 32.7 | 65 | No | 45 | No |
| 2 – Residential Uses (southwest) | 24.3 | 65 | No | 45 | No |
| 5 – Residential Uses (southeast) | 24.5 | 65 | No | 45 | No |
| 6 – Residential Uses (east) | 23.3 | 65 | No | 45 | No |
| 7 – Residential Uses (north) | 40.4 | 65 | No | 45 | No |
| 8 – Residential Uses (south) | 33.4 | 65 | No | 45 | No |
| 9 – Residential Uses (west) | 18.5 | 65 | No | 45 | No |
| 10 – Residential Uses (northwest) | 24.2 | 65 | No | 45 | No |
| 11 – Residential Uses (northeast) | 24.4 | 65 | No | 45 | No |

[50] Kariel, H. G., *Noise in Rural Recreational Environments, Canadian Acoustics 19(5), 3-10*, 1991.
[51] Drive-thru reference noise level measurements collected by Kimley-Horn on August 17, 2018.

| Table 20: Phase II Drive-Thru Lanes Noise Levels | | | | | |
|---|---|---|---|---|---|
| **Sensitive Receptor** | **Noise Level at Receptor (dBA)** | **Daytime Noise Standard[1] (dBA)** | **Exceeds Standard?** | **Nighttime Noise Standard[1] (dBA)** | **Exceeds Standard?** |

dBA = A-weighted decibels
1. Pursuant to Municipal Code Section 5-29.04, the exterior single-family residential use daytime noise standard is 65 dBA and nighttime noise standard is 45 dBA.

Truck Deliveries

Truck deliveries would occur infrequently at the commercial uses within the MU – Great Park (PA 4, 5, 10, and 11) land use for goods replenishment. Truck deliveries would generate noise from the trucks' diesel engines, exhaust systems, and brakes during low gear shifting and braking activities; backing up toward the delivery area (known as back-up beepers); dropping down the truck ramps; and maneuvering away from the delivery area. Heavy truck and loading operations typically generate a noise level of approximately 64.4 dBA at a distance of 50 feet.[52] It is conservatively assumed that truck delivery activity would occur at the property line nearest the sensitive receptor and at any time of day. **Table 21: Phase II Truck Delivery Noise Levels** shows the truck deliveries noise levels at the nearest sensitive receptors would not exceed the City daytime or nighttime noise standard. Impacts would be less than significant, and no mitigation is required.

| Table 21: Phase II Truck Delivery Noise Levels | | | | | |
|---|---|---|---|---|---|
| **Sensitive Receptor** | **Noise Level at Receptor (dBA)** | **Daytime Noise Standard[1] (dBA)** | **Exceeds Standard?** | **Nighttime Noise Standard[1] (dBA)** | **Exceeds Standard?** |
| 1 – Residential Uses (east) | 41.1 | 65 | No | 45 | No |
| 2 – Residential Uses (southwest) | 32.6 | 65 | No | 45 | No |
| 5 – Residential Uses (southeast) | 32.9 | 65 | No | 45 | No |
| 6 – Residential Uses (east) | 31.7 | 65 | No | 45 | No |
| 7 – Residential Uses (north) | 38.8[2] | 65 | No | 45 | No |
| 8 – Residential Uses (south) | 41.7 | 65 | No | 45 | No |
| 9 – Residential Uses (west) | 26.8 | 65 | No | 45 | No |
| 10 – Residential Uses (northwest) | 32.6 | 65 | No | 45 | No |
| 11 – Residential Uses (northeast) | 32.7 | 65 | No | 45 | No |

dBA = A-weighted decibels
1. Pursuant to Municipal Code Section 5-29.04, the exterior single-family residential use daytime noise standard is 65 dBA and nighttime noise standard is 45 dBA.
2. Noise level accounts for a 10 dBA reduction, as the City of Ontario Development Code, Section 6.02.025, A. Required Walls and Fences, requires loading areas within non-residential zones to be completely screened with an 8-foot wall. Source: City of Ontario, Development Code, *Chapter 6.0, Development and Subdivision Regulations, Section 6.02.025: Design Standards for Nonresidential Zoning Districts,* https://content.ontarioca.gov/sites/default/files/2025-01/Chapter%206.0%20-%20Development%20%26%20Subdivision%20Regs_Rev%2012-03-2024.pdf, accessed April 2025.

Recreational Park

The MDR (PAs 1 through 3 and 7 through 9) and OS – R (PAs 14 through 16) land uses would include recreational parks. As it is speculative to assume the recreational park operational hours, it is conservatively assumed that residents and guests could visit the recreational areas, which could include playgrounds, at any time of day. Assuming that approximately 20 people would visit the neighborhood parks at any given time (ten children and ten adults [half female and half male] with half of the individuals are speaking loudly), the recreational areas would generate noise levels of approximately 69.6 dBA at 3 feet.[53] It is conservatively assumed recreational activity would occur at

[52] Loading dock reference noise level measurements collected by Kimley-Horn on December 18, 2018.
[53] American Journal of Audiology, Volume 7, Page 3, 1998.

the property line nearest the sensitive receptor. **Table 22: Phase II Recreational Park Noise Levels** shows the recreational activity noise levels would not exceed the City daytime or nighttime noise standards. Impacts would be less than significant, and no mitigation is required.

**Table 22: Phase II Recreational Park Noise Levels**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? | Nighttime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|---|---|
| 1 – Residential Uses (northeast) | 41.8 | 65 | No | 45 | No |
| 2 – Residential Uses (south) | 41.3 | 65 | No | 45 | No |
| 5 – Residential Uses (southeast) | 34.8 | 65 | No | 45 | No |
| 6 – Residential Uses (northeast) | 33.4 | 65 | No | 45 | No |
| 7 – Residential Uses (north) | 23.7 | 65 | No | 45 | No |
| 8 – Residential Uses (south) | 25.1 | 65 | No | 45 | No |
| 9 – Residential Uses (northwest) | 25.5 | 65 | No | 45 | No |
| 10 – Residential Uses (north) | 23.3 | 65 | No | 45 | No |
| 11 – Residential Uses (northeast) | 16.9 | 65 | No | 45 | No |

dBA = A-weighted decibels

1. Pursuant to Municipal Code Section 5-29.04, the exterior single-family residential use daytime noise standard is 65 dBA and nighttime noise standard is 45 dBA.

Special Events

The OS – R (PAs 14 through 16) land use is assumed to include recreational open space that would allow for special events such as festivals, concerts, sporting events, or outdoor gatherings that would require speakers to be brought on-site. The frequency of said special events is uncertain; however, all special events would be required to comply with the Municipal Code 5-29.13, which requires special events to submit a permit application to the Police Chief that acknowledges that sound from speakers would not create an audible disturbance at a distance further than 100 feet and includes illustrations of the speaker orientation and location. Therefore, speakers brought on-site for special events would be located and oriented away from the nearest sensitive receptors to not cause a noise impact. In addition, speaker use would be prohibited between the hours of 8:00 p.m. and 8:00 a.m. every day. Impacts would be less than significant, and no mitigation is required.

Parking

The single-family residential buildings would include private attached garages. The multi-family and commercial uses would include subterranean parking garages. The Phase II Project area would include on-street parking along internal roadways for residential guests and commercial visitors. Noises associated with parking activities include vehicles starting and stopping, vehicle doors closing, car horns and car alarms, loading and unloading, car radios, and conversations. Parking activity noise levels can reach 63 dBA $L_{eq}$ and are short-term in nature.[54] The residential and commercial parking spaces would be enclosed and would not result in measurable increases in ambient noise levels within the Phase II Project area. On-street and surface parking lot parking spaces would be dispersed throughout the interior of the Phase II Project area and shielded by the Phase II buildings and traffic along surrounding roadways. In addition, parking lot noise currently occurs under existing conditions within the Phase II Project area. Impacts would be less than significant, and no mitigation is required.

[54] Kariel, H. G., *Noise in Rural Recreational Environments*, *Canadian Acoustics 19(5), 3-10*, 1991.

On-site Traffic

Passenger vehicles would access the Phase II Project site through internal drive isles. On-site traffic noise levels were calculated using the methodology described in the FHWA Traffic Noise Model Technical Manual (1998) and calculations were validated with the results from FHWA's Traffic Noise Model Version 2.5. According to the Traffic Analysis, Phase II of the Project would generate 36,446 daily vehicle trips and 2,820 peak hour auto trips. Based on 2,820 peak hour auto trips, on-site travel would generate noise levels of 64.1 dBA $L_{eq}$ at 50 feet from the roadway centerline. The on-site traffic noise levels were calculated assuming all 2,820 auto trips would travel simultaneously along the drive aisle nearest the sensitive receptor and without accounting for shielding provided by intervening structures. **Table 23: Phase II On-site Traffic Noise Levels** shows that the on-site traffic noise levels would not exceed the City daytime noise standard.[55] Impacts would be less than significant, and no mitigation is required.

**Table 23: Phase II On-site Traffic Noise Levels**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|
| 1 – Residential Uses (east) | 40.8 | 65 | No |
| 2 – Residential Uses (south) | 60.2 | 65 | No |
| 5 – Residential Uses (southeast) | 32.7 | 65 | No |
| 6 – Residential Uses (east) | 31.4 | 65 | No |
| 7 – Residential Uses (north) | 49.9 | 65 | No |
| 8 – Residential Uses (south) | 44.0 | 65 | No |
| 9 – Residential Uses (west) | 44.4 | 65 | No |
| 10 – Residential Uses (north) | 42.7 | 65 | No |
| 11 – Residential Uses (northeast) | 32.5 | 65 | No |

dBA = A-weighted decibels
1. Pursuant to Municipal Code Section 5-29.04, the exterior daytime noise standard for single-family residential uses is 65 dBA.

## Project Buildout (Phase I + Phase II)

### Construction Noise

As it is speculative to assume the Phase II construction timeline, it is conservatively assumed that Phase I construction would overlap with Phase II construction. As stated above under Phase I and Phase II, the construction noise at the nearest sensitive receptors was calculated using the FHWA's RCNM and applying a noise reduction from the FSEIR MM 12-4. **Table 24: Phase I and Phase II Overlapping Construction Noise Levels** summarizes the maximum overlapping Phase I and Phase II construction noise at the nearest sensitive receptors. As shown in **Table 24**, the maximum overlapping construction noise levels would not exceed the FTA's residential significance criterion of 80 dBA $L_{eq,}$or substantially increase the ambient noise levels at the nearest sensitive receptors. Construction-related noise would be temporary and would cease with construction. Thus, Project construction activities would not result in a permanent increase in ambient noise levels in the area. Impacts would be less than significant, and no mitigation is required.

### Operational Noise

As discussed under Phase I and Phase II, Project implementation would create new noise sources

[55] Due to the nature of the proposed uses, peak daytime volumes would not occur during nighttime hours and on-site traffic noise impacts during nighttime hours is not anticipated.

in the Project area. The Project includes all the noise sources from Phase I and Phase II and off-site traffic noise when the entire Project is built and operational. See Phase I and Phase II for more information about each noise source.

Mechanical Equipment

Refer to the mechanical equipment discussion under Phase I and Phase II. Noise generated by mechanical equipment would not exceed the City daytime or nighttime noise standard at the nearest sensitive receptors. Impacts would be less than significant, and no mitigation is required.

Open Space

Refer to the open space discussion under Phase I and Phase II. Open space noise impacts would be less than significant, and no mitigation is required.

Trash and Recycling Pick-up

Refer to the trash and recycling pick-up discussion under Phase I and Phase II. Noise generated by trash and recycling pick-up activity would not exceed the City daytime noise standard at the nearest sensitive receptors. Impacts would be less than significant, and no mitigation is required.

Drive-Thru Lanes

Refer to drive-thru lane discussions under Phase II. Noise generated by drive-thru lane operations would not exceed the City daytime or nighttime noise standard at the nearest sensitive receptors. Impacts would be less than significant, and no mitigation is required.

Truck Deliveries

Refer to truck deliveries discussions under Phase II. Noise generated by truck delivery activity would not exceed the City daytime or nighttime noise standard at the nearest sensitive receptors. Impacts would be less than significant, and no mitigation is required.

Recreational Park

Refer to the recreational park discussion under Phase I and Phase II. Noise generated by recreational park activity would not exceed the City daytime or nighttime noise standard at the nearest sensitive receptors. Impacts would be less than significant, and no mitigation is required.

**Table 24: Phase I and Phase II Overlapping Construction Noise Levels**

| Sensitive Receptor | Maximum Noise Level (dBA $L_{eq}$)[3] | Noise Threshold (dBA $L_{eq}$)[2] | Noise Threshold Exceeded? | Ambient Noise Level (dBA $L_{eq}$) | Construction - Ambient Noise Level Difference (dBA $L_{eq}$) | Difference Exceeds 5 dBA?[3] (dBA $L_{eq}$) |
|---|---|---|---|---|---|---|
| 1- Residential Uses | 65.4 | 80 | No | 74.8 | -- | No |
| 2- Residential Uses | 65.6 | | No | 66.8 | -- | No |
| 5- Residential Uses | 60.1 | | No | 65.3 | -- | No |
| 6- Residential Uses | 59.0 | | No | 65.3 | -- | No |
| 7- Residential Uses | 57.5 | | No | 72.8 | -- | No |
| 8- Residential Uses | 53.5 | | No | 70.8 | -- | No |
| 9- Residential Uses | 52.8 | | No | 76.4 | -- | No |
| 10- Residential Uses | 51.4 | | No | 76.4 | -- | No |
| 11- Residential Uses | 46.4 | | No | 74.8 | -- | No |

dBA = A-weighted decibels, $L_{eq}$ = equivalent noise level

1. Noise levels assume a minimum 18 dBA reduction from FSEIR MM 12-4.
2. The City does not have a quantitative noise threshold for construction. The FTA's construction noise threshold is conservatively used for this analysis (FTA, *Transit Noise and Vibration Impact Assessment Manual*, September 2018).
3. A noise level increase of 5 dBA is considered perceptible and readily noticeable.

Source: Federal Highway Administration, *Roadway Construction Noise Model, 2006*. Refer to **Appendix A** for the noise modeling results.

Special Events

Refer to the special event discussion under Phase I and Phase II. Amplified noise generated from special events would not exceed the City daytime or nighttime noise standard at the nearest sensitive receptors. Impacts would be less than significant, and no mitigation is required.

Parking

Refer to the parking discussion under Phase I and Phase II. Parking noise impacts would be less than significant, and no mitigation is required.

On-site Traffic

Passenger vehicles would access the Project site through internal drive isles. On-site traffic noise levels were calculated using the methodology described in the FHWA Traffic Noise Model Technical Manual (1998) and calculations were validated with the results from FHWA's Traffic Noise Model Version 2.5. According to the Traffic Analysis, the Project would generate 44,716 daily vehicle trips and 3,507 peak hour auto trips at full buildout. Based on 3,507 peak hour auto trips, on-site travel would generate noise levels of 65.1 dBA $L_{eq}$ at 50 feet from the roadway centerline. The on-site traffic noise levels were calculated assuming all 3,507 auto trips would travel simultaneously along the drive aisle nearest the sensitive receptor and without accounting for shielding provided by intervening structures. **Table 25: Project Buildout On-site Traffic Noise Levels** shows that the on-site traffic noise levels would not exceed the City daytime noise standard.[56] Impacts would be less than significant, and no mitigation is required.

**Table 25: Project Buildout On-site Traffic Noise Levels**

| Sensitive Receptor | Noise Level at Receptor (dBA) | Daytime Noise Standard[1] (dBA) | Exceeds Standard? |
|---|---|---|---|
| 1 – Residential Uses (east) | 61.7 | 65 | No |
| 2 – Residential Uses (west) | 61.2 | 65 | No |
| 5 – Residential Uses (southwest) | 54.7 | 65 | No |
| 6 – Residential Uses (east) | 53.3 | 65 | No |
| 7 – Residential Uses (northwest) | 50.9 | 65 | No |
| 8 – Residential Uses (southwest) | 45.0 | 65 | No |
| 9 – Residential Uses (west) | 45.4 | 65 | No |
| 10 – Residential Uses (southwest) | 43.7 | 65 | No |
| 11 – Residential Uses (southwest) | 33.5 | 65 | No |

dBA = A-weighted decibels

1. Pursuant to Municipal Code Section 5-29.04, the exterior daytime noise standard for single-family residential uses is 65 dBA.

On-site Composite Noise

The potential maximum Project-related noise level increase at the nearest sensitive receptors was conservatively quantified by combining the Project operational noise sources and existing ambient noise level (i.e., composite noise level). Given the variability and uncertainty of the recreational amenities and special events, the recreational noise sources (i.e., recreational park crowds and special events) were not included in the composite noise analysis. It is assumed that all the known equipment and operational activity at the Project site would occur in a constant, simultaneous manner. However, noise sources would occur intermittently throughout the day (except for the

[56] Due to the nature of the proposed uses, peak daytime volumes would not occur during nighttime hours and on-site traffic noise impacts during nighttime hours is not anticipated.

HVAC which may operate in a steady-state manner). Since a noise level increase of less than 3 dBA is considered barely perceptible, an ambient noise level increases less than 3 dBA would be considered less than significant. **Table 26: Composite On-site Noise Level** shows the combined noise level increase experienced by the sensitive receptors from Project operations would not exceed 3 dBA. Impacts would be less than significant, and no mitigation is required.

**Table 26: Composite On-site Noise Level**

| Sensitive Receptor | Noise Level (dBA) | Ambient Noise Level (dBA) | Composite Noise Level (dBA) | Incremental Increase (dBA) | Increase Exceeds 3 dBA? (dBA) |
|---|---|---|---|---|---|
| 1 – Residential Uses | 63.4 | 74.8 | 75.1 | 0.3 | No |
| 2 – Residential Uses | 62.9 | 66.8 | 68.3 | 1.5 | No |
| 5 – Residential Uses | 56.4 | 65.3 | 65.8 | 0.5 | No |
| 6 – Residential Uses | 55.0 | 65.3 | 65.7 | 0.4 | No |
| 7 – Residential Uses | 53.0 | 72.8 | 72.8 | 0.0 | No |
| 8 – Residential Uses | 48.0 | 70.8 | 70.8 | 0.0 | No |
| 9 – Residential Uses | 47.1 | 76.4 | 76.4 | 0.0 | No |
| 10 – Residential Uses | 45.6 | 76.4 | 76.4 | 0.0 | No |
| 11 – Residential Uses | 38.3 | 74.8 | 74.8 | 0.0 | No |

dBA = A-weighted decibels

Off-Site Mobile Noise

Project implementation would generate a total of 44,714 daily trips along nearby roadway segments.[57] The Project is consistent with the land uses designated in the TOP 2050, and as a result, traffic noise levels associated with the proposed Project have been contemplated and addressed in the FSEIR. Therefore, traffic noise levels generated by the proposed Project would be consistent with the findings of the FSEIR. The FSEIR concluded that the traffic noise attributable to new land development would have a less than significant impact on nearby sensitive receptors. Therefore, the Project's impacts are within the limits of the impacts identified in the FSEIR and the Project would not result in any new or more severe impacts than previously analyzed.

## Conclusion

Project implementation would result in substantial temporary or permanent increases in ambient noise levels. The mitigated Project construction-related noise would not exceed the FTA's construction noise threshold of 80 dBA for residential uses, nor would it substantially increase the ambient noise level. As discussed above, the operational stationary source noise would not exceed the applicable noise standards, but the on-site and off-site traffic noise levels would. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

### FSEIR Mitigation Measures:

The FSEIR analyzed impacts associated with construction noise throughout the City and implements the following mitigation measure, which is applicable to the Project.

**NOI 12-4** Construction activities associated with new development that occurs near sensitive receptors shall be evaluated for potential noise impacts. Construction contractors

[57] Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

shall implement the following measures for construction activities conducted in the City of Ontario. Construction plans submitted to the City shall identify these measures on demolition, grading, and construction plans submitted to the City. The City of Ontario Planning and Building Departments shall verify that grading, demolition, and/or construction plans submitted include these notations prior to issuance of demolition, grading, and/or building permits.

- Construction activity is limited to the hours: 7:00 a.m. and 6:00 p.m. Monday through Friday and 9:00 a.m. to 6:00 p.m. Saturdays and Sundays, as prescribed in the Municipal Code Section 5-29.09.
- During the entire active construction period, equipment and trucks used for project construction shall use the best-available noise control techniques (e.g., improved mufflers, equipment re-design, use of intake silencers, ducts, engine enclosures, and acoustically attenuating shields or shrouds) wherever feasible.
- Impact tools (e.g., jack hammers and hoe rams) shall be hydraulically or electronically powered whenever possible. Where the use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used along with external noise jackets on the tools.
- Stationary equipment, such as generators and air compressors shall be located as far as feasible from nearby noise-sensitive uses.
- Stockpiling shall be located as far as feasible from nearby noise-sensitive receptors.
- Construction traffic shall be limited, to the extent feasible, to approved haul routes established by the City's Engineering Department.
- At least 10 days prior to the start of construction activities, a sign shall be posted at the entrance(s) to the job site, clearly visible to the public, that includes permitted construction days and hours, as well as the telephone numbers of the City's and contractor's authorized representatives that are assigned to respond in the event of a noise or vibration complaint. If the authorized contractor's representative receives a complaint, he/she shall investigate, take appropriate corrective action, and report the action to the City.
- Signs shall be posted at the job site entrance(s), within the on-site construction zones, and along queueing lanes (if any) to reinforce the prohibition of unnecessary engine idling. All other equipment shall be turned off if not in use for more than 5 minutes.
- During the entire construction period and to the extent feasible, the use of noise-producing signals, including horns, whistles, alarms, and bells, shall be safety warning purposes only. The construction manager shall use smart back-up alarms, which automatically adjust the alarm level based on the

background noise level or switch of back-up alarms and replace with human spotters in compliance with all safety requirements and laws.

- Erect temporary noise barriers (at least as high as the exhaust of equipment and breaking line-of-sight between noise sources and sensitive receptors) as necessary and feasible, to maintain construction noise levels at or below the performance standard of 80 dBA $L_{eq}$. Barriers shall be constructed with a solid material that has a density of at least 1.5 pounds per square foot with no gaps from the ground to the top of the barrier and may be lined on the construction side with an acoustical blanket, curtain, or equivalent absorptive material.

**Mitigation Measures:** No additional mitigation is required.

**Level of Significance:** Significant and Unavoidable.

**Threshold 6.2 Would the Project generate excessive ground-borne vibration or ground-borne noise levels?**

## Phase I (Proposed Development), Phase II (Future Development), and Project Buildout (Phase I + Phase II)

### On-Site Construction Vibration

Increases in ground-borne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Project construction would have the potential to result in varying degrees of temporary ground-borne vibration, depending on the specific construction equipment used and the operations involved.

The types of construction vibration impacts include building damage and human annoyance. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. The City has not established vibration standards for construction activities. This analysis uses the Caltrans' structural damage criteria of 0.3 in/sec PPV for older residential structures and human annoyance criterion of 0.4 in/sec PPV.

**Table 27: Typical Construction Equipment Vibration Levels** lists the vibration levels for typical construction equipment at 25 feet (the reference distance), 74 feet (the distance from the Phase I Project area to the nearest structure and sensitive receptor), and 78 feet (the distance from the Phase II Project area to the nearest structure and sensitive receptor).

| Table 27: Typical Construction Equipment Vibration Levels | | | |
|---|---|---|---|
| **Equipment** | **Reference Level PPV at 25 Feet (in/sec)** | **Phase I** | **Phase II** |
| | | **PPV at 74 Feet (in/sec)[1]** | **PPV at 78 Feet (in/sec)[1]** |
| Loaded Trucks | 0.076 | 0.0149 | 0.0138 |
| Large Bulldozer | 0.089 | 0.0175 | 0.0161 |
| Small Bulldozer | 0.003 | 0.0006 | 0.0005 |
| Vibratory Roller | 0.21 | 0.0412 | 0.0381 |

PPV = peak particle velocity.

1. Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: $PPV_{equip}$ = the peak particle velocity in in/sec of the equipment adjusted for the distance; $PPV_{ref}$ = the reference vibration level in in/sec from *Table 7-4 of the Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual*, 2018; D = the distance from the equipment to the receiver.

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018

Construction activities are anticipated to occur up to the Phase I and Phase II Project area property line. As shown in **Table 27**, vibration velocities from anticipated Project construction equipment would range from 0.001 to 0.043 in/sec PPV. The vibration velocities associated with Project construction activities would not exceed the Caltrans' older residential damage threshold of 0.3 in/sec or annoyance threshold of 0.4 in/sec at the structure and sensitive receptor nearest Phase I or Phase II Project areas. Impacts would be less then significant, and no mitigation would be required.

### Off-Site Construction Vibration

Project construction would involve truck travel along nearby roadways, generating vibration events with each passing truck. According to the FTA's *Transit Noise and Vibration Impact Assessment*, a heavy truck rarely creates vibration levels that exceeds 0.012 in/sec PPV at 50 feet when on a roadway.[58] The factors influencing levels of ground-borne vibration include vehicle speed, vehicle suspension, and wheel condition and type. The frequency of vibration events is not listed as an influencing factor for vibration velocity by the FTA.[59] As such, multiple trucks traveling along the roadway would increase the frequency of vibration events but would not affect the vibration velocity experienced by sensitive receptors. Impacts would be less than significant, and no mitigation would be required.

### On-site Operational Vibration

Project operations would primarily involve personal automobiles used by residents accessing the surface parking, occasional delivery trucks (such as UPS, FedEx, etc.), and trash and recycling collection trucks. Due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.[60] In addition, there are no substantial ground borne vibration sources associated with the Project, such as rail or subways. Impacts would be less than significant.

## Conclusion

As demonstrated in **Table 27** and discussed above, Project implementation would not result in excessive groundborne vibration levels. The Project's impacts are within the limit of impacts

[58] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
[59] Ibid.
[60] Ibid.

identified in the FSEIR. As a result, the proposed project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

**Mitigation Measures:** No mitigation is required.

**Level of Significance:** Less than significant impact.

**Threshold 6.3 For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport of public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?**

## Phase I (Proposed Development), Phase II (Future Development), and Project Buildout (Phase I + Phase II)

### Chino Airport

The Project site is located approximately 0.8 miles to the north of the Chino Airport. According to the Riverside Airport Land Use Compatibility Plan (ALUCP), the Project site is located outside of the Chino Airport 55 dBA CNEL contour.[61] However, the Project site is within the Chino Airport Influence Area and would be required to comply with the development regulations within the Riverside ALUCP. Impacts would be less than significant, and no mitigation is required.

### Ontario International Airport

The Project site is located approximately 3.8 miles to the southwest of the Ontario International Airport. According to the Ontario International ALUCP, the Project site is outside of the Ontario International Airport 60 to 65 dB CNEL contour.[62] However, the Project site is located within the Ontario International Airport Influence Area and would be required to comply with the development regulations within the Ontario International ALUCP. Impacts would be less than significant, and no mitigation is required.

## Conclusion

As the Project site is located outside of the Chino Airport and Ontario International Airport noise contours, Project implementation would not expose residents or workers to excessive airport noise levels. The Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

**Mitigation Measures:** No mitigation is required.

**Level of Significance:** No impact.

[61] Riverside County Airport Land Use Commission, *Riverside County Airport Land Use Compatibility Plan, Chapter 3 Individual Airport Policies and Compatibility Maps, Map CH-3; Future Noise Impacts Chino Airport*, 2004, https://rcaluc.org/sites/g/files/aldnop421/files/migrated/Portals-13-PDFGeneral-plan-newplan-09--20Vol.-201-20Chino.pdf, accessed March 2025.

[62] Ontario Airport Planning, *Ontario International Airport Land Use Compatibility Plan, Chapter 2: Procedural and Compatibility Policies, Map 2-3 Compatibility Policy Map: Noise Impact Zones*, 2018, https://www.ont-iac.com/wp-content/uploads/2019/02/ONT-AIA-policy-map-2-3rev2-1.pdf, accessed March 2025.

## 6.2 Cumulative Noise Impacts

Noise by definition is a localized phenomenon and drastically reduces as distance from the source increases. Cumulative noise impacts involve development of the proposed Project in combination with ambient growth and other related development projects. As noise levels decrease as distance from the source increases, only projects in the nearby area could combine with the proposed Project to potentially result in cumulative noise impacts. Pursuant to TOP 2050, Project implementation would represent a consistent and logical continuation of the existing and planned development pattern in the Ontario Ranch area. The City has long anticipated that this area would transition from dairy and agricultural uses to urban uses.[63]

### Cumulative Construction Noise

Project construction would not result in a substantial temporary increase in ambient noise levels. Construction noise would be periodic and would cease upon completion of construction activities. The Project would contribute to other proximate construction project noise impacts if construction activities were conducted concurrently. Construction activities at other planned and approved projects near the Project site would be required to comply with applicable City rules related to noise and would take place during daytime hours on the days permitted by the applicable Municipal Code regulations, and projects requiring discretionary City approvals would require the City to evaluate construction noise impacts, comply with the City's standard conditions of approval, and implement mitigation, if necessary, to minimize noise impacts. Construction noise impacts are localized by nature. Because noise dissipates as it travels away from its source, noise impacts would be limited to the Project site and immediate area. Therefore, Project construction would not result in a cumulatively considerable contribution to significant cumulative impacts, assuming such a cumulative impact existed, and impacts in this regard would not be cumulatively considerable. Additionally, cumulative construction noise would be consistent with the findings of the FSEIR.

### Cumulative Construction Vibration

Ground-borne vibration decreases rapidly with distance. Potential vibration impacts are generally limited to buildings and structures that are located in close proximity of construction activity. There are no cumulative projects located adjacent to any structures impacted by Project construction. Due to the rapid attenuation characteristics of ground-borne vibration and given the distance of the nearest related project to the Project site, there is no potential for cumulative construction vibration impact.

### Cumulative Operational Noise

Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the proposed Project and other foreseeable projects. Cumulative noise impacts would occur primarily as a result of the Project-generated traffic on local roadways in combination with cumulative projects in the area.

[63] City of Ontario, The Ontario Plan 2050, Draft Supplemental Environmental Impact Report, https://content.ontarioca.gov/sites/default/files/2024-12/Final_DraftSEIR_TOP2050.pdf, accessed March 2025.

On-site Stationary Noise

Stationary noise sources of the proposed Project would result in an incremental increase in non-transportation noise sources in the Project area. However, as discussed above, operational noise caused by the Project would be less than significant. Similar to the proposed Project, other planned and approved projects would be required to mitigate for stationary noise impacts at nearby sensitive receptors, if necessary. As stationary noise sources are generally localized, there is a limited potential for other projects to contribute to cumulative noise impacts.

No known past, present, or reasonably foreseeable projects would combine with the operational noise levels generated by the Project to increase noise levels above acceptable standards because each project must comply with applicable Municipal Code regulations that limit operational noise. Therefore, the Project, together with other projects, would not create a significant cumulative impact, and even if there was such a significant cumulative impact, the Project would not make a cumulatively considerable contribution to significant cumulative operational noises.

Off-site Mobile Noise

The Project is consistent with the land uses designated in the TOP 2050, and as a result, traffic noise levels associated with the proposed Project have been contemplated and addressed in the FSEIR. The Project's contribution to cumulative impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

### Cumulative Operational Vibration Impacts

Operation of the Project would primarily involve personal automobiles used by residents and delivery trucks (e.g., UPS, FedEx, etc.). Due to the rapid drop-off rate of ground-borne vibration, the short duration of the associated events, and the distance of cumulative projects, there is no potential for cumulative operational vibration impact.

**Mitigation Measures:** No mitigation is required.

**Level of Significance:** Significant and Unavoidable.

### Conclusion

**Table 28: Project Consistency with the FSEIR** summarizes the consistency of the Project's impacts with the findings of the FSEIR. The Project-generated construction noise, stationary source noise, on-site mobile noise, construction vibration, and operational vibration would not exceed the applicable. However, the Project-generated mobile noise would exceed the applicable noise standards and be cumulatively significant. As shown in **Table 28**, the Project's impacts are within the limit of impacts identified in the FSEIR. As a result, the proposed Project would not result in any new or more severe impacts than previously analyzed in the FSEIR.

| **Table 28: Project Consistency with the FSEIR** | | |
|---|---|---|
| **Impact** | **FSEIR Findings** | **Project Findings** |
| Construction Noise | Significant and Unavoidable | Less than Significant |
| Cumulatively Considerable Net Increase of Construction Noise | Significant and Unavoidable | Less than Significant |
| Non-Industrial Stationary Source Noise | Less than Significant | Less than Significant |
| Cumulatively Considerable Net Increase of Stationary Source Noise | Less than Significant | Less than Significant |
| Mobile Noise | -- | Significant and Unavoidable |
| Cumulatively Considerable Net Increase of Mobile Noise | Less than Significant | Less than Significant |
| Construction Vibration | Significant and Unavoidable | Less than Significant |
| Operational Vibration | Less than Significant | Less than Significant |
| Airport Noise | Significant and Unavoidable | Less than Significant |

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# Appendix A

## Noise Data

## Noise Measurement Field Data

| | | | |
|---|---|---|---|
| **Project:** | Center Park Specific Plan | **Job Number:** | 19559001 |
| **Site No.:** | 1 | **Date:** | 11/20/2024 |
| **Analyst:** | Dharma Truong and Daria Young | **Time:** | 9:16 AM - 9:31 AM |
| **Location:** | 7469 Edison Avenue | | |
| **Noise Sources:** | traffic, trucks idling, and birds chirping | | |
| **Comments:** | | | |

**Results (dBA):**

| Leq: | Lmin: | Lmax: | Peak: |
|---|---|---|---|
| 76.4 | 49.1 | 90.9 | 49.1 |

| Equipment | |
|---|---|
| **Sound Level Meter:** | LD SoundExpert LxT |
| **Calibrator:** | CAL200 |
| **Response Time:** | Slow |
| **Weighting:** | A |
| **Microphone Height:** | 5 feet |

| Weather | |
|---|---|
| **Temp. (degrees F):** | 58 |
| **Wind (mph):** | 2 |
| **Sky:** | Clear |
| **Bar. Pressure:** | 30.19 |
| **Humidity:** | 35% |

**Photo:**

Kimley»Horn

# Measurement Report

## Report Summary

| | | | |
|---|---|---|---|
| Meter's File Name | ST.034.s | Computer's File Name | LxTse_0007061-20241120 091652-ST.034.ldbin |
| Meter | LxT SE 0007061 | Firmware | 2.404 |
| User | | Location | |
| Job Description | | | |
| Note | | | |

| | | | | | |
|---|---|---|---|---|---|
| Start Time | 2024-11-20 09:16:52 | Duration | 0:15:00.0 | | |
| End Time | 2024-11-20 09:31:52 | Run Time | 0:15:00.0 | Pause Time | 0:00:00.0 |
| Pre-Calibration | 2024-11-20 09:10:36 | Post-Calibration | None | Calibration Deviation | --- |

## Results

### Overall Metrics

| | | | |
|---|---|---|---|
| $LA_{eq}$ | 76.4 dB | | |
| LAE | 105.9 dB | SEA | --- dB |
| EA | 4.4 mPa²h | | |
| $LA_{peak}$ | 109.0 dB | 2024-11-20 09:26:29 | |
| $LAS_{max}$ | 90.9 dB | 2024-11-20 09:30:05 | |
| $LAS_{min}$ | 49.1 dB | 2024-11-20 09:20:23 | |
| $LA_{eq}$ | 76.4 dB | | |
| $LC_{eq}$ | 80.1 dB | $LC_{eq}$ - $LA_{eq}$ | 3.7 dB |
| $LAI_{eq}$ | 79.5 dB | $LAI_{eq}$ - $LA_{eq}$ | 3.1 dB |

| Exceedances | Count | Duration |
|---|---|---|
| LAS > 85.0 dB | 12 | 0:00:28.9 |
| LAS > 115.0 dB | 0 | 0:00:00.0 |
| LApeak > 135.0 dB | 0 | 0:00:00.0 |
| LApeak > 137.0 dB | 0 | 0:00:00.0 |
| LApeak > 140.0 dB | 0 | 0:00:00.0 |

| Community Noise | LDN | LDay | LNight |
|---|---|---|---|
| | 76.4 dB | 76.4 dB | 0.0 dB |

| | LDEN | LDay | LEve | LNight |
|---|---|---|---|---|
| | 76.4 dB | 76.4 dB | --- dB | --- dB |

| Any Data | A | | C | | Z | |
|---|---|---|---|---|---|---|
| | Level | Time Stamp | Level | Time Stamp | Level | Time Stamp |
| $L_{eq}$ | 76.4 dB | | 80.1 dB | | --- dB | |
| $Ls_{(max)}$ | 90.9 dB | 2024-11-20 09:30:05 | --- dB | None | --- dB | None |
| $LS_{(min)}$ | 49.1 dB | 2024-11-20 09:20:23 | --- dB | None | --- dB | None |
| $L_{Peak(max)}$ | 109.0 dB | 2024-11-20 09:26:29 | --- dB | None | --- dB | None |

| Overloads | Count | Duration | OBA Count | OBA Duration |
|---|---|---|---|---|
| | 0 | 0:00:00.0 | 0 | 0:00:00.0 |

### Statistics

| | |
|---|---|
| LAS 5.0 | 82.4 dB |
| LAS 10.0 | 80.3 dB |
| LAS 33.3 | 75.0 dB |
| LAS 50.0 | 70.1 dB |
| LAS 66.6 | 63.8 dB |
| LAS 90.0 | 56.2 dB |

## Noise Measurement Field Data

| | | | |
|---|---|---|---|
| **Project:** | Center Park Specific Plan | **Job Number:** | 19559001 |
| **Site No.:** | 2 | **Date:** | 11/20/2024 |
| **Analyst:** | Dharma Truong and Daria Young | **Time:** | 9:39 AM - 9:54 AM |
| **Location:** | 8061 Edison Ave | | |
| **Noise Sources:** | traffic, trucks idling, birds chirping, power wash machine, goats, car horn, rooster crowing, airplane, door slamming | | |
| **Comments:** | | | |

**Results (dBA):**

| Leq: | Lmin: | Lmax: | Peak: |
|---|---|---|---|
| 72.8 | 48.6 | 92.4 | 105.7 |

| Equipment | |
|---|---|
| **Sound Level Meter:** | LD SoundExpert LxT |
| **Calibrator:** | CAL200 |
| **Response Time:** | Slow |
| **Weighting:** | A |
| **Microphone Height:** | 5 feet |

| Weather | |
|---|---|
| **Temp. (degrees F):** | 60 |
| **Wind (mph):** | 2 |
| **Sky:** | Clear |
| **Bar. Pressure:** | 30.2 |
| **Humidity:** | 3200% |

**Photo:**

Kimley»Horn

# Measurement Report

## Report Summary

| | | | |
|---|---|---|---|
| Meter's File Name | ST.035.s | Computer's File Name | LxTse_0007061-20241120 093935-ST.035.ldbin |
| Meter | LxT SE 0007061 | Firmware | 2.404 |
| User | | Location | |
| Job Description | | | |
| Note | | | |

| | | | | | |
|---|---|---|---|---|---|
| Start Time | 2024-11-20 09:39:35 | Duration | 0:15:00.0 | | |
| End Time | 2024-11-20 09:54:35 | Run Time | 0:15:00.0 | Pause Time | 0:00:00.0 |
| Pre-Calibration | 2024-07-11 10:35:45 | Post-Calibration | None | Calibration Deviation | --- |

## Results

### Overall Metrics

| | | | |
|---|---|---|---|
| $LA_{eq}$ | 72.8 dB | | |
| LAE | 102.3 dB | SEA | --- dB |
| EA | 1.9 mPa²h | | |
| $LA_{peak}$ | 105.7 dB | 2024-11-20 09:47:13 | |
| $LAS_{max}$ | 92.4 dB | 2024-11-20 09:47:13 | |
| $LAS_{min}$ | 48.6 dB | 2024-11-20 09:51:42 | |
| $LA_{eq}$ | 72.8 dB | | |
| $LC_{eq}$ | 78.7 dB | $LC_{eq}$ - $LA_{eq}$ | 5.9 dB |
| $LAI_{eq}$ | 75.6 dB | $LAI_{eq}$ - $LA_{eq}$ | 2.8 dB |

| Exceedances | Count | Duration |
|---|---|---|
| LAS > 85.0 dB | 2 | 0:00:05.6 |
| LAS > 115.0 dB | 0 | 0:00:00.0 |
| LApeak > 135.0 dB | 0 | 0:00:00.0 |
| LApeak > 137.0 dB | 0 | 0:00:00.0 |
| LApeak > 140.0 dB | 0 | 0:00:00.0 |

| Community Noise | LDN | LDay | LNight |
|---|---|---|---|
| | 72.8 dB | 72.8 dB | 0.0 dB |

| | LDEN | LDay | LEve | LNight |
|---|---|---|---|---|
| | 72.8 dB | 72.8 dB | --- dB | --- dB |

| Any Data | A | | C | | Z | |
|---|---|---|---|---|---|---|
| | Level | Time Stamp | Level | Time Stamp | Level | Time Stamp |
| $L_{eq}$ | 72.8 dB | | 78.7 dB | | --- dB | |
| $Ls_{(max)}$ | 92.4 dB | 2024-11-20 09:47:13 | --- dB | None | --- dB | None |
| $LS_{(min)}$ | 48.6 dB | 2024-11-20 09:51:42 | --- dB | None | --- dB | None |
| $L_{Peak(max)}$ | 105.7 dB | 2024-11-20 09:47:13 | --- dB | None | --- dB | None |

| Overloads | Count | Duration | OBA Count | OBA Duration |
|---|---|---|---|---|
| | 0 | 0:00:00.0 | 0 | 0:00:00.0 |

### Statistics

| | |
|---|---|
| LAS 5.0 | 78.3 dB |
| LAS 10.0 | 76.0 dB |
| LAS 33.3 | 70.7 dB |
| LAS 50.0 | 66.9 dB |
| LAS 66.6 | 62.4 dB |
| LAS 90.0 | 53.4 dB |

## Noise Measurement Field Data

| | | | |
|---|---|---|---|
| **Project:** | Center Park Specific Plan | **Job Number:** | 19559001 |
| **Site No.:** | 3 | **Date:** | 11/20/2024 |
| **Analyst:** | Dharma Truong and Daria Young | **Time:** | 9:59 AM - 10:14 AM |
| **Location:** | 8314 Edison Avenue | | |
| **Noise Sources:** | traffic, birds chirping, sprinklers, forlift operations, car honking, cows mooing, and airplane | | |
| **Comments:** | | | |

**Results (dBA):**

| Leq: | Lmin: | Lmax: | Peak: |
|---|---|---|---|
| 74.8 | 49.4 | 88.8 | 103.5 |

| Equipment | |
|---|---|
| **Sound Level Meter:** | LD SoundExpert LxT |
| **Calibrator:** | CAL200 |
| **Response Time:** | Slow |
| **Weighting:** | A |
| **Microphone Height:** | 5 feet |

| Weather | |
|---|---|
| **Temp. (degrees F):** | 63 |
| **Wind (mph):** | 2 |
| **Sky:** | Clear |
| **Bar. Pressure:** | 30.2 |
| **Humidity:** | 30% |

**Photo:**

Kimley»Horn

# Measurement Report

## Report Summary

| | | | |
|---|---|---|---|
| Meter's File Name | ST.036.s | Computer's File Name | LxTse_0007061-20241120 095944-ST.036.ldbin |
| Meter | LxT SE 0007061 | Firmware | 2.404 |
| User | | Location | |
| Job Description | | | |
| Note | | | |

| | | | | | |
|---|---|---|---|---|---|
| Start Time | 2024-11-20 09:59:44 | Duration | 0:15:00.0 | | |
| End Time | 2024-11-20 10:14:44 | Run Time | 0:15:00.0 | Pause Time | 0:00:00.0 |
| Pre-Calibration | 2024-07-11 10:35:45 | Post-Calibration | None | Calibration Deviation | --- |

## Results

### Overall Metrics

| | | | |
|---|---|---|---|
| $LA_{eq}$ | 74.8 dB | | |
| LAE | 104.3 dB | SEA | --- dB |
| EA | 3.0 mPa²h | | |
| $LA_{peak}$ | 103.5 dB | 2024-11-20 10:14:26 | |
| $LAS_{max}$ | 88.8 dB | 2024-11-20 10:14:27 | |
| $LAS_{min}$ | 49.4 dB | 2024-11-20 10:02:10 | |
| $LA_{eq}$ | 74.8 dB | | |
| $LC_{eq}$ | 81.0 dB | $LC_{eq}$ - $LA_{eq}$ | 6.2 dB |
| $LAI_{eq}$ | 78.2 dB | $LAI_{eq}$ - $LA_{eq}$ | 3.4 dB |

| Exceedances | Count | Duration |
|---|---|---|
| LAS > 85.0 dB | 8 | 0:00:12.2 |
| LAS > 115.0 dB | 0 | 0:00:00.0 |
| LApeak > 135.0 dB | 0 | 0:00:00.0 |
| LApeak > 137.0 dB | 0 | 0:00:00.0 |
| LApeak > 140.0 dB | 0 | 0:00:00.0 |

| Community Noise | LDN | LDay | LNight |
|---|---|---|---|
| | 74.8 dB | 74.8 dB | 0.0 dB |

| | LDEN | LDay | LEve | LNight |
|---|---|---|---|---|
| | 74.8 dB | 74.8 dB | --- dB | --- dB |

| Any Data | A | | C | | Z | |
|---|---|---|---|---|---|---|
| | Level | Time Stamp | Level | Time Stamp | Level | Time Stamp |
| $L_{eq}$ | 74.8 dB | | 81.0 dB | | --- dB | |
| $Ls_{(max)}$ | 88.8 dB | 2024-11-20 10:14:27 | --- dB | None | --- dB | None |
| $LS_{(min)}$ | 49.4 dB | 2024-11-20 10:02:10 | --- dB | None | --- dB | None |
| $L_{Peak(max)}$ | 103.5 dB | 2024-11-20 10:14:26 | --- dB | None | --- dB | None |

| Overloads | Count | Duration | OBA Count | OBA Duration |
|---|---|---|---|---|
| | 0 | 0:00:00.0 | 0 | 0:00:00.0 |

### Statistics

| | |
|---|---|
| LAS 5.0 | 81.6 dB |
| LAS 10.0 | 79.5 dB |
| LAS 33.3 | 72.7 dB |
| LAS 50.0 | 67.2 dB |
| LAS 66.6 | 62.0 dB |
| LAS 90.0 | 52.9 dB |

## Noise Measurement Field Data

| | | | |
|---|---|---|---|
| **Project:** | Center Park Specific Plan | **Job Number:** | 19559001 |
| **Site No.:** | 4 | **Date:** | 11/20/2024 |
| **Analyst:** | Dharma Truong and Daria Young | **Time:** | 10:24 AM -10:39 AM |
| **Location:** | 14300 Walker Avenue | | |
| **Noise Sources:** | traffic, birds chirping, car beeper, truck back-up beepers, crows, cows | | |
| **Comments:** | | | |

**Results (dBA):**

| Leq: | Lmin: | Lmax: | Peak: |
|---|---|---|---|
| 65.3 | 39.7 | 80.3 | 103.8 |

| Equipment | |
|---|---|
| **Sound Level Meter:** | LD SoundExpert LxT |
| **Calibrator:** | CAL200 |
| **Response Time:** | Slow |
| **Weighting:** | A |
| **Microphone Height:** | 5 feet |

| Weather | |
|---|---|
| **Temp. (degrees F):** | 65 |
| **Wind (mph):** | 2 |
| **Sky:** | Clear |
| **Bar. Pressure:** | 30.2 |
| **Humidity:** | 27% |

**Photo:**

Kimley»Horn

# Measurement Report

## Report Summary

| | | | |
|---|---|---|---|
| Meter's File Name | ST.037.s | Computer's File Name | LxTse_0007061-20241120 102428-ST.037.ldbin |
| Meter | LxT SE 0007061 | Firmware | 2.404 |
| User | | Location | |
| Job Description | | | |
| Note | | | |

| | | | | | |
|---|---|---|---|---|---|
| Start Time | 2024-11-20 10:24:28 | Duration | 0:15:00.0 | | |
| End Time | 2024-11-20 10:39:28 | Run Time | 0:15:00.0 | Pause Time | 0:00:00.0 |
| Pre-Calibration | 2024-07-11 10:35:45 | Post-Calibration | None | Calibration Deviation | --- |

## Results

### Overall Metrics

| | | | |
|---|---|---|---|
| $LA_{eq}$ | 65.3 dB | | |
| LAE | 94.8 dB | SEA | --- dB |
| EA | 338.8 µPa²h | | |
| $LA_{peak}$ | 103.8 dB | 2024-11-20 10:24:29 | |
| $LAS_{max}$ | 80.3 dB | 2024-11-20 10:25:33 | |
| $LAS_{min}$ | 39.7 dB | 2024-11-20 10:28:21 | |
| $LA_{eq}$ | 65.3 dB | | |
| $LC_{eq}$ | 70.5 dB | $LC_{eq}$ - $LA_{eq}$ | 5.2 dB |
| $LAI_{eq}$ | 68.6 dB | $LAI_{eq}$ - $LA_{eq}$ | 3.3 dB |

| Exceedances | Count | Duration |
|---|---|---|
| LAS > 85.0 dB | 0 | 0:00:00.0 |
| LAS > 115.0 dB | 0 | 0:00:00.0 |
| LApeak > 135.0 dB | 0 | 0:00:00.0 |
| LApeak > 137.0 dB | 0 | 0:00:00.0 |
| LApeak > 140.0 dB | 0 | 0:00:00.0 |

| Community Noise | LDN | LDay | LNight | |
|---|---|---|---|---|
| | 65.3 dB | 65.3 dB | 0.0 dB | |
| | LDEN | LDay | LEve | LNight |
| | 65.3 dB | 65.3 dB | --- dB | --- dB |

| Any Data | A | | C | | Z | |
|---|---|---|---|---|---|---|
| | Level | Time Stamp | Level | Time Stamp | Level | Time Stamp |
| $L_{eq}$ | 65.3 dB | | 70.5 dB | | --- dB | |
| $Ls_{(max)}$ | 80.3 dB | 2024-11-20 10:25:33 | --- dB | None | --- dB | None |
| $LS_{(min)}$ | 39.7 dB | 2024-11-20 10:28:21 | --- dB | None | --- dB | None |
| $L_{Peak(max)}$ | 103.8 dB | 2024-11-20 10:24:29 | --- dB | None | --- dB | None |

| Overloads | Count | Duration | OBA Count | OBA Duration |
|---|---|---|---|---|
| | 0 | 0:00:00.0 | 0 | 0:00:00.0 |

### Statistics

| | |
|---|---|
| LAS 5.0 | 73.3 dB |
| LAS 10.0 | 69.3 dB |
| LAS 33.3 | 53.1 dB |
| LAS 50.0 | 47.7 dB |
| LAS 66.6 | 44.4 dB |
| LAS 90.0 | 42.1 dB |

## Noise Measurement Field Data

| | | | |
|---|---|---|---|
| **Project:** | Center Park Specific Plan | **Job Number:** | 19559001 |
| **Site No.:** | 5 | **Date:** | 11/20/2024 |
| **Analyst:** | Dharma Truong and Daria Young | **Time:** | 10:45 AM - 11:00 AM |
| **Location:** | 14361 Grove Avenue | | |
| **Noise Sources:** | traffic, birds chirping, hand tools, cows, helicopter | | |
| **Comments:** | | | |

**Results (dBA):**

| Leq: | Lmin: | Lmax: | Peak: |
|---|---|---|---|
| 70.8 | 45.3 | 85.7 | 99.9 |

| Equipment | |
|---|---|
| **Sound Level Meter:** | LD SoundExpert LxT |
| **Calibrator:** | CAL200 |
| **Response Time:** | Slow |
| **Weighting:** | A |
| **Microphone Height:** | 5 feet |

| Weather | |
|---|---|
| **Temp. (degrees F):** | 67 |
| **Wind (mph):** | 2 |
| **Sky:** | Clear |
| **Bar. Pressure:** | 30.19 |
| **Humidity:** | 27% |

**Photo:**

Kimley»Horn

# Measurement Report

## Report Summary

| | | | |
|---|---|---|---|
| Meter's File Name | ST.038.s | Computer's File Name | LxTse_0007061-20241120 104508-ST.038.ldbin |
| Meter | LxT SE 0007061 | Firmware | 2.404 |
| User | | Location | |
| Job Description | | | |
| Note | | | |

| | | | | | |
|---|---|---|---|---|---|
| Start Time | 2024-11-20 10:45:08 | Duration | 0:15:00.0 | | |
| End Time | 2024-11-20 11:00:08 | Run Time | 0:15:00.0 | Pause Time | 0:00:00.0 |
| Pre-Calibration | 2024-07-11 10:35:45 | Post-Calibration | None | Calibration Deviation | --- |

## Results

### Overall Metrics

| | | | |
|---|---|---|---|
| $LA_{eq}$ | 70.8 dB | | |
| LAE | 100.3 dB | SEA | --- dB |
| EA | 1.2 mPa²h | | |
| $LA_{peak}$ | 99.9 dB | 2024-11-20 10:59:23 | |
| $LAS_{max}$ | 85.7 dB | 2024-11-20 10:59:23 | |
| $LAS_{min}$ | 45.3 dB | 2024-11-20 10:56:05 | |
| $LA_{eq}$ | 70.8 dB | | |
| $LC_{eq}$ | 75.0 dB | $LC_{eq}$ - $LA_{eq}$ | 4.2 dB |
| $LAI_{eq}$ | 73.7 dB | $LAI_{eq}$ - $LA_{eq}$ | 2.9 dB |

| Exceedances | Count | Duration |
|---|---|---|
| LAS > 85.0 dB | 1 | 0:00:01.8 |
| LAS > 115.0 dB | 0 | 0:00:00.0 |
| LApeak > 135.0 dB | 0 | 0:00:00.0 |
| LApeak > 137.0 dB | 0 | 0:00:00.0 |
| LApeak > 140.0 dB | 0 | 0:00:00.0 |

| Community Noise | LDN | LDay | LNight |
|---|---|---|---|
| | 70.8 dB | 70.8 dB | 0.0 dB |

| | LDEN | LDay | LEve | LNight |
|---|---|---|---|---|
| | 70.8 dB | 70.8 dB | --- dB | --- dB |

| Any Data | A | | C | | Z | |
|---|---|---|---|---|---|---|
| | Level | Time Stamp | Level | Time Stamp | Level | Time Stamp |
| $L_{eq}$ | 70.8 dB | | 75.0 dB | | --- dB | |
| $Ls_{(max)}$ | 85.7 dB | 2024-11-20 10:59:23 | --- dB | None | --- dB | None |
| $LS_{(min)}$ | 45.3 dB | 2024-11-20 10:56:05 | --- dB | None | --- dB | None |
| $L_{Peak(max)}$ | 99.9 dB | 2024-11-20 10:59:23 | --- dB | None | --- dB | None |

| Overloads | Count | Duration | OBA Count | OBA Duration |
|---|---|---|---|---|
| | 0 | 0:00:00.0 | 0 | 0:00:00.0 |

### Statistics

| | |
|---|---|
| LAS 5.0 | 78.1 dB |
| LAS 10.0 | 75.9 dB |
| LAS 33.3 | 66.1 dB |
| LAS 50.0 | 60.8 dB |
| LAS 66.6 | 55.9 dB |
| LAS 90.0 | 47.9 dB |

## Noise Measurement Field Data

| | | | |
|---|---|---|---|
| **Project:** | Center Park Specific Plan | **Job Number:** | 19559001 |
| **Site No.:** | 6 | **Date:** | 11/20/2024 |
| **Analyst:** | Dharma and Daria | **Time:** | 11:06 AM - 11:21 AM |
| **Location:** | 14316 Bon View Avenue | | |
| **Noise Sources:** | traffic, dogs barking, birds and roosters, music playing | | |
| **Comments:** | | | |

**Results (dBA):**

| Leq: | Lmin: | Lmax: | Peak: |
|---|---|---|---|
| 66.8 | 40.9 | 84.4 | 99.1 |

| Equipment | |
|---|---|
| **Sound Level Meter:** | LD SoundExpert LxT |
| **Calibrator:** | CAL200 |
| **Response Time:** | Slow |
| **Weighting:** | A |
| **Microphone Height:** | 5 feet |

| Weather | |
|---|---|
| **Temp. (degrees F):** | 68 |
| **Wind (mph):** | 2 |
| **Sky:** | Clear |
| **Bar. Pressure:** | 30.18 |
| **Humidity:** | 25% |

**Photo:**

Kimley»Horn

# Measurement Report

## Report Summary

| | | | |
|---|---|---|---|
| Meter's File Name | ST.039.s | Computer's File Name | LxTse_0007061-20241120 110619-ST.039.ldbin |
| Meter | LxT SE 0007061 | Firmware | 2.404 |
| User | | Location | |
| Job Description | | | |
| Note | | | |

| | | | | | |
|---|---|---|---|---|---|
| Start Time | 2024-11-20 11:06:19 | Duration | 0:15:00.0 | | |
| End Time | 2024-11-20 11:21:19 | Run Time | 0:15:00.0 | Pause Time | 0:00:00.0 |
| Pre-Calibration | 2024-07-11 10:35:45 | Post-Calibration | None | Calibration Deviation | --- |

## Results

### Overall Metrics

| | | | |
|---|---|---|---|
| $LA_{eq}$ | 66.8 dB | | |
| LAE | 96.3 dB | SEA | --- dB |
| EA | 478.6 µPa²h | | |
| $LA_{peak}$ | 99.1 dB | 2024-11-20 11:08:34 | |
| $LAS_{max}$ | 84.4 dB | 2024-11-20 11:08:34 | |
| $LAS_{min}$ | 40.9 dB | 2024-11-20 11:20:17 | |
| $LA_{eq}$ | 66.8 dB | | |
| $LC_{eq}$ | 74.8 dB | $LC_{eq}$ - $LA_{eq}$ | 8.0 dB |
| $LAI_{eq}$ | 69.3 dB | $LAI_{eq}$ - $LA_{eq}$ | 2.5 dB |

| Exceedances | Count | Duration |
|---|---|---|
| LAS > 85.0 dB | 0 | 0:00:00.0 |
| LAS > 115.0 dB | 0 | 0:00:00.0 |
| LApeak > 135.0 dB | 0 | 0:00:00.0 |
| LApeak > 137.0 dB | 0 | 0:00:00.0 |
| LApeak > 140.0 dB | 0 | 0:00:00.0 |

| Community Noise | LDN | LDay | LNight | |
|---|---|---|---|---|
| | 66.8 dB | 66.8 dB | 0.0 dB | |
| | LDEN | LDay | LEve | LNight |
| | 66.8 dB | 66.8 dB | --- dB | --- dB |

| Any Data | A | | C | | Z | |
|---|---|---|---|---|---|---|
| | Level | Time Stamp | Level | Time Stamp | Level | Time Stamp |
| $L_{eq}$ | 66.8 dB | | 74.8 dB | | --- dB | |
| $Ls_{(max)}$ | 84.4 dB | 2024-11-20 11:08:34 | --- dB | None | --- dB | None |
| $LS_{(min)}$ | 40.9 dB | 2024-11-20 11:20:17 | --- dB | None | --- dB | None |
| $L_{Peak(max)}$ | 99.1 dB | 2024-11-20 11:08:34 | --- dB | None | --- dB | None |

| Overloads | Count | Duration | OBA Count | OBA Duration |
|---|---|---|---|---|
| | 0 | 0:00:00.0 | 0 | 0:00:00.0 |

### Statistics

| | |
|---|---|
| LAS 5.0 | 74.7 dB |
| LAS 10.0 | 69.6 dB |
| LAS 33.3 | 57.3 dB |
| LAS 50.0 | 52.1 dB |
| LAS 66.6 | 49.1 dB |
| LAS 90.0 | 45.3 dB |

**Construction Noise Impact on Sensitive Receptors w/o FSEIR MM**

***Parameters***

| | | |
|---|---|---|
| **Construction Hours:** | Daytime hours (7 am to 7 pm) | 8.0 |
| | Evening hours (7 pm to 10 pm) | 0.0 |
| | Nighttime hours (10 pm to 7 am) | 0.0 |
| **Leq to L10 factor** | | 3.0 |

| **Sensitive Receptors** | **Land Use** | **Distance to Property Line (feet)** | **Shielding** | **Direction to Project Site** |
|---|---|---|---|---|
| **1** | Residential Uses | 36.0 | 18.0 | N |
| **2** | Residential Uses | 53.0 | 18.0 | S |
| **3** | On-site Residential Uses | 55.0 | 18.0 | W |
| **4** | Future Phase I Residential Uses | 55.0 | 18.0 | E |
| **5** | Residential Uses | 348.0 | 18.0 | SE |
| **6** | Residential Uses | 172.0 | 18.0 | E |
| **7** | Residential Uses | 223.0 | 18.0 | N |
| **8** | Residential Uses | 357.0 | 18.0 | S |
| **9** | Residential Uses | 460.0 | 18.0 | W |
| **10** | Residential Uses | 574.0 | 18.0 | N |
| **11** | Residential Uses | 1207.0 | 18.0 | NE |

| | | | | | **RECEPTOR 1** | | | **RECEPTOR 2** | | | **RECEPTOR 3** | | | **RECEPTOR 4** | | | **RECEPTOR 5** | | | **RECEPTOR 6** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Construction Phase** | **Equipment Type** | **No. of Equip.** | **Acoustical Usage Factor** | **Reference Noise Level at 50ft per Unit, Lmax** | **Distance (feet)** | **Noise Level at Receptor 1, Lmax** | **Noise Level at Receptor 1, Leq** | **Distance (feet)** | **Noise Level at Receptor 2, Lmax** | **Noise Level at Receptor 2, Leq** | **Distance (feet)** | **Noise Level at Receptor 3, Lmax** | **Noise Level at Receptor 3, Leq** | **Distance (feet)** | **Noise Level at Receptor 4, Lmax** | **Noise Level at Receptor 4, Leq** | **Distance (feet)** | **Noise Level at Receptor 5, Lmax** | **Noise Level at Receptor 5, Leq** | **Distance (feet)** | **Noise Level at Receptor 6, Lmax** | **Noise Level at Receptor 6, Leq** |
| **Phase I** | | | | | | | | | | | | | | | | | | | | | | |
| **Demolition - PA: 6, 12, 13, 17, 18 and 22** | Concrete Saw | 1.0 | 0.2 | 89.6 | 74 | 68.2 | 61.2 | 3217 | 35.4 | 28.4 | 98 | 65.8 | 58.8 | | | | 165 | 61.2 | 54.2 | 194 | 59.8 | 52.8 |
| | Dozer | 1.0 | 0.4 | 81.7 | 174 | 52.9 | 48.9 | 3317 | 27.3 | 23.3 | 198 | 51.7 | 47.8 | | | | 265 | 49.2 | 45.2 | 294 | 48.3 | 44.3 |
| | Dozer | 1.0 | 0.4 | 81.7 | 174 | 52.9 | 48.9 | 3317 | 27.3 | 23.3 | 198 | 51.7 | 47.8 | | | | 265 | 49.2 | 45.2 | 294 | 48.3 | 44.3 |
| | Excavator | 1.0 | 0.4 | 80.7 | 274 | 47.9 | 43.9 | 3417 | 26.0 | 22.0 | 298 | 47.2 | 43.2 | | | | 365 | 45.4 | 41.5 | 394 | 44.8 | 40.8 |
| | Excavator | 1.0 | 0.4 | 80.7 | 274 | 47.9 | 43.9 | 3417 | 26.0 | 22.0 | 298 | 47.2 | 43.2 | | | | 365 | 45.4 | 41.5 | 394 | 44.8 | 40.8 |
| | Excavator | 1.0 | 0.4 | 80.7 | 374 | 45.2 | 41.2 | 3517 | 25.8 | 21.8 | 398 | 44.7 | 40.7 | | | | 465 | 43.3 | 39.4 | 494 | 42.8 | 38.8 |
| | **Combined LEQ** | | | | | | **61.9** | | | **32.0** | | | **59.7** | | | | | | **55.7** | | | **54.4** |
| **Phase I** | | | | | | | | | | | | | | | | | | | | | | |
| **Site Preparation - PA: 6, 12, 13, 17, 18 and 22** | Tractor | 1.0 | 0.4 | 84.0 | 74 | 62.6 | 58.6 | 3217 | 29.8 | 25.9 | 98 | 60.2 | 56.2 | | | | 165 | 55.6 | 51.7 | 194 | 54.2 | 50.2 |
| | Tractor | 1.0 | 0.4 | 84.0 | 174 | 55.2 | 51.2 | 3317 | 29.6 | 25.6 | 198 | 54.0 | 50.1 | | | | 265 | 51.5 | 47.5 | 294 | 50.6 | 46.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 174 | 55.2 | 51.2 | 3317 | 29.6 | 25.6 | 198 | 54.0 | 50.1 | | | | 265 | 51.5 | 47.5 | 294 | 50.6 | 46.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 274 | 51.2 | 47.2 | 3417 | 29.3 | 25.3 | 298 | 50.5 | 46.5 | | | | 365 | 48.7 | 44.8 | 394 | 48.1 | 44.1 |
| | Dozer | 1.0 | 0.4 | 81.7 | 274 | 48.9 | 44.9 | 3417 | 27.0 | 23.0 | 298 | 48.2 | 44.2 | | | | 365 | 46.4 | 42.5 | 394 | 45.8 | 41.8 |
| | Dozer | 1.0 | 0.4 | 81.7 | 374 | 46.2 | 42.2 | 3517 | 26.8 | 22.8 | 398 | 45.7 | 41.7 | | | | 465 | 44.3 | 40.4 | 494 | 43.8 | 39.8 |
| | Dozer | 1.0 | 0.4 | 81.7 | 374 | 46.2 | 42.2 | 3517 | 26.8 | 22.8 | 398 | 45.7 | 41.7 | | | | 465 | 44.3 | 40.4 | 494 | 43.8 | 39.8 |
| | **Combined LEQ** | | | | | | **60.4** | | | **33.1** | | | **45.6** | | | | | | **55.2** | | | **54.1** |
| **Phase I** | | | | | | | | | | | | | | | | | | | | | | |
| **Grading - PA: 6, 12, 13, 17, 18 and 22** | | | | | | | | | | | | | | | | | | | | 194 | | |
| | Grader | 1.0 | 0.4 | 85.0 | 74 | 63.6 | 59.6 | 3217 | 30.8 | 26.9 | 98 | 61.2 | 57.2 | | | | 165 | 56.6 | 52.7 | 294 | 51.6 | 47.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 174 | 55.2 | 51.2 | 3317 | 29.6 | 25.6 | 198 | 54.0 | 50.1 | | | | 265 | 51.5 | 47.5 | 294 | 50.6 | 46.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 174 | 55.2 | 51.2 | 3317 | 29.6 | 25.6 | 198 | 54.0 | 50.1 | | | | 265 | 51.5 | 47.5 | 394 | 48.1 | 44.1 |
| | Scraper | 1.0 | 0.4 | 83.6 | 274 | 50.8 | 46.8 | 3417 | 28.9 | 24.9 | 298 | 50.1 | 46.1 | | | | 365 | 48.3 | 44.4 | 394 | 47.7 | 43.7 |
| | Scraper | 1.0 | 0.4 | 83.6 | 274 | 50.8 | 46.8 | 3417 | 28.9 | 24.9 | 298 | 50.1 | 46.1 | | | | 365 | 48.3 | 44.4 | 494 | 45.7 | 41.7 |
| | Dozer | 1.0 | 0.4 | 81.7 | 374 | 46.2 | 42.2 | 3517 | 26.8 | 22.8 | 398 | 45.7 | 41.7 | | | | 465 | 44.3 | 40.4 | 494 | 43.8 | 39.8 |
| | Excavator | 1.0 | 0.4 | 80.7 | 374 | 45.2 | 41.2 | 3517 | 25.8 | 21.8 | 398 | 44.7 | 40.7 | | | | 465 | 43.3 | 39.4 | 594 | 41.2 | 37.2 |
| | Excavator | 1.0 | 0.4 | 80.7 | 474 | 43.2 | 39.2 | 3617 | 25.5 | 21.5 | 498 | 42.7 | 38.8 | | | | 565 | 41.6 | 37.7 | 594 | 41.2 | 37.2 |
| | **Combined LEQ** | | | | | | **61.2** | | | **33.6** | | | **59.2** | | | | | | **55.8** | | | **52.7** |
| **Phase I** | | | | | | | | | | | | | | | | | | | | | | |
| **Infrastructure Improvements- PA: 6, 12, 13, 17, 18 and 22** | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 74 | 63.6 | 60.6 | 3217 | 30.8 | 27.8 | 98 | 61.2 | 58.1 | | | | 165 | 56.6 | 53.6 | 194 | 55.2 | 52.2 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 174 | 56.2 | 53.2 | 3317 | 30.6 | 27.6 | 198 | 55.0 | 52.0 | | | | 265 | 52.5 | 49.5 | 294 | 51.6 | 48.6 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 174 | 56.2 | 53.2 | 3317 | 30.6 | 27.6 | 198 | 55.0 | 52.0 | | | | 265 | 52.5 | 49.5 | 294 | 51.6 | 48.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 274 | 51.2 | 47.2 | 3417 | 29.3 | 25.3 | 298 | 50.5 | 46.5 | | | | 365 | 48.7 | 44.8 | 394 | 48.1 | 44.1 |
| | Tractor | 1.0 | 0.4 | 84.0 | 274 | 51.2 | 47.2 | 3417 | 29.3 | 25.3 | 298 | 50.5 | 46.5 | | | | 365 | 48.7 | 44.8 | 394 | 48.1 | 44.1 |
| | Tractor | 1.0 | 0.4 | 84.0 | 374 | 48.5 | 44.5 | 3517 | 29.1 | 25.1 | 398 | 48.0 | 44.0 | | | | 465 | 46.6 | 42.7 | 494 | 46.1 | 42.1 |
| | Generator | 1.0 | 0.5 | 80.6 | 374 | 45.1 | 42.1 | 3517 | 25.7 | 22.6 | 398 | 44.6 | 41.6 | | | | 465 | 43.2 | 40.2 | 494 | 42.7 | 39.7 |
| | Crane | 1.0 | 0.2 | 80.6 | 474 | 43.1 | 35.1 | 3617 | 25.4 | 17.5 | 498 | 42.6 | 34.7 | | | | 565 | 41.5 | 33.6 | 594 | 41.1 | 33.1 |
| | Welder/Torch | 1.0 | 0.4 | 74.0 | 474 | 36.5 | 32.5 | 3617 | 18.8 | 14.8 | 498 | 36.0 | 32.1 | | | | 565 | 34.9 | 31.0 | 594 | 34.5 | 30.5 |
| | **Combined LEQ** | | | | | | **62.3** | | | **34.8** | | | **47.4** | | | | | | **57.0** | | | **55.9** |
| **Phase I** | | | | | | | | | | | | | | | | | | | | | | |
| **Building Construction - PA 6, 12, 13, 17, and 18** | | | | | | | | 3217 | | | | | | | | | | | | | | |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 74 | 63.6 | 60.6 | 3317 | 30.6 | 27.6 | | | | | | | 165 | 56.6 | 53.6 | 194 | 55.2 | 52.2 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 174 | 56.2 | 53.2 | 3317 | 30.6 | 27.6 | | | | | | | 265 | 52.5 | 49.5 | 294 | 51.6 | 48.6 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 174 | 56.2 | 53.2 | 3417 | 30.3 | 27.3 | | | | | | | 265 | 52.5 | 49.5 | 294 | 51.6 | 48.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 274 | 51.2 | 47.2 | 3417 | 29.3 | 25.3 | | | | | | | 365 | 48.7 | 44.8 | 394 | 48.1 | 44.1 |
| | Tractor | 1.0 | 0.4 | 84.0 | 274 | 51.2 | 47.2 | 3517 | 29.1 | 25.1 | | | | | | | 365 | 48.7 | 44.8 | 394 | 48.1 | 44.1 |
| | Tractor | 1.0 | 0.4 | 84.0 | 374 | 48.5 | 44.5 | 3517 | 29.1 | 25.1 | | | | | | | 465 | 46.6 | 42.7 | 494 | 46.1 | 42.1 |
| | Generator | 1.0 | 0.5 | 80.6 | 374 | 45.1 | 42.1 | 3617 | 25.4 | 22.4 | | | | | | | 465 | 43.2 | 40.2 | 494 | 42.7 | 39.7 |
| | Crane | 1.0 | 0.2 | 80.6 | 474 | 43.1 | 35.1 | 3617 | 25.4 | 17.5 | | | | | | | 565 | 41.5 | 33.6 | 594 | 41.1 | 33.1 |
| | Welder/Torch | | 0.4 | 74.0 | 474 | 0.0 | 0.0 | 3717 | 0.0 | 0.0 | | | | | | | 565 | 0.0 | 0.0 | 594 | 0.0 | 0.0 |
| | **Combined LEQ** | | | | | | **62.3** | | | **34.6** | | | | | | | | | **57.0** | | | **55.9** |
| **Phase I** | | | | | | | | | | | | | | | | | | | | | | |
| **Paving - PA: 6, 12, 13, 17, 18 and 22** | Pavement Scarafier | 1.0 | 0.2 | 89.5 | 74 | 68.1 | 61.1 | 3217 | 35.3 | 28.3 | | | | | | | 165 | 61.1 | 54.1 | 194 | 59.7 | 52.7 |
| | Pavement Scarafier | 1.0 | 0.2 | 89.5 | 174 | 60.7 | 53.7 | 3317 | 35.1 | 28.1 | | | | | | | 265 | 57.0 | 50.0 | 294 | 56.1 | 49.1 |
| | Roller | 1.0 | 0.2 | 80.0 | 174 | 51.2 | 44.2 | 3317 | 25.6 | 18.6 | | | | | | | 265 | 47.5 | 40.5 | 294 | 46.6 | 39.6 |
| | Roller | 1.0 | 0.2 | 80.0 | 274 | 47.2 | 40.2 | 3417 | 25.3 | 18.3 | | | | | | | 365 | 44.7 | 37.7 | 394 | 44.1 | 37.1 |
| | Paver | 1.0 | 0.5 | 77.2 | 274 | 44.4 | 41.4 | 3417 | 22.5 | 19.5 | | | | | | | 365 | 41.9 | 38.9 | 394 | 41.3 | 38.3 |
| | Paver | 1.0 | 0.5 | 77.2 | 374 | 41.7 | 38.7 | 3517 | 22.3 | 19.2 | | | | | | | 465 | 39.8 | 36.8 | 494 | 39.3 | 36.3 |
| | **Combined LEQ** | | | | | | **62.0** | | | **32.2** | | | | | | | | | **55.9** | | | **54.7** |
| **Phase I** | | | | | | | | | | | | | | | | | | | | | | |
| **Architectural Coating - PA 6, 12, 13, 17, 18, and 22** | Compressor (air) | 1.0 | 0.4 | 77.7 | 74 | 56.3 | 52.3 | 3217 | 23.5 | 19.6 | | | | | | | 165 | 49.3 | 45.4 | 194 | 47.9 | 43.9 |
| | **Combined LEQ** | | | | | | **52.3** | | | **20.1** | | | | | | | | | **45.4** | | | **43.9** |
| **Phase II** | | | | | | | | | | | | | | | | | | | | | | |
| **Demolition - PA: 1-5, 7-11, 14-16, and 19-21** | Concrete Saw | 1.0 | 0.2 | 89.6 | 735 | 48.3 | 41.3 | 78 | 67.7 | 60.7 | | | | 55 | 70.8 | 63.8 | 1852 | 40.2 | 33.2 | 2157 | 38.9 | 31.9 |
| | Dozer | 1.0 | 0.4 | 81.7 | 835 | 39.2 | 35.3 | 178 | 52.7 | 48.7 | | | | 155 | 53.9 | 49.9 | 1952 | 31.9 | 27.9 | 2257 | 30.6 | 26.6 |
| | Dozer | 1.0 | 0.4 | 81.7 | 835 | 39.2 | 35.3 | 178 | 52.7 | 48.7 | | | | 155 | 53.9 | 49.9 | 1952 | 31.9 | 27.9 | 2257 | 30.6 | 26.6 |
| | Excavator | 1.0 | 0.4 | 80.7 | 935 | 37.3 | 33.3 | 278 | 47.8 | 43.8 | | | | 255 | 48.5 | 44.6 | 2052 | 30.4 | 26.5 | 2357 | 29.2 | 25.3 |
| | Excavator | 1.0 | 0.4 | 80.7 | 935 | 37.3 | 33.3 | 278 | 47.8 | 43.8 | | | | 255 | 48.5 | 44.6 | 2052 | 30.4 | 26.5 | 2357 | 29.2 | 25.3 |
| | Excavator | 1.0 | 0.4 | 80.7 | 1035 | 36.4 | 32.4 | 378 | 45.1 | 41.2 | | | | 355 | 45.7 | 41.7 | 2152 | 30.0 | 26.0 | 2457 | 28.9 | 24.9 |
| | **Combined LEQ** | | | | | | **44.2** | | | **61.5** | | | | | | **64.2** | | | **36.7** | | | **35.4** |
| **Phase II** | | | | | | | | | | | | | | | | | | | | | | |
| **Site Preparation - PA: 1-5, 7-11, 14-16, and 19-21** | Tractor | 1.0 | 0.4 | 84.0 | 735 | 42.7 | 38.7 | 78 | 62.1 | 58.2 | | | | 55 | 65.2 | 61.2 | 1852 | 34.6 | 30.6 | 2157 | 33.3 | 29.3 |
| | Tractor | 1.0 | 0.4 | 84.0 | 835 | 41.5 | 37.6 | 178 | 55.0 | 51.0 | | | | 155 | 56.2 | 52.2 | 1952 | 34.2 | 30.2 | 2257 | 32.9 | 28.9 |
| | Tractor | 1.0 | 0.4 | 84.0 | 835 | 41.5 | 37.6 | 178 | 55.0 | 51.0 | | | | 155 | 56.2 | 52.2 | 1952 | 34.2 | 30.2 | 2257 | 32.9 | 28.9 |
| | Tractor | 1.0 | 0.4 | 84.0 | 935 | 40.6 | 36.6 | 278 | 51.1 | 47.1 | | | | 255 | 51.8 | 47.9 | 2052 | 33.7 | 29.8 | 2357 | 32.5 | 28.6 |
| | Dozer | 1.0 | 0.4 | 81.7 | 935 | 38.3 | 34.3 | 278 | 48.8 | 44.8 | | | | 255 | 49.5 | 45.6 | 2052 | 31.4 | 27.5 | 2357 | 30.2 | 26.3 |
| | Dozer | 1.0 | 0.4 | 81.7 | 1035 | 37.4 | 33.4 | 378 | 46.1 | 42.2 | | | | 355 | 46.7 | 42.7 | 2152 | 31.0 | 27.0 | 2457 | 29.9 | 25.9 |
| | Dozer | 1.0 | 0.4 | 81.7 | 1035 | 37.4 | 33.4 | 378 | 46.1 | 42.2 | | | | 355 | 46.7 | 42.7 | 2152 | 31.0 | 27.0 | 2457 | 29.9 | 25.9 |
| | **Combined LEQ** | | | | | | **44.8** | | | **60.1** | | | | | | **62.5** | | | **37.6** | | | **36.4** |
| **Phase II** | | | | | | | | | | | | | | | | | | | | | | |
| **Grading - PA: 1-5, 7-11, 14-16, and 19-21** | Grader | 1.0 | 0.4 | 85.0 | 735 | 43.7 | 39.7 | 78 | 63.1 | 59.2 | | | | 55 | 66.2 | 62.2 | 1852 | 35.6 | 31.6 | 2157 | 34.3 | 30.3 |
| | Tractor | 1.0 | 0.4 | 84.0 | 835 | 41.5 | 37.6 | 178 | 55.0 | 51.0 | | | | 155 | 56.2 | 52.2 | 1952 | 34.2 | 30.2 | 2257 | 32.9 | 28.9 |
| | Tractor | 1.0 | 0.4 | 84.0 | 835 | 41.5 | 37.6 | 178 | 55.0 | 51.0 | | | | 155 | 56.2 | 52.2 | 1952 | 34.2 | 30.2 | 2257 | 32.9 | 28.9 |
| | Scraper | 1.0 | 0.4 | 83.6 | 935 | 40.2 | 36.2 | 278 | 50.7 | 46.7 | | | | 255 | 51.4 | 47.5 | 2052 | 33.3 | 29.4 | 2357 | 32.1 | 28.2 |
| | Scraper | 1.0 | 0.4 | 83.6 | 935 | 40.2 | 36.2 | 278 | 50.7 | 46.7 | | | | 255 | 51.4 | 47.5 | 2052 | 33.3 | 29.4 | 2357 | 32.1 | 28.2 |
| | Dozer | 1.0 | 0.4 | 81.7 | 1035 | 37.4 | 33.4 | 378 | 46.1 | 42.2 | | | | 355 | 46.7 | 42.7 | 2152 | 31.0 | 27.0 | 2457 | 29.9 | 25.9 |
| | Excavator | 1.0 | 0.4 | 80.7 | 1035 | 36.4 | 32.4 | 378 | 45.1 | 41.2 | | | | 355 | 45.7 | 41.7 | 2152 | 30.0 | 26.0 | 2457 | 28.9 | 24.9 |
| | Excavator | 1.0 | 0.4 | 80.7 | 1135 | 35.6 | 31.6 | 478 | 43.1 | 39.1 | | | | 455 | 43.5 | 39.5 | 2252 | 29.6 | 25.6 | 2557 | 28.5 | 24.5 |
| | **Combined LEQ** | | | | | | **45.4** | | | **60.8** | | | | | | **63.3** | | | **38.2** | | | **36.9** |
| **Phase II** | | | | | | | | | | | | | | | | | | | | | | |
| **Infrastructure Improvements - PA: 1-5, 7-11, 14-16, and 19-21** | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 735 | 43.7 | 40.6 | 78 | 63.1 | 60.1 | | | | 55 | 66.2 | 63.2 | 1852 | 35.6 | 32.6 | 2157 | 34.3 | 31.3 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 835 | 42.5 | 39.5 | 178 | 56.0 | 53.0 | | | | 155 | 57.2 | 54.2 | 1952 | 35.2 | 32.2 | 2257 | 33.9 | 30.9 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 835 | 42.5 | 39.5 | 178 | 56.0 | 53.0 | | | | 155 | 57.2 | 54.2 | 1952 | 35.2 | 32.2 | 2257 | 33.9 | 30.9 |
| | Tractor | 1.0 | 0.4 | 84.0 | 935 | 40.6 | 36.6 | 278 | 51.1 | 47.1 | | | | 255 | 51.8 | 47.9 | 2052 | 33.7 | 29.8 | 2357 | 32.5 | 28.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 935 | 40.6 | 36.6 | 278 | 51.1 | 47.1 | | | | 255 | 51.8 | 47.9 | 2052 | 33.7 | 29.8 | 2357 | 32.5 | 28.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1035 | 39.7 | 35.7 | 378 | 48.4 | 44.5 | | | | 355 | 49.0 | 45.0 | 2152 | 33.3 | 29.3 | 2457 | 32.2 | 28.2 |
| | Generator | 1.0 | 0.5 | 80.6 | 1035 | 36.3 | 33.3 | 378 | 45.0 | 42.0 | | | | 355 | 45.6 | 42.6 | 2152 | 29.9 | 26.9 | 2457 | 28.8 | 25.8 |
| | Crane | 1.0 | 0.2 | 80.6 | 1135 | 35.5 | 27.5 | 478 | 43.0 | 35.0 | | | | 455 | 43.4 | 35.5 | 2252 | 29.5 | 21.6 | 2557 | 28.4 | 20.5 |

| Construction Phase | Equipment Type | No. of Equip. | Acoustical Usage Factor | Reference Noise Level at 50ft per Unit, Lmax | RECEPTOR 1 Distance (feet) | RECEPTOR 1 Noise Level at Receptor 1, Lmax | RECEPTOR 1 Noise Level at Receptor 1, Leq | RECEPTOR 2 Distance (feet) | RECEPTOR 2 Noise Level at Receptor 2, Lmax | RECEPTOR 2 Noise Level at Receptor 2, Leq | RECEPTOR 3 Distance (feet) | RECEPTOR 3 Noise Level at Receptor 3, Lmax | RECEPTOR 3 Noise Level at Receptor 3, Leq | RECEPTOR 4 Distance (feet) | RECEPTOR 4 Noise Level at Receptor 4, Lmax | RECEPTOR 4 Noise Level at Receptor 4, Leq | RECEPTOR 5 Distance (feet) | RECEPTOR 5 Noise Level at Receptor 5, Lmax | RECEPTOR 5 Noise Level at Receptor 5, Leq | RECEPTOR 6 Distance (feet) | RECEPTOR 6 Noise Level at Receptor 6, Lmax | RECEPTOR 6 Noise Level at Receptor 6, Leq |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welder/Torch | 1.0 | 0.4 | 74.0 | 1135 | 28.9 | 24.9 | 478 | 36.4 | 32.4 | | | | 455 | 36.8 | 32.8 | 2252 | 22.9 | 18.9 | 2557 | 21.8 | 17.8 |
| | **Combined LEQ** | | | | | | **46.6** | | | **62.0** | | | | | | **64.4** | | | **39.3** | | | **38.1** |
| **Phase II** | | | | | | | | | | | | | | | | | | | | | | |
| **Building Construction - PA: 1-5, 7-11, and 14-16** | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 735 | 43.7 | 40.6 | 78 | 63.1 | 60.1 | | | | 55 | 66.2 | 63.2 | 1852 | 35.6 | 32.6 | 2157 | 34.3 | 31.3 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 835 | 42.5 | 39.5 | 178 | 56.0 | 53.0 | | | | 155 | 57.2 | 54.2 | 1952 | 35.2 | 32.2 | 2257 | 33.9 | 30.9 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 835 | 42.5 | 39.5 | 178 | 56.0 | 53.0 | | | | 155 | 57.2 | 54.2 | 1952 | 35.2 | 32.2 | 2257 | 33.9 | 30.9 |
| | Tractor | 1.0 | 0.4 | 84.0 | 935 | 40.6 | 36.6 | 278 | 51.1 | 47.1 | | | | 255 | 51.8 | 47.9 | 2052 | 33.7 | 29.8 | 2357 | 32.5 | 28.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 935 | 40.6 | 36.6 | 278 | 51.1 | 47.1 | | | | 255 | 51.8 | 47.9 | 2052 | 33.7 | 29.8 | 2357 | 32.5 | 28.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1035 | 39.7 | 35.7 | 378 | 48.4 | 44.5 | | | | 355 | 49.0 | 45.0 | 2152 | 33.3 | 29.3 | 2457 | 32.2 | 28.2 |
| | Generator | 1.0 | 0.5 | 80.6 | 1035 | 36.3 | 33.3 | 378 | 45.0 | 42.0 | | | | 355 | 45.6 | 42.6 | 2152 | 29.9 | 26.9 | 2457 | 28.8 | 25.8 |
| | Crane | 1.0 | 0.2 | 80.6 | 1135 | 35.5 | 27.5 | 478 | 43.0 | 35.0 | | | | 455 | 43.4 | 35.5 | 2252 | 29.5 | 21.6 | 2557 | 28.4 | 20.5 |
| | Welder/Torch | 1.0 | 0.4 | 74.0 | 1135 | 28.9 | 24.9 | 478 | 36.4 | 32.4 | | | | 455 | 36.8 | 32.8 | 2252 | 22.9 | 18.9 | 2557 | 21.8 | 17.8 |
| | **Combined LEQ** | | | | | | **46.6** | | | **62.0** | | | | | | **64.4** | | | **39.3** | | | **38.1** |
| **Phase II** | | | | | | | | | | | | | | | | | | | | | | |
| **Paving - PA: 1-5, 7-11, 14-16, and 19-21** | | | | | | | | | | | | | | | | | | | | | | |
| | Pavement Scarafier | 1.0 | 0.2 | 89.5 | 735 | 48.2 | 41.2 | 78 | 67.6 | 60.6 | | | | 55 | 70.7 | 63.7 | 1852 | 40.1 | 33.1 | 2157 | 38.8 | 31.8 |
| | Pavement Scarafier | 1.0 | 0.2 | 89.5 | 835 | 47.0 | 40.1 | 178 | 60.5 | 53.5 | | | | 155 | 61.7 | 54.7 | 1952 | 39.7 | 32.7 | 2257 | 38.4 | 31.4 |
| | Roller | 1.0 | 0.2 | 80.0 | 835 | 37.5 | 30.6 | 178 | 51.0 | 44.0 | | | | 155 | 52.2 | 45.2 | 1952 | 30.2 | 23.2 | 2257 | 28.9 | 21.9 |
| | Roller | 1.0 | 0.2 | 80.0 | 935 | 36.6 | 29.6 | 278 | 47.1 | 40.1 | | | | 255 | 47.8 | 40.9 | 2052 | 29.7 | 22.7 | 2357 | 28.5 | 21.5 |
| | Paver | 1.0 | 0.5 | 77.2 | 935 | 33.8 | 30.8 | 278 | 44.3 | 41.3 | | | | 255 | 45.0 | 42.0 | 2052 | 26.9 | 23.9 | 2357 | 25.7 | 22.7 |
| | Paver | 1.0 | 0.5 | 77.2 | 1035 | 32.9 | 29.9 | 378 | 41.6 | 38.6 | | | | 355 | 42.2 | 39.2 | 2152 | 26.5 | 23.5 | 2457 | 25.4 | 22.4 |
| | **Combined LEQ** | | | | | | **44.4** | | | **61.6** | | | | | | **64.3** | | | **36.8** | | | **35.5** |
| **Phase II** | | | | | | | | | | | | | | | | | | | | | | |
| **Architectural Coating - PA: 1-5, 7-11, 14-16, and 19-21** | Compressor (air) | 1.0 | 0.4 | 77.7 | 735 | 36.4 | 32.4 | 78 | 55.8 | 51.9 | | | | 55 | 58.9 | 54.9 | 1852 | 28.3 | 24.3 | 2157 | 27.0 | 23.0 |
| | **Combined LEQ** | | | | | | **32.4** | | | **51.9** | | | | | | **54.9** | | **1.0** | **24.5** | | | **23.2** |
| **Phase I Overlapping Phases** | | | | | | | | | | | | | | | | | | | | | | |
| Demolition + Site Preparation | | | | | | | 64.2 | | | 35.6 | | | 59.8 | | | | | | 58.4 | | | 57.3 |
| Demolition + Site Preparation + Grading | | | | | | | 66.0 | | | 37.7 | | | 62.6 | | | | | | 60.3 | | | 58.6 |
| Site Preparation + Grading | | | | | | | 63.8 | | | 36.4 | | | 59.4 | | | | | | 58.5 | | | 56.5 |
| Grading + Infrastructure Improvements | | | | | | | 64.8 | | | 37.3 | | | 59.5 | | | | | | 59.4 | | | 57.6 |
| Infrastructure Improvements + Building Construction | | | | | | | 65.3 | | | 37.7 | | | | | | | | | 60.0 | | | 58.9 |
| Building Construction + Paving | | | | | | | 65.2 | | | 36.6 | | | | | | | | | 59.5 | | | 58.4 |
| **Maximum Noise Level** | | | | | | | **66.0** | | | **37.7** | | | **62.6** | | | | | | **60.3** | | | **58.9** |
| **Phase II Overlapping Phases** | | | | | | | | | | | | | | | | | | | | | | |
| Demolition + Site Preparation | | | | | | | 47.5 | | | 63.8 | | | | | | 66.5 | | | 40.2 | | | 38.9 |
| Demolition + Site Preparation + Grading | | | | | | | 49.6 | | | 65.6 | | | | | | 68.2 | | | 42.3 | | | 41.0 |
| Site Prepation + Grading | | | | | | | 48.1 | | | 63.5 | | | | | | 65.9 | | | 40.9 | | | 39.7 |
| Grading + Infrastructure Improvements | | | | | | | 49.0 | | | 64.4 | | | | | | 66.9 | | | 41.8 | | | 40.6 |
| Infrastructure Improvements + Paving | | | | | | | 48.6 | | | 64.8 | | | | | | 67.4 | | | 41.3 | | | 40.0 |
| Infrastructure Improvements + Paving + Building Construction | | | | | | | 50.7 | | | 66.6 | | | | | | 69.2 | | | 43.4 | | | 42.2 |
| Paving + Building Construction | | | | | | | 48.6 | | | 64.8 | | | | | | 67.4 | | | 41.3 | | | 40.0 |
| **Maximum Noise Level** | | | | | | | **50.7** | | | **66.6** | | | | | | **69.2** | | | **43.4** | | | **42.2** |
| **Phase I + Phase II Overlapping Phases** | | | | | | | | | | | | | | | | | | | | | | |
| PI Building Construction + PI Infrastructure Improvements + PII Demolition | | | | | | | 65.4 | | | 61.5 | | | | | | | | | 60.0 | | | 59.0 |
| PI Building Construction + PI Infrastructure Improvements + PII Demolition + PII Site Preparation | | | | | | | 65.2 | | | 63.8 | | | | | | | | | 59.5 | | | 58.4 |
| PI Building Construction + PI Paving + PII Demolition + PII Site Preparation | | | | | | | 65.2 | | | 63.8 | | | | | | | | | 59.5 | | | 58.4 |
| PI Building Construction + PII Demolition + PII Site Prepation | | | | | | | 62.5 | | | 63.8 | | | | | | | | | 57.1 | | | 56.0 |
| PI Building Construction +PII Demolition + PII Site Preparation + PII Grading | | | | | | | 62.6 | | | 65.6 | | | | | | | | | 57.1 | | | 56.1 |
| PI Architectural Coating + PII Demolition + PII Site Preparation + PII Grading | | | | | | | 54.2 | | | 65.6 | | | | | | | | | 47.1 | | | 45.7 |
| **Maximum Noise Level** | | | | | | | **65.4** | | | **65.6** | | | | | | | | | **60.0** | | | **59.0** |

Source for Ref. Noise Levels: RCNM, 2005

* source for any user defined equipment/data

**Construction Noise Impact on Sensitive Receptors w/o FSEIR MM**

***Parameters***

| | | |
|---|---|---|
| **Construction Hours:** | Daytime hours (7 am to 7 pm) | 8.0 |
| | Evening hours (7 pm to 10 pm) | 0.0 |
| | Nighttime hours (10 pm to 7 am) | 0.0 |
| **Leq to L10 factor** | | 3.0 |

| **Sensitive Receptors** | **Land Use** | **Distance to Property Line (feet)** | **Shielding** | **Direction to Project Site** |
|---|---|---|---|---|
| **1** | Residential Uses | 36.0 | 18.0 | N |
| **2** | Residential Uses | 53.0 | 18.0 | S |
| **3** | On-site Residential Uses | 55.0 | 18.0 | W |
| **4** | Future Phase I Residential Uses | 55.0 | 18.0 | E |
| **5** | Residential Uses | 348.0 | 18.0 | SE |
| **6** | Residential Uses | 172.0 | 18.0 | E |
| **7** | Residential Uses | 223.0 | 18.0 | N |
| **8** | Residential Uses | 357.0 | 18.0 | S |
| **9** | Residential Uses | 460.0 | 18.0 | W |
| **10** | Residential Uses | 574.0 | 18.0 | N |
| **11** | Residential Uses | 1207.0 | 18.0 | NE |

| | | | | | **RECEPTOR 7** | | | **RECEPTOR 8** | | | **RECEPTOR 9** | | | **RECEPTOR 10** | | | **RECEPTOR 11** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Construction Phase** | **Equipment Type** | **No. of Equip.** | **Acoustical Usage Factor** | **Reference Noise Level at 50ft per Unit, Lmax** | **Distance (feet)** | **Noise Level at Receptor 7, Lmax** | **Noise Level at Receptor 7, Leq** | **Distance (feet)** | **Noise Level at Receptor 8, Lmax** | **Noise Level at Receptor 8, Leq** | **Distance (feet)** | **Noise Level at Receptor 9, Lmax** | **Noise Level at Receptor 9, Leq** | **Distance (feet)** | **Noise Level at Receptor 10, Lmax** | **Noise Level at Receptor 10, Leq** | **Distance (feet)** | **Noise Level at Receptor 11, Lmax** | **Noise Level at Receptor 11, Leq** |
| **Phase I** | | | | | | | | | | | | | | | | | | | |
| **Demolition - PA: 6, 12, 13, 17, 18 and 22** | Concrete Saw | 1.0 | 0.2 | 89.6 | 845 | 47.0 | 40.1 | 680 | 48.9 | 41.9 | 5080 | 31.5 | 24.5 | 3220 | 35.4 | 28.4 | 1260 | 43.6 | 36.6 |
| | Dozer | 1.0 | 0.4 | 81.7 | 945 | 38.2 | 34.2 | 780 | 39.8 | 35.9 | 5180 | 23.4 | 19.4 | 3320 | 27.3 | 23.3 | 1360 | 35.0 | 31.0 |
| | Dozer | 1.0 | 0.4 | 81.7 | 945 | 38.2 | 34.2 | 780 | 39.8 | 35.9 | 5180 | 23.4 | 19.4 | 3320 | 27.3 | 23.3 | 1360 | 35.0 | 31.0 |
| | Excavator | 1.0 | 0.4 | 80.7 | 1045 | 36.3 | 32.3 | 880 | 37.8 | 33.8 | 5280 | 22.2 | 18.2 | 3420 | 26.0 | 22.0 | 1460 | 33.4 | 29.4 |
| | Excavator | 1.0 | 0.4 | 80.7 | 1045 | 36.3 | 32.3 | 880 | 37.8 | 33.8 | 5280 | 22.2 | 18.2 | 3420 | 26.0 | 22.0 | 1460 | 33.4 | 29.4 |
| | Excavator | 1.0 | 0.4 | 80.7 | 1145 | 35.5 | 31.5 | 980 | 36.9 | 32.9 | 5380 | 22.1 | 18.1 | 3520 | 25.7 | 21.8 | 1560 | 32.8 | 28.8 |
| | **Combined LEQ** | | | | | | **43.1** | | | **44.8** | | | **26.2** | | | **32.0** | | | **39.8** |
| **Phase I** | | | | | | | | | | | | | | | | | | | |
| **Site Preparation - PA: 6, 12, 13, 17, 18 and 22** | Tractor | 1.0 | 0.4 | 84.0 | 845 | 41.4 | 37.5 | 680 | 43.3 | 39.3 | 5080 | 25.9 | 21.9 | 3220 | 29.8 | 25.8 | 1260 | 38.0 | 34.0 |
| | Tractor | 1.0 | 0.4 | 84.0 | 945 | 40.5 | 36.5 | 780 | 42.1 | 38.2 | 5180 | 25.7 | 21.7 | 3320 | 29.6 | 25.6 | 1360 | 37.3 | 33.3 |
| | Tractor | 1.0 | 0.4 | 84.0 | 945 | 40.5 | 36.5 | 780 | 42.1 | 38.2 | 5180 | 25.7 | 21.7 | 3320 | 29.6 | 25.6 | 1360 | 37.3 | 33.3 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1045 | 39.6 | 35.6 | 880 | 41.1 | 37.1 | 5280 | 25.5 | 21.5 | 3420 | 29.3 | 25.3 | 1460 | 36.7 | 32.7 |
| | Dozer | 1.0 | 0.4 | 81.7 | 1045 | 37.3 | 33.3 | 880 | 38.8 | 34.8 | 5280 | 23.2 | 19.2 | 3420 | 27.0 | 23.0 | 1460 | 34.4 | 30.4 |
| | Dozer | 1.0 | 0.4 | 81.7 | 1145 | 36.5 | 32.5 | 980 | 37.9 | 33.9 | 5380 | 23.1 | 19.1 | 3520 | 26.7 | 22.8 | 1560 | 33.8 | 29.8 |
| | Dozer | 1.0 | 0.4 | 81.7 | 1145 | 36.5 | 32.5 | 980 | 37.9 | 33.9 | 5380 | 23.1 | 19.1 | 3520 | 26.7 | 22.8 | 1560 | 33.8 | 29.8 |
| | **Combined LEQ** | | | | | | **43.8** | | | **45.4** | | | **29.3** | | | **33.1** | | | **40.7** |
| **Phase I** | | | | | | | | | | | | | | | | | | | |
| **Grading - PA: 6, 12, 13, 17, 18 and 22** | Grader | 1.0 | 0.4 | 85.0 | 845 | 42.4 | 38.5 | 680 | 44.3 | 40.3 | 5080 | 26.9 | 22.9 | 3220 | 30.8 | 26.8 | 1260 | 39.0 | 35.0 |
| | Tractor | 1.0 | 0.4 | 84.0 | 945 | 40.5 | 36.5 | 780 | 42.1 | 38.2 | 5180 | 25.7 | 21.7 | 3320 | 29.6 | 25.6 | 1360 | 37.3 | 33.3 |
| | Tractor | 1.0 | 0.4 | 84.0 | 945 | 40.5 | 36.5 | 780 | 42.1 | 38.2 | 5180 | 25.7 | 21.7 | 3320 | 29.6 | 25.6 | 1360 | 37.3 | 33.3 |
| | Scraper | 1.0 | 0.4 | 83.6 | 1045 | 39.2 | 35.2 | 880 | 40.7 | 36.7 | 5280 | 25.1 | 21.1 | 3420 | 28.9 | 24.9 | 1460 | 36.3 | 32.3 |
| | Scraper | 1.0 | 0.4 | 83.6 | 1045 | 39.2 | 35.2 | 880 | 40.7 | 36.7 | 5280 | 25.1 | 21.1 | 3420 | 28.9 | 24.9 | 1460 | 36.3 | 32.3 |
| | Dozer | 1.0 | 0.4 | 81.7 | 1145 | 36.5 | 32.5 | 980 | 37.9 | 33.9 | 5380 | 23.1 | 19.1 | 3520 | 26.7 | 22.8 | 1560 | 33.8 | 29.8 |
| | Excavator | 1.0 | 0.4 | 80.7 | 1145 | 35.5 | 31.5 | 980 | 36.9 | 32.9 | 5380 | 22.1 | 18.1 | 3520 | 25.7 | 21.8 | 1560 | 32.8 | 28.8 |
| | Excavator | 1.0 | 0.4 | 80.7 | 1245 | 34.8 | 30.8 | 1080 | 36.0 | 32.0 | 5480 | 21.9 | 17.9 | 3620 | 25.5 | 21.5 | 1660 | 32.3 | 28.3 |
| | **Combined LEQ** | | | | | | **44.3** | | | **45.9** | | | **29.8** | | | **33.6** | | | **41.2** |
| **Phase I** | | | | | | | | | | | | | | | | | | | |
| **Infrastructure Improvements- PA: 6, 12, 13, 17, 18 and 22** | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 845 | 42.4 | 39.4 | 680 | 44.3 | 41.3 | 5080 | 26.9 | 23.9 | 3220 | 30.8 | 27.8 | 1260 | 39.0 | 36.0 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 945 | 41.5 | 38.5 | 780 | 43.1 | 40.1 | 5180 | 26.7 | 23.7 | 3320 | 30.6 | 27.5 | 1360 | 38.3 | 35.3 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 945 | 41.5 | 38.5 | 780 | 43.1 | 40.1 | 5180 | 26.7 | 23.7 | 3320 | 30.6 | 27.5 | 1360 | 38.3 | 35.3 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1045 | 39.6 | 35.6 | 880 | 41.1 | 37.1 | 5280 | 25.5 | 21.5 | 3420 | 29.3 | 25.3 | 1460 | 36.7 | 32.7 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1045 | 39.6 | 35.6 | 880 | 41.1 | 37.1 | 5280 | 25.5 | 21.5 | 3420 | 29.3 | 25.3 | 1460 | 36.7 | 32.7 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1145 | 38.8 | 34.8 | 980 | 40.2 | 36.2 | 5380 | 25.4 | 21.4 | 3520 | 29.0 | 25.1 | 1560 | 36.1 | 32.1 |
| | Generator | 1.0 | 0.5 | 80.6 | 1145 | 35.4 | 32.4 | 980 | 36.8 | 33.7 | 5380 | 22.0 | 19.0 | 3520 | 25.6 | 22.6 | 1560 | 32.7 | 29.7 |
| | Crane | 1.0 | 0.2 | 80.6 | 1245 | 34.7 | 26.7 | 1080 | 35.9 | 28.0 | 5480 | 21.8 | 13.8 | 3620 | 25.4 | 17.4 | 1660 | 32.2 | 24.2 |
| | Welder/Torch | 1.0 | 0.4 | 74.0 | 1245 | 28.1 | 24.1 | 1080 | 29.3 | 25.3 | 5480 | 15.2 | 11.2 | 3620 | 18.8 | 14.8 | 1660 | 25.6 | 21.6 |
| | **Combined LEQ** | | | | | | **45.5** | | | **47.2** | | | **31.0** | | | **34.8** | | | **42.4** |
| **Phase I** | | | | | | | | | | | | | | | | | | | |
| **Building Construction - PA 6, 12, 13, 17, and 18** | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 880 | 42.1 | 39.1 | 680 | 44.3 | 41.3 | 5080 | 26.9 | 23.9 | 3244 | 30.8 | 27.7 | 1292 | 38.8 | 35.7 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 980 | 41.2 | 38.1 | 780 | 43.1 | 40.1 | 5180 | 26.7 | 23.7 | 3344 | 30.5 | 27.5 | 1392 | 38.1 | 35.1 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 980 | 41.2 | 38.1 | 780 | 43.1 | 40.1 | 5180 | 26.7 | 23.7 | 3344 | 30.5 | 27.5 | 1392 | 38.1 | 35.1 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1080 | 39.3 | 35.3 | 880 | 41.1 | 37.1 | 5280 | 25.5 | 21.5 | 3444 | 29.2 | 25.3 | 1492 | 36.5 | 32.5 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1080 | 39.3 | 35.3 | 880 | 41.1 | 37.1 | 5280 | 25.5 | 21.5 | 3444 | 29.2 | 25.3 | 1492 | 36.5 | 32.5 |
| | Tractor | 1.0 | 0.4 | 84.0 | 1180 | 38.5 | 34.6 | 980 | 40.2 | 36.2 | 5380 | 25.4 | 21.4 | 3544 | 29.0 | 25.0 | 1592 | 35.9 | 32.0 |
| | Generator | 1.0 | 0.5 | 80.6 | 1180 | 35.1 | 32.1 | 980 | 36.8 | 33.7 | 5380 | 22.0 | 19.0 | 3544 | 25.6 | 22.6 | 1592 | 32.5 | 29.5 |
| | Crane | 1.0 | 0.2 | 80.6 | 1280 | 34.4 | 26.5 | 1080 | 35.9 | 28.0 | 5480 | 21.8 | 13.8 | 3644 | 25.3 | 17.4 | 1692 | 32.0 | 24.1 |
| | Welder/Torch | | 0.4 | 74.0 | 1280 | 0.0 | 0.0 | 1080 | 0.0 | 0.0 | 5480 | 0.0 | 0.0 | 3644 | 0.0 | 0.0 | 1692 | 0.0 | 0.0 |
| | **Combined LEQ** | | | | | | **45.2** | | | **47.1** | | | **30.9** | | | **34.7** | | | **42.2** |
| **Phase I** | | | | | | | | | | | | | | | | | | | |
| **Paving - PA: 6, 12, 13, 17, 18 and 22** | Pavement Scarafier | 1.0 | 0.2 | 89.5 | 845 | 46.9 | 40.0 | 680 | 48.8 | 41.8 | 5080 | 31.4 | 24.4 | 3220 | 35.3 | 28.3 | 1260 | 43.5 | 36.5 |
| | Pavement Scarafier | 1.0 | 0.2 | 89.5 | 945 | 46.0 | 39.0 | 780 | 47.6 | 40.6 | 5180 | 31.2 | 24.2 | 3320 | 35.1 | 28.1 | 1360 | 42.8 | 35.8 |
| | Roller | 1.0 | 0.2 | 80.0 | 945 | 36.5 | 29.5 | 780 | 38.1 | 31.1 | 5180 | 21.7 | 14.7 | 3320 | 25.6 | 18.6 | 1360 | 33.3 | 26.3 |
| | Roller | 1.0 | 0.2 | 80.0 | 1045 | 35.6 | 28.6 | 880 | 37.1 | 30.1 | 5280 | 21.5 | 14.5 | 3420 | 25.3 | 18.3 | 1460 | 32.7 | 25.7 |
| | Paver | 1.0 | 0.5 | 77.2 | 1045 | 32.8 | 29.8 | 880 | 34.3 | 31.3 | 5280 | 18.7 | 15.7 | 3420 | 22.5 | 19.5 | 1460 | 29.9 | 26.9 |
| | Paver | 1.0 | 0.5 | 77.2 | 1145 | 32.0 | 29.0 | 980 | 33.4 | 30.3 | 5380 | 18.6 | 15.6 | 3520 | 22.2 | 19.2 | 1560 | 29.3 | 26.3 |
| | **Combined LEQ** | | | | | | **43.3** | | | **45.0** | | | **28.3** | | | **32.1** | | | **40.0** |
| **Phase I** | | | | | | | | | | | | | | | | | | | |
| **Architectural Coating - PA 6, 12, 13, 17, 18, and 22** | Compressor (air) | 1.0 | 0.4 | 77.7 | 845 | 35.1 | 31.2 | 680 | 37.0 | 33.0 | 5080 | 19.6 | 15.6 | 3220 | 23.5 | 19.5 | 1260 | 31.7 | 27.7 |
| | **Combined LEQ** | | | | | | **31.2** | | | **33.1** | | | **16.7** | | | **20.0** | | | **27.8** |
| **Phase II** | | | | | | | | | | | | | | | | | | | |
| **Demolition - PA: 1-5, 7-11, 14-16, and 19-21** | Concrete Saw | 1.0 | 0.2 | 89.6 | 255 | 57.4 | 50.5 | 506 | 51.5 | 44.5 | 483 | 51.9 | 44.9 | 586 | 50.2 | 43.2 | 1895 | 40.0 | 33.0 |
| | Dozer | 1.0 | 0.4 | 81.7 | 355 | 46.7 | 42.7 | 606 | 42.0 | 38.1 | 583 | 42.4 | 38.4 | 686 | 41.0 | 37.0 | 1995 | 31.7 | 27.7 |
| | Dozer | 1.0 | 0.4 | 81.7 | 355 | 46.7 | 42.7 | 606 | 42.0 | 38.1 | 583 | 42.4 | 38.4 | 686 | 41.0 | 37.0 | 1995 | 31.7 | 27.7 |
| | Excavator | 1.0 | 0.4 | 80.7 | 455 | 43.5 | 39.5 | 706 | 39.7 | 35.7 | 683 | 40.0 | 36.0 | 786 | 38.8 | 34.8 | 2095 | 30.3 | 26.3 |
| | Excavator | 1.0 | 0.4 | 80.7 | 455 | 43.5 | 39.5 | 706 | 39.7 | 35.7 | 683 | 40.0 | 36.0 | 786 | 38.8 | 34.8 | 2095 | 30.3 | 26.3 |
| | Excavator | 1.0 | 0.4 | 80.7 | 555 | 41.8 | 37.8 | 806 | 38.6 | 34.6 | 783 | 38.8 | 34.8 | 886 | 37.7 | 33.8 | 2195 | 29.9 | 25.9 |
| | **Combined LEQ** | | | | | | **52.4** | | | **47.1** | | | **47.5** | | | **46.0** | | | **36.5** |
| **Phase II** | | | | | | | | | | | | | | | | | | | |
| **Site Preparation - PA: 1-5, 7-11, 14-16, and 19-21** | Tractor | 1.0 | 0.4 | 84.0 | 255 | 51.8 | 47.9 | 506 | 45.9 | 41.9 | 483 | 46.3 | 42.3 | 586 | 44.6 | 40.6 | 1895 | 34.4 | 30.4 |
| | Tractor | 1.0 | 0.4 | 84.0 | 355 | 49.0 | 45.0 | 606 | 44.3 | 40.4 | 583 | 44.7 | 40.7 | 686 | 43.3 | 39.3 | 1995 | 34.0 | 30.0 |
| | Tractor | 1.0 | 0.4 | 84.0 | 355 | 49.0 | 45.0 | 606 | 44.3 | 40.4 | 583 | 44.7 | 40.7 | 686 | 43.3 | 39.3 | 1995 | 34.0 | 30.0 |
| | Tractor | 1.0 | 0.4 | 84.0 | 455 | 46.8 | 42.8 | 706 | 43.0 | 39.0 | 683 | 43.3 | 39.3 | 786 | 42.1 | 38.1 | 2095 | 33.6 | 29.6 |
| | Dozer | 1.0 | 0.4 | 81.7 | 455 | 44.5 | 40.5 | 706 | 40.7 | 36.7 | 683 | 41.0 | 37.0 | 786 | 39.8 | 35.8 | 2095 | 31.3 | 27.3 |
| | Dozer | 1.0 | 0.4 | 81.7 | 555 | 42.8 | 38.8 | 806 | 39.6 | 35.6 | 783 | 39.8 | 35.8 | 886 | 38.7 | 34.8 | 2195 | 30.9 | 26.9 |
| | Dozer | 1.0 | 0.4 | 81.7 | 555 | 42.8 | 38.8 | 806 | 39.6 | 35.6 | 783 | 39.8 | 35.8 | 886 | 38.7 | 34.8 | 2195 | 30.9 | 26.9 |
| | **Combined LEQ** | | | | | | **52.3** | | | **47.6** | | | **47.9** | | | **46.5** | | | **37.4** |
| **Phase II** | | | | | | | | | | | | | | | | | | | |
| **Grading - PA: 1-5, 7-11, 14-16, and 19-21** | Grader | 1.0 | 0.4 | 85.0 | 255 | 52.8 | 48.9 | 506 | 46.9 | 42.9 | 483 | 47.3 | 43.3 | 586 | 45.6 | 41.6 | 1895 | 35.4 | 31.4 |
| | Tractor | 1.0 | 0.4 | 84.0 | 355 | 49.0 | 45.0 | 606 | 44.3 | 40.4 | 583 | 44.7 | 40.7 | 686 | 43.3 | 39.3 | 1995 | 34.0 | 30.0 |
| | Tractor | 1.0 | 0.4 | 84.0 | 355 | 49.0 | 45.0 | 606 | 44.3 | 40.4 | 583 | 44.7 | 40.7 | 686 | 43.3 | 39.3 | 1995 | 34.0 | 30.0 |
| | Scraper | 1.0 | 0.4 | 83.6 | 455 | 46.4 | 42.4 | 706 | 42.6 | 38.6 | 683 | 42.9 | 38.9 | 786 | 41.7 | 37.7 | 2095 | 33.2 | 29.2 |
| | Scraper | 1.0 | 0.4 | 83.6 | 455 | 46.4 | 42.4 | 706 | 42.6 | 38.6 | 683 | 42.9 | 38.9 | 786 | 41.7 | 37.7 | 2095 | 33.2 | 29.2 |
| | Dozer | 1.0 | 0.4 | 81.7 | 555 | 42.8 | 38.8 | 806 | 39.6 | 35.6 | 783 | 39.8 | 35.8 | 886 | 38.7 | 34.8 | 2195 | 30.9 | 26.9 |
| | Excavator | 1.0 | 0.4 | 80.7 | 555 | 41.8 | 37.8 | 806 | 38.6 | 34.6 | 783 | 38.8 | 34.8 | 886 | 37.7 | 33.8 | 2195 | 29.9 | 25.9 |
| | Excavator | 1.0 | 0.4 | 80.7 | 655 | 40.4 | 36.4 | 906 | 37.5 | 33.6 | 883 | 37.8 | 33.8 | 986 | 36.8 | 32.8 | 2295 | 29.5 | 25.5 |
| | **Combined LEQ** | | | | | | **52.9** | | | **48.1** | | | **48.4** | | | **47.0** | | | **38.0** |
| **Phase II** | | | | | | | | | | | | | | | | | | | |
| **Infrastructure Improvements - PA: 1-5, 7-11, 14-16, and 19-21** | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 255 | 52.8 | 49.8 | 506 | 46.9 | 43.9 | 483 | 47.3 | 44.3 | 586 | 45.6 | 42.6 | 1895 | 35.4 | 32.4 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 355 | 50.0 | 47.0 | 606 | 45.3 | 42.3 | 583 | 45.7 | 42.7 | 686 | 44.3 | 41.2 | 1995 | 35.0 | 32.0 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 355 | 50.0 | 47.0 | 606 | 45.3 | 42.3 | 583 | 45.7 | 42.7 | 686 | 44.3 | 41.2 | 1995 | 35.0 | 32.0 |
| | Tractor | 1.0 | 0.4 | 84.0 | 455 | 46.8 | 42.8 | 706 | 43.0 | 39.0 | 683 | 43.3 | 39.3 | 786 | 42.1 | 38.1 | 2095 | 33.6 | 29.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 455 | 46.8 | 42.8 | 706 | 43.0 | 39.0 | 683 | 43.3 | 39.3 | 786 | 42.1 | 38.1 | 2095 | 33.6 | 29.6 |
| | Tractor | 1.0 | 0.4 | 84.0 | 555 | 45.1 | 41.1 | 806 | 41.9 | 37.9 | 783 | 42.1 | 38.1 | 886 | 41.0 | 37.1 | 2195 | 33.2 | 29.2 |
| | Generator | 1.0 | 0.5 | 80.6 | 555 | 41.7 | 38.7 | 806 | 38.5 | 35.4 | 783 | 38.7 | 35.7 | 886 | 37.6 | 34.6 | 2195 | 29.8 | 26.7 |
| | Crane | 1.0 | 0.2 | 80.6 | 655 | 40.3 | 32.3 | 906 | 37.4 | 29.5 | 883 | 37.7 | 29.7 | 986 | 36.7 | 28.7 | 2295 | 29.4 | 21.4 |

| Construction Phase | Equipment Type | No. of Equip. | Acoustical Usage Factor | Reference Noise Level at 50ft per Unit, Lmax | RECEPTOR 7 Distance (feet) | RECEPTOR 7 Noise Level at Receptor 7, Lmax | RECEPTOR 7 Noise Level at Receptor 7, Leq | RECEPTOR 8 Distance (feet) | RECEPTOR 8 Noise Level at Receptor 8, Lmax | RECEPTOR 8 Noise Level at Receptor 8, Leq | RECEPTOR 9 Distance (feet) | RECEPTOR 9 Noise Level at Receptor 9, Lmax | RECEPTOR 9 Noise Level at Receptor 9, Leq | RECEPTOR 10 Distance (feet) | RECEPTOR 10 Noise Level at Receptor 10, Lmax | RECEPTOR 10 Noise Level at Receptor 10, Leq | RECEPTOR 11 Distance (feet) | RECEPTOR 11 Noise Level at Receptor 11, Lmax | RECEPTOR 11 Noise Level at Receptor 11, Leq |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Welder/Torch | 1.0 | 0.4 | 74.0 | 655 | 33.7 | 26.7 | 906 | 30.8 | 26.9 | 883 | 31.1 | 27.1 | 986 | 30.1 | 26.1 | 2295 | 22.8 | 18.8 |
| | **Combined LEQ** | | | | | | **54.1** | | | **49.3** | | | **49.7** | | | **48.3** | | | **39.1** |
| **Phase II** | | | | | | | | | | | | | | | | | | | |
| **Building Construction - PA: 1-5, 7-11, and 14-16** | | | | | | | | | | | | | | | | | | | |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 301 | 51.4 | 48.4 | 506 | 46.9 | 43.9 | 483 | 47.3 | 44.3 | 620 | 45.1 | 42.1 | 1918 | 35.3 | 32.3 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 401 | 48.9 | 45.9 | 606 | 45.3 | 42.3 | 583 | 45.7 | 42.7 | 720 | 43.8 | 40.8 | 2018 | 34.9 | 31.9 |
| | All Other Equipment > 5 HP | 1.0 | 0.5 | 85.0 | 401 | 48.9 | 45.9 | 606 | 45.3 | 42.3 | 583 | 45.7 | 42.7 | 720 | 43.8 | 40.8 | 2018 | 34.9 | 31.9 |
| | Tractor | 1.0 | 0.4 | 84.0 | 501 | 46.0 | 42.0 | 706 | 43.0 | 39.0 | 683 | 43.3 | 39.3 | 820 | 41.7 | 37.7 | 2118 | 33.5 | 29.5 |
| | Tractor | 1.0 | 0.4 | 84.0 | 501 | 46.0 | 42.0 | 706 | 43.0 | 39.0 | 683 | 43.3 | 39.3 | 820 | 41.7 | 37.7 | 2118 | 33.5 | 29.5 |
| | Tractor | 1.0 | 0.4 | 84.0 | 601 | 44.4 | 40.4 | 806 | 41.9 | 37.9 | 783 | 42.1 | 38.1 | 920 | 40.7 | 36.7 | 2218 | 33.1 | 29.1 |
| | Generator | 1.0 | 0.5 | 80.6 | 601 | 41.0 | 38.0 | 806 | 38.5 | 35.4 | 783 | 38.7 | 35.7 | 920 | 37.3 | 34.3 | 2218 | 29.7 | 26.6 |
| | Crane | 1.0 | 0.2 | 80.6 | 701 | 39.7 | 31.7 | 906 | 37.4 | 29.5 | 883 | 37.7 | 29.7 | 1020 | 36.4 | 28.4 | 2318 | 29.3 | 21.3 |
| | Welder/Torch | 1.0 | 0.4 | 74.0 | 701 | 33.1 | 29.1 | 906 | 30.8 | 26.9 | 883 | 31.1 | 27.1 | 1020 | 29.8 | 25.8 | 2318 | 22.7 | 18.7 |
| | **Combined LEQ** | | | | | | **53.0** | | **1.0** | **49.3** | | | **49.7** | | | **47.8** | | | **39.1** |
| **Phase II** | | | | | | | | | | | | | | | | | | | |
| **Paving - PA: 1-5, 7-11, 14-16, and 19-21** | | | | | | | | | | | | | | | | | | | |
| | Pavement Scarafier | 1.0 | 0.2 | 89.5 | 255 | 57.3 | 50.4 | 506 | 51.4 | 44.4 | 483 | 51.8 | 44.8 | 586 | 50.1 | 43.1 | 1895 | 39.9 | 32.9 |
| | Pavement Scarafier | 1.0 | 0.2 | 89.5 | 355 | 54.5 | 47.5 | 606 | 49.8 | 42.8 | 583 | 50.2 | 43.2 | 686 | 48.8 | 41.8 | 1995 | 39.5 | 32.5 |
| | Roller | 1.0 | 0.2 | 80.0 | 355 | 45.0 | 38.0 | 606 | 40.3 | 33.3 | 583 | 40.7 | 33.7 | 686 | 39.3 | 32.3 | 1995 | 30.0 | 23.0 |
| | Roller | 1.0 | 0.2 | 80.0 | 455 | 42.8 | 35.8 | 706 | 39.0 | 32.0 | 683 | 39.3 | 32.3 | 786 | 38.1 | 31.1 | 2095 | 29.6 | 22.6 |
| | Paver | 1.0 | 0.5 | 77.2 | 455 | 40.0 | 37.0 | 706 | 36.2 | 33.2 | 683 | 36.5 | 33.5 | 786 | 35.3 | 32.3 | 2095 | 26.8 | 23.7 |
| | Paver | 1.0 | 0.5 | 77.2 | 555 | 38.3 | 35.3 | 806 | 35.1 | 32.0 | 783 | 35.3 | 32.3 | 886 | 34.2 | 31.2 | 2195 | 26.4 | 23.3 |
| | **Combined LEQ** | | | | | | **52.6** | | | **47.3** | | | **47.7** | | | **46.2** | | | **36.6** |
| **Phase II** | | | | | | | | | | | | | | | | | | | |
| **Architectural Coating - PA: 1-5, 7-11, 14-16, and 19-21** | Compressor (air) | 1.0 | 0.4 | 77.7 | 255 | 45.5 | 41.6 | 506 | 39.6 | 35.6 | 483 | 40.0 | 36.0 | 586 | 38.3 | 34.3 | 1895 | 28.1 | 24.1 |
| | **Combined LEQ** | | | | | | **41.6** | | | **35.6** | | | **36.0** | | | **34.4** | | | **24.3** |
| **Phase I Overlapping Phases** | | | | | | | | | | | | | | | | | | | |
| Demolition + Site Preparation | | | | | | | 46.4 | | | 48.1 | | | 31.8 | | | 35.6 | | | 43.3 |
| Demolition + Site Preparation + Grading | | | | | | | 48.5 | | | 50.2 | | | 33.9 | | | 37.7 | | | 45.4 |
| Site Preparation + Grading | | | | | | | 47.1 | | | 48.7 | | | 32.6 | | | 36.4 | | | 44.0 |
| Grading + Infrastructure Improvements | | | | | | | 48.0 | | | 49.6 | | | 33.5 | | | 37.3 | | | 44.9 |
| Infrastructure Improvements + Building Construction | | | | | | | 48.4 | | | 50.1 | | | 34.0 | | | 37.8 | | | 45.3 |
| Building Construction + Paving | | | | | | | 47.3 | | | 49.2 | | | 32.8 | | | 36.6 | | | 44.2 |
| **Maximum Noise Level** | | | | | | | **48.5** | | | **50.2** | | | **34.0** | | | **37.8** | | | **45.4** |
| **Phase II Overlapping Phases** | | | | | | | | | | | | | | | | | | | |
| Demolition + Site Preparation | | | | | | | 55.3 | | | 50.4 | | | 50.7 | | | 49.3 | | | 40.0 |
| Demolition + Site Preparation + Grading | | | | | | | 57.3 | | | 52.4 | | | 52.7 | | | 51.3 | | | 42.1 |
| Site Prepation + Grading | | | | | | | 55.6 | | | 50.9 | | | 51.2 | | | 49.8 | | | 40.7 |
| Grading + Infrastructure Improvements | | | | | | | 56.5 | | | 51.8 | | | 52.1 | | | 50.7 | | | 41.6 |
| Infrastructure Improvements + Paving | | | | | | | 56.4 | | | 51.5 | | | 51.8 | | | 50.4 | | | 41.1 |
| Infrastructure Improvements + Paving + Building Construction | | | | | | | 58.1 | | | 53.5 | | | 53.9 | | | 52.3 | | | 43.2 |
| Paving + Building Construction | | | | | | | 55.8 | | | 51.5 | | | 51.8 | | | 50.1 | | | 41.0 |
| **Maximum Noise Level** | | | | | | | **58.1** | | | **53.5** | | | **53.9** | | | **52.3** | | | **43.2** |
| **Phase I + Phase II Overlapping Phases** | | | | | | | | | | | | | | | | | | | |
| PI Building Construction + PI Infrastructure Improvements + PII Demolition | | | | | | | 53.8 | | | 51.9 | | | 47.7 | | | 46.6 | | | 45.8 |
| PI Building Construction + PI Infrastructure Improvements + PII Demolition + PII Site Preparation | | | | | | | 56.0 | | | 52.8 | | | 50.8 | | | 49.5 | | | 45.6 |
| PI Building Construction + PI Paving + PII Demolition + PII Site Preparation | | | | | | | 56.0 | | | 52.8 | | | 50.8 | | | 49.5 | | | 45.6 |
| PI Building Construction + PII Demolition + PII Site Prepation | | | | | | | 55.7 | | | 52.0 | | | 50.7 | | | 49.4 | | | 44.2 |
| PI Building Construction +PII Demolition + PII Site Preparation + PII Grading | | | | | | | 57.5 | | | 53.5 | | | 52.8 | | | 51.4 | | | 45.2 |
| PI Architectural Coating + PII Demolition + PII Site Preparation + PII Grading | | | | | | | 57.3 | | | 52.4 | | | 52.7 | | | 51.3 | | | 42.3 |
| **Maximum Noise Level** | | | | | | | **57.5** | | | **53.5** | | | **52.8** | | | **51.4** | | | **45.8** |

Source for Ref. Noise Levels: RCNM, 2005

* source for any user defined equipment/data

## Phase I

| SR | Maximum Construction Noise Level (dBA $L_{eq}$) | Threshold (dBA $L_{eq}$) | Exceeds Threshold? | Ambient Noise Level (dBA $L_{eq}$) | Incremental Noise Level Difference (dBA $L_{eq}$) | Threshold (dBA $L_{eq}$) | Exceeds Threshold? |
|---|---|---|---|---|---|---|---|
| 1 | 66.0 | 80 | No | 74.8 | -8.8 | 5 | No |
| 2 | 37.7 | 80 | No | 66.8 | -29.1 | 5 | No |
| 3 | 62.6 | 80 | No | 72.8 | -8.8 | 5 | No |
| 5 | 60.3 | 80 | No | 65.3 | -5.0 | 5 | No |
| 6 | 58.9 | 80 | No | 65.3 | -5.0 | 5 | No |
| 7 | 48.5 | 80 | No | 72.8 | -24.3 | 5 | No |
| 8 | 50.2 | 80 | No | 70.8 | -20.6 | 5 | No |
| 9 | 34.0 | 80 | No | 76.4 | -42.4 | 5 | No |
| 10 | 37.7 | 80 | No | 76.4 | -38.7 | 5 | No |
| 11 | 45.4 | 80 | No | 74.8 | -29.4 | 5 | No |

## Phase II

| SR | Maximum Construction Noise Level (dBA $L_{eq}$) | Threshold (dBA $L_{eq}$) | Exceeds Threshold? | Ambient Noise Level (dBA $L_{eq}$) | Incremental Noise Level Difference (dBA $L_{eq}$) | Threshold (dBA $L_{eq}$) | Exceeds Threshold? |
|---|---|---|---|---|---|---|---|
| 1 | 50.7 | 80 | No | 74.8 | -24.1 | 5 | No |
| 2 | 66.6 | 80 | No | 66.8 | -0.2 | 5 | No |
| 4 | 69.2 | 80 | No | 72.8 | -3.6 | 5 | No |
| 5 | 43.4 | 80 | No | 65.3 | -21.9 | 5 | No |
| 6 | 42.2 | 80 | No | 65.3 | -23.1 | 5 | No |
| 7 | 58.1 | 80 | No | 72.8 | -14.7 | 5 | No |
| 8 | 53.5 | 80 | No | 70.8 | -17.3 | 5 | No |
| 9 | 53.9 | 80 | No | 76.4 | -22.5 | 5 | No |
| 10 | 52.3 | 80 | No | 76.4 | -24.1 | 5 | No |
| 11 | 43.2 | 80 | No | 74.8 | -31.6 | 5 | No |

## Phase I + Phase II Overlap

| SR | Maximum Construction Noise Level (dBA $L_{eq}$) | Threshold (dBA $L_{eq}$) | Exceeds Threshold? | Ambient Noise Level (dBA $L_{eq}$) | Incremental Noise Level Difference (dBA $L_{eq}$) | Threshold (dBA $L_{eq}$) | Exceeds Threshold? |
|---|---|---|---|---|---|---|---|
| 1 | 65.4 | 80 | No | 74.8 | -9.4 | 5 | No |
| 2 | 65.6 | 80 | No | 66.8 | -1.2 | 5 | No |
| 5 | 60.0 | 80 | No | 65.3 | -5.3 | 5 | No |
| 6 | 59.0 | 80 | No | 65.3 | -6.3 | 5 | No |
| 7 | 57.5 | 80 | No | 72.8 | -15.3 | 5 | No |
| 8 | 53.5 | 80 | No | 70.8 | -17.3 | 5 | No |
| 9 | 52.8 | 80 | No | 76.4 | -23.6 | 5 | No |
| 10 | 51.4 | 80 | No | 76.4 | -25.0 | 5 | No |
| 11 | 46.4 | 80 | No | 74.8 | -28.4 | 5 | No |

**Phase I Construction Truck Pass-By Noise**

**Average Hourly Noise (8 - hour workday)**

| Source | Noise Level | Reference Dist. (feet) | Dist. to Receptor (feet) | Distance Attenuation | Duration (minutes) |
|---|---|---|---|---|---|
| Truck passby (arrival, departure) | 70 | 50 | 50 | 70.0 | 2.38 |
| | | | | Total* | 2.38 |

| Results | | |
|---|---|---|
| Truck Pass-by Noise Levels at 50 feet from Roadway Centerline | | Exceeds Daytime Noise Standard? |
| Metric | Exterior | Exterior |
| $L_{eq(15\text{-}min)}$ | 62.0 | No |
| $L_{max}$ | 70.0 | No |

**Worst Case Noise (assumes all trucks would arrive in 15 minutes)**

| Source | Noise Level | Reference Dist. (feet) | Dist. to Receptor (feet) | Distance Attenuation | Duration (minutes) |
|---|---|---|---|---|---|
| Truck passby (arrival, departure) | 70 | 50 | 50 | 70.0 | 18.7 |
| | | | | Total* | 18.7 |

| Results | | |
|---|---|---|
| Truck Pass-by Noise Levels at 50 feet from Roadway Centerline | | Exceeds Daytime Noise Standard? |
| Metric | Exterior | Exterior |
| $L_{eq(15\text{-}min)}$ | 71.0 | No |
| $L_{max}$ | 70.0 | No |

** Duration assumes 0.17 minutes per truck during a pass-by event.*

Source: University of Washington Department of Environmental and Occupational Health Sciences, Noise Navigator Sound Level Database, July 6, 2010.

**Phase II Construction Truck Pass-By Noise**

**Average Hourly Noise (8 - hour workday)**

| Source | Noise Level | Reference Dist. (feet) | Dist. to Receptor (feet) | Distance Attenuation | Duration (minutes) |
|---|---|---|---|---|---|
| Truck passby (arrival, departure) | 70 | 50 | 50 | 70.0 | 8.33 |
| | | | | Total* | 8.33 |

| Results | | |
|---|---|---|
| Truck Pass-by Noise Levels at 50 feet from Roadway Centerline | | Exceeds Daytime Noise Standard? |
| Metric | Exterior | Exterior |
| $L_{eq(15\text{-}min)}$ | 67.4 | No |
| $L_{max}$ | 70.0 | No |

**Worst Case Noise (assumes all trucks would arrive in 15 minutes)**

| Source | Noise Level | Reference Dist. (feet) | Dist. to Receptor (feet) | Distance Attenuation | Duration (minutes) |
|---|---|---|---|---|---|
| Truck passby (arrival, departure) | 70 | 50 | 50 | 70.0 | 66.47 |
| | | | | Total* | 66.47 |

| Results | | |
|---|---|---|
| Truck Pass-by Noise Levels at 50 feet from Roadway Centerline | | Exceeds Daytime Noise Standard? |
| Metric | Exterior | Exterior |
| $L_{eq(15\text{-}min)}$ | 76.5 | No |
| $L_{max}$ | 70.0 | No |

** Duration assumes 0.17 minutes per truck during a pass-by event.*

Source: University of Washington Department of Environmental and Occupational Health Sciences, Noise Navigator Sound Level Database, July 6, 2010.

**Phase I Operational Noise Calculations**

Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20Log(d_1/d_2)$, where $dBA_2$ = estimated noise level at receptor; $dBA_1$ = reference noise level; $d_1$ = reference distance; $d_2$ = receptor location distance.

**Mechanical Equipment**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 52 | 50 | 74 | 48.6 |
| 2- Residential Uses (SW) | 52 | 50 | 3217 | 15.8 |
| 5- Residential Uses (SE) | 52 | 50 | 165 | 41.6 |
| 6- Residential Uses (E) | 52 | 50 | 194 | 40.2 |
| 7- Residential Uses (NW) | 52 | 50 | 880 | 27.1 |
| 8- Residential Uses (S) | 52 | 50 | 680 | 29.3 |
| 9- Residential Uses (W) | 52 | 50 | 5080 | 11.9 |
| 10- Residential Uses (NW) | 52 | 50 | 3244 | 15.8 |
| 11- Residential Uses (NE) | 52 | 50 | 1292 | 23.8 |

1. Source: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values* , July 6, 2010.
2. Distance based on the nearest potential HVAC location within the MDR (PAs 6, 12, and 13) and OS-R (PAs 17 and 18) land uses.

**Trash and Recycling Pick-up**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 85 | 3.3 | 74 | 58.0 |
| 2- Residential Uses (SW) | 85 | 3.3 | 3217 | 25.2 |
| 5- Residential Uses (SE) | 85 | 3.3 | 165 | 51.0 |
| 6- Residential Uses (E) | 85 | 3.3 | 194 | 49.6 |
| 7- Residential Uses (NW) | 85 | 3.3 | 845 | 36.8 |
| 8- Residential Uses (SW) | 85 | 3.3 | 680 | 38.7 |
| 9- Residential Uses (W) | 85 | 3.3 | 5080 | 21.3 |
| 10- Residential Uses (NW) | 85 | 3.3 | 3220 | 25.2 |
| 11- Residential Uses (NE) | 85 | 3.3 | 1260 | 33.4 |

1. Source: Kariel, *H. G.*, *Noise in Rural Recreational Environments* , Canadian Acoustics 19(5), 3-10, 1991.
2. Distance based on the nearest potential driving isle within the proposed Phase I Project site.

**Recreational Park Crowds**

| Category | # of Individuals (estimated capacity) | # of Individuals Speaking[1] | Reference Distance (ft)[2] | Reference Noise Level (dBA)[2] | Noise Level (dBA) |
|---|---|---|---|---|---|
| Females (Adult) | 5 | 3 | 3 | 55.0 | 59.8 |
| Males (Adult) | 5 | 3 | 3 | 58.0 | 62.8 |
| Children | 10 | 10 | 3 | 58.0 | 68.0 |
| **Total** | 20 | 16 | - | - | 69.6 |

1. Assumes that half the adults and all the children would speak simultaneously.
2. Source: American Journal of Audiology Vol. 7, p. 3 (1998).

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet) | Distance to Receptor (feet)[1] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (N) | 69.6 | 3 | 74 | 41.8 |
| 2- Residential Uses (SW) | 69.6 | 3 | 3217 | 9.0 |
| 5- Residential Uses (SE) | 69.6 | 3 | 165 | 34.8 |
| 6- Residential Uses (NE) | 69.6 | 3 | 194 | 33.4 |
| 7- Residential Uses (NW) | 69.6 | 3 | 880 | 20.3 |
| 8- Residential Uses (SW) | 69.6 | 3 | 680 | 22.5 |
| 9- Residential Uses (NW) | 69.6 | 3 | 5080 | 5.0 |
| 10- Residential Uses (NW) | 69.6 | 3 | 3244 | 8.9 |
| 11- Residential Uses (NE) | 69.6 | 3 | 1292 | 16.9 |

1. Distance based on the nearest potential recreational open space area within the MDR (PAs 6, 12, and 13) and OS-R (PAs 17 and 18) land uses.

**On-Site Traffic**

| Ground Type | Distance from Roadway to Receiver (feet) | Speed (mph) | | | Peak Hour Volume | | | Peak Hour Noise Level (Leq(h) dBA)[1] |
|---|---|---|---|---|---|---|---|---|
| | | Auto | MT | HT | Auto[2] | MT | HT | |
| Hard | 50 | 25 | 25 | 25 | 687 | 0 | 0 | 58.0 |

1. Source: FHWA, *Traffic Noise Model Version 2.5*
2. Peak hour volume from Urban Crossroads, *Center Park Specific Plan Traffic Analysis,* 2025.

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet) | Distance to Receptor (feet)[1] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 58.0 | 50 | 74 | 54.6 |
| 2- Residential Uses (SW) | 58.0 | 50 | 3217 | 21.8 |
| 5- Residential Uses (SE) | 58.0 | 50 | 165 | 47.6 |
| 6- Residential Uses (E) | 58.0 | 50 | 194 | 46.2 |
| 7- Residential Uses (NW) | 58.0 | 50 | 845 | 33.4 |
| 8- Residential Uses (SW) | 58.0 | 50 | 680 | 35.3 |
| 9- Residential Uses (W) | 58.0 | 50 | 5080 | 17.9 |
| 10- Residential Uses (NW) | 58.0 | 50 | 3220 | 21.8 |
| 11- Residential Uses (NE) | 58.0 | 50 | 1260 | 30.0 |

1. Distance based on the nearest potential driving isle within the proposed Phase I Project site.

**Phase I Operational Noise Calculations**

Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20Log(d_1/d_2)$, where $dBA_2$ = estimated noise level at receptor; $dBA_1$ = reference noise level; $d_1$ = reference distance; $d_2$ = receptor location distance.

**Mechanical Equipment**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 52 | 50 | 735 | 28.7 |
| 2- Residential Uses (S)[3] | 52 | 50 | 78 | 48.1 |
| 5- Residential Uses (SE) | 52 | 50 | 1852 | 20.6 |
| 6- Residential Uses (E) | 52 | 50 | 2157 | 19.3 |
| 7- Residential Uses (N) | 52 | 50 | 301 | 36.4 |
| 8- Residential Uses (S) | 52 | 50 | 506 | 31.9 |
| 9- Residential Uses (W) | 52 | 50 | 483 | 32.3 |
| 10- Residential Uses (N) | 52 | 50 | 620 | 30.1 |
| 11- Residential Uses (NE) | 52 | 50 | 1918 | 20.3 |

1. Source: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.
2. Distance based on the nearest potential HVAC location within the MDR (PAs 1, 2, 3, 7, 8, and 9), MU (4, 5, 10, and 11) and OS-R (PAs 14, 15, and 16) land uses.
3. The PAs nearest the sensitive receptor is PA 14 and 15.

**Trash and Recycling Pick-up**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 85 | 3.3 | 735 | 38.0 |
| 2- Residential Uses (S) | 85 | 3.3 | 78 | 57.5 |
| 5- Residential Uses (SE) | 85 | 3.3 | 1852 | 30.0 |
| 6- Residential Uses (E) | 85 | 3.3 | 2157 | 28.7 |
| 7- Residential Uses (N) | 85 | 3.3 | 255 | 47.2 |
| 8- Residential Uses (S) | 85 | 3.3 | 506 | 41.3 |
| 9- Residential Uses (W) | 85 | 3.3 | 483 | 41.7 |
| 10- Residential Uses (N) | 85 | 3.3 | 586 | 40.0 |
| 11- Residential Uses (NE) | 85 | 3.3 | 1895 | 29.8 |

1. Source: Kariel, *H. G., Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.
2. Distance based on the nearest potential driving isle within the proposed Phase II Project site.

**Recreational Park Crowds**

| Category | # of Individuals (estimated capacity) | # of Individuals Speaking[1] | Reference Distance (ft)[2] | Reference Noise Level (dBA)[2] | Noise Level (dBA) |
|---|---|---|---|---|---|
| Females (Adult) | 5 | 3 | 3 | 55.0 | 59.8 |
| Males (Adult) | 5 | 3 | 3 | 58.0 | 62.8 |
| Children | 10 | 10 | 3 | 58.0 | 68.0 |
| **Total** | 20 | 16 | - | - | 69.6 |

1. Assumes that half the adults and all the children would speak simultaneously.
2. Source: American Journal of Audiology Vol. 7, p. 3 (1998).

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet) | Distance to Receptor (feet)[1] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (NE) | 69.6 | 3 | 1378 | 16.4 |
| 2- Residential Uses (S) | 69.6 | 3 | 78 | 41.3 |
| 5- Residential Uses (SE) | 69.6 | 3 | 1852 | 13.8 |
| 6- Residential Uses (NE) | 69.6 | 3 | 2387 | 11.6 |
| 7- Residential Uses (N) | 69.6 | 3 | 595 | 23.7 |
| 8- Residential Uses (S) | 69.6 | 3 | 506 | 25.1 |
| 9- Residential Uses (NW) | 69.6 | 3 | 483 | 25.5 |
| 10- Residential Uses (N) | 69.6 | 3 | 620 | 23.3 |
| 11- Residential Uses (NE) | 69.6 | 3 | 2763 | 10.3 |

1. Distance based on the nearest potential recreational open space area within the MDR (PAs 1, 2, 3, 7, 8, and 9) and OS-R (PAs 14, 15, and 16) land uses.

**Drive-Thru Lanes**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 64 | 20 | 735 | 32.7 |
| 2- Residential Uses (SW) | 64 | 20 | 1935 | 24.3 |
| 5- Residential Uses (SE) | 64 | 20 | 1880 | 24.5 |
| 6- Residential Uses (E) | 64 | 20 | 2157 | 23.3 |
| 7- Residential Uses (N) | 64 | 20 | 301 | 40.4 |
| 8- Residential Uses (S) | 64 | 20 | 680 | 33.4 |
| 9- Residential Uses (W) | 64 | 20 | 3780 | 18.5 |
| 10- Residential Uses (NW) | 64 | 20 | 1945 | 24.2 |
| 11- Residential Uses (NE) | 64 | 20 | 1918 | 24.4 |

1. Source: Drive-thru noise sample collected by Kimley-Horn on August 17, 2018
2. Distance based on the nearest potential drive-thru lane location within the MU – Great Park (PA 4, 5, 10, and 11) land use.

**Truck Deliveries**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 64.4 | 50 | 735 | 41.1 |
| 2- Residential Uses (S) | 64.4 | 50 | 1935 | 32.6 |
| 5- Residential Uses (SE) | 64.4 | 50 | 1880 | 32.9 |
| 6- Residential Uses (E) | 64.4 | 50 | 2157 | 31.7 |
| 7- Residential Uses (N) | 64.4 | 50 | 301 | 48.8 |
| 8- Residential Uses (S) | 64.4 | 50 | 680 | 41.7 |
| 9- Residential Uses (W) | 64.4 | 50 | 3780 | 26.8 |
| 10- Residential Uses (N) | 64.4 | 50 | 1945 | 32.6 |
| 11- Residential Uses (NE) | 64.4 | 50 | 1918 | 32.7 |

1. Source: Loading dock reference noise level measurements collected by Kimley-Horn on December 18, 2018.
2. Distance based on the nearest potential drive-thru lane location within the MU – Great Park (PA 4, 5, 10, and 11) land use.

**On-Site Traffic**

| Ground Type | Distance from Roadway to Receiver (feet) | Speed (mph) | | | Peak Hour Volume | | | Peak Hour Noise Level (Leq(h) dBA)[1] |
|---|---|---|---|---|---|---|---|---|
| | | Auto | MT | HT | Auto[2] | MT | HT | |
| Hard | 50 | 25 | 25 | 25 | 5184 | 0 | 0 | 64.1 |

1. Source: FHWA, *Traffic Noise Model Version 2.5*
2. Peak hour volume from Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet) | Distance to Receptor (feet)[1] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 64.1 | 50 | 735 | 40.8 |
| 2- Residential Uses (S) | 64.1 | 50 | 78 | 60.2 |
| 5- Residential Uses (SE) | 64.1 | 50 | 1852 | 32.7 |
| 6- Residential Uses (E) | 64.1 | 50 | 2157 | 31.4 |
| 7- Residential Uses (N) | 64.1 | 50 | 255 | 49.9 |
| 8- Residential Uses (S) | 64.1 | 50 | 506 | 44.0 |
| 9- Residential Uses (W) | 64.1 | 50 | 483 | 44.4 |
| 10- Residential Uses (N) | 64.1 | 50 | 586 | 42.7 |
| 11- Residential Uses (NE) | 64.1 | 50 | 1895 | 32.5 |

1. Distance based on the nearest potential driving isle within the proposed Phase II Project site.

**Buildout Operational Noise Calculations**

Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20Log(d_1/d_2)$, where $dBA_2$ = estimated noise level at receptor; $dBA_1$ = reference noise level; $d_1$ = reference distance; $d_2$ = receptor location distance.

**Mechanical Equipment**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 52 | 50 | 74 | 48.6 |
| 2- Residential Uses (S) | 52 | 50 | 78 | 48.1 |
| 5- Residential Uses (SE) | 52 | 50 | 165 | 41.6 |
| 6- Residential Uses (E) | 52 | 50 | 194 | 40.2 |
| 7- Residential Uses (N) | 52 | 50 | 301 | 36.4 |
| 8- Residential Uses (S) | 52 | 50 | 506 | 31.9 |
| 9- Residential Uses (W) | 52 | 50 | 483 | 32.3 |
| 10- Residential Uses (N) | 52 | 50 | 620 | 30.1 |
| 11- Residential Uses (NE) | 52 | 50 | 1292 | 23.8 |

1. Source: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.
2. Distance based on the nearest potential HVAC location within the MDR, MU, and OS-R land uses, excludes the OS - NR land use (PAs 19-22)

**Trash and Recycling Pick-up**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 85 | 3.3 | 74 | 58.0 |
| 2- Residential Uses (S) | 85 | 3.3 | 78 | 57.5 |
| 5- Residential Uses (SE) | 85 | 3.3 | 165 | 51.0 |
| 6- Residential Uses (E) | 85 | 3.3 | 194 | 49.6 |
| 7- Residential Uses (NW) | 85 | 3.3 | 255 | 47.2 |
| 8- Residential Uses (S) | 85 | 3.3 | 506 | 41.3 |
| 9- Residential Uses (W) | 85 | 3.3 | 483 | 41.7 |
| 10- Residential Uses (N) | 85 | 3.3 | 586 | 40.0 |
| 11- Residential Uses (NE) | 85 | 3.3 | 1260 | 33.4 |

1. Source: Kariel, *H. G., Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.
2. Distance based on the nearest potential driving isle within the proposed Phase II Project site.

**Recreational Park Crowds**

| Category | # of Individuals (estimated capacity) | # of Individuals Speaking[1] | Reference Distance (ft)[2] | Reference Noise Level (dBA)[2] | Noise Level (dBA) |
|---|---|---|---|---|---|
| Females (Adult) | 5 | 3 | 3 | 55.0 | 59.8 |
| Males (Adult) | 5 | 3 | 3 | 58.0 | 62.8 |
| Children | 10 | 10 | 3 | 58.0 | 68.0 |
| **Total** | 20 | 16 | - | - | 69.6 |

1. Assumes that half the adults and all the children would speak simultaneously.
2. Source: American Journal of Audiology Vol. 7, p. 3 (1998).

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet) | Distance to Receptor (feet)[1] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 69.6 | 3 | 74 | 41.8 |
| 2- Residential Uses (S) | 69.6 | 3 | 78 | 41.3 |
| 5- Residential Uses (SE) | 69.6 | 3 | 165 | 34.8 |
| 6- Residential Uses (E) | 69.6 | 3 | 194 | 33.4 |
| 7- Residential Uses (NE) | 69.6 | 3 | 595 | 23.7 |
| 8- Residential Uses (S) | 69.6 | 3 | 506 | 25.1 |
| 9- Residential Uses (W) | 69.6 | 3 | 483 | 25.5 |
| 10- Residential Uses (N) | 69.6 | 3 | 620 | 23.3 |
| 11- Residential Uses (NE) | 69.6 | 3 | 1292 | 16.9 |

1. Distance based on the nearest potential recreational open space area within the MDR (PAs 1-3, 7-9, and 12-13) and OS-R (PAs 14-18) land uses.

**Drive-Thru Lanes**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 64 | 20 | 735 | 32.7 |
| 2- Residential Uses (SW) | 64 | 20 | 1935 | 24.3 |
| 5- Residential Uses (SE) | 64 | 20 | 1880 | 24.5 |
| 6- Residential Uses (E) | 64 | 20 | 2157 | 23.3 |
| 7- Residential Uses (N) | 64 | 20 | 301 | 40.4 |
| 8- Residential Uses (S) | 64 | 20 | 680 | 33.4 |
| 9- Residential Uses (W) | 64 | 20 | 3780 | 18.5 |
| 10- Residential Uses (NW) | 64 | 20 | 1945 | 24.2 |
| 11- Residential Uses (NE) | 64 | 20 | 1918 | 24.4 |

1. Source: Drive-thru noise sample collected by Kimley-Horn on August 17, 2018
2. Distance based on the nearest potential drive-thru lane location within the MU – Great Park (PA 4, 5, 10, and 11) land use.

**Truck Deliveries**

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet)[1] | Distance to Receptor (feet)[2] | Noise Level at Receptor w/o Sheilding (dBA) | Noise Level at Receptor w/ Sheilding (dBA) |
|---|---|---|---|---|---|
| 1- Residential Uses (E) | 64.4 | 50 | 735 | 41.1 | 31.1 |
| 2- Residential Uses (S) | 64.4 | 50 | 1935 | 32.6 | 22.6 |
| 5- Residential Uses (E) | 64.4 | 50 | 1880 | 32.9 | 22.9 |
| 6- Residential Uses (E) | 64.4 | 50 | 2157 | 31.7 | 21.7 |
| 7- Residential Uses (N) | 64.4 | 50 | 301 | 48.8 | 38.8 |
| 8- Residential Uses (S) | 64.4 | 50 | 680 | 41.7 | 31.7 |
| 9- Residential Uses (W) | 64.4 | 50 | 3780 | 26.8 | 16.8 |
| 10- Residential Uses (N) | 64.4 | 50 | 1945 | 32.6 | 22.6 |
| 11- Residential Uses (NE) | 64.4 | 50 | 1918 | 32.7 | 22.7 |

1. Source: Loading dock reference noise level measurements collected by Kimley-Horn on December 18, 2018.
2. Distance based on the nearest potential drive-thru lane location within the MU – Great Park (PA 4, 5, 10, and 11) land use.
3. Noise levels assume a 10 dBA reduction per the City of Ontario Development Code, Chapter 6: Development and Subdivision Regulations, which requires loading areas to be screened by a maximum 8 foot wall

**On-Site Traffic**

| Ground Type | Distance from Roadway to Receiver (feet) | Speed (mph) | | | Peak Hour Volume | | | Peak Hour Noise Level (Leq(h) dBA)[1] |
|---|---|---|---|---|---|---|---|---|
| | | Auto | MT | HT | Auto[2] | MT | HT | |
| Hard | 50 | 25 | 25 | 25 | 5871 | 0 | 0 | 65.1 |

1. Source: FHWA, *Traffic Noise Model Version 2.5*
2. Peak hour volume from Urban Crossroads, *Center Park Specific Plan Traffic Analysis*, 2025.

| Sensitive Receptor | Reference Level (dBA) | Reference Distance (feet) | Distance to Receptor (feet)[1] | Noise Level at Receptor (dBA) |
|---|---|---|---|---|
| 1- Residential Uses (E) | 65.1 | 50 | 74 | 61.7 |
| 2- Residential Uses (W) | 65.1 | 50 | 78 | 61.2 |
| 5- Residential Uses (SE) | 65.1 | 50 | 165 | 54.7 |
| 6- Residential Uses (E) | 65.1 | 50 | 194 | 53.3 |
| 7- Residential Uses (NW) | 65.1 | 50 | 255 | 50.9 |
| 8- Residential Uses (SW) | 65.1 | 50 | 506 | 45.0 |
| 9- Residential Uses (W) | 65.1 | 50 | 483 | 45.4 |
| 10- Residential Uses (NW) | 65.1 | 50 | 586 | 43.7 |
| 11- Residential Uses (NE) | 65.1 | 50 | 1895 | 33.5 |

1. Distance based on the nearest potential driving isle within the proposed Phase II Project site.

**Buildout Composite**

| Sensitive Receptor | Mechanical Equipment (dBA) | Trash and Recycling Pick Up (dBA) | Drive-Thru Lanes (dBA) | Truck Deliveries (dBA) | On-Site Traffic (dBA) | Combined Noise at Receptor (dBA) | Ambient (dBA) | Ambient + Operational (dBA) | Incremental Increase (dBA) | Incremental Increase Threshold (dBA) | Significant? |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 - Residential Uses | 48.6 | 58.0 | 32.7 | 41.1 | 61.7 | 63.4 | 74.8 | 75.1 | 0.3 | 3.0 | No |
| 2 - Residential Uses | 48.1 | 57.5 | 24.3 | 32.6 | 61.2 | 62.9 | 66.8 | 68.3 | 1.5 | 3.0 | No |
| 5 - Residential Uses | 41.6 | 51.0 | 24.5 | 32.9 | 54.7 | 56.4 | 65.3 | 65.8 | 0.5 | 3.0 | No |
| 6 - Residential Uses | 40.2 | 49.6 | 23.3 | 31.7 | 53.3 | 55.0 | 65.3 | 65.7 | 0.4 | 3.0 | No |
| 7 - Residential Uses | 36.4 | 47.2 | 40.4 | 38.8 | 50.9 | 53.0 | 72.8 | 72.8 | 0.0 | 3.0 | No |
| 8 - Residential Uses | 31.9 | 41.3 | 33.4 | 41.7 | 45.0 | 48.0 | 70.8 | 70.8 | 0.0 | 3.0 | No |
| 9 - Residential Uses | 32.3 | 41.7 | 18.5 | 26.8 | 45.4 | 47.1 | 76.4 | 76.4 | 0.0 | 3.0 | No |
| 10 - Residential Uses | 30.1 | 40.0 | 24.2 | 32.6 | 43.7 | 45.6 | 76.4 | 76.4 | 0.0 | 3.0 | No |
| 11 - Residential Uses | 23.8 | 33.4 | 24.4 | 32.7 | 33.5 | 38.3 | 74.8 | 74.8 | 0.0 | 3.0 | No |

# APPENDIX I1

## TRAFFIC ANALYSIS

# CENTER PARK SPECIFIC PLAN

## TRAFFIC ANALYSIS

Prepared By:

Charlene So, PE | cso@urbanxroads.com
Jared Brawner | jbrawner@urbanxroads.com
Aric Evatt | aevatt@urbanxroads.com

DRAFT

| Reference Number | Agency | Date |
|---|---|---|
| 16036-04 TA Report | City of Ontario | March 26, 2025 |

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# LIST OF ABBREVIATED TERMS

| | |
|---|---|
| (1) | Reference |
| ADT | Average Daily Traffic |
| CA MUTCD | California Manual on Uniform Traffic Control Devices |
| Caltrans | California Department of Transportation |
| CEQA | California Environmental Quality Act |
| DIF | Development Impact Fee |
| E+P | Existing plus Project |
| HCM | Highway Capacity Manual |
| ITE | Institute of Transportation Engineers |
| LOS | Level of Service |
| NCHRP | National Cooperative Highway Research Program |
| PA | Planning Area |
| PHF | Peak Hour Factor |
| Project | Center Park Specific Plan |
| SBCTA | San Bernardino County Transportation Authority |
| SBTAM | San Bernardino County Transportation Analysis Model |
| SED | Socio-economic Data |
| SPA | Specific Plan Amendment |
| TA | Traffic Analysis |
| TAZ | Transportation Analysis Zone |
| TOP | The Ontario Plan |
| TUMF | Transportation Uniform Mitigation Fee |
| WRCOG | Western Riverside Council of Governments |
| vphgpl | Vehicles per Hour Green per Lane |

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# 1 SUMMARY OF FINDINGS

This report presents the results of the Traffic Analysis (TA) for the Center Park Specific Plan (Project), which is bounded by Campus Avenue to the west, Walker Avenue to the east, and on either side of Edison Avenue in the City of Ontario, as shown in Exhibit 1-1.

The purpose of this TA is to evaluate the potential circulation system deficiencies that may result when the Project is developed and where circulation system (intersection and/or roadway) improvements are needed to maintain acceptable levels of service consistent with the City's General Plan level of service goals and policies, which are described in the City of Ontario's The Ontario Plan: Policy Plan (adopted August 16, 2022). (1) The scope of analysis included in this evaluation is based on the County of San Bernardino's Transportation Impact Study Guidelines (July 9, 2019) (County Guidelines) and consultation with City staff during the traffic study scoping process. (2) The TA Scoping Agreement is included in Appendix 1.1 and has been reviewed and approved by the City of Ontario.

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## EXHIBIT 1-1 : LOCATION MAP

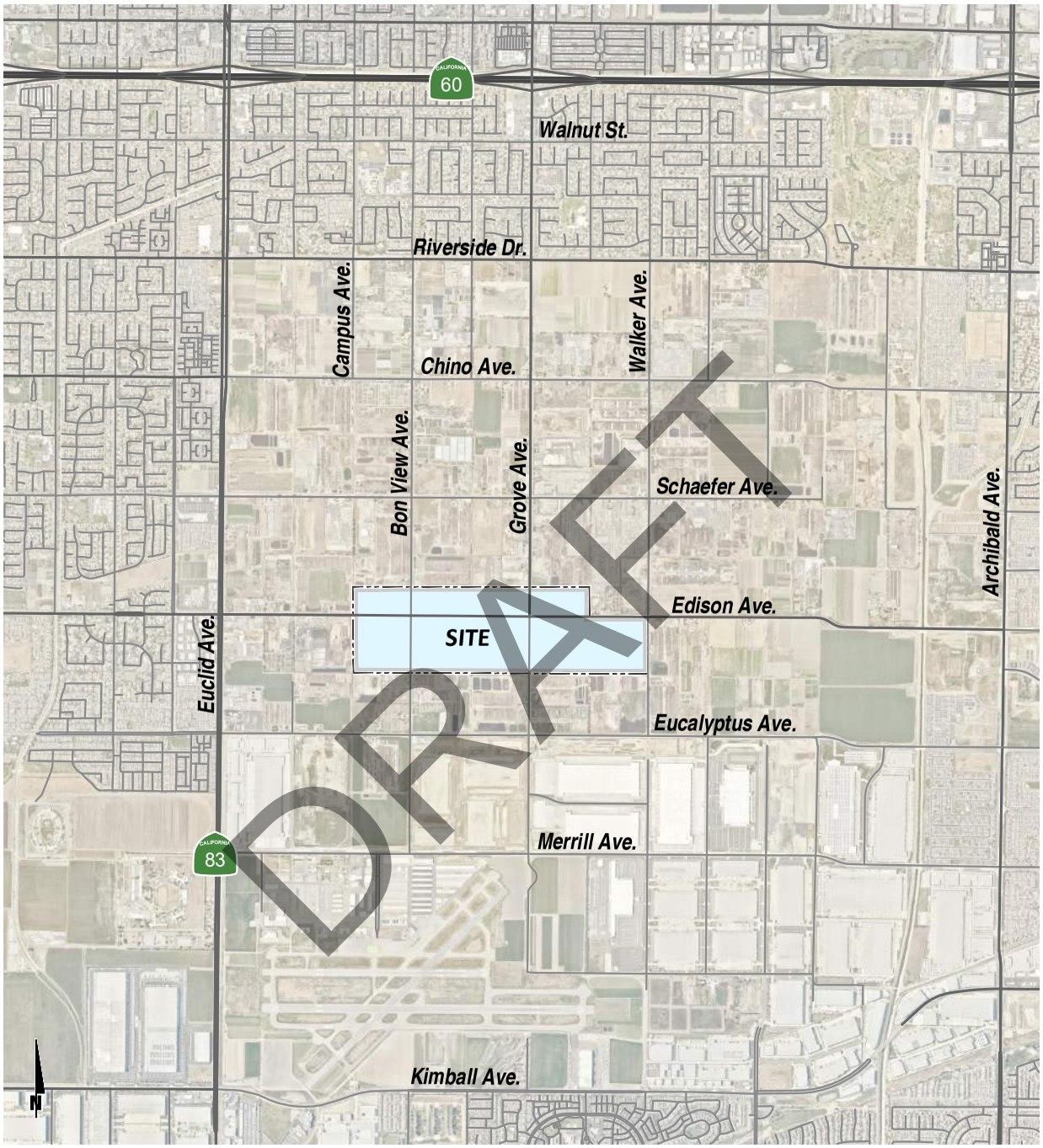

## 1.1 PROJECT OVERVIEW

### 1.1.1 Land Use

The Project is anticipated to develop in two phases. Exhibit 1-2 shows the preliminary land use plan. The Project is anticipated to consist of the following:

- 802 Single Family Detached dwelling units
- 3,491 Multifamily (Low-Rise) Residential units
- 115,809 square feet of Commercial Retail use
- 135,111 square feet of General Office use
- 55.98 acres of Parkland use

The first phase of the Project consists of the development of up to 256 Single Family Detached residential dwelling units with 768 Multifamily (Low-Rise) Residential dwelling units and 19.6 acres of Parkland use with an anticipated Opening Year of 2029. The Project Buildout is anticipated in 2034. For purposes of the TA, the mix of uses for each planning area is summarized in Table 1-1. It should be noted that the Commercial Retail square footage within the Mixed-Use areas of the Project would be evenly divided in thirds between Strip Retail Plaza, Fast-Food Restaurant Without Drive-Thru Window, and Fast-Food Restaurant With Drive-Thru Window. Similarly, Office square footage within the Mixed-Use areas assumes up to 10,000 square feet of Medical Office use in each Planning Area (PA). Access to the proposed Project would be provided to the surrounding roadways of Campus Avenue, Edison Avenue, Bon View Avenue, Cucamonga Avenue, Grove Avenue, Parco Avenue, and Walker Avenue.

### 1.1.2 Trip Generation

In order to develop traffic estimates for the proposed Project, trip-generation statistics published by the Institute of Transportation Engineers (ITE) in their Trip Generation Manual (11th Edition, 2021) were utilized to represent the following land uses allowed by the Specific Plan (3):

- Single Family Detached Housing (ITE Land Use Code 210)
- Multifamily (Low-Rise) Residential (ITE Land Use Code 220)
- Public Park (ITE Land Use Code 411)
- General Office (ITE Land Use Code 710)
- Medical Office (ITE Land Use Code 720)
- Strip Retail Plaza (<40,000 square feet (SF)) (ITE Land Use Code 822)
- Fast-Food Restaurant Without Drive-Thru (ITE Land Use Code 933)
- Fast-Food Restaurant With Drive-Thru (ITE Land Use Code 934)

For the purposes of this TA, trip generation estimates for the active park, with ball fields, land use has been based on trip-generation statistics from the San Diego Municipal Code Land Development Code Trip Generation Manual, May 2003: (4)

- Active Park (with Ball Fields)

At buildout, the Project is anticipated to generate a total of 44,716 two-way trips per day with 3,462 AM peak hour trips and 3,507 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation.*

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## Exhibit 1-2: Preliminary Land Use Plan & Phasing

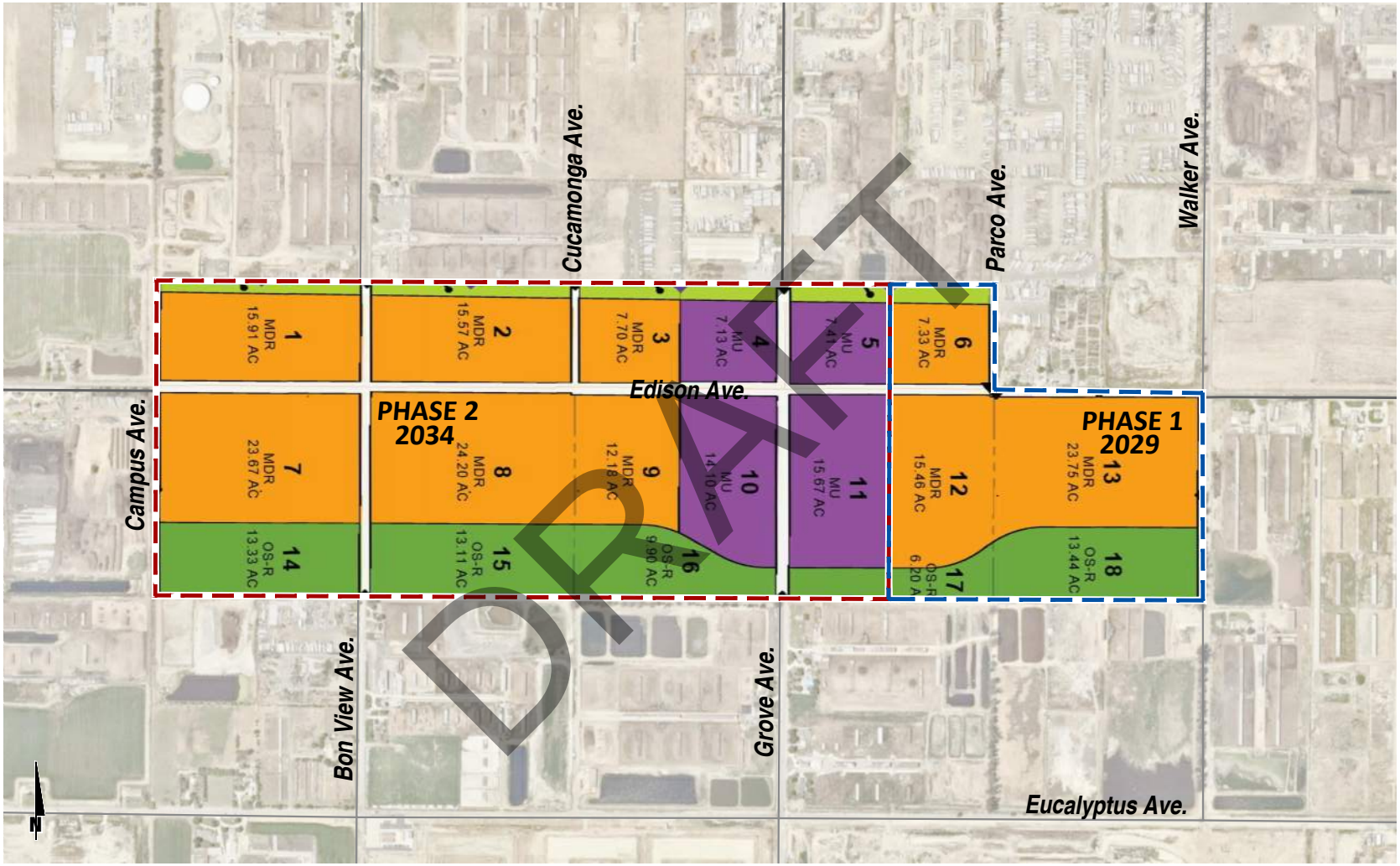

## TABLE 1-1: PROPOSED LAND USES

| PA | Description | Land Use | Quantity | Unit[1] |
|---|---|---|---|---|
| 1 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 88 | DU |
| | | Multifamily (Low-Rise) Residential | 262 | DU |
| 2 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 86 | DU |
| | | Multifamily (Low-Rise) Residential | 257 | DU |
| 3 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 42 | DU |
| | | Multifamily (Low-Rise) Residential | 127 | DU |
| 4 | Mixed-Use | Multifamily (Low-Rise) Residential | 175 | DU |
| | | Retail[2] | 18,635 | SF |
| | | General Office[3] | 21,741 | SF |
| 5 | Mixed-Use | Multifamily (Low-Rise) Residential | 182 | DU |
| | | Retail[2] | 19,367 | SF |
| | | General Office[3] | 22,595 | SF |
| 6 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 40 | DU |
| | | Multifamily (Low-Rise) Residential | 121 | DU |
| 7 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 130 | DU |
| | | Multifamily (Low-Rise) Residential | 391 | DU |
| 8 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 133 | DU |
| | | Multifamily (Low-Rise) Residential | 399 | DU |
| 9 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 67 | DU |
| | | Multifamily (Low-Rise) Residential | 201 | DU |
| 10 | Mixed-Use | Multifamily (Low-Rise) Residential | 345 | DU |
| | | Retail[2] | 36,852 | SF |
| | | General Office[3] | 42,994 | SF |
| 11 | Mixed-Use | Multifamily (Low-Rise) Residential | 384 | DU |
| | | Retail[2] | 40,955 | SF |
| | | General Office[3] | 47,781 | SF |
| 12 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 85 | DU |
| | | Multifamily (Low-Rise) Residential | 255 | DU |
| 13 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 131 | DU |
| | | Multifamily (Low-Rise) Residential | 392 | DU |
| 14 | Open Space/Parkland | Active Park | 13.33 | AC |
| 15 | Open Space/Parkland | Active Park | 13.11 | AC |
| 16 | Open Space/Parkland | Public Park | 9.9 | AC |
| 17 | Open Space/Parkland | Public Park | 6.2 | AC |
| 18 | Open Space/Parkland | Active Park | 13.44 | AC |

[1] DU = dwelling unit; SF = square feet; AC = acres
[2] Square footage to be divided evenly between strip retail plaza and fast-food restaurant without and with drive-thru window uses.
[3] Square footage to be divided evenly between general office and medical office uses.

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## 1.2 ANALYSIS SCENARIOS

For the purposes of this TA, peak hour intersection operations have been evaluated for each of the following traffic conditions:

- Existing (2024)
- Existing plus Project (E+P) (Phase 1)
- E+P (Buildout)
- Opening Year Cumulative (2034) Without Project
- Opening Year Cumulative (2034) With Project
- Horizon Year (2050) Without Project
- Horizon Year (2050) With Project

### 1.2.1 Existing (2024) Conditions

Information for Existing (2024) conditions is disclosed to represent the current traffic conditions as they existed at the time this report was prepared.

### 1.2.2 Existing plus Project (E+P) Conditions

The Existing plus Project analysis determines traffic deficiencies that would occur on the existing roadway system with the addition of Project traffic. For the purposes of this TA, the E+P analysis scenario has been evaluated for both Phase 1 and Project Buildout (Phase 1 and Phase 2) in order to determine site-adjacent and off-site improvement needs associated with both phases of development.

### 1.2.3 Opening Year Cumulative (2034) Conditions

The Opening Year Cumulative conditions analysis determines the potential near-term cumulative circulation system deficiencies. The roadway network is similar to Existing conditions except for new connections/driveways to be constructed by the Project or other known Cumulative Projects. To account for background traffic growth, an annual ambient growth rate based on an interpolation between Existing conditions and Horizon Year (2050) traffic conditions is included for Opening Year Cumulative (2034) traffic conditions. The Opening Year Cumulative analysis is intended to identify "Opening Year" deficiencies associated with the development of the proposed Project based on the expected background growth within the study area.

### 1.2.4 Horizon Year (2050) Conditions

Traffic projections for Horizon Year (2050) conditions were derived from the San Bernardino County Transportation Analysis Model (SBTAM) using accepted procedures for model forecast refinement and smoothing and is based on the currently adopted The Ontario Plan (TOP) 2050 General Plan Update. The Horizon Year conditions analysis will be utilized to determine if improvements funded through regional transportation mitigation fee programs can accommodate the long-range cumulative traffic at the target Level of Service (LOS) identified in the City of Ontario (lead agency) General Plan. Each of the applicable transportation fee programs are discussed in more detail In Section 8 *Local and Regional Funding Mechanisms*.

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## 1.3 STUDY AREA

For the purposes of this TA, a total of 45 study area intersections were selected for evaluation based on County Guidelines and consultation with City staff. The 45 study area intersections shown in Exhibit 1-3 and listed in Table 1-2 have been selected for assessment based on the County's analysis criteria of 50 or more peak hour trips. The study area intersections will be evaluated using the Highway Capacity Manual (HCM) 7th Edition methodology.

### TABLE 1-2: INTERSECTION ANALYSIS LOCATIONS

| # | Intersection |
|---|---|
| 1 | Euclid Av. (SR-83) & SR-60 WB Ramps |
| 2 | Euclid Av. (SR-83) & SR-60 EB Ramps |
| 3 | Euclid Av. (SR-83) & Walnut St. |
| 4 | Euclid Av. (SR-83) & Riverside Dr. |
| 5 | Euclid Av. (SR-83) & Chino Av. |
| 6 | Euclid Av. (SR-83) & Schafer Av. |
| 7 | Euclid Av. (SR-83) & Edison Av. |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. |
| 9 | Euclid Av. (SR-83) & Merrill Av. |
| 10 | Euclid Av. (SR-83) & Kimball Av. |
| 11 | Euclid Av. (SR-83) & Pine Av. |
| 12 | SR-71 NB Ramps & Euclid Av. (SR-83) |
| 13 | SR-71 SB Off-Ramp & Euclid Av. (SR-83) |
| 14 | Campus Av. & Edison Av. |
| 15 | Bon View Av. & Riverside Dr. |
| 16 | Bon View Av. & Schaefer Av. |
| 17 | Bon View Av. & Edison Av. |
| 18 | Bon View Av. & Eucalyptus Av. |
| 19 | Cucamonga Av. & Edison Av. |
| 20 | Grove Av. & SR-60 WB Ramps |
| 21 | Grove Av. & SR-60 EB Ramps |
| 22 | Grove Av. & Walnut St. |
| 23 | Grove Av. & Riverside Dr. |

| # | Intersection |
|---|---|
| 23 | Grove Av. & Riverside Dr. |
| 24 | Grove Av. & Chino Av. |
| 25 | Grove Av. & Schaefer Av. |
| 26 | Grove Av. & Edison Av. |
| 27 | Grove Av. & Eucalyptus Av. |
| 28 | Parco Av. & Edison Av. |
| 29 | Walker Av. & Riverside Dr. |
| 30 | Walker Av. & Schaefer Av. |
| 31 | Walker Av. & Edison Av. |
| 32 | Walker Av. & Eucalyptus Av. |
| 33 | Archibald Av. & SR-60 WB Ramps |
| 34 | Archibald Av. & SR-60 EB Ramps |
| 35 | Archibald Av. & Riverside Dr. |
| 36 | Archibald Av. & Chino Av. |
| 37 | Archibald Av. & Schaefer Av. |
| 38 | Archibald Av. & Edison Av./Ontario Ranch Rd. |
| 39 | Archibald Av. & Merrill Av. |
| 40 | Archibald Av. & Limonite Av. |
| 41 | Turner Av. & Ontario Ranch Rd. |
| 42 | Haven Av. & Ontario Ranch Rd. |
| 43 | Hamner Av. & Ontario Ranch Rd. |
| 44 | I-15 SB Ramps & Ontario Ranch Rd. |
| 45 | I-15 NB Ramps & Ontario Ranch Rd. |

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## EXHIBIT 1-3 : STUDY AREA

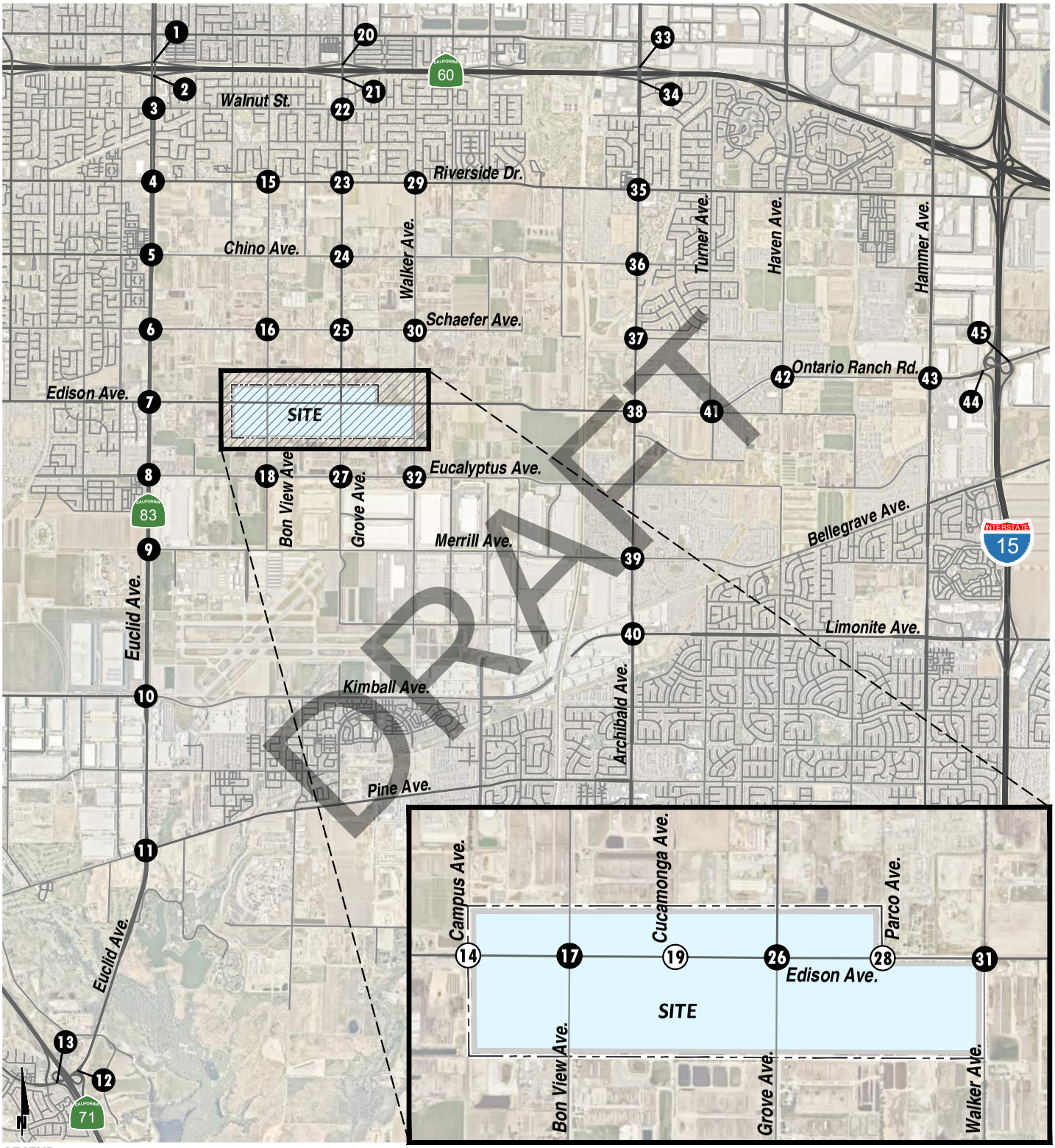


**LEGEND:**

0 = *Existing Intersection Analysis Location*

0 = *Future Intersection Analysis Location*

## 1.4 General Plan Consistency Requirements for Intersections

This section provides a brief overview of the intersection LOS deficiencies identified in this report. The LOS standards used for this assessment are consistent with those identified in the City of Ontario General Plan. Section 2 *Methodologies* provides a detailed explanation on the methodologies used for this assessment, while Section 3 *Area Conditions*, Section 5 *Existing plus Project Traffic Conditions*, Section 6 *Opening Year Cumulative (2034) Traffic Conditions*, and Section 7 *Horizon Year (2050) Traffic Conditions* include the operations analysis results for each analysis scenario. Additionally, a summary of the peak hour LOS analysis results is presented in Table 1-3.

### 1.4.1 Existing (2024) Conditions

The assessment of Existing (2024) traffic conditions is performed to establish a baseline of current LOS operations from which the effects of the Project's future contribution of traffic can be measured. The following intersection was found to currently operate at a deficient LOS (i.e., below the City of Ontario's adopted General Plan thresholds) during one or both peak hours:

- Euclid Avenue (SR-83) & Pine Avenue (#11) – LOS E PM peak hour only

### 1.4.2 Existing plus Project (E+P) Conditions

The assessment of E+P traffic conditions is performed to identify whether the Project's contribution of traffic has the potential to cause intersection LOS to fall below the City's adopted thresholds.

**E+P (Phase 1)**

No study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under E+P (Phase 1) traffic conditions, in addition to the intersection identified under Existing (2024) traffic conditions.

**E+P (Buildout)**

The following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under E+P (Buildout) traffic conditions, in addition to the intersection identified under Existing (2024) traffic conditions:

- Bon View Avenue & Riverside Drive (#15) – LOS F AM peak hour only
- Grove Avenue & Chino Avenue (#24) – LOS F AM and PM peak hours
- Grove Avenue & Schaefer Avenue (#25) – LOS F AM and PM peak hours

### 1.4.3 Opening Year Cumulative (2034) and Horizon Year (2050) Conditions

An assessment of opening year and horizon year cumulative traffic conditions is performed to identify whether the traffic contribution associated with both the proposed Project and that of other reasonably foreseeable future development projects in the area have the potential to cause intersection LOS to fall below the City's adopted thresholds. The Project's contribution to these forecasted LOS deficiencies is typically addressed through fee payments to an established fee program (both local and regional).

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The results of the LOS assessments for Opening Year Cumulative (2034) and Horizon Year (2050) traffic conditions are also summarized in Table 1-3, while Section 6 *Opening Year Cumulative (2034) Traffic Conditions*, and Section 7 *Horizon Year (2050) Traffic Conditions* provide a more detailed list of the forecast LOS deficiencies.

## TABLE 1-3: SUMMARY OF LOS

| | Intersections | Existing | E+P (Phase 1) | E+P (Buildout) | 2034 Without Project | 2034 With Project | 2050 Without Project | 2050 With Project |
|---|---|---|---|---|---|---|---|---|
| 1 | Euclid Av. (SR-83) & SR-60 WB Ramps | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 2 | Euclid Av. (SR-83) & SR-60 EB Ramps | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 3 | Euclid Av. (SR-83) & Walnut St. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 4 | Euclid Av. (SR-83) & Riverside Dr. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 |
| 5 | Euclid Av. (SR-83) & Chino Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 |
| 6 | Euclid Av. (SR-83) & Schaefer Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 |
| 7 | Euclid Av. (SR-83) & Edison Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 | 🔴 |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🔴 |
| 9 | Euclid Av. (SR-83) & Merrill Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 |
| 10 | Euclid Av. (SR-83) & Kimball Av. | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🟢🔴 | 🔴 | 🔴 |
| 11 | Euclid Av. (SR-83) & Pine Av. | 🟢🔴 | 🟢🔴 | 🟢🔴 | 🟢🔴 | 🟢🔴 | 🔴 | 🔴 |
| 12 | SR-71 NB Ramps & Euclid Av. (SR-83) | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 13 | SR-71 SB Off-Ramp & Euclid Av. (SR-83) | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 14 | Campus Av. & Edison Av. | Future Intersection | Future Intersection | 🟢 | Future Intersection | 🔴 | 🔴 | 🔴 |
| 15 | Bon View Av. & Riverside Dr. | 🟢 | 🟢 | 🟢🔴 | 🔴🟢 | 🔴🟢 | 🔴 | 🔴 |
| 16 | Bon View Av. & Schaefer Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 |
| 17 | Bon View Av. & Edison Av. | 🟢 | 🟢 | 🟢 | 🔴 | 🟢🔴 | 🟢 | 🔴 |
| 18 | Bon View Av. & Eucalyptus Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🔴 |
| 19 | Cucamonga Av. & Edison Av. | Future Intersection | Future Intersection | 🟢 | Future Intersection | 🟢 | Future Intersection | 🟢 |
| 20 | Grove Av. & SR-60 WB Ramps | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 |
| 21 | Grove Av. & SR-60 EB Ramps | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 | 🔴 | 🔴 |
| 22 | Grove Av. & Walnut St. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 23 | Grove Av. & Riverside Dr. | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🔴 | 🔴 | 🔴 |
| 24 | Grove Av. & Chino Av. | 🟢 | 🟢 | 🔴 | 🔴 | 🔴 | 🔴 | 🔴 |
| 25 | Grove Av. & Schaefer Av. | 🟢 | 🟢 | 🔴 | 🟢 | 🔴 | 🔴 | 🔴 |
| 26 | Grove Av. & Edison Av. | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 | 🔴 | 🔴 |
| 27 | Grove Av. & Eucalyptus Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🔴 | 🔴 |
| 28 | Parco Av. & Edison Av. | Future Intersection | 🟢 | 🟢 | Future Intersection | 🔴 | 🔴 | 🔴 |
| 29 | Walker Av. & Riverside Dr. | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 | 🔴 | 🔴 |
| 30 | Walker Av. & Schaefer Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 |
| 31 | Walker Av. & Edison Av. | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 | 🔴🟢 | 🔴 |
| 32 | Walker Av. & Eucalyptus Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🔴 |
| 33 | Archibald Av. & SR-60 WB Ramps | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 34 | Archibald Av. & SR-60 EB Ramps | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 35 | Archibald Av. & Riverside Dr. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 36 | Archibald Av. & Chino Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🟢🔴 |
| 37 | Archibald Av. & Schaefer Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 38 | Archibald Av. & Edison Av./Ontario Ranch Rd. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 |
| 39 | Archibald Av. & Merrill Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 40 | Archibald Av. & Limonite Av. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🔴 | 🔴 |
| 41 | Turner Av. & Ontario Ranch Rd. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 |
| 42 | Haven Av. & Ontario Ranch Rd. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🔴 |
| 43 | Hamner Av. & Ontario Ranch Rd. | 🟢 | 🟢 | 🟢 | 🟢🔴 | 🟢🔴 | 🔴 | 🔴 |
| 44 | I-15 SB Ramps & Ontario Ranch Rd. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |
| 45 | I-15 NB Ramps & Ontario Ranch Rd. | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 | 🟢 |

**LEGEND:**

◖ = *AM Peak Hour* 🟢 = *Acceptable LOS*

◗ = *PM Peak Hour* 🔴 = *Deficient LOS*

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## 1.5 RECOMMENDATIONS

### 1.5.1 Intersection Improvement Recommendations Necessary to Maintain General Plan Consistency

Based on the results of this TA, intersection improvement recommendations necessary to maintain City of Ontario General Plan LOS standards are listed in Table 1-4. Improvements found to be included in the WRCOG TUMF program or City of Ontario DIF program have been identified as such.

### 1.5.2 On-Site Circulation Recommendations

The following recommendations are based on the minimum improvements needed to accommodate site access and maintain acceptable peak hour operations for the proposed Project. The site-adjacent recommendations are shown in Exhibit 1-4. It should be noted that the Project is to construct pavement for eight lanes (four in each direction) along Edison Avenue, as shown in Exhibit 1-4 which is consistent with the City's Ontario Plan classification for Edison Avenue. However, until such time the receiving lanes are constructed to the west and east of the Project in order to accommodate the additional through lanes, the pavement is to be striped/reduced for interim use. In the interim condition, Edison Avenue within the Project boundaries, consists of through lanes beyond what is available outside the Project site, as such tapers will be necessary to reduce the number of lanes through striping in order to correspond with the available receiving lanes on either side of the Project.

**Phase 1:**

***Recommendation 1 – Grove Avenue & Edison Avenue (#26)*** – The following improvements are necessary to accommodate site access:

- Install a traffic signal.

***Recommendation 2 – Parco Avenue & Edison Avenue (#28)*** – The following improvements are necessary to accommodate site access:

- Install a stop sign on the southbound approach (Parco Avenue).
- Construct a southbound shared left-through-right lane.

***Recommendation 3 – Walker Avenue & Edison Avenue (#31)*** – The following improvements are necessary to accommodate site access:

- Install a traffic signal.

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## TABLE 1-4: IMPROVEMENTS REQUIRED TO MAINTAIN GENERAL PLAN CONSISTENCY (1 OF 5)

| # | Intersection Location | Jurisdiction | Existing (2024) | E+P | E+P | 2034 Without Project | 2034 With Project | 2050 Without Project | 2050 With Project | Improvements in DIF?[1] | Project Fair Share %[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Euclid Av. (SR-83) & Riverside Dr. | Caltrans, Chino, Ontario | None | None | None | None | None | Restripe the northbound approach to provide a left turn lane, two through lanes, and one shared through-right turn lane | Same | No | 12.2% |
| | | | | | | | | Restripe the southbound approach to provide a left turn lane, two through lanes, and one shared through-right turn lane | Same | No | |
| | | | | | | | | Add 2nd EB through lane | Same | No | |
| | | | | | | | | Add 2nd NB left turn lane | Same | No | |
| | | | | | | | | Add 2nd SB left turn lane | Same | No | |
| 5 | Euclid Av. (SR-83) & Chino Av. | Caltrans, Chino, Ontario | None | None | None | None | None | Add WB left turn lane | Same | No | 12.5% |
| 6 | Euclid Av. (SR-83) & Schafer Av. | Caltrans, Chino, Ontario | None | None | None | None | None | Add 3rd NB through lane | Same | Yes | 15.2% |
| | | | | | | | | Add 3rd SB through lane | Same | Yes | |
| 7 | Euclid Av. (SR-83) & Edison Av. | Caltrans, Chino, Ontario | None | None | None | Add WB right turn lane | Same | Same | Same | No | 16.8% |
| | | | | | | Add 3rd NB through lane | Same | Same | Same | Yes | |
| | | | | | | Add 3rd SB through lane | Same | Same | Same | Yes | |
| | | | | | | Add 2nd SB left turn lane | Same | Same | Same | No | |
| | | | | | | | | Add 2nd EB left turn lane | Same | No | |
| | | | | | | | | Add 2nd EB through lane | Same | No | |
| | | | | | | | | Restripe the eastbound approach to provide two left turn lanes, two through lanes, and one shared through-right turn lane | Same | No | |
| | | | | | | | | Add 2nd WB left turn lane | Same | No | |
| | | | | | | | | Add 2nd WB through lane | Same | Yes | |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. | Caltrans, Chino, Ontario | None | None | None | None | None | Add 3rd NB through lane | Same | Yes | 27.2% |
| | | | | | | | | Restripe the southbound approach to provide one left turn lanes, two through lanes, and one shared through-right turn lane | Same | Yes | |
| 9 | Euclid Av. (SR-83) & Merrill Av. | Caltrans, Chino, Ontario | None | None | None | None | None | Add WB left turn lane | Same | No | 23.0% |
| | | | | | | | | Modify the traffic signal to implement overlap phasing for the WB right turn lane | Same | No | |
| | | | | | | | | Add 3rd NB through lane | Same | No | |
| | | | | | | | | Add 3rd SB through lane | Same | Yes | |
| | | | | | | | | Add EB left turn lane | Same | No | |
| | | | | | | | | Add 2nd WB left turn lane | Same | No | |
| 10 | Euclid Av. (SR-83) & Kimball Av. | Caltrans, Chino | None | None | None | Modify the traffic signal to extend the cycle length to 130 seconds | Same | Same | Same | No | 18.5% |
| | | | | | | | | Add 3rd NB through lane | Same | No | |
| | | | | | | | | Add 3rd SB through lane | Same | No | |

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## TABLE 1-4: IMPROVEMENTS REQUIRED TO MAINTAIN GENERAL PLAN CONSISTENCY (2 OF 5)

| # | Intersection Location | Jurisdiction | Existing (2024) | E+P (Phase 1) | E+P (Buildout) | 2034 Without Project | 2034 With Project | 2050 Without Project | 2050 With Project | Improvements in DIF?[1] | Project Fair Share %[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Euclid Av. (SR-83) & Pine Av. | Caltrans, Chino | Add 2nd EB through lane | Same | Same | Same | Same | Same | Same | No | 18.7% |
| | | | | | | | | Add 2nd NB left turn lane | Same | No | |
| | | | | | | | | Add 2nd SB left turn lane | Same | No | |
| | | | | | | | | Add SB right turn lane | Same | No | |
| | | | | | | | | Add 2nd WB through lane | Same | No | |
| 14 | Campus Av. & Edison Av. | Ontario | None | None | Add NB shared left-through-right turn lane | Not Applicable | Same as E+P | Same as E+P | Same as E+P | No | 15.3% |
| | | | | | Add SB shared left-through-right turn lane | Not Applicable | Same as E+P | Same as E+P | Same as E+P | No | |
| | | | | | Install stop controls on the NB and SB approaches. | Not Applicable | Same as E+P | Not Applicable | Not Applicable | No | |
| | | | | | | | Add 2nd EB through lane | Same | Same | No | |
| | | | | | | | Add 2nd WB through lane | Same | Same | No | |
| | | | | | | | | Install a Traffic Signal | Same | No | |
| | | | | | | | | Add EB left turn lane | Same | No | |
| | | | | | | | | Add WB left turn lane | Same | No | |
| 15 | Bon View Av. & Riverside Dr. | Ontario | None | None | Install a Traffic Signal | Same | Same | Same | Same | No | 10.1% |
| 16 | Bon View Av. & Schaefer Av. | Ontario | None | None | None | None | None | None | Install a Traffic Signal | No | 46.5% |
| 17 | Bon View Av. & Edison Av. | Ontario | None | None | Install a Traffic Signal | Same | Same | Same | Same | No | 44.7% |
| | | | | | Add NB left turn lane | Same | Same | Same | Same | No | |
| | | | | | Add SB left turn lane | Same | Same | Same | Same | No | |
| | | | | | Add 2nd EB through lane | Same | Same | Same | Same | Yes | |
| | | | | | Add 2nd WB through lane | Same | Same | Same | Same | Yes | |
| | | | | | Add EB left turn lane | Same | Same | Same | Same | No | |
| | | | | | Add WB left turn lane | Same | Same | Same | Same | No | |
| | | | | | Add EB right turn lane | Not Applicable | Not Applicable | Not Applicable | Not Applicable | No | |
| | | | | | | Add 3rd EB through lane | Same | Same | Same | Yes | |
| | | | | | | | | Add 3rd WB through lane | Same | Yes | |
| | | | | | | | | Add 4th EB through lane | Same | Yes | |
| | | | | | | | | Add WB right turn lane | Same | No | |
| 18 | Bon View Av. & Eucalyptus Av. | Ontario | None | None | None | None | None | None | Install a Traffic Signal | No | 32.8% |

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## TABLE 1-4: IMPROVEMENTS REQUIRED TO MAINTAIN GENERAL PLAN CONSISTENCY (3 OF 5)

| # | Intersection Location | Jurisdiction | Existing (2024) | E+P (Phase 1) | E+P (Buildout) | 2034 Without Project | 2034 With Project | 2050 Without Project | 2050 With Project | Improvements in DIF?[1] | Project Fair Share %[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | Cucamonga Av. & Edison Av. | Ontario | None | None | None<br>Install a Traffic Signal<br>Add SB shared left-right turn lane<br>Add EB left turn lane<br>Add 2nd EB through lane<br>Add 2nd WB through lane<br>Add WB left turn lane<br>Add EB right turn lane | None<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same | None<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same | None<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same | Install a Traffic Signal<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same | No<br>No<br>No<br>No<br>Yes<br>Yes<br>No<br>No | 0.0%<br>0.0% |
| 20 | Grove Av. & SR-60 WB Ramps | Caltrans, Ontario | None | None | None | None | None | Modify the traffic signal to extend the cycle length to 100 seconds in the PM peak hour | Same | No | 26.5% |
| 21 | Grove Av. & SR-60 EB Ramps | Caltrans, Ontario | None | None | None | Add NB right turn lane | Same | Same<br>Modify the traffic signal to extend the cycle length to 100 seconds in the PM peak hour | Same<br>Same | No<br>No | 45.2% |
| 23 | Grove Av. & Riverside Dr. | Ontario | None | None | None | Add 2nd NB through lane<br>Restripe the southbound approach to provide one left turn lane, one through lane, and one shared through-right turn lane | Same<br>Same | Same<br>Same<br>Add 2nd EB through lane | Same<br>Same<br>Same | Yes<br>Yes<br>No | 30.2% |
| 24 | Grove Av. & Chino Av. | Ontario | None | None | Install a Traffic Signal | Same<br>Add NB left turn lane<br>Add SB left turn lane<br>Add EB left turn lane<br>Add WB left turn lane | Same<br>Same<br>Same<br>Same<br>Same | Same<br>Same<br>Same<br>Same<br>Same | Same<br>Same<br>Same<br>Same<br>Same | No<br>No<br>No<br>No<br>No | 38.1% |
| 25 | Grove Av. & Schaefer Av. | Ontario | None | None | Install a Traffic Signal | Same | Same | Same<br>Add NB left turn lane<br>Add SB left turn lane<br>Add EB left turn lane<br>Add WB left turn lane | Same<br>Same<br>Same<br>Same<br>Same | No<br>No<br>No<br>No<br>No | 46.9% |

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## TABLE 1-4: IMPROVEMENTS REQUIRED TO MAINTAIN GENERAL PLAN CONSISTENCY (4 OF 5)

| # | Intersection Location | Jurisdiction | Existing (2024) | E+P (Phase 1) | E+P (Buildout) | 2034 Without Project | 2034 With Project | 2050 Without Project | 2050 With Project | Improvements in DIF?[1] | Project Fair Share %[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | Grove Av. & Edison Av. | Ontario | None | Install a Traffic Signal | Same | Same | Same | Same | Same | No | 52.7% |
| | | | | | Add NB left turn lane | Same | Same | Same | Same | No | |
| | | | | | Add SB left turn lane | Same | Same | Same | Same | No | |
| | | | | | Add 2nd EB through lane | Same | Same | Same | Same | Yes | |
| | | | | | Add 2nd WB through lane | Same | Same | Same | Same | Yes | |
| | | | | | Add EB left turn lane | Same | Same | Same | Same | No | |
| | | | | | Add WB left turn lane | Same | Same | Same | Same | No | |
| | | | | | Add EB right turn lane | Same | Same | Not Applicable | Not Applicable | No | |
| | | | | | Add WB right turn lane | Same | Same | Not Applicable | Not Applicable | No | |
| | | | | | | Add 3rd EB through lane | Same | Same | Same | Yes | |
| | | | | | | Add 3rd WB through lane | Same | Same | Same | Yes | |
| | | | | | | | | Add 2nd NB through lane | Same | Yes | |
| | | | | | | | | Add 2nd SB through lane | Same | Yes | |
| | | | | | | | | Add 4th EB through lane | Same | Yes | |
| | | | | | | | | Add 4th WB through lane | Same | Yes | |
| | | | | | | | | Add 2nd EB left turn lane | Same | No | |
| | | | | | | | | Add 2nd WB left turn lane | Same | No | |
| 27 | Grove Av. & Eucalyptus Av. | Ontario | None | None | None | Install a Traffic Signal | Same | Same | Same | No | 18.8% |
| | | | | | | | | Add NB left turn lane | Same | No | |
| | | | | | | | | Add SB left turn lane | Same | No | |
| | | | | | | | | Add EB left turn lane | Same | No | |
| | | | | | | | | Add WB left turn lane | Same | No | |
| | | | | | | | | Add WB right turn lane | Same | No | |
| 28 | Parco Av. & Edison Av. | Ontario | None | Install stop controls on the NB and SB approaches. | Same | Not Applicable | Same as E+P | Same as E+P | Same as E+P | No | 35.2% |
| | | | | Add SB shared left-right turn lane | Same | Not Applicable | Same as E+P | Same as E+P | Same as E+P | No | |
| | | | | | Add 2nd EB through lane | Not Applicable | Same as E+P | Not Applicable | Same as E+P | Yes | |
| | | | | | | Install a Traffic Signal | Same | Same | Same | No | |
| | | | | | | Add EB left turn lane | Same | Same | Same | No | |
| | | | | | | | | Add 2nd WB through lane | Same | Yes | |
| 29 | Walker Av. & Riverside Dr. | Ontario | None | None | None | Install a Traffic Signal | Same | Same | Same | No | 8.8% |
| 30 | Walker Av. & Schaefer Av. | Ontario | None | None | None | None | None | Add NB left turn lane | Same | No | 25.2% |
| | | | | | | | | Add SB left turn lane | Same | No | |

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## TABLE 1-4: IMPROVEMENTS REQUIRED TO MAINTAIN GENERAL PLAN CONSISTENCY (5 OF 5)

| # | Intersection Location | Jurisdiction | Existing (2024) | E+P (Phase 1) | E+P (Buildout) | 2034 Without Project | 2034 With Project | 2050 Without Project | 2050 With Project | Improvements in DIF?[1] | Project Fair Share %[2] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | Walker Av. & Edison Av. | Ontario | None | Install a Traffic Signal | Same<br>Add NB left turn lane<br>Add SB left turn lane<br>Add EB left turn lane<br>Add EB right turn lane<br>Add WB left turn lane | Same<br>Same<br>Same<br>Same<br>Not Applicable<br>Same<br>Add 2nd EB through lane<br>Add 2nd WB through lane | Same<br>Same<br>Same<br>Same<br>Not Applicable<br>Same<br>Same<br>Same<br>Add 3rd WB through lane | Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Add 3rd WB through lane | Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same<br>Same | Yes<br>No<br>No<br>No<br>No<br>No<br>Yes<br>Yes<br>Yes | 48.5% |
| 32 | Walker Av. & Eucalyptus Av. | Ontario | None | None | None | None | None | Install a Traffic Signal<br>Add EB left turn lane | Same<br>Same | No<br>No | 11.5% |
| 36 | Archibald Av. & Chino Av. | Ontario | None | None | None | None | None | Add EB right turn lane | Same | No | 15.4% |
| 38 | Archibald Av. & Edison Av./Ontario Ranch Rd. | Ontario | None | None | None | None | None | Add 2nd WB through lane<br>Add 2nd NB left turn lane<br>Add 3rd WB through lane<br>Add 2nd SB left turn lane | Same<br>Same<br>Same<br>Same | Yes<br>No<br>Yes<br>No | 29.4% |
| 40 | Archibald Av. & Limonite Av. | Eastvale | None | None | None | None | None | Add 3rd NB through lane<br>Add 3rd SB through lane<br>Modify the traffic signal to extend the cycle length to 130 seconds | Same<br>Same<br>Same | No<br>No<br>No | 3.0% |
| 41 | Turner Av. & Ontario Ranch Rd. | Ontario | None | None | None | None | None | Restripe the eastbound approach to provide one left turn lane, two through lanes, and one shared through-right turn lane<br>Restripe the westbound approach to provide one left turn lane, two through lanes, and one shared through-right turn lane | Same<br>Same | Yes<br>Yes | 28.7% |
| 42 | Haven Av. & Ontario Ranch Rd. | Ontario | None | None | None | None | None | Add 2nd NB through lane<br>Add 2nd SB through lane | Same<br>Same | Yes<br>Yes | 24.5% |
| 43 | Hamner Av. & Ontario Ranch Rd. | Ontario, Eastvale | None | None | None | Restripe the westbound approach to provide two left turn lanes, two through lanes, and one shared through-right turn lane | Same | Same<br>Modify the traffic signal to extend the cycle length to 130 seconds<br>Add 3rd SB through lane<br>Add 4th WB through lane | Same<br>Same<br>Same<br>Same | No<br>No<br>No<br>No | 20.6% |

[1] Improvements included in City of Ontario DIF program for local, regional and specific plan components.

[2] Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 8-2 for Fair Share Calculations.

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## EXHIBIT 1-4 : SITE ACCESS RECOMMENDATIONS

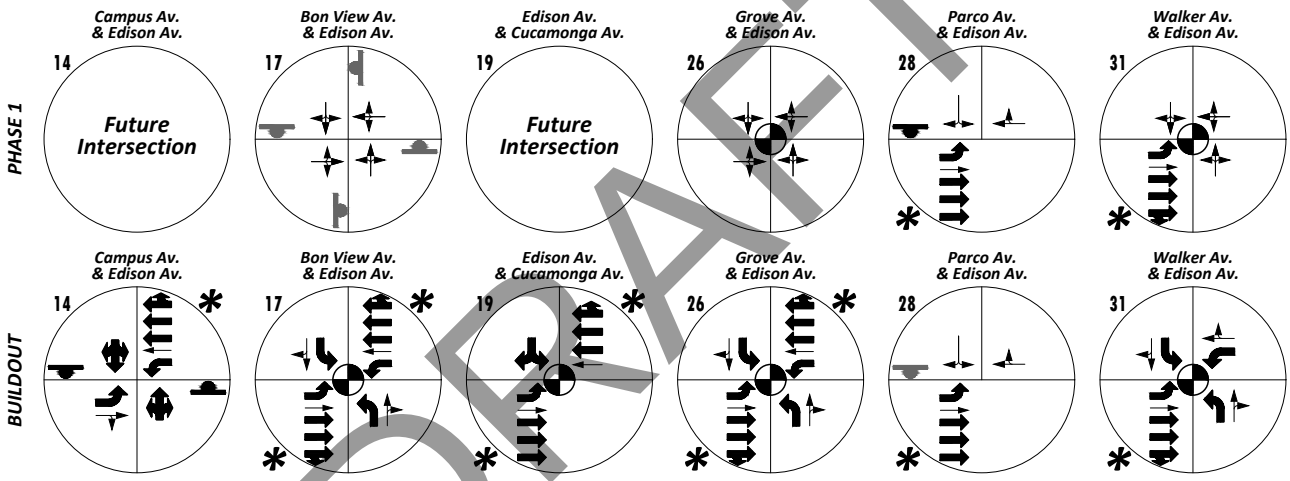


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** = The Project is to provide pavement for four lanes along Edison Avenue adjacent to the Project site. These lanes will not be striped for use until such time the receiving lanes are constructed.*

**LEGEND:**

- *= Existing Intersection Analysis Location*
- *= Future Intersection Analysis Location*
- *= Existing Stop Sign*
- *= Existing Lane*
- *= Future Traffic Signal*
- *= Proposed Stop Sign*
- *= Proposed Lane*

**Buildout:**

***Recommendation 4 – Campus Avenue & Edison Avenue (#14)*** – The following improvements are necessary to accommodate site access:

- Install a stop sign on the northbound and southbound approach (Campus Avenue).
- Construct a northbound shared left-through-right lane.
- Construct a southbound shared left-through-right lane.

***Recommendation 5 – Bon View Avenue & Edison Avenue (#17)*** – The following improvements are necessary to accommodate site access:

- Install a traffic signal.
- Construct a northbound left turn lane with a minimum of 275 feet of storage.
- Construct a southbound left turn lane with a minimum of 250 feet of storage.
- Construct an eastbound left turn lane with a minimum of 250 feet of storage, a second through lane, and a right turn lane.
- Construct a westbound left turn lane with a minimum of 425 feet of storage and a second through lane.

***Recommendation 6 – Cucamonga Avenue & Edison Avenue (#19)*** – The following improvements are necessary to accommodate site access:

- Install a traffic signal.
- Construct a shared southbound left-right turn lane.
- Construct an eastbound left turn lane with a minimum of 125 feet of storage and a second through lane.
- Construct a second westbound through lane.

***Recommendation 7 – Grove Avenue & Edison Avenue (#26)*** – The following improvements are necessary to accommodate site access:

- Construct a northbound left turn lane with a minimum of 300 feet of storage.
- Construct a southbound left turn lane with a minimum of 400 feet of storage.
- Construct an eastbound left turn lane with a minimum of 375 feet of storage, a second through lane, and a right turn lane.
- Construct a westbound left turn lane with a minimum of 375 feet of storage, a second through lane, and a right turn lane.

***Recommendation 8 – Parco Avenue & Edison Avenue (#28)*** – The following improvements are necessary to accommodate site access:

- Construct a second eastbound through lane.

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***Recommendation 9 – Walker Avenue & Edison Avenue (#31)*** – The following improvements are necessary to accommodate site access:

- Construct a northbound left turn lane with a minimum of 500 feet of storage.
- Construct a southbound left turn lane with a minimum of 250 feet of storage.
- Construct an eastbound left turn lane with a minimum of 125 feet of storage and a right turn lane.
- Construct a westbound left turn lane with a minimum of 600 feet of storage.

***Recommendation 10 – Edison Avenue*** is an east-west oriented roadway located within the Project site. Project to construct Edison Avenue from Campus Avenue to Walker Avenue at its ultimate full-section width as an Other Principal Arterial with 8 lanes (4 lanes in each direction).

***Recommendation 11 – Campus Avenue*** is a north-south oriented roadway located at the Project's western boundary. Project to construct Campus Avenue from the Project's northern boundary to the Project's southern boundary at its ultimate half-section width as a 4-lane Minor Arterial, plus 12 feet of pavement on the west side (southbound direction) to facilitate site access, in compliance with the circulation recommendations found in the City of Ontario General Plan.

***Recommendation 12 – Bon View Avenue*** is a north-south oriented roadway located within the Project site. Project to construct Bon View Avenue from the Project's northern boundary to the Project's southern boundary at its ultimate full-section width as a 2-lane Collector, in compliance with the circulation recommendations found in the City of Ontario General Plan.

***Recommendation 13 – Grove Avenue*** is a north-south oriented roadway located within the Project site. Project to construct Grove Avenue from the Project's northern boundary to the Project's southern boundary at its ultimate full-section width as a 4-lane Principal Arterial, in compliance with the circulation recommendations found in the City of Ontario General Plan.

***Recommendation 14 – Walker Avenue*** is a north-south oriented roadway located at the Project's eastern boundary. Project to construct Walker Avenue from Edison Avenue to the Project's southern boundary at its ultimate half-section width as a 2-lane Collector, plus 12 feet of pavement on the east side (northbound direction) to facilitate site access, in compliance with the circulation recommendations found in the City of Ontario General Plan.

On-site traffic signing and striping for all phases should be implemented agreeable with the provisions of the California Manual on Uniform Traffic Control Devices (CA MUTCD) and in conjunction with detailed construction plans for the Project site. Sight distance at each Project access point should be reviewed with respect to standard California Department of Transportation (Caltrans) and City of Ontario sight distance standards at the time of preparation of final grading, landscape, and street improvement plans.

The Specific Plan proposes to eliminate the future extensions of Cucamonga Avenue and Parco/Comet Avenue south of Edison Avenue. Since these roadways are not classified as collector or higher in the City of Ontario General Plan, they were not included in the Horizon Year (2050) Without or With Project traffic volume forecasts. However, their removal, as reflected in this TA, will likely increase traffic demand on nearby roadways such as Bon View Avenue, Grove Avenue, and Walker Avenue, as vehicles adjust their travel patterns to utilize existing higher-classified roadways.

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### 1.5.3 Queuing Analysis at Project Driveway

A queuing analysis was conducted for Horizon Year (2050) With Project, with Improvements, traffic conditions to determine the turn pocket lengths necessary to accommodate 95th percentile queues. The analysis was conducted for the weekday AM and weekday PM peak hours. The results are provided in Appendix 1.2 and summarized in Table 1-5. No queuing issues are anticipated at the Project access point.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The 95$^{th}$ percentile queue is derived from the average queue plus 1.65 standard deviations. The 95$^{th}$ percentile queue is not necessarily ever observed; it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations). Many agencies utilize the 95$^{th}$ percentile queues for design purposes. A vehicle is considered queued whenever it is traveling at less than 10 feet/second. The random simulations generated by SimTraffic have been utilized to determine the 95$^{th}$ percentile queue lengths observed for each turn movement. A SimTraffic simulation has been recorded five (5) times, during the weekday AM and weekday PM peak hours, and has been seeded for 30-minute periods with 60-minute recording intervals.

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## TABLE 1-5: SITE ADJACENT PEAK HOUR QUEUING SUMMARY

| # | Intersection | Movement | Horizon Year (2050) With Project 95th Percentile Queue (Feet) AM Peak | PM Peak |
|---|---|---|---|---|
| 14 | Campus Av. & Edison Av. | EBL | 188 | 168 |
| | | WBL | 198 | 130 |
| 17 | Bon View Av. & Edison Av. | NBL | 249 | 252 |
| | | SBL | 228 | 242 |
| | | EBL | 237 | 248 |
| | | WBL | 403 | 350 |
| 19 | Cucamonga Av. & Edison Av. | EBL | 102 | 122 |
| 26 | Grove Av. & Edison Av. | NBL | 280 | 293 |
| | | SBL | 354 | 391 |
| | | EBL | 250 | 374 |
| | | WBL | 374 | 260 |
| 28 | Parco Av. & Edison Av. | EBL | 181 | 177 |
| 31 | Walker Av. & Edison Av. | NBL | 487 | 469 |
| | | SBL | 240 | 222 |
| | | EBL | 92 | 110 |
| | | WBL | 591 | 450 |

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# 2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with the County Guidelines.

## 2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors, such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing a breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

## 2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The 7th Edition Highway Capacity Manual (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (5) The HCM uses different procedures depending on the type of intersection control.

### 2.2.1 Signalized Intersections

The City of Ontario requires signalized intersection operations analysis based on the methodology described in the HCM. (5) Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections, LOS is related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1.

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## TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

| Description | Average Control Delay (Seconds), V/C ≤ 1.0 | Level of Service V/C ≤ 1.0[1] |
|---|---|---|
| Operations with very low delay occurring with favorable progression and/or short cycle length. | 0 to 10.00 | A |
| Operations with low delay occurring with good progression and/or short cycle lengths. | 10.01 to 20.00 | B |
| Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear. | 20.01 to 35.00 | C |
| Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable. | 35.01 to 55.00 | D |
| Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay. | 55.01 to 80.00 | E |
| Operations with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths. | 80.01 and up | F |

Source: HCM, 7th Edition
[1] If V/C is greater than 1.0, then LOS is F per HCM

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Consistent with Appendix B of the San Bernardino County CMP, the following saturation flow rates, in vehicles per hour green per lane (vphgpl), will be utilized in the traffic analysis for signalized intersections:

*Existing, E+P, and Opening Year Cumulative Traffic Conditions:*

- Exclusive through: 1800 vphgpl
- Exclusive left: 1700 vphgpl
- Exclusive right: 1800 vphgpl
- Exclusive dual left: 1600 vphgpl
- Exclusive triple left: 1500 vphgpl

*Horizon Year Traffic Conditions:*

- Exclusive through: 1900 vphgpl
- Exclusive left: 1800 vphgpl
- Exclusive right: 1900 vphgpl
- Exclusive dual left: 1700 vphgpl
- Exclusive triple left: 1600 vphgpl

The traffic modeling and signal timing optimization software package Synchro (Version 12) has been utilized to analyze signalized intersections. Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Customary practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g., PHF = [Hourly Volume] / [4 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (5)

### 2.2.2 Unsignalized Intersections

The City of Ontario requires the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (5) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2). At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. Delay for the intersection is reported for the worst individual movement at a two-way stop-controlled intersection. For all-way stop controlled intersections, LOS is computed for the intersection as a whole (average delay).

**TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS**

| Description | Average Control Delay (Seconds), V/C ≤ 1.0 | Level of Service V/C ≤ 1.0[1] |
|---|---|---|
| Little or no delays. | 0 to 10.00 | A |
| Short traffic delays. | 10.01 to 15.00 | B |
| Average traffic delays. | 15.01 to 25.00 | C |
| Long traffic delays. | 25.01 to 35.00 | D |
| Very long traffic delays. | 35.01 to 50.00 | E |
| Extreme traffic delays with intersection capacity exceeded. | > 50.00 | F |

Source: HCM, 7th Edition
[1] If V/C is greater than 1.0, then LOS is F per HCM

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## 2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or determine the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TA uses the signal warrant criteria presented in the latest edition of the Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD). (6)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (6) Specifically, this TA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions and for all future analysis scenarios for existing unsignalized intersections. Warrant 3 is appropriate to use for this TA because it provides specialized warrant criteria for intersections with rural characteristics. For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection. Urban warrants have been used where posted speed limits on the major roadways with unsignalized intersections are 40 miles per hour or below while rural warrants have been used where speeds exceed 40 miles per hour.Future intersections that do not currently exist have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets. Similarly, the speed limit has been used as the basis for determining the use of Urban and Rural warrants.

Traffic signal warrant analyses were performed for the following study area intersections shown in Table 2-3.

### TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

| # | Intersection |
|---|---|
| 14 | Campus Av. & Edison Av. |
| 15 | Bon View Av. & Riverside Dr. |
| 16 | Bon View Av. & Schaefer Av. |
| 17 | Bon View Av. & Edison Av. |
| 18 | Bon View Av. & Eucalyptus Av. |
| 19 | Cucamonga Av. & Edison Av. |
| 24 | Grove Av. & Chino Av. |
| 25 | Grove Av. & Schaefer Av. |
| 26 | Grove Av. & Edison Av. |
| 27 | Grove Av. & Eucalyptus Av. |
| 28 | Parco Av. & Edison Av. |
| 29 | Walker Av. & Riverside Dr. |
| 30 | Walker Av. & Schaefer Av. |
| 31 | Walker Av. & Edison Av. |
| 32 | Walker Av. & Eucalyptus Av. |

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The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions.* The traffic signal warrant analyses for future conditions are presented in Section 5 *E+P Traffic Conditions*, Section 6 *Opening Year Cumulative (2034) Traffic Conditions*, and Section 7 *Horizon Year (2050) Traffic Conditions.* It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

## 2.4 Roadway Segment Capacity Analysis

Roadway segment operations have been evaluated using the County of San Bernardino Roadway Capacity Thresholds provided in the County's General Plan. These roadway capacities are "rule of thumb" estimates for planning purposes and are affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic) and pedestrian bicycle traffic. In other words, while using ADT for planning purposes is suitable with regards to evaluating potential volume to capacity with future forecasts, it is not suitable for operational analysis because it does not account for the factors listed previously. As such, where the ADT-based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis and progression analysis are undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity.

## 2.5 Queuing Analysis

Consistent with Caltrans requirements, the 95$^{th}$ percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the freeway ramp intersections at SR-60 Freeway at the Euclid Avenue, Grove Avenue, and Archibald Avenue interchanges, at SR-71 Freeway at the Euclid Avenue interchange, and the I-15 Freeway at the Cantu Galleano Road interchange. Specifically, the off-ramp queuing analysis is utilized to identify any potential queuing and "spill back" onto the freeway mainlines from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95$^{th}$ percentile queue resulting from the Synchro progression analysis. The footnote from the Synchro output sheets indicates if the 95$^{th}$ percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95$^{th}$ percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95$^{th}$ percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The 95$^{th}$ percentile queue is derived from the average queue plus 1.65 standard deviations. The 95$^{th}$ percentile queue is not necessarily ever observed, it is simply based on statistical calculations.

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## 2.6 Minimum Acceptable Levels of Service (LOS)

Minimum Acceptable LOS and associated definitions of intersection deficiencies have been obtained from each of the applicable surrounding jurisdictions.

### 2.6.1 City of Ontario

Per TOP's Policy M-1.5, the City of Ontario utilizes a minimum acceptable LOS of E, where feasible. (7)

### 2.6.2 City of Eastvale

The City of Eastvale General Plan strives to maintain LOS C for commuter roadways but acknowledges that constraints on roadway expansion may result in different LOS. (8) Based on this criterion, where feasible, LOS D is the minimum acceptable LOS at each of the study intersections within the City of Eastvale.

### 2.6.3 City of Chino

According to the City of Chino's General Plan Objective TRA-1.2/Policy P1, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours, where feasible. (9)

### 2.6.4 Caltrans

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway System facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. (10) If an existing State highway facility is operating at less than this target LOS, the existing LOS should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways and intersections is LOS D. Consistent with the City of Ontario LOS threshold of D and in excess of the City of Ontario stated threshold of LOS E, LOS D will be used as the target LOS.

### 2.6.5 CMP

The CMP definition of deficiency is based on maintaining a level of service standard of LOS E or better, where feasible, except where an existing LOS F condition is identified in the CMP document. However, in an effort to overstate as opposed to understate potential deficiencies, LOS D has been utilized for the CMP intersections for the purposes of this analysis, unless the intersection is located in the City of Ontario (which uses LOS E). (11)

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## 2.7 DEFICIENCY CRITERIA

To determine whether the addition of project traffic at a study intersection would result in a traffic deficiency, the following will be utilized:

- When the Without Project condition is at or better than LOS D (or LOS E for CMP intersections and intersections located in the City of Ontario) (i.e., acceptable LOS), and project-generated traffic causes deterioration below LOS D/LOS E (i.e., unacceptable LOS), a deficiency is deemed to occur.

When the Without Project condition is already below LOS D/LOS E (i.e., unacceptable LOS), the Project will be responsible for improving its deficiency to acceptable levels of service. Thus, for intersections operating at unacceptable LOS during either the AM and/or PM peak hour, improvements have been identified to improve the deficiencies of the Project to an intersection LOS that is equal to or better than Without Project conditions (see Table 2-4).

The Project's contribution to a deficiency can be reduced if the Project is required to implement or fund its fair share of improvements designed to alleviate its contribution to the deficient condition.

In the event that an intersection is operating at or is forecast to operate at a deficient LOS, the CMP guidelines have defined a series of steps to be completed to determine the Project's contribution to the deficiency of intersections, which has been applied to both CMP and non-CMP study area intersections. The steps are as follows:

- Determine the improvements necessary to achieve an acceptable service level;
- Calculate the Project's share in the future traffic volume projections for the peak hours;
- Estimate the cost to implement recommended improvements; and
- Calculate the Project's fair-share contribution to improve the Project's traffic deficiencies.

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### TABLE 2-4: DEFICIENCY CRITERIA

| Without Project LOS | LOS | Deficient? | Improvement Required? |
|---|---|---|---|
| City of Ontario | | | |
| A | A-D | No | No |
| B | B-D | No | No |
| C | C-D | No | No |
| D | D-E | No | No |
| E | E | No | No |
| A-E | F | Yes | Yes, bring LOS to E or better |
| F | F | Yes | Yes, bring LOS to E or better |
| | | | |
| City of Eastvale, City of Chino | | | |
| A | A-D | No | No |
| B | B-D | No | No |
| C | C-D | No | No |
| D | D-E | No | No |
| A-D | E or F | Yes | Yes, bring LOS to D or better |
| E | E | Yes | Yes, bring LOS to D or better |
| E | F | Yes | Yes, bring LOS to D or better |
| F | F | Yes | Yes, bring LOS to D or better |

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## 2.8 PROJECT FAIR SHARE CALCULATION METHODOLOGY

Improvements found to be included in the County TUMF and/or City DIF programs will be identified as such. For improvements that do not appear to be in either of the pre-existing fee programs, a fair share contribution based on the Project's proportional share may be imposed in order to address the Project's share of deficiencies in lieu of construction. It should be noted that fair share calculations are for informational purposes only and the City Traffic Engineer will determine the appropriate improvements to be implemented by a project (to be identified in the conditions of approval). The Project's fair share cost of improvements would be determined based on the following equation, which is the ratio of Project traffic to new traffic, where new traffic is total future traffic less existing baseline traffic

Project Fair Share % = Project AM/PM Traffic / (2050 With Project AM/PM Total Traffic – Existing AM/PM Traffic)

# 3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the 2050 Ontario Plan Circulation Network, and a review of existing peak hour intersection operations, traffic signal warrant, and off-ramp queuing analyses.

## 3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Ontario staff (Appendix 1.1), the study area includes a total of 45 existing and future intersections as shown previously in Exhibit 1-3. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

## 3.2 CITY OF ONTARIO GENERAL PLAN CIRCULATION ELEMENT

The 2050 Ontario Plan circulation element is shown in Exhibit 3-2.

The study area roadways that are classified as 8-lane Principal Arterials are identified as having four lanes of travel in each direction. The following study area roadways within the City of Ontario are classified as 8-lane Principal Arterials:

- Euclid Avenue
- Edison Avenue

The study area roadways that are classified as 6-lane Principal Arterials are identified as having three lanes of travel in each direction and a 14-foot curbed or painted median. The following study area roadways within the City of Ontario are classified as 6-lane Other Principal Arterials:

- Grove Avenue, north of Riverside Drive
- Vineyard Avenue, south of Riverside Drive
- Archibald Avenue
- Hamner Avenue

The study area roadways that are classified as 4-lane Principal Arterials are identified as having two lanes of travel in each direction. The following study area roadways within the City of Ontario are classified as 4-lane Other Principal Arterials:

- Grove Avenue, south of Riverside Drive
- Vineyard Avenue, north of Riverside Drive
- Haven Avenue, south of Riverside Drive

The study area roadway that is classified as a 6-lane Minor Arterial is identified as having three lanes of travel in each direction. The following study area roadway within the City of Ontario is classified as a 6-lane Minor Arterial:

- Riverside Drive

City of Ontario

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## Exhibit 3-1 : Existing Number of Through Lanes and Intersection Controls

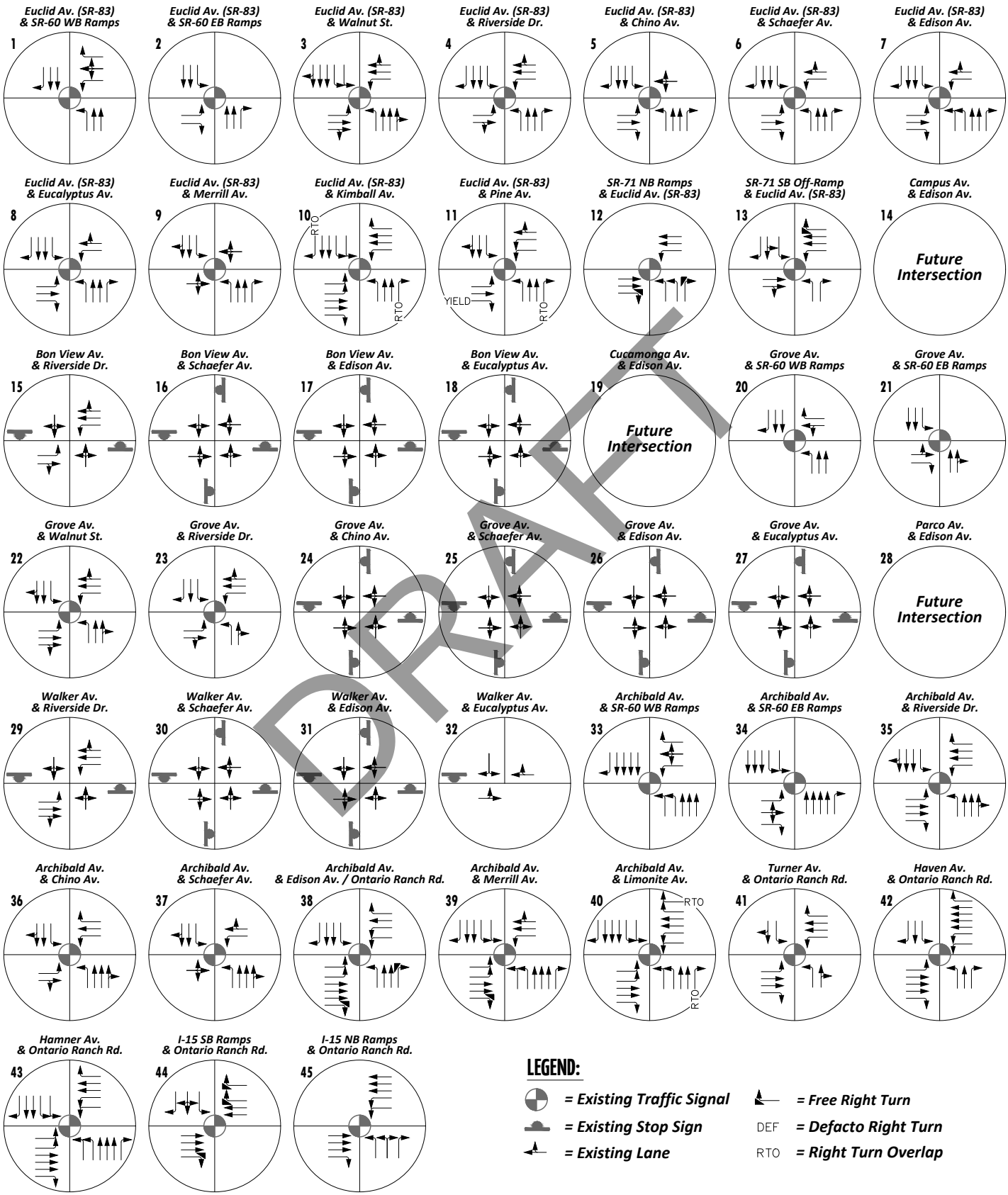


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## EXHIBIT 3-2: CITY OF ONTARIO 2050 GENERAL PLAN CIRCULATION ELEMENT

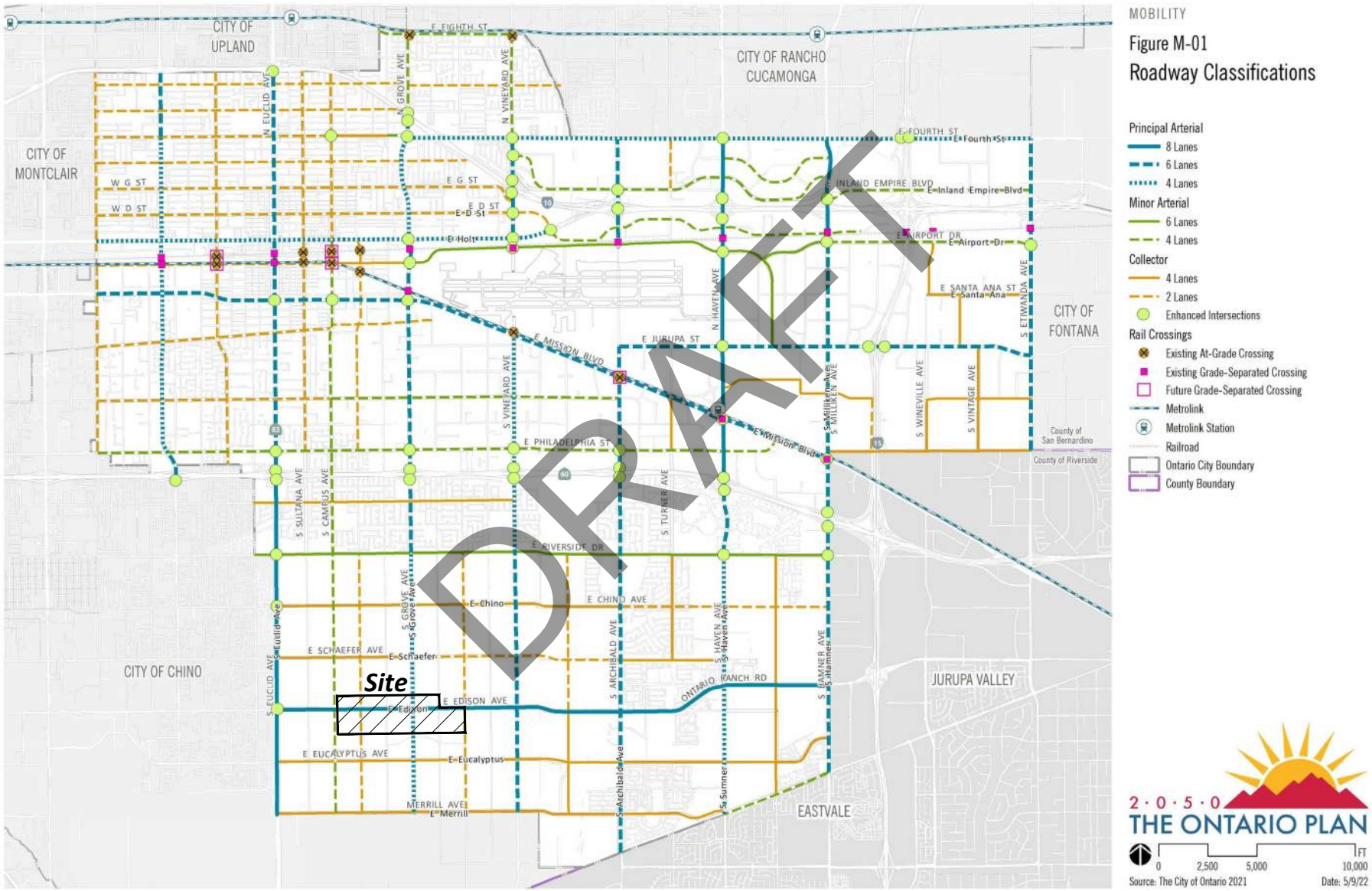

The study area roadway that is classified as a 4-lane Minor Arterial is identified as having two lanes of travel in each direction. The following study area roadway within the City of Ontario is classified as a 4-lane Minor Arterial:

- Campus Avenue

The study area roadways that are classified as Collector Streets are identified as having two to four lanes of travel in each direction. The following study area roadways within the City of Ontario are classified as Collector Streets:

- Walnut Avenue
- Chino Avenue
- Schaefer Avenue
- Eucalyptus Avenue
- Merrill Avenue
- Bon View Avenue
- Walker Avenue
- Turner Avenue

## 3.3 Bicycle & Pedestrian Facilities

Exhibit 3-3 illustrates the 2050 Ontario Plan bicycle facilities. Existing pedestrian facilities within the study area are shown in Exhibit 3-4. As shown in Exhibit 3-4, there are limited pedestrian facilities in the vicinity of the Project site. Field observations and traffic counts conducted in 2024 indicate light pedestrian and bicycle activity within the study area.

## 3.4 Transit Service

Exhibit 3-5 shows the 2050 Ontario Plan transit routes. The study area within the City of Ontario is currently served by Omnitrans, a public transit agency serving various jurisdictions within San Bernardino County. Exhibit 3-6 shows the existing transit facilities, which indicates that Omnitrans Route 83 could potentially serve the Project site. Transit service is reviewed and updated by Omnitrans periodically to address ridership, budget, and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the Applicant work in conjunction with Omnitrans to potentially provide bus service to the site.

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## EXHIBIT 3-3: CITY OF ONTARIO 2050 BICYCLE FACILITIES

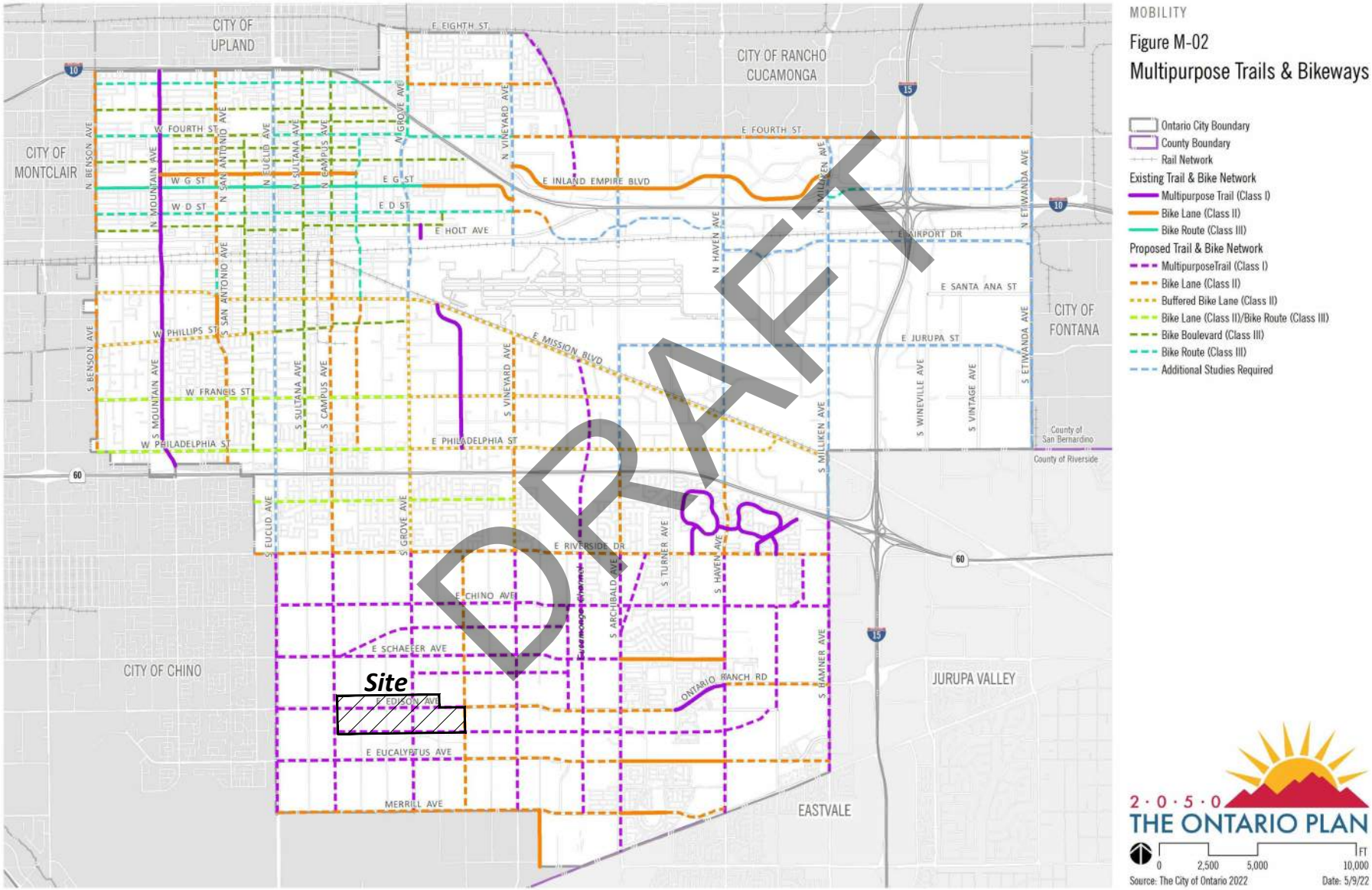

## EXHIBIT 3-4 : EXISTING PEDESTRIAN FACILITIES

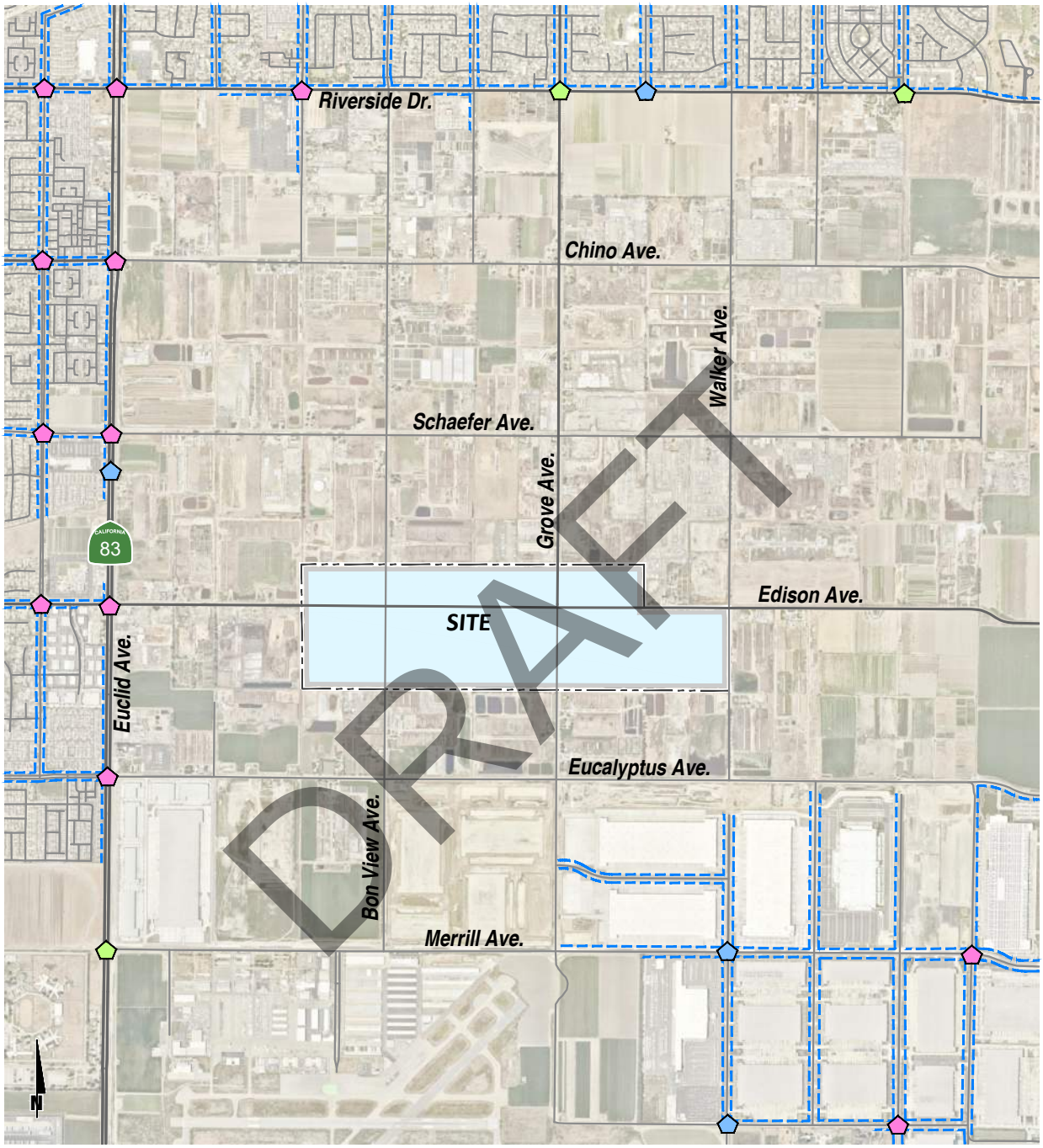


**LEGEND:**

- = 1 Approach
- = 2 Approaches
- = All Approaches
- = Sidewalks

## EXHIBIT 3-5 : CITY OF ONTARIO 2050 GENERAL PLAN TRANSIT ROUTES

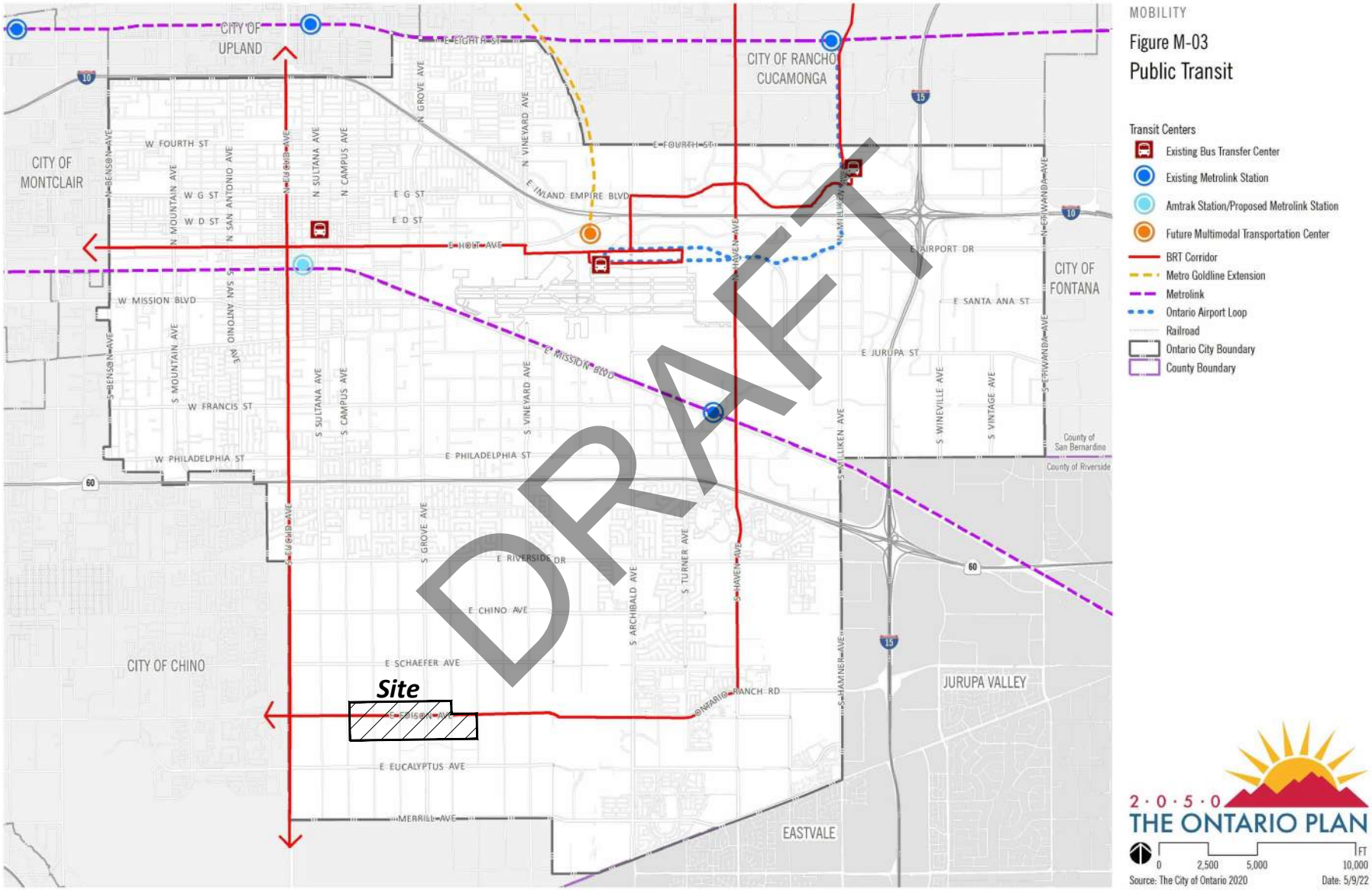

## Exhibit 3-6 : Existing Transit Facilities

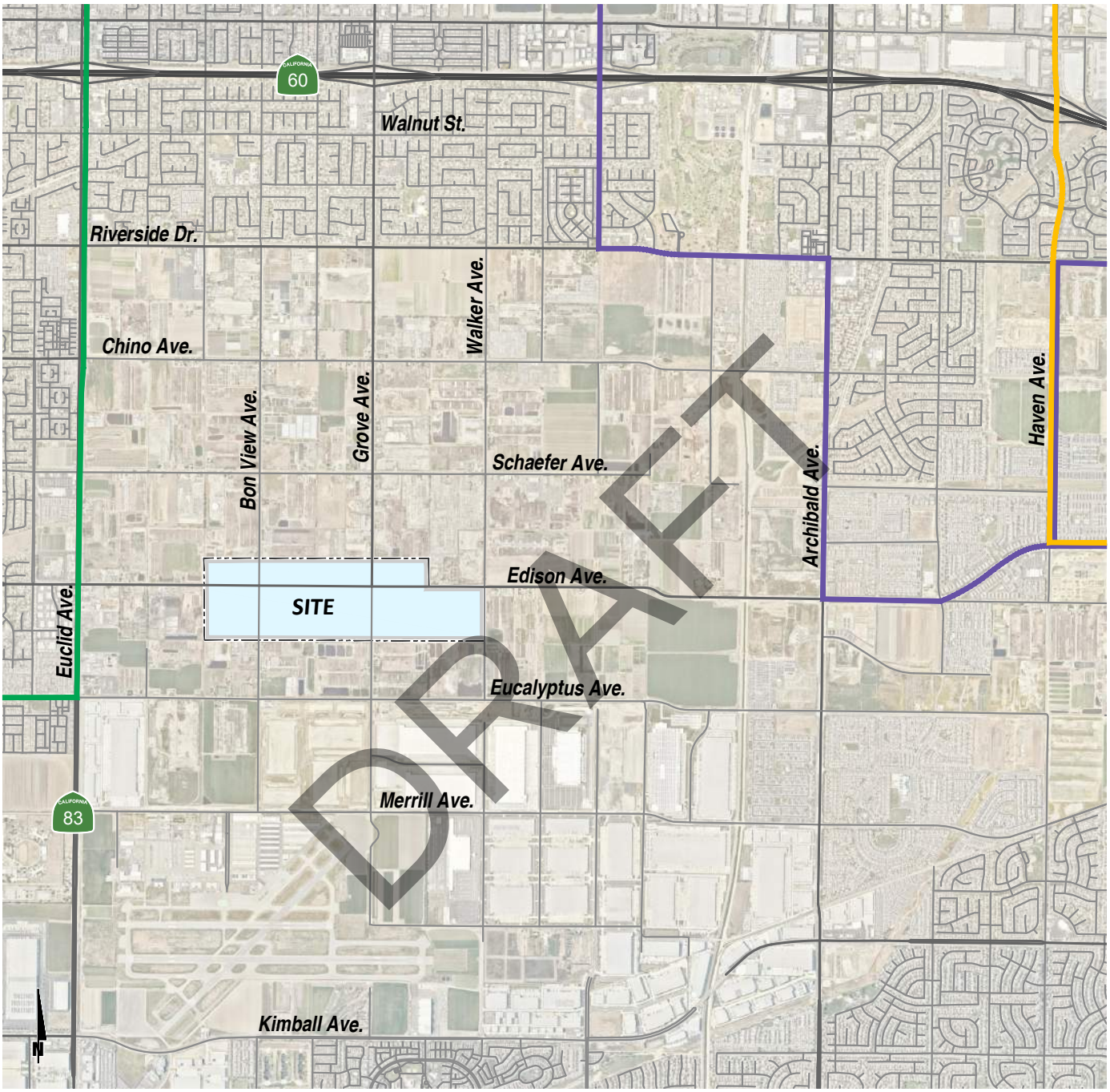


**LEGEND:**

- = Omnitrans Route 81
- = Omnitrans Route 83
- = Omnitrans Route 87

## 3.5 EXISTING (2024) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in 2024. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

The 2024 weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. As such, no additional adjustments were made to the traffic counts to establish the baseline condition. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

Existing weekday ADT volumes are shown in Exhibit 3-7. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 13.59 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 7.36 percent. As such, the above equation utilizing a factor of 13.59 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of 7.36 percent (i.e., 1/0.0736 = 13.59) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday and weekend peak hour intersection volumes, in actual vehicles, are also shown in Exhibit 3-7.

## 3.6 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis.* The intersection operations analysis results are summarized in Table 3-1, which indicates that the following study area intersection is currently operating at an unacceptable LOS during one of the peak hours:

- Euclid Avenue (SR-83) & Pine Avenue (#11) – LOS E PM peak hour only

The intersection operations analysis worksheets are included in Appendix 3.2 of this TA.

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# Exhibit 3-7 : Existing (2024) Traffic Volumes

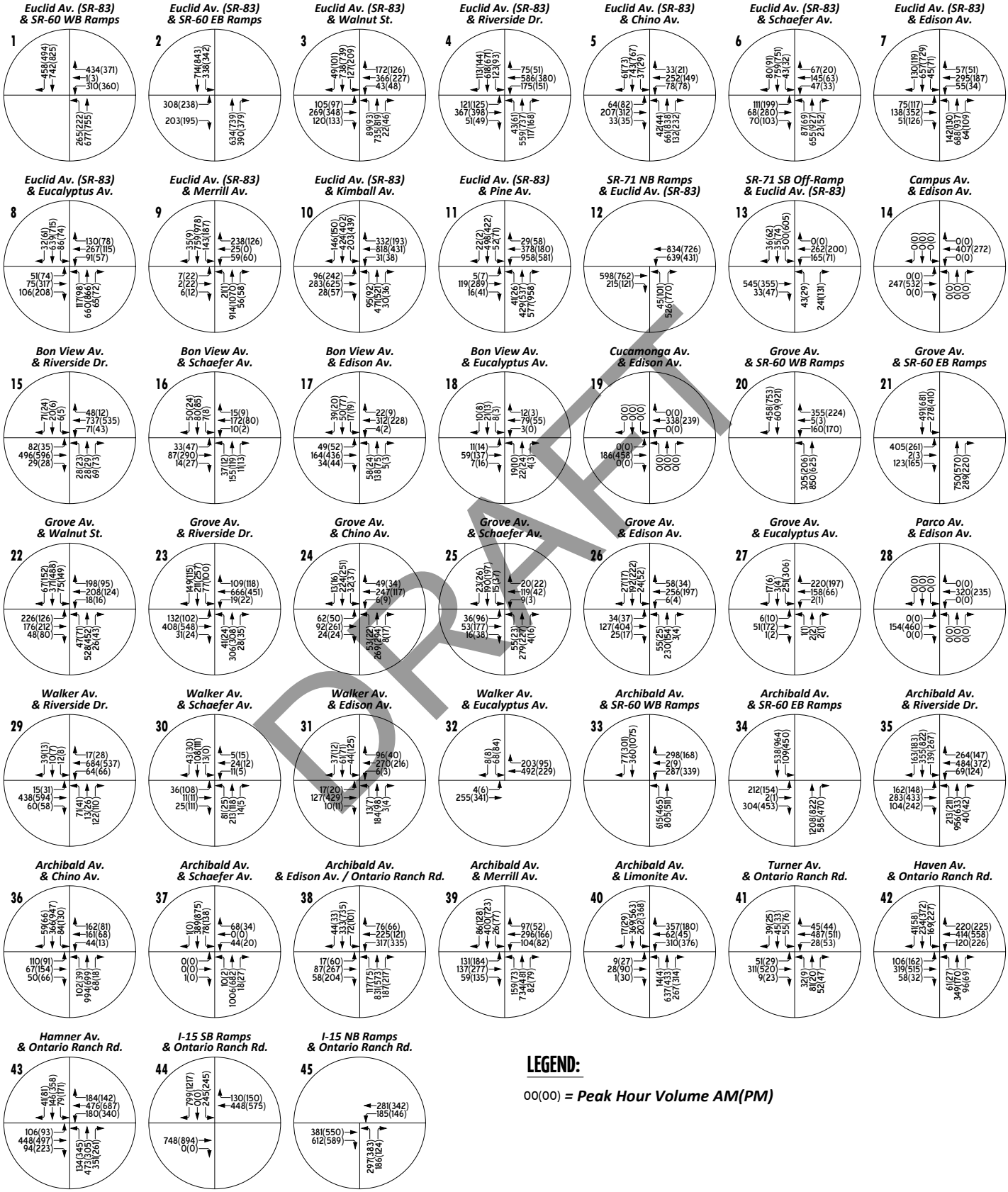


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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## TABLE 3-1: EXISTING (2024) INTERSECTION ANALYSIS

| # | Intersection | Traffic Control[2] | Delay[1] (secs.) AM | Delay[1] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|
| 1 | Euclid Av. (SR-83) & SR-60 WB Ramps | TS | 21.6 | 26.5 | C | C | D |
| 2 | Euclid Av. (SR-83) & SR-60 EB Ramps | TS | 24.5 | 19.8 | C | B | D |
| 3 | Euclid Av. (SR-83) & Walnut St. | TS | 14.8 | 14.9 | B | B | D |
| 4 | Euclid Av. (SR-83) & Riverside Dr. | TS | 36.1 | 36.9 | D | D | E |
| 5 | Euclid Av. (SR-83) & Chino Av. | TS | 16.4 | 15.4 | B | B | E |
| 6 | Euclid Av. (SR-83) & Schafer Av. | TS | 26.9 | 27.0 | C | C | E |
| 7 | Euclid Av. (SR-83) & Edison Av. | TS | 21.9 | 24.7 | C | C | E |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. | TS | 22.4 | 22.1 | C | C | E |
| 9 | Euclid Av. (SR-83) & Merrill Av. | TS | 25.3 | 27.5 | C | C | E |
| 10 | Euclid Av. (SR-83) & Kimball Av. | TS | 29.4 | 43.9 | C | D | D |
| 11 | Euclid Av. (SR-83) & Pine Av. | TS | 34.5 | **75.0** | C | **E** | D |
| 12 | SR-71 NB Ramps & Euclid Av. (SR-83) | TS | 31.3 | 28.0 | C | C | D |
| 13 | SR-71 SB Off-Ramp & Euclid Av. (SR-83) | TS | 29.0 | 28.5 | C | C | D |
| 14 | Campus Av. & Edison Av. | | Future Intersection | | | | E |
| 15 | Bon View Av. & Riverside Dr. | CSS | 30.8 | 18.3 | D | C | E |
| 16 | Bon View Av. & Schaefer Av. | AWS | 10.0 | 11.3 | A | B | E |
| 17 | Bon View Av. & Edison Av. | AWS | 12.6 | 19.6 | B | C | E |
| 18 | Bon View Av. & Eucalyptus Av. | AWS | 7.7 | 8.1 | A | A | E |
| 19 | Cucamonga Av. & Edison Av. | | Future Intersection | | | | E |
| 20 | Grove Av. & SR-60 WB Ramps | TS | 18.5 | 19.1 | B | B | D |
| 21 | Grove Av. & SR-60 EB Ramps | TS | 41.4 | 44.4 | D | D | D |
| 22 | Grove Av. & Walnut St. | TS | 28.3 | 21.8 | C | C | E |
| 23 | Grove Av. & Riverside Dr. | TS | 29.3 | 31.3 | C | C | E |
| 24 | Grove Av. & Chino Av. | AWS | 22.0 | 18.1 | C | C | E |
| 25 | Grove Av. & Schaefer Av. | AWS | 12.7 | 13.2 | B | B | E |
| 26 | Grove Av. & Edison Av. | AWS | 17.8 | 28.4 | C | D | E |
| 27 | Grove Av. & Eucalyptus Av. | AWS | 11.6 | 12.7 | B | B | E |
| 28 | Parco Av. & Edison Av. | | Future Intersection | | | | E |
| 29 | Walker Av. & Riverside Dr. | CSS | 20.0 | 18.5 | C | C | E |
| 30 | Walker Av. & Schaefer Av. | AWS | 9.8 | 9.4 | A | A | E |
| 31 | Walker Av. & Edison Av. | AWS | 12.9 | 16.3 | B | C | E |
| 32 | Walker Av. & Eucalyptus Av. | CSS | 15.4 | 14.0 | C | B | E |
| 33 | Archibald Av. & SR-60 WB Ramps | TS | 26.4 | 36.5 | C | D | D |
| 34 | Archibald Av. & SR-60 EB Ramps | TS | 12.6 | 18.2 | B | B | D |
| 35 | Archibald Av. & Riverside Dr. | TS | 27.6 | 27.4 | C | C | E |
| 36 | Archibald Av. & Chino Av. | TS | 21.2 | 17.8 | C | B | E |
| 37 | Archibald Av. & Schaefer Av. | TS | 10.4 | 7.5 | B | A | E |
| 38 | Archibald Av. & Edison Av./Ontario Ranch Rd. | TS | 20.7 | 21.6 | C | C | E |
| 39 | Archibald Av. & Merrill Av. | TS | 17.5 | 19.1 | B | B | E |

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| # | Intersection | Traffic Control[2] | Delay[1] (secs.) AM | Delay[1] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|
| 40 | Archibald Av. & Limonite Av. | TS | 15.5 | 21.3 | B | C | D |
| 41 | Turner Av. & Ontario Ranch Rd. | TS | 13.4 | 11.9 | B | B | E |
| 42 | Haven Av. & Ontario Ranch Rd. | TS | 21.7 | 22.3 | C | C | E |
| 43 | Hamner Av. & Ontario Ranch Rd. | TS | 17.4 | 28.0 | B | C | D |
| 44 | I-15 SB Ramps & Ontario Ranch Rd. | TS | 21.1 | 34.9 | C | C | D |
| 45 | I-15 NB Ramps & Ontario Ranch Rd. | TS | 20.7 | 19.9 | C | B | D |

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

2 TS = Traffic Signal; AWS = All-way Stop; CSS = Cross-Street Stop

## 3.7 Traffic Signal Warrants Analysis

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. The following intersections currently meet a traffic signal warrant under Existing (2024) traffic conditions:

- Bon View Avenue & Riverside Drive (#15)
- Bon View Avenue & Edison Avenue (#17)
- Grove Avenue & Chino Avenue (#24)
- Grove Avenue & Schaefer Avenue (#25)
- Grove Avenue & Edison Avenue (#26)
- Grove Avenue & Eucalyptus Avenue (#27)
- Walker Avenue & Riverside Drive (#29)
- Walker Avenue & Edison Avenue (#31)

Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

## 3.8 Roadway Segment Analysis

The roadway capacity utilized for the Edison Avenue, between Euclid Avenue and Campus Avenue, roadway segment analysis is obtained from the County's General Plan. The roadway segment capacity is an approximate figure only and is used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 3-2 provides a summary of the Existing (2024) roadway segment capacity analysis. As shown in Table 3-2, the roadway segment is currently operating at an acceptable LOS based on the daily roadway capacity thresholds and minimum LOS criteria.

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### TABLE 3-2: EXISTING (2024) ROADWAY SEGMENT ANALYSIS

| # | Roadway | Segment Limits | Jurisdiction | Roadway Section | LOS Capacity[1] | Existing (2024) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | 2024 | V/C[2] | LOS[3] |
| 1 | Edison Av. | Euclid Av. to Campus Av. | Ontario | 2U | 16,000 | 11,609 | 0.726 | C |

[1] These maximum roadway capacities are based on the applicable agency's thresholds.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

## 3.9 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the SR-60 Freeway at the Euclid Avenue, Grove Avenue, and Archibald interchanges, at the SR-71 Freeway at the Euclid Avenue interchange, and at the I-15 Freeway at the Cantu Galleano Road interchange, to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the freeway mainline. Queuing analysis findings are presented in Table 3-3. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 3-3, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for Existing (2024) traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

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## TABLE 3-3: EXISTING (2024) PEAK HOUR OFF-RAMP QUEUING ANALYSIS

| # | Intersection | Movement | Available Stacking Distance (Feet) | 95th Percentile Queue (Feet)[3] | | Acceptable? [1] | |
|---|---|---|---|---|---|---|---|
| | | | | AM Peak Hour | PM Peak Hour | AM | PM |
| 1 | Euclid Av. & SR-60 WB Ramps | WBL | 350 | 245 | 237 | Yes | Yes |
| | | WBL/T/R | 1,415 | 106 | 197 | Yes | Yes |
| | | WBR | 350 | 81 | 96 | Yes | Yes |
| 2 | Euclid Av. & SR-60 EB Ramps | EBL | 900 | 260 [2] | 200 | Yes | Yes |
| | | EBL/R | 1,290 | 52 | 56 | Yes | Yes |
| 12 | SR-71 NB Ramps & Euclid Av. | NBL | 1,475 | 31 | 48 | Yes | Yes |
| | | NBR | 425 | 149 [2] | 555 | Yes | Yes |
| 13 | Euclid Av. & SR-71 SB Off-Ramp | SBL | 1,100 | 267 | 284 | Yes | Yes |
| | | SBL/T | 1,550 | 234 | 285 | Yes | Yes |
| | | SBR | 360 | 0 | 0 | Yes | Yes |
| 20 | Grove Av. & SR-60 WB Ramps | WBL/T | 1,360 | 142 | 152 | Yes | Yes |
| | | WBR | 225 | 221 | 58 | Yes | Yes |
| 21 | Grove Av. & SR-60 EB Ramps | EBL/T | 1,365 | 368 [2] | 205 | Yes | Yes |
| | | EBR | 310 | 39 | 45 | Yes | Yes |
| 33 | Archibald Av. & SR-60 WB Ramps | WBL | 360 | 216 [2] | 0 | Yes | Yes |
| | | WBL/T/R | 1,410 | 162 | 418 [2] | Yes | Yes |
| | | WBR | 1,410 | 58 | 0 | Yes | Yes |
| 34 | Archibald Av. & SR-60 EB Ramps | EBL | 325 | 164 | 127 | | Yes |
| | | EBL/T/R | 1,530 | 75 | 148 | Yes | Yes |
| | | EBR | 1,530 | 51 | 142 | Yes | Yes |
| 44 | I-15 SB Ramps & Cantu Galleano Ranch Rd. | SBL | 1,435 | 185 | 196 | Yes | Yes |
| | | SBL/R | 550 | 261 | 106 | Yes | Yes |
| | | SBR | 455 | 253 | 78 | Yes | Yes |
| 45 | I-15 NB Ramps & Cantu Galleano Ranch Rd. | NBL | 1,615 | 166 | 202 | Yes | Yes |
| | | NBL/R | 585 | 59 | 50 | Yes | Yes |

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

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# 4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. A preliminary land use plan for the Project is shown previously in Exhibit 1-2. The proposed Project is to consist of the following:

- 802 Single Family Detached dwelling units
- 3,491 Multifamily (Low-Rise) Residential units
- 115,809 square feet of Commercial Retail use
- 135,111 square feet of General Office use
- 55.98 acres of Parkland use

## 4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. The Project trip generation is based upon information collected by the ITE as provided in their latest Trip Generation Manual (11th Edition, 2021) for the proposed uses. Table 4-1 summarizes the ITE trip generation rates.

Internal capture is a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site (trips that travel between uses without leaving the site). In other words, trips may be made between the retail, office, and residential uses proposed on-site which can be made either by walking or using internal roadways without using external streets. The internal capture is based on the National Cooperative Highway Research Program's (NCHRP Report 684) internal capture trip capture estimation tool. The internal capture worksheets are attached to the Scoping Agreement (see Appendix 1.1).

Pass-by trip reductions have been applied to the proposed Project uses consistent with the allowable values per the ITE Trip Generation Manual (11th Edition, 2021). Pass-by trips represent traffic that is already on the roadway today that would make an intermediate stop at the site before continuing on to their ultimate destination.

As shown in Table 4-2, the Project is anticipated to generate a net total of 8,270 two-way trips per day with 513 AM peak hour trips and 687 PM peak hour trips at Phase 1, and a net total of 44,716 two-way trips per day with 3,462 AM peak hour trips and 3,507 PM peak hour trips at Project Buildout.

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## TABLE 4-1: TRIP GENERATION RATES

| Land Use[1] | Units[2] | ITE LU Code | AM Peak Hour | | | PM Peak Hour | | | Daily |
|---|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total | |
| Single Family Detached Residential | DU | 210 | 0.18 | 0.52 | 0.70 | 0.59 | 0.35 | 0.94 | 9.43 |
| Multifamily (Low-Rise) Residential | DU | 220 | 0.10 | 0.30 | 0.40 | 0.32 | 0.19 | 0.51 | 6.74 |
| Public Park | Acres | 411 | 0.01 | 0.01 | 0.02 | 0.06 | 0.05 | 0.11 | 0.78 |
| Active Park (With Ball Fields) | Acres | --[3] | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 4.00 | 50.00 |
| General Office (Average Rates) | TSF | 710 | 1.34 | 0.18 | 1.52 | 0.24 | 1.20 | 1.44 | 10.84 |
| Medical Office | TSF | 720 | 2.45 | 0.65 | 3.10 | 1.18 | 2.75 | 3.93 | 36.00 |
| Strip Retail Plaza (<40,000 SF) | TSF | 822 | 1.42 | 0.94 | 2.36 | 3.30 | 3.29 | 6.59 | 54.45 |
| Fast-Food Restaurant Without Drive-Thru | TSF | 933 | 25.04 | 18.14 | 43.18 | 16.61 | 16.60 | 33.21 | 450.49 |
| Fast-Food Restaurant With Drive-Thru | TSF | 934 | 22.75 | 21.86 | 44.61 | 17.18 | 15.85 | 33.03 | 467.48 |

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).
[2] DU = dwelling units; TSF = thousand square feet
[3] Trip Generation Source: San Diego Municipal Code Land Development Code Trip Generation Manual, May 2003.

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## TABLE 4-2: PROJECT TRIP GENERATION

| Land Use | Quantity | Units[1] | AM Peak Hour | | | PM Peak Hour | | | Daily |
|---|---|---|---|---|---|---|---|---|---|
| | | | In | Out | Total | In | Out | Total | |
| Project Phase 1 (2029): | | | | | | | | | |
| PA 6, 12 & 13: Single Family Detached | 256 | DU | 47 | 133 | 180 | 152 | 89 | 241 | 2,416 |
| PA 6, 12 & 13: Multifamily (Low-Rise) Residential | 768 | DU | 74 | 233 | 307 | 247 | 145 | 392 | 5,176 |
| PA 17: Public Park | 6.20 | Acres | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| PA 18: Active Park | 13.44 | Acres | 13 | 13 | 26 | 27 | 27 | 54 | 672 |
| **Phase 1 (2029) Total** | | | **134** | **379** | **513** | **426** | **261** | **687** | **8,270** |
| Project Phase 2 (2034): | | | | | | | | | |
| PA 4, 5, 10 & 11: Multifamily (Low-Rise) Residential | 1,086 | DU | 104 | 330 | 434 | 349 | 205 | 554 | 7,320 |
| PA 4, 5, 10 & 11: Strip Retail Plaza | 38.603 | TSF | 55 | 36 | 91 | 127 | 127 | 254 | 2,102 |
| Internal Capture Reduction | | | -29 | -19 | -48 | -87 | -73 | -160 | -1,110 |
| Pass-by Trip Reduction (40% - PM/Daily) | | | 0 | 0 | 0 | -16 | -16 | -32 | -398 |
| PA 4, 5, 10 & 11: Fast-Food Without Drive-Thru | 38.603 | TSF | 967 | 700 | 1,667 | 641 | 641 | 1,282 | 17,390 |
| PA 4, 5, 10 & 11: Fast-Food With Drive-Thru | 38.603 | TSF | 878 | 844 | 1,722 | 663 | 612 | 1,275 | 18,046 |
| Internal Capture Reduction | | | -335 | -60 | -395 | -231 | -319 | -550 | -4,130 |
| Pass-by Trip Reduction (50% - AM; 55% - PM/Daily) | | | -742 | -742 | -1,484 | -514 | -514 | -1,028 | -17,218 |
| PA 4, 5, 10 & 11: General Office | 67.555 | TSF | 90 | 12 | 102 | 17 | 81 | 98 | 732 |
| PA 4, 5, 10 & 11: Medical Dental Office | 67.556 | TSF | 165 | 44 | 209 | 80 | 186 | 266 | 2,432 |
| Internal Capture Reduction | | | -48 | -51 | -99 | -70 | -26 | -96 | -836 |
| PA 2, 3, 8 & 9: Single Family Detached | 328 | DU | 60 | 170 | 230 | 194 | 114 | 308 | 3,094 |
| PA 2, 3, 8 & 9: Multifamily (Low-Rise) Residential | 984 | DU | 94 | 299 | 393 | 316 | 186 | 502 | 6,632 |
| PA 15: Active Park | 13.11 | Acres | 13 | 13 | 26 | 26 | 26 | 52 | 656 |
| PA 16: Public Park | 9.90 | Acres | 0 | 0 | 0 | 1 | 0 | 1 | 8 |
| PA 1 & 7: Single Family Detached | 218 | DU | 40 | 113 | 153 | 129 | 76 | 205 | 2,056 |
| PA 1 & 7: Multifamily (Low-Rise) Residential | 653 | DU | 63 | 199 | 262 | 210 | 123 | 333 | 4,402 |
| PA 14: Active Park | 13.33 | Acres | 13 | 13 | 26 | 27 | 27 | 54 | 668 |
| Internal Capture Reduction (8%) | | | -29 | -311 | -340 | -264 | -234 | -498 | -5,400 |
| **Total Project Trips** | | | **1,493** | **1,969** | **3,462** | **2,024** | **1,483** | **3,507** | **44,716** |

[1] DU = dwelling units; TSF = thousand square feet

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## 4.2 Project Trip Distribution

The Project trip distribution represents the directional orientation of traffic to and from the Project site. Trip distribution is the process of identifying the probable destinations, directions or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify the route where the Project traffic would distribute. The Project trip distributions are shown for near-term and long-range traffic conditions (see Exhibits 4-1 and 4-2). Long-range trip distribution patterns include future planned roadways as contemplated by TOP.

## 4.3 Modal Split

The potential for Project trips to be reduced by the use of public transit, walking, or bicycling have not been included as part of the Project's estimated trip generation. Essentially, the Project's traffic projections are "conservative" in that these alternative travel modes would reduce the forecasted traffic volumes.

## 4.4 Project Trip Assignment

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project peak hour intersection turning movement volumes for Phase 1, Project Buildout (Near-Term), and Project Buildout (2050), are shown in Exhibits 4-3, 4-4, and 4-5, respectively.

## 4.5 Background Traffic

Future year traffic forecasts have been based upon background (ambient) growth based on an interpolation between Existing conditions and Horizon Year (2050) traffic conditions. The ambient growth is intended to approximate regional traffic growth and growth generated by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways. The traffic generated by the proposed Project was then manually added to the base volume to determine With Project forecasts.

## 4.6 Cumulative Development Traffic

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Ontario and the neighboring jurisdictions of the City of Chino and City of Eastvale. The cumulative projects listed are those that would generate traffic and would contribute traffic to study area intersections. Exhibit 4-6 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown in Table 4-3. Cumulative projects have been included for the long-range forecasts developed from SBTAM based on a comparison of a project's location within a Transportation Analysis Zone (TAZ) and the current socio-economic data (SED) within the TAZ. The SED data was reviewed to ensure that the cumulative projects are accounted for within the traffic model.

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## Exhibit 4-1: Project (Near-Term) Trip Distribution

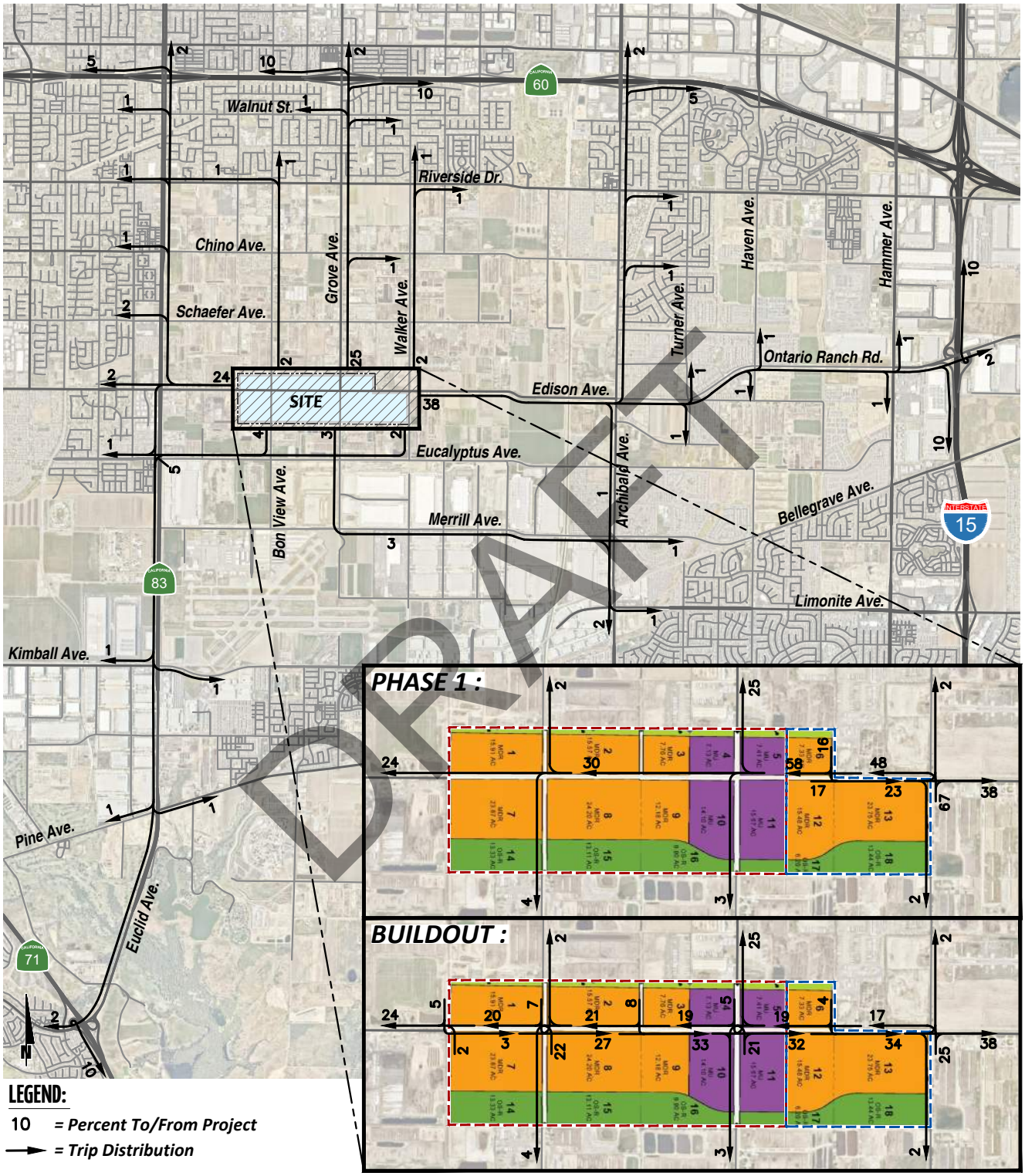

## Exhibit 4-2: Project (2050) Trip Distribution

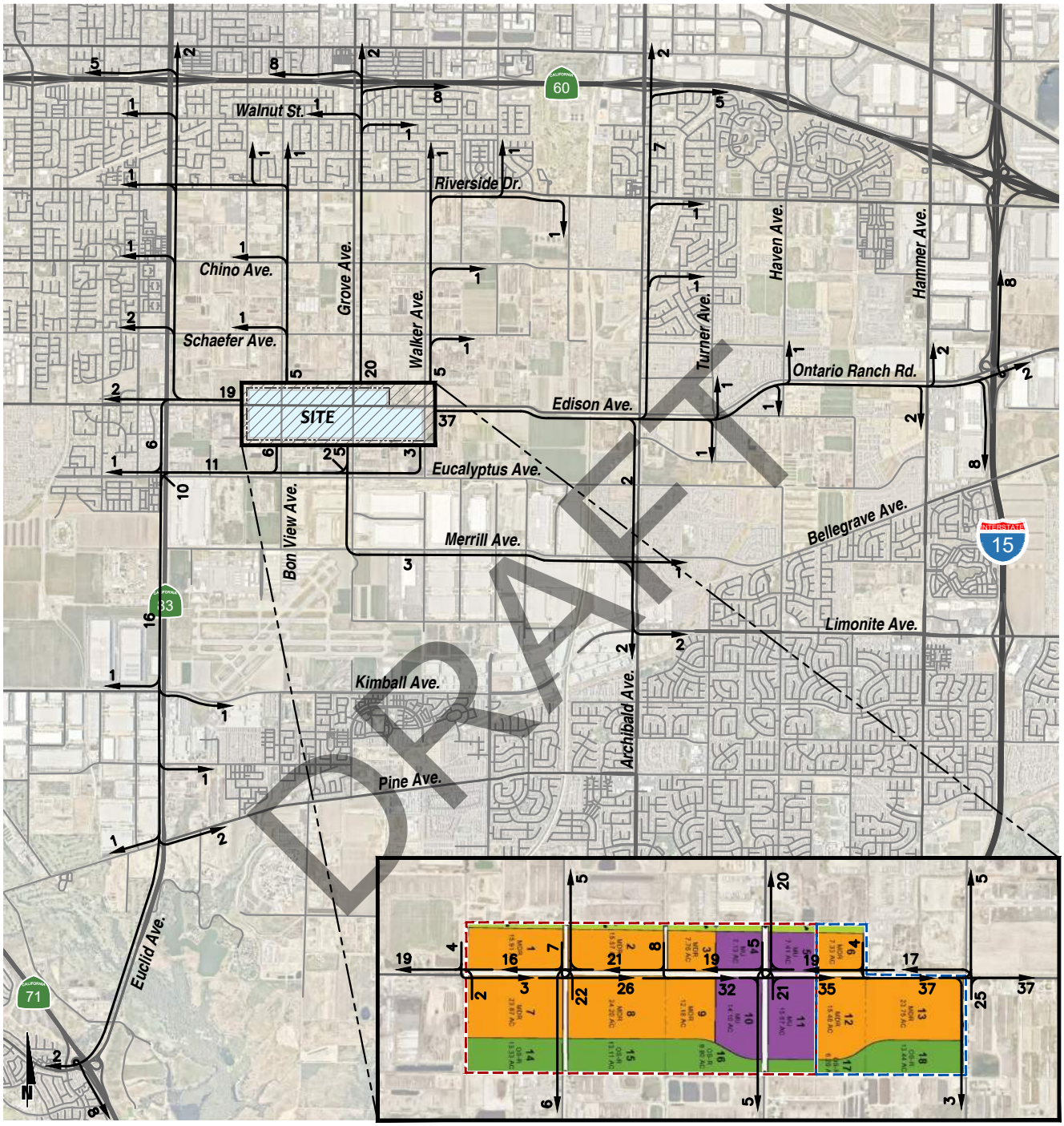


**LEGEND:**

10 = *Percent To/From Project*

→ = *Trip Distribution*

# EXHIBIT 4-3: PROJECT ONLY (PHASE 1) TRAFFIC VOLUMES

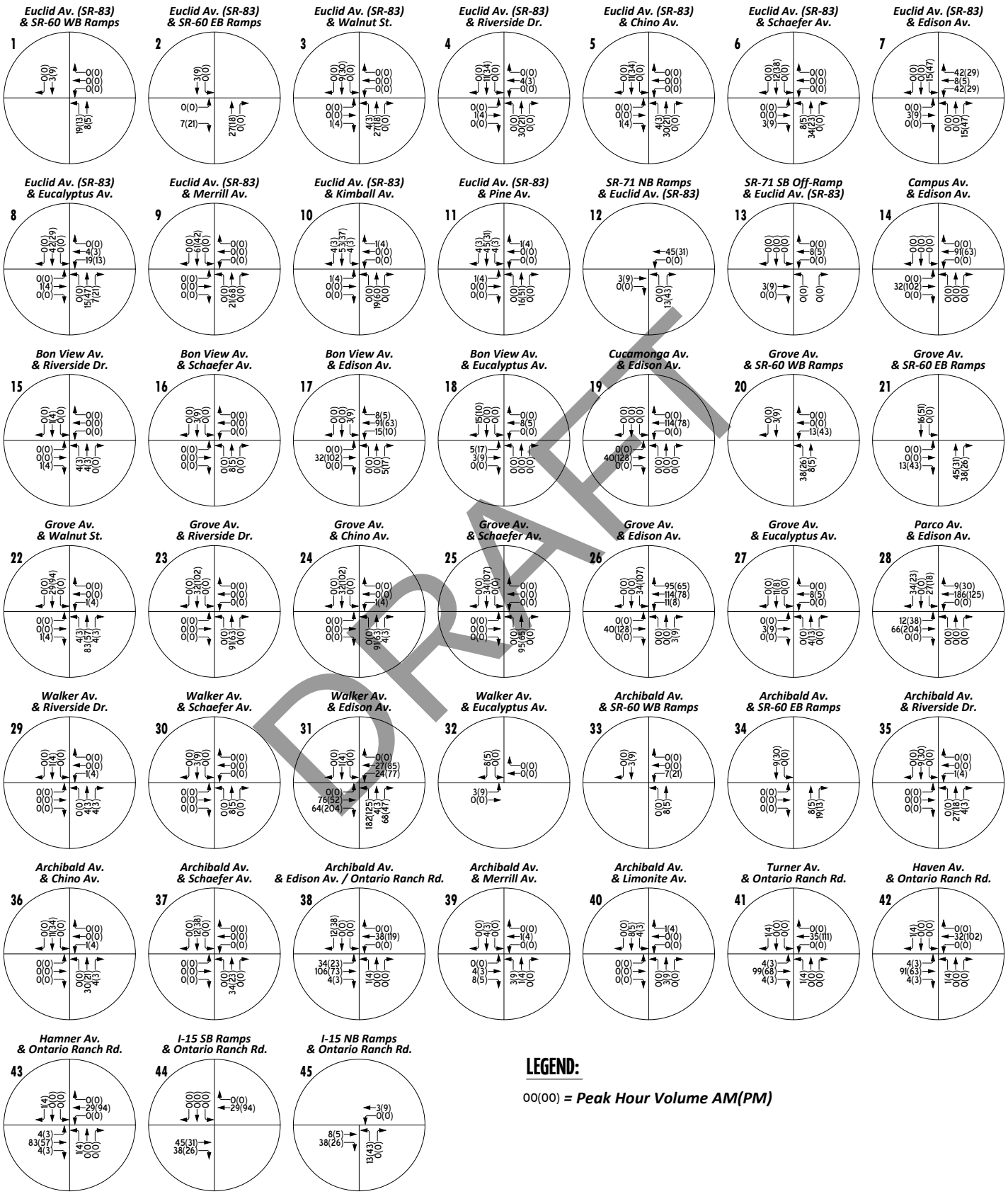


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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# Exhibit 4-4 : Project Only (Buildout) Traffic Volumes

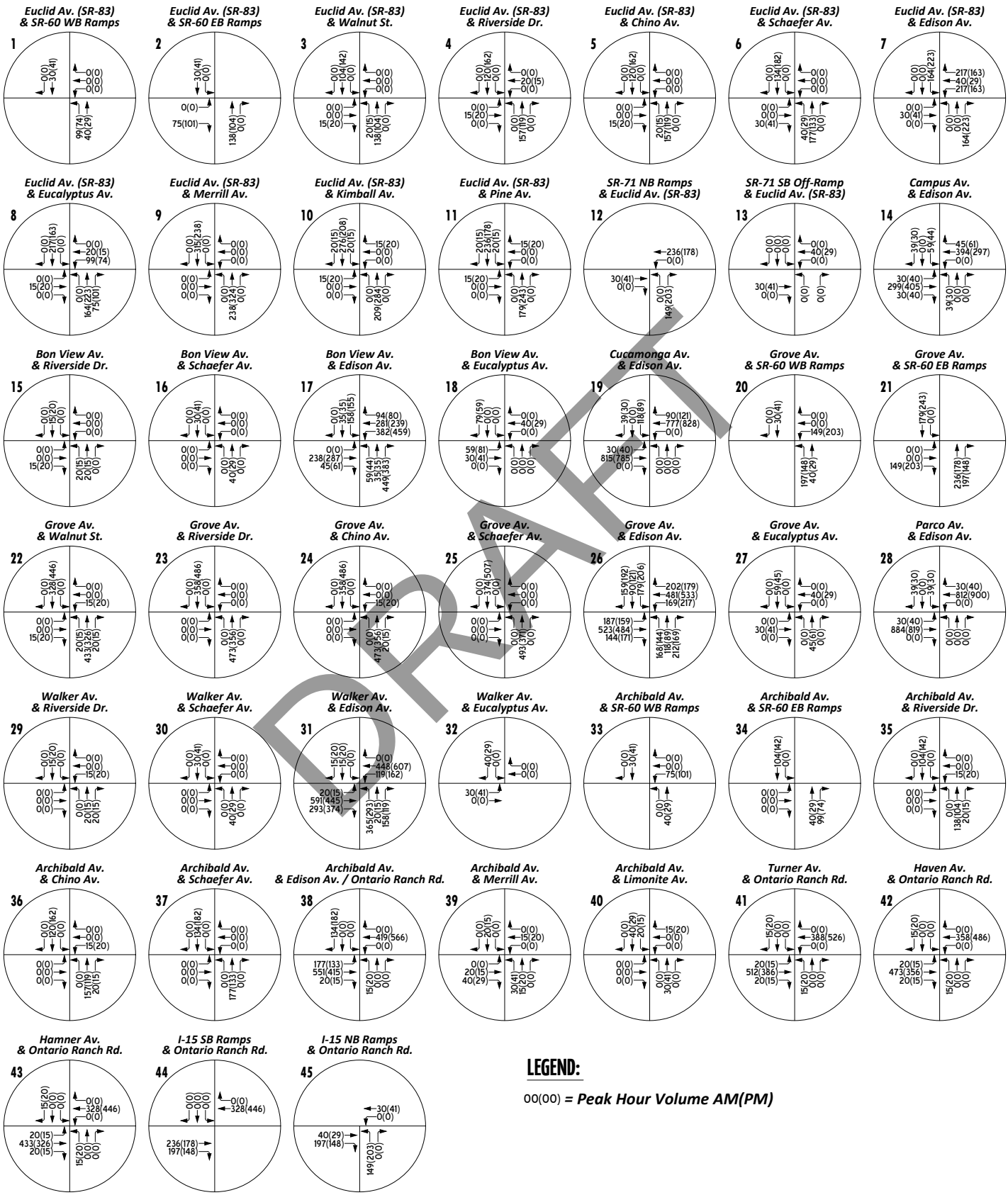


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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# Exhibit 4-5 : Project Only (2050) Traffic Volumes

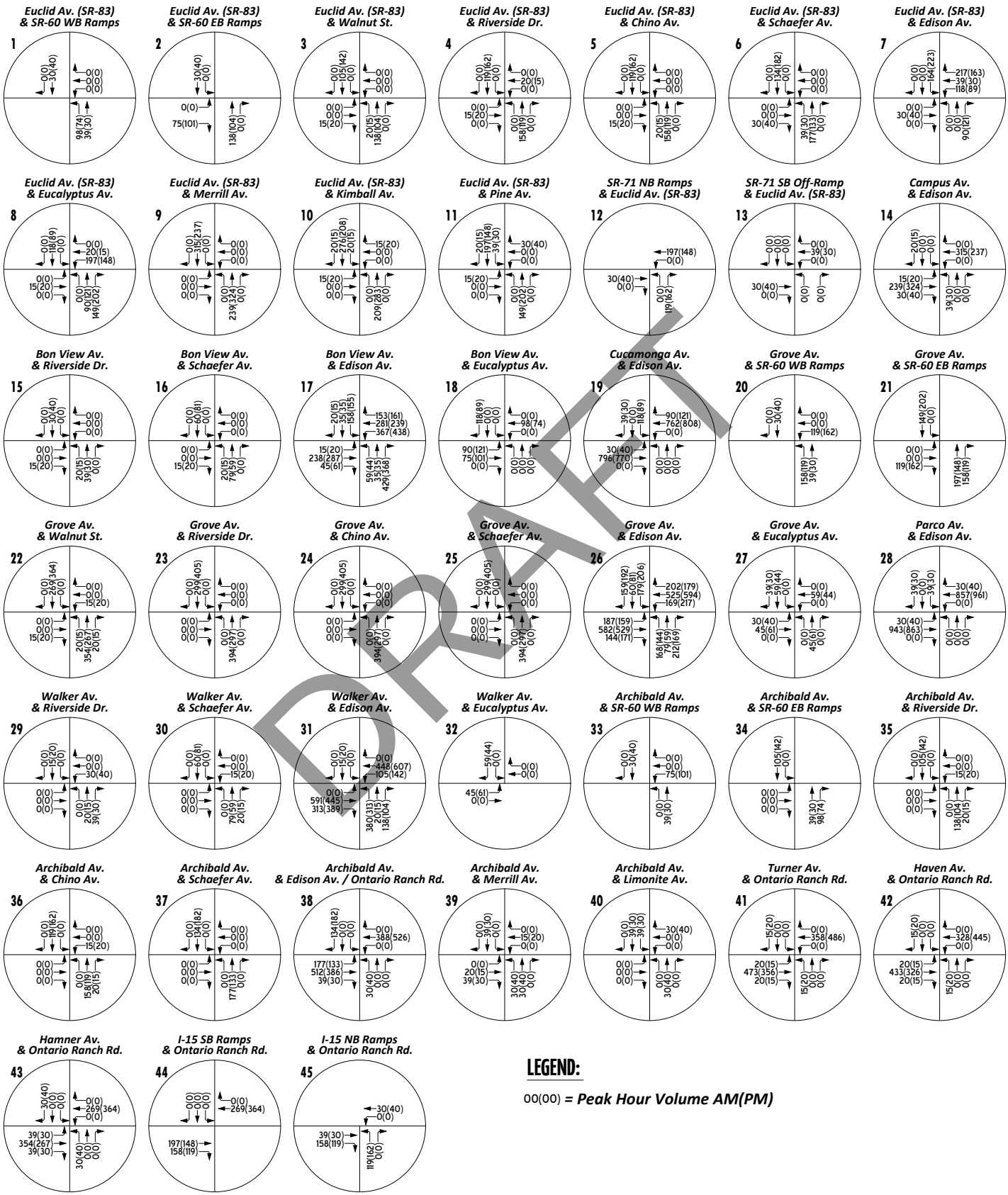


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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## EXHIBIT 4-6 : CUMULATIVE DEVELOPMENT LOCATION MAP

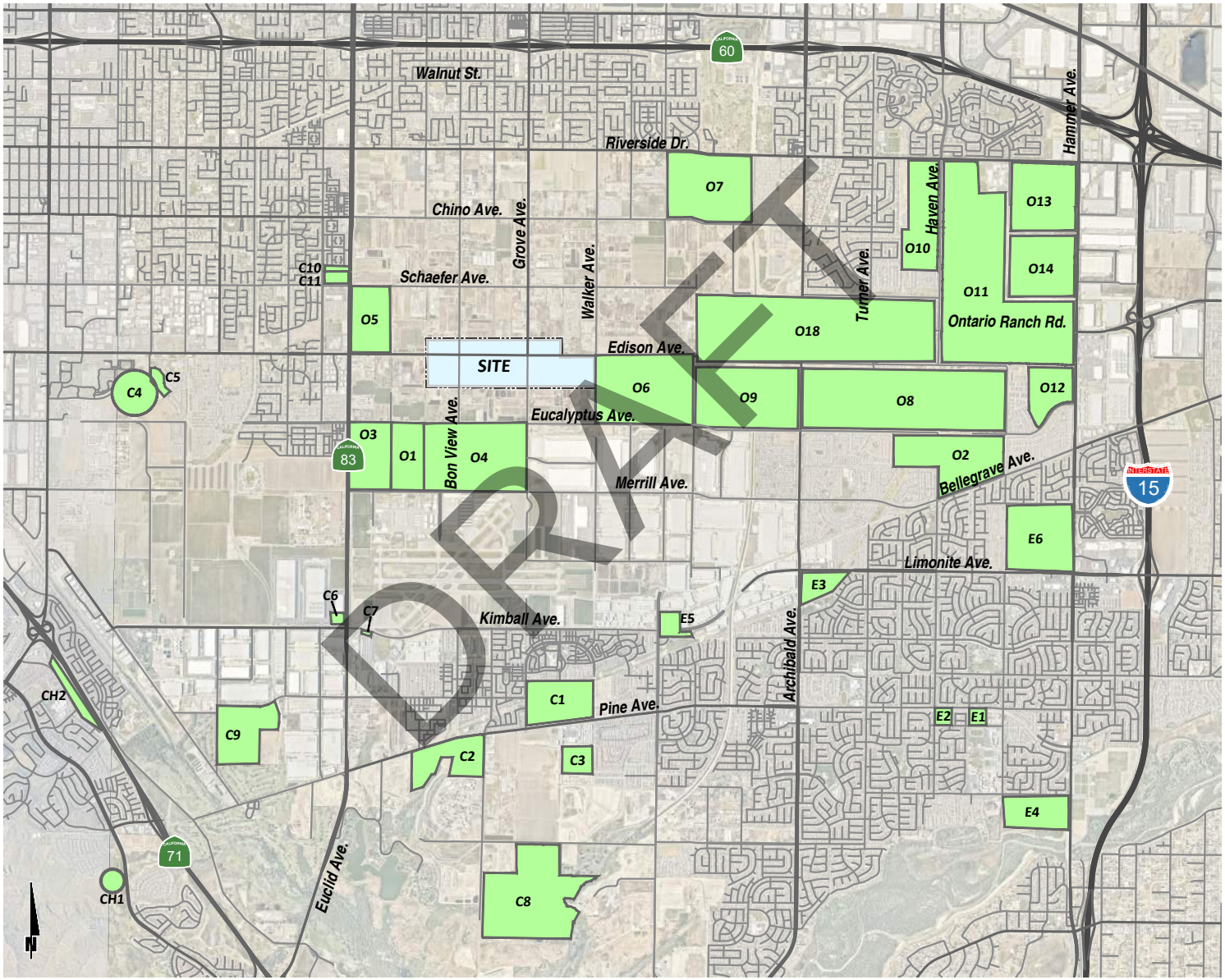


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## TABLE 4-3: CUMULATIVE DEVELOPMENT LAND USE SUMMARY (1 OF 3)

| # | Project/Location | Land Use | Quantity | Units[1] |
|---|---|---|---|---|
| City of Ontario | | | | |
| O1 | Ontario Ranch Business Park | Business Park | 227.951 | TSF |
| | | High-Cube Fulfillment Center Warehouse | 913.053 | TSF |
| | | High-Cube Cold Storage Warehouse | 179.135 | TSF |
| | | Warehouse | 320.551 | TSF |
| O2 | Subarea 29 & Amendment (PA 30-34) | Single Family Detached | 1,667 | DU |
| | | Middle School | 1,200 | STU |
| O3 | Ontario Ranch Commerce Center | High-Cube Fulfillment Warehouse | 1,447.123 | TSF |
| | | Business Park | 457.904 | TSF |
| O4 | South Ontario Logistics Center | Business Park | 1,075.235 | TSF |
| | | High-Cube Fulfillment Warehouse | 2,819.282 | TSF |
| | | High-Cube Cold Storage Warehouse | 563.857 | TSF |
| | | Warehousing | 954.218 | TSF |
| O5 | Euclid Mixed-Use | Warehousing | 972.817 | TSF |
| | | Industrial Park | 191.378 | TSF |
| | | Trailer Yard | 12.2 | AC |
| | | Multifamily (Low-Rise) Residential | 466 | DU |
| | | Strip Retail (<40,000 SF) | 10.225 | TSF |
| | | Fast-Food Without Drive-Thru Window | 10.000 | TSF |
| | | Fast-Food With Drive-Thru Window | 10.000 | TSF |
| O6 | Parente Home Ranch SP | Single Family Detached | 270 | DU |
| | | Condo/Townhouse | 1,872 | DU |
| | | General Office | 462.281 | TSF |
| | | Shopping Center | 194.278 | TSF |
| O7 | Armstrong Ranch | Single Family Detached | 994 | DU |
| O8 | Grand Park Specific Plan Amendment | Single Family Detached | 484 | DU |
| | | Multifamily Attached (Condo) | 843 | DU |
| | | Elementary School | 850 | STU |
| | | High School | 2,500 | STU |
| | | County Park | 131.0 | AC |
| O9 | Parkside Specific Plan | Single Family Detached | 500 | DU |
| | | Multifamily Attached (Apartments) | 2,047 | DU |
| | | Park | 57.9 | AC |
| | | Shopping Center | 15.000 | TSF |
| O10 | West Haven | Single Family Detached | 149 | DU |
| | | Multifamily Housing | 654 | DU |
| | | Elementary School | 650 | STU |
| | | Shopping Center | 87.000 | TSF |
| O11 | Rich Haven | Single Family Detached | 2,732 | DU |
| | | Multifamily Attached (Condo) | 1,524 | DU |
| | | Shopping Center | 317.400 | TSF |
| O12 | Esperanza | Elementary School | 10.2 | AC |
| | | Multifamily Attached (Apartments) | 405 | DU |
| O13 | Edenglen | Multifamily Attached (Condo) | 99 | DU |
| | | Shopping Center | 217.520 | TSF |
| | | Business Park | 550.000 | TSF |

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## TABLE 4-3: CUMULATIVE DEVELOPMENT LAND USE SUMMARY (2 OF 3)

| # | Project/Location | Land Use | Quantity | Units[1] |
|---|---|---|---|---|
| O14 | Tuscana Village | Single Family Detached | 176 | DU |
| | | Shopping Center | 26.000 | TSF |
| O15 | The Avenue | Single Family Detached | 638 | DU |
| | | Multi-Family Attached (Condo) | 1,376 | DU |
| | | Elementary School | 1,600 | STU |
| | | Shopping Center | 204.496 | TSF |
| City of Chino | | | | |
| C1 | Falloncrest at the Preserve | Multifamily Housing (Low-Rise) | 698 | DU |
| | | Multifamily Housing (Mid-Rise) | 440 | DU |
| | | Public Parks | 21.60 | AC |
| | | General Office | 77.597 | TSF |
| | | Shopping Center | 77.597 | TSF |
| C2 | Pines Community | Single Family Detached | 552 | DU |
| | | Public Park | 3.0 | AC |
| | | Self Storage & RV Storage | 120.000 | TSF |
| | | Sports Park | 41.8 | AC |
| C3 | The Preserve Civic Center | Elementary School | 1,200 | STU |
| | | Library | 10.00 | AC |
| | | Community Center | 10.00 | AC |
| | | Park | 8.00 | AC |
| C4 | Chaffey College Expansion | Junior/Community College | 93.50 | AC |
| | College Park Commercial | Shopping Center | 7.50 | AC |
| C5 | The Campus at College Park | Church | 27.000 | TSF |
| | | General Office | 16.969 | TSF |
| | | Shopping Center | 17.785 | TSF |
| | | High-Turnover (Sit Down) Restaurant | 15.876 | TSF |
| C6 | Majestic Gateway | Specialty Retail | 25.000 | TSF |
| | | Pharmacy/Drugstore with Drive-Thru | 13.000 | TSF |
| | | Fast-Food with Drive-Thru | 8.600 | TSF |
| C7 | Archibald's (PL 17-0037) | Fast-Food with Drive-Thru | 3.147 | TSF |
| C8 | Rancho Miramonte | Single Family Detached | 691 | DU |
| | | Condo/Townhouse | 132 | DU |
| | | Neighborhood Retail | 21.780 | TSF |
| | | Church | 400 | SEAT |
| C9 | Majestic Chino Heritage | High-Cube Fulfillment Warehouse | 1982.700 | TSF |
| | | High-Cube Cold Storage Warehouse | 100.000 | TSF |
| C10 | APN: 105258104 | Multifamily Housing | 116 | DU |
| C11 | Eden Mixed-Use | Self-Storage Facility | 145 | TSF |
| | | Multifamily (Mid-Rise) Residential | 282 | DU |
| | | Retail Shops | 3 | TSF |
| | | Fast-Food Restaurant without Drive-Thru | 9 | TSF |
| | | Fast-Food Restaurant with Drive-Thru | 7 | TSF |

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## TABLE 4-3: CUMULATIVE DEVELOPMENT LAND USE SUMMARY (3 OF 3)

| # | Project/Location | Land Use | Quantity | Units[1] |
|---|---|---|---|---|
| City of Eastvale | | | | |
| E1 | Magnolia Ranch | Single Family Detached | 39 | DU |
| | | Multifamily Housing | 90 | DU |
| E2 | Sumner Place | Multifamily Housing | 216 | DU |
| | | Shopping Center | 2.500 | TSF |
| | | Fast-Food Without Drive-Thru | 2.500 | TSF |
| E3 | Eastvale Shopping Center | Free-Standing Discount Superstore | 192.000 | TSF |
| | | Specialty Retail | 9.200 | TSF |
| | | Fast-Food Without Drive-Thru | 7.200 | TSF |
| | | Coffee/Donut Shop w/ Drive Thru | 2.000 | TSF |
| | | Fast-Food with Drive-Thru | 3.500 | TSF |
| | | Gas Station w/ convenience store and car wash | 16 | VFP |
| E4 | Van Leeuwen | Single Family Detached | 224 | DU |
| E5 | SP00358 - The Ranch at Eastvale (75% complete) | Shopping Center | 267.200 | TSF |
| E6 | Leal Master Plan | Lifestyle Center (Commercial) | 1,300.000 | TSF |
| | | General Commercial | 225.000 | TSF |
| | | Office | 920.000 | TSF |
| | | Hotel | 450 | RM |
| | | High Density Residential | 500-660 | DU |
| City of Chino Hills | | | | |
| CH1 | Vila Borba Specific Plan (TR 16414) | Single Family Detached | 172 | DU |
| CH2 | Heritage Professional Center | Hospital | 55.000 | TSF |

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## 4.7 HORIZON YEAR (2050) VOLUME DEVELOPMENT

Traffic projections for Horizon Year (2050) without Project conditions were derived from the SBTAM using accepted procedures for model forecast refinement and smoothing for study area intersections located within the County of San Bernardino and are based on the City on Ontario TOP 2050 currently approved General Plan forecasts. The traffic forecasts reflect the area-wide growth anticipated between Existing (2024) conditions and Horizon Year (2050) traffic conditions.

In most instances, the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year (2050) peak hour forecasts were refined using the model derived long range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data collected at each analysis location in 2024. The SBTAM has a base (validation) year of 2019 and a horizon (future forecast) year of 2050. The difference in model volumes (2050-2019) defines the growth in traffic over the 31-year period.

The refined future peak hour approach and departure volumes obtained from the model output data are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP Report 765), along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

Typically, the model growth is prorated and is subsequently added to the existing (base validation) traffic volumes to represent Horizon Year traffic conditions. In an effort to conduct a conservative analysis, reductions to traffic forecasts from either Existing or Opening Year Cumulative traffic conditions were not assumed as part of this analysis. As such, in conjunction with the addition of cumulative projects that are not consistent with the General Plan, additional growth has also been applied on a movement-by-movement basis, where applicable, to estimate reasonable Horizon Year (2050) forecasts. Horizon Year (2050) turning volumes were compared to Opening Year Cumulative (2034) volumes in order to ensure a minimum growth as a part of the refinement process.

The future Horizon Year (2050) Without Project peak hour turning movements were then reviewed by Urban Crossroads, Inc. for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two adjacent driveway locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis. Post-processing worksheets for Horizon Year (2050) without Project traffic conditions are provided in Appendix 4.1.

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# 5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for E+P conditions and the resulting intersection operations, traffic signal warrant, and off-ramp queuing analyses.

## 5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P conditions are consistent with those shown previously in Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

## 5.2 E+P TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus the addition of Project traffic. The weekday AM and PM peak hour volumes which can be expected for the E+P (Phase 1) and E+P (Buildout) scenarios conditions are shown in Exhibits 5-1 and 5-2, respectively.

## 5.3 INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies.* The intersection analysis results are summarized in Table 5-1 for E+P traffic conditions, which indicates that no study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under E+P (Phase 1) traffic conditions, other than the intersection previously identified under Existing (2024) traffic conditions.

The following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under E+P (Buildout) traffic conditions, in addition to the intersection previously identified under Existing (2024) traffic conditions:

- Bon View Avenue & Riverside Drive (#15) – LOS F AM peak hour only
- Grove Avenue & Chino Avenue (#24) – LOS F AM and PM peak hours
- Grove Avenue & Schaefer Avenue (#25) – LOS F AM and PM peak hours

The intersection operations analysis worksheets for E+P (Phase 1) and E+P (Buildout) traffic conditions are included in Appendices 5.1 and 5.2, respectively.

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# EXHIBIT 5-1 : E+P (PHASE 1) TRAFFIC VOLUMES

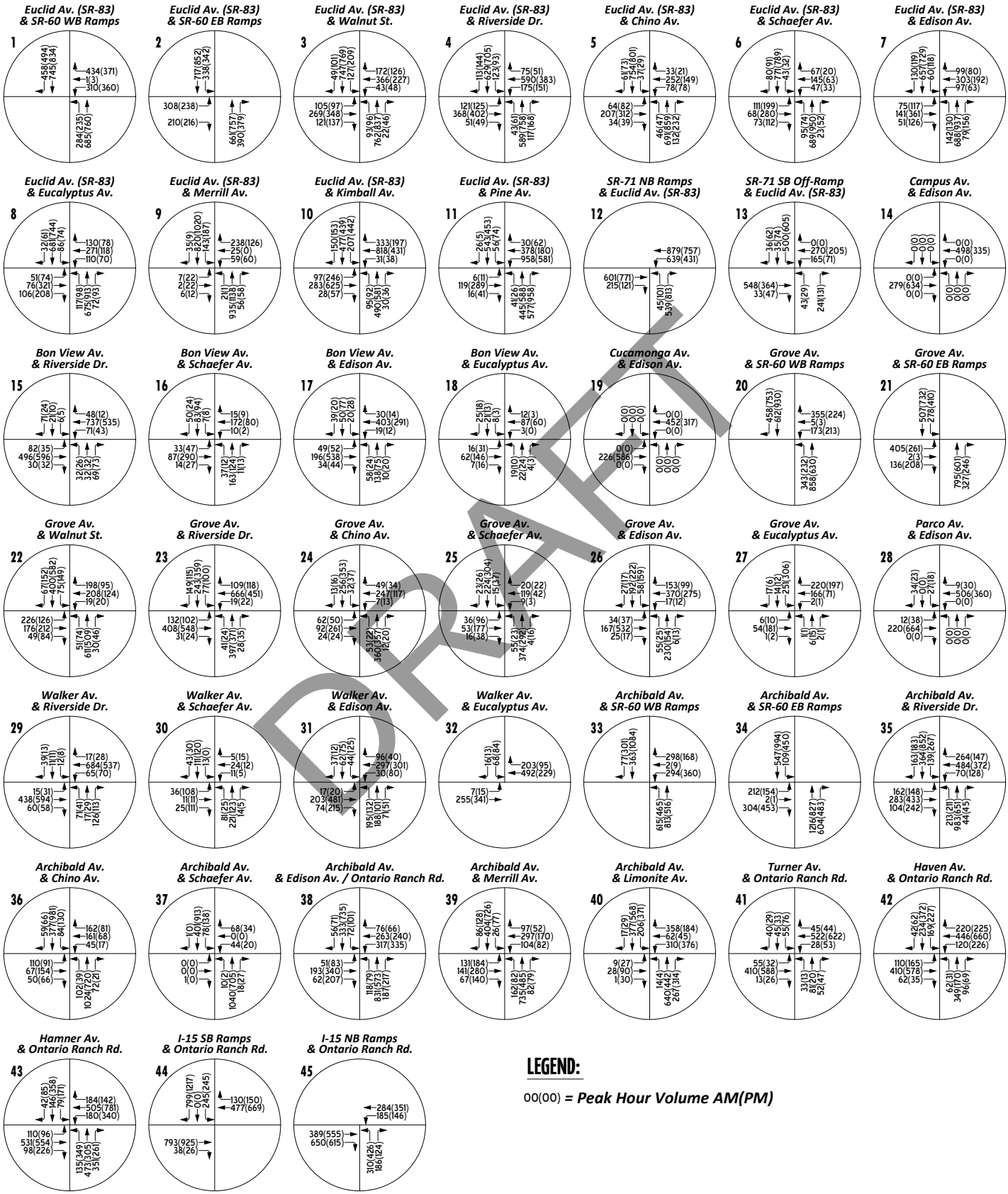


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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# Exhibit 5-2: E+P (Project Buildout) Traffic Volumes

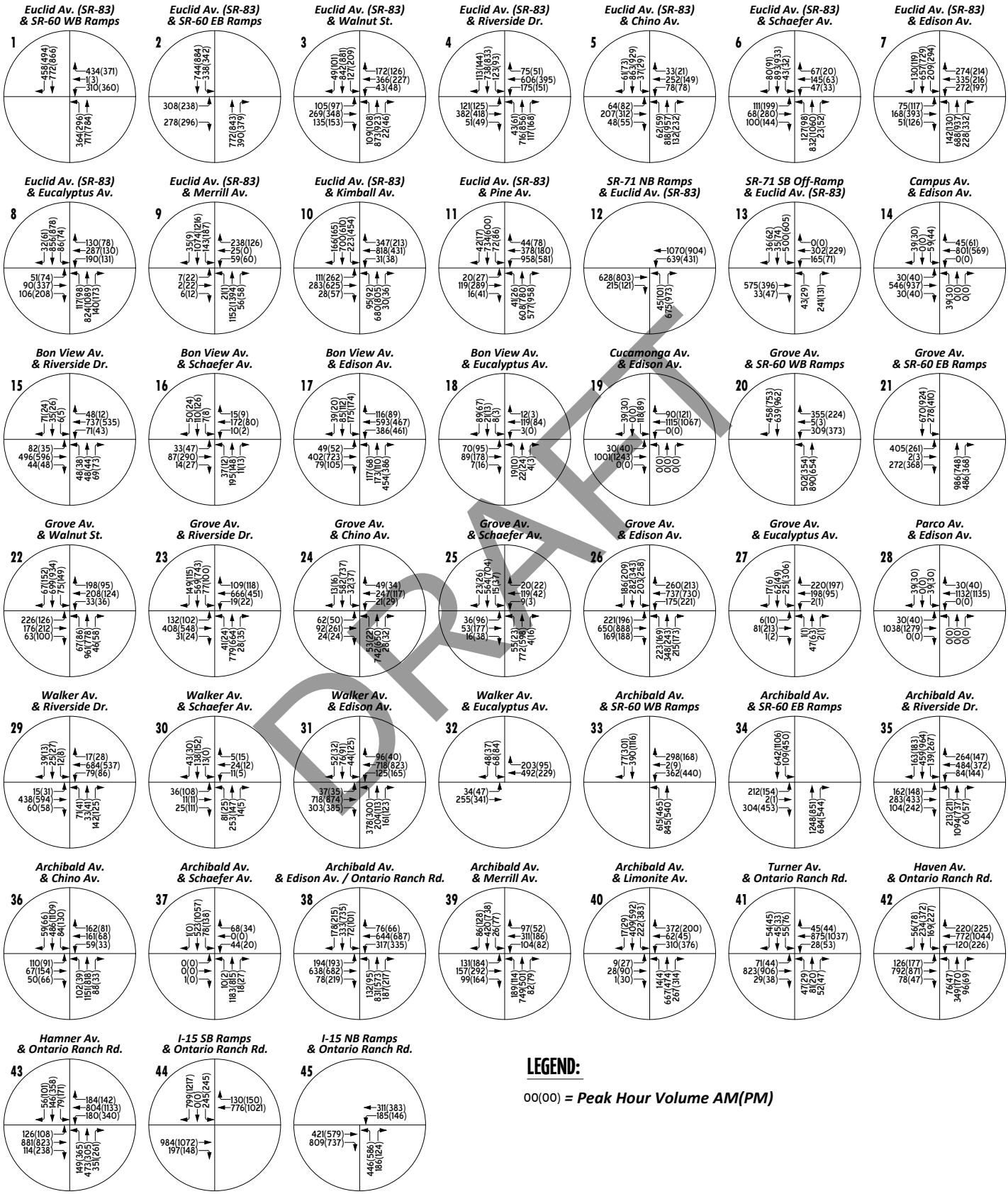


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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## TABLE 5-1: E+P INTERSECTION ANALYSIS (1 OF 2)

| # | Intersection | Traffic Control[2] | Existing (2024) Delay[1] (secs.) AM | Existing (2024) Delay[1] (secs.) PM | Existing (2024) Level of Service AM | Existing (2024) Level of Service PM | E+P (Phase 1) Delay[1] (secs.) AM | E+P (Phase 1) Delay[1] (secs.) PM | E+P (Phase 1) Level of Service AM | E+P (Phase 1) Level of Service PM | E+P (Buildout) Delay[1] (secs.) AM | E+P (Buildout) Delay[1] (secs.) PM | E+P (Buildout) Level of Service AM | E+P (Buildout) Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Euclid Av. (SR-83) & SR-60 WB Ramps | TS | 21.6 | 26.5 | C | C | 22.2 | 27.1 | C | C | 25.9 | 30.1 | C | C | D |
| 2 | Euclid Av. (SR-83) & SR-60 EB Ramps | TS | 24.5 | 19.8 | C | B | 24.5 | 21.0 | C | C | 25.1 | 21.6 | C | C | D |
| 3 | Euclid Av. (SR-83) & Walnut St. | TS | 14.8 | 14.9 | B | B | 14.9 | 15.0 | B | B | 15.7 | 15.6 | B | B | D |
| 4 | Euclid Av. (SR-83) & Riverside Dr. | TS | 36.1 | 36.9 | D | D | 37.0 | 37.7 | D | D | 42.9 | 41.9 | D | D | E |
| 5 | Euclid Av. (SR-83) & Chino Av. | TS | 16.4 | 15.4 | B | B | 16.8 | 15.6 | B | B | 18.6 | 16.8 | B | B | E |
| 6 | Euclid Av. (SR-83) & Schafer Av. | TS | 26.9 | 27.0 | C | C | 27.2 | 27.6 | C | C | 30.4 | 30.9 | C | C | E |
| 7 | Euclid Av. (SR-83) & Edison Av. | TS | 21.9 | 24.7 | C | C | 23.9 | 27.3 | C | C | 43.4 | 59.2 | D | E | E |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. | TS | 22.4 | 22.1 | C | C | 22.9 | 23.4 | C | C | 25.9 | 32.7 | C | C | E |
| 9 | Euclid Av. (SR-83) & Merrill Av. | TS | 25.3 | 27.5 | C | C | 25.9 | 16.7 | C | B | 33.8 | 20.7 | C | C | E |
| 10 | Euclid Av. (SR-83) & Kimball Av. | TS | 29.4 | 43.9 | C | D | 29.9 | 47.2 | C | D | 35.5 | 54.2 | D | D | D |
| 11 | Euclid Av. (SR-83) & Pine Av. | TS | 34.5 | **75.0** | C | **E** | 35.1 | **74.5** | D | **E** | 40.8 | **72.8** | D | **E** | D |
| 12 | SR-71 NB Ramps & Euclid Av. (SR-83) | TS | 31.3 | 28.0 | C | C | 30.7 | 27.5 | C | C | 28.3 | 25.6 | C | C | D |
| 13 | SR-71 SB Off-Ramp & Euclid Av. (SR-83) | TS | 29.0 | 28.5 | C | C | 28.8 | 28.3 | C | C | 28.0 | 27.6 | C | C | D |
| 14 | Campus Av. & Edison Av. | CSS | Future Intersection | | | | Future Intersection | | | | 30.7 | 35.1 | D | E | E |
| 15 | Bon View Av. & Riverside Dr. | CSS | 30.8 | 18.3 | D | C | 34.5 | 18.9 | D | C | **61.7** | 21.7 | **F** | C | E |
| 16 | Bon View Av. & Schaefer Av. | AWS | 10.0 | 11.3 | A | B | 10.1 | 11.6 | B | B | 10.7 | 12.1 | B | B | E |
| 17 | Bon View Av. & Edison Av. | AWS/TS | 12.6 | 19.6 | B | C | 17.2 | 43.4 | C | E | 55.7 | 79.7 | E | E | E |
| 18 | Bon View Av. & Eucalyptus Av. | AWS | 7.7 | 8.1 | A | A | 7.8 | 8.2 | A | A | 8.6 | 9.2 | A | A | E |
| 19 | Cucamonga Av. & Edison Av. | TS | Future Intersection | | | | Future Intersection | | | | 6.2 | 5.4 | A | A | E |
| 20 | Grove Av. & SR-60 WB Ramps | TS | 18.5 | 19.1 | B | B | 19.1 | 21.5 | B | C | 42.1 | 50.5 | D | D | D |
| 21 | Grove Av. & SR-60 EB Ramps | TS | 41.4 | 44.4 | D | D | 43.5 | 35.4 | D | D | 54.8 | 45.3 | D | D | D |
| 22 | Grove Av. & Walnut St. | TS | 28.3 | 21.8 | C | C | 31.0 | 22.8 | C | C | 53.5 | 33.9 | D | C | E |
| 23 | Grove Av. & Riverside Dr. | TS | 29.3 | 31.3 | C | C | 36.3 | 36.4 | D | D | 76.5 | 61.9 | E | E | E |
| 24 | Grove Av. & Chino Av. | AWS | 22.0 | 18.1 | C | C | 44.3 | 32.0 | E | D | **>100** | **>100** | **F** | **F** | E |
| 25 | Grove Av. & Schaefer Av. | AWS | 12.7 | 13.2 | B | B | 16.7 | 17.6 | C | C | **>100** | **>100** | **F** | **F** | E |
| 26 | Grove Av. & Edison Av. | AWS/TS | 17.8 | 28.4 | C | D | 9.7 | 11.8 | A | B | 79.8 | 75.7 | E | E | E |
| 27 | Grove Av. & Eucalyptus Av. | AWS | 11.6 | 12.7 | B | B | 11.9 | 13.2 | B | B | 14.5 | 16.6 | B | C | E |
| 28 | Parco Av. & Edison Av. | CSS[3] | Future Intersection | | | | 13.5 | 14.0 | B | B | 32.7 | 31.2 | D | D | E |
| 29 | Walker Av. & Riverside Dr. | CSS | 20.0 | 18.5 | C | C | 20.9 | 19.1 | C | C | 27.3 | 22.0 | D | C | E |

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## TABLE 5-1: E+P INTERSECTION ANALYSIS (2 OF 2)

| # | Intersection | Traffic Control[2] | Existing (2024) | | | | E+P (Phase 1) | | | | E+P (Buildout) | | | | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay[1] (secs.) | | Level of Service | | Delay[1] (secs.) | | Level of Service | | Delay[1] (secs.) | | Level of Service | | |
| | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | |
| 30 | Walker Av. & Schaefer Av. | AWS | 9.8 | 9.4 | A | A | 9.9 | 9.5 | A | A | 10.5 | 9.9 | B | A | E |
| 31 | Walker Av. & Edison Av. | AWS/<u>TS</u> | 12.9 | 16.3 | B | C | 11.1 | 10.5 | B | B | 75.2 | 75.6 | E | E | E |
| 32 | Walker Av. & Eucalyptus Av. | CSS | 15.4 | 14.0 | C | B | 15.6 | 14.2 | C | B | 16.8 | 15.0 | C | C | E |
| 33 | Archibald Av. & SR-60 WB Ramps | TS | 26.4 | 36.5 | C | D | 26.6 | 29.0 | C | C | 28.1 | 29.9 | C | C | D |
| 34 | Archibald Av. & SR-60 EB Ramps | TS | 12.6 | 18.2 | B | B | 12.5 | 18.3 | B | B | 12.4 | 18.0 | B | B | D |
| 35 | Archibald Av. & Riverside Dr. | TS | 27.6 | 27.4 | C | C | 28.1 | 27.8 | C | C | 30.5 | 30.4 | C | C | E |
| 36 | Archibald Av. & Chino Av. | TS | 21.2 | 17.8 | C | B | 21.4 | 18.2 | C | B | 22.8 | 19.8 | C | B | E |
| 37 | Archibald Av. & Schaefer Av. | TS | 10.4 | 7.5 | B | A | 10.4 | 7.4 | B | A | 10.3 | 7.4 | B | A | E |
| 38 | Archibald Av. & Edison Av./Ontario Ranch Rd. | TS | 20.7 | 21.6 | C | C | 22.4 | 21.8 | C | C | 54.8 | 52.3 | D | D | E |
| 39 | Archibald Av. & Merrill Av. | TS | 17.5 | 19.1 | B | B | 17.6 | 19.2 | B | B | 17.9 | 19.7 | B | B | E |
| 40 | Archibald Av. & Limonite Av. | TS | 15.5 | 21.3 | B | C | 15.6 | 21.6 | B | C | 15.9 | 22.6 | B | C | D |
| 41 | Turner Av. & Ontario Ranch Rd. | TS | 13.4 | 11.9 | B | B | 13.4 | 12.0 | B | B | 14.2 | 12.5 | B | B | E |
| 42 | Haven Av. & Ontario Ranch Rd. | TS | 21.7 | 22.3 | C | C | 21.9 | 23.2 | C | C | 25.0 | 26.5 | C | C | E |
| 43 | Hamner Av. & Ontario Ranch Rd. | TS | 17.4 | 28.0 | B | C | 17.6 | 31.6 | B | C | 19.4 | 49.9 | B | D | D |
| 44 | I-15 SB Ramps & Ontario Ranch Rd. | TS | 21.1 | 34.9 | C | C | 20.6 | 23.6 | C | C | 17.6 | 22.3 | B | C | D |
| 45 | I-15 NB Ramps & Ontario Ranch Rd. | TS | 20.7 | 19.9 | C | B | 20.6 | 20.9 | C | C | 22.6 | 29.1 | C | C | D |

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

2 TS = Traffic Signal; AWS = All-way Stop; CSS = Cross-street Stop; <u>Underline</u> = Improvement

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## 5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

The traffic signal warrant analysis for E+P traffic conditions is based on the peak hour volumes or planning level ADT volume-based traffic signal warrants for each applicable phase. There are no study area intersections anticipated to meet traffic signal warrants for E+P (Phase 1) traffic conditions, in addition to the intersections previously identified under Existing (2024) traffic conditions.

The following additional study area intersections are anticipated to meet a traffic signal warrant for E+P (Buildout) traffic conditions, in addition to the intersections previously identified under Existing (2024) traffic conditions:

- Campus Avenue & Edison Avenue (#14)
- Cucamonga Avenue & Edison Avenue (#19)
- Parco Avenue & Edison Avenue (#28)

Worksheets for E+P (Phase 1) and E+P (Buildout) traffic signal warrants are provided in Appendices 5.3 and 5.4, respectively.

## 5.5 ROADWAY SEGMENT ANALYSIS

Table 5-2 provides a summary of the E+P roadway segment capacity analysis. As shown in Table 5-2, the roadway segment is anticipated to continue to operate at an acceptable LOS under E+P (Phase 1) traffic conditions, however it is anticipated to operate at an unacceptable LOS under E+P (Buildout) traffic conditions, based on the daily roadway capacity thresholds and minimum LOS criteria.

## 5.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for E+P are presented in Table 5-3. As shown in Table 5-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95$^{th}$ percentile traffic flows, consistent with Existing (2024) traffic conditions. Worksheets for E+P traffic conditions queuing analysis are provided in Appendix 5.3.

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## TABLE 5-2: E+P ROADWAY SEGMENT ANALYSIS

| # | Roadway | Segment Limits | Jurisdiction | Roadway Section | LOS Capacity[1] | Existing (2024) | | | E+P (Phase 1) | | | E + P (Buildout) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2024 | V/C[2] | LOS[3] | E+P | V/C[2] | LOS[3] | E+P | V/C[2] | LOS[3] |
| 1 | Edison Av. | Euclid Av. to Campus Av. | Ontario | 2U | 16,000 | 11,609 | 0.726 | C | 13,595 | 0.850 | D | **22,343** | **1.396** | **F** |

**BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] These maximum roadway capacities are based on the applicable agency's thresholds.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

## TABLE 5-3: E+P PEAK HOUR OFF-RAMP QUEUING ANALYSIS (1 OF 2)

| # | Intersection | Movement | Available Stacking Distance (Feet) | Existing (2024) | | | | E+P (Phase 1) | | | | E+P (Buildout) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 95th Percentile Queue (Feet) | | Acceptable?[1] | | 95th Percentile Queue (Feet) | | Acceptable?[1] | | 95th Percentile Queue (Feet) | | Acceptable?[1] | |
| | | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| 1 | Euclid Av. & SR-60 WB Ramps | WBL | 350 | 245 | 237 | Yes | Yes | 283 [2] | 271 [2] | Yes | Yes | 283 [2] | 271 [2] | Yes | Yes |
| | | WBL/T/R | 1,415 | 106 | 197 | Yes | Yes | 107 | 201 | Yes | Yes | 107 | 201 | Yes | Yes |
| | | WBR | 350 | 81 | 96 | Yes | Yes | 85 | 101 | Yes | Yes | 96 | 107 | Yes | Yes |
| 2 | Euclid Av. & SR-60 EB Ramps | EBL | 900 | 260 [2] | 200 | Yes | Yes | 301 [2] | 208 [2] | Yes | Yes | 301 [2] | 208 [2] | Yes | Yes |
| | | EBL/R | 1,290 | 52 | 56 | Yes | Yes | 54 | 74 | Yes | Yes | 115 | 149 | Yes | Yes |
| 12 | SR-71 NB Ramps & Euclid Av. | NBL | 1,475 | 31 | 48 | Yes | Yes | 32 | 48 | Yes | Yes | 32 | 48 | Yes | Yes |
| | | NBR | 425 | 149 [2] | 555 [2,3] | Yes | Yes | 161 [2] | 639 [2,3] | Yes | Yes | 317 [2] | 892 [2,3] | Yes | Yes |
| 13 | Euclid Av. & SR-71 SB Off-Ramp | SBL | 1,100 | 267 | 284 | Yes | Yes | 278 | 291 | Yes | Yes | 278 | 291 | Yes | Yes |
| | | SBL/T | 1,550 | 234 | 285 | Yes | Yes | 237 | 284 | Yes | Yes | 237 | 284 | Yes | Yes |
| | | SBR | 360 | 0 | 0 | Yes | Yes | 0 | 0 | Yes | Yes | 0 | 0 | Yes | Yes |
| 20 | Grove Av. & SR-60 WB Ramps | WBL/T | 1,360 | 142 | 152 | Yes | Yes | 154 | 189 | Yes | Yes | 305 [2] | 415 [2] | Yes | Yes |
| | | WBR | 225 | 221 | 58 | Yes | Yes | 255 [2,3] | 58 | Yes | Yes | 265 [2,3] | 58 | Yes | Yes |
| 21 | Grove Av. & SR-60 EB Ramps | EBL/T | 1,365 | 368 [2] | 205 | Yes | Yes | 384 [2] | 208 | Yes | Yes | 384 [2] | 208 | Yes | Yes |
| | | EBR | 310 | 39 | 45 | Yes | Yes | 41 | 66 | Yes | Yes | 98 | 248 [2] | Yes | Yes |

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## TABLE 5-3: E+P PEAK HOUR OFF-RAMP QUEUING ANALYSIS (2 OF 2)

| # | Intersection | Movement | Available Stacking Distance (Feet) | Existing (2024) | | | | E+P (Phase 1) | | | | E+P (Buildout) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 95th Percentile Queue (Feet) | | Acceptable? [1] | | 95th Percentile Queue (Feet) | | Acceptable? [1] | | 95th Percentile Queue (Feet) | | Acceptable? [1] | |
| | | | | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM | AM | PM |
| 33 | Archibald Av. & SR-60 WB Ramps | WBL | 360 | 216 [2] | 0 | Yes | Yes | 242 [2] | 191 | Yes | Yes | 282 [2] | 257 [2] | Yes | Yes |
| | | WBL/T/R | 1,410 | 162 | 418 [2] | Yes | Yes | 172 [2] | 194 | Yes | Yes | 249 [2] | 262 [2] | Yes | Yes |
| | | WBR | 1,410 | 58 | 0 | Yes | Yes | 60 | 51 | Yes | Yes | 82 | 51 | Yes | Yes |
| 34 | Archibald Av. & SR-60 EB Ramps | EBL | 325 | 164 | 127 | Yes | Yes | 170 | 132 | Yes | Yes | 170 | 136 | Yes | Yes |
| | | EBL/T/R | 1,530 | 75 | 148 | Yes | Yes | 76 | 161 | Yes | Yes | 76 | 185 | Yes | Yes |
| | | EBR | 1,530 | 51 | 142 | Yes | Yes | 52 | 153 | Yes | Yes | 52 | 172 | Yes | Yes |
| | | | | | 0 | | | | | | | | | | |
| 44 | I-15 SB Ramps & Cantu Galleano Ranch Rd. | SBL | 1,435 | 185 | 196 | Yes | Yes | 161 | 134 | Yes | Yes | 161 | 141 | Yes | Yes |
| | | SBL/R | 550 | 261 | 106 | Yes | Yes | 19 | 516 | Yes | Yes | 317 | 564 [3] | Yes | Yes |
| | | SBR | 455 | 253 | 78 | Yes | Yes | 215 | 521 [3] | Yes | Yes | 309 | 569 [3] | Yes | Yes |
| 45 | I-15 NB Ramps & Cantu Galleano Ranch Rd. | NBL | 1,615 | 166 | 202 | Yes | Yes | 171 | 220 | Yes | Yes | 223 | 284 | Yes | Yes |
| | | NBL/R | 585 | 59 | 50 | Yes | Yes | 58 | 48 | Yes | Yes | 57 | 45 | Yes | Yes |

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the freeway mainline.

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## 5.7 Project Deficiencies and Recommended Improvements

Improvements needed to achieve acceptable LOS have been identified at intersections or off-ramps that are anticipated to operate at a deficient LOS under E+P traffic conditions.

### 5.7.1 Improvements To Address Deficiencies At Intersections

Improvement strategies have been recommended at intersections that have been identified as deficient under E+P traffic conditions in an effort to achieve an acceptable LOS. The effectiveness of the recommended improvement strategies to address E+P traffic deficiencies are presented in Table 5-4. The intersection operations analysis worksheets for E+P conditions, with improvements, are included in Appendix 5.4.

### 5.7.2 Improvements To Address Deficiencies along Roadway Segments

As shown in Table 5-2, Edison Avenue, between Euclid Avenue and Campus Avenue, is anticipated to operate at an unacceptable LOS under E+P (Buildout) traffic conditions. While the intersection operations analysis indicated that additional through lanes are not needed in order to process peak hour volumes at the intersections, roadway segment improvements have been provided in an effort to achieve an acceptable LOS. The roadway segment improvements are summarized in Table 5-5.

### 5.7.3 Improvements To Address Deficiencies On Off-Ramp Queues

As shown in Table 5-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95$^{th}$ percentile traffic flows for E+P traffic conditions. As such, no improvements have been identified.

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## TABLE 5-4: E+P INTERSECTION ANALYSIS WITH IMPROVEMENTS

| # | Intersection | Traffic Control[3] | Intersection Approach Lanes[1] Northbound L | Northbound T | Northbound R | Southbound L | Southbound T | Southbound R | Eastbound L | Eastbound T | Eastbound R | Westbound L | Westbound T | Westbound R | Delay[2] (secs.) AM | Delay[2] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Euclid Av. & Pine Av. | | | | | | | | | | | | | | | | | | |
| | Phase 1: | TS | 1 | 2 | 1 | 1 | 2 | 1 | 1 | **2** | 1 | 2 | 1 | 0 | 30.5 | 49.8 | C | D | D |
| | Buildout: | TS | 1 | 2 | 1 | 1 | 2 | 1 | 1 | **2** | 1 | 2 | 1 | 0 | 36.6 | 51.1 | D | D | |
| 15 | Bon View Av. & Riverside Dr. | | | | | | | | | | | | | | | | | | |
| | Without Project: | | Not Applicable | | | | | | | | | | | | | | | | E |
| | With Project: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 9.1 | 8.8 | A | A | |
| 24 | Grove Av. & Chino Av. | | | | | | | | | | | | | | | | | | |
| | Without Project: | | Not Applicable | | | | | | | | | | | | | | | | E |
| | With Project: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 19.3 | 13.9 | B | B | |
| 25 | Grove Av. & Schaefer Av. | | | | | | | | | | | | | | | | | | |
| | Without Project: | | Not Applicable | | | | | | | | | | | | | | | | E |
| | With Project: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 10.5 | 13.1 | B | B | |

1 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement

2 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

3 TS = Traffic Signal; **TS** = Improvement

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## TABLE 5-5: E+P ROADWAY SEGMENT ANALYSIS WITH IMPROVEMENTS

| # | Roadway | Segment Limits | Jurisdiction | Roadway Section | LOS Capacity[1] | Existing (2024) 2024 | Existing (2024) V/C[2] | Existing (2024) LOS[3] | E + P (Phase 1) 2024 | E + P (Phase 1) V/C[2] | E + P (Phase 1) LOS[3] | E + P (Buildout) 2024 | E + P (Buildout) V/C[2] | E + P (Buildout) LOS[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Edison Av. | Euclid Av. to Campus Av. | Ontario | 4U | 30,000 | 11,609 | 0.387 | A | 13,595 | 0.453 | A | 22,343 | 0.745 | C |

Underline = Improvement

[1] These maximum roadway capacities are based on the applicable agency's thresholds.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

# 6 OPENING YEAR CUMULATIVE (2034) TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Opening Year Cumulative (2034) conditions and the resulting intersection operations, traffic signal warrant, and off-ramp queuing analyses.

## 6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2034) conditions are consistent with those shown previously in Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Opening Year Cumulative (2034) conditions (e.g., intersection and roadway improvements at the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative (2034) conditions (e.g., intersection and roadway improvements along the cumulative development's frontages).

## 6.2 OPENING YEAR CUMULATIVE (2034) TRAFFIC VOLUME FORECASTS

The Opening Year Cumulative (2034) scenario includes Existing traffic volumes plus an ambient growth factor based on an interpolation between Existing conditions and Horizon Year (2050) traffic conditions. The cumulative projects are included in the Horizon Year (2050) traffic conditions. The Opening Year Cumulative (2034) With Project scenario includes Existing traffic volumes, plus the ambient growth factor, and the Project (Buildout) traffic. The weekday peak hour intersection turning movement volumes for Opening Year Cumulative (2034), Without and With Project, traffic conditions are shown in Exhibits 6-1 and 6-2, respectively.

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# EXHIBIT 6-1 : OPENING YEAR CUMULATIVE (2034) WITHOUT PROJECT TRAFFIC VOLUMES

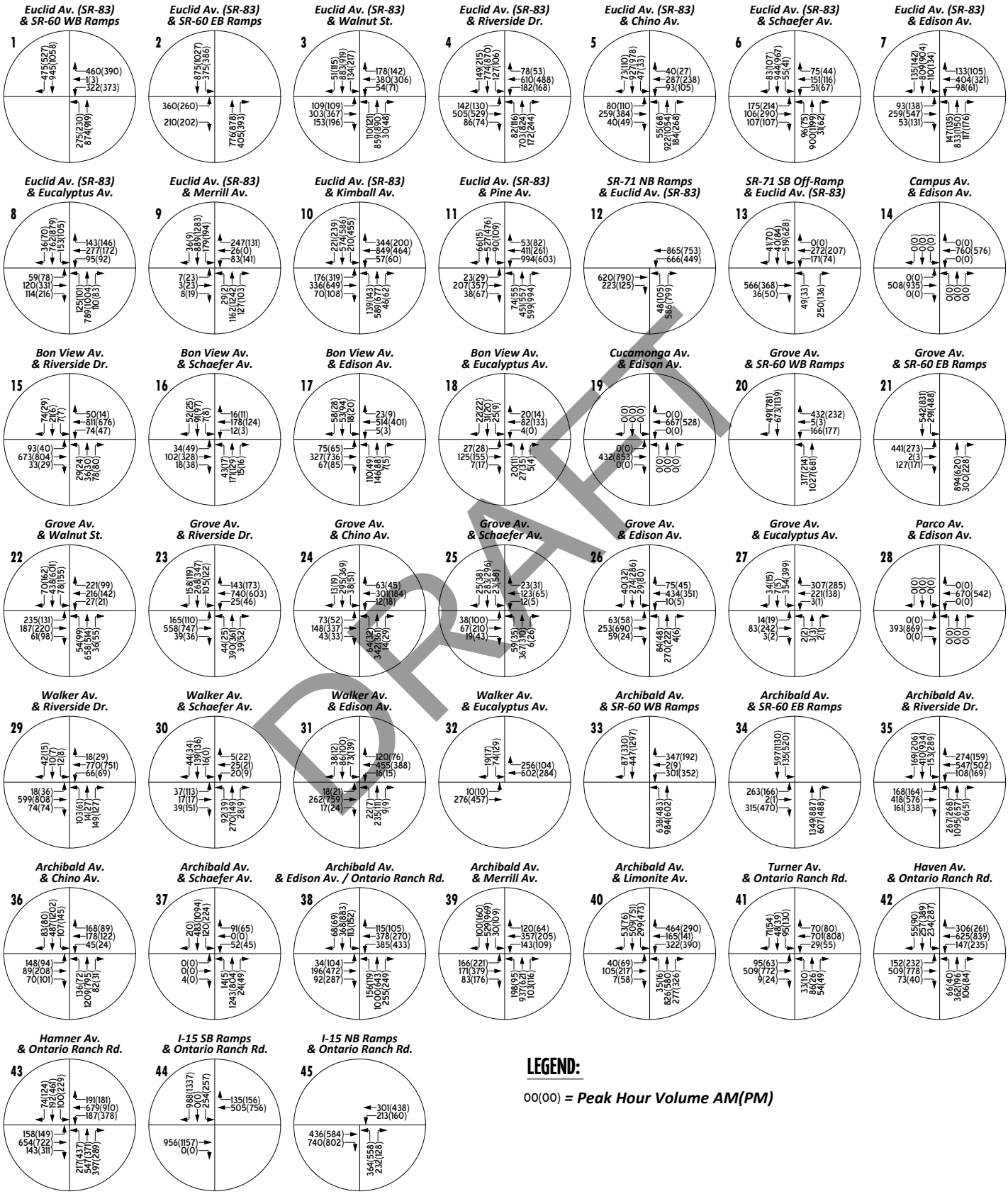


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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# EXHIBIT 6-2 : OPENING YEAR CUMULATIVE (2034) WITH PROJECT TRAFFIC VOLUMES

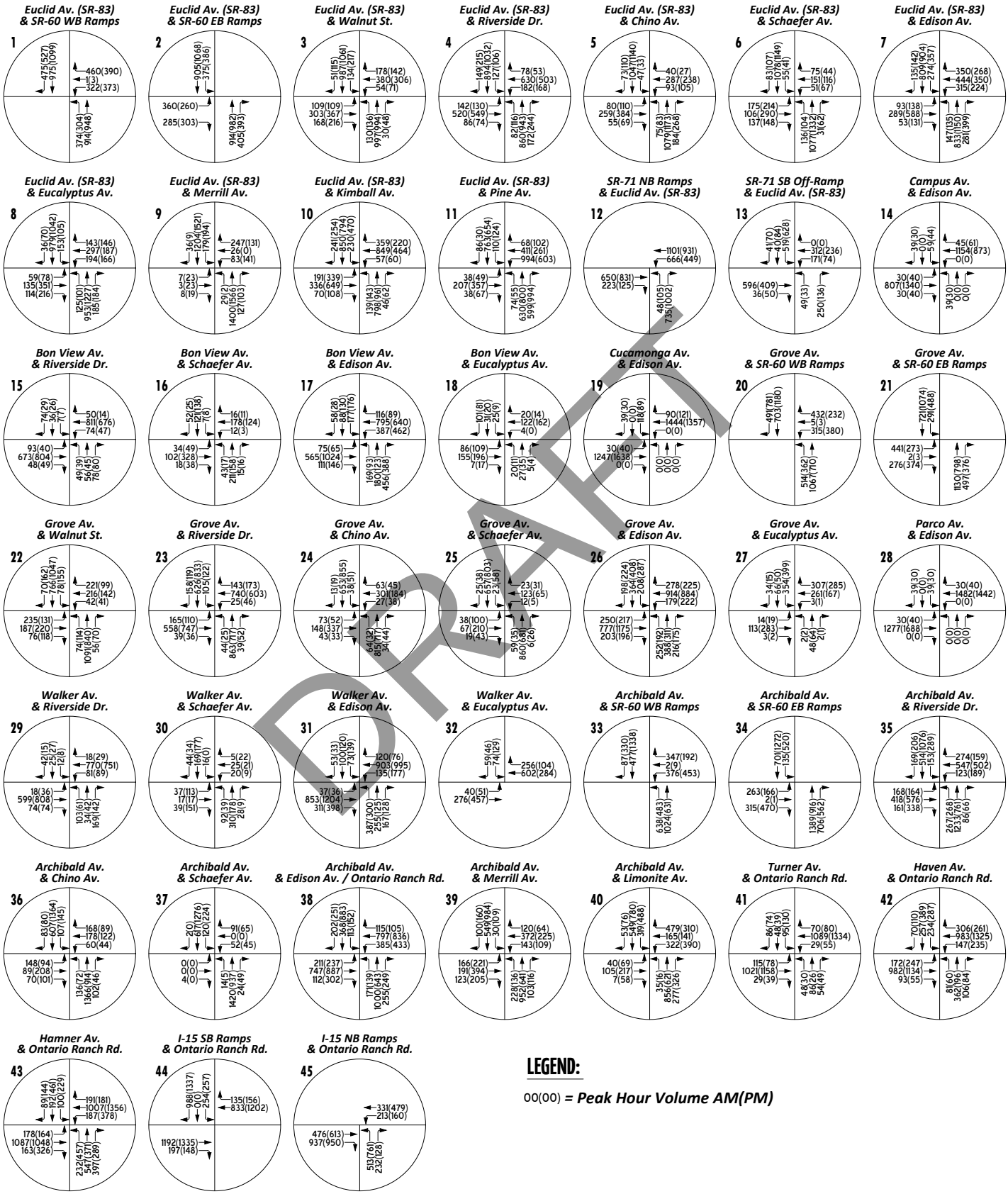


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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## 6.3 INTERSECTION OPERATIONS ANALYSIS

Opening Year Cumulative (2034) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies.* The intersection analysis results are summarized in Table 6-1 , which indicates that the following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours under Opening Year Cumulative (2034) Without Project traffic conditions:

- Euclid Avenue (SR-83) & Kimball Avenue (#10) – LOS E PM peak hour only
- Euclid Avenue (SR-83) & Pine Avenue (#11) – LOS F PM peak hour only
- Bon View Avenue & Riverside Drive (#15) – LOS F AM peak hour only
- Bon View Avenue & Edison Avenue (#17) – LOS F AM and PM peak hours
- Grove Avenue & SR-60 Eastbound Ramps (#21) – LOS E AM and PM peak hours
- Grove Avenue & Riverside Drive (#23) – LOS F PM peak hour only
- Grove Avenue & Chino Avenue (#24) – LOS F AM and PM peak hours
- Grove Avenue & Edison Avenue (#26) – LOS F AM and PM peak hours
- Walker Avenue & Riverside Drive (#29) – LOS F AM and PM peak hours
- Walker Avenue & Edison Avenue (#31) – LOS F AM and PM peak hours
- Hamner Avenue & Ontario Ranch Road (#43) – LOS E PM peak hour only

The following additional study area intersections are anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic under Opening Year Cumulative (2034) With Project traffic conditions:

- Euclid Avenue (SR-83) & Edison Avenue (#7) – LOS F AM and PM peak hours
- Campus Avenue & Edison Avenue (#14) – LOS F AM and PM peak hours
- Grove Avenue & Riverside Drive (#23) – LOS F AM peak hour only
- Grove Avenue & Schaefer Avenue (#25) – LOS F AM and PM peak hours
- Grove Avenue & Eucalyptus Avenue (#27) – LOS F PM peak hour only
- Parco Avenue & Edison Avenue (#28) – LOS F AM and PM peak hours

Grove Avenue and Riverside Drive (#23) is anticipated to operate at an unacceptable LOS (LOS F) during the AM peak hour under Opening Year Cumulative (2034) traffic conditions, in addition to the PM peak hour deficiency identified under Without Project traffic conditions. The following study area intersections are anticipated to degrade from LOS E to LOS F during the peak hours with the addition of Project traffic:

- Grove Avenue & SR-60 Eastbound Ramps (#21) – AM peak hour only
- Hamner Avenue & Ontario Ranch Road (#43) – PM peak hour

With the addition of the Project site access improvements, Bon View Avenue and Edison Avenue (#17) is anticipated to operate at an acceptable LOS during the AM peak hour under Opening Year Cumulative (2034) With Project traffic conditions.

The intersection operations analysis worksheets for Opening Year Cumulative (2034) Without Project and With Project traffic conditions are included in Appendices 6.1 and 6.2, respectively.

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## TABLE 6-1: 2034 INTERSECTION ANALYSIS (1 OF 2)

| # | Intersection | Traffic Control[2] | 2034 Without Project Delay[1] (secs.) AM | PM | Level of Service AM | PM | 2034 With Project Delay[1] (secs.) AM | PM | Level of Service AM | PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Euclid Av. (SR-83) & SR-60 WB Ramps | TS | 21.6 | 28.2 | C | C | 25.9 | 32.5 | C | C | D |
| 2 | Euclid Av. (SR-83) & SR-60 EB Ramps | TS | 27.3 | 20.6 | C | C | 30.4 | 22.4 | C | C | D |
| 3 | Euclid Av. (SR-83) & Walnut St. | TS | 16.5 | 18.0 | B | B | 18.1 | 20.2 | B | C | D |
| 4 | Euclid Av. (SR-83) & Riverside Dr. | TS | 62.1 | 58.1 | E | E | 79.2 | 72.6 | E | E | E |
| 5 | Euclid Av. (SR-83) & Chino Av. | TS | 27.4 | 28.4 | C | C | 34.0 | 32.8 | C | C | E |
| 6 | Euclid Av. (SR-83) & Schafer Av. | TS | 36.8 | 42.8 | D | D | 47.6 | 58.3 | D | E | E |
| 7 | Euclid Av. (SR-83) & Edison Av. | TS | 35.8 | 50.4 | D | D | **85.1** | **184.6** | **F** | **F** | E |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. | TS | 26.1 | 28.6 | C | C | 32.3 | 55.9 | C | D | E |
| 9 | Euclid Av. (SR-83) & Merrill Av. | TS | 44.6 | 24.6 | D | C | 79.4 | 43.5 | E | D | E |
| 10 | Euclid Av. (SR-83) & Kimball Av. | TS | 34.8 | **61.7** | C | **E** | 45.0 | **68.0** | D | **E** | D |
| 11 | Euclid Av. (SR-83) & Pine Av. | TS | 48.7 | **90.1** | D | **F** | 52.1 | **93.1** | D | **F** | D |
| 12 | SR-71 NB Ramps & Euclid Av. (SR-83) | TS | 36.4 | 31.7 | D | C | 33.0 | 29.1 | C | C | D |
| 13 | SR-71 SB Off-Ramp & Euclid Av. (SR-83) | TS | 29.6 | 29.1 | C | C | 28.7 | 28.2 | C | C | D |
| 14 | Campus Av. & Edison Av. | CSS | Future Intersection | | | | **53.0** | **84.9** | **F** | **F** | E |
| 15 | Bon View Av. & Riverside Dr. | CSS | **67.6** | 26.7 | **F** | D | **>100** | 35.0 | **F** | D | E |
| 16 | Bon View Av. & Schaefer Av. | AWS | 10.7 | 13.3 | B | B | 11.5 | 14.5 | B | B | E |
| 17 | Bon View Av. & Edison Av. | AWS/TS | **60.0** | **>100** | **F** | **F** | 77.0 | **176.5** | E | **F** | E |
| 18 | Bon View Av. & Eucalyptus Av. | AWS | 8.4 | 8.9 | A | A | 9.8 | 10.2 | A | B | E |
| 19 | Cucamonga Av. & Edison Av. | TS | Future Intersection | | | | 6.9 | 6.0 | A | A | E |
| 20 | Grove Av. & SR-60 WB Ramps | TS | 25.7 | 20.5 | C | C | 44.8 | 44.6 | D | D | D |
| 21 | Grove Av. & SR-60 EB Ramps | TS | **59.1** | **69.2** | **E** | **E** | **106.8** | **64.2** | **F** | **E** | D |
| 22 | Grove Av. & Walnut St. | TS | 35.7 | 24.5 | D | C | 55.1 | 35.4 | E | D | E |
| 23 | Grove Av. & Riverside Dr. | TS | 55.3 | **92.9** | E | **F** | **>200** | **178.2** | **F** | **F** | E |
| 24 | Grove Av. & Chino Av. | AWS | **>100** | **90.1** | **F** | **F** | **>100** | **>100** | **F** | **F** | E |
| 25 | Grove Av. & Schaefer Av. | AWS | 20.3 | 25.5 | C | D | **>100** | **>100** | **F** | **F** | E |
| 26 | Grove Av. & Edison Av. | AWS/TS | **>100** | **>100** | **F** | **F** | **170.5** | **>200** | **F** | **F** | E |
| 27 | Grove Av. & Eucalyptus Av. | AWS | 22.1 | 28.7 | C | D | 41.6 | **61.0** | E | **F** | E |
| 28 | Parco Av. & Edison Av. | CSS | Future Intersection | | | | **>100** | **81.4** | **F** | **F** | E |
| 29 | Walker Av. & Riverside Dr. | CSS | **67.7** | **52.0** | **F** | **F** | **>100** | **91.0** | **F** | **F** | E |
| 30 | Walker Av. & Schaefer Av. | AWS | 11.5 | 10.6 | B | B | 12.7 | 11.5 | B | B | E |
| 31 | Walker Av. & Edison Av. | AWS/TS | **67.4** | **>100** | **F** | **F** | **193.3** | **>200.0** | **F** | **F** | E |

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## TABLE 6-1: 2034 INTERSECTION ANALYSIS (2 OF 2)

| # | Intersection | Traffic Control[2] | 2034 Without Project Delay[1] (secs.) AM | 2034 Without Project Delay[1] (secs.) PM | 2034 Without Project Level of Service AM | 2034 Without Project Level of Service PM | 2034 With Project Delay[1] (secs.) AM | 2034 With Project Delay[1] (secs.) PM | 2034 With Project Level of Service AM | 2034 With Project Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Walker Av. & Eucalyptus Av. | CSS | 18.4 | 18.7 | C | C | 21.2 | 21.8 | C | C | E |
| 33 | Archibald Av. & SR-60 WB Ramps | TS | 23.4 | 28.3 | C | C | 21.7 | 29.5 | C | C | D |
| 34 | Archibald Av. & SR-60 EB Ramps | TS | 14.0 | 20.5 | B | C | 13.9 | 20.1 | B | C | D |
| 35 | Archibald Av. & Riverside Dr. | TS | 35.2 | 42.6 | D | D | 40.6 | 48.6 | D | D | E |
| 36 | Archibald Av. & Chino Av. | TS | 28.5 | 27.1 | C | C | 31.7 | 32.9 | C | C | E |
| 37 | Archibald Av. & Schaefer Av. | TS | 12.0 | 9.3 | B | A | 12.0 | 9.3 | B | A | E |
| 38 | Archibald Av. & Edison Av./Ontario Ranch Rd. | TS | 36.6 | 32.9 | D | C | 75.8 | 78.2 | E | E | E |
| 39 | Archibald Av. & Merrill Av. | TS | 19.3 | 21.7 | B | C | 20.2 | 22.5 | C | C | E |
| 40 | Archibald Av. & Limonite Av. | TS | 22.7 | 39.7 | C | D | 24.0 | 44.3 | C | D | D |
| 41 | Turner Av. & Ontario Ranch Rd. | TS | 15.4 | 14.1 | B | B | 18.4 | 16.4 | B | B | E |
| 42 | Haven Av. & Ontario Ranch Rd. | TS | 31.8 | 31.0 | C | C | 37.2 | 40.7 | D | D | E |
| 43 | Hamner Av. & Ontario Ranch Rd. | TS | 20.6 | **68.3** | C | **E** | 24.4 | **106.8** | C | **F** | D |
| 44 | I-15 SB Ramps & Ontario Ranch Rd. | TS | 21.4 | 26.1 | C | C | 18.9 | 27.4 | B | C | D |
| 45 | I-15 NB Ramps & Ontario Ranch Rd. | TS | 22.4 | 25.2 | C | C | 25.9 | 35.4 | C | C | D |

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

2 TS = Traffic Signal; AWS = All-way Stop; CSS = Cross-street Stop; Underline = Improvement

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## 6.4 Traffic Signal Warrants Analysis

The traffic signal warrant analysis for Opening Year Cumulative (2034) traffic conditions are based on the peak hour volumes or planning level ADT volume-based traffic signal warrants. There are no additional unsignalized study area intersections anticipated to meet a traffic signal warrant under Opening Year Cumulative (2034) Without Project conditions, in addition to the intersections identified under Existing and E+P traffic conditions (see Appendix 6.3). The following unsignalized study area intersection is anticipated to meet a traffic signal warrant under Opening Year Cumulative (2034) With Project conditions (see Appendix 6.4):

- Walker Avenue & Eucalyptus Avenue (#32)

## 6.5 Roadway Segment Analysis

Table 6-2 provides a summary of the Opening Year Cumulative (2034) roadway segment capacity analysis. As shown in Table 6-2, the roadway segment is anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2034) traffic conditions, based on the daily roadway capacity thresholds and minimum LOS criteria.

### Table 6-2: 2034 Roadway Segment Analysis

| # | Roadway | Segment Limits | Jurisdiction | Roadway Section | LOS Capacity[1] | Without Project | | | With Project | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2034 | V/C[2] | LOS[3] | 2034 | V/C[2] | LOS[3] |
| 1 | Edison Av. | Euclid Av. to Campus Av. | Ontario | 2U | 16,000 | **20,876** | **1.305** | **F** | **31,610** | **1.976** | **F** |

**BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).
[1] These maximum roadway capacities are based on the applicable agency's thresholds.
[2] V/C = Volume to Capacity Ratio
[3] LOS = Level of Service

## 6.6 Off-Ramp Queuing Analysis

Queuing analysis findings for Opening Year Cumulative (2034) traffic conditions are presented in Table 6-3. As shown in Table 6-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95$^{th}$ percentile traffic flows. Worksheets for Opening Year Cumulative (2034) Without Project and With Project traffic conditions queuing analysis are provided in Appendices 6.4 and 6.5, respectively.

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## TABLE 6-3: 2034 PEAK HOUR OFF-RAMP QUEUING ANALYSIS

| # | Intersection | Movement | Available Stacking Distance (Feet) | 2034 Without Project | | | | 2034 With Project | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 95th Percentile Queue (Feet) | | Acceptable? [1] | | 95th Percentile Queue (Feet) | | Acceptable? [1] | |
| | | | | AM Peak | PM Peak | AM | PM | AM Peak | PM Peak | AM | PM |
| 1 | Euclid Av. & SR-60 WB Ramps | WBL | 350 | 303 [2] | 286 [2] | Yes | Yes | 303 [2] | 286 [2] | Yes | Yes |
| | | WBL/T/R | 1,415 | 165 | 213 | Yes | Yes | 175 | 213 | Yes | Yes |
| | | WBR | 350 | 154 | 152 | Yes | Yes | 164 | 157 | Yes | Yes |
| 2 | Euclid Av. & SR-60 EB Ramps | EBL | 900 | 373 [2] | 251 [2] | Yes | Yes | 373 [2] | 251 [2] | Yes | Yes |
| | | EBL/R | 1,290 | 92 | 99 | Yes | Yes | 162 | 212 [2] | Yes | Yes |
| 12 | SR-71 NB Ramps & Euclid Av. | NBL | 1,475 | 34 | 50 | Yes | Yes | 34 | 51 | Yes | Yes |
| | | NBR | 425 | 173 [2] | 618 [2,3] | Yes | Yes | 416 [2] | 938 [2,3] | Yes | Yes |
| 13 | Euclid Av. & SR-71 SB Off-Ramp | SBL | 1,100 | 291 | 308 | Yes | Yes | 291 | 308 | Yes | Yes |
| | | SBL/T | 1,550 | 251 | 307 | Yes | Yes | 251 | 307 | Yes | Yes |
| | | SBR | 360 | 0 | 0 | Yes | Yes | 0 | 0 | Yes | Yes |
| 20 | Grove Av. & SR-60 WB Ramps | WBL/T | 1,360 | 148 | 158 | Yes | Yes | 313 [2] | 425 [2] | Yes | Yes |
| | | WBR | 225 | 414 [2,3] | 59 | Yes | Yes | 414 [2,3] | 59 | Yes | Yes |
| 21 | Grove Av. & SR-60 EB Ramps | EBL/T | 1,365 | 435 [2] | 217 | Yes | Yes | 435 [2] | 217 | Yes | Yes |
| | | EBR | 310 | 40 | 62 | Yes | Yes | 117 | 288 [2] | Yes | Yes |
| 33 | Archibald Av. & SR-60 WB Ramps | WBL | 360 | 273 [2] | 188 | Yes | Yes | 314 [2] | 269 [2] | Yes | Yes |
| | | WBL/T/R | 1,410 | 174 [2] | 192 | Yes | Yes | 272 [2] | 278 [2] | Yes | Yes |
| | | WBR | 1,410 | 115 | 54 | Yes | Yes | 146 | 54 | Yes | Yes |
| 34 | Archibald Av. & SR-60 EB Ramps | EBL | 325 | 191 | 147 | Yes | Yes | 191 | 147 | Yes | Yes |
| | | EBL/T/R | 1,530 | 118 | 198 | Yes | Yes | 118 | 238 [2] | Yes | Yes |
| | | EBR | 1,530 | 55 | 182 | Yes | Yes | 55 | 182 | Yes | Yes |
| 44 | I-15 SB Ramps & Cantu Galleano Ranch Rd. | SBL | 1,435 | 152 | 148 | Yes | Yes | 142 | 148 | Yes | Yes |
| | | SBL/R | 550 | 323 | 740 [2,3] | Yes | Yes | 372 | 744 [2,3] | Yes | Yes |
| | | SBR | 455 | 317 | 744 [2,3] | Yes | Yes | 366 | 748 [2,3] | Yes | Yes |
| 45 | I-15 NB Ramps & Cantu Galleano Ranch Rd. | NBL | 1,615 | 196 | 269 | Yes | Yes | 317 [2] | 358 | Yes | Yes |
| | | NBL/R | 585 | 60 | 44 | Yes | Yes | 67 | 41 | Yes | Yes |

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the Freeway mainline.

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## 6.7 Project Deficiencies and Recommended Improvements

Improvements needed to achieve acceptable LOS have been identified at intersections or off-ramps that are anticipated to operate at a deficient LOS under Opening Year Cumulative (2034) traffic conditions.

### 6.7.1 Improvements To Address Deficiencies At Intersections

Improvement strategies have been recommended at intersections that have been identified as deficient under Opening Year Cumulative (2034) With Project traffic conditions in an effort to achieve an acceptable LOS. The effectiveness of the recommended improvement strategies to address Opening Year Cumulative (2034) With Project traffic deficiencies is presented in Table 6-4. Worksheets for Opening Year Cumulative (2034) With Project traffic conditions, with improvements, HCM calculation worksheets are provided in Appendix 6.7.

### 6.7.2 Improvements To Address Deficiencies along Roadway Segments

As shown in Table 6-2, Edison Avenue, between Euclid Avenue and Campus Avenue, is anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2034) traffic conditions. The roadway segment improvements are summarized in Table 6-5. While the roadway segment is anticipated to continue to operate at an unacceptable LOS with the roadway segment improvements, additional roadway widening has not been recommended as the operations analysis indicates that additional through lanes are not needed in order to process peak hour volumes at the intersections.

### 6.7.3 Improvements To Address Deficiencies On Off-Ramp Queues

As shown previously in Table 6-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95$^{th}$ percentile traffic flows for Opening Year Cumulative (2034) traffic conditions. As such, no improvements have been identified.

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## TABLE 6-4: 2034 INTERSECTION ANALYSIS WITH IMPROVEMENTS (1 OF 3)

| # | Intersection | Traffic Control[3] | Intersection Approach Lanes[1] Northbound L | Northbound T | Northbound R | Southbound L | Southbound T | Southbound R | Eastbound L | Eastbound T | Eastbound R | Westbound L | Westbound T | Westbound R | Delay[2] (secs.) AM | Delay[2] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7 | Euclid Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 85.1 | **184.6** | F | **F** | E |
| | With Improvements: | TS | 2 | **3** | 1 | **2** | **3** | 1 | 1 | 1 | 1 | 1 | 1 | **1** | 28.3 | 62.2 | C | E | |
| 10 | Euclid Av. & Kimball Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 45.0 | **68.0** | D | **E** | D |
| | With Improvements: | **TS** | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 43.9 | 47.9 | D | D | |
| 11 | Euclid Av. & Pine Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 52.1 | **93.1** | D | **F** | D |
| | With Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 0 | 1 | **2** | 1 | 2 | 1 | 0 | 42.7 | 40.7 | D | D | |
| 14 | Campus Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **53.0** | **84.9** | **F** | **F** | E |
| | With Improvements: | CSS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | **2** | 0 | 0 | **2** | 0 | 31.4 | 45.6 | D | E | |
| 15 | Bon View Av. & Riverside Dr. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | **>100** | 35.0 | **F** | D | E |
| | With Improvements: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 9.7 | 9.5 | A | A | |
| 17 | Bon View Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 | 77.0 | **176.5** | E | **F** | E |
| | With Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | **3** | **0** | 1 | 2 | 0 | 63.7 | 75.1 | E | E | |
| 21 | Grove Av. & SR-60 EB Ramps | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 0 | 2 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | **106.8** | 64.2 | **F** | E | D |
| | With Improvements: | TS | 0 | 2 | **1** | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 49.5 | 54.8 | D | D | |

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## TABLE 6-4: 2034 INTERSECTION ANALYSIS WITH IMPROVEMENTS (2 OF 3)

| # | Intersection | Traffic Control[3] | Intersection Approach Lanes[1] Northbound L | Northbound T | Northbound R | Southbound L | Southbound T | Southbound R | Eastbound L | Eastbound T | Eastbound R | Westbound L | Westbound T | Westbound R | Delay[2] (secs.) AM | Delay[2] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | Grove Av. & Riverside Dr. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | **>200** | **178.2** | **F** | **F** | E |
| | With Improvements: | TS | 1 | 2 | 0 | 1 | **2** | **0** | 1 | 1 | 0 | 1 | 2 | 0 | 45.0 | 47.8 | D | D | |
| 24 | Grove Av. & Chino Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | 29.2 | 17.9 | C | B | |
| 25 | Grove Av. & Schaefer Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 11.4 | 23.0 | B | C | |
| 26 | Grove Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | **170.5** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | **3** | 1 | 1 | **3** | 1 | 73.9 | 71.3 | E | E | |
| 27 | Grove Av. & Eucalyptus Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 41.6 | **61.0** | E | **F** | E |
| | With Improvements: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 17.5 | 17.1 | B | B | |
| 28 | Parco Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | **>100** | **81.4** | **F** | **F** | E |
| | With Improvements: | **TS** | 0 | 0 | 0 | 0 | 1 | 0 | **1** | 2 | 0 | 0 | 1 | 0 | 4.7 | 4.2 | A | A | |

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## TABLE 6-4: 2034 INTERSECTION ANALYSIS WITH IMPROVEMENTS (3 OF 3)

| # | Intersection | Traffic Control[3] | Intersection Approach Lanes[1] Northbound L | Northbound T | Northbound R | Southbound L | Southbound T | Southbound R | Eastbound L | Eastbound T | Eastbound R | Westbound L | Westbound T | Westbound R | Delay[2] (secs.) AM | Delay[2] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | Walker Av. & Riverside Av. | - | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | **>100** | **91.0** | **F** | **F** | E |
| | With Improvements: | **TS** | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 10.2 | 8.6 | B | A | |
| 31 | Walker Av. & Edison Av. | - | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | **193.3** | **>200.0** | **F** | **F** | E |
| | With Improvements: | TS | 0 | 1 | 0 | 0 | 1 | 0 | 1 | **2** | **0** | 1 | **2** | 0 | 44.0 | 54.2 | D | D | |
| 43 | Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 24.4 | **106.8** | C | **F** | D |
| | With Improvements: | TS | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 3 | 1 | 2 | **3** | **0** | 23.0 | 51.7 | C | D | |

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement

2 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

3 CSS = Cross-Street Stop; AWS = All-Way Stop; TS = Traffic Signal; **TS** = Improvement

## TABLE 6-5: 2034 ROADWAY SEGMENT ANALYSIS WITH IMPROVEMENTS

| # | Roadway | Segment Limits | Jurisdiction | Roadway Section | LOS Capacity[1] | Without Project 2034 | Without Project V/C[2] | Without Project LOS[3] | With Project 2034 | With Project V/C[2] | With Project LOS[3] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Edison Av. | Euclid Av. to Campus Av. | Ontario | 4U | 30,000 | 20,876 | 0.696 | B | **31,610** | **1.054** | **F** |

Underline = Improvement

**BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] These maximum roadway capacities are based on the applicable agency's thresholds.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

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# 7 HORIZON YEAR (2050) TRAFFIC CONDITIONS

This section discusses the methods used to develop Horizon Year (2050) Without and With Project traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

## 7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Horizon Year (2050) conditions are consistent with those shown previously in Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Horizon Year conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- If applicable, driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Horizon Year conditions only.

The Specific Plan proposes to eliminate the future extensions of Cucamonga Avenue and Parco/Comet Avenue south of Edison Avenue. Since these roadways are not classified as collector or higher in the City of Ontario General Plan, they were not included in the Horizon Year (2050) Without or With Project traffic volume forecasts. However, their removal, as reflected in this TA, will likely increase traffic demand on nearby roadways such as Bon View Avenue, Grove Avenue, and Walker Avenue, as vehicles adjust their travel patterns to utilize existing higher-classified roadways.

## 7.2 WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the SBTAM (see Section 4.7 *Horizon Year (2050) Volume Development* for a detailed discussion on the post-processing methodology). The weekday AM and PM peak hour volumes which can be expected for Horizon Year (2050) Without Project traffic conditions are shown in Exhibit 7-1.

## 7.3 WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the SBTAM. The weekday AM and PM peak hour volumes which can be expected for Horizon Year (2050) With Project traffic conditions are shown in Exhibit 7-2.

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# EXHIBIT 7-1 : HORIZON YEAR (2050) WITHOUT PROJECT TRAFFIC VOLUMES

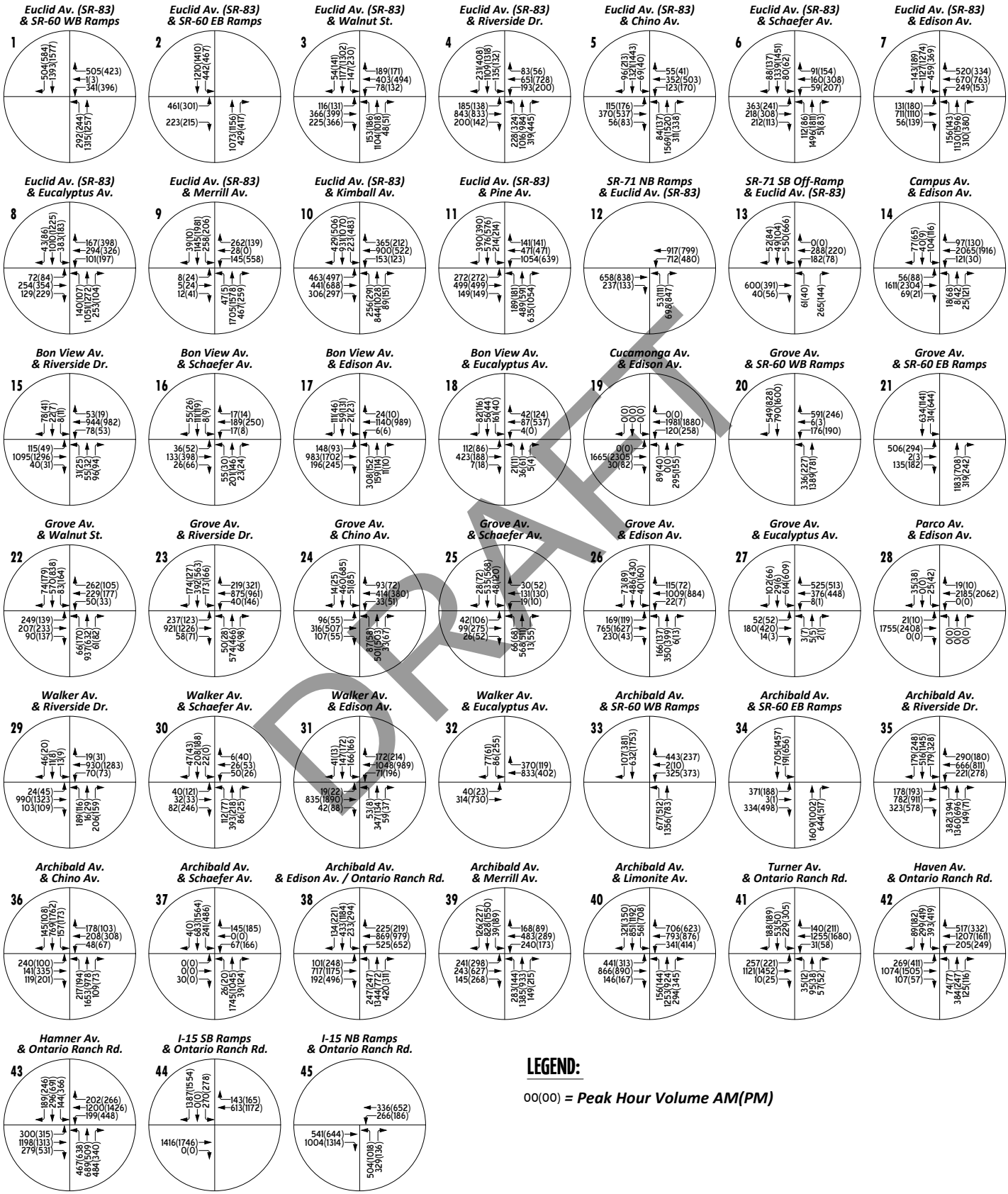


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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# Exhibit 7-2: Horizon Year (2050) With Project Volumes

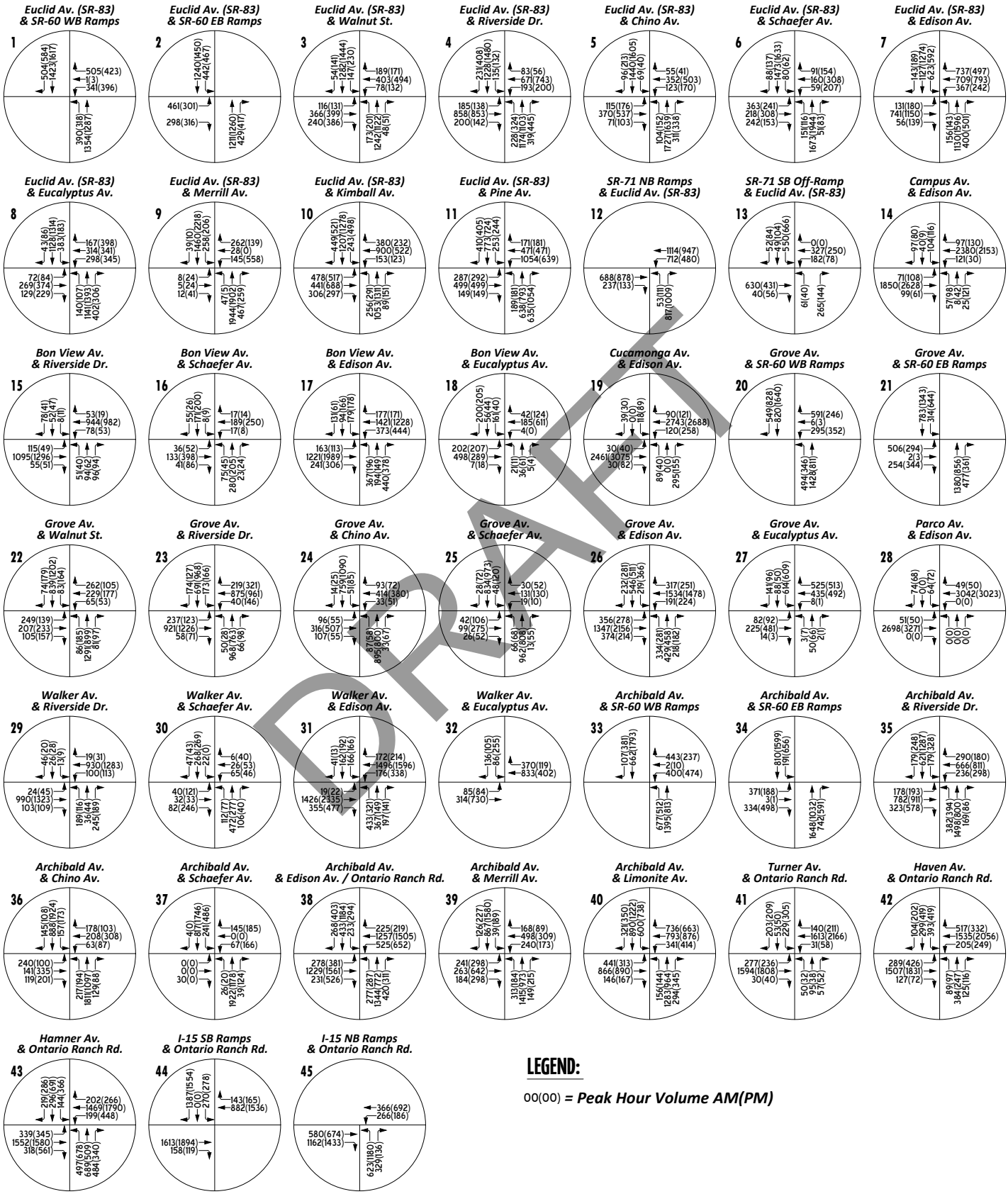


**LEGEND:**

00(00) = ***Peak Hour Volume AM(PM)***

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## 7.4 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year (2050) Without Project conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, the following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours Without Project:

- Euclid Avenue (SR-83) & Riverside Drive (#4) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Chino Avenue (#5) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Schaefer Avenue (#6) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Edison Avenue (#7) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Eucalyptus Avenue (#8) – LOS F PM peak hour only
- Euclid Avenue (SR-83) & Merrill Avenue (#9) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Kimball Avenue (#10) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Pine Avenue (#11) – LOS F AM and PM peak hours
- Campus Avenue & Edison Avenue (#14) – LOS F AM and PM peak hours
- Bon View Avenue & Riverside Drive (#15) – LOS F AM and PM peak hours
- Bon View Avenue & Eucalyptus Avenue (#18) – LOS F PM peak hour only
- Grove Avenue & SR-60 Eastbound Ramps (#21) – LOS F AM and PM peak hours
- Grove Avenue & Riverside Drive (#23) – LOS F AM and PM peak hours
- Grove Avenue & Chino Avenue (#24) – LOS F AM and PM peak hours
- Grove Avenue & Schaefer Avenue (#25) – LOS F AM and PM peak hours
- Grove Avenue & Eucalyptus Avenue (#27) – LOS F AM and PM peak hours
- Parco Avenue & Edison Avenue (#28) – LOS F AM and PM peak hours
- Walker Avenue & Riverside Drive (#29) – LOS F AM and PM peak hours
- Walker Avenue & Edison Avenue (#31) – LOS F AM peak hour, LOS E PM peak hour
- Walker Avenue & Eucalyptus Avenue (#32) – LOS F PM peak hour only
- Archibald Avenue & Chino Avenue (#36) – LOS F PM peak hour only
- Archibald Avenue & Edison Avenue/Ontario Ranch Road (#38) – LOS F AM and PM peak hours
- Archibald Avenue & Limonite Avenue (#40) – LOS F AM and PM peak hours
- Haven Avenue & Ontario Ranch Road (#42) – LOS F PM peak hour only
- Hamner Avenue & Ontario Ranch Road (#43) – LOS F AM and PM peak hours

The following study area intersections are anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic under Horizon Year (2050) With Project traffic conditions, in addition to the intersections identified above:

- Bon View Avenue & Schaefer Avenue (#16) – LOS F PM peak hour only
- Bon View Avenue & Edison Avenue (#17) – LOS F AM and PM peak hours
- Grove Avenue & SR-60 Westbound Ramps (#20) – LOS E PM peak hour only
- Grove Avenue & Edison Avenue (#26) – LOS F AM and PM peak hours
- Walker Avenue & Schaefer Avenue (#30) – LOS F AM peak hour only
- Turner Avenue & Ontario Ranch Road (#41) – LOS F PM peak hour only

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## TABLE 7-1: HORIZON YEAR (2050) INTERSECTION ANALYSIS (1 OF 2)

| # | Intersection | Traffic Control[2] | 2050 Without Project | | | | 2050 With Project | | | | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Delay[1] (secs.) | | Level of Service | | Delay[1] (secs.) | | Level of Service | | |
| | | | AM | PM | AM | PM | AM | PM | AM | PM | |
| 1 | Euclid Av. (SR-83) & SR-60 WB Ramps | TS | 31.8 | 45.5 | C | D | 52.1 | 49.4 | D | D | D |
| 2 | Euclid Av. (SR-83) & SR-60 EB Ramps | TS | 48.9 | 25.4 | D | C | 53.1 | 34.6 | D | C | D |
| 3 | Euclid Av. (SR-83) & Walnut St. | TS | 21.4 | 31.5 | C | C | 22.7 | 35.3 | C | D | D |
| 4 | Euclid Av. (SR-83) & Riverside Dr. | TS | **193.4** | **179.1** | **F** | **F** | **>200** | **>200** | **F** | **F** | E |
| 5 | Euclid Av. (SR-83) & Chino Av. | TS | **112.4** | **187.2** | **F** | **F** | **140.3** | **198.8** | **F** | **F** | E |
| 6 | Euclid Av. (SR-83) & Schafer Av. | TS | **140.9** | **>200** | **F** | **F** | **180.8** | **>200** | **F** | **F** | E |
| 7 | Euclid Av. (SR-83) & Edison Av. | TS | **>200** | **>200** | **F** | **F** | **>200** | **>200** | **F** | **F** | E |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. | TS | 64.1 | **87.9** | E | **F** | **81.9** | **119.7** | **F** | **F** | E |
| 9 | Euclid Av. (SR-83) & Merrill Av. | TS | **143.6** | **132.2** | **F** | **F** | **195.5** | **195.9** | **F** | **F** | E |
| 10 | Euclid Av. (SR-83) & Kimball Av. | TS | **90.8** | **122.6** | **F** | **F** | **120.8** | **159.8** | **F** | **F** | D |
| 11 | Euclid Av. (SR-83) & Pine Av. | TS | **185.3** | **165.3** | **F** | **F** | **>200** | **195.0** | **F** | **F** | D |
| 12 | SR-71 NB Ramps & Euclid Av. (SR-83) | TS | 37.7 | 32.5 | D | D | 34.8 | 30.2 | C | C | D |
| 13 | SR-71 SB Off-Ramp & Euclid Av. (SR-83) | TS | 29.5 | 28.9 | C | C | 28.6 | 28.0 | C | C | D |
| 14 | Campus Av. & Edison Av. | CSS | **>100** | **>100** | **F** | **F** | **>100** | **>100** | **F** | **F** | E |
| 15 | Bon View Av. & Riverside Dr. | CSS | **>100** | **>100** | **F** | **F** | **>100** | **>100** | **F** | **F** | E |
| 16 | Bon View Av. & Schaefer Av. | AWS | 12.3 | 26.2 | B | D | 16.9 | **50.9** | C | **F** | E |
| 17 | Bon View Av. & Edison Av. | TS | 41.2 | 58.7 | D | E | **161.3** | **>200** | **F** | **F** | E |
| 18 | Bon View Av. & Eucalyptus Av. | AWS | 32.6 | **91.6** | D | **F** | **>100** | **>100** | **F** | **F** | E |
| 19 | Cucamonga Av. & Edison Av. | TS | Future Intersection | | | | 39.5 | 64.8 | D | E | E |
| 20 | Grove Av. & SR-60 WB Ramps | TS | 34.1 | 22.6 | C | C | 47.4 | **66.0** | D | **E** | D |
| 21 | Grove Av. & SR-60 EB Ramps | TS | **83.8** | **100.3** | **F** | **F** | **139.6** | **90.9** | **F** | **F** | D |
| 22 | Grove Av. & Walnut St. | TS | 53.3 | 34.2 | D | C | 75.3 | 45.2 | E | D | E |
| 23 | Grove Av. & Riverside Dr. | TS | **186.3** | **>200** | **F** | **F** | **>200** | **>200** | **F** | **F** | E |
| 24 | Grove Av. & Chino Av. | AWS | **>100** | **>100** | **F** | **F** | **>100** | **>100** | **F** | **F** | E |
| 25 | Grove Av. & Schaefer Av. | AWS | **>100** | **>100** | **F** | **F** | **>100** | **>100** | **F** | **F** | E |
| 26 | Grove Av. & Edison Av. | TS | 66.4 | 73.1 | E | E | **>200** | **>200** | **F** | **F** | E |
| 27 | Grove Av. & Eucalyptus Av. | AWS | **>100** | **>100** | **F** | **F** | **>100** | **>100** | **F** | **F** | E |
| 28 | Parco Av. & Edison Av. | CSS | **>100** | **>100** | **F** | **F** | **>100** | **>100** | **F** | **F** | E |
| 29 | Walker Av. & Riverside Dr. | CSS | **>100** | **>100** | **F** | **F** | **>100** | **>100** | **F** | **F** | E |
| 30 | Walker Av. & Schaefer Av. | AWS | 30.2 | 19.6 | D | C | **66.8** | **38.6** | **F** | **E** | E |
| 31 | Walker Av. & Edison Av. | TS | **>200** | **>200** | **F** | **F** | **>200** | **>200** | **F** | **F** | E |

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## TABLE 7-1: HORIZON YEAR (2050) INTERSECTION ANALYSIS (2 OF 2)

| # | Intersection | Traffic Control[2] | 2050 Without Project Delay[1] (secs.) AM | 2050 Without Project Delay[1] (secs.) PM | 2050 Without Project Level of Service AM | 2050 Without Project Level of Service PM | 2050 With Project Delay[1] (secs.) AM | 2050 With Project Delay[1] (secs.) PM | 2050 With Project Level of Service AM | 2050 With Project Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Walker Av. & Eucalyptus Av. | CSS | 44.8 | **>100** | E | **F** | **91.7** | **>100** | **F** | **F** | E |
| 33 | Archibald Av. & SR-60 WB Ramps | TS | 28.5 | 26.0 | C | C | 29.7 | 27.4 | C | C | D |
| 34 | Archibald Av. & SR-60 EB Ramps | TS | 17.8 | 29.2 | B | C | 17.6 | 28.4 | B | C | D |
| 35 | Archibald Av. & Riverside Dr. | TS | 64.1 | 71.4 | E | E | 70.4 | 79.6 | E | E | E |
| 36 | Archibald Av. & Chino Av. | TS | 61.0 | **140.1** | E | **F** | 75.7 | **167.1** | E | **F** | E |
| 37 | Archibald Av. & Schaefer Av. | TS | 23.5 | 21.5 | C | C | 25.7 | 23.6 | C | C | E |
| 38 | Archibald Av. & Edison Av./Ontario Ranch Rd. | TS | **179.9** | **190.6** | **F** | **F** | **>200** | **>200** | **F** | **F** | E |
| 39 | Archibald Av. & Merrill Av. | TS | 37.3 | 55.1 | D | E | 43.6 | 61.3 | D | E | E |
| 40 | Archibald Av. & Limonite Av. | TS | **170.8** | **148.6** | **F** | **F** | **172.1** | **152.1** | **F** | **F** | D |
| 41 | Turner Av. & Ontario Ranch Rd. | TS | 65.7 | 65.5 | E | E | 78.7 | **100.6** | E | **F** | E |
| 42 | Haven Av. & Ontario Ranch Rd. | TS | 76.0 | **86.9** | E | **F** | **81.1** | **108.2** | **F** | **F** | E |
| 43 | Hamner Av. & Ontario Ranch Rd. | TS | **80.1** | **198.4** | **F** | **F** | **100.9** | **>200** | **F** | **F** | D |
| 44 | I-15 SB Ramps & Ontario Ranch Rd. | TS | 25.2 | 34.3 | C | C | 24.4 | 52.4 | C | D | D |
| 45 | I-15 NB Ramps & Ontario Ranch Rd. | TS | 28.1 | 38.9 | C | D | 46.7 | 54.9 | D | D | D |

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

2 TS = Traffic Signal; AWS = All-way Stop; CSS = Cross-street Stop; Underline = Improvement

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As shown in Table 7-1, the following study area intersections are anticipated to operate at an unacceptable LOS (LOS F) during the AM peak hour under Horizon Year (2050) With Project traffic conditions, in addition to the PM peak hour deficiency identified under Without Project traffic conditions:

- Euclid Avenue (SR-83) & Eucalyptus Avenue (#8)
- Bon View Avenue & Eucalyptus Avenue (#18)
- Walker Avenue & Eucalyptus Avenue (#32)
- Haven Avenue & Ontario Ranch Road (#42)

The intersection operations analysis worksheets for Horizon Year (2050) Without Project and With Project traffic conditions are included in Appendices 7.1 and 7.2, respectively.

## 7.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

The traffic signal warrant analysis for Horizon Year (2050) Without Project traffic conditions are based on the peak hour volumes or planning level ADT volume-based traffic signal warrants. The following unsignalized study area intersections are anticipated to meet a traffic signal warrant under Horizon Year (2050) Without Project conditions (see Appendix 7.3):

- Bon View Avenue & Schaefer Avenue (#16)
- Bon View Avenue & Eucalyptus Avenue (#18)

All unsignalized study area intersections are anticipated to meet a traffic signal warrant under scenarios prior to Horizon Year (2050) With Project traffic conditions. As such, traffic signal warrants have not been evaluated for Horizon Year (2050) With Project traffic conditions.

## 7.6 ROADWAY SEGMENT ANALYSIS

Table 7-2 provides a summary of the Horizon Year (2050) roadway segment capacity analysis. As shown in Table 7-2, the roadway segment is anticipated to operate at an unacceptable LOS under Horizon Year (2050) traffic conditions, based on the daily roadway capacity thresholds and minimum LOS criteria.

### TABLE 7-2: HORIZON YEAR (2050) ROADWAY SEGMENT ANALYSIS

| # | Roadway | Segment Limits | Jurisdiction | Roadway Section | LOS Capacity[1] | Without Project | | | With Project | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2050 | V/C[2] | LOS[3] | 2050 | V/C[2] | LOS[3] |
| 1 | Edison Av. | Euclid Av. to Campus Av. | Ontario | 2U | 16,000 | 53,386 | 3.337 | **F** | 61,880 | 3.868 | **F** |

**BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] These maximum roadway capacities are based on the applicable agency's thresholds.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

## 7.7 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Horizon Year (2050) traffic conditions are presented in Table 7-3. As shown in Table 7-3, no movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95$^{th}$ percentile traffic flows. Worksheets for Horizon Year (2050) Without Project and With Project traffic conditions queuing analysis are provided in Appendices 7.5 and 7.6, respectively.

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## TABLE 7-3: HORIZON YEAR (2050) PEAK HOUR OFF-RAMP QUEUING ANALYSIS

| # | Intersection | Movement | Available Stacking Distance (Feet) | 2050 Without Project | | | | 2050 With Project | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 95th Percentile Queue (Feet) | | Acceptable? [1] | | 95th Percentile Queue (Feet) | | Acceptable? [1] | |
| | | | | AM Peak | PM Peak | AM | PM | AM Peak | PM Peak | AM | PM |
| 1 | Euclid Av. & SR-60 WB Ramps | WBL | 350 | 327 [2] | 303 [2] | Yes | Yes | 327 [2] | 358 [2,3] | Yes | Yes |
| | | WBL/T/R | 1,415 | 284 [2] | 257 [2] | Yes | Yes | 289 [2] | 296 [2] | Yes | Yes |
| | | WBR | 350 | 200 | 187 | Yes | Yes | 200 | 235 [2] | Yes | Yes |
| 2 | Euclid Av. & SR-60 EB Ramps | EBL | 900 | 499 [2] | 295 [2] | Yes | Yes | 499 [2] | 295 [2] | Yes | Yes |
| | | EBL/R | 1,290 | 134 | 130 | Yes | Yes | 198 | 245 [2] | Yes | Yes |
| 12 | SR-71 NB Ramps & Euclid Av. | NBL | 1,475 | 36 | 52 | Yes | Yes | 36 | 52 | Yes | Yes |
| | | NBR | 425 | 349 [2] | 680 [2,3] | Yes | Yes | 542 [2,3] | 935 [2,3] | Yes | Yes |
| 13 | Euclid Av. & SR-71 SB Off-Ramp | SBL | 1,100 | 313 [2] | 331 | Yes | Yes | 313 [2] | 331 | Yes | Yes |
| | | SBL/T | 1,550 | 265 | 331 | Yes | Yes | 265 | 331 | Yes | Yes |
| | | SBR | 360 | 0 | 7 | Yes | Yes | 0 | 7 | Yes | Yes |
| 20 | Grove Av. & SR-60 WB Ramps | WBL/T | 1,360 | 155 | 167 | Yes | Yes | 258 | 374 [2] | Yes | Yes |
| | | WBR | 225 | 628 [2,3] | 75 | Yes | Yes | 628 [2,3] | 83 | Yes | Yes |
| 21 | Grove Av. & SR-60 EB Ramps | EBL/T | 1,365 | 508 [2] | 231 | Yes | Yes | 508 [2] | 231 | Yes | Yes |
| | | EBR | 310 | 41 | 95 | Yes | Yes | 113 | 227 | Yes | Yes |
| 33 | Archibald Av. & SR-60 WB Ramps | WBL | 360 | 328 [2] | 207 | Yes | Yes | 368 [2,3] | 282 [2] | Yes | Yes |
| | | WBL/T/R | 1,410 | 269 [2] | 207 | Yes | Yes | 319 [2] | 284 [2] | Yes | Yes |
| | | WBR | 1,410 | 202 [2] | 64 | Yes | Yes | 236 [2] | 88 | Yes | Yes |
| 34 | Archibald Av. & SR-60 EB Ramps | EBL | 325 | 231 [2] | 165 | Yes | Yes | 231 [2] | 165 | Yes | Yes |
| | | EBL/T/R | 1,530 | 204 | 275 [2] | Yes | Yes | 204 | 286 [2] | Yes | Yes |
| | | EBR | 1,530 | 60 | 193 | Yes | Yes | 85 | 193 | Yes | Yes |
| 44 | I-15 SB Ramps & Cantu Galleano Ranch Rd. | SBL | 1,435 | 145 | 158 | Yes | Yes | 145 | 186 | Yes | Yes |
| | | SBL/R | 550 | 570 [3] | 718 [3] | Yes | Yes | 614 [3] | 746 [2,3] | Yes | Yes |
| | | SBR | 455 | 577 [3] | 731 [2,3] | Yes | Yes | 622 [3] | 775 [2,3] | Yes | Yes |
| 45 | I-15 NB Ramps & Cantu Galleano Ranch Rd. | NBL | 1,615 | 331 [2] | 556 [2] | Yes | Yes | 408 [2] | 702 [2] | Yes | Yes |
| | | NBL/R | 585 | 74 | 47 | Yes | Yes | 79 | 57 | Yes | Yes |

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

[2] 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the freeway mainline.

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## 7.8 Project Deficiencies and Recommended Improvements

Improvements needed to achieve acceptable LOS have been identified at intersections or off-ramps that are anticipated to operate at a deficient LOS under Horizon Year (2050) traffic conditions.

### 7.8.1 Improvements To Address Deficiencies At Intersections

Improvement strategies have been recommended at intersections that have been identified as deficient under Horizon Year (2050) traffic conditions in an effort to achieve an acceptable LOS. The effectiveness of the recommended improvement strategies to address Horizon Year (2050) traffic deficiencies are presented in Table 7-4. Worksheets for Horizon Year (2050) Without Project and With Project traffic conditions, with improvements, HCM calculation worksheets are provided in Appendices 7.7 and 7.8, respectively.

### 7.8.2 Improvements To Address Deficiencies along Roadway Segments

As shown in Table 7-2, Edison Avenue, between Euclid Avenue and Campus Avenue, is anticipated to operate at an unacceptable LOS under Horizon Year (2050) traffic conditions. The roadway segment improvements are summarized in Table 7-5. While the roadway segment is anticipated to continue to operate at an unacceptable LOS with the roadway segment improvements, additional roadway widening has not been recommended as the operations analysis indicates that additional through lanes are not needed in order to process peak hour volumes at the intersections.

### 7.8.3 Improvements To Address Deficiencies On Off-Ramp Queues

As shown previously in Table 7-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95$^{th}$ percentile traffic flows for Horizon Year (2050) conditions. As such, no improvements have been identified.

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## TABLE 7-4: HORIZON YEAR (2050) INTERSECTION ANALYSIS WITH IMPROVEMENTS (1 OF 4)

| # | Intersection | Traffic Control[3] | Intersection Approach Lanes[1] Northbound L | Northbound T | Northbound R | Southbound L | Southbound T | Southbound R | Eastbound L | Eastbound T | Eastbound R | Westbound L | Westbound T | Westbound R | Delay[2] (secs.) AM | Delay[2] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Euclid Av. & Riverside Dr. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | **>200** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | **2** | **3** | **0** | **2** | **3** | **0** | 1 | **2** | 0 | 1 | 2 | 0 | 54.9 | 51.0 | D | D | |
| 5 | Euclid Av. & Chino Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | **140.3** | **198.8** | **F** | **F** | E |
| | With Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | **1** | 1 | 0 | 50.1 | 42.7 | D | D | |
| 6 | Euclid Av. & Schaefer Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | **180.8** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | 1 | **3** | 1 | 1 | **3** | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 54.6 | 52.9 | D | D | |
| 7 | Euclid Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | **>200** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | 2 | **3** | 1 | **2** | **3** | 1 | **2** | **3** | **0** | **2** | **2** | **1** | 52.7 | 32.6 | D | C | |
| 8 | Euclid Av. & Eucalyptus Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 81.9 | **119.7** | F | **F** | E |
| | With Improvements: | TS | 1 | **3** | 1 | 1 | **3** | **0** | 1 | 1 | 1 | 1 | 1 | 0 | 48.7 | 44.7 | D | D | |
| 9 | Euclid Av. & Merrill Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **195.5** | **195.9** | **F** | **F** | E |
| | With Improvements: | TS | 1 | **3** | 1 | 1 | **3** | 0 | **1** | 1 | 0 | **2** | 1 | 0 | 31.9 | 48.7 | C | D | |
| 10 | Euclid Av. & Kimball Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | **120.8** | **159.8** | **F** | **F** | D |
| | With Improvements: | TS | 1 | **3** | 1 | 2 | **3** | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 50.5 | 54.0 | D | D | |
| 11 | Euclid Av. & Pine Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | **>200** | **195.0** | **F** | **F** | D |
| | With Improvements: | TS | **2** | 2 | 1 | **2** | 2 | **1** | 1 | **2** | 1 | 2 | **2** | 0 | 41.2 | 48.9 | D | D | |
| 14 | Campus Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | **1** | **2** | 0 | **1** | **2** | 0 | 31.0 | 57.8 | C | E | |

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## TABLE 7-4: HORIZON YEAR (2050) INTERSECTION ANALYSIS WITH IMPROVEMENTS (2 OF 4)

| # | Intersection | Traffic Control[3] | Intersection Approach Lanes[1] Northbound L | Northbound T | Northbound R | Southbound L | Southbound T | Southbound R | Eastbound L | Eastbound T | Eastbound R | Westbound L | Westbound T | Westbound R | Delay[2] (secs.) AM | Delay[2] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | Bon View Av. & Riverside Dr. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 0 | 25.6 | 20.9 | C | C | |
| 16 | Bon View Av. & Schaefer Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 16.9 | **50.9** | C | **F** | E |
| | With Improvements: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 6.9 | 8.1 | A | A | |
| 17 | Bon View Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 0 | **161.3** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | **4** | 0 | 1 | **3** | **1** | 61.2 | 70.1 | E | E | |
| 18 | Bon View Av. & Eucalyptus Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 22.4 | 26.7 | C | C | |
| 20 | Grove Av. & SR-60 WB Ramps | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 47.4 | **66.0** | D | **E** | D |
| | With Improvements: | TS | 1 | 2 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 50.2 | 46.0 | D | D | |
| 21 | Grove Av. & SR-60 EB Ramps | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 0 | 2 | 0 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | **139.6** | **90.9** | **F** | **F** | D |
| | With Improvements: | TS | 0 | 2 | **1** | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 45.6 | 47.4 | D | D | |
| 23 | Grove Av. & Riverside Dr. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 0 | **>200** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | 1 | 2 | 0 | 1 | **2** | **0** | 1 | **2** | 0 | 1 | 2 | 0 | 75.0 | 76.7 | E | E | |
| 24 | Grove Av. & Chino Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | 56.2 | 53.6 | E | D | |
| 25 | Grove Av. & Schaefer Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | 12.1 | 22.8 | B | C | |

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## TABLE 7-4: HORIZON YEAR (2050) INTERSECTION ANALYSIS WITH IMPROVEMENTS (3 OF 4)

| # | Intersection | Traffic Control[3] | Intersection Approach Lanes[1] Northbound L | Northbound T | Northbound R | Southbound L | Southbound T | Southbound R | Eastbound L | Eastbound T | Eastbound R | Westbound L | Westbound T | Westbound R | Delay[2] (secs.) AM | Delay[2] (secs.) PM | Level of Service AM | Level of Service PM | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | Grove Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | **>200** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | 1 | **2** | 0 | 1 | **2** | 0 | **2** | **4** | **0** | **2** | **4** | **0** | 56.5 | 54.8 | E | D | |
| 27 | Grove Av. & Eucalyptus Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | **1** | 28.9 | 46.5 | C | D | |
| 28 | Parco Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | 0 | 0 | 0 | 0 | 1 | 0 | **1** | 2 | 0 | 0 | **2** | 0 | 49.0 | 70.0 | D | E | |
| 29 | Walker Av. & Riverside Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | **>100** | **>100** | **F** | **F** | E |
| | With Improvements: | **TS** | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 1 | 2 | 0 | 21.5 | 16.0 | C | B | |
| 30 | Walker Av. & Schaefer Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | AWS | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **66.8** | 38.6 | **F** | E | E |
| | With Improvements: | AWS | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | **1** | 1 | 0 | 43.7 | 31.6 | E | D | |
| 31 | Walker Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | **>200** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | 0 | 1 | 0 | 0 | 1 | 0 | 1 | **3** | 1 | 1 | **2** | 0 | 74.5 | 67.0 | E | E | |
| 32 | Eucalyptus Av. & Walker Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | CSS | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | **91.7** | **>100** | **F** | **F** | |
| | With Improvements: | **TS** | 0 | 0 | 0 | 0 | 1 | 0 | **1** | 1 | 0 | 0 | 1 | 0 | 27.7 | 13.9 | C | B | |
| 36 | Archibald Av. & Chino Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 3 | 0 | 1 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 75.7 | **167.1** | E | **F** | E |
| | With Improvements: | TS | 1 | 3 | 0 | 1 | 2 | 0 | 1 | 1 | **1** | 1 | 1 | 1 | 63.3 | 77.0 | E | E | |
| 38 | Archibald Av. & Edison Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 1 | 1 | **>200** | **>200** | **F** | **F** | E |
| | With Improvements: | TS | **2** | 2 | 1 | **2** | 2 | 1 | 2 | 3 | 1 | 2 | **3** | 1 | 67.5 | 78.4 | E | E | |

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## TABLE 7-4: HORIZON YEAR (2050) INTERSECTION ANALYSIS WITH IMPROVEMENTS (4 OF 4)

| # | Intersection | Traffic Control[3] | Intersection Approach Lanes[1] | | | | | | | | | | | | Delay[2] (secs.) | | Level of Service | | Acceptable LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Northbound | | | Southbound | | | Eastbound | | | Westbound | | | | | | | |
| | | | L | T | R | L | T | R | L | T | R | L | T | R | AM | PM | AM | PM | |
| 40 | Archibald Av. & Limonite Av. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | **172.1** | **152.1** | **F** | **F** | D |
| | With Improvements: | TS | 2 | **3** | 1 | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 49.4 | 53.0 | D | D | |
| 41 | Turner Av. & Ontario Ranch Rd. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 2 | 1 | 78.7 | **100.6** | E | **F** | E |
| | With Improvements: | TS | 1 | 1 | 0 | 1 | 1 | 0 | 1 | **3** | **0** | 1 | **3** | **0** | 36.2 | 45.3 | D | D | |
| 43 | Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd. | | | | | | | | | | | | | | | | | | |
| | Without Improvements: | TS | 2 | 3 | 1 | 2 | 2 | 1 | 2 | 3 | 1 | 2 | 2 | 1 | **100.9** | **>200** | **F** | **F** | D |
| | With Improvements: | TS | 2 | 3 | 1 | 2 | **3** | 1 | 2 | 3 | 1 | 2 | **4** | 1 | 41.8 | 52.7 | D | D | |

* **BOLD** = Level of Service (LOS) does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

1 When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement

2 Per the Highway Capacity Manual (7th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

3 CSS = Cross-Street Stop; AWS = All-Way Stop; TS = Traffic Signal; TS = Improvement

## TABLE 7-5: HORIZON YEAR (2050) ROADWAY SEGMENT ANALYSIS WITH IMPROVEMENTS

| # | Roadway | Segment Limits | Jurisdiction | Roadway Section | LOS Capacity[1] | No Project | | | With Project | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 2050 | V/C[2] | LOS[3] | 2050 | V/C[2] | LOS[3] |
| 1 | Edison Av. | Euclid Av. to Campus Av. | Ontario | 6U | 48,000 | **53,386** | **1.112** | **F** | **61,880** | **1.289** | **F** |

**BOLD** = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[1] These maximum roadway capacities are based on the applicable agency's thresholds.

[2] V/C = Volume to Capacity Ratio

[3] LOS = Level of Service

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# 8 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Ontario are funded through a combination of construction of improvements, development impact fee programs or fair share contributions, such as the City of Ontario Development Impact Fee (DIF) program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

## 8.1 CITY OF ONTARIO DEVELOPMENT IMPACT FEE PROGRAM

The City of Ontario has created its own local DIF program to impose and collect fees from new residential, commercial, and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the City's General Plan Circulation Element. The City's DIF includes regional improvements to comply with Measure "I." The fee schedule was last updated in January 2023 and is reviewed/adjusted annually based upon changes in the construction cost index (CCI). Under the City's DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

The timing to use the DIF is established through periodic capital improvement programs which are overseen by the City's Public Works Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City are also periodically performed by City staff and consultants. The City uses this data to determine the timing of implementing the improvements listed in its facilities list. The City also uses this data to ensure that the improvements listed on the facilities list are constructed before the LOS falls below the LOS performance standards adopted by the City. In this way, the improvements are constructed before the LOS falls below the City's LOS performance thresholds.

The Project Applicant will be subject to the City's DIF program and will pay the requisite City DIF at the rates then in effect pursuant to the City's ordinance. The Project Applicant's payment of the requisite DIF at the rates then in effect, pursuant to the City DIF Program, would satisfy the Project's proportional improvement requirements at potentially affected DIF-funded facilities. Table 8-1 summarizes the estimated fee obligation for the Project.

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### TABLE 8-1: ESTIMATED FEE OBLIGATION

| Fee Reference | $ PER UNIT |
|---|---|
| Detached Dwellings | $58,575/Unit |
| Attached Dwellings | $42,405/Unit |
| Retail/Service Uses | $24.772/Sq. Ft. |
| Office Uses | $19.148/Sq. Ft. |

Source: City of Ontario (Ontario Ranch) Development Impact Fees (DIF), effective July 1, 2026.

| Fee Calculation | | | | |
|---|---|---|---|---|
| **Program** | **Category** | **Unit Cost** | **Units** | **Local Circulation** |
| Regional Streets | Detached Dwellings | $3,302.00 | 802 | $2,648,204 |
| Local Streets | Detached Dwellings | $2,701.00 | 802 | $2,166,202 |
| Regional Streets | Attached Dwellings | $2,204.00 | 3,491 | $7,694,164 |
| Local Streets | Attached Dwellings | $1,804.00 | 3,491 | $6,297,764 |
| Regional Streets | Retail/Service Uses | $6.671 | 115,809 | $772,562 |
| Local Streets | Retail/Service Uses | $5.458 | 115,809 | $632,086 |
| Regional Streets | Office Uses | $3.813 | 135,111 | $515,178 |
| Local Streets | Office Uses | $3.119 | 135,111 | $421,411 |

| | |
|---|---|
| **Total Transportation Impact Fees** | **$21,147,571** |

## 8.2 MEASURE "I" FUNDS

In 2004, the voters of San Bernardino County approved the 30-year extension of Measure "I," a one-half of one percent sales tax on retail transactions, through the year 2050, for transportation projects including, but not limited to, infrastructure improvements, commuter rail, public transit, and other identified improvements. The Measure "I" extension requires that a regional traffic impact fee be created to ensure development is paying its fair share. A regional Nexus study was prepared by San Bernardino County Transportation Authority (SBCTA) and concluded that each jurisdiction should include a regional fee component in their local programs in order to meet the Measure "I" requirement. The regional component assigns specific facilities and cost sharing formulas to each jurisdiction and was updated in November 2011. Revenues collected through these programs are used in tandem with Measure "I" funds to deliver projects identified in the Nexus Study. While Measure "I" is a self-executing sales tax administered by SBCTA, it bears discussion here because the funds raised through Measure "I" have funded in the past and will continue to fund new transportation facilities in San Bernardino County.

## 8.3 FAIR SHARE CONTRIBUTION

Project improvement may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City's discretion).

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When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, has been provided in Table 8-2 for the applicable deficient study area intersections.

These fees are collected with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases.

### TABLE 8-2: PROJECT FAIR SHARE CALCULATIONS (1 OF 3)

| # | Intersection | | Existing (2024) | Project (2050) | 2050 With Project[2] | Total New Traffic | Project % of New Traffic[1] |
|---|---|---|---|---|---|---|---|
| 4 | Euclid Av. (SR-83) & Riverside Dr. | | | | | | |
| | | AM: | 2,948 | 312 | 5,505 | 2,557 | **12.2%** |
| | | PM: | 3,028 | 216 | 6,024 | 2,996 | 7.2% |
| 5 | Euclid Av. (SR-83) & Chino Av. | | | | | | |
| | | AM: | 2,343 | 312 | 4,833 | 2,490 | **12.5%** |
| | | PM: | 2,660 | 316 | 5,517 | 2,857 | 11.1% |
| 6 | Euclid Av. (SR-83) & Schafer Av. | | | | | | |
| | | AM: | 2,155 | 380 | 4,649 | 2,494 | **15.2%** |
| | | PM: | 2,620 | 385 | 5,346 | 2,726 | 14.1% |
| 7 | Euclid Av. (SR-83) & Edison Av. | | | | | | |
| | | AM: | 2,397 | 658 | 6,320 | 3,923 | **16.8%** |
| | | PM: | 2,962 | 666 | 7,296 | 4,334 | 15.4% |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. | | | | | | |
| | | AM: | 2,319 | 589 | 4,486 | 2,167 | **27.2%** |
| | | PM: | 2,735 | 595 | 5,160 | 2,425 | 24.5% |
| 9 | Euclid Av. (SR-83) & Merrill Av. | | | | | | |
| | | AM: | 2,265 | 554 | 4,675 | 2,410 | **23.0%** |
| | | PM: | 2,545 | 561 | 5,386 | 2,841 | 19.7% |
| 10 | Euclid Av. (SR-83) & Kimball Av. | | | | | | |
| | | AM: | 2,957 | 555 | 5,955 | 2,998 | **18.5%** |
| | | PM: | 3,226 | 561 | 6,429 | 3,203 | 17.5% |
| 11 | Euclid Av. (SR-83) & Pine Av. | | | | | | |
| | | AM: | 3,124 | 450 | 5,529 | 2,405 | **18.7%** |
| | | PM: | 3,172 | 455 | 5,632 | 2,460 | 18.5% |
| 14 | Campus Av. & Edison Av. | | | | | | |
| | | AM: | 654 | 658 | 4,949 | 4,295 | **15.3%** |
| | | PM: | 804 | 666 | 5,576 | 4,772 | 14.0% |
| 15 | Bon View Av. & Riverside Dr. | | | | | | |
| | | AM: | 1,685 | 104 | 2,719 | 1,034 | **10.1%** |
| | | PM: | 1,409 | 105 | 2,745 | 1,336 | 7.9% |
| 16 | Bon View Av. & Schaefer Av. | | | | | | |
| | | AM: | 671 | 174 | 1,045 | 374 | **46.5%** |
| | | PM: | 716 | 175 | 1,317 | 601 | 29.1% |
| 17 | Bon View Av. & Edison Av. | | | | | | |
| | | AM: | 892 | 1,835 | 5,001 | 4,109 | **44.7%** |
| | | PM: | 989 | 1,859 | 5,380 | 4,391 | 42.3% |

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## TABLE 8-2: PROJECT FAIR SHARE CALCULATIONS (2 OF 3)

| # | Intersection | | Existing (2024) | Project (2050) | 2050 With Project[2] | Total New Traffic | Project % of New Traffic[1] |
|---|---|---|---|---|---|---|---|
| 18 | Bon View Av. & Eucalyptus Av. | | | | | | |
| | | AM: | 255 | 381 | 1,417 | 1,162 | **32.8%** |
| | | PM: | 288 | 385 | 1,614 | 1,326 | 29.0% |
| 20 | Grove Av. & SR-60 WB Ramps | | | | | | |
| | | AM: | 2,742 | 346 | 4,183 | 1,441 | 24.0% |
| | | PM: | 2,902 | 351 | 4,226 | 1,324 | **26.5%** |
| 21 | Grove Av. & SR-60 EB Ramps | | | | | | |
| | | AM: | 2,338 | 623 | 3,716 | 1,378 | **45.2%** |
| | | PM: | 2,310 | 631 | 3,845 | 1,535 | 41.1% |
| 23 | Grove Av. & Riverside Dr. | | | | | | |
| | | AM: | 2,177 | 693 | 4,472 | 2,295 | **30.2%** |
| | | PM: | 2,104 | 702 | 4,998 | 2,894 | 24.3% |
| 24 | Grove Av. & Chino Av. | | | | | | |
| | | AM: | 1,079 | 693 | 2,898 | 1,819 | **38.1%** |
| | | PM: | 1,132 | 702 | 3,245 | 2,113 | 33.2% |
| 25 | Grove Av. & Schaefer Av. | | | | | | |
| | | AM: | 819 | 693 | 2,298 | 1,479 | **46.9%** |
| | | PM: | 904 | 702 | 2,721 | 1,817 | 38.6% |
| 26 | Grove Av. & Edison Av. | | | | | | |
| | | AM: | 1,037 | 2,666 | 6,097 | 5,060 | **52.7%** |
| | | PM: | 1,167 | 2,700 | 6,680 | 5,513 | 49.0% |
| 27 | Grove Av. & Eucalyptus Av. | | | | | | |
| | | AM: | 714 | 277 | 2,187 | 1,473 | **18.8%** |
| | | PM: | 768 | 280 | 2,411 | 1,643 | 17.0% |
| 28 | Parco Av. & Edison Av. | | | | | | |
| | | AM: | 474 | 1,939 | 5,979 | 5,505 | **35.2%** |
| | | PM: | 695 | 1,964 | 6,534 | 5,839 | 33.6% |
| 29 | Walker Av. & Riverside Dr. | | | | | | |
| | | AM: | 1,545 | 104 | 2,721 | 1,176 | **8.8%** |
| | | PM: | 1,519 | 105 | 3,310 | 1,791 | 5.9% |
| 30 | Walker Av. & Schaefer Av. | | | | | | |
| | | AM: | 584 | 174 | 1,278 | 694 | 25.1% |
| | | PM: | 551 | 175 | 1,245 | 694 | **25.2%** |
| 31 | Walker Av. & Edison Av. | | | | | | |
| | | AM: | 868 | 2,008 | 5,008 | 4,140 | **48.5%** |
| | | PM: | 1,036 | 2,034 | 5,963 | 4,927 | 41.3% |
| 32 | Walker Av. & Eucalyptus Av. | | | | | | |
| | | AM: | 1,035 | 104 | 1,936 | 901 | **11.5%** |
| | | PM: | 772 | 105 | 1,814 | 1,042 | 10.1% |
| 36 | Archibald Av. & Chino Av. | | | | | | |
| | | AM: | 2,267 | 312 | 4,296 | 2,029 | **15.4%** |
| | | PM: | 2,372 | 316 | 4,718 | 2,346 | 13.5% |
| 38 | Archibald Av. & Edison Av./Ontario Ranch Rd. | | | | | | |
| | | AM: | 2,364 | 1,280 | 6,720 | 4,356 | **29.4%** |
| | | PM: | 2,787 | 1,297 | 8,095 | 5,308 | 24.4% |

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## TABLE 8-2: PROJECT FAIR SHARE CALCULATIONS (3 OF 3)

| # | Intersection | | Existing (2024) | Project (2050) | 2050 With Project[2] | Total New Traffic | Project % of New Traffic[1] |
|---|---|---|---|---|---|---|---|
| 40 | Archibald Av. & Limonite Av. | | | | | | |
| | | AM: | 2,273 | 138 | 6,867 | 4,594 | 3.0% |
| | | PM: | 2,459 | 140 | 7,086 | 4,627 | **3.0%** |
| 41 | Turner Av. & Ontario Ranch Rd. | | | | | | |
| | | AM: | 1,235 | 901 | 4,372 | 3,137 | **28.7%** |
| | | PM: | 1,390 | 912 | 5,205 | 3,815 | 23.9% |
| 42 | Haven Av. & Ontario Ranch Rd. | | | | | | |
| | | AM: | 2,187 | 831 | 5,574 | 3,387 | **24.5%** |
| | | PM: | 2,641 | 841 | 6,466 | 3,825 | 22.0% |
| 43 | Hamner Av. & Ontario Ranch Rd. | | | | | | |
| | | AM: | 2,712 | 761 | 6,408 | 3,696 | **20.6%** |
| | | PM: | 3,503 | 771 | 7,860 | 4,357 | 17.7% |

[1] **BOLD =** Highest fair share percentage is highlighted.

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# 9 REFERENCES


1. **City of Ontario.** *The Ontario Plan: Policy Plan.* City of Ontario : s.n., Adopted August 16, 2022. 2050 The Ontario Plan.
2. **County of San Bernardino.** *Transportation Impact Study Guidelines.* County of San Bernardino : s.n., July 2019.
3. **Institute of Transportation Engineers.** *Trip Generation Manual.* 11th Edition. 2021.
4. **San Diego.** *San Diego Municipal Code Land Development Code Trip Generation Manual.* San Diego : s.n., May 2003.
5. **Transportation Research Board.** *Highway Capacity Manual (HCM).* 7th Edition. s.l. : National Academy of Sciences, 2022.
6. **California Department of Transportation.** California Manual on Uniform Traffic Control Devices (CA MUTCD). [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CA MUTCD).* 2014, Updated March 30, 2021 (Revision 6).
7. **The Planning Center for The City of Ontario.** *The Ontario Plan Environmental Impact Report.* Ontario : s.n., July 2009.
8. **The City of Eastvale.** *Eastvale General Plan 2040.* Eastvale : s.n., Adopted March 27, 2024.
9. **The City of Chino.** *Envision Chino General Plan 2025.* Chino : s.n., July 2010.
10. **California Department of Transportation.** *Guide for the Preparation of Traffic Impact Studies.* December 2002.
11. **San Bernardino Associated Governments.** *Congestion Management Program for County of San Bernardino.* County of San Bernardino : s.n., Updated June 2016.


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# 10 CERTIFICATION

The contents of this Traffic Analysis represent an accurate depiction of the transportation environment and deficiencies associated with the proposed Center Park Specific Plan Project. The information contained in this Traffic Analysis is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 861-0177.

Charlene So, P.E.
Principal
URBAN CROSSROADS, INC.
1133 Camelback #8329
Newport Beach, CA 92658
(949) 861-0177
cso@urbanxroads.com

### Education

Bachelor of Science in Civil Engineering
University of California, Irvine • June 2004

### Professional Registrations

PE – Registered Professional Traffic Engineer – TR 2414 • January 2007

### Professional Affiliations

ITE – Institute of Transportation Engineers
WTS – Women's Transportation Seminar

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# APPENDIX 1.1:

# APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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MEMORANDUM

URBAN | CROSSROADS

**DATE:** October 16, 2024
**TO:** Rafael Torres, City of Ontario
**FROM:** Charlene So, Urban Crossroads
**JOB NO:** 16036-02 TA REV Scope

## CENTER PARK SPECIFIC PLAN TRAFFIC STUDY SCOPING AGREEMENT (REVISED)

Urban Crossroads, Inc. is pleased to submit the following Traffic Study Scoping Agreement (Revised) for Center Park Specific Plan development (referred to as **Project**), to establish a traffic analysis (**TA**) scope of work that would be prepared in support of the proposed Specific Plan (**SP**). The Project is bounded by Campus Avenue to the west, Walker Avenue to the east, and on either side of Edison Avenue in the City of Ontario. The following memo outlines the project-related trip generation, trip distribution patterns, proposed study area and analysis scenarios expected to be included in the Project traffic analysis.

## PROPOSED PROJECT

Exhibit 1 shows the preliminary land use plan. It is our understanding that the Project is to consist of the following:

- 802 Single Family Detached dwelling units
- 3,491 Multifamily (Low-Rise) Residential units
- 115,809 square feet of Commercial Retail use
- 135,111 square feet of General Office use
- 55.98 acres of Parkland use

The Project is proposing to develop in two phases with the first phase consisting of the development of up to 256 Single Family Detached residential dwelling units with 768 Multifamily (Low-Rise) Residential dwelling units and 19.6 acres of Parkland use with an anticipated Opening Year of 2029. The proposed Project Buildout is anticipated in 2033. For purposes of the TA, the mix of uses for each planning area is summarized in Table 1. It should be noted that the Commercial Retail square footage within the Mixed-Use areas of the Project would be evenly divided in thirds between Strip Retail Plaza, Fast-Food Restaurant Without Drive-Through Window, and Fast-Food Restaurant With Drive-Through Window use. Similarly, Office square footage within the Mixed-Use areas assumes up to 10,000 square feet of Medical Office use in each Planning Area (PA). Access to the proposed Project would be provided to the surrounding roadways of Campus Avenue, Edison Avenue, Bon View Avenue, Cucamonga Avenue, Grove Avenue, Parco Avenue, and Walker Avenue.

**EXHIBIT 1: PRELIMINARY LAND USE PLAN & PHASING**

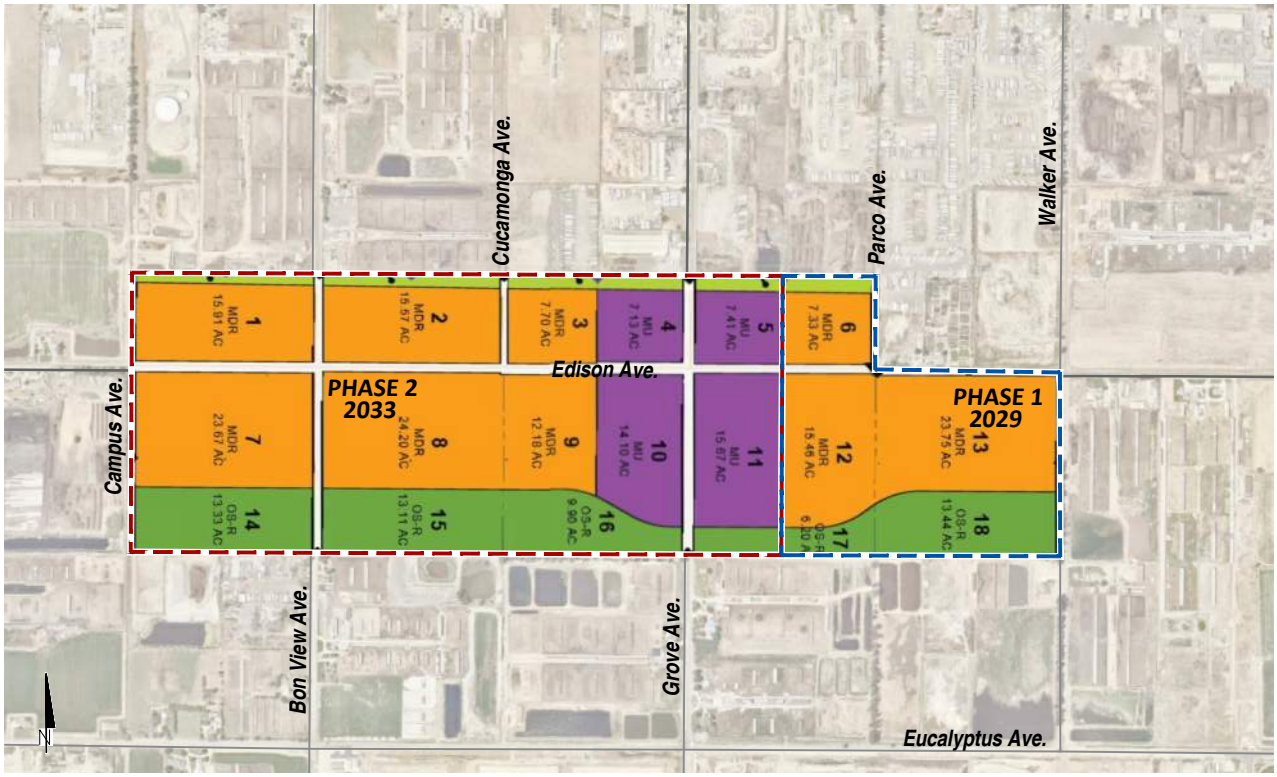

**TABLE 1: SUMMARY OF PROPOSED LAND USES**

| PA | Description | Land Use | Quantity | Unit[1] |
|---|---|---|---|---|
| 1 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 88 | DU |
| | | Multifamily (Low-Rise) Residential | 262 | DU |
| 2 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 86 | DU |
| | | Multifamily (Low-Rise) Residential | 257 | DU |
| 3 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 42 | DU |
| | | Multifamily (Low-Rise) Residential | 127 | DU |
| 4 | Mixed-Use | Multifamily (Low-Rise) Residential | 175 | DU |
| | | Retail[2] | 18,635 | SF |
| | | General Office[3] | 21,741 | SF |
| 5 | Mixed-Use | Multifamily (Low-Rise) Residential | 182 | DU |
| | | Retail[2] | 19,367 | SF |
| | | General Office[3] | 22,595 | SF |
| 6 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 40 | DU |
| | | Multifamily (Low-Rise) Residential | 121 | DU |
| 7 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 130 | DU |
| | | Multifamily (Low-Rise) Residential | 391 | DU |
| 8 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 133 | DU |
| | | Multifamily (Low-Rise) Residential | 399 | DU |
| 9 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 67 | DU |
| | | Multifamily (Low-Rise) Residential | 201 | DU |
| 10 | Mixed-Use | Multifamily (Low-Rise) Residential | 345 | DU |
| | | Retail[2] | 36,852 | SF |
| | | General Office[3] | 42,994 | SF |
| 11 | Mixed-Use | Multifamily (Low-Rise) Residential | 384 | DU |
| | | Retail[2] | 40,955 | SF |
| | | General Office[3] | 47,781 | SF |
| 12 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 85 | DU |
| | | Multifamily (Low-Rise) Residential | 255 | DU |
| 13 | Medium Density Residential (11.1-25.0 DU/Acre) | Single Family Detached | 131 | DU |
| | | Multifamily (Low-Rise) Residential | 392 | DU |
| 14 | Open Space/Parkland | Active Park | 13.33 | Acres |
| 15 | Open Space/Parkland | Active Park | 13.11 | Acres |
| 16 | Open Space/Parkland | Public Park | 9.9 | Acres |
| 17 | Open Space/Parkland | Public Park | 6.2 | Acres |
| 18 | Open Space/Parkland | Active Park | 13.44 | Acres |

[1] DU = dwelling unit; TSF = thousand square feet, AC = acres

[2] Square footage to be divided evenly between strip retail plaza and fast-food restaurant without and with drive-through window uses.

[3] Square footage to be divided evenly between general office and medical office uses.

## TRIP GENERATION

Trip generation represents the amount of traffic, which is both attracted to, and produced by, a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development. The proposed Project trip generation will be based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their latest Trip Generation Manual (11th Edition, 2021) for the proposed uses. Table 2 summarizes the ITE trip generation rates.

**TABLE 2: TRIP GENERATION RATES**

| Land Use[1] | Units[2] | ITE LU Code | AM Peak Hour In | AM Peak Hour Out | AM Peak Hour Total | PM Peak Hour In | PM Peak Hour Out | PM Peak Hour Total | Daily |
|---|---|---|---|---|---|---|---|---|---|
| Single Family Detached Residential | DU | 210 | 0.18 | 0.52 | 0.70 | 0.59 | 0.35 | 0.94 | 9.43 |
| Multifamily (Low-Rise) Residential | DU | 220 | 0.10 | 0.30 | 0.40 | 0.32 | 0.19 | 0.51 | 6.74 |
| Public Park | Acres | 411 | 0.01 | 0.01 | 0.02 | 0.06 | 0.05 | 0.11 | 0.78 |
| Active Park (With Ball Fields) | Acres | --[3] | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 4.00 | 50.00 |
| General Office (Average Rates) | TSF | 710 | 1.34 | 0.18 | 1.52 | 0.24 | 1.20 | 1.44 | 10.84 |
| Medical Office | TSF | 720 | 2.45 | 0.65 | 3.10 | 1.18 | 2.75 | 3.93 | 36.00 |
| Strip Retail Plaza (<40,000 SF) | TSF | 822 | 1.42 | 0.94 | 2.36 | 3.30 | 3.29 | 6.59 | 54.45 |
| Fast-Food Restaurant Without Drive-Thru | TSF | 933 | 25.04 | 18.14 | 43.18 | 16.61 | 16.60 | 33.21 | 450.49 |
| Fast-Food Restaurant With Drive-Thru | TSF | 934 | 22.75 | 21.86 | 44.61 | 17.18 | 15.85 | 33.03 | 467.48 |

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 11th Edition (2021).

[2] DU = dwelling units; TSF = thousand square feet

[3] Trip Generation Source: San Diego Municipal Code Land Development Code Trip Generation Manual, May 2003.

Internal capture is a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site (trips that travel between uses without leaving the site). In other words, trips may be made between the retail, office, and residential uses proposed on-site which can be made either by walking or using internal roadways without using external streets. The internal capture is based on the National Cooperative Highway Research Program's (NCHRP Report 684) internal capture trip capture estimation tool. These internal capture worksheets are attached to this scoping agreement (see Attachment A).

Pass-by trip reductions have been applied to the proposed Project uses consistent with the allowable values per the ITE Trip Generation Manual (11th Edition, 2021). Pass-by trips represent traffic that is already on the roadway today that would make an intermediate stop at the site before continuing on to their ultimate destination.

As shown in Table 3, the proposed Project is anticipated to generate a net total of 44,716 two-way trips per day with 3,462 AM peak hour trips and 3,507 PM peak hour trips at Project Buildout.

**TABLE 3: PROJECT TRIP GENERATION SUMMARY**

| | | | AM Peak Hour | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|
| Land Use | Quantity | Units[1] | In | Out | Total | In | Out | Total | Daily |
| Project Phase 1 (2029): | | | | | | | | | |
| PA 6, 12 & 13: Single Family Detached | 256 | DU | 47 | 133 | 180 | 152 | 89 | 241 | 2,416 |
| PA 6, 12 & 13: Multifamily (Low-Rise) Residential | 768 | DU | 74 | 233 | 307 | 247 | 145 | 392 | 5,176 |
| PA 17: Public Park | 6.20 | Acres | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| PA 18: Active Park | 13.44 | Acres | 13 | 13 | 26 | 27 | 27 | 54 | 672 |
| **Phase 1 (2029) Total** | | | **134** | **379** | **513** | **426** | **261** | **687** | **8,270** |
| Project Phase 2 (2033): | | | | | | | | | |
| PA 4, 5, 10 & 11: Multifamily (Low-Rise) Residential | 1,086 | DU | 104 | 330 | 434 | 349 | 205 | 554 | 7,320 |
| PA 4, 5, 10 & 11: Strip Retail Plaza | 38.603 | TSF | 55 | 36 | 91 | 127 | 127 | 254 | 2,102 |
| Internal Capture Reduction | | | -29 | -19 | -48 | -87 | -73 | -160 | -1,110 |
| Pass-by Trip Reduction (40% - PM/Daily) | | | 0 | 0 | 0 | -16 | -16 | -32 | -398 |
| PA 4, 5, 10 & 11: Fast-Food Without Drive-Thru | 38.603 | TSF | 967 | 700 | 1,667 | 641 | 641 | 1,282 | 17,390 |
| PA 4, 5, 10 & 11: Fast-Food With Drive-Thru | 38.603 | TSF | 878 | 844 | 1,722 | 663 | 612 | 1,275 | 18,046 |
| Internal Capture Reduction | | | -335 | -60 | -395 | -231 | -319 | -550 | -4,130 |
| Pass-by Trip Reduction (50% - AM; 55% - PM/Daily) | | | -742 | -742 | -1,484 | -514 | -514 | -1,028 | -17,218 |
| PA 4, 5, 10 & 11: General Office | 67.555 | TSF | 90 | 12 | 102 | 17 | 81 | 98 | 732 |
| PA 4, 5, 10 & 11: Medical Dental Office | 67.556 | TSF | 165 | 44 | 209 | 80 | 186 | 266 | 2,432 |
| Internal Capture Reduction | | | -48 | -51 | -99 | -70 | -26 | -96 | -836 |
| PA 2, 3, 8 & 9: Single Family Detached | 328 | DU | 60 | 170 | 230 | 194 | 114 | 308 | 3,094 |
| PA 2, 3, 8 & 9: Multifamily (Low-Rise) Residential | 984 | DU | 94 | 299 | 393 | 316 | 186 | 502 | 6,632 |
| PA 15: Active Park | 13.11 | Acres | 13 | 13 | 26 | 26 | 26 | 52 | 656 |
| PA 16: Public Park | 9.90 | Acres | 0 | 0 | 0 | 1 | 0 | 1 | 8 |
| PA 1 & 7: Single Family Detached | 218 | DU | 40 | 113 | 153 | 129 | 76 | 205 | 2,056 |
| PA 1 & 7: Multifamily (Low-Rise) Residential | 653 | DU | 63 | 199 | 262 | 210 | 123 | 333 | 4,402 |
| PA 14: Active Park | 13.33 | Acres | 13 | 13 | 26 | 27 | 27 | 54 | 668 |
| Internal Capture Reduction (8%) | | | -29 | -311 | -340 | -264 | -234 | -498 | -5,400 |
| **Total Project Trips** | | | **1,493** | **1,969** | **3,462** | **2,024** | **1,483** | **3,507** | **44,716** |

[1] DU = dwelling units; TSF = thousand square feet

## TRIP DISTRIBUTION

The Project trip distribution represents the directional orientation of traffic to and from the Project site. Trip distribution is the process of identifying the probable destinations, directions or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify the route where the Project traffic would distribute. The proposed Project trip distributions are shown for near-term and long-range traffic conditions (see Exhibits 2 and 3). Long-range trip distribution patterns include future planned roadways as contemplated by The Ontario Plan (TOP).

## EXHIBIT 2: PROJECT (NEAR-TERM) TRIP DISTRIBUTION

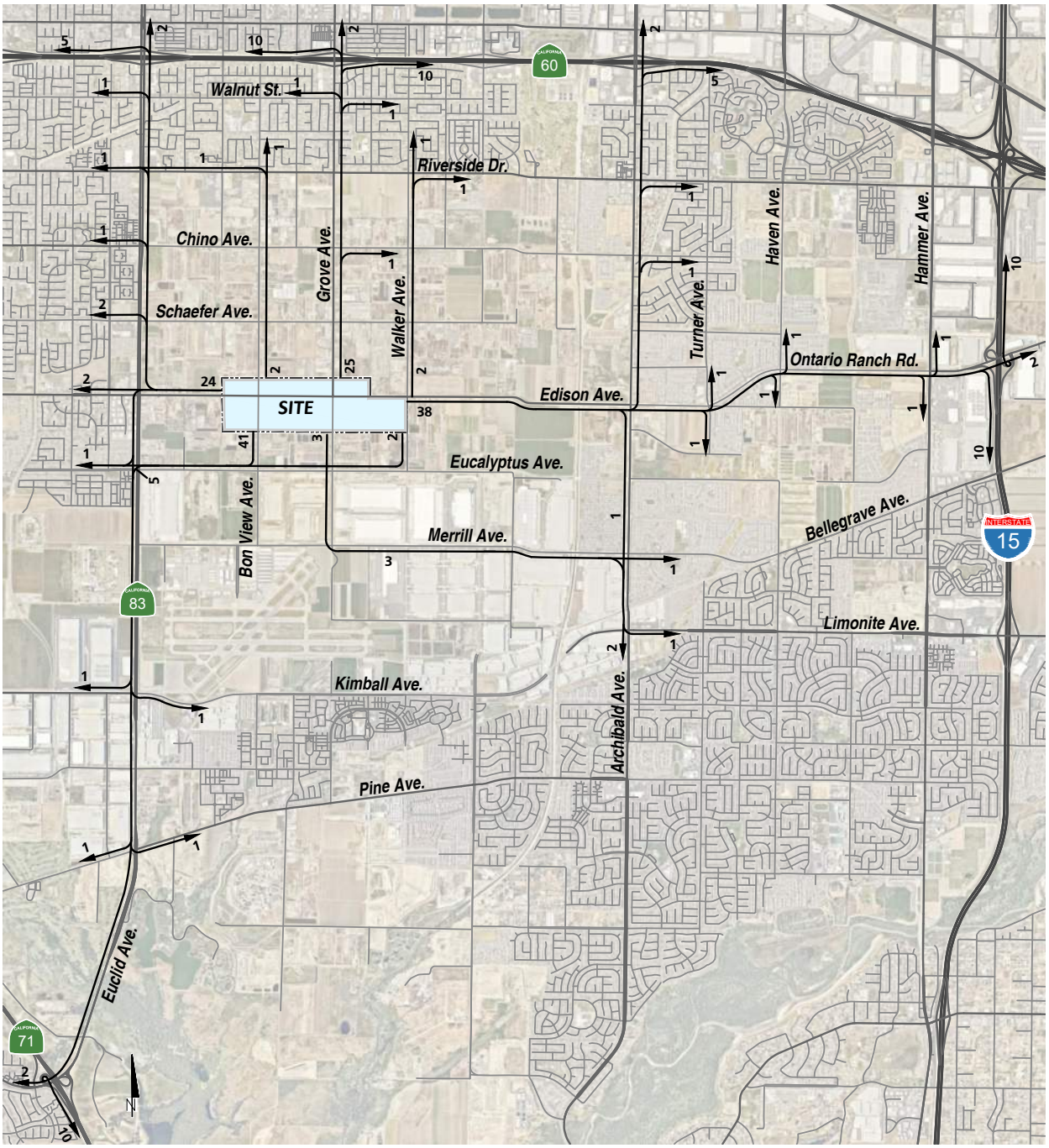


**LEGEND:**

10 = *Percent To/From Project*

→ = *Trip Distribution*

## EXHIBIT 3: PROJECT (2050) TRIP DISTRIBUTION

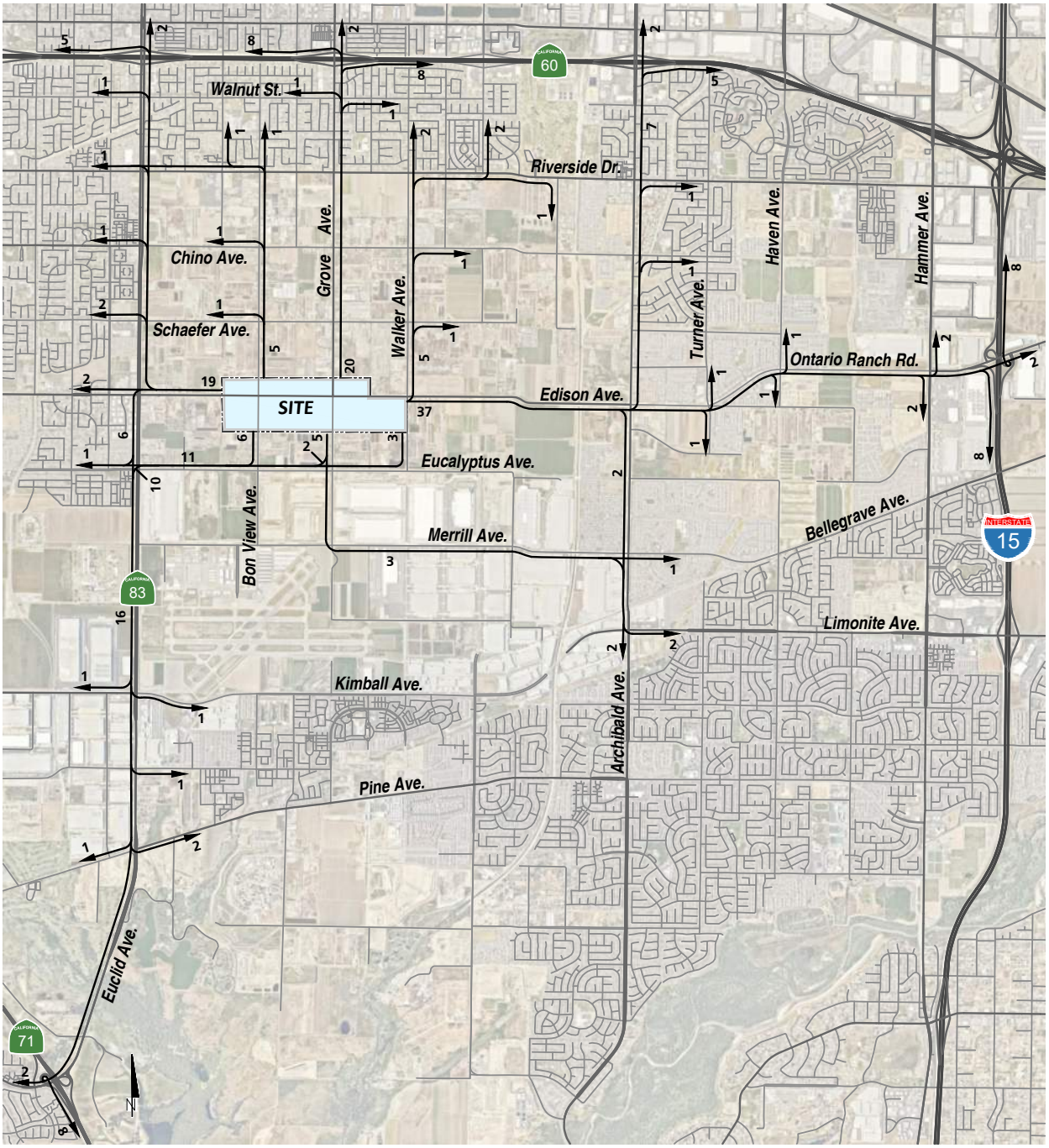


**LEGEND:**

10 = *Percent To/From Project*

→ = *Trip Distribution*

## PROPOSED ANALYSIS SCENARIOS

The following analysis scenarios are proposed to be evaluated in the Traffic Study:

1. Existing (2024)
2. Existing plus Project (E+P) – Phase 1
3. E+P (Project Buildout)
4. Opening Year Cumulative (2033) Without Project
5. Opening Year Cumulative (2033) With Project (Project Buildout only)
6. Horizon Year (2050) Without Project
7. Horizon Year (2050) With Project

All study area intersections will be evaluated using the Highway Capacity Manual (HCM) 7th Edition analysis methodology. Horizon Year (2050) traffic forecasts will be derived using the SBTAM Traffic Model and near-term cumulative traffic volumes will be interpolated between Existing and Horizon Year traffic conditions, with cumulative projects being added as applicable for the Opening Year Cumulative traffic conditions.

## INTERSECTION ANALYSIS LOCATIONS

Exhibit 4 depicts the recommended intersection analysis locations, based upon the Project trip generation and trip distribution patterns included as part of this letter.

| # | Intersection | # | Intersection |
|---|---|---|---|
| 1 | Euclid Av. (SR-83) & SR-60 WB Ramps | 20 | Grove Av. & Riverside Dr. |
| 2 | Euclid Av. (SR-83) & SR-60 EB Ramps | 21 | Grove Av. & Chino Av. |
| 3 | Euclid Av. (SR-83) & Walnut St. | 22 | Grove Av. & Schaefer Av. |
| 4 | Euclid Av. (SR-83) & Riverside Dr. | 23 | Grove Av. & Edison Av. |
| 5 | Euclid Av. (SR-83) & Chino Av. | 24 | Parco Av. & Edison Av. |
| 6 | Euclid Av. (SR-83) & Schafer Av. | 25 | Walker Av. & Edison Av. |
| 7 | Euclid Av. (SR-83) & Edison Av. | 26 | Archibald Av. & SR-60 WB Ramps |
| 8 | Euclid Av. (SR-83) & Eucalyptus Av. | 27 | Archibald Av. & SR-60 EB Ramps |
| 9 | Euclid Av. (SR-83) & Merrill Av. | 28 | Archibald Av. & Riverside Dr. |
| 10 | Euclid Av. (SR-83) & Kimball Av. | 29 | Archibald Av. & Chino Av. |
| 11 | Euclid Av. (SR-83) & Pine Av. | 30 | Archibald Av. & Schaefer Av. |
| 12 | SR-71 NB Ramps & Euclid Av. (SR-83) | 31 | Archibald Av. & Edison Av./Ontario Ranch Rd. |
| 13 | SR-71 SB Off-Ramp & Euclid Av. (SR-83) | 32 | Archibald Av. & Merrill Av. |
| 14 | Campus Av. & Edison Av. | 33 | Archibald Av. & Limonite Av. |
| 15 | Bon View Av. & Edison Av. | 34 | Turner Av. & Ontario Ranch Rd. |
| 16 | Cucamonga Av. & Edison Av. | 35 | Haven Av. & Ontario Ranch Rd. |
| 17 | Grove Av. & SR-60 WB Ramps | 36 | Hamner Av. & Ontario Ranch Rd. |
| 18 | Grove Av. & SR-60 EB Ramps | 37 | I-15 SB Ramps & Ontario Ranch Rd. |
| 19 | Grove Av. & Walnut St. | 38 | I-15 NB Ramps & Ontario Ranch Rd. |

## EXHIBIT 4: INTERSECTION ANALYSIS LOCATIONS

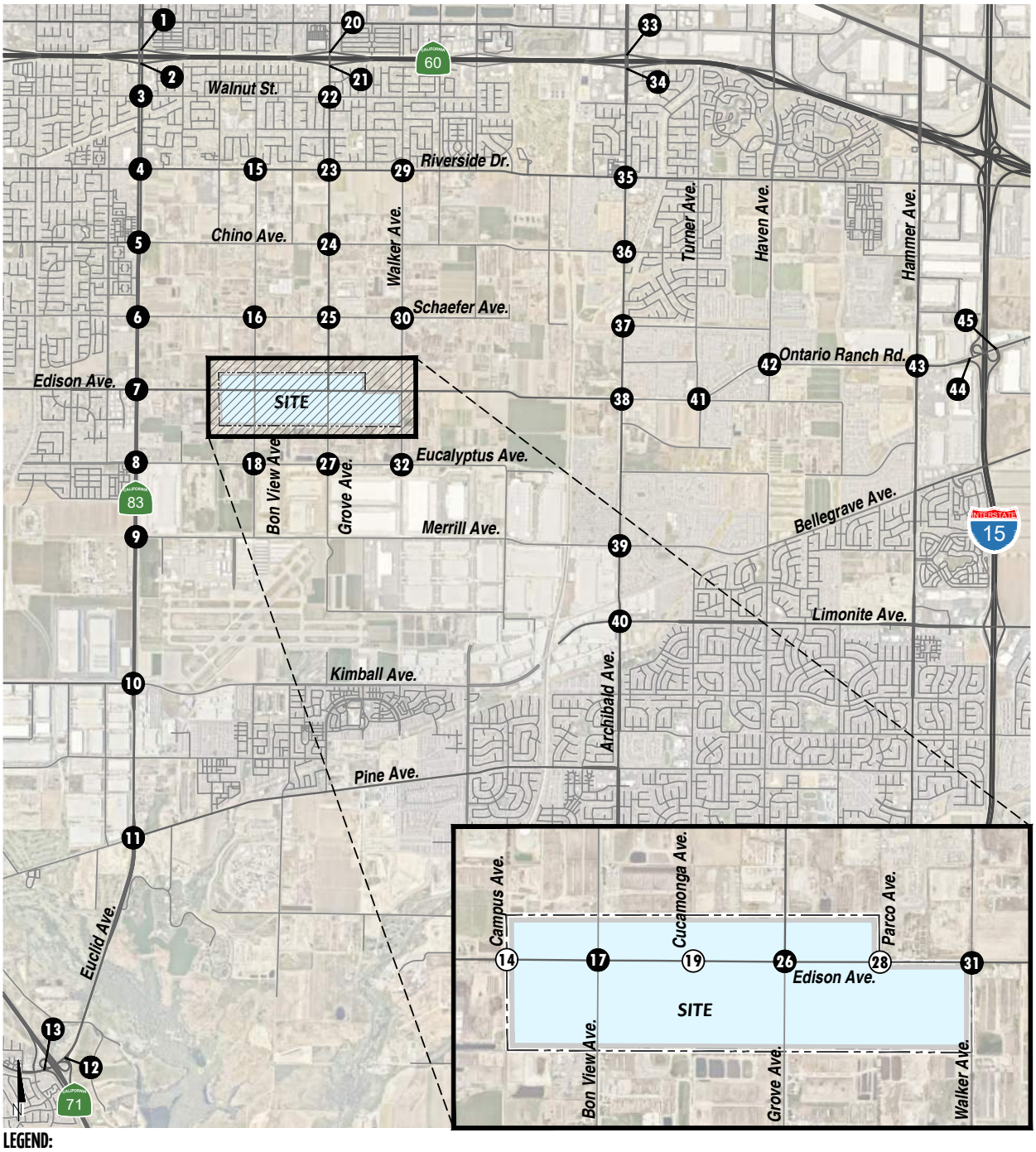


**LEGEND:**

*= Existing Intersection Analysis Location*

*= Future Intersection Analysis Location*

## ROADWAY SEGMENT

The roadway segments along Edison Avenue will be evaluated between the study area intersections between Euclid Avenue (SR-83) and Campus Avenue.

## EXISTING COUNT DATA

We are proposing to conduct new traffic counts for the study area intersections and will not apply any further adjustments in establishing the baseline as traffic counts would reflect the current conditions. However, traffic counts will need to be conducted once local schools are back in session for the 2023-2024 school year (after August 19, 2024). There is also construction activity and roadway closures in the area, as such, it is requested the City provide input on whether historic counts be utilized for certain intersections or corridors.

## AMBIENT GROWTH

Near-term cumulative traffic forecasts will be based upon interpolation between Existing and Horizon Year traffic forecasts. However, if applicable, individual cumulative projects will be manually accounted for based on their location and contribution to study area intersections.

## TRAFFIC SIGNAL WARRANTS

Traffic signal warrant analysis will be conducted for all unsignalized full access driveways/intersections following the guidance of the California Manual on Uniform Control Devices (CA MUTCD).

## OPEN ITEMS – CUMULATIVE DEVELOPMENT PROJECTS

It is requested that the City of Ontario provide a current list of cumulative development projects for inclusion in our traffic study. A preliminary list of cumulative development projects is provided in Table 4 and graphically shown in Exhibit 5.

## SPECIAL ISSUES

The Specific Plan proposes to alter the City's General Plan Circulation by eliminating the extension of Cucamonga Avenue and Parco/Comet Avenue south of Edison Avenue. Therefore, the long-range analysis will also evaluate the potential changes associated with the proposed circulation changes. Horizon Year Without Project will evaluate the network as contemplated by the General Plan and Horizon Year With Project conditions will account for the elimination of the aforementioned segments.

The City has completed their Edison Avenue/Ontario Ranch Road Widening Feasibility Study in 2023 and determined that 4-lanes are required along Edison Avenue within the Ontario Ranch area (2-lanes in each direction of travel). The Project Traffic Study will also evaluate the applicable roadway segments of Edison Avenue between Euclid Avenue (SR-83) and Campus Avenue in order to provide an analysis of the proposed 4-lane segment. It is anticipated the Project will be

responsible for the construction of any additional lanes along Edison Avenue needed between Euclid Avenue (SR-83) and Campus Avenue.

## OPEN ITEMS – SIGNAL TIMING

It is requested that the City provide traffic signal timing for any City controlled intersections that we should take into consideration in our operations analysis. Applicable signal timing for Caltrans facilities will be obtained from District 8.

If you have any questions or comments, I can be reached at cso@urbanxroads.com.

**EXHIBIT 5: CUMULATIVE DEVELOPMENT LOCATION MAP**

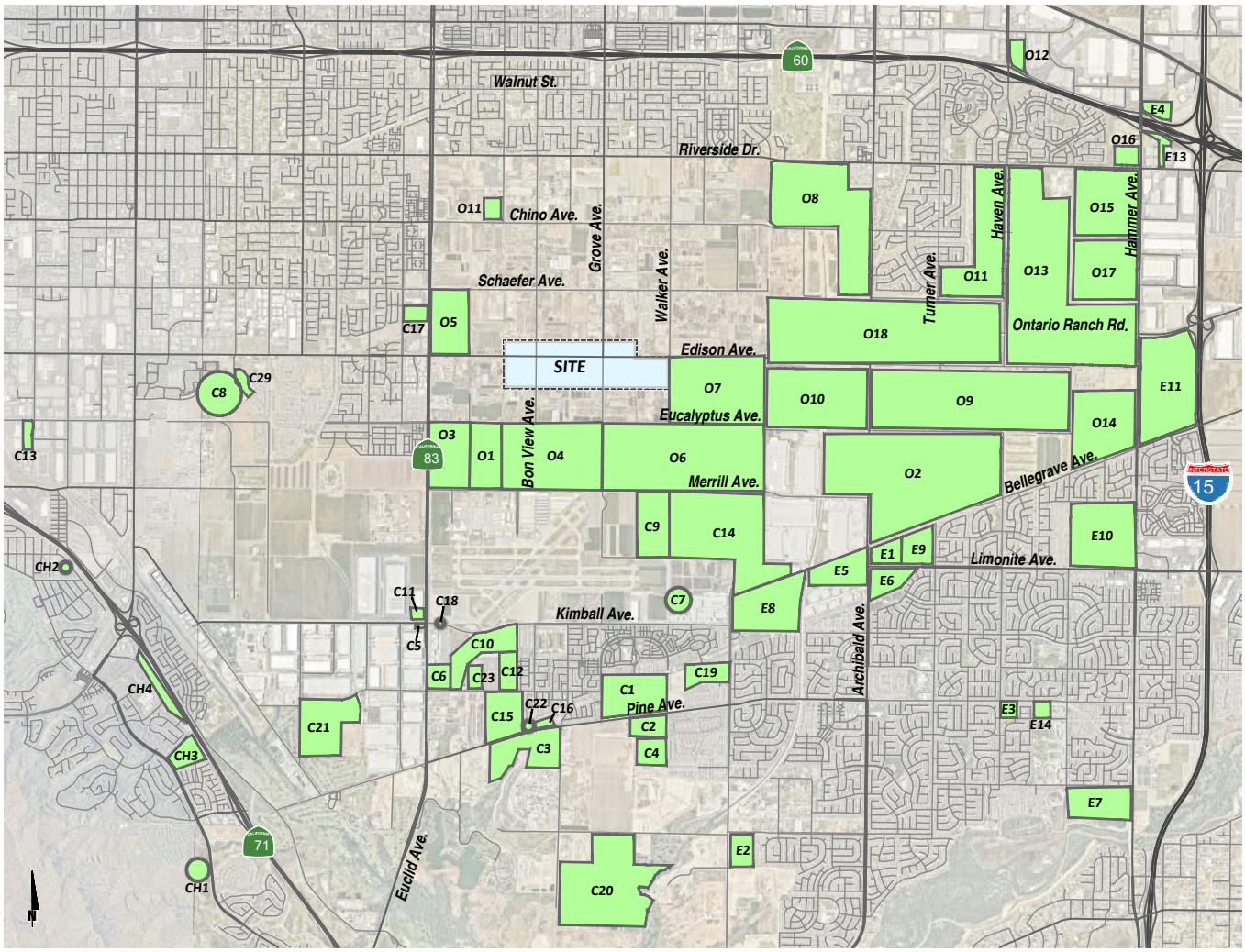

## TABLE 4: SUMMARY OF CUULATIVE DEVELOPMENT PROJECTS

| # | Project/Location | Land Use | Quantity | Units[1] |
|---|---|---|---|---|
| City of Ontario | | | | |
| O1 | Ontario Ranch Business Park | Business Park | 227.951 | TSF |
| | | High-Cube Fulfillment Center Warehouse | 913.053 | TSF |
| | | High-Cube Cold Storage Warehouse | 179.135 | TSF |
| | | Warehouse | 320.551 | TSF |
| O2 | Subarea 29 & Amendment (75% complete) | Single Family Detached | 716 | DU |
| | | Shopping Center | 87.000 | TSF |
| O3 | Ontario Ranch Commerce Center | High-Cube Fulfillment Warehouse | 1,447.123 | TSF |
| | | Business Park | 457.904 | TSF |
| O4 | South Ontario Logistics Center | Business Park | 1,075.235 | TSF |
| | | High-Cube Fulfillment Warehouse | 2,819.282 | TSF |
| | | High-Cube Cold Storage Warehouse | 563.857 | TSF |
| | | Warehousing | 954.218 | TSF |
| O5 | Euclid Mixed-Use | Warehousing | 972.817 | TSF |
| | | Industrial Park | 191.378 | TSF |
| | | Trailer Yard | 12.2 | AC |
| | | Multifamily (Low-Rise) Residential | 466 | DU |
| | | Strip Retail (<40,000 SF) | 10.225 | TSF |
| | | Fast-Food Without Drive-Through Window | 10.000 | TSF |
| | | Fast-Food With Drive-Through Window | 10.000 | TSF |
| O6 | Merrill Commerce Center | High-Cube Fulfillment Warehouse | 7014.000 | TSF |
| | | Business Park | 1441.000 | TSF |
| O7 | Parente Home Ranch SP | Single Family Detached | 270 | DU |
| | | Condo/Townhouse | 1,872 | DU |
| | | General Office | 462.281 | TSF |
| | | Shopping Center | 194.278 | TSF |
| O8 | Countryside | Single Family Detached | 819 | DU |
| | Armstrong Ranch | Single Family Detached | 994 | DU |
| O9 | Grand Park Specific Plan Amendment | Single Family Detached | 484 | DU |
| | | Multi-Family Attached (Condo) | 843 | DU |
| | | Elementary School | 850 | STU |
| | | High School | 2,500 | STU |
| | | County Park | 131.0 | AC |
| O10 | Parkside Specific Plan | Single Family Detached | 804 | DU |
| | | Multi-Family Attached (Apartments) | 2,047 | DU |
| | | Park | 58.9 | AC |
| | | Shopping Center | 15.000 | TSF |
| O11 | West Haven | Single Family Detached | 149 | DU |
| | | Multifamily Housing | 654 | DU |
| | | Elementary School | 650 | STU |
| | | Shopping Center | 87.000 | TSF |
| O12 | Haven Gateway | General Light Industrial | 42.160 | TSF |
| | | High-Cube Warehouse | 168.640 | TSF |
| O13 | Rich Haven | Single Family Detached | 2,732 | DU |
| | | Multi-Family Attached (Condo) | 1,524 | DU |
| | | Shopping Center | 317.400 | TSF |
| O14 | Esperanza | Single Family Detached | 914 | DU |
| | | Multi-Family Attached (Apartments) | 496 | DU |
| O15 | Edenglen | Single Family Detached | 310 | DU |
| | | Multi-Family Attached (Condo) | 274 | DU |
| | | Shopping Center | 217.520 | TSF |
| | | Business Park | 550.000 | TSF |
| O16 | PDEV10-008 - Dry Food Storage | Mini-Warehouse | 17.000 | TSF |

| # | Project/Location | Land Use | Quantity | Units[1] |
|---|---|---|---|---|
| O17 | Tuscana Village | Single Family Detached | 176 | DU |
| | | Shopping Center | 26.000 | TSF |
| O18 | The Avenue | Single Family Detached | 638 | DU |
| | | Multi-Family Attached (Condo) | 1,376 | DU |
| | | Elementary School | 1,600 | STU |
| | | Shopping Center | 204.496 | TSF |
| City of Chino | | | | |
| C1 | Falloncrest at the Preserve | Multifamily Housing (Low-Rise) | 698 | DU |
| | | Multifamily Housing (Mid-Rise) | 440 | DU |
| | | Public Parks | 21.60 | AC |
| | | General Office | 77.597 | TSF |
| | | Shopping Center | 77.597 | TSF |
| C0 | The Preserve Town Center (Blocks 6 and 7) | Multifamily Housing | 549 | DU |
| | | Office | 16.300 | TSF |
| | | Shopping Center | 36.800 | TSF |
| | | Pharmacy with Drive-Thru | 12.900 | TSF |
| | | Supermarket | 45.000 | TSF |
| | | Fast-Food Restaurant with Drive-Thru | 6.500 | TSF |
| | | Fast Casual Restaurant | 13.750 | TSF |
| | | Quality Restaurant | 13.750 | TSF |
| C3 | Pines Community | Single Family Detached | 552 | DU |
| | | Public Park | 3.0 | AC |
| | | Self Storage & RV Storage | 120.000 | TSF |
| | | Sports Park | 41.8 | AC |
| C4 | The Preserve Civic Center | Elementary School | 1,200 | STU |
| | | Library | 10.00 | AC |
| | | Community Center | 10.00 | AC |
| | | Park | 8.00 | AC |
| C5 | Farmer Boys | Fast-food w/ Drive-Thru | 3.218 | TSF |
| | | Shopping Center | 2.300 | TSF |
| C6 | Euclid & Bickmore Warehouse | Warehousing | 205.820 | TSF |
| | | General Light Industrial | 51.030 | TSF |
| | | Business Park | 110.620 | TSF |
| C7 | Kimball Business Park | Business Park | 146.550 | TSF |
| C8 | Chaffey College Expansion | Junior/Community College | 93.50 | AC |
| | College Park Commercial | Shopping Center | 7.50 | AC |
| C9 | The Campus at College Park | Church | 27.000 | TSF |
| | | General Office | 16.969 | TSF |
| | | Shopping Center | 17.785 | TSF |
| | | High-Turnover (Sit Down) Restaurant | 15.876 | TSF |
| C10 | Altitude Business Centre | Warehousing | 715.000 | TSF |
| | | Light Industrial | 255.000 | TSF |
| | | Business Park | 233.000 | TSF |
| | | Self-Storage | 110.000 | TSF |
| C11 | Majestic Gateway | Specialty Retail | 25.000 | TSF |
| | | Pharmacy/Drugstore with Drive-Thru | 13.000 | TSF |
| | | Fast-Food with Drive-Thru | 8.600 | TSF |
| C12 | The Preserve Civic Center | Elementary School | 1,200 | STU |
| | | Library | 10.00 | AC |
| | | Community Center | 10.00 | AC |
| | | Park | 8.00 | AC |
| C13 | Fairfield Inn & Suites (PL 17-0060 & PL 17-0061) | Hotel | 111 | RM |
| C14 | Watson Industrial Park (90% complete) | High-Cube Warehouse | 388.990 | TSF |
| C15 | Ag. Buffer, Bungalow, Lic. Product, Liberty Deluxe, Lyon 2 & 3 | Single Family Detached | 474 | DU |
| C16 | Flores Site | Shopping Center | 4.000 | TSF |
| | | Gas Station w/ convenience store | 16 | VFP |
| | | Express Car Wash | 5.000 | TSF |

| # | Project/Location | Land Use | Quantity | Units[1] |
|---|---|---|---|---|
| C17 | Brewart Residential (Stonebrook - TM 18923) | Single Family Detached | 127 | DU |
| C18 | Archibald's (PL 17-0037) | Fast-Food with Drive-Thru | 3.147 | TSF |
| C19 | Tract 19951, 19952, 19953, 19935 & 18479 | Single Family Detached | 151 | DU |
| | | Condo/Townhouse | 150 | DU |
| C20 | Rancho Miramonte | Single Family Detached | 691 | DU |
| | | Condo/Townhouse | 132 | DU |
| | | Neighborhood Retail | 21.780 | TSF |
| | | Church | 400 | SEAT |
| C21 | Majestic Chino Heritage | High-Cube Fulfillment Warehouse | 1982.700 | TSF |
| | | High-Cube Cold Storage Warehouse | 100.000 | TSF |
| C22 | Church | Church | 47.979 | TSF |
| | | Daycare | 190 | STU |
| C23 | Appesetche Residential | Single Family Detached | 60 | DU |
| | | Condo/Townhouse | 160 | DU |
| City of Eastvale | | | | |
| E1 | The Merge | Warehousing | 336.501 | TSF |
| | | Shopping Center | 4.750 | TSF |
| | | Supermarket | 30.000 | TSF |
| | | Gas Station w/ convenience store | 16 | VFP |
| | | Pharmacy/Drugstore with Drive-Thru | 14.600 | TSF |
| | | Fast-Food with Drive-Thru | 6.000 | TSF |
| | | Automated Car Wash | 4.000 | TSF |
| | | Fast-Food Without Drive-Thru | 7.750 | TSF |
| | | Coffee/Donut Shop With Drive-Thru | 2.500 | TSF |
| E1 | Magnolia Ranch | Single Family Detached | 39 | DU |
| | | Multifamily Housing | 90 | DU |
| E2 | TR29997 | Single Family Detached | 122 | DU |
| E3 | Sumner Place | Multifamily Housing | 216 | DU |
| | | Shopping Center | 2.500 | TSF |
| | | Fast-Food Without Drive-Thru | 2.500 | TSF |
| E4 | S. Milliken Warehouse | High-Cube Warehouse | 280.000 | TSF |
| E5 | PP23219 (PM35865) (50% complete) | General Light Industrial | 738.430 | TSF |
| E6 | Eastvale Shopping Center | Free-Standing Discount Superstore | 192.000 | TSF |
| | | Specialty Retail | 9.200 | TSF |
| | | Fast-Food Without Drive-Thru | 7.200 | TSF |
| | | Coffee/Donut Shop w/ Drive Thru | 2.000 | TSF |
| | | Fast-Food with Drive-Thru | 3.500 | TSF |
| | | Gas Station w/ convenience store and car wash | 16 | VFP |
| E8 | SP00358 - The Ranch at Eastvale (75% complete) | Shopping Center | 267.200 | TSF |
| | | General Light Industrial | 801.500 | TSF |
| | | Business Park | 280.275 | TSF |
| E9 | SC Limonite, LLC | Single Family Detached | 330 | TSF |
| E9 | 15-1508 - Industrial Warehouse | Warehousing | 155.000 | TSF |
| E10 | Leal Master Plan | Lifestyle Center (Commercial) | 1,300.000 | TSF |
| | | General Commercial | 225.000 | TSF |
| | | Office | 920.000 | TSF |
| | | Hotel | 450 | RM |
| | | High Density Residential | 500-660 | DU |
| E11 | Eastvale Commerce Center (75% complete) | Shopping Center | 162.500 | TSF |
| City of Chino Hills | | | | |
| CH1 | Vila Borba Specific Plan (TR 16414) | Single Family Detached | 172 | DU |
| CH2 | Country Club Villas | Condo/Townhouse | 46 | DU |
| CH3 | The Goddard School | Daycare | 10.587 | TSF |
| CH4 | Heritage Professional Center | Hospital | 55.000 | TSF |

[1] TSF = Thousand Square Feet; DU = Dwelling Unit; VFP = Vehicle Fueling Position ; AC = Acres; RM = Rooms

# ATTACHMENT A: INTERNAL CAPTURE WORKSHEETS

| NCHRP 8-51 Internal Trip Capture Estimation Tool | | | |
|---|---|---|---|
| **Project Name:** | Center Park | **Organization:** | Urban Crossroads, Inc. |
| **Project Location:** | Ontario | **Performed By:** | CS |
| **Scenario Description:** | | **Date:** | 8/26/2024 |
| **Analysis Year:** | | **Checked By:** | |
| **Analysis Period:** | **AM Street Peak Hour** | **Date:** | |

**Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)**

| Land Use | Development Data (*For Information Only*) | | | Estimated Vehicle-Trips | | |
|---|---|---|---|---|---|---|
| | ITE LUCs[1] | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 281 | 225 | 56 |
| Retail | | | | 91 | 55 | 36 |
| Restaurant | | | | 3389 | 1845 | 1544 |
| Cinema/Entertainment | | | | 0 | | |
| Residential | | | | 1959 | 482 | 1477 |
| Hotel | | | | 0 | | |
| All Other Land Uses[2] | | | | 0 | | |
| Total | | | | 5720 | 2607 | 3113 |

**Table 2-A: Mode Split and Vehicle Occupancy Estimates**

| Land Use | Entering Trips | | | Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ. | % Transit | % Non-Motorized | Veh. Occ. | % Transit | % Non-Motorized |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |
| All Other Land Uses[2] | | | | | | |

**Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |

**Table 4-A: Internal Person-Trip Origin-Destination Matrix***

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 16 | 35 | 0 | 0 | 0 |
| Retail | 9 | | 5 | 0 | 5 | 0 |
| Restaurant | 32 | 4 | | 0 | 24 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 7 | 9 | 295 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 5-A: Computations Summary**

| | Total | Entering | Exiting |
|---|---|---|---|
| All Person-Trips | 5,720 | 2,607 | 3,113 |
| Internal Capture Percentage | 15% | 17% | 14% |
| | | | |
| External Vehicle-Trips[3] | 4,838 | 2,166 | 2,672 |
| External Transit-Trips[4] | 0 | 0 | 0 |
| External Non-Motorized Trips[4] | 0 | 0 | 0 |

**Table 6-A: Internal Trip Capture Percentages by Land Use**

| Land Use | Entering Trips | Exiting Trips |
|---|---|---|
| Office | 21% | 91% |
| Retail | 53% | 53% |
| Restaurant | 18% | 4% |
| Cinema/Entertainment | N/A | N/A |
| Residential | 6% | 21% |
| Hotel | N/A | N/A |

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.
[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator
[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A
[4]Person-Trips
*Indicates computation that has been rounded to the nearest whole number.

*Estimation Tool Developed by the Texas Transportation Institute*

| NCHRP 8-51 Internal Trip Capture Estimation Tool | | | |
|---|---|---|---|
| **Project Name:** | Center Park | **Organization:** | Urban Crossroads, Inc. |
| **Project Location:** | Ontario | **Performed By:** | CS |
| **Scenario Description:** | | **Date:** | 8/26/2024 |
| **Analysis Year:** | | **Checked By:** | |
| **Analysis Period:** | **PM Street Peak Hour** | **Date:** | |

**Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)**

| Land Use | Development Data (*For Information Only*) | | | Estimated Vehicle-Trips | | |
|---|---|---|---|---|---|---|
| | ITE LUCs[1] | Quantity | Units | Total | Entering | Exiting |
| Office | | | | 364 | 97 | 267 |
| Retail | | | | 254 | 127 | 127 |
| Restaurant | | | | 2557 | 1304 | 1253 |
| Cinema/Entertainment | | | | 0 | | |
| Residential | | | | 2535 | 1597 | 938 |
| Hotel | | | | 0 | | |
| All Other Land Uses[2] | | | | 0 | | |
| Total | | | | 5710 | 3125 | 2585 |

**Table 2-P: Mode Split and Vehicle Occupancy Estimates**

| Land Use | Entering Trips | | | Exiting Trips | | |
|---|---|---|---|---|---|---|
| | Veh. Occ. | % Transit | % Non-Motorized | Veh. Occ. | % Transit | % Non-Motorized |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |
| All Other Land Uses[2] | | | | | | |

**Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)**

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | | | | | |
| Retail | | | | | | |
| Restaurant | | | | | | |
| Cinema/Entertainment | | | | | | |
| Residential | | | | | | |
| Hotel | | | | | | |

**Table 4-P: Internal Person-Trip Origin-Destination Matrix***

| Origin (From) | Destination (To) | | | | | |
|---|---|---|---|---|---|---|
| | Office | Retail | Restaurant | Cinema/Entertainment | Residential | Hotel |
| Office | | 10 | 11 | 0 | 5 | 0 |
| Retail | 3 | | 37 | 0 | 33 | 0 |
| Restaurant | 29 | 64 | | 0 | 226 | 0 |
| Cinema/Entertainment | 0 | 0 | 0 | | 0 | 0 |
| Residential | 38 | 13 | 183 | 0 | | 0 |
| Hotel | 0 | 0 | 0 | 0 | 0 | |

**Table 5-P: Computations Summary**

| | Total | Entering | Exiting |
|---|---|---|---|
| All Person-Trips | 5,710 | 3,125 | 2,585 |
| Internal Capture Percentage | 23% | 21% | 25% |
| | | | |
| External Vehicle-Trips[3] | 4,406 | 2,473 | 1,933 |
| External Transit-Trips[4] | 0 | 0 | 0 |
| External Non-Motorized Trips[4] | 0 | 0 | 0 |

**Table 6-P: Internal Trip Capture Percentages by Land Use**

| Land Use | Entering Trips | Exiting Trips |
|---|---|---|
| Office | 72% | 10% |
| Retail | 69% | 57% |
| Restaurant | 18% | 25% |
| Cinema/Entertainment | N/A | N/A |
| Residential | 17% | 25% |
| Hotel | N/A | N/A |

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.
[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator
[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P
[4]Person-Trips
*Indicates computation that has been rounded to the nearest whole number.

*Estimation Tool Developed by the Texas Transportation Institute*

# APPENDIX 1.2:

# SITE ADJACENT QUEUES

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## Intersection: 14: Campus Av. & Edison Av.

| Movement | EB | EB | EB | WB | WB | WB | NB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | TR | L | T | TR | LTR | LTR |
| Maximum Queue (ft) | 150 | 1394 | 1380 | 150 | 1254 | 1244 | 158 | 426 |
| Average Queue (ft) | 119 | 798 | 794 | 125 | 1114 | 1111 | 63 | 232 |
| 95th Queue (ft) | 188 | 1779 | 1773 | 198 | 1522 | 1513 | 123 | 407 |
| Link Distance (ft) | | 1426 | 1426 | | 1195 | 1195 | 921 | 1223 |
| Upstream Blk Time (%) | | 37 | 35 | | 53 | 38 | | |
| Queuing Penalty (veh) | | 0 | 0 | | 0 | 0 | | |
| Storage Bay Dist (ft) | 100 | | | 100 | | | | |
| Storage Blk Time (%) | 69 | 15 | | 63 | 18 | | | |
| Queuing Penalty (veh) | 634 | 11 | | 752 | 22 | | | |

## Intersection: 17: Bon View Av. & Edison Av.

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | T | TR | L | T | T | T | R | L | TR |
| Maximum Queue (ft) | 200 | 435 | 425 | 407 | 325 | 350 | 1028 | 948 | 785 | 102 | 200 | 1310 |
| Average Queue (ft) | 174 | 307 | 288 | 252 | 212 | 331 | 606 | 574 | 299 | 34 | 187 | 1279 |
| 95th Queue (ft) | 237 | 430 | 410 | 367 | 321 | 403 | 1032 | 995 | 543 | 72 | 249 | 1300 |
| Link Distance (ft) | | 1196 | 1196 | 1196 | 1196 | | 1255 | 1255 | 1255 | 1255 | | 1256 |
| Upstream Blk Time (%) | | | | | | | 0 | | | | | 79 |
| Queuing Penalty (veh) | | | | | | | 0 | | | | | 0 |
| Storage Bay Dist (ft) | 150 | | | | | 300 | | | | | 150 | |
| Storage Blk Time (%) | 23 | 42 | | | | 62 | 4 | | | | 20 | 53 |
| Queuing Penalty (veh) | 70 | 68 | | | | 291 | 15 | | | | 125 | 196 |

## Intersection: 17: Bon View Av. & Edison Av.

| Movement | SB | SB |
|---|---|---|
| Directions Served | L | TR |
| Maximum Queue (ft) | 200 | 439 |
| Average Queue (ft) | 153 | 201 |
| 95th Queue (ft) | 228 | 411 |
| Link Distance (ft) | | 2533 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | 150 | |
| Storage Blk Time (%) | 26 | 12 |
| Queuing Penalty (veh) | 59 | 22 |

## Intersection: 19: Edison Av. & Cucamonga Av.

| Movement | EB | EB | EB | WB | WB | SB |
|---|---|---|---|---|---|---|
| Directions Served | L | T | T | T | TR | LR |
| Maximum Queue (ft) | 134 | 467 | 467 | 1267 | 1260 | 230 |
| Average Queue (ft) | 41 | 178 | 177 | 1160 | 1155 | 121 |
| 95th Queue (ft) | 102 | 354 | 354 | 1447 | 1438 | 206 |
| Link Distance (ft) | | 1198 | 1198 | 1221 | 1221 | 730 |
| Upstream Blk Time (%) | | | | 25 | 18 | |
| Queuing Penalty (veh) | | | | 0 | 0 | |
| Storage Bay Dist (ft) | 100 | | | | | |
| Storage Blk Time (%) | 5 | 9 | | | | |
| Queuing Penalty (veh) | 63 | 3 | | | | |

## Intersection: 26: Grove Av. & Edison Av.

| Movement | EB | EB | EB | EB | EB | EB | WB | WB | WB | WB | WB | WB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | TR | L | L | T | T | T | TR |
| Maximum Queue (ft) | 240 | 291 | 340 | 322 | 311 | 362 | 145 | 300 | 592 | 576 | 533 | 471 |
| Average Queue (ft) | 142 | 167 | 225 | 218 | 200 | 206 | 65 | 195 | 406 | 388 | 358 | 330 |
| 95th Queue (ft) | 214 | 250 | 303 | 296 | 279 | 313 | 123 | 374 | 650 | 618 | 575 | 540 |
| Link Distance (ft) | | | 1170 | 1170 | 1170 | 1170 | | | 1177 | 1177 | 1177 | 1177 |
| Upstream Blk Time (%) | | | | | | | | | | | | |
| Queuing Penalty (veh) | | | | | | | | | | | | |
| Storage Bay Dist (ft) | 250 | 250 | | | | | 250 | 250 | | | | |
| Storage Blk Time (%) | 0 | 0 | 4 | | | | | 0 | 36 | | | |
| Queuing Penalty (veh) | 0 | 1 | 13 | | | | | 0 | 68 | | | |

## Intersection: 26: Grove Av. & Edison Av.

| Movement | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | L | T | TR | L | T | TR |
| Maximum Queue (ft) | 250 | 437 | 379 | 318 | 492 | 518 |
| Average Queue (ft) | 224 | 246 | 203 | 206 | 291 | 317 |
| 95th Queue (ft) | 280 | 419 | 336 | 354 | 516 | 537 |
| Link Distance (ft) | | 1255 | 1255 | | 5472 | 5472 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 200 | | | 300 | | |
| Storage Blk Time (%) | 29 | 5 | | 0 | 14 | |
| Queuing Penalty (veh) | 63 | 16 | | 1 | 30 | |

## Intersection: 28: Edison Av. & Parco Av.

| Movement | EB | EB | EB | WB | WB | SB |
|---|---|---|---|---|---|---|
| Directions Served | L | T | T | T | TR | LR |
| Maximum Queue (ft) | 150 | 1245 | 1244 | 1201 | 1200 | 181 |
| Average Queue (ft) | 131 | 1017 | 1008 | 1035 | 1052 | 98 |
| 95th Queue (ft) | 181 | 1597 | 1589 | 1464 | 1437 | 161 |
| Link Distance (ft) | | 1198 | 1198 | 1154 | 1154 | 543 |
| Upstream Blk Time (%) | | 52 | 46 | 21 | 15 | |
| Queuing Penalty (veh) | | 0 | 0 | 0 | 0 | |
| Storage Bay Dist (ft) | 100 | | | | | |
| Storage Blk Time (%) | 84 | 10 | | | | |
| Queuing Penalty (veh) | 1131 | 5 | | | | |

## Intersection: 31: Walker Av. & Edison Av.

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | T | R | L | T | TR | L | TR | L | TR |
| Maximum Queue (ft) | 129 | 374 | 384 | 332 | 206 | 450 | 1833 | 1842 | 450 | 1308 | 200 | 685 |
| Average Queue (ft) | 25 | 272 | 261 | 227 | 91 | 335 | 1314 | 1311 | 446 | 1215 | 177 | 330 |
| 95th Queue (ft) | 92 | 350 | 350 | 309 | 162 | 591 | 2094 | 2089 | 487 | 1500 | 240 | 623 |
| Link Distance (ft) | | 1156 | 1156 | 1156 | | | 1797 | 1797 | | 1256 | | 816 |
| Upstream Blk Time (%) | | | | | | | 26 | 25 | | 55 | | 0 |
| Queuing Penalty (veh) | | | | | | | 0 | 0 | | 0 | | 0 |
| Storage Bay Dist (ft) | 100 | | | | 500 | 400 | | | 400 | | 150 | |
| Storage Blk Time (%) | 0 | 47 | | | | 0 | 50 | | 29 | 42 | 55 | 14 |
| Queuing Penalty (veh) | 0 | 9 | | | | 0 | 88 | | 163 | 181 | 112 | 24 |

## Network Summary

Network wide Queuing Penalty: 4235

## Intersection: 14: Campus Av. & Edison Av.

| Movement | EB | EB | EB | WB | WB | WB | NB | SB |
|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | TR | L | T | TR | LTR | LTR |
| Maximum Queue (ft) | 150 | 1482 | 1475 | 149 | 784 | 779 | 452 | 360 |
| Average Queue (ft) | 143 | 1445 | 1441 | 44 | 369 | 368 | 257 | 170 |
| 95th Queue (ft) | 168 | 1465 | 1474 | 130 | 812 | 811 | 447 | 303 |
| Link Distance (ft) | | 1426 | 1426 | | 1202 | 1202 | 923 | 1262 |
| Upstream Blk Time (%) | | 91 | 84 | | 5 | 4 | | |
| Queuing Penalty (veh) | | 0 | 0 | | 0 | 0 | | |
| Storage Bay Dist (ft) | 100 | | | 100 | | | | |
| Storage Blk Time (%) | 93 | 21 | | 11 | 19 | | | |
| Queuing Penalty (veh) | 1218 | 22 | | 121 | 6 | | | |

## Intersection: 17: Bon View Av. & Edison Av.

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | WB | WB | NB | NB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | T | TR | L | T | T | T | R | L | TR |
| Maximum Queue (ft) | 200 | 566 | 546 | 516 | 472 | 350 | 1257 | 1241 | 1224 | 893 | 200 | 1310 |
| Average Queue (ft) | 140 | 398 | 384 | 350 | 314 | 350 | 1161 | 1134 | 692 | 87 | 176 | 1266 |
| 95th Queue (ft) | 248 | 531 | 517 | 477 | 440 | 350 | 1418 | 1441 | 1495 | 410 | 252 | 1388 |
| Link Distance (ft) | | 1181 | 1181 | 1181 | 1181 | | 1209 | 1209 | 1209 | 1209 | | 1256 |
| Upstream Blk Time (%) | | | | | | | 69 | 29 | 0 | 0 | | 88 |
| Queuing Penalty (veh) | | | | | | | 0 | 0 | 0 | 0 | | 0 |
| Storage Bay Dist (ft) | 150 | | | | | 300 | | | | | 150 | |
| Storage Blk Time (%) | 3 | 49 | | | | 83 | 0 | | | | 15 | 74 |
| Queuing Penalty (veh) | 16 | 55 | | | | 341 | 0 | | | | 79 | 144 |

## Intersection: 17: Bon View Av. & Edison Av.

| Movement | SB | SB |
|---|---|---|
| Directions Served | L | TR |
| Maximum Queue (ft) | 199 | 598 |
| Average Queue (ft) | 171 | 345 |
| 95th Queue (ft) | 242 | 765 |
| Link Distance (ft) | | 2563 |
| Upstream Blk Time (%) | | |
| Queuing Penalty (veh) | | |
| Storage Bay Dist (ft) | 150 | |
| Storage Blk Time (%) | 45 | 20 |
| Queuing Penalty (veh) | 102 | 36 |

## Intersection: 19: Edison Av. & Cucamonga Av.

| Movement | EB | EB | EB | WB | WB | SB |
|---|---|---|---|---|---|---|
| Directions Served | L | T | T | T | TR | LR |
| Maximum Queue (ft) | 149 | 1263 | 1256 | 1205 | 1203 | 191 |
| Average Queue (ft) | 52 | 1094 | 1099 | 958 | 968 | 85 |
| 95th Queue (ft) | 122 | 1529 | 1495 | 1415 | 1400 | 153 |
| Link Distance (ft) | | 1214 | 1214 | 1160 | 1160 | 730 |
| Upstream Blk Time (%) | | 18 | 17 | 17 | 11 | |
| Queuing Penalty (veh) | | 0 | 0 | 0 | 0 | |
| Storage Bay Dist (ft) | 100 | | | | | |
| Storage Blk Time (%) | 6 | 18 | | | | |
| Queuing Penalty (veh) | 96 | 7 | | | | |

## Intersection: 26: Grove Av. & Edison Av.

| Movement | EB | EB | EB | EB | EB | EB | WB | WB | WB | WB | WB | WB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | L | T | T | T | TR | L | L | T | T | T | TR |
| Maximum Queue (ft) | 226 | 300 | 1148 | 1144 | 1108 | 1039 | 183 | 299 | 382 | 359 | 326 | 328 |
| Average Queue (ft) | 119 | 274 | 898 | 866 | 789 | 714 | 91 | 145 | 258 | 249 | 224 | 203 |
| 95th Queue (ft) | 190 | 374 | 1298 | 1247 | 1139 | 1059 | 184 | 260 | 340 | 328 | 302 | 286 |
| Link Distance (ft) | | | 1142 | 1142 | 1142 | 1142 | | | 1194 | 1194 | 1194 | 1194 |
| Upstream Blk Time (%) | | | 8 | 3 | 0 | 0 | | | | | | |
| Queuing Penalty (veh) | | | 0 | 0 | 0 | 0 | | | | | | |
| Storage Bay Dist (ft) | 250 | 250 | | | | | 250 | 250 | | | | |
| Storage Blk Time (%) | 0 | 0 | 60 | | | | 0 | 1 | 8 | | | |
| Queuing Penalty (veh) | 1 | 1 | 168 | | | | 2 | 3 | 17 | | | |

## Intersection: 26: Grove Av. & Edison Av.

| Movement | NB | NB | NB | SB | SB | SB |
|---|---|---|---|---|---|---|
| Directions Served | L | T | TR | L | T | TR |
| Maximum Queue (ft) | 250 | 513 | 483 | 350 | 540 | 521 |
| Average Queue (ft) | 215 | 299 | 284 | 270 | 278 | 290 |
| 95th Queue (ft) | 293 | 498 | 458 | 391 | 487 | 467 |
| Link Distance (ft) | | 1250 | 1250 | | 5473 | 5473 |
| Upstream Blk Time (%) | | | | | | |
| Queuing Penalty (veh) | | | | | | |
| Storage Bay Dist (ft) | 200 | | | 300 | | |
| Storage Blk Time (%) | 25 | 21 | | 11 | 7 | |
| Queuing Penalty (veh) | 58 | 60 | | 29 | 26 | |

## Intersection: 28: Edison Av. & Parco Av.

| Movement | EB | EB | EB | WB | WB | SB |
|---|---|---|---|---|---|---|
| Directions Served | L | T | T | T | TR | LR |
| Maximum Queue (ft) | 150 | 1209 | 1198 | 1226 | 1231 | 217 |
| Average Queue (ft) | 120 | 1095 | 1104 | 1092 | 1087 | 107 |
| 95th Queue (ft) | 177 | 1436 | 1405 | 1462 | 1436 | 183 |
| Link Distance (ft) | | 1155 | 1155 | 1185 | 1185 | 543 |
| Upstream Blk Time (%) | | 38 | 32 | 23 | 16 | |
| Queuing Penalty (veh) | | 0 | 0 | 0 | 0 | |
| Storage Bay Dist (ft) | 100 | | | | | |
| Storage Blk Time (%) | 73 | 17 | | | | |
| Queuing Penalty (veh) | 1197 | 8 | | | | |

## Intersection: 31: Walker Av. & Edison Av.

| Movement | EB | EB | EB | EB | EB | WB | WB | WB | NB | NB | SB | SB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Directions Served | L | T | T | T | R | L | T | TR | L | TR | L | TR |
| Maximum Queue (ft) | 134 | 1233 | 1228 | 1229 | 550 | 450 | 3648 | 3669 | 450 | 1307 | 200 | 435 |
| Average Queue (ft) | 35 | 1179 | 1175 | 1175 | 540 | 450 | 2805 | 2800 | 447 | 1145 | 150 | 192 |
| 95th Queue (ft) | 110 | 1321 | 1322 | 1330 | 637 | 450 | 4405 | 4403 | 469 | 1561 | 222 | 356 |
| Link Distance (ft) | | 1184 | 1184 | 1184 | | | 3612 | 3612 | | 1256 | | 816 |
| Upstream Blk Time (%) | | 39 | 48 | 55 | | | 44 | 42 | | 63 | | |
| Queuing Penalty (veh) | | 0 | 0 | 0 | | | 0 | 0 | | 0 | | |
| Storage Bay Dist (ft) | 100 | | | | 500 | 400 | | | 400 | | 150 | |
| Storage Blk Time (%) | 0 | 59 | | 55 | 0 | 92 | 6 | | 82 | 8 | 12 | 15 |
| Queuing Penalty (veh) | 0 | 13 | | 264 | 0 | 738 | 21 | | 238 | 25 | 25 | 24 |

## Network Summary

Network wide Queuing Penalty: 5165

# APPENDIX 3.1:

# TRAFFIC COUNTS

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Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 144 | 107 | 48 | 251 | 81 | 0 | 71 | 36 | 152 | 57 | 133 | 0 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 84 | 593 | 677 |
| 07:15 AM | 0 | 168 | 104 | 50 | 272 | 93 | 1 | 124 | 47 | 218 | 65 | 128 | 0 | 0 | 193 | 0 | 0 | 0 | 0 | 0 | 97 | 683 | 780 |
| 07:30 AM | 0 | 169 | 110 | 48 | 279 | 72 | 0 | 98 | 53 | 170 | 75 | 165 | 0 | 0 | 240 | 0 | 0 | 0 | 0 | 0 | 101 | 689 | 790 |
| 07:45 AM | 0 | 197 | 111 | 54 | 308 | 73 | 0 | 114 | 43 | 187 | 66 | 207 | 0 | 0 | 273 | 0 | 0 | 0 | 0 | 0 | 97 | 768 | 865 |
| Total | 0 | 678 | 432 | 200 | 1110 | 319 | 1 | 407 | 179 | 727 | 263 | 633 | 0 | 0 | 896 | 0 | 0 | 0 | 0 | 0 | 379 | 2733 | 3112 |
| 08:00 AM | 0 | 185 | 133 | 60 | 318 | 63 | 0 | 98 | 39 | 161 | 59 | 177 | 0 | 0 | 236 | 0 | 0 | 0 | 0 | 0 | 99 | 715 | 814 |
| 08:15 AM | 0 | 220 | 100 | 39 | 320 | 74 | 0 | 74 | 27 | 148 | 59 | 148 | 0 | 0 | 207 | 0 | 0 | 0 | 0 | 0 | 66 | 675 | 741 |
| 08:30 AM | 0 | 163 | 90 | 38 | 253 | 84 | 0 | 57 | 29 | 141 | 65 | 124 | 0 | 0 | 189 | 0 | 0 | 0 | 0 | 0 | 67 | 583 | 650 |
| 08:45 AM | 0 | 133 | 81 | 28 | 214 | 81 | 0 | 65 | 30 | 146 | 56 | 156 | 0 | 0 | 212 | 0 | 0 | 0 | 0 | 0 | 58 | 572 | 630 |
| Total | 0 | 701 | 404 | 165 | 1105 | 302 | 0 | 294 | 125 | 596 | 239 | 605 | 0 | 0 | 844 | 0 | 0 | 0 | 0 | 0 | 290 | 2545 | 2835 |
| Grand Total | 0 | 1379 | 836 | 365 | 2215 | 621 | 1 | 701 | 304 | 1323 | 502 | 1238 | 0 | 0 | 1740 | 0 | 0 | 0 | 0 | 0 | 669 | 5278 | 5947 |
| Apprch % | 0 | 62.3 | 37.7 | | | 46.9 | 0.1 | 53 | | | 28.9 | 71.1 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 26.1 | 15.8 | | 42 | 11.8 | 0 | 13.3 | | 25.1 | 9.5 | 23.5 | 0 | | 33 | 0 | 0 | 0 | | 0 | 11.2 | 88.8 | |
| Passenger Vehicles | 0 | 1307 | 786 | | 2441 | 359 | 0 | 679 | | 1336 | 350 | 1149 | 0 | | 1499 | 0 | 0 | 0 | | 0 | 0 | 0 | 5276 |
| % Passenger Vehicles | 0 | 94.8 | 94 | 95.3 | 94.6 | 57.8 | 0 | 96.9 | 98 | 82.1 | 69.7 | 92.8 | 0 | 0 | 86.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 88.7 |
| Large 2 Axle Vehicles | 0 | 28 | 14 | | 49 | 40 | 1 | 12 | | 56 | 13 | 31 | 0 | | 44 | 0 | 0 | 0 | | 0 | 0 | 0 | 149 |
| % Large 2 Axle Vehicles | 0 | 2 | 1.7 | 1.9 | 1.9 | 6.4 | 100 | 1.7 | 1 | 3.4 | 2.6 | 2.5 | 0 | 0 | 2.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.5 |
| 3 Axle Vehicles | 0 | 13 | 9 | | 24 | 47 | 0 | 1 | | 48 | 19 | 12 | 0 | | 31 | 0 | 0 | 0 | | 0 | 0 | 0 | 103 |
| % 3 Axle Vehicles | 0 | 0.9 | 1.1 | 0.5 | 0.9 | 7.6 | 0 | 0.1 | 0 | 3 | 3.8 | 1 | 0 | 0 | 1.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.7 |
| 4+ Axle Trucks | 0 | 31 | 27 | | 66 | 175 | 0 | 9 | | 187 | 120 | 46 | 0 | | 166 | 0 | 0 | 0 | | 0 | 0 | 0 | 419 |
| % 4+ Axle Trucks | 0 | 2.2 | 3.2 | 2.2 | 2.6 | 28.2 | 0 | 1.3 | 1 | 11.5 | 23.9 | 3.7 | 0 | 0 | 9.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 168 | 104 | 272 | **93** | **1** | **124** | **218** | 65 | 128 | 0 | 193 | 0 | 0 | 0 | 0 | 683 |
| 07:30 AM | 0 | 169 | 110 | 279 | 72 | 0 | 98 | 170 | **75** | 165 | 0 | 240 | 0 | 0 | 0 | 0 | 689 |
| 07:45 AM | 0 | **197** | 111 | 308 | 73 | 0 | 114 | 187 | 66 | **207** | 0 | **273** | 0 | 0 | 0 | 0 | **768** |
| 08:00 AM | 0 | 185 | **133** | **318** | 63 | 0 | 98 | 161 | 59 | 177 | 0 | 236 | 0 | 0 | 0 | 0 | 715 |
| Total Volume | 0 | 719 | 458 | 1177 | 301 | 1 | 434 | 736 | 265 | 677 | 0 | 942 | 0 | 0 | 0 | 0 | 2855 |
| % App. Total | 0 | 61.1 | 38.9 | | 40.9 | 0.1 | 59 | | 28.1 | 71.9 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .912 | .861 | .925 | .809 | .250 | .875 | .844 | .883 | .818 | .000 | .863 | .000 | .000 | .000 | .000 | .929 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

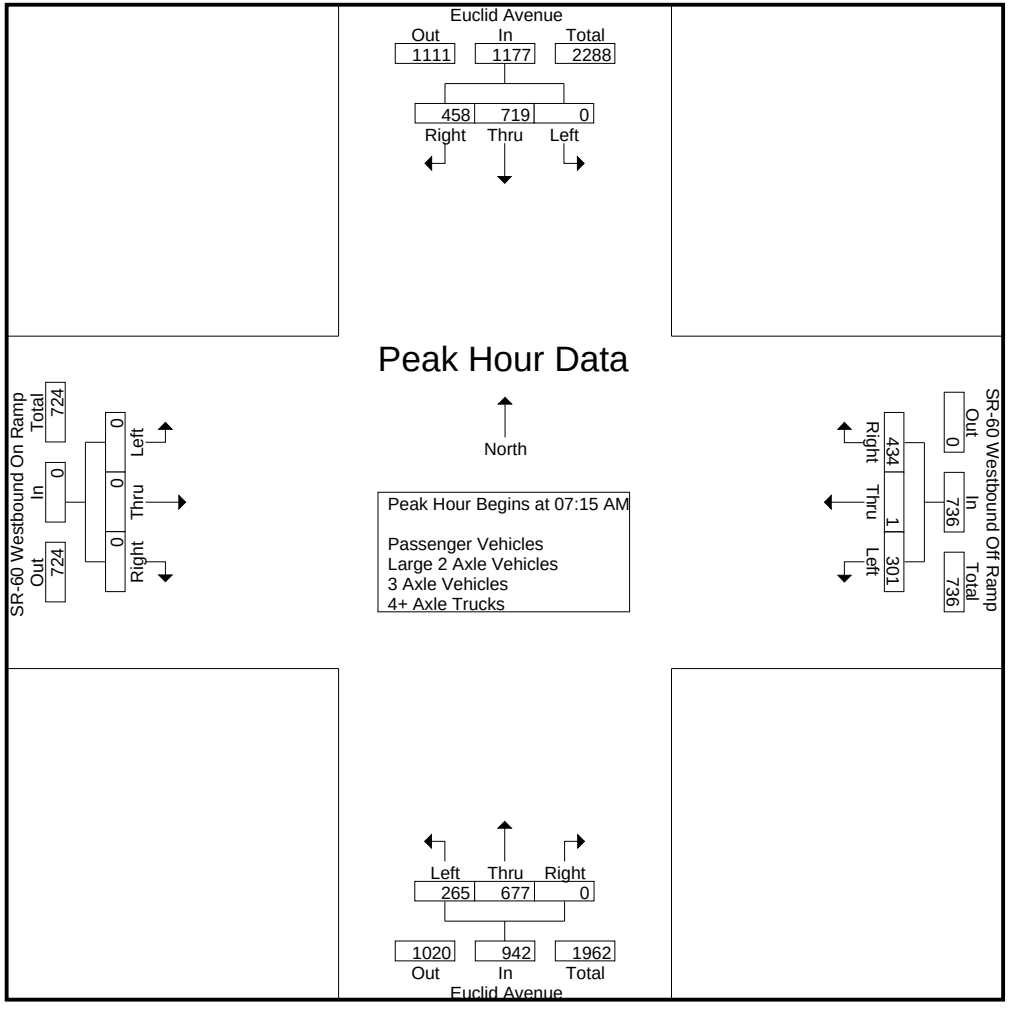

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| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:15 AM | | | | 07:30 AM | | | | 07:00 AM | | | | |
| +0 mins. | 0 | 169 | 110 | 279 | **93** | **1** | **124** | **218** | **75** | 165 | 0 | 240 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 197 | 111 | 308 | 72 | 0 | 98 | 170 | 66 | **207** | 0 | **273** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 185 | **133** | 318 | 73 | 0 | 114 | 187 | 59 | 177 | 0 | 236 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **220** | 100 | **320** | 63 | 0 | 98 | 161 | 59 | 148 | 0 | 207 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 771 | 454 | 1225 | 301 | 1 | 434 | 736 | 259 | 697 | 0 | 956 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 62.9 | 37.1 | | 40.9 | 0.1 | 59 | | 27.1 | 72.9 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .876 | .853 | .957 | .809 | .250 | .875 | .844 | .863 | .842 | .000 | .875 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 135 | 98 | 45 | 233 | 55 | 0 | 71 | 36 | 126 | 39 | 123 | 0 | 0 | 162 | 0 | 0 | 0 | 0 | 0 | 81 | 521 | 602 |
| 07:15 AM | 0 | 162 | 100 | 48 | 262 | 63 | 0 | 118 | 46 | 181 | 48 | 123 | 0 | 0 | 171 | 0 | 0 | 0 | 0 | 0 | 94 | 614 | 708 |
| 07:30 AM | 0 | 160 | 105 | 46 | 265 | 43 | 0 | 95 | 52 | 138 | 56 | 158 | 0 | 0 | 214 | 0 | 0 | 0 | 0 | 0 | 98 | 617 | 715 |
| 07:45 AM | 0 | 189 | 108 | 53 | 297 | 47 | 0 | 112 | 43 | 159 | 43 | 198 | 0 | 0 | 241 | 0 | 0 | 0 | 0 | 0 | 96 | 697 | 793 |
| Total | 0 | 646 | 411 | 192 | 1057 | 208 | 0 | 396 | 177 | 604 | 186 | 602 | 0 | 0 | 788 | 0 | 0 | 0 | 0 | 0 | 369 | 2449 | 2818 |
| 08:00 AM | 0 | 176 | 131 | 60 | 307 | 35 | 0 | 95 | 38 | 130 | 35 | 157 | 0 | 0 | 192 | 0 | 0 | 0 | 0 | 0 | 98 | 629 | 727 |
| 08:15 AM | 0 | 212 | 94 | 37 | 306 | 38 | 0 | 71 | 26 | 109 | 38 | 131 | 0 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | 63 | 584 | 647 |
| 08:30 AM | 0 | 152 | 79 | 35 | 231 | 40 | 0 | 55 | 28 | 95 | 47 | 113 | 0 | 0 | 160 | 0 | 0 | 0 | 0 | 0 | 63 | 486 | 549 |
| 08:45 AM | 0 | 121 | 71 | 24 | 192 | 38 | 0 | 62 | 29 | 100 | 44 | 146 | 0 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 53 | 482 | 535 |
| Total | 0 | 661 | 375 | 156 | 1036 | 151 | 0 | 283 | 121 | 434 | 164 | 547 | 0 | 0 | 711 | 0 | 0 | 0 | 0 | 0 | 277 | 2181 | 2458 |
| Grand Total | 0 | 1307 | 786 | 348 | 2093 | 359 | 0 | 679 | 298 | 1038 | 350 | 1149 | 0 | 0 | 1499 | 0 | 0 | 0 | 0 | 0 | 646 | 4630 | 5276 |
| Apprch % | 0 | 62.4 | 37.6 | | | 34.6 | 0 | 65.4 | | | 23.3 | 76.7 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 28.2 | 17 | | 45.2 | 7.8 | 0 | 14.7 | | 22.4 | 7.6 | 24.8 | 0 | | 32.4 | 0 | 0 | 0 | | 0 | 12.2 | 87.8 | |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 162 | 100 | 262 | **63** | 0 | **118** | **181** | 48 | 123 | 0 | 171 | 0 | 0 | 0 | 0 | 614 |
| 07:30 AM | 0 | 160 | 105 | 265 | 43 | 0 | 95 | 138 | **56** | 158 | 0 | 214 | 0 | 0 | 0 | 0 | 617 |
| 07:45 AM | 0 | **189** | 108 | 297 | 47 | 0 | 112 | 159 | 43 | **198** | 0 | **241** | 0 | 0 | 0 | 0 | **697** |
| 08:00 AM | 0 | 176 | **131** | **307** | 35 | 0 | 95 | 130 | 35 | 157 | 0 | 192 | 0 | 0 | 0 | 0 | 629 |
| Total Volume | 0 | 687 | 444 | 1131 | 188 | 0 | 420 | 608 | 182 | 636 | 0 | 818 | 0 | 0 | 0 | 0 | 2557 |
| % App. Total | 0 | 60.7 | 39.3 | | 30.9 | 0 | 69.1 | | 22.2 | 77.8 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .909 | .847 | .921 | .746 | .000 | .890 | .840 | .813 | .803 | .000 | .849 | .000 | .000 | .000 | .000 | .917 |

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

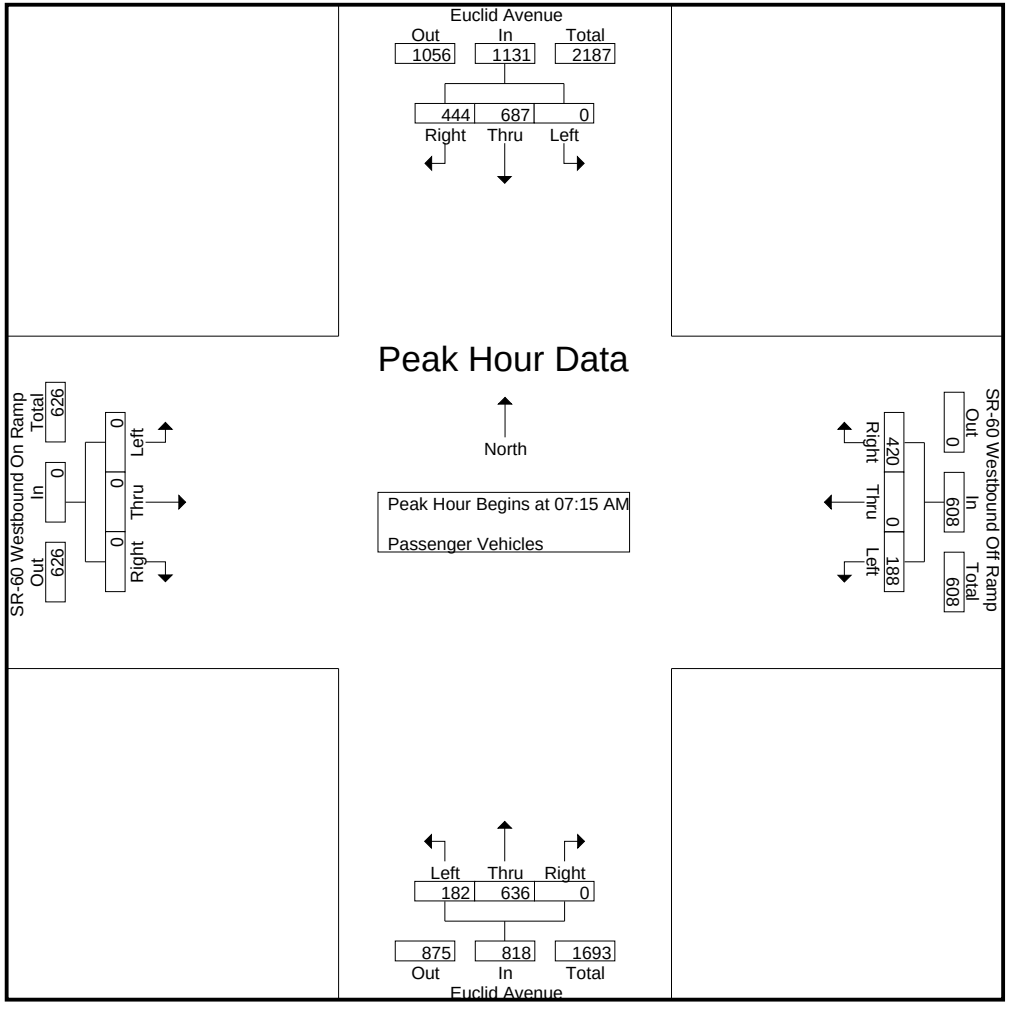

Counts Unlimited, Inc.
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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | 162 | 100 | 262 | **63** | 0 | **118** | **181** | 48 | 123 | 0 | 171 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 160 | 105 | 265 | 43 | 0 | 95 | 138 | **56** | 158 | 0 | 214 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **189** | 108 | 297 | 47 | 0 | 112 | 159 | 43 | **198** | 0 | **241** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 176 | **131** | **307** | 35 | 0 | 95 | 130 | 35 | 157 | 0 | 192 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 687 | 444 | 1131 | 188 | 0 | 420 | 608 | 182 | 636 | 0 | 818 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 60.7 | 39.3 | | 30.9 | 0 | 69.1 | | 22.2 | 77.8 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .909 | .847 | .921 | .746 | .000 | .890 | .840 | .813 | .803 | .000 | .849 | .000 | .000 | .000 | .000 | |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 5 | 4 | 2 | 9 | 5 | 0 | 0 | 0 | 5 | 3 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 18 | 20 |
| 07:15 AM | 0 | 4 | 2 | 2 | 6 | 5 | 1 | 1 | 0 | 7 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 16 | 18 |
| 07:30 AM | 0 | 6 | 1 | 0 | 7 | 5 | 0 | 1 | 0 | 6 | 3 | 4 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 07:45 AM | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 2 | 0 | 4 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Total | 0 | 17 | 7 | 4 | 24 | 17 | 1 | 4 | 0 | 22 | 7 | 11 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 4 | 64 | 68 |
| 08:00 AM | 0 | 3 | 1 | 0 | 4 | 5 | 0 | 1 | 0 | 6 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 16 |
| 08:15 AM | 0 | 2 | 2 | 1 | 4 | 7 | 0 | 3 | 1 | 10 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 21 | 23 |
| 08:30 AM | 0 | 2 | 2 | 1 | 4 | 5 | 0 | 2 | 1 | 7 | 2 | 7 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 2 | 20 | 22 |
| 08:45 AM | 0 | 4 | 2 | 1 | 6 | 6 | 0 | 2 | 1 | 8 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 18 | 20 |
| Total | 0 | 11 | 7 | 3 | 18 | 23 | 0 | 8 | 3 | 31 | 6 | 20 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 6 | 75 | 81 |
| Grand Total | 0 | 28 | 14 | 7 | 42 | 40 | 1 | 12 | 3 | 53 | 13 | 31 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 10 | 139 | 149 |
| Apprch % | 0 | 66.7 | 33.3 | | | 75.5 | 1.9 | 22.6 | | | 29.5 | 70.5 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 20.1 | 10.1 | | 30.2 | 28.8 | 0.7 | 8.6 | | 38.1 | 9.4 | 22.3 | 0 | | 31.7 | 0 | 0 | 0 | | 0 | 6.7 | 93.3 | |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 4 | **2** | 6 | **5** | **1** | 1 | **7** | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 16 |
| 07:30 AM | 0 | **6** | 1 | **7** | 5 | 0 | 1 | 6 | **3** | 4 | 0 | **7** | 0 | 0 | 0 | 0 | **20** |
| 07:45 AM | 0 | 2 | 0 | 2 | 2 | 0 | **2** | 4 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 10 |
| 08:00 AM | 0 | 3 | 1 | 4 | 5 | 0 | 1 | 6 | 1 | **5** | 0 | 6 | 0 | 0 | 0 | 0 | 16 |
| Total Volume | 0 | 15 | 4 | 19 | 17 | 1 | 5 | 23 | 5 | 15 | 0 | 20 | 0 | 0 | 0 | 0 | 62 |
| % App. Total | 0 | 78.9 | 21.1 | | 73.9 | 4.3 | 21.7 | | 25 | 75 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .500 | .679 | .850 | .250 | .625 | .821 | .417 | .750 | .000 | .714 | .000 | .000 | .000 | .000 | .775 |

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PO Box 1178
Corona, CA 92878
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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

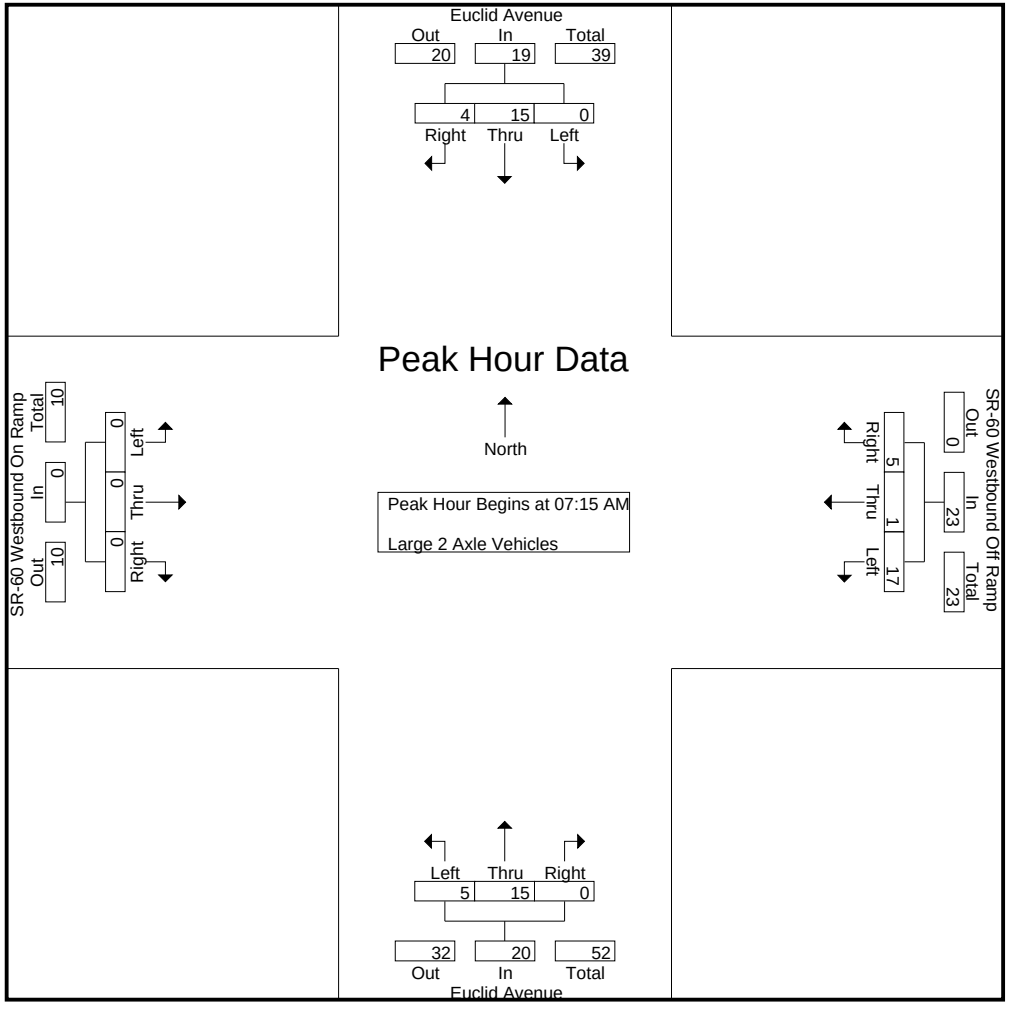

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | 4 | **2** | 6 | **5** | **1** | 1 | **7** | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | **6** | 1 | **7** | 5 | 0 | 1 | 6 | **3** | 4 | 0 | **7** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 2 | 0 | 2 | 2 | 0 | **2** | 4 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 3 | 1 | 4 | 5 | 0 | 1 | 6 | 1 | **5** | 0 | 6 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 15 | 4 | 19 | 17 | 1 | 5 | 23 | 5 | 15 | 0 | 20 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 78.9 | 21.1 | | 73.9 | 4.3 | 21.7 | | 25 | 75 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .500 | .679 | .850 | .250 | .625 | .821 | .417 | .750 | .000 | .714 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 1 | 2 | 0 | 3 | 5 | 0 | 0 | 0 | 5 | 3 | 3 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 |
| 07:15 AM | 0 | 1 | 1 | 0 | 2 | 11 | 0 | 0 | 0 | 11 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 16 |
| 07:30 AM | 0 | 2 | 3 | 2 | 5 | 5 | 0 | 1 | 0 | 6 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 14 | 16 |
| 07:45 AM | 0 | 2 | 1 | 0 | 3 | 4 | 0 | 0 | 0 | 4 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| Total | 0 | 6 | 7 | 2 | 13 | 25 | 0 | 1 | 0 | 26 | 10 | 6 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 2 | 55 | 57 |
| 08:00 AM | 0 | 3 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 5 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 08:15 AM | 0 | 2 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 5 | 4 | 2 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| 08:30 AM | 0 | 1 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 8 | 3 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| 08:45 AM | 0 | 1 | 2 | 0 | 3 | 4 | 0 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| Total | 0 | 7 | 2 | 0 | 9 | 22 | 0 | 0 | 0 | 22 | 9 | 6 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 46 |
| Grand Total | 0 | 13 | 9 | 2 | 22 | 47 | 0 | 1 | 0 | 48 | 19 | 12 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 2 | 101 | 103 |
| Apprch % | 0 | 59.1 | 40.9 | | | 97.9 | 0 | 2.1 | | | 61.3 | 38.7 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 12.9 | 8.9 | | 21.8 | 46.5 | 0 | 1 | | 47.5 | 18.8 | 11.9 | 0 | | 30.7 | 0 | 0 | 0 | | 0 | 1.9 | 98.1 | |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 1 | 1 | 2 | **11** | 0 | 0 | **11** | **3** | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **16** |
| 07:30 AM | 0 | 2 | **3** | **5** | 5 | 0 | **1** | 6 | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 14 |
| 07:45 AM | 0 | 2 | 1 | 3 | 4 | 0 | 0 | 4 | 2 | **2** | 0 | **4** | 0 | 0 | 0 | 0 | 11 |
| 08:00 AM | 0 | **3** | 0 | 3 | 5 | 0 | 0 | 5 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 11 |
| Total Volume | 0 | 8 | 5 | 13 | 25 | 0 | 1 | 26 | 8 | 5 | 0 | 13 | 0 | 0 | 0 | 0 | 52 |
| % App. Total | 0 | 61.5 | 38.5 | | 96.2 | 0 | 3.8 | | 61.5 | 38.5 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .667 | .417 | .650 | .568 | .000 | .250 | .591 | .667 | .625 | .000 | .813 | .000 | .000 | .000 | .000 | .813 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

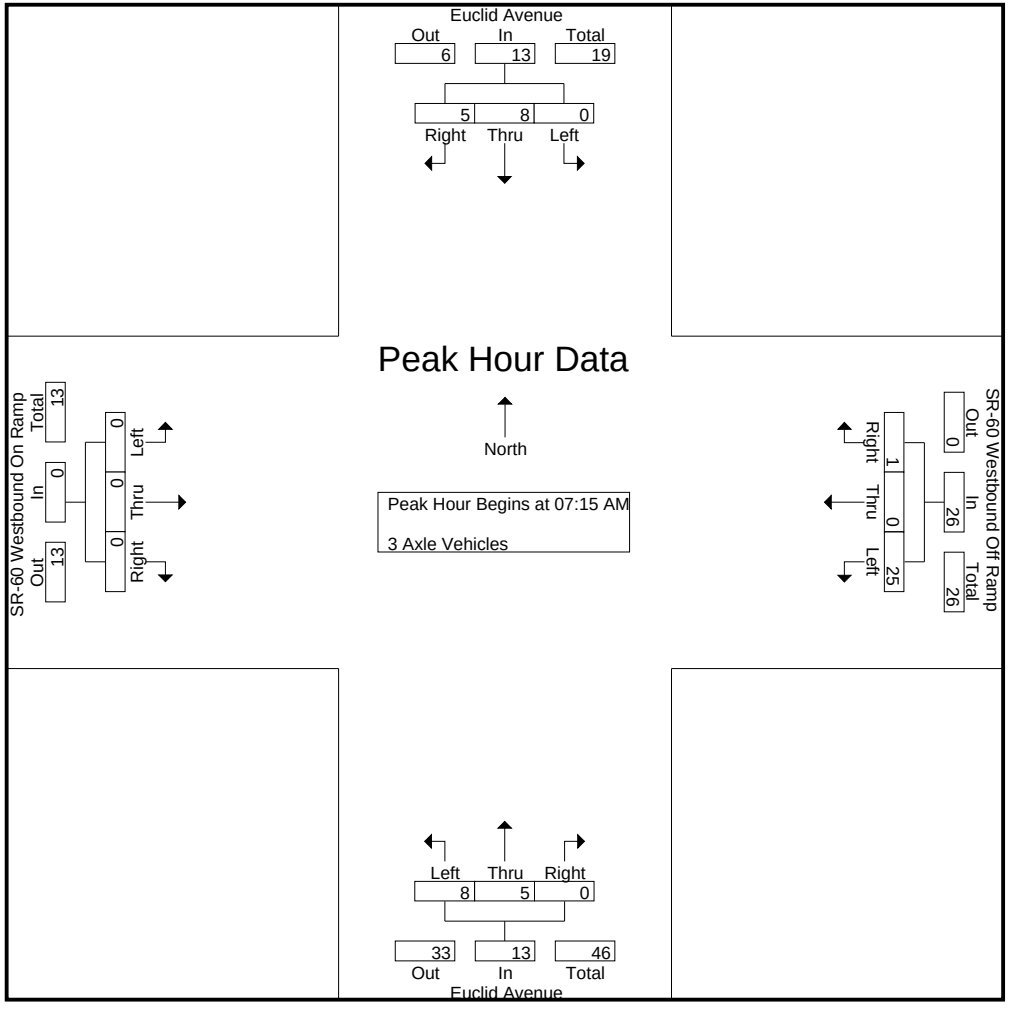

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | 1 | 1 | 2 | **11** | 0 | 0 | **11** | **3** | 0 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 2 | **3** | **5** | 5 | 0 | **1** | 6 | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 2 | 1 | 3 | 4 | 0 | 0 | 4 | 2 | **2** | 0 | **4** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **3** | 0 | 3 | 5 | 0 | 0 | 5 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 8 | 5 | 13 | 25 | 0 | 1 | 26 | 8 | 5 | 0 | 13 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 61.5 | 38.5 | | 96.2 | 0 | 3.8 | | 61.5 | 38.5 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .667 | .417 | .650 | .568 | .000 | .250 | .591 | .667 | .625 | .000 | .813 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 3 | 3 | 1 | 6 | 16 | 0 | 0 | 0 | 16 | 12 | 6 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 1 | 40 | 41 |
| 07:15 AM | 0 | 1 | 1 | 0 | 2 | 14 | 0 | 5 | 1 | 19 | 14 | 2 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 1 | 37 | 38 |
| 07:30 AM | 0 | 1 | 1 | 0 | 2 | 19 | 0 | 1 | 1 | 20 | 14 | 2 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 1 | 38 | 39 |
| 07:45 AM | 0 | 4 | 2 | 1 | 6 | 20 | 0 | 0 | 0 | 20 | 20 | 4 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 1 | 50 | 51 |
| Total | 0 | 9 | 7 | 2 | 16 | 69 | 0 | 6 | 2 | 75 | 60 | 14 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 4 | 165 | 169 |
| 08:00 AM | 0 | 3 | 1 | 0 | 4 | 18 | 0 | 2 | 1 | 20 | 22 | 13 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 1 | 59 | 60 |
| 08:15 AM | 0 | 4 | 4 | 1 | 8 | 24 | 0 | 0 | 0 | 24 | 16 | 9 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 1 | 57 | 58 |
| 08:30 AM | 0 | 8 | 9 | 2 | 17 | 31 | 0 | 0 | 0 | 31 | 13 | 3 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 2 | 64 | 66 |
| 08:45 AM | 0 | 7 | 6 | 3 | 13 | 33 | 0 | 1 | 0 | 34 | 9 | 7 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 3 | 63 | 66 |
| Total | 0 | 22 | 20 | 6 | 42 | 106 | 0 | 3 | 1 | 109 | 60 | 32 | 0 | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 7 | 243 | 250 |
| Grand Total | 0 | 31 | 27 | 8 | 58 | 175 | 0 | 9 | 3 | 184 | 120 | 46 | 0 | 0 | 166 | 0 | 0 | 0 | 0 | 0 | 11 | 408 | 419 |
| Apprch % | 0 | 53.4 | 46.6 | | | 95.1 | 0 | 4.9 | | | 72.3 | 27.7 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 7.6 | 6.6 | | 14.2 | 42.9 | 0 | 2.2 | | 45.1 | 29.4 | 11.3 | 0 | | 40.7 | 0 | 0 | 0 | | 0 | 2.6 | 97.4 | |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 1 | 1 | 2 | 14 | 0 | **5** | 19 | 14 | 2 | 0 | 16 | 0 | 0 | 0 | 0 | 37 |
| 07:30 AM | 0 | 1 | 1 | 2 | 19 | 0 | 1 | **20** | 14 | 2 | 0 | 16 | 0 | 0 | 0 | 0 | 38 |
| 07:45 AM | 0 | **4** | **2** | **6** | **20** | 0 | 0 | 20 | 20 | 4 | 0 | 24 | 0 | 0 | 0 | 0 | 50 |
| 08:00 AM | 0 | 3 | 1 | 4 | 18 | 0 | 2 | 20 | **22** | **13** | 0 | **35** | 0 | 0 | 0 | 0 | **59** |
| Total Volume | 0 | 9 | 5 | 14 | 71 | 0 | 8 | 79 | 70 | 21 | 0 | 91 | 0 | 0 | 0 | 0 | 184 |
| % App. Total | 0 | 64.3 | 35.7 | | 89.9 | 0 | 10.1 | | 76.9 | 23.1 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .563 | .625 | .583 | .888 | .000 | .400 | .988 | .795 | .404 | .000 | .650 | .000 | .000 | .000 | .000 | .780 |

Counts Unlimited, Inc.
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City of Ontario
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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

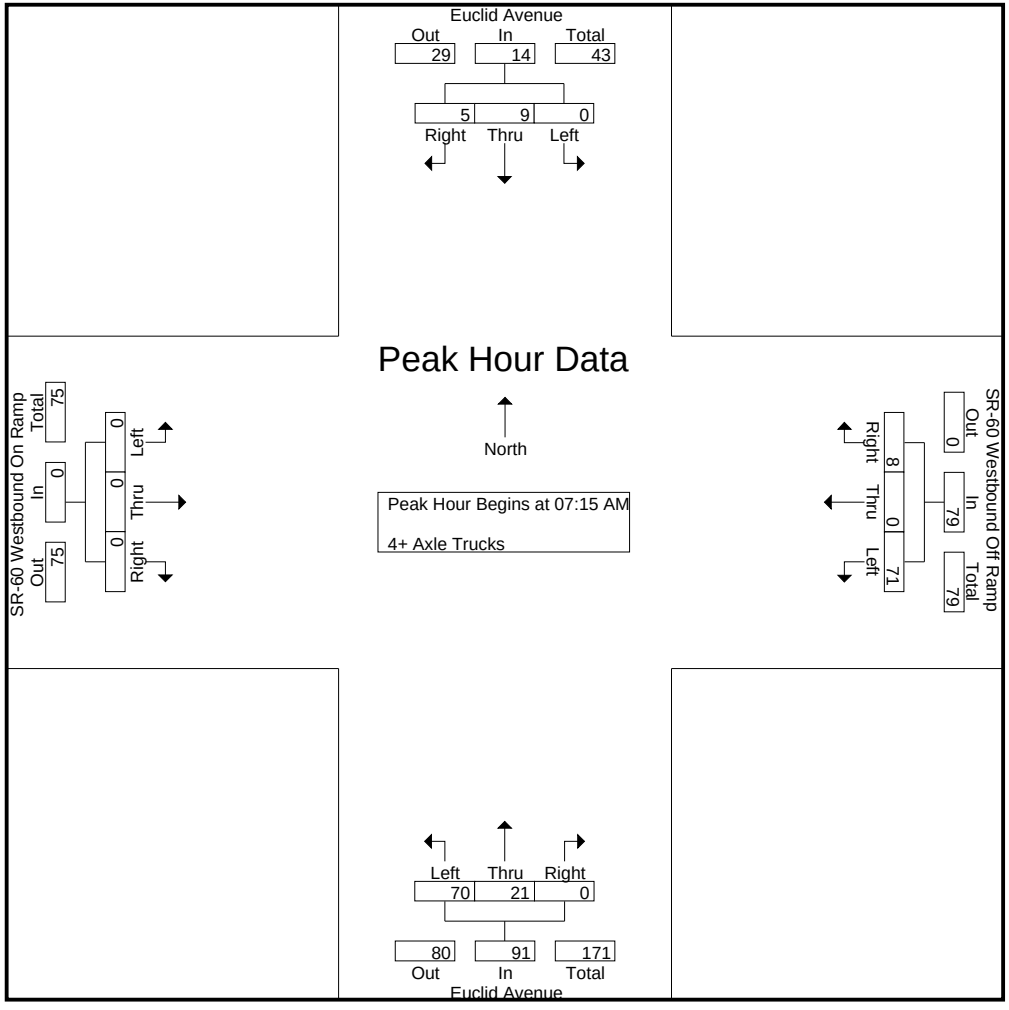

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | 1 | 1 | 2 | 14 | 0 | **5** | 19 | 14 | 2 | 0 | 16 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 1 | 1 | 2 | 19 | 0 | 1 | **20** | 14 | 2 | 0 | 16 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **4** | **2** | **6** | **20** | 0 | 0 | 20 | 20 | 4 | 0 | 24 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 3 | 1 | 4 | 18 | 0 | 2 | 20 | **22** | **13** | 0 | **35** | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 9 | 5 | 14 | 71 | 0 | 8 | 79 | 70 | 21 | 0 | 91 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 64.3 | 35.7 | | 89.9 | 0 | 10.1 | | 76.9 | 23.1 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .563 | .625 | .583 | .888 | .000 | .400 | .988 | .795 | .404 | .000 | .650 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 205 | 135 | 58 | 340 | 80 | 2 | 88 | 41 | 170 | 60 | 201 | 0 | 0 | 261 | 0 | 0 | 0 | 0 | 0 | 99 | 771 | 870 |
| 04:15 PM | 0 | 184 | 94 | 48 | 278 | 89 | 0 | 91 | 42 | 180 | 53 | 193 | 0 | 0 | 246 | 0 | 0 | 0 | 0 | 0 | 90 | 704 | 794 |
| 04:30 PM | 0 | 206 | 149 | 69 | 355 | 90 | 1 | 102 | 45 | 193 | 49 | 198 | 0 | 0 | 247 | 0 | 0 | 0 | 0 | 0 | 114 | 795 | 909 |
| 04:45 PM | 0 | 211 | 116 | 50 | 327 | 93 | 0 | 90 | 47 | 183 | 60 | 163 | 0 | 0 | 223 | 0 | 0 | 0 | 0 | 0 | 97 | 733 | 830 |
| Total | 0 | 806 | 494 | 225 | 1300 | 352 | 3 | 371 | 175 | 726 | 222 | 755 | 0 | 0 | 977 | 0 | 0 | 0 | 0 | 0 | 400 | 3003 | 3403 |
| 05:00 PM | 0 | 205 | 110 | 61 | 315 | 80 | 2 | 78 | 31 | 160 | 50 | 173 | 0 | 0 | 223 | 0 | 0 | 0 | 0 | 0 | 92 | 698 | 790 |
| 05:15 PM | 0 | 196 | 111 | 58 | 307 | 68 | 0 | 88 | 30 | 156 | 53 | 165 | 0 | 0 | 218 | 0 | 0 | 0 | 0 | 0 | 88 | 681 | 769 |
| 05:30 PM | 0 | 226 | 121 | 66 | 347 | 93 | 1 | 69 | 27 | 163 | 51 | 193 | 0 | 0 | 244 | 0 | 0 | 0 | 0 | 0 | 93 | 754 | 847 |
| 05:45 PM | 0 | 218 | 122 | 54 | 340 | 80 | 0 | 79 | 37 | 159 | 52 | 155 | 0 | 0 | 207 | 0 | 0 | 0 | 0 | 0 | 91 | 706 | 797 |
| Total | 0 | 845 | 464 | 239 | 1309 | 321 | 3 | 314 | 125 | 638 | 206 | 686 | 0 | 0 | 892 | 0 | 0 | 0 | 0 | 0 | 364 | 2839 | 3203 |
| Grand Total | 0 | 1651 | 958 | 464 | 2609 | 673 | 6 | 685 | 300 | 1364 | 428 | 1441 | 0 | 0 | 1869 | 0 | 0 | 0 | 0 | 0 | 764 | 5842 | 6606 |
| Apprch % | 0 | 63.3 | 36.7 | | | 49.3 | 0.4 | 50.2 | | | 22.9 | 77.1 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 28.3 | 16.4 | | 44.7 | 11.5 | 0.1 | 11.7 | | 23.3 | 7.3 | 24.7 | 0 | | 32 | 0 | 0 | 0 | | 0 | 11.6 | 88.4 | |
| Passenger Vehicles | 0 | 1594 | 936 | | 2983 | 468 | 2 | 675 | | 1441 | 381 | 1379 | 0 | | 1760 | 0 | 0 | 0 | | 0 | 0 | 0 | 6184 |
| % Passenger Vehicles | 0 | 96.5 | 97.7 | 97.6 | 97.1 | 69.5 | 33.3 | 98.5 | 98.7 | 86.6 | 89 | 95.7 | 0 | 0 | 94.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 93.6 |
| Large 2 Axle Vehicles | 0 | 22 | 11 | | 41 | 27 | 3 | 7 | | 41 | 10 | 25 | 0 | | 35 | 0 | 0 | 0 | | 0 | 0 | 0 | 117 |
| % Large 2 Axle Vehicles | 0 | 1.3 | 1.1 | 1.7 | 1.3 | 4 | 50 | 1 | 1.3 | 2.5 | 2.3 | 1.7 | 0 | 0 | 1.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.8 |
| 3 Axle Vehicles | 0 | 14 | 3 | | 18 | 53 | 0 | 1 | | 54 | 5 | 12 | 0 | | 17 | 0 | 0 | 0 | | 0 | 0 | 0 | 89 |
| % 3 Axle Vehicles | 0 | 0.8 | 0.3 | 0.2 | 0.6 | 7.9 | 0 | 0.1 | 0 | 3.2 | 1.2 | 0.8 | 0 | 0 | 0.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1.3 |
| 4+ Axle Trucks | 0 | 21 | 8 | | 31 | 125 | 1 | 2 | | 128 | 32 | 25 | 0 | | 57 | 0 | 0 | 0 | | 0 | 0 | 0 | 216 |
| % 4+ Axle Trucks | 0 | 1.3 | 0.8 | 0.4 | 1 | 18.6 | 16.7 | 0.3 | 0 | 7.7 | 7.5 | 1.7 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.3 |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | 205 | 135 | 340 | 80 | **2** | 88 | 170 | **60** | **201** | 0 | **261** | 0 | 0 | 0 | 0 | 771 |
| 04:15 PM | 0 | 184 | 94 | 278 | 89 | 0 | 91 | 180 | 53 | 193 | 0 | 246 | 0 | 0 | 0 | 0 | 704 |
| 04:30 PM | 0 | 206 | **149** | **355** | 90 | 1 | **102** | **193** | 49 | 198 | 0 | 247 | 0 | 0 | 0 | 0 | **795** |
| 04:45 PM | 0 | **211** | 116 | 327 | **93** | 0 | 90 | 183 | 60 | 163 | 0 | 223 | 0 | 0 | 0 | 0 | 733 |
| Total Volume | 0 | 806 | 494 | 1300 | 352 | 3 | 371 | 726 | 222 | 755 | 0 | 977 | 0 | 0 | 0 | 0 | 3003 |
| % App. Total | 0 | 62 | 38 | | 48.5 | 0.4 | 51.1 | | 22.7 | 77.3 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .955 | .829 | .915 | .946 | .375 | .909 | .940 | .925 | .939 | .000 | .936 | .000 | .000 | .000 | .000 | .944 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

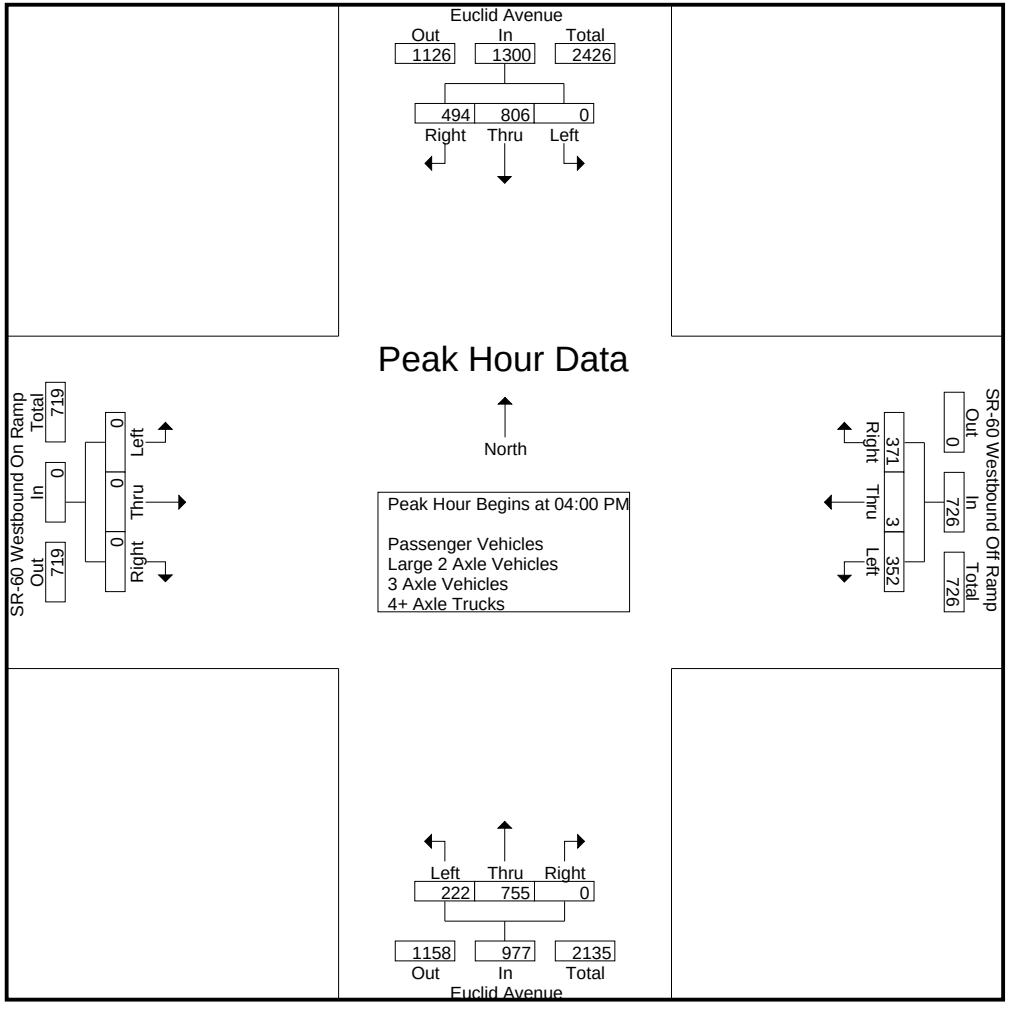

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Site Code : 05124953
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Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 205 | 110 | 315 | 80 | **2** | 88 | 170 | **60** | **201** | 0 | **261** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 196 | 111 | 307 | 89 | 0 | 91 | 180 | 53 | 193 | 0 | 246 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **226** | 121 | **347** | 90 | 1 | **102** | **193** | 49 | 198 | 0 | 247 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 218 | **122** | 340 | **93** | 0 | 90 | 183 | 60 | 163 | 0 | 223 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 845 | 464 | 1309 | 352 | 3 | 371 | 726 | 222 | 755 | 0 | 977 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 64.6 | 35.4 | | 48.5 | 0.4 | 51.1 | | 22.7 | 77.3 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .935 | .951 | .943 | .946 | .375 | .909 | .940 | .925 | .939 | .000 | .936 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Euclid Avenue
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Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 198 | 129 | 54 | 327 | 58 | 2 | 88 | 41 | 148 | 50 | 195 | 0 | 0 | 245 | 0 | 0 | 0 | 0 | 0 | 95 | 720 | 815 |
| 04:15 PM | 0 | 180 | 92 | 47 | 272 | 65 | 0 | 86 | 40 | 151 | 48 | 190 | 0 | 0 | 238 | 0 | 0 | 0 | 0 | 0 | 87 | 661 | 748 |
| 04:30 PM | 0 | 197 | 144 | 67 | 341 | 61 | 0 | 102 | 45 | 163 | 45 | 184 | 0 | 0 | 229 | 0 | 0 | 0 | 0 | 0 | 112 | 733 | 845 |
| 04:45 PM | 0 | 204 | 116 | 50 | 320 | 59 | 0 | 89 | 47 | 148 | 53 | 159 | 0 | 0 | 212 | 0 | 0 | 0 | 0 | 0 | 97 | 680 | 777 |
| Total | 0 | 779 | 481 | 218 | 1260 | 243 | 2 | 365 | 173 | 610 | 196 | 728 | 0 | 0 | 924 | 0 | 0 | 0 | 0 | 0 | 391 | 2794 | 3185 |
| 05:00 PM | 0 | 202 | 105 | 58 | 307 | 56 | 0 | 76 | 30 | 132 | 44 | 165 | 0 | 0 | 209 | 0 | 0 | 0 | 0 | 0 | 88 | 648 | 736 |
| 05:15 PM | 0 | 185 | 109 | 57 | 294 | 52 | 0 | 87 | 29 | 139 | 47 | 154 | 0 | 0 | 201 | 0 | 0 | 0 | 0 | 0 | 86 | 634 | 720 |
| 05:30 PM | 0 | 217 | 120 | 66 | 337 | 66 | 0 | 69 | 27 | 135 | 47 | 181 | 0 | 0 | 228 | 0 | 0 | 0 | 0 | 0 | 93 | 700 | 793 |
| 05:45 PM | 0 | 211 | 121 | 54 | 332 | 51 | 0 | 78 | 37 | 129 | 47 | 151 | 0 | 0 | 198 | 0 | 0 | 0 | 0 | 0 | 91 | 659 | 750 |
| Total | 0 | 815 | 455 | 235 | 1270 | 225 | 0 | 310 | 123 | 535 | 185 | 651 | 0 | 0 | 836 | 0 | 0 | 0 | 0 | 0 | 358 | 2641 | 2999 |
| Grand Total | 0 | 1594 | 936 | 453 | 2530 | 468 | 2 | 675 | 296 | 1145 | 381 | 1379 | 0 | 0 | 1760 | 0 | 0 | 0 | 0 | 0 | 749 | 5435 | 6184 |
| Apprch % | 0 | 63 | 37 | | | 40.9 | 0.2 | 59 | | | 21.6 | 78.4 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 29.3 | 17.2 | | 46.6 | 8.6 | 0 | 12.4 | | 21.1 | 7 | 25.4 | 0 | | 32.4 | 0 | 0 | 0 | | 0 | 12.1 | 87.9 | |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | 198 | 129 | 327 | 58 | **2** | 88 | 148 | 50 | **195** | 0 | **245** | 0 | 0 | 0 | 0 | 720 |
| 04:15 PM | 0 | 180 | 92 | 272 | **65** | 0 | 86 | 151 | 48 | 190 | 0 | 238 | 0 | 0 | 0 | 0 | 661 |
| 04:30 PM | 0 | 197 | **144** | **341** | 61 | 0 | **102** | **163** | 45 | 184 | 0 | 229 | 0 | 0 | 0 | 0 | **733** |
| 04:45 PM | 0 | **204** | 116 | 320 | 59 | 0 | 89 | 148 | **53** | 159 | 0 | 212 | 0 | 0 | 0 | 0 | 680 |
| Total Volume | 0 | 779 | 481 | 1260 | 243 | 2 | 365 | 610 | 196 | 728 | 0 | 924 | 0 | 0 | 0 | 0 | 2794 |
| % App. Total | 0 | 61.8 | 38.2 | | 39.8 | 0.3 | 59.8 | | 21.2 | 78.8 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .955 | .835 | .924 | .935 | .250 | .895 | .936 | .925 | .933 | .000 | .943 | .000 | .000 | .000 | .000 | .953 |

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City of Ontario
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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

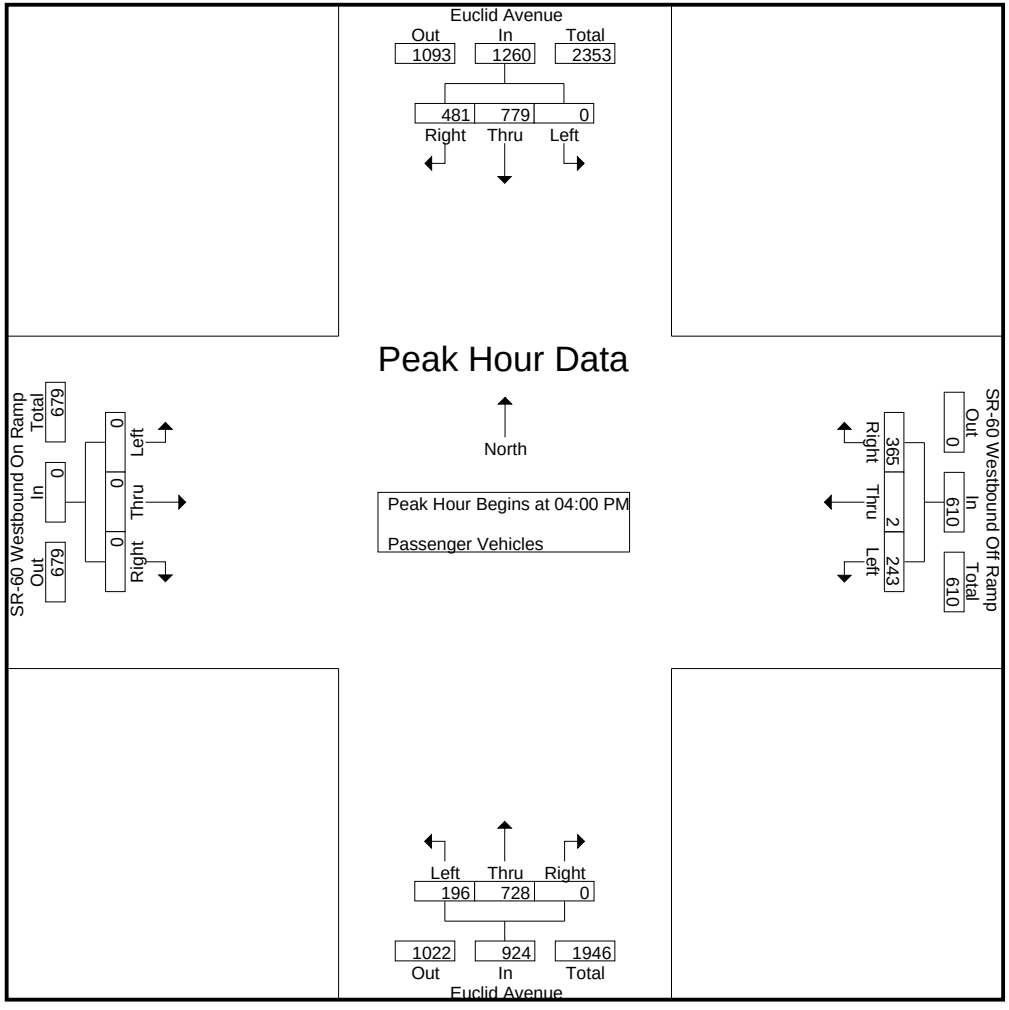

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| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 198 | 129 | 327 | 58 | **2** | 88 | 148 | 50 | **195** | 0 | **245** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 180 | 92 | 272 | **65** | 0 | 86 | 151 | 48 | 190 | 0 | 238 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 197 | **144** | **341** | 61 | 0 | **102** | **163** | 45 | 184 | 0 | 229 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **204** | 116 | 320 | 59 | 0 | 89 | 148 | **53** | 159 | 0 | 212 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 779 | 481 | 1260 | 243 | 2 | 365 | 610 | 196 | 728 | 0 | 924 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 61.8 | 38.2 | | 39.8 | 0.3 | 59.8 | | 21.2 | 78.8 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .955 | .835 | .924 | .935 | .250 | .895 | .936 | .925 | .933 | .000 | .943 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 3 | 2 | 2 | 5 | 3 | 0 | 0 | 0 | 3 | 3 | 4 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 15 | 17 |
| 04:15 PM | 0 | 3 | 2 | 1 | 5 | 2 | 0 | 3 | 2 | 5 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 13 | 16 |
| 04:30 PM | 0 | 3 | 2 | 2 | 5 | 5 | 1 | 0 | 0 | 6 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 17 | 19 |
| 04:45 PM | 0 | 4 | 0 | 0 | 4 | 4 | 0 | 1 | 0 | 5 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| Total | 0 | 13 | 6 | 5 | 19 | 14 | 1 | 4 | 2 | 19 | 6 | 14 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 7 | 58 | 65 |
| 05:00 PM | 0 | 2 | 4 | 2 | 6 | 2 | 1 | 1 | 1 | 4 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 15 | 18 |
| 05:15 PM | 0 | 1 | 1 | 1 | 2 | 4 | 0 | 1 | 1 | 5 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 10 | 12 |
| 05:30 PM | 0 | 4 | 0 | 0 | 4 | 3 | 1 | 0 | 0 | 4 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 05:45 PM | 0 | 2 | 0 | 0 | 2 | 4 | 0 | 1 | 0 | 5 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Total | 0 | 9 | 5 | 3 | 14 | 13 | 2 | 3 | 2 | 18 | 4 | 11 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 5 | 47 | 52 |
| Grand Total | 0 | 22 | 11 | 8 | 33 | 27 | 3 | 7 | 4 | 37 | 10 | 25 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 12 | 105 | 117 |
| Apprch % | 0 | 66.7 | 33.3 | | | 73 | 8.1 | 18.9 | | | 28.6 | 71.4 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 21 | 10.5 | | 31.4 | 25.7 | 2.9 | 6.7 | | 35.2 | 9.5 | 23.8 | 0 | | 33.3 | 0 | 0 | 0 | | 0 | 10.3 | 89.7 | |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | 3 | **2** | **5** | 3 | 0 | 0 | 3 | **3** | 4 | 0 | **7** | 0 | 0 | 0 | 0 | 15 |
| 04:15 PM | 0 | 3 | 2 | 5 | 2 | 0 | **3** | 5 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 13 |
| 04:30 PM | 0 | 3 | 2 | 5 | **5** | **1** | 0 | **6** | 1 | **5** | 0 | 6 | 0 | 0 | 0 | 0 | **17** |
| 04:45 PM | 0 | **4** | 0 | 4 | 4 | 0 | 1 | 5 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 13 |
| Total Volume | 0 | 13 | 6 | 19 | 14 | 1 | 4 | 19 | 6 | 14 | 0 | 20 | 0 | 0 | 0 | 0 | 58 |
| % App. Total | 0 | 68.4 | 31.6 | | 73.7 | 5.3 | 21.1 | | 30 | 70 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .813 | .750 | .950 | .700 | .250 | .333 | .792 | .500 | .700 | .000 | .714 | .000 | .000 | .000 | .000 | .853 |

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Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

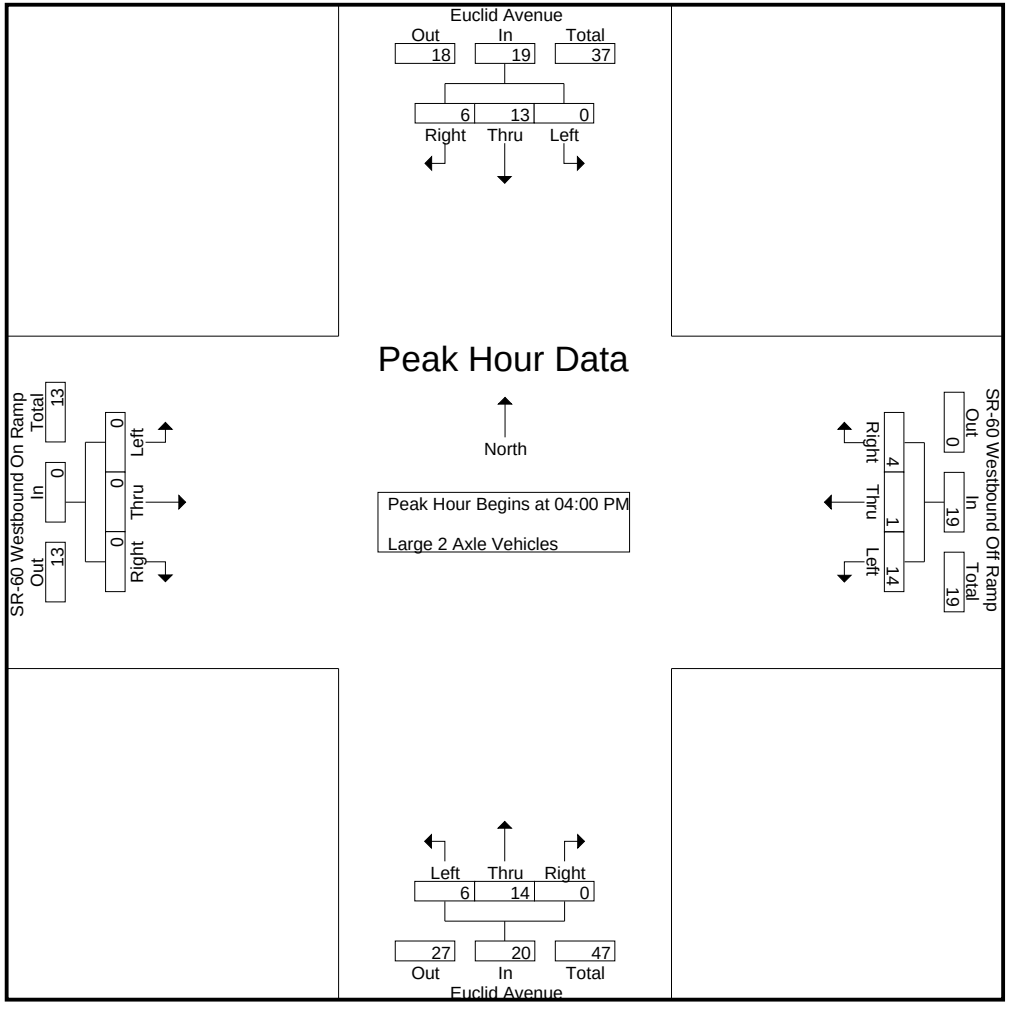

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City of Ontario
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Site Code : 05124953
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| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 3 | **2** | **5** | 3 | 0 | 0 | 3 | **3** | 4 | 0 | **7** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 3 | 2 | 5 | 2 | 0 | **3** | 5 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 3 | 2 | 5 | **5** | **1** | 0 | **6** | 1 | **5** | 0 | 6 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **4** | 0 | 4 | 4 | 0 | 1 | 5 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 13 | 6 | 19 | 14 | 1 | 4 | 19 | 6 | 14 | 0 | 20 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 68.4 | 31.6 | | 73.7 | 5.3 | 21.1 | | 30 | 70 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .813 | .750 | .950 | .700 | .250 | .333 | .792 | .500 | .700 | .000 | .714 | .000 | .000 | .000 | .000 | |

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City of Ontario
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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 1 | 1 | 1 | 2 | 5 | 0 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 10 |
| 04:15 PM | 0 | 1 | 0 | 0 | 1 | 7 | 0 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| 04:30 PM | 0 | 2 | 1 | 0 | 3 | 11 | 0 | 0 | 0 | 11 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 04:45 PM | 0 | 1 | 0 | 0 | 1 | 8 | 0 | 0 | 0 | 8 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| Total | 0 | 5 | 2 | 1 | 7 | 31 | 0 | 1 | 0 | 32 | 4 | 6 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 49 | 50 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| 05:15 PM | 0 | 3 | 1 | 0 | 4 | 3 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 05:30 PM | 0 | 4 | 0 | 0 | 4 | 9 | 0 | 0 | 0 | 9 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| 05:45 PM | 0 | 2 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 |
| Total | 0 | 9 | 1 | 0 | 10 | 22 | 0 | 0 | 0 | 22 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 39 |
| Grand Total | 0 | 14 | 3 | 1 | 17 | 53 | 0 | 1 | 0 | 54 | 5 | 12 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 1 | 88 | 89 |
| Apprch % | 0 | 82.4 | 17.6 | | | 98.1 | 0 | 1.9 | | | 29.4 | 70.6 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 15.9 | 3.4 | | 19.3 | 60.2 | 0 | 1.1 | | 61.4 | 5.7 | 13.6 | 0 | | 19.3 | 0 | 0 | 0 | | 0 | 1.1 | 98.9 | |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | 1 | **1** | 2 | 5 | 0 | 0 | 5 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 9 |
| 04:15 PM | 0 | 1 | 0 | 1 | 7 | 0 | **1** | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 04:30 PM | 0 | **2** | 1 | **3** | **11** | 0 | 0 | **11** | **2** | **4** | 0 | **6** | 0 | 0 | 0 | 0 | **20** |
| 04:45 PM | 0 | 1 | 0 | 1 | 8 | 0 | 0 | 8 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 11 |
| Total Volume | 0 | 5 | 2 | 7 | 31 | 0 | 1 | 32 | 4 | 6 | 0 | 10 | 0 | 0 | 0 | 0 | 49 |
| % App. Total | 0 | 71.4 | 28.6 | | 96.9 | 0 | 3.1 | | 40 | 60 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .500 | .583 | .705 | .000 | .250 | .727 | .500 | .375 | .000 | .417 | .000 | .000 | .000 | .000 | .613 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

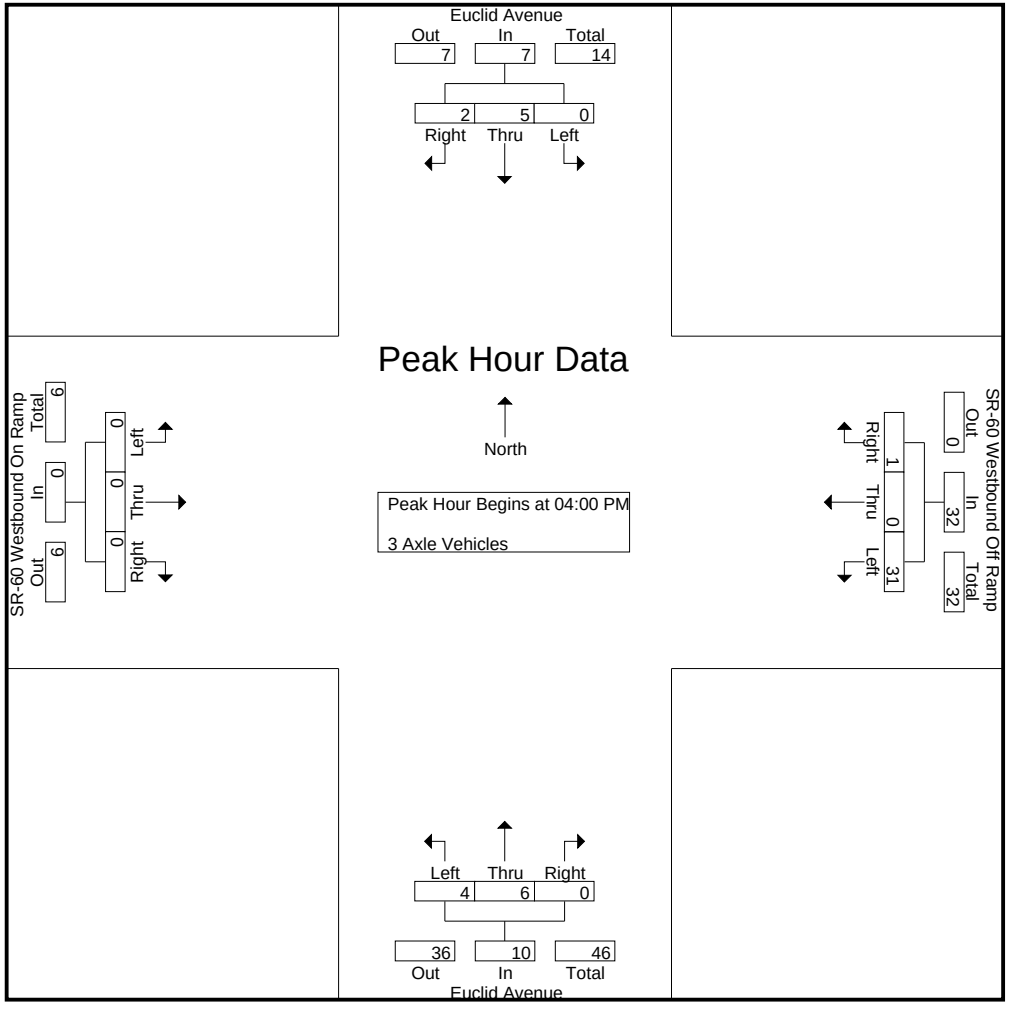

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City of Ontario
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File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 1 | **1** | 2 | 5 | 0 | 0 | 5 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 1 | 0 | 1 | 7 | 0 | **1** | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **2** | 1 | **3** | **11** | 0 | 0 | **11** | **2** | **4** | 0 | **6** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 1 | 0 | 1 | 8 | 0 | 0 | 8 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 5 | 2 | 7 | 31 | 0 | 1 | 32 | 4 | 6 | 0 | 10 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 71.4 | 28.6 | | 96.9 | 0 | 3.1 | | 40 | 60 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .500 | .583 | .705 | .000 | .250 | .727 | .500 | .375 | .000 | .417 | .000 | .000 | .000 | .000 | |

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City of Ontario
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Weather: Clear

File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 3 | 3 | 1 | 6 | 14 | 0 | 0 | 0 | 14 | 6 | 1 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 27 | 28 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 1 | 0 | 16 | 4 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| 04:30 PM | 0 | 4 | 2 | 0 | 6 | 13 | 0 | 0 | 0 | 13 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| 04:45 PM | 0 | 2 | 0 | 0 | 2 | 22 | 0 | 0 | 0 | 22 | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 29 |
| Total | 0 | 9 | 5 | 1 | 14 | 64 | 0 | 1 | 0 | 65 | 16 | 7 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 1 | 102 | 103 |
| 05:00 PM | 0 | 1 | 1 | 1 | 2 | 17 | 1 | 1 | 0 | 19 | 5 | 3 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 29 | 30 |
| 05:15 PM | 0 | 7 | 0 | 0 | 7 | 9 | 0 | 0 | 0 | 9 | 5 | 5 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 26 |
| 05:30 PM | 0 | 1 | 1 | 0 | 2 | 15 | 0 | 0 | 0 | 15 | 2 | 8 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 27 |
| 05:45 PM | 0 | 3 | 1 | 0 | 4 | 20 | 0 | 0 | 0 | 20 | 4 | 2 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 30 |
| Total | 0 | 12 | 3 | 1 | 15 | 61 | 1 | 1 | 0 | 63 | 16 | 18 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 1 | 112 | 113 |
| Grand Total | 0 | 21 | 8 | 2 | 29 | 125 | 1 | 2 | 0 | 128 | 32 | 25 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 2 | 214 | 216 |
| Apprch % | 0 | 72.4 | 27.6 | | | 97.7 | 0.8 | 1.6 | | | 56.1 | 43.9 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 9.8 | 3.7 | | 13.6 | 58.4 | 0.5 | 0.9 | | 59.8 | 15 | 11.7 | 0 | | 26.6 | 0 | 0 | 0 | | 0 | 0.9 | 99.1 | |

| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | 3 | **3** | **6** | 14 | 0 | 0 | 14 | **6** | 1 | 0 | **7** | 0 | 0 | 0 | 0 | 27 |
| 04:15 PM | 0 | 0 | 0 | 0 | 15 | 0 | **1** | 16 | 4 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 21 |
| 04:30 PM | 0 | **4** | 2 | 6 | 13 | 0 | 0 | 13 | 1 | **5** | 0 | 6 | 0 | 0 | 0 | 0 | 25 |
| 04:45 PM | 0 | 2 | 0 | 2 | **22** | 0 | 0 | **22** | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | **29** |
| Total Volume | 0 | 9 | 5 | 14 | 64 | 0 | 1 | 65 | 16 | 7 | 0 | 23 | 0 | 0 | 0 | 0 | 102 |
| % App. Total | 0 | 64.3 | 35.7 | | 98.5 | 0 | 1.5 | | 69.6 | 30.4 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .563 | .417 | .583 | .727 | .000 | .250 | .739 | .667 | .350 | .000 | .821 | .000 | .000 | .000 | .000 | .879 |

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File Name : 01_ONT_Euc_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

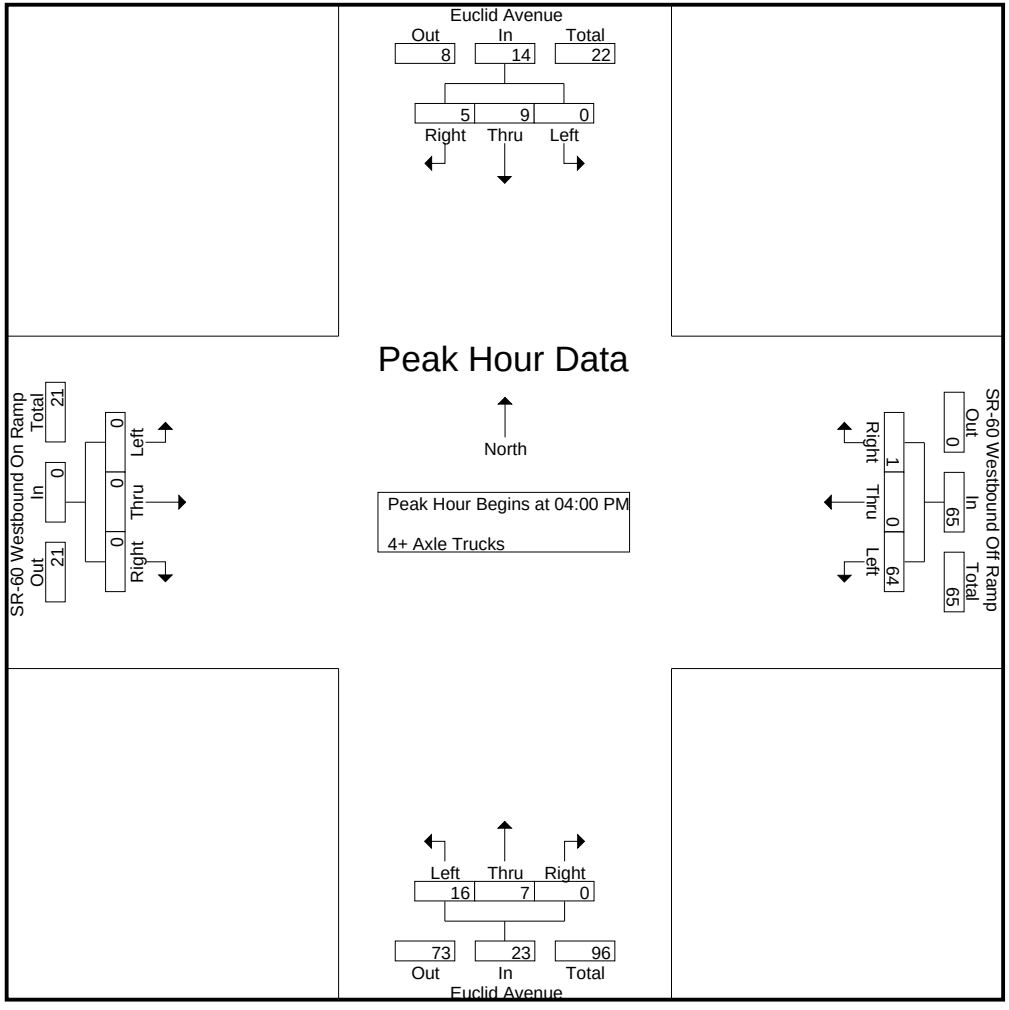

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City of Ontario
N/S: Euclid Avenue
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| | Euclid Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 3 | **3** | **6** | 14 | 0 | 0 | 14 | **6** | 1 | 0 | **7** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 0 | 0 | 0 | 15 | 0 | **1** | 16 | 4 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **4** | 2 | 6 | 13 | 0 | 0 | 13 | 1 | **5** | 0 | 6 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 2 | 0 | 2 | **22** | 0 | 0 | **22** | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 9 | 5 | 14 | 64 | 0 | 1 | 65 | 16 | 7 | 0 | 23 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 64.3 | 35.7 | | 98.5 | 0 | 1.5 | | 69.6 | 30.4 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .563 | .417 | .583 | .727 | .000 | .250 | .739 | .667 | .350 | .000 | .821 | .000 | .000 | .000 | .000 | |

Location: Ontario
N/S: Euclid Avenue
E/W: SR-60 WB Ramps

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg SR-60 WB Ramps | South Leg Euclid Avenue | West Leg SR-60 WB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 2 | 0 | 0 | 0 | 2 |
| 7:45 AM | 0 | 1 | 0 | 0 | 1 |
| 8:00 AM | 0 | 2 | 0 | 0 | 2 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 2 | 4 | 0 | 0 | 6 |

| | North Leg Euclid Avenue | East Leg SR-60 WB Ramps | South Leg Euclid Avenue | West Leg SR-60 WB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 2 | 0 | 0 | 0 | 2 |
| 4:15 PM | 0 | 1 | 0 | 0 | 1 |
| 4:30 PM | 0 | 2 | 0 | 5 | 7 |
| 4:45 PM | 0 | 0 | 0 | 1 | 1 |
| 5:00 PM | 0 | 0 | 0 | 2 | 2 |
| 5:15 PM | 0 | 1 | 0 | 2 | 3 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 1 | 0 | 3 | 4 |
| TOTAL VOLUMES: | 2 | 5 | 0 | 13 | 20 |

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951-268-6268

Location: Ontario
N/S: Euclid Avenue
E/W: SR-60 WB Ramps

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound SR-60 WB Ramps | | | Northbound Euclid Avenue | | | Eastbound SR-60 WB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |

| | Southbound Euclid Avenue | | | Westbound SR-60 WB Ramps | | | Northbound Euclid Avenue | | | Eastbound SR-60 WB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 87 | 152 | 0 | 0 | 239 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 119 | 39 | 239 | 66 | 1 | 70 | 25 | 137 | 64 | 615 | 679 |
| 07:15 AM | 93 | 172 | 0 | 0 | 265 | 0 | 0 | 0 | 0 | 0 | 0 | 137 | 110 | 29 | 247 | 73 | 0 | 52 | 17 | 125 | 46 | 637 | 683 |
| 07:30 AM | 94 | 150 | 0 | 0 | 244 | 0 | 0 | 0 | 0 | 0 | 0 | 165 | 110 | 23 | 275 | 71 | 1 | 42 | 13 | 114 | 36 | 633 | 669 |
| 07:45 AM | 78 | 186 | 0 | 0 | 264 | 0 | 0 | 0 | 0 | 0 | 0 | 168 | 90 | 31 | 258 | 94 | 0 | 52 | 18 | 146 | 49 | 668 | 717 |
| Total | 352 | 660 | 0 | 0 | 1012 | 0 | 0 | 0 | 0 | 0 | 0 | 590 | 429 | 122 | 1019 | 304 | 2 | 216 | 73 | 522 | 195 | 2553 | 2748 |
| 08:00 AM | 79 | 176 | 0 | 0 | 255 | 0 | 0 | 0 | 0 | 0 | 0 | 160 | 84 | 19 | 244 | 72 | 0 | 60 | 14 | 132 | 33 | 631 | 664 |
| 08:15 AM | 87 | 202 | 0 | 0 | 289 | 0 | 0 | 0 | 0 | 0 | 0 | 136 | 106 | 27 | 242 | 68 | 0 | 49 | 11 | 117 | 38 | 648 | 686 |
| 08:30 AM | 86 | 173 | 0 | 0 | 259 | 0 | 0 | 0 | 0 | 0 | 0 | 142 | 91 | 24 | 233 | 58 | 0 | 59 | 11 | 117 | 35 | 609 | 644 |
| 08:45 AM | 52 | 167 | 0 | 0 | 219 | 0 | 0 | 0 | 0 | 0 | 0 | 144 | 87 | 30 | 231 | 81 | 1 | 67 | 21 | 149 | 51 | 599 | 650 |
| Total | 304 | 718 | 0 | 0 | 1022 | 0 | 0 | 0 | 0 | 0 | 0 | 582 | 368 | 100 | 950 | 279 | 1 | 235 | 57 | 515 | 157 | 2487 | 2644 |
| Grand Total | 656 | 1378 | 0 | 0 | 2034 | 0 | 0 | 0 | 0 | 0 | 0 | 1172 | 797 | 222 | 1969 | 583 | 3 | 451 | 130 | 1037 | 352 | 5040 | 5392 |
| Apprch % | 32.3 | 67.7 | 0 | | | 0 | 0 | 0 | | | 0 | 59.5 | 40.5 | | | 56.2 | 0.3 | 43.5 | | | | | |
| Total % | 13 | 27.3 | 0 | | 40.4 | 0 | 0 | 0 | | 0 | 0 | 23.3 | 15.8 | | 39.1 | 11.6 | 0.1 | 8.9 | | 20.6 | 6.5 | 93.5 | |
| Passenger Vehicles | 633 | 1072 | 0 | | 1705 | 0 | 0 | 0 | | 0 | 0 | 980 | 528 | | 1670 | 537 | 2 | 315 | | 941 | 0 | 0 | 4316 |
| % Passenger Vehicles | 96.5 | 77.8 | 0 | 0 | 83.8 | 0 | 0 | 0 | 0 | 0 | 0 | 83.6 | 66.2 | 73 | 76.2 | 92.1 | 66.7 | 69.8 | 66.9 | 80.6 | 0 | 0 | 80 |
| Large 2 Axle Vehicles | 14 | 54 | 0 | | 68 | 0 | 0 | 0 | | 0 | 0 | 32 | 41 | | 86 | 16 | 1 | 17 | | 38 | 0 | 0 | 192 |
| % Large 2 Axle Vehicles | 2.1 | 3.9 | 0 | 0 | 3.3 | 0 | 0 | 0 | 0 | 0 | 0 | 2.7 | 5.1 | 5.9 | 3.9 | 2.7 | 33.3 | 3.8 | 3.1 | 3.3 | 0 | 0 | 3.6 |
| 3 Axle Vehicles | 1 | 56 | 0 | | 57 | 0 | 0 | 0 | | 0 | 0 | 30 | 38 | | 75 | 2 | 0 | 19 | | 25 | 0 | 0 | 157 |
| % 3 Axle Vehicles | 0.2 | 4.1 | 0 | 0 | 2.8 | 0 | 0 | 0 | 0 | 0 | 0 | 2.6 | 4.8 | 3.2 | 3.4 | 0.3 | 0 | 4.2 | 3.1 | 2.1 | 0 | 0 | 2.9 |
| 4+ Axle Trucks | 8 | 196 | 0 | | 204 | 0 | 0 | 0 | | 0 | 0 | 130 | 190 | | 360 | 28 | 0 | 100 | | 163 | 0 | 0 | 727 |
| % 4+ Axle Trucks | 1.2 | 14.2 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 11.1 | 23.8 | 18 | 16.4 | 4.8 | 0 | 22.2 | 26.9 | 14 | 0 | 0 | 13.5 |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **94** | 150 | 0 | 244 | 0 | 0 | 0 | 0 | 0 | 165 | **110** | **275** | 71 | **1** | 42 | 114 | 633 |
| 07:45 AM | 78 | 186 | 0 | 264 | 0 | 0 | 0 | 0 | 0 | **168** | 90 | 258 | **94** | 0 | 52 | **146** | **668** |
| 08:00 AM | 79 | 176 | 0 | 255 | 0 | 0 | 0 | 0 | 0 | 160 | 84 | 244 | 72 | 0 | **60** | 132 | 631 |
| 08:15 AM | 87 | **202** | 0 | **289** | 0 | 0 | 0 | 0 | 0 | 136 | 106 | 242 | 68 | 0 | 49 | 117 | 648 |
| Total Volume | 338 | 714 | 0 | 1052 | 0 | 0 | 0 | 0 | 0 | 629 | 390 | 1019 | 305 | 1 | 203 | 509 | 2580 |
| % App. Total | 32.1 | 67.9 | 0 | | 0 | 0 | 0 | | 0 | 61.7 | 38.3 | | 59.9 | 0.2 | 39.9 | | |
| PHF | .899 | .884 | .000 | .910 | .000 | .000 | .000 | .000 | .000 | .936 | .886 | .926 | .811 | .250 | .846 | .872 | .966 |

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Start Date : 10/2/2024
Page No : 2

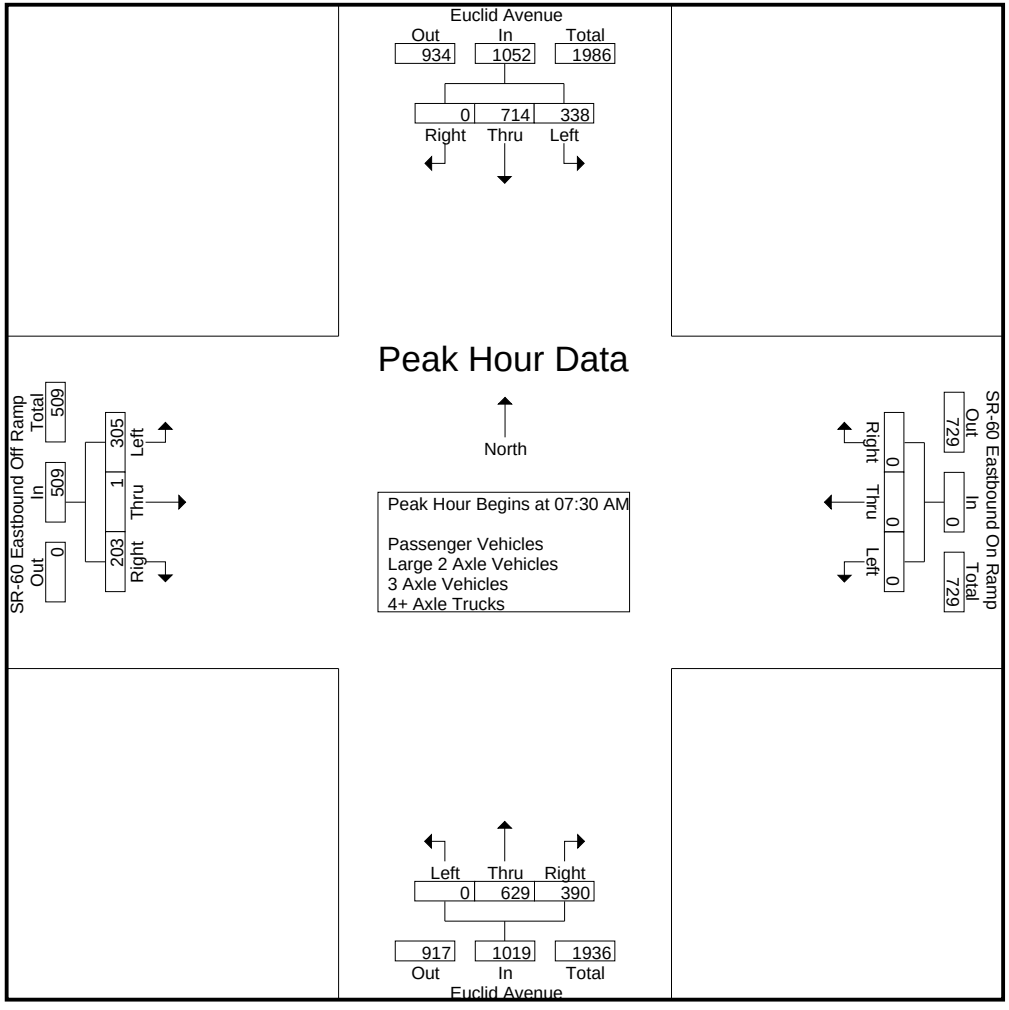

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:45 AM | | | | 07:00 AM | | | | 07:15 AM | | | | 07:00 AM | | | | |
| +0 mins. | 78 | 186 | 0 | 264 | 0 | 0 | 0 | 0 | 0 | 137 | **110** | 247 | 66 | **1** | **70** | 137 | |
| +15 mins. | 79 | 176 | 0 | 255 | 0 | 0 | 0 | 0 | 0 | 165 | 110 | **275** | 73 | 0 | 52 | 125 | |
| +30 mins. | **87** | **202** | 0 | **289** | 0 | 0 | 0 | 0 | 0 | **168** | 90 | 258 | 71 | 1 | 42 | 114 | |
| +45 mins. | 86 | 173 | 0 | 259 | 0 | 0 | 0 | 0 | 0 | 160 | 84 | 244 | **94** | 0 | 52 | **146** | |
| Total Volume | 330 | 737 | 0 | 1067 | 0 | 0 | 0 | 0 | 0 | 630 | 394 | 1024 | 304 | 2 | 216 | 522 | |
| % App. Total | 30.9 | 69.1 | 0 | | 0 | 0 | 0 | | 0 | 61.5 | 38.5 | | 58.2 | 0.4 | 41.4 | | |
| PHF | .948 | .912 | .000 | .923 | .000 | .000 | .000 | .000 | .000 | .938 | .895 | .931 | .809 | .500 | .771 | .894 | |

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File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 80 | 126 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 0 | 99 | 92 | 31 | 191 | 64 | 1 | 43 | 11 | 108 | 42 | 505 | 547 |
| 07:15 AM | 91 | 137 | 0 | 0 | 228 | 0 | 0 | 0 | 0 | 0 | 0 | 113 | 78 | 23 | 191 | 69 | 0 | 35 | 11 | 104 | 34 | 523 | 557 |
| 07:30 AM | 91 | 114 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 144 | 75 | 18 | 219 | 69 | 0 | 31 | 12 | 100 | 30 | 524 | 554 |
| 07:45 AM | 75 | 155 | 0 | 0 | 230 | 0 | 0 | 0 | 0 | 0 | 0 | 143 | 56 | 22 | 199 | 89 | 0 | 40 | 14 | 129 | 36 | 558 | 594 |
| Total | 337 | 532 | 0 | 0 | 869 | 0 | 0 | 0 | 0 | 0 | 0 | 499 | 301 | 94 | 800 | 291 | 1 | 149 | 48 | 441 | 142 | 2110 | 2252 |
| 08:00 AM | 79 | 137 | 0 | 0 | 216 | 0 | 0 | 0 | 0 | 0 | 0 | 131 | 49 | 12 | 180 | 62 | 0 | 40 | 11 | 102 | 23 | 498 | 521 |
| 08:15 AM | 85 | 166 | 0 | 0 | 251 | 0 | 0 | 0 | 0 | 0 | 0 | 105 | 61 | 16 | 166 | 60 | 0 | 35 | 6 | 95 | 22 | 512 | 534 |
| 08:30 AM | 83 | 120 | 0 | 0 | 203 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 60 | 15 | 177 | 51 | 0 | 44 | 6 | 95 | 21 | 475 | 496 |
| 08:45 AM | 49 | 117 | 0 | 0 | 166 | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 57 | 25 | 185 | 73 | 1 | 47 | 16 | 121 | 41 | 472 | 513 |
| Total | 296 | 540 | 0 | 0 | 836 | 0 | 0 | 0 | 0 | 0 | 0 | 481 | 227 | 68 | 708 | 246 | 1 | 166 | 39 | 413 | 107 | 1957 | 2064 |
| Grand Total | 633 | 1072 | 0 | 0 | 1705 | 0 | 0 | 0 | 0 | 0 | 0 | 980 | 528 | 162 | 1508 | 537 | 2 | 315 | 87 | 854 | 249 | 4067 | 4316 |
| Apprch % | 37.1 | 62.9 | 0 | | | 0 | 0 | 0 | | | 0 | 65 | 35 | | | 62.9 | 0.2 | 36.9 | | | | | |
| Total % | 15.6 | 26.4 | 0 | | 41.9 | 0 | 0 | 0 | | 0 | 0 | 24.1 | 13 | | 37.1 | 13.2 | 0 | 7.7 | | 21 | 5.8 | 94.2 | |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **91** | 114 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | **144** | **75** | **219** | 69 | 0 | 31 | 100 | 524 |
| 07:45 AM | 75 | 155 | 0 | 230 | 0 | 0 | 0 | 0 | 0 | 143 | 56 | 199 | **89** | 0 | **40** | **129** | **558** |
| 08:00 AM | 79 | 137 | 0 | 216 | 0 | 0 | 0 | 0 | 0 | 131 | 49 | 180 | 62 | 0 | 40 | 102 | 498 |
| 08:15 AM | 85 | **166** | 0 | **251** | 0 | 0 | 0 | 0 | 0 | 105 | 61 | 166 | 60 | 0 | 35 | 95 | 512 |
| Total Volume | 330 | 572 | 0 | 902 | 0 | 0 | 0 | 0 | 0 | 523 | 241 | 764 | 280 | 0 | 146 | 426 | 2092 |
| % App. Total | 36.6 | 63.4 | 0 | | 0 | 0 | 0 | | 0 | 68.5 | 31.5 | | 65.7 | 0 | 34.3 | | |
| PHF | .907 | .861 | .000 | .898 | .000 | .000 | .000 | .000 | .000 | .908 | .803 | .872 | .787 | .000 | .913 | .826 | .937 |

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File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

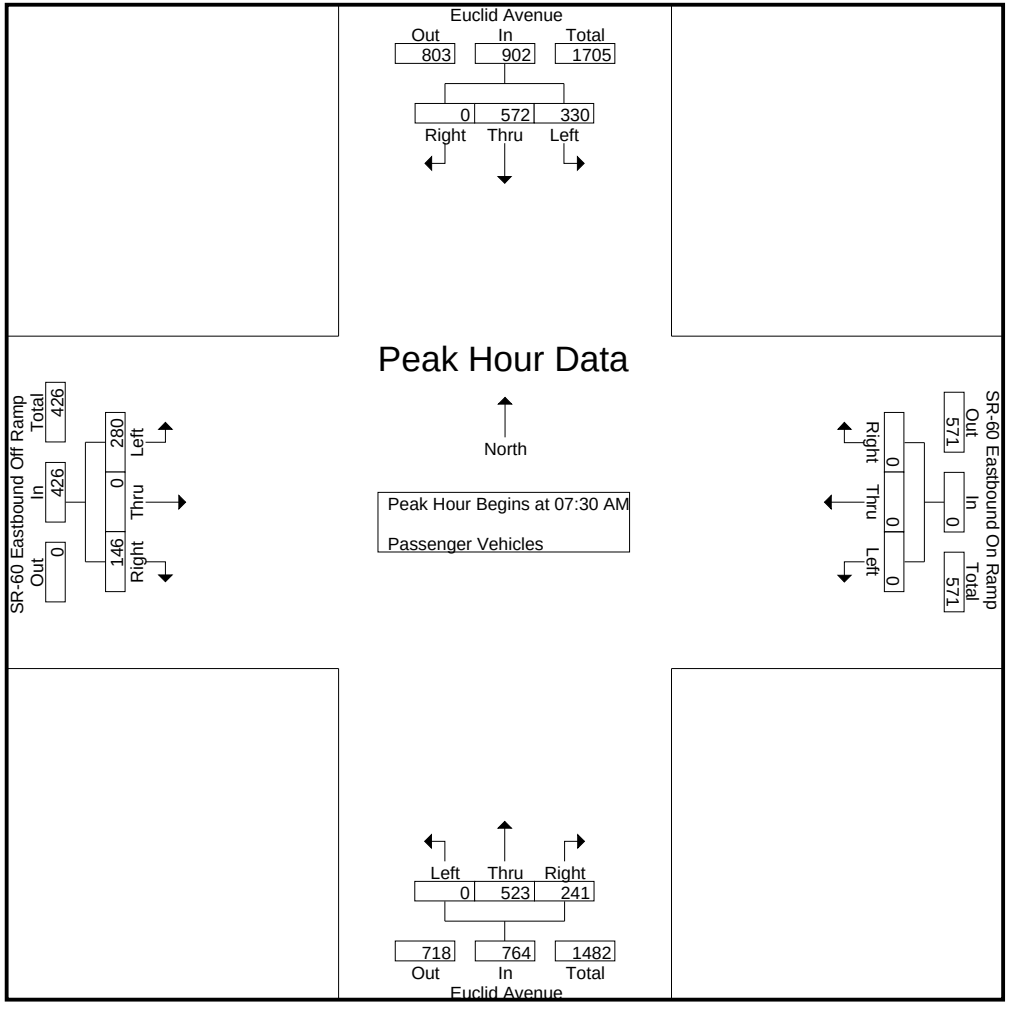

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City of Ontario
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| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **91** | 114 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | **144** | **75** | **219** | 69 | 0 | 31 | 100 | |
| +15 mins. | 75 | 155 | 0 | 230 | 0 | 0 | 0 | 0 | 0 | 143 | 56 | 199 | **89** | 0 | **40** | **129** | |
| +30 mins. | 79 | 137 | 0 | 216 | 0 | 0 | 0 | 0 | 0 | 131 | 49 | 180 | 62 | 0 | 40 | 102 | |
| +45 mins. | 85 | **166** | 0 | **251** | 0 | 0 | 0 | 0 | 0 | 105 | 61 | 166 | 60 | 0 | 35 | 95 | |
| Total Volume | 330 | 572 | 0 | 902 | 0 | 0 | 0 | 0 | 0 | 523 | 241 | 764 | 280 | 0 | 146 | 426 | |
| % App. Total | 36.6 | 63.4 | 0 | | 0 | 0 | 0 | | 0 | 68.5 | 31.5 | | 65.7 | 0 | 34.3 | | |
| PHF | .907 | .861 | .000 | .898 | .000 | .000 | .000 | .000 | .000 | .908 | .803 | .872 | .787 | .000 | .913 | .826 | |

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City of Ontario
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E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 6 | 4 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 3 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 19 | 20 |
| 07:15 AM | 2 | 8 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 2 | 7 | 1 | 0 | 2 | 0 | 3 | 2 | 20 | 22 |
| 07:30 AM | 1 | 8 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 | 0 | 9 | 0 | 1 | 1 | 0 | 2 | 0 | 20 | 20 |
| 07:45 AM | 2 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 4 | 1 | 0 | 2 | 1 | 3 | 3 | 12 | 15 |
| Total | 11 | 23 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 15 | 5 | 29 | 2 | 1 | 5 | 1 | 8 | 6 | 71 | 77 |
| 08:00 AM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 2 | 8 | 3 | 0 | 3 | 0 | 6 | 2 | 22 | 24 |
| 08:15 AM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 6 | 0 | 10 | 3 | 0 | 1 | 0 | 4 | 0 | 22 | 22 |
| 08:30 AM | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 3 | 14 | 6 | 0 | 2 | 2 | 8 | 5 | 29 | 34 |
| 08:45 AM | 1 | 10 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 8 | 3 | 12 | 2 | 0 | 6 | 1 | 8 | 4 | 31 | 35 |
| Total | 3 | 31 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 26 | 8 | 44 | 14 | 0 | 12 | 3 | 26 | 11 | 104 | 115 |
| Grand Total | 14 | 54 | 0 | 0 | 68 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 41 | 13 | 73 | 16 | 1 | 17 | 4 | 34 | 17 | 175 | 192 |
| Apprch % | 20.6 | 79.4 | 0 | | | 0 | 0 | 0 | | | 0 | 43.8 | 56.2 | | | 47.1 | 2.9 | 50 | | | | | |
| Total % | 8 | 30.9 | 0 | | 38.9 | 0 | 0 | 0 | | 0 | 0 | 18.3 | 23.4 | | 41.7 | 9.1 | 0.6 | 9.7 | | 19.4 | 8.9 | 91.1 | |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 1 | **8** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 3 | **6** | 9 | 0 | **1** | 1 | 2 | 20 |
| 07:45 AM | **2** | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 | 1 | 0 | 2 | 3 | 12 |
| 08:00 AM | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 8 | **3** | 0 | **3** | **6** | **22** |
| 08:15 AM | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | **4** | 6 | **10** | 3 | 0 | 1 | 4 | 22 |
| Total Volume | 3 | 27 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 11 | 20 | 31 | 7 | 1 | 7 | 15 | 76 |
| % App. Total | 10 | 90 | 0 | | 0 | 0 | 0 | | 0 | 35.5 | 64.5 | | 46.7 | 6.7 | 46.7 | | |
| PHF | .375 | .844 | .000 | .833 | .000 | .000 | .000 | .000 | .000 | .688 | .833 | .775 | .583 | .250 | .583 | .625 | .864 |

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City of Ontario
N/S: Euclid Avenue
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File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

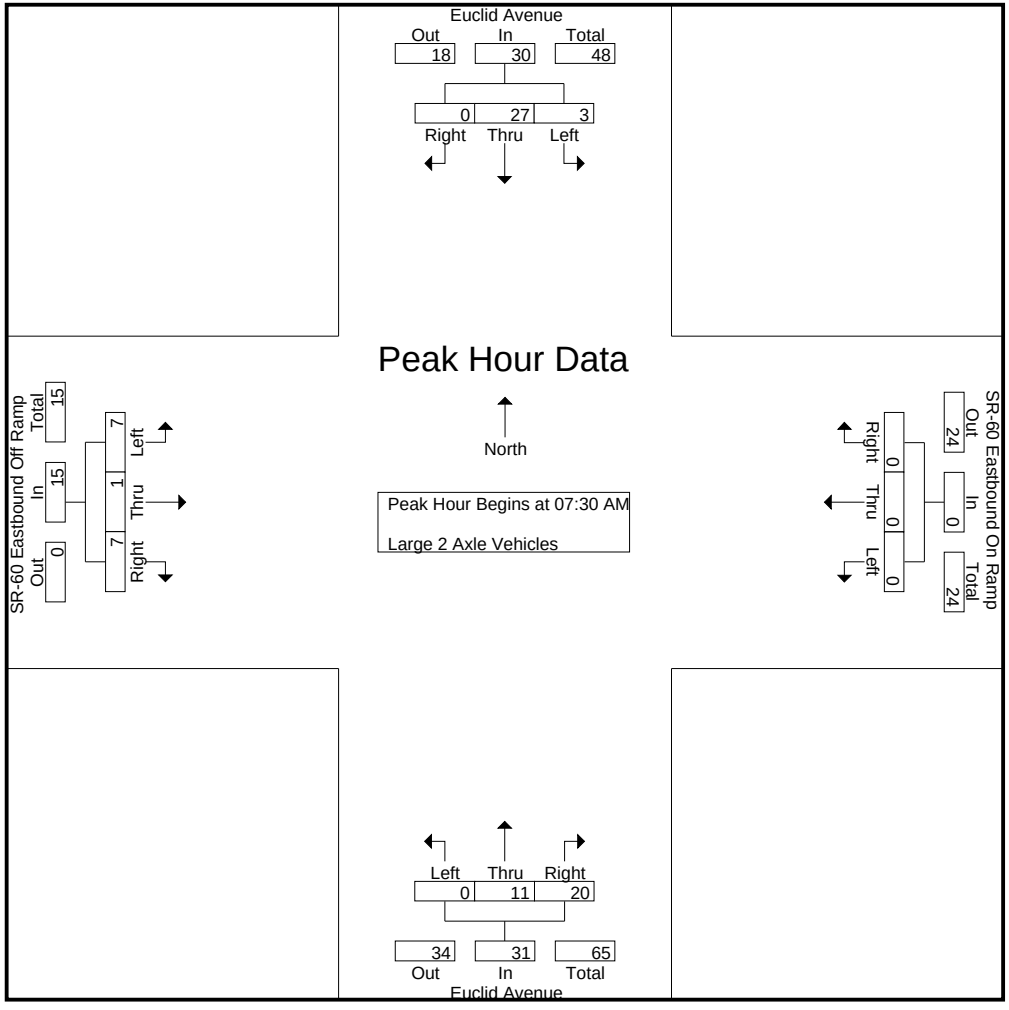

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City of Ontario
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Site Code : 05124953
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| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 1 | **8** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 3 | **6** | 9 | 0 | **1** | 1 | 2 | |
| +15 mins. | **2** | 3 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 | 1 | 0 | 2 | 3 | |
| +30 mins. | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 8 | **3** | 0 | **3** | **6** | |
| +45 mins. | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | **4** | 6 | **10** | 3 | 0 | 1 | 4 | |
| Total Volume | 3 | 27 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 11 | 20 | 31 | 7 | 1 | 7 | 15 | |
| % App. Total | 10 | 90 | 0 | | 0 | 0 | 0 | | 0 | 35.5 | 64.5 | | 46.7 | 6.7 | 46.7 | | |
| PHF | .375 | .844 | .000 | .833 | .000 | .000 | .000 | .000 | .000 | .688 | .833 | .775 | .583 | .250 | .583 | .625 | |

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Weather: Clear

File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 2 | 6 | 0 | 0 | 5 | 2 | 5 | 4 | 16 | 20 |
| 07:15 AM | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 | 2 | 10 | 0 | 0 | 1 | 0 | 1 | 2 | 22 | 24 |
| 07:30 AM | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 1 | 7 | 0 | 0 | 2 | 1 | 2 | 2 | 16 | 18 |
| 07:45 AM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 0 | 8 | 0 | 0 | 4 | 0 | 4 | 0 | 19 | 19 |
| Total | 1 | 29 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 17 | 5 | 31 | 0 | 0 | 12 | 3 | 12 | 8 | 73 | 81 |
| 08:00 AM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 5 | 2 | 0 | 4 | 0 | 6 | 0 | 19 | 19 |
| 08:15 AM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 | 1 | 16 | 0 | 0 | 2 | 1 | 2 | 2 | 25 | 27 |
| 08:30 AM | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 1 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 18 |
| 08:45 AM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 12 | 12 |
| Total | 0 | 27 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 21 | 2 | 37 | 2 | 0 | 7 | 1 | 9 | 3 | 73 | 76 |
| Grand Total | 1 | 56 | 0 | 0 | 57 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 38 | 7 | 68 | 2 | 0 | 19 | 4 | 21 | 11 | 146 | 157 |
| Apprch % | 1.8 | 98.2 | 0 | | | 0 | 0 | 0 | | | 0 | 44.1 | 55.9 | | | 9.5 | 0 | 90.5 | | | | | |
| Total % | 0.7 | 38.4 | 0 | | 39 | 0 | 0 | 0 | | 0 | 0 | 20.5 | 26 | | 46.6 | 1.4 | 0 | 13 | | 14.4 | 7 | 93 | |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 7 | 0 | 0 | 2 | 2 | 16 |
| 07:45 AM | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 8 | 0 | 0 | **4** | 4 | 19 |
| 08:00 AM | 0 | **8** | 0 | **8** | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 5 | **2** | 0 | 4 | **6** | 19 |
| 08:15 AM | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | **8** | **8** | **16** | 0 | 0 | 2 | 2 | **25** |
| Total Volume | 1 | 28 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 17 | 19 | 36 | 2 | 0 | 12 | 14 | 79 |
| % App. Total | 3.4 | 96.6 | 0 | | 0 | 0 | 0 | | 0 | 47.2 | 52.8 | | 14.3 | 0 | 85.7 | | |
| PHF | .250 | .875 | .000 | .906 | .000 | .000 | .000 | .000 | .000 | .531 | .594 | .563 | .250 | .000 | .750 | .583 | .790 |

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File Name : 02_ONT_Euc_60E AMC
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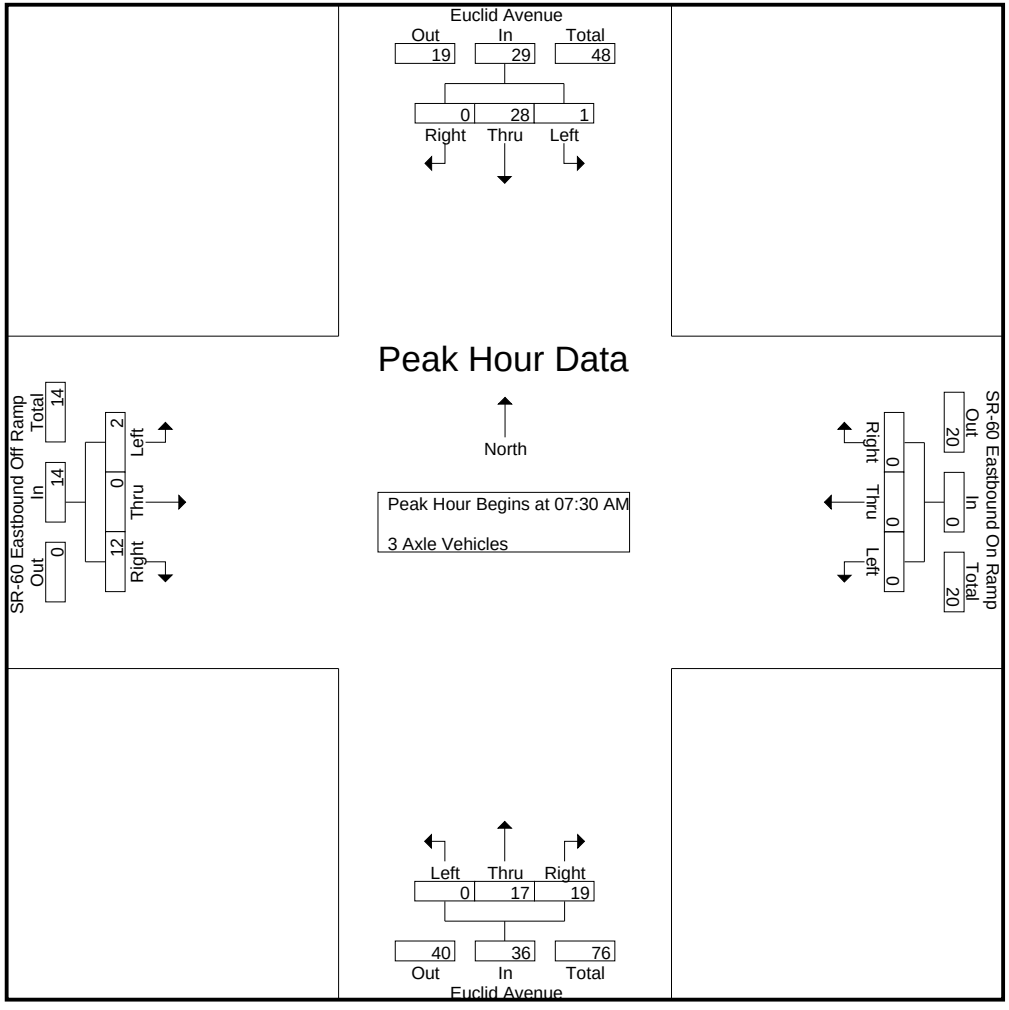

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| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 7 | 0 | 0 | 2 | 2 | |
| +15 mins. | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 8 | 0 | 0 | **4** | 4 | |
| +30 mins. | 0 | **8** | 0 | **8** | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 5 | **2** | 0 | 4 | **6** | |
| +45 mins. | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | **8** | **8** | **16** | 0 | 0 | 2 | 2 | |
| Total Volume | 1 | 28 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 17 | 19 | 36 | 2 | 0 | 12 | 14 | |
| % App. Total | 3.4 | 96.6 | 0 | | 0 | 0 | 0 | | 0 | 47.2 | 52.8 | | 14.3 | 0 | 85.7 | | |
| PHF | .250 | .875 | .000 | .906 | .000 | .000 | .000 | .000 | .000 | .531 | .594 | .563 | .250 | .000 | .750 | .583 | |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 17 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 20 | 5 | 33 | 2 | 0 | 22 | 12 | 24 | 17 | 75 | 92 |
| 07:15 AM | 0 | 16 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 24 | 2 | 39 | 3 | 0 | 14 | 6 | 17 | 8 | 72 | 80 |
| 07:30 AM | 1 | 22 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 24 | 4 | 40 | 2 | 0 | 8 | 0 | 10 | 4 | 73 | 77 |
| 07:45 AM | 1 | 21 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 28 | 7 | 47 | 4 | 0 | 6 | 3 | 10 | 10 | 79 | 89 |
| Total | 3 | 76 | 0 | 0 | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | 96 | 18 | 159 | 11 | 0 | 50 | 21 | 61 | 39 | 299 | 338 |
| 08:00 AM | 0 | 23 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 27 | 5 | 51 | 5 | 0 | 13 | 3 | 18 | 8 | 92 | 100 |
| 08:15 AM | 2 | 21 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 31 | 10 | 50 | 5 | 0 | 11 | 4 | 16 | 14 | 89 | 103 |
| 08:30 AM | 1 | 39 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 19 | 5 | 34 | 1 | 0 | 13 | 3 | 14 | 8 | 88 | 96 |
| 08:45 AM | 2 | 37 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 17 | 2 | 26 | 6 | 0 | 13 | 4 | 19 | 6 | 84 | 90 |
| Total | 5 | 120 | 0 | 0 | 125 | 0 | 0 | 0 | 0 | 0 | 0 | 67 | 94 | 22 | 161 | 17 | 0 | 50 | 14 | 67 | 36 | 353 | 389 |
| Grand Total | 8 | 196 | 0 | 0 | 204 | 0 | 0 | 0 | 0 | 0 | 0 | 130 | 190 | 40 | 320 | 28 | 0 | 100 | 35 | 128 | 75 | 652 | 727 |
| Apprch % | 3.9 | 96.1 | 0 | | | 0 | 0 | 0 | | | 0 | 40.6 | 59.4 | | | 21.9 | 0 | 78.1 | | | | | |
| Total % | 1.2 | 30.1 | 0 | | 31.3 | 0 | 0 | 0 | | 0 | 0 | 19.9 | 29.1 | | 49.1 | 4.3 | 0 | 15.3 | | 19.6 | 10.3 | 89.7 | |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 1 | 22 | 0 | **23** | 0 | 0 | 0 | 0 | 0 | 16 | 24 | 40 | 2 | 0 | 8 | 10 | 73 |
| 07:45 AM | 1 | 21 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 19 | 28 | 47 | 4 | 0 | 6 | 10 | 79 |
| 08:00 AM | 0 | **23** | 0 | 23 | 0 | 0 | 0 | 0 | 0 | **24** | 27 | **51** | **5** | 0 | **13** | **18** | **92** |
| 08:15 AM | **2** | 21 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 19 | **31** | 50 | 5 | 0 | 11 | 16 | 89 |
| Total Volume | 4 | 87 | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 78 | 110 | 188 | 16 | 0 | 38 | 54 | 333 |
| % App. Total | 4.4 | 95.6 | 0 | | 0 | 0 | 0 | | 0 | 41.5 | 58.5 | | 29.6 | 0 | 70.4 | | |
| PHF | .500 | .946 | .000 | .989 | .000 | .000 | .000 | .000 | .000 | .813 | .887 | .922 | .800 | .000 | .731 | .750 | .905 |

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 02_ONT_Euc_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

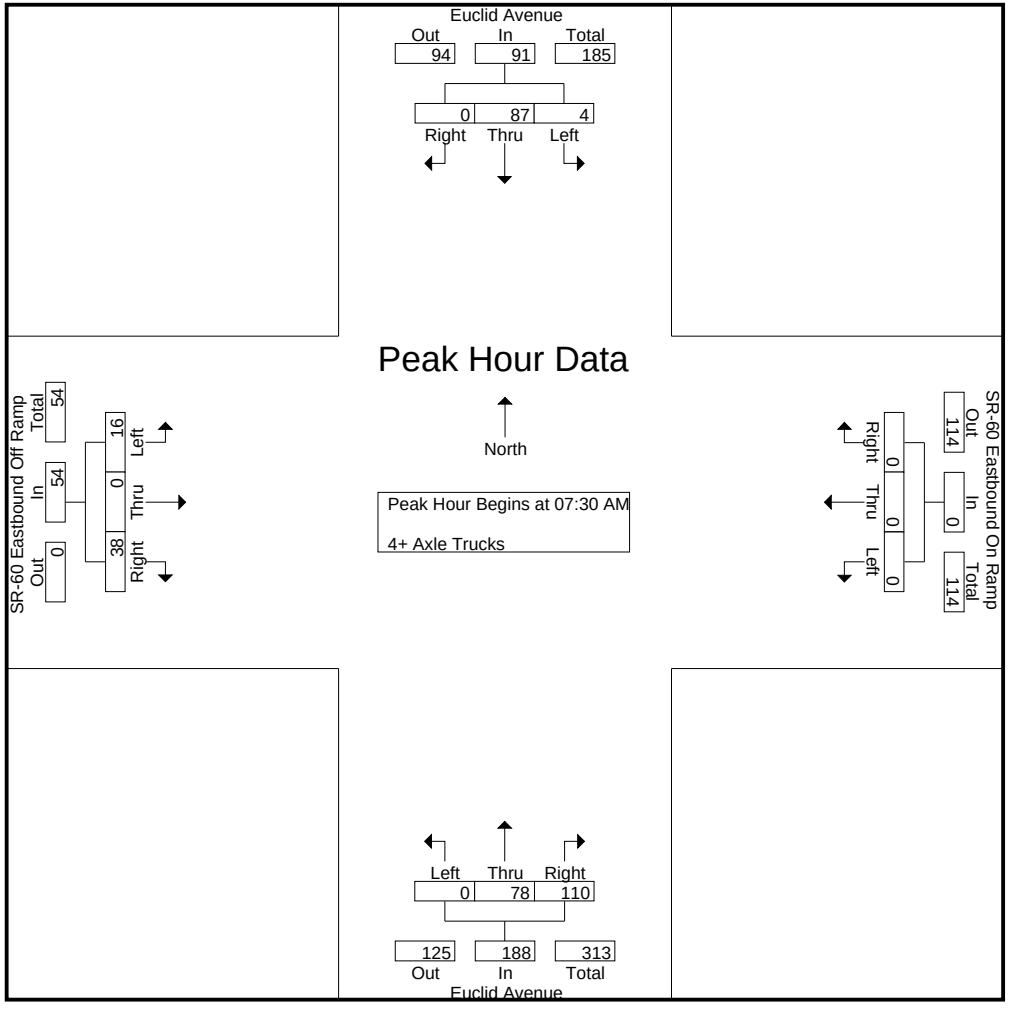

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City of Ontario
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File Name : 02_ONT_Euc_60E AMC
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Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 1 | 22 | 0 | **23** | 0 | 0 | 0 | 0 | 0 | 16 | 24 | 40 | 2 | 0 | 8 | 10 | |
| +15 mins. | 1 | 21 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 19 | 28 | 47 | 4 | 0 | 6 | 10 | |
| +30 mins. | 0 | **23** | 0 | 23 | 0 | 0 | 0 | 0 | 0 | **24** | 27 | **51** | **5** | 0 | **13** | **18** | |
| +45 mins. | **2** | 21 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 19 | **31** | 50 | 5 | 0 | 11 | 16 | |
| Total Volume | 4 | 87 | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 78 | 110 | 188 | 16 | 0 | 38 | 54 | |
| % App. Total | 4.4 | 95.6 | 0 | | 0 | 0 | 0 | | 0 | 41.5 | 58.5 | | 29.6 | 0 | 70.4 | | |
| PHF | .500 | .946 | .000 | .989 | .000 | .000 | .000 | .000 | .000 | .813 | .887 | .922 | .800 | .000 | .731 | .750 | |

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City of Ontario
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File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 84 | 207 | 0 | 0 | 291 | 0 | 0 | 0 | 0 | 0 | 0 | 181 | 98 | 26 | 279 | 68 | 0 | 44 | 16 | 112 | 42 | 682 | 724 |
| 04:15 PM | 68 | 211 | 0 | 0 | 279 | 0 | 0 | 0 | 0 | 0 | 0 | 182 | 94 | 26 | 276 | 49 | 0 | 51 | 13 | 100 | 39 | 655 | 694 |
| 04:30 PM | 94 | 200 | 0 | 0 | 294 | 0 | 0 | 0 | 0 | 0 | 0 | 180 | 92 | 30 | 272 | 61 | 1 | 57 | 13 | 119 | 43 | 685 | 728 |
| 04:45 PM | 96 | 225 | 0 | 0 | 321 | 0 | 0 | 0 | 0 | 0 | 0 | 171 | 95 | 32 | 266 | 52 | 1 | 40 | 16 | 93 | 48 | 680 | 728 |
| Total | 342 | 843 | 0 | 0 | 1185 | 0 | 0 | 0 | 0 | 0 | 0 | 714 | 379 | 114 | 1093 | 230 | 2 | 192 | 58 | 424 | 172 | 2702 | 2874 |
| 05:00 PM | 112 | 186 | 0 | 0 | 298 | 0 | 0 | 0 | 0 | 0 | 0 | 156 | 88 | 17 | 244 | 60 | 0 | 50 | 12 | 110 | 29 | 652 | 681 |
| 05:15 PM | 90 | 182 | 0 | 0 | 272 | 0 | 0 | 0 | 0 | 0 | 0 | 190 | 113 | 16 | 303 | 48 | 1 | 45 | 14 | 94 | 30 | 669 | 699 |
| 05:30 PM | 100 | 233 | 0 | 0 | 333 | 0 | 0 | 0 | 0 | 0 | 0 | 179 | 84 | 16 | 263 | 54 | 0 | 49 | 18 | 103 | 34 | 699 | 733 |
| 05:45 PM | 98 | 213 | 0 | 0 | 311 | 0 | 0 | 0 | 0 | 0 | 0 | 147 | 103 | 22 | 250 | 61 | 0 | 57 | 19 | 118 | 41 | 679 | 720 |
| Total | 400 | 814 | 0 | 0 | 1214 | 0 | 0 | 0 | 0 | 0 | 0 | 672 | 388 | 71 | 1060 | 223 | 1 | 201 | 63 | 425 | 134 | 2699 | 2833 |
| Grand Total | 742 | 1657 | 0 | 0 | 2399 | 0 | 0 | 0 | 0 | 0 | 0 | 1386 | 767 | 185 | 2153 | 453 | 3 | 393 | 121 | 849 | 306 | 5401 | 5707 |
| Apprch % | 30.9 | 69.1 | 0 | | | 0 | 0 | 0 | | | 0 | 64.4 | 35.6 | | | 53.4 | 0.4 | 46.3 | | | | | |
| Total % | 13.7 | 30.7 | 0 | | 44.4 | 0 | 0 | 0 | | 0 | 0 | 25.7 | 14.2 | | 39.9 | 8.4 | 0.1 | 7.3 | | 15.7 | 5.4 | 94.6 | |
| Passenger Vehicles | 729 | 1407 | 0 | | 2136 | 0 | 0 | 0 | | 0 | 0 | 1308 | 559 | | 2018 | 426 | 0 | 324 | | 847 | 0 | 0 | 5001 |
| % Passenger Vehicles | 98.2 | 84.9 | 0 | 0 | 89 | 0 | 0 | 0 | 0 | 0 | 0 | 94.4 | 72.9 | 81.6 | 86.3 | 94 | 0 | 82.4 | 80.2 | 87.3 | 0 | 0 | 87.6 |
| Large 2 Axle Vehicles | 8 | 41 | 0 | | 49 | 0 | 0 | 0 | | 0 | 0 | 21 | 31 | | 56 | 7 | 3 | 13 | | 32 | 0 | 0 | 137 |
| % Large 2 Axle Vehicles | 1.1 | 2.5 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1.5 | 4 | 2.2 | 2.4 | 1.5 | 100 | 3.3 | 7.4 | 3.3 | 0 | 0 | 2.4 |
| 3 Axle Vehicles | 2 | 64 | 0 | | 66 | 0 | 0 | 0 | | 0 | 0 | 5 | 25 | | 36 | 10 | 0 | 12 | | 28 | 0 | 0 | 130 |
| % 3 Axle Vehicles | 0.3 | 3.9 | 0 | 0 | 2.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4 | 3.3 | 3.2 | 1.5 | 2.2 | 0 | 3.1 | 5 | 2.9 | 0 | 0 | 2.3 |
| 4+ Axle Trucks | 3 | 145 | 0 | | 148 | 0 | 0 | 0 | | 0 | 0 | 52 | 152 | | 228 | 10 | 0 | 44 | | 63 | 0 | 0 | 439 |
| % 4+ Axle Trucks | 0.4 | 8.8 | 0 | 0 | 6.2 | 0 | 0 | 0 | 0 | 0 | 0 | 3.8 | 19.8 | 13 | 9.8 | 2.2 | 0 | 11.2 | 7.4 | 6.5 | 0 | 0 | 7.7 |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 84 | 207 | 0 | 291 | 0 | 0 | 0 | 0 | 0 | 181 | **98** | **279** | **68** | 0 | 44 | 112 | 682 |
| 04:15 PM | 68 | 211 | 0 | 279 | 0 | 0 | 0 | 0 | 0 | **182** | 94 | 276 | 49 | 0 | 51 | 100 | 655 |
| 04:30 PM | 94 | 200 | 0 | 294 | 0 | 0 | 0 | 0 | 0 | 180 | 92 | 272 | 61 | **1** | **57** | **119** | **685** |
| 04:45 PM | **96** | **225** | 0 | **321** | 0 | 0 | 0 | 0 | 0 | 171 | 95 | 266 | 52 | 1 | 40 | 93 | 680 |
| Total Volume | 342 | 843 | 0 | 1185 | 0 | 0 | 0 | 0 | 0 | 714 | 379 | 1093 | 230 | 2 | 192 | 424 | 2702 |
| % App. Total | 28.9 | 71.1 | 0 | | 0 | 0 | 0 | | 0 | 65.3 | 34.7 | | 54.2 | 0.5 | 45.3 | | |
| PHF | .891 | .937 | .000 | .923 | .000 | .000 | .000 | .000 | .000 | .981 | .967 | .979 | .846 | .500 | .842 | .891 | .986 |

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File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

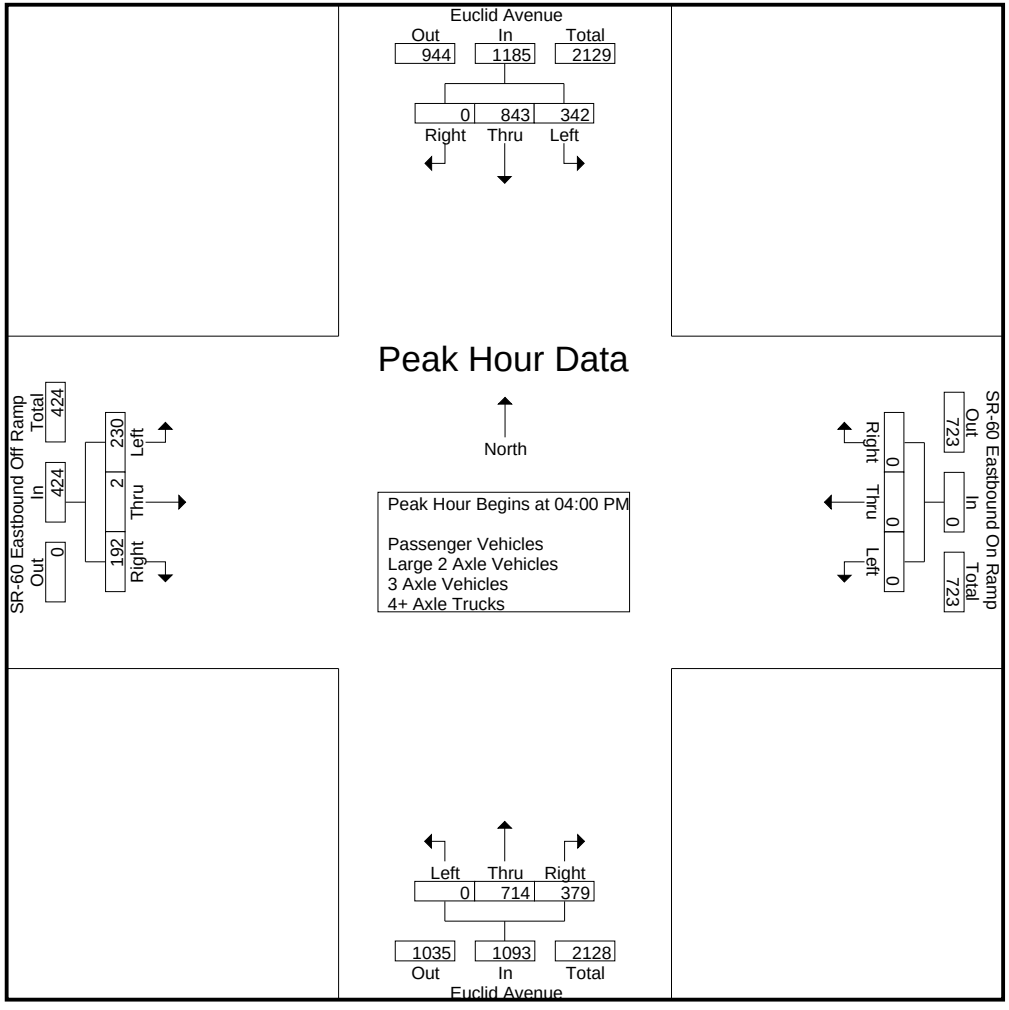

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E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:45 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 05:00 PM | | | | |
| +0 mins. | 96 | 225 | 0 | 321 | 0 | 0 | 0 | 0 | 0 | 181 | **98** | **279** | 60 | 0 | 50 | 110 | |
| +15 mins. | **112** | 186 | 0 | 298 | 0 | 0 | 0 | 0 | 0 | **182** | 94 | 276 | 48 | **1** | 45 | 94 | |
| +30 mins. | 90 | 182 | 0 | 272 | 0 | 0 | 0 | 0 | 0 | 180 | 92 | 272 | 54 | 0 | 49 | 103 | |
| +45 mins. | 100 | **233** | 0 | **333** | 0 | 0 | 0 | 0 | 0 | 171 | 95 | 266 | **61** | 0 | **57** | **118** | |
| Total Volume | 398 | 826 | 0 | 1224 | 0 | 0 | 0 | 0 | 0 | 714 | 379 | 1093 | 223 | 1 | 201 | 425 | |
| % App. Total | 32.5 | 67.5 | 0 | | 0 | 0 | 0 | | 0 | 65.3 | 34.7 | | 52.5 | 0.2 | 47.3 | | |
| PHF | .888 | .886 | .000 | .919 | .000 | .000 | .000 | .000 | .000 | .981 | .967 | .979 | .914 | .250 | .882 | .900 | |

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Weather: Clear

File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 83 | 177 | 0 | 0 | 260 | 0 | 0 | 0 | 0 | 0 | 0 | 168 | 67 | 21 | 235 | 66 | 0 | 34 | 13 | 100 | 34 | 595 | 629 |
| 04:15 PM | 68 | 182 | 0 | 0 | 250 | 0 | 0 | 0 | 0 | 0 | 0 | 178 | 62 | 22 | 240 | 48 | 0 | 45 | 12 | 93 | 34 | 583 | 617 |
| 04:30 PM | 92 | 164 | 0 | 0 | 256 | 0 | 0 | 0 | 0 | 0 | 0 | 170 | 69 | 26 | 239 | 54 | 0 | 45 | 7 | 99 | 33 | 594 | 627 |
| 04:45 PM | 93 | 187 | 0 | 0 | 280 | 0 | 0 | 0 | 0 | 0 | 0 | 161 | 71 | 25 | 232 | 50 | 0 | 33 | 14 | 83 | 39 | 595 | 634 |
| Total | 336 | 710 | 0 | 0 | 1046 | 0 | 0 | 0 | 0 | 0 | 0 | 677 | 269 | 94 | 946 | 218 | 0 | 157 | 46 | 375 | 140 | 2367 | 2507 |
| 05:00 PM | 112 | 161 | 0 | 0 | 273 | 0 | 0 | 0 | 0 | 0 | 0 | 144 | 63 | 13 | 207 | 58 | 0 | 42 | 10 | 100 | 23 | 580 | 603 |
| 05:15 PM | 87 | 159 | 0 | 0 | 246 | 0 | 0 | 0 | 0 | 0 | 0 | 179 | 86 | 15 | 265 | 42 | 0 | 35 | 11 | 77 | 26 | 588 | 614 |
| 05:30 PM | 98 | 199 | 0 | 0 | 297 | 0 | 0 | 0 | 0 | 0 | 0 | 168 | 62 | 12 | 230 | 49 | 0 | 39 | 13 | 88 | 25 | 615 | 640 |
| 05:45 PM | 96 | 178 | 0 | 0 | 274 | 0 | 0 | 0 | 0 | 0 | 0 | 140 | 79 | 17 | 219 | 59 | 0 | 51 | 17 | 110 | 34 | 603 | 637 |
| Total | 393 | 697 | 0 | 0 | 1090 | 0 | 0 | 0 | 0 | 0 | 0 | 631 | 290 | 57 | 921 | 208 | 0 | 167 | 51 | 375 | 108 | 2386 | 2494 |
| Grand Total | 729 | 1407 | 0 | 0 | 2136 | 0 | 0 | 0 | 0 | 0 | 0 | 1308 | 559 | 151 | 1867 | 426 | 0 | 324 | 97 | 750 | 248 | 4753 | 5001 |
| Apprch % | 34.1 | 65.9 | 0 | | | 0 | 0 | 0 | | | 0 | 70.1 | 29.9 | | | 56.8 | 0 | 43.2 | | | | | |
| Total % | 15.3 | 29.6 | 0 | | 44.9 | 0 | 0 | 0 | | 0 | 0 | 27.5 | 11.8 | | 39.3 | 9 | 0 | 6.8 | | 15.8 | 5 | 95 | |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 83 | 177 | 0 | 260 | 0 | 0 | 0 | 0 | 0 | 168 | 67 | 235 | **66** | 0 | 34 | **100** | **595** |
| 04:15 PM | 68 | 182 | 0 | 250 | 0 | 0 | 0 | 0 | 0 | **178** | 62 | **240** | 48 | 0 | **45** | 93 | 583 |
| 04:30 PM | 92 | 164 | 0 | 256 | 0 | 0 | 0 | 0 | 0 | 170 | 69 | 239 | 54 | 0 | 45 | 99 | 594 |
| 04:45 PM | **93** | **187** | 0 | **280** | 0 | 0 | 0 | 0 | 0 | 161 | **71** | 232 | 50 | 0 | 33 | 83 | 595 |
| Total Volume | 336 | 710 | 0 | 1046 | 0 | 0 | 0 | 0 | 0 | 677 | 269 | 946 | 218 | 0 | 157 | 375 | 2367 |
| % App. Total | 32.1 | 67.9 | 0 | | 0 | 0 | 0 | | 0 | 71.6 | 28.4 | | 58.1 | 0 | 41.9 | | |
| PHF | .903 | .949 | .000 | .934 | .000 | .000 | .000 | .000 | .000 | .951 | .947 | .985 | .826 | .000 | .872 | .938 | .995 |

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Start Date : 10/2/2024
Page No : 2

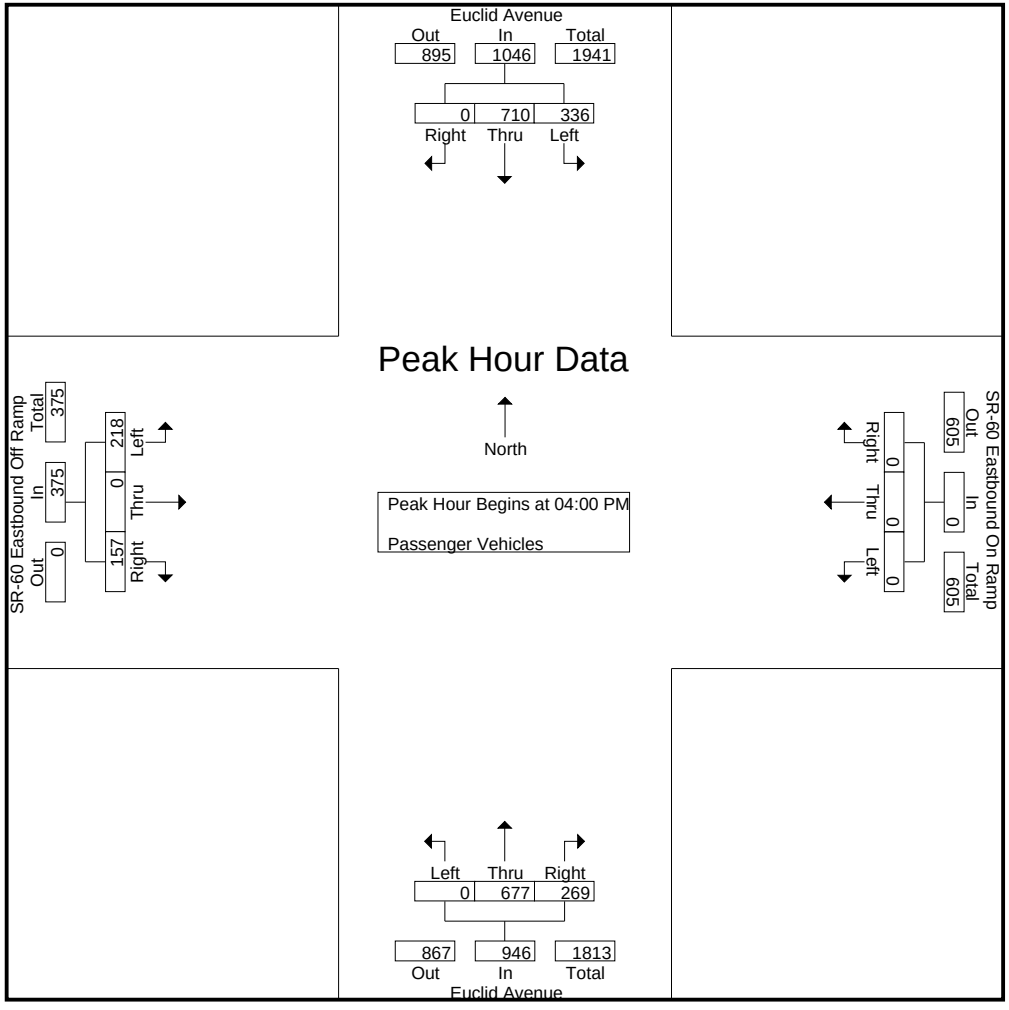

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| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 83 | 177 | 0 | 260 | 0 | 0 | 0 | 0 | 0 | 168 | 67 | 235 | **66** | 0 | 34 | **100** | |
| +15 mins. | 68 | 182 | 0 | 250 | 0 | 0 | 0 | 0 | 0 | **178** | 62 | **240** | 48 | 0 | **45** | 93 | |
| +30 mins. | 92 | 164 | 0 | 256 | 0 | 0 | 0 | 0 | 0 | 170 | 69 | 239 | 54 | 0 | 45 | 99 | |
| +45 mins. | **93** | **187** | 0 | **280** | 0 | 0 | 0 | 0 | 0 | 161 | **71** | 232 | 50 | 0 | 33 | 83 | |
| Total Volume | 336 | 710 | 0 | 1046 | 0 | 0 | 0 | 0 | 0 | 677 | 269 | 946 | 218 | 0 | 157 | 375 | |
| % App. Total | 32.1 | 67.9 | 0 | | 0 | 0 | 0 | | 0 | 71.6 | 28.4 | | 58.1 | 0 | 41.9 | | |
| PHF | .903 | .949 | .000 | .934 | .000 | .000 | .000 | .000 | .000 | .951 | .947 | .985 | .826 | .000 | .872 | .938 | |

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(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 8 | 1 | 0 | 1 | 1 | 2 | 1 | 16 | 17 |
| 04:15 PM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 5 | 0 | 0 | 1 | 1 | 1 | 1 | 10 | 11 |
| 04:30 PM | 1 | 8 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 4 | 1 | 1 | 4 | 3 | 6 | 3 | 19 | 22 |
| 04:45 PM | 2 | 6 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 2 | 7 | 1 | 1 | 1 | 0 | 3 | 2 | 18 | 20 |
| Total | 3 | 24 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 13 | 2 | 24 | 3 | 2 | 7 | 5 | 12 | 7 | 63 | 70 |
| 05:00 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 1 | 8 | 0 | 0 | 1 | 1 | 1 | 2 | 11 | 13 |
| 05:15 PM | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 7 | 1 | 1 | 3 | 1 | 5 | 1 | 19 | 20 |
| 05:30 PM | 2 | 6 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 4 | 3 | 0 | 1 | 1 | 4 | 1 | 16 | 17 |
| 05:45 PM | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 | 1 | 9 | 0 | 0 | 1 | 1 | 1 | 2 | 15 | 17 |
| Total | 5 | 17 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 18 | 2 | 28 | 4 | 1 | 6 | 4 | 11 | 6 | 61 | 67 |
| Grand Total | 8 | 41 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 31 | 4 | 52 | 7 | 3 | 13 | 9 | 23 | 13 | 124 | 137 |
| Apprch % | 16.3 | 83.7 | 0 | | | 0 | 0 | 0 | | | 0 | 40.4 | 59.6 | | | 30.4 | 13 | 56.5 | | | | | |
| Total % | 6.5 | 33.1 | 0 | | 39.5 | 0 | 0 | 0 | | 0 | 0 | 16.9 | 25 | | 41.9 | 5.6 | 2.4 | 10.5 | | 18.5 | 9.5 | 90.5 | |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | **4** | **4** | **8** | **1** | 0 | 1 | 2 | 16 |
| 04:15 PM | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 5 | 0 | 0 | 1 | 1 | 10 |
| 04:30 PM | 1 | **8** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 4 | 1 | **1** | **4** | **6** | **19** |
| 04:45 PM | **2** | 6 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 7 | 1 | 1 | 1 | 3 | 18 |
| Total Volume | 3 | 24 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 11 | 13 | 24 | 3 | 2 | 7 | 12 | 63 |
| % App. Total | 11.1 | 88.9 | 0 | | 0 | 0 | 0 | | 0 | 45.8 | 54.2 | | 25 | 16.7 | 58.3 | | |
| PHF | .375 | .750 | .000 | .750 | .000 | .000 | .000 | .000 | .000 | .688 | .813 | .750 | .750 | .500 | .438 | .500 | .829 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

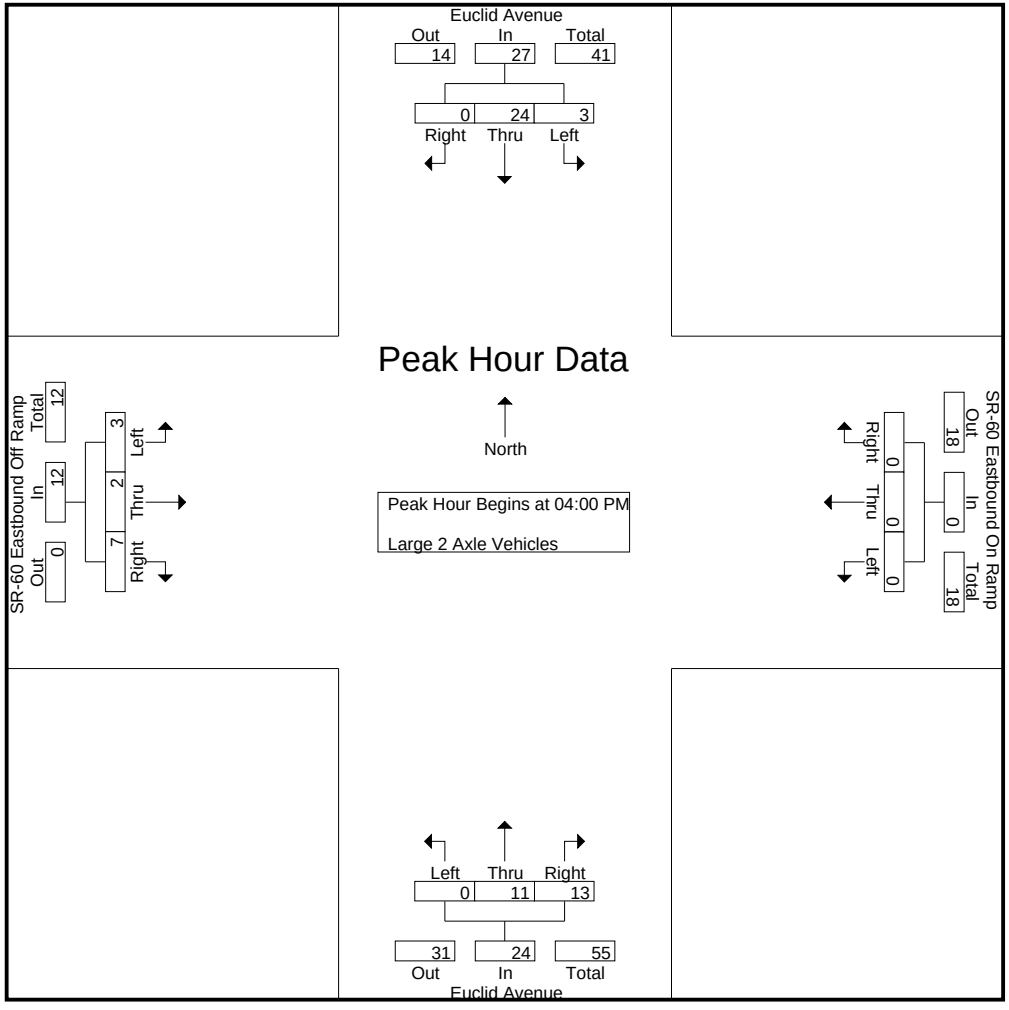

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City of Ontario
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Site Code : 05124953
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Page No : 3

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | **4** | **4** | **8** | **1** | 0 | 1 | 2 | |
| +15 mins. | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 5 | 0 | 0 | 1 | 1 | |
| +30 mins. | 1 | **8** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 4 | 1 | **1** | **4** | **6** | |
| +45 mins. | **2** | 6 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 7 | 1 | 1 | 1 | 3 | |
| Total Volume | 3 | 24 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 11 | 13 | 24 | 3 | 2 | 7 | 12 | |
| % App. Total | 11.1 | 88.9 | 0 | | 0 | 0 | 0 | | 0 | 45.8 | 54.2 | | 25 | 16.7 | 58.3 | | |
| PHF | .375 | .750 | .000 | .750 | .000 | .000 | .000 | .000 | .000 | .688 | .813 | .750 | .750 | .500 | .438 | .500 | |

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City of Ontario
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File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 1 | 3 | 1 | 11 | 12 |
| 04:15 PM | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 1 | 0 | 1 | 0 | 2 | 0 | 15 | 15 |
| 04:30 PM | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 4 | 3 | 0 | 0 | 0 | 3 | 1 | 20 | 21 |
| 04:45 PM | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 6 | 1 | 0 | 2 | 1 | 3 | 2 | 16 | 18 |
| Total | 2 | 35 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 11 | 2 | 14 | 6 | 0 | 5 | 2 | 11 | 4 | 62 | 66 |
| 05:00 PM | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 3 | 1 | 0 | 2 | 1 | 3 | 2 | 11 | 13 |
| 05:15 PM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 6 | 2 | 0 | 2 | 1 | 4 | 1 | 14 | 15 |
| 05:30 PM | 0 | 12 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 5 | 1 | 0 | 3 | 2 | 4 | 4 | 21 | 25 |
| 05:45 PM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 11 |
| Total | 0 | 29 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 14 | 4 | 16 | 4 | 0 | 7 | 4 | 11 | 8 | 56 | 64 |
| Grand Total | 2 | 64 | 0 | 0 | 66 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 25 | 6 | 30 | 10 | 0 | 12 | 6 | 22 | 12 | 118 | 130 |
| Apprch % | 3 | 97 | 0 | | | 0 | 0 | 0 | | | 0 | 16.7 | 83.3 | | | 45.5 | 0 | 54.5 | | | | | |
| Total % | 1.7 | 54.2 | 0 | | 55.9 | 0 | 0 | 0 | | 0 | 0 | 4.2 | 21.2 | | 25.4 | 8.5 | 0 | 10.2 | | 18.6 | 9.2 | 90.8 | |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | **2** | **3** | 11 |
| 04:15 PM | 0 | 10 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 1 | 2 | 15 |
| 04:30 PM | 0 | **13** | 0 | **13** | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 | **3** | 0 | 0 | 3 | **20** |
| 04:45 PM | 1 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | **2** | **4** | **6** | 1 | 0 | 2 | 3 | 16 |
| Total Volume | 2 | 35 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 3 | 11 | 14 | 6 | 0 | 5 | 11 | 62 |
| % App. Total | 5.4 | 94.6 | 0 | | 0 | 0 | 0 | | 0 | 21.4 | 78.6 | | 54.5 | 0 | 45.5 | | |
| PHF | .500 | .673 | .000 | .712 | .000 | .000 | .000 | .000 | .000 | .375 | .688 | .583 | .500 | .000 | .625 | .917 | .775 |

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File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

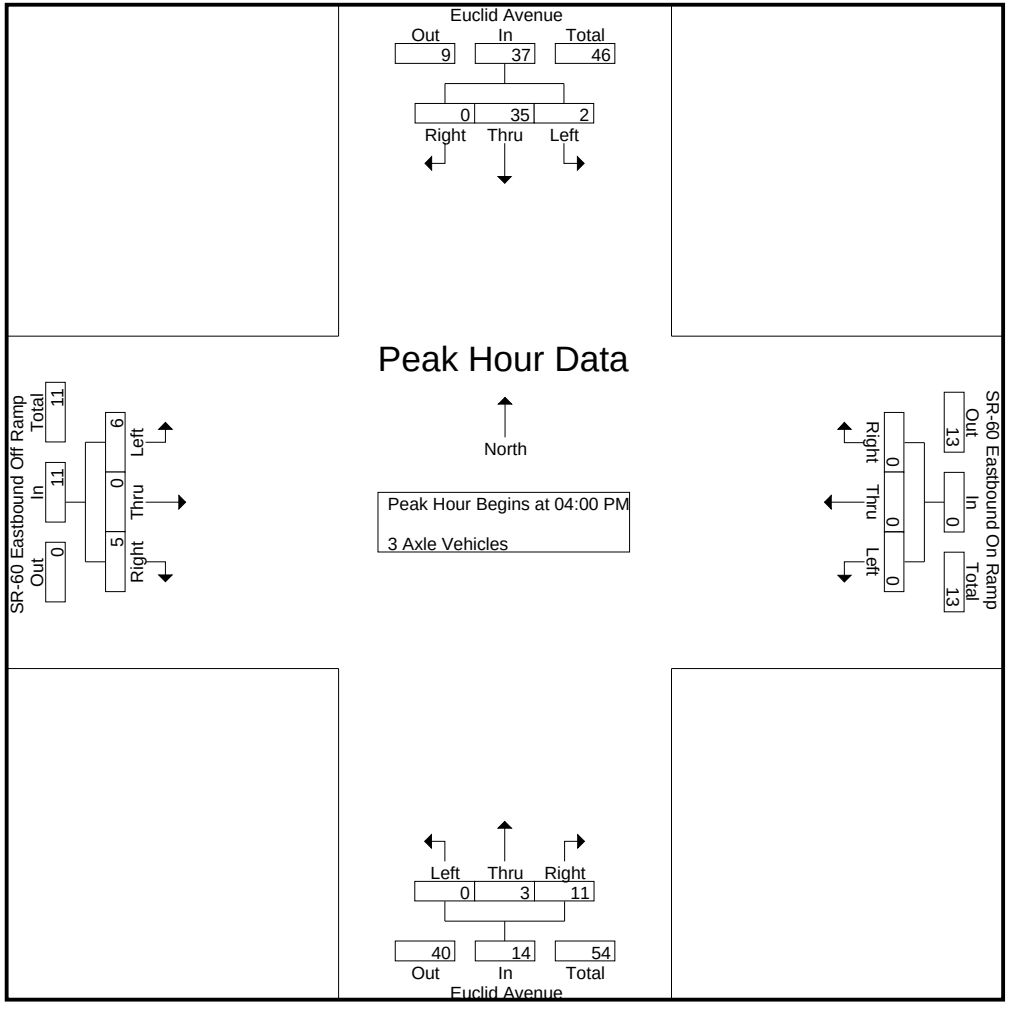

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File Name : 02_ONT_Euc_60E PMC
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| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | **2** | **3** | |
| +15 mins. | 0 | 10 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 1 | 0 | 1 | 2 | |
| +30 mins. | 0 | **13** | 0 | **13** | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 | **3** | 0 | 0 | 3 | |
| +45 mins. | 1 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | **2** | **4** | **6** | 1 | 0 | 2 | 3 | |
| Total Volume | 2 | 35 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 3 | 11 | 14 | 6 | 0 | 5 | 11 | |
| % App. Total | 5.4 | 94.6 | 0 | | 0 | 0 | 0 | | 0 | 21.4 | 78.6 | | 54.5 | 0 | 45.5 | | |
| PHF | .500 | .673 | .000 | .712 | .000 | .000 | .000 | .000 | .000 | .375 | .688 | .583 | .500 | .000 | .625 | .917 | |

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City of Ontario
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Weather: Clear

File Name : 02_ONT_Euc_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Euclid Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 18 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 26 | 5 | 35 | 0 | 0 | 7 | 1 | 7 | 6 | 60 | 66 |
| 04:15 PM | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 25 | 4 | 28 | 0 | 0 | 4 | 0 | 4 | 4 | 47 | 51 |
| 04:30 PM | 1 | 15 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 19 | 3 | 25 | 3 | 0 | 8 | 3 | 11 | 6 | 52 | 58 |
| 04:45 PM | 0 | 26 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 16 | 4 | 21 | 0 | 0 | 4 | 1 | 4 | 5 | 51 | 56 |
| Total | 1 | 74 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 86 | 16 | 109 | 3 | 0 | 23 | 5 | 26 | 21 | 210 | 231 |
| 05:00 PM | 0 | 18 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 19 | 2 | 26 | 1 | 0 | 5 | 0 | 6 | 2 | 50 | 52 |
| 05:15 PM | 1 | 14 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 16 | 1 | 25 | 3 | 0 | 5 | 1 | 8 | 2 | 48 | 50 |
| 05:30 PM | 0 | 16 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 15 | 2 | 24 | 1 | 0 | 6 | 2 | 7 | 4 | 47 | 51 |
| 05:45 PM | 1 | 23 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 16 | 3 | 20 | 2 | 0 | 5 | 1 | 7 | 4 | 51 | 55 |
| Total | 2 | 71 | 0 | 0 | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 66 | 8 | 95 | 7 | 0 | 21 | 4 | 28 | 12 | 196 | 208 |
| Grand Total | 3 | 145 | 0 | 0 | 148 | 0 | 0 | 0 | 0 | 0 | 0 | 52 | 152 | 24 | 204 | 10 | 0 | 44 | 9 | 54 | 33 | 406 | 439 |
| Apprch % | 2 | 98 | 0 | | | 0 | 0 | 0 | | | 0 | 25.5 | 74.5 | | | 18.5 | 0 | 81.5 | | | | | |
| Total % | 0.7 | 35.7 | 0 | | 36.5 | 0 | 0 | 0 | | 0 | 0 | 12.8 | 37.4 | | 50.2 | 2.5 | 0 | 10.8 | | 13.3 | 7.5 | 92.5 | |

| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | 18 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | **9** | **26** | **35** | 0 | 0 | 7 | 7 | **60** |
| 04:15 PM | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 3 | 25 | 28 | 0 | 0 | 4 | 4 | 47 |
| 04:30 PM | **1** | 15 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 6 | 19 | 25 | **3** | 0 | **8** | **11** | 52 |
| 04:45 PM | 0 | **26** | 0 | **26** | 0 | 0 | 0 | 0 | 0 | 5 | 16 | 21 | 0 | 0 | 4 | 4 | 51 |
| Total Volume | 1 | 74 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 23 | 86 | 109 | 3 | 0 | 23 | 26 | 210 |
| % App. Total | 1.3 | 98.7 | 0 | | 0 | 0 | 0 | | 0 | 21.1 | 78.9 | | 11.5 | 0 | 88.5 | | |
| PHF | .250 | .712 | .000 | .721 | .000 | .000 | .000 | .000 | .000 | .639 | .827 | .779 | .250 | .000 | .719 | .591 | .875 |

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Start Date : 10/2/2024
Page No : 2

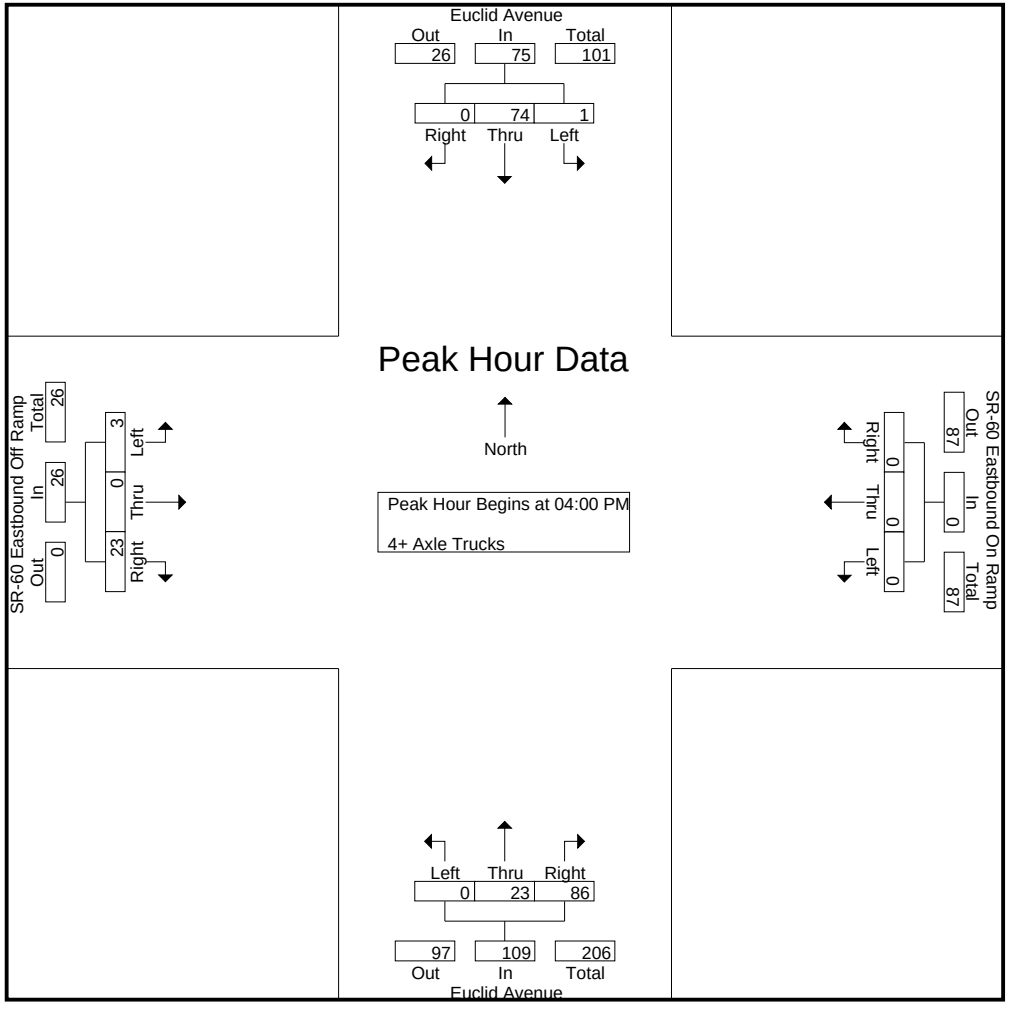

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City of Ontario
N/S: Euclid Avenue
E/W: SR-60 Eastbound Ramps
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File Name : 02_ONT_Euc_60E PMC
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Start Date : 10/2/2024
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| | Euclid Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Euclid Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 18 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | **9** | **26** | **35** | 0 | 0 | 7 | 7 | |
| +15 mins. | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 3 | 25 | 28 | 0 | 0 | 4 | 4 | |
| +30 mins. | **1** | 15 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 6 | 19 | 25 | **3** | 0 | **8** | **11** | |
| +45 mins. | 0 | **26** | 0 | **26** | 0 | 0 | 0 | 0 | 0 | 5 | 16 | 21 | 0 | 0 | 4 | 4 | |
| Total Volume | 1 | 74 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 23 | 86 | 109 | 3 | 0 | 23 | 26 | |
| % App. Total | 1.3 | 98.7 | 0 | | 0 | 0 | 0 | | 0 | 21.1 | 78.9 | | 11.5 | 0 | 88.5 | | |
| PHF | .250 | .712 | .000 | .721 | .000 | .000 | .000 | .000 | .000 | .639 | .827 | .779 | .250 | .000 | .719 | .591 | |

Location: Ontario
N/S: Euclid Avenue
E/W: SR-60 EB Ramps

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg SR-60 EB Ramps | South Leg Euclid Avenue | West Leg SR-60 EB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 1 | 1 |
| 7:15 AM | 0 | 0 | 0 | 1 | 1 |
| 7:30 AM | 0 | 0 | 0 | 1 | 1 |
| 7:45 AM | 0 | 0 | 0 | 1 | 1 |
| 8:00 AM | 0 | 1 | 0 | 0 | 1 |
| 8:15 AM | 0 | 1 | 0 | 2 | 3 |
| 8:30 AM | 0 | 0 | 0 | 1 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 7 | 9 |

| | North Leg Euclid Avenue | East Leg SR-60 EB Ramps | South Leg Euclid Avenue | West Leg SR-60 EB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 1 | 2 | 3 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 1 | 0 | 6 | 7 |
| 4:45 PM | 0 | 2 | 0 | 1 | 3 |
| 5:00 PM | 0 | 0 | 0 | 3 | 3 |
| 5:15 PM | 0 | 1 | 0 | 2 | 3 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 1 | 0 | 2 | 3 |
| TOTAL VOLUMES: | 0 | 5 | 1 | 16 | 22 |

Counts Unlimited, Inc.
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951-268-6268

Location: Ontario
N/S: Euclid Avenue
E/W: SR-60 EB Ramps

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound SR-60 EB Ramps | | | Northbound Euclid Avenue | | | Eastbound SR-60 EB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |

| | Southbound Euclid Avenue | | | Westbound SR-60 EB Ramps | | | Northbound Euclid Avenue | | | Eastbound SR-60 EB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 29 | 143 | 6 | 2 | 178 | 17 | 41 | 42 | 15 | 100 | 11 | 199 | 8 | 1 | 218 | 25 | 28 | 15 | 3 | 68 | 21 | 564 | 585 |
| 07:15 AM | 22 | 166 | 8 | 1 | 196 | 9 | 41 | 53 | 18 | 103 | 18 | 183 | 3 | 2 | 204 | 28 | 35 | 20 | 4 | 83 | 25 | 586 | 611 |
| 07:30 AM | 27 | 166 | 10 | 4 | 203 | 11 | 93 | 39 | 9 | 143 | 30 | 190 | 5 | 1 | 225 | 17 | 53 | 31 | 1 | 101 | 15 | 672 | 687 |
| 07:45 AM | 30 | 166 | 15 | 3 | 211 | 17 | 112 | 49 | 16 | 178 | 33 | 199 | 9 | 3 | 241 | 26 | 55 | 35 | 7 | 116 | 29 | 746 | 775 |
| Total | 108 | 641 | 39 | 10 | 788 | 54 | 287 | 183 | 58 | 524 | 92 | 771 | 25 | 7 | 888 | 96 | 171 | 101 | 15 | 368 | 90 | 2568 | 2658 |
| 08:00 AM | 40 | 193 | 12 | 5 | 245 | 11 | 105 | 49 | 10 | 165 | 25 | 183 | 3 | 1 | 211 | 19 | 58 | 24 | 1 | 101 | 17 | 722 | 739 |
| 08:15 AM | 28 | 187 | 10 | 7 | 225 | 12 | 96 | 34 | 8 | 142 | 19 | 175 | 6 | 5 | 200 | 30 | 66 | 31 | 2 | 127 | 22 | 694 | 716 |
| 08:30 AM | 29 | 192 | 12 | 6 | 233 | 3 | 53 | 40 | 7 | 96 | 12 | 178 | 4 | 0 | 194 | 30 | 90 | 30 | 2 | 150 | 15 | 673 | 688 |
| 08:45 AM | 32 | 194 | 12 | 4 | 238 | 13 | 55 | 33 | 12 | 101 | 12 | 203 | 8 | 2 | 223 | 18 | 55 | 20 | 3 | 93 | 21 | 655 | 676 |
| Total | 129 | 766 | 46 | 22 | 941 | 39 | 309 | 156 | 37 | 504 | 68 | 739 | 21 | 8 | 828 | 97 | 269 | 105 | 8 | 471 | 75 | 2744 | 2819 |
| Grand Total | 237 | 1407 | 85 | 32 | 1729 | 93 | 596 | 339 | 95 | 1028 | 160 | 1510 | 46 | 15 | 1716 | 193 | 440 | 206 | 23 | 839 | 165 | 5312 | 5477 |
| Apprch % | 13.7 | 81.4 | 4.9 | | | 9 | 58 | 33 | | | 9.3 | 88 | 2.7 | | | 23 | 52.4 | 24.6 | | | | | |
| Total % | 4.5 | 26.5 | 1.6 | | 32.5 | 1.8 | 11.2 | 6.4 | | 19.4 | 3 | 28.4 | 0.9 | | 32.3 | 3.6 | 8.3 | 3.9 | | 15.8 | 3 | 97 | |
| Passenger Vehicles | 231 | 1056 | 82 | | 1400 | 87 | 583 | 335 | | 1099 | 159 | 1070 | 44 | | 1287 | 192 | 432 | 198 | | 844 | 0 | 0 | 4630 |
| % Passenger Vehicles | 97.5 | 75.1 | 96.5 | 96.9 | 79.5 | 93.5 | 97.8 | 98.8 | 98.9 | 97.9 | 99.4 | 70.9 | 95.7 | 93.3 | 74.4 | 99.5 | 98.2 | 96.1 | 95.7 | 97.9 | 0 | 0 | 84.5 |
| Large 2 Axle Vehicles | 2 | 70 | 2 | | 74 | 4 | 12 | 3 | | 20 | 0 | 93 | 2 | | 96 | 1 | 7 | 7 | | 16 | 0 | 0 | 206 |
| % Large 2 Axle Vehicles | 0.8 | 5 | 2.4 | 0 | 4.2 | 4.3 | 2 | 0.9 | 1.1 | 1.8 | 0 | 6.2 | 4.3 | 6.7 | 5.5 | 0.5 | 1.6 | 3.4 | 4.3 | 1.9 | 0 | 0 | 3.8 |
| 3 Axle Vehicles | 3 | 53 | 1 | | 58 | 2 | 1 | 1 | | 4 | 1 | 65 | 0 | | 66 | 0 | 1 | 1 | | 2 | 0 | 0 | 130 |
| % 3 Axle Vehicles | 1.3 | 3.8 | 1.2 | 3.1 | 3.3 | 2.2 | 0.2 | 0.3 | 0 | 0.4 | 0.6 | 4.3 | 0 | 0 | 3.8 | 0 | 0.2 | 0.5 | 0 | 0.2 | 0 | 0 | 2.4 |
| 4+ Axle Trucks | 1 | 228 | 0 | | 229 | 0 | 0 | 0 | | 0 | 0 | 282 | 0 | | 282 | 0 | 0 | 0 | | 0 | 0 | 0 | 511 |
| % 4+ Axle Trucks | 0.4 | 16.2 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 18.7 | 0 | 0 | 16.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9.3 |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | |
| 07:45 AM | 30 | 166 | **15** | 211 | **17** | **112** | **49** | **178** | **33** | **199** | **9** | **241** | 26 | 55 | **35** | 116 | **746** |
| 08:00 AM | **40** | **193** | 12 | **245** | 11 | 105 | 49 | 165 | 25 | 183 | 3 | 211 | 19 | 58 | 24 | 101 | 722 |
| 08:15 AM | 28 | 187 | 10 | 225 | 12 | 96 | 34 | 142 | 19 | 175 | 6 | 200 | **30** | 66 | 31 | 127 | 694 |
| 08:30 AM | 29 | 192 | 12 | 233 | 3 | 53 | 40 | 96 | 12 | 178 | 4 | 194 | 30 | **90** | 30 | **150** | 673 |
| Total Volume | 127 | 738 | 49 | 914 | 43 | 366 | 172 | 581 | 89 | 735 | 22 | 846 | 105 | 269 | 120 | 494 | 2835 |
| % App. Total | 13.9 | 80.7 | 5.4 | | 7.4 | 63 | 29.6 | | 10.5 | 86.9 | 2.6 | | 21.3 | 54.5 | 24.3 | | |
| PHF | .794 | .956 | .817 | .933 | .632 | .817 | .878 | .816 | .674 | .923 | .611 | .878 | .875 | .747 | .857 | .823 | .950 |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

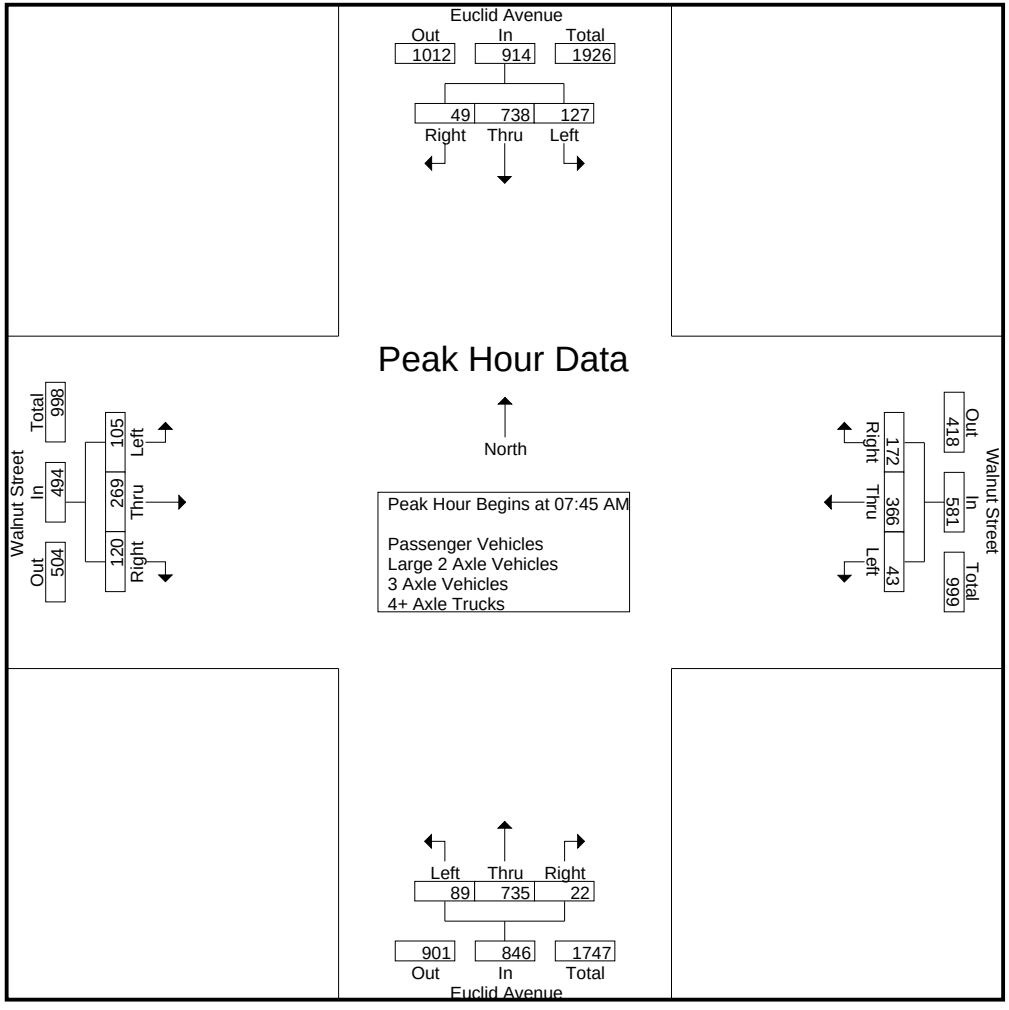

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City of Ontario
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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 08:00 AM | | | | 07:30 AM | | | | 07:00 AM | | | | 07:45 AM | | | | |
| +0 mins. | **40** | 193 | **12** | **245** | 11 | 93 | 39 | 143 | 11 | **199** | 8 | 218 | 26 | 55 | **35** | 116 | |
| +15 mins. | 28 | 187 | 10 | 225 | **17** | **112** | **49** | **178** | 18 | 183 | 3 | 204 | 19 | 58 | 24 | 101 | |
| +30 mins. | 29 | 192 | 12 | 233 | 11 | 105 | 49 | 165 | 30 | 190 | 5 | 225 | **30** | 66 | 31 | 127 | |
| +45 mins. | 32 | **194** | 12 | 238 | 12 | 96 | 34 | 142 | **33** | 199 | **9** | **241** | 30 | **90** | 30 | **150** | |
| Total Volume | 129 | 766 | 46 | 941 | 51 | 406 | 171 | 628 | 92 | 771 | 25 | 888 | 105 | 269 | 120 | 494 | |
| % App. Total | 13.7 | 81.4 | 4.9 | | 8.1 | 64.6 | 27.2 | | 10.4 | 86.8 | 2.8 | | 21.3 | 54.5 | 24.3 | | |
| PHF | .806 | .987 | .958 | .960 | .750 | .906 | .872 | .882 | .697 | .969 | .694 | .921 | .875 | .747 | .857 | .823 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 29 | 105 | 5 | 2 | 139 | 17 | 40 | 41 | 14 | 98 | 11 | 152 | 8 | 1 | 171 | 24 | 27 | 12 | 2 | 63 | 19 | 471 | 490 |
| 07:15 AM | 21 | 135 | 8 | 1 | 164 | 9 | 40 | 53 | 18 | 102 | 18 | 144 | 3 | 2 | 165 | 28 | 35 | 19 | 4 | 82 | 25 | 513 | 538 |
| 07:30 AM | 27 | 119 | 10 | 4 | 156 | 11 | 91 | 38 | 9 | 140 | 29 | 133 | 5 | 1 | 167 | 17 | 52 | 30 | 1 | 99 | 15 | 562 | 577 |
| 07:45 AM | 27 | 124 | 15 | 3 | 166 | 17 | 111 | 48 | 16 | 176 | 33 | 133 | 8 | 3 | 174 | 26 | 52 | 35 | 7 | 113 | 29 | 629 | 658 |
| Total | 104 | 483 | 38 | 10 | 625 | 54 | 282 | 180 | 57 | 516 | 91 | 562 | 24 | 7 | 677 | 95 | 166 | 96 | 14 | 357 | 88 | 2175 | 2263 |
| 08:00 AM | 39 | 138 | 11 | 5 | 188 | 9 | 103 | 49 | 10 | 161 | 25 | 129 | 3 | 1 | 157 | 19 | 58 | 23 | 1 | 100 | 17 | 606 | 623 |
| 08:15 AM | 27 | 143 | 9 | 6 | 179 | 10 | 92 | 34 | 8 | 136 | 19 | 107 | 5 | 4 | 131 | 30 | 65 | 31 | 2 | 126 | 20 | 572 | 592 |
| 08:30 AM | 29 | 150 | 12 | 6 | 191 | 3 | 52 | 39 | 7 | 94 | 12 | 121 | 4 | 0 | 137 | 30 | 89 | 29 | 2 | 148 | 15 | 570 | 585 |
| 08:45 AM | 32 | 142 | 12 | 4 | 186 | 11 | 54 | 33 | 12 | 98 | 12 | 151 | 8 | 2 | 171 | 18 | 54 | 19 | 3 | 91 | 21 | 546 | 567 |
| Total | 127 | 573 | 44 | 21 | 744 | 33 | 301 | 155 | 37 | 489 | 68 | 508 | 20 | 7 | 596 | 97 | 266 | 102 | 8 | 465 | 73 | 2294 | 2367 |
| Grand Total | 231 | 1056 | 82 | 31 | 1369 | 87 | 583 | 335 | 94 | 1005 | 159 | 1070 | 44 | 14 | 1273 | 192 | 432 | 198 | 22 | 822 | 161 | 4469 | 4630 |
| Apprch % | 16.9 | 77.1 | 6 | | | 8.7 | 58 | 33.3 | | | 12.5 | 84.1 | 3.5 | | | 23.4 | 52.6 | 24.1 | | | | | |
| Total % | 5.2 | 23.6 | 1.8 | | 30.6 | 1.9 | 13 | 7.5 | | 22.5 | 3.6 | 23.9 | 1 | | 28.5 | 4.3 | 9.7 | 4.4 | | 18.4 | 3.5 | 96.5 | |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | |
| 07:45 AM | 27 | 124 | **15** | 166 | **17** | **111** | 48 | **176** | **33** | **133** | **8** | **174** | 26 | 52 | **35** | 113 | **629** |
| 08:00 AM | **39** | 138 | 11 | 188 | 9 | 103 | **49** | 161 | 25 | 129 | 3 | 157 | 19 | 58 | 23 | 100 | 606 |
| 08:15 AM | 27 | 143 | 9 | 179 | 10 | 92 | 34 | 136 | 19 | 107 | 5 | 131 | **30** | 65 | 31 | 126 | 572 |
| 08:30 AM | 29 | **150** | 12 | **191** | 3 | 52 | 39 | 94 | 12 | 121 | 4 | 137 | 30 | **89** | 29 | **148** | 570 |
| Total Volume | 122 | 555 | 47 | 724 | 39 | 358 | 170 | 567 | 89 | 490 | 20 | 599 | 105 | 264 | 118 | 487 | 2377 |
| % App. Total | 16.9 | 76.7 | 6.5 | | 6.9 | 63.1 | 30 | | 14.9 | 81.8 | 3.3 | | 21.6 | 54.2 | 24.2 | | |
| PHF | .782 | .925 | .783 | .948 | .574 | .806 | .867 | .805 | .674 | .921 | .625 | .861 | .875 | .742 | .843 | .823 | .945 |

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E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

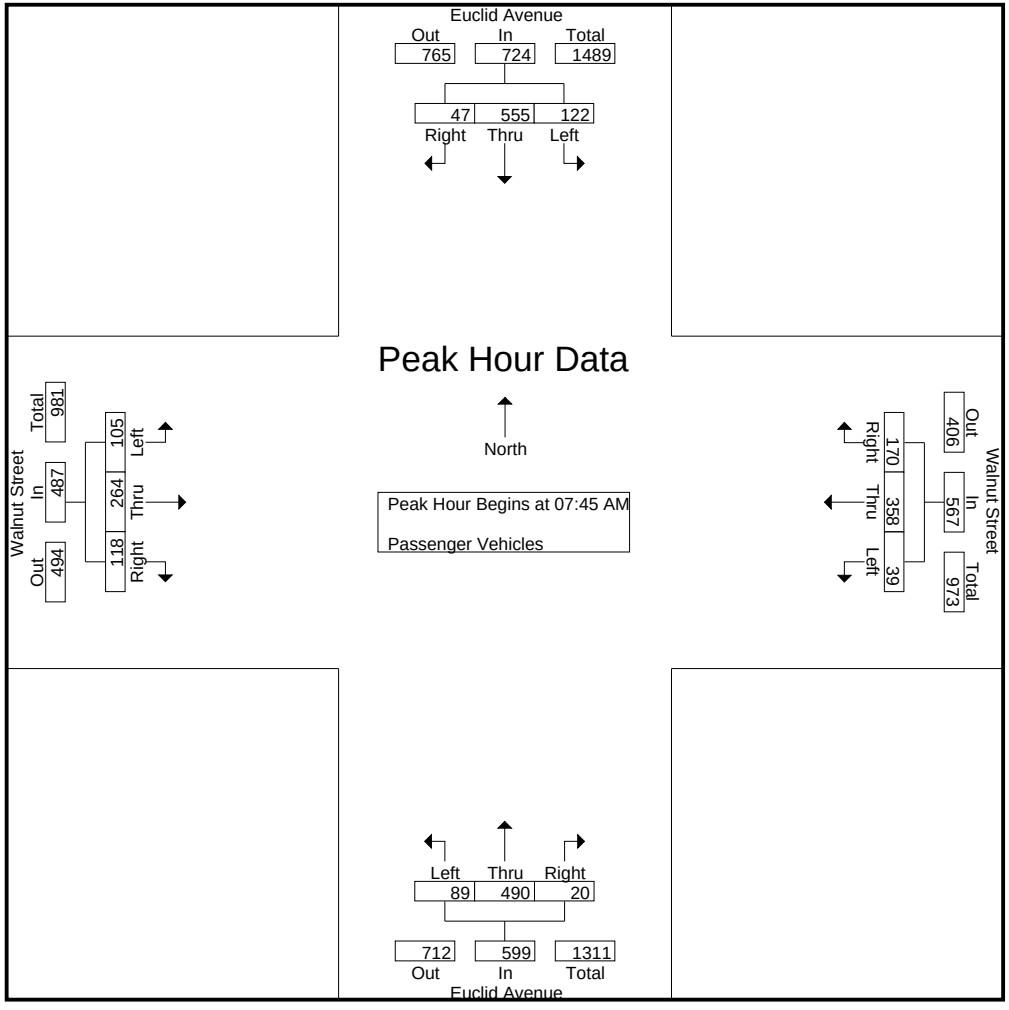

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Site Code : 05124953
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Page No : 3

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:45 AM | | | | 07:45 AM | | | | 07:45 AM | | | | 07:45 AM | | | | |
| +0 mins. | 27 | 124 | **15** | 166 | **17** | **111** | 48 | **176** | **33** | **133** | **8** | **174** | 26 | 52 | **35** | 113 | |
| +15 mins. | **39** | 138 | 11 | 188 | 9 | 103 | **49** | 161 | 25 | 129 | 3 | 157 | 19 | 58 | 23 | 100 | |
| +30 mins. | 27 | 143 | 9 | 179 | 10 | 92 | 34 | 136 | 19 | 107 | 5 | 131 | **30** | 65 | 31 | 126 | |
| +45 mins. | 29 | **150** | 12 | **191** | 3 | 52 | 39 | 94 | 12 | 121 | 4 | 137 | 30 | **89** | 29 | **148** | |
| Total Volume | 122 | 555 | 47 | 724 | 39 | 358 | 170 | 567 | 89 | 490 | 20 | 599 | 105 | 264 | 118 | 487 | |
| % App. Total | 16.9 | 76.7 | 6.5 | | 6.9 | 63.1 | 30 | | 14.9 | 81.8 | 3.3 | | 21.6 | 54.2 | 24.2 | | |
| PHF | .782 | .925 | .783 | .948 | .574 | .806 | .867 | .805 | .674 | .921 | .625 | .861 | .875 | .742 | .843 | .823 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 7 | 1 | 0 | 8 | 0 | 1 | 1 | 1 | 2 | 0 | 6 | 0 | 0 | 6 | 1 | 1 | 3 | 1 | 5 | 2 | 21 | 23 |
| 07:15 AM | 0 | 9 | 0 | 0 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 19 | 19 |
| 07:30 AM | 0 | 10 | 0 | 0 | 10 | 0 | 2 | 1 | 0 | 3 | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 1 | 0 | 1 | 0 | 27 | 27 |
| 07:45 AM | 1 | 7 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 1 | 0 | 11 | 1 | 0 | 12 | 0 | 3 | 0 | 0 | 3 | 0 | 24 | 24 |
| Total | 1 | 33 | 1 | 0 | 35 | 0 | 5 | 2 | 1 | 7 | 0 | 38 | 1 | 0 | 39 | 1 | 4 | 5 | 1 | 10 | 2 | 91 | 93 |
| 08:00 AM | 0 | 13 | 1 | 0 | 14 | 1 | 2 | 0 | 0 | 3 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 26 | 26 |
| 08:15 AM | 1 | 9 | 0 | 0 | 10 | 1 | 3 | 0 | 0 | 4 | 0 | 18 | 1 | 1 | 19 | 0 | 1 | 0 | 0 | 1 | 1 | 34 | 35 |
| 08:30 AM | 0 | 5 | 0 | 0 | 5 | 0 | 1 | 1 | 0 | 2 | 0 | 13 | 0 | 0 | 13 | 0 | 1 | 0 | 0 | 1 | 0 | 21 | 21 |
| 08:45 AM | 0 | 10 | 0 | 0 | 10 | 2 | 1 | 0 | 0 | 3 | 0 | 16 | 0 | 0 | 16 | 0 | 1 | 1 | 0 | 2 | 0 | 31 | 31 |
| Total | 1 | 37 | 1 | 0 | 39 | 4 | 7 | 1 | 0 | 12 | 0 | 55 | 1 | 1 | 56 | 0 | 3 | 2 | 0 | 5 | 1 | 112 | 113 |
| Grand Total | 2 | 70 | 2 | 0 | 74 | 4 | 12 | 3 | 1 | 19 | 0 | 93 | 2 | 1 | 95 | 1 | 7 | 7 | 1 | 15 | 3 | 203 | 206 |
| Apprch % | 2.7 | 94.6 | 2.7 | | | 21.1 | 63.2 | 15.8 | | | 0 | 97.9 | 2.1 | | | 6.7 | 46.7 | 46.7 | | | | | |
| Total % | 1 | 34.5 | 1 | | 36.5 | 2 | 5.9 | 1.5 | | 9.4 | 0 | 45.8 | 1 | | 46.8 | 0.5 | 3.4 | 3.4 | | 7.4 | 1.5 | 98.5 | |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | |
| 07:45 AM | **1** | 7 | 0 | 8 | 0 | 1 | 0 | 1 | 0 | 11 | **1** | 12 | 0 | **3** | 0 | **3** | 24 |
| 08:00 AM | 0 | **13** | **1** | **14** | **1** | 2 | 0 | 3 | 0 | 8 | 0 | 8 | 0 | 0 | **1** | 1 | 26 |
| 08:15 AM | 1 | 9 | 0 | 10 | 1 | **3** | 0 | **4** | 0 | **18** | 1 | **19** | 0 | 1 | 0 | 1 | **34** |
| 08:30 AM | 0 | 5 | 0 | 5 | 0 | 1 | **1** | 2 | 0 | 13 | 0 | 13 | 0 | 1 | 0 | 1 | 21 |
| Total Volume | 2 | 34 | 1 | 37 | 2 | 7 | 1 | 10 | 0 | 50 | 2 | 52 | 0 | 5 | 1 | 6 | 105 |
| % App. Total | 5.4 | 91.9 | 2.7 | | 20 | 70 | 10 | | 0 | 96.2 | 3.8 | | 0 | 83.3 | 16.7 | | |
| PHF | .500 | .654 | .250 | .661 | .500 | .583 | .250 | .625 | .000 | .694 | .500 | .684 | .000 | .417 | .250 | .500 | .772 |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

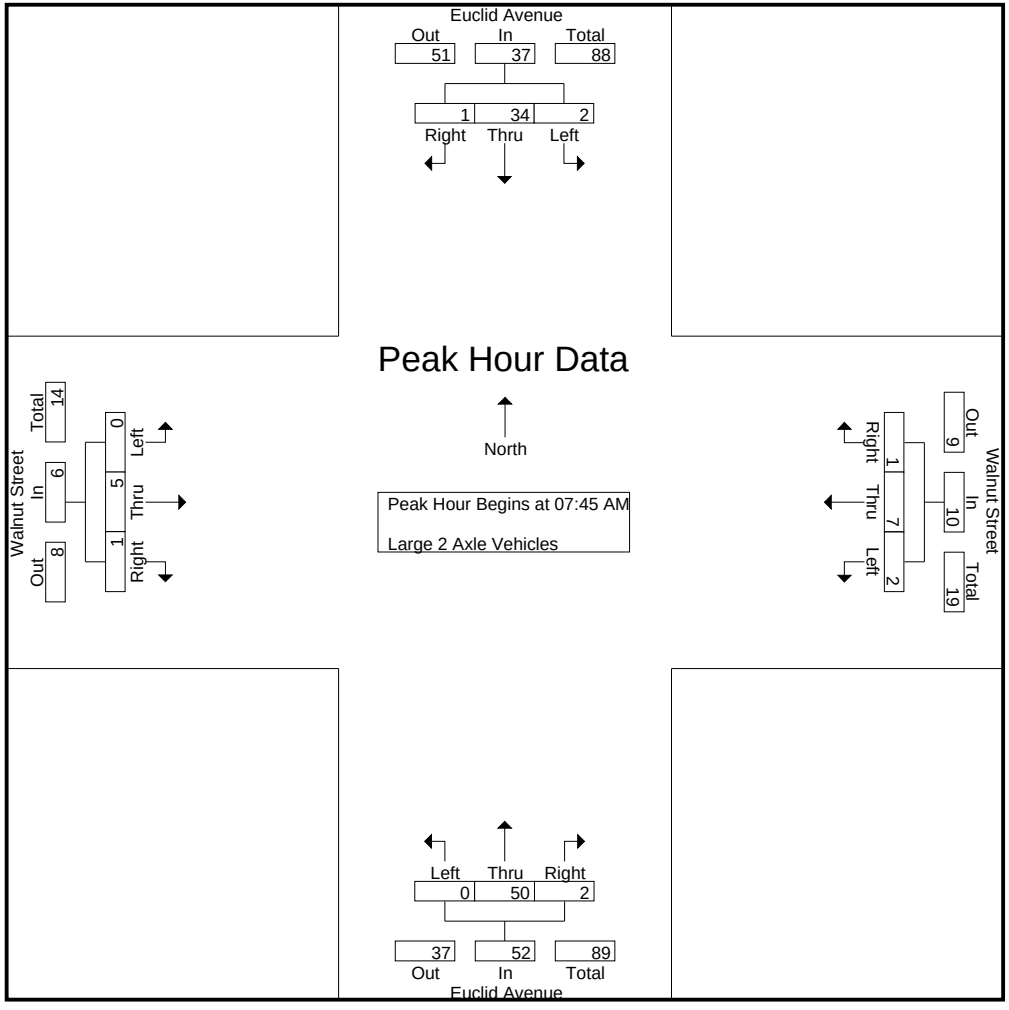


Peak Hour Data

North

Peak Hour Begins at 07:45 AM

Large 2 Axle Vehicles

Counts Unlimited, Inc.
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Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:45 AM | | | | 07:45 AM | | | | 07:45 AM | | | | 07:45 AM | | | | |
| +0 mins. | **1** | 7 | 0 | 8 | 0 | 1 | 0 | 1 | 0 | 11 | **1** | 12 | 0 | **3** | 0 | **3** | |
| +15 mins. | 0 | **13** | **1** | **14** | **1** | 2 | 0 | 3 | 0 | 8 | 0 | 8 | 0 | 0 | **1** | 1 | |
| +30 mins. | 1 | 9 | 0 | 10 | 1 | **3** | 0 | **4** | 0 | **18** | 1 | **19** | 0 | 1 | 0 | 1 | |
| +45 mins. | 0 | 5 | 0 | 5 | 0 | 1 | **1** | 2 | 0 | 13 | 0 | 13 | 0 | 1 | 0 | 1 | |
| Total Volume | 2 | 34 | 1 | 37 | 2 | 7 | 1 | 10 | 0 | 50 | 2 | 52 | 0 | 5 | 1 | 6 | |
| % App. Total | 5.4 | 91.9 | 2.7 | | 20 | 70 | 10 | | 0 | 96.2 | 3.8 | | 0 | 83.3 | 16.7 | | |
| PHF | .500 | .654 | .250 | .661 | .500 | .583 | .250 | .625 | .000 | .694 | .500 | .684 | .000 | .417 | .250 | .500 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 26 |
| 07:15 AM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 07:30 AM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 15 | 15 |
| 07:45 AM | 2 | 3 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| Total | 2 | 25 | 0 | 0 | 27 | 0 | 0 | 1 | 0 | 1 | 1 | 35 | 0 | 0 | 36 | 0 | 1 | 0 | 0 | 1 | 0 | 65 | 65 |
| 08:00 AM | 1 | 10 | 0 | 0 | 11 | 1 | 0 | 0 | 0 | 1 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 19 |
| 08:15 AM | 0 | 5 | 1 | 1 | 6 | 1 | 1 | 0 | 0 | 2 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 15 | 16 |
| 08:30 AM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 12 | 0 | 0 | 1 | 0 | 1 | 0 | 17 | 17 |
| 08:45 AM | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| Total | 1 | 28 | 1 | 1 | 30 | 2 | 1 | 0 | 0 | 3 | 0 | 30 | 0 | 0 | 30 | 0 | 0 | 1 | 0 | 1 | 1 | 64 | 65 |
| Grand Total | 3 | 53 | 1 | 1 | 57 | 2 | 1 | 1 | 0 | 4 | 1 | 65 | 0 | 0 | 66 | 0 | 1 | 1 | 0 | 2 | 1 | 129 | 130 |
| Apprch % | 5.3 | 93 | 1.8 | | | 50 | 25 | 25 | | | 1.5 | 98.5 | 0 | | | 0 | 50 | 50 | | | | | |
| Total % | 2.3 | 41.1 | 0.8 | | 44.2 | 1.6 | 0.8 | 0.8 | | 3.1 | 0.8 | 50.4 | 0 | | 51.2 | 0 | 0.8 | 0.8 | | 1.6 | 0.8 | 99.2 | |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | |
| 07:45 AM | **2** | 3 | 0 | 5 | 0 | 0 | **1** | 1 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 12 |
| 08:00 AM | 1 | **10** | 0 | **11** | **1** | 0 | 0 | 1 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | **19** |
| 08:15 AM | 0 | 5 | **1** | 6 | 1 | **1** | 0 | **2** | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 15 |
| 08:30 AM | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | **12** | 0 | **12** | 0 | 0 | **1** | **1** | 17 |
| Total Volume | 3 | 22 | 1 | 26 | 2 | 1 | 1 | 4 | 0 | 32 | 0 | 32 | 0 | 0 | 1 | 1 | 63 |
| % App. Total | 11.5 | 84.6 | 3.8 | | 50 | 25 | 25 | | 0 | 100 | 0 | | 0 | 0 | 100 | | |
| PHF | .375 | .550 | .250 | .591 | .500 | .250 | .250 | .500 | .000 | .667 | .000 | .667 | .000 | .000 | .250 | .250 | .829 |

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Corona, CA 92878
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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

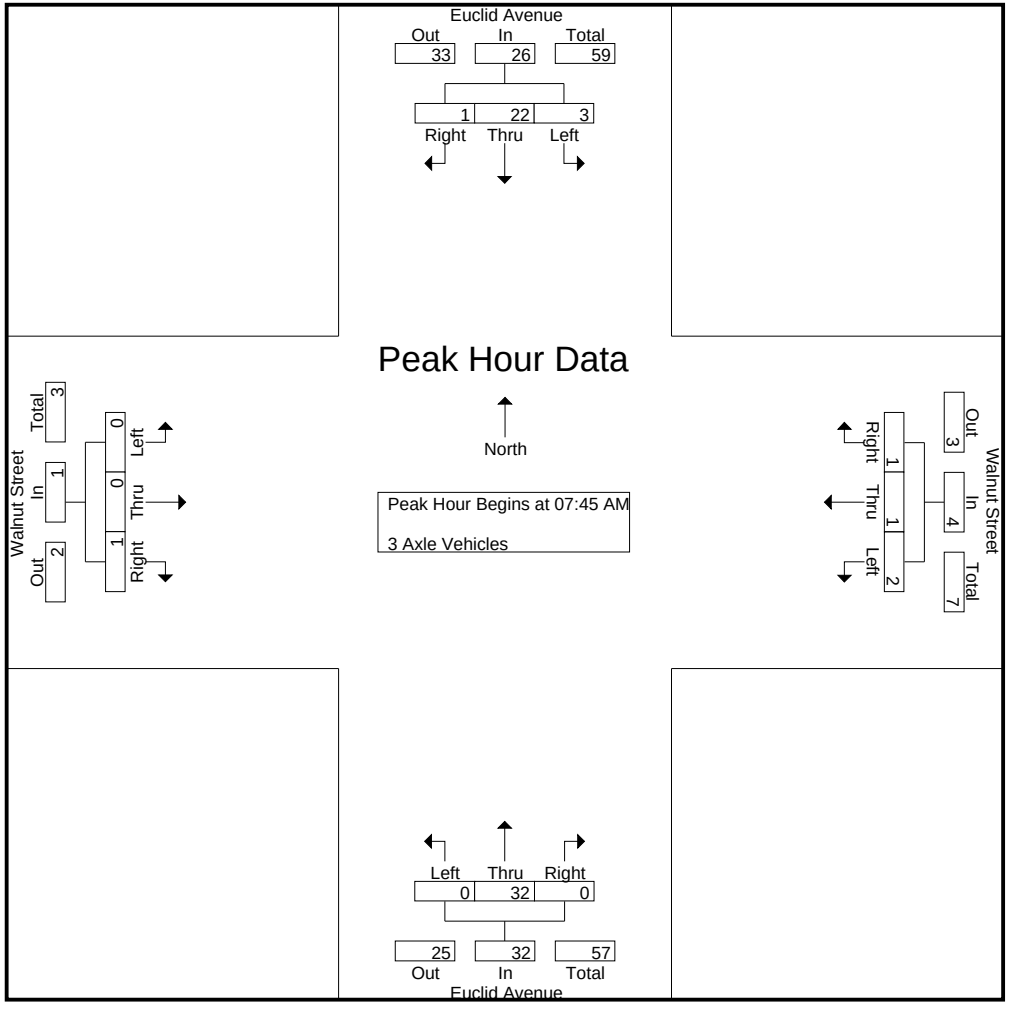

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| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:45 AM | | | | 07:45 AM | | | | 07:45 AM | | | | 07:45 AM | | | | |
| +0 mins. | **2** | 3 | 0 | 5 | 0 | 0 | **1** | 1 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | |
| +15 mins. | 1 | **10** | 0 | **11** | **1** | 0 | 0 | 1 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 5 | **1** | 6 | 1 | **1** | 0 | **2** | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | **12** | 0 | **12** | 0 | 0 | **1** | **1** | |
| Total Volume | 3 | 22 | 1 | 26 | 2 | 1 | 1 | 4 | 0 | 32 | 0 | 32 | 0 | 0 | 1 | 1 | |
| % App. Total | 11.5 | 84.6 | 3.8 | | 50 | 25 | 25 | | 0 | 100 | 0 | | 0 | 0 | 100 | | |
| PHF | .375 | .550 | .250 | .591 | .500 | .250 | .250 | .500 | .000 | .667 | .000 | .667 | .000 | .000 | .250 | .250 | |

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Weather: Clear

File Name : 03_ONT_Euc_Wal AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 20 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 46 |
| 07:15 AM | 1 | 18 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 42 |
| 07:30 AM | 0 | 30 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 0 | 0 | 38 | 0 | 0 | 0 | 0 | 0 | 0 | 68 | 68 |
| 07:45 AM | 0 | 32 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 0 | 81 | 81 |
| Total | 1 | 100 | 0 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 136 | 0 | 0 | 136 | 0 | 0 | 0 | 0 | 0 | 0 | 237 | 237 |
| 08:00 AM | 0 | 32 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 71 | 71 |
| 08:15 AM | 0 | 30 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 73 |
| 08:30 AM | 0 | 33 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 65 |
| 08:45 AM | 0 | 33 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 0 | 65 | 65 |
| Total | 0 | 128 | 0 | 0 | 128 | 0 | 0 | 0 | 0 | 0 | 0 | 146 | 0 | 0 | 146 | 0 | 0 | 0 | 0 | 0 | 0 | 274 | 274 |
| Grand Total | 1 | 228 | 0 | 0 | 229 | 0 | 0 | 0 | 0 | 0 | 0 | 282 | 0 | 0 | 282 | 0 | 0 | 0 | 0 | 0 | 0 | 511 | 511 |
| Apprch % | 0.4 | 99.6 | 0 | | | 0 | 0 | 0 | | | 0 | 100 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0.2 | 44.6 | 0 | | 44.8 | 0 | 0 | 0 | | 0 | 0 | 55.2 | 0 | | 55.2 | 0 | 0 | 0 | | 0 | 0 | 100 | |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:45 AM | | | | | | | | | | | | | | | | | |
| 07:45 AM | 0 | 32 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | **49** | 0 | **49** | 0 | 0 | 0 | 0 | **81** |
| 08:00 AM | 0 | 32 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 39 | 0 | 0 | 0 | 0 | 71 |
| 08:15 AM | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 43 | 0 | 0 | 0 | 0 | 73 |
| 08:30 AM | 0 | **33** | 0 | **33** | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 32 | 0 | 0 | 0 | 0 | 65 |
| Total Volume | 0 | 127 | 0 | 127 | 0 | 0 | 0 | 0 | 0 | 163 | 0 | 163 | 0 | 0 | 0 | 0 | 290 |
| % App. Total | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .962 | .000 | .962 | .000 | .000 | .000 | .000 | .000 | .832 | .000 | .832 | .000 | .000 | .000 | .000 | .895 |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

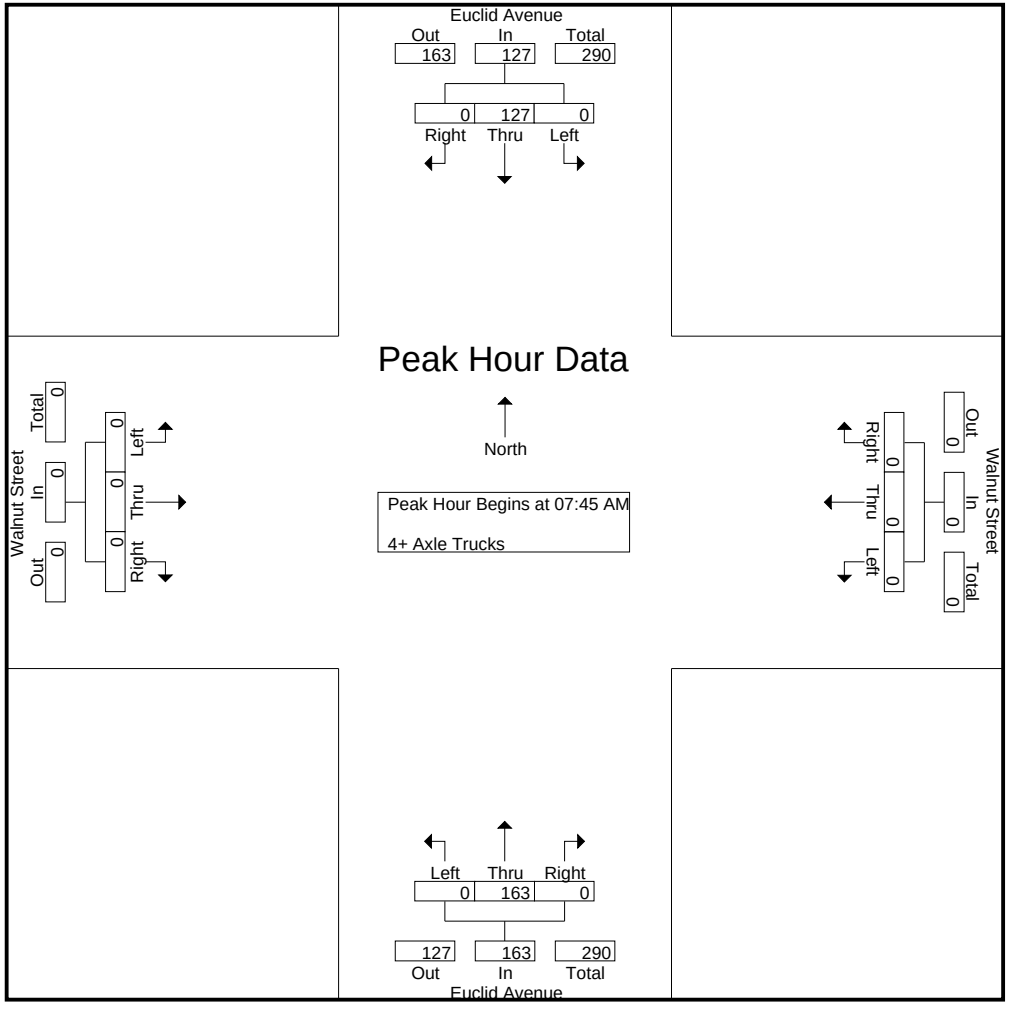

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City of Ontario
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| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:45 AM to 08:30 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:45 AM | | | | 07:45 AM | | | | 07:45 AM | | | | 07:45 AM | | | | |
| +0 mins. | 0 | 32 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | **49** | 0 | **49** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 32 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 39 | 0 | 39 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 43 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **33** | 0 | **33** | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 32 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 127 | 0 | 127 | 0 | 0 | 0 | 0 | 0 | 163 | 0 | 163 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .962 | .000 | .962 | .000 | .000 | .000 | .000 | .000 | .832 | .000 | .832 | .000 | .000 | .000 | .000 | |

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City of Ontario
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E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 40 | 162 | 29 | 10 | 231 | 9 | 43 | 36 | 12 | 88 | 33 | 209 | 7 | 6 | 249 | 20 | 70 | 33 | 3 | 123 | 31 | 691 | 722 |
| 04:15 PM | 53 | 178 | 16 | 6 | 247 | 5 | 29 | 35 | 5 | 69 | 51 | 218 | 10 | 4 | 279 | 22 | 88 | 27 | 2 | 137 | 17 | 732 | 749 |
| 04:30 PM | 43 | 201 | 22 | 10 | 266 | 15 | 51 | 23 | 8 | 89 | 34 | 207 | 12 | 5 | 253 | 35 | 71 | 43 | 4 | 149 | 27 | 757 | 784 |
| 04:45 PM | 48 | 195 | 26 | 6 | 269 | 10 | 57 | 36 | 9 | 103 | 21 | 199 | 14 | 3 | 234 | 25 | 100 | 30 | 2 | 155 | 20 | 761 | 781 |
| Total | 184 | 736 | 93 | 32 | 1013 | 39 | 180 | 130 | 34 | 349 | 139 | 833 | 43 | 18 | 1015 | 102 | 329 | 133 | 11 | 564 | 95 | 2941 | 3036 |
| 05:00 PM | 42 | 157 | 38 | 13 | 237 | 11 | 56 | 38 | 7 | 105 | 24 | 211 | 6 | 5 | 241 | 21 | 70 | 33 | 1 | 124 | 26 | 707 | 733 |
| 05:15 PM | 57 | 195 | 21 | 5 | 273 | 12 | 55 | 19 | 3 | 86 | 15 | 222 | 10 | 3 | 247 | 22 | 83 | 28 | 2 | 133 | 13 | 739 | 752 |
| 05:30 PM | 62 | 192 | 16 | 5 | 270 | 15 | 59 | 33 | 10 | 107 | 33 | 187 | 16 | 9 | 236 | 29 | 95 | 42 | 1 | 166 | 25 | 779 | 804 |
| 05:45 PM | 64 | 162 | 26 | 5 | 252 | 20 | 55 | 39 | 6 | 114 | 29 | 194 | 9 | 6 | 232 | 28 | 82 | 45 | 2 | 155 | 19 | 753 | 772 |
| Total | 225 | 706 | 101 | 28 | 1032 | 58 | 225 | 129 | 26 | 412 | 101 | 814 | 41 | 23 | 956 | 100 | 330 | 148 | 6 | 578 | 83 | 2978 | 3061 |
| Grand Total | 409 | 1442 | 194 | 60 | 2045 | 97 | 405 | 259 | 60 | 761 | 240 | 1647 | 84 | 41 | 1971 | 202 | 659 | 281 | 17 | 1142 | 178 | 5919 | 6097 |
| Apprch % | 20 | 70.5 | 9.5 | | | 12.7 | 53.2 | 34 | | | 12.2 | 83.6 | 4.3 | | | 17.7 | 57.7 | 24.6 | | | | | |
| Total % | 6.9 | 24.4 | 3.3 | | 34.5 | 1.6 | 6.8 | 4.4 | | 12.9 | 4.1 | 27.8 | 1.4 | | 33.3 | 3.4 | 11.1 | 4.7 | | 19.3 | 2.9 | 97.1 | |
| Passenger Vehicles | 407 | 1155 | 193 | | 1815 | 94 | 402 | 255 | | 809 | 237 | 1316 | 83 | | 1677 | 195 | 657 | 279 | | 1148 | 0 | 0 | 5449 |
| % Passenger Vehicles | 99.5 | 80.1 | 99.5 | 100 | 86.2 | 96.9 | 99.3 | 98.5 | 96.7 | 98.5 | 98.8 | 79.9 | 98.8 | 100 | 83.3 | 96.5 | 99.7 | 99.3 | 100 | 99.1 | 0 | 0 | 89.4 |
| Large 2 Axle Vehicles | 2 | 49 | 1 | | 52 | 1 | 2 | 3 | | 7 | 2 | 47 | 1 | | 50 | 6 | 2 | 2 | | 10 | 0 | 0 | 119 |
| % Large 2 Axle Vehicles | 0.5 | 3.4 | 0.5 | 0 | 2.5 | 1 | 0.5 | 1.2 | 1.7 | 0.9 | 0.8 | 2.9 | 1.2 | 0 | 2.5 | 3 | 0.3 | 0.7 | 0 | 0.9 | 0 | 0 | 2 |
| 3 Axle Vehicles | 0 | 65 | 0 | | 65 | 2 | 1 | 0 | | 3 | 0 | 65 | 0 | | 65 | 0 | 0 | 0 | | 0 | 0 | 0 | 133 |
| % 3 Axle Vehicles | 0 | 4.5 | 0 | 0 | 3.1 | 2.1 | 0.2 | 0 | 0 | 0.4 | 0 | 3.9 | 0 | 0 | 3.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 4+ Axle Trucks | 0 | 173 | 0 | | 173 | 0 | 0 | 1 | | 2 | 1 | 219 | 0 | | 220 | 1 | 0 | 0 | | 1 | 0 | 0 | 396 |
| % 4+ Axle Trucks | 0 | 12 | 0 | 0 | 8.2 | 0 | 0 | 0.4 | 1.7 | 0.2 | 0.4 | 13.3 | 0 | 0 | 10.9 | 0.5 | 0 | 0 | 0 | 0.1 | 0 | 0 | 6.5 |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 48 | **195** | 26 | 269 | 10 | 57 | 36 | 103 | 21 | 199 | 14 | 234 | 25 | **100** | 30 | 155 | 761 |
| 05:00 PM | 42 | 157 | **38** | 237 | 11 | 56 | **38** | 105 | 24 | 211 | 6 | 241 | 21 | 70 | 33 | 124 | 707 |
| 05:15 PM | 57 | 195 | 21 | **273** | 12 | 55 | 19 | 86 | 15 | **222** | 10 | **247** | 22 | 83 | 28 | 133 | 739 |
| 05:30 PM | **62** | 192 | 16 | 270 | **15** | **59** | 33 | **107** | **33** | 187 | **16** | 236 | **29** | 95 | **42** | **166** | **779** |
| Total Volume | 209 | 739 | 101 | 1049 | 48 | 227 | 126 | 401 | 93 | 819 | 46 | 958 | 97 | 348 | 133 | 578 | 2986 |
| % App. Total | 19.9 | 70.4 | 9.6 | | 12 | 56.6 | 31.4 | | 9.7 | 85.5 | 4.8 | | 16.8 | 60.2 | 23 | | |
| PHF | .843 | .947 | .664 | .961 | .800 | .962 | .829 | .937 | .705 | .922 | .719 | .970 | .836 | .870 | .792 | .870 | .958 |

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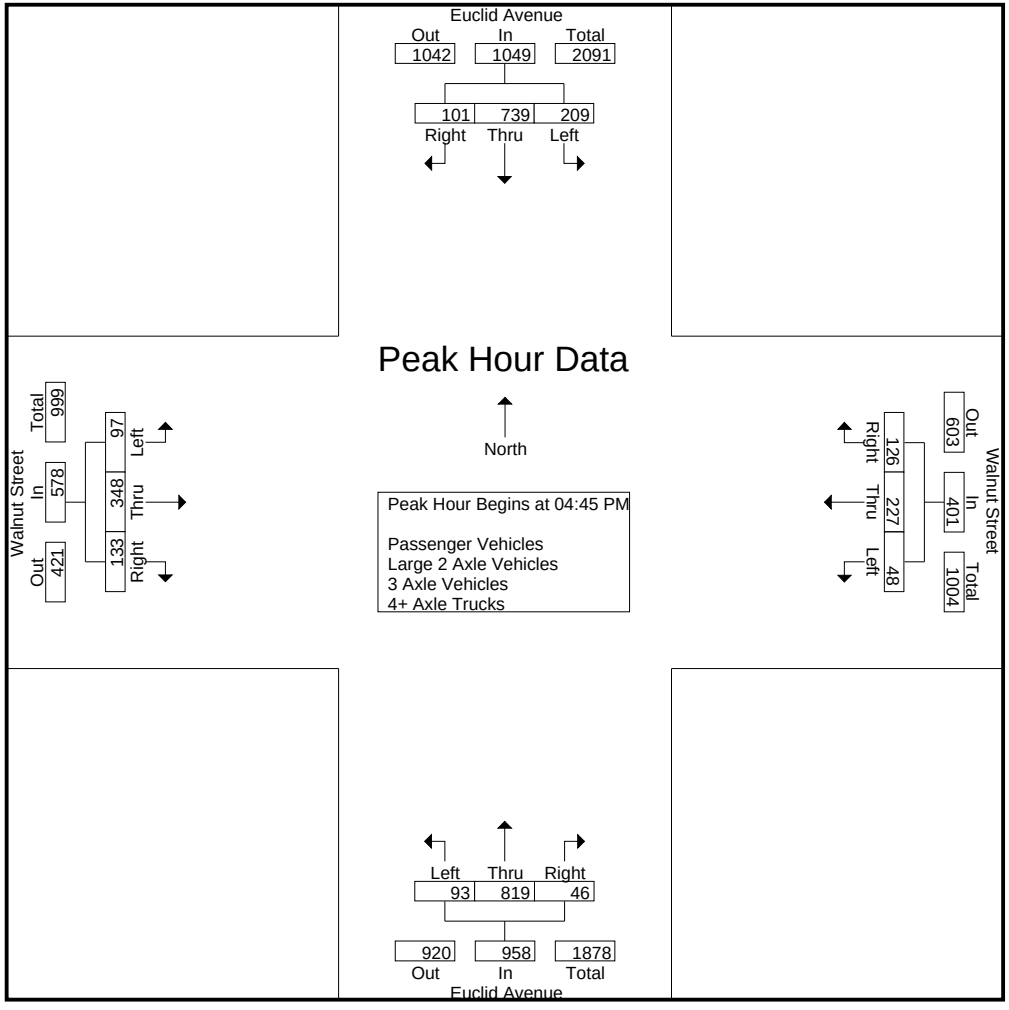

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File Name : 03_ONT_Euc_Wal PMC
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| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:45 PM | | | | 05:00 PM | | | | 04:00 PM | | | | 04:45 PM | | | | |
| +0 mins. | 48 | **195** | 26 | 269 | 11 | 56 | 38 | 105 | 33 | 209 | 7 | 249 | 25 | **100** | 30 | 155 | |
| +15 mins. | 42 | 157 | **38** | 237 | 12 | 55 | 19 | 86 | **51** | **218** | 10 | **279** | 21 | 70 | 33 | 124 | |
| +30 mins. | 57 | 195 | 21 | **273** | 15 | **59** | 33 | 107 | 34 | 207 | 12 | 253 | 22 | 83 | 28 | 133 | |
| +45 mins. | **62** | 192 | 16 | 270 | **20** | 55 | **39** | **114** | 21 | 199 | **14** | 234 | **29** | 95 | **42** | **166** | |
| Total Volume | 209 | 739 | 101 | 1049 | 58 | 225 | 129 | 412 | 139 | 833 | 43 | 1015 | 97 | 348 | 133 | 578 | |
| % App. Total | 19.9 | 70.4 | 9.6 | | 14.1 | 54.6 | 31.3 | | 13.7 | 82.1 | 4.2 | | 16.8 | 60.2 | 23 | | |
| PHF | .843 | .947 | .664 | .961 | .725 | .953 | .827 | .904 | .681 | .955 | .768 | .909 | .836 | .870 | .792 | .870 | |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 40 | 116 | 29 | 10 | 185 | 9 | 43 | 36 | 12 | 88 | 33 | 154 | 7 | 6 | 194 | 18 | 70 | 32 | 3 | 120 | 31 | 587 | 618 |
| 04:15 PM | 52 | 140 | 16 | 6 | 208 | 5 | 29 | 33 | 4 | 67 | 51 | 173 | 10 | 4 | 234 | 20 | 87 | 27 | 2 | 134 | 16 | 643 | 659 |
| 04:30 PM | 43 | 161 | 22 | 10 | 226 | 15 | 51 | 23 | 8 | 89 | 32 | 154 | 12 | 5 | 198 | 35 | 71 | 43 | 4 | 149 | 27 | 662 | 689 |
| 04:45 PM | 48 | 151 | 26 | 6 | 225 | 9 | 56 | 36 | 9 | 101 | 20 | 167 | 14 | 3 | 201 | 25 | 100 | 30 | 2 | 155 | 20 | 682 | 702 |
| Total | 183 | 568 | 93 | 32 | 844 | 38 | 179 | 128 | 33 | 345 | 136 | 648 | 43 | 18 | 827 | 98 | 328 | 132 | 11 | 558 | 94 | 2574 | 2668 |
| 05:00 PM | 42 | 125 | 38 | 13 | 205 | 10 | 55 | 36 | 6 | 101 | 24 | 169 | 6 | 5 | 199 | 19 | 69 | 33 | 1 | 121 | 25 | 626 | 651 |
| 05:15 PM | 56 | 169 | 20 | 5 | 245 | 12 | 54 | 19 | 3 | 85 | 15 | 183 | 9 | 3 | 207 | 21 | 83 | 27 | 2 | 131 | 13 | 668 | 681 |
| 05:30 PM | 62 | 158 | 16 | 5 | 236 | 14 | 59 | 33 | 10 | 106 | 33 | 156 | 16 | 9 | 205 | 29 | 95 | 42 | 1 | 166 | 25 | 713 | 738 |
| 05:45 PM | 64 | 135 | 26 | 5 | 225 | 20 | 55 | 39 | 6 | 114 | 29 | 160 | 9 | 6 | 198 | 28 | 82 | 45 | 2 | 155 | 19 | 692 | 711 |
| Total | 224 | 587 | 100 | 28 | 911 | 56 | 223 | 127 | 25 | 406 | 101 | 668 | 40 | 23 | 809 | 97 | 329 | 147 | 6 | 573 | 82 | 2699 | 2781 |
| Grand Total | 407 | 1155 | 193 | 60 | 1755 | 94 | 402 | 255 | 58 | 751 | 237 | 1316 | 83 | 41 | 1636 | 195 | 657 | 279 | 17 | 1131 | 176 | 5273 | 5449 |
| Apprch % | 23.2 | 65.8 | 11 | | | 12.5 | 53.5 | 34 | | | 14.5 | 80.4 | 5.1 | | | 17.2 | 58.1 | 24.7 | | | | | |
| Total % | 7.7 | 21.9 | 3.7 | | 33.3 | 1.8 | 7.6 | 4.8 | | 14.2 | 4.5 | 25 | 1.6 | | 31 | 3.7 | 12.5 | 5.3 | | 21.4 | 3.2 | 96.8 | |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 48 | 151 | 26 | 225 | 9 | 56 | **36** | 101 | 20 | 167 | 14 | 201 | 25 | **100** | 30 | 155 | 682 |
| 05:00 PM | 42 | 125 | **38** | 205 | 10 | 55 | 36 | 101 | 24 | 169 | 6 | 199 | 19 | 69 | 33 | 121 | 626 |
| 05:15 PM | 56 | **169** | 20 | **245** | 12 | 54 | 19 | 85 | 15 | **183** | 9 | **207** | 21 | 83 | 27 | 131 | 668 |
| 05:30 PM | **62** | 158 | 16 | 236 | **14** | **59** | 33 | **106** | **33** | 156 | **16** | 205 | **29** | 95 | **42** | **166** | **713** |
| Total Volume | 208 | 603 | 100 | 911 | 45 | 224 | 124 | 393 | 92 | 675 | 45 | 812 | 94 | 347 | 132 | 573 | 2689 |
| % App. Total | 22.8 | 66.2 | 11 | | 11.5 | 57 | 31.6 | | 11.3 | 83.1 | 5.5 | | 16.4 | 60.6 | 23 | | |
| PHF | .839 | .892 | .658 | .930 | .804 | .949 | .861 | .927 | .697 | .922 | .703 | .981 | .810 | .868 | .786 | .863 | .943 |

Counts Unlimited, Inc.
PO Box 1178
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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

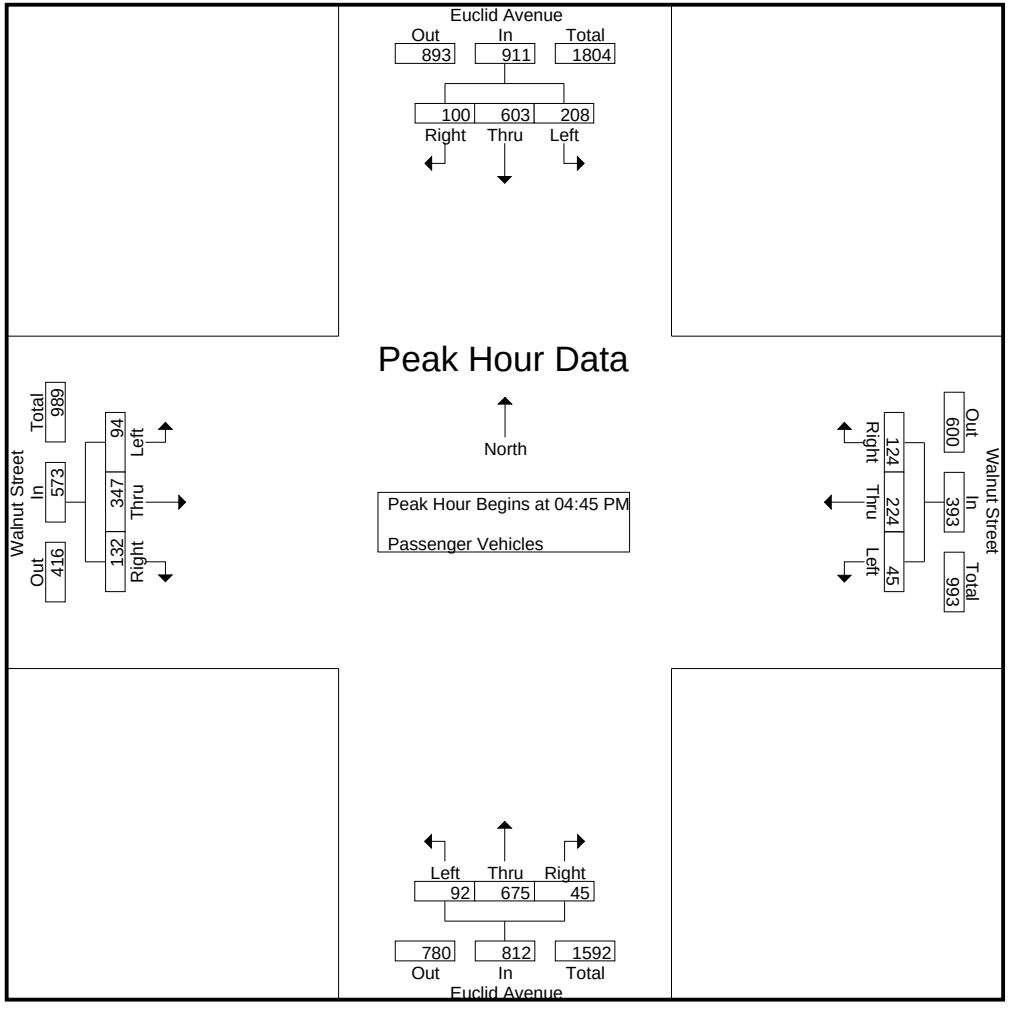

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:45 PM | | | | 04:45 PM | | | | 04:45 PM | | | | 04:45 PM | | | | |
| +0 mins. | 48 | 151 | 26 | 225 | 9 | 56 | **36** | 101 | 20 | 167 | 14 | 201 | 25 | **100** | 30 | 155 | |
| +15 mins. | 42 | 125 | **38** | 205 | 10 | 55 | 36 | 101 | 24 | 169 | 6 | 199 | 19 | 69 | 33 | 121 | |
| +30 mins. | 56 | **169** | 20 | **245** | 12 | 54 | 19 | 85 | 15 | **183** | 9 | **207** | 21 | 83 | 27 | 131 | |
| +45 mins. | **62** | 158 | 16 | 236 | **14** | **59** | 33 | **106** | **33** | 156 | **16** | 205 | **29** | 95 | **42** | **166** | |
| Total Volume | 208 | 603 | 100 | 911 | 45 | 224 | 124 | 393 | 92 | 675 | 45 | 812 | 94 | 347 | 132 | 573 | |
| % App. Total | 22.8 | 66.2 | 11 | | 11.5 | 57 | 31.6 | | 11.3 | 83.1 | 5.5 | | 16.4 | 60.6 | 23 | | |
| PHF | .839 | .892 | .658 | .930 | .804 | .949 | .861 | .927 | .697 | .922 | .703 | .981 | .810 | .868 | .786 | .863 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 12 | 2 | 0 | 1 | 0 | 3 | 0 | 24 | 24 |
| 04:15 PM | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 2 | 1 | 2 | 0 | 4 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 2 | 1 | 15 | 16 |
| 04:30 PM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| 04:45 PM | 0 | 7 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 1 | 1 | 8 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 17 |
| Total | 1 | 29 | 0 | 0 | 30 | 0 | 1 | 2 | 1 | 3 | 2 | 29 | 0 | 0 | 31 | 3 | 1 | 1 | 0 | 5 | 1 | 69 | 70 |
| 05:00 PM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 6 | 0 | 0 | 6 | 2 | 1 | 0 | 0 | 3 | 0 | 18 | 18 |
| 05:15 PM | 1 | 3 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 0 | 6 | 1 | 0 | 7 | 1 | 0 | 1 | 0 | 2 | 0 | 15 | 15 |
| 05:30 PM | 0 | 6 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| 05:45 PM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 |
| Total | 1 | 20 | 1 | 0 | 22 | 1 | 1 | 1 | 0 | 3 | 0 | 18 | 1 | 0 | 19 | 3 | 1 | 1 | 0 | 5 | 0 | 49 | 49 |
| Grand Total | 2 | 49 | 1 | 0 | 52 | 1 | 2 | 3 | 1 | 6 | 2 | 47 | 1 | 0 | 50 | 6 | 2 | 2 | 0 | 10 | 1 | 118 | 119 |
| Apprch % | 3.8 | 94.2 | 1.9 | | | 16.7 | 33.3 | 50 | | | 4 | 94 | 2 | | | 60 | 20 | 20 | | | | | |
| Total % | 1.7 | 41.5 | 0.8 | | 44.1 | 0.8 | 1.7 | 2.5 | | 5.1 | 1.7 | 39.8 | 0.8 | | 42.4 | 5.1 | 1.7 | 1.7 | | 8.5 | 0.8 | 99.2 | |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 0 | 7 | 0 | 7 | 0 | **1** | 0 | **1** | **1** | **8** | 0 | **9** | 0 | 0 | 0 | 0 | 17 |
| 05:00 PM | 0 | **8** | 0 | **8** | 0 | 0 | **1** | 1 | 0 | 6 | 0 | 6 | **2** | **1** | 0 | **3** | **18** |
| 05:15 PM | **1** | 3 | **1** | 5 | 0 | 1 | 0 | 1 | 0 | 6 | **1** | 7 | 1 | 0 | **1** | 2 | 15 |
| 05:30 PM | 0 | 6 | 0 | 6 | **1** | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 9 |
| Total Volume | 1 | 24 | 1 | 26 | 1 | 2 | 1 | 4 | 1 | 22 | 1 | 24 | 3 | 1 | 1 | 5 | 59 |
| % App. Total | 3.8 | 92.3 | 3.8 | | 25 | 50 | 25 | | 4.2 | 91.7 | 4.2 | | 60 | 20 | 20 | | |
| PHF | .250 | .750 | .250 | .813 | .250 | .500 | .250 | 1.00 | .250 | .688 | .250 | .667 | .375 | .250 | .250 | .417 | .819 |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

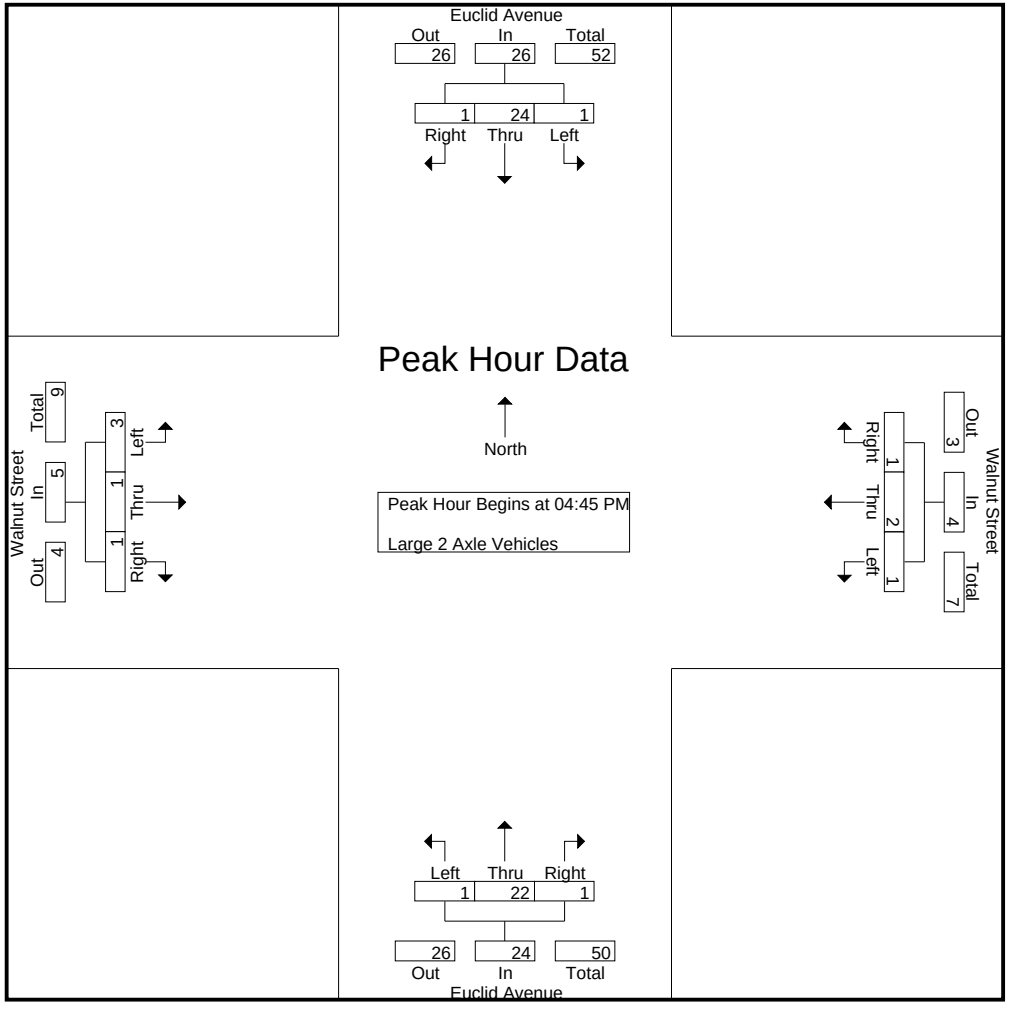

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:45 PM | | | | 04:45 PM | | | | 04:45 PM | | | | 04:45 PM | | | | |
| +0 mins. | 0 | 7 | 0 | 7 | 0 | **1** | 0 | **1** | **1** | **8** | 0 | **9** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | **8** | 0 | **8** | 0 | 0 | **1** | 1 | 0 | 6 | 0 | 6 | **2** | **1** | 0 | **3** | |
| +30 mins. | **1** | 3 | **1** | 5 | 0 | 1 | 0 | 1 | 0 | 6 | **1** | 7 | 1 | 0 | **1** | 2 | |
| +45 mins. | 0 | 6 | 0 | 6 | **1** | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | |
| Total Volume | 1 | 24 | 1 | 26 | 1 | 2 | 1 | 4 | 1 | 22 | 1 | 24 | 3 | 1 | 1 | 5 | |
| % App. Total | 3.8 | 92.3 | 3.8 | | 25 | 50 | 25 | | 4.2 | 91.7 | 4.2 | | 60 | 20 | 20 | | |
| PHF | .250 | .750 | .250 | .813 | .250 | .500 | .250 | 1.000 | .250 | .688 | .250 | .667 | .375 | .250 | .250 | .417 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| 04:15 PM | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 19 |
| 04:30 PM | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| 04:45 PM | 0 | 12 | 0 | 0 | 12 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| Total | 0 | 38 | 0 | 0 | 38 | 1 | 0 | 0 | 0 | 1 | 0 | 37 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 76 | 76 |
| 05:00 PM | 0 | 7 | 0 | 0 | 7 | 1 | 1 | 0 | 0 | 2 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| 05:15 PM | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| 05:30 PM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 |
| 05:45 PM | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| Total | 0 | 27 | 0 | 0 | 27 | 1 | 1 | 0 | 0 | 2 | 0 | 28 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 57 | 57 |
| Grand Total | 0 | 65 | 0 | 0 | 65 | 2 | 1 | 0 | 0 | 3 | 0 | 65 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 133 | 133 |
| Apprch % | 0 | 100 | 0 | | | 66.7 | 33.3 | 0 | | | 0 | 100 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 48.9 | 0 | | 48.9 | 1.5 | 0.8 | 0 | | 2.3 | 0 | 48.9 | 0 | | 48.9 | 0 | 0 | 0 | | 0 | 0 | 100 | |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 0 | **12** | 0 | **12** | **1** | 0 | 0 | 1 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | **18** |
| 05:00 PM | 0 | 7 | 0 | 7 | 1 | **1** | 0 | **2** | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 15 |
| 05:15 PM | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | **9** | 0 | **9** | 0 | 0 | 0 | 0 | 15 |
| 05:30 PM | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 14 |
| Total Volume | 0 | 33 | 0 | 33 | 2 | 1 | 0 | 3 | 0 | 26 | 0 | 26 | 0 | 0 | 0 | 0 | 62 |
| % App. Total | 0 | 100 | 0 | | 66.7 | 33.3 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .688 | .000 | .688 | .500 | .250 | .000 | .375 | .000 | .722 | .000 | .722 | .000 | .000 | .000 | .000 | .861 |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

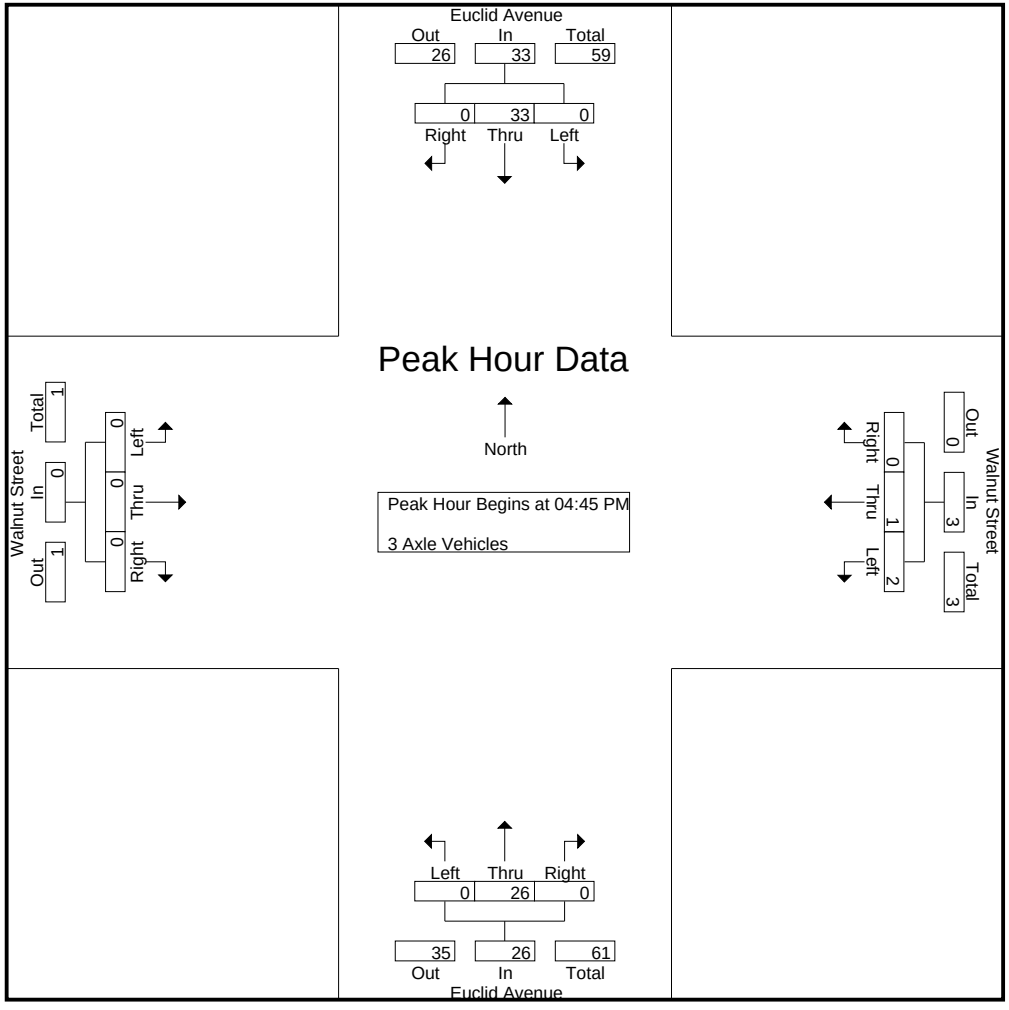

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:45 PM | | | | 04:45 PM | | | | 04:45 PM | | | | 04:45 PM | | | | |
| +0 mins. | 0 | **12** | 0 | **12** | **1** | 0 | 0 | 1 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 7 | 0 | 7 | 1 | **1** | 0 | **2** | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | **9** | 0 | **9** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 33 | 0 | 33 | 2 | 1 | 0 | 3 | 0 | 26 | 0 | 26 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 100 | 0 | | 66.7 | 33.3 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .688 | .000 | .688 | .500 | .250 | .000 | .375 | .000 | .722 | .000 | .722 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Walnut Street Westbound | | | | | Euclid Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 27 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 62 | 62 |
| 04:15 PM | 0 | 22 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 32 | 0 | 0 | 32 | 1 | 0 | 0 | 0 | 1 | 0 | 55 | 55 |
| 04:30 PM | 0 | 27 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 1 | 33 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 61 |
| 04:45 PM | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 44 | 44 |
| Total | 0 | 101 | 0 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 1 | 119 | 0 | 0 | 120 | 1 | 0 | 0 | 0 | 1 | 0 | 222 | 222 |
| 05:00 PM | 0 | 17 | 0 | 0 | 17 | 0 | 0 | 1 | 1 | 1 | 0 | 30 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 1 | 48 | 49 |
| 05:15 PM | 0 | 17 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 41 |
| 05:30 PM | 0 | 20 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 43 |
| 05:45 PM | 0 | 18 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 41 |
| Total | 0 | 72 | 0 | 0 | 72 | 0 | 0 | 1 | 1 | 1 | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 1 | 173 | 174 |
| Grand Total | 0 | 173 | 0 | 0 | 173 | 0 | 0 | 1 | 1 | 1 | 1 | 219 | 0 | 0 | 220 | 1 | 0 | 0 | 0 | 1 | 1 | 395 | 396 |
| Apprch % | 0 | 100 | 0 | | | 0 | 0 | 100 | | | 0.5 | 99.5 | 0 | | | 100 | 0 | 0 | | | | | |
| Total % | 0 | 43.8 | 0 | | 43.8 | 0 | 0 | 0.3 | | 0.3 | 0.3 | 55.4 | 0 | | 55.7 | 0.3 | 0 | 0 | | 0.3 | 0.3 | 99.7 | |

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 0 | **25** | 0 | **25** | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 19 | 0 | 0 | 0 | 0 | 44 |
| 05:00 PM | 0 | 17 | 0 | 17 | 0 | 0 | **1** | **1** | 0 | **30** | 0 | **30** | 0 | 0 | 0 | 0 | **48** |
| 05:15 PM | 0 | 17 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 41 |
| 05:30 PM | 0 | 20 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 23 | 0 | 0 | 0 | 0 | 43 |
| Total Volume | 0 | 79 | 0 | 79 | 0 | 0 | 1 | 1 | 0 | 96 | 0 | 96 | 0 | 0 | 0 | 0 | 176 |
| % App. Total | 0 | 100 | 0 | | 0 | 0 | 100 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .790 | .000 | .790 | .000 | .000 | .250 | .250 | .000 | .800 | .000 | .800 | .000 | .000 | .000 | .000 | .917 |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

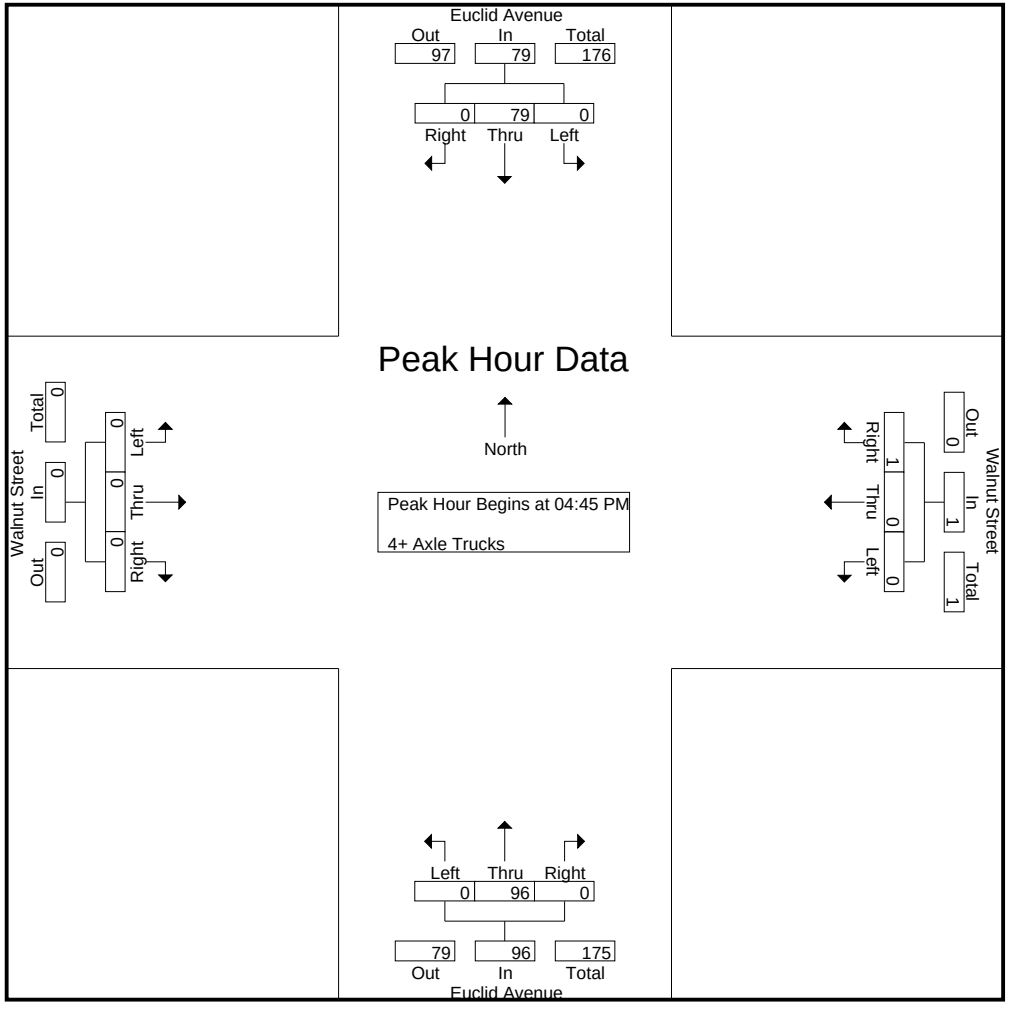

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City of Ontario
N/S: Euclid Avenue
E/W: Walnut Street
Weather: Clear

File Name : 03_ONT_Euc_Wal PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Walnut Street Westbound | | | | Euclid Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:45 PM | | | | 04:45 PM | | | | 04:45 PM | | | | 04:45 PM | | | | |
| +0 mins. | 0 | **25** | 0 | **25** | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 19 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 17 | 0 | 17 | 0 | 0 | **1** | **1** | 0 | **30** | 0 | **30** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 17 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 20 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 23 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 79 | 0 | 79 | 0 | 0 | 1 | 1 | 0 | 96 | 0 | 96 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 100 | 0 | | 0 | 0 | 100 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .790 | .000 | .790 | .000 | .000 | .250 | .250 | .000 | .800 | .000 | .800 | .000 | .000 | .000 | .000 | |

Location: Ontario
N/S: Euclid Avenue
E/W: Walnut Street

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg Walnut Street | South Leg Euclid Avenue | West Leg Walnut Street | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 1 | 0 | 1 |
| 7:15 AM | 0 | 1 | 1 | 0 | 2 |
| 7:30 AM | 0 | 2 | 4 | 0 | 6 |
| 7:45 AM | 1 | 1 | 1 | 0 | 3 |
| 8:00 AM | 1 | 0 | 0 | 0 | 1 |
| 8:15 AM | 1 | 1 | 0 | 0 | 2 |
| 8:30 AM | 0 | 0 | 1 | 0 | 1 |
| 8:45 AM | 1 | 1 | 2 | 1 | 5 |
| TOTAL VOLUMES: | 4 | 6 | 10 | 1 | 21 |

| | North Leg Euclid Avenue | East Leg Walnut Street | South Leg Euclid Avenue | West Leg Walnut Street | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 1 | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 1 | 2 | 0 | 3 |
| 4:30 PM | 2 | 1 | 0 | 1 | 4 |
| 4:45 PM | 3 | 0 | 0 | 1 | 4 |
| 5:00 PM | 4 | 0 | 0 | 2 | 6 |
| 5:15 PM | 2 | 1 | 1 | 0 | 4 |
| 5:30 PM | 0 | 2 | 2 | 0 | 4 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 12 | 5 | 5 | 4 | 26 |



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951-268-6268

Location: Ontario
N/S: Euclid Avenue
E/W: Walnut Street

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound Walnut Street | | | Northbound Euclid Avenue | | | Eastbound Walnut Street | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 |

| | Southbound Euclid Avenue | | | Westbound Walnut Street | | | Northbound Euclid Avenue | | | Eastbound Walnut Street | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 6 |

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PO Box 1178
Corona, CA 92878
951-268-6268

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PO Box 1178
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(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 21 | 156 | 19 | 10 | 196 | 36 | 71 | 8 | 4 | 115 | 16 | 166 | 26 | 9 | 208 | 28 | 36 | 8 | 6 | 72 | 29 | 591 | 620 |
| 07:15 AM | 14 | 148 | 28 | 12 | 190 | 39 | 103 | 14 | 8 | 156 | 13 | 143 | 22 | 8 | 178 | 25 | 65 | 10 | 3 | 100 | 31 | 624 | 655 |
| 07:30 AM | 23 | 148 | 25 | 12 | 196 | 42 | 124 | 18 | 4 | 184 | 16 | 149 | 23 | 12 | 188 | 32 | 89 | 18 | 11 | 139 | 39 | 707 | 746 |
| 07:45 AM | 26 | 150 | 29 | 18 | 205 | 46 | 160 | 15 | 6 | 221 | 7 | 158 | 30 | 20 | 195 | 35 | 105 | 9 | 4 | 149 | 48 | 770 | 818 |
| Total | 84 | 602 | 101 | 52 | 787 | 163 | 458 | 55 | 22 | 676 | 52 | 616 | 101 | 49 | 769 | 120 | 295 | 45 | 24 | 460 | 147 | 2692 | 2839 |
| 08:00 AM | 30 | 158 | 31 | 17 | 219 | 46 | 99 | 17 | 8 | 162 | 10 | 140 | 33 | 19 | 183 | 32 | 78 | 16 | 8 | 126 | 52 | 690 | 742 |
| 08:15 AM | 44 | 162 | 28 | 10 | 234 | 25 | 150 | 18 | 4 | 193 | 10 | 112 | 31 | 12 | 153 | 22 | 95 | 8 | 2 | 125 | 28 | 705 | 733 |
| 08:30 AM | 56 | 163 | 20 | 5 | 239 | 41 | 77 | 17 | 5 | 135 | 16 | 134 | 21 | 8 | 171 | 21 | 96 | 16 | 6 | 133 | 24 | 678 | 702 |
| 08:45 AM | 54 | 156 | 28 | 14 | 238 | 25 | 101 | 26 | 13 | 152 | 8 | 135 | 22 | 13 | 165 | 26 | 104 | 8 | 6 | 138 | 46 | 693 | 739 |
| Total | 184 | 639 | 107 | 46 | 930 | 137 | 427 | 78 | 30 | 642 | 44 | 521 | 107 | 52 | 672 | 101 | 373 | 48 | 22 | 522 | 150 | 2766 | 2916 |
| Grand Total | 268 | 1241 | 208 | 98 | 1717 | 300 | 885 | 133 | 52 | 1318 | 96 | 1137 | 208 | 101 | 1441 | 221 | 668 | 93 | 46 | 982 | 297 | 5458 | 5755 |
| Apprch % | 15.6 | 72.3 | 12.1 | | | 22.8 | 67.1 | 10.1 | | | 6.7 | 78.9 | 14.4 | | | 22.5 | 68 | 9.5 | | | | | |
| Total % | 4.9 | 22.7 | 3.8 | | 31.5 | 5.5 | 16.2 | 2.4 | | 24.1 | 1.8 | 20.8 | 3.8 | | 26.4 | 4 | 12.2 | 1.7 | | 18 | 5.2 | 94.8 | |
| Passenger Vehicles | 254 | 893 | 191 | | 1428 | 285 | 865 | 122 | | 1322 | 82 | 735 | 197 | | 1112 | 198 | 653 | 80 | | 971 | 0 | 0 | 4833 |
| % Passenger Vehicles | 94.8 | 72 | 91.8 | 91.8 | 78.7 | 95 | 97.7 | 91.7 | 96.2 | 96.5 | 85.4 | 64.6 | 94.7 | 97 | 72.1 | 89.6 | 97.8 | 86 | 87 | 94.5 | 0 | 0 | 84 |
| Large 2 Axle Vehicles | 8 | 62 | 6 | | 78 | 12 | 16 | 5 | | 34 | 8 | 73 | 7 | | 90 | 9 | 11 | 4 | | 26 | 0 | 0 | 228 |
| % Large 2 Axle Vehicles | 3 | 5 | 2.9 | 2 | 4.3 | 4 | 1.8 | 3.8 | 1.9 | 2.5 | 8.3 | 6.4 | 3.4 | 2 | 5.8 | 4.1 | 1.6 | 4.3 | 4.3 | 2.5 | 0 | 0 | 4 |
| 3 Axle Vehicles | 4 | 60 | 2 | | 68 | 1 | 2 | 2 | | 5 | 5 | 59 | 1 | | 65 | 5 | 1 | 8 | | 17 | 0 | 0 | 155 |
| % 3 Axle Vehicles | 1.5 | 4.8 | 1 | 2 | 3.7 | 0.3 | 0.2 | 1.5 | 0 | 0.4 | 5.2 | 5.2 | 0.5 | 0 | 4.2 | 2.3 | 0.1 | 8.6 | 6.5 | 1.7 | 0 | 0 | 2.7 |
| 4+ Axle Trucks | 2 | 226 | 9 | | 241 | 2 | 2 | 4 | | 9 | 1 | 270 | 3 | | 275 | 9 | 3 | 1 | | 14 | 0 | 0 | 539 |
| % 4+ Axle Trucks | 0.7 | 18.2 | 4.3 | 4.1 | 13.3 | 0.7 | 0.2 | 3 | 1.9 | 0.7 | 1 | 23.7 | 1.4 | 1 | 17.8 | 4.1 | 0.4 | 1.1 | 2.2 | 1.4 | 0 | 0 | 9.4 |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 23 | 148 | 25 | 196 | 42 | 124 | **18** | 184 | **16** | 149 | 23 | 188 | 32 | 89 | **18** | 139 | 707 |
| 07:45 AM | 26 | 150 | 29 | 205 | **46** | **160** | 15 | **221** | 7 | **158** | 30 | **195** | **35** | **105** | 9 | **149** | **770** |
| 08:00 AM | 30 | 158 | **31** | 219 | 46 | 99 | 17 | 162 | 10 | 140 | **33** | 183 | 32 | 78 | 16 | 126 | 690 |
| 08:15 AM | **44** | **162** | 28 | **234** | 25 | 150 | 18 | 193 | 10 | 112 | 31 | 153 | 22 | 95 | 8 | 125 | 705 |
| Total Volume | 123 | 618 | 113 | 854 | 159 | 533 | 68 | 760 | 43 | 559 | 117 | 719 | 121 | 367 | 51 | 539 | 2872 |
| % App. Total | 14.4 | 72.4 | 13.2 | | 20.9 | 70.1 | 8.9 | | 6 | 77.7 | 16.3 | | 22.4 | 68.1 | 9.5 | | |
| PHF | .699 | .954 | .911 | .912 | .864 | .833 | .944 | .860 | .672 | .884 | .886 | .922 | .864 | .874 | .708 | .904 | .932 |

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

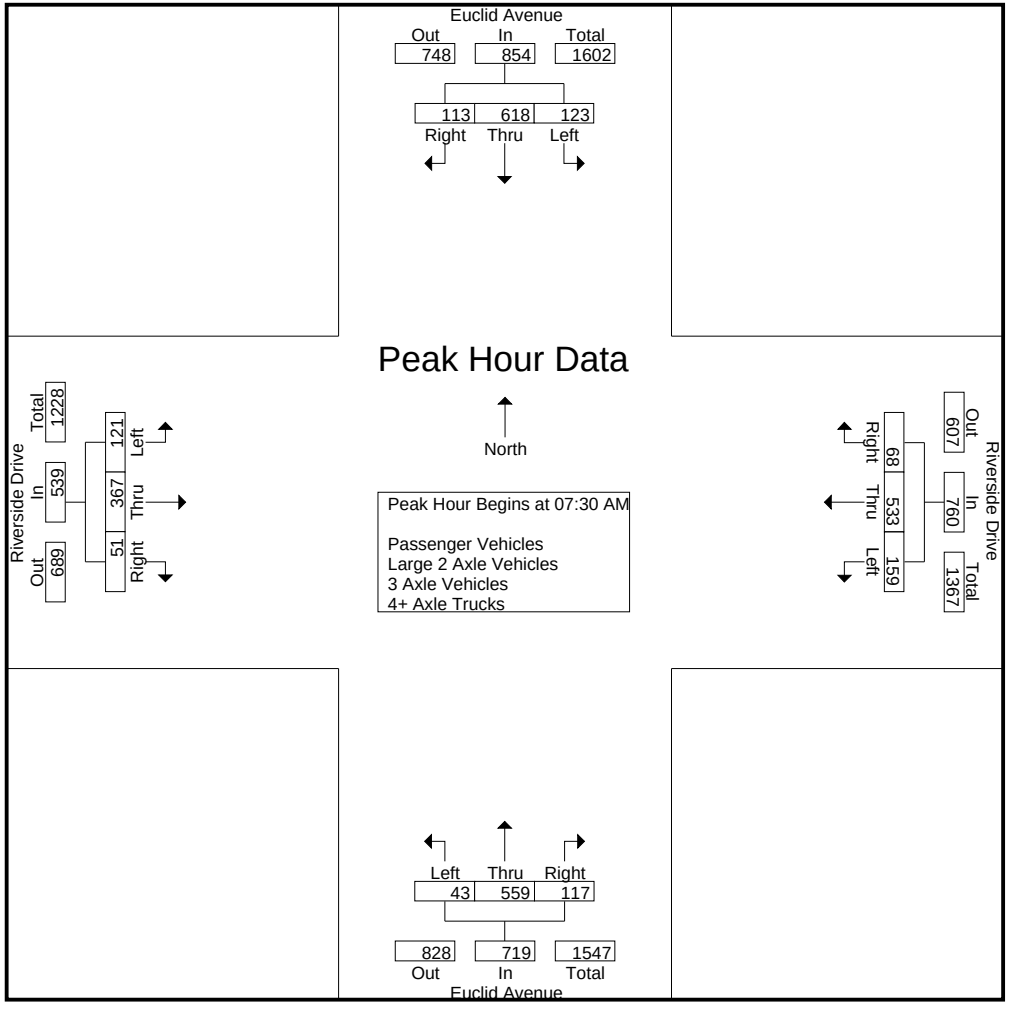

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 08:00 AM | | | | 07:30 AM | | | | 07:00 AM | | | | 07:30 AM | | | | |
| +0 mins. | 30 | 158 | **31** | 219 | 42 | 124 | **18** | 184 | **16** | **166** | 26 | **208** | 32 | 89 | **18** | 139 | |
| +15 mins. | 44 | 162 | 28 | 234 | **46** | **160** | 15 | **221** | 13 | 143 | 22 | 178 | **35** | **105** | 9 | **149** | |
| +30 mins. | **56** | **163** | 20 | **239** | 46 | 99 | 17 | 162 | 16 | 149 | 23 | 188 | 32 | 78 | 16 | 126 | |
| +45 mins. | 54 | 156 | 28 | 238 | 25 | 150 | 18 | 193 | 7 | 158 | **30** | 195 | 22 | 95 | 8 | 125 | |
| Total Volume | 184 | 639 | 107 | 930 | 159 | 533 | 68 | 760 | 52 | 616 | 101 | 769 | 121 | 367 | 51 | 539 | |
| % App. Total | 19.8 | 68.7 | 11.5 | | 20.9 | 70.1 | 8.9 | | 6.8 | 80.1 | 13.1 | | 22.4 | 68.1 | 9.5 | | |
| PHF | .821 | .980 | .863 | .973 | .864 | .833 | .944 | .860 | .813 | .928 | .842 | .924 | .864 | .874 | .708 | .904 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 16 | 110 | 18 | 10 | 144 | 34 | 71 | 8 | 4 | 113 | 12 | 126 | 23 | 9 | 161 | 28 | 34 | 4 | 3 | 66 | 26 | 484 | 510 |
| 07:15 AM | 13 | 120 | 25 | 10 | 158 | 36 | 101 | 13 | 8 | 150 | 11 | 102 | 19 | 6 | 132 | 23 | 64 | 9 | 3 | 96 | 27 | 536 | 563 |
| 07:30 AM | 21 | 108 | 24 | 11 | 153 | 40 | 122 | 17 | 4 | 179 | 13 | 93 | 22 | 12 | 128 | 30 | 89 | 17 | 10 | 136 | 37 | 596 | 633 |
| 07:45 AM | 26 | 111 | 27 | 16 | 164 | 44 | 155 | 14 | 6 | 213 | 7 | 102 | 29 | 20 | 138 | 30 | 102 | 8 | 4 | 140 | 46 | 655 | 701 |
| Total | 76 | 449 | 94 | 47 | 619 | 154 | 449 | 52 | 22 | 655 | 43 | 423 | 93 | 47 | 559 | 111 | 289 | 38 | 20 | 438 | 136 | 2271 | 2407 |
| 08:00 AM | 27 | 108 | 29 | 16 | 164 | 44 | 97 | 16 | 8 | 157 | 8 | 84 | 32 | 19 | 124 | 29 | 77 | 11 | 6 | 117 | 49 | 562 | 611 |
| 08:15 AM | 44 | 119 | 22 | 8 | 185 | 24 | 145 | 14 | 4 | 183 | 9 | 55 | 31 | 12 | 95 | 18 | 94 | 8 | 2 | 120 | 26 | 583 | 609 |
| 08:30 AM | 55 | 117 | 19 | 5 | 191 | 39 | 75 | 15 | 4 | 129 | 15 | 82 | 19 | 7 | 116 | 18 | 92 | 15 | 6 | 125 | 22 | 561 | 583 |
| 08:45 AM | 52 | 100 | 27 | 14 | 179 | 24 | 99 | 25 | 12 | 148 | 7 | 91 | 22 | 13 | 120 | 22 | 101 | 8 | 6 | 131 | 45 | 578 | 623 |
| Total | 178 | 444 | 97 | 43 | 719 | 131 | 416 | 70 | 28 | 617 | 39 | 312 | 104 | 51 | 455 | 87 | 364 | 42 | 20 | 493 | 142 | 2284 | 2426 |
| Grand Total | 254 | 893 | 191 | 90 | 1338 | 285 | 865 | 122 | 50 | 1272 | 82 | 735 | 197 | 98 | 1014 | 198 | 653 | 80 | 40 | 931 | 278 | 4555 | 4833 |
| Apprch % | 19 | 66.7 | 14.3 | | | 22.4 | 68 | 9.6 | | | 8.1 | 72.5 | 19.4 | | | 21.3 | 70.1 | 8.6 | | | | | |
| Total % | 5.6 | 19.6 | 4.2 | | 29.4 | 6.3 | 19 | 2.7 | | 27.9 | 1.8 | 16.1 | 4.3 | | 22.3 | 4.3 | 14.3 | 1.8 | | 20.4 | 5.8 | 94.2 | |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 21 | 108 | 24 | 153 | 40 | 122 | **17** | 179 | **13** | 93 | 22 | 128 | **30** | 89 | **17** | 136 | 596 |
| 07:45 AM | 26 | 111 | 27 | 164 | **44** | **155** | 14 | **213** | 7 | **102** | 29 | **138** | 30 | **102** | 8 | **140** | **655** |
| 08:00 AM | 27 | 108 | **29** | 164 | 44 | 97 | 16 | 157 | 8 | 84 | **32** | 124 | 29 | 77 | 11 | 117 | 562 |
| 08:15 AM | **44** | **119** | 22 | **185** | 24 | 145 | 14 | 183 | 9 | 55 | 31 | 95 | 18 | 94 | 8 | 120 | 583 |
| Total Volume | 118 | 446 | 102 | 666 | 152 | 519 | 61 | 732 | 37 | 334 | 114 | 485 | 107 | 362 | 44 | 513 | 2396 |
| % App. Total | 17.7 | 67 | 15.3 | | 20.8 | 70.9 | 8.3 | | 7.6 | 68.9 | 23.5 | | 20.9 | 70.6 | 8.6 | | |
| PHF | .670 | .937 | .879 | .900 | .864 | .837 | .897 | .859 | .712 | .819 | .891 | .879 | .892 | .887 | .647 | .916 | .915 |

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City of Ontario
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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

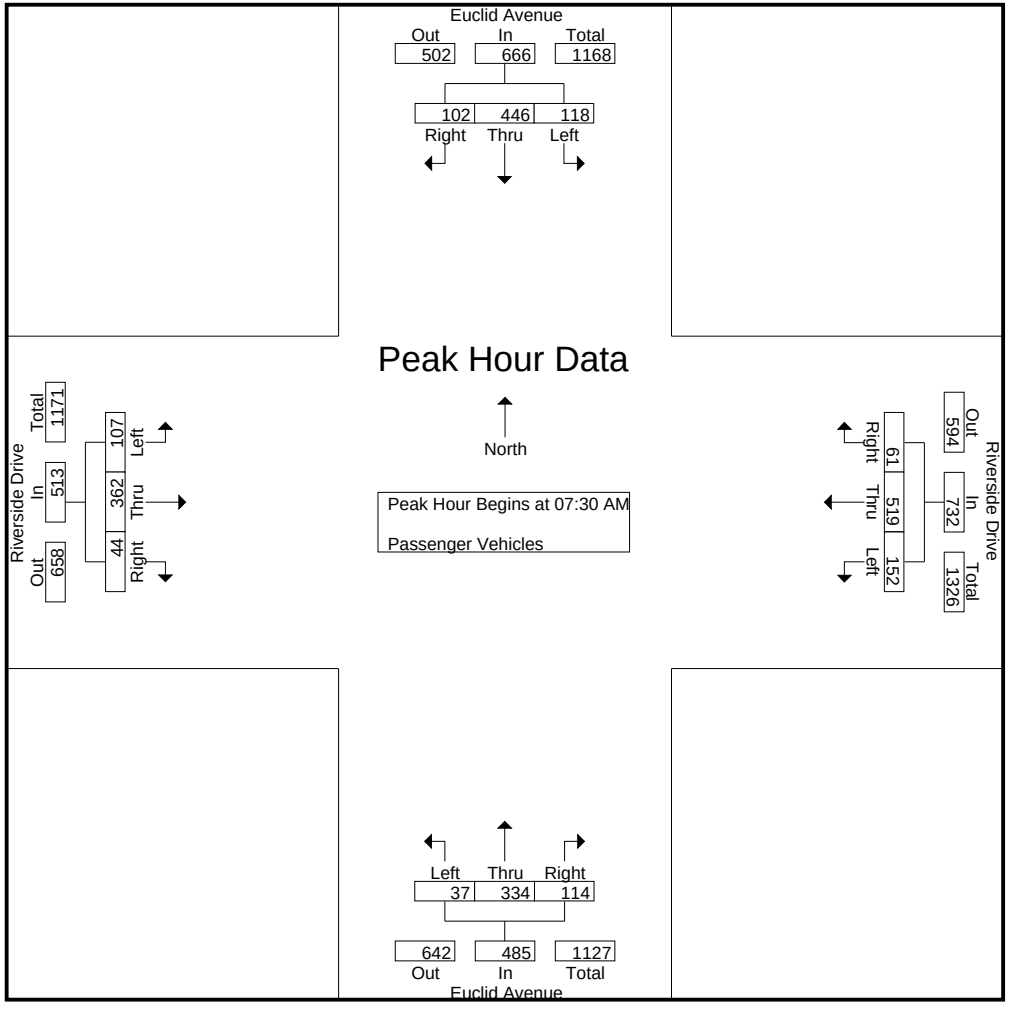

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 21 | 108 | 24 | 153 | 40 | 122 | **17** | 179 | **13** | 93 | 22 | 128 | **30** | 89 | **17** | 136 | |
| +15 mins. | 26 | 111 | 27 | 164 | **44** | **155** | 14 | **213** | 7 | **102** | 29 | **138** | 30 | **102** | 8 | **140** | |
| +30 mins. | 27 | 108 | **29** | 164 | 44 | 97 | 16 | 157 | 8 | 84 | **32** | 124 | 29 | 77 | 11 | 117 | |
| +45 mins. | **44** | **119** | 22 | **185** | 24 | 145 | 14 | 183 | 9 | 55 | 31 | 95 | 18 | 94 | 8 | 120 | |
| Total Volume | 118 | 446 | 102 | 666 | 152 | 519 | 61 | 732 | 37 | 334 | 114 | 485 | 107 | 362 | 44 | 513 | |
| % App. Total | 17.7 | 67 | 15.3 | | 20.8 | 70.9 | 8.3 | | 7.6 | 68.9 | 23.5 | | 20.9 | 70.6 | 8.6 | | |
| PHF | .670 | .937 | .879 | .900 | .864 | .837 | .897 | .859 | .712 | .819 | .891 | .879 | .892 | .887 | .647 | .916 | |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 8 | 0 | 0 | 11 | 1 | 0 | 0 | 0 | 1 | 3 | 3 | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 19 |
| 07:15 AM | 1 | 5 | 2 | 1 | 8 | 2 | 1 | 0 | 0 | 3 | 1 | 7 | 2 | 1 | 10 | 2 | 1 | 0 | 0 | 3 | 2 | 24 | 26 |
| 07:30 AM | 1 | 8 | 0 | 0 | 9 | 2 | 2 | 0 | 0 | 4 | 1 | 14 | 0 | 0 | 15 | 1 | 0 | 1 | 1 | 2 | 1 | 30 | 31 |
| 07:45 AM | 0 | 7 | 0 | 0 | 7 | 2 | 4 | 1 | 0 | 7 | 0 | 9 | 1 | 0 | 10 | 1 | 3 | 0 | 0 | 4 | 0 | 28 | 28 |
| Total | 5 | 28 | 2 | 1 | 35 | 7 | 7 | 1 | 0 | 15 | 5 | 33 | 4 | 1 | 42 | 4 | 4 | 1 | 1 | 9 | 3 | 101 | 104 |
| 08:00 AM | 2 | 9 | 0 | 0 | 11 | 2 | 2 | 1 | 0 | 5 | 1 | 5 | 1 | 0 | 7 | 0 | 1 | 2 | 1 | 3 | 1 | 26 | 27 |
| 08:15 AM | 0 | 9 | 3 | 1 | 12 | 1 | 4 | 2 | 0 | 7 | 1 | 13 | 0 | 0 | 14 | 2 | 0 | 0 | 0 | 2 | 1 | 35 | 36 |
| 08:30 AM | 1 | 6 | 0 | 0 | 7 | 1 | 2 | 1 | 1 | 4 | 1 | 10 | 2 | 1 | 13 | 0 | 4 | 1 | 0 | 5 | 2 | 29 | 31 |
| 08:45 AM | 0 | 10 | 1 | 0 | 11 | 1 | 1 | 0 | 0 | 2 | 0 | 12 | 0 | 0 | 12 | 3 | 2 | 0 | 0 | 5 | 0 | 30 | 30 |
| Total | 3 | 34 | 4 | 1 | 41 | 5 | 9 | 4 | 1 | 18 | 3 | 40 | 3 | 1 | 46 | 5 | 7 | 3 | 1 | 15 | 4 | 120 | 124 |
| Grand Total | 8 | 62 | 6 | 2 | 76 | 12 | 16 | 5 | 1 | 33 | 8 | 73 | 7 | 2 | 88 | 9 | 11 | 4 | 2 | 24 | 7 | 221 | 228 |
| Apprch % | 10.5 | 81.6 | 7.9 | | | 36.4 | 48.5 | 15.2 | | | 9.1 | 83 | 8 | | | 37.5 | 45.8 | 16.7 | | | | | |
| Total % | 3.6 | 28.1 | 2.7 | | 34.4 | 5.4 | 7.2 | 2.3 | | 14.9 | 3.6 | 33 | 3.2 | | 39.8 | 4.1 | 5 | 1.8 | | 10.9 | 3.1 | 96.9 | |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 1 | 8 | 0 | 9 | **2** | 2 | 0 | 4 | **1** | **14** | 0 | **15** | 1 | 0 | 1 | 2 | 30 |
| 07:45 AM | 0 | 7 | 0 | 7 | 2 | **4** | 1 | **7** | 0 | 9 | **1** | 10 | 1 | **3** | 0 | **4** | 28 |
| 08:00 AM | **2** | **9** | 0 | 11 | 2 | 2 | 1 | 5 | 1 | 5 | 1 | 7 | 0 | 1 | **2** | 3 | 26 |
| 08:15 AM | 0 | 9 | **3** | **12** | 1 | 4 | **2** | 7 | 1 | 13 | 0 | 14 | **2** | 0 | 0 | 2 | **35** |
| Total Volume | 3 | 33 | 3 | 39 | 7 | 12 | 4 | 23 | 3 | 41 | 2 | 46 | 4 | 4 | 3 | 11 | 119 |
| % App. Total | 7.7 | 84.6 | 7.7 | | 30.4 | 52.2 | 17.4 | | 6.5 | 89.1 | 4.3 | | 36.4 | 36.4 | 27.3 | | |
| PHF | .375 | .917 | .250 | .813 | .875 | .750 | .500 | .821 | .750 | .732 | .500 | .767 | .500 | .333 | .375 | .688 | .850 |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

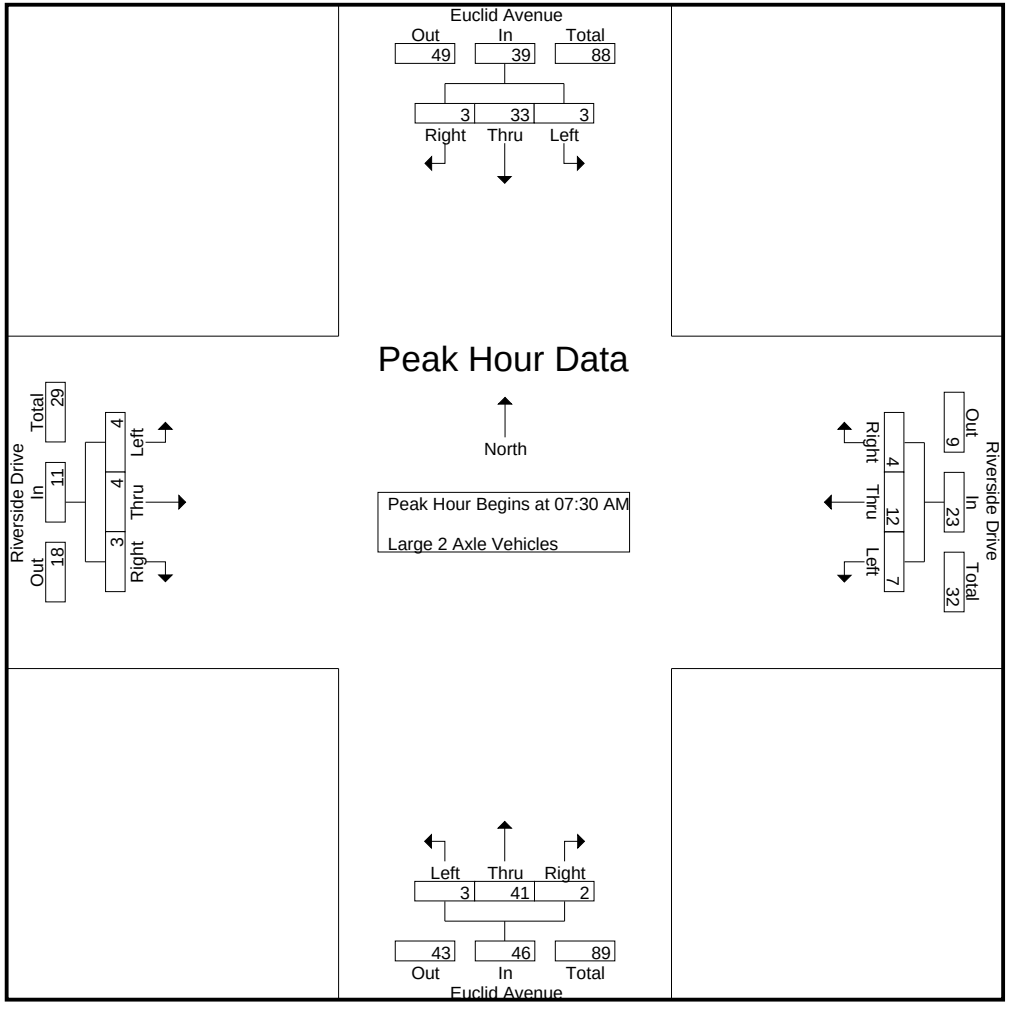

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City of Ontario
N/S: Euclid Avenue
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Weather: Clear

File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
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Page No : 3

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 1 | 8 | 0 | 9 | **2** | 2 | 0 | 4 | **1** | **14** | 0 | **15** | 1 | 0 | 1 | 2 | |
| +15 mins. | 0 | 7 | 0 | 7 | 2 | **4** | 1 | **7** | 0 | 9 | **1** | 10 | 1 | **3** | 0 | **4** | |
| +30 mins. | **2** | **9** | 0 | 11 | 2 | 2 | 1 | 5 | 1 | 5 | 1 | 7 | 0 | 1 | **2** | 3 | |
| +45 mins. | 0 | 9 | **3** | **12** | 1 | 4 | **2** | 7 | 1 | 13 | 0 | 14 | **2** | 0 | 0 | 2 | |
| Total Volume | 3 | 33 | 3 | 39 | 7 | 12 | 4 | 23 | 3 | 41 | 2 | 46 | 4 | 4 | 3 | 11 | |
| % App. Total | 7.7 | 84.6 | 7.7 | | 30.4 | 52.2 | 17.4 | | 6.5 | 89.1 | 4.3 | | 36.4 | 36.4 | 27.3 | | |
| PHF | .375 | .917 | .250 | .813 | .875 | .750 | .500 | .821 | .750 | .732 | .500 | .767 | .500 | .333 | .375 | .688 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 17 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 1 | 14 | 1 | 0 | 16 | 0 | 1 | 3 | 2 | 4 | 2 | 39 | 41 |
| 07:15 AM | 0 | 4 | 1 | 1 | 5 | 0 | 1 | 1 | 0 | 2 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 1 | 0 | 1 | 1 | 15 | 16 |
| 07:30 AM | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 17 |
| 07:45 AM | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 6 | 0 | 0 | 6 | 2 | 0 | 1 | 0 | 3 | 0 | 11 | 11 |
| Total | 3 | 28 | 1 | 1 | 32 | 0 | 2 | 1 | 0 | 3 | 3 | 35 | 1 | 0 | 39 | 2 | 1 | 5 | 2 | 8 | 3 | 82 | 85 |
| 08:00 AM | 1 | 10 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 7 | 1 | 0 | 3 | 1 | 4 | 1 | 22 | 23 |
| 08:15 AM | 0 | 6 | 1 | 1 | 7 | 0 | 0 | 1 | 0 | 1 | 0 | 7 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 1 | 16 | 17 |
| 08:30 AM | 0 | 5 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 8 | 0 | 0 | 8 | 1 | 0 | 0 | 0 | 1 | 0 | 15 | 15 |
| 08:45 AM | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| Total | 1 | 32 | 1 | 1 | 34 | 1 | 0 | 1 | 0 | 2 | 2 | 24 | 0 | 0 | 26 | 3 | 0 | 3 | 1 | 6 | 2 | 68 | 70 |
| Grand Total | 4 | 60 | 2 | 2 | 66 | 1 | 2 | 2 | 0 | 5 | 5 | 59 | 1 | 0 | 65 | 5 | 1 | 8 | 3 | 14 | 5 | 150 | 155 |
| Apprch % | 6.1 | 90.9 | 3 | | | 20 | 40 | 40 | | | 7.7 | 90.8 | 1.5 | | | 35.7 | 7.1 | 57.1 | | | | | |
| Total % | 2.7 | 40 | 1.3 | | 44 | 0.7 | 1.3 | 1.3 | | 3.3 | 3.3 | 39.3 | 0.7 | | 43.3 | 3.3 | 0.7 | 5.3 | | 9.3 | 3.2 | 96.8 | |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | **1** | **9** | 0 | **10** | 0 | 0 | 0 | 0 | 17 |
| 07:45 AM | 0 | 1 | 0 | 1 | 0 | **1** | 0 | **1** | 0 | 6 | 0 | 6 | **2** | 0 | 1 | 3 | 11 |
| 08:00 AM | 1 | **10** | 0 | **11** | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 7 | 1 | 0 | **3** | **4** | **22** |
| 08:15 AM | 0 | 6 | **1** | 7 | 0 | 0 | **1** | 1 | 0 | 7 | 0 | 7 | 1 | 0 | 0 | 1 | 16 |
| Total Volume | 2 | 23 | 1 | 26 | 0 | 1 | 1 | 2 | 2 | 28 | 0 | 30 | 4 | 0 | 4 | 8 | 66 |
| % App. Total | 7.7 | 88.5 | 3.8 | | 0 | 50 | 50 | | 6.7 | 93.3 | 0 | | 50 | 0 | 50 | | |
| PHF | .500 | .575 | .250 | .591 | .000 | .250 | .250 | .500 | .500 | .778 | .000 | .750 | .500 | .000 | .333 | .500 | .750 |

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Weather: Clear

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Site Code : 05124953
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Page No : 2

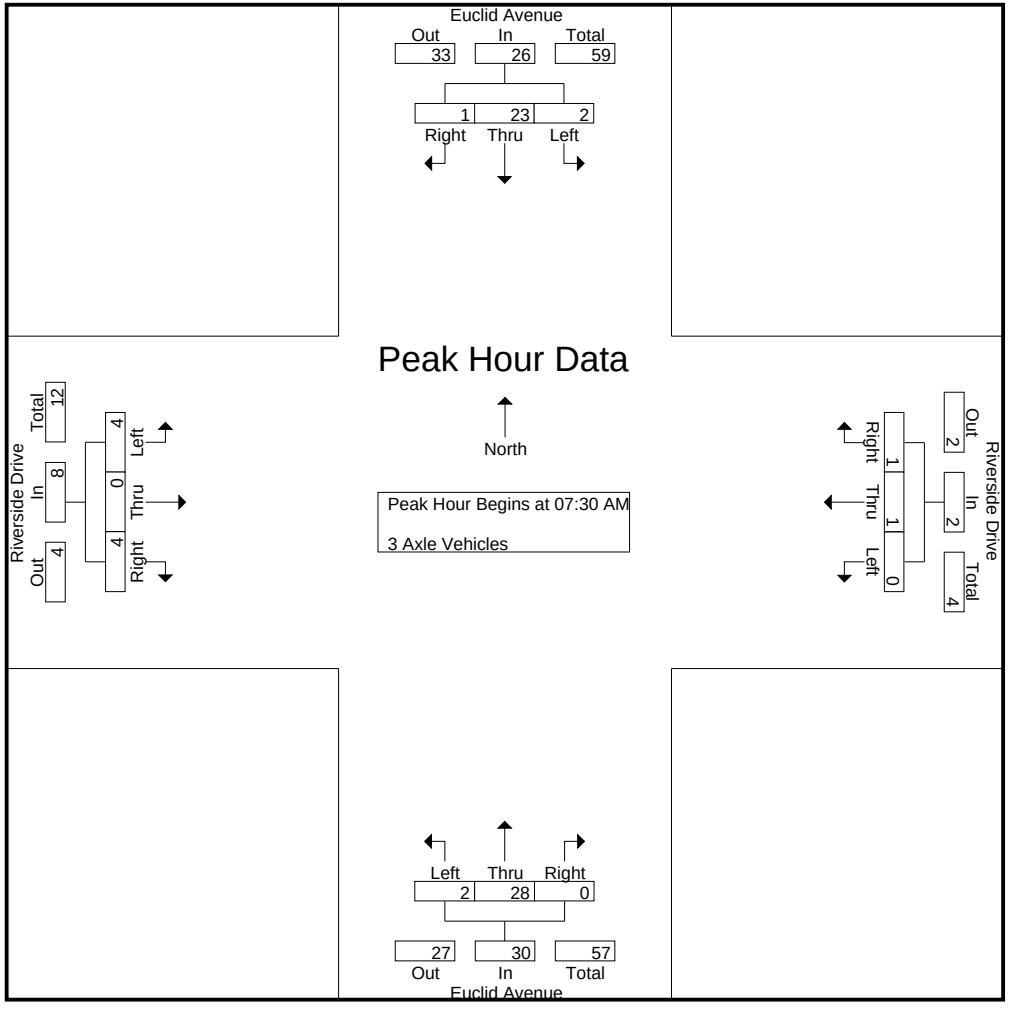

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File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
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Page No : 3

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | **1** | **9** | 0 | **10** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 1 | 0 | 1 | 0 | **1** | 0 | **1** | 0 | 6 | 0 | 6 | **2** | 0 | 1 | 3 | |
| +30 mins. | 1 | **10** | 0 | **11** | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 7 | 1 | 0 | **3** | **4** | |
| +45 mins. | 0 | 6 | **1** | 7 | 0 | 0 | **1** | 1 | 0 | 7 | 0 | 7 | 1 | 0 | 0 | 1 | |
| Total Volume | 2 | 23 | 1 | 26 | 0 | 1 | 1 | 2 | 2 | 28 | 0 | 30 | 4 | 0 | 4 | 8 | |
| % App. Total | 7.7 | 88.5 | 3.8 | | 0 | 50 | 50 | | 6.7 | 93.3 | 0 | | 50 | 0 | 50 | | |
| PHF | .500 | .575 | .250 | .591 | .000 | .250 | .250 | .500 | .500 | .778 | .000 | .750 | .500 | .000 | .333 | .500 | |

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City of Ontario
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Weather: Clear

File Name : 04_ONT_Euc_Riv AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 21 | 1 | 0 | 22 | 1 | 0 | 0 | 0 | 1 | 0 | 23 | 1 | 0 | 24 | 0 | 1 | 1 | 1 | 2 | 1 | 49 | 50 |
| 07:15 AM | 0 | 19 | 0 | 0 | 19 | 1 | 0 | 0 | 0 | 1 | 0 | 28 | 1 | 1 | 29 | 0 | 0 | 0 | 0 | 0 | 1 | 49 | 50 |
| 07:30 AM | 0 | 26 | 1 | 1 | 27 | 0 | 0 | 1 | 0 | 1 | 1 | 33 | 1 | 0 | 35 | 1 | 0 | 0 | 0 | 1 | 1 | 64 | 65 |
| 07:45 AM | 0 | 31 | 2 | 2 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 0 | 41 | 2 | 0 | 0 | 0 | 2 | 2 | 76 | 78 |
| Total | 0 | 97 | 4 | 3 | 101 | 2 | 0 | 1 | 0 | 3 | 1 | 125 | 3 | 1 | 129 | 3 | 1 | 1 | 1 | 5 | 5 | 238 | 243 |
| 08:00 AM | 0 | 31 | 2 | 1 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 0 | 0 | 45 | 2 | 0 | 0 | 0 | 2 | 1 | 80 | 81 |
| 08:15 AM | 0 | 28 | 2 | 0 | 30 | 0 | 1 | 1 | 0 | 2 | 0 | 37 | 0 | 0 | 37 | 1 | 1 | 0 | 0 | 2 | 0 | 71 | 71 |
| 08:30 AM | 0 | 35 | 1 | 0 | 36 | 0 | 0 | 1 | 0 | 1 | 0 | 34 | 0 | 0 | 34 | 2 | 0 | 0 | 0 | 2 | 0 | 73 | 73 |
| 08:45 AM | 2 | 35 | 0 | 0 | 37 | 0 | 1 | 1 | 1 | 2 | 0 | 29 | 0 | 0 | 29 | 1 | 1 | 0 | 0 | 2 | 1 | 70 | 71 |
| Total | 2 | 129 | 5 | 1 | 136 | 0 | 2 | 3 | 1 | 5 | 0 | 145 | 0 | 0 | 145 | 6 | 2 | 0 | 0 | 8 | 2 | 294 | 296 |
| Grand Total | 2 | 226 | 9 | 4 | 237 | 2 | 2 | 4 | 1 | 8 | 1 | 270 | 3 | 1 | 274 | 9 | 3 | 1 | 1 | 13 | 7 | 532 | 539 |
| Apprch % | 0.8 | 95.4 | 3.8 | | | 25 | 25 | 50 | | | 0.4 | 98.5 | 1.1 | | | 69.2 | 23.1 | 7.7 | | | | | |
| Total % | 0.4 | 42.5 | 1.7 | | 44.5 | 0.4 | 0.4 | 0.8 | | 1.5 | 0.2 | 50.8 | 0.6 | | 51.5 | 1.7 | 0.6 | 0.2 | | 2.4 | 1.3 | 98.7 | |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 26 | 1 | 27 | 0 | 0 | **1** | 1 | **1** | 33 | **1** | 35 | 1 | 0 | 0 | 1 | 64 |
| 07:45 AM | 0 | **31** | **2** | **33** | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 41 | **2** | 0 | 0 | **2** | 76 |
| 08:00 AM | 0 | 31 | 2 | 33 | 0 | 0 | 0 | 0 | 0 | **45** | 0 | **45** | 2 | 0 | 0 | 2 | **80** |
| 08:15 AM | 0 | 28 | 2 | 30 | 0 | **1** | 1 | **2** | 0 | 37 | 0 | 37 | 1 | **1** | 0 | 2 | 71 |
| Total Volume | 0 | 116 | 7 | 123 | 0 | 1 | 2 | 3 | 1 | 156 | 1 | 158 | 6 | 1 | 0 | 7 | 291 |
| % App. Total | 0 | 94.3 | 5.7 | | 0 | 33.3 | 66.7 | | 0.6 | 98.7 | 0.6 | | 85.7 | 14.3 | 0 | | |
| PHF | .000 | .935 | .875 | .932 | .000 | .250 | .500 | .375 | .250 | .867 | .250 | .878 | .750 | .250 | .000 | .875 | .909 |

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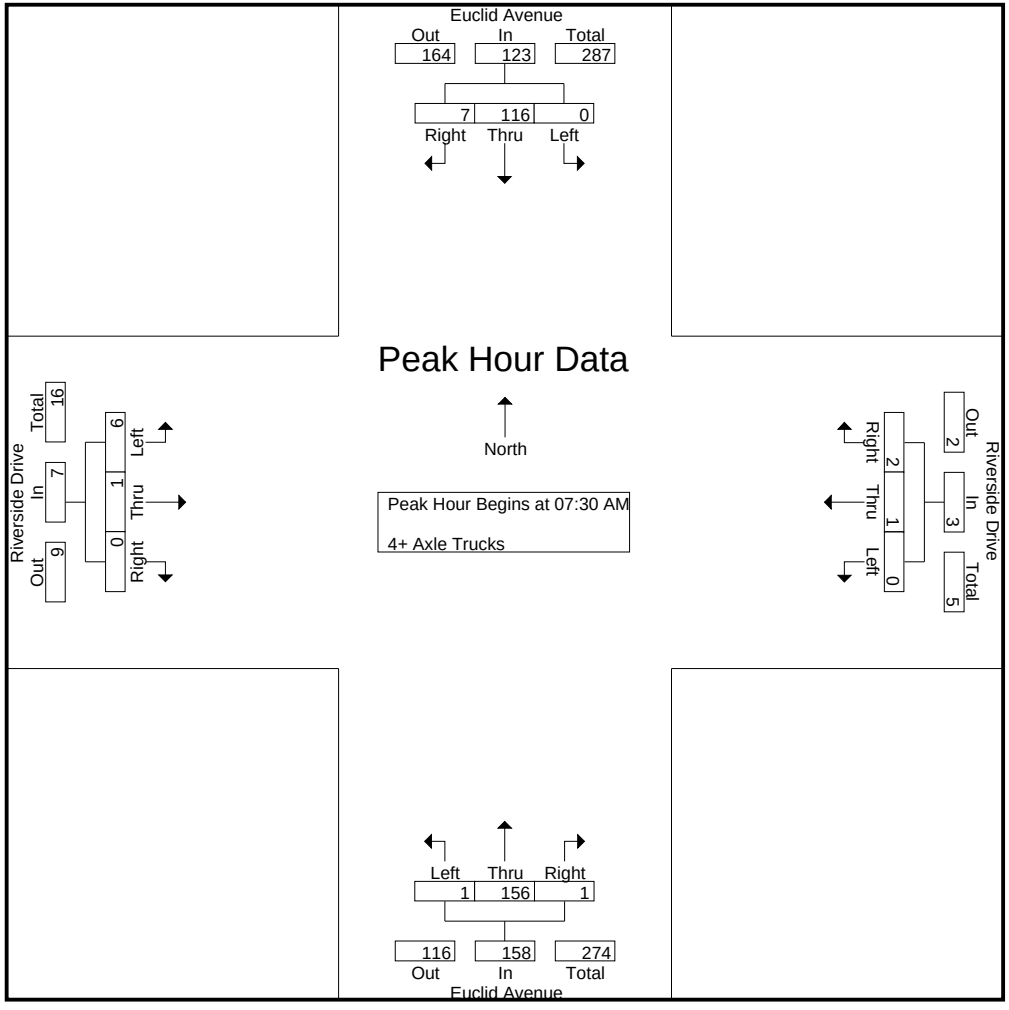

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| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 26 | 1 | 27 | 0 | 0 | **1** | 1 | **1** | 33 | **1** | 35 | 1 | 0 | 0 | 1 | |
| +15 mins. | 0 | **31** | **2** | **33** | 0 | 0 | 0 | 0 | 0 | 41 | 0 | 41 | **2** | 0 | 0 | **2** | |
| +30 mins. | 0 | 31 | 2 | 33 | 0 | 0 | 0 | 0 | 0 | **45** | 0 | **45** | 2 | 0 | 0 | 2 | |
| +45 mins. | 0 | 28 | 2 | 30 | 0 | **1** | 1 | **2** | 0 | 37 | 0 | 37 | 1 | **1** | 0 | 2 | |
| Total Volume | 0 | 116 | 7 | 123 | 0 | 1 | 2 | 3 | 1 | 156 | 1 | 158 | 6 | 1 | 0 | 7 | |
| % App. Total | 0 | 94.3 | 5.7 | | 0 | 33.3 | 66.7 | | 0.6 | 98.7 | 0.6 | | 85.7 | 14.3 | 0 | | |
| PHF | .000 | .935 | .875 | .932 | .000 | .250 | .500 | .375 | .250 | .867 | .250 | .878 | .750 | .250 | .000 | .875 | |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 19 | 155 | 21 | 10 | 195 | 36 | 83 | 11 | 7 | 130 | 17 | 202 | 39 | 18 | 258 | 20 | 72 | 12 | 8 | 104 | 43 | 687 | 730 |
| 04:15 PM | 23 | 149 | 25 | 15 | 197 | 37 | 82 | 18 | 8 | 137 | 9 | 181 | 47 | 25 | 237 | 27 | 88 | 11 | 3 | 126 | 51 | 697 | 748 |
| 04:30 PM | 22 | 173 | 34 | 17 | 229 | 38 | 92 | 11 | 6 | 141 | 17 | 178 | 41 | 25 | 236 | 35 | 111 | 11 | 2 | 157 | 50 | 763 | 813 |
| 04:45 PM | 21 | 172 | 50 | 21 | 243 | 38 | 98 | 7 | 4 | 143 | 17 | 179 | 45 | 24 | 241 | 24 | 101 | 10 | 5 | 135 | 54 | 762 | 816 |
| Total | 85 | 649 | 130 | 63 | 864 | 149 | 355 | 47 | 25 | 551 | 60 | 740 | 172 | 92 | 972 | 106 | 372 | 44 | 18 | 522 | 198 | 2909 | 3107 |
| 05:00 PM | 27 | 157 | 27 | 13 | 211 | 33 | 88 | 19 | 9 | 140 | 11 | 201 | 35 | 20 | 247 | 33 | 93 | 14 | 9 | 140 | 51 | 738 | 789 |
| 05:15 PM | 23 | 169 | 33 | 16 | 225 | 40 | 99 | 14 | 3 | 153 | 16 | 179 | 47 | 30 | 242 | 33 | 93 | 14 | 8 | 140 | 57 | 760 | 817 |
| 05:30 PM | 27 | 174 | 45 | 15 | 246 | 36 | 89 | 16 | 10 | 141 | 5 | 179 | 50 | 22 | 234 | 28 | 93 | 10 | 5 | 131 | 52 | 752 | 804 |
| 05:45 PM | 27 | 163 | 33 | 11 | 223 | 50 | 88 | 21 | 10 | 159 | 13 | 162 | 40 | 18 | 215 | 32 | 79 | 9 | 5 | 120 | 44 | 717 | 761 |
| Total | 104 | 663 | 138 | 55 | 905 | 159 | 364 | 70 | 32 | 593 | 45 | 721 | 172 | 90 | 938 | 126 | 358 | 47 | 27 | 531 | 204 | 2967 | 3171 |
| Grand Total | 189 | 1312 | 268 | 118 | 1769 | 308 | 719 | 117 | 57 | 1144 | 105 | 1461 | 344 | 182 | 1910 | 232 | 730 | 91 | 45 | 1053 | 402 | 5876 | 6278 |
| Apprch % | 10.7 | 74.2 | 15.1 | | | 26.9 | 62.8 | 10.2 | | | 5.5 | 76.5 | 18 | | | 22 | 69.3 | 8.6 | | | | | |
| Total % | 3.2 | 22.3 | 4.6 | | 30.1 | 5.2 | 12.2 | 2 | | 19.5 | 1.8 | 24.9 | 5.9 | | 32.5 | 3.9 | 12.4 | 1.5 | | 17.9 | 6.4 | 93.6 | |
| Passenger Vehicles | 181 | 1030 | 258 | | 1583 | 302 | 712 | 107 | | 1176 | 96 | 1156 | 333 | | 1761 | 215 | 721 | 85 | | 1065 | 0 | 0 | 5585 |
| % Passenger Vehicles | 95.8 | 78.5 | 96.3 | 96.6 | 83.9 | 98.1 | 99 | 91.5 | 96.5 | 97.9 | 91.4 | 79.1 | 96.8 | 96.7 | 84.2 | 92.7 | 98.8 | 93.4 | 97.8 | 97 | 0 | 0 | 89 |
| Large 2 Axle Vehicles | 2 | 46 | 6 | | 56 | 5 | 7 | 1 | | 13 | 7 | 43 | 5 | | 58 | 4 | 2 | 2 | | 9 | 0 | 0 | 136 |
| % Large 2 Axle Vehicles | 1.1 | 3.5 | 2.2 | 1.7 | 3 | 1.6 | 1 | 0.9 | 0 | 1.1 | 6.7 | 2.9 | 1.5 | 1.6 | 2.8 | 1.7 | 0.3 | 2.2 | 2.2 | 0.8 | 0 | 0 | 2.2 |
| 3 Axle Vehicles | 4 | 63 | 0 | | 67 | 0 | 0 | 3 | | 3 | 0 | 57 | 1 | | 58 | 1 | 3 | 1 | | 5 | 0 | 0 | 133 |
| % 3 Axle Vehicles | 2.1 | 4.8 | 0 | 0 | 3.6 | 0 | 0 | 2.6 | 0 | 0.2 | 0 | 3.9 | 0.3 | 0 | 2.8 | 0.4 | 0.4 | 1.1 | 0 | 0.5 | 0 | 0 | 2.1 |
| 4+ Axle Trucks | 2 | 173 | 4 | | 181 | 1 | 0 | 6 | | 9 | 2 | 205 | 5 | | 215 | 12 | 4 | 3 | | 19 | 0 | 0 | 424 |
| % 4+ Axle Trucks | 1.1 | 13.2 | 1.5 | 1.7 | 9.6 | 0.3 | 0 | 5.1 | 3.5 | 0.7 | 1.9 | 14 | 1.5 | 1.6 | 10.3 | 5.2 | 0.5 | 3.3 | 0 | 1.7 | 0 | 0 | 6.8 |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 22 | **173** | 34 | 229 | 38 | 92 | 11 | 141 | **17** | 178 | 41 | 236 | **35** | **111** | 11 | **157** | **763** |
| 04:45 PM | 21 | 172 | **50** | **243** | 38 | 98 | 7 | 143 | 17 | 179 | 45 | 241 | 24 | 101 | 10 | 135 | 762 |
| 05:00 PM | **27** | 157 | 27 | 211 | 33 | 88 | **19** | 140 | 11 | **201** | 35 | **247** | 33 | 93 | **14** | 140 | 738 |
| 05:15 PM | 23 | 169 | 33 | 225 | **40** | **99** | 14 | **153** | 16 | 179 | **47** | 242 | 33 | 93 | 14 | 140 | 760 |
| Total Volume | 93 | 671 | 144 | 908 | 149 | 377 | 51 | 577 | 61 | 737 | 168 | 966 | 125 | 398 | 49 | 572 | 3023 |
| % App. Total | 10.2 | 73.9 | 15.9 | | 25.8 | 65.3 | 8.8 | | 6.3 | 76.3 | 17.4 | | 21.9 | 69.6 | 8.6 | | |
| PHF | .861 | .970 | .720 | .934 | .931 | .952 | .671 | .943 | .897 | .917 | .894 | .978 | .893 | .896 | .875 | .911 | .990 |

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E/W: Riverside Drive
Weather: Clear

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

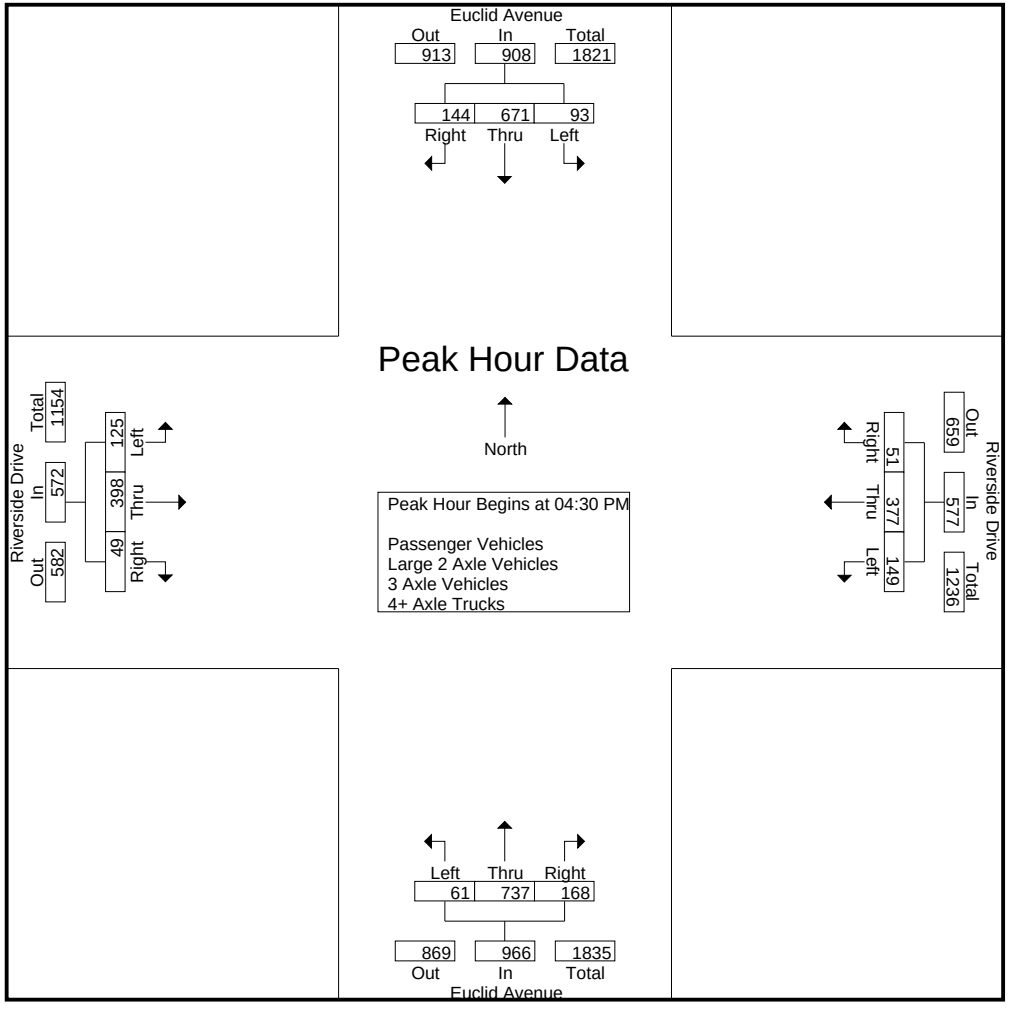

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Weather: Clear

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:45 PM | | | | 05:00 PM | | | | 04:00 PM | | | | 04:30 PM | | | | |
| +0 mins. | 21 | 172 | **50** | 243 | 33 | 88 | 19 | 140 | **17** | **202** | 39 | **258** | **35** | **111** | 11 | **157** | |
| +15 mins. | **27** | 157 | 27 | 211 | 40 | **99** | 14 | 153 | 9 | 181 | **47** | 237 | 24 | 101 | 10 | 135 | |
| +30 mins. | 23 | 169 | 33 | 225 | 36 | 89 | 16 | 141 | 17 | 178 | 41 | 236 | 33 | 93 | **14** | 140 | |
| +45 mins. | 27 | **174** | 45 | **246** | **50** | 88 | **21** | **159** | 17 | 179 | 45 | 241 | 33 | 93 | 14 | 140 | |
| Total Volume | 98 | 672 | 155 | 925 | 159 | 364 | 70 | 593 | 60 | 740 | 172 | 972 | 125 | 398 | 49 | 572 | |
| % App. Total | 10.6 | 72.6 | 16.8 | | 26.8 | 61.4 | 11.8 | | 6.2 | 76.1 | 17.7 | | 21.9 | 69.6 | 8.6 | | |
| PHF | .907 | .966 | .775 | .940 | .795 | .919 | .833 | .932 | .882 | .916 | .915 | .942 | .893 | .896 | .875 | .911 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 17 | 108 | 20 | 9 | 145 | 35 | 81 | 11 | 7 | 127 | 14 | 149 | 35 | 17 | 198 | 19 | 69 | 11 | 8 | 99 | 41 | 569 | 610 |
| 04:15 PM | 22 | 110 | 24 | 15 | 156 | 36 | 82 | 16 | 8 | 134 | 8 | 140 | 46 | 24 | 194 | 23 | 88 | 11 | 3 | 122 | 50 | 606 | 656 |
| 04:30 PM | 21 | 144 | 33 | 17 | 198 | 37 | 90 | 9 | 5 | 136 | 15 | 135 | 40 | 25 | 190 | 33 | 110 | 10 | 2 | 153 | 49 | 677 | 726 |
| 04:45 PM | 21 | 130 | 48 | 20 | 199 | 36 | 98 | 6 | 4 | 140 | 15 | 151 | 44 | 23 | 210 | 23 | 100 | 9 | 5 | 132 | 52 | 681 | 733 |
| Total | 81 | 492 | 125 | 61 | 698 | 144 | 351 | 42 | 24 | 537 | 52 | 575 | 165 | 89 | 792 | 98 | 367 | 41 | 18 | 506 | 192 | 2533 | 2725 |
| 05:00 PM | 27 | 117 | 26 | 13 | 170 | 33 | 87 | 18 | 9 | 138 | 11 | 161 | 33 | 19 | 205 | 29 | 93 | 13 | 9 | 135 | 50 | 648 | 698 |
| 05:15 PM | 21 | 147 | 32 | 15 | 200 | 40 | 98 | 12 | 3 | 150 | 15 | 140 | 47 | 30 | 202 | 33 | 91 | 14 | 8 | 138 | 56 | 690 | 746 |
| 05:30 PM | 25 | 138 | 43 | 15 | 206 | 36 | 89 | 15 | 9 | 140 | 5 | 154 | 48 | 20 | 207 | 27 | 91 | 8 | 4 | 126 | 48 | 679 | 727 |
| 05:45 PM | 27 | 136 | 32 | 10 | 195 | 49 | 87 | 20 | 10 | 156 | 13 | 126 | 40 | 18 | 179 | 28 | 79 | 9 | 5 | 116 | 43 | 646 | 689 |
| Total | 100 | 538 | 133 | 53 | 771 | 158 | 361 | 65 | 31 | 584 | 44 | 581 | 168 | 87 | 793 | 117 | 354 | 44 | 26 | 515 | 197 | 2663 | 2860 |
| Grand Total | 181 | 1030 | 258 | 114 | 1469 | 302 | 712 | 107 | 55 | 1121 | 96 | 1156 | 333 | 176 | 1585 | 215 | 721 | 85 | 44 | 1021 | 389 | 5196 | 5585 |
| Apprch % | 12.3 | 70.1 | 17.6 | | | 26.9 | 63.5 | 9.5 | | | 6.1 | 72.9 | 21 | | | 21.1 | 70.6 | 8.3 | | | | | |
| Total % | 3.5 | 19.8 | 5 | | 28.3 | 5.8 | 13.7 | 2.1 | | 21.6 | 1.8 | 22.2 | 6.4 | | 30.5 | 4.1 | 13.9 | 1.6 | | 19.6 | 7 | 93 | |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 21 | 144 | 33 | 198 | 37 | 90 | 9 | 136 | **15** | 135 | 40 | 190 | **33** | **110** | 10 | **153** | 677 |
| 04:45 PM | 21 | 130 | **48** | 199 | 36 | **98** | 6 | 140 | 15 | 151 | 44 | **210** | 23 | 100 | 9 | 132 | 681 |
| 05:00 PM | **27** | 117 | 26 | 170 | 33 | 87 | **18** | 138 | 11 | **161** | 33 | 205 | 29 | 93 | 13 | 135 | 648 |
| 05:15 PM | 21 | **147** | 32 | **200** | **40** | 98 | 12 | **150** | 15 | 140 | **47** | 202 | 33 | 91 | **14** | 138 | **690** |
| Total Volume | 90 | 538 | 139 | 767 | 146 | 373 | 45 | 564 | 56 | 587 | 164 | 807 | 118 | 394 | 46 | 558 | 2696 |
| % App. Total | 11.7 | 70.1 | 18.1 | | 25.9 | 66.1 | 8 | | 6.9 | 72.7 | 20.3 | | 21.1 | 70.6 | 8.2 | | |
| PHF | .833 | .915 | .724 | .959 | .913 | .952 | .625 | .940 | .933 | .911 | .872 | .961 | .894 | .895 | .821 | .912 | .977 |

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Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

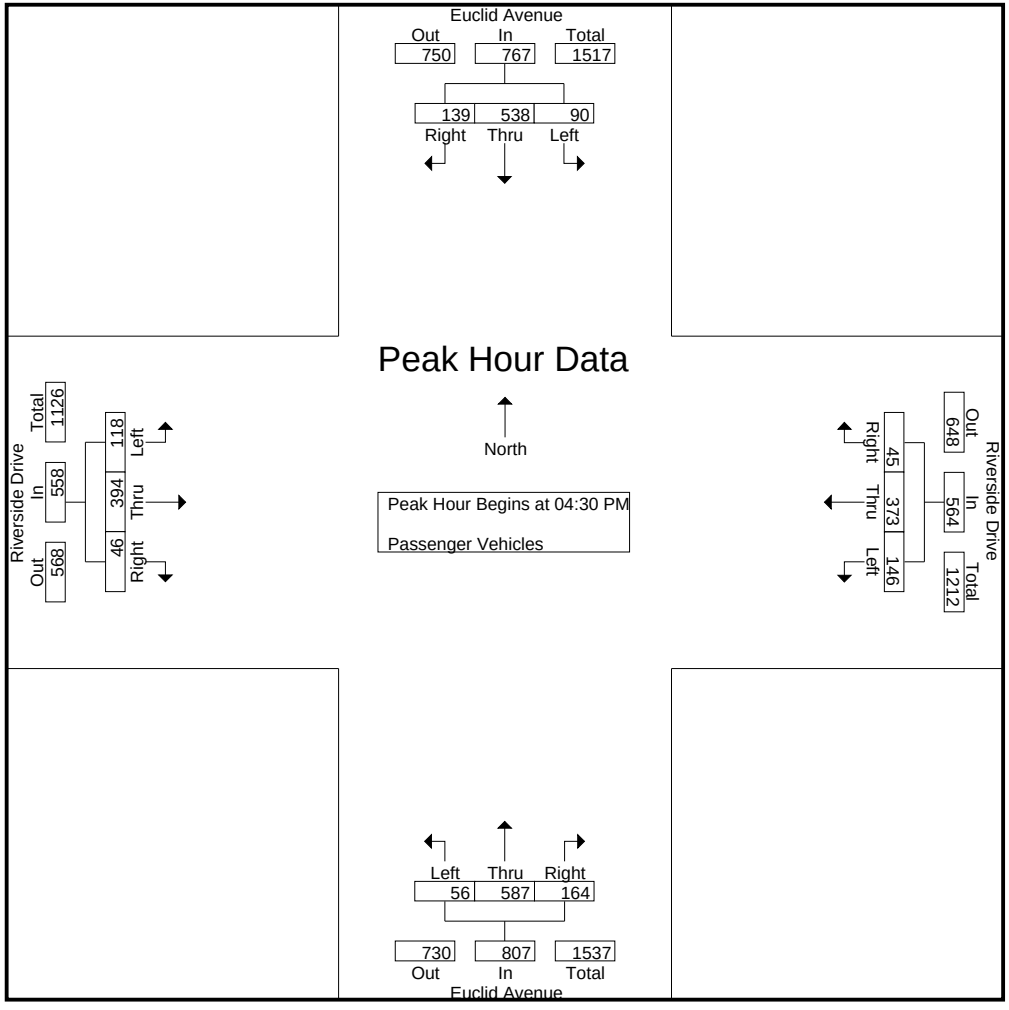

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Site Code : 05124953
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| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 21 | 144 | 33 | 198 | 37 | 90 | 9 | 136 | **15** | 135 | 40 | 190 | **33** | **110** | 10 | **153** | |
| +15 mins. | 21 | 130 | **48** | 199 | 36 | **98** | 6 | 140 | 15 | 151 | 44 | **210** | 23 | 100 | 9 | 132 | |
| +30 mins. | **27** | 117 | 26 | 170 | 33 | 87 | **18** | 138 | 11 | **161** | 33 | 205 | 29 | 93 | 13 | 135 | |
| +45 mins. | 21 | **147** | 32 | **200** | **40** | 98 | 12 | **150** | 15 | 140 | **47** | 202 | 33 | 91 | **14** | 138 | |
| Total Volume | 90 | 538 | 139 | 767 | 146 | 373 | 45 | 564 | 56 | 587 | 164 | 807 | 118 | 394 | 46 | 558 | |
| % App. Total | 11.7 | 70.1 | 18.1 | | 25.9 | 66.1 | 8 | | 6.9 | 72.7 | 20.3 | | 21.1 | 70.6 | 8.2 | | |
| PHF | .833 | .915 | .724 | .959 | .913 | .952 | .625 | .940 | .933 | .911 | .872 | .961 | .894 | .895 | .821 | .912 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 7 | 1 | 1 | 9 | 1 | 2 | 0 | 0 | 3 | 3 | 10 | 2 | 1 | 15 | 0 | 1 | 1 | 0 | 2 | 2 | 29 | 31 |
| 04:15 PM | 0 | 8 | 1 | 0 | 9 | 1 | 0 | 0 | 0 | 1 | 1 | 4 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 16 | 16 |
| 04:30 PM | 0 | 5 | 0 | 0 | 5 | 1 | 2 | 1 | 0 | 4 | 1 | 4 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 15 | 15 |
| 04:45 PM | 0 | 7 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| Total | 1 | 27 | 2 | 1 | 30 | 4 | 4 | 1 | 0 | 9 | 6 | 24 | 2 | 1 | 32 | 2 | 1 | 1 | 0 | 4 | 2 | 75 | 77 |
| 05:00 PM | 0 | 8 | 1 | 0 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 2 | 1 | 6 | 1 | 0 | 0 | 0 | 1 | 1 | 17 | 18 |
| 05:15 PM | 1 | 4 | 1 | 1 | 6 | 0 | 1 | 0 | 0 | 1 | 1 | 7 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 1 | 1 | 16 | 17 |
| 05:30 PM | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 8 | 10 |
| 05:45 PM | 0 | 4 | 0 | 0 | 4 | 1 | 1 | 0 | 0 | 2 | 0 | 7 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 0 | 14 | 14 |
| Total | 1 | 19 | 4 | 1 | 24 | 1 | 3 | 0 | 0 | 4 | 1 | 19 | 3 | 2 | 23 | 2 | 1 | 1 | 1 | 4 | 4 | 55 | 59 |
| Grand Total | 2 | 46 | 6 | 2 | 54 | 5 | 7 | 1 | 0 | 13 | 7 | 43 | 5 | 3 | 55 | 4 | 2 | 2 | 1 | 8 | 6 | 130 | 136 |
| Apprch % | 3.7 | 85.2 | 11.1 | | | 38.5 | 53.8 | 7.7 | | | 12.7 | 78.2 | 9.1 | | | 50 | 25 | 25 | | | | | |
| Total % | 1.5 | 35.4 | 4.6 | | 41.5 | 3.8 | 5.4 | 0.8 | | 10 | 5.4 | 33.1 | 3.8 | | 42.3 | 3.1 | 1.5 | 1.5 | | 6.2 | 4.4 | 95.6 | |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 5 | 0 | 5 | **1** | **2** | **1** | **4** | **1** | 4 | 0 | 5 | **1** | 0 | 0 | **1** | 15 |
| 04:45 PM | 0 | 7 | 0 | 7 | 1 | 0 | 0 | 1 | 1 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 15 |
| 05:00 PM | 0 | **8** | **1** | **9** | 0 | 1 | 0 | 1 | 0 | 4 | **2** | 6 | 1 | 0 | 0 | 1 | **17** |
| 05:15 PM | **1** | 4 | 1 | 6 | 0 | 1 | 0 | 1 | 1 | **7** | 0 | **8** | 0 | **1** | 0 | 1 | 16 |
| Total Volume | 1 | 24 | 2 | 27 | 2 | 4 | 1 | 7 | 3 | 21 | 2 | 26 | 2 | 1 | 0 | 3 | 63 |
| % App. Total | 3.7 | 88.9 | 7.4 | | 28.6 | 57.1 | 14.3 | | 11.5 | 80.8 | 7.7 | | 66.7 | 33.3 | 0 | | |
| PHF | .250 | .750 | .500 | .750 | .500 | .500 | .250 | .438 | .750 | .750 | .250 | .813 | .500 | .250 | .000 | .750 | .926 |

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Page No : 2

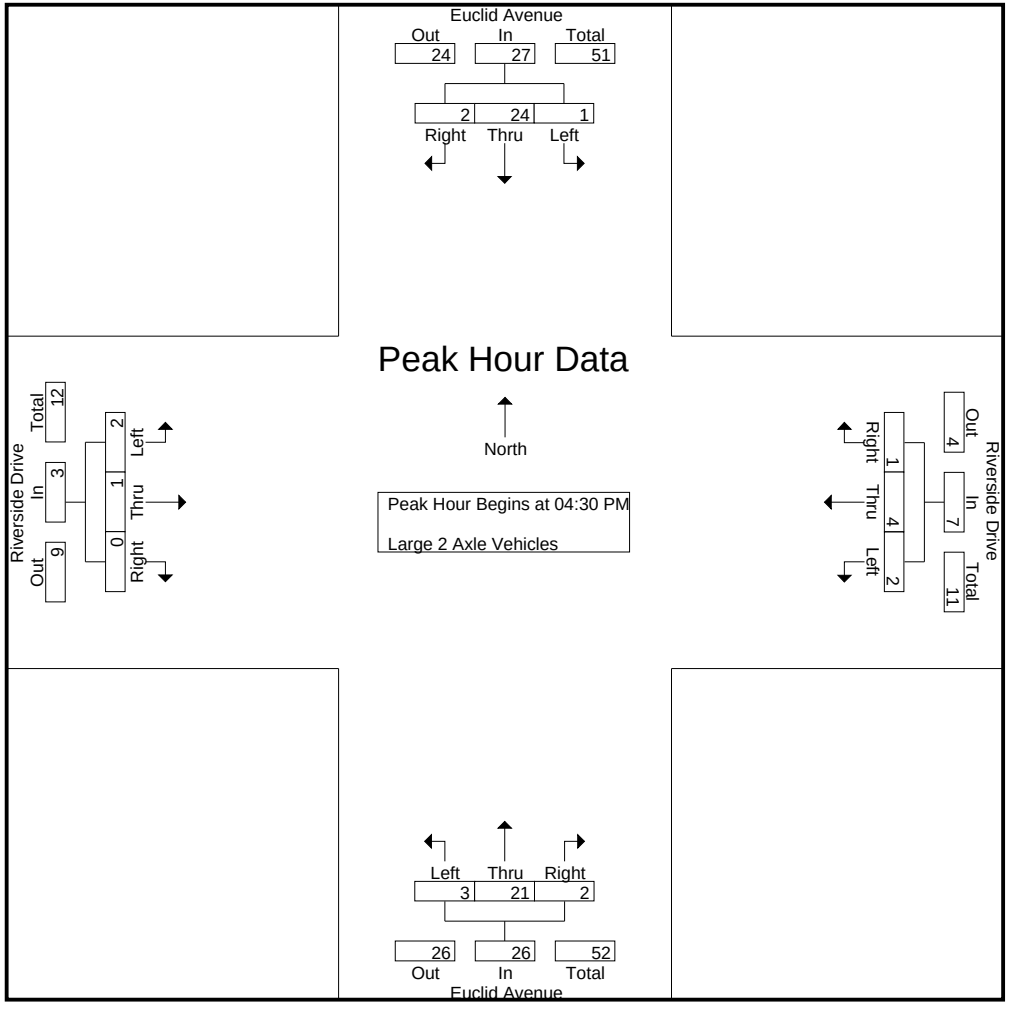

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Site Code : 05124953
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| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 5 | 0 | 5 | **1** | **2** | **1** | **4** | **1** | 4 | 0 | 5 | **1** | 0 | 0 | **1** | |
| +15 mins. | 0 | 7 | 0 | 7 | 1 | 0 | 0 | 1 | 1 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **8** | **1** | **9** | 0 | 1 | 0 | 1 | 0 | 4 | **2** | 6 | 1 | 0 | 0 | 1 | |
| +45 mins. | **1** | 4 | 1 | 6 | 0 | 1 | 0 | 1 | 1 | **7** | 0 | **8** | 0 | **1** | 0 | 1 | |
| Total Volume | 1 | 24 | 2 | 27 | 2 | 4 | 1 | 7 | 3 | 21 | 2 | 26 | 2 | 1 | 0 | 3 | |
| % App. Total | 3.7 | 88.9 | 7.4 | | 28.6 | 57.1 | 14.3 | | 11.5 | 80.8 | 7.7 | | 66.7 | 33.3 | 0 | | |
| PHF | .250 | .750 | .500 | .750 | .500 | .500 | .250 | .438 | .750 | .750 | .250 | .813 | .500 | .250 | .000 | .750 | |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 10 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 1 | 0 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 21 | 21 |
| 04:15 PM | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 2 | 0 | 2 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| 04:30 PM | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| 04:45 PM | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 15 | 15 |
| Total | 3 | 32 | 0 | 0 | 35 | 0 | 0 | 2 | 0 | 2 | 0 | 32 | 1 | 0 | 33 | 0 | 1 | 1 | 0 | 2 | 0 | 72 | 72 |
| 05:00 PM | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 16 | 16 |
| 05:15 PM | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 1 | 0 | 7 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 15 | 15 |
| 05:30 PM | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 0 | 16 | 16 |
| 05:45 PM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 |
| Total | 1 | 31 | 0 | 0 | 32 | 0 | 0 | 1 | 0 | 1 | 0 | 25 | 0 | 0 | 25 | 1 | 2 | 0 | 0 | 3 | 0 | 61 | 61 |
| Grand Total | 4 | 63 | 0 | 0 | 67 | 0 | 0 | 3 | 0 | 3 | 0 | 57 | 1 | 0 | 58 | 1 | 3 | 1 | 0 | 5 | 0 | 133 | 133 |
| Apprch % | 6 | 94 | 0 | | | 0 | 0 | 100 | | | 0 | 98.3 | 1.7 | | | 20 | 60 | 20 | | | | | |
| Total % | 3 | 47.4 | 0 | | 50.4 | 0 | 0 | 2.3 | | 2.3 | 0 | 42.9 | 0.8 | | 43.6 | 0.8 | 2.3 | 0.8 | | 3.8 | 0 | 100 | |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | **1** | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | **13** | 0 | **13** | 0 | 0 | 0 | 0 | **18** |
| 04:45 PM | 0 | **11** | 0 | **11** | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | **1** | **1** | 15 |
| 05:00 PM | 0 | 9 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | **1** | 0 | 0 | 1 | 16 |
| 05:15 PM | 1 | 5 | 0 | 6 | 0 | 0 | **1** | **1** | 0 | 7 | 0 | 7 | 0 | **1** | 0 | 1 | 15 |
| Total Volume | 2 | 29 | 0 | 31 | 0 | 0 | 1 | 1 | 0 | 29 | 0 | 29 | 1 | 1 | 1 | 3 | 64 |
| % App. Total | 6.5 | 93.5 | 0 | | 0 | 0 | 100 | | 0 | 100 | 0 | | 33.3 | 33.3 | 33.3 | | |
| PHF | .500 | .659 | .000 | .705 | .000 | .000 | .250 | .250 | .000 | .558 | .000 | .558 | .250 | .250 | .250 | .750 | .889 |

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

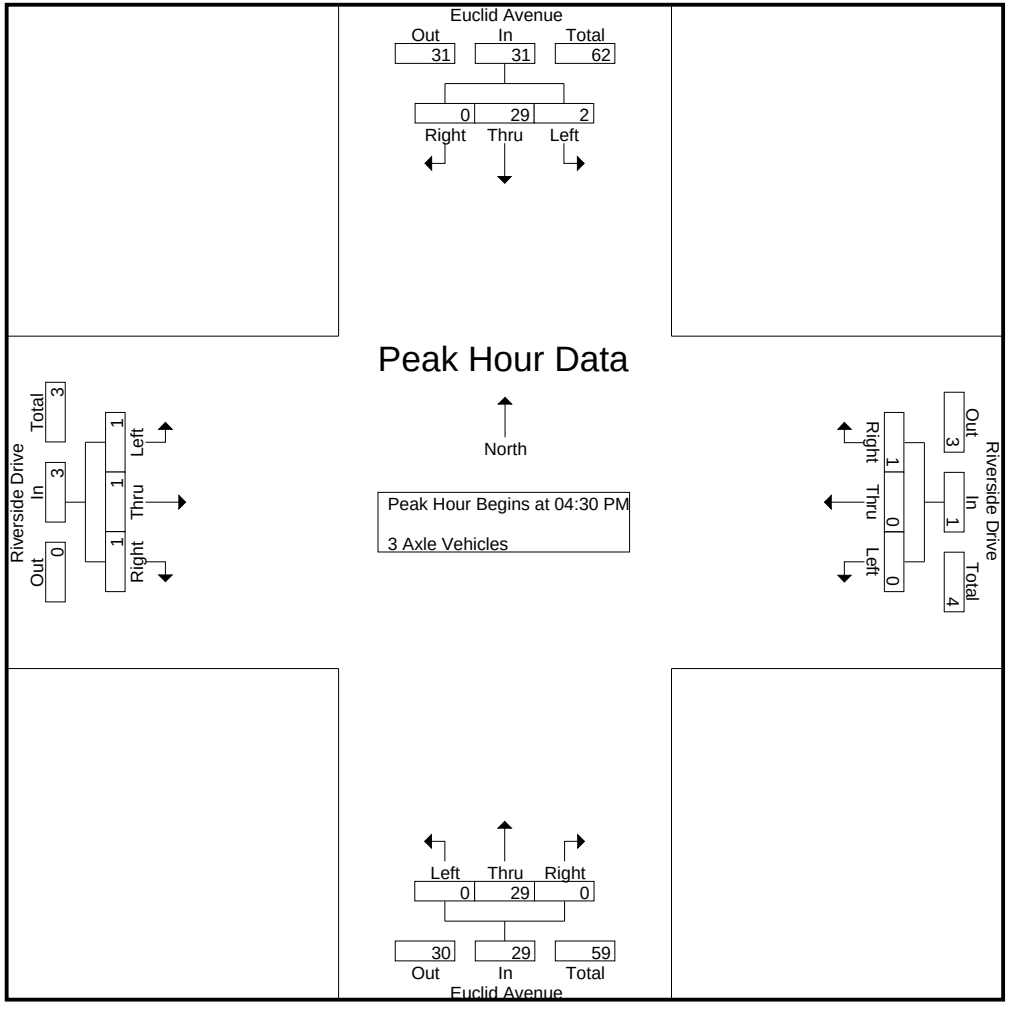

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | **1** | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | **13** | 0 | **13** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | **11** | 0 | **11** | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | **1** | **1** | |
| +30 mins. | 0 | 9 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | **1** | 0 | 0 | 1 | |
| +45 mins. | 1 | 5 | 0 | 6 | 0 | 0 | **1** | **1** | 0 | 7 | 0 | 7 | 0 | **1** | 0 | 1 | |
| Total Volume | 2 | 29 | 0 | 31 | 0 | 0 | 1 | 1 | 0 | 29 | 0 | 29 | 1 | 1 | 1 | 3 | |
| % App. Total | 6.5 | 93.5 | 0 | | 0 | 0 | 100 | | 0 | 100 | 0 | | 33.3 | 33.3 | 33.3 | | |
| PHF | .500 | .659 | .000 | .705 | .000 | .000 | .250 | .250 | .000 | .558 | .000 | .558 | .250 | .250 | .250 | .750 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Euclid Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 30 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 35 | 1 | 0 | 36 | 1 | 1 | 0 | 0 | 2 | 0 | 68 | 68 |
| 04:15 PM | 0 | 24 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 1 | 1 | 30 | 3 | 0 | 0 | 0 | 3 | 1 | 57 | 58 |
| 04:30 PM | 0 | 20 | 1 | 0 | 21 | 0 | 0 | 1 | 1 | 1 | 1 | 26 | 1 | 0 | 28 | 1 | 1 | 1 | 0 | 3 | 1 | 53 | 54 |
| 04:45 PM | 0 | 24 | 2 | 1 | 26 | 1 | 0 | 1 | 0 | 2 | 1 | 19 | 1 | 1 | 21 | 1 | 1 | 0 | 0 | 2 | 2 | 51 | 53 |
| Total | 0 | 98 | 3 | 1 | 101 | 1 | 0 | 2 | 1 | 3 | 2 | 109 | 4 | 2 | 115 | 6 | 3 | 1 | 0 | 10 | 4 | 229 | 233 |
| 05:00 PM | 0 | 23 | 0 | 0 | 23 | 0 | 0 | 1 | 0 | 1 | 0 | 30 | 0 | 0 | 30 | 2 | 0 | 1 | 0 | 3 | 0 | 57 | 57 |
| 05:15 PM | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 1 | 0 | 1 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 39 |
| 05:30 PM | 2 | 23 | 0 | 0 | 25 | 0 | 0 | 1 | 1 | 1 | 0 | 19 | 1 | 1 | 20 | 1 | 1 | 1 | 0 | 3 | 2 | 49 | 51 |
| 05:45 PM | 0 | 16 | 1 | 1 | 17 | 0 | 0 | 1 | 0 | 1 | 0 | 22 | 0 | 0 | 22 | 3 | 0 | 0 | 0 | 3 | 1 | 43 | 44 |
| Total | 2 | 75 | 1 | 1 | 78 | 0 | 0 | 4 | 1 | 4 | 0 | 96 | 1 | 1 | 97 | 6 | 1 | 2 | 0 | 9 | 3 | 188 | 191 |
| Grand Total | 2 | 173 | 4 | 2 | 179 | 1 | 0 | 6 | 2 | 7 | 2 | 205 | 5 | 3 | 212 | 12 | 4 | 3 | 0 | 19 | 7 | 417 | 424 |
| Apprch % | 1.1 | 96.6 | 2.2 | | | 14.3 | 0 | 85.7 | | | 0.9 | 96.7 | 2.4 | | | 63.2 | 21.1 | 15.8 | | | | | |
| Total % | 0.5 | 41.5 | 1 | | 42.9 | 0.2 | 0 | 1.4 | | 1.7 | 0.5 | 49.2 | 1.2 | | 50.8 | 2.9 | 1 | 0.7 | | 4.6 | 1.7 | 98.3 | |

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 20 | 1 | 21 | 0 | 0 | **1** | 1 | **1** | 26 | **1** | 28 | 1 | **1** | **1** | **3** | 53 |
| 04:45 PM | 0 | **24** | **2** | **26** | **1** | 0 | 1 | **2** | 1 | 19 | 1 | 21 | 1 | 1 | 0 | 2 | 51 |
| 05:00 PM | 0 | 23 | 0 | 23 | 0 | 0 | 1 | 1 | 0 | **30** | 0 | **30** | **2** | 0 | 1 | 3 | **57** |
| 05:15 PM | 0 | 13 | 0 | 13 | 0 | 0 | 1 | 1 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 39 |
| Total Volume | 0 | 80 | 3 | 83 | 1 | 0 | 4 | 5 | 2 | 100 | 2 | 104 | 4 | 2 | 2 | 8 | 200 |
| % App. Total | 0 | 96.4 | 3.6 | | 20 | 0 | 80 | | 1.9 | 96.2 | 1.9 | | 50 | 25 | 25 | | |
| PHF | .000 | .833 | .375 | .798 | .250 | .000 | 1.00 | .625 | .500 | .833 | .500 | .867 | .500 | .500 | .500 | .667 | .877 |

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

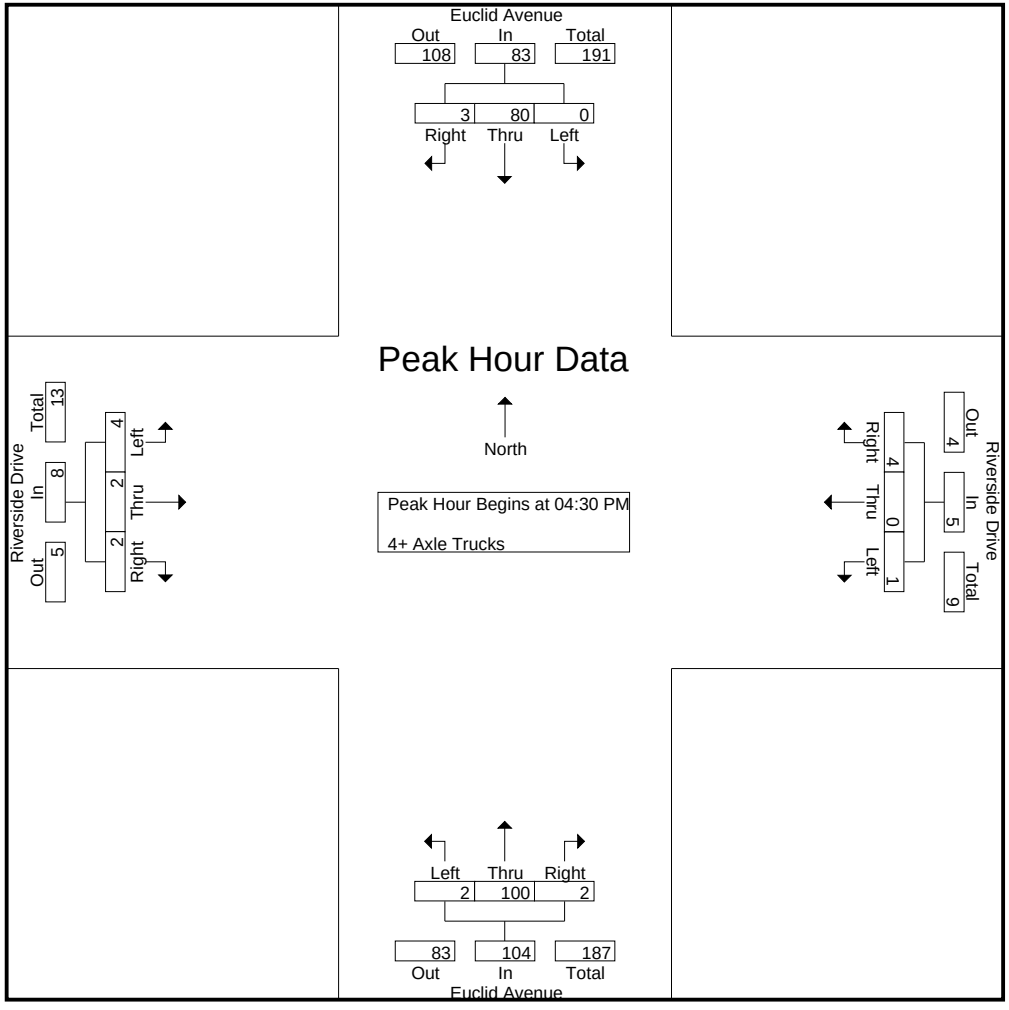

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City of Ontario
N/S: Euclid Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 04_ONT_Euc_Riv PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Riverside Drive Westbound | | | | Euclid Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 20 | 1 | 21 | 0 | 0 | **1** | 1 | **1** | 26 | **1** | 28 | 1 | **1** | **1** | **3** | |
| +15 mins. | 0 | **24** | **2** | **26** | **1** | 0 | 1 | **2** | 1 | 19 | 1 | 21 | 1 | 1 | 0 | 2 | |
| +30 mins. | 0 | 23 | 0 | 23 | 0 | 0 | 1 | 1 | 0 | **30** | 0 | **30** | **2** | 0 | 1 | 3 | |
| +45 mins. | 0 | 13 | 0 | 13 | 0 | 0 | 1 | 1 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 80 | 3 | 83 | 1 | 0 | 4 | 5 | 2 | 100 | 2 | 104 | 4 | 2 | 2 | 8 | |
| % App. Total | 0 | 96.4 | 3.6 | | 20 | 0 | 80 | | 1.9 | 96.2 | 1.9 | | 50 | 25 | 25 | | |
| PHF | .000 | .833 | .375 | .798 | .250 | .000 | 1.000 | .625 | .500 | .833 | .500 | .867 | .500 | .500 | .500 | .667 | |

Location: Ontario
N/S: Euclid Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg Riverside Drive | South Leg Euclid Avenue | West Leg Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 1 | 0 | 0 | 1 | 2 |
| 7:15 AM | 1 | 0 | 0 | 1 | 2 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 1 | 0 | 0 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 1 | 0 | 0 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 3 | 0 | 0 | 0 | 3 |
| TOTAL VOLUMES: | 7 | 0 | 0 | 2 | 9 |

| | North Leg Euclid Avenue | East Leg Riverside Drive | South Leg Euclid Avenue | West Leg Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 2 | 0 | 0 | 0 | 2 |
| 5:00 PM | 1 | 0 | 0 | 0 | 1 |
| 5:15 PM | 2 | 0 | 0 | 0 | 2 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 1 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 6 | 0 | 0 | 0 | 6 |



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Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Euclid Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound Riverside Drive | | | Northbound Euclid Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |

| | Southbound Euclid Avenue | | | Westbound Riverside Drive | | | Northbound Euclid Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:45 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 5 |

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Corona, Ca 92878
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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 7 | 167 | 15 | 5 | 189 | 26 | 46 | 4 | 3 | 76 | 3 | 152 | 26 | 12 | 181 | 19 | 22 | 6 | 2 | 47 | 22 | 493 | 515 |
| 07:15 AM | 7 | 179 | 12 | 4 | 198 | 22 | 52 | 2 | 0 | 76 | 10 | 149 | 30 | 11 | 189 | 19 | 42 | 6 | 2 | 67 | 17 | 530 | 547 |
| 07:30 AM | 8 | 200 | 12 | 5 | 220 | 23 | 74 | 10 | 0 | 107 | 13 | 185 | 32 | 10 | 230 | 14 | 47 | 8 | 4 | 69 | 19 | 626 | 645 |
| 07:45 AM | 8 | 206 | 17 | 7 | 231 | 20 | 70 | 10 | 0 | 100 | 13 | 173 | 36 | 7 | 222 | 21 | 63 | 12 | 3 | 96 | 17 | 649 | 666 |
| Total | 30 | 752 | 56 | 21 | 838 | 91 | 242 | 26 | 3 | 359 | 39 | 659 | 124 | 40 | 822 | 73 | 174 | 32 | 11 | 279 | 75 | 2298 | 2373 |
| 08:00 AM | 14 | 158 | 20 | 11 | 192 | 13 | 56 | 11 | 0 | 80 | 6 | 154 | 34 | 3 | 194 | 10 | 55 | 7 | 2 | 72 | 16 | 538 | 554 |
| 08:15 AM | 10 | 186 | 9 | 3 | 205 | 17 | 51 | 7 | 2 | 75 | 5 | 140 | 32 | 15 | 177 | 13 | 39 | 4 | 3 | 56 | 23 | 513 | 536 |
| 08:30 AM | 17 | 199 | 10 | 10 | 226 | 18 | 33 | 20 | 1 | 71 | 10 | 138 | 49 | 15 | 197 | 6 | 55 | 8 | 3 | 69 | 29 | 563 | 592 |
| 08:45 AM | 9 | 159 | 9 | 5 | 177 | 17 | 36 | 15 | 2 | 68 | 4 | 132 | 37 | 9 | 173 | 17 | 37 | 10 | 4 | 64 | 20 | 482 | 502 |
| Total | 50 | 702 | 48 | 29 | 800 | 65 | 176 | 53 | 5 | 294 | 25 | 564 | 152 | 42 | 741 | 46 | 186 | 29 | 12 | 261 | 88 | 2096 | 2184 |
| Grand Total | 80 | 1454 | 104 | 50 | 1638 | 156 | 418 | 79 | 8 | 653 | 64 | 1223 | 276 | 82 | 1563 | 119 | 360 | 61 | 23 | 540 | 163 | 4394 | 4557 |
| Apprch % | 4.9 | 88.8 | 6.3 | | | 23.9 | 64 | 12.1 | | | 4.1 | 78.2 | 17.7 | | | 22 | 66.7 | 11.3 | | | | | |
| Total % | 1.8 | 33.1 | 2.4 | | 37.3 | 3.6 | 9.5 | 1.8 | | 14.9 | 1.5 | 27.8 | 6.3 | | 35.6 | 2.7 | 8.2 | 1.4 | | 12.3 | 3.6 | 96.4 | |
| Passenger Vehicles | 51 | 1110 | 99 | | 1309 | 134 | 406 | 39 | | 582 | 60 | 843 | 260 | | 1243 | 112 | 347 | 61 | | 543 | 0 | 0 | 3677 |
| % Passenger Vehicles | 63.8 | 76.3 | 95.2 | 98 | 77.5 | 85.9 | 97.1 | 49.4 | 37.5 | 88 | 93.8 | 68.9 | 94.2 | 97.6 | 75.6 | 94.1 | 96.4 | 100 | 100 | 96.4 | 0 | 0 | 80.7 |
| Large 2 Axle Vehicles | 7 | 73 | 2 | | 82 | 9 | 7 | 14 | | 34 | 0 | 65 | 9 | | 75 | 3 | 12 | 0 | | 15 | 0 | 0 | 206 |
| % Large 2 Axle Vehicles | 8.8 | 5 | 1.9 | 0 | 4.9 | 5.8 | 1.7 | 17.7 | 50 | 5.1 | 0 | 5.3 | 3.3 | 1.2 | 4.6 | 2.5 | 3.3 | 0 | 0 | 2.7 | 0 | 0 | 4.5 |
| 3 Axle Vehicles | 7 | 67 | 0 | | 74 | 6 | 3 | 8 | | 18 | 2 | 59 | 3 | | 65 | 1 | 0 | 0 | | 1 | 0 | 0 | 158 |
| % 3 Axle Vehicles | 8.8 | 4.6 | 0 | 0 | 4.4 | 3.8 | 0.7 | 10.1 | 12.5 | 2.7 | 3.1 | 4.8 | 1.1 | 1.2 | 4 | 0.8 | 0 | 0 | 0 | 0.2 | 0 | 0 | 3.5 |
| 4+ Axle Trucks | 15 | 204 | 3 | | 223 | 7 | 2 | 18 | | 27 | 2 | 256 | 4 | | 262 | 3 | 1 | 0 | | 4 | 0 | 0 | 516 |
| % 4+ Axle Trucks | 18.8 | 14 | 2.9 | 2 | 13.2 | 4.5 | 0.5 | 22.8 | 0 | 4.1 | 3.1 | 20.9 | 1.4 | 0 | 15.9 | 2.5 | 0.3 | 0 | 0 | 0.7 | 0 | 0 | 11.3 |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 7 | 179 | 12 | 198 | 22 | 52 | 2 | 76 | 10 | 149 | 30 | 189 | 19 | 42 | 6 | 67 | 530 |
| 07:30 AM | 8 | 200 | 12 | 220 | **23** | **74** | 10 | **107** | **13** | **185** | 32 | **230** | 14 | 47 | 8 | 69 | 626 |
| 07:45 AM | 8 | **206** | 17 | **231** | 20 | 70 | 10 | 100 | 13 | 173 | **36** | 222 | **21** | **63** | **12** | **96** | **649** |
| 08:00 AM | **14** | 158 | **20** | 192 | 13 | 56 | **11** | 80 | 6 | 154 | 34 | 194 | 10 | 55 | 7 | 72 | 538 |
| Total Volume | 37 | 743 | 61 | 841 | 78 | 252 | 33 | 363 | 42 | 661 | 132 | 835 | 64 | 207 | 33 | 304 | 2343 |
| % App. Total | 4.4 | 88.3 | 7.3 | | 21.5 | 69.4 | 9.1 | | 5 | 79.2 | 15.8 | | 21.1 | 68.1 | 10.9 | | |
| PHF | .661 | .902 | .763 | .910 | .848 | .851 | .750 | .848 | .808 | .893 | .917 | .908 | .762 | .821 | .688 | .792 | .903 |

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

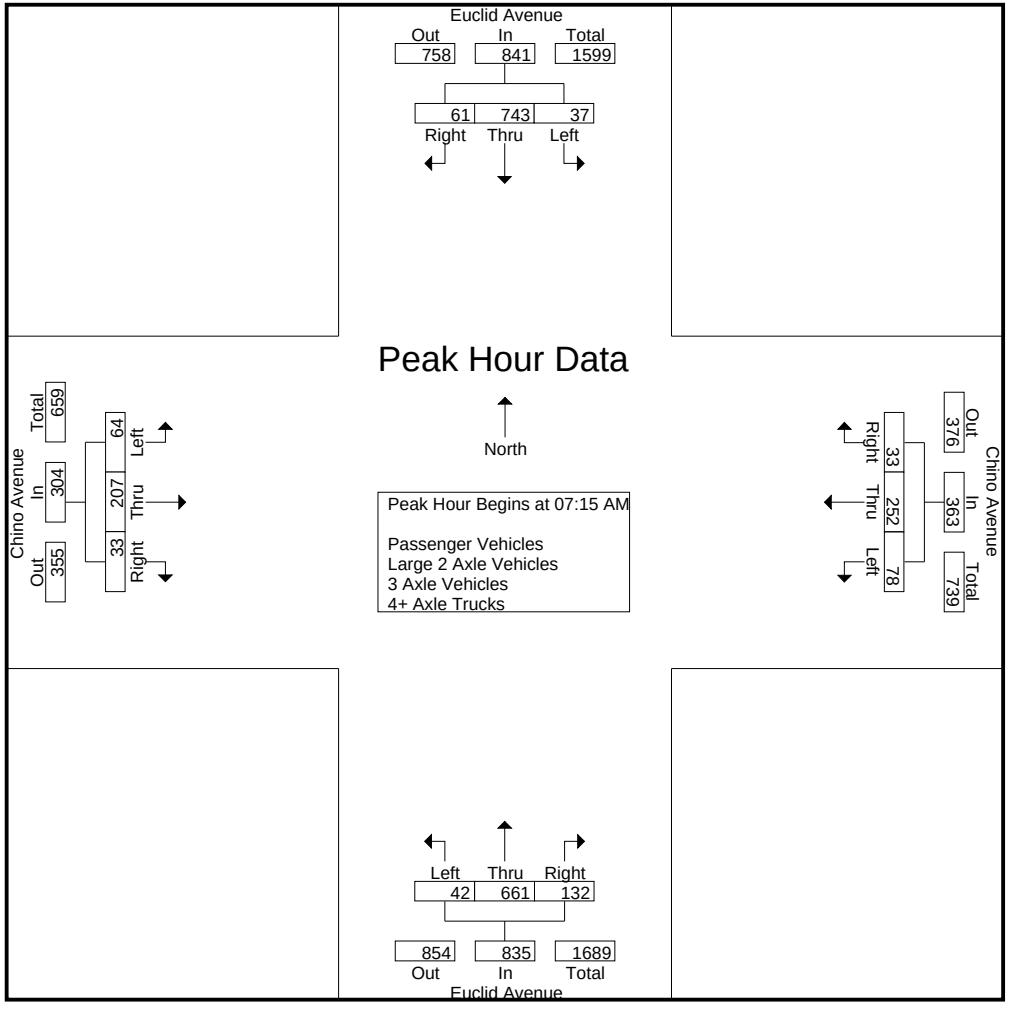

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City of Ontario
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Weather: Clear

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:45 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 8 | **206** | 17 | **231** | 22 | 52 | 2 | 76 | 10 | 149 | 30 | 189 | 19 | 42 | 6 | 67 | |
| +15 mins. | 14 | 158 | **20** | 192 | **23** | **74** | 10 | **107** | **13** | **185** | 32 | **230** | 14 | 47 | 8 | 69 | |
| +30 mins. | 10 | 186 | 9 | 205 | 20 | 70 | 10 | 100 | 13 | 173 | **36** | 222 | **21** | **63** | **12** | **96** | |
| +45 mins. | **17** | 199 | 10 | 226 | 13 | 56 | **11** | 80 | 6 | 154 | 34 | 194 | 10 | 55 | 7 | 72 | |
| Total Volume | 49 | 749 | 56 | 854 | 78 | 252 | 33 | 363 | 42 | 661 | 132 | 835 | 64 | 207 | 33 | 304 | |
| % App. Total | 5.7 | 87.7 | 6.6 | | 21.5 | 69.4 | 9.1 | | 5 | 79.2 | 15.8 | | 21.1 | 68.1 | 10.9 | | |
| PHF | .721 | .909 | .700 | .924 | .848 | .851 | .750 | .848 | .808 | .893 | .917 | .908 | .762 | .821 | .688 | .792 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 123 | 13 | 5 | 137 | 18 | 42 | 2 | 2 | 62 | 2 | 114 | 24 | 12 | 140 | 17 | 21 | 6 | 2 | 44 | 21 | 383 | 404 |
| 07:15 AM | 6 | 149 | 12 | 4 | 167 | 21 | 50 | 1 | 0 | 72 | 10 | 110 | 29 | 10 | 149 | 18 | 40 | 6 | 2 | 64 | 16 | 452 | 468 |
| 07:30 AM | 4 | 160 | 12 | 5 | 176 | 19 | 73 | 5 | 0 | 97 | 12 | 127 | 31 | 10 | 170 | 12 | 45 | 8 | 4 | 65 | 19 | 508 | 527 |
| 07:45 AM | 7 | 157 | 17 | 7 | 181 | 18 | 70 | 6 | 0 | 94 | 13 | 118 | 34 | 7 | 165 | 21 | 60 | 12 | 3 | 93 | 17 | 533 | 550 |
| Total | 18 | 589 | 54 | 21 | 661 | 76 | 235 | 14 | 2 | 325 | 37 | 469 | 118 | 39 | 624 | 68 | 166 | 32 | 11 | 266 | 73 | 1876 | 1949 |
| 08:00 AM | 10 | 119 | 20 | 11 | 149 | 13 | 56 | 6 | 0 | 75 | 6 | 103 | 30 | 3 | 139 | 10 | 55 | 7 | 2 | 72 | 16 | 435 | 451 |
| 08:15 AM | 7 | 136 | 8 | 3 | 151 | 14 | 49 | 2 | 1 | 65 | 4 | 83 | 29 | 14 | 116 | 12 | 38 | 4 | 3 | 54 | 21 | 386 | 407 |
| 08:30 AM | 12 | 153 | 9 | 9 | 174 | 16 | 33 | 10 | 0 | 59 | 10 | 106 | 48 | 15 | 164 | 5 | 54 | 8 | 3 | 67 | 27 | 464 | 491 |
| 08:45 AM | 4 | 113 | 8 | 5 | 125 | 15 | 33 | 7 | 0 | 55 | 3 | 82 | 35 | 9 | 120 | 17 | 34 | 10 | 4 | 61 | 18 | 361 | 379 |
| Total | 33 | 521 | 45 | 28 | 599 | 58 | 171 | 25 | 1 | 254 | 23 | 374 | 142 | 41 | 539 | 44 | 181 | 29 | 12 | 254 | 82 | 1646 | 1728 |
| Grand Total | 51 | 1110 | 99 | 49 | 1260 | 134 | 406 | 39 | 3 | 579 | 60 | 843 | 260 | 80 | 1163 | 112 | 347 | 61 | 23 | 520 | 155 | 3522 | 3677 |
| Apprch % | 4 | 88.1 | 7.9 | | | 23.1 | 70.1 | 6.7 | | | 5.2 | 72.5 | 22.4 | | | 21.5 | 66.7 | 11.7 | | | | | |
| Total % | 1.4 | 31.5 | 2.8 | | 35.8 | 3.8 | 11.5 | 1.1 | | 16.4 | 1.7 | 23.9 | 7.4 | | 33 | 3.2 | 9.9 | 1.7 | | 14.8 | 4.2 | 95.8 | |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 6 | 149 | 12 | 167 | **21** | 50 | 1 | 72 | 10 | 110 | 29 | 149 | 18 | 40 | 6 | 64 | 452 |
| 07:30 AM | 4 | **160** | 12 | 176 | 19 | **73** | 5 | **97** | 12 | **127** | 31 | **170** | 12 | 45 | 8 | 65 | 508 |
| 07:45 AM | 7 | 157 | 17 | **181** | 18 | 70 | **6** | 94 | **13** | 118 | **34** | 165 | **21** | **60** | **12** | **93** | **533** |
| 08:00 AM | **10** | 119 | **20** | 149 | 13 | 56 | 6 | 75 | 6 | 103 | 30 | 139 | 10 | 55 | 7 | 72 | 435 |
| Total Volume | 27 | 585 | 61 | 673 | 71 | 249 | 18 | 338 | 41 | 458 | 124 | 623 | 61 | 200 | 33 | 294 | 1928 |
| % App. Total | 4 | 86.9 | 9.1 | | 21 | 73.7 | 5.3 | | 6.6 | 73.5 | 19.9 | | 20.7 | 68 | 11.2 | | |
| PHF | .675 | .914 | .763 | .930 | .845 | .853 | .750 | .871 | .788 | .902 | .912 | .916 | .726 | .833 | .688 | .790 | .904 |

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E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

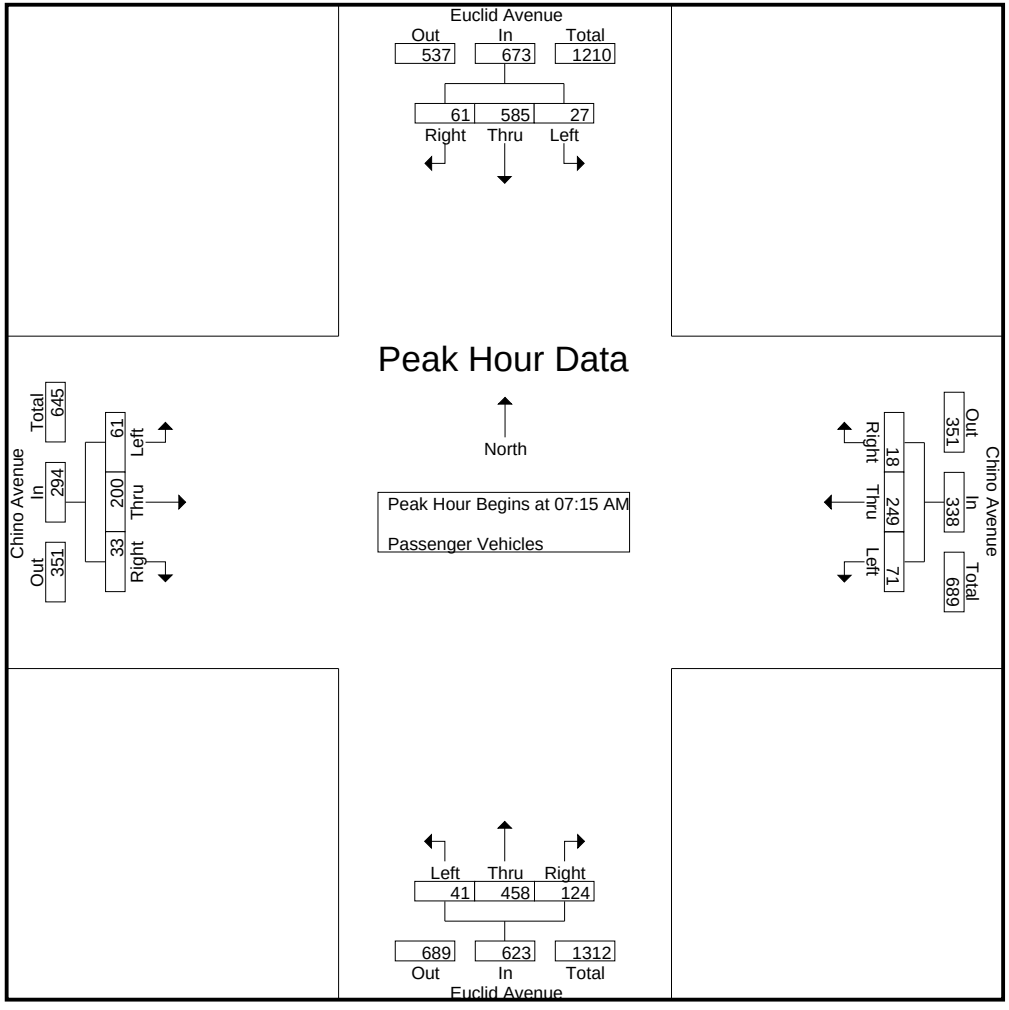

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File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 6 | 149 | 12 | 167 | **21** | 50 | 1 | 72 | 10 | 110 | 29 | 149 | 18 | 40 | 6 | 64 | |
| +15 mins. | 4 | **160** | 12 | 176 | 19 | **73** | 5 | **97** | 12 | **127** | 31 | **170** | 12 | 45 | 8 | 65 | |
| +30 mins. | 7 | 157 | 17 | **181** | 18 | 70 | **6** | 94 | **13** | 118 | **34** | 165 | **21** | **60** | **12** | **93** | |
| +45 mins. | **10** | 119 | **20** | 149 | 13 | 56 | 6 | 75 | 6 | 103 | 30 | 139 | 10 | 55 | 7 | 72 | |
| Total Volume | 27 | 585 | 61 | 673 | 71 | 249 | 18 | 338 | 41 | 458 | 124 | 623 | 61 | 200 | 33 | 294 | |
| % App. Total | 4 | 86.9 | 9.1 | | 21 | 73.7 | 5.3 | | 6.6 | 73.5 | 19.9 | | 20.7 | 68 | 11.2 | | |
| PHF | .675 | .914 | .763 | .930 | .845 | .853 | .750 | .871 | .788 | .902 | .912 | .916 | .726 | .833 | .688 | .790 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 8 | 1 | 0 | 10 | 6 | 3 | 1 | 1 | 10 | 0 | 5 | 2 | 0 | 7 | 1 | 1 | 0 | 0 | 2 | 1 | 29 | 30 |
| 07:15 AM | 1 | 6 | 0 | 0 | 7 | 0 | 1 | 1 | 0 | 2 | 0 | 8 | 0 | 0 | 8 | 0 | 2 | 0 | 0 | 2 | 0 | 19 | 19 |
| 07:30 AM | 1 | 10 | 0 | 0 | 11 | 0 | 1 | 2 | 0 | 3 | 0 | 13 | 0 | 0 | 13 | 1 | 2 | 0 | 0 | 3 | 0 | 30 | 30 |
| 07:45 AM | 0 | 13 | 0 | 0 | 13 | 0 | 0 | 2 | 0 | 2 | 0 | 6 | 2 | 0 | 8 | 0 | 3 | 0 | 0 | 3 | 0 | 26 | 26 |
| Total | 3 | 37 | 1 | 0 | 41 | 6 | 5 | 6 | 1 | 17 | 0 | 32 | 4 | 0 | 36 | 2 | 8 | 0 | 0 | 10 | 1 | 104 | 105 |
| 08:00 AM | 1 | 9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| 08:15 AM | 0 | 11 | 0 | 0 | 11 | 2 | 0 | 3 | 1 | 5 | 0 | 9 | 2 | 1 | 11 | 0 | 1 | 0 | 0 | 1 | 2 | 28 | 30 |
| 08:30 AM | 3 | 9 | 0 | 0 | 12 | 0 | 0 | 3 | 1 | 3 | 0 | 6 | 1 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 1 | 23 | 24 |
| 08:45 AM | 0 | 7 | 1 | 0 | 8 | 1 | 2 | 2 | 1 | 5 | 0 | 11 | 1 | 0 | 12 | 0 | 3 | 0 | 0 | 3 | 1 | 28 | 29 |
| Total | 4 | 36 | 1 | 0 | 41 | 3 | 2 | 8 | 3 | 13 | 0 | 33 | 5 | 1 | 38 | 1 | 4 | 0 | 0 | 5 | 4 | 97 | 101 |
| Grand Total | 7 | 73 | 2 | 0 | 82 | 9 | 7 | 14 | 4 | 30 | 0 | 65 | 9 | 1 | 74 | 3 | 12 | 0 | 0 | 15 | 5 | 201 | 206 |
| Apprch % | 8.5 | 89 | 2.4 | | | 30 | 23.3 | 46.7 | | | 0 | 87.8 | 12.2 | | | 20 | 80 | 0 | | | | | |
| Total % | 3.5 | 36.3 | 1 | | 40.8 | 4.5 | 3.5 | 7 | | 14.9 | 0 | 32.3 | 4.5 | | 36.8 | 1.5 | 6 | 0 | | 7.5 | 2.4 | 97.6 | |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | **1** | 6 | 0 | 7 | 0 | **1** | 1 | 2 | 0 | 8 | 0 | 8 | 0 | 2 | 0 | 2 | 19 |
| 07:30 AM | 1 | 10 | 0 | 11 | 0 | 1 | **2** | **3** | 0 | **13** | 0 | **13** | **1** | 2 | 0 | **3** | **30** |
| 07:45 AM | 0 | **13** | 0 | **13** | 0 | 0 | 2 | 2 | 0 | 6 | **2** | 8 | 0 | **3** | 0 | 3 | 26 |
| 08:00 AM | 1 | 9 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 7 | 1 | 8 | 0 | 0 | 0 | 0 | 18 |
| Total Volume | 3 | 38 | 0 | 41 | 0 | 2 | 5 | 7 | 0 | 34 | 3 | 37 | 1 | 7 | 0 | 8 | 93 |
| % App. Total | 7.3 | 92.7 | 0 | | 0 | 28.6 | 71.4 | | 0 | 91.9 | 8.1 | | 12.5 | 87.5 | 0 | | |
| PHF | .750 | .731 | .000 | .788 | .000 | .500 | .625 | .583 | .000 | .654 | .375 | .712 | .250 | .583 | .000 | .667 | .775 |

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E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

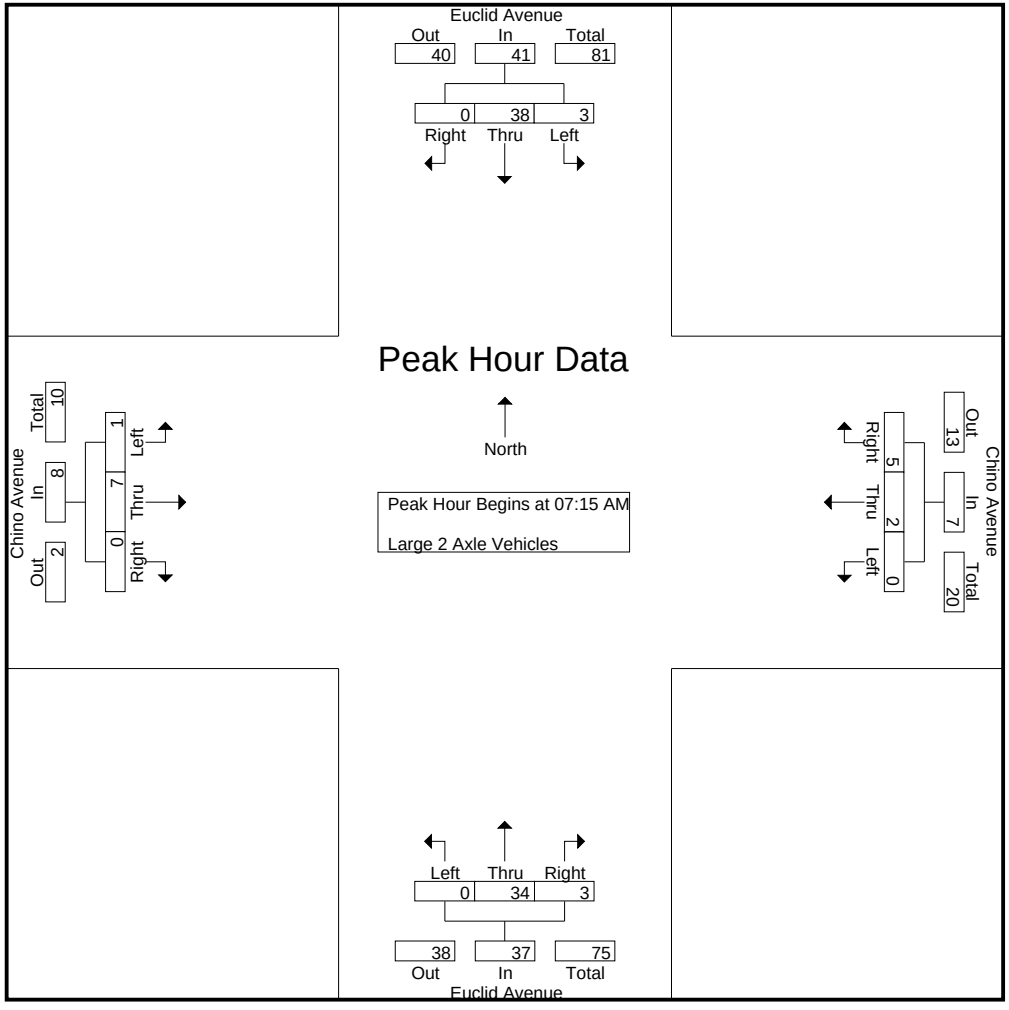

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | **1** | 6 | 0 | 7 | 0 | **1** | 1 | 2 | 0 | 8 | 0 | 8 | 0 | 2 | 0 | 2 | |
| +15 mins. | 1 | 10 | 0 | 11 | 0 | 1 | **2** | **3** | 0 | **13** | 0 | **13** | **1** | 2 | 0 | **3** | |
| +30 mins. | 0 | **13** | 0 | **13** | 0 | 0 | 2 | 2 | 0 | 6 | **2** | 8 | 0 | **3** | 0 | 3 | |
| +45 mins. | 1 | 9 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 7 | 1 | 8 | 0 | 0 | 0 | 0 | |
| Total Volume | 3 | 38 | 0 | 41 | 0 | 2 | 5 | 7 | 0 | 34 | 3 | 37 | 1 | 7 | 0 | 8 | |
| % App. Total | 7.3 | 92.7 | 0 | | 0 | 28.6 | 71.4 | | 0 | 91.9 | 8.1 | | 12.5 | 87.5 | 0 | | |
| PHF | .750 | .731 | .000 | .788 | .000 | .500 | .625 | .583 | .000 | .654 | .375 | .712 | .250 | .583 | .000 | .667 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 16 | 0 | 0 | 18 | 1 | 1 | 1 | 0 | 3 | 1 | 12 | 0 | 0 | 13 | 1 | 0 | 0 | 0 | 1 | 0 | 35 | 35 |
| 07:15 AM | 0 | 9 | 0 | 0 | 9 | 1 | 1 | 0 | 0 | 2 | 0 | 6 | 1 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 18 | 19 |
| 07:30 AM | 0 | 7 | 0 | 0 | 7 | 3 | 0 | 1 | 0 | 4 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| 07:45 AM | 1 | 4 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| Total | 3 | 36 | 0 | 0 | 39 | 6 | 2 | 2 | 0 | 10 | 1 | 33 | 1 | 1 | 35 | 1 | 0 | 0 | 0 | 1 | 1 | 85 | 86 |
| 08:00 AM | 2 | 8 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 1 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 19 |
| 08:15 AM | 1 | 8 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 1 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 08:30 AM | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 2 | 0 | 2 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 08:45 AM | 1 | 10 | 0 | 0 | 11 | 0 | 1 | 2 | 1 | 3 | 1 | 4 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 20 | 21 |
| Total | 4 | 31 | 0 | 0 | 35 | 0 | 1 | 6 | 1 | 7 | 1 | 26 | 2 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 1 | 71 | 72 |
| Grand Total | 7 | 67 | 0 | 0 | 74 | 6 | 3 | 8 | 1 | 17 | 2 | 59 | 3 | 1 | 64 | 1 | 0 | 0 | 0 | 1 | 2 | 156 | 158 |
| Apprch % | 9.5 | 90.5 | 0 | | | 35.3 | 17.6 | 47.1 | | | 3.1 | 92.2 | 4.7 | | | 100 | 0 | 0 | | | | | |
| Total % | 4.5 | 42.9 | 0 | | 47.4 | 3.8 | 1.9 | 5.1 | | 10.9 | 1.3 | 37.8 | 1.9 | | 41 | 0.6 | 0 | 0 | | 0.6 | 1.3 | 98.7 | |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | **9** | 0 | 9 | 1 | **1** | 0 | 2 | 0 | 6 | **1** | 7 | 0 | 0 | 0 | 0 | 18 |
| 07:30 AM | 0 | 7 | 0 | 7 | **3** | 0 | **1** | **4** | 0 | **10** | 0 | **10** | 0 | 0 | 0 | 0 | **21** |
| 07:45 AM | 1 | 4 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 11 |
| 08:00 AM | **2** | 8 | 0 | **10** | 0 | 0 | 1 | 1 | 0 | 7 | 1 | 8 | 0 | 0 | 0 | 0 | 19 |
| Total Volume | 3 | 28 | 0 | 31 | 5 | 1 | 2 | 8 | 0 | 28 | 2 | 30 | 0 | 0 | 0 | 0 | 69 |
| % App. Total | 9.7 | 90.3 | 0 | | 62.5 | 12.5 | 25 | | 0 | 93.3 | 6.7 | | 0 | 0 | 0 | | |
| PHF | .375 | .778 | .000 | .775 | .417 | .250 | .500 | .500 | .000 | .700 | .500 | .750 | .000 | .000 | .000 | .000 | .821 |

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Site Code : 05124953
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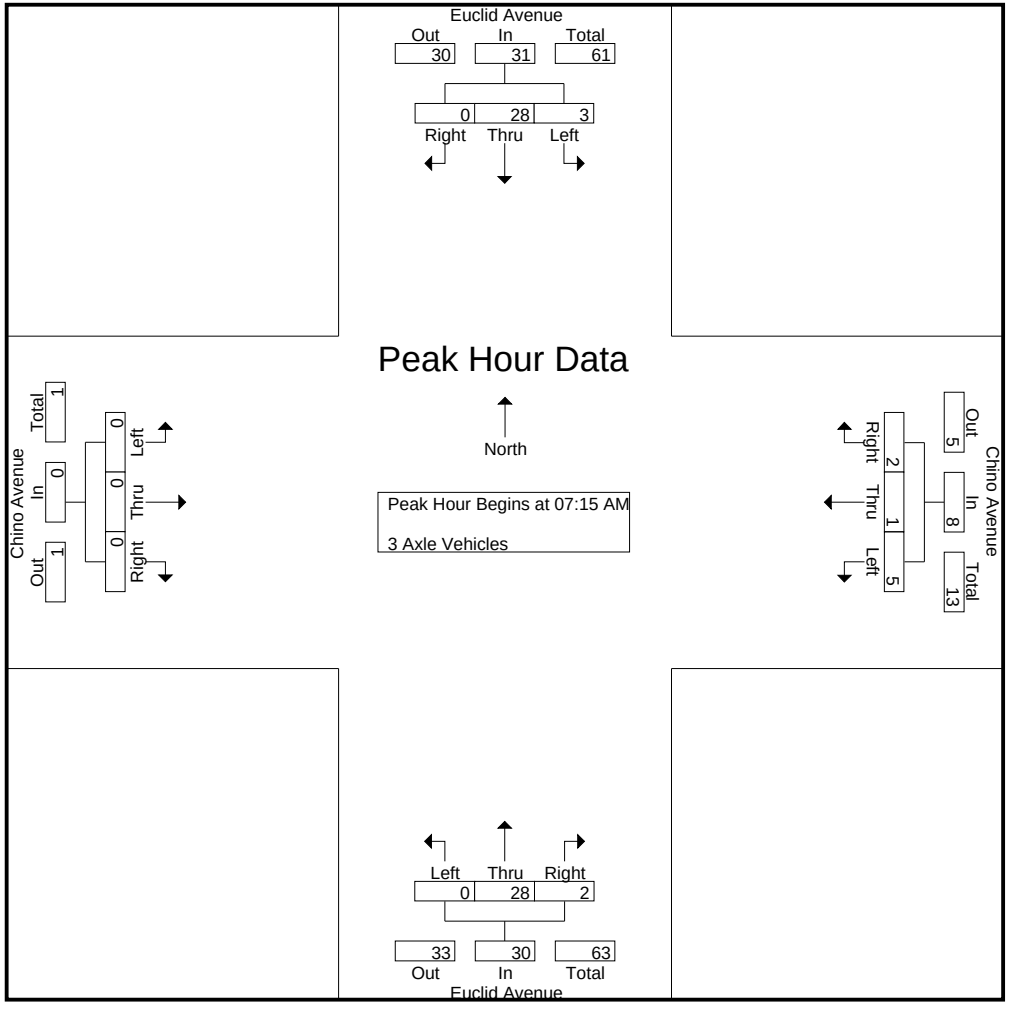

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(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | **9** | 0 | 9 | 1 | **1** | 0 | 2 | 0 | 6 | **1** | 7 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 7 | 0 | 7 | **3** | 0 | **1** | **4** | 0 | **10** | 0 | **10** | 0 | 0 | 0 | 0 | |
| +30 mins. | 1 | 4 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | |
| +45 mins. | **2** | 8 | 0 | **10** | 0 | 0 | 1 | 1 | 0 | 7 | 1 | 8 | 0 | 0 | 0 | 0 | |
| Total Volume | 3 | 28 | 0 | 31 | 5 | 1 | 2 | 8 | 0 | 28 | 2 | 30 | 0 | 0 | 0 | 0 | |
| % App. Total | 9.7 | 90.3 | 0 | | 62.5 | 12.5 | 25 | | 0 | 93.3 | 6.7 | | 0 | 0 | 0 | | |
| PHF | .375 | .778 | .000 | .775 | .417 | .250 | .500 | .500 | .000 | .700 | .500 | .750 | .000 | .000 | .000 | .000 | |

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Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 20 | 1 | 0 | 24 | 1 | 0 | 0 | 0 | 1 | 0 | 21 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 46 |
| 07:15 AM | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 25 | 1 | 0 | 0 | 0 | 1 | 0 | 41 | 41 |
| 07:30 AM | 3 | 23 | 0 | 0 | 26 | 1 | 0 | 2 | 0 | 3 | 1 | 35 | 1 | 0 | 37 | 1 | 0 | 0 | 0 | 1 | 0 | 67 | 67 |
| 07:45 AM | 0 | 32 | 0 | 0 | 32 | 1 | 0 | 2 | 0 | 3 | 0 | 44 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 79 |
| Total | 6 | 90 | 1 | 0 | 97 | 3 | 0 | 4 | 0 | 7 | 1 | 125 | 1 | 0 | 127 | 2 | 0 | 0 | 0 | 2 | 0 | 233 | 233 |
| 08:00 AM | 1 | 22 | 0 | 0 | 23 | 0 | 0 | 4 | 0 | 4 | 0 | 37 | 2 | 0 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 66 | 66 |
| 08:15 AM | 2 | 31 | 1 | 0 | 34 | 1 | 2 | 1 | 0 | 4 | 1 | 38 | 1 | 0 | 40 | 1 | 0 | 0 | 0 | 1 | 0 | 79 | 79 |
| 08:30 AM | 2 | 32 | 1 | 1 | 35 | 2 | 0 | 5 | 0 | 7 | 0 | 21 | 0 | 0 | 21 | 0 | 1 | 0 | 0 | 1 | 1 | 64 | 65 |
| 08:45 AM | 4 | 29 | 0 | 0 | 33 | 1 | 0 | 4 | 0 | 5 | 0 | 35 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 73 | 73 |
| Total | 9 | 114 | 2 | 1 | 125 | 4 | 2 | 14 | 0 | 20 | 1 | 131 | 3 | 0 | 135 | 1 | 1 | 0 | 0 | 2 | 1 | 282 | 283 |
| Grand Total | 15 | 204 | 3 | 1 | 222 | 7 | 2 | 18 | 0 | 27 | 2 | 256 | 4 | 0 | 262 | 3 | 1 | 0 | 0 | 4 | 1 | 515 | 516 |
| Apprch % | 6.8 | 91.9 | 1.4 | | | 25.9 | 7.4 | 66.7 | | | 0.8 | 97.7 | 1.5 | | | 75 | 25 | 0 | | | | | |
| Total % | 2.9 | 39.6 | 0.6 | | 43.1 | 1.4 | 0.4 | 3.5 | | 5.2 | 0.4 | 49.7 | 0.8 | | 50.9 | 0.6 | 0.2 | 0 | | 0.8 | 0.2 | 99.8 | |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 25 | **1** | 0 | 0 | **1** | 41 |
| 07:30 AM | **3** | 23 | 0 | 26 | **1** | 0 | 2 | 3 | **1** | 35 | 1 | 37 | 1 | 0 | 0 | 1 | 67 |
| 07:45 AM | 0 | **32** | 0 | **32** | 1 | 0 | 2 | 3 | 0 | **44** | 0 | **44** | 0 | 0 | 0 | 0 | **79** |
| 08:00 AM | 1 | 22 | 0 | 23 | 0 | 0 | **4** | **4** | 0 | 37 | **2** | 39 | 0 | 0 | 0 | 0 | 66 |
| Total Volume | 4 | 92 | 0 | 96 | 2 | 0 | 8 | 10 | 1 | 141 | 3 | 145 | 2 | 0 | 0 | 2 | 253 |
| % App. Total | 4.2 | 95.8 | 0 | | 20 | 0 | 80 | | 0.7 | 97.2 | 2.1 | | 100 | 0 | 0 | | |
| PHF | .333 | .719 | .000 | .750 | .500 | .000 | .500 | .625 | .250 | .801 | .375 | .824 | .500 | .000 | .000 | .500 | .801 |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

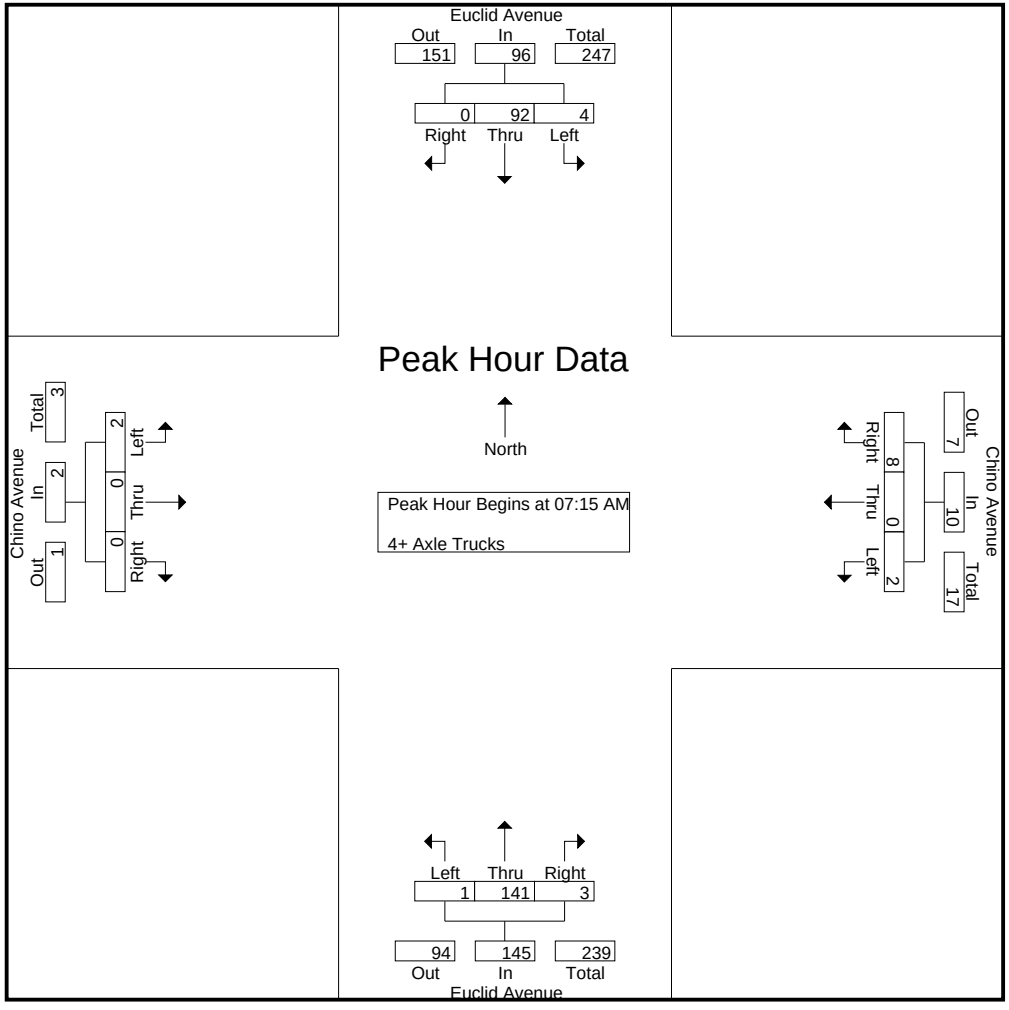

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City of Ontario
N/S: Euclid Avenue
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Page No : 3

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | 15 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 25 | **1** | 0 | 0 | **1** | |
| +15 mins. | **3** | 23 | 0 | 26 | **1** | 0 | 2 | 3 | **1** | 35 | 1 | 37 | 1 | 0 | 0 | 1 | |
| +30 mins. | 0 | **32** | 0 | **32** | 1 | 0 | 2 | 3 | 0 | **44** | 0 | **44** | 0 | 0 | 0 | 0 | |
| +45 mins. | 1 | 22 | 0 | 23 | 0 | 0 | **4** | **4** | 0 | 37 | **2** | 39 | 0 | 0 | 0 | 0 | |
| Total Volume | 4 | 92 | 0 | 96 | 2 | 0 | 8 | 10 | 1 | 141 | 3 | 145 | 2 | 0 | 0 | 2 | |
| % App. Total | 4.2 | 95.8 | 0 | | 20 | 0 | 80 | | 0.7 | 97.2 | 2.1 | | 100 | 0 | 0 | | |
| PHF | .333 | .719 | .000 | .750 | .500 | .000 | .500 | .625 | .250 | .801 | .375 | .824 | .500 | .000 | .000 | .500 | |

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City of Ontario
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Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 3 | 171 | 14 | 9 | 188 | 23 | 18 | 10 | 1 | 51 | 9 | 233 | 59 | 18 | 301 | 20 | 80 | 8 | 5 | 108 | 33 | 648 | 681 |
| 04:15 PM | 4 | 181 | 10 | 4 | 195 | 25 | 45 | 3 | 0 | 73 | 13 | 212 | 60 | 21 | 285 | 15 | 65 | 6 | 1 | 86 | 26 | 639 | 665 |
| 04:30 PM | 11 | 184 | 23 | 8 | 218 | 25 | 24 | 5 | 0 | 54 | 10 | 199 | 52 | 16 | 261 | 22 | 95 | 6 | 2 | 123 | 26 | 656 | 682 |
| 04:45 PM | 5 | 204 | 19 | 10 | 228 | 16 | 39 | 3 | 0 | 58 | 9 | 211 | 59 | 12 | 279 | 20 | 74 | 10 | 5 | 104 | 27 | 669 | 696 |
| Total | 23 | 740 | 66 | 31 | 829 | 89 | 126 | 21 | 1 | 236 | 41 | 855 | 230 | 67 | 1126 | 77 | 314 | 30 | 13 | 421 | 112 | 2612 | 2724 |
| 05:00 PM | 8 | 187 | 11 | 2 | 206 | 18 | 41 | 5 | 1 | 64 | 13 | 214 | 65 | 26 | 292 | 26 | 78 | 11 | 5 | 115 | 34 | 677 | 711 |
| 05:15 PM | 5 | 192 | 20 | 7 | 217 | 19 | 45 | 8 | 1 | 72 | 12 | 214 | 56 | 20 | 282 | 14 | 65 | 8 | 5 | 87 | 33 | 658 | 691 |
| 05:30 PM | 8 | 181 | 17 | 5 | 206 | 10 | 24 | 1 | 1 | 35 | 14 | 212 | 42 | 11 | 268 | 17 | 70 | 7 | 2 | 94 | 19 | 603 | 622 |
| 05:45 PM | 9 | 200 | 19 | 4 | 228 | 15 | 37 | 5 | 1 | 57 | 11 | 225 | 52 | 19 | 288 | 16 | 56 | 6 | 2 | 78 | 26 | 651 | 677 |
| Total | 30 | 760 | 67 | 18 | 857 | 62 | 147 | 19 | 4 | 228 | 50 | 865 | 215 | 76 | 1130 | 73 | 269 | 32 | 14 | 374 | 112 | 2589 | 2701 |
| Grand Total | 53 | 1500 | 133 | 49 | 1686 | 151 | 273 | 40 | 5 | 464 | 91 | 1720 | 445 | 143 | 2256 | 150 | 583 | 62 | 27 | 795 | 224 | 5201 | 5425 |
| Apprch % | 3.1 | 89 | 7.9 | | | 32.5 | 58.8 | 8.6 | | | 4 | 76.2 | 19.7 | | | 18.9 | 73.3 | 7.8 | | | | | |
| Total % | 1 | 28.8 | 2.6 | | 32.4 | 2.9 | 5.2 | 0.8 | | 8.9 | 1.7 | 33.1 | 8.6 | | 43.4 | 2.9 | 11.2 | 1.2 | | 15.3 | 4.1 | 95.9 | |
| Passenger Vehicles | 39 | 1231 | 125 | | 1441 | 144 | 269 | 34 | | 450 | 89 | 1400 | 424 | | 2052 | 141 | 576 | 61 | | 804 | 0 | 0 | 4747 |
| % Passenger Vehicles | 73.6 | 82.1 | 94 | 93.9 | 83.1 | 95.4 | 98.5 | 85 | 60 | 95.9 | 97.8 | 81.4 | 95.3 | 97.2 | 85.5 | 94 | 98.8 | 98.4 | 96.3 | 97.8 | 0 | 0 | 87.5 |
| Large 2 Axle Vehicles | 1 | 53 | 2 | | 56 | 3 | 3 | 1 | | 7 | 1 | 53 | 10 | | 68 | 5 | 5 | 1 | | 12 | 0 | 0 | 143 |
| % Large 2 Axle Vehicles | 1.9 | 3.5 | 1.5 | 0 | 3.2 | 2 | 1.1 | 2.5 | 0 | 1.5 | 1.1 | 3.1 | 2.2 | 2.8 | 2.8 | 3.3 | 0.9 | 1.6 | 3.7 | 1.5 | 0 | 0 | 2.6 |
| 3 Axle Vehicles | 0 | 62 | 3 | | 66 | 1 | 1 | 0 | | 2 | 1 | 62 | 5 | | 68 | 0 | 2 | 0 | | 2 | 0 | 0 | 138 |
| % 3 Axle Vehicles | 0 | 4.1 | 2.3 | 2 | 3.8 | 0.7 | 0.4 | 0 | 0 | 0.4 | 1.1 | 3.6 | 1.1 | 0 | 2.8 | 0 | 0.3 | 0 | 0 | 0.2 | 0 | 0 | 2.5 |
| 4+ Axle Trucks | 13 | 154 | 3 | | 172 | 3 | 0 | 5 | | 10 | 0 | 205 | 6 | | 211 | 4 | 0 | 0 | | 4 | 0 | 0 | 397 |
| % 4+ Axle Trucks | 24.5 | 10.3 | 2.3 | 4.1 | 9.9 | 2 | 0 | 12.5 | 40 | 2.1 | 0 | 11.9 | 1.3 | 0 | 8.8 | 2.7 | 0 | 0 | 0 | 0.5 | 0 | 0 | 7.3 |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | **11** | 184 | **23** | 218 | **25** | 24 | 5 | 54 | 10 | 199 | 52 | 261 | 22 | **95** | 6 | **123** | 656 |
| 04:45 PM | 5 | **204** | 19 | **228** | 16 | 39 | 3 | 58 | 9 | 211 | 59 | 279 | 20 | 74 | 10 | 104 | 669 |
| 05:00 PM | 8 | 187 | 11 | 206 | 18 | 41 | 5 | 64 | **13** | **214** | **65** | **292** | **26** | 78 | **11** | 115 | **677** |
| 05:15 PM | 5 | 192 | 20 | 217 | 19 | **45** | **8** | **72** | 12 | 214 | 56 | 282 | 14 | 65 | 8 | 87 | 658 |
| Total Volume | 29 | 767 | 73 | 869 | 78 | 149 | 21 | 248 | 44 | 838 | 232 | 1114 | 82 | 312 | 35 | 429 | 2660 |
| % App. Total | 3.3 | 88.3 | 8.4 | | 31.5 | 60.1 | 8.5 | | 3.9 | 75.2 | 20.8 | | 19.1 | 72.7 | 8.2 | | |
| PHF | .659 | .940 | .793 | .953 | .780 | .828 | .656 | .861 | .846 | .979 | .892 | .954 | .788 | .821 | .795 | .872 | .982 |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

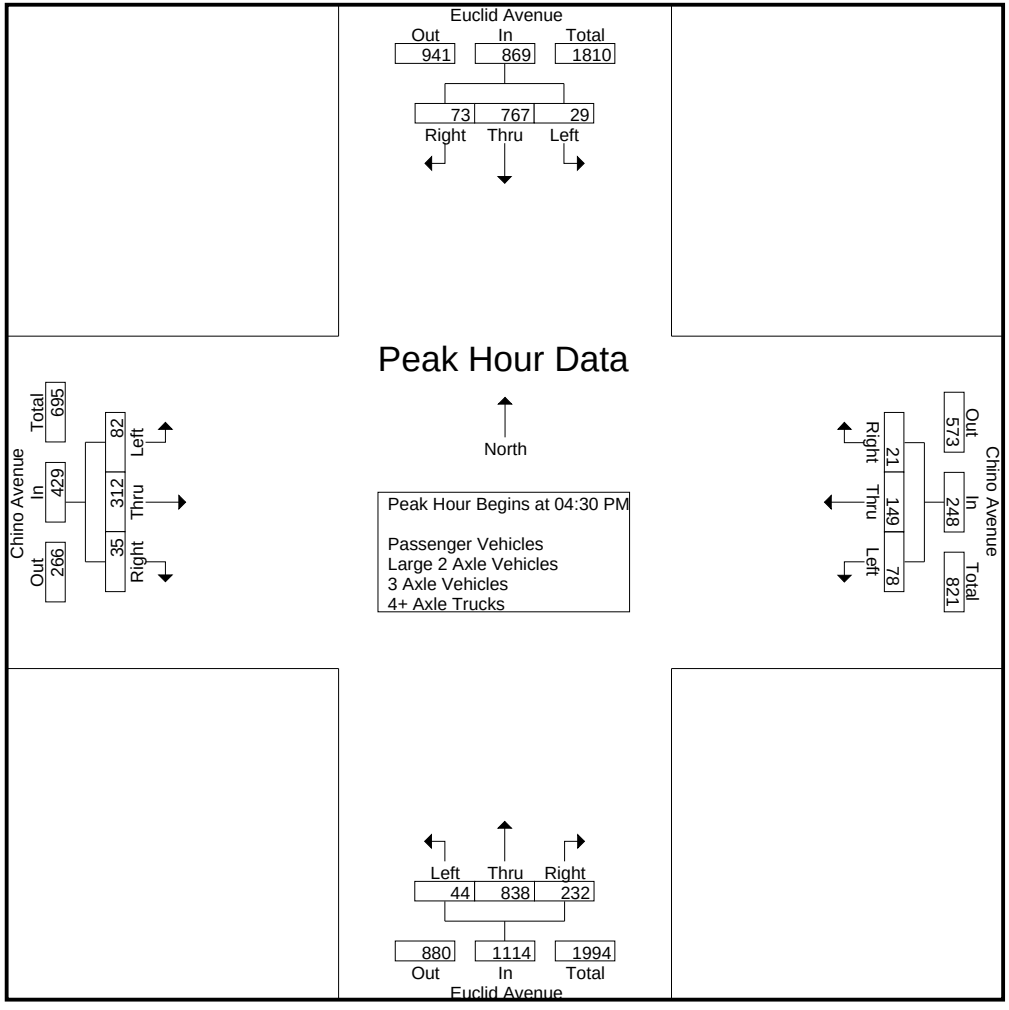

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| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:15 PM | | | | 05:00 PM | | | | 04:30 PM | | | | |
| +0 mins. | **11** | 184 | **23** | 218 | **25** | **45** | 3 | **73** | 13 | 214 | **65** | **292** | 22 | **95** | 6 | **123** | |
| +15 mins. | 5 | **204** | 19 | **228** | 25 | 24 | **5** | 54 | 12 | 214 | 56 | 282 | 20 | 74 | 10 | 104 | |
| +30 mins. | 8 | 187 | 11 | 206 | 16 | 39 | 3 | 58 | **14** | 212 | 42 | 268 | **26** | 78 | **11** | 115 | |
| +45 mins. | 5 | 192 | 20 | 217 | 18 | 41 | 5 | 64 | 11 | **225** | 52 | 288 | 14 | 65 | 8 | 87 | |
| Total Volume | 29 | 767 | 73 | 869 | 84 | 149 | 16 | 249 | 50 | 865 | 215 | 1130 | 82 | 312 | 35 | 429 | |
| % App. Total | 3.3 | 88.3 | 8.4 | | 33.7 | 59.8 | 6.4 | | 4.4 | 76.5 | 19 | | 19.1 | 72.7 | 8.2 | | |
| PHF | .659 | .940 | .793 | .953 | .840 | .828 | .800 | .853 | .893 | .961 | .827 | .967 | .788 | .821 | .795 | .872 | |

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Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 2 | 126 | 13 | 8 | 141 | 22 | 16 | 8 | 1 | 46 | 8 | 171 | 58 | 18 | 237 | 20 | 80 | 8 | 5 | 108 | 32 | 532 | 564 |
| 04:15 PM | 4 | 149 | 8 | 4 | 161 | 25 | 44 | 3 | 0 | 72 | 13 | 167 | 54 | 21 | 234 | 12 | 65 | 6 | 1 | 83 | 26 | 550 | 576 |
| 04:30 PM | 5 | 153 | 19 | 6 | 177 | 22 | 24 | 5 | 0 | 51 | 10 | 165 | 49 | 14 | 224 | 19 | 90 | 6 | 2 | 115 | 22 | 567 | 589 |
| 04:45 PM | 3 | 170 | 19 | 10 | 192 | 15 | 39 | 3 | 0 | 57 | 9 | 177 | 58 | 12 | 244 | 20 | 74 | 10 | 5 | 104 | 27 | 597 | 624 |
| Total | 14 | 598 | 59 | 28 | 671 | 84 | 123 | 19 | 1 | 226 | 40 | 680 | 219 | 65 | 939 | 71 | 309 | 30 | 13 | 410 | 107 | 2246 | 2353 |
| 05:00 PM | 7 | 146 | 11 | 2 | 164 | 17 | 40 | 3 | 0 | 60 | 13 | 174 | 63 | 26 | 250 | 26 | 77 | 11 | 5 | 114 | 33 | 588 | 621 |
| 05:15 PM | 3 | 170 | 20 | 7 | 193 | 18 | 45 | 8 | 1 | 71 | 11 | 173 | 55 | 20 | 239 | 14 | 65 | 7 | 4 | 86 | 32 | 589 | 621 |
| 05:30 PM | 7 | 148 | 16 | 5 | 171 | 10 | 24 | 1 | 1 | 35 | 14 | 188 | 38 | 10 | 240 | 16 | 70 | 7 | 2 | 93 | 18 | 539 | 557 |
| 05:45 PM | 8 | 169 | 19 | 4 | 196 | 15 | 37 | 3 | 0 | 55 | 11 | 185 | 49 | 18 | 245 | 14 | 55 | 6 | 2 | 75 | 24 | 571 | 595 |
| Total | 25 | 633 | 66 | 18 | 724 | 60 | 146 | 15 | 2 | 221 | 49 | 720 | 205 | 74 | 974 | 70 | 267 | 31 | 13 | 368 | 107 | 2287 | 2394 |
| Grand Total | 39 | 1231 | 125 | 46 | 1395 | 144 | 269 | 34 | 3 | 447 | 89 | 1400 | 424 | 139 | 1913 | 141 | 576 | 61 | 26 | 778 | 214 | 4533 | 4747 |
| Apprch % | 2.8 | 88.2 | 9 | | | 32.2 | 60.2 | 7.6 | | | 4.7 | 73.2 | 22.2 | | | 18.1 | 74 | 7.8 | | | | | |
| Total % | 0.9 | 27.2 | 2.8 | | 30.8 | 3.2 | 5.9 | 0.8 | | 9.9 | 2 | 30.9 | 9.4 | | 42.2 | 3.1 | 12.7 | 1.3 | | 17.2 | 4.5 | 95.5 | |

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| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 5 | 153 | 19 | 177 | **22** | 24 | 5 | 51 | 10 | 165 | 49 | 224 | 19 | **90** | 6 | **115** | 567 |
| 04:45 PM | 3 | **170** | 19 | 192 | 15 | 39 | 3 | 57 | 9 | **177** | 58 | 244 | 20 | 74 | 10 | 104 | **597** |
| 05:00 PM | **7** | 146 | 11 | 164 | 17 | 40 | 3 | 60 | **13** | 174 | **63** | **250** | **26** | 77 | **11** | 114 | 588 |
| 05:15 PM | 3 | 170 | **20** | **193** | 18 | **45** | **8** | **71** | 11 | 173 | 55 | 239 | 14 | 65 | 7 | 86 | 589 |
| Total Volume | 18 | 639 | 69 | 726 | 72 | 148 | 19 | 239 | 43 | 689 | 225 | 957 | 79 | 306 | 34 | 419 | 2341 |
| % App. Total | 2.5 | 88 | 9.5 | | 30.1 | 61.9 | 7.9 | | 4.5 | 72 | 23.5 | | 18.9 | 73 | 8.1 | | |
| PHF | .643 | .940 | .863 | .940 | .818 | .822 | .594 | .842 | .827 | .973 | .893 | .957 | .760 | .850 | .773 | .911 | .980 |

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Page No : 2

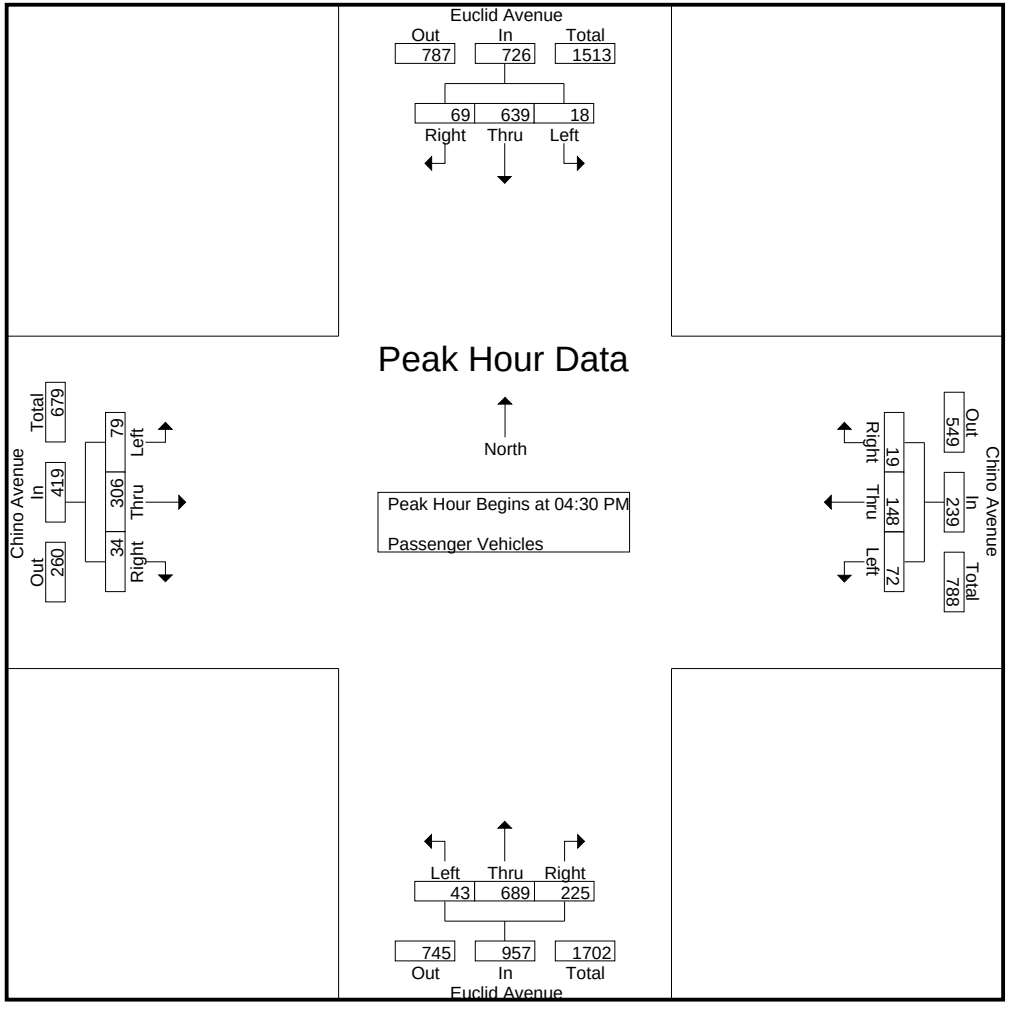

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| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 5 | 153 | 19 | 177 | **22** | 24 | 5 | 51 | 10 | 165 | 49 | 224 | 19 | **90** | 6 | **115** | |
| +15 mins. | 3 | **170** | 19 | 192 | 15 | 39 | 3 | 57 | 9 | **177** | 58 | 244 | 20 | 74 | 10 | 104 | |
| +30 mins. | **7** | 146 | 11 | 164 | 17 | 40 | 3 | 60 | **13** | 174 | **63** | **250** | **26** | 77 | **11** | 114 | |
| +45 mins. | 3 | 170 | **20** | **193** | 18 | **45** | **8** | **71** | 11 | 173 | 55 | 239 | 14 | 65 | 7 | 86 | |
| Total Volume | 18 | 639 | 69 | 726 | 72 | 148 | 19 | 239 | 43 | 689 | 225 | 957 | 79 | 306 | 34 | 419 | |
| % App. Total | 2.5 | 88 | 9.5 | | 30.1 | 61.9 | 7.9 | | 4.5 | 72 | 23.5 | | 18.9 | 73 | 8.1 | | |
| PHF | .643 | .940 | .863 | .940 | .818 | .822 | .594 | .842 | .827 | .973 | .893 | .957 | .760 | .850 | .773 | .911 | |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 10 | 0 | 0 | 10 | 0 | 2 | 1 | 0 | 3 | 0 | 14 | 1 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 28 |
| 04:15 PM | 0 | 6 | 0 | 0 | 6 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 3 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 0 | 15 | 15 |
| 04:30 PM | 0 | 10 | 1 | 0 | 11 | 2 | 0 | 0 | 0 | 2 | 0 | 5 | 2 | 2 | 7 | 1 | 4 | 0 | 0 | 5 | 2 | 25 | 27 |
| 04:45 PM | 1 | 5 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 |
| Total | 1 | 31 | 1 | 0 | 33 | 3 | 3 | 1 | 0 | 7 | 0 | 30 | 6 | 2 | 36 | 2 | 4 | 0 | 0 | 6 | 2 | 82 | 84 |
| 05:00 PM | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 17 |
| 05:15 PM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 10 | 1 | 0 | 12 | 0 | 0 | 1 | 1 | 1 | 1 | 17 | 18 |
| 05:30 PM | 0 | 4 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 3 | 1 | 0 | 0 | 0 | 1 | 1 | 9 | 10 |
| 05:45 PM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 1 | 7 | 2 | 1 | 0 | 0 | 3 | 1 | 13 | 14 |
| Total | 0 | 22 | 1 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 1 | 23 | 4 | 2 | 28 | 3 | 1 | 1 | 1 | 5 | 3 | 56 | 59 |
| Grand Total | 1 | 53 | 2 | 0 | 56 | 3 | 3 | 1 | 0 | 7 | 1 | 53 | 10 | 4 | 64 | 5 | 5 | 1 | 1 | 11 | 5 | 138 | 143 |
| Apprch % | 1.8 | 94.6 | 3.6 | | | 42.9 | 42.9 | 14.3 | | | 1.6 | 82.8 | 15.6 | | | 45.5 | 45.5 | 9.1 | | | | | |
| Total % | 0.7 | 38.4 | 1.4 | | 40.6 | 2.2 | 2.2 | 0.7 | | 5.1 | 0.7 | 38.4 | 7.2 | | 46.4 | 3.6 | 3.6 | 0.7 | | 8 | 3.5 | 96.5 | |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 10 | **1** | **11** | **2** | 0 | 0 | **2** | 0 | 5 | **2** | 7 | **1** | **4** | 0 | **5** | **25** |
| 04:45 PM | **1** | 5 | 0 | 6 | 1 | 0 | 0 | 1 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 14 |
| 05:00 PM | 0 | **11** | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 17 |
| 05:15 PM | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | **1** | **10** | 1 | **12** | 0 | 0 | **1** | 1 | 17 |
| Total Volume | 1 | 30 | 1 | 32 | 3 | 0 | 0 | 3 | 1 | 28 | 3 | 32 | 1 | 4 | 1 | 6 | 73 |
| % App. Total | 3.1 | 93.8 | 3.1 | | 100 | 0 | 0 | | 3.1 | 87.5 | 9.4 | | 16.7 | 66.7 | 16.7 | | |
| PHF | .250 | .682 | .250 | .727 | .375 | .000 | .000 | .375 | .250 | .700 | .375 | .667 | .250 | .250 | .250 | .300 | .730 |

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

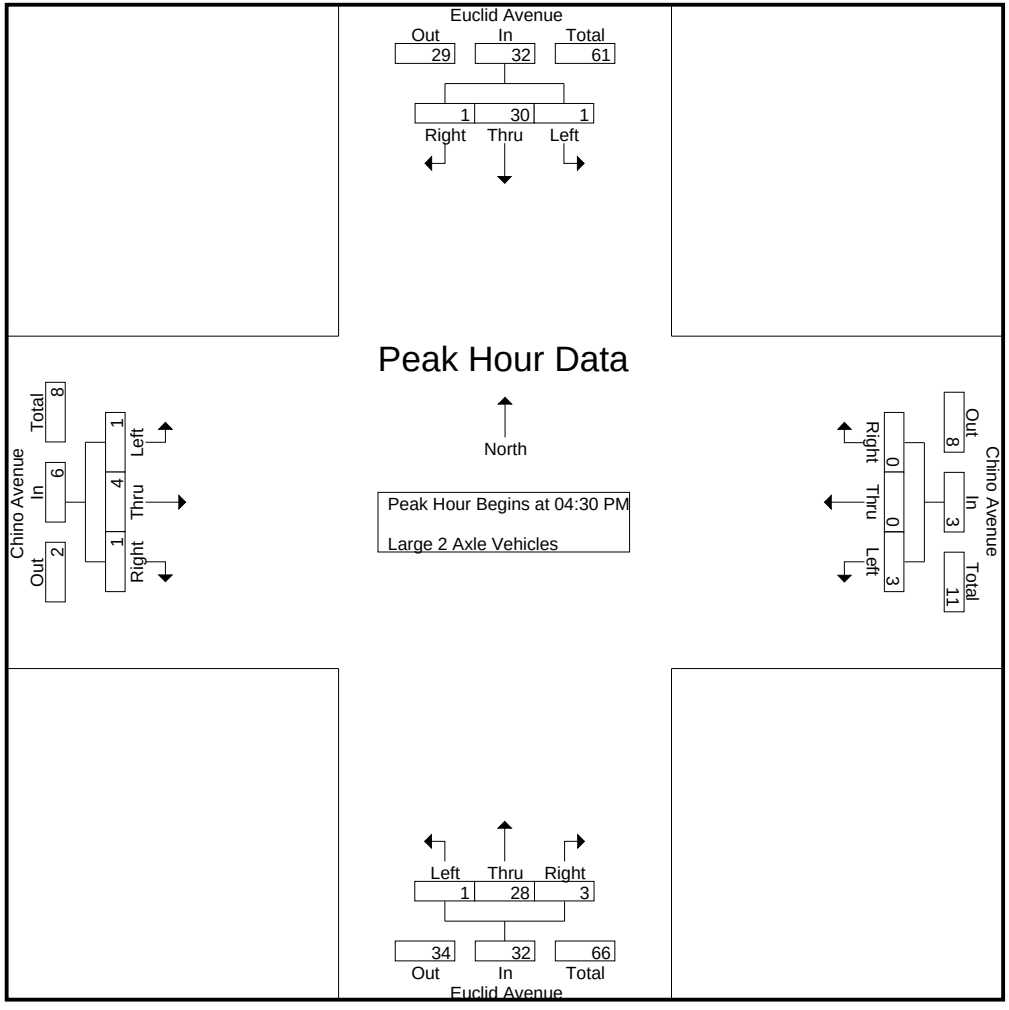

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 10 | **1** | **11** | **2** | 0 | 0 | **2** | 0 | 5 | **2** | 7 | **1** | **4** | 0 | **5** | |
| +15 mins. | **1** | 5 | 0 | 6 | 1 | 0 | 0 | 1 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **11** | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | **1** | **10** | 1 | **12** | 0 | 0 | **1** | 1 | |
| Total Volume | 1 | 30 | 1 | 32 | 3 | 0 | 0 | 3 | 1 | 28 | 3 | 32 | 1 | 4 | 1 | 6 | |
| % App. Total | 3.1 | 93.8 | 3.1 | | 100 | 0 | 0 | | 3.1 | 87.5 | 9.4 | | 16.7 | 66.7 | 16.7 | | |
| PHF | .250 | .682 | .250 | .727 | .375 | .000 | .000 | .375 | .250 | .700 | .375 | .667 | .250 | .250 | .250 | .300 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 23 |
| 04:15 PM | 0 | 4 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 1 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 17 |
| 04:30 PM | 0 | 4 | 2 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 1 | 0 | 11 | 0 | 1 | 0 | 0 | 1 | 1 | 18 | 19 |
| 04:45 PM | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| Total | 0 | 27 | 3 | 1 | 30 | 0 | 0 | 0 | 0 | 0 | 1 | 35 | 3 | 0 | 39 | 0 | 1 | 0 | 0 | 1 | 1 | 70 | 71 |
| 05:00 PM | 0 | 9 | 0 | 0 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 0 | 16 | 16 |
| 05:15 PM | 0 | 6 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 |
| 05:30 PM | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 16 |
| 05:45 PM | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| Total | 0 | 35 | 0 | 0 | 35 | 1 | 1 | 0 | 0 | 2 | 0 | 27 | 2 | 0 | 29 | 0 | 1 | 0 | 0 | 1 | 0 | 67 | 67 |
| Grand Total | 0 | 62 | 3 | 1 | 65 | 1 | 1 | 0 | 0 | 2 | 1 | 62 | 5 | 0 | 68 | 0 | 2 | 0 | 0 | 2 | 1 | 137 | 138 |
| Apprch % | 0 | 95.4 | 4.6 | | | 50 | 50 | 0 | | | 1.5 | 91.2 | 7.4 | | | 0 | 100 | 0 | | | | | |
| Total % | 0 | 45.3 | 2.2 | | 47.4 | 0.7 | 0.7 | 0 | | 1.5 | 0.7 | 45.3 | 3.6 | | 49.6 | 0 | 1.5 | 0 | | 1.5 | 0.7 | 99.3 | |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 4 | **2** | 6 | 0 | 0 | 0 | 0 | 0 | **10** | **1** | **11** | 0 | **1** | 0 | **1** | **18** |
| 04:45 PM | 0 | **9** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 0 | 0 | 12 |
| 05:00 PM | 0 | 9 | 0 | 9 | 0 | **1** | 0 | **1** | 0 | 5 | 0 | 5 | 0 | 1 | 0 | 1 | 16 |
| 05:15 PM | 0 | 6 | 0 | 6 | **1** | 0 | 0 | 1 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 14 |
| Total Volume | 0 | 28 | 2 | 30 | 1 | 1 | 0 | 2 | 0 | 24 | 2 | 26 | 0 | 2 | 0 | 2 | 60 |
| % App. Total | 0 | 93.3 | 6.7 | | 50 | 50 | 0 | | 0 | 92.3 | 7.7 | | 0 | 100 | 0 | | |
| PHF | .000 | .778 | .250 | .833 | .250 | .250 | .000 | .500 | .000 | .600 | .500 | .591 | .000 | .500 | .000 | .500 | .833 |

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Corona, CA 92878
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N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

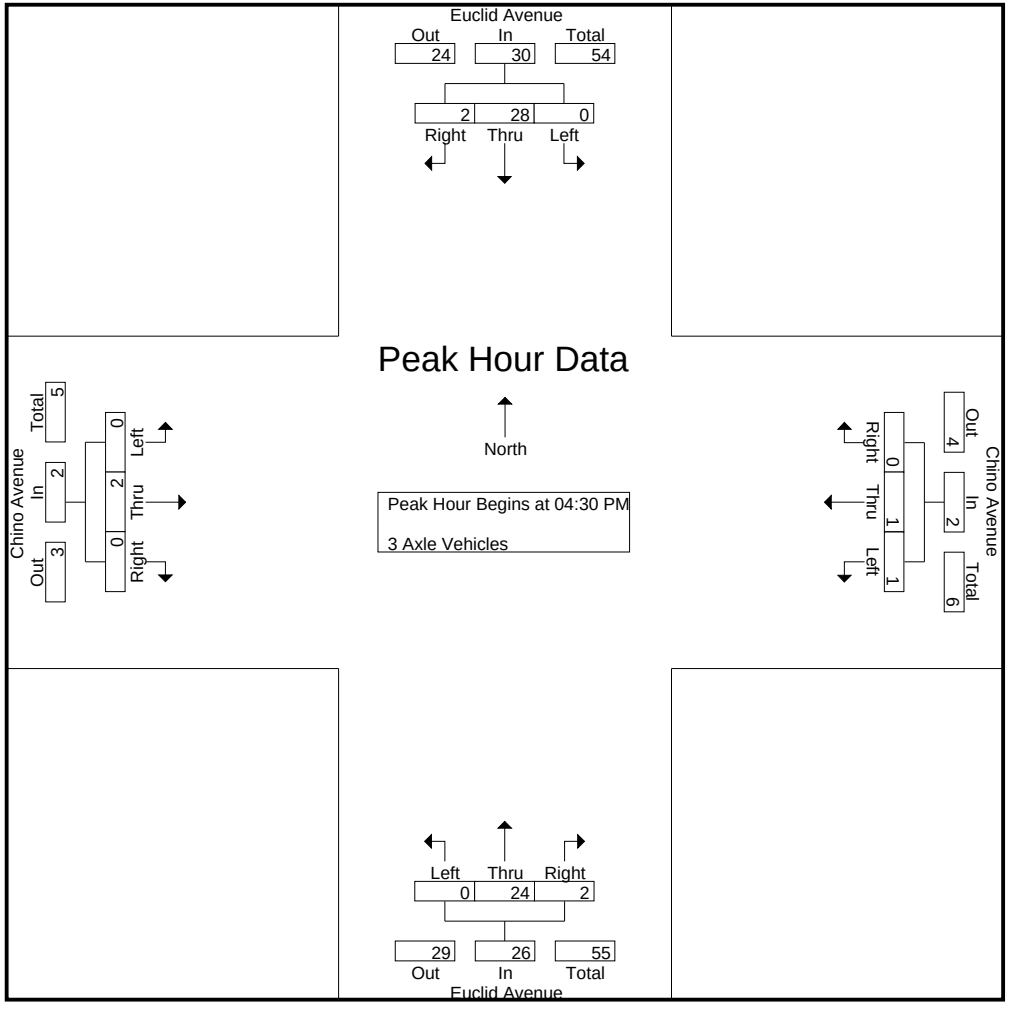

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 4 | **2** | 6 | 0 | 0 | 0 | 0 | 0 | **10** | **1** | **11** | 0 | **1** | 0 | **1** | |
| +15 mins. | 0 | **9** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 9 | 0 | 9 | 0 | **1** | 0 | **1** | 0 | 5 | 0 | 5 | 0 | 1 | 0 | 1 | |
| +45 mins. | 0 | 6 | 0 | 6 | **1** | 0 | 0 | 1 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 28 | 2 | 30 | 1 | 1 | 0 | 2 | 0 | 24 | 2 | 26 | 0 | 2 | 0 | 2 | |
| % App. Total | 0 | 93.3 | 6.7 | | 50 | 50 | 0 | | 0 | 92.3 | 7.7 | | 0 | 100 | 0 | | |
| PHF | .000 | .778 | .250 | .833 | .250 | .250 | .000 | .500 | .000 | .600 | .500 | .591 | .000 | .500 | .000 | .500 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 25 | 1 | 1 | 27 | 1 | 0 | 1 | 0 | 2 | 0 | 36 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 1 | 65 | 66 |
| 04:15 PM | 0 | 22 | 1 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 2 | 0 | 32 | 2 | 0 | 0 | 0 | 2 | 0 | 57 | 57 |
| 04:30 PM | 6 | 17 | 1 | 1 | 24 | 1 | 0 | 0 | 0 | 1 | 0 | 19 | 0 | 0 | 19 | 2 | 0 | 0 | 0 | 2 | 1 | 46 | 47 |
| 04:45 PM | 1 | 20 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 46 |
| Total | 8 | 84 | 3 | 2 | 95 | 2 | 0 | 1 | 0 | 3 | 0 | 110 | 2 | 0 | 112 | 4 | 0 | 0 | 0 | 4 | 2 | 214 | 216 |
| 05:00 PM | 1 | 21 | 0 | 0 | 22 | 1 | 0 | 2 | 1 | 3 | 0 | 29 | 2 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 1 | 56 | 57 |
| 05:15 PM | 2 | 12 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 38 |
| 05:30 PM | 1 | 20 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 1 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 39 | 39 |
| 05:45 PM | 1 | 17 | 0 | 0 | 18 | 0 | 0 | 2 | 1 | 2 | 0 | 25 | 1 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 1 | 46 | 47 |
| Total | 5 | 70 | 0 | 0 | 75 | 1 | 0 | 4 | 2 | 5 | 0 | 95 | 4 | 0 | 99 | 0 | 0 | 0 | 0 | 0 | 2 | 179 | 181 |
| Grand Total | 13 | 154 | 3 | 2 | 170 | 3 | 0 | 5 | 2 | 8 | 0 | 205 | 6 | 0 | 211 | 4 | 0 | 0 | 0 | 4 | 4 | 393 | 397 |
| Apprch % | 7.6 | 90.6 | 1.8 | | | 37.5 | 0 | 62.5 | | | 0 | 97.2 | 2.8 | | | 100 | 0 | 0 | | | | | |
| Total % | 3.3 | 39.2 | 0.8 | | 43.3 | 0.8 | 0 | 1.3 | | 2 | 0 | 52.2 | 1.5 | | 53.7 | 1 | 0 | 0 | | 1 | 1 | 99 | |

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | **6** | 17 | **1** | **24** | **1** | 0 | 0 | 1 | 0 | 19 | 0 | 19 | **2** | 0 | 0 | **2** | 46 |
| 04:45 PM | 1 | 20 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 46 |
| 05:00 PM | 1 | **21** | 0 | 22 | 1 | 0 | **2** | **3** | 0 | **29** | **2** | **31** | 0 | 0 | 0 | 0 | **56** |
| 05:15 PM | 2 | 12 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | 38 |
| Total Volume | 10 | 70 | 1 | 81 | 2 | 0 | 2 | 4 | 0 | 97 | 2 | 99 | 2 | 0 | 0 | 2 | 186 |
| % App. Total | 12.3 | 86.4 | 1.2 | | 50 | 0 | 50 | | 0 | 98 | 2 | | 100 | 0 | 0 | | |
| PHF | .417 | .833 | .250 | .844 | .500 | .000 | .250 | .333 | .000 | .836 | .250 | .798 | .250 | .000 | .000 | .250 | .830 |

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Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

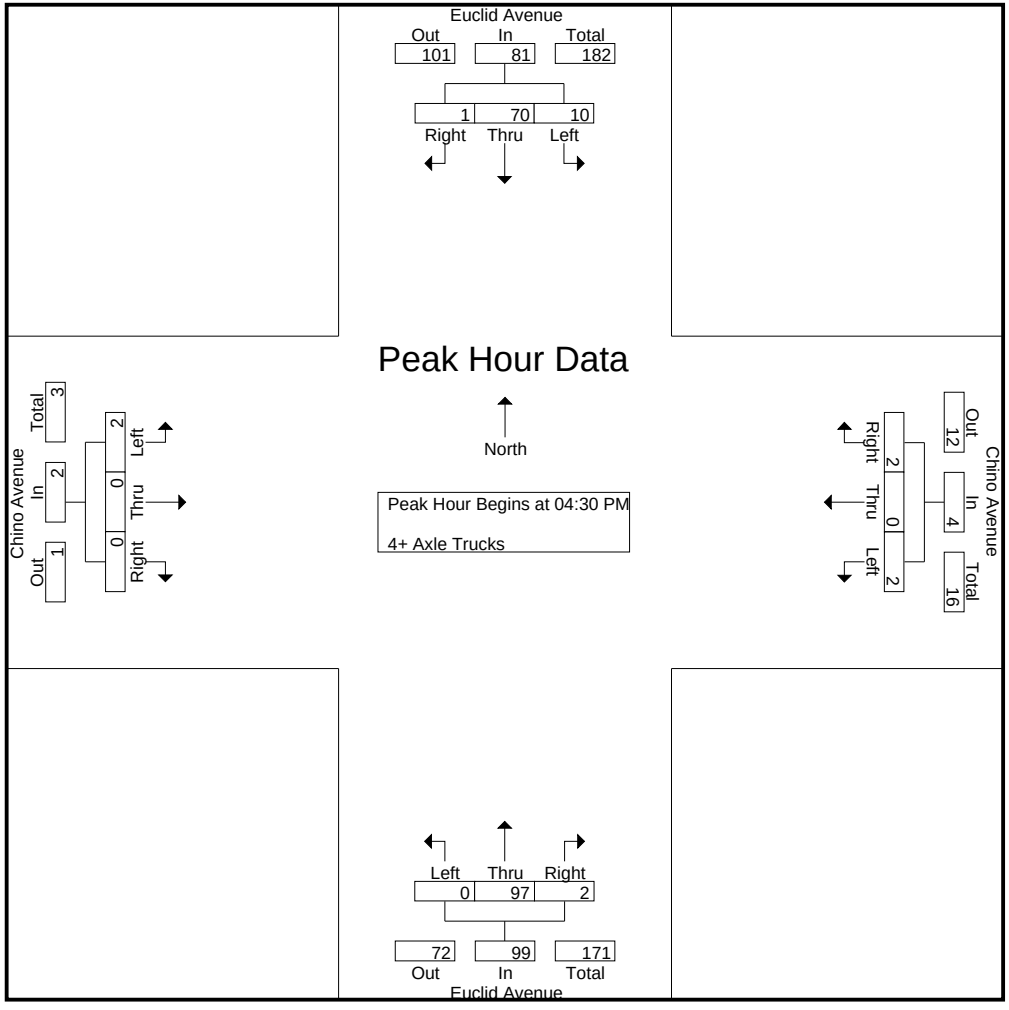

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City of Ontario
N/S: Euclid Avenue
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Weather: Clear

File Name : 05_ONT_Euc_Chino PMC
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Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Chino Avenue Westbound | | | | Euclid Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | **6** | 17 | **1** | **24** | **1** | 0 | 0 | 1 | 0 | 19 | 0 | 19 | **2** | 0 | 0 | **2** | |
| +15 mins. | 1 | 20 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | |
| +30 mins. | 1 | **21** | 0 | 22 | 1 | 0 | **2** | **3** | 0 | **29** | **2** | **31** | 0 | 0 | 0 | 0 | |
| +45 mins. | 2 | 12 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 24 | 0 | 0 | 0 | 0 | |
| Total Volume | 10 | 70 | 1 | 81 | 2 | 0 | 2 | 4 | 0 | 97 | 2 | 99 | 2 | 0 | 0 | 2 | |
| % App. Total | 12.3 | 86.4 | 1.2 | | 50 | 0 | 50 | | 0 | 98 | 2 | | 100 | 0 | 0 | | |
| PHF | .417 | .833 | .250 | .844 | .500 | .000 | .250 | .333 | .000 | .836 | .250 | .798 | .250 | .000 | .000 | .250 | |

Location: Ontario
N/S: Euclid Avenue
E/W: Chino Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg Chino Avenue | South Leg Euclid Avenue | West Leg Chino Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 1 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 3 | 3 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 1 | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 2 | 0 | 0 | 3 | 5 |

| | North Leg Euclid Avenue | East Leg Chino Avenue | South Leg Euclid Avenue | West Leg Chino Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 1 | 0 | 1 | 2 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 1 | 2 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Euclid Avenue
E/W: Chino Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound Chino Avenue | | | Northbound Euclid Avenue | | | Eastbound Chino Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | Southbound Euclid Avenue | | | Westbound Chino Avenue | | | Northbound Euclid Avenue | | | Eastbound Chino Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |

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Corona, Ca 92878
951-268-6268

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 22 | 183 | 18 | 7 | 223 | 11 | 23 | 14 | 2 | 48 | 22 | 164 | 10 | 2 | 196 | 24 | 13 | 18 | 12 | 55 | 23 | 522 | 545 |
| 07:15 AM | 5 | 170 | 30 | 15 | 205 | 15 | 36 | 9 | 3 | 60 | 16 | 143 | 2 | 1 | 161 | 34 | 15 | 12 | 9 | 61 | 28 | 487 | 515 |
| 07:30 AM | 6 | 200 | 15 | 11 | 221 | 8 | 34 | 25 | 3 | 67 | 29 | 169 | 3 | 0 | 201 | 21 | 18 | 18 | 9 | 57 | 23 | 546 | 569 |
| 07:45 AM | 10 | 206 | 17 | 10 | 233 | 11 | 46 | 16 | 2 | 73 | 20 | 179 | 8 | 3 | 207 | 32 | 22 | 22 | 10 | 76 | 25 | 589 | 614 |
| Total | 43 | 759 | 80 | 43 | 882 | 45 | 139 | 64 | 10 | 248 | 87 | 655 | 23 | 6 | 765 | 111 | 68 | 70 | 40 | 249 | 99 | 2144 | 2243 |
| 08:00 AM | 5 | 171 | 24 | 9 | 200 | 5 | 47 | 12 | 2 | 64 | 25 | 159 | 9 | 2 | 193 | 18 | 10 | 11 | 7 | 39 | 20 | 496 | 516 |
| 08:15 AM | 8 | 168 | 22 | 14 | 198 | 14 | 50 | 17 | 1 | 81 | 13 | 142 | 7 | 2 | 162 | 30 | 19 | 10 | 5 | 59 | 22 | 500 | 522 |
| 08:30 AM | 8 | 202 | 18 | 4 | 228 | 7 | 27 | 12 | 5 | 46 | 18 | 153 | 18 | 5 | 189 | 16 | 28 | 22 | 16 | 66 | 30 | 529 | 559 |
| 08:45 AM | 11 | 154 | 18 | 5 | 183 | 6 | 20 | 16 | 3 | 42 | 14 | 147 | 11 | 0 | 172 | 26 | 21 | 34 | 22 | 81 | 30 | 478 | 508 |
| Total | 32 | 695 | 82 | 32 | 809 | 32 | 144 | 57 | 11 | 233 | 70 | 601 | 45 | 9 | 716 | 90 | 78 | 77 | 50 | 245 | 102 | 2003 | 2105 |
| Grand Total | 75 | 1454 | 162 | 75 | 1691 | 77 | 283 | 121 | 21 | 481 | 157 | 1256 | 68 | 15 | 1481 | 201 | 146 | 147 | 90 | 494 | 201 | 4147 | 4348 |
| Apprch % | 4.4 | 86 | 9.6 | | | 16 | 58.8 | 25.2 | | | 10.6 | 84.8 | 4.6 | | | 40.7 | 29.6 | 29.8 | | | | | |
| Total % | 1.8 | 35.1 | 3.9 | | 40.8 | 1.9 | 6.8 | 2.9 | | 11.6 | 3.8 | 30.3 | 1.6 | | 35.7 | 4.8 | 3.5 | 3.5 | | 11.9 | 4.6 | 95.4 | |
| Passenger Vehicles | 31 | 1140 | 157 | | 1403 | 47 | 278 | 30 | | 359 | 156 | 959 | 43 | | 1169 | 194 | 140 | 141 | | 561 | 0 | 0 | 3492 |
| % Passenger Vehicles | 41.3 | 78.4 | 96.9 | 100 | 79.4 | 61 | 98.2 | 24.8 | 19 | 71.5 | 99.4 | 76.4 | 63.2 | 73.3 | 78.1 | 96.5 | 95.9 | 95.9 | 95.6 | 96.1 | 0 | 0 | 80.3 |
| Large 2 Axle Vehicles | 3 | 74 | 4 | | 81 | 6 | 4 | 8 | | 19 | 1 | 57 | 3 | | 62 | 4 | 4 | 2 | | 11 | 0 | 0 | 173 |
| % Large 2 Axle Vehicles | 4 | 5.1 | 2.5 | 0 | 4.6 | 7.8 | 1.4 | 6.6 | 4.8 | 3.8 | 0.6 | 4.5 | 4.4 | 6.7 | 4.1 | 2 | 2.7 | 1.4 | 1.1 | 1.9 | 0 | 0 | 4 |
| 3 Axle Vehicles | 26 | 47 | 0 | | 73 | 7 | 0 | 23 | | 37 | 0 | 47 | 5 | | 53 | 0 | 2 | 2 | | 5 | 0 | 0 | 168 |
| % 3 Axle Vehicles | 34.7 | 3.2 | 0 | 0 | 4.1 | 9.1 | 0 | 19 | 33.3 | 7.4 | 0 | 3.7 | 7.4 | 6.7 | 3.5 | 0 | 1.4 | 1.4 | 1.1 | 0.9 | 0 | 0 | 3.9 |
| 4+ Axle Trucks | 15 | 193 | 1 | | 209 | 17 | 1 | 60 | | 87 | 0 | 193 | 17 | | 212 | 3 | 0 | 2 | | 7 | 0 | 0 | 515 |
| % 4+ Axle Trucks | 20 | 13.3 | 0.6 | 0 | 11.8 | 22.1 | 0.4 | 49.6 | 42.9 | 17.3 | 0 | 15.4 | 25 | 13.3 | 14.2 | 1.5 | 0 | 1.4 | 2.2 | 1.2 | 0 | 0 | 11.8 |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | **22** | 183 | 18 | 223 | 11 | 23 | 14 | 48 | 22 | 164 | **10** | 196 | 24 | 13 | 18 | 55 | 522 |
| 07:15 AM | 5 | 170 | **30** | 205 | **15** | 36 | 9 | 60 | 16 | 143 | 2 | 161 | **34** | 15 | 12 | 61 | 487 |
| 07:30 AM | 6 | 200 | 15 | 221 | 8 | 34 | **25** | 67 | **29** | 169 | 3 | 201 | 21 | 18 | 18 | 57 | 546 |
| 07:45 AM | 10 | **206** | 17 | **233** | 11 | **46** | 16 | **73** | 20 | **179** | 8 | **207** | 32 | **22** | **22** | **76** | **589** |
| Total Volume | 43 | 759 | 80 | 882 | 45 | 139 | 64 | 248 | 87 | 655 | 23 | 765 | 111 | 68 | 70 | 249 | 2144 |
| % App. Total | 4.9 | 86.1 | 9.1 | | 18.1 | 56 | 25.8 | | 11.4 | 85.6 | 3 | | 44.6 | 27.3 | 28.1 | | |
| PHF | .489 | .921 | .667 | .946 | .750 | .755 | .640 | .849 | .750 | .915 | .575 | .924 | .816 | .773 | .795 | .819 | .910 |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

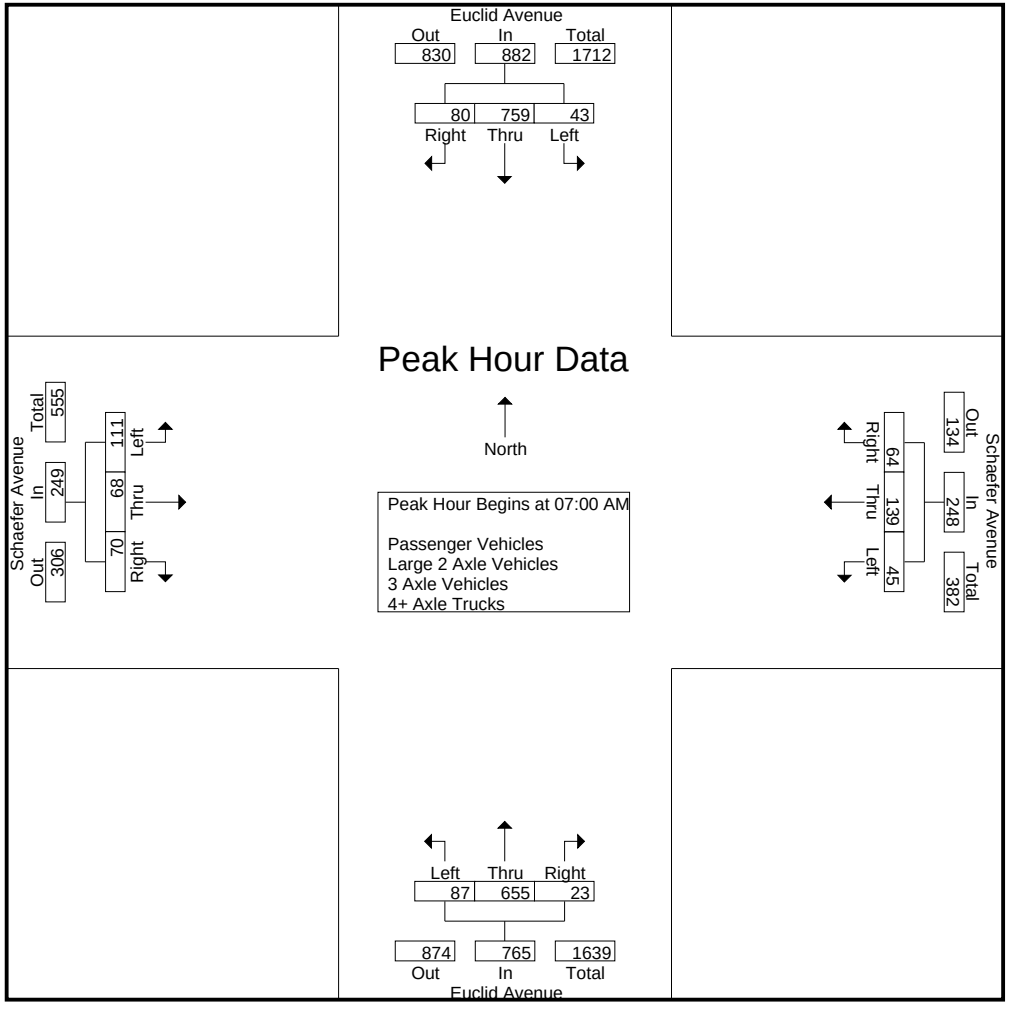

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City of Ontario
N/S: Euclid Avenue
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Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:30 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | **22** | 183 | 18 | 223 | 8 | 34 | **25** | 67 | 22 | 164 | **10** | 196 | 24 | 13 | 18 | 55 | |
| +15 mins. | 5 | 170 | **30** | 205 | 11 | 46 | 16 | 73 | 16 | 143 | 2 | 161 | **34** | 15 | 12 | 61 | |
| +30 mins. | 6 | 200 | 15 | 221 | 5 | 47 | 12 | 64 | **29** | 169 | 3 | 201 | 21 | 18 | 18 | 57 | |
| +45 mins. | 10 | **206** | 17 | **233** | **14** | **50** | 17 | **81** | 20 | **179** | 8 | **207** | 32 | **22** | **22** | **76** | |
| Total Volume | 43 | 759 | 80 | 882 | 38 | 177 | 70 | 285 | 87 | 655 | 23 | 765 | 111 | 68 | 70 | 249 | |
| % App. Total | 4.9 | 86.1 | 9.1 | | 13.3 | 62.1 | 24.6 | | 11.4 | 85.6 | 3 | | 44.6 | 27.3 | 28.1 | | |
| PHF | .489 | .921 | .667 | .946 | .679 | .885 | .700 | .880 | .750 | .915 | .575 | .924 | .816 | .773 | .795 | .819 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 5 | 139 | 17 | 7 | 161 | 9 | 23 | 2 | 0 | 34 | 22 | 133 | 5 | 2 | 160 | 22 | 13 | 16 | 11 | 51 | 20 | 406 | 426 |
| 07:15 AM | 3 | 143 | 29 | 15 | 175 | 8 | 36 | 7 | 2 | 51 | 16 | 108 | 1 | 1 | 125 | 34 | 15 | 12 | 9 | 61 | 27 | 412 | 439 |
| 07:30 AM | 4 | 164 | 14 | 11 | 182 | 5 | 34 | 3 | 0 | 42 | 29 | 130 | 3 | 0 | 162 | 21 | 18 | 17 | 8 | 56 | 19 | 442 | 461 |
| 07:45 AM | 6 | 159 | 16 | 10 | 181 | 7 | 46 | 4 | 0 | 57 | 20 | 134 | 5 | 1 | 159 | 31 | 21 | 21 | 9 | 73 | 20 | 470 | 490 |
| Total | 18 | 605 | 76 | 43 | 699 | 29 | 139 | 16 | 2 | 184 | 87 | 505 | 14 | 4 | 606 | 108 | 67 | 66 | 37 | 241 | 86 | 1730 | 1816 |
| 08:00 AM | 2 | 132 | 24 | 9 | 158 | 4 | 47 | 1 | 0 | 52 | 25 | 115 | 7 | 2 | 147 | 17 | 9 | 10 | 7 | 36 | 18 | 393 | 411 |
| 08:15 AM | 4 | 129 | 21 | 14 | 154 | 5 | 49 | 4 | 0 | 58 | 13 | 106 | 4 | 1 | 123 | 29 | 16 | 10 | 5 | 55 | 20 | 390 | 410 |
| 08:30 AM | 2 | 157 | 18 | 4 | 177 | 4 | 26 | 4 | 1 | 34 | 17 | 130 | 13 | 4 | 160 | 15 | 28 | 22 | 16 | 65 | 25 | 436 | 461 |
| 08:45 AM | 5 | 117 | 18 | 5 | 140 | 5 | 17 | 5 | 1 | 27 | 14 | 103 | 5 | 0 | 122 | 25 | 20 | 33 | 21 | 78 | 27 | 367 | 394 |
| Total | 13 | 535 | 81 | 32 | 629 | 18 | 139 | 14 | 2 | 171 | 69 | 454 | 29 | 7 | 552 | 86 | 73 | 75 | 49 | 234 | 90 | 1586 | 1676 |
| Grand Total | 31 | 1140 | 157 | 75 | 1328 | 47 | 278 | 30 | 4 | 355 | 156 | 959 | 43 | 11 | 1158 | 194 | 140 | 141 | 86 | 475 | 176 | 3316 | 3492 |
| Apprch % | 2.3 | 85.8 | 11.8 | | | 13.2 | 78.3 | 8.5 | | | 13.5 | 82.8 | 3.7 | | | 40.8 | 29.5 | 29.7 | | | | | |
| Total % | 0.9 | 34.4 | 4.7 | | 40 | 1.4 | 8.4 | 0.9 | | 10.7 | 4.7 | 28.9 | 1.3 | | 34.9 | 5.9 | 4.2 | 4.3 | | 14.3 | 5 | 95 | |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | 5 | 139 | 17 | 161 | **9** | 23 | 2 | 34 | 22 | 133 | **5** | 160 | 22 | 13 | 16 | 51 | 406 |
| 07:15 AM | 3 | 143 | **29** | 175 | 8 | 36 | **7** | 51 | 16 | 108 | 1 | 125 | **34** | 15 | 12 | 61 | 412 |
| 07:30 AM | 4 | **164** | 14 | **182** | 5 | 34 | 3 | 42 | **29** | 130 | 3 | **162** | 21 | 18 | 17 | 56 | 442 |
| 07:45 AM | **6** | 159 | 16 | 181 | 7 | **46** | 4 | **57** | 20 | **134** | 5 | 159 | 31 | **21** | **21** | **73** | **470** |
| Total Volume | 18 | 605 | 76 | 699 | 29 | 139 | 16 | 184 | 87 | 505 | 14 | 606 | 108 | 67 | 66 | 241 | 1730 |
| % App. Total | 2.6 | 86.6 | 10.9 | | 15.8 | 75.5 | 8.7 | | 14.4 | 83.3 | 2.3 | | 44.8 | 27.8 | 27.4 | | |
| PHF | .750 | .922 | .655 | .960 | .806 | .755 | .571 | .807 | .750 | .942 | .700 | .935 | .794 | .798 | .786 | .825 | .920 |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

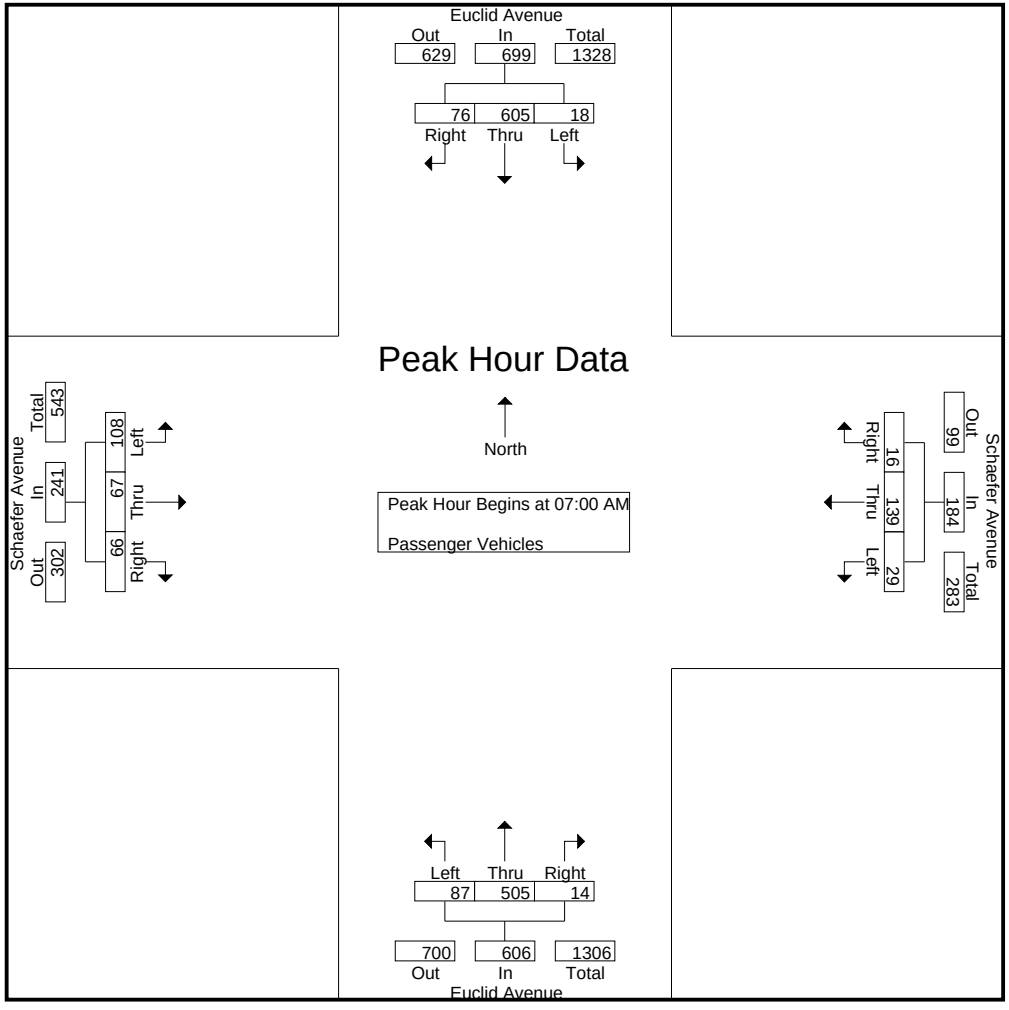

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N/S: Euclid Avenue
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File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | 5 | 139 | 17 | 161 | **9** | 23 | 2 | 34 | 22 | 133 | **5** | 160 | 22 | 13 | 16 | 51 | |
| +15 mins. | 3 | 143 | **29** | 175 | 8 | 36 | **7** | 51 | 16 | 108 | 1 | 125 | **34** | 15 | 12 | 61 | |
| +30 mins. | 4 | **164** | 14 | **182** | 5 | 34 | 3 | 42 | **29** | 130 | 3 | **162** | 21 | 18 | 17 | 56 | |
| +45 mins. | **6** | 159 | 16 | 181 | 7 | **46** | 4 | **57** | 20 | **134** | 5 | 159 | 31 | **21** | **21** | **73** | |
| Total Volume | 18 | 605 | 76 | 699 | 29 | 139 | 16 | 184 | 87 | 505 | 14 | 606 | 108 | 67 | 66 | 241 | |
| % App. Total | 2.6 | 86.6 | 10.9 | | 15.8 | 75.5 | 8.7 | | 14.4 | 83.3 | 2.3 | | 44.8 | 27.8 | 27.4 | | |
| PHF | .750 | .922 | .655 | .960 | .806 | .755 | .571 | .807 | .750 | .942 | .700 | .935 | .794 | .798 | .786 | .825 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 14 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 1 | 1 | 1 | 1 | 26 | 27 |
| 07:15 AM | 0 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| 07:30 AM | 1 | 8 | 1 | 0 | 10 | 0 | 0 | 3 | 0 | 3 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 22 |
| 07:45 AM | 0 | 11 | 1 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 1 | 7 | 1 | 1 | 0 | 0 | 2 | 1 | 21 | 22 |
| Total | 3 | 38 | 4 | 0 | 45 | 0 | 0 | 3 | 0 | 3 | 0 | 30 | 1 | 1 | 31 | 1 | 1 | 1 | 1 | 3 | 2 | 82 | 84 |
| 08:00 AM | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 3 | 0 | 3 | 0 | 4 | 1 | 0 | 5 | 0 | 1 | 1 | 0 | 2 | 0 | 20 | 20 |
| 08:15 AM | 0 | 11 | 0 | 0 | 11 | 5 | 1 | 1 | 0 | 7 | 0 | 6 | 0 | 0 | 6 | 1 | 1 | 0 | 0 | 2 | 0 | 26 | 26 |
| 08:30 AM | 0 | 9 | 0 | 0 | 9 | 0 | 1 | 1 | 1 | 2 | 1 | 5 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 1 | 18 | 19 |
| 08:45 AM | 0 | 6 | 0 | 0 | 6 | 1 | 2 | 0 | 0 | 3 | 0 | 12 | 1 | 0 | 13 | 1 | 1 | 0 | 0 | 2 | 0 | 24 | 24 |
| Total | 0 | 36 | 0 | 0 | 36 | 6 | 4 | 5 | 1 | 15 | 1 | 27 | 2 | 0 | 30 | 3 | 3 | 1 | 0 | 7 | 1 | 88 | 89 |
| Grand Total | 3 | 74 | 4 | 0 | 81 | 6 | 4 | 8 | 1 | 18 | 1 | 57 | 3 | 1 | 61 | 4 | 4 | 2 | 1 | 10 | 3 | 170 | 173 |
| Apprch % | 3.7 | 91.4 | 4.9 | | | 33.3 | 22.2 | 44.4 | | | 1.6 | 93.4 | 4.9 | | | 40 | 40 | 20 | | | | | |
| Total % | 1.8 | 43.5 | 2.4 | | 47.6 | 3.5 | 2.4 | 4.7 | | 10.6 | 0.6 | 33.5 | 1.8 | | 35.9 | 2.4 | 2.4 | 1.2 | | 5.9 | 1.7 | 98.3 | |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | **2** | **14** | **1** | **17** | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 0 | **1** | 1 | **26** |
| 07:15 AM | 0 | 5 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 13 |
| 07:30 AM | 1 | 8 | 1 | 10 | 0 | 0 | **3** | **3** | 0 | **9** | 0 | **9** | 0 | 0 | 0 | 0 | 22 |
| 07:45 AM | 0 | 11 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 6 | **1** | 7 | **1** | **1** | 0 | **2** | 21 |
| Total Volume | 3 | 38 | 4 | 45 | 0 | 0 | 3 | 3 | 0 | 30 | 1 | 31 | 1 | 1 | 1 | 3 | 82 |
| % App. Total | 6.7 | 84.4 | 8.9 | | 0 | 0 | 100 | | 0 | 96.8 | 3.2 | | 33.3 | 33.3 | 33.3 | | |
| PHF | .375 | .679 | 1.00 | .662 | .000 | .000 | .250 | .250 | .000 | .833 | .250 | .861 | .250 | .250 | .250 | .375 | .788 |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

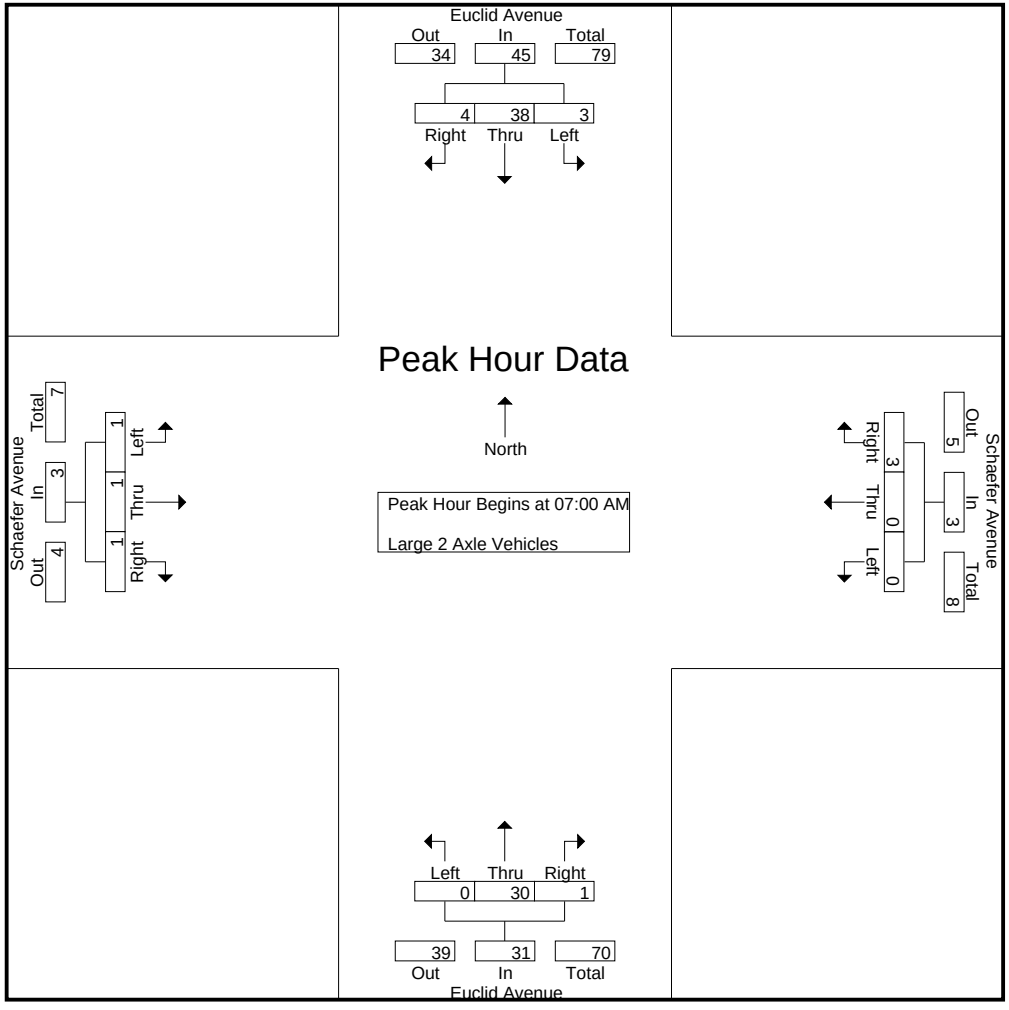

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City of Ontario
N/S: Euclid Avenue
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File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | **2** | **14** | **1** | **17** | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 0 | **1** | 1 | |
| +15 mins. | 0 | 5 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | |
| +30 mins. | 1 | 8 | 1 | 10 | 0 | 0 | **3** | **3** | 0 | **9** | 0 | **9** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 11 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 6 | **1** | 7 | **1** | **1** | 0 | **2** | |
| Total Volume | 3 | 38 | 4 | 45 | 0 | 0 | 3 | 3 | 0 | 30 | 1 | 31 | 1 | 1 | 1 | 3 | |
| % App. Total | 6.7 | 84.4 | 8.9 | | 0 | 0 | 100 | | 0 | 96.8 | 3.2 | | 33.3 | 33.3 | 33.3 | | |
| PHF | .375 | .679 | 1.000 | .662 | .000 | .000 | .250 | .250 | .000 | .833 | .250 | .861 | .250 | .250 | .250 | .375 | |

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City of Ontario
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Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 11 | 8 | 0 | 0 | 19 | 1 | 0 | 5 | 1 | 6 | 0 | 8 | 3 | 0 | 11 | 0 | 0 | 1 | 0 | 1 | 1 | 37 | 38 |
| 07:15 AM | 2 | 8 | 0 | 0 | 10 | 2 | 0 | 1 | 1 | 3 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 21 | 22 |
| 07:30 AM | 1 | 6 | 0 | 0 | 7 | 2 | 0 | 6 | 2 | 8 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 18 | 20 |
| 07:45 AM | 4 | 5 | 0 | 0 | 9 | 1 | 0 | 2 | 0 | 3 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 1 | 1 | 1 | 1 | 20 | 21 |
| Total | 18 | 27 | 0 | 0 | 45 | 6 | 0 | 14 | 4 | 20 | 0 | 26 | 3 | 0 | 29 | 0 | 0 | 2 | 1 | 2 | 5 | 96 | 101 |
| 08:00 AM | 2 | 6 | 0 | 0 | 8 | 0 | 0 | 2 | 0 | 2 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| 08:15 AM | 2 | 6 | 0 | 0 | 8 | 0 | 0 | 4 | 1 | 4 | 0 | 6 | 0 | 0 | 6 | 0 | 2 | 0 | 0 | 2 | 1 | 20 | 21 |
| 08:30 AM | 1 | 4 | 0 | 0 | 5 | 1 | 0 | 2 | 1 | 3 | 0 | 2 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 11 | 13 |
| 08:45 AM | 3 | 4 | 0 | 0 | 7 | 0 | 0 | 1 | 1 | 1 | 0 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 14 | 15 |
| Total | 8 | 20 | 0 | 0 | 28 | 1 | 0 | 9 | 3 | 10 | 0 | 21 | 2 | 1 | 23 | 0 | 2 | 0 | 0 | 2 | 4 | 63 | 67 |
| Grand Total | 26 | 47 | 0 | 0 | 73 | 7 | 0 | 23 | 7 | 30 | 0 | 47 | 5 | 1 | 52 | 0 | 2 | 2 | 1 | 4 | 9 | 159 | 168 |
| Apprch % | 35.6 | 64.4 | 0 | | | 23.3 | 0 | 76.7 | | | 0 | 90.4 | 9.6 | | | 0 | 50 | 50 | | | | | |
| Total % | 16.4 | 29.6 | 0 | | 45.9 | 4.4 | 0 | 14.5 | | 18.9 | 0 | 29.6 | 3.1 | | 32.7 | 0 | 1.3 | 1.3 | | 2.5 | 5.4 | 94.6 | |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | **11** | **8** | 0 | **19** | 1 | 0 | 5 | 6 | 0 | **8** | **3** | **11** | 0 | 0 | **1** | **1** | **37** |
| 07:15 AM | 2 | 8 | 0 | 10 | **2** | 0 | 1 | 3 | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | 21 |
| 07:30 AM | 1 | 6 | 0 | 7 | 2 | 0 | **6** | **8** | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 18 |
| 07:45 AM | 4 | 5 | 0 | 9 | 1 | 0 | 2 | 3 | 0 | 7 | 0 | 7 | 0 | 0 | 1 | 1 | 20 |
| Total Volume | 18 | 27 | 0 | 45 | 6 | 0 | 14 | 20 | 0 | 26 | 3 | 29 | 0 | 0 | 2 | 2 | 96 |
| % App. Total | 40 | 60 | 0 | | 30 | 0 | 70 | | 0 | 89.7 | 10.3 | | 0 | 0 | 100 | | |
| PHF | .409 | .844 | .000 | .592 | .750 | .000 | .583 | .625 | .000 | .813 | .250 | .659 | .000 | .000 | .500 | .500 | .649 |

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E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

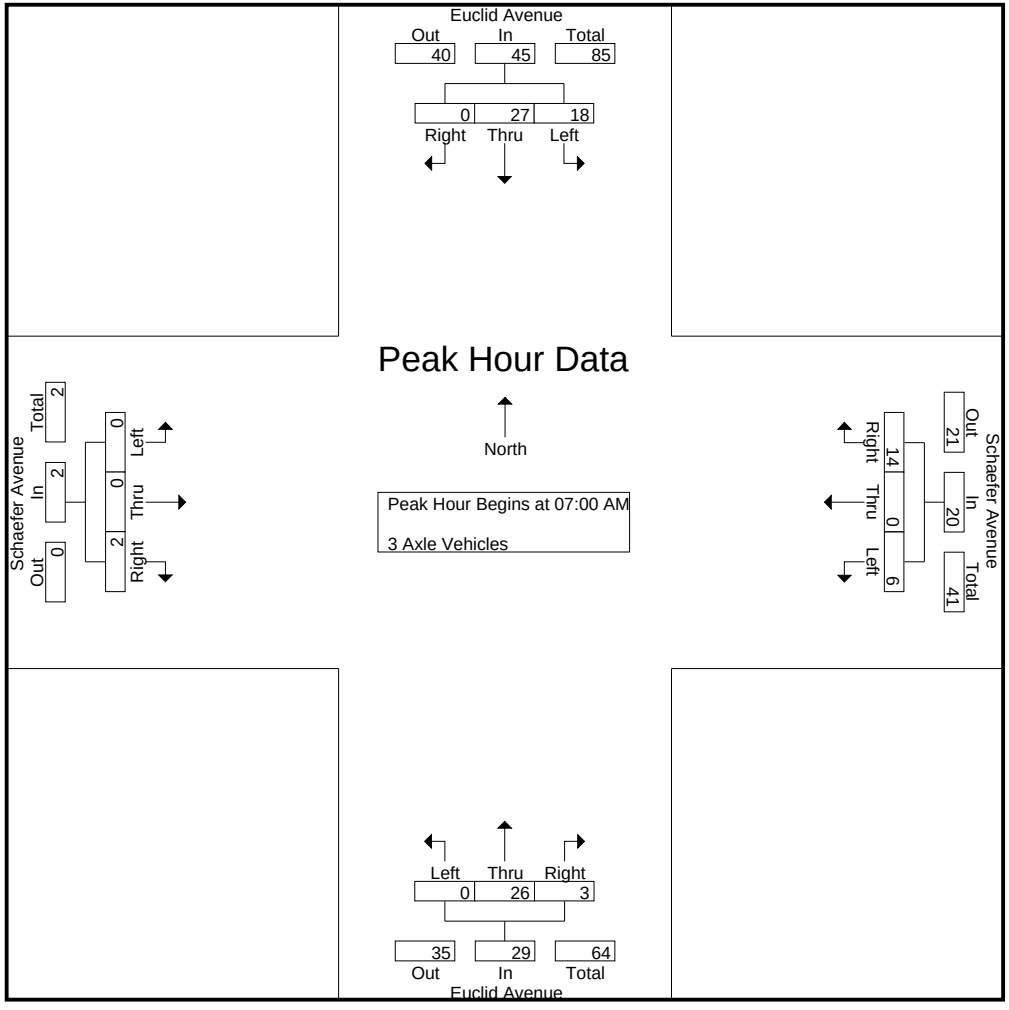

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City of Ontario
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File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | **11** | **8** | 0 | **19** | 1 | 0 | 5 | 6 | 0 | **8** | **3** | **11** | 0 | 0 | **1** | **1** | |
| +15 mins. | 2 | 8 | 0 | 10 | **2** | 0 | 1 | 3 | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | |
| +30 mins. | 1 | 6 | 0 | 7 | 2 | 0 | **6** | **8** | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +45 mins. | 4 | 5 | 0 | 9 | 1 | 0 | 2 | 3 | 0 | 7 | 0 | 7 | 0 | 0 | 1 | 1 | |
| Total Volume | 18 | 27 | 0 | 45 | 6 | 0 | 14 | 20 | 0 | 26 | 3 | 29 | 0 | 0 | 2 | 2 | |
| % App. Total | 40 | 60 | 0 | | 30 | 0 | 70 | | 0 | 89.7 | 10.3 | | 0 | 0 | 100 | | |
| PHF | .409 | .844 | .000 | .592 | .750 | .000 | .583 | .625 | .000 | .813 | .250 | .659 | .000 | .000 | .500 | .500 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 4 | 22 | 0 | 0 | 26 | 1 | 0 | 7 | 1 | 8 | 0 | 15 | 2 | 0 | 17 | 2 | 0 | 0 | 0 | 2 | 1 | 53 | 54 |
| 07:15 AM | 0 | 14 | 0 | 0 | 14 | 5 | 0 | 1 | 0 | 6 | 0 | 20 | 1 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 41 |
| 07:30 AM | 0 | 22 | 0 | 0 | 22 | 1 | 0 | 13 | 1 | 14 | 0 | 27 | 0 | 0 | 27 | 0 | 0 | 1 | 1 | 1 | 2 | 64 | 66 |
| 07:45 AM | 0 | 31 | 0 | 0 | 31 | 3 | 0 | 10 | 2 | 13 | 0 | 32 | 2 | 1 | 34 | 0 | 0 | 0 | 0 | 0 | 3 | 78 | 81 |
| Total | 4 | 89 | 0 | 0 | 93 | 10 | 0 | 31 | 4 | 41 | 0 | 94 | 5 | 1 | 99 | 2 | 0 | 1 | 1 | 3 | 6 | 236 | 242 |
| 08:00 AM | 1 | 23 | 0 | 0 | 24 | 1 | 0 | 6 | 2 | 7 | 0 | 32 | 1 | 0 | 33 | 1 | 0 | 0 | 0 | 1 | 2 | 65 | 67 |
| 08:15 AM | 2 | 22 | 1 | 0 | 25 | 4 | 0 | 8 | 0 | 12 | 0 | 24 | 3 | 1 | 27 | 0 | 0 | 0 | 0 | 0 | 1 | 64 | 65 |
| 08:30 AM | 5 | 32 | 0 | 0 | 37 | 2 | 0 | 5 | 2 | 7 | 0 | 16 | 4 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 2 | 64 | 66 |
| 08:45 AM | 3 | 27 | 0 | 0 | 30 | 0 | 1 | 10 | 1 | 11 | 0 | 27 | 4 | 0 | 31 | 0 | 0 | 1 | 1 | 1 | 2 | 73 | 75 |
| Total | 11 | 104 | 1 | 0 | 116 | 7 | 1 | 29 | 5 | 37 | 0 | 99 | 12 | 1 | 111 | 1 | 0 | 1 | 1 | 2 | 7 | 266 | 273 |
| Grand Total | 15 | 193 | 1 | 0 | 209 | 17 | 1 | 60 | 9 | 78 | 0 | 193 | 17 | 2 | 210 | 3 | 0 | 2 | 2 | 5 | 13 | 502 | 515 |
| Apprch % | 7.2 | 92.3 | 0.5 | | | 21.8 | 1.3 | 76.9 | | | 0 | 91.9 | 8.1 | | | 60 | 0 | 40 | | | | | |
| Total % | 3 | 38.4 | 0.2 | | 41.6 | 3.4 | 0.2 | 12 | | 15.5 | 0 | 38.4 | 3.4 | | 41.8 | 0.6 | 0 | 0.4 | | 1 | 2.5 | 97.5 | |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | **4** | 22 | 0 | 26 | 1 | 0 | 7 | 8 | 0 | 15 | **2** | 17 | **2** | 0 | 0 | **2** | 53 |
| 07:15 AM | 0 | 14 | 0 | 14 | **5** | 0 | 1 | 6 | 0 | 20 | 1 | 21 | 0 | 0 | 0 | 0 | 41 |
| 07:30 AM | 0 | 22 | 0 | 22 | 1 | 0 | **13** | **14** | 0 | 27 | 0 | 27 | 0 | 0 | **1** | 1 | 64 |
| 07:45 AM | 0 | **31** | 0 | **31** | 3 | 0 | 10 | 13 | 0 | **32** | 2 | **34** | 0 | 0 | 0 | 0 | **78** |
| Total Volume | 4 | 89 | 0 | 93 | 10 | 0 | 31 | 41 | 0 | 94 | 5 | 99 | 2 | 0 | 1 | 3 | 236 |
| % App. Total | 4.3 | 95.7 | 0 | | 24.4 | 0 | 75.6 | | 0 | 94.9 | 5.1 | | 66.7 | 0 | 33.3 | | |
| PHF | .250 | .718 | .000 | .750 | .500 | .000 | .596 | .732 | .000 | .734 | .625 | .728 | .250 | .000 | .250 | .375 | .756 |

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(951) 268-6268

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File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

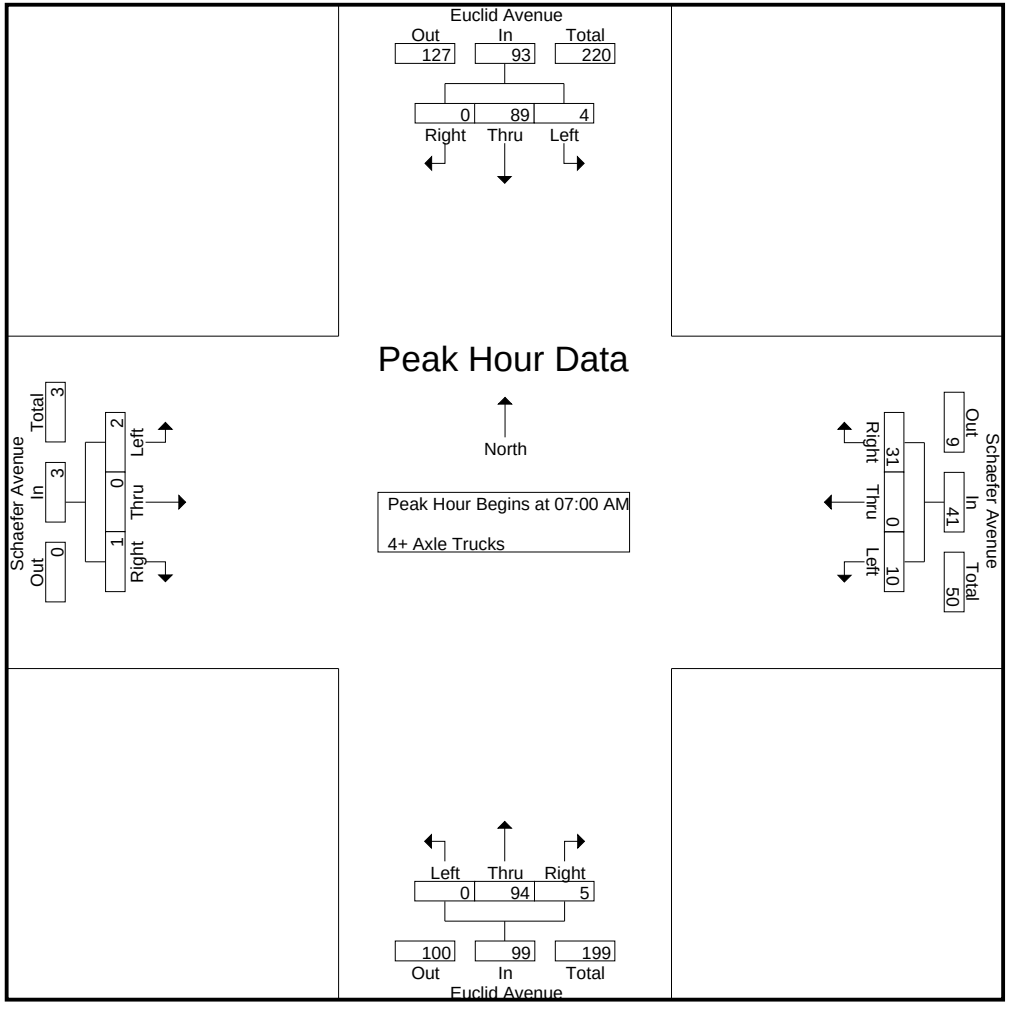

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File Name : 06_ONT_Euc_Sch AMC
Site Code : 05124953
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| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | **4** | 22 | 0 | 26 | 1 | 0 | 7 | 8 | 0 | 15 | **2** | 17 | **2** | 0 | 0 | **2** | |
| +15 mins. | 0 | 14 | 0 | 14 | **5** | 0 | 1 | 6 | 0 | 20 | 1 | 21 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 22 | 0 | 22 | 1 | 0 | **13** | **14** | 0 | 27 | 0 | 27 | 0 | 0 | **1** | 1 | |
| +45 mins. | 0 | **31** | 0 | **31** | 3 | 0 | 10 | 13 | 0 | **32** | 2 | **34** | 0 | 0 | 0 | 0 | |
| Total Volume | 4 | 89 | 0 | 93 | 10 | 0 | 31 | 41 | 0 | 94 | 5 | 99 | 2 | 0 | 1 | 3 | |
| % App. Total | 4.3 | 95.7 | 0 | | 24.4 | 0 | 75.6 | | 0 | 94.9 | 5.1 | | 66.7 | 0 | 33.3 | | |
| PHF | .250 | .718 | .000 | .750 | .500 | .000 | .596 | .732 | .000 | .734 | .625 | .728 | .250 | .000 | .250 | .375 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 9 | 169 | 15 | 3 | 193 | 10 | 17 | 8 | 3 | 35 | 15 | 223 | 13 | 2 | 251 | 49 | 67 | 25 | 16 | 141 | 24 | 620 | 644 |
| 04:15 PM | 5 | 217 | 21 | 7 | 243 | 7 | 17 | 4 | 1 | 28 | 22 | 244 | 16 | 2 | 282 | 46 | 54 | 25 | 12 | 125 | 22 | 678 | 700 |
| 04:30 PM | 3 | 172 | 24 | 11 | 199 | 10 | 16 | 1 | 0 | 27 | 13 | 233 | 11 | 4 | 257 | 55 | 94 | 35 | 19 | 184 | 34 | 667 | 701 |
| 04:45 PM | 15 | 193 | 31 | 9 | 239 | 6 | 13 | 7 | 4 | 26 | 19 | 227 | 12 | 5 | 258 | 49 | 60 | 18 | 10 | 127 | 28 | 650 | 678 |
| Total | 32 | 751 | 91 | 30 | 874 | 33 | 63 | 20 | 8 | 116 | 69 | 927 | 52 | 13 | 1048 | 199 | 275 | 103 | 57 | 577 | 108 | 2615 | 2723 |
| 05:00 PM | 14 | 164 | 21 | 8 | 199 | 10 | 9 | 3 | 1 | 22 | 10 | 223 | 8 | 1 | 241 | 41 | 70 | 29 | 22 | 140 | 32 | 602 | 634 |
| 05:15 PM | 7 | 192 | 20 | 8 | 219 | 1 | 12 | 2 | 0 | 15 | 25 | 226 | 12 | 4 | 263 | 57 | 53 | 41 | 15 | 151 | 27 | 648 | 675 |
| 05:30 PM | 10 | 198 | 10 | 3 | 218 | 5 | 9 | 4 | 0 | 18 | 10 | 229 | 12 | 2 | 251 | 40 | 45 | 30 | 21 | 115 | 26 | 602 | 628 |
| 05:45 PM | 11 | 186 | 17 | 4 | 214 | 7 | 13 | 9 | 2 | 29 | 10 | 192 | 6 | 2 | 208 | 47 | 43 | 23 | 15 | 113 | 23 | 564 | 587 |
| Total | 42 | 740 | 68 | 23 | 850 | 23 | 43 | 18 | 3 | 84 | 55 | 870 | 38 | 9 | 963 | 185 | 211 | 123 | 73 | 519 | 108 | 2416 | 2524 |
| Grand Total | 74 | 1491 | 159 | 53 | 1724 | 56 | 106 | 38 | 11 | 200 | 124 | 1797 | 90 | 22 | 2011 | 384 | 486 | 226 | 130 | 1096 | 216 | 5031 | 5247 |
| Apprch % | 4.3 | 86.5 | 9.2 | | | 28 | 53 | 19 | | | 6.2 | 89.4 | 4.5 | | | 35 | 44.3 | 20.6 | | | | | |
| Total % | 1.5 | 29.6 | 3.2 | | 34.3 | 1.1 | 2.1 | 0.8 | | 4 | 2.5 | 35.7 | 1.8 | | 40 | 7.6 | 9.7 | 4.5 | | 21.8 | 4.1 | 95.9 | |
| Passenger Vehicles | 23 | 1261 | 147 | | 1477 | 45 | 100 | 25 | | 177 | 122 | 1490 | 55 | | 1684 | 378 | 480 | 218 | | 1200 | 0 | 0 | 4538 |
| % Passenger Vehicles | 31.1 | 84.6 | 92.5 | 86.8 | 83.1 | 80.4 | 94.3 | 65.8 | 63.6 | 83.9 | 98.4 | 82.9 | 61.1 | 77.3 | 82.8 | 98.4 | 98.8 | 96.5 | 95.4 | 97.9 | 0 | 0 | 86.5 |
| Large 2 Axle Vehicles | 11 | 51 | 6 | | 70 | 2 | 4 | 0 | | 6 | 1 | 60 | 5 | | 67 | 4 | 2 | 8 | | 20 | 0 | 0 | 163 |
| % Large 2 Axle Vehicles | 14.9 | 3.4 | 3.8 | 3.8 | 3.9 | 3.6 | 3.8 | 0 | 0 | 2.8 | 0.8 | 3.3 | 5.6 | 4.5 | 3.3 | 1 | 0.4 | 3.5 | 4.6 | 1.6 | 0 | 0 | 3.1 |
| 3 Axle Vehicles | 6 | 55 | 4 | | 69 | 7 | 2 | 5 | | 16 | 0 | 55 | 11 | | 70 | 0 | 2 | 0 | | 2 | 0 | 0 | 157 |
| % 3 Axle Vehicles | 8.1 | 3.7 | 2.5 | 7.5 | 3.9 | 12.5 | 1.9 | 13.2 | 18.2 | 7.6 | 0 | 3.1 | 12.2 | 18.2 | 3.4 | 0 | 0.4 | 0 | 0 | 0.2 | 0 | 0 | 3 |
| 4+ Axle Trucks | 34 | 124 | 2 | | 161 | 2 | 0 | 8 | | 12 | 1 | 192 | 19 | | 212 | 2 | 2 | 0 | | 4 | 0 | 0 | 389 |
| % 4+ Axle Trucks | 45.9 | 8.3 | 1.3 | 1.9 | 9.1 | 3.6 | 0 | 21.1 | 18.2 | 5.7 | 0.8 | 10.7 | 21.1 | 0 | 10.4 | 0.5 | 0.4 | 0 | 0 | 0.3 | 0 | 0 | 7.4 |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 9 | 169 | 15 | 193 | **10** | **17** | **8** | **35** | 15 | 223 | 13 | 251 | 49 | 67 | 25 | 141 | 620 |
| 04:15 PM | 5 | **217** | 21 | **243** | 7 | 17 | 4 | 28 | **22** | **244** | **16** | **282** | 46 | 54 | 25 | 125 | **678** |
| 04:30 PM | 3 | 172 | 24 | 199 | 10 | 16 | 1 | 27 | 13 | 233 | 11 | 257 | **55** | **94** | **35** | **184** | 667 |
| 04:45 PM | **15** | 193 | **31** | 239 | 6 | 13 | 7 | 26 | 19 | 227 | 12 | 258 | 49 | 60 | 18 | 127 | 650 |
| Total Volume | 32 | 751 | 91 | 874 | 33 | 63 | 20 | 116 | 69 | 927 | 52 | 1048 | 199 | 275 | 103 | 577 | 2615 |
| % App. Total | 3.7 | 85.9 | 10.4 | | 28.4 | 54.3 | 17.2 | | 6.6 | 88.5 | 5 | | 34.5 | 47.7 | 17.9 | | |
| PHF | .533 | .865 | .734 | .899 | .825 | .926 | .625 | .829 | .784 | .950 | .813 | .929 | .905 | .731 | .736 | .784 | .964 |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

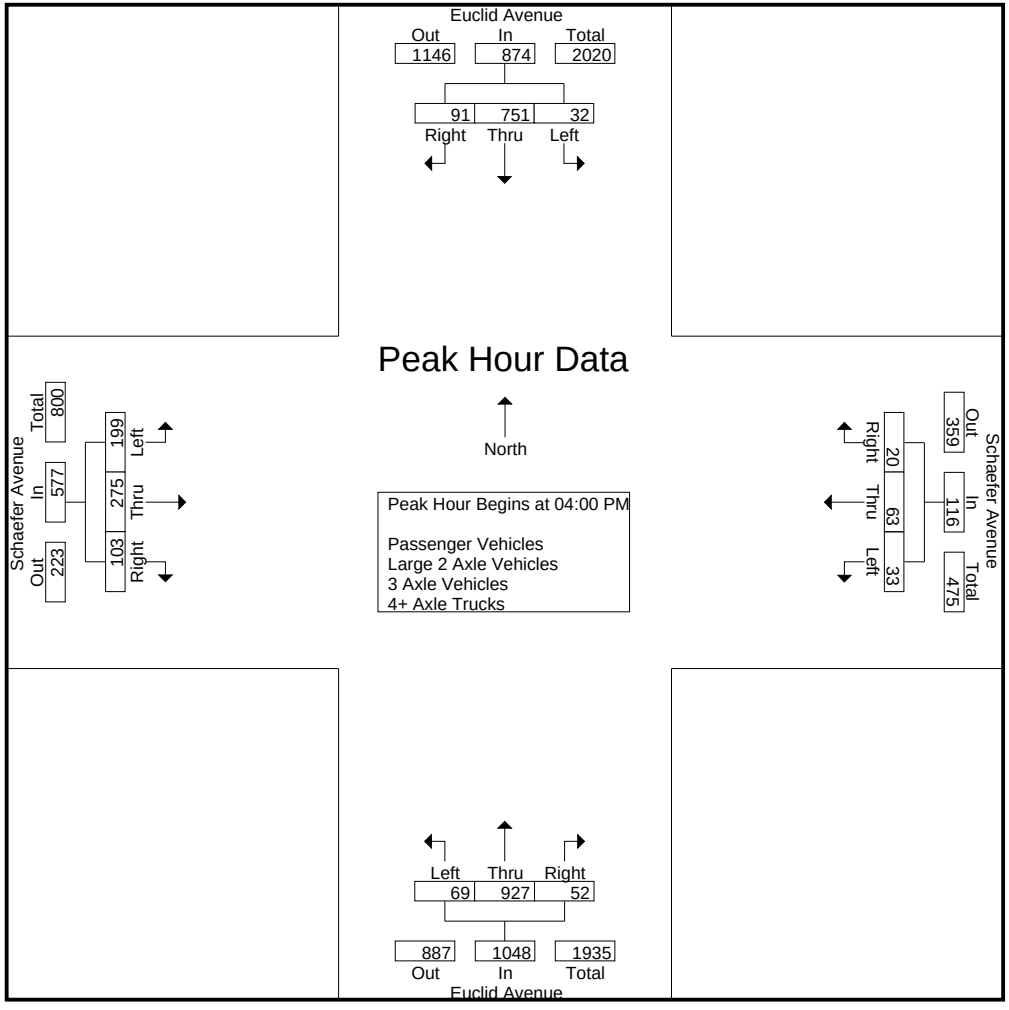

Counts Unlimited, Inc.
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City of Ontario
N/S: Euclid Avenue
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File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:30 PM | | | | |
| +0 mins. | 5 | **217** | 21 | **243** | **10** | **17** | **8** | **35** | 15 | 223 | 13 | 251 | 55 | **94** | 35 | **184** | |
| +15 mins. | 3 | 172 | 24 | 199 | 7 | 17 | 4 | 28 | **22** | **244** | **16** | **282** | 49 | 60 | 18 | 127 | |
| +30 mins. | **15** | 193 | **31** | 239 | 10 | 16 | 1 | 27 | 13 | 233 | 11 | 257 | 41 | 70 | 29 | 140 | |
| +45 mins. | 14 | 164 | 21 | 199 | 6 | 13 | 7 | 26 | 19 | 227 | 12 | 258 | **57** | 53 | **41** | 151 | |
| Total Volume | 37 | 746 | 97 | 880 | 33 | 63 | 20 | 116 | 69 | 927 | 52 | 1048 | 202 | 277 | 123 | 602 | |
| % App. Total | 4.2 | 84.8 | 11 | | 28.4 | 54.3 | 17.2 | | 6.6 | 88.5 | 5 | | 33.6 | 46 | 20.4 | | |
| PHF | .617 | .859 | .782 | .905 | .825 | .926 | .625 | .829 | .784 | .950 | .813 | .929 | .886 | .737 | .750 | .818 | |

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File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 129 | 13 | 3 | 143 | 5 | 16 | 4 | 1 | 25 | 15 | 173 | 9 | 1 | 197 | 49 | 67 | 23 | 15 | 139 | 20 | 504 | 524 |
| 04:15 PM | 3 | 181 | 21 | 7 | 205 | 6 | 16 | 1 | 1 | 23 | 21 | 193 | 9 | 2 | 223 | 46 | 53 | 24 | 11 | 123 | 21 | 574 | 595 |
| 04:30 PM | 1 | 146 | 22 | 9 | 169 | 8 | 14 | 1 | 0 | 23 | 13 | 201 | 9 | 4 | 223 | 55 | 92 | 34 | 18 | 181 | 31 | 596 | 627 |
| 04:45 PM | 3 | 161 | 28 | 7 | 192 | 5 | 12 | 5 | 4 | 22 | 19 | 189 | 8 | 3 | 216 | 46 | 60 | 18 | 10 | 124 | 24 | 554 | 578 |
| Total | 8 | 617 | 84 | 26 | 709 | 24 | 58 | 11 | 6 | 93 | 68 | 756 | 35 | 10 | 859 | 196 | 272 | 99 | 54 | 567 | 96 | 2228 | 2324 |
| 05:00 PM | 6 | 134 | 17 | 6 | 157 | 10 | 9 | 3 | 1 | 22 | 10 | 192 | 4 | 1 | 206 | 41 | 70 | 28 | 21 | 139 | 29 | 524 | 553 |
| 05:15 PM | 3 | 172 | 20 | 8 | 195 | 1 | 11 | 1 | 0 | 13 | 24 | 186 | 5 | 3 | 215 | 56 | 51 | 40 | 14 | 147 | 25 | 570 | 595 |
| 05:30 PM | 1 | 174 | 9 | 2 | 184 | 5 | 9 | 4 | 0 | 18 | 10 | 200 | 7 | 2 | 217 | 40 | 44 | 28 | 20 | 112 | 24 | 531 | 555 |
| 05:45 PM | 5 | 164 | 17 | 4 | 186 | 5 | 13 | 6 | 0 | 24 | 10 | 156 | 4 | 1 | 170 | 45 | 43 | 23 | 15 | 111 | 20 | 491 | 511 |
| Total | 15 | 644 | 63 | 20 | 722 | 21 | 42 | 14 | 1 | 77 | 54 | 734 | 20 | 7 | 808 | 182 | 208 | 119 | 70 | 509 | 98 | 2116 | 2214 |
| Grand Total | 23 | 1261 | 147 | 46 | 1431 | 45 | 100 | 25 | 7 | 170 | 122 | 1490 | 55 | 17 | 1667 | 378 | 480 | 218 | 124 | 1076 | 194 | 4344 | 4538 |
| Apprch % | 1.6 | 88.1 | 10.3 | | | 26.5 | 58.8 | 14.7 | | | 7.3 | 89.4 | 3.3 | | | 35.1 | 44.6 | 20.3 | | | | | |
| Total % | 0.5 | 29 | 3.4 | | 32.9 | 1 | 2.3 | 0.6 | | 3.9 | 2.8 | 34.3 | 1.3 | | 38.4 | 8.7 | 11 | 5 | | 24.8 | 4.3 | 95.7 | |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 1 | 129 | 13 | 143 | 5 | **16** | 4 | **25** | 15 | 173 | **9** | 197 | 49 | 67 | 23 | 139 | 504 |
| 04:15 PM | **3** | **181** | 21 | **205** | 6 | 16 | 1 | 23 | **21** | 193 | 9 | **223** | 46 | 53 | 24 | 123 | 574 |
| 04:30 PM | 1 | 146 | 22 | 169 | **8** | 14 | 1 | 23 | 13 | **201** | 9 | 223 | **55** | **92** | **34** | **181** | **596** |
| 04:45 PM | 3 | 161 | **28** | 192 | 5 | 12 | **5** | 22 | 19 | 189 | 8 | 216 | 46 | 60 | 18 | 124 | 554 |
| Total Volume | 8 | 617 | 84 | 709 | 24 | 58 | 11 | 93 | 68 | 756 | 35 | 859 | 196 | 272 | 99 | 567 | 2228 |
| % App. Total | 1.1 | 87 | 11.8 | | 25.8 | 62.4 | 11.8 | | 7.9 | 88 | 4.1 | | 34.6 | 48 | 17.5 | | |
| PHF | .667 | .852 | .750 | .865 | .750 | .906 | .550 | .930 | .810 | .940 | .972 | .963 | .891 | .739 | .728 | .783 | .935 |

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File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

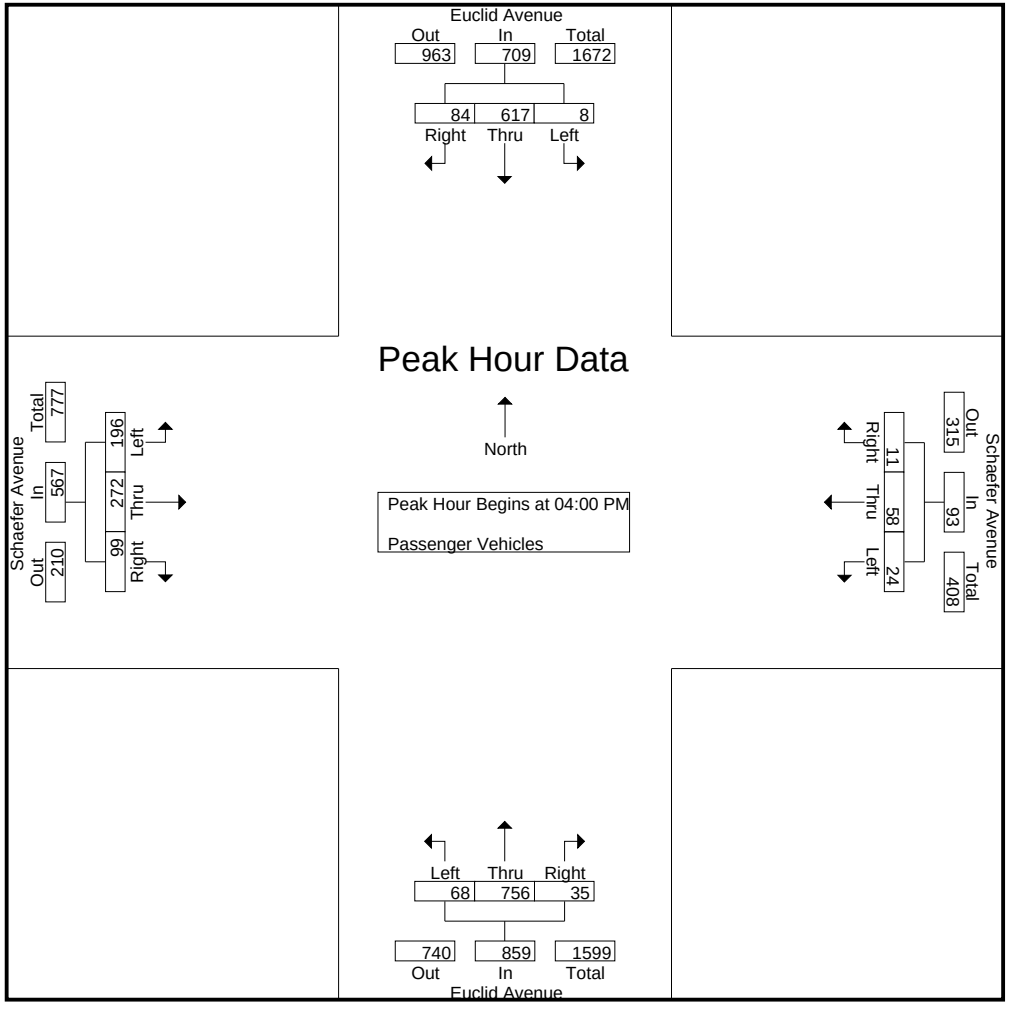

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File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 1 | 129 | 13 | 143 | 5 | **16** | 4 | **25** | 15 | 173 | **9** | 197 | 49 | 67 | 23 | 139 | |
| +15 mins. | **3** | **181** | 21 | **205** | 6 | 16 | 1 | 23 | **21** | 193 | 9 | **223** | 46 | 53 | 24 | 123 | |
| +30 mins. | 1 | 146 | 22 | 169 | **8** | 14 | 1 | 23 | 13 | **201** | 9 | 223 | **55** | **92** | **34** | **181** | |
| +45 mins. | 3 | 161 | **28** | 192 | 5 | 12 | **5** | 22 | 19 | 189 | 8 | 216 | 46 | 60 | 18 | 124 | |
| Total Volume | 8 | 617 | 84 | 709 | 24 | 58 | 11 | 93 | 68 | 756 | 35 | 859 | 196 | 272 | 99 | 567 | |
| % App. Total | 1.1 | 87 | 11.8 | | 25.8 | 62.4 | 11.8 | | 7.9 | 88 | 4.1 | | 34.6 | 48 | 17.5 | | |
| PHF | .667 | .852 | .750 | .865 | .750 | .906 | .550 | .930 | .810 | .940 | .972 | .963 | .891 | .739 | .728 | .783 | |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 2 | 6 | 2 | 0 | 10 | 1 | 1 | 0 | 0 | 2 | 0 | 12 | 1 | 0 | 13 | 0 | 0 | 2 | 1 | 2 | 1 | 27 | 28 |
| 04:15 PM | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 3 | 0 | 12 | 0 | 1 | 1 | 1 | 2 | 1 | 22 | 23 |
| 04:30 PM | 2 | 9 | 2 | 2 | 13 | 1 | 2 | 0 | 0 | 3 | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 1 | 1 | 1 | 3 | 28 | 31 |
| 04:45 PM | 3 | 8 | 1 | 0 | 12 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 1 | 1 | 5 | 3 | 0 | 0 | 0 | 3 | 1 | 21 | 22 |
| Total | 8 | 30 | 5 | 2 | 43 | 2 | 4 | 0 | 0 | 6 | 1 | 35 | 5 | 1 | 41 | 3 | 1 | 4 | 3 | 8 | 6 | 98 | 104 |
| 05:00 PM | 2 | 10 | 1 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 1 | 1 | 1 | 1 | 19 | 20 |
| 05:15 PM | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 1 | 1 | 1 | 2 | 1 | 17 | 18 |
| 05:30 PM | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 2 | 1 | 2 | 1 | 10 | 11 |
| 05:45 PM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 10 | 10 |
| Total | 3 | 21 | 1 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 25 | 1 | 1 | 4 | 3 | 6 | 3 | 56 | 59 |
| Grand Total | 11 | 51 | 6 | 2 | 68 | 2 | 4 | 0 | 0 | 6 | 1 | 60 | 5 | 1 | 66 | 4 | 2 | 8 | 6 | 14 | 9 | 154 | 163 |
| Apprch % | 16.2 | 75 | 8.8 | | | 33.3 | 66.7 | 0 | | | 1.5 | 90.9 | 7.6 | | | 28.6 | 14.3 | 57.1 | | | | | |
| Total % | 7.1 | 33.1 | 3.9 | | 44.2 | 1.3 | 2.6 | 0 | | 3.9 | 0.6 | 39 | 3.2 | | 42.9 | 2.6 | 1.3 | 5.2 | | 9.1 | 5.5 | 94.5 | |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 2 | 6 | **2** | 10 | **1** | 1 | 0 | 2 | 0 | **12** | 1 | **13** | 0 | 0 | **2** | 2 | 27 |
| 04:15 PM | 1 | 7 | 0 | 8 | 0 | 0 | 0 | 0 | **1** | 8 | **3** | 12 | 0 | **1** | 1 | 2 | 22 |
| 04:30 PM | 2 | **9** | 2 | **13** | 1 | **2** | 0 | **3** | 0 | 11 | 0 | 11 | 0 | 0 | 1 | 1 | **28** |
| 04:45 PM | **3** | 8 | 1 | 12 | 0 | 1 | 0 | 1 | 0 | 4 | 1 | 5 | **3** | 0 | 0 | **3** | 21 |
| Total Volume | 8 | 30 | 5 | 43 | 2 | 4 | 0 | 6 | 1 | 35 | 5 | 41 | 3 | 1 | 4 | 8 | 98 |
| % App. Total | 18.6 | 69.8 | 11.6 | | 33.3 | 66.7 | 0 | | 2.4 | 85.4 | 12.2 | | 37.5 | 12.5 | 50 | | |
| PHF | .667 | .833 | .625 | .827 | .500 | .500 | .000 | .500 | .250 | .729 | .417 | .788 | .250 | .250 | .500 | .667 | .875 |

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File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

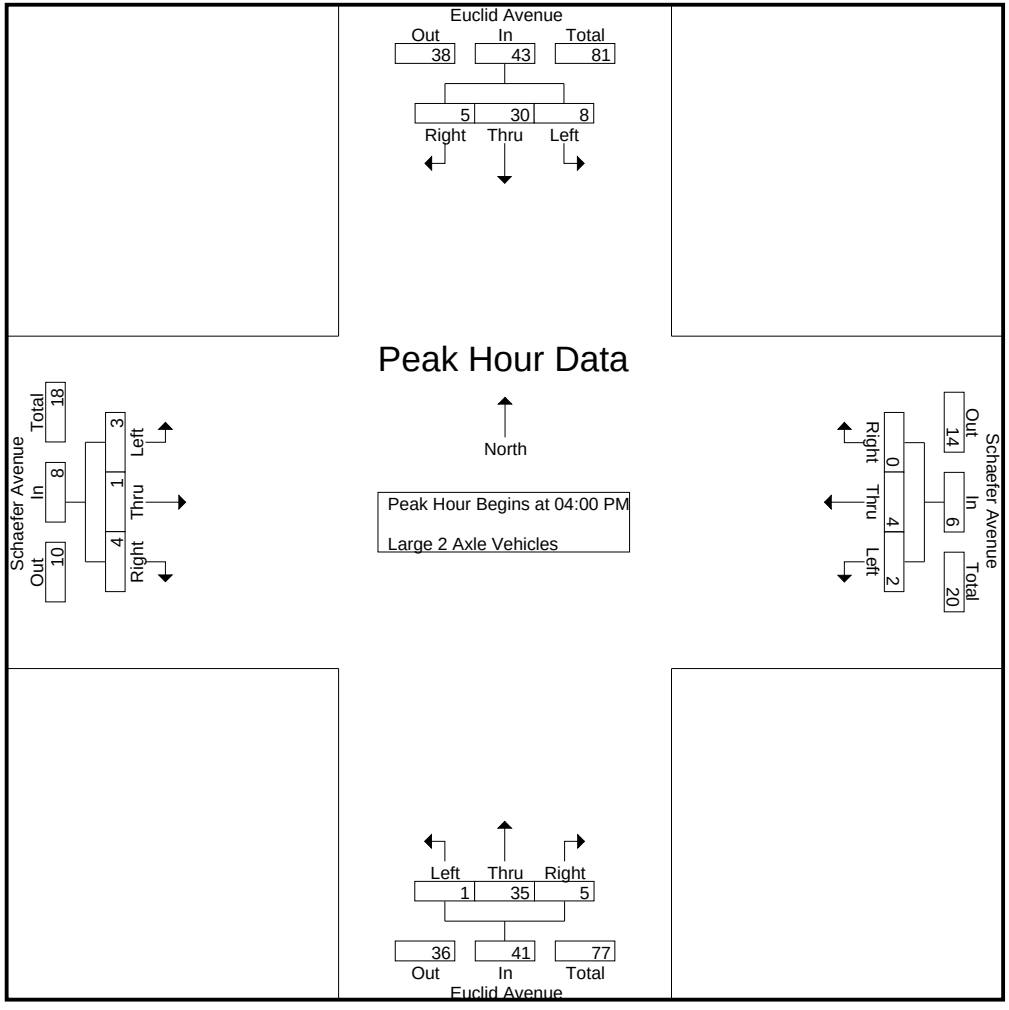

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| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 2 | 6 | **2** | 10 | **1** | 1 | 0 | 2 | 0 | **12** | 1 | **13** | 0 | 0 | **2** | 2 | |
| +15 mins. | 1 | 7 | 0 | 8 | 0 | 0 | 0 | 0 | **1** | 8 | **3** | 12 | 0 | **1** | 1 | 2 | |
| +30 mins. | 2 | **9** | 2 | **13** | 1 | **2** | 0 | **3** | 0 | 11 | 0 | 11 | 0 | 0 | 1 | 1 | |
| +45 mins. | **3** | 8 | 1 | 12 | 0 | 1 | 0 | 1 | 0 | 4 | 1 | 5 | **3** | 0 | 0 | **3** | |
| Total Volume | 8 | 30 | 5 | 43 | 2 | 4 | 0 | 6 | 1 | 35 | 5 | 41 | 3 | 1 | 4 | 8 | |
| % App. Total | 18.6 | 69.8 | 11.6 | | 33.3 | 66.7 | 0 | | 2.4 | 85.4 | 12.2 | | 37.5 | 12.5 | 50 | | |
| PHF | .667 | .833 | .625 | .827 | .500 | .500 | .000 | .500 | .250 | .729 | .417 | .788 | .250 | .250 | .500 | .667 | |

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File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
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Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 11 | 0 | 0 | 12 | 3 | 0 | 1 | 0 | 4 | 0 | 8 | 1 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 26 |
| 04:15 PM | 0 | 5 | 0 | 0 | 5 | 1 | 1 | 1 | 0 | 3 | 0 | 11 | 2 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| 04:30 PM | 0 | 3 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 8 | 2 | 0 | 10 | 0 | 1 | 0 | 0 | 1 | 0 | 15 | 15 |
| 04:45 PM | 2 | 6 | 1 | 1 | 9 | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 15 | 17 |
| Total | 3 | 25 | 1 | 1 | 29 | 6 | 1 | 2 | 0 | 9 | 0 | 31 | 6 | 2 | 37 | 0 | 1 | 0 | 0 | 1 | 3 | 76 | 79 |
| 05:00 PM | 1 | 7 | 2 | 2 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 16 | 18 |
| 05:15 PM | 0 | 5 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 0 | 8 | 2 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 16 | 17 |
| 05:30 PM | 1 | 8 | 1 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 1 | 16 | 17 |
| 05:45 PM | 1 | 10 | 0 | 0 | 11 | 1 | 0 | 3 | 2 | 4 | 0 | 7 | 1 | 1 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 23 | 26 |
| Total | 3 | 30 | 3 | 3 | 36 | 1 | 1 | 3 | 2 | 5 | 0 | 24 | 5 | 2 | 29 | 0 | 1 | 0 | 0 | 1 | 7 | 71 | 78 |
| Grand Total | 6 | 55 | 4 | 4 | 65 | 7 | 2 | 5 | 2 | 14 | 0 | 55 | 11 | 4 | 66 | 0 | 2 | 0 | 0 | 2 | 10 | 147 | 157 |
| Apprch % | 9.2 | 84.6 | 6.2 | | | 50 | 14.3 | 35.7 | | | 0 | 83.3 | 16.7 | | | 0 | 100 | 0 | | | | | |
| Total % | 4.1 | 37.4 | 2.7 | | 44.2 | 4.8 | 1.4 | 3.4 | | 9.5 | 0 | 37.4 | 7.5 | | 44.9 | 0 | 1.4 | 0 | | 1.4 | 6.4 | 93.6 | |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 1 | **11** | 0 | **12** | **3** | 0 | **1** | **4** | 0 | 8 | 1 | 9 | 0 | 0 | 0 | 0 | **25** |
| 04:15 PM | 0 | 5 | 0 | 5 | 1 | **1** | 1 | 3 | 0 | **11** | **2** | **13** | 0 | 0 | 0 | 0 | 21 |
| 04:30 PM | 0 | 3 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 8 | 2 | 10 | 0 | **1** | 0 | **1** | 15 |
| 04:45 PM | **2** | 6 | **1** | 9 | 1 | 0 | 0 | 1 | 0 | 4 | 1 | 5 | 0 | 0 | 0 | 0 | 15 |
| Total Volume | 3 | 25 | 1 | 29 | 6 | 1 | 2 | 9 | 0 | 31 | 6 | 37 | 0 | 1 | 0 | 1 | 76 |
| % App. Total | 10.3 | 86.2 | 3.4 | | 66.7 | 11.1 | 22.2 | | 0 | 83.8 | 16.2 | | 0 | 100 | 0 | | |
| PHF | .375 | .568 | .250 | .604 | .500 | .250 | .500 | .563 | .000 | .705 | .750 | .712 | .000 | .250 | .000 | .250 | .760 |

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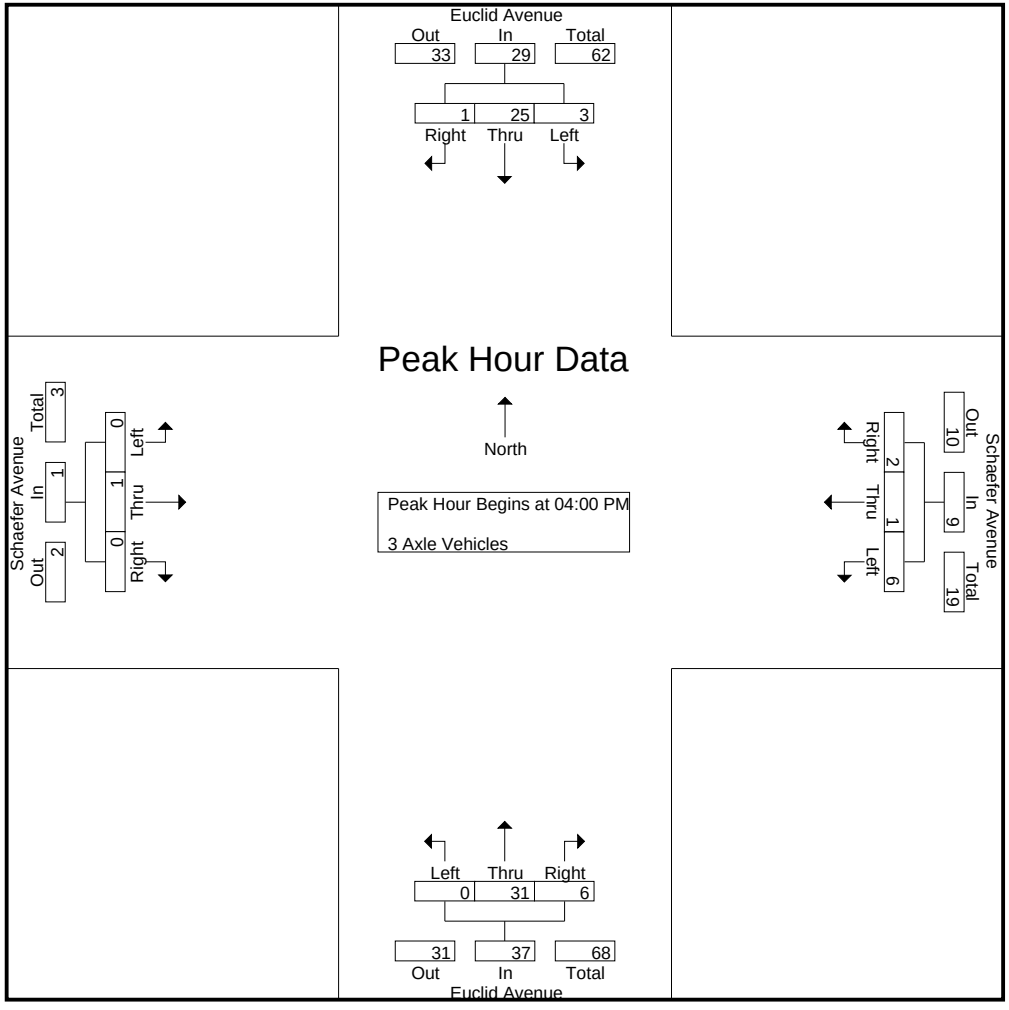

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File Name : 06_ONT_Euc_Sch PMC
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| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 1 | **11** | 0 | **12** | **3** | 0 | **1** | **4** | 0 | 8 | 1 | 9 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 5 | 0 | 5 | 1 | **1** | 1 | 3 | 0 | **11** | **2** | **13** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 3 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 8 | 2 | 10 | 0 | **1** | 0 | **1** | |
| +45 mins. | **2** | 6 | **1** | 9 | 1 | 0 | 0 | 1 | 0 | 4 | 1 | 5 | 0 | 0 | 0 | 0 | |
| Total Volume | 3 | 25 | 1 | 29 | 6 | 1 | 2 | 9 | 0 | 31 | 6 | 37 | 0 | 1 | 0 | 1 | |
| % App. Total | 10.3 | 86.2 | 3.4 | | 66.7 | 11.1 | 22.2 | | 0 | 83.8 | 16.2 | | 0 | 100 | 0 | | |
| PHF | .375 | .568 | .250 | .604 | .500 | .250 | .500 | .563 | .000 | .705 | .750 | .712 | .000 | .250 | .000 | .250 | |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 5 | 23 | 0 | 0 | 28 | 1 | 0 | 3 | 2 | 4 | 0 | 30 | 2 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 2 | 64 | 66 |
| 04:15 PM | 1 | 24 | 0 | 0 | 25 | 0 | 0 | 2 | 0 | 2 | 0 | 32 | 2 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 61 | 61 |
| 04:30 PM | 0 | 14 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 13 | 0 | 1 | 0 | 0 | 1 | 0 | 28 | 28 |
| 04:45 PM | 7 | 18 | 1 | 1 | 26 | 0 | 0 | 2 | 0 | 2 | 0 | 30 | 2 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 1 | 60 | 61 |
| Total | 13 | 79 | 1 | 1 | 93 | 1 | 0 | 7 | 2 | 8 | 0 | 105 | 6 | 0 | 111 | 0 | 1 | 0 | 0 | 1 | 3 | 213 | 216 |
| 05:00 PM | 5 | 13 | 1 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 2 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 43 |
| 05:15 PM | 4 | 10 | 0 | 0 | 14 | 0 | 0 | 1 | 0 | 1 | 1 | 22 | 5 | 0 | 28 | 1 | 1 | 0 | 0 | 2 | 0 | 45 | 45 |
| 05:30 PM | 7 | 13 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 5 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 45 | 45 |
| 05:45 PM | 5 | 9 | 0 | 0 | 14 | 1 | 0 | 0 | 0 | 1 | 0 | 23 | 1 | 0 | 24 | 1 | 0 | 0 | 0 | 1 | 0 | 40 | 40 |
| Total | 21 | 45 | 1 | 0 | 67 | 1 | 0 | 1 | 0 | 2 | 1 | 87 | 13 | 0 | 101 | 2 | 1 | 0 | 0 | 3 | 0 | 173 | 173 |
| Grand Total | 34 | 124 | 2 | 1 | 160 | 2 | 0 | 8 | 2 | 10 | 1 | 192 | 19 | 0 | 212 | 2 | 2 | 0 | 0 | 4 | 3 | 386 | 389 |
| Apprch % | 21.2 | 77.5 | 1.2 | | | 20 | 0 | 80 | | | 0.5 | 90.6 | 9 | | | 50 | 50 | 0 | | | | | |
| Total % | 8.8 | 32.1 | 0.5 | | 41.5 | 0.5 | 0 | 2.1 | | 2.6 | 0.3 | 49.7 | 4.9 | | 54.9 | 0.5 | 0.5 | 0 | | 1 | 0.8 | 99.2 | |

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 5 | 23 | 0 | **28** | **1** | 0 | **3** | **4** | 0 | 30 | **2** | 32 | 0 | 0 | 0 | 0 | **64** |
| 04:15 PM | 1 | **24** | 0 | 25 | 0 | 0 | 2 | 2 | 0 | **32** | 2 | **34** | 0 | 0 | 0 | 0 | 61 |
| 04:30 PM | 0 | 14 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 13 | 0 | **1** | 0 | **1** | 28 |
| 04:45 PM | **7** | 18 | **1** | 26 | 0 | 0 | 2 | 2 | 0 | 30 | 2 | 32 | 0 | 0 | 0 | 0 | 60 |
| Total Volume | 13 | 79 | 1 | 93 | 1 | 0 | 7 | 8 | 0 | 105 | 6 | 111 | 0 | 1 | 0 | 1 | 213 |
| % App. Total | 14 | 84.9 | 1.1 | | 12.5 | 0 | 87.5 | | 0 | 94.6 | 5.4 | | 0 | 100 | 0 | | |
| PHF | .464 | .823 | .250 | .830 | .250 | .000 | .583 | .500 | .000 | .820 | .750 | .816 | .000 | .250 | .000 | .250 | .832 |

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

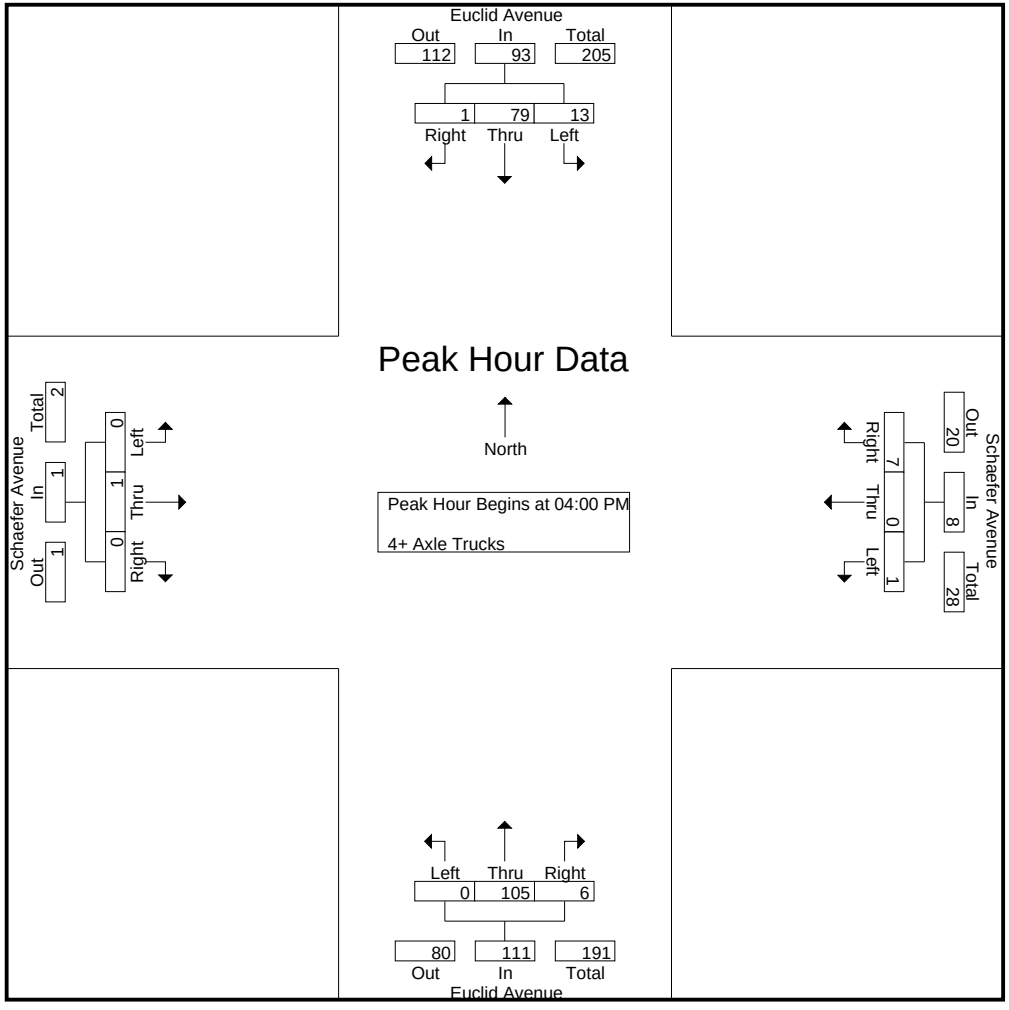

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City of Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 06_ONT_Euc_Sch PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Euclid Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 5 | 23 | 0 | **28** | **1** | 0 | **3** | **4** | 0 | 30 | **2** | 32 | 0 | 0 | 0 | 0 | |
| +15 mins. | 1 | **24** | 0 | 25 | 0 | 0 | 2 | 2 | 0 | **32** | 2 | **34** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 14 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 13 | 0 | **1** | 0 | **1** | |
| +45 mins. | **7** | 18 | **1** | 26 | 0 | 0 | 2 | 2 | 0 | 30 | 2 | 32 | 0 | 0 | 0 | 0 | |
| Total Volume | 13 | 79 | 1 | 93 | 1 | 0 | 7 | 8 | 0 | 105 | 6 | 111 | 0 | 1 | 0 | 1 | |
| % App. Total | 14 | 84.9 | 1.1 | | 12.5 | 0 | 87.5 | | 0 | 94.6 | 5.4 | | 0 | 100 | 0 | | |
| PHF | .464 | .823 | .250 | .830 | .250 | .000 | .583 | .500 | .000 | .820 | .750 | .816 | .000 | .250 | .000 | .250 | |

Location: Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg Schaefer Avenue | South Leg Euclid Avenue | West Leg Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 1 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 1 | 0 | 1 |
| 8:45 AM | 2 | 1 | 0 | 0 | 3 |
| TOTAL VOLUMES: | 2 | 1 | 1 | 1 | 5 |

| | North Leg Euclid Avenue | East Leg Schaefer Avenue | South Leg Euclid Avenue | West Leg Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 1 | 0 | 0 | 0 | 1 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 1 | 0 | 0 | 0 | 1 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Euclid Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound Schaefer Avenue | | | Northbound Euclid Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

| | Southbound Euclid Avenue | | | Westbound Schaefer Avenue | | | Northbound Euclid Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |

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PO Box 1178
Corona, Ca 92878
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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 9 | 171 | 22 | 4 | 202 | 12 | 85 | 9 | 0 | 106 | 14 | 164 | 4 | 1 | 182 | 21 | 27 | 10 | 4 | 58 | 9 | 548 | 557 |
| 07:15 AM | 7 | 155 | 44 | 12 | 206 | 15 | 78 | 9 | 4 | 102 | 21 | 153 | 11 | 4 | 185 | 21 | 28 | 8 | 3 | 57 | 23 | 550 | 573 |
| 07:30 AM | 8 | 186 | 26 | 6 | 220 | 16 | 71 | 19 | 3 | 106 | 39 | 198 | 9 | 4 | 246 | 15 | 36 | 13 | 6 | 64 | 19 | 636 | 655 |
| 07:45 AM | 20 | 179 | 24 | 6 | 223 | 12 | 69 | 17 | 1 | 98 | 54 | 164 | 17 | 2 | 235 | 21 | 38 | 12 | 6 | 71 | 15 | 627 | 642 |
| Total | 44 | 691 | 116 | 28 | 851 | 55 | 303 | 54 | 8 | 412 | 128 | 679 | 41 | 11 | 848 | 78 | 129 | 43 | 19 | 250 | 66 | 2361 | 2427 |
| 08:00 AM | 9 | 137 | 36 | 10 | 182 | 12 | 77 | 12 | 1 | 101 | 28 | 173 | 25 | 6 | 226 | 18 | 33 | 18 | 11 | 69 | 28 | 578 | 606 |
| 08:15 AM | 9 | 146 | 22 | 10 | 177 | 15 | 56 | 16 | 3 | 87 | 48 | 143 | 13 | 4 | 204 | 19 | 36 | 19 | 10 | 74 | 27 | 542 | 569 |
| 08:30 AM | 10 | 181 | 26 | 8 | 217 | 15 | 54 | 9 | 1 | 78 | 29 | 169 | 21 | 4 | 219 | 19 | 34 | 19 | 8 | 72 | 21 | 586 | 607 |
| 08:45 AM | 9 | 131 | 25 | 2 | 165 | 16 | 58 | 15 | 2 | 89 | 39 | 177 | 17 | 5 | 233 | 15 | 29 | 19 | 14 | 63 | 23 | 550 | 573 |
| Total | 37 | 595 | 109 | 30 | 741 | 58 | 245 | 52 | 7 | 355 | 144 | 662 | 76 | 19 | 882 | 71 | 132 | 75 | 43 | 278 | 99 | 2256 | 2355 |
| Grand Total | 81 | 1286 | 225 | 58 | 1592 | 113 | 548 | 106 | 15 | 767 | 272 | 1341 | 117 | 30 | 1730 | 149 | 261 | 118 | 62 | 528 | 165 | 4617 | 4782 |
| Apprch % | 5.1 | 80.8 | 14.1 | | | 14.7 | 71.4 | 13.8 | | | 15.7 | 77.5 | 6.8 | | | 28.2 | 49.4 | 22.3 | | | | | |
| Total % | 1.8 | 27.9 | 4.9 | | 34.5 | 2.4 | 11.9 | 2.3 | | 16.6 | 5.9 | 29 | 2.5 | | 37.5 | 3.2 | 5.7 | 2.6 | | 11.4 | 3.5 | 96.5 | |
| Passenger Vehicles | 56 | 1074 | 115 | | 1283 | 68 | 500 | 59 | | 632 | 243 | 1169 | 86 | | 1521 | 42 | 222 | 102 | | 423 | 0 | 0 | 3859 |
| % Passenger Vehicles | 69.1 | 83.5 | 51.1 | 65.5 | 77.8 | 60.2 | 91.2 | 55.7 | 33.3 | 80.8 | 89.3 | 87.2 | 73.5 | 76.7 | 86.4 | 28.2 | 85.1 | 86.4 | 91.9 | 71.7 | 0 | 0 | 80.7 |
| Large 2 Axle Vehicles | 4 | 58 | 17 | | 84 | 3 | 13 | 6 | | 25 | 8 | 38 | 5 | | 55 | 18 | 17 | 3 | | 40 | 0 | 0 | 204 |
| % Large 2 Axle Vehicles | 4.9 | 4.5 | 7.6 | 8.6 | 5.1 | 2.7 | 2.4 | 5.7 | 20 | 3.2 | 2.9 | 2.8 | 4.3 | 13.3 | 3.1 | 12.1 | 6.5 | 2.5 | 3.2 | 6.8 | 0 | 0 | 4.3 |
| 3 Axle Vehicles | 5 | 34 | 20 | | 65 | 14 | 6 | 9 | | 31 | 4 | 19 | 4 | | 27 | 12 | 5 | 5 | | 23 | 0 | 0 | 146 |
| % 3 Axle Vehicles | 6.2 | 2.6 | 8.9 | 10.3 | 3.9 | 12.4 | 1.1 | 8.5 | 13.3 | 4 | 1.5 | 1.4 | 3.4 | 0 | 1.5 | 8.1 | 1.9 | 4.2 | 1.6 | 3.9 | 0 | 0 | 3.1 |
| 4+ Axle Trucks | 16 | 120 | 73 | | 218 | 28 | 29 | 32 | | 94 | 17 | 115 | 22 | | 157 | 77 | 17 | 8 | | 104 | 0 | 0 | 573 |
| % 4+ Axle Trucks | 19.8 | 9.3 | 32.4 | 15.5 | 13.2 | 24.8 | 5.3 | 30.2 | 33.3 | 12 | 6.2 | 8.6 | 18.8 | 10 | 8.9 | 51.7 | 6.5 | 6.8 | 3.2 | 17.6 | 0 | 0 | 12 |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 7 | 155 | **44** | 206 | 15 | **78** | 9 | 102 | 21 | 153 | 11 | 185 | **21** | 28 | 8 | 57 | 550 |
| 07:30 AM | 8 | **186** | 26 | 220 | **16** | 71 | **19** | **106** | 39 | **198** | 9 | **246** | 15 | 36 | 13 | 64 | **636** |
| 07:45 AM | **20** | 179 | 24 | **223** | 12 | 69 | 17 | 98 | **54** | 164 | 17 | 235 | 21 | **38** | 12 | **71** | 627 |
| 08:00 AM | 9 | 137 | 36 | 182 | 12 | 77 | 12 | 101 | 28 | 173 | **25** | 226 | 18 | 33 | **18** | 69 | 578 |
| Total Volume | 44 | 657 | 130 | 831 | 55 | 295 | 57 | 407 | 142 | 688 | 62 | 892 | 75 | 135 | 51 | 261 | 2391 |
| % App. Total | 5.3 | 79.1 | 15.6 | | 13.5 | 72.5 | 14 | | 15.9 | 77.1 | 7 | | 28.7 | 51.7 | 19.5 | | |
| PHF | .550 | .883 | .739 | .932 | .859 | .946 | .750 | .960 | .657 | .869 | .620 | .907 | .893 | .888 | .708 | .919 | .940 |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

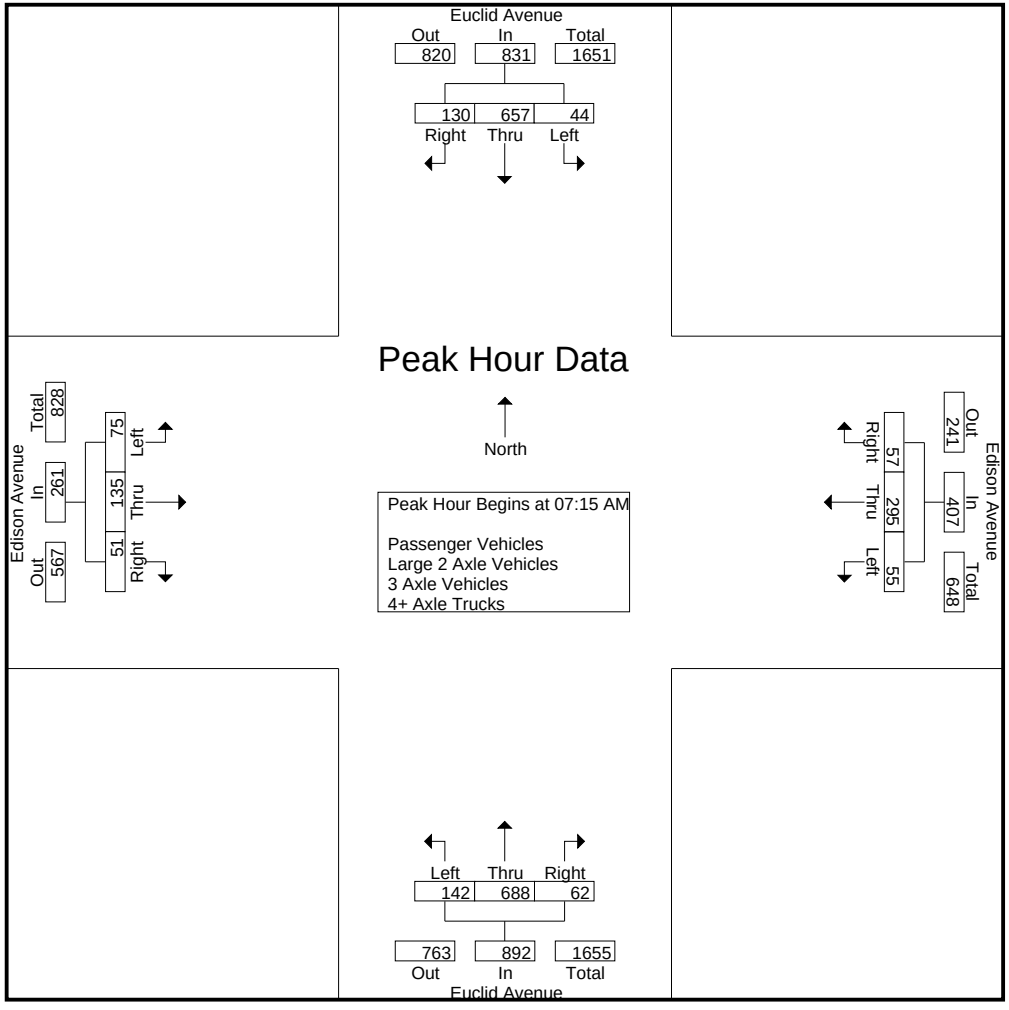

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:30 AM | | | | 07:45 AM | | | | |
| +0 mins. | 9 | 171 | 22 | 202 | 12 | **85** | 9 | **106** | 39 | **198** | 9 | **246** | **21** | **38** | 12 | 71 | |
| +15 mins. | 7 | 155 | **44** | 206 | 15 | 78 | 9 | 102 | **54** | 164 | 17 | 235 | 18 | 33 | 18 | 69 | |
| +30 mins. | 8 | **186** | 26 | 220 | **16** | 71 | **19** | 106 | 28 | 173 | **25** | 226 | 19 | 36 | **19** | **74** | |
| +45 mins. | **20** | 179 | 24 | **223** | 12 | 69 | 17 | 98 | 48 | 143 | 13 | 204 | 19 | 34 | 19 | 72 | |
| Total Volume | 44 | 691 | 116 | 851 | 55 | 303 | 54 | 412 | 169 | 678 | 64 | 911 | 77 | 141 | 68 | 286 | |
| % App. Total | 5.2 | 81.2 | 13.6 | | 13.3 | 73.5 | 13.1 | | 18.6 | 74.4 | 7 | | 26.9 | 49.3 | 23.8 | | |
| PHF | .550 | .929 | .659 | .954 | .859 | .891 | .711 | .972 | .782 | .856 | .640 | .926 | .917 | .928 | .895 | .966 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 4 | 141 | 12 | 3 | 157 | 7 | 76 | 8 | 0 | 91 | 14 | 153 | 1 | 0 | 168 | 4 | 21 | 10 | 4 | 35 | 7 | 451 | 458 |
| 07:15 AM | 5 | 138 | 30 | 10 | 173 | 12 | 70 | 4 | 1 | 86 | 17 | 136 | 9 | 4 | 162 | 5 | 24 | 7 | 3 | 36 | 18 | 457 | 475 |
| 07:30 AM | 8 | 156 | 14 | 5 | 178 | 7 | 62 | 9 | 0 | 78 | 32 | 177 | 8 | 4 | 217 | 5 | 31 | 9 | 6 | 45 | 15 | 518 | 533 |
| 07:45 AM | 13 | 147 | 9 | 4 | 169 | 7 | 65 | 10 | 1 | 82 | 51 | 141 | 14 | 1 | 206 | 3 | 33 | 12 | 6 | 48 | 12 | 505 | 517 |
| Total | 30 | 582 | 65 | 22 | 677 | 33 | 273 | 31 | 2 | 337 | 114 | 607 | 32 | 9 | 753 | 17 | 109 | 38 | 19 | 164 | 52 | 1931 | 1983 |
| 08:00 AM | 5 | 115 | 18 | 5 | 138 | 10 | 71 | 6 | 0 | 87 | 22 | 151 | 17 | 3 | 190 | 6 | 27 | 16 | 11 | 49 | 19 | 464 | 483 |
| 08:15 AM | 6 | 119 | 9 | 4 | 134 | 6 | 53 | 10 | 2 | 69 | 46 | 115 | 10 | 3 | 171 | 5 | 29 | 15 | 9 | 49 | 18 | 423 | 441 |
| 08:30 AM | 7 | 152 | 12 | 5 | 171 | 10 | 47 | 5 | 1 | 62 | 26 | 152 | 15 | 3 | 193 | 10 | 30 | 17 | 6 | 57 | 15 | 483 | 498 |
| 08:45 AM | 8 | 106 | 11 | 2 | 125 | 9 | 56 | 7 | 0 | 72 | 35 | 144 | 12 | 5 | 191 | 4 | 27 | 16 | 12 | 47 | 19 | 435 | 454 |
| Total | 26 | 492 | 50 | 16 | 568 | 35 | 227 | 28 | 3 | 290 | 129 | 562 | 54 | 14 | 745 | 25 | 113 | 64 | 38 | 202 | 71 | 1805 | 1876 |
| Grand Total | 56 | 1074 | 115 | 38 | 1245 | 68 | 500 | 59 | 5 | 627 | 243 | 1169 | 86 | 23 | 1498 | 42 | 222 | 102 | 57 | 366 | 123 | 3736 | 3859 |
| Apprch % | 4.5 | 86.3 | 9.2 | | | 10.8 | 79.7 | 9.4 | | | 16.2 | 78 | 5.7 | | | 11.5 | 60.7 | 27.9 | | | | | |
| Total % | 1.5 | 28.7 | 3.1 | | 33.3 | 1.8 | 13.4 | 1.6 | | 16.8 | 6.5 | 31.3 | 2.3 | | 40.1 | 1.1 | 5.9 | 2.7 | | 9.8 | 3.2 | 96.8 | |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 5 | 138 | **30** | 173 | **12** | 70 | 4 | 86 | 17 | 136 | 9 | 162 | 5 | 24 | 7 | 36 | 457 |
| 07:30 AM | 8 | **156** | 14 | **178** | 7 | 62 | 9 | 78 | 32 | **177** | 8 | **217** | 5 | 31 | 9 | 45 | **518** |
| 07:45 AM | **13** | 147 | 9 | 169 | 7 | 65 | **10** | 82 | **51** | 141 | 14 | 206 | 3 | **33** | 12 | 48 | 505 |
| 08:00 AM | 5 | 115 | 18 | 138 | 10 | **71** | 6 | **87** | 22 | 151 | **17** | 190 | **6** | 27 | **16** | **49** | 464 |
| Total Volume | 31 | 556 | 71 | 658 | 36 | 268 | 29 | 333 | 122 | 605 | 48 | 775 | 19 | 115 | 44 | 178 | 1944 |
| % App. Total | 4.7 | 84.5 | 10.8 | | 10.8 | 80.5 | 8.7 | | 15.7 | 78.1 | 6.2 | | 10.7 | 64.6 | 24.7 | | |
| PHF | .596 | .891 | .592 | .924 | .750 | .944 | .725 | .957 | .598 | .855 | .706 | .893 | .792 | .871 | .688 | .908 | .938 |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

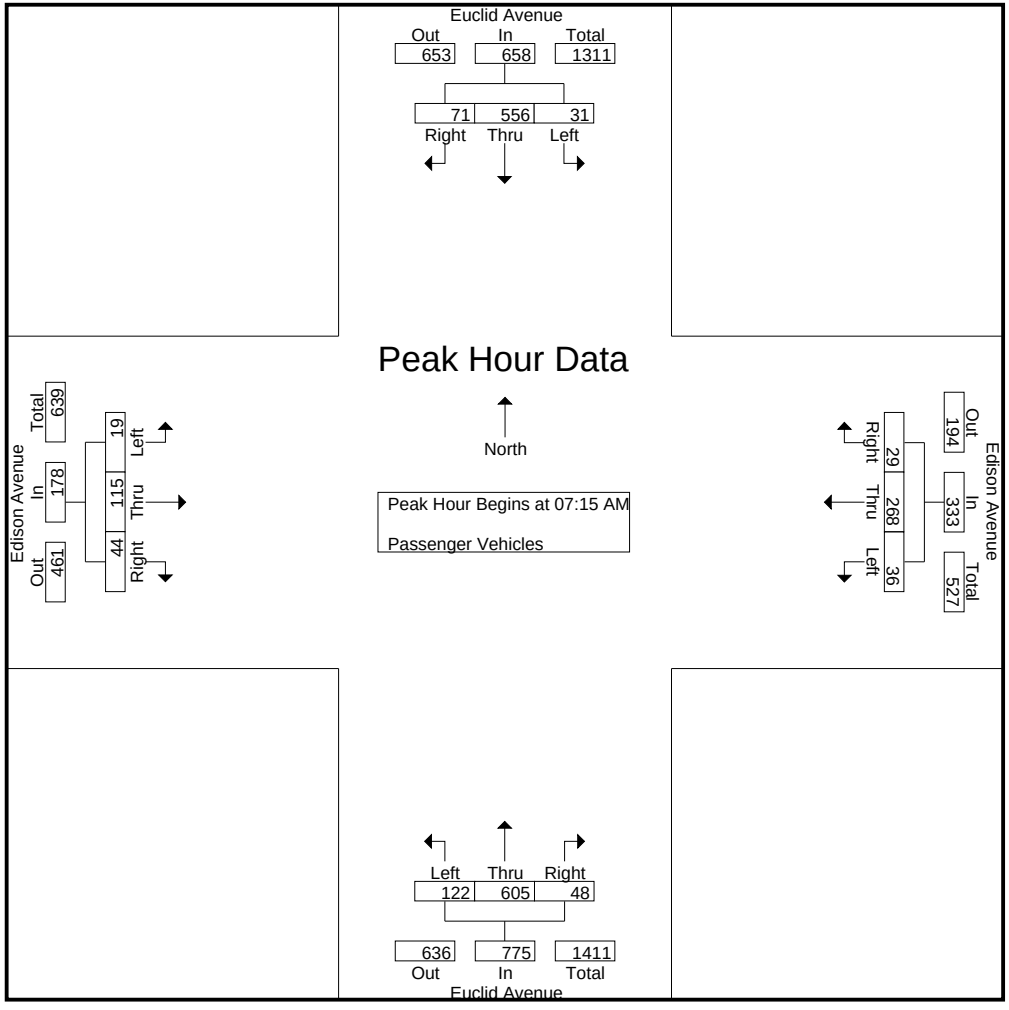

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 5 | 138 | **30** | 173 | **12** | 70 | 4 | 86 | 17 | 136 | 9 | 162 | 5 | 24 | 7 | 36 | |
| +15 mins. | 8 | **156** | 14 | **178** | 7 | 62 | 9 | 78 | 32 | **177** | 8 | **217** | 5 | 31 | 9 | 45 | |
| +30 mins. | **13** | 147 | 9 | 169 | 7 | 65 | **10** | 82 | **51** | 141 | 14 | 206 | 3 | **33** | 12 | 48 | |
| +45 mins. | 5 | 115 | 18 | 138 | 10 | **71** | 6 | **87** | 22 | 151 | **17** | 190 | **6** | 27 | **16** | **49** | |
| Total Volume | 31 | 556 | 71 | 658 | 36 | 268 | 29 | 333 | 122 | 605 | 48 | 775 | 19 | 115 | 44 | 178 | |
| % App. Total | 4.7 | 84.5 | 10.8 | | 10.8 | 80.5 | 8.7 | | 15.7 | 78.1 | 6.2 | | 10.7 | 64.6 | 24.7 | | |
| PHF | .596 | .891 | .592 | .924 | .750 | .944 | .725 | .957 | .598 | .855 | .706 | .893 | .792 | .871 | .688 | .908 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 10 | 2 | 1 | 13 | 0 | 4 | 0 | 0 | 4 | 0 | 3 | 0 | 0 | 3 | 3 | 4 | 0 | 0 | 7 | 1 | 27 | 28 |
| 07:15 AM | 0 | 5 | 2 | 1 | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 6 | 1 | 0 | 7 | 3 | 2 | 0 | 0 | 5 | 1 | 20 | 21 |
| 07:30 AM | 0 | 4 | 1 | 0 | 5 | 0 | 3 | 3 | 2 | 6 | 0 | 5 | 0 | 0 | 5 | 1 | 1 | 1 | 0 | 3 | 2 | 19 | 21 |
| 07:45 AM | 0 | 14 | 2 | 2 | 16 | 1 | 1 | 1 | 0 | 3 | 2 | 4 | 1 | 1 | 7 | 1 | 1 | 0 | 0 | 2 | 3 | 28 | 31 |
| Total | 1 | 33 | 7 | 4 | 41 | 1 | 9 | 4 | 2 | 14 | 2 | 18 | 2 | 1 | 22 | 8 | 8 | 1 | 0 | 17 | 7 | 94 | 101 |
| 08:00 AM | 0 | 7 | 4 | 0 | 11 | 0 | 1 | 0 | 0 | 1 | 1 | 4 | 2 | 2 | 7 | 1 | 2 | 0 | 0 | 3 | 2 | 22 | 24 |
| 08:15 AM | 1 | 7 | 4 | 1 | 12 | 1 | 0 | 0 | 0 | 1 | 1 | 8 | 0 | 0 | 9 | 1 | 4 | 0 | 0 | 5 | 1 | 27 | 28 |
| 08:30 AM | 1 | 5 | 0 | 0 | 6 | 1 | 3 | 0 | 0 | 4 | 1 | 1 | 1 | 1 | 3 | 5 | 1 | 1 | 1 | 7 | 2 | 20 | 22 |
| 08:45 AM | 1 | 6 | 2 | 0 | 9 | 0 | 0 | 2 | 1 | 2 | 3 | 7 | 0 | 0 | 10 | 3 | 2 | 1 | 1 | 6 | 2 | 27 | 29 |
| Total | 3 | 25 | 10 | 1 | 38 | 2 | 4 | 2 | 1 | 8 | 6 | 20 | 3 | 3 | 29 | 10 | 9 | 2 | 2 | 21 | 7 | 96 | 103 |
| Grand Total | 4 | 58 | 17 | 5 | 79 | 3 | 13 | 6 | 3 | 22 | 8 | 38 | 5 | 4 | 51 | 18 | 17 | 3 | 2 | 38 | 14 | 190 | 204 |
| Apprch % | 5.1 | 73.4 | 21.5 | | | 13.6 | 59.1 | 27.3 | | | 15.7 | 74.5 | 9.8 | | | 47.4 | 44.7 | 7.9 | | | | | |
| Total % | 2.1 | 30.5 | 8.9 | | 41.6 | 1.6 | 6.8 | 3.2 | | 11.6 | 4.2 | 20 | 2.6 | | 26.8 | 9.5 | 8.9 | 1.6 | | 20 | 6.9 | 93.1 | |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 5 | 2 | 7 | 0 | 1 | 0 | 1 | 0 | **6** | 1 | **7** | **3** | **2** | 0 | **5** | 20 |
| 07:30 AM | 0 | 4 | 1 | 5 | 0 | **3** | **3** | **6** | 0 | 5 | 0 | 5 | 1 | 1 | **1** | 3 | 19 |
| 07:45 AM | 0 | **14** | 2 | **16** | **1** | 1 | 1 | 3 | **2** | 4 | 1 | 7 | 1 | 1 | 0 | 2 | **28** |
| 08:00 AM | 0 | 7 | **4** | 11 | 0 | 1 | 0 | 1 | 1 | 4 | **2** | 7 | 1 | 2 | 0 | 3 | 22 |
| Total Volume | 0 | 30 | 9 | 39 | 1 | 6 | 4 | 11 | 3 | 19 | 4 | 26 | 6 | 6 | 1 | 13 | 89 |
| % App. Total | 0 | 76.9 | 23.1 | | 9.1 | 54.5 | 36.4 | | 11.5 | 73.1 | 15.4 | | 46.2 | 46.2 | 7.7 | | |
| PHF | .000 | .536 | .563 | .609 | .250 | .500 | .333 | .458 | .375 | .792 | .500 | .929 | .500 | .750 | .250 | .650 | .795 |

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Corona, CA 92878
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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

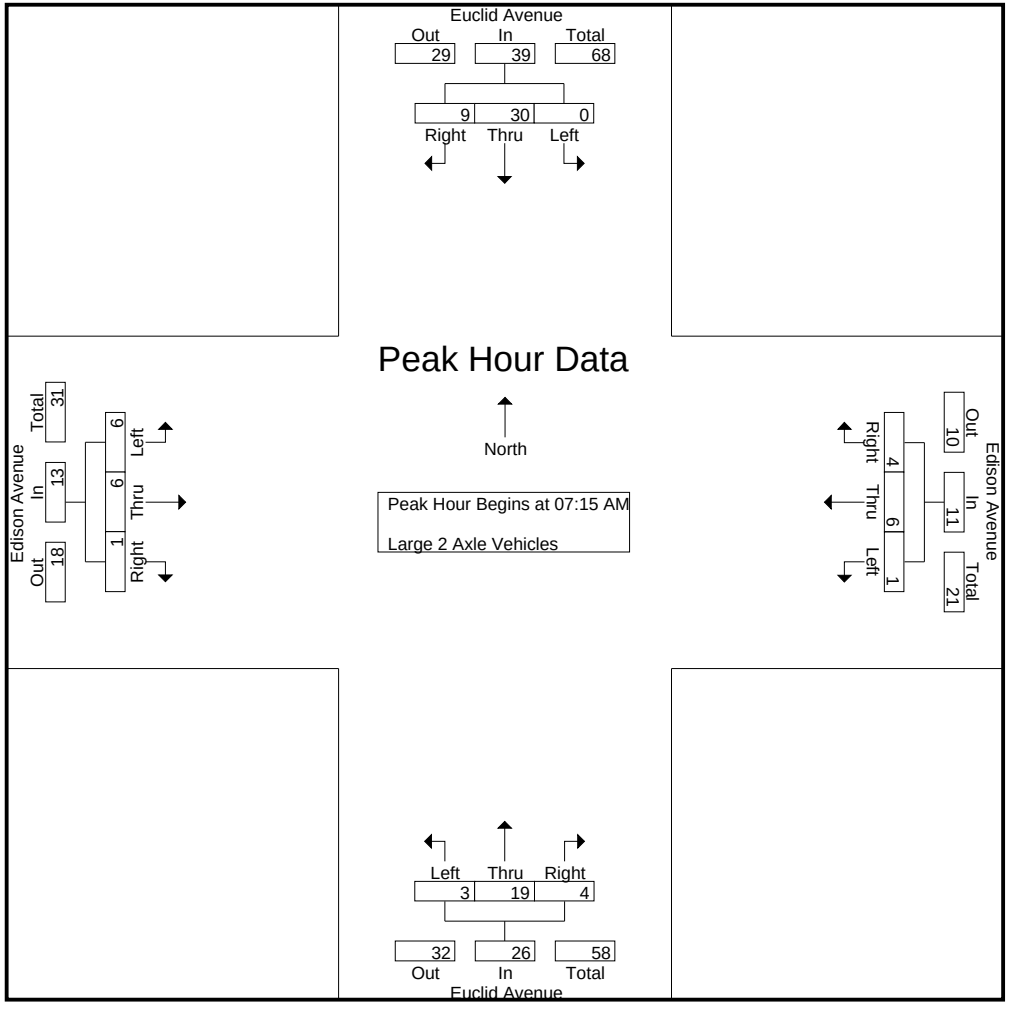

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | 5 | 2 | 7 | 0 | 1 | 0 | 1 | 0 | **6** | 1 | **7** | **3** | **2** | 0 | **5** | |
| +15 mins. | 0 | 4 | 1 | 5 | 0 | **3** | **3** | **6** | 0 | 5 | 0 | 5 | 1 | 1 | **1** | 3 | |
| +30 mins. | 0 | **14** | 2 | **16** | **1** | 1 | 1 | 3 | **2** | 4 | 1 | 7 | 1 | 1 | 0 | 2 | |
| +45 mins. | 0 | 7 | **4** | 11 | 0 | 1 | 0 | 1 | 1 | 4 | **2** | 7 | 1 | 2 | 0 | 3 | |
| Total Volume | 0 | 30 | 9 | 39 | 1 | 6 | 4 | 11 | 3 | 19 | 4 | 26 | 6 | 6 | 1 | 13 | |
| % App. Total | 0 | 76.9 | 23.1 | | 9.1 | 54.5 | 36.4 | | 11.5 | 73.1 | 15.4 | | 46.2 | 46.2 | 7.7 | | |
| PHF | .000 | .536 | .563 | .609 | .250 | .500 | .333 | .458 | .375 | .792 | .500 | .929 | .500 | .750 | .250 | .650 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 7 | 2 | 0 | 12 | 1 | 1 | 0 | 0 | 2 | 0 | 4 | 0 | 0 | 4 | 4 | 2 | 0 | 0 | 6 | 0 | 24 | 24 |
| 07:15 AM | 0 | 4 | 4 | 1 | 8 | 1 | 2 | 1 | 1 | 4 | 0 | 2 | 0 | 0 | 2 | 4 | 0 | 1 | 0 | 5 | 2 | 19 | 21 |
| 07:30 AM | 0 | 6 | 4 | 1 | 10 | 2 | 1 | 1 | 0 | 4 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 2 | 0 | 2 | 1 | 20 | 21 |
| 07:45 AM | 1 | 5 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 1 | 0 | 12 | 12 |
| Total | 4 | 22 | 10 | 2 | 36 | 5 | 4 | 2 | 1 | 11 | 2 | 12 | 0 | 0 | 14 | 8 | 3 | 3 | 0 | 14 | 3 | 75 | 78 |
| 08:00 AM | 0 | 4 | 2 | 2 | 6 | 0 | 1 | 1 | 0 | 2 | 1 | 2 | 2 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 2 | 14 | 16 |
| 08:15 AM | 1 | 5 | 2 | 1 | 8 | 3 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 2 | 3 | 1 | 1 | 0 | 5 | 1 | 18 | 19 |
| 08:30 AM | 0 | 1 | 3 | 1 | 4 | 2 | 0 | 1 | 0 | 3 | 1 | 1 | 2 | 0 | 4 | 0 | 1 | 0 | 0 | 1 | 1 | 12 | 13 |
| 08:45 AM | 0 | 2 | 3 | 0 | 5 | 4 | 1 | 5 | 1 | 10 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 18 | 20 |
| Total | 1 | 12 | 10 | 4 | 23 | 9 | 2 | 7 | 1 | 18 | 2 | 7 | 4 | 0 | 13 | 4 | 2 | 2 | 1 | 8 | 6 | 62 | 68 |
| Grand Total | 5 | 34 | 20 | 6 | 59 | 14 | 6 | 9 | 2 | 29 | 4 | 19 | 4 | 0 | 27 | 12 | 5 | 5 | 1 | 22 | 9 | 137 | 146 |
| Apprch % | 8.5 | 57.6 | 33.9 | | | 48.3 | 20.7 | 31 | | | 14.8 | 70.4 | 14.8 | | | 54.5 | 22.7 | 22.7 | | | | | |
| Total % | 3.6 | 24.8 | 14.6 | | 43.1 | 10.2 | 4.4 | 6.6 | | 21.2 | 2.9 | 13.9 | 2.9 | | 19.7 | 8.8 | 3.6 | 3.6 | | 16.1 | 6.2 | 93.8 | |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 4 | **4** | 8 | 1 | **2** | **1** | **4** | 0 | 2 | 0 | 2 | **4** | 0 | 1 | **5** | 19 |
| 07:30 AM | 0 | **6** | 4 | **10** | **2** | 1 | 1 | 4 | **2** | 2 | 0 | 4 | 0 | 0 | **2** | 2 | **20** |
| 07:45 AM | **1** | 5 | 0 | 6 | 1 | 0 | 0 | 1 | 0 | **4** | 0 | 4 | 0 | **1** | 0 | 1 | 12 |
| 08:00 AM | 0 | 4 | 2 | 6 | 0 | 1 | 1 | 2 | 1 | 2 | **2** | **5** | 1 | 0 | 0 | 1 | 14 |
| Total Volume | 1 | 19 | 10 | 30 | 4 | 4 | 3 | 11 | 3 | 10 | 2 | 15 | 5 | 1 | 3 | 9 | 65 |
| % App. Total | 3.3 | 63.3 | 33.3 | | 36.4 | 36.4 | 27.3 | | 20 | 66.7 | 13.3 | | 55.6 | 11.1 | 33.3 | | |
| PHF | .250 | .792 | .625 | .750 | .500 | .500 | .750 | .688 | .375 | .625 | .250 | .750 | .313 | .250 | .375 | .450 | .813 |

Counts Unlimited, Inc.
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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

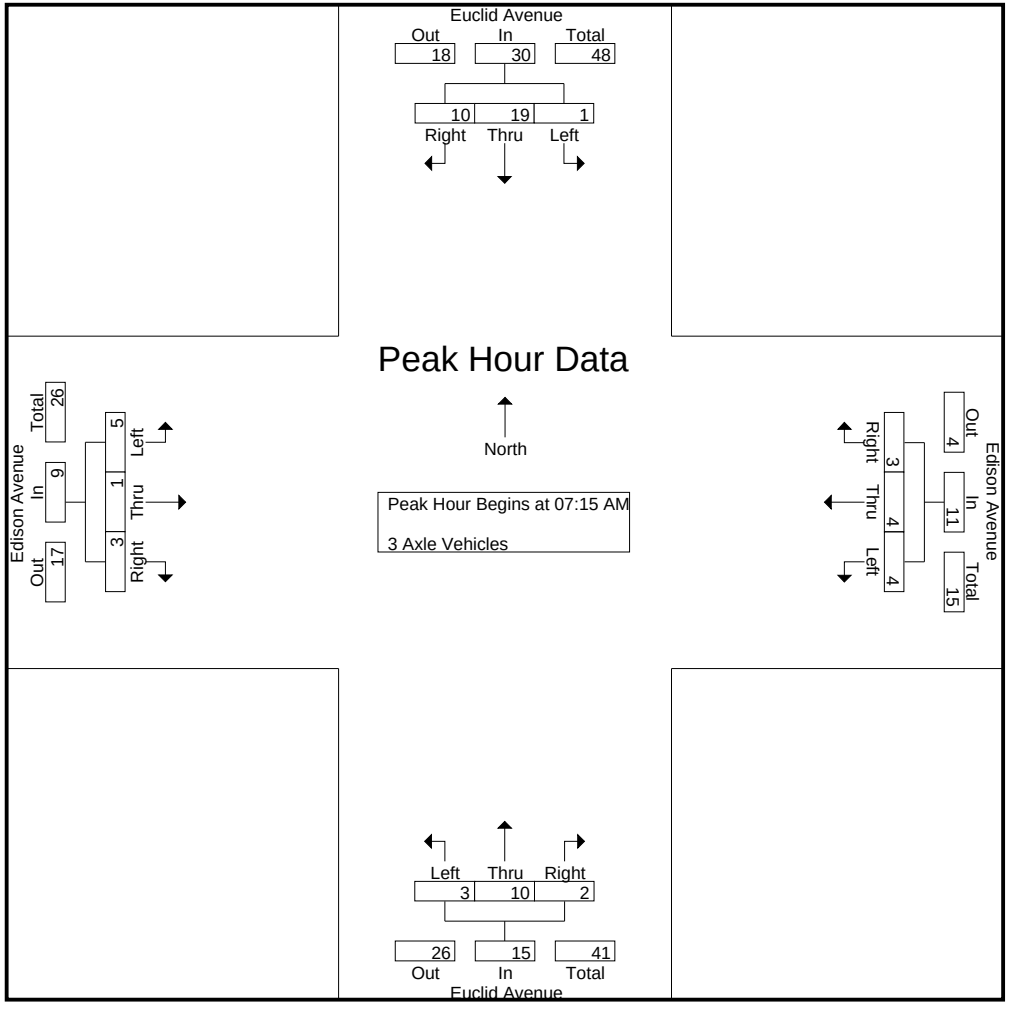

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | 4 | **4** | 8 | 1 | **2** | **1** | **4** | 0 | 2 | 0 | 2 | **4** | 0 | 1 | **5** | |
| +15 mins. | 0 | **6** | 4 | **10** | **2** | 1 | 1 | 4 | **2** | 2 | 0 | 4 | 0 | 0 | **2** | 2 | |
| +30 mins. | **1** | 5 | 0 | 6 | 1 | 0 | 0 | 1 | 0 | **4** | 0 | 4 | 0 | **1** | 0 | 1 | |
| +45 mins. | 0 | 4 | 2 | 6 | 0 | 1 | 1 | 2 | 1 | 2 | **2** | **5** | 1 | 0 | 0 | 1 | |
| Total Volume | 1 | 19 | 10 | 30 | 4 | 4 | 3 | 11 | 3 | 10 | 2 | 15 | 5 | 1 | 3 | 9 | |
| % App. Total | 3.3 | 63.3 | 33.3 | | 36.4 | 36.4 | 27.3 | | 20 | 66.7 | 13.3 | | 55.6 | 11.1 | 33.3 | | |
| PHF | .250 | .792 | .625 | .750 | .500 | .500 | .750 | .688 | .375 | .625 | .250 | .750 | .313 | .250 | .375 | .450 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 13 | 6 | 0 | 20 | 4 | 4 | 1 | 0 | 9 | 0 | 4 | 3 | 1 | 7 | 10 | 0 | 0 | 0 | 10 | 1 | 46 | 47 |
| 07:15 AM | 2 | 8 | 8 | 0 | 18 | 2 | 5 | 4 | 2 | 11 | 4 | 9 | 1 | 0 | 14 | 9 | 2 | 0 | 0 | 11 | 2 | 54 | 56 |
| 07:30 AM | 0 | 20 | 7 | 0 | 27 | 7 | 5 | 6 | 1 | 18 | 5 | 14 | 1 | 0 | 20 | 9 | 4 | 1 | 0 | 14 | 1 | 79 | 80 |
| 07:45 AM | 6 | 13 | 13 | 0 | 32 | 3 | 3 | 6 | 0 | 12 | 1 | 15 | 2 | 0 | 18 | 17 | 3 | 0 | 0 | 20 | 0 | 82 | 82 |
| Total | 9 | 54 | 34 | 0 | 97 | 16 | 17 | 17 | 3 | 50 | 10 | 42 | 7 | 1 | 59 | 45 | 9 | 1 | 0 | 55 | 4 | 261 | 265 |
| 08:00 AM | 4 | 11 | 12 | 3 | 27 | 2 | 4 | 5 | 1 | 11 | 4 | 16 | 4 | 1 | 24 | 10 | 4 | 2 | 0 | 16 | 5 | 78 | 83 |
| 08:15 AM | 1 | 15 | 7 | 4 | 23 | 5 | 3 | 6 | 1 | 14 | 1 | 18 | 3 | 1 | 22 | 10 | 2 | 3 | 1 | 15 | 7 | 74 | 81 |
| 08:30 AM | 2 | 23 | 11 | 2 | 36 | 2 | 4 | 3 | 0 | 9 | 1 | 15 | 3 | 0 | 19 | 4 | 2 | 1 | 1 | 7 | 3 | 71 | 74 |
| 08:45 AM | 0 | 17 | 9 | 0 | 26 | 3 | 1 | 1 | 0 | 5 | 1 | 24 | 5 | 0 | 30 | 8 | 0 | 1 | 0 | 9 | 0 | 70 | 70 |
| Total | 7 | 66 | 39 | 9 | 112 | 12 | 12 | 15 | 2 | 39 | 7 | 73 | 15 | 2 | 95 | 32 | 8 | 7 | 2 | 47 | 15 | 293 | 308 |
| Grand Total | 16 | 120 | 73 | 9 | 209 | 28 | 29 | 32 | 5 | 89 | 17 | 115 | 22 | 3 | 154 | 77 | 17 | 8 | 2 | 102 | 19 | 554 | 573 |
| Apprch % | 7.7 | 57.4 | 34.9 | | | 31.5 | 32.6 | 36 | | | 11 | 74.7 | 14.3 | | | 75.5 | 16.7 | 7.8 | | | | | |
| Total % | 2.9 | 21.7 | 13.2 | | 37.7 | 5.1 | 5.2 | 5.8 | | 16.1 | 3.1 | 20.8 | 4 | | 27.8 | 13.9 | 3.1 | 1.4 | | 18.4 | 3.3 | 96.7 | |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 2 | 8 | 8 | 18 | 2 | **5** | 4 | 11 | 4 | 9 | 1 | 14 | 9 | 2 | 0 | 11 | 54 |
| 07:30 AM | 0 | **20** | 7 | 27 | **7** | 5 | **6** | **18** | **5** | 14 | 1 | 20 | 9 | **4** | 1 | 14 | 79 |
| 07:45 AM | **6** | 13 | **13** | **32** | 3 | 3 | 6 | 12 | 1 | 15 | 2 | 18 | **17** | 3 | 0 | **20** | **82** |
| 08:00 AM | 4 | 11 | 12 | 27 | 2 | 4 | 5 | 11 | 4 | **16** | **4** | **24** | 10 | 4 | **2** | 16 | 78 |
| Total Volume | 12 | 52 | 40 | 104 | 14 | 17 | 21 | 52 | 14 | 54 | 8 | 76 | 45 | 13 | 3 | 61 | 293 |
| % App. Total | 11.5 | 50 | 38.5 | | 26.9 | 32.7 | 40.4 | | 18.4 | 71.1 | 10.5 | | 73.8 | 21.3 | 4.9 | | |
| PHF | .500 | .650 | .769 | .813 | .500 | .850 | .875 | .722 | .700 | .844 | .500 | .792 | .662 | .813 | .375 | .763 | .893 |

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

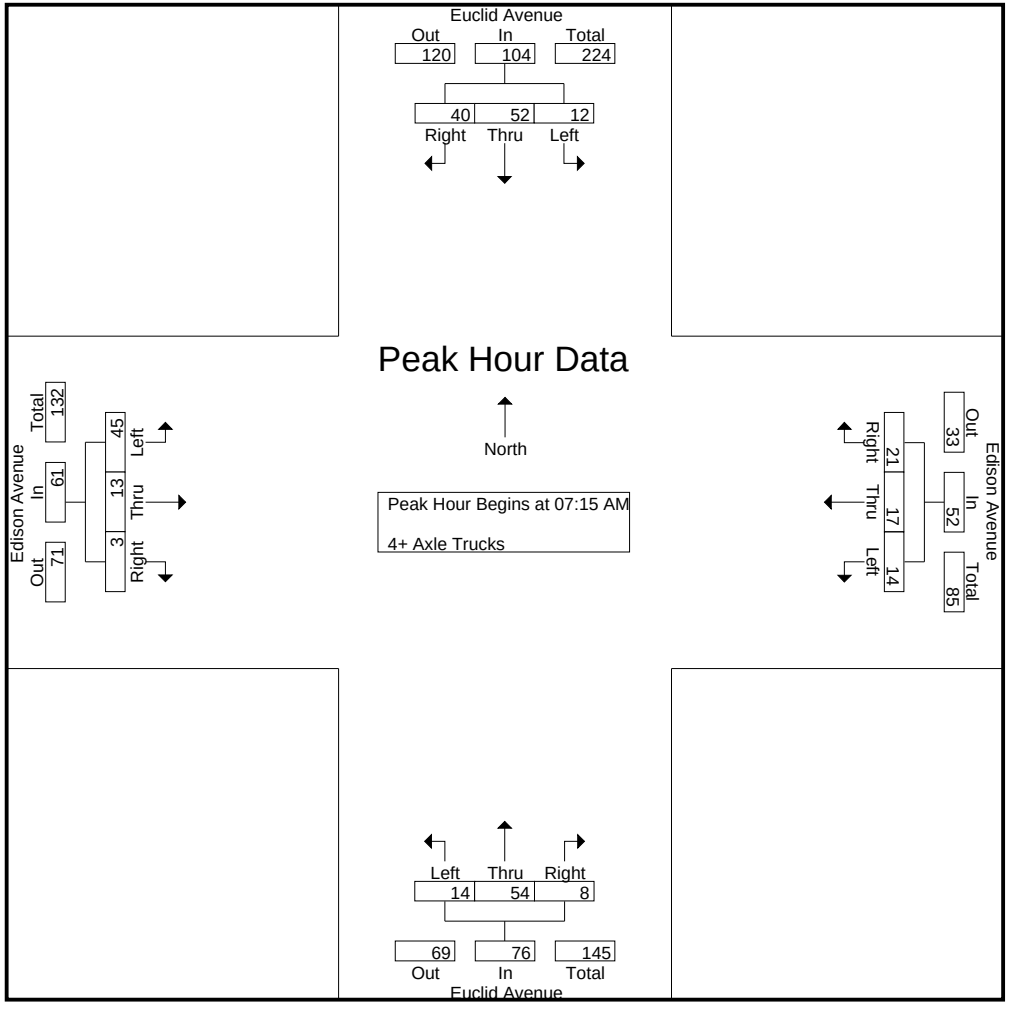

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City of Chino
N/S: Euclid Avenue
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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 2 | 8 | 8 | 18 | 2 | **5** | 4 | 11 | 4 | 9 | 1 | 14 | 9 | 2 | 0 | 11 | |
| +15 mins. | 0 | **20** | 7 | 27 | **7** | 5 | **6** | **18** | **5** | 14 | 1 | 20 | 9 | **4** | 1 | 14 | |
| +30 mins. | **6** | 13 | **13** | **32** | 3 | 3 | 6 | 12 | 1 | 15 | 2 | 18 | **17** | 3 | 0 | **20** | |
| +45 mins. | 4 | 11 | 12 | 27 | 2 | 4 | 5 | 11 | 4 | **16** | **4** | **24** | 10 | 4 | **2** | 16 | |
| Total Volume | 12 | 52 | 40 | 104 | 14 | 17 | 21 | 52 | 14 | 54 | 8 | 76 | 45 | 13 | 3 | 61 | |
| % App. Total | 11.5 | 50 | 38.5 | | 26.9 | 32.7 | 40.4 | | 18.4 | 71.1 | 10.5 | | 73.8 | 21.3 | 4.9 | | |
| PHF | .500 | .650 | .769 | .813 | .500 | .850 | .875 | .722 | .700 | .844 | .500 | .792 | .662 | .813 | .375 | .763 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 17 | 177 | 47 | 9 | 241 | 5 | 36 | 11 | 3 | 52 | 29 | 214 | 22 | 3 | 265 | 31 | 83 | 24 | 9 | 138 | 24 | 696 | 720 |
| 04:15 PM | 20 | 170 | 24 | 10 | 214 | 11 | 50 | 12 | 1 | 73 | 42 | 250 | 40 | 16 | 332 | 30 | 80 | 33 | 15 | 143 | 42 | 762 | 804 |
| 04:30 PM | 18 | 180 | 20 | 10 | 218 | 12 | 48 | 14 | 2 | 74 | 22 | 222 | 21 | 2 | 265 | 28 | 102 | 38 | 20 | 168 | 34 | 725 | 759 |
| 04:45 PM | 14 | 202 | 28 | 8 | 244 | 6 | 53 | 14 | 2 | 73 | 37 | 251 | 24 | 5 | 312 | 28 | 79 | 31 | 9 | 138 | 24 | 767 | 791 |
| Total | 69 | 729 | 119 | 37 | 917 | 34 | 187 | 51 | 8 | 272 | 130 | 937 | 107 | 26 | 1174 | 117 | 344 | 126 | 53 | 587 | 124 | 2950 | 3074 |
| 05:00 PM | 10 | 174 | 38 | 12 | 222 | 7 | 34 | 7 | 2 | 48 | 22 | 234 | 22 | 8 | 278 | 31 | 70 | 29 | 13 | 130 | 35 | 678 | 713 |
| 05:15 PM | 22 | 162 | 16 | 6 | 200 | 6 | 51 | 7 | 1 | 64 | 24 | 251 | 16 | 8 | 291 | 24 | 97 | 24 | 12 | 145 | 27 | 700 | 727 |
| 05:30 PM | 23 | 188 | 24 | 4 | 235 | 12 | 57 | 8 | 0 | 77 | 33 | 236 | 26 | 10 | 295 | 25 | 93 | 32 | 17 | 150 | 31 | 757 | 788 |
| 05:45 PM | 15 | 165 | 43 | 17 | 223 | 5 | 54 | 12 | 1 | 71 | 43 | 185 | 21 | 6 | 249 | 32 | 89 | 26 | 12 | 147 | 36 | 690 | 726 |
| Total | 70 | 689 | 121 | 39 | 880 | 30 | 196 | 34 | 4 | 260 | 122 | 906 | 85 | 32 | 1113 | 112 | 349 | 111 | 54 | 572 | 129 | 2825 | 2954 |
| Grand Total | 139 | 1418 | 240 | 76 | 1797 | 64 | 383 | 85 | 12 | 532 | 252 | 1843 | 192 | 58 | 2287 | 229 | 693 | 237 | 107 | 1159 | 253 | 5775 | 6028 |
| Apprch % | 7.7 | 78.9 | 13.4 | | | 12 | 72 | 16 | | | 11 | 80.6 | 8.4 | | | 19.8 | 59.8 | 20.4 | | | | | |
| Total % | 2.4 | 24.6 | 4.2 | | 31.1 | 1.1 | 6.6 | 1.5 | | 9.2 | 4.4 | 31.9 | 3.3 | | 39.6 | 4 | 12 | 4.1 | | 20.1 | 4.2 | 95.8 | |
| Passenger Vehicles | 124 | 1277 | 150 | | 1602 | 55 | 357 | 70 | | 493 | 211 | 1624 | 172 | | 2060 | 121 | 630 | 198 | | 1044 | 0 | 0 | 5199 |
| % Passenger Vehicles | 89.2 | 90.1 | 62.5 | 67.1 | 85.5 | 85.9 | 93.2 | 82.4 | 91.7 | 90.6 | 83.7 | 88.1 | 89.6 | 91.4 | 87.8 | 52.8 | 90.9 | 83.5 | 88.8 | 82.5 | 0 | 0 | 86.2 |
| Large 2 Axle Vehicles | 4 | 29 | 18 | | 59 | 3 | 5 | 1 | | 9 | 10 | 41 | 1 | | 52 | 16 | 22 | 12 | | 56 | 0 | 0 | 176 |
| % Large 2 Axle Vehicles | 2.9 | 2 | 7.5 | 10.5 | 3.2 | 4.7 | 1.3 | 1.2 | 0 | 1.7 | 4 | 2.2 | 0.5 | 0 | 2.2 | 7 | 3.2 | 5.1 | 5.6 | 4.4 | 0 | 0 | 2.9 |
| 3 Axle Vehicles | 0 | 37 | 26 | | 71 | 3 | 4 | 8 | | 16 | 5 | 43 | 8 | | 59 | 17 | 8 | 4 | | 32 | 0 | 0 | 178 |
| % 3 Axle Vehicles | 0 | 2.6 | 10.8 | 10.5 | 3.8 | 4.7 | 1 | 9.4 | 8.3 | 2.9 | 2 | 2.3 | 4.2 | 5.2 | 2.5 | 7.4 | 1.2 | 1.7 | 2.8 | 2.5 | 0 | 0 | 3 |
| 4+ Axle Trucks | 11 | 75 | 46 | | 141 | 3 | 17 | 6 | | 26 | 26 | 135 | 11 | | 174 | 75 | 33 | 23 | | 134 | 0 | 0 | 475 |
| % 4+ Axle Trucks | 7.9 | 5.3 | 19.2 | 11.8 | 7.5 | 4.7 | 4.4 | 7.1 | 0 | 4.8 | 10.3 | 7.3 | 5.7 | 3.4 | 7.4 | 32.8 | 4.8 | 9.7 | 2.8 | 10.6 | 0 | 0 | 7.9 |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 17 | 177 | **47** | 241 | 5 | 36 | 11 | 52 | 29 | 214 | 22 | 265 | **31** | 83 | 24 | 138 | 696 |
| 04:15 PM | **20** | 170 | 24 | 214 | 11 | 50 | 12 | 73 | **42** | 250 | **40** | **332** | 30 | 80 | 33 | 143 | 762 |
| 04:30 PM | 18 | 180 | 20 | 218 | **12** | 48 | **14** | **74** | 22 | 222 | 21 | 265 | 28 | **102** | **38** | **168** | 725 |
| 04:45 PM | 14 | **202** | 28 | **244** | 6 | **53** | 14 | 73 | 37 | **251** | 24 | 312 | 28 | 79 | 31 | 138 | **767** |
| Total Volume | 69 | 729 | 119 | 917 | 34 | 187 | 51 | 272 | 130 | 937 | 107 | 1174 | 117 | 344 | 126 | 587 | 2950 |
| % App. Total | 7.5 | 79.5 | 13 | | 12.5 | 68.8 | 18.8 | | 11.1 | 79.8 | 9.1 | | 19.9 | 58.6 | 21.5 | | |
| PHF | .863 | .902 | .633 | .940 | .708 | .882 | .911 | .919 | .774 | .933 | .669 | .884 | .944 | .843 | .829 | .874 | .962 |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

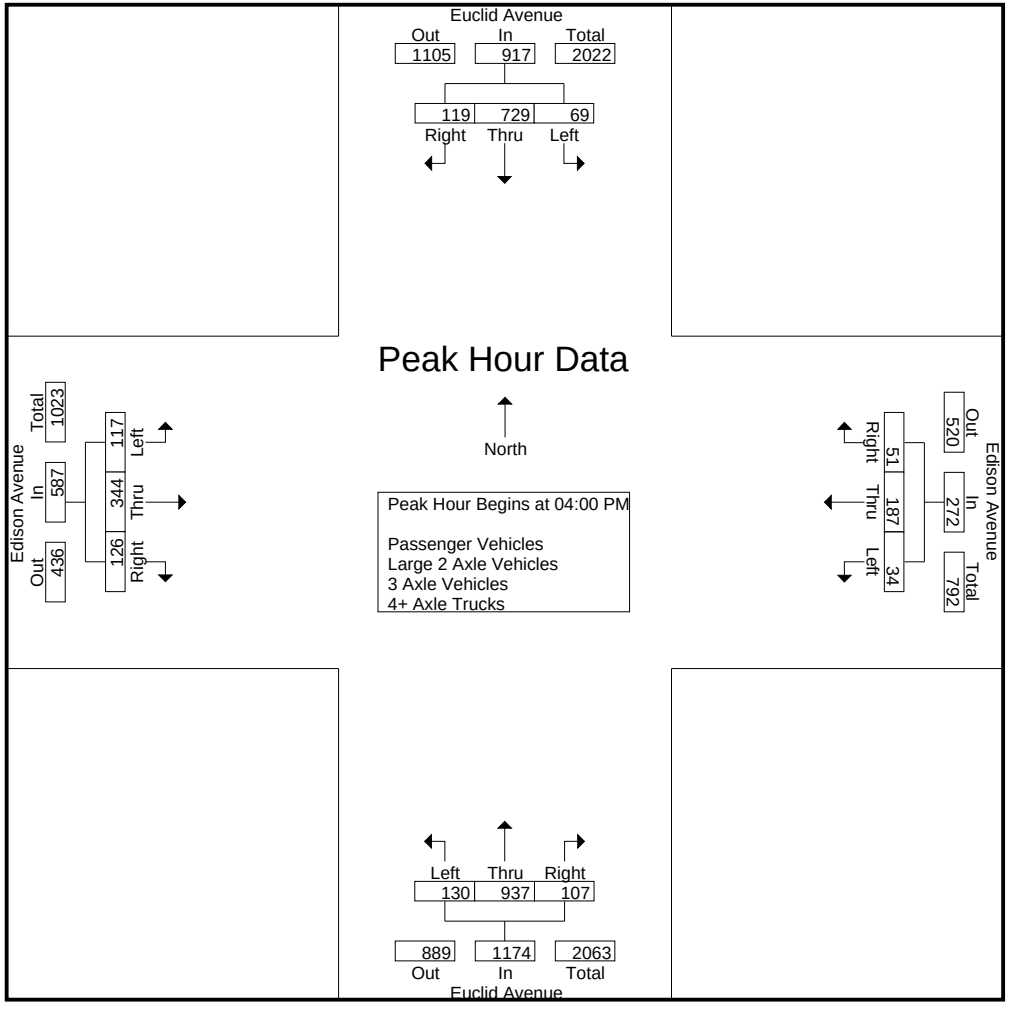

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:15 PM | | | | 04:00 PM | | | | |
| +0 mins. | 17 | 177 | **47** | 241 | 5 | 36 | 11 | 52 | **42** | 250 | **40** | **332** | **31** | 83 | 24 | 138 | |
| +15 mins. | **20** | 170 | 24 | 214 | 11 | 50 | 12 | 73 | 22 | 222 | 21 | 265 | 30 | 80 | 33 | 143 | |
| +30 mins. | 18 | 180 | 20 | 218 | **12** | 48 | **14** | **74** | 37 | **251** | 24 | 312 | 28 | **102** | **38** | **168** | |
| +45 mins. | 14 | **202** | 28 | **244** | 6 | **53** | 14 | 73 | 22 | 234 | 22 | 278 | 28 | 79 | 31 | 138 | |
| Total Volume | 69 | 729 | 119 | 917 | 34 | 187 | 51 | 272 | 123 | 957 | 107 | 1187 | 117 | 344 | 126 | 587 | |
| % App. Total | 7.5 | 79.5 | 13 | | 12.5 | 68.8 | 18.8 | | 10.4 | 80.6 | 9 | | 19.9 | 58.6 | 21.5 | | |
| PHF | .863 | .902 | .633 | .940 | .708 | .882 | .911 | .919 | .732 | .953 | .669 | .894 | .944 | .843 | .829 | .874 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 14 | 152 | 29 | 5 | 195 | 3 | 31 | 8 | 2 | 42 | 24 | 182 | 20 | 2 | 226 | 12 | 76 | 18 | 7 | 106 | 16 | 569 | 585 |
| 04:15 PM | 18 | 150 | 12 | 6 | 180 | 8 | 50 | 8 | 1 | 66 | 38 | 212 | 37 | 14 | 287 | 14 | 64 | 28 | 12 | 106 | 33 | 639 | 672 |
| 04:30 PM | 14 | 162 | 11 | 6 | 187 | 12 | 42 | 14 | 2 | 68 | 21 | 202 | 17 | 2 | 240 | 13 | 95 | 33 | 18 | 141 | 28 | 636 | 664 |
| 04:45 PM | 11 | 184 | 16 | 4 | 211 | 4 | 51 | 12 | 2 | 67 | 29 | 229 | 21 | 4 | 279 | 12 | 71 | 27 | 8 | 110 | 18 | 667 | 685 |
| Total | 57 | 648 | 68 | 21 | 773 | 27 | 174 | 42 | 7 | 243 | 112 | 825 | 95 | 22 | 1032 | 51 | 306 | 106 | 45 | 463 | 95 | 2511 | 2606 |
| 05:00 PM | 9 | 153 | 27 | 10 | 189 | 7 | 31 | 5 | 2 | 43 | 19 | 207 | 19 | 8 | 245 | 17 | 65 | 23 | 12 | 105 | 32 | 582 | 614 |
| 05:15 PM | 21 | 152 | 11 | 5 | 184 | 6 | 49 | 4 | 1 | 59 | 19 | 217 | 15 | 8 | 251 | 17 | 91 | 20 | 11 | 128 | 25 | 622 | 647 |
| 05:30 PM | 22 | 174 | 15 | 1 | 211 | 10 | 53 | 8 | 0 | 71 | 25 | 211 | 24 | 9 | 260 | 17 | 85 | 27 | 16 | 129 | 26 | 671 | 697 |
| 05:45 PM | 15 | 150 | 29 | 14 | 194 | 5 | 50 | 11 | 1 | 66 | 36 | 164 | 19 | 6 | 219 | 19 | 83 | 22 | 11 | 124 | 32 | 603 | 635 |
| Total | 67 | 629 | 82 | 30 | 778 | 28 | 183 | 28 | 4 | 239 | 99 | 799 | 77 | 31 | 975 | 70 | 324 | 92 | 50 | 486 | 115 | 2478 | 2593 |
| Grand Total | 124 | 1277 | 150 | 51 | 1551 | 55 | 357 | 70 | 11 | 482 | 211 | 1624 | 172 | 53 | 2007 | 121 | 630 | 198 | 95 | 949 | 210 | 4989 | 5199 |
| Apprch % | 8 | 82.3 | 9.7 | | | 11.4 | 74.1 | 14.5 | | | 10.5 | 80.9 | 8.6 | | | 12.8 | 66.4 | 20.9 | | | | | |
| Total % | 2.5 | 25.6 | 3 | | 31.1 | 1.1 | 7.2 | 1.4 | | 9.7 | 4.2 | 32.6 | 3.4 | | 40.2 | 2.4 | 12.6 | 4 | | 19 | 4 | 96 | |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 14 | 152 | **29** | 195 | 3 | 31 | 8 | 42 | 24 | 182 | 20 | 226 | 12 | 76 | 18 | 106 | 569 |
| 04:15 PM | **18** | 150 | 12 | 180 | 8 | 50 | 8 | 66 | **38** | 212 | **37** | **287** | **14** | 64 | 28 | 106 | 639 |
| 04:30 PM | 14 | 162 | 11 | 187 | **12** | 42 | **14** | **68** | 21 | 202 | 17 | 240 | 13 | **95** | **33** | **141** | 636 |
| 04:45 PM | 11 | **184** | 16 | **211** | 4 | **51** | 12 | 67 | 29 | **229** | 21 | 279 | 12 | 71 | 27 | 110 | **667** |
| Total Volume | 57 | 648 | 68 | 773 | 27 | 174 | 42 | 243 | 112 | 825 | 95 | 1032 | 51 | 306 | 106 | 463 | 2511 |
| % App. Total | 7.4 | 83.8 | 8.8 | | 11.1 | 71.6 | 17.3 | | 10.9 | 79.9 | 9.2 | | 11 | 66.1 | 22.9 | | |
| PHF | .792 | .880 | .586 | .916 | .563 | .853 | .750 | .893 | .737 | .901 | .642 | .899 | .911 | .805 | .803 | .821 | .941 |

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Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

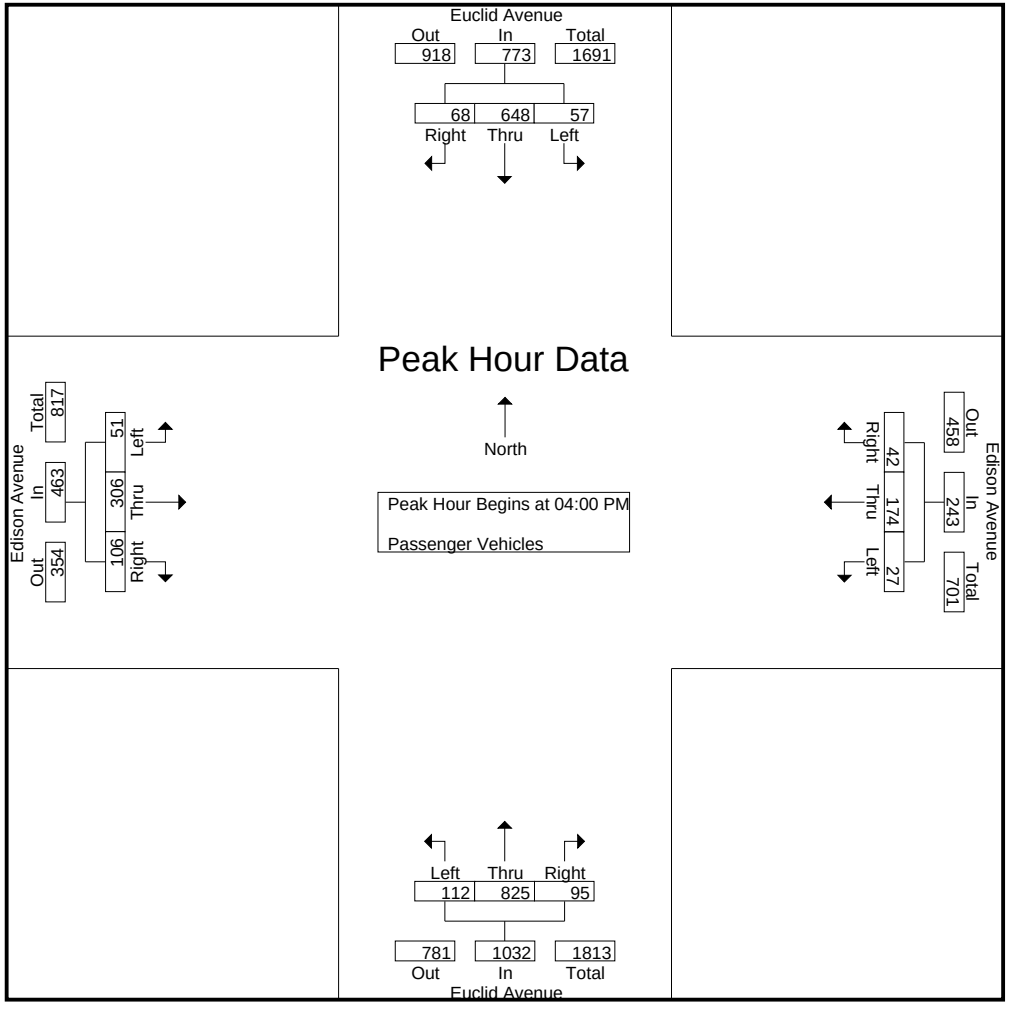

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Site Code : 05124953
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Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 14 | 152 | **29** | 195 | 3 | 31 | 8 | 42 | 24 | 182 | 20 | 226 | 12 | 76 | 18 | 106 | |
| +15 mins. | **18** | 150 | 12 | 180 | 8 | 50 | 8 | 66 | **38** | 212 | **37** | **287** | **14** | 64 | 28 | 106 | |
| +30 mins. | 14 | 162 | 11 | 187 | **12** | 42 | **14** | **68** | 21 | 202 | 17 | 240 | 13 | **95** | **33** | **141** | |
| +45 mins. | 11 | **184** | 16 | **211** | 4 | **51** | 12 | 67 | 29 | **229** | 21 | 279 | 12 | 71 | 27 | 110 | |
| Total Volume | 57 | 648 | 68 | 773 | 27 | 174 | 42 | 243 | 112 | 825 | 95 | 1032 | 51 | 306 | 106 | 463 | |
| % App. Total | 7.4 | 83.8 | 8.8 | | 11.1 | 71.6 | 17.3 | | 10.9 | 79.9 | 9.2 | | 11 | 66.1 | 22.9 | | |
| PHF | .792 | .880 | .586 | .916 | .563 | .853 | .750 | .893 | .737 | .901 | .642 | .899 | .911 | .805 | .803 | .821 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 7 | 2 | 1 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 8 | 0 | 0 | 8 | 2 | 2 | 3 | 2 | 7 | 3 | 25 | 28 |
| 04:15 PM | 1 | 1 | 3 | 2 | 5 | 3 | 0 | 0 | 0 | 3 | 1 | 10 | 0 | 0 | 11 | 2 | 5 | 1 | 1 | 8 | 3 | 27 | 30 |
| 04:30 PM | 1 | 5 | 2 | 2 | 8 | 0 | 2 | 0 | 0 | 2 | 1 | 7 | 0 | 0 | 8 | 2 | 2 | 2 | 1 | 6 | 3 | 24 | 27 |
| 04:45 PM | 0 | 3 | 3 | 1 | 6 | 0 | 0 | 1 | 0 | 1 | 2 | 2 | 0 | 0 | 4 | 0 | 2 | 0 | 0 | 2 | 1 | 13 | 14 |
| Total | 2 | 16 | 10 | 6 | 28 | 3 | 3 | 1 | 0 | 7 | 4 | 27 | 0 | 0 | 31 | 6 | 11 | 6 | 4 | 23 | 10 | 89 | 99 |
| 05:00 PM | 1 | 6 | 3 | 1 | 10 | 0 | 2 | 0 | 0 | 2 | 1 | 4 | 0 | 0 | 5 | 4 | 1 | 4 | 0 | 9 | 1 | 26 | 27 |
| 05:15 PM | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 1 | 0 | 9 | 1 | 3 | 0 | 0 | 4 | 0 | 17 | 17 |
| 05:30 PM | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 4 | 2 | 5 | 1 | 1 | 8 | 1 | 15 | 16 |
| 05:45 PM | 0 | 3 | 3 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 3 | 2 | 1 | 1 | 6 | 2 | 15 | 17 |
| Total | 2 | 13 | 8 | 2 | 23 | 0 | 2 | 0 | 0 | 2 | 6 | 14 | 1 | 0 | 21 | 10 | 11 | 6 | 2 | 27 | 4 | 73 | 77 |
| Grand Total | 4 | 29 | 18 | 8 | 51 | 3 | 5 | 1 | 0 | 9 | 10 | 41 | 1 | 0 | 52 | 16 | 22 | 12 | 6 | 50 | 14 | 162 | 176 |
| Apprch % | 7.8 | 56.9 | 35.3 | | | 33.3 | 55.6 | 11.1 | | | 19.2 | 78.8 | 1.9 | | | 32 | 44 | 24 | | | | | |
| Total % | 2.5 | 17.9 | 11.1 | | 31.5 | 1.9 | 3.1 | 0.6 | | 5.6 | 6.2 | 25.3 | 0.6 | | 32.1 | 9.9 | 13.6 | 7.4 | | 30.9 | 8 | 92 | |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | **7** | 2 | **9** | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 8 | **2** | 2 | **3** | 7 | 25 |
| 04:15 PM | **1** | 1 | **3** | 5 | **3** | 0 | 0 | **3** | 1 | **10** | 0 | **11** | 2 | **5** | 1 | **8** | **27** |
| 04:30 PM | 1 | 5 | 2 | 8 | 0 | **2** | 0 | 2 | 1 | 7 | 0 | 8 | 2 | 2 | 2 | 6 | 24 |
| 04:45 PM | 0 | 3 | 3 | 6 | 0 | 0 | **1** | 1 | **2** | 2 | 0 | 4 | 0 | 2 | 0 | 2 | 13 |
| Total Volume | 2 | 16 | 10 | 28 | 3 | 3 | 1 | 7 | 4 | 27 | 0 | 31 | 6 | 11 | 6 | 23 | 89 |
| % App. Total | 7.1 | 57.1 | 35.7 | | 42.9 | 42.9 | 14.3 | | 12.9 | 87.1 | 0 | | 26.1 | 47.8 | 26.1 | | |
| PHF | .500 | .571 | .833 | .778 | .250 | .375 | .250 | .583 | .500 | .675 | .000 | .705 | .750 | .550 | .500 | .719 | .824 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

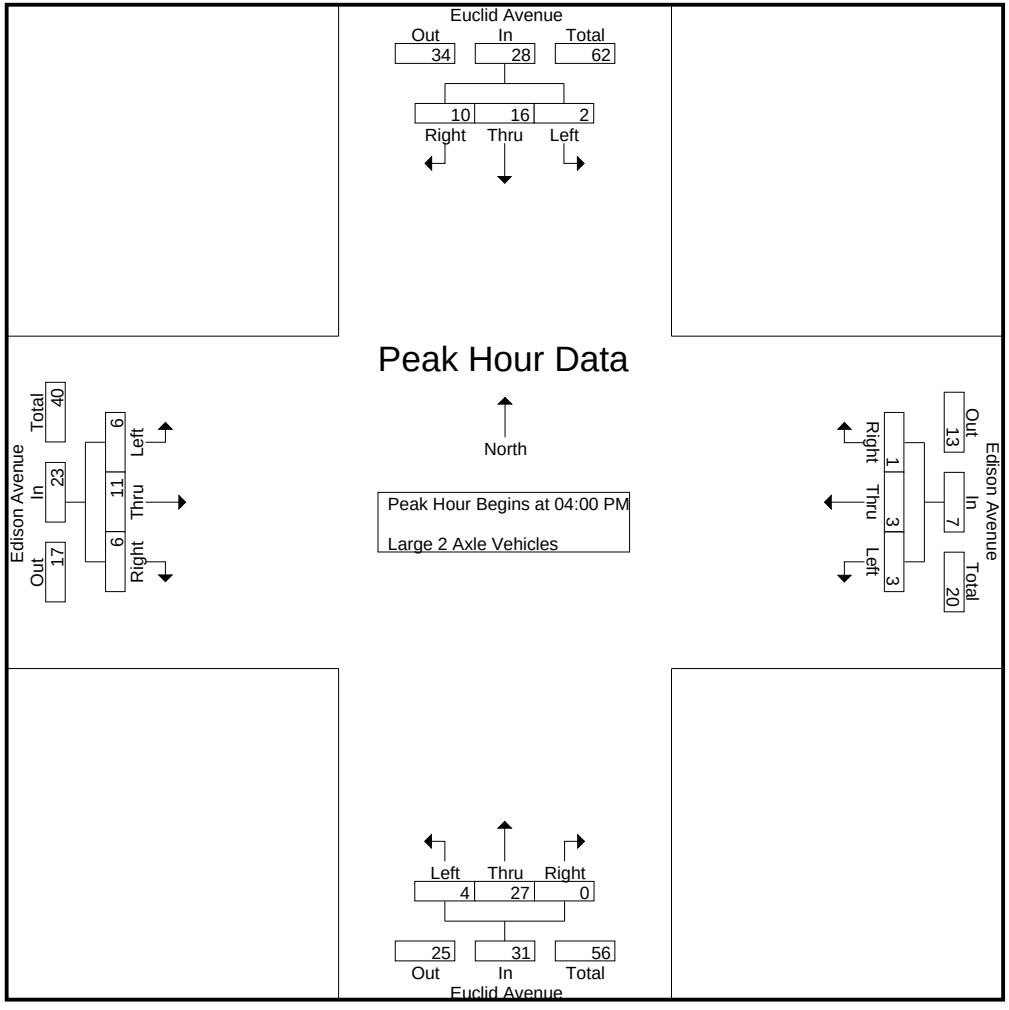

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | **7** | 2 | **9** | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 8 | **2** | 2 | **3** | 7 | |
| +15 mins. | **1** | 1 | **3** | 5 | **3** | 0 | 0 | **3** | 1 | **10** | 0 | **11** | 2 | **5** | 1 | **8** | |
| +30 mins. | 1 | 5 | 2 | 8 | 0 | **2** | 0 | 2 | 1 | 7 | 0 | 8 | 2 | 2 | 2 | 6 | |
| +45 mins. | 0 | 3 | 3 | 6 | 0 | 0 | **1** | 1 | **2** | 2 | 0 | 4 | 0 | 2 | 0 | 2 | |
| Total Volume | 2 | 16 | 10 | 28 | 3 | 3 | 1 | 7 | 4 | 27 | 0 | 31 | 6 | 11 | 6 | 23 | |
| % App. Total | 7.1 | 57.1 | 35.7 | | 42.9 | 42.9 | 14.3 | | 12.9 | 87.1 | 0 | | 26.1 | 47.8 | 26.1 | | |
| PHF | .500 | .571 | .833 | .778 | .250 | .375 | .250 | .583 | .500 | .675 | .000 | .705 | .750 | .550 | .500 | .719 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 6 | 5 | 2 | 11 | 1 | 1 | 2 | 1 | 4 | 1 | 7 | 1 | 1 | 9 | 1 | 2 | 0 | 0 | 3 | 4 | 27 | 31 |
| 04:15 PM | 0 | 5 | 1 | 1 | 6 | 0 | 0 | 2 | 0 | 2 | 0 | 12 | 2 | 1 | 14 | 2 | 0 | 1 | 1 | 3 | 3 | 25 | 28 |
| 04:30 PM | 0 | 4 | 3 | 2 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 5 | 1 | 2 | 1 | 8 | 3 | 17 | 20 |
| 04:45 PM | 0 | 3 | 2 | 1 | 5 | 2 | 1 | 0 | 0 | 3 | 1 | 3 | 2 | 1 | 6 | 3 | 1 | 0 | 0 | 4 | 2 | 18 | 20 |
| Total | 0 | 18 | 11 | 6 | 29 | 3 | 2 | 4 | 1 | 9 | 2 | 24 | 5 | 3 | 31 | 11 | 4 | 3 | 2 | 18 | 12 | 87 | 99 |
| 05:00 PM | 0 | 8 | 2 | 1 | 10 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 1 | 0 | 5 | 1 | 1 | 0 | 0 | 2 | 1 | 18 | 19 |
| 05:15 PM | 0 | 3 | 1 | 0 | 4 | 0 | 1 | 2 | 0 | 3 | 1 | 5 | 0 | 0 | 6 | 2 | 2 | 1 | 1 | 5 | 1 | 18 | 19 |
| 05:30 PM | 0 | 6 | 4 | 0 | 10 | 0 | 1 | 0 | 0 | 1 | 1 | 5 | 1 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 0 | 19 | 19 |
| 05:45 PM | 0 | 2 | 8 | 1 | 10 | 0 | 0 | 1 | 0 | 1 | 1 | 5 | 1 | 0 | 7 | 2 | 1 | 0 | 0 | 3 | 1 | 21 | 22 |
| Total | 0 | 19 | 15 | 2 | 34 | 0 | 2 | 4 | 0 | 6 | 3 | 19 | 3 | 0 | 25 | 6 | 4 | 1 | 1 | 11 | 3 | 76 | 79 |
| Grand Total | 0 | 37 | 26 | 8 | 63 | 3 | 4 | 8 | 1 | 15 | 5 | 43 | 8 | 3 | 56 | 17 | 8 | 4 | 3 | 29 | 15 | 163 | 178 |
| Apprch % | 0 | 58.7 | 41.3 | | | 20 | 26.7 | 53.3 | | | 8.9 | 76.8 | 14.3 | | | 58.6 | 27.6 | 13.8 | | | | | |
| Total % | 0 | 22.7 | 16 | | 38.7 | 1.8 | 2.5 | 4.9 | | 9.2 | 3.1 | 26.4 | 4.9 | | 34.4 | 10.4 | 4.9 | 2.5 | | 17.8 | 8.4 | 91.6 | |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | **6** | **5** | **11** | 1 | **1** | **2** | **4** | **1** | 7 | 1 | 9 | 1 | **2** | 0 | 3 | **27** |
| 04:15 PM | 0 | 5 | 1 | 6 | 0 | 0 | 2 | 2 | 0 | **12** | **2** | **14** | 2 | 0 | 1 | 3 | 25 |
| 04:30 PM | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | **5** | 1 | **2** | **8** | 17 |
| 04:45 PM | 0 | 3 | 2 | 5 | **2** | 1 | 0 | 3 | 1 | 3 | 2 | 6 | 3 | 1 | 0 | 4 | 18 |
| Total Volume | 0 | 18 | 11 | 29 | 3 | 2 | 4 | 9 | 2 | 24 | 5 | 31 | 11 | 4 | 3 | 18 | 87 |
| % App. Total | 0 | 62.1 | 37.9 | | 33.3 | 22.2 | 44.4 | | 6.5 | 77.4 | 16.1 | | 61.1 | 22.2 | 16.7 | | |
| PHF | .000 | .750 | .550 | .659 | .375 | .500 | .500 | .563 | .500 | .500 | .625 | .554 | .550 | .500 | .375 | .563 | .806 |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

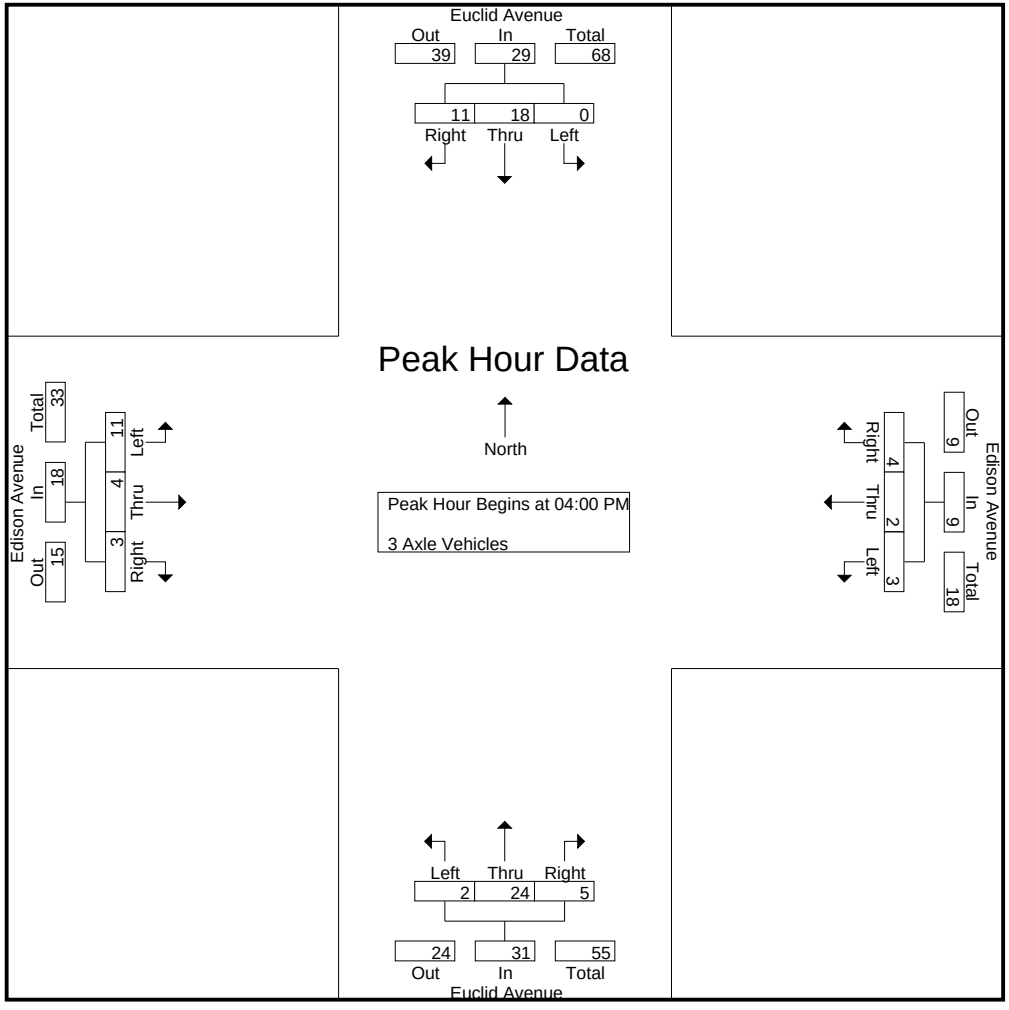

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | **6** | **5** | **11** | 1 | **1** | **2** | **4** | **1** | 7 | 1 | 9 | 1 | **2** | 0 | 3 | |
| +15 mins. | 0 | 5 | 1 | 6 | 0 | 0 | 2 | 2 | 0 | **12** | **2** | **14** | 2 | 0 | 1 | 3 | |
| +30 mins. | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | **5** | 1 | **2** | **8** | |
| +45 mins. | 0 | 3 | 2 | 5 | **2** | 1 | 0 | 3 | 1 | 3 | 2 | 6 | 3 | 1 | 0 | 4 | |
| Total Volume | 0 | 18 | 11 | 29 | 3 | 2 | 4 | 9 | 2 | 24 | 5 | 31 | 11 | 4 | 3 | 18 | |
| % App. Total | 0 | 62.1 | 37.9 | | 33.3 | 22.2 | 44.4 | | 6.5 | 77.4 | 16.1 | | 61.1 | 22.2 | 16.7 | | |
| PHF | .000 | .750 | .550 | .659 | .375 | .500 | .500 | .563 | .500 | .500 | .625 | .554 | .550 | .500 | .375 | .563 | |

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City of Chino
N/S: Euclid Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 3 | 12 | 11 | 1 | 26 | 1 | 3 | 1 | 0 | 5 | 4 | 17 | 1 | 0 | 22 | 16 | 3 | 3 | 0 | 22 | 1 | 75 | 76 |
| 04:15 PM | 1 | 14 | 8 | 1 | 23 | 0 | 0 | 2 | 0 | 2 | 3 | 16 | 1 | 1 | 20 | 12 | 11 | 3 | 1 | 26 | 3 | 71 | 74 |
| 04:30 PM | 3 | 9 | 4 | 0 | 16 | 0 | 4 | 0 | 0 | 4 | 0 | 11 | 4 | 0 | 15 | 8 | 4 | 1 | 0 | 13 | 0 | 48 | 48 |
| 04:45 PM | 3 | 12 | 7 | 2 | 22 | 0 | 1 | 1 | 0 | 2 | 5 | 17 | 1 | 0 | 23 | 13 | 5 | 4 | 1 | 22 | 3 | 69 | 72 |
| Total | 10 | 47 | 30 | 4 | 87 | 1 | 8 | 4 | 0 | 13 | 12 | 61 | 7 | 1 | 80 | 49 | 23 | 11 | 2 | 83 | 7 | 263 | 270 |
| 05:00 PM | 0 | 7 | 6 | 0 | 13 | 0 | 1 | 1 | 0 | 2 | 2 | 19 | 2 | 0 | 23 | 9 | 3 | 2 | 1 | 14 | 1 | 52 | 53 |
| 05:15 PM | 0 | 4 | 4 | 1 | 8 | 0 | 1 | 1 | 0 | 2 | 3 | 22 | 0 | 0 | 25 | 4 | 1 | 3 | 0 | 8 | 1 | 43 | 44 |
| 05:30 PM | 1 | 7 | 3 | 3 | 11 | 2 | 3 | 0 | 0 | 5 | 4 | 19 | 1 | 1 | 24 | 5 | 3 | 4 | 0 | 12 | 4 | 52 | 56 |
| 05:45 PM | 0 | 10 | 3 | 1 | 13 | 0 | 4 | 0 | 0 | 4 | 5 | 14 | 1 | 0 | 20 | 8 | 3 | 3 | 0 | 14 | 1 | 51 | 52 |
| Total | 1 | 28 | 16 | 5 | 45 | 2 | 9 | 2 | 0 | 13 | 14 | 74 | 4 | 1 | 92 | 26 | 10 | 12 | 1 | 48 | 7 | 198 | 205 |
| Grand Total | 11 | 75 | 46 | 9 | 132 | 3 | 17 | 6 | 0 | 26 | 26 | 135 | 11 | 2 | 172 | 75 | 33 | 23 | 3 | 131 | 14 | 461 | 475 |
| Apprch % | 8.3 | 56.8 | 34.8 | | | 11.5 | 65.4 | 23.1 | | | 15.1 | 78.5 | 6.4 | | | 57.3 | 25.2 | 17.6 | | | | | |
| Total % | 2.4 | 16.3 | 10 | | 28.6 | 0.7 | 3.7 | 1.3 | | 5.6 | 5.6 | 29.3 | 2.4 | | 37.3 | 16.3 | 7.2 | 5 | | 28.4 | 2.9 | 97.1 | |

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | **3** | 12 | **11** | **26** | **1** | 3 | 1 | **5** | 4 | **17** | 1 | 22 | **16** | 3 | 3 | 22 | **75** |
| 04:15 PM | 1 | **14** | 8 | 23 | 0 | 0 | **2** | 2 | 3 | 16 | 1 | 20 | 12 | **11** | 3 | **26** | 71 |
| 04:30 PM | 3 | 9 | 4 | 16 | 0 | **4** | 0 | 4 | 0 | 11 | **4** | 15 | 8 | 4 | 1 | 13 | 48 |
| 04:45 PM | 3 | 12 | 7 | 22 | 0 | 1 | 1 | 2 | **5** | 17 | 1 | **23** | 13 | 5 | **4** | 22 | 69 |
| Total Volume | 10 | 47 | 30 | 87 | 1 | 8 | 4 | 13 | 12 | 61 | 7 | 80 | 49 | 23 | 11 | 83 | 263 |
| % App. Total | 11.5 | 54 | 34.5 | | 7.7 | 61.5 | 30.8 | | 15 | 76.2 | 8.8 | | 59 | 27.7 | 13.3 | | |
| PHF | .833 | .839 | .682 | .837 | .250 | .500 | .500 | .650 | .600 | .897 | .438 | .870 | .766 | .523 | .688 | .798 | .877 |

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City of Chino
N/S: Euclid Avenue
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Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
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Page No : 2

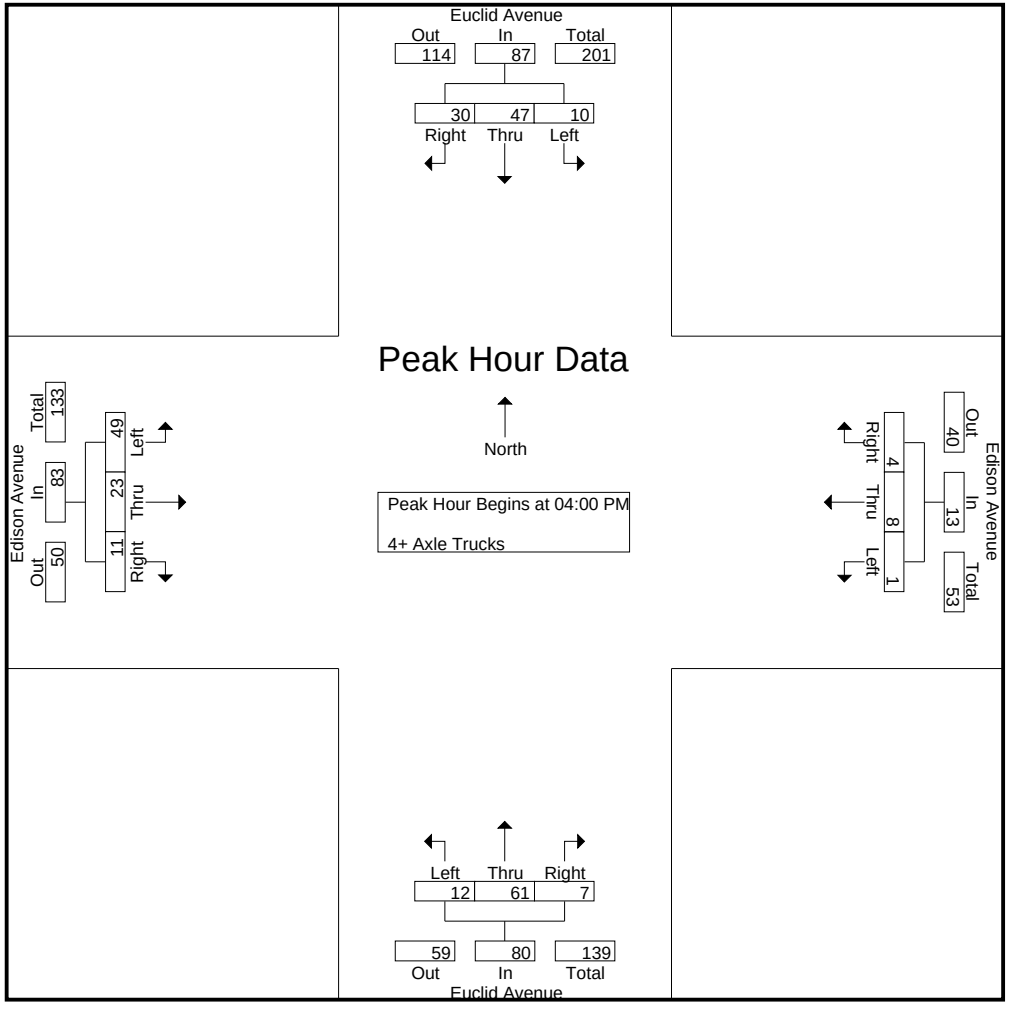

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City of Chino
N/S: Euclid Avenue
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Weather: Clear

File Name : 07_CHN_Euc_Edi PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Edison Avenue Westbound | | | | Euclid Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | **3** | 12 | **11** | **26** | **1** | 3 | 1 | **5** | 4 | **17** | 1 | 22 | **16** | 3 | 3 | 22 | |
| +15 mins. | 1 | **14** | 8 | 23 | 0 | 0 | **2** | 2 | 3 | 16 | 1 | 20 | 12 | **11** | 3 | **26** | |
| +30 mins. | 3 | 9 | 4 | 16 | 0 | **4** | 0 | 4 | 0 | 11 | **4** | 15 | 8 | 4 | 1 | 13 | |
| +45 mins. | 3 | 12 | 7 | 22 | 0 | 1 | 1 | 2 | **5** | 17 | 1 | **23** | 13 | 5 | **4** | 22 | |
| Total Volume | 10 | 47 | 30 | 87 | 1 | 8 | 4 | 13 | 12 | 61 | 7 | 80 | 49 | 23 | 11 | 83 | |
| % App. Total | 11.5 | 54 | 34.5 | | 7.7 | 61.5 | 30.8 | | 15 | 76.2 | 8.8 | | 59 | 27.7 | 13.3 | | |
| PHF | .833 | .839 | .682 | .837 | .250 | .500 | .500 | .650 | .600 | .897 | .438 | .870 | .766 | .523 | .688 | .798 | |

Location: Chino
N/S: Euclid Avenue
E/W: Edison Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg Edison Avenue | South Leg Euclid Avenue | West Leg Edison Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 1 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 1 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 1 | 0 | 0 | 1 | 2 |

| | North Leg Euclid Avenue | East Leg Edison Avenue | South Leg Euclid Avenue | West Leg Edison Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 1 | 2 | 3 |
| 4:15 PM | 0 | 0 | 0 | 1 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 1 | 1 | 0 | 1 | 3 |
| TOTAL VOLUMES: | 1 | 1 | 1 | 4 | 7 |

Counts Unlimited, Inc.
PO Box 1178
Corona, Ca 92878
951-268-6268

Location: Chino
N/S: Euclid Avenue
E/W: Edison Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound Edison Avenue | | | Northbound Euclid Avenue | | | Eastbound Edison Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | Southbound Euclid Avenue | | | Westbound Edison Avenue | | | Northbound Euclid Avenue | | | Eastbound Edison Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |

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PO Box 1178
Corona, Ca 92878
951-268-6268

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: | LOCATION: | Chino | PROJECT #: | SC4049 |
|---|---|---|---|---|
| Tue, May 23, 23 | NORTH & SOUTH: | Euclid | LOCATION #: | 17 |
| | EAST & WEST: | Eucalyptus | CONTROL: | SIGNAL |

NOTES:

AM / PM / MD / OTHER / OTHER — ◄ W, E ►, ▲ N, S ▼

| | | NORTHBOUND Euclid | | | SOUTHBOUND Euclid | | | EASTBOUND Eucalyptus | | | WESTBOUND Eucalyptus | | | | U-TURNS | | | | | RTOR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1 | NT 2 | NR 1 | SL 1 | ST 2 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL | NB 0 | SB 0 | EB 0 | WB 0 | TTL | NRR 0 | SRR 0 | ERR 0 | WRR 0 |
| AM | 6:00 AM | 11 | 65 | 12 | 31 | 147 | 2 | 9 | 13 | 18 | 16 | 16 | 18 | 358 | 1 | 0 | 0 | 0 | 1 | 5 | 0 | 11 | 7 |
| | 6:15 AM | 10 | 67 | 5 | 30 | 183 | 1 | 4 | 12 | 28 | 20 | 16 | 11 | 387 | 2 | 3 | 0 | 0 | 5 | 2 | 0 | 18 | 1 |
| | 6:30 AM | 8 | 82 | 19 | 25 | 202 | 3 | 8 | 11 | 29 | 32 | 31 | 15 | 465 | 1 | 1 | 0 | 0 | 2 | 7 | 2 | 12 | 4 |
| | 6:45 AM | 15 | 119 | 18 | 31 | 270 | 2 | 4 | 16 | 32 | 31 | 38 | 16 | 592 | 1 | 4 | 0 | 0 | 5 | 3 | 2 | 13 | 5 |
| | 7:00 AM | 10 | 115 | 9 | 22 | 180 | 1 | 8 | 15 | 26 | 23 | 45 | 27 | 481 | 1 | 1 | 0 | 0 | 2 | 3 | 0 | 12 | 2 |
| | 7:15 AM | 20 | 139 | 16 | 20 | 134 | 8 | 14 | 16 | 20 | 25 | 58 | 31 | 501 | 0 | 2 | 0 | 0 | 2 | 4 | 1 | 11 | 5 |
| | 7:30 AM | 25 | 159 | 11 | 25 | 154 | 9 | 15 | 15 | 29 | 18 | 64 | 27 | 551 | 0 | 2 | 0 | 0 | 2 | 3 | 2 | 10 | 4 |
| | 7:45 AM | 37 | 165 | 14 | 19 | 164 | 8 | 7 | 22 | 26 | 28 | 64 | 31 | 585 | 0 | 0 | 0 | 0 | 0 | 7 | 4 | 7 | 3 |
| | 8:00 AM | 29 | 165 | 21 | 18 | 156 | 5 | 13 | 18 | 26 | 16 | 68 | 35 | 570 | 1 | 4 | 0 | 0 | 5 | 8 | 3 | 11 | 7 |
| | 8:15 AM | 16 | 161 | 10 | 6 | 166 | 6 | 15 | 16 | 20 | 15 | 40 | 25 | 496 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 12 | 5 |
| | 8:30 AM | 31 | 132 | 14 | 23 | 123 | 7 | 12 | 24 | 28 | 14 | 35 | 40 | 483 | 0 | 2 | 0 | 0 | 2 | 3 | 2 | 14 | 9 |
| | 8:45 AM | 16 | 149 | 13 | 11 | 177 | 10 | 13 | 11 | 18 | 8 | 41 | 18 | 485 | 0 | 1 | 0 | 0 | 1 | 5 | 4 | 12 | 3 |
| | VOLUMES | 228 | 1,518 | 162 | 261 | 2,056 | 62 | 122 | 189 | 300 | 246 | 516 | 294 | 5,954 | 7 | 20 | 0 | 0 | 27 | 53 | 21 | 143 | 55 |
| | APPROACH % | 12% | 80% | 8% | 11% | 86% | 3% | 20% | 31% | 49% | 23% | 49% | 28% | | | | | | | | | | |
| | APP/DEPART | 1,908 | / | 1,954 | 2,379 | / | 2,609 | 611 | / | 592 | 1,056 | / | 799 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 7:15 AM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 111 | 628 | 62 | 82 | 608 | 30 | 49 | 71 | 101 | 87 | 254 | 124 | 2,207 | | | | | | 22 | 10 | 39 | 19 |
| | APPROACH % | 14% | 78% | 8% | 11% | 84% | 4% | 22% | 32% | 46% | 19% | 55% | 27% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.927 | | | 0.942 | | | 0.936 | | | 0.945 | | 0.943 | | | | | | | | | |
| | APP/DEPART | 801 | / | 809 | 720 | / | 797 | 221 | / | 207 | 465 | / | 394 | 0 | | | | | | | | | |
| PM | 04:00 PM | 20 | 195 | 19 | 12 | 135 | 12 | 15 | 70 | 27 | 17 | 17 | 22 | 561 | 0 | 2 | 0 | 0 | 2 | 6 | 5 | 15 | 4 |
| | 4:15 PM | 17 | 196 | 9 | 17 | 164 | 15 | 21 | 54 | 44 | 13 | 30 | 14 | 594 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 28 | 3 |
| | 4:30 PM | 25 | 204 | 19 | 18 | 143 | 14 | 17 | 94 | 38 | 12 | 21 | 24 | 629 | 0 | 3 | 0 | 0 | 3 | 8 | 8 | 16 | 8 |
| | 4:45 PM | 21 | 219 | 17 | 11 | 154 | 16 | 16 | 77 | 47 | 17 | 29 | 18 | 642 | 0 | 0 | 0 | 0 | 0 | 8 | 10 | 25 | 2 |
| | 5:00 PM | 30 | 200 | 20 | 18 | 182 | 17 | 21 | 75 | 60 | 14 | 19 | 17 | 673 | 0 | 2 | 0 | 0 | 2 | 7 | 10 | 28 | 2 |
| | 5:15 PM | 21 | 158 | 12 | 22 | 168 | 8 | 18 | 80 | 60 | 10 | 31 | 16 | 604 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 26 | 4 |
| | 5:30 PM | 19 | 230 | 18 | 18 | 162 | 16 | 14 | 63 | 27 | 12 | 28 | 22 | 629 | 0 | 1 | 0 | 0 | 1 | 7 | 3 | 18 | 4 |
| | 5:45 PM | 35 | 164 | 8 | 18 | 150 | 8 | 12 | 63 | 31 | 16 | 17 | 16 | 538 | 0 | 3 | 0 | 0 | 3 | 3 | 2 | 16 | 4 |
| | 6:00 PM | 12 | 167 | 4 | 16 | 112 | 16 | 11 | 46 | 31 | 8 | 12 | 19 | 454 | 0 | 2 | 0 | 0 | 2 | 0 | 7 | 19 | 5 |
| | 6:15 PM | 19 | 140 | 7 | 18 | 142 | 11 | 10 | 29 | 39 | 7 | 18 | 4 | 444 | 0 | 1 | 0 | 0 | 1 | 2 | 6 | 24 | 1 |
| | 6:30 PM | 15 | 106 | 5 | 15 | 115 | 17 | 6 | 28 | 23 | 7 | 7 | 13 | 357 | 0 | 1 | 0 | 0 | 1 | 1 | 6 | 14 | 8 |
| | 6:45 PM | 14 | 111 | 4 | 15 | 103 | 4 | 7 | 13 | 24 | 3 | 11 | 18 | 327 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 14 | 8 |
| | VOLUMES | 248 | 2,090 | 142 | 198 | 1,730 | 154 | 168 | 692 | 451 | 136 | 240 | 203 | 6,452 | 0 | 16 | 0 | 0 | 16 | 48 | 69 | 243 | 53 |
| | APPROACH % | 10% | 84% | 6% | 10% | 83% | 7% | 13% | 53% | 34% | 23% | 41% | 35% | | | | | | | | | | |
| | APP/DEPART | 2,480 | / | 2,477 | 2,082 | / | 2,317 | 1,311 | / | 1,016 | 579 | / | 642 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 91 | 807 | 67 | 69 | 666 | 57 | 69 | 295 | 194 | 53 | 107 | 73 | 2,548 | | | | | | 23 | 31 | 97 | 12 |
| | APPROACH % | 9% | 84% | 7% | 9% | 84% | 7% | 12% | 53% | 35% | 23% | 46% | 31% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.904 | | | 0.912 | | | 0.883 | | | 0.910 | | 0.947 | | | | | | | | | |
| | APP/DEPART | 965 | / | 952 | 792 | / | 913 | 558 | / | 428 | 233 | / | 255 | 0 | | | | | | | | | |

**Euclid**

NORTH SIDE

**Eucalyptus** WEST SIDE — EAST SIDE **Eucalyptus**

SOUTH SIDE

**Euclid**

| | | ALL PED AND BIKE | | | | | PEDESTRIAN CROSSINGS | | | | | BICYCLE CROSSINGS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | E SIDE | W SIDE | S SIDE | N SIDE | TOTAL | E SIDE | W SIDE | S SIDE | N SIDE | TOTAL | ES | WS | SS | NS | TOTAL |
| AM | 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:15 AM | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 6:30 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 6:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:00 AM | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 7:15 AM | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| | 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TOTAL | 0 | 4 | 0 | 0 | 4 | 0 | 3 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 |
| PM | 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:30 PM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| | 4:45 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 5:00 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 5:15 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:15 PM | 0 | 3 | 0 | 1 | 4 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 1 |
| | 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | TOTAL | 0 | 6 | 1 | 1 | 8 | 0 | 3 | 0 | 0 | 3 | 0 | 3 | 1 | 1 | 5 |

**AimTD LLC**

TURNING MOVEMENT COUNTS

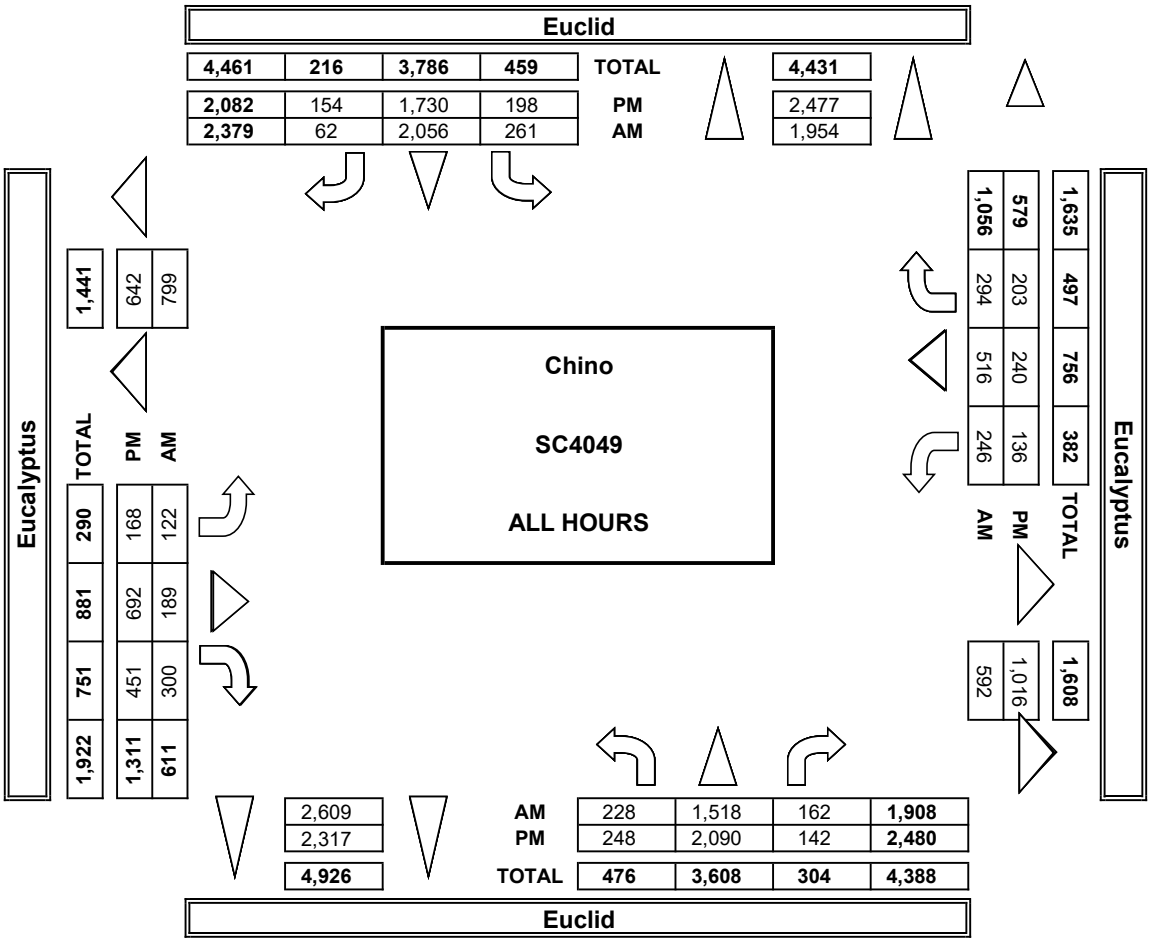


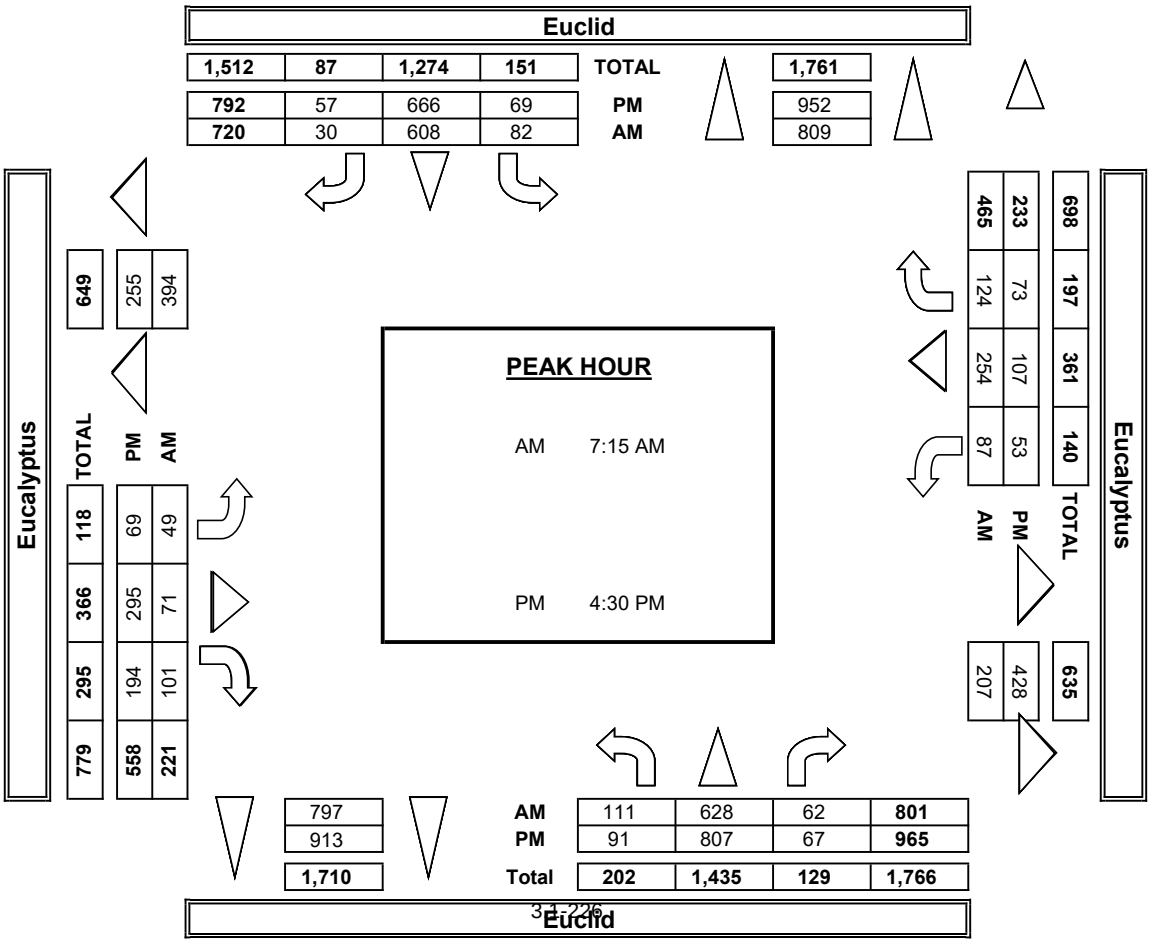

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: | LOCATION: | Chino | PROJECT #: | SC4049 |
|---|---|---|---|---|
| 5/23/23 | NORTH & SOUTH: | Euclid | LOCATION #: | 17 |
| TUESDAY | EAST & WEST: | Eucalyptus | CONTROL: | SIGNAL |

| | NOTES: | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCE Adjusted | Class | 1 | 2 | 3 | 4 | 5 | 6 | | | AM | | ▲ N | |
| | Factor | 1 | 1.5 | 2 | 3 | 2 | 2 | | | PM | ◄ W | | E ► |
| | | | | | | | | | | MD | | | |
| | | | | | | | | | | OTHER | | S ▼ | |
| | | | | | | | | | | OTHER | | | |

| | | NORTHBOUND Euclid | | | SOUTHBOUND Euclid | | | EASTBOUND Eucalyptus | | | WESTBOUND Eucalyptus | | | | U-TURNS | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1 | NT 2 | NR 1 | SL 1 | ST 2 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL | NB | SB | EB | WB | TTL |
| AM | 6:00 AM | 11 | 87 | 14 | 50 | 183 | 2 | 10 | 14 | 18 | 21 | 17 | 28 | 455 | | | | | 0 |
| | 6:15 AM | 10 | 90 | 6 | 55 | 228 | 2 | 4 | 13 | 28 | 21 | 17 | 23 | 494 | | | | | 0 |
| | 6:30 AM | 8 | 110 | 21 | 36 | 238 | 3 | 8 | 11 | 30 | 38 | 31 | 27 | 560 | | | | | 0 |
| | 6:45 AM | 16 | 148 | 26 | 52 | 317 | 2 | 5 | 16 | 33 | 32 | 39 | 23 | 706 | | | | | 0 |
| | 7:00 AM | 11 | 136 | 11 | 38 | 235 | 1 | 9 | 15 | 26 | 27 | 47 | 52 | 607 | | | | | 0 |
| | 7:15 AM | 21 | 167 | 24 | 38 | 171 | 10 | 15 | 17 | 21 | 33 | 59 | 53 | 627 | | | | | 0 |
| | 7:30 AM | 27 | 189 | 14 | 39 | 200 | 11 | 17 | 15 | 30 | 19 | 65 | 43 | 666 | | | | | 0 |
| | 7:45 AM | 40 | 198 | 19 | 29 | 203 | 9 | 7 | 23 | 26 | 31 | 65 | 51 | 700 | | | | | 0 |
| | 8:00 AM | 31 | 194 | 28 | 21 | 201 | 5 | 14 | 19 | 29 | 23 | 70 | 55 | 687 | | | | | 0 |
| | 8:15 AM | 17 | 206 | 11 | 7 | 224 | 7 | 16 | 17 | 21 | 21 | 42 | 32 | 618 | | | | | 0 |
| | 8:30 AM | 32 | 165 | 21 | 33 | 161 | 10 | 14 | 25 | 30 | 17 | 36 | 56 | 596 | | | | | 0 |
| | 8:45 AM | 17 | 184 | 18 | 17 | 232 | 12 | 14 | 11 | 19 | 11 | 43 | 29 | 605 | | | | | 0 |
| | VOLUMES | 239 | 1,873 | 211 | 412 | 2,591 | 74 | 131 | 194 | 309 | 291 | 529 | 469 | 7,319 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 10% | 81% | 9% | 13% | 84% | 2% | 21% | 31% | 49% | 23% | 41% | 36% | | | | | | |
| | APP/DEPART | 2,322 | / | 2,473 | 3,076 | / | 3,190 | 633 | / | 816 | 1,288 | / | 841 | 0 | | | | | |
| | BEGIN PEAK HR | | 7:15 AM | | | | | | | | | | | | | | | | |
| | VOLUMES | 119 | 748 | 84 | 126 | 774 | 35 | 52 | 74 | 105 | 105 | 259 | 201 | 2,679 | | | | | |
| | APPROACH % | 12% | 79% | 9% | 13% | 83% | 4% | 22% | 32% | 46% | 19% | 46% | 36% | | | | | | |
| | PEAK HR FACTOR | | 0.924 | | | 0.937 | | | 0.943 | | | 0.960 | | 0.957 | | | | | |
| | APP/DEPART | 950 | / | 1,000 | 935 | / | 984 | 230 | / | 283 | 565 | / | 412 | 0 | | | | | |
| PM | 04:00 PM | 22 | 235 | 20 | 18 | 166 | 12 | 16 | 71 | 27 | 18 | 17 | 36 | 656 | | | | | 0 |
| | 4:15 PM | 17 | 227 | 11 | 23 | 195 | 16 | 22 | 55 | 45 | 18 | 31 | 18 | 675 | | | | | 0 |
| | 4:30 PM | 27 | 230 | 19 | 29 | 166 | 15 | 19 | 101 | 39 | 13 | 21 | 29 | 705 | | | | | 0 |
| | 4:45 PM | 22 | 251 | 18 | 19 | 173 | 17 | 17 | 79 | 48 | 21 | 30 | 24 | 717 | | | | | 0 |
| | 5:00 PM | 30 | 230 | 23 | 26 | 195 | 17 | 21 | 79 | 61 | 14 | 19 | 25 | 739 | | | | | 0 |
| | 5:15 PM | 22 | 179 | 14 | 33 | 189 | 8 | 20 | 81 | 61 | 14 | 31 | 22 | 671 | | | | | 0 |
| | 5:30 PM | 19 | 244 | 20 | 22 | 188 | 17 | 15 | 64 | 27 | 17 | 29 | 29 | 690 | | | | | 0 |
| | 5:45 PM | 35 | 192 | 11 | 33 | 171 | 8 | 12 | 64 | 31 | 18 | 17 | 28 | 618 | | | | | 0 |
| | 6:00 PM | 12 | 196 | 4 | 24 | 131 | 16 | 11 | 46 | 31 | 11 | 12 | 23 | 516 | | | | | 0 |
| | 6:15 PM | 20 | 163 | 9 | 32 | 170 | 11 | 11 | 29 | 39 | 9 | 18 | 5 | 515 | | | | | 0 |
| | 6:30 PM | 15 | 121 | 5 | 22 | 141 | 18 | 6 | 28 | 24 | 8 | 7 | 17 | 410 | | | | | 0 |
| | 6:45 PM | 14 | 135 | 6 | 22 | 119 | 4 | 7 | 13 | 24 | 3 | 11 | 26 | 384 | | | | | 0 |
| | VOLUMES | 253 | 2,400 | 158 | 300 | 2,002 | 159 | 176 | 708 | 455 | 162 | 242 | 279 | 7,292 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 9% | 85% | 6% | 12% | 81% | 6% | 13% | 53% | 34% | 24% | 35% | 41% | | | | | | |
| | APP/DEPART | 2,810 | / | 2,855 | 2,460 | / | 2,619 | 1,339 | / | 1,166 | 683 | / | 653 | 0 | | | | | |
| | BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | |
| | VOLUMES | 100 | 889 | 74 | 106 | 722 | 57 | 76 | 339 | 208 | 62 | 101 | 100 | 2,831 | | | | | |
| | APPROACH % | 9% | 84% | 7% | 12% | 82% | 6% | 12% | 54% | 33% | 24% | 38% | 38% | | | | | | |
| | PEAK HR FACTOR | | 0.916 | | | 0.930 | | | 0.967 | | | 0.875 | | 0.958 | | | | | |
| | APP/DEPART | 1,062 | / | 1,065 | 884 | / | 992 | 623 | / | 518 | 263 | / | 257 | 0 | | | | | |

**Euclid**

NORTH SIDE

**Eucalyptus** WEST SIDE EAST SIDE **Eucalyptus**

SOUTH SIDE

**Euclid**

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: | LOCATION: | Chino | PROJECT #: | SC4049 |
|---|---|---|---|---|
| 5/23/23 | NORTH & SOUTH: | Euclid | LOCATION #: | 17 |
| TUESDAY | EAST & WEST: | Eucalyptus | CONTROL: | SIGNAL |

**CLASS 1:** PASSENGER VEHICLES

**NOTES:**

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

| | NORTHBOUND Euclid | | | SOUTHBOUND Euclid | | | EASTBOUND Eucalyptus | | | WESTBOUND Eucalyptus | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LANES: | NL 1 | NT 2 | NR 1 | SL 1 | ST 2 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL |
| **AM** | | | | | | | | | | | | | |
| 6:00 AM | 11 | 48 | 9 | 18 | 116 | 2 | 8 | 12 | 18 | 12 | 14 | 11 | 279 |
| 6:15 AM | 10 | 51 | 4 | 17 | 147 | 0 | 4 | 11 | 28 | 19 | 15 | 3 | 309 |
| 6:30 AM | 8 | 60 | 15 | 18 | 173 | 3 | 8 | 11 | 28 | 28 | 31 | 6 | 389 |
| 6:45 AM | 14 | 96 | 11 | 17 | 230 | 2 | 3 | 16 | 31 | 30 | 36 | 10 | 496 |
| 7:00 AM | 9 | 96 | 7 | 14 | 134 | 1 | 7 | 15 | 26 | 20 | 42 | 11 | 382 |
| 7:15 AM | 18 | 117 | 10 | 9 | 101 | 6 | 13 | 15 | 19 | 19 | 57 | 15 | 399 |
| 7:30 AM | 23 | 135 | 8 | 16 | 119 | 7 | 13 | 15 | 28 | 17 | 63 | 13 | 457 |
| 7:45 AM | 33 | 140 | 8 | 11 | 134 | 7 | 7 | 21 | 26 | 25 | 63 | 17 | 492 |
| 8:00 AM | 27 | 143 | 13 | 15 | 114 | 5 | 12 | 17 | 24 | 10 | 65 | 19 | 464 |
| 8:15 AM | 15 | 132 | 9 | 5 | 127 | 5 | 14 | 15 | 19 | 9 | 37 | 19 | 406 |
| 8:30 AM | 30 | 108 | 9 | 15 | 92 | 5 | 10 | 23 | 26 | 10 | 34 | 28 | 390 |
| 8:45 AM | 15 | 124 | 10 | 8 | 132 | 8 | 11 | 11 | 17 | 5 | 37 | 8 | 386 |
| VOLUMES | 213 | 1,250 | 113 | 163 | 1,619 | 51 | 110 | 182 | 290 | 204 | 494 | 160 | 4,849 |
| APPROACH % | 14% | 79% | 7% | 9% | 88% | 3% | 19% | 31% | 50% | 24% | 58% | 19% | |
| APP/DEPART | 1,576 | / | 1,536 | 1,833 | / | 2,119 | 582 | / | 442 | 858 | / | 752 | 0 |
| BEGIN PEAK HR | | 7:15 AM | | | | | | | | | | | |
| VOLUMES | 101 | 535 | 39 | 45 | 468 | 25 | 45 | 68 | 97 | 71 | 248 | 64 | 1,812 |
| APPROACH % | 15% | 79% | 6% | 8% | 86% | 5% | 21% | 32% | 46% | 19% | 65% | 17% | |
| PEAK HR FACTOR | | 0.922 | | | 0.895 | | | 0.938 | | | 0.912 | | 0.921 |
| APP/DEPART | 675 | / | 650 | 544 | / | 636 | 210 | / | 152 | 383 | / | 374 | 0 |
| **PM** | | | | | | | | | | | | | |
| 04:00 PM | 18 | 162 | 18 | 7 | 114 | 12 | 13 | 68 | 27 | 16 | 17 | 14 | 486 |
| 4:15 PM | 17 | 170 | 7 | 11 | 142 | 14 | 20 | 52 | 43 | 9 | 29 | 10 | 524 |
| 4:30 PM | 23 | 182 | 19 | 11 | 126 | 13 | 15 | 87 | 37 | 10 | 21 | 21 | 565 |
| 4:45 PM | 20 | 195 | 16 | 6 | 138 | 15 | 14 | 74 | 45 | 13 | 28 | 15 | 579 |
| 5:00 PM | 30 | 175 | 18 | 12 | 172 | 17 | 21 | 71 | 58 | 14 | 19 | 12 | 619 |
| 5:15 PM | 20 | 141 | 10 | 15 | 153 | 8 | 16 | 78 | 59 | 8 | 31 | 12 | 551 |
| 5:30 PM | 19 | 217 | 17 | 14 | 143 | 15 | 12 | 62 | 27 | 8 | 27 | 14 | 575 |
| 5:45 PM | 35 | 143 | 6 | 9 | 135 | 8 | 12 | 62 | 31 | 14 | 17 | 9 | 481 |
| 6:00 PM | 12 | 145 | 4 | 8 | 101 | 16 | 11 | 46 | 31 | 6 | 12 | 16 | 408 |
| 6:15 PM | 18 | 122 | 6 | 8 | 126 | 11 | 9 | 29 | 39 | 5 | 18 | 3 | 394 |
| 6:30 PM | 15 | 96 | 5 | 10 | 101 | 16 | 6 | 28 | 22 | 6 | 7 | 10 | 322 |
| 6:45 PM | 14 | 91 | 3 | 10 | 92 | 4 | 7 | 13 | 24 | 3 | 11 | 13 | 285 |
| VOLUMES | 241 | 1,839 | 129 | 121 | 1,543 | 149 | 156 | 670 | 443 | 112 | 237 | 149 | 5,789 |
| APPROACH % | 11% | 83% | 6% | 7% | 85% | 8% | 12% | 53% | 35% | 22% | 48% | 30% | |
| APP/DEPART | 2,209 | / | 2,151 | 1,813 | / | 2,098 | 1,269 | / | 913 | 498 | / | 627 | 0 |
| BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | |
| VOLUMES | 93 | 693 | 63 | 41 | 589 | 53 | 66 | 310 | 199 | 45 | 99 | 60 | 2,314 |
| APPROACH % | 11% | 82% | 7% | 6% | 86% | 8% | 11% | 54% | 35% | 22% | 49% | 29% | |
| PEAK HR FACTOR | | 0.919 | | | 0.853 | | | 0.940 | | | 0.911 | | 0.935 |
| APP/DEPART | 849 | / | 822 | 686 | / | 833 | 575 | / | 414 | 204 | / | 245 | 0 |

**U-TURNS**

| | NB | SB | EB | WB | TTL |
|---|---|---|---|---|---|
| 6:00 AM | 1 | 0 | 0 | 0 | 1 |
| 6:15 AM | 2 | 2 | 0 | 0 | 4 |
| 6:30 AM | 1 | 1 | 0 | 0 | 2 |
| 6:45 AM | 1 | 3 | 0 | 0 | 4 |
| 7:00 AM | 1 | 1 | 0 | 0 | 2 |
| 7:15 AM | 0 | 1 | 0 | 0 | 1 |
| 7:30 AM | 0 | 1 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 4 | 0 | 0 | 4 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 2 | 0 | 0 | 2 |
| 8:45 AM | 0 | 1 | 0 | 0 | 1 |
| VOLUMES | 6 | 16 | 0 | 0 | 22 |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 2 | 0 | 0 | 2 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 1 | 0 | 0 | 1 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 1 | 0 | 0 | 1 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| 6:00 PM | 0 | 1 | 0 | 0 | 1 |
| 6:15 PM | 0 | 1 | 0 | 0 | 1 |
| 6:30 PM | 0 | 1 | 0 | 0 | 1 |
| 6:45 PM | 0 | 0 | 0 | 0 | 0 |
| VOLUMES | 0 | 7 | 0 | 0 | 7 |

**RTOR**

| | NRR 0 | SRR 0 | ERR 0 | WRR 0 |
|---|---|---|---|---|
| 6:00 AM | 5 | 0 | 11 | 3 |
| 6:15 AM | 1 | 0 | 18 | 0 |
| 6:30 AM | 7 | 2 | 12 | 1 |
| 6:45 AM | 2 | 2 | 13 | 3 |
| 7:00 AM | 2 | 0 | 12 | 1 |
| 7:15 AM | 4 | 0 | 11 | 2 |
| 7:30 AM | 3 | 2 | 10 | 0 |
| 7:45 AM | 4 | 4 | 7 | 1 |
| 8:00 AM | 5 | 3 | 9 | 4 |
| 8:15 AM | 3 | 1 | 12 | 5 |
| 8:30 AM | 2 | 1 | 14 | 4 |
| 8:45 AM | 5 | 3 | 11 | 2 |
| VOLUMES | 43 | 18 | 140 | 26 |
| PEAK HR | 16 | 9 | 37 | 7 |
| 04:00 PM | 6 | 5 | 15 | 3 |
| 4:15 PM | 2 | 4 | 27 | 2 |
| 4:30 PM | 8 | 8 | 16 | 8 |
| 4:45 PM | 8 | 9 | 24 | 2 |
| 5:00 PM | 7 | 10 | 27 | 2 |
| 5:15 PM | 1 | 8 | 25 | 4 |
| 5:30 PM | 7 | 3 | 18 | 3 |
| 5:45 PM | 3 | 2 | 16 | 2 |
| 6:00 PM | 0 | 7 | 19 | 5 |
| 6:15 PM | 2 | 6 | 24 | 1 |
| 6:30 PM | 1 | 6 | 14 | 6 |
| 6:45 PM | 1 | 0 | 14 | 5 |
| VOLUMES | 46 | 68 | 239 | 43 |
| PEAK HR | 24 | 35 | 92 | 16 |

**Euclid**

NORTH SIDE

**Eucalyptus** WEST SIDE

EAST SIDE **Eucalyptus**

SOUTH SIDE

**Euclid**

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: | LOCATION: | Chino | PROJECT #: | SC4049 |
|---|---|---|---|---|
| 5/23/23 | NORTH & SOUTH: | Euclid | LOCATION #: | 17 |
| TUESDAY | EAST & WEST: | Eucalyptus | CONTROL: | SIGNAL |

| CLASS 2: | NOTES: |
|---|---|
| 2-AXLE WORK VEHICLES/ TRUCKS | |

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

| | NORTHBOUND Euclid | | | SOUTHBOUND Euclid | | | EASTBOUND Eucalyptus | | | WESTBOUND Eucalyptus | | | | U-TURNS | | | | | RTOR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LANES: | NL 1 | NT 2 | NR 1 | SL 1 | ST 2 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL | NB | SB | EB | WB | TTL | NRR 0 | SRR 0 | ERR 0 | WRR 0 |
| **AM** | | | | | | | | | | | | | | | | | | | | | | |
| 6:00 AM | 0 | 6 | 2 | 4 | 14 | 0 | 0 | 1 | 0 | 2 | 2 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15 AM | 0 | 4 | 1 | 1 | 13 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 6:30 AM | 0 | 8 | 4 | 1 | 10 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:45 AM | 1 | 6 | 3 | 5 | 15 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 34 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| 7:00 AM | 0 | 8 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 2 | 6 | 1 | 1 | 17 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 5 | 1 | 1 | 12 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 2 | 8 | 2 | 4 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 28 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| 8:00 AM | 1 | 4 | 5 | 2 | 21 | 0 | 1 | 0 | 1 | 1 | 2 | 3 | 41 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 1 |
| 8:15 AM | 1 | 5 | 0 | 0 | 8 | 0 | 0 | 1 | 1 | 4 | 3 | 1 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 1 | 8 | 2 | 3 | 11 | 0 | 1 | 1 | 1 | 3 | 1 | 2 | 34 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 8:45 AM | 1 | 6 | 0 | 0 | 16 | 1 | 2 | 0 | 1 | 2 | 4 | 3 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| VOLUMES | 9 | 74 | 21 | 22 | 163 | 1 | 6 | 5 | 5 | 19 | 19 | 16 | 360 | 0 | 1 | 0 | 0 | 1 | 6 | 0 | 2 | 2 |
| APPROACH % | 9% | 71% | 20% | 12% | 88% | 1% | 38% | 31% | 31% | 35% | 35% | 30% | | | | | | | | | | |
| APP/DEPART | 104 | / | 97 | 186 | / | 187 | 16 | / | 47 | 54 | / | 29 | 0 | | | | | | | | | |
| BEGIN PEAK HR | | 7:15 AM | | | | | | | | | | | | | | | | | | | | |
| VOLUMES | 5 | 23 | 9 | 8 | 60 | 0 | 3 | 1 | 2 | 4 | 3 | 8 | 126 | | | | | | 3 | 0 | 1 | 1 |
| APPROACH % | 14% | 62% | 24% | 12% | 88% | 0% | 50% | 17% | 33% | 27% | 20% | 53% | | | | | | | | | | |
| PEAK HR FACTOR | | 0.771 | | | 0.739 | | | 0.750 | | | 0.625 | | 0.768 | | | | | | | | | |
| APP/DEPART | 37 | / | 34 | 68 | / | 66 | 6 | / | 18 | 15 | / | 8 | 0 | | | | | | | | | |
| **PM** | | | | | | | | | | | | | | | | | | | | | | |
| 04:00 PM | 1 | 13 | 1 | 2 | 6 | 0 | 2 | 2 | 0 | 1 | 0 | 1 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 9 | 1 | 3 | 7 | 0 | 0 | 2 | 1 | 2 | 1 | 3 | 29 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 |
| 4:30 PM | 1 | 10 | 0 | 1 | 5 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 1 | 7 | 0 | 1 | 5 | 0 | 2 | 3 | 2 | 2 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 5:00 PM | 0 | 11 | 0 | 2 | 3 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 5:15 PM | 1 | 6 | 1 | 1 | 4 | 0 | 1 | 2 | 1 | 0 | 0 | 1 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 5:30 PM | 0 | 7 | 0 | 2 | 4 | 0 | 2 | 1 | 0 | 2 | 1 | 4 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 8 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:00 PM | 0 | 7 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:15 PM | 1 | 6 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 6:30 PM | 0 | 3 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 6:45 PM | 0 | 8 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VOLUMES | 5 | 95 | 4 | 17 | 43 | 1 | 8 | 14 | 8 | 12 | 2 | 12 | 221 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 1 |
| APPROACH % | 5% | 91% | 4% | 28% | 70% | 2% | 27% | 47% | 27% | 46% | 8% | 46% | | | | | | | | | | |
| APP/DEPART | 104 | / | 115 | 61 | / | 63 | 30 | / | 35 | 26 | / | 8 | 0 | | | | | | | | | |
| BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | | | | | |
| VOLUMES | 3 | 34 | 1 | 5 | 17 | 1 | 4 | 9 | 6 | 4 | 0 | 1 | 85 | | | | | | 0 | 0 | 3 | 0 |
| APPROACH % | 8% | 89% | 3% | 22% | 74% | 4% | 21% | 47% | 32% | 80% | 0% | 20% | | | | | | | | | | |
| PEAK HR FACTOR | | 0.864 | | | 0.821 | | | 0.679 | | | 0.625 | | 0.924 | | | | | | | | | |
| APP/DEPART | 38 | / | 39 | 23 | / | 27 | 19 | / | 15 | 5 | / | 4 | 0 | | | | | | | | | |

**Euclid**

NORTH SIDE

**Eucalyptus** WEST SIDE

EAST SIDE **Eucalyptus**

SOUTH SIDE

**Euclid**

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: 5/23/23 TUESDAY | LOCATION: | Chino | PROJECT #: | SC4049 |
|---|---|---|---|---|
| | NORTH & SOUTH: | Euclid | LOCATION #: | 17 |
| | EAST & WEST: | Eucalyptus | CONTROL: | SIGNAL |

**CLASS 3:** 3-AXLE TRUCKS

**NOTES:**

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

| | | NORTHBOUND Euclid | | | SOUTHBOUND Euclid | | | EASTBOUND Eucalyptus | | | WESTBOUND Eucalyptus | | | | U-TURNS | | | | | RTOR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1 | NT 2 | NR 1 | SL 1 | ST 2 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL | NB | SB | EB | WB | TTL | NRR 0 | SRR 0 | ERR 0 | WRR 0 |
| AM | 6:00 AM | 0 | 3 | 1 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| | 6:15 AM | 0 | 3 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 6:30 AM | 0 | 4 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 6:45 AM | 0 | 6 | 2 | 0 | 9 | 0 | 1 | 0 | 0 | 0 | 0 | 4 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 7:00 AM | 0 | 4 | 2 | 0 | 12 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 25 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| | 7:15 AM | 0 | 7 | 3 | 3 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 7 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 7:30 AM | 1 | 11 | 2 | 3 | 4 | 2 | 0 | 0 | 0 | 0 | 1 | 9 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| | 7:45 AM | 2 | 4 | 4 | 0 | 4 | 0 | 0 | 1 | 0 | 3 | 0 | 6 | 24 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 |
| | 8:00 AM | 1 | 8 | 2 | 0 | 7 | 0 | 0 | 1 | 0 | 4 | 0 | 8 | 31 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| | 8:15 AM | 0 | 6 | 1 | 1 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:30 AM | 0 | 1 | 0 | 2 | 8 | 0 | 0 | 0 | 1 | 1 | 0 | 5 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| | 8:45 AM | 0 | 4 | 1 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | VOLUMES | 4 | 61 | 18 | 12 | 80 | 3 | 1 | 2 | 1 | 10 | 2 | 68 | 262 | 1 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 18 |
| | APPROACH % | 5% | 73% | 22% | 13% | 84% | 3% | 25% | 50% | 25% | 13% | 3% | 85% | | | | | | | | | | |
| | APP/DEPART | 83 | / | 130 | 95 | / | 92 | 4 | / | 32 | 80 | / | 8 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 7:15 AM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 3 | 30 | 11 | 6 | 18 | 2 | 0 | 2 | 0 | 8 | 2 | 30 | 113 | | | | | | 3 | 0 | 0 | 7 |
| | APPROACH % | 7% | 67% | 24% | 23% | 69% | 8% | 0% | 100% | 0% | 20% | 5% | 75% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.804 | | | 0.722 | | | 0.500 | | | 0.833 | | 0.856 | | | | | | | | | |
| | APP/DEPART | 45 | / | 60 | 26 | / | 27 | 2 | / | 19 | 40 | / | 7 | 0 | | | | | | | | | |
| PM | 04:00 PM | 0 | 7 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | 4:15 PM | 0 | 7 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| | 4:30 PM | 0 | 3 | 0 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:45 PM | 0 | 6 | 1 | 1 | 6 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:00 PM | 0 | 4 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 11 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | 5:15 PM | 0 | 3 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:30 PM | 0 | 2 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 5:45 PM | 0 | 2 | 0 | 2 | 6 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 13 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | 6:00 PM | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | 6:15 PM | 0 | 4 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:30 PM | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:45 PM | 0 | 3 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| | VOLUMES | 0 | 47 | 4 | 27 | 36 | 0 | 0 | 7 | 0 | 4 | 1 | 14 | 140 | 0 | 4 | 0 | 0 | 4 | 1 | 0 | 0 | 3 |
| | APPROACH % | 0% | 92% | 8% | 43% | 57% | 0% | 0% | 100% | 0% | 21% | 5% | 74% | | | | | | | | | | |
| | APP/DEPART | 51 | / | 65 | 63 | / | 40 | 7 | / | 34 | 19 | / | 1 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 16 | 3 | 5 | 15 | 0 | 0 | 6 | 0 | 1 | 1 | 4 | 52 | | | | | | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 84% | 16% | 24% | 71% | 0% | 0% | 100% | 0% | 17% | 17% | 67% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.679 | | | 0.750 | | | 0.250 | | | 0.750 | | 0.813 | | | | | | | | | |
| | APP/DEPART | 19 | / | 21 | 21 | / | 16 | 6 | / | 14 | 6 | / | 1 | 0 | | | | | | | | | |

**Euclid**

NORTH SIDE

**Eucalyptus** WEST SIDE

EAST SIDE **Eucalyptus**

SOUTH SIDE

**Euclid**

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: 5/23/23 TUESDAY | LOCATION: | Chino | PROJECT #: | SC4049 |
|---|---|---|---|---|
| | NORTH & SOUTH: | Euclid | LOCATION #: | 17 |
| | EAST & WEST: | Eucalyptus | CONTROL: | SIGNAL |

**CLASS 4:** 4 OR MORE AXLE TRUCKS

**NOTES:**

AM / PM / MD / OTHER / OTHER

▲ N ◄ W E ► S ▼

| | | NORTHBOUND Euclid | | | SOUTHBOUND Euclid | | | EASTBOUND Eucalyptus | | | WESTBOUND Eucalyptus | | | | U-TURNS | | | | | RTOR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1 | NT 2 | NR 1 | SL 1 | ST 2 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL | NB | SB | EB | WB | TTL | NRR 0 | SRR 0 | ERR 0 | WRR 0 |
| AM | 6:00 AM | 0 | 8 | 0 | 8 | 12 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| | 6:15 AM | 0 | 9 | 0 | 12 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 40 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | 6:30 AM | 0 | 10 | 0 | 4 | 12 | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:45 AM | 0 | 9 | 2 | 9 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 7:00 AM | 0 | 6 | 0 | 8 | 17 | 0 | 0 | 0 | 0 | 1 | 0 | 9 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:15 AM | 0 | 9 | 2 | 7 | 12 | 0 | 0 | 0 | 0 | 3 | 0 | 7 | 40 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 2 |
| | 7:30 AM | 0 | 8 | 0 | 5 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 33 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | 7:45 AM | 0 | 12 | 0 | 4 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 8:00 AM | 0 | 9 | 1 | 1 | 13 | 0 | 0 | 0 | 1 | 1 | 0 | 5 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| | 8:15 AM | 0 | 18 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:30 AM | 0 | 13 | 3 | 3 | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 8:45 AM | 0 | 13 | 2 | 3 | 18 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | VOLUMES | 0 | 124 | 10 | 64 | 179 | 1 | 0 | 0 | 1 | 12 | 0 | 49 | 440 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 1 | 9 |
| | APPROACH % | 0% | 93% | 7% | 26% | 73% | 0% | 0% | 0% | 100% | 20% | 0% | 80% | | | | | | | | | | |
| | APP/DEPART | 134 | / | 176 | 244 | / | 192 | 1 | / | 71 | 61 | / | 1 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 7:15 AM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 38 | 3 | 15 | 56 | 0 | 0 | 0 | 1 | 4 | 0 | 21 | 140 | | | | | | 0 | 0 | 1 | 4 |
| | APPROACH % | 0% | 93% | 7% | 21% | 77% | 0% | 0% | 0% | 100% | 16% | 0% | 84% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.854 | | | 0.830 | | | 0.250 | | | 0.625 | | 0.875 | | | | | | | | | |
| | APP/DEPART | 41 | / | 61 | 73 | / | 61 | 1 | / | 18 | 25 | / | 0 | 0 | | | | | | | | | |
| PM | 04:00 PM | 0 | 13 | 0 | 2 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 34 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | 4:15 PM | 0 | 9 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 4:30 PM | 0 | 9 | 0 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 23 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| | 4:45 PM | 0 | 11 | 0 | 3 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:00 PM | 0 | 10 | 1 | 3 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:15 PM | 0 | 7 | 0 | 4 | 8 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:30 PM | 0 | 4 | 1 | 1 | 9 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:45 PM | 0 | 11 | 1 | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 30 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 2 |
| | 6:00 PM | 0 | 10 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:15 PM | 0 | 8 | 1 | 4 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:30 PM | 0 | 6 | 0 | 2 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 6:45 PM | 0 | 8 | 1 | 2 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 20 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| | VOLUMES | 0 | 106 | 5 | 33 | 106 | 0 | 0 | 1 | 0 | 8 | 0 | 28 | 287 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 6 |
| | APPROACH % | 0% | 95% | 5% | 24% | 76% | 0% | 0% | 100% | 0% | 22% | 0% | 78% | | | | | | | | | | |
| | APP/DEPART | 111 | / | 139 | 139 | / | 114 | 1 | / | 34 | 36 | / | 0 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 37 | 1 | 13 | 25 | 0 | 0 | 1 | 0 | 3 | 0 | 10 | 91 | | | | | | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 97% | 3% | 33% | 64% | 0% | 0% | 100% | 0% | 23% | 0% | 77% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.864 | | | 0.813 | | | 0.250 | | | 0.813 | | 0.989 | | | | | | | | | |
| | APP/DEPART | 38 | / | 48 | 39 | / | 28 | 1 | / | 15 | 13 | / | 0 | 0 | | | | | | | | | |

**Euclid**

NORTH SIDE

**Eucalyptus** WEST SIDE

EAST SIDE **Eucalyptus**

SOUTH SIDE

**Euclid**

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: | LOCATION: | Chino | PROJECT #: | SC4049 |
|---|---|---|---|---|
| 5/23/23 | NORTH & SOUTH: | Euclid | LOCATION #: | 17 |
| TUESDAY | EAST & WEST: | Eucalyptus | CONTROL: | SIGNAL |

| CLASS 5: | NOTES: |
|---|---|
| RV | |

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

| | | NORTHBOUND Euclid | | | SOUTHBOUND Euclid | | | EASTBOUND Eucalyptus | | | WESTBOUND Eucalyptus | | | | U-TURNS | | | | | RTOR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1 | NT 2 | NR 1 | SL 1 | ST 2 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL | NB | SB | EB | WB | TTL | NRR 0 | SRR 0 | ERR 0 | WRR 0 |
| AM | 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:45 AM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:30 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:45 AM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | VOLUMES | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 100% | 0% | 0% | | | | | | | | | | |
| | APP/DEPART | 5 | / | 5 | 0 | / | 1 | 0 | / | 0 | 1 | / | 0 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 7:15 AM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.000 | | | 0.000 | | | 0.000 | | | 0.000 | | 0.000 | | | | | | | | | |
| | APP/DEPART | 0 | / | 0 | 0 | / | 0 | 0 | / | 0 | 0 | / | 0 | 0 | | | | | | | | | |
| PM | 04:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:15 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:15 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:45 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | VOLUMES | 0 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | | | | | | | | | | |
| | APP/DEPART | 3 | / | 3 | 1 | / | 1 | 0 | / | 0 | 0 | / | 0 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | | | | | | 0 | 0 | 0 | 0 |
| | APPROACH % | 0% | 100% | 0% | 0% | 100% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.250 | | | 0.250 | | | 0.000 | | | 0.000 | | 0.250 | | | | | | | | | |
| | APP/DEPART | 1 | / | 1 | 1 | / | 1 | 0 | / | 0 | 0 | / | 0 | 0 | | | | | | | | | |

**Euclid**

NORTH SIDE

**Eucalyptus** WEST SIDE

EAST SIDE **Eucalyptus**

SOUTH SIDE

**Euclid**

# INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

| DATE: | LOCATION: | Chino | PROJECT #: | SC4049 |
|---|---|---|---|---|
| 5/23/23 | NORTH & SOUTH: | Euclid | LOCATION #: | 17 |
| TUESDAY | EAST & WEST: | Eucalyptus | CONTROL: | SIGNAL |

| CLASS 6: | NOTES: |
|---|---|
| BUSES | |

AM / PM / MD / OTHER / OTHER — ▲ N ◄ W E ► S ▼

| | | NORTHBOUND Euclid | | | SOUTHBOUND Euclid | | | EASTBOUND Eucalyptus | | | WESTBOUND Eucalyptus | | | | U-TURNS | | | | | RTOR | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LANES: | NL 1 | NT 2 | NR 1 | SL 1 | ST 2 | SR 1 | EL 1 | ET 1 | ER 1 | WL 1 | WT 1 | WR 0 | TOTAL | NB | SB | EB | WB | TTL | NRR 0 | SRR 0 | ERR 0 | WRR 0 |
| AM | 6:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:15 AM | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:30 AM | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:45 AM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:00 AM | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:15 AM | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | 7:30 AM | 1 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7:45 AM | 0 | 1 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:00 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8:30 AM | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | 8:45 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | VOLUMES | 2 | 4 | 0 | 0 | 15 | 6 | 5 | 0 | 3 | 0 | 1 | 1 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| | APPROACH % | 33% | 67% | 0% | 0% | 71% | 29% | 63% | 0% | 38% | 0% | 50% | 50% | | | | | | | | | | |
| | APP/DEPART | 6 | / | 10 | 21 | / | 18 | 8 | / | 0 | 2 | / | 9 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 7:15 AM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 1 | 2 | 0 | 0 | 6 | 3 | 1 | 0 | 1 | 0 | 1 | 1 | 16 | | | | | | 0 | 1 | 0 | 0 |
| | APPROACH % | 33% | 67% | 0% | 0% | 67% | 33% | 50% | 0% | 50% | 0% | 50% | 50% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.750 | | | 0.750 | | | 0.500 | | | 0.500 | | 0.800 | | | | | | | | | |
| | APP/DEPART | 3 | / | 4 | 9 | / | 7 | 2 | / | 0 | 2 | / | 5 | 0 | | | | | | | | | |
| PM | 04:00 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:15 PM | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:30 PM | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4:45 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | VOLUMES | 2 | 0 | 0 | 0 | 1 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| | APPROACH % | 100% | 0% | 0% | 0% | 20% | 80% | 100% | 0% | 0% | 0% | 0% | 0% | | | | | | | | | | |
| | APP/DEPART | 2 | / | 4 | 5 | / | 1 | 4 | / | 0 | 0 | / | 6 | 0 | | | | | | | | | |
| | BEGIN PEAK HR | | 4:30 PM | | | | | | | | | | | | | | | | | | | | |
| | VOLUMES | 1 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | | | | | | 0 | 1 | 0 | 0 |
| | APPROACH % | 100% | 0% | 0% | 0% | 0% | 100% | 100% | 0% | 0% | 0% | 0% | 0% | | | | | | | | | | |
| | PEAK HR FACTOR | | 0.250 | | | 0.250 | | | 0.500 | | | 0.000 | | 0.500 | | | | | | | | | |
| | APP/DEPART | 1 | / | 2 | 1 | / | 0 | 2 | / | 0 | 0 | / | 2 | 0 | | | | | | | | | |

**Euclid**

NORTH SIDE

**Eucalyptus** WEST SIDE

EAST SIDE **Eucalyptus**

SOUTH SIDE

**Euclid**

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 21 | 209 | 15 | 3 | 245 | 16 | 11 | 33 | 1 | 60 | 7 | 192 | 10 | 1 | 209 | 1 | 1 | 1 | 0 | 3 | 5 | 517 | 522 |
| 07:15 AM | 20 | 179 | 8 | 2 | 207 | 15 | 10 | 51 | 6 | 76 | 6 | 213 | 9 | 1 | 228 | 4 | 0 | 0 | 0 | 4 | 9 | 515 | 524 |
| 07:30 AM | 35 | 190 | 7 | 2 | 232 | 10 | 3 | 65 | 2 | 78 | 9 | 217 | 15 | 1 | 241 | 2 | 1 | 0 | 0 | 3 | 5 | 554 | 559 |
| 07:45 AM | 41 | 225 | 14 | 3 | 280 | 12 | 6 | 59 | 0 | 77 | 4 | 267 | 20 | 1 | 291 | 0 | 1 | 2 | 0 | 3 | 4 | 651 | 655 |
| Total | 117 | 803 | 44 | 10 | 964 | 53 | 30 | 208 | 9 | 291 | 26 | 889 | 54 | 4 | 969 | 7 | 3 | 3 | 0 | 13 | 23 | 2237 | 2260 |
| 08:00 AM | 47 | 165 | 6 | 3 | 218 | 22 | 6 | 63 | 6 | 91 | 2 | 217 | 12 | 1 | 231 | 1 | 0 | 4 | 3 | 5 | 13 | 545 | 558 |
| 08:15 AM | 36 | 173 | 3 | 2 | 212 | 13 | 3 | 42 | 3 | 58 | 2 | 186 | 15 | 2 | 203 | 1 | 0 | 0 | 0 | 1 | 7 | 474 | 481 |
| 08:30 AM | 47 | 181 | 2 | 0 | 230 | 23 | 1 | 55 | 6 | 79 | 1 | 221 | 12 | 1 | 234 | 5 | 1 | 0 | 0 | 6 | 7 | 549 | 556 |
| 08:45 AM | 33 | 160 | 4 | 2 | 197 | 7 | 0 | 43 | 6 | 50 | 2 | 206 | 7 | 1 | 215 | 2 | 0 | 0 | 0 | 2 | 9 | 464 | 473 |
| Total | 163 | 679 | 15 | 7 | 857 | 65 | 10 | 203 | 21 | 278 | 7 | 830 | 46 | 5 | 883 | 9 | 1 | 4 | 3 | 14 | 36 | 2032 | 2068 |
| Grand Total | 280 | 1482 | 59 | 17 | 1821 | 118 | 40 | 411 | 30 | 569 | 33 | 1719 | 100 | 9 | 1852 | 16 | 4 | 7 | 3 | 27 | 59 | 4269 | 4328 |
| Apprch % | 15.4 | 81.4 | 3.2 | | | 20.7 | 7 | 72.2 | | | 1.8 | 92.8 | 5.4 | | | 59.3 | 14.8 | 25.9 | | | | | |
| Total % | 6.6 | 34.7 | 1.4 | | 42.7 | 2.8 | 0.9 | 9.6 | | 13.3 | 0.8 | 40.3 | 2.3 | | 43.4 | 0.4 | 0.1 | 0.2 | | 0.6 | 1.4 | 98.6 | |
| Passenger Vehicles | 236 | 1254 | 54 | | 1561 | 96 | 40 | 355 | | 518 | 31 | 1526 | 65 | | 1630 | 10 | 2 | 5 | | 20 | 0 | 0 | 3729 |
| % Passenger Vehicles | 84.3 | 84.6 | 91.5 | 100 | 84.9 | 81.4 | 100 | 86.4 | 90 | 86.5 | 93.9 | 88.8 | 65 | 88.9 | 87.6 | 62.5 | 50 | 71.4 | 100 | 66.7 | 0 | 0 | 86.2 |
| Large 2 Axle Vehicles | 13 | 46 | 0 | | 59 | 5 | 0 | 14 | | 19 | 1 | 47 | 11 | | 59 | 1 | 1 | 1 | | 3 | 0 | 0 | 140 |
| % Large 2 Axle Vehicles | 4.6 | 3.1 | 0 | 0 | 3.2 | 4.2 | 0 | 3.4 | 0 | 3.2 | 3 | 2.7 | 11 | 0 | 3.2 | 6.2 | 25 | 14.3 | 0 | 10 | 0 | 0 | 3.2 |
| 3 Axle Vehicles | 5 | 42 | 0 | | 47 | 3 | 0 | 9 | | 13 | 0 | 24 | 4 | | 28 | 0 | 0 | 0 | | 0 | 0 | 0 | 88 |
| % 3 Axle Vehicles | 1.8 | 2.8 | 0 | 0 | 2.6 | 2.5 | 0 | 2.2 | 3.3 | 2.2 | 0 | 1.4 | 4 | 0 | 1.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4+ Axle Trucks | 26 | 140 | 5 | | 171 | 14 | 0 | 33 | | 49 | 1 | 122 | 20 | | 144 | 5 | 1 | 1 | | 7 | 0 | 0 | 371 |
| % 4+ Axle Trucks | 9.3 | 9.4 | 8.5 | 0 | 9.3 | 11.9 | 0 | 8 | 6.7 | 8.2 | 3 | 7.1 | 20 | 11.1 | 7.7 | 31.2 | 25 | 14.3 | 0 | 23.3 | 0 | 0 | 8.6 |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 20 | 179 | 8 | 207 | 15 | **10** | 51 | 76 | 6 | 213 | 9 | 228 | **4** | 0 | 0 | 4 | 515 |
| 07:30 AM | 35 | 190 | 7 | 232 | 10 | 3 | **65** | 78 | **9** | 217 | 15 | 241 | 2 | **1** | 0 | 3 | 554 |
| 07:45 AM | 41 | **225** | **14** | **280** | 12 | 6 | 59 | 77 | 4 | **267** | **20** | **291** | 0 | 1 | 2 | 3 | **651** |
| 08:00 AM | **47** | 165 | 6 | 218 | **22** | 6 | 63 | **91** | 2 | 217 | 12 | 231 | 1 | 0 | **4** | **5** | 545 |
| Total Volume | 143 | 759 | 35 | 937 | 59 | 25 | 238 | 322 | 21 | 914 | 56 | 991 | 7 | 2 | 6 | 15 | 2265 |
| % App. Total | 15.3 | 81 | 3.7 | | 18.3 | 7.8 | 73.9 | | 2.1 | 92.2 | 5.7 | | 46.7 | 13.3 | 40 | | |
| PHF | .761 | .843 | .625 | .837 | .670 | .625 | .915 | .885 | .583 | .856 | .700 | .851 | .438 | .500 | .375 | .750 | .870 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

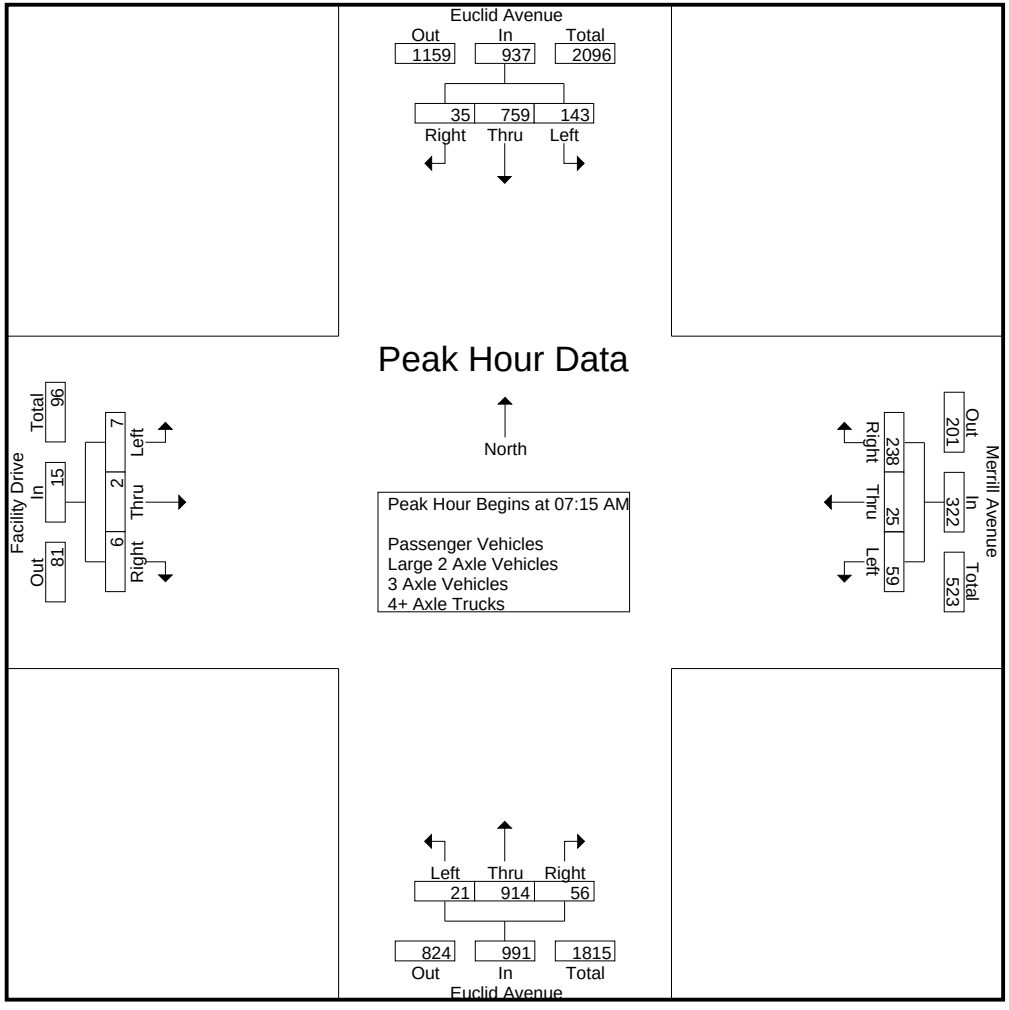

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 21 | 209 | **15** | 245 | 15 | **10** | 51 | 76 | 6 | 213 | 9 | 228 | **4** | 0 | 0 | 4 | |
| +15 mins. | 20 | 179 | 8 | 207 | 10 | 3 | **65** | 78 | **9** | 217 | 15 | 241 | 2 | **1** | 0 | 3 | |
| +30 mins. | 35 | 190 | 7 | 232 | 12 | 6 | 59 | 77 | 4 | **267** | **20** | **291** | 0 | 1 | 2 | 3 | |
| +45 mins. | **41** | **225** | 14 | **280** | **22** | 6 | 63 | **91** | 2 | 217 | 12 | 231 | 1 | 0 | **4** | **5** | |
| Total Volume | 117 | 803 | 44 | 964 | 59 | 25 | 238 | 322 | 21 | 914 | 56 | 991 | 7 | 2 | 6 | 15 | |
| % App. Total | 12.1 | 83.3 | 4.6 | | 18.3 | 7.8 | 73.9 | | 2.1 | 92.2 | 5.7 | | 46.7 | 13.3 | 40 | | |
| PHF | .713 | .892 | .733 | .861 | .670 | .625 | .915 | .885 | .583 | .856 | .700 | .851 | .438 | .500 | .375 | .750 | |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 17 | 170 | 13 | 3 | 200 | 16 | 11 | 29 | 0 | 56 | 6 | 173 | 8 | 1 | 187 | 1 | 1 | 0 | 0 | 2 | 4 | 445 | 449 |
| 07:15 AM | 18 | 161 | 8 | 2 | 187 | 12 | 10 | 44 | 6 | 66 | 6 | 193 | 9 | 1 | 208 | 2 | 0 | 0 | 0 | 2 | 9 | 463 | 472 |
| 07:30 AM | 31 | 155 | 7 | 2 | 193 | 9 | 3 | 59 | 2 | 71 | 9 | 194 | 9 | 1 | 212 | 2 | 0 | 0 | 0 | 2 | 5 | 478 | 483 |
| 07:45 AM | 32 | 197 | 13 | 3 | 242 | 10 | 6 | 48 | 0 | 64 | 4 | 243 | 13 | 1 | 260 | 0 | 1 | 2 | 0 | 3 | 4 | 569 | 573 |
| Total | 98 | 683 | 41 | 10 | 822 | 47 | 30 | 180 | 8 | 257 | 25 | 803 | 39 | 4 | 867 | 5 | 2 | 2 | 0 | 9 | 22 | 1955 | 1977 |
| 08:00 AM | 42 | 140 | 6 | 3 | 188 | 17 | 6 | 55 | 5 | 78 | 2 | 194 | 7 | 1 | 203 | 0 | 0 | 3 | 3 | 3 | 12 | 472 | 484 |
| 08:15 AM | 28 | 143 | 3 | 2 | 174 | 8 | 3 | 35 | 3 | 46 | 1 | 157 | 8 | 2 | 166 | 0 | 0 | 0 | 0 | 0 | 7 | 386 | 393 |
| 08:30 AM | 41 | 153 | 1 | 0 | 195 | 19 | 1 | 50 | 6 | 70 | 1 | 198 | 5 | 0 | 204 | 3 | 0 | 0 | 0 | 3 | 6 | 472 | 478 |
| 08:45 AM | 27 | 135 | 3 | 2 | 165 | 5 | 0 | 35 | 5 | 40 | 2 | 174 | 6 | 1 | 182 | 2 | 0 | 0 | 0 | 2 | 8 | 389 | 397 |
| Total | 138 | 571 | 13 | 7 | 722 | 49 | 10 | 175 | 19 | 234 | 6 | 723 | 26 | 4 | 755 | 5 | 0 | 3 | 3 | 8 | 33 | 1719 | 1752 |
| Grand Total | 236 | 1254 | 54 | 17 | 1544 | 96 | 40 | 355 | 27 | 491 | 31 | 1526 | 65 | 8 | 1622 | 10 | 2 | 5 | 3 | 17 | 55 | 3674 | 3729 |
| Apprch % | 15.3 | 81.2 | 3.5 | | | 19.6 | 8.1 | 72.3 | | | 1.9 | 94.1 | 4 | | | 58.8 | 11.8 | 29.4 | | | | | |
| Total % | 6.4 | 34.1 | 1.5 | | 42 | 2.6 | 1.1 | 9.7 | | 13.4 | 0.8 | 41.5 | 1.8 | | 44.1 | 0.3 | 0.1 | 0.1 | | 0.5 | 1.5 | 98.5 | |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 18 | 161 | 8 | 187 | 12 | **10** | 44 | 66 | 6 | 193 | 9 | 208 | **2** | 0 | 0 | 2 | 463 |
| 07:30 AM | 31 | 155 | 7 | 193 | 9 | 3 | **59** | 71 | **9** | 194 | 9 | 212 | 2 | 0 | 0 | 2 | 478 |
| 07:45 AM | 32 | **197** | **13** | **242** | 10 | 6 | 48 | 64 | 4 | **243** | **13** | **260** | 0 | **1** | 2 | **3** | **569** |
| 08:00 AM | **42** | 140 | 6 | 188 | **17** | 6 | 55 | **78** | 2 | 194 | 7 | 203 | 0 | 0 | **3** | 3 | 472 |
| Total Volume | 123 | 653 | 34 | 810 | 48 | 25 | 206 | 279 | 21 | 824 | 38 | 883 | 4 | 1 | 5 | 10 | 1982 |
| % App. Total | 15.2 | 80.6 | 4.2 | | 17.2 | 9 | 73.8 | | 2.4 | 93.3 | 4.3 | | 40 | 10 | 50 | | |
| PHF | .732 | .829 | .654 | .837 | .706 | .625 | .873 | .894 | .583 | .848 | .731 | .849 | .500 | .250 | .417 | .833 | .871 |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

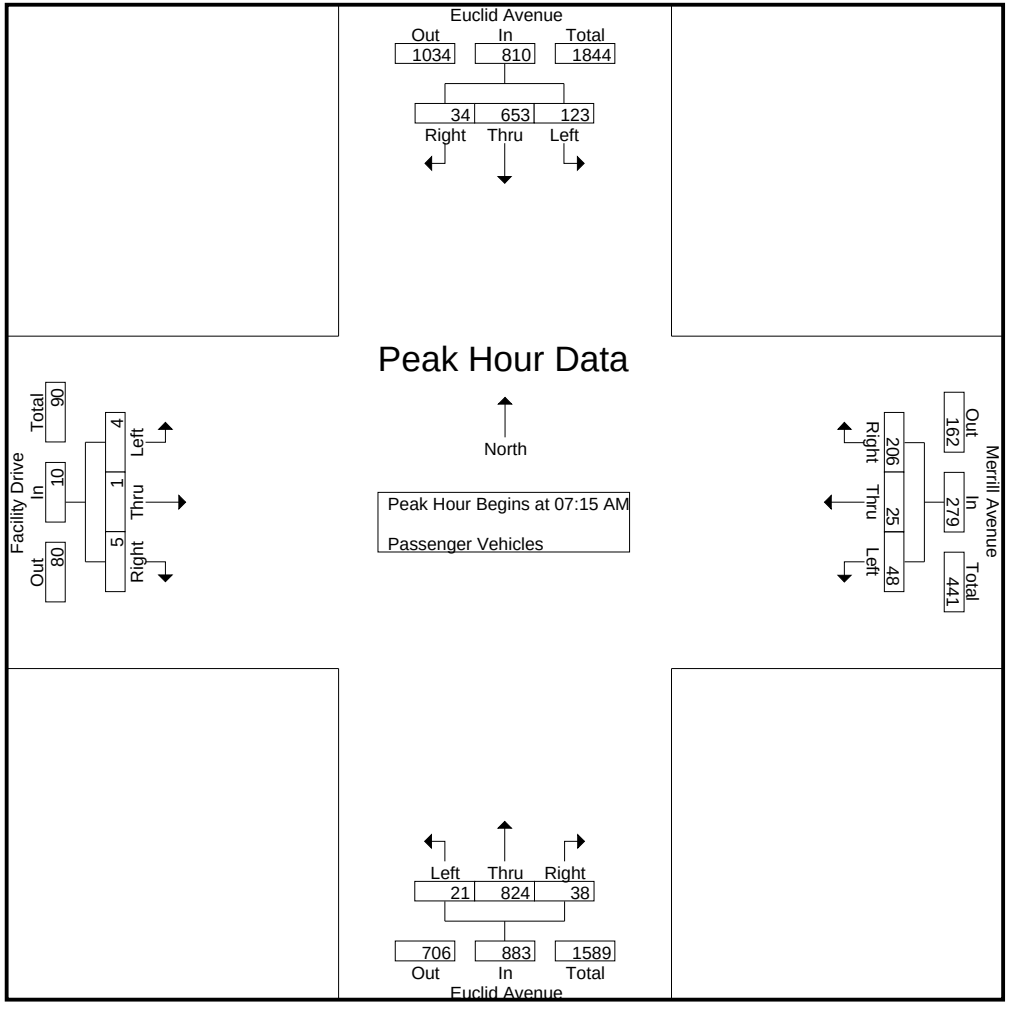

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City of Chino
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E/W: Facility Drive/Merrill Avenue
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File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 18 | 161 | 8 | 187 | 12 | **10** | 44 | 66 | 6 | 193 | 9 | 208 | **2** | 0 | 0 | 2 | |
| +15 mins. | 31 | 155 | 7 | 193 | 9 | 3 | **59** | 71 | **9** | 194 | 9 | 212 | 2 | 0 | 0 | 2 | |
| +30 mins. | 32 | **197** | **13** | **242** | 10 | 6 | 48 | 64 | 4 | **243** | **13** | **260** | 0 | **1** | 2 | **3** | |
| +45 mins. | **42** | 140 | 6 | 188 | **17** | 6 | 55 | **78** | 2 | 194 | 7 | 203 | 0 | 0 | **3** | 3 | |
| Total Volume | 123 | 653 | 34 | 810 | 48 | 25 | 206 | 279 | 21 | 824 | 38 | 883 | 4 | 1 | 5 | 10 | |
| % App. Total | 15.2 | 80.6 | 4.2 | | 17.2 | 9 | 73.8 | | 2.4 | 93.3 | 4.3 | | 40 | 10 | 50 | | |
| PHF | .732 | .829 | .654 | .837 | .706 | .625 | .873 | .894 | .583 | .848 | .731 | .849 | .500 | .250 | .417 | .833 | |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 12 | 0 | 0 | 13 | 0 | 0 | 2 | 0 | 2 | 1 | 4 | 1 | 0 | 6 | 0 | 0 | 1 | 0 | 1 | 0 | 22 | 22 |
| 07:15 AM | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 0 | 7 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 0 | 14 | 14 |
| 07:30 AM | 0 | 5 | 0 | 0 | 5 | 1 | 0 | 1 | 0 | 2 | 0 | 7 | 3 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 17 |
| 07:45 AM | 4 | 3 | 0 | 0 | 7 | 1 | 0 | 3 | 0 | 4 | 0 | 4 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| Total | 6 | 24 | 0 | 0 | 30 | 2 | 0 | 7 | 0 | 9 | 1 | 22 | 7 | 0 | 30 | 1 | 0 | 1 | 0 | 2 | 0 | 71 | 71 |
| 08:00 AM | 1 | 7 | 0 | 0 | 8 | 1 | 0 | 2 | 0 | 3 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 18 | 18 |
| 08:15 AM | 3 | 6 | 0 | 0 | 9 | 1 | 0 | 2 | 0 | 3 | 0 | 6 | 2 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 08:30 AM | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 2 | 0 | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 15 | 15 |
| 08:45 AM | 1 | 5 | 0 | 0 | 6 | 1 | 0 | 2 | 0 | 3 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 16 |
| Total | 7 | 22 | 0 | 0 | 29 | 3 | 0 | 7 | 0 | 10 | 0 | 25 | 4 | 0 | 29 | 0 | 1 | 0 | 0 | 1 | 0 | 69 | 69 |
| Grand Total | 13 | 46 | 0 | 0 | 59 | 5 | 0 | 14 | 0 | 19 | 1 | 47 | 11 | 0 | 59 | 1 | 1 | 1 | 0 | 3 | 0 | 140 | 140 |
| Apprch % | 22 | 78 | 0 | | | 26.3 | 0 | 73.7 | | | 1.7 | 79.7 | 18.6 | | | 33.3 | 33.3 | 33.3 | | | | | |
| Total % | 9.3 | 32.9 | 0 | | 42.1 | 3.6 | 0 | 10 | | 13.6 | 0.7 | 33.6 | 7.9 | | 42.1 | 0.7 | 0.7 | 0.7 | | 2.1 | 0 | 100 | |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 1 | 4 | 0 | 5 | 0 | 0 | 1 | 1 | 0 | **7** | 0 | 7 | **1** | 0 | 0 | **1** | 14 |
| 07:30 AM | 0 | 5 | 0 | 5 | **1** | 0 | 1 | 2 | 0 | 7 | **3** | **10** | 0 | 0 | 0 | 0 | 17 |
| 07:45 AM | **4** | 3 | 0 | 7 | 1 | 0 | **3** | **4** | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | **18** |
| 08:00 AM | 1 | **7** | 0 | **8** | 1 | 0 | 2 | 3 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 18 |
| Total Volume | 6 | 19 | 0 | 25 | 3 | 0 | 7 | 10 | 0 | 25 | 6 | 31 | 1 | 0 | 0 | 1 | 67 |
| % App. Total | 24 | 76 | 0 | | 30 | 0 | 70 | | 0 | 80.6 | 19.4 | | 100 | 0 | 0 | | |
| PHF | .375 | .679 | .000 | .781 | .750 | .000 | .583 | .625 | .000 | .893 | .500 | .775 | .250 | .000 | .000 | .250 | .931 |

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E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

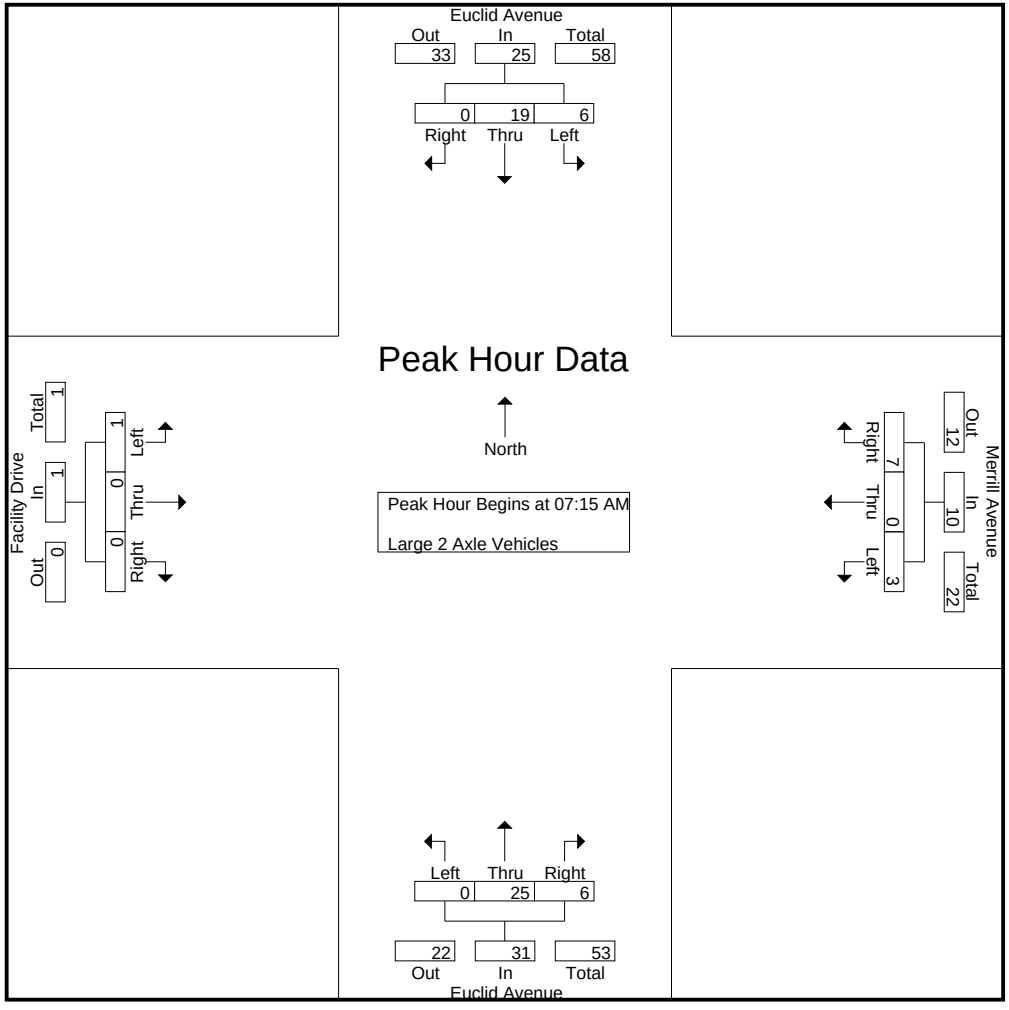

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File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 1 | 4 | 0 | 5 | 0 | 0 | 1 | 1 | 0 | **7** | 0 | 7 | **1** | 0 | 0 | **1** | |
| +15 mins. | 0 | 5 | 0 | 5 | **1** | 0 | 1 | 2 | 0 | 7 | **3** | **10** | 0 | 0 | 0 | 0 | |
| +30 mins. | **4** | 3 | 0 | 7 | 1 | 0 | **3** | **4** | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | |
| +45 mins. | 1 | **7** | 0 | **8** | 1 | 0 | 2 | 3 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | |
| Total Volume | 6 | 19 | 0 | 25 | 3 | 0 | 7 | 10 | 0 | 25 | 6 | 31 | 1 | 0 | 0 | 1 | |
| % App. Total | 24 | 76 | 0 | | 30 | 0 | 70 | | 0 | 80.6 | 19.4 | | 100 | 0 | 0 | | |
| PHF | .375 | .679 | .000 | .781 | .750 | .000 | .583 | .625 | .000 | .893 | .500 | .775 | .250 | .000 | .000 | .250 | |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 2 | 1 | 2 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 13 |
| 07:15 AM | 1 | 3 | 0 | 0 | 4 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 |
| 07:30 AM | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 07:45 AM | 1 | 8 | 0 | 0 | 9 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| Total | 2 | 27 | 0 | 0 | 29 | 1 | 0 | 4 | 1 | 5 | 0 | 11 | 1 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 1 | 46 | 47 |
| 08:00 AM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 2 | 0 | 2 | 0 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 08:15 AM | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| 08:30 AM | 0 | 5 | 0 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 08:45 AM | 2 | 1 | 0 | 0 | 3 | 1 | 0 | 2 | 0 | 3 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| Total | 3 | 15 | 0 | 0 | 18 | 2 | 0 | 5 | 0 | 7 | 0 | 13 | 3 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 41 |
| Grand Total | 5 | 42 | 0 | 0 | 47 | 3 | 0 | 9 | 1 | 12 | 0 | 24 | 4 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 1 | 87 | 88 |
| Apprch % | 10.6 | 89.4 | 0 | | | 25 | 0 | 75 | | | 0 | 85.7 | 14.3 | | | 0 | 0 | 0 | | | | | |
| Total % | 5.7 | 48.3 | 0 | | 54 | 3.4 | 0 | 10.3 | | 13.8 | 0 | 27.6 | 4.6 | | 32.2 | 0 | 0 | 0 | | 0 | 1.1 | 98.9 | |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | **1** | 3 | 0 | 4 | **1** | 0 | 1 | **2** | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 8 |
| 07:30 AM | 0 | **9** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 11 |
| 07:45 AM | 1 | 8 | 0 | 9 | 0 | 0 | 1 | 1 | 0 | 4 | **1** | 5 | 0 | 0 | 0 | 0 | **15** |
| 08:00 AM | 0 | 4 | 0 | 4 | 0 | 0 | **2** | 2 | 0 | **5** | 1 | **6** | 0 | 0 | 0 | 0 | 12 |
| Total Volume | 2 | 24 | 0 | 26 | 1 | 0 | 4 | 5 | 0 | 13 | 2 | 15 | 0 | 0 | 0 | 0 | 46 |
| % App. Total | 7.7 | 92.3 | 0 | | 20 | 0 | 80 | | 0 | 86.7 | 13.3 | | 0 | 0 | 0 | | |
| PHF | .500 | .667 | .000 | .722 | .250 | .000 | .500 | .625 | .000 | .650 | .500 | .625 | .000 | .000 | .000 | .000 | .767 |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

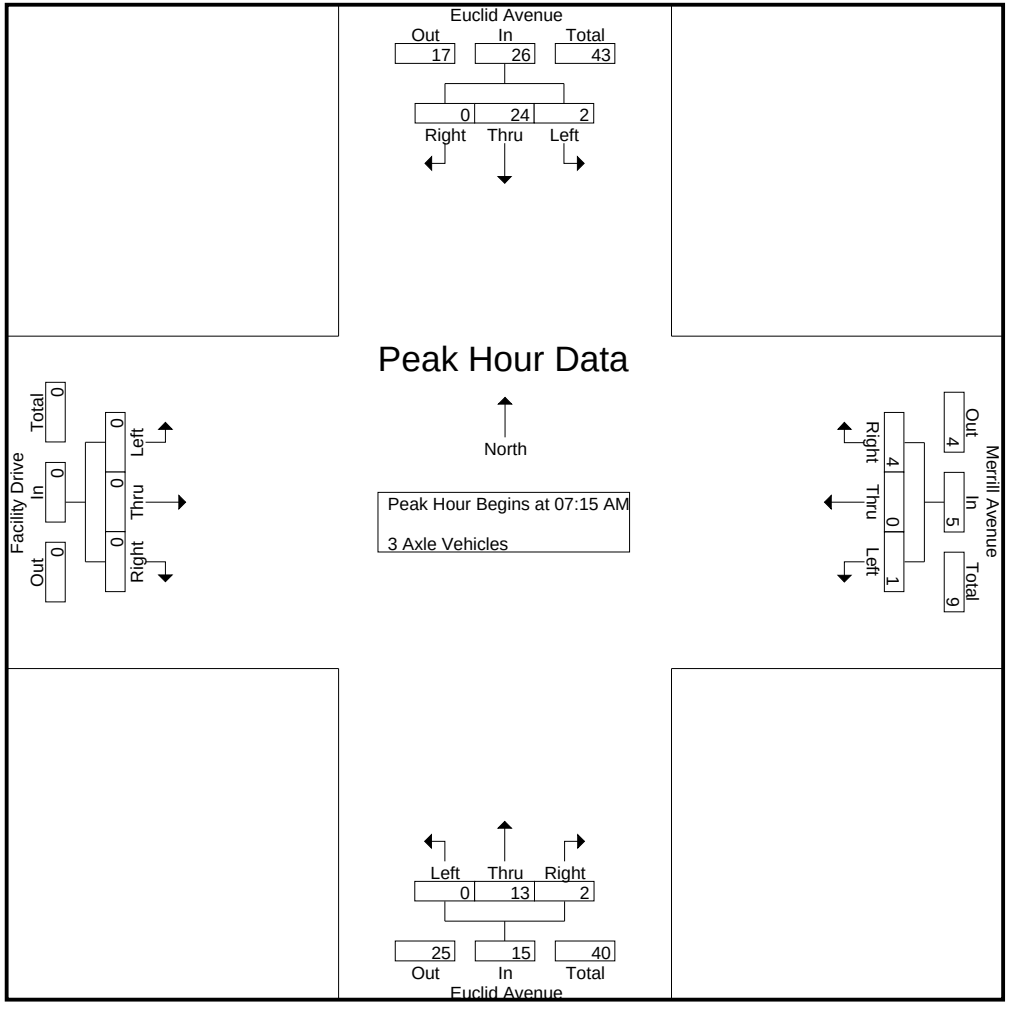

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File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
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| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | **1** | 3 | 0 | 4 | **1** | 0 | 1 | **2** | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | **9** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | |
| +30 mins. | 1 | 8 | 0 | 9 | 0 | 0 | 1 | 1 | 0 | 4 | **1** | 5 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 4 | 0 | 4 | 0 | 0 | **2** | 2 | 0 | **5** | 1 | **6** | 0 | 0 | 0 | 0 | |
| Total Volume | 2 | 24 | 0 | 26 | 1 | 0 | 4 | 5 | 0 | 13 | 2 | 15 | 0 | 0 | 0 | 0 | |
| % App. Total | 7.7 | 92.3 | 0 | | 20 | 0 | 80 | | 0 | 86.7 | 13.3 | | 0 | 0 | 0 | | |
| PHF | .500 | .667 | .000 | .722 | .250 | .000 | .500 | .625 | .000 | .650 | .500 | .625 | .000 | .000 | .000 | .000 | |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 20 | 2 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 1 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 38 |
| 07:15 AM | 0 | 11 | 0 | 0 | 11 | 2 | 0 | 5 | 0 | 7 | 0 | 11 | 0 | 0 | 11 | 1 | 0 | 0 | 0 | 1 | 0 | 30 | 30 |
| 07:30 AM | 4 | 21 | 0 | 0 | 25 | 0 | 0 | 5 | 0 | 5 | 0 | 14 | 3 | 0 | 17 | 0 | 1 | 0 | 0 | 1 | 0 | 48 | 48 |
| 07:45 AM | 4 | 17 | 1 | 0 | 22 | 1 | 0 | 7 | 0 | 8 | 0 | 16 | 3 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 49 |
| Total | 11 | 69 | 3 | 0 | 83 | 3 | 0 | 17 | 0 | 20 | 0 | 53 | 7 | 0 | 60 | 1 | 1 | 0 | 0 | 2 | 0 | 165 | 165 |
| 08:00 AM | 4 | 14 | 0 | 0 | 18 | 4 | 0 | 4 | 1 | 8 | 0 | 11 | 4 | 0 | 15 | 1 | 0 | 1 | 0 | 2 | 1 | 43 | 44 |
| 08:15 AM | 4 | 19 | 0 | 0 | 23 | 4 | 0 | 4 | 0 | 8 | 1 | 21 | 5 | 0 | 27 | 1 | 0 | 0 | 0 | 1 | 0 | 59 | 59 |
| 08:30 AM | 4 | 19 | 1 | 0 | 24 | 3 | 0 | 4 | 0 | 7 | 0 | 15 | 3 | 1 | 18 | 2 | 0 | 0 | 0 | 2 | 1 | 51 | 52 |
| 08:45 AM | 3 | 19 | 1 | 0 | 23 | 0 | 0 | 4 | 1 | 4 | 0 | 22 | 1 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 1 | 50 | 51 |
| Total | 15 | 71 | 2 | 0 | 88 | 11 | 0 | 16 | 2 | 27 | 1 | 69 | 13 | 1 | 83 | 4 | 0 | 1 | 0 | 5 | 3 | 203 | 206 |
| Grand Total | 26 | 140 | 5 | 0 | 171 | 14 | 0 | 33 | 2 | 47 | 1 | 122 | 20 | 1 | 143 | 5 | 1 | 1 | 0 | 7 | 3 | 368 | 371 |
| Apprch % | 15.2 | 81.9 | 2.9 | | | 29.8 | 0 | 70.2 | | | 0.7 | 85.3 | 14 | | | 71.4 | 14.3 | 14.3 | | | | | |
| Total % | 7.1 | 38 | 1.4 | | 46.5 | 3.8 | 0 | 9 | | 12.8 | 0.3 | 33.2 | 5.4 | | 38.9 | 1.4 | 0.3 | 0.3 | | 1.9 | 0.8 | 99.2 | |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 11 | 0 | 11 | 2 | 0 | 5 | 7 | 0 | 11 | 0 | 11 | **1** | 0 | 0 | 1 | 30 |
| 07:30 AM | **4** | **21** | 0 | **25** | 0 | 0 | 5 | 5 | 0 | 14 | 3 | 17 | 0 | **1** | 0 | 1 | 48 |
| 07:45 AM | 4 | 17 | **1** | 22 | 1 | 0 | **7** | **8** | 0 | **16** | 3 | **19** | 0 | 0 | 0 | 0 | **49** |
| 08:00 AM | 4 | 14 | 0 | 18 | **4** | 0 | 4 | 8 | 0 | 11 | **4** | 15 | 1 | 0 | **1** | **2** | 43 |
| Total Volume | 12 | 63 | 1 | 76 | 7 | 0 | 21 | 28 | 0 | 52 | 10 | 62 | 2 | 1 | 1 | 4 | 170 |
| % App. Total | 15.8 | 82.9 | 1.3 | | 25 | 0 | 75 | | 0 | 83.9 | 16.1 | | 50 | 25 | 25 | | |
| PHF | .750 | .750 | .250 | .760 | .438 | .000 | .750 | .875 | .000 | .813 | .625 | .816 | .500 | .250 | .250 | .500 | .867 |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

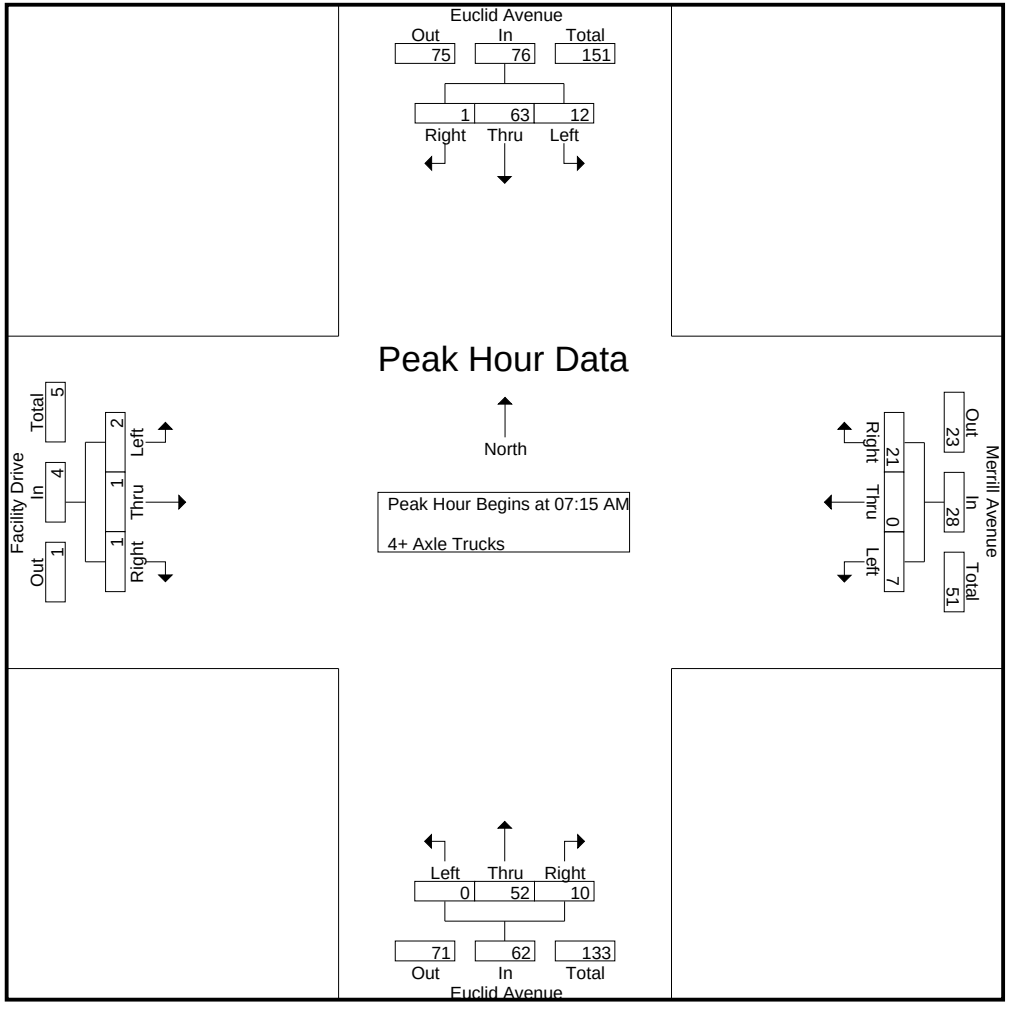

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City of Chino
N/S: Euclid Avenue
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File Name : 09_CHN_Euc_Mer AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 0 | 11 | 0 | 11 | 2 | 0 | 5 | 7 | 0 | 11 | 0 | 11 | **1** | 0 | 0 | 1 | |
| +15 mins. | **4** | **21** | 0 | **25** | 0 | 0 | 5 | 5 | 0 | 14 | 3 | 17 | 0 | **1** | 0 | 1 | |
| +30 mins. | 4 | 17 | **1** | 22 | 1 | 0 | **7** | **8** | 0 | **16** | 3 | **19** | 0 | 0 | 0 | 0 | |
| +45 mins. | 4 | 14 | 0 | 18 | **4** | 0 | 4 | 8 | 0 | 11 | **4** | 15 | 1 | 0 | **1** | **2** | |
| Total Volume | 12 | 63 | 1 | 76 | 7 | 0 | 21 | 28 | 0 | 52 | 10 | 62 | 2 | 1 | 1 | 4 | |
| % App. Total | 15.8 | 82.9 | 1.3 | | 25 | 0 | 75 | | 0 | 83.9 | 16.1 | | 50 | 25 | 25 | | |
| PHF | .750 | .750 | .250 | .760 | .438 | .000 | .750 | .875 | .000 | .813 | .625 | .816 | .500 | .250 | .250 | .500 | |

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File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 39 | 229 | 1 | 0 | 269 | 17 | 0 | 32 | 1 | 49 | 0 | 286 | 12 | 0 | 298 | 10 | 6 | 6 | 2 | 22 | 3 | 638 | 641 |
| 04:15 PM | 45 | 224 | 2 | 0 | 271 | 17 | 0 | 24 | 0 | 41 | 1 | 262 | 17 | 1 | 280 | 6 | 7 | 3 | 3 | 16 | 4 | 608 | 612 |
| 04:30 PM | 56 | 257 | 4 | 1 | 317 | 11 | 0 | 43 | 7 | 54 | 0 | 262 | 17 | 3 | 279 | 3 | 7 | 2 | 2 | 12 | 13 | 662 | 675 |
| 04:45 PM | 47 | 268 | 2 | 0 | 317 | 15 | 0 | 27 | 0 | 42 | 0 | 260 | 12 | 0 | 272 | 3 | 2 | 1 | 0 | 6 | 0 | 637 | 637 |
| Total | 187 | 978 | 9 | 1 | 1174 | 60 | 0 | 126 | 8 | 186 | 1 | 1070 | 58 | 4 | 1129 | 22 | 22 | 12 | 7 | 56 | 20 | 2545 | 2565 |
| 05:00 PM | 43 | 223 | 1 | 1 | 267 | 19 | 0 | 30 | 0 | 49 | 0 | 276 | 22 | 3 | 298 | 2 | 1 | 4 | 0 | 7 | 4 | 621 | 625 |
| 05:15 PM | 56 | 209 | 1 | 0 | 266 | 24 | 0 | 41 | 0 | 65 | 0 | 254 | 14 | 3 | 268 | 2 | 3 | 0 | 0 | 5 | 3 | 604 | 607 |
| 05:30 PM | 48 | 219 | 1 | 0 | 268 | 25 | 0 | 40 | 0 | 65 | 0 | 251 | 13 | 2 | 264 | 0 | 1 | 0 | 0 | 1 | 2 | 598 | 600 |
| 05:45 PM | 57 | 233 | 2 | 1 | 292 | 10 | 0 | 34 | 2 | 44 | 1 | 221 | 10 | 1 | 232 | 0 | 0 | 2 | 0 | 2 | 4 | 570 | 574 |
| Total | 204 | 884 | 5 | 2 | 1093 | 78 | 0 | 145 | 2 | 223 | 1 | 1002 | 59 | 9 | 1062 | 4 | 5 | 6 | 0 | 15 | 13 | 2393 | 2406 |
| Grand Total | 391 | 1862 | 14 | 3 | 2267 | 138 | 0 | 271 | 10 | 409 | 2 | 2072 | 117 | 13 | 2191 | 26 | 27 | 18 | 7 | 71 | 33 | 4938 | 4971 |
| Apprch % | 17.2 | 82.1 | 0.6 | | | 33.7 | 0 | 66.3 | | | 0.1 | 94.6 | 5.3 | | | 36.6 | 38 | 25.4 | | | | | |
| Total % | 7.9 | 37.7 | 0.3 | | 45.9 | 2.8 | 0 | 5.5 | | 8.3 | 0 | 42 | 2.4 | | 44.4 | 0.5 | 0.5 | 0.4 | | 1.4 | 0.7 | 99.3 | |
| Passenger Vehicles | 338 | 1719 | 13 | | 2073 | 114 | 0 | 211 | | 335 | 2 | 1868 | 95 | | 1977 | 25 | 27 | 18 | | 77 | 0 | 0 | 4462 |
| % Passenger Vehicles | 86.4 | 92.3 | 92.9 | 100 | 91.3 | 82.6 | 0 | 77.9 | 100 | 80 | 100 | 90.2 | 81.2 | 92.3 | 89.7 | 96.2 | 100 | 100 | 100 | 98.7 | 0 | 0 | 89.8 |
| Large 2 Axle Vehicles | 15 | 32 | 0 | | 47 | 5 | 0 | 12 | | 17 | 0 | 39 | 6 | | 45 | 0 | 0 | 0 | | 0 | 0 | 0 | 109 |
| % Large 2 Axle Vehicles | 3.8 | 1.7 | 0 | 0 | 2.1 | 3.6 | 0 | 4.4 | 0 | 4.1 | 0 | 1.9 | 5.1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 3 Axle Vehicles | 6 | 41 | 0 | | 47 | 10 | 0 | 13 | | 23 | 0 | 37 | 4 | | 41 | 0 | 0 | 0 | | 0 | 0 | 0 | 111 |
| % 3 Axle Vehicles | 1.5 | 2.2 | 0 | 0 | 2.1 | 7.2 | 0 | 4.8 | 0 | 5.5 | 0 | 1.8 | 3.4 | 0 | 1.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 |
| 4+ Axle Trucks | 32 | 70 | 1 | | 103 | 9 | 0 | 35 | | 44 | 0 | 128 | 12 | | 141 | 1 | 0 | 0 | | 1 | 0 | 0 | 289 |
| % 4+ Axle Trucks | 8.2 | 3.8 | 7.1 | 0 | 4.5 | 6.5 | 0 | 12.9 | 0 | 10.5 | 0 | 6.2 | 10.3 | 7.7 | 6.4 | 3.8 | 0 | 0 | 0 | 1.3 | 0 | 0 | 5.8 |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 39 | 229 | 1 | 269 | **17** | 0 | 32 | 49 | 0 | **286** | 12 | **298** | **10** | 6 | **6** | **22** | 638 |
| 04:15 PM | 45 | 224 | 2 | 271 | 17 | 0 | 24 | 41 | **1** | 262 | **17** | 280 | 6 | **7** | 3 | 16 | 608 |
| 04:30 PM | **56** | 257 | **4** | **317** | 11 | 0 | **43** | **54** | 0 | 262 | 17 | 279 | 3 | 7 | 2 | 12 | **662** |
| 04:45 PM | 47 | **268** | 2 | 317 | 15 | 0 | 27 | 42 | 0 | 260 | 12 | 272 | 3 | 2 | 1 | 6 | 637 |
| Total Volume | 187 | 978 | 9 | 1174 | 60 | 0 | 126 | 186 | 1 | 1070 | 58 | 1129 | 22 | 22 | 12 | 56 | 2545 |
| % App. Total | 15.9 | 83.3 | 0.8 | | 32.3 | 0 | 67.7 | | 0.1 | 94.8 | 5.1 | | 39.3 | 39.3 | 21.4 | | |
| PHF | .835 | .912 | .563 | .926 | .882 | .000 | .733 | .861 | .250 | .935 | .853 | .947 | .550 | .786 | .500 | .636 | .961 |

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File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

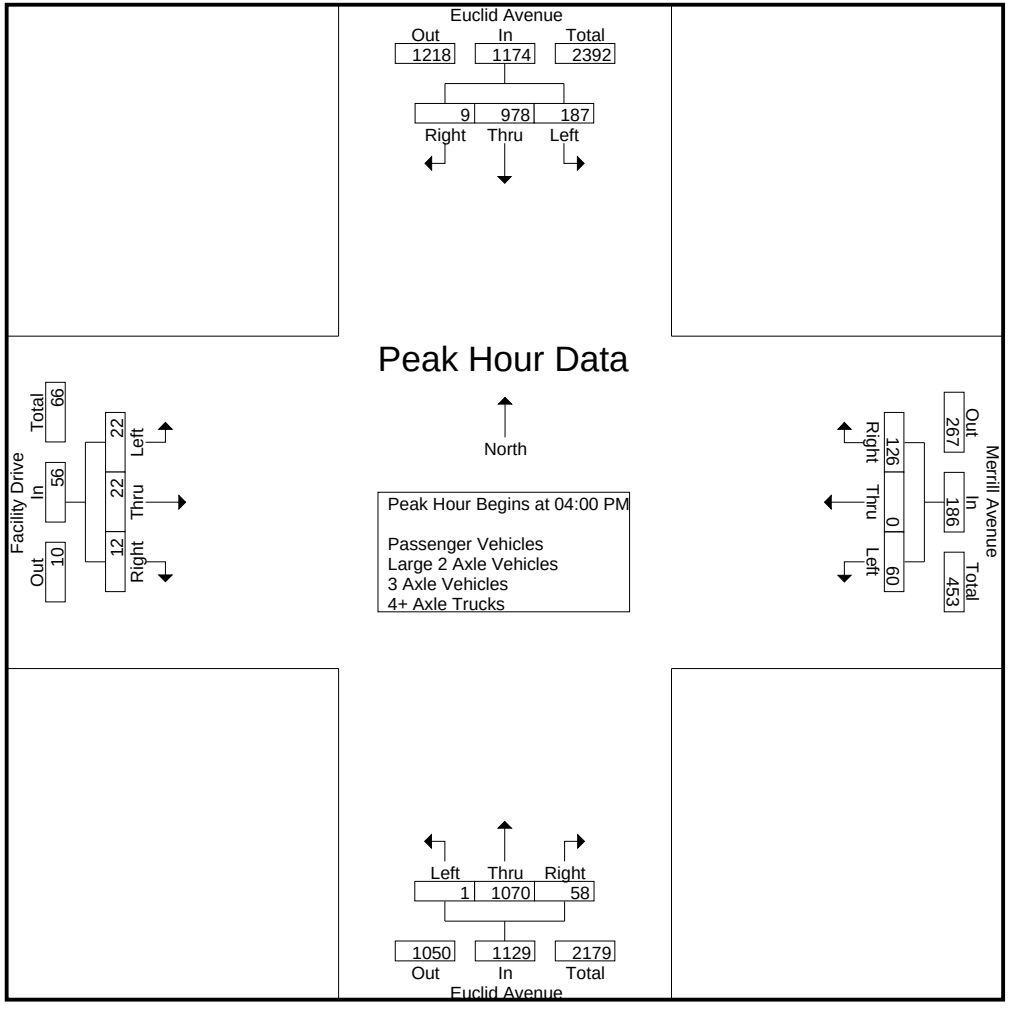

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E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 05:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 39 | 229 | 1 | 269 | 19 | 0 | 30 | 49 | 0 | **286** | 12 | **298** | **10** | 6 | **6** | **22** | |
| +15 mins. | 45 | 224 | 2 | 271 | 24 | 0 | **41** | **65** | **1** | 262 | **17** | 280 | 6 | **7** | 3 | 16 | |
| +30 mins. | **56** | 257 | **4** | **317** | **25** | 0 | 40 | 65 | 0 | 262 | 17 | 279 | 3 | 7 | 2 | 12 | |
| +45 mins. | 47 | **268** | 2 | 317 | 10 | 0 | 34 | 44 | 0 | 260 | 12 | 272 | 3 | 2 | 1 | 6 | |
| Total Volume | 187 | 978 | 9 | 1174 | 78 | 0 | 145 | 223 | 1 | 1070 | 58 | 1129 | 22 | 22 | 12 | 56 | |
| % App. Total | 15.9 | 83.3 | 0.8 | | 35 | 0 | 65 | | 0.1 | 94.8 | 5.1 | | 39.3 | 39.3 | 21.4 | | |
| PHF | .835 | .912 | .563 | .926 | .780 | .000 | .884 | .858 | .250 | .935 | .853 | .947 | .550 | .786 | .500 | .636 | |

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City of Chino
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Weather: Clear

File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 36 | 201 | 0 | 0 | 237 | 12 | 0 | 17 | 1 | 29 | 0 | 256 | 9 | 0 | 265 | 9 | 6 | 6 | 2 | 21 | 3 | 552 | 555 |
| 04:15 PM | 38 | 204 | 2 | 0 | 244 | 14 | 0 | 19 | 0 | 33 | 1 | 224 | 12 | 1 | 237 | 6 | 7 | 3 | 3 | 16 | 4 | 530 | 534 |
| 04:30 PM | 45 | 236 | 4 | 1 | 285 | 9 | 0 | 42 | 7 | 51 | 0 | 244 | 12 | 2 | 256 | 3 | 7 | 2 | 2 | 12 | 12 | 604 | 616 |
| 04:45 PM | 41 | 249 | 2 | 0 | 292 | 12 | 0 | 19 | 0 | 31 | 0 | 238 | 11 | 0 | 249 | 3 | 2 | 1 | 0 | 6 | 0 | 578 | 578 |
| Total | 160 | 890 | 8 | 1 | 1058 | 47 | 0 | 97 | 8 | 144 | 1 | 962 | 44 | 3 | 1007 | 21 | 22 | 12 | 7 | 55 | 19 | 2264 | 2283 |
| 05:00 PM | 36 | 205 | 1 | 1 | 242 | 13 | 0 | 25 | 0 | 38 | 0 | 251 | 20 | 3 | 271 | 2 | 1 | 4 | 0 | 7 | 4 | 558 | 562 |
| 05:15 PM | 52 | 200 | 1 | 0 | 253 | 21 | 0 | 33 | 0 | 54 | 0 | 218 | 13 | 3 | 231 | 2 | 3 | 0 | 0 | 5 | 3 | 543 | 546 |
| 05:30 PM | 40 | 205 | 1 | 0 | 246 | 24 | 0 | 30 | 0 | 54 | 0 | 237 | 10 | 2 | 247 | 0 | 1 | 0 | 0 | 1 | 2 | 548 | 550 |
| 05:45 PM | 50 | 219 | 2 | 1 | 271 | 9 | 0 | 26 | 2 | 35 | 1 | 200 | 8 | 1 | 209 | 0 | 0 | 2 | 0 | 2 | 4 | 517 | 521 |
| Total | 178 | 829 | 5 | 2 | 1012 | 67 | 0 | 114 | 2 | 181 | 1 | 906 | 51 | 9 | 958 | 4 | 5 | 6 | 0 | 15 | 13 | 2166 | 2179 |
| Grand Total | 338 | 1719 | 13 | 3 | 2070 | 114 | 0 | 211 | 10 | 325 | 2 | 1868 | 95 | 12 | 1965 | 25 | 27 | 18 | 7 | 70 | 32 | 4430 | 4462 |
| Apprch % | 16.3 | 83 | 0.6 | | | 35.1 | 0 | 64.9 | | | 0.1 | 95.1 | 4.8 | | | 35.7 | 38.6 | 25.7 | | | | | |
| Total % | 7.6 | 38.8 | 0.3 | | 46.7 | 2.6 | 0 | 4.8 | | 7.3 | 0 | 42.2 | 2.1 | | 44.4 | 0.6 | 0.6 | 0.4 | | 1.6 | 0.7 | 99.3 | |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 36 | 201 | 0 | 237 | 12 | 0 | 17 | 29 | 0 | **256** | 9 | **265** | **9** | 6 | **6** | **21** | 552 |
| 04:15 PM | 38 | 204 | 2 | 244 | **14** | 0 | 19 | 33 | **1** | 224 | **12** | 237 | 6 | **7** | 3 | 16 | 530 |
| 04:30 PM | **45** | 236 | **4** | 285 | 9 | 0 | **42** | **51** | 0 | 244 | 12 | 256 | 3 | 7 | 2 | 12 | **604** |
| 04:45 PM | 41 | **249** | 2 | **292** | 12 | 0 | 19 | 31 | 0 | 238 | 11 | 249 | 3 | 2 | 1 | 6 | 578 |
| Total Volume | 160 | 890 | 8 | 1058 | 47 | 0 | 97 | 144 | 1 | 962 | 44 | 1007 | 21 | 22 | 12 | 55 | 2264 |
| % App. Total | 15.1 | 84.1 | 0.8 | | 32.6 | 0 | 67.4 | | 0.1 | 95.5 | 4.4 | | 38.2 | 40 | 21.8 | | |
| PHF | .889 | .894 | .500 | .906 | .839 | .000 | .577 | .706 | .250 | .939 | .917 | .950 | .583 | .786 | .500 | .655 | .937 |

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File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

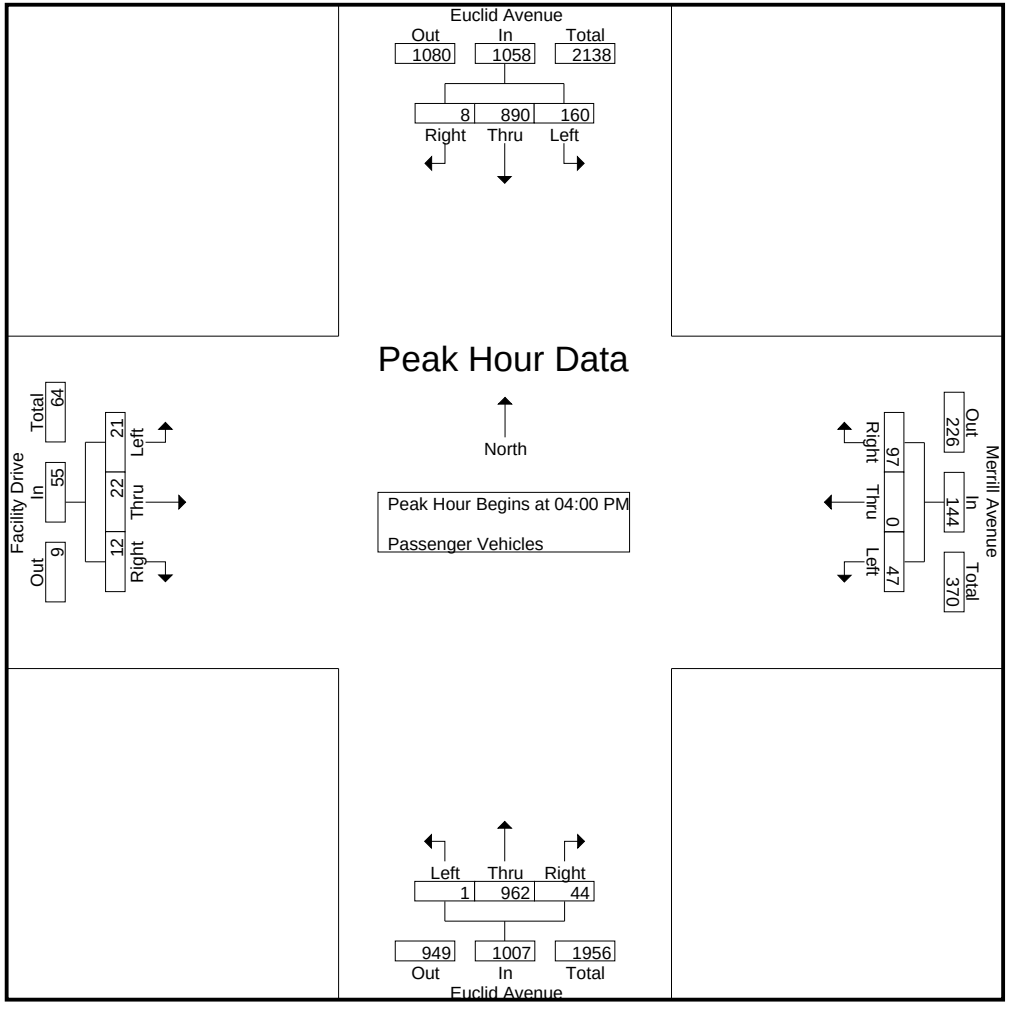

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File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 36 | 201 | 0 | 237 | 12 | 0 | 17 | 29 | 0 | **256** | 9 | **265** | **9** | 6 | **6** | **21** | |
| +15 mins. | 38 | 204 | 2 | 244 | **14** | 0 | 19 | 33 | **1** | 224 | **12** | 237 | 6 | **7** | 3 | 16 | |
| +30 mins. | **45** | 236 | **4** | 285 | 9 | 0 | **42** | **51** | 0 | 244 | 12 | 256 | 3 | 7 | 2 | 12 | |
| +45 mins. | 41 | **249** | 2 | **292** | 12 | 0 | 19 | 31 | 0 | 238 | 11 | 249 | 3 | 2 | 1 | 6 | |
| Total Volume | 160 | 890 | 8 | 1058 | 47 | 0 | 97 | 144 | 1 | 962 | 44 | 1007 | 21 | 22 | 12 | 55 | |
| % App. Total | 15.1 | 84.1 | 0.8 | | 32.6 | 0 | 67.4 | | 0.1 | 95.5 | 4.4 | | 38.2 | 40 | 21.8 | | |
| PHF | .889 | .894 | .500 | .906 | .839 | .000 | .577 | .706 | .250 | .939 | .917 | .950 | .583 | .786 | .500 | .655 | |

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Weather: Clear

File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 7 | 0 | 0 | 8 | 1 | 0 | 5 | 0 | 6 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 22 | 22 |
| 04:15 PM | 1 | 5 | 0 | 0 | 6 | 2 | 0 | 0 | 0 | 2 | 0 | 10 | 2 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 04:30 PM | 3 | 7 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| 04:45 PM | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| Total | 6 | 24 | 0 | 0 | 30 | 3 | 0 | 6 | 0 | 9 | 0 | 23 | 4 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 66 | 66 |
| 05:00 PM | 4 | 3 | 0 | 0 | 7 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 05:15 PM | 2 | 1 | 0 | 0 | 3 | 1 | 0 | 1 | 0 | 2 | 0 | 8 | 1 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 |
| 05:30 PM | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 3 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| 05:45 PM | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 |
| Total | 9 | 8 | 0 | 0 | 17 | 2 | 0 | 6 | 0 | 8 | 0 | 16 | 2 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 43 |
| Grand Total | 15 | 32 | 0 | 0 | 47 | 5 | 0 | 12 | 0 | 17 | 0 | 39 | 6 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 109 | 109 |
| Apprch % | 31.9 | 68.1 | 0 | | | 29.4 | 0 | 70.6 | | | 0 | 86.7 | 13.3 | | | 0 | 0 | 0 | | | | | |
| Total % | 13.8 | 29.4 | 0 | | 43.1 | 4.6 | 0 | 11 | | 15.6 | 0 | 35.8 | 5.5 | | 41.3 | 0 | 0 | 0 | | 0 | 0 | 100 | |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 1 | **7** | 0 | 8 | 1 | 0 | **5** | **6** | 0 | 7 | 1 | 8 | 0 | 0 | 0 | 0 | **22** |
| 04:15 PM | 1 | 5 | 0 | 6 | **2** | 0 | 0 | 2 | 0 | **10** | **2** | **12** | 0 | 0 | 0 | 0 | 20 |
| 04:30 PM | **3** | 7 | 0 | **10** | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 13 |
| 04:45 PM | 1 | 5 | 0 | 6 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 4 | 0 | 0 | 0 | 0 | 11 |
| Total Volume | 6 | 24 | 0 | 30 | 3 | 0 | 6 | 9 | 0 | 23 | 4 | 27 | 0 | 0 | 0 | 0 | 66 |
| % App. Total | 20 | 80 | 0 | | 33.3 | 0 | 66.7 | | 0 | 85.2 | 14.8 | | 0 | 0 | 0 | | |
| PHF | .500 | .857 | .000 | .750 | .375 | .000 | .300 | .375 | .000 | .575 | .500 | .563 | .000 | .000 | .000 | .000 | .750 |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

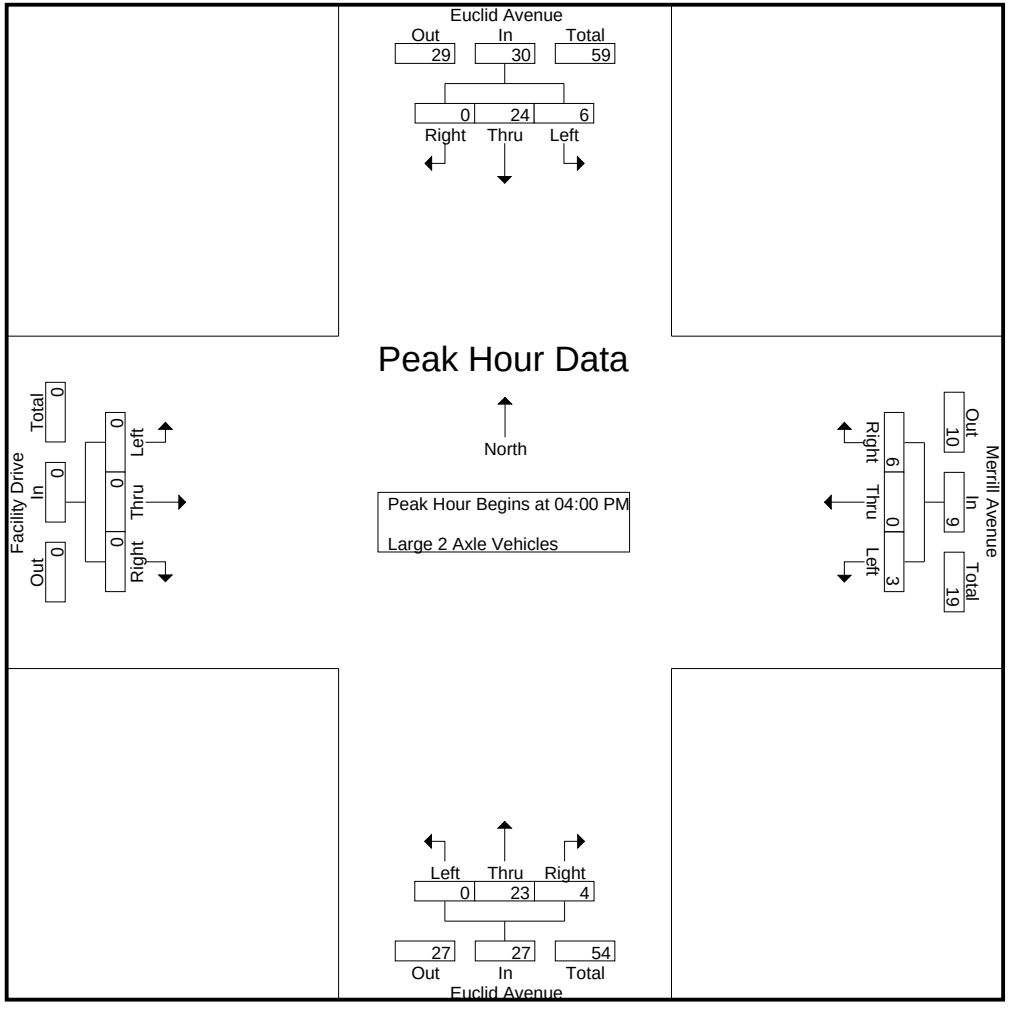

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 1 | **7** | 0 | 8 | 1 | 0 | **5** | **6** | 0 | 7 | 1 | 8 | 0 | 0 | 0 | 0 | |
| +15 mins. | 1 | 5 | 0 | 6 | **2** | 0 | 0 | 2 | 0 | **10** | **2** | **12** | 0 | 0 | 0 | 0 | |
| +30 mins. | **3** | 7 | 0 | **10** | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +45 mins. | 1 | 5 | 0 | 6 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 4 | 0 | 0 | 0 | 0 | |
| Total Volume | 6 | 24 | 0 | 30 | 3 | 0 | 6 | 9 | 0 | 23 | 4 | 27 | 0 | 0 | 0 | 0 | |
| % App. Total | 20 | 80 | 0 | | 33.3 | 0 | 66.7 | | 0 | 85.2 | 14.8 | | 0 | 0 | 0 | | |
| PHF | .500 | .857 | .000 | .750 | .375 | .000 | .300 | .375 | .000 | .575 | .500 | .563 | .000 | .000 | .000 | .000 | |

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File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 7 | 0 | 0 | 8 | 1 | 0 | 4 | 0 | 5 | 0 | 7 | 1 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| 04:15 PM | 1 | 6 | 0 | 0 | 7 | 1 | 0 | 2 | 0 | 3 | 0 | 9 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 04:30 PM | 3 | 4 | 0 | 0 | 7 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 04:45 PM | 0 | 4 | 0 | 0 | 4 | 3 | 0 | 1 | 0 | 4 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Total | 5 | 21 | 0 | 0 | 26 | 5 | 0 | 8 | 0 | 13 | 0 | 21 | 3 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 63 | 63 |
| 05:00 PM | 0 | 9 | 0 | 0 | 9 | 4 | 0 | 1 | 0 | 5 | 0 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 05:15 PM | 1 | 4 | 0 | 0 | 5 | 1 | 0 | 1 | 0 | 2 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 05:30 PM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 |
| 05:45 PM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Total | 1 | 20 | 0 | 0 | 21 | 5 | 0 | 5 | 0 | 10 | 0 | 16 | 1 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 48 |
| Grand Total | 6 | 41 | 0 | 0 | 47 | 10 | 0 | 13 | 0 | 23 | 0 | 37 | 4 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 0 | 111 | 111 |
| Apprch % | 12.8 | 87.2 | 0 | | | 43.5 | 0 | 56.5 | | | 0 | 90.2 | 9.8 | | | 0 | 0 | 0 | | | | | |
| Total % | 5.4 | 36.9 | 0 | | 42.3 | 9 | 0 | 11.7 | | 20.7 | 0 | 33.3 | 3.6 | | 36.9 | 0 | 0 | 0 | | 0 | 0 | 100 | |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 1 | **7** | 0 | **8** | 1 | 0 | **4** | **5** | 0 | 7 | **1** | 8 | 0 | 0 | 0 | 0 | **21** |
| 04:15 PM | 1 | 6 | 0 | 7 | 1 | 0 | 2 | 3 | 0 | **9** | 1 | **10** | 0 | 0 | 0 | 0 | 20 |
| 04:30 PM | **3** | 4 | 0 | 7 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 4 | 0 | 0 | 0 | 0 | 12 |
| 04:45 PM | 0 | 4 | 0 | 4 | **3** | 0 | 1 | 4 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 10 |
| Total Volume | 5 | 21 | 0 | 26 | 5 | 0 | 8 | 13 | 0 | 21 | 3 | 24 | 0 | 0 | 0 | 0 | 63 |
| % App. Total | 19.2 | 80.8 | 0 | | 38.5 | 0 | 61.5 | | 0 | 87.5 | 12.5 | | 0 | 0 | 0 | | |
| PHF | .417 | .750 | .000 | .813 | .417 | .000 | .500 | .650 | .000 | .583 | .750 | .600 | .000 | .000 | .000 | .000 | .750 |

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Weather: Clear

File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

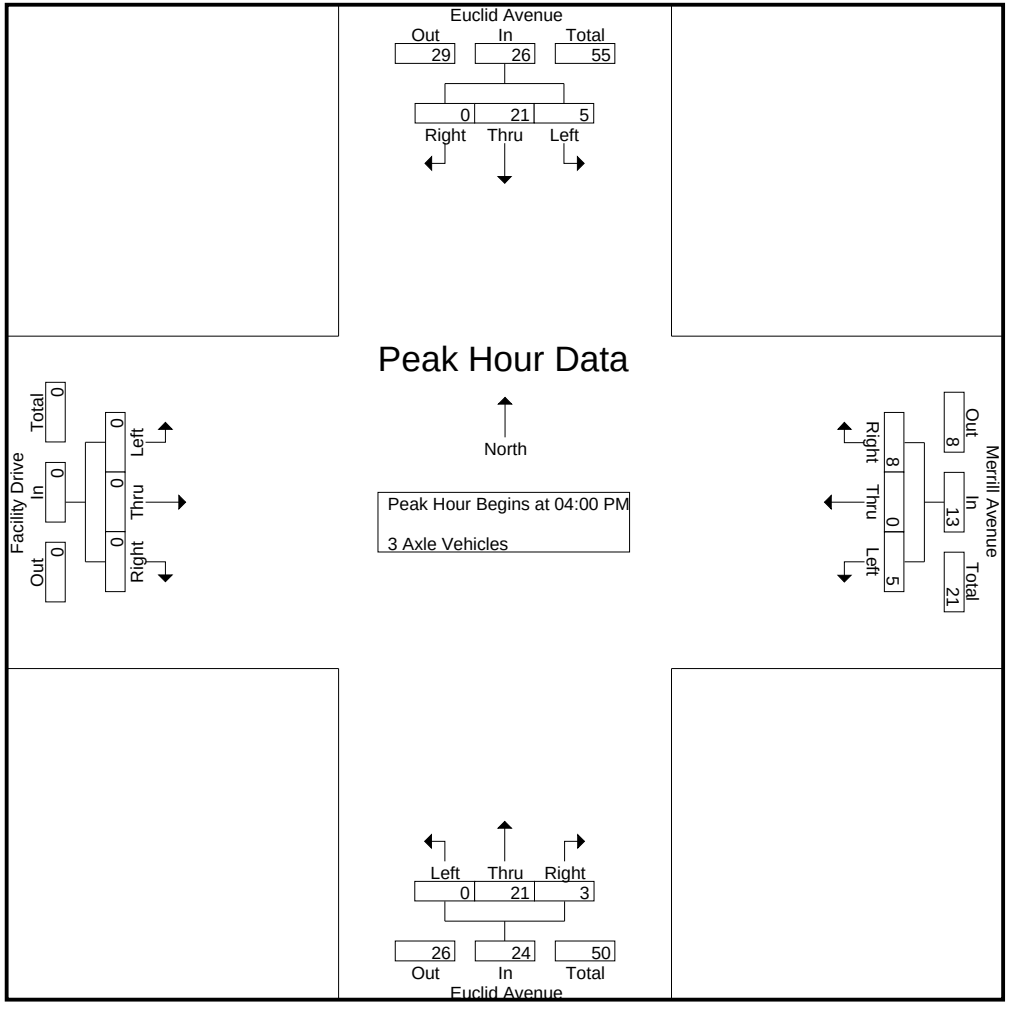

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City of Chino
N/S: Euclid Avenue
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File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 1 | **7** | 0 | **8** | 1 | 0 | **4** | **5** | 0 | 7 | **1** | 8 | 0 | 0 | 0 | 0 | |
| +15 mins. | 1 | 6 | 0 | 7 | 1 | 0 | 2 | 3 | 0 | **9** | 1 | **10** | 0 | 0 | 0 | 0 | |
| +30 mins. | **3** | 4 | 0 | 7 | 0 | 0 | 1 | 1 | 0 | 3 | 1 | 4 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 4 | 0 | 4 | **3** | 0 | 1 | 4 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | |
| Total Volume | 5 | 21 | 0 | 26 | 5 | 0 | 8 | 13 | 0 | 21 | 3 | 24 | 0 | 0 | 0 | 0 | |
| % App. Total | 19.2 | 80.8 | 0 | | 38.5 | 0 | 61.5 | | 0 | 87.5 | 12.5 | | 0 | 0 | 0 | | |
| PHF | .417 | .750 | .000 | .813 | .417 | .000 | .500 | .650 | .000 | .583 | .750 | .600 | .000 | .000 | .000 | .000 | |

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
Weather: Clear

File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Facility Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 14 | 1 | 0 | 16 | 3 | 0 | 6 | 0 | 9 | 0 | 16 | 1 | 0 | 17 | 1 | 0 | 0 | 0 | 1 | 0 | 43 | 43 |
| 04:15 PM | 5 | 9 | 0 | 0 | 14 | 0 | 0 | 3 | 0 | 3 | 0 | 19 | 2 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 38 |
| 04:30 PM | 5 | 10 | 0 | 0 | 15 | 2 | 0 | 0 | 0 | 2 | 0 | 12 | 4 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 1 | 33 | 34 |
| 04:45 PM | 5 | 10 | 0 | 0 | 15 | 0 | 0 | 6 | 0 | 6 | 0 | 17 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 38 |
| Total | 16 | 43 | 1 | 0 | 60 | 5 | 0 | 15 | 0 | 20 | 0 | 64 | 7 | 1 | 71 | 1 | 0 | 0 | 0 | 1 | 1 | 152 | 153 |
| 05:00 PM | 3 | 6 | 0 | 0 | 9 | 2 | 0 | 3 | 0 | 5 | 0 | 17 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 31 |
| 05:15 PM | 1 | 4 | 0 | 0 | 5 | 1 | 0 | 6 | 0 | 7 | 0 | 24 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 36 |
| 05:30 PM | 6 | 7 | 0 | 0 | 13 | 1 | 0 | 5 | 0 | 6 | 0 | 11 | 3 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 33 | 33 |
| 05:45 PM | 6 | 10 | 0 | 0 | 16 | 0 | 0 | 6 | 0 | 6 | 0 | 12 | 2 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 36 | 36 |
| Total | 16 | 27 | 0 | 0 | 43 | 4 | 0 | 20 | 0 | 24 | 0 | 64 | 5 | 0 | 69 | 0 | 0 | 0 | 0 | 0 | 0 | 136 | 136 |
| Grand Total | 32 | 70 | 1 | 0 | 103 | 9 | 0 | 35 | 0 | 44 | 0 | 128 | 12 | 1 | 140 | 1 | 0 | 0 | 0 | 1 | 1 | 288 | 289 |
| Apprch % | 31.1 | 68 | 1 | | | 20.5 | 0 | 79.5 | | | 0 | 91.4 | 8.6 | | | 100 | 0 | 0 | | | | | |
| Total % | 11.1 | 24.3 | 0.3 | | 35.8 | 3.1 | 0 | 12.2 | | 15.3 | 0 | 44.4 | 4.2 | | 48.6 | 0.3 | 0 | 0 | | 0.3 | 0.3 | 99.7 | |

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 1 | **14** | **1** | **16** | **3** | 0 | **6** | **9** | 0 | 16 | 1 | 17 | **1** | 0 | 0 | **1** | **43** |
| 04:15 PM | **5** | 9 | 0 | 14 | 0 | 0 | 3 | 3 | 0 | **19** | 2 | **21** | 0 | 0 | 0 | 0 | 38 |
| 04:30 PM | 5 | 10 | 0 | 15 | 2 | 0 | 0 | 2 | 0 | 12 | **4** | 16 | 0 | 0 | 0 | 0 | 33 |
| 04:45 PM | 5 | 10 | 0 | 15 | 0 | 0 | 6 | 6 | 0 | 17 | 0 | 17 | 0 | 0 | 0 | 0 | 38 |
| Total Volume | 16 | 43 | 1 | 60 | 5 | 0 | 15 | 20 | 0 | 64 | 7 | 71 | 1 | 0 | 0 | 1 | 152 |
| % App. Total | 26.7 | 71.7 | 1.7 | | 25 | 0 | 75 | | 0 | 90.1 | 9.9 | | 100 | 0 | 0 | | |
| PHF | .800 | .768 | .250 | .938 | .417 | .000 | .625 | .556 | .000 | .842 | .438 | .845 | .250 | .000 | .000 | .250 | .884 |

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File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

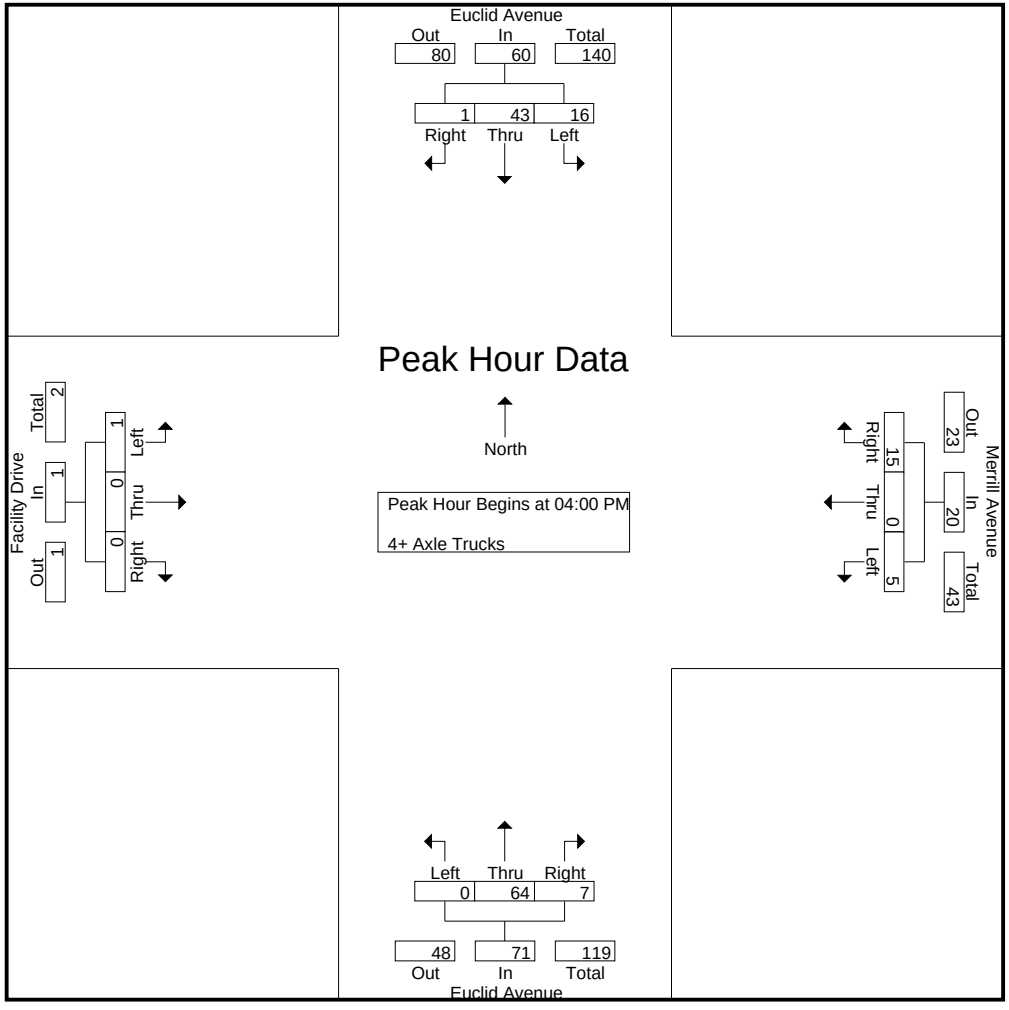

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City of Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue
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File Name : 09_CHN_Euc_Mer PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Merrill Avenue Westbound | | | | Euclid Avenue Northbound | | | | Facility Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 1 | **14** | **1** | **16** | **3** | 0 | **6** | **9** | 0 | 16 | 1 | 17 | **1** | 0 | 0 | **1** | |
| +15 mins. | **5** | 9 | 0 | 14 | 0 | 0 | 3 | 3 | 0 | **19** | 2 | **21** | 0 | 0 | 0 | 0 | |
| +30 mins. | 5 | 10 | 0 | 15 | 2 | 0 | 0 | 2 | 0 | 12 | **4** | 16 | 0 | 0 | 0 | 0 | |
| +45 mins. | 5 | 10 | 0 | 15 | 0 | 0 | 6 | 6 | 0 | 17 | 0 | 17 | 0 | 0 | 0 | 0 | |
| Total Volume | 16 | 43 | 1 | 60 | 5 | 0 | 15 | 20 | 0 | 64 | 7 | 71 | 1 | 0 | 0 | 1 | |
| % App. Total | 26.7 | 71.7 | 1.7 | | 25 | 0 | 75 | | 0 | 90.1 | 9.9 | | 100 | 0 | 0 | | |
| PHF | .800 | .768 | .250 | .938 | .417 | .000 | .625 | .556 | .000 | .842 | .438 | .845 | .250 | .000 | .000 | .250 | |

Location: Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg Merrill Avenue | South Leg Euclid Avenue | West Leg Facility Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 2 | 2 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 2 | 2 |

| | North Leg Euclid Avenue | East Leg Merrill Avenue | South Leg Euclid Avenue | West Leg Facility Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 1 | 1 |
| 4:15 PM | 0 | 0 | 0 | 2 | 2 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 3 | 3 |

Location: Chino
N/S: Euclid Avenue
E/W: Facility Drive/Merrill Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound Merrill Avenue | | | Northbound Euclid Avenue | | | Eastbound Facility Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 |

| | Southbound Euclid Avenue | | | Westbound Merrill Avenue | | | Northbound Euclid Avenue | | | Eastbound Facility Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 5:00 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:15 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 30 | 96 | 39 | 8 | 165 | 6 | 199 | 80 | 27 | 285 | 21 | 80 | 5 | 2 | 106 | 24 | 43 | 2 | 1 | 69 | 38 | 625 | 663 |
| 07:15 AM | 44 | 117 | 31 | 5 | 192 | 4 | 202 | 66 | 35 | 272 | 15 | 114 | 9 | 5 | 138 | 19 | 45 | 4 | 2 | 68 | 47 | 670 | 717 |
| 07:30 AM | 48 | 107 | 42 | 12 | 197 | 7 | 235 | 88 | 39 | 330 | 25 | 130 | 6 | 5 | 161 | 33 | 49 | 5 | 1 | 87 | 57 | 775 | 832 |
| 07:45 AM | 58 | 107 | 34 | 8 | 199 | 6 | 208 | 87 | 61 | 301 | 25 | 122 | 9 | 4 | 156 | 18 | 51 | 6 | 4 | 75 | 77 | 731 | 808 |
| Total | 180 | 427 | 146 | 33 | 753 | 23 | 844 | 321 | 162 | 1188 | 86 | 446 | 29 | 16 | 561 | 94 | 188 | 17 | 8 | 299 | 219 | 2801 | 3020 |
| 08:00 AM | 51 | 94 | 35 | 9 | 180 | 9 | 209 | 76 | 34 | 294 | 24 | 116 | 9 | 5 | 149 | 28 | 99 | 9 | 5 | 136 | 53 | 759 | 812 |
| 08:15 AM | 46 | 116 | 35 | 21 | 197 | 9 | 166 | 81 | 34 | 256 | 21 | 103 | 6 | 6 | 130 | 17 | 84 | 8 | 5 | 109 | 66 | 692 | 758 |
| 08:30 AM | 50 | 95 | 42 | 16 | 187 | 11 | 171 | 87 | 32 | 269 | 20 | 120 | 5 | 2 | 145 | 14 | 87 | 9 | 2 | 110 | 52 | 711 | 763 |
| 08:45 AM | 51 | 89 | 41 | 16 | 181 | 3 | 132 | 76 | 50 | 211 | 23 | 123 | 10 | 2 | 156 | 20 | 81 | 11 | 8 | 112 | 76 | 660 | 736 |
| Total | 198 | 394 | 153 | 62 | 745 | 32 | 678 | 320 | 150 | 1030 | 88 | 462 | 30 | 15 | 580 | 79 | 351 | 37 | 20 | 467 | 247 | 2822 | 3069 |
| Grand Total | 378 | 821 | 299 | 95 | 1498 | 55 | 1522 | 641 | 312 | 2218 | 174 | 908 | 59 | 31 | 1141 | 173 | 539 | 54 | 28 | 766 | 466 | 5623 | 6089 |
| Apprch % | 25.2 | 54.8 | 20 | | | 2.5 | 68.6 | 28.9 | | | 15.2 | 79.6 | 5.2 | | | 22.6 | 70.4 | 7 | | | | | |
| Total % | 6.7 | 14.6 | 5.3 | | 26.6 | 1 | 27.1 | 11.4 | | 39.4 | 3.1 | 16.1 | 1 | | 20.3 | 3.1 | 9.6 | 1 | | 13.6 | 7.7 | 92.3 | |
| Passenger Vehicles | 358 | 684 | 208 | | 1329 | 48 | 1498 | 622 | | 2469 | 163 | 760 | 54 | | 1006 | 83 | 511 | 39 | | 654 | 0 | 0 | 5458 |
| % Passenger Vehicles | 94.7 | 83.3 | 69.6 | 83.2 | 83.4 | 87.3 | 98.4 | 97 | 96.5 | 97.6 | 93.7 | 83.7 | 91.5 | 93.5 | 85.8 | 48 | 94.8 | 72.2 | 75 | 82.4 | 0 | 0 | 89.6 |
| Large 2 Axle Vehicles | 8 | 41 | 10 | | 66 | 7 | 17 | 13 | | 45 | 5 | 32 | 5 | | 44 | 11 | 12 | 5 | | 31 | 0 | 0 | 186 |
| % Large 2 Axle Vehicles | 2.1 | 5 | 3.3 | 7.4 | 4.1 | 12.7 | 1.1 | 2 | 2.6 | 1.8 | 2.9 | 3.5 | 8.5 | 6.5 | 3.8 | 6.4 | 2.2 | 9.3 | 10.7 | 3.9 | 0 | 0 | 3.1 |
| 3 Axle Vehicles | 1 | 38 | 13 | | 56 | 0 | 2 | 0 | | 2 | 3 | 45 | 0 | | 48 | 5 | 6 | 2 | | 15 | 0 | 0 | 121 |
| % 3 Axle Vehicles | 0.3 | 4.6 | 4.3 | 4.2 | 3.5 | 0 | 0.1 | 0 | 0 | 0.1 | 1.7 | 5 | 0 | 0 | 4.1 | 2.9 | 1.1 | 3.7 | 7.1 | 1.9 | 0 | 0 | 2 |
| 4+ Axle Trucks | 11 | 58 | 68 | | 142 | 0 | 5 | 6 | | 14 | 3 | 71 | 0 | | 74 | 74 | 10 | 8 | | 94 | 0 | 0 | 324 |
| % 4+ Axle Trucks | 2.9 | 7.1 | 22.7 | 5.3 | 8.9 | 0 | 0.3 | 0.9 | 1 | 0.6 | 1.7 | 7.8 | 0 | 0 | 6.3 | 42.8 | 1.9 | 14.8 | 7.1 | 11.8 | 0 | 0 | 5.3 |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 48 | 107 | **42** | 197 | 7 | **235** | **88** | **330** | **25** | **130** | 6 | **161** | **33** | 49 | 5 | 87 | **775** |
| 07:45 AM | **58** | 107 | 34 | **199** | 6 | 208 | 87 | 301 | 25 | 122 | **9** | 156 | 18 | 51 | 6 | 75 | 731 |
| 08:00 AM | 51 | 94 | 35 | 180 | **9** | 209 | 76 | 294 | 24 | 116 | 9 | 149 | 28 | **99** | **9** | **136** | 759 |
| 08:15 AM | 46 | **116** | 35 | 197 | 9 | 166 | 81 | 256 | 21 | 103 | 6 | 130 | 17 | 84 | 8 | 109 | 692 |
| Total Volume | 203 | 424 | 146 | 773 | 31 | 818 | 332 | 1181 | 95 | 471 | 30 | 596 | 96 | 283 | 28 | 407 | 2957 |
| % App. Total | 26.3 | 54.9 | 18.9 | | 2.6 | 69.3 | 28.1 | | 15.9 | 79 | 5 | | 23.6 | 69.5 | 6.9 | | |
| PHF | .875 | .914 | .869 | .971 | .861 | .870 | .943 | .895 | .950 | .906 | .833 | .925 | .727 | .715 | .778 | .748 | .954 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

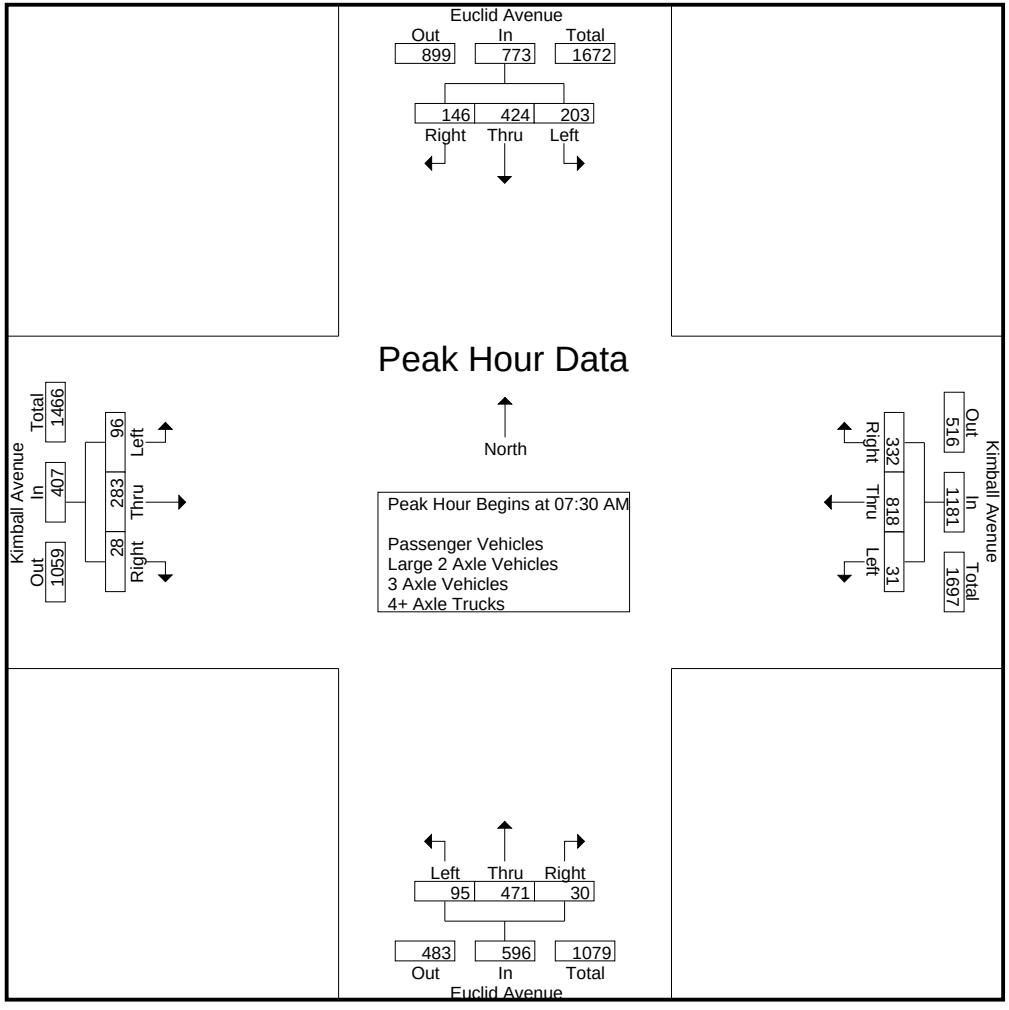

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 08:00 AM | | | | |
| +0 mins. | 48 | 107 | **42** | 197 | 4 | 202 | 66 | 272 | 15 | 114 | **9** | 138 | **28** | **99** | 9 | **136** | |
| +15 mins. | **58** | 107 | 34 | **199** | 7 | **235** | **88** | **330** | **25** | **130** | 6 | **161** | 17 | 84 | 8 | 109 | |
| +30 mins. | 51 | 94 | 35 | 180 | 6 | 208 | 87 | 301 | 25 | 122 | 9 | 156 | 14 | 87 | 9 | 110 | |
| +45 mins. | 46 | **116** | 35 | 197 | **9** | 209 | 76 | 294 | 24 | 116 | 9 | 149 | 20 | 81 | **11** | 112 | |
| Total Volume | 203 | 424 | 146 | 773 | 26 | 854 | 317 | 1197 | 89 | 482 | 33 | 604 | 79 | 351 | 37 | 467 | |
| % App. Total | 26.3 | 54.9 | 18.9 | | 2.2 | 71.3 | 26.5 | | 14.7 | 79.8 | 5.5 | | 16.9 | 75.2 | 7.9 | | |
| PHF | .875 | .914 | .869 | .971 | .722 | .909 | .901 | .907 | .890 | .927 | .917 | .938 | .705 | .886 | .841 | .858 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 27 | 85 | 23 | 6 | 135 | 4 | 195 | 79 | 26 | 278 | 20 | 67 | 5 | 2 | 92 | 14 | 40 | 0 | 0 | 54 | 34 | 559 | 593 |
| 07:15 AM | 43 | 103 | 25 | 3 | 171 | 3 | 201 | 63 | 33 | 267 | 15 | 90 | 8 | 5 | 113 | 9 | 41 | 4 | 2 | 54 | 43 | 605 | 648 |
| 07:30 AM | 46 | 91 | 28 | 9 | 165 | 5 | 233 | 85 | 38 | 323 | 23 | 112 | 5 | 4 | 140 | 17 | 48 | 4 | 1 | 69 | 52 | 697 | 749 |
| 07:45 AM | 56 | 84 | 24 | 7 | 164 | 6 | 205 | 86 | 60 | 297 | 23 | 105 | 9 | 4 | 137 | 7 | 48 | 5 | 4 | 60 | 75 | 658 | 733 |
| Total | 172 | 363 | 100 | 25 | 635 | 18 | 834 | 313 | 157 | 1165 | 81 | 374 | 27 | 15 | 482 | 47 | 177 | 13 | 7 | 237 | 204 | 2519 | 2723 |
| 08:00 AM | 47 | 76 | 24 | 6 | 147 | 9 | 202 | 72 | 31 | 283 | 24 | 94 | 8 | 4 | 126 | 6 | 92 | 7 | 4 | 105 | 45 | 661 | 706 |
| 08:15 AM | 44 | 90 | 22 | 18 | 156 | 8 | 163 | 80 | 34 | 251 | 20 | 90 | 6 | 6 | 116 | 12 | 81 | 4 | 1 | 97 | 59 | 620 | 679 |
| 08:30 AM | 48 | 77 | 33 | 16 | 158 | 10 | 168 | 85 | 31 | 263 | 16 | 99 | 3 | 2 | 118 | 5 | 85 | 5 | 1 | 95 | 50 | 634 | 684 |
| 08:45 AM | 47 | 78 | 29 | 14 | 154 | 3 | 131 | 72 | 48 | 206 | 22 | 103 | 10 | 2 | 135 | 13 | 76 | 10 | 8 | 99 | 72 | 594 | 666 |
| Total | 186 | 321 | 108 | 54 | 615 | 30 | 664 | 309 | 144 | 1003 | 82 | 386 | 27 | 14 | 495 | 36 | 334 | 26 | 14 | 396 | 226 | 2509 | 2735 |
| Grand Total | 358 | 684 | 208 | 79 | 1250 | 48 | 1498 | 622 | 301 | 2168 | 163 | 760 | 54 | 29 | 977 | 83 | 511 | 39 | 21 | 633 | 430 | 5028 | 5458 |
| Apprch % | 28.6 | 54.7 | 16.6 | | | 2.2 | 69.1 | 28.7 | | | 16.7 | 77.8 | 5.5 | | | 13.1 | 80.7 | 6.2 | | | | | |
| Total % | 7.1 | 13.6 | 4.1 | | 24.9 | 1 | 29.8 | 12.4 | | 43.1 | 3.2 | 15.1 | 1.1 | | 19.4 | 1.7 | 10.2 | 0.8 | | 12.6 | 7.9 | 92.1 | |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 46 | **91** | **28** | **165** | 5 | **233** | 85 | **323** | 23 | **112** | 5 | **140** | **17** | 48 | 4 | 69 | **697** |
| 07:45 AM | **56** | 84 | 24 | 164 | 6 | 205 | **86** | 297 | 23 | 105 | **9** | 137 | 7 | 48 | 5 | 60 | 658 |
| 08:00 AM | 47 | 76 | 24 | 147 | **9** | 202 | 72 | 283 | **24** | 94 | 8 | 126 | 6 | **92** | **7** | **105** | 661 |
| 08:15 AM | 44 | 90 | 22 | 156 | 8 | 163 | 80 | 251 | 20 | 90 | 6 | 116 | 12 | 81 | 4 | 97 | 620 |
| Total Volume | 193 | 341 | 98 | 632 | 28 | 803 | 323 | 1154 | 90 | 401 | 28 | 519 | 42 | 269 | 20 | 331 | 2636 |
| % App. Total | 30.5 | 54 | 15.5 | | 2.4 | 69.6 | 28 | | 17.3 | 77.3 | 5.4 | | 12.7 | 81.3 | 6 | | |
| PHF | .862 | .937 | .875 | .958 | .778 | .862 | .939 | .893 | .938 | .895 | .778 | .927 | .618 | .731 | .714 | .788 | .945 |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

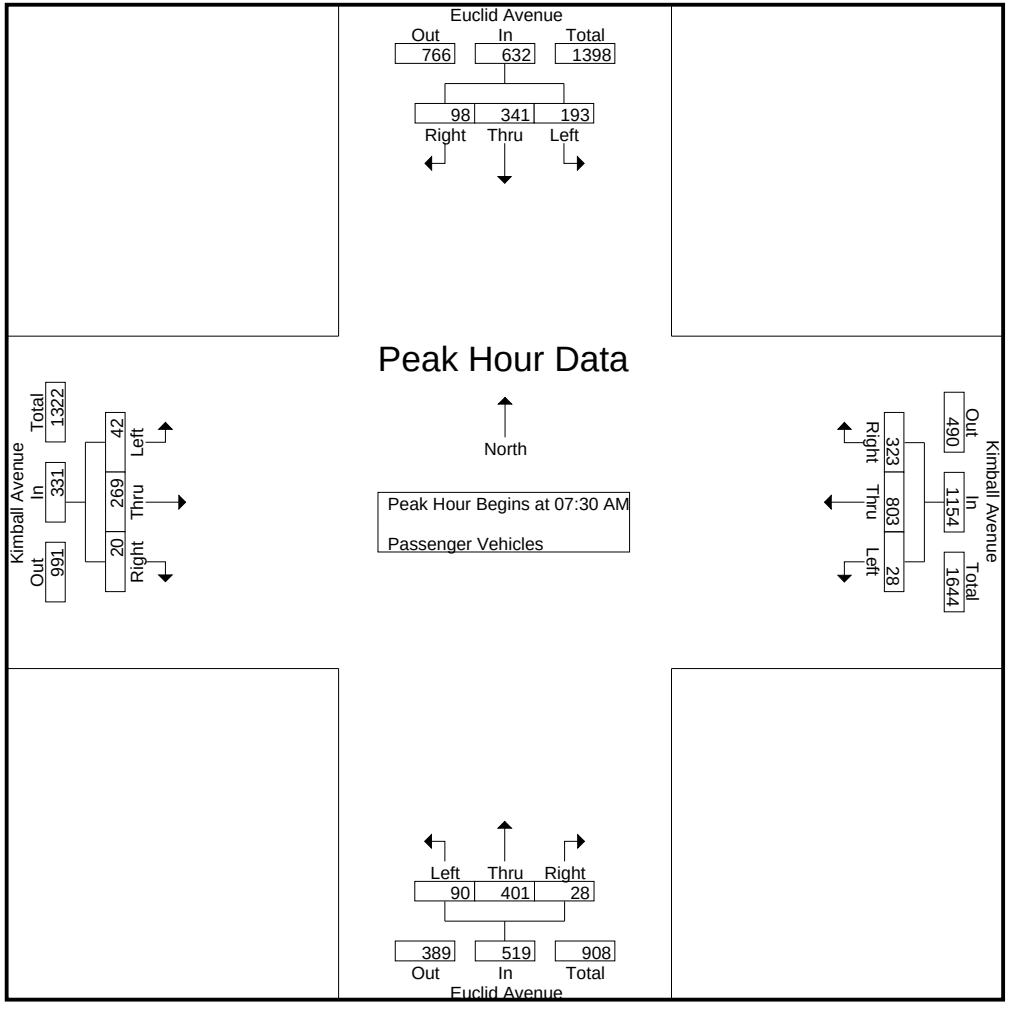

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City of Chino
N/S: Euclid Avenue
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Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 46 | **91** | **28** | **165** | 5 | **233** | 85 | **323** | 23 | **112** | 5 | **140** | **17** | 48 | 4 | 69 | |
| +15 mins. | **56** | 84 | 24 | 164 | 6 | 205 | **86** | 297 | 23 | 105 | **9** | 137 | 7 | 48 | 5 | 60 | |
| +30 mins. | 47 | 76 | 24 | 147 | **9** | 202 | 72 | 283 | **24** | 94 | 8 | 126 | 6 | **92** | **7** | **105** | |
| +45 mins. | 44 | 90 | 22 | 156 | 8 | 163 | 80 | 251 | 20 | 90 | 6 | 116 | 12 | 81 | 4 | 97 | |
| Total Volume | 193 | 341 | 98 | 632 | 28 | 803 | 323 | 1154 | 90 | 401 | 28 | 519 | 42 | 269 | 20 | 331 | |
| % App. Total | 30.5 | 54 | 15.5 | | 2.4 | 69.6 | 28 | | 17.3 | 77.3 | 5.4 | | 12.7 | 81.3 | 6 | | |
| PHF | .862 | .937 | .875 | .958 | .778 | .862 | .939 | .893 | .938 | .895 | .778 | .927 | .618 | .731 | .714 | .788 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 7 | 2 | 1 | 11 | 2 | 3 | 1 | 1 | 6 | 1 | 2 | 0 | 0 | 3 | 1 | 2 | 1 | 1 | 4 | 3 | 24 | 27 |
| 07:15 AM | 0 | 5 | 1 | 1 | 6 | 1 | 0 | 2 | 2 | 3 | 0 | 10 | 1 | 0 | 11 | 0 | 1 | 0 | 0 | 1 | 3 | 21 | 24 |
| 07:30 AM | 2 | 6 | 1 | 0 | 9 | 2 | 0 | 3 | 1 | 5 | 2 | 3 | 1 | 1 | 6 | 2 | 0 | 1 | 0 | 3 | 2 | 23 | 25 |
| 07:45 AM | 1 | 7 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 6 | 2 | 1 | 0 | 0 | 3 | 0 | 18 | 18 |
| Total | 5 | 25 | 4 | 2 | 34 | 5 | 4 | 6 | 4 | 15 | 4 | 20 | 2 | 1 | 26 | 5 | 4 | 2 | 1 | 11 | 8 | 86 | 94 |
| 08:00 AM | 1 | 6 | 2 | 2 | 9 | 0 | 7 | 3 | 2 | 10 | 0 | 3 | 1 | 1 | 4 | 3 | 4 | 0 | 0 | 7 | 5 | 30 | 35 |
| 08:15 AM | 0 | 6 | 2 | 2 | 8 | 1 | 3 | 0 | 0 | 4 | 1 | 3 | 0 | 0 | 4 | 0 | 1 | 1 | 1 | 2 | 3 | 18 | 21 |
| 08:30 AM | 2 | 3 | 1 | 0 | 6 | 1 | 2 | 0 | 0 | 3 | 0 | 3 | 2 | 0 | 5 | 0 | 2 | 2 | 1 | 4 | 1 | 18 | 19 |
| 08:45 AM | 0 | 1 | 1 | 1 | 2 | 0 | 1 | 4 | 2 | 5 | 0 | 3 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | 4 | 3 | 14 | 17 |
| Total | 3 | 16 | 6 | 5 | 25 | 2 | 13 | 7 | 4 | 22 | 1 | 12 | 3 | 1 | 16 | 6 | 8 | 3 | 2 | 17 | 12 | 80 | 92 |
| Grand Total | 8 | 41 | 10 | 7 | 59 | 7 | 17 | 13 | 8 | 37 | 5 | 32 | 5 | 2 | 42 | 11 | 12 | 5 | 3 | 28 | 20 | 166 | 186 |
| Apprch % | 13.6 | 69.5 | 16.9 | | | 18.9 | 45.9 | 35.1 | | | 11.9 | 76.2 | 11.9 | | | 39.3 | 42.9 | 17.9 | | | | | |
| Total % | 4.8 | 24.7 | 6 | | 35.5 | 4.2 | 10.2 | 7.8 | | 22.3 | 3 | 19.3 | 3 | | 25.3 | 6.6 | 7.2 | 3 | | 16.9 | 10.8 | 89.2 | |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **2** | 6 | 1 | **9** | **2** | 0 | **3** | 5 | **2** | 3 | **1** | **6** | 2 | 0 | **1** | 3 | 23 |
| 07:45 AM | 1 | **7** | 0 | 8 | 0 | 1 | 0 | 1 | 1 | **5** | 0 | 6 | 2 | 1 | 0 | 3 | 18 |
| 08:00 AM | 1 | 6 | **2** | 9 | 0 | **7** | 3 | **10** | 0 | 3 | 1 | 4 | **3** | **4** | 0 | **7** | **30** |
| 08:15 AM | 0 | 6 | 2 | 8 | 1 | 3 | 0 | 4 | 1 | 3 | 0 | 4 | 0 | 1 | 1 | 2 | 18 |
| Total Volume | 4 | 25 | 5 | 34 | 3 | 11 | 6 | 20 | 4 | 14 | 2 | 20 | 7 | 6 | 2 | 15 | 89 |
| % App. Total | 11.8 | 73.5 | 14.7 | | 15 | 55 | 30 | | 20 | 70 | 10 | | 46.7 | 40 | 13.3 | | |
| PHF | .500 | .893 | .625 | .944 | .375 | .393 | .500 | .500 | .500 | .700 | .500 | .833 | .583 | .375 | .500 | .536 | .742 |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

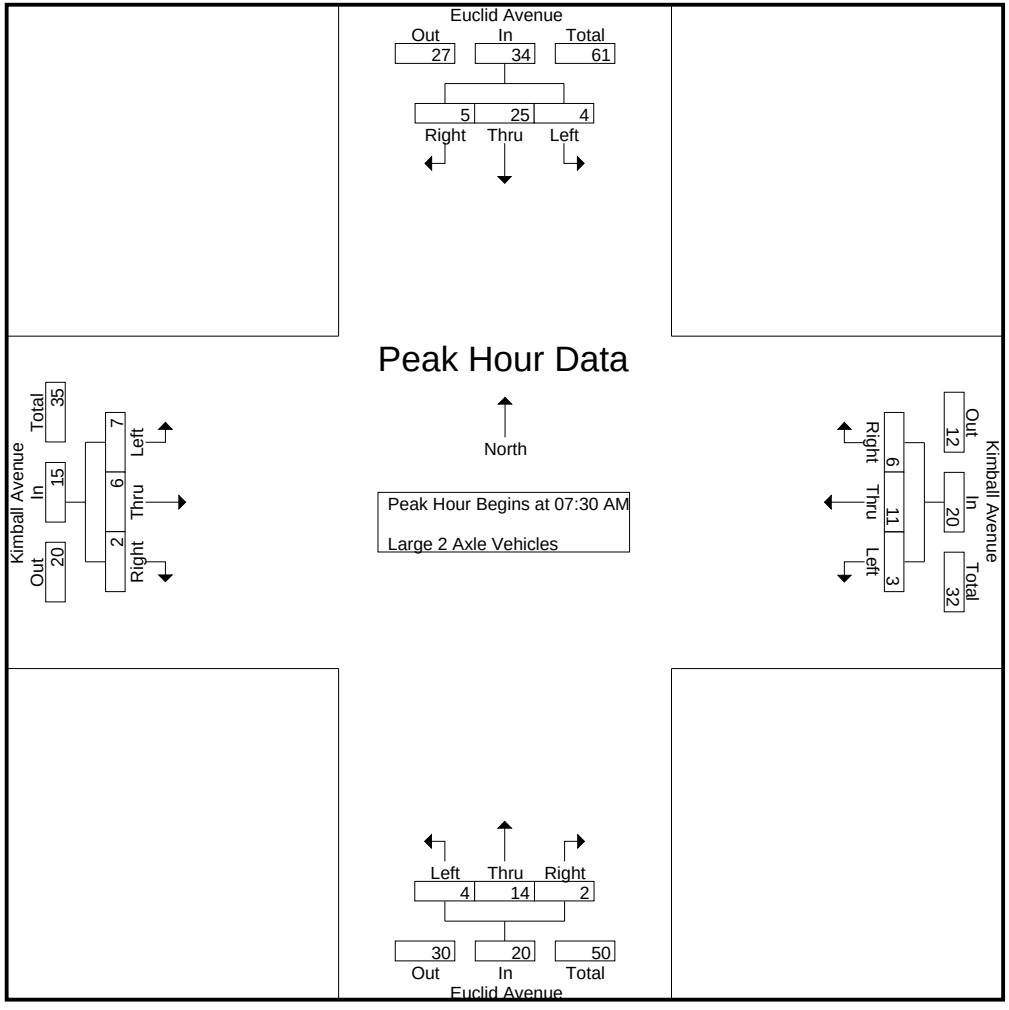

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **2** | 6 | 1 | **9** | **2** | 0 | **3** | 5 | **2** | 3 | **1** | **6** | 2 | 0 | **1** | 3 | |
| +15 mins. | 1 | **7** | 0 | 8 | 0 | 1 | 0 | 1 | 1 | **5** | 0 | 6 | 2 | 1 | 0 | 3 | |
| +30 mins. | 1 | 6 | **2** | 9 | 0 | **7** | 3 | **10** | 0 | 3 | 1 | 4 | **3** | **4** | 0 | **7** | |
| +45 mins. | 0 | 6 | 2 | 8 | 1 | 3 | 0 | 4 | 1 | 3 | 0 | 4 | 0 | 1 | 1 | 2 | |
| Total Volume | 4 | 25 | 5 | 34 | 3 | 11 | 6 | 20 | 4 | 14 | 2 | 20 | 7 | 6 | 2 | 15 | |
| % App. Total | 11.8 | 73.5 | 14.7 | | 15 | 55 | 30 | | 20 | 70 | 10 | | 46.7 | 40 | 13.3 | | |
| PHF | .500 | .893 | .625 | .944 | .375 | .393 | .500 | .500 | .500 | .700 | .500 | .833 | .583 | .375 | .500 | .536 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 5 | 6 |
| 07:15 AM | 0 | 1 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 2 | 0 | 8 | 8 |
| 07:30 AM | 0 | 2 | 2 | 1 | 4 | 0 | 1 | 0 | 0 | 1 | 0 | 7 | 0 | 0 | 7 | 1 | 1 | 0 | 0 | 2 | 1 | 14 | 15 |
| 07:45 AM | 0 | 5 | 2 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 |
| Total | 0 | 9 | 7 | 2 | 16 | 0 | 2 | 0 | 0 | 2 | 1 | 17 | 0 | 0 | 18 | 2 | 3 | 0 | 0 | 5 | 2 | 41 | 43 |
| 08:00 AM | 0 | 3 | 3 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 10 | 3 | 0 | 1 | 1 | 4 | 2 | 20 | 22 |
| 08:15 AM | 1 | 14 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 1 | 1 | 1 | 1 | 19 | 20 |
| 08:30 AM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| 08:45 AM | 0 | 5 | 3 | 1 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 9 | 0 | 3 | 0 | 0 | 3 | 1 | 20 | 21 |
| Total | 1 | 29 | 6 | 2 | 36 | 0 | 0 | 0 | 0 | 0 | 2 | 28 | 0 | 0 | 30 | 3 | 3 | 2 | 2 | 8 | 4 | 74 | 78 |
| Grand Total | 1 | 38 | 13 | 4 | 52 | 0 | 2 | 0 | 0 | 2 | 3 | 45 | 0 | 0 | 48 | 5 | 6 | 2 | 2 | 13 | 6 | 115 | 121 |
| Apprch % | 1.9 | 73.1 | 25 | | | 0 | 100 | 0 | | | 6.2 | 93.8 | 0 | | | 38.5 | 46.2 | 15.4 | | | | | |
| Total % | 0.9 | 33 | 11.3 | | 45.2 | 0 | 1.7 | 0 | | 1.7 | 2.6 | 39.1 | 0 | | 41.7 | 4.3 | 5.2 | 1.7 | | 11.3 | 5 | 95 | |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 2 | 2 | 4 | 0 | **1** | 0 | **1** | 0 | 7 | 0 | 7 | 1 | **1** | 0 | 2 | 14 |
| 07:45 AM | 0 | 5 | 2 | 7 | 0 | 0 | 0 | 0 | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 14 |
| 08:00 AM | 0 | 3 | **3** | 6 | 0 | 0 | 0 | 0 | 0 | **10** | 0 | **10** | **3** | 0 | **1** | **4** | **20** |
| 08:15 AM | **1** | **14** | 0 | **15** | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 1 | 1 | 19 |
| Total Volume | 1 | 24 | 7 | 32 | 0 | 1 | 0 | 1 | 1 | 26 | 0 | 27 | 4 | 1 | 2 | 7 | 67 |
| % App. Total | 3.1 | 75 | 21.9 | | 0 | 100 | 0 | | 3.7 | 96.3 | 0 | | 57.1 | 14.3 | 28.6 | | |
| PHF | .250 | .429 | .583 | .533 | .000 | .250 | .000 | .250 | .250 | .650 | .000 | .675 | .333 | .250 | .500 | .438 | .838 |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

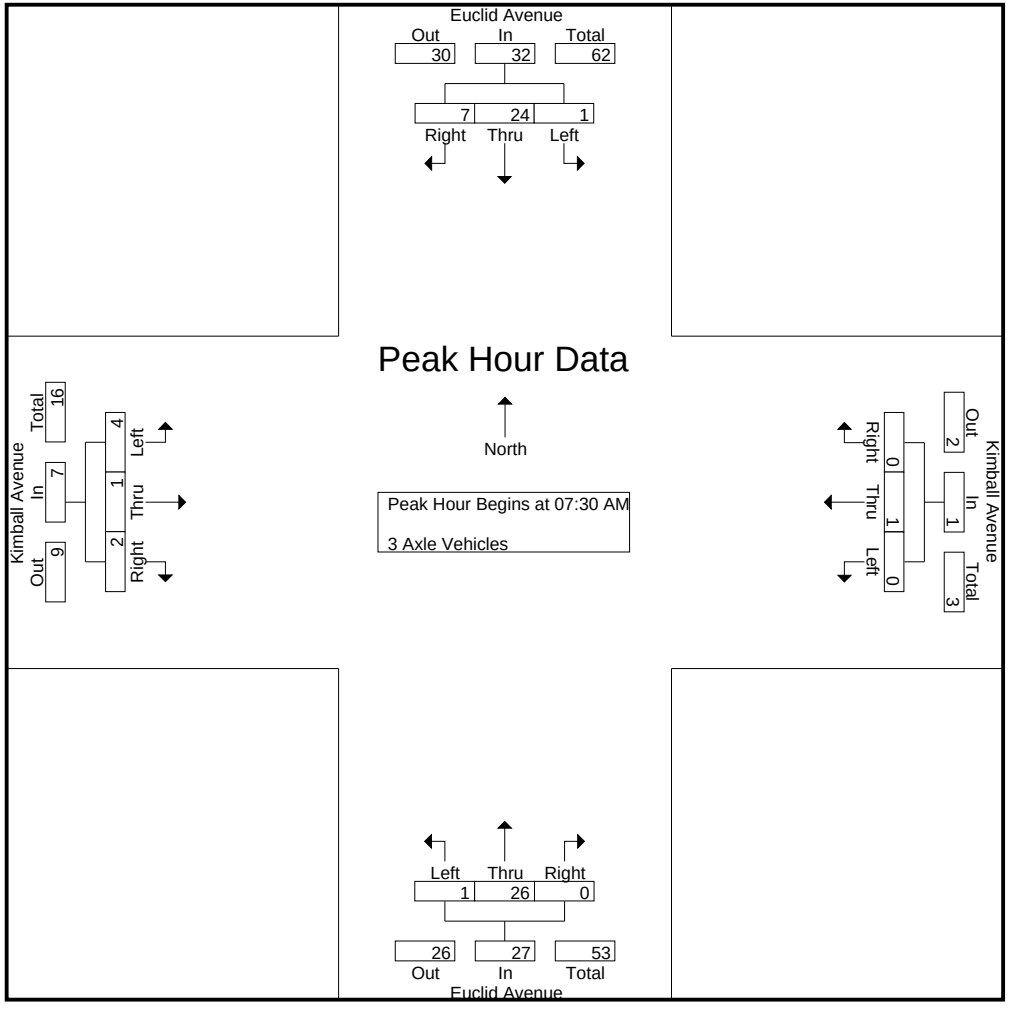

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| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 2 | 2 | 4 | 0 | **1** | 0 | **1** | 0 | 7 | 0 | 7 | 1 | **1** | 0 | 2 | |
| +15 mins. | 0 | 5 | 2 | 7 | 0 | 0 | 0 | 0 | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 3 | **3** | 6 | 0 | 0 | 0 | 0 | 0 | **10** | 0 | **10** | **3** | 0 | **1** | **4** | |
| +45 mins. | **1** | **14** | 0 | **15** | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 1 | 1 | |
| Total Volume | 1 | 24 | 7 | 32 | 0 | 1 | 0 | 1 | 1 | 26 | 0 | 27 | 4 | 1 | 2 | 7 | |
| % App. Total | 3.1 | 75 | 21.9 | | 0 | 100 | 0 | | 3.7 | 96.3 | 0 | | 57.1 | 14.3 | 28.6 | | |
| PHF | .250 | .429 | .583 | .533 | .000 | .250 | .000 | .250 | .250 | .650 | .000 | .675 | .333 | .250 | .500 | .438 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 3 | 13 | 0 | 17 | 0 | 1 | 0 | 0 | 1 | 0 | 9 | 0 | 0 | 9 | 9 | 0 | 1 | 0 | 10 | 0 | 37 | 37 |
| 07:15 AM | 1 | 8 | 3 | 1 | 12 | 0 | 0 | 1 | 0 | 1 | 0 | 12 | 0 | 0 | 12 | 9 | 2 | 0 | 0 | 11 | 1 | 36 | 37 |
| 07:30 AM | 0 | 8 | 11 | 2 | 19 | 0 | 1 | 0 | 0 | 1 | 0 | 8 | 0 | 0 | 8 | 13 | 0 | 0 | 0 | 13 | 2 | 41 | 43 |
| 07:45 AM | 1 | 11 | 8 | 1 | 20 | 0 | 2 | 1 | 1 | 3 | 0 | 6 | 0 | 0 | 6 | 9 | 2 | 1 | 0 | 12 | 2 | 41 | 43 |
| Total | 3 | 30 | 35 | 4 | 68 | 0 | 4 | 2 | 1 | 6 | 0 | 35 | 0 | 0 | 35 | 40 | 4 | 2 | 0 | 46 | 5 | 155 | 160 |
| 08:00 AM | 3 | 9 | 6 | 0 | 18 | 0 | 0 | 1 | 1 | 1 | 0 | 9 | 0 | 0 | 9 | 16 | 3 | 1 | 0 | 20 | 1 | 48 | 49 |
| 08:15 AM | 1 | 6 | 11 | 1 | 18 | 0 | 0 | 1 | 0 | 1 | 0 | 7 | 0 | 0 | 7 | 5 | 2 | 2 | 2 | 9 | 3 | 35 | 38 |
| 08:30 AM | 0 | 8 | 8 | 0 | 16 | 0 | 1 | 2 | 1 | 3 | 3 | 11 | 0 | 0 | 14 | 9 | 0 | 2 | 0 | 11 | 1 | 44 | 45 |
| 08:45 AM | 4 | 5 | 8 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 4 | 1 | 1 | 0 | 6 | 0 | 32 | 32 |
| Total | 8 | 28 | 33 | 1 | 69 | 0 | 1 | 4 | 2 | 5 | 3 | 36 | 0 | 0 | 39 | 34 | 6 | 6 | 2 | 46 | 5 | 159 | 164 |
| Grand Total | 11 | 58 | 68 | 5 | 137 | 0 | 5 | 6 | 3 | 11 | 3 | 71 | 0 | 0 | 74 | 74 | 10 | 8 | 2 | 92 | 10 | 314 | 324 |
| Apprch % | 8 | 42.3 | 49.6 | | | 0 | 45.5 | 54.5 | | | 4.1 | 95.9 | 0 | | | 80.4 | 10.9 | 8.7 | | | | | |
| Total % | 3.5 | 18.5 | 21.7 | | 43.6 | 0 | 1.6 | 1.9 | | 3.5 | 1 | 22.6 | 0 | | 23.6 | 23.6 | 3.2 | 2.5 | | 29.3 | 3.1 | 96.9 | |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 8 | **11** | 19 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 8 | 13 | 0 | 0 | 13 | 41 |
| 07:45 AM | 1 | **11** | 8 | **20** | 0 | **2** | **1** | **3** | 0 | 6 | 0 | 6 | 9 | 2 | 1 | 12 | 41 |
| 08:00 AM | **3** | 9 | 6 | 18 | 0 | 0 | 1 | 1 | 0 | **9** | 0 | **9** | **16** | **3** | 1 | **20** | **48** |
| 08:15 AM | 1 | 6 | 11 | 18 | 0 | 0 | 1 | 1 | 0 | 7 | 0 | 7 | 5 | 2 | **2** | 9 | 35 |
| Total Volume | 5 | 34 | 36 | 75 | 0 | 3 | 3 | 6 | 0 | 30 | 0 | 30 | 43 | 7 | 4 | 54 | 165 |
| % App. Total | 6.7 | 45.3 | 48 | | 0 | 50 | 50 | | 0 | 100 | 0 | | 79.6 | 13 | 7.4 | | |
| PHF | .417 | .773 | .818 | .938 | .000 | .375 | .750 | .500 | .000 | .833 | .000 | .833 | .672 | .583 | .500 | .675 | .859 |

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City of Chino
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E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

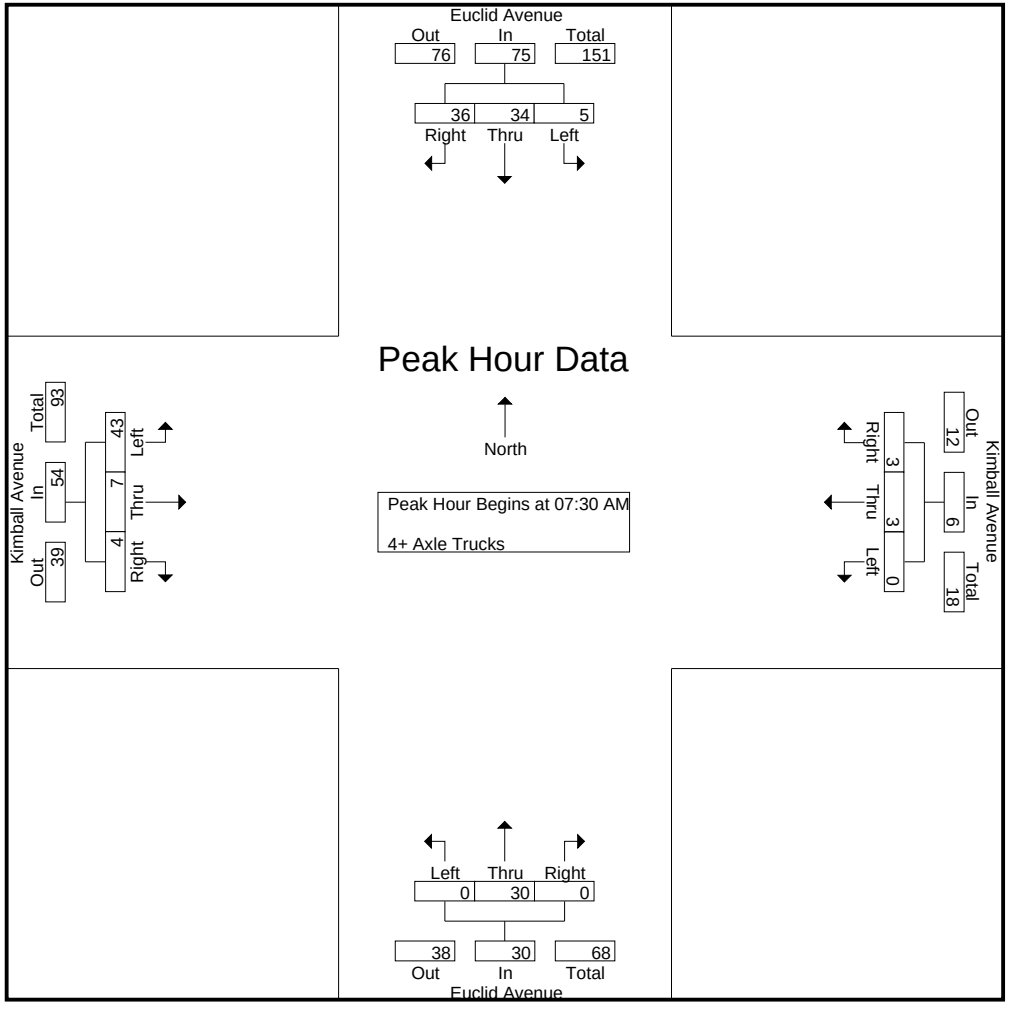

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City of Chino
N/S: Euclid Avenue
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File Name : 10_CHN_Euc_Kim AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 8 | **11** | 19 | 0 | 1 | 0 | 1 | 0 | 8 | 0 | 8 | 13 | 0 | 0 | 13 | |
| +15 mins. | 1 | **11** | 8 | **20** | 0 | **2** | **1** | **3** | 0 | 6 | 0 | 6 | 9 | 2 | 1 | 12 | |
| +30 mins. | **3** | 9 | 6 | 18 | 0 | 0 | 1 | 1 | 0 | **9** | 0 | **9** | **16** | **3** | 1 | **20** | |
| +45 mins. | 1 | 6 | 11 | 18 | 0 | 0 | 1 | 1 | 0 | 7 | 0 | 7 | 5 | 2 | **2** | 9 | |
| Total Volume | 5 | 34 | 36 | 75 | 0 | 3 | 3 | 6 | 0 | 30 | 0 | 30 | 43 | 7 | 4 | 54 | |
| % App. Total | 6.7 | 45.3 | 48 | | 0 | 50 | 50 | | 0 | 100 | 0 | | 79.6 | 13 | 7.4 | | |
| PHF | .417 | .773 | .818 | .938 | .000 | .375 | .750 | .500 | .000 | .833 | .000 | .833 | .672 | .583 | .500 | .675 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 102 | 96 | 24 | 9 | 222 | 5 | 90 | 51 | 19 | 146 | 22 | 142 | 10 | 3 | 174 | 61 | 158 | 15 | 7 | 234 | 38 | 776 | 814 |
| 04:15 PM | 97 | 98 | 31 | 14 | 226 | 12 | 72 | 39 | 20 | 123 | 15 | 143 | 11 | 8 | 169 | 69 | 185 | 14 | 4 | 268 | 46 | 786 | 832 |
| 04:30 PM | 96 | 107 | 55 | 29 | 258 | 8 | 108 | 56 | 23 | 172 | 25 | 141 | 7 | 4 | 173 | 61 | 133 | 11 | 7 | 205 | 63 | 808 | 871 |
| 04:45 PM | 122 | 100 | 49 | 25 | 271 | 8 | 128 | 42 | 22 | 178 | 29 | 101 | 4 | 1 | 134 | 47 | 144 | 12 | 5 | 203 | 53 | 786 | 839 |
| Total | 417 | 401 | 159 | 77 | 977 | 33 | 398 | 188 | 84 | 619 | 91 | 527 | 32 | 16 | 650 | 238 | 620 | 52 | 23 | 910 | 200 | 3156 | 3356 |
| 05:00 PM | 124 | 97 | 15 | 7 | 236 | 10 | 123 | 56 | 33 | 189 | 23 | 136 | 14 | 6 | 173 | 65 | 163 | 20 | 14 | 248 | 60 | 846 | 906 |
| 05:15 PM | 79 | 70 | 31 | 18 | 180 | 7 | 113 | 53 | 22 | 173 | 14 | 132 | 6 | 3 | 152 | 43 | 194 | 19 | 9 | 256 | 52 | 761 | 813 |
| 05:30 PM | 117 | 96 | 26 | 18 | 239 | 8 | 103 | 48 | 23 | 159 | 23 | 110 | 7 | 3 | 140 | 86 | 152 | 16 | 7 | 254 | 51 | 792 | 843 |
| 05:45 PM | 95 | 96 | 27 | 18 | 218 | 9 | 93 | 41 | 17 | 143 | 30 | 127 | 8 | 3 | 165 | 43 | 150 | 9 | 7 | 202 | 45 | 728 | 773 |
| Total | 415 | 359 | 99 | 61 | 873 | 34 | 432 | 198 | 95 | 664 | 90 | 505 | 35 | 15 | 630 | 237 | 659 | 64 | 37 | 960 | 208 | 3127 | 3335 |
| Grand Total | 832 | 760 | 258 | 138 | 1850 | 67 | 830 | 386 | 179 | 1283 | 181 | 1032 | 67 | 31 | 1280 | 475 | 1279 | 116 | 60 | 1870 | 408 | 6283 | 6691 |
| Apprch % | 45 | 41.1 | 13.9 | | | 5.2 | 64.7 | 30.1 | | | 14.1 | 80.6 | 5.2 | | | 25.4 | 68.4 | 6.2 | | | | | |
| Total % | 13.2 | 12.1 | 4.1 | | 29.4 | 1.1 | 13.2 | 6.1 | | 20.4 | 2.9 | 16.4 | 1.1 | | 20.4 | 7.6 | 20.4 | 1.8 | | 29.8 | 6.1 | 93.9 | |
| Passenger Vehicles | 823 | 703 | 171 | | 1798 | 66 | 821 | 373 | | 1435 | 161 | 930 | 61 | | 1180 | 380 | 1256 | 95 | | 1785 | 0 | 0 | 6198 |
| % Passenger Vehicles | 98.9 | 92.5 | 66.3 | 73.2 | 90.4 | 98.5 | 98.9 | 96.6 | 97.8 | 98.2 | 89 | 90.1 | 91 | 90.3 | 90 | 80 | 98.2 | 81.9 | 90 | 92.5 | 0 | 0 | 92.6 |
| Large 2 Axle Vehicles | 6 | 17 | 6 | | 33 | 0 | 8 | 10 | | 20 | 6 | 25 | 5 | | 39 | 6 | 17 | 5 | | 29 | 0 | 0 | 121 |
| % Large 2 Axle Vehicles | 0.7 | 2.2 | 2.3 | 2.9 | 1.7 | 0 | 1 | 2.6 | 1.1 | 1.4 | 3.3 | 2.4 | 7.5 | 9.7 | 3 | 1.3 | 1.3 | 4.3 | 1.7 | 1.5 | 0 | 0 | 1.8 |
| 3 Axle Vehicles | 2 | 14 | 25 | | 49 | 1 | 0 | 1 | | 3 | 1 | 20 | 0 | | 21 | 20 | 2 | 2 | | 25 | 0 | 0 | 98 |
| % 3 Axle Vehicles | 0.2 | 1.8 | 9.7 | 5.8 | 2.5 | 1.5 | 0 | 0.3 | 0.6 | 0.2 | 0.6 | 1.9 | 0 | 0 | 1.6 | 4.2 | 0.2 | 1.7 | 1.7 | 1.3 | 0 | 0 | 1.5 |
| 4+ Axle Trucks | 1 | 26 | 56 | | 108 | 0 | 1 | 2 | | 4 | 13 | 57 | 1 | | 71 | 69 | 4 | 14 | | 91 | 0 | 0 | 274 |
| % 4+ Axle Trucks | 0.1 | 3.4 | 21.7 | 18.1 | 5.4 | 0 | 0.1 | 0.5 | 0.6 | 0.3 | 7.2 | 5.5 | 1.5 | 0 | 5.4 | 14.5 | 0.3 | 12.1 | 6.7 | 4.7 | 0 | 0 | 4.1 |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 97 | 98 | 31 | 226 | **12** | 72 | 39 | 123 | 15 | **143** | 11 | 169 | **69** | **185** | 14 | **268** | 786 |
| 04:30 PM | 96 | **107** | **55** | 258 | 8 | 108 | **56** | 172 | 25 | 141 | 7 | **173** | 61 | 133 | 11 | 205 | 808 |
| 04:45 PM | 122 | 100 | 49 | **271** | 8 | **128** | 42 | 178 | **29** | 101 | 4 | 134 | 47 | 144 | 12 | 203 | 786 |
| 05:00 PM | **124** | 97 | 15 | 236 | 10 | 123 | 56 | **189** | 23 | 136 | **14** | 173 | 65 | 163 | **20** | 248 | **846** |
| Total Volume | 439 | 402 | 150 | 991 | 38 | 431 | 193 | 662 | 92 | 521 | 36 | 649 | 242 | 625 | 57 | 924 | 3226 |
| % App. Total | 44.3 | 40.6 | 15.1 | | 5.7 | 65.1 | 29.2 | | 14.2 | 80.3 | 5.5 | | 26.2 | 67.6 | 6.2 | | |
| PHF | .885 | .939 | .682 | .914 | .792 | .842 | .862 | .876 | .793 | .911 | .643 | .938 | .877 | .845 | .713 | .862 | .953 |

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Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

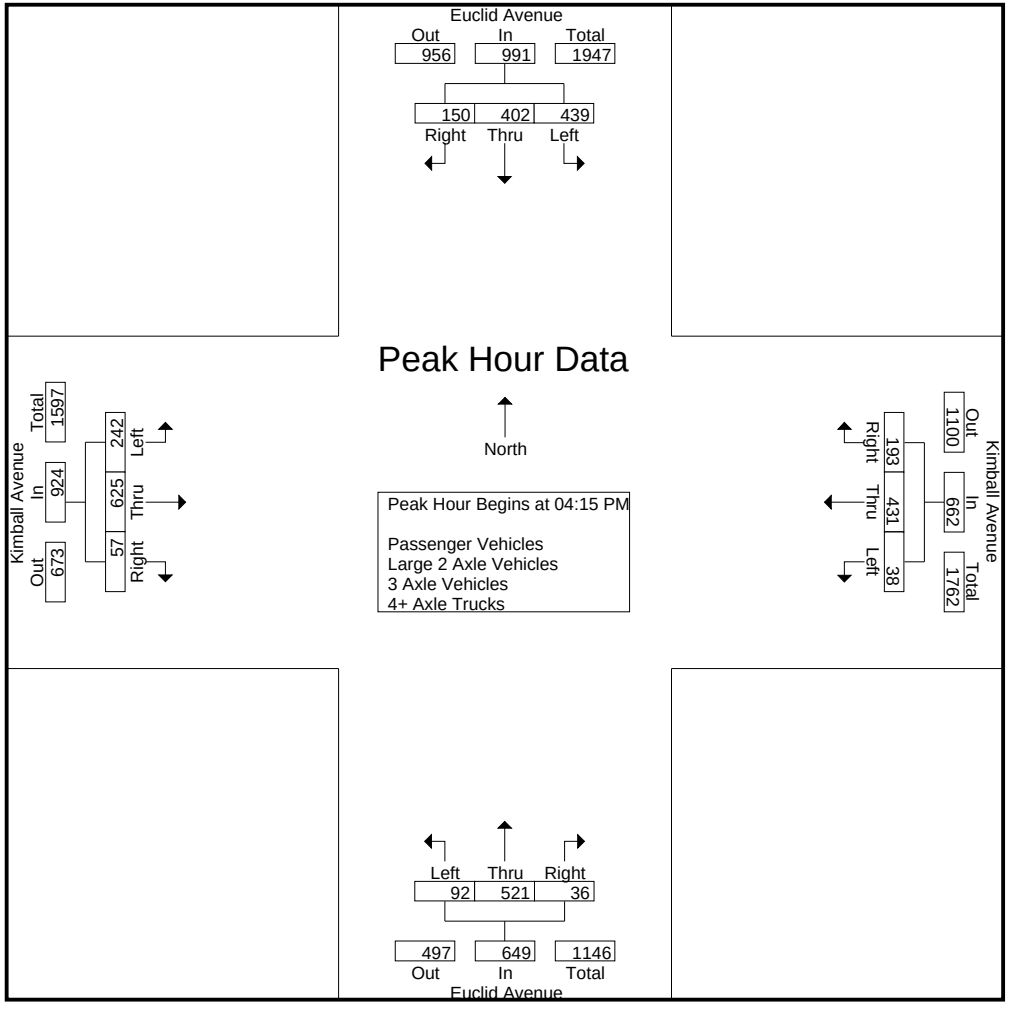

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Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:30 PM | | | | 04:00 PM | | | | 04:45 PM | | | | |
| +0 mins. | 97 | 98 | 31 | 226 | 8 | 108 | **56** | 172 | 22 | 142 | 10 | **174** | 47 | 144 | 12 | 203 | |
| +15 mins. | 96 | **107** | **55** | 258 | 8 | **128** | 42 | 178 | 15 | **143** | **11** | 169 | 65 | 163 | **20** | 248 | |
| +30 mins. | 122 | 100 | 49 | **271** | **10** | 123 | 56 | **189** | 25 | 141 | 7 | 173 | 43 | **194** | 19 | **256** | |
| +45 mins. | **124** | 97 | 15 | 236 | 7 | 113 | 53 | 173 | **29** | 101 | 4 | 134 | **86** | 152 | 16 | 254 | |
| Total Volume | 439 | 402 | 150 | 991 | 33 | 472 | 207 | 712 | 91 | 527 | 32 | 650 | 241 | 653 | 67 | 961 | |
| % App. Total | 44.3 | 40.6 | 15.1 | | 4.6 | 66.3 | 29.1 | | 14 | 81.1 | 4.9 | | 25.1 | 68 | 7 | | |
| PHF | .885 | .939 | .682 | .914 | .825 | .922 | .924 | .942 | .784 | .921 | .727 | .934 | .701 | .841 | .838 | .938 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 102 | 84 | 11 | 6 | 197 | 5 | 87 | 46 | 17 | 138 | 20 | 120 | 9 | 3 | 149 | 55 | 155 | 13 | 7 | 223 | 33 | 707 | 740 |
| 04:15 PM | 95 | 90 | 19 | 10 | 204 | 11 | 72 | 38 | 20 | 121 | 12 | 130 | 9 | 7 | 151 | 46 | 183 | 10 | 4 | 239 | 41 | 715 | 756 |
| 04:30 PM | 95 | 98 | 43 | 24 | 236 | 8 | 108 | 54 | 22 | 170 | 21 | 131 | 6 | 4 | 158 | 50 | 131 | 8 | 5 | 189 | 55 | 753 | 808 |
| 04:45 PM | 121 | 93 | 37 | 20 | 251 | 8 | 128 | 42 | 22 | 178 | 27 | 83 | 4 | 1 | 114 | 36 | 144 | 8 | 5 | 188 | 48 | 731 | 779 |
| Total | 413 | 365 | 110 | 60 | 888 | 32 | 395 | 180 | 81 | 607 | 80 | 464 | 28 | 15 | 572 | 187 | 613 | 39 | 21 | 839 | 177 | 2906 | 3083 |
| 05:00 PM | 122 | 89 | 9 | 7 | 220 | 10 | 123 | 56 | 33 | 189 | 23 | 123 | 12 | 4 | 158 | 54 | 159 | 19 | 14 | 232 | 58 | 799 | 857 |
| 05:15 PM | 78 | 65 | 18 | 12 | 161 | 7 | 111 | 51 | 22 | 169 | 11 | 116 | 6 | 3 | 133 | 30 | 188 | 16 | 8 | 234 | 45 | 697 | 742 |
| 05:30 PM | 115 | 91 | 15 | 10 | 221 | 8 | 99 | 45 | 22 | 152 | 21 | 106 | 7 | 3 | 134 | 76 | 148 | 14 | 6 | 238 | 41 | 745 | 786 |
| 05:45 PM | 95 | 93 | 19 | 12 | 207 | 9 | 93 | 41 | 17 | 143 | 26 | 121 | 8 | 3 | 155 | 33 | 148 | 7 | 5 | 188 | 37 | 693 | 730 |
| Total | 410 | 338 | 61 | 41 | 809 | 34 | 426 | 193 | 94 | 653 | 81 | 466 | 33 | 13 | 580 | 193 | 643 | 56 | 33 | 892 | 181 | 2934 | 3115 |
| Grand Total | 823 | 703 | 171 | 101 | 1697 | 66 | 821 | 373 | 175 | 1260 | 161 | 930 | 61 | 28 | 1152 | 380 | 1256 | 95 | 54 | 1731 | 358 | 5840 | 6198 |
| Apprch % | 48.5 | 41.4 | 10.1 | | | 5.2 | 65.2 | 29.6 | | | 14 | 80.7 | 5.3 | | | 22 | 72.6 | 5.5 | | | | | |
| Total % | 14.1 | 12 | 2.9 | | 29.1 | 1.1 | 14.1 | 6.4 | | 21.6 | 2.8 | 15.9 | 1 | | 19.7 | 6.5 | 21.5 | 1.6 | | 29.6 | 5.8 | 94.2 | |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 95 | 90 | 19 | 204 | **11** | 72 | 38 | 121 | 12 | 130 | 9 | 151 | 46 | **183** | 10 | **239** | 715 |
| 04:30 PM | 95 | **98** | **43** | 236 | 8 | 108 | 54 | 170 | 21 | **131** | 6 | **158** | 50 | 131 | 8 | 189 | 753 |
| 04:45 PM | 121 | 93 | 37 | **251** | 8 | **128** | 42 | 178 | **27** | 83 | 4 | 114 | 36 | 144 | 8 | 188 | 731 |
| 05:00 PM | **122** | 89 | 9 | 220 | 10 | 123 | **56** | **189** | 23 | 123 | **12** | 158 | **54** | 159 | **19** | 232 | **799** |
| Total Volume | 433 | 370 | 108 | 911 | 37 | 431 | 190 | 658 | 83 | 467 | 31 | 581 | 186 | 617 | 45 | 848 | 2998 |
| % App. Total | 47.5 | 40.6 | 11.9 | | 5.6 | 65.5 | 28.9 | | 14.3 | 80.4 | 5.3 | | 21.9 | 72.8 | 5.3 | | |
| PHF | .887 | .944 | .628 | .907 | .841 | .842 | .848 | .870 | .769 | .891 | .646 | .919 | .861 | .843 | .592 | .887 | .938 |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

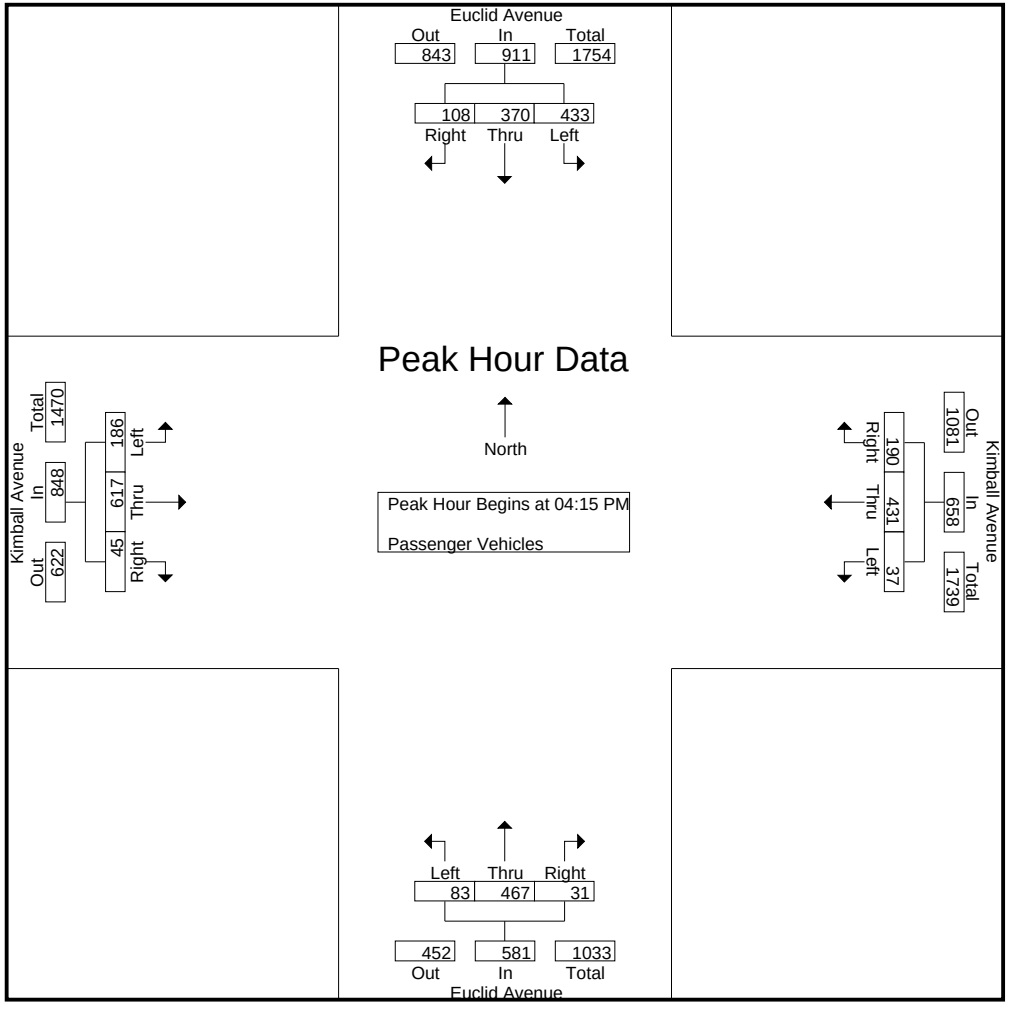

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 95 | 90 | 19 | 204 | **11** | 72 | 38 | 121 | 12 | 130 | 9 | 151 | 46 | **183** | 10 | **239** | |
| +15 mins. | 95 | **98** | **43** | 236 | 8 | 108 | 54 | 170 | 21 | **131** | 6 | **158** | 50 | 131 | 8 | 189 | |
| +30 mins. | 121 | 93 | 37 | **251** | 8 | **128** | 42 | 178 | **27** | 83 | 4 | 114 | 36 | 144 | 8 | 188 | |
| +45 mins. | **122** | 89 | 9 | 220 | 10 | 123 | **56** | **189** | 23 | 123 | **12** | 158 | **54** | 159 | **19** | 232 | |
| Total Volume | 433 | 370 | 108 | 911 | 37 | 431 | 190 | 658 | 83 | 467 | 31 | 581 | 186 | 617 | 45 | 848 | |
| % App. Total | 47.5 | 40.6 | 11.9 | | 5.6 | 65.5 | 28.9 | | 14.3 | 80.4 | 5.3 | | 21.9 | 72.8 | 5.3 | | |
| PHF | .887 | .944 | .628 | .907 | .841 | .842 | .848 | .870 | .769 | .891 | .646 | .919 | .861 | .843 | .592 | .887 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 6 | 1 | 1 | 7 | 0 | 3 | 4 | 1 | 7 | 0 | 5 | 1 | 0 | 6 | 0 | 3 | 0 | 0 | 3 | 2 | 23 | 25 |
| 04:15 PM | 1 | 4 | 1 | 1 | 6 | 0 | 0 | 1 | 0 | 1 | 2 | 3 | 1 | 1 | 6 | 3 | 2 | 2 | 0 | 7 | 2 | 20 | 22 |
| 04:30 PM | 0 | 2 | 1 | 1 | 3 | 0 | 0 | 2 | 1 | 2 | 3 | 1 | 1 | 0 | 5 | 0 | 1 | 1 | 1 | 2 | 3 | 12 | 15 |
| 04:45 PM | 1 | 2 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 1 | 0 | 1 | 0 | 2 | 0 | 13 | 13 |
| Total | 2 | 14 | 4 | 3 | 20 | 0 | 3 | 7 | 2 | 10 | 5 | 16 | 3 | 1 | 24 | 4 | 6 | 4 | 1 | 14 | 7 | 68 | 75 |
| 05:00 PM | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 2 | 2 | 8 | 1 | 4 | 0 | 0 | 5 | 2 | 16 | 18 |
| 05:15 PM | 0 | 2 | 1 | 0 | 3 | 0 | 1 | 2 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 1 | 0 | 5 | 0 | 12 | 12 |
| 05:30 PM | 2 | 0 | 1 | 1 | 3 | 0 | 4 | 1 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 3 | 1 | 12 | 13 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 3 |
| Total | 4 | 3 | 2 | 1 | 9 | 0 | 5 | 3 | 0 | 8 | 1 | 9 | 2 | 2 | 12 | 2 | 11 | 1 | 0 | 14 | 3 | 43 | 46 |
| Grand Total | 6 | 17 | 6 | 4 | 29 | 0 | 8 | 10 | 2 | 18 | 6 | 25 | 5 | 3 | 36 | 6 | 17 | 5 | 1 | 28 | 10 | 111 | 121 |
| Apprch % | 20.7 | 58.6 | 20.7 | | | 0 | 44.4 | 55.6 | | | 16.7 | 69.4 | 13.9 | | | 21.4 | 60.7 | 17.9 | | | | | |
| Total % | 5.4 | 15.3 | 5.4 | | 26.1 | 0 | 7.2 | 9 | | 16.2 | 5.4 | 22.5 | 4.5 | | 32.4 | 5.4 | 15.3 | 4.5 | | 25.2 | 8.3 | 91.7 | |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 1 | **4** | **1** | **6** | 0 | 0 | 1 | 1 | 2 | 3 | 1 | 6 | **3** | 2 | **2** | **7** | **20** |
| 04:30 PM | 0 | 2 | 1 | 3 | 0 | 0 | **2** | **2** | **3** | 1 | 1 | 5 | 0 | 1 | 1 | 2 | 12 |
| 04:45 PM | 1 | 2 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | **7** | 0 | 7 | 1 | 0 | 1 | 2 | 13 |
| 05:00 PM | **2** | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | **2** | **8** | 1 | **4** | 0 | 5 | 16 |
| Total Volume | 4 | 9 | 3 | 16 | 0 | 0 | 3 | 3 | 5 | 17 | 4 | 26 | 5 | 7 | 4 | 16 | 61 |
| % App. Total | 25 | 56.2 | 18.8 | | 0 | 0 | 100 | | 19.2 | 65.4 | 15.4 | | 31.2 | 43.8 | 25 | | |
| PHF | .500 | .563 | .750 | .667 | .000 | .000 | .375 | .375 | .417 | .607 | .500 | .813 | .417 | .438 | .500 | .571 | .763 |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

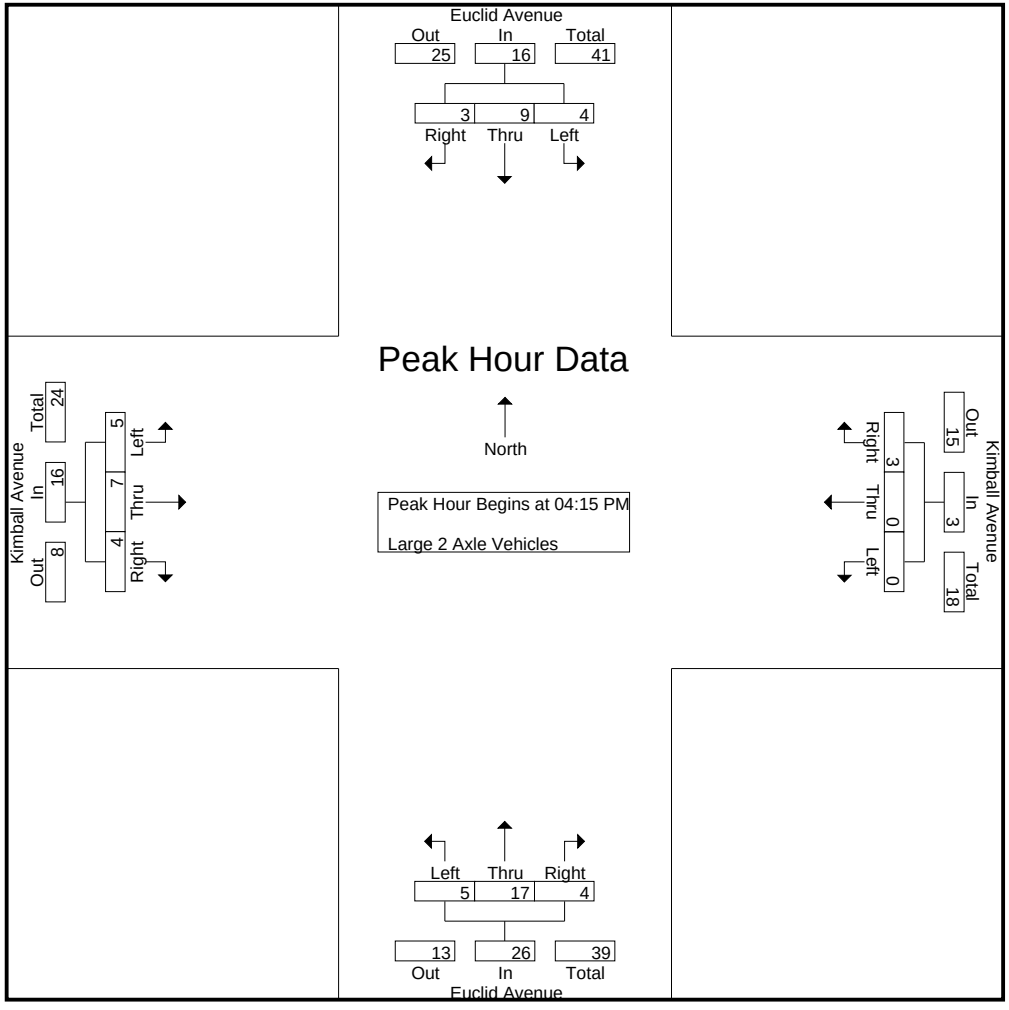

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 1 | **4** | **1** | **6** | 0 | 0 | 1 | 1 | 2 | 3 | 1 | 6 | **3** | 2 | **2** | **7** | |
| +15 mins. | 0 | 2 | 1 | 3 | 0 | 0 | **2** | **2** | **3** | 1 | 1 | 5 | 0 | 1 | 1 | 2 | |
| +30 mins. | 1 | 2 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | **7** | 0 | 7 | 1 | 0 | 1 | 2 | |
| +45 mins. | **2** | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 6 | **2** | **8** | 1 | **4** | 0 | 5 | |
| Total Volume | 4 | 9 | 3 | 16 | 0 | 0 | 3 | 3 | 5 | 17 | 4 | 26 | 5 | 7 | 4 | 16 | |
| % App. Total | 25 | 56.2 | 18.8 | | 0 | 0 | 100 | | 19.2 | 65.4 | 15.4 | | 31.2 | 43.8 | 25 | | |
| PHF | .500 | .563 | .750 | .667 | .000 | .000 | .375 | .375 | .417 | .607 | .500 | .813 | .417 | .438 | .500 | .571 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 3 | 4 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 2 | 0 | 13 | 13 |
| 04:15 PM | 1 | 1 | 3 | 1 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 3 | 1 | 11 | 12 |
| 04:30 PM | 0 | 2 | 3 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 4 | 1 | 10 | 11 |
| 04:45 PM | 0 | 3 | 7 | 2 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 5 | 2 | 0 | 0 | 0 | 2 | 2 | 17 | 19 |
| Total | 1 | 9 | 17 | 4 | 27 | 1 | 0 | 0 | 0 | 1 | 1 | 11 | 0 | 0 | 12 | 11 | 0 | 0 | 0 | 11 | 4 | 51 | 55 |
| 05:00 PM | 0 | 3 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 4 | 0 | 1 | 0 | 5 | 0 | 14 | 14 |
| 05:15 PM | 1 | 1 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 6 | 3 | 0 | 0 | 0 | 3 | 2 | 14 | 16 |
| 05:30 PM | 0 | 1 | 2 | 2 | 3 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 3 | 3 | 7 | 10 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 3 |
| Total | 1 | 5 | 8 | 4 | 14 | 0 | 0 | 1 | 1 | 1 | 0 | 9 | 0 | 0 | 9 | 9 | 2 | 2 | 1 | 13 | 6 | 37 | 43 |
| Grand Total | 2 | 14 | 25 | 8 | 41 | 1 | 0 | 1 | 1 | 2 | 1 | 20 | 0 | 0 | 21 | 20 | 2 | 2 | 1 | 24 | 10 | 88 | 98 |
| Apprch % | 4.9 | 34.1 | 61 | | | 50 | 0 | 50 | | | 4.8 | 95.2 | 0 | | | 83.3 | 8.3 | 8.3 | | | | | |
| Total % | 2.3 | 15.9 | 28.4 | | 46.6 | 1.1 | 0 | 1.1 | | 2.3 | 1.1 | 22.7 | 0 | | 23.9 | 22.7 | 2.3 | 2.3 | | 27.3 | 10.2 | 89.8 | |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | **1** | 1 | 3 | 5 | **1** | 0 | 0 | **1** | 0 | 2 | 0 | 2 | 3 | 0 | 0 | 3 | 11 |
| 04:30 PM | 0 | 2 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **4** | 0 | 0 | 4 | 10 |
| 04:45 PM | 0 | **3** | **7** | **10** | 0 | 0 | 0 | 0 | 0 | **5** | 0 | **5** | 2 | 0 | 0 | 2 | **17** |
| 05:00 PM | 0 | 3 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 4 | 0 | **1** | **5** | 14 |
| Total Volume | 1 | 9 | 16 | 26 | 1 | 0 | 0 | 1 | 0 | 11 | 0 | 11 | 13 | 0 | 1 | 14 | 52 |
| % App. Total | 3.8 | 34.6 | 61.5 | | 100 | 0 | 0 | | 0 | 100 | 0 | | 92.9 | 0 | 7.1 | | |
| PHF | .250 | .750 | .571 | .650 | .250 | .000 | .000 | .250 | .000 | .550 | .000 | .550 | .813 | .000 | .250 | .700 | .765 |

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E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

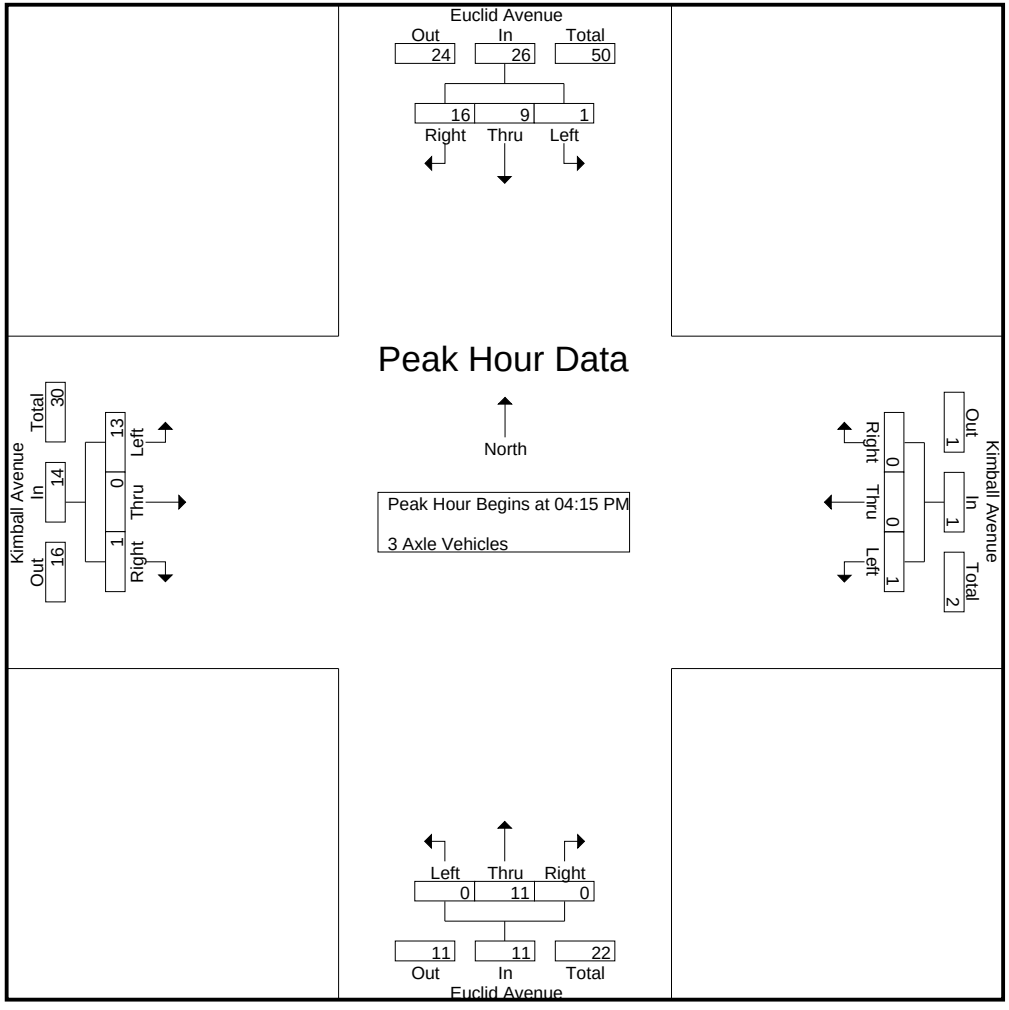

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | **1** | 1 | 3 | 5 | **1** | 0 | 0 | **1** | 0 | 2 | 0 | 2 | 3 | 0 | 0 | 3 | |
| +15 mins. | 0 | 2 | 3 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **4** | 0 | 0 | 4 | |
| +30 mins. | 0 | **3** | **7** | **10** | 0 | 0 | 0 | 0 | 0 | **5** | 0 | **5** | 2 | 0 | 0 | 2 | |
| +45 mins. | 0 | 3 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 4 | 0 | **1** | **5** | |
| Total Volume | 1 | 9 | 16 | 26 | 1 | 0 | 0 | 1 | 0 | 11 | 0 | 11 | 13 | 0 | 1 | 14 | |
| % App. Total | 3.8 | 34.6 | 61.5 | | 100 | 0 | 0 | | 0 | 100 | 0 | | 92.9 | 0 | 7.1 | | |
| PHF | .250 | .750 | .571 | .650 | .250 | .000 | .000 | .250 | .000 | .550 | .000 | .550 | .813 | .000 | .250 | .700 | |

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City of Chino
N/S: Euclid Avenue
E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Kimball Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Kimball Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 3 | 8 | 2 | 11 | 0 | 0 | 1 | 1 | 1 | 1 | 14 | 0 | 0 | 15 | 4 | 0 | 2 | 0 | 6 | 3 | 33 | 36 |
| 04:15 PM | 0 | 3 | 8 | 2 | 11 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 1 | 0 | 10 | 17 | 0 | 2 | 0 | 19 | 2 | 40 | 42 |
| 04:30 PM | 1 | 5 | 8 | 3 | 14 | 0 | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 0 | 9 | 7 | 1 | 2 | 1 | 10 | 4 | 33 | 37 |
| 04:45 PM | 0 | 2 | 4 | 3 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 8 | 8 | 0 | 3 | 0 | 11 | 3 | 25 | 28 |
| Total | 1 | 13 | 28 | 10 | 42 | 0 | 0 | 1 | 1 | 1 | 5 | 36 | 1 | 0 | 42 | 36 | 1 | 9 | 1 | 46 | 12 | 131 | 143 |
| 05:00 PM | 0 | 4 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 6 | 0 | 0 | 0 | 6 | 0 | 17 | 17 |
| 05:15 PM | 0 | 2 | 9 | 4 | 11 | 0 | 1 | 0 | 0 | 1 | 3 | 9 | 0 | 0 | 12 | 10 | 2 | 2 | 1 | 14 | 5 | 38 | 43 |
| 05:30 PM | 0 | 4 | 8 | 5 | 12 | 0 | 0 | 1 | 0 | 1 | 2 | 3 | 0 | 0 | 5 | 7 | 1 | 2 | 1 | 10 | 6 | 28 | 34 |
| 05:45 PM | 0 | 3 | 8 | 6 | 11 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 8 | 10 | 0 | 1 | 1 | 11 | 7 | 30 | 37 |
| Total | 0 | 13 | 28 | 15 | 41 | 0 | 1 | 1 | 0 | 2 | 8 | 21 | 0 | 0 | 29 | 33 | 3 | 5 | 3 | 41 | 18 | 113 | 131 |
| Grand Total | 1 | 26 | 56 | 25 | 83 | 0 | 1 | 2 | 1 | 3 | 13 | 57 | 1 | 0 | 71 | 69 | 4 | 14 | 4 | 87 | 30 | 244 | 274 |
| Apprch % | 1.2 | 31.3 | 67.5 | | | 0 | 33.3 | 66.7 | | | 18.3 | 80.3 | 1.4 | | | 79.3 | 4.6 | 16.1 | | | | | |
| Total % | 0.4 | 10.7 | 23 | | 34 | 0 | 0.4 | 0.8 | | 1.2 | 5.3 | 23.4 | 0.4 | | 29.1 | 28.3 | 1.6 | 5.7 | | 35.7 | 10.9 | 89.1 | |

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 0 | 3 | **8** | 11 | 0 | 0 | 0 | 0 | 1 | **8** | **1** | **10** | **17** | 0 | 2 | **19** | **40** |
| 04:30 PM | **1** | **5** | 8 | **14** | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 9 | 7 | **1** | 2 | 10 | 33 |
| 04:45 PM | 0 | 2 | 4 | 6 | 0 | 0 | 0 | 0 | **2** | 6 | 0 | 8 | 8 | 0 | **3** | 11 | 25 |
| 05:00 PM | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 6 | 0 | 0 | 6 | 17 |
| Total Volume | 1 | 14 | 23 | 38 | 0 | 0 | 0 | 0 | 4 | 26 | 1 | 31 | 38 | 1 | 7 | 46 | 115 |
| % App. Total | 2.6 | 36.8 | 60.5 | | 0 | 0 | 0 | | 12.9 | 83.9 | 3.2 | | 82.6 | 2.2 | 15.2 | | |
| PHF | .250 | .700 | .719 | .679 | .000 | .000 | .000 | .000 | .500 | .813 | .250 | .775 | .559 | .250 | .583 | .605 | .719 |

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File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
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Page No : 2

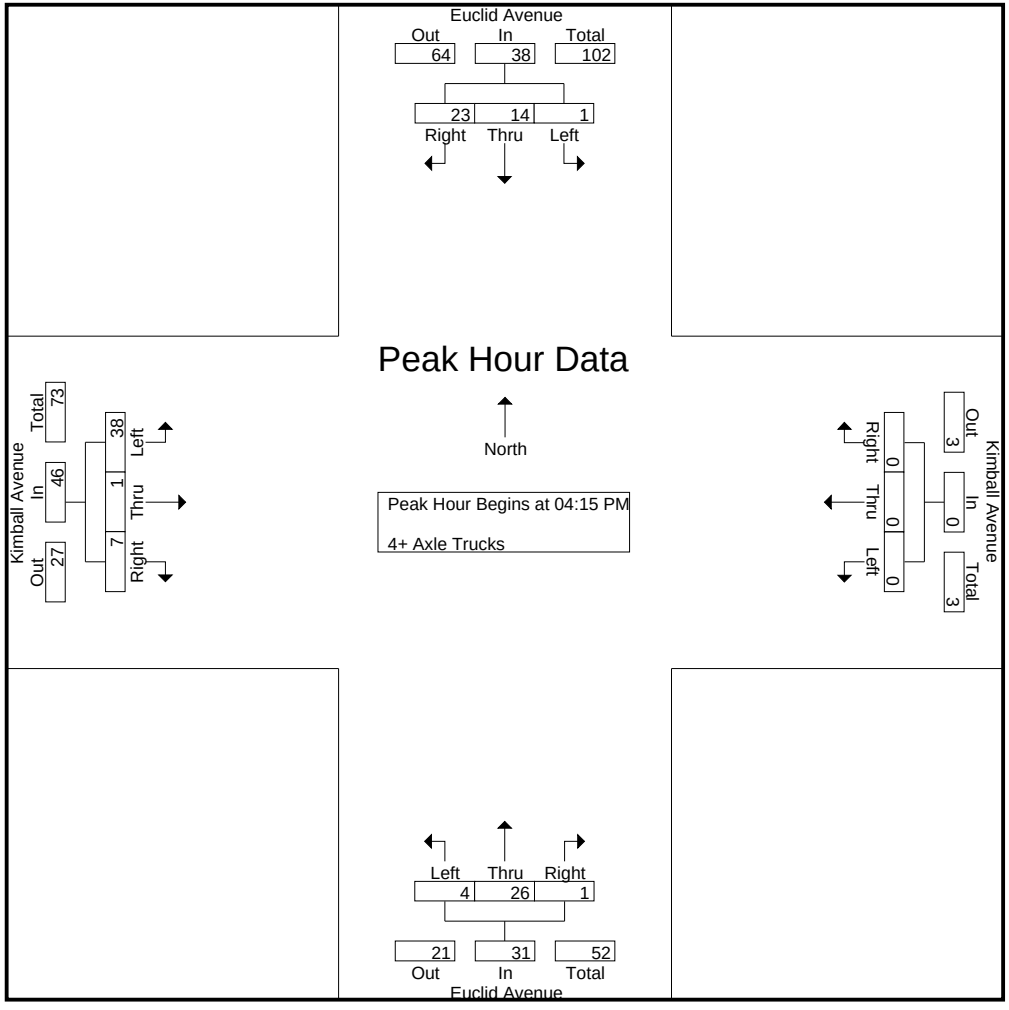

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E/W: Kimball Avenue
Weather: Clear

File Name : 10_CHN_Euc_Kim PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Kimball Avenue Westbound | | | | Euclid Avenue Northbound | | | | Kimball Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 0 | 3 | **8** | 11 | 0 | 0 | 0 | 0 | 1 | **8** | **1** | **10** | **17** | 0 | 2 | **19** | |
| +15 mins. | **1** | **5** | 8 | **14** | 0 | 0 | 0 | 0 | 1 | 8 | 0 | 9 | 7 | **1** | 2 | 10 | |
| +30 mins. | 0 | 2 | 4 | 6 | 0 | 0 | 0 | 0 | **2** | 6 | 0 | 8 | 8 | 0 | **3** | 11 | |
| +45 mins. | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 6 | 0 | 0 | 6 | |
| Total Volume | 1 | 14 | 23 | 38 | 0 | 0 | 0 | 0 | 4 | 26 | 1 | 31 | 38 | 1 | 7 | 46 | |
| % App. Total | 2.6 | 36.8 | 60.5 | | 0 | 0 | 0 | | 12.9 | 83.9 | 3.2 | | 82.6 | 2.2 | 15.2 | | |
| PHF | .250 | .700 | .719 | .679 | .000 | .000 | .000 | .000 | .500 | .813 | .250 | .775 | .559 | .250 | .583 | .605 | |

Location: Chino
N/S: Euclid Avenue
E/W: Kimball Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg Kimball Avenue | South Leg Euclid Avenue | West Leg Kimball Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg Euclid Avenue | East Leg Kimball Avenue | South Leg Euclid Avenue | West Leg Kimball Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 1 | 0 | 0 | 1 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 1 |



Counts Unlimited, Inc.
PO Box 1178
Corona, Ca 92878
951-268-6268

Location: Chino
N/S: Euclid Avenue
E/W: Kimball Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound Kimball Avenue | | | Northbound Euclid Avenue | | | Eastbound Kimball Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 |

| | Southbound Euclid Avenue | | | Westbound Kimball Avenue | | | Northbound Euclid Avenue | | | Eastbound Kimball Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 20 | 105 | 6 | 3 | 131 | 219 | 115 | 9 | 3 | 343 | 6 | 61 | 96 | 17 | 163 | 1 | 25 | 0 | 0 | 26 | 23 | 663 | 686 |
| 07:15 AM | 7 | 162 | 6 | 0 | 175 | 241 | 86 | 6 | 0 | 333 | 2 | 92 | 146 | 23 | 240 | 1 | 21 | 6 | 0 | 28 | 23 | 776 | 799 |
| 07:30 AM | 8 | 111 | 3 | 3 | 122 | 232 | 118 | 13 | 1 | 363 | 15 | 102 | 168 | 17 | 285 | 0 | 24 | 3 | 0 | 27 | 21 | 797 | 818 |
| 07:45 AM | 14 | 114 | 6 | 2 | 134 | 181 | 110 | 6 | 0 | 297 | 8 | 120 | 153 | 22 | 281 | 1 | 36 | 4 | 0 | 41 | 24 | 753 | 777 |
| Total | 49 | 492 | 21 | 8 | 562 | 873 | 429 | 34 | 4 | 1336 | 31 | 375 | 563 | 79 | 969 | 3 | 106 | 13 | 0 | 122 | 91 | 2989 | 3080 |
| 08:00 AM | 14 | 138 | 6 | 1 | 158 | 266 | 75 | 5 | 1 | 346 | 6 | 96 | 122 | 24 | 224 | 3 | 29 | 6 | 0 | 38 | 26 | 766 | 792 |
| 08:15 AM | 16 | 135 | 7 | 0 | 158 | 279 | 75 | 5 | 1 | 359 | 12 | 111 | 134 | 11 | 257 | 1 | 30 | 3 | 0 | 34 | 12 | 808 | 820 |
| 08:30 AM | 13 | 93 | 2 | 1 | 108 | 180 | 89 | 13 | 2 | 282 | 9 | 103 | 130 | 18 | 242 | 3 | 29 | 3 | 0 | 35 | 21 | 667 | 688 |
| 08:45 AM | 12 | 74 | 1 | 0 | 87 | 174 | 60 | 17 | 2 | 251 | 39 | 118 | 123 | 20 | 280 | 5 | 34 | 5 | 0 | 44 | 22 | 662 | 684 |
| Total | 55 | 440 | 16 | 2 | 511 | 899 | 299 | 40 | 6 | 1238 | 66 | 428 | 509 | 73 | 1003 | 12 | 122 | 17 | 0 | 151 | 81 | 2903 | 2984 |
| Grand Total | 104 | 932 | 37 | 10 | 1073 | 1772 | 728 | 74 | 10 | 2574 | 97 | 803 | 1072 | 152 | 1972 | 15 | 228 | 30 | 0 | 273 | 172 | 5892 | 6064 |
| Apprch % | 9.7 | 86.9 | 3.4 | | | 68.8 | 28.3 | 2.9 | | | 4.9 | 40.7 | 54.4 | | | 5.5 | 83.5 | 11 | | | | | |
| Total % | 1.8 | 15.8 | 0.6 | | 18.2 | 30.1 | 12.4 | 1.3 | | 43.7 | 1.6 | 13.6 | 18.2 | | 33.5 | 0.3 | 3.9 | 0.5 | | 4.6 | 2.8 | 97.2 | |
| Passenger Vehicles | 86 | 827 | 28 | | 950 | 1704 | 711 | 58 | | 2481 | 85 | 710 | 1008 | | 1952 | 6 | 213 | 18 | | 237 | 0 | 0 | 5620 |
| % Passenger Vehicles | 82.7 | 88.7 | 75.7 | 90 | 87.7 | 96.2 | 97.7 | 78.4 | 80 | 96 | 87.6 | 88.4 | 94 | 98 | 91.9 | 40 | 93.4 | 60 | 0 | 86.8 | 0 | 0 | 92.7 |
| Large 2 Axle Vehicles | 10 | 38 | 1 | | 49 | 23 | 9 | 6 | | 39 | 4 | 21 | 33 | | 60 | 1 | 6 | 1 | | 8 | 0 | 0 | 156 |
| % Large 2 Axle Vehicles | 9.6 | 4.1 | 2.7 | 0 | 4.5 | 1.3 | 1.2 | 8.1 | 10 | 1.5 | 4.1 | 2.6 | 3.1 | 1.3 | 2.8 | 6.7 | 2.6 | 3.3 | 0 | 2.9 | 0 | 0 | 2.6 |
| 3 Axle Vehicles | 3 | 27 | 0 | | 30 | 10 | 1 | 7 | | 18 | 1 | 28 | 7 | | 37 | 0 | 2 | 0 | | 2 | 0 | 0 | 87 |
| % 3 Axle Vehicles | 2.9 | 2.9 | 0 | 0 | 2.8 | 0.6 | 0.1 | 9.5 | 0 | 0.7 | 1 | 3.5 | 0.7 | 0.7 | 1.7 | 0 | 0.9 | 0 | 0 | 0.7 | 0 | 0 | 1.4 |
| 4+ Axle Trucks | 5 | 40 | 8 | | 54 | 35 | 7 | 3 | | 46 | 7 | 44 | 24 | | 75 | 8 | 7 | 11 | | 26 | 0 | 0 | 201 |
| % 4+ Axle Trucks | 4.8 | 4.3 | 21.6 | 10 | 5 | 2 | 1 | 4.1 | 10 | 1.8 | 7.2 | 5.5 | 2.2 | 0 | 3.5 | 53.3 | 3.1 | 36.7 | 0 | 9.5 | 0 | 0 | 3.3 |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 8 | 111 | 3 | 122 | 232 | **118** | **13** | **363** | **15** | 102 | **168** | **285** | 0 | 24 | 3 | 27 | 797 |
| 07:45 AM | 14 | 114 | 6 | 134 | 181 | 110 | 6 | 297 | 8 | **120** | 153 | 281 | 1 | **36** | 4 | **41** | 753 |
| 08:00 AM | 14 | **138** | 6 | **158** | 266 | 75 | 5 | 346 | 6 | 96 | 122 | 224 | **3** | 29 | **6** | 38 | 766 |
| 08:15 AM | **16** | 135 | **7** | 158 | **279** | 75 | 5 | 359 | 12 | 111 | 134 | 257 | 1 | 30 | 3 | 34 | **808** |
| Total Volume | 52 | 498 | 22 | 572 | 958 | 378 | 29 | 1365 | 41 | 429 | 577 | 1047 | 5 | 119 | 16 | 140 | 3124 |
| % App. Total | 9.1 | 87.1 | 3.8 | | 70.2 | 27.7 | 2.1 | | 3.9 | 41 | 55.1 | | 3.6 | 85 | 11.4 | | |
| PHF | .813 | .902 | .786 | .905 | .858 | .801 | .558 | .940 | .683 | .894 | .859 | .918 | .417 | .826 | .667 | .854 | .967 |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

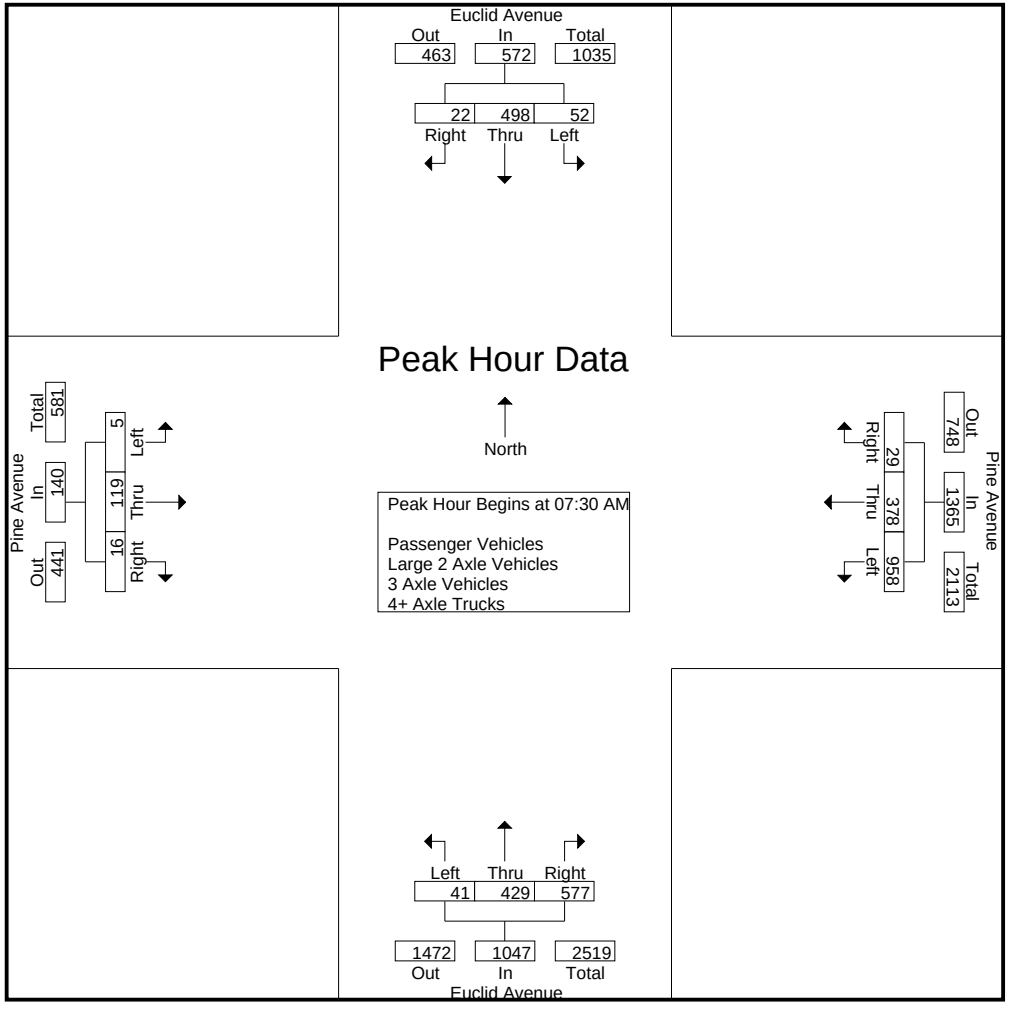

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 08:00 AM | | | | |
| +0 mins. | 7 | **162** | **6** | **175** | 232 | **118** | **13** | **363** | **15** | 102 | **168** | **285** | 3 | 29 | **6** | 38 | |
| +15 mins. | 8 | 111 | 3 | 122 | 181 | 110 | 6 | 297 | 8 | **120** | 153 | 281 | 1 | 30 | 3 | 34 | |
| +30 mins. | **14** | 114 | 6 | 134 | 266 | 75 | 5 | 346 | 6 | 96 | 122 | 224 | 3 | 29 | 3 | 35 | |
| +45 mins. | 14 | 138 | 6 | 158 | **279** | 75 | 5 | 359 | 12 | 111 | 134 | 257 | **5** | **34** | 5 | **44** | |
| Total Volume | 43 | 525 | 21 | 589 | 958 | 378 | 29 | 1365 | 41 | 429 | 577 | 1047 | 12 | 122 | 17 | 151 | |
| % App. Total | 7.3 | 89.1 | 3.6 | | 70.2 | 27.7 | 2.1 | | 3.9 | 41 | 55.1 | | 7.9 | 80.8 | 11.3 | | |
| PHF | .768 | .810 | .875 | .841 | .858 | .801 | .558 | .940 | .683 | .894 | .859 | .918 | .600 | .897 | .708 | .858 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 18 | 103 | 6 | 3 | 127 | 212 | 112 | 8 | 3 | 332 | 5 | 55 | 85 | 16 | 145 | 1 | 25 | 0 | 0 | 26 | 22 | 630 | 652 |
| 07:15 AM | 5 | 152 | 4 | 0 | 161 | 231 | 83 | 5 | 0 | 319 | 2 | 84 | 134 | 22 | 220 | 0 | 19 | 3 | 0 | 22 | 22 | 722 | 744 |
| 07:30 AM | 6 | 101 | 3 | 3 | 110 | 215 | 117 | 8 | 0 | 340 | 13 | 92 | 159 | 17 | 264 | 0 | 22 | 2 | 0 | 24 | 20 | 738 | 758 |
| 07:45 AM | 13 | 98 | 4 | 2 | 115 | 170 | 109 | 5 | 0 | 284 | 6 | 104 | 145 | 21 | 255 | 0 | 33 | 3 | 0 | 36 | 23 | 690 | 713 |
| Total | 42 | 454 | 17 | 8 | 513 | 828 | 421 | 26 | 3 | 1275 | 26 | 335 | 523 | 76 | 884 | 1 | 99 | 8 | 0 | 108 | 87 | 2780 | 2867 |
| 08:00 AM | 12 | 124 | 4 | 1 | 140 | 261 | 73 | 3 | 1 | 337 | 6 | 82 | 116 | 24 | 204 | 2 | 28 | 5 | 0 | 35 | 26 | 716 | 742 |
| 08:15 AM | 14 | 105 | 5 | 0 | 124 | 274 | 72 | 4 | 1 | 350 | 9 | 99 | 128 | 11 | 236 | 1 | 28 | 2 | 0 | 31 | 12 | 741 | 753 |
| 08:30 AM | 7 | 80 | 1 | 0 | 88 | 176 | 87 | 10 | 1 | 273 | 9 | 92 | 123 | 18 | 224 | 0 | 26 | 2 | 0 | 28 | 19 | 613 | 632 |
| 08:45 AM | 11 | 64 | 1 | 0 | 76 | 165 | 58 | 15 | 2 | 238 | 35 | 102 | 118 | 20 | 255 | 2 | 32 | 1 | 0 | 35 | 22 | 604 | 626 |
| Total | 44 | 373 | 11 | 1 | 428 | 876 | 290 | 32 | 5 | 1198 | 59 | 375 | 485 | 73 | 919 | 5 | 114 | 10 | 0 | 129 | 79 | 2674 | 2753 |
| Grand Total | 86 | 827 | 28 | 9 | 941 | 1704 | 711 | 58 | 8 | 2473 | 85 | 710 | 1008 | 149 | 1803 | 6 | 213 | 18 | 0 | 237 | 166 | 5454 | 5620 |
| Apprch % | 9.1 | 87.9 | 3 | | | 68.9 | 28.8 | 2.3 | | | 4.7 | 39.4 | 55.9 | | | 2.5 | 89.9 | 7.6 | | | | | |
| Total % | 1.6 | 15.2 | 0.5 | | 17.3 | 31.2 | 13 | 1.1 | | 45.3 | 1.6 | 13 | 18.5 | | 33.1 | 0.1 | 3.9 | 0.3 | | 4.3 | 3 | 97 | |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 6 | 101 | 3 | 110 | 215 | **117** | **8** | 340 | **13** | 92 | **159** | **264** | 0 | 22 | 2 | 24 | 738 |
| 07:45 AM | 13 | 98 | 4 | 115 | 170 | 109 | 5 | 284 | 6 | **104** | 145 | 255 | 0 | **33** | 3 | **36** | 690 |
| 08:00 AM | 12 | **124** | 4 | **140** | 261 | 73 | 3 | 337 | 6 | 82 | 116 | 204 | **2** | 28 | **5** | 35 | 716 |
| 08:15 AM | **14** | 105 | **5** | 124 | **274** | 72 | 4 | **350** | 9 | 99 | 128 | 236 | 1 | 28 | 2 | 31 | **741** |
| Total Volume | 45 | 428 | 16 | 489 | 920 | 371 | 20 | 1311 | 34 | 377 | 548 | 959 | 3 | 111 | 12 | 126 | 2885 |
| % App. Total | 9.2 | 87.5 | 3.3 | | 70.2 | 28.3 | 1.5 | | 3.5 | 39.3 | 57.1 | | 2.4 | 88.1 | 9.5 | | |
| PHF | .804 | .863 | .800 | .873 | .839 | .793 | .625 | .936 | .654 | .906 | .862 | .908 | .375 | .841 | .600 | .875 | .973 |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

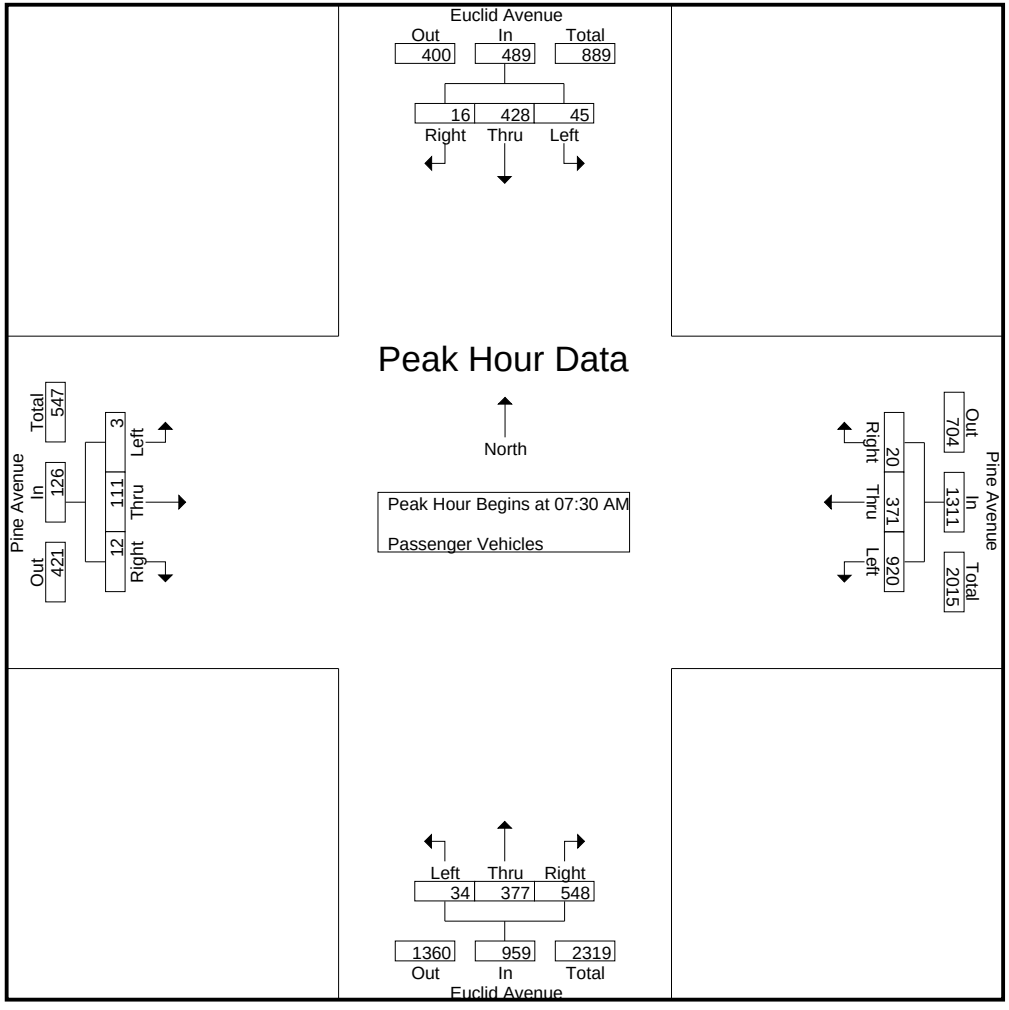

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 6 | 101 | 3 | 110 | 215 | **117** | **8** | 340 | **13** | 92 | **159** | **264** | 0 | 22 | 2 | 24 | |
| +15 mins. | 13 | 98 | 4 | 115 | 170 | 109 | 5 | 284 | 6 | **104** | 145 | 255 | 0 | **33** | 3 | **36** | |
| +30 mins. | 12 | **124** | 4 | **140** | 261 | 73 | 3 | 337 | 6 | 82 | 116 | 204 | **2** | 28 | **5** | 35 | |
| +45 mins. | **14** | 105 | **5** | 124 | **274** | 72 | 4 | **350** | 9 | 99 | 128 | 236 | 1 | 28 | 2 | 31 | |
| Total Volume | 45 | 428 | 16 | 489 | 920 | 371 | 20 | 1311 | 34 | 377 | 548 | 959 | 3 | 111 | 12 | 126 | |
| % App. Total | 9.2 | 87.5 | 3.3 | | 70.2 | 28.3 | 1.5 | | 3.5 | 39.3 | 57.1 | | 2.4 | 88.1 | 9.5 | | |
| PHF | .804 | .863 | .800 | .873 | .839 | .793 | .625 | .936 | .654 | .906 | .862 | .908 | .375 | .841 | .600 | .875 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 1 | 0 | 0 | 2 | 3 | 2 | 1 | 0 | 6 | 0 | 1 | 8 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 18 |
| 07:15 AM | 1 | 6 | 1 | 0 | 8 | 5 | 2 | 0 | 0 | 7 | 0 | 1 | 9 | 1 | 10 | 0 | 1 | 0 | 0 | 1 | 1 | 26 | 27 |
| 07:30 AM | 2 | 5 | 0 | 0 | 7 | 5 | 0 | 1 | 1 | 6 | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 18 | 19 |
| 07:45 AM | 1 | 5 | 0 | 0 | 6 | 1 | 1 | 0 | 0 | 2 | 1 | 3 | 3 | 0 | 7 | 0 | 2 | 0 | 0 | 2 | 0 | 17 | 17 |
| Total | 5 | 17 | 1 | 0 | 23 | 14 | 5 | 2 | 1 | 21 | 1 | 8 | 22 | 2 | 31 | 0 | 3 | 0 | 0 | 3 | 3 | 78 | 81 |
| 08:00 AM | 2 | 5 | 0 | 0 | 7 | 3 | 2 | 2 | 0 | 7 | 0 | 4 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 21 |
| 08:15 AM | 1 | 8 | 0 | 0 | 9 | 2 | 0 | 1 | 0 | 3 | 1 | 5 | 3 | 0 | 9 | 0 | 1 | 0 | 0 | 1 | 0 | 22 | 22 |
| 08:30 AM | 2 | 5 | 0 | 0 | 7 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 2 | 0 | 3 | 1 | 2 | 0 | 0 | 3 | 0 | 15 | 15 |
| 08:45 AM | 0 | 3 | 0 | 0 | 3 | 3 | 2 | 0 | 0 | 5 | 2 | 3 | 3 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 17 | 17 |
| Total | 5 | 21 | 0 | 0 | 26 | 9 | 4 | 4 | 0 | 17 | 3 | 13 | 11 | 0 | 27 | 1 | 3 | 1 | 0 | 5 | 0 | 75 | 75 |
| Grand Total | 10 | 38 | 1 | 0 | 49 | 23 | 9 | 6 | 1 | 38 | 4 | 21 | 33 | 2 | 58 | 1 | 6 | 1 | 0 | 8 | 3 | 153 | 156 |
| Apprch % | 20.4 | 77.6 | 2 | | | 60.5 | 23.7 | 15.8 | | | 6.9 | 36.2 | 56.9 | | | 12.5 | 75 | 12.5 | | | | | |
| Total % | 6.5 | 24.8 | 0.7 | | 32 | 15 | 5.9 | 3.9 | | 24.8 | 2.6 | 13.7 | 21.6 | | 37.9 | 0.7 | 3.9 | 0.7 | | 5.2 | 1.9 | 98.1 | |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **2** | 5 | 0 | 7 | **5** | 0 | 1 | 6 | 0 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | 18 |
| 07:45 AM | 1 | 5 | 0 | 6 | 1 | 1 | 0 | 2 | **1** | 3 | **3** | 7 | 0 | **2** | 0 | **2** | 17 |
| 08:00 AM | 2 | 5 | 0 | 7 | 3 | **2** | **2** | **7** | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | 21 |
| 08:15 AM | 1 | **8** | 0 | **9** | 2 | 0 | 1 | 3 | 1 | **5** | 3 | **9** | 0 | 1 | 0 | 1 | **22** |
| Total Volume | 6 | 23 | 0 | 29 | 11 | 3 | 4 | 18 | 2 | 15 | 11 | 28 | 0 | 3 | 0 | 3 | 78 |
| % App. Total | 20.7 | 79.3 | 0 | | 61.1 | 16.7 | 22.2 | | 7.1 | 53.6 | 39.3 | | 0 | 100 | 0 | | |
| PHF | .750 | .719 | .000 | .806 | .550 | .375 | .500 | .643 | .500 | .750 | .917 | .778 | .000 | .375 | .000 | .375 | .886 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

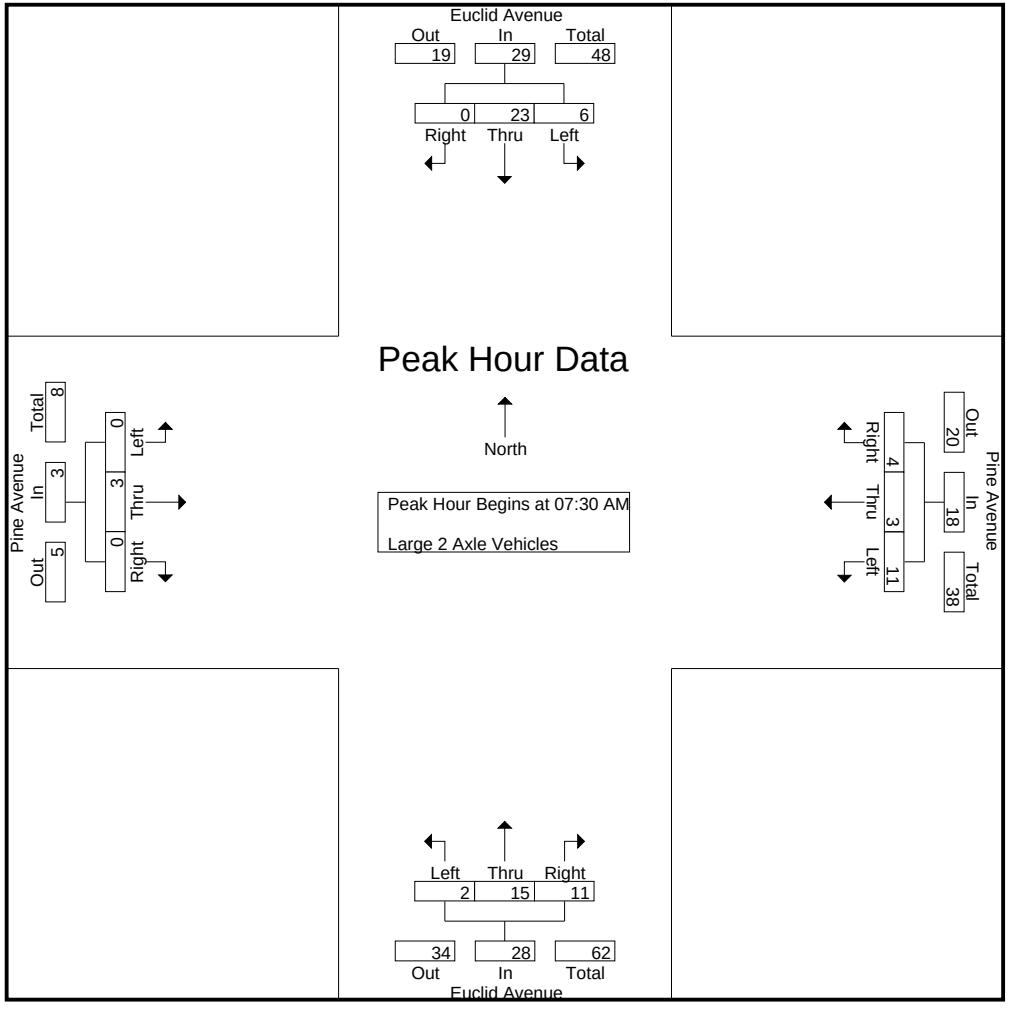

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **2** | 5 | 0 | 7 | **5** | 0 | 1 | 6 | 0 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | |
| +15 mins. | 1 | 5 | 0 | 6 | 1 | 1 | 0 | 2 | **1** | 3 | **3** | 7 | 0 | **2** | 0 | **2** | |
| +30 mins. | 2 | 5 | 0 | 7 | 3 | **2** | **2** | **7** | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | |
| +45 mins. | 1 | **8** | 0 | **9** | 2 | 0 | 1 | 3 | 1 | **5** | 3 | **9** | 0 | 1 | 0 | 1 | |
| Total Volume | 6 | 23 | 0 | 29 | 11 | 3 | 4 | 18 | 2 | 15 | 11 | 28 | 0 | 3 | 0 | 3 | |
| % App. Total | 20.7 | 79.3 | 0 | | 61.1 | 16.7 | 22.2 | | 7.1 | 53.6 | 39.3 | | 0 | 100 | 0 | | |
| PHF | .750 | .719 | .000 | .806 | .550 | .375 | .500 | .643 | .500 | .750 | .917 | .778 | .000 | .375 | .000 | .375 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| 07:15 AM | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 2 | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 |
| 07:30 AM | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| 07:45 AM | 0 | 4 | 0 | 0 | 4 | 2 | 0 | 1 | 0 | 3 | 0 | 7 | 2 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 16 | 17 |
| Total | 1 | 5 | 0 | 0 | 6 | 9 | 0 | 6 | 0 | 15 | 0 | 13 | 4 | 1 | 17 | 0 | 0 | 0 | 0 | 0 | 1 | 38 | 39 |
| 08:00 AM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 1 | 0 | 9 | 9 |
| 08:15 AM | 1 | 11 | 0 | 0 | 12 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 16 | 16 |
| 08:30 AM | 1 | 5 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 5 | 2 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 |
| 08:45 AM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| Total | 2 | 22 | 0 | 0 | 24 | 1 | 1 | 1 | 0 | 3 | 1 | 15 | 3 | 0 | 19 | 0 | 2 | 0 | 0 | 2 | 0 | 48 | 48 |
| Grand Total | 3 | 27 | 0 | 0 | 30 | 10 | 1 | 7 | 0 | 18 | 1 | 28 | 7 | 1 | 36 | 0 | 2 | 0 | 0 | 2 | 1 | 86 | 87 |
| Apprch % | 10 | 90 | 0 | | | 55.6 | 5.6 | 38.9 | | | 2.8 | 77.8 | 19.4 | | | 0 | 100 | 0 | | | | | |
| Total % | 3.5 | 31.4 | 0 | | 34.9 | 11.6 | 1.2 | 8.1 | | 20.9 | 1.2 | 32.6 | 8.1 | | 41.9 | 0 | 2.3 | 0 | | 2.3 | 1.1 | 98.9 | |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 1 | 0 | 1 | **2** | 0 | **4** | **6** | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 10 |
| 07:45 AM | 0 | 4 | 0 | 4 | 2 | 0 | 1 | 3 | 0 | **7** | **2** | **9** | 0 | 0 | 0 | 0 | **16** |
| 08:00 AM | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | **1** | 0 | **1** | 9 |
| 08:15 AM | **1** | **11** | 0 | **12** | 0 | **1** | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 16 |
| Total Volume | 1 | 20 | 0 | 21 | 4 | 1 | 5 | 10 | 0 | 15 | 3 | 18 | 0 | 2 | 0 | 2 | 51 |
| % App. Total | 4.8 | 95.2 | 0 | | 40 | 10 | 50 | | 0 | 83.3 | 16.7 | | 0 | 100 | 0 | | |
| PHF | .250 | .455 | .000 | .438 | .500 | .250 | .313 | .417 | .000 | .536 | .375 | .500 | .000 | .500 | .000 | .500 | .797 |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

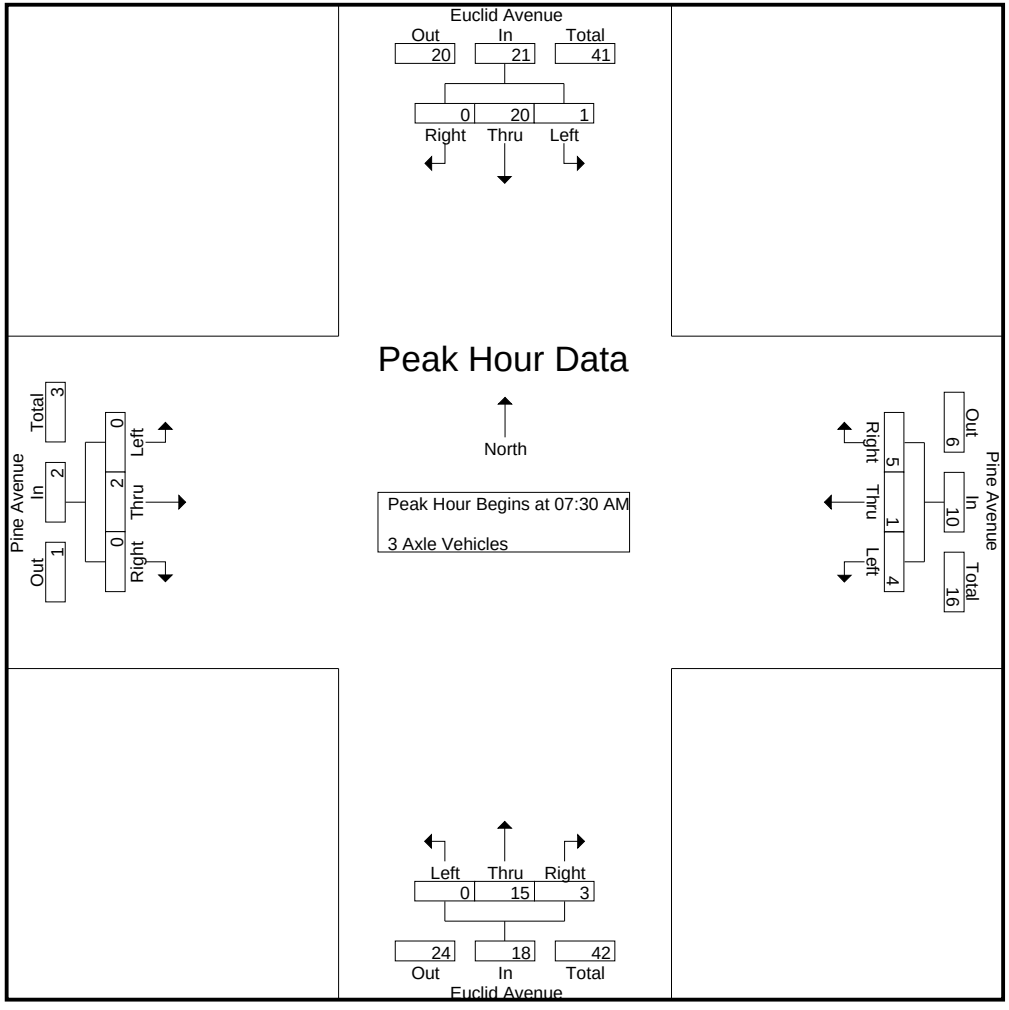

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 1 | 0 | 1 | **2** | 0 | **4** | **6** | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 4 | 0 | 4 | 2 | 0 | 1 | 3 | 0 | **7** | **2** | **9** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | **1** | 0 | **1** | |
| +45 mins. | **1** | **11** | 0 | **12** | 0 | **1** | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | |
| Total Volume | 1 | 20 | 0 | 21 | 4 | 1 | 5 | 10 | 0 | 15 | 3 | 18 | 0 | 2 | 0 | 2 | |
| % App. Total | 4.8 | 95.2 | 0 | | 40 | 10 | 50 | | 0 | 83.3 | 16.7 | | 0 | 100 | 0 | | |
| PHF | .250 | .455 | .000 | .438 | .500 | .250 | .313 | .417 | .000 | .536 | .375 | .500 | .000 | .500 | .000 | .500 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 5 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 07:15 AM | 0 | 4 | 1 | 0 | 5 | 4 | 1 | 0 | 0 | 5 | 0 | 4 | 1 | 0 | 5 | 1 | 1 | 3 | 0 | 5 | 0 | 20 | 20 |
| 07:30 AM | 0 | 4 | 0 | 0 | 4 | 10 | 1 | 0 | 0 | 11 | 2 | 4 | 7 | 0 | 13 | 0 | 2 | 1 | 0 | 3 | 0 | 31 | 31 |
| 07:45 AM | 0 | 7 | 2 | 0 | 9 | 8 | 0 | 0 | 0 | 8 | 1 | 6 | 3 | 0 | 10 | 1 | 1 | 1 | 0 | 3 | 0 | 30 | 30 |
| Total | 1 | 16 | 3 | 0 | 20 | 22 | 3 | 0 | 0 | 25 | 4 | 19 | 14 | 0 | 37 | 2 | 4 | 5 | 0 | 11 | 0 | 93 | 93 |
| 08:00 AM | 0 | 5 | 2 | 0 | 7 | 2 | 0 | 0 | 0 | 2 | 0 | 6 | 3 | 0 | 9 | 1 | 0 | 1 | 0 | 2 | 0 | 20 | 20 |
| 08:15 AM | 0 | 11 | 2 | 0 | 13 | 3 | 2 | 0 | 0 | 5 | 2 | 6 | 2 | 0 | 10 | 0 | 0 | 1 | 0 | 1 | 0 | 29 | 29 |
| 08:30 AM | 3 | 3 | 1 | 1 | 7 | 2 | 2 | 2 | 1 | 6 | 0 | 5 | 3 | 0 | 8 | 2 | 1 | 1 | 0 | 4 | 2 | 25 | 27 |
| 08:45 AM | 1 | 5 | 0 | 0 | 6 | 6 | 0 | 1 | 0 | 7 | 1 | 8 | 2 | 0 | 11 | 3 | 2 | 3 | 0 | 8 | 0 | 32 | 32 |
| Total | 4 | 24 | 5 | 1 | 33 | 13 | 4 | 3 | 1 | 20 | 3 | 25 | 10 | 0 | 38 | 6 | 3 | 6 | 0 | 15 | 2 | 106 | 108 |
| Grand Total | 5 | 40 | 8 | 1 | 53 | 35 | 7 | 3 | 1 | 45 | 7 | 44 | 24 | 0 | 75 | 8 | 7 | 11 | 0 | 26 | 2 | 199 | 201 |
| Apprch % | 9.4 | 75.5 | 15.1 | | | 77.8 | 15.6 | 6.7 | | | 9.3 | 58.7 | 32 | | | 30.8 | 26.9 | 42.3 | | | | | |
| Total % | 2.5 | 20.1 | 4 | | 26.6 | 17.6 | 3.5 | 1.5 | | 22.6 | 3.5 | 22.1 | 12.1 | | 37.7 | 4 | 3.5 | 5.5 | | 13.1 | 1 | 99 | |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 4 | 0 | 4 | **10** | 1 | 0 | **11** | **2** | 4 | **7** | **13** | 0 | **2** | **1** | **3** | **31** |
| 07:45 AM | 0 | 7 | **2** | 9 | 8 | 0 | 0 | 8 | 1 | **6** | 3 | 10 | **1** | 1 | 1 | 3 | 30 |
| 08:00 AM | 0 | 5 | 2 | 7 | 2 | 0 | 0 | 2 | 0 | 6 | 3 | 9 | 1 | 0 | 1 | 2 | 20 |
| 08:15 AM | 0 | **11** | 2 | **13** | 3 | **2** | 0 | 5 | 2 | 6 | 2 | 10 | 0 | 0 | 1 | 1 | 29 |
| Total Volume | 0 | 27 | 6 | 33 | 23 | 3 | 0 | 26 | 5 | 22 | 15 | 42 | 2 | 3 | 4 | 9 | 110 |
| % App. Total | 0 | 81.8 | 18.2 | | 88.5 | 11.5 | 0 | | 11.9 | 52.4 | 35.7 | | 22.2 | 33.3 | 44.4 | | |
| PHF | .000 | .614 | .750 | .635 | .575 | .375 | .000 | .591 | .625 | .917 | .536 | .808 | .500 | .375 | 1.00 | .750 | .887 |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

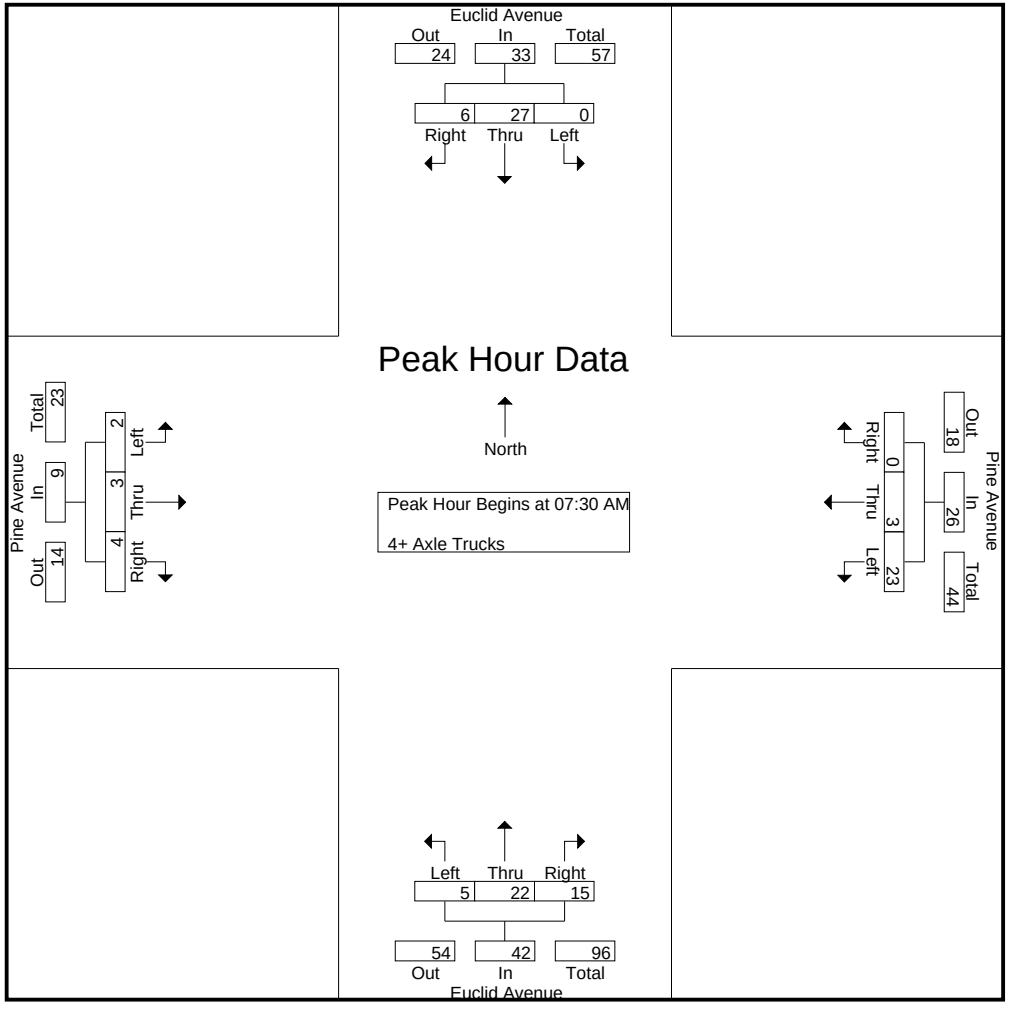

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 4 | 0 | 4 | **10** | 1 | 0 | **11** | **2** | 4 | **7** | **13** | 0 | **2** | **1** | **3** | |
| +15 mins. | 0 | 7 | **2** | 9 | 8 | 0 | 0 | 8 | 1 | **6** | 3 | 10 | **1** | 1 | 1 | 3 | |
| +30 mins. | 0 | 5 | 2 | 7 | 2 | 0 | 0 | 2 | 0 | 6 | 3 | 9 | 1 | 0 | 1 | 2 | |
| +45 mins. | 0 | **11** | 2 | **13** | 3 | **2** | 0 | 5 | 2 | 6 | 2 | 10 | 0 | 0 | 1 | 1 | |
| Total Volume | 0 | 27 | 6 | 33 | 23 | 3 | 0 | 26 | 5 | 22 | 15 | 42 | 2 | 3 | 4 | 9 | |
| % App. Total | 0 | 81.8 | 18.2 | | 88.5 | 11.5 | 0 | | 11.9 | 52.4 | 35.7 | | 22.2 | 33.3 | 44.4 | | |
| PHF | .000 | .614 | .750 | .635 | .575 | .375 | .000 | .591 | .625 | .917 | .536 | .808 | .500 | .375 | 1.000 | .750 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 14 | 102 | 0 | 0 | 116 | 143 | 36 | 15 | 2 | 194 | 6 | 128 | 219 | 23 | 353 | 3 | 79 | 15 | 0 | 97 | 25 | 760 | 785 |
| 04:15 PM | 17 | 115 | 0 | 0 | 132 | 174 | 48 | 17 | 4 | 239 | 7 | 150 | 238 | 19 | 395 | 1 | 69 | 14 | 0 | 84 | 23 | 850 | 873 |
| 04:30 PM | 18 | 98 | 2 | 0 | 118 | 125 | 49 | 15 | 3 | 189 | 11 | 132 | 243 | 22 | 386 | 1 | 69 | 10 | 0 | 80 | 25 | 773 | 798 |
| 04:45 PM | 15 | 97 | 0 | 0 | 112 | 138 | 46 | 13 | 0 | 197 | 3 | 126 | 239 | 13 | 368 | 4 | 80 | 6 | 0 | 90 | 13 | 767 | 780 |
| Total | 64 | 412 | 2 | 0 | 478 | 580 | 179 | 60 | 9 | 819 | 27 | 536 | 939 | 77 | 1502 | 9 | 297 | 45 | 0 | 351 | 86 | 3150 | 3236 |
| 05:00 PM | 21 | 112 | 0 | 0 | 133 | 144 | 37 | 13 | 1 | 194 | 5 | 129 | 238 | 16 | 372 | 1 | 71 | 11 | 0 | 83 | 17 | 782 | 799 |
| 05:15 PM | 17 | 71 | 0 | 0 | 88 | 157 | 41 | 6 | 0 | 204 | 3 | 150 | 218 | 11 | 371 | 0 | 74 | 9 | 0 | 83 | 11 | 746 | 757 |
| 05:30 PM | 18 | 94 | 0 | 0 | 112 | 144 | 53 | 9 | 2 | 206 | 2 | 132 | 251 | 19 | 385 | 1 | 76 | 10 | 0 | 87 | 21 | 790 | 811 |
| 05:45 PM | 10 | 86 | 1 | 1 | 97 | 140 | 33 | 14 | 1 | 187 | 7 | 143 | 248 | 17 | 398 | 1 | 69 | 6 | 0 | 76 | 19 | 758 | 777 |
| Total | 66 | 363 | 1 | 1 | 430 | 585 | 164 | 42 | 4 | 791 | 17 | 554 | 955 | 63 | 1526 | 3 | 290 | 36 | 0 | 329 | 68 | 3076 | 3144 |
| Grand Total | 130 | 775 | 3 | 1 | 908 | 1165 | 343 | 102 | 13 | 1610 | 44 | 1090 | 1894 | 140 | 3028 | 12 | 587 | 81 | 0 | 680 | 154 | 6226 | 6380 |
| Apprch % | 14.3 | 85.4 | 0.3 | | | 72.4 | 21.3 | 6.3 | | | 1.5 | 36 | 62.5 | | | 1.8 | 86.3 | 11.9 | | | | | |
| Total % | 2.1 | 12.4 | 0 | | 14.6 | 18.7 | 5.5 | 1.6 | | 25.9 | 0.7 | 17.5 | 30.4 | | 48.6 | 0.2 | 9.4 | 1.3 | | 10.9 | 2.4 | 97.6 | |
| Passenger Vehicles | 120 | 734 | 2 | | 857 | 1131 | 336 | 96 | | 1574 | 31 | 1011 | 1856 | | 3034 | 11 | 575 | 69 | | 655 | 0 | 0 | 6120 |
| % Passenger Vehicles | 92.3 | 94.7 | 66.7 | 100 | 94.3 | 97.1 | 98 | 94.1 | 84.6 | 97 | 70.5 | 92.8 | 98 | 97.1 | 95.8 | 91.7 | 98 | 85.2 | 0 | 96.3 | 0 | 0 | 95.9 |
| Large 2 Axle Vehicles | 5 | 12 | 0 | | 17 | 13 | 3 | 4 | | 20 | 2 | 23 | 17 | | 44 | 0 | 6 | 1 | | 7 | 0 | 0 | 88 |
| % Large 2 Axle Vehicles | 3.8 | 1.5 | 0 | 0 | 1.9 | 1.1 | 0.9 | 3.9 | 0 | 1.2 | 4.5 | 2.1 | 0.9 | 1.4 | 1.4 | 0 | 1 | 1.2 | 0 | 1 | 0 | 0 | 1.4 |
| 3 Axle Vehicles | 2 | 3 | 1 | | 6 | 6 | 2 | 0 | | 8 | 0 | 10 | 4 | | 14 | 0 | 4 | 1 | | 5 | 0 | 0 | 33 |
| % 3 Axle Vehicles | 1.5 | 0.4 | 33.3 | 0 | 0.7 | 0.5 | 0.6 | 0 | 0 | 0.5 | 0 | 0.9 | 0.2 | 0 | 0.4 | 0 | 0.7 | 1.2 | 0 | 0.7 | 0 | 0 | 0.5 |
| 4+ Axle Trucks | 3 | 26 | 0 | | 29 | 15 | 2 | 2 | | 21 | 11 | 46 | 17 | | 76 | 1 | 2 | 10 | | 13 | 0 | 0 | 139 |
| % 4+ Axle Trucks | 2.3 | 3.4 | 0 | 0 | 3.2 | 1.3 | 0.6 | 2 | 15.4 | 1.3 | 25 | 4.2 | 0.9 | 1.4 | 2.4 | 8.3 | 0.3 | 12.3 | 0 | 1.9 | 0 | 0 | 2.2 |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 17 | **115** | 0 | 132 | **174** | 48 | **17** | **239** | 7 | **150** | 238 | **395** | 1 | 69 | **14** | 84 | **850** |
| 04:30 PM | 18 | 98 | **2** | 118 | 125 | **49** | 15 | 189 | **11** | 132 | **243** | 386 | 1 | 69 | 10 | 80 | 773 |
| 04:45 PM | 15 | 97 | 0 | 112 | 138 | 46 | 13 | 197 | 3 | 126 | 239 | 368 | **4** | **80** | 6 | **90** | 767 |
| 05:00 PM | **21** | 112 | 0 | **133** | 144 | 37 | 13 | 194 | 5 | 129 | 238 | 372 | 1 | 71 | 11 | 83 | 782 |
| Total Volume | 71 | 422 | 2 | 495 | 581 | 180 | 58 | 819 | 26 | 537 | 958 | 1521 | 7 | 289 | 41 | 337 | 3172 |
| % App. Total | 14.3 | 85.3 | 0.4 | | 70.9 | 22 | 7.1 | | 1.7 | 35.3 | 63 | | 2.1 | 85.8 | 12.2 | | |
| PHF | .845 | .917 | .250 | .930 | .835 | .918 | .853 | .857 | .591 | .895 | .986 | .963 | .438 | .903 | .732 | .936 | .933 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

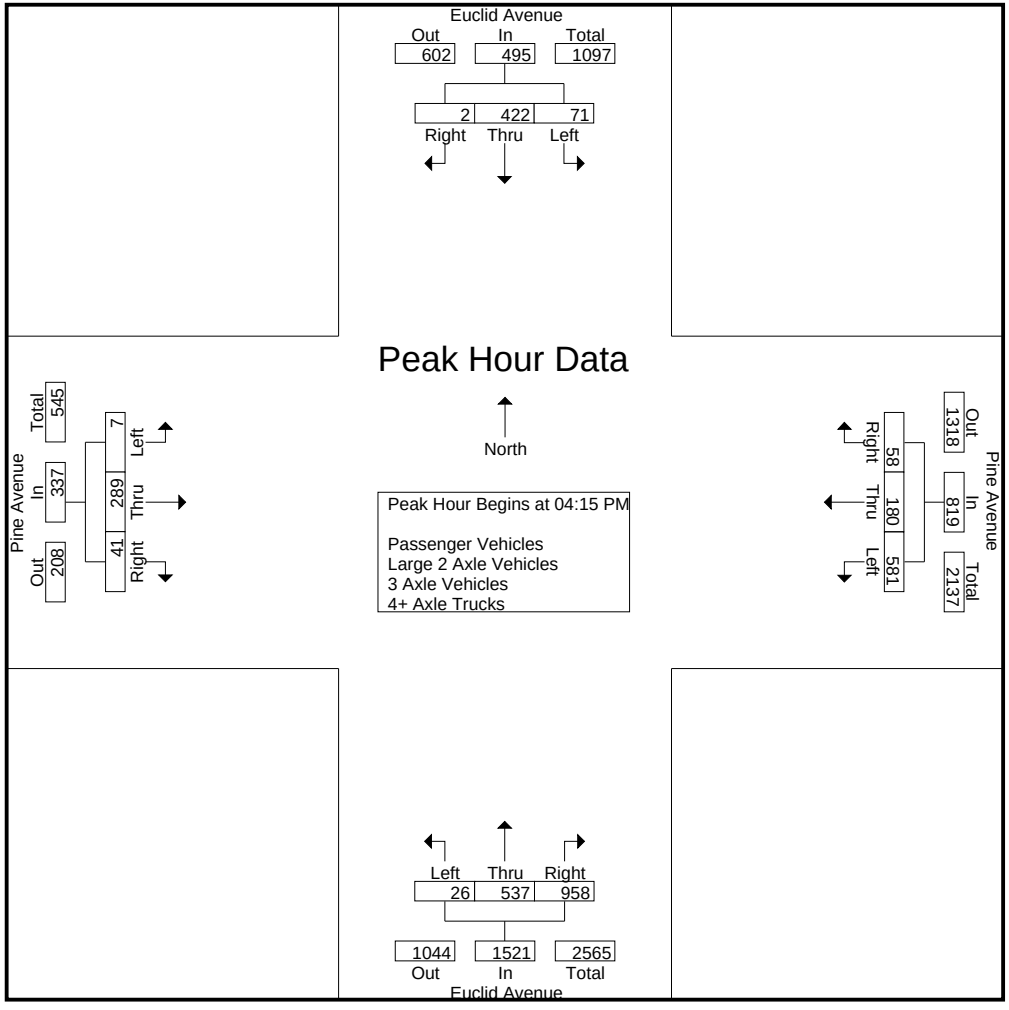

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:00 PM | | | | 05:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 17 | **115** | 0 | 132 | 143 | 36 | 15 | 194 | 5 | 129 | 238 | 372 | 3 | 79 | **15** | **97** | |
| +15 mins. | 18 | 98 | **2** | 118 | **174** | 48 | **17** | **239** | 3 | **150** | 218 | 371 | 1 | 69 | 14 | 84 | |
| +30 mins. | 15 | 97 | 0 | 112 | 125 | **49** | 15 | 189 | 2 | 132 | **251** | 385 | 1 | 69 | 10 | 80 | |
| +45 mins. | **21** | 112 | 0 | **133** | 138 | 46 | 13 | 197 | **7** | 143 | 248 | **398** | **4** | **80** | 6 | 90 | |
| Total Volume | 71 | 422 | 2 | 495 | 580 | 179 | 60 | 819 | 17 | 554 | 955 | 1526 | 9 | 297 | 45 | 351 | |
| % App. Total | 14.3 | 85.3 | 0.4 | | 70.8 | 21.9 | 7.3 | | 1.1 | 36.3 | 62.6 | | 2.6 | 84.6 | 12.8 | | |
| PHF | .845 | .917 | .250 | .930 | .833 | .913 | .882 | .857 | .607 | .923 | .951 | .959 | .563 | .928 | .750 | .905 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 13 | 100 | 0 | 0 | 113 | 138 | 36 | 13 | 1 | 187 | 5 | 115 | 217 | 22 | 337 | 3 | 79 | 13 | 0 | 95 | 23 | 732 | 755 |
| 04:15 PM | 14 | 111 | 0 | 0 | 125 | 167 | 47 | 15 | 4 | 229 | 5 | 136 | 232 | 19 | 373 | 1 | 69 | 13 | 0 | 83 | 23 | 810 | 833 |
| 04:30 PM | 17 | 91 | 1 | 0 | 109 | 120 | 48 | 14 | 2 | 182 | 6 | 126 | 238 | 21 | 370 | 1 | 66 | 9 | 0 | 76 | 23 | 737 | 760 |
| 04:45 PM | 12 | 89 | 0 | 0 | 101 | 135 | 44 | 12 | 0 | 191 | 2 | 115 | 233 | 13 | 350 | 4 | 79 | 5 | 0 | 88 | 13 | 730 | 743 |
| Total | 56 | 391 | 1 | 0 | 448 | 560 | 175 | 54 | 7 | 789 | 18 | 492 | 920 | 75 | 1430 | 9 | 293 | 40 | 0 | 342 | 82 | 3009 | 3091 |
| 05:00 PM | 21 | 107 | 0 | 0 | 128 | 141 | 37 | 13 | 1 | 191 | 4 | 117 | 231 | 14 | 352 | 1 | 71 | 8 | 0 | 80 | 15 | 751 | 766 |
| 05:15 PM | 17 | 62 | 0 | 0 | 79 | 152 | 40 | 6 | 0 | 198 | 3 | 137 | 216 | 11 | 356 | 0 | 71 | 7 | 0 | 78 | 11 | 711 | 722 |
| 05:30 PM | 17 | 90 | 0 | 0 | 107 | 140 | 51 | 9 | 2 | 200 | 2 | 126 | 246 | 19 | 374 | 0 | 73 | 9 | 0 | 82 | 21 | 763 | 784 |
| 05:45 PM | 9 | 84 | 1 | 1 | 94 | 138 | 33 | 14 | 1 | 185 | 4 | 139 | 243 | 17 | 386 | 1 | 67 | 5 | 0 | 73 | 19 | 738 | 757 |
| Total | 64 | 343 | 1 | 1 | 408 | 571 | 161 | 42 | 4 | 774 | 13 | 519 | 936 | 61 | 1468 | 2 | 282 | 29 | 0 | 313 | 66 | 2963 | 3029 |
| Grand Total | 120 | 734 | 2 | 1 | 856 | 1131 | 336 | 96 | 11 | 1563 | 31 | 1011 | 1856 | 136 | 2898 | 11 | 575 | 69 | 0 | 655 | 148 | 5972 | 6120 |
| Apprch % | 14 | 85.7 | 0.2 | | | 72.4 | 21.5 | 6.1 | | | 1.1 | 34.9 | 64 | | | 1.7 | 87.8 | 10.5 | | | | | |
| Total % | 2 | 12.3 | 0 | | 14.3 | 18.9 | 5.6 | 1.6 | | 26.2 | 0.5 | 16.9 | 31.1 | | 48.5 | 0.2 | 9.6 | 1.2 | | 11 | 2.4 | 97.6 | |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 14 | **111** | 0 | 125 | **167** | 47 | **15** | **229** | 5 | **136** | 232 | **373** | 1 | 69 | **13** | 83 | **810** |
| 04:30 PM | 17 | 91 | **1** | 109 | 120 | **48** | 14 | 182 | **6** | 126 | **238** | 370 | 1 | 66 | 9 | 76 | 737 |
| 04:45 PM | 12 | 89 | 0 | 101 | 135 | 44 | 12 | 191 | 2 | 115 | 233 | 350 | **4** | **79** | 5 | **88** | 730 |
| 05:00 PM | **21** | 107 | 0 | **128** | 141 | 37 | 13 | 191 | 4 | 117 | 231 | 352 | 1 | 71 | 8 | 80 | 751 |
| Total Volume | 64 | 398 | 1 | 463 | 563 | 176 | 54 | 793 | 17 | 494 | 934 | 1445 | 7 | 285 | 35 | 327 | 3028 |
| % App. Total | 13.8 | 86 | 0.2 | | 71 | 22.2 | 6.8 | | 1.2 | 34.2 | 64.6 | | 2.1 | 87.2 | 10.7 | | |
| PHF | .762 | .896 | .250 | .904 | .843 | .917 | .900 | .866 | .708 | .908 | .981 | .968 | .438 | .902 | .673 | .929 | .935 |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

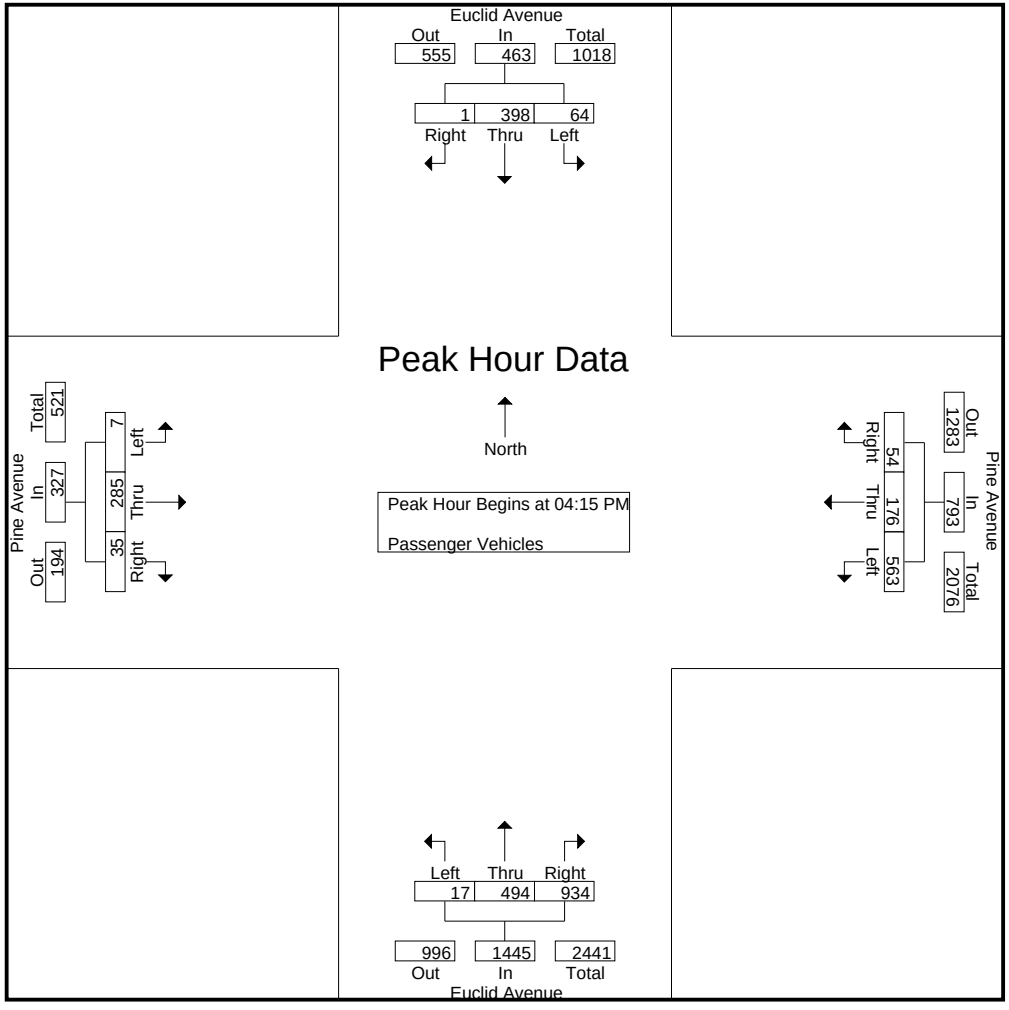

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 14 | **111** | 0 | 125 | **167** | 47 | **15** | **229** | 5 | **136** | 232 | **373** | 1 | 69 | **13** | 83 | |
| +15 mins. | 17 | 91 | **1** | 109 | 120 | **48** | 14 | 182 | **6** | 126 | **238** | 370 | 1 | 66 | 9 | 76 | |
| +30 mins. | 12 | 89 | 0 | 101 | 135 | 44 | 12 | 191 | 2 | 115 | 233 | 350 | **4** | **79** | 5 | **88** | |
| +45 mins. | **21** | 107 | 0 | **128** | 141 | 37 | 13 | 191 | 4 | 117 | 231 | 352 | 1 | 71 | 8 | 80 | |
| Total Volume | 64 | 398 | 1 | 463 | 563 | 176 | 54 | 793 | 17 | 494 | 934 | 1445 | 7 | 285 | 35 | 327 | |
| % App. Total | 13.8 | 86 | 0.2 | | 71 | 22.2 | 6.8 | | 1.2 | 34.2 | 64.6 | | 2.1 | 87.2 | 10.7 | | |
| PHF | .762 | .896 | .250 | .904 | .843 | .917 | .900 | .866 | .708 | .908 | .981 | .968 | .438 | .902 | .673 | .929 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 3 | 0 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| 04:15 PM | 3 | 1 | 0 | 0 | 4 | 1 | 0 | 2 | 0 | 3 | 1 | 2 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 04:30 PM | 1 | 4 | 0 | 0 | 5 | 5 | 0 | 0 | 0 | 5 | 0 | 1 | 3 | 1 | 4 | 0 | 3 | 0 | 0 | 3 | 1 | 17 | 18 |
| 04:45 PM | 1 | 2 | 0 | 0 | 3 | 0 | 2 | 1 | 0 | 3 | 0 | 5 | 3 | 0 | 8 | 0 | 1 | 1 | 0 | 2 | 0 | 16 | 16 |
| Total | 5 | 7 | 0 | 0 | 12 | 8 | 2 | 4 | 0 | 14 | 1 | 13 | 9 | 1 | 23 | 0 | 4 | 1 | 0 | 5 | 1 | 54 | 55 |
| 05:00 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 3 | 1 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 11 | 12 |
| 05:15 PM | 0 | 3 | 0 | 0 | 3 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 |
| 05:30 PM | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 2 | 3 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 0 | 9 | 9 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 5 |
| Total | 0 | 5 | 0 | 0 | 5 | 5 | 1 | 0 | 0 | 6 | 1 | 10 | 8 | 1 | 19 | 0 | 2 | 0 | 0 | 2 | 1 | 32 | 33 |
| Grand Total | 5 | 12 | 0 | 0 | 17 | 13 | 3 | 4 | 0 | 20 | 2 | 23 | 17 | 2 | 42 | 0 | 6 | 1 | 0 | 7 | 2 | 86 | 88 |
| Apprch % | 29.4 | 70.6 | 0 | | | 65 | 15 | 20 | | | 4.8 | 54.8 | 40.5 | | | 0 | 85.7 | 14.3 | | | | | |
| Total % | 5.8 | 14 | 0 | | 19.8 | 15.1 | 3.5 | 4.7 | | 23.3 | 2.3 | 26.7 | 19.8 | | 48.8 | 0 | 7 | 1.2 | | 8.1 | 2.3 | 97.7 | |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | **3** | 1 | 0 | 4 | 1 | 0 | **2** | 3 | **1** | 2 | 2 | 5 | 0 | 0 | 0 | 0 | 12 |
| 04:30 PM | 1 | **4** | 0 | **5** | **5** | 0 | 0 | **5** | 0 | 1 | **3** | 4 | 0 | **3** | 0 | **3** | **17** |
| 04:45 PM | 1 | 2 | 0 | 3 | 0 | **2** | 1 | 3 | 0 | 5 | 3 | 8 | 0 | 1 | **1** | 2 | 16 |
| 05:00 PM | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **7** | 3 | **10** | 0 | 0 | 0 | 0 | 11 |
| Total Volume | 5 | 8 | 0 | 13 | 6 | 2 | 3 | 11 | 1 | 15 | 11 | 27 | 0 | 4 | 1 | 5 | 56 |
| % App. Total | 38.5 | 61.5 | 0 | | 54.5 | 18.2 | 27.3 | | 3.7 | 55.6 | 40.7 | | 0 | 80 | 20 | | |
| PHF | .417 | .500 | .000 | .650 | .300 | .250 | .375 | .550 | .250 | .536 | .917 | .675 | .000 | .333 | .250 | .417 | .824 |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

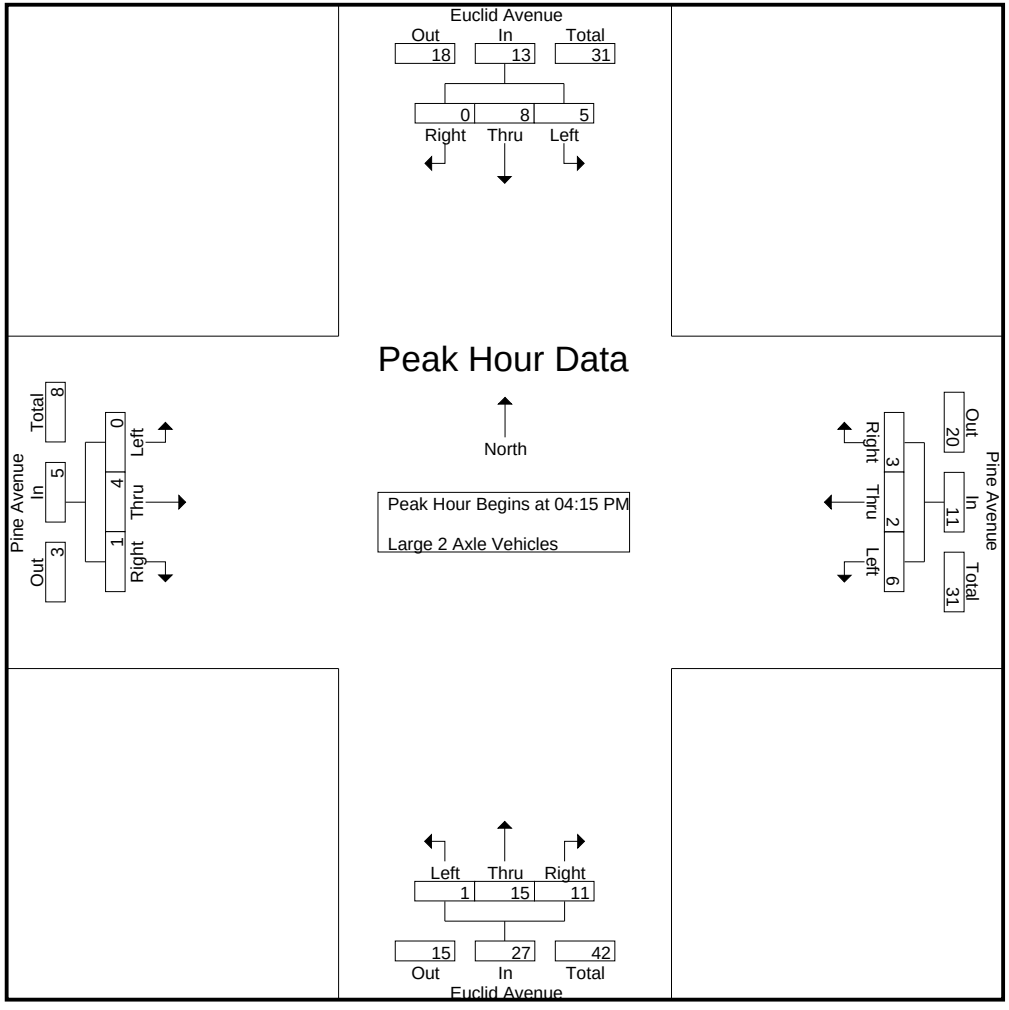

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | **3** | 1 | 0 | 4 | 1 | 0 | **2** | 3 | **1** | 2 | 2 | 5 | 0 | 0 | 0 | 0 | |
| +15 mins. | 1 | **4** | 0 | **5** | **5** | 0 | 0 | **5** | 0 | 1 | **3** | 4 | 0 | **3** | 0 | **3** | |
| +30 mins. | 1 | 2 | 0 | 3 | 0 | **2** | 1 | 3 | 0 | 5 | 3 | 8 | 0 | 1 | **1** | 2 | |
| +45 mins. | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **7** | 3 | **10** | 0 | 0 | 0 | 0 | |
| Total Volume | 5 | 8 | 0 | 13 | 6 | 2 | 3 | 11 | 1 | 15 | 11 | 27 | 0 | 4 | 1 | 5 | |
| % App. Total | 38.5 | 61.5 | 0 | | 54.5 | 18.2 | 27.3 | | 3.7 | 55.6 | 40.7 | | 0 | 80 | 20 | | |
| PHF | .417 | .500 | .000 | .650 | .300 | .250 | .375 | .550 | .250 | .536 | .917 | .675 | .000 | .333 | .250 | .417 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 5 |
| 04:30 PM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 04:45 PM | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Total | 2 | 0 | 1 | 0 | 3 | 3 | 1 | 0 | 0 | 4 | 0 | 5 | 1 | 0 | 6 | 0 | 0 | 1 | 0 | 1 | 0 | 14 | 14 |
| 05:00 PM | 0 | 3 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 2 | 0 | 6 | 6 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 4 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 3 |
| Total | 0 | 3 | 0 | 0 | 3 | 3 | 1 | 0 | 0 | 4 | 0 | 5 | 3 | 0 | 8 | 0 | 4 | 0 | 0 | 4 | 0 | 19 | 19 |
| Grand Total | 2 | 3 | 1 | 0 | 6 | 6 | 2 | 0 | 0 | 8 | 0 | 10 | 4 | 0 | 14 | 0 | 4 | 1 | 0 | 5 | 0 | 33 | 33 |
| Apprch % | 33.3 | 50 | 16.7 | | | 75 | 25 | 0 | | | 0 | 71.4 | 28.6 | | | 0 | 80 | 20 | | | | | |
| Total % | 6.1 | 9.1 | 3 | | 18.2 | 18.2 | 6.1 | 0 | | 24.2 | 0 | 30.3 | 12.1 | | 42.4 | 0 | 12.1 | 3 | | 15.2 | 0 | 100 | |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 0 | 0 | 0 | 0 | **1** | **1** | 0 | **2** | 0 | **2** | 0 | **2** | 0 | 0 | **1** | **1** | 5 |
| 04:30 PM | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 1 | **1** | 2 | 0 | 0 | 0 | 0 | 3 |
| 04:45 PM | **2** | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| 05:00 PM | 0 | **3** | 0 | **3** | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | **6** |
| Total Volume | 2 | 3 | 1 | 6 | 3 | 1 | 0 | 4 | 0 | 5 | 2 | 7 | 0 | 0 | 1 | 1 | 18 |
| % App. Total | 33.3 | 50 | 16.7 | | 75 | 25 | 0 | | 0 | 71.4 | 28.6 | | 0 | 0 | 100 | | |
| PHF | .250 | .250 | .250 | .500 | .750 | .250 | .000 | .500 | .000 | .625 | .500 | .875 | .000 | .000 | .250 | .250 | .750 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

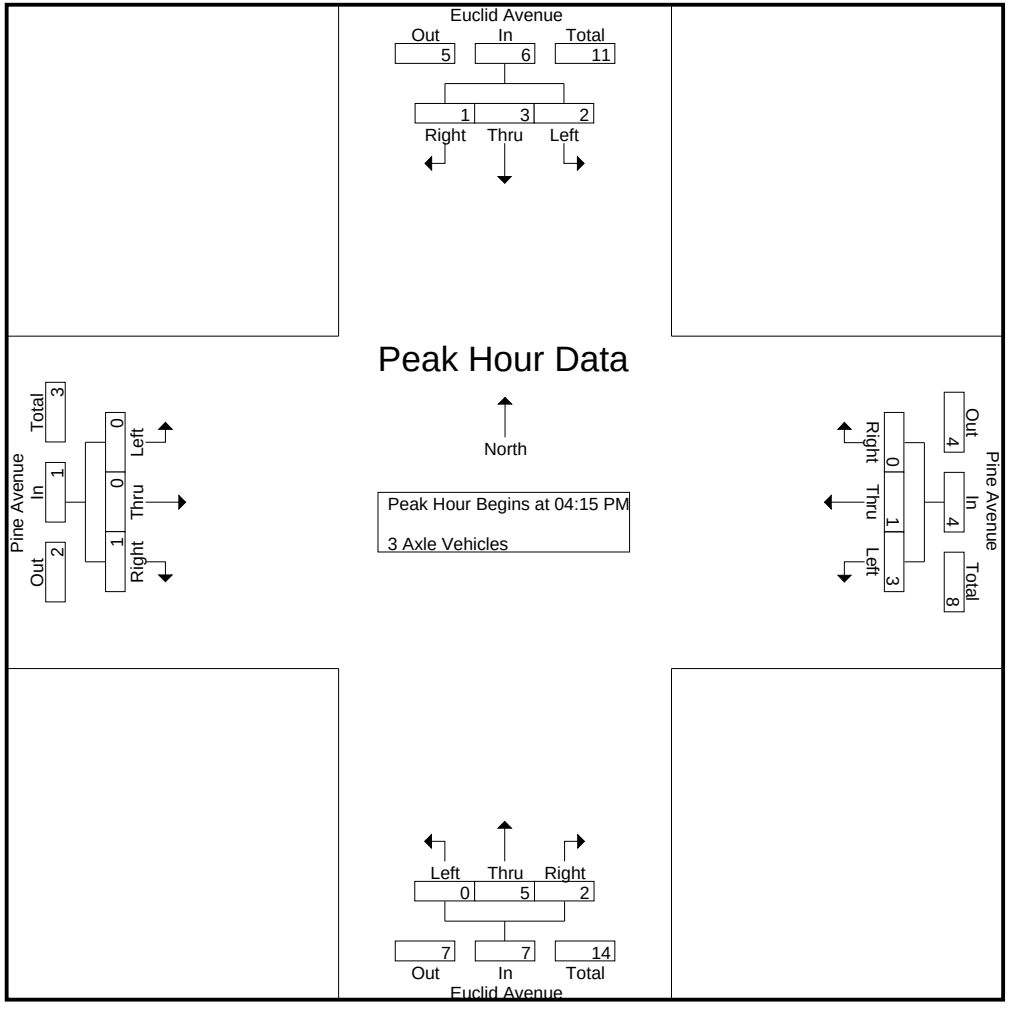

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 0 | 0 | 0 | 0 | **1** | **1** | 0 | **2** | 0 | **2** | 0 | **2** | 0 | 0 | **1** | **1** | |
| +15 mins. | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 1 | **1** | 2 | 0 | 0 | 0 | 0 | |
| +30 mins. | **2** | 0 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **3** | 0 | **3** | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | |
| Total Volume | 2 | 3 | 1 | 6 | 3 | 1 | 0 | 4 | 0 | 5 | 2 | 7 | 0 | 0 | 1 | 1 | |
| % App. Total | 33.3 | 50 | 16.7 | | 75 | 25 | 0 | | 0 | 71.4 | 28.6 | | 0 | 0 | 100 | | |
| PHF | .250 | .250 | .250 | .500 | .750 | .250 | .000 | .500 | .000 | .625 | .500 | .875 | .000 | .000 | .250 | .250 | |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Southbound | | | | | Pine Avenue Westbound | | | | | Euclid Avenue Northbound | | | | | Pine Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 2 | 0 | 0 | 3 | 2 | 0 | 1 | 1 | 3 | 1 | 7 | 1 | 1 | 9 | 0 | 0 | 2 | 0 | 2 | 2 | 17 | 19 |
| 04:15 PM | 0 | 3 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 5 | 1 | 10 | 4 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 23 |
| 04:30 PM | 0 | 3 | 0 | 0 | 3 | 0 | 1 | 1 | 1 | 2 | 5 | 4 | 1 | 0 | 10 | 0 | 0 | 1 | 0 | 1 | 1 | 16 | 17 |
| 04:45 PM | 0 | 6 | 0 | 0 | 6 | 2 | 0 | 0 | 0 | 2 | 1 | 5 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 17 |
| Total | 1 | 14 | 0 | 0 | 15 | 9 | 1 | 2 | 2 | 12 | 8 | 26 | 9 | 1 | 43 | 0 | 0 | 3 | 0 | 3 | 3 | 73 | 76 |
| 05:00 PM | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 1 | 4 | 3 | 1 | 8 | 0 | 0 | 3 | 0 | 3 | 1 | 14 | 15 |
| 05:15 PM | 0 | 6 | 0 | 0 | 6 | 2 | 1 | 0 | 0 | 3 | 0 | 9 | 1 | 0 | 10 | 0 | 1 | 2 | 0 | 3 | 0 | 22 | 22 |
| 05:30 PM | 1 | 3 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 2 | 0 | 3 | 2 | 0 | 5 | 1 | 1 | 1 | 0 | 3 | 0 | 14 | 14 |
| 05:45 PM | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 2 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 12 | 12 |
| Total | 2 | 12 | 0 | 0 | 14 | 6 | 1 | 0 | 0 | 7 | 3 | 20 | 8 | 1 | 31 | 1 | 2 | 7 | 0 | 10 | 1 | 62 | 63 |
| Grand Total | 3 | 26 | 0 | 0 | 29 | 15 | 2 | 2 | 2 | 19 | 11 | 46 | 17 | 2 | 74 | 1 | 2 | 10 | 0 | 13 | 4 | 135 | 139 |
| Apprch % | 10.3 | 89.7 | 0 | | | 78.9 | 10.5 | 10.5 | | | 14.9 | 62.2 | 23 | | | 7.7 | 15.4 | 76.9 | | | | | |
| Total % | 2.2 | 19.3 | 0 | | 21.5 | 11.1 | 1.5 | 1.5 | | 14.1 | 8.1 | 34.1 | 12.6 | | 54.8 | 0.7 | 1.5 | 7.4 | | 9.6 | 2.9 | 97.1 | |

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 0 | 3 | 0 | 3 | **5** | 0 | 0 | **5** | 1 | **10** | **4** | **15** | 0 | 0 | 0 | 0 | **23** |
| 04:30 PM | 0 | 3 | 0 | 3 | 0 | **1** | **1** | 2 | **5** | 4 | 1 | 10 | 0 | 0 | 1 | 1 | 16 |
| 04:45 PM | 0 | **6** | 0 | **6** | 2 | 0 | 0 | 2 | 1 | 5 | 3 | 9 | 0 | 0 | 0 | 0 | 17 |
| 05:00 PM | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 1 | 4 | 3 | 8 | 0 | 0 | **3** | **3** | 14 |
| Total Volume | 0 | 13 | 0 | 13 | 9 | 1 | 1 | 11 | 8 | 23 | 11 | 42 | 0 | 0 | 4 | 4 | 70 |
| % App. Total | 0 | 100 | 0 | | 81.8 | 9.1 | 9.1 | | 19 | 54.8 | 26.2 | | 0 | 0 | 100 | | |
| PHF | .000 | .542 | .000 | .542 | .450 | .250 | .250 | .550 | .400 | .575 | .688 | .700 | .000 | .000 | .333 | .333 | .761 |

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City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

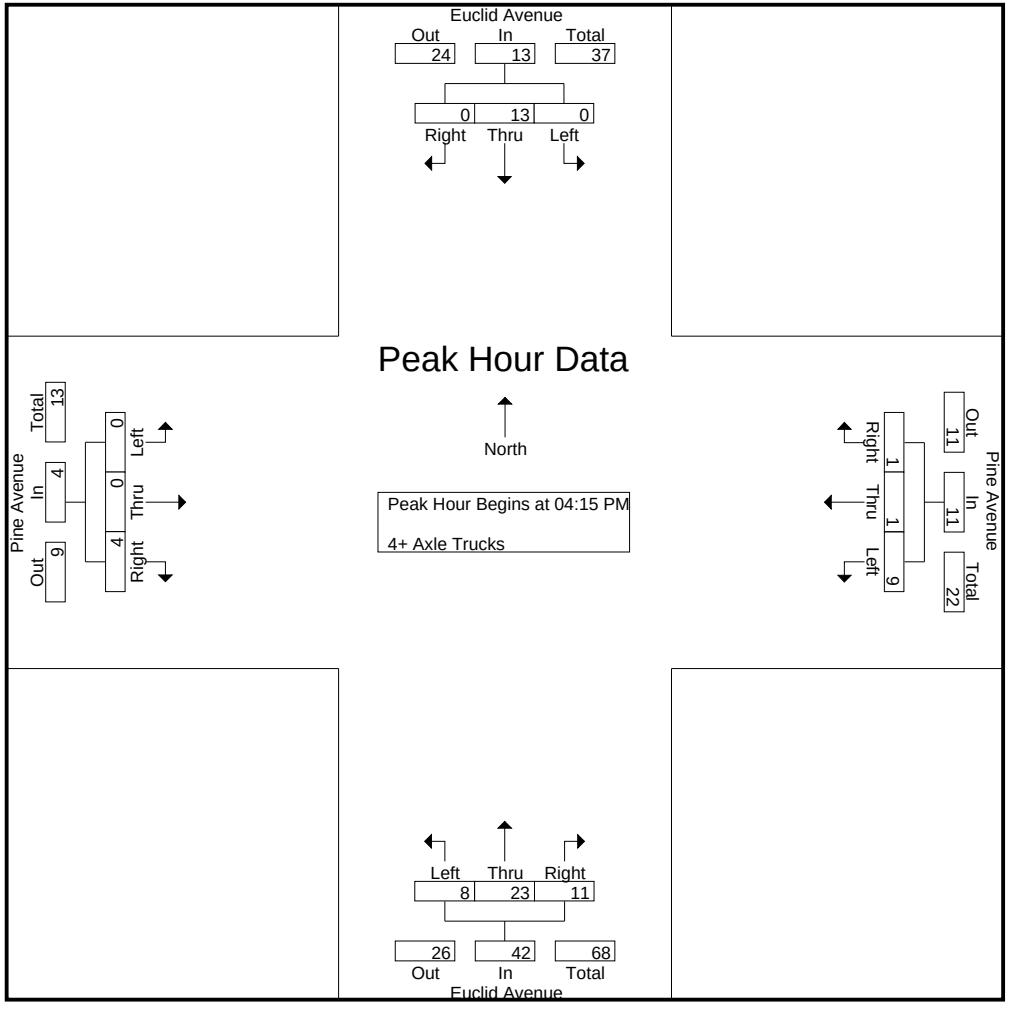

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(951) 268-6268

City of Chino
N/S: Euclid Avenue
E/W: Pine Avenue
Weather: Clear

File Name : 11_CHN_Euc_Pine PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Euclid Avenue Southbound | | | | Pine Avenue Westbound | | | | Euclid Avenue Northbound | | | | Pine Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 0 | 3 | 0 | 3 | **5** | 0 | 0 | **5** | 1 | **10** | **4** | **15** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 3 | 0 | 3 | 0 | **1** | **1** | 2 | **5** | 4 | 1 | 10 | 0 | 0 | 1 | 1 | |
| +30 mins. | 0 | **6** | 0 | **6** | 2 | 0 | 0 | 2 | 1 | 5 | 3 | 9 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 1 | 4 | 3 | 8 | 0 | 0 | **3** | **3** | |
| Total Volume | 0 | 13 | 0 | 13 | 9 | 1 | 1 | 11 | 8 | 23 | 11 | 42 | 0 | 0 | 4 | 4 | |
| % App. Total | 0 | 100 | 0 | | 81.8 | 9.1 | 9.1 | | 19 | 54.8 | 26.2 | | 0 | 0 | 100 | | |
| PHF | .000 | .542 | .000 | .542 | .450 | .250 | .250 | .550 | .400 | .575 | .688 | .700 | .000 | .000 | .333 | .333 | |

Location: Chino
N/S: Euclid Avenue
E/W: Pine Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Euclid Avenue | East Leg Pine Avenue | South Leg Euclid Avenue | West Leg Pine Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg Euclid Avenue | East Leg Pine Avenue | South Leg Euclid Avenue | West Leg Pine Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

Counts Unlimited, Inc.
PO Box 1178
Corona, Ca 92878
951-268-6268

Location: Chino
N/S: Euclid Avenue
E/W: Pine Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Euclid Avenue | | | Westbound Pine Avenue | | | Northbound Euclid Avenue | | | Eastbound Pine Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Southbound Euclid Avenue | | | Westbound Pine Avenue | | | Northbound Euclid Avenue | | | Eastbound Pine Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 201 | 198 | 399 | 6 | 93 | 0 | 99 | 84 | 50 | 0 | 134 | 0 | 632 | 632 |
| 07:15 AM | 173 | 206 | 379 | 19 | 100 | 0 | 119 | 103 | 47 | 0 | 150 | 0 | 648 | 648 |
| 07:30 AM | 171 | 210 | 381 | 12 | 119 | 0 | 131 | 143 | 44 | 0 | 187 | 0 | 699 | 699 |
| 07:45 AM | 148 | 235 | 383 | 14 | 142 | 0 | 156 | 194 | 67 | 0 | 261 | 0 | 800 | 800 |
| Total | 693 | 849 | 1542 | 51 | 454 | 0 | 505 | 524 | 208 | 0 | 732 | 0 | 2779 | 2779 |
| 08:00 AM | 157 | 200 | 357 | 12 | 120 | 0 | 132 | 121 | 47 | 0 | 168 | 0 | 657 | 657 |
| 08:15 AM | 163 | 189 | 352 | 7 | 145 | 0 | 152 | 140 | 57 | 0 | 197 | 0 | 701 | 701 |
| 08:30 AM | 155 | 194 | 349 | 9 | 132 | 0 | 141 | 138 | 48 | 0 | 186 | 0 | 676 | 676 |
| 08:45 AM | 125 | 182 | 307 | 17 | 112 | 0 | 129 | 134 | 32 | 0 | 166 | 0 | 602 | 602 |
| Total | 600 | 765 | 1365 | 45 | 509 | 0 | 554 | 533 | 184 | 0 | 717 | 0 | 2636 | 2636 |
| Grand Total | 1293 | 1614 | 2907 | 96 | 963 | 0 | 1059 | 1057 | 392 | 0 | 1449 | 0 | 5415 | 5415 |
| Apprch % | 44.5 | 55.5 | | 9.1 | 90.9 | | | 72.9 | 27.1 | | | | | |
| Total % | 23.9 | 29.8 | 53.7 | 1.8 | 17.8 | | 19.6 | 19.5 | 7.2 | | 26.8 | 0 | 100 | |
| Passenger Vehicles | 1250 | 1494 | 2744 | 84 | 876 | | 960 | 1002 | 385 | | 1387 | 0 | 0 | 5091 |
| % Passenger Vehicles | 96.7 | 92.6 | 94.4 | 87.5 | 91 | 0 | 90.7 | 94.8 | 98.2 | 0 | 95.7 | 0 | 0 | 94 |
| Large 2 Axle Vehicles | 7 | 32 | 39 | 5 | 25 | | 30 | 16 | 4 | | 20 | 0 | 0 | 89 |
| % Large 2 Axle Vehicles | 0.5 | 2 | 1.3 | 5.2 | 2.6 | 0 | 2.8 | 1.5 | 1 | 0 | 1.4 | 0 | 0 | 1.6 |
| 3 Axle Vehicles | 4 | 15 | 19 | 0 | 11 | | 11 | 12 | 0 | | 12 | 0 | 0 | 42 |
| % 3 Axle Vehicles | 0.3 | 0.9 | 0.7 | 0 | 1.1 | 0 | 1 | 1.1 | 0 | 0 | 0.8 | 0 | 0 | 0.8 |
| 4+ Axle Trucks | 32 | 73 | 105 | 7 | 51 | | 58 | 27 | 3 | | 30 | 0 | 0 | 193 |
| % 4+ Axle Trucks | 2.5 | 4.5 | 3.6 | 7.3 | 5.3 | 0 | 5.5 | 2.6 | 0.8 | 0 | 2.1 | 0 | 0 | 3.6 |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | |
| 07:30 AM | **171** | 210 | 381 | 12 | 119 | 131 | 143 | 44 | 187 | 699 |
| 07:45 AM | 148 | **235** | **383** | **14** | 142 | **156** | **194** | **67** | **261** | **800** |
| 08:00 AM | 157 | 200 | 357 | 12 | 120 | 132 | 121 | 47 | 168 | 657 |
| 08:15 AM | 163 | 189 | 352 | 7 | **145** | 152 | 140 | 57 | 197 | 701 |
| Total Volume | 639 | 834 | 1473 | 45 | 526 | 571 | 598 | 215 | 813 | 2857 |
| % App. Total | 43.4 | 56.6 | | 7.9 | 92.1 | | 73.6 | 26.4 | | |
| PHF | .934 | .887 | .961 | .804 | .907 | .915 | .771 | .802 | .779 | .893 |

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

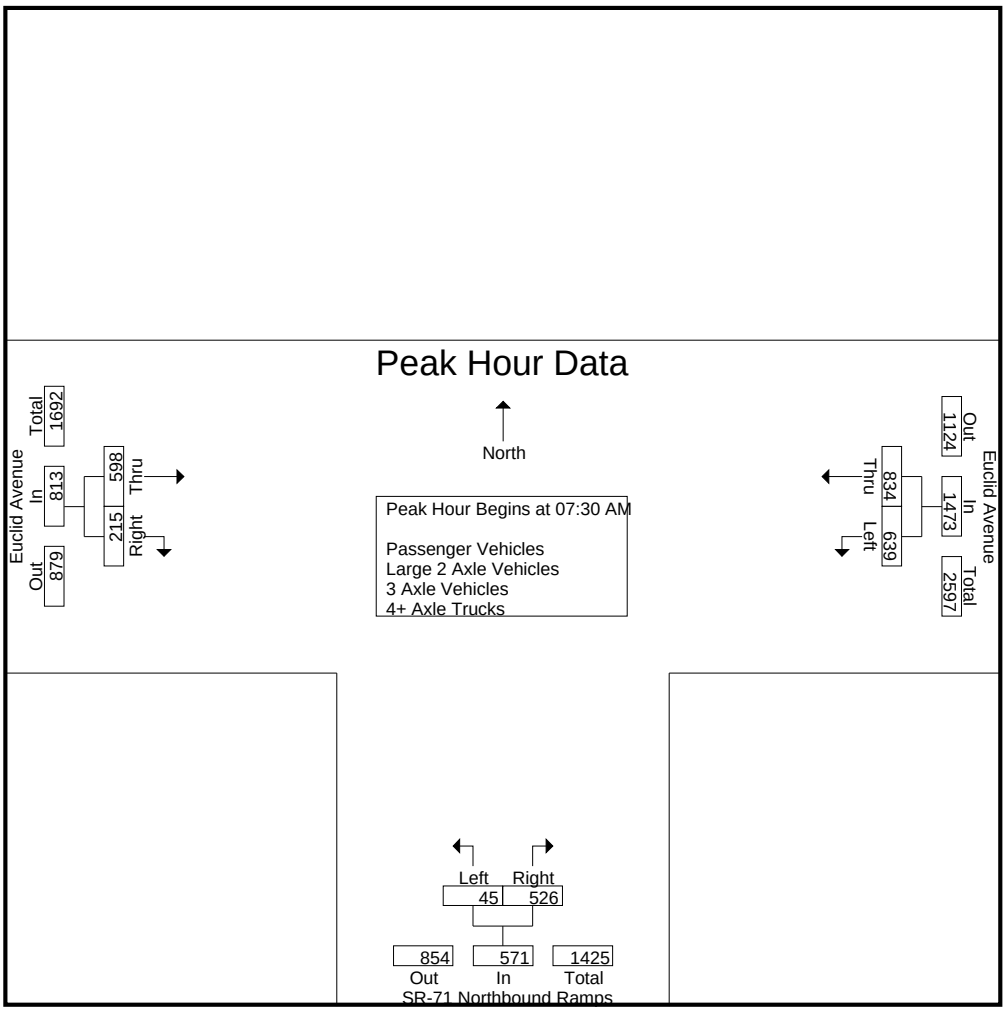


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:00 AM | | | 07:45 AM | | | 07:30 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **201** | 198 | **399** | **14** | 142 | **156** | 143 | 44 | 187 |
| +15 mins. | 173 | 206 | 379 | 12 | 120 | 132 | **194** | **67** | **261** |
| +30 mins. | 171 | 210 | 381 | 7 | **145** | 152 | 121 | 47 | 168 |
| +45 mins. | 148 | **235** | 383 | 9 | 132 | 141 | 140 | 57 | 197 |
| Total Volume | 693 | 849 | 1542 | 42 | 539 | 581 | 598 | 215 | 813 |
| % App. Total | 44.9 | 55.1 | | 7.2 | 92.8 | | 73.6 | 26.4 | |
| PHF | .862 | .903 | .966 | .750 | .929 | .931 | .771 | .802 | .779 |

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City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 198 | 188 | 386 | 5 | 84 | 0 | 89 | 77 | 47 | 0 | 124 | 0 | 599 | 599 |
| 07:15 AM | 164 | 184 | 348 | 17 | 97 | 0 | 114 | 100 | 47 | 0 | 147 | 0 | 609 | 609 |
| 07:30 AM | 166 | 197 | 363 | 9 | 106 | 0 | 115 | 132 | 44 | 0 | 176 | 0 | 654 | 654 |
| 07:45 AM | 144 | 225 | 369 | 14 | 127 | 0 | 141 | 185 | 65 | 0 | 250 | 0 | 760 | 760 |
| Total | 672 | 794 | 1466 | 45 | 414 | 0 | 459 | 494 | 203 | 0 | 697 | 0 | 2622 | 2622 |
| 08:00 AM | 150 | 190 | 340 | 11 | 112 | 0 | 123 | 113 | 47 | 0 | 160 | 0 | 623 | 623 |
| 08:15 AM | 159 | 170 | 329 | 6 | 133 | 0 | 139 | 137 | 57 | 0 | 194 | 0 | 662 | 662 |
| 08:30 AM | 146 | 181 | 327 | 8 | 122 | 0 | 130 | 134 | 47 | 0 | 181 | 0 | 638 | 638 |
| 08:45 AM | 123 | 159 | 282 | 14 | 95 | 0 | 109 | 124 | 31 | 0 | 155 | 0 | 546 | 546 |
| Total | 578 | 700 | 1278 | 39 | 462 | 0 | 501 | 508 | 182 | 0 | 690 | 0 | 2469 | 2469 |
| Grand Total | 1250 | 1494 | 2744 | 84 | 876 | 0 | 960 | 1002 | 385 | 0 | 1387 | 0 | 5091 | 5091 |
| Apprch % | 45.6 | 54.4 | | 8.8 | 91.2 | | | 72.2 | 27.8 | | | | | |
| Total % | 24.6 | 29.3 | 53.9 | 1.6 | 17.2 | | 18.9 | 19.7 | 7.6 | | 27.2 | 0 | 100 | |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | |
| 07:30 AM | **166** | 197 | 363 | 9 | 106 | 115 | 132 | 44 | 176 | 654 |
| 07:45 AM | 144 | **225** | **369** | **14** | 127 | **141** | **185** | **65** | **250** | **760** |
| 08:00 AM | 150 | 190 | 340 | 11 | 112 | 123 | 113 | 47 | 160 | 623 |
| 08:15 AM | 159 | 170 | 329 | 6 | **133** | 139 | 137 | 57 | 194 | 662 |
| Total Volume | 619 | 782 | 1401 | 40 | 478 | 518 | 567 | 213 | 780 | 2699 |
| % App. Total | 44.2 | 55.8 | | 7.7 | 92.3 | | 72.7 | 27.3 | | |
| PHF | .932 | .869 | .949 | .714 | .898 | .918 | .766 | .819 | .780 | .888 |

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

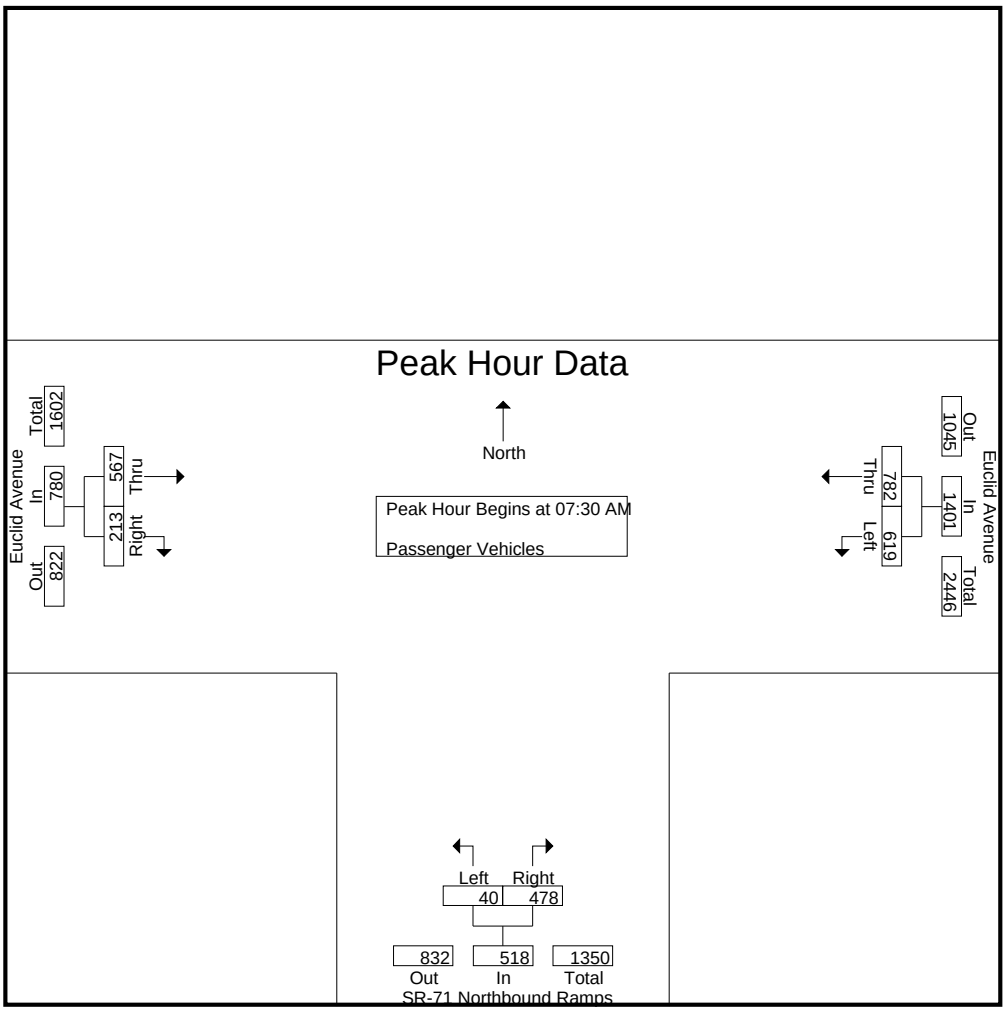


Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:30 AM | | | 07:30 AM | | | 07:30 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **166** | 197 | 363 | 9 | 106 | 115 | 132 | 44 | 176 |
| +15 mins. | 144 | **225** | **369** | **14** | 127 | **141** | **185** | **65** | **250** |
| +30 mins. | 150 | 190 | 340 | 11 | 112 | 123 | 113 | 47 | 160 |
| +45 mins. | 159 | 170 | 329 | 6 | **133** | 139 | 137 | 57 | 194 |
| Total Volume | 619 | 782 | 1401 | 40 | 478 | 518 | 567 | 213 | 780 |
| % App. Total | 44.2 | 55.8 | | 7.7 | 92.3 | | 72.7 | 27.3 | |
| PHF | .932 | .869 | .949 | .714 | .898 | .918 | .766 | .819 | .780 |

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City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 5 | 6 | 1 | 3 | 0 | 4 | 3 | 2 | 0 | 5 | 0 | 15 | 15 |
| 07:15 AM | 3 | 6 | 9 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 07:30 AM | 0 | 2 | 2 | 1 | 6 | 0 | 7 | 1 | 0 | 0 | 1 | 0 | 10 | 10 |
| 07:45 AM | 0 | 4 | 4 | 0 | 1 | 0 | 1 | 4 | 1 | 0 | 5 | 0 | 10 | 10 |
| Total | 4 | 17 | 21 | 3 | 11 | 0 | 14 | 8 | 3 | 0 | 11 | 0 | 46 | 46 |
| 08:00 AM | 1 | 2 | 3 | 0 | 4 | 0 | 4 | 3 | 0 | 0 | 3 | 0 | 10 | 10 |
| 08:15 AM | 1 | 3 | 4 | 0 | 3 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 8 | 8 |
| 08:30 AM | 1 | 2 | 3 | 0 | 2 | 0 | 2 | 3 | 1 | 0 | 4 | 0 | 9 | 9 |
| 08:45 AM | 0 | 8 | 8 | 2 | 5 | 0 | 7 | 1 | 0 | 0 | 1 | 0 | 16 | 16 |
| Total | 3 | 15 | 18 | 2 | 14 | 0 | 16 | 8 | 1 | 0 | 9 | 0 | 43 | 43 |
| Grand Total | 7 | 32 | 39 | 5 | 25 | 0 | 30 | 16 | 4 | 0 | 20 | 0 | 89 | 89 |
| Apprch % | 17.9 | 82.1 | | 16.7 | 83.3 | | | 80 | 20 | | | | | |
| Total % | 7.9 | 36 | 43.8 | 5.6 | 28.1 | | 33.7 | 18 | 4.5 | | 22.5 | 0 | 100 | |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | |
| 07:30 AM | 0 | 2 | 2 | **1** | **6** | **7** | 1 | 0 | 1 | **10** |
| 07:45 AM | 0 | **4** | **4** | 0 | 1 | 1 | **4** | **1** | **5** | 10 |
| 08:00 AM | **1** | 2 | 3 | 0 | 4 | 4 | 3 | 0 | 3 | 10 |
| 08:15 AM | 1 | 3 | 4 | 0 | 3 | 3 | 1 | 0 | 1 | 8 |
| Total Volume | 2 | 11 | 13 | 1 | 14 | 15 | 9 | 1 | 10 | 38 |
| % App. Total | 15.4 | 84.6 | | 6.7 | 93.3 | | 90 | 10 | | |
| PHF | .500 | .688 | .813 | .250 | .583 | .536 | .563 | .250 | .500 | .950 |

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City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

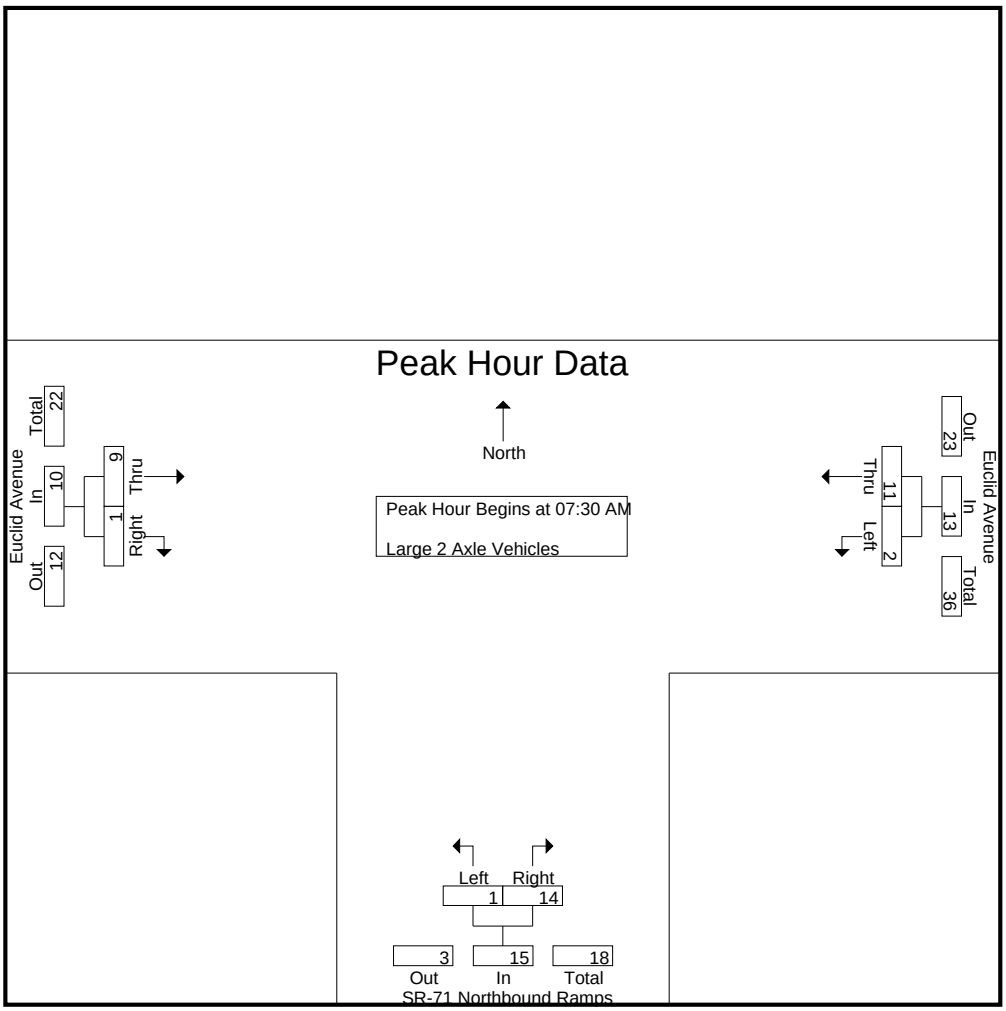


Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:30 AM | | | 07:30 AM | | | 07:30 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 2 | 2 | **1** | **6** | **7** | 1 | 0 | 1 |
| +15 mins. | 0 | **4** | **4** | 0 | 1 | 1 | **4** | **1** | **5** |
| +30 mins. | **1** | 2 | 3 | 0 | 4 | 4 | 3 | 0 | 3 |
| +45 mins. | 1 | 3 | 4 | 0 | 3 | 3 | 1 | 0 | 1 |
| Total Volume | 2 | 11 | 13 | 1 | 14 | 15 | 9 | 1 | 10 |
| % App. Total | 15.4 | 84.6 | | 6.7 | 93.3 | | 90 | 10 | |
| PHF | .500 | .688 | .813 | .250 | .583 | .536 | .563 | .250 | .500 |

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City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 2 | 2 | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 2 | 0 | 6 | 6 |
| 07:15 AM | 1 | 4 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 6 | 6 |
| 07:30 AM | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 4 | 4 |
| 07:45 AM | 1 | 1 | 2 | 0 | 4 | 0 | 4 | 3 | 0 | 0 | 3 | 0 | 9 | 9 |
| Total | 2 | 8 | 10 | 0 | 7 | 0 | 7 | 8 | 0 | 0 | 8 | 0 | 25 | 25 |
| 08:00 AM | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 08:15 AM | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 3 | 3 |
| 08:30 AM | 0 | 3 | 3 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 08:45 AM | 1 | 2 | 3 | 0 | 2 | 0 | 2 | 2 | 0 | 0 | 2 | 0 | 7 | 7 |
| Total | 2 | 7 | 9 | 0 | 4 | 0 | 4 | 4 | 0 | 0 | 4 | 0 | 17 | 17 |
| Grand Total | 4 | 15 | 19 | 0 | 11 | 0 | 11 | 12 | 0 | 0 | 12 | 0 | 42 | 42 |
| Apprch % | 21.1 | 78.9 | | 0 | 100 | | | 100 | 0 | | | | | |
| Total % | 9.5 | 35.7 | 45.2 | 0 | 26.2 | | 26.2 | 28.6 | 0 | | 28.6 | 0 | 100 | |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | |
| 07:30 AM | 0 | **1** | 1 | 0 | 1 | 1 | 2 | 0 | 2 | 4 |
| 07:45 AM | **1** | 1 | **2** | 0 | **4** | **4** | **3** | 0 | **3** | **9** |
| 08:00 AM | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 08:15 AM | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 2 | 3 |
| Total Volume | 2 | 4 | 6 | 0 | 5 | 5 | 7 | 0 | 7 | 18 |
| % App. Total | 33.3 | 66.7 | | 0 | 100 | | 100 | 0 | | |
| PHF | .500 | 1.00 | .750 | .000 | .313 | .313 | .583 | .000 | .583 | .500 |

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City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

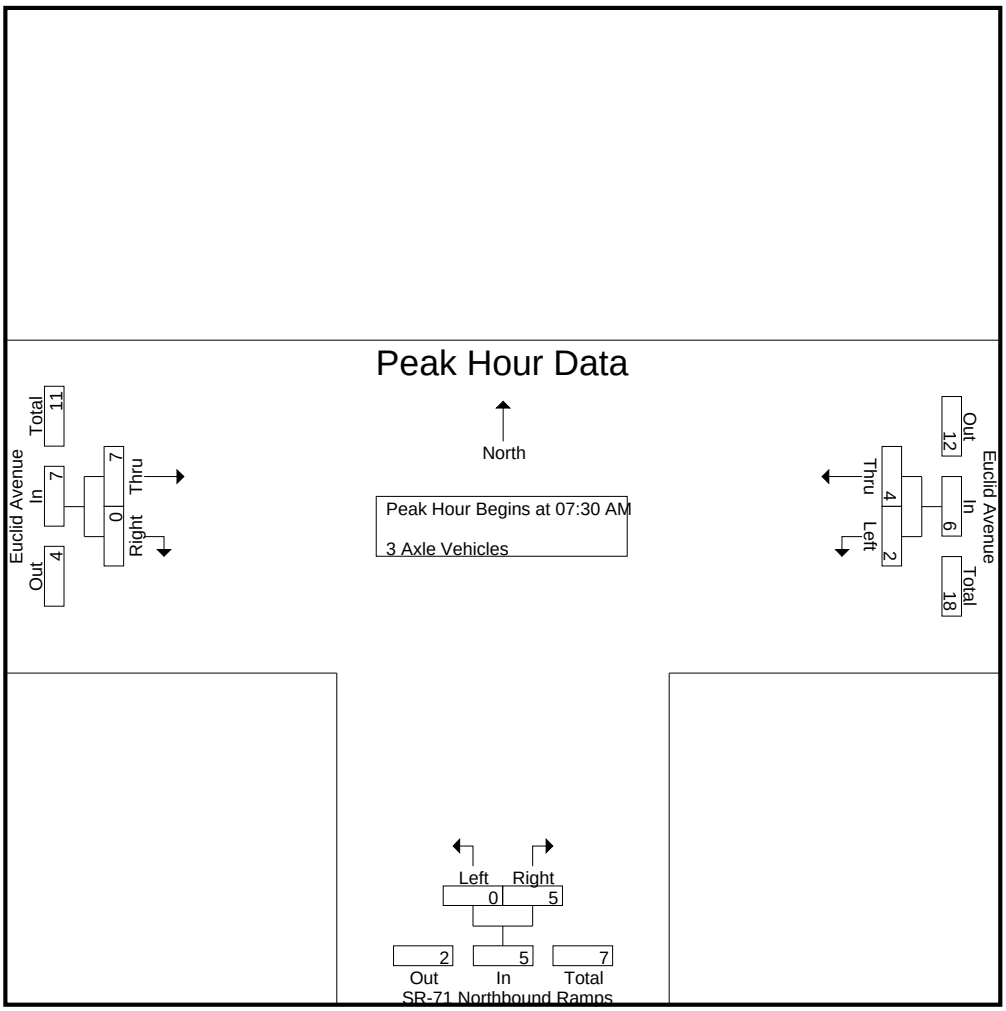


Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:30 AM | | | 07:30 AM | | | 07:30 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | **1** | 1 | 0 | 1 | 1 | 2 | 0 | 2 |
| +15 mins. | **1** | 1 | **2** | 0 | **4** | **4** | **3** | 0 | **3** |
| +30 mins. | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| +45 mins. | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0 | 2 |
| Total Volume | 2 | 4 | 6 | 0 | 5 | 5 | 7 | 0 | 7 |
| % App. Total | 33.3 | 66.7 | | 0 | 100 | | 100 | 0 | |
| PHF | .500 | 1.000 | .750 | .000 | .313 | .313 | .583 | .000 | .583 |

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City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 3 | 5 | 0 | 4 | 0 | 4 | 2 | 1 | 0 | 3 | 0 | 12 | 12 |
| 07:15 AM | 5 | 12 | 17 | 1 | 2 | 0 | 3 | 2 | 0 | 0 | 2 | 0 | 22 | 22 |
| 07:30 AM | 5 | 10 | 15 | 2 | 6 | 0 | 8 | 8 | 0 | 0 | 8 | 0 | 31 | 31 |
| 07:45 AM | 3 | 5 | 8 | 0 | 10 | 0 | 10 | 2 | 1 | 0 | 3 | 0 | 21 | 21 |
| Total | 15 | 30 | 45 | 3 | 22 | 0 | 25 | 14 | 2 | 0 | 16 | 0 | 86 | 86 |
| 08:00 AM | 5 | 7 | 12 | 1 | 4 | 0 | 5 | 5 | 0 | 0 | 5 | 0 | 22 | 22 |
| 08:15 AM | 3 | 15 | 18 | 1 | 9 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 28 | 28 |
| 08:30 AM | 8 | 8 | 16 | 1 | 6 | 0 | 7 | 1 | 0 | 0 | 1 | 0 | 24 | 24 |
| 08:45 AM | 1 | 13 | 14 | 1 | 10 | 0 | 11 | 7 | 1 | 0 | 8 | 0 | 33 | 33 |
| Total | 17 | 43 | 60 | 4 | 29 | 0 | 33 | 13 | 1 | 0 | 14 | 0 | 107 | 107 |
| Grand Total | 32 | 73 | 105 | 7 | 51 | 0 | 58 | 27 | 3 | 0 | 30 | 0 | 193 | 193 |
| Apprch % | 30.5 | 69.5 | | 12.1 | 87.9 | | | 90 | 10 | | | | | |
| Total % | 16.6 | 37.8 | 54.4 | 3.6 | 26.4 | | 30.1 | 14 | 1.6 | | 15.5 | 0 | 100 | |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | |
| 07:30 AM | **5** | 10 | 15 | **2** | 6 | 8 | **8** | 0 | **8** | **31** |
| 07:45 AM | 3 | 5 | 8 | 0 | **10** | **10** | 2 | **1** | 3 | 21 |
| 08:00 AM | 5 | 7 | 12 | 1 | 4 | 5 | 5 | 0 | 5 | 22 |
| 08:15 AM | 3 | **15** | **18** | 1 | 9 | 10 | 0 | 0 | 0 | 28 |
| Total Volume | 16 | 37 | 53 | 4 | 29 | 33 | 15 | 1 | 16 | 102 |
| % App. Total | 30.2 | 69.8 | | 12.1 | 87.9 | | 93.8 | 6.2 | | |
| PHF | .800 | .617 | .736 | .500 | .725 | .825 | .469 | .250 | .500 | .823 |

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

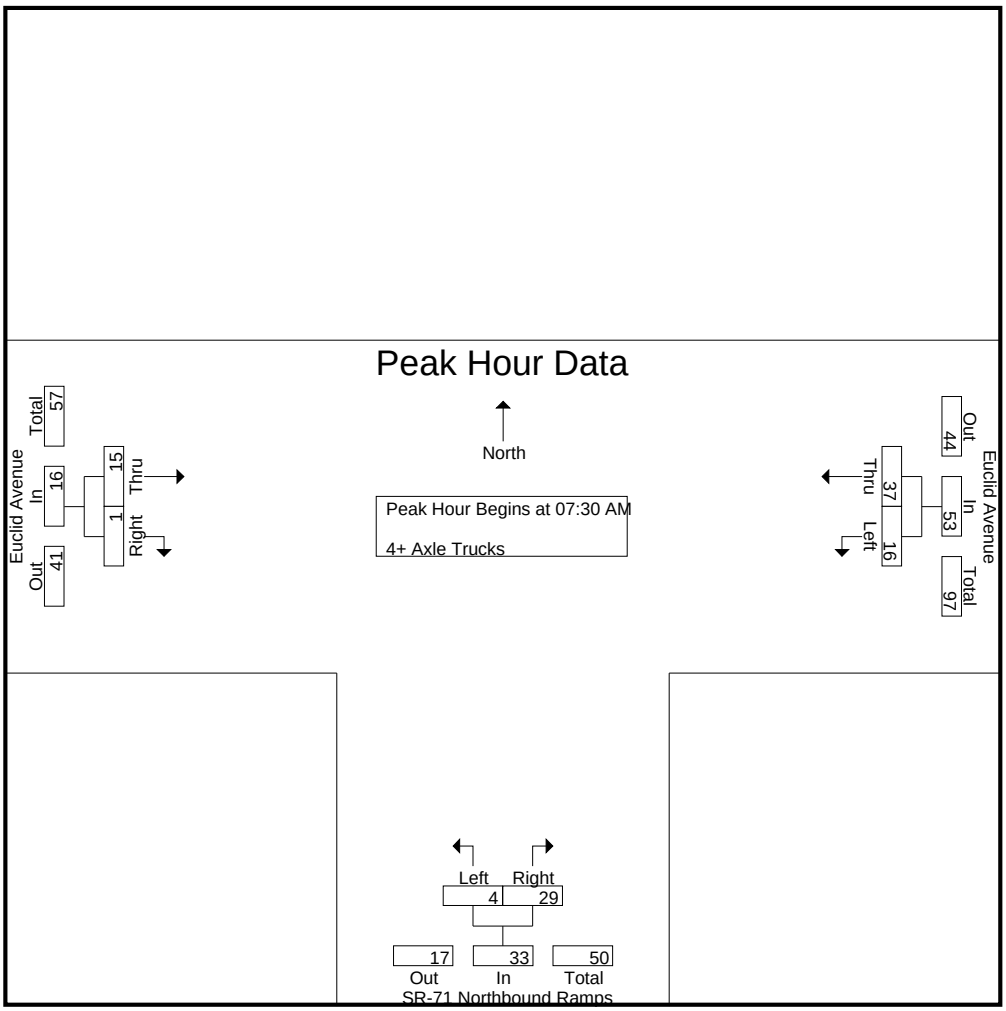


Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:30 AM | | | 07:30 AM | | | 07:30 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **5** | 10 | 15 | **2** | 6 | 8 | **8** | 0 | **8** |
| +15 mins. | 3 | 5 | 8 | 0 | **10** | **10** | 2 | **1** | 3 |
| +30 mins. | 5 | 7 | 12 | 1 | 4 | 5 | 5 | 0 | 5 |
| +45 mins. | 3 | **15** | **18** | 1 | 9 | 10 | 0 | 0 | 0 |
| Total Volume | 16 | 37 | 53 | 4 | 29 | 33 | 15 | 1 | 16 |
| % App. Total | 30.2 | 69.8 | | 12.1 | 87.9 | | 93.8 | 6.2 | |
| PHF | .800 | .617 | .736 | .500 | .725 | .825 | .469 | .250 | .500 |

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City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 74 | 185 | 259 | 17 | 201 | 0 | 218 | 157 | 33 | 0 | 190 | 0 | 667 | 667 |
| 04:15 PM | 117 | 181 | 298 | 24 | 183 | 0 | 207 | 131 | 19 | 0 | 150 | 0 | 655 | 655 |
| 04:30 PM | 100 | 221 | 321 | 32 | 190 | 0 | 222 | 225 | 42 | 0 | 267 | 0 | 810 | 810 |
| 04:45 PM | 108 | 151 | 259 | 27 | 208 | 0 | 235 | 194 | 33 | 0 | 227 | 0 | 721 | 721 |
| Total | 399 | 738 | 1137 | 100 | 782 | 0 | 882 | 707 | 127 | 0 | 834 | 0 | 2853 | 2853 |
| 05:00 PM | 106 | 173 | 279 | 18 | 189 | 0 | 207 | 212 | 27 | 0 | 239 | 0 | 725 | 725 |
| 05:15 PM | 92 | 131 | 223 | 26 | 168 | 0 | 194 | 189 | 33 | 0 | 222 | 0 | 639 | 639 |
| 05:30 PM | 99 | 177 | 276 | 19 | 178 | 0 | 197 | 184 | 27 | 0 | 211 | 0 | 684 | 684 |
| 05:45 PM | 96 | 136 | 232 | 27 | 187 | 0 | 214 | 190 | 25 | 0 | 215 | 0 | 661 | 661 |
| Total | 393 | 617 | 1010 | 90 | 722 | 0 | 812 | 775 | 112 | 0 | 887 | 0 | 2709 | 2709 |
| Grand Total | 792 | 1355 | 2147 | 190 | 1504 | 0 | 1694 | 1482 | 239 | 0 | 1721 | 0 | 5562 | 5562 |
| Apprch % | 36.9 | 63.1 | | 11.2 | 88.8 | | | 86.1 | 13.9 | | | | | |
| Total % | 14.2 | 24.4 | 38.6 | 3.4 | 27 | | 30.5 | 26.6 | 4.3 | | 30.9 | 0 | 100 | |
| Passenger Vehicles | 768 | 1288 | 2056 | 188 | 1413 | | 1601 | 1447 | 235 | | 1682 | 0 | 0 | 5339 |
| % Passenger Vehicles | 97 | 95.1 | 95.8 | 98.9 | 93.9 | 0 | 94.5 | 97.6 | 98.3 | 0 | 97.7 | 0 | 0 | 96 |
| Large 2 Axle Vehicles | 3 | 13 | 16 | 2 | 18 | | 20 | 12 | 1 | | 13 | 0 | 0 | 49 |
| % Large 2 Axle Vehicles | 0.4 | 1 | 0.7 | 1.1 | 1.2 | 0 | 1.2 | 0.8 | 0.4 | 0 | 0.8 | 0 | 0 | 0.9 |
| 3 Axle Vehicles | 7 | 5 | 12 | 0 | 8 | | 8 | 5 | 1 | | 6 | 0 | 0 | 26 |
| % 3 Axle Vehicles | 0.9 | 0.4 | 0.6 | 0 | 0.5 | 0 | 0.5 | 0.3 | 0.4 | 0 | 0.3 | 0 | 0 | 0.5 |
| 4+ Axle Trucks | 14 | 49 | 63 | 0 | 65 | | 65 | 18 | 2 | | 20 | 0 | 0 | 148 |
| % 4+ Axle Trucks | 1.8 | 3.6 | 2.9 | 0 | 4.3 | 0 | 3.8 | 1.2 | 0.8 | 0 | 1.2 | 0 | 0 | 2.7 |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | |
| 04:15 PM | **117** | 181 | 298 | 24 | 183 | 207 | 131 | 19 | 150 | 655 |
| 04:30 PM | 100 | **221** | **321** | **32** | 190 | 222 | **225** | **42** | **267** | **810** |
| 04:45 PM | 108 | 151 | 259 | 27 | **208** | **235** | 194 | 33 | 227 | 721 |
| 05:00 PM | 106 | 173 | 279 | 18 | 189 | 207 | 212 | 27 | 239 | 725 |
| Total Volume | 431 | 726 | 1157 | 101 | 770 | 871 | 762 | 121 | 883 | 2911 |
| % App. Total | 37.3 | 62.7 | | 11.6 | 88.4 | | 86.3 | 13.7 | | |
| PHF | .921 | .821 | .901 | .789 | .925 | .927 | .847 | .720 | .827 | .898 |

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City of Chino
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File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

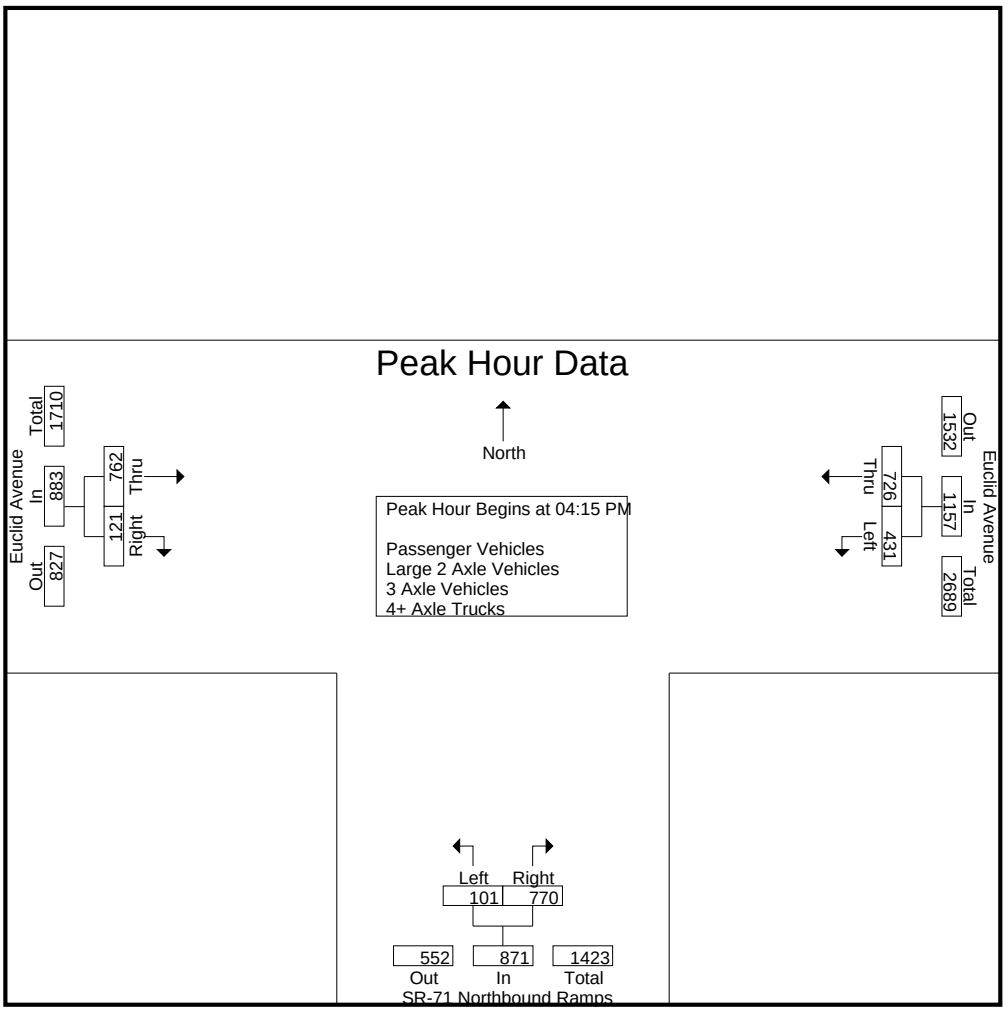


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 04:15 PM | | | 04:00 PM | | | 04:30 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **117** | 181 | 298 | 17 | 201 | 218 | **225** | **42** | **267** |
| +15 mins. | 100 | **221** | **321** | 24 | 183 | 207 | 194 | 33 | 227 |
| +30 mins. | 108 | 151 | 259 | **32** | 190 | 222 | 212 | 27 | 239 |
| +45 mins. | 106 | 173 | 279 | 27 | **208** | **235** | 189 | 33 | 222 |
| Total Volume | 431 | 726 | 1157 | 100 | 782 | 882 | 820 | 135 | 955 |
| % App. Total | 37.3 | 62.7 | | 11.3 | 88.7 | | 85.9 | 14.1 | |
| PHF | .921 | .821 | .901 | .781 | .940 | .938 | .911 | .804 | .894 |

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City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 71 | 179 | 250 | 17 | 188 | 0 | 205 | 151 | 31 | 0 | 182 | 0 | 637 | 637 |
| 04:15 PM | 112 | 174 | 286 | 23 | 164 | 0 | 187 | 127 | 19 | 0 | 146 | 0 | 619 | 619 |
| 04:30 PM | 96 | 212 | 308 | 31 | 179 | 0 | 210 | 220 | 42 | 0 | 262 | 0 | 780 | 780 |
| 04:45 PM | 105 | 143 | 248 | 27 | 197 | 0 | 224 | 190 | 33 | 0 | 223 | 0 | 695 | 695 |
| Total | 384 | 708 | 1092 | 98 | 728 | 0 | 826 | 688 | 125 | 0 | 813 | 0 | 2731 | 2731 |
| 05:00 PM | 103 | 165 | 268 | 18 | 178 | 0 | 196 | 205 | 26 | 0 | 231 | 0 | 695 | 695 |
| 05:15 PM | 88 | 122 | 210 | 26 | 157 | 0 | 183 | 187 | 33 | 0 | 220 | 0 | 613 | 613 |
| 05:30 PM | 97 | 163 | 260 | 19 | 170 | 0 | 189 | 180 | 26 | 0 | 206 | 0 | 655 | 655 |
| 05:45 PM | 96 | 130 | 226 | 27 | 180 | 0 | 207 | 187 | 25 | 0 | 212 | 0 | 645 | 645 |
| Total | 384 | 580 | 964 | 90 | 685 | 0 | 775 | 759 | 110 | 0 | 869 | 0 | 2608 | 2608 |
| Grand Total | 768 | 1288 | 2056 | 188 | 1413 | 0 | 1601 | 1447 | 235 | 0 | 1682 | 0 | 5339 | 5339 |
| Apprch % | 37.4 | 62.6 | | 11.7 | 88.3 | | | 86 | 14 | | | | | |
| Total % | 14.4 | 24.1 | 38.5 | 3.5 | 26.5 | | 30 | 27.1 | 4.4 | | 31.5 | 0 | 100 | |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | |
| 04:15 PM | **112** | 174 | 286 | 23 | 164 | 187 | 127 | 19 | 146 | 619 |
| 04:30 PM | 96 | **212** | **308** | **31** | 179 | 210 | **220** | **42** | **262** | **780** |
| 04:45 PM | 105 | 143 | 248 | 27 | **197** | **224** | 190 | 33 | 223 | 695 |
| 05:00 PM | 103 | 165 | 268 | 18 | 178 | 196 | 205 | 26 | 231 | 695 |
| Total Volume | 416 | 694 | 1110 | 99 | 718 | 817 | 742 | 120 | 862 | 2789 |
| % App. Total | 37.5 | 62.5 | | 12.1 | 87.9 | | 86.1 | 13.9 | | |
| PHF | .929 | .818 | .901 | .798 | .911 | .912 | .843 | .714 | .823 | .894 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

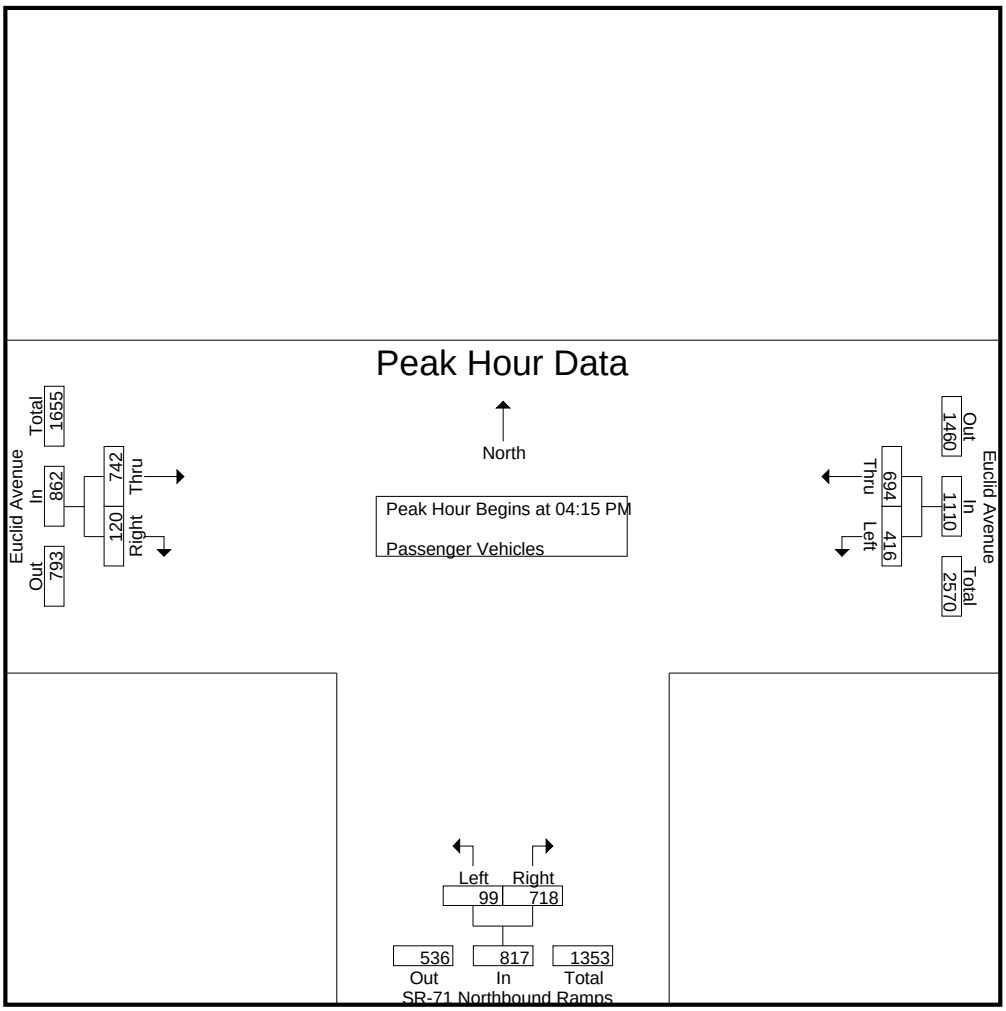


Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 04:15 PM | | | 04:15 PM | | | 04:15 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **112** | 174 | 286 | 23 | 164 | 187 | 127 | 19 | 146 |
| +15 mins. | 96 | **212** | **308** | **31** | 179 | 210 | **220** | **42** | **262** |
| +30 mins. | 105 | 143 | 248 | 27 | **197** | **224** | 190 | 33 | 223 |
| +45 mins. | 103 | 165 | 268 | 18 | 178 | 196 | 205 | 26 | 231 |
| Total Volume | 416 | 694 | 1110 | 99 | 718 | 817 | 742 | 120 | 862 |
| % App. Total | 37.5 | 62.5 | | 12.1 | 87.9 | | 86.1 | 13.9 | |
| PHF | .929 | .818 | .901 | .798 | .911 | .912 | .843 | .714 | .823 |

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(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 2 | 2 | 0 | 1 | 0 | 1 | 2 | 1 | 0 | 3 | 0 | 6 | 6 |
| 04:15 PM | 1 | 3 | 4 | 1 | 6 | 0 | 7 | 1 | 0 | 0 | 1 | 0 | 12 | 12 |
| 04:30 PM | 2 | 2 | 4 | 1 | 3 | 0 | 4 | 1 | 0 | 0 | 1 | 0 | 9 | 9 |
| 04:45 PM | 0 | 1 | 1 | 0 | 3 | 0 | 3 | 2 | 0 | 0 | 2 | 0 | 6 | 6 |
| Total | 3 | 8 | 11 | 2 | 13 | 0 | 15 | 6 | 1 | 0 | 7 | 0 | 33 | 33 |
| 05:00 PM | 0 | 2 | 2 | 0 | 2 | 0 | 2 | 4 | 0 | 0 | 4 | 0 | 8 | 8 |
| 05:15 PM | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 2 |
| 05:30 PM | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 05:45 PM | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 4 | 4 |
| Total | 0 | 5 | 5 | 0 | 5 | 0 | 5 | 6 | 0 | 0 | 6 | 0 | 16 | 16 |
| Grand Total | 3 | 13 | 16 | 2 | 18 | 0 | 20 | 12 | 1 | 0 | 13 | 0 | 49 | 49 |
| Apprch % | 18.8 | 81.2 | | 10 | 90 | | | 92.3 | 7.7 | | | | | |
| Total % | 6.1 | 26.5 | 32.7 | 4.1 | 36.7 | | 40.8 | 24.5 | 2 | | 26.5 | 0 | 100 | |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | |
| 04:15 PM | 1 | **3** | **4** | **1** | **6** | **7** | 1 | 0 | 1 | **12** |
| 04:30 PM | **2** | 2 | 4 | 1 | 3 | 4 | 1 | 0 | 1 | 9 |
| 04:45 PM | 0 | 1 | 1 | 0 | 3 | 3 | 2 | 0 | 2 | 6 |
| 05:00 PM | 0 | 2 | 2 | 0 | 2 | 2 | **4** | 0 | **4** | 8 |
| Total Volume | 3 | 8 | 11 | 2 | 14 | 16 | 8 | 0 | 8 | 35 |
| % App. Total | 27.3 | 72.7 | | 12.5 | 87.5 | | 100 | 0 | | |
| PHF | .375 | .667 | .688 | .500 | .583 | .571 | .500 | .000 | .500 | .729 |

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

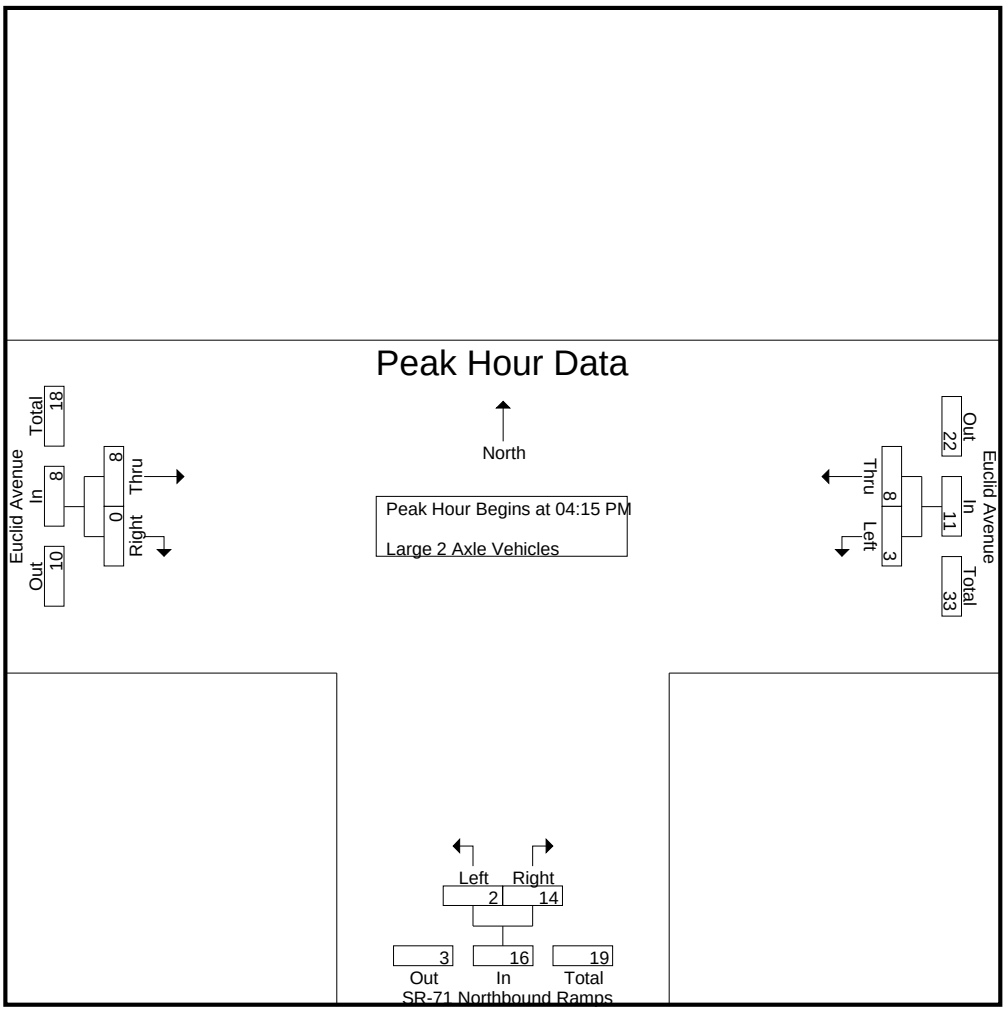


Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 04:15 PM | | | 04:15 PM | | | 04:15 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 1 | **3** | **4** | **1** | **6** | **7** | 1 | 0 | 1 |
| +15 mins. | **2** | 2 | 4 | 1 | 3 | 4 | 1 | 0 | 1 |
| +30 mins. | 0 | 1 | 1 | 0 | 3 | 3 | 2 | 0 | 2 |
| +45 mins. | 0 | 2 | 2 | 0 | 2 | 2 | **4** | 0 | **4** |
| Total Volume | 3 | 8 | 11 | 2 | 14 | 16 | 8 | 0 | 8 |
| % App. Total | 27.3 | 72.7 | | 12.5 | 87.5 | | 100 | 0 | |
| PHF | .375 | .667 | .688 | .500 | .583 | .571 | .500 | .000 | .500 |

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 2 | 2 | 0 | 4 | 0 | 4 | 1 | 0 | 0 | 1 | 0 | 7 | 7 |
| 04:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 04:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 04:45 PM | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Total | 1 | 2 | 3 | 0 | 6 | 0 | 6 | 2 | 0 | 0 | 2 | 0 | 11 | 11 |
| 05:00 PM | 3 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 5 |
| 05:15 PM | 2 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 05:30 PM | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 5 | 5 |
| 05:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 2 |
| Total | 6 | 3 | 9 | 0 | 2 | 0 | 2 | 3 | 1 | 0 | 4 | 0 | 15 | 15 |
| Grand Total | 7 | 5 | 12 | 0 | 8 | 0 | 8 | 5 | 1 | 0 | 6 | 0 | 26 | 26 |
| Apprch % | 58.3 | 41.7 | | 0 | 100 | | | 83.3 | 16.7 | | | | | |
| Total % | 26.9 | 19.2 | 46.2 | 0 | 30.8 | | 30.8 | 19.2 | 3.8 | | 23.1 | 0 | 100 | |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | |
| 04:15 PM | 0 | 0 | 0 | 0 | **1** | **1** | 0 | 0 | 0 | 1 |
| 04:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 1 |
| 04:45 PM | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 2 |
| 05:00 PM | **3** | **1** | **4** | 0 | 0 | 0 | 0 | **1** | 1 | **5** |
| Total Volume | 4 | 1 | 5 | 0 | 2 | 2 | 1 | 1 | 2 | 9 |
| % App. Total | 80 | 20 | | 0 | 100 | | 50 | 50 | | |
| PHF | .333 | .250 | .313 | .000 | .500 | .500 | .250 | .250 | .500 | .450 |

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Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

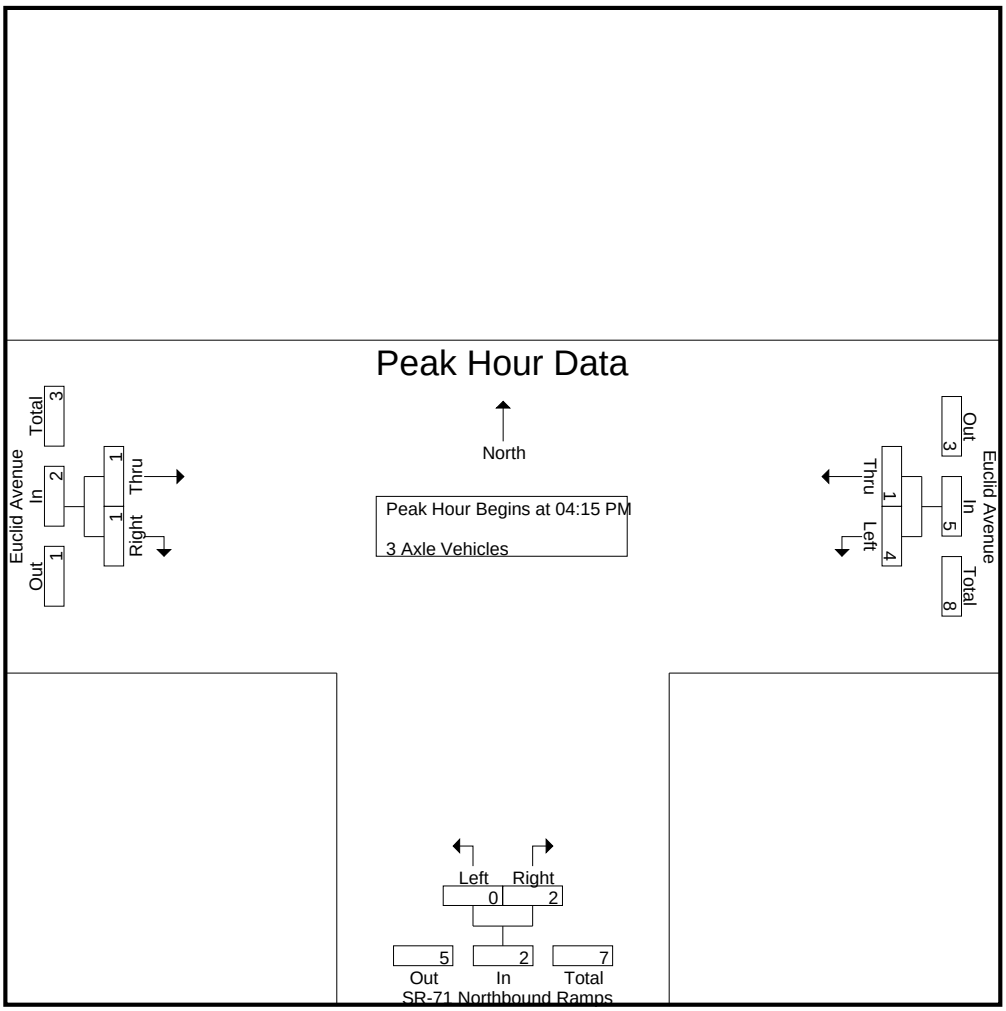


Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 04:15 PM | | | 04:15 PM | | | 04:15 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 0 | 0 | 0 | **1** | **1** | 0 | 0 | 0 |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** |
| +30 mins. | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 |
| +45 mins. | **3** | **1** | **4** | 0 | 0 | 0 | 0 | **1** | 1 |
| Total Volume | 4 | 1 | 5 | 0 | 2 | 2 | 1 | 1 | 2 |
| % App. Total | 80 | 20 | | 0 | 100 | | 50 | 50 | |
| PHF | .333 | .250 | .313 | .000 | .500 | .500 | .250 | .250 | .500 |

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(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | | Euclid Avenue Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 3 | 2 | 5 | 0 | 8 | 0 | 8 | 3 | 1 | 0 | 4 | 0 | 17 | 17 |
| 04:15 PM | 4 | 4 | 8 | 0 | 12 | 0 | 12 | 3 | 0 | 0 | 3 | 0 | 23 | 23 |
| 04:30 PM | 2 | 7 | 9 | 0 | 8 | 0 | 8 | 3 | 0 | 0 | 3 | 0 | 20 | 20 |
| 04:45 PM | 2 | 7 | 9 | 0 | 7 | 0 | 7 | 2 | 0 | 0 | 2 | 0 | 18 | 18 |
| Total | 11 | 20 | 31 | 0 | 35 | 0 | 35 | 11 | 1 | 0 | 12 | 0 | 78 | 78 |
| 05:00 PM | 0 | 5 | 5 | 0 | 9 | 0 | 9 | 3 | 0 | 0 | 3 | 0 | 17 | 17 |
| 05:15 PM | 2 | 7 | 9 | 0 | 11 | 0 | 11 | 1 | 0 | 0 | 1 | 0 | 21 | 21 |
| 05:30 PM | 1 | 12 | 13 | 0 | 6 | 0 | 6 | 2 | 1 | 0 | 3 | 0 | 22 | 22 |
| 05:45 PM | 0 | 5 | 5 | 0 | 4 | 0 | 4 | 1 | 0 | 0 | 1 | 0 | 10 | 10 |
| Total | 3 | 29 | 32 | 0 | 30 | 0 | 30 | 7 | 1 | 0 | 8 | 0 | 70 | 70 |
| Grand Total | 14 | 49 | 63 | 0 | 65 | 0 | 65 | 18 | 2 | 0 | 20 | 0 | 148 | 148 |
| Apprch % | 22.2 | 77.8 | | 0 | 100 | | | 90 | 10 | | | | | |
| Total % | 9.5 | 33.1 | 42.6 | 0 | 43.9 | | 43.9 | 12.2 | 1.4 | | 13.5 | 0 | 100 | |

| | Euclid Avenue Westbound | | | SR-71 Northbound Ramps Northbound | | | Euclid Avenue Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | |
| 04:15 PM | **4** | 4 | 8 | 0 | **12** | **12** | **3** | 0 | **3** | **23** |
| 04:30 PM | 2 | **7** | **9** | 0 | 8 | 8 | 3 | 0 | 3 | 20 |
| 04:45 PM | 2 | 7 | 9 | 0 | 7 | 7 | 2 | 0 | 2 | 18 |
| 05:00 PM | 0 | 5 | 5 | 0 | 9 | 9 | 3 | 0 | 3 | 17 |
| Total Volume | 8 | 23 | 31 | 0 | 36 | 36 | 11 | 0 | 11 | 78 |
| % App. Total | 25.8 | 74.2 | | 0 | 100 | | 100 | 0 | | |
| PHF | .500 | .821 | .861 | .000 | .750 | .750 | .917 | .000 | .917 | .848 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 Northbound Ramps
E/W: Euclid Avenue
Weather: Clear

File Name : 12_CHN_71N_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

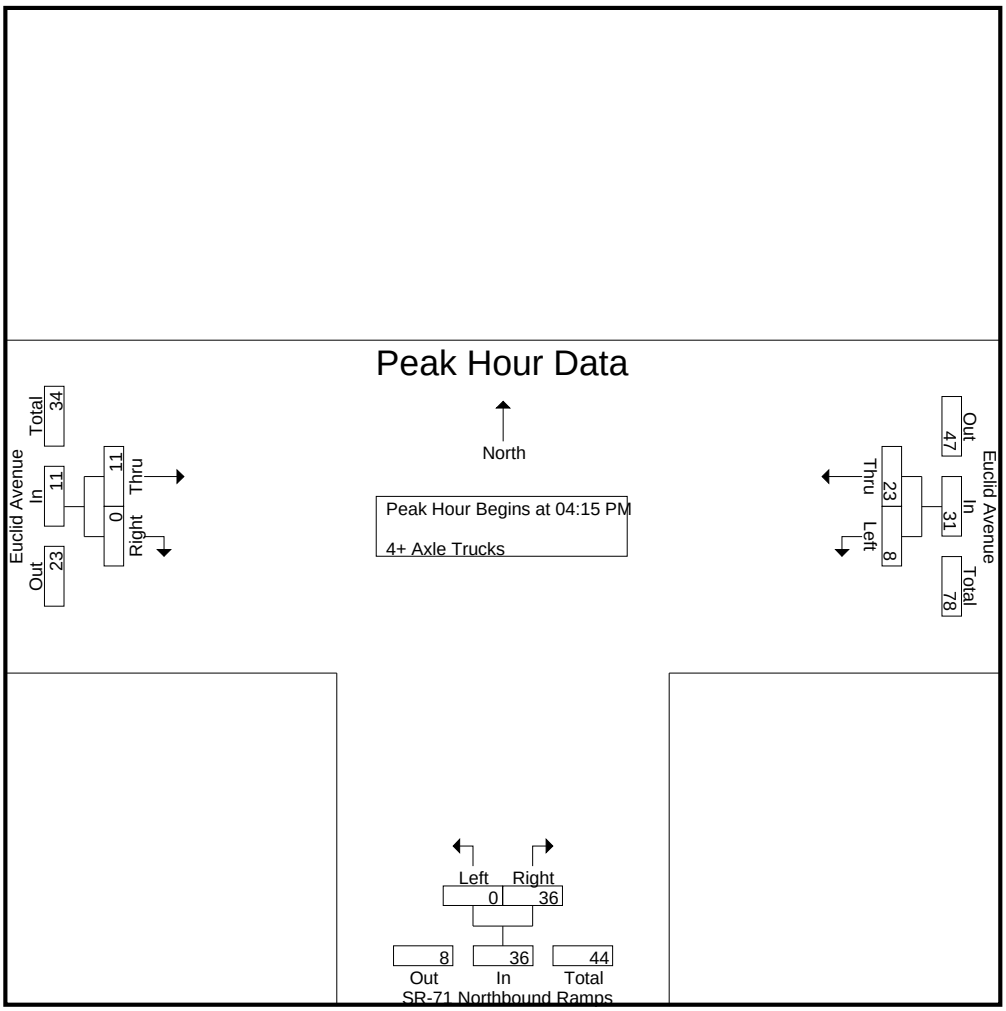


Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 04:15 PM | | | 04:15 PM | | | 04:15 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **4** | 4 | 8 | 0 | **12** | **12** | **3** | 0 | **3** |
| +15 mins. | 2 | **7** | **9** | 0 | 8 | 8 | 3 | 0 | 3 |
| +30 mins. | 2 | 7 | 9 | 0 | 7 | 7 | 2 | 0 | 2 |
| +45 mins. | 0 | 5 | 5 | 0 | 9 | 9 | 3 | 0 | 3 |
| Total Volume | 8 | 23 | 31 | 0 | 36 | 36 | 11 | 0 | 11 |
| % App. Total | 25.8 | 74.2 | | 0 | 100 | | 100 | 0 | |
| PHF | .500 | .821 | .861 | .000 | .750 | .750 | .917 | .000 | .917 |

Location: Chino
N/S: SR-71 NB Ramps
E/W: Euclid Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Dead End | East Leg<br>Euclid Avenue | South Leg<br>SR-71 NB Ramps | West Leg<br>Euclid Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg<br>Dead End | East Leg<br>Euclid Avenue | South Leg<br>SR-71 NB Ramps | West Leg<br>Euclid Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

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951-268-6268

Location: Chino
N/S: SR-71 NB Ramps
E/W: Euclid Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Dead End | | | Westbound Euclid Avenue | | | Northbound SR-71 NB Ramps | | | Eastbound Euclid Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

| | Southbound Dead End | | | Westbound Euclid Avenue | | | Northbound SR-71 NB Ramps | | | Eastbound Euclid Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 |

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 SB Off Ramps/Shady View Drive
E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 79 | 6 | 4 | 2 | 89 | 54 | 27 | 0 | 0 | 81 | 0 | 0 | 55 | 28 | 55 | 0 | 88 | 8 | 2 | 96 | 32 | 321 | 353 |
| 07:15 AM | 87 | 12 | 3 | 1 | 102 | 46 | 33 | 0 | 0 | 79 | 2 | 0 | 49 | 24 | 51 | 0 | 113 | 7 | 2 | 120 | 27 | 352 | 379 |
| 07:30 AM | 142 | 6 | 4 | 3 | 152 | 57 | 53 | 0 | 0 | 110 | 5 | 0 | 59 | 30 | 64 | 0 | 121 | 11 | 5 | 132 | 38 | 458 | 496 |
| 07:45 AM | 144 | 12 | 7 | 5 | 163 | 42 | 67 | 0 | 0 | 109 | 20 | 0 | 88 | 20 | 108 | 0 | 141 | 7 | 2 | 148 | 27 | 528 | 555 |
| Total | 452 | 36 | 18 | 11 | 506 | 199 | 180 | 0 | 0 | 379 | 27 | 0 | 251 | 102 | 278 | 0 | 463 | 33 | 11 | 496 | 124 | 1659 | 1783 |
| 08:00 AM | 99 | 9 | 10 | 6 | 118 | 32 | 81 | 0 | 0 | 113 | 8 | 0 | 45 | 27 | 53 | 0 | 135 | 7 | 2 | 142 | 35 | 426 | 461 |
| 08:15 AM | 115 | 8 | 15 | 7 | 138 | 34 | 61 | 0 | 0 | 95 | 10 | 0 | 49 | 29 | 59 | 0 | 148 | 8 | 3 | 156 | 39 | 448 | 487 |
| 08:30 AM | 73 | 9 | 6 | 1 | 88 | 19 | 39 | 0 | 0 | 58 | 7 | 0 | 43 | 33 | 50 | 0 | 139 | 7 | 2 | 146 | 36 | 342 | 378 |
| 08:45 AM | 88 | 8 | 13 | 8 | 109 | 19 | 41 | 0 | 0 | 60 | 8 | 0 | 50 | 38 | 58 | 0 | 72 | 2 | 1 | 74 | 47 | 301 | 348 |
| Total | 375 | 34 | 44 | 22 | 453 | 104 | 222 | 0 | 0 | 326 | 33 | 0 | 187 | 127 | 220 | 0 | 494 | 24 | 8 | 518 | 157 | 1517 | 1674 |
| Grand Total | 827 | 70 | 62 | 33 | 959 | 303 | 402 | 0 | 0 | 705 | 60 | 0 | 438 | 229 | 498 | 0 | 957 | 57 | 19 | 1014 | 281 | 3176 | 3457 |
| Apprch % | 86.2 | 7.3 | 6.5 | | | 43 | 57 | 0 | | | 12 | 0 | 88 | | | 0 | 94.4 | 5.6 | | | | | |
| Total % | 26 | 2.2 | 2 | | 30.2 | 9.5 | 12.7 | 0 | | 22.2 | 1.9 | 0 | 13.8 | | 15.7 | 0 | 30.1 | 1.8 | | 31.9 | 8.1 | 91.9 | |
| Passenger Vehicles | 778 | 67 | 58 | | 934 | 290 | 385 | 0 | | 675 | 59 | 0 | 425 | | 707 | 0 | 942 | 55 | | 1015 | 0 | 0 | 3331 |
| % Passenger Vehicles | 94.1 | 95.7 | 93.5 | 93.9 | 94.2 | 95.7 | 95.8 | 0 | 0 | 95.7 | 98.3 | 0 | 97 | 97.4 | 97.2 | 0 | 98.4 | 96.5 | 94.7 | 98.3 | 0 | 0 | 96.4 |
| Large 2 Axle Vehicles | 12 | 1 | 3 | | 18 | 6 | 11 | 0 | | 17 | 1 | 0 | 6 | | 10 | 0 | 10 | 1 | | 11 | 0 | 0 | 56 |
| % Large 2 Axle Vehicles | 1.5 | 1.4 | 4.8 | 6.1 | 1.8 | 2 | 2.7 | 0 | 0 | 2.4 | 1.7 | 0 | 1.4 | 1.3 | 1.4 | 0 | 1 | 1.8 | 0 | 1.1 | 0 | 0 | 1.6 |
| 3 Axle Vehicles | 8 | 0 | 1 | | 9 | 2 | 3 | 0 | | 5 | 0 | 0 | 1 | | 1 | 0 | 4 | 0 | | 4 | 0 | 0 | 19 |
| % 3 Axle Vehicles | 1 | 0 | 1.6 | 0 | 0.9 | 0.7 | 0.7 | 0 | 0 | 0.7 | 0 | 0 | 0.2 | 0 | 0.1 | 0 | 0.4 | 0 | 0 | 0.4 | 0 | 0 | 0.5 |
| 4+ Axle Trucks | 29 | 2 | 0 | | 31 | 5 | 3 | 0 | | 8 | 0 | 0 | 6 | | 9 | 0 | 1 | 1 | | 3 | 0 | 0 | 51 |
| % 4+ Axle Trucks | 3.5 | 2.9 | 0 | 0 | 3.1 | 1.7 | 0.7 | 0 | 0 | 1.1 | 0 | 0 | 1.4 | 1.3 | 1.2 | 0 | 0.1 | 1.8 | 5.3 | 0.3 | 0 | 0 | 1.5 |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 142 | 6 | 4 | 152 | **57** | 53 | 0 | 110 | 5 | 0 | 59 | 64 | 0 | 121 | **11** | 132 | 458 |
| 07:45 AM | **144** | **12** | 7 | **163** | 42 | 67 | 0 | 109 | **20** | 0 | **88** | **108** | 0 | 141 | 7 | 148 | **528** |
| 08:00 AM | 99 | 9 | 10 | 118 | 32 | **81** | 0 | **113** | 8 | 0 | 45 | 53 | 0 | 135 | 7 | 142 | 426 |
| 08:15 AM | 115 | 8 | **15** | 138 | 34 | 61 | 0 | 95 | 10 | 0 | 49 | 59 | 0 | **148** | 8 | **156** | 448 |
| Total Volume | 500 | 35 | 36 | 571 | 165 | 262 | 0 | 427 | 43 | 0 | 241 | 284 | 0 | 545 | 33 | 578 | 1860 |
| % App. Total | 87.6 | 6.1 | 6.3 | | 38.6 | 61.4 | 0 | | 15.1 | 0 | 84.9 | | 0 | 94.3 | 5.7 | | |
| PHF | .868 | .729 | .600 | .876 | .724 | .809 | .000 | .945 | .538 | .000 | .685 | .657 | .000 | .921 | .750 | .926 | .881 |

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E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

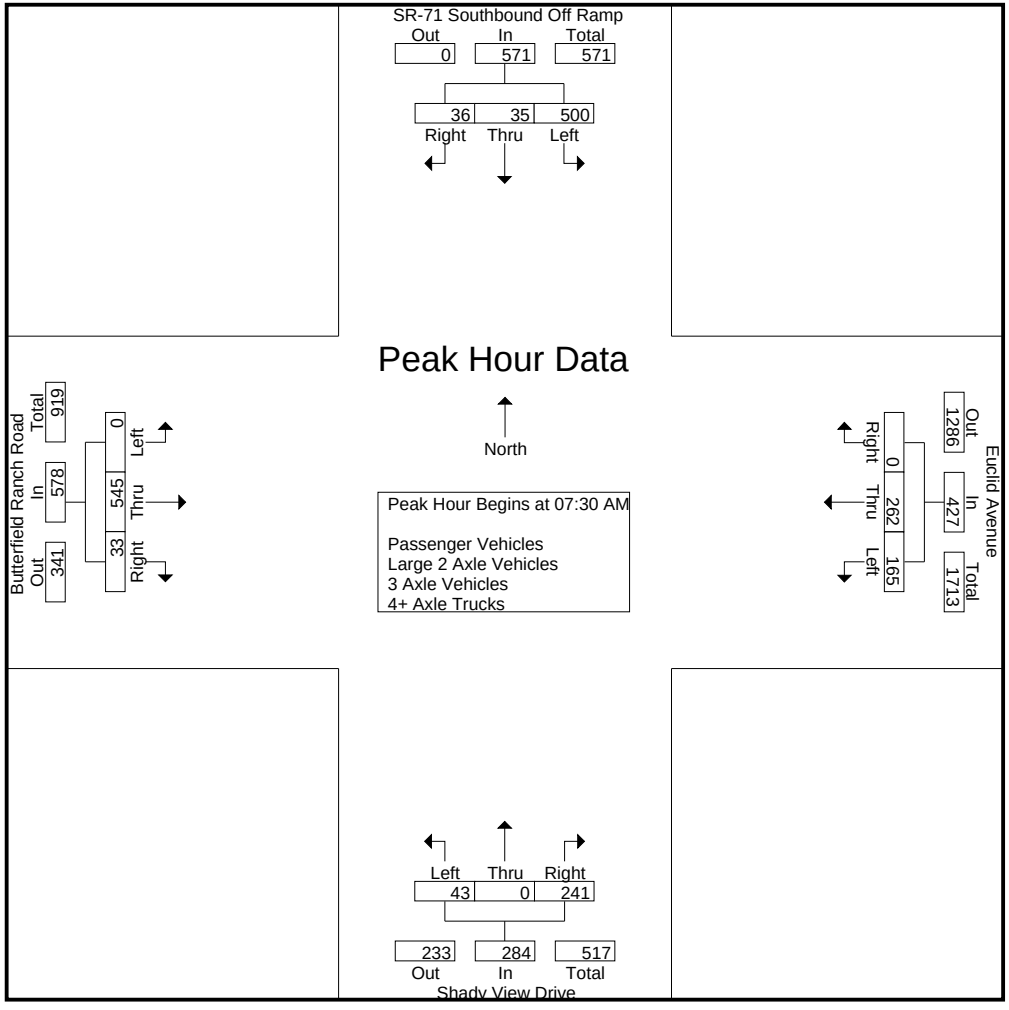

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File Name : 13_CHN_71S_Euc AMC
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Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:45 AM | | | | |
| +0 mins. | 142 | 6 | 4 | 152 | **57** | 53 | 0 | 110 | 5 | 0 | 59 | 64 | 0 | 141 | 7 | 148 | |
| +15 mins. | **144** | **12** | 7 | **163** | 42 | 67 | 0 | 109 | **20** | 0 | **88** | **108** | 0 | 135 | 7 | 142 | |
| +30 mins. | 99 | 9 | 10 | 118 | 32 | **81** | 0 | **113** | 8 | 0 | 45 | 53 | 0 | **148** | **8** | **156** | |
| +45 mins. | 115 | 8 | **15** | 138 | 34 | 61 | 0 | 95 | 10 | 0 | 49 | 59 | 0 | 139 | 7 | 146 | |
| Total Volume | 500 | 35 | 36 | 571 | 165 | 262 | 0 | 427 | 43 | 0 | 241 | 284 | 0 | 563 | 29 | 592 | |
| % App. Total | 87.6 | 6.1 | 6.3 | | 38.6 | 61.4 | 0 | | 15.1 | 0 | 84.9 | | 0 | 95.1 | 4.9 | | |
| PHF | .868 | .729 | .600 | .876 | .724 | .809 | .000 | .945 | .538 | .000 | .685 | .657 | .000 | .951 | .906 | .949 | |

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E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 73 | 5 | 3 | 1 | 81 | 52 | 23 | 0 | 0 | 75 | 0 | 0 | 54 | 28 | 54 | 0 | 85 | 8 | 2 | 93 | 31 | 303 | 334 |
| 07:15 AM | 84 | 12 | 3 | 1 | 99 | 44 | 31 | 0 | 0 | 75 | 2 | 0 | 49 | 24 | 51 | 0 | 111 | 5 | 1 | 116 | 26 | 341 | 367 |
| 07:30 AM | 132 | 6 | 4 | 3 | 142 | 56 | 52 | 0 | 0 | 108 | 5 | 0 | 53 | 27 | 58 | 0 | 120 | 11 | 5 | 131 | 35 | 439 | 474 |
| 07:45 AM | 137 | 11 | 6 | 4 | 154 | 41 | 66 | 0 | 0 | 107 | 20 | 0 | 85 | 20 | 105 | 0 | 139 | 7 | 2 | 146 | 26 | 512 | 538 |
| Total | 426 | 34 | 16 | 9 | 476 | 193 | 172 | 0 | 0 | 365 | 27 | 0 | 241 | 99 | 268 | 0 | 455 | 31 | 10 | 486 | 118 | 1595 | 1713 |
| 08:00 AM | 93 | 9 | 10 | 6 | 112 | 30 | 79 | 0 | 0 | 109 | 8 | 0 | 45 | 27 | 53 | 0 | 134 | 7 | 2 | 141 | 35 | 415 | 450 |
| 08:15 AM | 110 | 8 | 15 | 7 | 133 | 34 | 58 | 0 | 0 | 92 | 9 | 0 | 48 | 28 | 57 | 0 | 146 | 8 | 3 | 154 | 38 | 436 | 474 |
| 08:30 AM | 71 | 8 | 5 | 1 | 84 | 17 | 38 | 0 | 0 | 55 | 7 | 0 | 43 | 33 | 50 | 0 | 136 | 7 | 2 | 143 | 36 | 332 | 368 |
| 08:45 AM | 78 | 8 | 12 | 8 | 98 | 16 | 38 | 0 | 0 | 54 | 8 | 0 | 48 | 36 | 56 | 0 | 71 | 2 | 1 | 73 | 45 | 281 | 326 |
| Total | 352 | 33 | 42 | 22 | 427 | 97 | 213 | 0 | 0 | 310 | 32 | 0 | 184 | 124 | 216 | 0 | 487 | 24 | 8 | 511 | 154 | 1464 | 1618 |
| Grand Total | 778 | 67 | 58 | 31 | 903 | 290 | 385 | 0 | 0 | 675 | 59 | 0 | 425 | 223 | 484 | 0 | 942 | 55 | 18 | 997 | 272 | 3059 | 3331 |
| Apprch % | 86.2 | 7.4 | 6.4 | | | 43 | 57 | 0 | | | 12.2 | 0 | 87.8 | | | 0 | 94.5 | 5.5 | | | | | |
| Total % | 25.4 | 2.2 | 1.9 | | 29.5 | 9.5 | 12.6 | 0 | | 22.1 | 1.9 | 0 | 13.9 | | 15.8 | 0 | 30.8 | 1.8 | | 32.6 | 8.2 | 91.8 | |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 132 | 6 | 4 | 142 | **56** | 52 | 0 | 108 | 5 | 0 | 53 | 58 | 0 | 120 | **11** | 131 | 439 |
| 07:45 AM | **137** | **11** | 6 | **154** | 41 | 66 | 0 | 107 | **20** | 0 | **85** | **105** | 0 | 139 | 7 | 146 | **512** |
| 08:00 AM | 93 | 9 | 10 | 112 | 30 | **79** | 0 | **109** | 8 | 0 | 45 | 53 | 0 | 134 | 7 | 141 | 415 |
| 08:15 AM | 110 | 8 | **15** | 133 | 34 | 58 | 0 | 92 | 9 | 0 | 48 | 57 | 0 | **146** | 8 | **154** | 436 |
| Total Volume | 472 | 34 | 35 | 541 | 161 | 255 | 0 | 416 | 42 | 0 | 231 | 273 | 0 | 539 | 33 | 572 | 1802 |
| % App. Total | 87.2 | 6.3 | 6.5 | | 38.7 | 61.3 | 0 | | 15.4 | 0 | 84.6 | | 0 | 94.2 | 5.8 | | |
| PHF | .861 | .773 | .583 | .878 | .719 | .807 | .000 | .954 | .525 | .000 | .679 | .650 | .000 | .923 | .750 | .929 | .880 |

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E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

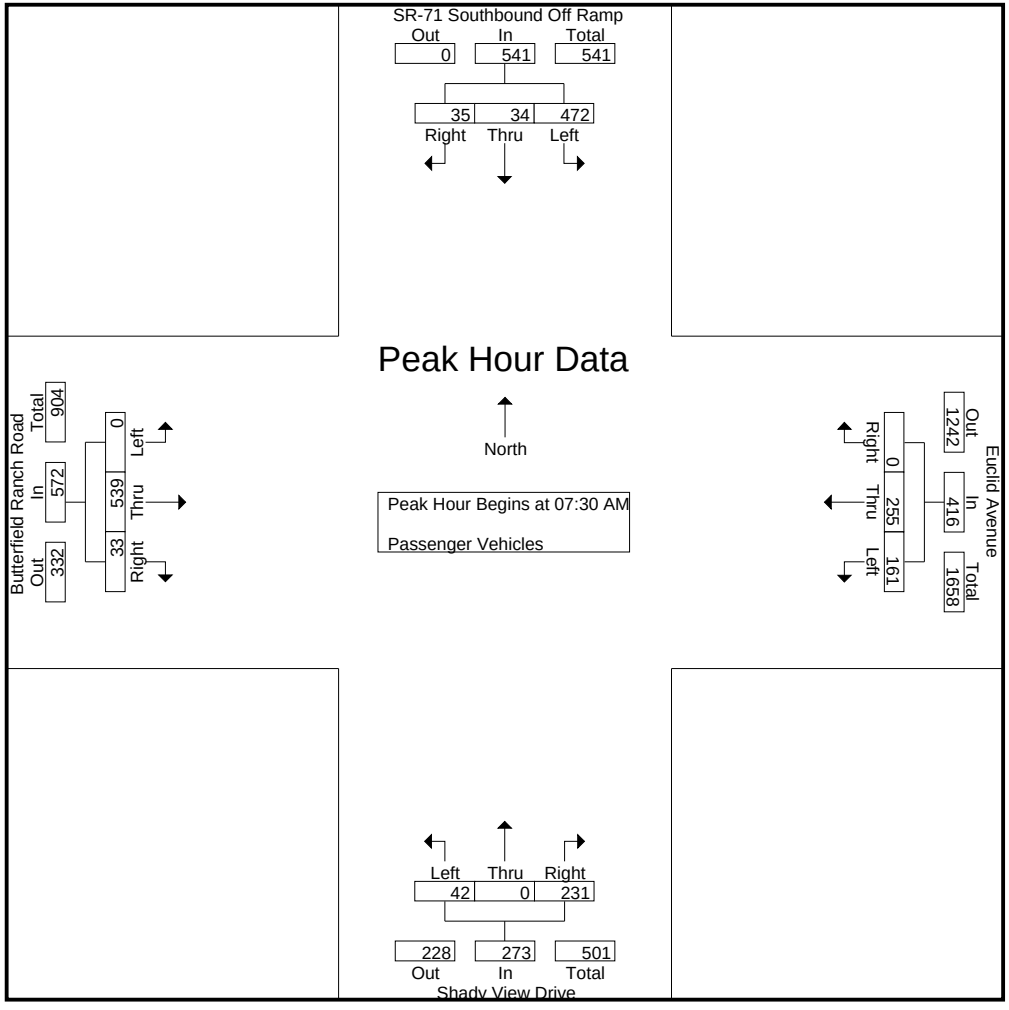

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File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 132 | 6 | 4 | 142 | **56** | 52 | 0 | 108 | 5 | 0 | 53 | 58 | 0 | 120 | **11** | 131 | |
| +15 mins. | **137** | **11** | 6 | **154** | 41 | 66 | 0 | 107 | **20** | 0 | **85** | **105** | 0 | 139 | 7 | 146 | |
| +30 mins. | 93 | 9 | 10 | 112 | 30 | **79** | 0 | **109** | 8 | 0 | 45 | 53 | 0 | 134 | 7 | 141 | |
| +45 mins. | 110 | 8 | **15** | 133 | 34 | 58 | 0 | 92 | 9 | 0 | 48 | 57 | 0 | **146** | 8 | **154** | |
| Total Volume | 472 | 34 | 35 | 541 | 161 | 255 | 0 | 416 | 42 | 0 | 231 | 273 | 0 | 539 | 33 | 572 | |
| % App. Total | 87.2 | 6.3 | 6.5 | | 38.7 | 61.3 | 0 | | 15.4 | 0 | 84.6 | | 0 | 94.2 | 5.8 | | |
| PHF | .861 | .773 | .583 | .878 | .719 | .807 | .000 | .954 | .525 | .000 | .679 | .650 | .000 | .923 | .750 | .929 | |

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City of Chino
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Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 0 | 1 | 1 | 3 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 9 | 10 |
| 07:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 4 | 4 |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 2 | 3 | 0 | 1 | 0 | 0 | 1 | 2 | 5 | 7 |
| 07:45 AM | 3 | 0 | 1 | 1 | 4 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 1 | 8 | 9 |
| Total | 5 | 0 | 2 | 2 | 7 | 4 | 4 | 0 | 0 | 8 | 0 | 0 | 5 | 2 | 5 | 0 | 5 | 1 | 0 | 6 | 4 | 26 | 30 |
| 08:00 AM | 2 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 6 | 6 |
| 08:15 AM | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 5 | 6 |
| 08:30 AM | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 6 | 6 |
| 08:45 AM | 3 | 0 | 1 | 0 | 4 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 |
| Total | 7 | 1 | 1 | 0 | 9 | 2 | 7 | 0 | 0 | 9 | 1 | 0 | 1 | 1 | 2 | 0 | 5 | 0 | 0 | 5 | 1 | 25 | 26 |
| Grand Total | 12 | 1 | 3 | 2 | 16 | 6 | 11 | 0 | 0 | 17 | 1 | 0 | 6 | 3 | 7 | 0 | 10 | 1 | 0 | 11 | 5 | 51 | 56 |
| Apprch % | 75 | 6.2 | 18.8 | | | 35.3 | 64.7 | 0 | | | 14.3 | 0 | 85.7 | | | 0 | 90.9 | 9.1 | | | | | |
| Total % | 23.5 | 2 | 5.9 | | 31.4 | 11.8 | 21.6 | 0 | | 33.3 | 2 | 0 | 11.8 | | 13.7 | 0 | 19.6 | 2 | | 21.6 | 8.9 | 91.1 | |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 0 | 0 | 0 | **1** | 0 | 0 | 1 | 0 | 0 | **3** | **3** | 0 | 1 | 0 | 1 | 5 |
| 07:45 AM | **3** | 0 | **1** | **4** | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | **2** | 0 | **2** | **8** |
| 08:00 AM | 2 | 0 | 0 | 2 | 1 | **2** | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 6 |
| 08:15 AM | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | **1** | 0 | 1 | 2 | 0 | 1 | 0 | 1 | 5 |
| Total Volume | 6 | 0 | 1 | 7 | 3 | 3 | 0 | 6 | 1 | 0 | 5 | 6 | 0 | 5 | 0 | 5 | 24 |
| % App. Total | 85.7 | 0 | 14.3 | | 50 | 50 | 0 | | 16.7 | 0 | 83.3 | | 0 | 100 | 0 | | |
| PHF | .500 | .000 | .250 | .438 | .750 | .375 | .000 | .500 | .250 | .000 | .417 | .500 | .000 | .625 | .000 | .625 | .750 |

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Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

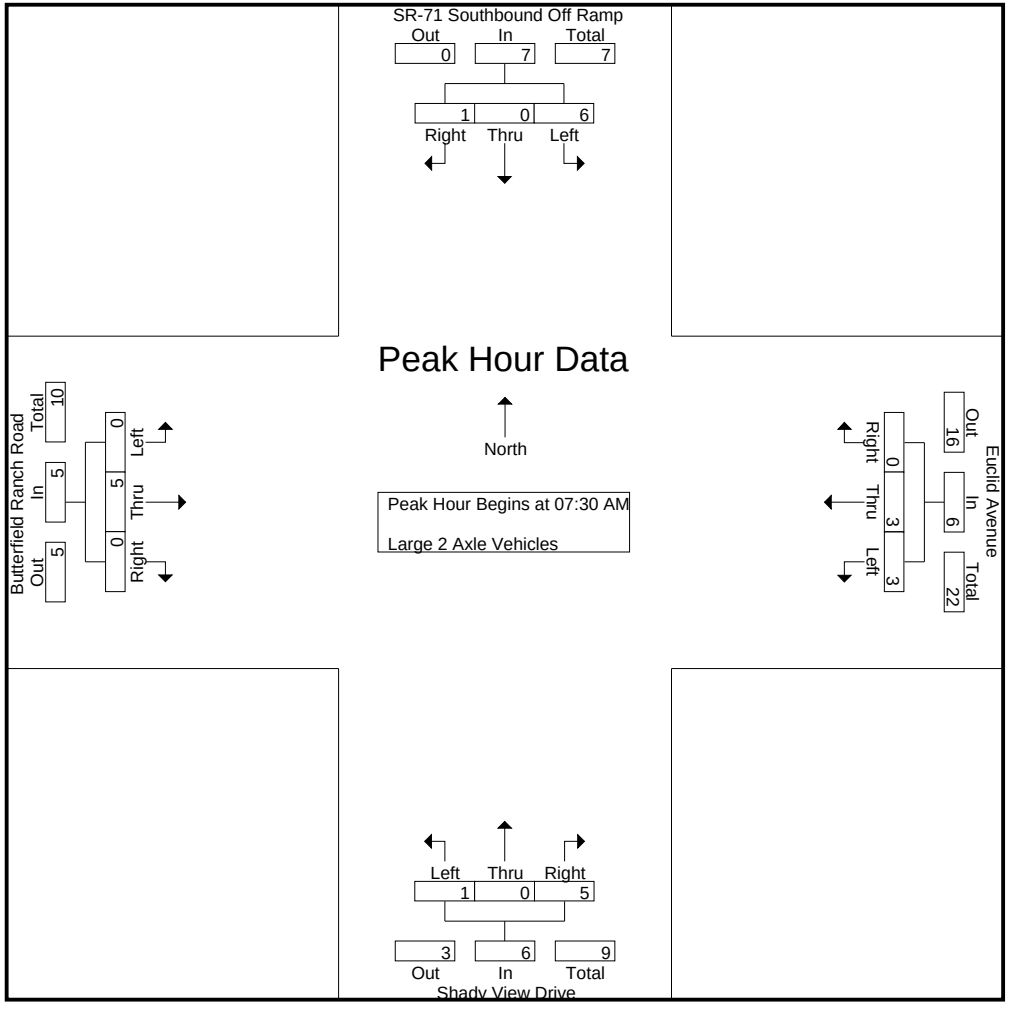

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File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
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Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 0 | 0 | 0 | **1** | 0 | 0 | 1 | 0 | 0 | **3** | **3** | 0 | 1 | 0 | 1 | |
| +15 mins. | **3** | 0 | **1** | **4** | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | **2** | 0 | **2** | |
| +30 mins. | 2 | 0 | 0 | 2 | 1 | **2** | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | |
| +45 mins. | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | **1** | 0 | 1 | 2 | 0 | 1 | 0 | 1 | |
| Total Volume | 6 | 0 | 1 | 7 | 3 | 3 | 0 | 6 | 1 | 0 | 5 | 6 | 0 | 5 | 0 | 5 | |
| % App. Total | 85.7 | 0 | 14.3 | | 50 | 50 | 0 | | 16.7 | 0 | 83.3 | | 0 | 100 | 0 | | |
| PHF | .500 | .000 | .250 | .438 | .750 | .375 | .000 | .500 | .250 | .000 | .417 | .500 | .000 | .625 | .000 | .625 | |

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Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 4 |
| 07:15 AM | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 3 |
| 07:30 AM | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Total | 6 | 0 | 0 | 0 | 6 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 12 | 12 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 AM | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 4 | 4 |
| 08:30 AM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 08:45 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 2 |
| Total | 2 | 0 | 1 | 0 | 3 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 7 | 7 |
| Grand Total | 8 | 0 | 1 | 0 | 9 | 2 | 3 | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 0 | 0 | 4 | 0 | 19 | 19 |
| Apprch % | 88.9 | 0 | 11.1 | | | 40 | 60 | 0 | | | 0 | 0 | 100 | | | 0 | 100 | 0 | | | | | |
| Total % | 42.1 | 0 | 5.3 | | 47.4 | 10.5 | 15.8 | 0 | | 26.3 | 0 | 0 | 5.3 | | 5.3 | 0 | 21.1 | 0 | | 21.1 | 0 | 100 | |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **3** | 0 | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | **1** | **1** | 0 | 0 | 0 | 0 | 2 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 AM | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | **4** |
| Total Volume | 5 | 0 | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 9 |
| % App. Total | 100 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 100 | | 0 | 100 | 0 | | |
| PHF | .417 | .000 | .000 | .417 | .000 | .500 | .000 | .500 | .000 | .000 | .250 | .250 | .000 | .250 | .000 | .250 | .563 |

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City of Chino
N/S: SR-71 SB Off Ramps/Shady View Drive
E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

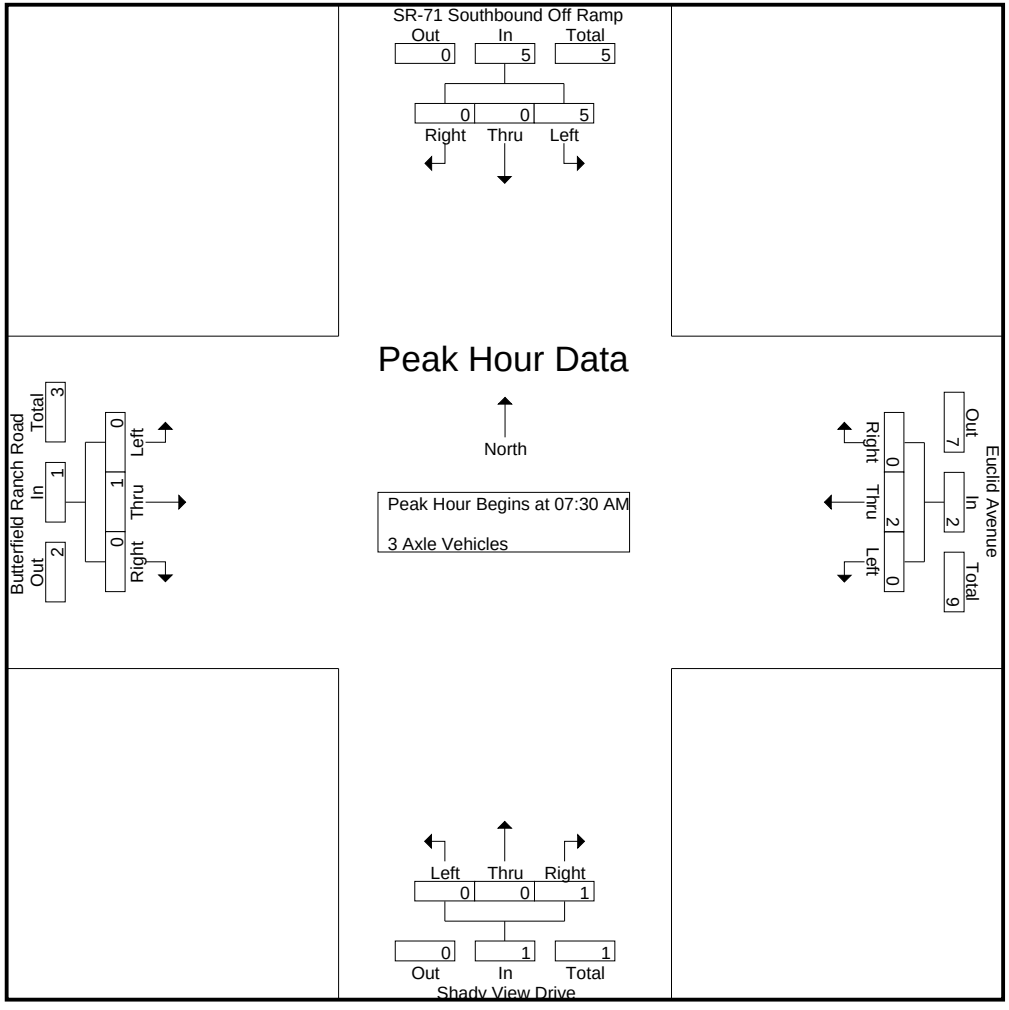

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| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **3** | 0 | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | **1** | **1** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +45 mins. | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | |
| Total Volume | 5 | 0 | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | |
| % App. Total | 100 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 100 | | 0 | 100 | 0 | | |
| PHF | .417 | .000 | .000 | .417 | .000 | .500 | .000 | .500 | .000 | .000 | .250 | .250 | .000 | .250 | .000 | .250 | |

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Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 1 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 5 |
| 07:15 AM | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 4 | 5 |
| 07:30 AM | 7 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 3 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 11 | 12 |
| 07:45 AM | 4 | 1 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| Total | 15 | 2 | 0 | 0 | 17 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 4 | 1 | 4 | 0 | 1 | 1 | 1 | 2 | 2 | 26 | 28 |
| 08:00 AM | 4 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 08:15 AM | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 08:30 AM | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 08:45 AM | 7 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 10 | 12 |
| Total | 14 | 0 | 0 | 0 | 14 | 4 | 1 | 0 | 0 | 5 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 21 | 23 |
| Grand Total | 29 | 2 | 0 | 0 | 31 | 5 | 3 | 0 | 0 | 8 | 0 | 0 | 6 | 3 | 6 | 0 | 1 | 1 | 1 | 2 | 4 | 47 | 51 |
| Apprch % | 93.5 | 6.5 | 0 | | | 62.5 | 37.5 | 0 | | | 0 | 0 | 100 | | | 0 | 50 | 50 | | | | | |
| Total % | 61.7 | 4.3 | 0 | | 66 | 10.6 | 6.4 | 0 | | 17 | 0 | 0 | 12.8 | | 12.8 | 0 | 2.1 | 2.1 | | 4.3 | 7.8 | 92.2 | |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **7** | 0 | 0 | **7** | 0 | **1** | 0 | **1** | 0 | 0 | **3** | **3** | 0 | 0 | 0 | 0 | **11** |
| 07:45 AM | 4 | **1** | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 6 |
| 08:00 AM | 4 | 0 | 0 | 4 | **1** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 08:15 AM | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Total Volume | 17 | 1 | 0 | 18 | 1 | 2 | 0 | 3 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | 25 |
| % App. Total | 94.4 | 5.6 | 0 | | 33.3 | 66.7 | 0 | | 0 | 0 | 100 | | 0 | 0 | 0 | | |
| PHF | .607 | .250 | .000 | .643 | .250 | .500 | .000 | .750 | .000 | .000 | .333 | .333 | .000 | .000 | .000 | .000 | .568 |

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Weather: Clear

File Name : 13_CHN_71S_Euc AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

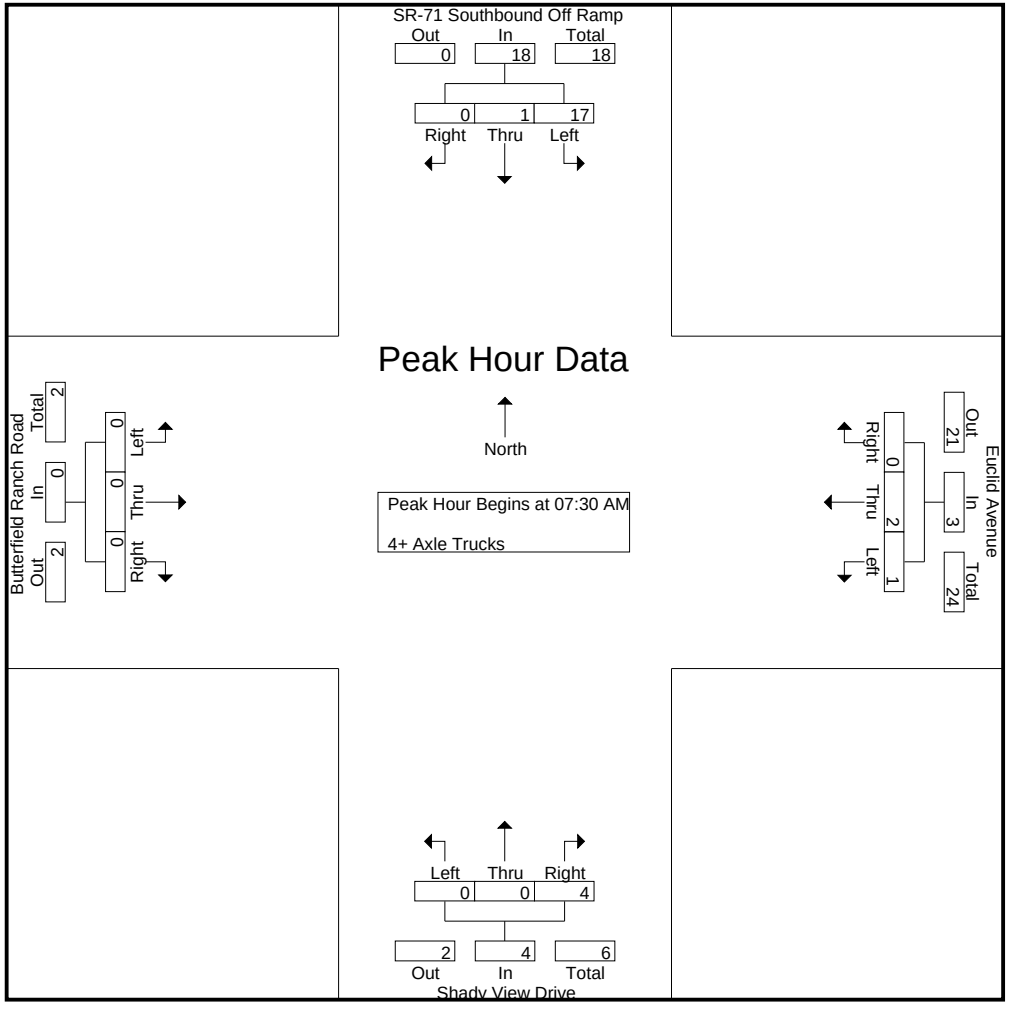

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Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **7** | 0 | 0 | **7** | 0 | **1** | 0 | **1** | 0 | 0 | **3** | **3** | 0 | 0 | 0 | 0 | |
| +15 mins. | 4 | **1** | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | |
| +30 mins. | 4 | 0 | 0 | 4 | **1** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +45 mins. | 2 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 17 | 1 | 0 | 18 | 1 | 2 | 0 | 3 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 0 | |
| % App. Total | 94.4 | 5.6 | 0 | | 33.3 | 66.7 | 0 | | 0 | 0 | 100 | | 0 | 0 | 0 | | |
| PHF | .607 | .250 | .000 | .643 | .250 | .500 | .000 | .750 | .000 | .000 | .333 | .333 | .000 | .000 | .000 | .000 | |

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E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 96 | 12 | 15 | 9 | 123 | 17 | 41 | 0 | 0 | 58 | 2 | 0 | 32 | 23 | 34 | 0 | 74 | 12 | 7 | 86 | 39 | 301 | 340 |
| 04:15 PM | 109 | 14 | 16 | 12 | 139 | 17 | 54 | 0 | 0 | 71 | 7 | 0 | 24 | 16 | 31 | 0 | 82 | 11 | 5 | 93 | 33 | 334 | 367 |
| 04:30 PM | 159 | 20 | 6 | 4 | 185 | 15 | 67 | 0 | 0 | 82 | 7 | 0 | 31 | 24 | 38 | 1 | 89 | 13 | 12 | 103 | 40 | 408 | 448 |
| 04:45 PM | 154 | 21 | 17 | 6 | 192 | 26 | 46 | 0 | 0 | 72 | 7 | 0 | 31 | 21 | 38 | 0 | 89 | 6 | 5 | 95 | 32 | 397 | 429 |
| Total | 518 | 67 | 54 | 31 | 639 | 75 | 208 | 0 | 0 | 283 | 23 | 0 | 118 | 84 | 141 | 1 | 334 | 42 | 29 | 377 | 144 | 1440 | 1584 |
| 05:00 PM | 152 | 14 | 20 | 10 | 186 | 15 | 45 | 0 | 0 | 60 | 6 | 0 | 34 | 22 | 40 | 0 | 90 | 12 | 4 | 102 | 36 | 388 | 424 |
| 05:15 PM | 140 | 19 | 19 | 8 | 178 | 15 | 42 | 0 | 0 | 57 | 9 | 0 | 35 | 22 | 44 | 0 | 87 | 16 | 11 | 103 | 41 | 382 | 423 |
| 05:30 PM | 148 | 22 | 11 | 5 | 181 | 20 | 57 | 0 | 0 | 77 | 6 | 0 | 39 | 27 | 45 | 0 | 70 | 12 | 7 | 82 | 39 | 385 | 424 |
| 05:45 PM | 165 | 24 | 14 | 6 | 203 | 17 | 39 | 0 | 0 | 56 | 4 | 0 | 22 | 18 | 26 | 0 | 53 | 9 | 6 | 62 | 30 | 347 | 377 |
| Total | 605 | 79 | 64 | 29 | 748 | 67 | 183 | 0 | 0 | 250 | 25 | 0 | 130 | 89 | 155 | 0 | 300 | 49 | 28 | 349 | 146 | 1502 | 1648 |
| Grand Total | 1123 | 146 | 118 | 60 | 1387 | 142 | 391 | 0 | 0 | 533 | 48 | 0 | 248 | 173 | 296 | 1 | 634 | 91 | 57 | 726 | 290 | 2942 | 3232 |
| Apprch % | 81 | 10.5 | 8.5 | | | 26.6 | 73.4 | 0 | | | 16.2 | 0 | 83.8 | | | 0.1 | 87.3 | 12.5 | | | | | |
| Total % | 38.2 | 5 | 4 | | 47.1 | 4.8 | 13.3 | 0 | | 18.1 | 1.6 | 0 | 8.4 | | 10.1 | 0 | 21.5 | 3.1 | | 24.7 | 9 | 91 | |
| Passenger Vehicles | 1097 | 146 | 117 | | 1419 | 140 | 385 | 0 | | 525 | 46 | 0 | 245 | | 461 | 1 | 618 | 86 | | 758 | 0 | 0 | 3163 |
| % Passenger Vehicles | 97.7 | 100 | 99.2 | 98.3 | 98.1 | 98.6 | 98.5 | 0 | 0 | 98.5 | 95.8 | 0 | 98.8 | 98.3 | 98.3 | 100 | 97.5 | 94.5 | 93 | 96.8 | 0 | 0 | 97.9 |
| Large 2 Axle Vehicles | 7 | 0 | 0 | | 7 | 0 | 4 | 0 | | 4 | 2 | 0 | 2 | | 6 | 0 | 10 | 3 | | 15 | 0 | 0 | 32 |
| % Large 2 Axle Vehicles | 0.6 | 0 | 0 | 0 | 0.5 | 0 | 1 | 0 | 0 | 0.8 | 4.2 | 0 | 0.8 | 1.2 | 1.3 | 0 | 1.6 | 3.3 | 3.5 | 1.9 | 0 | 0 | 1 |
| 3 Axle Vehicles | 5 | 0 | 0 | | 5 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 2 | 0 | | 2 | 0 | 0 | 7 |
| % 3 Axle Vehicles | 0.4 | 0 | 0 | 0 | 0.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3 | 0 | 0 | 0.3 | 0 | 0 | 0.2 |
| 4+ Axle Trucks | 14 | 0 | 1 | | 16 | 2 | 2 | 0 | | 4 | 0 | 0 | 1 | | 2 | 0 | 4 | 2 | | 8 | 0 | 0 | 30 |
| % 4+ Axle Trucks | 1.2 | 0 | 0.8 | 1.7 | 1.1 | 1.4 | 0.5 | 0 | 0 | 0.8 | 0 | 0 | 0.4 | 0.6 | 0.4 | 0 | 0.6 | 2.2 | 3.5 | 1 | 0 | 0 | 0.9 |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | **159** | 20 | 6 | 185 | 15 | **67** | 0 | **82** | 7 | 0 | 31 | 38 | **1** | 89 | 13 | **103** | **408** |
| 04:45 PM | 154 | **21** | 17 | **192** | **26** | 46 | 0 | 72 | 7 | 0 | 31 | 38 | 0 | 89 | 6 | 95 | 397 |
| 05:00 PM | 152 | 14 | **20** | 186 | 15 | 45 | 0 | 60 | 6 | 0 | 34 | 40 | 0 | **90** | 12 | 102 | 388 |
| 05:15 PM | 140 | 19 | 19 | 178 | 15 | 42 | 0 | 57 | **9** | 0 | **35** | **44** | 0 | 87 | **16** | 103 | 382 |
| Total Volume | 605 | 74 | 62 | 741 | 71 | 200 | 0 | 271 | 29 | 0 | 131 | 160 | 1 | 355 | 47 | 403 | 1575 |
| % App. Total | 81.6 | 10 | 8.4 | | 26.2 | 73.8 | 0 | | 18.1 | 0 | 81.9 | | 0.2 | 88.1 | 11.7 | | |
| PHF | .951 | .881 | .775 | .965 | .683 | .746 | .000 | .826 | .806 | .000 | .936 | .909 | .250 | .986 | .734 | .978 | .965 |

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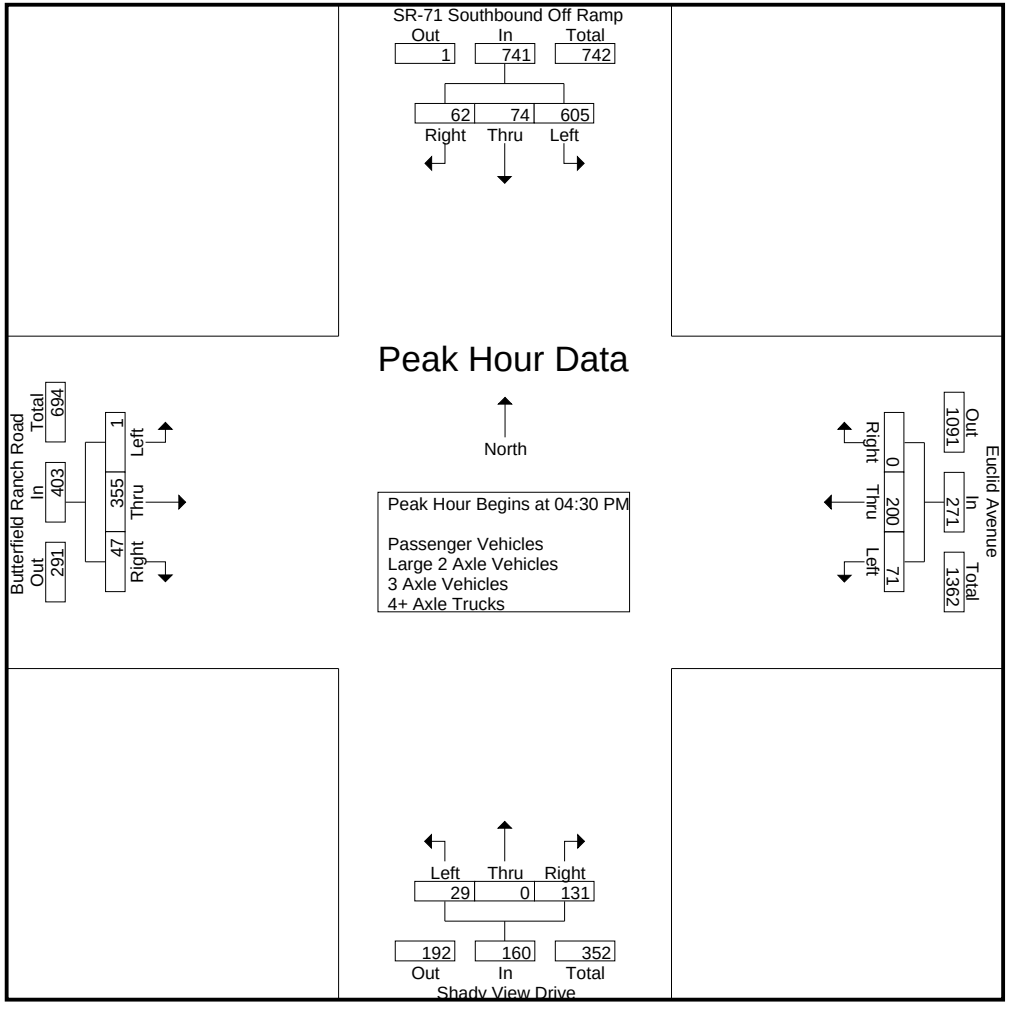

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Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:15 PM | | | | 04:45 PM | | | | 04:30 PM | | | | |
| +0 mins. | 152 | 14 | **20** | 186 | 17 | 54 | 0 | 71 | 7 | 0 | 31 | 38 | **1** | 89 | 13 | **103** | |
| +15 mins. | 140 | 19 | 19 | 178 | 15 | **67** | 0 | **82** | 6 | 0 | 34 | 40 | 0 | 89 | 6 | 95 | |
| +30 mins. | 148 | 22 | 11 | 181 | **26** | 46 | 0 | 72 | **9** | 0 | 35 | 44 | 0 | **90** | 12 | 102 | |
| +45 mins. | **165** | **24** | 14 | **203** | 15 | 45 | 0 | 60 | 6 | 0 | **39** | **45** | 0 | 87 | **16** | 103 | |
| Total Volume | 605 | 79 | 64 | 748 | 73 | 212 | 0 | 285 | 28 | 0 | 139 | 167 | 1 | 355 | 47 | 403 | |
| % App. Total | 80.9 | 10.6 | 8.6 | | 25.6 | 74.4 | 0 | | 16.8 | 0 | 83.2 | | 0.2 | 88.1 | 11.7 | | |
| PHF | .917 | .823 | .800 | .921 | .702 | .791 | .000 | .869 | .778 | .000 | .891 | .928 | .250 | .986 | .734 | .978 | |

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Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 94 | 12 | 15 | 9 | 121 | 17 | 40 | 0 | 0 | 57 | 2 | 0 | 32 | 23 | 34 | 0 | 69 | 10 | 5 | 79 | 37 | 291 | 328 |
| 04:15 PM | 106 | 14 | 16 | 12 | 136 | 17 | 53 | 0 | 0 | 70 | 7 | 0 | 24 | 16 | 31 | 0 | 80 | 11 | 5 | 91 | 33 | 328 | 361 |
| 04:30 PM | 155 | 20 | 6 | 4 | 181 | 14 | 66 | 0 | 0 | 80 | 7 | 0 | 31 | 24 | 38 | 1 | 89 | 12 | 11 | 102 | 39 | 401 | 440 |
| 04:45 PM | 150 | 21 | 17 | 6 | 188 | 26 | 44 | 0 | 0 | 70 | 6 | 0 | 31 | 21 | 37 | 0 | 88 | 5 | 5 | 93 | 32 | 388 | 420 |
| Total | 505 | 67 | 54 | 31 | 626 | 74 | 203 | 0 | 0 | 277 | 22 | 0 | 118 | 84 | 140 | 1 | 326 | 38 | 26 | 365 | 141 | 1408 | 1549 |
| 05:00 PM | 147 | 14 | 20 | 10 | 181 | 15 | 45 | 0 | 0 | 60 | 6 | 0 | 34 | 22 | 40 | 0 | 83 | 12 | 4 | 95 | 36 | 376 | 412 |
| 05:15 PM | 139 | 19 | 18 | 7 | 176 | 15 | 41 | 0 | 0 | 56 | 9 | 0 | 35 | 22 | 44 | 0 | 86 | 16 | 11 | 102 | 40 | 378 | 418 |
| 05:30 PM | 144 | 22 | 11 | 5 | 177 | 19 | 57 | 0 | 0 | 76 | 6 | 0 | 36 | 24 | 42 | 0 | 70 | 12 | 7 | 82 | 36 | 377 | 413 |
| 05:45 PM | 162 | 24 | 14 | 6 | 200 | 17 | 39 | 0 | 0 | 56 | 3 | 0 | 22 | 18 | 25 | 0 | 53 | 8 | 5 | 61 | 29 | 342 | 371 |
| Total | 592 | 79 | 63 | 28 | 734 | 66 | 182 | 0 | 0 | 248 | 24 | 0 | 127 | 86 | 151 | 0 | 292 | 48 | 27 | 340 | 141 | 1473 | 1614 |
| Grand Total | 1097 | 146 | 117 | 59 | 1360 | 140 | 385 | 0 | 0 | 525 | 46 | 0 | 245 | 170 | 291 | 1 | 618 | 86 | 53 | 705 | 282 | 2881 | 3163 |
| Apprch % | 80.7 | 10.7 | 8.6 | | | 26.7 | 73.3 | 0 | | | 15.8 | 0 | 84.2 | | | 0.1 | 87.7 | 12.2 | | | | | |
| Total % | 38.1 | 5.1 | 4.1 | | 47.2 | 4.9 | 13.4 | 0 | | 18.2 | 1.6 | 0 | 8.5 | | 10.1 | 0 | 21.5 | 3 | | 24.5 | 8.9 | 91.1 | |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | **155** | 20 | 6 | 181 | 14 | **66** | 0 | **80** | 7 | 0 | 31 | 38 | **1** | **89** | 12 | **102** | **401** |
| 04:45 PM | 150 | **21** | 17 | **188** | **26** | 44 | 0 | 70 | 6 | 0 | 31 | 37 | 0 | 88 | 5 | 93 | 388 |
| 05:00 PM | 147 | 14 | **20** | 181 | 15 | 45 | 0 | 60 | 6 | 0 | 34 | 40 | 0 | 83 | 12 | 95 | 376 |
| 05:15 PM | 139 | 19 | 18 | 176 | 15 | 41 | 0 | 56 | **9** | 0 | **35** | **44** | 0 | 86 | **16** | 102 | 378 |
| Total Volume | 591 | 74 | 61 | 726 | 70 | 196 | 0 | 266 | 28 | 0 | 131 | 159 | 1 | 346 | 45 | 392 | 1543 |
| % App. Total | 81.4 | 10.2 | 8.4 | | 26.3 | 73.7 | 0 | | 17.6 | 0 | 82.4 | | 0.3 | 88.3 | 11.5 | | |
| PHF | .953 | .881 | .763 | .965 | .673 | .742 | .000 | .831 | .778 | .000 | .936 | .903 | .250 | .972 | .703 | .961 | .962 |

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City of Chino
N/S: SR-71 SB Off Ramps/Shady View Drive
E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

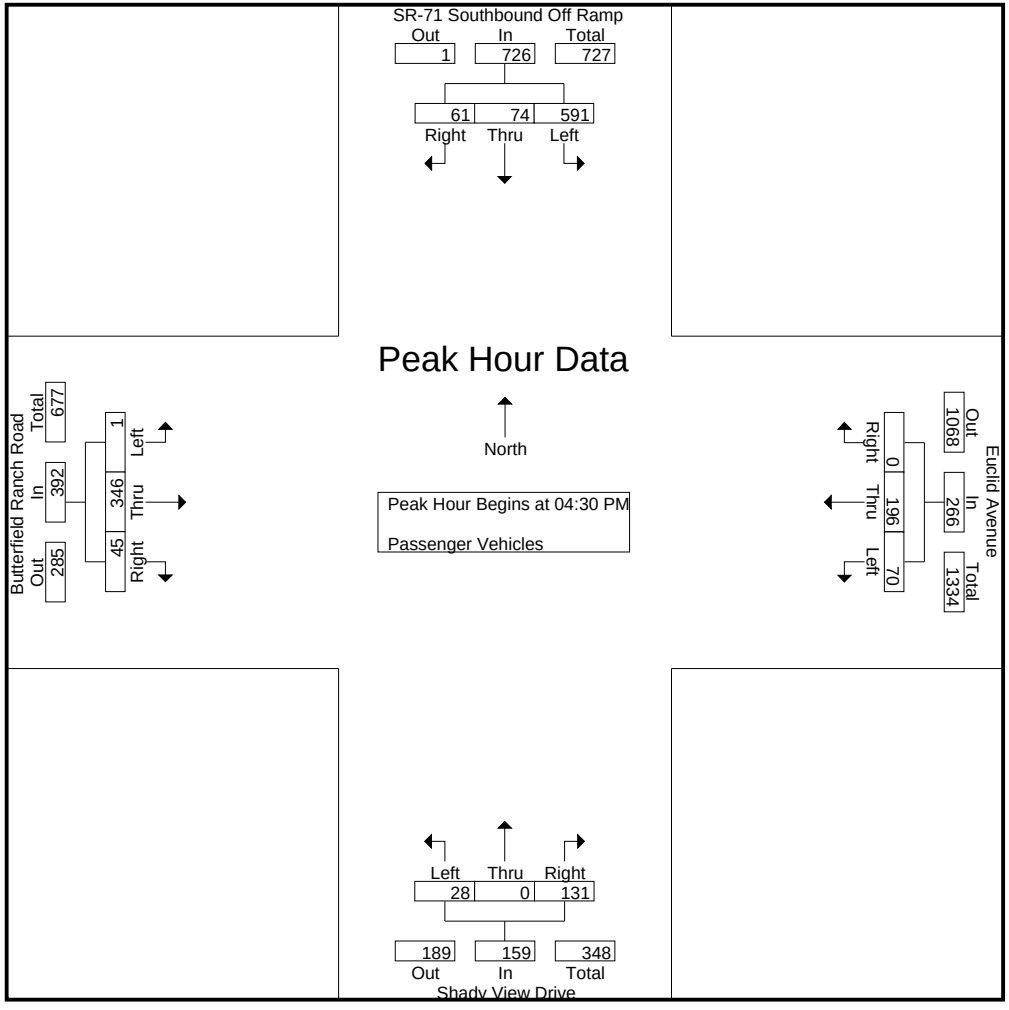

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Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | **155** | 20 | 6 | 181 | 14 | **66** | 0 | **80** | 7 | 0 | 31 | 38 | **1** | **89** | 12 | **102** | |
| +15 mins. | 150 | **21** | 17 | **188** | **26** | 44 | 0 | 70 | 6 | 0 | 31 | 37 | 0 | 88 | 5 | 93 | |
| +30 mins. | 147 | 14 | **20** | 181 | 15 | 45 | 0 | 60 | 6 | 0 | 34 | 40 | 0 | 83 | 12 | 95 | |
| +45 mins. | 139 | 19 | 18 | 176 | 15 | 41 | 0 | 56 | **9** | 0 | **35** | **44** | 0 | 86 | **16** | 102 | |
| Total Volume | 591 | 74 | 61 | 726 | 70 | 196 | 0 | 266 | 28 | 0 | 131 | 159 | 1 | 346 | 45 | 392 | |
| % App. Total | 81.4 | 10.2 | 8.4 | | 26.3 | 73.7 | 0 | | 17.6 | 0 | 82.4 | | 0.3 | 88.3 | 11.5 | | |
| PHF | .953 | .881 | .763 | .965 | .673 | .742 | .000 | .831 | .778 | .000 | .936 | .903 | .250 | .972 | .703 | .961 | |

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City of Chino
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E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 4 | 1 | 5 | 6 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 3 | 3 |
| 04:30 PM | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 04:45 PM | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 2 | 0 | 5 | 5 |
| Total | 3 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 6 | 2 | 1 | 8 | 1 | 15 | 16 |
| 05:00 PM | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 6 | 6 |
| 05:15 PM | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 4 |
| 05:45 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 3 | 4 |
| Total | 4 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 2 | 2 | 3 | 0 | 4 | 1 | 1 | 5 | 3 | 13 | 16 |
| Grand Total | 7 | 0 | 0 | 0 | 7 | 0 | 4 | 0 | 0 | 4 | 2 | 0 | 2 | 2 | 4 | 0 | 10 | 3 | 2 | 13 | 4 | 28 | 32 |
| Apprch % | 100 | 0 | 0 | | | 0 | 100 | 0 | | | 50 | 0 | 50 | | | 0 | 76.9 | 23.1 | | | | | |
| Total % | 25 | 0 | 0 | | 25 | 0 | 14.3 | 0 | | 14.3 | 7.1 | 0 | 7.1 | | 14.3 | 0 | 35.7 | 10.7 | | 46.4 | 12.5 | 87.5 | |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 1 | 0 | 0 | 1 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 04:45 PM | **2** | 0 | 0 | **2** | 0 | 0 | 0 | 0 | **1** | 0 | 0 | **1** | 0 | 1 | **1** | 2 | 5 |
| 05:00 PM | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** | 0 | **4** | **6** |
| 05:15 PM | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Total Volume | 6 | 0 | 0 | 6 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 5 | 1 | 6 | 15 |
| % App. Total | 100 | 0 | 0 | | 0 | 100 | 0 | | 100 | 0 | 0 | | 0 | 83.3 | 16.7 | | |
| PHF | .750 | .000 | .000 | .750 | .000 | .500 | .000 | .500 | .250 | .000 | .000 | .250 | .000 | .313 | .250 | .375 | .625 |

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Corona, CA 92878
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E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

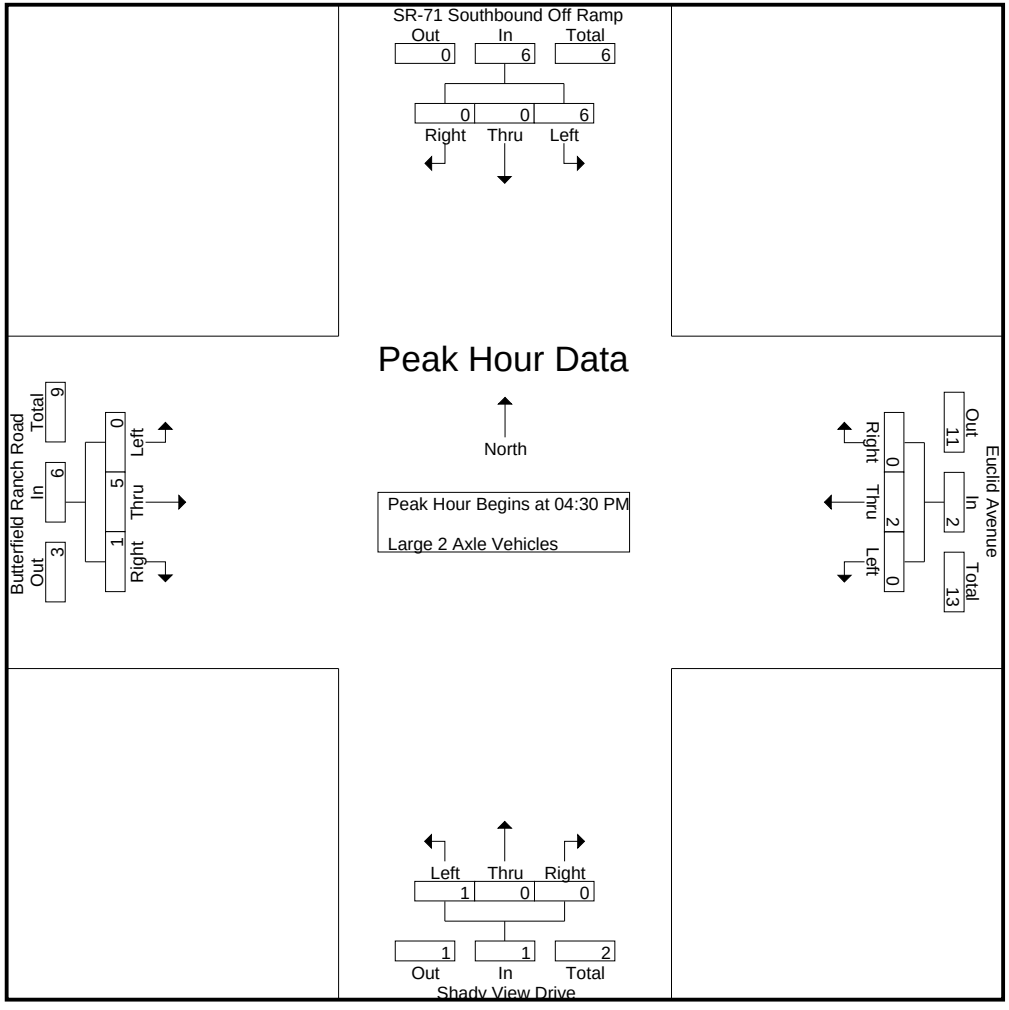

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Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 1 | 0 | 0 | 1 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +15 mins. | **2** | 0 | 0 | **2** | 0 | 0 | 0 | 0 | **1** | 0 | 0 | **1** | 0 | 1 | **1** | 2 | |
| +30 mins. | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** | 0 | **4** | |
| +45 mins. | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 6 | 0 | 0 | 6 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 5 | 1 | 6 | |
| % App. Total | 100 | 0 | 0 | | 0 | 100 | 0 | | 100 | 0 | 0 | | 0 | 83.3 | 16.7 | | |
| PHF | .750 | .000 | .000 | .750 | .000 | .500 | .000 | .500 | .250 | .000 | .000 | .250 | .000 | .313 | .250 | .375 | |

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City of Chino
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Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:30 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 04:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 2 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:30 PM | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 05:45 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 5 |
| Grand Total | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 7 | 7 |
| Apprch % | 100 | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 0 | 0 | | | 0 | 100 | 0 | | | | | |
| Total % | 71.4 | 0 | 0 | | 71.4 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | 0 | 28.6 | 0 | | 28.6 | 0 | 100 | |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | **1** | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 04:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 1 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| % App. Total | 100 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .250 | .000 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | .500 |

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E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

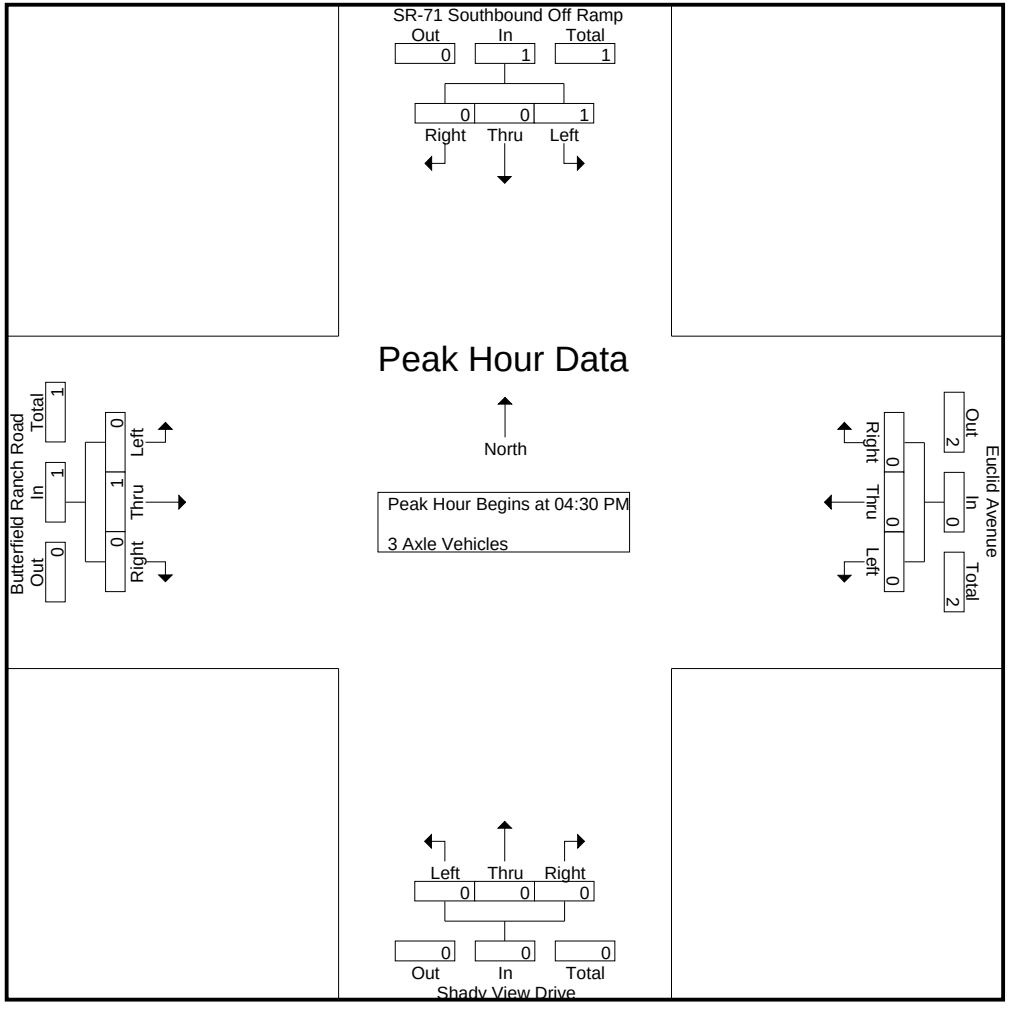

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File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
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Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | **1** | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | |
| % App. Total | 100 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .250 | .000 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | |

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Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | SR-71 Southbound Off Ramp Southbound | | | | | Euclid Avenue Westbound | | | | | Shady View Drive Northbound | | | | | Butterfield Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 4 | 5 |
| 04:15 PM | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 04:30 PM | 2 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 4 | 5 |
| 04:45 PM | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Total | 9 | 0 | 0 | 0 | 9 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 3 | 2 | 15 | 17 |
| 05:00 PM | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 5 | 5 |
| 05:15 PM | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 3 |
| 05:30 PM | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 |
| 05:45 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 5 | 0 | 1 | 1 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 3 | 2 | 11 | 13 |
| Grand Total | 14 | 0 | 1 | 1 | 15 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 1 | 1 | 1 | 0 | 4 | 2 | 2 | 6 | 4 | 26 | 30 |
| Apprch % | 93.3 | 0 | 6.7 | | | 50 | 50 | 0 | | | 0 | 0 | 100 | | | 0 | 66.7 | 33.3 | | | | | |
| Total % | 53.8 | 0 | 3.8 | | 57.7 | 7.7 | 7.7 | 0 | | 15.4 | 0 | 0 | 3.8 | | 3.8 | 0 | 15.4 | 7.7 | | 23.1 | 13.3 | 86.7 | |

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 2 | 0 | 0 | 2 | **1** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 1 | 4 |
| 04:45 PM | 2 | 0 | 0 | 2 | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 05:00 PM | **3** | 0 | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** | 0 | **2** | **5** |
| 05:15 PM | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| Total Volume | 7 | 0 | 1 | 8 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 4 | 15 |
| % App. Total | 87.5 | 0 | 12.5 | | 33.3 | 66.7 | 0 | | 0 | 0 | 0 | | 0 | 75 | 25 | | |
| PHF | .583 | .000 | .250 | .667 | .250 | .250 | .000 | .375 | .000 | .000 | .000 | .000 | .000 | .375 | .250 | .500 | .750 |

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 SB Off Ramps/Shady View Drive
E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

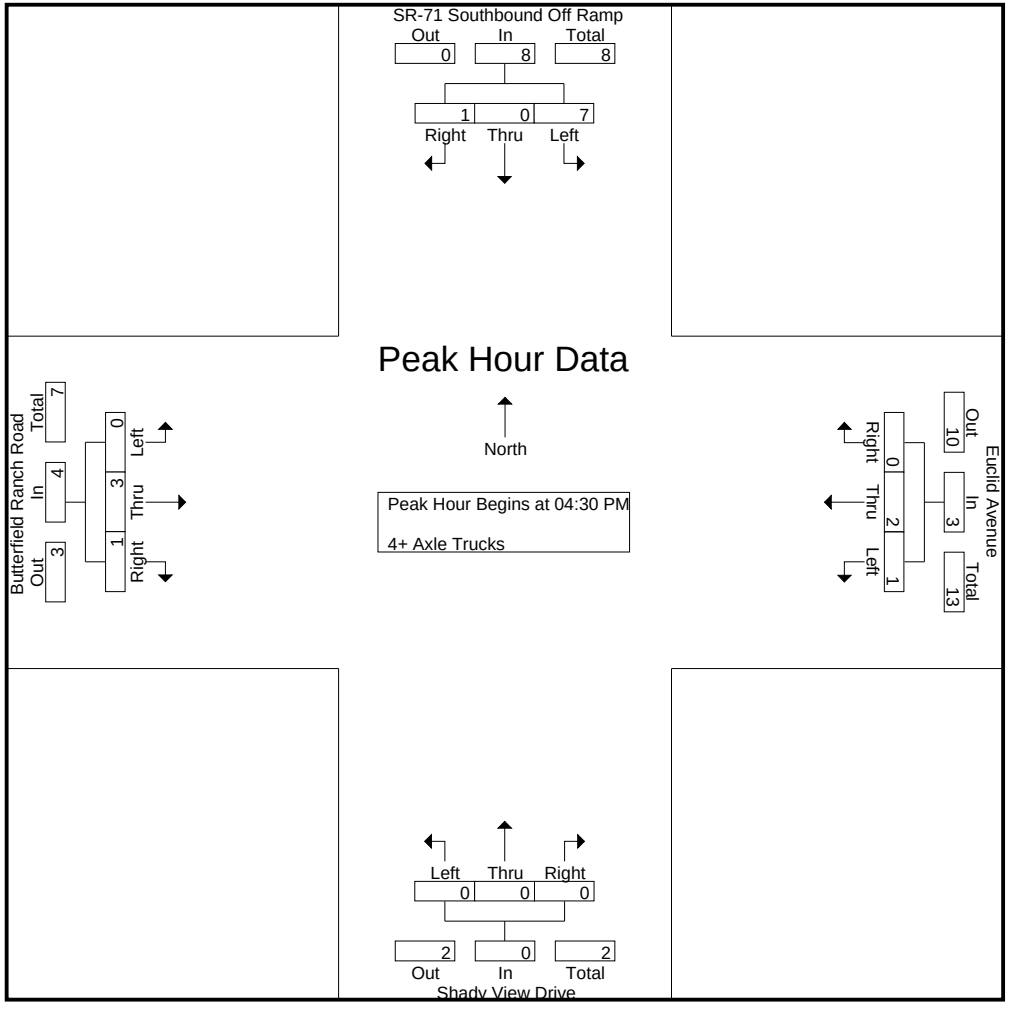

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Chino
N/S: SR-71 SB Off Ramps/Shady View Drive
E/W: Butterfield Ranch Rd/ Euclid Avenue
Weather: Clear

File Name : 13_CHN_71S_Euc PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | SR-71 Southbound Off Ramp Southbound | | | | Euclid Avenue Westbound | | | | Shady View Drive Northbound | | | | Butterfield Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 2 | 0 | 0 | 2 | **1** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 1 | |
| +15 mins. | 2 | 0 | 0 | 2 | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +30 mins. | **3** | 0 | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** | 0 | **2** | |
| +45 mins. | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | |
| Total Volume | 7 | 0 | 1 | 8 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 4 | |
| % App. Total | 87.5 | 0 | 12.5 | | 33.3 | 66.7 | 0 | | 0 | 0 | 0 | | 0 | 75 | 25 | | |
| PHF | .583 | .000 | .250 | .667 | .250 | .250 | .000 | .375 | .000 | .000 | .000 | .000 | .000 | .375 | .250 | .500 | |

Location: Chino
N/S: SR-71 SB Ramps
E/W: Euclid Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg SR-71 SB Ramps | East Leg Euclid Avenue | South Leg SR-71 SB Ramps | West Leg Euclid Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 1 | 1 |
| 8:15 AM | 0 | 0 | 1 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 1 | 1 | 2 |

| | North Leg SR-71 SB Ramps | East Leg Euclid Avenue | South Leg SR-71 SB Ramps | West Leg Euclid Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 1 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 4 | 4 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 1 | 1 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 2 | 2 |
| 5:30 PM | 0 | 0 | 0 | 1 | 1 |
| 5:45 PM | 0 | 0 | 0 | 1 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 1 | 9 | 10 |

Counts Unlimited, Inc.
PO Box 1178
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951-268-6268

Location: Chino
N/S: SR-71 SB Ramps
E/W: Euclid Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound SR-71 SB Ramps | | | Westbound Euclid Avenue | | | Northbound SR-71 SB Ramps | | | Eastbound Euclid Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Southbound SR-71 SB Ramps | | | Westbound Euclid Avenue | | | Northbound SR-71 SB Ramps | | | Eastbound Euclid Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:00 PM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 7 |

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City of Ontario
N/S: Bon View Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 15_ONT_Bon_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Bon View Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Bon View Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 3 | 5 | 0 | 9 | 20 | 114 | 3 | 0 | 137 | 4 | 5 | 10 | 0 | 19 | 4 | 72 | 8 | 0 | 84 | 0 | 249 | 249 |
| 07:15 AM | 2 | 6 | 16 | 0 | 24 | 21 | 159 | 5 | 0 | 185 | 2 | 5 | 10 | 0 | 17 | 14 | 72 | 3 | 0 | 89 | 0 | 315 | 315 |
| 07:30 AM | 2 | 7 | 13 | 0 | 22 | 16 | 190 | 31 | 0 | 237 | 8 | 14 | 9 | 0 | 31 | 26 | 92 | 6 | 0 | 124 | 0 | 414 | 414 |
| 07:45 AM | 3 | 7 | 34 | 0 | 44 | 22 | 199 | 9 | 0 | 230 | 3 | 8 | 25 | 0 | 36 | 24 | 115 | 6 | 0 | 145 | 0 | 455 | 455 |
| Total | 8 | 23 | 68 | 0 | 99 | 79 | 662 | 48 | 0 | 789 | 17 | 32 | 54 | 0 | 103 | 68 | 351 | 23 | 0 | 442 | 0 | 1433 | 1433 |
| 08:00 AM | 1 | 5 | 17 | 0 | 23 | 18 | 163 | 8 | 0 | 189 | 9 | 4 | 21 | 0 | 34 | 6 | 112 | 8 | 0 | 126 | 0 | 372 | 372 |
| 08:15 AM | 0 | 1 | 7 | 0 | 8 | 15 | 185 | 10 | 0 | 210 | 8 | 2 | 14 | 0 | 24 | 12 | 96 | 5 | 0 | 113 | 0 | 355 | 355 |
| 08:30 AM | 0 | 0 | 3 | 0 | 3 | 16 | 139 | 11 | 0 | 166 | 5 | 3 | 17 | 0 | 25 | 5 | 93 | 2 | 0 | 100 | 0 | 294 | 294 |
| 08:45 AM | 2 | 3 | 7 | 0 | 12 | 15 | 172 | 18 | 0 | 205 | 3 | 7 | 5 | 0 | 15 | 6 | 103 | 5 | 0 | 114 | 0 | 346 | 346 |
| Total | 3 | 9 | 34 | 0 | 46 | 64 | 659 | 47 | 0 | 770 | 25 | 16 | 57 | 0 | 98 | 29 | 404 | 20 | 0 | 453 | 0 | 1367 | 1367 |
| Grand Total | 11 | 32 | 102 | 0 | 145 | 143 | 1321 | 95 | 0 | 1559 | 42 | 48 | 111 | 0 | 201 | 97 | 755 | 43 | 0 | 895 | 0 | 2800 | 2800 |
| Apprch % | 7.6 | 22.1 | 70.3 | | | 9.2 | 84.7 | 6.1 | | | 20.9 | 23.9 | 55.2 | | | 10.8 | 84.4 | 4.8 | | | | | |
| Total % | 0.4 | 1.1 | 3.6 | | 5.2 | 5.1 | 47.2 | 3.4 | | 55.7 | 1.5 | 1.7 | 4 | | 7.2 | 3.5 | 27 | 1.5 | | 32 | 0 | 100 | |

| | Bon View Avenue Southbound | | | | Riverside Drive Westbound | | | | Bon View Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 2 | **7** | 13 | 22 | 16 | 190 | **31** | **237** | 8 | **14** | 9 | 31 | **26** | 92 | 6 | 124 | 414 |
| 07:45 AM | **3** | 7 | **34** | **44** | **22** | **199** | 9 | 230 | 3 | 8 | **25** | **36** | 24 | **115** | 6 | **145** | **455** |
| 08:00 AM | 1 | 5 | 17 | 23 | 18 | 163 | 8 | 189 | **9** | 4 | 21 | 34 | 6 | 112 | **8** | 126 | 372 |
| 08:15 AM | 0 | 1 | 7 | 8 | 15 | 185 | 10 | 210 | 8 | 2 | 14 | 24 | 12 | 96 | 5 | 113 | 355 |
| Total Volume | 6 | 20 | 71 | 97 | 71 | 737 | 58 | 866 | 28 | 28 | 69 | 125 | 68 | 415 | 25 | 508 | 1596 |
| % App. Total | 6.2 | 20.6 | 73.2 | | 8.2 | 85.1 | 6.7 | | 22.4 | 22.4 | 55.2 | | 13.4 | 81.7 | 4.9 | | |
| PHF | .500 | .714 | .522 | .551 | .807 | .926 | .468 | .914 | .778 | .500 | .690 | .868 | .654 | .902 | .781 | .876 | .877 |

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City of Ontario
N/S: Bon View Avenue
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Weather: Clear

File Name : 15_ONT_Bon_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

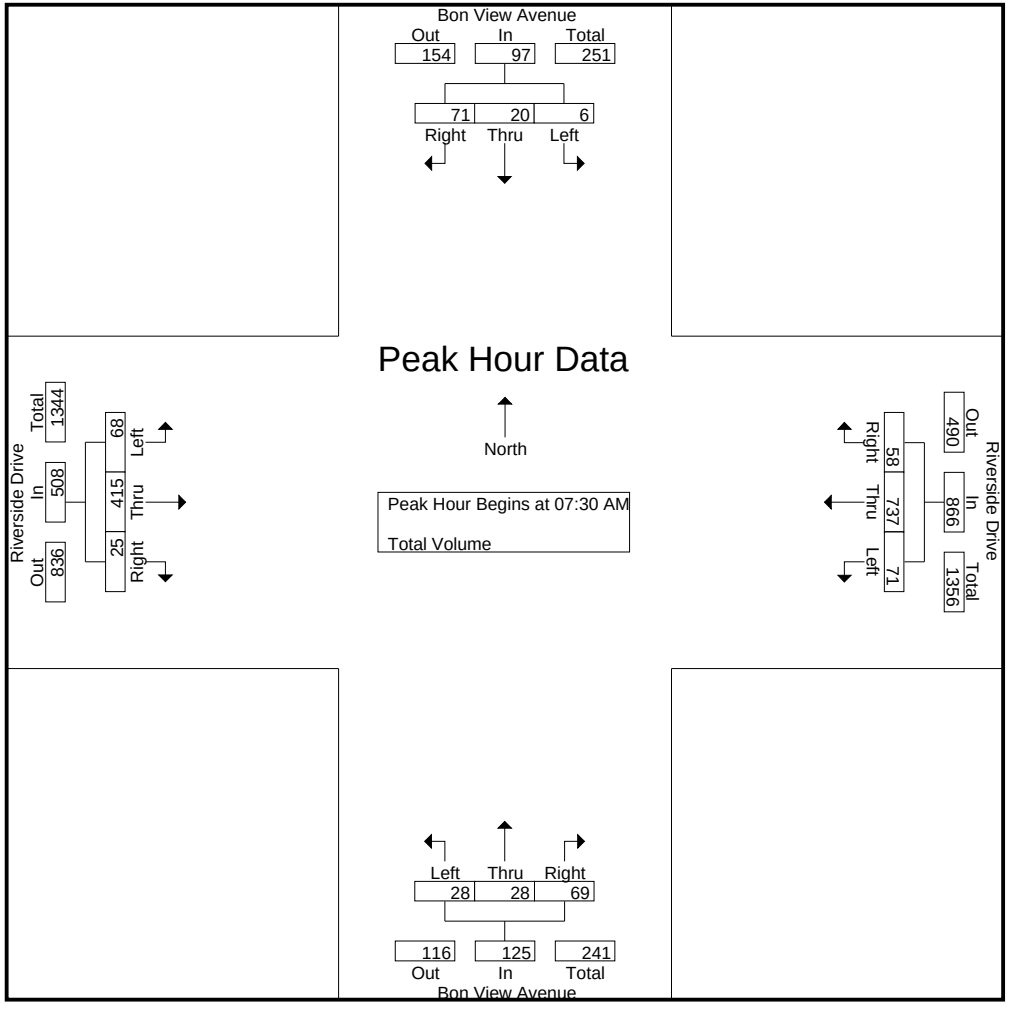

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City of Ontario
N/S: Bon View Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 15_ONT_Bon_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Bon View Avenue Southbound | | | | Riverside Drive Westbound | | | | Bon View Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 2 | 6 | 16 | 24 | 16 | 190 | **31** | **237** | 8 | **14** | 9 | 31 | **26** | 92 | 6 | 124 | |
| +15 mins. | 2 | **7** | 13 | 22 | **22** | **199** | 9 | 230 | 3 | 8 | **25** | **36** | 24 | **115** | 6 | **145** | |
| +30 mins. | **3** | 7 | **34** | **44** | 18 | 163 | 8 | 189 | **9** | 4 | 21 | 34 | 6 | 112 | **8** | 126 | |
| +45 mins. | 1 | 5 | 17 | 23 | 15 | 185 | 10 | 210 | 8 | 2 | 14 | 24 | 12 | 96 | 5 | 113 | |
| Total Volume | 8 | 25 | 80 | 113 | 71 | 737 | 58 | 866 | 28 | 28 | 69 | 125 | 68 | 415 | 25 | 508 | |
| % App. Total | 7.1 | 22.1 | 70.8 | | 8.2 | 85.1 | 6.7 | | 22.4 | 22.4 | 55.2 | | 13.4 | 81.7 | 4.9 | | |
| PHF | .667 | .893 | .588 | .642 | .807 | .926 | .468 | .914 | .778 | .500 | .690 | .868 | .654 | .902 | .781 | .876 | |

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City of Ontario
N/S: Bon View Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 15_ONT_Bon_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Bon View Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Bon View Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 6 | 2 | 0 | 8 | 16 | 130 | 2 | 0 | 148 | 9 | 9 | 25 | 0 | 43 | 10 | 128 | 5 | 0 | 143 | 0 | 342 | 342 |
| 04:15 PM | 2 | 4 | 7 | 0 | 13 | 8 | 99 | 3 | 0 | 110 | 6 | 6 | 12 | 0 | 24 | 6 | 132 | 10 | 0 | 148 | 0 | 295 | 295 |
| 04:30 PM | 0 | 2 | 5 | 0 | 7 | 16 | 107 | 2 | 0 | 125 | 4 | 7 | 28 | 0 | 39 | 9 | 140 | 8 | 0 | 157 | 0 | 328 | 328 |
| 04:45 PM | 1 | 0 | 6 | 0 | 7 | 4 | 131 | 5 | 0 | 140 | 9 | 8 | 17 | 0 | 34 | 7 | 150 | 8 | 0 | 165 | 0 | 346 | 346 |
| Total | 3 | 12 | 20 | 0 | 35 | 44 | 467 | 12 | 0 | 523 | 28 | 30 | 82 | 0 | 140 | 32 | 550 | 31 | 0 | 613 | 0 | 1311 | 1311 |
| 05:00 PM | 3 | 2 | 6 | 0 | 11 | 11 | 129 | 3 | 0 | 143 | 1 | 7 | 14 | 0 | 22 | 10 | 143 | 8 | 0 | 161 | 0 | 337 | 337 |
| 05:15 PM | 1 | 1 | 6 | 0 | 8 | 16 | 148 | 0 | 0 | 164 | 8 | 7 | 19 | 0 | 34 | 7 | 141 | 3 | 0 | 151 | 0 | 357 | 357 |
| 05:30 PM | 0 | 3 | 6 | 0 | 9 | 12 | 127 | 4 | 0 | 143 | 5 | 7 | 23 | 0 | 35 | 10 | 145 | 8 | 0 | 163 | 0 | 350 | 350 |
| 05:45 PM | 3 | 3 | 3 | 0 | 9 | 14 | 122 | 3 | 0 | 139 | 6 | 8 | 19 | 0 | 33 | 6 | 132 | 7 | 0 | 145 | 0 | 326 | 326 |
| Total | 7 | 9 | 21 | 0 | 37 | 53 | 526 | 10 | 0 | 589 | 20 | 29 | 75 | 0 | 124 | 33 | 561 | 26 | 0 | 620 | 0 | 1370 | 1370 |
| Grand Total | 10 | 21 | 41 | 0 | 72 | 97 | 993 | 22 | 0 | 1112 | 48 | 59 | 157 | 0 | 264 | 65 | 1111 | 57 | 0 | 1233 | 0 | 2681 | 2681 |
| Apprch % | 13.9 | 29.2 | 56.9 | | | 8.7 | 89.3 | 2 | | | 18.2 | 22.3 | 59.5 | | | 5.3 | 90.1 | 4.6 | | | | | |
| Total % | 0.4 | 0.8 | 1.5 | | 2.7 | 3.6 | 37 | 0.8 | | 41.5 | 1.8 | 2.2 | 5.9 | | 9.8 | 2.4 | 41.4 | 2.1 | | 46 | 0 | 100 | |

| | Bon View Avenue Southbound | | | | Riverside Drive Westbound | | | | Bon View Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 1 | 0 | **6** | 7 | 4 | 131 | **5** | 140 | **9** | **8** | 17 | 34 | 7 | **150** | **8** | **165** | 346 |
| 05:00 PM | **3** | 2 | 6 | **11** | 11 | 129 | 3 | 143 | 1 | 7 | 14 | 22 | **10** | 143 | 8 | 161 | 337 |
| 05:15 PM | 1 | 1 | 6 | 8 | **16** | **148** | 0 | **164** | 8 | 7 | 19 | 34 | 7 | 141 | 3 | 151 | **357** |
| 05:30 PM | 0 | **3** | 6 | 9 | 12 | 127 | 4 | 143 | 5 | 7 | **23** | **35** | 10 | 145 | 8 | 163 | 350 |
| Total Volume | 5 | 6 | 24 | 35 | 43 | 535 | 12 | 590 | 23 | 29 | 73 | 125 | 34 | 579 | 27 | 640 | 1390 |
| % App. Total | 14.3 | 17.1 | 68.6 | | 7.3 | 90.7 | 2 | | 18.4 | 23.2 | 58.4 | | 5.3 | 90.5 | 4.2 | | |
| PHF | .417 | .500 | 1.00 | .795 | .672 | .904 | .600 | .899 | .639 | .906 | .793 | .893 | .850 | .965 | .844 | .970 | .973 |

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File Name : 15_ONT_Bon_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
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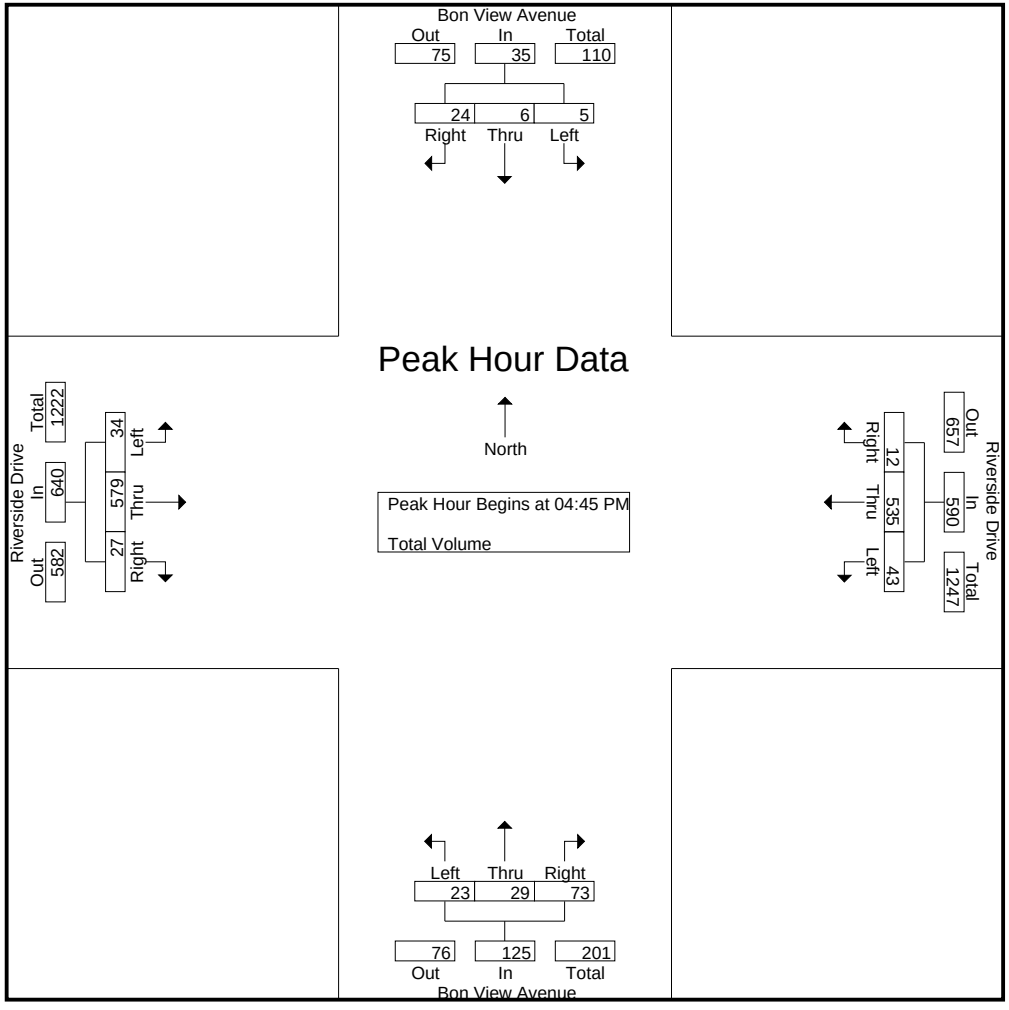

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City of Ontario
N/S: Bon View Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 15_ONT_Bon_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Bon View Avenue Southbound | | | | Riverside Drive Westbound | | | | Bon View Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:45 PM | | | | 04:00 PM | | | | 04:45 PM | | | | |
| +0 mins. | 2 | **4** | **7** | **13** | 4 | 131 | **5** | 140 | **9** | **9** | 25 | **43** | 7 | **150** | **8** | **165** | |
| +15 mins. | 0 | 2 | 5 | 7 | 11 | 129 | 3 | 143 | 6 | 6 | 12 | 24 | **10** | 143 | 8 | 161 | |
| +30 mins. | 1 | 0 | 6 | 7 | **16** | **148** | 0 | **164** | 4 | 7 | **28** | 39 | 7 | 141 | 3 | 151 | |
| +45 mins. | **3** | 2 | 6 | 11 | 12 | 127 | 4 | 143 | 9 | 8 | 17 | 34 | 10 | 145 | 8 | 163 | |
| Total Volume | 6 | 8 | 24 | 38 | 43 | 535 | 12 | 590 | 28 | 30 | 82 | 140 | 34 | 579 | 27 | 640 | |
| % App. Total | 15.8 | 21.1 | 63.2 | | 7.3 | 90.7 | 2 | | 20 | 21.4 | 58.6 | | 5.3 | 90.5 | 4.2 | | |
| PHF | .500 | .500 | .857 | .731 | .672 | .904 | .600 | .899 | .778 | .833 | .732 | .814 | .850 | .965 | .844 | .970 | |

Location: Ontario
N/S: Bon View Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Bon View Avenue | East Leg<br>Riverside Drive | South Leg<br>Bon View Avenue | West Leg<br>Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 1 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 3 | 0 | 0 | 0 | 3 |
| 8:30 AM | 1 | 0 | 0 | 0 | 1 |
| 8:45 AM | 6 | 0 | 0 | 0 | 6 |
| TOTAL VOLUMES: | 11 | 0 | 0 | 0 | 11 |

| | North Leg<br>Bon View Avenue | East Leg<br>Riverside Drive | South Leg<br>Bon View Avenue | West Leg<br>Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 2 | 0 | 0 | 0 | 2 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 3 | 0 | 0 | 0 | 3 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 1 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 6 | 0 | 0 | 0 | 6 |

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Location: Ontario
N/S: Bon View Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Bon View Avenue | | | Westbound Riverside Drive | | | Northbound Bon View Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 |

| | Southbound Bon View Avenue | | | Westbound Riverside Drive | | | Northbound Bon View Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 5 |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Bon View Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 16_ONT_Bon_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Bon View Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Bon View Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 19 | 16 | 0 | 35 | 2 | 35 | 1 | 0 | 38 | 12 | 19 | 3 | 0 | 34 | 4 | 30 | 5 | 0 | 39 | 0 | 146 | 146 |
| 07:15 AM | 3 | 21 | 13 | 0 | 37 | 1 | 35 | 3 | 0 | 39 | 11 | 25 | 2 | 0 | 38 | 3 | 17 | 3 | 0 | 23 | 0 | 137 | 137 |
| 07:30 AM | 2 | 14 | 10 | 0 | 26 | 4 | 40 | 6 | 0 | 50 | 9 | 54 | 2 | 0 | 65 | 6 | 23 | 4 | 0 | 33 | 0 | 174 | 174 |
| 07:45 AM | 1 | 24 | 13 | 0 | 38 | 4 | 43 | 3 | 0 | 50 | 6 | 44 | 3 | 0 | 53 | 9 | 24 | 4 | 0 | 37 | 0 | 178 | 178 |
| Total | 6 | 78 | 52 | 0 | 136 | 11 | 153 | 13 | 0 | 177 | 38 | 142 | 10 | 0 | 190 | 22 | 94 | 16 | 0 | 132 | 0 | 635 | 635 |
| 08:00 AM | 2 | 23 | 17 | 0 | 42 | 0 | 34 | 2 | 0 | 36 | 12 | 32 | 5 | 0 | 49 | 8 | 17 | 3 | 0 | 28 | 0 | 155 | 155 |
| 08:15 AM | 2 | 19 | 10 | 0 | 31 | 2 | 55 | 3 | 0 | 60 | 10 | 25 | 1 | 0 | 36 | 7 | 15 | 2 | 0 | 24 | 0 | 151 | 151 |
| 08:30 AM | 1 | 16 | 9 | 0 | 26 | 5 | 27 | 4 | 0 | 36 | 9 | 25 | 3 | 0 | 37 | 9 | 34 | 6 | 0 | 49 | 0 | 148 | 148 |
| 08:45 AM | 1 | 19 | 6 | 0 | 26 | 3 | 28 | 4 | 0 | 35 | 3 | 19 | 2 | 0 | 24 | 8 | 23 | 5 | 0 | 36 | 0 | 121 | 121 |
| Total | 6 | 77 | 42 | 0 | 125 | 10 | 144 | 13 | 0 | 167 | 34 | 101 | 11 | 0 | 146 | 32 | 89 | 16 | 0 | 137 | 0 | 575 | 575 |
| Grand Total | 12 | 155 | 94 | 0 | 261 | 21 | 297 | 26 | 0 | 344 | 72 | 243 | 21 | 0 | 336 | 54 | 183 | 32 | 0 | 269 | 0 | 1210 | 1210 |
| Apprch % | 4.6 | 59.4 | 36 | | | 6.1 | 86.3 | 7.6 | | | 21.4 | 72.3 | 6.2 | | | 20.1 | 68 | 11.9 | | | | | |
| Total % | 1 | 12.8 | 7.8 | | 21.6 | 1.7 | 24.5 | 2.1 | | 28.4 | 6 | 20.1 | 1.7 | | 27.8 | 4.5 | 15.1 | 2.6 | | 22.2 | 0 | 100 | |

| | Bon View Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Bon View Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **2** | 14 | 10 | 26 | **4** | 40 | **6** | 50 | 9 | **54** | 2 | **65** | 6 | 23 | **4** | 33 | 174 |
| 07:45 AM | 1 | **24** | 13 | 38 | 4 | 43 | 3 | 50 | 6 | 44 | 3 | 53 | **9** | **24** | 4 | **37** | **178** |
| 08:00 AM | 2 | 23 | **17** | **42** | 0 | 34 | 2 | 36 | **12** | 32 | **5** | 49 | 8 | 17 | 3 | 28 | 155 |
| 08:15 AM | 2 | 19 | 10 | 31 | 2 | **55** | 3 | **60** | 10 | 25 | 1 | 36 | 7 | 15 | 2 | 24 | 151 |
| Total Volume | 7 | 80 | 50 | 137 | 10 | 172 | 14 | 196 | 37 | 155 | 11 | 203 | 30 | 79 | 13 | 122 | 658 |
| % App. Total | 5.1 | 58.4 | 36.5 | | 5.1 | 87.8 | 7.1 | | 18.2 | 76.4 | 5.4 | | 24.6 | 64.8 | 10.7 | | |
| PHF | .875 | .833 | .735 | .815 | .625 | .782 | .583 | .817 | .771 | .718 | .550 | .781 | .833 | .823 | .813 | .824 | .924 |

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Corona, CA 92878
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City of Ontario
N/S: Bon View Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 16_ONT_Bon_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

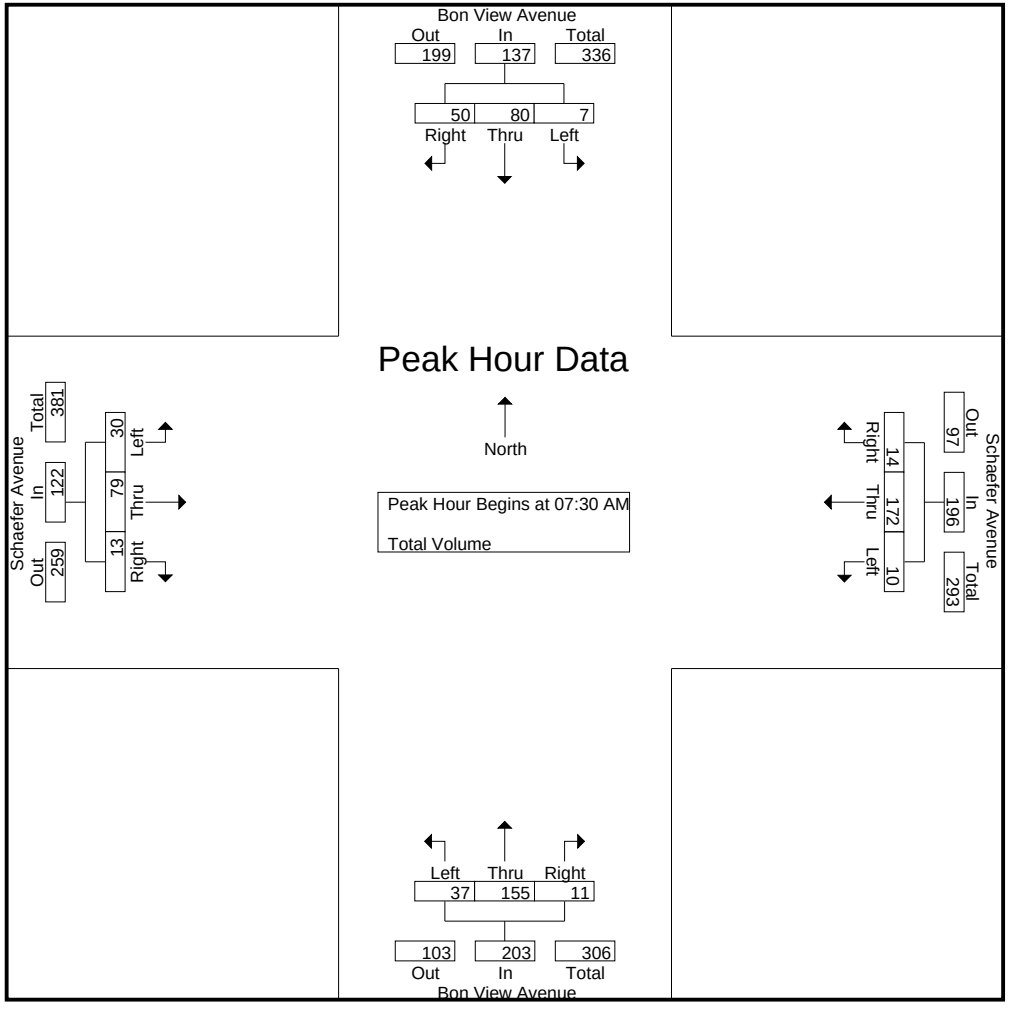

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City of Ontario
N/S: Bon View Avenue
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File Name : 16_ONT_Bon_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Bon View Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Bon View Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:30 AM | | | | 07:15 AM | | | | 07:45 AM | | | | |
| +0 mins. | **3** | 21 | 13 | 37 | **4** | 40 | **6** | 50 | 11 | 25 | 2 | 38 | **9** | 24 | 4 | 37 | |
| +15 mins. | 2 | 14 | 10 | 26 | 4 | 43 | 3 | 50 | 9 | **54** | 2 | **65** | 8 | 17 | 3 | 28 | |
| +30 mins. | 1 | **24** | 13 | 38 | 0 | 34 | 2 | 36 | 6 | 44 | 3 | 53 | 7 | 15 | 2 | 24 | |
| +45 mins. | 2 | 23 | **17** | **42** | 2 | **55** | 3 | **60** | **12** | 32 | **5** | 49 | 9 | **34** | **6** | **49** | |
| Total Volume | 8 | 82 | 53 | 143 | 10 | 172 | 14 | 196 | 38 | 155 | 12 | 205 | 33 | 90 | 15 | 138 | |
| % App. Total | 5.6 | 57.3 | 37.1 | | 5.1 | 87.8 | 7.1 | | 18.5 | 75.6 | 5.9 | | 23.9 | 65.2 | 10.9 | | |
| PHF | .667 | .854 | .779 | .851 | .625 | .782 | .583 | .817 | .792 | .718 | .600 | .788 | .917 | .662 | .625 | .704 | |

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City of Ontario
N/S: Bon View Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 16_ONT_Bon_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Bon View Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Bon View Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 21 | 7 | 0 | 29 | 1 | 19 | 4 | 0 | 24 | 2 | 29 | 3 | 0 | 34 | 14 | 67 | 3 | 0 | 84 | 0 | 171 | 171 |
| 04:15 PM | 4 | 26 | 6 | 0 | 36 | 0 | 15 | 2 | 0 | 17 | 3 | 29 | 2 | 0 | 34 | 8 | 68 | 9 | 0 | 85 | 0 | 172 | 172 |
| 04:30 PM | 3 | 18 | 7 | 0 | 28 | 1 | 15 | 2 | 0 | 18 | 3 | 35 | 5 | 0 | 43 | 16 | 75 | 7 | 0 | 98 | 0 | 187 | 187 |
| 04:45 PM | 0 | 20 | 1 | 0 | 21 | 0 | 19 | 1 | 0 | 20 | 2 | 26 | 3 | 0 | 31 | 9 | 80 | 8 | 0 | 97 | 0 | 169 | 169 |
| Total | 8 | 85 | 21 | 0 | 114 | 2 | 68 | 9 | 0 | 79 | 10 | 119 | 13 | 0 | 142 | 47 | 290 | 27 | 0 | 364 | 0 | 699 | 699 |
| 05:00 PM | 1 | 22 | 4 | 0 | 27 | 2 | 18 | 0 | 0 | 20 | 3 | 22 | 1 | 0 | 26 | 8 | 63 | 5 | 0 | 76 | 0 | 149 | 149 |
| 05:15 PM | 0 | 17 | 4 | 0 | 21 | 1 | 11 | 2 | 0 | 14 | 1 | 15 | 2 | 0 | 18 | 13 | 56 | 5 | 0 | 74 | 0 | 127 | 127 |
| 05:30 PM | 1 | 20 | 4 | 0 | 25 | 2 | 16 | 1 | 0 | 19 | 5 | 33 | 2 | 0 | 40 | 14 | 57 | 5 | 0 | 76 | 0 | 160 | 160 |
| 05:45 PM | 3 | 25 | 5 | 0 | 33 | 0 | 16 | 2 | 0 | 18 | 6 | 30 | 2 | 0 | 38 | 6 | 47 | 7 | 0 | 60 | 0 | 149 | 149 |
| Total | 5 | 84 | 17 | 0 | 106 | 5 | 61 | 5 | 0 | 71 | 15 | 100 | 7 | 0 | 122 | 41 | 223 | 22 | 0 | 286 | 0 | 585 | 585 |
| Grand Total | 13 | 169 | 38 | 0 | 220 | 7 | 129 | 14 | 0 | 150 | 25 | 219 | 20 | 0 | 264 | 88 | 513 | 49 | 0 | 650 | 0 | 1284 | 1284 |
| Apprch % | 5.9 | 76.8 | 17.3 | | | 4.7 | 86 | 9.3 | | | 9.5 | 83 | 7.6 | | | 13.5 | 78.9 | 7.5 | | | | | |
| Total % | 1 | 13.2 | 3 | | 17.1 | 0.5 | 10 | 1.1 | | 11.7 | 1.9 | 17.1 | 1.6 | | 20.6 | 6.9 | 40 | 3.8 | | 50.6 | 0 | 100 | |

| | Bon View Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Bon View Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 1 | 21 | **7** | 29 | **1** | **19** | **4** | **24** | 2 | 29 | 3 | 34 | 14 | 67 | 3 | 84 | 171 |
| 04:15 PM | **4** | **26** | 6 | **36** | 0 | 15 | 2 | 17 | **3** | 29 | 2 | 34 | 8 | 68 | **9** | 85 | 172 |
| 04:30 PM | 3 | 18 | 7 | 28 | 1 | 15 | 2 | 18 | 3 | **35** | **5** | **43** | **16** | 75 | 7 | **98** | **187** |
| 04:45 PM | 0 | 20 | 1 | 21 | 0 | 19 | 1 | 20 | 2 | 26 | 3 | 31 | 9 | **80** | 8 | 97 | 169 |
| Total Volume | 8 | 85 | 21 | 114 | 2 | 68 | 9 | 79 | 10 | 119 | 13 | 142 | 47 | 290 | 27 | 364 | 699 |
| % App. Total | 7 | 74.6 | 18.4 | | 2.5 | 86.1 | 11.4 | | 7 | 83.8 | 9.2 | | 12.9 | 79.7 | 7.4 | | |
| PHF | .500 | .817 | .750 | .792 | .500 | .895 | .563 | .823 | .833 | .850 | .650 | .826 | .734 | .906 | .750 | .929 | .934 |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

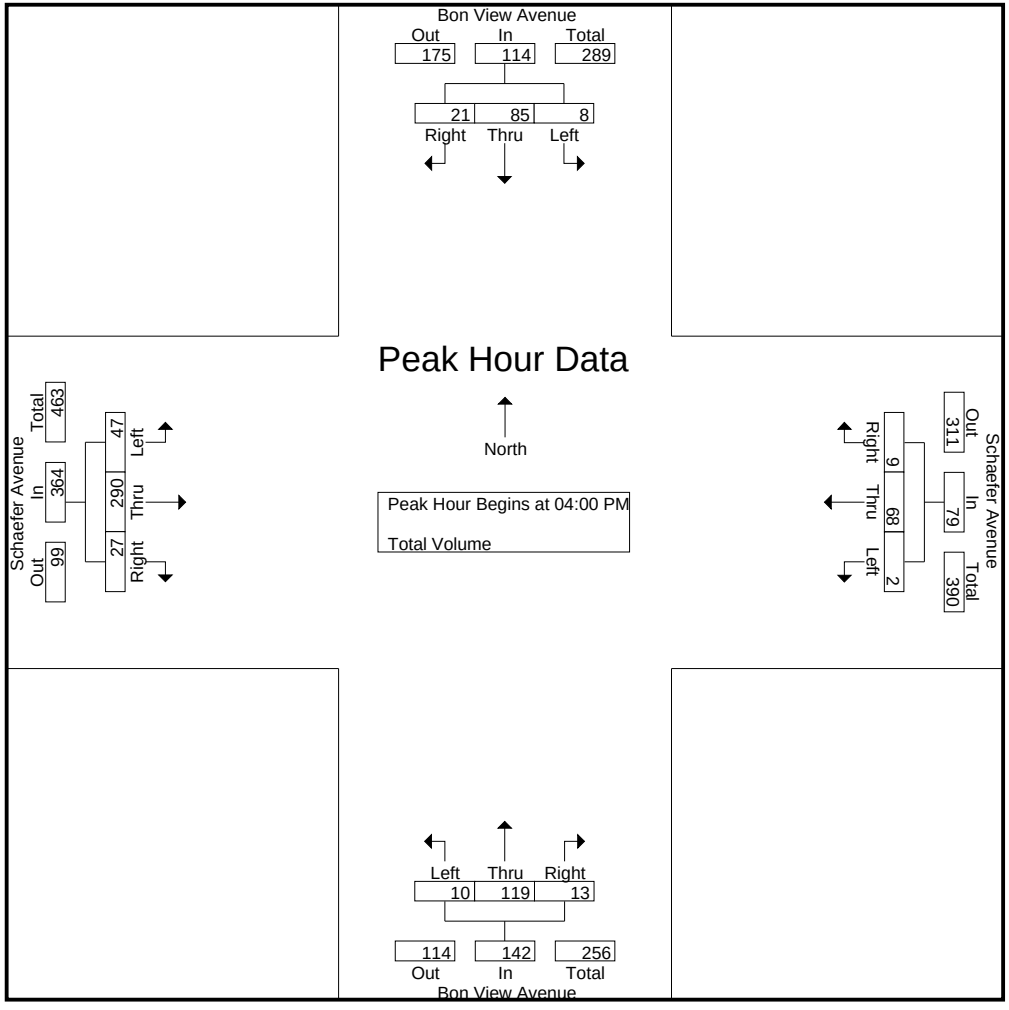

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City of Ontario
N/S: Bon View Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 16_ONT_Bon_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Bon View Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Bon View Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 1 | 21 | **7** | 29 | **1** | **19** | **4** | **24** | 2 | 29 | 3 | 34 | 14 | 67 | 3 | 84 | |
| +15 mins. | **4** | **26** | 6 | **36** | 0 | 15 | 2 | 17 | **3** | 29 | 2 | 34 | 8 | 68 | **9** | 85 | |
| +30 mins. | 3 | 18 | 7 | 28 | 1 | 15 | 2 | 18 | 3 | **35** | **5** | **43** | **16** | 75 | 7 | **98** | |
| +45 mins. | 0 | 20 | 1 | 21 | 0 | 19 | 1 | 20 | 2 | 26 | 3 | 31 | 9 | **80** | 8 | 97 | |
| Total Volume | 8 | 85 | 21 | 114 | 2 | 68 | 9 | 79 | 10 | 119 | 13 | 142 | 47 | 290 | 27 | 364 | |
| % App. Total | 7 | 74.6 | 18.4 | | 2.5 | 86.1 | 11.4 | | 7 | 83.8 | 9.2 | | 12.9 | 79.7 | 7.4 | | |
| PHF | .500 | .817 | .750 | .792 | .500 | .895 | .563 | .823 | .833 | .850 | .650 | .826 | .734 | .906 | .750 | .929 | |

Location: Ontario
N/S: Bon View Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Bon View Avenue | East Leg<br>Schaefer Avenue | South Leg<br>Bon View Avenue | West Leg<br>Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg<br>Bon View Avenue | East Leg<br>Schaefer Avenue | South Leg<br>Bon View Avenue | West Leg<br>Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

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PO Box 1178
Corona, Ca 92878
951-268-6268

Location: Ontario
N/S: Bon View Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Bon View Avenue | | | Westbound Schaefer Avenue | | | Northbound Bon View Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Southbound Bon View Avenue | | | Westbound Schaefer Avenue | | | Northbound Bon View Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |

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Corona, Ca 92878
951-268-6268

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City of Ontario
N/S: Bon View Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 17_ONT_Bon_Edi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Bon View Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Bon View Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 4 | 16 | 5 | 0 | 25 | 0 | 62 | 8 | 0 | 70 | 21 | 18 | 1 | 0 | 40 | 6 | 28 | 5 | 0 | 39 | 0 | 174 | 174 |
| 07:15 AM | 5 | 13 | 10 | 0 | 28 | 0 | 75 | 8 | 0 | 83 | 19 | 25 | 1 | 0 | 45 | 11 | 29 | 10 | 0 | 50 | 0 | 206 | 206 |
| 07:30 AM | 4 | 7 | 10 | 0 | 21 | 0 | 70 | 7 | 0 | 77 | 17 | 46 | 2 | 0 | 65 | 12 | 36 | 4 | 0 | 52 | 0 | 215 | 215 |
| 07:45 AM | 4 | 11 | 11 | 0 | 26 | 1 | 88 | 3 | 0 | 92 | 8 | 39 | 2 | 0 | 49 | 14 | 45 | 10 | 0 | 69 | 0 | 236 | 236 |
| Total | 17 | 47 | 36 | 0 | 100 | 1 | 295 | 26 | 0 | 322 | 65 | 128 | 6 | 0 | 199 | 43 | 138 | 29 | 0 | 210 | 0 | 831 | 831 |
| 08:00 AM | 4 | 19 | 8 | 0 | 31 | 3 | 77 | 4 | 0 | 84 | 14 | 28 | 0 | 0 | 42 | 12 | 54 | 10 | 0 | 76 | 0 | 233 | 233 |
| 08:15 AM | 3 | 12 | 11 | 0 | 26 | 1 | 64 | 4 | 0 | 69 | 12 | 24 | 0 | 0 | 36 | 13 | 40 | 7 | 0 | 60 | 0 | 191 | 191 |
| 08:30 AM | 2 | 11 | 13 | 0 | 26 | 0 | 59 | 10 | 0 | 69 | 14 | 17 | 1 | 0 | 32 | 12 | 53 | 10 | 0 | 75 | 0 | 202 | 202 |
| 08:45 AM | 3 | 16 | 9 | 0 | 28 | 2 | 68 | 4 | 0 | 74 | 16 | 17 | 0 | 0 | 33 | 2 | 51 | 8 | 0 | 61 | 0 | 196 | 196 |
| Total | 12 | 58 | 41 | 0 | 111 | 6 | 268 | 22 | 0 | 296 | 56 | 86 | 1 | 0 | 143 | 39 | 198 | 35 | 0 | 272 | 0 | 822 | 822 |
| Grand Total | 29 | 105 | 77 | 0 | 211 | 7 | 563 | 48 | 0 | 618 | 121 | 214 | 7 | 0 | 342 | 82 | 336 | 64 | 0 | 482 | 0 | 1653 | 1653 |
| Apprch % | 13.7 | 49.8 | 36.5 | | | 1.1 | 91.1 | 7.8 | | | 35.4 | 62.6 | 2 | | | 17 | 69.7 | 13.3 | | | | | |
| Total % | 1.8 | 6.4 | 4.7 | | 12.8 | 0.4 | 34.1 | 2.9 | | 37.4 | 7.3 | 12.9 | 0.4 | | 20.7 | 5 | 20.3 | 3.9 | | 29.2 | 0 | 100 | |

| | Bon View Avenue Southbound | | | | Edison Avenue Westbound | | | | Bon View Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | **5** | 13 | 10 | 28 | 0 | 75 | **8** | 83 | **19** | 25 | 1 | 45 | 11 | 29 | **10** | 50 | 206 |
| 07:30 AM | 4 | 7 | 10 | 21 | 0 | 70 | 7 | 77 | 17 | **46** | **2** | **65** | 12 | 36 | 4 | 52 | 215 |
| 07:45 AM | 4 | 11 | **11** | 26 | 1 | **88** | 3 | **92** | 8 | 39 | 2 | 49 | **14** | 45 | 10 | 69 | **236** |
| 08:00 AM | 4 | **19** | 8 | **31** | **3** | 77 | 4 | 84 | 14 | 28 | 0 | 42 | 12 | **54** | 10 | **76** | 233 |
| Total Volume | 17 | 50 | 39 | 106 | 4 | 310 | 22 | 336 | 58 | 138 | 5 | 201 | 49 | 164 | 34 | 247 | 890 |
| % App. Total | 16 | 47.2 | 36.8 | | 1.2 | 92.3 | 6.5 | | 28.9 | 68.7 | 2.5 | | 19.8 | 66.4 | 13.8 | | |
| PHF | .850 | .658 | .886 | .855 | .333 | .881 | .688 | .913 | .763 | .750 | .625 | .773 | .875 | .759 | .850 | .813 | .943 |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Bon View Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 17_ONT_Bon_Edi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

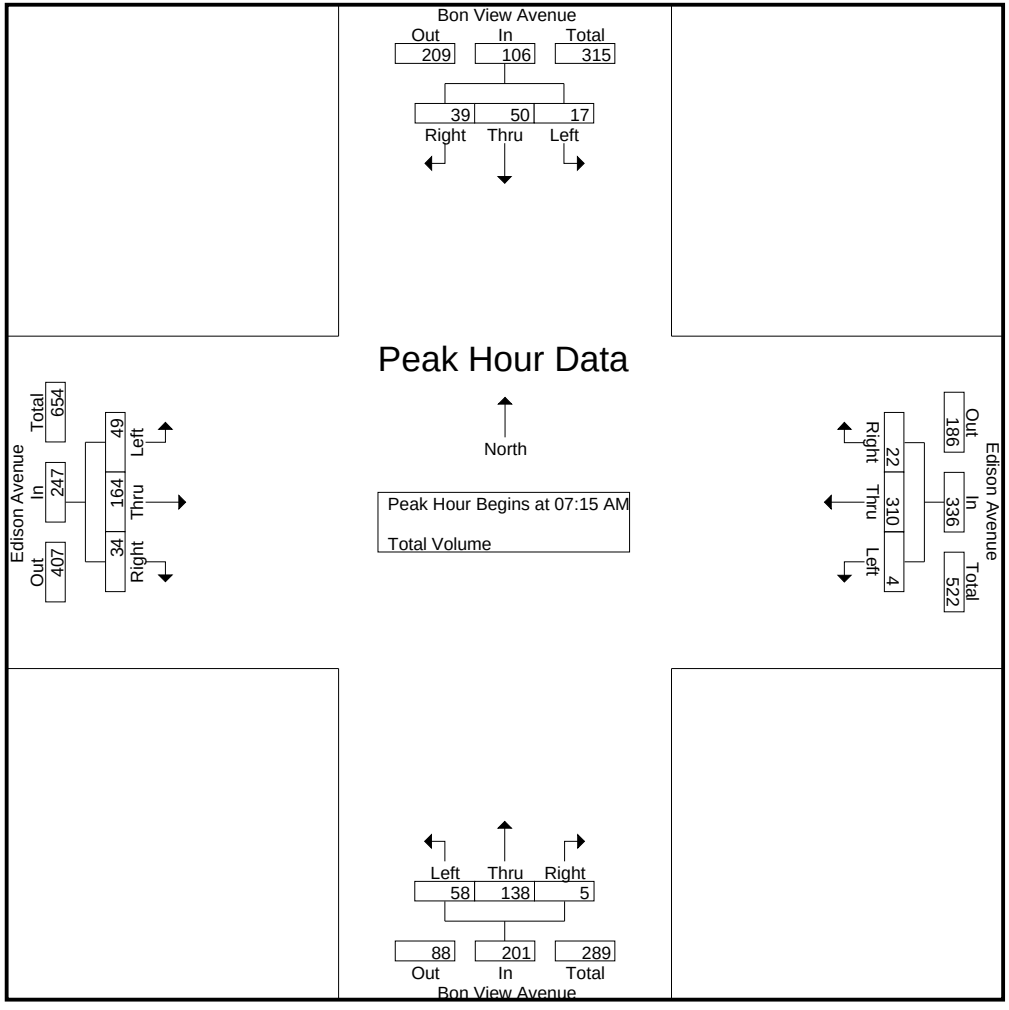

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Bon View Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 17_ONT_Bon_Edi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Bon View Avenue Southbound | | | | Edison Avenue Westbound | | | | Bon View Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 08:00 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:45 AM | | | | |
| +0 mins. | **4** | **19** | 8 | **31** | 0 | 75 | **8** | 83 | **19** | 25 | 1 | 45 | **14** | 45 | **10** | 69 | |
| +15 mins. | 3 | 12 | 11 | 26 | 0 | 70 | 7 | 77 | 17 | **46** | **2** | **65** | 12 | **54** | 10 | **76** | |
| +30 mins. | 2 | 11 | **13** | 26 | 1 | **88** | 3 | **92** | 8 | 39 | 2 | 49 | 13 | 40 | 7 | 60 | |
| +45 mins. | 3 | 16 | 9 | 28 | **3** | 77 | 4 | 84 | 14 | 28 | 0 | 42 | 12 | 53 | 10 | 75 | |
| Total Volume | 12 | 58 | 41 | 111 | 4 | 310 | 22 | 336 | 58 | 138 | 5 | 201 | 51 | 192 | 37 | 280 | |
| % App. Total | 10.8 | 52.3 | 36.9 | | 1.2 | 92.3 | 6.5 | | 28.9 | 68.7 | 2.5 | | 18.2 | 68.6 | 13.2 | | |
| PHF | .750 | .763 | .788 | .895 | .333 | .881 | .688 | .913 | .763 | .750 | .625 | .773 | .911 | .889 | .925 | .921 | |

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City of Ontario
N/S: Bon View Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 17_ONT_Bon_Edi PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Bon View Avenue Southbound | | | | | Edison Avenue Westbound | | | | | Bon View Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 3 | 11 | 7 | 0 | 21 | 2 | 46 | 5 | 0 | 53 | 4 | 15 | 3 | 0 | 22 | 13 | 96 | 7 | 0 | 116 | 0 | 212 | 212 |
| 04:15 PM | 2 | 23 | 6 | 0 | 31 | 2 | 52 | 3 | 0 | 57 | 5 | 19 | 0 | 0 | 24 | 13 | 109 | 14 | 0 | 136 | 0 | 248 | 248 |
| 04:30 PM | 4 | 16 | 4 | 0 | 24 | 0 | 63 | 4 | 0 | 67 | 8 | 20 | 2 | 0 | 30 | 22 | 117 | 8 | 0 | 147 | 0 | 268 | 268 |
| 04:45 PM | 9 | 20 | 4 | 0 | 33 | 0 | 61 | 1 | 0 | 62 | 6 | 17 | 1 | 0 | 24 | 10 | 111 | 10 | 0 | 131 | 0 | 250 | 250 |
| Total | 18 | 70 | 21 | 0 | 109 | 4 | 222 | 13 | 0 | 239 | 23 | 71 | 6 | 0 | 100 | 58 | 433 | 39 | 0 | 530 | 0 | 978 | 978 |
| 05:00 PM | 4 | 18 | 6 | 0 | 28 | 0 | 47 | 1 | 0 | 48 | 4 | 19 | 0 | 0 | 23 | 7 | 99 | 12 | 0 | 118 | 0 | 217 | 217 |
| 05:15 PM | 3 | 15 | 9 | 0 | 27 | 1 | 47 | 2 | 0 | 50 | 6 | 11 | 1 | 0 | 18 | 5 | 111 | 13 | 0 | 129 | 0 | 224 | 224 |
| 05:30 PM | 8 | 10 | 6 | 0 | 24 | 0 | 64 | 3 | 0 | 67 | 4 | 25 | 1 | 0 | 30 | 16 | 112 | 12 | 0 | 140 | 0 | 261 | 261 |
| 05:45 PM | 3 | 21 | 8 | 0 | 32 | 2 | 53 | 5 | 0 | 60 | 7 | 16 | 1 | 0 | 24 | 12 | 114 | 16 | 0 | 142 | 0 | 258 | 258 |
| Total | 18 | 64 | 29 | 0 | 111 | 3 | 211 | 11 | 0 | 225 | 21 | 71 | 3 | 0 | 95 | 40 | 436 | 53 | 0 | 529 | 0 | 960 | 960 |
| Grand Total | 36 | 134 | 50 | 0 | 220 | 7 | 433 | 24 | 0 | 464 | 44 | 142 | 9 | 0 | 195 | 98 | 869 | 92 | 0 | 1059 | 0 | 1938 | 1938 |
| Apprch % | 16.4 | 60.9 | 22.7 | | | 1.5 | 93.3 | 5.2 | | | 22.6 | 72.8 | 4.6 | | | 9.3 | 82.1 | 8.7 | | | | | |
| Total % | 1.9 | 6.9 | 2.6 | | 11.4 | 0.4 | 22.3 | 1.2 | | 23.9 | 2.3 | 7.3 | 0.5 | | 10.1 | 5.1 | 44.8 | 4.7 | | 54.6 | 0 | 100 | |

| | Bon View Avenue Southbound | | | | Edison Avenue Westbound | | | | Bon View Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 2 | **23** | **6** | 31 | **2** | 52 | 3 | 57 | 5 | 19 | 0 | 24 | 13 | 109 | **14** | 136 | 248 |
| 04:30 PM | 4 | 16 | 4 | 24 | 0 | **63** | **4** | **67** | **8** | **20** | **2** | **30** | **22** | **117** | 8 | **147** | **268** |
| 04:45 PM | **9** | 20 | 4 | **33** | 0 | 61 | 1 | 62 | 6 | 17 | 1 | 24 | 10 | 111 | 10 | 131 | 250 |
| 05:00 PM | 4 | 18 | 6 | 28 | 0 | 47 | 1 | 48 | 4 | 19 | 0 | 23 | 7 | 99 | 12 | 118 | 217 |
| Total Volume | 19 | 77 | 20 | 116 | 2 | 223 | 9 | 234 | 23 | 75 | 3 | 101 | 52 | 436 | 44 | 532 | 983 |
| % App. Total | 16.4 | 66.4 | 17.2 | | 0.9 | 95.3 | 3.8 | | 22.8 | 74.3 | 3 | | 9.8 | 82 | 8.3 | | |
| PHF | .528 | .837 | .833 | .879 | .250 | .885 | .563 | .873 | .719 | .938 | .375 | .842 | .591 | .932 | .786 | .905 | .917 |

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N/S: Bon View Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 17_ONT_Bon_Edi PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

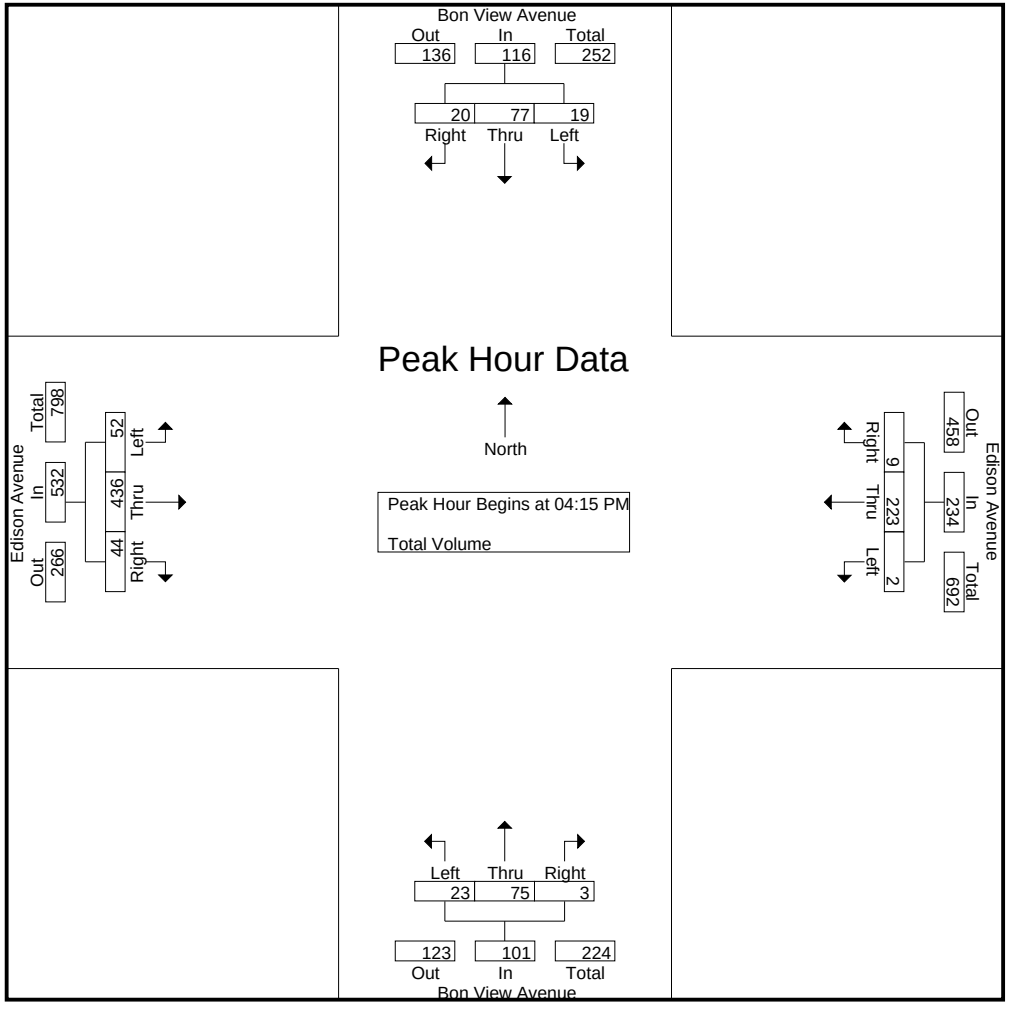

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City of Ontario
N/S: Bon View Avenue
E/W: Edison Avenue
Weather: Clear

File Name : 17_ONT_Bon_Edi PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Bon View Avenue Southbound | | | | Edison Avenue Westbound | | | | Bon View Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:00 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 2 | **23** | **6** | 31 | **2** | 46 | **5** | 53 | 5 | 19 | 0 | 24 | 13 | 109 | **14** | 136 | |
| +15 mins. | 4 | 16 | 4 | 24 | 2 | 52 | 3 | 57 | **8** | **20** | **2** | **30** | **22** | **117** | 8 | **147** | |
| +30 mins. | **9** | 20 | 4 | **33** | 0 | **63** | 4 | **67** | 6 | 17 | 1 | 24 | 10 | 111 | 10 | 131 | |
| +45 mins. | 4 | 18 | 6 | 28 | 0 | 61 | 1 | 62 | 4 | 19 | 0 | 23 | 7 | 99 | 12 | 118 | |
| Total Volume | 19 | 77 | 20 | 116 | 4 | 222 | 13 | 239 | 23 | 75 | 3 | 101 | 52 | 436 | 44 | 532 | |
| % App. Total | 16.4 | 66.4 | 17.2 | | 1.7 | 92.9 | 5.4 | | 22.8 | 74.3 | 3 | | 9.8 | 82 | 8.3 | | |
| PHF | .528 | .837 | .833 | .879 | .500 | .881 | .650 | .892 | .719 | .938 | .375 | .842 | .591 | .932 | .786 | .905 | |

Location: Ontario
N/S: Bon View Avenue
E/W: Edison Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Bon View Avenue | East Leg<br>Edison Avenue | South Leg<br>Bon View Avenue | West Leg<br>Edison Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg<br>Bon View Avenue | East Leg<br>Edison Avenue | South Leg<br>Bon View Avenue | West Leg<br>Edison Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

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951-268-6268

Location: Ontario
N/S: Bon View Avenue
E/W: Edison Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Bon View Avenue | | | Westbound Edison Avenue | | | Northbound Bon View Avenue | | | Eastbound Edison Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Southbound Bon View Avenue | | | Westbound Edison Avenue | | | Northbound Bon View Avenue | | | Eastbound Edison Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 09:00 AM | 2 | 5 | 2 | 9 | 1 | 20 | 3 | 24 | 3 | 5 | 1 | 9 | 2 | 16 | 2 | 20 | 62 |
| 09:15 AM | 0 | 3 | 2 | 5 | 0 | 15 | 3 | 18 | 4 | 7 | 1 | 12 | 2 | 14 | 1 | 17 | 52 |
| 09:30 AM | 4 | 7 | 2 | 13 | 1 | 23 | 2 | 26 | 5 | 4 | 0 | 9 | 5 | 13 | 0 | 18 | 66 |
| 09:45 AM | 1 | 4 | 3 | 8 | 1 | 14 | 3 | 18 | 5 | 4 | 2 | 11 | 1 | 10 | 3 | 14 | 51 |
| Total | 7 | 19 | 9 | 35 | 3 | 72 | 11 | 86 | 17 | 20 | 4 | 41 | 10 | 53 | 6 | 69 | 231 |
| | | | | | | | | | | | | | | | | | |
| 10:00 AM | 4 | 5 | 6 | 15 | 0 | 23 | 0 | 23 | 3 | 5 | 2 | 10 | 1 | 11 | 2 | 14 | 62 |
| 10:15 AM | 3 | 4 | 4 | 11 | 1 | 9 | 1 | 11 | 1 | 2 | 1 | 4 | 0 | 7 | 2 | 9 | 35 |
| 10:30 AM | 1 | 5 | 2 | 8 | 0 | 15 | 1 | 16 | 2 | 3 | 2 | 7 | 1 | 16 | 1 | 18 | 49 |
| 10:45 AM | 0 | 1 | 2 | 3 | 0 | 9 | 0 | 9 | 0 | 3 | 1 | 4 | 7 | 16 | 1 | 24 | 40 |
| Total | 8 | 15 | 14 | 37 | 1 | 56 | 2 | 59 | 6 | 13 | 6 | 25 | 9 | 50 | 6 | 65 | 186 |
| | | | | | | | | | | | | | | | | | |
| Grand Total | 15 | 34 | 23 | 72 | 4 | 128 | 13 | 145 | 23 | 33 | 10 | 66 | 19 | 103 | 12 | 134 | 417 |
| Apprch % | 20.8 | 47.2 | 31.9 | | 2.8 | 88.3 | 9 | | 34.8 | 50 | 15.2 | | 14.2 | 76.9 | 9 | | |
| Total % | 3.6 | 8.2 | 5.5 | 17.3 | 1 | 30.7 | 3.1 | 34.8 | 5.5 | 7.9 | 2.4 | 15.8 | 4.6 | 24.7 | 2.9 | 32.1 | |
| Passenger Vehicles | 11 | 32 | 19 | 62 | 1 | 91 | 9 | 101 | 19 | 30 | 1 | 50 | 16 | 77 | 11 | 104 | 317 |
| % Passenger Vehicles | 73.3 | 94.1 | 82.6 | 86.1 | 25 | 71.1 | 69.2 | 69.7 | 82.6 | 90.9 | 10 | 75.8 | 84.2 | 74.8 | 91.7 | 77.6 | 76 |
| Large 2 Axle Vehicles | 0 | 2 | 2 | 4 | 0 | 10 | 0 | 10 | 2 | 1 | 0 | 3 | 1 | 5 | 0 | 6 | 23 |
| % Large 2 Axle Vehicles | 0 | 5.9 | 8.7 | 5.6 | 0 | 7.8 | 0 | 6.9 | 8.7 | 3 | 0 | 4.5 | 5.3 | 4.9 | 0 | 4.5 | 5.5 |
| 3 Axle Vehicles | 1 | 0 | 2 | 3 | 3 | 17 | 1 | 21 | 2 | 1 | 6 | 9 | 1 | 8 | 0 | 9 | 42 |
| % 3 Axle Vehicles | 6.7 | 0 | 8.7 | 4.2 | 75 | 13.3 | 7.7 | 14.5 | 8.7 | 3 | 60 | 13.6 | 5.3 | 7.8 | 0 | 6.7 | 10.1 |
| 4+ Axle Trucks | 3 | 0 | 0 | 3 | 0 | 10 | 3 | 13 | 0 | 1 | 3 | 4 | 1 | 13 | 1 | 15 | 35 |
| % 4+ Axle Trucks | 20 | 0 | 0 | 4.2 | 0 | 7.8 | 23.1 | 9 | 0 | 3 | 30 | 6.1 | 5.3 | 12.6 | 8.3 | 11.2 | 8.4 |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 09:00 AM to 10:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 09:00 AM | | | | | | | | | | | | | | | | | |
| 09:00 AM | 2 | 5 | 2 | 9 | **1** | 20 | **3** | 24 | 3 | 5 | 1 | 9 | 2 | **16** | 2 | **20** | 62 |
| 09:15 AM | 0 | 3 | 2 | 5 | 0 | 15 | 3 | 18 | 4 | **7** | 1 | **12** | 2 | 14 | 1 | 17 | 52 |
| 09:30 AM | **4** | **7** | 2 | **13** | 1 | **23** | 2 | **26** | **5** | 4 | 0 | 9 | **5** | 13 | 0 | 18 | **66** |
| 09:45 AM | 1 | 4 | **3** | 8 | 1 | 14 | 3 | 18 | 5 | 4 | **2** | 11 | 1 | 10 | **3** | 14 | 51 |
| Total Volume | 7 | 19 | 9 | 35 | 3 | 72 | 11 | 86 | 17 | 20 | 4 | 41 | 10 | 53 | 6 | 69 | 231 |
| % App. Total | 20 | 54.3 | 25.7 | | 3.5 | 83.7 | 12.8 | | 41.5 | 48.8 | 9.8 | | 14.5 | 76.8 | 8.7 | | |
| PHF | .438 | .679 | .750 | .673 | .750 | .783 | .917 | .827 | .850 | .714 | .500 | .854 | .500 | .828 | .500 | .863 | .875 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

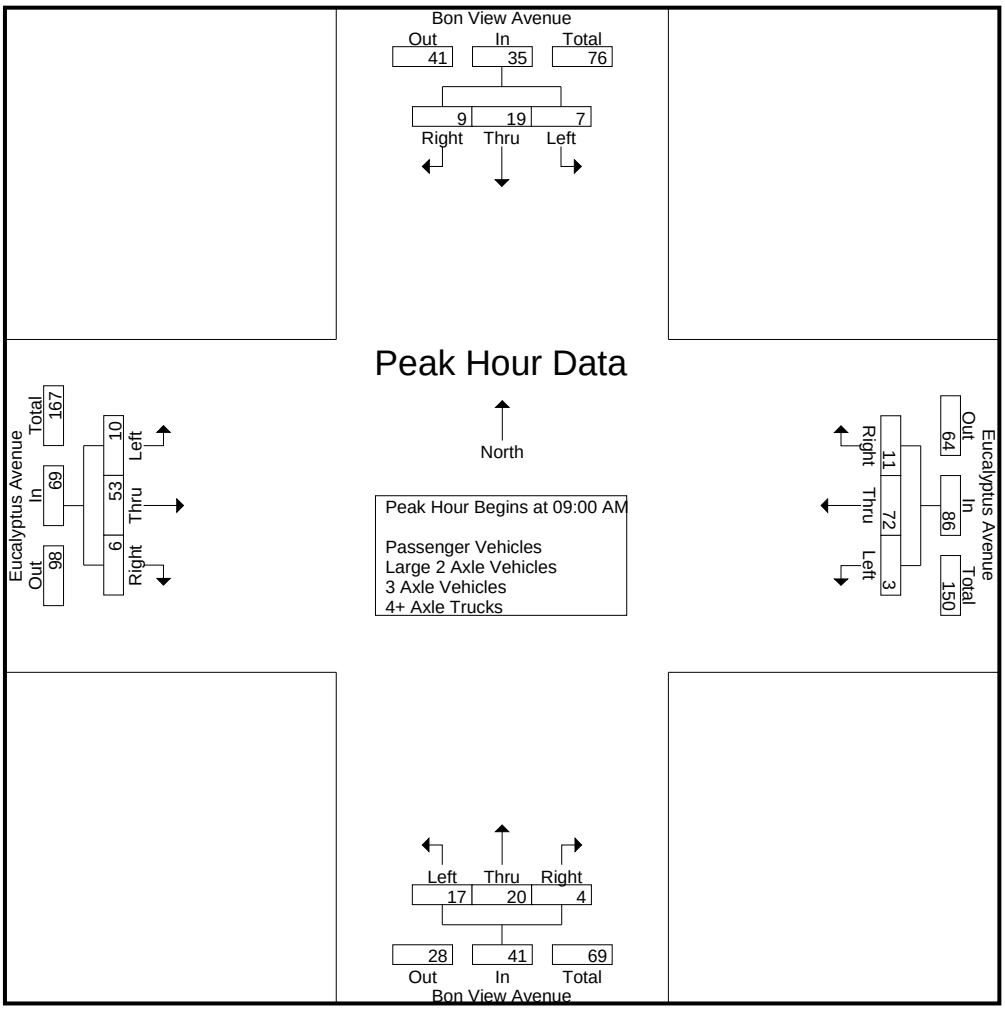


Peak Hour Analysis From 09:00 AM to 10:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 09:30 AM | | | | 09:00 AM | | | | 09:15 AM | | | | 09:00 AM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **4** | **7** | 2 | 13 | **1** | 20 | **3** | 24 | 4 | **7** | 1 | **12** | 2 | **16** | 2 | **20** |
| +15 mins. | 1 | 4 | 3 | 8 | 0 | 15 | 3 | 18 | **5** | 4 | 0 | 9 | 2 | 14 | 1 | 17 |
| +30 mins. | 4 | 5 | **6** | **15** | 1 | **23** | 2 | **26** | 5 | 4 | **2** | 11 | **5** | 13 | 0 | 18 |
| +45 mins. | 3 | 4 | 4 | 11 | 1 | 14 | 3 | 18 | 3 | 5 | 2 | 10 | 1 | 10 | **3** | 14 |
| Total Volume | 12 | 20 | 15 | 47 | 3 | 72 | 11 | 86 | 17 | 20 | 5 | 42 | 10 | 53 | 6 | 69 |
| % App. Total | 25.5 | 42.6 | 31.9 | | 3.5 | 83.7 | 12.8 | | 40.5 | 47.6 | 11.9 | | 14.5 | 76.8 | 8.7 | |
| PHF | .750 | .714 | .625 | .783 | .750 | .783 | .917 | .827 | .850 | .714 | .625 | .875 | .500 | .828 | .500 | .863 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- Passenger Vehicles

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 09:00 AM | 2 | 5 | 1 | 8 | 0 | 18 | 3 | 21 | 2 | 3 | 0 | 5 | 1 | 12 | 1 | 14 | 48 |
| 09:15 AM | 0 | 3 | 2 | 5 | 0 | 13 | 2 | 15 | 4 | 7 | 0 | 11 | 2 | 11 | 1 | 14 | 45 |
| 09:30 AM | 2 | 7 | 1 | 10 | 1 | 16 | 0 | 17 | 3 | 4 | 0 | 7 | 4 | 9 | 0 | 13 | 47 |
| 09:45 AM | 1 | 4 | 2 | 7 | 0 | 10 | 3 | 13 | 4 | 4 | 0 | 8 | 1 | 9 | 3 | 13 | 41 |
| Total | 5 | 19 | 6 | 30 | 1 | 57 | 8 | 66 | 13 | 18 | 0 | 31 | 8 | 41 | 5 | 54 | 181 |
| | | | | | | | | | | | | | | | | | |
| 10:00 AM | 3 | 4 | 5 | 12 | 0 | 11 | 0 | 11 | 3 | 4 | 0 | 7 | 1 | 8 | 2 | 11 | 41 |
| 10:15 AM | 3 | 3 | 4 | 10 | 0 | 5 | 1 | 6 | 1 | 2 | 1 | 4 | 0 | 6 | 2 | 8 | 28 |
| 10:30 AM | 0 | 5 | 2 | 7 | 0 | 12 | 0 | 12 | 2 | 3 | 0 | 5 | 1 | 12 | 1 | 14 | 38 |
| 10:45 AM | 0 | 1 | 2 | 3 | 0 | 6 | 0 | 6 | 0 | 3 | 0 | 3 | 6 | 10 | 1 | 17 | 29 |
| Total | 6 | 13 | 13 | 32 | 0 | 34 | 1 | 35 | 6 | 12 | 1 | 19 | 8 | 36 | 6 | 50 | 136 |
| | | | | | | | | | | | | | | | | | |
| Grand Total | 11 | 32 | 19 | 62 | 1 | 91 | 9 | 101 | 19 | 30 | 1 | 50 | 16 | 77 | 11 | 104 | 317 |
| Apprch % | 17.7 | 51.6 | 30.6 | | 1 | 90.1 | 8.9 | | 38 | 60 | 2 | | 15.4 | 74 | 10.6 | | |
| Total % | 3.5 | 10.1 | 6 | 19.6 | 0.3 | 28.7 | 2.8 | 31.9 | 6 | 9.5 | 0.3 | 15.8 | 5 | 24.3 | 3.5 | 32.8 | |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 09:00 AM to 09:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 09:00 AM | | | | | | | | | | | | | | | | | |
| 09:00 AM | **2** | 5 | 1 | 8 | 0 | **18** | **3** | **21** | 2 | 3 | 0 | 5 | 1 | **12** | 1 | **14** | **48** |
| 09:15 AM | 0 | 3 | **2** | 5 | 0 | 13 | 2 | 15 | **4** | **7** | 0 | **11** | 2 | 11 | 1 | 14 | 45 |
| 09:30 AM | 2 | **7** | 1 | **10** | **1** | 16 | 0 | 17 | 3 | 4 | 0 | 7 | **4** | 9 | 0 | 13 | 47 |
| 09:45 AM | 1 | 4 | 2 | 7 | 0 | 10 | 3 | 13 | 4 | 4 | 0 | 8 | 1 | 9 | **3** | 13 | 41 |
| Total Volume | 5 | 19 | 6 | 30 | 1 | 57 | 8 | 66 | 13 | 18 | 0 | 31 | 8 | 41 | 5 | 54 | 181 |
| % App. Total | 16.7 | 63.3 | 20 | | 1.5 | 86.4 | 12.1 | | 41.9 | 58.1 | 0 | | 14.8 | 75.9 | 9.3 | | |
| PHF | .625 | .679 | .750 | .750 | .250 | .792 | .667 | .786 | .813 | .643 | .000 | .705 | .500 | .854 | .417 | .964 | .943 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

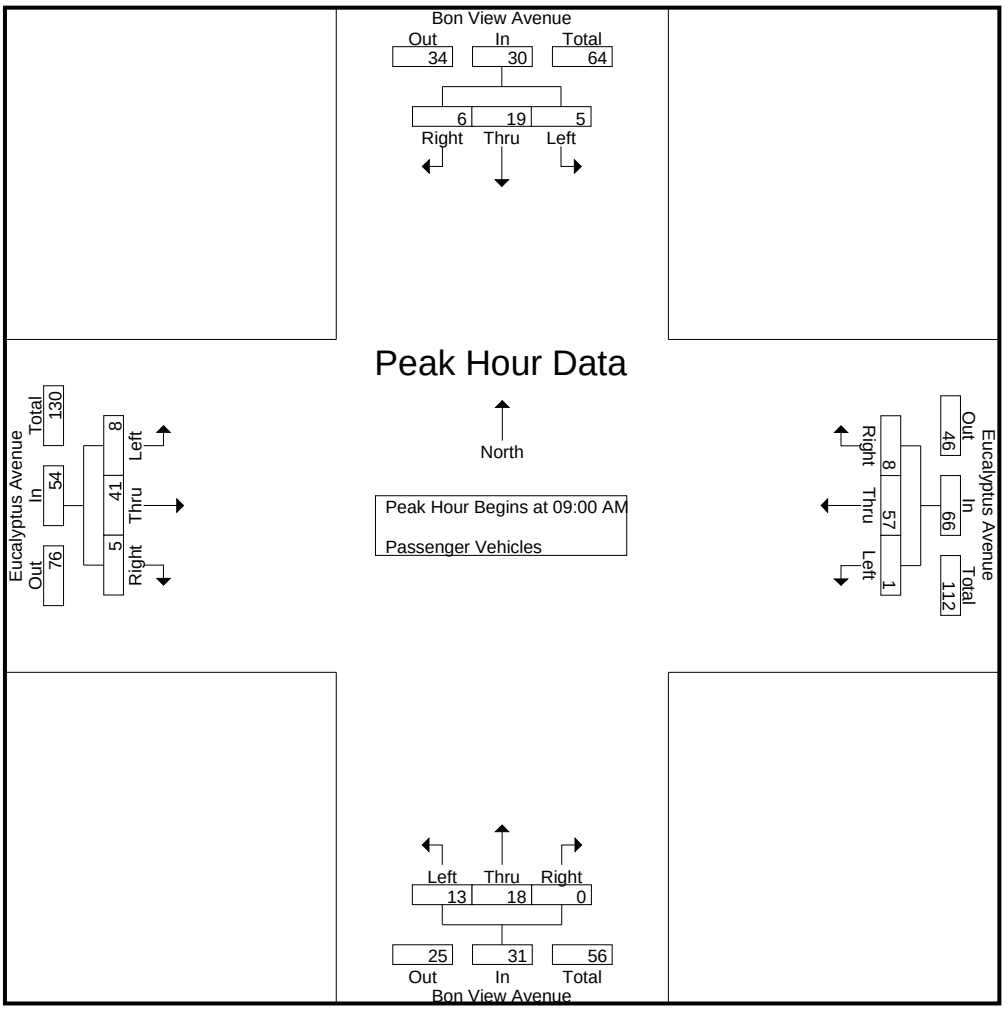


Peak Hour Analysis From 09:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 09:00 AM | | | | 09:00 AM | | | | 09:00 AM | | | | 09:00 AM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **2** | 5 | 1 | 8 | 0 | **18** | **3** | **21** | 2 | 3 | 0 | 5 | 1 | **12** | 1 | **14** |
| +15 mins. | 0 | 3 | **2** | 5 | 0 | 13 | 2 | 15 | **4** | **7** | 0 | **11** | 2 | 11 | 1 | 14 |
| +30 mins. | 2 | **7** | 1 | **10** | **1** | 16 | 0 | 17 | 3 | 4 | 0 | 7 | **4** | 9 | 0 | 13 |
| +45 mins. | 1 | 4 | 2 | 7 | 0 | 10 | 3 | 13 | 4 | 4 | 0 | 8 | 1 | 9 | **3** | 13 |
| Total Volume | 5 | 19 | 6 | 30 | 1 | 57 | 8 | 66 | 13 | 18 | 0 | 31 | 8 | 41 | 5 | 54 |
| % App. Total | 16.7 | 63.3 | 20 | | 1.5 | 86.4 | 12.1 | | 41.9 | 58.1 | 0 | | 14.8 | 75.9 | 9.3 | |
| PHF | .625 | .679 | .750 | .750 | .250 | .792 | .667 | .786 | .813 | .643 | .000 | .705 | .500 | .854 | .417 | .964 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 09:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 4 |
| 09:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 09:30 AM | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| 09:45 AM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | 0 | 0 | 1 | 1 | 0 | 5 | 0 | 5 | 2 | 0 | 0 | 2 | 1 | 2 | 0 | 3 | 11 |
| | | | | | | | | | | | | | | | | | |
| 10:00 AM | 0 | 1 | 1 | 2 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 6 |
| 10:15 AM | 0 | 1 | 0 | 1 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| Total | 0 | 2 | 1 | 3 | 0 | 5 | 0 | 5 | 0 | 1 | 0 | 1 | 0 | 3 | 0 | 3 | 12 |
| | | | | | | | | | | | | | | | | | |
| Grand Total | 0 | 2 | 2 | 4 | 0 | 10 | 0 | 10 | 2 | 1 | 0 | 3 | 1 | 5 | 0 | 6 | 23 |
| Apprch % | 0 | 50 | 50 | | 0 | 100 | 0 | | 66.7 | 33.3 | 0 | | 16.7 | 83.3 | 0 | | |
| Total % | 0 | 8.7 | 8.7 | 17.4 | 0 | 43.5 | 0 | 43.5 | 8.7 | 4.3 | 0 | 13 | 4.3 | 21.7 | 0 | 26.1 | |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 09:00 AM to 09:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 09:00 AM | | | | | | | | | | | | | | | | | |
| 09:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **1** | 0 | 0 | **1** | **1** | **1** | 0 | **2** | **4** |
| 09:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 09:30 AM | 0 | 0 | 0 | 0 | 0 | **3** | 0 | **3** | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 |
| 09:45 AM | 0 | 0 | **1** | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total Volume | 0 | 0 | 1 | 1 | 0 | 5 | 0 | 5 | 2 | 0 | 0 | 2 | 1 | 2 | 0 | 3 | 11 |
| % App. Total | 0 | 0 | 100 | | 0 | 100 | 0 | | 100 | 0 | 0 | | 33.3 | 66.7 | 0 | | |
| PHF | .000 | .000 | .250 | .250 | .000 | .417 | .000 | .417 | .500 | .000 | .000 | .500 | .250 | .500 | .000 | .375 | .688 |

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City of Ontario
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E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

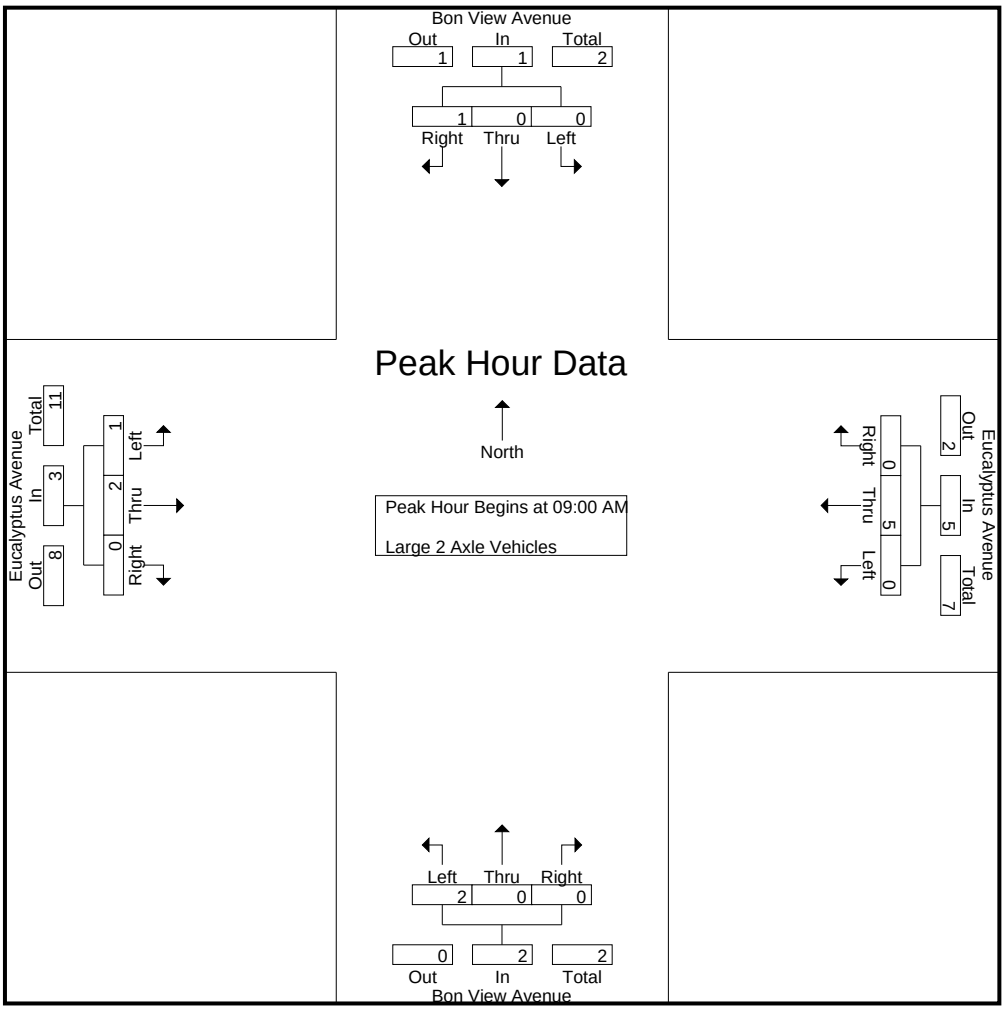


Peak Hour Analysis From 09:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 09:00 AM | | | | 09:00 AM | | | | 09:00 AM | | | | 09:00 AM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **1** | 0 | 0 | **1** | **1** | **1** | 0 | **2** |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | **3** | 0 | **3** | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| +45 mins. | 0 | 0 | **1** | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 0 | 0 | 1 | 1 | 0 | 5 | 0 | 5 | 2 | 0 | 0 | 2 | 1 | 2 | 0 | 3 |
| % App. Total | 0 | 0 | 100 | | 0 | 100 | 0 | | 100 | 0 | 0 | | 33.3 | 66.7 | 0 | |
| PHF | .000 | .000 | .250 | .250 | .000 | .417 | .000 | .417 | .500 | .000 | .000 | .500 | .250 | .500 | .000 | .375 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 09:00 AM | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 5 |
| 09:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 09:30 AM | 0 | 0 | 1 | 1 | 0 | 2 | 1 | 3 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 3 | 8 |
| 09:45 AM | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 4 | 1 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 7 |
| Total | 0 | 0 | 2 | 2 | 2 | 6 | 1 | 9 | 2 | 1 | 3 | 6 | 1 | 4 | 0 | 5 | 22 |
| | | | | | | | | | | | | | | | | | |
| 10:00 AM | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 8 |
| 10:15 AM | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 3 |
| 10:30 AM | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 4 |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 5 |
| Total | 1 | 0 | 0 | 1 | 1 | 11 | 0 | 12 | 0 | 0 | 3 | 3 | 0 | 4 | 0 | 4 | 20 |
| | | | | | | | | | | | | | | | | | |
| Grand Total | 1 | 0 | 2 | 3 | 3 | 17 | 1 | 21 | 2 | 1 | 6 | 9 | 1 | 8 | 0 | 9 | 42 |
| Apprch % | 33.3 | 0 | 66.7 | | 14.3 | 81 | 4.8 | | 22.2 | 11.1 | 66.7 | | 11.1 | 88.9 | 0 | | |
| Total % | 2.4 | 0 | 4.8 | 7.1 | 7.1 | 40.5 | 2.4 | 50 | 4.8 | 2.4 | 14.3 | 21.4 | 2.4 | 19 | 0 | 21.4 | |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 09:00 AM to 09:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 09:00 AM | | | | | | | | | | | | | | | | | |
| 09:00 AM | 0 | 0 | **1** | **1** | **1** | 0 | 0 | 1 | 0 | **1** | 1 | 2 | 0 | 1 | 0 | 1 | 5 |
| 09:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 09:30 AM | 0 | 0 | 1 | 1 | 0 | 2 | **1** | 3 | **1** | 0 | 0 | 1 | **1** | **2** | 0 | **3** | **8** |
| 09:45 AM | 0 | 0 | 0 | 0 | 1 | **3** | 0 | **4** | 1 | 0 | **2** | **3** | 0 | 0 | 0 | 0 | 7 |
| Total Volume | 0 | 0 | 2 | 2 | 2 | 6 | 1 | 9 | 2 | 1 | 3 | 6 | 1 | 4 | 0 | 5 | 22 |
| % App. Total | 0 | 0 | 100 | | 22.2 | 66.7 | 11.1 | | 33.3 | 16.7 | 50 | | 20 | 80 | 0 | | |
| PHF | .000 | .000 | .500 | .500 | .500 | .500 | .250 | .563 | .500 | .250 | .375 | .500 | .250 | .500 | .000 | .417 | .688 |

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Corona, CA 92878
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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

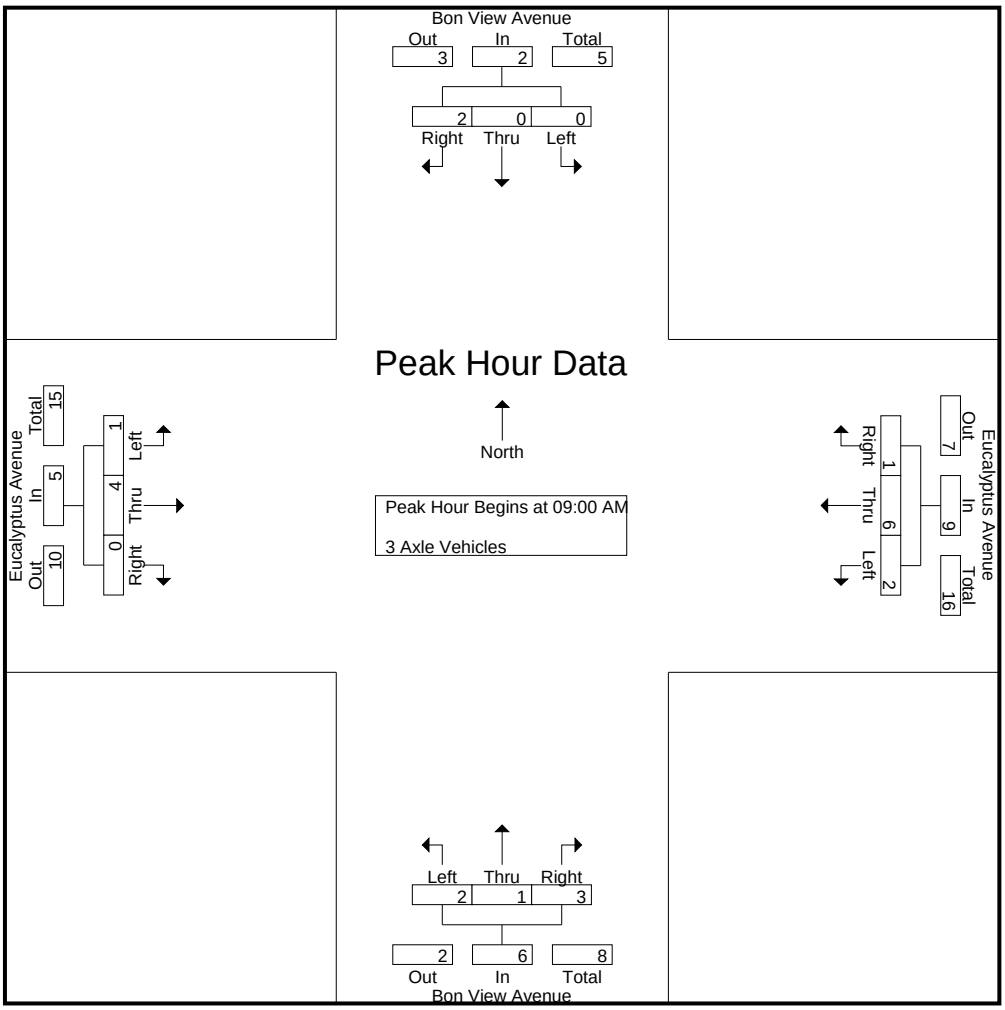


Peak Hour Analysis From 09:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 09:00 AM | | | | 09:00 AM | | | | 09:00 AM | | | | 09:00 AM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 0 | **1** | **1** | **1** | 0 | 0 | 1 | 0 | **1** | 1 | 2 | 0 | 1 | 0 | 1 |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| +30 mins. | 0 | 0 | 1 | 1 | 0 | 2 | **1** | 3 | **1** | 0 | 0 | 1 | **1** | **2** | 0 | **3** |
| +45 mins. | 0 | 0 | 0 | 0 | 1 | **3** | 0 | **4** | 1 | 0 | **2** | **3** | 0 | 0 | 0 | 0 |
| Total Volume | 0 | 0 | 2 | 2 | 2 | 6 | 1 | 9 | 2 | 1 | 3 | 6 | 1 | 4 | 0 | 5 |
| % App. Total | 0 | 0 | 100 | | 22.2 | 66.7 | 11.1 | | 33.3 | 16.7 | 50 | | 20 | 80 | 0 | |
| PHF | .000 | .000 | .500 | .500 | .500 | .500 | .250 | .563 | .500 | .250 | .375 | .500 | .250 | .500 | .000 | .417 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 09:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 2 | 1 | 3 | 5 |
| 09:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 3 |
| 09:30 AM | 2 | 0 | 0 | 2 | 0 | 2 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 7 |
| 09:45 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| Total | 2 | 0 | 0 | 2 | 0 | 4 | 2 | 6 | 0 | 1 | 1 | 2 | 0 | 6 | 1 | 7 | 17 |
| 10:00 AM | 1 | 0 | 0 | 1 | 0 | 3 | 0 | 3 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 7 |
| 10:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 10:30 AM | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 2 | 5 |
| 10:45 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 4 | 5 |
| Total | 1 | 0 | 0 | 1 | 0 | 6 | 1 | 7 | 0 | 0 | 2 | 2 | 1 | 7 | 0 | 8 | 18 |
| Grand Total | 3 | 0 | 0 | 3 | 0 | 10 | 3 | 13 | 0 | 1 | 3 | 4 | 1 | 13 | 1 | 15 | 35 |
| Apprch % | 100 | 0 | 0 | | 0 | 76.9 | 23.1 | | 0 | 25 | 75 | | 6.7 | 86.7 | 6.7 | | |
| Total % | 8.6 | 0 | 0 | 8.6 | 0 | 28.6 | 8.6 | 37.1 | 0 | 2.9 | 8.6 | 11.4 | 2.9 | 37.1 | 2.9 | 42.9 | |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 09:00 AM to 09:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 09:00 AM | | | | | | | | | | | | | | | | | |
| 09:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | **1** | 0 | **1** | 0 | **2** | **1** | **3** | 5 |
| 09:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 1 | 0 | 0 | **1** | 1 | 0 | 1 | 0 | 1 | 3 |
| 09:30 AM | **2** | 0 | 0 | **2** | 0 | **2** | 1 | **3** | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | **7** |
| 09:45 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| Total Volume | 2 | 0 | 0 | 2 | 0 | 4 | 2 | 6 | 0 | 1 | 1 | 2 | 0 | 6 | 1 | 7 | 17 |
| % App. Total | 100 | 0 | 0 | | 0 | 66.7 | 33.3 | | 0 | 50 | 50 | | 0 | 85.7 | 14.3 | | |
| PHF | .250 | .000 | .000 | .250 | .000 | .500 | .500 | .500 | .000 | .250 | .250 | .500 | .000 | .750 | .250 | .583 | .607 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca AM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

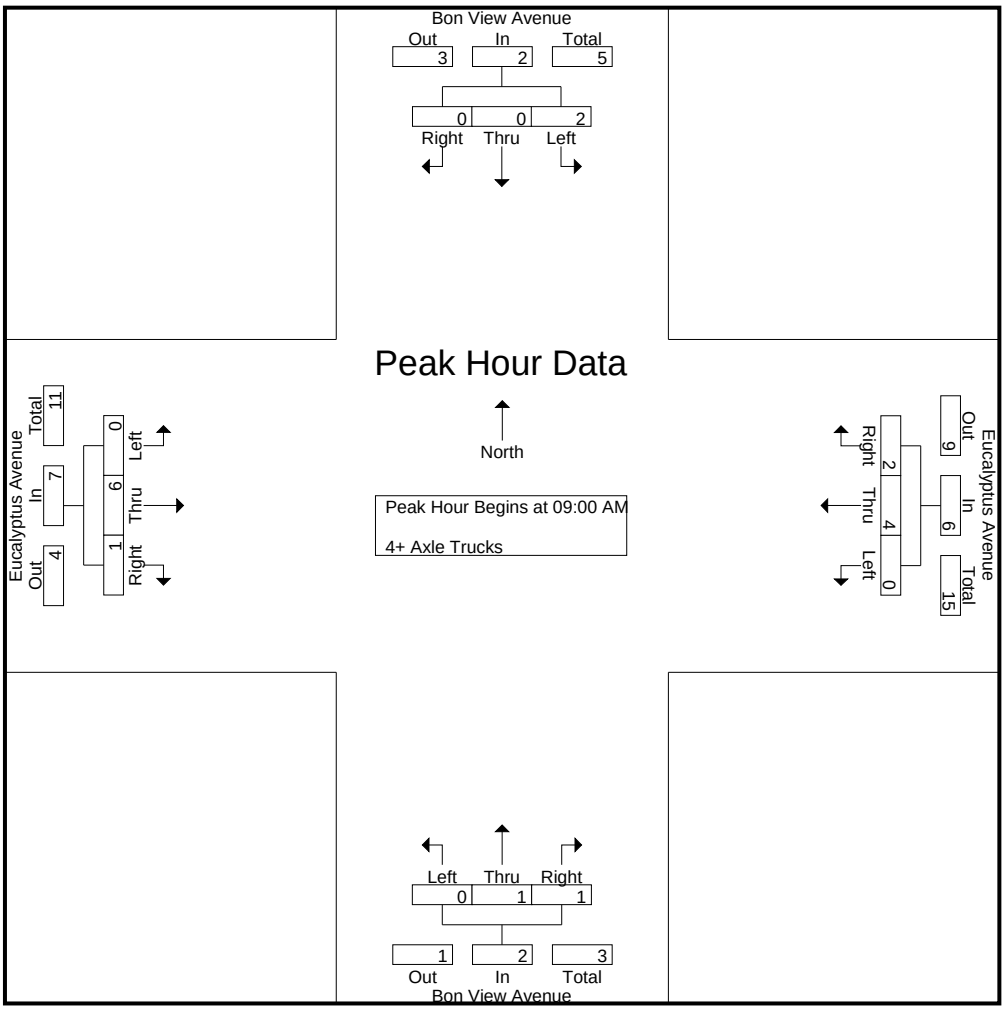


Peak Hour Analysis From 09:00 AM to 09:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 09:00 AM | | | | 09:00 AM | | | | 09:00 AM | | | | 09:00 AM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | **1** | 0 | **1** | 0 | **2** | **1** | **3** |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 1 | 0 | 0 | **1** | 1 | 0 | 1 | 0 | 1 |
| +30 mins. | **2** | 0 | 0 | **2** | 0 | **2** | 1 | **3** | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Total Volume | 2 | 0 | 0 | 2 | 0 | 4 | 2 | 6 | 0 | 1 | 1 | 2 | 0 | 6 | 1 | 7 |
| % App. Total | 100 | 0 | 0 | | 0 | 66.7 | 33.3 | | 0 | 50 | 50 | | 0 | 85.7 | 14.3 | |
| PHF | .250 | .000 | .000 | .250 | .000 | .500 | .500 | .500 | .000 | .250 | .250 | .500 | .000 | .750 | .250 | .583 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 06:00 PM | 1 | 4 | 1 | 6 | 0 | 14 | 0 | 14 | 3 | 6 | 1 | 10 | 4 | 39 | 3 | 46 | 76 |
| 06:15 PM | 1 | 3 | 3 | 7 | 0 | 12 | 2 | 14 | 2 | 4 | 2 | 8 | 2 | 27 | 3 | 32 | 61 |
| 06:30 PM | 1 | 0 | 2 | 3 | 0 | 13 | 0 | 13 | 3 | 5 | 0 | 8 | 4 | 27 | 4 | 35 | 59 |
| 06:45 PM | 0 | 4 | 1 | 5 | 0 | 9 | 1 | 10 | 1 | 6 | 0 | 7 | 2 | 26 | 4 | 32 | 54 |
| Total | 3 | 11 | 7 | 21 | 0 | 48 | 3 | 51 | 9 | 21 | 3 | 33 | 12 | 119 | 14 | 145 | 250 |
| 07:00 PM | 0 | 5 | 0 | 5 | 0 | 4 | 1 | 5 | 2 | 6 | 0 | 8 | 1 | 9 | 3 | 13 | 31 |
| 07:15 PM | 0 | 4 | 1 | 5 | 0 | 7 | 1 | 8 | 3 | 4 | 0 | 7 | 2 | 10 | 2 | 14 | 34 |
| 07:30 PM | 1 | 3 | 0 | 4 | 0 | 9 | 0 | 9 | 2 | 2 | 0 | 4 | 1 | 6 | 1 | 8 | 25 |
| 07:45 PM | 1 | 5 | 0 | 6 | 0 | 7 | 1 | 8 | 3 | 6 | 0 | 9 | 3 | 7 | 2 | 12 | 35 |
| Total | 2 | 17 | 1 | 20 | 0 | 27 | 3 | 30 | 10 | 18 | 0 | 28 | 7 | 32 | 8 | 47 | 125 |
| Grand Total | 5 | 28 | 8 | 41 | 0 | 75 | 6 | 81 | 19 | 39 | 3 | 61 | 19 | 151 | 22 | 192 | 375 |
| Apprch % | 12.2 | 68.3 | 19.5 | | 0 | 92.6 | 7.4 | | 31.1 | 63.9 | 4.9 | | 9.9 | 78.6 | 11.5 | | |
| Total % | 1.3 | 7.5 | 2.1 | 10.9 | 0 | 20 | 1.6 | 21.6 | 5.1 | 10.4 | 0.8 | 16.3 | 5.1 | 40.3 | 5.9 | 51.2 | |
| Passenger Vehicles | 5 | 28 | 8 | 41 | 0 | 65 | 6 | 71 | 19 | 37 | 3 | 59 | 19 | 144 | 21 | 184 | 355 |
| % Passenger Vehicles | 100 | 100 | 100 | 100 | 0 | 86.7 | 100 | 87.7 | 100 | 94.9 | 100 | 96.7 | 100 | 95.4 | 95.5 | 95.8 | 94.7 |
| Large 2 Axle Vehicles | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 1 | 4 | 8 |
| % Large 2 Axle Vehicles | 0 | 0 | 0 | 0 | 0 | 2.7 | 0 | 2.5 | 0 | 5.1 | 0 | 3.3 | 0 | 2 | 4.5 | 2.1 | 2.1 |
| 3 Axle Vehicles | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| % 3 Axle Vehicles | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 3.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.8 |
| 4+ Axle Trucks | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 9 |
| % 4+ Axle Trucks | 0 | 0 | 0 | 0 | 0 | 6.7 | 0 | 6.2 | 0 | 0 | 0 | 0 | 0 | 2.6 | 0 | 2.1 | 2.4 |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 PM to 07:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 06:00 PM | | | | | | | | | | | | | | | | | |
| 06:00 PM | **1** | **4** | 1 | 6 | 0 | **14** | 0 | **14** | **3** | **6** | 1 | **10** | **4** | **39** | 3 | **46** | **76** |
| 06:15 PM | 1 | 3 | **3** | **7** | 0 | 12 | **2** | 14 | 2 | 4 | **2** | 8 | 2 | 27 | 3 | 32 | 61 |
| 06:30 PM | 1 | 0 | 2 | 3 | 0 | 13 | 0 | 13 | 3 | 5 | 0 | 8 | 4 | 27 | **4** | 35 | 59 |
| 06:45 PM | 0 | 4 | 1 | 5 | 0 | 9 | 1 | 10 | 1 | 6 | 0 | 7 | 2 | 26 | 4 | 32 | 54 |
| Total Volume | 3 | 11 | 7 | 21 | 0 | 48 | 3 | 51 | 9 | 21 | 3 | 33 | 12 | 119 | 14 | 145 | 250 |
| % App. Total | 14.3 | 52.4 | 33.3 | | 0 | 94.1 | 5.9 | | 27.3 | 63.6 | 9.1 | | 8.3 | 82.1 | 9.7 | | |
| PHF | .750 | .688 | .583 | .750 | .000 | .857 | .375 | .911 | .750 | .875 | .375 | .825 | .750 | .763 | .875 | .788 | .822 |

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City of Ontario
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E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

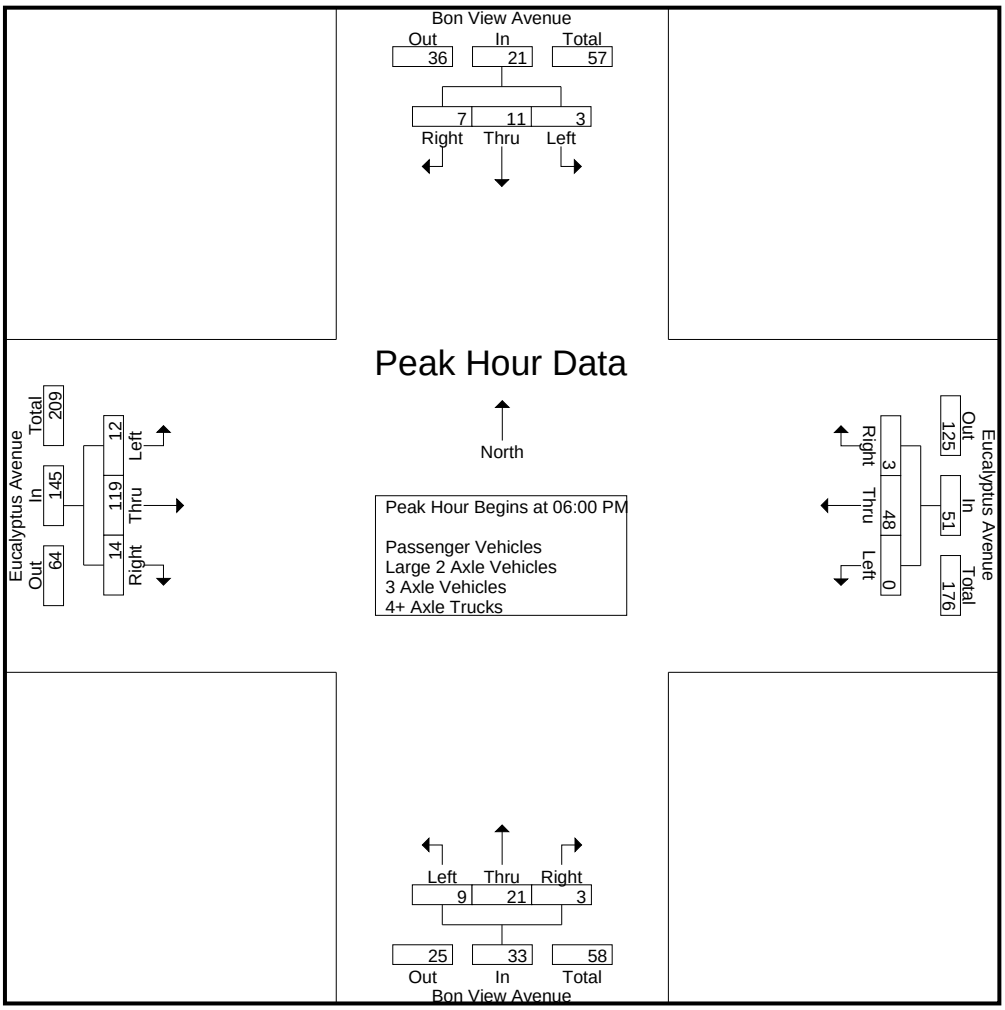


Peak Hour Analysis From 06:00 PM to 07:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **1** | **4** | 1 | 6 | 0 | **14** | 0 | **14** | **3** | **6** | 1 | **10** | **4** | **39** | 3 | **46** |
| +15 mins. | 1 | 3 | **3** | **7** | 0 | 12 | **2** | 14 | 2 | 4 | **2** | 8 | 2 | 27 | 3 | 32 |
| +30 mins. | 1 | 0 | 2 | 3 | 0 | 13 | 0 | 13 | 3 | 5 | 0 | 8 | 4 | 27 | **4** | 35 |
| +45 mins. | 0 | 4 | 1 | 5 | 0 | 9 | 1 | 10 | 1 | 6 | 0 | 7 | 2 | 26 | 4 | 32 |
| Total Volume | 3 | 11 | 7 | 21 | 0 | 48 | 3 | 51 | 9 | 21 | 3 | 33 | 12 | 119 | 14 | 145 |
| % App. Total | 14.3 | 52.4 | 33.3 | | 0 | 94.1 | 5.9 | | 27.3 | 63.6 | 9.1 | | 8.3 | 82.1 | 9.7 | |
| PHF | .750 | .688 | .583 | .750 | .000 | .857 | .375 | .911 | .750 | .875 | .375 | .825 | .750 | .763 | .875 | .788 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- Passenger Vehicles

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 06:00 PM | 1 | 4 | 1 | 6 | 0 | 14 | 0 | 14 | 3 | 6 | 1 | 10 | 4 | 38 | 3 | 45 | 75 |
| 06:15 PM | 1 | 3 | 3 | 7 | 0 | 10 | 2 | 12 | 2 | 4 | 2 | 8 | 2 | 26 | 3 | 31 | 58 |
| 06:30 PM | 1 | 0 | 2 | 3 | 0 | 11 | 0 | 11 | 3 | 5 | 0 | 8 | 4 | 26 | 3 | 33 | 55 |
| 06:45 PM | 0 | 4 | 1 | 5 | 0 | 7 | 1 | 8 | 1 | 6 | 0 | 7 | 2 | 25 | 4 | 31 | 51 |
| Total | 3 | 11 | 7 | 21 | 0 | 42 | 3 | 45 | 9 | 21 | 3 | 33 | 12 | 115 | 13 | 140 | 239 |
| | | | | | | | | | | | | | | | | | |
| 07:00 PM | 0 | 5 | 0 | 5 | 0 | 3 | 1 | 4 | 2 | 6 | 0 | 8 | 1 | 9 | 3 | 13 | 30 |
| 07:15 PM | 0 | 4 | 1 | 5 | 0 | 6 | 1 | 7 | 3 | 4 | 0 | 7 | 2 | 10 | 2 | 14 | 33 |
| 07:30 PM | 1 | 3 | 0 | 4 | 0 | 8 | 0 | 8 | 2 | 2 | 0 | 4 | 1 | 5 | 1 | 7 | 23 |
| 07:45 PM | 1 | 5 | 0 | 6 | 0 | 6 | 1 | 7 | 3 | 4 | 0 | 7 | 3 | 5 | 2 | 10 | 30 |
| Total | 2 | 17 | 1 | 20 | 0 | 23 | 3 | 26 | 10 | 16 | 0 | 26 | 7 | 29 | 8 | 44 | 116 |
| | | | | | | | | | | | | | | | | | |
| Grand Total | 5 | 28 | 8 | 41 | 0 | 65 | 6 | 71 | 19 | 37 | 3 | 59 | 19 | 144 | 21 | 184 | 355 |
| Apprch % | 12.2 | 68.3 | 19.5 | | 0 | 91.5 | 8.5 | | 32.2 | 62.7 | 5.1 | | 10.3 | 78.3 | 11.4 | | |
| Total % | 1.4 | 7.9 | 2.3 | 11.5 | 0 | 18.3 | 1.7 | 20 | 5.4 | 10.4 | 0.8 | 16.6 | 5.4 | 40.6 | 5.9 | 51.8 | |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 PM to 06:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 06:00 PM | | | | | | | | | | | | | | | | | |
| 06:00 PM | **1** | **4** | 1 | 6 | 0 | **14** | 0 | **14** | **3** | **6** | 1 | **10** | **4** | **38** | 3 | **45** | **75** |
| 06:15 PM | 1 | 3 | **3** | **7** | 0 | 10 | **2** | 12 | 2 | 4 | **2** | 8 | 2 | 26 | 3 | 31 | 58 |
| 06:30 PM | 1 | 0 | 2 | 3 | 0 | 11 | 0 | 11 | 3 | 5 | 0 | 8 | 4 | 26 | 3 | 33 | 55 |
| 06:45 PM | 0 | 4 | 1 | 5 | 0 | 7 | 1 | 8 | 1 | 6 | 0 | 7 | 2 | 25 | **4** | 31 | 51 |
| Total Volume | 3 | 11 | 7 | 21 | 0 | 42 | 3 | 45 | 9 | 21 | 3 | 33 | 12 | 115 | 13 | 140 | 239 |
| % App. Total | 14.3 | 52.4 | 33.3 | | 0 | 93.3 | 6.7 | | 27.3 | 63.6 | 9.1 | | 8.6 | 82.1 | 9.3 | | |
| PHF | .750 | .688 | .583 | .750 | .000 | .750 | .375 | .804 | .750 | .875 | .375 | .825 | .750 | .757 | .813 | .778 | .797 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

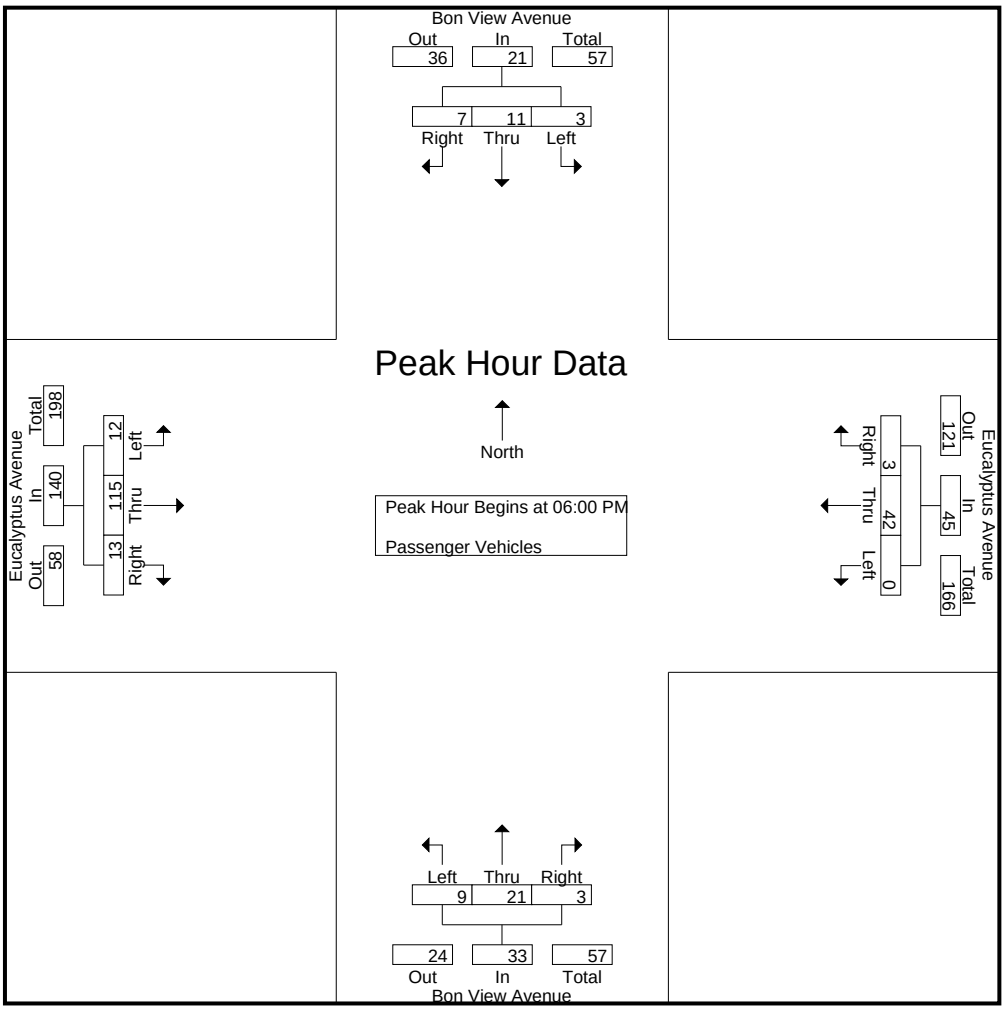


Peak Hour Analysis From 06:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **1** | **4** | 1 | 6 | 0 | **14** | 0 | **14** | **3** | **6** | 1 | **10** | **4** | **38** | 3 | **45** |
| +15 mins. | 1 | 3 | **3** | **7** | 0 | 10 | **2** | 12 | 2 | 4 | **2** | 8 | 2 | 26 | 3 | 31 |
| +30 mins. | 1 | 0 | 2 | 3 | 0 | 11 | 0 | 11 | 3 | 5 | 0 | 8 | 4 | 26 | 3 | 33 |
| +45 mins. | 0 | 4 | 1 | 5 | 0 | 7 | 1 | 8 | 1 | 6 | 0 | 7 | 2 | 25 | **4** | 31 |
| Total Volume | 3 | 11 | 7 | 21 | 0 | 42 | 3 | 45 | 9 | 21 | 3 | 33 | 12 | 115 | 13 | 140 |
| % App. Total | 14.3 | 52.4 | 33.3 | | 0 | 93.3 | 6.7 | | 27.3 | 63.6 | 9.1 | | 8.6 | 82.1 | 9.3 | |
| PHF | .750 | .688 | .583 | .750 | .000 | .750 | .375 | .804 | .750 | .875 | .375 | .825 | .750 | .757 | .813 | .778 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 06:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 06:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 06:45 PM | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Total | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 4 |
| 07:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 07:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 1 | 0 | 1 | 3 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 4 |
| Grand Total | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 1 | 4 | 8 |
| Apprch % | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 100 | 0 | | 0 | 75 | 25 | | |
| Total % | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 25 | 0 | 25 | 0 | 25 | 0 | 37.5 | 12.5 | 50 | |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 PM to 06:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 06:00 PM | | | | | | | | | | | | | | | | | |
| 06:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 1 |
| 06:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 1 | 1 |
| 06:45 PM | 0 | 0 | 0 | 0 | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 4 |
| % App. Total | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 50 | 50 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .250 | .250 | .500 | .500 |

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N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

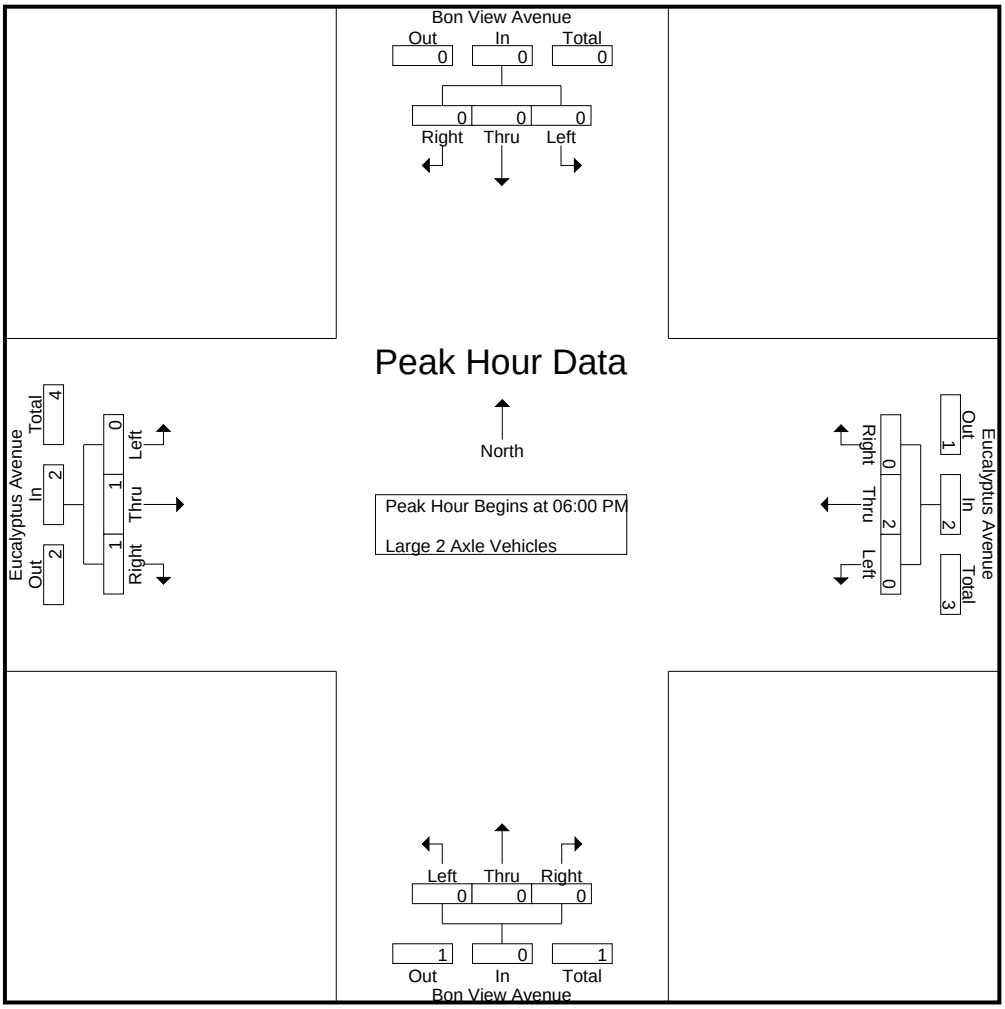


Peak Hour Analysis From 06:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 1 |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| % App. Total | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 50 | 50 | |
| PHF | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .250 | .250 | .500 |

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City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 06:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 06:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 06:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 07:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 07:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Grand Total | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Apprch % | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | |
| Total % | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 PM to 06:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 06:00 PM | | | | | | | | | | | | | | | | | |
| 06:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:15 PM | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 06:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 06:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| % App. Total | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .500 | .000 | .500 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .500 |

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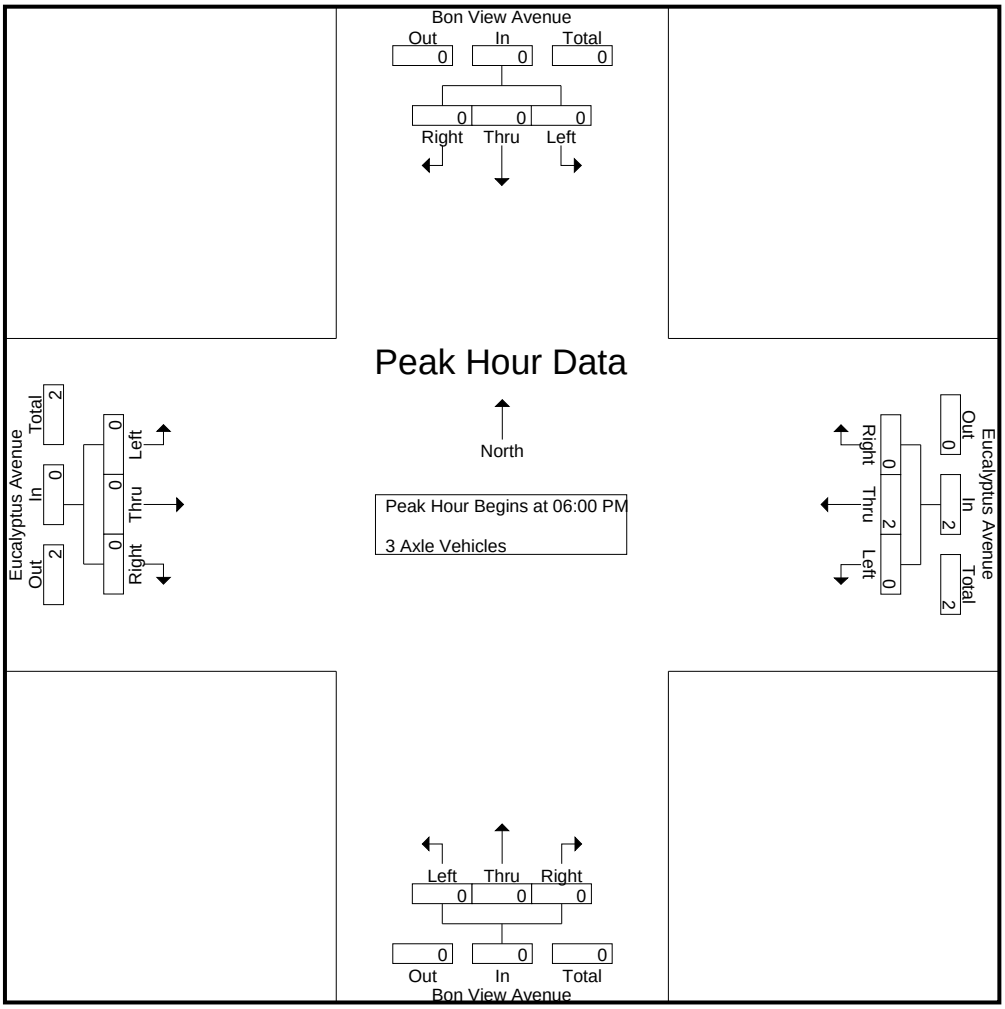


Peak Hour Analysis From 06:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| % App. Total | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | |
| PHF | .000 | .000 | .000 | .000 | .000 | .500 | .000 | .500 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |

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E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| 06:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 06:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 06:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| Total | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 5 |
| 07:00 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 07:15 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 07:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| Total | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 4 |
| Grand Total | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 9 |
| Apprch % | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| Total % | 0 | 0 | 0 | 0 | 0 | 55.6 | 0 | 55.6 | 0 | 0 | 0 | 0 | 0 | 44.4 | 0 | 44.4 | |

| | Bon View Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Bon View Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 06:00 PM to 06:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 06:00 PM | | | | | | | | | | | | | | | | | |
| 06:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 06:15 PM | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | **2** |
| 06:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 |
| 06:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 5 |
| % App. Total | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .500 | .000 | .500 | .000 | .000 | .000 | .000 | .000 | .750 | .000 | .750 | .625 |

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PO Box 1178
Corona, CA 92878
(951)268-6268

City of Ontario
N/S: Bon View Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 08_ONT_Bon_Euca PM
Site Code : 05122477
Start Date : 5/19/2022
Page No : 2

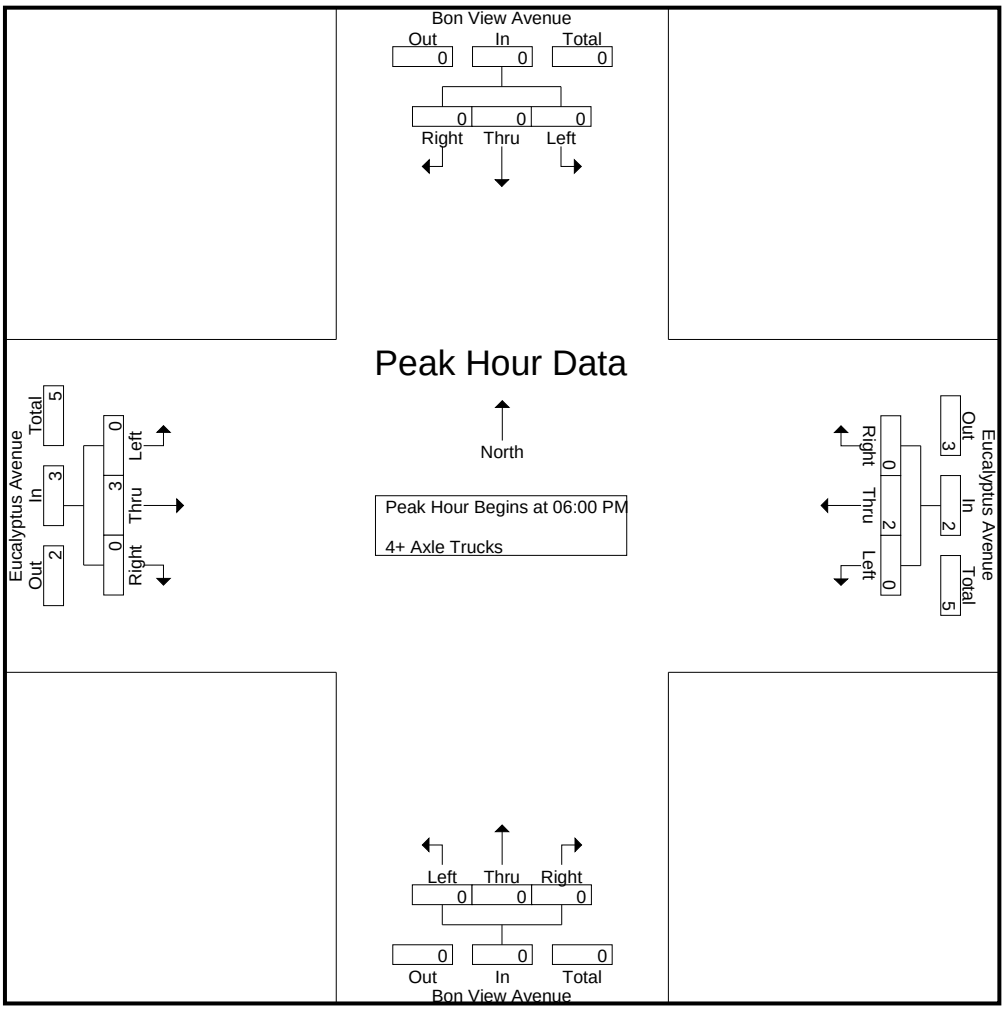


Peak Hour Analysis From 06:00 PM to 06:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | | 06:00 PM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 |
| % App. Total | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | |
| PHF | .000 | .000 | .000 | .000 | .000 | .500 | .000 | .500 | .000 | .000 | .000 | .000 | .000 | .750 | .000 | .750 |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 99 | 79 | 22 | 178 | 37 | 1 | 80 | 25 | 118 | 72 | 134 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 47 | 502 | 549 |
| 07:15 AM | 0 | 118 | 112 | 40 | 230 | 34 | 3 | 85 | 43 | 122 | 68 | 138 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 83 | 558 | 641 |
| 07:30 AM | 0 | 154 | 113 | 31 | 267 | 29 | 2 | 82 | 44 | 113 | 86 | 210 | 0 | 0 | 296 | 0 | 0 | 0 | 0 | 0 | 75 | 676 | 751 |
| 07:45 AM | 0 | 165 | 137 | 26 | 302 | 34 | 2 | 98 | 40 | 134 | 76 | 214 | 0 | 0 | 290 | 0 | 0 | 0 | 0 | 0 | 66 | 726 | 792 |
| Total | 0 | 536 | 441 | 119 | 977 | 134 | 8 | 345 | 152 | 487 | 302 | 696 | 0 | 0 | 998 | 0 | 0 | 0 | 0 | 0 | 271 | 2462 | 2733 |
| 08:00 AM | 0 | 152 | 102 | 30 | 254 | 44 | 1 | 88 | 32 | 133 | 77 | 217 | 0 | 0 | 294 | 0 | 0 | 0 | 0 | 0 | 62 | 681 | 743 |
| 08:15 AM | 0 | 130 | 106 | 49 | 236 | 51 | 0 | 87 | 19 | 138 | 66 | 206 | 0 | 0 | 272 | 0 | 0 | 0 | 0 | 0 | 68 | 646 | 714 |
| 08:30 AM | 0 | 132 | 107 | 36 | 239 | 46 | 0 | 91 | 30 | 137 | 45 | 185 | 0 | 0 | 230 | 0 | 0 | 0 | 0 | 0 | 66 | 606 | 672 |
| 08:45 AM | 0 | 138 | 101 | 30 | 239 | 52 | 0 | 70 | 28 | 122 | 58 | 183 | 0 | 0 | 241 | 0 | 0 | 0 | 0 | 0 | 58 | 602 | 660 |
| Total | 0 | 552 | 416 | 145 | 968 | 193 | 1 | 336 | 109 | 530 | 246 | 791 | 0 | 0 | 1037 | 0 | 0 | 0 | 0 | 0 | 254 | 2535 | 2789 |
| Grand Total | 0 | 1088 | 857 | 264 | 1945 | 327 | 9 | 681 | 261 | 1017 | 548 | 1487 | 0 | 0 | 2035 | 0 | 0 | 0 | 0 | 0 | 525 | 4997 | 5522 |
| Apprch % | 0 | 55.9 | 44.1 | | | 32.2 | 0.9 | 67 | | | 26.9 | 73.1 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 21.8 | 17.2 | | 38.9 | 6.5 | 0.2 | 13.6 | | 20.4 | 11 | 29.8 | 0 | | 40.7 | 0 | 0 | 0 | | 0 | 9.5 | 90.5 | |
| Passenger Vehicles | 0 | 977 | 746 | | 1968 | 303 | 5 | 625 | | 1181 | 511 | 1413 | 0 | | 1924 | 0 | 0 | 0 | | 0 | 0 | 0 | 5073 |
| % Passenger Vehicles | 0 | 89.8 | 87 | 92.8 | 89.1 | 92.7 | 55.6 | 91.8 | 95 | 92.4 | 93.2 | 95 | 0 | 0 | 94.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91.9 |
| Large 2 Axle Vehicles | 0 | 47 | 34 | | 89 | 12 | 2 | 19 | | 41 | 11 | 36 | 0 | | 47 | 0 | 0 | 0 | | 0 | 0 | 0 | 177 |
| % Large 2 Axle Vehicles | 0 | 4.3 | 4 | 3 | 4 | 3.7 | 22.2 | 2.8 | 3.1 | 3.2 | 2 | 2.4 | 0 | 0 | 2.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.2 |
| 3 Axle Vehicles | 0 | 17 | 9 | | 27 | 6 | 1 | 3 | | 12 | 10 | 5 | 0 | | 15 | 0 | 0 | 0 | | 0 | 0 | 0 | 54 |
| % 3 Axle Vehicles | 0 | 1.6 | 1.1 | 0.4 | 1.2 | 1.8 | 11.1 | 0.4 | 0.8 | 0.9 | 1.8 | 0.3 | 0 | 0 | 0.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4+ Axle Trucks | 0 | 47 | 68 | | 125 | 6 | 1 | 34 | | 44 | 16 | 33 | 0 | | 49 | 0 | 0 | 0 | | 0 | 0 | 0 | 218 |
| % 4+ Axle Trucks | 0 | 4.3 | 7.9 | 3.8 | 5.7 | 1.8 | 11.1 | 5 | 1.1 | 3.4 | 2.9 | 2.2 | 0 | 0 | 2.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3.9 |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 154 | 113 | 267 | 29 | **2** | 82 | 113 | **86** | 210 | 0 | **296** | 0 | 0 | 0 | 0 | 676 |
| 07:45 AM | 0 | **165** | **137** | **302** | 34 | 2 | **98** | 134 | 76 | 214 | 0 | 290 | 0 | 0 | 0 | 0 | **726** |
| 08:00 AM | 0 | 152 | 102 | 254 | 44 | 1 | 88 | 133 | 77 | **217** | 0 | 294 | 0 | 0 | 0 | 0 | 681 |
| 08:15 AM | 0 | 130 | 106 | 236 | **51** | 0 | 87 | **138** | 66 | 206 | 0 | 272 | 0 | 0 | 0 | 0 | 646 |
| Total Volume | 0 | 601 | 458 | 1059 | 158 | 5 | 355 | 518 | 305 | 847 | 0 | 1152 | 0 | 0 | 0 | 0 | 2729 |
| % App. Total | 0 | 56.8 | 43.2 | | 30.5 | 1 | 68.5 | | 26.5 | 73.5 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .911 | .836 | .877 | .775 | .625 | .906 | .938 | .887 | .976 | .000 | .973 | .000 | .000 | .000 | .000 | .940 |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

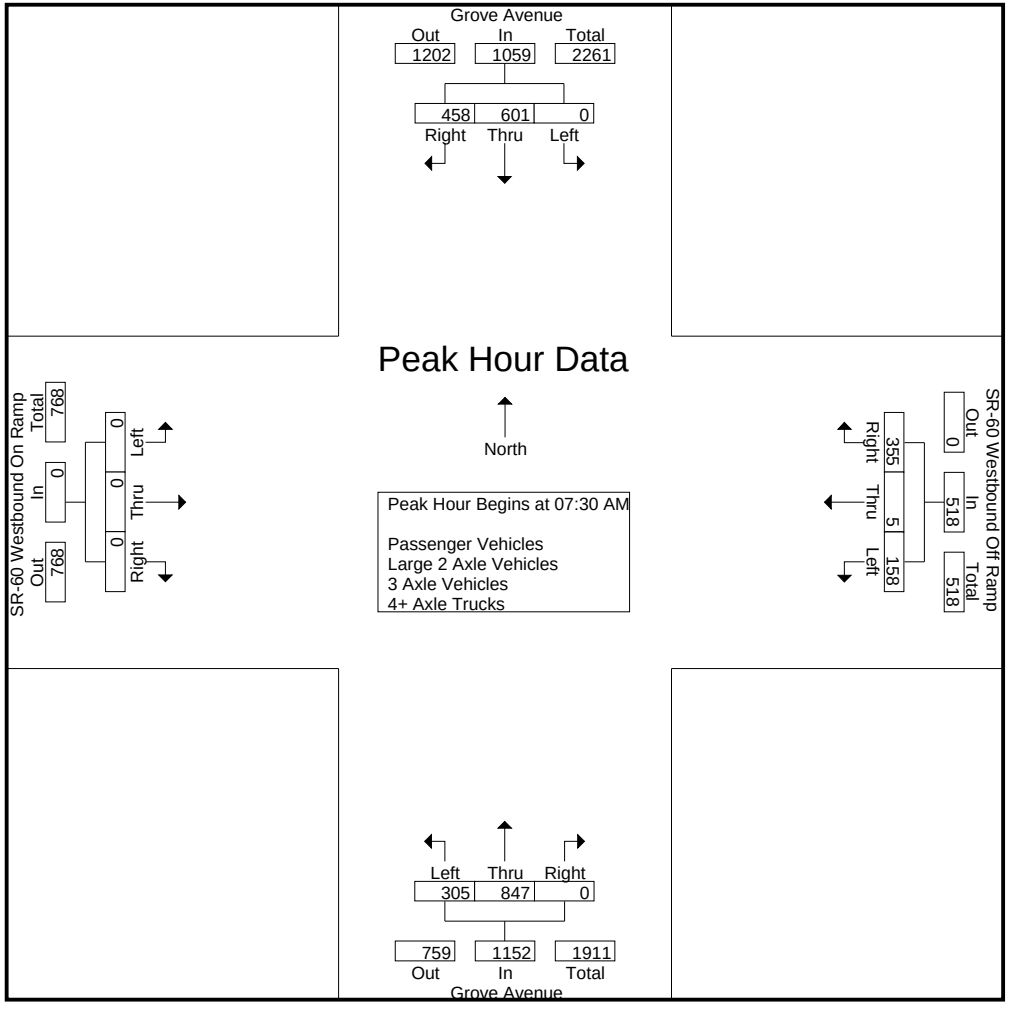

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Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:45 AM | | | | 07:30 AM | | | | 07:00 AM | | | | |
| +0 mins. | 0 | 154 | 113 | 267 | 34 | **2** | **98** | 134 | **86** | 210 | 0 | **296** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | **165** | **137** | **302** | 44 | 1 | 88 | 133 | 76 | 214 | 0 | 290 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 152 | 102 | 254 | **51** | 0 | 87 | **138** | 77 | **217** | 0 | 294 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 130 | 106 | 236 | 46 | 0 | 91 | 137 | 66 | 206 | 0 | 272 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 601 | 458 | 1059 | 175 | 3 | 364 | 542 | 305 | 847 | 0 | 1152 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 56.8 | 43.2 | | 32.3 | 0.6 | 67.2 | | 26.5 | 73.5 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .911 | .836 | .877 | .858 | .375 | .929 | .982 | .887 | .976 | .000 | .973 | .000 | .000 | .000 | .000 | |

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City of Ontario
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Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 91 | 71 | 21 | 162 | 31 | 0 | 71 | 22 | 102 | 70 | 119 | 0 | 0 | 189 | 0 | 0 | 0 | 0 | 0 | 43 | 453 | 496 |
| 07:15 AM | 0 | 103 | 103 | 38 | 206 | 32 | 3 | 79 | 41 | 114 | 64 | 134 | 0 | 0 | 198 | 0 | 0 | 0 | 0 | 0 | 79 | 518 | 597 |
| 07:30 AM | 0 | 138 | 102 | 30 | 240 | 26 | 0 | 79 | 42 | 105 | 84 | 201 | 0 | 0 | 285 | 0 | 0 | 0 | 0 | 0 | 72 | 630 | 702 |
| 07:45 AM | 0 | 147 | 116 | 24 | 263 | 34 | 2 | 92 | 39 | 128 | 68 | 208 | 0 | 0 | 276 | 0 | 0 | 0 | 0 | 0 | 63 | 667 | 730 |
| Total | 0 | 479 | 392 | 113 | 871 | 123 | 5 | 321 | 144 | 449 | 286 | 662 | 0 | 0 | 948 | 0 | 0 | 0 | 0 | 0 | 257 | 2268 | 2525 |
| 08:00 AM | 0 | 135 | 86 | 24 | 221 | 40 | 0 | 80 | 32 | 120 | 74 | 207 | 0 | 0 | 281 | 0 | 0 | 0 | 0 | 0 | 56 | 622 | 678 |
| 08:15 AM | 0 | 114 | 94 | 47 | 208 | 48 | 0 | 80 | 17 | 128 | 59 | 194 | 0 | 0 | 253 | 0 | 0 | 0 | 0 | 0 | 64 | 589 | 653 |
| 08:30 AM | 0 | 122 | 92 | 34 | 214 | 41 | 0 | 82 | 29 | 123 | 41 | 179 | 0 | 0 | 220 | 0 | 0 | 0 | 0 | 0 | 63 | 557 | 620 |
| 08:45 AM | 0 | 127 | 82 | 27 | 209 | 51 | 0 | 62 | 26 | 113 | 51 | 171 | 0 | 0 | 222 | 0 | 0 | 0 | 0 | 0 | 53 | 544 | 597 |
| Total | 0 | 498 | 354 | 132 | 852 | 180 | 0 | 304 | 104 | 484 | 225 | 751 | 0 | 0 | 976 | 0 | 0 | 0 | 0 | 0 | 236 | 2312 | 2548 |
| Grand Total | 0 | 977 | 746 | 245 | 1723 | 303 | 5 | 625 | 248 | 933 | 511 | 1413 | 0 | 0 | 1924 | 0 | 0 | 0 | 0 | 0 | 493 | 4580 | 5073 |
| Apprch % | 0 | 56.7 | 43.3 | | | 32.5 | 0.5 | 67 | | | 26.6 | 73.4 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 21.3 | 16.3 | | 37.6 | 6.6 | 0.1 | 13.6 | | 20.4 | 11.2 | 30.9 | 0 | | 42 | 0 | 0 | 0 | | 0 | 9.7 | 90.3 | |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 138 | 102 | 240 | 26 | 0 | 79 | 105 | **84** | 201 | 0 | **285** | 0 | 0 | 0 | 0 | 630 |
| 07:45 AM | 0 | **147** | **116** | **263** | 34 | **2** | **92** | **128** | 68 | **208** | 0 | 276 | 0 | 0 | 0 | 0 | **667** |
| 08:00 AM | 0 | 135 | 86 | 221 | 40 | 0 | 80 | 120 | 74 | 207 | 0 | 281 | 0 | 0 | 0 | 0 | 622 |
| 08:15 AM | 0 | 114 | 94 | 208 | **48** | 0 | 80 | 128 | 59 | 194 | 0 | 253 | 0 | 0 | 0 | 0 | 589 |
| Total Volume | 0 | 534 | 398 | 932 | 148 | 2 | 331 | 481 | 285 | 810 | 0 | 1095 | 0 | 0 | 0 | 0 | 2508 |
| % App. Total | 0 | 57.3 | 42.7 | | 30.8 | 0.4 | 68.8 | | 26 | 74 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .908 | .858 | .886 | .771 | .250 | .899 | .939 | .848 | .974 | .000 | .961 | .000 | .000 | .000 | .000 | .940 |

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File Name : 20_ONT_Grove_60W AMC
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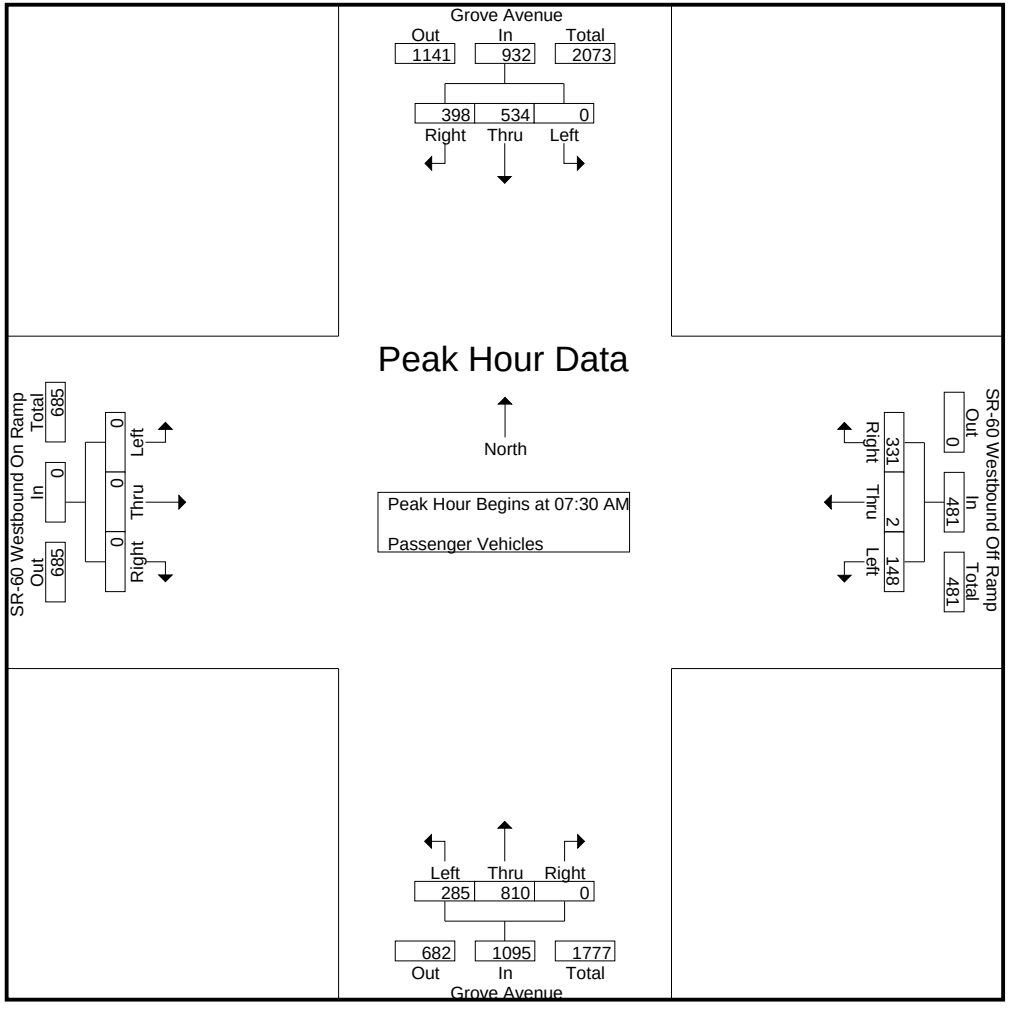

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File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
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| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 138 | 102 | 240 | 26 | 0 | 79 | 105 | **84** | 201 | 0 | **285** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | **147** | **116** | **263** | 34 | **2** | **92** | **128** | 68 | **208** | 0 | 276 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 135 | 86 | 221 | 40 | 0 | 80 | 120 | 74 | 207 | 0 | 281 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 114 | 94 | 208 | **48** | 0 | 80 | 128 | 59 | 194 | 0 | 253 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 534 | 398 | 932 | 148 | 2 | 331 | 481 | 285 | 810 | 0 | 1095 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 57.3 | 42.7 | | 30.8 | 0.4 | 68.8 | | 26 | 74 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .908 | .858 | .886 | .771 | .250 | .899 | .939 | .848 | .974 | .000 | .961 | .000 | .000 | .000 | .000 | |

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File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
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Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 3 | 0 | 0 | 3 | 2 | 0 | 3 | 1 | 5 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 14 | 15 |
| 07:15 AM | 0 | 6 | 4 | 2 | 10 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 15 | 17 |
| 07:30 AM | 0 | 5 | 3 | 1 | 8 | 1 | 1 | 2 | 2 | 4 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 17 | 20 |
| 07:45 AM | 0 | 9 | 7 | 0 | 16 | 0 | 0 | 2 | 0 | 2 | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| Total | 0 | 23 | 14 | 3 | 37 | 4 | 1 | 7 | 3 | 12 | 4 | 18 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 6 | 71 | 77 |
| 08:00 AM | 0 | 8 | 3 | 2 | 11 | 2 | 1 | 2 | 0 | 5 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 19 | 21 |
| 08:15 AM | 0 | 8 | 6 | 1 | 14 | 1 | 0 | 5 | 2 | 6 | 3 | 5 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 28 | 31 |
| 08:30 AM | 0 | 6 | 7 | 1 | 13 | 4 | 0 | 1 | 1 | 5 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 22 | 24 |
| 08:45 AM | 0 | 2 | 4 | 1 | 6 | 1 | 0 | 4 | 2 | 5 | 3 | 7 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 3 | 21 | 24 |
| Total | 0 | 24 | 20 | 5 | 44 | 8 | 1 | 12 | 5 | 21 | 7 | 18 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 10 | 90 | 100 |
| Grand Total | 0 | 47 | 34 | 8 | 81 | 12 | 2 | 19 | 8 | 33 | 11 | 36 | 0 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 16 | 161 | 177 |
| Apprch % | 0 | 58 | 42 | | | 36.4 | 6.1 | 57.6 | | | 23.4 | 76.6 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 29.2 | 21.1 | | 50.3 | 7.5 | 1.2 | 11.8 | | 20.5 | 6.8 | 22.4 | 0 | | 29.2 | 0 | 0 | 0 | | 0 | 9 | 91 | |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 5 | 3 | 8 | 1 | **1** | 2 | 4 | 0 | **5** | 0 | 5 | 0 | 0 | 0 | 0 | 17 |
| 07:45 AM | 0 | **9** | **7** | **16** | 0 | 0 | 2 | 2 | 2 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | 25 |
| 08:00 AM | 0 | 8 | 3 | 11 | **2** | 1 | 2 | 5 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 19 |
| 08:15 AM | 0 | 8 | 6 | 14 | 1 | 0 | **5** | **6** | **3** | 5 | 0 | **8** | 0 | 0 | 0 | 0 | **28** |
| Total Volume | 0 | 30 | 19 | 49 | 4 | 2 | 11 | 17 | 5 | 18 | 0 | 23 | 0 | 0 | 0 | 0 | 89 |
| % App. Total | 0 | 61.2 | 38.8 | | 23.5 | 11.8 | 64.7 | | 21.7 | 78.3 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .833 | .679 | .766 | .500 | .500 | .550 | .708 | .417 | .900 | .000 | .719 | .000 | .000 | .000 | .000 | .795 |

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PO Box 1178
Corona, CA 92878
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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

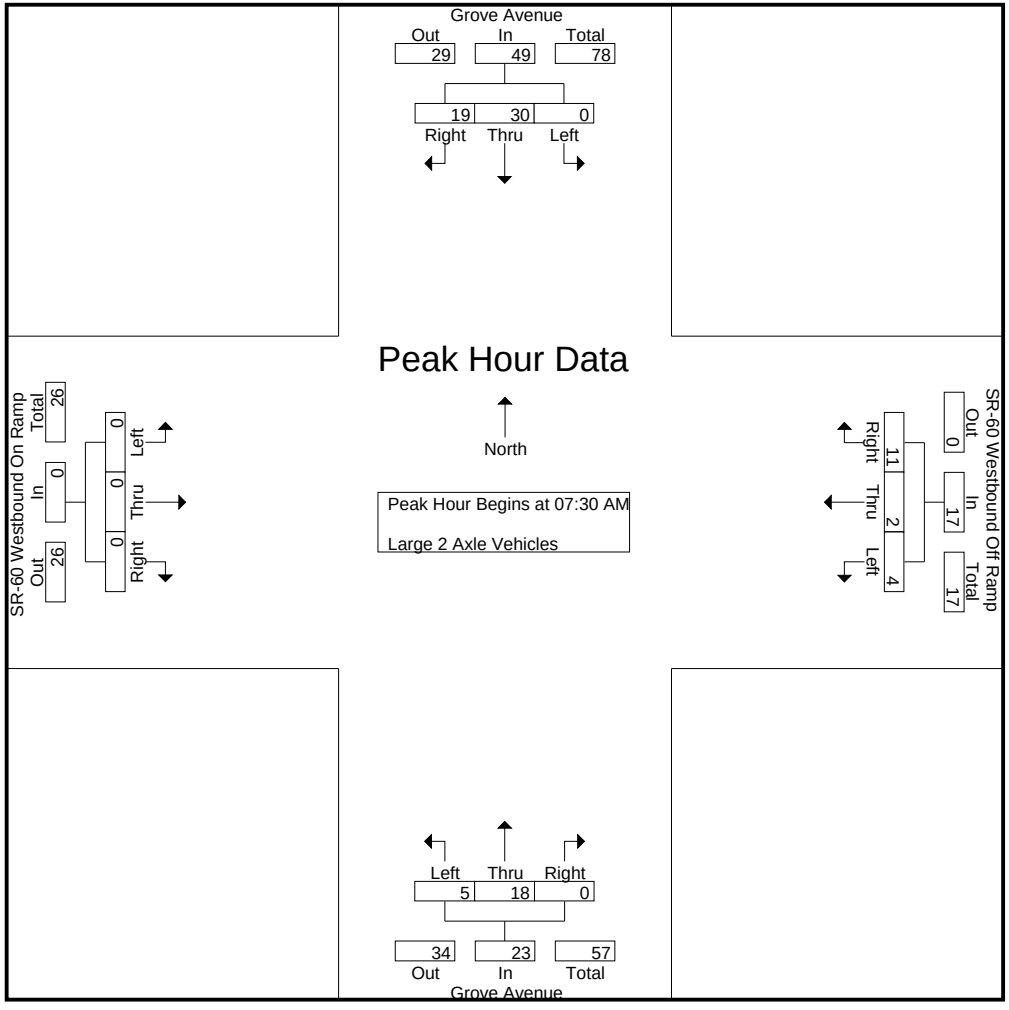

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File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 5 | 3 | 8 | 1 | **1** | 2 | 4 | 0 | **5** | 0 | 5 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | **9** | **7** | **16** | 0 | 0 | 2 | 2 | 2 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 8 | 3 | 11 | **2** | 1 | 2 | 5 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 8 | 6 | 14 | 1 | 0 | **5** | **6** | **3** | 5 | 0 | **8** | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 30 | 19 | 49 | 4 | 2 | 11 | 17 | 5 | 18 | 0 | 23 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 61.2 | 38.8 | | 23.5 | 11.8 | 64.7 | | 21.7 | 78.3 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .833 | .679 | .766 | .500 | .500 | .550 | .708 | .417 | .900 | .000 | .719 | .000 | .000 | .000 | .000 | |

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City of Ontario
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Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 |
| 07:15 AM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 07:30 AM | 0 | 5 | 0 | 0 | 5 | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| 07:45 AM | 0 | 4 | 1 | 0 | 5 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 10 |
| Total | 0 | 12 | 1 | 0 | 13 | 2 | 1 | 3 | 2 | 6 | 3 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 24 | 26 |
| 08:00 AM | 0 | 1 | 2 | 1 | 3 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 8 |
| 08:15 AM | 0 | 2 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 |
| 08:30 AM | 0 | 1 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 08:45 AM | 0 | 1 | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 |
| Total | 0 | 5 | 8 | 1 | 13 | 4 | 0 | 0 | 0 | 4 | 7 | 3 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 27 | 28 |
| Grand Total | 0 | 17 | 9 | 1 | 26 | 6 | 1 | 3 | 2 | 10 | 10 | 5 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 3 | 51 | 54 |
| Apprch % | 0 | 65.4 | 34.6 | | | 60 | 10 | 30 | | | 66.7 | 33.3 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 33.3 | 17.6 | | 51 | 11.8 | 2 | 5.9 | | 19.6 | 19.6 | 9.8 | 0 | | 29.4 | 0 | 0 | 0 | | 0 | 5.6 | 94.4 | |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | **5** | 0 | **5** | 1 | **1** | 0 | **2** | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | **9** |
| 07:45 AM | 0 | 4 | 1 | 5 | 0 | 0 | **1** | 1 | 2 | 1 | 0 | **3** | 0 | 0 | 0 | 0 | 9 |
| 08:00 AM | 0 | 1 | **2** | 3 | **2** | 0 | 0 | 2 | 0 | **2** | 0 | 2 | 0 | 0 | 0 | 0 | 7 |
| 08:15 AM | 0 | 2 | 1 | 3 | 1 | 0 | 0 | 1 | **3** | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 7 |
| Total Volume | 0 | 12 | 4 | 16 | 4 | 1 | 1 | 6 | 6 | 4 | 0 | 10 | 0 | 0 | 0 | 0 | 32 |
| % App. Total | 0 | 75 | 25 | | 66.7 | 16.7 | 16.7 | | 60 | 40 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .600 | .500 | .800 | .500 | .250 | .250 | .750 | .500 | .500 | .000 | .833 | .000 | .000 | .000 | .000 | .889 |

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

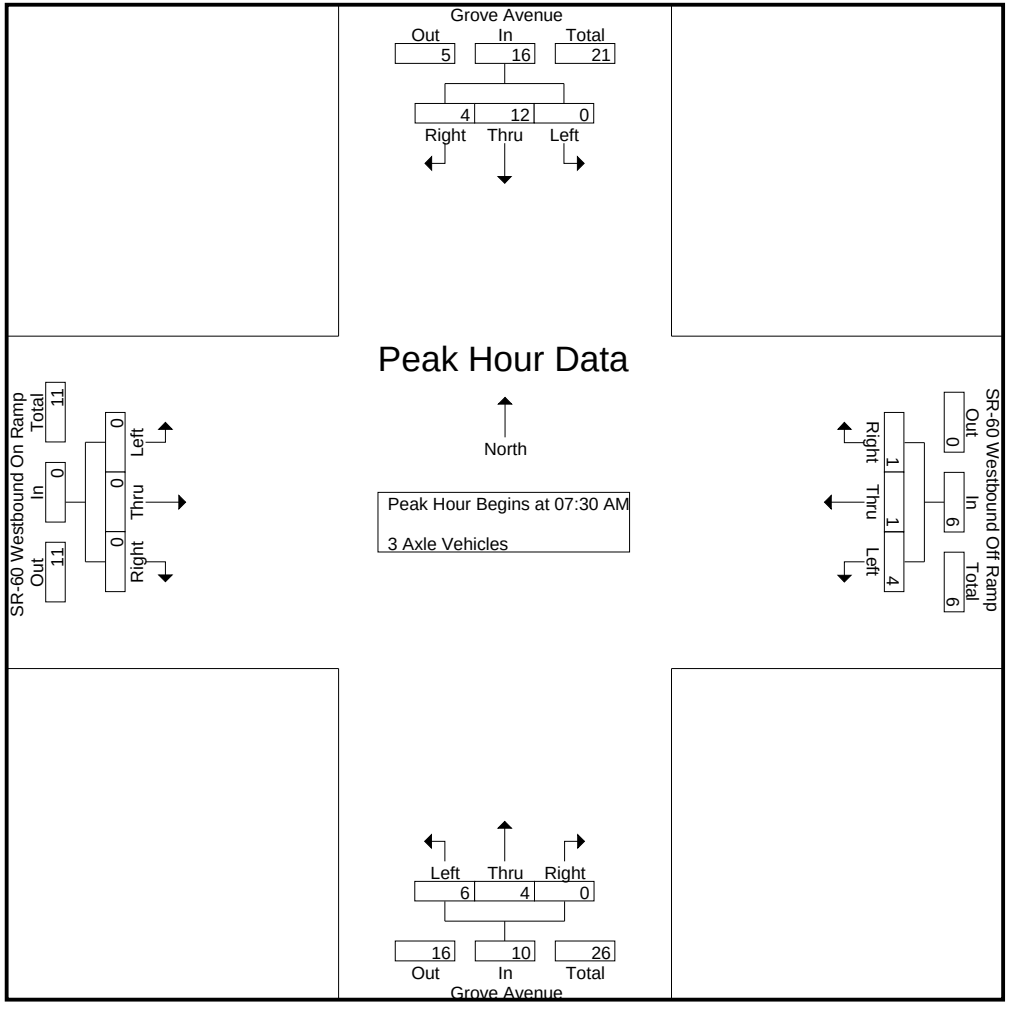

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File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | **5** | 0 | **5** | 1 | **1** | 0 | **2** | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 4 | 1 | 5 | 0 | 0 | **1** | 1 | 2 | 1 | 0 | **3** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 1 | **2** | 3 | **2** | 0 | 0 | 2 | 0 | **2** | 0 | 2 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 2 | 1 | 3 | 1 | 0 | 0 | 1 | **3** | 0 | 0 | 3 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 12 | 4 | 16 | 4 | 1 | 1 | 6 | 6 | 4 | 0 | 10 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 75 | 25 | | 66.7 | 16.7 | 16.7 | | 60 | 40 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .600 | .500 | .800 | .500 | .250 | .250 | .750 | .500 | .500 | .000 | .833 | .000 | .000 | .000 | .000 | |

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City of Ontario
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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 4 | 8 | 1 | 12 | 3 | 1 | 5 | 1 | 9 | 2 | 9 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 2 | 32 | 34 |
| 07:15 AM | 0 | 7 | 5 | 0 | 12 | 1 | 0 | 5 | 2 | 6 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 22 | 24 |
| 07:30 AM | 0 | 6 | 8 | 0 | 14 | 1 | 0 | 1 | 0 | 2 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 20 |
| 07:45 AM | 0 | 5 | 13 | 2 | 18 | 0 | 0 | 3 | 0 | 3 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 25 | 27 |
| Total | 0 | 22 | 34 | 3 | 56 | 5 | 1 | 14 | 3 | 20 | 9 | 14 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 6 | 99 | 105 |
| 08:00 AM | 0 | 8 | 11 | 3 | 19 | 0 | 0 | 6 | 0 | 6 | 3 | 5 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 3 | 33 | 36 |
| 08:15 AM | 0 | 6 | 5 | 1 | 11 | 1 | 0 | 2 | 0 | 3 | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 22 | 23 |
| 08:30 AM | 0 | 3 | 7 | 1 | 10 | 0 | 0 | 8 | 0 | 8 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 22 | 23 |
| 08:45 AM | 0 | 8 | 11 | 2 | 19 | 0 | 0 | 4 | 0 | 4 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 29 | 31 |
| Total | 0 | 25 | 34 | 7 | 59 | 1 | 0 | 20 | 0 | 21 | 7 | 19 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 7 | 106 | 113 |
| Grand Total | 0 | 47 | 68 | 10 | 115 | 6 | 1 | 34 | 3 | 41 | 16 | 33 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0 | 13 | 205 | 218 |
| Apprch % | 0 | 40.9 | 59.1 | | | 14.6 | 2.4 | 82.9 | | | 32.7 | 67.3 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 22.9 | 33.2 | | 56.1 | 2.9 | 0.5 | 16.6 | | 20 | 7.8 | 16.1 | 0 | | 23.9 | 0 | 0 | 0 | | 0 | 6 | 94 | |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 6 | 8 | 14 | **1** | 0 | 1 | 2 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 20 |
| 07:45 AM | 0 | 5 | **13** | 18 | 0 | 0 | 3 | 3 | **4** | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 25 |
| 08:00 AM | 0 | **8** | 11 | **19** | 0 | 0 | **6** | **6** | 3 | 5 | 0 | **8** | 0 | 0 | 0 | 0 | **33** |
| 08:15 AM | 0 | 6 | 5 | 11 | 1 | 0 | 2 | 3 | 1 | **7** | 0 | 8 | 0 | 0 | 0 | 0 | 22 |
| Total Volume | 0 | 25 | 37 | 62 | 2 | 0 | 12 | 14 | 9 | 15 | 0 | 24 | 0 | 0 | 0 | 0 | 100 |
| % App. Total | 0 | 40.3 | 59.7 | | 14.3 | 0 | 85.7 | | 37.5 | 62.5 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .781 | .712 | .816 | .500 | .000 | .500 | .583 | .563 | .536 | .000 | .750 | .000 | .000 | .000 | .000 | .758 |

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Corona, CA 92878
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City of Ontario
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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

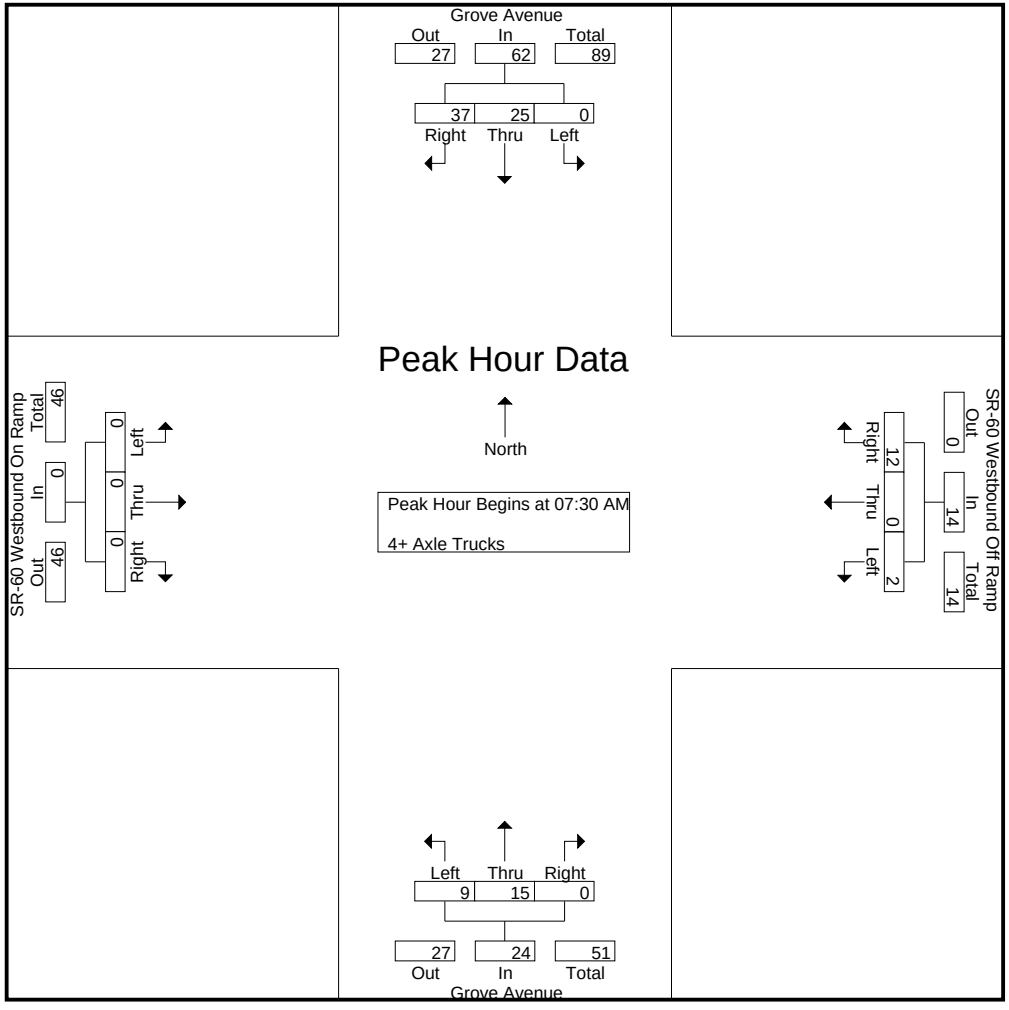

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Weather: Clear

File Name : 20_ONT_Grove_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 6 | 8 | 14 | **1** | 0 | 1 | 2 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 5 | **13** | 18 | 0 | 0 | 3 | 3 | **4** | 0 | 0 | 4 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **8** | 11 | **19** | 0 | 0 | **6** | **6** | 3 | 5 | 0 | **8** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 6 | 5 | 11 | 1 | 0 | 2 | 3 | 1 | **7** | 0 | 8 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 25 | 37 | 62 | 2 | 0 | 12 | 14 | 9 | 15 | 0 | 24 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 40.3 | 59.7 | | 14.3 | 0 | 85.7 | | 37.5 | 62.5 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .781 | .712 | .816 | .500 | .000 | .500 | .583 | .563 | .536 | .000 | .750 | .000 | .000 | .000 | .000 | |

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City of Ontario
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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 202 | 158 | 41 | 360 | 53 | 1 | 81 | 44 | 135 | 48 | 142 | 0 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 85 | 685 | 770 |
| 04:15 PM | 0 | 204 | 138 | 21 | 342 | 43 | 1 | 77 | 44 | 121 | 55 | 149 | 0 | 0 | 204 | 0 | 0 | 0 | 0 | 0 | 65 | 667 | 732 |
| 04:30 PM | 0 | 232 | 181 | 47 | 413 | 42 | 0 | 73 | 44 | 115 | 45 | 151 | 0 | 0 | 196 | 0 | 0 | 0 | 0 | 0 | 91 | 724 | 815 |
| 04:45 PM | 0 | 215 | 171 | 31 | 386 | 48 | 0 | 56 | 31 | 104 | 61 | 168 | 0 | 0 | 229 | 0 | 0 | 0 | 0 | 0 | 62 | 719 | 781 |
| Total | 0 | 853 | 648 | 140 | 1501 | 186 | 2 | 287 | 163 | 475 | 209 | 610 | 0 | 0 | 819 | 0 | 0 | 0 | 0 | 0 | 303 | 2795 | 3098 |
| 05:00 PM | 0 | 227 | 196 | 51 | 423 | 46 | 1 | 53 | 30 | 100 | 42 | 151 | 0 | 0 | 193 | 0 | 0 | 0 | 0 | 0 | 81 | 716 | 797 |
| 05:15 PM | 0 | 247 | 205 | 52 | 452 | 34 | 2 | 42 | 30 | 78 | 50 | 130 | 0 | 0 | 180 | 0 | 0 | 0 | 0 | 0 | 82 | 710 | 792 |
| 05:30 PM | 0 | 200 | 141 | 32 | 341 | 32 | 1 | 56 | 39 | 89 | 48 | 138 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | 0 | 71 | 616 | 687 |
| 05:45 PM | 1 | 208 | 153 | 32 | 362 | 42 | 0 | 63 | 36 | 105 | 65 | 140 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 68 | 672 | 740 |
| Total | 1 | 882 | 695 | 167 | 1578 | 154 | 4 | 214 | 135 | 372 | 205 | 559 | 0 | 0 | 764 | 0 | 0 | 0 | 0 | 0 | 302 | 2714 | 3016 |
| Grand Total | 1 | 1735 | 1343 | 307 | 3079 | 340 | 6 | 501 | 298 | 847 | 414 | 1169 | 0 | 0 | 1583 | 0 | 0 | 0 | 0 | 0 | 605 | 5509 | 6114 |
| Apprch % | 0 | 56.3 | 43.6 | | | 40.1 | 0.7 | 59.1 | | | 26.2 | 73.8 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 31.5 | 24.4 | | 55.9 | 6.2 | 0.1 | 9.1 | | 15.4 | 7.5 | 21.2 | 0 | | 28.7 | 0 | 0 | 0 | | 0 | 9.9 | 90.1 | |
| Passenger Vehicles | 1 | 1662 | 1236 | | 3188 | 326 | 3 | 446 | | 1041 | 401 | 1106 | 0 | | 1507 | 0 | 0 | 0 | | 0 | 0 | 0 | 5736 |
| % Passenger Vehicles | 100 | 95.8 | 92 | 94.1 | 94.2 | 95.9 | 50 | 89 | 89.3 | 90.9 | 96.9 | 94.6 | 0 | 0 | 95.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 93.8 |
| Large 2 Axle Vehicles | 0 | 36 | 28 | | 72 | 7 | 3 | 20 | | 43 | 11 | 26 | 0 | | 37 | 0 | 0 | 0 | | 0 | 0 | 0 | 152 |
| % Large 2 Axle Vehicles | 0 | 2.1 | 2.1 | 2.6 | 2.1 | 2.1 | 50 | 4 | 4.4 | 3.8 | 2.7 | 2.2 | 0 | 0 | 2.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.5 |
| 3 Axle Vehicles | 0 | 12 | 24 | | 38 | 4 | 0 | 7 | | 16 | 1 | 8 | 0 | | 9 | 0 | 0 | 0 | | 0 | 0 | 0 | 63 |
| % 3 Axle Vehicles | 0 | 0.7 | 1.8 | 0.7 | 1.1 | 1.2 | 0 | 1.4 | 1.7 | 1.4 | 0.2 | 0.7 | 0 | 0 | 0.6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4+ Axle Trucks | 0 | 25 | 55 | | 88 | 3 | 0 | 28 | | 45 | 1 | 29 | 0 | | 30 | 0 | 0 | 0 | | 0 | 0 | 0 | 163 |
| % 4+ Axle Trucks | 0 | 1.4 | 4.1 | 2.6 | 2.6 | 0.9 | 0 | 5.6 | 4.7 | 3.9 | 0.2 | 2.5 | 0 | 0 | 1.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.7 |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 232 | 181 | 413 | 42 | 0 | **73** | **115** | 45 | 151 | 0 | 196 | 0 | 0 | 0 | 0 | **724** |
| 04:45 PM | 0 | 215 | 171 | 386 | **48** | 0 | 56 | 104 | **61** | **168** | 0 | **229** | 0 | 0 | 0 | 0 | 719 |
| 05:00 PM | 0 | 227 | 196 | 423 | 46 | 1 | 53 | 100 | 42 | 151 | 0 | 193 | 0 | 0 | 0 | 0 | 716 |
| 05:15 PM | 0 | **247** | **205** | **452** | 34 | **2** | 42 | 78 | 50 | 130 | 0 | 180 | 0 | 0 | 0 | 0 | 710 |
| Total Volume | 0 | 921 | 753 | 1674 | 170 | 3 | 224 | 397 | 198 | 600 | 0 | 798 | 0 | 0 | 0 | 0 | 2869 |
| % App. Total | 0 | 55 | 45 | | 42.8 | 0.8 | 56.4 | | 24.8 | 75.2 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .932 | .918 | .926 | .885 | .375 | .767 | .863 | .811 | .893 | .000 | .871 | .000 | .000 | .000 | .000 | .991 |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

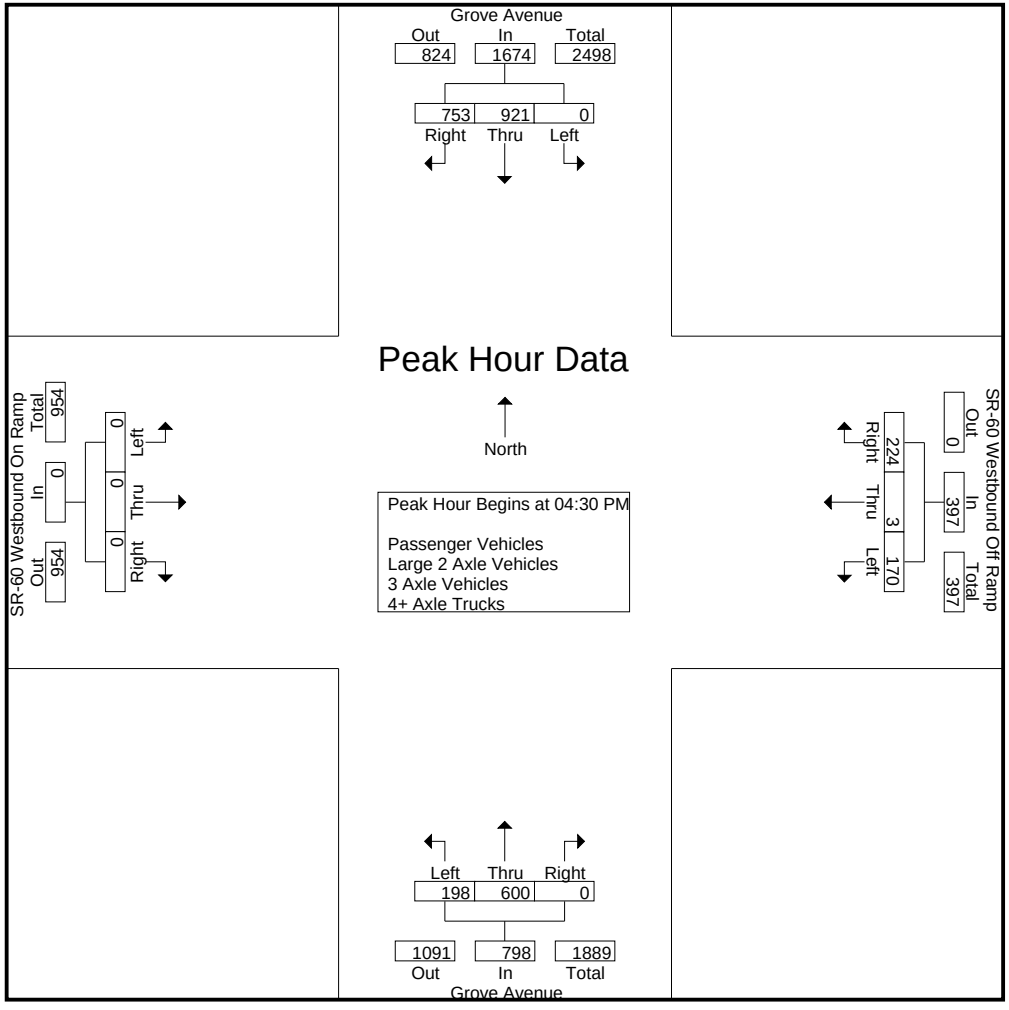

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| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:00 PM | | | | 04:15 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 232 | 181 | 413 | **53** | **1** | **81** | **135** | 55 | 149 | 0 | 204 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 215 | 171 | 386 | 43 | 1 | 77 | 121 | 45 | 151 | 0 | 196 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 227 | 196 | 423 | 42 | 0 | 73 | 115 | **61** | **168** | 0 | **229** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **247** | **205** | **452** | 48 | 0 | 56 | 104 | 42 | 151 | 0 | 193 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 921 | 753 | 1674 | 186 | 2 | 287 | 475 | 203 | 619 | 0 | 822 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 55 | 45 | | 39.2 | 0.4 | 60.4 | | 24.7 | 75.3 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .932 | .918 | .926 | .877 | .500 | .886 | .880 | .832 | .921 | .000 | .897 | .000 | .000 | .000 | .000 | |

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City of Ontario
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Weather: Clear

File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 195 | 147 | 36 | 342 | 52 | 0 | 64 | 35 | 116 | 48 | 131 | 0 | 0 | 179 | 0 | 0 | 0 | 0 | 0 | 71 | 637 | 708 |
| 04:15 PM | 0 | 194 | 122 | 19 | 316 | 40 | 0 | 66 | 38 | 106 | 52 | 140 | 0 | 0 | 192 | 0 | 0 | 0 | 0 | 0 | 57 | 614 | 671 |
| 04:30 PM | 0 | 223 | 168 | 44 | 391 | 40 | 0 | 70 | 43 | 110 | 43 | 143 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | 0 | 87 | 687 | 774 |
| 04:45 PM | 0 | 206 | 162 | 31 | 368 | 46 | 0 | 49 | 27 | 95 | 59 | 159 | 0 | 0 | 218 | 0 | 0 | 0 | 0 | 0 | 58 | 681 | 739 |
| Total | 0 | 818 | 599 | 130 | 1417 | 178 | 0 | 249 | 143 | 427 | 202 | 573 | 0 | 0 | 775 | 0 | 0 | 0 | 0 | 0 | 273 | 2619 | 2892 |
| 05:00 PM | 0 | 211 | 180 | 46 | 391 | 44 | 0 | 48 | 28 | 92 | 42 | 145 | 0 | 0 | 187 | 0 | 0 | 0 | 0 | 0 | 74 | 670 | 744 |
| 05:15 PM | 0 | 233 | 190 | 52 | 423 | 33 | 2 | 39 | 27 | 74 | 48 | 119 | 0 | 0 | 167 | 0 | 0 | 0 | 0 | 0 | 79 | 664 | 743 |
| 05:30 PM | 0 | 197 | 127 | 32 | 324 | 30 | 1 | 53 | 36 | 84 | 48 | 133 | 0 | 0 | 181 | 0 | 0 | 0 | 0 | 0 | 68 | 589 | 657 |
| 05:45 PM | 1 | 203 | 140 | 29 | 344 | 41 | 0 | 57 | 32 | 98 | 61 | 136 | 0 | 0 | 197 | 0 | 0 | 0 | 0 | 0 | 61 | 639 | 700 |
| Total | 1 | 844 | 637 | 159 | 1482 | 148 | 3 | 197 | 123 | 348 | 199 | 533 | 0 | 0 | 732 | 0 | 0 | 0 | 0 | 0 | 282 | 2562 | 2844 |
| Grand Total | 1 | 1662 | 1236 | 289 | 2899 | 326 | 3 | 446 | 266 | 775 | 401 | 1106 | 0 | 0 | 1507 | 0 | 0 | 0 | 0 | 0 | 555 | 5181 | 5736 |
| Apprch % | 0 | 57.3 | 42.6 | | | 42.1 | 0.4 | 57.5 | | | 26.6 | 73.4 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 32.1 | 23.9 | | 56 | 6.3 | 0.1 | 8.6 | | 15 | 7.7 | 21.3 | 0 | | 29.1 | 0 | 0 | 0 | | 0 | 9.7 | 90.3 | |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 223 | 168 | 391 | 40 | 0 | **70** | **110** | 43 | 143 | 0 | 186 | 0 | 0 | 0 | 0 | **687** |
| 04:45 PM | 0 | 206 | 162 | 368 | **46** | 0 | 49 | 95 | **59** | **159** | 0 | **218** | 0 | 0 | 0 | 0 | 681 |
| 05:00 PM | 0 | 211 | 180 | 391 | 44 | 0 | 48 | 92 | 42 | 145 | 0 | 187 | 0 | 0 | 0 | 0 | 670 |
| 05:15 PM | 0 | **233** | **190** | **423** | 33 | **2** | 39 | 74 | 48 | 119 | 0 | 167 | 0 | 0 | 0 | 0 | 664 |
| Total Volume | 0 | 873 | 700 | 1573 | 163 | 2 | 206 | 371 | 192 | 566 | 0 | 758 | 0 | 0 | 0 | 0 | 2702 |
| % App. Total | 0 | 55.5 | 44.5 | | 43.9 | 0.5 | 55.5 | | 25.3 | 74.7 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .937 | .921 | .930 | .886 | .250 | .736 | .843 | .814 | .890 | .000 | .869 | .000 | .000 | .000 | .000 | .983 |

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City of Ontario
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Weather: Clear

File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

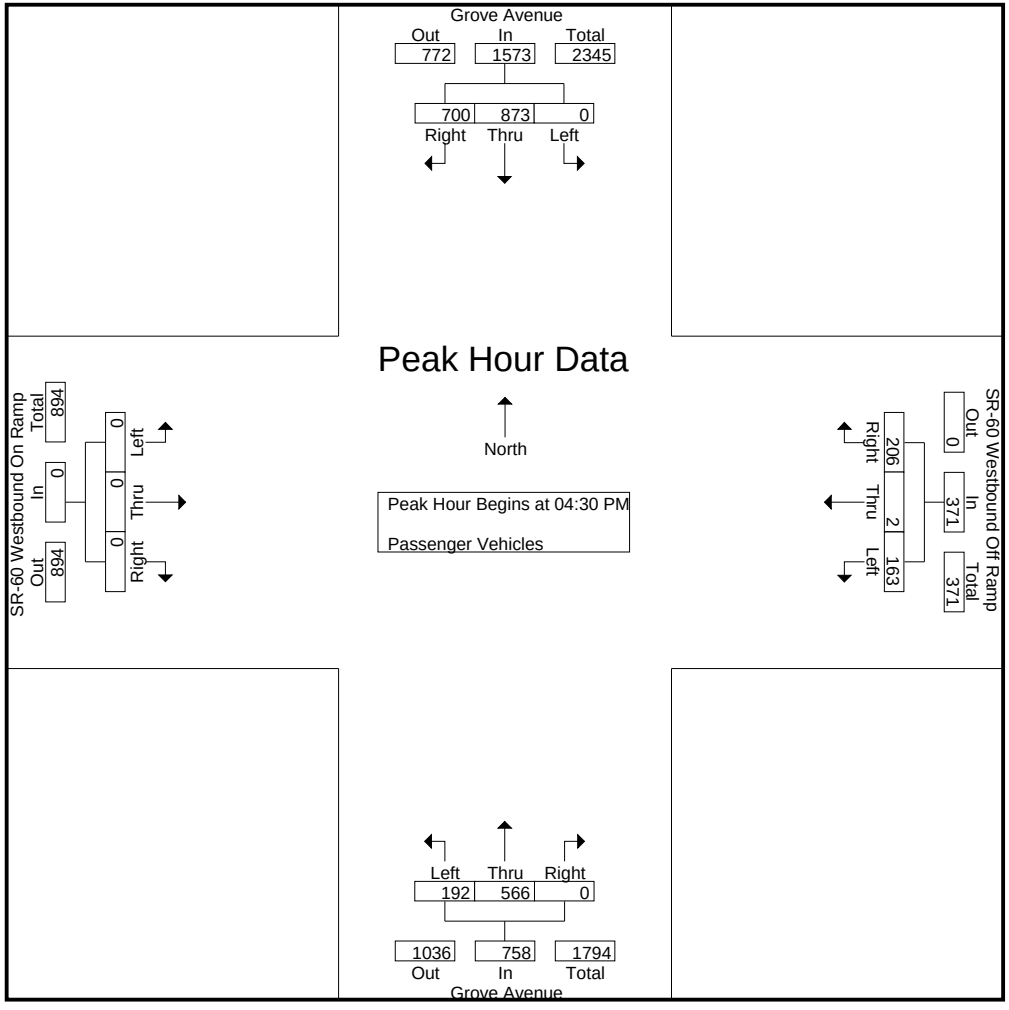

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Site Code : 05124953
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Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 223 | 168 | 391 | 40 | 0 | **70** | **110** | 43 | 143 | 0 | 186 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 206 | 162 | 368 | **46** | 0 | 49 | 95 | **59** | **159** | 0 | **218** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 211 | 180 | 391 | 44 | 0 | 48 | 92 | 42 | 145 | 0 | 187 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **233** | **190** | **423** | 33 | **2** | 39 | 74 | 48 | 119 | 0 | 167 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 873 | 700 | 1573 | 163 | 2 | 206 | 371 | 192 | 566 | 0 | 758 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 55.5 | 44.5 | | 43.9 | 0.5 | 55.5 | | 25.3 | 74.7 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .937 | .921 | .930 | .886 | .250 | .736 | .843 | .814 | .890 | .000 | .869 | .000 | .000 | .000 | .000 | |

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City of Ontario
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Weather: Clear

File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 1 | 5 | 2 | 6 | 0 | 1 | 5 | 4 | 6 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 6 | 16 | 22 |
| 04:15 PM | 0 | 6 | 5 | 0 | 11 | 1 | 1 | 3 | 2 | 5 | 3 | 5 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 2 | 24 | 26 |
| 04:30 PM | 0 | 6 | 5 | 1 | 11 | 1 | 0 | 1 | 0 | 2 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 18 |
| 04:45 PM | 0 | 5 | 4 | 0 | 9 | 2 | 0 | 5 | 3 | 7 | 2 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 21 | 24 |
| Total | 0 | 18 | 19 | 3 | 37 | 4 | 2 | 14 | 9 | 20 | 6 | 15 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 12 | 78 | 90 |
| 05:00 PM | 0 | 6 | 7 | 4 | 13 | 2 | 1 | 1 | 0 | 4 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 19 | 23 |
| 05:15 PM | 0 | 9 | 1 | 0 | 10 | 0 | 0 | 1 | 1 | 1 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 18 |
| 05:30 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 3 | 3 | 3 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 8 | 11 |
| 05:45 PM | 0 | 1 | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 2 | 3 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 10 |
| Total | 0 | 18 | 9 | 5 | 27 | 3 | 1 | 6 | 4 | 10 | 5 | 11 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 9 | 53 | 62 |
| Grand Total | 0 | 36 | 28 | 8 | 64 | 7 | 3 | 20 | 13 | 30 | 11 | 26 | 0 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 21 | 131 | 152 |
| Apprch % | 0 | 56.2 | 43.8 | | | 23.3 | 10 | 66.7 | | | 29.7 | 70.3 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 27.5 | 21.4 | | 48.9 | 5.3 | 2.3 | 15.3 | | 22.9 | 8.4 | 19.8 | 0 | | 28.2 | 0 | 0 | 0 | | 0 | 13.8 | 86.2 | |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 6 | 5 | 11 | 1 | 0 | 1 | 2 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 17 |
| 04:45 PM | 0 | 5 | 4 | 9 | **2** | 0 | **5** | **7** | **2** | 3 | 0 | 5 | 0 | 0 | 0 | 0 | **21** |
| 05:00 PM | 0 | 6 | **7** | **13** | 2 | **1** | 1 | 4 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 19 |
| 05:15 PM | 0 | **9** | 1 | 10 | 0 | 0 | 1 | 1 | 2 | **4** | 0 | **6** | 0 | 0 | 0 | 0 | 17 |
| Total Volume | 0 | 26 | 17 | 43 | 5 | 1 | 8 | 14 | 5 | 12 | 0 | 17 | 0 | 0 | 0 | 0 | 74 |
| % App. Total | 0 | 60.5 | 39.5 | | 35.7 | 7.1 | 57.1 | | 29.4 | 70.6 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .722 | .607 | .827 | .625 | .250 | .400 | .500 | .625 | .750 | .000 | .708 | .000 | .000 | .000 | .000 | .881 |

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File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

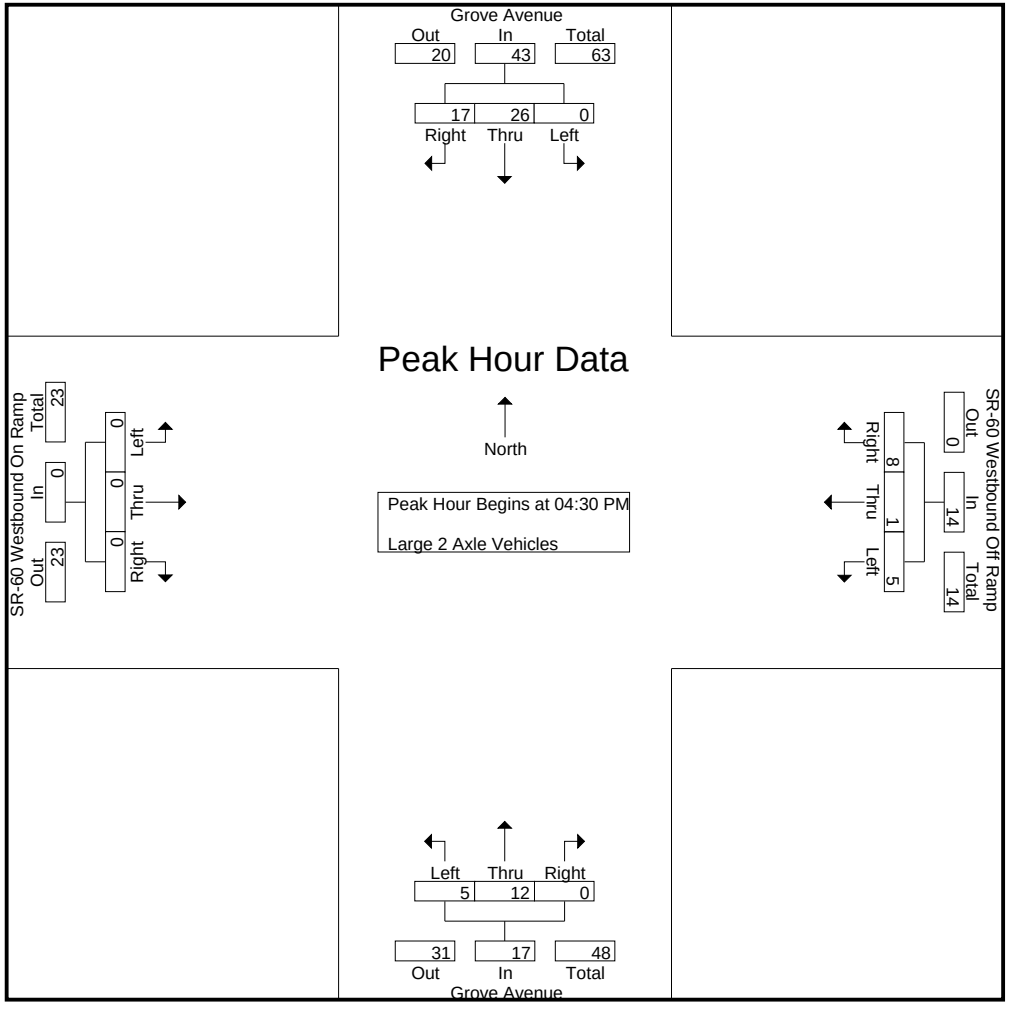

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Site Code : 05124953
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| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 6 | 5 | 11 | 1 | 0 | 1 | 2 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 5 | 4 | 9 | **2** | 0 | **5** | **7** | **2** | 3 | 0 | 5 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 6 | **7** | **13** | 2 | **1** | 1 | 4 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **9** | 1 | 10 | 0 | 0 | 1 | 1 | 2 | **4** | 0 | **6** | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 26 | 17 | 43 | 5 | 1 | 8 | 14 | 5 | 12 | 0 | 17 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 60.5 | 39.5 | | 35.7 | 7.1 | 57.1 | | 29.4 | 70.6 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .722 | .607 | .827 | .625 | .250 | .400 | .500 | .625 | .750 | .000 | .708 | .000 | .000 | .000 | .000 | |

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File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 2 | 2 | 1 | 4 | 1 | 0 | 2 | 1 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 8 | 10 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 5 |
| 04:30 PM | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 04:45 PM | 0 | 2 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Total | 0 | 5 | 5 | 1 | 10 | 1 | 0 | 4 | 2 | 5 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 3 | 19 | 22 |
| 05:00 PM | 0 | 3 | 2 | 1 | 5 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 8 |
| 05:15 PM | 0 | 3 | 8 | 0 | 11 | 1 | 0 | 1 | 1 | 2 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 18 |
| 05:30 PM | 0 | 0 | 5 | 0 | 5 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 |
| 05:45 PM | 0 | 1 | 4 | 0 | 5 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 8 |
| Total | 0 | 7 | 19 | 1 | 26 | 3 | 0 | 3 | 3 | 6 | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 4 | 37 | 41 |
| Grand Total | 0 | 12 | 24 | 2 | 36 | 4 | 0 | 7 | 5 | 11 | 1 | 8 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 7 | 56 | 63 |
| Apprch % | 0 | 33.3 | 66.7 | | | 36.4 | 0 | 63.6 | | | 11.1 | 88.9 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 21.4 | 42.9 | | 64.3 | 7.1 | 0 | 12.5 | | 19.6 | 1.8 | 14.3 | 0 | | 16.1 | 0 | 0 | 0 | | 0 | 11.1 | 88.9 | |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 3 |
| 04:45 PM | 0 | 2 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 05:00 PM | 0 | **3** | 2 | 5 | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 05:15 PM | 0 | 3 | **8** | **11** | **1** | 0 | 1 | **2** | 0 | **4** | 0 | **4** | 0 | 0 | 0 | 0 | **17** |
| Total Volume | 0 | 9 | 13 | 22 | 1 | 0 | 2 | 3 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 30 |
| % App. Total | 0 | 40.9 | 59.1 | | 33.3 | 0 | 66.7 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .750 | .406 | .500 | .250 | .000 | .500 | .375 | .000 | .313 | .000 | .313 | .000 | .000 | .000 | .000 | .441 |

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File Name : 20_ONT_Grove_60W PMC
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Start Date : 10/2/2024
Page No : 2

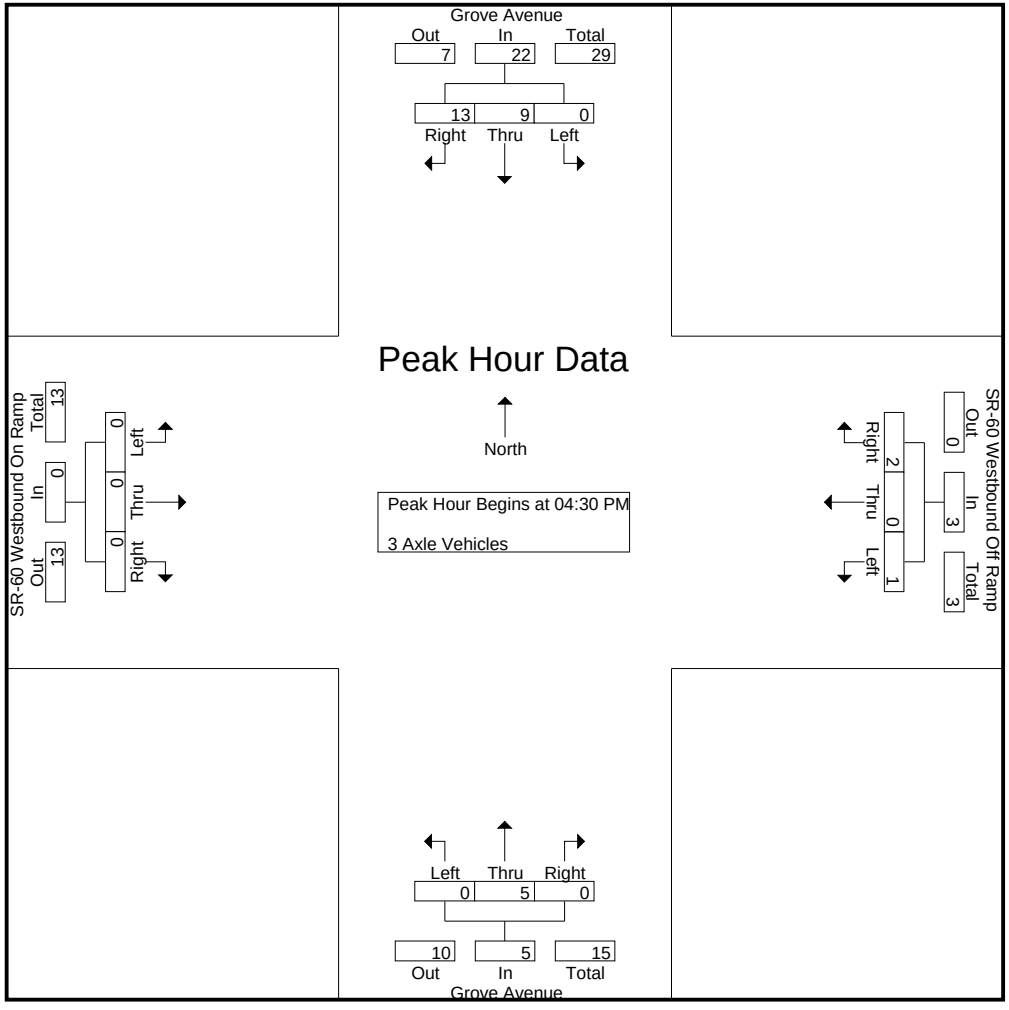

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 2 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **3** | 2 | 5 | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 3 | **8** | **11** | **1** | 0 | 1 | **2** | 0 | **4** | 0 | **4** | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 9 | 13 | 22 | 1 | 0 | 2 | 3 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 40.9 | 59.1 | | 33.3 | 0 | 66.7 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .750 | .406 | .500 | .250 | .000 | .500 | .375 | .000 | .313 | .000 | .313 | .000 | .000 | .000 | .000 | |

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File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
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Page No : 1

Groups Printed- 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 4 | 4 | 2 | 8 | 0 | 0 | 10 | 4 | 10 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 6 | 24 | 30 |
| 04:15 PM | 0 | 4 | 11 | 2 | 15 | 2 | 0 | 6 | 3 | 8 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 5 | 25 | 30 |
| 04:30 PM | 0 | 2 | 7 | 2 | 9 | 1 | 0 | 2 | 1 | 3 | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 17 | 20 |
| 04:45 PM | 0 | 2 | 3 | 0 | 5 | 0 | 0 | 2 | 1 | 2 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 13 | 14 |
| Total | 0 | 12 | 25 | 6 | 37 | 3 | 0 | 20 | 9 | 23 | 1 | 18 | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 15 | 79 | 94 |
| 05:00 PM | 0 | 7 | 7 | 0 | 14 | 0 | 0 | 3 | 1 | 3 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 21 | 22 |
| 05:15 PM | 0 | 2 | 6 | 0 | 8 | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 13 |
| 05:30 PM | 0 | 1 | 9 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 12 |
| 05:45 PM | 0 | 3 | 8 | 2 | 11 | 0 | 0 | 4 | 3 | 4 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 5 | 17 | 22 |
| Total | 0 | 13 | 30 | 2 | 43 | 0 | 0 | 8 | 5 | 8 | 0 | 11 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 7 | 62 | 69 |
| Grand Total | 0 | 25 | 55 | 8 | 80 | 3 | 0 | 28 | 14 | 31 | 1 | 29 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 22 | 141 | 163 |
| Apprch % | 0 | 31.2 | 68.8 | | | 9.7 | 0 | 90.3 | | | 3.3 | 96.7 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 17.7 | 39 | | 56.7 | 2.1 | 0 | 19.9 | | 22 | 0.7 | 20.6 | 0 | | 21.3 | 0 | 0 | 0 | | 0 | 13.5 | 86.5 | |

| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 2 | **7** | 9 | **1** | 0 | 2 | **3** | **1** | 4 | 0 | 5 | 0 | 0 | 0 | 0 | 17 |
| 04:45 PM | 0 | 2 | 3 | 5 | 0 | 0 | 2 | 2 | 0 | **6** | 0 | **6** | 0 | 0 | 0 | 0 | 13 |
| 05:00 PM | 0 | **7** | 7 | **14** | 0 | 0 | **3** | 3 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | **21** |
| 05:15 PM | 0 | 2 | 6 | 8 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 12 |
| Total Volume | 0 | 13 | 23 | 36 | 1 | 0 | 8 | 9 | 1 | 17 | 0 | 18 | 0 | 0 | 0 | 0 | 63 |
| % App. Total | 0 | 36.1 | 63.9 | | 11.1 | 0 | 88.9 | | 5.6 | 94.4 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .464 | .821 | .643 | .250 | .000 | .667 | .750 | .250 | .708 | .000 | .750 | .000 | .000 | .000 | .000 | .750 |

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File Name : 20_ONT_Grove_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

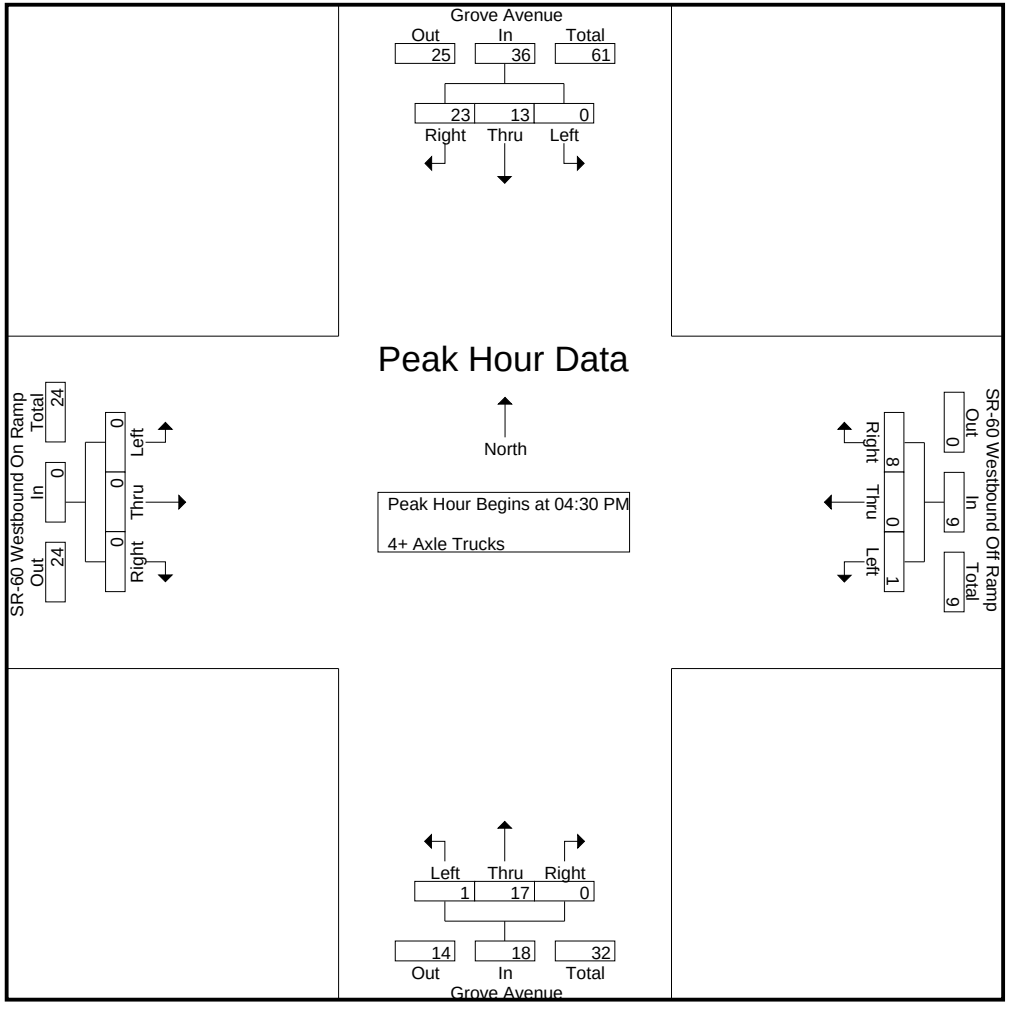

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| | Grove Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 2 | **7** | 9 | **1** | 0 | 2 | **3** | **1** | 4 | 0 | 5 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 2 | 3 | 5 | 0 | 0 | 2 | 2 | 0 | **6** | 0 | **6** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **7** | 7 | **14** | 0 | 0 | **3** | 3 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 2 | 6 | 8 | 0 | 0 | 1 | 1 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 13 | 23 | 36 | 1 | 0 | 8 | 9 | 1 | 17 | 0 | 18 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 36.1 | 63.9 | | 11.1 | 0 | 88.9 | | 5.6 | 94.4 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .464 | .821 | .643 | .250 | .000 | .667 | .750 | .250 | .708 | .000 | .750 | .000 | .000 | .000 | .000 | |

Location: Ontario
N/S: Grove Avenue
E/W: SR-60 WB Ramps

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Grove Avenue | East Leg SR-60 WB Ramps | South Leg Grove Avenue | West Leg SR-60 WB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 1 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 1 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 |
| 8:30 AM | 0 | 1 | 0 | 3 | 4 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 3 | 0 | 4 | 7 |

| | North Leg Grove Avenue | East Leg SR-60 WB Ramps | South Leg Grove Avenue | West Leg SR-60 WB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 2 | 0 | 0 | 2 |
| 4:15 PM | 0 | 0 | 0 | 1 | 1 |
| 4:30 PM | 0 | 0 | 0 | 2 | 2 |
| 4:45 PM | 0 | 2 | 0 | 2 | 4 |
| 5:00 PM | 0 | 2 | 0 | 0 | 2 |
| 5:15 PM | 0 | 1 | 0 | 0 | 1 |
| 5:30 PM | 0 | 3 | 1 | 1 | 5 |
| 5:45 PM | 0 | 1 | 0 | 2 | 3 |
| TOTAL VOLUMES: | 0 | 11 | 1 | 8 | 20 |

Location: Ontario
N/S: Grove Avenue
E/W: SR-60 WB Ramps

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Grove Avenue | | | Westbound SR-60 WB Ramps | | | Northbound Grove Avenue | | | Eastbound SR-60 WB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 4 |

| | Southbound Grove Avenue | | | Westbound SR-60 WB Ramps | | | Northbound Grove Avenue | | | Eastbound SR-60 WB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

Counts Unlimited, Inc.
PO Box 1178
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951-268-6268

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 44 | 83 | 0 | 0 | 127 | 0 | 0 | 0 | 0 | 0 | 0 | 137 | 63 | 23 | 200 | 74 | 1 | 41 | 25 | 116 | 48 | 443 | 491 |
| 07:15 AM | 69 | 90 | 0 | 0 | 159 | 0 | 0 | 0 | 0 | 0 | 0 | 139 | 72 | 11 | 211 | 68 | 0 | 34 | 23 | 102 | 34 | 472 | 506 |
| 07:30 AM | 75 | 109 | 0 | 0 | 184 | 0 | 0 | 0 | 0 | 0 | 0 | 205 | 80 | 34 | 285 | 95 | 0 | 46 | 27 | 141 | 61 | 610 | 671 |
| 07:45 AM | 69 | 136 | 0 | 0 | 205 | 0 | 0 | 0 | 0 | 0 | 0 | 203 | 58 | 21 | 261 | 90 | 1 | 34 | 20 | 125 | 41 | 591 | 632 |
| Total | 257 | 418 | 0 | 0 | 675 | 0 | 0 | 0 | 0 | 0 | 0 | 684 | 273 | 89 | 957 | 327 | 2 | 155 | 95 | 484 | 184 | 2116 | 2300 |
| 08:00 AM | 70 | 124 | 0 | 0 | 194 | 0 | 0 | 0 | 0 | 0 | 0 | 172 | 75 | 35 | 247 | 110 | 0 | 18 | 10 | 128 | 45 | 569 | 614 |
| 08:15 AM | 64 | 122 | 0 | 0 | 186 | 0 | 0 | 0 | 0 | 0 | 0 | 170 | 76 | 26 | 246 | 110 | 1 | 25 | 14 | 136 | 40 | 568 | 608 |
| 08:30 AM | 69 | 115 | 0 | 0 | 184 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 57 | 16 | 174 | 107 | 2 | 41 | 21 | 150 | 37 | 508 | 545 |
| 08:45 AM | 50 | 143 | 0 | 0 | 193 | 0 | 0 | 0 | 0 | 0 | 0 | 139 | 45 | 7 | 184 | 104 | 0 | 34 | 17 | 138 | 24 | 515 | 539 |
| Total | 253 | 504 | 0 | 0 | 757 | 0 | 0 | 0 | 0 | 0 | 0 | 598 | 253 | 84 | 851 | 431 | 3 | 118 | 62 | 552 | 146 | 2160 | 2306 |
| Grand Total | 510 | 922 | 0 | 0 | 1432 | 0 | 0 | 0 | 0 | 0 | 0 | 1282 | 526 | 173 | 1808 | 758 | 5 | 273 | 157 | 1036 | 330 | 4276 | 4606 |
| Apprch % | 35.6 | 64.4 | 0 | | | 0 | 0 | 0 | | | 0 | 70.9 | 29.1 | | | 73.2 | 0.5 | 26.4 | | | | | |
| Total % | 11.9 | 21.6 | 0 | | 33.5 | 0 | 0 | 0 | | 0 | 0 | 30 | 12.3 | | 42.3 | 17.7 | 0.1 | 6.4 | | 24.2 | 7.2 | 92.8 | |
| Passenger Vehicles | 436 | 862 | 0 | | 1298 | 0 | 0 | 0 | | 0 | 0 | 1223 | 493 | | 1880 | 707 | 4 | 254 | | 1113 | 0 | 0 | 4291 |
| % Passenger Vehicles | 85.5 | 93.5 | 0 | 0 | 90.6 | 0 | 0 | 0 | 0 | 0 | 0 | 95.4 | 93.7 | 94.8 | 94.9 | 93.3 | 80 | 93 | 94.3 | 93.3 | 0 | 0 | 93.2 |
| Large 2 Axle Vehicles | 29 | 29 | 0 | | 58 | 0 | 0 | 0 | | 0 | 0 | 25 | 18 | | 47 | 21 | 1 | 10 | | 35 | 0 | 0 | 140 |
| % Large 2 Axle Vehicles | 5.7 | 3.1 | 0 | 0 | 4.1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3.4 | 2.3 | 2.4 | 2.8 | 20 | 3.7 | 1.9 | 2.9 | 0 | 0 | 3 |
| 3 Axle Vehicles | 9 | 14 | 0 | | 23 | 0 | 0 | 0 | | 0 | 0 | 14 | 8 | | 24 | 1 | 0 | 2 | | 5 | 0 | 0 | 52 |
| % 3 Axle Vehicles | 1.8 | 1.5 | 0 | 0 | 1.6 | 0 | 0 | 0 | 0 | 0 | 0 | 1.1 | 1.5 | 1.2 | 1.2 | 0.1 | 0 | 0.7 | 1.3 | 0.4 | 0 | 0 | 1.1 |
| 4+ Axle Trucks | 36 | 17 | 0 | | 53 | 0 | 0 | 0 | | 0 | 0 | 20 | 7 | | 30 | 29 | 0 | 7 | | 40 | 0 | 0 | 123 |
| % 4+ Axle Trucks | 7.1 | 1.8 | 0 | 0 | 3.7 | 0 | 0 | 0 | 0 | 0 | 0 | 1.6 | 1.3 | 1.7 | 1.5 | 3.8 | 0 | 2.6 | 2.5 | 3.4 | 0 | 0 | 2.7 |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **75** | 109 | 0 | 184 | 0 | 0 | 0 | 0 | 0 | **205** | **80** | **285** | 95 | 0 | **46** | **141** | **610** |
| 07:45 AM | 69 | **136** | 0 | **205** | 0 | 0 | 0 | 0 | 0 | 203 | 58 | 261 | 90 | **1** | 34 | 125 | 591 |
| 08:00 AM | 70 | 124 | 0 | 194 | 0 | 0 | 0 | 0 | 0 | 172 | 75 | 247 | **110** | 0 | 18 | 128 | 569 |
| 08:15 AM | 64 | 122 | 0 | 186 | 0 | 0 | 0 | 0 | 0 | 170 | 76 | 246 | 110 | 1 | 25 | 136 | 568 |
| Total Volume | 278 | 491 | 0 | 769 | 0 | 0 | 0 | 0 | 0 | 750 | 289 | 1039 | 405 | 2 | 123 | 530 | 2338 |
| % App. Total | 36.2 | 63.8 | 0 | | 0 | 0 | 0 | | 0 | 72.2 | 27.8 | | 76.4 | 0.4 | 23.2 | | |
| PHF | .927 | .903 | .000 | .938 | .000 | .000 | .000 | .000 | .000 | .915 | .903 | .911 | .920 | .500 | .668 | .940 | .958 |

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File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

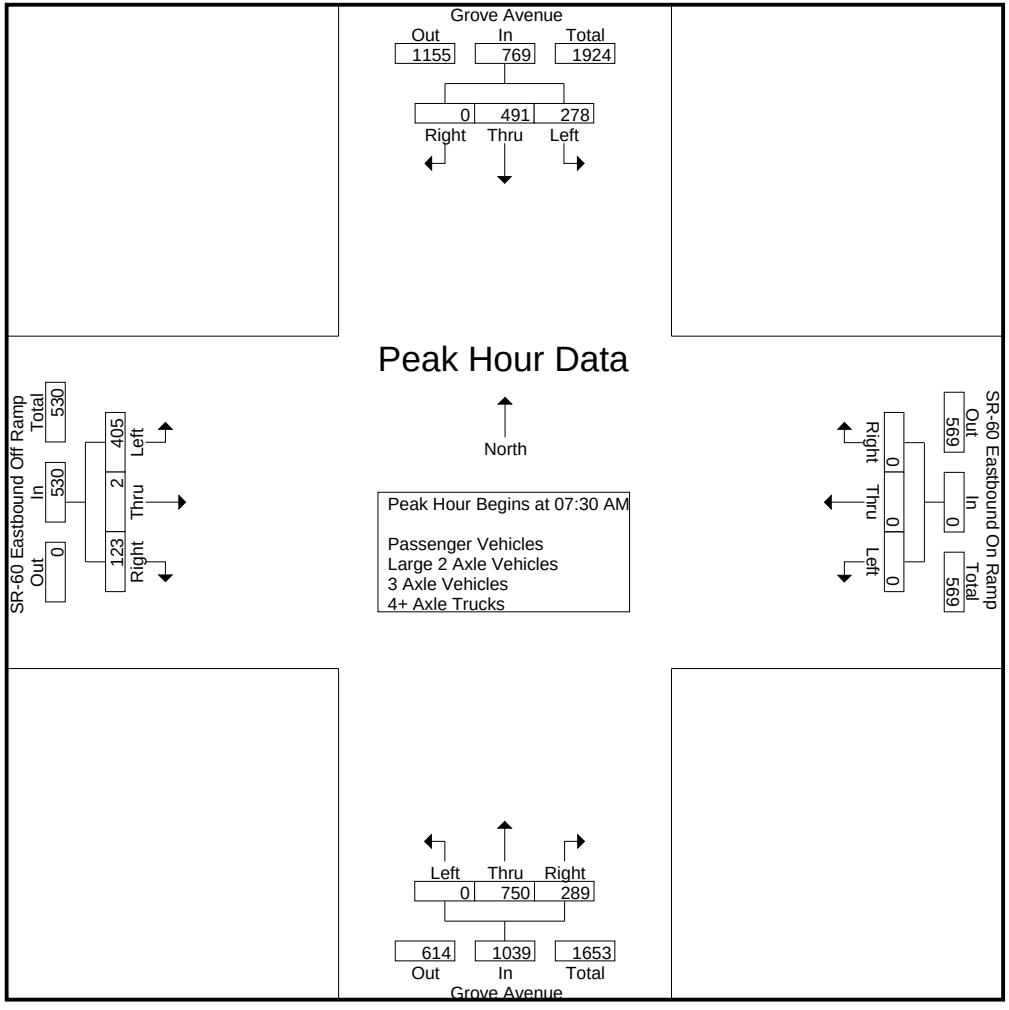

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File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
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| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:00 AM | | | | 07:30 AM | | | | 08:00 AM | | | | |
| +0 mins. | **75** | 109 | 0 | 184 | 0 | 0 | 0 | 0 | 0 | **205** | **80** | **285** | **110** | 0 | 18 | 128 | |
| +15 mins. | 69 | **136** | 0 | **205** | 0 | 0 | 0 | 0 | 0 | 203 | 58 | 261 | 110 | 1 | 25 | 136 | |
| +30 mins. | 70 | 124 | 0 | 194 | 0 | 0 | 0 | 0 | 0 | 172 | 75 | 247 | 107 | **2** | **41** | **150** | |
| +45 mins. | 64 | 122 | 0 | 186 | 0 | 0 | 0 | 0 | 0 | 170 | 76 | 246 | 104 | 0 | 34 | 138 | |
| Total Volume | 278 | 491 | 0 | 769 | 0 | 0 | 0 | 0 | 0 | 750 | 289 | 1039 | 431 | 3 | 118 | 552 | |
| % App. Total | 36.2 | 63.8 | 0 | | 0 | 0 | 0 | | 0 | 72.2 | 27.8 | | 78.1 | 0.5 | 21.4 | | |
| PHF | .927 | .903 | .000 | .938 | .000 | .000 | .000 | .000 | .000 | .915 | .903 | .911 | .980 | .375 | .720 | .920 | |

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Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 37 | 77 | 0 | 0 | 114 | 0 | 0 | 0 | 0 | 0 | 0 | 132 | 57 | 21 | 189 | 62 | 1 | 38 | 25 | 101 | 46 | 404 | 450 |
| 07:15 AM | 59 | 82 | 0 | 0 | 141 | 0 | 0 | 0 | 0 | 0 | 0 | 131 | 68 | 10 | 199 | 66 | 0 | 34 | 23 | 100 | 33 | 440 | 473 |
| 07:30 AM | 67 | 99 | 0 | 0 | 166 | 0 | 0 | 0 | 0 | 0 | 0 | 200 | 78 | 34 | 278 | 89 | 0 | 39 | 22 | 128 | 56 | 572 | 628 |
| 07:45 AM | 59 | 128 | 0 | 0 | 187 | 0 | 0 | 0 | 0 | 0 | 0 | 192 | 52 | 18 | 244 | 86 | 0 | 31 | 18 | 117 | 36 | 548 | 584 |
| Total | 222 | 386 | 0 | 0 | 608 | 0 | 0 | 0 | 0 | 0 | 0 | 655 | 255 | 83 | 910 | 303 | 1 | 142 | 88 | 446 | 171 | 1964 | 2135 |
| 08:00 AM | 60 | 113 | 0 | 0 | 173 | 0 | 0 | 0 | 0 | 0 | 0 | 167 | 72 | 34 | 239 | 105 | 0 | 18 | 10 | 123 | 44 | 535 | 579 |
| 08:15 AM | 55 | 114 | 0 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | 0 | 161 | 73 | 26 | 234 | 101 | 1 | 22 | 13 | 124 | 39 | 527 | 566 |
| 08:30 AM | 57 | 110 | 0 | 0 | 167 | 0 | 0 | 0 | 0 | 0 | 0 | 111 | 51 | 14 | 162 | 103 | 2 | 40 | 21 | 145 | 35 | 474 | 509 |
| 08:45 AM | 42 | 139 | 0 | 0 | 181 | 0 | 0 | 0 | 0 | 0 | 0 | 129 | 42 | 7 | 171 | 95 | 0 | 32 | 16 | 127 | 23 | 479 | 502 |
| Total | 214 | 476 | 0 | 0 | 690 | 0 | 0 | 0 | 0 | 0 | 0 | 568 | 238 | 81 | 806 | 404 | 3 | 112 | 60 | 519 | 141 | 2015 | 2156 |
| Grand Total | 436 | 862 | 0 | 0 | 1298 | 0 | 0 | 0 | 0 | 0 | 0 | 1223 | 493 | 164 | 1716 | 707 | 4 | 254 | 148 | 965 | 312 | 3979 | 4291 |
| Apprch % | 33.6 | 66.4 | 0 | | | 0 | 0 | 0 | | | 0 | 71.3 | 28.7 | | | 73.3 | 0.4 | 26.3 | | | | | |
| Total % | 11 | 21.7 | 0 | | 32.6 | 0 | 0 | 0 | | 0 | 0 | 30.7 | 12.4 | | 43.1 | 17.8 | 0.1 | 6.4 | | 24.3 | 7.3 | 92.7 | |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **67** | 99 | 0 | 166 | 0 | 0 | 0 | 0 | 0 | **200** | **78** | **278** | 89 | 0 | **39** | **128** | **572** |
| 07:45 AM | 59 | **128** | 0 | **187** | 0 | 0 | 0 | 0 | 0 | 192 | 52 | 244 | 86 | 0 | 31 | 117 | 548 |
| 08:00 AM | 60 | 113 | 0 | 173 | 0 | 0 | 0 | 0 | 0 | 167 | 72 | 239 | **105** | 0 | 18 | 123 | 535 |
| 08:15 AM | 55 | 114 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | 161 | 73 | 234 | 101 | **1** | 22 | 124 | 527 |
| Total Volume | 241 | 454 | 0 | 695 | 0 | 0 | 0 | 0 | 0 | 720 | 275 | 995 | 381 | 1 | 110 | 492 | 2182 |
| % App. Total | 34.7 | 65.3 | 0 | | 0 | 0 | 0 | | 0 | 72.4 | 27.6 | | 77.4 | 0.2 | 22.4 | | |
| PHF | .899 | .887 | .000 | .929 | .000 | .000 | .000 | .000 | .000 | .900 | .881 | .895 | .907 | .250 | .705 | .961 | .954 |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

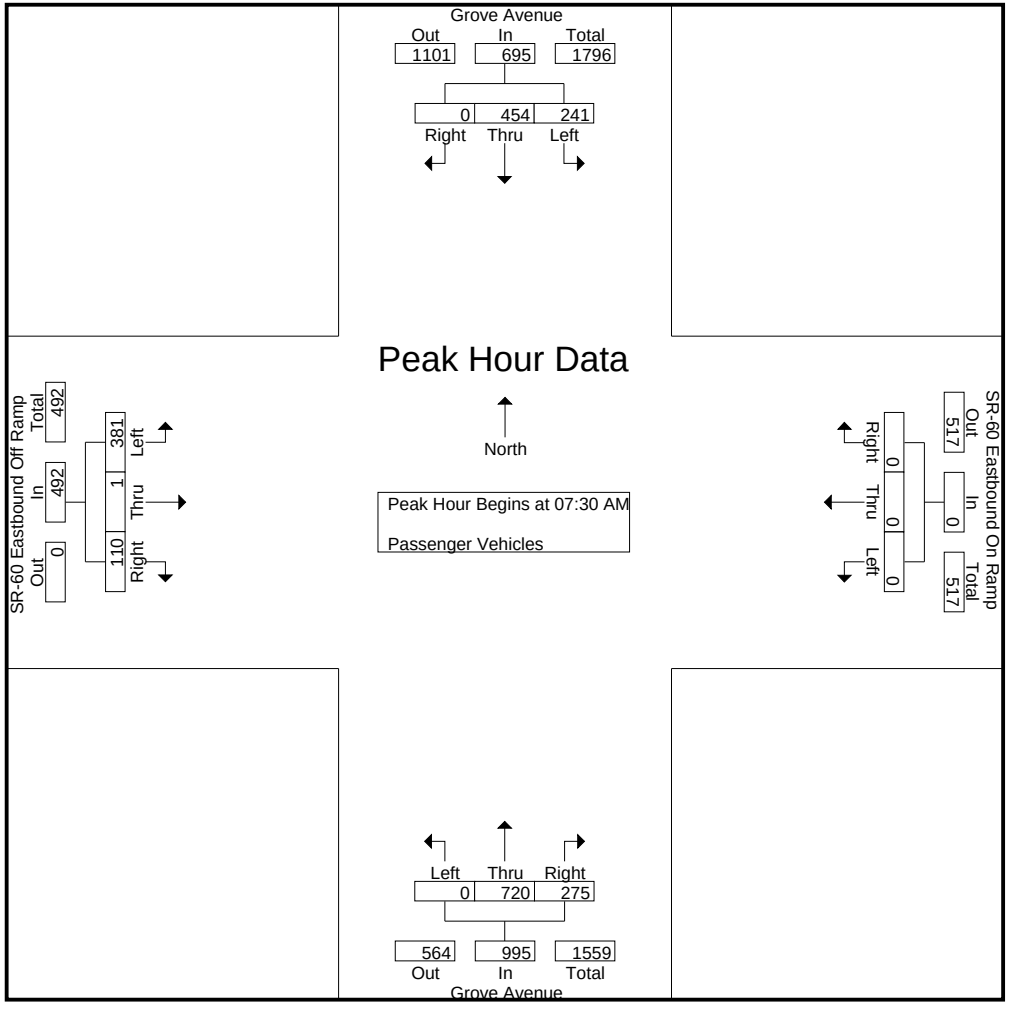

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **67** | 99 | 0 | 166 | 0 | 0 | 0 | 0 | 0 | **200** | **78** | **278** | 89 | 0 | **39** | **128** | |
| +15 mins. | 59 | **128** | 0 | **187** | 0 | 0 | 0 | 0 | 0 | 192 | 52 | 244 | 86 | 0 | 31 | 117 | |
| +30 mins. | 60 | 113 | 0 | 173 | 0 | 0 | 0 | 0 | 0 | 167 | 72 | 239 | **105** | 0 | 18 | 123 | |
| +45 mins. | 55 | 114 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | 161 | 73 | 234 | 101 | **1** | 22 | 124 | |
| Total Volume | 241 | 454 | 0 | 695 | 0 | 0 | 0 | 0 | 0 | 720 | 275 | 995 | 381 | 1 | 110 | 492 | |
| % App. Total | 34.7 | 65.3 | 0 | | 0 | 0 | 0 | | 0 | 72.4 | 27.6 | | 77.4 | 0.2 | 22.4 | | |
| PHF | .899 | .887 | .000 | .929 | .000 | .000 | .000 | .000 | .000 | .900 | .881 | .895 | .907 | .250 | .705 | .961 | |

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City of Ontario
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E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 6 | 4 | 0 | 3 | 0 | 7 | 1 | 18 | 19 |
| 07:15 AM | 4 | 3 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 5 | 1 | 0 | 0 | 0 | 1 | 0 | 13 | 13 |
| 07:30 AM | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 3 | 0 | 2 | 1 | 5 | 1 | 13 | 14 |
| 07:45 AM | 7 | 2 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 4 | 1 | 9 | 3 | 1 | 2 | 1 | 6 | 2 | 24 | 26 |
| Total | 15 | 12 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 9 | 2 | 22 | 11 | 1 | 7 | 2 | 19 | 4 | 68 | 72 |
| 08:00 AM | 4 | 6 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 0 | 13 | 13 |
| 08:15 AM | 4 | 4 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 5 | 3 | 0 | 2 | 1 | 5 | 1 | 18 | 19 |
| 08:30 AM | 6 | 4 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 2 | 7 | 1 | 0 | 0 | 0 | 1 | 2 | 18 | 20 |
| 08:45 AM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 7 | 5 | 0 | 1 | 0 | 6 | 0 | 16 | 16 |
| Total | 14 | 17 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 9 | 2 | 21 | 10 | 0 | 3 | 1 | 13 | 3 | 65 | 68 |
| Grand Total | 29 | 29 | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 18 | 4 | 43 | 21 | 1 | 10 | 3 | 32 | 7 | 133 | 140 |
| Apprch % | 50 | 50 | 0 | | | 0 | 0 | 0 | | | 0 | 58.1 | 41.9 | | | 65.6 | 3.1 | 31.2 | | | | | |
| Total % | 21.8 | 21.8 | 0 | | 43.6 | 0 | 0 | 0 | | 0 | 0 | 18.8 | 13.5 | | 32.3 | 15.8 | 0.8 | 7.5 | | 24.1 | 5 | 95 | |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 1 | 5 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | **3** | 0 | **2** | 5 | 13 |
| 07:45 AM | **7** | 2 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | **5** | **4** | **9** | 3 | **1** | 2 | **6** | **24** |
| 08:00 AM | 4 | **6** | 0 | **10** | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | 13 |
| 08:15 AM | 4 | 4 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 5 | 3 | 0 | 2 | 5 | 18 |
| Total Volume | 16 | 17 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 11 | 7 | 18 | 10 | 1 | 6 | 17 | 68 |
| % App. Total | 48.5 | 51.5 | 0 | | 0 | 0 | 0 | | 0 | 61.1 | 38.9 | | 58.8 | 5.9 | 35.3 | | |
| PHF | .571 | .708 | .000 | .825 | .000 | .000 | .000 | .000 | .000 | .550 | .438 | .500 | .833 | .250 | .750 | .708 | .708 |

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(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

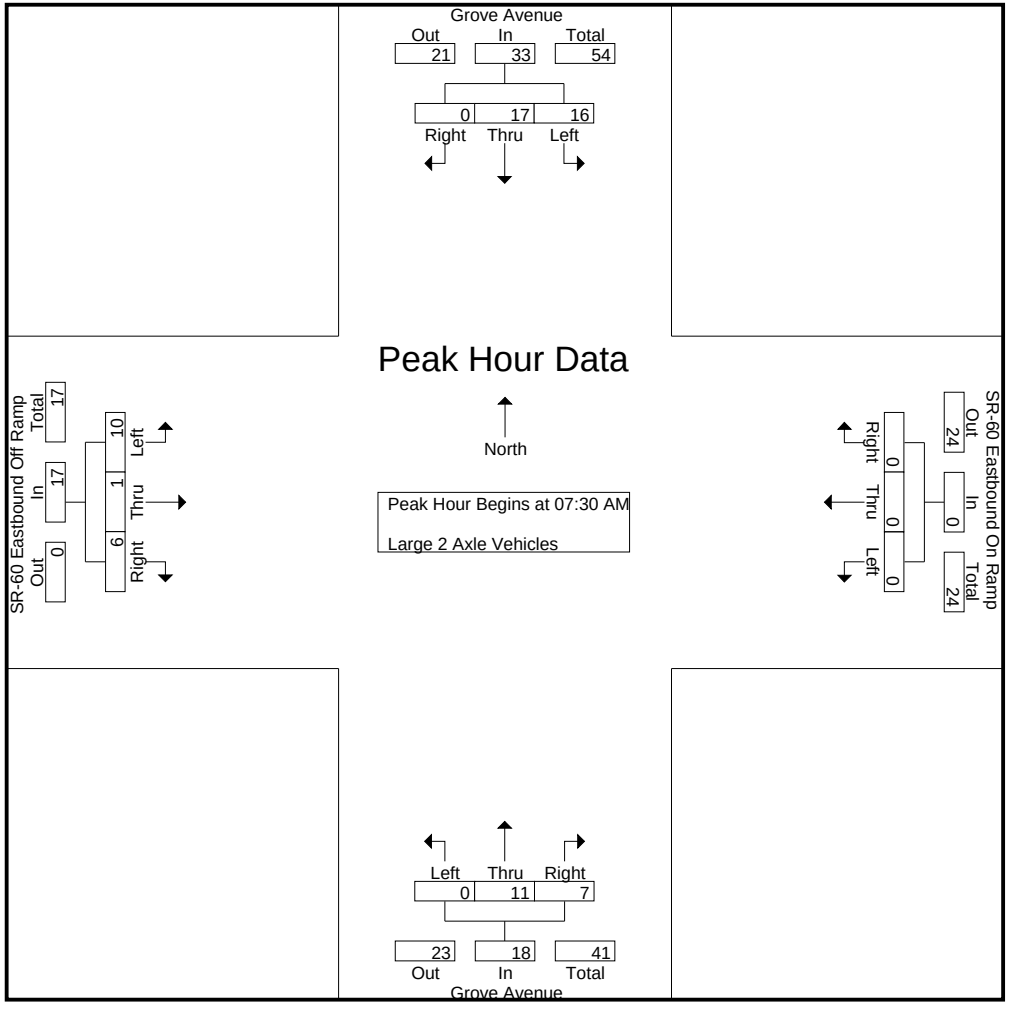

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File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 1 | 5 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | **3** | 0 | **2** | 5 | |
| +15 mins. | **7** | 2 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | **5** | **4** | **9** | 3 | **1** | 2 | **6** | |
| +30 mins. | 4 | **6** | 0 | **10** | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 1 | |
| +45 mins. | 4 | 4 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 5 | 3 | 0 | 2 | 5 | |
| Total Volume | 16 | 17 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 11 | 7 | 18 | 10 | 1 | 6 | 17 | |
| % App. Total | 48.5 | 51.5 | 0 | | 0 | 0 | 0 | | 0 | 61.1 | 38.9 | | 58.8 | 5.9 | 35.3 | | |
| PHF | .571 | .708 | .000 | .825 | .000 | .000 | .000 | .000 | .000 | .550 | .438 | .500 | .833 | .250 | .750 | .708 | |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 4 |
| 07:15 AM | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| 07:30 AM | 4 | 2 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3 | 0 | 0 | 2 | 2 | 2 | 2 | 11 | 13 |
| 07:45 AM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 8 | 8 |
| Total | 6 | 8 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 6 | 1 | 11 | 1 | 0 | 2 | 2 | 3 | 3 | 28 | 31 |
| 08:00 AM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 6 |
| 08:15 AM | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| 08:30 AM | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| 08:45 AM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| Total | 3 | 6 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 2 | 1 | 11 | 0 | 0 | 0 | 0 | 0 | 1 | 20 | 21 |
| Grand Total | 9 | 14 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 8 | 2 | 22 | 1 | 0 | 2 | 2 | 3 | 4 | 48 | 52 |
| Apprch % | 39.1 | 60.9 | 0 | | | 0 | 0 | 0 | | | 0 | 63.6 | 36.4 | | | 33.3 | 0 | 66.7 | | | | | |
| Total % | 18.8 | 29.2 | 0 | | 47.9 | 0 | 0 | 0 | | 0 | 0 | 29.2 | 16.7 | | 45.8 | 2.1 | 0 | 4.2 | | 6.2 | 7.7 | 92.3 | |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **4** | 2 | 0 | **6** | 0 | 0 | 0 | 0 | 0 | 1 | **2** | **3** | 0 | 0 | **2** | **2** | **11** |
| 07:45 AM | 0 | **4** | 0 | 4 | 0 | 0 | 0 | 0 | 0 | **3** | 0 | 3 | **1** | 0 | 0 | 1 | 8 |
| 08:00 AM | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 5 |
| 08:15 AM | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 6 |
| Total Volume | 5 | 11 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 8 | 3 | 11 | 1 | 0 | 2 | 3 | 30 |
| % App. Total | 31.2 | 68.8 | 0 | | 0 | 0 | 0 | | 0 | 72.7 | 27.3 | | 33.3 | 0 | 66.7 | | |
| PHF | .313 | .688 | .000 | .667 | .000 | .000 | .000 | .000 | .000 | .667 | .375 | .917 | .250 | .000 | .250 | .375 | .682 |

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Corona, CA 92878
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City of Ontario
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E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

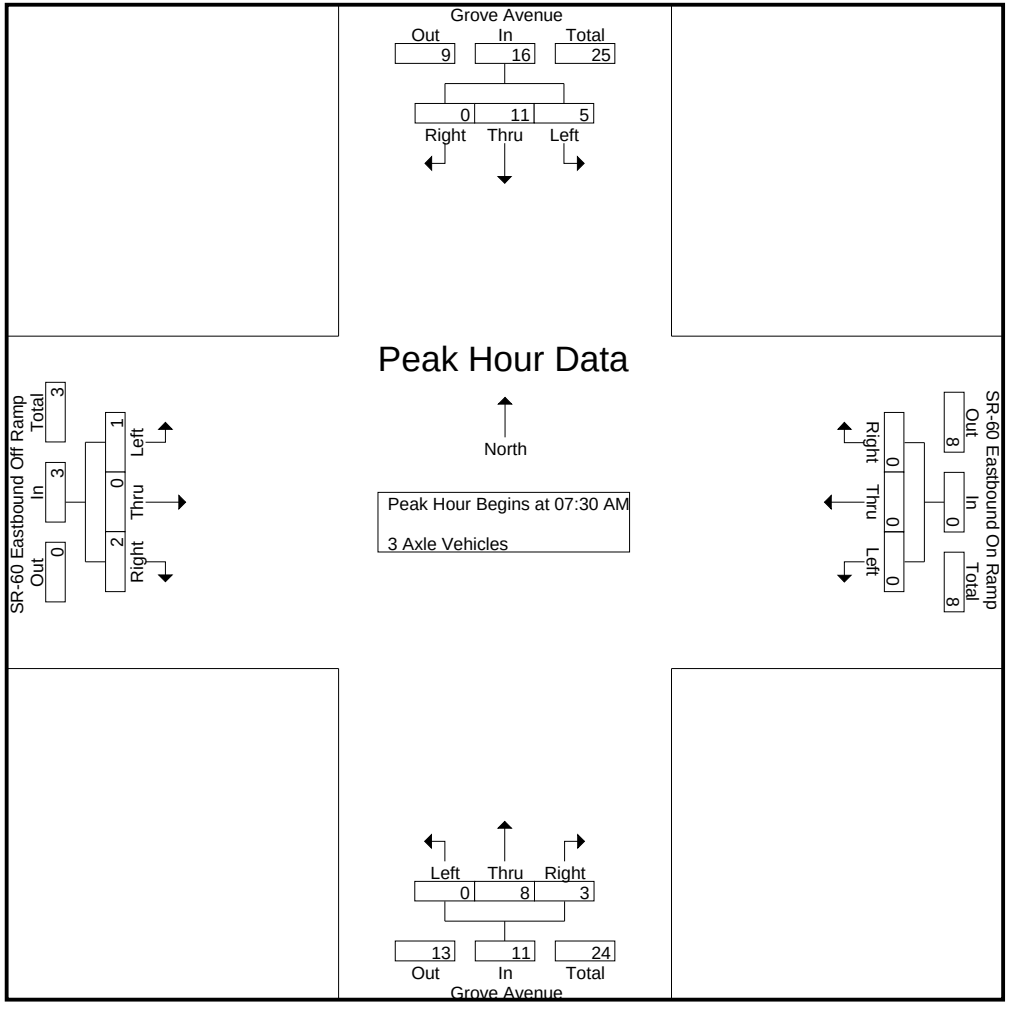

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Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **4** | 2 | 0 | **6** | 0 | 0 | 0 | 0 | 0 | 1 | **2** | **3** | 0 | 0 | **2** | **2** | |
| +15 mins. | 0 | **4** | 0 | 4 | 0 | 0 | 0 | 0 | 0 | **3** | 0 | 3 | **1** | 0 | 0 | 1 | |
| +30 mins. | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | |
| +45 mins. | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | |
| Total Volume | 5 | 11 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 8 | 3 | 11 | 1 | 0 | 2 | 3 | |
| % App. Total | 31.2 | 68.8 | 0 | | 0 | 0 | 0 | | 0 | 72.7 | 27.3 | | 33.3 | 0 | 66.7 | | |
| PHF | .313 | .688 | .000 | .667 | .000 | .000 | .000 | .000 | .000 | .667 | .375 | .917 | .250 | .000 | .250 | .375 | |

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City of Ontario
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E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 4 | 3 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 8 | 0 | 0 | 0 | 8 | 0 | 18 | 18 |
| 07:15 AM | 4 | 4 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 1 | 4 | 1 | 0 | 0 | 0 | 1 | 1 | 13 | 14 |
| 07:30 AM | 3 | 3 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 3 | 0 | 3 | 2 | 6 | 2 | 14 | 16 |
| 07:45 AM | 3 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 2 | 5 | 0 | 0 | 1 | 1 | 1 | 3 | 11 | 14 |
| Total | 14 | 12 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 3 | 3 | 14 | 12 | 0 | 4 | 3 | 16 | 6 | 56 | 62 |
| 08:00 AM | 6 | 2 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 4 | 0 | 16 | 16 |
| 08:15 AM | 4 | 2 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 4 | 6 | 0 | 1 | 0 | 7 | 0 | 17 | 17 |
| 08:30 AM | 5 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3 | 3 | 0 | 1 | 0 | 4 | 0 | 12 | 12 |
| 08:45 AM | 7 | 1 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 4 | 0 | 1 | 1 | 5 | 1 | 15 | 16 |
| Total | 22 | 5 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 4 | 0 | 13 | 17 | 0 | 3 | 1 | 20 | 1 | 60 | 61 |
| Grand Total | 36 | 17 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 7 | 3 | 27 | 29 | 0 | 7 | 4 | 36 | 7 | 116 | 123 |
| Apprch % | 67.9 | 32.1 | 0 | | | 0 | 0 | 0 | | | 0 | 74.1 | 25.9 | | | 80.6 | 0 | 19.4 | | | | | |
| Total % | 31 | 14.7 | 0 | | 45.7 | 0 | 0 | 0 | | 0 | 0 | 17.2 | 6 | | 23.3 | 25 | 0 | 6 | | 31 | 5.7 | 94.3 | |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 3 | **3** | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 3 | 0 | **3** | 6 | 14 |
| 07:45 AM | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | **2** | **5** | 0 | 0 | 1 | 1 | 11 |
| 08:00 AM | **6** | 2 | 0 | **8** | 0 | 0 | 0 | 0 | 0 | **4** | 0 | 4 | 4 | 0 | 0 | 4 | 16 |
| 08:15 AM | 4 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 4 | **6** | 0 | 1 | **7** | **17** |
| Total Volume | 16 | 9 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 11 | 4 | 15 | 13 | 0 | 5 | 18 | 58 |
| % App. Total | 64 | 36 | 0 | | 0 | 0 | 0 | | 0 | 73.3 | 26.7 | | 72.2 | 0 | 27.8 | | |
| PHF | .667 | .750 | .000 | .781 | .000 | .000 | .000 | .000 | .000 | .688 | .500 | .750 | .542 | .000 | .417 | .643 | .853 |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

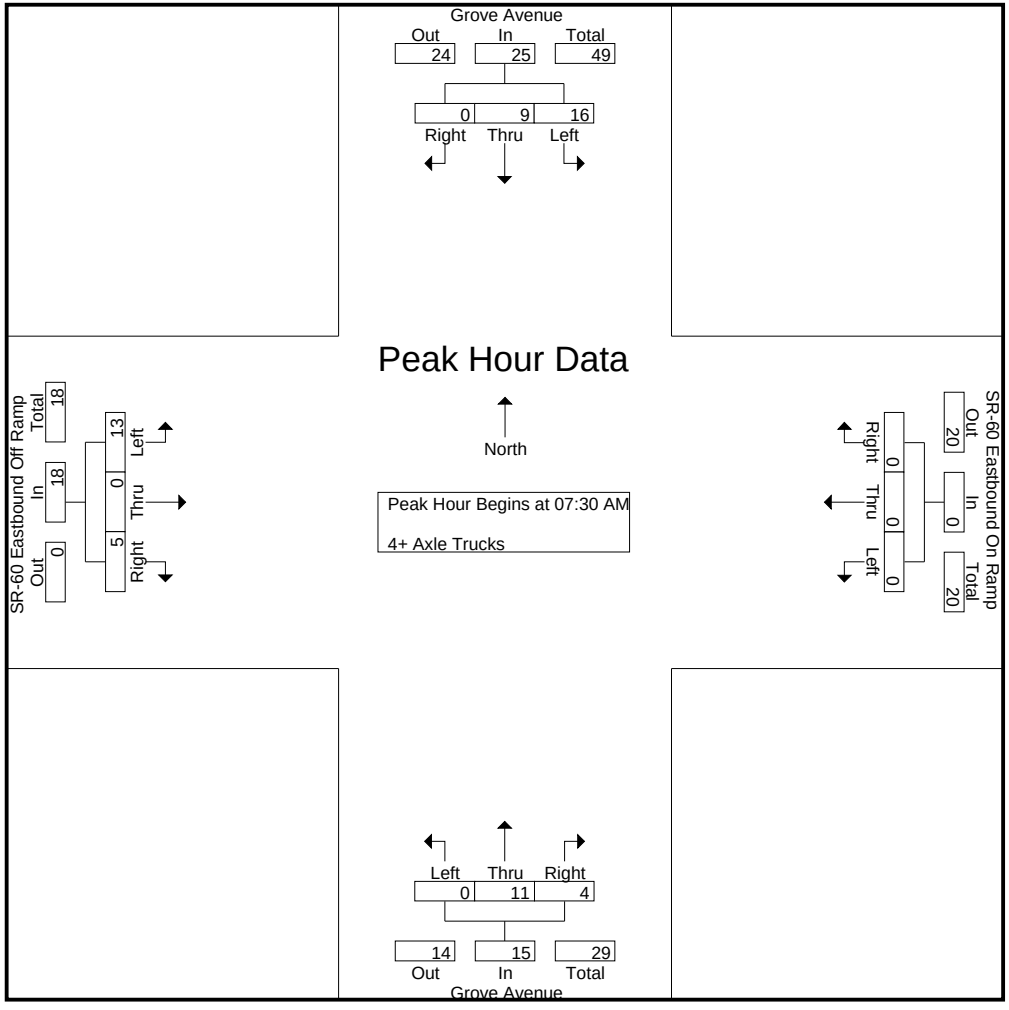

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| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 3 | **3** | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 3 | 0 | **3** | 6 | |
| +15 mins. | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | **2** | **5** | 0 | 0 | 1 | 1 | |
| +30 mins. | **6** | 2 | 0 | **8** | 0 | 0 | 0 | 0 | 0 | **4** | 0 | 4 | 4 | 0 | 0 | 4 | |
| +45 mins. | 4 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 4 | **6** | 0 | 1 | **7** | |
| Total Volume | 16 | 9 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 11 | 4 | 15 | 13 | 0 | 5 | 18 | |
| % App. Total | 64 | 36 | 0 | | 0 | 0 | 0 | | 0 | 73.3 | 26.7 | | 72.2 | 0 | 27.8 | | |
| PHF | .667 | .750 | .000 | .781 | .000 | .000 | .000 | .000 | .000 | .688 | .500 | .750 | .542 | .000 | .417 | .643 | |

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Site Code : 05124953
Start Date : 10/2/2024
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Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 93 | 161 | 0 | 0 | 254 | 0 | 0 | 0 | 0 | 0 | 0 | 130 | 62 | 23 | 192 | 63 | 1 | 39 | 14 | 103 | 37 | 549 | 586 |
| 04:15 PM | 86 | 167 | 0 | 0 | 253 | 0 | 0 | 0 | 0 | 0 | 0 | 147 | 59 | 22 | 206 | 56 | 0 | 35 | 14 | 91 | 36 | 550 | 586 |
| 04:30 PM | 109 | 149 | 0 | 0 | 258 | 0 | 0 | 0 | 0 | 0 | 0 | 131 | 58 | 15 | 189 | 73 | 0 | 38 | 17 | 111 | 32 | 558 | 590 |
| 04:45 PM | 97 | 176 | 0 | 0 | 273 | 0 | 0 | 0 | 0 | 0 | 0 | 153 | 46 | 9 | 199 | 70 | 2 | 43 | 20 | 115 | 29 | 587 | 616 |
| Total | 385 | 653 | 0 | 0 | 1038 | 0 | 0 | 0 | 0 | 0 | 0 | 561 | 225 | 69 | 786 | 262 | 3 | 155 | 65 | 420 | 134 | 2244 | 2378 |
| 05:00 PM | 106 | 169 | 0 | 0 | 275 | 0 | 0 | 0 | 0 | 0 | 0 | 139 | 57 | 15 | 196 | 62 | 1 | 49 | 32 | 112 | 47 | 583 | 630 |
| 05:15 PM | 87 | 185 | 0 | 0 | 272 | 0 | 0 | 0 | 0 | 0 | 0 | 125 | 51 | 16 | 176 | 56 | 1 | 37 | 14 | 94 | 30 | 542 | 572 |
| 05:30 PM | 87 | 150 | 0 | 0 | 237 | 0 | 0 | 0 | 0 | 0 | 0 | 112 | 50 | 17 | 162 | 66 | 0 | 59 | 34 | 125 | 51 | 524 | 575 |
| 05:45 PM | 82 | 170 | 0 | 0 | 252 | 0 | 0 | 0 | 0 | 0 | 0 | 149 | 53 | 9 | 202 | 61 | 0 | 64 | 27 | 125 | 36 | 579 | 615 |
| Total | 362 | 674 | 0 | 0 | 1036 | 0 | 0 | 0 | 0 | 0 | 0 | 525 | 211 | 57 | 736 | 245 | 2 | 209 | 107 | 456 | 164 | 2228 | 2392 |
| Grand Total | 747 | 1327 | 0 | 0 | 2074 | 0 | 0 | 0 | 0 | 0 | 0 | 1086 | 436 | 126 | 1522 | 507 | 5 | 364 | 172 | 876 | 298 | 4472 | 4770 |
| Apprch % | 36 | 64 | 0 | | | 0 | 0 | 0 | | | 0 | 71.4 | 28.6 | | | 57.9 | 0.6 | 41.6 | | | | | |
| Total % | 16.7 | 29.7 | 0 | | 46.4 | 0 | 0 | 0 | | 0 | 0 | 24.3 | 9.7 | | 34 | 11.3 | 0.1 | 8.1 | | 19.6 | 6.2 | 93.8 | |
| Passenger Vehicles | 700 | 1286 | 0 | | 1986 | 0 | 0 | 0 | | 0 | 0 | 1051 | 416 | | 1587 | 465 | 3 | 352 | | 985 | 0 | 0 | 4558 |
| % Passenger Vehicles | 93.7 | 96.9 | 0 | 0 | 95.8 | 0 | 0 | 0 | 0 | 0 | 0 | 96.8 | 95.4 | 95.2 | 96.3 | 91.7 | 60 | 96.7 | 95.9 | 94 | 0 | 0 | 95.6 |
| Large 2 Axle Vehicles | 15 | 28 | 0 | | 43 | 0 | 0 | 0 | | 0 | 0 | 29 | 11 | | 42 | 9 | 2 | 10 | | 27 | 0 | 0 | 112 |
| % Large 2 Axle Vehicles | 2 | 2.1 | 0 | 0 | 2.1 | 0 | 0 | 0 | 0 | 0 | 0 | 2.7 | 2.5 | 1.6 | 2.5 | 1.8 | 40 | 2.7 | 3.5 | 2.6 | 0 | 0 | 2.3 |
| 3 Axle Vehicles | 8 | 8 | 0 | | 16 | 0 | 0 | 0 | | 0 | 0 | 2 | 6 | | 10 | 6 | 0 | 0 | | 6 | 0 | 0 | 32 |
| % 3 Axle Vehicles | 1.1 | 0.6 | 0 | 0 | 0.8 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | 1.4 | 1.6 | 0.6 | 1.2 | 0 | 0 | 0 | 0.6 | 0 | 0 | 0.7 |
| 4+ Axle Trucks | 24 | 5 | 0 | | 29 | 0 | 0 | 0 | | 0 | 0 | 4 | 3 | | 9 | 27 | 0 | 2 | | 30 | 0 | 0 | 68 |
| % 4+ Axle Trucks | 3.2 | 0.4 | 0 | 0 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4 | 0.7 | 1.6 | 0.5 | 5.3 | 0 | 0.5 | 0.6 | 2.9 | 0 | 0 | 1.4 |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 86 | 167 | 0 | 253 | 0 | 0 | 0 | 0 | 0 | 147 | **59** | **206** | 56 | 0 | 35 | 91 | 550 |
| 04:30 PM | **109** | 149 | 0 | 258 | 0 | 0 | 0 | 0 | 0 | 131 | 58 | 189 | **73** | 0 | 38 | 111 | 558 |
| 04:45 PM | 97 | **176** | 0 | 273 | 0 | 0 | 0 | 0 | 0 | **153** | 46 | 199 | 70 | **2** | 43 | **115** | **587** |
| 05:00 PM | 106 | 169 | 0 | **275** | 0 | 0 | 0 | 0 | 0 | 139 | 57 | 196 | 62 | 1 | **49** | 112 | 583 |
| Total Volume | 398 | 661 | 0 | 1059 | 0 | 0 | 0 | 0 | 0 | 570 | 220 | 790 | 261 | 3 | 165 | 429 | 2278 |
| % App. Total | 37.6 | 62.4 | 0 | | 0 | 0 | 0 | | 0 | 72.2 | 27.8 | | 60.8 | 0.7 | 38.5 | | |
| PHF | .913 | .939 | .000 | .963 | .000 | .000 | .000 | .000 | .000 | .931 | .932 | .959 | .894 | .375 | .842 | .933 | .970 |

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File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

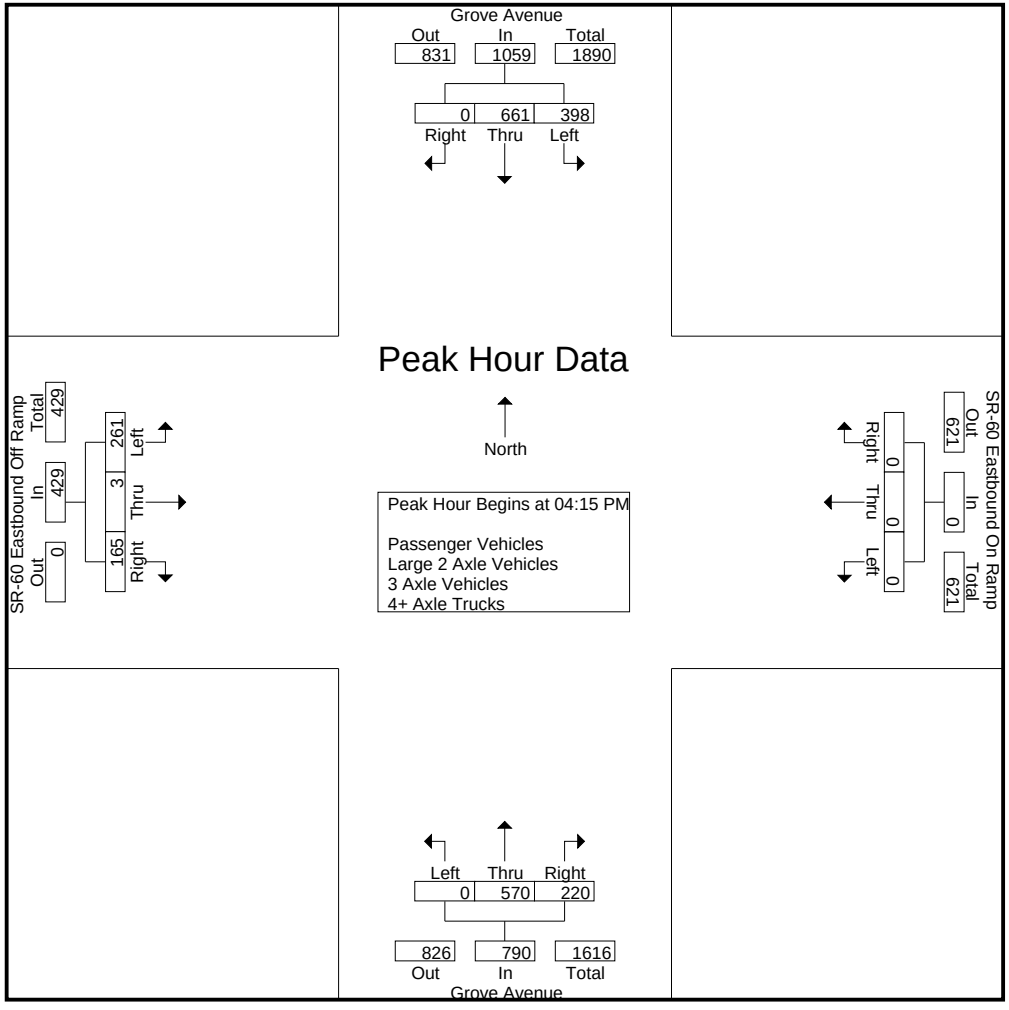

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:00 PM | | | | 04:15 PM | | | | 05:00 PM | | | | |
| +0 mins. | **109** | 149 | 0 | 258 | 0 | 0 | 0 | 0 | 0 | 147 | **59** | **206** | 62 | **1** | 49 | 112 | |
| +15 mins. | 97 | 176 | 0 | 273 | 0 | 0 | 0 | 0 | 0 | 131 | 58 | 189 | 56 | 1 | 37 | 94 | |
| +30 mins. | 106 | 169 | 0 | **275** | 0 | 0 | 0 | 0 | 0 | **153** | 46 | 199 | **66** | 0 | 59 | **125** | |
| +45 mins. | 87 | **185** | 0 | 272 | 0 | 0 | 0 | 0 | 0 | 139 | 57 | 196 | 61 | 0 | **64** | 125 | |
| Total Volume | 399 | 679 | 0 | 1078 | 0 | 0 | 0 | 0 | 0 | 570 | 220 | 790 | 245 | 2 | 209 | 456 | |
| % App. Total | 37 | 63 | 0 | | 0 | 0 | 0 | | 0 | 72.2 | 27.8 | | 53.7 | 0.4 | 45.8 | | |
| PHF | .915 | .918 | .000 | .980 | .000 | .000 | .000 | .000 | .000 | .931 | .932 | .959 | .928 | .500 | .816 | .912 | |

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File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 88 | 159 | 0 | 0 | 247 | 0 | 0 | 0 | 0 | 0 | 0 | 128 | 60 | 23 | 188 | 55 | 0 | 39 | 14 | 94 | 37 | 529 | 566 |
| 04:15 PM | 76 | 163 | 0 | 0 | 239 | 0 | 0 | 0 | 0 | 0 | 0 | 141 | 52 | 19 | 193 | 50 | 0 | 34 | 13 | 84 | 32 | 516 | 548 |
| 04:30 PM | 105 | 142 | 0 | 0 | 247 | 0 | 0 | 0 | 0 | 0 | 0 | 126 | 56 | 14 | 182 | 68 | 0 | 36 | 16 | 104 | 30 | 533 | 563 |
| 04:45 PM | 91 | 172 | 0 | 0 | 263 | 0 | 0 | 0 | 0 | 0 | 0 | 148 | 45 | 9 | 193 | 64 | 2 | 41 | 20 | 107 | 29 | 563 | 592 |
| Total | 360 | 636 | 0 | 0 | 996 | 0 | 0 | 0 | 0 | 0 | 0 | 543 | 213 | 65 | 756 | 237 | 2 | 150 | 63 | 389 | 128 | 2141 | 2269 |
| 05:00 PM | 98 | 158 | 0 | 0 | 256 | 0 | 0 | 0 | 0 | 0 | 0 | 136 | 54 | 15 | 190 | 58 | 0 | 48 | 31 | 106 | 46 | 552 | 598 |
| 05:15 PM | 76 | 180 | 0 | 0 | 256 | 0 | 0 | 0 | 0 | 0 | 0 | 120 | 50 | 16 | 170 | 48 | 1 | 34 | 12 | 83 | 28 | 509 | 537 |
| 05:30 PM | 87 | 145 | 0 | 0 | 232 | 0 | 0 | 0 | 0 | 0 | 0 | 109 | 47 | 15 | 156 | 64 | 0 | 57 | 33 | 121 | 48 | 509 | 557 |
| 05:45 PM | 79 | 167 | 0 | 0 | 246 | 0 | 0 | 0 | 0 | 0 | 0 | 143 | 52 | 9 | 195 | 58 | 0 | 63 | 26 | 121 | 35 | 562 | 597 |
| Total | 340 | 650 | 0 | 0 | 990 | 0 | 0 | 0 | 0 | 0 | 0 | 508 | 203 | 55 | 711 | 228 | 1 | 202 | 102 | 431 | 157 | 2132 | 2289 |
| Grand Total | 700 | 1286 | 0 | 0 | 1986 | 0 | 0 | 0 | 0 | 0 | 0 | 1051 | 416 | 120 | 1467 | 465 | 3 | 352 | 165 | 820 | 285 | 4273 | 4558 |
| Apprch % | 35.2 | 64.8 | 0 | | | 0 | 0 | 0 | | | 0 | 71.6 | 28.4 | | | 56.7 | 0.4 | 42.9 | | | | | |
| Total % | 16.4 | 30.1 | 0 | | 46.5 | 0 | 0 | 0 | | 0 | 0 | 24.6 | 9.7 | | 34.3 | 10.9 | 0.1 | 8.2 | | 19.2 | 6.3 | 93.7 | |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 76 | 163 | 0 | 239 | 0 | 0 | 0 | 0 | 0 | 141 | 52 | **193** | 50 | 0 | 34 | 84 | 516 |
| 04:30 PM | **105** | 142 | 0 | 247 | 0 | 0 | 0 | 0 | 0 | 126 | **56** | 182 | **68** | 0 | 36 | 104 | 533 |
| 04:45 PM | 91 | **172** | 0 | **263** | 0 | 0 | 0 | 0 | 0 | **148** | 45 | 193 | 64 | **2** | 41 | **107** | **563** |
| 05:00 PM | 98 | 158 | 0 | 256 | 0 | 0 | 0 | 0 | 0 | 136 | 54 | 190 | 58 | 0 | **48** | 106 | 552 |
| Total Volume | 370 | 635 | 0 | 1005 | 0 | 0 | 0 | 0 | 0 | 551 | 207 | 758 | 240 | 2 | 159 | 401 | 2164 |
| % App. Total | 36.8 | 63.2 | 0 | | 0 | 0 | 0 | | 0 | 72.7 | 27.3 | | 59.9 | 0.5 | 39.7 | | |
| PHF | .881 | .923 | .000 | .955 | .000 | .000 | .000 | .000 | .000 | .931 | .924 | .982 | .882 | .250 | .828 | .937 | .961 |

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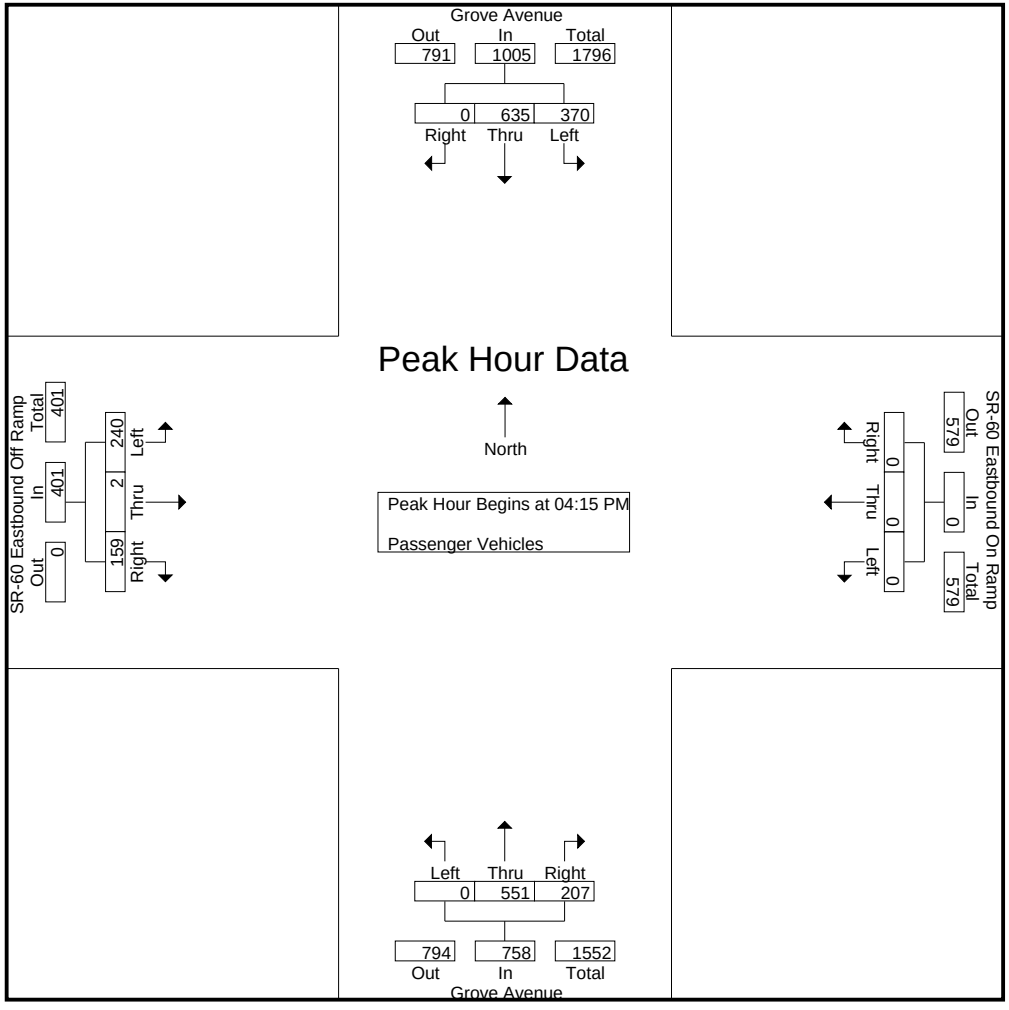

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| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 76 | 163 | 0 | 239 | 0 | 0 | 0 | 0 | 0 | 141 | 52 | **193** | 50 | 0 | 34 | 84 | |
| +15 mins. | **105** | 142 | 0 | 247 | 0 | 0 | 0 | 0 | 0 | 126 | **56** | 182 | **68** | 0 | 36 | 104 | |
| +30 mins. | 91 | **172** | 0 | **263** | 0 | 0 | 0 | 0 | 0 | **148** | 45 | 193 | 64 | **2** | 41 | **107** | |
| +45 mins. | 98 | 158 | 0 | 256 | 0 | 0 | 0 | 0 | 0 | 136 | 54 | 190 | 58 | 0 | **48** | 106 | |
| Total Volume | 370 | 635 | 0 | 1005 | 0 | 0 | 0 | 0 | 0 | 551 | 207 | 758 | 240 | 2 | 159 | 401 | |
| % App. Total | 36.8 | 63.2 | 0 | | 0 | 0 | 0 | | 0 | 72.7 | 27.3 | | 59.9 | 0.5 | 39.7 | | |
| PHF | .881 | .923 | .000 | .955 | .000 | .000 | .000 | .000 | .000 | .931 | .924 | .982 | .882 | .250 | .828 | .937 | |

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File Name : 21_ONT_Grove_60E PMC
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Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 3 | 2 | 1 | 0 | 0 | 3 | 0 | 7 | 7 |
| 04:15 PM | 5 | 2 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 4 | 1 | 10 | 2 | 0 | 1 | 1 | 3 | 2 | 20 | 22 |
| 04:30 PM | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 1 | 5 | 1 | 0 | 1 | 0 | 2 | 1 | 14 | 15 |
| 04:45 PM | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 5 | 1 | 0 | 1 | 0 | 2 | 0 | 13 | 13 |
| Total | 9 | 12 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 8 | 2 | 23 | 6 | 1 | 3 | 1 | 10 | 3 | 54 | 57 |
| 05:00 PM | 1 | 8 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 4 | 0 | 1 | 1 | 1 | 2 | 1 | 15 | 16 |
| 05:15 PM | 5 | 4 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 4 | 2 | 0 | 3 | 2 | 5 | 2 | 18 | 20 |
| 05:30 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 2 | 1 | 2 | 1 | 7 | 8 |
| 05:45 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 1 | 0 | 6 | 1 | 0 | 1 | 1 | 2 | 1 | 10 | 11 |
| Total | 6 | 16 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 3 | 0 | 17 | 3 | 1 | 7 | 5 | 11 | 5 | 50 | 55 |
| Grand Total | 15 | 28 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 11 | 2 | 40 | 9 | 2 | 10 | 6 | 21 | 8 | 104 | 112 |
| Apprch % | 34.9 | 65.1 | 0 | | | 0 | 0 | 0 | | | 0 | 72.5 | 27.5 | | | 42.9 | 9.5 | 47.6 | | | | | |
| Total % | 14.4 | 26.9 | 0 | | 41.3 | 0 | 0 | 0 | | 0 | 0 | 27.9 | 10.6 | | 38.5 | 8.7 | 1.9 | 9.6 | | 20.2 | 7.1 | 92.9 | |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | **5** | 2 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | **6** | **4** | **10** | **2** | 0 | **1** | **3** | **20** |
| 04:30 PM | 2 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 5 | 1 | 0 | 1 | 2 | 14 |
| 04:45 PM | 2 | 4 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 5 | 1 | 0 | 1 | 2 | 13 |
| 05:00 PM | 1 | **8** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 4 | 0 | **1** | 1 | 2 | 15 |
| Total Volume | 10 | 19 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 16 | 8 | 24 | 4 | 1 | 4 | 9 | 62 |
| % App. Total | 34.5 | 65.5 | 0 | | 0 | 0 | 0 | | 0 | 66.7 | 33.3 | | 44.4 | 11.1 | 44.4 | | |
| PHF | .500 | .594 | .000 | .806 | .000 | .000 | .000 | .000 | .000 | .667 | .500 | .600 | .500 | .250 | 1.00 | .750 | .775 |

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PO Box 1178
Corona, CA 92878
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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

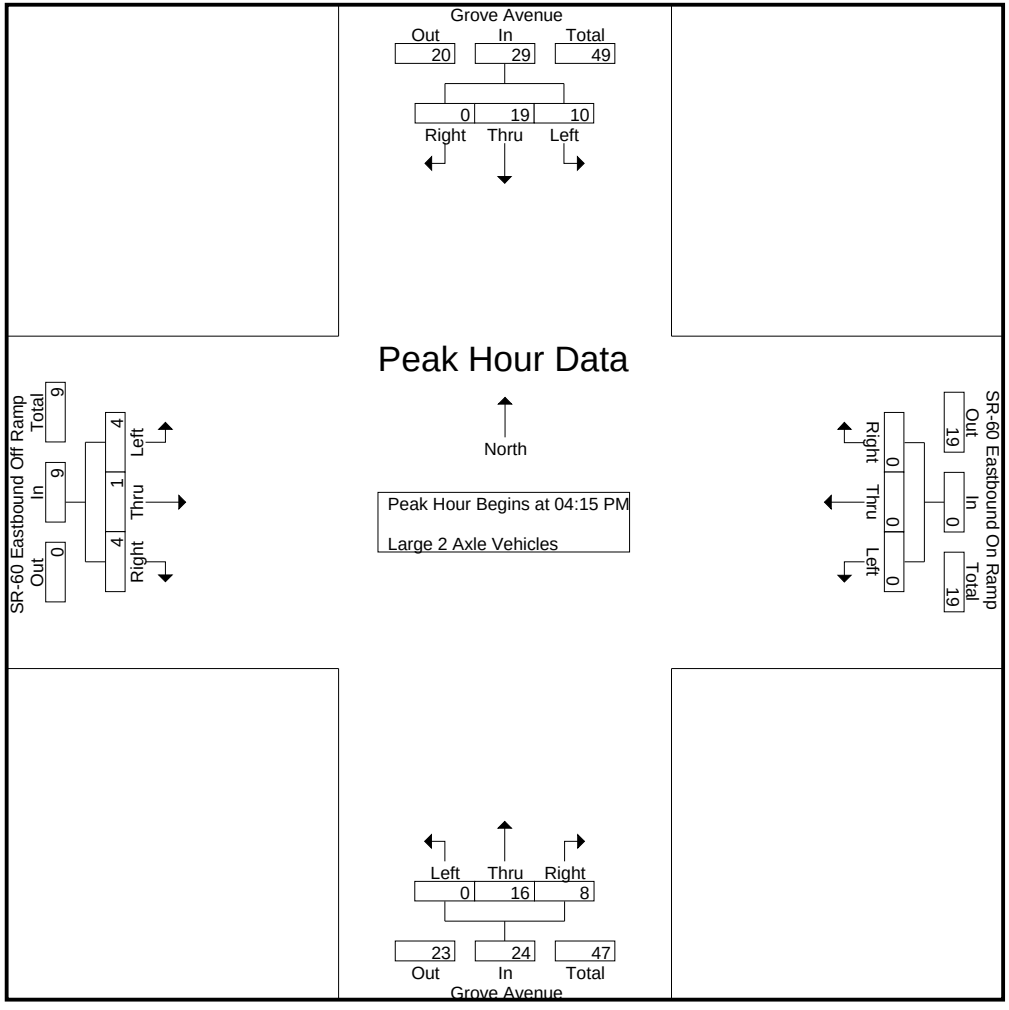

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City of Ontario
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File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | **5** | 2 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | **6** | **4** | **10** | **2** | 0 | **1** | **3** | |
| +15 mins. | 2 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 5 | 1 | 0 | 1 | 2 | |
| +30 mins. | 2 | 4 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 5 | 1 | 0 | 1 | 2 | |
| +45 mins. | 1 | **8** | 0 | **9** | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 4 | 0 | **1** | 1 | 2 | |
| Total Volume | 10 | 19 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 16 | 8 | 24 | 4 | 1 | 4 | 9 | |
| % App. Total | 34.5 | 65.5 | 0 | | 0 | 0 | 0 | | 0 | 66.7 | 33.3 | | 44.4 | 11.1 | 44.4 | | |
| PHF | .500 | .594 | .000 | .806 | .000 | .000 | .000 | .000 | .000 | .667 | .500 | .600 | .500 | .250 | 1.000 | .750 | |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 2 | 2 | 4 | 6 |
| 04:30 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 04:45 PM | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Total | 4 | 2 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 4 | 2 | 0 | 0 | 0 | 2 | 2 | 12 | 14 |
| 05:00 PM | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| 05:15 PM | 3 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 8 | 8 |
| 05:30 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 05:45 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Total | 4 | 6 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 4 | 4 | 0 | 0 | 0 | 4 | 0 | 18 | 18 |
| Grand Total | 8 | 8 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 2 | 8 | 6 | 0 | 0 | 0 | 6 | 2 | 30 | 32 |
| Apprch % | 50 | 50 | 0 | | | 0 | 0 | 0 | | | 0 | 25 | 75 | | | 100 | 0 | 0 | | | | | |
| Total % | 26.7 | 26.7 | 0 | | 53.3 | 0 | 0 | 0 | | 0 | 0 | 6.7 | 20 | | 26.7 | 20 | 0 | 0 | | 20 | 6.2 | 93.8 | |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** | **2** | **2** | 0 | 0 | **2** | 4 |
| 04:30 PM | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 04:45 PM | **2** | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:00 PM | 1 | **2** | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | **5** |
| Total Volume | 3 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 5 | 2 | 0 | 0 | 2 | 13 |
| % App. Total | 50 | 50 | 0 | | 0 | 0 | 0 | | 0 | 20 | 80 | | 100 | 0 | 0 | | |
| PHF | .375 | .375 | .000 | .500 | .000 | .000 | .000 | .000 | .000 | .250 | .500 | .625 | .250 | .000 | .000 | .250 | .650 |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

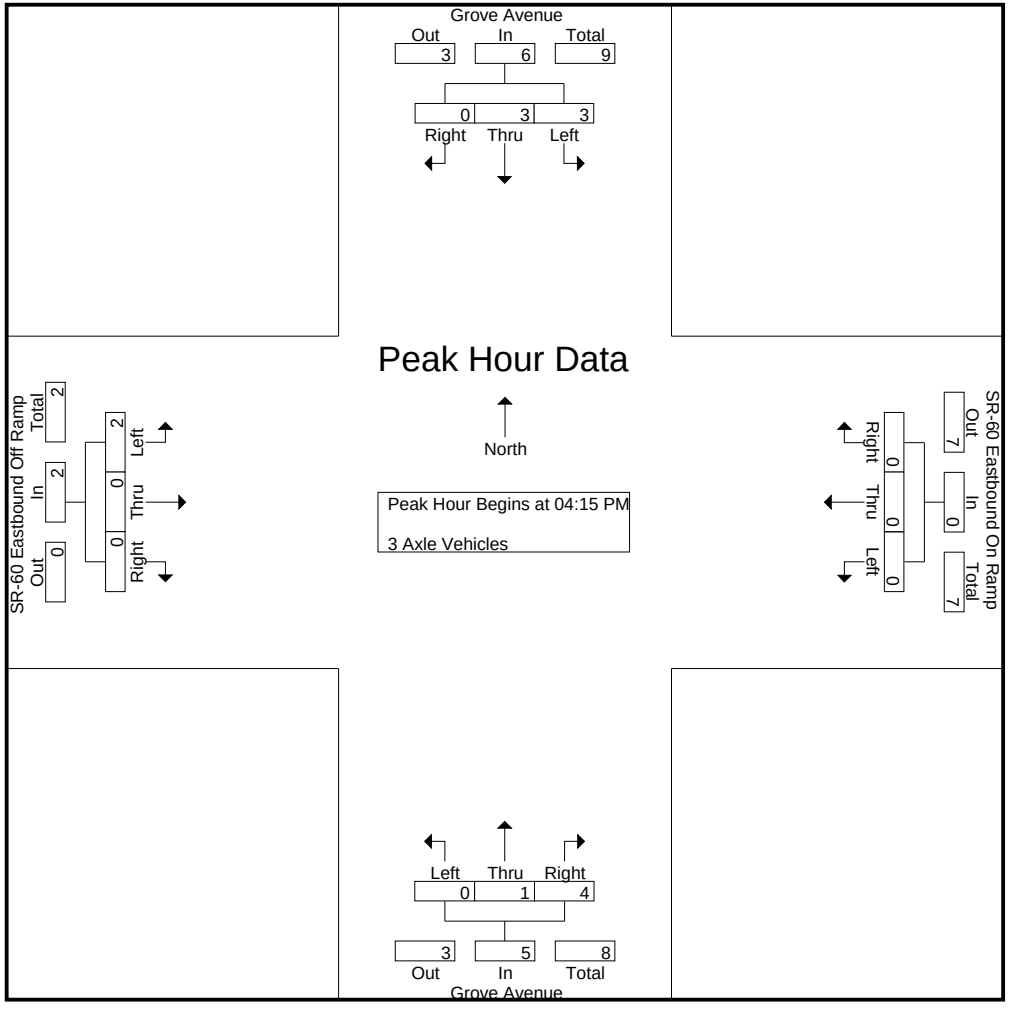

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File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **2** | **2** | **2** | 0 | 0 | **2** | |
| +15 mins. | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | 1 | 0 | 0 | 0 | 0 | |
| +30 mins. | **2** | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +45 mins. | 1 | **2** | 0 | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | |
| Total Volume | 3 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 5 | 2 | 0 | 0 | 2 | |
| % App. Total | 50 | 50 | 0 | | 0 | 0 | 0 | | 0 | 20 | 80 | | 100 | 0 | 0 | | |
| PHF | .375 | .375 | .000 | .500 | .000 | .000 | .000 | .000 | .000 | .250 | .500 | .625 | .250 | .000 | .000 | .250 | |

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Grove Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 6 | 0 | 9 | 9 |
| 04:15 PM | 5 | 2 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 10 | 10 |
| 04:30 PM | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 4 | 0 | 1 | 1 | 5 | 1 | 9 | 10 |
| 04:45 PM | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 5 | 0 | 1 | 0 | 6 | 0 | 9 | 9 |
| Total | 12 | 3 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 3 | 17 | 0 | 2 | 1 | 19 | 1 | 37 | 38 |
| 05:00 PM | 6 | 1 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 11 | 11 |
| 05:15 PM | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 2 | 0 | 7 | 7 |
| 05:30 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 2 | 2 | 5 | 7 |
| 05:45 PM | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 2 | 0 | 5 | 5 |
| Total | 12 | 2 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 4 | 10 | 0 | 0 | 0 | 10 | 2 | 28 | 30 |
| Grand Total | 24 | 5 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 2 | 7 | 27 | 0 | 2 | 1 | 29 | 3 | 65 | 68 |
| Apprch % | 82.8 | 17.2 | 0 | | | 0 | 0 | 0 | | | 0 | 57.1 | 42.9 | | | 93.1 | 0 | 6.9 | | | | | |
| Total % | 36.9 | 7.7 | 0 | | 44.6 | 0 | 0 | 0 | | 0 | 0 | 6.2 | 4.6 | | 10.8 | 41.5 | 0 | 3.1 | | 44.6 | 4.4 | 95.6 | |

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 5 | **2** | 0 | **7** | 0 | 0 | 0 | 0 | 0 | 0 | **1** | **1** | 2 | 0 | 0 | 2 | 10 |
| 04:30 PM | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | 1 | 4 | 0 | **1** | 5 | 9 |
| 04:45 PM | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **5** | 0 | 1 | **6** | 9 |
| 05:00 PM | **6** | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | **11** |
| Total Volume | 15 | 4 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 15 | 0 | 2 | 17 | 39 |
| % App. Total | 78.9 | 21.1 | 0 | | 0 | 0 | 0 | | 0 | 66.7 | 33.3 | | 88.2 | 0 | 11.8 | | |
| PHF | .625 | .500 | .000 | .679 | .000 | .000 | .000 | .000 | .000 | .500 | .250 | .750 | .750 | .000 | .500 | .708 | .886 |

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(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

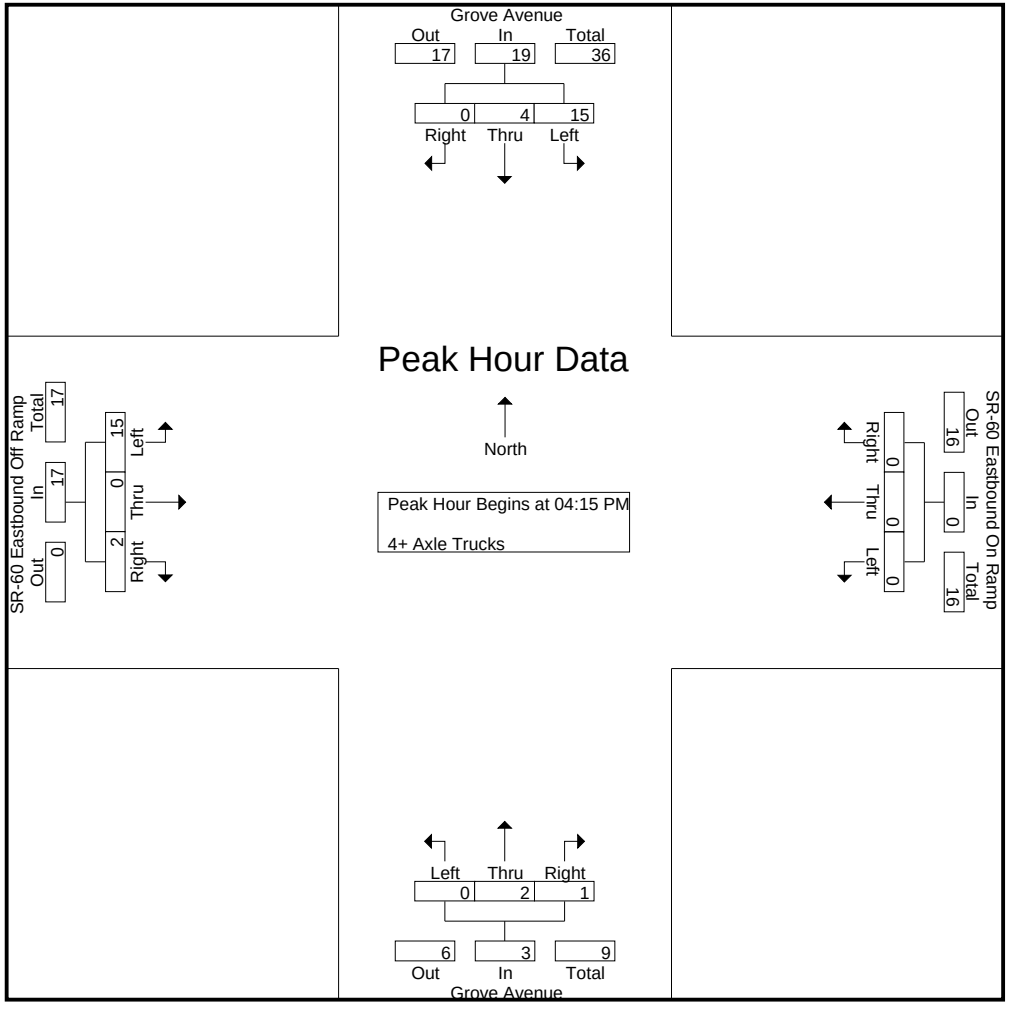

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City of Ontario
N/S: Grove Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 21_ONT_Grove_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Grove Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:15 PM to 05:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | 04:15 PM | | | | |
| +0 mins. | 5 | **2** | 0 | **7** | 0 | 0 | 0 | 0 | 0 | 0 | **1** | **1** | 2 | 0 | 0 | 2 | |
| +15 mins. | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | 1 | 4 | 0 | **1** | 5 | |
| +30 mins. | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | **5** | 0 | 1 | **6** | |
| +45 mins. | **6** | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | |
| Total Volume | 15 | 4 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 3 | 15 | 0 | 2 | 17 | |
| % App. Total | 78.9 | 21.1 | 0 | | 0 | 0 | 0 | | 0 | 66.7 | 33.3 | | 88.2 | 0 | 11.8 | | |
| PHF | .625 | .500 | .000 | .679 | .000 | .000 | .000 | .000 | .000 | .500 | .250 | .750 | .750 | .000 | .500 | .708 | |

Location: Ontario
N/S: Grove Avenue
E/W: SR-60 EB Ramps

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Grove Avenue | East Leg SR-60 EB Ramps | South Leg Grove Avenue | West Leg SR-60 EB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 1 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 1 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 1 | 0 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 2 | 2 |
| 8:30 AM | 0 | 0 | 0 | 2 | 2 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 5 | 7 |

| | North Leg Grove Avenue | East Leg SR-60 EB Ramps | South Leg Grove Avenue | West Leg SR-60 EB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 2 | 0 | 0 | 2 |
| 4:15 PM | 0 | 0 | 0 | 1 | 1 |
| 4:30 PM | 0 | 1 | 1 | 3 | 5 |
| 4:45 PM | 0 | 2 | 0 | 1 | 3 |
| 5:00 PM | 0 | 1 | 0 | 1 | 2 |
| 5:15 PM | 0 | 1 | 2 | 1 | 4 |
| 5:30 PM | 0 | 2 | 0 | 2 | 4 |
| 5:45 PM | 0 | 0 | 0 | 2 | 2 |
| TOTAL VOLUMES: | 0 | 9 | 3 | 11 | 23 |

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951-268-6268

Location: Ontario
N/S: Grove Avenue
E/W: SR-60 EB Ramps

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Grove Avenue | | | Westbound SR-60 EB Ramps | | | Northbound Grove Avenue | | | Eastbound SR-60 EB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 5 |

| | Southbound Grove Avenue | | | Westbound SR-60 EB Ramps | | | Northbound Grove Avenue | | | Eastbound SR-60 EB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

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951-268-6268

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PO Box 1178
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City of Ontario
N/S: Grove Avenue
E/W: Walnut Street
Weather: Clear

File Name : 22_ONT_Grove_Wal AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Walnut Street Westbound | | | | | Grove Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 6 | 89 | 12 | 7 | 107 | 1 | 20 | 40 | 22 | 61 | 3 | 99 | 5 | 3 | 107 | 38 | 19 | 5 | 2 | 62 | 34 | 337 | 371 |
| 07:15 AM | 11 | 104 | 13 | 3 | 128 | 4 | 38 | 46 | 19 | 88 | 8 | 131 | 2 | 1 | 141 | 44 | 20 | 12 | 0 | 76 | 23 | 433 | 456 |
| 07:30 AM | 29 | 78 | 22 | 13 | 129 | 7 | 65 | 65 | 15 | 137 | 14 | 119 | 4 | 2 | 137 | 61 | 47 | 9 | 0 | 117 | 30 | 520 | 550 |
| 07:45 AM | 13 | 110 | 19 | 10 | 142 | 5 | 64 | 48 | 10 | 117 | 13 | 143 | 12 | 2 | 168 | 69 | 59 | 14 | 1 | 142 | 23 | 569 | 592 |
| Total | 59 | 381 | 66 | 33 | 506 | 17 | 187 | 199 | 66 | 403 | 38 | 492 | 23 | 8 | 553 | 212 | 145 | 40 | 3 | 397 | 110 | 1859 | 1969 |
| 08:00 AM | 22 | 79 | 13 | 9 | 114 | 2 | 41 | 39 | 8 | 82 | 12 | 135 | 8 | 3 | 155 | 52 | 50 | 13 | 7 | 115 | 27 | 466 | 493 |
| 08:15 AM | 12 | 91 | 19 | 8 | 122 | 0 | 27 | 32 | 17 | 59 | 15 | 124 | 7 | 3 | 146 | 36 | 45 | 9 | 1 | 90 | 29 | 417 | 446 |
| 08:30 AM | 14 | 91 | 20 | 7 | 125 | 1 | 34 | 26 | 12 | 61 | 10 | 109 | 5 | 4 | 124 | 39 | 52 | 10 | 4 | 101 | 27 | 411 | 438 |
| 08:45 AM | 13 | 102 | 16 | 8 | 131 | 0 | 39 | 20 | 7 | 59 | 10 | 89 | 3 | 0 | 102 | 40 | 50 | 7 | 2 | 97 | 17 | 389 | 406 |
| Total | 61 | 363 | 68 | 32 | 492 | 3 | 141 | 117 | 44 | 261 | 47 | 457 | 23 | 10 | 527 | 167 | 197 | 39 | 14 | 403 | 100 | 1683 | 1783 |
| Grand Total | 120 | 744 | 134 | 65 | 998 | 20 | 328 | 316 | 110 | 664 | 85 | 949 | 46 | 18 | 1080 | 379 | 342 | 79 | 17 | 800 | 210 | 3542 | 3752 |
| Apprch % | 12 | 74.5 | 13.4 | | | 3 | 49.4 | 47.6 | | | 7.9 | 87.9 | 4.3 | | | 47.4 | 42.8 | 9.9 | | | | | |
| Total % | 3.4 | 21 | 3.8 | | 28.2 | 0.6 | 9.3 | 8.9 | | 18.7 | 2.4 | 26.8 | 1.3 | | 30.5 | 10.7 | 9.7 | 2.2 | | 22.6 | 5.6 | 94.4 | |

| | Grove Avenue Southbound | | | | Walnut Street Westbound | | | | Grove Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 11 | 104 | 13 | 128 | 4 | 38 | 46 | 88 | 8 | 131 | 2 | 141 | 44 | 20 | 12 | 76 | 433 |
| 07:30 AM | **29** | 78 | **22** | 129 | **7** | **65** | **65** | **137** | **14** | 119 | 4 | 137 | 61 | 47 | 9 | 117 | 520 |
| 07:45 AM | 13 | **110** | 19 | **142** | 5 | 64 | 48 | 117 | 13 | **143** | **12** | **168** | **69** | **59** | **14** | **142** | **569** |
| 08:00 AM | 22 | 79 | 13 | 114 | 2 | 41 | 39 | 82 | 12 | 135 | 8 | 155 | 52 | 50 | 13 | 115 | 466 |
| Total Volume | 75 | 371 | 67 | 513 | 18 | 208 | 198 | 424 | 47 | 528 | 26 | 601 | 226 | 176 | 48 | 450 | 1988 |
| % App. Total | 14.6 | 72.3 | 13.1 | | 4.2 | 49.1 | 46.7 | | 7.8 | 87.9 | 4.3 | | 50.2 | 39.1 | 10.7 | | |
| PHF | .647 | .843 | .761 | .903 | .643 | .800 | .762 | .774 | .839 | .923 | .542 | .894 | .819 | .746 | .857 | .792 | .873 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: Walnut Street
Weather: Clear

File Name : 22_ONT_Grove_Wal AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

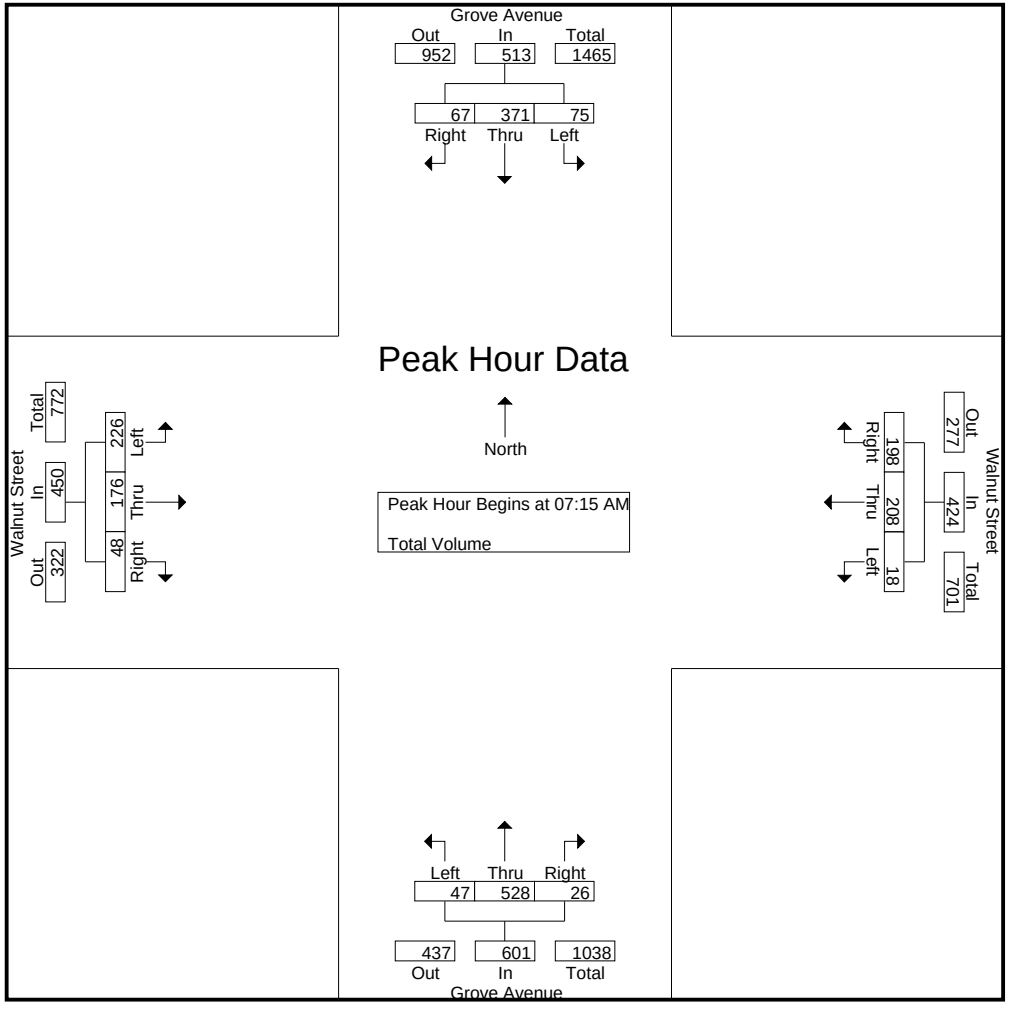

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: Walnut Street
Weather: Clear

File Name : 22_ONT_Grove_Wal AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Walnut Street Westbound | | | | Grove Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 11 | 104 | 13 | 128 | 4 | 38 | 46 | 88 | 14 | 119 | 4 | 137 | 61 | 47 | 9 | 117 | |
| +15 mins. | **29** | 78 | **22** | 129 | **7** | **65** | **65** | **137** | 13 | **143** | **12** | **168** | **69** | **59** | **14** | **142** | |
| +30 mins. | 13 | **110** | 19 | **142** | 5 | 64 | 48 | 117 | 12 | 135 | 8 | 155 | 52 | 50 | 13 | 115 | |
| +45 mins. | 22 | 79 | 13 | 114 | 2 | 41 | 39 | 82 | **15** | 124 | 7 | 146 | 36 | 45 | 9 | 90 | |
| Total Volume | 75 | 371 | 67 | 513 | 18 | 208 | 198 | 424 | 54 | 521 | 31 | 606 | 218 | 201 | 45 | 464 | |
| % App. Total | 14.6 | 72.3 | 13.1 | | 4.2 | 49.1 | 46.7 | | 8.9 | 86 | 5.1 | | 47 | 43.3 | 9.7 | | |
| PHF | .647 | .843 | .761 | .903 | .643 | .800 | .762 | .774 | .900 | .911 | .646 | .902 | .790 | .852 | .804 | .817 | |

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City of Ontario
N/S: Grove Avenue
E/W: Walnut Street
Weather: Clear

File Name : 22_ONT_Grove_Wal PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Walnut Street Westbound | | | | | Grove Avenue Northbound | | | | | Walnut Street Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 34 | 88 | 33 | 18 | 155 | 2 | 22 | 29 | 18 | 53 | 8 | 109 | 5 | 2 | 122 | 40 | 54 | 20 | 2 | 114 | 40 | 444 | 484 |
| 04:15 PM | 35 | 111 | 40 | 18 | 186 | 2 | 23 | 26 | 11 | 51 | 8 | 121 | 5 | 4 | 134 | 29 | 61 | 23 | 2 | 113 | 35 | 484 | 519 |
| 04:30 PM | 27 | 97 | 29 | 13 | 153 | 5 | 30 | 24 | 7 | 59 | 17 | 113 | 10 | 4 | 140 | 30 | 58 | 28 | 6 | 116 | 30 | 468 | 498 |
| 04:45 PM | 39 | 117 | 38 | 16 | 194 | 0 | 33 | 30 | 10 | 63 | 22 | 133 | 11 | 3 | 166 | 32 | 70 | 21 | 4 | 123 | 33 | 546 | 579 |
| Total | 135 | 413 | 140 | 65 | 688 | 9 | 108 | 109 | 46 | 226 | 55 | 476 | 31 | 13 | 562 | 131 | 243 | 92 | 14 | 466 | 138 | 1942 | 2080 |
| 05:00 PM | 34 | 113 | 43 | 26 | 190 | 3 | 37 | 23 | 8 | 63 | 12 | 107 | 9 | 5 | 128 | 34 | 42 | 22 | 6 | 98 | 45 | 479 | 524 |
| 05:15 PM | 39 | 139 | 31 | 8 | 209 | 9 | 32 | 20 | 12 | 61 | 18 | 103 | 10 | 5 | 131 | 31 | 43 | 15 | 7 | 89 | 32 | 490 | 522 |
| 05:30 PM | 37 | 119 | 40 | 21 | 196 | 4 | 22 | 22 | 11 | 48 | 19 | 109 | 13 | 5 | 141 | 29 | 57 | 22 | 6 | 108 | 43 | 493 | 536 |
| 05:45 PM | 27 | 136 | 42 | 22 | 205 | 6 | 27 | 29 | 13 | 62 | 9 | 118 | 2 | 2 | 129 | 33 | 44 | 20 | 2 | 97 | 39 | 493 | 532 |
| Total | 137 | 507 | 156 | 77 | 800 | 22 | 118 | 94 | 44 | 234 | 58 | 437 | 34 | 17 | 529 | 127 | 186 | 79 | 21 | 392 | 159 | 1955 | 2114 |
| Grand Total | 272 | 920 | 296 | 142 | 1488 | 31 | 226 | 203 | 90 | 460 | 113 | 913 | 65 | 30 | 1091 | 258 | 429 | 171 | 35 | 858 | 297 | 3897 | 4194 |
| Apprch % | 18.3 | 61.8 | 19.9 | | | 6.7 | 49.1 | 44.1 | | | 10.4 | 83.7 | 6 | | | 30.1 | 50 | 19.9 | | | | | |
| Total % | 7 | 23.6 | 7.6 | | 38.2 | 0.8 | 5.8 | 5.2 | | 11.8 | 2.9 | 23.4 | 1.7 | | 28 | 6.6 | 11 | 4.4 | | 22 | 7.1 | 92.9 | |

| | Grove Avenue Southbound | | | | Walnut Street Westbound | | | | Grove Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | **39** | 117 | 38 | 194 | 0 | 33 | **30** | **63** | **22** | **133** | 11 | **166** | 32 | **70** | 21 | **123** | **546** |
| 05:00 PM | 34 | 113 | **43** | 190 | 3 | **37** | 23 | 63 | 12 | 107 | 9 | 128 | **34** | 42 | **22** | 98 | 479 |
| 05:15 PM | 39 | **139** | 31 | **209** | **9** | 32 | 20 | 61 | 18 | 103 | 10 | 131 | 31 | 43 | 15 | 89 | 490 |
| 05:30 PM | 37 | 119 | 40 | 196 | 4 | 22 | 22 | 48 | 19 | 109 | **13** | 141 | 29 | 57 | 22 | 108 | 493 |
| Total Volume | 149 | 488 | 152 | 789 | 16 | 124 | 95 | 235 | 71 | 452 | 43 | 566 | 126 | 212 | 80 | 418 | 2008 |
| % App. Total | 18.9 | 61.9 | 19.3 | | 6.8 | 52.8 | 40.4 | | 12.5 | 79.9 | 7.6 | | 30.1 | 50.7 | 19.1 | | |
| PHF | .955 | .878 | .884 | .944 | .444 | .838 | .792 | .933 | .807 | .850 | .827 | .852 | .926 | .757 | .909 | .850 | .919 |

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City of Ontario
N/S: Grove Avenue
E/W: Walnut Street
Weather: Clear

File Name : 22_ONT_Grove_Wal PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

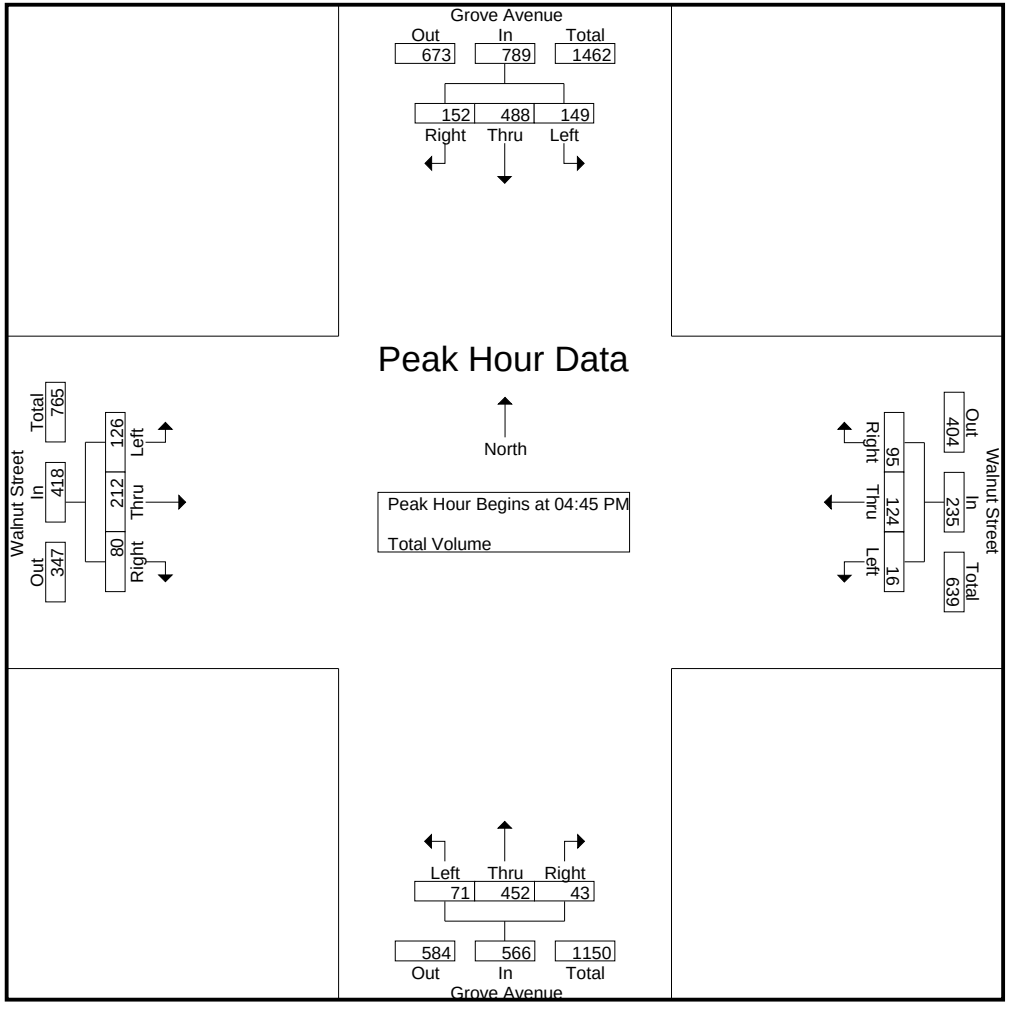

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City of Ontario
N/S: Grove Avenue
E/W: Walnut Street
Weather: Clear

File Name : 22_ONT_Grove_Wal PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Walnut Street Westbound | | | | Grove Avenue Northbound | | | | Walnut Street Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:30 PM | | | | 04:15 PM | | | | 04:00 PM | | | | |
| +0 mins. | 34 | 113 | **43** | 190 | 5 | 30 | 24 | 59 | 8 | 121 | 5 | 134 | **40** | 54 | 20 | 114 | |
| +15 mins. | **39** | **139** | 31 | **209** | 0 | 33 | **30** | **63** | 17 | 113 | 10 | 140 | 29 | 61 | 23 | 113 | |
| +30 mins. | 37 | 119 | 40 | 196 | 3 | **37** | 23 | 63 | **22** | **133** | **11** | **166** | 30 | 58 | **28** | 116 | |
| +45 mins. | 27 | 136 | 42 | 205 | **9** | 32 | 20 | 61 | 12 | 107 | 9 | 128 | 32 | **70** | 21 | **123** | |
| Total Volume | 137 | 507 | 156 | 800 | 17 | 132 | 97 | 246 | 59 | 474 | 35 | 568 | 131 | 243 | 92 | 466 | |
| % App. Total | 17.1 | 63.4 | 19.5 | | 6.9 | 53.7 | 39.4 | | 10.4 | 83.5 | 6.2 | | 28.1 | 52.1 | 19.7 | | |
| PHF | .878 | .912 | .907 | .957 | .472 | .892 | .808 | .976 | .670 | .891 | .795 | .855 | .819 | .868 | .821 | .947 | |

Location: Ontario
N/S: Grove Avenue
E/W: Walnut Street

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Grove Avenue | East Leg Walnut Street | South Leg Grove Avenue | West Leg Walnut Street | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 2 | 0 | 0 | 1 | 3 |
| 7:45 AM | 1 | 0 | 2 | 0 | 3 |
| 8:00 AM | 0 | 0 | 1 | 0 | 1 |
| 8:15 AM | 1 | 1 | 2 | 0 | 4 |
| 8:30 AM | 0 | 0 | 2 | 0 | 2 |
| 8:45 AM | 0 | 0 | 1 | 0 | 1 |
| TOTAL VOLUMES: | 4 | 1 | 8 | 1 | 14 |

| | North Leg Grove Avenue | East Leg Walnut Street | South Leg Grove Avenue | West Leg Walnut Street | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 2 | 1 | 3 |
| 4:15 PM | 0 | 0 | 1 | 0 | 1 |
| 4:30 PM | 1 | 1 | 1 | 0 | 3 |
| 4:45 PM | 4 | 2 | 2 | 0 | 8 |
| 5:00 PM | 1 | 0 | 1 | 1 | 3 |
| 5:15 PM | 5 | 2 | 3 | 0 | 10 |
| 5:30 PM | 0 | 0 | 2 | 0 | 2 |
| 5:45 PM | 1 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 12 | 5 | 12 | 2 | 31 |

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951-268-6268

Location: Ontario
N/S: Grove Avenue
E/W: Walnut Street

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Grove Avenue | | | Westbound Walnut Street | | | Northbound Grove Avenue | | | Eastbound Walnut Street | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 |
| 7:15 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 5 |

| | Southbound Grove Avenue | | | Westbound Walnut Street | | | Northbound Grove Avenue | | | Eastbound Walnut Street | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

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City of Ontario
N/S: Grove Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 23_ONT_Grove_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Grove Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 15 | 61 | 27 | 14 | 103 | 0 | 108 | 16 | 7 | 124 | 6 | 43 | 0 | 0 | 49 | 28 | 46 | 7 | 0 | 81 | 21 | 357 | 378 |
| 07:15 AM | 14 | 64 | 32 | 21 | 110 | 2 | 132 | 20 | 10 | 154 | 8 | 80 | 5 | 1 | 93 | 26 | 54 | 4 | 1 | 84 | 33 | 441 | 474 |
| 07:30 AM | 14 | 52 | 35 | 17 | 101 | 1 | 188 | 24 | 14 | 213 | 14 | 72 | 3 | 0 | 89 | 18 | 83 | 5 | 0 | 106 | 31 | 509 | 540 |
| 07:45 AM | 26 | 73 | 34 | 13 | 133 | 2 | 166 | 27 | 14 | 195 | 8 | 81 | 12 | 4 | 101 | 37 | 87 | 10 | 0 | 134 | 31 | 563 | 594 |
| Total | 69 | 250 | 128 | 65 | 447 | 5 | 594 | 87 | 45 | 686 | 36 | 276 | 20 | 5 | 332 | 109 | 270 | 26 | 1 | 405 | 116 | 1870 | 1986 |
| 08:00 AM | 20 | 50 | 33 | 17 | 103 | 7 | 157 | 33 | 13 | 197 | 7 | 79 | 6 | 1 | 92 | 34 | 102 | 6 | 1 | 142 | 32 | 534 | 566 |
| 08:15 AM | 17 | 36 | 44 | 23 | 97 | 9 | 142 | 25 | 8 | 176 | 11 | 74 | 7 | 1 | 92 | 23 | 74 | 5 | 1 | 102 | 33 | 467 | 500 |
| 08:30 AM | 13 | 51 | 41 | 16 | 105 | 1 | 109 | 22 | 9 | 132 | 5 | 55 | 16 | 5 | 76 | 25 | 77 | 2 | 0 | 104 | 30 | 417 | 447 |
| 08:45 AM | 9 | 44 | 46 | 27 | 99 | 6 | 158 | 15 | 3 | 179 | 4 | 52 | 5 | 1 | 61 | 29 | 84 | 4 | 0 | 117 | 31 | 456 | 487 |
| Total | 59 | 181 | 164 | 83 | 404 | 23 | 566 | 95 | 33 | 684 | 27 | 260 | 34 | 8 | 321 | 111 | 337 | 17 | 2 | 465 | 126 | 1874 | 2000 |
| Grand Total | 128 | 431 | 292 | 148 | 851 | 28 | 1160 | 182 | 78 | 1370 | 63 | 536 | 54 | 13 | 653 | 220 | 607 | 43 | 3 | 870 | 242 | 3744 | 3986 |
| Apprch % | 15 | 50.6 | 34.3 | | | 2 | 84.7 | 13.3 | | | 9.6 | 82.1 | 8.3 | | | 25.3 | 69.8 | 4.9 | | | | | |
| Total % | 3.4 | 11.5 | 7.8 | | 22.7 | 0.7 | 31 | 4.9 | | 36.6 | 1.7 | 14.3 | 1.4 | | 17.4 | 5.9 | 16.2 | 1.1 | | 23.2 | 6.1 | 93.9 | |

| | Grove Avenue Southbound | | | | Riverside Drive Westbound | | | | Grove Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 14 | 52 | 35 | 101 | 1 | **188** | 24 | **213** | **14** | 72 | 3 | 89 | 18 | 83 | 5 | 106 | 509 |
| 07:45 AM | **26** | **73** | 34 | **133** | 2 | 166 | 27 | 195 | 8 | **81** | **12** | **101** | **37** | 87 | **10** | 134 | **563** |
| 08:00 AM | 20 | 50 | 33 | 103 | 7 | 157 | **33** | 197 | 7 | 79 | 6 | 92 | 34 | **102** | 6 | **142** | 534 |
| 08:15 AM | 17 | 36 | **44** | 97 | **9** | 142 | 25 | 176 | 11 | 74 | 7 | 92 | 23 | 74 | 5 | 102 | 467 |
| Total Volume | 77 | 211 | 146 | 434 | 19 | 653 | 109 | 781 | 40 | 306 | 28 | 374 | 112 | 346 | 26 | 484 | 2073 |
| % App. Total | 17.7 | 48.6 | 33.6 | | 2.4 | 83.6 | 14 | | 10.7 | 81.8 | 7.5 | | 23.1 | 71.5 | 5.4 | | |
| PHF | .740 | .723 | .830 | .816 | .528 | .868 | .826 | .917 | .714 | .944 | .583 | .926 | .757 | .848 | .650 | .852 | .921 |

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City of Ontario
N/S: Grove Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 23_ONT_Grove_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

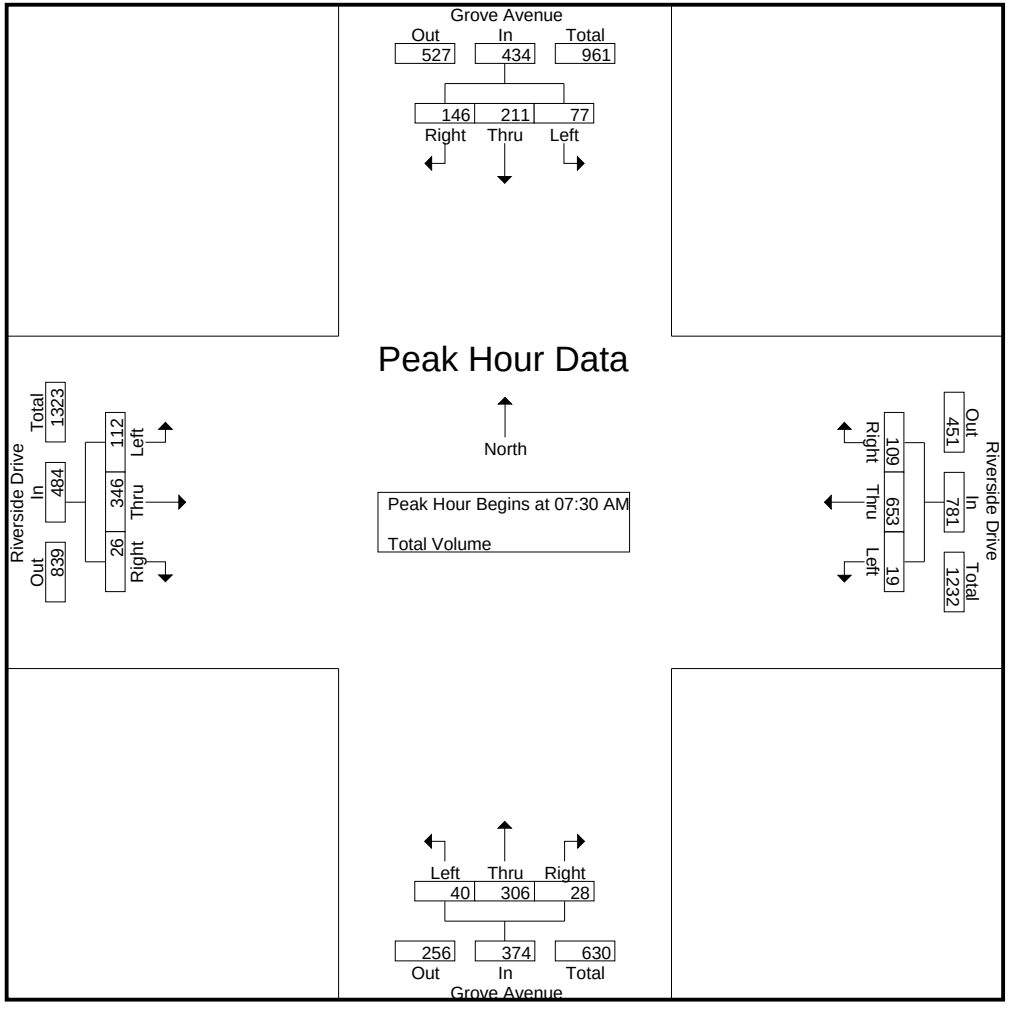

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City of Ontario
N/S: Grove Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 23_ONT_Grove_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Riverside Drive Westbound | | | | Grove Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:30 AM | | | | 07:15 AM | | | | 07:30 AM | | | | |
| +0 mins. | 15 | 61 | 27 | 103 | 1 | **188** | 24 | **213** | 8 | 80 | 5 | 93 | 18 | 83 | 5 | 106 | |
| +15 mins. | 14 | 64 | 32 | 110 | 2 | 166 | 27 | 195 | **14** | 72 | 3 | 89 | **37** | 87 | **10** | 134 | |
| +30 mins. | 14 | 52 | **35** | 101 | 7 | 157 | **33** | 197 | 8 | **81** | **12** | **101** | 34 | **102** | 6 | **142** | |
| +45 mins. | **26** | **73** | 34 | **133** | **9** | 142 | 25 | 176 | 7 | 79 | 6 | 92 | 23 | 74 | 5 | 102 | |
| Total Volume | 69 | 250 | 128 | 447 | 19 | 653 | 109 | 781 | 37 | 312 | 26 | 375 | 112 | 346 | 26 | 484 | |
| % App. Total | 15.4 | 55.9 | 28.6 | | 2.4 | 83.6 | 14 | | 9.9 | 83.2 | 6.9 | | 23.1 | 71.5 | 5.4 | | |
| PHF | .663 | .856 | .914 | .840 | .528 | .868 | .826 | .917 | .661 | .963 | .542 | .928 | .757 | .848 | .650 | .852 | |

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City of Ontario
N/S: Grove Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 23_ONT_Grove_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Grove Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 23 | 47 | 25 | 8 | 95 | 4 | 123 | 35 | 15 | 162 | 4 | 60 | 12 | 5 | 76 | 33 | 120 | 3 | 0 | 156 | 28 | 489 | 517 |
| 04:15 PM | 22 | 50 | 21 | 12 | 93 | 5 | 94 | 39 | 18 | 138 | 6 | 85 | 8 | 2 | 99 | 17 | 117 | 5 | 1 | 139 | 33 | 469 | 502 |
| 04:30 PM | 29 | 55 | 23 | 14 | 107 | 7 | 78 | 29 | 7 | 114 | 9 | 79 | 12 | 4 | 100 | 38 | 124 | 4 | 2 | 166 | 27 | 487 | 514 |
| 04:45 PM | 28 | 63 | 35 | 18 | 126 | 11 | 99 | 32 | 14 | 142 | 5 | 92 | 12 | 3 | 109 | 20 | 115 | 2 | 0 | 137 | 35 | 514 | 549 |
| Total | 102 | 215 | 104 | 52 | 421 | 27 | 394 | 135 | 54 | 556 | 24 | 316 | 44 | 14 | 384 | 108 | 476 | 14 | 3 | 598 | 123 | 1959 | 2082 |
| 05:00 PM | 32 | 54 | 20 | 12 | 106 | 5 | 120 | 24 | 10 | 149 | 9 | 68 | 9 | 5 | 86 | 27 | 124 | 7 | 5 | 158 | 32 | 499 | 531 |
| 05:15 PM | 25 | 65 | 36 | 14 | 126 | 3 | 121 | 30 | 10 | 154 | 5 | 70 | 8 | 2 | 83 | 18 | 134 | 6 | 1 | 158 | 27 | 521 | 548 |
| 05:30 PM | 15 | 75 | 24 | 4 | 114 | 3 | 109 | 29 | 15 | 141 | 5 | 78 | 6 | 2 | 89 | 26 | 112 | 6 | 2 | 144 | 23 | 488 | 511 |
| 05:45 PM | 17 | 82 | 35 | 19 | 134 | 3 | 91 | 32 | 15 | 126 | 5 | 73 | 13 | 5 | 91 | 19 | 122 | 7 | 0 | 148 | 39 | 499 | 538 |
| Total | 89 | 276 | 115 | 49 | 480 | 14 | 441 | 115 | 50 | 570 | 24 | 289 | 36 | 14 | 349 | 90 | 492 | 26 | 8 | 608 | 121 | 2007 | 2128 |
| Grand Total | 191 | 491 | 219 | 101 | 901 | 41 | 835 | 250 | 104 | 1126 | 48 | 605 | 80 | 28 | 733 | 198 | 968 | 40 | 11 | 1206 | 244 | 3966 | 4210 |
| Apprch % | 21.2 | 54.5 | 24.3 | | | 3.6 | 74.2 | 22.2 | | | 6.5 | 82.5 | 10.9 | | | 16.4 | 80.3 | 3.3 | | | | | |
| Total % | 4.8 | 12.4 | 5.5 | | 22.7 | 1 | 21.1 | 6.3 | | 28.4 | 1.2 | 15.3 | 2 | | 18.5 | 5 | 24.4 | 1 | | 30.4 | 5.8 | 94.2 | |

| | Grove Avenue Southbound | | | | Riverside Drive Westbound | | | | Grove Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 28 | 63 | 35 | **126** | **11** | 99 | **32** | 142 | 5 | **92** | **12** | **109** | 20 | 115 | 2 | 137 | 514 |
| 05:00 PM | **32** | 54 | 20 | 106 | 5 | 120 | 24 | 149 | **9** | 68 | 9 | 86 | **27** | 124 | **7** | **158** | 499 |
| 05:15 PM | 25 | 65 | **36** | 126 | 3 | **121** | 30 | **154** | 5 | 70 | 8 | 83 | 18 | **134** | 6 | 158 | **521** |
| 05:30 PM | 15 | **75** | 24 | 114 | 3 | 109 | 29 | 141 | 5 | 78 | 6 | 89 | 26 | 112 | 6 | 144 | 488 |
| Total Volume | 100 | 257 | 115 | 472 | 22 | 449 | 115 | 586 | 24 | 308 | 35 | 367 | 91 | 485 | 21 | 597 | 2022 |
| % App. Total | 21.2 | 54.4 | 24.4 | | 3.8 | 76.6 | 19.6 | | 6.5 | 83.9 | 9.5 | | 15.2 | 81.2 | 3.5 | | |
| PHF | .781 | .857 | .799 | .937 | .500 | .928 | .898 | .951 | .667 | .837 | .729 | .842 | .843 | .905 | .750 | .945 | .970 |

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City of Ontario
N/S: Grove Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 23_ONT_Grove_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

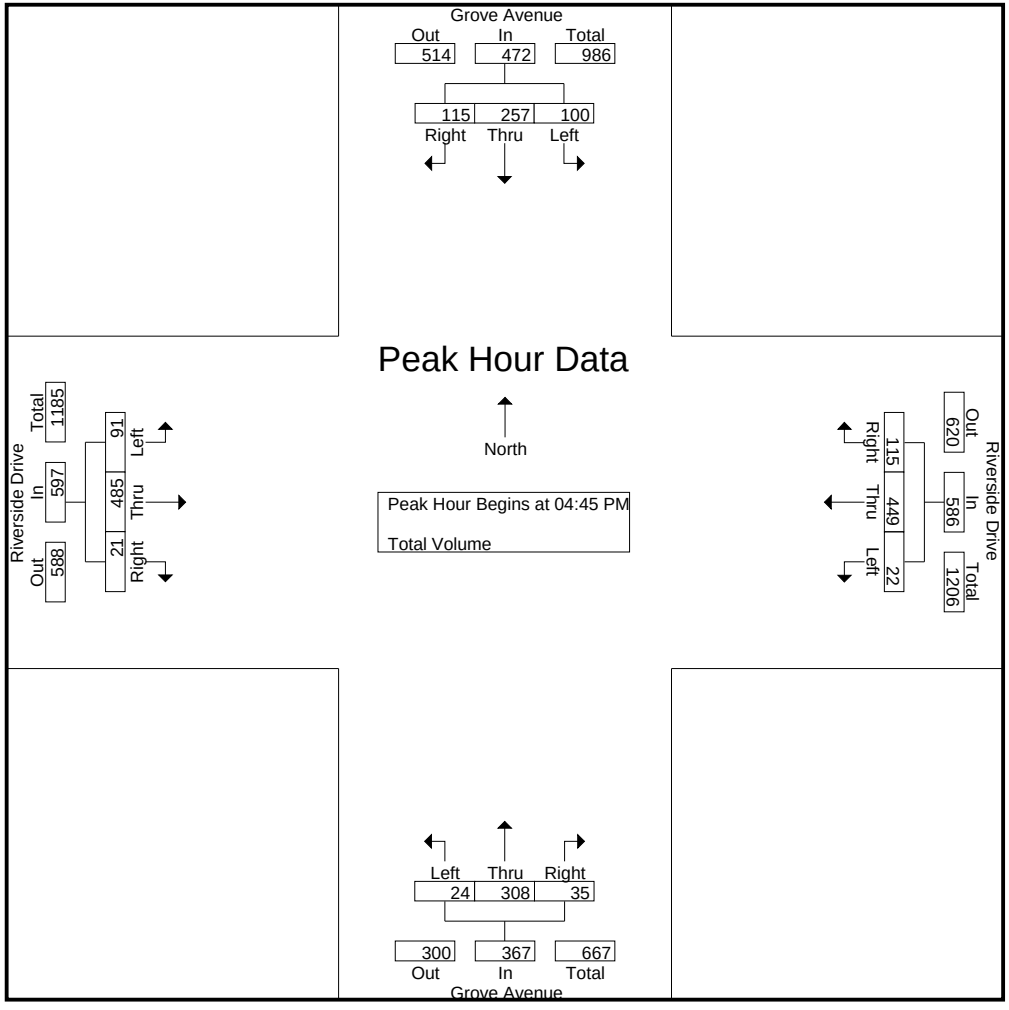

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City of Ontario
N/S: Grove Avenue
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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Riverside Drive Westbound | | | | Grove Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:45 PM | | | | 04:15 PM | | | | 04:30 PM | | | | |
| +0 mins. | **32** | 54 | 20 | 106 | **11** | 99 | **32** | 142 | 6 | 85 | 8 | 99 | **38** | 124 | 4 | **166** | |
| +15 mins. | 25 | 65 | **36** | 126 | 5 | 120 | 24 | 149 | **9** | 79 | **12** | 100 | 20 | 115 | 2 | 137 | |
| +30 mins. | 15 | 75 | 24 | 114 | 3 | **121** | 30 | **154** | 5 | **92** | 12 | **109** | 27 | 124 | **7** | 158 | |
| +45 mins. | 17 | **82** | 35 | **134** | 3 | 109 | 29 | 141 | 9 | 68 | 9 | 86 | 18 | **134** | 6 | 158 | |
| Total Volume | 89 | 276 | 115 | 480 | 22 | 449 | 115 | 586 | 29 | 324 | 41 | 394 | 103 | 497 | 19 | 619 | |
| % App. Total | 18.5 | 57.5 | 24 | | 3.8 | 76.6 | 19.6 | | 7.4 | 82.2 | 10.4 | | 16.6 | 80.3 | 3.1 | | |
| PHF | .695 | .841 | .799 | .896 | .500 | .928 | .898 | .951 | .806 | .880 | .854 | .904 | .678 | .927 | .679 | .932 | |

Location: Ontario
N/S: Grove Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Grove Avenue | East Leg Riverside Drive | South Leg Grove Avenue | West Leg Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 1 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 1 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 2 | 0 | 0 | 0 | 2 |

| | North Leg Grove Avenue | East Leg Riverside Drive | South Leg Grove Avenue | West Leg Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 2 | 0 | 0 | 0 | 2 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 2 | 0 | 0 | 0 | 2 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 4 | 0 | 0 | 0 | 4 |

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Location: Ontario
N/S: Grove Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Grove Avenue | | | Westbound Riverside Drive | | | Northbound Grove Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 7:15 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 7 |

| | Southbound Grove Avenue | | | Westbound Riverside Drive | | | Northbound Grove Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 5 |

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City of Ontario
N/S: Grove Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 24_ONT_Grove_Chi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 4 | 64 | 1 | 0 | 69 | 3 | 44 | 7 | 0 | 54 | 10 | 38 | 1 | 0 | 49 | 10 | 27 | 6 | 0 | 43 | 0 | 215 | 215 |
| 07:15 AM | 5 | 60 | 4 | 0 | 69 | 1 | 54 | 14 | 0 | 69 | 10 | 63 | 0 | 0 | 73 | 20 | 14 | 4 | 0 | 38 | 0 | 249 | 249 |
| 07:30 AM | 8 | 47 | 4 | 0 | 59 | 1 | 65 | 10 | 0 | 76 | 12 | 64 | 2 | 0 | 78 | 13 | 17 | 5 | 0 | 35 | 0 | 248 | 248 |
| 07:45 AM | 12 | 67 | 3 | 0 | 82 | 2 | 70 | 12 | 0 | 84 | 17 | 73 | 3 | 0 | 93 | 14 | 30 | 10 | 0 | 54 | 0 | 313 | 313 |
| Total | 29 | 238 | 12 | 0 | 279 | 7 | 233 | 43 | 0 | 283 | 49 | 238 | 6 | 0 | 293 | 57 | 88 | 25 | 0 | 170 | 0 | 1025 | 1025 |
| 08:00 AM | 7 | 50 | 2 | 0 | 59 | 2 | 58 | 13 | 0 | 73 | 14 | 69 | 3 | 0 | 86 | 15 | 31 | 5 | 0 | 51 | 0 | 269 | 269 |
| 08:15 AM | 6 | 41 | 8 | 0 | 55 | 2 | 45 | 11 | 0 | 58 | 15 | 61 | 2 | 0 | 78 | 14 | 18 | 4 | 0 | 36 | 0 | 227 | 227 |
| 08:30 AM | 5 | 42 | 5 | 0 | 52 | 3 | 56 | 7 | 0 | 66 | 6 | 53 | 4 | 0 | 63 | 15 | 26 | 11 | 0 | 52 | 0 | 233 | 233 |
| 08:45 AM | 6 | 41 | 0 | 0 | 47 | 1 | 35 | 10 | 0 | 46 | 9 | 40 | 3 | 0 | 52 | 16 | 21 | 6 | 0 | 43 | 0 | 188 | 188 |
| Total | 24 | 174 | 15 | 0 | 213 | 8 | 194 | 41 | 0 | 243 | 44 | 223 | 12 | 0 | 279 | 60 | 96 | 26 | 0 | 182 | 0 | 917 | 917 |
| Grand Total | 53 | 412 | 27 | 0 | 492 | 15 | 427 | 84 | 0 | 526 | 93 | 461 | 18 | 0 | 572 | 117 | 184 | 51 | 0 | 352 | 0 | 1942 | 1942 |
| Apprch % | 10.8 | 83.7 | 5.5 | | | 2.9 | 81.2 | 16 | | | 16.3 | 80.6 | 3.1 | | | 33.2 | 52.3 | 14.5 | | | | | |
| Total % | 2.7 | 21.2 | 1.4 | | 25.3 | 0.8 | 22 | 4.3 | | 27.1 | 4.8 | 23.7 | 0.9 | | 29.5 | 6 | 9.5 | 2.6 | | 18.1 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Chino Avenue Westbound | | | | Grove Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 5 | 60 | **4** | 69 | 1 | 54 | **14** | 69 | 10 | 63 | 0 | 73 | **20** | 14 | 4 | 38 | 249 |
| 07:30 AM | 8 | 47 | 4 | 59 | 1 | 65 | 10 | 76 | 12 | 64 | 2 | 78 | 13 | 17 | 5 | 35 | 248 |
| 07:45 AM | **12** | **67** | 3 | **82** | **2** | **70** | 12 | **84** | **17** | **73** | **3** | **93** | 14 | 30 | **10** | **54** | **313** |
| 08:00 AM | 7 | 50 | 2 | 59 | 2 | 58 | 13 | 73 | 14 | 69 | 3 | 86 | 15 | **31** | 5 | 51 | 269 |
| Total Volume | 32 | 224 | 13 | 269 | 6 | 247 | 49 | 302 | 53 | 269 | 8 | 330 | 62 | 92 | 24 | 178 | 1079 |
| % App. Total | 11.9 | 83.3 | 4.8 | | 2 | 81.8 | 16.2 | | 16.1 | 81.5 | 2.4 | | 34.8 | 51.7 | 13.5 | | |
| PHF | .667 | .836 | .813 | .820 | .750 | .882 | .875 | .899 | .779 | .921 | .667 | .887 | .775 | .742 | .600 | .824 | .862 |

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City of Ontario
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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

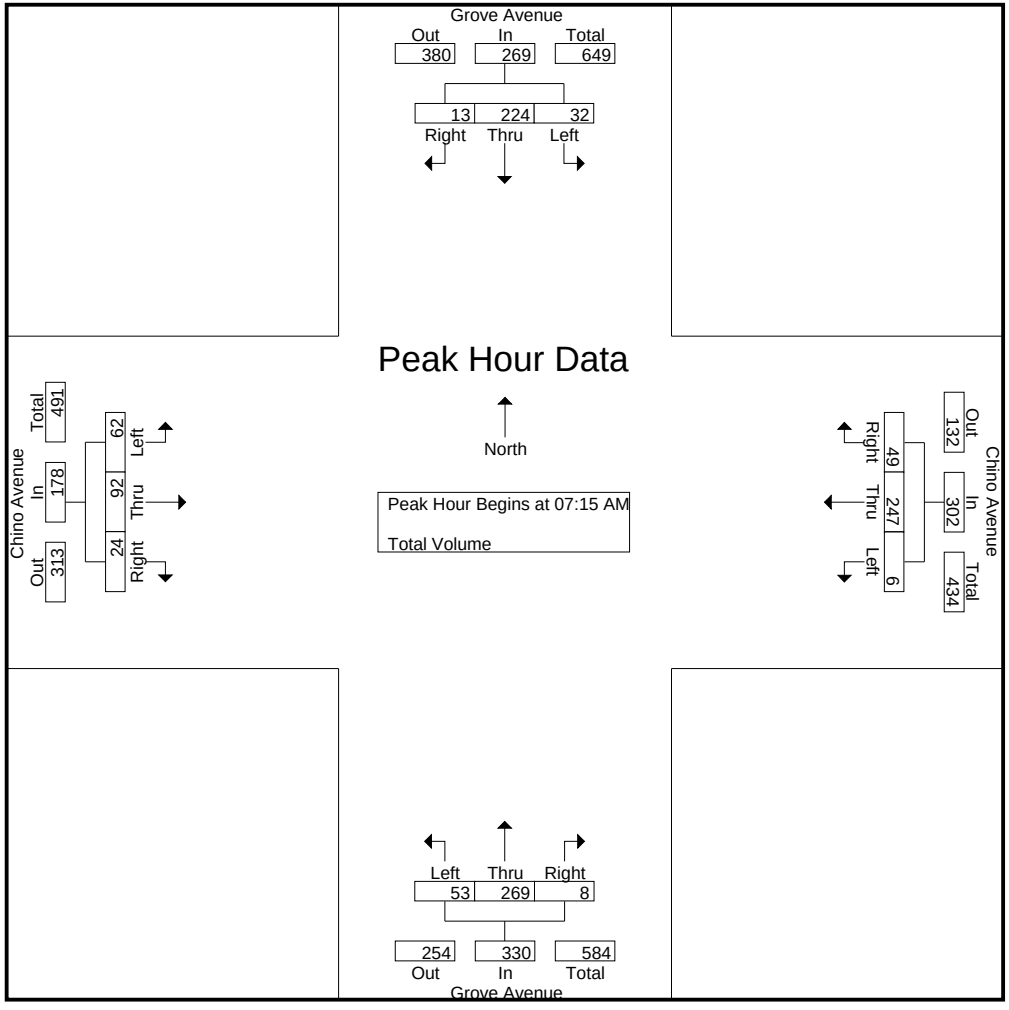

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City of Ontario
N/S: Grove Avenue
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Weather: Clear

File Name : 24_ONT_Grove_Chi AMR
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Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Chino Avenue Westbound | | | | Grove Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:15 AM | | | | 07:30 AM | | | | 07:45 AM | | | | |
| +0 mins. | 4 | 64 | 1 | 69 | 1 | 54 | **14** | 69 | 12 | 64 | 2 | 78 | 14 | 30 | 10 | **54** | |
| +15 mins. | 5 | 60 | **4** | 69 | 1 | 65 | 10 | 76 | **17** | **73** | **3** | **93** | **15** | **31** | 5 | 51 | |
| +30 mins. | 8 | 47 | 4 | 59 | **2** | **70** | 12 | **84** | 14 | 69 | 3 | 86 | 14 | 18 | 4 | 36 | |
| +45 mins. | **12** | **67** | 3 | **82** | 2 | 58 | 13 | 73 | 15 | 61 | 2 | 78 | 15 | 26 | **11** | 52 | |
| Total Volume | 29 | 238 | 12 | 279 | 6 | 247 | 49 | 302 | 58 | 267 | 10 | 335 | 58 | 105 | 30 | 193 | |
| % App. Total | 10.4 | 85.3 | 4.3 | | 2 | 81.8 | 16.2 | | 17.3 | 79.7 | 3 | | 30.1 | 54.4 | 15.5 | | |
| PHF | .604 | .888 | .750 | .851 | .750 | .882 | .875 | .899 | .853 | .914 | .833 | .901 | .967 | .847 | .682 | .894 | |

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City of Ontario
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Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 12 | 44 | 4 | 0 | 60 | 4 | 29 | 19 | 0 | 52 | 4 | 50 | 4 | 0 | 58 | 14 | 53 | 6 | 0 | 73 | 0 | 243 | 243 |
| 04:15 PM | 8 | 46 | 6 | 0 | 60 | 2 | 34 | 14 | 0 | 50 | 11 | 74 | 5 | 0 | 90 | 11 | 48 | 10 | 0 | 69 | 0 | 269 | 269 |
| 04:30 PM | 5 | 49 | 3 | 0 | 57 | 2 | 20 | 10 | 0 | 32 | 3 | 75 | 8 | 0 | 86 | 16 | 58 | 6 | 0 | 80 | 0 | 255 | 255 |
| 04:45 PM | 11 | 60 | 7 | 0 | 78 | 1 | 35 | 8 | 0 | 44 | 7 | 83 | 6 | 0 | 96 | 10 | 60 | 6 | 0 | 76 | 0 | 294 | 294 |
| Total | 36 | 199 | 20 | 0 | 255 | 9 | 118 | 51 | 0 | 178 | 25 | 282 | 23 | 0 | 330 | 51 | 219 | 28 | 0 | 298 | 0 | 1061 | 1061 |
| 05:00 PM | 10 | 52 | 4 | 0 | 66 | 1 | 28 | 9 | 0 | 38 | 3 | 76 | 2 | 0 | 81 | 12 | 71 | 7 | 0 | 90 | 0 | 275 | 275 |
| 05:15 PM | 6 | 64 | 4 | 0 | 74 | 5 | 30 | 10 | 0 | 45 | 4 | 59 | 6 | 0 | 69 | 10 | 67 | 3 | 0 | 80 | 0 | 268 | 268 |
| 05:30 PM | 10 | 75 | 1 | 1 | 86 | 2 | 24 | 7 | 0 | 33 | 8 | 76 | 3 | 0 | 87 | 18 | 63 | 8 | 0 | 89 | 1 | 295 | 296 |
| 05:45 PM | 9 | 75 | 7 | 0 | 91 | 2 | 32 | 7 | 0 | 41 | 6 | 65 | 3 | 0 | 74 | 13 | 39 | 10 | 0 | 62 | 0 | 268 | 268 |
| Total | 35 | 266 | 16 | 1 | 317 | 10 | 114 | 33 | 0 | 157 | 21 | 276 | 14 | 0 | 311 | 53 | 240 | 28 | 0 | 321 | 1 | 1106 | 1107 |
| Grand Total | 71 | 465 | 36 | 1 | 572 | 19 | 232 | 84 | 0 | 335 | 46 | 558 | 37 | 0 | 641 | 104 | 459 | 56 | 0 | 619 | 1 | 2167 | 2168 |
| Apprch % | 12.4 | 81.3 | 6.3 | | | 5.7 | 69.3 | 25.1 | | | 7.2 | 87.1 | 5.8 | | | 16.8 | 74.2 | 9 | | | | | |
| Total % | 3.3 | 21.5 | 1.7 | | 26.4 | 0.9 | 10.7 | 3.9 | | 15.5 | 2.1 | 25.7 | 1.7 | | 29.6 | 4.8 | 21.2 | 2.6 | | 28.6 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Chino Avenue Westbound | | | | Grove Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | **11** | 60 | **7** | 78 | 1 | **35** | 8 | 44 | 7 | **83** | **6** | **96** | 10 | 60 | 6 | 76 | 294 |
| 05:00 PM | 10 | 52 | 4 | 66 | 1 | 28 | 9 | 38 | 3 | 76 | 2 | 81 | 12 | **71** | 7 | **90** | 275 |
| 05:15 PM | 6 | 64 | 4 | 74 | **5** | 30 | **10** | **45** | 4 | 59 | 6 | 69 | 10 | 67 | 3 | 80 | 268 |
| 05:30 PM | 10 | **75** | 1 | **86** | 2 | 24 | 7 | 33 | **8** | 76 | 3 | 87 | **18** | 63 | **8** | 89 | **295** |
| Total Volume | 37 | 251 | 16 | 304 | 9 | 117 | 34 | 160 | 22 | 294 | 17 | 333 | 50 | 261 | 24 | 335 | 1132 |
| % App. Total | 12.2 | 82.6 | 5.3 | | 5.6 | 73.1 | 21.2 | | 6.6 | 88.3 | 5.1 | | 14.9 | 77.9 | 7.2 | | |
| PHF | .841 | .837 | .571 | .884 | .450 | .836 | .850 | .889 | .688 | .886 | .708 | .867 | .694 | .919 | .750 | .931 | .959 |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

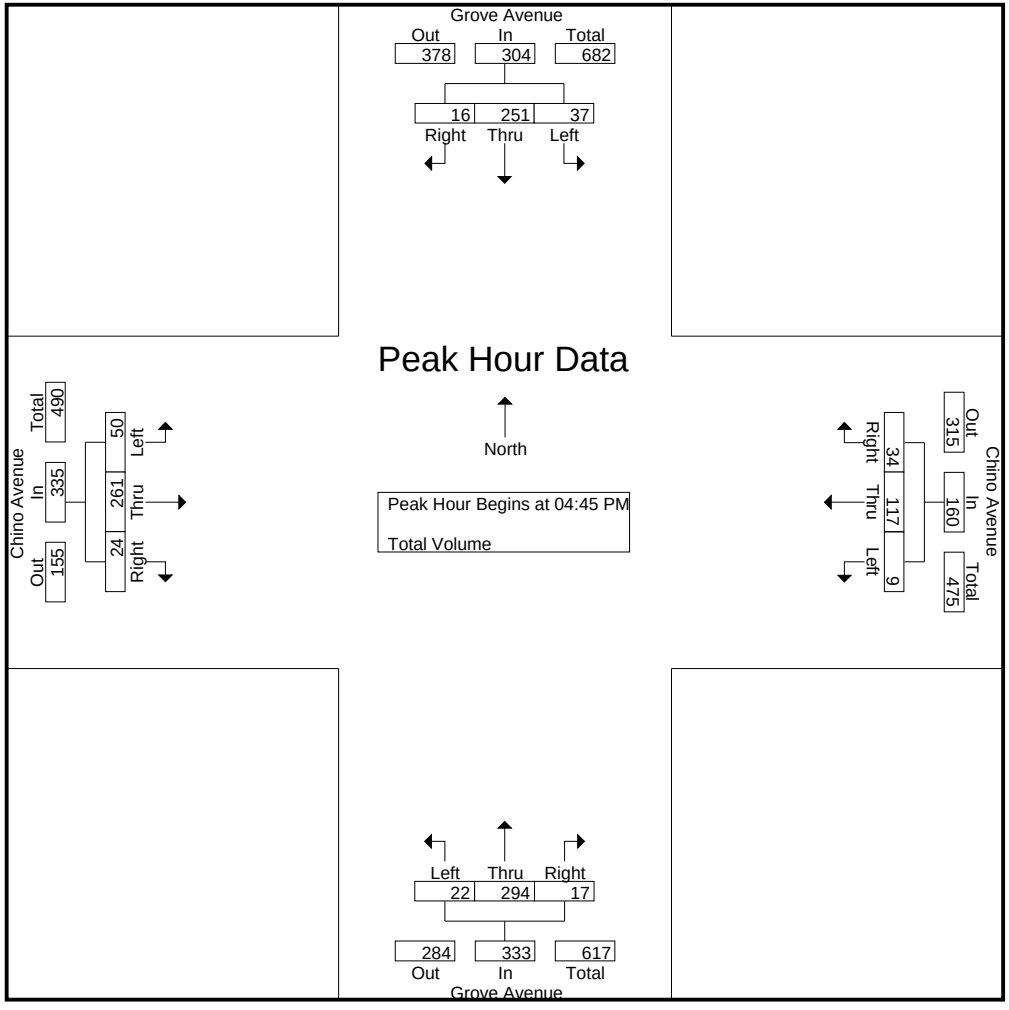

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City of Ontario
N/S: Grove Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 24_ONT_Grove_Chi PMR
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Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Chino Avenue Westbound | | | | Grove Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:00 PM | | | | 04:15 PM | | | | 04:45 PM | | | | |
| +0 mins. | **10** | 52 | 4 | 66 | **4** | 29 | **19** | **52** | **11** | 74 | 5 | 90 | 10 | 60 | 6 | 76 | |
| +15 mins. | 6 | 64 | 4 | 74 | 2 | 34 | 14 | 50 | 3 | 75 | **8** | 86 | 12 | **71** | 7 | **90** | |
| +30 mins. | 10 | **75** | 1 | 86 | 2 | 20 | 10 | 32 | 7 | **83** | 6 | **96** | 10 | 67 | 3 | 80 | |
| +45 mins. | 9 | 75 | **7** | **91** | 1 | **35** | 8 | 44 | 3 | 76 | 2 | 81 | **18** | 63 | **8** | 89 | |
| Total Volume | 35 | 266 | 16 | 317 | 9 | 118 | 51 | 178 | 24 | 308 | 21 | 353 | 50 | 261 | 24 | 335 | |
| % App. Total | 11 | 83.9 | 5 | | 5.1 | 66.3 | 28.7 | | 6.8 | 87.3 | 5.9 | | 14.9 | 77.9 | 7.2 | | |
| PHF | .875 | .887 | .571 | .871 | .563 | .843 | .671 | .856 | .545 | .928 | .656 | .919 | .694 | .919 | .750 | .931 | |

Location: Ontario
N/S: Grove Avenue
E/W: Chino Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Grove Avenue | East Leg Chino Avenue | South Leg Grove Avenue | West Leg Chino Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg Grove Avenue | East Leg Chino Avenue | South Leg Grove Avenue | West Leg Chino Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 1 | 1 | 0 | 2 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 1 | 0 | 2 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Grove Avenue
E/W: Chino Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Grove Avenue | | | Westbound Chino Avenue | | | Northbound Grove Avenue | | | Eastbound Chino Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |

| | Southbound Grove Avenue | | | Westbound Chino Avenue | | | Northbound Grove Avenue | | | Eastbound Chino Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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City of Ontario
N/S: Grove Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 25_ONT_Grove_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 8 | 49 | 7 | 0 | 64 | 4 | 24 | 3 | 0 | 31 | 8 | 42 | 0 | 0 | 50 | 7 | 20 | 9 | 0 | 36 | 0 | 181 | 181 |
| 07:15 AM | 4 | 63 | 4 | 0 | 71 | 1 | 26 | 2 | 0 | 29 | 10 | 55 | 0 | 0 | 65 | 6 | 8 | 2 | 0 | 16 | 0 | 181 | 181 |
| 07:30 AM | 3 | 43 | 7 | 0 | 53 | 2 | 33 | 6 | 0 | 41 | 10 | 64 | 2 | 0 | 76 | 15 | 10 | 5 | 0 | 30 | 0 | 200 | 200 |
| 07:45 AM | 6 | 62 | 4 | 0 | 72 | 2 | 25 | 7 | 0 | 34 | 21 | 76 | 1 | 0 | 98 | 11 | 11 | 6 | 0 | 28 | 0 | 232 | 232 |
| Total | 21 | 217 | 22 | 0 | 260 | 9 | 108 | 18 | 0 | 135 | 49 | 237 | 3 | 0 | 289 | 39 | 49 | 22 | 0 | 110 | 0 | 794 | 794 |
| 08:00 AM | 3 | 52 | 4 | 0 | 59 | 0 | 26 | 1 | 0 | 27 | 10 | 76 | 0 | 0 | 86 | 3 | 19 | 3 | 0 | 25 | 0 | 197 | 197 |
| 08:15 AM | 3 | 33 | 8 | 0 | 44 | 5 | 35 | 6 | 0 | 46 | 14 | 63 | 1 | 0 | 78 | 6 | 11 | 2 | 0 | 19 | 0 | 187 | 187 |
| 08:30 AM | 2 | 52 | 4 | 0 | 58 | 2 | 17 | 2 | 0 | 21 | 12 | 52 | 1 | 0 | 65 | 10 | 19 | 8 | 0 | 37 | 0 | 181 | 181 |
| 08:45 AM | 5 | 39 | 4 | 0 | 48 | 1 | 23 | 4 | 0 | 28 | 8 | 46 | 2 | 0 | 56 | 6 | 15 | 4 | 0 | 25 | 0 | 157 | 157 |
| Total | 13 | 176 | 20 | 0 | 209 | 8 | 101 | 13 | 0 | 122 | 44 | 237 | 4 | 0 | 285 | 25 | 64 | 17 | 0 | 106 | 0 | 722 | 722 |
| Grand Total | 34 | 393 | 42 | 0 | 469 | 17 | 209 | 31 | 0 | 257 | 93 | 474 | 7 | 0 | 574 | 64 | 113 | 39 | 0 | 216 | 0 | 1516 | 1516 |
| Apprch % | 7.2 | 83.8 | 9 | | | 6.6 | 81.3 | 12.1 | | | 16.2 | 82.6 | 1.2 | | | 29.6 | 52.3 | 18.1 | | | | | |
| Total % | 2.2 | 25.9 | 2.8 | | 30.9 | 1.1 | 13.8 | 2 | | 17 | 6.1 | 31.3 | 0.5 | | 37.9 | 4.2 | 7.5 | 2.6 | | 14.2 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Grove Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 3 | 43 | 7 | 53 | 2 | 33 | 6 | 41 | 10 | 64 | **2** | 76 | **15** | 10 | 5 | **30** | 200 |
| 07:45 AM | **6** | **62** | 4 | **72** | 2 | 25 | **7** | 34 | **21** | **76** | 1 | **98** | 11 | 11 | **6** | 28 | **232** |
| 08:00 AM | 3 | 52 | 4 | 59 | 0 | 26 | 1 | 27 | 10 | 76 | 0 | 86 | 3 | **19** | 3 | 25 | 197 |
| 08:15 AM | 3 | 33 | **8** | 44 | **5** | **35** | 6 | **46** | 14 | 63 | 1 | 78 | 6 | 11 | 2 | 19 | 187 |
| Total Volume | 15 | 190 | 23 | 228 | 9 | 119 | 20 | 148 | 55 | 279 | 4 | 338 | 35 | 51 | 16 | 102 | 816 |
| % App. Total | 6.6 | 83.3 | 10.1 | | 6.1 | 80.4 | 13.5 | | 16.3 | 82.5 | 1.2 | | 34.3 | 50 | 15.7 | | |
| PHF | .625 | .766 | .719 | .792 | .450 | .850 | .714 | .804 | .655 | .918 | .500 | .862 | .583 | .671 | .667 | .850 | .879 |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 25_ONT_Grove_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

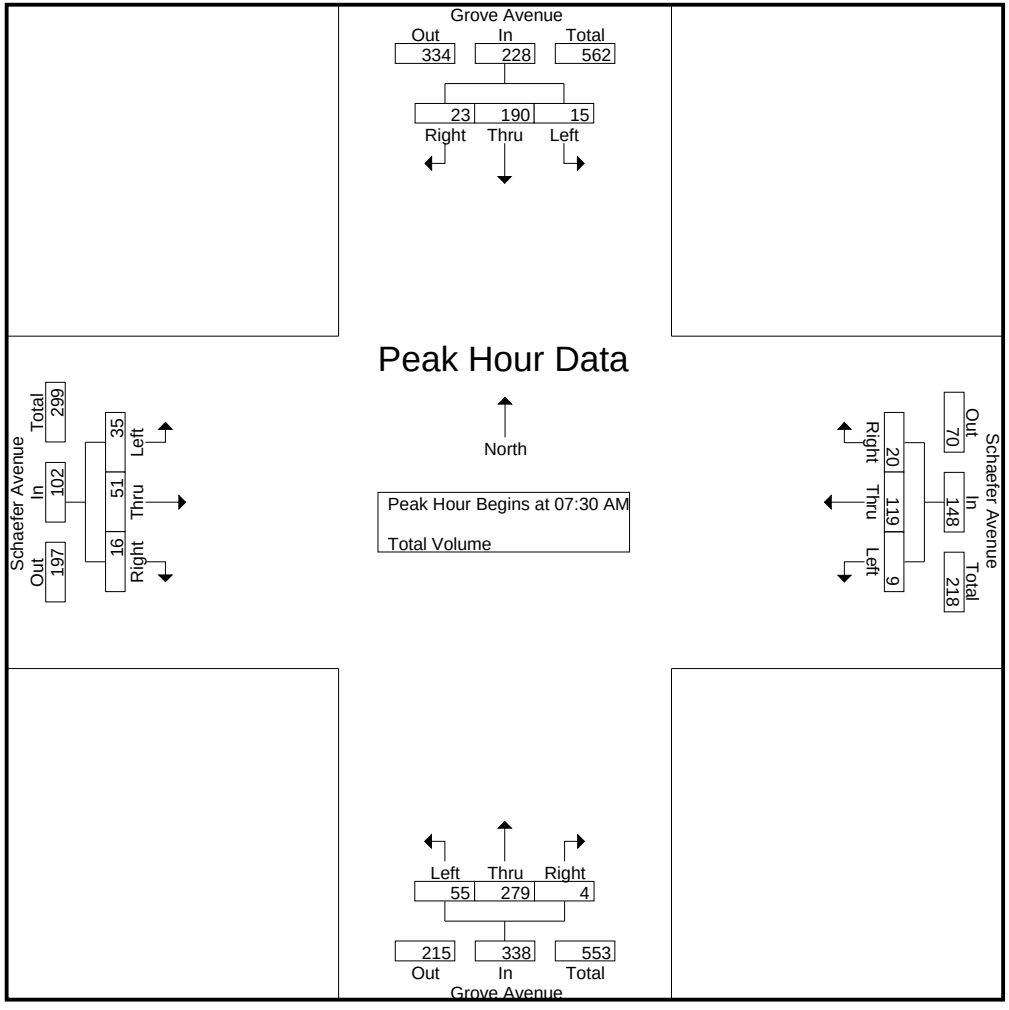

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City of Ontario
N/S: Grove Avenue
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Weather: Clear

File Name : 25_ONT_Grove_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Grove Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:00 AM | | | | |
| +0 mins. | **8** | 49 | **7** | 64 | 2 | 33 | 6 | 41 | 10 | 64 | **2** | 76 | 7 | **20** | **9** | **36** | |
| +15 mins. | 4 | **63** | 4 | 71 | 2 | 25 | **7** | 34 | **21** | **76** | 1 | **98** | 6 | 8 | 2 | 16 | |
| +30 mins. | 3 | 43 | 7 | 53 | 0 | 26 | 1 | 27 | 10 | 76 | 0 | 86 | **15** | 10 | 5 | 30 | |
| +45 mins. | 6 | 62 | 4 | **72** | **5** | **35** | 6 | **46** | 14 | 63 | 1 | 78 | 11 | 11 | 6 | 28 | |
| Total Volume | 21 | 217 | 22 | 260 | 9 | 119 | 20 | 148 | 55 | 279 | 4 | 338 | 39 | 49 | 22 | 110 | |
| % App. Total | 8.1 | 83.5 | 8.5 | | 6.1 | 80.4 | 13.5 | | 16.3 | 82.5 | 1.2 | | 35.5 | 44.5 | 20 | | |
| PHF | .656 | .861 | .786 | .903 | .450 | .850 | .714 | .804 | .655 | .918 | .500 | .862 | .650 | .613 | .611 | .764 | |

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City of Ontario
N/S: Grove Avenue
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Weather: Clear

File Name : 25_ONT_Grove_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 3 | 42 | 8 | 0 | 53 | 0 | 11 | 5 | 0 | 16 | 5 | 36 | 2 | 0 | 43 | 17 | 32 | 17 | 0 | 66 | 0 | 178 | 178 |
| 04:15 PM | 5 | 47 | 3 | 0 | 55 | 0 | 10 | 7 | 0 | 17 | 5 | 48 | 3 | 0 | 56 | 30 | 41 | 12 | 0 | 83 | 0 | 211 | 211 |
| 04:30 PM | 5 | 45 | 5 | 0 | 55 | 2 | 10 | 7 | 0 | 19 | 5 | 62 | 2 | 0 | 69 | 21 | 46 | 7 | 0 | 74 | 0 | 217 | 217 |
| 04:45 PM | 4 | 56 | 7 | 0 | 67 | 0 | 8 | 3 | 0 | 11 | 6 | 58 | 2 | 0 | 66 | 29 | 46 | 11 | 0 | 86 | 0 | 230 | 230 |
| Total | 17 | 190 | 23 | 0 | 230 | 2 | 39 | 22 | 0 | 63 | 21 | 204 | 9 | 0 | 234 | 97 | 165 | 47 | 0 | 309 | 0 | 836 | 836 |
| 05:00 PM | 6 | 49 | 7 | 0 | 62 | 1 | 8 | 5 | 0 | 14 | 4 | 59 | 1 | 0 | 64 | 14 | 41 | 7 | 0 | 62 | 0 | 202 | 202 |
| 05:15 PM | 2 | 58 | 6 | 0 | 66 | 3 | 5 | 7 | 0 | 15 | 4 | 41 | 2 | 0 | 47 | 17 | 40 | 8 | 0 | 65 | 0 | 193 | 193 |
| 05:30 PM | 5 | 73 | 8 | 0 | 86 | 1 | 7 | 2 | 0 | 10 | 5 | 67 | 1 | 0 | 73 | 15 | 30 | 12 | 0 | 57 | 0 | 226 | 226 |
| 05:45 PM | 3 | 76 | 4 | 0 | 83 | 1 | 5 | 6 | 0 | 12 | 6 | 51 | 3 | 0 | 60 | 14 | 29 | 8 | 0 | 51 | 0 | 206 | 206 |
| Total | 16 | 256 | 25 | 0 | 297 | 6 | 25 | 20 | 0 | 51 | 19 | 218 | 7 | 0 | 244 | 60 | 140 | 35 | 0 | 235 | 0 | 827 | 827 |
| Grand Total | 33 | 446 | 48 | 0 | 527 | 8 | 64 | 42 | 0 | 114 | 40 | 422 | 16 | 0 | 478 | 157 | 305 | 82 | 0 | 544 | 0 | 1663 | 1663 |
| Apprch % | 6.3 | 84.6 | 9.1 | | | 7 | 56.1 | 36.8 | | | 8.4 | 88.3 | 3.3 | | | 28.9 | 56.1 | 15.1 | | | | | |
| Total % | 2 | 26.8 | 2.9 | | 31.7 | 0.5 | 3.8 | 2.5 | | 6.9 | 2.4 | 25.4 | 1 | | 28.7 | 9.4 | 18.3 | 4.9 | | 32.7 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Grove Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | |
| 04:15 PM | 5 | 47 | 3 | 55 | 0 | **10** | **7** | 17 | 5 | 48 | **3** | 56 | **30** | 41 | **12** | 83 | 211 |
| 04:30 PM | 5 | 45 | 5 | 55 | **2** | 10 | 7 | **19** | 5 | **62** | 2 | **69** | 21 | **46** | 7 | 74 | 217 |
| 04:45 PM | 4 | **56** | **7** | **67** | 0 | 8 | 3 | 11 | **6** | 58 | 2 | 66 | 29 | 46 | 11 | **86** | **230** |
| 05:00 PM | **6** | 49 | 7 | 62 | 1 | 8 | 5 | 14 | 4 | 59 | 1 | 64 | 14 | 41 | 7 | 62 | 202 |
| Total Volume | 20 | 197 | 22 | 239 | 3 | 36 | 22 | 61 | 20 | 227 | 8 | 255 | 94 | 174 | 37 | 305 | 860 |
| % App. Total | 8.4 | 82.4 | 9.2 | | 4.9 | 59 | 36.1 | | 7.8 | 89 | 3.1 | | 30.8 | 57 | 12.1 | | |
| PHF | .833 | .879 | .786 | .892 | .375 | .900 | .786 | .803 | .833 | .915 | .667 | .924 | .783 | .946 | .771 | .887 | .935 |

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N/S: Grove Avenue
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Weather: Clear

File Name : 25_ONT_Grove_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

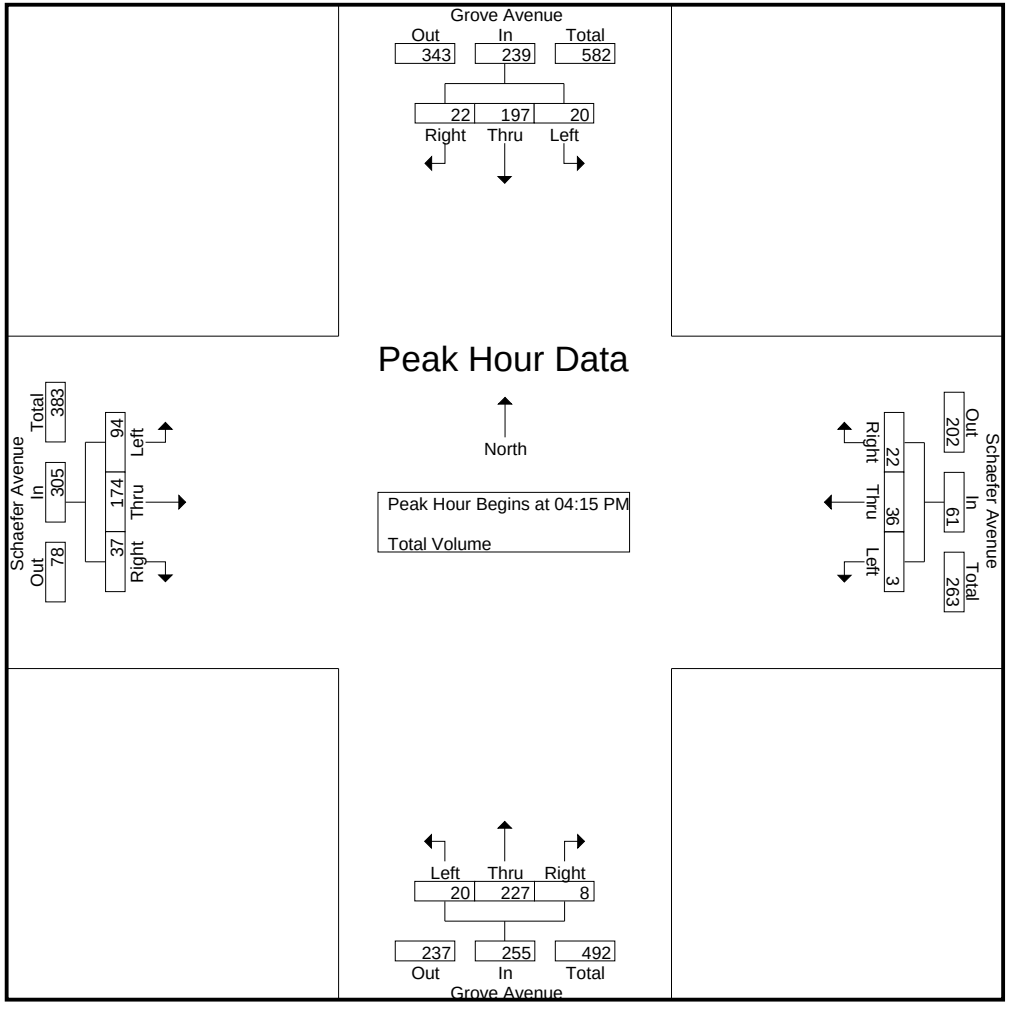

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City of Ontario
N/S: Grove Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 25_ONT_Grove_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Grove Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:00 PM | | | | 04:15 PM | | | | 04:00 PM | | | | |
| +0 mins. | **6** | 49 | 7 | 62 | 0 | **11** | 5 | 16 | 5 | 48 | **3** | 56 | 17 | 32 | **17** | 66 | |
| +15 mins. | 2 | 58 | 6 | 66 | 0 | 10 | **7** | 17 | 5 | **62** | 2 | **69** | **30** | 41 | 12 | 83 | |
| +30 mins. | 5 | 73 | **8** | **86** | **2** | 10 | 7 | **19** | **6** | 58 | 2 | 66 | 21 | **46** | 7 | 74 | |
| +45 mins. | 3 | **76** | 4 | 83 | 0 | 8 | 3 | 11 | 4 | 59 | 1 | 64 | 29 | 46 | 11 | **86** | |
| Total Volume | 16 | 256 | 25 | 297 | 2 | 39 | 22 | 63 | 20 | 227 | 8 | 255 | 97 | 165 | 47 | 309 | |
| % App. Total | 5.4 | 86.2 | 8.4 | | 3.2 | 61.9 | 34.9 | | 7.8 | 89 | 3.1 | | 31.4 | 53.4 | 15.2 | | |
| PHF | .667 | .842 | .781 | .863 | .250 | .886 | .786 | .829 | .833 | .915 | .667 | .924 | .808 | .897 | .691 | .898 | |

Location: Ontario
N/S: Grove Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Grove Avenue | East Leg<br>Schaefer Avenue | South Leg<br>Grove Avenue | West Leg<br>Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg<br>Grove Avenue | East Leg<br>Schaefer Avenue | South Leg<br>Grove Avenue | West Leg<br>Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Grove Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Grove Avenue | | | Westbound Schaefer Avenue | | | Northbound Grove Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

| | Southbound Grove Avenue | | | Westbound Schaefer Avenue | | | Northbound Grove Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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PO Box 1178
Corona, Ca 92878
951-268-6268

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: Edison Ave/Ontario Ranch Road
Weather: Clear

File Name : 26_ONT_Grove_Edi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Grove Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 7 | 44 | 1 | 0 | 52 | 0 | 62 | 11 | 0 | 73 | 9 | 33 | 0 | 0 | 42 | 4 | 24 | 4 | 0 | 32 | 0 | 199 | 199 |
| 07:15 AM | 5 | 56 | 5 | 0 | 66 | 3 | 67 | 11 | 0 | 81 | 13 | 47 | 0 | 0 | 60 | 5 | 21 | 5 | 0 | 31 | 0 | 238 | 238 |
| 07:30 AM | 4 | 41 | 3 | 0 | 48 | 2 | 59 | 16 | 0 | 77 | 14 | 55 | 1 | 0 | 70 | 7 | 27 | 9 | 0 | 43 | 0 | 238 | 238 |
| 07:45 AM | 7 | 53 | 8 | 0 | 68 | 0 | 70 | 17 | 0 | 87 | 18 | 65 | 1 | 0 | 84 | 8 | 40 | 3 | 0 | 51 | 0 | 290 | 290 |
| Total | 23 | 194 | 17 | 0 | 234 | 5 | 258 | 55 | 0 | 318 | 54 | 200 | 2 | 0 | 256 | 24 | 112 | 21 | 0 | 157 | 0 | 965 | 965 |
| 08:00 AM | 8 | 42 | 11 | 0 | 61 | 1 | 60 | 13 | 0 | 74 | 10 | 63 | 1 | 0 | 74 | 13 | 35 | 7 | 0 | 55 | 0 | 264 | 264 |
| 08:15 AM | 4 | 22 | 7 | 0 | 33 | 5 | 50 | 20 | 0 | 75 | 9 | 36 | 0 | 0 | 45 | 10 | 30 | 8 | 0 | 48 | 0 | 201 | 201 |
| 08:30 AM | 6 | 26 | 7 | 0 | 39 | 5 | 58 | 13 | 0 | 76 | 6 | 38 | 0 | 0 | 44 | 11 | 42 | 1 | 0 | 54 | 0 | 213 | 213 |
| 08:45 AM | 11 | 38 | 8 | 0 | 57 | 2 | 57 | 12 | 0 | 71 | 5 | 31 | 1 | 0 | 37 | 12 | 45 | 2 | 0 | 59 | 0 | 224 | 224 |
| Total | 29 | 128 | 33 | 0 | 190 | 13 | 225 | 58 | 0 | 296 | 30 | 168 | 2 | 0 | 200 | 46 | 152 | 18 | 0 | 216 | 0 | 902 | 902 |
| Grand Total | 52 | 322 | 50 | 0 | 424 | 18 | 483 | 113 | 0 | 614 | 84 | 368 | 4 | 0 | 456 | 70 | 264 | 39 | 0 | 373 | 0 | 1867 | 1867 |
| Apprch % | 12.3 | 75.9 | 11.8 | | | 2.9 | 78.7 | 18.4 | | | 18.4 | 80.7 | 0.9 | | | 18.8 | 70.8 | 10.5 | | | | | |
| Total % | 2.8 | 17.2 | 2.7 | | 22.7 | 1 | 25.9 | 6.1 | | 32.9 | 4.5 | 19.7 | 0.2 | | 24.4 | 3.7 | 14.1 | 2.1 | | 20 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Grove Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 5 | **56** | 5 | 66 | **3** | 67 | 11 | 81 | 13 | 47 | 0 | 60 | 5 | 21 | 5 | 31 | 238 |
| 07:30 AM | 4 | 41 | 3 | 48 | 2 | 59 | 16 | 77 | 14 | 55 | **1** | 70 | 7 | 27 | **9** | 43 | 238 |
| 07:45 AM | 7 | 53 | 8 | **68** | 0 | **70** | **17** | **87** | **18** | **65** | 1 | **84** | 8 | **40** | 3 | 51 | **290** |
| 08:00 AM | **8** | 42 | **11** | 61 | 1 | 60 | 13 | 74 | 10 | 63 | 1 | 74 | **13** | 35 | 7 | **55** | 264 |
| Total Volume | 24 | 192 | 27 | 243 | 6 | 256 | 57 | 319 | 55 | 230 | 3 | 288 | 33 | 123 | 24 | 180 | 1030 |
| % App. Total | 9.9 | 79 | 11.1 | | 1.9 | 80.3 | 17.9 | | 19.1 | 79.9 | 1 | | 18.3 | 68.3 | 13.3 | | |
| PHF | .750 | .857 | .614 | .893 | .500 | .914 | .838 | .917 | .764 | .885 | .750 | .857 | .635 | .769 | .667 | .818 | .888 |

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: Edison Ave/Ontario Ranch Road
Weather: Clear

File Name : 26_ONT_Grove_Edi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

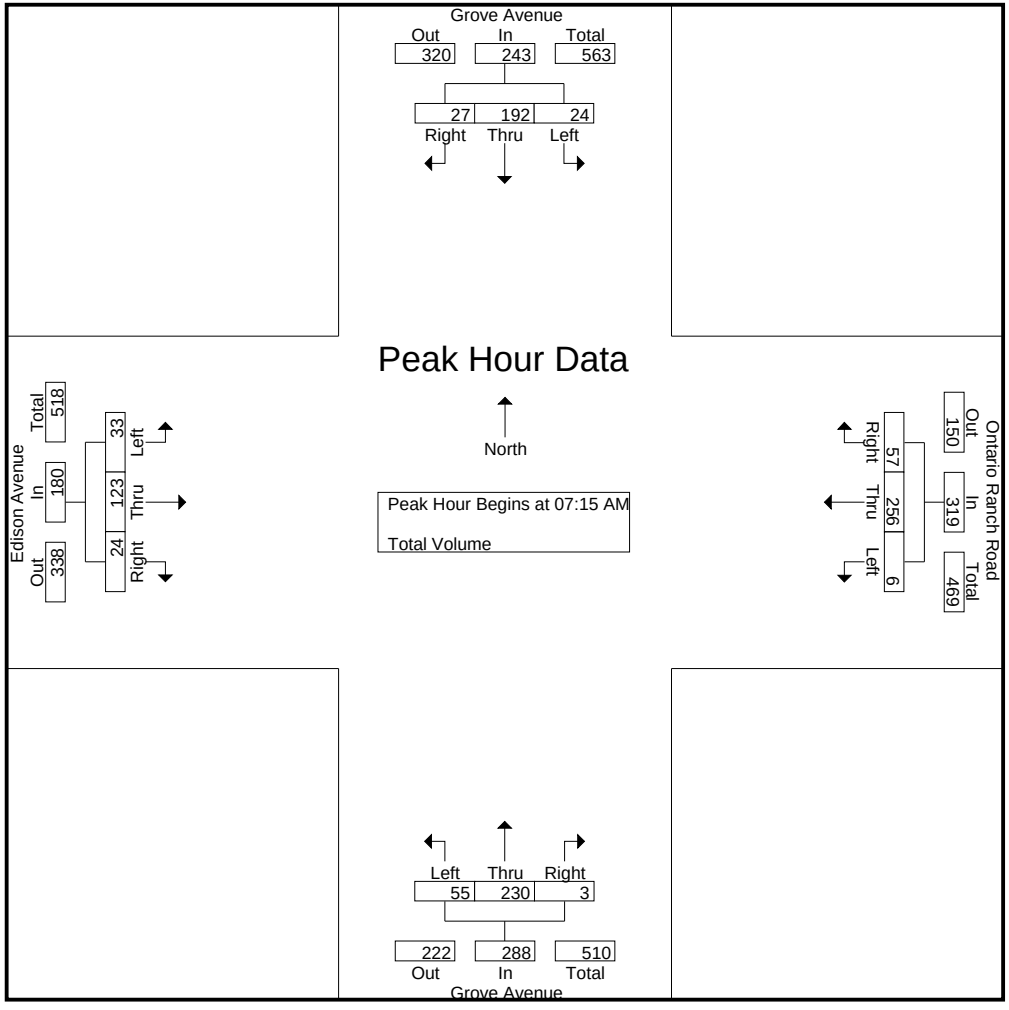

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Weather: Clear

File Name : 26_ONT_Grove_Edi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Grove Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 08:00 AM | | | | |
| +0 mins. | 5 | **56** | 5 | 66 | **3** | 67 | 11 | 81 | 13 | 47 | 0 | 60 | **13** | 35 | 7 | 55 | |
| +15 mins. | 4 | 41 | 3 | 48 | 2 | 59 | 16 | 77 | 14 | 55 | **1** | 70 | 10 | 30 | **8** | 48 | |
| +30 mins. | 7 | 53 | 8 | **68** | 0 | **70** | **17** | **87** | **18** | **65** | 1 | **84** | 11 | 42 | 1 | 54 | |
| +45 mins. | **8** | 42 | **11** | 61 | 1 | 60 | 13 | 74 | 10 | 63 | 1 | 74 | 12 | **45** | 2 | **59** | |
| Total Volume | 24 | 192 | 27 | 243 | 6 | 256 | 57 | 319 | 55 | 230 | 3 | 288 | 46 | 152 | 18 | 216 | |
| % App. Total | 9.9 | 79 | 11.1 | | 1.9 | 80.3 | 17.9 | | 19.1 | 79.9 | 1 | | 21.3 | 70.4 | 8.3 | | |
| PHF | .750 | .857 | .614 | .893 | .500 | .914 | .838 | .917 | .764 | .885 | .750 | .857 | .885 | .844 | .563 | .915 | |

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City of Ontario
N/S: Grove Avenue
E/W: Edison Ave/Ontario Ranch Road
Weather: Clear

File Name : 26_ONT_Grove_Edi PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Grove Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Grove Avenue Northbound | | | | | Edison Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 17 | 30 | 4 | 0 | 51 | 2 | 44 | 13 | 0 | 59 | 8 | 22 | 0 | 0 | 30 | 8 | 92 | 4 | 0 | 104 | 0 | 244 | 244 |
| 04:15 PM | 14 | 34 | 5 | 0 | 53 | 1 | 41 | 11 | 0 | 53 | 10 | 37 | 1 | 0 | 48 | 7 | 97 | 4 | 0 | 108 | 0 | 262 | 262 |
| 04:30 PM | 14 | 33 | 7 | 0 | 54 | 1 | 46 | 13 | 0 | 60 | 11 | 39 | 2 | 0 | 52 | 13 | 105 | 6 | 0 | 124 | 0 | 290 | 290 |
| 04:45 PM | 14 | 42 | 7 | 0 | 63 | 1 | 46 | 6 | 0 | 53 | 11 | 48 | 1 | 0 | 60 | 12 | 96 | 11 | 0 | 119 | 0 | 295 | 295 |
| Total | 59 | 139 | 23 | 0 | 221 | 5 | 177 | 43 | 0 | 225 | 40 | 146 | 4 | 0 | 190 | 40 | 390 | 25 | 0 | 455 | 0 | 1091 | 1091 |
| 05:00 PM | 12 | 40 | 3 | 0 | 55 | 0 | 38 | 11 | 0 | 49 | 5 | 33 | 0 | 0 | 38 | 13 | 95 | 4 | 0 | 112 | 0 | 254 | 254 |
| 05:15 PM | 15 | 47 | 4 | 0 | 66 | 1 | 44 | 8 | 0 | 53 | 6 | 27 | 2 | 0 | 35 | 9 | 100 | 5 | 0 | 114 | 0 | 268 | 268 |
| 05:30 PM | 15 | 59 | 4 | 0 | 78 | 2 | 57 | 7 | 0 | 66 | 6 | 52 | 1 | 0 | 59 | 10 | 97 | 4 | 0 | 111 | 0 | 314 | 314 |
| 05:45 PM | 10 | 76 | 5 | 0 | 91 | 1 | 45 | 8 | 0 | 54 | 6 | 42 | 1 | 0 | 49 | 5 | 110 | 4 | 0 | 119 | 0 | 313 | 313 |
| Total | 52 | 222 | 16 | 0 | 290 | 4 | 184 | 34 | 0 | 222 | 23 | 154 | 4 | 0 | 181 | 37 | 402 | 17 | 0 | 456 | 0 | 1149 | 1149 |
| Grand Total | 111 | 361 | 39 | 0 | 511 | 9 | 361 | 77 | 0 | 447 | 63 | 300 | 8 | 0 | 371 | 77 | 792 | 42 | 0 | 911 | 0 | 2240 | 2240 |
| Apprch % | 21.7 | 70.6 | 7.6 | | | 2 | 80.8 | 17.2 | | | 17 | 80.9 | 2.2 | | | 8.5 | 86.9 | 4.6 | | | | | |
| Total % | 5 | 16.1 | 1.7 | | 22.8 | 0.4 | 16.1 | 3.4 | | 20 | 2.8 | 13.4 | 0.4 | | 16.6 | 3.4 | 35.4 | 1.9 | | 40.7 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Grove Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 12 | 40 | 3 | 55 | 0 | 38 | **11** | 49 | 5 | 33 | 0 | 38 | **13** | 95 | 4 | 112 | 254 |
| 05:15 PM | **15** | 47 | 4 | 66 | 1 | 44 | 8 | 53 | **6** | 27 | **2** | 35 | 9 | 100 | **5** | 114 | 268 |
| 05:30 PM | 15 | 59 | 4 | 78 | **2** | **57** | 7 | **66** | 6 | **52** | 1 | **59** | 10 | 97 | 4 | 111 | **314** |
| 05:45 PM | 10 | **76** | **5** | **91** | 1 | 45 | 8 | 54 | 6 | 42 | 1 | 49 | 5 | **110** | 4 | **119** | 313 |
| Total Volume | 52 | 222 | 16 | 290 | 4 | 184 | 34 | 222 | 23 | 154 | 4 | 181 | 37 | 402 | 17 | 456 | 1149 |
| % App. Total | 17.9 | 76.6 | 5.5 | | 1.8 | 82.9 | 15.3 | | 12.7 | 85.1 | 2.2 | | 8.1 | 88.2 | 3.7 | | |
| PHF | .867 | .730 | .800 | .797 | .500 | .807 | .773 | .841 | .958 | .740 | .500 | .767 | .712 | .914 | .850 | .958 | .915 |

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File Name : 26_ONT_Grove_Edi PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

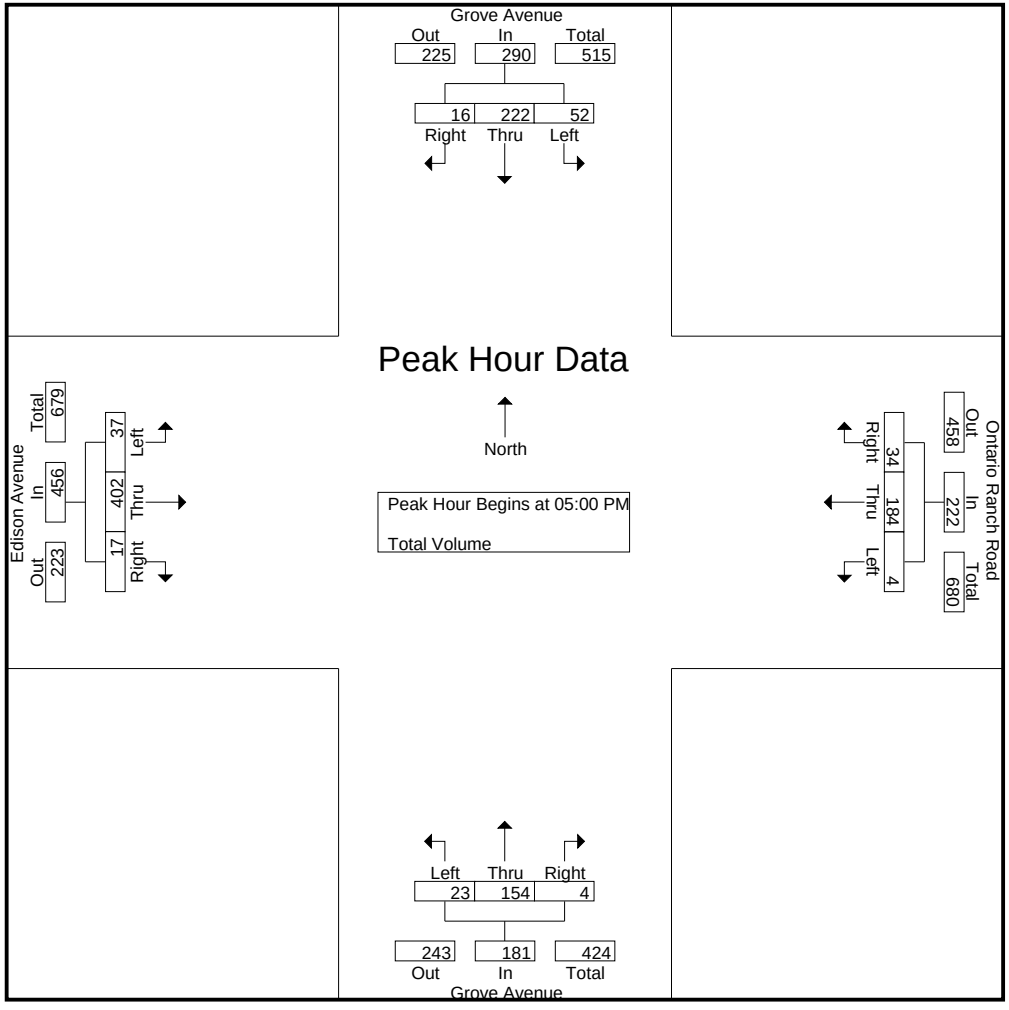

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City of Ontario
N/S: Grove Avenue
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Weather: Clear

File Name : 26_ONT_Grove_Edi PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Grove Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Grove Avenue Northbound | | | | Edison Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:00 PM | | | | 04:15 PM | | | | 04:30 PM | | | | |
| +0 mins. | 12 | 40 | 3 | 55 | **2** | 44 | **13** | 59 | 10 | 37 | 1 | 48 | **13** | **105** | 6 | **124** | |
| +15 mins. | **15** | 47 | 4 | 66 | 1 | 41 | 11 | 53 | **11** | 39 | **2** | 52 | 12 | 96 | **11** | 119 | |
| +30 mins. | 15 | 59 | 4 | 78 | 1 | **46** | 13 | **60** | 11 | **48** | 1 | **60** | 13 | 95 | 4 | 112 | |
| +45 mins. | 10 | **76** | **5** | **91** | 1 | 46 | 6 | 53 | 5 | 33 | 0 | 38 | 9 | 100 | 5 | 114 | |
| Total Volume | 52 | 222 | 16 | 290 | 5 | 177 | 43 | 225 | 37 | 157 | 4 | 198 | 47 | 396 | 26 | 469 | |
| % App. Total | 17.9 | 76.6 | 5.5 | | 2.2 | 78.7 | 19.1 | | 18.7 | 79.3 | 2 | | 10 | 84.4 | 5.5 | | |
| PHF | .867 | .730 | .800 | .797 | .625 | .962 | .827 | .938 | .841 | .818 | .500 | .825 | .904 | .943 | .591 | .946 | |

Location: Ontario
N/S: Grove Avenue
E/W: Edison Ave/Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Grove Avenue | East Leg<br>Ontario Ranch Road | South Leg<br>Grove Avenue | West Leg<br>Edison Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg<br>Grove Avenue | East Leg<br>Ontario Ranch Road | South Leg<br>Grove Avenue | West Leg<br>Edison Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 2 | 0 | 2 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 2 | 0 | 2 |

Location: Ontario
N/S: Grove Avenue
E/W: Edison Ave/Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Grove Avenue | | | Westbound Ontario Ranch Road | | | Northbound Grove Avenue | | | Eastbound Edison Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

| | Southbound Grove Avenue | | | Westbound Ontario Ranch Road | | | Northbound Grove Avenue | | | Eastbound Edison Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



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PO Box 1178
Corona, CA 92878
951-268-6268

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City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 69 | 0 | 6 | 0 | 75 | 2 | 36 | 42 | 0 | 80 | 1 | 0 | 1 | 0 | 2 | 1 | 12 | 0 | 0 | 13 | 0 | 170 | 170 |
| 07:15 AM | 77 | 0 | 4 | 0 | 81 | 0 | 31 | 53 | 0 | 84 | 0 | 0 | 1 | 0 | 1 | 1 | 22 | 0 | 0 | 23 | 0 | 189 | 189 |
| 07:30 AM | 40 | 1 | 4 | 0 | 45 | 0 | 47 | 62 | 0 | 109 | 0 | 2 | 0 | 0 | 2 | 3 | 5 | 1 | 0 | 9 | 0 | 165 | 165 |
| 07:45 AM | 65 | 2 | 3 | 0 | 70 | 0 | 44 | 63 | 0 | 107 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 0 | 13 | 0 | 190 | 190 |
| Total | 251 | 3 | 17 | 0 | 271 | 2 | 158 | 220 | 0 | 380 | 1 | 2 | 2 | 0 | 5 | 6 | 51 | 1 | 0 | 58 | 0 | 714 | 714 |
| 08:00 AM | 40 | 3 | 1 | 0 | 44 | 0 | 42 | 61 | 0 | 103 | 0 | 0 | 1 | 0 | 1 | 2 | 12 | 0 | 0 | 14 | 0 | 162 | 162 |
| 08:15 AM | 19 | 1 | 3 | 0 | 23 | 3 | 28 | 57 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 2 | 10 | 0 | 0 | 12 | 0 | 123 | 123 |
| 08:30 AM | 36 | 2 | 5 | 0 | 43 | 0 | 42 | 49 | 0 | 91 | 0 | 0 | 2 | 0 | 2 | 2 | 15 | 0 | 0 | 17 | 0 | 153 | 153 |
| 08:45 AM | 24 | 0 | 3 | 0 | 27 | 1 | 18 | 30 | 0 | 49 | 0 | 1 | 0 | 0 | 1 | 1 | 11 | 0 | 0 | 12 | 0 | 89 | 89 |
| Total | 119 | 6 | 12 | 0 | 137 | 4 | 130 | 197 | 0 | 331 | 0 | 1 | 3 | 0 | 4 | 7 | 48 | 0 | 0 | 55 | 0 | 527 | 527 |
| Grand Total | 370 | 9 | 29 | 0 | 408 | 6 | 288 | 417 | 0 | 711 | 1 | 3 | 5 | 0 | 9 | 13 | 99 | 1 | 0 | 113 | 0 | 1241 | 1241 |
| Apprch % | 90.7 | 2.2 | 7.1 | | | 0.8 | 40.5 | 58.6 | | | 11.1 | 33.3 | 55.6 | | | 11.5 | 87.6 | 0.9 | | | | | |
| Total % | 29.8 | 0.7 | 2.3 | | 32.9 | 0.5 | 23.2 | 33.6 | | 57.3 | 0.1 | 0.2 | 0.4 | | 0.7 | 1 | 8 | 0.1 | | 9.1 | 0 | 100 | |
| Passenger Vehicles | 357 | 7 | 23 | | 387 | 6 | 281 | 411 | | 698 | 1 | 3 | 4 | | 8 | 12 | 92 | 1 | | 105 | 0 | 0 | 1198 |
| % Passenger Vehicles | 96.5 | 77.8 | 79.3 | 0 | 94.9 | 100 | 97.6 | 98.6 | 0 | 98.2 | 100 | 100 | 80 | 0 | 88.9 | 92.3 | 92.9 | 100 | 0 | 92.9 | 0 | 0 | 96.5 |
| Large 2 Axle Vehicles | 4 | 0 | 5 | | 9 | 0 | 3 | 2 | | 5 | 0 | 0 | 1 | | 1 | 1 | 3 | 0 | | 4 | 0 | 0 | 19 |
| % Large 2 Axle Vehicles | 1.1 | 0 | 17.2 | 0 | 2.2 | 0 | 1 | 0.5 | 0 | 0.7 | 0 | 0 | 20 | 0 | 11.1 | 7.7 | 3 | 0 | 0 | 3.5 | 0 | 0 | 1.5 |
| 3 Axle Vehicles | 1 | 1 | 1 | | 3 | 0 | 0 | 1 | | 1 | 0 | 0 | 0 | | 0 | 0 | 2 | 0 | | 2 | 0 | 0 | 6 |
| % 3 Axle Vehicles | 0.3 | 11.1 | 3.4 | 0 | 0.7 | 0 | 0 | 0.2 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1.8 | 0 | 0 | 0.5 |
| 4+ Axle Trucks | 8 | 1 | 0 | | 9 | 0 | 4 | 3 | | 7 | 0 | 0 | 0 | | 0 | 0 | 2 | 0 | | 2 | 0 | 0 | 18 |
| % 4+ Axle Trucks | 2.2 | 11.1 | 0 | 0 | 2.2 | 0 | 1.4 | 0.7 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1.8 | 0 | 0 | 1.5 |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | 69 | 0 | **6** | 75 | **2** | 36 | 42 | 80 | **1** | 0 | **1** | **2** | 1 | 12 | 0 | 13 | 170 |
| 07:15 AM | **77** | 0 | 4 | **81** | 0 | 31 | 53 | 84 | 0 | 0 | 1 | 1 | 1 | **22** | 0 | **23** | 189 |
| 07:30 AM | 40 | 1 | 4 | 45 | 0 | **47** | 62 | **109** | 0 | **2** | 0 | 2 | **3** | 5 | **1** | 9 | 165 |
| 07:45 AM | 65 | **2** | 3 | 70 | 0 | 44 | **63** | 107 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 13 | **190** |
| Total Volume | 251 | 3 | 17 | 271 | 2 | 158 | 220 | 380 | 1 | 2 | 2 | 5 | 6 | 51 | 1 | 58 | 714 |
| % App. Total | 92.6 | 1.1 | 6.3 | | 0.5 | 41.6 | 57.9 | | 20 | 40 | 40 | | 10.3 | 87.9 | 1.7 | | |
| PHF | .815 | .375 | .708 | .836 | .250 | .840 | .873 | .872 | .250 | .250 | .500 | .625 | .500 | .580 | .250 | .630 | .939 |

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City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

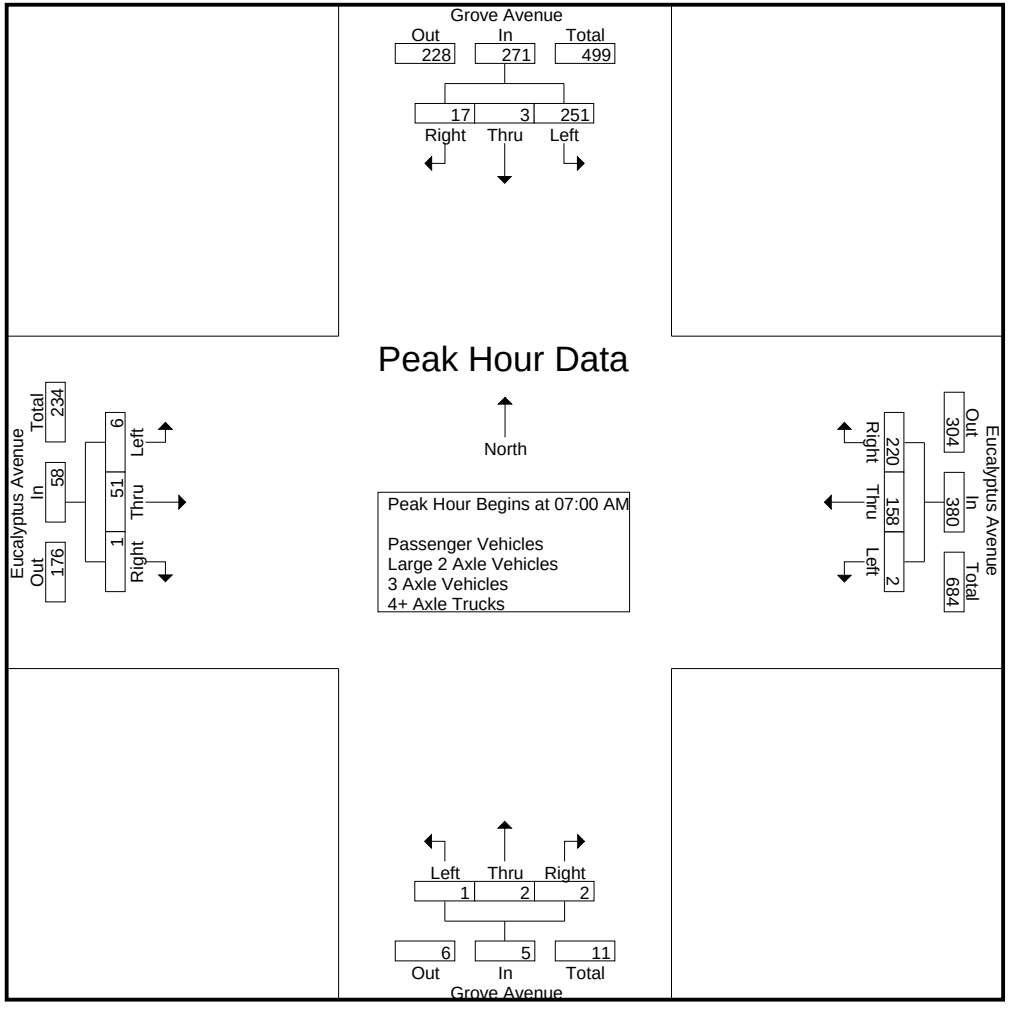

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File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 3

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:30 AM | | | | 07:00 AM | | | | 07:15 AM | | | | |
| +0 mins. | 69 | 0 | **6** | 75 | 0 | **47** | 62 | **109** | **1** | 0 | **1** | **2** | 1 | **22** | 0 | **23** | |
| +15 mins. | **77** | 0 | 4 | **81** | 0 | 44 | **63** | 107 | 0 | 0 | 1 | 1 | **3** | 5 | **1** | 9 | |
| +30 mins. | 40 | 1 | 4 | 45 | 0 | 42 | 61 | 103 | 0 | **2** | 0 | 2 | 1 | 12 | 0 | 13 | |
| +45 mins. | 65 | **2** | 3 | 70 | **3** | 28 | 57 | 88 | 0 | 0 | 0 | 0 | 2 | 12 | 0 | 14 | |
| Total Volume | 251 | 3 | 17 | 271 | 3 | 161 | 243 | 407 | 1 | 2 | 2 | 5 | 7 | 51 | 1 | 59 | |
| % App. Total | 92.6 | 1.1 | 6.3 | | 0.7 | 39.6 | 59.7 | | 20 | 40 | 40 | | 11.9 | 86.4 | 1.7 | | |
| PHF | .815 | .375 | .708 | .836 | .250 | .856 | .964 | .933 | .250 | .250 | .500 | .625 | .583 | .580 | .250 | .641 | |

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City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- Passenger Vehicles

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 67 | 0 | 5 | 0 | 72 | 2 | 35 | 42 | 0 | 79 | 1 | 0 | 1 | 0 | 2 | 1 | 11 | 0 | 0 | 12 | 0 | 165 | 165 |
| 07:15 AM | 74 | 0 | 2 | 0 | 76 | 0 | 31 | 52 | 0 | 83 | 0 | 0 | 1 | 0 | 1 | 1 | 21 | 0 | 0 | 22 | 0 | 182 | 182 |
| 07:30 AM | 40 | 1 | 2 | 0 | 43 | 0 | 47 | 62 | 0 | 109 | 0 | 2 | 0 | 0 | 2 | 3 | 4 | 1 | 0 | 8 | 0 | 162 | 162 |
| 07:45 AM | 64 | 2 | 3 | 0 | 69 | 0 | 39 | 62 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 0 | 13 | 0 | 183 | 183 |
| Total | 245 | 3 | 12 | 0 | 260 | 2 | 152 | 218 | 0 | 372 | 1 | 2 | 2 | 0 | 5 | 6 | 48 | 1 | 0 | 55 | 0 | 692 | 692 |
| 08:00 AM | 38 | 2 | 1 | 0 | 41 | 0 | 42 | 61 | 0 | 103 | 0 | 0 | 1 | 0 | 1 | 2 | 11 | 0 | 0 | 13 | 0 | 158 | 158 |
| 08:15 AM | 17 | 0 | 3 | 0 | 20 | 3 | 27 | 57 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 10 | 0 | 117 | 117 |
| 08:30 AM | 34 | 2 | 5 | 0 | 41 | 0 | 42 | 48 | 0 | 90 | 0 | 0 | 1 | 0 | 1 | 2 | 15 | 0 | 0 | 17 | 0 | 149 | 149 |
| 08:45 AM | 23 | 0 | 2 | 0 | 25 | 1 | 18 | 27 | 0 | 46 | 0 | 1 | 0 | 0 | 1 | 1 | 9 | 0 | 0 | 10 | 0 | 82 | 82 |
| Total | 112 | 4 | 11 | 0 | 127 | 4 | 129 | 193 | 0 | 326 | 0 | 1 | 2 | 0 | 3 | 6 | 44 | 0 | 0 | 50 | 0 | 506 | 506 |
| Grand Total | 357 | 7 | 23 | 0 | 387 | 6 | 281 | 411 | 0 | 698 | 1 | 3 | 4 | 0 | 8 | 12 | 92 | 1 | 0 | 105 | 0 | 1198 | 1198 |
| Apprch % | 92.2 | 1.8 | 5.9 | | | 0.9 | 40.3 | 58.9 | | | 12.5 | 37.5 | 50 | | | 11.4 | 87.6 | 1 | | | | | |
| Total % | 29.8 | 0.6 | 1.9 | | 32.3 | 0.5 | 23.5 | 34.3 | | 58.3 | 0.1 | 0.3 | 0.3 | | 0.7 | 1 | 7.7 | 0.1 | | 8.8 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | 67 | 0 | **5** | 72 | **2** | 35 | 42 | 79 | **1** | 0 | **1** | **2** | 1 | 11 | 0 | 12 | 165 |
| 07:15 AM | **74** | 0 | 2 | **76** | 0 | 31 | 52 | 83 | 0 | 0 | 1 | 1 | 1 | **21** | 0 | **22** | 182 |
| 07:30 AM | 40 | 1 | 2 | 43 | 0 | **47** | **62** | **109** | 0 | **2** | 0 | 2 | **3** | 4 | **1** | 8 | 162 |
| 07:45 AM | 64 | **2** | 3 | 69 | 0 | 39 | 62 | 101 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 13 | **183** |
| Total Volume | 245 | 3 | 12 | 260 | 2 | 152 | 218 | 372 | 1 | 2 | 2 | 5 | 6 | 48 | 1 | 55 | 692 |
| % App. Total | 94.2 | 1.2 | 4.6 | | 0.5 | 40.9 | 58.6 | | 20 | 40 | 40 | | 10.9 | 87.3 | 1.8 | | |
| PHF | .828 | .375 | .600 | .855 | .250 | .809 | .879 | .853 | .250 | .250 | .500 | .625 | .500 | .571 | .250 | .625 | .945 |

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Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

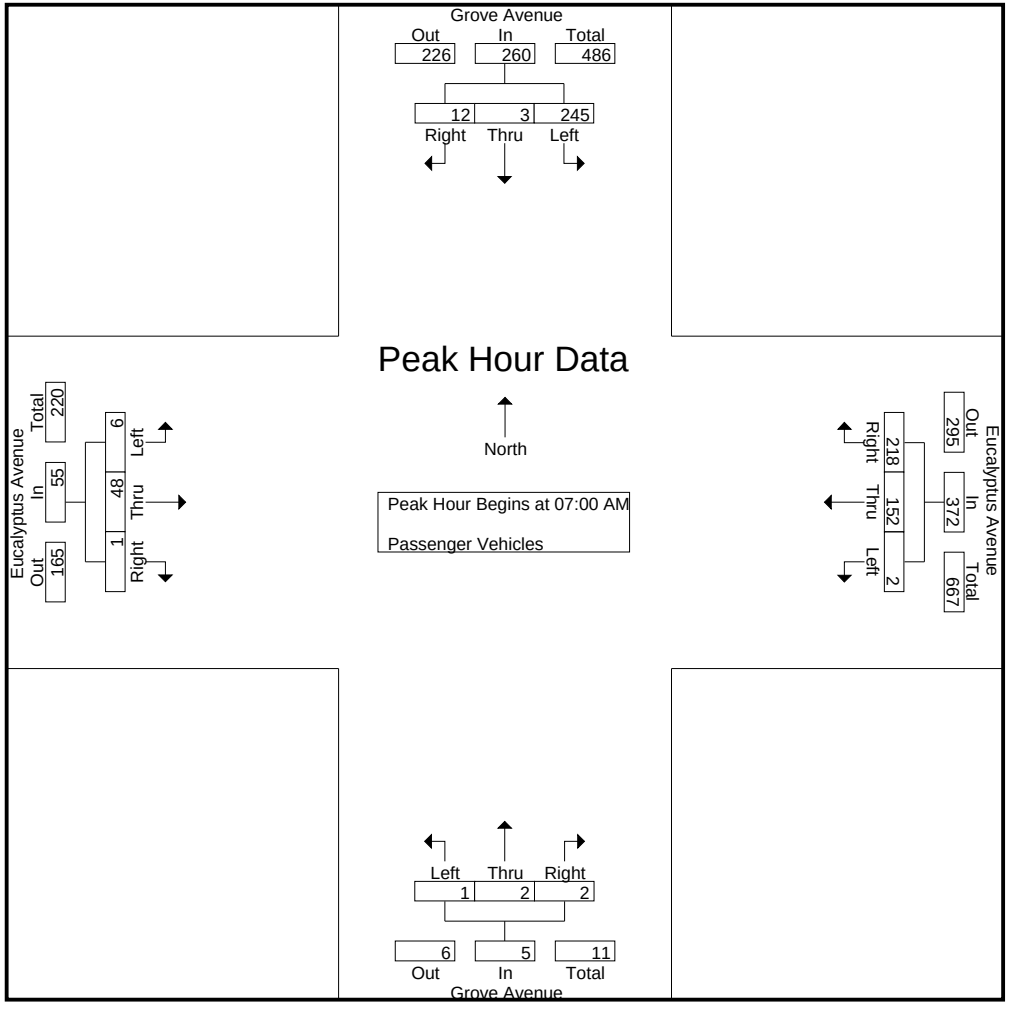

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Site Code : 05125092
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Page No : 3

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | 67 | 0 | **5** | 72 | **2** | 35 | 42 | 79 | **1** | 0 | **1** | **2** | 1 | 11 | 0 | 12 | |
| +15 mins. | **74** | 0 | 2 | **76** | 0 | 31 | 52 | 83 | 0 | 0 | 1 | 1 | 1 | **21** | 0 | **22** | |
| +30 mins. | 40 | 1 | 2 | 43 | 0 | **47** | **62** | **109** | 0 | **2** | 0 | 2 | **3** | 4 | **1** | 8 | |
| +45 mins. | 64 | **2** | 3 | 69 | 0 | 39 | 62 | 101 | 0 | 0 | 0 | 0 | 1 | 12 | 0 | 13 | |
| Total Volume | 245 | 3 | 12 | 260 | 2 | 152 | 218 | 372 | 1 | 2 | 2 | 5 | 6 | 48 | 1 | 55 | |
| % App. Total | 94.2 | 1.2 | 4.6 | | 0.5 | 40.9 | 58.6 | | 20 | 40 | 40 | | 10.9 | 87.3 | 1.8 | | |
| PHF | .828 | .375 | .600 | .855 | .250 | .809 | .879 | .853 | .250 | .250 | .500 | .625 | .500 | .571 | .250 | .625 | |

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City of Ontario
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E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 07:15 AM | 1 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 07:30 AM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 2 |
| 07:45 AM | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| Total | 2 | 0 | 4 | 0 | 6 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 10 | 10 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 2 | 2 |
| 08:30 AM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 08:45 AM | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 5 | 5 |
| Total | 2 | 0 | 1 | 0 | 3 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 1 | 2 | 0 | 0 | 3 | 0 | 9 | 9 |
| Grand Total | 4 | 0 | 5 | 0 | 9 | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 1 | 0 | 1 | 1 | 3 | 0 | 0 | 4 | 0 | 19 | 19 |
| Apprch % | 44.4 | 0 | 55.6 | | | 0 | 60 | 40 | | | 0 | 0 | 100 | | | 25 | 75 | 0 | | | | | |
| Total % | 21.1 | 0 | 26.3 | | 47.4 | 0 | 15.8 | 10.5 | | 26.3 | 0 | 0 | 5.3 | | 5.3 | 5.3 | 15.8 | 0 | | 21.1 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 07:15 AM | **1** | 0 | **2** | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **3** |
| 07:30 AM | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 2 |
| 07:45 AM | 1 | 0 | 0 | 1 | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Total Volume | 2 | 0 | 4 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 10 |
| % App. Total | 33.3 | 0 | 66.7 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .500 | .000 | .500 | .500 | .000 | .375 | .000 | .375 | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | .833 |

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E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

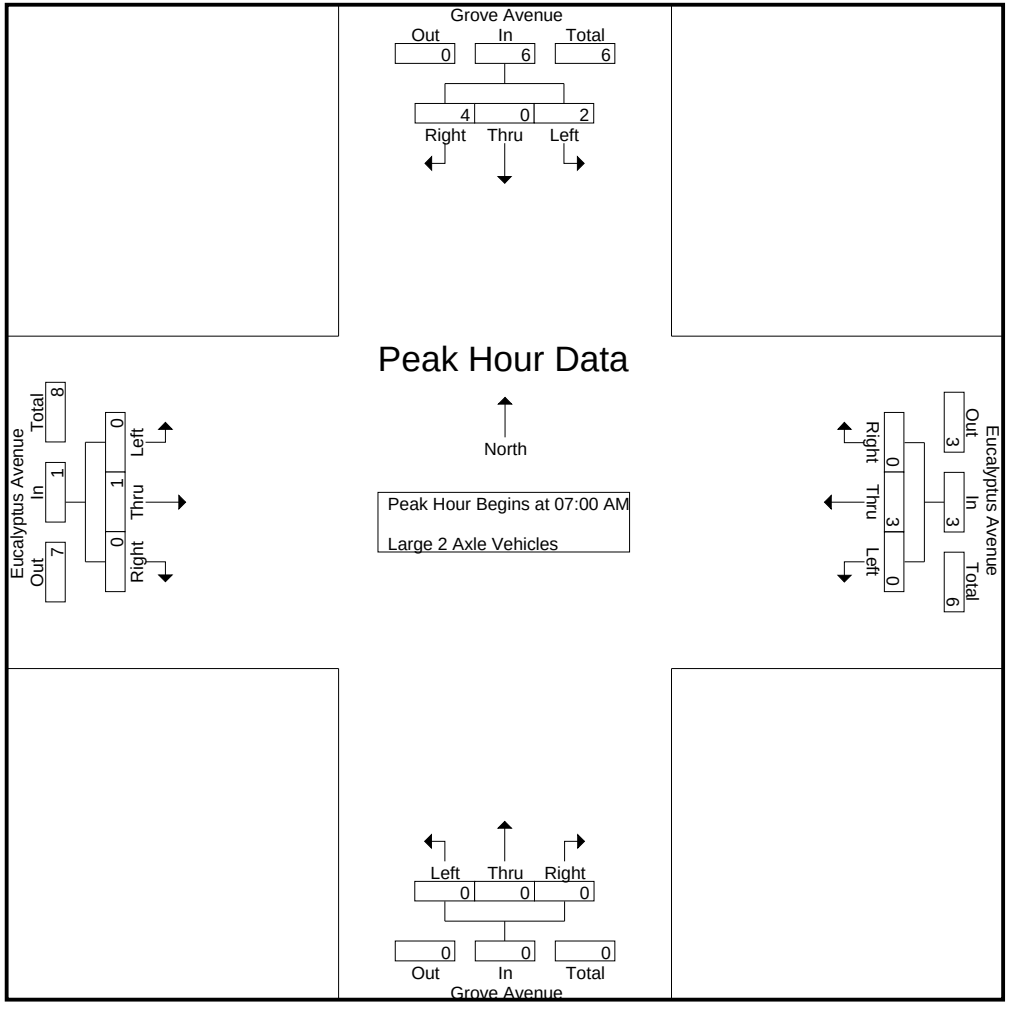

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| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +15 mins. | **1** | 0 | **2** | **3** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | |
| +45 mins. | 1 | 0 | 0 | 1 | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 2 | 0 | 4 | 6 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | |
| % App. Total | 33.3 | 0 | 66.7 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .500 | .000 | .500 | .500 | .000 | .375 | .000 | .375 | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | |

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City of Ontario
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Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 07:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 07:30 AM | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 3 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| 08:15 AM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 08:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 3 |
| Grand Total | 1 | 1 | 1 | 0 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 6 | 6 |
| Apprch % | 33.3 | 33.3 | 33.3 | | | 0 | 0 | 100 | | | 0 | 0 | 0 | | | 0 | 100 | 0 | | | | | |
| Total % | 16.7 | 16.7 | 16.7 | | 50 | 0 | 0 | 16.7 | | 16.7 | 0 | 0 | 0 | | 0 | 0 | 33.3 | 0 | | 33.3 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | **1** | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 07:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 1 |
| 07:30 AM | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 3 |
| % App. Total | 50 | 0 | 50 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .250 | .000 | .250 | .500 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | .750 |

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File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

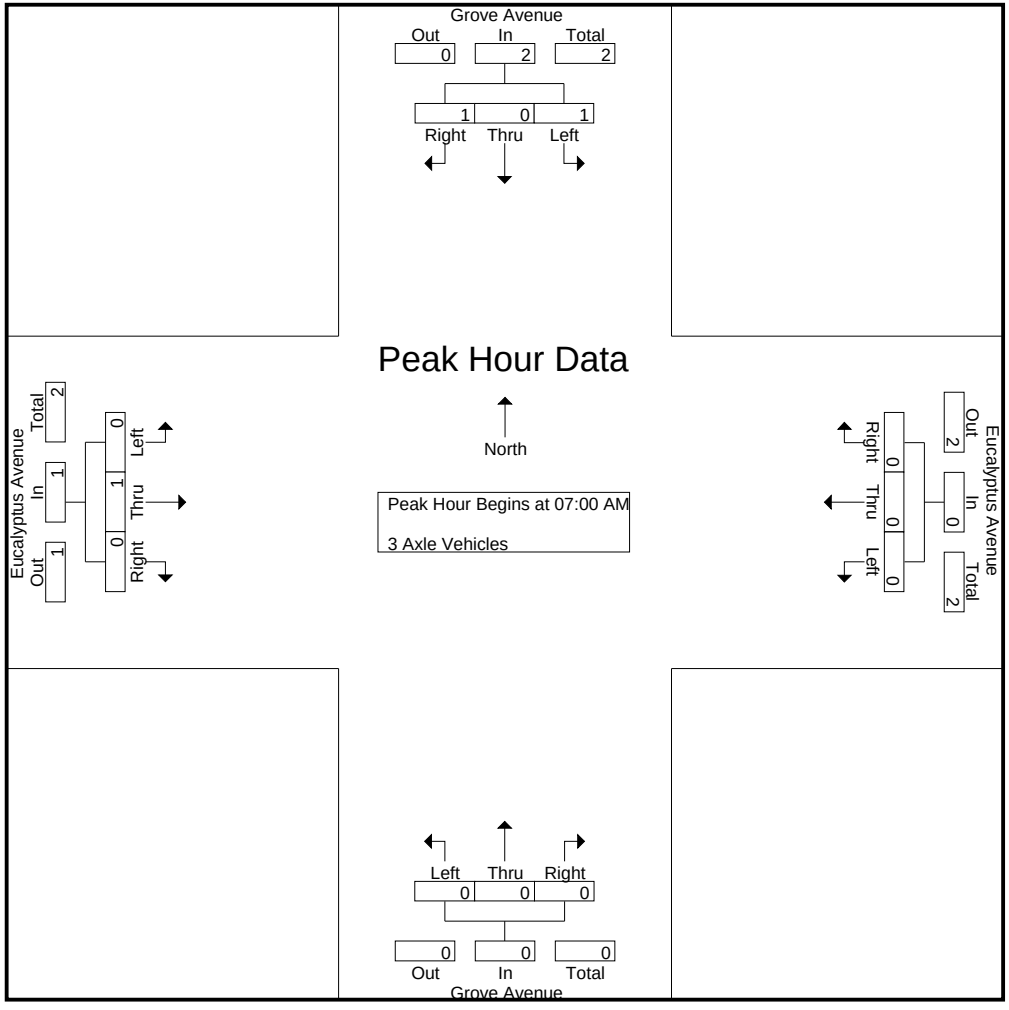

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Start Date : 1/29/2025
Page No : 3

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | **1** | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | |
| +30 mins. | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 1 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | |
| % App. Total | 50 | 0 | 50 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .250 | .000 | .250 | .500 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | |

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City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 2 |
| 07:15 AM | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| Total | 3 | 0 | 0 | 0 | 3 | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 9 | 9 |
| 08:00 AM | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 08:15 AM | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 08:30 AM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 08:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 |
| Total | 5 | 1 | 0 | 0 | 6 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 9 | 9 |
| Grand Total | 8 | 1 | 0 | 0 | 9 | 0 | 4 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 18 | 18 |
| Apprch % | 88.9 | 11.1 | 0 | | | 0 | 57.1 | 42.9 | | | 0 | 0 | 0 | | | 0 | 100 | 0 | | | | | |
| Total % | 44.4 | 5.6 | 0 | | 50 | 0 | 22.2 | 16.7 | | 38.9 | 0 | 0 | 0 | | 0 | 0 | 11.1 | 0 | | 11.1 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | |
| 07:00 AM | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 2 |
| 07:15 AM | **2** | 0 | 0 | **2** | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | **3** | 1 | **4** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **4** |
| Total Volume | 3 | 0 | 0 | 3 | 0 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 9 |
| % App. Total | 100 | 0 | 0 | | 0 | 60 | 40 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .375 | .000 | .000 | .375 | .000 | .250 | .500 | .313 | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | .563 |

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E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc AM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

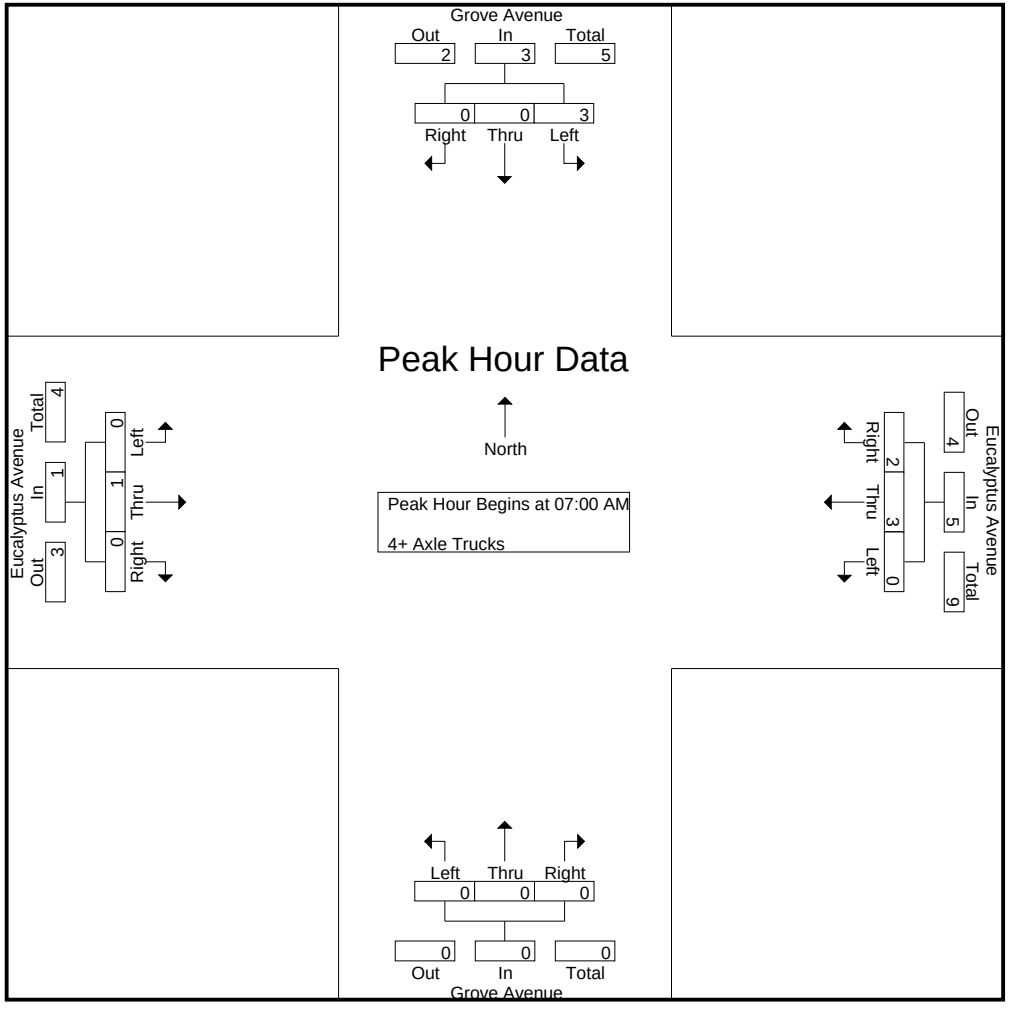

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| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 07:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | |
| +15 mins. | **2** | 0 | 0 | **2** | 0 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | **3** | 1 | **4** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 3 | 0 | 0 | 3 | 0 | 3 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | |
| % App. Total | 100 | 0 | 0 | | 0 | 60 | 40 | | 0 | 0 | 0 | | 0 | 100 | 0 | | |
| PHF | .375 | .000 | .000 | .375 | .000 | .250 | .500 | .313 | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | |

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City of Ontario
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File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 31 | 1 | 5 | 0 | 37 | 0 | 12 | 40 | 0 | 52 | 0 | 1 | 0 | 0 | 1 | 4 | 22 | 0 | 0 | 26 | 0 | 116 | 116 |
| 04:15 PM | 30 | 1 | 2 | 0 | 33 | 0 | 14 | 47 | 0 | 61 | 0 | 2 | 1 | 0 | 3 | 6 | 28 | 0 | 0 | 34 | 0 | 131 | 131 |
| 04:30 PM | 43 | 3 | 1 | 0 | 47 | 0 | 28 | 48 | 0 | 76 | 0 | 1 | 0 | 0 | 1 | 7 | 18 | 0 | 0 | 25 | 0 | 149 | 149 |
| 04:45 PM | 46 | 1 | 3 | 0 | 50 | 1 | 10 | 30 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 4 | 36 | 0 | 0 | 40 | 0 | 131 | 131 |
| Total | 150 | 6 | 11 | 0 | 167 | 1 | 64 | 165 | 0 | 230 | 0 | 4 | 1 | 0 | 5 | 21 | 104 | 0 | 0 | 125 | 0 | 527 | 527 |
| 05:00 PM | 74 | 2 | 1 | 0 | 77 | 0 | 11 | 46 | 0 | 57 | 1 | 1 | 0 | 0 | 2 | 2 | 41 | 1 | 0 | 44 | 0 | 180 | 180 |
| 05:15 PM | 53 | 0 | 2 | 0 | 55 | 0 | 17 | 41 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 4 | 46 | 1 | 0 | 51 | 0 | 164 | 164 |
| 05:30 PM | 75 | 0 | 2 | 0 | 77 | 1 | 21 | 57 | 0 | 79 | 0 | 1 | 0 | 0 | 1 | 1 | 45 | 0 | 0 | 46 | 0 | 203 | 203 |
| 05:45 PM | 104 | 2 | 1 | 0 | 107 | 0 | 17 | 53 | 0 | 70 | 0 | 0 | 1 | 0 | 1 | 3 | 40 | 0 | 0 | 43 | 0 | 221 | 221 |
| Total | 306 | 4 | 6 | 0 | 316 | 1 | 66 | 197 | 0 | 264 | 1 | 2 | 1 | 0 | 4 | 10 | 172 | 2 | 0 | 184 | 0 | 768 | 768 |
| Grand Total | 456 | 10 | 17 | 0 | 483 | 2 | 130 | 362 | 0 | 494 | 1 | 6 | 2 | 0 | 9 | 31 | 276 | 2 | 0 | 309 | 0 | 1295 | 1295 |
| Apprch % | 94.4 | 2.1 | 3.5 | | | 0.4 | 26.3 | 73.3 | | | 11.1 | 66.7 | 22.2 | | | 10 | 89.3 | 0.6 | | | | | |
| Total % | 35.2 | 0.8 | 1.3 | | 37.3 | 0.2 | 10 | 28 | | 38.1 | 0.1 | 0.5 | 0.2 | | 0.7 | 2.4 | 21.3 | 0.2 | | 23.9 | 0 | 100 | |
| Passenger Vehicles | 447 | 4 | 17 | | 468 | 1 | 125 | 359 | | 485 | 1 | 3 | 2 | | 6 | 29 | 267 | 0 | | 296 | 0 | 0 | 1255 |
| % Passenger Vehicles | 98 | 40 | 100 | 0 | 96.9 | 50 | 96.2 | 99.2 | 0 | 98.2 | 100 | 50 | 100 | 0 | 66.7 | 93.5 | 96.7 | 0 | 0 | 95.8 | 0 | 0 | 96.9 |
| Large 2 Axle Vehicles | 4 | 0 | 0 | | 4 | 0 | 1 | 1 | | 2 | 0 | 0 | 0 | | 0 | 0 | 4 | 0 | | 4 | 0 | 0 | 10 |
| % Large 2 Axle Vehicles | 0.9 | 0 | 0 | 0 | 0.8 | 0 | 0.8 | 0.3 | 0 | 0.4 | 0 | 0 | 0 | 0 | 0 | 0 | 1.4 | 0 | 0 | 1.3 | 0 | 0 | 0.8 |
| 3 Axle Vehicles | 2 | 1 | 0 | | 3 | 0 | 1 | 0 | | 1 | 0 | 0 | 0 | | 0 | 0 | 1 | 2 | | 3 | 0 | 0 | 7 |
| % 3 Axle Vehicles | 0.4 | 10 | 0 | 0 | 0.6 | 0 | 0.8 | 0 | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0.4 | 100 | 0 | 1 | 0 | 0 | 0.5 |
| 4+ Axle Trucks | 3 | 5 | 0 | | 8 | 1 | 3 | 2 | | 6 | 0 | 3 | 0 | | 3 | 2 | 4 | 0 | | 6 | 0 | 0 | 23 |
| % 4+ Axle Trucks | 0.7 | 50 | 0 | 0 | 1.7 | 50 | 2.3 | 0.6 | 0 | 1.2 | 0 | 50 | 0 | 0 | 33.3 | 6.5 | 1.4 | 0 | 0 | 1.9 | 0 | 0 | 1.8 |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 74 | **2** | 1 | 77 | 0 | 11 | 46 | 57 | **1** | **1** | 0 | **2** | 2 | 41 | **1** | 44 | 180 |
| 05:15 PM | 53 | 0 | **2** | 55 | 0 | 17 | 41 | 58 | 0 | 0 | 0 | 0 | **4** | **46** | 1 | **51** | 164 |
| 05:30 PM | 75 | 0 | 2 | 77 | **1** | **21** | **57** | **79** | 0 | 1 | 0 | 1 | 1 | 45 | 0 | 46 | 203 |
| 05:45 PM | **104** | 2 | 1 | **107** | 0 | 17 | 53 | 70 | 0 | 0 | **1** | 1 | 3 | 40 | 0 | 43 | **221** |
| Total Volume | 306 | 4 | 6 | 316 | 1 | 66 | 197 | 264 | 1 | 2 | 1 | 4 | 10 | 172 | 2 | 184 | 768 |
| % App. Total | 96.8 | 1.3 | 1.9 | | 0.4 | 25 | 74.6 | | 25 | 50 | 25 | | 5.4 | 93.5 | 1.1 | | |
| PHF | .736 | .500 | .750 | .738 | .250 | .786 | .864 | .835 | .250 | .500 | .250 | .500 | .625 | .935 | .500 | .902 | .869 |

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File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

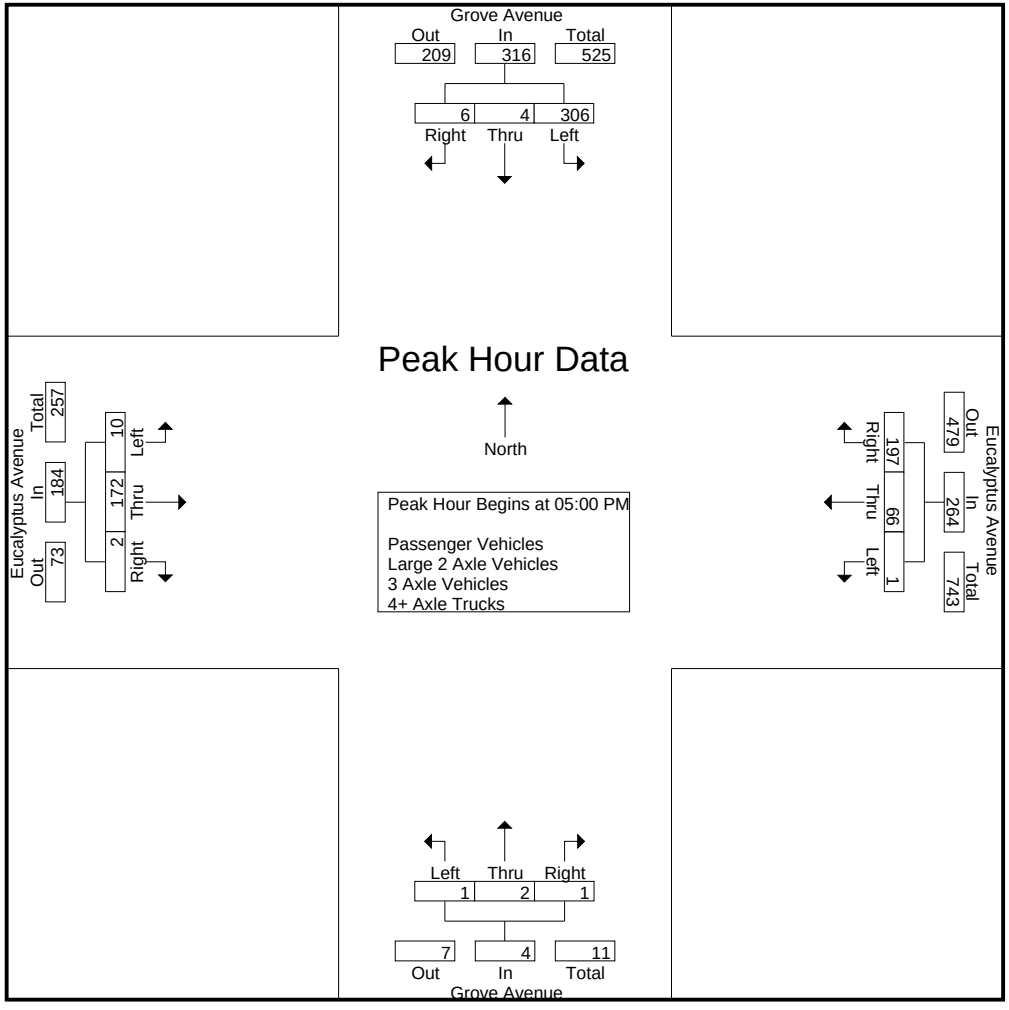

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| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 04:15 PM | | | | 05:00 PM | | | | |
| +0 mins. | 74 | **2** | 1 | 77 | 0 | 11 | 46 | 57 | 0 | **2** | **1** | **3** | 2 | 41 | **1** | 44 | |
| +15 mins. | 53 | 0 | **2** | 55 | 0 | 17 | 41 | 58 | 0 | 1 | 0 | 1 | **4** | **46** | 1 | **51** | |
| +30 mins. | 75 | 0 | 2 | 77 | **1** | **21** | **57** | **79** | 0 | 0 | 0 | 0 | 1 | 45 | 0 | 46 | |
| +45 mins. | **104** | 2 | 1 | **107** | 0 | 17 | 53 | 70 | **1** | 1 | 0 | 2 | 3 | 40 | 0 | 43 | |
| Total Volume | 306 | 4 | 6 | 316 | 1 | 66 | 197 | 264 | 1 | 4 | 1 | 6 | 10 | 172 | 2 | 184 | |
| % App. Total | 96.8 | 1.3 | 1.9 | | 0.4 | 25 | 74.6 | | 16.7 | 66.7 | 16.7 | | 5.4 | 93.5 | 1.1 | | |
| PHF | .736 | .500 | .750 | .738 | .250 | .786 | .864 | .835 | .250 | .500 | .250 | .500 | .625 | .935 | .500 | .902 | |

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File Name : 01_ONT_Gro_Euc PM
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Groups Printed- Passenger Vehicles

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 27 | 1 | 5 | 0 | 33 | 0 | 12 | 38 | 0 | 50 | 0 | 1 | 0 | 0 | 1 | 3 | 19 | 0 | 0 | 22 | 0 | 106 | 106 |
| 04:15 PM | 30 | 0 | 2 | 0 | 32 | 0 | 13 | 47 | 0 | 60 | 0 | 1 | 1 | 0 | 2 | 6 | 25 | 0 | 0 | 31 | 0 | 125 | 125 |
| 04:30 PM | 42 | 0 | 1 | 0 | 43 | 0 | 25 | 47 | 0 | 72 | 0 | 1 | 0 | 0 | 1 | 7 | 18 | 0 | 0 | 25 | 0 | 141 | 141 |
| 04:45 PM | 43 | 0 | 3 | 0 | 46 | 1 | 10 | 30 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 4 | 36 | 0 | 0 | 40 | 0 | 127 | 127 |
| Total | 142 | 1 | 11 | 0 | 154 | 1 | 60 | 162 | 0 | 223 | 0 | 3 | 1 | 0 | 4 | 20 | 98 | 0 | 0 | 118 | 0 | 499 | 499 |
| 05:00 PM | 73 | 1 | 1 | 0 | 75 | 0 | 11 | 46 | 0 | 57 | 1 | 0 | 0 | 0 | 1 | 2 | 41 | 0 | 0 | 43 | 0 | 176 | 176 |
| 05:15 PM | 53 | 0 | 2 | 0 | 55 | 0 | 17 | 41 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 3 | 46 | 0 | 0 | 49 | 0 | 162 | 162 |
| 05:30 PM | 75 | 0 | 2 | 0 | 77 | 0 | 20 | 57 | 0 | 77 | 0 | 0 | 0 | 0 | 0 | 1 | 42 | 0 | 0 | 43 | 0 | 197 | 197 |
| 05:45 PM | 104 | 2 | 1 | 0 | 107 | 0 | 17 | 53 | 0 | 70 | 0 | 0 | 1 | 0 | 1 | 3 | 40 | 0 | 0 | 43 | 0 | 221 | 221 |
| Total | 305 | 3 | 6 | 0 | 314 | 0 | 65 | 197 | 0 | 262 | 1 | 0 | 1 | 0 | 2 | 9 | 169 | 0 | 0 | 178 | 0 | 756 | 756 |
| Grand Total | 447 | 4 | 17 | 0 | 468 | 1 | 125 | 359 | 0 | 485 | 1 | 3 | 2 | 0 | 6 | 29 | 267 | 0 | 0 | 296 | 0 | 1255 | 1255 |
| Apprch % | 95.5 | 0.9 | 3.6 | | | 0.2 | 25.8 | 74 | | | 16.7 | 50 | 33.3 | | | 9.8 | 90.2 | 0 | | | | | |
| Total % | 35.6 | 0.3 | 1.4 | | 37.3 | 0.1 | 10 | 28.6 | | 38.6 | 0.1 | 0.2 | 0.2 | | 0.5 | 2.3 | 21.3 | 0 | | 23.6 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 73 | 1 | 1 | 75 | 0 | 11 | 46 | 57 | **1** | 0 | 0 | **1** | 2 | 41 | 0 | 43 | 176 |
| 05:15 PM | 53 | 0 | **2** | 55 | 0 | 17 | 41 | 58 | 0 | 0 | 0 | 0 | **3** | **46** | 0 | **49** | 162 |
| 05:30 PM | 75 | 0 | 2 | 77 | 0 | **20** | **57** | **77** | 0 | 0 | 0 | 0 | 1 | 42 | 0 | 43 | 197 |
| 05:45 PM | **104** | **2** | 1 | **107** | 0 | 17 | 53 | 70 | 0 | 0 | **1** | 1 | 3 | 40 | 0 | 43 | **221** |
| Total Volume | 305 | 3 | 6 | 314 | 0 | 65 | 197 | 262 | 1 | 0 | 1 | 2 | 9 | 169 | 0 | 178 | 756 |
| % App. Total | 97.1 | 1 | 1.9 | | 0 | 24.8 | 75.2 | | 50 | 0 | 50 | | 5.1 | 94.9 | 0 | | |
| PHF | .733 | .375 | .750 | .734 | .000 | .813 | .864 | .851 | .250 | .000 | .250 | .500 | .750 | .918 | .000 | .908 | .855 |

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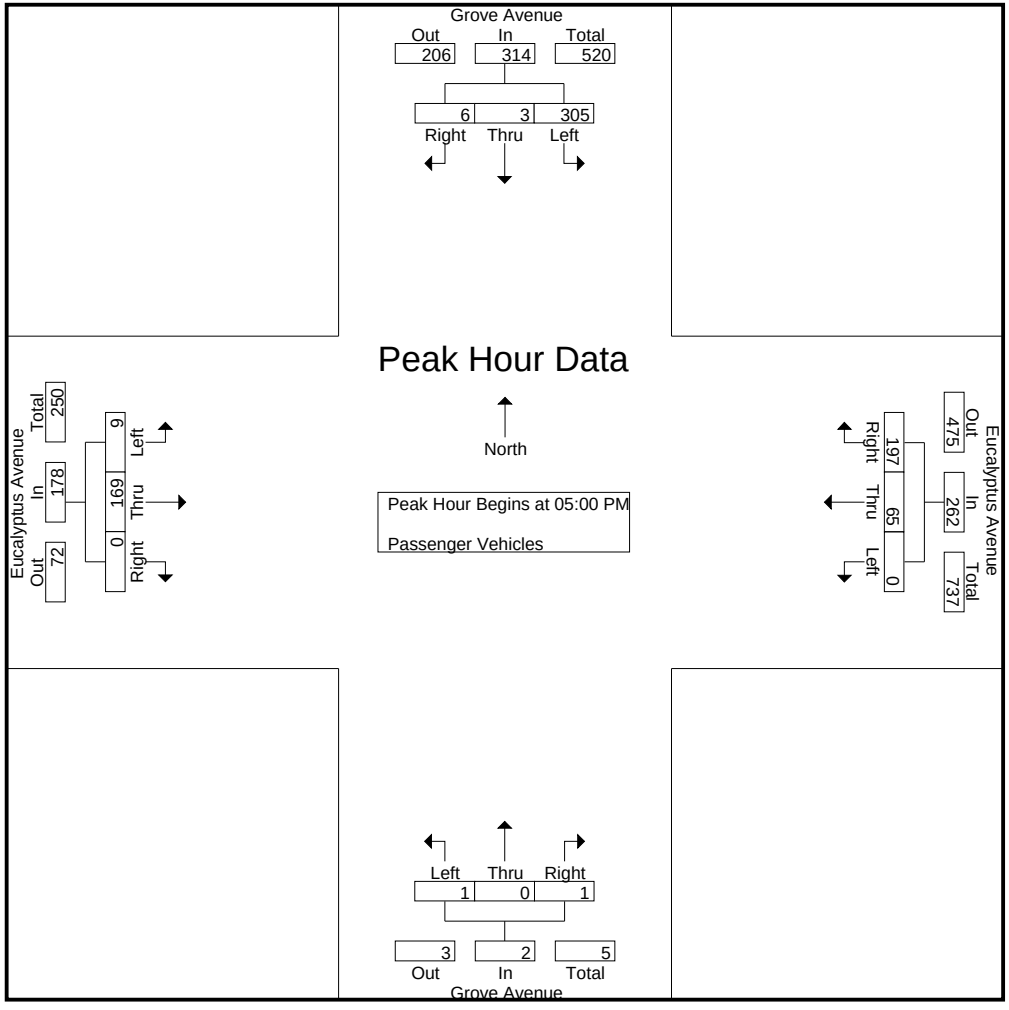

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| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | |
| +0 mins. | 73 | 1 | 1 | 75 | 0 | 11 | 46 | 57 | **1** | 0 | 0 | **1** | 2 | 41 | 0 | 43 | |
| +15 mins. | 53 | 0 | **2** | 55 | 0 | 17 | 41 | 58 | 0 | 0 | 0 | 0 | **3** | **46** | 0 | **49** | |
| +30 mins. | 75 | 0 | 2 | 77 | 0 | **20** | **57** | **77** | 0 | 0 | 0 | 0 | 1 | 42 | 0 | 43 | |
| +45 mins. | **104** | **2** | 1 | **107** | 0 | 17 | 53 | 70 | 0 | 0 | **1** | 1 | 3 | 40 | 0 | 43 | |
| Total Volume | 305 | 3 | 6 | 314 | 0 | 65 | 197 | 262 | 1 | 0 | 1 | 2 | 9 | 169 | 0 | 178 | |
| % App. Total | 97.1 | 1 | 1.9 | | 0 | 24.8 | 75.2 | | 50 | 0 | 50 | | 5.1 | 94.9 | 0 | | |
| PHF | .733 | .375 | .750 | .734 | .000 | .813 | .864 | .851 | .250 | .000 | .250 | .500 | .750 | .918 | .000 | .908 | |

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 3 | 3 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 4 | 4 |
| 04:30 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 04:45 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 3 | 0 | 0 | 0 | 3 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 9 | 9 |
| 05:00 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Grand Total | 4 | 0 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 10 | 10 |
| Apprch % | 100 | 0 | 0 | | | 0 | 50 | 50 | | | 0 | 0 | 0 | | | 0 | 100 | 0 | | | | | |
| Total % | 40 | 0 | 0 | | 40 | 0 | 10 | 10 | | 20 | 0 | 0 | 0 | | 0 | 0 | 40 | 0 | | 40 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | **1** | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| % App. Total | 100 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | |
| PHF | .250 | .000 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .250 |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

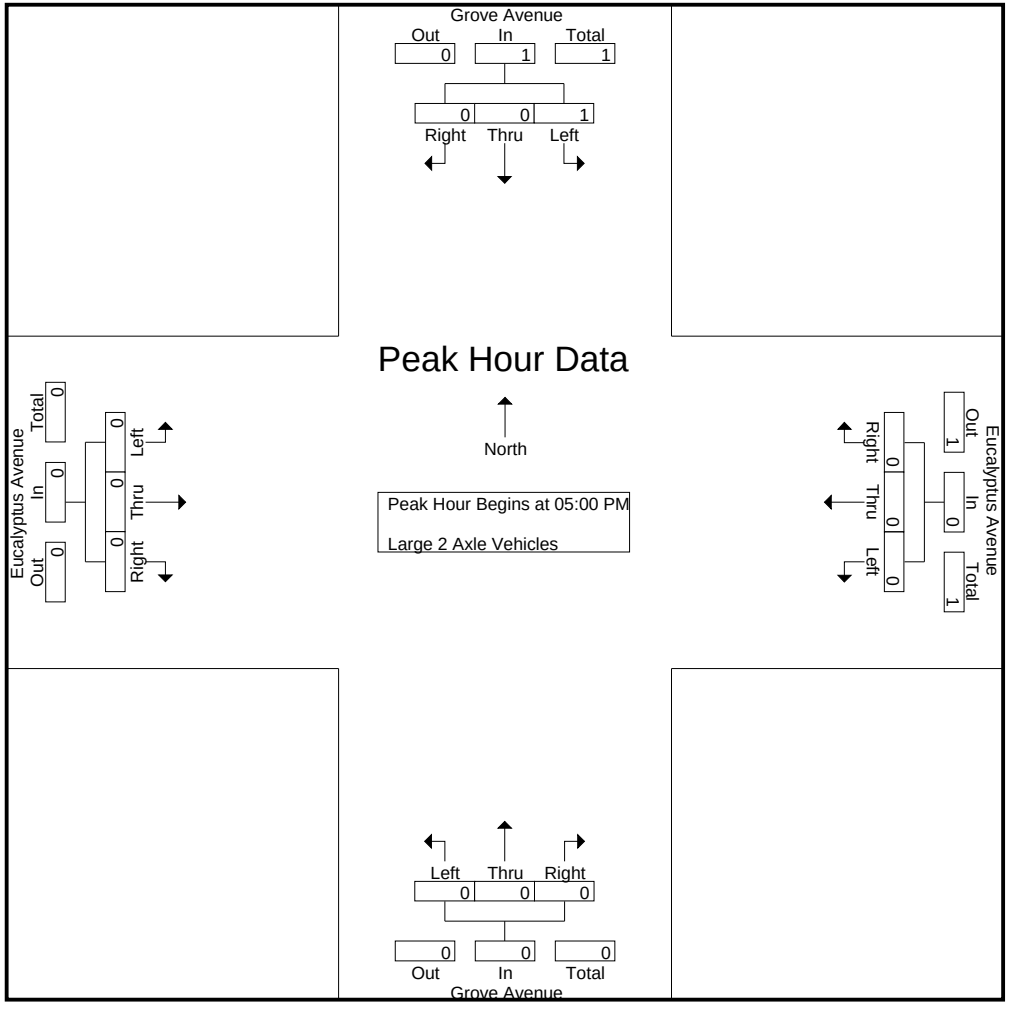

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City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 3

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | |
| +0 mins. | **1** | 0 | 0 | **1** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| % App. Total | 100 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | 0 | | |
| PHF | .250 | .000 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:30 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 04:45 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Total | 2 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 2 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3 | 0 | 4 | 4 |
| Grand Total | 2 | 1 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 3 | 0 | 7 | 7 |
| Apprch % | 66.7 | 33.3 | 0 | | | 0 | 100 | 0 | | | 0 | 0 | 0 | | | 0 | 33.3 | 66.7 | | | | | |
| Total % | 28.6 | 14.3 | 0 | | 42.9 | 0 | 14.3 | 0 | | 14.3 | 0 | 0 | 0 | | 0 | 0 | 14.3 | 28.6 | | 42.9 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | **1** | 1 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | **1** | 0 | 1 | **2** |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | 4 |
| % App. Total | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 33.3 | 66.7 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .250 | .500 | .750 | .500 |

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

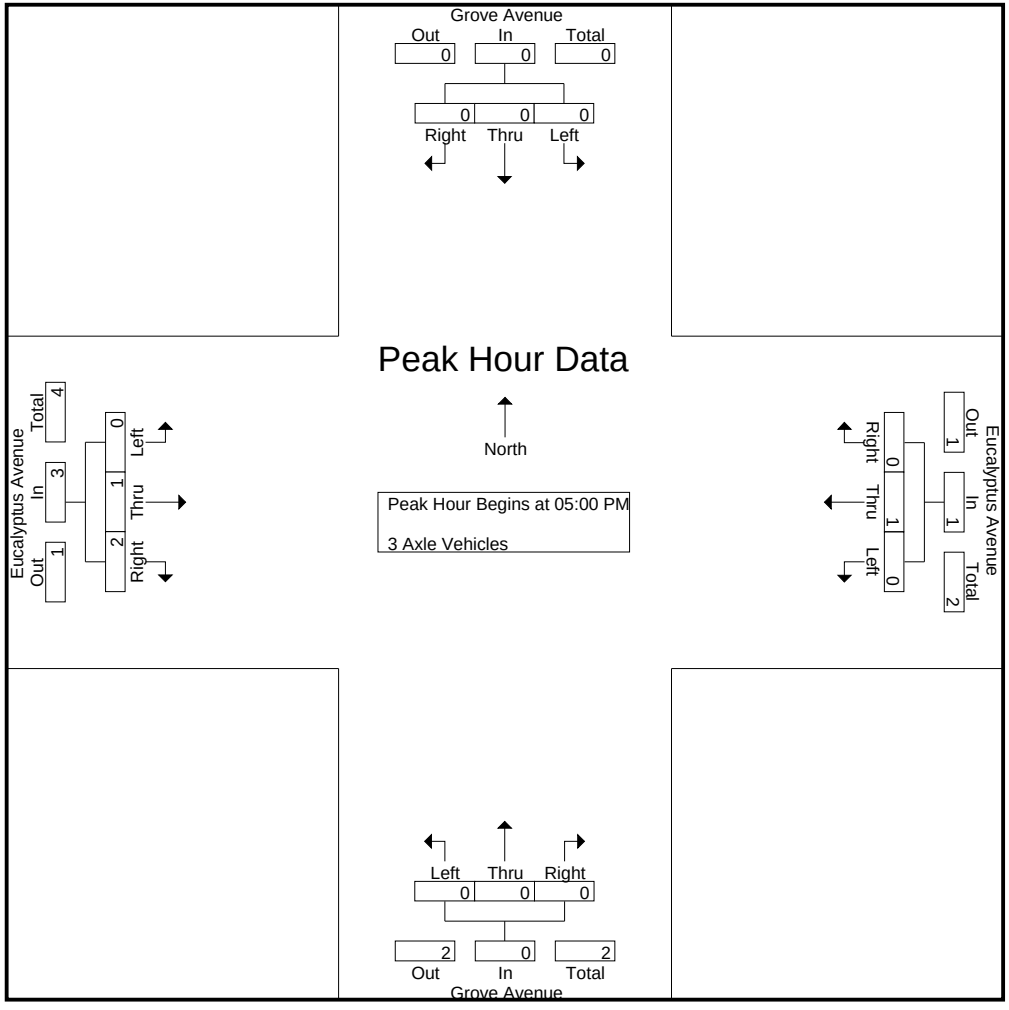

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City of Ontario
N/S: Grove Avenue
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Weather: Clear

File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 3

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | |
| +0 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | **1** | |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | |
| +30 mins. | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | **1** | 0 | 1 | |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 3 | |
| % App. Total | 0 | 0 | 0 | | 0 | 100 | 0 | | 0 | 0 | 0 | | 0 | 33.3 | 66.7 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .250 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .250 | .500 | .750 | |

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City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Grove Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Grove Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 0 | 6 | 6 |
| 04:15 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 04:30 PM | 0 | 2 | 0 | 0 | 2 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| 04:45 PM | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| Total | 3 | 4 | 0 | 0 | 7 | 0 | 3 | 2 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 3 | 0 | 16 | 16 |
| 05:00 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 4 | 4 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 3 | 0 | 7 | 7 |
| Grand Total | 3 | 5 | 0 | 0 | 8 | 1 | 3 | 2 | 0 | 6 | 0 | 3 | 0 | 0 | 3 | 2 | 4 | 0 | 0 | 6 | 0 | 23 | 23 |
| Apprch % | 37.5 | 62.5 | 0 | | | 16.7 | 50 | 33.3 | | | 0 | 100 | 0 | | | 33.3 | 66.7 | 0 | | | | | |
| Total % | 13 | 21.7 | 0 | | 34.8 | 4.3 | 13 | 8.7 | | 26.1 | 0 | 13 | 0 | | 13 | 8.7 | 17.4 | 0 | | 26.1 | 0 | 100 | |

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 2 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | 0 | 1 | 1 |
| 05:30 PM | 0 | 0 | 0 | 0 | **1** | 0 | 0 | **1** | 0 | 1 | 0 | 1 | 0 | **2** | 0 | **2** | **4** |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Volume | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 1 | 2 | 0 | 3 | 7 |
| % App. Total | 0 | 100 | 0 | | 100 | 0 | 0 | | 0 | 100 | 0 | | 33.3 | 66.7 | 0 | | |
| PHF | .000 | .250 | .000 | .250 | .250 | .000 | .000 | .250 | .000 | .500 | .000 | .500 | .250 | .250 | .000 | .375 | .438 |

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City of Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 2

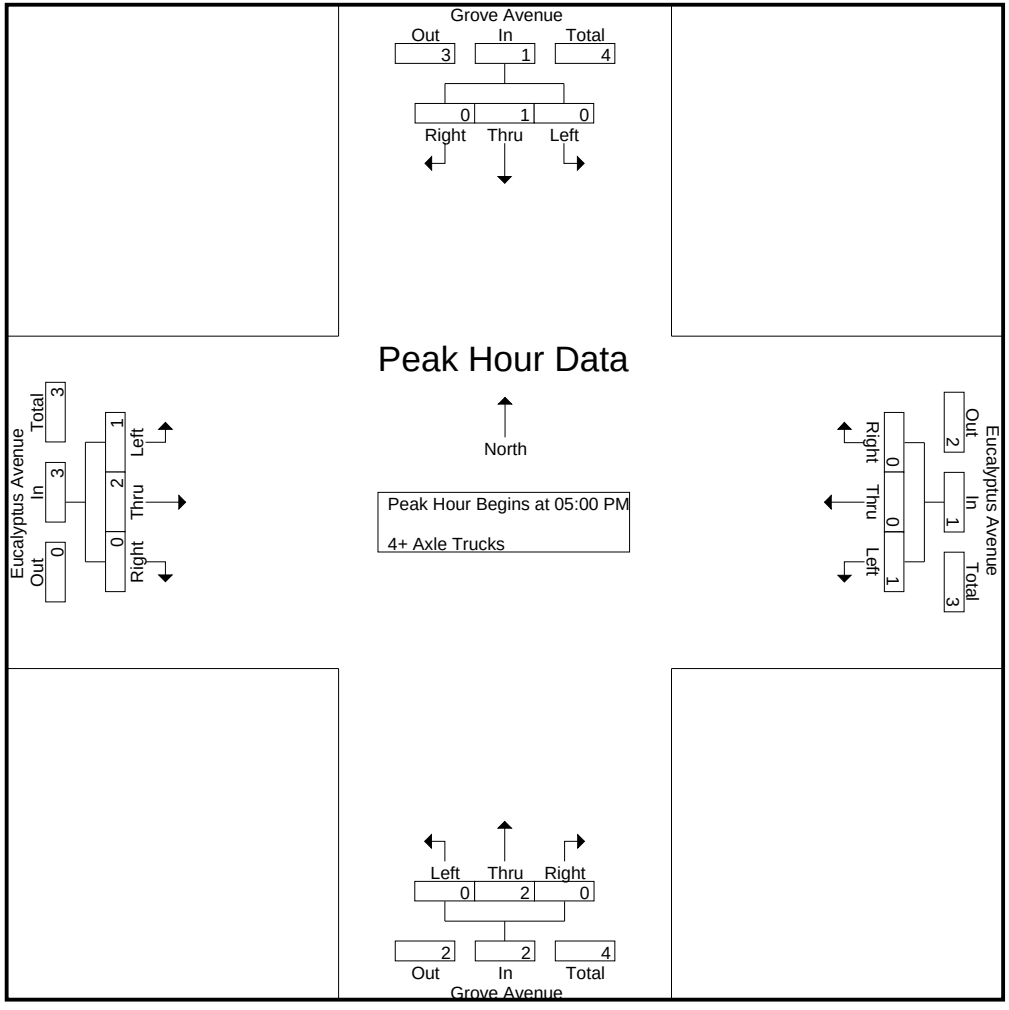

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City of Ontario
N/S: Grove Avenue
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File Name : 01_ONT_Gro_Euc PM
Site Code : 05125092
Start Date : 1/29/2025
Page No : 3

| | Grove Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Grove Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | |
| +0 mins. | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | 0 | **1** | 0 | **1** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **1** | 0 | 0 | 1 | |
| +30 mins. | 0 | 0 | 0 | 0 | **1** | 0 | 0 | **1** | 0 | 1 | 0 | 1 | 0 | **2** | 0 | **2** | |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 2 | 1 | 2 | 0 | 3 | |
| % App. Total | 0 | 100 | 0 | | 100 | 0 | 0 | | 0 | 100 | 0 | | 33.3 | 66.7 | 0 | | |
| PHF | .000 | .250 | .000 | .250 | .250 | .000 | .000 | .250 | .000 | .500 | .000 | .500 | .250 | .250 | .000 | .375 | |

Location: Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue

Date: 1/29/2025
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Grove Avenue | East Leg<br>Eucalyptus Avenue | South Leg<br>Grove Avenue | West Leg<br>Eucalyptus Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg<br>Grove Avenue | East Leg<br>Eucalyptus Avenue | South Leg<br>Grove Avenue | West Leg<br>Eucalyptus Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

Location: Ontario
N/S: Grove Avenue
E/W: Eucalyptus Avenue

Date: 1/29/2025
Day: Wednesday

**BICYCLES**

| | Southbound Grove Avenue | | | Westbound Eucalyptus Avenue | | | Northbound Grove Avenue | | | Eastbound Eucalyptus Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |

| | Southbound Grove Avenue | | | Westbound Eucalyptus Avenue | | | Northbound Grove Avenue | | | Eastbound Eucalyptus Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

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PO Box 1178
Corona, CA 92878
951-268-6268

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Walker Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 29_ONT_Wal_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Walker Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Walker Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 0 | 6 | 0 | 8 | 17 | 107 | 2 | 0 | 126 | 5 | 1 | 18 | 0 | 24 | 2 | 42 | 12 | 0 | 56 | 0 | 214 | 214 |
| 07:15 AM | 1 | 2 | 8 | 0 | 11 | 16 | 152 | 1 | 0 | 169 | 17 | 4 | 19 | 0 | 40 | 1 | 64 | 12 | 0 | 77 | 0 | 297 | 297 |
| 07:30 AM | 2 | 1 | 10 | 0 | 13 | 15 | 212 | 3 | 0 | 230 | 18 | 3 | 26 | 0 | 47 | 2 | 86 | 12 | 0 | 100 | 0 | 390 | 390 |
| 07:45 AM | 4 | 0 | 9 | 0 | 13 | 25 | 167 | 4 | 0 | 196 | 23 | 3 | 30 | 0 | 56 | 3 | 134 | 14 | 0 | 151 | 0 | 416 | 416 |
| Total | 9 | 3 | 33 | 0 | 45 | 73 | 638 | 10 | 0 | 721 | 63 | 11 | 93 | 0 | 167 | 8 | 326 | 50 | 0 | 384 | 0 | 1317 | 1317 |
| 08:00 AM | 4 | 5 | 12 | 0 | 21 | 17 | 161 | 4 | 0 | 182 | 21 | 5 | 38 | 0 | 64 | 4 | 95 | 18 | 0 | 117 | 0 | 384 | 384 |
| 08:15 AM | 2 | 4 | 8 | 0 | 14 | 7 | 137 | 6 | 0 | 150 | 8 | 2 | 28 | 0 | 38 | 5 | 92 | 12 | 0 | 109 | 0 | 311 | 311 |
| 08:30 AM | 0 | 2 | 8 | 0 | 10 | 11 | 118 | 2 | 0 | 131 | 11 | 1 | 16 | 0 | 28 | 0 | 86 | 11 | 0 | 97 | 0 | 266 | 266 |
| 08:45 AM | 3 | 1 | 6 | 0 | 10 | 14 | 160 | 2 | 0 | 176 | 8 | 1 | 15 | 0 | 24 | 7 | 89 | 10 | 0 | 106 | 0 | 316 | 316 |
| Total | 9 | 12 | 34 | 0 | 55 | 49 | 576 | 14 | 0 | 639 | 48 | 9 | 97 | 0 | 154 | 16 | 362 | 51 | 0 | 429 | 0 | 1277 | 1277 |
| Grand Total | 18 | 15 | 67 | 0 | 100 | 122 | 1214 | 24 | 0 | 1360 | 111 | 20 | 190 | 0 | 321 | 24 | 688 | 101 | 0 | 813 | 0 | 2594 | 2594 |
| Apprch % | 18 | 15 | 67 | | | 9 | 89.3 | 1.8 | | | 34.6 | 6.2 | 59.2 | | | 3 | 84.6 | 12.4 | | | | | |
| Total % | 0.7 | 0.6 | 2.6 | | 3.9 | 4.7 | 46.8 | 0.9 | | 52.4 | 4.3 | 0.8 | 7.3 | | 12.4 | 0.9 | 26.5 | 3.9 | | 31.3 | 0 | 100 | |

| | Walker Avenue Southbound | | | | Riverside Drive Westbound | | | | Walker Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 2 | 1 | 10 | 13 | 15 | **212** | 3 | **230** | 18 | 3 | 26 | 47 | 2 | 86 | 12 | 100 | 390 |
| 07:45 AM | **4** | 0 | 9 | 13 | **25** | 167 | 4 | 196 | **23** | 3 | 30 | 56 | 3 | **134** | 14 | **151** | **416** |
| 08:00 AM | 4 | **5** | **12** | **21** | 17 | 161 | 4 | 182 | 21 | **5** | **38** | **64** | 4 | 95 | **18** | 117 | 384 |
| 08:15 AM | 2 | 4 | 8 | 14 | 7 | 137 | **6** | 150 | 8 | 2 | 28 | 38 | **5** | 92 | 12 | 109 | 311 |
| Total Volume | 12 | 10 | 39 | 61 | 64 | 677 | 17 | 758 | 70 | 13 | 122 | 205 | 14 | 407 | 56 | 477 | 1501 |
| % App. Total | 19.7 | 16.4 | 63.9 | | 8.4 | 89.3 | 2.2 | | 34.1 | 6.3 | 59.5 | | 2.9 | 85.3 | 11.7 | | |
| PHF | .750 | .500 | .813 | .726 | .640 | .798 | .708 | .824 | .761 | .650 | .803 | .801 | .700 | .759 | .778 | .790 | .902 |

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City of Ontario
N/S: Walker Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 29_ONT_Wal_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

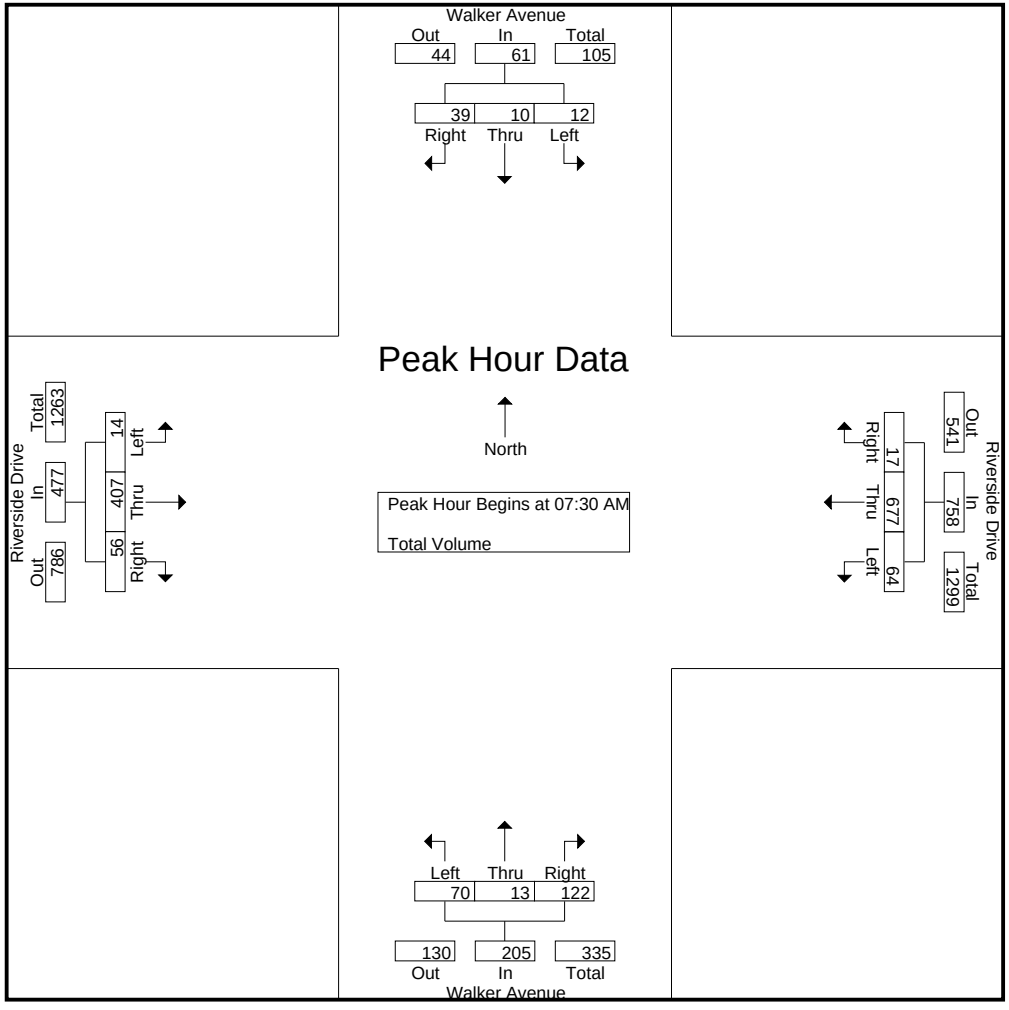

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City of Ontario
N/S: Walker Avenue
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Weather: Clear

File Name : 29_ONT_Wal_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Walker Avenue Southbound | | | | Riverside Drive Westbound | | | | Walker Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:30 AM | | | | |
| +0 mins. | 2 | 1 | 10 | 13 | 16 | 152 | 1 | 169 | 17 | 4 | 19 | 40 | 2 | 86 | 12 | 100 | |
| +15 mins. | **4** | 0 | 9 | 13 | 15 | **212** | 3 | **230** | 18 | 3 | 26 | 47 | 3 | **134** | 14 | **151** | |
| +30 mins. | 4 | **5** | **12** | **21** | **25** | 167 | **4** | 196 | **23** | 3 | 30 | 56 | 4 | 95 | **18** | 117 | |
| +45 mins. | 2 | 4 | 8 | 14 | 17 | 161 | 4 | 182 | 21 | **5** | **38** | **64** | **5** | 92 | 12 | 109 | |
| Total Volume | 12 | 10 | 39 | 61 | 73 | 692 | 12 | 777 | 79 | 15 | 113 | 207 | 14 | 407 | 56 | 477 | |
| % App. Total | 19.7 | 16.4 | 63.9 | | 9.4 | 89.1 | 1.5 | | 38.2 | 7.2 | 54.6 | | 2.9 | 85.3 | 11.7 | | |
| PHF | .750 | .500 | .813 | .726 | .730 | .816 | .750 | .845 | .859 | .750 | .743 | .809 | .700 | .759 | .778 | .790 | |

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City of Ontario
N/S: Walker Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 29_ONT_Wal_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Walker Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Walker Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 4 | 3 | 8 | 0 | 15 | 10 | 133 | 8 | 0 | 151 | 12 | 5 | 29 | 0 | 46 | 4 | 132 | 11 | 0 | 147 | 0 | 359 | 359 |
| 04:15 PM | 1 | 2 | 4 | 0 | 7 | 9 | 122 | 4 | 0 | 135 | 7 | 4 | 33 | 0 | 44 | 6 | 120 | 8 | 0 | 134 | 0 | 320 | 320 |
| 04:30 PM | 3 | 2 | 0 | 0 | 5 | 15 | 103 | 6 | 0 | 124 | 9 | 2 | 24 | 0 | 35 | 6 | 144 | 14 | 0 | 164 | 0 | 328 | 328 |
| 04:45 PM | 3 | 0 | 4 | 0 | 7 | 13 | 134 | 9 | 0 | 156 | 11 | 10 | 34 | 0 | 55 | 7 | 134 | 13 | 0 | 154 | 0 | 372 | 372 |
| Total | 11 | 7 | 16 | 0 | 34 | 47 | 492 | 27 | 0 | 566 | 39 | 21 | 120 | 0 | 180 | 23 | 530 | 46 | 0 | 599 | 0 | 1379 | 1379 |
| 05:00 PM | 4 | 3 | 3 | 0 | 10 | 23 | 144 | 6 | 0 | 173 | 4 | 7 | 22 | 0 | 33 | 8 | 141 | 10 | 0 | 159 | 0 | 375 | 375 |
| 05:15 PM | 1 | 3 | 1 | 0 | 5 | 15 | 134 | 7 | 0 | 156 | 11 | 8 | 24 | 0 | 43 | 7 | 128 | 16 | 0 | 151 | 0 | 355 | 355 |
| 05:30 PM | 0 | 1 | 5 | 0 | 6 | 15 | 125 | 6 | 0 | 146 | 15 | 1 | 30 | 0 | 46 | 5 | 122 | 12 | 0 | 139 | 0 | 337 | 337 |
| 05:45 PM | 1 | 2 | 6 | 0 | 9 | 21 | 106 | 7 | 0 | 134 | 9 | 8 | 23 | 0 | 40 | 8 | 132 | 8 | 0 | 148 | 0 | 331 | 331 |
| Total | 6 | 9 | 15 | 0 | 30 | 74 | 509 | 26 | 0 | 609 | 39 | 24 | 99 | 0 | 162 | 28 | 523 | 46 | 0 | 597 | 0 | 1398 | 1398 |
| Grand Total | 17 | 16 | 31 | 0 | 64 | 121 | 1001 | 53 | 0 | 1175 | 78 | 45 | 219 | 0 | 342 | 51 | 1053 | 92 | 0 | 1196 | 0 | 2777 | 2777 |
| Apprch % | 26.6 | 25 | 48.4 | | | 10.3 | 85.2 | 4.5 | | | 22.8 | 13.2 | 64 | | | 4.3 | 88 | 7.7 | | | | | |
| Total % | 0.6 | 0.6 | 1.1 | | 2.3 | 4.4 | 36 | 1.9 | | 42.3 | 2.8 | 1.6 | 7.9 | | 12.3 | 1.8 | 37.9 | 3.3 | | 43.1 | 0 | 100 | |

| | Walker Avenue Southbound | | | | Riverside Drive Westbound | | | | Walker Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 3 | 0 | 4 | 7 | 13 | 134 | **9** | 156 | 11 | **10** | **34** | **55** | 7 | 134 | 13 | 154 | 372 |
| 05:00 PM | **4** | **3** | 3 | **10** | **23** | **144** | 6 | **173** | 4 | 7 | 22 | 33 | **8** | **141** | 10 | **159** | **375** |
| 05:15 PM | 1 | 3 | 1 | 5 | 15 | 134 | 7 | 156 | 11 | 8 | 24 | 43 | 7 | 128 | **16** | 151 | 355 |
| 05:30 PM | 0 | 1 | **5** | 6 | 15 | 125 | 6 | 146 | **15** | 1 | 30 | 46 | 5 | 122 | 12 | 139 | 337 |
| Total Volume | 8 | 7 | 13 | 28 | 66 | 537 | 28 | 631 | 41 | 26 | 110 | 177 | 27 | 525 | 51 | 603 | 1439 |
| % App. Total | 28.6 | 25 | 46.4 | | 10.5 | 85.1 | 4.4 | | 23.2 | 14.7 | 62.1 | | 4.5 | 87.1 | 8.5 | | |
| PHF | .500 | .583 | .650 | .700 | .717 | .932 | .778 | .912 | .683 | .650 | .809 | .805 | .844 | .931 | .797 | .948 | .959 |

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Weather: Clear

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

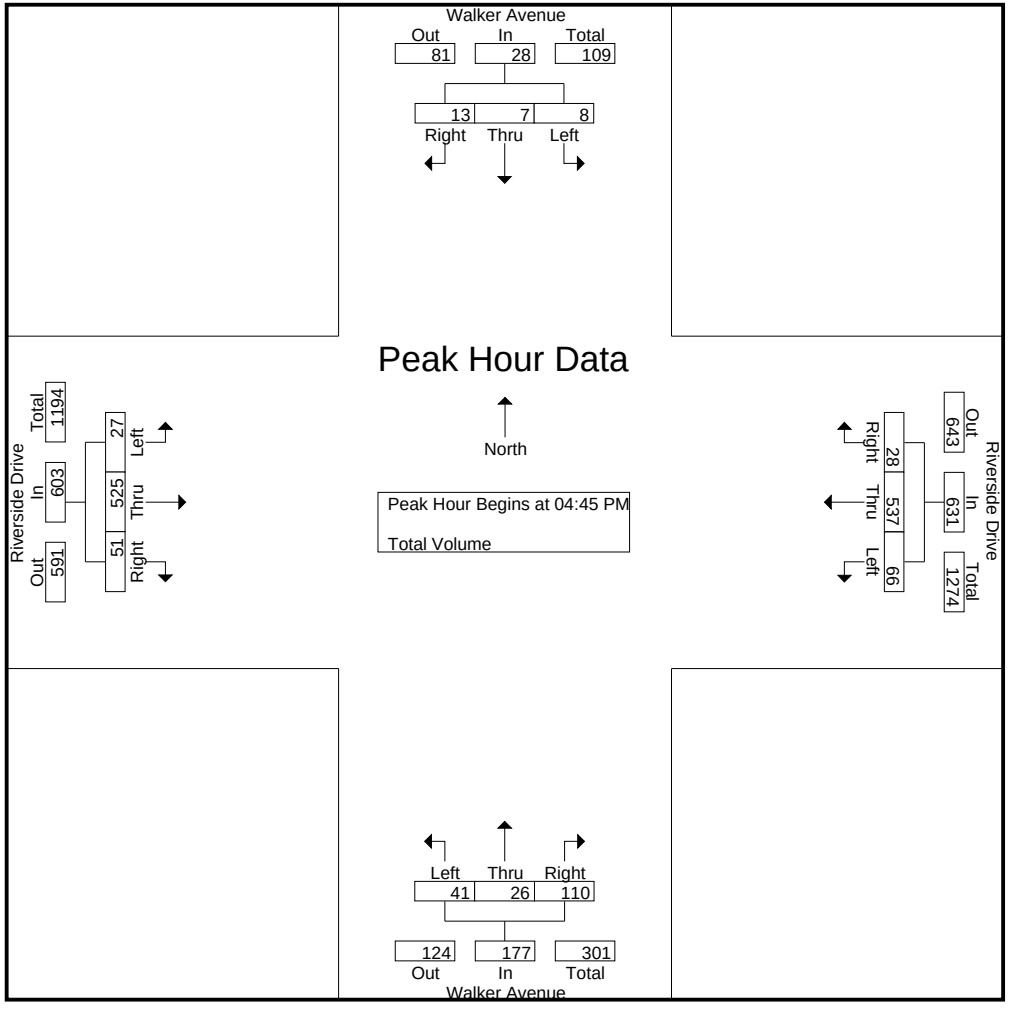

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City of Ontario
N/S: Walker Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 29_ONT_Wal_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Walker Avenue Southbound | | | | Riverside Drive Westbound | | | | Walker Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:45 PM | | | | 04:00 PM | | | | 04:30 PM | | | | |
| +0 mins. | **4** | **3** | **8** | **15** | 13 | 134 | **9** | 156 | **12** | 5 | 29 | 46 | 6 | **144** | 14 | **164** | |
| +15 mins. | 1 | 2 | 4 | 7 | **23** | **144** | 6 | **173** | 7 | 4 | 33 | 44 | 7 | 134 | 13 | 154 | |
| +30 mins. | 3 | 2 | 0 | 5 | 15 | 134 | 7 | 156 | 9 | 2 | 24 | 35 | **8** | 141 | 10 | 159 | |
| +45 mins. | 3 | 0 | 4 | 7 | 15 | 125 | 6 | 146 | 11 | **10** | **34** | **55** | 7 | 128 | **16** | 151 | |
| Total Volume | 11 | 7 | 16 | 34 | 66 | 537 | 28 | 631 | 39 | 21 | 120 | 180 | 28 | 547 | 53 | 628 | |
| % App. Total | 32.4 | 20.6 | 47.1 | | 10.5 | 85.1 | 4.4 | | 21.7 | 11.7 | 66.7 | | 4.5 | 87.1 | 8.4 | | |
| PHF | .688 | .583 | .500 | .567 | .717 | .932 | .778 | .912 | .813 | .525 | .882 | .818 | .875 | .950 | .828 | .957 | |

Location: Ontario
N/S: Walker Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Walker Avenue | East Leg Riverside Drive | South Leg Walker Avenue | West Leg Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 1 | 0 | 0 | 0 | 1 |
| 7:15 AM | 1 | 0 | 0 | 0 | 1 |
| 7:30 AM | 2 | 0 | 0 | 0 | 2 |
| 7:45 AM | 1 | 0 | 0 | 0 | 1 |
| 8:00 AM | 1 | 0 | 0 | 0 | 1 |
| 8:15 AM | 2 | 0 | 0 | 0 | 2 |
| 8:30 AM | 1 | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 9 | 0 | 0 | 0 | 9 |

| | North Leg Walker Avenue | East Leg Riverside Drive | South Leg Walker Avenue | West Leg Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 1 | 0 | 0 | 0 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 1 | 0 | 0 | 0 | 1 |
| 5:00 PM | 1 | 0 | 0 | 0 | 1 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 2 | 0 | 0 | 0 | 2 |
| 5:45 PM | 1 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 6 | 0 | 0 | 0 | 6 |



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951-268-6268

Location: Ontario
N/S: Walker Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Walker Avenue | | | Westbound Riverside Drive | | | Northbound Walker Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 5 |

| | Southbound Walker Avenue | | | Westbound Riverside Drive | | | Northbound Walker Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 5:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 5 |



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Corona, CA 92878
951-268-6268

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City of Ontario
N/S: Walker Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 30_ONT_Wal_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Walker Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Walker Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 22 | 12 | 0 | 36 | 4 | 8 | 0 | 0 | 12 | 8 | 16 | 4 | 0 | 28 | 12 | 5 | 7 | 0 | 24 | 0 | 100 | 100 |
| 07:15 AM | 3 | 29 | 5 | 0 | 37 | 2 | 7 | 0 | 0 | 9 | 16 | 40 | 1 | 0 | 57 | 10 | 0 | 9 | 0 | 19 | 0 | 122 | 122 |
| 07:30 AM | 2 | 22 | 14 | 0 | 38 | 2 | 5 | 1 | 0 | 8 | 18 | 56 | 3 | 0 | 77 | 8 | 3 | 5 | 0 | 16 | 0 | 139 | 139 |
| 07:45 AM | 6 | 30 | 14 | 0 | 50 | 3 | 4 | 2 | 0 | 9 | 20 | 59 | 6 | 0 | 85 | 6 | 3 | 3 | 0 | 12 | 0 | 156 | 156 |
| Total | 13 | 103 | 45 | 0 | 161 | 11 | 24 | 3 | 0 | 38 | 62 | 171 | 14 | 0 | 247 | 36 | 11 | 24 | 0 | 71 | 0 | 517 | 517 |
| 08:00 AM | 2 | 27 | 6 | 0 | 35 | 4 | 5 | 2 | 0 | 11 | 19 | 58 | 4 | 0 | 81 | 10 | 5 | 7 | 0 | 22 | 0 | 149 | 149 |
| 08:15 AM | 1 | 24 | 9 | 0 | 34 | 2 | 7 | 1 | 0 | 10 | 27 | 18 | 3 | 0 | 48 | 4 | 5 | 6 | 0 | 15 | 0 | 107 | 107 |
| 08:30 AM | 1 | 17 | 6 | 0 | 24 | 1 | 4 | 5 | 0 | 10 | 12 | 32 | 5 | 0 | 49 | 5 | 4 | 8 | 0 | 17 | 0 | 100 | 100 |
| 08:45 AM | 3 | 17 | 5 | 0 | 25 | 10 | 3 | 1 | 0 | 14 | 17 | 20 | 1 | 0 | 38 | 7 | 5 | 8 | 0 | 20 | 0 | 97 | 97 |
| Total | 7 | 85 | 26 | 0 | 118 | 17 | 19 | 9 | 0 | 45 | 75 | 128 | 13 | 0 | 216 | 26 | 19 | 29 | 0 | 74 | 0 | 453 | 453 |
| Grand Total | 20 | 188 | 71 | 0 | 279 | 28 | 43 | 12 | 0 | 83 | 137 | 299 | 27 | 0 | 463 | 62 | 30 | 53 | 0 | 145 | 0 | 970 | 970 |
| Apprch % | 7.2 | 67.4 | 25.4 | | | 33.7 | 51.8 | 14.5 | | | 29.6 | 64.6 | 5.8 | | | 42.8 | 20.7 | 36.6 | | | | | |
| Total % | 2.1 | 19.4 | 7.3 | | 28.8 | 2.9 | 4.4 | 1.2 | | 8.6 | 14.1 | 30.8 | 2.8 | | 47.7 | 6.4 | 3.1 | 5.5 | | 14.9 | 0 | 100 | |

| | Walker Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Walker Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 3 | 29 | 5 | 37 | 2 | **7** | 0 | 9 | 16 | 40 | 1 | 57 | **10** | 0 | **9** | 19 | 122 |
| 07:30 AM | 2 | 22 | **14** | 38 | 2 | 5 | 1 | 8 | 18 | 56 | 3 | 77 | 8 | 3 | 5 | 16 | 139 |
| 07:45 AM | **6** | **30** | 14 | **50** | 3 | 4 | **2** | 9 | **20** | **59** | **6** | **85** | 6 | 3 | 3 | 12 | **156** |
| 08:00 AM | 2 | 27 | 6 | 35 | **4** | 5 | 2 | **11** | 19 | 58 | 4 | 81 | 10 | **5** | 7 | **22** | 149 |
| Total Volume | 13 | 108 | 39 | 160 | 11 | 21 | 5 | 37 | 73 | 213 | 14 | 300 | 34 | 11 | 24 | 69 | 566 |
| % App. Total | 8.1 | 67.5 | 24.4 | | 29.7 | 56.8 | 13.5 | | 24.3 | 71 | 4.7 | | 49.3 | 15.9 | 34.8 | | |
| PHF | .542 | .900 | .696 | .800 | .688 | .750 | .625 | .841 | .913 | .903 | .583 | .882 | .850 | .550 | .667 | .784 | .907 |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Walker Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 30_ONT_Wal_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

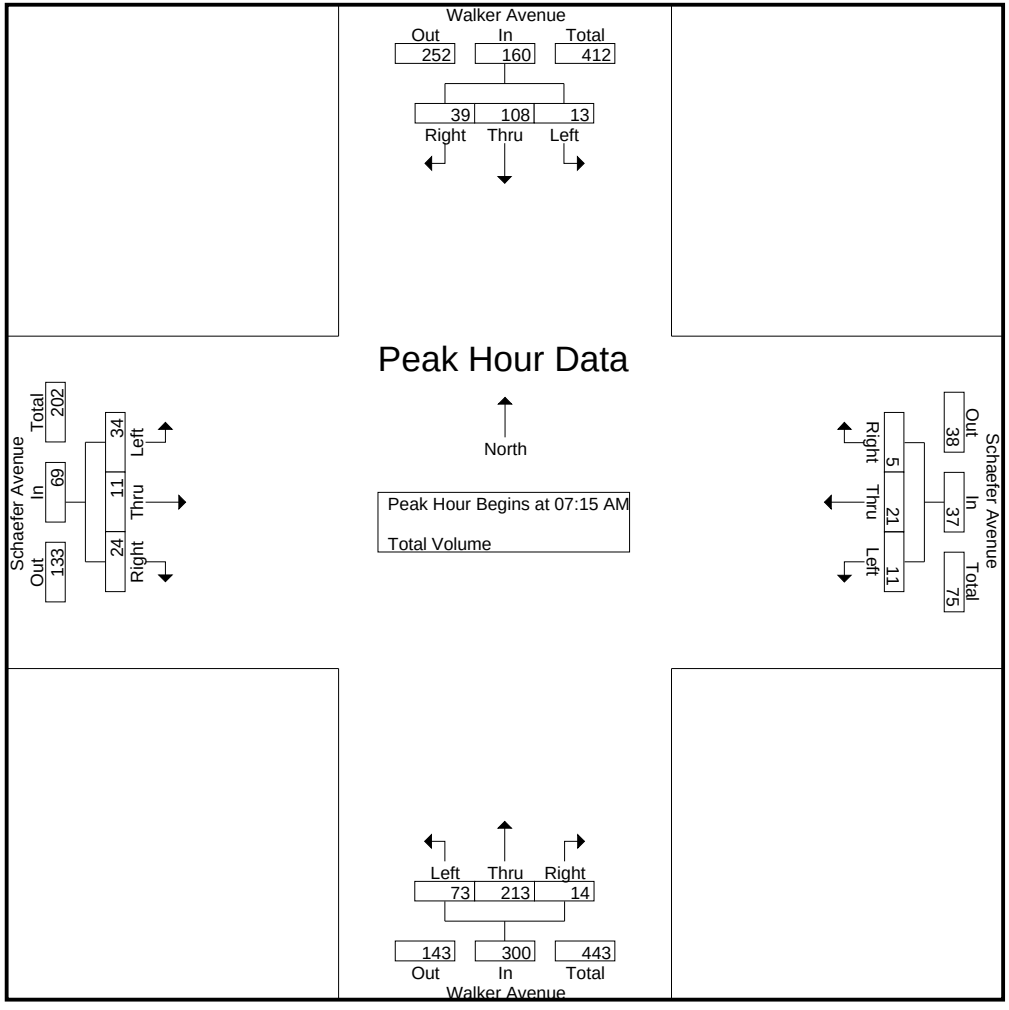

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City of Ontario
N/S: Walker Avenue
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Weather: Clear

File Name : 30_ONT_Wal_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Walker Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Walker Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:00 AM | | | | 08:00 AM | | | | 07:15 AM | | | | 08:00 AM | | | | |
| +0 mins. | 2 | 22 | 12 | 36 | 4 | 5 | 2 | 11 | 16 | 40 | 1 | 57 | **10** | **5** | 7 | **22** | |
| +15 mins. | 3 | 29 | 5 | 37 | 2 | **7** | 1 | 10 | 18 | 56 | 3 | 77 | 4 | 5 | 6 | 15 | |
| +30 mins. | 2 | 22 | **14** | 38 | 1 | 4 | **5** | 10 | **20** | **59** | **6** | **85** | 5 | 4 | **8** | 17 | |
| +45 mins. | **6** | **30** | 14 | **50** | **10** | 3 | 1 | **14** | 19 | 58 | 4 | 81 | 7 | 5 | 8 | 20 | |
| Total Volume | 13 | 103 | 45 | 161 | 17 | 19 | 9 | 45 | 73 | 213 | 14 | 300 | 26 | 19 | 29 | 74 | |
| % App. Total | 8.1 | 64 | 28 | | 37.8 | 42.2 | 20 | | 24.3 | 71 | 4.7 | | 35.1 | 25.7 | 39.2 | | |
| PHF | .542 | .858 | .804 | .805 | .425 | .679 | .450 | .804 | .913 | .903 | .583 | .882 | .650 | .950 | .906 | .841 | |

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City of Ontario
N/S: Walker Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 30_ONT_Wal_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Walker Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Walker Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 23 | 7 | 0 | 31 | 2 | 5 | 2 | 0 | 9 | 3 | 33 | 1 | 0 | 37 | 31 | 6 | 25 | 0 | 62 | 0 | 139 | 139 |
| 04:15 PM | 0 | 15 | 5 | 0 | 20 | 2 | 4 | 0 | 0 | 6 | 5 | 19 | 0 | 0 | 24 | 22 | 4 | 15 | 0 | 41 | 0 | 91 | 91 |
| 04:30 PM | 0 | 21 | 6 | 0 | 27 | 2 | 5 | 7 | 0 | 14 | 7 | 28 | 1 | 0 | 36 | 35 | 5 | 35 | 0 | 75 | 0 | 152 | 152 |
| 04:45 PM | 0 | 20 | 9 | 0 | 29 | 1 | 4 | 5 | 0 | 10 | 5 | 27 | 0 | 0 | 32 | 15 | 0 | 22 | 0 | 37 | 0 | 108 | 108 |
| Total | 1 | 79 | 27 | 0 | 107 | 7 | 18 | 14 | 0 | 39 | 20 | 107 | 2 | 0 | 129 | 103 | 15 | 97 | 0 | 215 | 0 | 490 | 490 |
| 05:00 PM | 0 | 43 | 7 | 0 | 50 | 1 | 1 | 2 | 0 | 4 | 1 | 30 | 1 | 0 | 32 | 26 | 2 | 24 | 0 | 52 | 0 | 138 | 138 |
| 05:15 PM | 0 | 27 | 4 | 0 | 31 | 1 | 1 | 1 | 0 | 3 | 9 | 33 | 3 | 0 | 45 | 32 | 4 | 30 | 0 | 66 | 0 | 145 | 145 |
| 05:30 PM | 0 | 39 | 4 | 0 | 43 | 0 | 0 | 1 | 0 | 1 | 4 | 25 | 2 | 0 | 31 | 25 | 3 | 25 | 0 | 53 | 0 | 128 | 128 |
| 05:45 PM | 0 | 39 | 7 | 0 | 46 | 0 | 0 | 1 | 0 | 1 | 4 | 28 | 1 | 0 | 33 | 24 | 2 | 26 | 0 | 52 | 0 | 132 | 132 |
| Total | 0 | 148 | 22 | 0 | 170 | 2 | 2 | 5 | 0 | 9 | 18 | 116 | 7 | 0 | 141 | 107 | 11 | 105 | 0 | 223 | 0 | 543 | 543 |
| Grand Total | 1 | 227 | 49 | 0 | 277 | 9 | 20 | 19 | 0 | 48 | 38 | 223 | 9 | 0 | 270 | 210 | 26 | 202 | 0 | 438 | 0 | 1033 | 1033 |
| Apprch % | 0.4 | 81.9 | 17.7 | | | 18.8 | 41.7 | 39.6 | | | 14.1 | 82.6 | 3.3 | | | 47.9 | 5.9 | 46.1 | | | | | |
| Total % | 0.1 | 22 | 4.7 | | 26.8 | 0.9 | 1.9 | 1.8 | | 4.6 | 3.7 | 21.6 | 0.9 | | 26.1 | 20.3 | 2.5 | 19.6 | | 42.4 | 0 | 100 | |

| | Walker Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Walker Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 21 | 6 | 27 | **2** | **5** | **7** | **14** | 7 | 28 | 1 | 36 | **35** | **5** | **35** | **75** | **152** |
| 04:45 PM | 0 | 20 | **9** | 29 | 1 | 4 | 5 | 10 | 5 | 27 | 0 | 32 | 15 | 0 | 22 | 37 | 108 |
| 05:00 PM | 0 | **43** | 7 | **50** | 1 | 1 | 2 | 4 | 1 | 30 | 1 | 32 | 26 | 2 | 24 | 52 | 138 |
| 05:15 PM | 0 | 27 | 4 | 31 | 1 | 1 | 1 | 3 | **9** | **33** | **3** | **45** | 32 | 4 | 30 | 66 | 145 |
| Total Volume | 0 | 111 | 26 | 137 | 5 | 11 | 15 | 31 | 22 | 118 | 5 | 145 | 108 | 11 | 111 | 230 | 543 |
| % App. Total | 0 | 81 | 19 | | 16.1 | 35.5 | 48.4 | | 15.2 | 81.4 | 3.4 | | 47 | 4.8 | 48.3 | | |
| PHF | .000 | .645 | .722 | .685 | .625 | .550 | .536 | .554 | .611 | .894 | .417 | .806 | .771 | .550 | .793 | .767 | .893 |

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City of Ontario
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E/W: Schaefer Avenue
Weather: Clear

File Name : 30_ONT_Wal_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

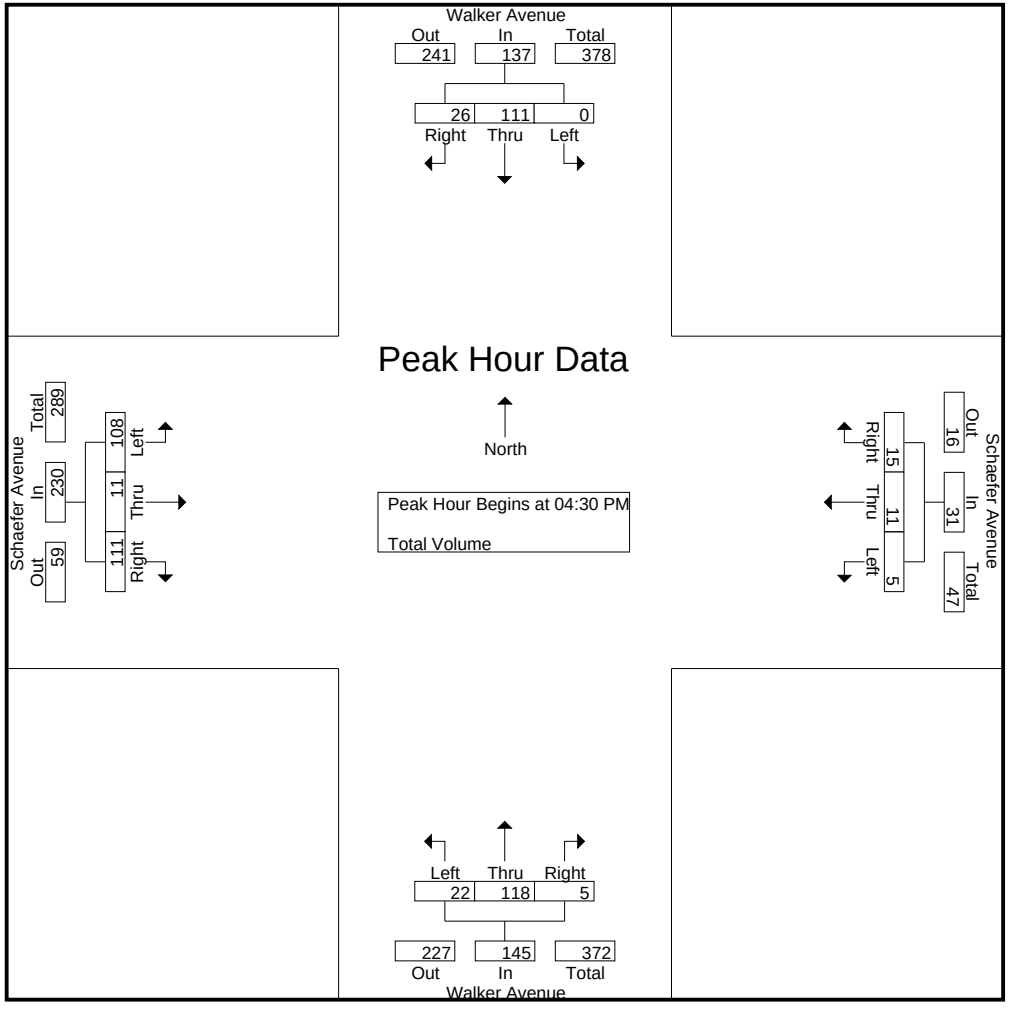

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City of Ontario
N/S: Walker Avenue
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File Name : 30_ONT_Wal_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Walker Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Walker Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:00 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | **43** | **7** | **50** | **2** | **5** | 2 | 9 | 7 | 28 | 1 | 36 | **35** | **5** | **35** | **75** | |
| +15 mins. | 0 | 27 | 4 | 31 | 2 | 4 | 0 | 6 | 5 | 27 | 0 | 32 | 15 | 0 | 22 | 37 | |
| +30 mins. | 0 | 39 | 4 | 43 | 2 | 5 | **7** | **14** | 1 | 30 | 1 | 32 | 26 | 2 | 24 | 52 | |
| +45 mins. | 0 | 39 | 7 | 46 | 1 | 4 | 5 | 10 | **9** | **33** | **3** | **45** | 32 | 4 | 30 | 66 | |
| Total Volume | 0 | 148 | 22 | 170 | 7 | 18 | 14 | 39 | 22 | 118 | 5 | 145 | 108 | 11 | 111 | 230 | |
| % App. Total | 0 | 87.1 | 12.9 | | 17.9 | 46.2 | 35.9 | | 15.2 | 81.4 | 3.4 | | 47 | 4.8 | 48.3 | | |
| PHF | .000 | .860 | .786 | .850 | .875 | .900 | .500 | .696 | .611 | .894 | .417 | .806 | .771 | .550 | .793 | .767 | |

Location: Ontario
N/S: Walker Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Walker Avenue | East Leg Schaefer Avenue | South Leg Walker Avenue | West Leg Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg Walker Avenue | East Leg Schaefer Avenue | South Leg Walker Avenue | West Leg Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

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951-268-6268

Location: Ontario
N/S: Walker Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Walker Avenue | | | Westbound Schaefer Avenue | | | Northbound Walker Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |

| | Southbound Walker Avenue | | | Westbound Schaefer Avenue | | | Northbound Walker Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| 4:30 PM | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 4 |

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City of Ontario
N/S: Walker Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 31_ONT_Wal_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Walker Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Walker Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 13 | 16 | 5 | 0 | 34 | 1 | 71 | 8 | 0 | 80 | 2 | 16 | 0 | 0 | 18 | 4 | 25 | 2 | 0 | 31 | 0 | 163 | 163 |
| 07:15 AM | 9 | 19 | 12 | 0 | 40 | 2 | 78 | 23 | 0 | 103 | 3 | 33 | 1 | 0 | 37 | 4 | 20 | 2 | 0 | 26 | 0 | 206 | 206 |
| 07:30 AM | 14 | 6 | 11 | 0 | 31 | 4 | 55 | 23 | 0 | 82 | 5 | 53 | 1 | 0 | 59 | 5 | 24 | 3 | 0 | 32 | 0 | 204 | 204 |
| 07:45 AM | 8 | 16 | 6 | 0 | 30 | 0 | 72 | 31 | 0 | 103 | 4 | 48 | 0 | 0 | 52 | 5 | 42 | 2 | 0 | 49 | 0 | 234 | 234 |
| Total | 44 | 57 | 34 | 0 | 135 | 7 | 276 | 85 | 0 | 368 | 14 | 150 | 2 | 0 | 166 | 18 | 111 | 9 | 0 | 138 | 0 | 807 | 807 |
| 08:00 AM | 13 | 20 | 8 | 0 | 41 | 0 | 65 | 19 | 0 | 84 | 1 | 50 | 1 | 0 | 52 | 3 | 38 | 3 | 0 | 44 | 0 | 221 | 221 |
| 08:15 AM | 7 | 19 | 5 | 0 | 31 | 1 | 50 | 27 | 0 | 78 | 17 | 13 | 3 | 0 | 33 | 3 | 26 | 8 | 0 | 37 | 0 | 179 | 179 |
| 08:30 AM | 9 | 13 | 4 | 0 | 26 | 0 | 66 | 13 | 0 | 79 | 3 | 26 | 0 | 0 | 29 | 12 | 32 | 3 | 0 | 47 | 0 | 181 | 181 |
| 08:45 AM | 17 | 11 | 7 | 0 | 35 | 1 | 65 | 23 | 0 | 89 | 2 | 14 | 0 | 0 | 16 | 2 | 52 | 3 | 0 | 57 | 0 | 197 | 197 |
| Total | 46 | 63 | 24 | 0 | 133 | 2 | 246 | 82 | 0 | 330 | 23 | 103 | 4 | 0 | 130 | 20 | 148 | 17 | 0 | 185 | 0 | 778 | 778 |
| Grand Total | 90 | 120 | 58 | 0 | 268 | 9 | 522 | 167 | 0 | 698 | 37 | 253 | 6 | 0 | 296 | 38 | 259 | 26 | 0 | 323 | 0 | 1585 | 1585 |
| Apprch % | 33.6 | 44.8 | 21.6 | | | 1.3 | 74.8 | 23.9 | | | 12.5 | 85.5 | 2 | | | 11.8 | 80.2 | 8 | | | | | |
| Total % | 5.7 | 7.6 | 3.7 | | 16.9 | 0.6 | 32.9 | 10.5 | | 44 | 2.3 | 16 | 0.4 | | 18.7 | 2.4 | 16.3 | 1.6 | | 20.4 | 0 | 100 | |

| | Walker Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Walker Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 9 | 19 | **12** | 40 | 2 | **78** | 23 | **103** | 3 | 33 | **1** | 37 | 4 | 20 | 2 | 26 | 206 |
| 07:30 AM | **14** | 6 | 11 | 31 | **4** | 55 | 23 | 82 | **5** | **53** | 1 | **59** | **5** | 24 | **3** | 32 | 204 |
| 07:45 AM | 8 | 16 | 6 | 30 | 0 | 72 | **31** | 103 | 4 | 48 | 0 | 52 | 5 | **42** | 2 | **49** | **234** |
| 08:00 AM | 13 | **20** | 8 | **41** | 0 | 65 | 19 | 84 | 1 | 50 | 1 | 52 | 3 | 38 | 3 | 44 | 221 |
| Total Volume | 44 | 61 | 37 | 142 | 6 | 270 | 96 | 372 | 13 | 184 | 3 | 200 | 17 | 124 | 10 | 151 | 865 |
| % App. Total | 31 | 43 | 26.1 | | 1.6 | 72.6 | 25.8 | | 6.5 | 92 | 1.5 | | 11.3 | 82.1 | 6.6 | | |
| PHF | .786 | .763 | .771 | .866 | .375 | .865 | .774 | .903 | .650 | .868 | .750 | .847 | .850 | .738 | .833 | .770 | .924 |

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N/S: Walker Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 31_ONT_Wal_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

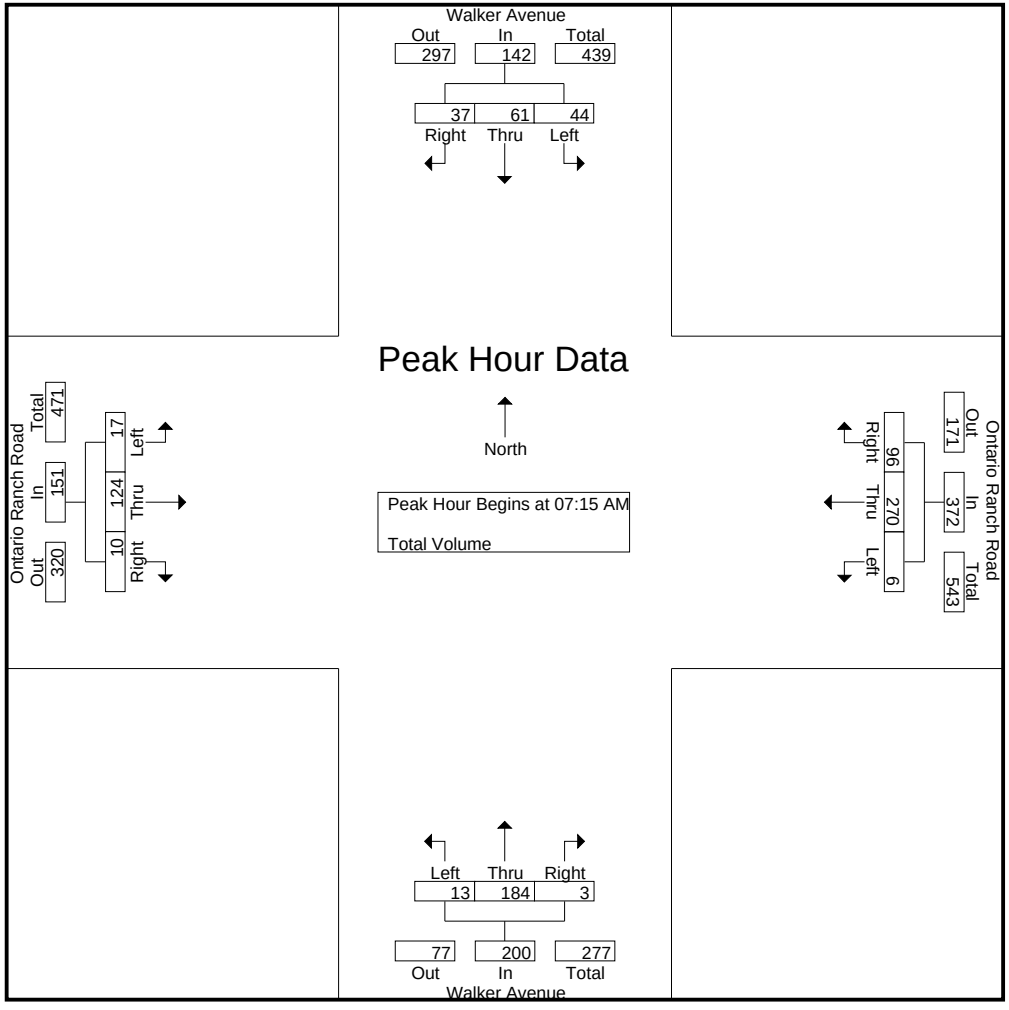

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City of Ontario
N/S: Walker Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 31_ONT_Wal_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Walker Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Walker Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 08:00 AM | | | | |
| +0 mins. | 9 | 19 | **12** | 40 | 2 | **78** | 23 | **103** | 3 | 33 | **1** | 37 | 3 | 38 | 3 | 44 | |
| +15 mins. | **14** | 6 | 11 | 31 | **4** | 55 | 23 | 82 | **5** | **53** | 1 | **59** | 3 | 26 | **8** | 37 | |
| +30 mins. | 8 | 16 | 6 | 30 | 0 | 72 | **31** | 103 | 4 | 48 | 0 | 52 | **12** | 32 | 3 | 47 | |
| +45 mins. | 13 | **20** | 8 | **41** | 0 | 65 | 19 | 84 | 1 | 50 | 1 | 52 | 2 | **52** | 3 | **57** | |
| Total Volume | 44 | 61 | 37 | 142 | 6 | 270 | 96 | 372 | 13 | 184 | 3 | 200 | 20 | 148 | 17 | 185 | |
| % App. Total | 31 | 43 | 26.1 | | 1.6 | 72.6 | 25.8 | | 6.5 | 92 | 1.5 | | 10.8 | 80 | 9.2 | | |
| PHF | .786 | .763 | .771 | .866 | .375 | .865 | .774 | .903 | .650 | .868 | .750 | .847 | .417 | .712 | .531 | .811 | |

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City of Ontario
N/S: Walker Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 31_ONT_Wal_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Walker Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Walker Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 25 | 19 | 2 | 0 | 46 | 0 | 52 | 9 | 0 | 61 | 2 | 19 | 1 | 0 | 22 | 7 | 93 | 4 | 0 | 104 | 0 | 233 | 233 |
| 04:15 PM | 26 | 11 | 6 | 0 | 43 | 1 | 47 | 8 | 0 | 56 | 2 | 18 | 0 | 0 | 20 | 15 | 97 | 1 | 0 | 113 | 0 | 232 | 232 |
| 04:30 PM | 29 | 14 | 4 | 0 | 47 | 1 | 55 | 7 | 0 | 63 | 3 | 25 | 0 | 0 | 28 | 7 | 105 | 1 | 0 | 113 | 0 | 251 | 251 |
| 04:45 PM | 36 | 16 | 2 | 0 | 54 | 0 | 44 | 11 | 0 | 55 | 2 | 20 | 1 | 0 | 23 | 8 | 109 | 3 | 0 | 120 | 0 | 252 | 252 |
| Total | 116 | 60 | 14 | 0 | 190 | 2 | 198 | 35 | 0 | 235 | 9 | 82 | 2 | 0 | 93 | 37 | 404 | 9 | 0 | 450 | 0 | 968 | 968 |
| 05:00 PM | 30 | 17 | 5 | 0 | 52 | 1 | 48 | 8 | 0 | 57 | 1 | 27 | 1 | 0 | 29 | 4 | 101 | 2 | 0 | 107 | 0 | 245 | 245 |
| 05:15 PM | 34 | 23 | 1 | 0 | 58 | 2 | 48 | 10 | 0 | 60 | 0 | 19 | 1 | 0 | 20 | 5 | 113 | 2 | 0 | 120 | 0 | 258 | 258 |
| 05:30 PM | 25 | 15 | 3 | 0 | 43 | 0 | 62 | 11 | 0 | 73 | 4 | 32 | 1 | 0 | 37 | 3 | 101 | 4 | 0 | 108 | 0 | 261 | 261 |
| 05:45 PM | 25 | 23 | 3 | 0 | 51 | 2 | 45 | 5 | 0 | 52 | 2 | 19 | 0 | 0 | 21 | 5 | 107 | 4 | 0 | 116 | 0 | 240 | 240 |
| Total | 114 | 78 | 12 | 0 | 204 | 5 | 203 | 34 | 0 | 242 | 7 | 97 | 3 | 0 | 107 | 17 | 422 | 12 | 0 | 451 | 0 | 1004 | 1004 |
| Grand Total | 230 | 138 | 26 | 0 | 394 | 7 | 401 | 69 | 0 | 477 | 16 | 179 | 5 | 0 | 200 | 54 | 826 | 21 | 0 | 901 | 0 | 1972 | 1972 |
| Apprch % | 58.4 | 35 | 6.6 | | | 1.5 | 84.1 | 14.5 | | | 8 | 89.5 | 2.5 | | | 6 | 91.7 | 2.3 | | | | | |
| Total % | 11.7 | 7 | 1.3 | | 20 | 0.4 | 20.3 | 3.5 | | 24.2 | 0.8 | 9.1 | 0.3 | | 10.1 | 2.7 | 41.9 | 1.1 | | 45.7 | 0 | 100 | |

| | Walker Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Walker Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | **36** | 16 | 2 | 54 | 0 | 44 | **11** | 55 | 2 | 20 | **1** | 23 | **8** | 109 | 3 | **120** | 252 |
| 05:00 PM | 30 | 17 | **5** | 52 | 1 | 48 | 8 | 57 | 1 | 27 | 1 | 29 | 4 | 101 | 2 | 107 | 245 |
| 05:15 PM | 34 | **23** | 1 | **58** | **2** | 48 | 10 | 60 | 0 | 19 | 1 | 20 | 5 | **113** | 2 | 120 | 258 |
| 05:30 PM | 25 | 15 | 3 | 43 | 0 | **62** | 11 | **73** | **4** | **32** | 1 | **37** | 3 | 101 | **4** | 108 | **261** |
| Total Volume | 125 | 71 | 11 | 207 | 3 | 202 | 40 | 245 | 7 | 98 | 4 | 109 | 20 | 424 | 11 | 455 | 1016 |
| % App. Total | 60.4 | 34.3 | 5.3 | | 1.2 | 82.4 | 16.3 | | 6.4 | 89.9 | 3.7 | | 4.4 | 93.2 | 2.4 | | |
| PHF | .868 | .772 | .550 | .892 | .375 | .815 | .909 | .839 | .438 | .766 | 1.00 | .736 | .625 | .938 | .688 | .948 | .973 |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Walker Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 31_ONT_Wal_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

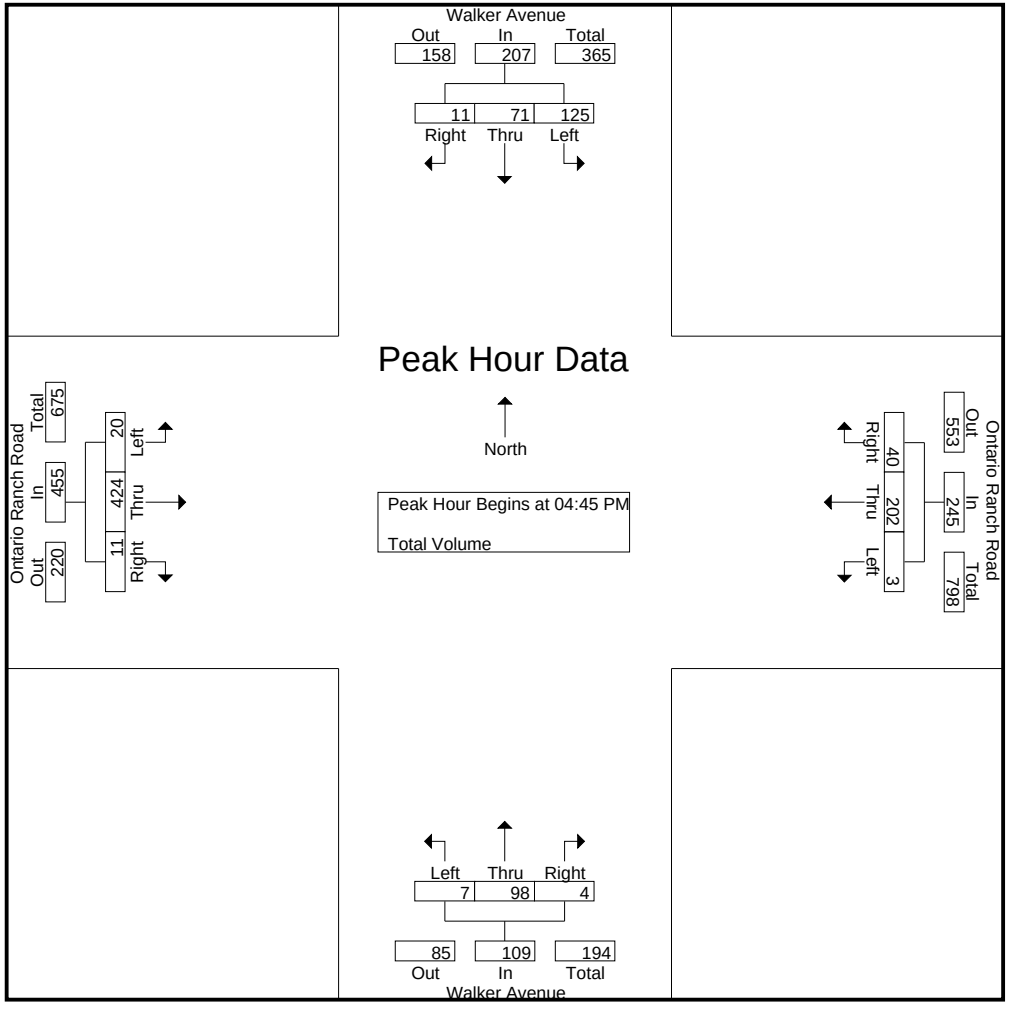

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(951) 268-6268

City of Ontario
N/S: Walker Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 31_ONT_Wal_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Walker Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Walker Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:45 PM | | | | 04:45 PM | | | | 04:30 PM | | | | |
| +0 mins. | 29 | 14 | 4 | 47 | 0 | 44 | **11** | 55 | 2 | 20 | **1** | 23 | 7 | 105 | 1 | 113 | |
| +15 mins. | **36** | 16 | 2 | 54 | 1 | 48 | 8 | 57 | 1 | 27 | 1 | 29 | **8** | 109 | **3** | **120** | |
| +30 mins. | 30 | 17 | **5** | 52 | **2** | 48 | 10 | 60 | 0 | 19 | 1 | 20 | 4 | 101 | 2 | 107 | |
| +45 mins. | 34 | **23** | 1 | **58** | 0 | **62** | 11 | **73** | **4** | **32** | 1 | **37** | 5 | **113** | 2 | 120 | |
| Total Volume | 129 | 70 | 12 | 211 | 3 | 202 | 40 | 245 | 7 | 98 | 4 | 109 | 24 | 428 | 8 | 460 | |
| % App. Total | 61.1 | 33.2 | 5.7 | | 1.2 | 82.4 | 16.3 | | 6.4 | 89.9 | 3.7 | | 5.2 | 93 | 1.7 | | |
| PHF | .896 | .761 | .600 | .909 | .375 | .815 | .909 | .839 | .438 | .766 | 1.000 | .736 | .750 | .947 | .667 | .958 | |

Location: Ontario
N/S: Walker Avenue
E/W: Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Walker Avenue | East Leg Ontario Ranch Road | South Leg Walker Avenue | West Leg Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 1 | 0 | 0 | 3 | 4 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 1 | 1 | 0 | 3 | 5 |

| | North Leg Walker Avenue | East Leg Ontario Ranch Road | South Leg Walker Avenue | West Leg Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

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Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Walker Avenue
E/W: Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Walker Avenue | | | Westbound Ontario Ranch Road | | | Northbound Walker Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 |

| | Southbound Walker Avenue | | | Westbound Ontario Ranch Road | | | Northbound Walker Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

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City of Ontario
N/S: Walker Avenue/Flight Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 32_ONT_Wal_Euc AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Walker Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Flight Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 18 | 0 | 1 | 0 | 19 | 0 | 91 | 20 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 1 | 54 | 0 | 0 | 55 | 0 | 185 | 185 |
| 07:15 AM | 19 | 1 | 0 | 0 | 20 | 0 | 112 | 35 | 0 | 147 | 0 | 0 | 0 | 0 | 0 | 3 | 66 | 0 | 0 | 69 | 0 | 236 | 236 |
| 07:30 AM | 12 | 1 | 4 | 0 | 17 | 1 | 131 | 57 | 0 | 189 | 0 | 0 | 0 | 0 | 0 | 1 | 61 | 0 | 0 | 62 | 0 | 268 | 268 |
| 07:45 AM | 15 | 0 | 2 | 0 | 17 | 1 | 130 | 56 | 0 | 187 | 0 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 0 | 58 | 0 | 262 | 262 |
| Total | 64 | 2 | 7 | 0 | 73 | 2 | 464 | 168 | 0 | 634 | 0 | 0 | 0 | 0 | 0 | 5 | 239 | 0 | 0 | 244 | 0 | 951 | 951 |
| 08:00 AM | 22 | 0 | 2 | 0 | 24 | 0 | 119 | 55 | 0 | 174 | 0 | 1 | 0 | 0 | 1 | 0 | 70 | 0 | 0 | 70 | 0 | 269 | 269 |
| 08:15 AM | 24 | 0 | 2 | 0 | 26 | 0 | 71 | 26 | 0 | 97 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 48 | 0 | 171 | 171 |
| 08:30 AM | 12 | 0 | 1 | 0 | 13 | 0 | 84 | 28 | 0 | 112 | 0 | 1 | 0 | 0 | 1 | 0 | 38 | 0 | 0 | 38 | 0 | 164 | 164 |
| 08:45 AM | 15 | 1 | 2 | 0 | 18 | 0 | 61 | 16 | 0 | 77 | 0 | 0 | 0 | 0 | 0 | 0 | 47 | 0 | 0 | 47 | 0 | 142 | 142 |
| Total | 73 | 1 | 7 | 0 | 81 | 0 | 335 | 125 | 0 | 460 | 0 | 2 | 0 | 0 | 2 | 0 | 203 | 0 | 0 | 203 | 0 | 746 | 746 |
| Grand Total | 137 | 3 | 14 | 0 | 154 | 2 | 799 | 293 | 0 | 1094 | 0 | 2 | 0 | 0 | 2 | 5 | 442 | 0 | 0 | 447 | 0 | 1697 | 1697 |
| Apprch % | 89 | 1.9 | 9.1 | | | 0.2 | 73 | 26.8 | | | 0 | 100 | 0 | | | 1.1 | 98.9 | 0 | | | | | |
| Total % | 8.1 | 0.2 | 0.8 | | 9.1 | 0.1 | 47.1 | 17.3 | | 64.5 | 0 | 0.1 | 0 | | 0.1 | 0.3 | 26 | 0 | | 26.3 | 0 | 100 | |

| | Walker Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Flight Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 19 | **1** | 0 | 20 | 0 | 112 | 35 | 147 | 0 | 0 | 0 | 0 | **3** | 66 | 0 | 69 | 236 |
| 07:30 AM | 12 | 1 | **4** | 17 | **1** | **131** | **57** | **189** | 0 | 0 | 0 | 0 | 1 | 61 | 0 | 62 | 268 |
| 07:45 AM | 15 | 0 | 2 | 17 | 1 | 130 | 56 | 187 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 58 | 262 |
| 08:00 AM | **22** | 0 | 2 | **24** | 0 | 119 | 55 | 174 | 0 | **1** | 0 | **1** | 0 | **70** | 0 | **70** | **269** |
| Total Volume | 68 | 2 | 8 | 78 | 2 | 492 | 203 | 697 | 0 | 1 | 0 | 1 | 4 | 255 | 0 | 259 | 1035 |
| % App. Total | 87.2 | 2.6 | 10.3 | | 0.3 | 70.6 | 29.1 | | 0 | 100 | 0 | | 1.5 | 98.5 | 0 | | |
| PHF | .773 | .500 | .500 | .813 | .500 | .939 | .890 | .922 | .000 | .250 | .000 | .250 | .333 | .911 | .000 | .925 | .962 |

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City of Ontario
N/S: Walker Avenue/Flight Avenue
E/W: Eucalyptus Avenue
Weather: Clear

File Name : 32_ONT_Wal_Euc AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

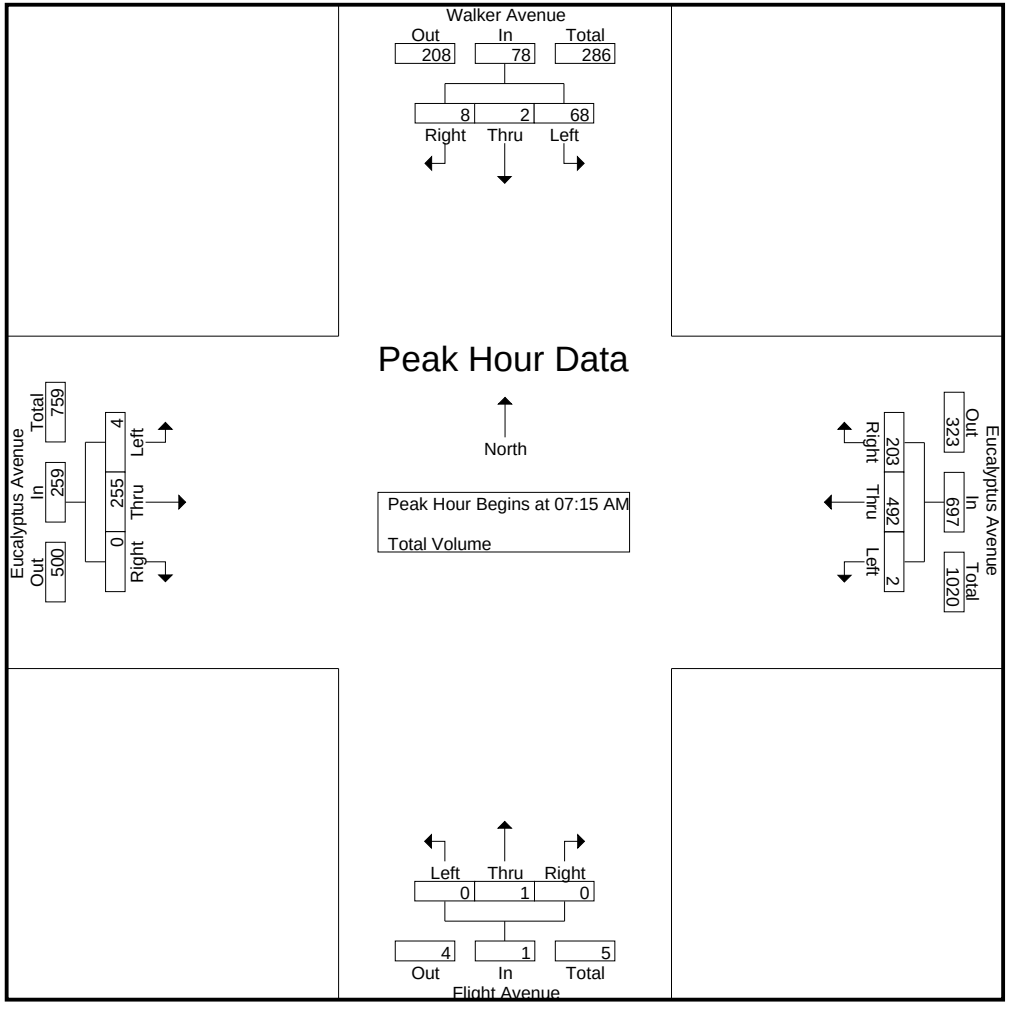

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City of Ontario
N/S: Walker Avenue/Flight Avenue
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Weather: Clear

File Name : 32_ONT_Wal_Euc AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Walker Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Flight Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:15 AM | | | | 07:45 AM | | | | 07:15 AM | | | | |
| +0 mins. | 12 | **1** | **4** | 17 | 0 | 112 | 35 | 147 | 0 | 0 | 0 | 0 | **3** | 66 | 0 | 69 | |
| +15 mins. | 15 | 0 | 2 | 17 | **1** | **131** | **57** | **189** | 0 | **1** | 0 | **1** | 1 | 61 | 0 | 62 | |
| +30 mins. | 22 | 0 | 2 | 24 | 1 | 130 | 56 | 187 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 58 | |
| +45 mins. | **24** | 0 | 2 | **26** | 0 | 119 | 55 | 174 | 0 | 1 | 0 | 1 | 0 | **70** | 0 | **70** | |
| Total Volume | 73 | 1 | 10 | 84 | 2 | 492 | 203 | 697 | 0 | 2 | 0 | 2 | 4 | 255 | 0 | 259 | |
| % App. Total | 86.9 | 1.2 | 11.9 | | 0.3 | 70.6 | 29.1 | | 0 | 100 | 0 | | 1.5 | 98.5 | 0 | | |
| PHF | .760 | .250 | .625 | .808 | .500 | .939 | .890 | .922 | .000 | .500 | .000 | .500 | .333 | .911 | .000 | .925 | |

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File Name : 32_ONT_Wal_Euc PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Walker Avenue Southbound | | | | | Eucalyptus Avenue Westbound | | | | | Flight Avenue Northbound | | | | | Eucalyptus Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 22 | 1 | 0 | 0 | 23 | 0 | 49 | 20 | 0 | 69 | 0 | 0 | 0 | 0 | 0 | 2 | 53 | 0 | 0 | 55 | 0 | 147 | 147 |
| 04:15 PM | 13 | 0 | 1 | 0 | 14 | 0 | 59 | 15 | 0 | 74 | 0 | 3 | 0 | 0 | 3 | 3 | 65 | 0 | 0 | 68 | 0 | 159 | 159 |
| 04:30 PM | 14 | 0 | 1 | 0 | 15 | 0 | 77 | 23 | 0 | 100 | 1 | 1 | 0 | 0 | 2 | 3 | 57 | 0 | 0 | 60 | 0 | 177 | 177 |
| 04:45 PM | 14 | 0 | 3 | 0 | 17 | 0 | 64 | 21 | 0 | 85 | 0 | 1 | 0 | 0 | 1 | 1 | 77 | 0 | 0 | 78 | 0 | 181 | 181 |
| Total | 63 | 1 | 5 | 0 | 69 | 0 | 249 | 79 | 0 | 328 | 1 | 5 | 0 | 0 | 6 | 9 | 252 | 0 | 0 | 261 | 0 | 664 | 664 |
| 05:00 PM | 19 | 1 | 1 | 0 | 21 | 0 | 50 | 23 | 0 | 73 | 0 | 2 | 0 | 0 | 2 | 2 | 69 | 0 | 0 | 71 | 0 | 167 | 167 |
| 05:15 PM | 21 | 0 | 5 | 0 | 26 | 0 | 41 | 18 | 0 | 59 | 0 | 1 | 0 | 0 | 1 | 1 | 82 | 0 | 0 | 83 | 0 | 169 | 169 |
| 05:30 PM | 18 | 0 | 1 | 0 | 19 | 0 | 85 | 34 | 0 | 119 | 0 | 2 | 0 | 0 | 2 | 2 | 81 | 0 | 0 | 83 | 0 | 223 | 223 |
| 05:45 PM | 26 | 1 | 1 | 0 | 28 | 0 | 53 | 20 | 0 | 73 | 0 | 1 | 1 | 0 | 2 | 1 | 109 | 0 | 0 | 110 | 0 | 213 | 213 |
| Total | 84 | 2 | 8 | 0 | 94 | 0 | 229 | 95 | 0 | 324 | 0 | 6 | 1 | 0 | 7 | 6 | 341 | 0 | 0 | 347 | 0 | 772 | 772 |
| Grand Total | 147 | 3 | 13 | 0 | 163 | 0 | 478 | 174 | 0 | 652 | 1 | 11 | 1 | 0 | 13 | 15 | 593 | 0 | 0 | 608 | 0 | 1436 | 1436 |
| Apprch % | 90.2 | 1.8 | 8 | | | 0 | 73.3 | 26.7 | | | 7.7 | 84.6 | 7.7 | | | 2.5 | 97.5 | 0 | | | | | |
| Total % | 10.2 | 0.2 | 0.9 | | 11.4 | 0 | 33.3 | 12.1 | | 45.4 | 0.1 | 0.8 | 0.1 | | 0.9 | 1 | 41.3 | 0 | | 42.3 | | 100 | |

| | Walker Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Flight Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 19 | **1** | 1 | 21 | 0 | 50 | 23 | 73 | 0 | **2** | 0 | **2** | **2** | 69 | 0 | 71 | 167 |
| 05:15 PM | 21 | 0 | **5** | 26 | 0 | 41 | 18 | 59 | 0 | 1 | 0 | 1 | 1 | 82 | 0 | 83 | 169 |
| 05:30 PM | 18 | 0 | 1 | 19 | 0 | **85** | **34** | **119** | 0 | 2 | 0 | 2 | 2 | 81 | 0 | 83 | **223** |
| 05:45 PM | **26** | 1 | 1 | **28** | 0 | 53 | 20 | 73 | 0 | 1 | **1** | 2 | 1 | **109** | 0 | **110** | 213 |
| Total Volume | 84 | 2 | 8 | 94 | 0 | 229 | 95 | 324 | 0 | 6 | 1 | 7 | 6 | 341 | 0 | 347 | 772 |
| % App. Total | 89.4 | 2.1 | 8.5 | | 0 | 70.7 | 29.3 | | 0 | 85.7 | 14.3 | | 1.7 | 98.3 | 0 | | |
| PHF | .808 | .500 | .400 | .839 | .000 | .674 | .699 | .681 | .000 | .750 | .250 | .875 | .750 | .782 | .000 | .789 | .865 |

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File Name : 32_ONT_Wal_Euc PMR
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Page No : 2

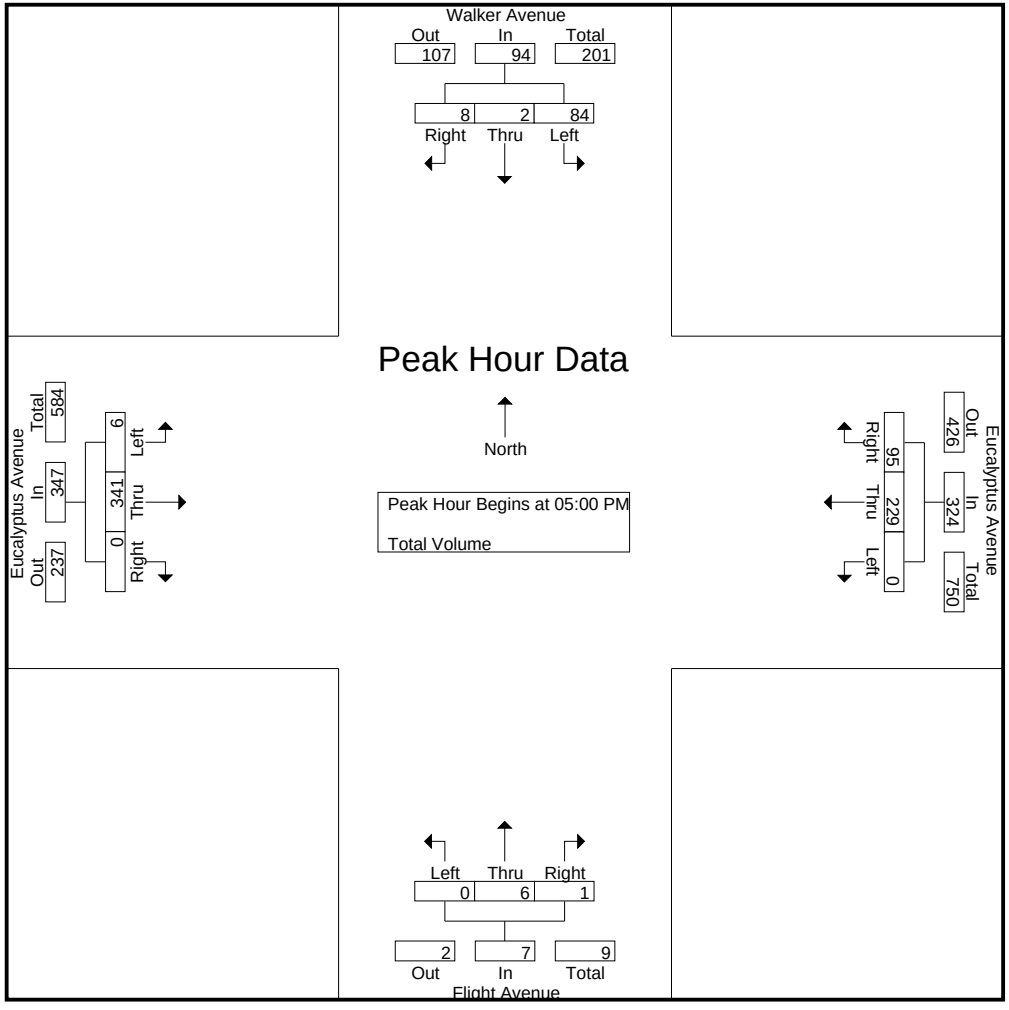

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City of Ontario
N/S: Walker Avenue/Flight Avenue
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Weather: Clear

File Name : 32_ONT_Wal_Euc PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Walker Avenue Southbound | | | | Eucalyptus Avenue Westbound | | | | Flight Avenue Northbound | | | | Eucalyptus Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:45 PM | | | | 04:15 PM | | | | 05:00 PM | | | | |
| +0 mins. | 19 | **1** | 1 | 21 | 0 | 64 | 21 | 85 | 0 | **3** | 0 | **3** | **2** | 69 | 0 | 71 | |
| +15 mins. | 21 | 0 | **5** | 26 | 0 | 50 | 23 | 73 | **1** | 1 | 0 | 2 | 1 | 82 | 0 | 83 | |
| +30 mins. | 18 | 0 | 1 | 19 | 0 | 41 | 18 | 59 | 0 | 1 | 0 | 1 | 2 | 81 | 0 | 83 | |
| +45 mins. | **26** | 1 | 1 | **28** | 0 | **85** | **34** | **119** | 0 | 2 | 0 | 2 | 1 | **109** | 0 | **110** | |
| Total Volume | 84 | 2 | 8 | 94 | 0 | 240 | 96 | 336 | 1 | 7 | 0 | 8 | 6 | 341 | 0 | 347 | |
| % App. Total | 89.4 | 2.1 | 8.5 | | 0 | 71.4 | 28.6 | | 12.5 | 87.5 | 0 | | 1.7 | 98.3 | 0 | | |
| PHF | .808 | .500 | .400 | .839 | .000 | .706 | .706 | .706 | .250 | .583 | .000 | .667 | .750 | .782 | .000 | .789 | |

Location: Ontario
N/S: Walker Avenue/Flight Avenue
E/W: Eucalyptus Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Walker Avenue | East Leg<br>Eucalyptus Avenue | South Leg<br>Flight Avenue | West Leg<br>Eucalyptus Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 2 | 0 | 2 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 2 | 0 | 2 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 4 | 0 | 4 |

| | North Leg<br>Walker Avenue | East Leg<br>Eucalyptus Avenue | South Leg<br>Flight Avenue | West Leg<br>Eucalyptus Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

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Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Walker Avenue/Flight Avenue
E/W: Eucalyptus Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Walker Avenue | | | Westbound Eucalyptus Avenue | | | Northbound Flight Avenue | | | Eastbound Eucalyptus Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 3 |

| | Southbound Walker Avenue | | | Westbound Eucalyptus Avenue | | | Northbound Flight Avenue | | | Eastbound Eucalyptus Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 63 | 23 | 14 | 86 | 71 | 1 | 57 | 34 | 129 | 126 | 154 | 0 | 0 | 280 | 0 | 0 | 0 | 0 | 0 | 48 | 495 | 543 |
| 07:15 AM | 0 | 72 | 22 | 7 | 94 | 53 | 2 | 62 | 46 | 117 | 167 | 151 | 0 | 0 | 318 | 0 | 0 | 0 | 0 | 0 | 53 | 529 | 582 |
| 07:30 AM | 0 | 97 | 22 | 4 | 119 | 76 | 1 | 66 | 46 | 143 | 165 | 172 | 0 | 0 | 337 | 0 | 0 | 0 | 0 | 0 | 50 | 599 | 649 |
| 07:45 AM | 0 | 95 | 14 | 5 | 109 | 78 | 0 | 72 | 40 | 150 | 142 | 194 | 0 | 0 | 336 | 0 | 0 | 0 | 0 | 0 | 45 | 595 | 640 |
| Total | 0 | 327 | 81 | 30 | 408 | 278 | 4 | 257 | 166 | 539 | 600 | 671 | 0 | 0 | 1271 | 0 | 0 | 0 | 0 | 0 | 196 | 2218 | 2414 |
| 08:00 AM | 0 | 93 | 21 | 11 | 114 | 77 | 1 | 85 | 55 | 163 | 136 | 235 | 0 | 0 | 371 | 0 | 0 | 0 | 0 | 0 | 66 | 648 | 714 |
| 08:15 AM | 0 | 75 | 20 | 9 | 95 | 56 | 0 | 75 | 51 | 131 | 166 | 196 | 0 | 0 | 362 | 0 | 0 | 0 | 0 | 0 | 60 | 588 | 648 |
| 08:30 AM | 0 | 82 | 23 | 6 | 105 | 49 | 0 | 71 | 41 | 120 | 157 | 198 | 0 | 0 | 355 | 0 | 0 | 0 | 0 | 0 | 47 | 580 | 627 |
| 08:45 AM | 0 | 77 | 29 | 13 | 106 | 60 | 1 | 77 | 53 | 138 | 153 | 171 | 0 | 0 | 324 | 0 | 0 | 0 | 0 | 0 | 66 | 568 | 634 |
| Total | 0 | 327 | 93 | 39 | 420 | 242 | 2 | 308 | 200 | 552 | 612 | 800 | 0 | 0 | 1412 | 0 | 0 | 0 | 0 | 0 | 239 | 2384 | 2623 |
| Grand Total | 0 | 654 | 174 | 69 | 828 | 520 | 6 | 565 | 366 | 1091 | 1212 | 1471 | 0 | 0 | 2683 | 0 | 0 | 0 | 0 | 0 | 435 | 4602 | 5037 |
| Apprch % | 0 | 79 | 21 | | | 47.7 | 0.5 | 51.8 | | | 45.2 | 54.8 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 14.2 | 3.8 | | 18 | 11.3 | 0.1 | 12.3 | | 23.7 | 26.3 | 32 | 0 | | 58.3 | 0 | 0 | 0 | | 0 | 8.6 | 91.4 | |
| Passenger Vehicles | 0 | 545 | 97 | | 691 | 440 | 4 | 515 | | 1298 | 1148 | 1366 | 0 | | 2514 | 0 | 0 | 0 | | 0 | 0 | 0 | 4503 |
| % Passenger Vehicles | 0 | 83.3 | 55.7 | 71 | 77 | 84.6 | 66.7 | 91.2 | 92.6 | 89.1 | 94.7 | 92.9 | 0 | 0 | 93.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 89.4 |
| Large 2 Axle Vehicles | 0 | 36 | 21 | | 64 | 9 | 2 | 19 | | 41 | 16 | 30 | 0 | | 46 | 0 | 0 | 0 | | 0 | 0 | 0 | 151 |
| % Large 2 Axle Vehicles | 0 | 5.5 | 12.1 | 10.1 | 7.1 | 1.7 | 33.3 | 3.4 | 3 | 2.8 | 1.3 | 2 | 0 | 0 | 1.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 3 Axle Vehicles | 0 | 21 | 9 | | 32 | 34 | 0 | 5 | | 41 | 4 | 26 | 0 | | 30 | 0 | 0 | 0 | | 0 | 0 | 0 | 103 |
| % 3 Axle Vehicles | 0 | 3.2 | 5.2 | 2.9 | 3.6 | 6.5 | 0 | 0.9 | 0.5 | 2.8 | 0.3 | 1.8 | 0 | 0 | 1.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 4+ Axle Trucks | 0 | 52 | 47 | | 110 | 37 | 0 | 26 | | 77 | 44 | 49 | 0 | | 93 | 0 | 0 | 0 | | 0 | 0 | 0 | 280 |
| % 4+ Axle Trucks | 0 | 8 | 27 | 15.9 | 12.3 | 7.1 | 0 | 4.6 | 3.8 | 5.3 | 3.6 | 3.3 | 0 | 0 | 3.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5.6 |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | **97** | **22** | **119** | 76 | **1** | 66 | 143 | 165 | 172 | 0 | 337 | 0 | 0 | 0 | 0 | 599 |
| 07:45 AM | 0 | 95 | 14 | 109 | **78** | 0 | 72 | 150 | 142 | 194 | 0 | 336 | 0 | 0 | 0 | 0 | 595 |
| 08:00 AM | 0 | 93 | 21 | 114 | 77 | 1 | **85** | **163** | 136 | **235** | 0 | **371** | 0 | 0 | 0 | 0 | **648** |
| 08:15 AM | 0 | 75 | 20 | 95 | 56 | 0 | 75 | 131 | **166** | 196 | 0 | 362 | 0 | 0 | 0 | 0 | 588 |
| Total Volume | 0 | 360 | 77 | 437 | 287 | 2 | 298 | 587 | 609 | 797 | 0 | 1406 | 0 | 0 | 0 | 0 | 2430 |
| % App. Total | 0 | 82.4 | 17.6 | | 48.9 | 0.3 | 50.8 | | 43.3 | 56.7 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .928 | .875 | .918 | .920 | .500 | .876 | .900 | .917 | .848 | .000 | .947 | .000 | .000 | .000 | .000 | .938 |

Counts Unlimited, Inc.
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Corona, CA 92878
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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

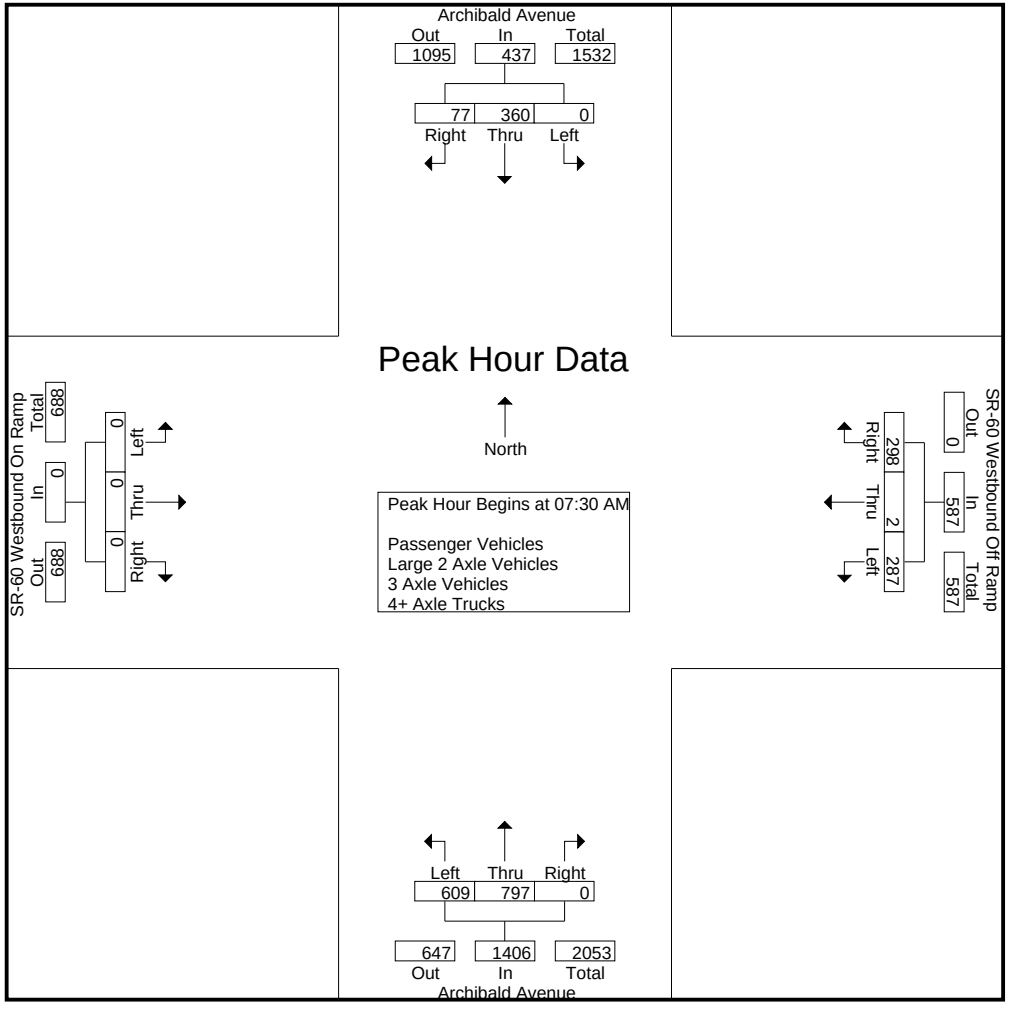

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File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:45 AM | | | | 07:00 AM | | | | |
| +0 mins. | 0 | **97** | **22** | **119** | 76 | **1** | 66 | 143 | 142 | 194 | 0 | 336 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 95 | 14 | 109 | **78** | 0 | 72 | 150 | 136 | **235** | 0 | **371** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 93 | 21 | 114 | 77 | 1 | **85** | **163** | **166** | 196 | 0 | 362 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 75 | 20 | 95 | 56 | 0 | 75 | 131 | 157 | 198 | 0 | 355 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 360 | 77 | 437 | 287 | 2 | 298 | 587 | 601 | 823 | 0 | 1424 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 82.4 | 17.6 | | 48.9 | 0.3 | 50.8 | | 42.2 | 57.8 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .928 | .875 | .918 | .920 | .500 | .876 | .900 | .905 | .876 | .000 | .960 | .000 | .000 | .000 | .000 | |

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File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 48 | 13 | 10 | 61 | 54 | 1 | 52 | 32 | 107 | 123 | 135 | 0 | 0 | 258 | 0 | 0 | 0 | 0 | 0 | 42 | 426 | 468 |
| 07:15 AM | 0 | 57 | 12 | 4 | 69 | 46 | 2 | 54 | 41 | 102 | 161 | 141 | 0 | 0 | 302 | 0 | 0 | 0 | 0 | 0 | 45 | 473 | 518 |
| 07:30 AM | 0 | 87 | 8 | 2 | 95 | 66 | 0 | 63 | 44 | 129 | 158 | 161 | 0 | 0 | 319 | 0 | 0 | 0 | 0 | 0 | 46 | 543 | 589 |
| 07:45 AM | 0 | 82 | 6 | 3 | 88 | 71 | 0 | 65 | 37 | 136 | 135 | 180 | 0 | 0 | 315 | 0 | 0 | 0 | 0 | 0 | 40 | 539 | 579 |
| Total | 0 | 274 | 39 | 19 | 313 | 237 | 3 | 234 | 154 | 474 | 577 | 617 | 0 | 0 | 1194 | 0 | 0 | 0 | 0 | 0 | 173 | 1981 | 2154 |
| 08:00 AM | 0 | 77 | 14 | 7 | 91 | 65 | 0 | 82 | 52 | 147 | 125 | 223 | 0 | 0 | 348 | 0 | 0 | 0 | 0 | 0 | 59 | 586 | 645 |
| 08:15 AM | 0 | 63 | 13 | 7 | 76 | 44 | 0 | 69 | 48 | 113 | 155 | 186 | 0 | 0 | 341 | 0 | 0 | 0 | 0 | 0 | 55 | 530 | 585 |
| 08:30 AM | 0 | 66 | 11 | 5 | 77 | 44 | 0 | 62 | 39 | 106 | 149 | 187 | 0 | 0 | 336 | 0 | 0 | 0 | 0 | 0 | 44 | 519 | 563 |
| 08:45 AM | 0 | 65 | 20 | 11 | 85 | 50 | 1 | 68 | 46 | 119 | 142 | 153 | 0 | 0 | 295 | 0 | 0 | 0 | 0 | 0 | 57 | 499 | 556 |
| Total | 0 | 271 | 58 | 30 | 329 | 203 | 1 | 281 | 185 | 485 | 571 | 749 | 0 | 0 | 1320 | 0 | 0 | 0 | 0 | 0 | 215 | 2134 | 2349 |
| Grand Total | 0 | 545 | 97 | 49 | 642 | 440 | 4 | 515 | 339 | 959 | 1148 | 1366 | 0 | 0 | 2514 | 0 | 0 | 0 | 0 | 0 | 388 | 4115 | 4503 |
| Apprch % | 0 | 84.9 | 15.1 | | | 45.9 | 0.4 | 53.7 | | | 45.7 | 54.3 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 13.2 | 2.4 | | 15.6 | 10.7 | 0.1 | 12.5 | | 23.3 | 27.9 | 33.2 | 0 | | 61.1 | 0 | 0 | 0 | | 0 | 8.6 | 91.4 | |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | **87** | 8 | **95** | 66 | 0 | 63 | 129 | **158** | 161 | 0 | 319 | 0 | 0 | 0 | 0 | 543 |
| 07:45 AM | 0 | 82 | 6 | 88 | **71** | 0 | 65 | 136 | 135 | 180 | 0 | 315 | 0 | 0 | 0 | 0 | 539 |
| 08:00 AM | 0 | 77 | **14** | 91 | 65 | 0 | **82** | **147** | 125 | **223** | 0 | **348** | 0 | 0 | 0 | 0 | **586** |
| 08:15 AM | 0 | 63 | 13 | 76 | 44 | 0 | 69 | 113 | 155 | 186 | 0 | 341 | 0 | 0 | 0 | 0 | 530 |
| Total Volume | 0 | 309 | 41 | 350 | 246 | 0 | 279 | 525 | 573 | 750 | 0 | 1323 | 0 | 0 | 0 | 0 | 2198 |
| % App. Total | 0 | 88.3 | 11.7 | | 46.9 | 0 | 53.1 | | 43.3 | 56.7 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .888 | .732 | .921 | .866 | .000 | .851 | .893 | .907 | .841 | .000 | .950 | .000 | .000 | .000 | .000 | .938 |

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Weather: Clear

File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

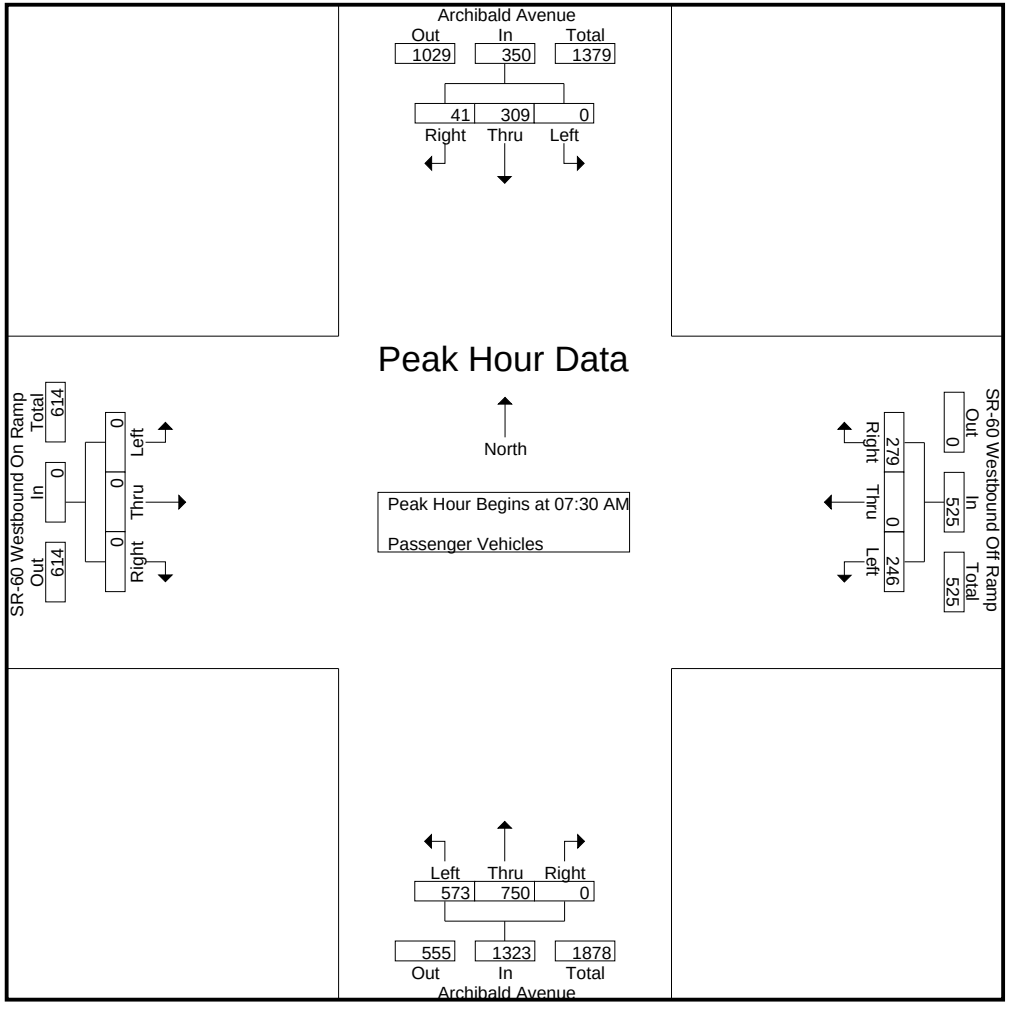

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City of Ontario
N/S: Archibald Avenue
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File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | **87** | 8 | **95** | 66 | 0 | 63 | 129 | **158** | 161 | 0 | 319 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 82 | 6 | 88 | **71** | 0 | 65 | 136 | 135 | 180 | 0 | 315 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 77 | **14** | 91 | 65 | 0 | **82** | **147** | 125 | **223** | 0 | **348** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 63 | 13 | 76 | 44 | 0 | 69 | 113 | 155 | 186 | 0 | 341 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 309 | 41 | 350 | 246 | 0 | 279 | 525 | 573 | 750 | 0 | 1323 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 88.3 | 11.7 | | 46.9 | 0 | 53.1 | | 43.3 | 56.7 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .888 | .732 | .921 | .866 | .000 | .851 | .893 | .907 | .841 | .000 | .950 | .000 | .000 | .000 | .000 | |

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City of Ontario
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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 7 | 4 | 2 | 11 | 3 | 0 | 2 | 1 | 5 | 2 | 8 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 3 | 26 | 29 |
| 07:15 AM | 0 | 6 | 2 | 0 | 8 | 1 | 0 | 3 | 2 | 4 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 16 | 18 |
| 07:30 AM | 0 | 3 | 6 | 1 | 9 | 1 | 1 | 2 | 2 | 4 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 19 | 22 |
| 07:45 AM | 0 | 4 | 1 | 0 | 5 | 1 | 0 | 2 | 1 | 3 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 14 | 15 |
| Total | 0 | 20 | 13 | 3 | 33 | 6 | 1 | 9 | 6 | 16 | 7 | 19 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 9 | 75 | 84 |
| 08:00 AM | 0 | 6 | 2 | 2 | 8 | 0 | 1 | 2 | 2 | 3 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 14 | 18 |
| 08:15 AM | 0 | 2 | 3 | 2 | 5 | 1 | 0 | 1 | 0 | 2 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 11 | 13 |
| 08:30 AM | 0 | 4 | 3 | 0 | 7 | 1 | 0 | 6 | 2 | 7 | 5 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 20 | 22 |
| 08:45 AM | 0 | 4 | 0 | 0 | 4 | 1 | 0 | 1 | 1 | 2 | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 13 | 14 |
| Total | 0 | 16 | 8 | 4 | 24 | 3 | 1 | 10 | 5 | 14 | 9 | 11 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 9 | 58 | 67 |
| Grand Total | 0 | 36 | 21 | 7 | 57 | 9 | 2 | 19 | 11 | 30 | 16 | 30 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 0 | 18 | 133 | 151 |
| Apprch % | 0 | 63.2 | 36.8 | | | 30 | 6.7 | 63.3 | | | 34.8 | 65.2 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 27.1 | 15.8 | | 42.9 | 6.8 | 1.5 | 14.3 | | 22.6 | 12 | 22.6 | 0 | | 34.6 | 0 | 0 | 0 | | 0 | 11.9 | 88.1 | |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 3 | **6** | **9** | **1** | **1** | **2** | **4** | **2** | 4 | 0 | **6** | 0 | 0 | 0 | 0 | **19** |
| 07:45 AM | 0 | 4 | 1 | 5 | 1 | 0 | 2 | 3 | 1 | **5** | 0 | 6 | 0 | 0 | 0 | 0 | 14 |
| 08:00 AM | 0 | **6** | 2 | 8 | 0 | 1 | 2 | 3 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 14 |
| 08:15 AM | 0 | 2 | 3 | 5 | 1 | 0 | 1 | 2 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 11 |
| Total Volume | 0 | 15 | 12 | 27 | 3 | 2 | 7 | 12 | 5 | 14 | 0 | 19 | 0 | 0 | 0 | 0 | 58 |
| % App. Total | 0 | 55.6 | 44.4 | | 25 | 16.7 | 58.3 | | 26.3 | 73.7 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .500 | .750 | .750 | .500 | .875 | .750 | .625 | .700 | .000 | .792 | .000 | .000 | .000 | .000 | .763 |

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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

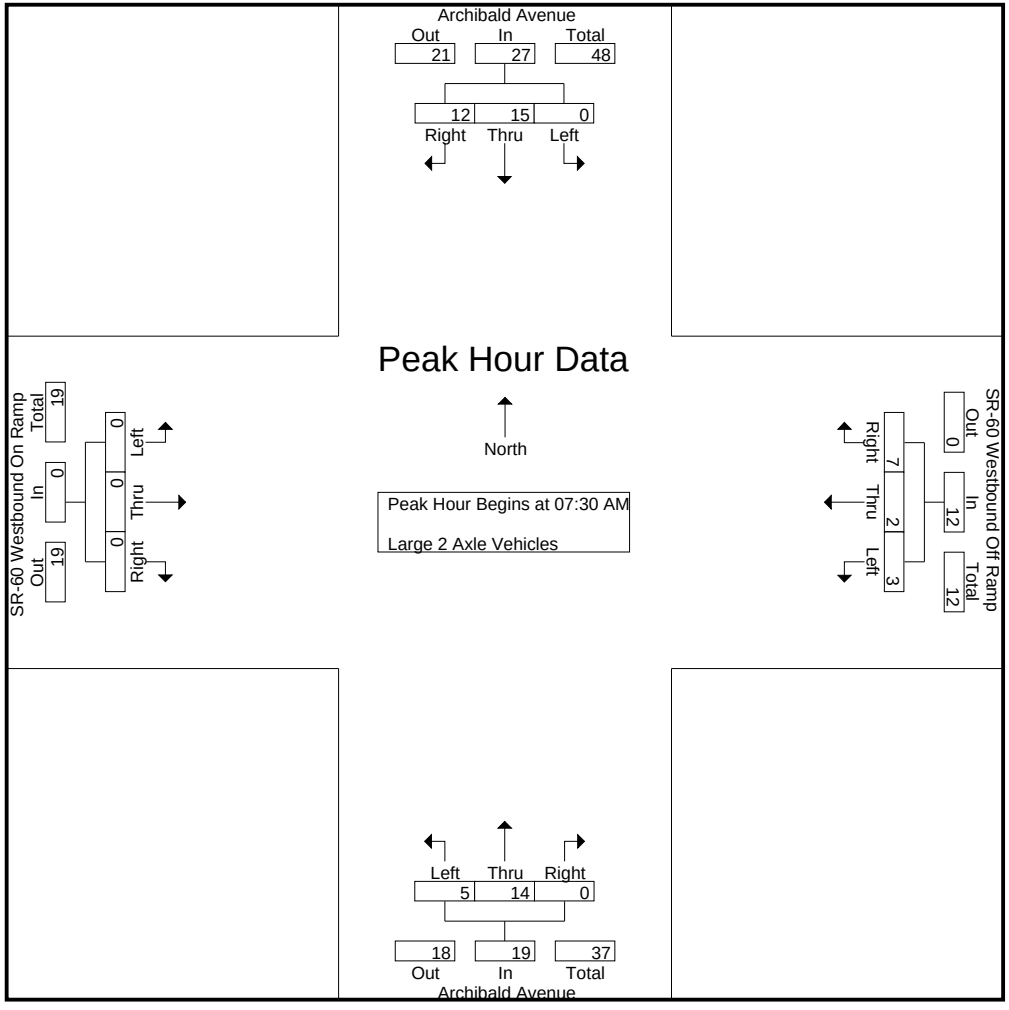

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File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 3 | **6** | **9** | **1** | **1** | **2** | **4** | **2** | 4 | 0 | **6** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 4 | 1 | 5 | 1 | 0 | 2 | 3 | 1 | **5** | 0 | 6 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **6** | 2 | 8 | 0 | 1 | 2 | 3 | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 2 | 3 | 5 | 1 | 0 | 1 | 2 | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 15 | 12 | 27 | 3 | 2 | 7 | 12 | 5 | 14 | 0 | 19 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 55.6 | 44.4 | | 25 | 16.7 | 58.3 | | 26.3 | 73.7 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .500 | .750 | .750 | .500 | .875 | .750 | .625 | .700 | .000 | .792 | .000 | .000 | .000 | .000 | |

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File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 2 | 3 | 0 | 5 | 6 | 0 | 1 | 0 | 7 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| 07:15 AM | 0 | 3 | 1 | 0 | 4 | 2 | 0 | 1 | 1 | 3 | 2 | 6 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 15 | 16 |
| 07:30 AM | 0 | 4 | 2 | 1 | 6 | 4 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 14 | 15 |
| 07:45 AM | 0 | 1 | 2 | 1 | 3 | 4 | 0 | 1 | 1 | 5 | 2 | 4 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 14 | 16 |
| Total | 0 | 10 | 8 | 2 | 18 | 16 | 0 | 3 | 2 | 19 | 4 | 17 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 4 | 58 | 62 |
| 08:00 AM | 0 | 1 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 9 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 13 |
| 08:15 AM | 0 | 4 | 0 | 0 | 4 | 4 | 0 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| 08:30 AM | 0 | 4 | 0 | 0 | 4 | 2 | 0 | 1 | 0 | 3 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 08:45 AM | 0 | 2 | 1 | 0 | 3 | 3 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 |
| Total | 0 | 11 | 1 | 0 | 12 | 18 | 0 | 2 | 0 | 20 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 41 |
| Grand Total | 0 | 21 | 9 | 2 | 30 | 34 | 0 | 5 | 2 | 39 | 4 | 26 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 4 | 99 | 103 |
| Apprch % | 0 | 70 | 30 | | | 87.2 | 0 | 12.8 | | | 13.3 | 86.7 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 21.2 | 9.1 | | 30.3 | 34.3 | 0 | 5.1 | | 39.4 | 4 | 26.3 | 0 | | 30.3 | 0 | 0 | 0 | | 0 | 3.9 | 96.1 | |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | **4** | **2** | **6** | 4 | 0 | 0 | 4 | 0 | **4** | 0 | 4 | 0 | 0 | 0 | 0 | **14** |
| 07:45 AM | 0 | 1 | 2 | 3 | 4 | 0 | **1** | 5 | **2** | 4 | 0 | **6** | 0 | 0 | 0 | 0 | 14 |
| 08:00 AM | 0 | 1 | 0 | 1 | **9** | 0 | 0 | **9** | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 13 |
| 08:15 AM | 0 | 4 | 0 | 4 | 4 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Total Volume | 0 | 10 | 4 | 14 | 21 | 0 | 2 | 23 | 2 | 11 | 0 | 13 | 0 | 0 | 0 | 0 | 50 |
| % App. Total | 0 | 71.4 | 28.6 | | 91.3 | 0 | 8.7 | | 15.4 | 84.6 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .500 | .583 | .583 | .000 | .500 | .639 | .250 | .688 | .000 | .542 | .000 | .000 | .000 | .000 | .893 |

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Weather: Clear

File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

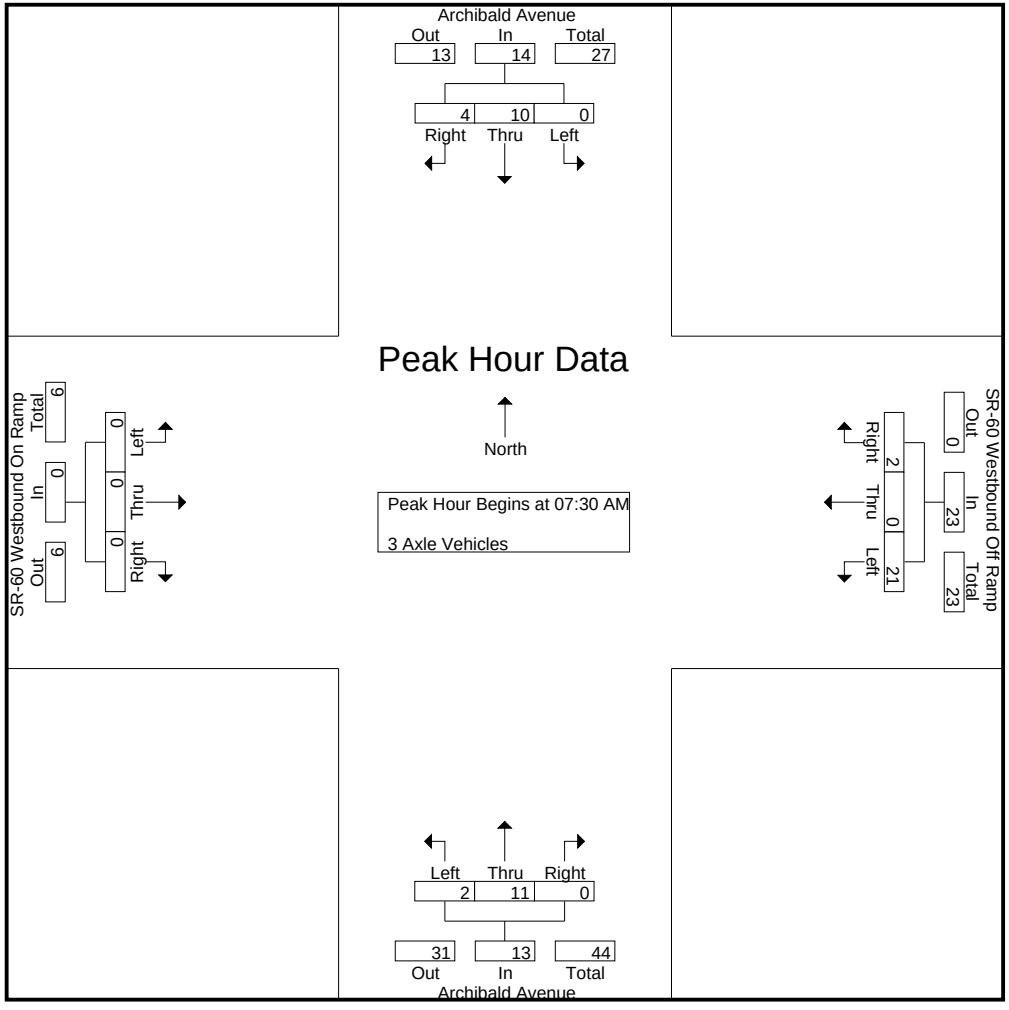

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | **4** | **2** | **6** | 4 | 0 | 0 | 4 | 0 | **4** | 0 | 4 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 1 | 2 | 3 | 4 | 0 | **1** | 5 | **2** | 4 | 0 | **6** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 1 | 0 | 1 | **9** | 0 | 0 | **9** | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 4 | 0 | 4 | 4 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 10 | 4 | 14 | 21 | 0 | 2 | 23 | 2 | 11 | 0 | 13 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 71.4 | 28.6 | | 91.3 | 0 | 8.7 | | 15.4 | 84.6 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .500 | .583 | .583 | .000 | .500 | .639 | .250 | .688 | .000 | .542 | .000 | .000 | .000 | .000 | |

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Weather: Clear

File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 6 | 3 | 2 | 9 | 8 | 0 | 2 | 1 | 10 | 1 | 8 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 3 | 28 | 31 |
| 07:15 AM | 0 | 6 | 7 | 3 | 13 | 4 | 0 | 4 | 2 | 8 | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 5 | 25 | 30 |
| 07:30 AM | 0 | 3 | 6 | 0 | 9 | 5 | 0 | 1 | 0 | 6 | 5 | 3 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 23 |
| 07:45 AM | 0 | 8 | 5 | 1 | 13 | 2 | 0 | 4 | 1 | 6 | 4 | 5 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 2 | 28 | 30 |
| Total | 0 | 23 | 21 | 6 | 44 | 19 | 0 | 11 | 4 | 30 | 12 | 18 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0 | 10 | 104 | 114 |
| 08:00 AM | 0 | 9 | 5 | 2 | 14 | 3 | 0 | 1 | 1 | 4 | 10 | 7 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 3 | 35 | 38 |
| 08:15 AM | 0 | 6 | 4 | 0 | 10 | 7 | 0 | 4 | 3 | 11 | 10 | 7 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 3 | 38 | 41 |
| 08:30 AM | 0 | 8 | 9 | 1 | 17 | 2 | 0 | 2 | 0 | 4 | 3 | 6 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 30 | 31 |
| 08:45 AM | 0 | 6 | 8 | 2 | 14 | 6 | 0 | 8 | 6 | 14 | 9 | 11 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 8 | 48 | 56 |
| Total | 0 | 29 | 26 | 5 | 55 | 18 | 0 | 15 | 10 | 33 | 32 | 31 | 0 | 0 | 63 | 0 | 0 | 0 | 0 | 0 | 15 | 151 | 166 |
| Grand Total | 0 | 52 | 47 | 11 | 99 | 37 | 0 | 26 | 14 | 63 | 44 | 49 | 0 | 0 | 93 | 0 | 0 | 0 | 0 | 0 | 25 | 255 | 280 |
| Apprch % | 0 | 52.5 | 47.5 | | | 58.7 | 0 | 41.3 | | | 47.3 | 52.7 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 20.4 | 18.4 | | 38.8 | 14.5 | 0 | 10.2 | | 24.7 | 17.3 | 19.2 | 0 | | 36.5 | 0 | 0 | 0 | | 0 | 8.9 | 91.1 | |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 0 | 3 | **6** | 9 | 5 | 0 | 1 | 6 | 5 | 3 | 0 | 8 | 0 | 0 | 0 | 0 | 23 |
| 07:45 AM | 0 | 8 | 5 | 13 | 2 | 0 | **4** | 6 | 4 | 5 | 0 | 9 | 0 | 0 | 0 | 0 | 28 |
| 08:00 AM | 0 | **9** | 5 | **14** | 3 | 0 | 1 | 4 | **10** | **7** | 0 | **17** | 0 | 0 | 0 | 0 | 35 |
| 08:15 AM | 0 | 6 | 4 | 10 | **7** | 0 | 4 | **11** | 10 | 7 | 0 | 17 | 0 | 0 | 0 | 0 | **38** |
| Total Volume | 0 | 26 | 20 | 46 | 17 | 0 | 10 | 27 | 29 | 22 | 0 | 51 | 0 | 0 | 0 | 0 | 124 |
| % App. Total | 0 | 56.5 | 43.5 | | 63 | 0 | 37 | | 56.9 | 43.1 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .722 | .833 | .821 | .607 | .000 | .625 | .614 | .725 | .786 | .000 | .750 | .000 | .000 | .000 | .000 | .816 |

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E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 33_ONT_Arch_60W AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

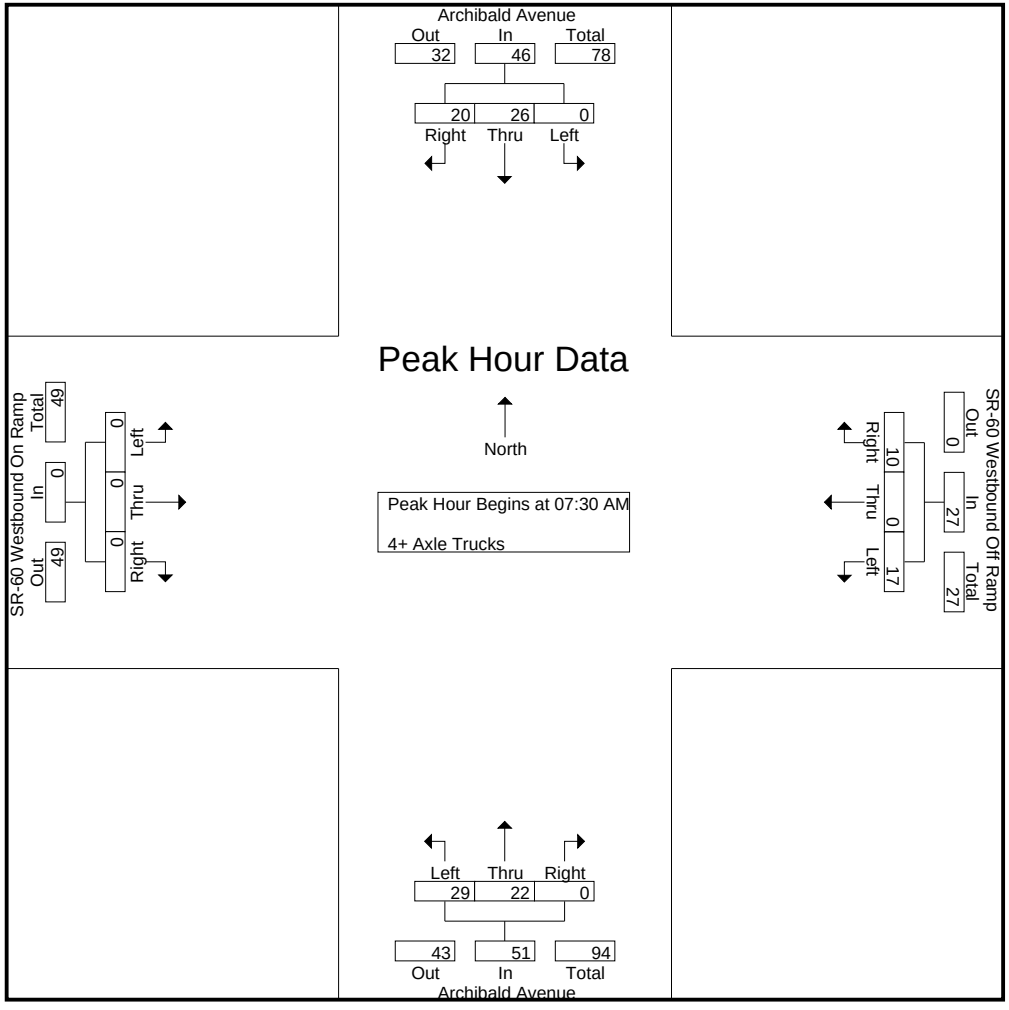

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Site Code : 05124953
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Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 0 | 3 | **6** | 9 | 5 | 0 | 1 | 6 | 5 | 3 | 0 | 8 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 8 | 5 | 13 | 2 | 0 | **4** | 6 | 4 | 5 | 0 | 9 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **9** | 5 | **14** | 3 | 0 | 1 | 4 | **10** | **7** | 0 | **17** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 6 | 4 | 10 | **7** | 0 | 4 | **11** | 10 | 7 | 0 | 17 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 26 | 20 | 46 | 17 | 0 | 10 | 27 | 29 | 22 | 0 | 51 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 56.5 | 43.5 | | 63 | 0 | 37 | | 56.9 | 43.1 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .722 | .833 | .821 | .607 | .000 | .625 | .614 | .725 | .786 | .000 | .750 | .000 | .000 | .000 | .000 | |

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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 246 | 59 | 25 | 305 | 55 | 0 | 49 | 33 | 104 | 122 | 197 | 0 | 0 | 319 | 0 | 0 | 0 | 0 | 0 | 58 | 728 | 786 |
| 04:15 PM | 0 | 252 | 55 | 17 | 307 | 60 | 1 | 31 | 17 | 92 | 116 | 149 | 0 | 0 | 265 | 0 | 0 | 0 | 0 | 0 | 34 | 664 | 698 |
| 04:30 PM | 0 | 255 | 69 | 28 | 324 | 84 | 3 | 36 | 24 | 123 | 90 | 100 | 0 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 52 | 637 | 689 |
| 04:45 PM | 0 | 235 | 58 | 16 | 293 | 87 | 1 | 43 | 35 | 131 | 108 | 113 | 0 | 0 | 221 | 0 | 0 | 0 | 0 | 0 | 51 | 645 | 696 |
| Total | 0 | 988 | 241 | 86 | 1229 | 286 | 5 | 159 | 109 | 450 | 436 | 559 | 0 | 0 | 995 | 0 | 0 | 0 | 0 | 0 | 195 | 2674 | 2869 |
| 05:00 PM | 0 | 307 | 106 | 37 | 413 | 78 | 3 | 37 | 28 | 118 | 88 | 112 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 65 | 731 | 796 |
| 05:15 PM | 0 | 278 | 68 | 33 | 346 | 90 | 2 | 52 | 36 | 144 | 103 | 103 | 0 | 0 | 206 | 0 | 0 | 0 | 0 | 0 | 69 | 696 | 765 |
| 05:30 PM | 0 | 228 | 69 | 23 | 297 | 110 | 3 | 44 | 28 | 157 | 83 | 99 | 0 | 0 | 182 | 0 | 0 | 0 | 0 | 0 | 51 | 636 | 687 |
| 05:45 PM | 0 | 214 | 47 | 12 | 261 | 86 | 2 | 39 | 27 | 127 | 89 | 92 | 0 | 0 | 181 | 0 | 0 | 0 | 0 | 0 | 39 | 569 | 608 |
| Total | 0 | 1027 | 290 | 105 | 1317 | 364 | 10 | 172 | 119 | 546 | 363 | 406 | 0 | 0 | 769 | 0 | 0 | 0 | 0 | 0 | 224 | 2632 | 2856 |
| Grand Total | 0 | 2015 | 531 | 191 | 2546 | 650 | 15 | 331 | 228 | 996 | 799 | 965 | 0 | 0 | 1764 | 0 | 0 | 0 | 0 | 0 | 419 | 5306 | 5725 |
| Apprch % | 0 | 79.1 | 20.9 | | | 65.3 | 1.5 | 33.2 | | | 45.3 | 54.7 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 38 | 10 | | 48 | 12.3 | 0.3 | 6.2 | | 18.8 | 15.1 | 18.2 | 0 | | 33.2 | 0 | 0 | 0 | | 0 | 7.3 | 92.7 | |
| Passenger Vehicles | 0 | 1909 | 475 | | 2564 | 580 | 11 | 295 | | 1094 | 767 | 827 | 0 | | 1594 | 0 | 0 | 0 | | 0 | 0 | 0 | 5252 |
| % Passenger Vehicles | 0 | 94.7 | 89.5 | 94.2 | 93.7 | 89.2 | 73.3 | 89.1 | 91.2 | 89.4 | 96 | 85.7 | 0 | 0 | 90.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 91.7 |
| Large 2 Axle Vehicles | 0 | 38 | 11 | | 51 | 11 | 2 | 12 | | 31 | 15 | 47 | 0 | | 62 | 0 | 0 | 0 | | 0 | 0 | 0 | 144 |
| % Large 2 Axle Vehicles | 0 | 1.9 | 2.1 | 1 | 1.9 | 1.7 | 13.3 | 3.6 | 2.6 | 2.5 | 1.9 | 4.9 | 0 | 0 | 3.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.5 |
| 3 Axle Vehicles | 0 | 15 | 5 | | 21 | 11 | 0 | 5 | | 19 | 1 | 11 | 0 | | 12 | 0 | 0 | 0 | | 0 | 0 | 0 | 52 |
| % 3 Axle Vehicles | 0 | 0.7 | 0.9 | 0.5 | 0.8 | 1.7 | 0 | 1.5 | 1.3 | 1.6 | 0.1 | 1.1 | 0 | 0 | 0.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.9 |
| 4+ Axle Trucks | 0 | 53 | 40 | | 101 | 48 | 2 | 19 | | 80 | 16 | 80 | 0 | | 96 | 0 | 0 | 0 | | 0 | 0 | 0 | 277 |
| % 4+ Axle Trucks | 0 | 2.6 | 7.5 | 4.2 | 3.7 | 7.4 | 13.3 | 5.7 | 4.8 | 6.5 | 2 | 8.3 | 0 | 0 | 5.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4.8 |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 255 | 69 | 324 | 84 | **3** | 36 | 123 | 90 | 100 | 0 | 190 | 0 | 0 | 0 | 0 | 637 |
| 04:45 PM | 0 | 235 | 58 | 293 | 87 | 1 | 43 | 131 | **108** | **113** | 0 | **221** | 0 | 0 | 0 | 0 | 645 |
| 05:00 PM | 0 | **307** | **106** | **413** | 78 | 3 | 37 | 118 | 88 | 112 | 0 | 200 | 0 | 0 | 0 | 0 | **731** |
| 05:15 PM | 0 | 278 | 68 | 346 | **90** | 2 | **52** | **144** | 103 | 103 | 0 | 206 | 0 | 0 | 0 | 0 | 696 |
| Total Volume | 0 | 1075 | 301 | 1376 | 339 | 9 | 168 | 516 | 389 | 428 | 0 | 817 | 0 | 0 | 0 | 0 | 2709 |
| % App. Total | 0 | 78.1 | 21.9 | | 65.7 | 1.7 | 32.6 | | 47.6 | 52.4 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .875 | .710 | .833 | .942 | .750 | .808 | .896 | .900 | .947 | .000 | .924 | .000 | .000 | .000 | .000 | .926 |

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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

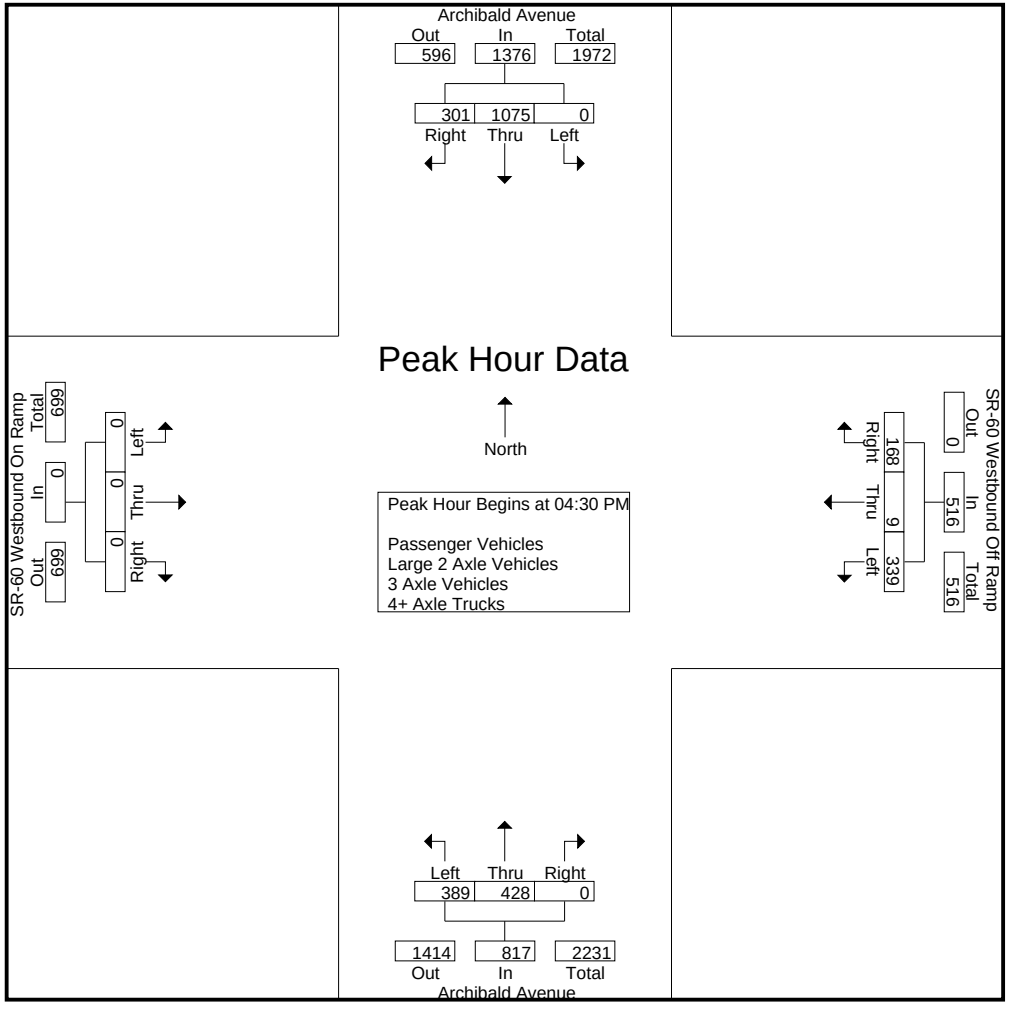

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| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:45 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 255 | 69 | 324 | 87 | 1 | 43 | 131 | **122** | **197** | 0 | **319** | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 235 | 58 | 293 | 78 | **3** | 37 | 118 | 116 | 149 | 0 | 265 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **307** | **106** | **413** | 90 | 2 | **52** | 144 | 90 | 100 | 0 | 190 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 278 | 68 | 346 | **110** | 3 | 44 | **157** | 108 | 113 | 0 | 221 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 1075 | 301 | 1376 | 365 | 9 | 176 | 550 | 436 | 559 | 0 | 995 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 78.1 | 21.9 | | 66.4 | 1.6 | 32 | | 43.8 | 56.2 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .875 | .710 | .833 | .830 | .750 | .846 | .876 | .893 | .709 | .000 | .780 | .000 | .000 | .000 | .000 | |

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File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 235 | 51 | 24 | 286 | 45 | 0 | 42 | 30 | 87 | 113 | 168 | 0 | 0 | 281 | 0 | 0 | 0 | 0 | 0 | 54 | 654 | 708 |
| 04:15 PM | 0 | 239 | 47 | 17 | 286 | 50 | 0 | 28 | 15 | 78 | 112 | 133 | 0 | 0 | 245 | 0 | 0 | 0 | 0 | 0 | 32 | 609 | 641 |
| 04:30 PM | 0 | 236 | 61 | 28 | 297 | 77 | 2 | 32 | 21 | 111 | 87 | 83 | 0 | 0 | 170 | 0 | 0 | 0 | 0 | 0 | 49 | 578 | 627 |
| 04:45 PM | 0 | 225 | 53 | 15 | 278 | 77 | 1 | 42 | 35 | 120 | 104 | 96 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0 | 50 | 598 | 648 |
| Total | 0 | 935 | 212 | 84 | 1147 | 249 | 3 | 144 | 101 | 396 | 416 | 480 | 0 | 0 | 896 | 0 | 0 | 0 | 0 | 0 | 185 | 2439 | 2624 |
| 05:00 PM | 0 | 287 | 101 | 35 | 388 | 74 | 3 | 31 | 23 | 108 | 85 | 90 | 0 | 0 | 175 | 0 | 0 | 0 | 0 | 0 | 58 | 671 | 729 |
| 05:15 PM | 0 | 265 | 60 | 30 | 325 | 77 | 2 | 47 | 34 | 126 | 100 | 90 | 0 | 0 | 190 | 0 | 0 | 0 | 0 | 0 | 64 | 641 | 705 |
| 05:30 PM | 0 | 221 | 60 | 20 | 281 | 99 | 3 | 41 | 27 | 143 | 81 | 92 | 0 | 0 | 173 | 0 | 0 | 0 | 0 | 0 | 47 | 597 | 644 |
| 05:45 PM | 0 | 201 | 42 | 11 | 243 | 81 | 0 | 32 | 23 | 113 | 85 | 75 | 0 | 0 | 160 | 0 | 0 | 0 | 0 | 0 | 34 | 516 | 550 |
| Total | 0 | 974 | 263 | 96 | 1237 | 331 | 8 | 151 | 107 | 490 | 351 | 347 | 0 | 0 | 698 | 0 | 0 | 0 | 0 | 0 | 203 | 2425 | 2628 |
| Grand Total | 0 | 1909 | 475 | 180 | 2384 | 580 | 11 | 295 | 208 | 886 | 767 | 827 | 0 | 0 | 1594 | 0 | 0 | 0 | 0 | 0 | 388 | 4864 | 5252 |
| Apprch % | 0 | 80.1 | 19.9 | | | 65.5 | 1.2 | 33.3 | | | 48.1 | 51.9 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 39.2 | 9.8 | | 49 | 11.9 | 0.2 | 6.1 | | 18.2 | 15.8 | 17 | 0 | | 32.8 | 0 | 0 | 0 | | 0 | 7.4 | 92.6 | |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 236 | 61 | 297 | **77** | 2 | 32 | 111 | 87 | 83 | 0 | 170 | 0 | 0 | 0 | 0 | 578 |
| 04:45 PM | 0 | 225 | 53 | 278 | 77 | 1 | 42 | 120 | **104** | **96** | 0 | **200** | 0 | 0 | 0 | 0 | 598 |
| 05:00 PM | 0 | **287** | **101** | **388** | 74 | **3** | 31 | 108 | 85 | 90 | 0 | 175 | 0 | 0 | 0 | 0 | **671** |
| 05:15 PM | 0 | 265 | 60 | 325 | 77 | 2 | **47** | **126** | 100 | 90 | 0 | 190 | 0 | 0 | 0 | 0 | 641 |
| Total Volume | 0 | 1013 | 275 | 1288 | 305 | 8 | 152 | 465 | 376 | 359 | 0 | 735 | 0 | 0 | 0 | 0 | 2488 |
| % App. Total | 0 | 78.6 | 21.4 | | 65.6 | 1.7 | 32.7 | | 51.2 | 48.8 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .882 | .681 | .830 | .990 | .667 | .809 | .923 | .904 | .935 | .000 | .919 | .000 | .000 | .000 | .000 | .927 |

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File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

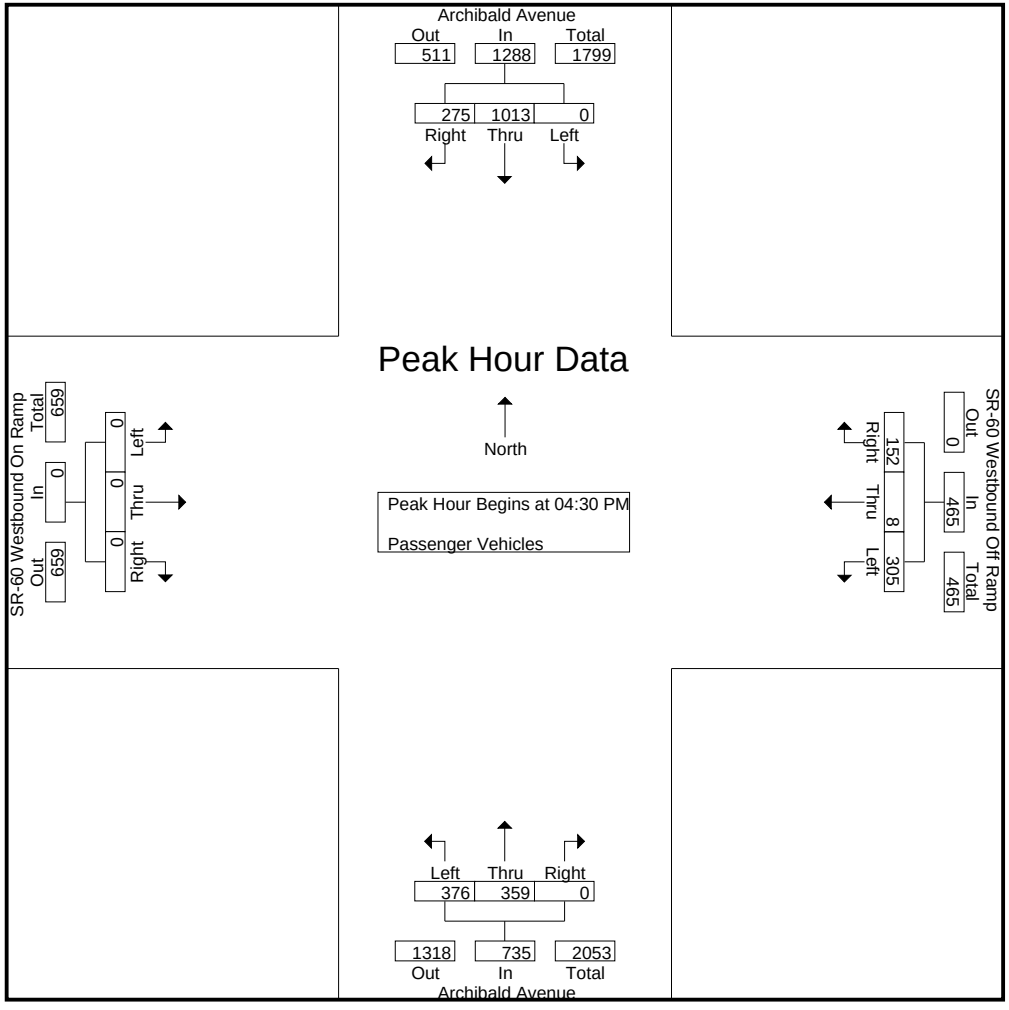

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File Name : 33_ONT_Arch_60W PMC
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| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 236 | 61 | 297 | **77** | 2 | 32 | 111 | 87 | 83 | 0 | 170 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 225 | 53 | 278 | 77 | 1 | 42 | 120 | **104** | **96** | 0 | **200** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **287** | **101** | **388** | 74 | **3** | 31 | 108 | 85 | 90 | 0 | 175 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 265 | 60 | 325 | 77 | 2 | **47** | **126** | 100 | 90 | 0 | 190 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 1013 | 275 | 1288 | 305 | 8 | 152 | 465 | 376 | 359 | 0 | 735 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 78.6 | 21.4 | | 65.6 | 1.7 | 32.7 | | 51.2 | 48.8 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .882 | .681 | .830 | .990 | .667 | .809 | .923 | .904 | .935 | .000 | .919 | .000 | .000 | .000 | .000 | |

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Weather: Clear

File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 3 | 3 | 0 | 6 | 0 | 0 | 3 | 2 | 3 | 6 | 12 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 2 | 27 | 29 |
| 04:15 PM | 0 | 4 | 2 | 0 | 6 | 2 | 1 | 0 | 0 | 3 | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 16 |
| 04:30 PM | 0 | 5 | 0 | 0 | 5 | 1 | 1 | 3 | 2 | 5 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 17 | 19 |
| 04:45 PM | 0 | 3 | 1 | 1 | 4 | 0 | 0 | 1 | 0 | 1 | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 13 | 14 |
| Total | 0 | 15 | 6 | 1 | 21 | 3 | 2 | 7 | 4 | 12 | 10 | 30 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 5 | 73 | 78 |
| 05:00 PM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 1 | 1 | 1 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 14 | 15 |
| 05:15 PM | 0 | 4 | 2 | 1 | 6 | 3 | 0 | 1 | 0 | 4 | 1 | 6 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 18 |
| 05:30 PM | 0 | 3 | 3 | 0 | 6 | 5 | 0 | 2 | 0 | 7 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| 05:45 PM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 1 | 1 | 1 | 3 | 5 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 18 |
| Total | 0 | 23 | 5 | 1 | 28 | 8 | 0 | 5 | 2 | 13 | 5 | 17 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 3 | 63 | 66 |
| Grand Total | 0 | 38 | 11 | 2 | 49 | 11 | 2 | 12 | 6 | 25 | 15 | 47 | 0 | 0 | 62 | 0 | 0 | 0 | 0 | 0 | 8 | 136 | 144 |
| Apprch % | 0 | 77.6 | 22.4 | | | 44 | 8 | 48 | | | 24.2 | 75.8 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 27.9 | 8.1 | | 36 | 8.1 | 1.5 | 8.8 | | 18.4 | 11 | 34.6 | 0 | | 45.6 | 0 | 0 | 0 | | 0 | 5.6 | 94.4 | |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 5 | 0 | 5 | 1 | **1** | **3** | **5** | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | **17** |
| 04:45 PM | 0 | 3 | 1 | 4 | 0 | 0 | 1 | 1 | 1 | **7** | 0 | **8** | 0 | 0 | 0 | 0 | 13 |
| 05:00 PM | 0 | **8** | 0 | **8** | 0 | 0 | 1 | 1 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 14 |
| 05:15 PM | 0 | 4 | **2** | 6 | **3** | 0 | 1 | 4 | 1 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | 17 |
| Total Volume | 0 | 20 | 3 | 23 | 4 | 1 | 6 | 11 | 3 | 24 | 0 | 27 | 0 | 0 | 0 | 0 | 61 |
| % App. Total | 0 | 87 | 13 | | 36.4 | 9.1 | 54.5 | | 11.1 | 88.9 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .375 | .719 | .333 | .250 | .500 | .550 | .750 | .857 | .000 | .844 | .000 | .000 | .000 | .000 | .897 |

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File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

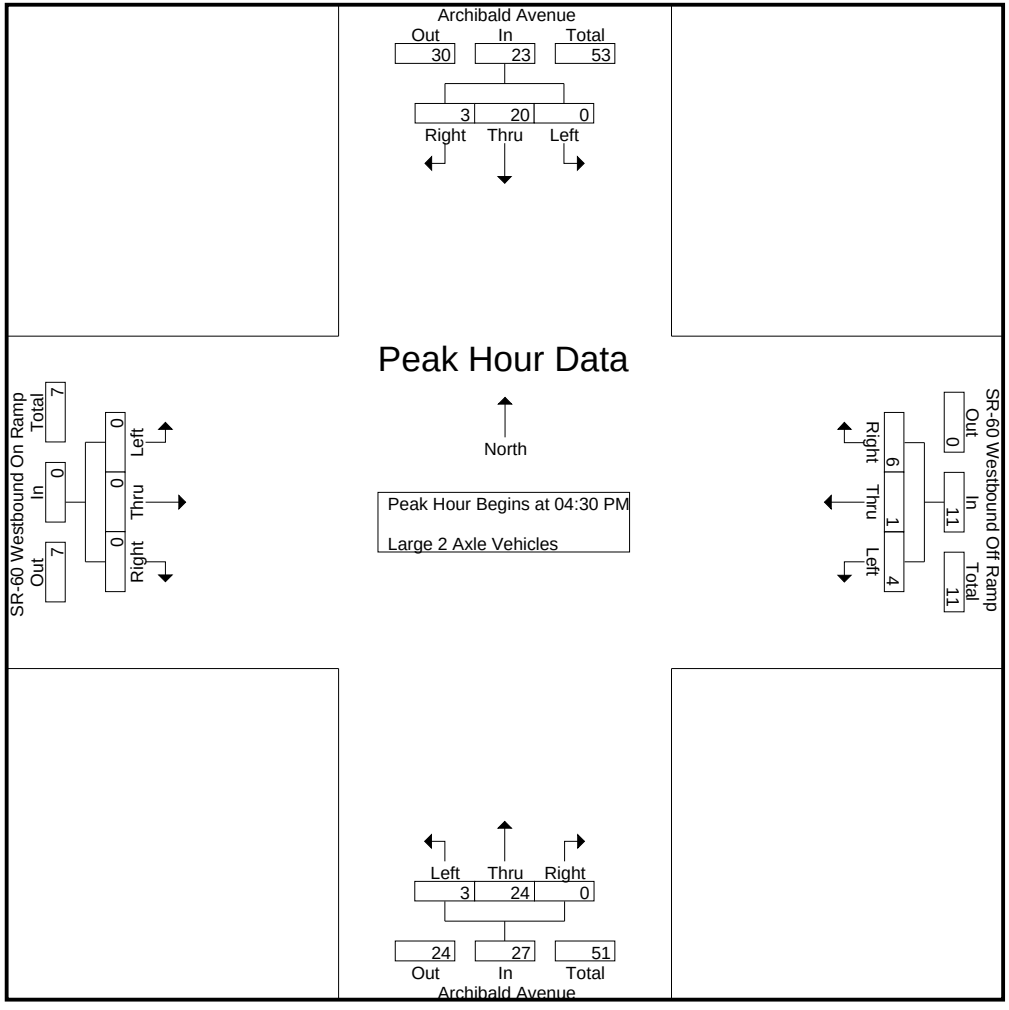

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| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 5 | 0 | 5 | 1 | **1** | **3** | **5** | **1** | 6 | 0 | 7 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 3 | 1 | 4 | 0 | 0 | 1 | 1 | 1 | **7** | 0 | **8** | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | **8** | 0 | **8** | 0 | 0 | 1 | 1 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 4 | **2** | 6 | **3** | 0 | 1 | 4 | 1 | 6 | 0 | 7 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 20 | 3 | 23 | 4 | 1 | 6 | 11 | 3 | 24 | 0 | 27 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 87 | 13 | | 36.4 | 9.1 | 54.5 | | 11.1 | 88.9 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .625 | .375 | .719 | .333 | .250 | .500 | .550 | .750 | .857 | .000 | .844 | .000 | .000 | .000 | .000 | |

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Groups Printed- 3 Axle Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 3 | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 9 |
| 04:15 PM | 0 | 4 | 1 | 0 | 5 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 10 |
| 04:30 PM | 0 | 1 | 2 | 0 | 3 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 |
| 04:45 PM | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 |
| Total | 0 | 7 | 3 | 0 | 10 | 5 | 0 | 2 | 1 | 7 | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 26 |
| 05:00 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 6 |
| 05:15 PM | 0 | 4 | 0 | 0 | 4 | 3 | 0 | 2 | 1 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 10 |
| 05:30 PM | 0 | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 5 |
| 05:45 PM | 0 | 1 | 1 | 0 | 2 | 3 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 5 |
| Total | 0 | 8 | 2 | 1 | 10 | 6 | 0 | 3 | 2 | 9 | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 3 | 23 | 26 |
| Grand Total | 0 | 15 | 5 | 1 | 20 | 11 | 0 | 5 | 3 | 16 | 1 | 11 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 4 | 48 | 52 |
| Apprch % | 0 | 75 | 25 | | | 68.8 | 0 | 31.2 | | | 8.3 | 91.7 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 31.2 | 10.4 | | 41.7 | 22.9 | 0 | 10.4 | | 33.3 | 2.1 | 22.9 | 0 | | 25 | 0 | 0 | 0 | | 0 | 7.7 | 92.3 | |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | 1 | **2** | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 04:45 PM | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 05:00 PM | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | 5 |
| 05:15 PM | 0 | **4** | 0 | **4** | **3** | 0 | **2** | **5** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | **9** |
| Total Volume | 0 | 8 | 2 | 10 | 6 | 0 | 3 | 9 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 21 |
| % App. Total | 0 | 80 | 20 | | 66.7 | 0 | 33.3 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .500 | .250 | .625 | .500 | .000 | .375 | .450 | .000 | .250 | .000 | .250 | .000 | .000 | .000 | .000 | .583 |

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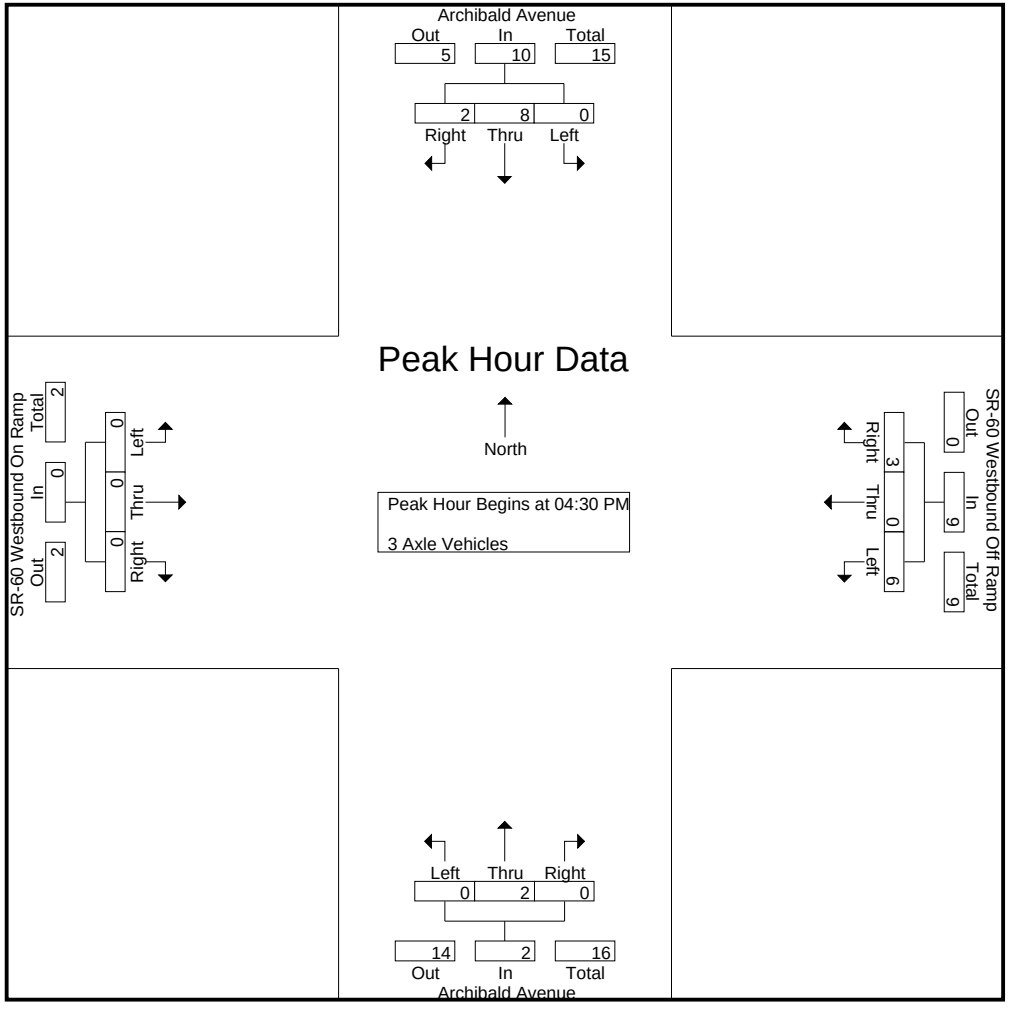

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Westbound Ramps
Weather: Clear

File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | 1 | **2** | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | **2** | 0 | **2** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | **4** | 0 | **4** | **3** | 0 | **2** | **5** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 8 | 2 | 10 | 6 | 0 | 3 | 9 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 80 | 20 | | 66.7 | 0 | 33.3 | | 0 | 100 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .500 | .250 | .625 | .500 | .000 | .375 | .450 | .000 | .250 | .000 | .250 | .000 | .000 | .000 | .000 | |

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File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Archibald Avenue Southbound | | | | | SR-60 Westbound Off Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Westbound On Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 7 | 5 | 1 | 12 | 8 | 0 | 3 | 1 | 11 | 3 | 12 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 2 | 38 | 40 |
| 04:15 PM | 0 | 5 | 5 | 0 | 10 | 8 | 0 | 2 | 1 | 10 | 1 | 9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 30 | 31 |
| 04:30 PM | 0 | 13 | 6 | 0 | 19 | 5 | 0 | 1 | 1 | 6 | 2 | 11 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 1 | 38 | 39 |
| 04:45 PM | 0 | 6 | 4 | 0 | 10 | 8 | 0 | 0 | 0 | 8 | 3 | 10 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 31 |
| Total | 0 | 31 | 20 | 1 | 51 | 29 | 0 | 6 | 3 | 35 | 9 | 42 | 0 | 0 | 51 | 0 | 0 | 0 | 0 | 0 | 4 | 137 | 141 |
| 05:00 PM | 0 | 10 | 5 | 2 | 15 | 4 | 0 | 4 | 3 | 8 | 3 | 15 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 5 | 41 | 46 |
| 05:15 PM | 0 | 5 | 6 | 2 | 11 | 7 | 0 | 2 | 1 | 9 | 2 | 7 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 3 | 29 | 32 |
| 05:30 PM | 0 | 3 | 5 | 2 | 8 | 6 | 0 | 1 | 1 | 7 | 1 | 4 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 20 | 23 |
| 05:45 PM | 0 | 4 | 4 | 1 | 8 | 2 | 2 | 6 | 3 | 10 | 1 | 12 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 4 | 31 | 35 |
| Total | 0 | 22 | 20 | 7 | 42 | 19 | 2 | 13 | 8 | 34 | 7 | 38 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 15 | 121 | 136 |
| Grand Total | 0 | 53 | 40 | 8 | 93 | 48 | 2 | 19 | 11 | 69 | 16 | 80 | 0 | 0 | 96 | 0 | 0 | 0 | 0 | 0 | 19 | 258 | 277 |
| Apprch % | 0 | 57 | 43 | | | 69.6 | 2.9 | 27.5 | | | 16.7 | 83.3 | 0 | | | 0 | 0 | 0 | | | | | |
| Total % | 0 | 20.5 | 15.5 | | 36 | 18.6 | 0.8 | 7.4 | | 26.7 | 6.2 | 31 | 0 | | 37.2 | 0 | 0 | 0 | | 0 | 6.9 | 93.1 | |

| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 0 | **13** | **6** | **19** | 5 | 0 | 1 | 6 | 2 | 11 | 0 | 13 | 0 | 0 | 0 | 0 | 38 |
| 04:45 PM | 0 | 6 | 4 | 10 | **8** | 0 | 0 | 8 | **3** | 10 | 0 | 13 | 0 | 0 | 0 | 0 | 31 |
| 05:00 PM | 0 | 10 | 5 | 15 | 4 | 0 | **4** | 8 | 3 | **15** | 0 | **18** | 0 | 0 | 0 | 0 | **41** |
| 05:15 PM | 0 | 5 | 6 | 11 | 7 | 0 | 2 | **9** | 2 | 7 | 0 | 9 | 0 | 0 | 0 | 0 | 29 |
| Total Volume | 0 | 34 | 21 | 55 | 24 | 0 | 7 | 31 | 10 | 43 | 0 | 53 | 0 | 0 | 0 | 0 | 139 |
| % App. Total | 0 | 61.8 | 38.2 | | 77.4 | 0 | 22.6 | | 18.9 | 81.1 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .654 | .875 | .724 | .750 | .000 | .438 | .861 | .833 | .717 | .000 | .736 | .000 | .000 | .000 | .000 | .848 |

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File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

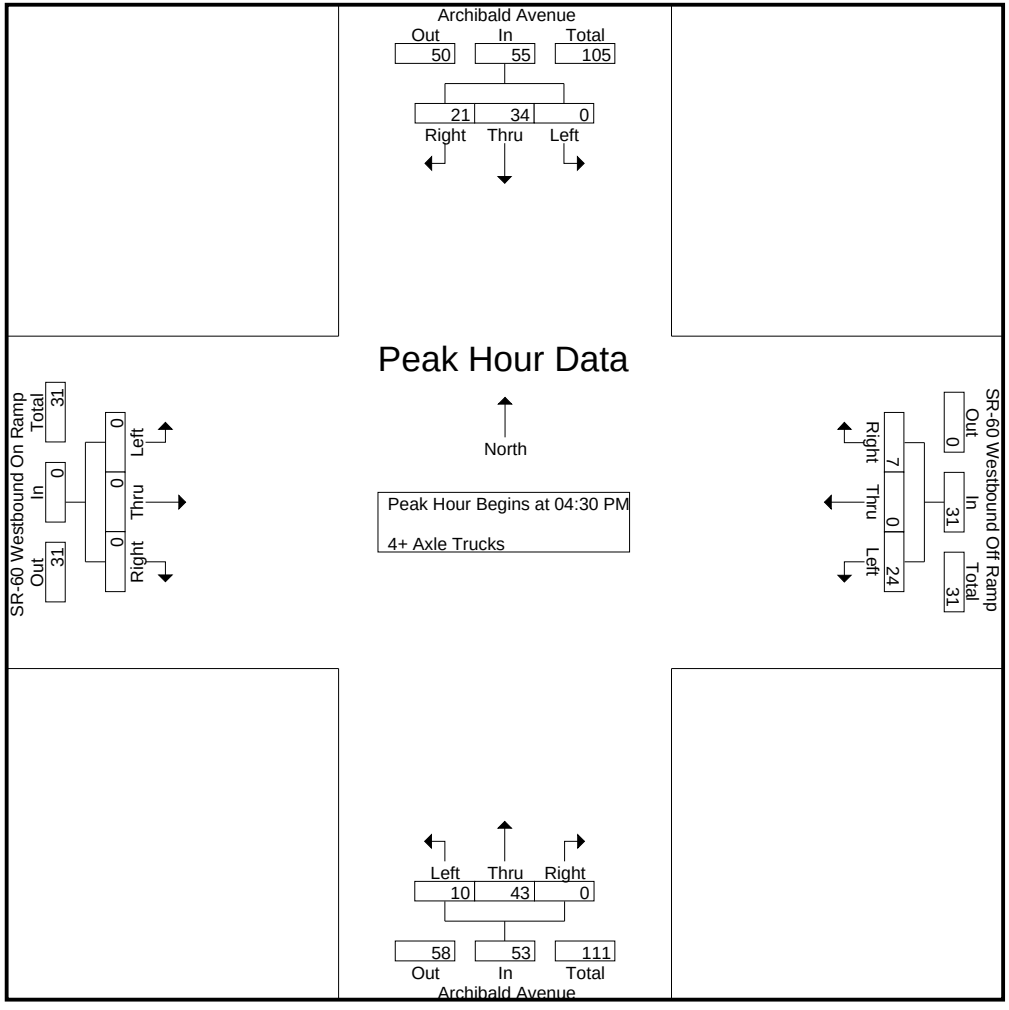

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City of Ontario
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File Name : 33_ONT_Arch_60W PMC
Site Code : 05124953
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| | Archibald Avenue Southbound | | | | SR-60 Westbound Off Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Westbound On Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | 04:30 PM | | | | |
| +0 mins. | 0 | **13** | **6** | **19** | 5 | 0 | 1 | 6 | 2 | 11 | 0 | 13 | 0 | 0 | 0 | 0 | |
| +15 mins. | 0 | 6 | 4 | 10 | **8** | 0 | 0 | 8 | **3** | 10 | 0 | 13 | 0 | 0 | 0 | 0 | |
| +30 mins. | 0 | 10 | 5 | 15 | 4 | 0 | **4** | 8 | 3 | **15** | 0 | **18** | 0 | 0 | 0 | 0 | |
| +45 mins. | 0 | 5 | 6 | 11 | 7 | 0 | 2 | **9** | 2 | 7 | 0 | 9 | 0 | 0 | 0 | 0 | |
| Total Volume | 0 | 34 | 21 | 55 | 24 | 0 | 7 | 31 | 10 | 43 | 0 | 53 | 0 | 0 | 0 | 0 | |
| % App. Total | 0 | 61.8 | 38.2 | | 77.4 | 0 | 22.6 | | 18.9 | 81.1 | 0 | | 0 | 0 | 0 | | |
| PHF | .000 | .654 | .875 | .724 | .750 | .000 | .438 | .861 | .833 | .717 | .000 | .736 | .000 | .000 | .000 | .000 | |

Location: Ontario
N/S: Archibald Avenue
E/W: SR-60 WB Ramps

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Archibald Avenue | East Leg<br>SR-60 WB Ramps | South Leg<br>Archibald Avenue | West Leg<br>SR-60 WB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 1 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 1 |

| | North Leg<br>Archibald Avenue | East Leg<br>SR-60 WB Ramps | South Leg<br>Archibald Avenue | West Leg<br>SR-60 WB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 1 | 0 | 0 | 1 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 1 | 0 | 0 | 1 |
| 5:15 PM | 0 | 0 | 2 | 0 | 2 |
| 5:30 PM | 0 | 0 | 1 | 0 | 1 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 3 | 0 | 5 |

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951-268-6268

Location: Ontario
N/S: Archibald Avenue
E/W: SR-60 WB Ramps

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Archibald Avenue | | | Westbound SR-60 WB Ramps | | | Northbound Archibald Avenue | | | Eastbound SR-60 WB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |

| | Southbound Archibald Avenue | | | Westbound SR-60 WB Ramps | | | Northbound Archibald Avenue | | | Eastbound SR-60 WB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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PO Box 1178
Corona, CA 92878
951-268-6268

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PO Box 1178
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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 24 | 102 | 0 | 0 | 126 | 0 | 0 | 0 | 0 | 0 | 0 | 241 | 98 | 22 | 339 | 29 | 1 | 47 | 20 | 77 | 42 | 542 | 584 |
| 07:15 AM | 18 | 98 | 0 | 0 | 116 | 0 | 0 | 0 | 0 | 0 | 0 | 291 | 131 | 15 | 422 | 23 | 0 | 57 | 24 | 80 | 39 | 618 | 657 |
| 07:30 AM | 35 | 141 | 0 | 0 | 176 | 0 | 0 | 0 | 0 | 0 | 0 | 300 | 145 | 27 | 445 | 44 | 0 | 73 | 33 | 117 | 60 | 738 | 798 |
| 07:45 AM | 16 | 151 | 0 | 0 | 167 | 0 | 0 | 0 | 0 | 0 | 0 | 285 | 152 | 25 | 437 | 57 | 0 | 102 | 39 | 159 | 64 | 763 | 827 |
| Total | 93 | 492 | 0 | 0 | 585 | 0 | 0 | 0 | 0 | 0 | 0 | 1117 | 526 | 89 | 1643 | 153 | 1 | 279 | 116 | 433 | 205 | 2661 | 2866 |
| 08:00 AM | 32 | 137 | 0 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | 0 | 319 | 152 | 29 | 471 | 65 | 0 | 67 | 43 | 132 | 72 | 772 | 844 |
| 08:15 AM | 24 | 102 | 0 | 0 | 126 | 0 | 0 | 0 | 0 | 0 | 0 | 304 | 136 | 38 | 440 | 46 | 2 | 62 | 36 | 110 | 74 | 676 | 750 |
| 08:30 AM | 22 | 105 | 0 | 0 | 127 | 0 | 0 | 0 | 0 | 0 | 0 | 292 | 102 | 26 | 394 | 59 | 2 | 64 | 36 | 125 | 62 | 646 | 708 |
| 08:45 AM | 19 | 118 | 0 | 0 | 137 | 0 | 0 | 0 | 0 | 0 | 0 | 284 | 91 | 19 | 375 | 45 | 0 | 75 | 30 | 120 | 49 | 632 | 681 |
| Total | 97 | 462 | 0 | 0 | 559 | 0 | 0 | 0 | 0 | 0 | 0 | 1199 | 481 | 112 | 1680 | 215 | 4 | 268 | 145 | 487 | 257 | 2726 | 2983 |
| Grand Total | 190 | 954 | 0 | 0 | 1144 | 0 | 0 | 0 | 0 | 0 | 0 | 2316 | 1007 | 201 | 3323 | 368 | 5 | 547 | 261 | 920 | 462 | 5387 | 5849 |
| Apprch % | 16.6 | 83.4 | 0 | | | 0 | 0 | 0 | | | 0 | 69.7 | 30.3 | | | 40 | 0.5 | 59.5 | | | | | |
| Total % | 3.5 | 17.7 | 0 | | 21.2 | 0 | 0 | 0 | | 0 | 0 | 43 | 18.7 | | 61.7 | 6.8 | 0.1 | 10.2 | | 17.1 | 7.9 | 92.1 | |
| Passenger Vehicles | 138 | 821 | 0 | | 959 | 0 | 0 | 0 | | 0 | 0 | 2187 | 824 | | 3198 | 325 | 3 | 488 | | 1057 | 0 | 0 | 5214 |
| % Passenger Vehicles | 72.6 | 86.1 | 0 | 0 | 83.8 | 0 | 0 | 0 | 0 | 0 | 0 | 94.4 | 81.8 | 93 | 90.7 | 88.3 | 60 | 89.2 | 92.3 | 89.5 | 0 | 0 | 89.1 |
| Large 2 Axle Vehicles | 16 | 29 | 0 | | 45 | 0 | 0 | 0 | | 0 | 0 | 42 | 24 | | 69 | 6 | 1 | 11 | | 20 | 0 | 0 | 134 |
| % Large 2 Axle Vehicles | 8.4 | 3 | 0 | 0 | 3.9 | 0 | 0 | 0 | 0 | 0 | 0 | 1.8 | 2.4 | 1.5 | 2 | 1.6 | 20 | 2 | 0.8 | 1.7 | 0 | 0 | 2.3 |
| 3 Axle Vehicles | 6 | 49 | 0 | | 55 | 0 | 0 | 0 | | 0 | 0 | 23 | 40 | | 67 | 7 | 0 | 12 | | 23 | 0 | 0 | 145 |
| % 3 Axle Vehicles | 3.2 | 5.1 | 0 | 0 | 4.8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 2 | 1.9 | 1.9 | 0 | 2.2 | 1.5 | 1.9 | 0 | 0 | 2.5 |
| 4+ Axle Trucks | 30 | 55 | 0 | | 85 | 0 | 0 | 0 | | 0 | 0 | 64 | 119 | | 190 | 30 | 1 | 36 | | 81 | 0 | 0 | 356 |
| % 4+ Axle Trucks | 15.8 | 5.8 | 0 | 0 | 7.4 | 0 | 0 | 0 | 0 | 0 | 0 | 2.8 | 11.8 | 3.5 | 5.4 | 8.2 | 20 | 6.6 | 5.4 | 6.9 | 0 | 0 | 6.1 |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **35** | 141 | 0 | **176** | 0 | 0 | 0 | 0 | 0 | 300 | 145 | 445 | 44 | 0 | 73 | 117 | 738 |
| 07:45 AM | 16 | **151** | 0 | 167 | 0 | 0 | 0 | 0 | 0 | 285 | **152** | 437 | 57 | 0 | **102** | **159** | 763 |
| 08:00 AM | 32 | 137 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | **319** | 152 | **471** | **65** | 0 | 67 | 132 | **772** |
| 08:15 AM | 24 | 102 | 0 | 126 | 0 | 0 | 0 | 0 | 0 | 304 | 136 | 440 | 46 | **2** | 62 | 110 | 676 |
| Total Volume | 107 | 531 | 0 | 638 | 0 | 0 | 0 | 0 | 0 | 1208 | 585 | 1793 | 212 | 2 | 304 | 518 | 2949 |
| % App. Total | 16.8 | 83.2 | 0 | | 0 | 0 | 0 | | 0 | 67.4 | 32.6 | | 40.9 | 0.4 | 58.7 | | |
| PHF | .764 | .879 | .000 | .906 | .000 | .000 | .000 | .000 | .000 | .947 | .962 | .952 | .815 | .250 | .745 | .814 | .955 |

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File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

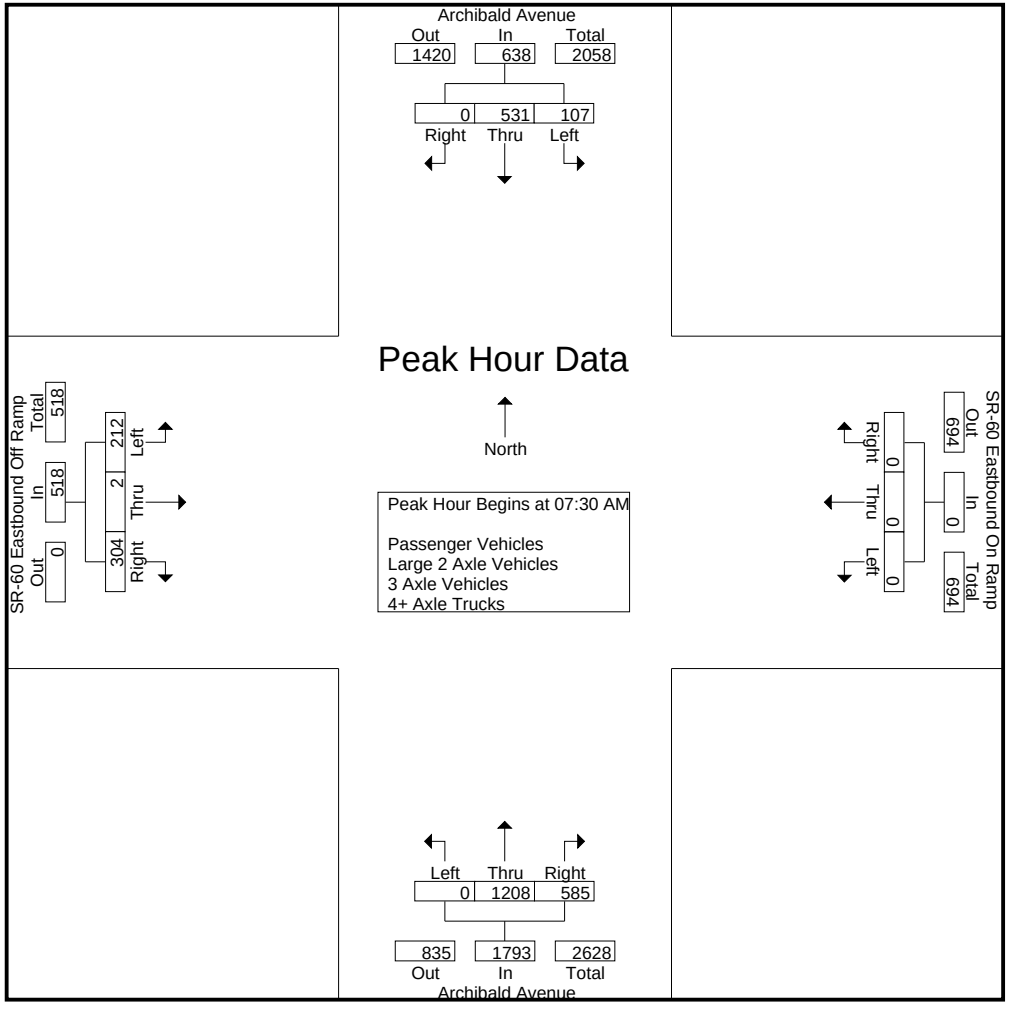

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:00 AM | | | | 07:30 AM | | | | 07:45 AM | | | | |
| +0 mins. | **35** | 141 | 0 | **176** | 0 | 0 | 0 | 0 | 0 | 300 | 145 | 445 | 57 | 0 | **102** | **159** | |
| +15 mins. | 16 | **151** | 0 | 167 | 0 | 0 | 0 | 0 | 0 | 285 | **152** | 437 | **65** | 0 | 67 | 132 | |
| +30 mins. | 32 | 137 | 0 | 169 | 0 | 0 | 0 | 0 | 0 | **319** | 152 | **471** | 46 | **2** | 62 | 110 | |
| +45 mins. | 24 | 102 | 0 | 126 | 0 | 0 | 0 | 0 | 0 | 304 | 136 | 440 | 59 | 2 | 64 | 125 | |
| Total Volume | 107 | 531 | 0 | 638 | 0 | 0 | 0 | 0 | 0 | 1208 | 585 | 1793 | 227 | 4 | 295 | 526 | |
| % App. Total | 16.8 | 83.2 | 0 | | 0 | 0 | 0 | | 0 | 67.4 | 32.6 | | 43.2 | 0.8 | 56.1 | | |
| PHF | .764 | .879 | .000 | .906 | .000 | .000 | .000 | .000 | .000 | .947 | .962 | .952 | .873 | .500 | .723 | .827 | |

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City of Ontario
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File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 18 | 77 | 0 | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 226 | 87 | 22 | 313 | 21 | 0 | 35 | 17 | 56 | 39 | 464 | 503 |
| 07:15 AM | 13 | 83 | 0 | 0 | 96 | 0 | 0 | 0 | 0 | 0 | 0 | 274 | 104 | 14 | 378 | 22 | 0 | 54 | 22 | 76 | 36 | 550 | 586 |
| 07:30 AM | 27 | 125 | 0 | 0 | 152 | 0 | 0 | 0 | 0 | 0 | 0 | 286 | 120 | 25 | 406 | 40 | 0 | 65 | 30 | 105 | 55 | 663 | 718 |
| 07:45 AM | 13 | 136 | 0 | 0 | 149 | 0 | 0 | 0 | 0 | 0 | 0 | 263 | 128 | 25 | 391 | 54 | 0 | 91 | 36 | 145 | 61 | 685 | 746 |
| Total | 71 | 421 | 0 | 0 | 492 | 0 | 0 | 0 | 0 | 0 | 0 | 1049 | 439 | 86 | 1488 | 137 | 0 | 245 | 105 | 382 | 191 | 2362 | 2553 |
| 08:00 AM | 19 | 122 | 0 | 0 | 141 | 0 | 0 | 0 | 0 | 0 | 0 | 298 | 116 | 23 | 414 | 61 | 0 | 64 | 41 | 125 | 64 | 680 | 744 |
| 08:15 AM | 16 | 85 | 0 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 0 | 291 | 115 | 37 | 406 | 41 | 1 | 59 | 35 | 101 | 72 | 608 | 680 |
| 08:30 AM | 17 | 89 | 0 | 0 | 106 | 0 | 0 | 0 | 0 | 0 | 0 | 283 | 81 | 23 | 364 | 49 | 2 | 56 | 33 | 107 | 56 | 577 | 633 |
| 08:45 AM | 15 | 104 | 0 | 0 | 119 | 0 | 0 | 0 | 0 | 0 | 0 | 266 | 73 | 18 | 339 | 37 | 0 | 64 | 27 | 101 | 45 | 559 | 604 |
| Total | 67 | 400 | 0 | 0 | 467 | 0 | 0 | 0 | 0 | 0 | 0 | 1138 | 385 | 101 | 1523 | 188 | 3 | 243 | 136 | 434 | 237 | 2424 | 2661 |
| Grand Total | 138 | 821 | 0 | 0 | 959 | 0 | 0 | 0 | 0 | 0 | 0 | 2187 | 824 | 187 | 3011 | 325 | 3 | 488 | 241 | 816 | 428 | 4786 | 5214 |
| Apprch % | 14.4 | 85.6 | 0 | | | 0 | 0 | 0 | | | 0 | 72.6 | 27.4 | | | 39.8 | 0.4 | 59.8 | | | | | |
| Total % | 2.9 | 17.2 | 0 | | 20 | 0 | 0 | 0 | | 0 | 0 | 45.7 | 17.2 | | 62.9 | 6.8 | 0.1 | 10.2 | | 17 | 8.2 | 91.8 | |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **27** | 125 | 0 | **152** | 0 | 0 | 0 | 0 | 0 | 286 | 120 | 406 | 40 | 0 | 65 | 105 | 663 |
| 07:45 AM | 13 | **136** | 0 | 149 | 0 | 0 | 0 | 0 | 0 | 263 | **128** | 391 | 54 | 0 | **91** | **145** | **685** |
| 08:00 AM | 19 | 122 | 0 | 141 | 0 | 0 | 0 | 0 | 0 | **298** | 116 | **414** | **61** | 0 | 64 | 125 | 680 |
| 08:15 AM | 16 | 85 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 291 | 115 | 406 | 41 | **1** | 59 | 101 | 608 |
| Total Volume | 75 | 468 | 0 | 543 | 0 | 0 | 0 | 0 | 0 | 1138 | 479 | 1617 | 196 | 1 | 279 | 476 | 2636 |
| % App. Total | 13.8 | 86.2 | 0 | | 0 | 0 | 0 | | 0 | 70.4 | 29.6 | | 41.2 | 0.2 | 58.6 | | |
| PHF | .694 | .860 | .000 | .893 | .000 | .000 | .000 | .000 | .000 | .955 | .936 | .976 | .803 | .250 | .766 | .821 | .962 |

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Corona, CA 92878
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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

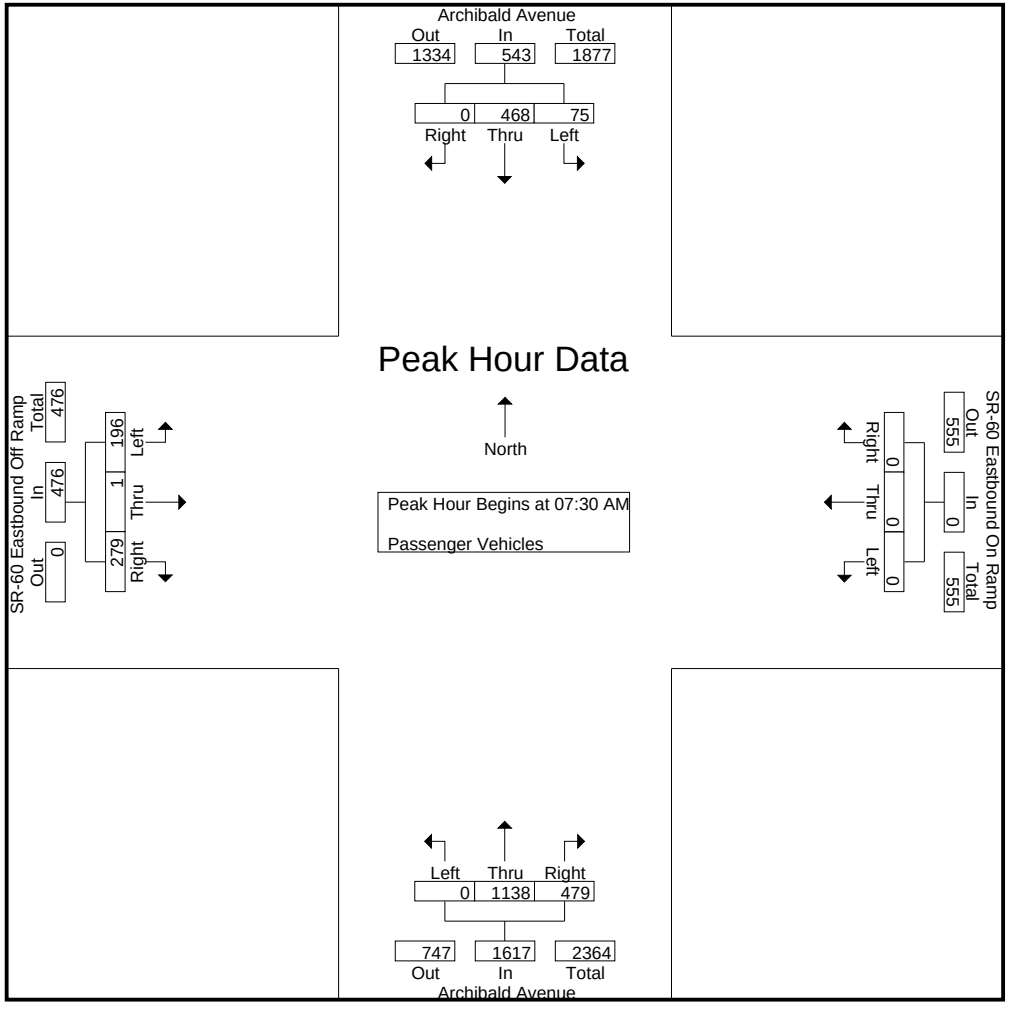

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Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **27** | 125 | 0 | **152** | 0 | 0 | 0 | 0 | 0 | 286 | 120 | 406 | 40 | 0 | 65 | 105 | |
| +15 mins. | 13 | **136** | 0 | 149 | 0 | 0 | 0 | 0 | 0 | 263 | **128** | 391 | 54 | 0 | **91** | **145** | |
| +30 mins. | 19 | 122 | 0 | 141 | 0 | 0 | 0 | 0 | 0 | **298** | 116 | **414** | **61** | 0 | 64 | 125 | |
| +45 mins. | 16 | 85 | 0 | 101 | 0 | 0 | 0 | 0 | 0 | 291 | 115 | 406 | 41 | **1** | 59 | 101 | |
| Total Volume | 75 | 468 | 0 | 543 | 0 | 0 | 0 | 0 | 0 | 1138 | 479 | 1617 | 196 | 1 | 279 | 476 | |
| % App. Total | 13.8 | 86.2 | 0 | | 0 | 0 | 0 | | 0 | 70.4 | 29.6 | | 41.2 | 0.2 | 58.6 | | |
| PHF | .694 | .860 | .000 | .893 | .000 | .000 | .000 | .000 | .000 | .955 | .936 | .976 | .803 | .250 | .766 | .821 | |

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City of Ontario
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Weather: Clear

File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 6 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 1 | 0 | 11 | 1 | 1 | 4 | 1 | 6 | 1 | 26 | 27 |
| 07:15 AM | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 15 | 15 |
| 07:30 AM | 3 | 4 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 2 | 8 | 1 | 0 | 1 | 0 | 2 | 2 | 17 | 19 |
| 07:45 AM | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 3 | 0 | 10 | 1 | 0 | 2 | 1 | 3 | 1 | 16 | 17 |
| Total | 8 | 17 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 10 | 2 | 38 | 3 | 1 | 7 | 2 | 11 | 4 | 74 | 78 |
| 08:00 AM | 4 | 4 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 6 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 18 |
| 08:15 AM | 2 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 11 | 11 |
| 08:30 AM | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 0 | 7 | 1 | 0 | 2 | 0 | 3 | 0 | 14 | 14 |
| 08:45 AM | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 2 | 0 | 5 | 2 | 0 | 2 | 0 | 4 | 0 | 13 | 13 |
| Total | 8 | 12 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 | 1 | 28 | 3 | 0 | 4 | 0 | 7 | 1 | 55 | 56 |
| Grand Total | 16 | 29 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 24 | 3 | 66 | 6 | 1 | 11 | 2 | 18 | 5 | 129 | 134 |
| Apprch % | 35.6 | 64.4 | 0 | | | 0 | 0 | 0 | | | 0 | 63.6 | 36.4 | | | 33.3 | 5.6 | 61.1 | | | | | |
| Total % | 12.4 | 22.5 | 0 | | 34.9 | 0 | 0 | 0 | | 0 | 0 | 32.6 | 18.6 | | 51.2 | 4.7 | 0.8 | 8.5 | | 14 | 3.7 | 96.3 | |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 3 | **4** | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 8 | **1** | 0 | 1 | 2 | **17** |
| 07:45 AM | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | **7** | 3 | **10** | 1 | 0 | **2** | **3** | 16 |
| 08:00 AM | **4** | 4 | 0 | **8** | 0 | 0 | 0 | 0 | 0 | 3 | **6** | 9 | 0 | 0 | 0 | 0 | 17 |
| 08:15 AM | 2 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | 11 |
| Total Volume | 10 | 12 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 19 | 15 | 34 | 2 | 0 | 3 | 5 | 61 |
| % App. Total | 45.5 | 54.5 | 0 | | 0 | 0 | 0 | | 0 | 55.9 | 44.1 | | 40 | 0 | 60 | | |
| PHF | .625 | .750 | .000 | .688 | .000 | .000 | .000 | .000 | .000 | .679 | .625 | .850 | .500 | .000 | .375 | .417 | .897 |

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E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

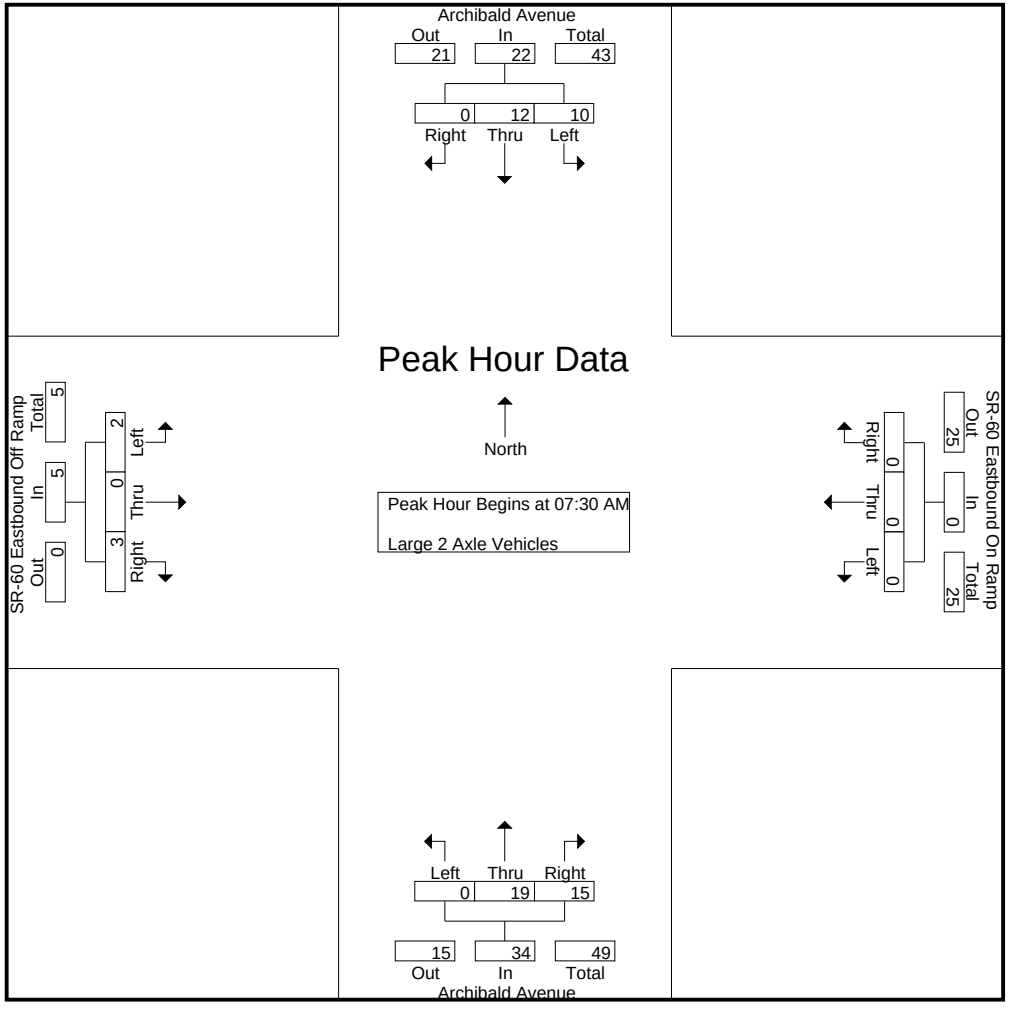

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 3 | **4** | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 5 | 3 | 8 | **1** | 0 | 1 | 2 | |
| +15 mins. | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | **7** | 3 | **10** | 1 | 0 | **2** | **3** | |
| +30 mins. | **4** | 4 | 0 | **8** | 0 | 0 | 0 | 0 | 0 | 3 | **6** | 9 | 0 | 0 | 0 | 0 | |
| +45 mins. | 2 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 7 | 0 | 0 | 0 | 0 | |
| Total Volume | 10 | 12 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 19 | 15 | 34 | 2 | 0 | 3 | 5 | |
| % App. Total | 45.5 | 54.5 | 0 | | 0 | 0 | 0 | | 0 | 55.9 | 44.1 | | 40 | 0 | 60 | | |
| PHF | .625 | .750 | .000 | .688 | .000 | .000 | .000 | .000 | .000 | .679 | .625 | .850 | .500 | .000 | .375 | .417 | |

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City of Ontario
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Weather: Clear

File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 2 | 0 | 1 | 0 | 3 | 0 | 14 | 14 |
| 07:15 AM | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 8 | 1 | 15 | 1 | 0 | 2 | 1 | 3 | 2 | 23 | 25 |
| 07:30 AM | 3 | 5 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 6 | 0 | 10 | 2 | 0 | 1 | 1 | 3 | 1 | 21 | 22 |
| 07:45 AM | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 0 | 12 | 0 | 0 | 2 | 0 | 2 | 0 | 19 | 19 |
| Total | 3 | 23 | 0 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 23 | 1 | 40 | 5 | 0 | 6 | 2 | 11 | 3 | 77 | 80 |
| 08:00 AM | 1 | 9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 6 | 0 | 0 | 2 | 1 | 2 | 2 | 18 | 20 |
| 08:15 AM | 2 | 6 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 10 | 10 |
| 08:30 AM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 2 | 8 | 2 | 0 | 2 | 1 | 4 | 3 | 19 | 22 |
| 08:45 AM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 8 | 0 | 0 | 1 | 0 | 1 | 0 | 13 | 13 |
| Total | 3 | 26 | 0 | 0 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 17 | 3 | 23 | 2 | 0 | 6 | 2 | 8 | 5 | 60 | 65 |
| Grand Total | 6 | 49 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 40 | 4 | 63 | 7 | 0 | 12 | 4 | 19 | 8 | 137 | 145 |
| Apprch % | 10.9 | 89.1 | 0 | | | 0 | 0 | 0 | | | 0 | 36.5 | 63.5 | | | 36.8 | 0 | 63.2 | | | | | |
| Total % | 4.4 | 35.8 | 0 | | 40.1 | 0 | 0 | 0 | | 0 | 0 | 16.8 | 29.2 | | 46 | 5.1 | 0 | 8.8 | | 13.9 | 5.5 | 94.5 | |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | **3** | 5 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | **6** | 10 | **2** | 0 | 1 | **3** | **21** |
| 07:45 AM | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | **6** | 6 | **12** | 0 | 0 | **2** | 2 | 19 |
| 08:00 AM | 1 | **9** | 0 | **10** | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 6 | 0 | 0 | 2 | 2 | 18 |
| 08:15 AM | 2 | 6 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 10 |
| Total Volume | 6 | 25 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 12 | 17 | 29 | 2 | 0 | 6 | 8 | 68 |
| % App. Total | 19.4 | 80.6 | 0 | | 0 | 0 | 0 | | 0 | 41.4 | 58.6 | | 25 | 0 | 75 | | |
| PHF | .500 | .694 | .000 | .775 | .000 | .000 | .000 | .000 | .000 | .500 | .708 | .604 | .250 | .000 | .750 | .667 | .810 |

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(951) 268-6268

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File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

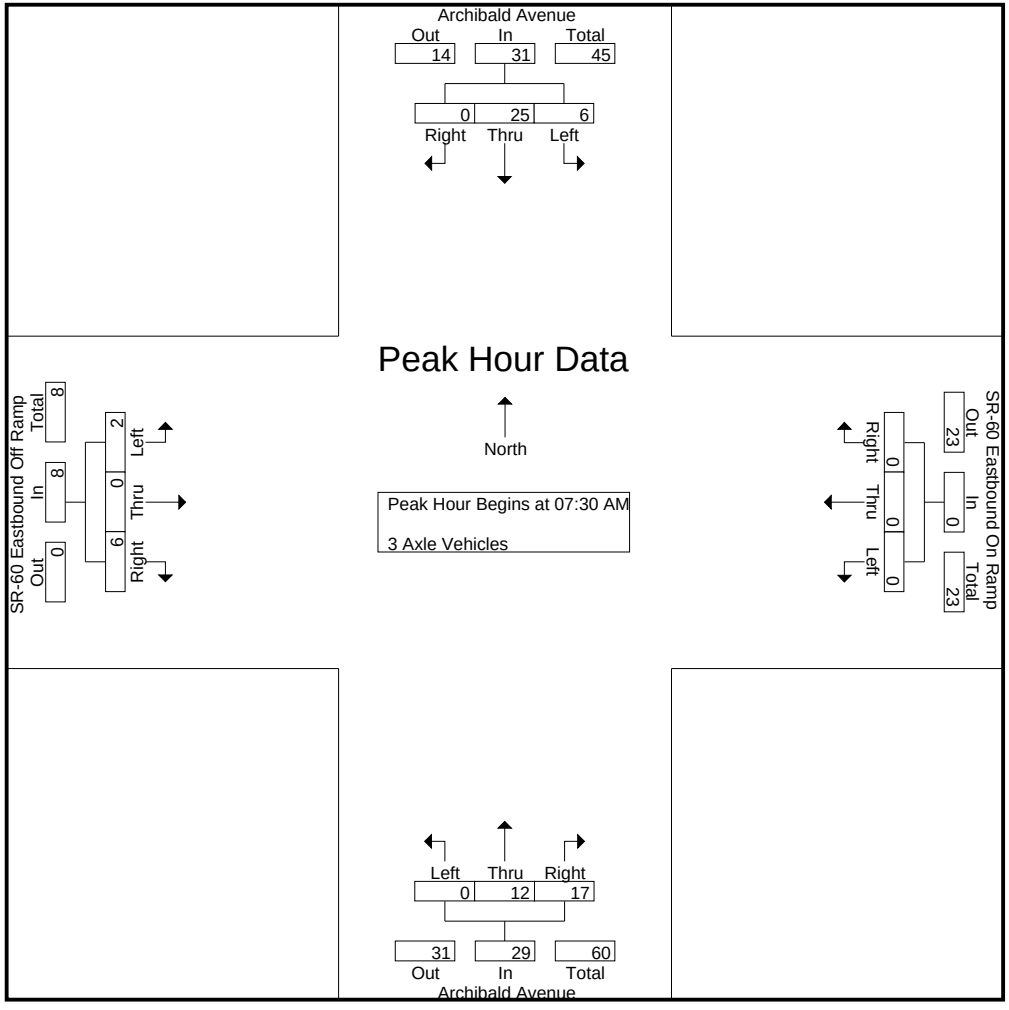

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| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | **3** | 5 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 4 | **6** | 10 | **2** | 0 | 1 | **3** | |
| +15 mins. | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | **6** | 6 | **12** | 0 | 0 | **2** | 2 | |
| +30 mins. | 1 | **9** | 0 | **10** | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 6 | 0 | 0 | 2 | 2 | |
| +45 mins. | 2 | 6 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | |
| Total Volume | 6 | 25 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 12 | 17 | 29 | 2 | 0 | 6 | 8 | |
| % App. Total | 19.4 | 80.6 | 0 | | 0 | 0 | 0 | | 0 | 41.4 | 58.6 | | 25 | 0 | 75 | | |
| PHF | .500 | .694 | .000 | .775 | .000 | .000 | .000 | .000 | .000 | .500 | .708 | .604 | .250 | .000 | .750 | .667 | |

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Weather: Clear

File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 11 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 7 | 0 | 12 | 5 | 0 | 7 | 2 | 12 | 2 | 38 | 40 |
| 07:15 AM | 4 | 5 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 16 | 0 | 20 | 0 | 0 | 1 | 1 | 1 | 1 | 30 | 31 |
| 07:30 AM | 2 | 7 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 16 | 0 | 21 | 1 | 0 | 6 | 2 | 7 | 2 | 37 | 39 |
| 07:45 AM | 2 | 8 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 15 | 0 | 24 | 2 | 0 | 7 | 2 | 9 | 2 | 43 | 45 |
| Total | 11 | 31 | 0 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 54 | 0 | 77 | 8 | 0 | 21 | 7 | 29 | 7 | 148 | 155 |
| 08:00 AM | 8 | 2 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 26 | 4 | 42 | 4 | 0 | 1 | 1 | 5 | 5 | 57 | 62 |
| 08:15 AM | 4 | 9 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 17 | 1 | 26 | 5 | 1 | 2 | 1 | 8 | 2 | 47 | 49 |
| 08:30 AM | 4 | 6 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 12 | 1 | 15 | 7 | 0 | 4 | 2 | 11 | 3 | 36 | 39 |
| 08:45 AM | 3 | 7 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 10 | 1 | 23 | 6 | 0 | 8 | 3 | 14 | 4 | 47 | 51 |
| Total | 19 | 24 | 0 | 0 | 43 | 0 | 0 | 0 | 0 | 0 | 0 | 41 | 65 | 7 | 106 | 22 | 1 | 15 | 7 | 38 | 14 | 187 | 201 |
| Grand Total | 30 | 55 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 64 | 119 | 7 | 183 | 30 | 1 | 36 | 14 | 67 | 21 | 335 | 356 |
| Apprch % | 35.3 | 64.7 | 0 | | | 0 | 0 | 0 | | | 0 | 35 | 65 | | | 44.8 | 1.5 | 53.7 | | | | | |
| Total % | 9 | 16.4 | 0 | | 25.4 | 0 | 0 | 0 | | 0 | 0 | 19.1 | 35.5 | | 54.6 | 9 | 0.3 | 10.7 | | 20 | 5.9 | 94.1 | |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 2 | 7 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 5 | 16 | 21 | 1 | 0 | 6 | 7 | 37 |
| 07:45 AM | 2 | 8 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 9 | 15 | 24 | 2 | 0 | **7** | **9** | 43 |
| 08:00 AM | **8** | 2 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | **16** | **26** | **42** | 4 | 0 | 1 | 5 | **57** |
| 08:15 AM | 4 | **9** | 0 | **13** | 0 | 0 | 0 | 0 | 0 | 9 | 17 | 26 | **5** | **1** | 2 | 8 | 47 |
| Total Volume | 16 | 26 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 39 | 74 | 113 | 12 | 1 | 16 | 29 | 184 |
| % App. Total | 38.1 | 61.9 | 0 | | 0 | 0 | 0 | | 0 | 34.5 | 65.5 | | 41.4 | 3.4 | 55.2 | | |
| PHF | .500 | .722 | .000 | .808 | .000 | .000 | .000 | .000 | .000 | .609 | .712 | .673 | .600 | .250 | .571 | .806 | .807 |

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City of Ontario
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E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

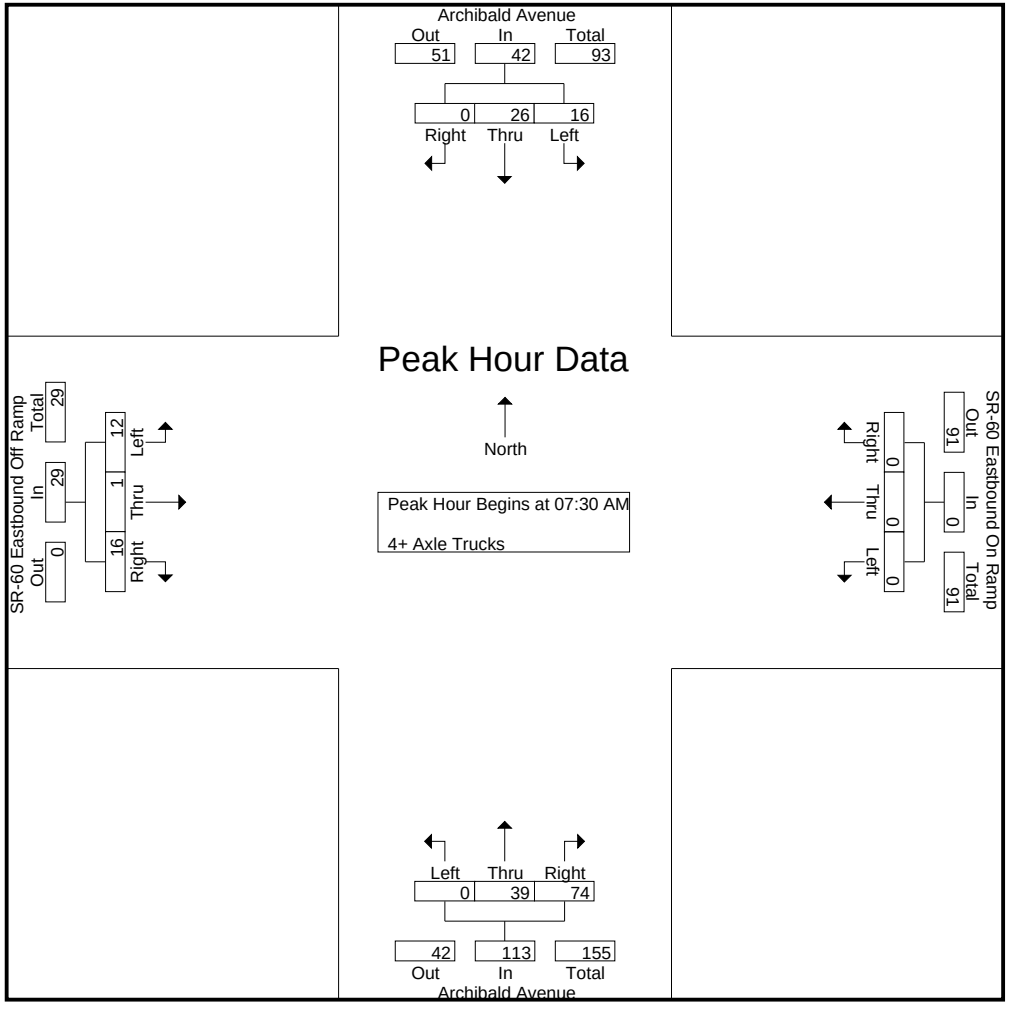

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| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | 07:30 AM | | | | |
| +0 mins. | 2 | 7 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 5 | 16 | 21 | 1 | 0 | 6 | 7 | |
| +15 mins. | 2 | 8 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 9 | 15 | 24 | 2 | 0 | **7** | **9** | |
| +30 mins. | **8** | 2 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | **16** | **26** | **42** | 4 | 0 | 1 | 5 | |
| +45 mins. | 4 | **9** | 0 | **13** | 0 | 0 | 0 | 0 | 0 | 9 | 17 | 26 | **5** | **1** | 2 | 8 | |
| Total Volume | 16 | 26 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 39 | 74 | 113 | 12 | 1 | 16 | 29 | |
| % App. Total | 38.1 | 61.9 | 0 | | 0 | 0 | 0 | | 0 | 34.5 | 65.5 | | 41.4 | 3.4 | 55.2 | | |
| PHF | .500 | .722 | .000 | .808 | .000 | .000 | .000 | .000 | .000 | .609 | .712 | .673 | .600 | .250 | .571 | .806 | |

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Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 101 | 203 | 0 | 0 | 304 | 0 | 0 | 0 | 0 | 0 | 0 | 243 | 117 | 42 | 360 | 66 | 1 | 129 | 51 | 196 | 93 | 860 | 953 |
| 04:15 PM | 100 | 215 | 0 | 0 | 315 | 0 | 0 | 0 | 0 | 0 | 0 | 219 | 129 | 23 | 348 | 37 | 0 | 106 | 48 | 143 | 71 | 806 | 877 |
| 04:30 PM | 112 | 213 | 0 | 0 | 325 | 0 | 0 | 0 | 0 | 0 | 0 | 165 | 111 | 17 | 276 | 25 | 0 | 102 | 34 | 127 | 51 | 728 | 779 |
| 04:45 PM | 86 | 224 | 0 | 0 | 310 | 0 | 0 | 0 | 0 | 0 | 0 | 195 | 113 | 22 | 308 | 26 | 0 | 116 | 38 | 142 | 60 | 760 | 820 |
| Total | 399 | 855 | 0 | 0 | 1254 | 0 | 0 | 0 | 0 | 0 | 0 | 822 | 470 | 104 | 1292 | 154 | 1 | 453 | 171 | 608 | 275 | 3154 | 3429 |
| 05:00 PM | 130 | 256 | 0 | 0 | 386 | 0 | 0 | 0 | 0 | 0 | 0 | 164 | 102 | 35 | 266 | 31 | 2 | 123 | 46 | 156 | 81 | 808 | 889 |
| 05:15 PM | 111 | 241 | 0 | 0 | 352 | 0 | 0 | 0 | 0 | 0 | 0 | 195 | 113 | 27 | 308 | 12 | 0 | 118 | 20 | 130 | 47 | 790 | 837 |
| 05:30 PM | 76 | 276 | 0 | 0 | 352 | 0 | 0 | 0 | 0 | 0 | 0 | 167 | 90 | 14 | 257 | 12 | 0 | 151 | 31 | 163 | 45 | 772 | 817 |
| 05:45 PM | 49 | 244 | 0 | 0 | 293 | 0 | 0 | 0 | 0 | 0 | 0 | 165 | 104 | 20 | 269 | 19 | 0 | 148 | 20 | 167 | 40 | 729 | 769 |
| Total | 366 | 1017 | 0 | 0 | 1383 | 0 | 0 | 0 | 0 | 0 | 0 | 691 | 409 | 96 | 1100 | 74 | 2 | 540 | 117 | 616 | 213 | 3099 | 3312 |
| Grand Total | 765 | 1872 | 0 | 0 | 2637 | 0 | 0 | 0 | 0 | 0 | 0 | 1513 | 879 | 200 | 2392 | 228 | 3 | 993 | 288 | 1224 | 488 | 6253 | 6741 |
| Apprch % | 29 | 71 | 0 | | | 0 | 0 | 0 | | | 0 | 63.3 | 36.7 | | | 18.6 | 0.2 | 81.1 | | | | | |
| Total % | 12.2 | 29.9 | 0 | | 42.2 | 0 | 0 | 0 | | 0 | 0 | 24.2 | 14.1 | | 38.3 | 3.6 | 0 | 15.9 | | 19.6 | 7.2 | 92.8 | |
| Passenger Vehicles | 730 | 1729 | 0 | | 2459 | 0 | 0 | 0 | | 0 | 0 | 1418 | 795 | | 2403 | 156 | 2 | 955 | | 1393 | 0 | 0 | 6255 |
| % Passenger Vehicles | 95.4 | 92.4 | 0 | 0 | 93.2 | 0 | 0 | 0 | 0 | 0 | 0 | 93.7 | 90.4 | 95 | 92.7 | 68.4 | 66.7 | 96.2 | 97.2 | 92.1 | 0 | 0 | 92.8 |
| Large 2 Axle Vehicles | 10 | 40 | 0 | | 50 | 0 | 0 | 0 | | 0 | 0 | 38 | 18 | | 59 | 21 | 1 | 6 | | 30 | 0 | 0 | 139 |
| % Large 2 Axle Vehicles | 1.3 | 2.1 | 0 | 0 | 1.9 | 0 | 0 | 0 | 0 | 0 | 0 | 2.5 | 2 | 1.5 | 2.3 | 9.2 | 33.3 | 0.6 | 0.7 | 2 | 0 | 0 | 2.1 |
| 3 Axle Vehicles | 7 | 21 | 0 | | 28 | 0 | 0 | 0 | | 0 | 0 | 8 | 24 | | 33 | 4 | 0 | 9 | | 15 | 0 | 0 | 76 |
| % 3 Axle Vehicles | 0.9 | 1.1 | 0 | 0 | 1.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0.5 | 2.7 | 0.5 | 1.3 | 1.8 | 0 | 0.9 | 0.7 | 1 | 0 | 0 | 1.1 |
| 4+ Axle Trucks | 18 | 82 | 0 | | 100 | 0 | 0 | 0 | | 0 | 0 | 49 | 42 | | 97 | 47 | 0 | 23 | | 74 | 0 | 0 | 271 |
| % 4+ Axle Trucks | 2.4 | 4.4 | 0 | 0 | 3.8 | 0 | 0 | 0 | 0 | 0 | 0 | 3.2 | 4.8 | 3 | 3.7 | 20.6 | 0 | 2.3 | 1.4 | 4.9 | 0 | 0 | 4 |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 101 | 203 | 0 | 304 | 0 | 0 | 0 | 0 | 0 | **243** | 117 | **360** | **66** | **1** | **129** | **196** | **860** |
| 04:15 PM | 100 | 215 | 0 | 315 | 0 | 0 | 0 | 0 | 0 | 219 | **129** | 348 | 37 | 0 | 106 | 143 | 806 |
| 04:30 PM | **112** | 213 | 0 | **325** | 0 | 0 | 0 | 0 | 0 | 165 | 111 | 276 | 25 | 0 | 102 | 127 | 728 |
| 04:45 PM | 86 | **224** | 0 | 310 | 0 | 0 | 0 | 0 | 0 | 195 | 113 | 308 | 26 | 0 | 116 | 142 | 760 |
| Total Volume | 399 | 855 | 0 | 1254 | 0 | 0 | 0 | 0 | 0 | 822 | 470 | 1292 | 154 | 1 | 453 | 608 | 3154 |
| % App. Total | 31.8 | 68.2 | 0 | | 0 | 0 | 0 | | 0 | 63.6 | 36.4 | | 25.3 | 0.2 | 74.5 | | |
| PHF | .891 | .954 | .000 | .965 | .000 | .000 | .000 | .000 | .000 | .846 | .911 | .897 | .583 | .250 | .878 | .776 | .917 |

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File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

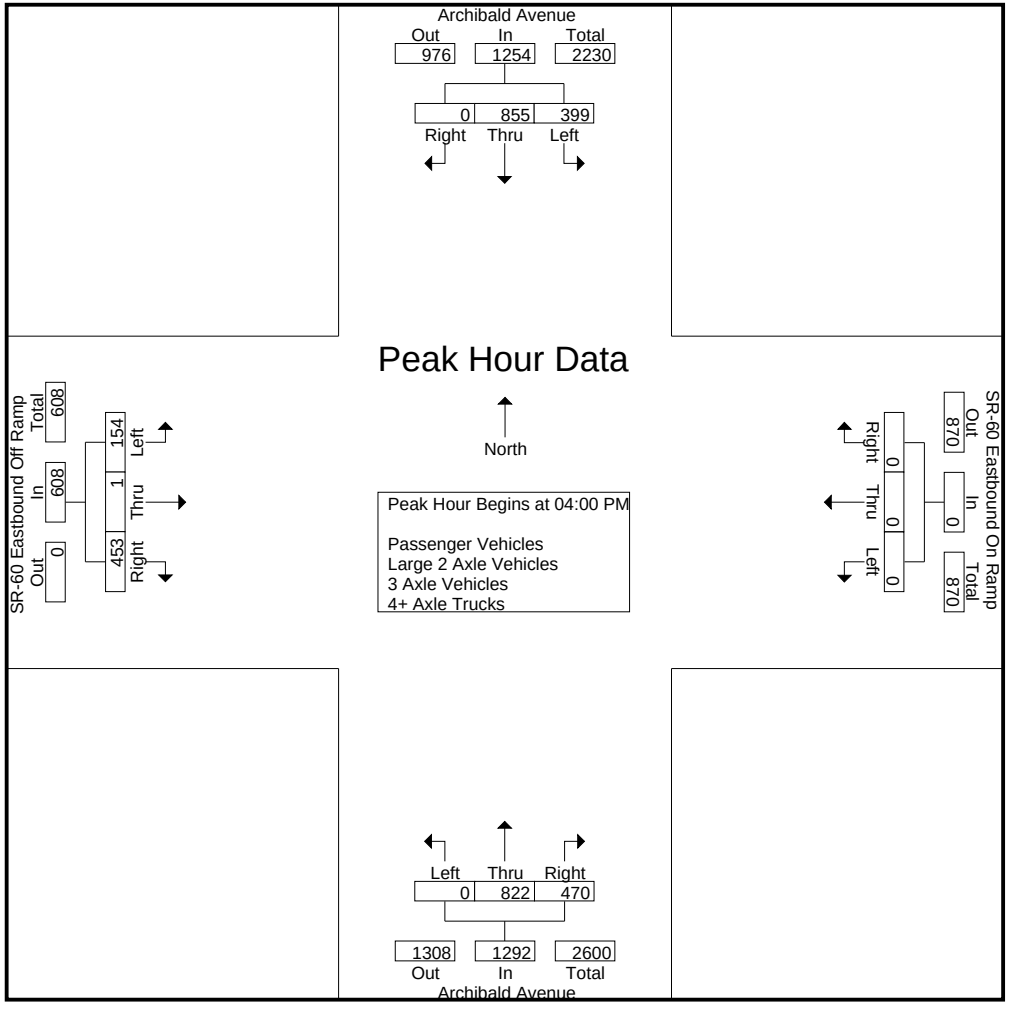

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File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:45 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 05:00 PM | | | | |
| +0 mins. | 86 | 224 | 0 | 310 | 0 | 0 | 0 | 0 | 0 | **243** | 117 | **360** | **31** | **2** | 123 | 156 | |
| +15 mins. | **130** | 256 | 0 | **386** | 0 | 0 | 0 | 0 | 0 | 219 | **129** | 348 | 12 | 0 | 118 | 130 | |
| +30 mins. | 111 | 241 | 0 | 352 | 0 | 0 | 0 | 0 | 0 | 165 | 111 | 276 | 12 | 0 | **151** | 163 | |
| +45 mins. | 76 | **276** | 0 | 352 | 0 | 0 | 0 | 0 | 0 | 195 | 113 | 308 | 19 | 0 | 148 | **167** | |
| Total Volume | 403 | 997 | 0 | 1400 | 0 | 0 | 0 | 0 | 0 | 822 | 470 | 1292 | 74 | 2 | 540 | 616 | |
| % App. Total | 28.8 | 71.2 | 0 | | 0 | 0 | 0 | | 0 | 63.6 | 36.4 | | 12 | 0.3 | 87.7 | | |
| PHF | .775 | .903 | .000 | .907 | .000 | .000 | .000 | .000 | .000 | .846 | .911 | .897 | .597 | .250 | .894 | .922 | |

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File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 99 | 182 | 0 | 0 | 281 | 0 | 0 | 0 | 0 | 0 | 0 | 223 | 108 | 38 | 331 | 53 | 1 | 123 | 48 | 177 | 86 | 789 | 875 |
| 04:15 PM | 94 | 196 | 0 | 0 | 290 | 0 | 0 | 0 | 0 | 0 | 0 | 209 | 116 | 22 | 325 | 28 | 0 | 105 | 48 | 133 | 70 | 748 | 818 |
| 04:30 PM | 106 | 195 | 0 | 0 | 301 | 0 | 0 | 0 | 0 | 0 | 0 | 153 | 102 | 16 | 255 | 16 | 0 | 99 | 33 | 115 | 49 | 671 | 720 |
| 04:45 PM | 81 | 207 | 0 | 0 | 288 | 0 | 0 | 0 | 0 | 0 | 0 | 184 | 100 | 20 | 284 | 15 | 0 | 113 | 35 | 128 | 55 | 700 | 755 |
| Total | 380 | 780 | 0 | 0 | 1160 | 0 | 0 | 0 | 0 | 0 | 0 | 769 | 426 | 96 | 1195 | 112 | 1 | 440 | 164 | 553 | 260 | 2908 | 3168 |
| 05:00 PM | 124 | 241 | 0 | 0 | 365 | 0 | 0 | 0 | 0 | 0 | 0 | 150 | 94 | 35 | 244 | 21 | 1 | 120 | 46 | 142 | 81 | 751 | 832 |
| 05:15 PM | 105 | 221 | 0 | 0 | 326 | 0 | 0 | 0 | 0 | 0 | 0 | 181 | 101 | 25 | 282 | 9 | 0 | 107 | 20 | 116 | 45 | 724 | 769 |
| 05:30 PM | 73 | 259 | 0 | 0 | 332 | 0 | 0 | 0 | 0 | 0 | 0 | 160 | 78 | 14 | 238 | 10 | 0 | 145 | 30 | 155 | 44 | 725 | 769 |
| 05:45 PM | 48 | 228 | 0 | 0 | 276 | 0 | 0 | 0 | 0 | 0 | 0 | 158 | 96 | 20 | 254 | 4 | 0 | 143 | 20 | 147 | 40 | 677 | 717 |
| Total | 350 | 949 | 0 | 0 | 1299 | 0 | 0 | 0 | 0 | 0 | 0 | 649 | 369 | 94 | 1018 | 44 | 1 | 515 | 116 | 560 | 210 | 2877 | 3087 |
| Grand Total | 730 | 1729 | 0 | 0 | 2459 | 0 | 0 | 0 | 0 | 0 | 0 | 1418 | 795 | 190 | 2213 | 156 | 2 | 955 | 280 | 1113 | 470 | 5785 | 6255 |
| Apprch % | 29.7 | 70.3 | 0 | | | 0 | 0 | 0 | | | 0 | 64.1 | 35.9 | | | 14 | 0.2 | 85.8 | | | | | |
| Total % | 12.6 | 29.9 | 0 | | 42.5 | 0 | 0 | 0 | | 0 | 0 | 24.5 | 13.7 | | 38.3 | 2.7 | 0 | 16.5 | | 19.2 | 7.5 | 92.5 | |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 99 | 182 | 0 | 281 | 0 | 0 | 0 | 0 | 0 | **223** | 108 | **331** | **53** | **1** | **123** | **177** | **789** |
| 04:15 PM | 94 | 196 | 0 | 290 | 0 | 0 | 0 | 0 | 0 | 209 | **116** | 325 | 28 | 0 | 105 | 133 | 748 |
| 04:30 PM | **106** | 195 | 0 | **301** | 0 | 0 | 0 | 0 | 0 | 153 | 102 | 255 | 16 | 0 | 99 | 115 | 671 |
| 04:45 PM | 81 | **207** | 0 | 288 | 0 | 0 | 0 | 0 | 0 | 184 | 100 | 284 | 15 | 0 | 113 | 128 | 700 |
| Total Volume | 380 | 780 | 0 | 1160 | 0 | 0 | 0 | 0 | 0 | 769 | 426 | 1195 | 112 | 1 | 440 | 553 | 2908 |
| % App. Total | 32.8 | 67.2 | 0 | | 0 | 0 | 0 | | 0 | 64.4 | 35.6 | | 20.3 | 0.2 | 79.6 | | |
| PHF | .896 | .942 | .000 | .963 | .000 | .000 | .000 | .000 | .000 | .862 | .918 | .903 | .528 | .250 | .894 | .781 | .921 |

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Page No : 2

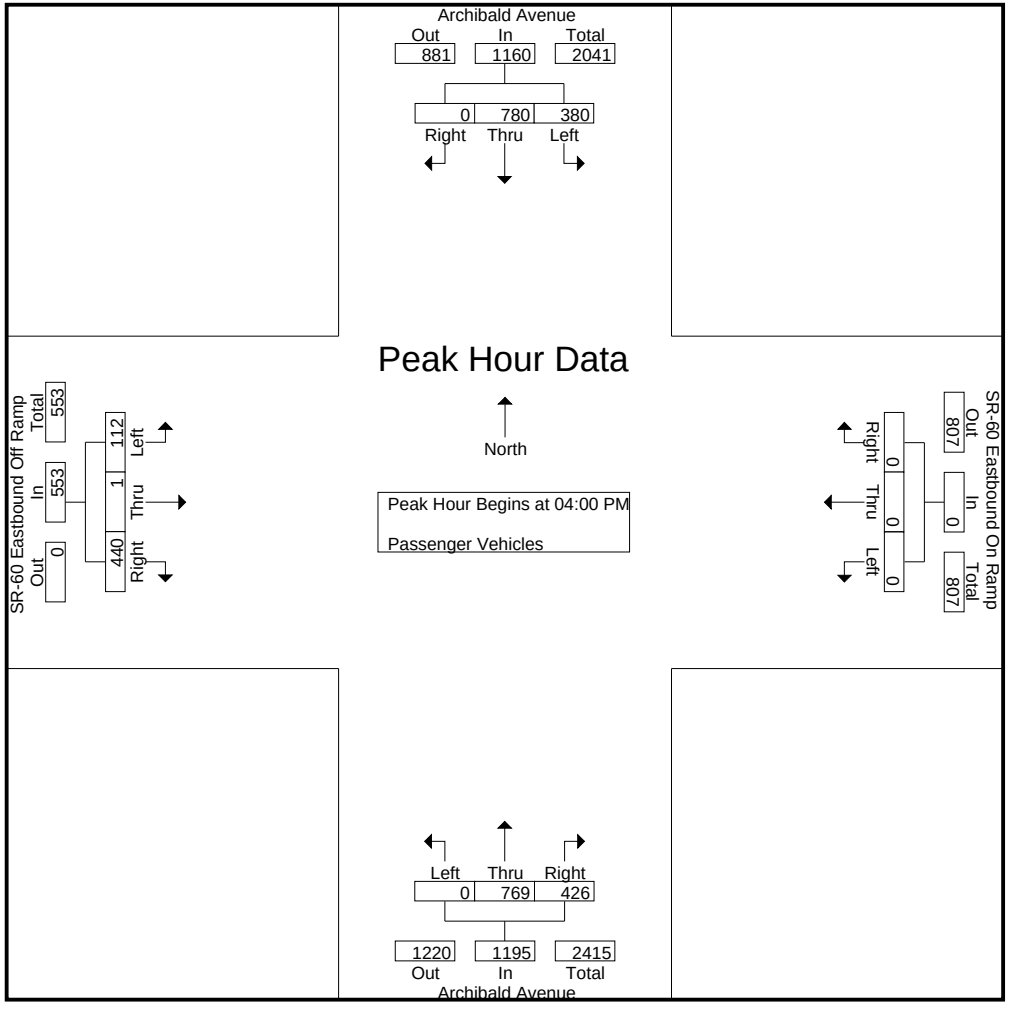

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| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 99 | 182 | 0 | 281 | 0 | 0 | 0 | 0 | 0 | **223** | 108 | **331** | **53** | **1** | **123** | **177** | |
| +15 mins. | 94 | 196 | 0 | 290 | 0 | 0 | 0 | 0 | 0 | 209 | **116** | 325 | 28 | 0 | 105 | 133 | |
| +30 mins. | **106** | 195 | 0 | **301** | 0 | 0 | 0 | 0 | 0 | 153 | 102 | 255 | 16 | 0 | 99 | 115 | |
| +45 mins. | 81 | **207** | 0 | 288 | 0 | 0 | 0 | 0 | 0 | 184 | 100 | 284 | 15 | 0 | 113 | 128 | |
| Total Volume | 380 | 780 | 0 | 1160 | 0 | 0 | 0 | 0 | 0 | 769 | 426 | 1195 | 112 | 1 | 440 | 553 | |
| % App. Total | 32.8 | 67.2 | 0 | | 0 | 0 | 0 | | 0 | 64.4 | 35.6 | | 20.3 | 0.2 | 79.6 | | |
| PHF | .896 | .942 | .000 | .963 | .000 | .000 | .000 | .000 | .000 | .862 | .918 | .903 | .528 | .250 | .894 | .781 | |

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Weather: Clear

File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 10 | 4 | 0 | 0 | 0 | 4 | 0 | 17 | 17 |
| 04:15 PM | 4 | 4 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 4 | 1 | 9 | 1 | 0 | 0 | 0 | 1 | 1 | 18 | 19 |
| 04:30 PM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 3 | 1 | 9 | 2 | 0 | 0 | 0 | 2 | 1 | 15 | 16 |
| 04:45 PM | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 1 | 7 | 5 | 0 | 2 | 2 | 7 | 3 | 21 | 24 |
| Total | 6 | 16 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 10 | 3 | 35 | 12 | 0 | 2 | 2 | 14 | 5 | 71 | 76 |
| 05:00 PM | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 4 | 2 | 1 | 0 | 0 | 3 | 0 | 13 | 13 |
| 05:15 PM | 2 | 5 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 7 | 1 | 0 | 3 | 0 | 4 | 0 | 18 | 18 |
| 05:30 PM | 2 | 6 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 3 | 0 | 0 | 1 | 0 | 1 | 0 | 12 | 12 |
| 05:45 PM | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 7 | 6 | 0 | 0 | 0 | 6 | 0 | 20 | 20 |
| Total | 4 | 24 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 8 | 0 | 21 | 9 | 1 | 4 | 0 | 14 | 0 | 63 | 63 |
| Grand Total | 10 | 40 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 38 | 18 | 3 | 56 | 21 | 1 | 6 | 2 | 28 | 5 | 134 | 139 |
| Apprch % | 20 | 80 | 0 | | | 0 | 0 | 0 | | | 0 | 67.9 | 32.1 | | | 75 | 3.6 | 21.4 | | | | | |
| Total % | 7.5 | 29.9 | 0 | | 37.3 | 0 | 0 | 0 | | 0 | 0 | 28.4 | 13.4 | | 41.8 | 15.7 | 0.7 | 4.5 | | 20.9 | 3.6 | 96.4 | |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | **10** | 0 | **10** | 4 | 0 | 0 | 4 | 17 |
| 04:15 PM | **4** | 4 | 0 | **8** | 0 | 0 | 0 | 0 | 0 | 5 | **4** | 9 | 1 | 0 | 0 | 1 | 18 |
| 04:30 PM | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 6 | 3 | 9 | 2 | 0 | 0 | 2 | 15 |
| 04:45 PM | 2 | **5** | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 7 | **5** | 0 | **2** | **7** | **21** |
| Total Volume | 6 | 16 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 25 | 10 | 35 | 12 | 0 | 2 | 14 | 71 |
| % App. Total | 27.3 | 72.7 | 0 | | 0 | 0 | 0 | | 0 | 71.4 | 28.6 | | 85.7 | 0 | 14.3 | | |
| PHF | .375 | .800 | .000 | .688 | .000 | .000 | .000 | .000 | .000 | .625 | .625 | .875 | .600 | .000 | .250 | .500 | .845 |

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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

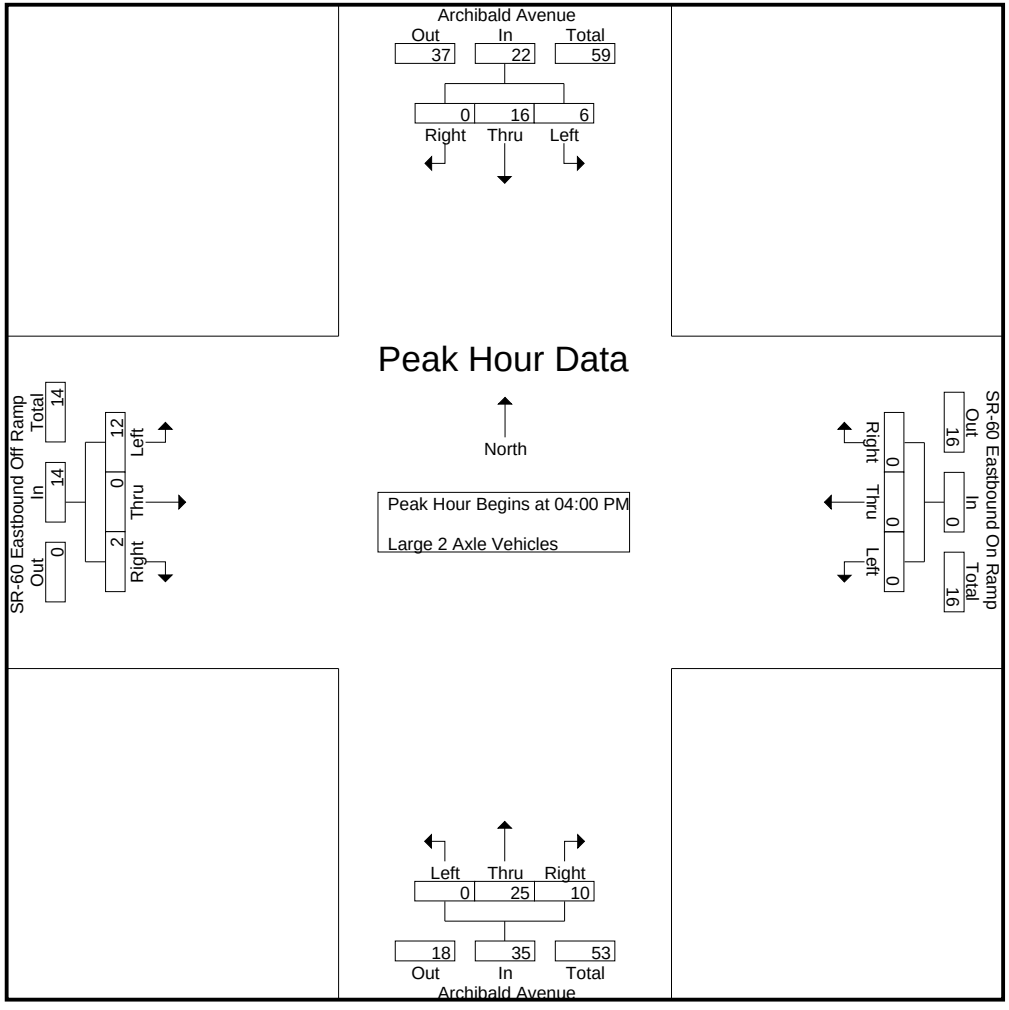

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File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | **10** | 0 | **10** | 4 | 0 | 0 | 4 | |
| +15 mins. | **4** | 4 | 0 | **8** | 0 | 0 | 0 | 0 | 0 | 5 | **4** | 9 | 1 | 0 | 0 | 1 | |
| +30 mins. | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 6 | 3 | 9 | 2 | 0 | 0 | 2 | |
| +45 mins. | 2 | **5** | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 4 | 3 | 7 | **5** | 0 | **2** | **7** | |
| Total Volume | 6 | 16 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 25 | 10 | 35 | 12 | 0 | 2 | 14 | |
| % App. Total | 27.3 | 72.7 | 0 | | 0 | 0 | 0 | | 0 | 71.4 | 28.6 | | 85.7 | 0 | 14.3 | | |
| PHF | .375 | .800 | .000 | .688 | .000 | .000 | .000 | .000 | .000 | .625 | .625 | .875 | .600 | .000 | .250 | .500 | |

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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 6 | 2 | 0 | 3 | 2 | 5 | 3 | 15 | 18 |
| 04:15 PM | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 0 | 11 | 11 |
| 04:30 PM | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 5 | 5 |
| 04:45 PM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| Total | 2 | 12 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 12 | 1 | 16 | 3 | 0 | 4 | 2 | 7 | 3 | 37 | 40 |
| 05:00 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 |
| 05:15 PM | 3 | 4 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 4 | 0 | 4 | 0 | 14 | 14 |
| 05:30 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 5 | 1 | 0 | 1 | 0 | 2 | 0 | 9 | 9 |
| 05:45 PM | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 6 |
| Total | 5 | 9 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 12 | 0 | 16 | 1 | 0 | 5 | 0 | 6 | 0 | 36 | 36 |
| Grand Total | 7 | 21 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 24 | 1 | 32 | 4 | 0 | 9 | 2 | 13 | 3 | 73 | 76 |
| Apprch % | 25 | 75 | 0 | | | 0 | 0 | 0 | | | 0 | 25 | 75 | | | 30.8 | 0 | 69.2 | | | | | |
| Total % | 9.6 | 28.8 | 0 | | 38.4 | 0 | 0 | 0 | | 0 | 0 | 11 | 32.9 | | 43.8 | 5.5 | 0 | 12.3 | | 17.8 | 3.9 | 96.1 | |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 0 | **4** | 0 | **4** | 0 | 0 | 0 | 0 | 0 | **2** | **4** | **6** | **2** | 0 | **3** | **5** | **15** |
| 04:15 PM | **1** | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 6 | 1 | 0 | 0 | 1 | 11 |
| 04:30 PM | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 5 |
| 04:45 PM | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 6 |
| Total Volume | 2 | 12 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 4 | 12 | 16 | 3 | 0 | 4 | 7 | 37 |
| % App. Total | 14.3 | 85.7 | 0 | | 0 | 0 | 0 | | 0 | 25 | 75 | | 42.9 | 0 | 57.1 | | |
| PHF | .500 | .750 | .000 | .875 | .000 | .000 | .000 | .000 | .000 | .500 | .750 | .667 | .375 | .000 | .333 | .350 | .617 |

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Corona, CA 92878
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City of Ontario
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E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

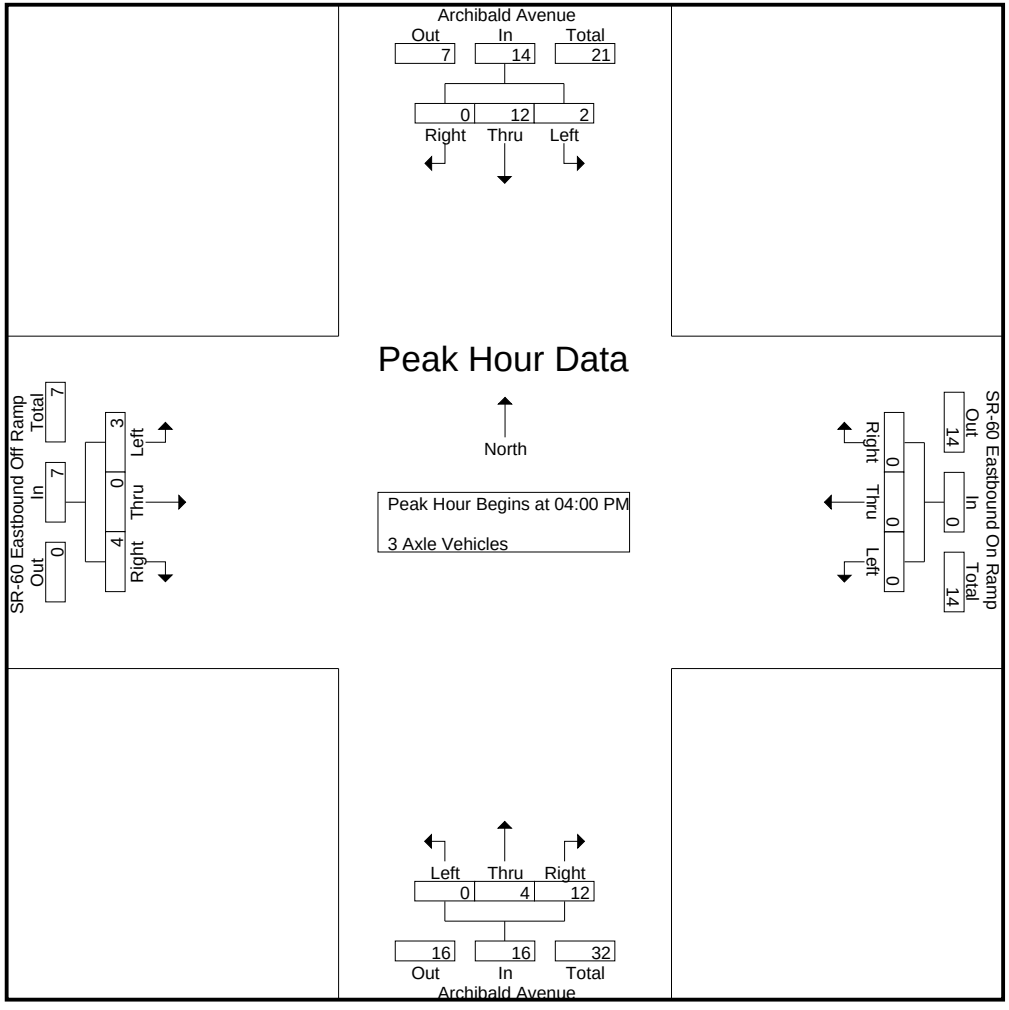

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Site Code : 05124953
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Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 0 | **4** | 0 | **4** | 0 | 0 | 0 | 0 | 0 | **2** | **4** | **6** | **2** | 0 | **3** | **5** | |
| +15 mins. | **1** | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 6 | 1 | 0 | 0 | 1 | |
| +30 mins. | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 1 | 1 | |
| +45 mins. | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | |
| Total Volume | 2 | 12 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 4 | 12 | 16 | 3 | 0 | 4 | 7 | |
| % App. Total | 14.3 | 85.7 | 0 | | 0 | 0 | 0 | | 0 | 25 | 75 | | 42.9 | 0 | 57.1 | | |
| PHF | .500 | .750 | .000 | .875 | .000 | .000 | .000 | .000 | .000 | .500 | .750 | .667 | .375 | .000 | .333 | .350 | |

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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Archibald Avenue Southbound | | | | | SR-60 Eastbound On Ramp Westbound | | | | | Archibald Avenue Northbound | | | | | SR-60 Eastbound Off Ramp Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 2 | 14 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 5 | 3 | 13 | 7 | 0 | 3 | 1 | 10 | 4 | 39 | 43 |
| 04:15 PM | 1 | 12 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 0 | 8 | 7 | 0 | 1 | 0 | 8 | 0 | 29 | 29 |
| 04:30 PM | 5 | 13 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 4 | 0 | 10 | 7 | 0 | 2 | 1 | 9 | 1 | 37 | 38 |
| 04:45 PM | 3 | 8 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 8 | 1 | 15 | 6 | 0 | 1 | 1 | 7 | 2 | 33 | 35 |
| Total | 11 | 47 | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 22 | 4 | 46 | 27 | 0 | 7 | 3 | 34 | 7 | 138 | 145 |
| 05:00 PM | 5 | 9 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 3 | 0 | 12 | 8 | 0 | 3 | 0 | 11 | 0 | 37 | 37 |
| 05:15 PM | 1 | 11 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 8 | 2 | 16 | 2 | 0 | 4 | 0 | 6 | 2 | 34 | 36 |
| 05:30 PM | 1 | 9 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 7 | 0 | 11 | 1 | 0 | 4 | 1 | 5 | 1 | 26 | 27 |
| 05:45 PM | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 6 | 9 | 0 | 5 | 0 | 14 | 0 | 26 | 26 |
| Total | 7 | 35 | 0 | 0 | 42 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 20 | 2 | 45 | 20 | 0 | 16 | 1 | 36 | 3 | 123 | 126 |
| Grand Total | 18 | 82 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 49 | 42 | 6 | 91 | 47 | 0 | 23 | 4 | 70 | 10 | 261 | 271 |
| Apprch % | 18 | 82 | 0 | | | 0 | 0 | 0 | | | 0 | 53.8 | 46.2 | | | 67.1 | 0 | 32.9 | | | | | |
| Total % | 6.9 | 31.4 | 0 | | 38.3 | 0 | 0 | 0 | | 0 | 0 | 18.8 | 16.1 | | 34.9 | 18 | 0 | 8.8 | | 26.8 | 3.7 | 96.3 | |

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | |
| 04:00 PM | 2 | **14** | 0 | 16 | 0 | 0 | 0 | 0 | 0 | **8** | 5 | 13 | **7** | 0 | **3** | **10** | **39** |
| 04:15 PM | 1 | 12 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 8 | 7 | 0 | 1 | 8 | 29 |
| 04:30 PM | **5** | 13 | 0 | **18** | 0 | 0 | 0 | 0 | 0 | 6 | 4 | 10 | 7 | 0 | 2 | 9 | 37 |
| 04:45 PM | 3 | 8 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 7 | **8** | **15** | 6 | 0 | 1 | 7 | 33 |
| Total Volume | 11 | 47 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 24 | 22 | 46 | 27 | 0 | 7 | 34 | 138 |
| % App. Total | 19 | 81 | 0 | | 0 | 0 | 0 | | 0 | 52.2 | 47.8 | | 79.4 | 0 | 20.6 | | |
| PHF | .550 | .839 | .000 | .806 | .000 | .000 | .000 | .000 | .000 | .750 | .688 | .767 | .964 | .000 | .583 | .850 | .885 |

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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

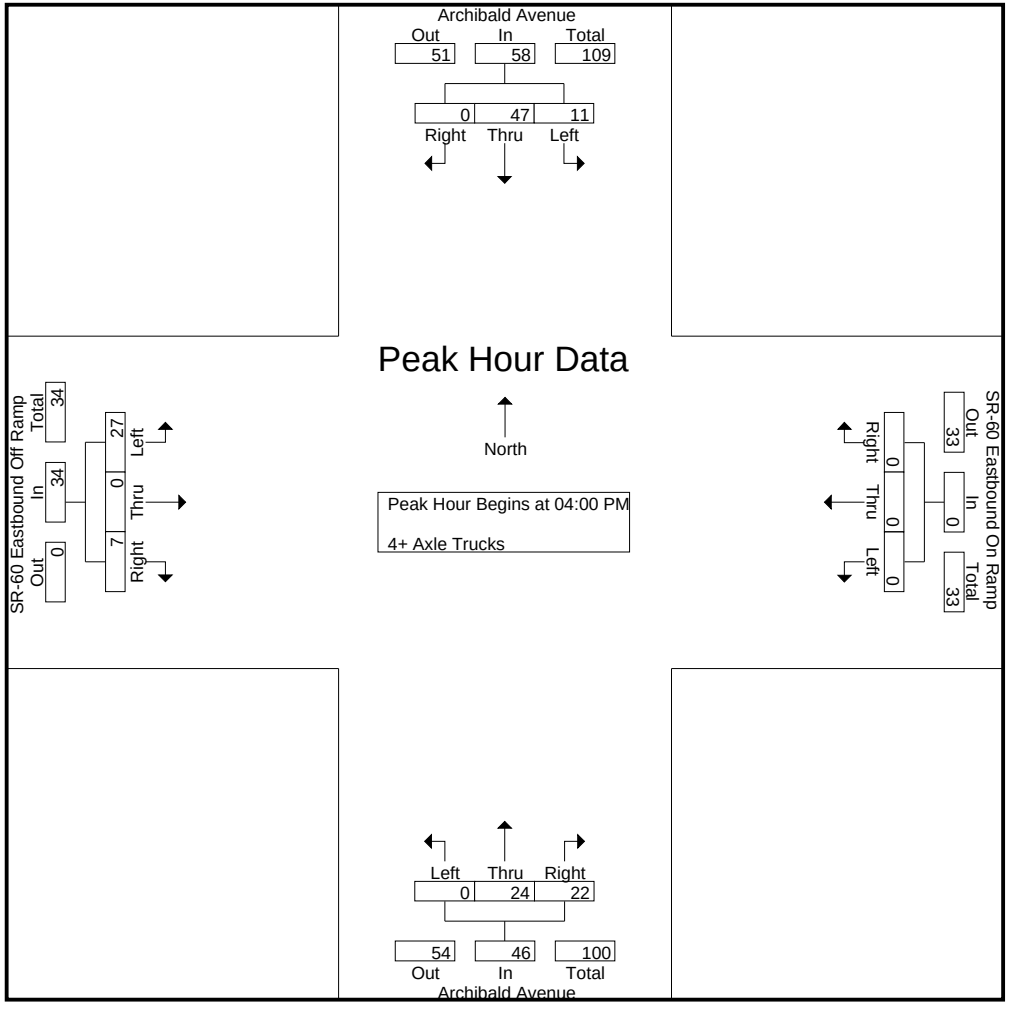

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City of Ontario
N/S: Archibald Avenue
E/W: SR-60 Eastbound Ramps
Weather: Clear

File Name : 34_ONT_Arch_60E PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | SR-60 Eastbound On Ramp Westbound | | | | Archibald Avenue Northbound | | | | SR-60 Eastbound Off Ramp Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 04:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 2 | **14** | 0 | 16 | 0 | 0 | 0 | 0 | 0 | **8** | 5 | 13 | **7** | 0 | **3** | **10** | |
| +15 mins. | 1 | 12 | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 3 | 5 | 8 | 7 | 0 | 1 | 8 | |
| +30 mins. | **5** | 13 | 0 | **18** | 0 | 0 | 0 | 0 | 0 | 6 | 4 | 10 | 7 | 0 | 2 | 9 | |
| +45 mins. | 3 | 8 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 7 | **8** | **15** | 6 | 0 | 1 | 7 | |
| Total Volume | 11 | 47 | 0 | 58 | 0 | 0 | 0 | 0 | 0 | 24 | 22 | 46 | 27 | 0 | 7 | 34 | |
| % App. Total | 19 | 81 | 0 | | 0 | 0 | 0 | | 0 | 52.2 | 47.8 | | 79.4 | 0 | 20.6 | | |
| PHF | .550 | .839 | .000 | .806 | .000 | .000 | .000 | .000 | .000 | .750 | .688 | .767 | .964 | .000 | .583 | .850 | |

Location: Ontario
N/S: Archibald Avenue
E/W: SR-60 EB Ramps

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Archibald Avenue | East Leg SR-60 EB Ramps | South Leg Archibald Avenue | West Leg SR-60 EB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 1 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 1 | 0 | 0 | 1 |
| 7:45 AM | 0 | 1 | 0 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 1 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 4 | 0 | 0 | 4 |

| | North Leg Archibald Avenue | East Leg SR-60 EB Ramps | South Leg Archibald Avenue | West Leg SR-60 EB Ramps | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 1 | 0 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 1 | 0 | 0 | 1 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 1 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 1 | 1 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 2 | 4 |

Location: Ontario
N/S: Archibald Avenue
E/W: SR-60 EB Ramps

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Archibald Avenue | | | Westbound SR-60 EB Ramps | | | Northbound Archibald Avenue | | | Eastbound SR-60 EB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Southbound Archibald Avenue | | | Westbound SR-60 EB Ramps | | | Northbound Archibald Avenue | | | Eastbound SR-60 EB Ramps | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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PO Box 1178
Corona, Ca. 92878
951-268-6268

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 35_ONT_Arch_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Archibald Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 16 | 81 | 26 | 10 | 123 | 22 | 71 | 41 | 25 | 134 | 49 | 186 | 9 | 0 | 244 | 15 | 23 | 18 | 11 | 56 | 46 | 557 | 603 |
| 07:15 AM | 12 | 54 | 23 | 13 | 89 | 13 | 115 | 65 | 22 | 193 | 55 | 272 | 7 | 0 | 334 | 24 | 41 | 17 | 11 | 82 | 46 | 698 | 744 |
| 07:30 AM | 26 | 69 | 38 | 13 | 133 | 20 | 128 | 66 | 23 | 214 | 48 | 220 | 7 | 0 | 275 | 39 | 58 | 25 | 9 | 122 | 45 | 744 | 789 |
| 07:45 AM | 41 | 102 | 42 | 13 | 185 | 17 | 130 | 67 | 18 | 214 | 48 | 246 | 12 | 1 | 306 | 55 | 81 | 26 | 12 | 162 | 44 | 867 | 911 |
| Total | 95 | 306 | 129 | 49 | 530 | 72 | 444 | 239 | 88 | 755 | 200 | 924 | 35 | 1 | 1159 | 133 | 203 | 86 | 43 | 422 | 181 | 2866 | 3047 |
| 08:00 AM | 45 | 113 | 53 | 21 | 211 | 17 | 128 | 58 | 21 | 203 | 71 | 248 | 10 | 0 | 329 | 33 | 72 | 25 | 19 | 130 | 61 | 873 | 934 |
| 08:15 AM | 27 | 71 | 30 | 10 | 128 | 15 | 98 | 73 | 15 | 186 | 46 | 242 | 11 | 1 | 299 | 35 | 72 | 28 | 11 | 135 | 37 | 748 | 785 |
| 08:30 AM | 29 | 82 | 19 | 8 | 130 | 21 | 122 | 59 | 25 | 202 | 51 | 245 | 10 | 1 | 306 | 34 | 52 | 20 | 8 | 106 | 42 | 744 | 786 |
| 08:45 AM | 27 | 78 | 32 | 14 | 137 | 13 | 90 | 45 | 17 | 148 | 56 | 196 | 6 | 1 | 258 | 28 | 45 | 25 | 13 | 98 | 45 | 641 | 686 |
| Total | 128 | 344 | 134 | 53 | 606 | 66 | 438 | 235 | 78 | 739 | 224 | 931 | 37 | 3 | 1192 | 130 | 241 | 98 | 51 | 469 | 185 | 3006 | 3191 |
| Grand Total | 223 | 650 | 263 | 102 | 1136 | 138 | 882 | 474 | 166 | 1494 | 424 | 1855 | 72 | 4 | 2351 | 263 | 444 | 184 | 94 | 891 | 366 | 5872 | 6238 |
| Apprch % | 19.6 | 57.2 | 23.2 | | | 9.2 | 59 | 31.7 | | | 18 | 78.9 | 3.1 | | | 29.5 | 49.8 | 20.7 | | | | | |
| Total % | 3.8 | 11.1 | 4.5 | | 19.3 | 2.4 | 15 | 8.1 | | 25.4 | 7.2 | 31.6 | 1.2 | | 40 | 4.5 | 7.6 | 3.1 | | 15.2 | 5.9 | 94.1 | |

| | Archibald Avenue Southbound | | | | Riverside Drive Westbound | | | | Archibald Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 26 | 69 | 38 | 133 | **20** | 128 | 66 | **214** | 48 | 220 | 7 | 275 | 39 | 58 | 25 | 122 | 744 |
| 07:45 AM | 41 | 102 | 42 | 185 | 17 | **130** | 67 | 214 | 48 | 246 | **12** | 306 | **55** | **81** | 26 | **162** | 867 |
| 08:00 AM | **45** | **113** | **53** | **211** | 17 | 128 | 58 | 203 | **71** | **248** | 10 | **329** | 33 | 72 | 25 | 130 | **873** |
| 08:15 AM | 27 | 71 | 30 | 128 | 15 | 98 | **73** | 186 | 46 | 242 | 11 | 299 | 35 | 72 | **28** | 135 | 748 |
| Total Volume | 139 | 355 | 163 | 657 | 69 | 484 | 264 | 817 | 213 | 956 | 40 | 1209 | 162 | 283 | 104 | 549 | 3232 |
| % App. Total | 21.2 | 54 | 24.8 | | 8.4 | 59.2 | 32.3 | | 17.6 | 79.1 | 3.3 | | 29.5 | 51.5 | 18.9 | | |
| PHF | .772 | .785 | .769 | .778 | .863 | .931 | .904 | .954 | .750 | .964 | .833 | .919 | .736 | .873 | .929 | .847 | .926 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 35_ONT_Arch_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

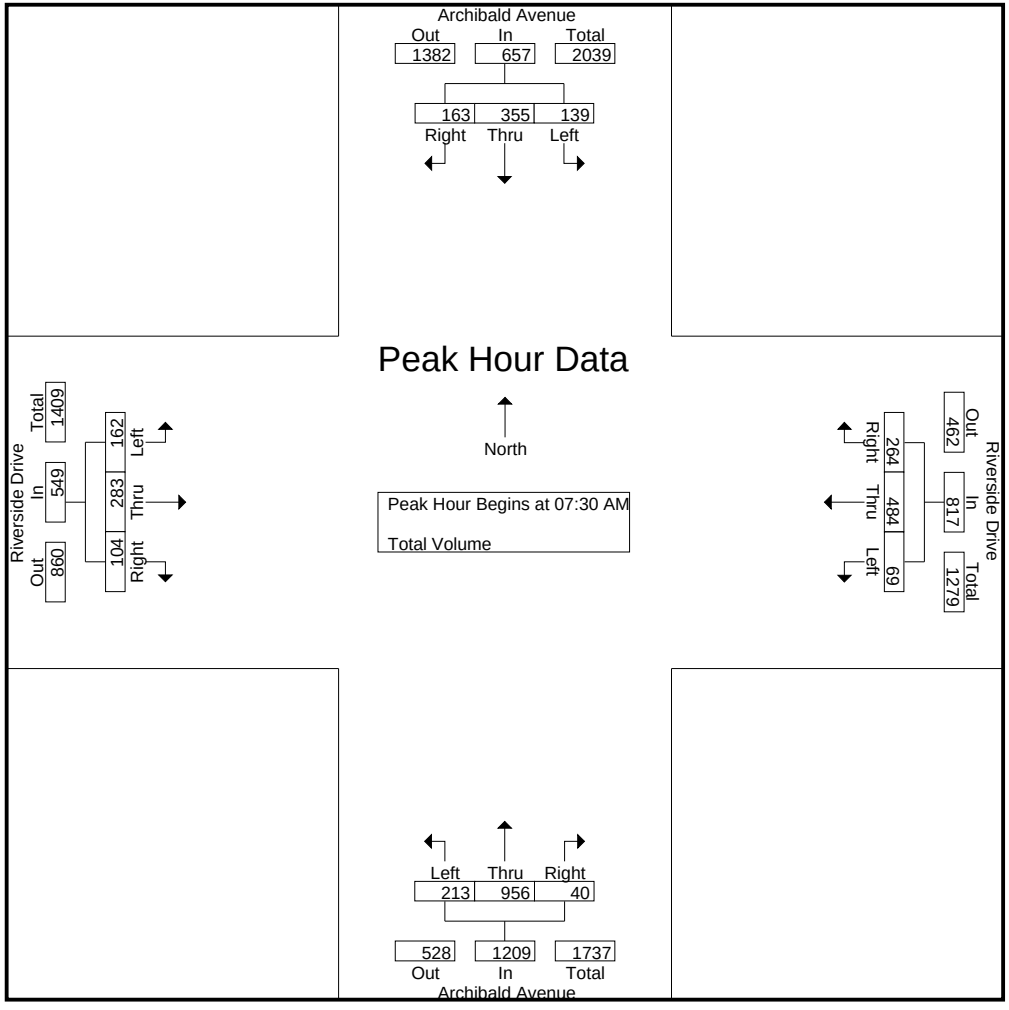

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(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 35_ONT_Arch_Riv AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Riverside Drive Westbound | | | | Archibald Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:15 AM | | | | 07:15 AM | | | | 07:30 AM | | | | |
| +0 mins. | 26 | 69 | 38 | 133 | 13 | 115 | 65 | 193 | 55 | **272** | 7 | **334** | 39 | 58 | 25 | 122 | |
| +15 mins. | 41 | 102 | 42 | 185 | **20** | 128 | 66 | **214** | 48 | 220 | 7 | 275 | **55** | **81** | 26 | **162** | |
| +30 mins. | **45** | **113** | **53** | **211** | 17 | **130** | **67** | 214 | 48 | 246 | **12** | 306 | 33 | 72 | 25 | 130 | |
| +45 mins. | 27 | 71 | 30 | 128 | 17 | 128 | 58 | 203 | **71** | 248 | 10 | 329 | 35 | 72 | **28** | 135 | |
| Total Volume | 139 | 355 | 163 | 657 | 67 | 501 | 256 | 824 | 222 | 986 | 36 | 1244 | 162 | 283 | 104 | 549 | |
| % App. Total | 21.2 | 54 | 24.8 | | 8.1 | 60.8 | 31.1 | | 17.8 | 79.3 | 2.9 | | 29.5 | 51.5 | 18.9 | | |
| PHF | .772 | .785 | .769 | .778 | .838 | .963 | .955 | .963 | .782 | .906 | .750 | .931 | .736 | .873 | .929 | .847 | |

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City of Ontario
N/S: Archibald Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 35_ONT_Arch_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Riverside Drive Westbound | | | | | Archibald Avenue Northbound | | | | | Riverside Drive Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 56 | 133 | 24 | 12 | 213 | 18 | 113 | 38 | 13 | 169 | 67 | 209 | 10 | 0 | 286 | 38 | 125 | 42 | 17 | 205 | 42 | 873 | 915 |
| 04:15 PM | 56 | 186 | 41 | 8 | 283 | 26 | 100 | 26 | 9 | 152 | 53 | 167 | 12 | 2 | 232 | 44 | 87 | 51 | 29 | 182 | 48 | 849 | 897 |
| 04:30 PM | 60 | 154 | 33 | 6 | 247 | 22 | 103 | 26 | 9 | 151 | 58 | 144 | 15 | 1 | 217 | 34 | 115 | 69 | 31 | 218 | 47 | 833 | 880 |
| 04:45 PM | 65 | 166 | 32 | 12 | 263 | 37 | 109 | 30 | 20 | 176 | 57 | 171 | 10 | 0 | 238 | 32 | 121 | 46 | 24 | 199 | 56 | 876 | 932 |
| Total | 237 | 639 | 130 | 38 | 1006 | 103 | 425 | 120 | 51 | 648 | 235 | 691 | 47 | 3 | 973 | 148 | 448 | 208 | 101 | 804 | 193 | 3431 | 3624 |
| 05:00 PM | 75 | 182 | 51 | 9 | 308 | 28 | 103 | 33 | 9 | 164 | 59 | 179 | 8 | 0 | 246 | 52 | 94 | 66 | 21 | 212 | 39 | 930 | 969 |
| 05:15 PM | 64 | 199 | 46 | 6 | 309 | 32 | 88 | 36 | 8 | 156 | 61 | 150 | 11 | 0 | 222 | 31 | 110 | 60 | 23 | 201 | 37 | 888 | 925 |
| 05:30 PM | 61 | 198 | 47 | 14 | 306 | 35 | 87 | 28 | 8 | 150 | 42 | 157 | 17 | 2 | 216 | 38 | 98 | 58 | 16 | 194 | 40 | 866 | 906 |
| 05:45 PM | 67 | 243 | 39 | 9 | 349 | 29 | 94 | 50 | 19 | 173 | 49 | 147 | 6 | 0 | 202 | 27 | 131 | 58 | 31 | 216 | 59 | 940 | 999 |
| Total | 267 | 822 | 183 | 38 | 1272 | 124 | 372 | 147 | 44 | 643 | 211 | 633 | 42 | 2 | 886 | 148 | 433 | 242 | 91 | 823 | 175 | 3624 | 3799 |
| Grand Total | 504 | 1461 | 313 | 76 | 2278 | 227 | 797 | 267 | 95 | 1291 | 446 | 1324 | 89 | 5 | 1859 | 296 | 881 | 450 | 192 | 1627 | 368 | 7055 | 7423 |
| Apprch % | 22.1 | 64.1 | 13.7 | | | 17.6 | 61.7 | 20.7 | | | 24 | 71.2 | 4.8 | | | 18.2 | 54.1 | 27.7 | | | | | |
| Total % | 7.1 | 20.7 | 4.4 | | 32.3 | 3.2 | 11.3 | 3.8 | | 18.3 | 6.3 | 18.8 | 1.3 | | 26.4 | 4.2 | 12.5 | 6.4 | | 23.1 | 5 | 95 | |

| | Archibald Avenue Southbound | | | | Riverside Drive Westbound | | | | Archibald Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | **75** | 182 | **51** | 308 | 28 | **103** | 33 | 164 | 59 | **179** | 8 | **246** | **52** | 94 | **66** | 212 | 930 |
| 05:15 PM | 64 | 199 | 46 | 309 | 32 | 88 | 36 | 156 | **61** | 150 | 11 | 222 | 31 | 110 | 60 | 201 | 888 |
| 05:30 PM | 61 | 198 | 47 | 306 | **35** | 87 | 28 | 150 | 42 | 157 | **17** | 216 | 38 | 98 | 58 | 194 | 866 |
| 05:45 PM | 67 | **243** | 39 | **349** | 29 | 94 | **50** | **173** | 49 | 147 | 6 | 202 | 27 | **131** | 58 | **216** | **940** |
| Total Volume | 267 | 822 | 183 | 1272 | 124 | 372 | 147 | 643 | 211 | 633 | 42 | 886 | 148 | 433 | 242 | 823 | 3624 |
| % App. Total | 21 | 64.6 | 14.4 | | 19.3 | 57.9 | 22.9 | | 23.8 | 71.4 | 4.7 | | 18 | 52.6 | 29.4 | | |
| PHF | .890 | .846 | .897 | .911 | .886 | .903 | .735 | .929 | .865 | .884 | .618 | .900 | .712 | .826 | .917 | .953 | .964 |

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Corona, CA 92878
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City of Ontario
N/S: Archibald Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 35_ONT_Arch_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

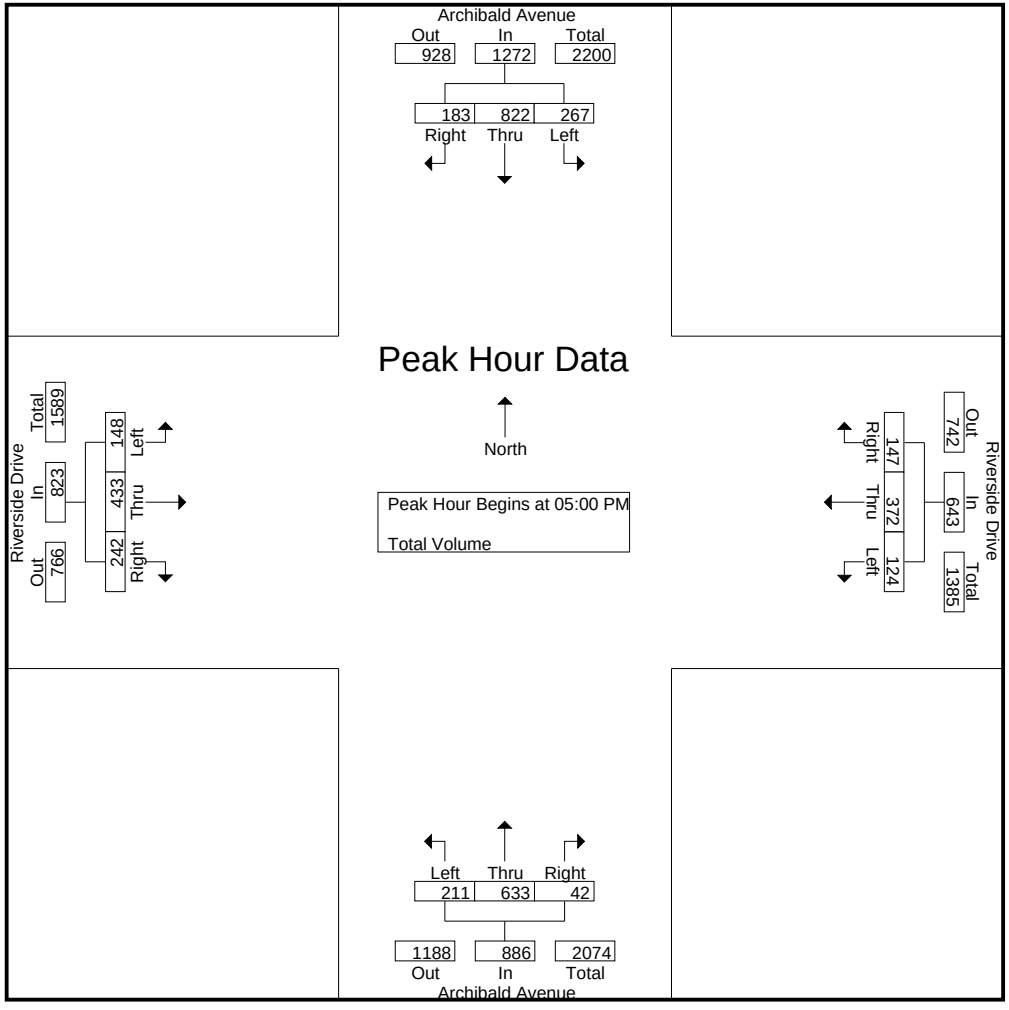

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City of Ontario
N/S: Archibald Avenue
E/W: Riverside Drive
Weather: Clear

File Name : 35_ONT_Arch_Riv PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Riverside Drive Westbound | | | | Archibald Avenue Northbound | | | | Riverside Drive Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:30 PM | | | | |
| +0 mins. | **75** | 182 | **51** | 308 | 18 | **113** | **38** | 169 | **67** | **209** | 10 | **286** | 34 | 115 | **69** | **218** | |
| +15 mins. | 64 | 199 | 46 | 309 | 26 | 100 | 26 | 152 | 53 | 167 | 12 | 232 | 32 | **121** | 46 | 199 | |
| +30 mins. | 61 | 198 | 47 | 306 | 22 | 103 | 26 | 151 | 58 | 144 | **15** | 217 | **52** | 94 | 66 | 212 | |
| +45 mins. | 67 | **243** | 39 | **349** | **37** | 109 | 30 | **176** | 57 | 171 | 10 | 238 | 31 | 110 | 60 | 201 | |
| Total Volume | 267 | 822 | 183 | 1272 | 103 | 425 | 120 | 648 | 235 | 691 | 47 | 973 | 149 | 440 | 241 | 830 | |
| % App. Total | 21 | 64.6 | 14.4 | | 15.9 | 65.6 | 18.5 | | 24.2 | 71 | 4.8 | | 18 | 53 | 29 | | |
| PHF | .890 | .846 | .897 | .911 | .696 | .940 | .789 | .920 | .877 | .827 | .783 | .851 | .716 | .909 | .873 | .952 | |

Location: Ontario
N/S: Archibald Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Archibald Avenue | East Leg Riverside Drive | South Leg Archibald Avenue | West Leg Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 6 | 0 | 0 | 4 | 10 |
| 7:15 AM | 1 | 0 | 2 | 1 | 4 |
| 7:30 AM | 3 | 4 | 3 | 0 | 10 |
| 7:45 AM | 3 | 0 | 2 | 4 | 9 |
| 8:00 AM | 1 | 1 | 1 | 2 | 5 |
| 8:15 AM | 1 | 1 | 1 | 1 | 4 |
| 8:30 AM | 1 | 1 | 3 | 3 | 8 |
| 8:45 AM | 0 | 0 | 3 | 1 | 4 |
| TOTAL VOLUMES: | 16 | 7 | 15 | 16 | 54 |

| | North Leg Archibald Avenue | East Leg Riverside Drive | South Leg Archibald Avenue | West Leg Riverside Drive | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 5 | 3 | 6 | 6 | 20 |
| 4:15 PM | 3 | 1 | 2 | 2 | 8 |
| 4:30 PM | 6 | 1 | 0 | 0 | 7 |
| 4:45 PM | 0 | 1 | 1 | 1 | 3 |
| 5:00 PM | 1 | 4 | 3 | 2 | 10 |
| 5:15 PM | 2 | 0 | 1 | 1 | 4 |
| 5:30 PM | 0 | 1 | 2 | 2 | 5 |
| 5:45 PM | 7 | 1 | 0 | 0 | 8 |
| TOTAL VOLUMES: | 24 | 12 | 15 | 14 | 65 |

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951-268-6268

Location: Ontario
N/S: Archibald Avenue
E/W: Riverside Drive

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Archibald Avenue | | | Westbound Riverside Drive | | | Northbound Archibald Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 3 |

| | Southbound Archibald Avenue | | | Westbound Riverside Drive | | | Northbound Archibald Avenue | | | Eastbound Riverside Drive | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 |



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City of Ontario
N/S: Archibald Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 36_ONT_Arch_Chi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Archibald Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 4 | 119 | 10 | 4 | 133 | 8 | 37 | 25 | 13 | 70 | 8 | 244 | 4 | 1 | 256 | 13 | 8 | 16 | 7 | 37 | 25 | 496 | 521 |
| 07:15 AM | 8 | 71 | 13 | 5 | 92 | 3 | 42 | 29 | 18 | 74 | 16 | 228 | 7 | 0 | 251 | 29 | 14 | 18 | 5 | 61 | 28 | 478 | 506 |
| 07:30 AM | 14 | 88 | 11 | 2 | 113 | 7 | 46 | 40 | 21 | 93 | 20 | 296 | 27 | 1 | 343 | 28 | 20 | 9 | 3 | 57 | 27 | 606 | 633 |
| 07:45 AM | 41 | 113 | 16 | 2 | 170 | 19 | 35 | 56 | 26 | 110 | 34 | 278 | 28 | 0 | 340 | 33 | 20 | 8 | 2 | 61 | 30 | 681 | 711 |
| Total | 67 | 391 | 50 | 13 | 508 | 37 | 160 | 150 | 78 | 347 | 78 | 1046 | 66 | 2 | 1190 | 103 | 62 | 51 | 17 | 216 | 110 | 2261 | 2371 |
| 08:00 AM | 21 | 94 | 19 | 6 | 134 | 15 | 38 | 37 | 24 | 90 | 32 | 192 | 6 | 0 | 230 | 20 | 13 | 15 | 3 | 48 | 33 | 502 | 535 |
| 08:15 AM | 17 | 81 | 12 | 4 | 110 | 1 | 24 | 27 | 20 | 52 | 22 | 254 | 3 | 0 | 279 | 15 | 7 | 13 | 5 | 35 | 29 | 476 | 505 |
| 08:30 AM | 10 | 97 | 6 | 1 | 113 | 4 | 28 | 28 | 21 | 60 | 33 | 254 | 2 | 0 | 289 | 19 | 17 | 10 | 2 | 46 | 24 | 508 | 532 |
| 08:45 AM | 10 | 101 | 17 | 3 | 128 | 6 | 20 | 20 | 13 | 46 | 10 | 202 | 3 | 1 | 215 | 16 | 15 | 13 | 3 | 44 | 20 | 433 | 453 |
| Total | 58 | 373 | 54 | 14 | 485 | 26 | 110 | 112 | 78 | 248 | 97 | 902 | 14 | 1 | 1013 | 70 | 52 | 51 | 13 | 173 | 106 | 1919 | 2025 |
| Grand Total | 125 | 764 | 104 | 27 | 993 | 63 | 270 | 262 | 156 | 595 | 175 | 1948 | 80 | 3 | 2203 | 173 | 114 | 102 | 30 | 389 | 216 | 4180 | 4396 |
| Apprch % | 12.6 | 76.9 | 10.5 | | | 10.6 | 45.4 | 44 | | | 7.9 | 88.4 | 3.6 | | | 44.5 | 29.3 | 26.2 | | | | | |
| Total % | 3 | 18.3 | 2.5 | | 23.8 | 1.5 | 6.5 | 6.3 | | 14.2 | 4.2 | 46.6 | 1.9 | | 52.7 | 4.1 | 2.7 | 2.4 | | 9.3 | 4.9 | 95.1 | |

| | Archibald Avenue Southbound | | | | Chino Avenue Westbound | | | | Archibald Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 8 | 71 | 13 | 92 | 3 | 42 | 29 | 74 | 16 | 228 | 7 | 251 | 29 | 14 | **18** | **61** | 478 |
| 07:30 AM | 14 | 88 | 11 | 113 | 7 | **46** | 40 | 93 | 20 | **296** | 27 | **343** | 28 | **20** | 9 | 57 | 606 |
| 07:45 AM | **41** | **113** | 16 | **170** | **19** | 35 | **56** | **110** | **34** | 278 | **28** | 340 | **33** | 20 | 8 | 61 | **681** |
| 08:00 AM | 21 | 94 | **19** | 134 | 15 | 38 | 37 | 90 | 32 | 192 | 6 | 230 | 20 | 13 | 15 | 48 | 502 |
| Total Volume | 84 | 366 | 59 | 509 | 44 | 161 | 162 | 367 | 102 | 994 | 68 | 1164 | 110 | 67 | 50 | 227 | 2267 |
| % App. Total | 16.5 | 71.9 | 11.6 | | 12 | 43.9 | 44.1 | | 8.8 | 85.4 | 5.8 | | 48.5 | 29.5 | 22 | | |
| PHF | .512 | .810 | .776 | .749 | .579 | .875 | .723 | .834 | .750 | .840 | .607 | .848 | .833 | .838 | .694 | .930 | .832 |

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City of Ontario
N/S: Archibald Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 36_ONT_Arch_Chi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

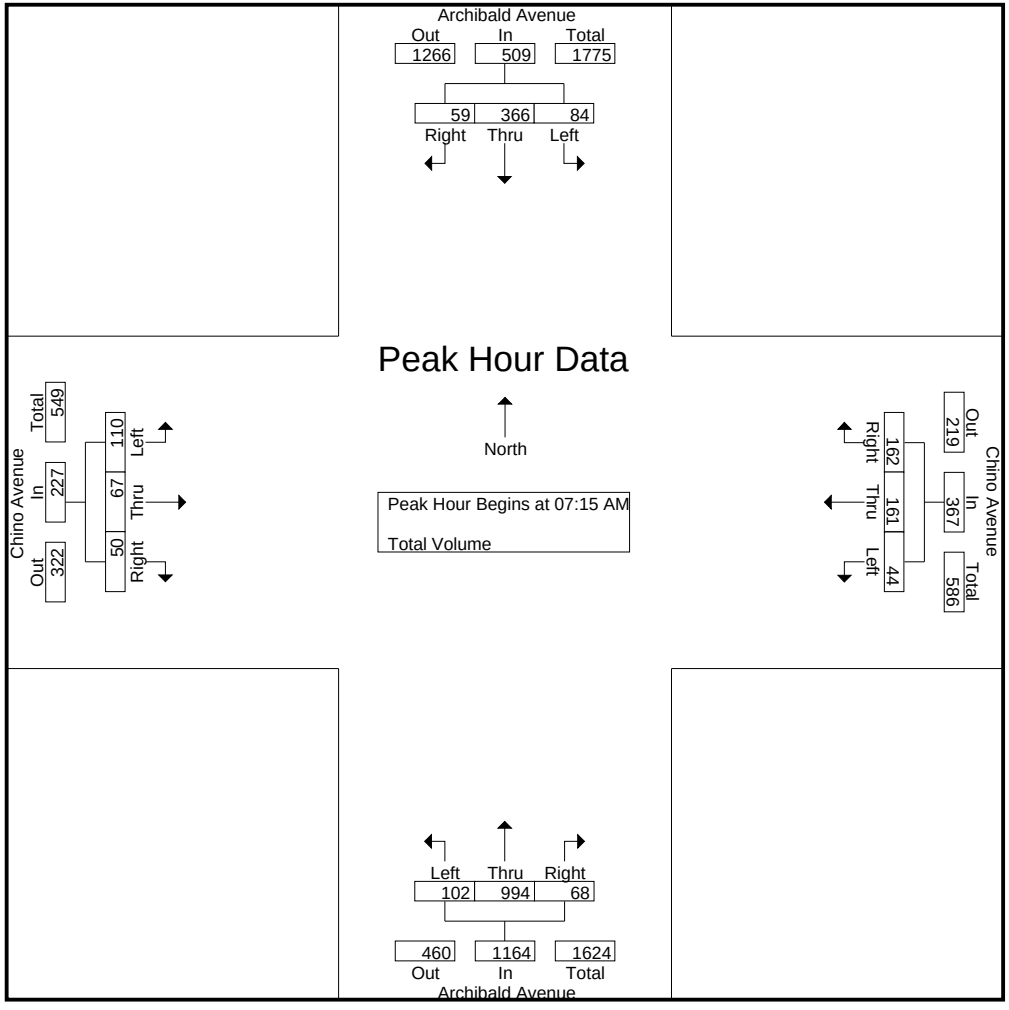

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City of Ontario
N/S: Archibald Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 36_ONT_Arch_Chi AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Chino Avenue Westbound | | | | Archibald Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:15 AM | | | | 07:30 AM | | | | 07:15 AM | | | | |
| +0 mins. | 14 | 88 | 11 | 113 | 3 | 42 | 29 | 74 | 20 | **296** | 27 | **343** | 29 | 14 | **18** | **61** | |
| +15 mins. | **41** | **113** | 16 | **170** | 7 | **46** | 40 | 93 | **34** | 278 | **28** | 340 | 28 | **20** | 9 | 57 | |
| +30 mins. | 21 | 94 | **19** | 134 | **19** | 35 | **56** | **110** | 32 | 192 | 6 | 230 | **33** | 20 | 8 | 61 | |
| +45 mins. | 17 | 81 | 12 | 110 | 15 | 38 | 37 | 90 | 22 | 254 | 3 | 279 | 20 | 13 | 15 | 48 | |
| Total Volume | 93 | 376 | 58 | 527 | 44 | 161 | 162 | 367 | 108 | 1020 | 64 | 1192 | 110 | 67 | 50 | 227 | |
| % App. Total | 17.6 | 71.3 | 11 | | 12 | 43.9 | 44.1 | | 9.1 | 85.6 | 5.4 | | 48.5 | 29.5 | 22 | | |
| PHF | .567 | .832 | .763 | .775 | .579 | .875 | .723 | .834 | .794 | .861 | .571 | .869 | .833 | .838 | .694 | .930 | |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 36_ONT_Arch_Chi PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Chino Avenue Westbound | | | | | Archibald Avenue Northbound | | | | | Chino Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 33 | 144 | 15 | 3 | 192 | 2 | 31 | 20 | 12 | 53 | 16 | 225 | 9 | 2 | 250 | 32 | 36 | 9 | 1 | 77 | 18 | 572 | 590 |
| 04:15 PM | 27 | 189 | 15 | 1 | 231 | 4 | 18 | 24 | 19 | 46 | 10 | 184 | 9 | 3 | 203 | 23 | 39 | 11 | 2 | 73 | 25 | 553 | 578 |
| 04:30 PM | 31 | 199 | 11 | 1 | 241 | 2 | 13 | 23 | 17 | 38 | 6 | 161 | 9 | 2 | 176 | 20 | 52 | 9 | 2 | 81 | 22 | 536 | 558 |
| 04:45 PM | 25 | 207 | 19 | 1 | 251 | 0 | 19 | 15 | 11 | 34 | 12 | 208 | 6 | 0 | 226 | 38 | 45 | 20 | 1 | 103 | 13 | 614 | 627 |
| Total | 116 | 739 | 60 | 6 | 915 | 8 | 81 | 82 | 59 | 171 | 44 | 778 | 33 | 7 | 855 | 113 | 172 | 49 | 6 | 334 | 78 | 2275 | 2353 |
| 05:00 PM | 33 | 199 | 12 | 0 | 244 | 1 | 19 | 19 | 13 | 39 | 10 | 200 | 1 | 0 | 211 | 23 | 40 | 20 | 4 | 83 | 17 | 577 | 594 |
| 05:15 PM | 33 | 229 | 16 | 5 | 278 | 3 | 17 | 19 | 12 | 39 | 16 | 160 | 8 | 0 | 184 | 29 | 51 | 11 | 2 | 91 | 19 | 592 | 611 |
| 05:30 PM | 28 | 229 | 18 | 7 | 275 | 2 | 15 | 24 | 17 | 41 | 6 | 177 | 6 | 2 | 189 | 24 | 33 | 21 | 6 | 78 | 32 | 583 | 615 |
| 05:45 PM | 36 | 290 | 20 | 1 | 346 | 7 | 17 | 19 | 14 | 43 | 7 | 162 | 3 | 0 | 172 | 15 | 30 | 14 | 4 | 59 | 19 | 620 | 639 |
| Total | 130 | 947 | 66 | 13 | 1143 | 13 | 68 | 81 | 56 | 162 | 39 | 699 | 18 | 2 | 756 | 91 | 154 | 66 | 16 | 311 | 87 | 2372 | 2459 |
| Grand Total | 246 | 1686 | 126 | 19 | 2058 | 21 | 149 | 163 | 115 | 333 | 83 | 1477 | 51 | 9 | 1611 | 204 | 326 | 115 | 22 | 645 | 165 | 4647 | 4812 |
| Apprch % | 12 | 81.9 | 6.1 | | | 6.3 | 44.7 | 48.9 | | | 5.2 | 91.7 | 3.2 | | | 31.6 | 50.5 | 17.8 | | | | | |
| Total % | 5.3 | 36.3 | 2.7 | | 44.3 | 0.5 | 3.2 | 3.5 | | 7.2 | 1.8 | 31.8 | 1.1 | | 34.7 | 4.4 | 7 | 2.5 | | 13.9 | 3.4 | 96.6 | |

| | Archibald Avenue Southbound | | | | Chino Avenue Westbound | | | | Archibald Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 33 | 199 | 12 | 244 | 1 | **19** | 19 | 39 | 10 | **200** | 1 | **211** | 23 | 40 | 20 | 83 | 577 |
| 05:15 PM | 33 | 229 | 16 | 278 | 3 | 17 | 19 | 39 | **16** | 160 | **8** | 184 | **29** | **51** | 11 | **91** | 592 |
| 05:30 PM | 28 | 229 | 18 | 275 | 2 | 15 | **24** | 41 | 6 | 177 | 6 | 189 | 24 | 33 | **21** | 78 | 583 |
| 05:45 PM | **36** | **290** | **20** | **346** | **7** | 17 | 19 | **43** | 7 | 162 | 3 | 172 | 15 | 30 | 14 | 59 | **620** |
| Total Volume | 130 | 947 | 66 | 1143 | 13 | 68 | 81 | 162 | 39 | 699 | 18 | 756 | 91 | 154 | 66 | 311 | 2372 |
| % App. Total | 11.4 | 82.9 | 5.8 | | 8 | 42 | 50 | | 5.2 | 92.5 | 2.4 | | 29.3 | 49.5 | 21.2 | | |
| PHF | .903 | .816 | .825 | .826 | .464 | .895 | .844 | .942 | .609 | .874 | .563 | .896 | .784 | .755 | .786 | .854 | .956 |

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City of Ontario
N/S: Archibald Avenue
E/W: Chino Avenue
Weather: Clear

File Name : 36_ONT_Arch_Chi PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

# Peak Hour Data

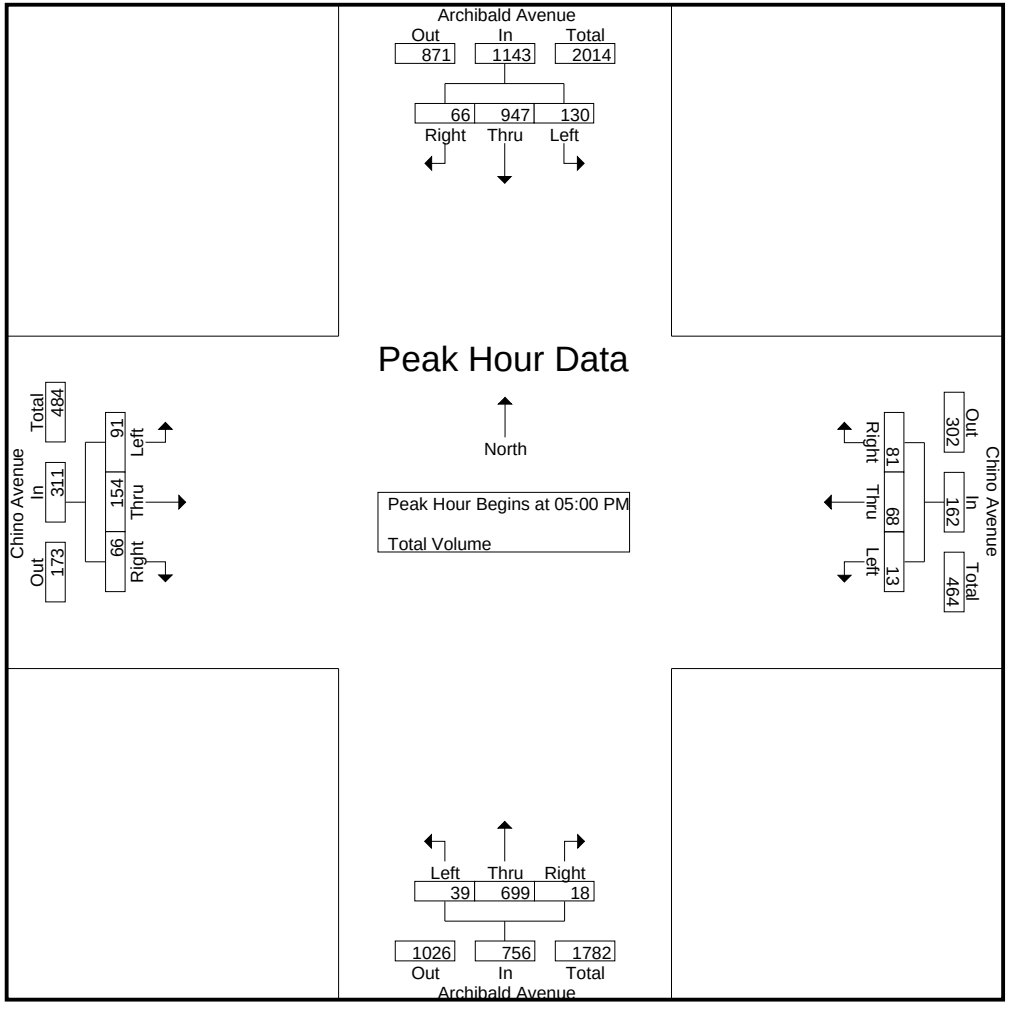

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City of Ontario
N/S: Archibald Avenue
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Site Code : 05124953
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Page No : 3

| | Archibald Avenue Southbound | | | | Chino Avenue Westbound | | | | Archibald Avenue Northbound | | | | Chino Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:00 PM | | | | 04:00 PM | | | | 04:30 PM | | | | |
| +0 mins. | 33 | 199 | 12 | 244 | 2 | **31** | 20 | **53** | **16** | **225** | **9** | **250** | 20 | **52** | 9 | 81 | |
| +15 mins. | 33 | 229 | 16 | 278 | **4** | 18 | **24** | 46 | 10 | 184 | 9 | 203 | **38** | 45 | **20** | **103** | |
| +30 mins. | 28 | 229 | 18 | 275 | 2 | 13 | 23 | 38 | 6 | 161 | 9 | 176 | 23 | 40 | 20 | 83 | |
| +45 mins. | **36** | **290** | **20** | **346** | 0 | 19 | 15 | 34 | 12 | 208 | 6 | 226 | 29 | 51 | 11 | 91 | |
| Total Volume | 130 | 947 | 66 | 1143 | 8 | 81 | 82 | 171 | 44 | 778 | 33 | 855 | 110 | 188 | 60 | 358 | |
| % App. Total | 11.4 | 82.9 | 5.8 | | 4.7 | 47.4 | 48 | | 5.1 | 91 | 3.9 | | 30.7 | 52.5 | 16.8 | | |
| PHF | .903 | .816 | .825 | .826 | .500 | .653 | .854 | .807 | .688 | .864 | .917 | .855 | .724 | .904 | .750 | .869 | |

Location: Ontario
N/S: Archibald Avenue
E/W: Chino Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Archibald Avenue | East Leg Chino Avenue | South Leg Archibald Avenue | West Leg Chino Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 2 | 0 | 0 | 2 |
| 7:45 AM | 0 | 1 | 2 | 0 | 3 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 1 | 0 | 1 |
| 8:45 AM | 0 | 2 | 0 | 0 | 2 |
| TOTAL VOLUMES: | 0 | 5 | 3 | 0 | 8 |

| | North Leg Archibald Avenue | East Leg Chino Avenue | South Leg Archibald Avenue | West Leg Chino Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 2 | 0 | 0 | 2 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 1 | 1 | 0 | 2 |
| TOTAL VOLUMES: | 0 | 3 | 1 | 0 | 4 |

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951-268-6268

Location: Ontario
N/S: Archibald Avenue
E/W: Chino Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Archibald Avenue | | | Westbound Chino Avenue | | | Northbound Archibald Avenue | | | Eastbound Chino Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 3 |

| | Southbound Archibald Avenue | | | Westbound Chino Avenue | | | Northbound Archibald Avenue | | | Eastbound Chino Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 4:15 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |

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City of Ontario
N/S: Archibald Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 37_ONT_Arch_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Archibald Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 8 | 102 | 0 | 0 | 110 | 4 | 0 | 11 | 5 | 15 | 2 | 240 | 4 | 0 | 246 | 0 | 0 | 1 | 0 | 1 | 5 | 372 | 377 |
| 07:15 AM | 14 | 95 | 0 | 0 | 109 | 11 | 0 | 12 | 10 | 23 | 1 | 236 | 2 | 0 | 239 | 0 | 0 | 0 | 0 | 0 | 10 | 371 | 381 |
| 07:30 AM | 14 | 84 | 1 | 0 | 99 | 16 | 0 | 26 | 15 | 42 | 3 | 276 | 4 | 0 | 283 | 0 | 0 | 1 | 0 | 1 | 15 | 425 | 440 |
| 07:45 AM | 24 | 103 | 0 | 0 | 127 | 14 | 0 | 21 | 10 | 35 | 2 | 275 | 4 | 1 | 281 | 0 | 0 | 0 | 0 | 0 | 11 | 443 | 454 |
| Total | 60 | 384 | 1 | 0 | 445 | 45 | 0 | 70 | 40 | 115 | 8 | 1027 | 14 | 1 | 1049 | 0 | 0 | 2 | 0 | 2 | 41 | 1611 | 1652 |
| 08:00 AM | 28 | 115 | 0 | 0 | 143 | 9 | 0 | 13 | 8 | 22 | 2 | 191 | 3 | 0 | 196 | 0 | 0 | 0 | 0 | 0 | 8 | 361 | 369 |
| 08:15 AM | 12 | 87 | 0 | 0 | 99 | 5 | 0 | 8 | 4 | 13 | 3 | 264 | 7 | 1 | 274 | 0 | 0 | 0 | 0 | 0 | 5 | 386 | 391 |
| 08:30 AM | 18 | 96 | 0 | 0 | 114 | 5 | 0 | 11 | 3 | 16 | 2 | 257 | 7 | 1 | 266 | 0 | 0 | 0 | 0 | 0 | 4 | 396 | 400 |
| 08:45 AM | 15 | 106 | 0 | 0 | 121 | 4 | 0 | 10 | 5 | 14 | 0 | 185 | 3 | 0 | 188 | 0 | 0 | 0 | 0 | 0 | 5 | 323 | 328 |
| Total | 73 | 404 | 0 | 0 | 477 | 23 | 0 | 42 | 20 | 65 | 7 | 897 | 20 | 2 | 924 | 0 | 0 | 0 | 0 | 0 | 22 | 1466 | 1488 |
| Grand Total | 133 | 788 | 1 | 0 | 922 | 68 | 0 | 112 | 60 | 180 | 15 | 1924 | 34 | 3 | 1973 | 0 | 0 | 2 | 0 | 2 | 63 | 3077 | 3140 |
| Apprch % | 14.4 | 85.5 | 0.1 | | | 37.8 | 0 | 62.2 | | | 0.8 | 97.5 | 1.7 | | | 0 | 0 | 100 | | | | | |
| Total % | 4.3 | 25.6 | 0 | | 30 | 2.2 | 0 | 3.6 | | 5.8 | 0.5 | 62.5 | 1.1 | | 64.1 | 0 | 0 | 0.1 | | 0.1 | 2 | 98 | |

| | Archibald Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Archibald Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 14 | 84 | **1** | 99 | **16** | 0 | **26** | **42** | **3** | **276** | 4 | **283** | 0 | 0 | **1** | **1** | 425 |
| 07:45 AM | 24 | 103 | 0 | 127 | 14 | 0 | 21 | 35 | 2 | 275 | 4 | 281 | 0 | 0 | 0 | 0 | **443** |
| 08:00 AM | **28** | **115** | 0 | **143** | 9 | 0 | 13 | 22 | 2 | 191 | 3 | 196 | 0 | 0 | 0 | 0 | 361 |
| 08:15 AM | 12 | 87 | 0 | 99 | 5 | 0 | 8 | 13 | 3 | 264 | **7** | 274 | 0 | 0 | 0 | 0 | 386 |
| Total Volume | 78 | 389 | 1 | 468 | 44 | 0 | 68 | 112 | 10 | 1006 | 18 | 1034 | 0 | 0 | 1 | 1 | 1615 |
| % App. Total | 16.7 | 83.1 | 0.2 | | 39.3 | 0 | 60.7 | | 1 | 97.3 | 1.7 | | 0 | 0 | 100 | | |
| PHF | .696 | .846 | .250 | .818 | .688 | .000 | .654 | .667 | .833 | .911 | .643 | .913 | .000 | .000 | .250 | .250 | .911 |

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City of Ontario
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Weather: Clear

File Name : 37_ONT_Arch_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

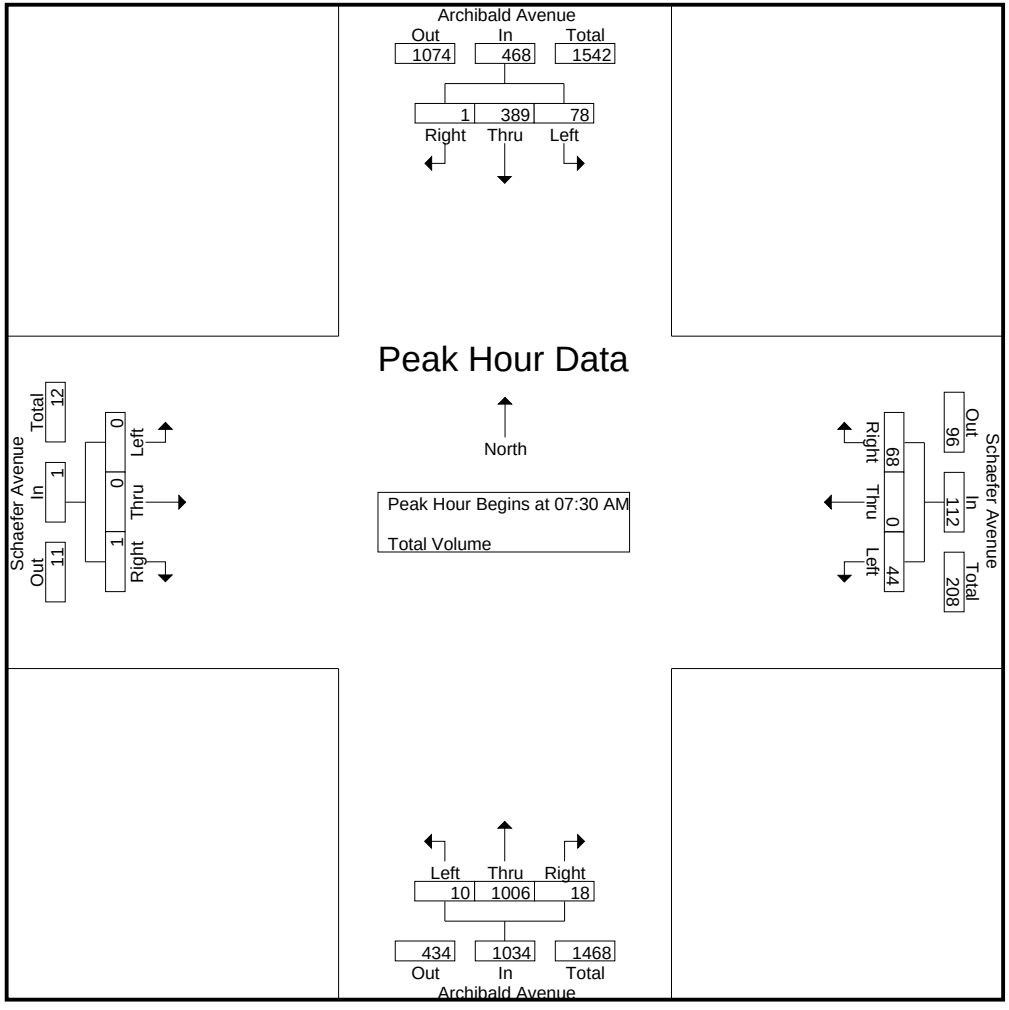

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City of Ontario
N/S: Archibald Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 37_ONT_Arch_Sch AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Archibald Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:45 AM | | | | 07:15 AM | | | | 07:00 AM | | | | 07:00 AM | | | | |
| +0 mins. | 24 | 103 | 0 | 127 | 11 | 0 | 12 | 23 | 2 | 240 | **4** | 246 | 0 | 0 | **1** | **1** | |
| +15 mins. | **28** | **115** | 0 | **143** | **16** | 0 | **26** | **42** | 1 | 236 | 2 | 239 | 0 | 0 | 0 | 0 | |
| +30 mins. | 12 | 87 | 0 | 99 | 14 | 0 | 21 | 35 | **3** | **276** | 4 | **283** | 0 | 0 | 1 | 1 | |
| +45 mins. | 18 | 96 | 0 | 114 | 9 | 0 | 13 | 22 | 2 | 275 | 4 | 281 | 0 | 0 | 0 | 0 | |
| Total Volume | 82 | 401 | 0 | 483 | 50 | 0 | 72 | 122 | 8 | 1027 | 14 | 1049 | 0 | 0 | 2 | 2 | |
| % App. Total | 17 | 83 | 0 | | 41 | 0 | 59 | | 0.8 | 97.9 | 1.3 | | 0 | 0 | 100 | | |
| PHF | .732 | .872 | .000 | .844 | .781 | .000 | .692 | .726 | .667 | .930 | .875 | .927 | .000 | .000 | .500 | .500 | |

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City of Ontario
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File Name : 37_ONT_Arch_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Schaefer Avenue Westbound | | | | | Archibald Avenue Northbound | | | | | Schaefer Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 28 | 130 | 0 | 0 | 158 | 4 | 0 | 13 | 7 | 17 | 0 | 220 | 3 | 0 | 223 | 0 | 0 | 0 | 0 | 0 | 7 | 398 | 405 |
| 04:15 PM | 27 | 178 | 0 | 0 | 205 | 4 | 0 | 4 | 1 | 8 | 3 | 169 | 3 | 1 | 175 | 0 | 0 | 0 | 0 | 0 | 2 | 388 | 390 |
| 04:30 PM | 39 | 180 | 0 | 0 | 219 | 10 | 0 | 5 | 1 | 15 | 1 | 176 | 7 | 1 | 184 | 0 | 0 | 0 | 0 | 0 | 2 | 418 | 420 |
| 04:45 PM | 39 | 196 | 0 | 0 | 235 | 3 | 0 | 9 | 2 | 12 | 0 | 167 | 6 | 0 | 173 | 0 | 0 | 0 | 0 | 0 | 2 | 420 | 422 |
| Total | 133 | 684 | 0 | 0 | 817 | 21 | 0 | 31 | 11 | 52 | 4 | 732 | 19 | 2 | 755 | 0 | 0 | 0 | 0 | 0 | 13 | 1624 | 1637 |
| 05:00 PM | 32 | 184 | 0 | 0 | 216 | 10 | 0 | 7 | 1 | 17 | 0 | 205 | 6 | 1 | 211 | 0 | 0 | 0 | 0 | 0 | 2 | 444 | 446 |
| 05:15 PM | 24 | 228 | 0 | 0 | 252 | 3 | 0 | 8 | 3 | 11 | 0 | 156 | 6 | 1 | 162 | 0 | 0 | 0 | 0 | 0 | 4 | 425 | 429 |
| 05:30 PM | 31 | 232 | 0 | 0 | 263 | 1 | 0 | 9 | 2 | 10 | 1 | 170 | 12 | 0 | 183 | 0 | 0 | 0 | 0 | 0 | 2 | 456 | 458 |
| 05:45 PM | 51 | 231 | 0 | 0 | 282 | 6 | 0 | 10 | 2 | 16 | 1 | 151 | 3 | 2 | 155 | 0 | 0 | 0 | 0 | 0 | 4 | 453 | 457 |
| Total | 138 | 875 | 0 | 0 | 1013 | 20 | 0 | 34 | 8 | 54 | 2 | 682 | 27 | 4 | 711 | 0 | 0 | 0 | 0 | 0 | 12 | 1778 | 1790 |
| Grand Total | 271 | 1559 | 0 | 0 | 1830 | 41 | 0 | 65 | 19 | 106 | 6 | 1414 | 46 | 6 | 1466 | 0 | 0 | 0 | 0 | 0 | 25 | 3402 | 3427 |
| Apprch % | 14.8 | 85.2 | 0 | | | 38.7 | 0 | 61.3 | | | 0.4 | 96.5 | 3.1 | | | 0 | 0 | 0 | | | | | |
| Total % | 8 | 45.8 | 0 | | 53.8 | 1.2 | 0 | 1.9 | | 3.1 | 0.2 | 41.6 | 1.4 | | 43.1 | 0 | 0 | 0 | | 0 | 0.7 | 99.3 | |

| | Archibald Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Archibald Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 32 | 184 | 0 | 216 | **10** | 0 | 7 | **17** | 0 | **205** | 6 | **211** | 0 | 0 | 0 | 0 | 444 |
| 05:15 PM | 24 | 228 | 0 | 252 | 3 | 0 | 8 | 11 | 0 | 156 | 6 | 162 | 0 | 0 | 0 | 0 | 425 |
| 05:30 PM | 31 | **232** | 0 | 263 | 1 | 0 | 9 | 10 | **1** | 170 | **12** | 183 | 0 | 0 | 0 | 0 | **456** |
| 05:45 PM | **51** | 231 | 0 | **282** | 6 | 0 | **10** | 16 | 1 | 151 | 3 | 155 | 0 | 0 | 0 | 0 | 453 |
| Total Volume | 138 | 875 | 0 | 1013 | 20 | 0 | 34 | 54 | 2 | 682 | 27 | 711 | 0 | 0 | 0 | 0 | 1778 |
| % App. Total | 13.6 | 86.4 | 0 | | 37 | 0 | 63 | | 0.3 | 95.9 | 3.8 | | 0 | 0 | 0 | | |
| PHF | .676 | .943 | .000 | .898 | .500 | .000 | .850 | .794 | .500 | .832 | .563 | .842 | .000 | .000 | .000 | .000 | .975 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 37_ONT_Arch_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

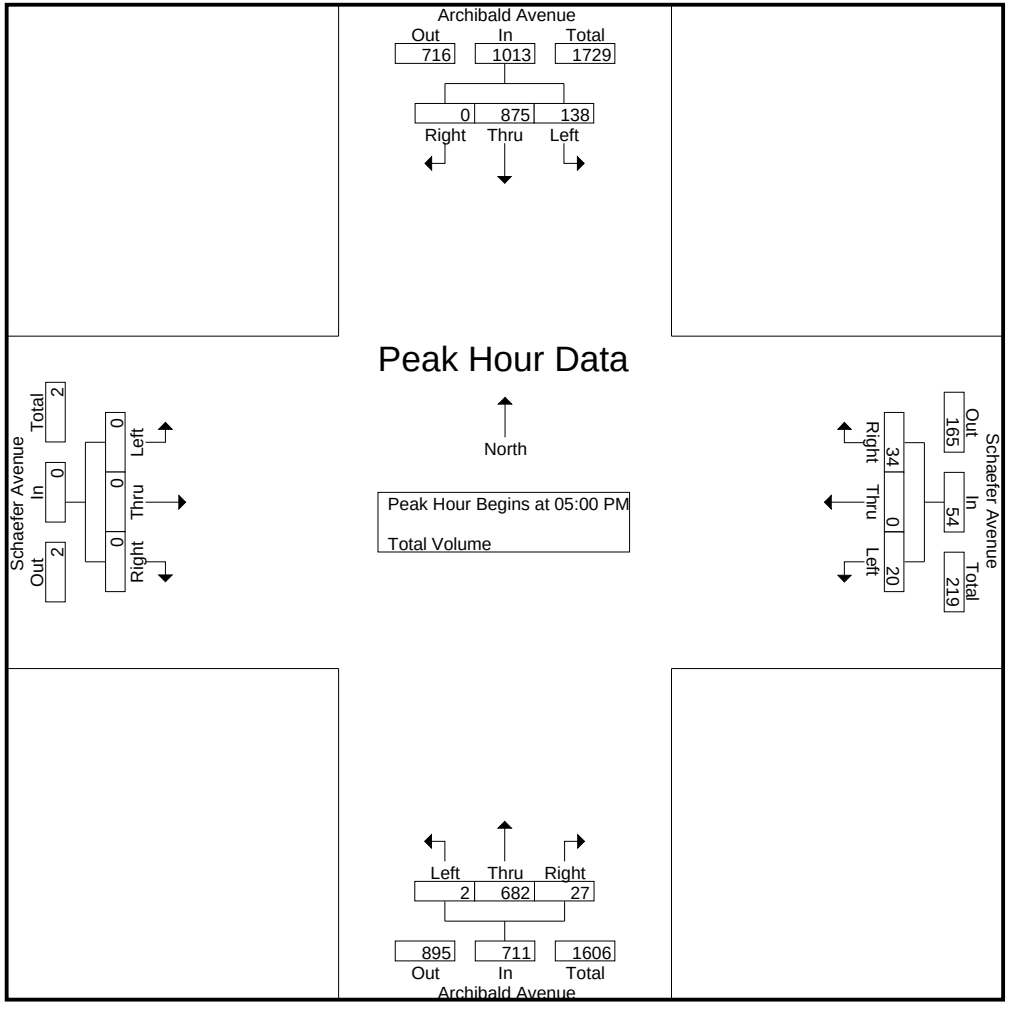

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(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: Schaefer Avenue
Weather: Clear

File Name : 37_ONT_Arch_Sch PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Schaefer Avenue Westbound | | | | Archibald Avenue Northbound | | | | Schaefer Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:30 PM | | | | 04:00 PM | | | | 04:00 PM | | | | |
| +0 mins. | 32 | 184 | 0 | 216 | **10** | 0 | 5 | 15 | 0 | **220** | 3 | **223** | 0 | 0 | 0 | 0 | |
| +15 mins. | 24 | 228 | 0 | 252 | 3 | 0 | **9** | 12 | **3** | 169 | 3 | 175 | 0 | 0 | 0 | 0 | |
| +30 mins. | 31 | **232** | 0 | 263 | 10 | 0 | 7 | **17** | 1 | 176 | **7** | 184 | 0 | 0 | 0 | 0 | |
| +45 mins. | **51** | 231 | 0 | **282** | 3 | 0 | 8 | 11 | 0 | 167 | 6 | 173 | 0 | 0 | 0 | 0 | |
| Total Volume | 138 | 875 | 0 | 1013 | 26 | 0 | 29 | 55 | 4 | 732 | 19 | 755 | 0 | 0 | 0 | 0 | |
| % App. Total | 13.6 | 86.4 | 0 | | 47.3 | 0 | 52.7 | | 0.5 | 97 | 2.5 | | 0 | 0 | 0 | | |
| PHF | .676 | .943 | .000 | .898 | .650 | .000 | .806 | .809 | .333 | .832 | .679 | .846 | .000 | .000 | .000 | .000 | |

Location: Ontario
N/S: Archibald Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Archibald Avenue | East Leg Schaefer Avenue | South Leg Archibald Avenue | West Leg Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 1 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 2 | 0 | 0 | 2 |
| 7:45 AM | 0 | 1 | 0 | 0 | 1 |
| 8:00 AM | 0 | 2 | 0 | 0 | 2 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 |
| 8:30 AM | 0 | 1 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 8 | 0 | 0 | 8 |

| | North Leg Archibald Avenue | East Leg Schaefer Avenue | South Leg Archibald Avenue | West Leg Schaefer Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 1 | 0 | 0 | 1 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 1 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Archibald Avenue
E/W: Schaefer Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Archibald Avenue | | | Westbound Schaefer Avenue | | | Northbound Archibald Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 |

| | Southbound Archibald Avenue | | | Westbound Schaefer Avenue | | | Northbound Archibald Avenue | | | Eastbound Schaefer Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |



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City of Ontario
N/S: Archibald Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 38_ONT_Arch_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Archibald Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 16 | 77 | 8 | 2 | 101 | 72 | 52 | 13 | 6 | 137 | 24 | 170 | 41 | 0 | 235 | 7 | 19 | 9 | 0 | 35 | 8 | 508 | 516 |
| 07:15 AM | 14 | 75 | 14 | 7 | 103 | 112 | 71 | 13 | 2 | 196 | 30 | 226 | 33 | 0 | 289 | 4 | 17 | 8 | 0 | 29 | 9 | 617 | 626 |
| 07:30 AM | 16 | 84 | 12 | 6 | 112 | 78 | 47 | 16 | 5 | 141 | 30 | 232 | 45 | 0 | 307 | 1 | 16 | 12 | 0 | 29 | 11 | 589 | 600 |
| 07:45 AM | 21 | 84 | 11 | 7 | 116 | 73 | 53 | 21 | 4 | 147 | 30 | 196 | 46 | 0 | 272 | 9 | 28 | 21 | 0 | 58 | 11 | 593 | 604 |
| Total | 67 | 320 | 45 | 22 | 432 | 335 | 223 | 63 | 17 | 621 | 114 | 824 | 165 | 0 | 1103 | 21 | 80 | 50 | 0 | 151 | 39 | 2307 | 2346 |
| 08:00 AM | 21 | 90 | 7 | 2 | 118 | 54 | 54 | 26 | 10 | 134 | 27 | 177 | 63 | 0 | 267 | 3 | 26 | 17 | 0 | 46 | 12 | 565 | 577 |
| 08:15 AM | 16 | 72 | 11 | 2 | 99 | 39 | 39 | 19 | 11 | 97 | 18 | 235 | 26 | 0 | 279 | 9 | 15 | 18 | 0 | 42 | 13 | 517 | 530 |
| 08:30 AM | 12 | 76 | 11 | 4 | 99 | 54 | 53 | 13 | 7 | 120 | 26 | 218 | 44 | 0 | 288 | 11 | 13 | 10 | 0 | 34 | 11 | 541 | 552 |
| 08:45 AM | 22 | 77 | 8 | 3 | 107 | 41 | 57 | 16 | 10 | 114 | 19 | 152 | 32 | 0 | 203 | 11 | 36 | 23 | 0 | 70 | 13 | 494 | 507 |
| Total | 71 | 315 | 37 | 11 | 423 | 188 | 203 | 74 | 38 | 465 | 90 | 782 | 165 | 0 | 1037 | 34 | 90 | 68 | 0 | 192 | 49 | 2117 | 2166 |
| Grand Total | 138 | 635 | 82 | 33 | 855 | 523 | 426 | 137 | 55 | 1086 | 204 | 1606 | 330 | 0 | 2140 | 55 | 170 | 118 | 0 | 343 | 88 | 4424 | 4512 |
| Apprch % | 16.1 | 74.3 | 9.6 | | | 48.2 | 39.2 | 12.6 | | | 9.5 | 75 | 15.4 | | | 16 | 49.6 | 34.4 | | | | | |
| Total % | 3.1 | 14.4 | 1.9 | | 19.3 | 11.8 | 9.6 | 3.1 | | 24.5 | 4.6 | 36.3 | 7.5 | | 48.4 | 1.2 | 3.8 | 2.7 | | 7.8 | 2 | 98 | |

| | Archibald Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Archibald Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 14 | 75 | **14** | 103 | **112** | **71** | 13 | **196** | **30** | 226 | 33 | 289 | 4 | 17 | 8 | 29 | **617** |
| 07:30 AM | 16 | 84 | 12 | 112 | 78 | 47 | 16 | 141 | 30 | **232** | 45 | **307** | 1 | 16 | 12 | 29 | 589 |
| 07:45 AM | **21** | 84 | 11 | 116 | 73 | 53 | 21 | 147 | 30 | 196 | 46 | 272 | **9** | **28** | **21** | **58** | 593 |
| 08:00 AM | 21 | **90** | 7 | **118** | 54 | 54 | **26** | 134 | 27 | 177 | **63** | 267 | 3 | 26 | 17 | 46 | 565 |
| Total Volume | 72 | 333 | 44 | 449 | 317 | 225 | 76 | 618 | 117 | 831 | 187 | 1135 | 17 | 87 | 58 | 162 | 2364 |
| % App. Total | 16 | 74.2 | 9.8 | | 51.3 | 36.4 | 12.3 | | 10.3 | 73.2 | 16.5 | | 10.5 | 53.7 | 35.8 | | |
| PHF | .857 | .925 | .786 | .951 | .708 | .792 | .731 | .788 | .975 | .895 | .742 | .924 | .472 | .777 | .690 | .698 | .958 |

Counts Unlimited, Inc.
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City of Ontario
N/S: Archibald Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 38_ONT_Arch_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

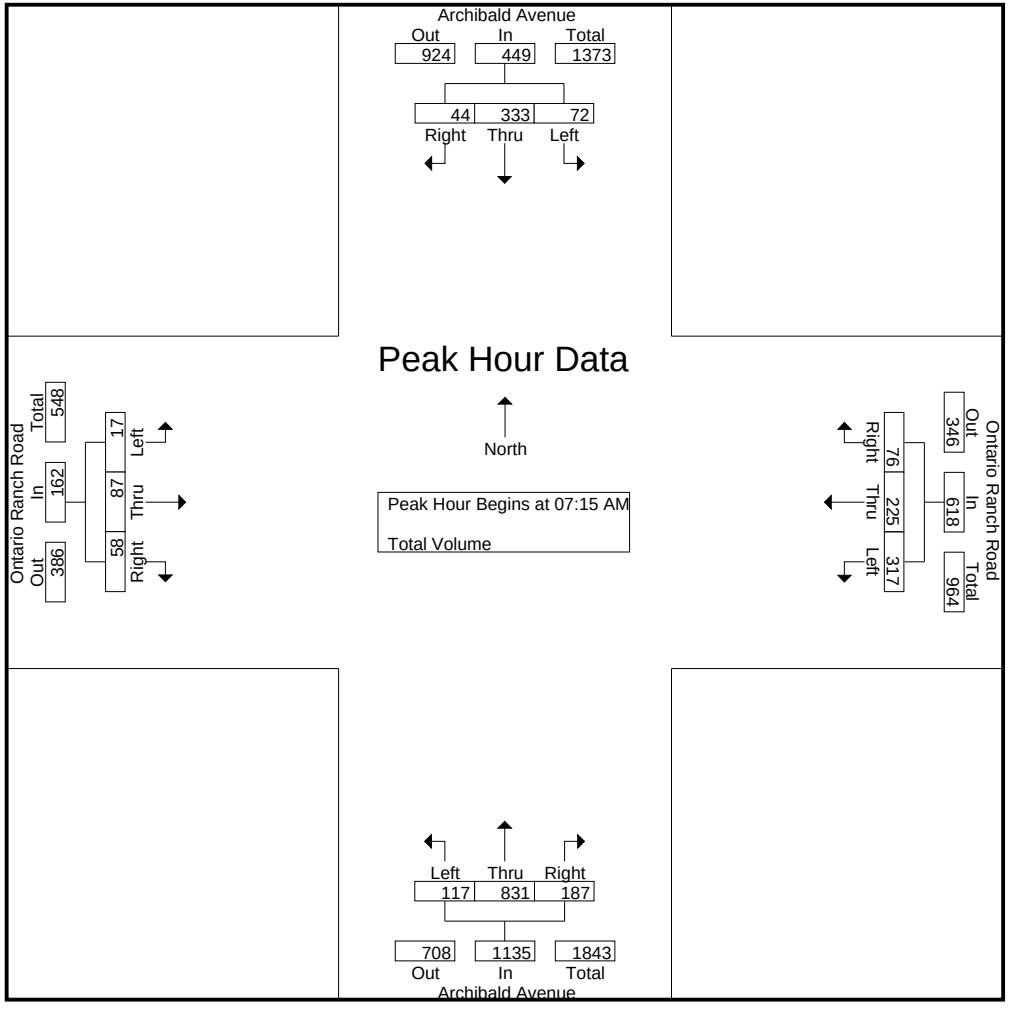

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City of Ontario
N/S: Archibald Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 38_ONT_Arch_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Archibald Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:00 AM | | | | 07:15 AM | | | | 08:00 AM | | | | |
| +0 mins. | 14 | 75 | **14** | 103 | 72 | 52 | 13 | 137 | **30** | 226 | 33 | 289 | 3 | 26 | 17 | 46 | |
| +15 mins. | 16 | 84 | 12 | 112 | **112** | **71** | 13 | **196** | 30 | **232** | 45 | **307** | 9 | 15 | 18 | 42 | |
| +30 mins. | **21** | 84 | 11 | 116 | 78 | 47 | 16 | 141 | 30 | 196 | 46 | 272 | **11** | 13 | 10 | 34 | |
| +45 mins. | 21 | **90** | 7 | **118** | 73 | 53 | **21** | 147 | 27 | 177 | **63** | 267 | 11 | **36** | **23** | **70** | |
| Total Volume | 72 | 333 | 44 | 449 | 335 | 223 | 63 | 621 | 117 | 831 | 187 | 1135 | 34 | 90 | 68 | 192 | |
| % App. Total | 16 | 74.2 | 9.8 | | 53.9 | 35.9 | 10.1 | | 10.3 | 73.2 | 16.5 | | 17.7 | 46.9 | 35.4 | | |
| PHF | .857 | .925 | .786 | .951 | .748 | .785 | .750 | .792 | .975 | .895 | .742 | .924 | .773 | .625 | .739 | .686 | |

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City of Ontario
N/S: Archibald Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 38_ONT_Arch_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Archibald Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 19 | 102 | 9 | 1 | 130 | 43 | 33 | 21 | 6 | 97 | 13 | 193 | 51 | 0 | 257 | 19 | 66 | 42 | 0 | 127 | 7 | 611 | 618 |
| 04:15 PM | 25 | 131 | 6 | 1 | 162 | 71 | 27 | 20 | 13 | 118 | 24 | 141 | 52 | 0 | 217 | 18 | 60 | 38 | 0 | 116 | 14 | 613 | 627 |
| 04:30 PM | 22 | 171 | 8 | 2 | 201 | 73 | 31 | 21 | 13 | 125 | 25 | 140 | 51 | 0 | 216 | 14 | 68 | 44 | 0 | 126 | 15 | 668 | 683 |
| 04:45 PM | 22 | 148 | 7 | 3 | 177 | 54 | 28 | 20 | 12 | 102 | 18 | 139 | 46 | 0 | 203 | 23 | 78 | 46 | 0 | 147 | 15 | 629 | 644 |
| Total | 88 | 552 | 30 | 7 | 670 | 241 | 119 | 82 | 44 | 442 | 80 | 613 | 200 | 0 | 893 | 74 | 272 | 170 | 0 | 516 | 51 | 2521 | 2572 |
| 05:00 PM | 25 | 169 | 5 | 2 | 199 | 72 | 29 | 9 | 6 | 110 | 21 | 184 | 60 | 0 | 265 | 8 | 66 | 50 | 0 | 124 | 8 | 698 | 706 |
| 05:15 PM | 23 | 184 | 13 | 2 | 220 | 89 | 29 | 26 | 11 | 144 | 18 | 117 | 57 | 0 | 192 | 19 | 78 | 54 | 0 | 151 | 13 | 707 | 720 |
| 05:30 PM | 27 | 183 | 9 | 3 | 219 | 63 | 37 | 14 | 5 | 114 | 24 | 149 | 53 | 0 | 226 | 13 | 60 | 51 | 0 | 124 | 8 | 683 | 691 |
| 05:45 PM | 26 | 199 | 6 | 2 | 231 | 111 | 26 | 17 | 6 | 154 | 12 | 123 | 47 | 0 | 182 | 20 | 63 | 49 | 0 | 132 | 8 | 699 | 707 |
| Total | 101 | 735 | 33 | 9 | 869 | 335 | 121 | 66 | 28 | 522 | 75 | 573 | 217 | 0 | 865 | 60 | 267 | 204 | 0 | 531 | 37 | 2787 | 2824 |
| Grand Total | 189 | 1287 | 63 | 16 | 1539 | 576 | 240 | 148 | 72 | 964 | 155 | 1186 | 417 | 0 | 1758 | 134 | 539 | 374 | 0 | 1047 | 88 | 5308 | 5396 |
| Apprch % | 12.3 | 83.6 | 4.1 | | | 59.8 | 24.9 | 15.4 | | | 8.8 | 67.5 | 23.7 | | | 12.8 | 51.5 | 35.7 | | | | | |
| Total % | 3.6 | 24.2 | 1.2 | | 29 | 10.9 | 4.5 | 2.8 | | 18.2 | 2.9 | 22.3 | 7.9 | | 33.1 | 2.5 | 10.2 | 7 | | 19.7 | 1.6 | 98.4 | |

| | Archibald Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Archibald Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 25 | 169 | 5 | 199 | 72 | 29 | 9 | 110 | 21 | **184** | **60** | **265** | 8 | 66 | 50 | 124 | 698 |
| 05:15 PM | 23 | 184 | **13** | 220 | 89 | 29 | **26** | 144 | 18 | 117 | 57 | 192 | 19 | **78** | **54** | **151** | **707** |
| 05:30 PM | **27** | 183 | 9 | 219 | 63 | **37** | 14 | 114 | **24** | 149 | 53 | 226 | 13 | 60 | 51 | 124 | 683 |
| 05:45 PM | 26 | **199** | 6 | **231** | **111** | 26 | 17 | **154** | 12 | 123 | 47 | 182 | **20** | 63 | 49 | 132 | 699 |
| Total Volume | 101 | 735 | 33 | 869 | 335 | 121 | 66 | 522 | 75 | 573 | 217 | 865 | 60 | 267 | 204 | 531 | 2787 |
| % App. Total | 11.6 | 84.6 | 3.8 | | 64.2 | 23.2 | 12.6 | | 8.7 | 66.2 | 25.1 | | 11.3 | 50.3 | 38.4 | | |
| PHF | .935 | .923 | .635 | .940 | .755 | .818 | .635 | .847 | .781 | .779 | .904 | .816 | .750 | .856 | .944 | .879 | .986 |

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City of Ontario
N/S: Archibald Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 38_ONT_Arch_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

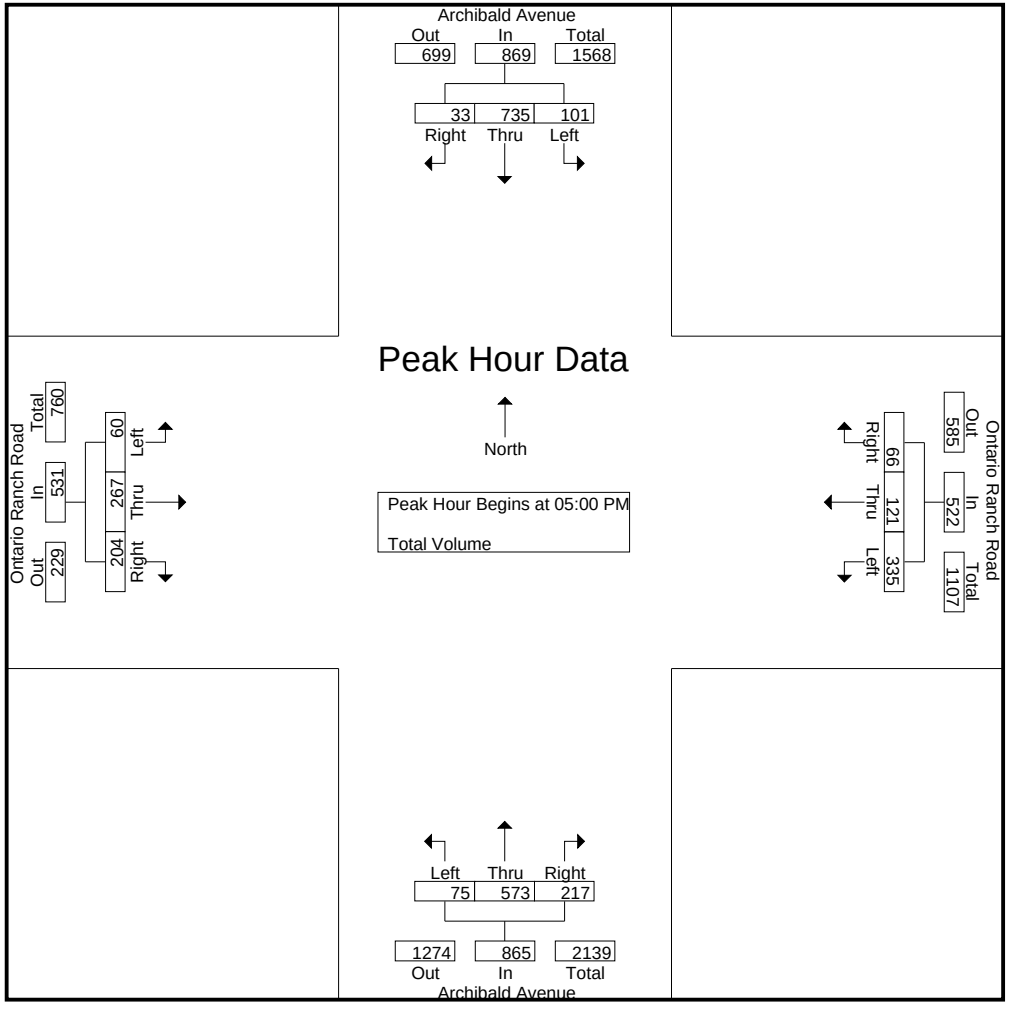

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City of Ontario
N/S: Archibald Avenue
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File Name : 38_ONT_Arch_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Archibald Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 04:15 PM | | | | 04:30 PM | | | | |
| +0 mins. | 25 | 169 | 5 | 199 | 72 | 29 | 9 | 110 | 24 | 141 | 52 | 217 | 14 | 68 | 44 | 126 | |
| +15 mins. | 23 | 184 | **13** | 220 | 89 | 29 | **26** | 144 | **25** | 140 | 51 | 216 | **23** | **78** | 46 | 147 | |
| +30 mins. | **27** | 183 | 9 | 219 | 63 | **37** | 14 | 114 | 18 | 139 | 46 | 203 | 8 | 66 | 50 | 124 | |
| +45 mins. | 26 | **199** | 6 | **231** | **111** | 26 | 17 | **154** | 21 | **184** | **60** | **265** | 19 | 78 | **54** | **151** | |
| Total Volume | 101 | 735 | 33 | 869 | 335 | 121 | 66 | 522 | 88 | 604 | 209 | 901 | 64 | 290 | 194 | 548 | |
| % App. Total | 11.6 | 84.6 | 3.8 | | 64.2 | 23.2 | 12.6 | | 9.8 | 67 | 23.2 | | 11.7 | 52.9 | 35.4 | | |
| PHF | .935 | .923 | .635 | .940 | .755 | .818 | .635 | .847 | .880 | .821 | .871 | .850 | .696 | .929 | .898 | .907 | |

Location: Ontario
N/S: Archibald Avenue
E/W: Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Archibald Avenue | East Leg Ontario Ranch Road | South Leg Archibald Avenue | West Leg Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 1 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 1 |

| | North Leg Archibald Avenue | East Leg Ontario Ranch Road | South Leg Archibald Avenue | West Leg Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |



Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Archibald Avenue
E/W: Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Archibald Avenue | | | Westbound Ontario Ranch Road | | | Northbound Archibald Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

| | Southbound Archibald Avenue | | | Westbound Ontario Ranch Road | | | Northbound Archibald Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

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PO Box 1178
Corona, CA 92878
951-268-6268

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Archibald Avenue
E/W: Merrill Avenue
Weather: Clear

File Name : 39_ONT_Arch_Mer AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Archibald Avenue Northbound | | | | | Merrill Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 6 | 82 | 26 | 9 | 114 | 18 | 80 | 18 | 8 | 116 | 38 | 213 | 15 | 5 | 266 | 32 | 11 | 9 | 0 | 52 | 22 | 548 | 570 |
| 07:15 AM | 1 | 89 | 20 | 11 | 110 | 12 | 82 | 22 | 13 | 116 | 48 | 191 | 13 | 5 | 252 | 29 | 21 | 8 | 0 | 58 | 29 | 536 | 565 |
| 07:30 AM | 7 | 98 | 19 | 7 | 124 | 28 | 91 | 24 | 20 | 143 | 39 | 189 | 14 | 5 | 242 | 34 | 43 | 18 | 0 | 95 | 32 | 604 | 636 |
| 07:45 AM | 4 | 87 | 26 | 15 | 117 | 33 | 70 | 25 | 16 | 128 | 44 | 172 | 30 | 12 | 246 | 36 | 36 | 12 | 0 | 84 | 43 | 575 | 618 |
| Total | 18 | 356 | 91 | 42 | 465 | 91 | 323 | 89 | 57 | 503 | 169 | 765 | 72 | 27 | 1006 | 131 | 111 | 47 | 0 | 289 | 126 | 2263 | 2389 |
| 08:00 AM | 14 | 126 | 21 | 14 | 161 | 31 | 53 | 26 | 13 | 110 | 28 | 182 | 25 | 9 | 235 | 32 | 37 | 21 | 0 | 90 | 36 | 596 | 632 |
| 08:15 AM | 9 | 94 | 22 | 4 | 125 | 17 | 53 | 14 | 9 | 84 | 38 | 203 | 24 | 5 | 265 | 22 | 27 | 10 | 0 | 59 | 18 | 533 | 551 |
| 08:30 AM | 6 | 77 | 29 | 14 | 112 | 10 | 54 | 14 | 8 | 78 | 39 | 177 | 16 | 3 | 232 | 30 | 30 | 11 | 0 | 71 | 25 | 493 | 518 |
| 08:45 AM | 4 | 101 | 25 | 12 | 130 | 11 | 57 | 13 | 9 | 81 | 39 | 152 | 10 | 4 | 201 | 27 | 20 | 17 | 0 | 64 | 25 | 476 | 501 |
| Total | 33 | 398 | 97 | 44 | 528 | 69 | 217 | 67 | 39 | 353 | 144 | 714 | 75 | 21 | 933 | 111 | 114 | 59 | 0 | 284 | 104 | 2098 | 2202 |
| Grand Total | 51 | 754 | 188 | 86 | 993 | 160 | 540 | 156 | 96 | 856 | 313 | 1479 | 147 | 48 | 1939 | 242 | 225 | 106 | 0 | 573 | 230 | 4361 | 4591 |
| Apprch % | 5.1 | 75.9 | 18.9 | | | 18.7 | 63.1 | 18.2 | | | 16.1 | 76.3 | 7.6 | | | 42.2 | 39.3 | 18.5 | | | | | |
| Total % | 1.2 | 17.3 | 4.3 | | 22.8 | 3.7 | 12.4 | 3.6 | | 19.6 | 7.2 | 33.9 | 3.4 | | 44.5 | 5.5 | 5.2 | 2.4 | | 13.1 | 5 | 95 | |

| | Archibald Avenue Southbound | | | | Merrill Avenue Westbound | | | | Archibald Avenue Northbound | | | | Merrill Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 1 | 89 | 20 | 110 | 12 | 82 | 22 | 116 | **48** | **191** | 13 | **252** | 29 | 21 | 8 | 58 | 536 |
| 07:30 AM | 7 | 98 | 19 | 124 | 28 | **91** | 24 | **143** | 39 | 189 | 14 | 242 | 34 | **43** | 18 | **95** | **604** |
| 07:45 AM | 4 | 87 | **26** | 117 | **33** | 70 | 25 | 128 | 44 | 172 | **30** | 246 | **36** | 36 | 12 | 84 | 575 |
| 08:00 AM | **14** | **126** | 21 | **161** | 31 | 53 | **26** | 110 | 28 | 182 | 25 | 235 | 32 | 37 | **21** | 90 | 596 |
| Total Volume | 26 | 400 | 86 | 512 | 104 | 296 | 97 | 497 | 159 | 734 | 82 | 975 | 131 | 137 | 59 | 327 | 2311 |
| % App. Total | 5.1 | 78.1 | 16.8 | | 20.9 | 59.6 | 19.5 | | 16.3 | 75.3 | 8.4 | | 40.1 | 41.9 | 18 | | |
| PHF | .464 | .794 | .827 | .795 | .788 | .813 | .933 | .869 | .828 | .961 | .683 | .967 | .910 | .797 | .702 | .861 | .957 |

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Corona, CA 92878
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City of Ontario
N/S: Archibald Avenue
E/W: Merrill Avenue
Weather: Clear

File Name : 39_ONT_Arch_Mer AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

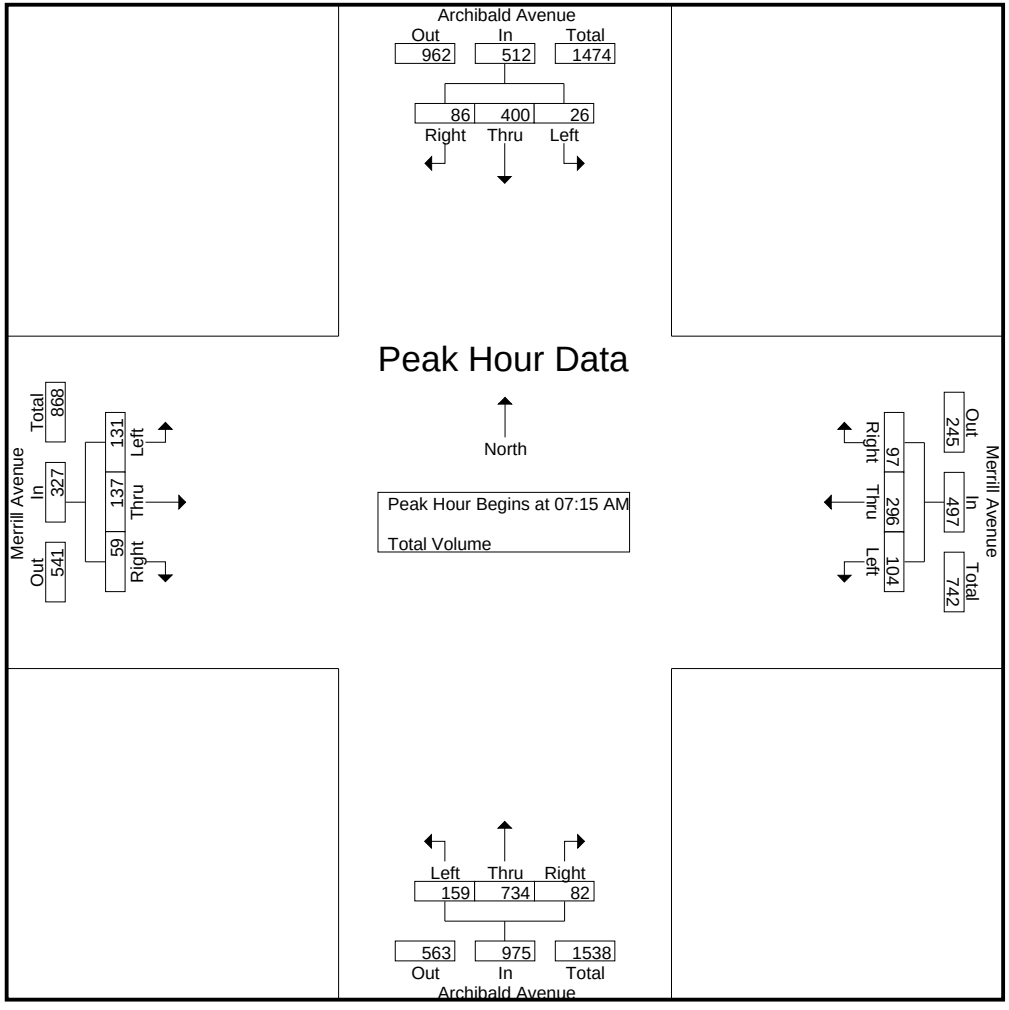

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City of Ontario
N/S: Archibald Avenue
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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Merrill Avenue Westbound | | | | Archibald Avenue Northbound | | | | Merrill Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 08:00 AM | | | | 07:00 AM | | | | 07:00 AM | | | | 07:30 AM | | | | |
| +0 mins. | **14** | **126** | 21 | **161** | 18 | 80 | 18 | 116 | 38 | **213** | 15 | **266** | 34 | **43** | 18 | **95** | |
| +15 mins. | 9 | 94 | 22 | 125 | 12 | 82 | 22 | 116 | **48** | 191 | 13 | 252 | **36** | 36 | 12 | 84 | |
| +30 mins. | 6 | 77 | **29** | 112 | 28 | **91** | 24 | **143** | 39 | 189 | 14 | 242 | 32 | 37 | **21** | 90 | |
| +45 mins. | 4 | 101 | 25 | 130 | **33** | 70 | **25** | 128 | 44 | 172 | **30** | 246 | 22 | 27 | 10 | 59 | |
| Total Volume | 33 | 398 | 97 | 528 | 91 | 323 | 89 | 503 | 169 | 765 | 72 | 1006 | 124 | 143 | 61 | 328 | |
| % App. Total | 6.2 | 75.4 | 18.4 | | 18.1 | 64.2 | 17.7 | | 16.8 | 76 | 7.2 | | 37.8 | 43.6 | 18.6 | | |
| PHF | .589 | .790 | .836 | .820 | .689 | .887 | .890 | .879 | .880 | .898 | .600 | .945 | .861 | .831 | .726 | .863 | |

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City of Ontario
N/S: Archibald Avenue
E/W: Merrill Avenue
Weather: Clear

File Name : 39_ONT_Arch_Mer PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Merrill Avenue Westbound | | | | | Archibald Avenue Northbound | | | | | Merrill Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 15 | 107 | 22 | 14 | 144 | 20 | 26 | 6 | 3 | 52 | 20 | 165 | 26 | 5 | 211 | 39 | 63 | 30 | 0 | 132 | 22 | 539 | 561 |
| 04:15 PM | 10 | 184 | 39 | 9 | 233 | 16 | 31 | 15 | 9 | 62 | 17 | 117 | 28 | 18 | 162 | 47 | 48 | 28 | 0 | 123 | 36 | 580 | 616 |
| 04:30 PM | 15 | 197 | 33 | 20 | 245 | 26 | 41 | 10 | 5 | 77 | 14 | 118 | 24 | 14 | 156 | 41 | 74 | 30 | 0 | 145 | 39 | 623 | 662 |
| 04:45 PM | 15 | 151 | 36 | 15 | 202 | 22 | 34 | 12 | 8 | 68 | 22 | 131 | 23 | 14 | 176 | 39 | 66 | 19 | 0 | 124 | 37 | 570 | 607 |
| Total | 55 | 639 | 130 | 58 | 824 | 84 | 132 | 43 | 25 | 259 | 73 | 531 | 101 | 51 | 705 | 166 | 251 | 107 | 0 | 524 | 134 | 2312 | 2446 |
| 05:00 PM | 17 | 151 | 31 | 14 | 199 | 24 | 36 | 9 | 5 | 69 | 20 | 133 | 21 | 5 | 174 | 61 | 58 | 34 | 0 | 153 | 24 | 595 | 619 |
| 05:15 PM | 15 | 218 | 37 | 12 | 270 | 21 | 31 | 13 | 8 | 65 | 14 | 120 | 22 | 9 | 156 | 43 | 89 | 26 | 0 | 158 | 29 | 649 | 678 |
| 05:30 PM | 29 | 156 | 23 | 8 | 208 | 17 | 46 | 17 | 8 | 80 | 15 | 118 | 19 | 7 | 152 | 49 | 67 | 46 | 0 | 162 | 23 | 602 | 625 |
| 05:45 PM | 16 | 198 | 37 | 16 | 251 | 20 | 53 | 13 | 8 | 86 | 24 | 110 | 17 | 11 | 151 | 31 | 63 | 29 | 0 | 123 | 35 | 611 | 646 |
| Total | 77 | 723 | 128 | 50 | 928 | 82 | 166 | 52 | 29 | 300 | 73 | 481 | 79 | 32 | 633 | 184 | 277 | 135 | 0 | 596 | 111 | 2457 | 2568 |
| Grand Total | 132 | 1362 | 258 | 108 | 1752 | 166 | 298 | 95 | 54 | 559 | 146 | 1012 | 180 | 83 | 1338 | 350 | 528 | 242 | 0 | 1120 | 245 | 4769 | 5014 |
| Apprch % | 7.5 | 77.7 | 14.7 | | | 29.7 | 53.3 | 17 | | | 10.9 | 75.6 | 13.5 | | | 31.2 | 47.1 | 21.6 | | | | | |
| Total % | 2.8 | 28.6 | 5.4 | | 36.7 | 3.5 | 6.2 | 2 | | 11.7 | 3.1 | 21.2 | 3.8 | | 28.1 | 7.3 | 11.1 | 5.1 | | 23.5 | 4.9 | 95.1 | |

| | Archibald Avenue Southbound | | | | Merrill Avenue Westbound | | | | Archibald Avenue Northbound | | | | Merrill Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 17 | 151 | 31 | 199 | **24** | 36 | 9 | 69 | 20 | **133** | 21 | **174** | **61** | 58 | 34 | 153 | 595 |
| 05:15 PM | 15 | **218** | **37** | **270** | 21 | 31 | 13 | 65 | 14 | 120 | **22** | 156 | 43 | **89** | 26 | 158 | **649** |
| 05:30 PM | **29** | 156 | 23 | 208 | 17 | 46 | **17** | 80 | 15 | 118 | 19 | 152 | 49 | 67 | **46** | **162** | 602 |
| 05:45 PM | 16 | 198 | 37 | 251 | 20 | **53** | 13 | **86** | **24** | 110 | 17 | 151 | 31 | 63 | 29 | 123 | 611 |
| Total Volume | 77 | 723 | 128 | 928 | 82 | 166 | 52 | 300 | 73 | 481 | 79 | 633 | 184 | 277 | 135 | 596 | 2457 |
| % App. Total | 8.3 | 77.9 | 13.8 | | 27.3 | 55.3 | 17.3 | | 11.5 | 76 | 12.5 | | 30.9 | 46.5 | 22.7 | | |
| PHF | .664 | .829 | .865 | .859 | .854 | .783 | .765 | .872 | .760 | .904 | .898 | .909 | .754 | .778 | .734 | .920 | .946 |

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City of Ontario
N/S: Archibald Avenue
E/W: Merrill Avenue
Weather: Clear

File Name : 39_ONT_Arch_Mer PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

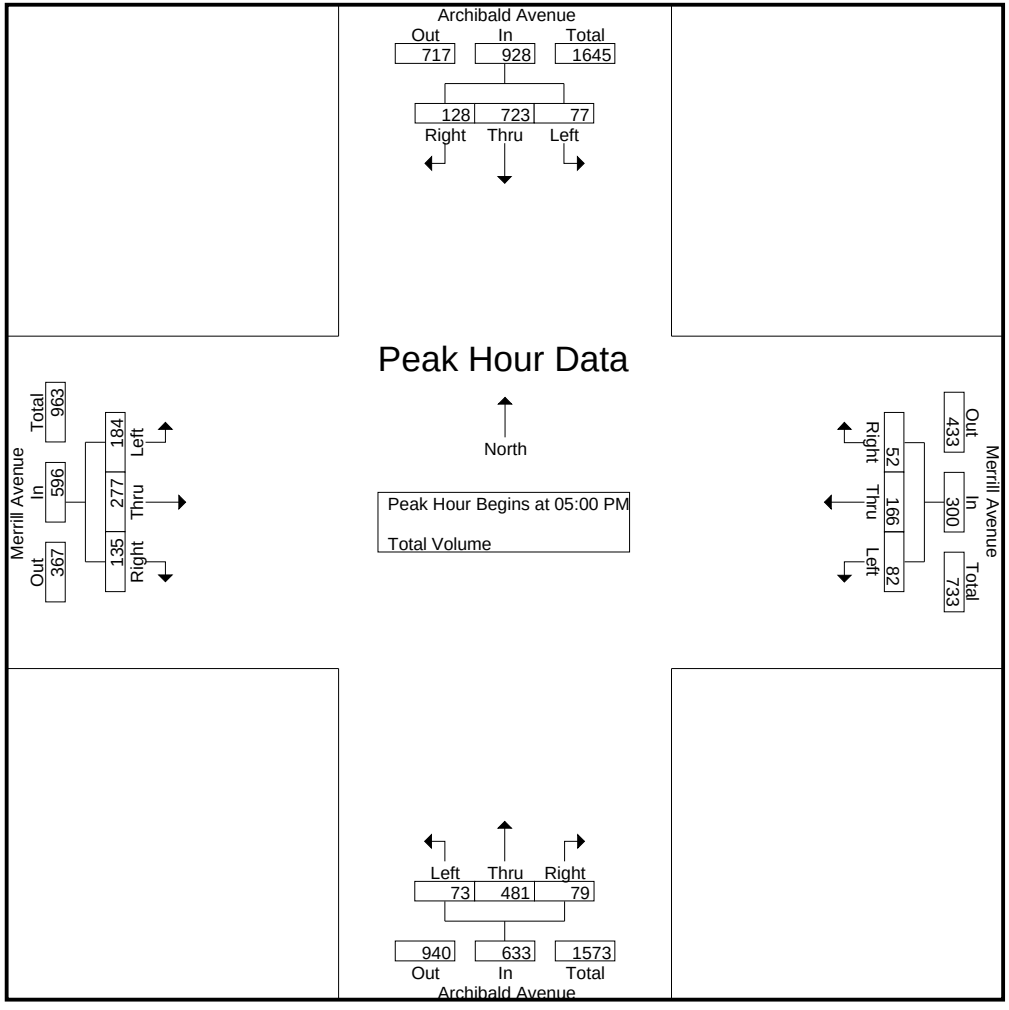

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City of Ontario
N/S: Archibald Avenue
E/W: Merrill Avenue
Weather: Clear

File Name : 39_ONT_Arch_Mer PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Merrill Avenue Westbound | | | | Archibald Avenue Northbound | | | | Merrill Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 04:00 PM | | | | 04:45 PM | | | | |
| +0 mins. | 17 | 151 | 31 | 199 | **24** | 36 | 9 | 69 | 20 | **165** | 26 | **211** | 39 | 66 | 19 | 124 | |
| +15 mins. | 15 | **218** | **37** | **270** | 21 | 31 | 13 | 65 | 17 | 117 | **28** | 162 | **61** | 58 | 34 | 153 | |
| +30 mins. | **29** | 156 | 23 | 208 | 17 | 46 | **17** | 80 | 14 | 118 | 24 | 156 | 43 | **89** | 26 | 158 | |
| +45 mins. | 16 | 198 | 37 | 251 | 20 | **53** | 13 | **86** | **22** | 131 | 23 | 176 | 49 | 67 | **46** | **162** | |
| Total Volume | 77 | 723 | 128 | 928 | 82 | 166 | 52 | 300 | 73 | 531 | 101 | 705 | 192 | 280 | 125 | 597 | |
| % App. Total | 8.3 | 77.9 | 13.8 | | 27.3 | 55.3 | 17.3 | | 10.4 | 75.3 | 14.3 | | 32.2 | 46.9 | 20.9 | | |
| PHF | .664 | .829 | .865 | .859 | .854 | .783 | .765 | .872 | .830 | .805 | .902 | .835 | .787 | .787 | .679 | .921 | |

Location: Ontario
N/S: Archibald Avenue
E/W: Merrill Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Archibald Avenue | East Leg Merrill Avenue | South Leg Archibald Avenue | West Leg Merrill Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 1 | 0 | 0 | 1 | 2 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 1 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 |
| 8:30 AM | 0 | 1 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 1 | 2 | 1 | 1 | 5 |

| | North Leg Archibald Avenue | East Leg Merrill Avenue | South Leg Archibald Avenue | West Leg Merrill Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 1 | 1 | 0 | 2 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 1 | 0 | 0 | 0 | 1 |
| 5:30 PM | 2 | 0 | 0 | 0 | 2 |
| 5:45 PM | 2 | 1 | 0 | 0 | 3 |
| TOTAL VOLUMES: | 5 | 2 | 1 | 0 | 8 |

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951-268-6268

Location: Ontario
N/S: Archibald Avenue
E/W: Merrill Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Archibald Avenue | | | Westbound Merrill Avenue | | | Northbound Archibald Avenue | | | Eastbound Merrill Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 3 |

| | Southbound Archibald Avenue | | | Westbound Merrill Avenue | | | Northbound Archibald Avenue | | | Eastbound Merrill Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 5:45 PM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 |

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City of Eastvale
N/S: Archibald Avenue
E/W: Limonite Avenue
Weather: Clear

File Name : 40_ESV_Arch_Lim AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Limonite Avenue Westbound | | | | | Archibald Avenue Northbound | | | | | Limonite Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 31 | 56 | 3 | 0 | 90 | 98 | 12 | 75 | 28 | 185 | 3 | 161 | 52 | 23 | 216 | 5 | 11 | 1 | 1 | 17 | 52 | 508 | 560 |
| 07:15 AM | 30 | 85 | 3 | 0 | 118 | 81 | 17 | 82 | 49 | 180 | 4 | 149 | 53 | 22 | 206 | 6 | 8 | 2 | 1 | 16 | 72 | 520 | 592 |
| 07:30 AM | 47 | 105 | 4 | 1 | 156 | 82 | 14 | 96 | 32 | 192 | 6 | 168 | 55 | 23 | 229 | 3 | 3 | 0 | 0 | 6 | 56 | 583 | 639 |
| 07:45 AM | 38 | 81 | 5 | 2 | 124 | 78 | 12 | 91 | 39 | 181 | 4 | 163 | 68 | 32 | 235 | 4 | 12 | 1 | 1 | 17 | 74 | 557 | 631 |
| Total | 146 | 327 | 15 | 3 | 488 | 339 | 55 | 344 | 148 | 738 | 17 | 641 | 228 | 100 | 886 | 18 | 34 | 4 | 3 | 56 | 254 | 2168 | 2422 |
| 08:00 AM | 68 | 116 | 4 | 2 | 188 | 64 | 21 | 82 | 50 | 167 | 1 | 152 | 75 | 29 | 228 | 1 | 10 | 0 | 0 | 11 | 81 | 594 | 675 |
| 08:15 AM | 49 | 67 | 4 | 2 | 120 | 86 | 15 | 88 | 47 | 189 | 3 | 154 | 69 | 16 | 226 | 1 | 3 | 0 | 0 | 4 | 65 | 539 | 604 |
| 08:30 AM | 39 | 65 | 9 | 4 | 113 | 60 | 13 | 87 | 33 | 160 | 5 | 150 | 48 | 23 | 203 | 3 | 7 | 2 | 2 | 12 | 62 | 488 | 550 |
| 08:45 AM | 48 | 70 | 4 | 2 | 122 | 97 | 7 | 73 | 40 | 177 | 2 | 109 | 59 | 29 | 170 | 8 | 7 | 3 | 3 | 18 | 74 | 487 | 561 |
| Total | 204 | 318 | 21 | 10 | 543 | 307 | 56 | 330 | 170 | 693 | 11 | 565 | 251 | 97 | 827 | 13 | 27 | 5 | 5 | 45 | 282 | 2108 | 2390 |
| Grand Total | 350 | 645 | 36 | 13 | 1031 | 646 | 111 | 674 | 318 | 1431 | 28 | 1206 | 479 | 197 | 1713 | 31 | 61 | 9 | 8 | 101 | 536 | 4276 | 4812 |
| Apprch % | 33.9 | 62.6 | 3.5 | | | 45.1 | 7.8 | 47.1 | | | 1.6 | 70.4 | 28 | | | 30.7 | 60.4 | 8.9 | | | | | |
| Total % | 8.2 | 15.1 | 0.8 | | 24.1 | 15.1 | 2.6 | 15.8 | | 33.5 | 0.7 | 28.2 | 11.2 | | 40.1 | 0.7 | 1.4 | 0.2 | | 2.4 | 11.1 | 88.9 | |

| | Archibald Avenue Southbound | | | | Limonite Avenue Westbound | | | | Archibald Avenue Northbound | | | | Limonite Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:30 AM | | | | | | | | | | | | | | | | | |
| 07:30 AM | 47 | 105 | 4 | 156 | 82 | 14 | **96** | **192** | **6** | **168** | 55 | 229 | 3 | 3 | 0 | 6 | 583 |
| 07:45 AM | 38 | 81 | **5** | 124 | 78 | 12 | 91 | 181 | 4 | 163 | 68 | **235** | **4** | **12** | **1** | **17** | 557 |
| 08:00 AM | **68** | **116** | 4 | **188** | 64 | **21** | 82 | 167 | 1 | 152 | **75** | 228 | 1 | 10 | 0 | 11 | **594** |
| 08:15 AM | 49 | 67 | 4 | 120 | **86** | 15 | 88 | 189 | 3 | 154 | 69 | 226 | 1 | 3 | 0 | 4 | 539 |
| Total Volume | 202 | 369 | 17 | 588 | 310 | 62 | 357 | 729 | 14 | 637 | 267 | 918 | 9 | 28 | 1 | 38 | 2273 |
| % App. Total | 34.4 | 62.8 | 2.9 | | 42.5 | 8.5 | 49 | | 1.5 | 69.4 | 29.1 | | 23.7 | 73.7 | 2.6 | | |
| PHF | .743 | .795 | .850 | .782 | .901 | .738 | .930 | .949 | .583 | .948 | .890 | .977 | .563 | .583 | .250 | .559 | .957 |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Eastvale
N/S: Archibald Avenue
E/W: Limonite Avenue
Weather: Clear

File Name : 40_ESV_Arch_Lim AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

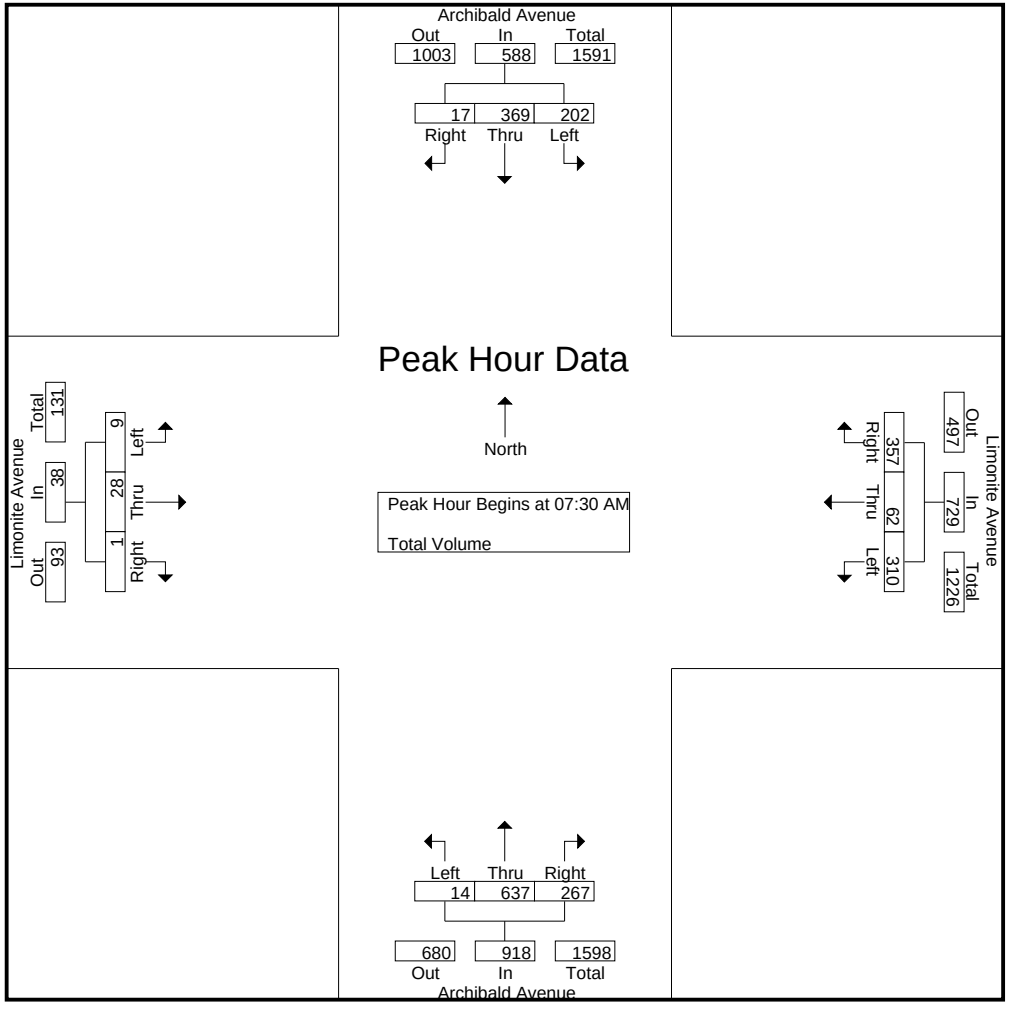

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City of Eastvale
N/S: Archibald Avenue
E/W: Limonite Avenue
Weather: Clear

File Name : 40_ESV_Arch_Lim AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Limonite Avenue Westbound | | | | Archibald Avenue Northbound | | | | Limonite Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:00 AM | | | | 07:30 AM | | | | 07:00 AM | | | | |
| +0 mins. | 47 | 105 | 4 | 156 | **98** | 12 | 75 | 185 | **6** | **168** | 55 | 229 | 5 | 11 | 1 | **17** | |
| +15 mins. | 38 | 81 | **5** | 124 | 81 | **17** | 82 | 180 | 4 | 163 | 68 | **235** | **6** | 8 | **2** | 16 | |
| +30 mins. | **68** | **116** | 4 | **188** | 82 | 14 | **96** | **192** | 1 | 152 | **75** | 228 | 3 | 3 | 0 | 6 | |
| +45 mins. | 49 | 67 | 4 | 120 | 78 | 12 | 91 | 181 | 3 | 154 | 69 | 226 | 4 | **12** | 1 | 17 | |
| Total Volume | 202 | 369 | 17 | 588 | 339 | 55 | 344 | 738 | 14 | 637 | 267 | 918 | 18 | 34 | 4 | 56 | |
| % App. Total | 34.4 | 62.8 | 2.9 | | 45.9 | 7.5 | 46.6 | | 1.5 | 69.4 | 29.1 | | 32.1 | 60.7 | 7.1 | | |
| PHF | .743 | .795 | .850 | .782 | .865 | .809 | .896 | .961 | .583 | .948 | .890 | .977 | .750 | .708 | .500 | .824 | |

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City of Eastvale
N/S: Archibald Avenue
E/W: Limonite Avenue
Weather: Clear

File Name : 40_ESV_Arch_Lim PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Archibald Avenue Southbound | | | | | Limonite Avenue Westbound | | | | | Archibald Avenue Northbound | | | | | Limonite Avenue Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 67 | 105 | 2 | 1 | 174 | 73 | 11 | 58 | 36 | 142 | 2 | 121 | 88 | 49 | 211 | 7 | 10 | 6 | 6 | 23 | 92 | 550 | 642 |
| 04:15 PM | 90 | 147 | 4 | 1 | 241 | 102 | 7 | 40 | 21 | 149 | 1 | 123 | 78 | 18 | 202 | 3 | 33 | 3 | 3 | 39 | 43 | 631 | 674 |
| 04:30 PM | 82 | 162 | 6 | 3 | 250 | 88 | 11 | 37 | 24 | 136 | 0 | 116 | 66 | 33 | 182 | 6 | 25 | 2 | 2 | 33 | 62 | 601 | 663 |
| 04:45 PM | 70 | 132 | 8 | 3 | 210 | 107 | 18 | 48 | 31 | 173 | 1 | 100 | 83 | 42 | 184 | 5 | 34 | 3 | 3 | 42 | 79 | 609 | 688 |
| Total | 309 | 546 | 20 | 8 | 875 | 370 | 47 | 183 | 112 | 600 | 4 | 460 | 315 | 142 | 779 | 21 | 102 | 14 | 14 | 137 | 276 | 2391 | 2667 |
| 05:00 PM | 87 | 151 | 7 | 2 | 245 | 77 | 6 | 51 | 28 | 134 | 0 | 110 | 78 | 45 | 188 | 7 | 9 | 7 | 5 | 23 | 80 | 590 | 670 |
| 05:15 PM | 98 | 157 | 10 | 2 | 265 | 92 | 12 | 39 | 29 | 143 | 2 | 114 | 78 | 38 | 194 | 5 | 31 | 10 | 6 | 46 | 75 | 648 | 723 |
| 05:30 PM | 113 | 123 | 4 | 3 | 240 | 100 | 9 | 42 | 26 | 151 | 1 | 109 | 75 | 43 | 185 | 10 | 16 | 10 | 7 | 36 | 79 | 612 | 691 |
| 05:45 PM | 89 | 150 | 6 | 1 | 245 | 88 | 8 | 38 | 27 | 134 | 4 | 87 | 86 | 31 | 177 | 8 | 23 | 1 | 0 | 32 | 59 | 588 | 647 |
| Total | 387 | 581 | 27 | 8 | 995 | 357 | 35 | 170 | 110 | 562 | 7 | 420 | 317 | 157 | 744 | 30 | 79 | 28 | 18 | 137 | 293 | 2438 | 2731 |
| Grand Total | 696 | 1127 | 47 | 16 | 1870 | 727 | 82 | 353 | 222 | 1162 | 11 | 880 | 632 | 299 | 1523 | 51 | 181 | 42 | 32 | 274 | 569 | 4829 | 5398 |
| Apprch % | 37.2 | 60.3 | 2.5 | | | 62.6 | 7.1 | 30.4 | | | 0.7 | 57.8 | 41.5 | | | 18.6 | 66.1 | 15.3 | | | | | |
| Total % | 14.4 | 23.3 | 1 | | 38.7 | 15.1 | 1.7 | 7.3 | | 24.1 | 0.2 | 18.2 | 13.1 | | 31.5 | 1.1 | 3.7 | 0.9 | | 5.7 | 10.5 | 89.5 | |

| | Archibald Avenue Southbound | | | | Limonite Avenue Westbound | | | | Archibald Avenue Northbound | | | | Limonite Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:45 PM | | | | | | | | | | | | | | | | | |
| 04:45 PM | 70 | 132 | 8 | 210 | **107** | **18** | 48 | **173** | 1 | 100 | **83** | 184 | 5 | **34** | 3 | 42 | 609 |
| 05:00 PM | 87 | 151 | 7 | 245 | 77 | 6 | **51** | 134 | 0 | 110 | 78 | 188 | 7 | 9 | 7 | 23 | 590 |
| 05:15 PM | 98 | **157** | **10** | **265** | 92 | 12 | 39 | 143 | **2** | **114** | 78 | **194** | 5 | 31 | **10** | **46** | **648** |
| 05:30 PM | **113** | 123 | 4 | 240 | 100 | 9 | 42 | 151 | 1 | 109 | 75 | 185 | **10** | 16 | 10 | 36 | 612 |
| Total Volume | 368 | 563 | 29 | 960 | 376 | 45 | 180 | 601 | 4 | 433 | 314 | 751 | 27 | 90 | 30 | 147 | 2459 |
| % App. Total | 38.3 | 58.6 | 3 | | 62.6 | 7.5 | 30 | | 0.5 | 57.7 | 41.8 | | 18.4 | 61.2 | 20.4 | | |
| PHF | .814 | .896 | .725 | .906 | .879 | .625 | .882 | .868 | .500 | .950 | .946 | .968 | .675 | .662 | .750 | .799 | .949 |

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City of Eastvale
N/S: Archibald Avenue
E/W: Limonite Avenue
Weather: Clear

File Name : 40_ESV_Arch_Lim PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

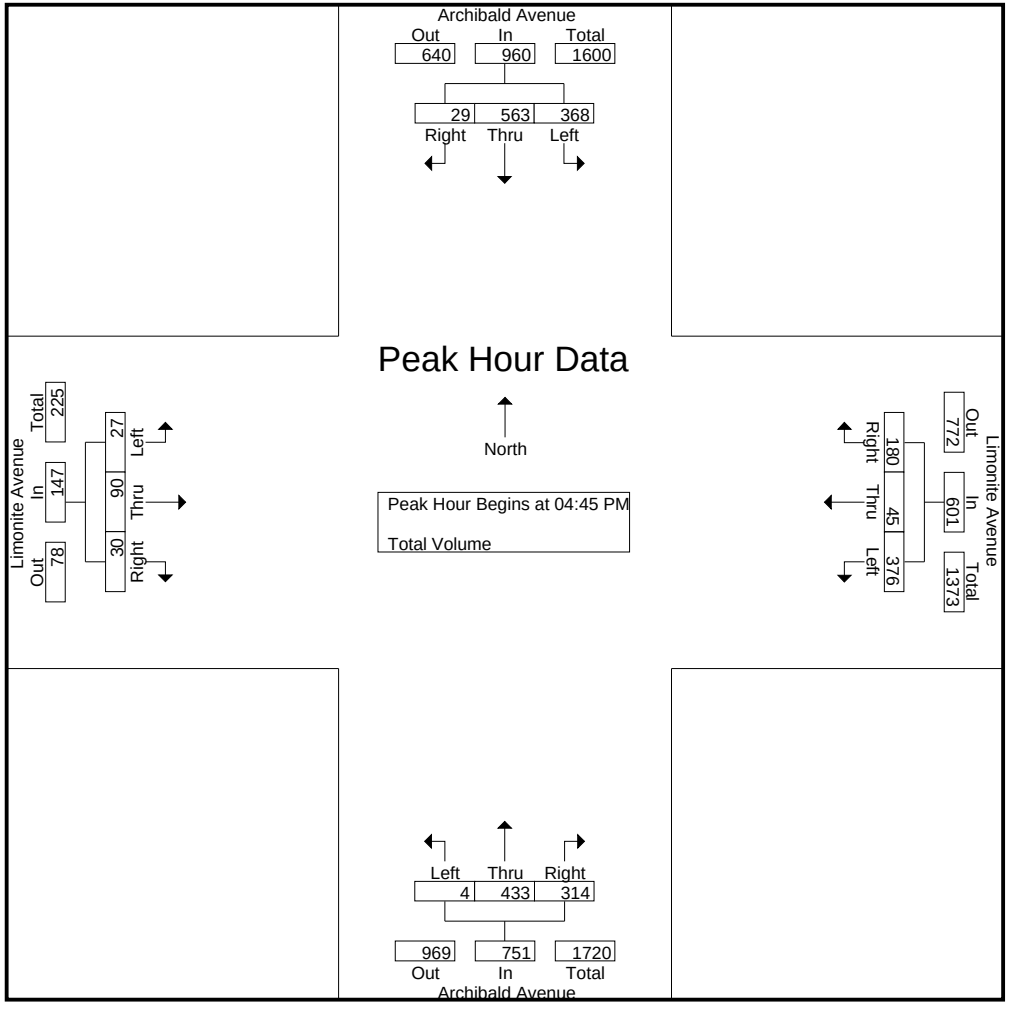

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City of Eastvale
N/S: Archibald Avenue
E/W: Limonite Avenue
Weather: Clear

File Name : 40_ESV_Arch_Lim PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Archibald Avenue Southbound | | | | Limonite Avenue Westbound | | | | Archibald Avenue Northbound | | | | Limonite Avenue Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 04:45 PM | | | | 04:00 PM | | | | 04:45 PM | | | | |
| +0 mins. | 87 | 151 | 7 | 245 | **107** | **18** | 48 | **173** | **2** | 121 | **88** | **211** | 5 | **34** | 3 | 42 | |
| +15 mins. | 98 | **157** | **10** | **265** | 77 | 6 | **51** | 134 | 1 | **123** | 78 | 202 | 7 | 9 | 7 | 23 | |
| +30 mins. | **113** | 123 | 4 | 240 | 92 | 12 | 39 | 143 | 0 | 116 | 66 | 182 | 5 | 31 | **10** | **46** | |
| +45 mins. | 89 | 150 | 6 | 245 | 100 | 9 | 42 | 151 | 1 | 100 | 83 | 184 | **10** | 16 | 10 | 36 | |
| Total Volume | 387 | 581 | 27 | 995 | 376 | 45 | 180 | 601 | 4 | 460 | 315 | 779 | 27 | 90 | 30 | 147 | |
| % App. Total | 38.9 | 58.4 | 2.7 | | 62.6 | 7.5 | 30 | | 0.5 | 59.1 | 40.4 | | 18.4 | 61.2 | 20.4 | | |
| PHF | .856 | .925 | .675 | .939 | .879 | .625 | .882 | .868 | .500 | .935 | .895 | .923 | .675 | .662 | .750 | .799 | |

Location: Eastvale
N/S: Archibald Avenue
E/W: Limonite Avenue

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Archibald Avenue | East Leg Limonite Avenue | South Leg Archibald Avenue | West Leg Limonite Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 1 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 1 | 1 | 0 | 0 | 2 |
| 8:30 AM | 1 | 1 | 0 | 0 | 2 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 2 | 2 | 0 | 1 | 5 |

| | North Leg Archibald Avenue | East Leg Limonite Avenue | South Leg Archibald Avenue | West Leg Limonite Avenue | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 1 | 1 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 1 | 0 | 0 | 1 | 2 |
| 5:00 PM | 1 | 0 | 0 | 0 | 1 |
| 5:15 PM | 1 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 1 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 4 | 0 | 0 | 2 | 6 |

Location: Eastvale
N/S: Archibald Avenue
E/W: Limonite Avenue

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Archibald Avenue | | | Westbound Limonite Avenue | | | Northbound Archibald Avenue | | | Eastbound Limonite Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Southbound Archibald Avenue | | | Westbound Limonite Avenue | | | Northbound Archibald Avenue | | | Eastbound Limonite Avenue | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |



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PO Box 1178
Corona, CA 92878
951-268-6268

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PO Box 1178
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(951) 268-6268

City of Ontario
N/S: Turner Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 41_ONT_Tur_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Turner Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Turner Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 7 | 2 | 7 | 4 | 16 | 2 | 130 | 2 | 1 | 134 | 3 | 8 | 14 | 7 | 25 | 3 | 75 | 0 | 0 | 78 | 12 | 253 | 265 |
| 07:15 AM | 9 | 2 | 7 | 5 | 18 | 11 | 149 | 7 | 2 | 167 | 13 | 14 | 13 | 6 | 40 | 5 | 60 | 2 | 1 | 67 | 14 | 292 | 306 |
| 07:30 AM | 11 | 6 | 10 | 4 | 27 | 4 | 102 | 21 | 15 | 127 | 6 | 28 | 13 | 4 | 47 | 25 | 81 | 2 | 0 | 108 | 23 | 309 | 332 |
| 07:45 AM | 22 | 20 | 11 | 6 | 53 | 7 | 116 | 12 | 3 | 135 | 6 | 23 | 10 | 3 | 39 | 15 | 60 | 2 | 0 | 77 | 12 | 304 | 316 |
| Total | 49 | 30 | 35 | 19 | 114 | 24 | 497 | 42 | 21 | 563 | 28 | 73 | 50 | 20 | 151 | 48 | 276 | 6 | 1 | 330 | 61 | 1158 | 1219 |
| 08:00 AM | 13 | 17 | 11 | 7 | 41 | 6 | 120 | 5 | 1 | 131 | 7 | 16 | 16 | 10 | 39 | 6 | 110 | 3 | 1 | 119 | 19 | 330 | 349 |
| 08:15 AM | 14 | 7 | 6 | 5 | 27 | 8 | 96 | 7 | 1 | 111 | 3 | 13 | 12 | 4 | 28 | 6 | 58 | 3 | 1 | 67 | 11 | 233 | 244 |
| 08:30 AM | 6 | 5 | 3 | 1 | 14 | 10 | 109 | 8 | 5 | 127 | 4 | 5 | 7 | 3 | 16 | 3 | 61 | 4 | 1 | 68 | 10 | 225 | 235 |
| 08:45 AM | 2 | 4 | 5 | 2 | 11 | 6 | 117 | 3 | 2 | 126 | 4 | 4 | 3 | 3 | 11 | 3 | 85 | 7 | 4 | 95 | 11 | 243 | 254 |
| Total | 35 | 33 | 25 | 15 | 93 | 30 | 442 | 23 | 9 | 495 | 18 | 38 | 38 | 20 | 94 | 18 | 314 | 17 | 7 | 349 | 51 | 1031 | 1082 |
| Grand Total | 84 | 63 | 60 | 34 | 207 | 54 | 939 | 65 | 30 | 1058 | 46 | 111 | 88 | 40 | 245 | 66 | 590 | 23 | 8 | 679 | 112 | 2189 | 2301 |
| Apprch % | 40.6 | 30.4 | 29 | | | 5.1 | 88.8 | 6.1 | | | 18.8 | 45.3 | 35.9 | | | 9.7 | 86.9 | 3.4 | | | | | |
| Total % | 3.8 | 2.9 | 2.7 | | 9.5 | 2.5 | 42.9 | 3 | | 48.3 | 2.1 | 5.1 | 4 | | 11.2 | 3 | 27 | 1.1 | | 31 | 4.9 | 95.1 | |

| | Turner Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Turner Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 9 | 2 | 7 | 18 | **11** | **149** | 7 | **167** | **13** | 14 | 13 | 40 | 5 | 60 | 2 | 67 | 292 |
| 07:30 AM | 11 | 6 | 10 | 27 | 4 | 102 | **21** | 127 | 6 | **28** | 13 | **47** | **25** | 81 | 2 | 108 | 309 |
| 07:45 AM | **22** | **20** | **11** | **53** | 7 | 116 | 12 | 135 | 6 | 23 | 10 | 39 | 15 | 60 | 2 | 77 | 304 |
| 08:00 AM | 13 | 17 | 11 | 41 | 6 | 120 | 5 | 131 | 7 | 16 | **16** | 39 | 6 | **110** | **3** | **119** | **330** |
| Total Volume | 55 | 45 | 39 | 139 | 28 | 487 | 45 | 560 | 32 | 81 | 52 | 165 | 51 | 311 | 9 | 371 | 1235 |
| % App. Total | 39.6 | 32.4 | 28.1 | | 5 | 87 | 8 | | 19.4 | 49.1 | 31.5 | | 13.7 | 83.8 | 2.4 | | |
| PHF | .625 | .563 | .886 | .656 | .636 | .817 | .536 | .838 | .615 | .723 | .813 | .878 | .510 | .707 | .750 | .779 | .936 |

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City of Ontario
N/S: Turner Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 41_ONT_Tur_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

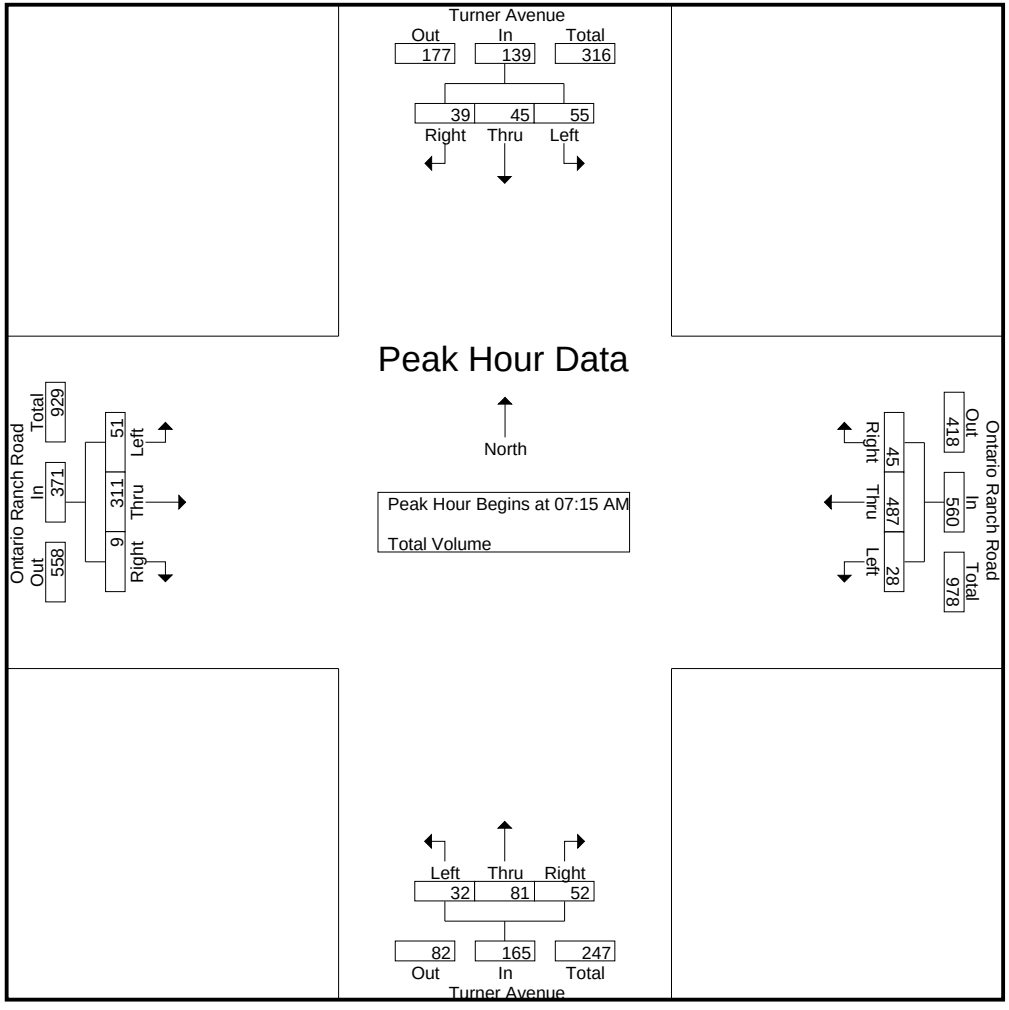

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City of Ontario
N/S: Turner Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 41_ONT_Tur_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Turner Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Turner Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:30 AM | | | | 07:00 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 11 | 6 | 10 | 27 | 2 | 130 | 2 | 134 | **13** | 14 | 13 | 40 | 5 | 60 | 2 | 67 | |
| +15 mins. | **22** | **20** | **11** | **53** | **11** | **149** | 7 | **167** | 6 | **28** | 13 | **47** | **25** | 81 | 2 | 108 | |
| +30 mins. | 13 | 17 | 11 | 41 | 4 | 102 | **21** | 127 | 6 | 23 | 10 | 39 | 15 | 60 | 2 | 77 | |
| +45 mins. | 14 | 7 | 6 | 27 | 7 | 116 | 12 | 135 | 7 | 16 | **16** | 39 | 6 | **110** | **3** | **119** | |
| Total Volume | 60 | 50 | 38 | 148 | 24 | 497 | 42 | 563 | 32 | 81 | 52 | 165 | 51 | 311 | 9 | 371 | |
| % App. Total | 40.5 | 33.8 | 25.7 | | 4.3 | 88.3 | 7.5 | | 19.4 | 49.1 | 31.5 | | 13.7 | 83.8 | 2.4 | | |
| PHF | .682 | .625 | .864 | .698 | .545 | .834 | .500 | .843 | .615 | .723 | .813 | .878 | .510 | .707 | .750 | .779 | |

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City of Ontario
N/S: Turner Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 41_ONT_Tur_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Turner Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Turner Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 15 | 6 | 5 | 4 | 26 | 14 | 88 | 6 | 5 | 108 | 3 | 2 | 5 | 5 | 10 | 6 | 125 | 5 | 3 | 136 | 17 | 280 | 297 |
| 04:15 PM | 8 | 3 | 10 | 7 | 21 | 15 | 109 | 6 | 2 | 130 | 4 | 7 | 10 | 7 | 21 | 12 | 141 | 8 | 1 | 161 | 17 | 333 | 350 |
| 04:30 PM | 14 | 5 | 1 | 0 | 20 | 14 | 146 | 5 | 3 | 165 | 3 | 1 | 11 | 6 | 15 | 3 | 128 | 6 | 3 | 137 | 12 | 337 | 349 |
| 04:45 PM | 15 | 10 | 6 | 2 | 31 | 10 | 103 | 18 | 4 | 131 | 0 | 7 | 11 | 5 | 18 | 4 | 149 | 7 | 2 | 160 | 13 | 340 | 353 |
| Total | 52 | 24 | 22 | 13 | 98 | 53 | 446 | 35 | 14 | 534 | 10 | 17 | 37 | 23 | 64 | 25 | 543 | 26 | 9 | 594 | 59 | 1290 | 1349 |
| 05:00 PM | 10 | 9 | 6 | 2 | 25 | 13 | 120 | 11 | 3 | 144 | 1 | 6 | 9 | 6 | 16 | 8 | 127 | 5 | 1 | 140 | 12 | 325 | 337 |
| 05:15 PM | 17 | 8 | 6 | 4 | 31 | 13 | 135 | 12 | 7 | 160 | 5 | 1 | 12 | 10 | 18 | 7 | 145 | 10 | 1 | 162 | 22 | 371 | 393 |
| 05:30 PM | 24 | 7 | 7 | 3 | 38 | 13 | 127 | 12 | 7 | 152 | 3 | 7 | 12 | 7 | 22 | 6 | 116 | 5 | 2 | 127 | 19 | 339 | 358 |
| 05:45 PM | 25 | 9 | 6 | 2 | 40 | 14 | 129 | 9 | 6 | 152 | 0 | 6 | 14 | 7 | 20 | 8 | 132 | 3 | 0 | 143 | 15 | 355 | 370 |
| Total | 76 | 33 | 25 | 11 | 134 | 53 | 511 | 44 | 23 | 608 | 9 | 20 | 47 | 30 | 76 | 29 | 520 | 23 | 4 | 572 | 68 | 1390 | 1458 |
| Grand Total | 128 | 57 | 47 | 24 | 232 | 106 | 957 | 79 | 37 | 1142 | 19 | 37 | 84 | 53 | 140 | 54 | 1063 | 49 | 13 | 1166 | 127 | 2680 | 2807 |
| Apprch % | 55.2 | 24.6 | 20.3 | | | 9.3 | 83.8 | 6.9 | | | 13.6 | 26.4 | 60 | | | 4.6 | 91.2 | 4.2 | | | | | |
| Total % | 4.8 | 2.1 | 1.8 | | 8.7 | 4 | 35.7 | 2.9 | | 42.6 | 0.7 | 1.4 | 3.1 | | 5.2 | 2 | 39.7 | 1.8 | | 43.5 | 4.5 | 95.5 | |

| | Turner Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Turner Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | 10 | **9** | 6 | 25 | 13 | 120 | 11 | 144 | 1 | 6 | 9 | 16 | **8** | 127 | 5 | 140 | 325 |
| 05:15 PM | 17 | 8 | 6 | 31 | 13 | **135** | **12** | **160** | **5** | 1 | 12 | 18 | 7 | **145** | **10** | **162** | **371** |
| 05:30 PM | 24 | 7 | **7** | 38 | 13 | 127 | 12 | 152 | 3 | **7** | 12 | **22** | 6 | 116 | 5 | 127 | 339 |
| 05:45 PM | **25** | 9 | 6 | **40** | **14** | 129 | 9 | 152 | 0 | 6 | **14** | 20 | 8 | 132 | 3 | 143 | 355 |
| Total Volume | 76 | 33 | 25 | 134 | 53 | 511 | 44 | 608 | 9 | 20 | 47 | 76 | 29 | 520 | 23 | 572 | 1390 |
| % App. Total | 56.7 | 24.6 | 18.7 | | 8.7 | 84 | 7.2 | | 11.8 | 26.3 | 61.8 | | 5.1 | 90.9 | 4 | | |
| PHF | .760 | .917 | .893 | .838 | .946 | .946 | .917 | .950 | .450 | .714 | .839 | .864 | .906 | .897 | .575 | .883 | .937 |

Counts Unlimited, Inc.
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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: Turner Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 41_ONT_Tur_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

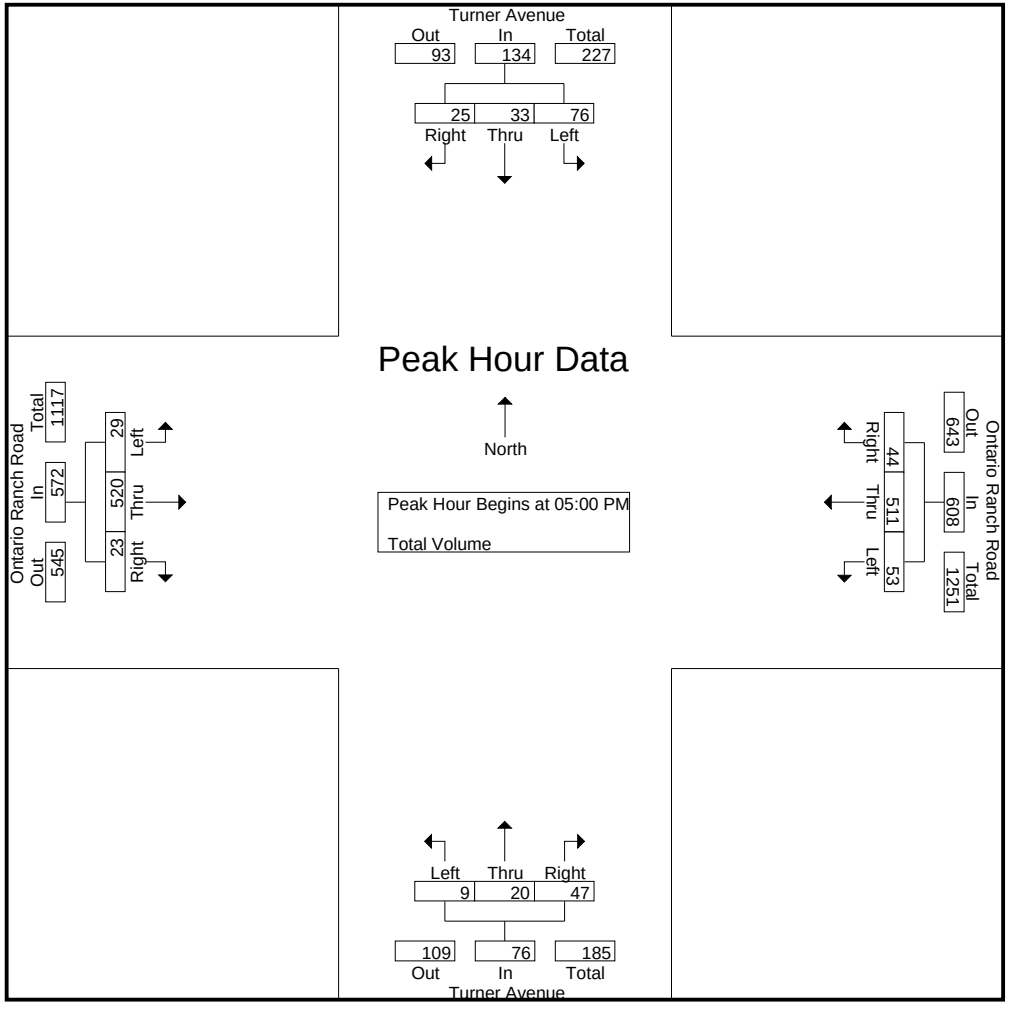

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City of Ontario
N/S: Turner Avenue
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Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Turner Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Turner Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 05:00 PM | | | | 04:30 PM | | | | |
| +0 mins. | 10 | **9** | 6 | 25 | 13 | 120 | 11 | 144 | 1 | 6 | 9 | 16 | 3 | 128 | 6 | 137 | |
| +15 mins. | 17 | 8 | 6 | 31 | 13 | **135** | **12** | **160** | **5** | 1 | 12 | 18 | 4 | **149** | 7 | 160 | |
| +30 mins. | 24 | 7 | **7** | 38 | 13 | 127 | 12 | 152 | 3 | **7** | 12 | **22** | **8** | 127 | 5 | 140 | |
| +45 mins. | **25** | 9 | 6 | **40** | **14** | 129 | 9 | 152 | 0 | 6 | **14** | 20 | 7 | 145 | **10** | **162** | |
| Total Volume | 76 | 33 | 25 | 134 | 53 | 511 | 44 | 608 | 9 | 20 | 47 | 76 | 22 | 549 | 28 | 599 | |
| % App. Total | 56.7 | 24.6 | 18.7 | | 8.7 | 84 | 7.2 | | 11.8 | 26.3 | 61.8 | | 3.7 | 91.7 | 4.7 | | |
| PHF | .760 | .917 | .893 | .838 | .946 | .946 | .917 | .950 | .450 | .714 | .839 | .864 | .688 | .921 | .700 | .924 | |

Location: Ontario
N/S: Turner Avenue
E/W: Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Turner Avenue | East Leg<br>Ontario Ranch Road | South Leg<br>Turner Avenue | West Leg<br>Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 1 | 0 | 0 | 1 |
| 7:15 AM | 1 | 4 | 0 | 0 | 5 |
| 7:30 AM | 0 | 1 | 0 | 0 | 1 |
| 7:45 AM | 0 | 2 | 0 | 0 | 2 |
| 8:00 AM | 0 | 1 | 0 | 0 | 1 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 2 | 0 | 0 | 2 |
| 8:45 AM | 3 | 0 | 0 | 0 | 3 |
| TOTAL VOLUMES: | 4 | 11 | 0 | 0 | 15 |

| | North Leg<br>Turner Avenue | East Leg<br>Ontario Ranch Road | South Leg<br>Turner Avenue | West Leg<br>Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 2 | 0 | 0 | 2 |
| 4:15 PM | 0 | 0 | 0 | 1 | 1 |
| 4:30 PM | 0 | 2 | 0 | 1 | 3 |
| 4:45 PM | 0 | 1 | 1 | 0 | 2 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 2 | 0 | 0 | 2 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 7 | 1 | 2 | 10 |



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Location: Ontario
N/S: Turner Avenue
E/W: Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Turner Avenue | | | Westbound Ontario Ranch Road | | | Northbound Turner Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 7 |

| | Southbound Turner Avenue | | | Westbound Ontario Ranch Road | | | Northbound Turner Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 4:30 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 4 |

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City of Ontario
N/S: Haven Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 42_ONT_Haven_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Haven Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Haven Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 32 | 26 | 10 | 2 | 68 | 31 | 115 | 54 | 28 | 200 | 9 | 71 | 14 | 11 | 94 | 37 | 90 | 7 | 5 | 134 | 46 | 496 | 542 |
| 07:15 AM | 34 | 55 | 9 | 2 | 98 | 30 | 124 | 62 | 25 | 216 | 13 | 88 | 20 | 13 | 121 | 18 | 64 | 10 | 8 | 92 | 48 | 527 | 575 |
| 07:30 AM | 33 | 56 | 6 | 5 | 95 | 32 | 92 | 57 | 28 | 181 | 16 | 93 | 21 | 11 | 130 | 22 | 72 | 19 | 14 | 113 | 58 | 519 | 577 |
| 07:45 AM | 45 | 53 | 17 | 4 | 115 | 33 | 101 | 53 | 32 | 187 | 17 | 81 | 33 | 23 | 131 | 25 | 82 | 19 | 12 | 126 | 71 | 559 | 630 |
| Total | 144 | 190 | 42 | 13 | 376 | 126 | 432 | 226 | 113 | 784 | 55 | 333 | 88 | 58 | 476 | 102 | 308 | 55 | 39 | 465 | 223 | 2101 | 2324 |
| 08:00 AM | 57 | 70 | 9 | 3 | 136 | 25 | 97 | 48 | 25 | 170 | 15 | 87 | 22 | 18 | 124 | 41 | 101 | 10 | 7 | 152 | 53 | 582 | 635 |
| 08:15 AM | 36 | 42 | 7 | 4 | 85 | 24 | 90 | 39 | 28 | 153 | 7 | 56 | 16 | 13 | 79 | 24 | 71 | 8 | 2 | 103 | 47 | 420 | 467 |
| 08:30 AM | 36 | 43 | 11 | 3 | 90 | 37 | 105 | 39 | 26 | 181 | 9 | 58 | 23 | 18 | 90 | 19 | 65 | 5 | 4 | 89 | 51 | 450 | 501 |
| 08:45 AM | 32 | 42 | 7 | 1 | 81 | 28 | 111 | 33 | 13 | 172 | 6 | 49 | 10 | 7 | 65 | 27 | 74 | 12 | 3 | 113 | 24 | 431 | 455 |
| Total | 161 | 197 | 34 | 11 | 392 | 114 | 403 | 159 | 92 | 676 | 37 | 250 | 71 | 56 | 358 | 111 | 311 | 35 | 16 | 457 | 175 | 1883 | 2058 |
| Grand Total | 305 | 387 | 76 | 24 | 768 | 240 | 835 | 385 | 205 | 1460 | 92 | 583 | 159 | 114 | 834 | 213 | 619 | 90 | 55 | 922 | 398 | 3984 | 4382 |
| Apprch % | 39.7 | 50.4 | 9.9 | | | 16.4 | 57.2 | 26.4 | | | 11 | 69.9 | 19.1 | | | 23.1 | 67.1 | 9.8 | | | | | |
| Total % | 7.7 | 9.7 | 1.9 | | 19.3 | 6 | 21 | 9.7 | | 36.6 | 2.3 | 14.6 | 4 | | 20.9 | 5.3 | 15.5 | 2.3 | | 23.1 | 9.1 | 90.9 | |

| | Haven Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Haven Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | 34 | 55 | 9 | 98 | 30 | **124** | **62** | **216** | 13 | 88 | 20 | 121 | 18 | 64 | 10 | 92 | 527 |
| 07:30 AM | 33 | 56 | 6 | 95 | 32 | 92 | 57 | 181 | 16 | **93** | 21 | 130 | 22 | 72 | **19** | 113 | 519 |
| 07:45 AM | 45 | 53 | **17** | 115 | **33** | 101 | 53 | 187 | **17** | 81 | **33** | **131** | 25 | 82 | 19 | 126 | 559 |
| 08:00 AM | **57** | **70** | 9 | **136** | 25 | 97 | 48 | 170 | 15 | 87 | 22 | 124 | **41** | **101** | 10 | **152** | **582** |
| Total Volume | 169 | 234 | 41 | 444 | 120 | 414 | 220 | 754 | 61 | 349 | 96 | 506 | 106 | 319 | 58 | 483 | 2187 |
| % App. Total | 38.1 | 52.7 | 9.2 | | 15.9 | 54.9 | 29.2 | | 12.1 | 69 | 19 | | 21.9 | 66 | 12 | | |
| PHF | .741 | .836 | .603 | .816 | .909 | .835 | .887 | .873 | .897 | .938 | .727 | .966 | .646 | .790 | .763 | .794 | .939 |

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File Name : 42_ONT_Haven_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

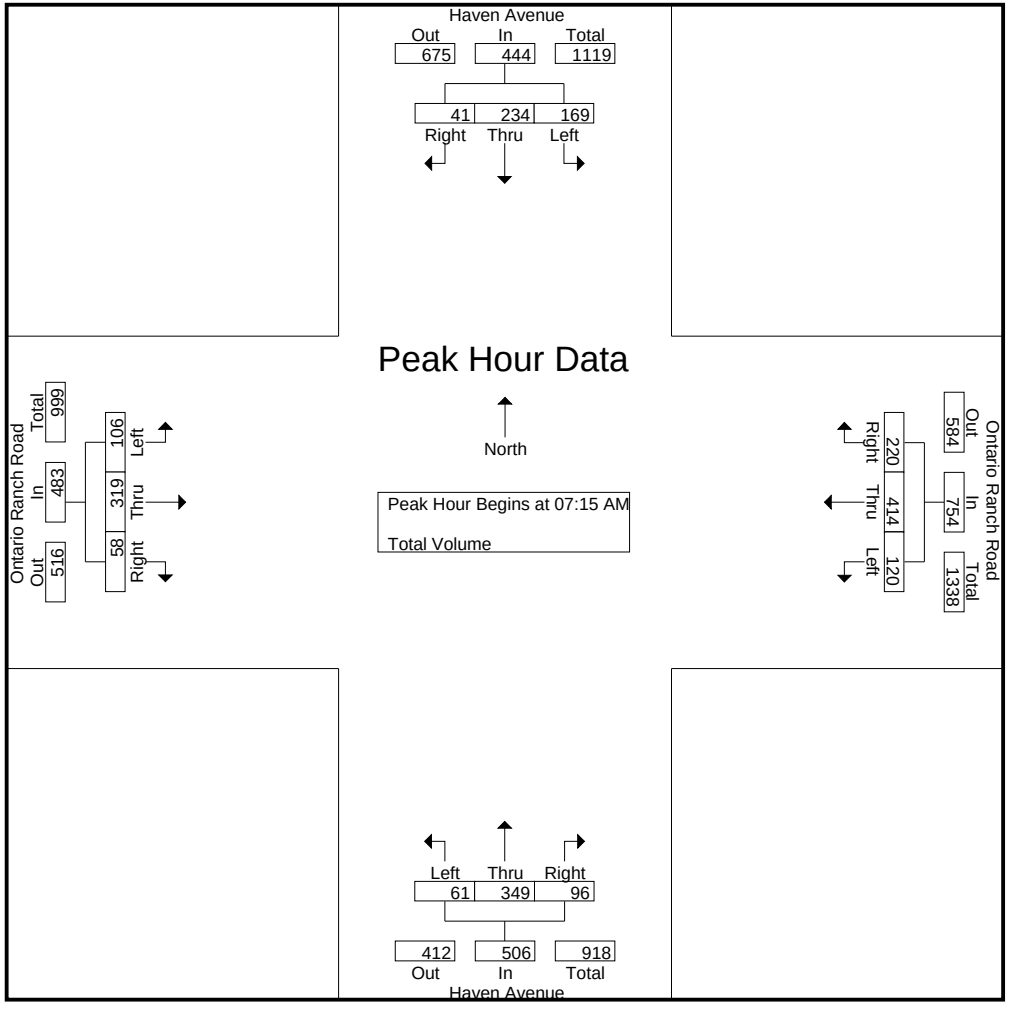

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City of Ontario
N/S: Haven Avenue
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File Name : 42_ONT_Haven_OntRa AMR
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| | Haven Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Haven Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:15 AM | | | | 07:00 AM | | | | 07:15 AM | | | | 07:30 AM | | | | |
| +0 mins. | 34 | 55 | 9 | 98 | 31 | 115 | 54 | 200 | 13 | 88 | 20 | 121 | 22 | 72 | **19** | 113 | |
| +15 mins. | 33 | 56 | 6 | 95 | 30 | **124** | **62** | **216** | 16 | **93** | 21 | 130 | 25 | 82 | 19 | 126 | |
| +30 mins. | 45 | 53 | **17** | 115 | 32 | 92 | 57 | 181 | **17** | 81 | **33** | **131** | **41** | **101** | 10 | **152** | |
| +45 mins. | **57** | **70** | 9 | **136** | **33** | 101 | 53 | 187 | 15 | 87 | 22 | 124 | 24 | 71 | 8 | 103 | |
| Total Volume | 169 | 234 | 41 | 444 | 126 | 432 | 226 | 784 | 61 | 349 | 96 | 506 | 112 | 326 | 56 | 494 | |
| % App. Total | 38.1 | 52.7 | 9.2 | | 16.1 | 55.1 | 28.8 | | 12.1 | 69 | 19 | | 22.7 | 66 | 11.3 | | |
| PHF | .741 | .836 | .603 | .816 | .955 | .871 | .911 | .907 | .897 | .938 | .727 | .966 | .683 | .807 | .737 | .813 | |

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Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Haven Avenue Southbound | | | | | Ontario Ranch Road Westbound | | | | | Haven Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 68 | 91 | 9 | 1 | 168 | 53 | 85 | 61 | 34 | 199 | 8 | 42 | 11 | 7 | 61 | 39 | 119 | 7 | 3 | 165 | 45 | 593 | 638 |
| 04:15 PM | 45 | 92 | 12 | 5 | 149 | 64 | 120 | 65 | 23 | 249 | 3 | 56 | 11 | 7 | 70 | 41 | 116 | 8 | 5 | 165 | 40 | 633 | 673 |
| 04:30 PM | 61 | 95 | 15 | 4 | 171 | 59 | 152 | 61 | 30 | 272 | 7 | 40 | 6 | 4 | 53 | 37 | 106 | 8 | 2 | 151 | 40 | 647 | 687 |
| 04:45 PM | 72 | 103 | 18 | 1 | 193 | 54 | 120 | 44 | 16 | 218 | 8 | 45 | 24 | 18 | 77 | 40 | 146 | 10 | 5 | 196 | 40 | 684 | 724 |
| Total | 246 | 381 | 54 | 11 | 681 | 230 | 477 | 231 | 103 | 938 | 26 | 183 | 52 | 36 | 261 | 157 | 487 | 33 | 15 | 677 | 165 | 2557 | 2722 |
| 05:00 PM | 44 | 87 | 6 | 2 | 137 | 60 | 139 | 58 | 23 | 257 | 6 | 42 | 16 | 14 | 64 | 37 | 133 | 6 | 4 | 176 | 43 | 634 | 677 |
| 05:15 PM | 50 | 87 | 19 | 7 | 156 | 53 | 147 | 62 | 29 | 262 | 6 | 43 | 23 | 19 | 72 | 48 | 130 | 8 | 5 | 186 | 60 | 676 | 736 |
| 05:30 PM | 55 | 84 | 12 | 3 | 151 | 63 | 131 | 56 | 40 | 250 | 6 | 30 | 21 | 16 | 57 | 39 | 107 | 15 | 12 | 161 | 71 | 619 | 690 |
| 05:45 PM | 56 | 96 | 20 | 7 | 172 | 52 | 145 | 50 | 30 | 247 | 5 | 34 | 26 | 17 | 65 | 28 | 129 | 12 | 5 | 169 | 59 | 653 | 712 |
| Total | 205 | 354 | 57 | 19 | 616 | 228 | 562 | 226 | 122 | 1016 | 23 | 149 | 86 | 66 | 258 | 152 | 499 | 41 | 26 | 692 | 233 | 2582 | 2815 |
| Grand Total | 451 | 735 | 111 | 30 | 1297 | 458 | 1039 | 457 | 225 | 1954 | 49 | 332 | 138 | 102 | 519 | 309 | 986 | 74 | 41 | 1369 | 398 | 5139 | 5537 |
| Apprch % | 34.8 | 56.7 | 8.6 | | | 23.4 | 53.2 | 23.4 | | | 9.4 | 64 | 26.6 | | | 22.6 | 72 | 5.4 | | | | | |
| Total % | 8.8 | 14.3 | 2.2 | | 25.2 | 8.9 | 20.2 | 8.9 | | 38 | 1 | 6.5 | 2.7 | | 10.1 | 6 | 19.2 | 1.4 | | 26.6 | 7.2 | 92.8 | |

| | Haven Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Haven Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:30 PM | | | | | | | | | | | | | | | | | |
| 04:30 PM | 61 | 95 | 15 | 171 | 59 | **152** | 61 | **272** | 7 | 40 | 6 | 53 | 37 | 106 | 8 | 151 | 647 |
| 04:45 PM | **72** | **103** | 18 | **193** | 54 | 120 | 44 | 218 | **8** | **45** | **24** | **77** | 40 | **146** | **10** | **196** | **684** |
| 05:00 PM | 44 | 87 | 6 | 137 | **60** | 139 | 58 | 257 | 6 | 42 | 16 | 64 | 37 | 133 | 6 | 176 | 634 |
| 05:15 PM | 50 | 87 | **19** | 156 | 53 | 147 | **62** | 262 | 6 | 43 | 23 | 72 | **48** | 130 | 8 | 186 | 676 |
| Total Volume | 227 | 372 | 58 | 657 | 226 | 558 | 225 | 1009 | 27 | 170 | 69 | 266 | 162 | 515 | 32 | 709 | 2641 |
| % App. Total | 34.6 | 56.6 | 8.8 | | 22.4 | 55.3 | 22.3 | | 10.2 | 63.9 | 25.9 | | 22.8 | 72.6 | 4.5 | | |
| PHF | .788 | .903 | .763 | .851 | .942 | .918 | .907 | .927 | .844 | .944 | .719 | .864 | .844 | .882 | .800 | .904 | .965 |

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Site Code : 05124953
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Page No : 2

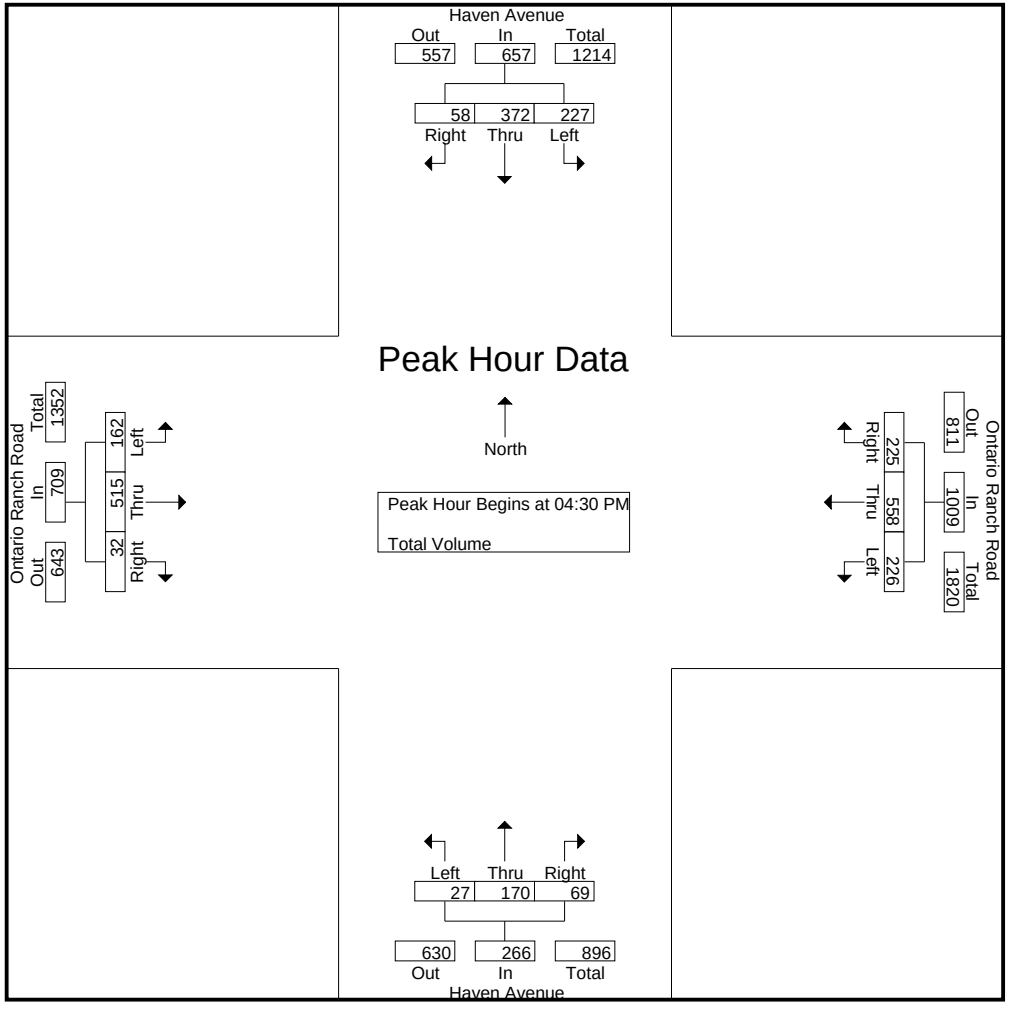

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City of Ontario
N/S: Haven Avenue
E/W: Ontario Ranch Road
Weather: Clear

File Name : 42_ONT_Haven_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Haven Avenue Southbound | | | | Ontario Ranch Road Westbound | | | | Haven Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 04:00 PM | | | | 05:00 PM | | | | 04:45 PM | | | | 04:45 PM | | | | |
| +0 mins. | 68 | 91 | 9 | 168 | 60 | 139 | 58 | 257 | **8** | **45** | **24** | **77** | 40 | **146** | 10 | **196** | |
| +15 mins. | 45 | 92 | 12 | 149 | 53 | **147** | **62** | **262** | 6 | 42 | 16 | 64 | 37 | 133 | 6 | 176 | |
| +30 mins. | 61 | 95 | 15 | 171 | **63** | 131 | 56 | 250 | 6 | 43 | 23 | 72 | **48** | 130 | 8 | 186 | |
| +45 mins. | **72** | **103** | **18** | **193** | 52 | 145 | 50 | 247 | 6 | 30 | 21 | 57 | 39 | 107 | **15** | 161 | |
| Total Volume | 246 | 381 | 54 | 681 | 228 | 562 | 226 | 1016 | 26 | 160 | 84 | 270 | 164 | 516 | 39 | 719 | |
| % App. Total | 36.1 | 55.9 | 7.9 | | 22.4 | 55.3 | 22.2 | | 9.6 | 59.3 | 31.1 | | 22.8 | 71.8 | 5.4 | | |
| PHF | .854 | .925 | .750 | .882 | .905 | .956 | .911 | .969 | .813 | .889 | .875 | .877 | .854 | .884 | .650 | .917 | |

Location: Ontario
N/S: Haven Avenue
E/W: Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg Haven Avenue | East Leg Ontario Ranch Road | South Leg Haven Avenue | West Leg Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 1 | 1 |
| 7:15 AM | 1 | 0 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 1 | 0 | 1 | 0 | 2 |
| 8:00 AM | 1 | 1 | 0 | 0 | 2 |
| 8:15 AM | 0 | 1 | 0 | 0 | 1 |
| 8:30 AM | 1 | 0 | 0 | 2 | 3 |
| 8:45 AM | 1 | 0 | 0 | 2 | 3 |
| TOTAL VOLUMES: | 5 | 2 | 1 | 5 | 13 |

| | North Leg Haven Avenue | East Leg Ontario Ranch Road | South Leg Haven Avenue | West Leg Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 2 | 2 |
| 4:45 PM | 2 | 0 | 0 | 2 | 4 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 2 | 4 | 5 | 1 | 12 |
| 5:30 PM | 0 | 0 | 0 | 2 | 2 |
| 5:45 PM | 0 | 0 | 0 | 1 | 1 |
| TOTAL VOLUMES: | 4 | 4 | 5 | 8 | 21 |



Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
951-268-6268

Location: Ontario
N/S: Haven Avenue
E/W: Ontario Ranch Road

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Haven Avenue | | | Westbound Ontario Ranch Road | | | Northbound Haven Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |

| | Southbound Haven Avenue | | | Westbound Ontario Ranch Road | | | Northbound Haven Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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951-268-6268

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City of Ontario
N/S: Hamner Avenue
E/W: Ontario Ranch Rd/Cantu-Galleano Rch
Weather: Clear

File Name : 43_ONT_Ham_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Hamner Avenue Southbound | | | | | Cantu-Galleano Ranch Road Westbound | | | | | Hamner Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 29 | 30 | 12 | 3 | 71 | 50 | 134 | 30 | 17 | 214 | 32 | 101 | 70 | 50 | 203 | 15 | 102 | 25 | 13 | 142 | 83 | 630 | 713 |
| 07:15 AM | 23 | 26 | 6 | 1 | 55 | 38 | 168 | 37 | 23 | 243 | 30 | 108 | 76 | 51 | 214 | 15 | 129 | 19 | 13 | 163 | 88 | 675 | 763 |
| 07:30 AM | 15 | 23 | 8 | 4 | 46 | 42 | 110 | 36 | 25 | 188 | 18 | 150 | 93 | 61 | 261 | 28 | 90 | 20 | 12 | 138 | 102 | 633 | 735 |
| 07:45 AM | 22 | 48 | 13 | 4 | 83 | 48 | 107 | 66 | 34 | 221 | 36 | 111 | 89 | 60 | 236 | 33 | 104 | 17 | 11 | 154 | 109 | 694 | 803 |
| Total | 89 | 127 | 39 | 12 | 255 | 178 | 519 | 169 | 99 | 866 | 116 | 470 | 328 | 222 | 914 | 91 | 425 | 81 | 49 | 597 | 382 | 2632 | 3014 |
| 08:00 AM | 19 | 49 | 14 | 3 | 82 | 52 | 91 | 45 | 29 | 188 | 50 | 104 | 93 | 52 | 247 | 30 | 125 | 38 | 16 | 193 | 100 | 710 | 810 |
| 08:15 AM | 22 | 44 | 18 | 1 | 84 | 64 | 106 | 38 | 31 | 208 | 27 | 99 | 67 | 36 | 193 | 25 | 86 | 30 | 16 | 141 | 84 | 626 | 710 |
| 08:30 AM | 23 | 51 | 24 | 3 | 98 | 34 | 111 | 47 | 28 | 192 | 44 | 85 | 78 | 47 | 207 | 20 | 97 | 28 | 19 | 145 | 97 | 642 | 739 |
| 08:45 AM | 11 | 39 | 14 | 4 | 64 | 45 | 106 | 32 | 19 | 183 | 38 | 77 | 59 | 37 | 174 | 23 | 84 | 33 | 24 | 140 | 84 | 561 | 645 |
| Total | 75 | 183 | 70 | 11 | 328 | 195 | 414 | 162 | 107 | 771 | 159 | 365 | 297 | 172 | 821 | 98 | 392 | 129 | 75 | 619 | 365 | 2539 | 2904 |
| Grand Total | 164 | 310 | 109 | 23 | 583 | 373 | 933 | 331 | 206 | 1637 | 275 | 835 | 625 | 394 | 1735 | 189 | 817 | 210 | 124 | 1216 | 747 | 5171 | 5918 |
| Apprch % | 28.1 | 53.2 | 18.7 | | | 22.8 | 57 | 20.2 | | | 15.9 | 48.1 | 36 | | | 15.5 | 67.2 | 17.3 | | | | | |
| Total % | 3.2 | 6 | 2.1 | | 11.3 | 7.2 | 18 | 6.4 | | 31.7 | 5.3 | 16.1 | 12.1 | | 33.6 | 3.7 | 15.8 | 4.1 | | 23.5 | 12.6 | 87.4 | |

| | Hamner Avenue Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Hamner Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | |
| 07:15 AM | **23** | 26 | 6 | 55 | 38 | **168** | 37 | **243** | 30 | 108 | 76 | 214 | 15 | **129** | 19 | 163 | 675 |
| 07:30 AM | 15 | 23 | 8 | 46 | 42 | 110 | 36 | 188 | 18 | **150** | **93** | **261** | 28 | 90 | 20 | 138 | 633 |
| 07:45 AM | 22 | 48 | 13 | **83** | 48 | 107 | **66** | 221 | 36 | 111 | 89 | 236 | **33** | 104 | 17 | 154 | 694 |
| 08:00 AM | 19 | **49** | **14** | 82 | **52** | 91 | 45 | 188 | **50** | 104 | 93 | 247 | 30 | 125 | **38** | **193** | **710** |
| Total Volume | 79 | 146 | 41 | 266 | 180 | 476 | 184 | 840 | 134 | 473 | 351 | 958 | 106 | 448 | 94 | 648 | 2712 |
| % App. Total | 29.7 | 54.9 | 15.4 | | 21.4 | 56.7 | 21.9 | | 14 | 49.4 | 36.6 | | 16.4 | 69.1 | 14.5 | | |
| PHF | .859 | .745 | .732 | .801 | .865 | .708 | .697 | .864 | .670 | .788 | .944 | .918 | .803 | .868 | .618 | .839 | .955 |

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City of Ontario
N/S: Hamner Avenue
E/W: Ontario Ranch Rd/Cantu-Galleano Rch
Weather: Clear

File Name : 43_ONT_Ham_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

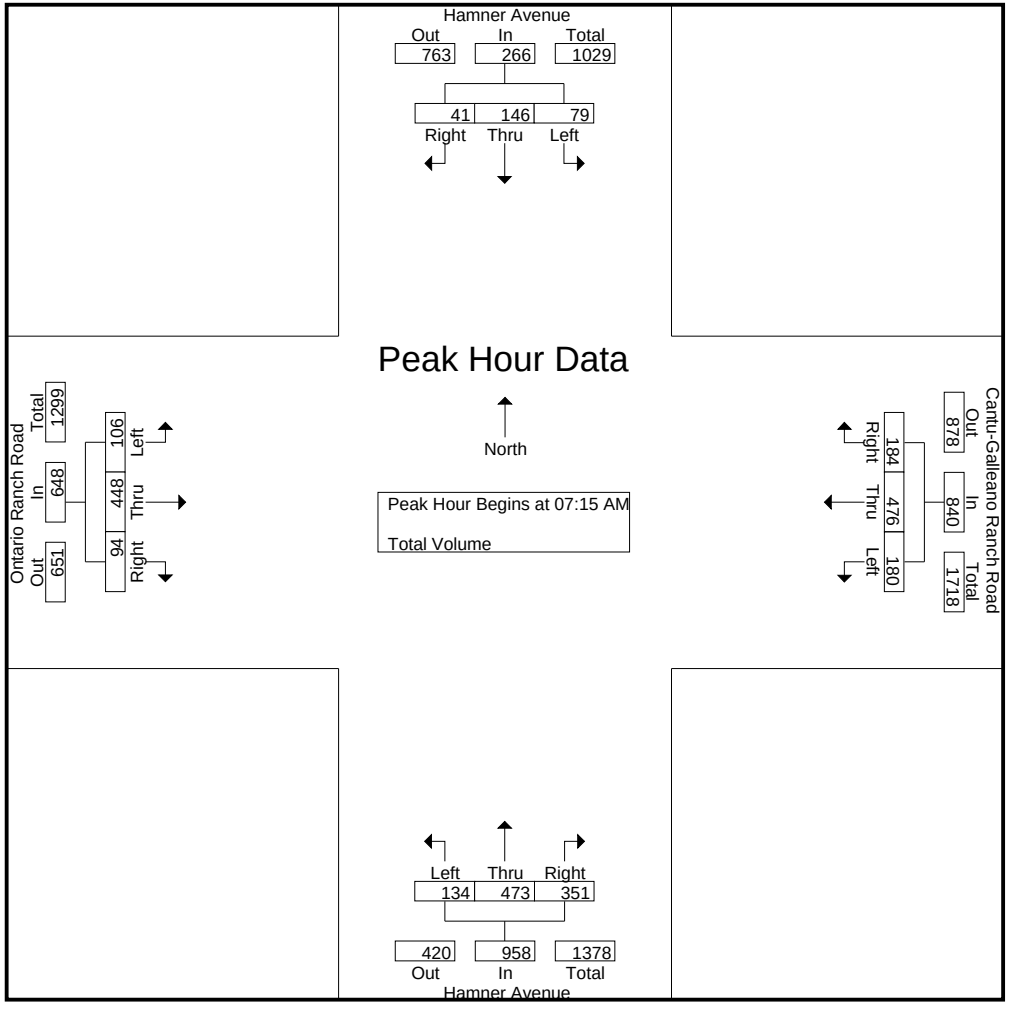

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City of Ontario
N/S: Hamner Avenue
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Weather: Clear

File Name : 43_ONT_Ham_OntRa AMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Hamner Avenue Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Hamner Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 07:45 AM | | | | 07:00 AM | | | | 07:15 AM | | | | 07:15 AM | | | | |
| +0 mins. | 22 | 48 | 13 | 83 | **50** | 134 | 30 | 214 | 30 | 108 | 76 | 214 | 15 | **129** | 19 | 163 | |
| +15 mins. | 19 | 49 | 14 | 82 | 38 | **168** | 37 | **243** | 18 | **150** | **93** | **261** | 28 | 90 | 20 | 138 | |
| +30 mins. | 22 | 44 | 18 | 84 | 42 | 110 | 36 | 188 | 36 | 111 | 89 | 236 | **33** | 104 | 17 | 154 | |
| +45 mins. | **23** | **51** | **24** | **98** | 48 | 107 | **66** | 221 | **50** | 104 | 93 | 247 | 30 | 125 | **38** | **193** | |
| Total Volume | 86 | 192 | 69 | 347 | 178 | 519 | 169 | 866 | 134 | 473 | 351 | 958 | 106 | 448 | 94 | 648 | |
| % App. Total | 24.8 | 55.3 | 19.9 | | 20.6 | 59.9 | 19.5 | | 14 | 49.4 | 36.6 | | 16.4 | 69.1 | 14.5 | | |
| PHF | .935 | .941 | .719 | .885 | .890 | .772 | .640 | .891 | .670 | .788 | .944 | .918 | .803 | .868 | .618 | .839 | |

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City of Ontario
N/S: Hamner Avenue
E/W: Ontario Ranch Rd/Cantu-Galleano Rch
Weather: Clear

File Name : 43_ONT_Ham_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Total Volume

| | Hamner Avenue Southbound | | | | | Cantu-Galleano Ranch Road Westbound | | | | | Hamner Avenue Northbound | | | | | Ontario Ranch Road Eastbound | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Left | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 54 | 91 | 18 | 2 | 163 | 66 | 110 | 33 | 15 | 209 | 76 | 80 | 62 | 39 | 218 | 10 | 101 | 56 | 22 | 167 | 78 | 757 | 835 |
| 04:15 PM | 43 | 72 | 12 | 1 | 127 | 66 | 165 | 22 | 19 | 253 | 130 | 82 | 76 | 34 | 288 | 11 | 126 | 52 | 28 | 189 | 82 | 857 | 939 |
| 04:30 PM | 31 | 78 | 11 | 2 | 120 | 74 | 147 | 37 | 22 | 258 | 94 | 79 | 55 | 36 | 228 | 12 | 103 | 52 | 30 | 167 | 90 | 773 | 863 |
| 04:45 PM | 39 | 79 | 16 | 2 | 134 | 87 | 152 | 36 | 26 | 275 | 86 | 77 | 40 | 27 | 203 | 25 | 137 | 74 | 18 | 236 | 73 | 848 | 921 |
| Total | 167 | 320 | 57 | 7 | 544 | 293 | 574 | 128 | 82 | 995 | 386 | 318 | 233 | 136 | 937 | 58 | 467 | 234 | 98 | 759 | 323 | 3235 | 3558 |
| 05:00 PM | 44 | 78 | 26 | 6 | 148 | 71 | 172 | 37 | 29 | 280 | 97 | 91 | 55 | 42 | 243 | 22 | 127 | 50 | 16 | 199 | 93 | 870 | 963 |
| 05:15 PM | 39 | 77 | 19 | 1 | 135 | 74 | 163 | 33 | 17 | 270 | 108 | 76 | 65 | 41 | 249 | 20 | 125 | 45 | 22 | 190 | 81 | 844 | 925 |
| 05:30 PM | 44 | 110 | 17 | 2 | 171 | 88 | 181 | 41 | 20 | 310 | 80 | 87 | 64 | 38 | 231 | 36 | 110 | 62 | 20 | 208 | 80 | 920 | 1000 |
| 05:45 PM | 44 | 93 | 19 | 2 | 156 | 107 | 171 | 31 | 22 | 309 | 60 | 51 | 77 | 58 | 188 | 15 | 135 | 66 | 34 | 216 | 116 | 869 | 985 |
| Total | 171 | 358 | 81 | 11 | 610 | 340 | 687 | 142 | 88 | 1169 | 345 | 305 | 261 | 179 | 911 | 93 | 497 | 223 | 92 | 813 | 370 | 3503 | 3873 |
| Grand Total | 338 | 678 | 138 | 18 | 1154 | 633 | 1261 | 270 | 170 | 2164 | 731 | 623 | 494 | 315 | 1848 | 151 | 964 | 457 | 190 | 1572 | 693 | 6738 | 7431 |
| Apprch % | 29.3 | 58.8 | 12 | | | 29.3 | 58.3 | 12.5 | | | 39.6 | 33.7 | 26.7 | | | 9.6 | 61.3 | 29.1 | | | | | |
| Total % | 5 | 10.1 | 2 | | 17.1 | 9.4 | 18.7 | 4 | | 32.1 | 10.8 | 9.2 | 7.3 | | 27.4 | 2.2 | 14.3 | 6.8 | | 23.3 | 9.3 | 90.7 | |

| | Hamner Avenue Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Hamner Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | |
| 05:00 PM | **44** | 78 | **26** | 148 | 71 | 172 | 37 | 280 | 97 | **91** | 55 | 243 | 22 | 127 | 50 | 199 | 870 |
| 05:15 PM | 39 | 77 | 19 | 135 | 74 | 163 | 33 | 270 | **108** | 76 | 65 | **249** | 20 | 125 | 45 | 190 | 844 |
| 05:30 PM | 44 | **110** | 17 | **171** | 88 | **181** | **41** | **310** | 80 | 87 | 64 | 231 | **36** | 110 | 62 | 208 | **920** |
| 05:45 PM | 44 | 93 | 19 | 156 | **107** | 171 | 31 | 309 | 60 | 51 | **77** | 188 | 15 | **135** | **66** | **216** | 869 |
| Total Volume | 171 | 358 | 81 | 610 | 340 | 687 | 142 | 1169 | 345 | 305 | 261 | 911 | 93 | 497 | 223 | 813 | 3503 |
| % App. Total | 28 | 58.7 | 13.3 | | 29.1 | 58.8 | 12.1 | | 37.9 | 33.5 | 28.6 | | 11.4 | 61.1 | 27.4 | | |
| PHF | .972 | .814 | .779 | .892 | .794 | .949 | .866 | .943 | .799 | .838 | .847 | .915 | .646 | .920 | .845 | .941 | .952 |

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City of Ontario
N/S: Hamner Avenue
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Weather: Clear

File Name : 43_ONT_Ham_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

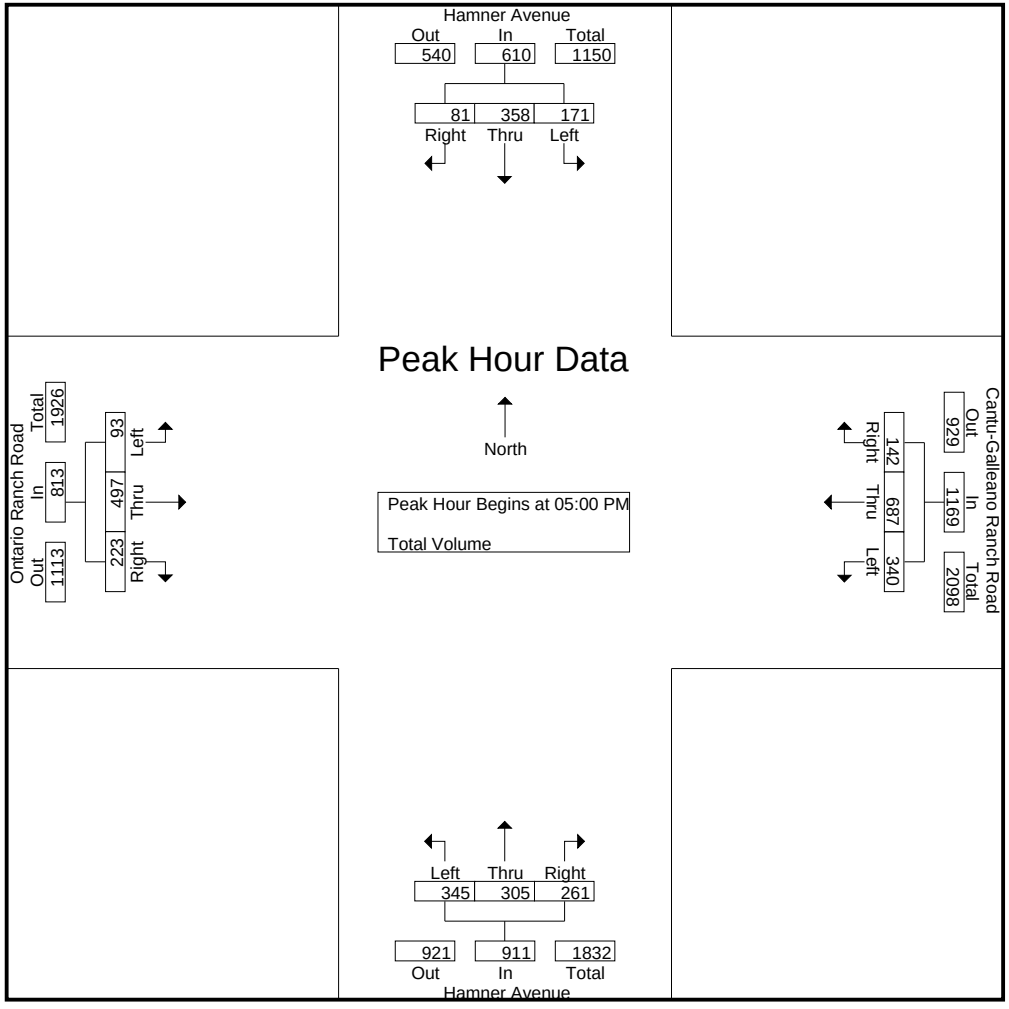

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City of Ontario
N/S: Hamner Avenue
E/W: Ontario Ranch Rd/Cantu-Galleano Rch
Weather: Clear

File Name : 43_ONT_Ham_OntRa PMR
Site Code : 05124953
Start Date : 10/2/2024
Page No : 3

| | Hamner Avenue Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Hamner Avenue Northbound | | | | Ontario Ranch Road Eastbound | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Left | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | |
| Peak Hour for Each Approach Begins at: | | | | | | | | | | | | | | | | | |
| | 05:00 PM | | | | 05:00 PM | | | | 04:15 PM | | | | 04:45 PM | | | | |
| +0 mins. | **44** | 78 | **26** | 148 | 71 | 172 | 37 | 280 | **130** | 82 | **76** | **288** | 25 | **137** | **74** | **236** | |
| +15 mins. | 39 | 77 | 19 | 135 | 74 | 163 | 33 | 270 | 94 | 79 | 55 | 228 | 22 | 127 | 50 | 199 | |
| +30 mins. | 44 | **110** | 17 | **171** | 88 | **181** | **41** | **310** | 86 | 77 | 40 | 203 | 20 | 125 | 45 | 190 | |
| +45 mins. | 44 | 93 | 19 | 156 | **107** | 171 | 31 | 309 | 97 | **91** | 55 | 243 | **36** | 110 | 62 | 208 | |
| Total Volume | 171 | 358 | 81 | 610 | 340 | 687 | 142 | 1169 | 407 | 329 | 226 | 962 | 103 | 499 | 231 | 833 | |
| % App. Total | 28 | 58.7 | 13.3 | | 29.1 | 58.8 | 12.1 | | 42.3 | 34.2 | 23.5 | | 12.4 | 59.9 | 27.7 | | |
| PHF | .972 | .814 | .779 | .892 | .794 | .949 | .866 | .943 | .783 | .904 | .743 | .835 | .715 | .911 | .780 | .882 | |

Location: Ontario
N/S: Hamner Avenue
E/W: Ontario Ranch Rd/Cantu-Galleano Ranch Rd

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>Hamner Avenue | East Leg<br>Cantu-Galleano Ranch Rd | South Leg<br>Hamner Avenue | West Leg<br>Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 1 | 0 | 0 | 1 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 1 | 0 | 0 | 1 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 1 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 1 | 1 | 2 |
| TOTAL VOLUMES: | 0 | 3 | 1 | 1 | 5 |

| | North Leg<br>Hamner Avenue | East Leg<br>Cantu-Galleano Ranch Rd | South Leg<br>Hamner Avenue | West Leg<br>Ontario Ranch Road | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 1 | 0 | 0 | 1 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 1 | 1 | 1 | 0 | 3 |
| 5:30 PM | 0 | 1 | 0 | 0 | 1 |
| 5:45 PM | 1 | 4 | 0 | 0 | 5 |
| TOTAL VOLUMES: | 2 | 7 | 1 | 0 | 10 |

Counts Unlimited, Inc.
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951-268-6268

Location: Ontario
N/S: Hamner Avenue
E/W: Ontario Ranch Rd/Cantu-Galleano Ranch Rd

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound Hamner Avenue | | | Westbound Cantu-Galleano Ranch Rd | | | Northbound Hamner Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 3 |

| | Southbound Hamner Avenue | | | Westbound Cantu-Galleano Ranch Rd | | | Northbound Hamner Avenue | | | Eastbound Ontario Ranch Road | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 3 |

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951-268-6268

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PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 51 | 245 | 37 | 296 | 95 | 26 | 0 | 121 | 0 | 162 | 162 | 37 | 579 | 616 |
| 07:15 AM | 40 | 251 | 73 | 291 | 131 | 36 | 0 | 167 | 0 | 163 | 163 | 73 | 621 | 694 |
| 07:30 AM | 66 | 206 | 46 | 272 | 110 | 34 | 0 | 144 | 0 | 185 | 185 | 46 | 601 | 647 |
| 07:45 AM | 72 | 163 | 50 | 235 | 112 | 21 | 0 | 133 | 0 | 185 | 185 | 50 | 553 | 603 |
| Total | 229 | 865 | 206 | 1094 | 448 | 117 | 0 | 565 | 0 | 695 | 695 | 206 | 2354 | 2560 |
| 08:00 AM | 63 | 179 | 64 | 242 | 95 | 39 | 0 | 134 | 0 | 204 | 204 | 64 | 580 | 644 |
| 08:15 AM | 51 | 186 | 55 | 237 | 86 | 28 | 0 | 114 | 0 | 133 | 133 | 55 | 484 | 539 |
| 08:30 AM | 46 | 185 | 53 | 231 | 87 | 34 | 0 | 121 | 0 | 156 | 156 | 53 | 508 | 561 |
| 08:45 AM | 57 | 176 | 57 | 233 | 103 | 27 | 0 | 130 | 0 | 120 | 120 | 57 | 483 | 540 |
| Total | 217 | 726 | 229 | 943 | 371 | 128 | 0 | 499 | 0 | 613 | 613 | 229 | 2055 | 2284 |
| Grand Total | 446 | 1591 | 435 | 2037 | 819 | 245 | 0 | 1064 | 0 | 1308 | 1308 | 435 | 4409 | 4844 |
| Apprch % | 21.9 | 78.1 | | | 77 | 23 | | | 0 | 100 | | | | |
| Total % | 10.1 | 36.1 | | 46.2 | 18.6 | 5.6 | | 24.1 | 0 | 29.7 | 29.7 | 9 | 91 | |
| Passenger Vehicles | 401 | 1477 | | 2294 | 745 | 162 | | 907 | 0 | 1189 | 1189 | 0 | 0 | 4390 |
| % Passenger Vehicles | 89.9 | 92.8 | 95.6 | 92.8 | 91 | 66.1 | 0 | 85.2 | 0 | 90.9 | 90.9 | 0 | 0 | 90.6 |
| Large 2 Axle Vehicles | 11 | 22 | | 44 | 22 | 5 | | 27 | 0 | 27 | 27 | 0 | 0 | 98 |
| % Large 2 Axle Vehicles | 2.5 | 1.4 | 2.5 | 1.8 | 2.7 | 2 | 0 | 2.5 | 0 | 2.1 | 2.1 | 0 | 0 | 2 |
| 3 Axle Vehicles | 6 | 22 | | 32 | 11 | 11 | | 22 | 0 | 25 | 25 | 0 | 0 | 79 |
| % 3 Axle Vehicles | 1.3 | 1.4 | 0.9 | 1.3 | 1.3 | 4.5 | 0 | 2.1 | 0 | 1.9 | 1.9 | 0 | 0 | 1.6 |
| 4+ Axle Trucks | 28 | 70 | | 102 | 41 | 67 | | 108 | 0 | 67 | 67 | 0 | 0 | 277 |
| % 4+ Axle Trucks | 6.3 | 4.4 | 0.9 | 4.1 | 5 | 27.3 | 0 | 10.2 | 0 | 5.1 | 5.1 | 0 | 0 | 5.7 |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 40 | **251** | **291** | **131** | 36 | **167** | 0 | 163 | 163 | **621** |
| 07:30 AM | 66 | 206 | 272 | 110 | 34 | 144 | 0 | 185 | 185 | 601 |
| 07:45 AM | **72** | 163 | 235 | 112 | 21 | 133 | 0 | 185 | 185 | 553 |
| 08:00 AM | 63 | 179 | 242 | 95 | **39** | 134 | 0 | **204** | **204** | 580 |
| Total Volume | 241 | 799 | 1040 | 448 | 130 | 578 | 0 | 737 | 737 | 2355 |
| % App. Total | 23.2 | 76.8 | | 77.5 | 22.5 | | 0 | 100 | | |
| PHF | .837 | .796 | .893 | .855 | .833 | .865 | .000 | .903 | .903 | .948 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

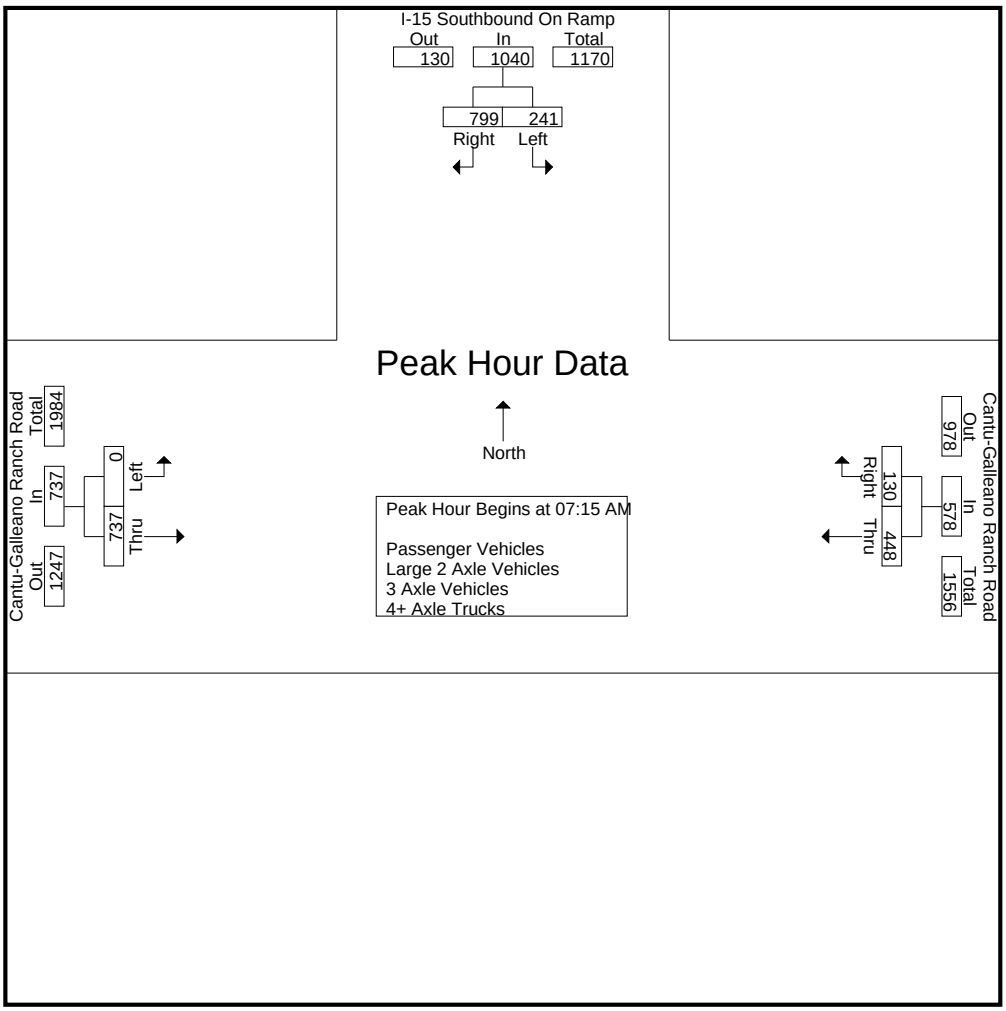


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:00 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 51 | 245 | **296** | **131** | 36 | **167** | 0 | 163 | 163 |
| +15 mins. | 40 | **251** | 291 | 110 | 34 | 144 | 0 | 185 | 185 |
| +30 mins. | 66 | 206 | 272 | 112 | 21 | 133 | 0 | 185 | 185 |
| +45 mins. | **72** | 163 | 235 | 95 | **39** | 134 | 0 | **204** | **204** |
| Total Volume | 229 | 865 | 1094 | 448 | 130 | 578 | 0 | 737 | 737 |
| % App. Total | 20.9 | 79.1 | | 77.5 | 22.5 | | 0 | 100 | |
| PHF | .795 | .862 | .924 | .855 | .833 | .865 | .000 | .903 | .903 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 43 | 236 | 37 | 279 | 88 | 22 | 0 | 110 | 0 | 143 | 143 | 37 | 532 | 569 |
| 07:15 AM | 34 | 233 | 72 | 267 | 123 | 24 | 0 | 147 | 0 | 147 | 147 | 72 | 561 | 633 |
| 07:30 AM | 59 | 190 | 42 | 249 | 98 | 23 | 0 | 121 | 0 | 168 | 168 | 42 | 538 | 580 |
| 07:45 AM | 66 | 148 | 47 | 214 | 100 | 13 | 0 | 113 | 0 | 172 | 172 | 47 | 499 | 546 |
| Total | 202 | 807 | 198 | 1009 | 409 | 82 | 0 | 491 | 0 | 630 | 630 | 198 | 2130 | 2328 |
| 08:00 AM | 59 | 164 | 57 | 223 | 89 | 27 | 0 | 116 | 0 | 192 | 192 | 57 | 531 | 588 |
| 08:15 AM | 50 | 171 | 53 | 221 | 78 | 17 | 0 | 95 | 0 | 121 | 121 | 53 | 437 | 490 |
| 08:30 AM | 42 | 175 | 52 | 217 | 77 | 21 | 0 | 98 | 0 | 142 | 142 | 52 | 457 | 509 |
| 08:45 AM | 48 | 160 | 56 | 208 | 92 | 15 | 0 | 107 | 0 | 104 | 104 | 56 | 419 | 475 |
| Total | 199 | 670 | 218 | 869 | 336 | 80 | 0 | 416 | 0 | 559 | 559 | 218 | 1844 | 2062 |
| Grand Total | 401 | 1477 | 416 | 1878 | 745 | 162 | 0 | 907 | 0 | 1189 | 1189 | 416 | 3974 | 4390 |
| Apprch % | 21.4 | 78.6 | | | 82.1 | 17.9 | | | 0 | 100 | | | | |
| Total % | 10.1 | 37.2 | | 47.3 | 18.7 | 4.1 | | 22.8 | 0 | 29.9 | 29.9 | 9.5 | 90.5 | |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 34 | **233** | **267** | **123** | 24 | **147** | 0 | 147 | 147 | **561** |
| 07:30 AM | 59 | 190 | 249 | 98 | 23 | 121 | 0 | 168 | 168 | 538 |
| 07:45 AM | **66** | 148 | 214 | 100 | 13 | 113 | 0 | 172 | 172 | 499 |
| 08:00 AM | 59 | 164 | 223 | 89 | **27** | 116 | 0 | **192** | **192** | 531 |
| Total Volume | 218 | 735 | 953 | 410 | 87 | 497 | 0 | 679 | 679 | 2129 |
| % App. Total | 22.9 | 77.1 | | 82.5 | 17.5 | | 0 | 100 | | |
| PHF | .826 | .789 | .892 | .833 | .806 | .845 | .000 | .884 | .884 | .949 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

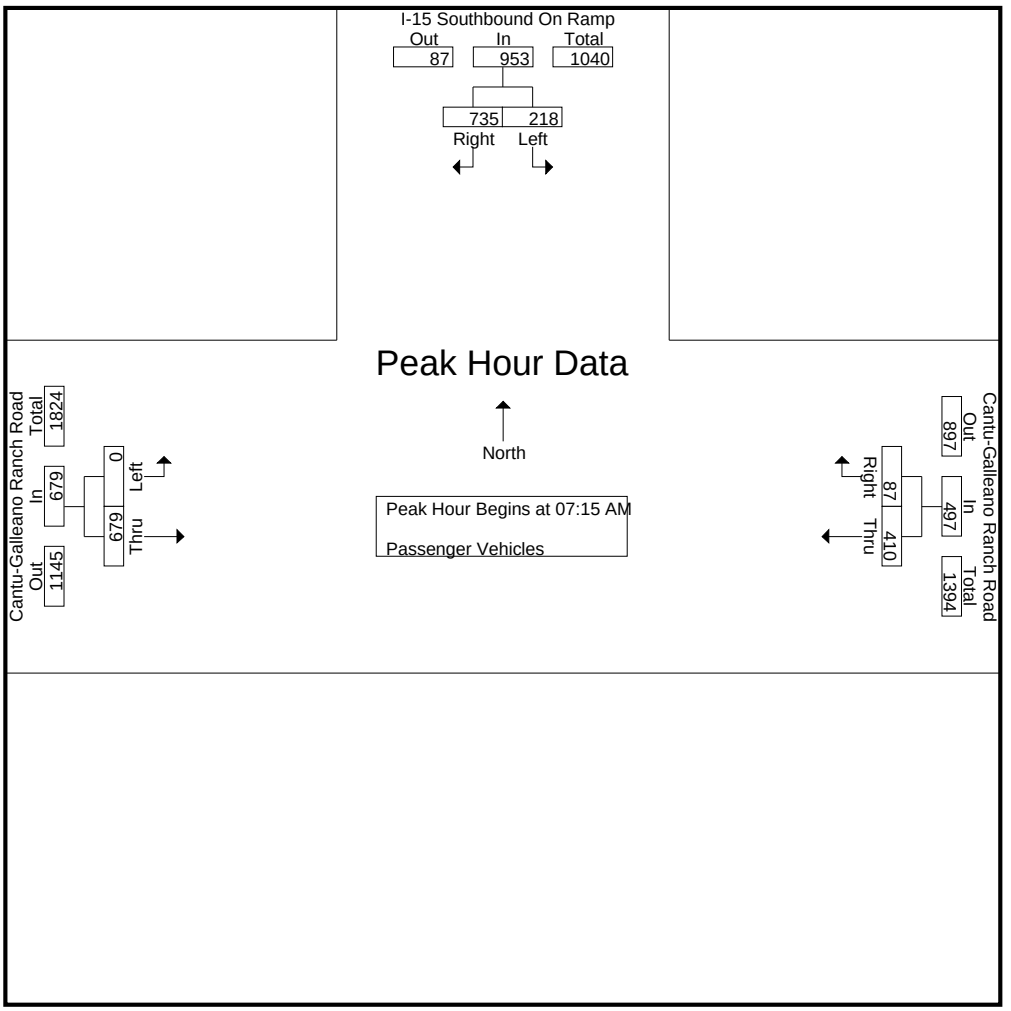


Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 34 | **233** | **267** | **123** | 24 | **147** | 0 | 147 | 147 |
| +15 mins. | 59 | 190 | 249 | 98 | 23 | 121 | 0 | 168 | 168 |
| +30 mins. | **66** | 148 | 214 | 100 | 13 | 113 | 0 | 172 | 172 |
| +45 mins. | 59 | 164 | 223 | 89 | **27** | 116 | 0 | **192** | **192** |
| Total Volume | 218 | 735 | 953 | 410 | 87 | 497 | 0 | 679 | 679 |
| % App. Total | 22.9 | 77.1 | | 82.5 | 17.5 | | 0 | 100 | |
| PHF | .826 | .789 | .892 | .833 | .806 | .845 | .000 | .884 | .884 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 3 | 0 | 4 | 3 | 1 | 0 | 4 | 0 | 4 | 4 | 0 | 12 | 12 |
| 07:15 AM | 2 | 1 | 1 | 3 | 3 | 0 | 0 | 3 | 0 | 5 | 5 | 1 | 11 | 12 |
| 07:30 AM | 1 | 8 | 4 | 9 | 3 | 0 | 0 | 3 | 0 | 5 | 5 | 4 | 17 | 21 |
| 07:45 AM | 2 | 2 | 2 | 4 | 6 | 0 | 0 | 6 | 0 | 5 | 5 | 2 | 15 | 17 |
| Total | 6 | 14 | 7 | 20 | 15 | 1 | 0 | 16 | 0 | 19 | 19 | 7 | 55 | 62 |
| 08:00 AM | 2 | 4 | 2 | 6 | 3 | 2 | 0 | 5 | 0 | 2 | 2 | 2 | 13 | 15 |
| 08:15 AM | 1 | 1 | 1 | 2 | 2 | 1 | 0 | 3 | 0 | 2 | 2 | 1 | 7 | 8 |
| 08:30 AM | 1 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 1 | 4 | 5 |
| 08:45 AM | 1 | 2 | 0 | 3 | 2 | 1 | 0 | 3 | 0 | 2 | 2 | 0 | 8 | 8 |
| Total | 5 | 8 | 4 | 13 | 7 | 4 | 0 | 11 | 0 | 8 | 8 | 4 | 32 | 36 |
| Grand Total | 11 | 22 | 11 | 33 | 22 | 5 | 0 | 27 | 0 | 27 | 27 | 11 | 87 | 98 |
| Apprch % | 33.3 | 66.7 | | | 81.5 | 18.5 | | | 0 | 100 | | | | |
| Total % | 12.6 | 25.3 | | 37.9 | 25.3 | 5.7 | | 31 | 0 | 31 | 31 | 11.2 | 88.8 | |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | **2** | 1 | 3 | 3 | 0 | 3 | 0 | **5** | **5** | 11 |
| 07:30 AM | 1 | **8** | **9** | 3 | 0 | 3 | 0 | 5 | 5 | **17** |
| 07:45 AM | 2 | 2 | 4 | **6** | 0 | **6** | 0 | 5 | 5 | 15 |
| 08:00 AM | 2 | 4 | 6 | 3 | **2** | 5 | 0 | 2 | 2 | 13 |
| Total Volume | 7 | 15 | 22 | 15 | 2 | 17 | 0 | 17 | 17 | 56 |
| % App. Total | 31.8 | 68.2 | | 88.2 | 11.8 | | 0 | 100 | | |
| PHF | .875 | .469 | .611 | .625 | .250 | .708 | .000 | .850 | .850 | .824 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

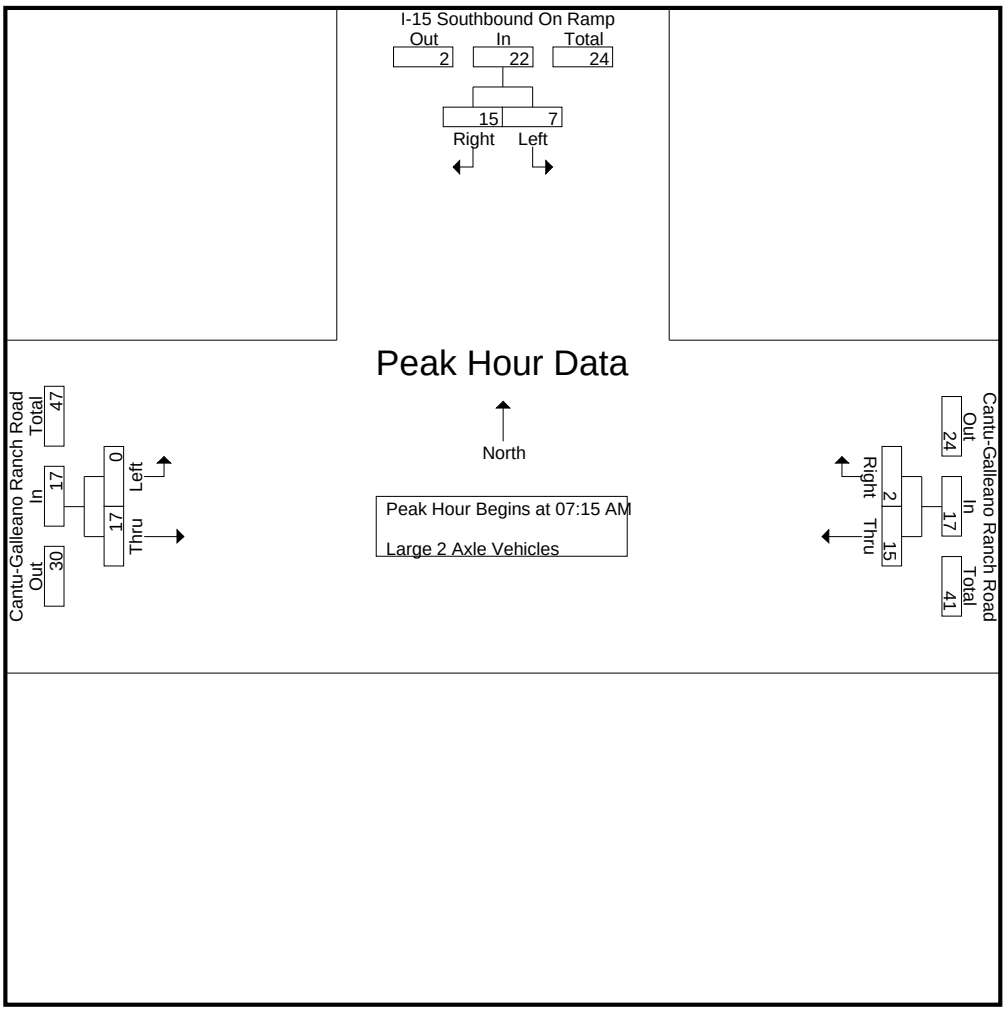


Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **2** | 1 | 3 | 3 | 0 | 3 | 0 | **5** | **5** |
| +15 mins. | 1 | **8** | **9** | 3 | 0 | 3 | 0 | 5 | 5 |
| +30 mins. | 2 | 2 | 4 | **6** | 0 | **6** | 0 | 5 | 5 |
| +45 mins. | 2 | 4 | 6 | 3 | **2** | 5 | 0 | 2 | 2 |
| Total Volume | 7 | 15 | 22 | 15 | 2 | 17 | 0 | 17 | 17 |
| % App. Total | 31.8 | 68.2 | | 88.2 | 11.8 | | 0 | 100 | |
| PHF | .875 | .469 | .611 | .625 | .250 | .708 | .000 | .850 | .850 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 2 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 0 | 7 | 7 |
| 07:15 AM | 1 | 2 | 0 | 3 | 1 | 1 | 0 | 2 | 0 | 5 | 5 | 0 | 10 | 10 |
| 07:30 AM | 0 | 3 | 0 | 3 | 3 | 3 | 0 | 6 | 0 | 2 | 2 | 0 | 11 | 11 |
| 07:45 AM | 1 | 4 | 0 | 5 | 0 | 2 | 0 | 2 | 0 | 3 | 3 | 0 | 10 | 10 |
| Total | 4 | 10 | 0 | 14 | 4 | 6 | 0 | 10 | 0 | 14 | 14 | 0 | 38 | 38 |
| 08:00 AM | 1 | 5 | 3 | 6 | 1 | 4 | 0 | 5 | 0 | 1 | 1 | 3 | 12 | 15 |
| 08:15 AM | 0 | 2 | 0 | 2 | 4 | 1 | 0 | 5 | 0 | 4 | 4 | 0 | 11 | 11 |
| 08:30 AM | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 3 | 3 |
| 08:45 AM | 0 | 5 | 1 | 5 | 1 | 0 | 0 | 1 | 0 | 5 | 5 | 1 | 11 | 12 |
| Total | 2 | 12 | 4 | 14 | 7 | 5 | 0 | 12 | 0 | 11 | 11 | 4 | 37 | 41 |
| Grand Total | 6 | 22 | 4 | 28 | 11 | 11 | 0 | 22 | 0 | 25 | 25 | 4 | 75 | 79 |
| Apprch % | 21.4 | 78.6 | | | 50 | 50 | | | 0 | 100 | | | | |
| Total % | 8 | 29.3 | | 37.3 | 14.7 | 14.7 | | 29.3 | 0 | 33.3 | 33.3 | 5.1 | 94.9 | |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | **1** | 2 | 3 | 1 | 1 | 2 | 0 | **5** | **5** | 10 |
| 07:30 AM | 0 | 3 | 3 | **3** | 3 | **6** | 0 | 2 | 2 | 11 |
| 07:45 AM | 1 | 4 | 5 | 0 | 2 | 2 | 0 | 3 | 3 | 10 |
| 08:00 AM | 1 | **5** | **6** | 1 | **4** | 5 | 0 | 1 | 1 | **12** |
| Total Volume | 3 | 14 | 17 | 5 | 10 | 15 | 0 | 11 | 11 | 43 |
| % App. Total | 17.6 | 82.4 | | 33.3 | 66.7 | | 0 | 100 | | |
| PHF | .750 | .700 | .708 | .417 | .625 | .625 | .000 | .550 | .550 | .896 |

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Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

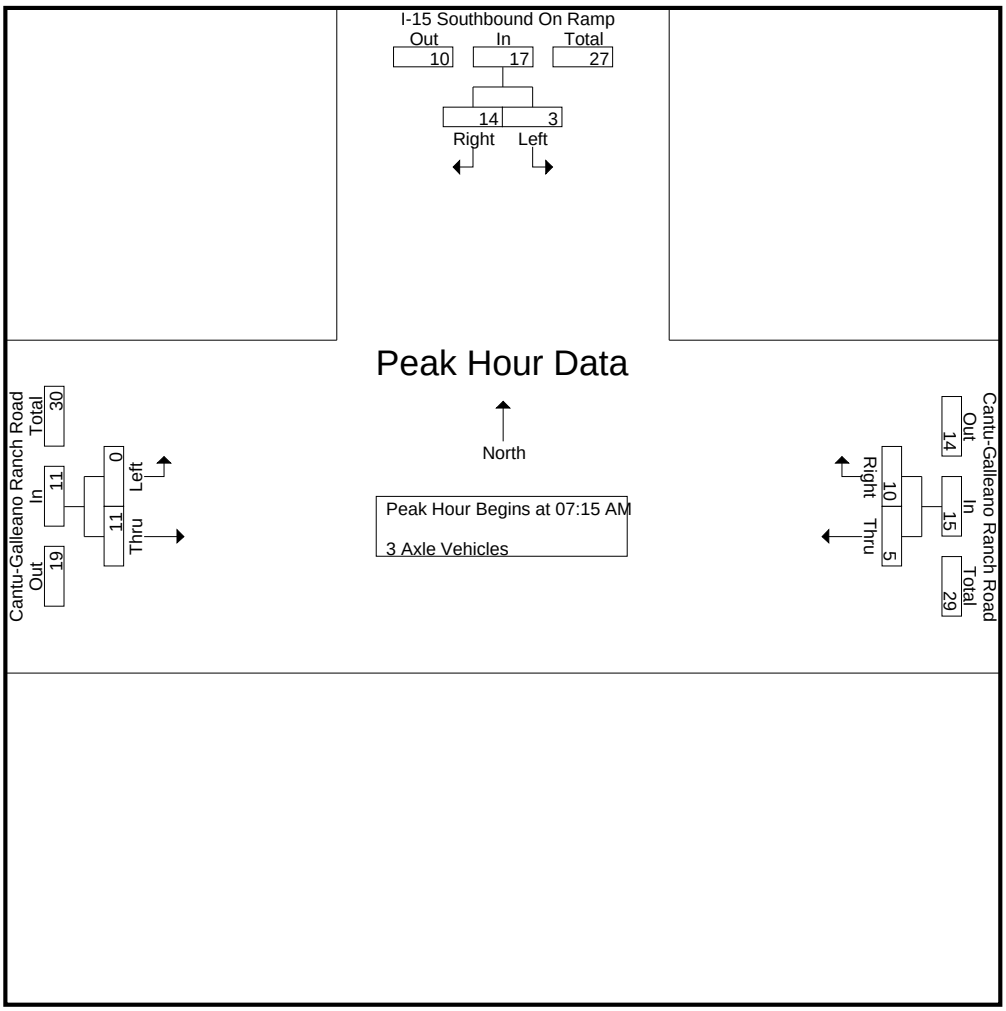


Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **1** | 2 | 3 | 1 | 1 | 2 | 0 | **5** | **5** |
| +15 mins. | 0 | 3 | 3 | **3** | 3 | **6** | 0 | 2 | 2 |
| +30 mins. | 1 | 4 | 5 | 0 | 2 | 2 | 0 | 3 | 3 |
| +45 mins. | 1 | **5** | **6** | 1 | **4** | 5 | 0 | 1 | 1 |
| Total Volume | 3 | 14 | 17 | 5 | 10 | 15 | 0 | 11 | 11 |
| % App. Total | 17.6 | 82.4 | | 33.3 | 66.7 | | 0 | 100 | |
| PHF | .750 | .700 | .708 | .417 | .625 | .625 | .000 | .550 | .550 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 5 | 5 | 0 | 10 | 4 | 3 | 0 | 7 | 0 | 11 | 11 | 0 | 28 | 28 |
| 07:15 AM | 3 | 15 | 0 | 18 | 4 | 11 | 0 | 15 | 0 | 6 | 6 | 0 | 39 | 39 |
| 07:30 AM | 6 | 5 | 0 | 11 | 6 | 8 | 0 | 14 | 0 | 10 | 10 | 0 | 35 | 35 |
| 07:45 AM | 3 | 9 | 1 | 12 | 6 | 6 | 0 | 12 | 0 | 5 | 5 | 1 | 29 | 30 |
| Total | 17 | 34 | 1 | 51 | 20 | 28 | 0 | 48 | 0 | 32 | 32 | 1 | 131 | 132 |
| 08:00 AM | 1 | 6 | 2 | 7 | 2 | 6 | 0 | 8 | 0 | 9 | 9 | 2 | 24 | 26 |
| 08:15 AM | 0 | 12 | 1 | 12 | 2 | 9 | 0 | 11 | 0 | 6 | 6 | 1 | 29 | 30 |
| 08:30 AM | 2 | 9 | 0 | 11 | 9 | 13 | 0 | 22 | 0 | 11 | 11 | 0 | 44 | 44 |
| 08:45 AM | 8 | 9 | 0 | 17 | 8 | 11 | 0 | 19 | 0 | 9 | 9 | 0 | 45 | 45 |
| Total | 11 | 36 | 3 | 47 | 21 | 39 | 0 | 60 | 0 | 35 | 35 | 3 | 142 | 145 |
| Grand Total | 28 | 70 | 4 | 98 | 41 | 67 | 0 | 108 | 0 | 67 | 67 | 4 | 273 | 277 |
| Apprch % | 28.6 | 71.4 | | | 38 | 62 | | | 0 | 100 | | | | |
| Total % | 10.3 | 25.6 | | 35.9 | 15 | 24.5 | | 39.6 | 0 | 24.5 | 24.5 | 1.4 | 98.6 | |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 3 | **15** | **18** | 4 | **11** | **15** | 0 | 6 | 6 | **39** |
| 07:30 AM | **6** | 5 | 11 | **6** | 8 | 14 | 0 | **10** | **10** | 35 |
| 07:45 AM | 3 | 9 | 12 | 6 | 6 | 12 | 0 | 5 | 5 | 29 |
| 08:00 AM | 1 | 6 | 7 | 2 | 6 | 8 | 0 | 9 | 9 | 24 |
| Total Volume | 13 | 35 | 48 | 18 | 31 | 49 | 0 | 30 | 30 | 127 |
| % App. Total | 27.1 | 72.9 | | 36.7 | 63.3 | | 0 | 100 | | |
| PHF | .542 | .583 | .667 | .750 | .705 | .817 | .000 | .750 | .750 | .814 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

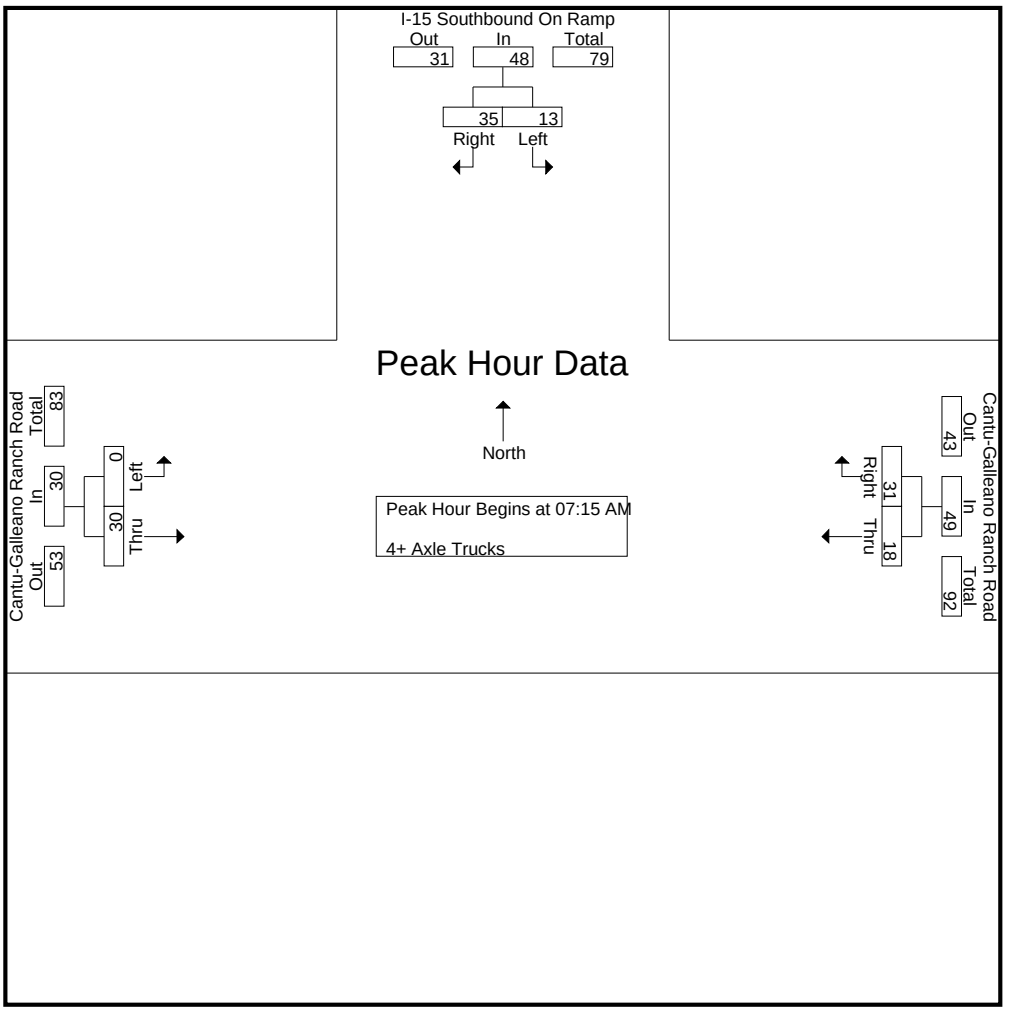


Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 3 | **15** | **18** | 4 | **11** | **15** | 0 | 6 | 6 |
| +15 mins. | **6** | 5 | 11 | **6** | 8 | 14 | 0 | **10** | **10** |
| +30 mins. | 3 | 9 | 12 | 6 | 6 | 12 | 0 | 5 | 5 |
| +45 mins. | 1 | 6 | 7 | 2 | 6 | 8 | 0 | 9 | 9 |
| Total Volume | 13 | 35 | 48 | 18 | 31 | 49 | 0 | 30 | 30 |
| % App. Total | 27.1 | 72.9 | | 36.7 | 63.3 | | 0 | 100 | |
| PHF | .542 | .583 | .667 | .750 | .705 | .817 | .000 | .750 | .750 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 68 | 198 | 50 | 266 | 104 | 53 | 0 | 157 | 0 | 200 | 200 | 50 | 623 | 673 |
| 04:15 PM | 66 | 242 | 44 | 308 | 123 | 35 | 0 | 158 | 0 | 177 | 177 | 44 | 643 | 687 |
| 04:30 PM | 69 | 251 | 63 | 320 | 130 | 43 | 0 | 173 | 0 | 206 | 206 | 63 | 699 | 762 |
| 04:45 PM | 63 | 275 | 57 | 338 | 115 | 49 | 0 | 164 | 0 | 157 | 157 | 57 | 659 | 716 |
| Total | 266 | 966 | 214 | 1232 | 472 | 180 | 0 | 652 | 0 | 740 | 740 | 214 | 2624 | 2838 |
| 05:00 PM | 66 | 263 | 56 | 329 | 130 | 40 | 0 | 170 | 0 | 192 | 192 | 56 | 691 | 747 |
| 05:15 PM | 46 | 299 | 46 | 345 | 136 | 35 | 0 | 171 | 0 | 207 | 207 | 46 | 723 | 769 |
| 05:30 PM | 58 | 305 | 59 | 363 | 135 | 45 | 0 | 180 | 0 | 258 | 258 | 59 | 801 | 860 |
| 05:45 PM | 70 | 350 | 36 | 420 | 174 | 30 | 0 | 204 | 0 | 221 | 221 | 36 | 845 | 881 |
| Total | 240 | 1217 | 197 | 1457 | 575 | 150 | 0 | 725 | 0 | 878 | 878 | 197 | 3060 | 3257 |
| Grand Total | 506 | 2183 | 411 | 2689 | 1047 | 330 | 0 | 1377 | 0 | 1618 | 1618 | 411 | 5684 | 6095 |
| Apprch % | 18.8 | 81.2 | | | 76 | 24 | | | 0 | 100 | | | | |
| Total % | 8.9 | 38.4 | | 47.3 | 18.4 | 5.8 | | 24.2 | 0 | 28.5 | 28.5 | 6.7 | 93.3 | |
| Passenger Vehicles | 445 | 2096 | | 2948 | 955 | 282 | | 1237 | 0 | 1494 | 1494 | 0 | 0 | 5679 |
| % Passenger Vehicles | 87.9 | 96 | 99 | 95.1 | 91.2 | 85.5 | 0 | 89.8 | 0 | 92.3 | 92.3 | 0 | 0 | 93.2 |
| Large 2 Axle Vehicles | 19 | 19 | | 39 | 30 | 3 | | 33 | 0 | 22 | 22 | 0 | 0 | 94 |
| % Large 2 Axle Vehicles | 3.8 | 0.9 | 0.2 | 1.3 | 2.9 | 0.9 | 0 | 2.4 | 0 | 1.4 | 1.4 | 0 | 0 | 1.5 |
| 3 Axle Vehicles | 8 | 15 | | 23 | 9 | 1 | | 10 | 0 | 26 | 26 | 0 | 0 | 59 |
| % 3 Axle Vehicles | 1.6 | 0.7 | 0 | 0.7 | 0.9 | 0.3 | 0 | 0.7 | 0 | 1.6 | 1.6 | 0 | 0 | 1 |
| 4+ Axle Trucks | 34 | 53 | | 90 | 53 | 44 | | 97 | 0 | 76 | 76 | 0 | 0 | 263 |
| % 4+ Axle Trucks | 6.7 | 2.4 | 0.7 | 2.9 | 5.1 | 13.3 | 0 | 7 | 0 | 4.7 | 4.7 | 0 | 0 | 4.3 |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | 66 | 263 | 329 | 130 | 40 | 170 | 0 | 192 | 192 | 691 |
| 05:15 PM | 46 | 299 | 345 | 136 | 35 | 171 | 0 | 207 | 207 | 723 |
| 05:30 PM | 58 | 305 | 363 | 135 | **45** | 180 | 0 | **258** | **258** | 801 |
| 05:45 PM | **70** | **350** | **420** | **174** | 30 | **204** | 0 | 221 | 221 | **845** |
| Total Volume | 240 | 1217 | 1457 | 575 | 150 | 725 | 0 | 878 | 878 | 3060 |
| % App. Total | 16.5 | 83.5 | | 79.3 | 20.7 | | 0 | 100 | | |
| PHF | .857 | .869 | .867 | .826 | .833 | .888 | .000 | .851 | .851 | .905 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

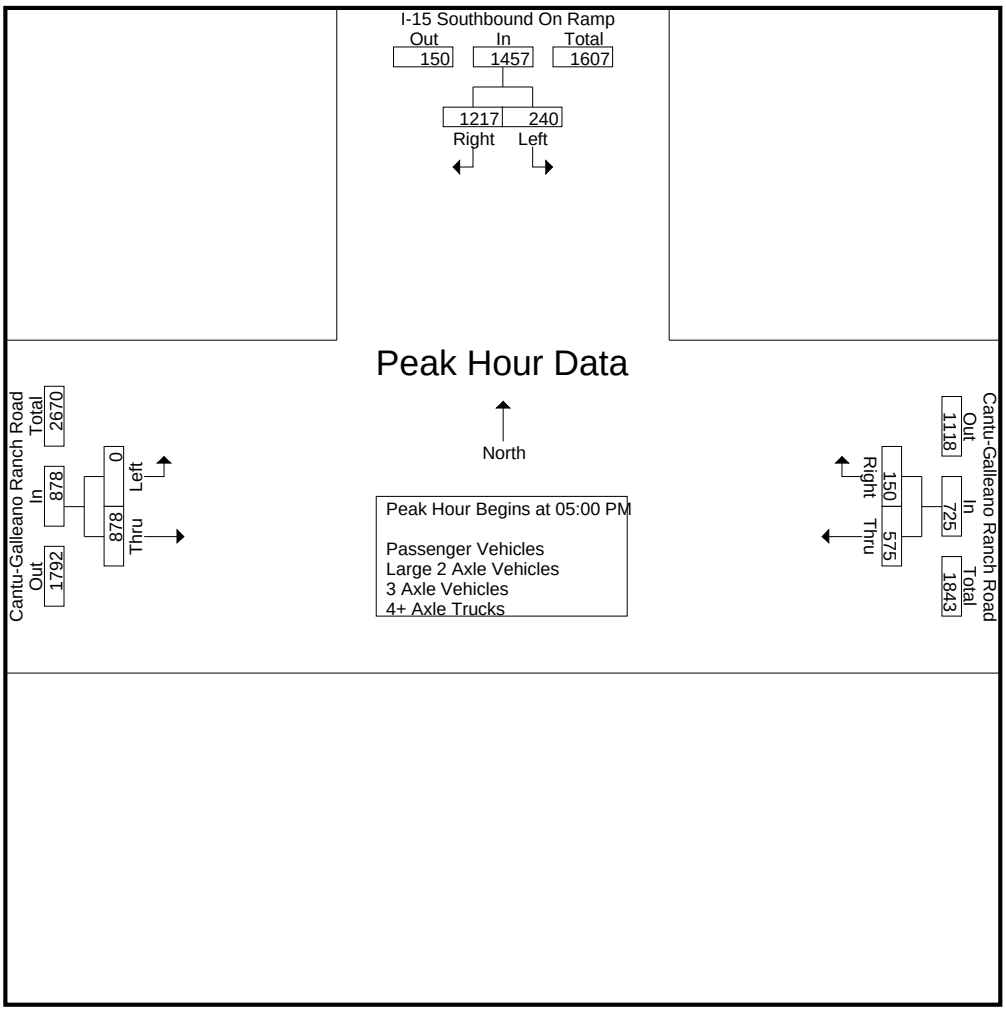


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 66 | 263 | 329 | 130 | 40 | 170 | 0 | 192 | 192 |
| +15 mins. | 46 | 299 | 345 | 136 | 35 | 171 | 0 | 207 | 207 |
| +30 mins. | 58 | 305 | 363 | 135 | **45** | 180 | 0 | **258** | **258** |
| +45 mins. | **70** | **350** | **420** | **174** | 30 | **204** | 0 | 221 | 221 |
| Total Volume | 240 | 1217 | 1457 | 575 | 150 | 725 | 0 | 878 | 878 |
| % App. Total | 16.5 | 83.5 | | 79.3 | 20.7 | | 0 | 100 | |
| PHF | .857 | .869 | .867 | .826 | .833 | .888 | .000 | .851 | .851 |

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City of Ontario
N/S: I-15 Southbound On Ramp
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Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 56 | 187 | 50 | 243 | 93 | 44 | 0 | 137 | 0 | 178 | 178 | 50 | 558 | 608 |
| 04:15 PM | 58 | 231 | 43 | 289 | 109 | 29 | 0 | 138 | 0 | 157 | 157 | 43 | 584 | 627 |
| 04:30 PM | 60 | 241 | 62 | 301 | 121 | 39 | 0 | 160 | 0 | 189 | 189 | 62 | 650 | 712 |
| 04:45 PM | 57 | 267 | 57 | 324 | 107 | 43 | 0 | 150 | 0 | 140 | 140 | 57 | 614 | 671 |
| Total | 231 | 926 | 212 | 1157 | 430 | 155 | 0 | 585 | 0 | 664 | 664 | 212 | 2406 | 2618 |
| 05:00 PM | 61 | 251 | 56 | 312 | 115 | 34 | 0 | 149 | 0 | 181 | 181 | 56 | 642 | 698 |
| 05:15 PM | 38 | 288 | 46 | 326 | 125 | 29 | 0 | 154 | 0 | 195 | 195 | 46 | 675 | 721 |
| 05:30 PM | 49 | 294 | 58 | 343 | 120 | 39 | 0 | 159 | 0 | 243 | 243 | 58 | 745 | 803 |
| 05:45 PM | 66 | 337 | 35 | 403 | 165 | 25 | 0 | 190 | 0 | 211 | 211 | 35 | 804 | 839 |
| Total | 214 | 1170 | 195 | 1384 | 525 | 127 | 0 | 652 | 0 | 830 | 830 | 195 | 2866 | 3061 |
| Grand Total | 445 | 2096 | 407 | 2541 | 955 | 282 | 0 | 1237 | 0 | 1494 | 1494 | 407 | 5272 | 5679 |
| Apprch % | 17.5 | 82.5 | | | 77.2 | 22.8 | | | 0 | 100 | | | | |
| Total % | 8.4 | 39.8 | | 48.2 | 18.1 | 5.3 | | 23.5 | 0 | 28.3 | 28.3 | 7.2 | 92.8 | |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | 61 | 251 | 312 | 115 | 34 | 149 | 0 | 181 | 181 | 642 |
| 05:15 PM | 38 | 288 | 326 | 125 | 29 | 154 | 0 | 195 | 195 | 675 |
| 05:30 PM | 49 | 294 | 343 | 120 | **39** | 159 | 0 | **243** | **243** | 745 |
| 05:45 PM | **66** | **337** | **403** | **165** | 25 | **190** | 0 | 211 | 211 | **804** |
| Total Volume | 214 | 1170 | 1384 | 525 | 127 | 652 | 0 | 830 | 830 | 2866 |
| % App. Total | 15.5 | 84.5 | | 80.5 | 19.5 | | 0 | 100 | | |
| PHF | .811 | .868 | .859 | .795 | .814 | .858 | .000 | .854 | .854 | .891 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

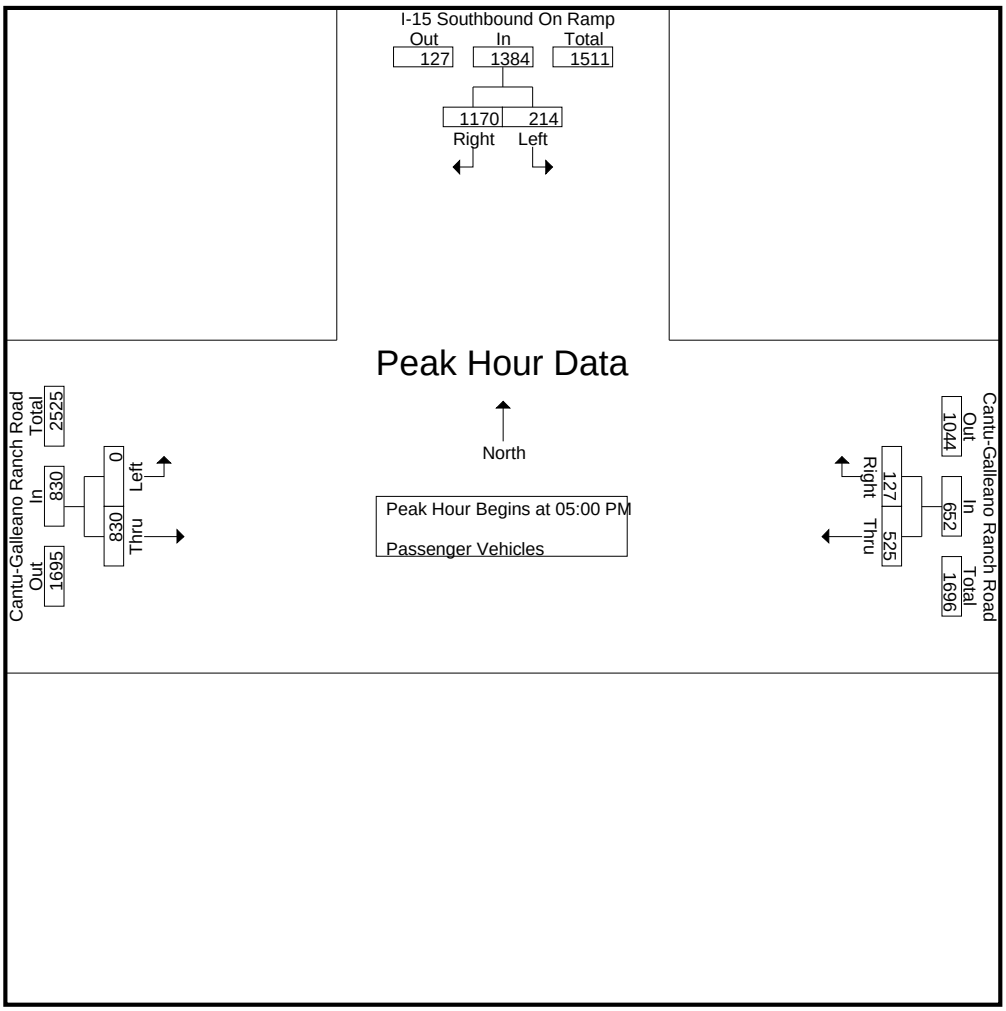


Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 61 | 251 | 312 | 115 | 34 | 149 | 0 | 181 | 181 |
| +15 mins. | 38 | 288 | 326 | 125 | 29 | 154 | 0 | 195 | 195 |
| +30 mins. | 49 | 294 | 343 | 120 | **39** | 159 | 0 | **243** | **243** |
| +45 mins. | **66** | **337** | **403** | **165** | 25 | **190** | 0 | 211 | 211 |
| Total Volume | 214 | 1170 | 1384 | 525 | 127 | 652 | 0 | 830 | 830 |
| % App. Total | 15.5 | 84.5 | | 80.5 | 19.5 | | 0 | 100 | |
| PHF | .811 | .868 | .859 | .795 | .814 | .858 | .000 | .854 | .854 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 2 | 4 | 0 | 6 | 5 | 0 | 0 | 5 | 0 | 5 | 5 | 0 | 16 | 16 |
| 04:15 PM | 3 | 2 | 0 | 5 | 6 | 1 | 0 | 7 | 0 | 4 | 4 | 0 | 16 | 16 |
| 04:30 PM | 5 | 3 | 1 | 8 | 2 | 1 | 0 | 3 | 0 | 2 | 2 | 1 | 13 | 14 |
| 04:45 PM | 1 | 2 | 0 | 3 | 4 | 0 | 0 | 4 | 0 | 4 | 4 | 0 | 11 | 11 |
| Total | 11 | 11 | 1 | 22 | 17 | 2 | 0 | 19 | 0 | 15 | 15 | 1 | 56 | 57 |
| 05:00 PM | 3 | 2 | 0 | 5 | 4 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 10 | 10 |
| 05:15 PM | 1 | 3 | 0 | 4 | 2 | 1 | 0 | 3 | 0 | 3 | 3 | 0 | 10 | 10 |
| 05:30 PM | 3 | 2 | 0 | 5 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 10 | 10 |
| 05:45 PM | 1 | 1 | 0 | 2 | 2 | 0 | 0 | 2 | 0 | 3 | 3 | 0 | 7 | 7 |
| Total | 8 | 8 | 0 | 16 | 13 | 1 | 0 | 14 | 0 | 7 | 7 | 0 | 37 | 37 |
| Grand Total | 19 | 19 | 1 | 38 | 30 | 3 | 0 | 33 | 0 | 22 | 22 | 1 | 93 | 94 |
| Apprch % | 50 | 50 | | | 90.9 | 9.1 | | | 0 | 100 | | | | |
| Total % | 20.4 | 20.4 | | 40.9 | 32.3 | 3.2 | | 35.5 | 0 | 23.7 | 23.7 | 1.1 | 98.9 | |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | **3** | 2 | **5** | 4 | 0 | 4 | 0 | 1 | 1 | **10** |
| 05:15 PM | 1 | **3** | 4 | 2 | **1** | 3 | 0 | **3** | **3** | 10 |
| 05:30 PM | 3 | 2 | 5 | **5** | 0 | **5** | 0 | 0 | 0 | 10 |
| 05:45 PM | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 3 | 3 | 7 |
| Total Volume | 8 | 8 | 16 | 13 | 1 | 14 | 0 | 7 | 7 | 37 |
| % App. Total | 50 | 50 | | 92.9 | 7.1 | | 0 | 100 | | |
| PHF | .667 | .667 | .800 | .650 | .250 | .700 | .000 | .583 | .583 | .925 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

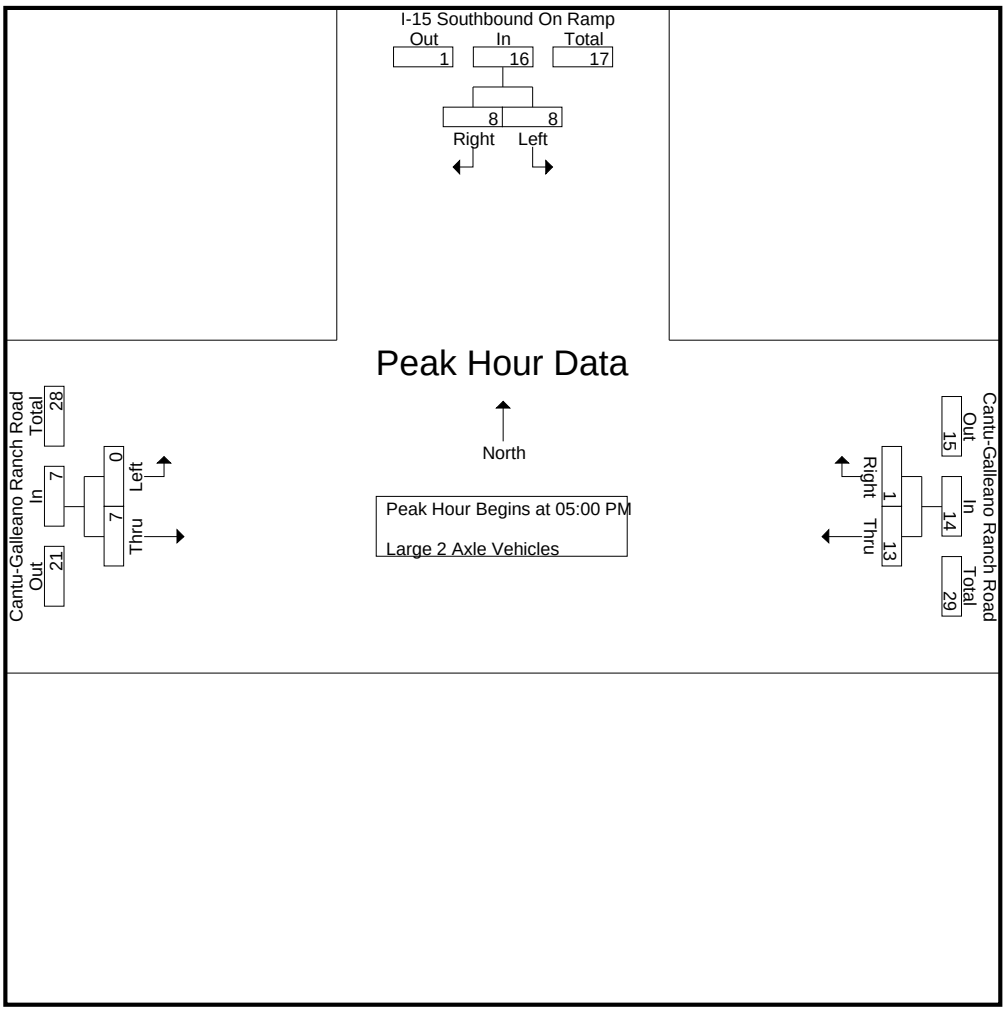


Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **3** | 2 | **5** | 4 | 0 | 4 | 0 | 1 | 1 |
| +15 mins. | 1 | **3** | 4 | 2 | **1** | 3 | 0 | **3** | **3** |
| +30 mins. | 3 | 2 | 5 | **5** | 0 | **5** | 0 | 0 | 0 |
| +45 mins. | 1 | 1 | 2 | 2 | 0 | 2 | 0 | 3 | 3 |
| Total Volume | 8 | 8 | 16 | 13 | 1 | 14 | 0 | 7 | 7 |
| % App. Total | 50 | 50 | | 92.9 | 7.1 | | 0 | 100 | |
| PHF | .667 | .667 | .800 | .650 | .250 | .700 | .000 | .583 | .583 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 3 | 1 | 0 | 4 | 1 | 1 | 0 | 2 | 0 | 1 | 1 | 0 | 7 | 7 |
| 04:15 PM | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 6 | 6 | 0 | 10 | 10 |
| 04:30 PM | 0 | 3 | 0 | 3 | 2 | 0 | 0 | 2 | 0 | 2 | 2 | 0 | 7 | 7 |
| 04:45 PM | 1 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 4 | 4 |
| Total | 5 | 9 | 0 | 14 | 3 | 1 | 0 | 4 | 0 | 10 | 10 | 0 | 28 | 28 |
| 05:00 PM | 1 | 1 | 0 | 2 | 3 | 0 | 0 | 3 | 0 | 5 | 5 | 0 | 10 | 10 |
| 05:15 PM | 1 | 1 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 5 | 5 | 0 | 8 | 8 |
| 05:30 PM | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 5 | 5 | 0 | 8 | 8 |
| 05:45 PM | 1 | 3 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 5 | 5 |
| Total | 3 | 6 | 0 | 9 | 6 | 0 | 0 | 6 | 0 | 16 | 16 | 0 | 31 | 31 |
| Grand Total | 8 | 15 | 0 | 23 | 9 | 1 | 0 | 10 | 0 | 26 | 26 | 0 | 59 | 59 |
| Apprch % | 34.8 | 65.2 | | | 90 | 10 | | | 0 | 100 | | | | |
| Total % | 13.6 | 25.4 | | 39 | 15.3 | 1.7 | | 16.9 | 0 | 44.1 | 44.1 | 0 | 100 | |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | **1** | 1 | 2 | **3** | 0 | **3** | 0 | **5** | **5** | **10** |
| 05:15 PM | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 5 | 5 | 8 |
| 05:30 PM | 0 | 1 | 1 | 2 | 0 | 2 | 0 | 5 | 5 | 8 |
| 05:45 PM | 1 | **3** | **4** | 0 | 0 | 0 | 0 | 1 | 1 | 5 |
| Total Volume | 3 | 6 | 9 | 6 | 0 | 6 | 0 | 16 | 16 | 31 |
| % App. Total | 33.3 | 66.7 | | 100 | 0 | | 0 | 100 | | |
| PHF | .750 | .500 | .563 | .500 | .000 | .500 | .000 | .800 | .800 | .775 |

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City of Ontario
N/S: I-15 Southbound On Ramp
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Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

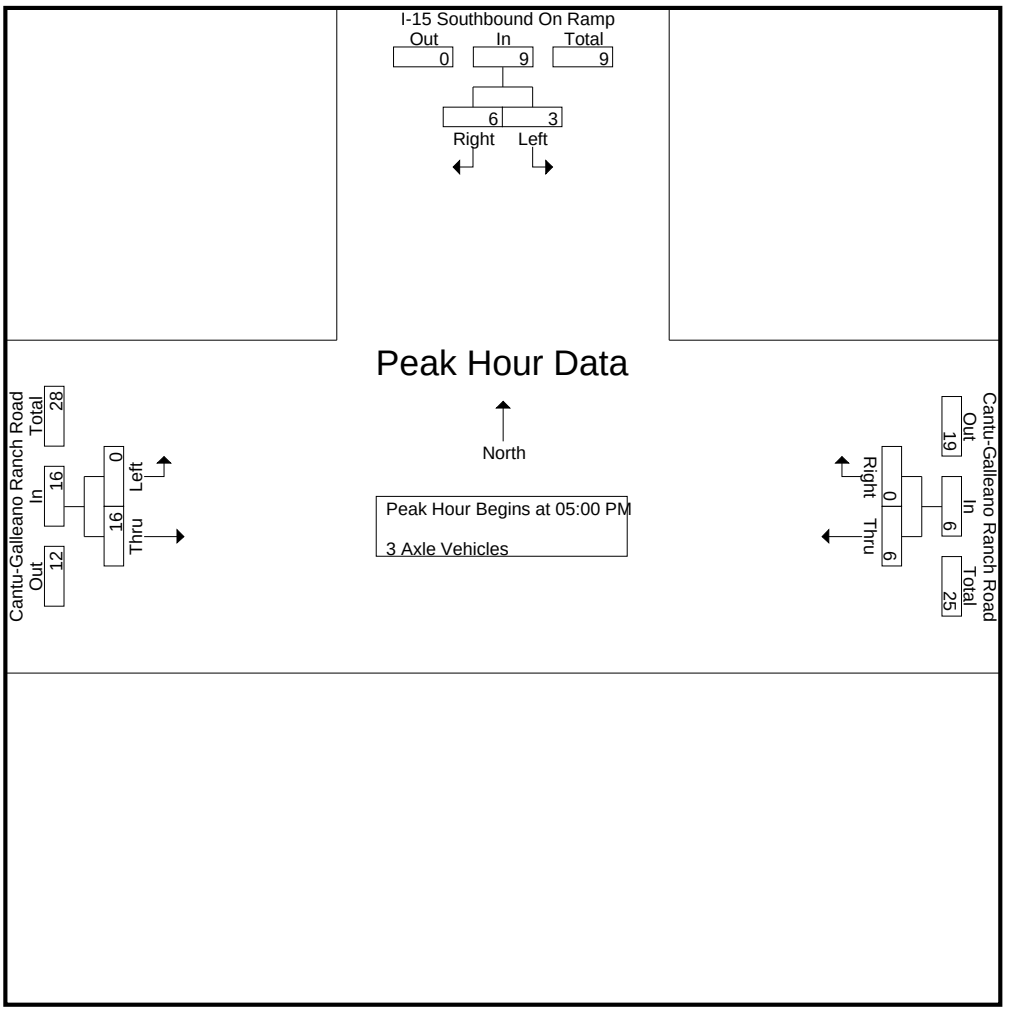


Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **1** | 1 | 2 | **3** | 0 | **3** | 0 | **5** | **5** |
| +15 mins. | 1 | 1 | 2 | 1 | 0 | 1 | 0 | 5 | 5 |
| +30 mins. | 0 | 1 | 1 | 2 | 0 | 2 | 0 | 5 | 5 |
| +45 mins. | 1 | **3** | **4** | 0 | 0 | 0 | 0 | 1 | 1 |
| Total Volume | 3 | 6 | 9 | 6 | 0 | 6 | 0 | 16 | 16 |
| % App. Total | 33.3 | 66.7 | | 100 | 0 | | 0 | 100 | |
| PHF | .750 | .500 | .563 | .500 | .000 | .500 | .000 | .800 | .800 |

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City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
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Page No : 1

Groups Printed- 4+ Axle Trucks

| | I-15 Southbound On Ramp Southbound | | | | Cantu-Galleano Ranch Road Westbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Left | Thru | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 7 | 6 | 0 | 13 | 5 | 8 | 0 | 13 | 0 | 16 | 16 | 0 | 42 | 42 |
| 04:15 PM | 4 | 6 | 1 | 10 | 8 | 5 | 0 | 13 | 0 | 10 | 10 | 1 | 33 | 34 |
| 04:30 PM | 4 | 4 | 0 | 8 | 5 | 3 | 0 | 8 | 0 | 13 | 13 | 0 | 29 | 29 |
| 04:45 PM | 4 | 4 | 0 | 8 | 4 | 6 | 0 | 10 | 0 | 12 | 12 | 0 | 30 | 30 |
| Total | 19 | 20 | 1 | 39 | 22 | 22 | 0 | 44 | 0 | 51 | 51 | 1 | 134 | 135 |
| 05:00 PM | 1 | 9 | 0 | 10 | 8 | 6 | 0 | 14 | 0 | 5 | 5 | 0 | 29 | 29 |
| 05:15 PM | 6 | 7 | 0 | 13 | 8 | 5 | 0 | 13 | 0 | 4 | 4 | 0 | 30 | 30 |
| 05:30 PM | 6 | 8 | 1 | 14 | 8 | 6 | 0 | 14 | 0 | 10 | 10 | 1 | 38 | 39 |
| 05:45 PM | 2 | 9 | 1 | 11 | 7 | 5 | 0 | 12 | 0 | 6 | 6 | 1 | 29 | 30 |
| Total | 15 | 33 | 2 | 48 | 31 | 22 | 0 | 53 | 0 | 25 | 25 | 2 | 126 | 128 |
| Grand Total | 34 | 53 | 3 | 87 | 53 | 44 | 0 | 97 | 0 | 76 | 76 | 3 | 260 | 263 |
| Apprch % | 39.1 | 60.9 | | | 54.6 | 45.4 | | | 0 | 100 | | | | |
| Total % | 13.1 | 20.4 | | 33.5 | 20.4 | 16.9 | | 37.3 | 0 | 29.2 | 29.2 | 1.1 | 98.9 | |

| | I-15 Southbound On Ramp Southbound | | | Cantu-Galleano Ranch Road Westbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Right | App. Total | Thru | Right | App. Total | Left | Thru | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | 1 | **9** | 10 | **8** | **6** | **14** | 0 | 5 | 5 | 29 |
| 05:15 PM | **6** | 7 | 13 | 8 | 5 | 13 | 0 | 4 | 4 | 30 |
| 05:30 PM | 6 | 8 | **14** | 8 | 6 | 14 | 0 | **10** | **10** | **38** |
| 05:45 PM | 2 | 9 | 11 | 7 | 5 | 12 | 0 | 6 | 6 | 29 |
| Total Volume | 15 | 33 | 48 | 31 | 22 | 53 | 0 | 25 | 25 | 126 |
| % App. Total | 31.2 | 68.8 | | 58.5 | 41.5 | | 0 | 100 | | |
| PHF | .625 | .917 | .857 | .969 | .917 | .946 | .000 | .625 | .625 | .829 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Southbound On Ramp
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 44_ESV_15S_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

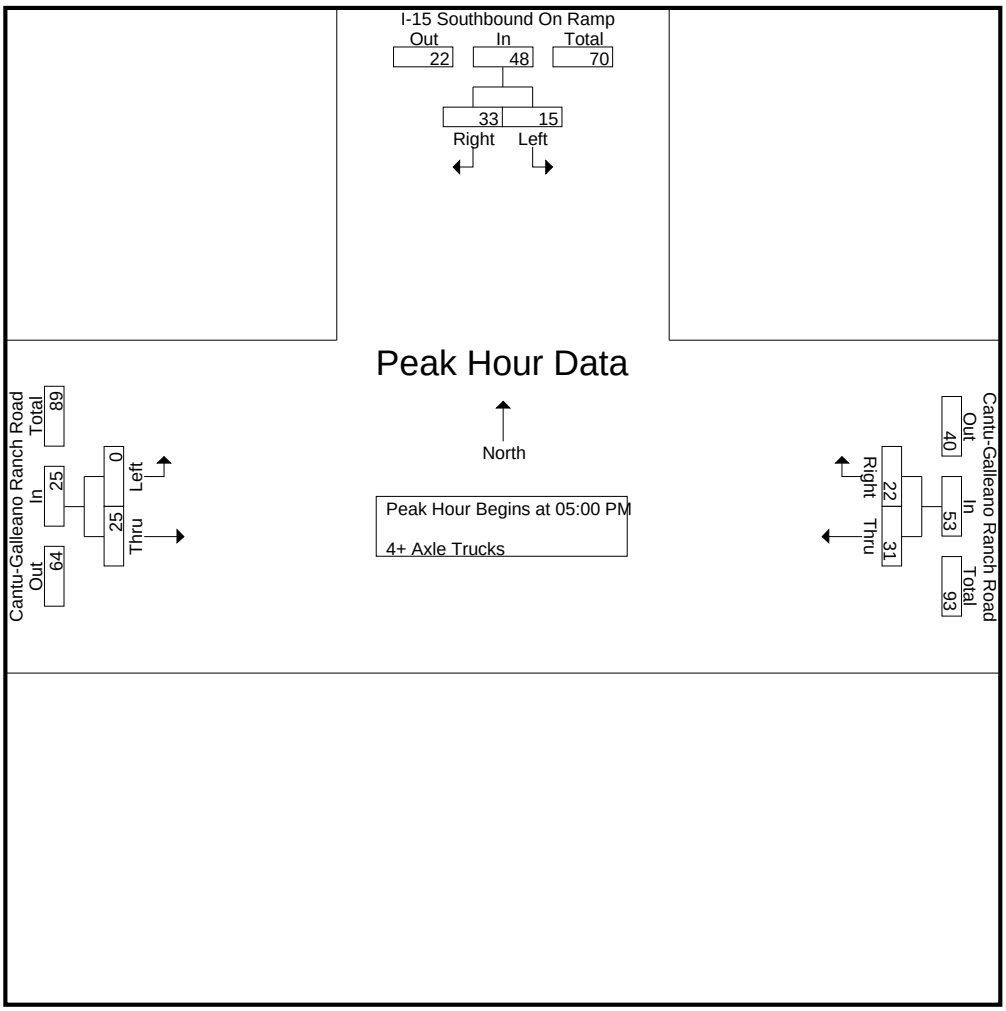


Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 1 | **9** | 10 | **8** | **6** | **14** | 0 | 5 | 5 |
| +15 mins. | **6** | 7 | 13 | 8 | 5 | 13 | 0 | 4 | 4 |
| +30 mins. | 6 | 8 | **14** | 8 | 6 | 14 | 0 | **10** | **10** |
| +45 mins. | 2 | 9 | 11 | 7 | 5 | 12 | 0 | 6 | 6 |
| Total Volume | 15 | 33 | 48 | 31 | 22 | 53 | 0 | 25 | 25 |
| % App. Total | 31.2 | 68.8 | | 58.5 | 41.5 | | 0 | 100 | |
| PHF | .625 | .917 | .857 | .969 | .917 | .946 | .000 | .625 | .625 |

Location: Eastvale
N/S: I-15 SB On Ramp
E/W: Cantu-Galleano Ranch Rd

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>I-15 SB On Ramp | East Leg<br>Cantu-Galleano Ranch Rd | South Leg<br>Dead End | West Leg<br>Cantu-Galleano Ranch Rd | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

| | North Leg<br>I-15 SB On Ramp | East Leg<br>Cantu-Galleano Ranch Rd | South Leg<br>Dead End | West Leg<br>Cantu-Galleano Ranch Rd | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 1 | 0 | 0 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 1 | 0 | 0 | 0 | 1 |

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951-268-6268

Location: Eastvale
N/S: I-15 SB On Ramp
E/W: Cantu-Galleano Ranch Rd

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound I-15 SB On Ramp | | | Westbound Cantu-Galleano Ranch Rd | | | Northbound Dead End | | | Eastbound Cantu-Galleano Ranch Rd | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

| | Southbound I-15 SB On Ramp | | | Westbound Cantu-Galleano Ranch Rd | | | Northbound Dead End | | | Eastbound Cantu-Galleano Ranch Rd | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

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Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 54 | 41 | 95 | 76 | 60 | 21 | 136 | 67 | 127 | 64 | 194 | 85 | 425 | 510 |
| 07:15 AM | 35 | 73 | 108 | 87 | 56 | 21 | 143 | 78 | 137 | 63 | 215 | 84 | 466 | 550 |
| 07:30 AM | 44 | 70 | 114 | 82 | 43 | 20 | 125 | 96 | 163 | 61 | 259 | 81 | 498 | 579 |
| 07:45 AM | 60 | 58 | 118 | 68 | 44 | 21 | 112 | 108 | 140 | 52 | 248 | 73 | 478 | 551 |
| Total | 193 | 242 | 435 | 313 | 203 | 83 | 516 | 349 | 567 | 240 | 916 | 323 | 1867 | 2190 |
| 08:00 AM | 46 | 73 | 119 | 53 | 43 | 23 | 96 | 99 | 172 | 18 | 271 | 41 | 486 | 527 |
| 08:15 AM | 36 | 55 | 91 | 59 | 54 | 21 | 113 | 77 | 108 | 26 | 185 | 47 | 389 | 436 |
| 08:30 AM | 48 | 60 | 108 | 55 | 50 | 24 | 105 | 76 | 114 | 37 | 190 | 61 | 403 | 464 |
| 08:45 AM | 27 | 60 | 87 | 62 | 63 | 30 | 125 | 88 | 96 | 46 | 184 | 76 | 396 | 472 |
| Total | 157 | 248 | 405 | 229 | 210 | 98 | 439 | 340 | 490 | 127 | 830 | 225 | 1674 | 1899 |
| Grand Total | 350 | 490 | 840 | 542 | 413 | 181 | 955 | 689 | 1057 | 367 | 1746 | 548 | 3541 | 4089 |
| Apprch % | 41.7 | 58.3 | | 56.8 | 43.2 | | | 39.5 | 60.5 | | | | | |
| Total % | 9.9 | 13.8 | 23.7 | 15.3 | 11.7 | | 27 | 19.5 | 29.9 | | 49.3 | 13.4 | 86.6 | |
| Passenger Vehicles | 297 | 381 | 678 | 499 | 306 | | 951 | 618 | 967 | | 1922 | 0 | 0 | 3551 |
| % Passenger Vehicles | 84.9 | 77.8 | 80.7 | 92.1 | 74.1 | 80.7 | 83.7 | 89.7 | 91.5 | 91.8 | 91 | 0 | 0 | 86.8 |
| Large 2 Axle Vehicles | 7 | 9 | 16 | 12 | 9 | | 24 | 17 | 21 | | 43 | 0 | 0 | 83 |
| % Large 2 Axle Vehicles | 2 | 1.8 | 1.9 | 2.2 | 2.2 | 1.7 | 2.1 | 2.5 | 2 | 1.4 | 2 | 0 | 0 | 2 |
| 3 Axle Vehicles | 10 | 19 | 29 | 8 | 5 | | 16 | 11 | 18 | | 37 | 0 | 0 | 82 |
| % 3 Axle Vehicles | 2.9 | 3.9 | 3.5 | 1.5 | 1.2 | 1.7 | 1.4 | 1.6 | 1.7 | 2.2 | 1.8 | 0 | 0 | 2 |
| 4+ Axle Trucks | 36 | 81 | 117 | 23 | 93 | | 145 | 43 | 51 | | 111 | 0 | 0 | 373 |
| % 4+ Axle Trucks | 10.3 | 16.5 | 13.9 | 4.2 | 22.5 | 16 | 12.8 | 6.2 | 4.8 | 4.6 | 5.3 | 0 | 0 | 9.1 |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 35 | **73** | 108 | **87** | **56** | **143** | 78 | 137 | 215 | 466 |
| 07:30 AM | 44 | 70 | 114 | 82 | 43 | 125 | 96 | 163 | 259 | **498** |
| 07:45 AM | **60** | 58 | 118 | 68 | 44 | 112 | **108** | 140 | 248 | 478 |
| 08:00 AM | 46 | 73 | **119** | 53 | 43 | 96 | 99 | **172** | **271** | 486 |
| Total Volume | 185 | 274 | 459 | 290 | 186 | 476 | 381 | 612 | 993 | 1928 |
| % App. Total | 40.3 | 59.7 | | 60.9 | 39.1 | | 38.4 | 61.6 | | |
| PHF | .771 | .938 | .964 | .833 | .830 | .832 | .882 | .890 | .916 | .968 |

Counts Unlimited, Inc.
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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

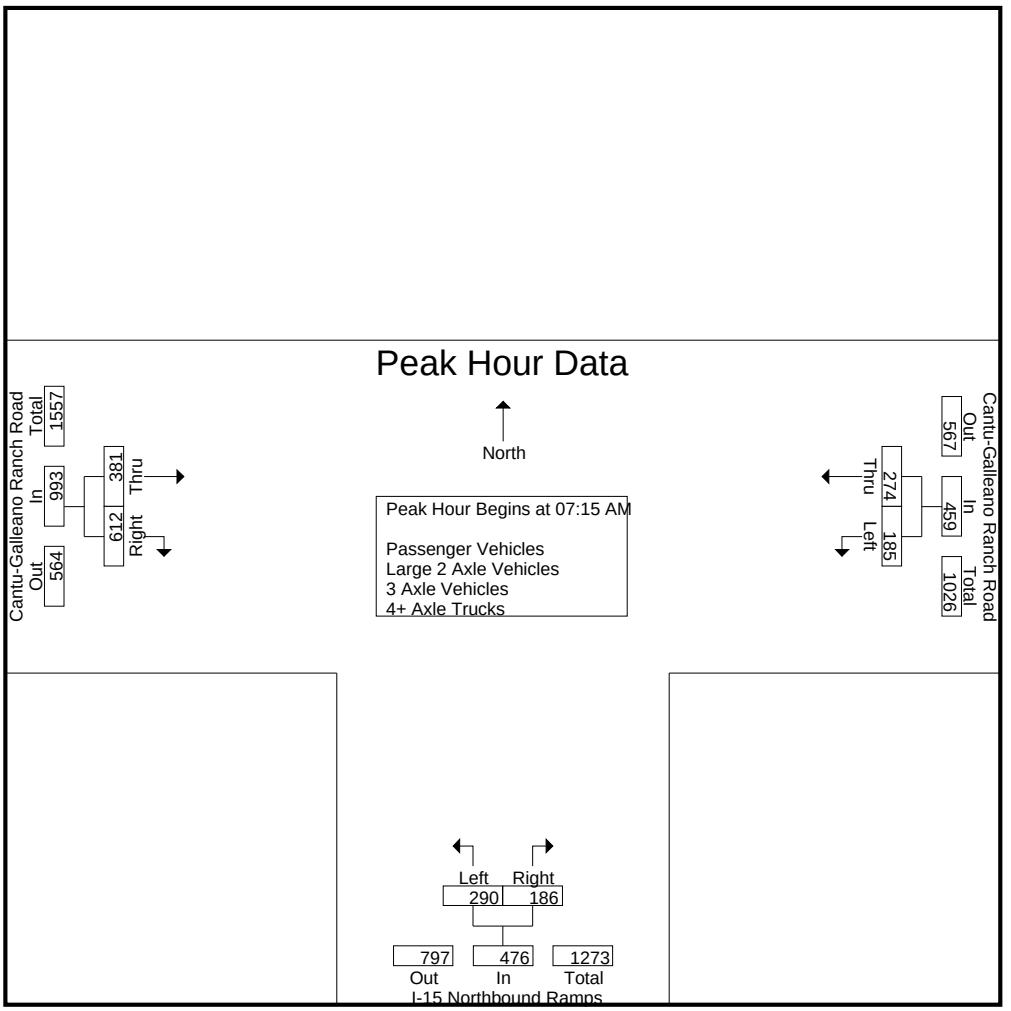


Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:00 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 35 | **73** | 108 | 76 | **60** | 136 | 78 | 137 | 215 |
| +15 mins. | 44 | 70 | 114 | **87** | 56 | **143** | 96 | 163 | 259 |
| +30 mins. | **60** | 58 | 118 | 82 | 43 | 125 | **108** | 140 | 248 |
| +45 mins. | 46 | 73 | **119** | 68 | 44 | 112 | 99 | **172** | **271** |
| Total Volume | 185 | 274 | 459 | 313 | 203 | 516 | 381 | 612 | 993 |
| % App. Total | 40.3 | 59.7 | | 60.7 | 39.3 | | 38.4 | 61.6 | |
| PHF | .771 | .938 | .964 | .899 | .846 | .902 | .882 | .890 | .916 |

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PO Box 1178
Corona, CA 92878
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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 47 | 33 | 80 | 71 | 44 | 16 | 115 | 57 | 114 | 57 | 171 | 73 | 366 | 439 |
| 07:15 AM | 30 | 56 | 86 | 85 | 47 | 17 | 132 | 66 | 123 | 58 | 189 | 75 | 407 | 482 |
| 07:30 AM | 36 | 55 | 91 | 74 | 35 | 17 | 109 | 86 | 148 | 60 | 234 | 77 | 434 | 511 |
| 07:45 AM | 55 | 44 | 99 | 63 | 31 | 15 | 94 | 101 | 131 | 49 | 232 | 64 | 425 | 489 |
| Total | 168 | 188 | 356 | 293 | 157 | 65 | 450 | 310 | 516 | 224 | 826 | 289 | 1632 | 1921 |
| 08:00 AM | 38 | 61 | 99 | 50 | 28 | 16 | 78 | 91 | 164 | 18 | 255 | 34 | 432 | 466 |
| 08:15 AM | 33 | 43 | 76 | 51 | 40 | 18 | 91 | 73 | 100 | 23 | 173 | 41 | 340 | 381 |
| 08:30 AM | 35 | 44 | 79 | 50 | 35 | 21 | 85 | 66 | 108 | 33 | 174 | 54 | 338 | 392 |
| 08:45 AM | 23 | 45 | 68 | 55 | 46 | 26 | 101 | 78 | 79 | 39 | 157 | 65 | 326 | 391 |
| Total | 129 | 193 | 322 | 206 | 149 | 81 | 355 | 308 | 451 | 113 | 759 | 194 | 1436 | 1630 |
| Grand Total | 297 | 381 | 678 | 499 | 306 | 146 | 805 | 618 | 967 | 337 | 1585 | 483 | 3068 | 3551 |
| Apprch % | 43.8 | 56.2 | | 62 | 38 | | | 39 | 61 | | | | | |
| Total % | 9.7 | 12.4 | 22.1 | 16.3 | 10 | | 26.2 | 20.1 | 31.5 | | 51.7 | 13.6 | 86.4 | |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 30 | 56 | 86 | **85** | **47** | **132** | 66 | 123 | 189 | 407 |
| 07:30 AM | 36 | 55 | 91 | 74 | 35 | 109 | 86 | 148 | 234 | **434** |
| 07:45 AM | **55** | 44 | **99** | 63 | 31 | 94 | **101** | 131 | 232 | 425 |
| 08:00 AM | 38 | **61** | 99 | 50 | 28 | 78 | 91 | **164** | **255** | 432 |
| Total Volume | 159 | 216 | 375 | 272 | 141 | 413 | 344 | 566 | 910 | 1698 |
| % App. Total | 42.4 | 57.6 | | 65.9 | 34.1 | | 37.8 | 62.2 | | |
| PHF | .723 | .885 | .947 | .800 | .750 | .782 | .851 | .863 | .892 | .978 |

Counts Unlimited, Inc.
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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

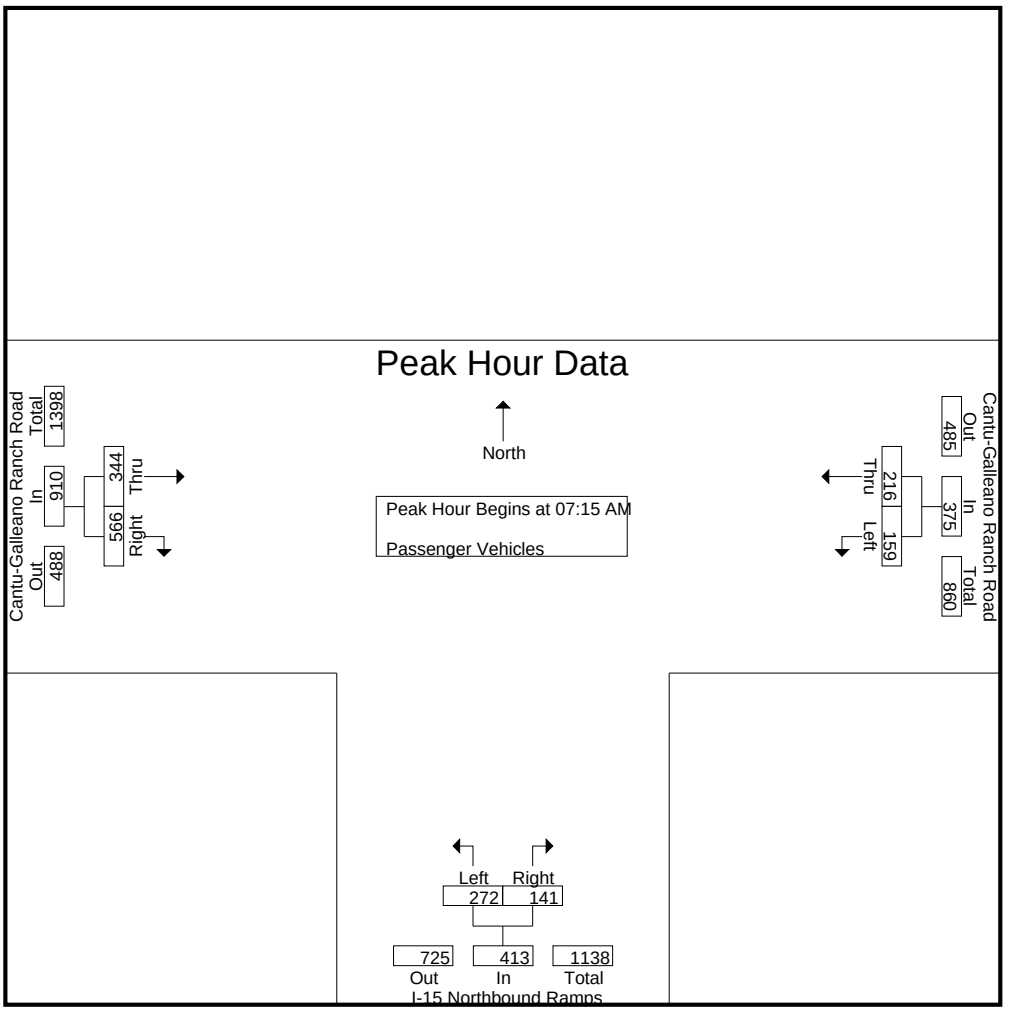


Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 30 | 56 | 86 | **85** | **47** | **132** | 66 | 123 | 189 |
| +15 mins. | 36 | 55 | 91 | 74 | 35 | 109 | 86 | 148 | 234 |
| +30 mins. | **55** | 44 | **99** | 63 | 31 | 94 | **101** | 131 | 232 |
| +45 mins. | 38 | **61** | 99 | 50 | 28 | 78 | 91 | **164** | **255** |
| Total Volume | 159 | 216 | 375 | 272 | 141 | 413 | 344 | 566 | 910 |
| % App. Total | 42.4 | 57.6 | | 65.9 | 34.1 | | 37.8 | 62.2 | |
| PHF | .723 | .885 | .947 | .800 | .750 | .782 | .851 | .863 | .892 |

Counts Unlimited, Inc.
PO Box 1178
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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 1 | 1 | 2 | 2 | 2 | 1 | 4 | 1 | 4 | 1 | 5 | 2 | 11 | 13 |
| 07:15 AM | 1 | 2 | 3 | 0 | 0 | 0 | 0 | 3 | 5 | 2 | 8 | 2 | 11 | 13 |
| 07:30 AM | 1 | 0 | 1 | 3 | 0 | 0 | 3 | 2 | 4 | 0 | 6 | 0 | 10 | 10 |
| 07:45 AM | 0 | 1 | 1 | 4 | 2 | 1 | 6 | 3 | 4 | 1 | 7 | 2 | 14 | 16 |
| Total | 3 | 4 | 7 | 9 | 4 | 2 | 13 | 9 | 17 | 4 | 26 | 6 | 46 | 52 |
| 08:00 AM | 1 | 2 | 3 | 0 | 2 | 0 | 2 | 3 | 1 | 0 | 4 | 0 | 9 | 9 |
| 08:15 AM | 0 | 1 | 1 | 2 | 1 | 0 | 3 | 2 | 0 | 0 | 2 | 0 | 6 | 6 |
| 08:30 AM | 3 | 0 | 3 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 6 | 7 |
| 08:45 AM | 0 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 0 | 4 | 1 | 8 | 9 |
| Total | 4 | 5 | 9 | 3 | 5 | 1 | 8 | 8 | 4 | 1 | 12 | 2 | 29 | 31 |
| Grand Total | 7 | 9 | 16 | 12 | 9 | 3 | 21 | 17 | 21 | 5 | 38 | 8 | 75 | 83 |
| Apprch % | 43.8 | 56.2 | | 57.1 | 42.9 | | | 44.7 | 55.3 | | | | | |
| Total % | 9.3 | 12 | 21.3 | 16 | 12 | | 28 | 22.7 | 28 | | 50.7 | 9.6 | 90.4 | |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | **1** | **2** | **3** | 0 | 0 | 0 | **3** | **5** | **8** | 11 |
| 07:30 AM | 1 | 0 | 1 | 3 | 0 | 3 | 2 | 4 | 6 | 10 |
| 07:45 AM | 0 | 1 | 1 | **4** | **2** | **6** | 3 | 4 | 7 | **14** |
| 08:00 AM | 1 | 2 | 3 | 0 | 2 | 2 | 3 | 1 | 4 | 9 |
| Total Volume | 3 | 5 | 8 | 7 | 4 | 11 | 11 | 14 | 25 | 44 |
| % App. Total | 37.5 | 62.5 | | 63.6 | 36.4 | | 44 | 56 | | |
| PHF | .750 | .625 | .667 | .438 | .500 | .458 | .917 | .700 | .781 | .786 |

Counts Unlimited, Inc.
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Corona, CA 92878
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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

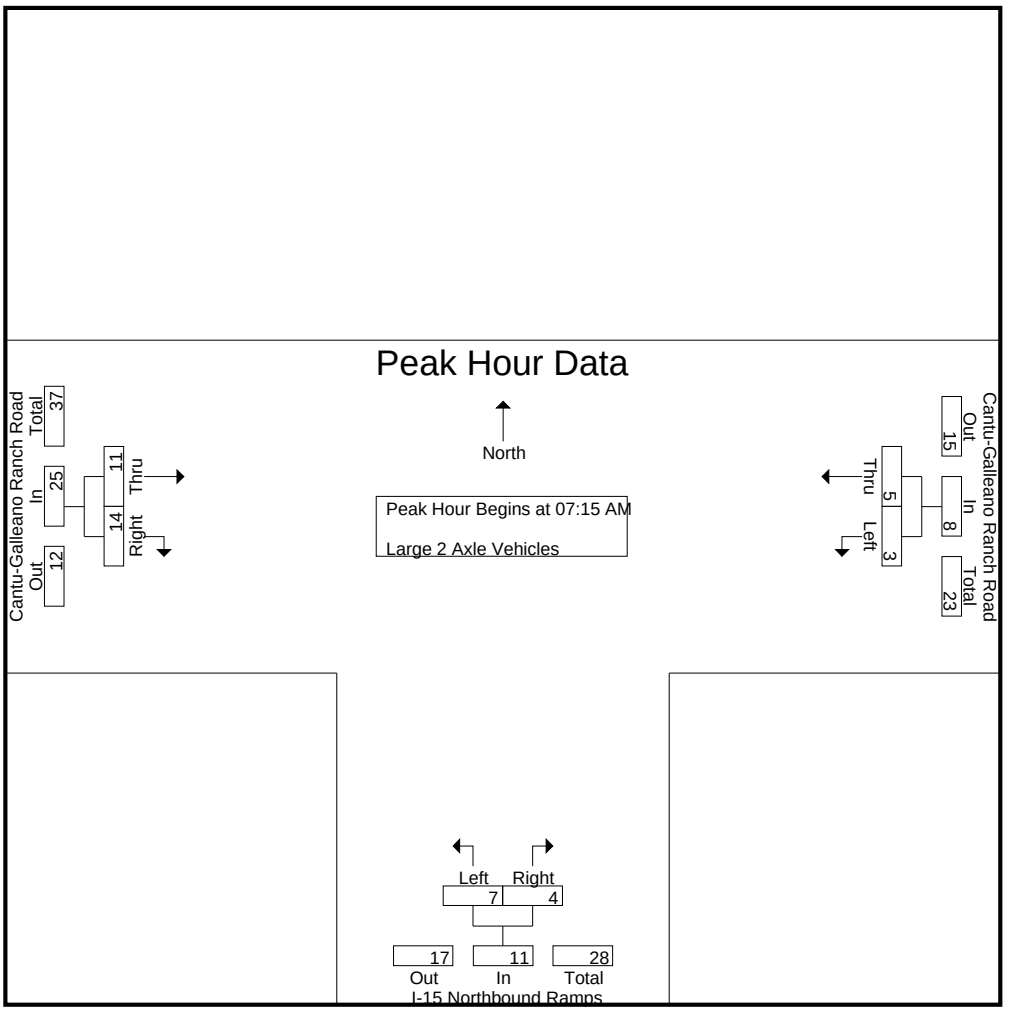


Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **1** | **2** | **3** | 0 | 0 | 0 | **3** | **5** | **8** |
| +15 mins. | 1 | 0 | 1 | 3 | 0 | 3 | 2 | 4 | 6 |
| +30 mins. | 0 | 1 | 1 | **4** | **2** | **6** | 3 | 4 | 7 |
| +45 mins. | 1 | 2 | 3 | 0 | 2 | 2 | 3 | 1 | 4 |
| Total Volume | 3 | 5 | 8 | 7 | 4 | 11 | 11 | 14 | 25 |
| % App. Total | 37.5 | 62.5 | | 63.6 | 36.4 | | 44 | 56 | |
| PHF | .750 | .625 | .667 | .438 | .500 | .458 | .917 | .700 | .781 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 1 | 4 | 0 | 1 | 1 | 1 | 3 | 3 | 3 | 6 | 4 | 11 | 15 |
| 07:15 AM | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 7 | 0 | 8 | 8 |
| 07:30 AM | 3 | 4 | 7 | 2 | 1 | 0 | 3 | 0 | 3 | 1 | 3 | 1 | 13 | 14 |
| 07:45 AM | 1 | 2 | 3 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 5 | 6 |
| Total | 7 | 8 | 15 | 2 | 3 | 2 | 5 | 7 | 10 | 4 | 17 | 6 | 37 | 43 |
| 08:00 AM | 1 | 3 | 4 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 2 | 0 | 7 | 7 |
| 08:15 AM | 0 | 1 | 1 | 3 | 1 | 1 | 4 | 1 | 3 | 2 | 4 | 3 | 9 | 12 |
| 08:30 AM | 2 | 6 | 8 | 1 | 1 | 0 | 2 | 2 | 0 | 0 | 2 | 0 | 12 | 12 |
| 08:45 AM | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 4 | 2 | 4 | 2 | 6 | 8 |
| Total | 3 | 11 | 14 | 6 | 2 | 1 | 8 | 4 | 8 | 4 | 12 | 5 | 34 | 39 |
| Grand Total | 10 | 19 | 29 | 8 | 5 | 3 | 13 | 11 | 18 | 8 | 29 | 11 | 71 | 82 |
| Apprch % | 34.5 | 65.5 | | 61.5 | 38.5 | | | 37.9 | 62.1 | | | | | |
| Total % | 14.1 | 26.8 | 40.8 | 11.3 | 7 | | 18.3 | 15.5 | 25.4 | | 40.8 | 13.4 | 86.6 | |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 0 | 1 | 1 | 0 | 0 | 0 | **3** | **4** | **7** | 8 |
| 07:30 AM | **3** | **4** | **7** | **2** | **1** | **3** | 0 | 3 | 3 | **13** |
| 07:45 AM | 1 | 2 | 3 | 0 | 1 | 1 | 1 | 0 | 1 | 5 |
| 08:00 AM | 1 | 3 | 4 | 1 | 0 | 1 | 1 | 1 | 2 | 7 |
| Total Volume | 5 | 10 | 15 | 3 | 2 | 5 | 5 | 8 | 13 | 33 |
| % App. Total | 33.3 | 66.7 | | 60 | 40 | | 38.5 | 61.5 | | |
| PHF | .417 | .625 | .536 | .375 | .500 | .417 | .417 | .500 | .464 | .635 |

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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

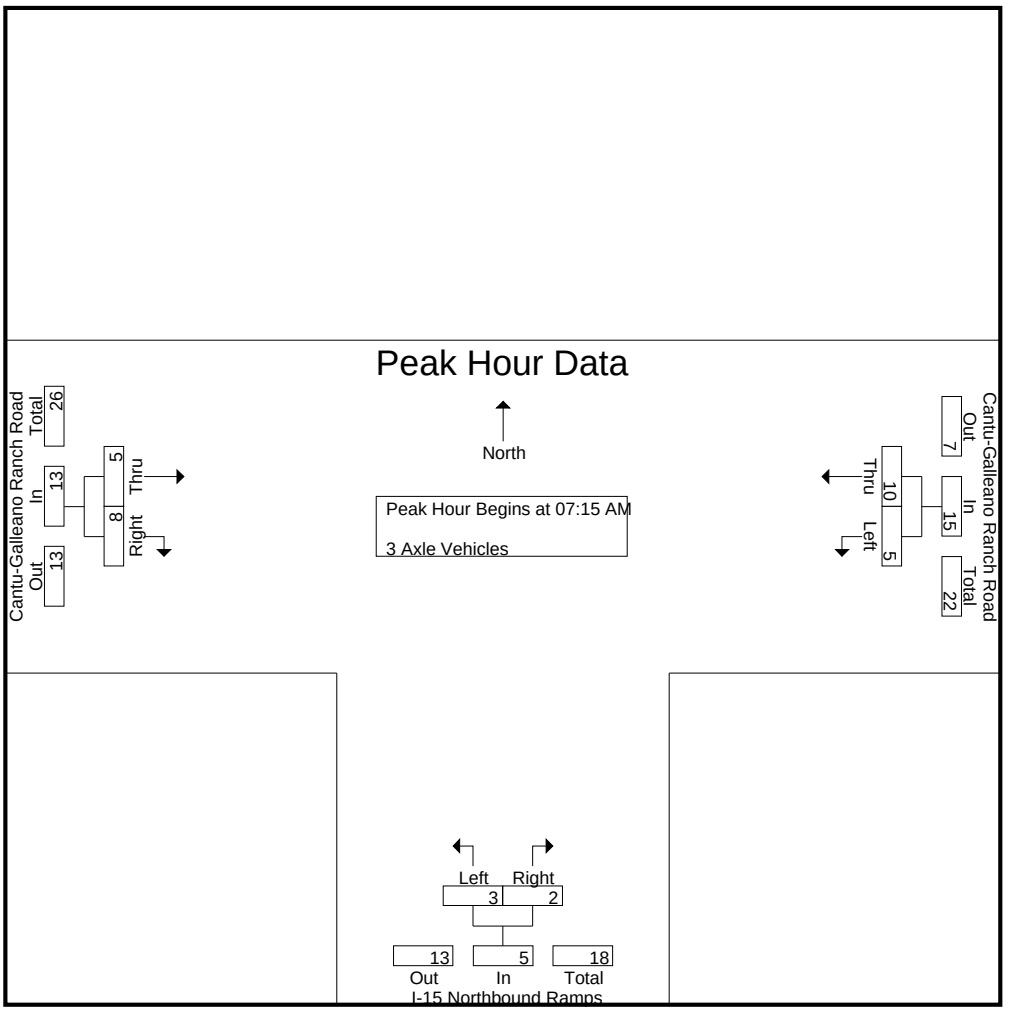


Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 1 | 1 | 0 | 0 | 0 | **3** | **4** | **7** |
| +15 mins. | **3** | **4** | **7** | **2** | **1** | **3** | 0 | 3 | 3 |
| +30 mins. | 1 | 2 | 3 | 0 | 1 | 1 | 1 | 0 | 1 |
| +45 mins. | 1 | 3 | 4 | 1 | 0 | 1 | 1 | 1 | 2 |
| Total Volume | 5 | 10 | 15 | 3 | 2 | 5 | 5 | 8 | 13 |
| % App. Total | 33.3 | 66.7 | | 60 | 40 | | 38.5 | 61.5 | |
| PHF | .417 | .625 | .536 | .375 | .500 | .417 | .417 | .500 | .464 |

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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 07:00 AM | 3 | 6 | 9 | 3 | 13 | 3 | 16 | 6 | 6 | 3 | 12 | 6 | 37 | 43 |
| 07:15 AM | 4 | 14 | 18 | 2 | 9 | 4 | 11 | 6 | 5 | 3 | 11 | 7 | 40 | 47 |
| 07:30 AM | 4 | 11 | 15 | 3 | 7 | 3 | 10 | 8 | 8 | 0 | 16 | 3 | 41 | 44 |
| 07:45 AM | 4 | 11 | 15 | 1 | 10 | 4 | 11 | 3 | 5 | 2 | 8 | 6 | 34 | 40 |
| Total | 15 | 42 | 57 | 9 | 39 | 14 | 48 | 23 | 24 | 8 | 47 | 22 | 152 | 174 |
| 08:00 AM | 6 | 7 | 13 | 2 | 13 | 7 | 15 | 4 | 6 | 0 | 10 | 7 | 38 | 45 |
| 08:15 AM | 3 | 10 | 13 | 3 | 12 | 2 | 15 | 1 | 5 | 1 | 6 | 3 | 34 | 37 |
| 08:30 AM | 8 | 10 | 18 | 4 | 13 | 3 | 17 | 7 | 5 | 3 | 12 | 6 | 47 | 53 |
| 08:45 AM | 4 | 12 | 16 | 5 | 16 | 3 | 21 | 8 | 11 | 5 | 19 | 8 | 56 | 64 |
| Total | 21 | 39 | 60 | 14 | 54 | 15 | 68 | 20 | 27 | 9 | 47 | 24 | 175 | 199 |
| Grand Total | 36 | 81 | 117 | 23 | 93 | 29 | 116 | 43 | 51 | 17 | 94 | 46 | 327 | 373 |
| Apprch % | 30.8 | 69.2 | | 19.8 | 80.2 | | | 45.7 | 54.3 | | | | | |
| Total % | 11 | 24.8 | 35.8 | 7 | 28.4 | | 35.5 | 13.1 | 15.6 | | 28.7 | 12.3 | 87.7 | |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | |
| 07:15 AM | 4 | **14** | **18** | 2 | 9 | 11 | 6 | 5 | 11 | 40 |
| 07:30 AM | 4 | 11 | 15 | **3** | 7 | 10 | **8** | **8** | **16** | **41** |
| 07:45 AM | 4 | 11 | 15 | 1 | 10 | 11 | 3 | 5 | 8 | 34 |
| 08:00 AM | **6** | 7 | 13 | 2 | **13** | **15** | 4 | 6 | 10 | 38 |
| Total Volume | 18 | 43 | 61 | 8 | 39 | 47 | 21 | 24 | 45 | 153 |
| % App. Total | 29.5 | 70.5 | | 17 | 83 | | 46.7 | 53.3 | | |
| PHF | .750 | .768 | .847 | .667 | .750 | .783 | .656 | .750 | .703 | .933 |

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City of Ontario
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E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR AMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

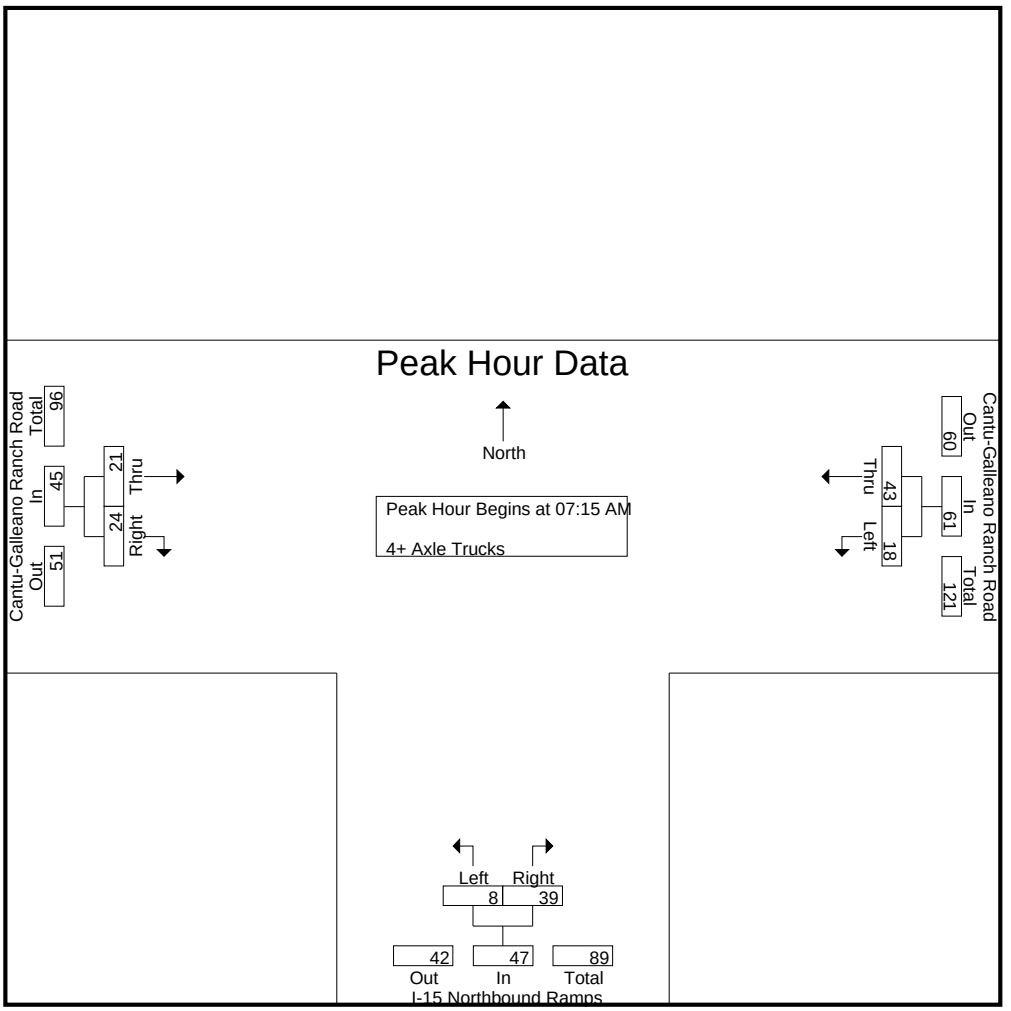


Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 07:15 AM | | | 07:15 AM | | | 07:15 AM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 4 | **14** | **18** | 2 | 9 | 11 | 6 | 5 | 11 |
| +15 mins. | 4 | 11 | 15 | **3** | 7 | 10 | **8** | **8** | **16** |
| +30 mins. | 4 | 11 | 15 | 1 | 10 | 11 | 3 | 5 | 8 |
| +45 mins. | **6** | 7 | 13 | 2 | **13** | **15** | 4 | 6 | 10 |
| Total Volume | 18 | 43 | 61 | 8 | 39 | 47 | 21 | 24 | 45 |
| % App. Total | 29.5 | 70.5 | | 17 | 83 | | 46.7 | 53.3 | |
| PHF | .750 | .768 | .847 | .667 | .750 | .783 | .656 | .750 | .703 |

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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles - Large 2 Axle Vehicles - 3 Axle Vehicles - 4+ Axle Trucks

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 39 | 90 | 129 | 67 | 65 | 28 | 132 | 149 | 127 | 56 | 276 | 84 | 537 | 621 |
| 04:15 PM | 38 | 75 | 113 | 78 | 59 | 24 | 137 | 136 | 110 | 35 | 246 | 59 | 496 | 555 |
| 04:30 PM | 43 | 95 | 138 | 74 | 37 | 18 | 111 | 169 | 115 | 44 | 284 | 62 | 533 | 595 |
| 04:45 PM | 39 | 87 | 126 | 73 | 42 | 15 | 115 | 120 | 103 | 33 | 223 | 48 | 464 | 512 |
| Total | 159 | 347 | 506 | 292 | 203 | 85 | 495 | 574 | 455 | 168 | 1029 | 253 | 2030 | 2283 |
| 05:00 PM | 38 | 85 | 123 | 73 | 29 | 12 | 102 | 135 | 132 | 38 | 267 | 50 | 492 | 542 |
| 05:15 PM | 39 | 74 | 113 | 102 | 28 | 13 | 130 | 139 | 112 | 47 | 251 | 60 | 494 | 554 |
| 05:30 PM | 34 | 92 | 126 | 81 | 37 | 12 | 118 | 141 | 188 | 91 | 329 | 103 | 573 | 676 |
| 05:45 PM | 35 | 79 | 114 | 113 | 30 | 18 | 143 | 135 | 157 | 46 | 292 | 64 | 549 | 613 |
| Total | 146 | 330 | 476 | 369 | 124 | 55 | 493 | 550 | 589 | 222 | 1139 | 277 | 2108 | 2385 |
| Grand Total | 305 | 677 | 982 | 661 | 327 | 140 | 988 | 1124 | 1044 | 390 | 2168 | 530 | 4138 | 4668 |
| Apprch % | 31.1 | 68.9 | | 66.9 | 33.1 | | | 51.8 | 48.2 | | | | | |
| Total % | 7.4 | 16.4 | 23.7 | 16 | 7.9 | | 23.9 | 27.2 | 25.2 | | 52.4 | 11.4 | 88.6 | |
| Passenger Vehicles | 274 | 589 | 863 | 611 | 260 | | 994 | 1016 | 973 | | 2355 | 0 | 0 | 4212 |
| % Passenger Vehicles | 89.8 | 87 | 87.9 | 92.4 | 79.5 | 87.9 | 88.1 | 90.4 | 93.2 | 93.8 | 92.1 | 0 | 0 | 90.2 |
| Large 2 Axle Vehicles | 6 | 16 | 22 | 15 | 8 | | 27 | 25 | 10 | | 38 | 0 | 0 | 87 |
| % Large 2 Axle Vehicles | 2 | 2.4 | 2.2 | 2.3 | 2.4 | 2.9 | 2.4 | 2.2 | 1 | 0.8 | 1.5 | 0 | 0 | 1.9 |
| 3 Axle Vehicles | 4 | 8 | 12 | 1 | 4 | | 5 | 17 | 17 | | 40 | 0 | 0 | 57 |
| % 3 Axle Vehicles | 1.3 | 1.2 | 1.2 | 0.2 | 1.2 | 0 | 0.4 | 1.5 | 1.6 | 1.5 | 1.6 | 0 | 0 | 1.2 |
| 4+ Axle Trucks | 21 | 64 | 85 | 34 | 55 | | 102 | 66 | 44 | | 125 | 0 | 0 | 312 |
| % 4+ Axle Trucks | 6.9 | 9.5 | 8.7 | 5.1 | 16.8 | 9.3 | 9 | 5.9 | 4.2 | 3.8 | 4.9 | 0 | 0 | 6.7 |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | 38 | 85 | 123 | 73 | 29 | 102 | 135 | 132 | 267 | 492 |
| 05:15 PM | **39** | 74 | 113 | 102 | 28 | 130 | 139 | 112 | 251 | 494 |
| 05:30 PM | 34 | **92** | **126** | 81 | **37** | 118 | **141** | **188** | **329** | **573** |
| 05:45 PM | 35 | 79 | 114 | **113** | 30 | **143** | 135 | 157 | 292 | 549 |
| Total Volume | 146 | 330 | 476 | 369 | 124 | 493 | 550 | 589 | 1139 | 2108 |
| % App. Total | 30.7 | 69.3 | | 74.8 | 25.2 | | 48.3 | 51.7 | | |
| PHF | .936 | .897 | .944 | .816 | .838 | .862 | .975 | .783 | .866 | .920 |

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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

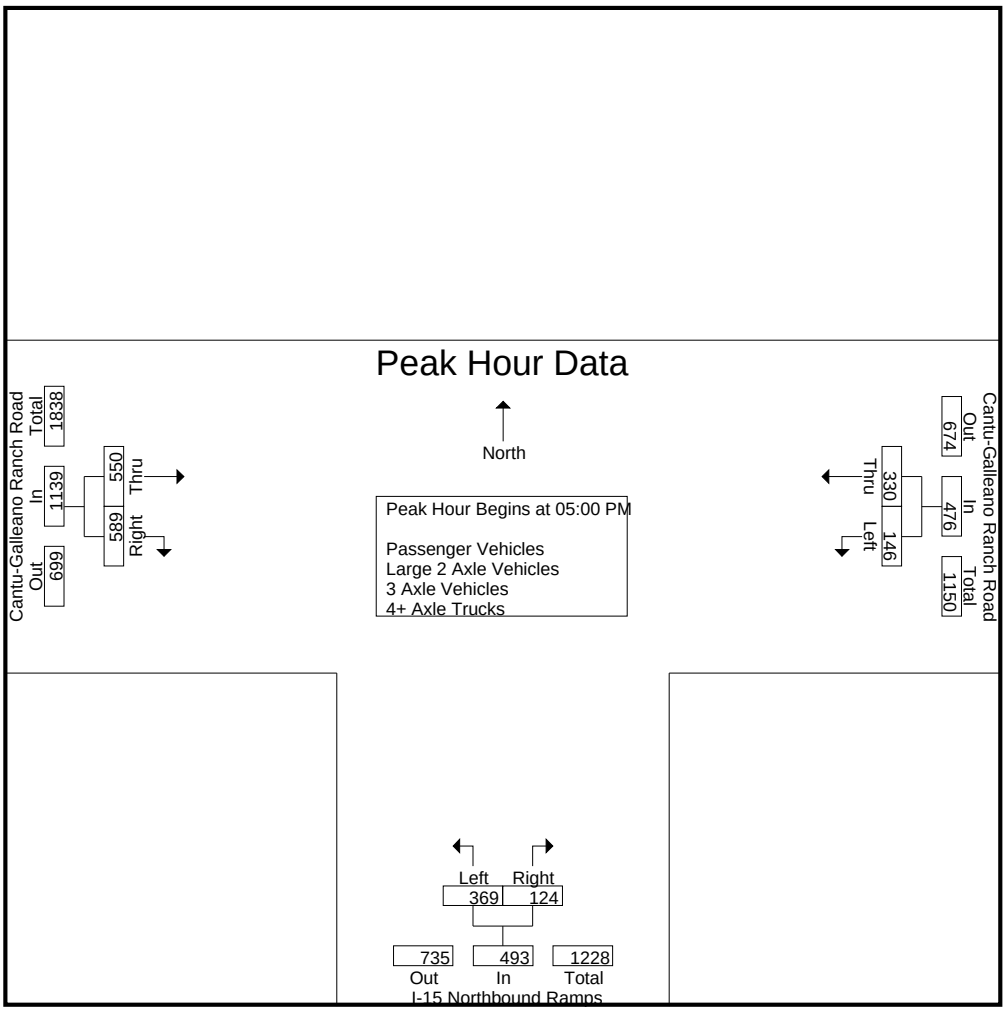


Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 04:00 PM | | | 04:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 39 | 90 | 129 | 67 | **65** | 132 | 135 | 132 | 267 |
| +15 mins. | 38 | 75 | 113 | **78** | 59 | **137** | 139 | 112 | 251 |
| +30 mins. | **43** | **95** | **138** | 74 | 37 | 111 | **141** | **188** | **329** |
| +45 mins. | 39 | 87 | 126 | 73 | 42 | 115 | 135 | 157 | 292 |
| Total Volume | 159 | 347 | 506 | 292 | 203 | 495 | 550 | 589 | 1139 |
| % App. Total | 31.4 | 68.6 | | 59 | 41 | | 48.3 | 51.7 | |
| PHF | .924 | .913 | .917 | .936 | .781 | .903 | .975 | .783 | .866 |

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Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Passenger Vehicles

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 35 | 76 | 111 | 61 | 50 | 25 | 111 | 128 | 113 | 53 | 241 | 78 | 463 | 541 |
| 04:15 PM | 33 | 62 | 95 | 73 | 48 | 22 | 121 | 122 | 96 | 32 | 218 | 54 | 434 | 488 |
| 04:30 PM | 40 | 86 | 126 | 70 | 27 | 13 | 97 | 148 | 109 | 43 | 257 | 56 | 480 | 536 |
| 04:45 PM | 33 | 77 | 110 | 68 | 33 | 14 | 101 | 110 | 92 | 28 | 202 | 42 | 413 | 455 |
| Total | 141 | 301 | 442 | 272 | 158 | 74 | 430 | 508 | 410 | 156 | 918 | 230 | 1790 | 2020 |
| 05:00 PM | 38 | 71 | 109 | 67 | 23 | 11 | 90 | 126 | 126 | 38 | 252 | 49 | 451 | 500 |
| 05:15 PM | 33 | 66 | 99 | 93 | 22 | 10 | 115 | 127 | 105 | 46 | 232 | 56 | 446 | 502 |
| 05:30 PM | 30 | 80 | 110 | 71 | 30 | 12 | 101 | 126 | 180 | 85 | 306 | 97 | 517 | 614 |
| 05:45 PM | 32 | 71 | 103 | 108 | 27 | 16 | 135 | 129 | 152 | 41 | 281 | 57 | 519 | 576 |
| Total | 133 | 288 | 421 | 339 | 102 | 49 | 441 | 508 | 563 | 210 | 1071 | 259 | 1933 | 2192 |
| Grand Total | 274 | 589 | 863 | 611 | 260 | 123 | 871 | 1016 | 973 | 366 | 1989 | 489 | 3723 | 4212 |
| Apprch % | 31.7 | 68.3 | | 70.1 | 29.9 | | | 51.1 | 48.9 | | | | | |
| Total % | 7.4 | 15.8 | 23.2 | 16.4 | 7 | | 23.4 | 27.3 | 26.1 | | 53.4 | 11.6 | 88.4 | |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | **38** | 71 | 109 | 67 | 23 | 90 | 126 | 126 | 252 | 451 |
| 05:15 PM | 33 | 66 | 99 | 93 | 22 | 115 | 127 | 105 | 232 | 446 |
| 05:30 PM | 30 | **80** | **110** | 71 | **30** | 101 | 126 | **180** | **306** | 517 |
| 05:45 PM | 32 | 71 | 103 | **108** | 27 | **135** | **129** | 152 | 281 | **519** |
| Total Volume | 133 | 288 | 421 | 339 | 102 | 441 | 508 | 563 | 1071 | 1933 |
| % App. Total | 31.6 | 68.4 | | 76.9 | 23.1 | | 47.4 | 52.6 | | |
| PHF | .875 | .900 | .957 | .785 | .850 | .817 | .984 | .782 | .875 | .931 |

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City of Ontario
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E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
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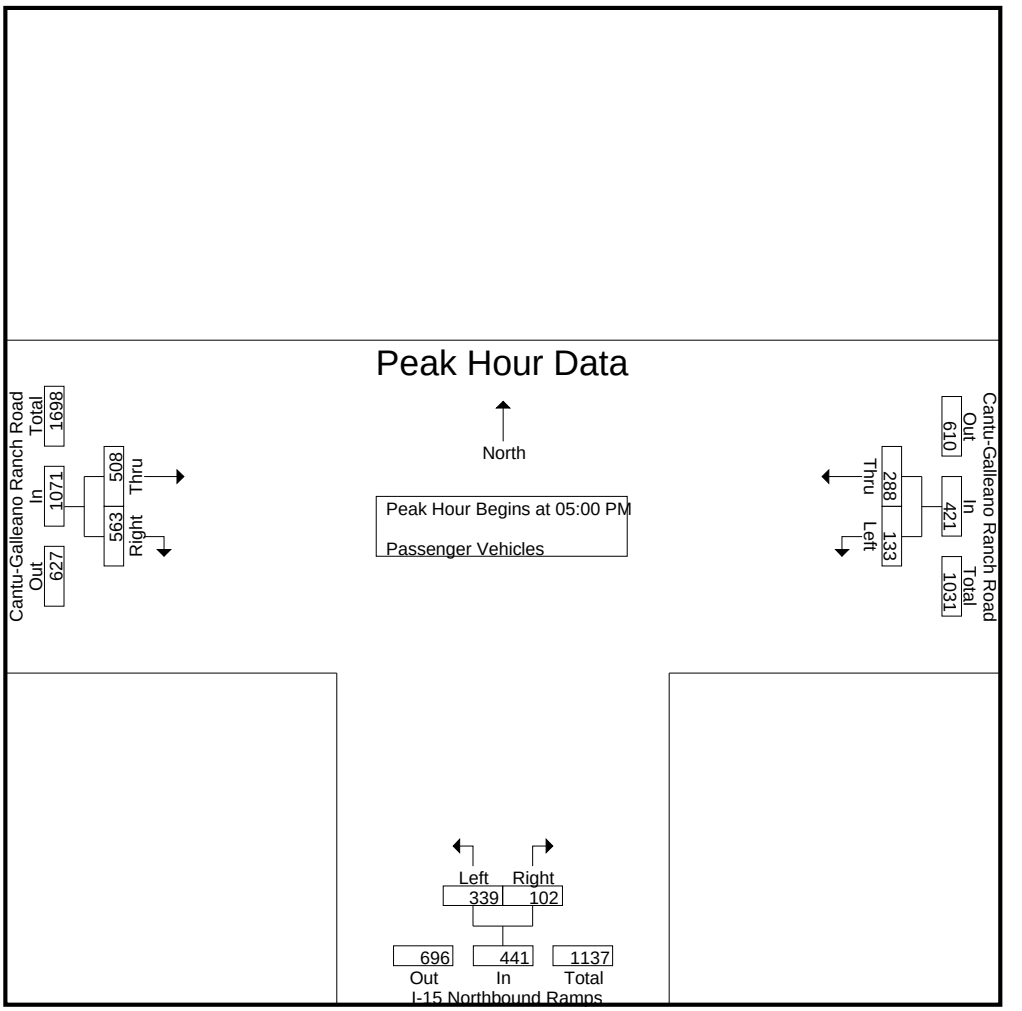


Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | **38** | 71 | 109 | 67 | 23 | 90 | 126 | 126 | 252 |
| +15 mins. | 33 | 66 | 99 | 93 | 22 | 115 | 127 | 105 | 232 |
| +30 mins. | 30 | **80** | **110** | 71 | **30** | 101 | 126 | **180** | **306** |
| +45 mins. | 32 | 71 | 103 | **108** | 27 | **135** | **129** | 152 | 281 |
| Total Volume | 133 | 288 | 421 | 339 | 102 | 441 | 508 | 563 | 1071 |
| % App. Total | 31.6 | 68.4 | | 76.9 | 23.1 | | 47.4 | 52.6 | |
| PHF | .875 | .900 | .957 | .785 | .850 | .817 | .984 | .782 | .875 |

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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- Large 2 Axle Vehicles

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 1 | 1 | 2 | 4 | 2 | 1 | 6 | 6 | 2 | 0 | 8 | 1 | 16 | 17 |
| 04:15 PM | 1 | 1 | 2 | 4 | 3 | 0 | 7 | 3 | 4 | 2 | 7 | 2 | 16 | 18 |
| 04:30 PM | 0 | 2 | 2 | 1 | 1 | 1 | 2 | 6 | 0 | 0 | 6 | 1 | 10 | 11 |
| 04:45 PM | 1 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 1 | 3 | 1 | 8 | 9 |
| Total | 3 | 8 | 11 | 9 | 6 | 2 | 15 | 15 | 9 | 3 | 24 | 5 | 50 | 55 |
| 05:00 PM | 0 | 2 | 2 | 2 | 0 | 0 | 2 | 3 | 0 | 0 | 3 | 0 | 7 | 7 |
| 05:15 PM | 2 | 1 | 3 | 2 | 0 | 0 | 2 | 2 | 1 | 0 | 3 | 0 | 8 | 8 |
| 05:30 PM | 1 | 3 | 4 | 2 | 0 | 0 | 2 | 3 | 0 | 0 | 3 | 0 | 9 | 9 |
| 05:45 PM | 0 | 2 | 2 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 | 6 | 8 |
| Total | 3 | 8 | 11 | 6 | 2 | 2 | 8 | 10 | 1 | 0 | 11 | 2 | 30 | 32 |
| Grand Total | 6 | 16 | 22 | 15 | 8 | 4 | 23 | 25 | 10 | 3 | 35 | 7 | 80 | 87 |
| Apprch % | 27.3 | 72.7 | | 65.2 | 34.8 | | | 71.4 | 28.6 | | | | | |
| Total % | 7.5 | 20 | 27.5 | 18.8 | 10 | | 28.8 | 31.2 | 12.5 | | 43.8 | 8 | 92 | |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | 0 | 2 | 2 | **2** | 0 | **2** | **3** | 0 | **3** | 7 |
| 05:15 PM | **2** | 1 | 3 | 2 | 0 | 2 | 2 | **1** | 3 | 8 |
| 05:30 PM | 1 | **3** | **4** | 2 | 0 | 2 | 3 | 0 | 3 | **9** |
| 05:45 PM | 0 | 2 | 2 | 0 | **2** | 2 | 2 | 0 | 2 | 6 |
| Total Volume | 3 | 8 | 11 | 6 | 2 | 8 | 10 | 1 | 11 | 30 |
| % App. Total | 27.3 | 72.7 | | 75 | 25 | | 90.9 | 9.1 | | |
| PHF | .375 | .667 | .688 | .750 | .250 | 1.00 | .833 | .250 | .917 | .833 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

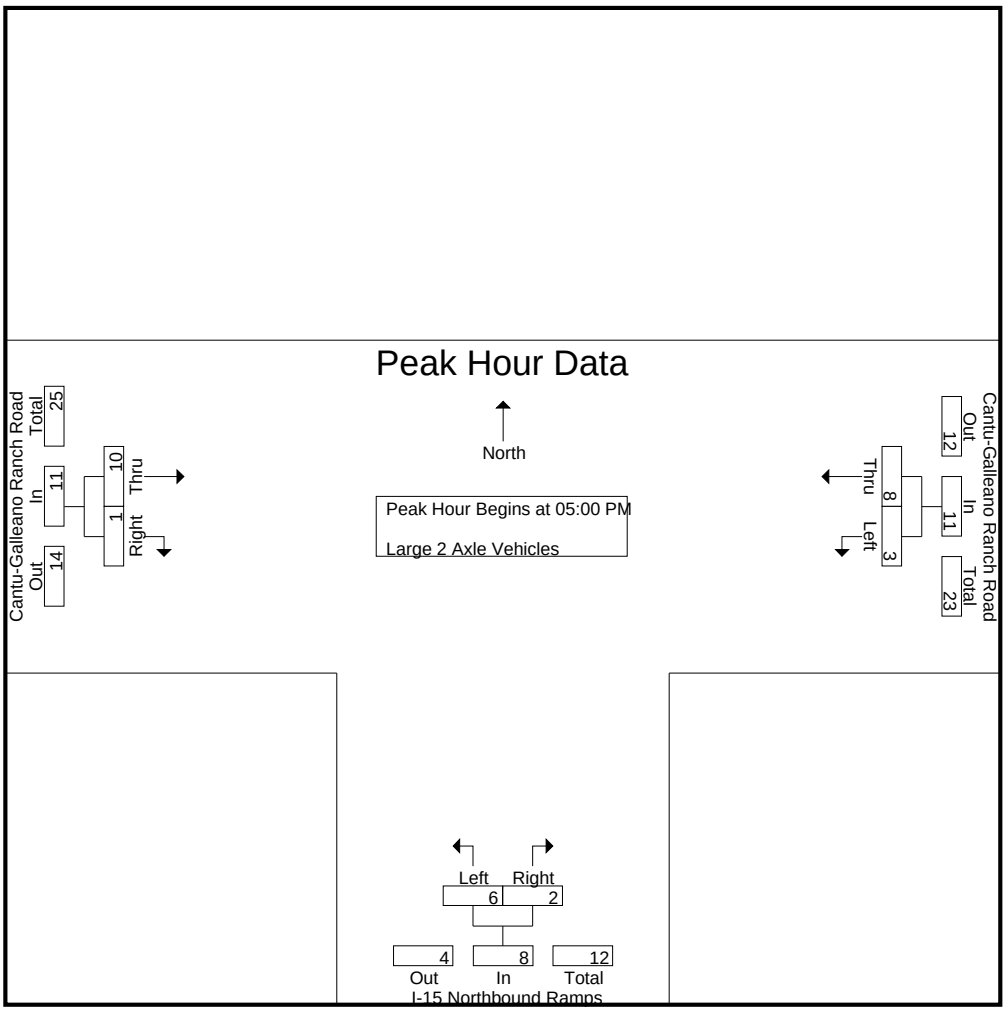


Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | 2 | 2 | **2** | 0 | **2** | **3** | 0 | **3** |
| +15 mins. | **2** | 1 | 3 | 2 | 0 | 2 | 2 | **1** | 3 |
| +30 mins. | 1 | **3** | **4** | 2 | 0 | 2 | 3 | 0 | 3 |
| +45 mins. | 0 | 2 | 2 | 0 | **2** | 2 | 2 | 0 | 2 |
| Total Volume | 3 | 8 | 11 | 6 | 2 | 8 | 10 | 1 | 11 |
| % App. Total | 27.3 | 72.7 | | 75 | 25 | | 90.9 | 9.1 | |
| PHF | .375 | .667 | .688 | .750 | .250 | 1.000 | .833 | .250 | .917 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 3 Axle Vehicles

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 0 | 2 | 2 | 0 | 2 | 0 | 2 | 4 | 1 | 0 | 5 | 0 | 9 | 9 |
| 04:15 PM | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 4 | 3 | 0 | 7 | 0 | 9 | 9 |
| 04:30 PM | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 4 | 4 |
| 04:45 PM | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 3 | 4 |
| Total | 2 | 3 | 5 | 0 | 4 | 0 | 4 | 11 | 5 | 1 | 16 | 1 | 25 | 26 |
| 05:00 PM | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 6 | 0 | 9 | 9 |
| 05:15 PM | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 2 | 4 | 1 | 6 | 1 | 8 | 9 |
| 05:30 PM | 1 | 1 | 2 | 1 | 0 | 0 | 1 | 1 | 4 | 3 | 5 | 3 | 8 | 11 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 |
| Total | 2 | 5 | 7 | 1 | 0 | 0 | 1 | 6 | 12 | 5 | 18 | 5 | 26 | 31 |
| Grand Total | 4 | 8 | 12 | 1 | 4 | 0 | 5 | 17 | 17 | 6 | 34 | 6 | 51 | 57 |
| Apprch % | 33.3 | 66.7 | | 20 | 80 | | | 50 | 50 | | | | | |
| Total % | 7.8 | 15.7 | 23.5 | 2 | 7.8 | | 9.8 | 33.3 | 33.3 | | 66.7 | 10.5 | 89.5 | |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | 0 | **3** | **3** | 0 | 0 | 0 | **3** | 3 | **6** | **9** |
| 05:15 PM | **1** | 1 | 2 | 0 | 0 | 0 | 2 | **4** | 6 | 8 |
| 05:30 PM | 1 | 1 | 2 | **1** | 0 | **1** | 1 | 4 | 5 | 8 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| Total Volume | 2 | 5 | 7 | 1 | 0 | 1 | 6 | 12 | 18 | 26 |
| % App. Total | 28.6 | 71.4 | | 100 | 0 | | 33.3 | 66.7 | | |
| PHF | .500 | .417 | .583 | .250 | .000 | .250 | .500 | .750 | .750 | .722 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

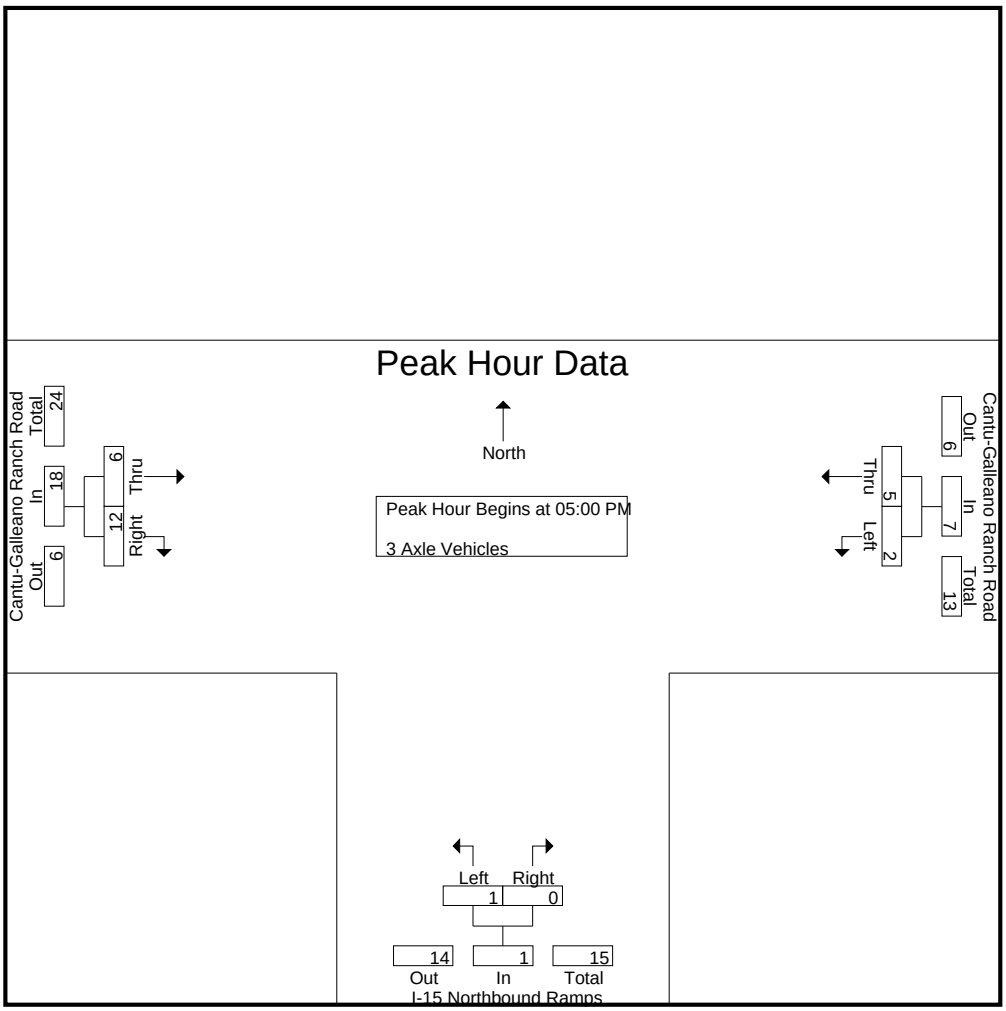


Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | **3** | **3** | 0 | 0 | 0 | **3** | 3 | **6** |
| +15 mins. | **1** | 1 | 2 | 0 | 0 | 0 | 2 | **4** | 6 |
| +30 mins. | 1 | 1 | 2 | **1** | 0 | **1** | 1 | 4 | 5 |
| +45 mins. | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| Total Volume | 2 | 5 | 7 | 1 | 0 | 1 | 6 | 12 | 18 |
| % App. Total | 28.6 | 71.4 | | 100 | 0 | | 33.3 | 66.7 | |
| PHF | .500 | .417 | .583 | .250 | .000 | .250 | .500 | .750 | .750 |

Counts Unlimited, Inc.
PO Box 1178
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City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 1

Groups Printed- 4+ Axle Trucks

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | | Cantu-Galleano Ranch Road Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | RTOR | App. Total | Thru | Right | RTOR | App. Total | Exclu. Total | Inclu. Total | Int. Total |
| 04:00 PM | 3 | 11 | 14 | 2 | 11 | 2 | 13 | 11 | 11 | 3 | 22 | 5 | 49 | 54 |
| 04:15 PM | 3 | 12 | 15 | 1 | 7 | 2 | 8 | 7 | 7 | 1 | 14 | 3 | 37 | 40 |
| 04:30 PM | 3 | 6 | 9 | 3 | 8 | 4 | 11 | 13 | 6 | 1 | 19 | 5 | 39 | 44 |
| 04:45 PM | 4 | 6 | 10 | 5 | 9 | 1 | 14 | 9 | 7 | 3 | 16 | 4 | 40 | 44 |
| Total | 13 | 35 | 48 | 11 | 35 | 9 | 46 | 40 | 31 | 8 | 71 | 17 | 165 | 182 |
| 05:00 PM | 0 | 9 | 9 | 4 | 6 | 1 | 10 | 3 | 3 | 0 | 6 | 1 | 25 | 26 |
| 05:15 PM | 3 | 6 | 9 | 7 | 6 | 3 | 13 | 8 | 2 | 0 | 10 | 3 | 32 | 35 |
| 05:30 PM | 2 | 8 | 10 | 7 | 7 | 0 | 14 | 11 | 4 | 3 | 15 | 3 | 39 | 42 |
| 05:45 PM | 3 | 6 | 9 | 5 | 1 | 0 | 6 | 4 | 4 | 4 | 8 | 4 | 23 | 27 |
| Total | 8 | 29 | 37 | 23 | 20 | 4 | 43 | 26 | 13 | 7 | 39 | 11 | 119 | 130 |
| Grand Total | 21 | 64 | 85 | 34 | 55 | 13 | 89 | 66 | 44 | 15 | 110 | 28 | 284 | 312 |
| Apprch % | 24.7 | 75.3 | | 38.2 | 61.8 | | | 60 | 40 | | | | | |
| Total % | 7.4 | 22.5 | 29.9 | 12 | 19.4 | | 31.3 | 23.2 | 15.5 | | 38.7 | 9 | 91 | |

| | Cantu-Galleano Ranch Road Westbound | | | I-15 Northbound Ramps Northbound | | | Cantu-Galleano Ranch Road Eastbound | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Left | Thru | App. Total | Left | Right | App. Total | Thru | Right | App. Total | Int. Total |
| Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | |
| 05:00 PM | 0 | **9** | 9 | 4 | 6 | 10 | 3 | 3 | 6 | 25 |
| 05:15 PM | **3** | 6 | 9 | **7** | 6 | 13 | 8 | 2 | 10 | 32 |
| 05:30 PM | 2 | 8 | **10** | 7 | **7** | **14** | **11** | **4** | **15** | **39** |
| 05:45 PM | 3 | 6 | 9 | 5 | 1 | 6 | 4 | 4 | 8 | 23 |
| Total Volume | 8 | 29 | 37 | 23 | 20 | 43 | 26 | 13 | 39 | 119 |
| % App. Total | 21.6 | 78.4 | | 53.5 | 46.5 | | 66.7 | 33.3 | | |
| PHF | .667 | .806 | .925 | .821 | .714 | .768 | .591 | .813 | .650 | .763 |

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951) 268-6268

City of Ontario
N/S: I-15 Northbound Ramps
E/W: Cantu-Galleano Ranch Road
Weather: Clear

File Name : 45_JVY_15N_CGR PMC
Site Code : 05124953
Start Date : 10/2/2024
Page No : 2

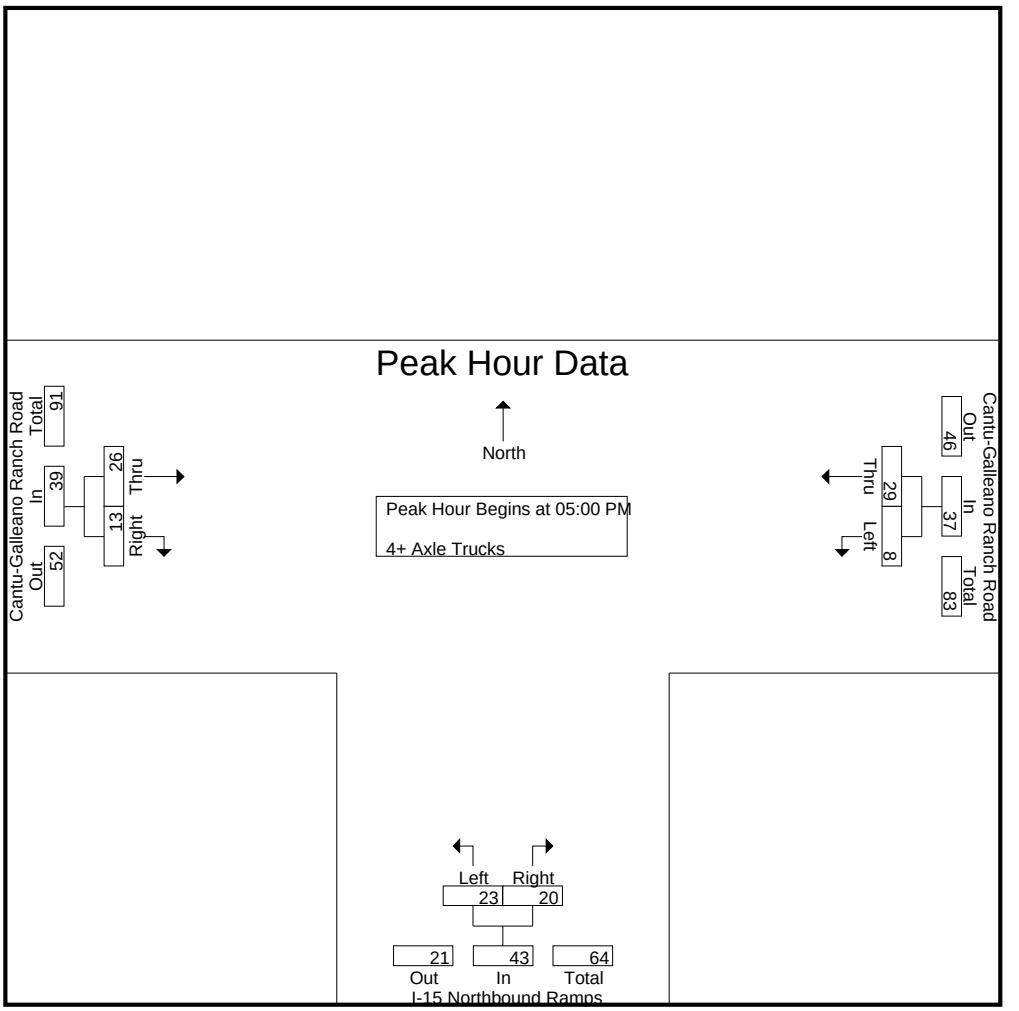


Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

| | 05:00 PM | | | 05:00 PM | | | 05:00 PM | | |
|---|---|---|---|---|---|---|---|---|---|
| +0 mins. | 0 | **9** | 9 | 4 | 6 | 10 | 3 | 3 | 6 |
| +15 mins. | **3** | 6 | 9 | **7** | 6 | 13 | 8 | 2 | 10 |
| +30 mins. | 2 | 8 | **10** | 7 | **7** | **14** | **11** | **4** | **15** |
| +45 mins. | 3 | 6 | 9 | 5 | 1 | 6 | 4 | 4 | 8 |
| Total Volume | 8 | 29 | 37 | 23 | 20 | 43 | 26 | 13 | 39 |
| % App. Total | 21.6 | 78.4 | | 53.5 | 46.5 | | 66.7 | 33.3 | |
| PHF | .667 | .806 | .925 | .821 | .714 | .768 | .591 | .813 | .650 |

Location: Eastvale
N/S: I-15 NB Ramps
E/W: Cantu-Galleano Ranch Rd

Date: 10/2/2024
Day: Wednesday

**PEDESTRIANS**

| | North Leg<br>I-15 NB Ramps | East Leg<br>Cantu-Galleano Ranch Rd | South Leg<br>Dead End | West Leg<br>Cantu-Galleano Ranch Rd | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 1 | 0 | 1 |
| TOTAL VOLUMES: | 0 | 0 | 1 | 0 | 1 |

| | North Leg<br>I-15 NB Ramps | East Leg<br>Cantu-Galleano Ranch Rd | South Leg<br>Dead End | West Leg<br>Cantu-Galleano Ranch Rd | |
|---|---|---|---|---|---|
| | Pedestrians | Pedestrians | Pedestrians | Pedestrians | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 |

Location: Eastvale
N/S: I-15 NB Ramps
E/W: Cantu-Galleano Ranch Rd

Date: 10/2/2024
Day: Wednesday

**BICYCLES**

| | Southbound I-15 NB Ramps | | | Westbound Cantu-Galleano Ranch Rd | | | Northbound Dead End | | | Eastbound Cantu-Galleano Ranch Rd | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 7:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 7:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

| | Southbound I-15 NB Ramps | | | Westbound Cantu-Galleano Ranch Rd | | | Northbound Dead End | | | Eastbound Cantu-Galleano Ranch Rd | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | Left | Thru | Right | |
| 4:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 5:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL VOLUMES: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |

Counts Unlimited, Inc.
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951-268-6268

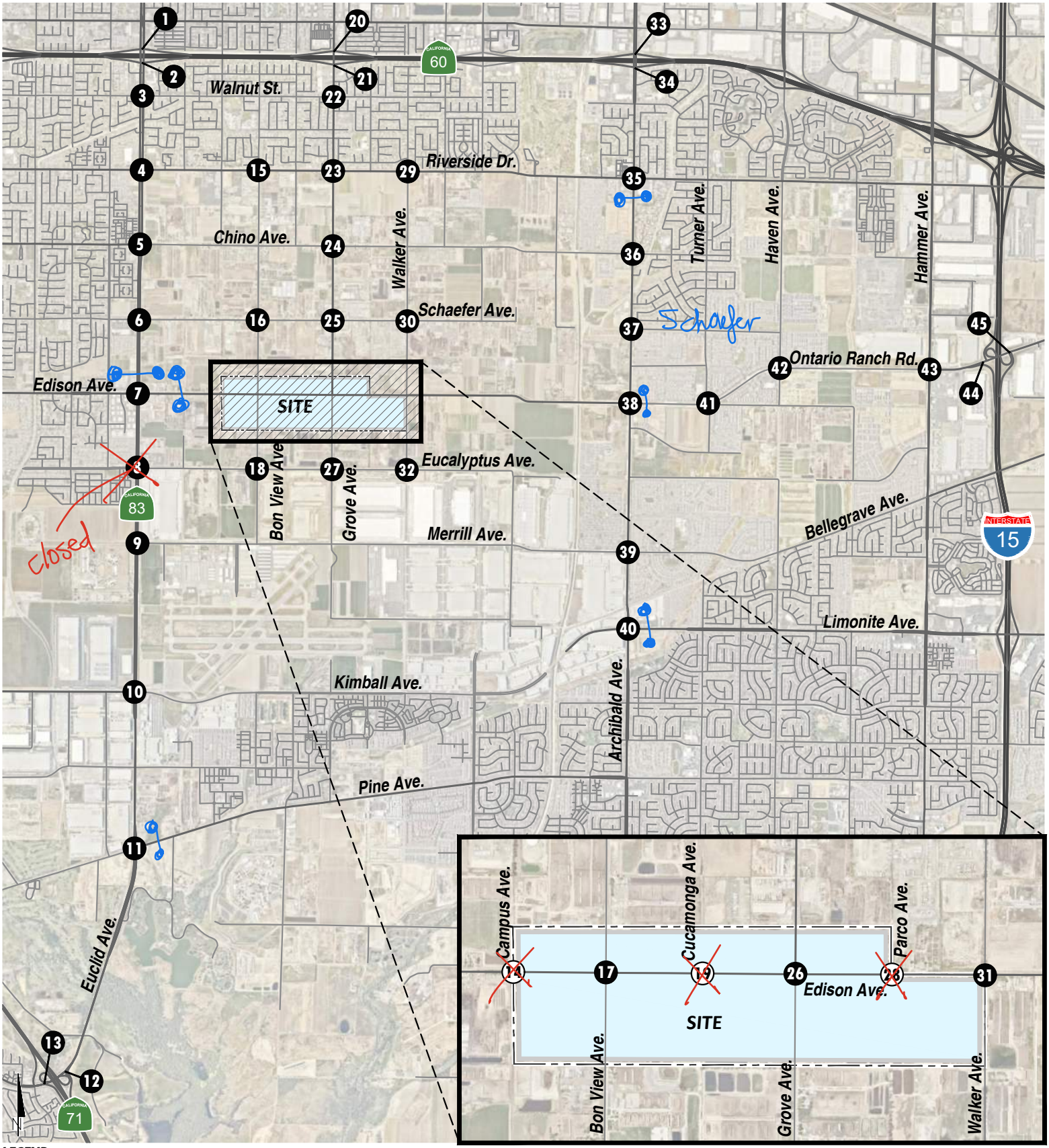


**LEGEND:**

**0** = *Existing Intersection Analysis Location*

(0) = *Future Intersection Analysis Location*

# Counts Unimited, Inc.

PO Box 1178
Corona, CA 92878
(951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Archibald Avenue
S/ Riverside Drive
24 Hour Directional Volume Count

ONT002
Site Code: 051-24953

| Start Time | 10/29/24 Tue | Northbound Morning | Northbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Southbound Morning | Southbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Combined Totals Morning | Combined Totals Afternoon |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:00 | | 52 | 198 | | | 54 | 201 | | | | |
| 12:15 | | 32 | 217 | | | 48 | 201 | | | | |
| 12:30 | | 38 | 240 | | | 44 | 156 | | | | |
| 12:45 | | 34 | 222 | 156 | 877 | 52 | 184 | 198 | 742 | 354 | 1619 |
| 01:00 | | 30 | 197 | | | 46 | 178 | | | | |
| 01:15 | | 34 | 230 | | | 37 | 168 | | | | |
| 01:30 | | 36 | 192 | | | 34 | 152 | | | | |
| 01:45 | | 40 | 244 | 140 | 863 | 46 | 195 | 163 | 693 | 303 | 1556 |
| 02:00 | | 15 | 197 | | | 22 | 172 | | | | |
| 02:15 | | 35 | 242 | | | 29 | 185 | | | | |
| 02:30 | | 30 | 284 | | | 34 | 214 | | | | |
| 02:45 | | 34 | 298 | 114 | 1021 | 26 | 217 | 111 | 788 | 225 | 1809 |
| 03:00 | | 41 | 260 | | | 30 | 234 | | | | |
| 03:15 | | 50 | **290** | | | 32 | 201 | | | | |
| 03:30 | | 50 | **308** | | | 40 | 248 | | | | |
| 03:45 | | 62 | **275** | 203 | 1133 | 47 | 210 | 149 | 893 | 352 | 2026 |
| 04:00 | | 72 | **308** | | | 53 | 216 | | | | |
| 04:15 | | 88 | 232 | | | 56 | 282 | | | | |
| 04:30 | | 124 | 254 | | | 74 | 273 | | | | |
| 04:45 | | 166 | 274 | 450 | 1068 | 78 | 288 | 261 | 1059 | 711 | 2127 |
| 05:00 | | 124 | 258 | | | 58 | 282 | | | | |
| 05:15 | | 137 | 244 | | | 58 | **322** | | | | |
| 05:30 | | 148 | 227 | | | 100 | **331** | | | | |
| 05:45 | | 174 | 222 | 583 | 951 | 110 | **372** | 326 | 1307 | 909 | 2258 |
| 06:00 | | 176 | 239 | | | 100 | **283** | | | | |
| 06:15 | | 192 | 186 | | | 122 | 306 | | | | |
| 06:30 | | 222 | 232 | | | 149 | 276 | | | | |
| 06:45 | | 276 | 180 | 866 | 837 | 153 | 223 | 524 | 1088 | 1390 | 1925 |
| 07:00 | | 268 | 180 | | | 141 | 242 | | | | |
| 07:15 | | **389** | 160 | | | 116 | 220 | | | | |
| 07:30 | | **403** | 122 | | | 138 | 224 | | | | |
| 07:45 | | **344** | 132 | 1404 | 594 | 166 | 198 | 561 | 884 | 1965 | 1478 |
| 08:00 | | **322** | 118 | | | 151 | 176 | | | | |
| 08:15 | | 310 | 117 | | | 134 | 200 | | | | |
| 08:30 | | 340 | 148 | | | 138 | 162 | | | | |
| 08:45 | | 282 | 108 | 1254 | 491 | 146 | 195 | 569 | 733 | 1823 | 1224 |
| 09:00 | | 260 | 121 | | | 125 | 212 | | | | |
| 09:15 | | 258 | 108 | | | 152 | 172 | | | | |
| 09:30 | | 244 | 76 | | | 118 | 146 | | | | |
| 09:45 | | 218 | 81 | 980 | 386 | 148 | 132 | 543 | 662 | 1523 | 1048 |
| 10:00 | | 196 | 58 | | | **158** | 123 | | | | |
| 10:15 | | 210 | 64 | | | **170** | 112 | | | | |
| 10:30 | | 210 | 72 | | | **142** | 112 | | | | |
| 10:45 | | 229 | 70 | 845 | 264 | **156** | 74 | 626 | 421 | 1471 | 685 |
| 11:00 | | 215 | 54 | | | 150 | 89 | | | | |
| 11:15 | | 208 | 60 | | | 144 | 63 | | | | |
| 11:30 | | 196 | 60 | | | 132 | 59 | | | | |
| 11:45 | | 202 | 52 | 821 | 226 | 194 | 42 | 620 | 253 | 1441 | 479 |
| Total | | 7816 | 8711 | 7816 | 8711 | 4651 | 9523 | 4651 | 9523 | 12467 | 18234 |
| Combined Total | | 16527 | | 16527 | | 14174 | | 14174 | | 30701 | |
| AM Peak | - | 07:15 | - | - | - | 10:00 | - | - | - | - | - |
| Vol. | - | 1458 | - | - | - | 626 | - | - | - | - | - |
| P.H.F. | | 0.904 | | | | 0.921 | | | | | |
| PM Peak | - | - | 03:15 | - | - | - | 05:15 | - | - | - | - |
| Vol. | - | - | 1181 | - | - | - | 1308 | - | - | - | - |
| P.H.F. | | | 0.959 | | | | 0.879 | | | | |
| Percentage | | 47.3% | 52.7% | | | 32.8% | 67.2% | | | | |
| ADT/AADT | | ADT 30,701 | | AADT 30,701 | | | | | | | |

# Counts Unimited, Inc.

PO Box 1178
Corona, CA 92878
(951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Edison Avenue
E/ Archibald Avenue
24 Hour Directional Volume Count

ONT003
Site Code: 051-24953

| Start Time | 10/29/24 Tue | Eastbound Morning | Eastbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Westbound Morning | Westbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Combined Totals Morning | Combined Totals Afternoon |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:00 | | 36 | 98 | | | 8 | 102 | | | | |
| 12:15 | | 22 | 118 | | | 8 | 124 | | | | |
| 12:30 | | 30 | 109 | | | 22 | 130 | | | | |
| 12:45 | | 13 | 114 | 101 | 439 | 10 | 130 | 48 | 486 | 149 | 925 |
| 01:00 | | 18 | 90 | | | 17 | 110 | | | | |
| 01:15 | | 12 | 92 | | | 18 | 157 | | | | |
| 01:30 | | 12 | 120 | | | 12 | 116 | | | | |
| 01:45 | | 26 | 129 | 68 | 431 | 27 | 118 | 74 | 501 | 142 | 932 |
| 02:00 | | 20 | 138 | | | 14 | 121 | | | | |
| 02:15 | | 19 | 108 | | | 14 | **147** | | | | |
| 02:30 | | 28 | **188** | | | 15 | **164** | | | | |
| 02:45 | | 6 | **161** | 73 | 595 | 26 | **176** | 69 | 608 | 142 | 1203 |
| 03:00 | | 12 | **160** | | | 18 | **148** | | | | |
| 03:15 | | 13 | **146** | | | 26 | 90 | | | | |
| 03:30 | | 33 | 134 | | | 24 | 114 | | | | |
| 03:45 | | 21 | 182 | 79 | 622 | 31 | 108 | 99 | 460 | 178 | 1082 |
| 04:00 | | 35 | 136 | | | 27 | 112 | | | | |
| 04:15 | | 43 | 158 | | | 48 | 136 | | | | |
| 04:30 | | 94 | 156 | | | 54 | 146 | | | | |
| 04:45 | | 81 | 160 | 253 | 610 | 116 | 112 | 245 | 506 | 498 | 1116 |
| 05:00 | | 36 | 162 | | | 92 | 152 | | | | |
| 05:15 | | 66 | 164 | | | **188** | 140 | | | | |
| 05:30 | | 66 | 146 | | | **244** | 148 | | | | |
| 05:45 | | 41 | 133 | 209 | 605 | **183** | 144 | 707 | 584 | 916 | 1189 |
| 06:00 | | 58 | 172 | | | **158** | 146 | | | | |
| 06:15 | | 60 | 135 | | | 152 | 104 | | | | |
| 06:30 | | 58 | 132 | | | 164 | 106 | | | | |
| 06:45 | | 71 | 114 | 247 | 553 | 178 | 87 | 652 | 443 | 899 | 996 |
| 07:00 | | 87 | 110 | | | 156 | 89 | | | | |
| 07:15 | | **86** | 114 | | | 214 | 70 | | | | |
| 07:30 | | **113** | 96 | | | 158 | 58 | | | | |
| 07:45 | | **114** | 89 | 400 | 409 | 182 | 66 | 710 | 283 | 1110 | 692 |
| 08:00 | | **126** | 88 | | | 145 | 78 | | | | |
| 08:15 | | 66 | 81 | | | 117 | 70 | | | | |
| 08:30 | | 76 | 78 | | | 141 | 58 | | | | |
| 08:45 | | 110 | 54 | 378 | 301 | 132 | 57 | 535 | 263 | 913 | 564 |
| 09:00 | | 85 | 62 | | | 121 | 52 | | | | |
| 09:15 | | 98 | 51 | | | 139 | 40 | | | | |
| 09:30 | | 94 | 55 | | | 151 | 54 | | | | |
| 09:45 | | 114 | 50 | 391 | 218 | 130 | 48 | 541 | 194 | 932 | 412 |
| 10:00 | | 104 | 48 | | | 132 | 47 | | | | |
| 10:15 | | 94 | 60 | | | 133 | 26 | | | | |
| 10:30 | | 100 | 44 | | | 85 | 32 | | | | |
| 10:45 | | 104 | 30 | 402 | 182 | 114 | 34 | 464 | 139 | 866 | 321 |
| 11:00 | | 96 | 34 | | | 92 | 25 | | | | |
| 11:15 | | 81 | 22 | | | 78 | 34 | | | | |
| 11:30 | | 118 | 55 | | | 132 | 24 | | | | |
| 11:45 | | 122 | 48 | 417 | 159 | 118 | 16 | 420 | 99 | 837 | 258 |
| Total | | 3018 | 5124 | 3018 | 5124 | 4564 | 4566 | 4564 | 4566 | 7582 | 9690 |
| Combined Total | | 8142 | | 8142 | | 9130 | | 9130 | | 17272 | |
| AM Peak | - | 07:15 | - | - | - | 05:15 | - | - | - | - | - |
| Vol. | - | 439 | - | - | - | 773 | - | - | - | - | - |
| P.H.F. | | 0.871 | | | | 0.792 | | | | | |
| PM Peak | - | - | 02:30 | - | - | - | 02:15 | - | - | - | - |
| Vol. | - | - | 655 | - | - | - | 635 | - | - | - | - |
| P.H.F. | | | 0.871 | | | | 0.902 | | | | |
| Percentage | | 37.1% | 62.9% | | | 50.0% | 50.0% | | | | |
| ADT/AADT | | ADT 17,272 | | AADT 17,272 | | | | | | | |

# Counts Unimited, Inc.

PO Box 1178
Corona, CA 92878
(951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Edison Avenue
E/ Euclid Avenue
24 Hour Directional Volume Count

ONT001
Site Code: 051-24953

| Start Time | 10/29/24 Tue | Eastbound Morning | Eastbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Westbound Morning | Westbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Combined Totals Morning | Combined Totals Afternoon |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:00 | | 8 | 76 | | | 3 | 76 | | | | |
| 12:15 | | 14 | 77 | | | 5 | 65 | | | | |
| 12:30 | | 7 | 112 | | | 8 | 68 | | | | |
| 12:45 | | 4 | 82 | 33 | 347 | 4 | 52 | 20 | 261 | 53 | 608 |
| 01:00 | | 8 | 78 | | | 15 | 70 | | | | |
| 01:15 | | 12 | 83 | | | 6 | 54 | | | | |
| 01:30 | | 10 | 98 | | | 6 | 63 | | | | |
| 01:45 | | 7 | 118 | 37 | 377 | 4 | 80 | 31 | 267 | 68 | 644 |
| 02:00 | | 4 | 109 | | | 9 | 60 | | | | |
| 02:15 | | 6 | 116 | | | 6 | 66 | | | | |
| 02:30 | | 12 | 158 | | | 7 | 72 | | | | |
| 02:45 | | 10 | 156 | 32 | 539 | 9 | 56 | 31 | 254 | 63 | 793 |
| 03:00 | | 6 | 133 | | | 12 | **75** | | | | |
| 03:15 | | 12 | 118 | | | 18 | **76** | | | | |
| 03:30 | | 6 | 156 | | | 19 | **84** | | | | |
| 03:45 | | 16 | 128 | 40 | 535 | 18 | **96** | 67 | 331 | 107 | 866 |
| 04:00 | | 8 | **137** | | | 22 | 62 | | | | |
| 04:15 | | 17 | **168** | | | 20 | 67 | | | | |
| 04:30 | | 17 | **163** | | | 46 | 78 | | | | |
| 04:45 | | 30 | **131** | 72 | 599 | 46 | 80 | 134 | 287 | 206 | 886 |
| 05:00 | | 16 | 122 | | | 43 | 55 | | | | |
| 05:15 | | 22 | 128 | | | 88 | 74 | | | | |
| 05:30 | | 32 | 150 | | | **164** | 80 | | | | |
| 05:45 | | 40 | 142 | 110 | 542 | **142** | 74 | 437 | 283 | 547 | 825 |
| 06:00 | | 38 | 124 | | | **105** | 74 | | | | |
| 06:15 | | 55 | 116 | | | **140** | 77 | | | | |
| 06:30 | | 43 | 127 | | | 150 | 52 | | | | |
| 06:45 | | 54 | 97 | 190 | 464 | 134 | 52 | 529 | 255 | 719 | 719 |
| 07:00 | | 46 | 98 | | | 100 | 44 | | | | |
| 07:15 | | 56 | 88 | | | 124 | 37 | | | | |
| 07:30 | | 64 | 72 | | | 126 | 31 | | | | |
| 07:45 | | **88** | 53 | 254 | 311 | 112 | 33 | 462 | 145 | 716 | 456 |
| 08:00 | | **94** | 58 | | | 110 | 27 | | | | |
| 08:15 | | **70** | 60 | | | 104 | 33 | | | | |
| 08:30 | | **88** | 48 | | | 92 | 33 | | | | |
| 08:45 | | 68 | 40 | 320 | 206 | 100 | 25 | 406 | 118 | 726 | 324 |
| 09:00 | | 98 | 65 | | | 87 | 22 | | | | |
| 09:15 | | 72 | 34 | | | 65 | 16 | | | | |
| 09:30 | | 62 | 21 | | | 78 | 14 | | | | |
| 09:45 | | 74 | 26 | 306 | 146 | 108 | 26 | 338 | 78 | 644 | 224 |
| 10:00 | | 70 | 24 | | | 62 | 20 | | | | |
| 10:15 | | 75 | 24 | | | 61 | 29 | | | | |
| 10:30 | | 64 | 24 | | | 72 | 12 | | | | |
| 10:45 | | 74 | 25 | 283 | 97 | 54 | 12 | 249 | 73 | 532 | 170 |
| 11:00 | | 73 | 12 | | | 80 | 23 | | | | |
| 11:15 | | 84 | 10 | | | 68 | 23 | | | | |
| 11:30 | | 90 | 6 | | | 54 | 11 | | | | |
| 11:45 | | 81 | 8 | 328 | 36 | 80 | 10 | 282 | 67 | 610 | 103 |
| Total | | 2005 | 4199 | 2005 | 4199 | 2986 | 2419 | 2986 | 2419 | 4991 | 6618 |
| Combined Total | | 6204 | | 6204 | | 5405 | | 5405 | | 11609 | |
| AM Peak | - | 07:45 | - | - | - | 05:30 | - | - | - | - | - |
| Vol. | - | 340 | - | - | - | 551 | - | - | - | - | - |
| P.H.F. | | 0.904 | | | | 0.840 | | | | | |
| PM Peak | - | - | 04:00 | - | - | - | 03:00 | - | - | - | - |
| Vol. | - | - | 599 | - | - | - | 331 | - | - | - | - |
| P.H.F. | | | 0.891 | | | | 0.862 | | | | |
| Percentage | | 32.3% | 67.7% | | | 55.2% | 44.8% | | | | |
| ADT/AADT | | ADT 11,609 | | AADT 11,609 | | | | | | | |

# Counts Unlimited, Inc.

PO Box 1178
Corona, CA 92878
Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Eycalyptus Avenue
E/ Grove Avenue
24 Hour Directional Classification Count

ONT001
Site Code: 051-25092

Eastbound

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/29/25 | 0 | 9 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 01:00 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 20 |
| 02:00 | 0 | 10 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 13 |
| 03:00 | 0 | 31 | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 34 |
| 04:00 | 0 | 94 | 6 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 102 |
| 05:00 | **1** | 199 | 8 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 209 |
| 06:00 | 1 | 181 | 25 | 0 | 3 | 1 | **2** | 0 | 4 | 0 | 0 | 0 | 0 | 217 |
| 07:00 | 0 | **246** | **49** | 0 | 3 | 2 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | **304** |
| 08:00 | 1 | 131 | 26 | 0 | 5 | 1 | 0 | 0 | **6** | 0 | 0 | 0 | 0 | 170 |
| 09:00 | 0 | 103 | 21 | 0 | **7** | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 135 |
| 10:00 | 0 | 75 | 20 | 0 | 7 | **3** | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 108 |
| 11:00 | 1 | 63 | 22 | 0 | 6 | 1 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 99 |
| 12 PM | **1** | 68 | 22 | 0 | 2 | 1 | 0 | **1** | 1 | 0 | 0 | 0 | 0 | 96 |
| 13:00 | 0 | 109 | 24 | 0 | 3 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 144 |
| 14:00 | 1 | 170 | 26 | **1** | **8** | **5** | **1** | 1 | 0 | 0 | 0 | 0 | 0 | 213 |
| 15:00 | 0 | 210 | 43 | 1 | 5 | 3 | 0 | 0 | **5** | 0 | 0 | 0 | 0 | 267 |
| 16:00 | 0 | 201 | 40 | 0 | 7 | 2 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 255 |
| 17:00 | 0 | **427** | **48** | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | **479** |
| 18:00 | 0 | 202 | 7 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 212 |
| 19:00 | 0 | 108 | 3 | 0 | 1 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 116 |
| 20:00 | 0 | 50 | 1 | 0 | 2 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 57 |
| 21:00 | 0 | 55 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 |
| 22:00 | 0 | 37 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 40 |
| 23:00 | 0 | 33 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 36 |
| Total | 6 | 2830 | 394 | 2 | 61 | 39 | 4 | 2 | 55 | 0 | 0 | 0 | 0 | 3393 |
| Percent | 0.2% | 83.4% | 11.6% | 0.1% | 1.8% | 1.1% | 0.1% | 0.1% | 1.6% | 0.0% | 0.0% | 0.0% | 0.0% | |
| AM Peak | 05:00 | 07:00 | 07:00 | | 09:00 | 10:00 | 06:00 | | 08:00 | | | | | 07:00 |
| Vol. | 1 | 246 | 49 | | 7 | 3 | 2 | | 6 | | | | | 304 |
| PM Peak | 12:00 | 17:00 | 17:00 | 14:00 | 14:00 | 14:00 | 14:00 | 12:00 | 15:00 | | | | | 17:00 |
| Vol. | 1 | 427 | 48 | 1 | 8 | 5 | 1 | 1 | 5 | | | | | 479 |
| Grand Total | 6 | 2830 | 394 | 2 | 61 | 39 | 4 | 2 | 55 | 0 | 0 | 0 | 0 | 3393 |
| Percent | 0.2% | 83.4% | 11.6% | 0.1% | 1.8% | 1.1% | 0.1% | 0.1% | 1.6% | 0.0% | 0.0% | 0.0% | 0.0% | |

Counts Unlimited, Inc.
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Phone: (951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Eycalyptus Avenue
E/ Grove Avenue
24 Hour Directional Classification Count

ONT001
Site Code: 051-25092

Westbound

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/29/25 | 1 | 49 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 52 |
| 01:00 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 21 |
| 02:00 | 0 | 30 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| 03:00 | 0 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 33 |
| 04:00 | 1 | 142 | 7 | 0 | 0 | **3** | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 154 |
| 05:00 | 0 | 103 | 12 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 119 |
| 06:00 | 0 | 163 | 29 | 0 | 1 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 197 |
| 07:00 | 0 | **328** | **44** | **2** | 1 | 0 | 1 | **1** | 3 | 0 | 0 | 0 | 0 | **380** |
| 08:00 | 0 | 283 | 43 | 0 | 2 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 331 |
| 09:00 | 0 | 100 | 20 | 0 | 4 | 1 | **2** | 0 | 1 | 0 | 0 | 0 | 0 | 128 |
| 10:00 | **2** | 95 | 27 | 0 | **8** | 0 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | 138 |
| 11:00 | 0 | 71 | 23 | 0 | 3 | 1 | 0 | 0 | **8** | 0 | 0 | 0 | 0 | 106 |
| 12 PM | 0 | 71 | 26 | 0 | **6** | 1 | 1 | **1** | 2 | 0 | 0 | 0 | 0 | 108 |
| 13:00 | 0 | 99 | 23 | 0 | 6 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 132 |
| 14:00 | 0 | 205 | **34** | **2** | 4 | 1 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | 252 |
| 15:00 | 0 | 193 | 34 | 0 | 4 | 1 | **2** | 0 | **11** | 0 | 0 | 0 | 0 | 245 |
| 16:00 | 0 | 195 | 28 | 0 | 2 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 230 |
| 17:00 | **1** | **238** | 23 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | **264** |
| 18:00 | 0 | 207 | 2 | 0 | 1 | **2** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 212 |
| 19:00 | 0 | 82 | 6 | 0 | 3 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 94 |
| 20:00 | 0 | 33 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 38 |
| 21:00 | 1 | 19 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 22:00 | 0 | 49 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 54 |
| 23:00 | 1 | 49 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 55 |
| Total | 7 | 2854 | 394 | 4 | 50 | 19 | 9 | 5 | 54 | 0 | 0 | 0 | 0 | 3396 |
| Percent | 0.2% | 84.0% | 11.6% | 0.1% | 1.5% | 0.6% | 0.3% | 0.1% | 1.6% | 0.0% | 0.0% | 0.0% | 0.0% | |
| AM Peak | 10:00 | 07:00 | 07:00 | 07:00 | 10:00 | 04:00 | 09:00 | 07:00 | 11:00 | | | | | 07:00 |
| Vol. | 2 | 328 | 44 | 2 | 8 | 3 | 2 | 1 | 8 | | | | | 380 |
| PM Peak | 17:00 | 17:00 | 14:00 | 14:00 | 12:00 | 18:00 | 15:00 | 12:00 | 15:00 | | | | | 17:00 |
| Vol. | 1 | 238 | 34 | 2 | 6 | 2 | 2 | 1 | 11 | | | | | 264 |
| Grand Total | 7 | 2854 | 394 | 4 | 50 | 19 | 9 | 5 | 54 | 0 | 0 | 0 | 0 | 3396 |
| Percent | 0.2% | 84.0% | 11.6% | 0.1% | 1.5% | 0.6% | 0.3% | 0.1% | 1.6% | 0.0% | 0.0% | 0.0% | 0.0% | |

# Counts Unlimited, Inc.

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City of Ontario
Eycalyptus Avenue
E/ Grove Avenue
24 Hour Directional Classification Count

ONT001
Site Code: 051-25092

Eastbound, Westbound

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/29/25 | 1 | 58 | 2 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 63 |
| 01:00 | 0 | 37 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 41 |
| 02:00 | 0 | 40 | 0 | 0 | 0 | **3** | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 45 |
| 03:00 | 0 | 62 | 0 | 0 | 0 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 67 |
| 04:00 | 1 | 236 | 13 | 0 | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 256 |
| 05:00 | 1 | 302 | 20 | 0 | 3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 328 |
| 06:00 | 1 | 344 | 54 | 0 | 4 | 2 | **2** | 0 | 7 | 0 | 0 | 0 | 0 | 414 |
| 07:00 | 0 | **574** | **93** | **2** | 4 | 2 | 1 | **1** | 7 | 0 | 0 | 0 | 0 | **684** |
| 08:00 | 1 | 414 | 69 | 0 | 7 | 2 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 501 |
| 09:00 | 0 | 203 | 41 | 0 | 11 | 3 | 2 | 0 | 3 | 0 | 0 | 0 | 0 | 263 |
| 10:00 | **2** | 170 | 47 | 0 | **15** | 3 | 1 | 1 | 7 | 0 | 0 | 0 | 0 | 246 |
| 11:00 | 1 | 134 | 45 | 0 | 9 | 2 | 1 | 0 | **13** | 0 | 0 | 0 | 0 | 205 |
| 12 PM | **1** | 139 | 48 | 0 | 8 | 2 | 1 | **2** | 3 | 0 | 0 | 0 | 0 | 204 |
| 13:00 | 0 | 208 | 47 | 0 | 9 | 5 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 276 |
| 14:00 | 1 | 375 | 60 | **3** | **12** | **6** | **2** | 2 | 4 | 0 | 0 | 0 | 0 | 465 |
| 15:00 | 0 | 403 | **77** | 1 | 9 | 4 | 2 | 0 | **16** | 0 | 0 | 0 | 0 | 512 |
| 16:00 | 0 | 396 | 68 | 0 | 9 | 2 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | 485 |
| 17:00 | 1 | **665** | 71 | 0 | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | **743** |
| 18:00 | 0 | 409 | 9 | 0 | 2 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 424 |
| 19:00 | 0 | 190 | 9 | 0 | 4 | 4 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 210 |
| 20:00 | 0 | 83 | 5 | 0 | 3 | 3 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 95 |
| 21:00 | 1 | 74 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 77 |
| 22:00 | 0 | 86 | 4 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 94 |
| 23:00 | 1 | 82 | 4 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 91 |
| Total | 13 | 5684 | 788 | 6 | 111 | 58 | 13 | 7 | 109 | 0 | 0 | 0 | 0 | 6789 |
| Percent | 0.2% | 83.7% | 11.6% | 0.1% | 1.6% | 0.9% | 0.2% | 0.1% | 1.6% | 0.0% | 0.0% | 0.0% | 0.0% | |
| AM Peak | 10:00 | 07:00 | 07:00 | 07:00 | 10:00 | 02:00 | 06:00 | 07:00 | 11:00 | | | | | 07:00 |
| Vol. | 2 | 574 | 93 | 2 | 15 | 3 | 2 | 1 | 13 | | | | | 684 |
| PM Peak | 12:00 | 17:00 | 15:00 | 14:00 | 14:00 | 14:00 | 14:00 | 12:00 | 15:00 | | | | | 17:00 |
| Vol. | 1 | 665 | 77 | 3 | 12 | 6 | 2 | 2 | 16 | | | | | 743 |
| Grand Total | 13 | 5684 | 788 | 6 | 111 | 58 | 13 | 7 | 109 | 0 | 0 | 0 | 0 | 6789 |
| Percent | 0.2% | 83.7% | 11.6% | 0.1% | 1.6% | 0.9% | 0.2% | 0.1% | 1.6% | 0.0% | 0.0% | 0.0% | 0.0% | |

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City of Ontario
Euclid Avenue
N/ Edison Avenue
24 Hour Directional Classification Count

ONT006
Site Code: 051-24953

Northbound

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/29/24 | 0 | 129 | 7 | 0 | 7 | 11 | 0 | 4 | 22 | 0 | 1 | 0 | 0 | 181 |
| 01:00 | 0 | 81 | 2 | 0 | 3 | 10 | 0 | 9 | 28 | 0 | 2 | 0 | 0 | 135 |
| 02:00 | 0 | 80 | 5 | 0 | 7 | 1 | 0 | 7 | 26 | 0 | 3 | 0 | 0 | 129 |
| 03:00 | 0 | 148 | 8 | 0 | 11 | 6 | 0 | 6 | 36 | 0 | 1 | 0 | 0 | 216 |
| 04:00 | 0 | 240 | 28 | 0 | 8 | 12 | 1 | 9 | 61 | 0 | 5 | 0 | 0 | 364 |
| 05:00 | 0 | 202 | 37 | 0 | 12 | 10 | 0 | 6 | 56 | 0 | 1 | 0 | 0 | 324 |
| 06:00 | **2** | 310 | 60 | 2 | 15 | 21 | 1 | 8 | 76 | 0 | **6** | 0 | 0 | 501 |
| 07:00 | 2 | **590** | 81 | **6** | 19 | 18 | 4 | **10** | 88 | 1 | 0 | **1** | 0 | **820** |
| 08:00 | 0 | 493 | **126** | 5 | 23 | 16 | **11** | 7 | 97 | **2** | 1 | 0 | 0 | 781 |
| 09:00 | 0 | 404 | 101 | 3 | 23 | 33 | 10 | 6 | 118 | 0 | 1 | 0 | 0 | 699 |
| 10:00 | 0 | 348 | 92 | 2 | **46** | **39** | 0 | 4 | 97 | 0 | 0 | 0 | 0 | 628 |
| 11:00 | 1 | 310 | 103 | 4 | 44 | 35 | 9 | 4 | **121** | 0 | 0 | 0 | **1** | 632 |
| 12 PM | 2 | 345 | 110 | 3 | **44** | **40** | 5 | 6 | 116 | 1 | 1 | 0 | 0 | 673 |
| 13:00 | 2 | 379 | 125 | 2 | 36 | 30 | **11** | 12 | **136** | 0 | **3** | 0 | 0 | 736 |
| 14:00 | 0 | 606 | 172 | 5 | 31 | 33 | 7 | 5 | 112 | 0 | 0 | 0 | 0 | 971 |
| 15:00 | 2 | 675 | **193** | 6 | 40 | 31 | 5 | 12 | 113 | **2** | 0 | 0 | 0 | 1079 |
| 16:00 | 1 | 755 | 166 | **8** | 19 | 37 | 4 | **13** | 99 | 0 | 0 | 0 | 0 | **1102** |
| 17:00 | **4** | **765** | 126 | 2 | 24 | 27 | 4 | 9 | 88 | 1 | 0 | 0 | 0 | 1050 |
| 18:00 | 0 | 507 | 85 | 2 | 13 | 33 | 2 | 2 | 48 | 0 | 0 | 0 | 0 | 692 |
| 19:00 | 0 | 397 | 35 | 2 | 2 | 24 | 0 | 5 | 86 | 0 | 0 | 0 | 0 | 551 |
| 20:00 | 0 | 291 | 22 | 1 | 3 | 15 | 0 | 0 | 69 | 1 | 0 | 0 | 0 | 402 |
| 21:00 | 0 | 240 | 36 | 0 | 2 | 28 | 1 | 7 | 42 | 0 | 0 | 0 | 0 | 356 |
| 22:00 | 0 | 253 | 15 | 0 | 4 | 22 | 0 | 9 | 50 | 0 | 0 | **1** | 0 | 354 |
| 23:00 | 0 | 240 | 20 | 0 | 4 | 18 | 0 | 11 | 37 | 0 | 1 | 0 | 0 | 331 |
| Total | 16 | 8788 | 1755 | 53 | 440 | 550 | 75 | 171 | 1822 | 8 | 26 | 2 | 1 | 13707 |
| Percent | 0.1% | 64.1% | 12.8% | 0.4% | 3.2% | 4.0% | 0.5% | 1.2% | 13.3% | 0.1% | 0.2% | 0.0% | 0.0% | |
| AM Peak | 06:00 | 07:00 | 08:00 | 07:00 | 10:00 | 10:00 | 08:00 | 07:00 | 11:00 | 08:00 | 06:00 | 07:00 | 11:00 | 07:00 |
| Vol. | 2 | 590 | 126 | 6 | 46 | 39 | 11 | 10 | 121 | 2 | 6 | 1 | 1 | 820 |
| PM Peak | 17:00 | 17:00 | 15:00 | 16:00 | 12:00 | 12:00 | 13:00 | 16:00 | 13:00 | 15:00 | 13:00 | 22:00 | | 16:00 |
| Vol. | 4 | 765 | 193 | 8 | 44 | 40 | 11 | 13 | 136 | 2 | 3 | 1 | | 1102 |
| Grand Total | 16 | 8788 | 1755 | 53 | 440 | 550 | 75 | 171 | 1822 | 8 | 26 | 2 | 1 | 13707 |
| Percent | 0.1% | 64.1% | 12.8% | 0.4% | 3.2% | 4.0% | 0.5% | 1.2% | 13.3% | 0.1% | 0.2% | 0.0% | 0.0% | |

# Counts Unimited, Inc.

PO Box 1178
Corona, CA 92878
(951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Euclid Avenue
N/ Edison Avenue
24 Hour Directional Classification Count

ONT006
Site Code: 051-24953

Southbound

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/29/24 | 0 | 72 | 2 | 0 | 4 | 9 | 0 | 7 | 33 | 0 | 0 | 2 | 0 | 129 |
| 01:00 | 1 | 73 | 9 | 0 | 2 | 12 | 0 | 3 | 41 | 0 | 0 | 2 | 0 | 143 |
| 02:00 | 0 | 79 | 4 | 0 | 3 | 12 | 0 | 5 | 32 | **2** | 0 | 2 | 0 | 139 |
| 03:00 | 1 | 152 | 20 | 0 | 3 | 12 | 1 | 5 | 68 | 1 | **1** | 1 | 0 | 265 |
| 04:00 | 1 | 377 | 65 | 0 | 5 | 10 | 1 | 4 | 49 | 0 | 0 | **3** | 0 | 515 |
| 05:00 | 3 | **580** | 147 | 0 | 8 | 19 | 0 | 8 | 65 | 0 | 0 | 0 | 0 | 830 |
| 06:00 | 1 | 537 | **154** | 4 | 14 | 30 | 2 | 5 | 85 | 0 | 0 | 0 | 0 | **832** |
| 07:00 | **6** | 511 | 122 | 5 | 27 | 33 | **8** | 7 | 80 | 0 | 1 | 1 | 0 | 801 |
| 08:00 | 1 | 420 | 122 | 4 | 25 | 24 | 3 | 5 | 97 | 1 | 0 | 0 | 0 | 702 |
| 09:00 | 3 | 326 | 89 | **7** | 24 | 34 | 2 | 9 | **111** | 0 | 0 | 0 | 0 | 605 |
| 10:00 | 0 | 287 | 97 | 2 | **46** | **36** | 0 | 9 | 106 | 1 | 0 | 0 | 0 | 584 |
| 11:00 | 0 | 278 | 86 | 1 | 40 | 31 | 3 | **14** | 110 | 1 | 0 | 0 | 0 | 564 |
| 12 PM | **3** | 406 | 93 | 2 | **37** | 24 | 2 | **22** | 108 | 0 | 1 | 0 | 0 | 698 |
| 13:00 | 1 | 346 | **129** | **5** | 33 | **35** | 6 | 20 | **110** | **1** | 0 | 0 | 0 | 686 |
| 14:00 | 2 | 406 | 114 | 4 | 30 | 25 | **9** | 11 | 93 | 0 | 0 | 0 | 0 | 694 |
| 15:00 | 2 | 450 | 120 | 2 | 33 | 21 | 1 | 10 | 87 | 0 | 0 | 0 | 0 | 726 |
| 16:00 | 1 | 643 | 125 | 4 | 22 | 28 | 3 | 10 | 69 | 1 | 0 | 0 | 0 | **906** |
| 17:00 | 2 | **699** | 94 | 2 | 14 | 30 | 0 | 3 | 42 | 0 | 0 | 0 | 0 | 886 |
| 18:00 | 1 | 450 | 60 | 1 | 12 | 18 | 0 | 6 | 69 | 1 | 0 | 0 | 0 | 618 |
| 19:00 | 0 | 359 | 43 | 2 | 9 | 20 | 0 | 5 | 44 | 0 | 0 | 0 | 0 | 482 |
| 20:00 | 0 | 289 | 39 | 2 | 7 | 16 | 0 | 5 | 58 | 0 | 0 | 0 | 0 | 416 |
| 21:00 | 0 | 230 | 33 | 0 | 5 | 18 | 0 | 5 | 52 | 0 | 0 | 0 | 0 | 343 |
| 22:00 | 1 | 165 | 21 | 0 | 4 | 13 | 0 | 4 | 36 | 0 | 0 | **1** | 0 | 245 |
| 23:00 | 0 | 121 | 20 | 0 | 2 | 9 | 0 | 1 | 31 | 0 | **3** | 0 | 0 | 187 |
| Total | 30 | 8256 | 1808 | 47 | 409 | 519 | 41 | 183 | 1676 | 9 | 6 | 12 | 0 | 12996 |
| Percent | 0.2% | 63.5% | 13.9% | 0.4% | 3.1% | 4.0% | 0.3% | 1.4% | 12.9% | 0.1% | 0.0% | 0.1% | 0.0% | |
| AM Peak | 07:00 | 05:00 | 06:00 | 09:00 | 10:00 | 10:00 | 07:00 | 11:00 | 09:00 | 02:00 | 03:00 | 04:00 | | 06:00 |
| Vol. | 6 | 580 | 154 | 7 | 46 | 36 | 8 | 14 | 111 | 2 | 1 | 3 | | 832 |
| PM Peak | 12:00 | 17:00 | 13:00 | 13:00 | 12:00 | 13:00 | 14:00 | 12:00 | 13:00 | 13:00 | 23:00 | 22:00 | | 16:00 |
| Vol. | 3 | 699 | 129 | 5 | 37 | 35 | 9 | 22 | 110 | 1 | 3 | 1 | | 906 |
| Grand Total | 30 | 8256 | 1808 | 47 | 409 | 519 | 41 | 183 | 1676 | 9 | 6 | 12 | 0 | 12996 |
| Percent | 0.2% | 63.5% | 13.9% | 0.4% | 3.1% | 4.0% | 0.3% | 1.4% | 12.9% | 0.1% | 0.0% | 0.1% | 0.0% | |

# Counts Unimited, Inc.

PO Box 1178
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(951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Euclid Avenue
N/ Edison Avenue
24 Hour Directional Classification Count

ONT006
Site Code: 051-24953

Northbound, Southbound

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/29/24 | 0 | 201 | 9 | 0 | 11 | 20 | 0 | 11 | 55 | 0 | 1 | 2 | 0 | 310 |
| 01:00 | 1 | 154 | 11 | 0 | 5 | 22 | 0 | 12 | 69 | 0 | 2 | 2 | 0 | 278 |
| 02:00 | 0 | 159 | 9 | 0 | 10 | 13 | 0 | 12 | 58 | 2 | 3 | 2 | 0 | 268 |
| 03:00 | 1 | 300 | 28 | 0 | 14 | 18 | 1 | 11 | 104 | 1 | 2 | 1 | 0 | 481 |
| 04:00 | 1 | 617 | 93 | 0 | 13 | 22 | 2 | 13 | 110 | 0 | 5 | **3** | 0 | 879 |
| 05:00 | 3 | 782 | 184 | 0 | 20 | 29 | 0 | 14 | 121 | 0 | 1 | 0 | 0 | 1154 |
| 06:00 | 3 | 847 | 214 | 6 | 29 | 51 | 3 | 13 | 161 | 0 | **6** | 0 | 0 | 1333 |
| 07:00 | **8** | **1101** | 203 | **11** | 46 | 51 | 12 | 17 | 168 | 1 | 1 | 2 | 0 | **1621** |
| 08:00 | 1 | 913 | **248** | 9 | 48 | 40 | **14** | 12 | 194 | **3** | 1 | 0 | 0 | 1483 |
| 09:00 | 3 | 730 | 190 | 10 | 47 | 67 | 12 | 15 | 229 | 0 | 1 | 0 | 0 | 1304 |
| 10:00 | 0 | 635 | 189 | 4 | **92** | **75** | 0 | 13 | 203 | 1 | 0 | 0 | 0 | 1212 |
| 11:00 | 1 | 588 | 189 | 5 | 84 | 66 | 12 | **18** | **231** | 1 | 0 | 0 | **1** | 1196 |
| 12 PM | 5 | 751 | 203 | 5 | **81** | 64 | 7 | 28 | 224 | 1 | 2 | 0 | 0 | 1371 |
| 13:00 | 3 | 725 | 254 | 7 | 69 | **65** | **17** | **32** | **246** | 1 | 3 | 0 | 0 | 1422 |
| 14:00 | 2 | 1012 | 286 | 9 | 61 | 58 | 16 | 16 | 205 | 0 | 0 | 0 | 0 | 1665 |
| 15:00 | 4 | 1125 | **313** | 8 | 73 | 52 | 6 | 22 | 200 | **2** | 0 | 0 | 0 | 1805 |
| 16:00 | 2 | 1398 | 291 | **12** | 41 | 65 | 7 | 23 | 168 | 1 | 0 | 0 | 0 | **2008** |
| 17:00 | **6** | **1464** | 220 | 4 | 38 | 57 | 4 | 12 | 130 | 1 | 0 | 0 | 0 | 1936 |
| 18:00 | 1 | 957 | 145 | 3 | 25 | 51 | 2 | 8 | 117 | 1 | 0 | 0 | 0 | 1310 |
| 19:00 | 0 | 756 | 78 | 4 | 11 | 44 | 0 | 10 | 130 | 0 | 0 | 0 | 0 | 1033 |
| 20:00 | 0 | 580 | 61 | 3 | 10 | 31 | 0 | 5 | 127 | 1 | 0 | 0 | 0 | 818 |
| 21:00 | 0 | 470 | 69 | 0 | 7 | 46 | 1 | 12 | 94 | 0 | 0 | 0 | 0 | 699 |
| 22:00 | 1 | 418 | 36 | 0 | 8 | 35 | 0 | 13 | 86 | 0 | 0 | **2** | 0 | 599 |
| 23:00 | 0 | 361 | 40 | 0 | 6 | 27 | 0 | 12 | 68 | 0 | **4** | 0 | 0 | 518 |
| Total | 46 | 17044 | 3563 | 100 | 849 | 1069 | 116 | 354 | 3498 | 17 | 32 | 14 | 1 | 26703 |
| Percent | 0.2% | 63.8% | 13.3% | 0.4% | 3.2% | 4.0% | 0.4% | 1.3% | 13.1% | 0.1% | 0.1% | 0.1% | 0.0% | |
| AM Peak | 07:00 | 07:00 | 08:00 | 07:00 | 10:00 | 10:00 | 08:00 | 11:00 | 11:00 | 08:00 | 06:00 | 04:00 | 11:00 | 07:00 |
| Vol. | 8 | 1101 | 248 | 11 | 92 | 75 | 14 | 18 | 231 | 3 | 6 | 3 | 1 | 1621 |
| PM Peak | 17:00 | 17:00 | 15:00 | 16:00 | 12:00 | 13:00 | 13:00 | 13:00 | 13:00 | 15:00 | 23:00 | 22:00 | | 16:00 |
| Vol. | 6 | 1464 | 313 | 12 | 81 | 65 | 17 | 32 | 246 | 2 | 4 | 2 | | 2008 |
| Grand Total | 46 | 17044 | 3563 | 100 | 849 | 1069 | 116 | 354 | 3498 | 17 | 32 | 14 | 1 | 26703 |
| Percent | 0.2% | 63.8% | 13.3% | 0.4% | 3.2% | 4.0% | 0.4% | 1.3% | 13.1% | 0.1% | 0.1% | 0.1% | 0.0% | |

# Counts Unimited, Inc.

PO Box 1178
Corona, CA 92878
(951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Limonite Avenue
E/ Archibald Avenue
24 Hour Directional Volume Count

ONT004
Site Code: 051-24953

| Start Time | 12/3/24 Tue | Eastbound Morning | Eastbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Westbound Morning | Westbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Combined Totals Morning | Combined Totals Afternoon |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:00 | | 32 | 152 | | | 32 | **157** | | | | |
| 12:15 | | 28 | 184 | | | 37 | **191** | | | | |
| 12:30 | | 34 | 143 | | | 29 | **156** | | | | |
| 12:45 | | 21 | 142 | 115 | 621 | 22 | **196** | 120 | 700 | 235 | 1321 |
| 01:00 | | 30 | 173 | | | 24 | 156 | | | | |
| 01:15 | | 23 | 146 | | | 16 | 160 | | | | |
| 01:30 | | 7 | 196 | | | 18 | 140 | | | | |
| 01:45 | | 10 | 196 | 70 | 711 | 16 | 147 | 74 | 603 | 144 | 1314 |
| 02:00 | | 14 | 196 | | | 17 | 162 | | | | |
| 02:15 | | 14 | 185 | | | 17 | 156 | | | | |
| 02:30 | | 22 | 198 | | | 12 | 144 | | | | |
| 02:45 | | 15 | 224 | 65 | 803 | 23 | 162 | 69 | 624 | 134 | 1427 |
| 03:00 | | 21 | 250 | | | 26 | 170 | | | | |
| 03:15 | | 16 | 235 | | | 38 | 156 | | | | |
| 03:30 | | 18 | **244** | | | 32 | 148 | | | | |
| 03:45 | | 36 | **240** | 91 | 969 | 38 | 156 | 134 | 630 | 225 | 1599 |
| 04:00 | | 42 | **252** | | | 38 | 146 | | | | |
| 04:15 | | 23 | **266** | | | 60 | 175 | | | | |
| 04:30 | | 52 | 230 | | | 96 | 138 | | | | |
| 04:45 | | 40 | 225 | 157 | 973 | 133 | 176 | 327 | 635 | 484 | 1608 |
| 05:00 | | 48 | 240 | | | 108 | 144 | | | | |
| 05:15 | | 40 | 264 | | | 118 | 151 | | | | |
| 05:30 | | 65 | 230 | | | 192 | 176 | | | | |
| 05:45 | | 80 | 207 | 233 | 941 | 202 | 168 | 620 | 639 | 853 | 1580 |
| 06:00 | | 116 | 236 | | | 176 | 166 | | | | |
| 06:15 | | 92 | 228 | | | 176 | 170 | | | | |
| 06:30 | | 89 | 224 | | | 180 | 158 | | | | |
| 06:45 | | 74 | 178 | 371 | 866 | 250 | 138 | 782 | 632 | 1153 | 1498 |
| 07:00 | | 100 | 156 | | | 218 | 127 | | | | |
| 07:15 | | 119 | 150 | | | 202 | 112 | | | | |
| 07:30 | | **130** | 152 | | | **240** | 106 | | | | |
| 07:45 | | **181** | 130 | 530 | 588 | **232** | 112 | 892 | 457 | 1422 | 1045 |
| 08:00 | | **170** | 130 | | | **230** | 104 | | | | |
| 08:15 | | **164** | 120 | | | **215** | 112 | | | | |
| 08:30 | | 128 | 116 | | | 236 | 104 | | | | |
| 08:45 | | 126 | 82 | 588 | 448 | 218 | 90 | 899 | 410 | 1487 | 858 |
| 09:00 | | 131 | 73 | | | 185 | 91 | | | | |
| 09:15 | | 183 | 73 | | | 164 | 94 | | | | |
| 09:30 | | 145 | 86 | | | 136 | 74 | | | | |
| 09:45 | | 124 | 76 | 583 | 308 | 128 | 70 | 613 | 329 | 1196 | 637 |
| 10:00 | | 130 | 68 | | | 157 | 78 | | | | |
| 10:15 | | 125 | 78 | | | 152 | 50 | | | | |
| 10:30 | | 132 | 54 | | | 148 | 47 | | | | |
| 10:45 | | 124 | 42 | 511 | 242 | 132 | 54 | 589 | 229 | 1100 | 471 |
| 11:00 | | 156 | 44 | | | 152 | 29 | | | | |
| 11:15 | | 142 | 42 | | | 158 | 28 | | | | |
| 11:30 | | 138 | 46 | | | 132 | 44 | | | | |
| 11:45 | | 176 | 28 | 612 | 160 | 166 | 30 | 608 | 131 | 1220 | 291 |
| Total | | 3926 | 7630 | 3926 | 7630 | 5727 | 6019 | 5727 | 6019 | 9653 | 13649 |
| Combined Total | | 11556 | | 11556 | | 11746 | | 11746 | | 23302 | |
| AM Peak | - | 07:30 | - | - | - | 07:30 | - | - | - | - | - |
| Vol. | - | 645 | - | - | - | 917 | - | - | - | - | - |
| P.H.F. | | 0.891 | | | | 0.955 | | | | | |
| PM Peak | - | - | 03:30 | - | - | - | 12:00 | - | - | - | - |
| Vol. | - | - | 1002 | - | - | - | 700 | - | - | - | - |
| P.H.F. | | | 0.942 | | | | 0.893 | | | | |
| Percentage | | 34.0% | 66.0% | | | 48.8% | 51.2% | | | | |
| ADT/AADT | | ADT 23,302 | | AADT 23,302 | | | | | | | |

# Counts Unimited, Inc.

PO Box 1178
Corona, CA 92878
(951) 268-6268
email: counts@countsunlimited.com

City of Ontario
Pine Avenue
E/ Euclid Avenue
24 Hour Directional Volume Count

ONT005
Site Code: 051-24953

| Start Time | 10/29/24 Tue | Eastbound Morning | Eastbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Westbound Morning | Westbound Afternoon | Hour Totals Morning | Hour Totals Afternoon | Combined Totals Morning | Combined Totals Afternoon |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 12:00 | | 49 | 160 | | | 20 | 191 | | | | |
| 12:15 | | 65 | 136 | | | 23 | 146 | | | | |
| 12:30 | | 52 | 167 | | | 23 | 175 | | | | |
| 12:45 | | 42 | 171 | 208 | 634 | 8 | 159 | 74 | 671 | 282 | 1305 |
| 01:00 | | 31 | 173 | | | 11 | 171 | | | | |
| 01:15 | | 23 | 152 | | | 14 | 166 | | | | |
| 01:30 | | 17 | 268 | | | 14 | 156 | | | | |
| 01:45 | | 22 | 243 | 93 | 836 | 11 | 212 | 50 | 705 | 143 | 1541 |
| 02:00 | | 18 | 225 | | | 18 | 230 | | | | |
| 02:15 | | 33 | 220 | | | 14 | 207 | | | | |
| 02:30 | | 26 | 330 | | | 19 | 177 | | | | |
| 02:45 | | 21 | 281 | 98 | 1056 | 23 | 192 | 74 | 806 | 172 | 1862 |
| 03:00 | | 17 | 275 | | | 22 | 214 | | | | |
| 03:15 | | 21 | 310 | | | 48 | 225 | | | | |
| 03:30 | | 21 | 315 | | | 54 | 203 | | | | |
| 03:45 | | 20 | 337 | 79 | 1237 | 49 | 182 | 173 | 824 | 252 | 2061 |
| 04:00 | | 17 | 329 | | | 81 | 182 | | | | |
| 04:15 | | 29 | 291 | | | 135 | **226** | | | | |
| 04:30 | | 28 | **323** | | | 175 | **230** | | | | |
| 04:45 | | 24 | **357** | 98 | 1300 | 211 | **201** | 602 | 839 | 700 | 2139 |
| 05:00 | | 35 | **370** | | | 254 | **198** | | | | |
| 05:15 | | 52 | **306** | | | 319 | 210 | | | | |
| 05:30 | | 67 | 318 | | | 339 | 201 | | | | |
| 05:45 | | 94 | 327 | 248 | 1321 | 384 | 163 | 1296 | 772 | 1544 | 2093 |
| 06:00 | | 80 | 322 | | | 377 | 153 | | | | |
| 06:15 | | 104 | 314 | | | 287 | 179 | | | | |
| 06:30 | | 128 | 338 | | | 338 | 158 | | | | |
| 06:45 | | 178 | 337 | 490 | 1311 | **367** | 118 | 1369 | 608 | 1859 | 1919 |
| 07:00 | | 134 | 317 | | | **371** | 112 | | | | |
| 07:15 | | 142 | 312 | | | **395** | 108 | | | | |
| 07:30 | | **190** | 295 | | | **357** | 75 | | | | |
| 07:45 | | **194** | 279 | 660 | 1203 | 325 | 86 | 1448 | 381 | 2108 | 1584 |
| 08:00 | | **179** | 240 | | | 330 | 89 | | | | |
| 08:15 | | **186** | 281 | | | 302 | 93 | | | | |
| 08:30 | | 184 | 245 | | | 289 | 102 | | | | |
| 08:45 | | 146 | 249 | 695 | 1015 | 260 | 86 | 1181 | 370 | 1876 | 1385 |
| 09:00 | | 77 | 229 | | | 249 | 98 | | | | |
| 09:15 | | 155 | 220 | | | 241 | 60 | | | | |
| 09:30 | | 97 | 217 | | | 203 | 56 | | | | |
| 09:45 | | 156 | 178 | 485 | 844 | 198 | 70 | 891 | 284 | 1376 | 1128 |
| 10:00 | | 122 | 169 | | | 178 | 62 | | | | |
| 10:15 | | 115 | 130 | | | 189 | 57 | | | | |
| 10:30 | | 119 | 112 | | | 189 | 50 | | | | |
| 10:45 | | 110 | 98 | 466 | 509 | 196 | 50 | 752 | 219 | 1218 | 728 |
| 11:00 | | 97 | 87 | | | 173 | 34 | | | | |
| 11:15 | | 144 | 70 | | | 183 | 27 | | | | |
| 11:30 | | 145 | 84 | | | 148 | 32 | | | | |
| 11:45 | | 166 | 70 | 552 | 311 | 162 | 27 | 666 | 120 | 1218 | 431 |
| Total | | 4172 | 11577 | 4172 | 11577 | 8576 | 6599 | 8576 | 6599 | 12748 | 18176 |
| Combined Total | | 15749 | | 15749 | | 15175 | | 15175 | | 30924 | |
| AM Peak | - | 07:30 | - | - | - | 06:45 | - | - | - | - | - |
| Vol. | - | 749 | - | - | - | 1490 | - | - | - | - | - |
| P.H.F. | | 0.965 | | | | 0.943 | | | | | |
| PM Peak | - | - | 04:30 | - | - | - | 04:15 | - | - | - | - |
| Vol. | - | - | 1356 | - | - | - | 855 | - | - | - | - |
| P.H.F. | | | 0.916 | | | | 0.929 | | | | |
| Percentage | | 26.5% | 73.5% | | | 56.5% | 43.5% | | | | |
| ADT/AADT | | ADT 30,924 | | AADT 30,924 | | | | | | | |

# APPENDIX 3.2:

# EXISTING (2024) INTERSECTION ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 310 | 1 | 434 | 265 | 677 | 742 | 458 |
| Future Volume (vph) | 310 | 1 | 434 | 265 | 677 | 742 | 458 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 27.0 | 61.0 | 34.0 | 34.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 30.0% | 67.8% | 37.8% | 37.8% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 20.1 | 20.1 | 20.1 | 18.6 | 56.9 | 33.1 | 33.1 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.21 | 0.63 | 0.37 | 0.37 |
| v/c Ratio | 0.75 | 0.54 | 0.51 | 0.78 | 0.33 | 0.61 | 0.56 |
| Control Delay (s/veh) | 45.3 | 12.3 | 9.6 | 54.1 | 8.4 | 27.1 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.3 | 12.3 | 9.6 | 54.1 | 8.4 | 27.1 | 5.1 |
| LOS | D | B | A | D | A | C | A |
| Approach Delay (s/veh) | | 23.0 | | | 21.3 | 18.7 | |
| Approach LOS | | C | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 36.8 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 20.6 | Intersection LOS: C |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

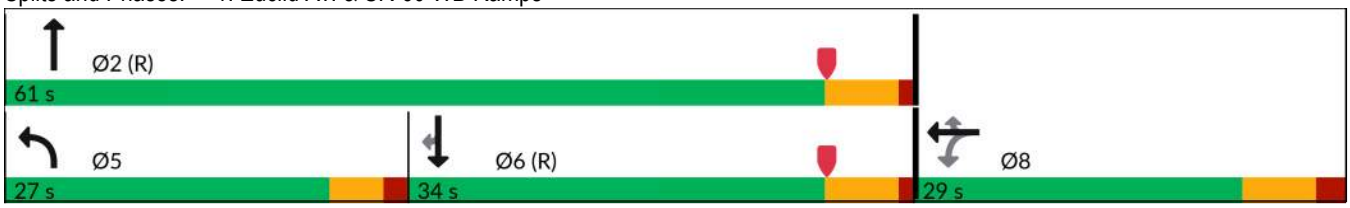

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 310 | 1 | 434 | 265 | 677 | 0 | 0 | 742 | 458 |
| Future Volume (veh/h) | 0 | 0 | 0 | 310 | 1 | 434 | 265 | 677 | 0 | 0 | 742 | 458 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1870 | 1870 | 1870 | 1870 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 418 | 0 | 181 | 285 | 728 | 0 | 0 | 798 | 264 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 573 | 0 | 254 | 318 | 2469 | 0 | 0 | 1630 | 711 |
| Arrive On Green | | | | 0.16 | 0.00 | 0.16 | 0.36 | 1.00 | 0.00 | 0.00 | 0.46 | 0.46 |
| Sat Flow, veh/h | | | | 3563 | 0 | 1579 | 1781 | 3647 | 0 | 0 | 3647 | 1551 |
| Grp Volume(v), veh/h | | | | 418 | 0 | 181 | 285 | 728 | 0 | 0 | 798 | 264 |
| Grp Sat Flow(s),veh/h/ln | | | | 1781 | 0 | 1579 | 1781 | 1777 | 0 | 0 | 1777 | 1551 |
| Q Serve(g_s), s | | | | 10.0 | 0.0 | 9.8 | 13.6 | 0.0 | 0.0 | 0.0 | 14.1 | 10.0 |
| Cycle Q Clear(g_c), s | | | | 10.0 | 0.0 | 9.8 | 13.6 | 0.0 | 0.0 | 0.0 | 14.1 | 10.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 573 | 0 | 254 | 318 | 2469 | 0 | 0 | 1630 | 711 |
| V/C Ratio(X) | | | | 0.73 | 0.00 | 0.71 | 0.90 | 0.29 | 0.00 | 0.00 | 0.49 | 0.37 |
| Avail Cap(c_a), veh/h | | | | 871 | 0 | 386 | 431 | 2469 | 0 | 0 | 1630 | 711 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.74 | 0.74 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.9 | 0.0 | 35.8 | 28.2 | 0.0 | 0.0 | 0.0 | 17.0 | 15.9 |
| Incr Delay (d2), s/veh | | | | 2.6 | 0.0 | 5.2 | 13.3 | 0.2 | 0.0 | 0.0 | 1.1 | 1.5 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.5 | 0.0 | 4.1 | 5.5 | 0.1 | 0.0 | 0.0 | 5.4 | 3.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 38.5 | 0.0 | 41.0 | 41.5 | 0.2 | 0.0 | 0.0 | 18.1 | 17.4 |
| LnGrp LOS | | | | D | | D | D | A | | | B | B |
| Approach Vol, veh/h | | | | | 599 | | | 1013 | | | 1062 | |
| Approach Delay, s/veh | | | | | 39.2 | | | 11.8 | | | 17.9 | |
| Approach LOS | | | | | D | | | B | | | B | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 68.5 | | 21.2 | 47.3 | | 21.5 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 21.8 | 28.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 15.6 | 16.1 | | 12.0 |
| Green Ext Time (p_c), s | 7.9 | | 0.4 | 6.1 | | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.4 |
| HCM 7th LOS | C |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 308 | 1 | 203 | 634 | 390 | 338 | 714 |
| Future Volume (vph) | 308 | 1 | 203 | 634 | 390 | 338 | 714 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 27.7 | 27.7 | 27.7 | 26.0 | 26.0 | 14.7 | 24.0 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 60.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 66.7% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | | 7.0 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 20.8 | 0.0 | 20.8 | 29.8 | 29.8 | 21.7 | 56.2 |
| Actuated g/C Ratio | 0.23 | 0.00 | 0.23 | 0.33 | 0.33 | 0.24 | 0.62 |
| v/c Ratio | 0.78 | no cap | 0.40 | 0.56 | 0.52 | 0.82 | 0.33 |
| Control Delay (s/veh) | 45.9 | | 6.5 | 28.6 | 5.6 | 59.7 | 7.9 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.9 | Error | 6.5 | 28.6 | 5.6 | 59.7 | 7.9 |
| LOS | D | F | A | C | A | E | A |
| Approach Delay (s/veh) | | Error | | 19.8 | | | 24.5 |
| Approach LOS | | F | | B | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 36.6 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

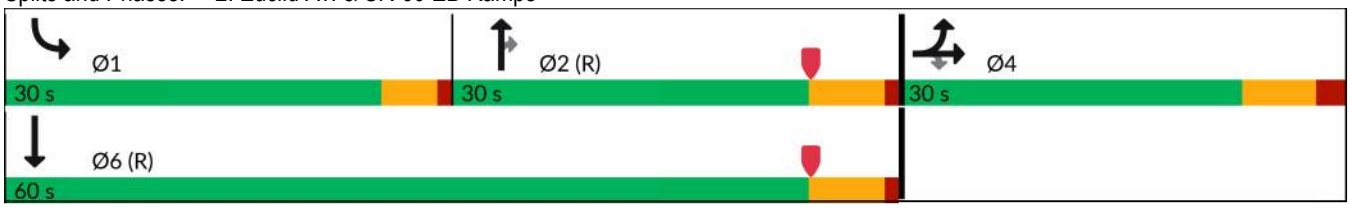

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 308 | 1 | 203 | 0 | 0 | 0 | 0 | 634 | 390 | 338 | 714 | 0 |
| Future Volume (veh/h) | 308 | 1 | 203 | 0 | 0 | 0 | 0 | 634 | 390 | 338 | 714 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | 0 |
| Adj Flow Rate, veh/h | 318 | 1 | 151 | | | | 0 | 654 | 299 | 348 | 736 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 370 | 0 | 329 | | | | 0 | 1360 | 605 | 379 | 2303 | 0 |
| Arrive On Green | 0.21 | 0.21 | 0.21 | | | | 0.00 | 0.38 | 0.38 | 0.43 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1781 | 0 | 1585 | | | | 0 | 3647 | 1581 | 1781 | 3647 | 0 |
| Grp Volume(v), veh/h | 318 | 0 | 151 | | | | 0 | 654 | 299 | 348 | 736 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1777 | 1581 | 1781 | 1777 | 0 |
| Q Serve(g_s), s | 15.5 | 0.0 | 7.5 | | | | 0.0 | 12.5 | 13.0 | 16.6 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 15.5 | 0.0 | 7.5 | | | | 0.0 | 12.5 | 13.0 | 16.6 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 370 | 0 | 329 | | | | 0 | 1360 | 605 | 379 | 2303 | 0 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.46 | | | | 0.00 | 0.48 | 0.49 | 0.92 | 0.32 | 0.00 |
| Avail Cap(c_a), veh/h | 455 | 0 | 405 | | | | 0 | 1360 | 605 | 501 | 2303 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.85 | 0.85 | 0.72 | 0.72 | 0.00 |
| Uniform Delay (d), s/veh | 34.4 | 0.0 | 31.2 | | | | 0.0 | 21.0 | 21.1 | 25.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 14.2 | 0.0 | 1.4 | | | | 0.0 | 1.0 | 2.4 | 14.3 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.0 | 0.0 | 3.0 | | | | 0.0 | 4.9 | 4.8 | 6.3 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 48.6 | 0.0 | 32.7 | | | | 0.0 | 22.0 | 23.6 | 39.4 | 0.3 | 0.0 |
| LnGrp LOS | D | | C | | | | | C | C | D | A | |
| Approach Vol, veh/h | | 469 | | | | | | 953 | | | 1084 | |
| Approach Delay, s/veh | | 43.5 | | | | | | 22.5 | | | 12.8 | |
| Approach LOS | | D | | | | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.9 | 40.5 | | 25.7 | | 64.3 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 7.0 | | 6.0 |
| Max Green Setting (Gmax), s | 25.3 | 24.0 | | 23.0 | | 54.0 |
| Max Q Clear Time (g_c+I1), s | 18.6 | 15.0 | | 17.5 | | 2.0 |
| Green Ext Time (p_c), s | 0.6 | 5.0 | | 1.2 | | 8.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.3 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 105 | 269 | 43 | 366 | 89 | 735 | 127 | 738 |
| Future Volume (vph) | 105 | 269 | 43 | 366 | 89 | 735 | 127 | 738 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 43.0 | 43.0 | 43.0 | 43.0 | 41.4 | 41.4 | 35.6 | 77.0 |
| Total Split (%) | 35.8% | 35.8% | 35.8% | 35.8% | 34.5% | 34.5% | 29.7% | 64.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 19.6 | 19.6 | 19.6 | 19.6 | 19.7 | 19.7 | 7.7 | 32.4 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.30 | 0.30 | 0.31 | 0.31 | 0.12 | 0.50 |
| v/c Ratio | 0.53 | 0.39 | 0.16 | 0.53 | 0.51 | 0.51 | 0.33 | 0.33 |
| Control Delay (s/veh) | 30.2 | 16.3 | 19.3 | 18.5 | 31.9 | 20.4 | 33.4 | 10.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.2 | 16.3 | 19.3 | 18.5 | 31.9 | 20.4 | 33.4 | 10.5 |
| LOS | C | B | B | B | C | C | C | B |
| Approach Delay (s/veh) | | 19.3 | | 18.6 | | 21.6 | | 13.7 |
| Approach LOS | | B | | B | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 64.5 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.53 | |
| Intersection Signal Delay (s/veh): 18.0 | Intersection LOS: B |
| Intersection Capacity Utilization 67.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

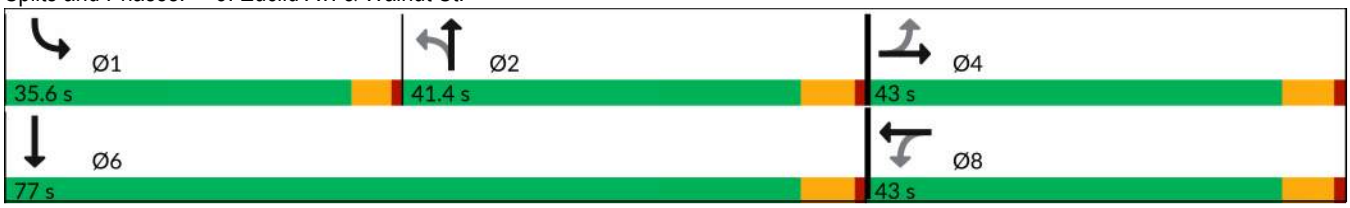

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 105 | 269 | 120 | 43 | 366 | 172 | 89 | 735 | 22 | 127 | 738 | 49 |
| Future Volume (veh/h) | 105 | 269 | 120 | 43 | 366 | 172 | 89 | 735 | 22 | 127 | 738 | 49 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 111 | 283 | 113 | 45 | 385 | 138 | 94 | 774 | 14 | 134 | 777 | 30 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 320 | 821 | 320 | 375 | 842 | 298 | 326 | 1443 | 26 | 283 | 2267 | 87 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.28 | 0.28 | 0.28 | 0.08 | 0.45 | 0.45 |
| Sat Flow, veh/h | 878 | 2495 | 972 | 986 | 2561 | 905 | 675 | 5163 | 93 | 3456 | 5045 | 194 |
| Grp Volume(v), veh/h | 111 | 200 | 196 | 45 | 265 | 258 | 94 | 510 | 278 | 134 | 524 | 283 |
| Grp Sat Flow(s),veh/h/ln | 878 | 1777 | 1690 | 986 | 1777 | 1689 | 675 | 1702 | 1852 | 1728 | 1702 | 1835 |
| Q Serve(g_s), s | 6.0 | 4.4 | 4.6 | 1.9 | 6.2 | 6.3 | 6.1 | 6.6 | 6.7 | 1.9 | 5.2 | 5.3 |
| Cycle Q Clear(g_c), s | 12.3 | 4.4 | 4.6 | 6.5 | 6.2 | 6.3 | 6.1 | 6.6 | 6.7 | 1.9 | 5.2 | 5.3 |
| Prop In Lane | 1.00 | | 0.58 | 1.00 | | 0.54 | 1.00 | | 0.05 | 1.00 | | 0.11 |
| Lane Grp Cap(c), veh/h | 320 | 584 | 556 | 375 | 584 | 556 | 326 | 951 | 518 | 283 | 1530 | 825 |
| V/C Ratio(X) | 0.35 | 0.34 | 0.35 | 0.12 | 0.45 | 0.46 | 0.29 | 0.54 | 0.54 | 0.47 | 0.34 | 0.34 |
| Avail Cap(c_a), veh/h | 656 | 1264 | 1202 | 752 | 1264 | 1201 | 597 | 2317 | 1260 | 2048 | 4633 | 2498 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 18.8 | 13.3 | 13.3 | 15.8 | 13.8 | 13.9 | 15.8 | 16.0 | 16.0 | 22.9 | 9.4 | 9.4 |
| Incr Delay (d2), s/veh | 0.6 | 0.3 | 0.4 | 0.1 | 0.6 | 0.6 | 0.5 | 0.5 | 0.9 | 0.5 | 0.1 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 1.4 | 1.4 | 0.4 | 2.0 | 2.0 | 0.8 | 2.1 | 2.4 | 0.7 | 1.4 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 19.4 | 13.6 | 13.7 | 15.9 | 14.4 | 14.5 | 16.3 | 16.4 | 16.8 | 23.4 | 9.5 | 9.6 |
| LnGrp LOS | B | B | B | B | B | B | B | B | B | C | A | A |
| Approach Vol, veh/h | | 507 | | | 568 | | | 882 | | | 941 | |
| Approach Delay, s/veh | | 14.9 | | | 14.6 | | | 16.6 | | | 11.5 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.9 | 20.4 | | 23.0 | | 29.3 | | 23.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.0 | 35.6 | | 37.2 | | 71.2 | | 37.2 |
| Max Q Clear Time (g_c+I1), s | 3.9 | 8.7 | | 14.3 | | 7.3 | | 8.5 |
| Green Ext Time (p_c), s | 0.2 | 5.9 | | 2.8 | | 5.5 | | 3.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 14.2 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 121 | 367 | 175 | 586 | 43 | 559 | 117 | 123 | 618 | 113 |
| Future Volume (vph) | 121 | 367 | 175 | 586 | 43 | 559 | 117 | 123 | 618 | 113 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 21.0 | 43.0 | 23.0 | 45.0 | 15.2 | 35.0 | 35.0 | 19.0 | 38.8 | 38.8 |
| Total Split (%) | 17.5% | 35.8% | 19.2% | 37.5% | 12.7% | 29.2% | 29.2% | 15.8% | 32.3% | 32.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.8 | 30.4 | 15.6 | 32.2 | 10.2 | 23.6 | 23.6 | 12.5 | 33.3 | 33.3 |
| Actuated g/C Ratio | 0.13 | 0.29 | 0.15 | 0.30 | 0.10 | 0.22 | 0.22 | 0.12 | 0.32 | 0.32 |
| v/c Ratio | 0.57 | 0.85 | 0.72 | 0.67 | 0.27 | 0.76 | 0.28 | 0.63 | 0.60 | 0.21 |
| Control Delay (s/veh) | 56.8 | 52.2 | 61.8 | 35.3 | 54.2 | 46.1 | 8.1 | 61.9 | 36.0 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 56.8 | 52.2 | 61.8 | 35.3 | 54.2 | 46.1 | 8.1 | 61.9 | 36.0 | 6.6 |
| LOS | E | D | E | D | D | D | A | E | D | A |
| Approach Delay (s/veh) | | 53.2 | | 40.8 | | 40.4 | | | 35.8 | |
| Approach LOS | | D | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105.6 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 41.5 | Intersection LOS: D |
| Intersection Capacity Utilization 76.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

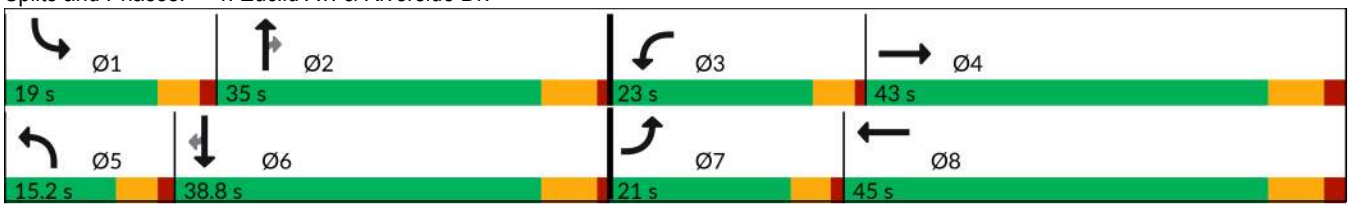

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 121 | 367 | 51 | 175 | 586 | 75 | 43 | 559 | 117 | 123 | 618 | 113 |
| Future Volume (veh/h) | 121 | 367 | 51 | 175 | 586 | 75 | 43 | 559 | 117 | 123 | 618 | 113 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 130 | 395 | 28 | 188 | 630 | 57 | 46 | 601 | 58 | 132 | 665 | 61 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 235 | 470 | 33 | 243 | 911 | 82 | 137 | 771 | 344 | 197 | 889 | 391 |
| Arrive On Green | 0.13 | 0.27 | 0.27 | 0.14 | 0.28 | 0.28 | 0.08 | 0.22 | 0.22 | 0.11 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1781 | 1726 | 122 | 1781 | 3291 | 297 | 1781 | 3554 | 1585 | 1781 | 3554 | 1565 |
| Grp Volume(v), veh/h | 130 | 0 | 423 | 188 | 340 | 347 | 46 | 601 | 58 | 132 | 665 | 61 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1848 | 1781 | 1777 | 1811 | 1781 | 1777 | 1585 | 1781 | 1777 | 1565 |
| Q Serve(g_s), s | 5.9 | 0.0 | 18.8 | 8.8 | 14.9 | 14.9 | 2.1 | 13.8 | 2.6 | 6.2 | 15.0 | 2.6 |
| Cycle Q Clear(g_c), s | 5.9 | 0.0 | 18.8 | 8.8 | 14.9 | 14.9 | 2.1 | 13.8 | 2.6 | 6.2 | 15.0 | 2.6 |
| Prop In Lane | 1.00 | | 0.07 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 235 | 0 | 503 | 243 | 492 | 501 | 137 | 771 | 344 | 197 | 889 | 391 |
| V/C Ratio(X) | 0.55 | 0.00 | 0.84 | 0.77 | 0.69 | 0.69 | 0.33 | 0.78 | 0.17 | 0.67 | 0.75 | 0.16 |
| Avail Cap(c_a), veh/h | 334 | 0 | 766 | 375 | 777 | 792 | 205 | 1187 | 529 | 283 | 1342 | 591 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.3 | 0.0 | 29.8 | 36.2 | 28.1 | 28.1 | 38.0 | 32.0 | 27.6 | 37.1 | 30.0 | 25.4 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 6.6 | 2.0 | 2.5 | 2.4 | 1.4 | 1.8 | 0.2 | 3.9 | 1.3 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.5 | 0.0 | 8.6 | 3.8 | 6.2 | 6.3 | 0.9 | 5.6 | 0.9 | 2.8 | 6.1 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.0 | 0.0 | 36.4 | 38.2 | 30.6 | 30.5 | 39.4 | 33.9 | 27.9 | 41.1 | 31.3 | 25.6 |
| LnGrp LOS | D | | D | D | C | C | D | C | C | D | C | C |
| Approach Vol, veh/h | | 553 | | | 875 | | | 705 | | | 858 | |
| Approach Delay, s/veh | | 36.3 | | | 32.2 | | | 33.7 | | | 32.4 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.8 | 24.8 | 16.6 | 30.6 | 11.9 | 27.7 | 16.2 | 31.0 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 13.8 | 29.0 | 18.3 | 36.0 | 10.0 | 32.8 | 16.3 | 38.0 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 15.8 | 10.8 | 20.8 | 4.1 | 17.0 | 7.9 | 16.9 |
| Green Ext Time (p_c), s | 0.1 | 3.0 | 0.1 | 2.9 | 0.0 | 3.9 | 0.1 | 5.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 33.4 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 64 | 207 | 33 | 78 | 252 | 42 | 661 | 132 | 37 | 743 | 61 |
| Future Volume (vph) | 64 | 207 | 33 | 78 | 252 | 42 | 661 | 132 | 37 | 743 | 61 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 56.0 | 56.0 | 56.0 | 56.0 | 56.0 | 49.0 | 49.0 | 49.0 | 15.0 | 64.0 | 64.0 |
| Total Split (%) | 46.7% | 46.7% | 46.7% | 46.7% | 46.7% | 40.8% | 40.8% | 40.8% | 12.5% | 53.3% | 53.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 25.6 | 25.6 | 25.6 | | 25.6 | 24.0 | 24.0 | 24.0 | 11.3 | 31.2 | 31.2 |
| Actuated g/C Ratio | 0.36 | 0.36 | 0.36 | | 0.36 | 0.34 | 0.34 | 0.34 | 0.16 | 0.44 | 0.44 |
| v/c Ratio | 0.23 | 0.34 | 0.06 | | 0.69 | 0.22 | 0.61 | 0.25 | 0.14 | 0.53 | 0.10 |
| Control Delay (s/veh) | 21.3 | 20.3 | 1.1 | | 28.3 | 24.8 | 24.3 | 14.0 | 37.5 | 15.7 | 4.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 21.3 | 20.3 | 1.1 | | 28.3 | 24.8 | 24.3 | 14.0 | 37.5 | 15.7 | 4.0 |
| LOS | C | C | A | | C | C | C | B | D | B | A |
| Approach Delay (s/veh) | | 18.4 | | | 28.3 | | 22.7 | | | 15.8 | |
| Approach LOS | | B | | | C | | C | | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 70.7 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.69 | |
| Intersection Signal Delay (s/veh): 20.5 | Intersection LOS: C |
| Intersection Capacity Utilization 79.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 64 | 207 | 33 | 78 | 252 | 33 | 42 | 661 | 132 | 37 | 743 | 61 |
| Future Volume (veh/h) | 64 | 207 | 33 | 78 | 252 | 33 | 42 | 661 | 132 | 37 | 743 | 61 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 71 | 230 | 25 | 87 | 280 | 37 | 47 | 734 | 113 | 41 | 826 | 38 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 364 | 595 | 504 | 152 | 375 | 46 | 321 | 1099 | 490 | 148 | 1675 | 729 |
| Arrive On Green | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.31 | 0.31 | 0.31 | 0.08 | 0.47 | 0.47 |
| Sat Flow, veh/h | 1063 | 1870 | 1585 | 243 | 1177 | 143 | 639 | 3554 | 1585 | 1781 | 3554 | 1547 |
| Grp Volume(v), veh/h | 71 | 230 | 25 | 404 | 0 | 0 | 47 | 734 | 113 | 41 | 826 | 38 |
| Grp Sat Flow(s),veh/h/ln | 1063 | 1870 | 1585 | 1563 | 0 | 0 | 639 | 1777 | 1585 | 1781 | 1777 | 1547 |
| Q Serve(g_s), s | 0.0 | 5.6 | 0.6 | 8.5 | 0.0 | 0.0 | 3.2 | 10.5 | 3.1 | 1.3 | 9.4 | 0.8 |
| Cycle Q Clear(g_c), s | 4.8 | 5.6 | 0.6 | 14.1 | 0.0 | 0.0 | 3.2 | 10.5 | 3.1 | 1.3 | 9.4 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 0.22 | | 0.09 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 364 | 595 | 504 | 572 | 0 | 0 | 321 | 1099 | 490 | 148 | 1675 | 729 |
| V/C Ratio(X) | 0.20 | 0.39 | 0.05 | 0.71 | 0.00 | 0.00 | 0.15 | 0.67 | 0.23 | 0.28 | 0.49 | 0.05 |
| Avail Cap(c_a), veh/h | 938 | 1607 | 1362 | 1445 | 0 | 0 | 588 | 2585 | 1153 | 317 | 3497 | 1522 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 15.2 | 15.5 | 13.8 | 18.3 | 0.0 | 0.0 | 15.0 | 17.6 | 15.0 | 25.1 | 10.6 | 8.4 |
| Incr Delay (d2), s/veh | 0.3 | 0.4 | 0.0 | 1.6 | 0.0 | 0.0 | 0.2 | 0.7 | 0.2 | 0.4 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 2.1 | 0.2 | 4.4 | 0.0 | 0.0 | 0.4 | 3.4 | 0.9 | 0.5 | 2.5 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 15.5 | 15.9 | 13.8 | 20.0 | 0.0 | 0.0 | 15.2 | 18.3 | 15.2 | 25.5 | 10.9 | 8.4 |
| LnGrp LOS | B | B | B | B | | | B | B | B | C | B | A |
| Approach Vol, veh/h | | 326 | | | 404 | | | 894 | | | 905 | |
| Approach Delay, s/veh | | 15.6 | | | 20.0 | | | 17.7 | | | 11.4 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.5 | 24.6 | | 24.4 | | 34.0 | | 24.4 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 42.5 | | 50.2 | | 57.5 | | 50.2 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 12.5 | | 7.6 | | 11.4 | | 16.1 |
| Green Ext Time (p_c), s | 0.0 | 5.6 | | 1.7 | | 5.8 | | 2.5 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 15.6 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 111 | 68 | 70 | 47 | 145 | 87 | 655 | 23 | 43 | 759 | 80 |
| Future Volume (vph) | 111 | 68 | 70 | 47 | 145 | 87 | 655 | 23 | 43 | 759 | 80 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 17.0 | 49.3 | 49.3 | 14.7 | 47.0 | 15.0 | 41.3 | 41.3 | 14.7 | 41.0 | 41.0 |
| Total Split (%) | 14.2% | 41.1% | 41.1% | 12.3% | 39.2% | 12.5% | 34.4% | 34.4% | 12.3% | 34.2% | 34.2% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.6 | 22.9 | 22.9 | 10.6 | 18.7 | 10.7 | 30.9 | 30.9 | 10.6 | 27.5 | 27.5 |
| Actuated g/C Ratio | 0.13 | 0.26 | 0.26 | 0.12 | 0.21 | 0.12 | 0.35 | 0.35 | 0.12 | 0.31 | 0.31 |
| v/c Ratio | 0.52 | 0.16 | 0.15 | 0.24 | 0.60 | 0.45 | 0.58 | 0.04 | 0.22 | 0.76 | 0.16 |
| Control Delay (s/veh) | 51.0 | 28.2 | 2.2 | 46.4 | 36.3 | 50.8 | 28.5 | 0.1 | 46.1 | 34.5 | 3.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.0 | 28.2 | 2.2 | 46.4 | 36.3 | 50.8 | 28.5 | 0.1 | 46.1 | 34.5 | 3.0 |
| LOS | D | C | A | D | D | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 31.1 | | | 38.1 | | 30.2 | | | 32.2 | |
| Approach LOS | | C | | | D | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 88.3 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay (s/veh): 32.1 | Intersection LOS: C |
| Intersection Capacity Utilization 68.6% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

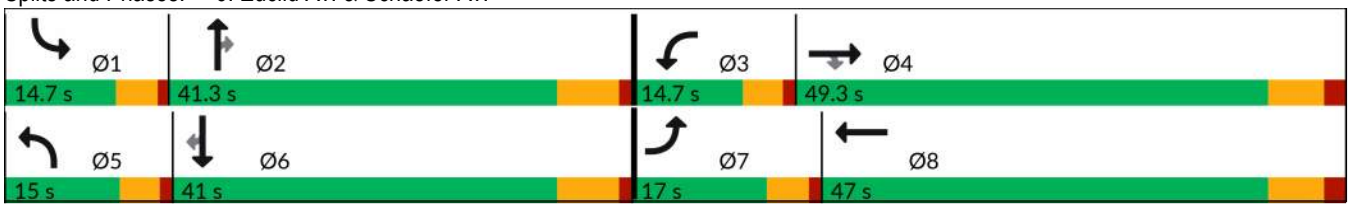

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 111 | 68 | 70 | 47 | 145 | 67 | 87 | 655 | 23 | 43 | 759 | 80 |
| Future Volume (veh/h) | 111 | 68 | 70 | 47 | 145 | 67 | 87 | 655 | 23 | 43 | 759 | 80 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 122 | 75 | 33 | 52 | 159 | 63 | 96 | 720 | 18 | 47 | 834 | 41 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 217 | 359 | 304 | 156 | 200 | 79 | 204 | 1189 | 530 | 148 | 1077 | 469 |
| Arrive On Green | 0.12 | 0.19 | 0.19 | 0.09 | 0.16 | 0.16 | 0.11 | 0.33 | 0.33 | 0.08 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1781 | 1870 | 1585 | 1781 | 1269 | 503 | 1781 | 3554 | 1585 | 1781 | 3554 | 1549 |
| Grp Volume(v), veh/h | 122 | 75 | 33 | 52 | 0 | 222 | 96 | 720 | 18 | 47 | 834 | 41 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 1585 | 1781 | 0 | 1772 | 1781 | 1777 | 1585 | 1781 | 1777 | 1549 |
| Q Serve(g_s), s | 4.9 | 2.6 | 1.3 | 2.1 | 0.0 | 9.1 | 3.8 | 12.8 | 0.6 | 1.9 | 16.2 | 1.4 |
| Cycle Q Clear(g_c), s | 4.9 | 2.6 | 1.3 | 2.1 | 0.0 | 9.1 | 3.8 | 12.8 | 0.6 | 1.9 | 16.2 | 1.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.28 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 217 | 359 | 304 | 156 | 0 | 280 | 204 | 1189 | 530 | 148 | 1077 | 469 |
| V/C Ratio(X) | 0.56 | 0.21 | 0.11 | 0.33 | 0.00 | 0.79 | 0.47 | 0.61 | 0.03 | 0.32 | 0.77 | 0.09 |
| Avail Cap(c_a), veh/h | 289 | 1045 | 886 | 235 | 0 | 936 | 242 | 1634 | 729 | 235 | 1620 | 706 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.3 | 25.7 | 25.2 | 32.4 | 0.0 | 30.7 | 31.4 | 21.0 | 16.9 | 32.7 | 24.0 | 18.9 |
| Incr Delay (d2), s/veh | 0.8 | 0.2 | 0.1 | 0.5 | 0.0 | 3.8 | 0.6 | 0.5 | 0.0 | 0.5 | 1.4 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 1.1 | 0.5 | 0.9 | 0.0 | 3.9 | 1.5 | 4.6 | 0.2 | 0.8 | 6.0 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 32.2 | 26.0 | 25.3 | 32.9 | 0.0 | 34.5 | 32.0 | 21.5 | 17.0 | 33.2 | 25.4 | 19.0 |
| LnGrp LOS | C | C | C | C | | C | C | C | B | C | C | B |
| Approach Vol, veh/h | | 230 | | | 274 | | | 834 | | | 922 | |
| Approach Delay, s/veh | | 29.2 | | | 34.2 | | | 22.6 | | | 25.5 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 31.8 | 11.3 | 21.5 | 13.4 | 29.4 | 13.9 | 19.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 34.8 | 10.0 | 42.3 | 10.3 | 34.5 | 12.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 3.9 | 14.8 | 4.1 | 4.6 | 5.8 | 18.2 | 6.9 | 11.1 |
| Green Ext Time (p_c), s | 0.0 | 4.2 | 0.0 | 0.3 | 0.0 | 4.7 | 0.1 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.9 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 75 | 138 | 51 | 55 | 295 | 142 | 688 | 64 | 45 | 657 | 130 |
| Future Volume (vph) | 75 | 138 | 51 | 55 | 295 | 142 | 688 | 64 | 45 | 657 | 130 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 53.0 | 53.0 | 53.0 | 53.0 | 53.0 | 17.0 | 50.0 | 50.0 | 17.0 | 50.0 | 50.0 |
| Total Split (%) | 44.2% | 44.2% | 44.2% | 44.2% | 44.2% | 14.2% | 41.7% | 41.7% | 14.2% | 41.7% | 41.7% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 21.6 | 21.6 | 21.6 | 21.6 | 21.6 | 10.6 | 29.1 | 29.1 | 10.4 | 21.6 | 21.6 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.15 | 0.40 | 0.40 | 0.14 | 0.30 | 0.30 |
| v/c Ratio | 0.39 | 0.27 | 0.10 | 0.16 | 0.69 | 0.30 | 0.52 | 0.10 | 0.19 | 0.67 | 0.25 |
| Control Delay (s/veh) | 27.5 | 21.4 | 3.4 | 20.8 | 29.6 | 34.1 | 21.5 | 4.6 | 36.0 | 26.8 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.5 | 21.4 | 3.4 | 20.8 | 29.6 | 34.1 | 21.5 | 4.6 | 36.0 | 26.8 | 5.6 |
| LOS | C | C | A | C | C | C | C | A | D | C | A |
| Approach Delay (s/veh) | | 19.7 | | | 28.4 | | 22.3 | | | 24.0 | |
| Approach LOS | | B | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 73 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.69 | |
| Intersection Signal Delay (s/veh): 23.6 | Intersection LOS: C |
| Intersection Capacity Utilization 76.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

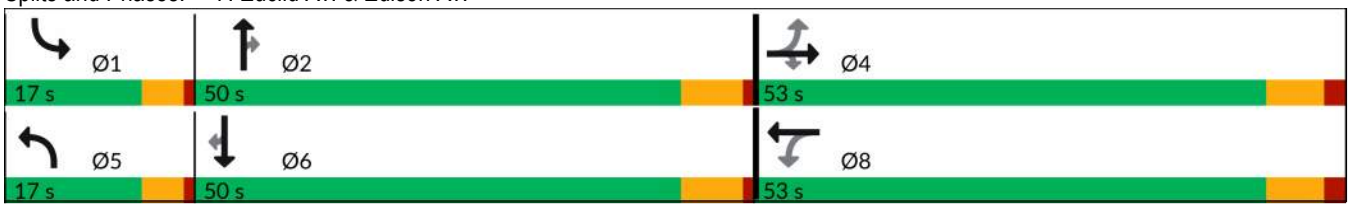

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 75 | 138 | 51 | 55 | 295 | 57 | 142 | 688 | 64 | 45 | 657 | 130 |
| Future Volume (veh/h) | 75 | 138 | 51 | 55 | 295 | 57 | 142 | 688 | 64 | 45 | 657 | 130 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 80 | 147 | 26 | 59 | 314 | 51 | 151 | 732 | 51 | 48 | 699 | 102 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 232 | 554 | 470 | 396 | 465 | 76 | 493 | 1189 | 530 | 158 | 998 | 439 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.14 | 0.33 | 0.33 | 0.09 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1017 | 1870 | 1585 | 1212 | 1570 | 255 | 3456 | 3554 | 1585 | 1781 | 3554 | 1563 |
| Grp Volume(v), veh/h | 80 | 147 | 26 | 59 | 0 | 365 | 151 | 732 | 51 | 48 | 699 | 102 |
| Grp Sat Flow(s),veh/h/ln | 1017 | 1870 | 1585 | 1212 | 0 | 1824 | 1728 | 1777 | 1585 | 1781 | 1777 | 1563 |
| Q Serve(g_s), s | 4.9 | 3.9 | 0.8 | 2.6 | 0.0 | 11.5 | 2.6 | 11.3 | 1.5 | 1.7 | 11.6 | 3.3 |
| Cycle Q Clear(g_c), s | 16.5 | 3.9 | 0.8 | 6.5 | 0.0 | 11.5 | 2.6 | 11.3 | 1.5 | 1.7 | 11.6 | 3.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.14 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 232 | 554 | 470 | 396 | 0 | 540 | 493 | 1189 | 530 | 158 | 998 | 439 |
| V/C Ratio(X) | 0.34 | 0.27 | 0.06 | 0.15 | 0.00 | 0.68 | 0.31 | 0.62 | 0.10 | 0.30 | 0.70 | 0.23 |
| Avail Cap(c_a), veh/h | 640 | 1305 | 1106 | 883 | 0 | 1273 | 648 | 2356 | 1051 | 334 | 2356 | 1036 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.6 | 17.6 | 16.5 | 20.1 | 0.0 | 20.3 | 25.2 | 18.3 | 15.0 | 28.0 | 21.1 | 18.2 |
| Incr Delay (d2), s/veh | 0.9 | 0.3 | 0.0 | 0.2 | 0.0 | 1.5 | 0.1 | 0.5 | 0.1 | 0.4 | 0.9 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 1.5 | 0.3 | 0.7 | 0.0 | 4.4 | 0.9 | 3.8 | 0.4 | 0.6 | 4.1 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.4 | 17.9 | 16.6 | 20.3 | 0.0 | 21.8 | 25.3 | 18.8 | 15.1 | 28.4 | 22.0 | 18.4 |
| LnGrp LOS | C | B | B | C | | C | C | B | B | C | C | B |
| Approach Vol, veh/h | | 253 | | | 424 | | | 934 | | | 849 | |
| Approach Delay, s/veh | | 21.1 | | | 21.6 | | | 19.7 | | | 22.0 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.5 | 28.5 | | 26.6 | 14.1 | 24.9 | | 26.6 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 12.3 | 43.5 | | 45.8 | 12.3 | 43.5 | | 45.8 |
| Max Q Clear Time (g_c+I1), s | 3.7 | 13.3 | | 18.5 | 4.6 | 13.6 | | 13.5 |
| Green Ext Time (p_c), s | 0.0 | 4.8 | | 1.2 | 0.1 | 4.7 | | 2.3 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 20.9 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 75 | 106 | 91 | 267 | 117 | 660 | 65 | 86 | 639 | 32 |
| Future Volume (vph) | 51 | 75 | 106 | 91 | 267 | 117 | 660 | 65 | 86 | 639 | 32 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 23.6 | 23.6 | 23.6 | 23.6 | 23.6 | 12.2 | 26.6 | 26.6 | 11.4 | 21.7 | 21.7 |
| Actuated g/C Ratio | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.16 | 0.35 | 0.35 | 0.15 | 0.28 | 0.28 |
| v/c Ratio | 0.30 | 0.14 | 0.20 | 0.24 | 0.75 | 0.44 | 0.54 | 0.12 | 0.35 | 0.68 | 0.07 |
| Control Delay (s/veh) | 27.0 | 21.1 | 5.6 | 22.9 | 32.6 | 39.2 | 24.9 | 5.1 | 39.2 | 29.5 | 0.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.0 | 21.1 | 5.6 | 22.9 | 32.6 | 39.2 | 24.9 | 5.1 | 39.2 | 29.5 | 0.3 |
| LOS | C | C | A | C | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 15.3 | | | 30.8 | | 25.3 | | | 29.4 | |
| Approach LOS | | B | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 76.9 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay (s/veh): 26.8 | Intersection LOS: C |
| Intersection Capacity Utilization 78.2% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

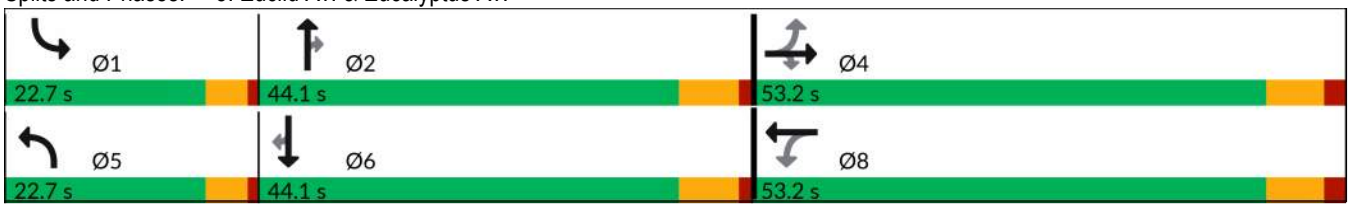

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 51 | 75 | 106 | 91 | 267 | 130 | 117 | 660 | 65 | 86 | 639 | 32 |
| Future Volume (veh/h) | 51 | 75 | 106 | 91 | 267 | 130 | 117 | 660 | 65 | 86 | 639 | 32 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 54 | 80 | 72 | 97 | 284 | 118 | 124 | 660 | 46 | 91 | 680 | 23 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 1.00 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 206 | 560 | 474 | 445 | 376 | 156 | 250 | 1009 | 450 | 225 | 959 | 428 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.14 | 0.28 | 0.28 | 0.13 | 0.27 | 0.27 |
| Sat Flow, veh/h | 983 | 1870 | 1585 | 1235 | 1255 | 521 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 54 | 80 | 72 | 97 | 0 | 402 | 124 | 660 | 46 | 91 | 680 | 23 |
| Grp Sat Flow(s),veh/h/ln | 983 | 1870 | 1585 | 1235 | 0 | 1776 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 3.3 | 2.0 | 2.1 | 4.0 | 0.0 | 13.0 | 4.1 | 10.3 | 1.4 | 3.0 | 10.9 | 0.7 |
| Cycle Q Clear(g_c), s | 16.3 | 2.0 | 2.1 | 5.9 | 0.0 | 13.0 | 4.1 | 10.3 | 1.4 | 3.0 | 10.9 | 0.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.29 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 206 | 560 | 474 | 445 | 0 | 532 | 250 | 1009 | 450 | 225 | 959 | 428 |
| V/C Ratio(X) | 0.26 | 0.14 | 0.15 | 0.22 | 0.00 | 0.76 | 0.50 | 0.65 | 0.10 | 0.41 | 0.71 | 0.05 |
| Avail Cap(c_a), veh/h | 626 | 1359 | 1151 | 972 | 0 | 1291 | 506 | 2110 | 941 | 506 | 2110 | 941 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.5 | 16.2 | 16.3 | 18.4 | 0.0 | 20.1 | 25.2 | 19.9 | 16.7 | 25.5 | 20.9 | 17.1 |
| Incr Delay (d2), s/veh | 0.5 | 0.1 | 0.1 | 0.2 | 0.0 | 1.7 | 1.1 | 0.7 | 0.1 | 0.9 | 1.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.7 | 0.7 | 1.0 | 0.0 | 4.7 | 1.6 | 3.6 | 0.4 | 1.1 | 3.8 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.0 | 16.3 | 16.4 | 18.6 | 0.0 | 21.7 | 26.3 | 20.7 | 16.8 | 26.4 | 21.8 | 17.2 |
| LnGrp LOS | C | B | B | B | | C | C | C | B | C | C | B |
| Approach Vol, veh/h | | 206 | | | 499 | | | 830 | | | 794 | |
| Approach Delay, s/veh | | 19.4 | | | 21.1 | | | 21.3 | | | 22.2 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.7 | 24.5 | | 26.2 | 13.6 | 23.6 | | 26.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 5.0 | 12.3 | | 18.3 | 6.1 | 12.9 | | 15.0 |
| Green Ext Time (p_c), s | 0.1 | 4.1 | | 0.6 | 0.1 | 4.2 | | 2.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 21.4 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 7 | 2 | 59 | 25 | 21 | 914 | 56 | 143 | 759 |
| Future Volume (vph) | 7 | 2 | 59 | 25 | 21 | 914 | 56 | 143 | 759 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.8 | 50.8 | 22.0 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.3% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 17.9 | | 21.4 | 10.7 | 32.8 | 32.8 | 13.5 | 46.7 |
| Actuated g/C Ratio | | 0.21 | | 0.25 | 0.12 | 0.38 | 0.38 | 0.15 | 0.53 |
| v/c Ratio | | 0.06 | | 0.79 | 0.11 | 0.79 | 0.10 | 0.60 | 0.49 |
| Control Delay (s/veh) | | 21.9 | | 33.3 | 45.4 | 30.5 | 0.3 | 49.2 | 16.8 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 21.9 | | 33.3 | 45.4 | 30.5 | 0.3 | 49.2 | 16.8 |
| LOS | | C | | C | D | C | A | D | B |
| Approach Delay (s/veh) | | 21.9 | | 33.3 | | 29.1 | | | 21.8 |
| Approach LOS | | C | | C | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.3 | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 26.6 | Intersection LOS: C |
| Intersection Capacity Utilization 74.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

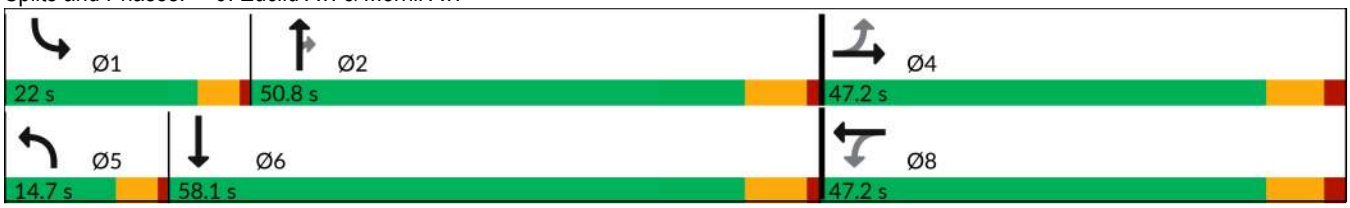

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 7 | 2 | 6 | 59 | 25 | 238 | 21 | 914 | 56 | 143 | 759 | 35 |
| Future Volume (veh/h) | 7 | 2 | 6 | 59 | 25 | 238 | 21 | 914 | 56 | 143 | 759 | 35 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 8 | 2 | 4 | 68 | 29 | 258 | 24 | 1051 | 59 | 164 | 872 | 29 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 215 | 60 | 82 | 117 | 57 | 324 | 92 | 1321 | 586 | 213 | 1541 | 51 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.05 | 0.37 | 0.37 | 0.12 | 0.44 | 0.44 |
| Sat Flow, veh/h | 515 | 211 | 290 | 227 | 202 | 1141 | 1781 | 3554 | 1577 | 1781 | 3505 | 117 |
| Grp Volume(v), veh/h | 14 | 0 | 0 | 355 | 0 | 0 | 24 | 1051 | 59 | 164 | 442 | 459 |
| Grp Sat Flow(s),veh/h/ln | 1016 | 0 | 0 | 1570 | 0 | 0 | 1781 | 1777 | 1577 | 1781 | 1777 | 1845 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 11.5 | 0.0 | 0.0 | 1.1 | 21.6 | 2.0 | 7.3 | 15.2 | 15.2 |
| Cycle Q Clear(g_c), s | 0.5 | 0.0 | 0.0 | 17.0 | 0.0 | 0.0 | 1.1 | 21.6 | 2.0 | 7.3 | 15.2 | 15.2 |
| Prop In Lane | 0.57 | | 0.29 | 0.19 | | 0.73 | 1.00 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 358 | 0 | 0 | 498 | 0 | 0 | 92 | 1321 | 586 | 213 | 781 | 811 |
| V/C Ratio(X) | 0.04 | 0.00 | 0.00 | 0.71 | 0.00 | 0.00 | 0.26 | 0.80 | 0.10 | 0.77 | 0.57 | 0.57 |
| Avail Cap(c_a), veh/h | 620 | 0 | 0 | 817 | 0 | 0 | 218 | 1927 | 855 | 377 | 1122 | 1165 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.1 | 0.0 | 0.0 | 27.0 | 0.0 | 0.0 | 37.3 | 22.9 | 16.8 | 34.9 | 17.1 | 17.1 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.6 | 1.5 | 0.1 | 2.2 | 0.6 | 0.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 | 0.4 | 7.9 | 0.6 | 3.0 | 5.2 | 5.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 21.1 | 0.0 | 0.0 | 27.7 | 0.0 | 0.0 | 37.8 | 24.4 | 16.8 | 37.1 | 17.7 | 17.7 |
| LnGrp LOS | C | | | C | | | D | C | B | D | B | B |
| Approach Vol, veh/h | | 14 | | | 355 | | | 1134 | | | 1065 | |
| Approach Delay, s/veh | | 21.1 | | | 27.7 | | | 24.3 | | | 20.7 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.5 | 36.9 | | 30.4 | 8.9 | 42.4 | | 30.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.3 | 44.3 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 9.3 | 23.6 | | 2.5 | 3.1 | 17.2 | | 19.0 |
| Green Ext Time (p_c), s | 0.1 | 6.8 | | 0.0 | 0.0 | 5.4 | | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 23.3 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 96 | 283 | 28 | 31 | 818 | 332 | 95 | 471 | 30 | 203 | 424 | 146 |
| Future Volume (vph) | 96 | 283 | 28 | 31 | 818 | 332 | 95 | 471 | 30 | 203 | 424 | 146 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 34.6 | 14.7 | 17.5 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 28.8% | 12.3% | 14.6% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.3 | 33.3 | 33.3 | 10.3 | 29.7 | 29.7 | 10.3 | 18.8 | 30.9 | 11.1 | 19.8 | 36.6 |
| Actuated g/C Ratio | 0.11 | 0.36 | 0.36 | 0.11 | 0.32 | 0.32 | 0.11 | 0.20 | 0.33 | 0.12 | 0.21 | 0.39 |
| v/c Ratio | 0.27 | 0.24 | 0.05 | 0.17 | 0.77 | 0.49 | 0.52 | 0.70 | 0.06 | 0.52 | 0.60 | 0.23 |
| Control Delay (s/veh) | 45.0 | 23.4 | 0.1 | 46.5 | 34.0 | 6.9 | 54.4 | 41.3 | 0.2 | 46.7 | 37.4 | 11.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.0 | 23.4 | 0.1 | 46.5 | 34.0 | 6.9 | 54.4 | 41.3 | 0.2 | 46.7 | 37.4 | 11.0 |
| LOS | D | C | A | D | C | A | D | D | A | D | D | B |
| Approach Delay (s/veh) | | 26.9 | | | 26.7 | | | 41.3 | | | 34.9 | |
| Approach LOS | | C | | | C | | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 93.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.77 | |
| Intersection Signal Delay (s/veh): 31.8 | Intersection LOS: C |
| Intersection Capacity Utilization 71.5% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

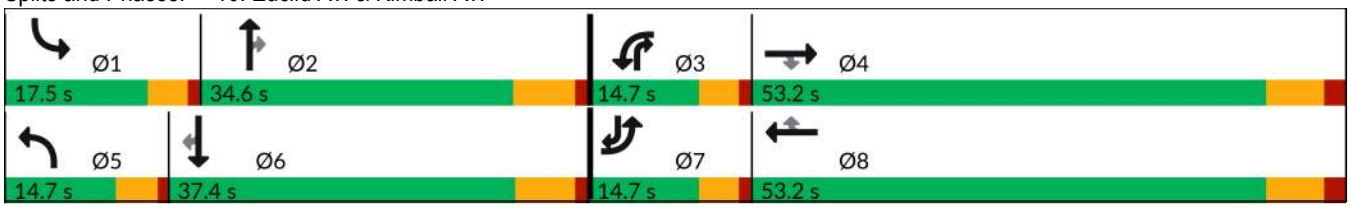

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 96 | 283 | 28 | 31 | 818 | 332 | 95 | 471 | 30 | 203 | 424 | 146 |
| Future Volume (veh/h) | 96 | 283 | 28 | 31 | 818 | 332 | 95 | 471 | 30 | 203 | 424 | 146 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 101 | 298 | 13 | 33 | 861 | 172 | 100 | 496 | 11 | 214 | 446 | 101 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 382 | 1216 | 543 | 115 | 1054 | 464 | 196 | 664 | 395 | 422 | 706 | 490 |
| Arrive On Green | 0.11 | 0.34 | 0.34 | 0.06 | 0.30 | 0.30 | 0.11 | 0.19 | 0.19 | 0.12 | 0.20 | 0.20 |
| Sat Flow, veh/h | 3456 | 3554 | 1585 | 1781 | 3554 | 1565 | 1781 | 3554 | 1564 | 3456 | 3554 | 1585 |
| Grp Volume(v), veh/h | 101 | 298 | 13 | 33 | 861 | 172 | 100 | 496 | 11 | 214 | 446 | 101 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1777 | 1585 | 1781 | 1777 | 1565 | 1781 | 1777 | 1564 | 1728 | 1777 | 1585 |
| Q Serve(g_s), s | 2.2 | 4.9 | 0.4 | 1.4 | 18.3 | 7.1 | 4.3 | 10.7 | 0.4 | 4.7 | 9.3 | 3.8 |
| Cycle Q Clear(g_c), s | 2.2 | 4.9 | 0.4 | 1.4 | 18.3 | 7.1 | 4.3 | 10.7 | 0.4 | 4.7 | 9.3 | 3.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 382 | 1216 | 543 | 115 | 1054 | 464 | 196 | 664 | 395 | 422 | 706 | 490 |
| V/C Ratio(X) | 0.26 | 0.24 | 0.02 | 0.29 | 0.82 | 0.37 | 0.51 | 0.75 | 0.03 | 0.51 | 0.63 | 0.21 |
| Avail Cap(c_a), veh/h | 425 | 2011 | 897 | 219 | 2011 | 885 | 219 | 1228 | 643 | 544 | 1355 | 779 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.1 | 19.2 | 17.7 | 36.2 | 26.6 | 22.6 | 34.1 | 31.2 | 22.9 | 33.4 | 29.8 | 20.7 |
| Incr Delay (d2), s/veh | 0.1 | 0.1 | 0.0 | 1.4 | 0.6 | 0.2 | 0.8 | 1.7 | 0.0 | 0.4 | 0.9 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 1.8 | 0.1 | 0.6 | 7.0 | 2.4 | 1.7 | 4.3 | 0.1 | 1.8 | 3.7 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 33.3 | 19.3 | 17.7 | 37.6 | 27.2 | 22.8 | 34.9 | 32.9 | 23.0 | 33.8 | 30.8 | 20.9 |
| LnGrp LOS | C | B | B | D | C | C | C | C | C | C | C | C |
| Approach Vol, veh/h | | 412 | | | 1066 | | | 607 | | | 761 | |
| Approach Delay, s/veh | | 22.7 | | | 26.8 | | | 33.1 | | | 30.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.6 | 21.7 | 10.0 | 35.0 | 13.7 | 22.7 | 13.7 | 31.3 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 12.8 | 28.1 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 6.7 | 12.7 | 3.4 | 6.9 | 6.3 | 11.3 | 4.2 | 20.3 |
| Green Ext Time (p_c), s | 0.2 | 2.5 | 0.0 | 1.8 | 0.0 | 2.7 | 0.1 | 3.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.5 |
| HCM 7th LOS | C |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 5 | 119 | 958 | 378 | 41 | 429 | 577 | 52 | 498 |
| Future Volume (vph) | 5 | 119 | 958 | 378 | 41 | 429 | 577 | 52 | 498 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 20.0 | 48.0 | 52.3 | 14.8 | 37.2 | 48.0 | 14.8 | 37.2 |
| Total Split (%) | 13.1% | 16.7% | 40.0% | 43.6% | 12.3% | 31.0% | 40.0% | 12.3% | 31.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.6 | 12.6 | 32.7 | 48.8 | 10.6 | 19.2 | 58.8 | 10.6 | 22.3 |
| Actuated g/C Ratio | 0.11 | 0.13 | 0.34 | 0.51 | 0.11 | 0.20 | 0.61 | 0.11 | 0.23 |
| v/c Ratio | 0.03 | 0.57 | 0.84 | 0.45 | 0.21 | 0.62 | 0.54 | 0.28 | 0.65 |
| Control Delay (s/veh) | 47.6 | 53.4 | 37.7 | 19.9 | 49.4 | 40.8 | 6.0 | 50.5 | 39.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.6 | 53.4 | 37.7 | 19.9 | 49.4 | 40.8 | 6.0 | 50.5 | 39.2 |
| LOS | D | D | D | B | D | D | A | D | D |
| Approach Delay (s/veh) | | 53.2 | | 32.4 | | 21.9 | | | 40.3 |
| Approach LOS | | D | | C | | C | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 95.7 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 31.3 | Intersection LOS: C |
| Intersection Capacity Utilization 78.4% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

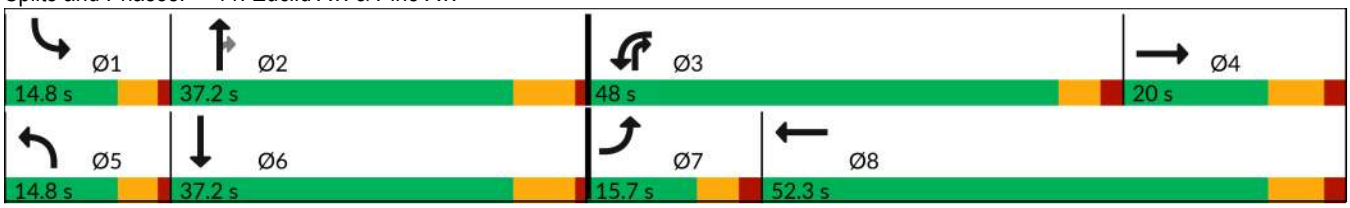

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 5 | 119 | 16 | 958 | 378 | 29 | 41 | 429 | 577 | 52 | 498 | 22 |
| Future Volume (veh/h) | 5 | 119 | 16 | 958 | 378 | 29 | 41 | 429 | 577 | 52 | 498 | 22 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 5 | 123 | 0 | 988 | 390 | 27 | 42 | 442 | 519 | 54 | 513 | 17 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 23 | 190 | | 1087 | 697 | 48 | 126 | 895 | 898 | 143 | 918 | 30 |
| Arrive On Green | 0.01 | 0.10 | 0.00 | 0.31 | 0.40 | 0.40 | 0.07 | 0.25 | 0.25 | 0.08 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3456 | 1729 | 120 | 1781 | 3554 | 1585 | 1781 | 3510 | 116 |
| Grp Volume(v), veh/h | 5 | 123 | 0 | 988 | 0 | 417 | 42 | 442 | 519 | 54 | 259 | 271 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1728 | 0 | 1849 | 1781 | 1777 | 1585 | 1781 | 1777 | 1849 |
| Q Serve(g_s), s | 0.3 | 6.0 | 0.0 | 26.0 | 0.0 | 16.5 | 2.1 | 10.1 | 20.0 | 2.7 | 12.0 | 12.0 |
| Cycle Q Clear(g_c), s | 0.3 | 6.0 | 0.0 | 26.0 | 0.0 | 16.5 | 2.1 | 10.1 | 20.0 | 2.7 | 12.0 | 12.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.06 | 1.00 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 23 | 190 | | 1087 | 0 | 745 | 126 | 895 | 898 | 143 | 464 | 483 |
| V/C Ratio(X) | 0.22 | 0.65 | | 0.91 | 0.00 | 0.56 | 0.33 | 0.49 | 0.58 | 0.38 | 0.56 | 0.56 |
| Avail Cap(c_a), veh/h | 188 | 257 | | 1542 | 0 | 884 | 190 | 1151 | 1012 | 190 | 575 | 599 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.3 | 41.0 | 0.0 | 31.2 | 0.0 | 21.8 | 41.9 | 30.3 | 13.2 | 41.4 | 30.3 | 30.3 |
| Incr Delay (d2), s/veh | 1.7 | 5.2 | 0.0 | 5.0 | 0.0 | 0.9 | 0.6 | 0.2 | 0.3 | 0.6 | 0.4 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 2.9 | 0.0 | 10.6 | 0.0 | 6.6 | 0.9 | 4.0 | 6.0 | 1.2 | 4.7 | 5.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 48.0 | 46.2 | 0.0 | 36.2 | 0.0 | 22.8 | 42.5 | 30.4 | 13.5 | 42.0 | 30.7 | 30.7 |
| LnGrp LOS | D | D | | D | | C | D | C | B | D | C | C |
| Approach Vol, veh/h | | 128 | | | 1405 | | | 1003 | | | 584 | |
| Approach Delay, s/veh | | 46.3 | | | 32.2 | | | 22.2 | | | 31.7 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.3 | 30.4 | 35.5 | 16.6 | 11.4 | 31.3 | 6.9 | 45.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.1 | 30.7 | 42.3 | 13.0 | 10.1 | 30.7 | 10.0 | 45.3 |
| Max Q Clear Time (g_c+I1), s | 4.7 | 22.0 | 28.0 | 8.0 | 4.1 | 14.0 | 2.3 | 18.5 |
| Green Ext Time (p_c), s | 0.0 | 1.9 | 1.8 | 0.3 | 0.0 | 1.4 | 0.0 | 3.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.5 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 598 | 639 | 834 | 45 | 526 |
| Future Volume (vph) | 598 | 639 | 834 | 45 | 526 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 14.5 | 9.6 | 9.6 |
| Total Split (s) | 35.7 | 46.2 | 81.9 | 18.1 | 18.1 |
| Total Split (%) | 35.7% | 46.2% | 81.9% | 18.1% | 18.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 31.3 | 43.5 | 79.5 | 9.4 | 9.4 |
| Actuated g/C Ratio | 0.31 | 0.44 | 0.80 | 0.09 | 0.09 |
| v/c Ratio | 0.83 | 0.93 | 0.33 | 0.16 | 0.86 |
| Control Delay (s/veh) | 36.5 | 48.3 | 3.5 | 41.2 | 17.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.5 | 48.3 | 3.5 | 41.2 | 17.8 |
| LOS | D | D | A | D | B |
| Approach Delay (s/veh) | 36.5 | | 22.9 | 19.6 | |
| Approach LOS | D | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay (s/veh): 26.1 | Intersection LOS: C |
| Intersection Capacity Utilization 76.1% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

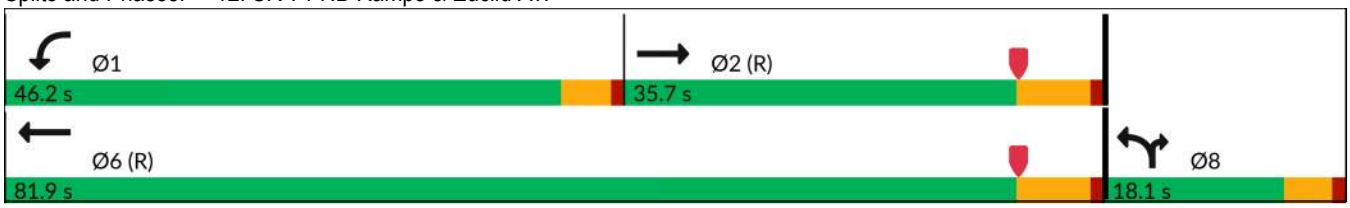

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 598 | 215 | 639 | 834 | 45 | 526 |
| Future Volume (veh/h) | 598 | 215 | 639 | 834 | 45 | 526 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 672 | 0 | 718 | 937 | 51 | 0 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1383 | | 739 | 3025 | 131 | |
| Arrive On Green | 0.78 | 0.00 | 0.41 | 0.85 | 0.04 | 0.00 |
| Sat Flow, veh/h | 3741 | 0 | 1781 | 3647 | 3456 | 1585 |
| Grp Volume(v), veh/h | 672 | 0 | 718 | 937 | 51 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1777 | 0 | 1781 | 1777 | 1728 | 1585 |
| Q Serve(g_s), s | 6.7 | 0.0 | 39.5 | 5.3 | 1.4 | 0.0 |
| Cycle Q Clear(g_c), s | 6.7 | 0.0 | 39.5 | 5.3 | 1.4 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1383 | | 739 | 3025 | 131 | |
| V/C Ratio(X) | 0.49 | | 0.97 | 0.31 | 0.39 | |
| Avail Cap(c_a), veh/h | 1383 | | 739 | 3025 | 467 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.70 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.5 | 0.0 | 28.7 | 1.5 | 47.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 25.9 | 0.3 | 1.9 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 0.0 | 20.0 | 0.2 | 0.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 8.4 | 0.0 | 54.6 | 1.8 | 48.9 | 0.0 |
| LnGrp LOS | A | | D | A | D | |
| Approach Vol, veh/h | 672 | | | 1655 | 51 | |
| Approach Delay, s/veh | 8.4 | | | 24.7 | 48.9 | |
| Approach LOS | A | | | C | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 46.2 | 45.4 | | | | 91.6 | 8.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 41.5 | 29.2 | | | | 75.4 | 13.5 |
| Max Q Clear Time (g_c+I1), s | 41.5 | 8.7 | | | | 7.3 | 3.4 |
| Green Ext Time (p_c), s | 0.0 | 3.1 | | | | 5.2 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.6 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 545 | 165 | 262 | 43 | 241 | 500 | 35 | 36 |
| Future Volume (vph) | 545 | 165 | 262 | 43 | 241 | 500 | 35 | 36 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 13.5 | 13.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 29.6 | 19.0 | 48.6 | 16.6 | 16.6 | 34.8 | 34.8 | 34.8 |
| Total Split (%) | 29.6% | 19.0% | 48.6% | 16.6% | 16.6% | 34.8% | 34.8% | 34.8% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 31.7 | 14.0 | 50.4 | 8.9 | 8.9 | 23.2 | 23.2 | 23.2 |
| Actuated g/C Ratio | 0.32 | 0.14 | 0.50 | 0.09 | 0.09 | 0.23 | 0.23 | 0.23 |
| v/c Ratio | 0.59 | 0.76 | 0.17 | 0.31 | 0.70 | 0.79 | 0.77 | 0.09 |
| Control Delay (s/veh) | 33.1 | 57.6 | 12.5 | 47.7 | 15.8 | 50.2 | 49.0 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.1 | 57.6 | 12.5 | 47.7 | 15.8 | 50.2 | 49.0 | 0.4 |
| LOS | C | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 33.1 | | 30.0 | | | | 46.5 | |
| Approach LOS | C | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 34.6 | Intersection LOS: C |
| Intersection Capacity Utilization 60.7% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

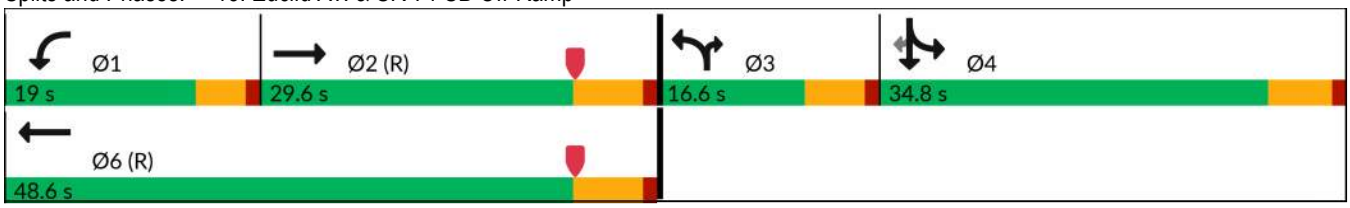

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 545 | 33 | 165 | 262 | 0 | 43 | 0 | 241 | 500 | 35 | 36 |
| Future Volume (veh/h) | 0 | 545 | 33 | 165 | 262 | 0 | 43 | 0 | 241 | 500 | 35 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 0 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 619 | 24 | 188 | 298 | 0 | 49 | 0 | 154 | 599 | 0 | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.80 | 0.88 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1793 | 69 | 216 | 2425 | | 0 | 0 | 0 | 704 | 0 | 313 |
| Arrive On Green | 0.00 | 0.51 | 0.51 | 0.24 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.20 |
| Sat Flow, veh/h | 0 | 3581 | 135 | 1781 | 3647 | 0 | | 0 | | 3563 | 0 | 1583 |
| Grp Volume(v), veh/h | 0 | 315 | 328 | 188 | 298 | 0 | | 0.0 | | 599 | 0 | 17 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1777 | 1846 | 1781 | 1777 | 0 | | | | 1781 | 0 | 1583 |
| Q Serve(g_s), s | 0.0 | 10.5 | 10.5 | 10.1 | 0.0 | 0.0 | | | | 16.2 | 0.0 | 0.9 |
| Cycle Q Clear(g_c), s | 0.0 | 10.5 | 10.5 | 10.1 | 0.0 | 0.0 | | | | 16.2 | 0.0 | 0.9 |
| Prop In Lane | 0.00 | | 0.07 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 913 | 949 | 216 | 2425 | | | | | 704 | 0 | 313 |
| V/C Ratio(X) | 0.00 | 0.34 | 0.35 | 0.87 | 0.12 | | | | | 0.85 | 0.00 | 0.05 |
| Avail Cap(c_a), veh/h | 0 | 913 | 949 | 255 | 2425 | | | | | 1033 | 0 | 459 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.96 | 0.96 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 14.3 | 14.4 | 37.1 | 0.0 | 0.0 | | | | 38.7 | 0.0 | 32.5 |
| Incr Delay (d2), s/veh | 0.0 | 1.0 | 1.0 | 20.6 | 0.1 | 0.0 | | | | 4.0 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 4.1 | 4.2 | 5.0 | 0.0 | 0.0 | | | | 7.4 | 0.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 15.4 | 15.4 | 57.7 | 0.1 | 0.0 | | | | 42.7 | 0.0 | 32.6 |
| LnGrp LOS | | B | B | E | A | | | | | D | | C |
| Approach Vol, veh/h | | 643 | | | 486 | | | | | | 616 | |
| Approach Delay, s/veh | | 15.4 | | | 22.4 | | | | | | 42.5 | |
| Approach LOS | | B | | | C | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.8 | 57.6 | | 25.6 | | 74.4 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 14.3 | 23.4 | | 29.0 | | 42.4 |
| Max Q Clear Time (g_c+I1), s | 12.1 | 12.5 | | 18.2 | | 2.0 |
| Green Ext Time (p_c), s | 0.1 | 1.7 | | 1.4 | | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 26.9 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 82 | 496 | 29 | 71 | 737 | 48 | 28 | 28 | 69 | 6 | 20 | 71 |
| Future Vol, veh/h | 82 | 496 | 29 | 71 | 737 | 48 | 28 | 28 | 69 | 6 | 20 | 71 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 93 | 564 | 33 | 81 | 838 | 55 | 32 | 32 | 78 | 7 | 23 | 81 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 895 | 0 | 0 | 597 | 0 | 0 | 1358 | 1823 | 580 | 1795 | 1812 | 449 |
| Stage 1 | - | - | - | - | - | - | 766 | 766 | - | 1029 | 1029 | - |
| Stage 2 | - | - | - | - | - | - | 591 | 1056 | - | 766 | 783 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 756 | - | - | 978 | - | - | 116 | 77 | 513 | 56 | 78 | 558 |
| Stage 1 | - | - | - | - | - | - | 394 | 411 | - | 251 | 310 | - |
| Stage 2 | - | - | - | - | - | - | 461 | 301 | - | 394 | 404 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 754 | - | - | 978 | - | - | 72 | 62 | 513 | 32 | 63 | 556 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 197 | 161 | - | 139 | 196 | - |
| Stage 1 | - | - | - | - | - | - | 345 | 360 | - | 230 | 284 | - |
| Stage 2 | - | - | - | - | - | - | 332 | 275 | - | 267 | 354 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.41 | 0.75 | 30.8 | 19.61 |
| HCM LOS | | | D | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 278 | 754 | - | - | 978 | - | - | 356 |
| HCM Lane V/C Ratio | 0.512 | 0.124 | - | - | 0.083 | - | - | 0.31 |
| HCM Control Delay (s/veh) | 30.8 | 10.4 | - | - | 9 | - | - | 19.6 |
| HCM Lane LOS | D | B | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 2.7 | 0.4 | - | - | 0.3 | - | - | 1.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 33 | 87 | 14 | 10 | 172 | 15 | 37 | 155 | 11 | 7 | 80 | 50 |
| Future Vol, veh/h | 33 | 87 | 14 | 10 | 172 | 15 | 37 | 155 | 11 | 7 | 80 | 50 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 36 | 95 | 15 | 11 | 187 | 16 | 40 | 168 | 12 | 8 | 87 | 54 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.6 | 10.2 | 10.4 | 9.3 |
| HCM LOS | A | B | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 18% | 25% | 5% | 5% |
| Vol Thru, % | 76% | 65% | 87% | 58% |
| Vol Right, % | 5% | 10% | 8% | 36% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 203 | 134 | 197 | 137 |
| LT Vol | 37 | 33 | 10 | 7 |
| Through Vol | 155 | 87 | 172 | 80 |
| RT Vol | 11 | 14 | 15 | 50 |
| Lane Flow Rate | 221 | 146 | 214 | 149 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.308 | 0.207 | 0.297 | 0.203 |
| Departure Headway (Hd) | 5.024 | 5.115 | 5 | 4.918 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 708 | 693 | 711 | 721 |
| Service Time | 3.109 | 3.211 | 3.088 | 3.011 |
| HCM Lane V/C Ratio | 0.312 | 0.211 | 0.301 | 0.207 |
| HCM Control Delay, s/veh | 10.4 | 9.6 | 10.2 | 9.3 |
| HCM Lane LOS | B | A | B | A |
| HCM 95th-tile Q | 1.3 | 0.8 | 1.2 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.6 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 49 | 164 | 34 | 4 | 312 | 22 | 58 | 138 | 5 | 17 | 50 | 39 |
| Future Vol, veh/h | 49 | 164 | 34 | 4 | 312 | 22 | 58 | 138 | 5 | 17 | 50 | 39 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 52 | 174 | 36 | 4 | 332 | 23 | 62 | 147 | 5 | 18 | 53 | 41 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 12 | 14.2 | 12 | 10.2 |
| HCM LOS | B | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 29% | 20% | 1% | 16% |
| Vol Thru, % | 69% | 66% | 92% | 47% |
| Vol Right, % | 2% | 14% | 7% | 37% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 201 | 247 | 338 | 106 |
| LT Vol | 58 | 49 | 4 | 17 |
| Through Vol | 138 | 164 | 312 | 50 |
| RT Vol | 5 | 34 | 22 | 39 |
| Lane Flow Rate | 214 | 263 | 360 | 113 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.347 | 0.396 | 0.528 | 0.183 |
| Departure Headway (Hd) | 5.85 | 5.429 | 5.291 | 5.841 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 612 | 662 | 680 | 611 |
| Service Time | 3.908 | 3.48 | 3.338 | 3.907 |
| HCM Lane V/C Ratio | 0.35 | 0.397 | 0.529 | 0.185 |
| HCM Control Delay, s/veh | 12 | 12 | 14.2 | 10.2 |
| HCM Lane LOS | B | B | B | B |
| HCM 95th-tile Q | 1.5 | 1.9 | 3.1 | 0.7 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.7 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 11 | 59 | 7 | 3 | 79 | 12 | 19 | 22 | 4 | 8 | 21 | 10 |
| Future Vol, veh/h | 11 | 59 | 7 | 3 | 79 | 12 | 19 | 22 | 4 | 8 | 21 | 10 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 13 | 67 | 8 | 3 | 90 | 14 | 22 | 25 | 5 | 9 | 24 | 11 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 7.7 | 7.8 | 7.7 | 7.6 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 42% | 14% | 3% | 21% |
| Vol Thru, % | 49% | 77% | 84% | 54% |
| Vol Right, % | 9% | 9% | 13% | 26% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 45 | 77 | 94 | 39 |
| LT Vol | 19 | 11 | 3 | 8 |
| Through Vol | 22 | 59 | 79 | 21 |
| RT Vol | 4 | 7 | 12 | 10 |
| Lane Flow Rate | 51 | 88 | 107 | 44 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.063 | 0.101 | 0.122 | 0.053 |
| Departure Headway (Hd) | 4.443 | 4.154 | 4.095 | 4.308 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 811 | 851 | 863 | 836 |
| Service Time | 2.444 | 2.241 | 2.178 | 2.309 |
| HCM Lane V/C Ratio | 0.063 | 0.103 | 0.124 | 0.053 |
| HCM Control Delay, s/veh | 7.7 | 7.7 | 7.8 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.2 | 0.3 | 0.4 | 0.2 |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 5 | 355 | 305 | 850 | 609 | 458 |
| Future Volume (vph) | 5 | 355 | 305 | 850 | 609 | 458 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 29.0 | 29.0 | 30.0 | 61.0 | 31.0 | 31.0 |
| Total Split (%) | 32.2% | 32.2% | 33.3% | 67.8% | 34.4% | 34.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 18.0 | 18.0 | 19.9 | 60.4 | 34.6 | 34.6 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.22 | 0.67 | 0.38 | 0.38 |
| v/c Ratio | 0.49 | 0.86 | 0.83 | 0.38 | 0.48 | 0.54 |
| Control Delay (s/veh) | 35.5 | 38.5 | 44.7 | 9.2 | 24.6 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.5 | 38.5 | 44.7 | 9.4 | 24.6 | 5.1 |
| LOS | D | D | D | A | C | A |
| Approach Delay (s/veh) | 37.6 | | | 18.7 | 16.2 | |
| Approach LOS | D | | | B | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 21.3 | Intersection LOS: C |
| Intersection Capacity Utilization 82.6% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

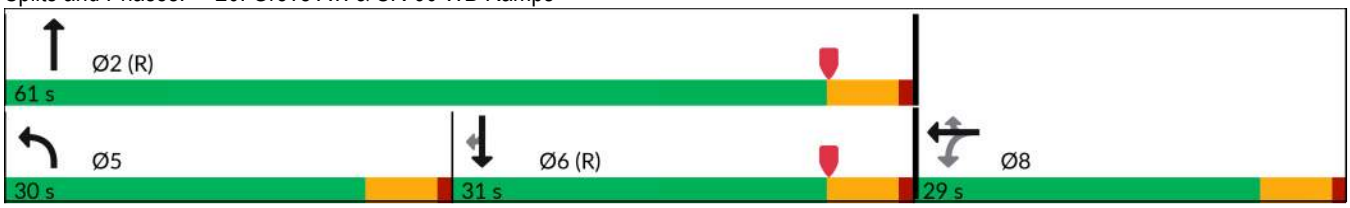

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 160 | 5 | 355 | 305 | 850 | 0 | 0 | 609 | 458 |
| Future Volume (veh/h) | 0 | 0 | 0 | 160 | 5 | 355 | 305 | 850 | 0 | 0 | 609 | 458 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1870 | 1870 | 1870 | 1870 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 170 | 5 | 234 | 324 | 904 | 0 | 0 | 648 | 342 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 303 | 9 | 277 | 353 | 2474 | 0 | 0 | 1542 | 688 |
| Arrive On Green | | | | 0.17 | 0.17 | 0.17 | 0.40 | 1.00 | 0.00 | 0.00 | 0.43 | 0.43 |
| Sat Flow, veh/h | | | | 1733 | 51 | 1585 | 1781 | 3647 | 0 | 0 | 3647 | 1585 |
| Grp Volume(v), veh/h | | | | 175 | 0 | 234 | 324 | 904 | 0 | 0 | 648 | 342 |
| Grp Sat Flow(s),veh/h/ln | | | | 1784 | 0 | 1585 | 1781 | 1777 | 0 | 0 | 1777 | 1585 |
| Q Serve(g_s), s | | | | 8.1 | 0.0 | 12.9 | 15.5 | 0.0 | 0.0 | 0.0 | 11.4 | 14.0 |
| Cycle Q Clear(g_c), s | | | | 8.1 | 0.0 | 12.9 | 15.5 | 0.0 | 0.0 | 0.0 | 11.4 | 14.0 |
| Prop In Lane | | | | 0.97 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 312 | 0 | 277 | 353 | 2474 | 0 | 0 | 1542 | 688 |
| V/C Ratio(X) | | | | 0.56 | 0.00 | 0.84 | 0.92 | 0.37 | 0.00 | 0.00 | 0.42 | 0.50 |
| Avail Cap(c_a), veh/h | | | | 460 | 0 | 409 | 479 | 2474 | 0 | 0 | 1542 | 688 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.35 | 0.35 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 34.0 | 0.0 | 35.9 | 26.5 | 0.0 | 0.0 | 0.0 | 17.6 | 18.4 |
| Incr Delay (d2), s/veh | | | | 1.2 | 0.0 | 8.8 | 6.9 | 0.1 | 0.0 | 0.0 | 0.8 | 2.6 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 3.4 | 0.0 | 5.4 | 5.3 | 0.1 | 0.0 | 0.0 | 4.4 | 5.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 35.2 | 0.0 | 44.8 | 33.4 | 0.1 | 0.0 | 0.0 | 18.5 | 20.9 |
| LnGrp LOS | | | | D | | D | C | A | | | B | C |
| Approach Vol, veh/h | | | | | 409 | | | 1228 | | | 990 | |
| Approach Delay, s/veh | | | | | 40.7 | | | 8.9 | | | 19.3 | |
| Approach LOS | | | | | D | | | A | | | B | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 68.5 | 23.6 | 44.9 | 21.5 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | 5.8 |
| Max Green Setting (Gmax), s | 55.2 | 24.2 | 25.2 | 23.2 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 17.5 | 16.0 | 14.9 |
| Green Ext Time (p_c), s | 5.5 | 0.3 | 3.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.8 |
| HCM 7th LOS | B |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 2 | 123 | 750 | 278 | 491 |
| Future Volume (vph) | 2 | 123 | 750 | 278 | 491 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 36.2 | 20.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 40.2% | 22.2% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 24.3 | 24.3 | 31.6 | 16.5 | 53.1 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.35 | 0.18 | 0.59 |
| v/c Ratio | 0.89 | 0.25 | 0.88 | 0.89 | 0.24 |
| Control Delay (s/veh) | 52.5 | 5.8 | 36.4 | 74.8 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.5 | 5.8 | 36.4 | 74.8 | 7.5 |
| LOS | D | A | D | E | A |
| Approach Delay (s/veh) | 41.7 | | 36.4 | | 31.9 |
| Approach LOS | D | | D | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 85 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.89 | |
| Intersection Signal Delay (s/veh): 36.1 | Intersection LOS: D |
| Intersection Capacity Utilization 82.6% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 405 | 2 | 123 | 0 | 0 | 0 | 0 | 750 | 289 | 278 | 491 | 0 |
| Future Volume (veh/h) | 405 | 2 | 123 | 0 | 0 | 0 | 0 | 750 | 289 | 278 | 491 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | 0 |
| Adj Flow Rate, veh/h | 422 | 2 | 54 | | | | 0 | 781 | 180 | 290 | 511 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 463 | 2 | 413 | | | | 0 | 1076 | 248 | 297 | 2129 | 0 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | | | | 0.00 | 0.38 | 0.38 | 0.22 | 0.80 | 0.00 |
| Sat Flow, veh/h | 1773 | 8 | 1585 | | | | 0 | 2947 | 658 | 1781 | 3647 | 0 |
| Grp Volume(v), veh/h | 424 | 0 | 54 | | | | 0 | 486 | 475 | 290 | 511 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1782 | 0 | 1585 | | | | 0 | 1777 | 1734 | 1781 | 1777 | 0 |
| Q Serve(g_s), s | 20.8 | 0.0 | 2.3 | | | | 0.0 | 21.1 | 21.1 | 14.6 | 3.3 | 0.0 |
| Cycle Q Clear(g_c), s | 20.8 | 0.0 | 2.3 | | | | 0.0 | 21.1 | 21.1 | 14.6 | 3.3 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 0.38 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 465 | 0 | 413 | | | | 0 | 670 | 654 | 297 | 2129 | 0 |
| V/C Ratio(X) | 0.91 | 0.00 | 0.13 | | | | 0.00 | 0.73 | 0.73 | 0.98 | 0.24 | 0.00 |
| Avail Cap(c_a), veh/h | 535 | 0 | 476 | | | | 0 | 670 | 654 | 297 | 2129 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.88 | 0.88 | 0.00 |
| Uniform Delay (d), s/veh | 32.3 | 0.0 | 25.5 | | | | 0.0 | 24.1 | 24.1 | 34.9 | 4.0 | 0.0 |
| Incr Delay (d2), s/veh | 17.3 | 0.0 | 0.1 | | | | 0.0 | 6.8 | 6.9 | 42.5 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.6 | 0.0 | 0.8 | | | | 0.0 | 9.3 | 9.1 | 9.0 | 1.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 49.6 | 0.0 | 25.5 | | | | 0.0 | 30.8 | 31.0 | 77.3 | 4.2 | 0.0 |
| LnGrp LOS | D | | C | | | | | C | C | E | A | |
| Approach Vol, veh/h | | 478 | | | | | | 961 | | | 801 | |
| Approach Delay, s/veh | | 46.9 | | | | | | 30.9 | | | 30.7 | |
| Approach LOS | | D | | | | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.0 | 39.7 | | 30.3 | | 59.7 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 15.0 | 30.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 16.6 | 23.1 | | 22.8 | | 5.3 |
| Green Ext Time (p_c), s | 0.0 | 2.8 | | 0.7 | | 2.7 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 34.2 |
| HCM 7th LOS | | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 226 | 176 | 18 | 208 | 47 | 528 | 75 | 371 |
| Future Volume (vph) | 226 | 176 | 18 | 208 | 47 | 528 | 75 | 371 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.4 | 24.8 | 5.8 | 12.4 | 6.9 | 17.8 | 7.9 | 20.9 |
| Actuated g/C Ratio | 0.17 | 0.36 | 0.08 | 0.18 | 0.10 | 0.26 | 0.12 | 0.31 |
| v/c Ratio | 0.88 | 0.20 | 0.14 | 0.60 | 0.30 | 0.69 | 0.42 | 0.47 |
| Control Delay (s/veh) | 64.5 | 17.2 | 35.9 | 17.4 | 36.6 | 28.0 | 37.9 | 21.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 64.5 | 17.2 | 35.9 | 17.4 | 36.6 | 28.0 | 37.9 | 21.1 |
| LOS | E | B | D | B | D | C | D | C |
| Approach Delay (s/veh) | | 41.0 | | 18.2 | | 28.7 | | 23.6 |
| Approach LOS | | D | | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 68.3 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay (s/veh): 27.9 | Intersection LOS: C |
| Intersection Capacity Utilization 62.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

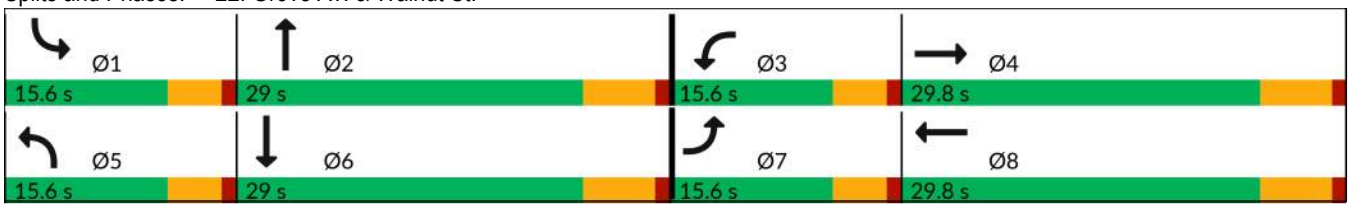

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 226 | 176 | 48 | 18 | 208 | 198 | 47 | 528 | 26 | 75 | 371 | 67 |
| Future Volume (veh/h) | 226 | 176 | 48 | 18 | 208 | 198 | 47 | 528 | 26 | 75 | 371 | 67 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 260 | 202 | 46 | 21 | 239 | 168 | 54 | 607 | 21 | 86 | 426 | 37 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 308 | 953 | 212 | 44 | 369 | 249 | 88 | 831 | 29 | 113 | 830 | 72 |
| Arrive On Green | 0.17 | 0.33 | 0.33 | 0.02 | 0.18 | 0.18 | 0.05 | 0.24 | 0.24 | 0.06 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1781 | 2886 | 643 | 1781 | 2026 | 1367 | 1781 | 3502 | 121 | 1781 | 3305 | 286 |
| Grp Volume(v), veh/h | 260 | 123 | 125 | 21 | 208 | 199 | 54 | 308 | 320 | 86 | 228 | 235 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1777 | 1753 | 1781 | 1777 | 1616 | 1781 | 1777 | 1847 | 1781 | 1777 | 1814 |
| Q Serve(g_s), s | 8.5 | 3.0 | 3.1 | 0.7 | 6.6 | 6.9 | 1.8 | 9.6 | 9.7 | 2.9 | 6.7 | 6.7 |
| Cycle Q Clear(g_c), s | 8.5 | 3.0 | 3.1 | 0.7 | 6.6 | 6.9 | 1.8 | 9.6 | 9.7 | 2.9 | 6.7 | 6.7 |
| Prop In Lane | 1.00 | | 0.37 | 1.00 | | 0.85 | 1.00 | | 0.07 | 1.00 | | 0.16 |
| Lane Grp Cap(c), veh/h | 308 | 587 | 579 | 44 | 324 | 295 | 88 | 421 | 438 | 113 | 446 | 456 |
| V/C Ratio(X) | 0.85 | 0.21 | 0.22 | 0.48 | 0.64 | 0.67 | 0.61 | 0.73 | 0.73 | 0.76 | 0.51 | 0.52 |
| Avail Cap(c_a), veh/h | 325 | 707 | 697 | 325 | 707 | 643 | 325 | 683 | 710 | 325 | 683 | 697 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.2 | 14.5 | 14.6 | 29.1 | 22.9 | 23.0 | 28.1 | 21.2 | 21.2 | 27.8 | 19.4 | 19.4 |
| Incr Delay (d2), s/veh | 16.4 | 0.2 | 0.2 | 3.0 | 2.1 | 2.7 | 2.6 | 2.4 | 2.4 | 4.0 | 0.9 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.5 | 1.0 | 1.1 | 0.3 | 2.6 | 2.5 | 0.7 | 3.7 | 3.9 | 1.2 | 2.5 | 2.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.6 | 14.7 | 14.8 | 32.1 | 25.0 | 25.7 | 30.7 | 23.7 | 23.6 | 31.8 | 20.3 | 20.3 |
| LnGrp LOS | D | B | B | C | C | C | C | C | C | C | C | C |
| Approach Vol, veh/h | | 508 | | | 428 | | | 682 | | | 549 | |
| Approach Delay, s/veh | | 28.0 | | | 25.7 | | | 24.2 | | | 22.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.4 | 20.1 | 6.1 | 25.7 | 7.6 | 21.0 | 15.0 | 16.8 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 4.9 | 11.7 | 2.7 | 5.1 | 3.8 | 8.7 | 10.5 | 8.9 |
| Green Ext Time (p_c), s | 0.0 | 2.7 | 0.0 | 1.1 | 0.0 | 2.2 | 0.0 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 24.9 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 132 | 408 | 19 | 666 | 41 | 306 | 77 | 211 | 149 |
| Future Volume (vph) | 132 | 408 | 19 | 666 | 41 | 306 | 77 | 211 | 149 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.7 | 33.3 | 5.9 | 22.7 | 6.9 | 19.6 | 8.2 | 22.9 | 22.9 |
| Actuated g/C Ratio | 0.12 | 0.42 | 0.07 | 0.29 | 0.09 | 0.25 | 0.10 | 0.29 | 0.29 |
| v/c Ratio | 0.66 | 0.62 | 0.16 | 0.84 | 0.29 | 0.79 | 0.46 | 0.43 | 0.28 |
| Control Delay (s/veh) | 52.6 | 26.9 | 41.6 | 37.0 | 42.9 | 43.5 | 45.4 | 27.7 | 6.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.6 | 26.9 | 41.6 | 37.0 | 42.9 | 43.5 | 45.4 | 27.7 | 6.0 |
| LOS | D | C | D | D | D | D | D | C | A |
| Approach Delay (s/veh) | | 32.9 | | 37.1 | | 43.5 | | 23.4 | |
| Approach LOS | | C | | D | | D | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 79.5 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 34.4 | Intersection LOS: C |
| Intersection Capacity Utilization 68.9% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

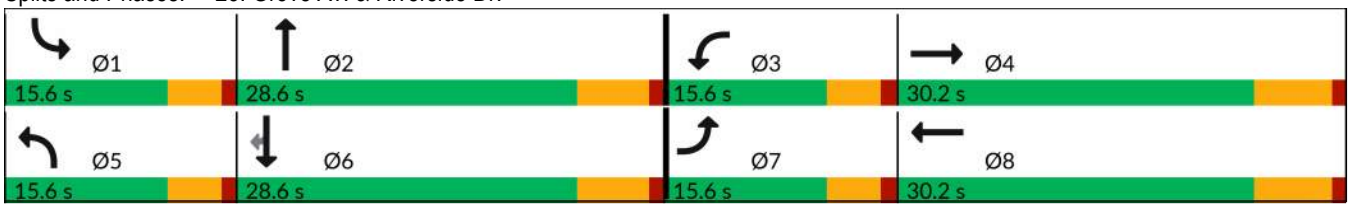

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 132 | 408 | 31 | 19 | 666 | 109 | 41 | 306 | 28 | 77 | 211 | 149 |
| Future Volume (veh/h) | 132 | 408 | 31 | 19 | 666 | 109 | 41 | 306 | 28 | 77 | 211 | 149 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 143 | 443 | 6 | 21 | 724 | 65 | 45 | 333 | 23 | 84 | 229 | 86 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 181 | 655 | 9 | 43 | 917 | 82 | 76 | 402 | 28 | 108 | 469 | 397 |
| Arrive On Green | 0.10 | 0.36 | 0.36 | 0.02 | 0.28 | 0.28 | 0.04 | 0.23 | 0.23 | 0.06 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1781 | 1840 | 25 | 1781 | 3294 | 296 | 1781 | 1729 | 119 | 1781 | 1870 | 1585 |
| Grp Volume(v), veh/h | 143 | 0 | 449 | 21 | 390 | 399 | 45 | 0 | 356 | 84 | 229 | 86 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1865 | 1781 | 1777 | 1812 | 1781 | 0 | 1849 | 1781 | 1870 | 1585 |
| Q Serve(g_s), s | 5.1 | 0.0 | 13.3 | 0.8 | 13.2 | 13.2 | 1.6 | 0.0 | 11.9 | 3.0 | 6.8 | 2.8 |
| Cycle Q Clear(g_c), s | 5.1 | 0.0 | 13.3 | 0.8 | 13.2 | 13.2 | 1.6 | 0.0 | 11.9 | 3.0 | 6.8 | 2.8 |
| Prop In Lane | 1.00 | | 0.01 | 1.00 | | 0.16 | 1.00 | | 0.06 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 181 | 0 | 664 | 43 | 495 | 505 | 76 | 0 | 430 | 108 | 469 | 397 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.68 | 0.49 | 0.79 | 0.79 | 0.59 | 0.00 | 0.83 | 0.78 | 0.49 | 0.22 |
| Avail Cap(c_a), veh/h | 302 | 0 | 689 | 302 | 657 | 670 | 302 | 0 | 649 | 302 | 657 | 557 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.5 | 0.0 | 17.7 | 31.3 | 21.7 | 21.7 | 30.5 | 0.0 | 23.7 | 30.1 | 20.8 | 19.3 |
| Incr Delay (d2), s/veh | 2.9 | 0.0 | 2.5 | 3.1 | 4.7 | 4.7 | 2.7 | 0.0 | 5.5 | 4.4 | 0.8 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 0.0 | 5.1 | 0.3 | 5.3 | 5.4 | 0.7 | 0.0 | 5.2 | 1.3 | 2.7 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 31.4 | 0.0 | 20.3 | 34.4 | 26.4 | 26.3 | 33.2 | 0.0 | 29.2 | 34.5 | 21.6 | 19.6 |
| LnGrp LOS | C | | C | C | C | C | C | | C | C | C | B |
| Approach Vol, veh/h | | 592 | | | 810 | | | 401 | | | 399 | |
| Approach Delay, s/veh | | 22.9 | | | 26.6 | | | 29.6 | | | 23.9 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.5 | 20.9 | 6.2 | 29.3 | 7.4 | 22.1 | 11.2 | 24.3 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 5.0 | 13.9 | 2.8 | 15.3 | 3.6 | 8.8 | 7.1 | 15.2 |
| Green Ext Time (p_c), s | 0.0 | 1.2 | 0.0 | 1.6 | 0.0 | 1.2 | 0.1 | 2.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.7 |
| HCM 7th LOS | C |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 22 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 62 | 92 | 24 | 6 | 247 | 49 | 53 | 269 | 8 | 32 | 224 | 13 |
| Future Vol, veh/h | 62 | 92 | 24 | 6 | 247 | 49 | 53 | 269 | 8 | 32 | 224 | 13 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 72 | 107 | 28 | 7 | 287 | 57 | 62 | 313 | 9 | 37 | 260 | 15 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 15.9 | 22.9 | 25.9 | 20.2 |
| HCM LOS | C | C | D | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 16% | 35% | 2% | 12% |
| Vol Thru, % | 82% | 52% | 82% | 83% |
| Vol Right, % | 2% | 13% | 16% | 5% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 330 | 178 | 302 | 269 |
| LT Vol | 53 | 62 | 6 | 32 |
| Through Vol | 269 | 92 | 247 | 224 |
| RT Vol | 8 | 24 | 49 | 13 |
| Lane Flow Rate | 384 | 207 | 351 | 313 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.725 | 0.425 | 0.67 | 0.605 |
| Departure Headway (Hd) | 6.804 | 7.389 | 6.866 | 6.967 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 530 | 486 | 527 | 516 |
| Service Time | 4.861 | 5.456 | 4.922 | 5.027 |
| HCM Lane V/C Ratio | 0.725 | 0.426 | 0.666 | 0.607 |
| HCM Control Delay, s/veh | 25.9 | 15.9 | 22.9 | 20.2 |
| HCM Lane LOS | D | C | C | C |
| HCM 95th-tile Q | 5.9 | 2.1 | 4.9 | 4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.7 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 53 | 16 | 9 | 119 | 20 | 55 | 279 | 4 | 15 | 190 | 23 |
| Future Vol, veh/h | 36 | 53 | 16 | 9 | 119 | 20 | 55 | 279 | 4 | 15 | 190 | 23 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 60 | 18 | 10 | 135 | 23 | 63 | 317 | 5 | 17 | 216 | 26 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 10.5 | 11 | 14.7 | 11.7 |
| HCM LOS | B | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 16% | 34% | 6% | 7% |
| Vol Thru, % | 83% | 50% | 80% | 83% |
| Vol Right, % | 1% | 15% | 14% | 10% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 338 | 105 | 148 | 228 |
| LT Vol | 55 | 36 | 9 | 15 |
| Through Vol | 279 | 53 | 119 | 190 |
| RT Vol | 4 | 16 | 20 | 23 |
| Lane Flow Rate | 384 | 119 | 168 | 259 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.557 | 0.197 | 0.271 | 0.383 |
| Departure Headway (Hd) | 5.218 | 5.94 | 5.791 | 5.326 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 691 | 601 | 619 | 674 |
| Service Time | 3.257 | 3.999 | 3.845 | 3.373 |
| HCM Lane V/C Ratio | 0.556 | 0.198 | 0.271 | 0.384 |
| HCM Control Delay, s/veh | 14.7 | 10.5 | 11 | 11.7 |
| HCM Lane LOS | B | B | B | B |
| HCM 95th-tile Q | 3.5 | 0.7 | 1.1 | 1.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 17.8 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 34 | 127 | 25 | 6 | 256 | 58 | 55 | 230 | 3 | 24 | 192 | 27 |
| Future Vol, veh/h | 34 | 127 | 25 | 6 | 256 | 58 | 55 | 230 | 3 | 24 | 192 | 27 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 39 | 144 | 28 | 7 | 291 | 66 | 63 | 261 | 3 | 27 | 218 | 31 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 14.3 | 20.1 | 18.7 | 16.2 |
| HCM LOS | B | C | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 19% | 18% | 2% | 10% |
| Vol Thru, % | 80% | 68% | 80% | 79% |
| Vol Right, % | 1% | 13% | 18% | 11% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 288 | 186 | 320 | 243 |
| LT Vol | 55 | 34 | 6 | 24 |
| Through Vol | 230 | 127 | 256 | 192 |
| RT Vol | 3 | 25 | 58 | 27 |
| Lane Flow Rate | 327 | 211 | 364 | 276 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.593 | 0.397 | 0.64 | 0.504 |
| Departure Headway (Hd) | 6.519 | 6.769 | 6.333 | 6.57 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 550 | 528 | 567 | 547 |
| Service Time | 4.595 | 4.856 | 4.405 | 4.65 |
| HCM Lane V/C Ratio | 0.595 | 0.4 | 0.642 | 0.505 |
| HCM Control Delay, s/veh | 18.7 | 14.3 | 20.1 | 16.2 |
| HCM Lane LOS | C | B | C | C |
| HCM 95th-tile Q | 3.8 | 1.9 | 4.5 | 2.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.6 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 6 | 51 | 1 | 2 | 158 | 220 | 1 | 2 | 2 | 251 | 3 | 17 |
| Future Vol, veh/h | 6 | 51 | 1 | 2 | 158 | 220 | 1 | 2 | 2 | 251 | 3 | 17 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 6 | 54 | 1 | 2 | 168 | 234 | 1 | 2 | 2 | 267 | 3 | 18 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 8.8 | 11.9 | 8.4 | 11.8 |
| HCM LOS | A | B | A | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 20% | 10% | 1% | 93% |
| Vol Thru, % | 40% | 88% | 42% | 1% |
| Vol Right, % | 40% | 2% | 58% | 6% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 5 | 58 | 380 | 271 |
| LT Vol | 1 | 6 | 2 | 251 |
| Through Vol | 2 | 51 | 158 | 3 |
| RT Vol | 2 | 1 | 220 | 17 |
| Lane Flow Rate | 5 | 62 | 404 | 288 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.008 | 0.089 | 0.499 | 0.412 |
| Departure Headway (Hd) | 5.32 | 5.193 | 4.446 | 5.139 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 677 | 684 | 809 | 695 |
| Service Time | 3.32 | 3.274 | 2.497 | 3.214 |
| HCM Lane V/C Ratio | 0.007 | 0.091 | 0.499 | 0.414 |
| HCM Control Delay, s/veh | 8.4 | 8.8 | 11.9 | 11.8 |
| HCM Lane LOS | A | A | B | B |
| HCM 95th-tile Q | 0 | 0.3 | 2.8 | 2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 15 | 438 | 60 | 64 | 684 | 17 | 71 | 13 | 122 | 12 | 10 | 39 |
| Future Vol, veh/h | 15 | 438 | 60 | 64 | 684 | 17 | 71 | 13 | 122 | 12 | 10 | 39 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 17 | 487 | 67 | 71 | 760 | 19 | 79 | 14 | 136 | 13 | 11 | 43 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 785 | 0 | 0 | 553 | 0 | 0 | 1081 | 1480 | 277 | 1202 | 1504 | 395 |
| Stage 1 | - | - | - | - | - | - | 553 | 553 | - | 918 | 918 | - |
| Stage 2 | - | - | - | - | - | - | 528 | 927 | - | 284 | 587 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 830 | - | - | 1013 | - | - | 172 | 124 | 721 | 140 | 120 | 604 |
| Stage 1 | - | - | - | - | - | - | 485 | 512 | - | 292 | 349 | - |
| Stage 2 | - | - | - | - | - | - | 502 | 345 | - | 699 | 495 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 825 | - | - | 1013 | - | - | 140 | 113 | 721 | 98 | 109 | 600 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 318 | 262 | - | 236 | 261 | - |
| Stage 1 | - | - | - | - | - | - | 475 | 502 | - | 270 | 322 | - |
| Stage 2 | - | - | - | - | - | - | 418 | 319 | - | 540 | 485 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.28 | 0.74 | 19.97 | 15.98 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 466 | 825 | - | - | 1013 | - | - | 395 |
| HCM Lane V/C Ratio | 0.492 | 0.02 | - | - | 0.07 | - | - | 0.171 |
| HCM Control Delay (s/veh) | 20 | 9.5 | - | - | 8.8 | - | - | 16 |
| HCM Lane LOS | C | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 2.7 | 0.1 | - | - | 0.2 | - | - | 0.6 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.8 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 11 | 25 | 11 | 24 | 5 | 81 | 213 | 14 | 13 | 108 | 43 |
| Future Vol, veh/h | 36 | 11 | 25 | 11 | 24 | 5 | 81 | 213 | 14 | 13 | 108 | 43 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 40 | 12 | 27 | 12 | 26 | 5 | 89 | 234 | 15 | 14 | 119 | 47 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 8.7 | 8.6 | 10.7 | 8.8 |
| HCM LOS | A | A | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 26% | 50% | 28% | 8% |
| Vol Thru, % | 69% | 15% | 60% | 66% |
| Vol Right, % | 5% | 35% | 13% | 26% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 308 | 72 | 40 | 164 |
| LT Vol | 81 | 36 | 11 | 13 |
| Through Vol | 213 | 11 | 24 | 108 |
| RT Vol | 14 | 25 | 5 | 43 |
| Lane Flow Rate | 338 | 79 | 44 | 180 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.42 | 0.111 | 0.063 | 0.224 |
| Departure Headway (Hd) | 4.469 | 5.048 | 5.191 | 4.475 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 806 | 707 | 687 | 800 |
| Service Time | 2.501 | 3.098 | 3.245 | 2.512 |
| HCM Lane V/C Ratio | 0.419 | 0.112 | 0.064 | 0.225 |
| HCM Control Delay, s/veh | 10.7 | 8.7 | 8.6 | 8.8 |
| HCM Lane LOS | B | A | A | A |
| HCM 95th-tile Q | 2.1 | 0.4 | 0.2 | 0.9 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.9 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 17 | 127 | 10 | 6 | 270 | 96 | 13 | 184 | 3 | 44 | 61 | 37 |
| Future Vol, veh/h | 17 | 127 | 10 | 6 | 270 | 96 | 13 | 184 | 3 | 44 | 61 | 37 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 18 | 138 | 11 | 7 | 293 | 104 | 14 | 200 | 3 | 48 | 66 | 40 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 10.7 | 15.1 | 11.9 | 10.8 |
| HCM LOS | B | C | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 7% | 11% | 2% | 31% |
| Vol Thru, % | 92% | 82% | 73% | 43% |
| Vol Right, % | 2% | 6% | 26% | 26% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 200 | 154 | 372 | 142 |
| LT Vol | 13 | 17 | 6 | 44 |
| Through Vol | 184 | 127 | 270 | 61 |
| RT Vol | 3 | 10 | 96 | 37 |
| Lane Flow Rate | 217 | 167 | 404 | 154 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.348 | 0.263 | 0.579 | 0.248 |
| Departure Headway (Hd) | 5.76 | 5.647 | 5.151 | 5.788 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 622 | 633 | 700 | 617 |
| Service Time | 3.818 | 3.707 | 3.199 | 3.852 |
| HCM Lane V/C Ratio | 0.349 | 0.264 | 0.577 | 0.25 |
| HCM Control Delay, s/veh | 11.9 | 10.7 | 15.1 | 10.8 |
| HCM Lane LOS | B | B | C | B |
| HCM 95th-tile Q | 1.6 | 1.1 | 3.7 | 1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.2 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 4 | 255 | 492 | 203 | 68 | 8 |
| Future Vol, veh/h | 4 | 255 | 492 | 203 | 68 | 8 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 4 | 266 | 513 | 211 | 71 | 8 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 726 | 0 | - | 0 | 894 | 620 |
| Stage 1 | - | - | - | - | 620 | - |
| Stage 2 | - | - | - | - | 274 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 877 | - | - | - | 312 | 488 |
| Stage 1 | - | - | - | - | 536 | - |
| Stage 2 | - | - | - | - | 772 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 875 | - | - | - | 309 | 487 |
| Mov Cap-2 Maneuver | - | - | - | - | 419 | - |
| Stage 1 | - | - | - | - | 532 | - |
| Stage 2 | - | - | - | - | 771 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.14 | 0 | 15.38 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 28 | - | - | - | 426 |
| HCM Lane V/C Ratio | 0.005 | - | - | - | 0.186 |
| HCM Control Delay (s/veh) | 9.1 | 0 | - | - | 15.4 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.7 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 287 | 2 | 298 | 615 | 805 | 360 | 77 |
| Future Volume (vph) | 287 | 2 | 298 | 615 | 805 | 360 | 77 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 23.0 | 23.0 | 23.0 | 27.0 | 67.0 | 40.0 | 40.0 |
| Total Split (%) | 25.6% | 25.6% | 25.6% | 30.0% | 74.4% | 44.4% | 44.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 16.2 | 16.2 | 16.2 | 20.7 | 62.2 | 36.5 | 36.5 |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.23 | 0.69 | 0.41 | 0.41 |
| v/c Ratio | 0.72 | 0.63 | 0.46 | 0.83 | 0.24 | 0.15 | 0.12 |
| Control Delay (s/veh) | 48.3 | 32.2 | 8.5 | 43.7 | 3.1 | 18.3 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.3 | 32.2 | 8.5 | 43.7 | 3.1 | 18.3 | 3.1 |
| LOS | D | C | A | D | A | B | A |
| Approach Delay (s/veh) | | 30.2 | | | 20.6 | 15.6 | |
| Approach LOS | | C | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 35.6 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 22.0 | Intersection LOS: C |
| Intersection Capacity Utilization 69.9% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

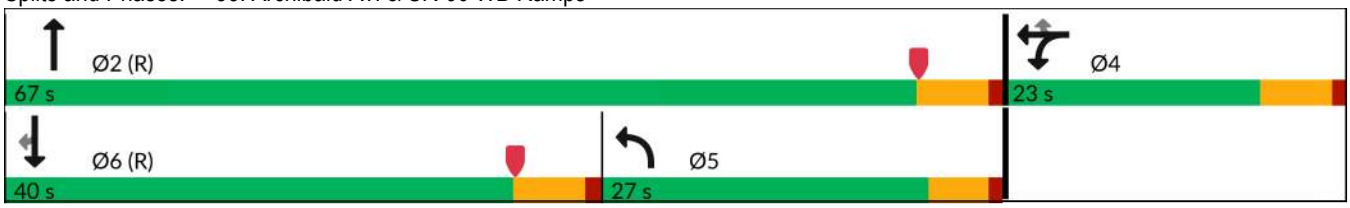

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 287 | 2 | 298 | 615 | 805 | 0 | 0 | 360 | 77 |
| Future Volume (veh/h) | 0 | 0 | 0 | 287 | 2 | 298 | 615 | 805 | 0 | 0 | 360 | 77 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1870 | 1870 | 1870 | 1870 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 341 | 0 | 76 | 654 | 856 | 0 | 0 | 383 | 51 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 443 | 0 | 197 | 1978 | 3814 | 0 | 0 | 709 | 168 |
| Arrive On Green | | | | 0.12 | 0.00 | 0.12 | 0.19 | 0.25 | 0.00 | 0.00 | 0.11 | 0.11 |
| Sat Flow, veh/h | | | | 3563 | 0 | 1585 | 3456 | 5274 | 0 | 0 | 6696 | 1525 |
| Grp Volume(v), veh/h | | | | 341 | 0 | 76 | 654 | 856 | 0 | 0 | 383 | 51 |
| Grp Sat Flow(s),veh/h/ln | | | | 1781 | 0 | 1585 | 1728 | 1702 | 0 | 0 | 1609 | 1525 |
| Q Serve(g_s), s | | | | 8.3 | 0.0 | 4.0 | 14.7 | 12.0 | 0.0 | 0.0 | 5.1 | 2.8 |
| Cycle Q Clear(g_c), s | | | | 8.3 | 0.0 | 4.0 | 14.7 | 12.0 | 0.0 | 0.0 | 5.1 | 2.8 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 443 | 0 | 197 | 1978 | 3814 | 0 | 0 | 709 | 168 |
| V/C Ratio(X) | | | | 0.77 | 0.00 | 0.39 | 0.33 | 0.22 | 0.00 | 0.00 | 0.54 | 0.30 |
| Avail Cap(c_a), veh/h | | | | 681 | 0 | 303 | 1978 | 3814 | 0 | 0 | 2445 | 580 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.94 | 0.94 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 38.2 | 0.0 | 36.3 | 21.6 | 13.1 | 0.0 | 0.0 | 37.9 | 36.9 |
| Incr Delay (d2), s/veh | | | | 2.9 | 0.0 | 1.2 | 0.0 | 0.1 | 0.0 | 0.0 | 2.9 | 4.6 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 3.6 | 0.0 | 3.6 | 6.7 | 4.7 | 0.0 | 0.0 | 2.0 | 1.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 41.1 | 0.0 | 37.5 | 21.6 | 13.2 | 0.0 | 0.0 | 40.8 | 41.5 |
| LnGrp LOS | | | | D | | D | C | B | | | D | D |
| Approach Vol, veh/h | | | | | 417 | | | 1510 | | | 434 | |
| Approach Delay, s/veh | | | | | 40.4 | | | 16.9 | | | 40.9 | |
| Approach LOS | | | | | D | | | B | | | D | |

| Timer - Assigned Phs | 2 | 4 | 5 | 6 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 73.0 | 17.0 | 57.3 | 15.7 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 61.2 | 17.2 | 22.0 | * 34 |
| Max Q Clear Time (g_c+I1), s | 14.0 | 10.3 | 16.7 | 7.1 |
| Green Ext Time (p_c), s | 6.4 | 0.8 | 0.7 | 2.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.4 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 212 | 2 | 304 | 1208 | 585 | 109 | 538 |
| Future Volume (vph) | 212 | 2 | 304 | 1208 | 585 | 109 | 538 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 52.0 | 52.0 | 11.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 57.8% | 57.8% | 12.2% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 15.6 | 15.6 | 15.6 | 53.1 | 53.1 | 6.7 | 62.8 |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | 0.59 | 0.59 | 0.07 | 0.70 |
| v/c Ratio | 0.65 | 0.48 | 0.43 | 0.33 | 0.52 | 0.45 | 0.16 |
| Control Delay (s/veh) | 44.3 | 12.9 | 8.2 | 10.9 | 2.9 | 62.3 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.3 | 12.9 | 8.2 | 10.9 | 2.9 | 62.3 | 0.8 |
| LOS | D | B | A | B | A | E | A |
| Approach Delay (s/veh) | | 22.3 | | 8.3 | | | 11.2 |
| Approach LOS | | C | | A | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 35.6 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.65 | |
| Intersection Signal Delay (s/veh): 11.4 | Intersection LOS: B |
| Intersection Capacity Utilization 69.9% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

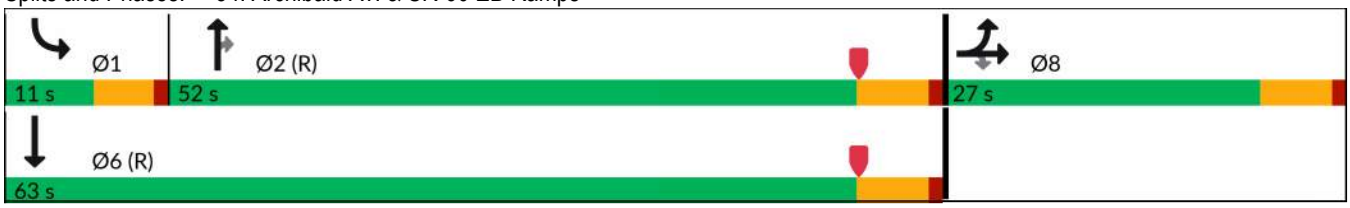

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 212 | 2 | 304 | 0 | 0 | 0 | 0 | 1208 | 585 | 109 | 538 | 0 |
| Future Volume (veh/h) | 212 | 2 | 304 | 0 | 0 | 0 | 0 | 1208 | 585 | 109 | 538 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | 0 |
| Adj Flow Rate, veh/h | 271 | 0 | 107 | | | | 0 | 1258 | 485 | 114 | 560 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 381 | 0 | 170 | | | | 0 | 4222 | 1038 | 181 | 3901 | 0 |
| Arrive On Green | 0.11 | 0.00 | 0.11 | | | | 0.00 | 0.66 | 0.66 | 0.10 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3563 | 0 | 1585 | | | | 0 | 6696 | 1583 | 3456 | 5274 | 0 |
| Grp Volume(v), veh/h | 271 | 0 | 107 | | | | 0 | 1258 | 485 | 114 | 560 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1583 | 1728 | 1702 | 0 |
| Q Serve(g_s), s | 6.6 | 0.0 | 5.8 | | | | 0.0 | 7.5 | 13.7 | 2.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 6.6 | 0.0 | 5.8 | | | | 0.0 | 7.5 | 13.7 | 2.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 381 | 0 | 170 | | | | 0 | 4222 | 1038 | 181 | 3901 | 0 |
| V/C Ratio(X) | 0.71 | 0.00 | 0.63 | | | | 0.00 | 0.30 | 0.47 | 0.63 | 0.14 | 0.00 |
| Avail Cap(c_a), veh/h | 839 | 0 | 373 | | | | 0 | 4222 | 1038 | 230 | 3901 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.94 | 0.94 | 0.00 |
| Uniform Delay (d), s/veh | 38.8 | 0.0 | 38.5 | | | | 0.0 | 6.6 | 7.7 | 39.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.5 | 0.0 | 3.8 | | | | 0.0 | 0.2 | 1.5 | 1.3 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 0.0 | 2.3 | | | | 0.0 | 1.9 | 3.8 | 1.1 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 41.3 | 0.0 | 42.3 | | | | 0.0 | 6.8 | 9.2 | 40.7 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | A | A | D | A | |
| Approach Vol, veh/h | | 378 | | | | | | 1743 | | | 674 | |
| Approach Delay, s/veh | | 41.6 | | | | | | 7.5 | | | 6.9 | |
| Approach LOS | | D | | | | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.7 | 64.9 | | | | 74.6 | | 15.4 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 46.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 4.8 | 15.7 | | | | 2.0 | | 8.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 12.3 | | | | 3.7 | | 1.0 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 11.9 |
| HCM 7th LOS | | | B |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 162 | 283 | 104 | 69 | 484 | 264 | 213 | 956 | 139 | 355 |
| Future Volume (vph) | 162 | 283 | 104 | 69 | 484 | 264 | 213 | 956 | 139 | 355 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 30.1 | 30.1 | 8.8 | 21.9 | 21.9 | 18.0 | 27.3 | 13.7 | 23.0 |
| Actuated g/C Ratio | 0.15 | 0.31 | 0.31 | 0.09 | 0.23 | 0.23 | 0.19 | 0.28 | 0.14 | 0.24 |
| v/c Ratio | 0.73 | 0.29 | 0.20 | 0.51 | 0.68 | 0.51 | 0.78 | 0.79 | 0.66 | 0.48 |
| Control Delay (s/veh) | 60.9 | 28.1 | 3.6 | 58.2 | 39.6 | 7.5 | 57.6 | 38.3 | 55.8 | 29.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 60.9 | 28.1 | 3.6 | 58.2 | 39.6 | 7.5 | 57.6 | 38.3 | 55.8 | 29.2 |
| LOS | E | C | A | E | D | A | E | D | E | C |
| Approach Delay (s/veh) | | 33.1 | | | 30.8 | | | 41.7 | | 34.8 |
| Approach LOS | | C | | | C | | | D | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 96.2 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 36.1 | Intersection LOS: D |
| Intersection Capacity Utilization 71.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

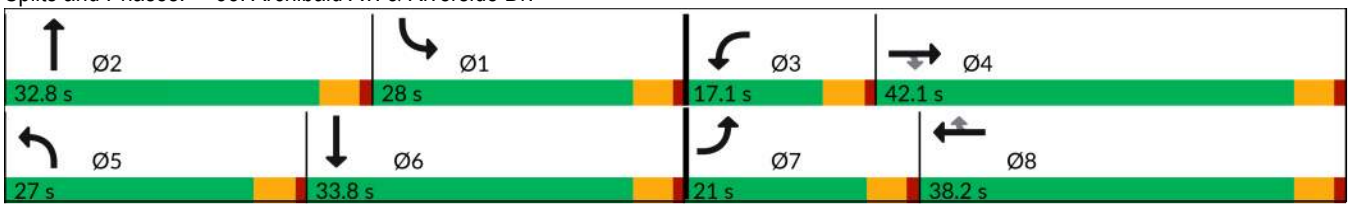

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 162 | 283 | 104 | 69 | 484 | 264 | 213 | 956 | 40 | 139 | 355 | 163 |
| Future Volume (veh/h) | 162 | 283 | 104 | 69 | 484 | 264 | 213 | 956 | 40 | 139 | 355 | 163 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 174 | 304 | 57 | 74 | 520 | 201 | 229 | 1028 | 42 | 149 | 382 | 114 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 208 | 1022 | 447 | 92 | 776 | 342 | 266 | 1365 | 56 | 182 | 871 | 249 |
| Arrive On Green | 0.13 | 0.30 | 0.30 | 0.06 | 0.23 | 0.23 | 0.17 | 0.29 | 0.29 | 0.11 | 0.23 | 0.23 |
| Sat Flow, veh/h | 1594 | 3367 | 1472 | 1594 | 3367 | 1486 | 1594 | 4766 | 195 | 1594 | 3729 | 1065 |
| Grp Volume(v), veh/h | 174 | 304 | 57 | 74 | 520 | 201 | 229 | 695 | 375 | 149 | 328 | 168 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1472 | 1594 | 1683 | 1486 | 1594 | 1612 | 1735 | 1594 | 1612 | 1569 |
| Q Serve(g_s), s | 8.2 | 5.3 | 2.2 | 3.5 | 10.9 | 6.5 | 10.8 | 15.1 | 15.2 | 7.1 | 6.7 | 7.1 |
| Cycle Q Clear(g_c), s | 8.2 | 5.3 | 2.2 | 3.5 | 10.9 | 6.5 | 10.8 | 15.1 | 15.2 | 7.1 | 6.7 | 7.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.11 | 1.00 | | 0.68 |
| Lane Grp Cap(c), veh/h | 208 | 1022 | 447 | 92 | 776 | 342 | 266 | 923 | 497 | 182 | 753 | 366 |
| V/C Ratio(X) | 0.84 | 0.30 | 0.13 | 0.81 | 0.67 | 0.59 | 0.86 | 0.75 | 0.75 | 0.82 | 0.44 | 0.46 |
| Avail Cap(c_a), veh/h | 339 | 1635 | 715 | 258 | 1465 | 647 | 462 | 1178 | 634 | 483 | 1220 | 593 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.7 | 20.6 | 19.5 | 36.0 | 27.0 | 12.8 | 31.3 | 25.1 | 25.1 | 33.4 | 25.3 | 25.4 |
| Incr Delay (d2), s/veh | 4.4 | 0.2 | 0.1 | 6.2 | 1.0 | 1.6 | 3.2 | 2.1 | 3.9 | 3.4 | 0.4 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.2 | 1.9 | 0.7 | 1.4 | 4.0 | 2.9 | 4.0 | 5.4 | 6.0 | 2.7 | 2.3 | 2.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 37.1 | 20.7 | 19.6 | 42.2 | 28.0 | 14.4 | 34.4 | 27.1 | 28.9 | 36.8 | 25.6 | 26.3 |
| LnGrp LOS | D | C | B | D | C | B | C | C | C | D | C | C |
| Approach Vol, veh/h | | 535 | | | 795 | | | 1299 | | | 645 | |
| Approach Delay, s/veh | | 25.9 | | | 25.9 | | | 28.9 | | | 28.4 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.4 | 26.7 | 9.0 | 28.0 | 17.5 | 22.6 | 14.7 | 22.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 9.1 | 17.2 | 5.5 | 7.3 | 12.8 | 9.1 | 10.2 | 12.9 |
| Green Ext Time (p_c), s | 0.1 | 4.7 | 0.0 | 1.9 | 0.2 | 2.7 | 0.1 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 110 | 67 | 44 | 161 | 162 | 102 | 994 | 84 | 366 |
| Future Volume (vph) | 110 | 67 | 44 | 161 | 162 | 102 | 994 | 84 | 366 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.3 | 26.4 | 5.5 | 15.7 | 15.7 | 12.0 | 31.1 | 10.5 | 29.6 |
| Actuated g/C Ratio | 0.15 | 0.29 | 0.06 | 0.17 | 0.17 | 0.13 | 0.35 | 0.12 | 0.33 |
| v/c Ratio | 0.57 | 0.28 | 0.55 | 0.63 | 0.46 | 0.59 | 0.71 | 0.55 | 0.45 |
| Control Delay (s/veh) | 49.3 | 22.5 | 70.2 | 46.8 | 9.5 | 53.3 | 28.3 | 54.9 | 25.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.3 | 22.5 | 70.2 | 46.8 | 9.5 | 53.3 | 28.3 | 54.9 | 25.4 |
| LOS | D | C | E | D | A | D | C | D | C |
| Approach Delay (s/veh) | | 35.5 | | 33.1 | | | 30.5 | | 30.2 |
| Approach LOS | | D | | C | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 89.9 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.71 | |
| Intersection Signal Delay (s/veh): 31.4 | Intersection LOS: C |
| Intersection Capacity Utilization 58.2% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 67 | 50 | 44 | 161 | 162 | 102 | 994 | 68 | 84 | 366 | 59 |
| Future Volume (veh/h) | 110 | 67 | 50 | 44 | 161 | 162 | 102 | 994 | 68 | 84 | 366 | 59 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 133 | 81 | 44 | 53 | 194 | 88 | 123 | 1198 | 81 | 101 | 441 | 53 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 168 | 226 | 123 | 76 | 269 | 228 | 154 | 1832 | 124 | 126 | 1098 | 131 |
| Arrive On Green | 0.11 | 0.21 | 0.21 | 0.05 | 0.15 | 0.15 | 0.10 | 0.37 | 0.37 | 0.08 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1594 | 1079 | 586 | 1594 | 1772 | 1502 | 1594 | 4922 | 333 | 1594 | 3098 | 370 |
| Grp Volume(v), veh/h | 133 | 0 | 125 | 53 | 194 | 88 | 123 | 862 | 417 | 101 | 251 | 243 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1664 | 1594 | 1772 | 1502 | 1594 | 1772 | 1710 | 1594 | 1772 | 1696 |
| Q Serve(g_s), s | 5.1 | 0.0 | 4.1 | 2.1 | 6.6 | 2.5 | 4.8 | 12.8 | 12.8 | 3.9 | 6.7 | 6.8 |
| Cycle Q Clear(g_c), s | 5.1 | 0.0 | 4.1 | 2.1 | 6.6 | 2.5 | 4.8 | 12.8 | 12.8 | 3.9 | 6.7 | 6.8 |
| Prop In Lane | 1.00 | | 0.35 | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 168 | 0 | 349 | 76 | 269 | 228 | 154 | 1319 | 637 | 126 | 628 | 601 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.36 | 0.69 | 0.72 | 0.39 | 0.80 | 0.65 | 0.65 | 0.80 | 0.40 | 0.40 |
| Avail Cap(c_a), veh/h | 514 | 0 | 1037 | 131 | 678 | 575 | 363 | 2533 | 1222 | 297 | 1193 | 1142 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.6 | 0.0 | 21.3 | 29.7 | 25.5 | 13.0 | 28.0 | 16.5 | 16.5 | 28.6 | 15.4 | 15.4 |
| Incr Delay (d2), s/veh | 8.0 | 0.0 | 0.6 | 10.7 | 3.6 | 1.1 | 9.0 | 0.6 | 1.1 | 11.0 | 0.4 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 1.5 | 1.0 | 2.8 | 1.1 | 2.0 | 4.1 | 4.1 | 1.7 | 2.3 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.6 | 0.0 | 22.0 | 40.4 | 29.1 | 14.1 | 36.9 | 17.0 | 17.6 | 39.6 | 15.8 | 15.8 |
| LnGrp LOS | D | | C | D | C | B | D | B | B | D | B | B |
| Approach Vol, veh/h | | 258 | | | 335 | | | 1402 | | | 595 | |
| Approach Delay, s/veh | | 29.0 | | | 27.0 | | | 19.0 | | | 19.8 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.6 | 28.1 | 7.6 | 17.9 | 10.7 | 27.0 | 11.3 | 14.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 5.9 | 14.8 | 4.1 | 6.1 | 6.8 | 8.8 | 7.1 | 8.6 |
| Green Ext Time (p_c), s | 0.1 | 8.8 | 0.0 | 0.7 | 0.1 | 2.7 | 0.2 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.2 |
| HCM 7th LOS | C |

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 0 | 44 | 0 | 10 | 1006 | 78 | 389 |
| Future Volume (vph) | 0 | 44 | 0 | 10 | 1006 | 78 | 389 |
| Turn Type | NA | Split | NA | Prot | NA | Prot | NA |
| Protected Phases | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | |
| Detector Phase | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 22.5 | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 |
| Total Split (s) | 22.5 | 33.0 | 33.0 | 10.0 | 45.5 | 19.0 | 54.5 |
| Total Split (%) | 18.8% | 27.5% | 27.5% | 8.3% | 37.9% | 15.8% | 45.4% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.2 | 11.7 | 11.7 | 8.0 | 27.3 | 10.2 | 36.3 |
| Actuated g/C Ratio | 0.15 | 0.22 | 0.22 | 0.15 | 0.52 | 0.19 | 0.68 |
| v/c Ratio | 0.00 | 0.14 | 0.11 | 0.05 | 0.46 | 0.28 | 0.19 |
| Control Delay (s/veh) | 0.0 | 24.3 | 0.3 | 34.9 | 15.1 | 30.2 | 7.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.0 | 24.3 | 0.3 | 34.9 | 15.1 | 30.2 | 7.7 |
| LOS | A | C | A | C | B | C | A |
| Approach Delay (s/veh) | | | 9.7 | | 15.3 | | 11.5 |
| Approach LOS | | | A | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 53 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.46 | |
| Intersection Signal Delay (s/veh): 13.8 | Intersection LOS: B |
| Intersection Capacity Utilization 47.6% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

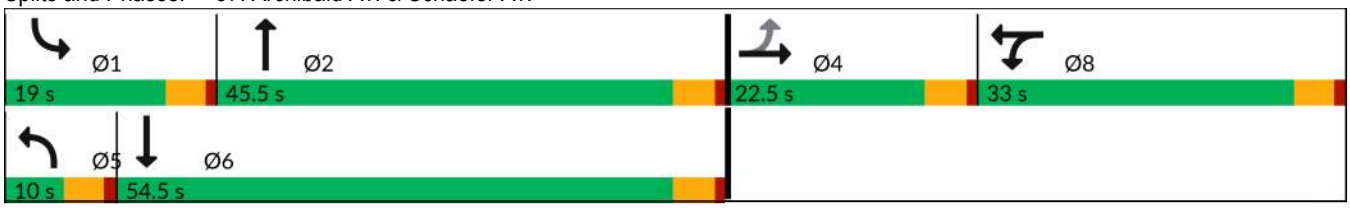

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 1 | 44 | 0 | 68 | 10 | 1006 | 18 | 78 | 389 | 1 |
| Future Volume (veh/h) | 0 | 0 | 1 | 44 | 0 | 68 | 10 | 1006 | 18 | 78 | 389 | 1 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 1 | 48 | 0 | 34 | 11 | 1105 | 18 | 86 | 427 | 1 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 0 | 4 | 117 | 0 | 110 | 23 | 2001 | 33 | 121 | 1618 | 4 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.07 | 0.01 | 0.41 | 0.41 | 0.08 | 0.47 | 0.47 |
| Sat Flow, veh/h | 0 | 0 | 1501 | 1594 | 0 | 1502 | 1594 | 4900 | 80 | 1594 | 3446 | 8 |
| Grp Volume(v), veh/h | 0 | 0 | 1 | 48 | 0 | 34 | 11 | 727 | 396 | 86 | 209 | 219 |
| Grp Sat Flow(s),veh/h/ln | 0 | 0 | 1502 | 1594 | 0 | 1502 | 1594 | 1612 | 1755 | 1594 | 1683 | 1770 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.9 | 0.3 | 7.2 | 7.2 | 2.2 | 3.1 | 3.1 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.9 | 0.3 | 7.2 | 7.2 | 2.2 | 3.1 | 3.1 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.05 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 0 | 4 | 117 | 0 | 110 | 23 | 1317 | 716 | 121 | 790 | 831 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.28 | 0.41 | 0.00 | 0.31 | 0.48 | 0.55 | 0.55 | 0.71 | 0.26 | 0.26 |
| Avail Cap(c_a), veh/h | 0 | 0 | 644 | 1085 | 0 | 1023 | 206 | 3163 | 1721 | 550 | 2014 | 2118 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 20.8 | 18.5 | 0.0 | 18.3 | 20.4 | 9.4 | 9.4 | 18.8 | 6.7 | 6.7 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 37.3 | 2.3 | 0.0 | 1.6 | 14.8 | 0.4 | 0.7 | 2.9 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.3 | 0.2 | 1.4 | 1.6 | 0.7 | 0.5 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 58.1 | 20.7 | 0.0 | 19.9 | 35.2 | 9.8 | 10.1 | 21.8 | 6.9 | 6.9 |
| LnGrp LOS | | | E | C | | B | D | A | B | C | A | A |
| Approach Vol, veh/h | | 1 | | | 82 | | | 1134 | | | 514 | |
| Approach Delay, s/veh | | 58.1 | | | 20.4 | | | 10.1 | | | 9.4 | |
| Approach LOS | | E | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.8 | 21.6 | | 4.7 | 5.2 | 24.2 | | 7.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 14.4 | 40.9 | | 17.9 | 5.4 | 49.9 | | 28.4 |
| Max Q Clear Time (g_c+I1), s | 4.2 | 9.2 | | 2.0 | 2.3 | 5.1 | | 3.2 |
| Green Ext Time (p_c), s | 0.1 | 7.3 | | 0.0 | 0.0 | 2.2 | | 0.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 10.4 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 17 | 87 | 58 | 317 | 225 | 76 | 117 | 831 | 187 | 72 | 333 | 44 |
| Future Volume (vph) | 17 | 87 | 58 | 317 | 225 | 76 | 117 | 831 | 187 | 72 | 333 | 44 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.8 | 15.4 | 76.3 | 11.6 | 23.6 | 23.6 | 10.8 | 28.8 | 76.3 | 8.9 | 23.2 | 23.2 |
| Actuated g/C Ratio | 0.08 | 0.20 | 1.00 | 0.15 | 0.31 | 0.31 | 0.14 | 0.38 | 1.00 | 0.12 | 0.30 | 0.30 |
| v/c Ratio | 0.08 | 0.09 | 0.04 | 0.75 | 0.43 | 0.14 | 0.54 | 0.69 | 0.13 | 0.41 | 0.34 | 0.08 |
| Control Delay (s/veh) | 44.6 | 28.6 | 0.1 | 49.2 | 26.8 | 0.7 | 48.1 | 27.1 | 0.2 | 45.0 | 22.6 | 0.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.6 | 28.6 | 0.1 | 49.2 | 26.8 | 0.7 | 48.1 | 27.1 | 0.2 | 45.0 | 22.6 | 0.3 |
| LOS | D | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 20.1 | | | 35.1 | | | 24.9 | | | 24.0 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 76.3 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay (s/veh): 27.0 | Intersection LOS: C |
| Intersection Capacity Utilization 57.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

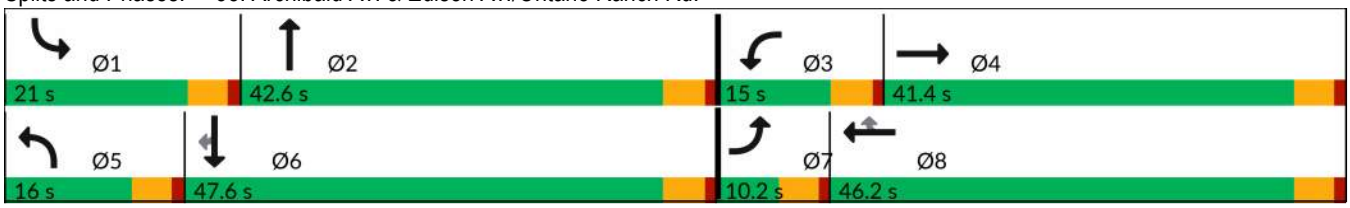

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 17 | 87 | 58 | 317 | 225 | 76 | 117 | 831 | 187 | 72 | 333 | 44 |
| Future Volume (veh/h) | 17 | 87 | 58 | 317 | 225 | 76 | 117 | 831 | 187 | 72 | 333 | 44 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 18 | 91 | 0 | 330 | 234 | 57 | 122 | 866 | 0 | 75 | 347 | 23 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 63 | 637 | | 422 | 452 | 383 | 151 | 1179 | | 96 | 1062 | 474 |
| Arrive On Green | 0.02 | 0.13 | 0.00 | 0.15 | 0.26 | 0.26 | 0.09 | 0.35 | 0.00 | 0.06 | 0.32 | 0.32 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1502 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 18 | 91 | 0 | 330 | 234 | 57 | 122 | 866 | 0 | 75 | 347 | 23 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1502 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 0.4 | 1.0 | 0.0 | 6.4 | 6.7 | 1.7 | 4.4 | 13.2 | 0.0 | 2.7 | 4.6 | 0.6 |
| Cycle Q Clear(g_c), s | 0.4 | 1.0 | 0.0 | 6.4 | 6.7 | 1.7 | 4.4 | 13.2 | 0.0 | 2.7 | 4.6 | 0.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 63 | 637 | | 422 | 452 | 383 | 151 | 1179 | | 96 | 1062 | 474 |
| V/C Ratio(X) | 0.29 | 0.14 | | 0.78 | 0.52 | 0.15 | 0.81 | 0.73 | | 0.78 | 0.33 | 0.05 |
| Avail Cap(c_a), veh/h | 277 | 3028 | | 515 | 1254 | 1063 | 309 | 2176 | | 445 | 2463 | 1098 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.3 | 22.6 | 0.0 | 24.2 | 18.8 | 17.0 | 26.1 | 16.7 | 0.0 | 27.3 | 15.4 | 14.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.1 | 0.0 | 4.9 | 0.9 | 0.2 | 3.8 | 0.9 | 0.0 | 5.2 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.3 | 0.0 | 2.2 | 2.4 | 0.5 | 1.6 | 4.0 | 0.0 | 1.0 | 1.4 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.2 | 22.7 | 0.0 | 29.2 | 19.7 | 17.1 | 29.9 | 17.6 | 0.0 | 32.4 | 15.5 | 14.0 |
| LnGrp LOS | C | C | | C | B | B | C | B | | C | B | B |
| Approach Vol, veh/h | | 109 | | | 621 | | | 988 | | | 445 | |
| Approach Delay, s/veh | | 23.8 | | | 24.5 | | | 19.1 | | | 18.3 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.1 | 25.2 | 13.1 | 12.3 | 10.2 | 23.1 | 5.9 | 19.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 4.7 | 15.2 | 8.4 | 3.0 | 6.4 | 6.6 | 2.4 | 8.7 |
| Green Ext Time (p_c), s | 0.0 | 5.4 | 0.1 | 0.5 | 0.1 | 2.1 | 0.0 | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.7 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 131 | 137 | 59 | 104 | 296 | 159 | 734 | 82 | 26 | 400 | 86 |
| Future Volume (vph) | 131 | 137 | 59 | 104 | 296 | 159 | 734 | 82 | 26 | 400 | 86 |
| Turn Type | Prot | NA | Free | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.1 | 15.5 | 67.2 | 10.3 | 16.7 | 5.8 | 22.8 | 22.8 | 6.6 | 15.8 | 15.8 |
| Actuated g/C Ratio | 0.14 | 0.23 | 1.00 | 0.15 | 0.25 | 0.09 | 0.34 | 0.34 | 0.10 | 0.24 | 0.24 |
| v/c Ratio | 0.34 | 0.18 | 0.04 | 0.44 | 0.47 | 0.65 | 0.43 | 0.14 | 0.09 | 0.50 | 0.20 |
| Control Delay (s/veh) | 32.9 | 21.3 | 0.1 | 38.1 | 20.9 | 47.9 | 21.1 | 1.5 | 36.0 | 25.5 | 2.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 32.9 | 21.3 | 0.1 | 38.1 | 20.9 | 47.9 | 21.1 | 1.5 | 36.0 | 25.5 | 2.4 |
| LOS | C | C | A | D | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 22.1 | | | 24.5 | | 23.8 | | | 22.1 | |
| Approach LOS | | C | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 67.2 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.65 | |
| Intersection Signal Delay (s/veh): 23.4 | Intersection LOS: C |
| Intersection Capacity Utilization 51.5% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

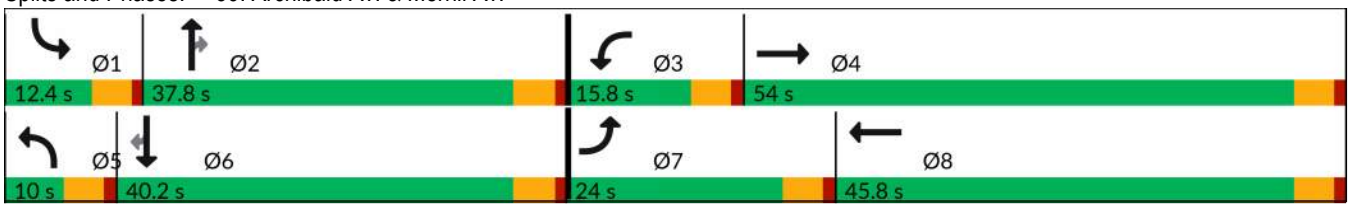

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 137 | 59 | 104 | 296 | 97 | 159 | 734 | 82 | 26 | 400 | 86 |
| Future Volume (veh/h) | 131 | 137 | 59 | 104 | 296 | 97 | 159 | 734 | 82 | 26 | 400 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 136 | 143 | 0 | 108 | 308 | 36 | 166 | 765 | 53 | 27 | 417 | 41 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 265 | 772 | | 134 | 666 | 77 | 282 | 1467 | 415 | 95 | 757 | 320 |
| Arrive On Green | 0.09 | 0.22 | 0.00 | 0.08 | 0.21 | 0.21 | 0.09 | 0.28 | 0.28 | 0.03 | 0.21 | 0.21 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 3112 | 360 | 3000 | 5316 | 1502 | 3000 | 3544 | 1500 |
| Grp Volume(v), veh/h | 136 | 143 | 0 | 108 | 174 | 170 | 166 | 765 | 53 | 27 | 417 | 41 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1701 | 1500 | 1772 | 1502 | 1500 | 1772 | 1500 |
| Q Serve(g_s), s | 2.0 | 1.6 | 0.0 | 3.1 | 4.0 | 4.1 | 2.5 | 5.7 | 1.2 | 0.4 | 4.9 | 1.0 |
| Cycle Q Clear(g_c), s | 2.0 | 1.6 | 0.0 | 3.1 | 4.0 | 4.1 | 2.5 | 5.7 | 1.2 | 0.4 | 4.9 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.21 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 265 | 772 | | 134 | 379 | 364 | 282 | 1467 | 415 | 95 | 757 | 320 |
| V/C Ratio(X) | 0.51 | 0.19 | | 0.80 | 0.46 | 0.47 | 0.59 | 0.52 | 0.13 | 0.28 | 0.55 | 0.13 |
| Avail Cap(c_a), veh/h | 1234 | 3713 | | 379 | 1548 | 1486 | 344 | 3743 | 1057 | 496 | 2675 | 1132 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.5 | 15.0 | 0.0 | 21.2 | 16.2 | 16.2 | 20.5 | 14.4 | 12.8 | 22.3 | 16.5 | 15.0 |
| Incr Delay (d2), s/veh | 1.5 | 0.1 | 0.0 | 10.7 | 0.9 | 0.9 | 2.0 | 0.3 | 0.1 | 1.6 | 0.6 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.5 | 0.0 | 1.4 | 1.4 | 1.4 | 0.8 | 1.7 | 0.3 | 0.1 | 1.5 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 22.1 | 15.1 | 0.0 | 31.9 | 17.0 | 17.1 | 22.4 | 14.7 | 12.9 | 23.9 | 17.2 | 15.2 |
| LnGrp LOS | C | B | | C | B | B | C | B | B | C | B | B |
| Approach Vol, veh/h | | 279 | | | 452 | | | 984 | | | 485 | |
| Approach Delay, s/veh | | 18.5 | | | 20.6 | | | 15.9 | | | 17.4 | |
| Approach LOS | | B | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.1 | 17.6 | 8.6 | 14.9 | 9.0 | 14.7 | 8.8 | 14.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 2.4 | 7.7 | 5.1 | 3.6 | 4.5 | 6.9 | 4.0 | 6.1 |
| Green Ext Time (p_c), s | 0.0 | 4.9 | 0.1 | 0.8 | 0.0 | 2.5 | 0.3 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.5 |
| HCM 7th LOS | B |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 9 | 28 | 1 | 310 | 62 | 357 | 14 | 637 | 267 | 202 | 369 | 17 |
| Future Volume (vph) | 9 | 28 | 1 | 310 | 62 | 357 | 14 | 637 | 267 | 202 | 369 | 17 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.8 | 13.1 | 13.1 | 13.5 | 19.2 | 22.9 | 5.8 | 21.9 | 35.4 | 9.9 | 36.1 | 36.1 |
| Actuated g/C Ratio | 0.09 | 0.20 | 0.20 | 0.20 | 0.29 | 0.34 | 0.09 | 0.33 | 0.53 | 0.15 | 0.54 | 0.54 |
| v/c Ratio | 0.03 | 0.04 | 0.00 | 0.56 | 0.07 | 0.34 | 0.06 | 0.61 | 0.30 | 0.46 | 0.15 | 0.02 |
| Control Delay (s/veh) | 42.6 | 30.8 | 0.0 | 32.3 | 19.6 | 3.8 | 42.4 | 23.0 | 2.2 | 37.3 | 11.5 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.6 | 30.8 | 0.0 | 32.3 | 19.6 | 3.8 | 42.4 | 23.0 | 2.2 | 37.3 | 11.5 | 0.1 |
| LOS | D | C | A | C | B | A | D | C | A | D | B | A |
| Approach Delay (s/veh) | | 32.7 | | | 17.2 | | | 17.3 | | | 20.0 | |
| Approach LOS | | C | | | B | | | B | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 67.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.61 | |
| Intersection Signal Delay (s/veh): 18.2 | Intersection LOS: B |
| Intersection Capacity Utilization 54.8% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

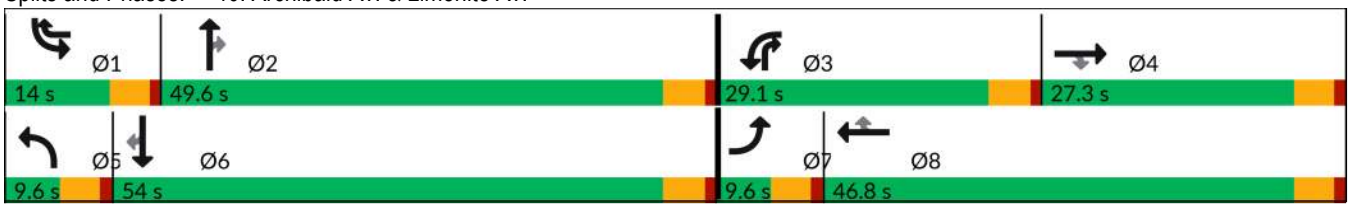

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 28 | 1 | 310 | 62 | 357 | 14 | 637 | 267 | 202 | 369 | 17 |
| Future Volume (veh/h) | 9 | 28 | 1 | 310 | 62 | 357 | 14 | 637 | 267 | 202 | 369 | 17 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 9 | 29 | 0 | 323 | 65 | 235 | 15 | 664 | 163 | 210 | 384 | 11 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 36 | 223 | 100 | 449 | 703 | 821 | 58 | 1041 | 696 | 316 | 1900 | 590 |
| Arrive On Green | 0.01 | 0.07 | 0.00 | 0.15 | 0.21 | 0.21 | 0.02 | 0.31 | 0.31 | 0.10 | 0.39 | 0.39 |
| Sat Flow, veh/h | 3092 | 3367 | 1502 | 2910 | 3367 | 2639 | 3092 | 3367 | 1500 | 3092 | 4837 | 1502 |
| Grp Volume(v), veh/h | 9 | 29 | 0 | 323 | 65 | 235 | 15 | 664 | 163 | 210 | 384 | 11 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1683 | 1502 | 1455 | 1683 | 1320 | 1546 | 1683 | 1500 | 1546 | 1612 | 1502 |
| Q Serve(g_s), s | 0.1 | 0.4 | 0.0 | 5.3 | 0.8 | 3.4 | 0.2 | 8.5 | 3.3 | 3.3 | 2.6 | 0.2 |
| Cycle Q Clear(g_c), s | 0.1 | 0.4 | 0.0 | 5.3 | 0.8 | 3.4 | 0.2 | 8.5 | 3.3 | 3.3 | 2.6 | 0.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 36 | 223 | 100 | 449 | 703 | 821 | 58 | 1041 | 696 | 316 | 1900 | 590 |
| V/C Ratio(X) | 0.25 | 0.13 | 0.00 | 0.72 | 0.09 | 0.29 | 0.26 | 0.64 | 0.23 | 0.66 | 0.20 | 0.02 |
| Avail Cap(c_a), veh/h | 309 | 1528 | 682 | 1426 | 2841 | 2498 | 309 | 3030 | 1582 | 581 | 4779 | 1484 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.5 | 22.0 | 0.0 | 20.1 | 16.0 | 13.0 | 24.2 | 14.9 | 8.1 | 21.6 | 10.0 | 9.3 |
| Incr Delay (d2), s/veh | 1.3 | 0.3 | 0.0 | 0.8 | 0.1 | 0.2 | 0.9 | 0.7 | 0.2 | 0.9 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.1 | 0.0 | 1.5 | 0.3 | 0.8 | 0.1 | 2.4 | 0.7 | 1.0 | 0.6 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 25.8 | 22.2 | 0.0 | 20.9 | 16.0 | 13.2 | 25.0 | 15.5 | 8.2 | 22.5 | 10.1 | 9.3 |
| LnGrp LOS | C | C | | C | B | B | C | B | A | C | B | A |
| Approach Vol, veh/h | | 38 | | | 623 | | | 842 | | | 605 | |
| Approach Delay, s/veh | | 23.1 | | | 17.5 | | | 14.3 | | | 14.4 | |
| Approach LOS | | C | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.7 | 20.1 | 12.3 | 7.9 | 5.5 | 24.2 | 5.2 | 15.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 10.5 | 7.3 | 2.4 | 2.2 | 4.6 | 2.1 | 5.4 |
| Green Ext Time (p_c), s | 0.1 | 4.8 | 0.5 | 0.1 | 0.0 | 2.4 | 0.0 | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 15.4 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 311 | 9 | 28 | 487 | 45 | 32 | 81 | 55 | 45 |
| Future Volume (vph) | 51 | 311 | 9 | 28 | 487 | 45 | 32 | 81 | 55 | 45 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.9 | 23.2 | 23.2 | 8.3 | 21.2 | 21.2 | 8.4 | 12.8 | 9.2 | 14.2 |
| Actuated g/C Ratio | 0.19 | 0.49 | 0.49 | 0.18 | 0.45 | 0.45 | 0.18 | 0.27 | 0.19 | 0.30 |
| v/c Ratio | 0.18 | 0.19 | 0.01 | 0.11 | 0.33 | 0.07 | 0.12 | 0.30 | 0.19 | 0.17 |
| Control Delay (s/veh) | 28.6 | 14.4 | 0.0 | 28.9 | 16.9 | 0.2 | 28.9 | 20.5 | 27.5 | 14.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 28.6 | 14.4 | 0.0 | 28.9 | 16.9 | 0.2 | 28.9 | 20.5 | 27.5 | 14.1 |
| LOS | C | B | A | C | B | A | C | C | C | B |
| Approach Delay (s/veh) | | 16.0 | | | 16.2 | | | 22.1 | | 19.4 |
| Approach LOS | | B | | | B | | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 47.2 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.33 | |
| Intersection Signal Delay (s/veh): 17.3 | Intersection LOS: B |
| Intersection Capacity Utilization 47.7% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

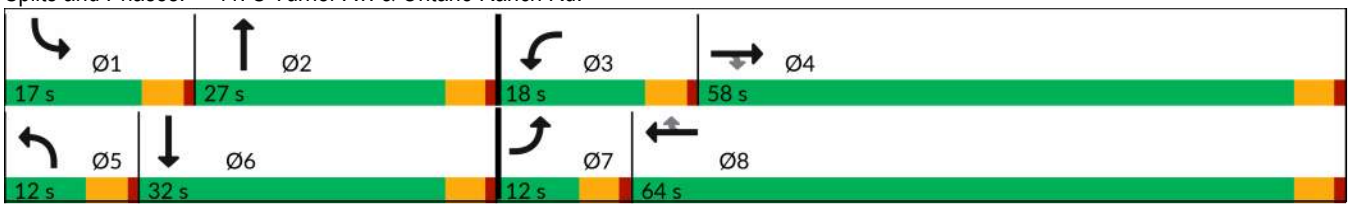

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 51 | 311 | 9 | 28 | 487 | 45 | 32 | 81 | 52 | 55 | 45 | 39 |
| Future Volume (veh/h) | 51 | 311 | 9 | 28 | 487 | 45 | 32 | 81 | 52 | 55 | 45 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 54 | 331 | 8 | 30 | 518 | 26 | 34 | 86 | 31 | 59 | 48 | 18 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 92 | 1048 | 434 | 57 | 971 | 411 | 64 | 136 | 49 | 98 | 162 | 61 |
| Arrive On Green | 0.06 | 0.30 | 0.30 | 0.04 | 0.27 | 0.27 | 0.04 | 0.11 | 0.11 | 0.06 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1594 | 3544 | 1468 | 1594 | 3544 | 1499 | 1594 | 1230 | 443 | 1594 | 1228 | 461 |
| Grp Volume(v), veh/h | 54 | 331 | 8 | 30 | 518 | 26 | 34 | 0 | 117 | 59 | 0 | 66 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1468 | 1594 | 1772 | 1499 | 1594 | 0 | 1673 | 1594 | 0 | 1689 |
| Q Serve(g_s), s | 1.2 | 2.7 | 0.1 | 0.7 | 4.6 | 0.5 | 0.8 | 0.0 | 2.5 | 1.3 | 0.0 | 1.3 |
| Cycle Q Clear(g_c), s | 1.2 | 2.7 | 0.1 | 0.7 | 4.6 | 0.5 | 0.8 | 0.0 | 2.5 | 1.3 | 0.0 | 1.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.26 | 1.00 | | 0.27 |
| Lane Grp Cap(c), veh/h | 92 | 1048 | 434 | 57 | 971 | 411 | 64 | 0 | 185 | 98 | 0 | 223 |
| V/C Ratio(X) | 0.59 | 0.32 | 0.02 | 0.53 | 0.53 | 0.06 | 0.54 | 0.00 | 0.63 | 0.60 | 0.00 | 0.30 |
| Avail Cap(c_a), veh/h | 318 | 5105 | 2115 | 576 | 5679 | 2402 | 318 | 0 | 1011 | 533 | 0 | 1249 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.0 | 10.1 | 9.2 | 17.6 | 11.4 | 9.9 | 17.5 | 0.0 | 15.8 | 17.0 | 0.0 | 14.5 |
| Incr Delay (d2), s/veh | 2.2 | 0.2 | 0.0 | 2.8 | 0.5 | 0.1 | 2.6 | 0.0 | 3.5 | 2.2 | 0.0 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.7 | 0.0 | 0.2 | 1.2 | 0.1 | 0.3 | 0.0 | 0.9 | 0.4 | 0.0 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 19.3 | 10.3 | 9.3 | 20.3 | 11.9 | 10.0 | 20.0 | 0.0 | 19.3 | 19.2 | 0.0 | 15.3 |
| LnGrp LOS | B | B | A | C | B | B | C | | B | B | | B |
| Approach Vol, veh/h | | 393 | | | 574 | | | 151 | | | 125 | |
| Approach Delay, s/veh | | 11.5 | | | 12.2 | | | 19.5 | | | 17.1 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.9 | 8.7 | 5.9 | 15.6 | 6.1 | 9.5 | 6.7 | 14.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 4.5 | 2.7 | 4.7 | 2.8 | 3.3 | 3.2 | 6.6 |
| Green Ext Time (p_c), s | 0.0 | 0.5 | 0.0 | 2.1 | 0.0 | 0.2 | 0.0 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 13.4 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 106 | 319 | 58 | 120 | 414 | 220 | 61 | 349 | 96 | 169 | 234 | 41 |
| Future Volume (vph) | 106 | 319 | 58 | 120 | 414 | 220 | 61 | 349 | 96 | 169 | 234 | 41 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.2 | 16.1 | 16.1 | 8.4 | 14.3 | 14.3 | 6.3 | 23.7 | 23.7 | 14.3 | 31.6 | 31.6 |
| Actuated g/C Ratio | 0.12 | 0.20 | 0.20 | 0.10 | 0.17 | 0.17 | 0.08 | 0.29 | 0.29 | 0.17 | 0.39 | 0.39 |
| v/c Ratio | 0.58 | 0.36 | 0.15 | 0.43 | 0.41 | 0.52 | 0.53 | 0.73 | 0.19 | 0.65 | 0.37 | 0.07 |
| Control Delay (s/veh) | 51.6 | 31.3 | 0.8 | 43.7 | 32.6 | 9.4 | 60.0 | 36.0 | 2.6 | 48.0 | 19.8 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.6 | 31.3 | 0.8 | 43.7 | 32.6 | 9.4 | 60.0 | 36.0 | 2.6 | 48.0 | 19.8 | 0.2 |
| LOS | D | C | A | D | C | A | E | D | A | D | B | A |
| Approach Delay (s/veh) | | 32.1 | | | 27.6 | | | 32.6 | | | 28.7 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 81.9 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.73 | |
| Intersection Signal Delay (s/veh): 30.0 | Intersection LOS: C |
| Intersection Capacity Utilization 62.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 106 | 319 | 58 | 120 | 414 | 220 | 61 | 349 | 96 | 169 | 234 | 41 |
| Future Volume (veh/h) | 106 | 319 | 58 | 120 | 414 | 220 | 61 | 349 | 96 | 169 | 234 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 113 | 339 | 18 | 128 | 440 | 117 | 65 | 371 | 33 | 180 | 249 | 29 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 140 | 940 | 287 | 221 | 1110 | 271 | 90 | 478 | 405 | 221 | 624 | 529 |
| Arrive On Green | 0.09 | 0.19 | 0.19 | 0.08 | 0.18 | 0.18 | 0.06 | 0.27 | 0.27 | 0.14 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1594 | 4837 | 1480 | 2910 | 6095 | 1489 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 113 | 339 | 18 | 128 | 440 | 117 | 65 | 371 | 33 | 180 | 249 | 29 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1480 | 1455 | 1524 | 1489 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 4.0 | 3.5 | 0.6 | 2.4 | 3.6 | 4.0 | 2.3 | 11.1 | 0.9 | 6.3 | 6.1 | 0.7 |
| Cycle Q Clear(g_c), s | 4.0 | 3.5 | 0.6 | 2.4 | 3.6 | 4.0 | 2.3 | 11.1 | 0.9 | 6.3 | 6.1 | 0.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 140 | 940 | 287 | 221 | 1110 | 271 | 90 | 478 | 405 | 221 | 624 | 529 |
| V/C Ratio(X) | 0.81 | 0.36 | 0.06 | 0.58 | 0.40 | 0.43 | 0.72 | 0.78 | 0.08 | 0.81 | 0.40 | 0.05 |
| Avail Cap(c_a), veh/h | 334 | 2458 | 752 | 650 | 3183 | 778 | 167 | 1349 | 1142 | 448 | 1662 | 1408 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.6 | 20.0 | 18.8 | 25.6 | 20.6 | 20.8 | 26.6 | 19.3 | 15.6 | 24.0 | 14.0 | 12.3 |
| Incr Delay (d2), s/veh | 4.1 | 0.2 | 0.1 | 0.9 | 0.2 | 1.1 | 4.1 | 2.7 | 0.1 | 2.8 | 0.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 1.1 | 0.2 | 0.7 | 1.1 | 1.2 | 0.9 | 4.1 | 0.3 | 2.2 | 2.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.7 | 20.2 | 18.9 | 26.5 | 20.9 | 21.9 | 30.7 | 22.0 | 15.7 | 26.7 | 14.4 | 12.3 |
| LnGrp LOS | C | C | B | C | C | C | C | C | B | C | B | B |
| Approach Vol, veh/h | | 470 | | | 685 | | | 469 | | | 458 | |
| Approach Delay, s/veh | | 22.5 | | | 22.1 | | | 22.8 | | | 19.1 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.5 | 20.1 | 8.9 | 15.7 | 7.8 | 24.8 | 9.6 | 15.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 8.3 | 13.1 | 4.4 | 5.5 | 4.3 | 8.1 | 6.0 | 6.0 |
| Green Ext Time (p_c), s | 0.1 | 2.2 | 0.1 | 2.0 | 0.0 | 1.5 | 0.1 | 2.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.7 |
| HCM 7th LOS | C |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 106 | 448 | 94 | 180 | 476 | 184 | 134 | 473 | 351 | 79 | 146 | 41 |
| Future Volume (vph) | 106 | 448 | 94 | 180 | 476 | 184 | 134 | 473 | 351 | 79 | 146 | 41 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.8 | 16.2 | 16.2 | 8.4 | 20.7 | 20.7 | 7.3 | 18.7 | 18.7 | 6.3 | 14.9 | 14.9 |
| Actuated g/C Ratio | 0.10 | 0.24 | 0.24 | 0.13 | 0.31 | 0.31 | 0.11 | 0.28 | 0.28 | 0.09 | 0.22 | 0.22 |
| v/c Ratio | 0.32 | 0.38 | 0.22 | 0.44 | 0.46 | 0.31 | 0.37 | 0.35 | 0.56 | 0.25 | 0.19 | 0.10 |
| Control Delay (s/veh) | 37.6 | 22.3 | 6.6 | 36.7 | 22.1 | 5.1 | 37.5 | 21.5 | 8.8 | 37.8 | 22.4 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.6 | 22.3 | 6.6 | 36.7 | 22.1 | 5.1 | 37.5 | 21.5 | 8.8 | 37.8 | 22.4 | 0.5 |
| LOS | D | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 22.5 | | | 21.5 | | | 19.1 | | | 23.6 | |
| Approach LOS | | C | | | C | | | B | | | C | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 67.2
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.56
Intersection Signal Delay (s/veh): 21.1 — Intersection LOS: C
Intersection Capacity Utilization 47.5% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

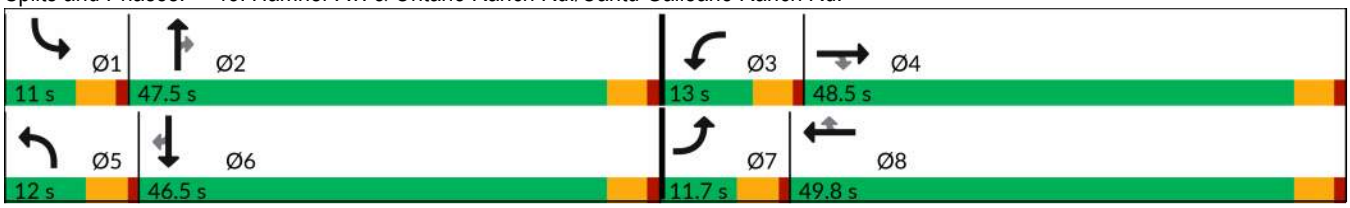

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 106 | 448 | 94 | 180 | 476 | 184 | 134 | 473 | 351 | 79 | 146 | 41 |
| Future Volume (veh/h) | 106 | 448 | 94 | 180 | 476 | 184 | 134 | 473 | 351 | 79 | 146 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 110 | 467 | 44 | 188 | 496 | 181 | 140 | 493 | 133 | 82 | 152 | 31 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 281 | 1156 | 359 | 337 | 863 | 385 | 309 | 1085 | 336 | 242 | 686 | 306 |
| Arrive On Green | 0.08 | 0.23 | 0.23 | 0.10 | 0.24 | 0.24 | 0.09 | 0.21 | 0.21 | 0.07 | 0.19 | 0.19 |
| Sat Flow, veh/h | 3456 | 5106 | 1585 | 3456 | 3554 | 1585 | 3456 | 5106 | 1581 | 3456 | 3554 | 1585 |
| Grp Volume(v), veh/h | 110 | 467 | 44 | 188 | 496 | 181 | 140 | 493 | 133 | 82 | 152 | 31 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1585 | 1728 | 1777 | 1585 | 1728 | 1702 | 1581 | 1728 | 1777 | 1585 |
| Q Serve(g_s), s | 1.4 | 3.6 | 1.0 | 2.4 | 5.7 | 4.6 | 1.8 | 3.9 | 3.4 | 1.1 | 1.7 | 0.8 |
| Cycle Q Clear(g_c), s | 1.4 | 3.6 | 1.0 | 2.4 | 5.7 | 4.6 | 1.8 | 3.9 | 3.4 | 1.1 | 1.7 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 281 | 1156 | 359 | 337 | 863 | 385 | 309 | 1085 | 336 | 242 | 686 | 306 |
| V/C Ratio(X) | 0.39 | 0.40 | 0.12 | 0.56 | 0.57 | 0.47 | 0.45 | 0.45 | 0.40 | 0.34 | 0.22 | 0.10 |
| Avail Cap(c_a), veh/h | 525 | 4792 | 1488 | 621 | 3434 | 1532 | 547 | 4683 | 1450 | 473 | 3183 | 1420 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.4 | 15.4 | 14.4 | 20.1 | 15.6 | 15.1 | 20.2 | 16.1 | 15.8 | 20.7 | 15.9 | 15.5 |
| Incr Delay (d2), s/veh | 0.3 | 0.2 | 0.2 | 0.5 | 0.6 | 0.9 | 0.4 | 0.3 | 0.8 | 0.3 | 0.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 1.1 | 0.3 | 0.8 | 1.8 | 1.3 | 0.6 | 1.2 | 1.0 | 0.4 | 0.5 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 20.7 | 15.6 | 14.5 | 20.7 | 16.2 | 16.0 | 20.6 | 16.4 | 16.6 | 21.0 | 16.1 | 15.7 |
| LnGrp LOS | C | B | B | C | B | B | C | B | B | C | B | B |
| Approach Vol, veh/h | | 621 | | | 865 | | | 766 | | | 265 | |
| Approach Delay, s/veh | | 16.5 | | | 17.1 | | | 17.2 | | | 17.6 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.9 | 14.5 | 9.2 | 15.2 | 8.8 | 13.6 | 8.4 | 16.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 3.1 | 5.9 | 4.4 | 5.6 | 3.8 | 3.7 | 3.4 | 7.7 |
| Green Ext Time (p_c), s | 0.0 | 3.6 | 0.1 | 3.0 | 0.1 | 0.9 | 0.0 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.0 |
| HCM 7th LOS | B |

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 748 | 448 | 130 | 245 | 0 | 799 |
| Future Volume (vph) | 748 | 448 | 130 | 245 | 0 | 799 |
| Turn Type | NA | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | 6 | | | 4 | |
| Permitted Phases | | | Free | 4 | | 4 |
| Detector Phase | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 76.4 | 76.4 | 120.0 | 32.5 | 32.5 | 32.5 |
| Actuated g/C Ratio | 0.64 | 0.64 | 1.00 | 0.27 | 0.27 | 0.27 |
| v/c Ratio | 0.22 | 0.20 | 0.05 | 0.48 | 0.78 | 0.77 |
| Control Delay (s/veh) | 10.9 | 21.7 | 0.0 | 38.0 | 32.7 | 31.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 10.9 | 21.7 | 0.0 | 38.0 | 32.7 | 31.7 |
| LOS | B | C | A | D | C | C |
| Approach Delay (s/veh) | 10.9 | 16.8 | | | 33.4 | |
| Approach LOS | B | B | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 37.5 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 45 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 22.3 | Intersection LOS: C |
| Intersection Capacity Utilization 54.6% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

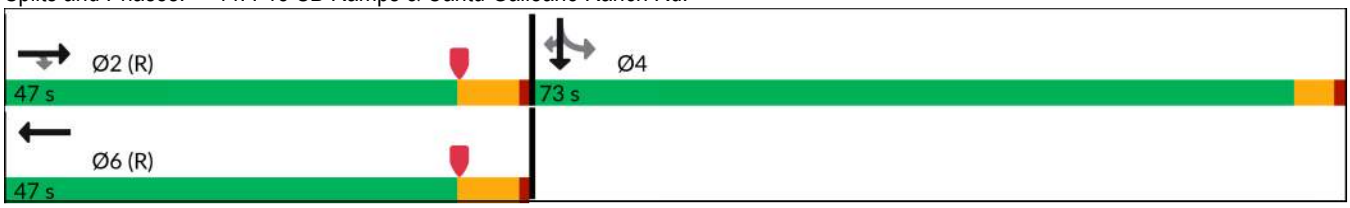

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 748 | 0 | 0 | 448 | 130 | 0 | 0 | 0 | 245 | 0 | 799 |
| Future Volume (veh/h) | 0 | 748 | 0 | 0 | 448 | 130 | 0 | 0 | 0 | 245 | 0 | 799 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 0 | 1870 | 1870 | | | | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 787 | 0 | 0 | 472 | 0 | | | | 172 | 0 | 688 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 3671 | | 0 | 2447 | | | | | 451 | 0 | 803 |
| Arrive On Green | 0.00 | 0.65 | 0.00 | 0.00 | 1.00 | 0.00 | | | | 0.25 | 0.00 | 0.25 |
| Sat Flow, veh/h | 0 | 5611 | 1585 | 0 | 3741 | 2790 | | | | 1781 | 0 | 3170 |
| Grp Volume(v), veh/h | 0 | 787 | 0 | 0 | 472 | 0 | | | | 172 | 0 | 688 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 0 | 1870 | 1395 | | | | 1781 | 0 | 1585 |
| Q Serve(g_s), s | 0.0 | 6.8 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 9.6 | 0.0 | 24.8 |
| Cycle Q Clear(g_c), s | 0.0 | 6.8 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 9.6 | 0.0 | 24.8 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 3671 | | 0 | 2447 | | | | | 451 | 0 | 803 |
| V/C Ratio(X) | 0.00 | 0.21 | | 0.00 | 0.19 | | | | | 0.38 | 0.00 | 0.86 |
| Avail Cap(c_a), veh/h | 0 | 3671 | | 0 | 2447 | | | | | 1015 | 0 | 1807 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.90 | 0.00 | 0.00 | 0.92 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 8.3 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 37.0 | 0.0 | 42.7 |
| Incr Delay (d2), s/veh | 0.0 | 0.1 | 0.0 | 0.0 | 0.2 | 0.0 | | | | 0.5 | 0.0 | 2.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.3 | 0.0 | 0.0 | 0.1 | 0.0 | | | | 4.1 | 0.0 | 9.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 8.5 | 0.0 | 0.0 | 0.2 | 0.0 | | | | 37.6 | 0.0 | 45.5 |
| LnGrp LOS | | A | | | A | | | | | D | | D |
| Approach Vol, veh/h | | 787 | | | 472 | | | | | | 860 | |
| Approach Delay, s/veh | | 8.5 | | | 0.2 | | | | | | 43.9 | |
| Approach LOS | | A | | | A | | | | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 85.0 | 35.0 | 85.0 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 8.8 | 26.8 | 2.0 |
| Green Ext Time (p_c), s | 5.1 | 3.6 | 2.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.0 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 381 | 612 | 185 | 281 | 297 | 186 |
| Future Volume (vph) | 381 | 612 | 185 | 281 | 297 | 186 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 75.9 | 75.9 | 11.8 | 92.3 | 16.6 | 16.6 |
| Actuated g/C Ratio | 0.63 | 0.63 | 0.10 | 0.77 | 0.14 | 0.14 |
| v/c Ratio | 0.11 | 0.51 | 0.55 | 0.07 | 0.69 | 0.44 |
| Control Delay (s/veh) | 7.0 | 4.2 | 57.3 | 3.7 | 55.2 | 10.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.0 | 4.2 | 57.3 | 3.7 | 55.2 | 10.9 |
| LOS | A | A | E | A | E | B |
| Approach Delay (s/veh) | 5.3 | | | 25.0 | 41.4 | |
| Approach LOS | A | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 44.8 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.69 | |
| Intersection Signal Delay (s/veh): 19.0 | Intersection LOS: B |
| Intersection Capacity Utilization 52.4% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

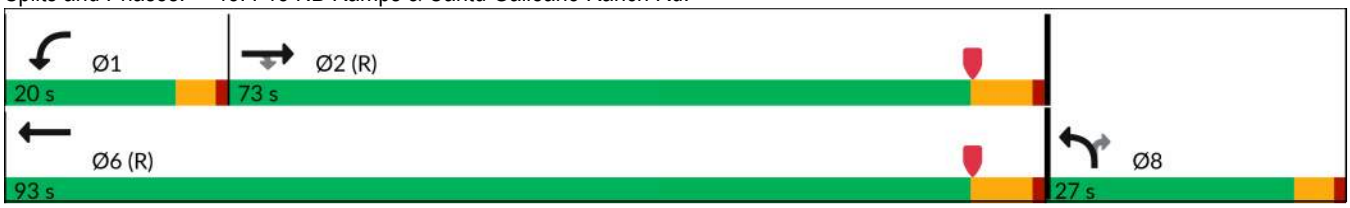

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 381 | 612 | 185 | 281 | 297 | 186 |
| Future Volume (veh/h) | 381 | 612 | 185 | 281 | 297 | 186 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 393 | 431 | 191 | 290 | 306 | 104 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3863 | 1091 | 255 | 4481 | 388 | 173 |
| Arrive On Green | 1.00 | 1.00 | 0.07 | 0.80 | 0.11 | 0.11 |
| Sat Flow, veh/h | 5611 | 1585 | 3563 | 5611 | 3563 | 1585 |
| Grp Volume(v), veh/h | 393 | 431 | 191 | 290 | 306 | 104 |
| Grp Sat Flow(s),veh/h/ln | 1870 | 1585 | 1781 | 1870 | 1781 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 6.3 | 1.3 | 10.0 | 7.5 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 6.3 | 1.3 | 10.0 | 7.5 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3863 | 1091 | 255 | 4481 | 388 | 173 |
| V/C Ratio(X) | 0.10 | 0.39 | 0.75 | 0.06 | 0.79 | 0.60 |
| Avail Cap(c_a), veh/h | 3863 | 1091 | 457 | 4481 | 665 | 296 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.97 | 0.97 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 54.6 | 2.6 | 52.1 | 51.0 |
| Incr Delay (d2), s/veh | 0.1 | 1.0 | 4.3 | 0.0 | 3.6 | 3.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.3 | 2.9 | 0.3 | 4.6 | 3.1 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.1 | 1.0 | 59.0 | 2.6 | 55.7 | 54.3 |
| LnGrp LOS | A | A | E | A | E | D |
| Approach Vol, veh/h | 824 | | | 481 | 410 | |
| Approach Delay, s/veh | 0.6 | | | 25.0 | 55.4 | |
| Approach LOS | A | | | C | E | |

| Timer - Assigned Phs | 1 | 2 | | | 6 | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.2 | 89.1 | | | 102.3 | 17.7 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 8.3 | 2.0 | | | 3.3 | 12.0 |
| Green Ext Time (p_c), s | 0.3 | 4.1 | | | 1.8 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.5 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 360 | 3 | 371 | 222 | 755 | 825 | 494 |
| Future Volume (vph) | 360 | 3 | 371 | 222 | 755 | 825 | 494 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 24.0 | 61.0 | 37.0 | 37.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 26.7% | 67.8% | 41.1% | 41.1% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 19.8 | 19.8 | 19.8 | 16.0 | 57.2 | 36.0 | 36.0 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.18 | 0.64 | 0.40 | 0.40 |
| v/c Ratio | 0.74 | 0.68 | 0.52 | 0.75 | 0.36 | 0.62 | 0.57 |
| Control Delay (s/veh) | 44.9 | 32.5 | 12.2 | 41.6 | 2.0 | 25.3 | 4.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.9 | 32.5 | 12.2 | 41.6 | 2.0 | 25.3 | 4.8 |
| LOS | D | C | B | D | A | C | A |
| Approach Delay (s/veh) | | 30.3 | | | 11.0 | 17.6 | |
| Approach LOS | | C | | | B | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay (s/veh): 18.6 | Intersection LOS: B |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

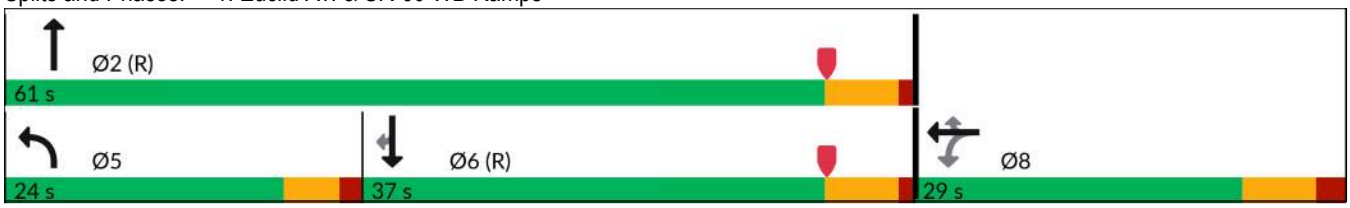

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 360 | 3 | 371 | 222 | 755 | 0 | 0 | 825 | 494 |
| Future Volume (veh/h) | 0 | 0 | 0 | 360 | 3 | 371 | 222 | 755 | 0 | 0 | 825 | 494 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1870 | 1870 | 1870 | 1870 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 449 | 0 | 140 | 236 | 803 | 0 | 0 | 878 | 287 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 597 | 0 | 265 | 278 | 2445 | 0 | 0 | 1684 | 746 |
| Arrive On Green | | | | 0.17 | 0.00 | 0.17 | 0.05 | 0.23 | 0.00 | 0.00 | 0.47 | 0.47 |
| Sat Flow, veh/h | | | | 3563 | 0 | 1579 | 1781 | 3647 | 0 | 0 | 3647 | 1575 |
| Grp Volume(v), veh/h | | | | 449 | 0 | 140 | 236 | 803 | 0 | 0 | 878 | 287 |
| Grp Sat Flow(s),veh/h/ln | | | | 1781 | 0 | 1579 | 1781 | 1777 | 0 | 0 | 1777 | 1575 |
| Q Serve(g_s), s | | | | 10.8 | 0.0 | 7.3 | 11.8 | 17.0 | 0.0 | 0.0 | 15.5 | 10.6 |
| Cycle Q Clear(g_c), s | | | | 10.8 | 0.0 | 7.3 | 11.8 | 17.0 | 0.0 | 0.0 | 15.5 | 10.6 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 597 | 0 | 265 | 278 | 2445 | 0 | 0 | 1684 | 746 |
| V/C Ratio(X) | | | | 0.75 | 0.00 | 0.53 | 0.85 | 0.33 | 0.00 | 0.00 | 0.52 | 0.38 |
| Avail Cap(c_a), veh/h | | | | 871 | 0 | 386 | 372 | 2445 | 0 | 0 | 1684 | 746 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.79 | 0.79 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.7 | 0.0 | 34.2 | 41.6 | 17.4 | 0.0 | 0.0 | 16.5 | 15.2 |
| Incr Delay (d2), s/veh | | | | 2.9 | 0.0 | 2.3 | 10.5 | 0.3 | 0.0 | 0.0 | 1.2 | 1.5 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.9 | 0.0 | 2.9 | 6.3 | 8.0 | 0.0 | 0.0 | 5.9 | 3.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 38.6 | 0.0 | 36.5 | 52.1 | 17.7 | 0.0 | 0.0 | 17.7 | 16.7 |
| LnGrp LOS | | | | D | | D | D | B | | | B | B |
| Approach Vol, veh/h | | | | | 589 | | | 1039 | | | 1165 | |
| Approach Delay, s/veh | | | | | 38.1 | | | 25.5 | | | 17.5 | |
| Approach LOS | | | | | D | | | C | | | B | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.9 | | 19.3 | 48.6 | | 22.1 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 18.8 | 31.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 19.0 | | 13.8 | 17.5 | | 12.8 |
| Green Ext Time (p_c), s | 8.5 | | 0.3 | 7.3 | | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 24.8 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 238 | 2 | 195 | 739 | 379 | 342 | 843 |
| Future Volume (vph) | 238 | 2 | 195 | 739 | 379 | 342 | 843 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 9.6 | 9.6 | 29.0 | 29.0 | 14.7 | 27.0 |
| Total Split (s) | 25.0 | 25.0 | 25.0 | 33.0 | 33.0 | 32.0 | 65.0 |
| Total Split (%) | 27.8% | 27.8% | 27.8% | 36.7% | 36.7% | 35.6% | 72.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | | 4.6 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 17.4 | 0.0 | 17.4 | 35.2 | 35.2 | 22.1 | 62.0 |
| Actuated g/C Ratio | 0.19 | 0.00 | 0.19 | 0.39 | 0.39 | 0.25 | 0.69 |
| v/c Ratio | 0.70 | no cap | 0.43 | 0.54 | 0.46 | 0.79 | 0.35 |
| Control Delay (s/veh) | 44.8 | | 8.1 | 24.8 | 4.7 | 35.6 | 12.7 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.8 | Error | 8.1 | 24.8 | 4.7 | 35.6 | 12.7 |
| LOS | D | F | A | C | A | D | B |
| Approach Delay (s/veh) | | Error | | 18.0 | | | 19.3 |
| Approach LOS | | F | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

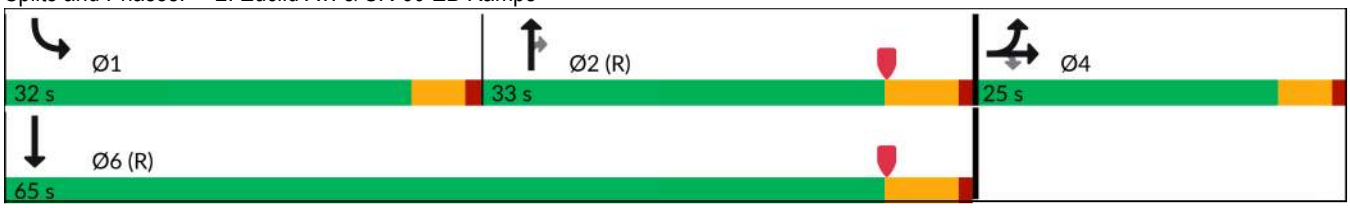

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 238 | 2 | 195 | 0 | 0 | 0 | 0 | 739 | 379 | 342 | 843 | 0 |
| Future Volume (veh/h) | 238 | 2 | 195 | 0 | 0 | 0 | 0 | 739 | 379 | 342 | 843 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | 0 |
| Adj Flow Rate, veh/h | 240 | 2 | 138 | | | | 0 | 746 | 268 | 345 | 852 | 0 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 286 | 0 | 254 | | | | 0 | 1625 | 723 | 378 | 2564 | 0 |
| Arrive On Green | 0.16 | 0.16 | 0.16 | | | | 0.00 | 0.46 | 0.46 | 0.42 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1781 | 0 | 1582 | | | | 0 | 3647 | 1580 | 1781 | 3647 | 0 |
| Grp Volume(v), veh/h | 240 | 0 | 138 | | | | 0 | 746 | 268 | 345 | 852 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1582 | | | | 0 | 1777 | 1580 | 1781 | 1777 | 0 |
| Q Serve(g_s), s | 11.8 | 0.0 | 7.2 | | | | 0.0 | 13.0 | 10.0 | 16.4 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 11.8 | 0.0 | 7.2 | | | | 0.0 | 13.0 | 10.0 | 16.4 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 286 | 0 | 254 | | | | 0 | 1625 | 723 | 378 | 2564 | 0 |
| V/C Ratio(X) | 0.84 | 0.00 | 0.54 | | | | 0.00 | 0.46 | 0.37 | 0.91 | 0.33 | 0.00 |
| Avail Cap(c_a), veh/h | 404 | 0 | 359 | | | | 0 | 1625 | 723 | 540 | 2564 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.84 | 0.84 | 0.71 | 0.71 | 0.00 |
| Uniform Delay (d), s/veh | 36.6 | 0.0 | 34.7 | | | | 0.0 | 16.8 | 16.0 | 25.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 10.4 | 0.0 | 1.8 | | | | 0.0 | 0.8 | 1.2 | 11.9 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.8 | 0.0 | 2.9 | | | | 0.0 | 4.9 | 3.5 | 6.0 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 47.1 | 0.0 | 36.5 | | | | 0.0 | 17.6 | 17.2 | 37.0 | 0.2 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | B | D | A | |
| Approach Vol, veh/h | | 378 | | | | | | 1014 | | | 1197 | |
| Approach Delay, s/veh | | 43.2 | | | | | | 17.5 | | | 10.8 | |
| Approach LOS | | D | | | | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.8 | 47.2 | | 19.1 | | 70.9 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 4.6 | | 6.0 |
| Max Green Setting (Gmax), s | 27.3 | 27.0 | | 20.4 | | 59.0 |
| Max Q Clear Time (g_c+I1), s | 18.4 | 15.0 | | 13.8 | | 2.0 |
| Green Ext Time (p_c), s | 0.7 | 6.5 | | 0.7 | | 9.9 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 18.2 |
| HCM 7th LOS | | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 97 | 348 | 48 | 227 | 93 | 819 | 209 | 739 |
| Future Volume (vph) | 97 | 348 | 48 | 227 | 93 | 819 | 209 | 739 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 49.0 | 49.0 | 36.0 | 85.0 |
| Total Split (%) | 29.2% | 29.2% | 29.2% | 29.2% | 40.8% | 40.8% | 30.0% | 70.8% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 16.2 | 16.2 | 16.2 | 16.2 | 21.1 | 21.1 | 9.4 | 35.3 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.25 | 0.25 | 0.33 | 0.33 | 0.15 | 0.55 |
| v/c Ratio | 0.40 | 0.57 | 0.26 | 0.41 | 0.51 | 0.54 | 0.43 | 0.31 |
| Control Delay (s/veh) | 27.6 | 22.6 | 25.8 | 17.5 | 29.5 | 18.9 | 30.7 | 7.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.6 | 22.6 | 25.8 | 17.5 | 29.5 | 18.9 | 30.7 | 7.8 |
| LOS | C | C | C | B | C | B | C | A |
| Approach Delay (s/veh) | | 23.4 | | 18.5 | | 19.9 | | 12.3 |
| Approach LOS | | C | | B | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 63.8 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.57 | |
| Intersection Signal Delay (s/veh): 17.7 | Intersection LOS: B |
| Intersection Capacity Utilization 67.0% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

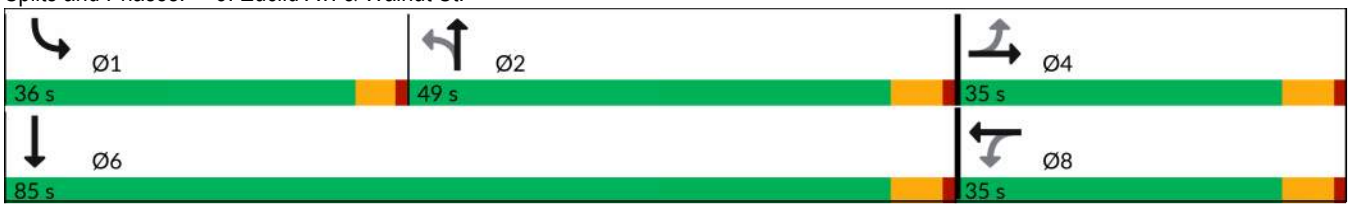

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 97 | 348 | 133 | 48 | 227 | 126 | 93 | 819 | 46 | 209 | 739 | 101 |
| Future Volume (veh/h) | 97 | 348 | 133 | 48 | 227 | 126 | 93 | 819 | 46 | 209 | 739 | 101 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 101 | 362 | 133 | 50 | 236 | 101 | 97 | 853 | 27 | 218 | 770 | 75 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 334 | 687 | 248 | 271 | 655 | 270 | 345 | 1603 | 51 | 351 | 2396 | 232 |
| Arrive On Green | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.32 | 0.32 | 0.32 | 0.10 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1038 | 2553 | 924 | 901 | 2434 | 1005 | 651 | 5082 | 161 | 3456 | 4733 | 458 |
| Grp Volume(v), veh/h | 101 | 250 | 245 | 50 | 170 | 167 | 97 | 571 | 309 | 218 | 553 | 292 |
| Grp Sat Flow(s),veh/h/ln | 1038 | 1777 | 1700 | 901 | 1777 | 1662 | 651 | 1702 | 1838 | 1728 | 1702 | 1787 |
| Q Serve(g_s), s | 4.5 | 6.2 | 6.3 | 2.6 | 4.0 | 4.2 | 6.2 | 7.1 | 7.1 | 3.1 | 4.9 | 5.0 |
| Cycle Q Clear(g_c), s | 8.7 | 6.2 | 6.3 | 8.9 | 4.0 | 4.2 | 6.2 | 7.1 | 7.1 | 3.1 | 4.9 | 5.0 |
| Prop In Lane | 1.00 | | 0.54 | 1.00 | | 0.60 | 1.00 | | 0.09 | 1.00 | | 0.26 |
| Lane Grp Cap(c), veh/h | 334 | 478 | 457 | 271 | 478 | 447 | 345 | 1074 | 580 | 351 | 1723 | 904 |
| V/C Ratio(X) | 0.30 | 0.52 | 0.54 | 0.18 | 0.36 | 0.37 | 0.28 | 0.53 | 0.53 | 0.62 | 0.32 | 0.32 |
| Avail Cap(c_a), veh/h | 642 | 1006 | 962 | 539 | 1006 | 941 | 685 | 2850 | 1539 | 2103 | 5226 | 2743 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 18.9 | 16.0 | 16.1 | 19.9 | 15.2 | 15.3 | 14.2 | 14.5 | 14.5 | 22.2 | 7.5 | 7.5 |
| Incr Delay (d2), s/veh | 0.5 | 0.9 | 1.0 | 0.3 | 0.4 | 0.5 | 0.4 | 0.4 | 0.8 | 0.7 | 0.1 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 2.1 | 2.1 | 0.5 | 1.4 | 1.3 | 0.8 | 2.2 | 2.4 | 1.1 | 1.2 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 19.4 | 16.9 | 17.1 | 20.2 | 15.7 | 15.8 | 14.6 | 14.9 | 15.3 | 22.9 | 7.6 | 7.7 |
| LnGrp LOS | B | B | B | C | B | B | B | B | B | C | A | A |
| Approach Vol, veh/h | | 596 | | | 387 | | | 977 | | | 1063 | |
| Approach Delay, s/veh | | 17.4 | | | 16.3 | | | 15.0 | | | 10.8 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.8 | 22.1 | | 19.7 | | 31.9 | | 19.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.4 | 43.2 | | 29.2 | | 79.2 | | 29.2 |
| Max Q Clear Time (g_c+I1), s | 5.1 | 9.1 | | 10.7 | | 7.0 | | 10.9 |
| Green Ext Time (p_c), s | 0.4 | 7.0 | | 3.0 | | 5.9 | | 1.9 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 14.2 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 125 | 398 | 151 | 380 | 61 | 737 | 168 | 93 | 671 | 144 |
| Future Volume (vph) | 125 | 398 | 151 | 380 | 61 | 737 | 168 | 93 | 671 | 144 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 20.8 | 43.0 | 21.0 | 43.2 | 15.2 | 40.0 | 40.0 | 16.0 | 40.8 | 40.8 |
| Total Split (%) | 17.3% | 35.8% | 17.5% | 36.0% | 12.7% | 33.3% | 33.3% | 13.3% | 34.0% | 34.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.8 | 30.8 | 14.4 | 31.3 | 10.4 | 28.5 | 28.5 | 10.8 | 28.9 | 28.9 |
| Actuated g/C Ratio | 0.13 | 0.30 | 0.14 | 0.30 | 0.10 | 0.27 | 0.27 | 0.10 | 0.28 | 0.28 |
| v/c Ratio | 0.54 | 0.82 | 0.62 | 0.41 | 0.35 | 0.77 | 0.32 | 0.51 | 0.69 | 0.27 |
| Control Delay (s/veh) | 55.8 | 49.4 | 58.5 | 30.7 | 56.1 | 42.1 | 12.2 | 60.3 | 38.9 | 6.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.8 | 49.4 | 58.5 | 30.7 | 56.1 | 42.1 | 12.2 | 60.3 | 38.9 | 6.7 |
| LOS | E | D | E | C | E | D | B | E | D | A |
| Approach Delay (s/veh) | | 50.8 | | 37.9 | | 37.7 | | | 36.0 | |
| Approach LOS | | D | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 103.8 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 39.7 | Intersection LOS: D |
| Intersection Capacity Utilization 81.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

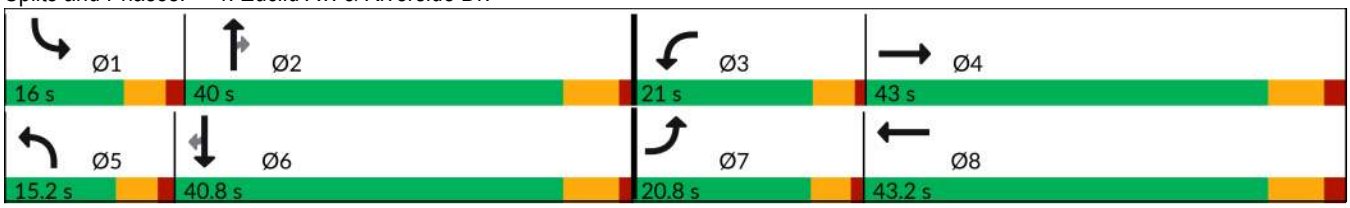

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 125 | 398 | 49 | 151 | 380 | 51 | 61 | 737 | 168 | 93 | 671 | 144 |
| Future Volume (veh/h) | 125 | 398 | 49 | 151 | 380 | 51 | 61 | 737 | 168 | 93 | 671 | 144 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 126 | 402 | 25 | 153 | 384 | 30 | 62 | 744 | 70 | 94 | 678 | 77 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 221 | 471 | 29 | 225 | 909 | 71 | 153 | 922 | 411 | 175 | 965 | 425 |
| Arrive On Green | 0.12 | 0.27 | 0.27 | 0.13 | 0.27 | 0.27 | 0.09 | 0.26 | 0.26 | 0.10 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1781 | 1742 | 108 | 1781 | 3335 | 259 | 1781 | 3554 | 1585 | 1781 | 3554 | 1565 |
| Grp Volume(v), veh/h | 126 | 0 | 427 | 153 | 204 | 210 | 62 | 744 | 70 | 94 | 678 | 77 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1851 | 1781 | 1777 | 1818 | 1781 | 1777 | 1585 | 1781 | 1777 | 1565 |
| Q Serve(g_s), s | 6.2 | 0.0 | 20.4 | 7.6 | 8.8 | 8.9 | 3.1 | 18.3 | 3.2 | 4.7 | 16.0 | 3.5 |
| Cycle Q Clear(g_c), s | 6.2 | 0.0 | 20.4 | 7.6 | 8.8 | 8.9 | 3.1 | 18.3 | 3.2 | 4.7 | 16.0 | 3.5 |
| Prop In Lane | 1.00 | | 0.06 | 1.00 | | 0.14 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 221 | 0 | 500 | 225 | 484 | 495 | 153 | 922 | 411 | 175 | 965 | 425 |
| V/C Ratio(X) | 0.57 | 0.00 | 0.85 | 0.68 | 0.42 | 0.42 | 0.41 | 0.81 | 0.17 | 0.54 | 0.70 | 0.18 |
| Avail Cap(c_a), veh/h | 308 | 0 | 716 | 312 | 691 | 707 | 191 | 1298 | 579 | 207 | 1329 | 585 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.4 | 0.0 | 32.2 | 38.8 | 27.8 | 27.8 | 40.3 | 32.3 | 26.7 | 40.0 | 30.5 | 26.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 8.3 | 1.3 | 0.8 | 0.8 | 1.7 | 2.6 | 0.2 | 2.6 | 1.0 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 0.0 | 9.6 | 3.3 | 3.6 | 3.7 | 1.3 | 7.5 | 1.2 | 2.1 | 6.5 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 39.3 | 0.0 | 40.5 | 40.2 | 28.6 | 28.7 | 42.0 | 34.9 | 26.9 | 42.5 | 31.5 | 26.2 |
| LnGrp LOS | D | | D | D | C | C | D | C | C | D | C | C |
| Approach Vol, veh/h | | 553 | | | 567 | | | 876 | | | 849 | |
| Approach Delay, s/veh | | 40.2 | | | 31.8 | | | 34.8 | | | 32.3 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.3 | 30.1 | 16.5 | 32.1 | 13.2 | 31.3 | 16.2 | 32.4 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.8 | 34.0 | 16.3 | 36.0 | 10.0 | 34.8 | 16.1 | 36.2 |
| Max Q Clear Time (g_c+I1), s | 6.7 | 20.3 | 9.6 | 22.4 | 5.1 | 18.0 | 8.2 | 10.9 |
| Green Ext Time (p_c), s | 0.1 | 3.9 | 0.1 | 2.8 | 0.0 | 4.1 | 0.1 | 3.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 34.5 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 82 | 312 | 35 | 78 | 149 | 44 | 838 | 232 | 29 | 767 | 73 |
| Future Volume (vph) | 82 | 312 | 35 | 78 | 149 | 44 | 838 | 232 | 29 | 767 | 73 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 55.0 | 55.0 | 55.0 | 15.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 41.7% | 45.8% | 45.8% | 45.8% | 12.5% | 58.3% | 58.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 21.2 | 21.2 | 21.2 | | 21.2 | 25.6 | 25.6 | 25.6 | 11.7 | 29.7 | 29.7 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | | 0.32 | 0.39 | 0.39 | 0.39 | 0.18 | 0.45 | 0.45 |
| v/c Ratio | 0.24 | 0.53 | 0.06 | | 0.61 | 0.17 | 0.62 | 0.35 | 0.10 | 0.49 | 0.10 |
| Control Delay (s/veh) | 22.0 | 24.1 | 1.1 | | 28.4 | 19.4 | 20.0 | 12.9 | 35.9 | 13.1 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 22.0 | 24.1 | 1.1 | | 28.4 | 19.4 | 20.0 | 12.9 | 35.9 | 13.1 | 3.2 |
| LOS | C | C | A | | C | B | B | B | D | B | A |
| Approach Delay (s/veh) | | 21.8 | | | 28.4 | | 18.5 | | | 13.1 | |
| Approach LOS | | C | | | C | | B | | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 65.3 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.62 | |
| Intersection Signal Delay (s/veh): 18.2 | Intersection LOS: B |
| Intersection Capacity Utilization 80.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 82 | 312 | 35 | 78 | 149 | 21 | 44 | 838 | 232 | 29 | 767 | 73 |
| Future Volume (veh/h) | 82 | 312 | 35 | 78 | 149 | 21 | 44 | 838 | 232 | 29 | 767 | 73 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 84 | 318 | 19 | 80 | 152 | 19 | 45 | 855 | 161 | 30 | 783 | 46 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 373 | 522 | 443 | 145 | 233 | 24 | 363 | 1276 | 569 | 118 | 1798 | 802 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.36 | 0.36 | 0.36 | 0.07 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1214 | 1870 | 1585 | 222 | 835 | 87 | 661 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 84 | 318 | 19 | 251 | 0 | 0 | 45 | 855 | 161 | 30 | 783 | 46 |
| Grp Sat Flow(s),veh/h/ln | 1214 | 1870 | 1585 | 1144 | 0 | 0 | 661 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 0.0 | 8.4 | 0.5 | 4.3 | 0.0 | 0.0 | 2.7 | 11.6 | 4.1 | 0.9 | 8.0 | 0.8 |
| Cycle Q Clear(g_c), s | 4.8 | 8.4 | 0.5 | 12.8 | 0.0 | 0.0 | 2.7 | 11.6 | 4.1 | 0.9 | 8.0 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 0.32 | | 0.08 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 373 | 522 | 443 | 402 | 0 | 0 | 363 | 1276 | 569 | 118 | 1798 | 802 |
| V/C Ratio(X) | 0.23 | 0.61 | 0.04 | 0.62 | 0.00 | 0.00 | 0.12 | 0.67 | 0.28 | 0.25 | 0.44 | 0.06 |
| Avail Cap(c_a), veh/h | 971 | 1444 | 1224 | 1131 | 0 | 0 | 686 | 3011 | 1343 | 324 | 3943 | 1759 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 16.6 | 17.9 | 15.0 | 19.1 | 0.0 | 0.0 | 12.6 | 15.5 | 13.1 | 25.4 | 9.0 | 7.2 |
| Incr Delay (d2), s/veh | 0.3 | 1.2 | 0.0 | 1.6 | 0.0 | 0.0 | 0.2 | 0.6 | 0.3 | 0.4 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 3.3 | 0.2 | 2.9 | 0.0 | 0.0 | 0.3 | 3.6 | 1.1 | 0.3 | 2.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 16.9 | 19.1 | 15.1 | 20.7 | 0.0 | 0.0 | 12.8 | 16.1 | 13.3 | 25.8 | 9.1 | 7.2 |
| LnGrp LOS | B | B | B | C | | | B | B | B | C | A | A |
| Approach Vol, veh/h | | 421 | | | 251 | | | 1061 | | | 859 | |
| Approach Delay, s/veh | | 18.5 | | | 20.7 | | | 15.5 | | | 9.6 | |
| Approach LOS | | B | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.4 | 27.1 | | 21.8 | | 35.4 | | 21.8 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 48.5 | | 44.2 | | 63.5 | | 44.2 |
| Max Q Clear Time (g_c+I1), s | 2.9 | 13.6 | | 10.4 | | 10.0 | | 14.8 |
| Green Ext Time (p_c), s | 0.0 | 6.9 | | 2.2 | | 5.5 | | 1.5 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 14.5 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 199 | 280 | 103 | 33 | 63 | 69 | 927 | 52 | 32 | 751 | 91 |
| Future Volume (vph) | 199 | 280 | 103 | 33 | 63 | 69 | 927 | 52 | 32 | 751 | 91 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 19.0 | 51.3 | 51.3 | 14.7 | 47.0 | 14.7 | 39.3 | 39.3 | 14.7 | 39.3 | 39.3 |
| Total Split (%) | 15.8% | 42.8% | 42.8% | 12.3% | 39.2% | 12.3% | 32.8% | 32.8% | 12.3% | 32.8% | 32.8% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.5 | 24.8 | 24.8 | 11.0 | 17.8 | 11.0 | 33.4 | 33.4 | 11.0 | 30.1 | 30.1 |
| Actuated g/C Ratio | 0.18 | 0.28 | 0.28 | 0.12 | 0.20 | 0.12 | 0.38 | 0.38 | 0.12 | 0.34 | 0.34 |
| v/c Ratio | 0.66 | 0.56 | 0.20 | 0.15 | 0.23 | 0.33 | 0.72 | 0.08 | 0.15 | 0.65 | 0.15 |
| Control Delay (s/veh) | 52.5 | 33.9 | 5.4 | 46.2 | 29.1 | 48.8 | 31.8 | 0.2 | 46.1 | 31.6 | 3.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.5 | 33.9 | 5.4 | 46.2 | 29.1 | 48.8 | 31.8 | 0.2 | 46.1 | 31.6 | 3.7 |
| LOS | D | C | A | D | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 35.2 | | | 33.9 | | 31.3 | | | 29.2 | |
| Approach LOS | | D | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 88.1 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.72 | |
| Intersection Signal Delay (s/veh): 31.6 | Intersection LOS: C |
| Intersection Capacity Utilization 76.1% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

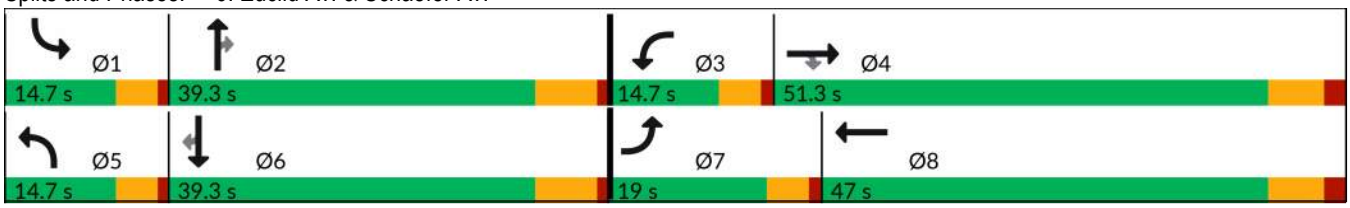

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 199 | 280 | 103 | 33 | 63 | 20 | 69 | 927 | 52 | 32 | 751 | 91 |
| Future Volume (veh/h) | 199 | 280 | 103 | 33 | 63 | 20 | 69 | 927 | 52 | 32 | 751 | 91 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 207 | 292 | 48 | 34 | 66 | 13 | 72 | 966 | 40 | 33 | 782 | 64 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 250 | 366 | 310 | 123 | 189 | 37 | 191 | 1223 | 545 | 120 | 1082 | 483 |
| Arrive On Green | 0.14 | 0.20 | 0.20 | 0.07 | 0.12 | 0.12 | 0.11 | 0.34 | 0.34 | 0.07 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1781 | 1870 | 1585 | 1781 | 1518 | 299 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 207 | 292 | 48 | 34 | 0 | 79 | 72 | 966 | 40 | 33 | 782 | 64 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 1585 | 1781 | 0 | 1817 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 8.0 | 10.5 | 1.8 | 1.3 | 0.0 | 2.8 | 2.7 | 17.3 | 1.2 | 1.2 | 13.9 | 2.1 |
| Cycle Q Clear(g_c), s | 8.0 | 10.5 | 1.8 | 1.3 | 0.0 | 2.8 | 2.7 | 17.3 | 1.2 | 1.2 | 13.9 | 2.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 250 | 366 | 310 | 123 | 0 | 226 | 191 | 1223 | 545 | 120 | 1082 | 483 |
| V/C Ratio(X) | 0.83 | 0.80 | 0.15 | 0.28 | 0.00 | 0.35 | 0.38 | 0.79 | 0.07 | 0.27 | 0.72 | 0.13 |
| Avail Cap(c_a), veh/h | 360 | 1171 | 993 | 252 | 0 | 1027 | 252 | 1648 | 735 | 252 | 1648 | 735 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.6 | 27.1 | 23.6 | 31.3 | 0.0 | 28.4 | 29.4 | 20.9 | 15.6 | 31.3 | 21.9 | 17.8 |
| Incr Delay (d2), s/veh | 6.9 | 3.0 | 0.2 | 0.5 | 0.0 | 0.7 | 0.5 | 1.9 | 0.1 | 0.5 | 0.9 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.6 | 4.5 | 0.6 | 0.5 | 0.0 | 1.2 | 1.0 | 6.2 | 0.4 | 0.5 | 5.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.5 | 30.1 | 23.8 | 31.7 | 0.0 | 29.0 | 29.9 | 22.8 | 15.7 | 31.8 | 22.9 | 18.0 |
| LnGrp LOS | D | C | C | C | | C | C | C | B | C | C | B |
| Approach Vol, veh/h | | 547 | | | 113 | | | 1078 | | | 879 | |
| Approach Delay, s/veh | | 32.0 | | | 29.8 | | | 23.0 | | | 22.8 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.5 | 30.8 | 9.6 | 20.9 | 12.3 | 28.0 | 14.6 | 15.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 32.8 | 10.0 | 44.3 | 10.0 | 32.8 | 14.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 19.3 | 3.3 | 12.5 | 4.7 | 15.9 | 10.0 | 4.8 |
| Green Ext Time (p_c), s | 0.0 | 5.0 | 0.0 | 1.4 | 0.0 | 4.5 | 0.1 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.1 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 117 | 352 | 126 | 34 | 187 | 130 | 937 | 109 | 71 | 729 | 119 |
| Future Volume (vph) | 117 | 352 | 126 | 34 | 187 | 130 | 937 | 109 | 71 | 729 | 119 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | 47.0 | 47.0 | 15.0 | 56.0 | 56.0 | 17.0 | 58.0 | 58.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | 39.2% | 39.2% | 12.5% | 46.7% | 46.7% | 14.2% | 48.3% | 48.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 24.7 | 24.7 | 24.7 | 24.7 | 24.7 | 10.7 | 36.5 | 36.5 | 11.0 | 32.4 | 32.4 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.12 | 0.42 | 0.42 | 0.13 | 0.37 | 0.37 |
| v/c Ratio | 0.47 | 0.73 | 0.25 | 0.22 | 0.50 | 0.34 | 0.69 | 0.17 | 0.35 | 0.60 | 0.20 |
| Control Delay (s/veh) | 34.1 | 38.3 | 6.1 | 30.0 | 29.7 | 43.9 | 25.9 | 8.6 | 46.9 | 24.3 | 4.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.1 | 38.3 | 6.1 | 30.0 | 29.7 | 43.9 | 25.9 | 8.6 | 46.9 | 24.3 | 4.5 |
| LOS | C | D | A | C | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 30.6 | | | 29.7 | | 26.3 | | | 23.5 | |
| Approach LOS | | C | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.3 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.73 | |
| Intersection Signal Delay (s/veh): 26.6 | Intersection LOS: C |
| Intersection Capacity Utilization 82.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

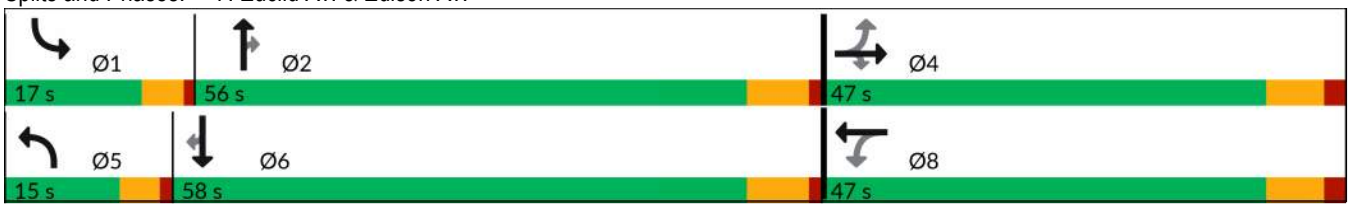

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 117 | 352 | 126 | 34 | 187 | 51 | 130 | 937 | 109 | 71 | 729 | 119 |
| Future Volume (veh/h) | 117 | 352 | 126 | 34 | 187 | 51 | 130 | 937 | 109 | 71 | 729 | 119 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 127 | 383 | 79 | 37 | 203 | 46 | 141 | 1018 | 90 | 77 | 792 | 89 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 285 | 530 | 449 | 186 | 418 | 95 | 427 | 1325 | 591 | 187 | 1259 | 553 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.12 | 0.37 | 0.37 | 0.10 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1131 | 1870 | 1583 | 930 | 1476 | 334 | 3456 | 3554 | 1585 | 1781 | 3554 | 1561 |
| Grp Volume(v), veh/h | 127 | 383 | 79 | 37 | 0 | 249 | 141 | 1018 | 90 | 77 | 792 | 89 |
| Grp Sat Flow(s),veh/h/ln | 1131 | 1870 | 1583 | 930 | 0 | 1810 | 1728 | 1777 | 1585 | 1781 | 1777 | 1561 |
| Q Serve(g_s), s | 8.1 | 14.2 | 2.9 | 2.9 | 0.0 | 8.8 | 2.9 | 19.4 | 2.9 | 3.1 | 14.3 | 3.0 |
| Cycle Q Clear(g_c), s | 16.9 | 14.2 | 2.9 | 17.1 | 0.0 | 8.8 | 2.9 | 19.4 | 2.9 | 3.1 | 14.3 | 3.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.18 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 285 | 530 | 449 | 186 | 0 | 513 | 427 | 1325 | 591 | 187 | 1259 | 553 |
| V/C Ratio(X) | 0.45 | 0.72 | 0.18 | 0.20 | 0.00 | 0.49 | 0.33 | 0.77 | 0.15 | 0.41 | 0.63 | 0.16 |
| Avail Cap(c_a), veh/h | 548 | 966 | 818 | 402 | 0 | 935 | 462 | 2283 | 1018 | 284 | 2375 | 1044 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.9 | 24.9 | 20.8 | 32.6 | 0.0 | 22.9 | 30.9 | 21.2 | 16.1 | 32.3 | 20.7 | 17.0 |
| Incr Delay (d2), s/veh | 1.1 | 1.9 | 0.2 | 0.5 | 0.0 | 0.7 | 0.2 | 1.0 | 0.1 | 0.5 | 0.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 5.9 | 1.0 | 0.6 | 0.0 | 3.5 | 1.1 | 6.9 | 0.9 | 1.2 | 5.1 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 31.0 | 26.7 | 21.0 | 33.1 | 0.0 | 23.6 | 31.0 | 22.2 | 16.2 | 32.8 | 21.2 | 17.2 |
| LnGrp LOS | C | C | C | C | | C | C | C | B | C | C | B |
| Approach Vol, veh/h | | 589 | | | 286 | | | 1249 | | | 958 | |
| Approach Delay, s/veh | | 26.9 | | | 24.9 | | | 22.8 | | | 21.8 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.8 | 35.2 | | 29.0 | 14.2 | 33.8 | | 29.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 12.3 | 49.5 | | 39.8 | 10.3 | 51.5 | | 39.8 |
| Max Q Clear Time (g_c+I1), s | 5.1 | 21.4 | | 18.9 | 4.9 | 16.3 | | 19.1 |
| Green Ext Time (p_c), s | 0.0 | 7.3 | | 2.8 | 0.1 | 5.6 | | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 23.4 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 317 | 208 | 57 | 115 | 98 | 866 | 72 | 74 | 715 | 61 |
| Future Volume (vph) | 74 | 317 | 208 | 57 | 115 | 98 | 866 | 72 | 74 | 715 | 61 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 21.7 | 21.7 | 21.7 | 21.7 | 21.7 | 12.2 | 26.5 | 26.5 | 11.7 | 26.0 | 26.0 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.16 | 0.35 | 0.35 | 0.16 | 0.35 | 0.35 |
| v/c Ratio | 0.23 | 0.62 | 0.36 | 0.26 | 0.38 | 0.36 | 0.73 | 0.12 | 0.28 | 0.61 | 0.11 |
| Control Delay (s/veh) | 25.0 | 30.7 | 5.4 | 26.6 | 22.2 | 39.1 | 26.8 | 5.4 | 39.0 | 24.9 | 4.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.0 | 30.7 | 5.4 | 26.6 | 22.2 | 39.1 | 26.8 | 5.4 | 39.0 | 24.9 | 4.2 |
| LOS | C | C | A | C | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 21.2 | | | 23.2 | | 26.5 | | | 24.6 | |
| Approach LOS | | C | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 74.9 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.73 | |
| Intersection Signal Delay (s/veh): 24.4 | Intersection LOS: C |
| Intersection Capacity Utilization 78.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

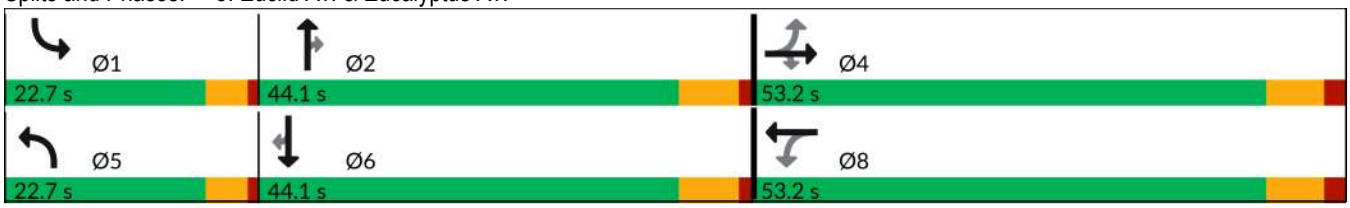

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 74 | 317 | 208 | 57 | 115 | 78 | 98 | 866 | 72 | 74 | 715 | 61 |
| Future Volume (veh/h) | 74 | 317 | 208 | 57 | 115 | 78 | 98 | 866 | 72 | 74 | 715 | 61 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 78 | 334 | 117 | 60 | 121 | 69 | 103 | 912 | 52 | 78 | 753 | 31 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 317 | 494 | 418 | 206 | 295 | 168 | 229 | 1219 | 544 | 205 | 1172 | 523 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.13 | 0.34 | 0.34 | 0.12 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1193 | 1870 | 1585 | 940 | 1118 | 638 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 |
| Grp Volume(v), veh/h | 78 | 334 | 117 | 60 | 0 | 190 | 103 | 912 | 52 | 78 | 753 | 31 |
| Grp Sat Flow(s),veh/h/ln | 1193 | 1870 | 1585 | 940 | 0 | 1756 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 |
| Q Serve(g_s), s | 3.8 | 10.6 | 3.9 | 4.0 | 0.0 | 5.9 | 3.5 | 15.0 | 1.5 | 2.7 | 11.9 | 0.9 |
| Cycle Q Clear(g_c), s | 9.7 | 10.6 | 3.9 | 14.6 | 0.0 | 5.9 | 3.5 | 15.0 | 1.5 | 2.7 | 11.9 | 0.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.36 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 317 | 494 | 418 | 206 | 0 | 463 | 229 | 1219 | 544 | 205 | 1172 | 523 |
| V/C Ratio(X) | 0.25 | 0.68 | 0.28 | 0.29 | 0.00 | 0.41 | 0.45 | 0.75 | 0.10 | 0.38 | 0.64 | 0.06 |
| Avail Cap(c_a), veh/h | 831 | 1299 | 1101 | 611 | 0 | 1220 | 484 | 2018 | 900 | 484 | 2018 | 900 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.1 | 21.8 | 19.4 | 28.4 | 0.0 | 20.1 | 26.7 | 19.2 | 14.8 | 27.1 | 18.9 | 15.2 |
| Incr Delay (d2), s/veh | 0.3 | 1.2 | 0.3 | 0.6 | 0.0 | 0.4 | 1.0 | 0.9 | 0.1 | 0.9 | 0.6 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 4.2 | 1.3 | 0.8 | 0.0 | 2.1 | 1.4 | 5.1 | 0.4 | 1.0 | 4.1 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 24.4 | 23.0 | 19.6 | 29.0 | 0.0 | 20.5 | 27.7 | 20.2 | 14.8 | 28.0 | 19.5 | 15.2 |
| LnGrp LOS | C | C | B | C | | C | C | C | B | C | B | B |
| Approach Vol, veh/h | | 529 | | | 250 | | | 1067 | | | 862 | |
| Approach Delay, s/veh | | 22.5 | | | 22.6 | | | 20.6 | | | 20.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.3 | 29.2 | | 24.7 | 13.2 | 28.3 | | 24.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 4.7 | 17.0 | | 12.6 | 5.5 | 13.9 | | 16.6 |
| Green Ext Time (p_c), s | 0.1 | 5.7 | | 1.9 | 0.1 | 4.7 | | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.0 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 9 | 22 | 12 | 60 | 1 | 1070 | 58 | 187 |
| Future Volume (vph) | 9 | 22 | 12 | 60 | 1 | 1070 | 58 | 187 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.7 | 22.1 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 18.4% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 18.1 | | 18.1 | 14.6 | 35.3 | 14.8 | 44.3 |
| Actuated g/C Ratio | | 0.27 | | 0.27 | 0.22 | 0.53 | 0.22 | 0.67 |
| v/c Ratio | | 0.12 | | 0.16 | 0.00 | 0.59 | 0.15 | 0.53 |
| Control Delay (s/veh) | | 17.5 | | 26.7 | 38.0 | 20.1 | 35.7 | 4.3 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 17.5 | | 26.7 | 38.0 | 20.1 | 35.7 | 4.3 |
| LOS | | B | | C | D | C | D | A |
| Approach Delay (s/veh) | | 17.5 | | 26.7 | | 20.1 | | 5.8 |
| Approach LOS | | B | | C | | C | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 66.4 | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.59 | |
| Intersection Signal Delay (s/veh): 13.0 | Intersection LOS: B |
| Intersection Capacity Utilization 67.9% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

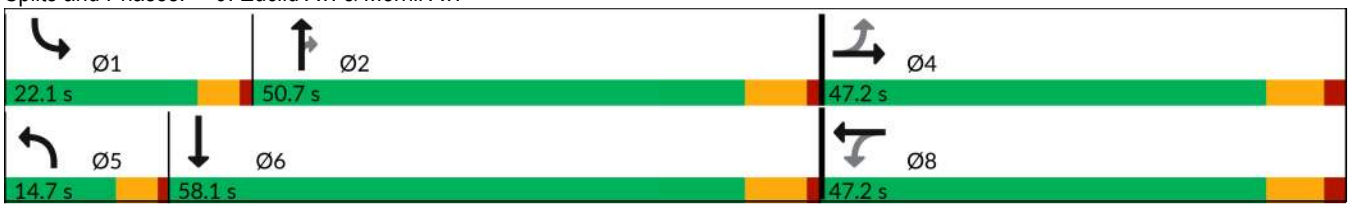

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 22 | 22 | 12 | 60 | 0 | 1 | 1070 | 0 | 58 | 187 | 978 |
| Future Volume (veh/h) | 9 | 22 | 22 | 12 | 60 | 0 | 1 | 1070 | 0 | 58 | 187 | 978 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 9 | 23 | 16 | 12 | 62 | -8 | 1 | 1115 | -4 | 60 | 195 | 1018 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 71 | 80 | 47 | 136 | 561 | 0 | 5 | 2063 | 920 | 168 | 1194 | 1039 |
| Arrive On Green | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.00 | 0.00 | 0.58 | 0.00 | 0.09 | 0.67 | 0.67 |
| Sat Flow, veh/h | 178 | 955 | 567 | 201 | 1858 | -223 | 1781 | 3554 | 1585 | 1781 | 1777 | 1546 |
| Grp Volume(v), veh/h | 48 | 0 | 0 | 0 | 0 | 0 | 1 | 1115 | -4 | 60 | 195 | 1018 |
| Grp Sat Flow(s),veh/h/ln | 1700 | 0 | 0 | 0 | 0 | 0 | 1781 | 1777 | 1585 | 1781 | 1777 | 1546 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 14.6 | 0.0 | 2.4 | 3.1 | 48.2 |
| Cycle Q Clear(g_c), s | 2.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 14.6 | 0.0 | 2.4 | 3.1 | 48.2 |
| Prop In Lane | 0.19 | | 0.33 | 0.18 | | -0.12 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 198 | 0 | 0 | 0 | 0 | 0 | 5 | 2063 | 920 | 168 | 1194 | 1039 |
| V/C Ratio(X) | 0.24 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.54 | 0.00 | 0.36 | 0.16 | 0.98 |
| Avail Cap(c_a), veh/h | 927 | 0 | 0 | 0 | 0 | 0 | 234 | 2063 | 920 | 407 | 1203 | 1046 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37.9 | 9.8 | 0.0 | 32.4 | 4.6 | 12.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 7.4 | 0.3 | 0.0 | 0.5 | 0.1 | 22.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.0 | 0.0 | 1.0 | 0.7 | 15.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 33.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 45.4 | 10.1 | 0.0 | 32.8 | 4.7 | 34.9 |
| LnGrp LOS | C | | | | | | D | B | | C | A | C |
| Approach Vol, veh/h | | 48 | | | 0 | | | 1112 | | | 1273 | |
| Approach Delay, s/veh | | 33.1 | | | 0.0 | | | 10.1 | | | 30.2 | |
| Approach LOS | | C | | | | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.9 | 50.8 | | 13.6 | 4.9 | 57.8 | | 13.6 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.4 | 44.2 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 4.4 | 16.6 | | 4.0 | 2.0 | 50.2 | | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 7.8 | | 0.2 | 0.0 | 1.0 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 21.1 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 242 | 625 | 57 | 38 | 431 | 193 | 92 | 521 | 36 | 439 | 402 | 150 |
| Future Volume (vph) | 242 | 625 | 57 | 38 | 431 | 193 | 92 | 521 | 36 | 439 | 402 | 150 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 37.4 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 31.2% | 12.3% | 12.3% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.4 | 27.4 | 27.4 | 10.4 | 23.4 | 23.4 | 10.4 | 19.4 | 36.6 | 10.4 | 23.5 | 40.5 |
| Actuated g/C Ratio | 0.12 | 0.31 | 0.31 | 0.12 | 0.27 | 0.27 | 0.12 | 0.22 | 0.42 | 0.12 | 0.27 | 0.46 |
| v/c Ratio | 0.63 | 0.60 | 0.11 | 0.19 | 0.48 | 0.35 | 0.46 | 0.70 | 0.05 | 1.14 | 0.45 | 0.19 |
| Control Delay (s/veh) | 48.1 | 29.1 | 0.4 | 44.3 | 28.1 | 5.4 | 49.9 | 37.6 | 0.1 | 125.4 | 31.5 | 4.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.1 | 29.1 | 0.4 | 44.3 | 28.1 | 5.4 | 49.9 | 37.6 | 0.1 | 125.4 | 31.5 | 4.1 |
| LOS | D | C | A | D | C | A | D | D | A | F | C | A |
| Approach Delay (s/veh) | | 32.3 | | | 22.4 | | | 37.3 | | | 68.9 | |
| Approach LOS | | C | | | C | | | D | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.7 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.14 | |
| Intersection Signal Delay (s/veh): 42.5 | Intersection LOS: D |
| Intersection Capacity Utilization 71.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

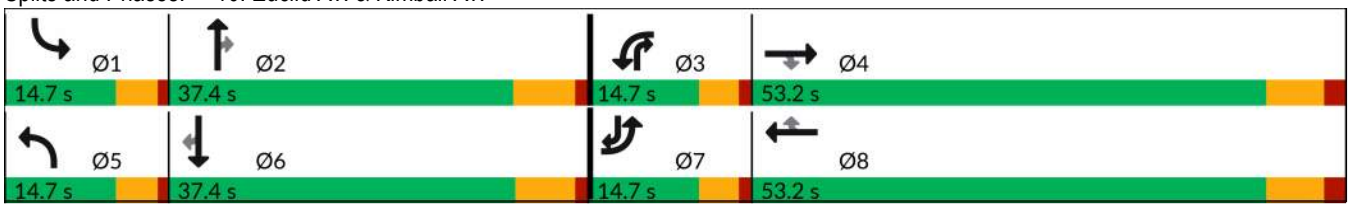

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 242 | 625 | 57 | 38 | 431 | 193 | 92 | 521 | 36 | 439 | 402 | 150 |
| Future Volume (veh/h) | 242 | 625 | 57 | 38 | 431 | 193 | 92 | 521 | 36 | 439 | 402 | 150 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 255 | 658 | 28 | 40 | 454 | 100 | 97 | 548 | 18 | 462 | 423 | 79 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 473 | 911 | 401 | 136 | 696 | 310 | 210 | 754 | 457 | 475 | 823 | 584 |
| Arrive On Green | 0.14 | 0.26 | 0.26 | 0.08 | 0.20 | 0.20 | 0.12 | 0.21 | 0.21 | 0.14 | 0.23 | 0.23 |
| Sat Flow, veh/h | 3456 | 3554 | 1565 | 1781 | 3554 | 1585 | 1781 | 3554 | 1585 | 3456 | 3554 | 1585 |
| Grp Volume(v), veh/h | 255 | 658 | 28 | 40 | 454 | 100 | 97 | 548 | 18 | 462 | 423 | 79 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1777 | 1565 | 1781 | 1777 | 1585 | 1781 | 1777 | 1585 | 1728 | 1777 | 1585 |
| Q Serve(g_s), s | 5.0 | 12.3 | 1.0 | 1.5 | 8.6 | 3.9 | 3.7 | 10.4 | 0.6 | 9.7 | 7.5 | 2.4 |
| Cycle Q Clear(g_c), s | 5.0 | 12.3 | 1.0 | 1.5 | 8.6 | 3.9 | 3.7 | 10.4 | 0.6 | 9.7 | 7.5 | 2.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 473 | 911 | 401 | 136 | 696 | 310 | 210 | 754 | 457 | 475 | 823 | 584 |
| V/C Ratio(X) | 0.54 | 0.72 | 0.07 | 0.29 | 0.65 | 0.32 | 0.46 | 0.73 | 0.04 | 0.97 | 0.51 | 0.14 |
| Avail Cap(c_a), veh/h | 475 | 2248 | 990 | 245 | 2248 | 1003 | 245 | 1510 | 794 | 475 | 1515 | 893 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.3 | 24.7 | 20.5 | 31.7 | 27.0 | 25.1 | 29.9 | 26.7 | 18.6 | 31.2 | 24.4 | 15.3 |
| Incr Delay (d2), s/veh | 0.7 | 1.1 | 0.1 | 1.2 | 0.4 | 0.2 | 0.6 | 1.4 | 0.0 | 33.9 | 0.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 4.7 | 0.3 | 0.7 | 3.3 | 1.3 | 1.4 | 4.0 | 0.2 | 5.8 | 2.8 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.9 | 25.8 | 20.5 | 32.9 | 27.3 | 25.3 | 30.5 | 28.0 | 18.7 | 65.1 | 24.9 | 15.4 |
| LnGrp LOS | C | C | C | C | C | C | C | C | B | E | C | B |
| Approach Vol, veh/h | | 941 | | | 594 | | | 663 | | | 964 | |
| Approach Delay, s/veh | | 26.7 | | | 27.4 | | | 28.1 | | | 43.4 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 21.9 | 10.2 | 25.8 | 13.3 | 23.3 | 14.6 | 21.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 10.0 | 30.9 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 11.7 | 12.4 | 3.5 | 14.3 | 5.7 | 9.5 | 7.0 | 10.6 |
| Green Ext Time (p_c), s | 0.0 | 3.0 | 0.0 | 4.4 | 0.0 | 2.5 | 0.1 | 1.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 32.2 |
| HCM 7th LOS | C |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 7 | 289 | 581 | 180 | 26 | 537 | 958 | 71 | 422 |
| Future Volume (vph) | 7 | 289 | 581 | 180 | 26 | 537 | 958 | 71 | 422 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 28.0 | 42.0 | 54.3 | 14.7 | 35.3 | 42.0 | 14.7 | 35.3 |
| Total Split (%) | 13.1% | 23.3% | 35.0% | 45.3% | 12.3% | 29.4% | 35.0% | 12.3% | 29.4% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.1 | 21.2 | 36.6 | 60.7 | 10.1 | 22.1 | 65.3 | 10.1 | 25.0 |
| Actuated g/C Ratio | 0.09 | 0.19 | 0.33 | 0.55 | 0.09 | 0.20 | 0.59 | 0.09 | 0.23 |
| v/c Ratio | 0.05 | 1.00 | 0.55 | 0.26 | 0.17 | 0.82 | 1.02 | 0.47 | 0.57 |
| Control Delay (s/veh) | 50.6 | 94.9 | 34.0 | 16.3 | 52.7 | 52.7 | 55.0 | 61.1 | 41.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.6 | 94.9 | 34.0 | 16.3 | 52.7 | 52.7 | 55.0 | 61.1 | 41.8 |
| LOS | D | F | C | B | D | D | D | E | D |
| Approach Delay (s/veh) | | 94.0 | | 28.9 | | 54.1 | | | 44.5 |
| Approach LOS | | F | | C | | D | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 110.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.02 | |
| Intersection Signal Delay (s/veh): 50.3 | Intersection LOS: D |
| Intersection Capacity Utilization 99.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

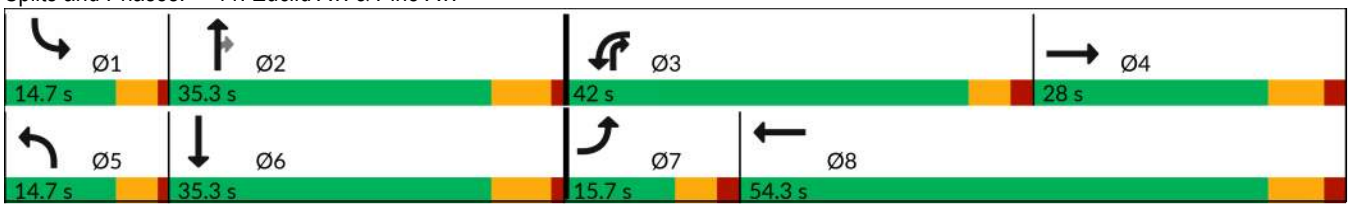

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 7 | 289 | 41 | 581 | 180 | 58 | 26 | 537 | 958 | 71 | 422 | 2 |
| Future Volume (veh/h) | 7 | 289 | 41 | 581 | 180 | 58 | 26 | 537 | 958 | 71 | 422 | 2 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 8 | 311 | 0 | 625 | 194 | 53 | 28 | 577 | 955 | 76 | 454 | 2 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 35 | 350 | | 711 | 527 | 144 | 96 | 1010 | 777 | 155 | 1152 | 5 |
| Arrive On Green | 0.02 | 0.19 | 0.00 | 0.21 | 0.37 | 0.37 | 0.05 | 0.28 | 0.28 | 0.09 | 0.32 | 0.32 |
| Sat Flow, veh/h | 1781 | 1870 | 0 | 3456 | 1414 | 386 | 1781 | 3554 | 1585 | 1781 | 3628 | 16 |
| Grp Volume(v), veh/h | 8 | 311 | 0 | 625 | 0 | 247 | 28 | 577 | 955 | 76 | 222 | 234 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1870 | 0 | 1728 | 0 | 1801 | 1781 | 1777 | 1585 | 1781 | 1777 | 1867 |
| Q Serve(g_s), s | 0.4 | 16.4 | 0.0 | 17.8 | 0.0 | 10.1 | 1.5 | 14.1 | 28.8 | 4.1 | 9.9 | 9.9 |
| Cycle Q Clear(g_c), s | 0.4 | 16.4 | 0.0 | 17.8 | 0.0 | 10.1 | 1.5 | 14.1 | 28.8 | 4.1 | 9.9 | 9.9 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.21 | 1.00 | | 1.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 35 | 350 | | 711 | 0 | 671 | 96 | 1010 | 777 | 155 | 564 | 593 |
| V/C Ratio(X) | 0.23 | 0.89 | | 0.88 | 0.00 | 0.37 | 0.29 | 0.57 | 1.23 | 0.49 | 0.39 | 0.39 |
| Avail Cap(c_a), veh/h | 176 | 388 | | 1238 | 0 | 841 | 176 | 1010 | 777 | 176 | 564 | 593 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.9 | 40.2 | 0.0 | 39.0 | 0.0 | 23.1 | 46.1 | 31.0 | 25.8 | 44.1 | 27.0 | 27.0 |
| Incr Delay (d2), s/veh | 1.2 | 21.0 | 0.0 | 1.6 | 0.0 | 0.5 | 0.6 | 0.5 | 114.6 | 0.9 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 9.2 | 0.0 | 7.2 | 0.0 | 4.1 | 0.7 | 5.6 | 40.8 | 1.8 | 3.9 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 50.1 | 61.2 | 0.0 | 40.6 | 0.0 | 23.6 | 46.7 | 31.5 | 140.4 | 45.0 | 27.1 | 27.1 |
| LnGrp LOS | D | E | | D | | C | D | C | F | D | C | C |
| Approach Vol, veh/h | | 319 | | | 872 | | | 1560 | | | 532 | |
| Approach Delay, s/veh | | 60.9 | | | 35.8 | | | 98.4 | | | 29.7 | |
| Approach LOS | | E | | | D | | | F | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.5 | 35.3 | 26.5 | 26.0 | 10.2 | 38.7 | 7.7 | 44.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 28.8 | 36.3 | 21.0 | 10.0 | 28.8 | 10.0 | 47.3 |
| Max Q Clear Time (g_c+I1), s | 6.1 | 30.8 | 19.8 | 18.4 | 3.5 | 11.9 | 2.4 | 12.1 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.1 | 0.5 | 0.0 | 1.2 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 67.0 |
| HCM 7th LOS | E |

**Notes**

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 762 | 431 | 726 | 101 | 770 |
| Future Volume (vph) | 762 | 431 | 726 | 101 | 770 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 24.5 | 9.6 | 9.6 |
| Total Split (s) | 35.2 | 31.7 | 66.9 | 33.1 | 33.1 |
| Total Split (%) | 35.2% | 31.7% | 66.9% | 33.1% | 33.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 28.7 | 27.0 | 60.4 | 28.5 | 28.5 |
| Actuated g/C Ratio | 0.29 | 0.27 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 0.97 | 1.00 | 0.38 | 0.11 | 1.02 |
| Control Delay (s/veh) | 57.6 | 80.1 | 10.8 | 26.9 | 52.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 57.6 | 80.1 | 10.8 | 26.9 | 52.0 |
| LOS | E | F | B | C | D |
| Approach Delay (s/veh) | 57.6 | | 36.6 | 49.1 | |
| Approach LOS | E | | D | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.02 | |
| Intersection Signal Delay (s/veh): 46.7 | Intersection LOS: D |
| Intersection Capacity Utilization 81.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

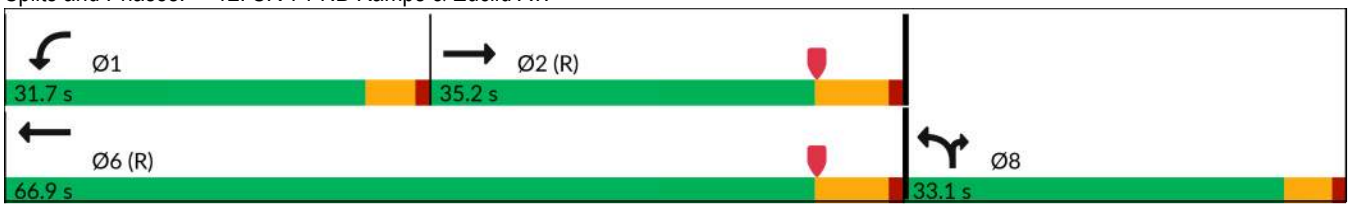

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 762 | 121 | 431 | 726 | 101 | 770 |
| Future Volume (veh/h) | 762 | 121 | 431 | 726 | 101 | 770 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 847 | 0 | 479 | 807 | 112 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1846 | | 481 | 2973 | 181 | |
| Arrive On Green | 1.00 | 0.00 | 0.27 | 0.84 | 0.05 | 0.00 |
| Sat Flow, veh/h | 3741 | 0 | 1781 | 3647 | 3456 | 1585 |
| Grp Volume(v), veh/h | 847 | 0 | 479 | 807 | 112 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1777 | 0 | 1781 | 1777 | 1728 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 26.9 | 4.8 | 3.2 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 26.9 | 4.8 | 3.2 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1846 | | 481 | 2973 | 181 | |
| V/C Ratio(X) | 0.46 | | 1.00 | 0.27 | 0.62 | |
| Avail Cap(c_a), veh/h | 1846 | | 481 | 2973 | 985 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.83 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.4 | 1.7 | 46.4 | 0.0 |
| Incr Delay (d2), s/veh | 0.7 | 0.0 | 39.9 | 0.2 | 3.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 16.0 | 0.4 | 1.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.7 | 0.0 | 76.3 | 2.0 | 49.8 | 0.0 |
| LnGrp LOS | A | | E | A | D | |
| Approach Vol, veh/h | 847 | | | 1286 | 112 | |
| Approach Delay, s/veh | 0.7 | | | 29.7 | 49.8 | |
| Approach LOS | A | | | C | D | |

| Timer - Assigned Phs | 1 | 2 | | | 6 | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.7 | 58.4 | | | 90.1 | 9.9 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 27.0 | 28.7 | | | 60.4 | 28.5 |
| Max Q Clear Time (g_c+I1), s | 28.9 | 2.0 | | | 6.8 | 5.2 |
| Green Ext Time (p_c), s | 0.0 | 4.3 | | | 4.3 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.7 |
| HCM 7th LOS | B |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 355 | 71 | 200 | 29 | 131 | 605 | 74 | 62 |
| Future Volume (vph) | 355 | 71 | 200 | 29 | 131 | 605 | 74 | 62 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 23.5 | 23.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 26.5 | 13.0 | 39.5 | 23.5 | 23.5 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 26.5% | 13.0% | 39.5% | 23.5% | 23.5% | 37.0% | 37.0% | 37.0% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 35.8 | 8.9 | 46.8 | 8.5 | 8.5 | 27.1 | 27.1 | 27.1 |
| Actuated g/C Ratio | 0.36 | 0.09 | 0.47 | 0.09 | 0.09 | 0.27 | 0.27 | 0.27 |
| v/c Ratio | 0.33 | 0.47 | 0.13 | 0.20 | 0.50 | 0.78 | 0.77 | 0.12 |
| Control Delay (s/veh) | 26.9 | 58.5 | 12.4 | 45.4 | 12.8 | 44.8 | 44.1 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.9 | 58.5 | 12.4 | 45.4 | 12.8 | 44.8 | 44.1 | 0.5 |
| LOS | C | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 26.9 | | 24.5 | | | | 40.8 | |
| Approach LOS | C | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 32.2 | Intersection LOS: C |
| Intersection Capacity Utilization 57.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

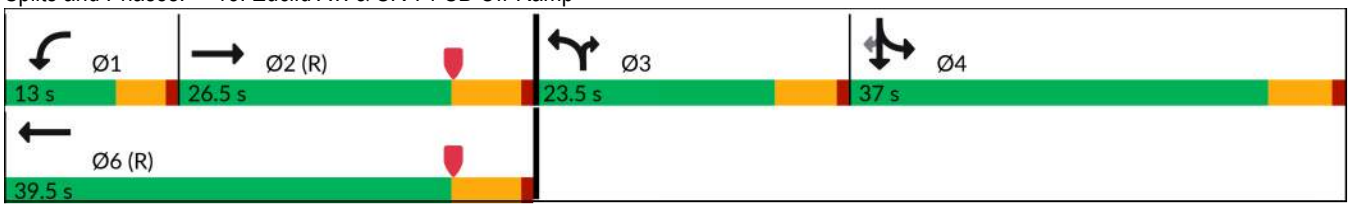

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 355 | 47 | 71 | 200 | 0 | 29 | 0 | 131 | 605 | 74 | 62 |
| Future Volume (veh/h) | 0 | 355 | 47 | 71 | 200 | 0 | 29 | 0 | 131 | 605 | 74 | 62 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 0 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 370 | 16 | 74 | 208 | 0 | 30 | 0 | 43 | 685 | 0 | 36 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1870 | 81 | 124 | 2330 | | 0 | 0 | 0 | 800 | 0 | 354 |
| Arrive On Green | 0.00 | 0.54 | 0.54 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.22 |
| Sat Flow, veh/h | 0 | 3564 | 150 | 1781 | 3647 | 0 | | 0 | | 3563 | 0 | 1579 |
| Grp Volume(v), veh/h | 0 | 189 | 197 | 74 | 208 | 0 | | 0.0 | | 685 | 0 | 36 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1777 | 1843 | 1781 | 1777 | 0 | | | | 1781 | 0 | 1579 |
| Q Serve(g_s), s | 0.0 | 5.5 | 5.5 | 3.9 | 0.0 | 0.0 | | | | 18.5 | 0.0 | 1.8 |
| Cycle Q Clear(g_c), s | 0.0 | 5.5 | 5.5 | 3.9 | 0.0 | 0.0 | | | | 18.5 | 0.0 | 1.8 |
| Prop In Lane | 0.00 | | 0.08 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 957 | 993 | 124 | 2330 | | | | | 800 | 0 | 354 |
| V/C Ratio(X) | 0.00 | 0.20 | 0.20 | 0.60 | 0.09 | | | | | 0.86 | 0.00 | 0.10 |
| Avail Cap(c_a), veh/h | 0 | 957 | 993 | 148 | 2330 | | | | | 1112 | 0 | 493 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.95 | 0.95 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 11.9 | 11.9 | 41.7 | 0.0 | 0.0 | | | | 37.2 | 0.0 | 30.8 |
| Incr Delay (d2), s/veh | 0.0 | 0.5 | 0.4 | 1.6 | 0.1 | 0.0 | | | | 4.5 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.1 | 2.2 | 1.6 | 0.0 | 0.0 | | | | 8.4 | 0.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 12.4 | 12.4 | 43.3 | 0.1 | 0.0 | | | | 41.7 | 0.0 | 30.9 |
| LnGrp LOS | | B | B | D | A | | | | | D | | C |
| Approach Vol, veh/h | | 386 | | | 282 | | | | | | 721 | |
| Approach Delay, s/veh | | 12.4 | | | 11.4 | | | | | | 41.2 | |
| Approach LOS | | B | | | B | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.7 | 60.1 | | 28.2 | | 71.8 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 8.3 | 20.3 | | 31.2 | | 33.3 |
| Max Q Clear Time (g_c+I1), s | 5.9 | 7.5 | | 20.5 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | | 1.7 | | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.1 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 35 | 596 | 28 | 43 | 535 | 12 | 23 | 29 | 73 | 5 | 6 | 24 |
| Future Vol, veh/h | 35 | 596 | 28 | 43 | 535 | 12 | 23 | 29 | 73 | 5 | 6 | 24 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 36 | 614 | 29 | 44 | 552 | 12 | 24 | 30 | 75 | 5 | 6 | 25 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 567 | 0 | 0 | 643 | 0 | 0 | 1069 | 1357 | 629 | 1351 | 1365 | 285 |
| Stage 1 | - | - | - | - | - | - | 701 | 701 | - | 649 | 649 | - |
| Stage 2 | - | - | - | - | - | - | 368 | 656 | - | 702 | 715 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 1003 | - | - | 939 | - | - | 187 | 148 | 481 | 118 | 147 | 713 |
| Stage 1 | - | - | - | - | - | - | 428 | 440 | - | 425 | 464 | - |
| Stage 2 | - | - | - | - | - | - | 625 | 461 | - | 428 | 433 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1000 | - | - | 939 | - | - | 163 | 136 | 481 | 83 | 134 | 711 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 341 | 304 | - | 230 | 297 | - |
| Stage 1 | - | - | - | - | - | - | 413 | 424 | - | 404 | 441 | - |
| Stage 2 | - | - | - | - | - | - | 567 | 438 | - | 324 | 418 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.46 | 0.66 | 18.34 | 13.45 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 397 | 1000 | - | - | 939 | - | - | 462 |
| HCM Lane V/C Ratio | 0.324 | 0.036 | - | - | 0.047 | - | - | 0.078 |
| HCM Control Delay (s/veh) | 18.3 | 8.7 | - | - | 9 | - | - | 13.4 |
| HCM Lane LOS | C | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 1.4 | 0.1 | - | - | 0.1 | - | - | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.3 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 47 | 290 | 27 | 2 | 80 | 9 | 12 | 119 | 13 | 8 | 85 | 24 |
| Future Vol, veh/h | 47 | 290 | 27 | 2 | 80 | 9 | 12 | 119 | 13 | 8 | 85 | 24 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 51 | 312 | 29 | 2 | 86 | 10 | 13 | 128 | 14 | 9 | 91 | 26 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 12.9 | 9.1 | 10 | 9.6 |
| HCM LOS | B | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 8% | 13% | 2% | 7% |
| Vol Thru, % | 83% | 80% | 88% | 73% |
| Vol Right, % | 9% | 7% | 10% | 21% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 144 | 364 | 91 | 117 |
| LT Vol | 12 | 47 | 2 | 8 |
| Through Vol | 119 | 290 | 80 | 85 |
| RT Vol | 13 | 27 | 9 | 24 |
| Lane Flow Rate | 155 | 391 | 98 | 126 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.23 | 0.518 | 0.141 | 0.186 |
| Departure Headway (Hd) | 5.359 | 4.76 | 5.196 | 5.328 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 674 | 748 | 693 | 676 |
| Service Time | 3.359 | 2.85 | 3.211 | 3.339 |
| HCM Lane V/C Ratio | 0.23 | 0.523 | 0.141 | 0.186 |
| HCM Control Delay, s/veh | 10 | 12.9 | 9.1 | 9.6 |
| HCM Lane LOS | A | B | A | A |
| HCM 95th-tile Q | 0.9 | 3 | 0.5 | 0.7 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 19.6 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 52 | 436 | 44 | 2 | 228 | 9 | 24 | 75 | 3 | 19 | 77 | 20 |
| Future Vol, veh/h | 52 | 436 | 44 | 2 | 228 | 9 | 24 | 75 | 3 | 19 | 77 | 20 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 57 | 474 | 48 | 2 | 248 | 10 | 26 | 82 | 3 | 21 | 84 | 22 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 26.5 | 12.2 | 11.1 | 11.1 |
| HCM LOS | D | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 24% | 10% | 1% | 16% |
| Vol Thru, % | 74% | 82% | 95% | 66% |
| Vol Right, % | 3% | 8% | 4% | 17% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 102 | 532 | 239 | 116 |
| LT Vol | 24 | 52 | 2 | 19 |
| Through Vol | 75 | 436 | 228 | 77 |
| RT Vol | 3 | 44 | 9 | 20 |
| Lane Flow Rate | 111 | 578 | 260 | 126 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.197 | 0.814 | 0.397 | 0.22 |
| Departure Headway (Hd) | 6.411 | 5.067 | 5.503 | 6.272 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 557 | 711 | 652 | 570 |
| Service Time | 4.483 | 3.111 | 3.56 | 4.342 |
| HCM Lane V/C Ratio | 0.199 | 0.813 | 0.399 | 0.221 |
| HCM Control Delay, s/veh | 11.1 | 26.5 | 12.2 | 11.1 |
| HCM Lane LOS | B | D | B | B |
| HCM 95th-tile Q | 0.7 | 8.6 | 1.9 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.1 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 14 | 137 | 16 | 0 | 55 | 3 | 10 | 24 | 3 | 3 | 13 | 8 |
| Future Vol, veh/h | 14 | 137 | 16 | 0 | 55 | 3 | 10 | 24 | 3 | 3 | 13 | 8 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 17 | 167 | 20 | 0 | 67 | 4 | 12 | 29 | 4 | 4 | 16 | 10 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 8.4 | 7.7 | 7.9 | 7.6 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 27% | 8% | 0% | 13% |
| Vol Thru, % | 65% | 82% | 95% | 54% |
| Vol Right, % | 8% | 10% | 5% | 33% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 37 | 167 | 58 | 24 |
| LT Vol | 10 | 14 | 0 | 3 |
| Through Vol | 24 | 137 | 55 | 13 |
| RT Vol | 3 | 16 | 3 | 8 |
| Lane Flow Rate | 45 | 204 | 71 | 29 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.057 | 0.231 | 0.082 | 0.036 |
| Departure Headway (Hd) | 4.575 | 4.076 | 4.188 | 4.414 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 787 | 872 | 841 | 816 |
| Service Time | 2.576 | 2.146 | 2.286 | 2.415 |
| HCM Lane V/C Ratio | 0.057 | 0.234 | 0.084 | 0.036 |
| HCM Control Delay, s/veh | 7.9 | 8.4 | 7.7 | 7.6 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.2 | 0.9 | 0.3 | 0.1 |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 224 | 206 | 625 | 921 | 753 |
| Future Volume (vph) | 3 | 224 | 206 | 625 | 921 | 753 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 24.8 | 24.8 | 22.0 | 65.2 | 43.2 | 43.2 |
| Total Split (%) | 27.6% | 27.6% | 24.4% | 72.4% | 48.0% | 48.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 14.0 | 14.0 | 14.2 | 64.4 | 44.5 | 44.5 |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.16 | 0.72 | 0.49 | 0.49 |
| v/c Ratio | 0.64 | 0.52 | 0.75 | 0.25 | 0.53 | 0.69 |
| Control Delay (s/veh) | 45.8 | 9.1 | 62.0 | 1.4 | 18.2 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.8 | 9.1 | 62.0 | 1.4 | 18.2 | 6.3 |
| LOS | D | A | E | A | B | A |
| Approach Delay (s/veh) | 25.1 | | | 16.4 | 12.8 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay (s/veh): 15.5 | Intersection LOS: B |
| Intersection Capacity Utilization 82.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

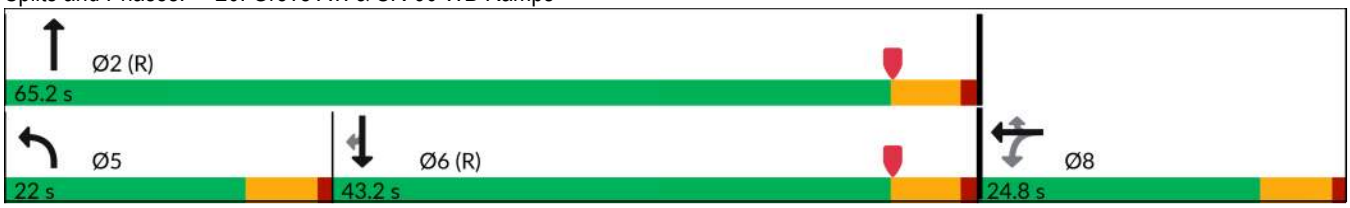

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 170 | 3 | 224 | 206 | 625 | 0 | 0 | 921 | 753 |
| Future Volume (veh/h) | 0 | 0 | 0 | 170 | 3 | 224 | 206 | 625 | 0 | 0 | 921 | 753 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1870 | 1870 | 1870 | 1870 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 172 | 3 | 90 | 208 | 631 | 0 | 0 | 930 | 578 |
| Peak Hour Factor | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 217 | 4 | 196 | 244 | 2656 | 0 | 0 | 1941 | 845 |
| Arrive On Green | | | | 0.12 | 0.12 | 0.12 | 0.14 | 0.75 | 0.00 | 0.00 | 0.55 | 0.55 |
| Sat Flow, veh/h | | | | 1752 | 31 | 1585 | 1781 | 3647 | 0 | 0 | 3647 | 1547 |
| Grp Volume(v), veh/h | | | | 175 | 0 | 90 | 208 | 631 | 0 | 0 | 930 | 578 |
| Grp Sat Flow(s),veh/h/ln | | | | 1783 | 0 | 1585 | 1781 | 1777 | 0 | 0 | 1777 | 1547 |
| Q Serve(g_s), s | | | | 8.6 | 0.0 | 4.7 | 10.3 | 4.9 | 0.0 | 0.0 | 14.5 | 24.4 |
| Cycle Q Clear(g_c), s | | | | 8.6 | 0.0 | 4.7 | 10.3 | 4.9 | 0.0 | 0.0 | 14.5 | 24.4 |
| Prop In Lane | | | | 0.98 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 221 | 0 | 196 | 244 | 2656 | 0 | 0 | 1941 | 845 |
| V/C Ratio(X) | | | | 0.79 | 0.00 | 0.46 | 0.85 | 0.24 | 0.00 | 0.00 | 0.48 | 0.68 |
| Avail Cap(c_a), veh/h | | | | 376 | 0 | 335 | 321 | 2656 | 0 | 0 | 1941 | 845 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.50 | 0.50 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 38.3 | 0.0 | 36.6 | 38.0 | 3.5 | 0.0 | 0.0 | 12.6 | 14.8 |
| Incr Delay (d2), s/veh | | | | 4.8 | 0.0 | 1.2 | 6.9 | 0.1 | 0.0 | 0.0 | 0.9 | 4.5 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 3.8 | 0.0 | 1.8 | 4.7 | 1.1 | 0.0 | 0.0 | 5.1 | 8.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 43.1 | 0.0 | 37.9 | 44.9 | 3.6 | 0.0 | 0.0 | 13.4 | 19.3 |
| LnGrp LOS | | | | D | | D | D | A | | | B | B |
| Approach Vol, veh/h | | | | | 265 | | | 839 | | | 1508 | |
| Approach Delay, s/veh | | | | | 41.3 | | | 13.8 | | | 15.7 | |
| Approach LOS | | | | | D | | | B | | | B | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 73.1 | 18.1 | 55.0 | 16.9 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | 5.8 |
| Max Green Setting (Gmax), s | 59.4 | 16.2 | 37.4 | 19.0 |
| Max Q Clear Time (g_c+I1), s | 6.9 | 12.3 | 26.4 | 10.6 |
| Green Ext Time (p_c), s | 3.5 | 0.1 | 5.1 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.7 |
| HCM 7th LOS | B |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 3 | 165 | 570 | 410 | 681 |
| Future Volume (vph) | 3 | 165 | 570 | 410 | 681 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 24.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 35.8% | 26.7% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 18.6 | 18.6 | 26.0 | 27.8 | 58.8 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.29 | 0.31 | 0.65 |
| v/c Ratio | 0.74 | 0.37 | 0.80 | 0.77 | 0.30 |
| Control Delay (s/veh) | 45.2 | 6.7 | 34.2 | 43.2 | 15.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.2 | 6.7 | 34.2 | 43.2 | 15.6 |
| LOS | D | A | C | D | B |
| Approach Delay (s/veh) | 30.4 | | 34.2 | | 26.0 |
| Approach LOS | C | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 85 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 29.6 | Intersection LOS: C |
| Intersection Capacity Utilization 82.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 261 | 3 | 165 | 0 | 0 | 0 | 0 | 570 | 220 | 410 | 681 | 0 |
| Future Volume (veh/h) | 261 | 3 | 165 | 0 | 0 | 0 | 0 | 570 | 220 | 410 | 681 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | 0 |
| Adj Flow Rate, veh/h | 269 | 3 | 84 | | | | 0 | 588 | 164 | 423 | 702 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 318 | 4 | 286 | | | | 0 | 1132 | 315 | 376 | 2415 | 0 |
| Arrive On Green | 0.18 | 0.18 | 0.18 | | | | 0.00 | 0.41 | 0.41 | 0.42 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1763 | 20 | 1582 | | | | 0 | 2836 | 763 | 1781 | 3647 | 0 |
| Grp Volume(v), veh/h | 272 | 0 | 84 | | | | 0 | 380 | 372 | 423 | 702 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1782 | 0 | 1582 | | | | 0 | 1777 | 1729 | 1781 | 1777 | 0 |
| Q Serve(g_s), s | 13.3 | 0.0 | 4.1 | | | | 0.0 | 14.4 | 14.5 | 19.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 13.3 | 0.0 | 4.1 | | | | 0.0 | 14.4 | 14.5 | 19.0 | 0.0 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 0.44 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 322 | 0 | 286 | | | | 0 | 734 | 714 | 376 | 2415 | 0 |
| V/C Ratio(X) | 0.85 | 0.00 | 0.29 | | | | 0.00 | 0.52 | 0.52 | 1.12 | 0.29 | 0.00 |
| Avail Cap(c_a), veh/h | 535 | 0 | 475 | | | | 0 | 734 | 714 | 376 | 2415 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.83 | 0.83 | 0.00 |
| Uniform Delay (d), s/veh | 35.7 | 0.0 | 31.9 | | | | 0.0 | 19.7 | 19.8 | 26.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.8 | 0.0 | 0.2 | | | | 0.0 | 2.6 | 2.7 | 81.0 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.7 | 0.0 | 1.5 | | | | 0.0 | 5.9 | 5.8 | 13.7 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 38.5 | 0.0 | 32.1 | | | | 0.0 | 22.3 | 22.5 | 107.0 | 0.3 | 0.0 |
| LnGrp LOS | D | | C | | | | | C | C | F | A | |
| Approach Vol, veh/h | | 356 | | | | | | 752 | | | 1125 | |
| Approach Delay, s/veh | | 37.0 | | | | | | 22.4 | | | 40.4 | |
| Approach LOS | | D | | | | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 43.0 | | 23.0 | | 67.0 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 19.0 | 26.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 16.5 | | 15.3 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 2.6 | | 0.8 | | 3.9 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 33.8 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 126 | 212 | 16 | 124 | 71 | 452 | 149 | 488 |
| Future Volume (vph) | 126 | 212 | 16 | 124 | 71 | 452 | 149 | 488 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.2 | 23.6 | 5.6 | 11.5 | 7.5 | 16.3 | 9.9 | 21.1 |
| Actuated g/C Ratio | 0.13 | 0.35 | 0.08 | 0.17 | 0.11 | 0.24 | 0.15 | 0.31 |
| v/c Ratio | 0.58 | 0.26 | 0.12 | 0.37 | 0.39 | 0.64 | 0.64 | 0.64 |
| Control Delay (s/veh) | 40.4 | 15.5 | 35.4 | 17.4 | 36.9 | 27.0 | 42.7 | 23.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.4 | 15.5 | 35.4 | 17.4 | 36.9 | 27.0 | 42.7 | 23.9 |
| LOS | D | B | D | B | D | C | D | C |
| Approach Delay (s/veh) | | 23.0 | | 18.6 | | 28.2 | | 27.4 |
| Approach LOS | | C | | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 68.2 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.64 | |
| Intersection Signal Delay (s/veh): 25.7 | Intersection LOS: C |
| Intersection Capacity Utilization 57.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

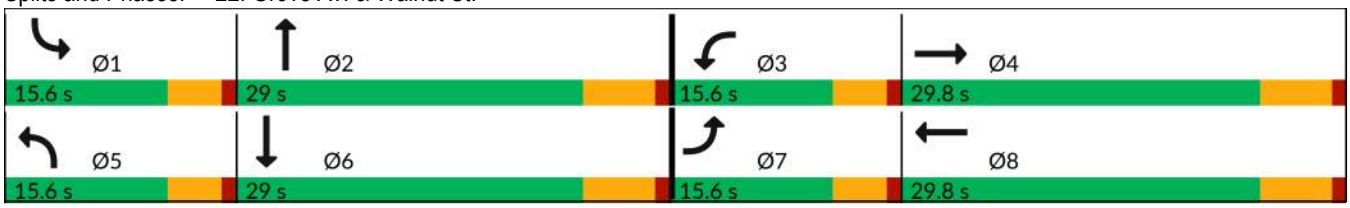

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 126 | 212 | 80 | 16 | 124 | 95 | 71 | 452 | 43 | 149 | 488 | 152 |
| Future Volume (veh/h) | 126 | 212 | 80 | 16 | 124 | 95 | 71 | 452 | 43 | 149 | 488 | 152 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 137 | 230 | 62 | 17 | 135 | 58 | 77 | 491 | 27 | 162 | 530 | 88 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 176 | 733 | 193 | 37 | 456 | 186 | 113 | 737 | 40 | 206 | 815 | 135 |
| Arrive On Green | 0.10 | 0.26 | 0.26 | 0.02 | 0.19 | 0.19 | 0.06 | 0.22 | 0.22 | 0.12 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1781 | 2777 | 731 | 1781 | 2448 | 1000 | 1781 | 3424 | 188 | 1781 | 3045 | 503 |
| Grp Volume(v), veh/h | 137 | 145 | 147 | 17 | 96 | 97 | 77 | 254 | 264 | 162 | 308 | 310 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 1777 | 1731 | 1781 | 1777 | 1671 | 1781 | 1777 | 1835 | 1781 | 1777 | 1771 |
| Q Serve(g_s), s | 4.1 | 3.5 | 3.7 | 0.5 | 2.5 | 2.7 | 2.3 | 7.1 | 7.1 | 4.8 | 8.3 | 8.4 |
| Cycle Q Clear(g_c), s | 4.1 | 3.5 | 3.7 | 0.5 | 2.5 | 2.7 | 2.3 | 7.1 | 7.1 | 4.8 | 8.3 | 8.4 |
| Prop In Lane | 1.00 | | 0.42 | 1.00 | | 0.60 | 1.00 | | 0.10 | 1.00 | | 0.28 |
| Lane Grp Cap(c), veh/h | 176 | 469 | 457 | 37 | 331 | 311 | 113 | 383 | 395 | 206 | 476 | 474 |
| V/C Ratio(X) | 0.78 | 0.31 | 0.32 | 0.46 | 0.29 | 0.31 | 0.68 | 0.66 | 0.67 | 0.79 | 0.65 | 0.65 |
| Avail Cap(c_a), veh/h | 362 | 787 | 767 | 362 | 787 | 740 | 362 | 761 | 786 | 362 | 761 | 759 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.8 | 16.0 | 16.0 | 26.2 | 19.0 | 19.0 | 24.8 | 19.5 | 19.5 | 23.3 | 17.6 | 17.6 |
| Incr Delay (d2), s/veh | 2.8 | 0.4 | 0.4 | 3.2 | 0.5 | 0.6 | 2.7 | 2.0 | 1.9 | 2.5 | 1.5 | 1.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 1.2 | 1.3 | 0.2 | 0.9 | 0.9 | 0.9 | 2.7 | 2.8 | 1.9 | 3.1 | 3.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.6 | 16.3 | 16.4 | 29.5 | 19.4 | 19.6 | 27.5 | 21.4 | 21.4 | 25.8 | 19.1 | 19.1 |
| LnGrp LOS | C | B | B | C | B | B | C | C | C | C | B | B |
| Approach Vol, veh/h | | 429 | | | 210 | | | 595 | | | 780 | |
| Approach Delay, s/veh | | 19.7 | | | 20.3 | | | 22.2 | | | 20.5 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.9 | 17.5 | 5.7 | 20.1 | 8.0 | 20.3 | 10.0 | 15.9 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 6.8 | 9.1 | 2.5 | 5.7 | 4.3 | 10.4 | 6.1 | 4.7 |
| Green Ext Time (p_c), s | 0.1 | 2.3 | 0.0 | 1.4 | 0.0 | 2.9 | 0.1 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.8 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 102 | 548 | 22 | 451 | 24 | 308 | 100 | 257 | 115 |
| Future Volume (vph) | 102 | 548 | 22 | 451 | 24 | 308 | 100 | 257 | 115 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.6 | 28.8 | 6.0 | 22.2 | 6.1 | 18.5 | 8.6 | 25.0 | 25.0 |
| Actuated g/C Ratio | 0.12 | 0.39 | 0.08 | 0.30 | 0.08 | 0.25 | 0.12 | 0.34 | 0.34 |
| v/c Ratio | 0.51 | 0.82 | 0.16 | 0.56 | 0.17 | 0.77 | 0.50 | 0.42 | 0.19 |
| Control Delay (s/veh) | 44.5 | 36.9 | 40.2 | 26.7 | 40.3 | 39.9 | 44.2 | 23.6 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.5 | 36.9 | 40.2 | 26.7 | 40.3 | 39.9 | 44.2 | 23.6 | 3.3 |
| LOS | D | D | D | C | D | D | D | C | A |
| Approach Delay (s/veh) | | 38.0 | | 27.2 | | 39.9 | | 23.0 | |
| Approach LOS | | D | | C | | D | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 74.2 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 31.9 | Intersection LOS: C |
| Intersection Capacity Utilization 76.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

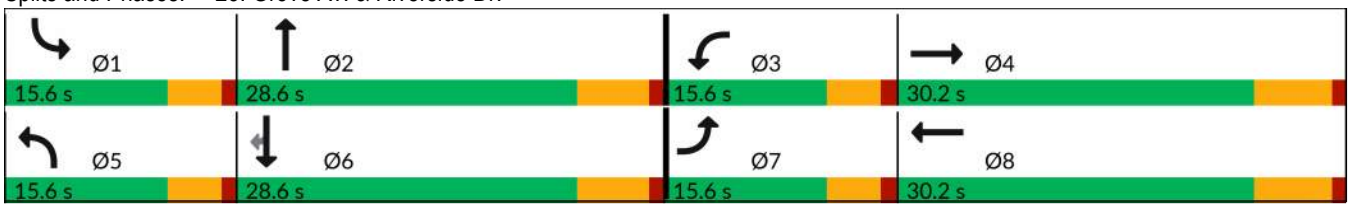

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 102 | 548 | 24 | 22 | 451 | 118 | 24 | 308 | 35 | 100 | 257 | 115 |
| Future Volume (veh/h) | 102 | 548 | 24 | 22 | 451 | 118 | 24 | 308 | 35 | 100 | 257 | 115 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 105 | 565 | 17 | 23 | 465 | 71 | 25 | 318 | 24 | 103 | 265 | 70 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 135 | 621 | 19 | 47 | 908 | 138 | 50 | 388 | 29 | 133 | 509 | 431 |
| Arrive On Green | 0.08 | 0.34 | 0.34 | 0.03 | 0.29 | 0.29 | 0.03 | 0.23 | 0.23 | 0.07 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1781 | 1806 | 54 | 1781 | 3085 | 468 | 1781 | 1717 | 130 | 1781 | 1870 | 1585 |
| Grp Volume(v), veh/h | 105 | 0 | 582 | 23 | 267 | 269 | 25 | 0 | 342 | 103 | 265 | 70 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1861 | 1781 | 1777 | 1777 | 1781 | 0 | 1847 | 1781 | 1870 | 1585 |
| Q Serve(g_s), s | 3.7 | 0.0 | 19.2 | 0.8 | 8.0 | 8.1 | 0.9 | 0.0 | 11.3 | 3.7 | 7.7 | 2.2 |
| Cycle Q Clear(g_c), s | 3.7 | 0.0 | 19.2 | 0.8 | 8.0 | 8.1 | 0.9 | 0.0 | 11.3 | 3.7 | 7.7 | 2.2 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 0.26 | 1.00 | | 0.07 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 135 | 0 | 640 | 47 | 523 | 523 | 50 | 0 | 417 | 133 | 509 | 431 |
| V/C Ratio(X) | 0.78 | 0.00 | 0.91 | 0.49 | 0.51 | 0.52 | 0.50 | 0.00 | 0.82 | 0.78 | 0.52 | 0.16 |
| Avail Cap(c_a), veh/h | 305 | 0 | 694 | 305 | 663 | 663 | 305 | 0 | 655 | 305 | 663 | 562 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.2 | 0.0 | 20.1 | 30.9 | 18.8 | 18.9 | 30.8 | 0.0 | 23.7 | 29.2 | 19.9 | 17.8 |
| Incr Delay (d2), s/veh | 3.6 | 0.0 | 15.3 | 3.0 | 0.8 | 0.8 | 2.9 | 0.0 | 4.7 | 3.6 | 0.8 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 9.4 | 0.4 | 2.9 | 2.9 | 0.4 | 0.0 | 4.9 | 1.6 | 3.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 32.8 | 0.0 | 35.4 | 33.9 | 19.6 | 19.7 | 33.7 | 0.0 | 28.4 | 32.9 | 20.7 | 18.0 |
| LnGrp LOS | C | | D | C | B | B | C | | C | C | C | B |
| Approach Vol, veh/h | | 687 | | | 559 | | | 367 | | | 438 | |
| Approach Delay, s/veh | | 35.0 | | | 20.2 | | | 28.7 | | | 23.1 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.4 | 20.3 | 6.3 | 28.3 | 6.4 | 23.3 | 9.5 | 25.1 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 13.3 | 2.8 | 21.2 | 2.9 | 9.7 | 5.7 | 10.1 |
| Green Ext Time (p_c), s | 0.0 | 1.2 | 0.0 | 0.9 | 0.0 | 1.3 | 0.0 | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.3 |
| HCM 7th LOS | C |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 18.1 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 50 | 261 | 24 | 9 | 117 | 34 | 22 | 294 | 17 | 37 | 251 | 16 |
| Future Vol, veh/h | 50 | 261 | 24 | 9 | 117 | 34 | 22 | 294 | 17 | 37 | 251 | 16 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 52 | 272 | 25 | 9 | 122 | 35 | 23 | 306 | 18 | 39 | 261 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 19.8 | 13.1 | 19.1 | 17.7 |
| HCM LOS | C | B | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 7% | 15% | 6% | 12% |
| Vol Thru, % | 88% | 78% | 73% | 83% |
| Vol Right, % | 5% | 7% | 21% | 5% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 333 | 335 | 160 | 304 |
| LT Vol | 22 | 50 | 9 | 37 |
| Through Vol | 294 | 261 | 117 | 251 |
| RT Vol | 17 | 24 | 34 | 16 |
| Lane Flow Rate | 347 | 349 | 167 | 317 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.614 | 0.626 | 0.317 | 0.567 |
| Departure Headway (Hd) | 6.372 | 6.46 | 6.856 | 6.448 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 565 | 558 | 522 | 557 |
| Service Time | 4.442 | 4.529 | 4.942 | 4.519 |
| HCM Lane V/C Ratio | 0.614 | 0.625 | 0.32 | 0.569 |
| HCM Control Delay, s/veh | 19.1 | 19.8 | 13.1 | 17.7 |
| HCM Lane LOS | C | C | B | C |
| HCM 95th-tile Q | 4.1 | 4.3 | 1.4 | 3.5 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 13.2 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 96 | 177 | 38 | 3 | 42 | 22 | 23 | 227 | 16 | 37 | 197 | 26 |
| Future Vol, veh/h | 96 | 177 | 38 | 3 | 42 | 22 | 23 | 227 | 16 | 37 | 197 | 26 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 102 | 188 | 40 | 3 | 45 | 23 | 24 | 241 | 17 | 39 | 210 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 14.5 | 9.8 | 12.9 | 12.7 |
| HCM LOS | B | A | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 9% | 31% | 4% | 14% |
| Vol Thru, % | 85% | 57% | 63% | 76% |
| Vol Right, % | 6% | 12% | 33% | 10% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 266 | 311 | 67 | 260 |
| LT Vol | 23 | 96 | 3 | 37 |
| Through Vol | 227 | 177 | 42 | 197 |
| RT Vol | 16 | 38 | 22 | 26 |
| Lane Flow Rate | 283 | 331 | 71 | 277 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.436 | 0.514 | 0.118 | 0.426 |
| Departure Headway (Hd) | 5.553 | 5.595 | 5.942 | 5.551 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 645 | 642 | 599 | 647 |
| Service Time | 3.609 | 3.648 | 4.017 | 3.608 |
| HCM Lane V/C Ratio | 0.439 | 0.516 | 0.119 | 0.428 |
| HCM Control Delay, s/veh | 12.9 | 14.5 | 9.8 | 12.7 |
| HCM Lane LOS | B | B | A | B |
| HCM 95th-tile Q | 2.2 | 2.9 | 0.4 | 2.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 28.4 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 37 | 404 | 17 | 4 | 197 | 34 | 25 | 154 | 4 | 52 | 222 | 17 |
| Future Vol, veh/h | 37 | 404 | 17 | 4 | 197 | 34 | 25 | 154 | 4 | 52 | 222 | 17 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 40 | 439 | 18 | 4 | 214 | 37 | 27 | 167 | 4 | 57 | 241 | 18 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 44 | 16.9 | 15.8 | 21.2 |
| HCM LOS | E | C | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 14% | 8% | 2% | 18% |
| Vol Thru, % | 84% | 88% | 84% | 76% |
| Vol Right, % | 2% | 4% | 14% | 6% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 183 | 458 | 235 | 291 |
| LT Vol | 25 | 37 | 4 | 52 |
| Through Vol | 154 | 404 | 197 | 222 |
| RT Vol | 4 | 17 | 34 | 17 |
| Lane Flow Rate | 199 | 498 | 255 | 316 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.413 | 0.905 | 0.498 | 0.622 |
| Departure Headway (Hd) | 7.478 | 6.542 | 7.016 | 7.082 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 479 | 558 | 511 | 509 |
| Service Time | 5.556 | 4.542 | 5.085 | 5.15 |
| HCM Lane V/C Ratio | 0.415 | 0.892 | 0.499 | 0.621 |
| HCM Control Delay, s/veh | 15.8 | 44 | 16.9 | 21.2 |
| HCM Lane LOS | C | E | C | C |
| HCM 95th-tile Q | 2 | 10.8 | 2.7 | 4.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.7 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 10 | 172 | 2 | 1 | 66 | 197 | 1 | 2 | 1 | 306 | 4 | 6 |
| Future Vol, veh/h | 10 | 172 | 2 | 1 | 66 | 197 | 1 | 2 | 1 | 306 | 4 | 6 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 198 | 2 | 1 | 76 | 226 | 1 | 2 | 1 | 352 | 5 | 7 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 11 | 11.3 | 8.9 | 14.9 |
| HCM LOS | B | B | A | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 25% | 5% | 0% | 97% |
| Vol Thru, % | 50% | 93% | 25% | 1% |
| Vol Right, % | 25% | 1% | 75% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 4 | 184 | 264 | 316 |
| LT Vol | 1 | 10 | 1 | 306 |
| Through Vol | 2 | 172 | 66 | 4 |
| RT Vol | 1 | 2 | 197 | 6 |
| Lane Flow Rate | 5 | 211 | 303 | 363 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.007 | 0.319 | 0.411 | 0.549 |
| Departure Headway (Hd) | 5.827 | 5.435 | 4.88 | 5.442 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 613 | 662 | 737 | 665 |
| Service Time | 3.874 | 3.47 | 2.913 | 3.468 |
| HCM Lane V/C Ratio | 0.008 | 0.319 | 0.411 | 0.546 |
| HCM Control Delay, s/veh | 8.9 | 11 | 11.3 | 14.9 |
| HCM Lane LOS | A | B | B | B |
| HCM 95th-tile Q | 0 | 1.4 | 2 | 3.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 31 | 594 | 58 | 66 | 537 | 28 | 41 | 26 | 110 | 8 | 7 | 13 |
| Future Vol, veh/h | 31 | 594 | 58 | 66 | 537 | 28 | 41 | 26 | 110 | 8 | 7 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 32 | 619 | 60 | 69 | 559 | 29 | 43 | 27 | 115 | 8 | 7 | 14 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 592 | 0 | 0 | 679 | 0 | 0 | 1134 | 1443 | 340 | 1102 | 1458 | 297 |
| Stage 1 | - | - | - | - | - | - | 714 | 714 | - | 714 | 714 | - |
| Stage 2 | - | - | - | - | - | - | 421 | 729 | - | 388 | 744 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 980 | - | - | 909 | - | - | 157 | 131 | 656 | 166 | 128 | 699 |
| Stage 1 | - | - | - | - | - | - | 389 | 433 | - | 388 | 433 | - |
| Stage 2 | - | - | - | - | - | - | 581 | 426 | - | 608 | 420 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 977 | - | - | 909 | - | - | 134 | 117 | 656 | 112 | 114 | 697 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 306 | 281 | - | 270 | 266 | - |
| Stage 1 | - | - | - | - | - | - | 376 | 419 | - | 358 | 399 | - |
| Stage 2 | - | - | - | - | - | - | 517 | 393 | - | 454 | 406 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.4 | 0.97 | 18.48 | 15.4 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 449 | 977 | - | - | 909 | - | - | 375 |
| HCM Lane V/C Ratio | 0.41 | 0.033 | - | - | 0.076 | - | - | 0.078 |
| HCM Control Delay (s/veh) | 18.5 | 8.8 | - | - | 9.3 | - | - | 15.4 |
| HCM Lane LOS | C | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 2 | 0.1 | - | - | 0.2 | - | - | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.4 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 108 | 11 | 111 | 5 | 12 | 15 | 25 | 118 | 5 | 0 | 111 | 30 |
| Future Vol, veh/h | 108 | 11 | 111 | 5 | 12 | 15 | 25 | 118 | 5 | 0 | 111 | 30 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 121 | 12 | 125 | 6 | 13 | 17 | 28 | 133 | 6 | 0 | 125 | 34 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.8 | 8.1 | 9.3 | 9 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 17% | 47% | 16% | 0% |
| Vol Thru, % | 80% | 5% | 38% | 79% |
| Vol Right, % | 3% | 48% | 47% | 21% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 148 | 230 | 32 | 141 |
| LT Vol | 25 | 108 | 5 | 0 |
| Through Vol | 118 | 11 | 12 | 111 |
| RT Vol | 5 | 111 | 15 | 30 |
| Lane Flow Rate | 166 | 258 | 36 | 158 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.223 | 0.327 | 0.048 | 0.207 |
| Departure Headway (Hd) | 4.83 | 4.555 | 4.778 | 4.704 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 740 | 786 | 744 | 759 |
| Service Time | 2.881 | 2.599 | 2.841 | 2.755 |
| HCM Lane V/C Ratio | 0.224 | 0.328 | 0.048 | 0.208 |
| HCM Control Delay, s/veh | 9.3 | 9.8 | 8.1 | 9 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.9 | 1.4 | 0.2 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 16.3 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 20 | 429 | 11 | 3 | 216 | 40 | 7 | 98 | 4 | 125 | 71 | 12 |
| Future Vol, veh/h | 20 | 429 | 11 | 3 | 216 | 40 | 7 | 98 | 4 | 125 | 71 | 12 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 21 | 442 | 11 | 3 | 223 | 41 | 7 | 101 | 4 | 129 | 73 | 12 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 21 | 12.8 | 11.2 | 13.1 |
| HCM LOS | C | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 6% | 4% | 1% | 60% |
| Vol Thru, % | 90% | 93% | 83% | 34% |
| Vol Right, % | 4% | 2% | 15% | 6% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 109 | 460 | 259 | 208 |
| LT Vol | 7 | 20 | 3 | 125 |
| Through Vol | 98 | 429 | 216 | 71 |
| RT Vol | 4 | 11 | 40 | 12 |
| Lane Flow Rate | 112 | 474 | 267 | 214 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.204 | 0.714 | 0.42 | 0.374 |
| Departure Headway (Hd) | 6.545 | 5.421 | 5.661 | 6.277 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 552 | 664 | 630 | 568 |
| Service Time | 4.545 | 3.495 | 3.75 | 4.367 |
| HCM Lane V/C Ratio | 0.203 | 0.714 | 0.424 | 0.377 |
| HCM Control Delay, s/veh | 11.2 | 21 | 12.8 | 13.1 |
| HCM Lane LOS | B | C | B | B |
| HCM 95th-tile Q | 0.8 | 6 | 2.1 | 1.7 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 6 | 341 | 229 | 95 | 84 | 8 |
| Future Vol, veh/h | 6 | 341 | 229 | 95 | 84 | 8 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 7 | 397 | 266 | 110 | 98 | 9 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 377 | 0 | - | 0 | 732 | 322 |
| Stage 1 | - | - | - | - | 322 | - |
| Stage 2 | - | - | - | - | 410 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1182 | - | - | - | 388 | 719 |
| Stage 1 | - | - | - | - | 735 | - |
| Stage 2 | - | - | - | - | 670 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1182 | - | - | - | 385 | 719 |
| Mov Cap-2 Maneuver | - | - | - | - | 494 | - |
| Stage 1 | - | - | - | - | 729 | - |
| Stage 2 | - | - | - | - | 670 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.14 | 0 | 13.97 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 31 | - | - | - | 508 |
| HCM Lane V/C Ratio | 0.006 | - | - | - | 0.211 |
| HCM Control Delay (s/veh) | 8.1 | 0 | - | - | 14 |
| HCM Lane LOS | A | A | - | - | B |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.8 |

| Lane Group | EBL | EBT | WBT | WBR | NBL | NBT | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 301 | 0 | 339 | 9 | 465 | 511 | 1075 |
| Future Volume (vph) | 301 | 0 | 339 | 9 | 465 | 511 | 1075 |
| Turn Type | D.Pm | | NA | Perm | Prot | NA | NA |
| Protected Phases | | | 4 | | 5 | 2 | 6 |
| Permitted Phases | 4 | | | 4 | | | |
| Detector Phase | 4 | | 4 | 4 | 5 | 2 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 |
| Total Split (s) | 26.0 | | 26.0 | 26.0 | 22.0 | 64.0 | 42.0 |
| Total Split (%) | 28.9% | | 28.9% | 28.9% | 24.4% | 71.1% | 46.7% |
| Yellow Time (s) | 4.8 | | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 |
| Lead/Lag | | | | | Lag | | Lead |
| Lead-Lag Optimize? | | | | | Yes | | Yes |
| Recall Mode | None | | None | None | None | C-Min | C-Min |
| Act Effct Green (s) | | 0.0 | 24.2 | 24.2 | 17.1 | 54.2 | 32.1 |
| Actuated g/C Ratio | | 0.00 | 0.27 | 0.27 | 0.19 | 0.60 | 0.36 |
| v/c Ratio | | no cap | 0.80 | 0.02 | 0.77 | 0.18 | 0.51 |
| Control Delay (s/veh) | | | 46.5 | 0.1 | 38.0 | 2.4 | 24.1 |
| Queue Delay | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | Error | 46.5 | 0.1 | 38.0 | 2.4 | 24.1 |
| LOS | | F | D | A | D | A | C |
| Approach Delay (s/veh) | | Error | 45.4 | | | 19.4 | 24.1 |
| Approach LOS | | F | D | | | B | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization 64.9% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

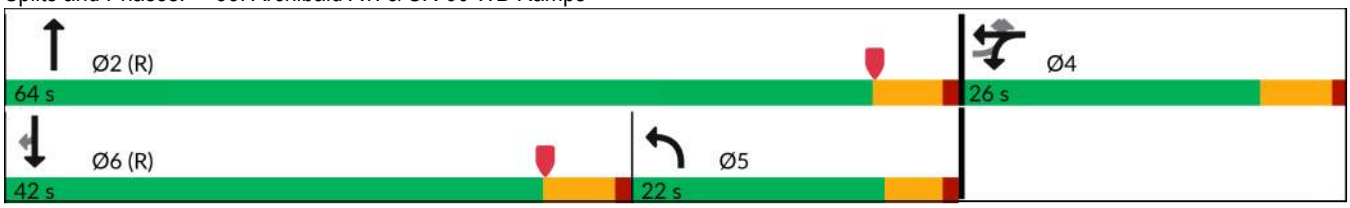

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 301 | 0 | 0 | 0 | 339 | 9 | 465 | 511 | 0 | 0 | 1075 | 0 |
| Future Volume (veh/h) | 301 | 0 | 0 | 0 | 339 | 9 | 465 | 511 | 0 | 0 | 1075 | 0 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1870 | 1870 | 1870 | 1870 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 0 | 365 | -122 | 500 | 549 | 0 | 0 | 1156 | -123 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 382 | 401 | 340 | 1125 | 3352 | 0 | 0 | 1716 | 423 |
| Arrive On Green | | | | 0.00 | 0.21 | 0.00 | 0.11 | 0.22 | 0.00 | 0.00 | 0.27 | 0.00 |
| Sat Flow, veh/h | | | | 1781 | 1870 | 1585 | 3456 | 5274 | 0 | 0 | 6696 | 1585 |
| Grp Volume(v), veh/h | | | | 0 | 365 | -122 | 500 | 549 | 0 | 0 | 1156 | -123 |
| Grp Sat Flow(s),veh/h/ln | | | | 1781 | 1870 | 1585 | 1728 | 1702 | 0 | 0 | 1609 | 1585 |
| Q Serve(g_s), s | | | | 0.0 | 17.1 | 0.0 | 12.2 | 7.9 | 0.0 | 0.0 | 14.5 | 0.0 |
| Cycle Q Clear(g_c), s | | | | 0.0 | 17.1 | 0.0 | 12.2 | 7.9 | 0.0 | 0.0 | 14.5 | 0.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 382 | 401 | 340 | 1125 | 3352 | 0 | 0 | 1716 | 423 |
| V/C Ratio(X) | | | | 0.00 | 0.91 | -0.36 | 0.44 | 0.16 | 0.00 | 0.00 | 0.67 | -0.29 |
| Avail Cap(c_a), veh/h | | | | 400 | 420 | 356 | 1125 | 3352 | 0 | 0 | 2588 | 638 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 0.00 | 1.00 | 0.00 | 0.95 | 0.95 | 0.00 | 0.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | | | | 0.0 | 34.5 | 0.0 | 32.5 | 15.2 | 0.0 | 0.0 | 29.5 | 0.0 |
| Incr Delay (d2), s/veh | | | | 0.0 | 22.9 | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 2.1 | 0.0 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 0.0 | 9.8 | 0.0 | 5.5 | 2.8 | 0.0 | 0.0 | 5.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 0.0 | 57.4 | 0.0 | 32.6 | 15.3 | 0.0 | 0.0 | 31.6 | 0.0 |
| LnGrp LOS | | | | | E | | C | B | | | C | |
| Approach Vol, veh/h | | | | | 243 | | | 1049 | | | 1033 | |
| Approach Delay, s/veh | | | | | 86.2 | | | 23.6 | | | 35.4 | |
| Approach LOS | | | | | F | | | C | | | D | |

| Timer - Assigned Phs | 2 | 4 | 5 | 6 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 64.9 | 25.1 | 35.1 | 29.8 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 58.2 | 20.2 | 17.0 | * 36 |
| Max Q Clear Time (g_c+I1), s | 9.9 | 19.1 | 14.2 | 16.5 |
| Green Ext Time (p_c), s | 3.8 | 0.2 | 0.3 | 7.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 35.4 |
| HCM 7th LOS | D |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 154 | 1 | 453 | 822 | 470 | 450 | 964 |
| Future Volume (vph) | 154 | 1 | 453 | 822 | 470 | 450 | 964 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 40.0 | 40.0 | 23.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 44.4% | 44.4% | 25.6% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 15.6 | 15.6 | 15.6 | 41.5 | 41.5 | 16.3 | 62.8 |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | 0.46 | 0.46 | 0.18 | 0.70 |
| v/c Ratio | 0.52 | 0.72 | 0.71 | 0.30 | 0.51 | 0.79 | 0.30 |
| Control Delay (s/veh) | 38.6 | 28.4 | 27.6 | 17.0 | 4.1 | 55.0 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.6 | 28.4 | 27.6 | 17.0 | 4.1 | 55.0 | 3.1 |
| LOS | D | C | C | B | A | E | A |
| Approach Delay (s/veh) | | 30.4 | | 12.3 | | | 19.6 |
| Approach LOS | | C | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 18.7 | Intersection LOS: B |
| Intersection Capacity Utilization 64.9% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

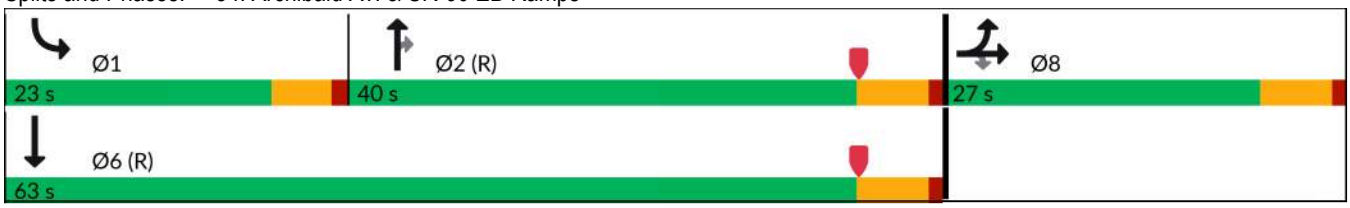

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 154 | 1 | 453 | 0 | 0 | 0 | 0 | 822 | 470 | 450 | 964 | 0 |
| Future Volume (veh/h) | 154 | 1 | 453 | 0 | 0 | 0 | 0 | 822 | 470 | 450 | 964 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1870 | 1870 | 0 |
| Adj Flow Rate, veh/h | 112 | 0 | 366 | | | | 0 | 893 | 398 | 489 | 1048 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 262 | 0 | 467 | | | | 0 | 3265 | 803 | 556 | 3696 | 0 |
| Arrive On Green | 0.15 | 0.00 | 0.15 | | | | 0.00 | 0.51 | 0.51 | 0.32 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1781 | 0 | 3170 | | | | 0 | 6696 | 1582 | 3456 | 5274 | 0 |
| Grp Volume(v), veh/h | 112 | 0 | 366 | | | | 0 | 893 | 398 | 489 | 1048 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1781 | 0 | 1585 | | | | 0 | 1609 | 1582 | 1728 | 1702 | 0 |
| Q Serve(g_s), s | 5.1 | 0.0 | 10.0 | | | | 0.0 | 7.1 | 14.9 | 12.1 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 5.1 | 0.0 | 10.0 | | | | 0.0 | 7.1 | 14.9 | 12.1 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 262 | 0 | 467 | | | | 0 | 3265 | 803 | 556 | 3696 | 0 |
| V/C Ratio(X) | 0.43 | 0.00 | 0.78 | | | | 0.00 | 0.27 | 0.50 | 0.88 | 0.28 | 0.00 |
| Avail Cap(c_a), veh/h | 420 | 0 | 747 | | | | 0 | 3265 | 803 | 691 | 3696 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.85 | 0.85 | 0.00 |
| Uniform Delay (d), s/veh | 34.9 | 0.0 | 37.0 | | | | 0.0 | 12.7 | 14.6 | 29.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.0 | 2.9 | | | | 0.0 | 0.2 | 2.2 | 8.1 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 3.9 | | | | 0.0 | 2.3 | 5.0 | 4.5 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.0 | 0.0 | 39.9 | | | | 0.0 | 12.9 | 16.8 | 37.8 | 0.2 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | B | D | A | |
| Approach Vol, veh/h | | 478 | | | | | | 1291 | | | 1537 | |
| Approach Delay, s/veh | | 39.0 | | | | | | 14.1 | | | 12.1 | |
| Approach LOS | | D | | | | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.5 | 51.5 | | | | 70.9 | | 19.1 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 18.0 | 34.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 14.1 | 16.9 | | | | 2.0 | | 12.0 | | | | |
| Green Ext Time (p_c), s | 0.4 | 6.6 | | | | 8.1 | | 1.2 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 16.8 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 148 | 433 | 242 | 124 | 372 | 147 | 211 | 633 | 267 | 822 |
| Future Volume (vph) | 148 | 433 | 242 | 124 | 372 | 147 | 211 | 633 | 267 | 822 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.1 | 20.8 | 20.8 | 11.3 | 19.0 | 19.0 | 17.1 | 20.0 | 23.5 | 26.4 |
| Actuated g/C Ratio | 0.14 | 0.22 | 0.22 | 0.12 | 0.20 | 0.20 | 0.18 | 0.21 | 0.25 | 0.28 |
| v/c Ratio | 0.69 | 0.60 | 0.48 | 0.68 | 0.57 | 0.36 | 0.75 | 0.68 | 0.69 | 0.77 |
| Control Delay (s/veh) | 59.2 | 37.5 | 7.4 | 62.9 | 38.8 | 8.5 | 56.4 | 38.9 | 45.7 | 36.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 59.2 | 37.5 | 7.4 | 62.9 | 38.8 | 8.5 | 56.4 | 38.9 | 45.7 | 36.4 |
| LOS | E | D | A | E | D | A | E | D | D | D |
| Approach Delay (s/veh) | | 32.5 | | | 36.6 | | | 43.1 | | 38.4 |
| Approach LOS | | C | | | D | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 94.7 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.77 | |
| Intersection Signal Delay (s/veh): 37.9 | Intersection LOS: D |
| Intersection Capacity Utilization 74.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

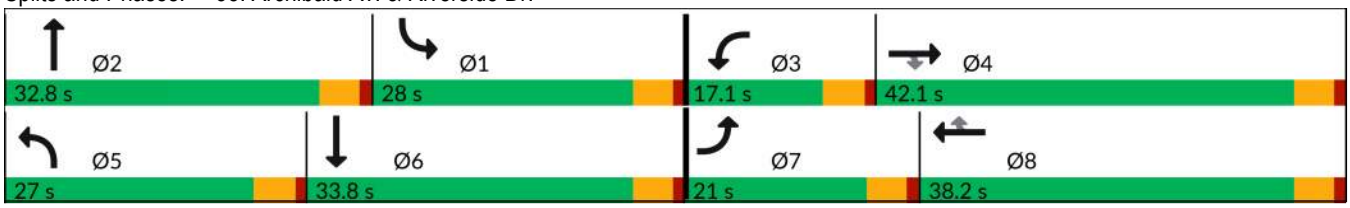

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 148 | 433 | 242 | 124 | 372 | 147 | 211 | 633 | 42 | 267 | 822 | 183 |
| Future Volume (veh/h) | 148 | 433 | 242 | 124 | 372 | 147 | 211 | 633 | 42 | 267 | 822 | 183 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 151 | 442 | 154 | 127 | 380 | 105 | 215 | 646 | 41 | 272 | 839 | 148 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 184 | 702 | 310 | 156 | 643 | 282 | 254 | 989 | 62 | 366 | 1169 | 205 |
| Arrive On Green | 0.12 | 0.21 | 0.21 | 0.10 | 0.19 | 0.19 | 0.16 | 0.21 | 0.21 | 0.23 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1594 | 3367 | 1489 | 1594 | 3367 | 1478 | 1594 | 4648 | 293 | 1594 | 4127 | 723 |
| Grp Volume(v), veh/h | 151 | 442 | 154 | 127 | 380 | 105 | 215 | 447 | 240 | 272 | 654 | 333 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1489 | 1594 | 1683 | 1478 | 1594 | 1612 | 1716 | 1594 | 1612 | 1625 |
| Q Serve(g_s), s | 6.8 | 8.8 | 6.7 | 5.7 | 7.5 | 2.5 | 9.6 | 9.3 | 9.4 | 11.6 | 13.4 | 13.5 |
| Cycle Q Clear(g_c), s | 6.8 | 8.8 | 6.7 | 5.7 | 7.5 | 2.5 | 9.6 | 9.3 | 9.4 | 11.6 | 13.4 | 13.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.17 | 1.00 | | 0.44 |
| Lane Grp Cap(c), veh/h | 184 | 702 | 310 | 156 | 643 | 282 | 254 | 686 | 365 | 366 | 913 | 460 |
| V/C Ratio(X) | 0.82 | 0.63 | 0.50 | 0.81 | 0.59 | 0.37 | 0.85 | 0.65 | 0.66 | 0.74 | 0.72 | 0.72 |
| Avail Cap(c_a), veh/h | 356 | 1722 | 761 | 272 | 1543 | 677 | 487 | 1240 | 660 | 509 | 1284 | 647 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.7 | 26.4 | 25.6 | 32.4 | 27.0 | 8.1 | 30.0 | 26.4 | 26.4 | 26.2 | 23.6 | 23.7 |
| Incr Delay (d2), s/veh | 3.4 | 0.9 | 1.2 | 3.8 | 0.9 | 0.8 | 3.0 | 1.1 | 2.0 | 2.0 | 1.1 | 2.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.5 | 3.2 | 2.2 | 2.2 | 2.8 | 1.4 | 3.5 | 3.3 | 3.6 | 4.1 | 4.6 | 4.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.1 | 27.4 | 26.8 | 36.2 | 27.9 | 8.9 | 33.0 | 27.4 | 28.4 | 28.3 | 24.8 | 26.1 |
| LnGrp LOS | D | C | C | D | C | A | C | C | C | C | C | C |
| Approach Vol, veh/h | | 747 | | | 612 | | | 902 | | | 1259 | |
| Approach Delay, s/veh | | 28.8 | | | 26.4 | | | 29.0 | | | 25.9 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.4 | 20.2 | 11.8 | 19.9 | 16.3 | 25.4 | 13.1 | 18.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 13.6 | 11.4 | 7.7 | 10.8 | 11.6 | 15.5 | 8.8 | 9.5 |
| Green Ext Time (p_c), s | 0.3 | 3.5 | 0.1 | 3.1 | 0.2 | 4.9 | 0.1 | 2.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.4 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 91 | 154 | 13 | 68 | 81 | 39 | 699 | 130 | 947 |
| Future Volume (vph) | 91 | 154 | 13 | 68 | 81 | 39 | 699 | 130 | 947 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.8 | 21.4 | 5.7 | 9.9 | 9.9 | 8.1 | 18.5 | 18.1 | 34.7 |
| Actuated g/C Ratio | 0.14 | 0.29 | 0.08 | 0.13 | 0.13 | 0.11 | 0.25 | 0.24 | 0.47 |
| v/c Ratio | 0.42 | 0.46 | 0.12 | 0.30 | 0.24 | 0.24 | 0.57 | 0.35 | 0.65 |
| Control Delay (s/veh) | 40.9 | 26.1 | 45.3 | 38.4 | 1.6 | 41.7 | 28.5 | 29.8 | 20.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.9 | 26.1 | 45.3 | 38.4 | 1.6 | 41.7 | 28.5 | 29.8 | 20.8 |
| LOS | D | C | D | D | A | D | C | C | C |
| Approach Delay (s/veh) | | 30.4 | | 20.7 | | | 29.2 | | 21.9 |
| Approach LOS | | C | | C | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 74.6 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.65 | |
| Intersection Signal Delay (s/veh): 25.2 | Intersection LOS: C |
| Intersection Capacity Utilization 58.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 91 | 154 | 66 | 13 | 68 | 81 | 39 | 699 | 18 | 130 | 947 | 66 |
| Future Volume (veh/h) | 91 | 154 | 66 | 13 | 68 | 81 | 39 | 699 | 18 | 130 | 947 | 66 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 95 | 160 | 52 | 14 | 71 | 26 | 41 | 728 | 17 | 135 | 986 | 55 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 119 | 221 | 72 | 28 | 204 | 173 | 69 | 1286 | 30 | 330 | 1372 | 77 |
| Arrive On Green | 0.07 | 0.17 | 0.17 | 0.02 | 0.12 | 0.12 | 0.04 | 0.25 | 0.25 | 0.21 | 0.41 | 0.41 |
| Sat Flow, veh/h | 1594 | 1280 | 416 | 1594 | 1772 | 1502 | 1594 | 5173 | 121 | 1594 | 3325 | 185 |
| Grp Volume(v), veh/h | 95 | 0 | 212 | 14 | 71 | 26 | 41 | 498 | 247 | 135 | 525 | 516 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1696 | 1594 | 1772 | 1502 | 1594 | 1772 | 1750 | 1594 | 1772 | 1739 |
| Q Serve(g_s), s | 3.0 | 0.0 | 6.1 | 0.5 | 1.9 | 0.5 | 1.3 | 6.4 | 6.4 | 3.8 | 12.9 | 12.9 |
| Cycle Q Clear(g_c), s | 3.0 | 0.0 | 6.1 | 0.5 | 1.9 | 0.5 | 1.3 | 6.4 | 6.4 | 3.8 | 12.9 | 12.9 |
| Prop In Lane | 1.00 | | 0.25 | 1.00 | | 1.00 | 1.00 | | 0.07 | 1.00 | | 0.11 |
| Lane Grp Cap(c), veh/h | 119 | 0 | 292 | 28 | 204 | 173 | 69 | 881 | 435 | 330 | 731 | 717 |
| V/C Ratio(X) | 0.80 | 0.00 | 0.73 | 0.50 | 0.35 | 0.15 | 0.60 | 0.57 | 0.57 | 0.41 | 0.72 | 0.72 |
| Avail Cap(c_a), veh/h | 626 | 0 | 1287 | 160 | 826 | 700 | 442 | 3086 | 1524 | 362 | 1454 | 1427 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.6 | 0.0 | 20.3 | 25.3 | 21.2 | 6.6 | 24.4 | 17.1 | 17.1 | 17.8 | 12.7 | 12.7 |
| Incr Delay (d2), s/veh | 11.3 | 0.0 | 3.4 | 13.0 | 1.0 | 0.4 | 8.1 | 0.6 | 1.2 | 0.8 | 1.3 | 1.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 0.0 | 2.4 | 0.3 | 0.8 | 0.3 | 0.6 | 2.0 | 2.1 | 1.2 | 3.8 | 3.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.9 | 0.0 | 23.7 | 38.3 | 22.2 | 7.0 | 32.5 | 17.6 | 18.2 | 18.6 | 14.1 | 14.1 |
| LnGrp LOS | C | | C | D | C | A | C | B | B | B | B | B |
| Approach Vol, veh/h | | 307 | | | 111 | | | 786 | | | 1176 | |
| Approach Delay, s/veh | | 27.2 | | | 20.7 | | | 18.6 | | | 14.6 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.3 | 17.5 | 5.5 | 13.5 | 6.8 | 26.0 | 8.5 | 10.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 5.8 | 8.4 | 2.5 | 8.1 | 3.3 | 14.9 | 5.0 | 3.9 |
| Green Ext Time (p_c), s | 0.1 | 4.5 | 0.0 | 1.2 | 0.0 | 6.6 | 0.2 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.8 |
| HCM 7th LOS | B |

| Lane Group | WBL | WBT | NBL | NBT | SBL | SBT | Ø4 |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 2 | 682 | 138 | 875 | |
| Future Volume (vph) | 20 | 0 | 2 | 682 | 138 | 875 | |
| Turn Type | Split | NA | Prot | NA | Prot | NA | |
| Protected Phases | 8 | 8 | 5 | 2 | 1 | 6 | 4 |
| Permitted Phases | | | | | | | |
| Detector Phase | 8 | 8 | 5 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 |
| Minimum Split (s) | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 | 22.5 |
| Total Split (s) | 32.6 | 32.6 | 9.6 | 39.9 | 25.0 | 55.3 | 22.5 |
| Total Split (%) | 27.2% | 27.2% | 8.0% | 33.3% | 20.8% | 46.1% | 19% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | |
| Lead/Lag | | | Lead | Lag | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.4 | 10.4 | 7.1 | 20.6 | 11.0 | 32.7 | |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.16 | 0.47 | 0.25 | 0.75 | |
| v/c Ratio | 0.05 | 0.04 | 0.01 | 0.32 | 0.35 | 0.35 | |
| Control Delay (s/veh) | 19.4 | 0.1 | 30.0 | 13.1 | 23.6 | 7.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay (s/veh) | 19.4 | 0.1 | 30.0 | 13.1 | 23.6 | 7.0 | |
| LOS | B | A | C | B | C | A | |
| Approach Delay (s/veh) | | 7.1 | | 13.2 | | 9.2 | |
| Approach LOS | | A | | B | | A | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 43.5 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.35 | |
| Intersection Signal Delay (s/veh): 10.7 | Intersection LOS: B |
| Intersection Capacity Utilization 45.4% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 20 | 0 | 34 | 2 | 682 | 27 | 138 | 875 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 20 | 0 | 34 | 2 | 682 | 27 | 138 | 875 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 20 | 0 | 27 | 2 | 696 | 24 | 141 | 893 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 6 | 0 | 86 | 0 | 81 | 5 | 1720 | 59 | 186 | 1589 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.36 | 0.36 | 0.12 | 0.47 | 0.00 |
| Sat Flow, veh/h | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 4802 | 165 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 20 | 0 | 27 | 2 | 467 | 253 | 141 | 893 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 1612 | 1742 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.5 | 0.0 | 3.2 | 3.2 | 2.5 | 5.6 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.5 | 0.0 | 3.2 | 3.2 | 2.5 | 5.6 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 0.09 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 6 | 0 | 86 | 0 | 81 | 5 | 1155 | 624 | 186 | 1589 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.33 | 0.37 | 0.40 | 0.41 | 0.76 | 0.56 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 1083 | 0 | 1523 | 0 | 1435 | 272 | 3885 | 2099 | 1110 | 5826 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 13.3 | 0.0 | 13.3 | 14.6 | 7.1 | 7.1 | 12.5 | 5.6 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 2.3 | 36.8 | 0.2 | 0.4 | 2.4 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.2 | 0.1 | 0.4 | 0.4 | 0.6 | 0.2 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 0.0 | 14.6 | 0.0 | 15.7 | 51.4 | 7.3 | 7.5 | 14.9 | 5.9 | 0.0 |
| LnGrp LOS | | | | B | | B | D | A | A | B | A | |
| Approach Vol, veh/h | | 0 | | | 47 | | | 722 | | | 1034 | |
| Approach Delay, s/veh | | 0.0 | | | 15.2 | | | 7.5 | | | 7.1 | |
| Approach LOS | | | | | B | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.0 | 15.1 | | 0.0 | 4.7 | 18.4 | | 6.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 20.4 | 35.3 | | 17.9 | 5.0 | 50.7 | | 28.0 |
| Max Q Clear Time (g_c+I1), s | 4.5 | 5.2 | | 0.0 | 2.0 | 7.6 | | 2.5 |
| Green Ext Time (p_c), s | 0.1 | 4.2 | | 0.0 | 0.0 | 6.3 | | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 7.5 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 60 | 267 | 204 | 335 | 121 | 66 | 75 | 573 | 217 | 101 | 735 | 33 |
| Future Volume (vph) | 60 | 267 | 204 | 335 | 121 | 66 | 75 | 573 | 217 | 101 | 735 | 33 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.9 | 14.3 | 73.7 | 11.3 | 18.0 | 18.0 | 8.2 | 21.5 | 73.7 | 9.8 | 22.9 | 22.9 |
| Actuated g/C Ratio | 0.08 | 0.19 | 1.00 | 0.15 | 0.24 | 0.24 | 0.11 | 0.29 | 1.00 | 0.13 | 0.31 | 0.31 |
| v/c Ratio | 0.27 | 0.29 | 0.14 | 0.76 | 0.28 | 0.14 | 0.43 | 0.59 | 0.15 | 0.49 | 0.71 | 0.06 |
| Control Delay (s/veh) | 42.8 | 27.8 | 0.2 | 47.1 | 26.4 | 0.7 | 44.8 | 26.7 | 0.2 | 43.0 | 27.7 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.8 | 27.8 | 0.2 | 47.1 | 26.4 | 0.7 | 44.8 | 26.7 | 0.2 | 43.0 | 27.7 | 0.2 |
| LOS | D | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 18.9 | | | 36.4 | | | 21.6 | | | 28.4 | |
| Approach LOS | | B | | | D | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 73.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay (s/veh): 26.0 | Intersection LOS: C |
| Intersection Capacity Utilization 61.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

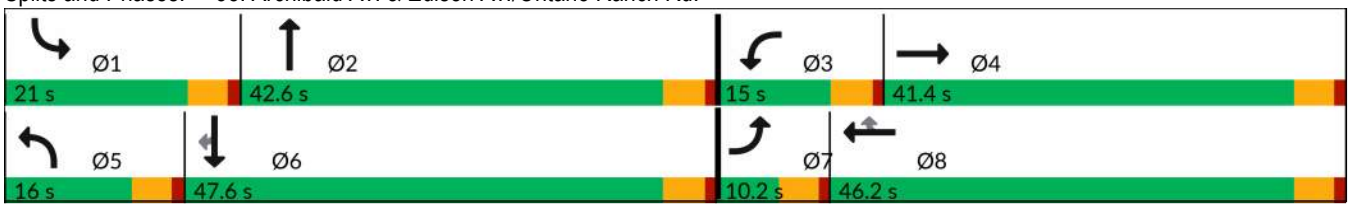

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 60 | 267 | 204 | 335 | 121 | 66 | 75 | 573 | 217 | 101 | 735 | 33 |
| Future Volume (veh/h) | 60 | 267 | 204 | 335 | 121 | 66 | 75 | 573 | 217 | 101 | 735 | 33 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 61 | 270 | 0 | 338 | 122 | 39 | 76 | 579 | 0 | 102 | 742 | 24 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 156 | 813 | | 430 | 465 | 393 | 96 | 981 | | 127 | 1045 | 466 |
| Arrive On Green | 0.05 | 0.17 | 0.00 | 0.15 | 0.26 | 0.26 | 0.06 | 0.29 | 0.00 | 0.08 | 0.31 | 0.31 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1500 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 61 | 270 | 0 | 338 | 122 | 39 | 76 | 579 | 0 | 102 | 742 | 24 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1500 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 1.2 | 2.9 | 0.0 | 6.6 | 3.2 | 1.2 | 2.8 | 8.6 | 0.0 | 3.7 | 11.5 | 0.7 |
| Cycle Q Clear(g_c), s | 1.2 | 2.9 | 0.0 | 6.6 | 3.2 | 1.2 | 2.8 | 8.6 | 0.0 | 3.7 | 11.5 | 0.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 156 | 813 | | 430 | 465 | 393 | 96 | 981 | | 127 | 1045 | 466 |
| V/C Ratio(X) | 0.39 | 0.33 | | 0.79 | 0.26 | 0.10 | 0.79 | 0.59 | | 0.80 | 0.71 | 0.05 |
| Avail Cap(c_a), veh/h | 277 | 3030 | | 515 | 1255 | 1062 | 309 | 2178 | | 445 | 2464 | 1099 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.9 | 21.5 | 0.0 | 24.1 | 17.2 | 16.4 | 27.2 | 17.8 | 0.0 | 26.6 | 17.9 | 14.2 |
| Incr Delay (d2), s/veh | 0.6 | 0.2 | 0.0 | 5.4 | 0.3 | 0.1 | 5.3 | 0.6 | 0.0 | 4.4 | 0.9 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.9 | 0.0 | 2.2 | 1.1 | 0.3 | 1.0 | 2.7 | 0.0 | 1.4 | 3.6 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.5 | 21.8 | 0.0 | 29.5 | 17.5 | 16.5 | 32.5 | 18.4 | 0.0 | 31.0 | 18.8 | 14.2 |
| LnGrp LOS | C | C | | C | B | B | C | B | | C | B | B |
| Approach Vol, veh/h | | 331 | | | 499 | | | 655 | | | 868 | |
| Approach Delay, s/veh | | 22.8 | | | 25.5 | | | 20.0 | | | 20.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.3 | 21.7 | 13.3 | 14.5 | 8.2 | 22.8 | 7.8 | 20.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 10.6 | 8.6 | 4.9 | 4.8 | 13.5 | 3.2 | 5.2 |
| Green Ext Time (p_c), s | 0.1 | 3.5 | 0.1 | 1.6 | 0.0 | 4.8 | 0.0 | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.6 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 277 | 135 | 82 | 166 | 52 | 73 | 481 | 79 | 77 | 723 | 128 |
| Future Volume (vph) | 184 | 277 | 135 | 82 | 166 | 52 | 73 | 481 | 79 | 77 | 723 | 128 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.0 | 20.5 | 71.9 | 9.6 | 15.5 | 15.5 | 6.0 | 20.8 | 20.8 | 7.6 | 22.4 | 22.4 |
| Actuated g/C Ratio | 0.15 | 0.29 | 1.00 | 0.13 | 0.22 | 0.22 | 0.08 | 0.29 | 0.29 | 0.11 | 0.31 | 0.31 |
| v/c Ratio | 0.43 | 0.29 | 0.09 | 0.41 | 0.23 | 0.13 | 0.31 | 0.33 | 0.16 | 0.26 | 0.69 | 0.24 |
| Control Delay (s/veh) | 35.4 | 24.1 | 0.1 | 41.9 | 25.7 | 0.6 | 42.8 | 22.7 | 1.2 | 39.3 | 27.4 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 24.1 | 0.1 | 41.9 | 25.7 | 0.6 | 42.8 | 22.7 | 1.2 | 39.3 | 27.4 | 5.7 |
| LOS | D | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 22.1 | | | 25.7 | | | 22.3 | | | 25.4 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 71.9 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.69 | |
| Intersection Signal Delay (s/veh): 23.8 | Intersection LOS: C |
| Intersection Capacity Utilization 59.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

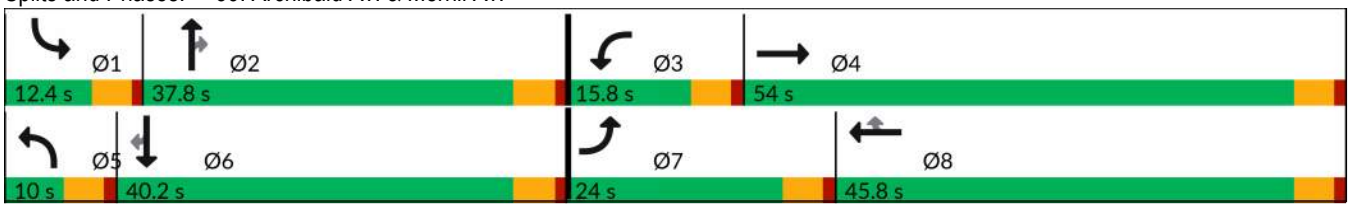

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 184 | 277 | 135 | 82 | 166 | 52 | 73 | 481 | 79 | 77 | 723 | 128 |
| Future Volume (veh/h) | 184 | 277 | 135 | 82 | 166 | 52 | 73 | 481 | 79 | 77 | 723 | 128 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 194 | 292 | 0 | 86 | 175 | 24 | 77 | 506 | 49 | 81 | 761 | 82 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 304 | 807 | | 106 | 683 | 284 | 188 | 1650 | 459 | 193 | 1106 | 468 |
| Arrive On Green | 0.10 | 0.23 | 0.00 | 0.07 | 0.19 | 0.19 | 0.06 | 0.31 | 0.31 | 0.06 | 0.31 | 0.31 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 3544 | 1470 | 3000 | 5316 | 1480 | 3000 | 3544 | 1502 |
| Grp Volume(v), veh/h | 194 | 292 | 0 | 86 | 175 | 24 | 77 | 506 | 49 | 81 | 761 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1470 | 1500 | 1772 | 1480 | 1500 | 1772 | 1502 |
| Q Serve(g_s), s | 3.5 | 3.9 | 0.0 | 3.0 | 2.3 | 0.7 | 1.4 | 4.0 | 1.3 | 1.4 | 10.5 | 2.2 |
| Cycle Q Clear(g_c), s | 3.5 | 3.9 | 0.0 | 3.0 | 2.3 | 0.7 | 1.4 | 4.0 | 1.3 | 1.4 | 10.5 | 2.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 304 | 807 | | 106 | 683 | 284 | 188 | 1650 | 459 | 193 | 1106 | 468 |
| V/C Ratio(X) | 0.64 | 0.36 | | 0.81 | 0.26 | 0.08 | 0.41 | 0.31 | 0.11 | 0.42 | 0.69 | 0.18 |
| Avail Cap(c_a), veh/h | 1048 | 3151 | | 321 | 2628 | 1090 | 292 | 3177 | 884 | 421 | 2271 | 962 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.0 | 18.1 | 0.0 | 25.6 | 19.0 | 18.4 | 25.1 | 14.6 | 13.7 | 25.0 | 16.7 | 13.9 |
| Incr Delay (d2), s/veh | 2.2 | 0.3 | 0.0 | 13.5 | 0.2 | 0.1 | 1.4 | 0.1 | 0.1 | 1.5 | 0.8 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 1.4 | 0.0 | 1.4 | 0.8 | 0.2 | 0.4 | 1.3 | 0.4 | 0.5 | 3.3 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.2 | 18.3 | 0.0 | 39.1 | 19.2 | 18.5 | 26.5 | 14.7 | 13.8 | 26.5 | 17.5 | 14.1 |
| LnGrp LOS | C | B | | D | B | B | C | B | B | C | B | B |
| Approach Vol, veh/h | | 486 | | | 285 | | | 632 | | | 924 | |
| Approach Delay, s/veh | | 21.5 | | | 25.2 | | | 16.1 | | | 18.0 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.2 | 21.8 | 8.3 | 17.3 | 8.1 | 21.9 | 10.2 | 15.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 3.4 | 6.0 | 5.0 | 5.9 | 3.4 | 12.5 | 5.5 | 4.3 |
| Green Ext Time (p_c), s | 0.1 | 3.2 | 0.1 | 1.8 | 0.0 | 4.9 | 0.5 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.1 |
| HCM 7th LOS | B |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 27 | 90 | 30 | 376 | 45 | 180 | 4 | 433 | 314 | 368 | 563 | 29 |
| Future Volume (vph) | 27 | 90 | 30 | 376 | 45 | 180 | 4 | 433 | 314 | 368 | 563 | 29 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.5 | 12.5 | 12.5 | 15.1 | 21.0 | 25.8 | 5.5 | 18.6 | 33.7 | 10.4 | 32.9 | 32.9 |
| Actuated g/C Ratio | 0.08 | 0.17 | 0.17 | 0.21 | 0.29 | 0.36 | 0.08 | 0.26 | 0.47 | 0.14 | 0.46 | 0.46 |
| v/c Ratio | 0.12 | 0.16 | 0.09 | 0.66 | 0.05 | 0.18 | 0.02 | 0.53 | 0.38 | 0.88 | 0.27 | 0.04 |
| Control Delay (s/veh) | 41.8 | 31.6 | 0.4 | 34.8 | 20.0 | 2.8 | 42.8 | 26.0 | 2.4 | 56.9 | 14.9 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.8 | 31.6 | 0.4 | 34.8 | 20.0 | 2.8 | 42.8 | 26.0 | 2.4 | 56.9 | 14.9 | 0.1 |
| LOS | D | C | A | C | C | A | D | C | A | E | B | A |
| Approach Delay (s/veh) | | 27.0 | | | 24.2 | | | 16.2 | | | 30.5 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 72 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay (s/veh): 24.4 | Intersection LOS: C |
| Intersection Capacity Utilization 56.7% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

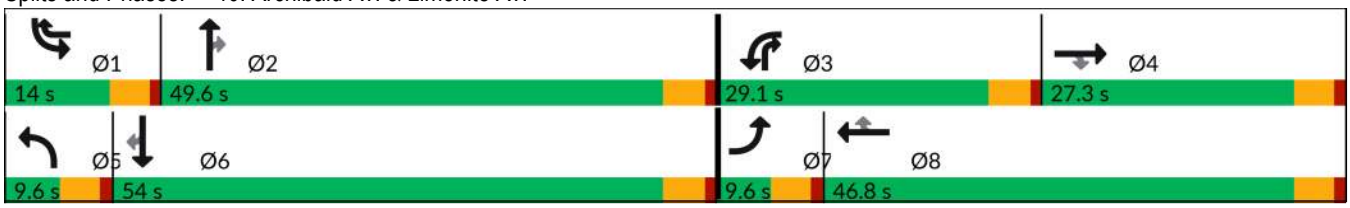

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 27 | 90 | 30 | 376 | 45 | 180 | 4 | 433 | 314 | 368 | 563 | 29 |
| Future Volume (veh/h) | 27 | 90 | 30 | 376 | 45 | 180 | 4 | 433 | 314 | 368 | 563 | 29 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 28 | 95 | 10 | 396 | 47 | 71 | 4 | 456 | 154 | 387 | 593 | 20 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 97 | 472 | 211 | 509 | 956 | 1159 | 17 | 718 | 578 | 481 | 1757 | 545 |
| Arrive On Green | 0.03 | 0.14 | 0.14 | 0.17 | 0.28 | 0.28 | 0.01 | 0.21 | 0.21 | 0.16 | 0.36 | 0.36 |
| Sat Flow, veh/h | 3092 | 3367 | 1502 | 2910 | 3367 | 2634 | 3092 | 3367 | 1480 | 3092 | 4837 | 1500 |
| Grp Volume(v), veh/h | 28 | 95 | 10 | 396 | 47 | 71 | 4 | 456 | 154 | 387 | 593 | 20 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1683 | 1502 | 1455 | 1683 | 1317 | 1546 | 1683 | 1480 | 1546 | 1612 | 1500 |
| Q Serve(g_s), s | 0.5 | 1.5 | 0.3 | 7.6 | 0.6 | 0.9 | 0.1 | 7.2 | 4.1 | 7.0 | 5.2 | 0.5 |
| Cycle Q Clear(g_c), s | 0.5 | 1.5 | 0.3 | 7.6 | 0.6 | 0.9 | 0.1 | 7.2 | 4.1 | 7.0 | 5.2 | 0.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 97 | 472 | 211 | 509 | 956 | 1159 | 17 | 718 | 578 | 481 | 1757 | 545 |
| V/C Ratio(X) | 0.29 | 0.20 | 0.05 | 0.78 | 0.05 | 0.06 | 0.24 | 0.64 | 0.27 | 0.80 | 0.34 | 0.04 |
| Avail Cap(c_a), veh/h | 266 | 1313 | 586 | 1225 | 2441 | 2321 | 266 | 2603 | 1407 | 499 | 4105 | 1273 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.6 | 22.1 | 21.7 | 22.9 | 15.1 | 9.4 | 28.8 | 20.8 | 12.2 | 23.7 | 13.4 | 12.0 |
| Incr Delay (d2), s/veh | 0.6 | 0.2 | 0.1 | 1.0 | 0.0 | 0.0 | 2.7 | 0.9 | 0.2 | 8.3 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.5 | 0.1 | 2.3 | 0.2 | 0.2 | 0.0 | 2.4 | 1.1 | 2.7 | 1.4 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.2 | 22.3 | 21.7 | 23.9 | 15.2 | 9.4 | 31.6 | 21.8 | 12.4 | 32.0 | 13.6 | 12.0 |
| LnGrp LOS | C | C | C | C | B | A | C | C | B | C | B | B |
| Approach Vol, veh/h | | 133 | | | 514 | | | 614 | | | 1000 | |
| Approach Delay, s/veh | | 23.5 | | | 21.1 | | | 19.5 | | | 20.7 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.7 | 17.0 | 14.8 | 12.8 | 4.9 | 25.7 | 6.4 | 21.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 9.0 | 9.2 | 9.6 | 3.5 | 2.1 | 7.2 | 2.5 | 2.9 |
| Green Ext Time (p_c), s | 0.0 | 3.2 | 0.6 | 0.4 | 0.0 | 3.9 | 0.0 | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 29 | 520 | 23 | 53 | 511 | 44 | 9 | 20 | 76 | 33 |
| Future Volume (vph) | 29 | 520 | 23 | 53 | 511 | 44 | 9 | 20 | 76 | 33 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.8 | 21.6 | 21.6 | 9.6 | 24.0 | 24.0 | 8.3 | 10.8 | 10.4 | 15.8 |
| Actuated g/C Ratio | 0.19 | 0.46 | 0.46 | 0.20 | 0.51 | 0.51 | 0.18 | 0.23 | 0.22 | 0.34 |
| v/c Ratio | 0.11 | 0.34 | 0.03 | 0.17 | 0.30 | 0.06 | 0.04 | 0.18 | 0.23 | 0.11 |
| Control Delay (s/veh) | 29.8 | 16.8 | 0.1 | 27.9 | 14.0 | 0.1 | 30.8 | 13.1 | 27.0 | 11.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.8 | 16.8 | 0.1 | 27.9 | 14.0 | 0.1 | 30.8 | 13.1 | 27.0 | 11.9 |
| LOS | C | B | A | C | B | A | C | B | C | B |
| Approach Delay (s/veh) | | 16.8 | | | 14.2 | | | 15.3 | | 20.5 |
| Approach LOS | | B | | | B | | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 46.9 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.34 | |
| Intersection Signal Delay (s/veh): 15.9 | Intersection LOS: B |
| Intersection Capacity Utilization 42.2% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

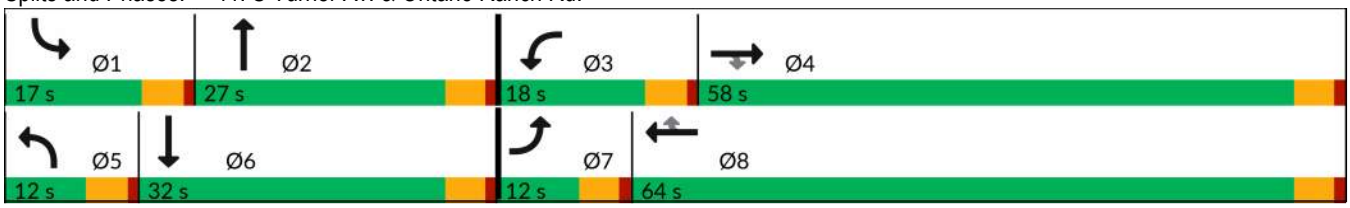

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 29 | 520 | 23 | 53 | 511 | 44 | 9 | 20 | 47 | 76 | 33 | 25 |
| Future Volume (veh/h) | 29 | 520 | 23 | 53 | 511 | 44 | 9 | 20 | 47 | 76 | 33 | 25 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 31 | 553 | 20 | 56 | 544 | 23 | 10 | 21 | 18 | 81 | 35 | 15 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 59 | 1039 | 440 | 95 | 1120 | 474 | 21 | 43 | 37 | 124 | 134 | 57 |
| Arrive On Green | 0.04 | 0.29 | 0.29 | 0.06 | 0.32 | 0.32 | 0.01 | 0.05 | 0.05 | 0.08 | 0.11 | 0.11 |
| Sat Flow, veh/h | 1594 | 3544 | 1502 | 1594 | 3544 | 1502 | 1594 | 872 | 748 | 1594 | 1177 | 504 |
| Grp Volume(v), veh/h | 31 | 553 | 20 | 56 | 544 | 23 | 10 | 0 | 39 | 81 | 0 | 50 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 1772 | 1502 | 1594 | 0 | 1620 | 1594 | 0 | 1681 |
| Q Serve(g_s), s | 0.7 | 4.6 | 0.3 | 1.2 | 4.4 | 0.4 | 0.2 | 0.0 | 0.8 | 1.7 | 0.0 | 1.0 |
| Cycle Q Clear(g_c), s | 0.7 | 4.6 | 0.3 | 1.2 | 4.4 | 0.4 | 0.2 | 0.0 | 0.8 | 1.7 | 0.0 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.46 | 1.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | 59 | 1039 | 440 | 95 | 1120 | 474 | 21 | 0 | 80 | 124 | 0 | 192 |
| V/C Ratio(X) | 0.52 | 0.53 | 0.05 | 0.59 | 0.49 | 0.05 | 0.47 | 0.00 | 0.49 | 0.66 | 0.00 | 0.26 |
| Avail Cap(c_a), veh/h | 333 | 5346 | 2265 | 603 | 5946 | 2520 | 333 | 0 | 1025 | 558 | 0 | 1301 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 16.7 | 10.5 | 9.0 | 16.2 | 9.8 | 8.4 | 17.3 | 0.0 | 16.4 | 15.9 | 0.0 | 14.3 |
| Incr Delay (d2), s/veh | 2.7 | 0.4 | 0.0 | 2.1 | 0.3 | 0.0 | 6.0 | 0.0 | 4.5 | 2.2 | 0.0 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 1.2 | 0.1 | 0.4 | 1.1 | 0.1 | 0.1 | 0.0 | 0.3 | 0.5 | 0.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 19.4 | 10.9 | 9.0 | 18.3 | 10.1 | 8.5 | 23.4 | 0.0 | 20.9 | 18.1 | 0.0 | 15.0 |
| LnGrp LOS | B | B | A | B | B | A | C | | C | B | | B |
| Approach Vol, veh/h | | 604 | | | 623 | | | 49 | | | 131 | |
| Approach Delay, s/veh | | 11.3 | | | 10.8 | | | 21.4 | | | 16.9 | |
| Approach LOS | | B | | | B | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.3 | 6.4 | 6.7 | 15.0 | 5.1 | 8.6 | 5.9 | 15.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 3.7 | 2.8 | 3.2 | 6.6 | 2.2 | 3.0 | 2.7 | 6.4 |
| Green Ext Time (p_c), s | 0.0 | 0.1 | 0.0 | 3.8 | 0.0 | 0.2 | 0.0 | 3.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 11.9 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 162 | 515 | 32 | 226 | 558 | 225 | 27 | 170 | 69 | 227 | 372 | 58 |
| Future Volume (vph) | 162 | 515 | 32 | 226 | 558 | 225 | 27 | 170 | 69 | 227 | 372 | 58 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.5 | 17.4 | 17.4 | 10.9 | 15.8 | 15.8 | 5.7 | 16.9 | 16.9 | 16.8 | 34.7 | 34.7 |
| Actuated g/C Ratio | 0.15 | 0.21 | 0.21 | 0.13 | 0.20 | 0.20 | 0.07 | 0.21 | 0.21 | 0.21 | 0.43 | 0.43 |
| v/c Ratio | 0.70 | 0.52 | 0.08 | 0.61 | 0.49 | 0.50 | 0.25 | 0.48 | 0.17 | 0.72 | 0.51 | 0.09 |
| Control Delay (s/veh) | 52.7 | 31.4 | 0.3 | 43.1 | 31.0 | 8.5 | 48.1 | 32.4 | 0.9 | 47.7 | 21.6 | 1.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.7 | 31.4 | 0.3 | 43.1 | 31.0 | 8.5 | 48.1 | 32.4 | 0.9 | 47.7 | 21.6 | 1.3 |
| LOS | D | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 34.9 | | | 28.7 | | | 25.8 | | | 28.8 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 81 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.72 | |
| Intersection Signal Delay (s/veh): 30.1 | Intersection LOS: C |
| Intersection Capacity Utilization 62.5% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 162 | 515 | 32 | 226 | 558 | 225 | 27 | 170 | 69 | 227 | 372 | 58 |
| Future Volume (veh/h) | 162 | 515 | 32 | 226 | 558 | 225 | 27 | 170 | 69 | 227 | 372 | 58 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 169 | 536 | 16 | 235 | 581 | 132 | 28 | 177 | 15 | 236 | 388 | 45 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 207 | 1023 | 315 | 330 | 1188 | 290 | 50 | 323 | 272 | 281 | 580 | 489 |
| Arrive On Green | 0.13 | 0.21 | 0.21 | 0.11 | 0.19 | 0.19 | 0.03 | 0.18 | 0.18 | 0.18 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1594 | 4837 | 1491 | 2910 | 6095 | 1486 | 1594 | 1772 | 1492 | 1594 | 1772 | 1495 |
| Grp Volume(v), veh/h | 169 | 536 | 16 | 235 | 581 | 132 | 28 | 177 | 15 | 236 | 388 | 45 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1491 | 1455 | 1524 | 1486 | 1594 | 1772 | 1492 | 1594 | 1772 | 1495 |
| Q Serve(g_s), s | 6.0 | 5.7 | 0.5 | 4.5 | 4.9 | 4.6 | 1.0 | 5.3 | 0.5 | 8.3 | 11.0 | 1.2 |
| Cycle Q Clear(g_c), s | 6.0 | 5.7 | 0.5 | 4.5 | 4.9 | 4.6 | 1.0 | 5.3 | 0.5 | 8.3 | 11.0 | 1.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 207 | 1023 | 315 | 330 | 1188 | 290 | 50 | 323 | 272 | 281 | 580 | 489 |
| V/C Ratio(X) | 0.82 | 0.52 | 0.05 | 0.71 | 0.49 | 0.46 | 0.56 | 0.55 | 0.06 | 0.84 | 0.67 | 0.09 |
| Avail Cap(c_a), veh/h | 329 | 2422 | 746 | 641 | 3135 | 764 | 165 | 1329 | 1119 | 441 | 1637 | 1381 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.6 | 20.3 | 18.3 | 24.9 | 20.8 | 20.7 | 27.8 | 21.6 | 19.6 | 23.1 | 16.8 | 13.6 |
| Incr Delay (d2), s/veh | 3.9 | 0.4 | 0.1 | 1.1 | 0.3 | 1.1 | 3.6 | 1.4 | 0.1 | 4.5 | 1.3 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 1.8 | 0.1 | 1.4 | 1.5 | 1.4 | 0.4 | 2.0 | 0.1 | 3.0 | 3.8 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.5 | 20.7 | 18.3 | 25.9 | 21.1 | 21.8 | 31.4 | 23.0 | 19.7 | 27.7 | 18.2 | 13.6 |
| LnGrp LOS | C | C | B | C | C | C | C | C | B | C | B | B |
| Approach Vol, veh/h | | 721 | | | 948 | | | 220 | | | 669 | |
| Approach Delay, s/veh | | 22.5 | | | 22.4 | | | 23.9 | | | 21.2 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.9 | 15.2 | 11.2 | 16.9 | 6.4 | 23.6 | 12.1 | 15.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 10.3 | 7.3 | 6.5 | 7.7 | 3.0 | 13.0 | 8.0 | 6.9 |
| Green Ext Time (p_c), s | 0.2 | 1.0 | 0.2 | 3.2 | 0.0 | 2.4 | 0.1 | 3.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.3 |
| HCM 7th LOS | C |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 93 | 497 | 223 | 340 | 687 | 142 | 345 | 305 | 261 | 171 | 358 | 81 |
| Future Volume (vph) | 93 | 497 | 223 | 340 | 687 | 142 | 345 | 305 | 261 | 171 | 358 | 81 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.6 | 19.9 | 19.9 | 9.0 | 25.0 | 25.0 | 8.0 | 17.4 | 17.4 | 6.9 | 16.3 | 16.3 |
| Actuated g/C Ratio | 0.09 | 0.27 | 0.27 | 0.12 | 0.34 | 0.34 | 0.11 | 0.24 | 0.24 | 0.09 | 0.22 | 0.22 |
| v/c Ratio | 0.32 | 0.38 | 0.39 | 0.84 | 0.60 | 0.24 | 0.97 | 0.27 | 0.48 | 0.56 | 0.48 | 0.20 |
| Control Delay (s/veh) | 40.1 | 22.0 | 5.4 | 54.0 | 23.6 | 5.0 | 77.4 | 23.4 | 7.1 | 44.1 | 26.9 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.1 | 22.0 | 5.4 | 54.0 | 23.6 | 5.0 | 77.4 | 23.4 | 7.1 | 44.1 | 26.9 | 5.7 |
| LOS | D | C | A | D | C | A | E | C | A | D | C | A |
| Approach Delay (s/veh) | | 19.5 | | | 30.2 | | | 39.1 | | | 28.9 | |
| Approach LOS | | B | | | C | | | D | | | C | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 73
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay (s/veh): 29.8 — Intersection LOS: C
Intersection Capacity Utilization 59.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

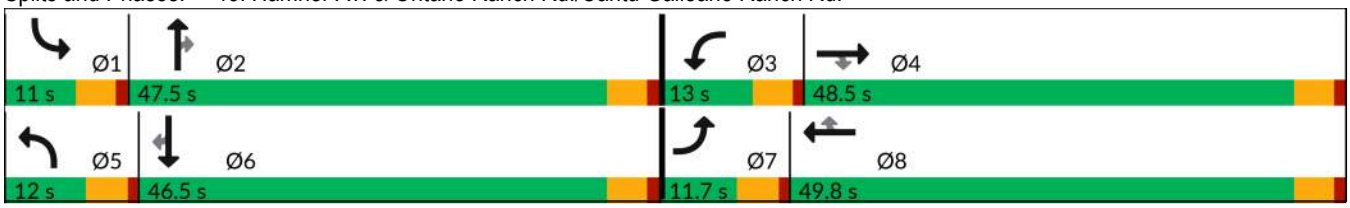

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 93 | 497 | 223 | 340 | 687 | 142 | 345 | 305 | 261 | 171 | 358 | 81 |
| Future Volume (veh/h) | 93 | 497 | 223 | 340 | 687 | 142 | 345 | 305 | 261 | 171 | 358 | 81 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 98 | 523 | 138 | 358 | 723 | 56 | 363 | 321 | 87 | 180 | 377 | 73 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 238 | 1213 | 376 | 468 | 1081 | 481 | 447 | 1139 | 346 | 285 | 626 | 275 |
| Arrive On Green | 0.07 | 0.24 | 0.24 | 0.14 | 0.30 | 0.30 | 0.13 | 0.22 | 0.22 | 0.08 | 0.18 | 0.18 |
| Sat Flow, veh/h | 3456 | 5106 | 1583 | 3456 | 3554 | 1582 | 3456 | 5106 | 1552 | 3456 | 3554 | 1562 |
| Grp Volume(v), veh/h | 98 | 523 | 138 | 358 | 723 | 56 | 363 | 321 | 87 | 180 | 377 | 73 |
| Grp Sat Flow(s),veh/h/ln | 1728 | 1702 | 1583 | 1728 | 1777 | 1582 | 1728 | 1702 | 1552 | 1728 | 1777 | 1562 |
| Q Serve(g_s), s | 1.6 | 5.0 | 4.2 | 5.7 | 10.2 | 1.5 | 5.8 | 3.0 | 2.6 | 2.9 | 5.6 | 2.3 |
| Cycle Q Clear(g_c), s | 1.6 | 5.0 | 4.2 | 5.7 | 10.2 | 1.5 | 5.8 | 3.0 | 2.6 | 2.9 | 5.6 | 2.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 238 | 1213 | 376 | 468 | 1081 | 481 | 447 | 1139 | 346 | 285 | 626 | 275 |
| V/C Ratio(X) | 0.41 | 0.43 | 0.37 | 0.76 | 0.67 | 0.12 | 0.81 | 0.28 | 0.25 | 0.63 | 0.60 | 0.27 |
| Avail Cap(c_a), veh/h | 429 | 3916 | 1214 | 507 | 2806 | 1249 | 447 | 3827 | 1163 | 386 | 2602 | 1144 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.5 | 18.5 | 18.2 | 23.9 | 17.4 | 14.4 | 24.2 | 18.4 | 18.3 | 25.4 | 21.7 | 20.4 |
| Incr Delay (d2), s/veh | 0.4 | 0.2 | 0.6 | 5.5 | 0.7 | 0.1 | 10.2 | 0.1 | 0.4 | 0.9 | 0.9 | 0.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 1.6 | 1.3 | 2.3 | 3.3 | 0.4 | 2.7 | 1.0 | 0.8 | 1.1 | 2.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.0 | 18.8 | 18.8 | 29.3 | 18.1 | 14.5 | 34.4 | 18.6 | 18.7 | 26.3 | 22.7 | 20.9 |
| LnGrp LOS | C | B | B | C | B | B | C | B | B | C | C | C |
| Approach Vol, veh/h | | 759 | | | 1137 | | | 771 | | | 630 | |
| Approach Delay, s/veh | | 19.7 | | | 21.5 | | | 26.1 | | | 23.5 | |
| Approach LOS | | B | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.3 | 17.4 | 12.4 | 18.2 | 12.0 | 14.7 | 8.5 | 22.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 4.9 | 5.0 | 7.7 | 7.0 | 7.8 | 7.6 | 3.6 | 12.2 |
| Green Ext Time (p_c), s | 0.0 | 2.3 | 0.1 | 3.7 | 0.0 | 2.5 | 0.0 | 4.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.5 |
| HCM 7th LOS | C |

| Lane Group | EBR | WBR | SBL | SBT | SBR | Ø6 |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 894 | 575 | 245 | 0 | 1217 | |
| Future Volume (vph) | 894 | 575 | 245 | 0 | 1217 | |
| Turn Type | Perm | Free | Perm | NA | Perm | |
| Protected Phases | | | | 4 | | 6 |
| Permitted Phases | 2 | Free | 4 | | 4 | |
| Detector Phase | 2 | | 4 | 4 | 4 | |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | | 22.5 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | | 73.0 | 73.0 | 73.0 | 47.0 |
| Total Split (%) | 39.2% | | 60.8% | 60.8% | 60.8% | 39% |
| Yellow Time (s) | 5.5 | | 3.6 | 3.6 | 3.6 | 5.5 |
| All-Red Time (s) | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 6.5 | | 4.6 | 4.6 | 4.6 | |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | C-Min | | Min | Min | Min | C-Min |
| Act Effct Green (s) | 76.9 | 120.0 | 32.0 | 32.0 | 32.0 | |
| Actuated g/C Ratio | 0.64 | 1.00 | 0.27 | 0.27 | 0.27 | |
| v/c Ratio | 0.72 | 0.23 | 0.52 | 0.76 | 0.74 | |
| Control Delay (s/veh) | 3.7 | 0.4 | 39.7 | 8.8 | 7.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay (s/veh) | 3.7 | 0.4 | 39.7 | 8.8 | 7.5 | |
| LOS | A | A | D | A | A | |
| Approach Delay (s/veh) | | | | 12.9 | | |
| Approach LOS | | | | B | | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 8.1 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 45 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay (s/veh): 7.6 | Intersection LOS: A |
| Intersection Capacity Utilization 83.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

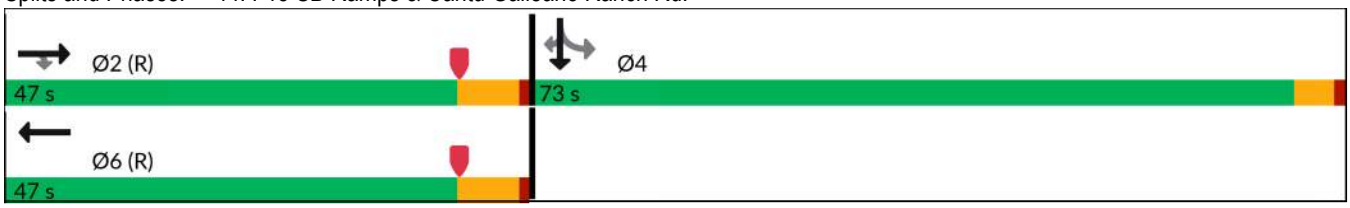

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 894 | 0 | 0 | 575 | 0 | 0 | 0 | 245 | 0 | 1217 |
| Future Volume (veh/h) | 0 | 0 | 894 | 0 | 0 | 575 | 0 | 0 | 0 | 245 | 0 | 1217 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 0 | 1870 | 1870 | | | | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 0 | 0 | 0 | | | | 181 | 0 | 1230 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2669 | | 0 | 1779 | | | | | 769 | 0 | 1369 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | 0.43 | 0.00 | 0.43 |
| Sat Flow, veh/h | 0 | 5611 | 1585 | 0 | 3741 | 2790 | | | | 1781 | 0 | 3170 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 0 | 0 | 0 | | | | 181 | 0 | 1230 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 0 | 1870 | 1395 | | | | 1781 | 0 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 7.7 | 0.0 | 43.2 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 7.7 | 0.0 | 43.2 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2669 | | 0 | 1779 | | | | | 769 | 0 | 1369 |
| V/C Ratio(X) | 0.00 | 0.00 | | 0.00 | 0.00 | | | | | 0.24 | 0.00 | 0.90 |
| Avail Cap(c_a), veh/h | 0 | 2669 | | 0 | 1779 | | | | | 1015 | 0 | 1807 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 21.6 | 0.0 | 31.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.2 | 0.0 | 5.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 3.1 | 0.0 | 16.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 21.7 | 0.0 | 36.9 |
| LnGrp LOS | | | | | | | | | | C | | D |
| Approach Vol, veh/h | | 0 | | | 0 | | | | | | 1411 | |
| Approach Delay, s/veh | | 0.0 | | | 0.0 | | | | | | 34.9 | |
| Approach LOS | | | | | | | | | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 63.6 | 56.4 | 63.6 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 0.0 | 45.2 | 0.0 |
| Green Ext Time (p_c), s | 0.0 | 6.6 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 34.9 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 550 | 589 | 146 | 342 | 383 | 124 |
| Future Volume (vph) | 550 | 589 | 146 | 342 | 383 | 124 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 73.8 | 73.8 | 10.7 | 89.1 | 19.8 | 19.8 |
| Actuated g/C Ratio | 0.62 | 0.62 | 0.09 | 0.74 | 0.17 | 0.17 |
| v/c Ratio | 0.17 | 0.53 | 0.50 | 0.09 | 0.74 | 0.33 |
| Control Delay (s/veh) | 12.4 | 5.6 | 57.3 | 4.6 | 54.8 | 9.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 12.4 | 5.6 | 57.3 | 4.6 | 54.8 | 9.7 |
| LOS | B | A | E | A | D | A |
| Approach Delay (s/veh) | 8.9 | | | 20.4 | 44.9 | |
| Approach LOS | A | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 15.4 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.74 | |
| Intersection Signal Delay (s/veh): 20.1 | Intersection LOS: C |
| Intersection Capacity Utilization 49.9% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

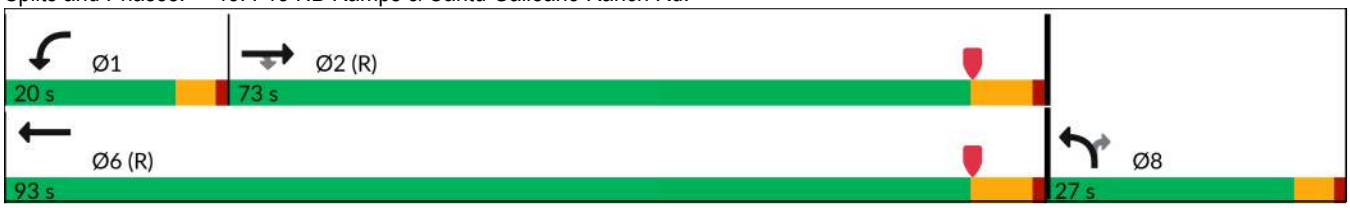

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 550 | 589 | 146 | 342 | 383 | 124 |
| Future Volume (veh/h) | 550 | 589 | 146 | 342 | 383 | 124 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 0.98 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 598 | 399 | 159 | 372 | 416 | 75 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3747 | 1037 | 222 | 4312 | 495 | 220 |
| Arrive On Green | 1.00 | 1.00 | 0.06 | 0.77 | 0.14 | 0.14 |
| Sat Flow, veh/h | 5611 | 1552 | 3563 | 5611 | 3563 | 1585 |
| Grp Volume(v), veh/h | 598 | 399 | 159 | 372 | 416 | 75 |
| Grp Sat Flow(s),veh/h/ln | 1870 | 1552 | 1781 | 1870 | 1781 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 5.3 | 2.0 | 13.7 | 5.1 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 5.3 | 2.0 | 13.7 | 5.1 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3747 | 1037 | 222 | 4312 | 495 | 220 |
| V/C Ratio(X) | 0.16 | 0.38 | 0.72 | 0.09 | 0.84 | 0.34 |
| Avail Cap(c_a), veh/h | 3747 | 1037 | 457 | 4312 | 665 | 296 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.84 | 0.84 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 55.2 | 3.4 | 50.4 | 46.7 |
| Incr Delay (d2), s/veh | 0.1 | 0.9 | 4.3 | 0.0 | 7.2 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.3 | 2.4 | 0.5 | 6.4 | 2.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.1 | 0.9 | 59.5 | 3.5 | 57.5 | 47.6 |
| LnGrp LOS | A | A | E | A | E | D |
| Approach Vol, veh/h | 997 | | | 531 | 491 | |
| Approach Delay, s/veh | 0.4 | | | 20.3 | 56.0 | |
| Approach LOS | A | | | C | E | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.1 | 86.6 | | | | 98.7 | 21.3 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 7.3 | 2.0 | | | | 4.0 | 15.7 |
| Green Ext Time (p_c), s | 0.3 | 5.6 | | | | 2.3 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.2 |
| HCM 7th LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

# APPENDIX 3.3:

# EXISTING (2024) SIGNAL WARRANT ANALYSIS

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# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday AM Peak Hour**

Major Street Name = **Riverside Dr.**
Total of Both Approaches (VPH) = **1463**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Bon View Av.**
High Volume Approach (VPH) = **125**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

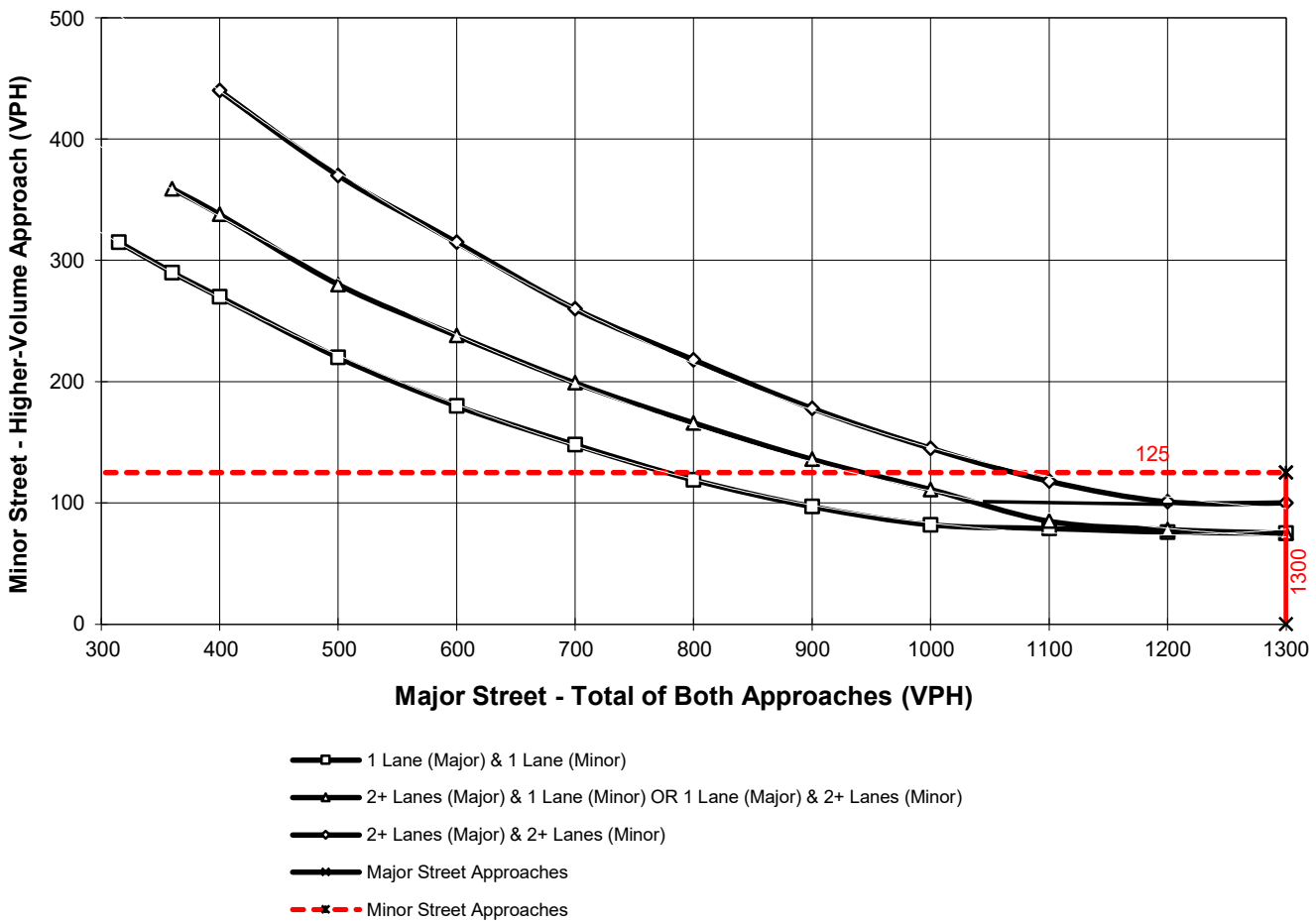


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

## Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday AM Peak Hour**

Major Street Name = **Bon View Av.**

Total of Both Approaches (VPH) = **340**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **197**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

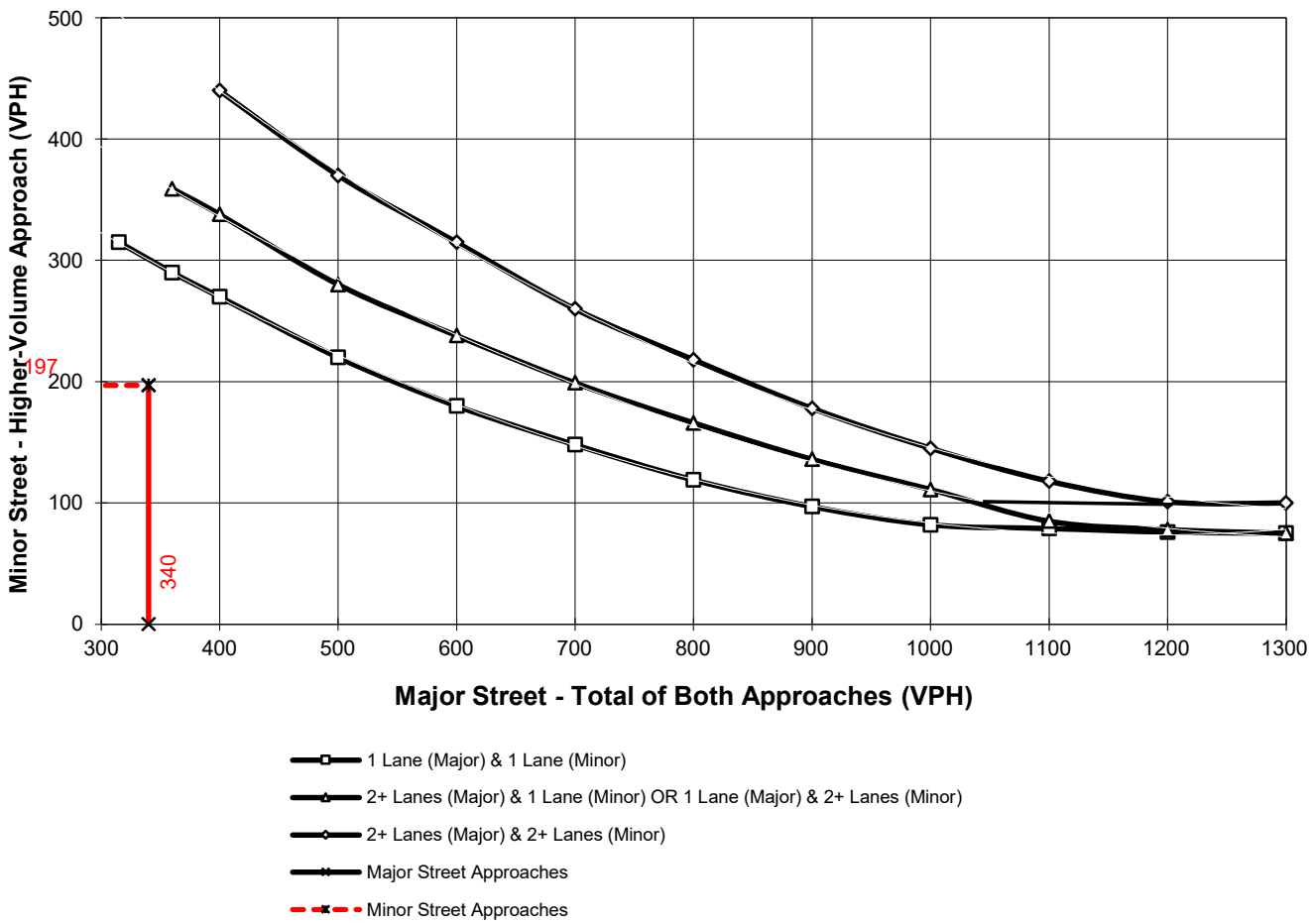


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday AM Peak Hour**

Major Street Name = **Edison Av.**

Total of Both Approaches (VPH) = **585**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Bon View Av.**

High Volume Approach (VPH) = **201**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

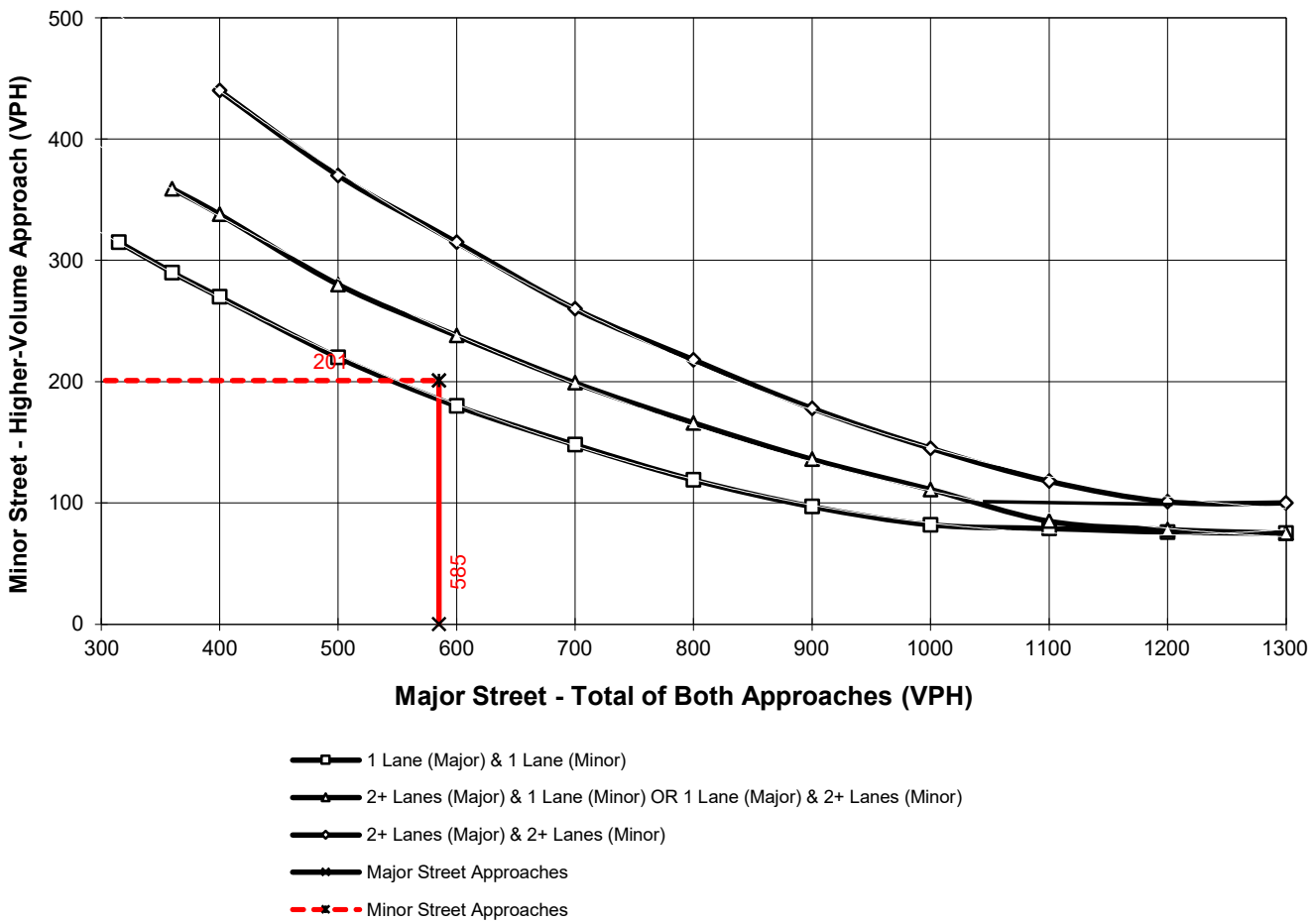


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday AM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **171**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Bon View Av.**
High Volume Approach (VPH) = **45**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

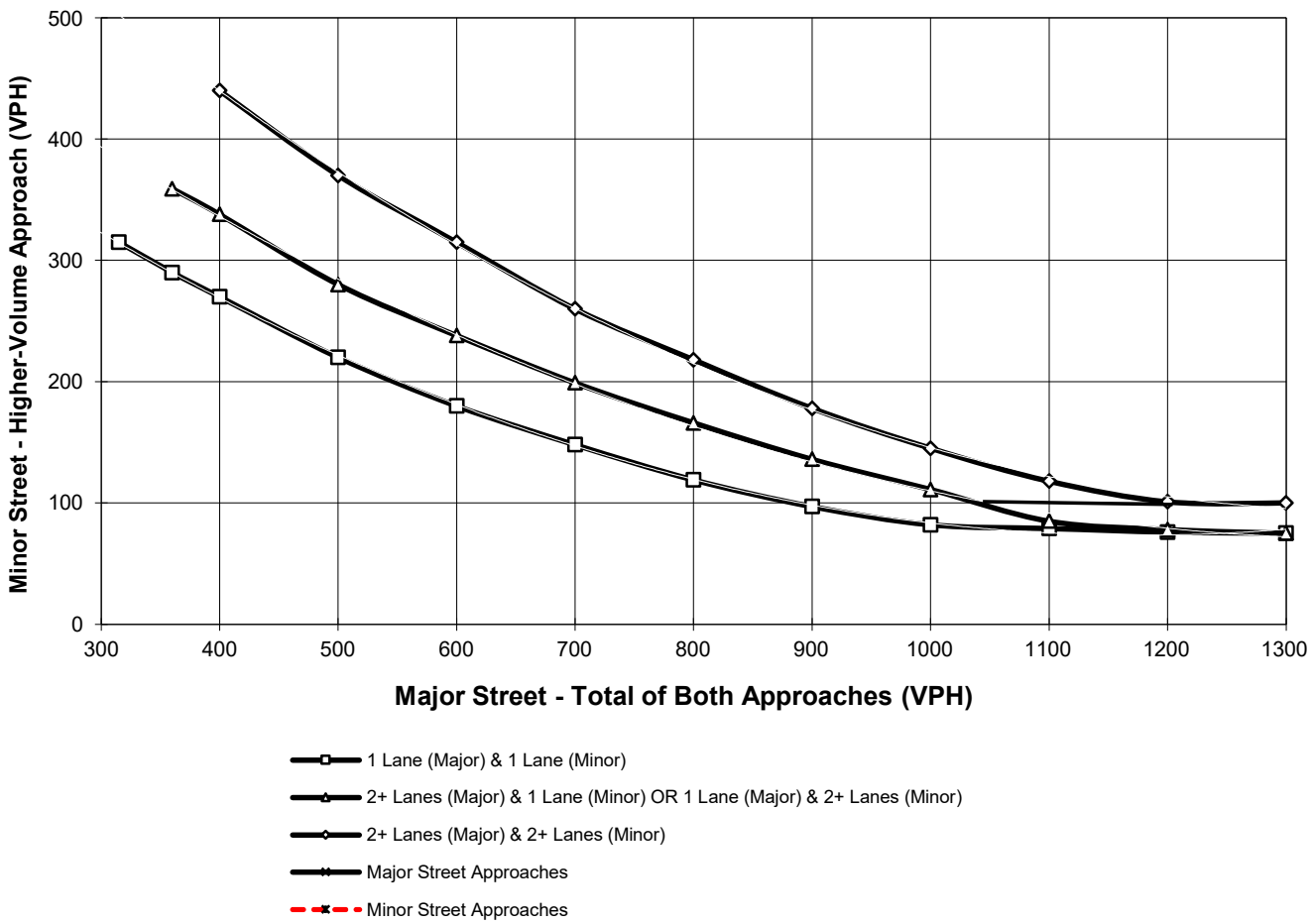


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday PM Peak Hour**

Major Street Name = **Grove Av.**

Total of Both Approaches (VPH) = **637**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Chino Av.**

High Volume Approach (VPH) = **335**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

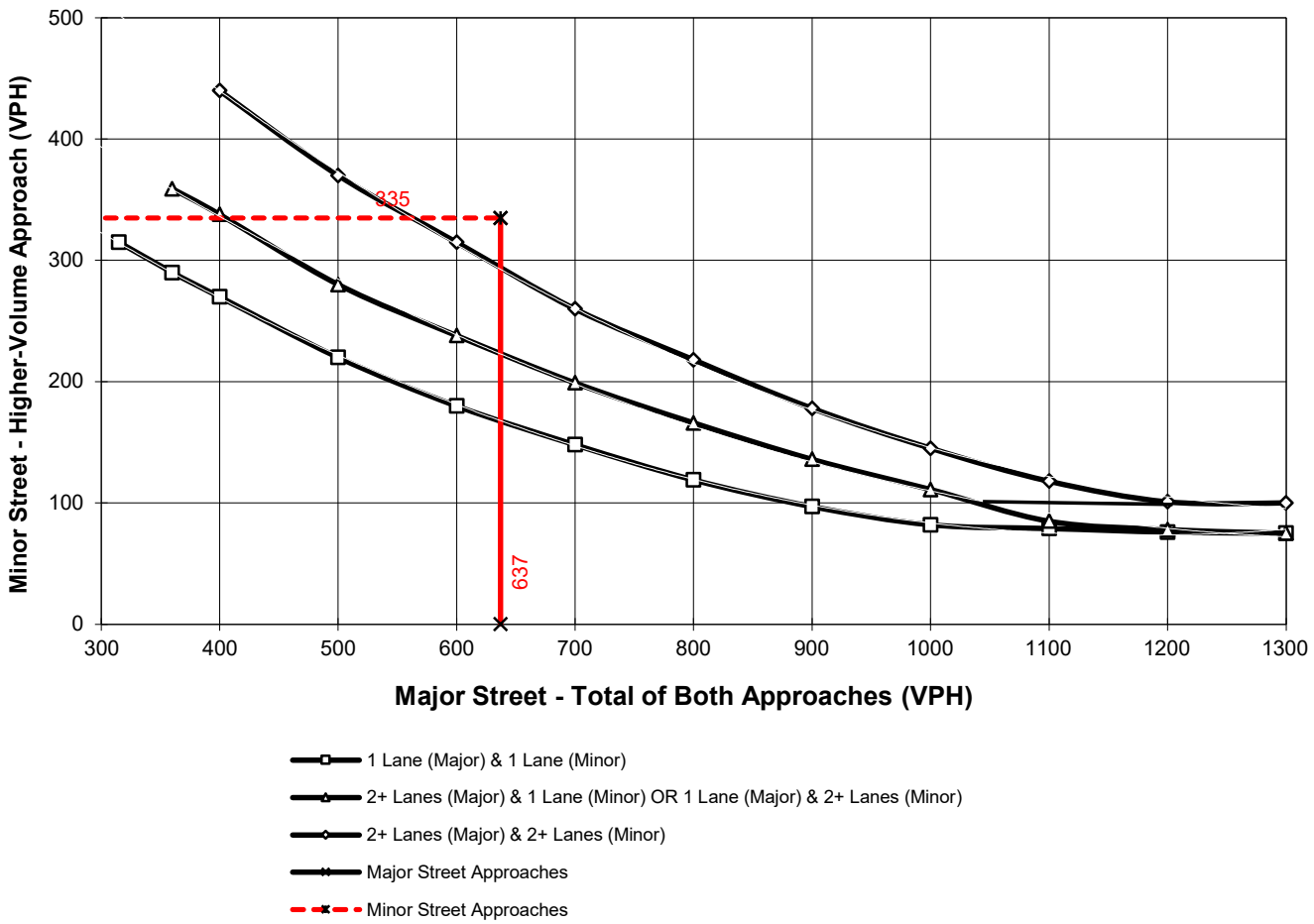


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday PM Peak Hour**

Major Street Name = **Grove Av.**

Total of Both Approaches (VPH) = **526**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **311**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

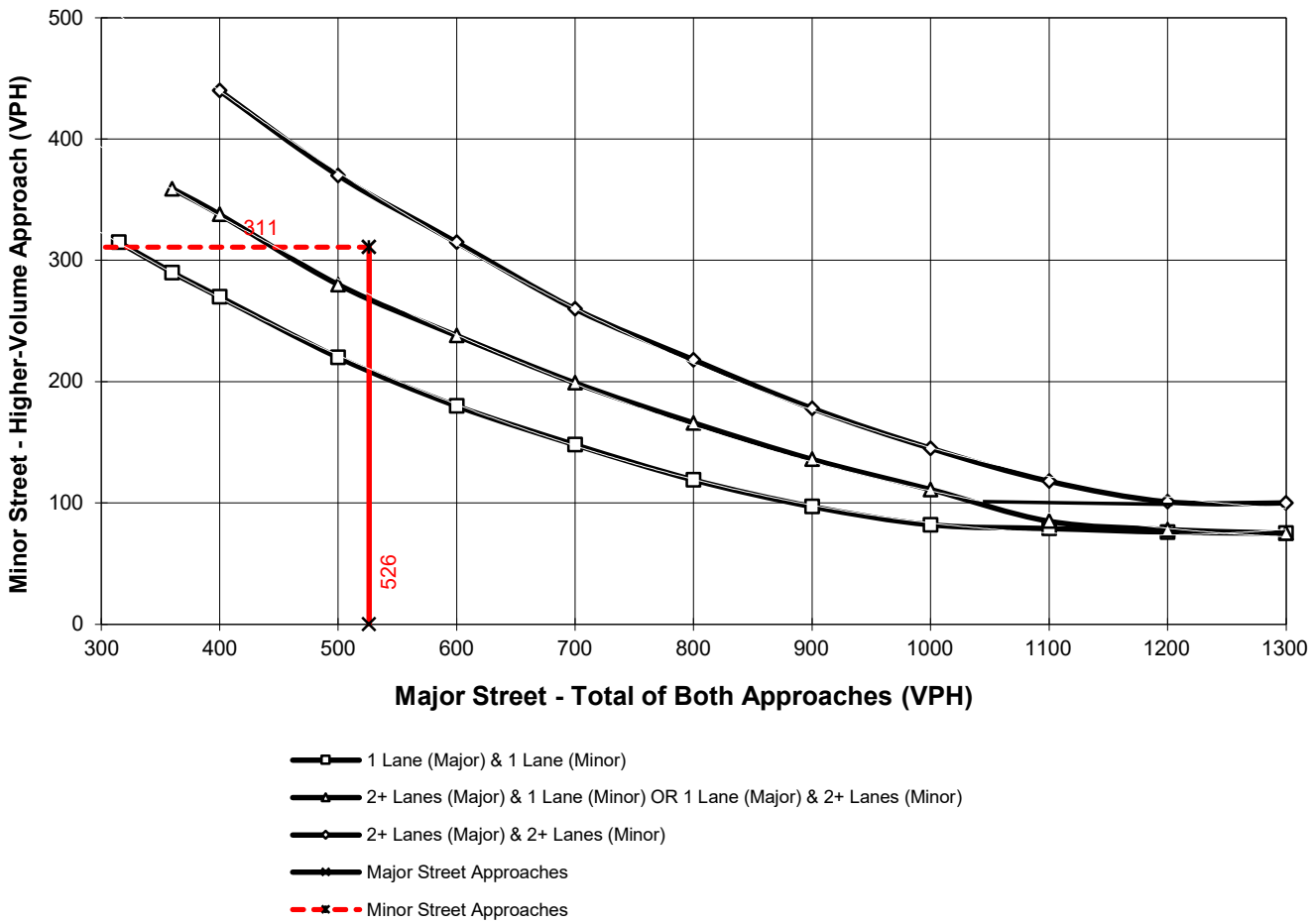


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday PM Peak Hour**

Major Street Name = **Grove Av.**

Total of Both Approaches (VPH) = **531**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Edison Av.**

High Volume Approach (VPH) = **320**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

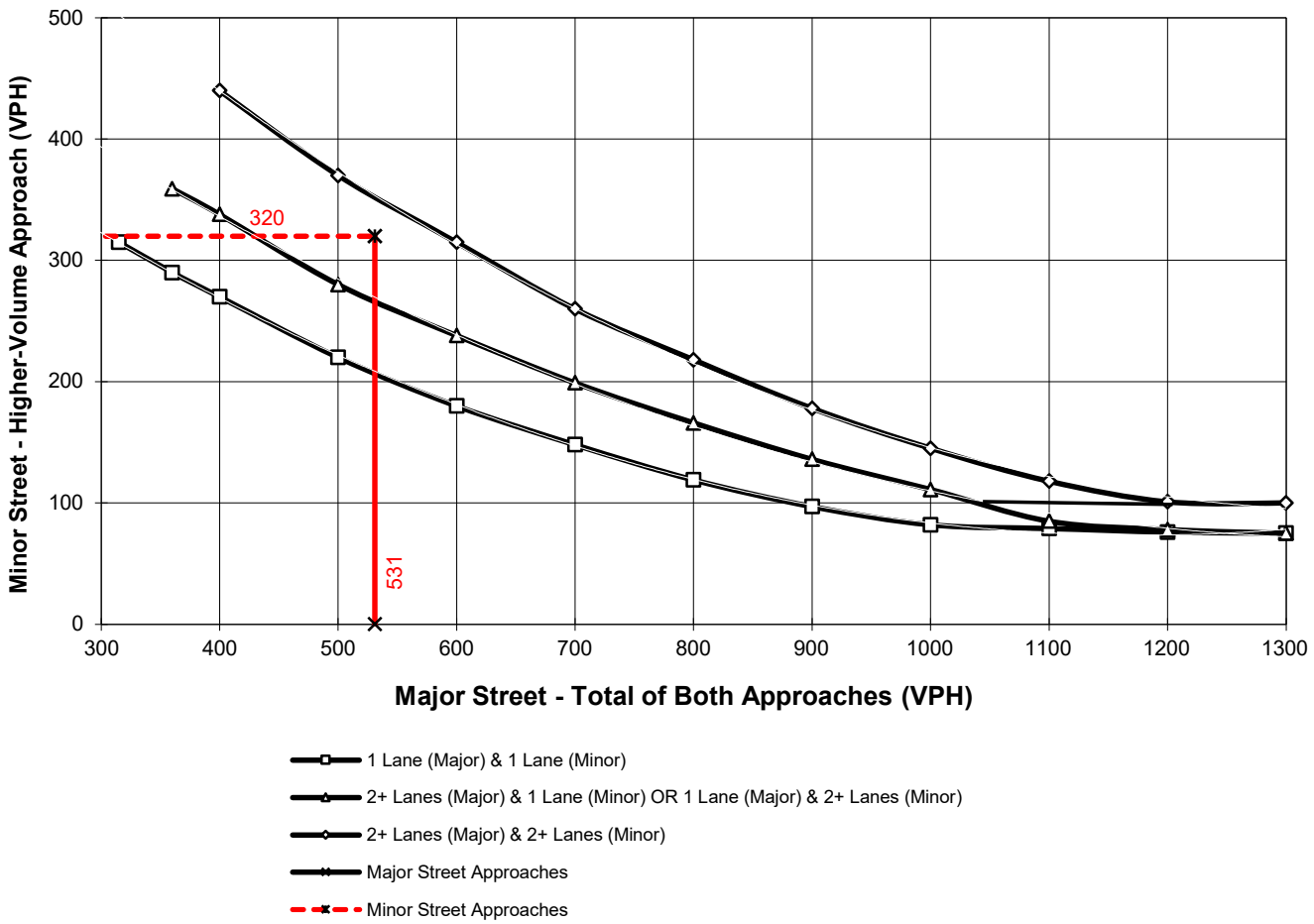


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday PM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **448**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Grove Av.**
High Volume Approach (VPH) = **316**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

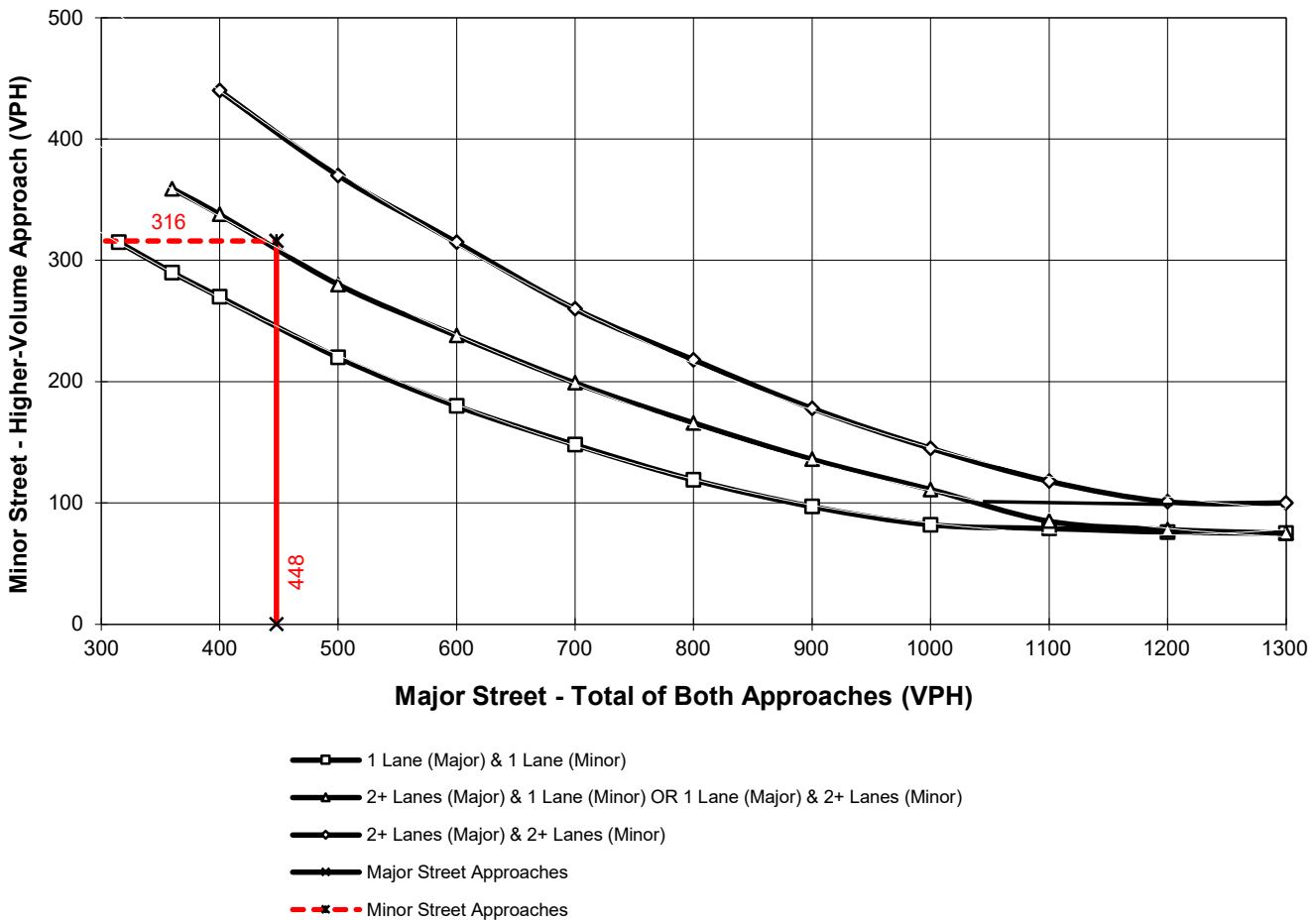


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday AM Peak Hour**

Major Street Name = **Riverside Dr.**
Total of Both Approaches (VPH) = **1278**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Walker Av.**
High Volume Approach (VPH) = **206**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

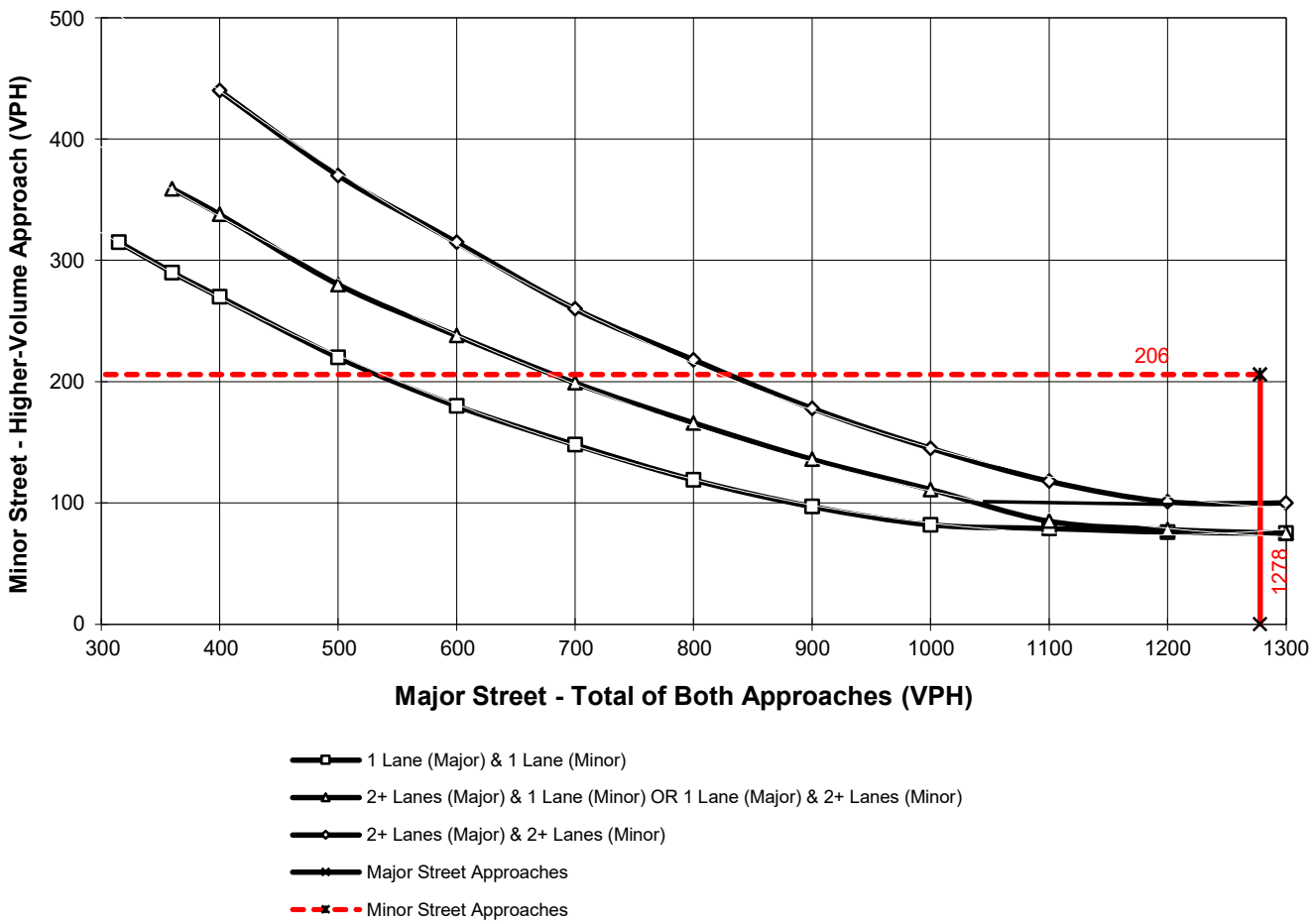


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday PM Peak Hour**

Major Street Name = **Walker Av.**

Total of Both Approaches (VPH) = **289**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **230**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

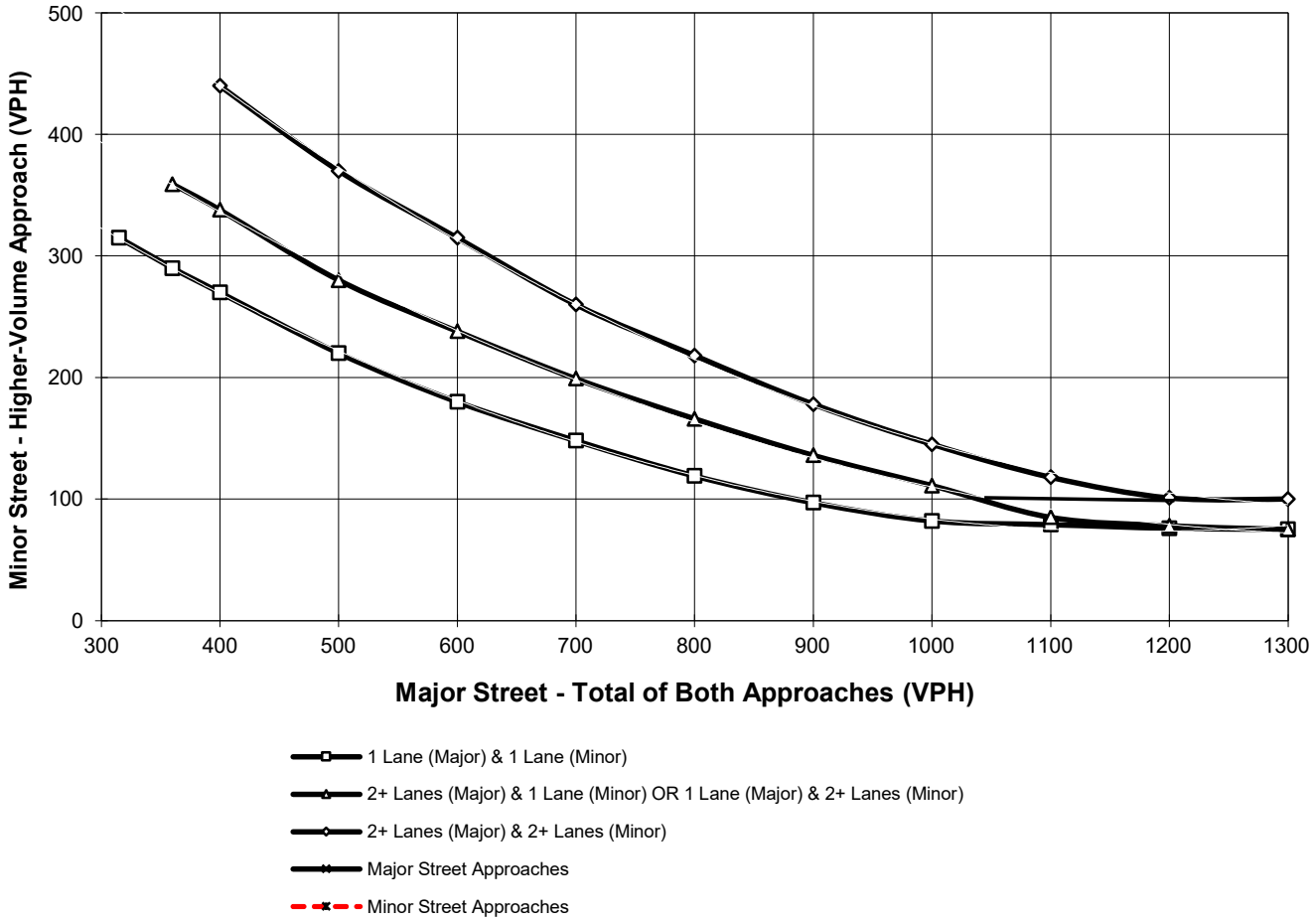


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday PM Peak Hour**

Major Street Name = **Ontario Ranch Rd.**
Total of Both Approaches (VPH) = **719**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Walker Av.**
High Volume Approach (VPH) = **208**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

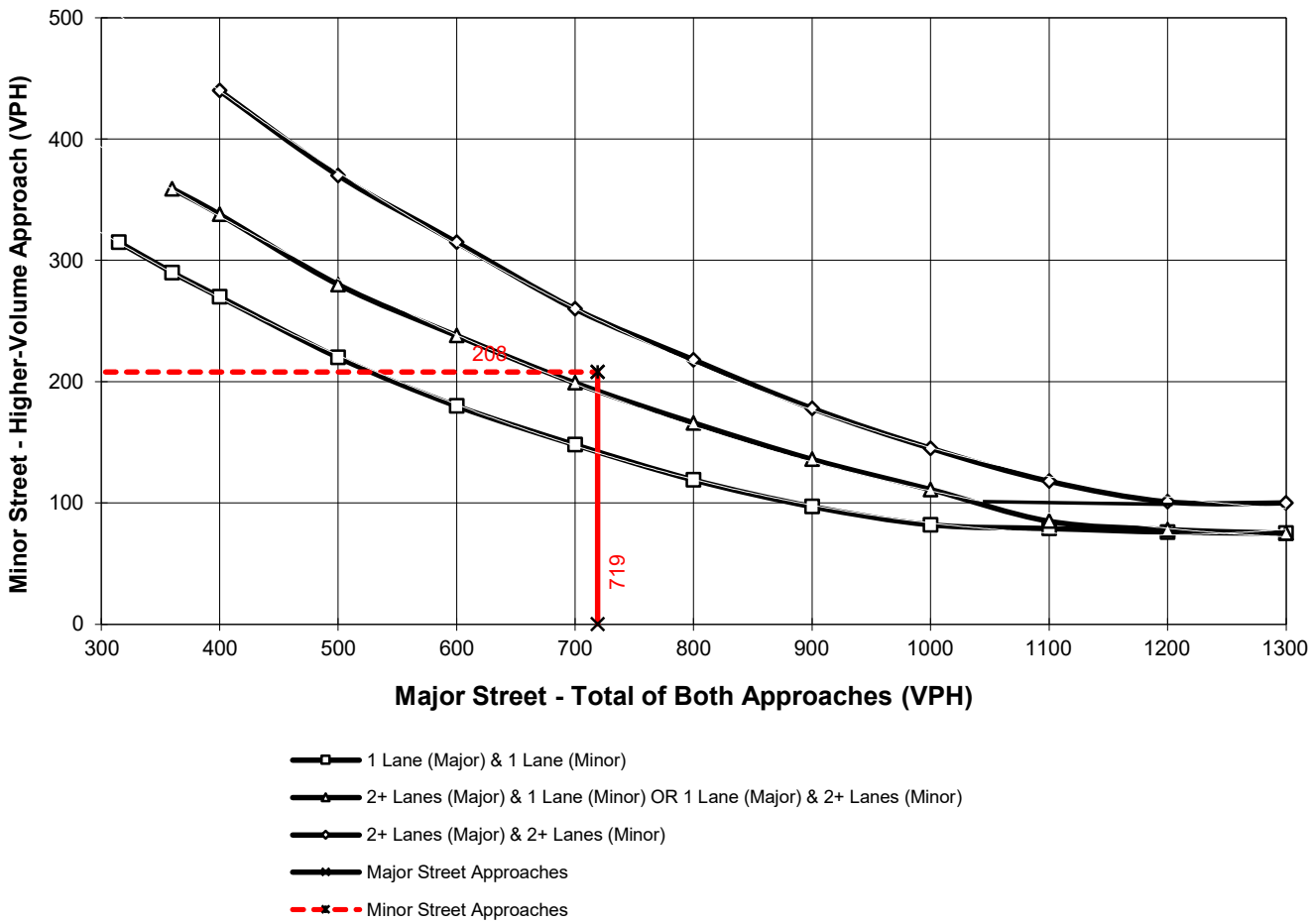


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **Existing (2024) Conditions - Weekday PM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **671**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Walker Av.**
High Volume Approach (VPH) = **94**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

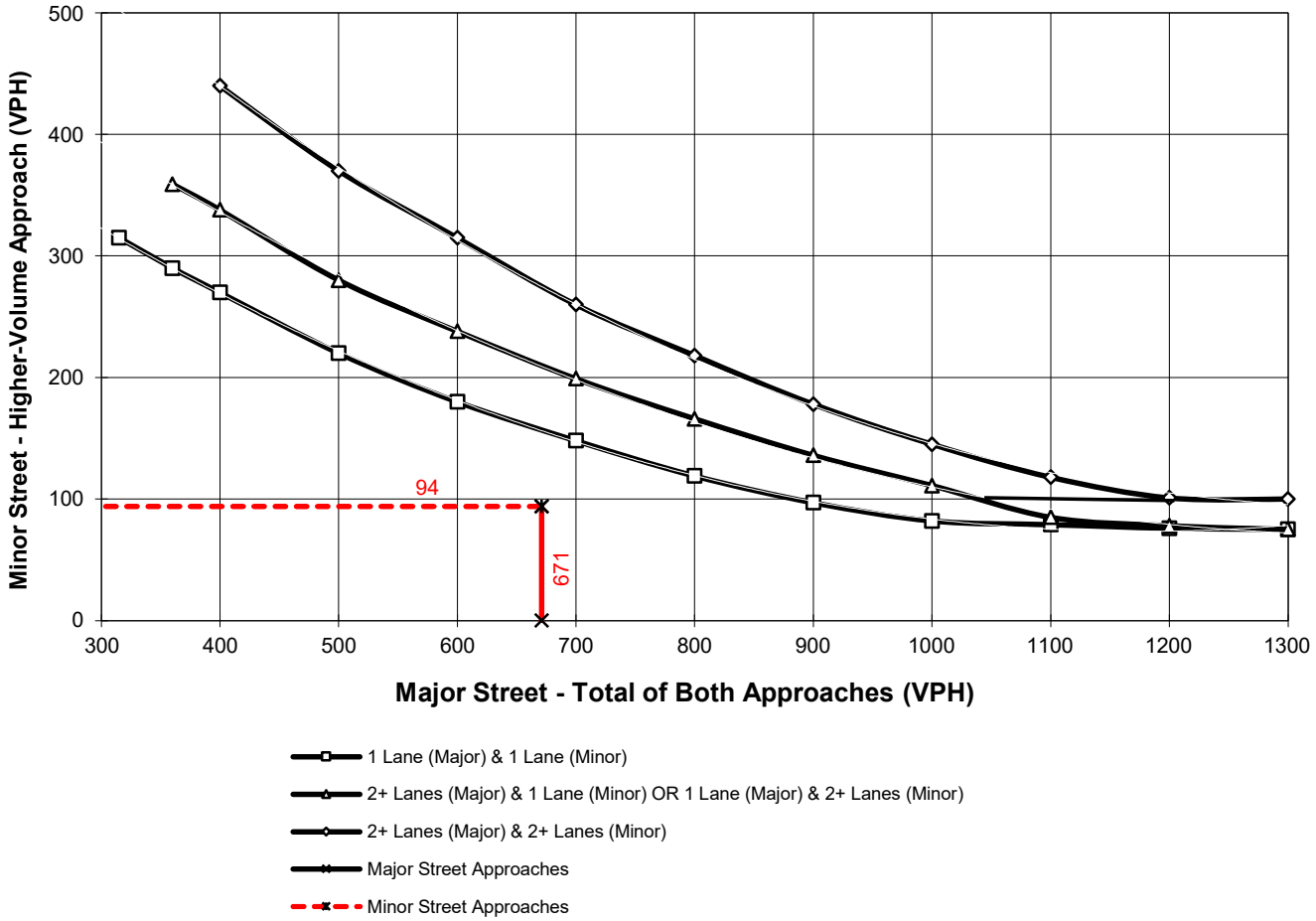


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# APPENDIX 3.4:

# EXISTING (2024) QUEUING ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 280 | 264 | 257 | 285 | 728 | 798 | 492 |
| v/c Ratio | 0.75 | 0.54 | 0.51 | 0.78 | 0.33 | 0.61 | 0.56 |
| Control Delay (s/veh) | 45.3 | 12.3 | 9.6 | 54.1 | 8.4 | 27.1 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.3 | 12.3 | 9.6 | 54.1 | 8.4 | 27.1 | 5.1 |
| Queue Length 50th (ft) | 152 | 28 | 13 | 178 | 91 | 202 | 0 |
| Queue Length 95th (ft) | 245 | 106 | 81 | m257 | 143 | 278 | 71 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 410 | 513 | 533 | 428 | 2235 | 1301 | 880 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.51 | 0.48 | 0.67 | 0.33 | 0.61 | 0.56 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 318 | 1 | 209 | 654 | 402 | 348 | 736 |
| v/c Ratio | 0.78 | no cap | 0.40 | 0.56 | 0.52 | 0.82 | 0.33 |
| Control Delay (s/veh) | 45.9 | | 6.5 | 28.6 | 5.6 | 59.7 | 7.9 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.9 | Error | 6.5 | 28.6 | 5.6 | 59.7 | 7.9 |
| Queue Length 50th (ft) | 164 | 0 | 0 | 168 | 0 | 217 | 80 |
| Queue Length 95th (ft) | #260 | 0 | 52 | 237 | 70 | 305 | 130 |
| Internal Link Dist (ft) | | 1421 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 452 | 1 | 560 | 1170 | 779 | 497 | 2208 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 1.00 | 0.37 | 0.56 | 0.52 | 0.70 | 0.33 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 914 | 718 | 937 | 51 | 591 |
| v/c Ratio | 0.83 | 0.93 | 0.33 | 0.16 | 0.86 |
| Control Delay (s/veh) | 36.5 | 48.3 | 3.5 | 41.2 | 17.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.5 | 48.3 | 3.5 | 41.2 | 17.8 |
| Queue Length 50th (ft) | 185 | 385 | 55 | 15 | 0 |
| Queue Length 95th (ft) | #370 | #676 | 108 | 31 | #149 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1633 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 1098 | 771 | 2812 | 463 | 724 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.83 | 0.93 | 0.33 | 0.11 | 0.82 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 657 | 188 | 298 | 49 | 274 | 307 | 305 | 41 |
| v/c Ratio | 0.59 | 0.76 | 0.17 | 0.31 | 0.70 | 0.79 | 0.77 | 0.09 |
| Control Delay (s/veh) | 33.1 | 57.6 | 12.5 | 47.7 | 15.8 | 50.2 | 49.0 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.1 | 57.6 | 12.5 | 47.7 | 15.8 | 50.2 | 49.0 | 0.4 |
| Queue Length 50th (ft) | 185 | 116 | 54 | 30 | 0 | 192 | 190 | 0 |
| Queue Length 95th (ft) | 265 | #212 | 91 | 64 | 69 | 267 | 234 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 1113 | 268 | 1782 | 196 | 419 | 487 | 492 | 556 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.59 | 0.70 | 0.17 | 0.25 | 0.65 | 0.63 | 0.62 | 0.07 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 175 | 378 | 324 | 904 | 648 | 487 |
| v/c Ratio | 0.49 | 0.86 | 0.83 | 0.38 | 0.48 | 0.54 |
| Control Delay (s/veh) | 35.5 | 38.5 | 44.7 | 9.2 | 24.6 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.5 | 38.5 | 44.7 | 9.4 | 24.6 | 5.1 |
| Queue Length 50th (ft) | 88 | 123 | 199 | 154 | 147 | 0 |
| Queue Length 95th (ft) | 142 | 221 | m238 | m175 | 230 | 75 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 458 | 523 | 475 | 2373 | 1361 | 908 |
| Starvation Cap Reductn | 0 | 0 | 0 | 666 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.38 | 0.72 | 0.68 | 0.53 | 0.48 | 0.54 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 424 | 128 | 1082 | 290 | 511 |
| v/c Ratio | 0.89 | 0.25 | 0.88 | 0.89 | 0.24 |
| Control Delay (s/veh) | 52.5 | 5.8 | 36.4 | 74.8 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.5 | 5.8 | 36.4 | 74.8 | 7.5 |
| Queue Length 50th (ft) | 223 | 0 | 290 | 182 | 39 |
| Queue Length 95th (ft) | #368 | 39 | #421 | #341 | 75 |
| Internal Link Dist (ft) | 1339 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 532 | 564 | 1225 | 325 | 2087 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.23 | 0.88 | 0.89 | 0.24 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 217 | 207 | 200 | 654 | 856 | 383 | 82 |
| v/c Ratio | 0.72 | 0.63 | 0.46 | 0.83 | 0.24 | 0.15 | 0.12 |
| Control Delay (s/veh) | 48.3 | 32.2 | 8.5 | 43.7 | 3.1 | 18.3 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.3 | 32.2 | 8.5 | 43.7 | 3.1 | 18.3 | 3.1 |
| Queue Length 50th (ft) | 121 | 80 | 0 | 190 | 11 | 40 | 0 |
| Queue Length 95th (ft) | #216 | 162 | 58 | 247 | 4 | 59 | 20 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 337 | 355 | 462 | 859 | 3561 | 2687 | 713 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.64 | 0.58 | 0.43 | 0.76 | 0.24 | 0.14 | 0.12 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 188 | 178 | 174 | 1258 | 609 | 114 | 560 |
| v/c Ratio | 0.65 | 0.48 | 0.43 | 0.33 | 0.52 | 0.45 | 0.16 |
| Control Delay (s/veh) | 44.3 | 12.9 | 8.2 | 10.9 | 2.9 | 62.3 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.3 | 12.9 | 8.2 | 10.9 | 2.9 | 62.3 | 0.8 |
| Queue Length 50th (ft) | 106 | 18 | 0 | 105 | 0 | 32 | 1 |
| Queue Length 95th (ft) | 164 | 75 | 51 | 147 | 51 | m62 | 7 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 398 | 459 | 489 | 3793 | 1172 | 260 | 3554 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.39 | 0.36 | 0.33 | 0.52 | 0.44 | 0.16 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 787 | 472 | 137 | 232 | 438 | 429 |
| v/c Ratio | 0.22 | 0.20 | 0.05 | 0.48 | 0.78 | 0.77 |
| Control Delay (s/veh) | 10.9 | 21.7 | 0.0 | 38.0 | 32.7 | 31.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 10.9 | 21.7 | 0.0 | 38.0 | 32.7 | 31.7 |
| Queue Length 50th (ft) | 79 | 133 | 0 | 151 | 196 | 188 |
| Queue Length 95th (ft) | 140 | 197 | 0 | 185 | 261 | 253 |
| Internal Link Dist (ft) | 1992 | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | 180 | | | |
| Base Capacity (vph) | 3556 | 2371 | 2787 | 1008 | 983 | 977 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.22 | 0.20 | 0.05 | 0.23 | 0.45 | 0.44 |

Intersection Summary

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 393 | 631 | 191 | 290 | 342 | 156 |
| v/c Ratio | 0.11 | 0.51 | 0.55 | 0.07 | 0.69 | 0.44 |
| Control Delay (s/veh) | 7.0 | 4.2 | 57.3 | 3.7 | 55.2 | 10.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.0 | 4.2 | 57.3 | 3.7 | 55.2 | 10.9 |
| Queue Length 50th (ft) | 26 | 99 | 71 | 15 | 124 | 0 |
| Queue Length 95th (ft) | 34 | 205 | 106 | 26 | 166 | 59 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 3535 | 1233 | 454 | 4298 | 662 | 422 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.11 | 0.51 | 0.42 | 0.07 | 0.52 | 0.37 |

Intersection Summary

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 272 | 260 | 249 | 236 | 803 | 878 | 526 |
| v/c Ratio | 0.74 | 0.68 | 0.52 | 0.75 | 0.36 | 0.62 | 0.57 |
| Control Delay (s/veh) | 44.9 | 32.5 | 12.2 | 41.6 | 2.0 | 25.3 | 4.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.9 | 32.5 | 12.2 | 41.6 | 2.0 | 25.3 | 4.8 |
| Queue Length 50th (ft) | 147 | 106 | 26 | 57 | 6 | 219 | 0 |
| Queue Length 95th (ft) | 237 | 197 | 96 | 128 | 10 | 295 | 69 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 410 | 420 | 508 | 369 | 2249 | 1413 | 926 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.66 | 0.62 | 0.49 | 0.64 | 0.36 | 0.62 | 0.57 |

Intersection Summary

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 240 | 2 | 197 | 746 | 383 | 345 | 852 |
| v/c Ratio | 0.70 | no cap | 0.43 | 0.54 | 0.46 | 0.79 | 0.35 |
| Control Delay (s/veh) | 44.8 | | 8.1 | 24.8 | 4.7 | 35.6 | 12.7 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.8 | Error | 8.1 | 24.8 | 4.7 | 35.6 | 12.7 |
| Queue Length 50th (ft) | 123 | 0 | 2 | 181 | 0 | 173 | 198 |
| Queue Length 95th (ft) | 200 | 0 | 56 | 261 | 63 | 248 | 241 |
| Internal Link Dist (ft) | | 1372 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 401 | 1 | 502 | 1384 | 836 | 536 | 2437 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 2.00 | 0.39 | 0.54 | 0.46 | 0.64 | 0.35 |

Intersection Summary

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 981 | 479 | 807 | 112 | 856 |
| v/c Ratio | 0.97 | 1.00 | 0.38 | 0.11 | 1.02 |
| Control Delay (s/veh) | 57.6 | 80.1 | 10.8 | 26.9 | 52.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 57.6 | 80.1 | 10.8 | 26.9 | 52.0 |
| Queue Length 50th (ft) | 342 | ~307 | 128 | 27 | ~317 |
| Queue Length 95th (ft) | #442 | #516 | 166 | 48 | #555 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1637 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 1008 | 477 | 2137 | 978 | 836 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.97 | 1.00 | 0.38 | 0.11 | 1.02 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 419 | 74 | 208 | 30 | 136 | 353 | 354 | 65 |
| v/c Ratio | 0.33 | 0.47 | 0.13 | 0.20 | 0.50 | 0.78 | 0.77 | 0.12 |
| Control Delay (s/veh) | 26.9 | 58.5 | 12.4 | 45.4 | 12.8 | 44.8 | 44.1 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 26.9 | 58.5 | 12.4 | 45.4 | 12.8 | 44.8 | 44.1 | 0.5 |
| Queue Length 50th (ft) | 101 | 51 | 25 | 18 | 0 | 217 | 217 | 0 |
| Queue Length 95th (ft) | 175 | 70 | 49 | 46 | 47 | 284 | 285 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 1251 | 159 | 1657 | 318 | 407 | 542 | 550 | 602 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.33 | 0.47 | 0.13 | 0.09 | 0.33 | 0.65 | 0.64 | 0.11 |

Intersection Summary

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 175 | 226 | 208 | 631 | 930 | 761 |
| v/c Ratio | 0.64 | 0.52 | 0.75 | 0.25 | 0.53 | 0.69 |
| Control Delay (s/veh) | 45.8 | 9.1 | 62.0 | 1.4 | 18.2 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.8 | 9.1 | 62.0 | 1.4 | 18.2 | 6.3 |
| Queue Length 50th (ft) | 95 | 0 | 129 | 15 | 184 | 21 |
| Queue Length 95th (ft) | 152 | 58 | m146 | m13 | 280 | 138 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 374 | 512 | 322 | 2533 | 1748 | 1110 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.47 | 0.44 | 0.65 | 0.25 | 0.53 | 0.69 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 272 | 170 | 815 | 423 | 702 |
| v/c Ratio | 0.74 | 0.37 | 0.80 | 0.77 | 0.30 |
| Control Delay (s/veh) | 45.2 | 6.7 | 34.2 | 43.2 | 15.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.2 | 6.7 | 34.2 | 43.2 | 15.6 |
| Queue Length 50th (ft) | 147 | 0 | 208 | 262 | 86 |
| Queue Length 95th (ft) | 205 | 45 | 278 | #474 | 278 |
| Internal Link Dist (ft) | 1341 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 532 | 587 | 1032 | 546 | 2311 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.51 | 0.29 | 0.79 | 0.77 | 0.30 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBT | WBR | NBL | NBT | SBT |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 324 | 366 | 9 | 500 | 549 | 1156 |
| v/c Ratio | no cap | 0.80 | 0.02 | 0.77 | 0.18 | 0.51 |
| Control Delay (s/veh) | | 46.5 | 0.1 | 38.0 | 2.4 | 24.1 |
| Queue Delay | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | Error | 46.5 | 0.1 | 38.0 | 2.4 | 24.1 |
| Queue Length 50th (ft) | 0 | 203 | 0 | 139 | 53 | 157 |
| Queue Length 95th (ft) | 0 | #418 | 0 | 190 | 4 | 177 |
| Internal Link Dist (ft) | 1401 | 1318 | | | 395 | 822 |
| Turn Bay Length (ft) | | | 360 | | | |
| Base Capacity (vph) | 1 | 455 | 480 | 694 | 3288 | 2617 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 324.00 | 0.80 | 0.02 | 0.72 | 0.17 | 0.44 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 150 | 254 | 256 | 893 | 511 | 489 | 1048 |
| v/c Ratio | 0.52 | 0.72 | 0.71 | 0.30 | 0.51 | 0.79 | 0.30 |
| Control Delay (s/veh) | 38.6 | 28.4 | 27.6 | 17.0 | 4.1 | 55.0 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.6 | 28.4 | 27.6 | 17.0 | 4.1 | 55.0 | 3.1 |
| Queue Length 50th (ft) | 83 | 76 | 73 | 88 | 0 | 153 | 33 |
| Queue Length 95th (ft) | 127 | 148 | 142 | 139 | 66 | 204 | 42 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 407 | 447 | 459 | 3004 | 1003 | 692 | 3587 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.37 | 0.57 | 0.56 | 0.30 | 0.51 | 0.71 | 0.29 |

Intersection Summary

| Lane Group | EBR | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 993 | 639 | 245 | 689 | 690 |
| v/c Ratio | 0.72 | 0.23 | 0.52 | 0.76 | 0.74 |
| Control Delay (s/veh) | 3.7 | 0.4 | 39.7 | 8.8 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 3.7 | 0.4 | 39.7 | 8.8 | 7.5 |
| Queue Length 50th (ft) | 0 | 2 | 165 | 16 | 0 |
| Queue Length 95th (ft) | 23 | 0 | 196 | 106 | 78 |
| Internal Link Dist (ft) | | | | 2051 | |
| Turn Bay Length (ft) | | 180 | | | |
| Base Capacity (vph) | 1385 | 2730 | 1008 | 1191 | 1199 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.72 | 0.23 | 0.24 | 0.58 | 0.58 |

Intersection Summary

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 598 | 640 | 159 | 372 | 430 | 121 |
| v/c Ratio | 0.17 | 0.53 | 0.50 | 0.09 | 0.74 | 0.33 |
| Control Delay (s/veh) | 12.4 | 5.6 | 57.3 | 4.6 | 54.8 | 9.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 12.4 | 5.6 | 57.3 | 4.6 | 54.8 | 9.7 |
| Queue Length 50th (ft) | 81 | 89 | 59 | 23 | 159 | 0 |
| Queue Length 95th (ft) | 120 | 168 | 92 | 37 | 202 | 50 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 3445 | 1210 | 454 | 4175 | 678 | 400 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.17 | 0.53 | 0.35 | 0.09 | 0.63 | 0.30 |

Intersection Summary

# APPENDIX 4.1:

# POST PROCESSING WORKSHEETS

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & SR-60 WB Ramps
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 265 | 215 | -50 | -19% | 222 | 175 | -47 | -21% |
| | Through | 677 | 1,315 | 638 | 94% | 755 | 1,257 | 502 | 66% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | NB Total | 942 | 1,530 | 588 | 62% | 977 | 1,432 | 455 | 47% |
| SOUTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 742 | 1,393 | 651 | 88% | 825 | 1,577 | 752 | 91% |
| | Right | 458 | 504 | 46 | 10% | 494 | 584 | 90 | 18% |
| | SB Total | 1,200 | 1,897 | 697 | 58% | 1,319 | 2,161 | 842 | 64% |
| EAST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | EB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| WEST BOUND | Left | 310 | 257 | -53 | -17% | 360 | 313 | -47 | -13% |
| | Through | 1 | 0 | -1 | -100% | 3 | 2 | -1 | -33% |
| | Right | 434 | 505 | 71 | 16% | 371 | 423 | 52 | 14% |
| | WB Total | 745 | 762 | 17 | 2% | 734 | 738 | 4 | 1% |
| TOTAL ENTERING VOLUME | | 2,887 | 4,189 | 1302 | 45% | 3,030 | 4,331 | 1301 | 43% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,897 | 2,161 | | | |
| North Leg | Outbound | 1,820 | 1,680 | | | |
| **North Leg** | **TOTAL** | **3,717** | **3,841** | **11%** | **12%** | **33,225** |
| | | | | | | |
| South Leg | Inbound | 1,530 | 1,432 | | | |
| South Leg | Outbound | 1,650 | 1,890 | | | |
| **South Leg** | **TOTAL** | **3,180** | **3,322** | **11%** | **11%** | **29,379** |
| | | | | | | |
| East Leg | Inbound | 762 | 738 | | | |
| East Leg | Outbound | 0 | 0 | | | |
| **East Leg** | **TOTAL** | **762** | **738** | **8%** | **7%** | **9,974** |
| | | | | | | |
| West Leg | Inbound | 0 | 0 | | | |
| West Leg | Outbound | 719 | 761 | | | |
| **West Leg** | **TOTAL** | **719** | **761** | **7%** | **8%** | **9,770** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***8,378*** | ***8,662*** | **10%** | ***11%*** | ***82,348*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & SR-60 EB Ramps
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 634 | 1,073 | 439 | 69% | 739 | 1,156 | 417 | 56% |
| | Right | 390 | 303 | -87 | -22% | 379 | 275 | -104 | -27% |
| | NB Total | 1,024 | 1,376 | 352 | 34% | 1,118 | 1,431 | 313 | 28% |
| SOUTH BOUND | Left | 338 | 442 | 104 | 31% | 342 | 467 | 125 | 37% |
| | Through | 714 | 1,210 | 496 | 69% | 843 | 1,410 | 567 | 67% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | SB Total | 1,052 | 1,652 | 600 | 57% | 1,185 | 1,877 | 692 | 58% |
| EAST BOUND | Left | 308 | 461 | 153 | 50% | 238 | 301 | 63 | 26% |
| | Through | 1 | 1 | 0 | 0% | 2 | 1 | -1 | -50% |
| | Right | 203 | 181 | -22 | -11% | 195 | 140 | -55 | -28% |
| | EB Total | 512 | 643 | 131 | 26% | 435 | 442 | 7 | 2% |
| WEST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | WB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| TOTAL ENTERING VOLUME | | 2,588 | 3,671 | 1083 | 42% | 2,738 | 3,750 | 1012 | 37% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,652 | 1,877 | | | |
| North Leg | Outbound | 1,534 | 1,457 | | | |
| **North Leg** | **TOTAL** | **3,186** | **3,334** | **11%** | **11%** | **29,379** |
| | | | | | | |
| South Leg | Inbound | 1,376 | 1,431 | | | |
| South Leg | Outbound | 1,391 | 1,550 | | | |
| **South Leg** | **TOTAL** | **2,767** | **2,981** | **9%** | **10%** | **29,297** |
| | | | | | | |
| East Leg | Inbound | 0 | 0 | | | |
| East Leg | Outbound | 746 | 743 | | | |
| **East Leg** | **TOTAL** | **746** | **743** | **8%** | **8%** | **9,825** |
| | | | | | | |
| West Leg | Inbound | 643 | 442 | | | |
| West Leg | Outbound | 0 | 0 | | | |
| **West Leg** | **TOTAL** | **643** | **442** | **10%** | **7%** | **6,765** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,342*** | ***7,500*** | **10%** | ***10%*** | ***75,266*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & Walnut St.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 89 | 153 | 64 | 72% | 93 | 186 | 93 | 100% |
| | Through | 735 | 1,104 | 369 | 50% | 819 | 1,018 | 199 | 24% |
| | Right | 22 | 48 | 26 | 118% | 46 | 48 | 2 | 4% |
| | NB Total | 846 | 1,305 | 459 | 54% | 958 | 1,252 | 294 | 31% |
| SOUTH BOUND | Left | 127 | 147 | 20 | 16% | 209 | 153 | -56 | -27% |
| | Through | 738 | 1,177 | 439 | 59% | 739 | 1,302 | 563 | 76% |
| | Right | 49 | 45 | -4 | -8% | 101 | 141 | 40 | 40% |
| | SB Total | 914 | 1,369 | 455 | 50% | 1,049 | 1,596 | 547 | 52% |
| EAST BOUND | Left | 105 | 99 | -6 | -6% | 97 | 131 | 34 | 35% |
| | Through | 269 | 366 | 97 | 36% | 348 | 399 | 51 | 15% |
| | Right | 120 | 225 | 105 | 88% | 133 | 366 | 233 | 175% |
| | EB Total | 494 | 690 | 196 | 40% | 578 | 896 | 318 | 55% |
| WEST BOUND | Left | 43 | 78 | 35 | 81% | 48 | 132 | 84 | 175% |
| | Through | 366 | 382 | 16 | 4% | 227 | 494 | 267 | 118% |
| | Right | 172 | 157 | -15 | -9% | 126 | 171 | 45 | 36% |
| | WB Total | 581 | 617 | 36 | 6% | 401 | 797 | 396 | 99% |
| TOTAL ENTERING VOLUME | | 2,835 | 3,981 | 1146 | 40% | 2,986 | 4,541 | 1555 | 52% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,369 | 1,596 | | | |
| North Leg | Outbound | 1,360 | 1,320 | | | |
| **North Leg** | **TOTAL** | **2,729** | **2,916** | **10%** | **10%** | **28,414** |
| | | | | | | |
| South Leg | Inbound | 1,305 | 1,252 | | | |
| South Leg | Outbound | 1,480 | 1,800 | | | |
| **South Leg** | **TOTAL** | **2,785** | **3,052** | **11%** | **12%** | **25,717** |
| | | | | | | |
| East Leg | Inbound | 617 | 797 | | | |
| East Leg | Outbound | 561 | 600 | | | |
| **East Leg** | **TOTAL** | **1,178** | **1,397** | **7%** | **8%** | **17,773** |
| | | | | | | |
| West Leg | Inbound | 690 | 896 | | | |
| West Leg | Outbound | 580 | 821 | | | |
| **West Leg** | **TOTAL** | **1,270** | **1,717** | **9%** | **13%** | **13,575** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,962*** | ***9,082*** | **9%** | ***11%*** | ***85,479*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & Riverside Dr.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 43 | 228 | 185 | 430% | 61 | 324 | 263 | 431% |
| | Through | 559 | 1,016 | 457 | 82% | 737 | 984 | 247 | 34% |
| | Right | 117 | 319 | 202 | 173% | 168 | 445 | 277 | 165% |
| | NB Total | 719 | 1,563 | 844 | 117% | 966 | 1,753 | 787 | 81% |
| SOUTH BOUND | Left | 123 | 129 | 6 | 5% | 93 | 132 | 39 | 42% |
| | Through | 618 | 1,109 | 491 | 79% | 671 | 1,318 | 647 | 96% |
| | Right | 113 | 231 | 118 | 104% | 144 | 408 | 264 | 183% |
| | SB Total | 854 | 1,469 | 615 | 72% | 908 | 1,858 | 950 | 105% |
| EAST BOUND | Left | 121 | 185 | 64 | 53% | 125 | 132 | 7 | 6% |
| | Through | 367 | 843 | 476 | 130% | 398 | 833 | 435 | 109% |
| | Right | 51 | 200 | 149 | 292% | 49 | 142 | 93 | 190% |
| | EB Total | 539 | 1,228 | 689 | 128% | 572 | 1,107 | 535 | 94% |
| WEST BOUND | Left | 175 | 171 | -4 | -2% | 151 | 200 | 49 | 32% |
| | Through | 586 | 651 | 65 | 11% | 380 | 728 | 348 | 92% |
| | Right | 75 | 29 | -46 | -61% | 51 | 25 | -26 | -51% |
| | WB Total | 836 | 851 | 15 | 2% | 582 | 953 | 371 | 64% |
| TOTAL ENTERING VOLUME | | 2,948 | 5,111 | 2163 | 73% | 3,028 | 5,671 | 2643 | 87% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,469 | 1,858 | | | |
| North Leg | Outbound | 1,230 | 1,141 | | | |
| **North Leg** | **TOTAL** | **2,699** | **2,999** | **10%** | **11%** | **27,045** |
| | | | | | | |
| South Leg | Inbound | 1,563 | 1,753 | | | |
| South Leg | Outbound | 1,480 | 1,660 | | | |
| **South Leg** | **TOTAL** | **3,043** | **3,413** | **8%** | **9%** | **39,434** |
| | | | | | | |
| East Leg | Inbound | 851 | 953 | | | |
| East Leg | Outbound | 1,291 | 1,410 | | | |
| **East Leg** | **TOTAL** | **2,142** | **2,363** | **7%** | **7%** | **31,926** |
| | | | | | | |
| West Leg | Inbound | 1,228 | 1,107 | | | |
| West Leg | Outbound | 1,110 | 1,460 | | | |
| **West Leg** | **TOTAL** | **2,338** | **2,567** | **8%** | **8%** | **30,902** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***10,222*** | ***11,342*** | ***8%*** | ***9%*** | ***129,307*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[04_Euclid & Riverside.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & Chino Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 42 | 84 | 42 | 100% | 44 | 137 | 93 | 211% |
| | Through | 661 | 1,569 | 908 | 137% | 838 | 1,520 | 682 | 81% |
| | Right | 132 | 311 | 179 | 136% | 232 | 338 | 106 | 46% |
| | NB Total | 835 | 1,964 | 1,129 | 135% | 1,114 | 1,995 | 881 | 79% |
| SOUTH BOUND | Left | 37 | 69 | 32 | 86% | 29 | 40 | 11 | 38% |
| | Through | 743 | 1,321 | 578 | 78% | 767 | 1,443 | 676 | 88% |
| | Right | 61 | 96 | 35 | 57% | 73 | 213 | 140 | 192% |
| | SB Total | 841 | 1,486 | 645 | 77% | 869 | 1,696 | 827 | 95% |
| EAST BOUND | Left | 64 | 115 | 51 | 80% | 82 | 176 | 94 | 115% |
| | Through | 207 | 370 | 163 | 79% | 312 | 537 | 225 | 72% |
| | Right | 33 | 56 | 23 | 70% | 35 | 83 | 48 | 137% |
| | EB Total | 304 | 541 | 237 | 78% | 429 | 796 | 367 | 86% |
| WEST BOUND | Left | 78 | 123 | 45 | 58% | 78 | 170 | 92 | 118% |
| | Through | 252 | 352 | 100 | 40% | 149 | 503 | 354 | 238% |
| | Right | 33 | 55 | 22 | 67% | 21 | 41 | 20 | 95% |
| | WB Total | 363 | 530 | 167 | 46% | 248 | 714 | 466 | 188% |
| TOTAL ENTERING VOLUME | | 2,343 | 4,521 | 2178 | 93% | 2,660 | 5,201 | 2541 | 96% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,486 | 1,696 | | | |
| North Leg | Outbound | 1,739 | 1,737 | | | |
| **North Leg** | **TOTAL** | **3,225** | **3,433** | **8%** | **8%** | **40,818** |
| | | | | | | |
| South Leg | Inbound | 1,964 | 1,995 | | | |
| South Leg | Outbound | 1,500 | 1,696 | | | |
| **South Leg** | **TOTAL** | **3,464** | **3,691** | **9%** | **10%** | **38,611** |
| | | | | | | |
| East Leg | Inbound | 530 | 714 | | | |
| East Leg | Outbound | 750 | 915 | | | |
| **East Leg** | **TOTAL** | **1,280** | **1,629** | **8%** | **10%** | **16,039** |
| | | | | | | |
| West Leg | Inbound | 541 | 796 | | | |
| West Leg | Outbound | 532 | 853 | | | |
| **West Leg** | **TOTAL** | **1,073** | **1,649** | **6%** | **10%** | **16,547** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***9,042*** | ***10,402*** | ***8%*** | ***9%*** | ***112,016*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[05_Euclid & Chino.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & Schaefer Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 87 | 112 | 25 | 29% | 69 | 86 | 17 | 25% |
| | Through | 655 | 1,496 | 841 | 128% | 927 | 1,811 | 884 | 95% |
| | Right | 23 | 51 | 28 | 122% | 52 | 83 | 31 | 60% |
| | NB Total | 765 | 1,659 | 894 | 117% | 1,048 | 1,980 | 932 | 89% |
| SOUTH BOUND | Left | 43 | 80 | 37 | 86% | 32 | 62 | 30 | 94% |
| | Through | 759 | 1,339 | 580 | 76% | 751 | 1,451 | 700 | 93% |
| | Right | 80 | 86 | 6 | 8% | 91 | 137 | 46 | 51% |
| | SB Total | 882 | 1,505 | 623 | 71% | 874 | 1,650 | 776 | 89% |
| EAST BOUND | Left | 111 | 363 | 252 | 227% | 199 | 241 | 42 | 21% |
| | Through | 68 | 218 | 150 | 221% | 280 | 278 | -2 | -1% |
| | Right | 70 | 212 | 142 | 203% | 103 | 102 | -1 | -1% |
| | EB Total | 249 | 793 | 544 | 218% | 582 | 621 | 39 | 7% |
| WEST BOUND | Left | 47 | 59 | 12 | 26% | 33 | 207 | 174 | 527% |
| | Through | 145 | 111 | -34 | -23% | 63 | 308 | 245 | 389% |
| | Right | 67 | 91 | 24 | 36% | 20 | 154 | 134 | 670% |
| | WB Total | 259 | 261 | 2 | 1% | 116 | 669 | 553 | 477% |
| TOTAL ENTERING VOLUME | | 2,155 | 4,218 | 2063 | 96% | 2,620 | 4,920 | 2300 | 88% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,505 | 1,650 | | | |
| North Leg | Outbound | 1,950 | 2,206 | | | |
| **North Leg** | **TOTAL** | **3,455** | **3,856** | **9%** | **10%** | **40,256** |
| | | | | | | |
| South Leg | Inbound | 1,659 | 1,980 | | | |
| South Leg | Outbound | 1,610 | 1,760 | | | |
| **South Leg** | **TOTAL** | **3,269** | **3,740** | **6%** | **7%** | **54,941** |
| | | | | | | |
| East Leg | Inbound | 261 | 669 | | | |
| East Leg | Outbound | 349 | 423 | | | |
| **East Leg** | **TOTAL** | **610** | **1,092** | **6%** | **11%** | **10,029** |
| | | | | | | |
| West Leg | Inbound | 793 | 621 | | | |
| West Leg | Outbound | 309 | 531 | | | |
| **West Leg** | **TOTAL** | **1,102** | **1,152** | **6%** | **6%** | **19,452** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***8,436*** | ***9,840*** | ***7%*** | ***8%*** | ***124,678*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[06_Euclid & Schaefer.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & Edison Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 142 | 58 | -84 | -59% | 130 | 138 | 8 | 6% |
| | Through | 688 | 1,130 | 442 | 64% | 937 | 1,596 | 659 | 70% |
| | Right | 64 | 310 | 246 | 384% | 109 | 380 | 271 | 249% |
| | NB Total | 894 | 1,498 | 604 | 68% | 1,176 | 2,114 | 938 | 80% |
| SOUTH BOUND | Left | 45 | 459 | 414 | 920% | 71 | 369 | 298 | 420% |
| | Through | 657 | 1,127 | 470 | 72% | 729 | 1,274 | 545 | 75% |
| | Right | 130 | 112 | -18 | -14% | 119 | 189 | 70 | 59% |
| | SB Total | 832 | 1,698 | 866 | 104% | 919 | 1,832 | 913 | 99% |
| EAST BOUND | Left | 75 | 131 | 56 | 75% | 117 | 180 | 63 | 54% |
| | Through | 138 | 711 | 573 | 415% | 352 | 1,110 | 758 | 215% |
| | Right | 51 | 44 | -7 | -14% | 126 | 133 | 7 | 6% |
| | EB Total | 264 | 886 | 622 | 236% | 595 | 1,423 | 828 | 139% |
| WEST BOUND | Left | 55 | 249 | 194 | 353% | 34 | 153 | 119 | 350% |
| | Through | 295 | 670 | 375 | 127% | 187 | 763 | 576 | 308% |
| | Right | 57 | 520 | 463 | 812% | 51 | 334 | 283 | 555% |
| | WB Total | 407 | 1,439 | 1,032 | 254% | 272 | 1,250 | 978 | 360% |
| TOTAL ENTERING VOLUME | | 2,397 | 5,521 | 3124 | 130% | 2,962 | 6,619 | 3657 | 123% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,698 | 1,832 | | | |
| North Leg | Outbound | 1,781 | 2,110 | | | |
| **North Leg** | **TOTAL** | **3,479** | **3,942** | **6%** | **7%** | **56,662** |
| | | | | | | |
| South Leg | Inbound | 1,498 | 2,114 | | | |
| South Leg | Outbound | 1,420 | 1,560 | | | |
| **South Leg** | **TOTAL** | **2,918** | **3,674** | **5%** | **7%** | **54,899** |
| | | | | | | |
| East Leg | Inbound | 1,439 | 1,250 | | | |
| East Leg | Outbound | 1,480 | 1,859 | | | |
| **East Leg** | **TOTAL** | **2,919** | **3,109** | **5%** | **6%** | **53,386** |
| | | | | | | |
| West Leg | Inbound | 886 | 1,423 | | | |
| West Leg | Outbound | 840 | 1,090 | | | |
| **West Leg** | **TOTAL** | **1,726** | **2,513** | **5%** | **8%** | **33,192** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***11,042*** | ***13,238*** | **6%** | ***7%*** | ***198,139*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[07_Euclid & Edison.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & Eucalyptus Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 117 | 140 | 23 | 20% | 98 | 80 | -18 | -18% |
| | Through | 660 | 1,051 | 391 | 59% | 866 | 1,272 | 406 | 47% |
| | Right | 65 | 253 | 188 | 288% | 72 | 104 | 32 | 45% |
| | NB Total | 842 | 1,444 | 602 | 72% | 1,036 | 1,456 | 420 | 41% |
| SOUTH BOUND | Left | 86 | 383 | 297 | 345% | 74 | 183 | 109 | 147% |
| | Through | 639 | 1,010 | 371 | 58% | 715 | 1,225 | 510 | 71% |
| | Right | 32 | 43 | 11 | 36% | 61 | 86 | 25 | 41% |
| | SB Total | 757 | 1,436 | 679 | 90% | 850 | 1,494 | 644 | 76% |
| EAST BOUND | Left | 51 | 72 | 21 | 40% | 74 | 84 | 10 | 13% |
| | Through | 75 | 254 | 179 | 240% | 317 | 354 | 37 | 12% |
| | Right | 106 | 129 | 23 | 22% | 208 | 161 | -47 | -23% |
| | EB Total | 232 | 455 | 223 | 96% | 599 | 599 | 0 | 0% |
| WEST BOUND | Left | 91 | 101 | 10 | 10% | 57 | 197 | 140 | 246% |
| | Through | 267 | 257 | -10 | -4% | 115 | 326 | 211 | 184% |
| | Right | 130 | 167 | 37 | 28% | 78 | 398 | 320 | 408% |
| | WB Total | 489 | 525 | 36 | 7% | 250 | 921 | 671 | 268% |
| TOTAL ENTERING VOLUME | | 2,319 | 3,860 | 1540.94237 | 66% | 2,735 | 4,470 | 1735 | 63% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,436 | 1,494 | | | |
| North Leg | Outbound | 1,290 | 1,754 | | | |
| **North Leg** | **TOTAL** | **2,726** | **3,248** | **5%** | **7%** | **49,682** |
| | | | | | | |
| South Leg | Inbound | 1,444 | 1,456 | | | |
| South Leg | Outbound | 1,240 | 1,583 | | | |
| **South Leg** | **TOTAL** | **2,684** | **3,039** | **6%** | **6%** | **47,927** |
| | | | | | | |
| East Leg | Inbound | 525 | 921 | | | |
| East Leg | Outbound | 890 | 641 | | | |
| **East Leg** | **TOTAL** | **1,415** | **1,562** | **7%** | **8%** | **19,210** |
| | | | | | | |
| West Leg | Inbound | 455 | 599 | | | |
| West Leg | Outbound | 440 | 492 | | | |
| **West Leg** | **TOTAL** | **895** | **1,091** | **8%** | **9%** | **11,858** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,720*** | ***8,940*** | **6%** | ***7%*** | ***128,678*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[08_Euclid & Eucalyptus.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: Euclid Av. (SR-83) & Merrill Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 21 | 47 | 26 | 124% | 1 | 5 | 4 | 400% |
| | Through | 914 | 1,705 | 791 | 87% | 1,070 | 1,578 | 508 | 47% |
| | Right | 56 | 467 | 411 | 734% | 58 | 259 | 201 | 347% |
| | NB Total | 991 | 2,219 | 1,228 | 124% | 1,129 | 1,842 | 713 | 63% |
| SOUTH BOUND | Left | 143 | 258 | 115 | 80% | 187 | 84 | -103 | -55% |
| | Through | 759 | 1,145 | 386 | 51% | 978 | 1,981 | 1,003 | 103% |
| | Right | 35 | 17 | -18 | -51% | 9 | 5 | -4 | -44% |
| | SB Total | 937 | 1,420 | 483 | 52% | 1,174 | 2,070 | 896 | 76% |
| EAST BOUND | Left | 7 | 4 | -3 | -43% | 22 | 5 | -17 | -77% |
| | Through | 2 | 5 | 3 | 150% | 22 | 17 | -5 | -23% |
| | Right | 6 | 12 | 6 | 100% | 12 | 41 | 29 | 242% |
| | EB Total | 15 | 21 | 6 | 40% | 56 | 63 | 7 | 13% |
| WEST BOUND | Left | 59 | 145 | 86 | 146% | 60 | 558 | 498 | 830% |
| | Through | 25 | 20 | -5 | -20% | 0 | 0 | 0 | #DIV/0! |
| | Right | 238 | 156 | -82 | -34% | 126 | 86 | -40 | -32% |
| | WB Total | 322 | 321 | -1 | 0% | 186 | 644 | 458 | 246% |
| TOTAL ENTERING VOLUME | | 2,265 | 3,981 | 1716 | 76% | 2,545 | 4,619 | 2074 | 81% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,420 | 2,070 | | | |
| North Leg | Outbound | 1,865 | 1,669 | | | |
| **North Leg** | **TOTAL** | **3,285** | **3,739** | **7%** | **7%** | **50,329** |
| | | | | | | |
| South Leg | Inbound | 2,219 | 1,842 | | | |
| South Leg | Outbound | 1,302 | 2,580 | | | |
| **South Leg** | **TOTAL** | **3,521** | **4,422** | **6%** | **7%** | **60,164** |
| | | | | | | |
| East Leg | Inbound | 321 | 644 | | | |
| East Leg | Outbound | 730 | 360 | | | |
| **East Leg** | **TOTAL** | **1,051** | **1,004** | **8%** | **7%** | **13,966** |
| | | | | | | |
| West Leg | Inbound | 21 | 63 | | | |
| West Leg | Outbound | 84 | 10 | | | |
| **West Leg** | **TOTAL** | **105** | **73** | **12%** | **8%** | **897** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,962*** | ***9,238*** | **6%** | ***7%*** | ***125,357*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[09_Euclid & Merrill.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | JB |
| | | Date: | 2/24/25 |

LOCATION: Euclid Av. (SR-83) & Kimball Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 1 | 256 | 255 | 25500% | 1 | 291 | 290 | 29000% |
| | Through | 2 | 844 | 842 | 42100% | 2 | 1,028 | 1,026 | 51300% |
| | Right | 1 | 89 | 88 | 8800% | 1 | 151 | 150 | 15000% |
| | NB Total | 4 | 1,189 | 1,185 | 29625% | 4 | 1,470 | 1,466 | 36650% |
| SOUTH BOUND | Left | 1 | 149 | 148 | 14800% | 1 | 263 | 262 | 26200% |
| | Through | 2 | 931 | 929 | 46450% | 2 | 1,070 | 1,068 | 53400% |
| | Right | 1 | 429 | 428 | 42800% | 1 | 506 | 505 | 50500% |
| | SB Total | 4 | 1,509 | 1,505 | 37625% | 4 | 1,839 | 1,835 | 45875% |
| EAST BOUND | Left | 1 | 463 | 462 | 46200% | 1 | 497 | 496 | 49600% |
| | Through | 2 | 441 | 439 | 21950% | 2 | 656 | 654 | 32700% |
| | Right | 1 | 306 | 305 | 30500% | 1 | 297 | 296 | 29600% |
| | EB Total | 4 | 1,210 | 1,206 | 30150% | 4 | 1,450 | 1,446 | 36150% |
| WEST BOUND | Left | 1 | 153 | 152 | 15200% | 1 | 123 | 122 | 12200% |
| | Through | 2 | 635 | 633 | 31650% | 2 | 522 | 520 | 26000% |
| | Right | 1 | 232 | 231 | 23100% | 1 | 205 | 204 | 20400% |
| | WB Total | 4 | 1,020 | 1,016 | 25400% | 4 | 850 | 846 | 21150% |
| TOTAL ENTERING VOLUME | | 16 | 4,928 | 4912 | 30700% | 16 | 5,609 | 5593 | 34956% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,509 | 1,839 | | | |
| North Leg | Outbound | 1,539 | 1,730 | | | |
| **North Leg** | **TOTAL** | **3,048** | **3,569** | **6%** | **7%** | **48,871** |
| | | | | | | |
| South Leg | Inbound | 1,189 | 1,470 | | | |
| South Leg | Outbound | 1,390 | 1,490 | | | |
| **South Leg** | **TOTAL** | **2,579** | **2,960** | **9%** | **10%** | **29,790** |
| | | | | | | |
| East Leg | Inbound | 1,020 | 850 | | | |
| East Leg | Outbound | 679 | 1,070 | | | |
| **East Leg** | **TOTAL** | **1,699** | **1,920** | **5%** | **5%** | **35,607** |
| | | | | | | |
| West Leg | Inbound | 1,210 | 1,450 | | | |
| West Leg | Outbound | 1,320 | 1,319 | | | |
| **West Leg** | **TOTAL** | **2,530** | **2,769** | **7%** | **8%** | **36,904** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***9,856*** | ***11,218*** | ***7%*** | ***7%*** | ***151,172*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[10_Euclid & Kimball-SEMI.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | JB |
| | | Date: | 2/24/25 |

LOCATION: Euclid Av. (SR-83) & Pine Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 1 | 189 | 188 | 18800% | 1 | 181 | 180 | 18000% |
| | Through | 2 | 502 | 500 | 25000% | 2 | 489 | 487 | 24350% |
| | Right | 1 | 131 | 130 | 13000% | 1 | 100 | 99 | 9900% |
| | NB Total | 4 | 822 | 818 | 20450% | 4 | 770 | 766 | 19150% |
| SOUTH BOUND | Left | 1 | 177 | 176 | 17600% | 1 | 214 | 213 | 21300% |
| | Through | 2 | 430 | 428 | 21400% | 2 | 576 | 574 | 28700% |
| | Right | 1 | 256 | 255 | 25500% | 1 | 390 | 389 | 38900% |
| | SB Total | 4 | 863 | 859 | 21475% | 4 | 1,180 | 1,176 | 29400% |
| EAST BOUND | Left | 1 | 196 | 195 | 19500% | 1 | 272 | 271 | 27100% |
| | Through | 2 | 462 | 460 | 23000% | 2 | 499 | 497 | 24850% |
| | Right | 1 | 124 | 123 | 12300% | 1 | 149 | 148 | 14800% |
| | EB Total | 4 | 782 | 778 | 19450% | 4 | 920 | 916 | 22900% |
| WEST BOUND | Left | 1 | 96 | 95 | 9500% | 1 | 77 | 76 | 7600% |
| | Through | 2 | 515 | 513 | 25650% | 2 | 471 | 469 | 23450% |
| | Right | 1 | 152 | 151 | 15100% | 1 | 141 | 140 | 14000% |
| | WB Total | 4 | 763 | 759 | 18975% | 4 | 689 | 685 | 17125% |
| TOTAL ENTERING VOLUME | | 16 | 3,230 | 3214 | 20088% | 16 | 3,559 | 3543 | 22144% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 863 | 1,180 | | | |
| North Leg | Outbound | 850 | 902 | | | |
| **North Leg** | **TOTAL** | **1,713** | **2,082** | **8%** | **10%** | **21,628** |
| South Leg | Inbound | 822 | 770 | | | |
| South Leg | Outbound | 650 | 802 | | | |
| **South Leg** | **TOTAL** | **1,472** | **1,572** | **4%** | **5%** | **34,795** |
| East Leg | Inbound | 763 | 689 | | | |
| East Leg | Outbound | 770 | 813 | | | |
| **East Leg** | **TOTAL** | **1,533** | **1,502** | **4%** | **4%** | **41,761** |
| West Leg | Inbound | 782 | 920 | | | |
| West Leg | Outbound | 960 | 1,042 | | | |
| **West Leg** | **TOTAL** | **1,742** | **1,962** | **7%** | **8%** | **25,730** |
| ***OVERALL TOTAL*** | | ***6,460*** | ***7,118*** | **5%** | ***6%*** | ***123,913*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[11_Euclid & Pine-SEMI.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: SR-71 NB Ramps & Euclid Av. (SR-83)
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 45 | 53 | 8 | 18% | 101 | 57 | -44 | -44% |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 526 | 698 | 172 | 33% | 770 | 833 | 63 | 8% |
| | NB Total | 571 | 751 | 180 | 32% | 871 | 890 | 19 | 2% |
| SOUTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | SB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| EAST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 598 | 496 | -102 | -17% | 762 | 697 | -65 | -9% |
| | Right | 215 | 194 | -21 | -10% | 121 | 70 | -51 | -42% |
| | EB Total | 813 | 690 | -123 | -15% | 883 | 767 | -116 | -13% |
| WEST BOUND | Left | 639 | 712 | 73 | 11% | 431 | 480 | 49 | 11% |
| | Through | 834 | 757 | -77 | -9% | 726 | 663 | -63 | -9% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | WB Total | 1,473 | 1,469 | -4 | 0% | 1,157 | 1,143 | -14 | -1% |
| TOTAL ENTERING VOLUME | | 2,857 | 2,910 | 53 | 2% | 2,911 | 2,800 | -111 | -4% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 0 | 0 | | | |
| North Leg | Outbound | 0 | 0 | | | |
| **North Leg** | **TOTAL** | **0** | **0** | **#DIV/0!** | **#DIV/0!** | **-** |
| | | | | | | |
| South Leg | Inbound | 751 | 890 | | | |
| South Leg | Outbound | 906 | 550 | | | |
| **South Leg** | **TOTAL** | **1,657** | **1,440** | **9%** | **7%** | **19,337** |
| | | | | | | |
| East Leg | Inbound | 1,469 | 1,143 | | | |
| East Leg | Outbound | 1,194 | 1,530 | | | |
| **East Leg** | **TOTAL** | **2,663** | **2,673** | **7%** | **7%** | **36,540** |
| | | | | | | |
| West Leg | Inbound | 690 | 767 | | | |
| West Leg | Outbound | 810 | 720 | | | |
| **West Leg** | **TOTAL** | **1,500** | **1,487** | **8%** | **8%** | **19,180** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***5,820*** | ***5,600*** | ***8%*** | ***7%*** | ***75,057*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[12_SR-71 NB Ramps & Euclid.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/18/25 |

LOCATION: SR-71 NB Ramps & Euclid Av. (SR-83)
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 43 | 61 | 18 | 42% | 29 | 40 | 11 | 38% |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 241 | 219 | -22 | -9% | 131 | 120 | -11 | -8% |
| | NB Total | 284 | 280 | -4 | -1% | 160 | 160 | 0 | 0% |
| SOUTH BOUND | Left | 500 | 468 | -32 | -6% | 605 | 552 | -53 | -9% |
| | Through | 35 | 49 | 14 | 40% | 74 | 104 | 30 | 41% |
| | Right | 36 | 52 | 16 | 44% | 62 | 84 | 22 | 35% |
| | SB Total | 571 | 569 | -2 | 0% | 741 | 740 | -1 | 0% |
| EAST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 545 | 448 | -97 | -18% | 355 | 274 | -81 | -23% |
| | Right | 33 | 40 | 7 | 21% | 47 | 56 | 9 | 19% |
| | EB Total | 578 | 488 | -90 | -16% | 402 | 330 | -72 | -18% |
| WEST BOUND | Left | 165 | 174 | 9 | 5% | 71 | 54 | -17 | -24% |
| | Through | 262 | 288 | 26 | 10% | 200 | 146 | -54 | -27% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | WB Total | 427 | 462 | 35 | 8% | 271 | 200 | -71 | -26% |
| TOTAL ENTERING VOLUME | | 1,860 | 1,799 | -61 | -3% | 1,574 | 1,430 | -144 | -9% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 569 | 740 | | | |
| North Leg | Outbound | 0 | 0 | | | |
| **North Leg** | **TOTAL** | **569** | **740** | **6%** | **7%** | **10,069** |
| | | | | | | |
| South Leg | Inbound | 280 | 160 | | | |
| South Leg | Outbound | 263 | 214 | | | |
| **South Leg** | **TOTAL** | **543** | **374** | **11%** | **8%** | **4,783** |
| | | | | | | |
| East Leg | Inbound | 462 | 200 | | | |
| East Leg | Outbound | 1,135 | 946 | | | |
| **East Leg** | **TOTAL** | **1,597** | **1,146** | **12%** | **9%** | **13,270** |
| | | | | | | |
| West Leg | Inbound | 488 | 330 | | | |
| West Leg | Outbound | 401 | 270 | | | |
| **West Leg** | **TOTAL** | **889** | **600** | **12%** | **8%** | **7,626** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***3,598*** | ***2,860*** | **10%** | ***8%*** | ***35,749*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | JB |
| | | Date: | 2/20/25 |

LOCATION: Campus Av. & Edison Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 1 | 18 | 17 | 1700% | 1 | 68 | 67 | 6700% |
| | Through | 1 | 8 | 7 | 700% | 1 | 42 | 41 | 4100% |
| | Right | 1 | 25 | 24 | 2400% | 1 | 121 | 120 | 12000% |
| | NB Total | 3 | 51 | 48 | 1600% | 3 | 231 | 228 | 7600% |
| SOUTH BOUND | Left | 1 | 104 | 103 | 10300% | 1 | 116 | 115 | 11500% |
| | Through | 1 | 40 | 39 | 3900% | 1 | 9 | 8 | 800% |
| | Right | 1 | 77 | 76 | 7600% | 1 | 65 | 64 | 6400% |
| | SB Total | 3 | 221 | 218 | 7267% | 3 | 190 | 187 | 6233% |
| EAST BOUND | Left | 1 | 56 | 55 | 5500% | 1 | 88 | 87 | 8700% |
| | Through | 2 | 1,611 | 1,609 | 80450% | 2 | 2,304 | 2,302 | 115100% |
| | Right | 1 | 69 | 68 | 6800% | 1 | 21 | 20 | 2000% |
| | EB Total | 4 | 1,736 | 1,732 | 43300% | 4 | 2,413 | 2,409 | 60225% |
| WEST BOUND | Left | 1 | 121 | 120 | 12000% | 1 | 30 | 29 | 2900% |
| | Through | 2 | 2,065 | 2,063 | 103150% | 2 | 1,916 | 1,914 | 95700% |
| | Right | 1 | 97 | 96 | 9600% | 1 | 130 | 129 | 12900% |
| | WB Total | 4 | 2,283 | 2,279 | 56975% | 4 | 2,076 | 2,072 | 51800% |
| TOTAL ENTERING VOLUME | | 14 | 4,291 | 4277 | 30550% | 14 | 4,910 | 4896 | 34971% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 221 | 190 | | | |
| North Leg | Outbound | 161 | 260 | | | |
| **North Leg** | **TOTAL** | **382** | **450** | **7%** | **8%** | **5,822** |
| | | | | | | |
| South Leg | Inbound | 51 | 231 | | | |
| South Leg | Outbound | 230 | 60 | | | |
| **South Leg** | **TOTAL** | **281** | **291** | **8%** | **8%** | **3,636** |
| | | | | | | |
| East Leg | Inbound | 2,283 | 2,076 | | | |
| East Leg | Outbound | 1,740 | 2,541 | | | |
| **East Leg** | **TOTAL** | **4,023** | **4,617** | **8%** | **9%** | **52,093** |
| | | | | | | |
| West Leg | Inbound | 1,736 | 2,413 | | | |
| West Leg | Outbound | 2,160 | 2,049 | | | |
| **West Leg** | **TOTAL** | **3,896** | **4,462** | **8%** | **9%** | **49,505** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***8,582*** | ***9,820*** | **8%** | ***9%*** | ***111,055*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Bon View Av. & Riverside Dr.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 28 | 30 | 2 | 7% | 23 | 23 | 0 | 0% |
| | Through | 28 | 25 | -3 | -11% | 29 | 24 | -5 | -17% |
| | Right | 69 | 96 | 27 | 39% | 73 | 94 | 21 | 29% |
| | NB Total | 125 | 151 | 26 | 21% | 125 | 141 | 16 | 13% |
| SOUTH BOUND | Left | 6 | 8 | 2 | 33% | 5 | 11 | 6 | 120% |
| | Through | 20 | 17 | -3 | -15% | 6 | 7 | 1 | 17% |
| | Right | 71 | 74 | 3 | 4% | 24 | 41 | 17 | 71% |
| | SB Total | 97 | 99 | 2 | 2% | 35 | 59 | 24 | 69% |
| EAST BOUND | Left | 82 | 115 | 33 | 40% | 35 | 49 | 14 | 40% |
| | Through | 496 | 1,095 | 599 | 121% | 596 | 1,296 | 700 | 117% |
| | Right | 29 | 40 | 11 | 38% | 28 | 31 | 3 | 11% |
| | EB Total | 607 | 1,250 | 643 | 106% | 659 | 1,376 | 717 | 109% |
| WEST BOUND | Left | 71 | 74 | 3 | 4% | 43 | 53 | 10 | 23% |
| | Through | 737 | 944 | 207 | 28% | 535 | 982 | 447 | 84% |
| | Right | 48 | 51 | 3 | 6% | 12 | 19 | 7 | 58% |
| | WB Total | 856 | 1,069 | 213 | 25% | 590 | 1,054 | 464 | 79% |
| TOTAL ENTERING VOLUME | | 1,685 | 2,569 | 884 | 52% | 1,409 | 2,630 | 1221 | 87% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 99 | 59 | | | |
| North Leg | Outbound | 191 | 92 | | | |
| **North Leg** | **TOTAL** | **290** | **151** | **17%** | **9%** | **1,662** |
| | | | | | | |
| South Leg | Inbound | 151 | 141 | | | |
| South Leg | Outbound | 131 | 91 | | | |
| **South Leg** | **TOTAL** | **282** | **232** | **10%** | **8%** | **2,745** |
| | | | | | | |
| East Leg | Inbound | 1,069 | 1,054 | | | |
| East Leg | Outbound | 1,199 | 1,401 | | | |
| **East Leg** | **TOTAL** | **2,268** | **2,455** | **7%** | **8%** | **31,199** |
| | | | | | | |
| West Leg | Inbound | 1,250 | 1,376 | | | |
| West Leg | Outbound | 1,048 | 1,046 | | | |
| **West Leg** | **TOTAL** | **2,298** | **2,422** | **7%** | **7%** | **32,416** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***5,138*** | ***5,260*** | ***8%*** | ***8%*** | ***68,022*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Bon View Av. & Schaefer Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 37 | 55 | 18 | 49% | 12 | 30 | 18 | 150% |
| | Through | 155 | 201 | 46 | 30% | 119 | 146 | 27 | 23% |
| | Right | 11 | 23 | 12 | 109% | 13 | 24 | 11 | 85% |
| | NB Total | 203 | 279 | 76 | 37% | 144 | 200 | 56 | 39% |
| SOUTH BOUND | Left | 7 | 8 | 1 | 14% | 8 | 6 | -2 | -25% |
| | Through | 80 | 111 | 31 | 39% | 85 | 119 | 34 | 40% |
| | Right | 50 | 41 | -9 | -18% | 24 | 26 | 2 | 8% |
| | SB Total | 137 | 160 | 23 | 17% | 117 | 151 | 34 | 29% |
| EAST BOUND | Left | 33 | 31 | -2 | -6% | 47 | 44 | -3 | -6% |
| | Through | 87 | 133 | 46 | 53% | 290 | 398 | 108 | 37% |
| | Right | 14 | 26 | 12 | 86% | 27 | 66 | 39 | 144% |
| | EB Total | 134 | 190 | 56 | 42% | 364 | 508 | 144 | 40% |
| WEST BOUND | Left | 10 | 17 | 7 | 70% | 2 | 8 | 6 | 300% |
| | Through | 172 | 170 | -2 | -1% | 80 | 250 | 170 | 213% |
| | Right | 15 | 13 | -2 | -13% | 9 | 14 | 5 | 56% |
| | WB Total | 197 | 200 | 3 | 2% | 91 | 272 | 181 | 199% |
| TOTAL ENTERING VOLUME | | 671 | 829 | 158 | 24% | 716 | 1,131 | 415 | 58% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 160 | 151 | | | |
| North Leg | Outbound | 245 | 204 | | | |
| **North Leg** | **TOTAL** | **405** | **355** | **10%** | **9%** | **3,968** |
| South Leg | Inbound | 279 | 200 | | | |
| South Leg | Outbound | 154 | 193 | | | |
| **South Leg** | **TOTAL** | **433** | **393** | **12%** | **11%** | **3,506** |
| East Leg | Inbound | 200 | 272 | | | |
| East Leg | Outbound | 164 | 428 | | | |
| **East Leg** | **TOTAL** | **364** | **700** | **7%** | **13%** | **5,463** |
| West Leg | Inbound | 190 | 508 | | | |
| West Leg | Outbound | 266 | 306 | | | |
| **West Leg** | **TOTAL** | **456** | **814** | **7%** | **12%** | **6,523** |
| ***OVERALL TOTAL*** | | ***1,658*** | ***2,262*** | **9%** | ***12%*** | ***19,459*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[16_Bon View & Schaefer.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Bon View Av. & Edison Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 58 | 308 | 250 | 431% | 24 | 152 | 128 | 533% |
| | Through | 138 | 159 | 21 | 15% | 75 | 114 | 39 | 52% |
| | Right | 5 | 11 | 6 | 120% | 3 | 10 | 7 | 233% |
| | NB Total | 201 | 478 | 277 | 138% | 102 | 276 | 174 | 171% |
| SOUTH BOUND | Left | 17 | 21 | 4 | 24% | 19 | 23 | 4 | 21% |
| | Through | 50 | 59 | 9 | 18% | 77 | 131 | 54 | 70% |
| | Right | 39 | 111 | 72 | 185% | 20 | 46 | 26 | 130% |
| | SB Total | 106 | 191 | 85 | 80% | 116 | 200 | 84 | 72% |
| EAST BOUND | Left | 49 | 148 | 99 | 202% | 52 | 93 | 41 | 79% |
| | Through | 164 | 983 | 819 | 499% | 436 | 1,702 | 1,266 | 290% |
| | Right | 34 | 196 | 162 | 476% | 44 | 245 | 201 | 457% |
| | EB Total | 247 | 1,327 | 1,080 | 437% | 532 | 2,040 | 1,508 | 283% |
| WEST BOUND | Left | 4 | 6 | 2 | 50% | 2 | 6 | 4 | 200% |
| | Through | 312 | 1,140 | 828 | 265% | 228 | 989 | 761 | 334% |
| | Right | 22 | 17 | -5 | -23% | 9 | 9 | 0 | 0% |
| | WB Total | 338 | 1,163 | 825 | 244% | 239 | 1,004 | 765 | 320% |
| TOTAL ENTERING VOLUME | | 892 | 3,159 | 2267 | 254% | 989 | 3,520 | 2531 | 256% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 191 | 200 | | | |
| North Leg | Outbound | 324 | 216 | | | |
| **North Leg** | **TOTAL** | **515** | **416** | **15%** | **12%** | **3,424** |
| South Leg | Inbound | 478 | 276 | | | |
| South Leg | Outbound | 261 | 382 | | | |
| **South Leg** | **TOTAL** | **739** | **658** | **10%** | **9%** | **7,385** |
| East Leg | Inbound | 1,163 | 1,004 | | | |
| East Leg | Outbound | 1,015 | 1,735 | | | |
| **East Leg** | **TOTAL** | **2,178** | **2,739** | **5%** | **7%** | **41,654** |
| West Leg | Inbound | 1,327 | 2,040 | | | |
| West Leg | Outbound | 1,559 | 1,187 | | | |
| **West Leg** | **TOTAL** | **2,886** | **3,227** | **6%** | **6%** | **52,093** |
| ***OVERALL TOTAL*** | | ***6,318*** | ***7,040*** | **6%** | ***7%*** | ***104,556*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[17_Bon View & Edison.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | JB |
| | | Date: | 2/20/25 |

LOCATION: Bon View Av. & Edison Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 19 | 9 | -10 | -52% | 10 | 7 | -3 | -32% |
| | Through | 22 | 36 | 14 | 63% | 24 | 61 | 37 | 152% |
| | Right | 4 | 5 | 1 | 13% | 3 | 2 | -1 | -42% |
| | NB Total | 45 | 50 | 5 | 10% | 38 | 70 | 32 | 84% |
| SOUTH BOUND | Left | 8 | 161 | 153 | 1983% | 3 | 40 | 37 | 1057% |
| | Through | 21 | 56 | 35 | 167% | 13 | 44 | 31 | 247% |
| | Right | 10 | 82 | 72 | 725% | 8 | 116 | 108 | 1338% |
| | SB Total | 39 | 299 | 260 | 674% | 24 | 200 | 176 | 727% |
| EAST BOUND | Left | 11 | 112 | 101 | 914% | 14 | 86 | 72 | 522% |
| | Through | 59 | 423 | 364 | 623% | 137 | 188 | 51 | 37% |
| | Right | 7 | 6 | -1 | -9% | 16 | 6 | -10 | -63% |
| | EB Total | 76 | 541 | 465 | 610% | 167 | 280 | 113 | 68% |
| WEST BOUND | Left | 3 | 1 | -2 | -70% | 0 | 0 | 0 | #DIV/0! |
| | Through | 79 | 77 | -2 | -3% | 55 | 537 | 482 | 871% |
| | Right | 12 | 42 | 30 | 246% | 3 | 124 | 121 | 3487% |
| | WB Total | 95 | 120 | 25 | 26% | 59 | 661 | 602 | 1025% |
| TOTAL ENTERING VOLUME | | 255 | 1,010 | 754.947024 | 296% | 288 | 1,211 | 923 | 320% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 299 | 200 | | | |
| North Leg | Outbound | 190 | 271 | | | |
| **North Leg** | **TOTAL** | **489** | **471** | **7%** | **7%** | **6,533** |
| | | | | | | |
| South Leg | Inbound | 50 | 70 | | | |
| South Leg | Outbound | 63 | 50 | | | |
| **South Leg** | **TOTAL** | **113** | **120** | **7%** | **8%** | **1,566** |
| | | | | | | |
| East Leg | Inbound | 120 | 661 | | | |
| East Leg | Outbound | 589 | 230 | | | |
| **East Leg** | **TOTAL** | **709** | **891** | **5%** | **7%** | **13,579** |
| | | | | | | |
| West Leg | Inbound | 541 | 280 | | | |
| West Leg | Outbound | 168 | 660 | | | |
| **West Leg** | **TOTAL** | **709** | **940** | **4%** | **6%** | **16,254** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***2,020*** | ***2,422*** | **5%** | ***6%*** | ***37,933*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | JB |
| | | Date: | 2/20/25 |

LOCATION: Cucamonga Av. & Edison Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 1 | 89 | 88 | 8800% | 1 | 40 | 39 | 3900% |
| | Through | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | Right | 1 | 295 | 294 | 29400% | 1 | 155 | 154 | 15400% |
| | NB Total | 3 | 384 | 381 | 12700% | 3 | 195 | 192 | 6400% |
| SOUTH BOUND | Left | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | Through | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | Right | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | SB Total | 3 | 0 | -3 | -100% | 3 | 0 | -3 | -100% |
| EAST BOUND | Left | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | Through | 2 | 1,665 | 1,663 | 83150% | 2 | 2,305 | 2,303 | 115150% |
| | Right | 1 | 30 | 29 | 2900% | 1 | 82 | 81 | 8100% |
| | EB Total | 4 | 1,695 | 1,691 | 42275% | 4 | 2,387 | 2,383 | 59575% |
| WEST BOUND | Left | 1 | 120 | 119 | 11900% | 1 | 258 | 257 | 25700% |
| | Through | 2 | 1,981 | 1,979 | 98950% | 2 | 1,880 | 1,878 | 93900% |
| | Right | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | WB Total | 4 | 2,101 | 2,097 | 52425% | 4 | 2,138 | 2,134 | 53350% |
| TOTAL ENTERING VOLUME | | 14 | 4,180 | 4166 | 29757% | 14 | 4,720 | 4706 | 33614% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 0 | 0 | | | |
| North Leg | Outbound | 0 | 0 | | | |
| **North Leg** | **TOTAL** | **0** | **0** | **#DIV/0!** | **#DIV/0!** | **-** |
| | | | | | | |
| South Leg | Inbound | 384 | 195 | | | |
| South Leg | Outbound | 150 | 340 | | | |
| **South Leg** | **TOTAL** | **534** | **535** | **7%** | **7%** | **7,617** |
| | | | | | | |
| East Leg | Inbound | 2,101 | 2,138 | | | |
| East Leg | Outbound | 1,960 | 2,460 | | | |
| **East Leg** | **TOTAL** | **4,061** | **4,598** | **9%** | **10%** | **47,663** |
| | | | | | | |
| West Leg | Inbound | 1,695 | 2,387 | | | |
| West Leg | Outbound | 2,070 | 1,920 | | | |
| **West Leg** | **TOTAL** | **3,765** | **4,307** | **9%** | **10%** | **41,654** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***8,360*** | ***9,440*** | **9%** | ***10%*** | ***96,934*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Grove Av. & SR-60 WB Ramps
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 305 | 276 | -29 | -10% | 206 | 170 | -36 | -17% |
| | Through | 850 | 1,389 | 539 | 63% | 625 | 781 | 156 | 25% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | NB Total | 1,155 | 1,665 | 510 | 44% | 831 | 951 | 120 | 14% |
| SOUTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 609 | 790 | 181 | 30% | 921 | 1,600 | 679 | 74% |
| | Right | 458 | 549 | 91 | 20% | 753 | 788 | 35 | 5% |
| | SB Total | 1,067 | 1,339 | 272 | 25% | 1,674 | 2,388 | 714 | 43% |
| EAST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | EB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| WEST BOUND | Left | 160 | 160 | 0 | 0% | 170 | 190 | 20 | 12% |
| | Through | 5 | 5 | 0 | 0% | 3 | 2 | -1 | -33% |
| | Right | 355 | 591 | 236 | 66% | 224 | 229 | 5 | 2% |
| | WB Total | 520 | 756 | 236 | 45% | 397 | 421 | 24 | 6% |
| TOTAL ENTERING VOLUME | | 2,742 | 3,760 | 1018 | 37% | 2,902 | 3,760 | 858 | 30% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,339 | 2,388 | | | |
| North Leg | Outbound | 1,980 | 1,010 | | | |
| **North Leg** | **TOTAL** | **3,319** | **3,398** | **6%** | **6%** | **55,837** |
| | | | | | | |
| South Leg | Inbound | 1,665 | 951 | | | |
| South Leg | Outbound | 950 | 1,790 | | | |
| **South Leg** | **TOTAL** | **2,615** | **2,741** | **6%** | **6%** | **42,928** |
| | | | | | | |
| East Leg | Inbound | 756 | 421 | | | |
| East Leg | Outbound | 0 | 0 | | | |
| **East Leg** | **TOTAL** | **756** | **421** | **13%** | **7%** | **5,796** |
| | | | | | | |
| West Leg | Inbound | 0 | 0 | | | |
| West Leg | Outbound | 830 | 960 | | | |
| **West Leg** | **TOTAL** | **830** | **960** | **6%** | **7%** | **13,072** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,520*** | ***7,520*** | **6%** | ***6%*** | ***117,633*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Grove Av. & SR-60 EB Ramps
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 750 | 1,183 | 433 | 58% | 570 | 708 | 138 | 24% |
| | Right | 289 | 319 | 30 | 10% | 220 | 186 | -34 | -15% |
| | NB Total | 1,039 | 1,502 | 463 | 45% | 790 | 894 | 104 | 13% |
| SOUTH BOUND | Left | 278 | 314 | 36 | 13% | 410 | 644 | 234 | 57% |
| | Through | 491 | 634 | 143 | 29% | 681 | 1,141 | 460 | 68% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | SB Total | 769 | 948 | 179 | 23% | 1,091 | 1,785 | 694 | 64% |
| EAST BOUND | Left | 405 | 506 | 101 | 25% | 261 | 294 | 33 | 13% |
| | Through | 2 | 2 | 0 | 0% | 3 | 2 | -1 | -33% |
| | Right | 123 | 123 | 0 | 0% | 165 | 135 | -30 | -18% |
| | EB Total | 530 | 631 | 101 | 19% | 429 | 431 | 2 | 0% |
| WEST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | WB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| TOTAL ENTERING VOLUME | | 2,338 | 3,081 | 743 | 32% | 2,310 | 3,110 | 800 | 35% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 948 | 1,785 | | | |
| North Leg | Outbound | 1,689 | 1,002 | | | |
| **North Leg** | **TOTAL** | **2,637** | **2,787** | **6%** | **6%** | **42,928** |
| South Leg | Inbound | 1,502 | 894 | | | |
| South Leg | Outbound | 757 | 1,276 | | | |
| **South Leg** | **TOTAL** | **2,259** | **2,170** | **6%** | **6%** | **36,255** |
| East Leg | Inbound | 0 | 0 | | | |
| East Leg | Outbound | 635 | 832 | | | |
| **East Leg** | **TOTAL** | **635** | **832** | **7%** | **10%** | **8,602** |
| West Leg | Inbound | 631 | 431 | | | |
| West Leg | Outbound | 0 | 0 | | | |
| **West Leg** | **TOTAL** | **631** | **431** | **9%** | **6%** | **7,311** |
| ***OVERALL TOTAL*** | | ***6,162*** | ***6,220*** | **6%** | ***7%*** | ***95,096*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Grove Av. & Walnut St.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 47 | 66 | 19 | 40% | 71 | 170 | 99 | 139% |
| | Through | 528 | 937 | 409 | 77% | 452 | 632 | 180 | 40% |
| | Right | 26 | 61 | 35 | 135% | 43 | 82 | 39 | 91% |
| | NB Total | 601 | 1,064 | 463 | 77% | 566 | 884 | 318 | 56% |
| SOUTH BOUND | Left | 75 | 72 | -3 | -4% | 149 | 140 | -9 | -6% |
| | Through | 371 | 570 | 199 | 54% | 488 | 838 | 350 | 72% |
| | Right | 67 | 38 | -29 | -43% | 152 | 179 | 27 | 18% |
| | SB Total | 513 | 680 | 167 | 33% | 789 | 1,157 | 368 | 47% |
| EAST BOUND | Left | 226 | 201 | -25 | -11% | 126 | 86 | -40 | -32% |
| | Through | 176 | 207 | 31 | 18% | 212 | 198 | -14 | -7% |
| | Right | 48 | 90 | 42 | 88% | 80 | 137 | 57 | 71% |
| | EB Total | 450 | 498 | 48 | 11% | 418 | 421 | 3 | 1% |
| WEST BOUND | Left | 18 | 50 | 32 | 178% | 16 | 33 | 17 | 106% |
| | Through | 208 | 216 | 8 | 4% | 124 | 177 | 53 | 43% |
| | Right | 198 | 262 | 64 | 32% | 95 | 79 | -16 | -17% |
| | WB Total | 424 | 528 | 104 | 25% | 235 | 289 | 54 | 23% |
| TOTAL ENTERING VOLUME | | 1,988 | 2,770 | 782 | 39% | 2,008 | 2,751 | 743 | 37% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 680 | 1,157 | | | |
| North Leg | Outbound | 1,400 | 797 | | | |
| **North Leg** | **TOTAL** | **2,080** | **1,954** | **6%** | **6%** | **33,535** |
| | | | | | | |
| South Leg | Inbound | 1,064 | 884 | | | |
| South Leg | Outbound | 710 | 1,008 | | | |
| **South Leg** | **TOTAL** | **1,774** | **1,892** | **6%** | **7%** | **28,906** |
| | | | | | | |
| East Leg | Inbound | 528 | 289 | | | |
| East Leg | Outbound | 340 | 420 | | | |
| **East Leg** | **TOTAL** | **868** | **709** | **10%** | **8%** | **8,683** |
| | | | | | | |
| West Leg | Inbound | 498 | 421 | | | |
| West Leg | Outbound | 320 | 526 | | | |
| **West Leg** | **TOTAL** | **818** | **947** | **7%** | **8%** | **11,488** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***5,540*** | ***5,502*** | ***7%*** | ***7%*** | ***82,612*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Grove Av. & Riverside Dr.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 41 | 50 | 9 | 22% | 24 | 28 | 4 | 17% |
| | Through | 306 | 574 | 268 | 88% | 308 | 466 | 158 | 51% |
| | Right | 28 | 66 | 38 | 136% | 35 | 98 | 63 | 180% |
| | NB Total | 375 | 690 | 315 | 84% | 367 | 592 | 225 | 61% |
| SOUTH BOUND | Left | 77 | 173 | 96 | 125% | 100 | 166 | 66 | 66% |
| | Through | 211 | 392 | 181 | 86% | 257 | 563 | 306 | 119% |
| | Right | 149 | 174 | 25 | 17% | 115 | 81 | -34 | -30% |
| | SB Total | 437 | 739 | 302 | 69% | 472 | 810 | 338 | 72% |
| EAST BOUND | Left | 132 | 237 | 105 | 80% | 102 | 123 | 21 | 21% |
| | Through | 408 | 921 | 513 | 126% | 548 | 1,226 | 678 | 124% |
| | Right | 31 | 58 | 27 | 87% | 24 | 71 | 47 | 196% |
| | EB Total | 571 | 1,216 | 645 | 113% | 674 | 1,420 | 746 | 111% |
| WEST BOUND | Left | 19 | 40 | 21 | 111% | 22 | 146 | 124 | 564% |
| | Through | 666 | 875 | 209 | 31% | 451 | 961 | 510 | 113% |
| | Right | 109 | 219 | 110 | 101% | 118 | 321 | 203 | 172% |
| | WB Total | 794 | 1,134 | 340 | 43% | 591 | 1,428 | 837 | 142% |
| TOTAL ENTERING VOLUME | | 2,177 | 3,779 | 1602 | 74% | 2,104 | 4,250 | 2146 | 102% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 739 | 810 | | | |
| North Leg | Outbound | 1,030 | 910 | | | |
| **North Leg** | **TOTAL** | **1,769** | **1,720** | **6%** | **6%** | **28,629** |
| | | | | | | |
| South Leg | Inbound | 690 | 592 | | | |
| South Leg | Outbound | 490 | 780 | | | |
| **South Leg** | **TOTAL** | **1,180** | **1,372** | **9%** | **10%** | **13,118** |
| | | | | | | |
| East Leg | Inbound | 1,134 | 1,428 | | | |
| East Leg | Outbound | 1,160 | 1,490 | | | |
| **East Leg** | **TOTAL** | **2,294** | **2,918** | **8%** | **10%** | **28,629** |
| | | | | | | |
| West Leg | Inbound | 1,216 | 1,420 | | | |
| West Leg | Outbound | 1,099 | 1,070 | | | |
| **West Leg** | **TOTAL** | **2,315** | **2,490** | **7%** | **8%** | **32,260** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,558*** | ***8,500*** | ***7%*** | ***8%*** | ***102,637*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Grove Av. & Chino Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 53 | 87 | 34 | 64% | 22 | 58 | 36 | 164% |
| | Through | 269 | 501 | 232 | 86% | 294 | 503 | 209 | 71% |
| | Right | 8 | 33 | 25 | 313% | 17 | 67 | 50 | 294% |
| | NB Total | 330 | 621 | 291 | 88% | 333 | 628 | 295 | 89% |
| SOUTH BOUND | Left | 32 | 51 | 19 | 59% | 37 | 85 | 48 | 130% |
| | Through | 224 | 460 | 236 | 105% | 251 | 685 | 434 | 173% |
| | Right | 13 | 8 | -5 | -38% | 16 | 25 | 9 | 56% |
| | SB Total | 269 | 519 | 250 | 93% | 304 | 795 | 491 | 162% |
| EAST BOUND | Left | 62 | 96 | 34 | 55% | 50 | 42 | -8 | -16% |
| | Through | 92 | 316 | 224 | 243% | 261 | 507 | 246 | 94% |
| | Right | 24 | 107 | 83 | 346% | 24 | 55 | 31 | 129% |
| | EB Total | 178 | 519 | 341 | 192% | 335 | 604 | 269 | 80% |
| WEST BOUND | Left | 6 | 33 | 27 | 450% | 9 | 51 | 42 | 467% |
| | Through | 247 | 414 | 167 | 68% | 117 | 380 | 263 | 225% |
| | Right | 49 | 93 | 44 | 90% | 34 | 72 | 38 | 112% |
| | WB Total | 302 | 540 | 238 | 79% | 160 | 503 | 343 | 214% |
| TOTAL ENTERING VOLUME | | 1,079 | 2,199 | 1120 | 104% | 1,132 | 2,530 | 1398 | 123% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 519 | 795 | | | |
| North Leg | Outbound | 690 | 617 | | | |
| **North Leg** | **TOTAL** | **1,209** | **1,412** | **9%** | **11%** | **13,118** |
| | | | | | | |
| South Leg | Inbound | 621 | 628 | | | |
| South Leg | Outbound | 600 | 791 | | | |
| **South Leg** | **TOTAL** | **1,221** | **1,419** | **9%** | **11%** | **13,420** |
| | | | | | | |
| East Leg | Inbound | 540 | 503 | | | |
| East Leg | Outbound | 400 | 659 | | | |
| **East Leg** | **TOTAL** | **940** | **1,162** | **6%** | **7%** | **15,691** |
| | | | | | | |
| West Leg | Inbound | 519 | 604 | | | |
| West Leg | Outbound | 509 | 463 | | | |
| **West Leg** | **TOTAL** | **1,028** | **1,067** | **6%** | **7%** | **15,838** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***4,398*** | ***5,060*** | ***8%*** | ***9%*** | ***58,068*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[24_Grove & Chino.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Grove Av. & Schaefer Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 55 | 66 | 11 | 20% | 23 | 68 | 45 | 196% |
| | Through | 279 | 568 | 289 | 104% | 227 | 511 | 284 | 125% |
| | Right | 4 | 13 | 9 | 225% | 16 | 55 | 39 | 244% |
| | NB Total | 338 | 647 | 309 | 91% | 266 | 634 | 368 | 138% |
| SOUTH BOUND | Left | 15 | 48 | 33 | 220% | 37 | 120 | 83 | 224% |
| | Through | 190 | 535 | 345 | 182% | 197 | 568 | 371 | 188% |
| | Right | 23 | 28 | 5 | 22% | 26 | 72 | 46 | 177% |
| | SB Total | 228 | 611 | 383 | 168% | 260 | 760 | 500 | 192% |
| EAST BOUND | Left | 36 | 42 | 6 | 17% | 96 | 97 | 1 | 1% |
| | Through | 53 | 99 | 46 | 87% | 177 | 275 | 98 | 55% |
| | Right | 16 | 26 | 10 | 63% | 38 | 52 | 14 | 37% |
| | EB Total | 105 | 167 | 62 | 59% | 311 | 424 | 113 | 36% |
| WEST BOUND | Left | 9 | 19 | 10 | 111% | 3 | 10 | 7 | 233% |
| | Through | 119 | 106 | -13 | -11% | 42 | 130 | 88 | 210% |
| | Right | 20 | 30 | 10 | 50% | 22 | 52 | 30 | 136% |
| | WB Total | 148 | 155 | 7 | 5% | 67 | 192 | 125 | 187% |
| TOTAL ENTERING VOLUME | | 819 | 1,580 | 761 | 93% | 904 | 2,010 | 1106 | 122% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 611 | 760 | | | |
| North Leg | Outbound | 640 | 660 | | | |
| **North Leg** | **TOTAL** | **1,251** | **1,420** | **9%** | **11%** | **13,420** |
| | | | | | | |
| South Leg | Inbound | 647 | 634 | | | |
| South Leg | Outbound | 580 | 630 | | | |
| **South Leg** | **TOTAL** | **1,227** | **1,264** | **10%** | **10%** | **12,147** |
| | | | | | | |
| East Leg | Inbound | 155 | 192 | | | |
| East Leg | Outbound | 160 | 450 | | | |
| **East Leg** | **TOTAL** | **315** | **642** | **6%** | **13%** | **5,034** |
| | | | | | | |
| West Leg | Inbound | 167 | 424 | | | |
| West Leg | Outbound | 200 | 270 | | | |
| **West Leg** | **TOTAL** | **367** | **694** | **7%** | **13%** | **5,463** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***3,160*** | ***4,020*** | **9%** | ***11%*** | ***36,064*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[25_Grove & Schaefer.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Grove Av. & Edison Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 55 | 166 | 111 | 202% | 25 | 137 | 112 | 448% |
| | Through | 230 | 350 | 120 | 52% | 154 | 399 | 245 | 159% |
| | Right | 3 | 6 | 3 | 100% | 4 | 13 | 9 | 225% |
| | NB Total | 288 | 522 | 234 | 81% | 183 | 549 | 366 | 200% |
| SOUTH BOUND | Left | 24 | 40 | 16 | 67% | 52 | 160 | 108 | 208% |
| | Through | 192 | 486 | 294 | 153% | 222 | 430 | 208 | 94% |
| | Right | 27 | 73 | 46 | 170% | 17 | 89 | 72 | 424% |
| | SB Total | 243 | 599 | 356 | 147% | 291 | 679 | 388 | 133% |
| EAST BOUND | Left | 34 | 169 | 135 | 397% | 37 | 119 | 82 | 222% |
| | Through | 127 | 765 | 638 | 502% | 404 | 1,627 | 1,223 | 303% |
| | Right | 25 | 230 | 205 | 820% | 17 | 43 | 26 | 153% |
| | EB Total | 186 | 1,164 | 978 | 526% | 458 | 1,789 | 1,331 | 291% |
| WEST BOUND | Left | 6 | 22 | 16 | 267% | 4 | 7 | 3 | 75% |
| | Through | 256 | 1,009 | 753 | 294% | 197 | 884 | 687 | 349% |
| | Right | 58 | 115 | 57 | 98% | 34 | 72 | 38 | 112% |
| | WB Total | 320 | 1,146 | 826 | 258% | 235 | 963 | 728 | 310% |
| TOTAL ENTERING VOLUME | | 1,037 | 3,431 | 2394 | 231% | 1,167 | 3,980 | 2813 | 241% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 599 | 679 | | | |
| North Leg | Outbound | 634 | 590 | | | |
| **North Leg** | **TOTAL** | **1,233** | **1,269** | **10%** | **10%** | **12,147** |
| | | | | | | |
| South Leg | Inbound | 522 | 549 | | | |
| South Leg | Outbound | 738 | 480 | | | |
| **South Leg** | **TOTAL** | **1,260** | **1,029** | **10%** | **8%** | **12,941** |
| | | | | | | |
| East Leg | Inbound | 1,146 | 963 | | | |
| East Leg | Outbound | 811 | 1,800 | | | |
| **East Leg** | **TOTAL** | **1,957** | **2,763** | **4%** | **6%** | **44,571** |
| | | | | | | |
| West Leg | Inbound | 1,164 | 1,789 | | | |
| West Leg | Outbound | 1,248 | 1,110 | | | |
| **West Leg** | **TOTAL** | **2,412** | **2,899** | **5%** | **6%** | **47,028** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***6,862*** | ***7,960*** | **6%** | ***7%*** | ***116,686*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Grove Av. & Eucalyptus Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 1 | 3 | 2 | 200% | 1 | 7 | 6 | 600% |
| | Through | 2 | 5 | 3 | 150% | 2 | 5 | 3 | 150% |
| | Right | 2 | 2 | 0 | 0% | 1 | 1 | 0 | 0% |
| | NB Total | 5 | 10 | 5 | 100% | 4 | 13 | 9 | 225% |
| SOUTH BOUND | Left | 251 | 614 | 363 | 145% | 306 | 609 | 303 | 99% |
| | Through | 3 | 29 | 26 | 867% | 4 | 6 | 2 | 50% |
| | Right | 17 | 102 | 85 | 500% | 6 | 66 | 60 | 1000% |
| | SB Total | 271 | 745 | 474 | 175% | 316 | 681 | 365 | 116% |
| EAST BOUND | Left | 6 | 52 | 46 | 767% | 10 | 52 | 42 | 420% |
| | Through | 51 | 180 | 129 | 253% | 172 | 420 | 248 | 144% |
| | Right | 1 | 14 | 13 | 1300% | 2 | 3 | 1 | 50% |
| | EB Total | 58 | 246 | 188 | 324% | 184 | 475 | 291 | 158% |
| WEST BOUND | Left | 2 | 8 | 6 | 300% | 1 | 1 | 0 | 0% |
| | Through | 158 | 376 | 218 | 138% | 66 | 448 | 382 | 579% |
| | Right | 220 | 525 | 305 | 139% | 197 | 513 | 316 | 160% |
| | WB Total | 380 | 909 | 529 | 139% | 264 | 962 | 698 | 264% |
| TOTAL ENTERING VOLUME | | 714 | 1,910 | 1196 | 168% | 768 | 2,131 | 1363 | 177% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 745 | 681 | | | |
| North Leg | Outbound | 582 | 570 | | | |
| **North Leg** | **TOTAL** | **1,327** | **1,251** | **10%** | **10%** | **12,941** |
| | | | | | | |
| South Leg | Inbound | 10 | 13 | | | |
| South Leg | Outbound | 51 | 10 | | | |
| **South Leg** | **TOTAL** | **61** | **23** | **21%** | **8%** | **296** |
| | | | | | | |
| East Leg | Inbound | 909 | 962 | | | |
| East Leg | Outbound | 796 | 1,030 | | | |
| **East Leg** | **TOTAL** | **1,705** | **1,992** | **12%** | **14%** | **14,617** |
| | | | | | | |
| West Leg | Inbound | 246 | 475 | | | |
| West Leg | Outbound | 481 | 521 | | | |
| **West Leg** | **TOTAL** | **727** | **996** | **4%** | **6%** | **16,679** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***3,820*** | ***4,262*** | **9%** | ***10%*** | ***44,532*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | JB |
| | | Date: | 2/20/25 |

LOCATION: Parco Av. & Edison Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | Through | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | Right | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | NB Total | 3 | 0 | -3 | -100% | 3 | 0 | -3 | -100% |
| SOUTH BOUND | Left | 1 | 25 | 24 | 2400% | 1 | 42 | 41 | 4100% |
| | Through | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | Right | 1 | 35 | 34 | 3400% | 1 | 38 | 37 | 3700% |
| | SB Total | 3 | 60 | 57 | 1900% | 3 | 80 | 77 | 2567% |
| EAST BOUND | Left | 1 | 21 | 20 | 2000% | 1 | 10 | 9 | 900% |
| | Through | 2 | 1,755 | 1,753 | 87650% | 2 | 2,408 | 2,406 | 120300% |
| | Right | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | EB Total | 4 | 1,776 | 1,772 | 44300% | 4 | 2,418 | 2,414 | 60350% |
| WEST BOUND | Left | 1 | 0 | -1 | -100% | 1 | 0 | -1 | -100% |
| | Through | 2 | 2,185 | 2,183 | 109150% | 2 | 2,062 | 2,060 | 103000% |
| | Right | 1 | 19 | 18 | 1800% | 1 | 10 | 9 | 900% |
| | WB Total | 4 | 2,204 | 2,200 | 55000% | 4 | 2,072 | 2,068 | 51700% |
| TOTAL ENTERING VOLUME | | 14 | 4,040 | 4026 | 28757% | 14 | 4,570 | 4556 | 32543% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 60 | 80 | | | |
| North Leg | Outbound | 40 | 20 | | | |
| **North Leg** | **TOTAL** | **100** | **100** | **6%** | **6%** | **1,591** |
| | | | | | | |
| South Leg | Inbound | 0 | 0 | | | |
| South Leg | Outbound | 0 | 0 | | | |
| **South Leg** | **TOTAL** | **0** | **0** | **#DIV/0!** | **#DIV/0!** | **-** |
| | | | | | | |
| East Leg | Inbound | 2,204 | 2,072 | | | |
| East Leg | Outbound | 1,780 | 2,450 | | | |
| **East Leg** | **TOTAL** | **3,984** | **4,522** | **9%** | **10%** | **44,687** |
| | | | | | | |
| West Leg | Inbound | 1,776 | 2,418 | | | |
| West Leg | Outbound | 2,220 | 2,100 | | | |
| **West Leg** | **TOTAL** | **3,996** | **4,518** | **9%** | **10%** | **45,012** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***8,080*** | ***9,140*** | **9%** | ***10%*** | ***91,290*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Walker Av. & Riverside Dr.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 71 | 189 | 118 | 166% | 41 | 116 | 75 | 183% |
| | Through | 13 | 16 | 3 | 23% | 26 | 24 | -2 | -8% |
| | Right | 122 | 206 | 84 | 69% | 110 | 159 | 49 | 45% |
| | NB Total | 206 | 411 | 205 | 100% | 177 | 299 | 122 | 69% |
| SOUTH BOUND | Left | 12 | 9 | -3 | -25% | 8 | 6 | -2 | -25% |
| | Through | 10 | 6 | -4 | -40% | 7 | 5 | -2 | -29% |
| | Right | 39 | 46 | 7 | 18% | 13 | 20 | 7 | 54% |
| | SB Total | 61 | 61 | 0 | 0% | 28 | 31 | 3 | 11% |
| EAST BOUND | Left | 15 | 24 | 9 | 60% | 31 | 45 | 14 | 45% |
| | Through | 438 | 990 | 552 | 126% | 594 | 1,323 | 729 | 123% |
| | Right | 60 | 103 | 43 | 72% | 58 | 109 | 51 | 88% |
| | EB Total | 513 | 1,117 | 604 | 118% | 683 | 1,477 | 794 | 116% |
| WEST BOUND | Left | 64 | 42 | -22 | -34% | 66 | 68 | 2 | 3% |
| | Through | 684 | 930 | 246 | 36% | 537 | 1,283 | 746 | 139% |
| | Right | 17 | 10 | -7 | -41% | 28 | 22 | -6 | -21% |
| | WB Total | 765 | 982 | 217 | 28% | 631 | 1,373 | 742 | 118% |
| TOTAL ENTERING VOLUME | | 1,545 | 2,571 | 1026 | 66% | 1,519 | 3,180 | 1661 | 109% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 61 | 31 | | | |
| North Leg | Outbound | 50 | 91 | | | |
| **North Leg** | **TOTAL** | **111** | **122** | **#DIV/0!** | **#DIV/0!** | **-** |
| | | | | | | |
| South Leg | Inbound | 411 | 299 | | | |
| South Leg | Outbound | 151 | 182 | | | |
| **South Leg** | **TOTAL** | **562** | **481** | **6%** | **5%** | **8,944** |
| | | | | | | |
| East Leg | Inbound | 982 | 1,373 | | | |
| East Leg | Outbound | 1,205 | 1,488 | | | |
| **East Leg** | **TOTAL** | **2,187** | **2,861** | **8%** | **10%** | **27,612** |
| | | | | | | |
| West Leg | Inbound | 1,117 | 1,477 | | | |
| West Leg | Outbound | 1,165 | 1,419 | | | |
| **West Leg** | **TOTAL** | **2,282** | **2,896** | **8%** | **10%** | **27,908** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***5,142*** | ***6,360*** | ***8%*** | ***10%*** | ***64,463*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[29_Walker & Riverside.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Walker Av. & Schaefer Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 81 | 112 | 31 | 38% | 25 | 77 | 52 | 208% |
| | Through | 213 | 393 | 180 | 85% | 118 | 218 | 100 | 85% |
| | Right | 14 | 86 | 72 | 514% | 5 | 25 | 20 | 400% |
| | NB Total | 308 | 591 | 283 | 92% | 148 | 320 | 172 | 116% |
| SOUTH BOUND | Left | 13 | 22 | 9 | 69% | 0 | 0 | 0 | #DIV/0! |
| | Through | 108 | 208 | 100 | 93% | 111 | 188 | 77 | 69% |
| | Right | 43 | 17 | -26 | -60% | 30 | 43 | 13 | 43% |
| | SB Total | 164 | 247 | 83 | 51% | 141 | 231 | 90 | 64% |
| EAST BOUND | Left | 36 | 31 | -5 | -14% | 108 | 121 | 13 | 12% |
| | Through | 11 | 32 | 21 | 191% | 11 | 33 | 22 | 200% |
| | Right | 25 | 82 | 57 | 228% | 111 | 246 | 135 | 122% |
| | EB Total | 72 | 145 | 73 | 101% | 230 | 400 | 170 | 74% |
| WEST BOUND | Left | 11 | 50 | 39 | 355% | 5 | 26 | 21 | 420% |
| | Through | 24 | 22 | -2 | -8% | 12 | 53 | 41 | 342% |
| | Right | 5 | 6 | 1 | 20% | 15 | 40 | 25 | 167% |
| | WB Total | 40 | 78 | 38 | 95% | 32 | 119 | 87 | 272% |
| TOTAL ENTERING VOLUME | | 584 | 1,061 | 477 | 82% | 551 | 1,070 | 519 | 94% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 247 | 231 | | | |
| North Leg | Outbound | 430 | 379 | | | |
| **North Leg** | **TOTAL** | **677** | **610** | **7%** | **6%** | **9,569** |
| South Leg | Inbound | 591 | 320 | | | |
| South Leg | Outbound | 340 | 460 | | | |
| **South Leg** | **TOTAL** | **931** | **780** | **9%** | **8%** | **9,960** |
| East Leg | Inbound | 78 | 119 | | | |
| East Leg | Outbound | 140 | 58 | | | |
| **East Leg** | **TOTAL** | **218** | **177** | **6%** | **5%** | **3,497** |
| West Leg | Inbound | 145 | 400 | | | |
| West Leg | Outbound | 151 | 173 | | | |
| **West Leg** | **TOTAL** | **296** | **573** | **7%** | **14%** | **4,036** |
| ***OVERALL TOTAL*** | | ***2,122*** | ***2,140*** | ***8%*** | ***8%*** | ***27,062*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[30_Walker & Schaefer.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Walker Av. & Ontario Ranch Rd.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 13 | 53 | 40 | 308% | 7 | 8 | 1 | 14% |
| | Through | 184 | 347 | 163 | 89% | 98 | 134 | 36 | 37% |
| | Right | 3 | 59 | 56 | 1867% | 4 | 37 | 33 | 825% |
| | NB Total | 200 | 459 | 259 | 130% | 109 | 179 | 70 | 64% |
| SOUTH BOUND | Left | 44 | 166 | 122 | 277% | 125 | 166 | 41 | 33% |
| | Through | 61 | 147 | 86 | 141% | 71 | 172 | 101 | 142% |
| | Right | 37 | 29 | -8 | -22% | 12 | 2 | -10 | -83% |
| | SB Total | 142 | 342 | 200 | 141% | 208 | 340 | 132 | 63% |
| EAST BOUND | Left | 17 | 11 | -6 | -35% | 20 | 13 | -7 | -35% |
| | Through | 127 | 835 | 708 | 557% | 429 | 1,890 | 1,461 | 341% |
| | Right | 10 | 42 | 32 | 320% | 11 | 88 | 77 | 700% |
| | EB Total | 154 | 888 | 734 | 477% | 460 | 1,991 | 1,531 | 333% |
| WEST BOUND | Left | 6 | 71 | 65 | 1083% | 3 | 196 | 193 | 6433% |
| | Through | 270 | 1,048 | 778 | 288% | 216 | 989 | 773 | 358% |
| | Right | 96 | 172 | 76 | 79% | 40 | 214 | 174 | 435% |
| | WB Total | 372 | 1,291 | 919 | 247% | 259 | 1,399 | 1,140 | 440% |
| TOTAL ENTERING VOLUME | | 868 | 2,980 | 2112 | 243% | 1,036 | 3,909 | 2873 | 277% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 342 | 340 | | | |
| North Leg | Outbound | 530 | 361 | | | |
| **North Leg** | **TOTAL** | **872** | **701** | **9%** | **8%** | **9,336** |
| | | | | | | |
| South Leg | Inbound | 459 | 179 | | | |
| South Leg | Outbound | 260 | 456 | | | |
| **South Leg** | **TOTAL** | **719** | **635** | **6%** | **6%** | **11,233** |
| | | | | | | |
| East Leg | Inbound | 1,291 | 1,399 | | | |
| East Leg | Outbound | 1,060 | 2,093 | | | |
| **East Leg** | **TOTAL** | **2,351** | **3,492** | **4%** | **6%** | **55,436** |
| | | | | | | |
| West Leg | Inbound | 888 | 1,991 | | | |
| West Leg | Outbound | 1,130 | 999 | | | |
| **West Leg** | **TOTAL** | **2,018** | **2,990** | **5%** | **7%** | **44,687** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***5,960*** | ***7,818*** | **5%** | ***6%*** | ***120,693*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[31_Walker & Ontario Ranch.xls]Output (3)*

| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Walker Av. & Eucalyptus Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 1 | 0 | -1 | -100% | 6 | 9 | 3 | 50% |
| | Right | 0 | 0 | 0 | #DIV/0! | 1 | 1 | 0 | 0% |
| | NB Total | 1 | 0 | -1 | -100% | 7 | 10 | 3 | 43% |
| SOUTH BOUND | Left | 68 | 86 | 18 | 26% | 84 | 255 | 171 | 204% |
| | Through | 2 | 0 | -2 | -100% | 2 | 0 | -2 | -100% |
| | Right | 8 | 77 | 69 | 863% | 8 | 61 | 53 | 663% |
| | SB Total | 78 | 163 | 85 | 109% | 94 | 316 | 222 | 236% |
| EAST BOUND | Left | 4 | 40 | 36 | 900% | 6 | 23 | 17 | 283% |
| | Through | 255 | 314 | 59 | 23% | 341 | 730 | 389 | 114% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | EB Total | 259 | 354 | 95 | 37% | 347 | 753 | 406 | 117% |
| WEST BOUND | Left | 2 | 0 | -2 | -100% | 0 | 0 | 0 | #DIV/0! |
| | Through | 492 | 833 | 341 | 69% | 229 | 402 | 173 | 76% |
| | Right | 203 | 370 | 167 | 82% | 95 | 119 | 24 | 25% |
| | WB Total | 697 | 1,203 | 506 | 73% | 324 | 521 | 197 | 61% |
| TOTAL ENTERING VOLUME | | 1,035 | 1,720 | 685 | 66% | 772 | 1,600 | 828 | 107% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 163 | 316 | | | |
| North Leg | Outbound | 410 | 151 | | | |
| **North Leg** | **TOTAL** | **573** | **467** | **8%** | **6%** | **7,532** |
| | | | | | | |
| South Leg | Inbound | 0 | 10 | | | |
| South Leg | Outbound | 0 | 0 | | | |
| **South Leg** | **TOTAL** | **0** | **10** | **0%** | **8%** | **122** |
| | | | | | | |
| East Leg | Inbound | 1,203 | 521 | | | |
| East Leg | Outbound | 400 | 986 | | | |
| **East Leg** | **TOTAL** | **1,603** | **1,507** | **16%** | **15%** | **10,192** |
| | | | | | | |
| West Leg | Inbound | 354 | 753 | | | |
| West Leg | Outbound | 910 | 463 | | | |
| **West Leg** | **TOTAL** | **1,264** | **1,216** | **13%** | **13%** | **9,447** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***3,440*** | ***3,200*** | **13%** | ***12%*** | ***27,293*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Archibald Av. & SR-60 WB Ramps
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 615 | 625 | 10 | 2% | 465 | 412 | -53 | -11% |
| | Through | 805 | 1,356 | 551 | 68% | 511 | 783 | 272 | 53% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | NB Total | 1,420 | 1,981 | 561 | 40% | 976 | 1,195 | 219 | 22% |
| SOUTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 360 | 632 | 272 | 76% | 1,075 | 1,753 | 678 | 63% |
| | Right | 77 | 107 | 30 | 39% | 301 | 381 | 80 | 27% |
| | SB Total | 437 | 739 | 302 | 69% | 1,376 | 2,134 | 758 | 55% |
| EAST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | EB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| WEST BOUND | Left | 287 | 325 | 38 | 13% | 339 | 357 | 18 | 5% |
| | Through | 2 | 2 | 0 | 0% | 9 | 7 | -2 | -22% |
| | Right | 298 | 443 | 145 | 49% | 168 | 237 | 69 | 41% |
| | WB Total | 587 | 770 | 183 | 31% | 516 | 601 | 85 | 16% |
| TOTAL ENTERING VOLUME | | 2,444 | 3,490 | 1046 | 43% | 2,868 | 3,930 | 1062 | 37% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 739 | 2,134 | | | |
| North Leg | Outbound | 1,799 | 1,020 | | | |
| **North Leg** | **TOTAL** | **2,538** | **3,154** | **6%** | **7%** | **45,771** |
| | | | | | | |
| South Leg | Inbound | 1,981 | 1,195 | | | |
| South Leg | Outbound | 957 | 2,110 | | | |
| **South Leg** | **TOTAL** | **2,938** | **3,305** | **7%** | **8%** | **41,126** |
| | | | | | | |
| East Leg | Inbound | 770 | 601 | | | |
| East Leg | Outbound | 0 | 0 | | | |
| **East Leg** | **TOTAL** | **770** | **601** | **9%** | **7%** | **8,161** |
| | | | | | | |
| West Leg | Inbound | 0 | 0 | | | |
| West Leg | Outbound | 734 | 800 | | | |
| **West Leg** | **TOTAL** | **734** | **800** | **7%** | **8%** | **10,531** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***6,980*** | ***7,860*** | ***7%*** | ***7%*** | ***105,589*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Archibald Av. & SR-60 EB Ramps
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 1,208 | 1,609 | 401 | 33% | 822 | 1,002 | 180 | 22% |
| | Right | 585 | 597 | 12 | 2% | 470 | 423 | -47 | -10% |
| | NB Total | 1,793 | 2,206 | 413 | 23% | 1,292 | 1,425 | 133 | 10% |
| SOUTH BOUND | Left | 109 | 191 | 82 | 75% | 450 | 656 | 206 | 46% |
| | Through | 538 | 705 | 167 | 31% | 964 | 1,457 | 493 | 51% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | SB Total | 647 | 896 | 249 | 38% | 1,414 | 2,113 | 699 | 49% |
| EAST BOUND | Left | 212 | 371 | 159 | 75% | 154 | 188 | 34 | 22% |
| | Through | 2 | 3 | 1 | 50% | 1 | 1 | 0 | 0% |
| | Right | 304 | 305 | 1 | 0% | 453 | 423 | -30 | -7% |
| | EB Total | 518 | 679 | 161 | 31% | 608 | 612 | 4 | 1% |
| WEST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | WB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| TOTAL ENTERING VOLUME | | 2,958 | 3,781 | 823 | 28% | 3,314 | 4,150 | 836 | 25% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 896 | 2,113 | | | |
| North Leg | Outbound | 1,980 | 1,190 | | | |
| **North Leg** | **TOTAL** | **2,876** | **3,303** | **7%** | **8%** | **41,126** |
| | | | | | | |
| South Leg | Inbound | 2,206 | 1,425 | | | |
| South Leg | Outbound | 1,010 | 1,880 | | | |
| **South Leg** | **TOTAL** | **3,216** | **3,305** | **9%** | **9%** | **36,812** |
| | | | | | | |
| East Leg | Inbound | 0 | 0 | | | |
| East Leg | Outbound | 791 | 1,080 | | | |
| **East Leg** | **TOTAL** | **791** | **1,080** | **6%** | **9%** | **12,515** |
| | | | | | | |
| West Leg | Inbound | 679 | 612 | | | |
| West Leg | Outbound | 0 | 0 | | | |
| **West Leg** | **TOTAL** | **679** | **612** | **8%** | **7%** | **8,262** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,562*** | ***8,300*** | ***8%*** | ***8%*** | ***98,715*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Archibald Av. & Riverside Dr.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 213 | 382 | 169 | 79% | 211 | 394 | 183 | 87% |
| | Through | 956 | 1,360 | 404 | 42% | 633 | 663 | 30 | 5% |
| | Right | 40 | 149 | 109 | 273% | 42 | 71 | 29 | 69% |
| | NB Total | 1,209 | 1,891 | 682 | 56% | 886 | 1,128 | 242 | 27% |
| SOUTH BOUND | Left | 139 | 179 | 40 | 29% | 267 | 328 | 61 | 23% |
| | Through | 355 | 516 | 161 | 45% | 822 | 1,145 | 323 | 39% |
| | Right | 163 | 102 | -61 | -37% | 183 | 248 | 65 | 36% |
| | SB Total | 657 | 797 | 140 | 21% | 1,272 | 1,721 | 449 | 35% |
| EAST BOUND | Left | 162 | 172 | 10 | 6% | 148 | 193 | 45 | 30% |
| | Through | 283 | 782 | 499 | 176% | 433 | 911 | 478 | 110% |
| | Right | 104 | 323 | 219 | 211% | 242 | 578 | 336 | 139% |
| | EB Total | 549 | 1,277 | 728 | 133% | 823 | 1,682 | 859 | 104% |
| WEST BOUND | Left | 69 | 221 | 152 | 220% | 124 | 278 | 154 | 124% |
| | Through | 484 | 666 | 182 | 38% | 372 | 811 | 439 | 118% |
| | Right | 264 | 288 | 24 | 9% | 147 | 180 | 33 | 22% |
| | WB Total | 817 | 1,175 | 358 | 44% | 643 | 1,269 | 626 | 97% |
| TOTAL ENTERING VOLUME | | 3,232 | 5,140 | 1908 | 59% | 3,624 | 5,800 | 2176 | 60% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 797 | 1,721 | | | |
| North Leg | Outbound | 1,820 | 1,036 | | | |
| **North Leg** | **TOTAL** | **2,617** | **2,757** | **9%** | **9%** | **29,895** |
| | | | | | | |
| South Leg | Inbound | 1,891 | 1,128 | | | |
| South Leg | Outbound | 1,060 | 2,001 | | | |
| **South Leg** | **TOTAL** | **2,951** | **3,129** | **8%** | **9%** | **35,095** |
| | | | | | | |
| East Leg | Inbound | 1,175 | 1,269 | | | |
| East Leg | Outbound | 1,110 | 1,310 | | | |
| **East Leg** | **TOTAL** | **2,285** | **2,579** | **6%** | **7%** | **35,333** |
| | | | | | | |
| West Leg | Inbound | 1,277 | 1,682 | | | |
| West Leg | Outbound | 1,150 | 1,453 | | | |
| **West Leg** | **TOTAL** | **2,427** | **3,135** | **8%** | **11%** | **28,577** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***10,280*** | ***11,600*** | ***8%*** | ***9%*** | ***128,900*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Archibald Av. & Chino Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 102 | 217 | 115 | 113% | 39 | 194 | 155 | 397% |
| | Through | 994 | 1,653 | 659 | 66% | 699 | 978 | 279 | 40% |
| | Right | 68 | 109 | 41 | 60% | 18 | 73 | 55 | 306% |
| | NB Total | 1,164 | 1,979 | 815 | 70% | 756 | 1,245 | 489 | 65% |
| SOUTH BOUND | Left | 84 | 157 | 73 | 87% | 130 | 173 | 43 | 33% |
| | Through | 366 | 769 | 403 | 110% | 947 | 1,762 | 815 | 86% |
| | Right | 59 | 145 | 86 | 146% | 66 | 108 | 42 | 64% |
| | SB Total | 509 | 1,071 | 562 | 110% | 1,143 | 2,043 | 900 | 79% |
| EAST BOUND | Left | 110 | 240 | 130 | 118% | 91 | 69 | -22 | -24% |
| | Through | 67 | 141 | 74 | 110% | 154 | 335 | 181 | 118% |
| | Right | 50 | 119 | 69 | 138% | 66 | 201 | 135 | 205% |
| | EB Total | 227 | 500 | 273 | 120% | 311 | 605 | 294 | 95% |
| WEST BOUND | Left | 44 | 48 | 4 | 9% | 13 | 67 | 54 | 415% |
| | Through | 161 | 208 | 47 | 29% | 68 | 308 | 240 | 353% |
| | Right | 162 | 164 | 2 | 1% | 81 | 103 | 22 | 27% |
| | WB Total | 367 | 420 | 53 | 14% | 162 | 478 | 316 | 195% |
| TOTAL ENTERING VOLUME | | 2,267 | 3,970 | 1703 | 75% | 2,372 | 4,371 | 1999 | 84% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,071 | 2,043 | | | |
| North Leg | Outbound | 2,057 | 1,150 | | | |
| **North Leg** | **TOTAL** | **3,128** | **3,193** | **9%** | **9%** | **36,336** |
| | | | | | | |
| South Leg | Inbound | 1,979 | 1,245 | | | |
| South Leg | Outbound | 936 | 2,030 | | | |
| **South Leg** | **TOTAL** | **2,915** | **3,275** | **8%** | **9%** | **37,273** |
| | | | | | | |
| East Leg | Inbound | 420 | 478 | | | |
| East Leg | Outbound | 407 | 581 | | | |
| **East Leg** | **TOTAL** | **827** | **1,059** | **7%** | **10%** | **11,074** |
| | | | | | | |
| West Leg | Inbound | 500 | 605 | | | |
| West Leg | Outbound | 570 | 610 | | | |
| **West Leg** | **TOTAL** | **1,070** | **1,215** | **7%** | **8%** | **16,057** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,940*** | ***8,742*** | **8%** | ***9%*** | ***100,740*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Archibald Av. & Schaefer Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 10 | 26 | 16 | 160% | 2 | 20 | 18 | 900% |
| | Through | 1,006 | 1,745 | 739 | 73% | 682 | 1,045 | 363 | 53% |
| | Right | 18 | 39 | 21 | 117% | 27 | 124 | 97 | 359% |
| | NB Total | 1,034 | 1,810 | 776 | 75% | 711 | 1,189 | 478 | 67% |
| SOUTH BOUND | Left | 78 | 241 | 163 | 209% | 138 | 486 | 348 | 252% |
| | Through | 389 | 683 | 294 | 76% | 875 | 1,564 | 689 | 79% |
| | Right | 1 | 4 | 3 | 300% | 0 | 0 | 0 | #DIV/0! |
| | SB Total | 468 | 928 | 460 | 98% | 1,013 | 2,050 | 1,037 | 102% |
| EAST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 1 | 30 | 29 | 2900% | 0 | 0 | 0 | #DIV/0! |
| | EB Total | 1 | 30 | 29 | 2900% | 0 | 0 | 0 | #DIV/0! |
| WEST BOUND | Left | 44 | 67 | 23 | 52% | 20 | 166 | 146 | 730% |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 68 | 145 | 77 | 113% | 34 | 185 | 151 | 444% |
| | WB Total | 112 | 212 | 100 | 89% | 54 | 351 | 297 | 550% |
| TOTAL ENTERING VOLUME | | 1,615 | 2,980 | 1365 | 85% | 1,778 | 3,590 | 1812 | 102% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 928 | 2,050 | | | |
| North Leg | Outbound | 1,890 | 1,230 | | | |
| **North Leg** | **TOTAL** | **2,818** | **3,280** | **8%** | **9%** | **37,273** |
| | | | | | | |
| South Leg | Inbound | 1,810 | 1,189 | | | |
| South Leg | Outbound | 780 | 1,730 | | | |
| **South Leg** | **TOTAL** | **2,590** | **2,919** | **8%** | **9%** | **32,891** |
| | | | | | | |
| East Leg | Inbound | 212 | 351 | | | |
| East Leg | Outbound | 280 | 610 | | | |
| **East Leg** | **TOTAL** | **492** | **961** | **5%** | **10%** | **9,587** |
| | | | | | | |
| West Leg | Inbound | 30 | 0 | | | |
| West Leg | Outbound | 30 | 20 | | | |
| **West Leg** | **TOTAL** | **60** | **20** | **23%** | **8%** | **259** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***5,960*** | ***7,180*** | ***7%*** | ***9%*** | ***80,010*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Archibald Av. & Edison Av./Ontario Ranch Rd.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 117 | 247 | 130 | 111% | 75 | 247 | 172 | 229% |
| | Through | 831 | 1,344 | 513 | 62% | 573 | 772 | 199 | 35% |
| | Right | 187 | 420 | 233 | 125% | 217 | 311 | 94 | 43% |
| | NB Total | 1,135 | 2,011 | 876 | 77% | 865 | 1,330 | 465 | 54% |
| SOUTH BOUND | Left | 72 | 233 | 161 | 224% | 101 | 294 | 193 | 191% |
| | Through | 333 | 433 | 100 | 30% | 735 | 1,184 | 449 | 61% |
| | Right | 44 | 134 | 90 | 205% | 33 | 221 | 188 | 570% |
| | SB Total | 449 | 800 | 351 | 78% | 869 | 1,699 | 830 | 96% |
| EAST BOUND | Left | 17 | 101 | 84 | 494% | 60 | 248 | 188 | 313% |
| | Through | 87 | 717 | 630 | 724% | 267 | 1,175 | 908 | 340% |
| | Right | 58 | 192 | 134 | 231% | 204 | 496 | 292 | 143% |
| | EB Total | 162 | 1,010 | 848 | 523% | 531 | 1,919 | 1,388 | 261% |
| WEST BOUND | Left | 317 | 525 | 208 | 66% | 335 | 652 | 317 | 95% |
| | Through | 225 | 869 | 644 | 286% | 121 | 979 | 858 | 709% |
| | Right | 76 | 225 | 149 | 196% | 66 | 219 | 153 | 232% |
| | WB Total | 618 | 1,619 | 1,001 | 162% | 522 | 1,850 | 1,328 | 254% |
| TOTAL ENTERING VOLUME | | 2,364 | 5,440 | 3076 | 130% | 2,787 | 6,798 | 4011 | 144% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 800 | 1,699 | | | |
| North Leg | Outbound | 1,670 | 1,239 | | | |
| **North Leg** | **TOTAL** | **2,470** | **2,938** | **8%** | **9%** | **32,891** |
| | | | | | | |
| South Leg | Inbound | 2,011 | 1,330 | | | |
| South Leg | Outbound | 1,150 | 2,332 | | | |
| **South Leg** | **TOTAL** | **3,161** | **3,662** | **9%** | **10%** | **34,992** |
| | | | | | | |
| East Leg | Inbound | 1,619 | 1,850 | | | |
| East Leg | Outbound | 1,370 | 1,780 | | | |
| **East Leg** | **TOTAL** | **2,989** | **3,630** | **6%** | **7%** | **49,376** |
| | | | | | | |
| West Leg | Inbound | 1,010 | 1,919 | | | |
| West Leg | Outbound | 1,250 | 1,447 | | | |
| **West Leg** | **TOTAL** | **2,260** | **3,366** | **4%** | **7%** | **51,782** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***10,880*** | ***13,596*** | **6%** | ***8%*** | ***169,040*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Archibald Av. & Merrill Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 159 | 283 | 124 | 78% | 73 | 144 | 71 | 97% |
| | Through | 734 | 1,385 | 651 | 89% | 481 | 933 | 452 | 94% |
| | Right | 82 | 149 | 67 | 82% | 79 | 215 | 136 | 172% |
| | NB Total | 975 | 1,817 | 842 | 86% | 633 | 1,292 | 659 | 104% |
| SOUTH BOUND | Left | 26 | 39 | 13 | 50% | 77 | 189 | 112 | 145% |
| | Through | 400 | 828 | 428 | 107% | 723 | 1,550 | 827 | 114% |
| | Right | 86 | 126 | 40 | 47% | 128 | 227 | 99 | 77% |
| | SB Total | 512 | 993 | 481 | 94% | 928 | 1,966 | 1,038 | 112% |
| EAST BOUND | Left | 131 | 241 | 110 | 84% | 184 | 298 | 114 | 62% |
| | Through | 137 | 243 | 106 | 77% | 277 | 627 | 350 | 126% |
| | Right | 59 | 145 | 86 | 146% | 135 | 268 | 133 | 99% |
| | EB Total | 327 | 629 | 302 | 92% | 596 | 1,193 | 597 | 100% |
| WEST BOUND | Left | 104 | 240 | 136 | 131% | 82 | 173 | 91 | 111% |
| | Through | 296 | 483 | 187 | 63% | 166 | 289 | 123 | 74% |
| | Right | 97 | 168 | 71 | 73% | 52 | 89 | 37 | 71% |
| | WB Total | 497 | 891 | 394 | 79% | 300 | 551 | 251 | 84% |
| TOTAL ENTERING VOLUME | | 2,311 | 4,330 | 2019 | 87% | 2,457 | 5,002 | 2545 | 104% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 993 | 1,966 | | | |
| North Leg | Outbound | 1,794 | 1,320 | | | |
| **North Leg** | **TOTAL** | **2,787** | **3,286** | **8%** | **9%** | **36,405** |
| | | | | | | |
| South Leg | Inbound | 1,817 | 1,292 | | | |
| South Leg | Outbound | 1,213 | 1,991 | | | |
| **South Leg** | **TOTAL** | **3,030** | **3,283** | **6%** | **7%** | **47,253** |
| | | | | | | |
| East Leg | Inbound | 891 | 551 | | | |
| East Leg | Outbound | 431 | 1,031 | | | |
| **East Leg** | **TOTAL** | **1,322** | **1,582** | **13%** | **16%** | **9,961** |
| | | | | | | |
| West Leg | Inbound | 629 | 1,193 | | | |
| West Leg | Outbound | 892 | 660 | | | |
| **West Leg** | **TOTAL** | **1,521** | **1,853** | **7%** | **9%** | **20,634** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***8,660*** | ***10,004*** | ***8%*** | ***9%*** | ***114,252*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | JB |
| | | Date: | 2/24/25 |

LOCATION: Archibald Av. & Limonite Av.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 1 | 156 | 155 | 15500% | 1 | 144 | 143 | 14300% |
| | Through | 4 | 1,253 | 1,249 | 31225% | 4 | 924 | 920 | 23000% |
| | Right | 1 | 273 | 272 | 27200% | 1 | 292 | 291 | 29100% |
| | NB Total | 6 | 1,682 | 1,676 | 27933% | 6 | 1,360 | 1,354 | 22567% |
| SOUTH BOUND | Left | 1 | 561 | 560 | 56000% | 1 | 708 | 707 | 70700% |
| | Through | 4 | 851 | 847 | 21175% | 4 | 1,192 | 1,188 | 29700% |
| | Right | 1 | 321 | 320 | 32000% | 1 | 350 | 349 | 34900% |
| | SB Total | 6 | 1,733 | 1,727 | 28783% | 6 | 2,250 | 2,244 | 37400% |
| EAST BOUND | Left | 1 | 441 | 440 | 44000% | 1 | 313 | 312 | 31200% |
| | Through | 4 | 866 | 862 | 21550% | 4 | 890 | 886 | 22150% |
| | Right | 1 | 146 | 145 | 14500% | 1 | 167 | 166 | 16600% |
| | EB Total | 6 | 1,453 | 1,447 | 24117% | 6 | 1,370 | 1,364 | 22733% |
| WEST BOUND | Left | 1 | 234 | 233 | 23300% | 1 | 331 | 330 | 33000% |
| | Through | 4 | 793 | 789 | 19725% | 4 | 876 | 872 | 21800% |
| | Right | 1 | 706 | 705 | 70500% | 1 | 623 | 622 | 62200% |
| | WB Total | 6 | 1,733 | 1,727 | 28783% | 6 | 1,830 | 1,824 | 30400% |
| TOTAL ENTERING VOLUME | | 24 | 6,601 | 6577 | 27404% | 24 | 6,810 | 6786 | 28275% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,733 | 2,250 | | | |
| North Leg | Outbound | 2,400 | 1,860 | | | |
| **North Leg** | **TOTAL** | **4,133** | **4,110** | **8%** | **8%** | **54,727** |
| | | | | | | |
| South Leg | Inbound | 1,682 | 1,360 | | | |
| South Leg | Outbound | 1,231 | 1,690 | | | |
| **South Leg** | **TOTAL** | **2,913** | **3,050** | **8%** | **8%** | **38,014** |
| | | | | | | |
| East Leg | Inbound | 1,733 | 1,830 | | | |
| East Leg | Outbound | 1,700 | 1,890 | | | |
| **East Leg** | **TOTAL** | **3,433** | **3,720** | **7%** | **8%** | **47,933** |
| | | | | | | |
| West Leg | Inbound | 1,453 | 1,370 | | | |
| West Leg | Outbound | 1,270 | 1,370 | | | |
| **West Leg** | **TOTAL** | **2,723** | **2,740** | **7%** | **7%** | **38,602** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***13,202*** | ***13,620*** | ***7%*** | ***8%*** | ***179,275*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Turner Av. & Ontario Ranch Rd.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 32 | 31 | -1 | -3% | 9 | 12 | 3 | 33% |
| | Through | 81 | 95 | 14 | 17% | 20 | 38 | 18 | 90% |
| | Right | 52 | 44 | -8 | -15% | 47 | 33 | -14 | -30% |
| | NB Total | 165 | 170 | 5 | 3% | 76 | 83 | 7 | 9% |
| SOUTH BOUND | Left | 55 | 229 | 174 | 316% | 76 | 305 | 229 | 301% |
| | Through | 45 | 53 | 8 | 18% | 33 | 50 | 17 | 52% |
| | Right | 39 | 188 | 149 | 382% | 25 | 189 | 164 | 656% |
| | SB Total | 139 | 470 | 331 | 238% | 134 | 544 | 410 | 306% |
| EAST BOUND | Left | 51 | 257 | 206 | 404% | 29 | 221 | 192 | 662% |
| | Through | 311 | 1,121 | 810 | 260% | 520 | 1,452 | 932 | 179% |
| | Right | 9 | 9 | 0 | 0% | 23 | 24 | 1 | 4% |
| | EB Total | 371 | 1,387 | 1,016 | 274% | 572 | 1,697 | 1,125 | 197% |
| WEST BOUND | Left | 28 | 18 | -10 | -36% | 53 | 35 | -18 | -34% |
| | Through | 487 | 1,255 | 768 | 158% | 511 | 1,680 | 1,169 | 229% |
| | Right | 45 | 140 | 95 | 211% | 44 | 211 | 167 | 380% |
| | WB Total | 560 | 1,413 | 853 | 152% | 608 | 1,926 | 1,318 | 217% |
| TOTAL ENTERING VOLUME | | 1,235 | 3,440 | 2205 | 179% | 1,390 | 4,250 | 2860 | 206% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 470 | 544 | | | |
| North Leg | Outbound | 492 | 470 | | | |
| **North Leg** | **TOTAL** | **962** | **1,014** | **7%** | **7%** | **14,308** |
| | | | | | | |
| South Leg | Inbound | 170 | 83 | | | |
| South Leg | Outbound | 80 | 109 | | | |
| **South Leg** | **TOTAL** | **250** | **192** | **10%** | **8%** | **2,514** |
| | | | | | | |
| East Leg | Inbound | 1,413 | 1,926 | | | |
| East Leg | Outbound | 1,394 | 1,790 | | | |
| **East Leg** | **TOTAL** | **2,807** | **3,716** | **6%** | **8%** | **47,030** |
| | | | | | | |
| West Leg | Inbound | 1,387 | 1,697 | | | |
| West Leg | Outbound | 1,474 | 1,881 | | | |
| **West Leg** | **TOTAL** | **2,861** | **3,578** | **6%** | **7%** | **49,376** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***6,880*** | ***8,500*** | **6%** | ***8%*** | ***113,228*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Haven Av. & Ontario Ranch Rd.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 61 | 74 | 13 | 21% | 27 | 77 | 50 | 185% |
| | Through | 349 | 341 | -8 | -2% | 170 | 247 | 77 | 45% |
| | Right | 96 | 125 | 29 | 30% | 69 | 116 | 47 | 68% |
| | NB Total | 506 | 540 | 34 | 7% | 266 | 440 | 174 | 65% |
| SOUTH BOUND | Left | 169 | 393 | 224 | 133% | 227 | 419 | 192 | 85% |
| | Through | 234 | 299 | 65 | 28% | 372 | 419 | 47 | 13% |
| | Right | 41 | 89 | 48 | 117% | 58 | 182 | 124 | 214% |
| | SB Total | 444 | 781 | 337 | 76% | 657 | 1,020 | 363 | 55% |
| EAST BOUND | Left | 106 | 269 | 163 | 154% | 162 | 411 | 249 | 154% |
| | Through | 319 | 1,074 | 755 | 237% | 515 | 1,505 | 990 | 192% |
| | Right | 58 | 107 | 49 | 84% | 32 | 57 | 25 | 78% |
| | EB Total | 483 | 1,450 | 967 | 200% | 709 | 1,973 | 1,264 | 178% |
| WEST BOUND | Left | 120 | 205 | 85 | 71% | 226 | 234 | 8 | 4% |
| | Through | 414 | 1,207 | 793 | 192% | 558 | 1,611 | 1,053 | 189% |
| | Right | 220 | 517 | 297 | 135% | 225 | 332 | 107 | 48% |
| | WB Total | 754 | 1,929 | 1,175 | 156% | 1,009 | 2,177 | 1,168 | 116% |
| TOTAL ENTERING VOLUME | | 2,187 | 4,700 | 2513 | 115% | 2,641 | 5,610 | 2969 | 112% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 781 | 1,020 | | | |
| North Leg | Outbound | 1,127 | 990 | | | |
| **North Leg** | **TOTAL** | **1,908** | **2,010** | **8%** | **8%** | **24,198** |
| | | | | | | |
| South Leg | Inbound | 540 | 440 | | | |
| South Leg | Outbound | 611 | 710 | | | |
| **South Leg** | **TOTAL** | **1,151** | **1,150** | **9%** | **9%** | **12,331** |
| | | | | | | |
| East Leg | Inbound | 1,929 | 2,177 | | | |
| East Leg | Outbound | 1,592 | 2,040 | | | |
| **East Leg** | **TOTAL** | **3,521** | **4,217** | **7%** | **9%** | **47,555** |
| | | | | | | |
| West Leg | Inbound | 1,450 | 1,973 | | | |
| West Leg | Outbound | 1,370 | 1,870 | | | |
| **West Leg** | **TOTAL** | **2,820** | **3,843** | **6%** | **8%** | **47,030** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***9,400*** | ***11,220*** | ***7%*** | ***9%*** | ***131,114*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: Hamner Av. & Ontario Ranch Rd.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 134 | 467 | 333 | 249% | 345 | 638 | 293 | 85% |
| | Through | 473 | 689 | 216 | 46% | 305 | 509 | 204 | 67% |
| | Right | 351 | 484 | 133 | 38% | 261 | 340 | 79 | 30% |
| | NB Total | 958 | 1,640 | 682 | 71% | 911 | 1,487 | 576 | 63% |
| SOUTH BOUND | Left | 79 | 144 | 65 | 82% | 171 | 366 | 195 | 114% |
| | Through | 146 | 296 | 150 | 103% | 358 | 691 | 333 | 93% |
| | Right | 41 | 189 | 148 | 361% | 81 | 246 | 165 | 204% |
| | SB Total | 266 | 629 | 363 | 136% | 610 | 1,303 | 693 | 114% |
| EAST BOUND | Left | 106 | 300 | 194 | 183% | 93 | 315 | 222 | 239% |
| | Through | 448 | 1,198 | 750 | 167% | 497 | 1,313 | 816 | 164% |
| | Right | 94 | 279 | 185 | 197% | 223 | 531 | 308 | 138% |
| | EB Total | 648 | 1,777 | 1,129 | 174% | 813 | 2,159 | 1,346 | 166% |
| WEST BOUND | Left | 180 | 199 | 19 | 11% | 340 | 448 | 108 | 32% |
| | Through | 476 | 1,200 | 724 | 152% | 687 | 1,426 | 739 | 108% |
| | Right | 184 | 194 | 10 | 5% | 142 | 266 | 124 | 87% |
| | WB Total | 840 | 1,593 | 753 | 90% | 1,169 | 2,140 | 971 | 83% |
| TOTAL ENTERING VOLUME | | 2,712 | 5,639 | 2927 | 108% | 3,503 | 7,089 | 3586 | 102% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 629 | 1,303 | | | |
| North Leg | Outbound | 1,183 | 1,090 | | | |
| **North Leg** | **TOTAL** | **1,812** | **2,393** | **5%** | **7%** | **33,020** |
| | | | | | | |
| South Leg | Inbound | 1,640 | 1,487 | | | |
| South Leg | Outbound | 774 | 1,670 | | | |
| **South Leg** | **TOTAL** | **2,414** | **3,157** | **9%** | **11%** | **27,852** |
| | | | | | | |
| East Leg | Inbound | 1,593 | 2,140 | | | |
| East Leg | Outbound | 1,826 | 2,019 | | | |
| **East Leg** | **TOTAL** | **3,419** | **4,159** | **7%** | **9%** | **48,195** |
| | | | | | | |
| West Leg | Inbound | 1,777 | 2,159 | | | |
| West Leg | Outbound | 1,856 | 2,310 | | | |
| **West Leg** | **TOTAL** | **3,633** | **4,469** | **8%** | **9%** | **47,730** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***11,278*** | ***14,178*** | ***7%*** | ***9%*** | ***156,798*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: I-15 SB Ramps & Cantu-Galleano Ranch Rd.
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | NB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| SOUTH BOUND | Left | 245 | 224 | -21 | -9% | 245 | 278 | 33 | 13% |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 799 | 1,387 | 588 | 74% | 1,217 | 1,554 | 337 | 28% |
| | SB Total | 1,044 | 1,611 | 567 | 54% | 1,462 | 1,832 | 370 | 25% |
| EAST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 748 | 1,416 | 668 | 89% | 894 | 1,746 | 852 | 95% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | EB Total | 748 | 1,416 | 668 | 89% | 894 | 1,746 | 852 | 95% |
| WEST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 448 | 613 | 165 | 37% | 575 | 1,172 | 597 | 104% |
| | Right | 130 | 130 | 0 | 0% | 150 | 150 | 0 | 0% |
| | WB Total | 578 | 743 | 165 | 29% | 725 | 1,322 | 597 | 82% |
| TOTAL ENTERING VOLUME | | 2,370 | 3,770 | 1400 | 59% | 3,081 | 4,900 | 1819 | 59% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 1,611 | 1,832 | | | |
| North Leg | Outbound | 130 | 150 | | | |
| **North Leg** | **TOTAL** | **1,741** | **1,982** | **8%** | **9%** | **21,905** |
| | | | | | | |
| South Leg | Inbound | 0 | 0 | | | |
| South Leg | Outbound | 0 | 0 | | | |
| **South Leg** | **TOTAL** | **0** | **0** | **#DIV/0!** | **#DIV/0!** | **-** |
| | | | | | | |
| East Leg | Inbound | 743 | 1,322 | | | |
| East Leg | Outbound | 1,640 | 2,024 | | | |
| **East Leg** | **TOTAL** | **2,383** | **3,346** | **8%** | **11%** | **29,647** |
| | | | | | | |
| West Leg | Inbound | 1,416 | 1,746 | | | |
| West Leg | Outbound | 2,000 | 2,726 | | | |
| **West Leg** | **TOTAL** | **3,416** | **4,472** | **8%** | **11%** | **40,882** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***7,540*** | ***9,800*** | ***8%*** | ***11%*** | ***92,434*** |

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| | | | |
|---|---|---|---|
| Project: | Center Park SP | Job #: | 16036 |
| Scenario: | Horizon Year (2050) Without Project | Analyst: | IA |
| | | Date: | 2/19/25 |

LOCATION: I-15 NB Ramps & Cantu-Galleano Ranch
FORECAST YEAR: 2050

**INDIVIDUAL TURN VOLUME GROWTH REVIEW**

| | | AM PEAK HOUR INPUT DATA | | | | PM PEAK HOUR INPUT DATA | | | |
|---|---|---|---|---|---|---|---|---|---|
| APPROACH | TURNING MOVEMENT | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE | EXISTING COUNT | FUTURE VOLUME | DIFF-ERENCE | % CHANGE |
| NORTH BOUND | Left | 297 | 504 | 207 | 70% | 383 | 1,018 | 635 | 166% |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 186 | 329 | 143 | 77% | 124 | 116 | -8 | -6% |
| | NB Total | 483 | 833 | 350 | 72% | 507 | 1,134 | 627 | 124% |
| SOUTH BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | SB Total | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| EAST BOUND | Left | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | Through | 381 | 541 | 160 | 42% | 550 | 644 | 94 | 17% |
| | Right | 612 | 1,004 | 392 | 64% | 589 | 1,314 | 725 | 123% |
| | EB Total | 993 | 1,545 | 552 | 56% | 1,139 | 1,958 | 819 | 72% |
| WEST BOUND | Left | 185 | 266 | 81 | 44% | 146 | 186 | 40 | 27% |
| | Through | 281 | 336 | 55 | 20% | 342 | 652 | 310 | 91% |
| | Right | 0 | 0 | 0 | #DIV/0! | 0 | 0 | 0 | #DIV/0! |
| | WB Total | 466 | 602 | 136 | 29% | 488 | 838 | 350 | 72% |
| TOTAL ENTERING VOLUME | | 1,942 | 2,980 | 1038 | 53% | 2,134 | 3,930 | 1796 | 84% |

**FORECAST PEAK HOUR TO ADT COMPARISON**

| | | VOLUMES | | PERCENT OF ADT | | |
|---|---|---|---|---|---|---|
| | | AM | PM | AM | PM | ADT |
| North Leg | Inbound | 0 | 0 | | | |
| North Leg | Outbound | 0 | 0 | | | |
| **North Leg** | **TOTAL** | **0** | **0** | **#DIV/0!** | **#DIV/0!** | **-** |
| | | | | | | |
| South Leg | Inbound | 833 | 1,134 | | | |
| South Leg | Outbound | 1,270 | 1,500 | | | |
| **South Leg** | **TOTAL** | **2,103** | **2,634** | **12%** | **16%** | **16,877** |
| | | | | | | |
| East Leg | Inbound | 602 | 838 | | | |
| East Leg | Outbound | 870 | 760 | | | |
| **East Leg** | **TOTAL** | **1,472** | **1,598** | **9%** | **10%** | **15,790** |
| | | | | | | |
| West Leg | Inbound | 1,545 | 1,958 | | | |
| West Leg | Outbound | 840 | 1,670 | | | |
| **West Leg** | **TOTAL** | **2,385** | **3,628** | **8%** | **12%** | **31,370** |
| | | | | | | |
| ***OVERALL TOTAL*** | | ***5,960*** | ***7,860*** | **9%** | ***12%*** | ***64,037*** |

*Z:\Shared\UcJobs_15600-16000_16000\16036\02_LOS\Post Processing\[45_I-15 NB Ramps & Cantu-Galleano Ranch.xls]Output (3)*

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# APPENDIX 5.1:

# E+P (PHASE 1) INTERSECTION ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 310 | 1 | 434 | 284 | 685 | 745 | 458 |
| Future Volume (vph) | 310 | 1 | 434 | 284 | 685 | 745 | 458 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 27.0 | 61.0 | 34.0 | 34.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 30.0% | 67.8% | 37.8% | 37.8% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 20.8 | 20.8 | 20.8 | 20.2 | 56.2 | 30.8 | 30.8 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.22 | 0.62 | 0.34 | 0.34 |
| v/c Ratio | 0.81 | 0.55 | 0.52 | 0.86 | 0.35 | 0.70 | 0.60 |
| Control Delay (s/veh) | 51.4 | 12.6 | 10.2 | 60.4 | 9.4 | 30.4 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.4 | 12.6 | 10.2 | 60.4 | 9.4 | 30.4 | 5.8 |
| LOS | D | B | B | E | A | C | A |
| Approach Delay (s/veh) | | 25.4 | | | 24.3 | 21.0 | |
| Approach LOS | | C | | | C | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 36.8 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 23.2 | Intersection LOS: C |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

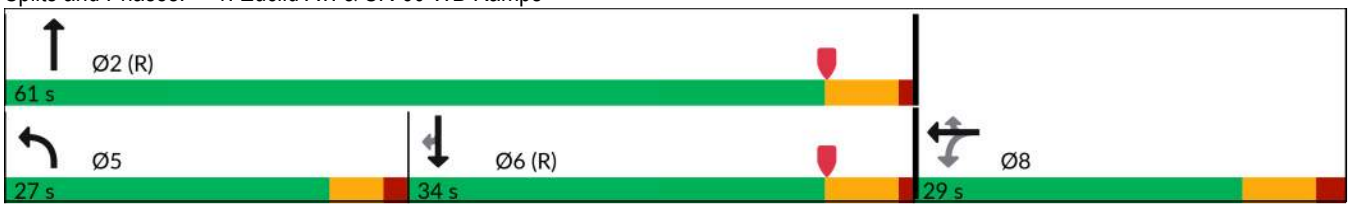

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 310 | 1 | 434 | 284 | 685 | 0 | 0 | 745 | 458 |
| Future Volume (veh/h) | 0 | 0 | 0 | 310 | 1 | 434 | 284 | 685 | 0 | 0 | 745 | 458 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 418 | 0 | 181 | 305 | 737 | 0 | 0 | 801 | 264 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 549 | 0 | 258 | 330 | 2300 | 0 | 0 | 1409 | 615 |
| Arrive On Green | | | | 0.17 | 0.00 | 0.17 | 0.41 | 1.00 | 0.00 | 0.00 | 0.42 | 0.42 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1496 | 1594 | 3455 | 0 | 0 | 3455 | 1469 |
| Grp Volume(v), veh/h | | | | 418 | 0 | 181 | 305 | 737 | 0 | 0 | 801 | 264 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1496 | 1594 | 1683 | 0 | 0 | 1683 | 1469 |
| Q Serve(g_s), s | | | | 11.2 | 0.0 | 10.3 | 16.3 | 0.0 | 0.0 | 0.0 | 16.3 | 11.5 |
| Cycle Q Clear(g_c), s | | | | 11.2 | 0.0 | 10.3 | 16.3 | 0.0 | 0.0 | 0.0 | 16.3 | 11.5 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 549 | 0 | 258 | 330 | 2300 | 0 | 0 | 1409 | 615 |
| V/C Ratio(X) | | | | 0.76 | 0.00 | 0.70 | 0.92 | 0.32 | 0.00 | 0.00 | 0.57 | 0.43 |
| Avail Cap(c_a), veh/h | | | | 779 | 0 | 366 | 386 | 2300 | 0 | 0 | 1409 | 615 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.63 | 0.63 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.5 | 0.0 | 35.1 | 25.7 | 0.0 | 0.0 | 0.0 | 20.0 | 18.6 |
| Incr Delay (d2), s/veh | | | | 3.6 | 0.0 | 4.9 | 18.3 | 0.2 | 0.0 | 0.0 | 1.7 | 2.2 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.6 | 0.0 | 4.0 | 5.9 | 0.1 | 0.0 | 0.0 | 6.1 | 3.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.1 | 0.0 | 40.0 | 43.9 | 0.2 | 0.0 | 0.0 | 21.6 | 20.7 |
| LnGrp LOS | | | | D | | D | D | A | | | C | C |
| Approach Vol, veh/h | | | | | 599 | | | 1042 | | | 1065 | |
| Approach Delay, s/veh | | | | | 39.4 | | | 13.0 | | | 21.4 | |
| Approach LOS | | | | | D | | | B | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.5 | | 23.8 | 43.7 | | 22.5 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 21.8 | 28.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 18.3 | 18.3 | | 13.2 |
| Green Ext Time (p_c), s | 8.1 | | 0.3 | 5.3 | | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.2 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 308 | 1 | 210 | 661 | 390 | 338 | 717 |
| Future Volume (vph) | 308 | 1 | 210 | 661 | 390 | 338 | 717 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 27.7 | 27.7 | 27.7 | 26.0 | 26.0 | 14.7 | 24.0 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 60.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 66.7% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | | 7.0 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 21.6 | 0.0 | 21.6 | 27.7 | 27.7 | 23.0 | 55.4 |
| Actuated g/C Ratio | 0.24 | 0.00 | 0.24 | 0.31 | 0.31 | 0.26 | 0.62 |
| v/c Ratio | 0.84 | no cap | 0.41 | 0.66 | 0.55 | 0.86 | 0.36 |
| Control Delay (s/veh) | 52.7 | | 6.8 | 32.0 | 6.2 | 62.4 | 8.7 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.7 | Error | 6.8 | 32.0 | 6.2 | 62.4 | 8.7 |
| LOS | D | F | A | C | A | E | A |
| Approach Delay (s/veh) | | Error | | 22.4 | | | 25.9 |
| Approach LOS | | F | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 36.6 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

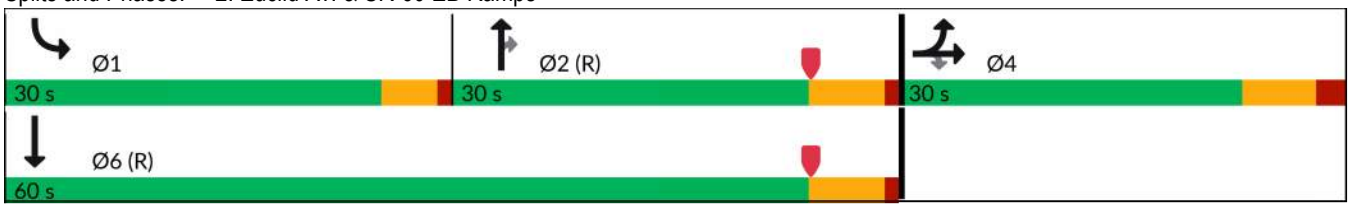

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 308 | 1 | 210 | 0 | 0 | 0 | 0 | 661 | 390 | 338 | 717 | 0 |
| Future Volume (veh/h) | 308 | 1 | 210 | 0 | 0 | 0 | 0 | 661 | 390 | 338 | 717 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 318 | 1 | 158 | | | | 0 | 681 | 299 | 348 | 739 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 359 | 0 | 338 | | | | 0 | 1160 | 516 | 373 | 2123 | 0 |
| Arrive On Green | 0.23 | 0.23 | 0.23 | | | | 0.00 | 0.34 | 0.34 | 0.47 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 1502 | | | | 0 | 3455 | 1497 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 318 | 0 | 158 | | | | 0 | 681 | 299 | 348 | 739 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1683 | 1497 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 17.4 | 0.0 | 8.2 | | | | 0.0 | 15.0 | 14.7 | 18.6 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 17.4 | 0.0 | 8.2 | | | | 0.0 | 15.0 | 14.7 | 18.6 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 359 | 0 | 338 | | | | 0 | 1160 | 516 | 373 | 2123 | 0 |
| V/C Ratio(X) | 0.89 | 0.00 | 0.47 | | | | 0.00 | 0.59 | 0.58 | 0.93 | 0.35 | 0.00 |
| Avail Cap(c_a), veh/h | 407 | 0 | 384 | | | | 0 | 1160 | 516 | 448 | 2123 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.82 | 0.82 | 0.61 | 0.61 | 0.00 |
| Uniform Delay (d), s/veh | 33.8 | 0.0 | 30.2 | | | | 0.0 | 24.2 | 24.2 | 23.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 19.7 | 0.0 | 1.4 | | | | 0.0 | 1.8 | 3.9 | 17.2 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.5 | 0.0 | 3.0 | | | | 0.0 | 5.8 | 5.3 | 6.2 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 53.5 | 0.0 | 31.6 | | | | 0.0 | 26.0 | 28.0 | 40.5 | 0.3 | 0.0 |
| LnGrp LOS | D | | C | | | | | C | C | D | A | |
| Approach Vol, veh/h | | 476 | | | | | | 980 | | | 1087 | |
| Approach Delay, s/veh | | 46.2 | | | | | | 26.6 | | | 13.1 | |
| Approach LOS | | D | | | | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.7 | 37.0 | | 27.3 | | 62.7 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 7.0 | | 6.0 |
| Max Green Setting (Gmax), s | 25.3 | 24.0 | | 23.0 | | 54.0 |
| Max Q Clear Time (g_c+I1), s | 20.6 | 17.0 | | 19.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.5 | 4.2 | | 0.9 | | 8.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 24.5 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 105 | 269 | 43 | 366 | 93 | 762 | 127 | 747 |
| Future Volume (vph) | 105 | 269 | 43 | 366 | 93 | 762 | 127 | 747 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 43.0 | 43.0 | 43.0 | 43.0 | 41.4 | 41.4 | 35.6 | 77.0 |
| Total Split (%) | 35.8% | 35.8% | 35.8% | 35.8% | 34.5% | 34.5% | 29.7% | 64.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 22.7 | 22.7 | 22.7 | 22.7 | 22.5 | 22.5 | 8.5 | 36.1 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.12 | 0.51 |
| v/c Ratio | 0.57 | 0.39 | 0.17 | 0.54 | 0.58 | 0.54 | 0.39 | 0.35 |
| Control Delay (s/veh) | 35.0 | 17.5 | 21.2 | 19.9 | 38.6 | 22.3 | 38.0 | 11.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.0 | 17.5 | 21.2 | 19.9 | 38.6 | 22.3 | 38.0 | 11.5 |
| LOS | D | B | C | B | D | C | D | B |
| Approach Delay (s/veh) | | 21.3 | | 20.0 | | 24.0 | | 15.2 |
| Approach LOS | | C | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 71.4 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.58 | |
| Intersection Signal Delay (s/veh): 19.9 | Intersection LOS: B |
| Intersection Capacity Utilization 69.1% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

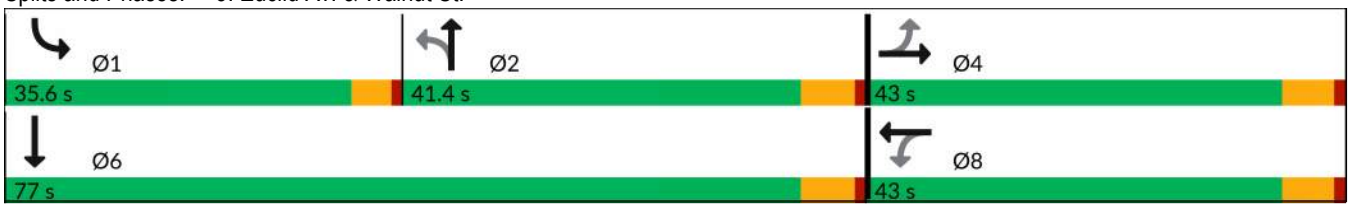

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 105 | 269 | 121 | 43 | 366 | 172 | 93 | 762 | 22 | 127 | 747 | 49 |
| Future Volume (veh/h) | 105 | 269 | 121 | 43 | 366 | 172 | 93 | 762 | 22 | 127 | 747 | 49 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 111 | 283 | 114 | 45 | 385 | 138 | 98 | 802 | 14 | 134 | 786 | 30 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 305 | 796 | 313 | 358 | 819 | 289 | 314 | 1415 | 25 | 230 | 2160 | 82 |
| Arrive On Green | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.29 | 0.29 | 0.29 | 0.08 | 0.45 | 0.45 |
| Sat Flow, veh/h | 830 | 2357 | 926 | 931 | 2427 | 857 | 632 | 4895 | 85 | 2910 | 4782 | 182 |
| Grp Volume(v), veh/h | 111 | 200 | 197 | 45 | 265 | 258 | 98 | 528 | 288 | 134 | 529 | 287 |
| Grp Sat Flow(s),veh/h/ln | 830 | 1683 | 1600 | 931 | 1683 | 1601 | 632 | 1612 | 1755 | 1455 | 1612 | 1739 |
| Q Serve(g_s), s | 6.7 | 4.9 | 5.1 | 2.1 | 6.8 | 7.0 | 7.2 | 7.7 | 7.7 | 2.4 | 5.9 | 6.0 |
| Cycle Q Clear(g_c), s | 13.7 | 4.9 | 5.1 | 7.2 | 6.8 | 7.0 | 7.2 | 7.7 | 7.7 | 2.4 | 5.9 | 6.0 |
| Prop In Lane | 1.00 | | 0.58 | 1.00 | | 0.54 | 1.00 | | 0.05 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 305 | 568 | 540 | 358 | 568 | 540 | 314 | 932 | 507 | 230 | 1457 | 786 |
| V/C Ratio(X) | 0.36 | 0.35 | 0.36 | 0.13 | 0.47 | 0.48 | 0.31 | 0.57 | 0.57 | 0.58 | 0.36 | 0.36 |
| Avail Cap(c_a), veh/h | 586 | 1137 | 1081 | 673 | 1137 | 1081 | 540 | 2085 | 1135 | 1638 | 4170 | 2249 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 19.8 | 13.7 | 13.8 | 16.5 | 14.3 | 14.4 | 16.5 | 16.6 | 16.6 | 24.5 | 9.9 | 9.9 |
| Incr Delay (d2), s/veh | 0.7 | 0.4 | 0.4 | 0.2 | 0.6 | 0.7 | 0.6 | 0.5 | 1.0 | 0.9 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 1.5 | 1.5 | 0.4 | 2.2 | 2.1 | 0.9 | 2.4 | 2.7 | 0.8 | 1.6 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 20.5 | 14.1 | 14.2 | 16.7 | 14.9 | 15.1 | 17.0 | 17.2 | 17.6 | 25.3 | 10.1 | 10.2 |
| LnGrp LOS | C | B | B | B | B | B | B | B | B | C | B | B |
| Approach Vol, veh/h | | 508 | | | 568 | | | 914 | | | 950 | |
| Approach Delay, s/veh | | 15.5 | | | 15.1 | | | 17.3 | | | 12.3 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.0 | 21.7 | | 24.4 | | 30.7 | | 24.4 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.0 | 35.6 | | 37.2 | | 71.2 | | 37.2 |
| Max Q Clear Time (g_c+I1), s | 4.4 | 9.7 | | 15.7 | | 8.0 | | 9.2 |
| Green Ext Time (p_c), s | 0.2 | 6.2 | | 2.8 | | 5.6 | | 3.3 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 14.9 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 121 | 368 | 175 | 590 | 43 | 589 | 117 | 123 | 629 | 113 |
| Future Volume (vph) | 121 | 368 | 175 | 590 | 43 | 589 | 117 | 123 | 629 | 113 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 21.0 | 43.0 | 23.0 | 45.0 | 15.2 | 35.0 | 35.0 | 19.0 | 38.8 | 38.8 |
| Total Split (%) | 17.5% | 35.8% | 19.2% | 37.5% | 12.7% | 29.2% | 29.2% | 15.8% | 32.3% | 32.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.2 | 32.1 | 16.4 | 34.3 | 10.2 | 25.2 | 25.2 | 12.8 | 31.9 | 31.9 |
| Actuated g/C Ratio | 0.13 | 0.29 | 0.15 | 0.31 | 0.09 | 0.23 | 0.23 | 0.12 | 0.29 | 0.29 |
| v/c Ratio | 0.64 | 0.88 | 0.80 | 0.69 | 0.32 | 0.82 | 0.29 | 0.71 | 0.70 | 0.24 |
| Control Delay (s/veh) | 63.1 | 57.8 | 71.7 | 37.1 | 57.4 | 50.9 | 8.2 | 71.3 | 41.3 | 6.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 63.1 | 57.8 | 71.7 | 37.1 | 57.4 | 50.9 | 8.2 | 71.3 | 41.3 | 6.8 |
| LOS | E | E | E | D | E | D | A | E | D | A |
| Approach Delay (s/veh) | | 59.0 | | 44.3 | | 44.6 | | | 41.0 | |
| Approach LOS | | E | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.9 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay (s/veh): 46.1 | Intersection LOS: D |
| Intersection Capacity Utilization 80.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

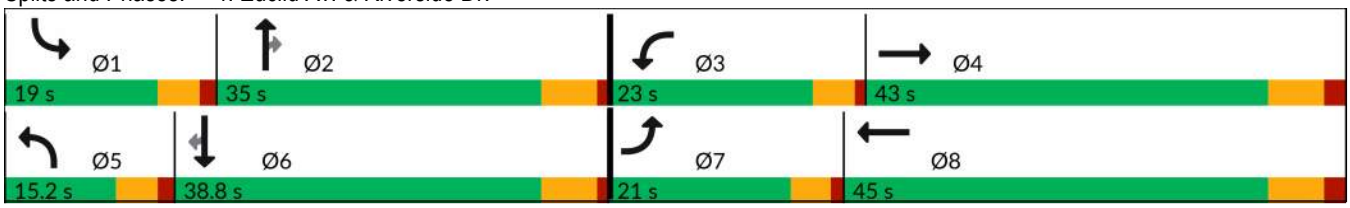

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 121 | 368 | 51 | 175 | 590 | 75 | 43 | 589 | 117 | 123 | 629 | 113 |
| Future Volume (veh/h) | 121 | 368 | 51 | 175 | 590 | 75 | 43 | 589 | 117 | 123 | 629 | 113 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 130 | 396 | 28 | 188 | 634 | 57 | 46 | 633 | 58 | 132 | 676 | 61 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 200 | 458 | 32 | 219 | 911 | 82 | 119 | 776 | 346 | 167 | 875 | 385 |
| Arrive On Green | 0.13 | 0.28 | 0.28 | 0.14 | 0.29 | 0.29 | 0.07 | 0.23 | 0.23 | 0.10 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1594 | 1635 | 116 | 1594 | 3119 | 280 | 1594 | 3367 | 1502 | 1594 | 3367 | 1482 |
| Grp Volume(v), veh/h | 130 | 0 | 424 | 188 | 342 | 349 | 46 | 633 | 58 | 132 | 676 | 61 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1751 | 1594 | 1683 | 1716 | 1594 | 1683 | 1502 | 1594 | 1683 | 1482 |
| Q Serve(g_s), s | 7.2 | 0.0 | 21.3 | 10.7 | 16.7 | 16.7 | 2.5 | 16.5 | 2.9 | 7.5 | 17.2 | 2.9 |
| Cycle Q Clear(g_c), s | 7.2 | 0.0 | 21.3 | 10.7 | 16.7 | 16.7 | 2.5 | 16.5 | 2.9 | 7.5 | 17.2 | 2.9 |
| Prop In Lane | 1.00 | | 0.07 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 200 | 0 | 491 | 219 | 492 | 501 | 119 | 776 | 346 | 167 | 875 | 385 |
| V/C Ratio(X) | 0.65 | 0.00 | 0.86 | 0.86 | 0.69 | 0.70 | 0.38 | 0.82 | 0.17 | 0.79 | 0.77 | 0.16 |
| Avail Cap(c_a), veh/h | 281 | 0 | 682 | 315 | 692 | 705 | 172 | 1056 | 471 | 238 | 1194 | 526 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.5 | 0.0 | 31.6 | 39.0 | 29.1 | 29.1 | 40.7 | 33.7 | 28.5 | 40.4 | 31.7 | 26.4 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 9.6 | 11.0 | 2.5 | 2.5 | 2.0 | 3.7 | 0.2 | 11.1 | 2.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.7 | 0.0 | 9.6 | 4.6 | 6.6 | 6.8 | 1.0 | 6.5 | 1.0 | 3.3 | 6.8 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 39.9 | 0.0 | 41.2 | 50.1 | 31.6 | 31.6 | 42.8 | 37.4 | 28.7 | 51.6 | 33.9 | 26.6 |
| LnGrp LOS | D | | D | D | C | C | D | D | C | D | C | C |
| Approach Vol, veh/h | | 554 | | | 879 | | | 737 | | | 869 | |
| Approach Delay, s/veh | | 40.9 | | | 35.5 | | | 37.0 | | | 36.0 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.9 | 27.3 | 17.4 | 32.9 | 12.1 | 30.0 | 16.3 | 34.0 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 13.8 | 29.0 | 18.3 | 36.0 | 10.0 | 32.8 | 16.3 | 38.0 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 18.5 | 12.7 | 23.3 | 4.5 | 19.2 | 9.2 | 18.7 |
| Green Ext Time (p_c), s | 0.1 | 2.8 | 0.1 | 2.6 | 0.0 | 3.7 | 0.1 | 5.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 37.0 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 64 | 207 | 34 | 78 | 252 | 46 | 691 | 132 | 37 | 754 | 61 |
| Future Volume (vph) | 64 | 207 | 34 | 78 | 252 | 46 | 691 | 132 | 37 | 754 | 61 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 56.0 | 56.0 | 56.0 | 56.0 | 56.0 | 49.0 | 49.0 | 49.0 | 15.0 | 64.0 | 64.0 |
| Total Split (%) | 46.7% | 46.7% | 46.7% | 46.7% | 46.7% | 40.8% | 40.8% | 40.8% | 12.5% | 53.3% | 53.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 28.5 | 28.5 | 28.5 | | 28.5 | 27.2 | 27.2 | 27.2 | 11.5 | 34.4 | 34.4 |
| Actuated g/C Ratio | 0.37 | 0.37 | 0.37 | | 0.37 | 0.35 | 0.35 | 0.35 | 0.15 | 0.45 | 0.45 |
| v/c Ratio | 0.26 | 0.35 | 0.06 | | 0.72 | 0.26 | 0.65 | 0.26 | 0.17 | 0.56 | 0.10 |
| Control Delay (s/veh) | 23.2 | 21.7 | 1.1 | | 31.0 | 27.1 | 26.4 | 14.7 | 42.4 | 17.3 | 4.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 23.2 | 21.7 | 1.1 | | 31.0 | 27.1 | 26.4 | 14.7 | 42.4 | 17.3 | 4.1 |
| LOS | C | C | A | | C | C | C | B | D | B | A |
| Approach Delay (s/veh) | | 19.7 | | | 31.0 | | 24.6 | | | 17.5 | |
| Approach LOS | | B | | | C | | C | | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 77 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.72 | |
| Intersection Signal Delay (s/veh): 22.4 | Intersection LOS: C |
| Intersection Capacity Utilization 83.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 64 | 207 | 34 | 78 | 252 | 33 | 46 | 691 | 132 | 37 | 754 | 61 |
| Future Volume (veh/h) | 64 | 207 | 34 | 78 | 252 | 33 | 46 | 691 | 132 | 37 | 754 | 61 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 71 | 230 | 26 | 87 | 280 | 37 | 51 | 768 | 113 | 41 | 838 | 38 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 324 | 582 | 493 | 145 | 365 | 44 | 295 | 1090 | 486 | 129 | 1608 | 700 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.32 | 0.32 | 0.32 | 0.08 | 0.48 | 0.48 |
| Sat Flow, veh/h | 1004 | 1772 | 1502 | 233 | 1110 | 135 | 597 | 3367 | 1502 | 1594 | 3367 | 1466 |
| Grp Volume(v), veh/h | 71 | 230 | 26 | 404 | 0 | 0 | 51 | 768 | 113 | 41 | 838 | 38 |
| Grp Sat Flow(s),veh/h/ln | 1004 | 1772 | 1502 | 1478 | 0 | 0 | 597 | 1683 | 1502 | 1594 | 1683 | 1466 |
| Q Serve(g_s), s | 0.0 | 6.4 | 0.8 | 10.0 | 0.0 | 0.0 | 4.1 | 12.7 | 3.5 | 1.5 | 11.0 | 0.9 |
| Cycle Q Clear(g_c), s | 6.4 | 6.4 | 0.8 | 16.3 | 0.0 | 0.0 | 5.4 | 12.7 | 3.5 | 1.5 | 11.0 | 0.9 |
| Prop In Lane | 1.00 | | 1.00 | 0.22 | | 0.09 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 324 | 582 | 493 | 555 | 0 | 0 | 295 | 1090 | 486 | 129 | 1608 | 700 |
| V/C Ratio(X) | 0.22 | 0.40 | 0.05 | 0.73 | 0.00 | 0.00 | 0.17 | 0.70 | 0.23 | 0.32 | 0.52 | 0.05 |
| Avail Cap(c_a), veh/h | 789 | 1403 | 1189 | 1274 | 0 | 0 | 502 | 2256 | 1006 | 261 | 3053 | 1329 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 16.5 | 16.4 | 14.5 | 19.8 | 0.0 | 0.0 | 16.8 | 18.8 | 15.7 | 27.5 | 11.5 | 8.9 |
| Incr Delay (d2), s/veh | 0.3 | 0.4 | 0.0 | 1.9 | 0.0 | 0.0 | 0.3 | 0.8 | 0.2 | 0.5 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 2.3 | 0.2 | 4.9 | 0.0 | 0.0 | 0.5 | 4.1 | 1.0 | 0.5 | 3.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 16.8 | 16.9 | 14.6 | 21.7 | 0.0 | 0.0 | 17.0 | 19.6 | 15.9 | 28.0 | 11.8 | 8.9 |
| LnGrp LOS | B | B | B | C | | | B | B | B | C | B | A |
| Approach Vol, veh/h | | 327 | | | 404 | | | 932 | | | 917 | |
| Approach Delay, s/veh | | 16.7 | | | 21.7 | | | 19.0 | | | 12.4 | |
| Approach LOS | | B | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.7 | 27.0 | | 26.6 | | 36.8 | | 26.6 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 42.5 | | 50.2 | | 57.5 | | 50.2 |
| Max Q Clear Time (g_c+I1), s | 3.5 | 14.7 | | 8.4 | | 13.0 | | 18.3 |
| Green Ext Time (p_c), s | 0.0 | 5.9 | | 1.7 | | 5.9 | | 2.5 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 16.8 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 111 | 68 | 73 | 47 | 145 | 95 | 689 | 23 | 43 | 771 | 80 |
| Future Volume (vph) | 111 | 68 | 73 | 47 | 145 | 95 | 689 | 23 | 43 | 771 | 80 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 17.0 | 49.3 | 49.3 | 14.7 | 47.0 | 15.0 | 41.3 | 41.3 | 14.7 | 41.0 | 41.0 |
| Total Split (%) | 14.2% | 41.1% | 41.1% | 12.3% | 39.2% | 12.5% | 34.4% | 34.4% | 12.3% | 34.2% | 34.2% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.6 | 20.6 | 20.6 | 10.3 | 19.3 | 10.4 | 36.6 | 36.6 | 10.3 | 29.4 | 29.4 |
| Actuated g/C Ratio | 0.12 | 0.22 | 0.22 | 0.11 | 0.20 | 0.11 | 0.39 | 0.39 | 0.11 | 0.31 | 0.31 |
| v/c Ratio | 0.63 | 0.19 | 0.19 | 0.30 | 0.65 | 0.59 | 0.58 | 0.04 | 0.27 | 0.81 | 0.16 |
| Control Delay (s/veh) | 58.4 | 30.7 | 2.8 | 49.7 | 40.0 | 59.5 | 28.6 | 0.1 | 49.1 | 38.2 | 3.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 58.4 | 30.7 | 2.8 | 49.7 | 40.0 | 59.5 | 28.6 | 0.1 | 49.1 | 38.2 | 3.0 |
| LOS | E | C | A | D | D | E | C | A | D | D | A |
| Approach Delay (s/veh) | | 34.8 | | | 41.8 | | 31.4 | | | 35.5 | |
| Approach LOS | | C | | | D | | C | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 94.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 34.7 | Intersection LOS: C |
| Intersection Capacity Utilization 70.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

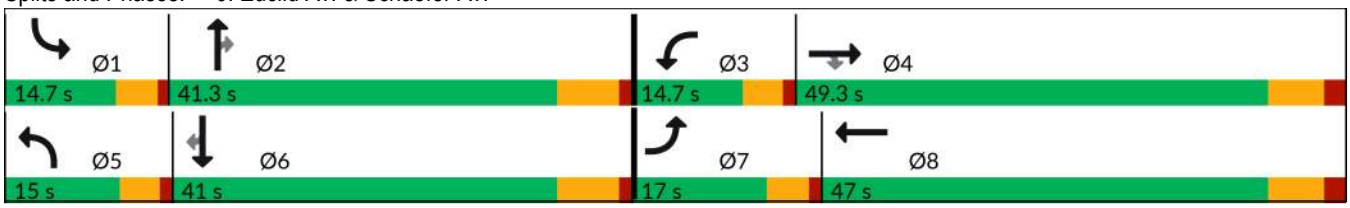

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 111 | 68 | 73 | 47 | 145 | 67 | 95 | 689 | 23 | 43 | 771 | 80 |
| Future Volume (veh/h) | 111 | 68 | 73 | 47 | 145 | 67 | 95 | 689 | 23 | 43 | 771 | 80 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 122 | 75 | 36 | 52 | 159 | 63 | 104 | 757 | 18 | 47 | 847 | 41 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 188 | 346 | 293 | 137 | 197 | 78 | 182 | 1165 | 520 | 130 | 1057 | 461 |
| Arrive On Green | 0.12 | 0.20 | 0.20 | 0.09 | 0.16 | 0.16 | 0.11 | 0.35 | 0.35 | 0.08 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1202 | 476 | 1594 | 3367 | 1502 | 1594 | 3367 | 1467 |
| Grp Volume(v), veh/h | 122 | 75 | 36 | 52 | 0 | 222 | 104 | 757 | 18 | 47 | 847 | 41 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1679 | 1594 | 1683 | 1502 | 1594 | 1683 | 1467 |
| Q Serve(g_s), s | 5.8 | 2.8 | 1.6 | 2.4 | 0.0 | 10.0 | 4.9 | 14.9 | 0.6 | 2.2 | 18.2 | 1.6 |
| Cycle Q Clear(g_c), s | 5.8 | 2.8 | 1.6 | 2.4 | 0.0 | 10.0 | 4.9 | 14.9 | 0.6 | 2.2 | 18.2 | 1.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.28 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 188 | 346 | 293 | 137 | 0 | 274 | 182 | 1165 | 520 | 130 | 1057 | 461 |
| V/C Ratio(X) | 0.65 | 0.22 | 0.12 | 0.38 | 0.00 | 0.81 | 0.57 | 0.65 | 0.03 | 0.36 | 0.80 | 0.09 |
| Avail Cap(c_a), veh/h | 249 | 951 | 806 | 202 | 0 | 852 | 208 | 1487 | 663 | 202 | 1474 | 643 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.2 | 26.6 | 26.1 | 34.0 | 0.0 | 31.8 | 33.1 | 21.7 | 17.0 | 34.2 | 24.8 | 19.1 |
| Incr Delay (d2), s/veh | 1.4 | 0.2 | 0.1 | 0.6 | 0.0 | 4.2 | 1.1 | 0.7 | 0.0 | 0.6 | 2.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 1.1 | 0.5 | 0.9 | 0.0 | 4.1 | 1.8 | 5.1 | 0.2 | 0.8 | 6.6 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.6 | 26.9 | 26.3 | 34.6 | 0.0 | 36.0 | 34.2 | 22.4 | 17.1 | 34.9 | 27.0 | 19.2 |
| LnGrp LOS | C | C | C | C | | D | C | C | B | C | C | B |
| Approach Vol, veh/h | | 233 | | | 274 | | | 879 | | | 935 | |
| Approach Delay, s/veh | | 30.8 | | | 35.7 | | | 23.7 | | | 27.1 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.1 | 33.8 | 11.5 | 22.4 | 13.7 | 31.2 | 14.0 | 19.9 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 34.8 | 10.0 | 42.3 | 10.3 | 34.5 | 12.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 4.2 | 16.9 | 4.4 | 4.8 | 6.9 | 20.2 | 7.8 | 12.0 |
| Green Ext Time (p_c), s | 0.0 | 4.3 | 0.0 | 0.4 | 0.0 | 4.5 | 0.1 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.2 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 75 | 141 | 51 | 97 | 303 | 142 | 688 | 79 | 60 | 657 | 130 |
| Future Volume (vph) | 75 | 141 | 51 | 97 | 303 | 142 | 688 | 79 | 60 | 657 | 130 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 53.0 | 53.0 | 53.0 | 53.0 | 53.0 | 17.0 | 50.0 | 50.0 | 17.0 | 50.0 | 50.0 |
| Total Split (%) | 44.2% | 44.2% | 44.2% | 44.2% | 44.2% | 14.2% | 41.7% | 41.7% | 14.2% | 41.7% | 41.7% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 26.0 | 10.9 | 28.8 | 28.8 | 10.8 | 24.6 | 24.6 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.13 | 0.36 | 0.36 | 0.13 | 0.30 | 0.30 |
| v/c Ratio | 0.47 | 0.27 | 0.10 | 0.29 | 0.77 | 0.39 | 0.61 | 0.14 | 0.30 | 0.68 | 0.25 |
| Control Delay (s/veh) | 33.9 | 22.4 | 3.4 | 24.1 | 34.4 | 40.0 | 26.6 | 6.8 | 42.2 | 29.2 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.9 | 22.4 | 3.4 | 24.1 | 34.4 | 40.0 | 26.6 | 6.8 | 42.2 | 29.2 | 5.7 |
| LOS | C | C | A | C | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 22.0 | | | 32.4 | | 27.0 | | | 26.5 | |
| Approach LOS | | C | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 80.8 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.77 | |
| Intersection Signal Delay (s/veh): 27.4 | Intersection LOS: C |
| Intersection Capacity Utilization 81.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

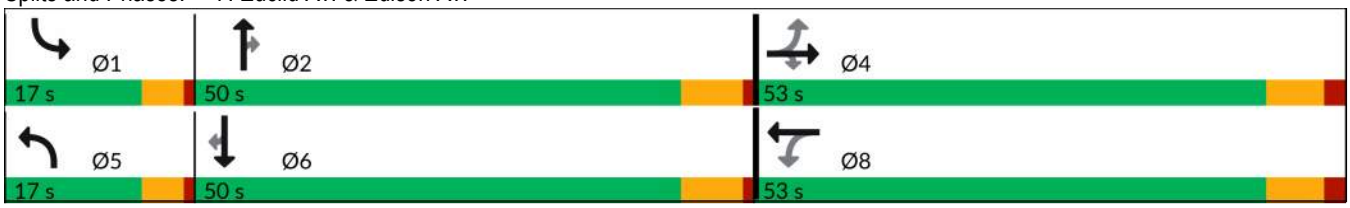

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 75 | 141 | 51 | 97 | 303 | 99 | 142 | 688 | 79 | 60 | 657 | 130 |
| Future Volume (veh/h) | 75 | 141 | 51 | 97 | 303 | 99 | 142 | 688 | 79 | 60 | 657 | 130 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 80 | 150 | 26 | 103 | 322 | 95 | 151 | 732 | 67 | 64 | 699 | 102 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 212 | 601 | 510 | 415 | 446 | 132 | 377 | 1048 | 468 | 158 | 945 | 416 |
| Arrive On Green | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.13 | 0.31 | 0.31 | 0.10 | 0.28 | 0.28 |
| Sat Flow, veh/h | 916 | 1772 | 1502 | 1141 | 1314 | 388 | 2910 | 3367 | 1502 | 1594 | 3367 | 1481 |
| Grp Volume(v), veh/h | 80 | 150 | 26 | 103 | 0 | 417 | 151 | 732 | 67 | 64 | 699 | 102 |
| Grp Sat Flow(s),veh/h/ln | 916 | 1772 | 1502 | 1141 | 0 | 1702 | 1455 | 1683 | 1502 | 1594 | 1683 | 1481 |
| Q Serve(g_s), s | 6.2 | 4.5 | 0.9 | 5.3 | 0.0 | 15.8 | 3.5 | 14.1 | 2.4 | 2.8 | 13.9 | 3.9 |
| Cycle Q Clear(g_c), s | 21.9 | 4.5 | 0.9 | 9.8 | 0.0 | 15.8 | 3.5 | 14.1 | 2.4 | 2.8 | 13.9 | 3.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.23 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 212 | 601 | 510 | 415 | 0 | 578 | 377 | 1048 | 468 | 158 | 945 | 416 |
| V/C Ratio(X) | 0.38 | 0.25 | 0.05 | 0.25 | 0.00 | 0.72 | 0.40 | 0.70 | 0.14 | 0.40 | 0.74 | 0.25 |
| Avail Cap(c_a), veh/h | 472 | 1103 | 935 | 739 | 0 | 1060 | 487 | 1991 | 888 | 266 | 1991 | 876 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.9 | 17.5 | 16.3 | 21.1 | 0.0 | 21.3 | 29.4 | 22.3 | 18.3 | 31.1 | 24.0 | 20.4 |
| Incr Delay (d2), s/veh | 1.1 | 0.2 | 0.0 | 0.3 | 0.0 | 1.7 | 0.3 | 0.9 | 0.1 | 0.6 | 1.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 1.7 | 0.3 | 1.3 | 0.0 | 5.8 | 1.1 | 4.8 | 0.7 | 1.0 | 4.9 | 1.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 32.0 | 17.8 | 16.4 | 21.4 | 0.0 | 23.0 | 29.6 | 23.1 | 18.4 | 31.7 | 25.2 | 20.7 |
| LnGrp LOS | C | B | B | C | | C | C | C | B | C | C | C |
| Approach Vol, veh/h | | 256 | | | 520 | | | 950 | | | 865 | |
| Approach Delay, s/veh | | 22.1 | | | 22.7 | | | 23.8 | | | 25.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.0 | 29.4 | | 32.2 | 14.2 | 27.2 | | 32.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 12.3 | 43.5 | | 45.8 | 12.3 | 43.5 | | 45.8 |
| Max Q Clear Time (g_c+I1), s | 4.8 | 16.1 | | 23.9 | 5.5 | 15.9 | | 17.8 |
| Green Ext Time (p_c), s | 0.0 | 4.8 | | 1.2 | 0.1 | 4.7 | | 2.9 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 23.9 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 76 | 106 | 110 | 271 | 117 | 675 | 72 | 86 | 681 | 32 |
| Future Volume (vph) | 51 | 76 | 106 | 110 | 271 | 117 | 675 | 72 | 86 | 681 | 32 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 26.6 | 26.6 | 26.6 | 26.6 | 26.6 | 13.0 | 30.2 | 30.2 | 12.0 | 25.0 | 25.0 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.15 | 0.36 | 0.36 | 0.14 | 0.30 | 0.30 |
| v/c Ratio | 0.33 | 0.15 | 0.21 | 0.32 | 0.78 | 0.51 | 0.56 | 0.13 | 0.40 | 0.73 | 0.07 |
| Control Delay (s/veh) | 30.5 | 22.8 | 5.7 | 25.9 | 36.4 | 45.8 | 26.8 | 6.2 | 44.9 | 32.4 | 0.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.5 | 22.8 | 5.7 | 25.9 | 36.4 | 45.8 | 26.8 | 6.2 | 44.9 | 32.4 | 0.3 |
| LOS | C | C | A | C | D | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 16.7 | | | 34.1 | | 27.6 | | | 32.5 | |
| Approach LOS | | B | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 84.1 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 29.6 | Intersection LOS: C |
| Intersection Capacity Utilization 81.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

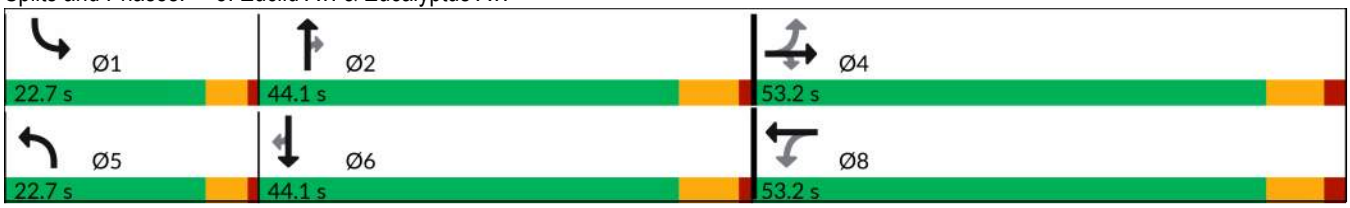

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 51 | 76 | 106 | 110 | 271 | 130 | 117 | 675 | 72 | 86 | 681 | 32 |
| Future Volume (veh/h) | 51 | 76 | 106 | 110 | 271 | 130 | 117 | 675 | 72 | 86 | 681 | 32 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 54 | 81 | 72 | 117 | 288 | 118 | 124 | 675 | 54 | 91 | 724 | 23 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 1.00 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 192 | 555 | 470 | 431 | 374 | 153 | 210 | 1009 | 450 | 191 | 968 | 432 |
| Arrive On Green | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.13 | 0.30 | 0.30 | 0.12 | 0.29 | 0.29 |
| Sat Flow, veh/h | 925 | 1772 | 1502 | 1166 | 1194 | 489 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 54 | 81 | 72 | 117 | 0 | 406 | 124 | 675 | 54 | 91 | 724 | 23 |
| Grp Sat Flow(s),veh/h/ln | 925 | 1772 | 1502 | 1166 | 0 | 1684 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 3.9 | 2.3 | 2.4 | 5.5 | 0.0 | 15.0 | 5.0 | 12.1 | 1.8 | 3.7 | 13.4 | 0.8 |
| Cycle Q Clear(g_c), s | 18.9 | 2.3 | 2.4 | 7.8 | 0.0 | 15.0 | 5.0 | 12.1 | 1.8 | 3.7 | 13.4 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.29 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 192 | 555 | 470 | 431 | 0 | 527 | 210 | 1009 | 450 | 191 | 968 | 432 |
| V/C Ratio(X) | 0.28 | 0.15 | 0.15 | 0.27 | 0.00 | 0.77 | 0.59 | 0.67 | 0.12 | 0.48 | 0.75 | 0.05 |
| Avail Cap(c_a), veh/h | 521 | 1185 | 1004 | 846 | 0 | 1126 | 417 | 1841 | 821 | 417 | 1841 | 821 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.9 | 17.0 | 17.0 | 19.8 | 0.0 | 21.4 | 28.1 | 21.1 | 17.5 | 28.3 | 22.2 | 17.7 |
| Incr Delay (d2), s/veh | 0.6 | 0.1 | 0.1 | 0.2 | 0.0 | 1.8 | 2.0 | 0.8 | 0.1 | 1.4 | 1.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.8 | 0.7 | 1.3 | 0.0 | 5.3 | 1.8 | 4.1 | 0.5 | 1.3 | 4.6 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 30.5 | 17.1 | 17.2 | 20.1 | 0.0 | 23.2 | 30.1 | 21.9 | 17.6 | 29.6 | 23.4 | 17.8 |
| LnGrp LOS | C | B | B | C | | C | C | C | B | C | C | B |
| Approach Vol, veh/h | | 207 | | | 523 | | | 853 | | | 838 | |
| Approach Delay, s/veh | | 20.6 | | | 22.5 | | | 22.8 | | | 23.9 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.9 | 27.1 | | 28.7 | 13.8 | 26.3 | | 28.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 14.1 | | 20.9 | 7.0 | 15.4 | | 17.0 |
| Green Ext Time (p_c), s | 0.1 | 4.2 | | 0.7 | 0.1 | 4.4 | | 2.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.9 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 7 | 2 | 59 | 25 | 21 | 935 | 56 | 143 | 820 |
| Future Volume (vph) | 7 | 2 | 59 | 25 | 21 | 935 | 56 | 143 | 820 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.8 | 50.8 | 22.0 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.3% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 18.3 | | 22.6 | 10.6 | 36.1 | 36.1 | 14.4 | 50.7 |
| Actuated g/C Ratio | | 0.20 | | 0.24 | 0.11 | 0.39 | 0.39 | 0.16 | 0.55 |
| v/c Ratio | | 0.06 | | 0.82 | 0.13 | 0.82 | 0.10 | 0.67 | 0.54 |
| Control Delay (s/veh) | | 22.9 | | 37.9 | 48.0 | 33.1 | 0.3 | 55.4 | 18.0 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 22.9 | | 37.9 | 48.0 | 33.1 | 0.3 | 55.4 | 18.0 |
| LOS | | C | | D | D | C | A | E | B |
| Approach Delay (s/veh) | | 22.9 | | 37.9 | | 31.6 | | | 23.3 |
| Approach LOS | | C | | D | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 92.6 | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 28.9 | Intersection LOS: C |
| Intersection Capacity Utilization 77.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

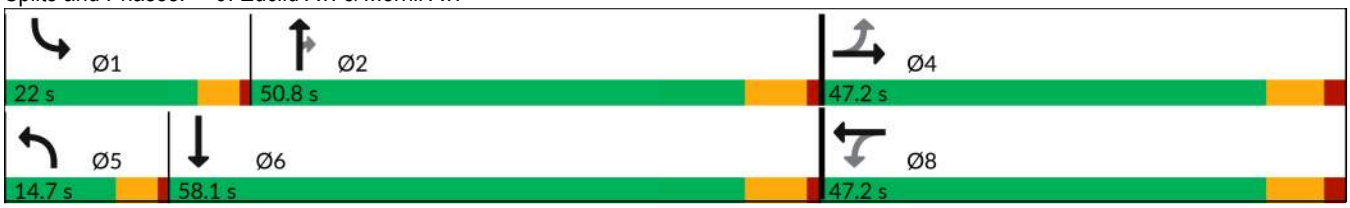

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 7 | 2 | 6 | 59 | 25 | 238 | 21 | 935 | 56 | 143 | 820 | 35 |
| Future Volume (veh/h) | 7 | 2 | 6 | 59 | 25 | 238 | 21 | 935 | 56 | 143 | 820 | 35 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 8 | 2 | 4 | 68 | 29 | 258 | 24 | 1075 | 59 | 164 | 943 | 29 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 198 | 54 | 75 | 112 | 54 | 313 | 80 | 1290 | 572 | 195 | 1515 | 47 |
| Arrive On Green | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.05 | 0.38 | 0.38 | 0.12 | 0.46 | 0.46 |
| Sat Flow, veh/h | 466 | 187 | 261 | 220 | 189 | 1090 | 1594 | 3367 | 1494 | 1594 | 3330 | 102 |
| Grp Volume(v), veh/h | 14 | 0 | 0 | 355 | 0 | 0 | 24 | 1075 | 59 | 164 | 477 | 495 |
| Grp Sat Flow(s),veh/h/ln | 915 | 0 | 0 | 1499 | 0 | 0 | 1594 | 1683 | 1494 | 1594 | 1683 | 1749 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 13.8 | 0.0 | 0.0 | 1.3 | 25.7 | 2.3 | 8.9 | 19.1 | 19.1 |
| Cycle Q Clear(g_c), s | 0.5 | 0.0 | 0.0 | 19.6 | 0.0 | 0.0 | 1.3 | 25.7 | 2.3 | 8.9 | 19.1 | 19.1 |
| Prop In Lane | 0.57 | | 0.29 | 0.19 | | 0.73 | 1.00 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 327 | 0 | 0 | 479 | 0 | 0 | 80 | 1290 | 572 | 195 | 766 | 796 |
| V/C Ratio(X) | 0.04 | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 | 0.30 | 0.83 | 0.10 | 0.84 | 0.62 | 0.62 |
| Avail Cap(c_a), veh/h | 531 | 0 | 0 | 721 | 0 | 0 | 179 | 1679 | 745 | 310 | 978 | 1016 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.7 | 0.0 | 0.0 | 29.4 | 0.0 | 0.0 | 40.7 | 24.8 | 17.6 | 38.2 | 18.4 | 18.4 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.8 | 2.9 | 0.1 | 6.0 | 0.8 | 0.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.0 | 6.5 | 0.0 | 0.0 | 0.5 | 9.4 | 0.7 | 3.5 | 6.5 | 6.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 22.8 | 0.0 | 0.0 | 30.3 | 0.0 | 0.0 | 41.4 | 27.8 | 17.7 | 44.2 | 19.2 | 19.2 |
| LnGrp LOS | C | | | C | | | D | C | B | D | B | B |
| Approach Vol, veh/h | | 14 | | | 355 | | | 1158 | | | 1136 | |
| Approach Delay, s/veh | | 22.8 | | | 30.3 | | | 27.5 | | | 22.8 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.6 | 40.5 | | 32.7 | 9.2 | 46.9 | | 32.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.3 | 44.3 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 10.9 | 27.7 | | 2.5 | 3.3 | 21.1 | | 21.6 |
| Green Ext Time (p_c), s | 0.1 | 6.3 | | 0.0 | 0.0 | 5.8 | | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.9 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 97 | 283 | 28 | 31 | 818 | 333 | 95 | 490 | 30 | 207 | 477 | 150 |
| Future Volume (vph) | 97 | 283 | 28 | 31 | 818 | 333 | 95 | 490 | 30 | 207 | 477 | 150 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 34.6 | 14.7 | 17.5 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 28.8% | 12.3% | 14.6% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.2 | 35.3 | 35.3 | 10.2 | 31.6 | 31.6 | 10.2 | 20.3 | 32.4 | 11.6 | 21.8 | 38.6 |
| Actuated g/C Ratio | 0.10 | 0.36 | 0.36 | 0.10 | 0.32 | 0.32 | 0.10 | 0.21 | 0.33 | 0.12 | 0.22 | 0.40 |
| v/c Ratio | 0.34 | 0.25 | 0.05 | 0.20 | 0.79 | 0.51 | 0.60 | 0.74 | 0.06 | 0.63 | 0.67 | 0.24 |
| Control Delay (s/veh) | 48.3 | 24.0 | 0.1 | 49.0 | 36.0 | 7.6 | 62.3 | 44.0 | 0.2 | 52.5 | 39.9 | 11.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.3 | 24.0 | 0.1 | 49.0 | 36.0 | 7.6 | 62.3 | 44.0 | 0.2 | 52.5 | 39.9 | 11.6 |
| LOS | D | C | A | D | D | A | E | D | A | D | D | B |
| Approach Delay (s/veh) | | 28.2 | | | 28.3 | | | 44.7 | | | 37.9 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 97.4 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 34.2 | Intersection LOS: C |
| Intersection Capacity Utilization 74.1% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

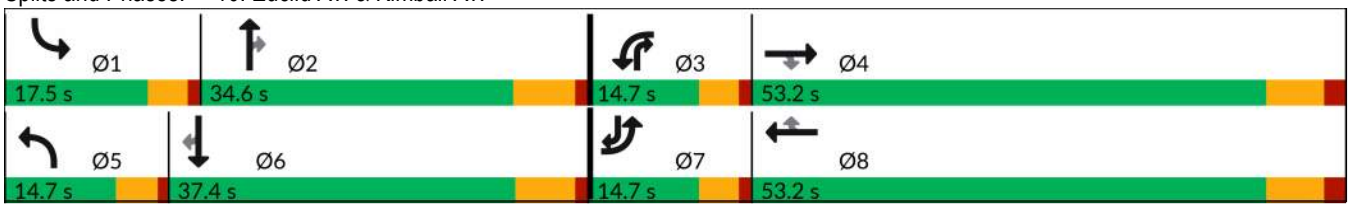

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 97 | 283 | 28 | 31 | 818 | 333 | 95 | 490 | 30 | 207 | 477 | 150 |
| Future Volume (veh/h) | 97 | 283 | 28 | 31 | 818 | 333 | 95 | 490 | 30 | 207 | 477 | 150 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 102 | 298 | 13 | 33 | 861 | 174 | 100 | 516 | 11 | 218 | 502 | 105 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 312 | 1178 | 525 | 101 | 1032 | 454 | 170 | 666 | 389 | 340 | 701 | 473 |
| Arrive On Green | 0.11 | 0.35 | 0.35 | 0.06 | 0.31 | 0.31 | 0.11 | 0.20 | 0.20 | 0.12 | 0.21 | 0.21 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 1594 | 3367 | 1483 | 1594 | 3367 | 1482 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 102 | 298 | 13 | 33 | 861 | 174 | 100 | 516 | 11 | 218 | 502 | 105 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1594 | 1683 | 1483 | 1594 | 1683 | 1482 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 2.8 | 5.4 | 0.5 | 1.7 | 20.3 | 7.8 | 5.1 | 12.3 | 0.5 | 6.1 | 11.8 | 4.4 |
| Cycle Q Clear(g_c), s | 2.8 | 5.4 | 0.5 | 1.7 | 20.3 | 7.8 | 5.1 | 12.3 | 0.5 | 6.1 | 11.8 | 4.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 312 | 1178 | 525 | 101 | 1032 | 454 | 170 | 666 | 389 | 340 | 701 | 473 |
| V/C Ratio(X) | 0.33 | 0.25 | 0.02 | 0.33 | 0.83 | 0.38 | 0.59 | 0.77 | 0.03 | 0.64 | 0.72 | 0.22 |
| Avail Cap(c_a), veh/h | 342 | 1822 | 813 | 188 | 1822 | 802 | 188 | 1113 | 586 | 438 | 1228 | 708 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.1 | 19.7 | 18.1 | 38.0 | 27.5 | 23.2 | 36.2 | 32.3 | 23.4 | 35.8 | 31.3 | 21.4 |
| Incr Delay (d2), s/veh | 0.2 | 0.1 | 0.0 | 1.8 | 0.7 | 0.2 | 2.1 | 2.0 | 0.0 | 0.8 | 1.4 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 1.9 | 0.2 | 0.7 | 7.4 | 2.5 | 1.9 | 4.7 | 0.2 | 2.0 | 4.5 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.3 | 19.8 | 18.1 | 39.9 | 28.2 | 23.4 | 38.3 | 34.3 | 23.4 | 36.6 | 32.7 | 21.7 |
| LnGrp LOS | D | B | B | D | C | C | D | C | C | D | C | C |
| Approach Vol, veh/h | | 413 | | | 1068 | | | 627 | | | 825 | |
| Approach Delay, s/veh | | 23.6 | | | 27.7 | | | 34.7 | | | 32.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.6 | 23.3 | 10.1 | 36.9 | 13.8 | 24.2 | 13.8 | 33.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 12.8 | 28.1 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 8.1 | 14.3 | 3.7 | 7.4 | 7.1 | 13.8 | 4.8 | 22.3 |
| Green Ext Time (p_c), s | 0.2 | 2.5 | 0.0 | 1.8 | 0.0 | 2.9 | 0.1 | 3.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.9 |
| HCM 7th LOS | C |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 6 | 119 | 958 | 378 | 41 | 445 | 577 | 56 | 543 |
| Future Volume (vph) | 6 | 119 | 958 | 378 | 41 | 445 | 577 | 56 | 543 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 20.0 | 48.0 | 52.3 | 14.8 | 37.2 | 48.0 | 14.8 | 37.2 |
| Total Split (%) | 13.1% | 16.7% | 40.0% | 43.6% | 12.3% | 31.0% | 40.0% | 12.3% | 31.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.3 | 12.6 | 40.0 | 55.7 | 10.3 | 22.4 | 69.1 | 10.4 | 25.3 |
| Actuated g/C Ratio | 0.10 | 0.12 | 0.38 | 0.53 | 0.10 | 0.21 | 0.65 | 0.10 | 0.24 |
| v/c Ratio | 0.04 | 0.67 | 0.90 | 0.46 | 0.27 | 0.65 | 0.54 | 0.37 | 0.73 |
| Control Delay (s/veh) | 50.3 | 63.3 | 45.2 | 21.1 | 54.8 | 43.7 | 6.1 | 57.8 | 44.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.3 | 63.3 | 45.2 | 21.1 | 54.8 | 43.7 | 6.1 | 57.8 | 44.2 |
| LOS | D | E | D | C | D | D | A | E | D |
| Approach Delay (s/veh) | | 62.7 | | 38.0 | | 23.7 | | | 45.4 |
| Approach LOS | | E | | D | | C | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105.7 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.90 | |
| Intersection Signal Delay (s/veh): 35.8 | Intersection LOS: D |
| Intersection Capacity Utilization 85.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

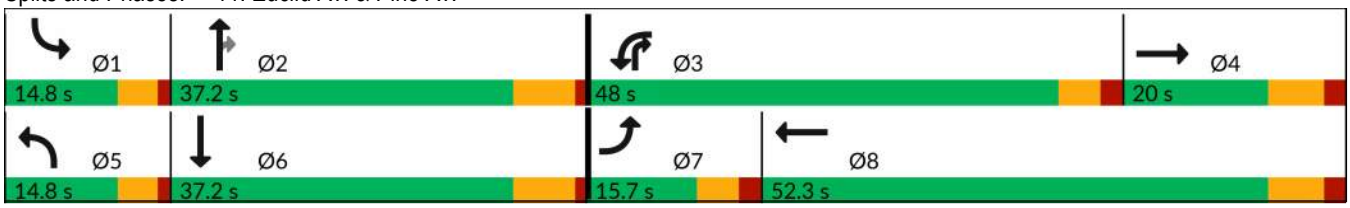

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 6 | 119 | 16 | 958 | 378 | 30 | 41 | 445 | 577 | 56 | 543 | 26 |
| Future Volume (veh/h) | 6 | 119 | 16 | 958 | 378 | 30 | 41 | 445 | 577 | 56 | 543 | 26 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 6 | 123 | 0 | 988 | 390 | 28 | 42 | 459 | 519 | 58 | 560 | 21 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 24 | 163 | | 1047 | 713 | 51 | 107 | 822 | 907 | 123 | 842 | 32 |
| Arrive On Green | 0.02 | 0.09 | 0.00 | 0.36 | 0.44 | 0.44 | 0.07 | 0.24 | 0.24 | 0.08 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1594 | 1772 | 0 | 2910 | 1634 | 117 | 1594 | 3367 | 1502 | 1594 | 3309 | 124 |
| Grp Volume(v), veh/h | 6 | 123 | 0 | 988 | 0 | 418 | 42 | 459 | 519 | 58 | 285 | 296 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 0 | 1455 | 0 | 1751 | 1594 | 1683 | 1502 | 1594 | 1683 | 1750 |
| Q Serve(g_s), s | 0.4 | 7.1 | 0.0 | 34.7 | 0.0 | 18.6 | 2.7 | 12.6 | 22.1 | 3.7 | 16.0 | 16.0 |
| Cycle Q Clear(g_c), s | 0.4 | 7.1 | 0.0 | 34.7 | 0.0 | 18.6 | 2.7 | 12.6 | 22.1 | 3.7 | 16.0 | 16.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.07 | 1.00 | | 1.00 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 24 | 163 | | 1047 | 0 | 765 | 107 | 822 | 907 | 123 | 428 | 445 |
| V/C Ratio(X) | 0.25 | 0.75 | | 0.94 | 0.00 | 0.55 | 0.39 | 0.56 | 0.57 | 0.47 | 0.66 | 0.67 |
| Avail Cap(c_a), veh/h | 151 | 218 | | 1166 | 0 | 765 | 153 | 979 | 977 | 153 | 490 | 509 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.4 | 46.7 | 0.0 | 32.7 | 0.0 | 22.0 | 47.2 | 34.9 | 12.7 | 46.6 | 35.3 | 35.3 |
| Incr Delay (d2), s/veh | 1.9 | 12.0 | 0.0 | 13.5 | 0.0 | 1.1 | 0.9 | 0.2 | 0.4 | 1.0 | 1.9 | 1.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 3.6 | 0.0 | 13.2 | 0.0 | 7.2 | 1.0 | 4.8 | 6.3 | 1.4 | 6.3 | 6.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 53.3 | 58.7 | 0.0 | 46.2 | 0.0 | 23.0 | 48.0 | 35.1 | 13.0 | 47.6 | 37.2 | 37.2 |
| LnGrp LOS | D | E | | D | | C | D | D | B | D | D | D |
| Approach Vol, veh/h | | 129 | | | 1406 | | | 1020 | | | 639 | |
| Approach Delay, s/veh | | 58.5 | | | 39.3 | | | 24.4 | | | 38.1 | |
| Approach LOS | | E | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.9 | 32.3 | 43.7 | 16.7 | 11.8 | 33.4 | 7.3 | 53.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.1 | 30.7 | 42.3 | 13.0 | 10.1 | 30.7 | 10.0 | 45.3 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 24.1 | 36.7 | 9.1 | 4.7 | 18.0 | 2.4 | 20.6 |
| Green Ext Time (p_c), s | 0.0 | 1.7 | 1.2 | 0.2 | 0.0 | 1.5 | 0.0 | 3.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 35.1 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 601 | 639 | 879 | 45 | 539 |
| Future Volume (vph) | 601 | 639 | 879 | 45 | 539 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 14.5 | 9.6 | 9.6 |
| Total Split (s) | 35.7 | 46.2 | 81.9 | 18.1 | 18.1 |
| Total Split (%) | 35.7% | 46.2% | 81.9% | 18.1% | 18.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 28.9 | 45.6 | 79.2 | 9.7 | 9.7 |
| Actuated g/C Ratio | 0.29 | 0.46 | 0.79 | 0.10 | 0.10 |
| v/c Ratio | 0.95 | 1.00 | 0.37 | 0.18 | 0.88 |
| Control Delay (s/veh) | 49.6 | 61.9 | 3.8 | 41.6 | 18.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.6 | 61.9 | 3.8 | 41.6 | 18.6 |
| LOS | D | E | A | D | B |
| Approach Delay (s/veh) | 49.6 | | 28.2 | 20.4 | |
| Approach LOS | D | | C | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.00 | |
| Intersection Signal Delay (s/veh): 32.6 | Intersection LOS: C |
| Intersection Capacity Utilization 81.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

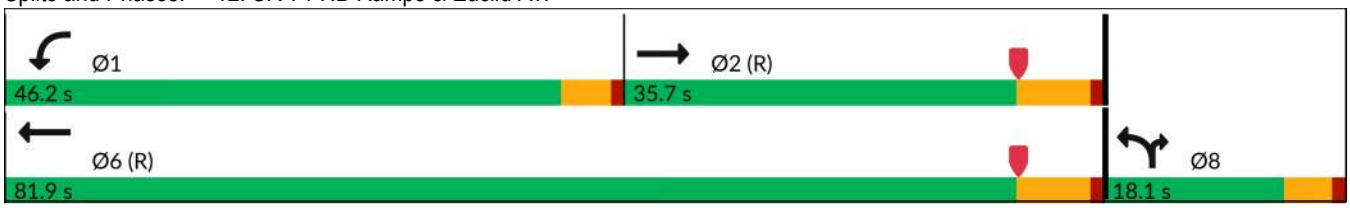

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 601 | 215 | 639 | 879 | 45 | 539 |
| Future Volume (veh/h) | 601 | 215 | 639 | 879 | 45 | 539 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1673 | 1772 | 1575 | 1772 |
| Adj Flow Rate, veh/h | 675 | 0 | 718 | 988 | 51 | 0 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1310 | | 661 | 2865 | 110 | |
| Arrive On Green | 0.78 | 0.00 | 0.41 | 0.85 | 0.04 | 0.00 |
| Sat Flow, veh/h | 3544 | 0 | 1594 | 3455 | 2910 | 1502 |
| Grp Volume(v), veh/h | 675 | 0 | 718 | 988 | 51 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1683 | 0 | 1594 | 1683 | 1455 | 1502 |
| Q Serve(g_s), s | 7.4 | 0.0 | 41.5 | 6.2 | 1.7 | 0.0 |
| Cycle Q Clear(g_c), s | 7.4 | 0.0 | 41.5 | 6.2 | 1.7 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1310 | | 661 | 2865 | 110 | |
| V/C Ratio(X) | 0.52 | | 1.09 | 0.34 | 0.46 | |
| Avail Cap(c_a), veh/h | 1310 | | 661 | 2865 | 393 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.62 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.6 | 0.0 | 29.3 | 1.6 | 47.1 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 60.5 | 0.3 | 3.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 0.0 | 24.9 | 0.2 | 0.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 8.5 | 0.0 | 89.7 | 1.9 | 50.1 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 675 | | | 1706 | 51 | |
| Approach Delay, s/veh | 8.5 | | | 38.9 | 50.1 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 46.2 | 45.4 | | | | 91.6 | 8.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 41.5 | 29.2 | | | | 75.4 | 13.5 |
| Max Q Clear Time (g_c+I1), s | 43.5 | 9.4 | | | | 8.2 | 3.7 |
| Green Ext Time (p_c), s | 0.0 | 3.1 | | | | 5.6 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.7 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 548 | 165 | 270 | 43 | 241 | 500 | 35 | 36 |
| Future Volume (vph) | 548 | 165 | 270 | 43 | 241 | 500 | 35 | 36 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 13.5 | 13.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 29.6 | 19.0 | 48.6 | 16.6 | 16.6 | 34.8 | 34.8 | 34.8 |
| Total Split (%) | 29.6% | 19.0% | 48.6% | 16.6% | 16.6% | 34.8% | 34.8% | 34.8% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 29.5 | 14.5 | 48.7 | 9.1 | 9.1 | 24.8 | 24.8 | 24.8 |
| Actuated g/C Ratio | 0.30 | 0.15 | 0.49 | 0.09 | 0.09 | 0.25 | 0.25 | 0.25 |
| v/c Ratio | 0.67 | 0.82 | 0.19 | 0.34 | 0.71 | 0.83 | 0.77 | 0.09 |
| Control Delay (s/veh) | 36.7 | 65.2 | 13.5 | 49.0 | 16.3 | 53.6 | 47.6 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.7 | 65.2 | 13.5 | 49.0 | 16.3 | 53.6 | 47.6 | 0.4 |
| LOS | D | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 36.7 | | 33.1 | | | | 47.5 | |
| Approach LOS | D | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 36.9 | Intersection LOS: D |
| Intersection Capacity Utilization 63.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

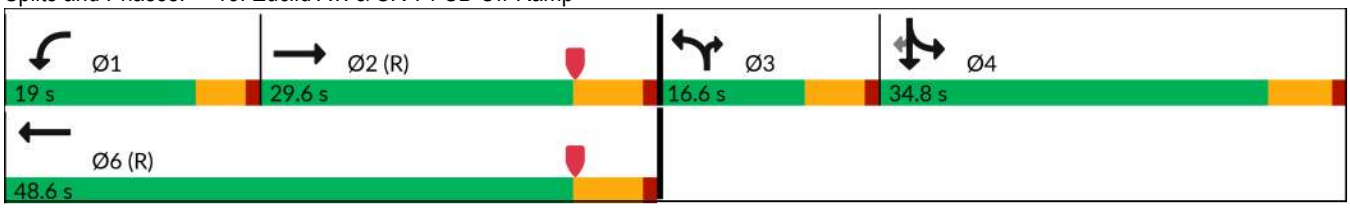

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 548 | 33 | 165 | 270 | 0 | 43 | 0 | 241 | 500 | 35 | 36 |
| Future Volume (veh/h) | 0 | 548 | 33 | 165 | 270 | 0 | 43 | 0 | 241 | 500 | 35 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 0 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 623 | 24 | 188 | 307 | 0 | 49 | 0 | 154 | 599 | 0 | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.80 | 0.88 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1601 | 62 | 212 | 2237 | | 0 | 0 | 0 | 687 | 0 | 323 |
| Arrive On Green | 0.00 | 0.48 | 0.48 | 0.27 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.22 |
| Sat Flow, veh/h | 0 | 3394 | 127 | 1594 | 3455 | 0 | | 0 | | 3188 | 0 | 1500 |
| Grp Volume(v), veh/h | 0 | 317 | 330 | 188 | 307 | 0 | | 0.0 | | 599 | 0 | 17 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1683 | 1749 | 1594 | 1683 | 0 | | | | 1594 | 0 | 1500 |
| Q Serve(g_s), s | 0.0 | 12.0 | 12.0 | 11.3 | 0.0 | 0.0 | | | | 18.2 | 0.0 | 0.9 |
| Cycle Q Clear(g_c), s | 0.0 | 12.0 | 12.0 | 11.3 | 0.0 | 0.0 | | | | 18.2 | 0.0 | 0.9 |
| Prop In Lane | 0.00 | | 0.07 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 816 | 847 | 212 | 2237 | | | | | 687 | 0 | 323 |
| V/C Ratio(X) | 0.00 | 0.39 | 0.39 | 0.89 | 0.14 | | | | | 0.87 | 0.00 | 0.05 |
| Avail Cap(c_a), veh/h | 0 | 816 | 847 | 228 | 2237 | | | | | 924 | 0 | 435 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.94 | 0.94 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 16.4 | 16.4 | 36.0 | 0.0 | 0.0 | | | | 37.9 | 0.0 | 31.1 |
| Incr Delay (d2), s/veh | 0.0 | 1.4 | 1.3 | 27.7 | 0.1 | 0.0 | | | | 6.5 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 4.5 | 4.7 | 5.3 | 0.0 | 0.0 | | | | 7.6 | 0.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 17.8 | 17.7 | 63.7 | 0.1 | 0.0 | | | | 44.4 | 0.0 | 31.2 |
| LnGrp LOS | | B | B | E | A | | | | | D | | C |
| Approach Vol, veh/h | | 647 | | | 495 | | | | | | 616 | |
| Approach Delay, s/veh | | 17.7 | | | 24.2 | | | | | | 44.0 | |
| Approach LOS | | B | | | C | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.0 | 54.7 | | 27.4 | | 72.6 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 14.3 | 23.4 | | 29.0 | | 42.4 |
| Max Q Clear Time (g_c+I1), s | 13.3 | 14.0 | | 20.2 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.6 | | 1.3 | | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.8 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 82 | 496 | 30 | 71 | 737 | 48 | 32 | 32 | 69 | 6 | 21 | 71 |
| Future Vol, veh/h | 82 | 496 | 30 | 71 | 737 | 48 | 32 | 32 | 69 | 6 | 21 | 71 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 93 | 564 | 34 | 81 | 838 | 55 | 36 | 36 | 78 | 7 | 24 | 81 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 895 | 0 | 0 | 598 | 0 | 0 | 1359 | 1823 | 581 | 1797 | 1813 | 449 |
| Stage 1 | - | - | - | - | - | - | 767 | 767 | - | 1029 | 1029 | - |
| Stage 2 | - | - | - | - | - | - | 592 | 1056 | - | 768 | 784 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 756 | - | - | 977 | - | - | 116 | 77 | 513 | 56 | 78 | 558 |
| Stage 1 | - | - | - | - | - | - | 394 | 410 | - | 251 | 310 | - |
| Stage 2 | - | - | - | - | - | - | 460 | 301 | - | 393 | 403 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 754 | - | - | 977 | - | - | 72 | 62 | 513 | 31 | 62 | 556 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 196 | 161 | - | 137 | 196 | - |
| Stage 1 | - | - | - | - | - | - | 345 | 360 | - | 229 | 284 | - |
| Stage 2 | - | - | - | - | - | - | 331 | 275 | - | 262 | 353 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.41 | 0.75 | 34.51 | 19.91 |
| HCM LOS | | | D | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 268 | 754 | - | - | 977 | - | - | 352 |
| HCM Lane V/C Ratio | 0.564 | 0.124 | - | - | 0.083 | - | - | 0.317 |
| HCM Control Delay (s/veh) | 34.5 | 10.4 | - | - | 9 | - | - | 19.9 |
| HCM Lane LOS | D | B | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 3.2 | 0.4 | - | - | 0.3 | - | - | 1.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.1 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 33 | 87 | 14 | 10 | 172 | 15 | 37 | 163 | 11 | 7 | 83 | 50 |
| Future Vol, veh/h | 33 | 87 | 14 | 10 | 172 | 15 | 37 | 163 | 11 | 7 | 83 | 50 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 36 | 95 | 15 | 11 | 187 | 16 | 40 | 177 | 12 | 8 | 90 | 54 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.7 | 10.3 | 10.5 | 9.4 |
| HCM LOS | A | B | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 18% | 25% | 5% | 5% |
| Vol Thru, % | 77% | 65% | 87% | 59% |
| Vol Right, % | 5% | 10% | 8% | 36% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 211 | 134 | 197 | 140 |
| LT Vol | 37 | 33 | 10 | 7 |
| Through Vol | 163 | 87 | 172 | 83 |
| RT Vol | 11 | 14 | 15 | 50 |
| Lane Flow Rate | 229 | 146 | 214 | 152 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.321 | 0.212 | 0.299 | 0.213 |
| Departure Headway (Hd) | 5.134 | 5.251 | 5.138 | 5.044 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 704 | 686 | 704 | 717 |
| Service Time | 3.134 | 3.259 | 3.138 | 3.044 |
| HCM Lane V/C Ratio | 0.325 | 0.213 | 0.304 | 0.212 |
| HCM Control Delay, s/veh | 10.5 | 9.7 | 10.3 | 9.4 |
| HCM Lane LOS | B | A | B | A |
| HCM 95th-tile Q | 1.4 | 0.8 | 1.3 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 17.2 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 49 | 196 | 34 | 19 | 403 | 30 | 58 | 138 | 10 | 20 | 50 | 39 |
| Future Vol, veh/h | 49 | 196 | 34 | 19 | 403 | 30 | 58 | 138 | 10 | 20 | 50 | 39 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 52 | 209 | 36 | 20 | 429 | 32 | 62 | 147 | 11 | 21 | 53 | 41 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 14.1 | 22.3 | 13.5 | 11.3 |
| HCM LOS | B | C | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 28% | 18% | 4% | 18% |
| Vol Thru, % | 67% | 70% | 89% | 46% |
| Vol Right, % | 5% | 12% | 7% | 36% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 206 | 279 | 452 | 109 |
| LT Vol | 58 | 49 | 19 | 20 |
| Through Vol | 138 | 196 | 403 | 50 |
| RT Vol | 10 | 34 | 30 | 39 |
| Lane Flow Rate | 219 | 297 | 481 | 116 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.392 | 0.476 | 0.733 | 0.21 |
| Departure Headway (Hd) | 6.447 | 5.88 | 5.488 | 6.535 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 561 | 617 | 654 | 552 |
| Service Time | 4.447 | 3.88 | 3.585 | 4.545 |
| HCM Lane V/C Ratio | 0.39 | 0.481 | 0.735 | 0.21 |
| HCM Control Delay, s/veh | 13.5 | 14.1 | 22.3 | 11.3 |
| HCM Lane LOS | B | B | C | B |
| HCM 95th-tile Q | 1.9 | 2.6 | 6.4 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 7.8 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 16 | 62 | 7 | 3 | 87 | 12 | 19 | 22 | 4 | 8 | 21 | 25 |
| Future Vol, veh/h | 16 | 62 | 7 | 3 | 87 | 12 | 19 | 22 | 4 | 8 | 21 | 25 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 18 | 70 | 8 | 3 | 99 | 14 | 22 | 25 | 5 | 9 | 24 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 7.9 | 7.9 | 7.8 | 7.5 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 42% | 19% | 3% | 15% |
| Vol Thru, % | 49% | 73% | 85% | 39% |
| Vol Right, % | 9% | 8% | 12% | 46% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 45 | 85 | 102 | 54 |
| LT Vol | 19 | 16 | 3 | 8 |
| Through Vol | 22 | 62 | 87 | 21 |
| RT Vol | 4 | 7 | 12 | 25 |
| Lane Flow Rate | 51 | 97 | 116 | 61 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.064 | 0.113 | 0.133 | 0.072 |
| Departure Headway (Hd) | 4.504 | 4.207 | 4.139 | 4.216 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 800 | 837 | 852 | 854 |
| Service Time | 2.506 | 2.305 | 2.234 | 2.218 |
| HCM Lane V/C Ratio | 0.064 | 0.116 | 0.136 | 0.071 |
| HCM Control Delay, s/veh | 7.8 | 7.9 | 7.9 | 7.5 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.2 | 0.4 | 0.5 | 0.2 |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 5 | 355 | 343 | 858 | 612 | 458 |
| Future Volume (vph) | 5 | 355 | 343 | 858 | 612 | 458 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 29.0 | 29.0 | 30.0 | 61.0 | 31.0 | 31.0 |
| Total Split (%) | 32.2% | 32.2% | 33.3% | 67.8% | 34.4% | 34.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 18.6 | 18.6 | 23.2 | 59.8 | 30.8 | 30.8 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.26 | 0.66 | 0.34 | 0.34 |
| v/c Ratio | 0.54 | 0.88 | 0.89 | 0.41 | 0.57 | 0.58 |
| Control Delay (s/veh) | 36.9 | 41.9 | 47.1 | 10.1 | 28.3 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.9 | 41.9 | 47.1 | 10.3 | 28.3 | 5.8 |
| LOS | D | D | D | B | C | A |
| Approach Delay (s/veh) | 40.2 | | | 20.8 | 18.7 | |
| Approach LOS | D | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.89 | |
| Intersection Signal Delay (s/veh): 23.7 | Intersection LOS: C |
| Intersection Capacity Utilization 89.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

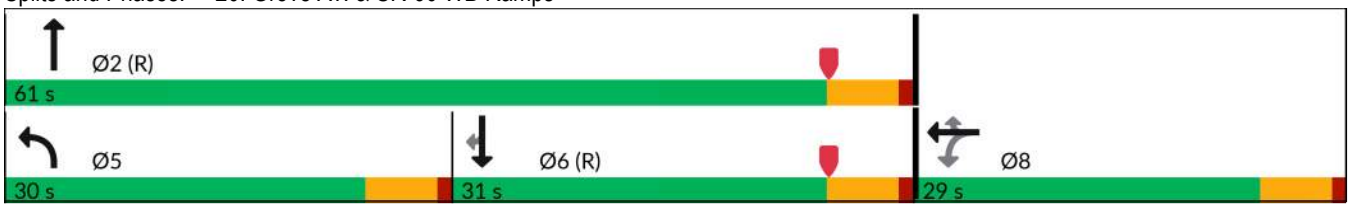

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 173 | 5 | 355 | 343 | 858 | 0 | 0 | 612 | 458 |
| Future Volume (veh/h) | 0 | 0 | 0 | 173 | 5 | 355 | 343 | 858 | 0 | 0 | 612 | 458 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 184 | 5 | 234 | 365 | 913 | 0 | 0 | 651 | 342 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 301 | 8 | 275 | 386 | 2317 | 0 | 0 | 1285 | 573 |
| Arrive On Green | | | | 0.18 | 0.18 | 0.18 | 0.48 | 1.00 | 0.00 | 0.00 | 0.38 | 0.38 |
| Sat Flow, veh/h | | | | 1645 | 45 | 1502 | 1594 | 3455 | 0 | 0 | 3455 | 1502 |
| Grp Volume(v), veh/h | | | | 189 | 0 | 234 | 365 | 913 | 0 | 0 | 651 | 342 |
| Grp Sat Flow(s),veh/h/ln | | | | 1690 | 0 | 1502 | 1594 | 1683 | 0 | 0 | 1683 | 1502 |
| Q Serve(g_s), s | | | | 9.3 | 0.0 | 13.6 | 19.6 | 0.0 | 0.0 | 0.0 | 13.3 | 16.4 |
| Cycle Q Clear(g_c), s | | | | 9.3 | 0.0 | 13.6 | 19.6 | 0.0 | 0.0 | 0.0 | 13.3 | 16.4 |
| Prop In Lane | | | | 0.97 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 309 | 0 | 275 | 386 | 2317 | 0 | 0 | 1285 | 573 |
| V/C Ratio(X) | | | | 0.61 | 0.00 | 0.85 | 0.95 | 0.39 | 0.00 | 0.00 | 0.51 | 0.60 |
| Avail Cap(c_a), veh/h | | | | 436 | 0 | 387 | 429 | 2317 | 0 | 0 | 1285 | 573 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 33.8 | 0.0 | 35.6 | 22.7 | 0.0 | 0.0 | 0.0 | 21.3 | 22.3 |
| Incr Delay (d2), s/veh | | | | 1.5 | 0.0 | 10.9 | 4.5 | 0.0 | 0.0 | 0.0 | 1.4 | 4.5 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 3.7 | 0.0 | 5.5 | 5.0 | 0.0 | 0.0 | 0.0 | 5.1 | 6.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 35.3 | 0.0 | 46.5 | 27.2 | 0.0 | 0.0 | 0.0 | 22.7 | 26.8 |
| LnGrp LOS | | | | D | | D | C | A | | | C | C |
| Approach Vol, veh/h | | | | | 423 | | | 1278 | | | 993 | |
| Approach Delay, s/veh | | | | | 41.5 | | | 7.8 | | | 24.1 | |
| Approach LOS | | | | | D | | | A | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.7 | | 27.6 | 40.2 | | 22.3 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 55.2 | | 24.2 | 25.2 | | 23.2 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 21.6 | 18.4 | | 15.6 |
| Green Ext Time (p_c), s | 5.5 | | 0.2 | 2.5 | | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.1 |
| HCM 7th LOS | B |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 2 | 136 | 795 | 278 | 507 |
| Future Volume (vph) | 2 | 136 | 795 | 278 | 507 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 36.2 | 20.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 40.2% | 22.2% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 25.0 | 25.0 | 30.4 | 17.0 | 52.4 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.34 | 0.19 | 0.58 |
| v/c Ratio | 0.91 | 0.27 | 1.04 | 0.97 | 0.27 |
| Control Delay (s/veh) | 56.1 | 5.8 | 66.4 | 91.9 | 8.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 56.1 | 5.8 | 66.4 | 91.9 | 8.5 |
| LOS | E | A | E | F | A |
| Approach Delay (s/veh) | 43.5 | | 66.4 | | 38.1 |
| Approach LOS | D | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.04 | |
| Intersection Signal Delay (s/veh): 52.2 | Intersection LOS: D |
| Intersection Capacity Utilization 89.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 405 | 2 | 136 | 0 | 0 | 0 | 0 | 795 | 327 | 278 | 507 | 0 |
| Future Volume (veh/h) | 405 | 2 | 136 | 0 | 0 | 0 | 0 | 795 | 327 | 278 | 507 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 422 | 2 | 68 | | | | 0 | 828 | 220 | 290 | 528 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 458 | 2 | 409 | | | | 0 | 956 | 254 | 266 | 1978 | 0 |
| Arrive On Green | 0.27 | 0.27 | 0.27 | | | | 0.00 | 0.37 | 0.37 | 0.22 | 0.78 | 0.00 |
| Sat Flow, veh/h | 1680 | 8 | 1502 | | | | 0 | 2705 | 695 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 424 | 0 | 68 | | | | 0 | 533 | 515 | 290 | 528 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1502 | | | | 0 | 1683 | 1628 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 22.0 | 0.0 | 3.1 | | | | 0.0 | 26.4 | 26.5 | 15.0 | 3.9 | 0.0 |
| Cycle Q Clear(g_c), s | 22.0 | 0.0 | 3.1 | | | | 0.0 | 26.4 | 26.5 | 15.0 | 3.9 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 0.43 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 460 | 0 | 409 | | | | 0 | 615 | 595 | 266 | 1978 | 0 |
| V/C Ratio(X) | 0.92 | 0.00 | 0.17 | | | | 0.00 | 0.87 | 0.87 | 1.09 | 0.27 | 0.00 |
| Avail Cap(c_a), veh/h | 506 | 0 | 450 | | | | 0 | 615 | 595 | 266 | 1978 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.80 | 0.80 | 0.00 |
| Uniform Delay (d), s/veh | 31.8 | 0.0 | 24.9 | | | | 0.0 | 26.5 | 26.5 | 35.0 | 4.5 | 0.0 |
| Incr Delay (d2), s/veh | 20.5 | 0.0 | 0.1 | | | | 0.0 | 15.1 | 15.6 | 76.2 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.9 | 0.0 | 1.0 | | | | 0.0 | 12.2 | 11.9 | 10.7 | 1.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 52.3 | 0.0 | 25.0 | | | | 0.0 | 41.6 | 42.1 | 111.2 | 4.7 | 0.0 |
| LnGrp LOS | D | | C | | | | | D | D | F | A | |
| Approach Vol, veh/h | | 492 | | | | | | 1048 | | | 818 | |
| Approach Delay, s/veh | | 48.5 | | | | | | 41.9 | | | 42.5 | |
| Approach LOS | | D | | | | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.0 | 38.7 | | 31.3 | | 58.7 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 15.0 | 30.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 17.0 | 28.5 | | 24.0 | | 5.9 |
| Green Ext Time (p_c), s | 0.0 | 1.1 | | 0.6 | | 2.8 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 43.5 |
| HCM 7th LOS | | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 226 | 176 | 19 | 208 | 51 | 611 | 75 | 400 |
| Future Volume (vph) | 226 | 176 | 19 | 208 | 51 | 611 | 75 | 400 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.4 | 24.7 | 5.9 | 12.7 | 7.4 | 20.4 | 8.1 | 23.3 |
| Actuated g/C Ratio | 0.16 | 0.35 | 0.08 | 0.18 | 0.10 | 0.29 | 0.11 | 0.33 |
| v/c Ratio | 1.03 | 0.23 | 0.17 | 0.64 | 0.36 | 0.77 | 0.48 | 0.50 |
| Control Delay (s/veh) | 102.6 | 18.4 | 37.4 | 18.8 | 39.1 | 30.8 | 41.6 | 21.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 102.6 | 18.4 | 37.4 | 18.8 | 39.1 | 30.8 | 41.6 | 21.8 |
| LOS | F | B | D | B | D | C | D | C |
| Approach Delay (s/veh) | | 60.7 | | 19.7 | | 31.4 | | 24.6 |
| Approach LOS | | E | | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 71.3 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.03 | |
| Intersection Signal Delay (s/veh): 33.5 | Intersection LOS: C |
| Intersection Capacity Utilization 67.9% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

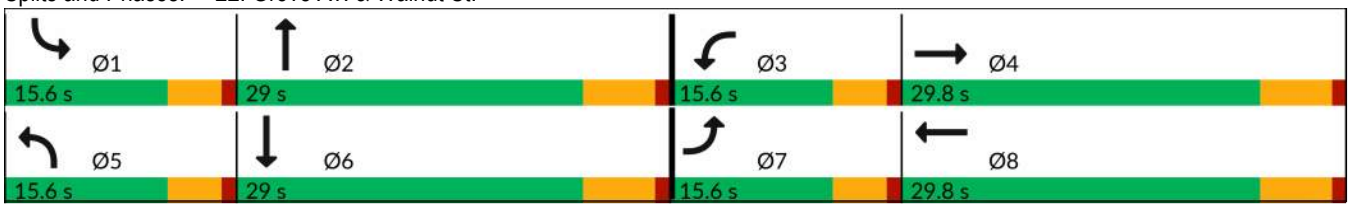

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 226 | 176 | 49 | 19 | 208 | 198 | 51 | 611 | 30 | 75 | 400 | 67 |
| Future Volume (veh/h) | 226 | 176 | 49 | 19 | 208 | 198 | 51 | 611 | 30 | 75 | 400 | 67 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 260 | 202 | 47 | 22 | 239 | 168 | 59 | 702 | 25 | 86 | 460 | 37 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 267 | 885 | 201 | 40 | 351 | 237 | 80 | 884 | 31 | 106 | 893 | 72 |
| Arrive On Green | 0.17 | 0.33 | 0.33 | 0.03 | 0.18 | 0.18 | 0.05 | 0.27 | 0.27 | 0.07 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1594 | 2722 | 619 | 1594 | 1920 | 1295 | 1594 | 3314 | 118 | 1594 | 3153 | 253 |
| Grp Volume(v), veh/h | 260 | 123 | 126 | 22 | 208 | 199 | 59 | 356 | 371 | 86 | 245 | 252 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1658 | 1594 | 1683 | 1531 | 1594 | 1683 | 1749 | 1594 | 1683 | 1722 |
| Q Serve(g_s), s | 10.7 | 3.5 | 3.6 | 0.9 | 7.6 | 8.0 | 2.4 | 12.9 | 13.0 | 3.5 | 8.0 | 8.1 |
| Cycle Q Clear(g_c), s | 10.7 | 3.5 | 3.6 | 0.9 | 7.6 | 8.0 | 2.4 | 12.9 | 13.0 | 3.5 | 8.0 | 8.1 |
| Prop In Lane | 1.00 | | 0.37 | 1.00 | | 0.85 | 1.00 | | 0.07 | 1.00 | | 0.15 |
| Lane Grp Cap(c), veh/h | 267 | 547 | 539 | 40 | 308 | 280 | 80 | 449 | 467 | 106 | 477 | 488 |
| V/C Ratio(X) | 0.98 | 0.23 | 0.23 | 0.55 | 0.68 | 0.71 | 0.74 | 0.79 | 0.79 | 0.81 | 0.51 | 0.52 |
| Avail Cap(c_a), veh/h | 267 | 614 | 605 | 267 | 614 | 559 | 267 | 594 | 617 | 267 | 594 | 608 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.2 | 16.2 | 16.2 | 31.7 | 25.1 | 25.2 | 30.8 | 22.4 | 22.4 | 30.3 | 19.8 | 19.8 |
| Incr Delay (d2), s/veh | 47.9 | 0.2 | 0.2 | 4.3 | 2.6 | 3.3 | 4.9 | 5.4 | 5.3 | 5.4 | 0.9 | 0.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.2 | 1.2 | 1.2 | 0.4 | 2.9 | 2.9 | 1.0 | 5.1 | 5.3 | 1.4 | 2.9 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 75.1 | 16.4 | 16.4 | 36.0 | 27.7 | 28.5 | 35.7 | 27.9 | 27.7 | 35.7 | 20.6 | 20.6 |
| LnGrp LOS | E | B | B | D | C | C | D | C | C | D | C | C |
| Approach Vol, veh/h | | 509 | | | 429 | | | 786 | | | 583 | |
| Approach Delay, s/veh | | 46.4 | | | 28.5 | | | 28.4 | | | 22.8 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.0 | 23.3 | 6.3 | 27.2 | 7.9 | 24.4 | 15.6 | 17.8 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 5.5 | 15.0 | 2.9 | 5.6 | 4.4 | 10.1 | 12.7 | 10.0 |
| Green Ext Time (p_c), s | 0.0 | 2.6 | 0.0 | 1.1 | 0.0 | 2.3 | 0.0 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 31.0 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 132 | 408 | 19 | 666 | 41 | 397 | 77 | 243 | 149 |
| Future Volume (vph) | 132 | 408 | 19 | 666 | 41 | 397 | 77 | 243 | 149 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.1 | 33.8 | 6.0 | 23.5 | 7.1 | 23.1 | 8.5 | 26.5 | 26.5 |
| Actuated g/C Ratio | 0.12 | 0.40 | 0.07 | 0.28 | 0.08 | 0.27 | 0.10 | 0.31 | 0.31 |
| v/c Ratio | 0.76 | 0.68 | 0.19 | 0.91 | 0.34 | 0.96 | 0.53 | 0.48 | 0.28 |
| Control Delay (s/veh) | 63.3 | 30.1 | 42.8 | 45.1 | 45.0 | 65.9 | 49.8 | 28.9 | 5.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 63.3 | 30.1 | 42.8 | 45.1 | 45.0 | 65.9 | 49.8 | 28.9 | 5.9 |
| LOS | E | C | D | D | D | E | D | C | A |
| Approach Delay (s/veh) | | 37.8 | | 45.0 | | 64.0 | | 25.0 | |
| Approach LOS | | D | | D | | E | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 84.2 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.96 | |
| Intersection Signal Delay (s/veh): 43.0 | Intersection LOS: D |
| Intersection Capacity Utilization 77.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

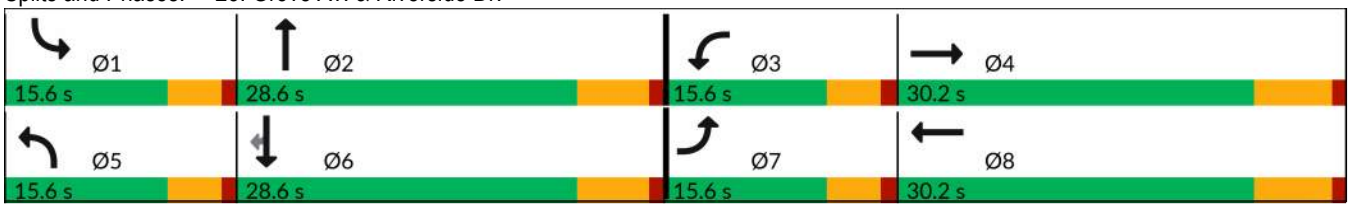

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 132 | 408 | 31 | 19 | 666 | 109 | 41 | 397 | 28 | 77 | 243 | 149 |
| Future Volume (veh/h) | 132 | 408 | 31 | 19 | 666 | 109 | 41 | 397 | 28 | 77 | 243 | 149 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 143 | 443 | 6 | 21 | 724 | 65 | 45 | 432 | 23 | 84 | 264 | 86 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 173 | 621 | 8 | 37 | 845 | 76 | 64 | 469 | 25 | 104 | 544 | 461 |
| Arrive On Green | 0.11 | 0.36 | 0.36 | 0.02 | 0.27 | 0.27 | 0.04 | 0.28 | 0.28 | 0.07 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1594 | 1743 | 24 | 1594 | 3120 | 280 | 1594 | 1667 | 89 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 143 | 0 | 449 | 21 | 390 | 399 | 45 | 0 | 455 | 84 | 264 | 86 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1767 | 1594 | 1683 | 1717 | 1594 | 0 | 1756 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 6.8 | 0.0 | 17.0 | 1.0 | 17.1 | 17.1 | 2.2 | 0.0 | 19.5 | 4.0 | 9.4 | 3.3 |
| Cycle Q Clear(g_c), s | 6.8 | 0.0 | 17.0 | 1.0 | 17.1 | 17.1 | 2.2 | 0.0 | 19.5 | 4.0 | 9.4 | 3.3 |
| Prop In Lane | 1.00 | | 0.01 | 1.00 | | 0.16 | 1.00 | | 0.05 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 173 | 0 | 629 | 37 | 456 | 465 | 64 | 0 | 494 | 104 | 544 | 461 |
| V/C Ratio(X) | 0.82 | 0.00 | 0.71 | 0.56 | 0.86 | 0.86 | 0.71 | 0.00 | 0.92 | 0.81 | 0.49 | 0.19 |
| Avail Cap(c_a), veh/h | 226 | 0 | 629 | 226 | 521 | 531 | 226 | 0 | 516 | 226 | 544 | 461 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.8 | 0.0 | 21.5 | 37.5 | 26.8 | 26.9 | 36.8 | 0.0 | 27.0 | 35.8 | 21.9 | 19.8 |
| Incr Delay (d2), s/veh | 13.5 | 0.0 | 3.8 | 4.8 | 12.0 | 11.9 | 5.2 | 0.0 | 21.4 | 5.4 | 0.7 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.1 | 0.0 | 6.7 | 0.4 | 7.6 | 7.7 | 0.9 | 0.0 | 10.3 | 1.6 | 3.6 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 47.3 | 0.0 | 25.4 | 42.3 | 38.9 | 38.8 | 42.0 | 0.0 | 48.4 | 41.2 | 22.6 | 20.0 |
| LnGrp LOS | D | | C | D | D | D | D | | D | D | C | B |
| Approach Vol, veh/h | | 592 | | | 810 | | | 500 | | | 434 | |
| Approach Delay, s/veh | | 30.7 | | | 38.9 | | | 47.8 | | | 25.6 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.7 | 27.6 | 6.4 | 33.8 | 7.7 | 29.6 | 13.0 | 27.2 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 6.0 | 21.5 | 3.0 | 19.0 | 4.2 | 11.4 | 8.8 | 19.1 |
| Green Ext Time (p_c), s | 0.0 | 0.4 | 0.0 | 1.1 | 0.0 | 1.2 | 0.0 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 36.3 |
| HCM 7th LOS | D |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 44.3 |
| Intersection LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 62 | 92 | 24 | 7 | 247 | 49 | 53 | 360 | 12 | 32 | 256 | 13 |
| Future Vol, veh/h | 62 | 92 | 24 | 7 | 247 | 49 | 53 | 360 | 12 | 32 | 256 | 13 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 72 | 107 | 28 | 8 | 287 | 57 | 62 | 419 | 14 | 37 | 298 | 15 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 19.5 | 31.7 | 73.2 | 30.9 |
| HCM LOS | C | D | F | D |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 12% | 35% | 2% | 11% |
| Vol Thru, % | 85% | 52% | 82% | 85% |
| Vol Right, % | 3% | 13% | 16% | 4% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 425 | 178 | 303 | 301 |
| LT Vol | 53 | 62 | 7 | 32 |
| Through Vol | 360 | 92 | 247 | 256 |
| RT Vol | 12 | 24 | 49 | 13 |
| Lane Flow Rate | 494 | 207 | 352 | 350 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.019 | 0.485 | 0.758 | 0.75 |
| Departure Headway (Hd) | 7.421 | 8.634 | 7.912 | 7.873 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 494 | 420 | 462 | 462 |
| Service Time | 5.421 | 6.634 | 5.912 | 5.873 |
| HCM Lane V/C Ratio | 1 | 0.493 | 0.762 | 0.758 |
| HCM Control Delay, s/veh | 73.2 | 19.5 | 31.7 | 30.9 |
| HCM Lane LOS | F | C | D | D |
| HCM 95th-tile Q | 14.2 | 2.6 | 6.4 | 6.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 16.7 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 53 | 16 | 9 | 119 | 20 | 55 | 374 | 4 | 15 | 224 | 23 |
| Future Vol, veh/h | 36 | 53 | 16 | 9 | 119 | 20 | 55 | 374 | 4 | 15 | 224 | 23 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 60 | 18 | 10 | 135 | 23 | 63 | 425 | 5 | 17 | 255 | 26 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 11.3 | 11.9 | 21.7 | 13.4 |
| HCM LOS | B | B | C | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 13% | 34% | 6% | 6% |
| Vol Thru, % | 86% | 50% | 80% | 85% |
| Vol Right, % | 1% | 15% | 14% | 9% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 433 | 105 | 148 | 262 |
| LT Vol | 55 | 36 | 9 | 15 |
| Through Vol | 374 | 53 | 119 | 224 |
| RT Vol | 4 | 16 | 20 | 23 |
| Lane Flow Rate | 492 | 119 | 168 | 298 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.732 | 0.213 | 0.292 | 0.461 |
| Departure Headway (Hd) | 5.353 | 6.412 | 6.241 | 5.58 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 674 | 555 | 572 | 640 |
| Service Time | 3.414 | 4.506 | 4.327 | 3.654 |
| HCM Lane V/C Ratio | 0.73 | 0.214 | 0.294 | 0.466 |
| HCM Control Delay, s/veh | 21.7 | 11.3 | 11.9 | 13.4 |
| HCM Lane LOS | C | B | B | B |
| HCM 95th-tile Q | 6.4 | 0.8 | 1.2 | 2.4 |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 34 | 167 | 17 | 370 | 55 | 230 | 58 | 192 |
| Future Volume (vph) | 34 | 167 | 17 | 370 | 55 | 230 | 58 | 192 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 4.6 | | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 16.6 | | 16.6 | | 13.0 | | 13.0 |
| Actuated g/C Ratio | | 0.43 | | 0.43 | | 0.33 | | 0.33 |
| v/c Ratio | | 0.38 | | 0.83 | | 0.63 | | 0.61 |
| Control Delay (s/veh) | | 10.2 | | 23.2 | | 17.0 | | 16.1 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 10.2 | | 23.2 | | 17.0 | | 16.1 |
| LOS | | B | | C | | B | | B |
| Approach Delay (s/veh) | | 10.2 | | 23.2 | | 17.0 | | 16.1 |
| Approach LOS | | B | | C | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 45.2 | |
| Actuated Cycle Length: 39 | |
| Natural Cycle: 50 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 18.1 | Intersection LOS: B |
| Intersection Capacity Utilization 62.8% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 34 | 167 | 25 | 17 | 370 | 153 | 55 | 230 | 6 | 58 | 192 | 27 |
| Future Volume (veh/h) | 34 | 167 | 25 | 17 | 370 | 153 | 55 | 230 | 6 | 58 | 192 | 27 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 39 | 190 | 28 | 19 | 420 | 174 | 62 | 261 | 7 | 66 | 218 | 31 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 183 | 605 | 81 | 124 | 522 | 210 | 190 | 393 | 10 | 200 | 345 | 45 |
| Arrive On Green | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 |
| Sat Flow, veh/h | 122 | 1369 | 182 | 20 | 1180 | 476 | 211 | 1447 | 36 | 237 | 1269 | 164 |
| Grp Volume(v), veh/h | 257 | 0 | 0 | 613 | 0 | 0 | 330 | 0 | 0 | 315 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1672 | 0 | 0 | 1676 | 0 | 0 | 1693 | 0 | 0 | 1671 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 3.1 | 0.0 | 0.0 | 10.3 | 0.0 | 0.0 | 5.4 | 0.0 | 0.0 | 5.2 | 0.0 | 0.0 |
| Prop In Lane | 0.15 | | 0.11 | 0.03 | | 0.28 | 0.19 | | 0.02 | 0.21 | | 0.10 |
| Lane Grp Cap(c), veh/h | 868 | 0 | 0 | 856 | 0 | 0 | 593 | 0 | 0 | 589 | 0 | 0 |
| V/C Ratio(X) | 0.30 | 0.00 | 0.00 | 0.72 | 0.00 | 0.00 | 0.56 | 0.00 | 0.00 | 0.53 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1044 | 0 | 0 | 1053 | 0 | 0 | 1054 | 0 | 0 | 1036 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 5.9 | 0.0 | 0.0 | 7.9 | 0.0 | 0.0 | 10.5 | 0.0 | 0.0 | 10.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 6.1 | 0.0 | 0.0 | 9.7 | 0.0 | 0.0 | 11.3 | 0.0 | 0.0 | 11.2 | 0.0 | 0.0 |
| LnGrp LOS | A | | | A | | | B | | | B | | |
| Approach Vol, veh/h | | 257 | | | 613 | | | 330 | | | 315 | |
| Approach Delay, s/veh | | 6.1 | | | 9.7 | | | 11.3 | | | 11.2 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.3 | 18.8 | 13.3 | 18.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 18.0 | 18.0 | 18.0 | 18.0 |
| Max Q Clear Time (g_c+I1), s | 7.4 | 5.1 | 7.2 | 12.3 |
| Green Ext Time (p_c), s | 1.3 | 1.1 | 1.3 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 9.7 |
| HCM 7th LOS | A |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.9 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 6 | 54 | 1 | 2 | 166 | 220 | 1 | 6 | 2 | 251 | 14 | 17 |
| Future Vol, veh/h | 6 | 54 | 1 | 2 | 166 | 220 | 1 | 6 | 2 | 251 | 14 | 17 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 6 | 57 | 1 | 2 | 177 | 234 | 1 | 6 | 2 | 267 | 15 | 18 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 8.9 | 12.3 | 8.6 | 12.2 |
| HCM LOS | A | B | A | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 11% | 10% | 1% | 89% |
| Vol Thru, % | 67% | 89% | 43% | 5% |
| Vol Right, % | 22% | 2% | 57% | 6% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 9 | 61 | 388 | 282 |
| LT Vol | 1 | 6 | 2 | 251 |
| Through Vol | 6 | 54 | 166 | 14 |
| RT Vol | 2 | 1 | 220 | 17 |
| Lane Flow Rate | 10 | 65 | 413 | 300 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.015 | 0.095 | 0.517 | 0.431 |
| Departure Headway (Hd) | 5.482 | 5.258 | 4.505 | 5.175 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 657 | 674 | 797 | 690 |
| Service Time | 3.482 | 3.349 | 2.56 | 3.26 |
| HCM Lane V/C Ratio | 0.015 | 0.096 | 0.518 | 0.435 |
| HCM Control Delay, s/veh | 8.6 | 8.9 | 12.3 | 12.2 |
| HCM Lane LOS | A | A | B | B |
| HCM 95th-tile Q | 0 | 0.3 | 3 | 2.2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 12 | 220 | 506 | 9 | 27 | 34 |
| Future Vol, veh/h | 12 | 220 | 506 | 9 | 27 | 34 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 13 | 239 | 550 | 10 | 29 | 37 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 560 | 0 | - | 0 | 820 | 555 |
| Stage 1 | - | - | - | - | 555 | - |
| Stage 2 | - | - | - | - | 265 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1011 | - | - | - | 345 | 531 |
| Stage 1 | - | - | - | - | 575 | - |
| Stage 2 | - | - | - | - | 779 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1011 | - | - | - | 339 | 531 |
| Mov Cap-2 Maneuver | - | - | - | - | 446 | - |
| Stage 1 | - | - | - | - | 566 | - |
| Stage 2 | - | - | - | - | 779 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.45 | 0 | 13.49 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 93 | - | - | - | 490 |
| HCM Lane V/C Ratio | 0.013 | - | - | - | 0.135 |
| HCM Control Delay (s/veh) | 8.6 | 0 | - | - | 13.5 |
| HCM Lane LOS | A | A | - | - | B |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.5 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 15 | 438 | 60 | 65 | 684 | 17 | 71 | 17 | 126 | 12 | 11 | 39 |
| Future Vol, veh/h | 15 | 438 | 60 | 65 | 684 | 17 | 71 | 17 | 126 | 12 | 11 | 39 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 17 | 487 | 67 | 72 | 760 | 19 | 79 | 19 | 140 | 13 | 12 | 43 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 785 | 0 | 0 | 553 | 0 | 0 | 1084 | 1483 | 277 | 1206 | 1507 | 395 |
| Stage 1 | - | - | - | - | - | - | 553 | 553 | - | 920 | 920 | - |
| Stage 2 | - | - | - | - | - | - | 531 | 929 | - | 286 | 587 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 830 | - | - | 1013 | - | - | 171 | 124 | 721 | 139 | 120 | 604 |
| Stage 1 | - | - | - | - | - | - | 485 | 512 | - | 292 | 348 | - |
| Stage 2 | - | - | - | - | - | - | 500 | 344 | - | 697 | 495 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 825 | - | - | 1013 | - | - | 138 | 112 | 721 | 95 | 108 | 600 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 316 | 261 | - | 233 | 260 | - |
| Stage 1 | - | - | - | - | - | - | 475 | 502 | - | 269 | 321 | - |
| Stage 2 | - | - | - | - | - | - | 414 | 318 | - | 530 | 485 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.28 | 0.75 | 20.87 | 16.18 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 460 | 825 | - | - | 1013 | - | - | 390 |
| HCM Lane V/C Ratio | 0.516 | 0.02 | - | - | 0.071 | - | - | 0.176 |
| HCM Control Delay (s/veh) | 20.9 | 9.5 | - | - | 8.8 | - | - | 16.2 |
| HCM Lane LOS | C | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 2.9 | 0.1 | - | - | 0.2 | - | - | 0.6 |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 17 | 203 | 30 | 297 | 195 | 188 | 44 | 62 |
| Future Volume (vph) | 17 | 203 | 30 | 297 | 195 | 188 | 44 | 62 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 53.5 | 53.5 | 53.5 | 53.5 | 66.5 | 66.5 | 66.5 | 66.5 |
| Total Split (%) | 44.6% | 44.6% | 44.6% | 44.6% | 55.4% | 55.4% | 55.4% | 55.4% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 4.6 | | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 27.2 | | 27.2 | | 33.3 | | 33.3 |
| Actuated g/C Ratio | | 0.38 | | 0.38 | | 0.47 | | 0.47 |
| v/c Ratio | | 0.50 | | 0.73 | | 0.75 | | 0.24 |
| Control Delay (s/veh) | | 20.8 | | 27.7 | | 24.8 | | 12.1 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 20.8 | | 27.7 | | 24.8 | | 12.1 |
| LOS | | C | | C | | C | | B |
| Approach Delay (s/veh) | | 20.8 | | 27.7 | | 24.8 | | 12.1 |
| Approach LOS | | C | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 71.1 | |
| Natural Cycle: 50 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay (s/veh): 23.5 | Intersection LOS: C |
| Intersection Capacity Utilization 73.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

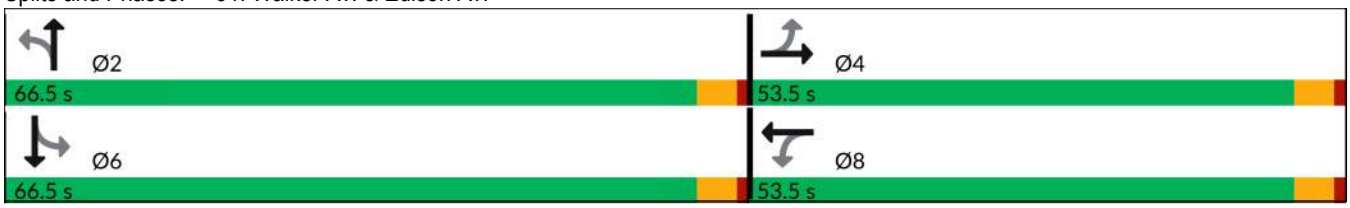

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 17 | 203 | 74 | 30 | 297 | 96 | 195 | 188 | 71 | 44 | 62 | 37 |
| Future Volume (veh/h) | 17 | 203 | 74 | 30 | 297 | 96 | 195 | 188 | 71 | 44 | 62 | 37 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 18 | 221 | 80 | 33 | 323 | 104 | 212 | 204 | 77 | 48 | 67 | 40 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 108 | 444 | 153 | 117 | 449 | 137 | 361 | 287 | 97 | 255 | 325 | 161 |
| Arrive On Green | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 |
| Sat Flow, veh/h | 38 | 1217 | 420 | 59 | 1230 | 377 | 575 | 705 | 237 | 340 | 797 | 395 |
| Grp Volume(v), veh/h | 319 | 0 | 0 | 460 | 0 | 0 | 493 | 0 | 0 | 155 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1674 | 0 | 0 | 1666 | 0 | 0 | 1517 | 0 | 0 | 1532 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 2.3 | 0.0 | 0.0 | 9.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 6.0 | 0.0 | 0.0 | 9.7 | 0.0 | 0.0 | 11.4 | 0.0 | 0.0 | 2.4 | 0.0 | 0.0 |
| Prop In Lane | 0.06 | | 0.25 | 0.07 | | 0.23 | 0.43 | | 0.16 | 0.31 | | 0.26 |
| Lane Grp Cap(c), veh/h | 705 | 0 | 0 | 703 | 0 | 0 | 745 | 0 | 0 | 741 | 0 | 0 |
| V/C Ratio(X) | 0.45 | 0.00 | 0.00 | 0.65 | 0.00 | 0.00 | 0.66 | 0.00 | 0.00 | 0.21 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 2073 | 0 | 0 | 2078 | 0 | 0 | 2408 | 0 | 0 | 2348 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 10.0 | 0.0 | 0.0 | 11.2 | 0.0 | 0.0 | 10.3 | 0.0 | 0.0 | 7.8 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 0.0 | 2.6 | 0.0 | 0.0 | 2.1 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 10.5 | 0.0 | 0.0 | 12.2 | 0.0 | 0.0 | 11.4 | 0.0 | 0.0 | 8.0 | 0.0 | 0.0 |
| LnGrp LOS | B | | | B | | | B | | | A | | |
| Approach Vol, veh/h | | 319 | | | 460 | | | 493 | | | 155 | |
| Approach Delay, s/veh | | 10.5 | | | 12.2 | | | 11.4 | | | 8.0 | |
| Approach LOS | | B | | | B | | | B | | | A | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.1 | 19.4 | 21.1 | 19.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 61.9 | 48.9 | 61.9 | 48.9 |
| Max Q Clear Time (g_c+I1), s | 13.4 | 8.0 | 4.4 | 11.7 |
| Green Ext Time (p_c), s | 3.1 | 2.0 | 0.9 | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 11.1 |
| HCM 7th LOS | B |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 26.8 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 17 | 203 | 74 | 30 | 297 | 96 | 195 | 188 | 71 | 44 | 62 | 37 |
| Future Vol, veh/h | 17 | 203 | 74 | 30 | 297 | 96 | 195 | 188 | 71 | 44 | 62 | 37 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 18 | 221 | 80 | 33 | 323 | 104 | 212 | 204 | 77 | 48 | 67 | 40 |
| Number of Lanes | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 2 | 2 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 2 | 2 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 2 | 2 |
| HCM Control Delay, s/veh | 14.9 | 17.4 | 47.2 | 14.6 |
| HCM LOS | B | C | E | B |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 |
|---|---|---|---|---|---|---|
| Vol Left, % | 43% | 14% | 0% | 17% | 0% | 31% |
| Vol Thru, % | 41% | 86% | 58% | 83% | 61% | 43% |
| Vol Right, % | 16% | 0% | 42% | 0% | 39% | 26% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 454 | 119 | 176 | 179 | 245 | 143 |
| LT Vol | 195 | 17 | 0 | 30 | 0 | 44 |
| Through Vol | 188 | 102 | 102 | 149 | 149 | 62 |
| RT Vol | 71 | 0 | 74 | 0 | 96 | 37 |
| Lane Flow Rate | 493 | 129 | 191 | 194 | 266 | 155 |
| Geometry Grp | 2 | 5 | 5 | 5 | 5 | 2 |
| Degree of Util (X) | 0.917 | 0.287 | 0.405 | 0.414 | 0.54 | 0.334 |
| Departure Headway (Hd) | 6.692 | 8.032 | 7.652 | 7.789 | 7.418 | 7.746 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 538 | 450 | 473 | 466 | 489 | 466 |
| Service Time | 4.779 | 5.732 | 5.352 | 5.489 | 5.118 | 5.76 |
| HCM Lane V/C Ratio | 0.916 | 0.287 | 0.404 | 0.416 | 0.544 | 0.333 |
| HCM Control Delay, s/veh | 47.2 | 13.9 | 15.5 | 15.9 | 18.5 | 14.6 |
| HCM Lane LOS | E | B | C | C | C | B |
| HCM 95th-tile Q | 11 | 1.2 | 1.9 | 2 | 3.2 | 1.5 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 7 | 255 | 492 | 203 | 68 | 16 |
| Future Vol, veh/h | 7 | 255 | 492 | 203 | 68 | 16 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 7 | 266 | 513 | 211 | 71 | 17 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 726 | 0 | - | 0 | 900 | 620 |
| Stage 1 | - | - | - | - | 620 | - |
| Stage 2 | - | - | - | - | 280 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 877 | - | - | - | 309 | 488 |
| Stage 1 | - | - | - | - | 536 | - |
| Stage 2 | - | - | - | - | 767 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 875 | - | - | - | 305 | 487 |
| Mov Cap-2 Maneuver | - | - | - | - | 416 | - |
| Stage 1 | - | - | - | - | 530 | - |
| Stage 2 | - | - | - | - | 766 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.24 | 0 | 15.56 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 48 | - | - | - | 428 |
| HCM Lane V/C Ratio | 0.008 | - | - | - | 0.204 |
| HCM Control Delay (s/veh) | 9.1 | 0 | - | - | 15.6 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.8 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 294 | 2 | 298 | 615 | 813 | 363 | 77 |
| Future Volume (vph) | 294 | 2 | 298 | 615 | 813 | 363 | 77 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 23.0 | 23.0 | 23.0 | 27.0 | 67.0 | 40.0 | 40.0 |
| Total Split (%) | 25.6% | 25.6% | 25.6% | 30.0% | 74.4% | 44.4% | 44.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 17.6 | 17.6 | 17.6 | 24.1 | 60.8 | 31.7 | 31.7 |
| Actuated g/C Ratio | 0.20 | 0.20 | 0.20 | 0.27 | 0.68 | 0.35 | 0.35 |
| v/c Ratio | 0.74 | 0.64 | 0.46 | 0.84 | 0.27 | 0.18 | 0.14 |
| Control Delay (s/veh) | 50.5 | 32.7 | 8.3 | 44.0 | 3.7 | 21.4 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.5 | 32.7 | 8.3 | 44.0 | 3.7 | 21.4 | 3.3 |
| LOS | D | C | A | D | A | C | A |
| Approach Delay (s/veh) | | 31.0 | | | 21.0 | 18.2 | |
| Approach LOS | | C | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 35.6 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 23.0 | Intersection LOS: C |
| Intersection Capacity Utilization 74.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

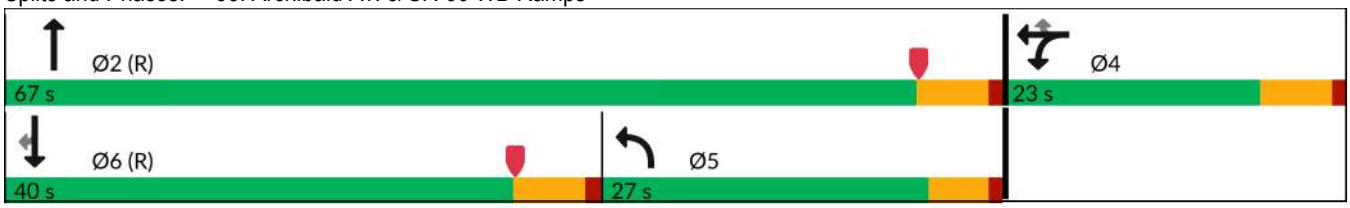

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 294 | 2 | 298 | 615 | 813 | 0 | 0 | 363 | 77 |
| Future Volume (veh/h) | 0 | 0 | 0 | 294 | 2 | 298 | 615 | 813 | 0 | 0 | 363 | 77 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1575 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 349 | 0 | 76 | 654 | 865 | 0 | 0 | 386 | 51 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 436 | 0 | 205 | 1618 | 3552 | 0 | 0 | 694 | 165 |
| Arrive On Green | | | | 0.14 | 0.00 | 0.14 | 0.18 | 0.24 | 0.00 | 0.00 | 0.11 | 0.11 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1502 | 2910 | 4997 | 0 | 0 | 6343 | 1446 |
| Grp Volume(v), veh/h | | | | 349 | 0 | 76 | 654 | 865 | 0 | 0 | 386 | 51 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1502 | 1455 | 1612 | 0 | 0 | 1524 | 1446 |
| Q Serve(g_s), s | | | | 9.6 | 0.0 | 4.1 | 17.8 | 13.0 | 0.0 | 0.0 | 5.4 | 2.9 |
| Cycle Q Clear(g_c), s | | | | 9.6 | 0.0 | 4.1 | 17.8 | 13.0 | 0.0 | 0.0 | 5.4 | 2.9 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 436 | 0 | 205 | 1618 | 3552 | 0 | 0 | 694 | 165 |
| V/C Ratio(X) | | | | 0.80 | 0.00 | 0.37 | 0.40 | 0.24 | 0.00 | 0.00 | 0.56 | 0.31 |
| Avail Cap(c_a), veh/h | | | | 609 | 0 | 287 | 1618 | 3552 | 0 | 0 | 2316 | 549 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.91 | 0.91 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 37.7 | 0.0 | 35.3 | 23.6 | 14.0 | 0.0 | 0.0 | 37.7 | 36.6 |
| Incr Delay (d2), s/veh | | | | 5.2 | 0.0 | 1.1 | 0.1 | 0.1 | 0.0 | 0.0 | 3.2 | 4.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 3.8 | 0.0 | 3.6 | 6.8 | 5.3 | 0.0 | 0.0 | 2.1 | 1.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 42.8 | 0.0 | 36.4 | 23.7 | 14.1 | 0.0 | 0.0 | 40.9 | 41.5 |
| LnGrp LOS | | | | D | | D | C | B | | | D | D |
| Approach Vol, veh/h | | | | | 425 | | | 1519 | | | 437 | |
| Approach Delay, s/veh | | | | | 41.7 | | | 18.2 | | | 41.0 | |
| Approach LOS | | | | | D | | | B | | | D | |

| Timer - Assigned Phs | 2 | 4 | 5 | 6 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 71.9 | 18.1 | 55.8 | 16.1 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 61.2 | 17.2 | 22.0 | * 34 |
| Max Q Clear Time (g_c+I1), s | 15.0 | 11.6 | 19.8 | 7.4 |
| Green Ext Time (p_c), s | 6.5 | 0.8 | 0.4 | 2.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 26.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 212 | 2 | 304 | 1216 | 604 | 109 | 547 |
| Future Volume (vph) | 212 | 2 | 304 | 1216 | 604 | 109 | 547 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 52.0 | 52.0 | 11.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 57.8% | 57.8% | 12.2% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 16.2 | 16.2 | 16.2 | 50.1 | 50.1 | 7.1 | 62.2 |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.56 | 0.56 | 0.08 | 0.69 |
| v/c Ratio | 0.69 | 0.48 | 0.44 | 0.37 | 0.57 | 0.50 | 0.17 |
| Control Delay (s/veh) | 47.6 | 13.0 | 8.4 | 12.2 | 3.4 | 65.7 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.6 | 13.0 | 8.4 | 12.2 | 3.4 | 65.7 | 0.8 |
| LOS | D | B | A | B | A | E | A |
| Approach Delay (s/veh) | | 23.6 | | 9.3 | | | 11.6 |
| Approach LOS | | C | | A | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 35.6 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.69 | |
| Intersection Signal Delay (s/veh): 12.3 | Intersection LOS: B |
| Intersection Capacity Utilization 74.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

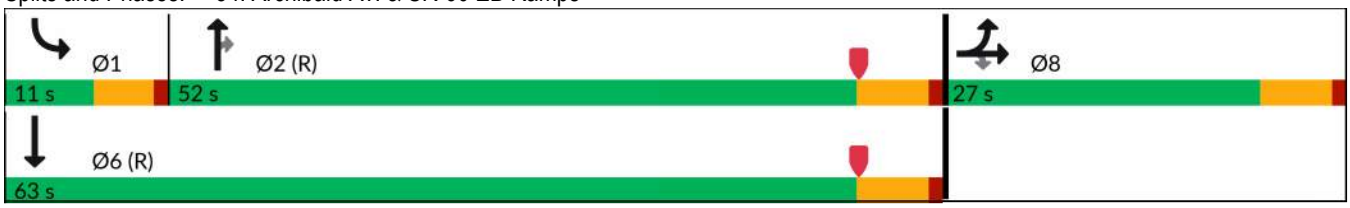

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 212 | 2 | 304 | 0 | 0 | 0 | 0 | 1216 | 604 | 109 | 547 | 0 |
| Future Volume (veh/h) | 212 | 2 | 304 | 0 | 0 | 0 | 0 | 1216 | 604 | 109 | 547 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1575 | 1772 | 0 |
| Adj Flow Rate, veh/h | 271 | 0 | 107 | | | | 0 | 1267 | 505 | 114 | 570 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 368 | 0 | 173 | | | | 0 | 3923 | 965 | 165 | 3655 | 0 |
| Arrive On Green | 0.12 | 0.00 | 0.12 | | | | 0.00 | 0.64 | 0.64 | 0.11 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3188 | 0 | 1502 | | | | 0 | 6343 | 1499 | 2910 | 4997 | 0 |
| Grp Volume(v), veh/h | 271 | 0 | 107 | | | | 0 | 1267 | 505 | 114 | 570 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1524 | 1499 | 1455 | 1612 | 0 |
| Q Serve(g_s), s | 7.4 | 0.0 | 6.1 | | | | 0.0 | 8.4 | 16.3 | 3.4 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 7.4 | 0.0 | 6.1 | | | | 0.0 | 8.4 | 16.3 | 3.4 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 368 | 0 | 173 | | | | 0 | 3923 | 965 | 165 | 3655 | 0 |
| V/C Ratio(X) | 0.74 | 0.00 | 0.62 | | | | 0.00 | 0.32 | 0.52 | 0.69 | 0.16 | 0.00 |
| Avail Cap(c_a), veh/h | 751 | 0 | 354 | | | | 0 | 3923 | 965 | 194 | 3655 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.93 | 0.93 | 0.00 |
| Uniform Delay (d), s/veh | 38.5 | 0.0 | 37.9 | | | | 0.0 | 7.2 | 8.6 | 39.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.9 | 0.0 | 3.5 | | | | 0.0 | 0.2 | 2.0 | 5.3 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 0.0 | 2.3 | | | | 0.0 | 2.1 | 4.4 | 1.2 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 41.4 | 0.0 | 41.5 | | | | 0.0 | 7.4 | 10.7 | 44.5 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | A | B | D | A | |
| Approach Vol, veh/h | | 378 | | | | | | 1772 | | | 684 | |
| Approach Delay, s/veh | | 41.4 | | | | | | 8.4 | | | 7.5 | |
| Approach LOS | | D | | | | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.1 | 63.7 | | | | 73.8 | | 16.2 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 46.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 5.4 | 18.3 | | | | 2.0 | | 9.4 | | | | |
| Green Ext Time (p_c), s | 0.0 | 12.1 | | | | 3.8 | | 1.0 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 12.5 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 162 | 283 | 104 | 70 | 484 | 264 | 213 | 983 | 139 | 364 |
| Future Volume (vph) | 162 | 283 | 104 | 70 | 484 | 264 | 213 | 983 | 139 | 364 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 30.0 | 30.0 | 8.8 | 21.9 | 21.9 | 18.0 | 27.8 | 13.7 | 23.6 |
| Actuated g/C Ratio | 0.15 | 0.31 | 0.31 | 0.09 | 0.23 | 0.23 | 0.19 | 0.29 | 0.14 | 0.24 |
| v/c Ratio | 0.74 | 0.29 | 0.20 | 0.52 | 0.69 | 0.51 | 0.78 | 0.80 | 0.67 | 0.48 |
| Control Delay (s/veh) | 61.4 | 28.2 | 3.6 | 58.6 | 39.9 | 7.5 | 58.1 | 38.8 | 56.1 | 29.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.4 | 28.2 | 3.6 | 58.6 | 39.9 | 7.5 | 58.1 | 38.8 | 56.1 | 29.4 |
| LOS | E | C | A | E | D | A | E | D | E | C |
| Approach Delay (s/veh) | | 33.3 | | | 31.0 | | | 42.1 | | 34.9 |
| Approach LOS | | C | | | C | | | D | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 96.6 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 36.4 | Intersection LOS: D |
| Intersection Capacity Utilization 72.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

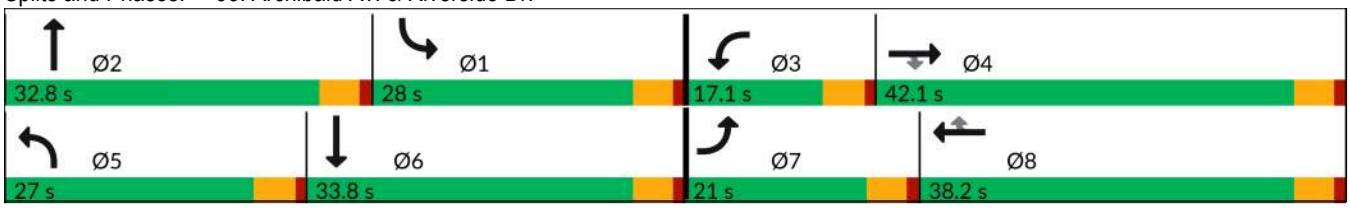

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 162 | 283 | 104 | 70 | 484 | 264 | 213 | 983 | 44 | 139 | 364 | 163 |
| Future Volume (veh/h) | 162 | 283 | 104 | 70 | 484 | 264 | 213 | 983 | 44 | 139 | 364 | 163 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 174 | 304 | 57 | 75 | 520 | 201 | 229 | 1057 | 46 | 149 | 391 | 114 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 208 | 1016 | 444 | 93 | 773 | 341 | 266 | 1381 | 60 | 182 | 892 | 249 |
| Arrive On Green | 0.13 | 0.30 | 0.30 | 0.06 | 0.23 | 0.23 | 0.17 | 0.29 | 0.29 | 0.11 | 0.24 | 0.24 |
| Sat Flow, veh/h | 1594 | 3367 | 1472 | 1594 | 3367 | 1486 | 1594 | 4752 | 207 | 1594 | 3749 | 1048 |
| Grp Volume(v), veh/h | 174 | 304 | 57 | 75 | 520 | 201 | 229 | 717 | 386 | 149 | 334 | 171 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1472 | 1594 | 1683 | 1486 | 1594 | 1612 | 1733 | 1594 | 1612 | 1572 |
| Q Serve(g_s), s | 8.3 | 5.4 | 2.2 | 3.6 | 11.0 | 6.6 | 10.9 | 15.9 | 15.9 | 7.1 | 6.9 | 7.3 |
| Cycle Q Clear(g_c), s | 8.3 | 5.4 | 2.2 | 3.6 | 11.0 | 6.6 | 10.9 | 15.9 | 15.9 | 7.1 | 6.9 | 7.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.12 | 1.00 | | 0.67 |
| Lane Grp Cap(c), veh/h | 208 | 1016 | 444 | 93 | 773 | 341 | 266 | 937 | 504 | 182 | 767 | 374 |
| V/C Ratio(X) | 0.84 | 0.30 | 0.13 | 0.81 | 0.67 | 0.59 | 0.86 | 0.77 | 0.77 | 0.82 | 0.44 | 0.46 |
| Avail Cap(c_a), veh/h | 334 | 1614 | 706 | 255 | 1446 | 638 | 456 | 1163 | 625 | 477 | 1204 | 587 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.2 | 21.0 | 19.8 | 36.4 | 27.5 | 13.1 | 31.7 | 25.3 | 25.3 | 33.9 | 25.3 | 25.5 |
| Incr Delay (d2), s/veh | 4.9 | 0.2 | 0.1 | 6.1 | 1.0 | 1.6 | 3.3 | 2.4 | 4.5 | 3.5 | 0.4 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.2 | 1.9 | 0.7 | 1.5 | 4.1 | 3.0 | 4.1 | 5.7 | 6.4 | 2.7 | 2.4 | 2.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 38.1 | 21.1 | 20.0 | 42.5 | 28.5 | 14.7 | 35.0 | 27.7 | 29.8 | 37.3 | 25.7 | 26.4 |
| LnGrp LOS | D | C | B | D | C | B | D | C | C | D | C | C |
| Approach Vol, veh/h | | 535 | | | 796 | | | 1332 | | | 654 | |
| Approach Delay, s/veh | | 26.5 | | | 26.3 | | | 29.6 | | | 28.5 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.5 | 27.3 | 9.2 | 28.2 | 17.6 | 23.2 | 14.8 | 22.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 9.1 | 17.9 | 5.6 | 7.4 | 12.9 | 9.3 | 10.3 | 13.0 |
| Green Ext Time (p_c), s | 0.1 | 4.6 | 0.0 | 1.9 | 0.2 | 2.7 | 0.1 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.1 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 110 | 67 | 45 | 161 | 162 | 102 | 1024 | 84 | 377 |
| Future Volume (vph) | 110 | 67 | 45 | 161 | 162 | 102 | 1024 | 84 | 377 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.4 | 26.7 | 5.5 | 15.9 | 15.9 | 12.0 | 32.3 | 10.5 | 30.8 |
| Actuated g/C Ratio | 0.15 | 0.29 | 0.06 | 0.17 | 0.17 | 0.13 | 0.35 | 0.11 | 0.34 |
| v/c Ratio | 0.57 | 0.28 | 0.57 | 0.63 | 0.46 | 0.59 | 0.71 | 0.56 | 0.45 |
| Control Delay (s/veh) | 50.2 | 23.0 | 73.0 | 47.8 | 9.6 | 54.8 | 28.4 | 56.4 | 25.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.2 | 23.0 | 73.0 | 47.8 | 9.6 | 54.8 | 28.4 | 56.4 | 25.3 |
| LOS | D | C | E | D | A | D | C | E | C |
| Approach Delay (s/veh) | | 36.2 | | 34.1 | | | 30.6 | | 30.3 |
| Approach LOS | | D | | C | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 91.5 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.71 | |
| Intersection Signal Delay (s/veh): 31.7 | Intersection LOS: C |
| Intersection Capacity Utilization 58.9% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 67 | 50 | 45 | 161 | 162 | 102 | 1024 | 72 | 84 | 377 | 59 |
| Future Volume (veh/h) | 110 | 67 | 50 | 45 | 161 | 162 | 102 | 1024 | 72 | 84 | 377 | 59 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 133 | 81 | 44 | 54 | 194 | 88 | 123 | 1234 | 86 | 101 | 454 | 53 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 168 | 225 | 122 | 77 | 268 | 227 | 154 | 1865 | 130 | 126 | 1126 | 131 |
| Arrive On Green | 0.11 | 0.21 | 0.21 | 0.05 | 0.15 | 0.15 | 0.10 | 0.38 | 0.38 | 0.08 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1594 | 1079 | 586 | 1594 | 1772 | 1502 | 1594 | 4910 | 342 | 1594 | 3109 | 361 |
| Grp Volume(v), veh/h | 133 | 0 | 125 | 54 | 194 | 88 | 123 | 890 | 430 | 101 | 258 | 249 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1664 | 1594 | 1772 | 1502 | 1594 | 1772 | 1709 | 1594 | 1772 | 1698 |
| Q Serve(g_s), s | 5.3 | 0.0 | 4.2 | 2.2 | 6.8 | 2.5 | 4.9 | 13.5 | 13.5 | 4.0 | 7.0 | 7.1 |
| Cycle Q Clear(g_c), s | 5.3 | 0.0 | 4.2 | 2.2 | 6.8 | 2.5 | 4.9 | 13.5 | 13.5 | 4.0 | 7.0 | 7.1 |
| Prop In Lane | 1.00 | | 0.35 | 1.00 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 0.21 |
| Lane Grp Cap(c), veh/h | 168 | 0 | 347 | 77 | 268 | 227 | 154 | 1346 | 649 | 126 | 642 | 615 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.36 | 0.71 | 0.72 | 0.39 | 0.80 | 0.66 | 0.66 | 0.80 | 0.40 | 0.41 |
| Avail Cap(c_a), veh/h | 503 | 0 | 1014 | 128 | 663 | 562 | 355 | 2476 | 1194 | 291 | 1167 | 1118 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.2 | 0.0 | 21.9 | 30.3 | 26.2 | 13.5 | 28.6 | 16.6 | 16.6 | 29.3 | 15.4 | 15.4 |
| Incr Delay (d2), s/veh | 8.1 | 0.0 | 0.6 | 11.2 | 3.7 | 1.1 | 9.0 | 0.6 | 1.2 | 11.0 | 0.4 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 1.5 | 1.0 | 2.9 | 1.2 | 2.0 | 4.3 | 4.3 | 1.8 | 2.4 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.3 | 0.0 | 22.5 | 41.6 | 29.9 | 14.6 | 37.6 | 17.2 | 17.8 | 40.3 | 15.8 | 15.9 |
| LnGrp LOS | D | | C | D | C | B | D | B | B | D | B | B |
| Approach Vol, veh/h | | 258 | | | 336 | | | 1443 | | | 608 | |
| Approach Delay, s/veh | | 29.6 | | | 27.8 | | | 19.1 | | | 19.9 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.7 | 29.2 | 7.7 | 18.1 | 10.9 | 28.0 | 11.4 | 14.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 6.0 | 15.5 | 4.2 | 6.2 | 6.9 | 9.1 | 7.3 | 8.8 |
| Green Ext Time (p_c), s | 0.1 | 9.1 | 0.0 | 0.7 | 0.1 | 2.8 | 0.2 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.4 |
| HCM 7th LOS | C |

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 0 | 44 | 0 | 10 | 1040 | 78 | 401 |
| Future Volume (vph) | 0 | 44 | 0 | 10 | 1040 | 78 | 401 |
| Turn Type | NA | Split | NA | Prot | NA | Prot | NA |
| Protected Phases | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | |
| Detector Phase | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 22.5 | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 |
| Total Split (s) | 22.5 | 33.0 | 33.0 | 10.0 | 45.5 | 19.0 | 54.5 |
| Total Split (%) | 18.8% | 27.5% | 27.5% | 8.3% | 37.9% | 15.8% | 45.4% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.2 | 11.8 | 11.8 | 8.1 | 28.0 | 10.3 | 37.1 |
| Actuated g/C Ratio | 0.15 | 0.22 | 0.22 | 0.15 | 0.52 | 0.19 | 0.69 |
| v/c Ratio | 0.00 | 0.14 | 0.11 | 0.05 | 0.47 | 0.28 | 0.19 |
| Control Delay (s/veh) | 0.0 | 24.8 | 0.3 | 35.5 | 15.1 | 30.8 | 7.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.0 | 24.8 | 0.3 | 35.5 | 15.1 | 30.8 | 7.6 |
| LOS | A | C | A | D | B | C | A |
| Approach Delay (s/veh) | | | 9.9 | | 15.3 | | 11.4 |
| Approach LOS | | | A | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 53.8 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.47 | |
| Intersection Signal Delay (s/veh): 13.8 | Intersection LOS: B |
| Intersection Capacity Utilization 48.1% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

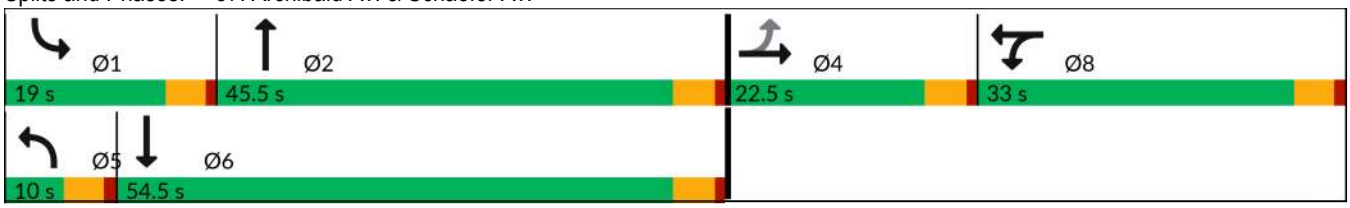

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 1 | 44 | 0 | 68 | 10 | 1040 | 18 | 78 | 401 | 1 |
| Future Volume (veh/h) | 0 | 0 | 1 | 44 | 0 | 68 | 10 | 1040 | 18 | 78 | 401 | 1 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 1 | 48 | 0 | 34 | 11 | 1143 | 18 | 86 | 441 | 1 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 0 | 4 | 116 | 0 | 110 | 23 | 2043 | 32 | 120 | 1645 | 4 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.07 | 0.01 | 0.42 | 0.42 | 0.08 | 0.48 | 0.48 |
| Sat Flow, veh/h | 0 | 0 | 1501 | 1594 | 0 | 1502 | 1594 | 4903 | 77 | 1594 | 3446 | 8 |
| Grp Volume(v), veh/h | 0 | 0 | 1 | 48 | 0 | 34 | 11 | 752 | 409 | 86 | 215 | 227 |
| Grp Sat Flow(s),veh/h/ln | 0 | 0 | 1502 | 1594 | 0 | 1502 | 1594 | 1612 | 1755 | 1594 | 1683 | 1770 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.9 | 0.3 | 7.5 | 7.5 | 2.2 | 3.3 | 3.3 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.9 | 0.3 | 7.5 | 7.5 | 2.2 | 3.3 | 3.3 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.04 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 0 | 4 | 116 | 0 | 110 | 23 | 1344 | 731 | 120 | 804 | 845 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.28 | 0.41 | 0.00 | 0.31 | 0.48 | 0.56 | 0.56 | 0.72 | 0.27 | 0.27 |
| Avail Cap(c_a), veh/h | 0 | 0 | 634 | 1067 | 0 | 1006 | 203 | 3110 | 1693 | 541 | 1981 | 2083 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 21.1 | 18.8 | 0.0 | 18.6 | 20.7 | 9.4 | 9.4 | 19.2 | 6.6 | 6.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 38.6 | 2.3 | 0.0 | 1.6 | 14.9 | 0.4 | 0.7 | 3.0 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.3 | 0.2 | 1.5 | 1.7 | 0.7 | 0.6 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 59.7 | 21.1 | 0.0 | 20.2 | 35.6 | 9.8 | 10.1 | 22.2 | 6.8 | 6.8 |
| LnGrp LOS | | | E | C | | C | D | A | B | C | A | A |
| Approach Vol, veh/h | | 1 | | | 82 | | | 1172 | | | 528 | |
| Approach Delay, s/veh | | 59.7 | | | 20.7 | | | 10.1 | | | 9.3 | |
| Approach LOS | | E | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.8 | 22.3 | | 4.7 | 5.2 | 24.8 | | 7.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 14.4 | 40.9 | | 17.9 | 5.4 | 49.9 | | 28.4 |
| Max Q Clear Time (g_c+I1), s | 4.2 | 9.5 | | 2.0 | 2.3 | 5.3 | | 3.2 |
| Green Ext Time (p_c), s | 0.1 | 7.7 | | 0.0 | 0.0 | 2.3 | | 0.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 10.4 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 193 | 62 | 317 | 263 | 76 | 118 | 831 | 187 | 72 | 333 | 56 |
| Future Volume (vph) | 51 | 193 | 62 | 317 | 263 | 76 | 118 | 831 | 187 | 72 | 333 | 56 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.7 | 16.4 | 81.6 | 11.0 | 26.9 | 26.9 | 10.7 | 28.6 | 81.6 | 8.8 | 23.9 | 23.9 |
| Actuated g/C Ratio | 0.07 | 0.20 | 1.00 | 0.13 | 0.33 | 0.33 | 0.13 | 0.35 | 1.00 | 0.11 | 0.29 | 0.29 |
| v/c Ratio | 0.26 | 0.21 | 0.04 | 0.84 | 0.47 | 0.13 | 0.59 | 0.74 | 0.13 | 0.44 | 0.35 | 0.11 |
| Control Delay (s/veh) | 46.9 | 28.8 | 0.0 | 59.4 | 28.9 | 0.6 | 51.9 | 29.7 | 0.2 | 47.7 | 23.9 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 46.9 | 28.8 | 0.0 | 59.4 | 28.9 | 0.6 | 51.9 | 29.7 | 0.2 | 47.7 | 23.9 | 0.4 |
| LOS | D | C | A | E | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 25.9 | | | 40.3 | | | 27.1 | | | 24.8 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 81.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 29.9 | Intersection LOS: C |
| Intersection Capacity Utilization 63.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

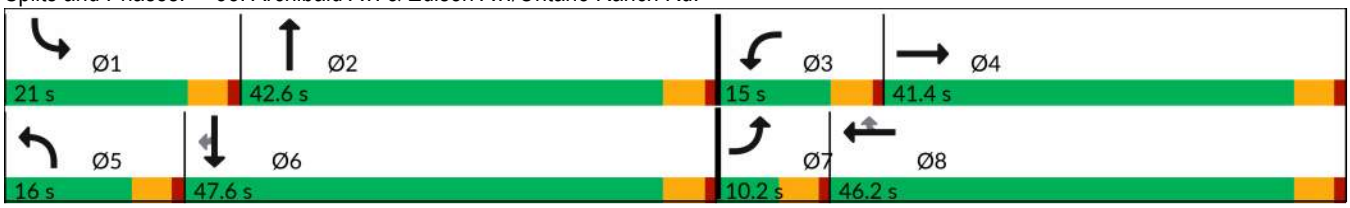

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 51 | 193 | 62 | 317 | 263 | 76 | 118 | 831 | 187 | 72 | 333 | 56 |
| Future Volume (veh/h) | 51 | 193 | 62 | 317 | 263 | 76 | 118 | 831 | 187 | 72 | 333 | 56 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 53 | 201 | 0 | 330 | 274 | 57 | 123 | 866 | 0 | 75 | 347 | 35 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 141 | 756 | | 417 | 445 | 377 | 152 | 1161 | | 93 | 1036 | 462 |
| Arrive On Green | 0.05 | 0.16 | 0.00 | 0.14 | 0.25 | 0.25 | 0.10 | 0.34 | 0.00 | 0.06 | 0.31 | 0.31 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1502 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 53 | 201 | 0 | 330 | 274 | 57 | 123 | 866 | 0 | 75 | 347 | 35 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1502 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 1.1 | 2.3 | 0.0 | 6.8 | 8.5 | 1.8 | 4.7 | 14.1 | 0.0 | 2.9 | 4.9 | 1.0 |
| Cycle Q Clear(g_c), s | 1.1 | 2.3 | 0.0 | 6.8 | 8.5 | 1.8 | 4.7 | 14.1 | 0.0 | 2.9 | 4.9 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 141 | 756 | | 417 | 445 | 377 | 152 | 1161 | | 93 | 1036 | 462 |
| V/C Ratio(X) | 0.38 | 0.27 | | 0.79 | 0.62 | 0.15 | 0.81 | 0.75 | | 0.80 | 0.34 | 0.08 |
| Avail Cap(c_a), veh/h | 263 | 2874 | | 489 | 1190 | 1009 | 293 | 2065 | | 422 | 2337 | 1042 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.6 | 23.0 | 0.0 | 25.6 | 20.5 | 18.0 | 27.4 | 17.9 | 0.0 | 28.8 | 16.6 | 15.2 |
| Incr Delay (d2), s/veh | 0.6 | 0.2 | 0.0 | 6.2 | 1.4 | 0.2 | 3.8 | 1.0 | 0.0 | 6.0 | 0.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.8 | 0.0 | 2.4 | 3.1 | 0.6 | 1.7 | 4.4 | 0.0 | 1.1 | 1.6 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.2 | 23.2 | 0.0 | 31.8 | 21.9 | 18.2 | 31.2 | 18.9 | 0.0 | 34.8 | 16.7 | 15.3 |
| LnGrp LOS | C | C | | C | C | B | C | B | | C | B | B |
| Approach Vol, veh/h | | 254 | | | 661 | | | 989 | | | 457 | |
| Approach Delay, s/veh | | 24.4 | | | 26.5 | | | 20.4 | | | 19.6 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.2 | 26.0 | 13.5 | 14.3 | 10.5 | 23.7 | 7.6 | 20.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 4.9 | 16.1 | 8.8 | 4.3 | 6.7 | 6.9 | 3.1 | 10.5 |
| Green Ext Time (p_c), s | 0.0 | 5.3 | 0.1 | 1.2 | 0.1 | 2.1 | 0.0 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.4 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 131 | 141 | 67 | 104 | 297 | 162 | 735 | 82 | 26 | 404 | 86 |
| Future Volume (vph) | 131 | 141 | 67 | 104 | 297 | 162 | 735 | 82 | 26 | 404 | 86 |
| Turn Type | Prot | NA | Free | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.1 | 15.6 | 67.2 | 10.3 | 16.7 | 5.8 | 22.8 | 22.8 | 6.6 | 15.8 | 15.8 |
| Actuated g/C Ratio | 0.14 | 0.23 | 1.00 | 0.15 | 0.25 | 0.09 | 0.34 | 0.34 | 0.10 | 0.24 | 0.24 |
| v/c Ratio | 0.34 | 0.18 | 0.05 | 0.45 | 0.47 | 0.66 | 0.43 | 0.14 | 0.09 | 0.51 | 0.20 |
| Control Delay (s/veh) | 33.0 | 21.3 | 0.1 | 38.2 | 20.9 | 48.6 | 21.1 | 1.5 | 36.0 | 25.5 | 2.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.0 | 21.3 | 0.1 | 38.2 | 20.9 | 48.6 | 21.1 | 1.5 | 36.0 | 25.5 | 2.4 |
| LOS | C | C | A | D | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 21.6 | | | 24.5 | | 24.0 | | | 22.2 | |
| Approach LOS | | C | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 67.2 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.66 | |
| Intersection Signal Delay (s/veh): 23.4 | Intersection LOS: C |
| Intersection Capacity Utilization 51.6% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

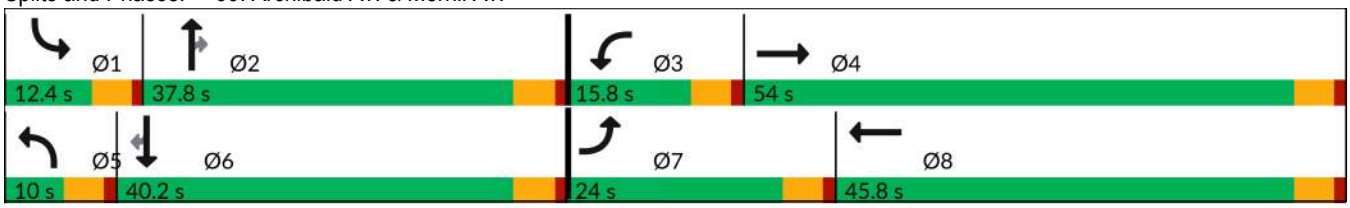

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 141 | 67 | 104 | 297 | 97 | 162 | 735 | 82 | 26 | 404 | 86 |
| Future Volume (veh/h) | 131 | 141 | 67 | 104 | 297 | 97 | 162 | 735 | 82 | 26 | 404 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 136 | 147 | 0 | 108 | 309 | 36 | 169 | 766 | 53 | 27 | 421 | 41 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 264 | 772 | | 134 | 666 | 77 | 283 | 1469 | 415 | 95 | 757 | 320 |
| Arrive On Green | 0.09 | 0.22 | 0.00 | 0.08 | 0.21 | 0.21 | 0.09 | 0.28 | 0.28 | 0.03 | 0.21 | 0.21 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 3114 | 359 | 3000 | 5316 | 1502 | 3000 | 3544 | 1500 |
| Grp Volume(v), veh/h | 136 | 147 | 0 | 108 | 175 | 170 | 169 | 766 | 53 | 27 | 421 | 41 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1701 | 1500 | 1772 | 1502 | 1500 | 1772 | 1500 |
| Q Serve(g_s), s | 2.0 | 1.6 | 0.0 | 3.1 | 4.1 | 4.1 | 2.6 | 5.7 | 1.2 | 0.4 | 5.0 | 1.0 |
| Cycle Q Clear(g_c), s | 2.0 | 1.6 | 0.0 | 3.1 | 4.1 | 4.1 | 2.6 | 5.7 | 1.2 | 0.4 | 5.0 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.21 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 264 | 772 | | 134 | 379 | 364 | 283 | 1469 | 415 | 95 | 757 | 320 |
| V/C Ratio(X) | 0.51 | 0.19 | | 0.80 | 0.46 | 0.47 | 0.60 | 0.52 | 0.13 | 0.28 | 0.56 | 0.13 |
| Avail Cap(c_a), veh/h | 1234 | 3710 | | 378 | 1547 | 1485 | 343 | 3741 | 1057 | 496 | 2674 | 1131 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.5 | 15.1 | 0.0 | 21.2 | 16.2 | 16.2 | 20.5 | 14.4 | 12.8 | 22.3 | 16.6 | 15.0 |
| Incr Delay (d2), s/veh | 1.5 | 0.1 | 0.0 | 10.7 | 0.9 | 0.9 | 2.0 | 0.3 | 0.1 | 1.6 | 0.6 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.5 | 0.0 | 1.4 | 1.4 | 1.4 | 0.8 | 1.7 | 0.3 | 0.1 | 1.6 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 22.1 | 15.2 | 0.0 | 31.9 | 17.0 | 17.1 | 22.5 | 14.7 | 12.9 | 24.0 | 17.2 | 15.2 |
| LnGrp LOS | C | B | | C | B | B | C | B | B | C | B | B |
| Approach Vol, veh/h | | 283 | | | 453 | | | 988 | | | 489 | |
| Approach Delay, s/veh | | 18.5 | | | 20.6 | | | 16.0 | | | 17.4 | |
| Approach LOS | | B | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.1 | 17.6 | 8.6 | 14.9 | 9.1 | 14.7 | 8.8 | 14.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 2.4 | 7.7 | 5.1 | 3.6 | 4.6 | 7.0 | 4.0 | 6.1 |
| Green Ext Time (p_c), s | 0.0 | 4.9 | 0.1 | 0.9 | 0.0 | 2.5 | 0.3 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.6 |
| HCM 7th LOS | B |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 9 | 28 | 1 | 310 | 62 | 358 | 14 | 640 | 267 | 206 | 377 | 17 |
| Future Volume (vph) | 9 | 28 | 1 | 310 | 62 | 358 | 14 | 640 | 267 | 206 | 377 | 17 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.7 | 13.0 | 13.0 | 13.4 | 19.1 | 23.6 | 5.7 | 22.2 | 35.6 | 10.6 | 36.8 | 36.8 |
| Actuated g/C Ratio | 0.08 | 0.19 | 0.19 | 0.20 | 0.28 | 0.35 | 0.08 | 0.33 | 0.53 | 0.16 | 0.54 | 0.54 |
| v/c Ratio | 0.04 | 0.05 | 0.00 | 0.56 | 0.07 | 0.34 | 0.06 | 0.61 | 0.30 | 0.48 | 0.15 | 0.02 |
| Control Delay (s/veh) | 42.7 | 30.8 | 0.0 | 32.6 | 19.7 | 3.8 | 42.5 | 23.1 | 2.2 | 37.7 | 11.4 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.7 | 30.8 | 0.0 | 32.6 | 19.7 | 3.8 | 42.5 | 23.1 | 2.2 | 37.7 | 11.4 | 0.1 |
| LOS | D | C | A | C | B | A | D | C | A | D | B | A |
| Approach Delay (s/veh) | | 32.8 | | | 17.4 | | | 17.4 | | | 20.1 | |
| Approach LOS | | C | | | B | | | B | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 67.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.61 | |
| Intersection Signal Delay (s/veh): 18.3 | Intersection LOS: B |
| Intersection Capacity Utilization 55.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

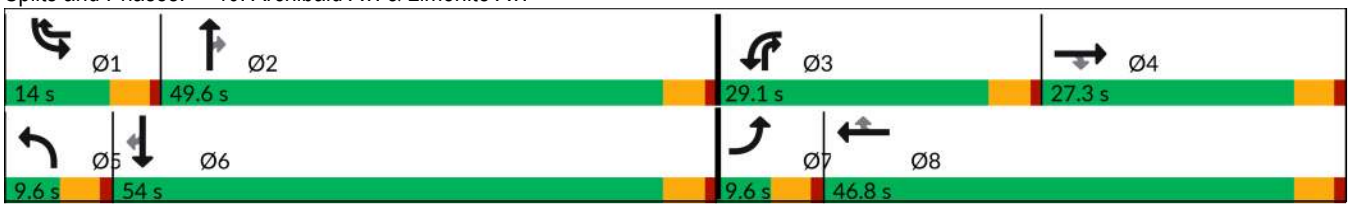

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 28 | 1 | 310 | 62 | 358 | 14 | 640 | 267 | 206 | 377 | 17 |
| Future Volume (veh/h) | 9 | 28 | 1 | 310 | 62 | 358 | 14 | 640 | 267 | 206 | 377 | 17 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 9 | 29 | 0 | 323 | 65 | 236 | 15 | 667 | 163 | 215 | 393 | 11 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 34 | 223 | 99 | 447 | 701 | 834 | 55 | 1041 | 695 | 313 | 1925 | 598 |
| Arrive On Green | 0.01 | 0.07 | 0.00 | 0.15 | 0.21 | 0.21 | 0.02 | 0.31 | 0.31 | 0.11 | 0.40 | 0.40 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 2910 | 3367 | 2639 | 2910 | 3367 | 1500 | 2910 | 4837 | 1502 |
| Grp Volume(v), veh/h | 9 | 29 | 0 | 323 | 65 | 236 | 15 | 667 | 163 | 215 | 393 | 11 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1455 | 1683 | 1320 | 1455 | 1683 | 1500 | 1455 | 1612 | 1502 |
| Q Serve(g_s), s | 0.2 | 0.4 | 0.0 | 5.4 | 0.8 | 3.4 | 0.3 | 8.6 | 3.3 | 3.6 | 2.7 | 0.2 |
| Cycle Q Clear(g_c), s | 0.2 | 0.4 | 0.0 | 5.4 | 0.8 | 3.4 | 0.3 | 8.6 | 3.3 | 3.6 | 2.7 | 0.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 34 | 223 | 99 | 447 | 701 | 834 | 55 | 1041 | 695 | 313 | 1925 | 598 |
| V/C Ratio(X) | 0.26 | 0.13 | 0.00 | 0.72 | 0.09 | 0.28 | 0.27 | 0.64 | 0.23 | 0.69 | 0.20 | 0.02 |
| Avail Cap(c_a), veh/h | 287 | 1509 | 673 | 1408 | 2805 | 2484 | 287 | 2991 | 1564 | 540 | 4718 | 1465 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.8 | 22.3 | 0.0 | 20.4 | 16.2 | 13.0 | 24.5 | 15.1 | 8.2 | 21.8 | 10.0 | 9.2 |
| Incr Delay (d2), s/veh | 1.5 | 0.3 | 0.0 | 0.8 | 0.1 | 0.2 | 1.0 | 0.7 | 0.2 | 1.0 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.1 | 0.0 | 1.6 | 0.3 | 0.8 | 0.1 | 2.5 | 0.8 | 1.0 | 0.6 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.3 | 22.5 | 0.0 | 21.2 | 16.2 | 13.2 | 25.5 | 15.7 | 8.4 | 22.8 | 10.0 | 9.3 |
| LnGrp LOS | C | C | | C | B | B | C | B | A | C | B | A |
| Approach Vol, veh/h | | 38 | | | 624 | | | 845 | | | 619 | |
| Approach Delay, s/veh | | 23.4 | | | 17.7 | | | 14.5 | | | 14.4 | |
| Approach LOS | | C | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.1 | 20.3 | 12.4 | 8.0 | 5.6 | 24.8 | 5.2 | 15.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 5.6 | 10.6 | 7.4 | 2.4 | 2.3 | 4.7 | 2.2 | 5.4 |
| Green Ext Time (p_c), s | 0.1 | 4.8 | 0.5 | 0.1 | 0.0 | 2.4 | 0.0 | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 15.6 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 55 | 410 | 13 | 28 | 522 | 45 | 33 | 81 | 55 | 45 |
| Future Volume (vph) | 55 | 410 | 13 | 28 | 522 | 45 | 33 | 81 | 55 | 45 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.0 | 24.0 | 24.0 | 8.3 | 22.0 | 22.0 | 8.4 | 12.9 | 9.3 | 14.3 |
| Actuated g/C Ratio | 0.19 | 0.50 | 0.50 | 0.17 | 0.46 | 0.46 | 0.17 | 0.27 | 0.19 | 0.30 |
| v/c Ratio | 0.20 | 0.25 | 0.02 | 0.11 | 0.34 | 0.06 | 0.13 | 0.31 | 0.19 | 0.18 |
| Control Delay (s/veh) | 29.2 | 14.5 | 0.0 | 29.4 | 16.9 | 0.2 | 29.4 | 21.0 | 28.1 | 14.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.2 | 14.5 | 0.0 | 29.4 | 16.9 | 0.2 | 29.4 | 21.0 | 28.1 | 14.3 |
| LOS | C | B | A | C | B | A | C | C | C | B |
| Approach Delay (s/veh) | | 15.8 | | | 16.2 | | | 22.6 | | 19.7 |
| Approach LOS | | B | | | B | | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 48.1 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.34 | |
| Intersection Signal Delay (s/veh): 17.2 | Intersection LOS: B |
| Intersection Capacity Utilization 48.7% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

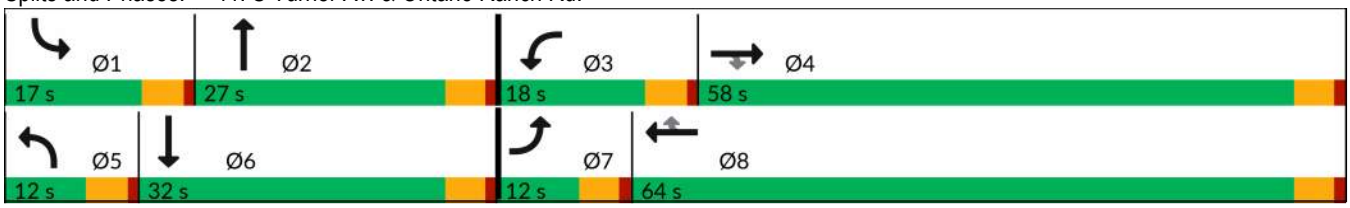

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 55 | 410 | 13 | 28 | 522 | 45 | 33 | 81 | 52 | 55 | 45 | 40 |
| Future Volume (veh/h) | 55 | 410 | 13 | 28 | 522 | 45 | 33 | 81 | 52 | 55 | 45 | 40 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 59 | 436 | 12 | 30 | 555 | 26 | 35 | 86 | 31 | 59 | 48 | 20 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 97 | 1104 | 457 | 57 | 1014 | 429 | 65 | 134 | 48 | 97 | 154 | 64 |
| Arrive On Green | 0.06 | 0.31 | 0.31 | 0.04 | 0.29 | 0.29 | 0.04 | 0.11 | 0.11 | 0.06 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1594 | 3544 | 1468 | 1594 | 3544 | 1499 | 1594 | 1229 | 443 | 1594 | 1188 | 495 |
| Grp Volume(v), veh/h | 59 | 436 | 12 | 30 | 555 | 26 | 35 | 0 | 117 | 59 | 0 | 68 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1468 | 1594 | 1772 | 1499 | 1594 | 0 | 1672 | 1594 | 0 | 1683 |
| Q Serve(g_s), s | 1.4 | 3.7 | 0.2 | 0.7 | 5.1 | 0.5 | 0.8 | 0.0 | 2.6 | 1.4 | 0.0 | 1.4 |
| Cycle Q Clear(g_c), s | 1.4 | 3.7 | 0.2 | 0.7 | 5.1 | 0.5 | 0.8 | 0.0 | 2.6 | 1.4 | 0.0 | 1.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.26 | 1.00 | | 0.29 |
| Lane Grp Cap(c), veh/h | 97 | 1104 | 457 | 57 | 1014 | 429 | 65 | 0 | 183 | 97 | 0 | 218 |
| V/C Ratio(X) | 0.61 | 0.39 | 0.03 | 0.53 | 0.55 | 0.06 | 0.54 | 0.00 | 0.64 | 0.61 | 0.00 | 0.31 |
| Avail Cap(c_a), veh/h | 309 | 4964 | 2056 | 560 | 5521 | 2335 | 309 | 0 | 983 | 518 | 0 | 1209 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.5 | 10.3 | 9.1 | 18.1 | 11.5 | 9.9 | 17.9 | 0.0 | 16.3 | 17.5 | 0.0 | 15.1 |
| Incr Delay (d2), s/veh | 2.3 | 0.2 | 0.0 | 2.8 | 0.5 | 0.1 | 2.6 | 0.0 | 3.7 | 2.3 | 0.0 | 0.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 1.0 | 0.0 | 0.2 | 1.4 | 0.1 | 0.3 | 0.0 | 0.9 | 0.5 | 0.0 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 19.7 | 10.5 | 9.1 | 20.9 | 12.0 | 9.9 | 20.5 | 0.0 | 20.0 | 19.7 | 0.0 | 15.9 |
| LnGrp LOS | B | B | A | C | B | A | C | | B | B | | B |
| Approach Vol, veh/h | | 507 | | | 611 | | | 152 | | | 127 | |
| Approach Delay, s/veh | | 11.6 | | | 12.3 | | | 20.1 | | | 17.7 | |
| Approach LOS | | B | | | B | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.9 | 8.8 | 6.0 | 16.5 | 6.1 | 9.5 | 6.9 | 15.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 3.4 | 4.6 | 2.7 | 5.7 | 2.8 | 3.4 | 3.4 | 7.1 |
| Green Ext Time (p_c), s | 0.0 | 0.5 | 0.0 | 2.9 | 0.0 | 0.3 | 0.0 | 3.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 13.4 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 110 | 410 | 62 | 120 | 446 | 220 | 62 | 349 | 96 | 169 | 234 | 42 |
| Future Volume (vph) | 110 | 410 | 62 | 120 | 446 | 220 | 62 | 349 | 96 | 169 | 234 | 42 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.4 | 17.0 | 17.0 | 8.5 | 15.1 | 15.1 | 6.3 | 24.0 | 24.0 | 14.4 | 32.0 | 32.0 |
| Actuated g/C Ratio | 0.13 | 0.20 | 0.20 | 0.10 | 0.18 | 0.18 | 0.08 | 0.29 | 0.29 | 0.17 | 0.38 | 0.38 |
| v/c Ratio | 0.59 | 0.44 | 0.16 | 0.44 | 0.43 | 0.51 | 0.55 | 0.73 | 0.19 | 0.66 | 0.37 | 0.07 |
| Control Delay (s/veh) | 52.7 | 32.1 | 0.8 | 44.4 | 32.8 | 9.1 | 62.0 | 36.7 | 2.6 | 49.1 | 20.2 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.7 | 32.1 | 0.8 | 44.4 | 32.8 | 9.1 | 62.0 | 36.7 | 2.6 | 49.1 | 20.2 | 0.2 |
| LOS | D | C | A | D | C | A | E | D | A | D | C | A |
| Approach Delay (s/veh) | | 32.6 | | | 27.9 | | | 33.3 | | | 29.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 83.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.73 | |
| Intersection Signal Delay (s/veh): 30.5 | Intersection LOS: C |
| Intersection Capacity Utilization 62.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 410 | 62 | 120 | 446 | 220 | 62 | 349 | 96 | 169 | 234 | 42 |
| Future Volume (veh/h) | 110 | 410 | 62 | 120 | 446 | 220 | 62 | 349 | 96 | 169 | 234 | 42 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 117 | 436 | 22 | 128 | 474 | 117 | 66 | 371 | 33 | 180 | 249 | 30 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 145 | 952 | 291 | 220 | 1104 | 270 | 90 | 478 | 404 | 221 | 623 | 528 |
| Arrive On Green | 0.09 | 0.20 | 0.20 | 0.08 | 0.18 | 0.18 | 0.06 | 0.27 | 0.27 | 0.14 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1594 | 4837 | 1480 | 2910 | 6095 | 1489 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 117 | 436 | 22 | 128 | 474 | 117 | 66 | 371 | 33 | 180 | 249 | 30 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1480 | 1455 | 1524 | 1489 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 4.1 | 4.6 | 0.7 | 2.4 | 4.0 | 4.0 | 2.3 | 11.1 | 0.9 | 6.3 | 6.1 | 0.8 |
| Cycle Q Clear(g_c), s | 4.1 | 4.6 | 0.7 | 2.4 | 4.0 | 4.0 | 2.3 | 11.1 | 0.9 | 6.3 | 6.1 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 145 | 952 | 291 | 220 | 1104 | 270 | 90 | 478 | 404 | 221 | 623 | 528 |
| V/C Ratio(X) | 0.81 | 0.46 | 0.08 | 0.58 | 0.43 | 0.43 | 0.73 | 0.78 | 0.08 | 0.82 | 0.40 | 0.06 |
| Avail Cap(c_a), veh/h | 332 | 2444 | 748 | 647 | 3165 | 773 | 166 | 1341 | 1136 | 446 | 1652 | 1400 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.7 | 20.4 | 18.9 | 25.7 | 20.9 | 21.0 | 26.7 | 19.4 | 15.7 | 24.1 | 14.1 | 12.4 |
| Incr Delay (d2), s/veh | 3.9 | 0.3 | 0.1 | 0.9 | 0.3 | 1.1 | 4.2 | 2.8 | 0.1 | 2.8 | 0.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 1.5 | 0.2 | 0.7 | 1.2 | 1.2 | 0.9 | 4.2 | 0.3 | 2.2 | 2.0 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.6 | 20.8 | 19.0 | 26.6 | 21.2 | 22.1 | 30.9 | 22.2 | 15.8 | 26.9 | 14.5 | 12.4 |
| LnGrp LOS | C | C | B | C | C | C | C | C | B | C | B | B |
| Approach Vol, veh/h | | 575 | | | 719 | | | 470 | | | 459 | |
| Approach Delay, s/veh | | 22.5 | | | 22.3 | | | 23.0 | | | 19.2 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.6 | 20.1 | 9.0 | 15.9 | 7.9 | 24.8 | 9.8 | 15.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 8.3 | 13.1 | 4.4 | 6.6 | 4.3 | 8.1 | 6.1 | 6.0 |
| Green Ext Time (p_c), s | 0.1 | 2.2 | 0.1 | 2.6 | 0.0 | 1.5 | 0.1 | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.9 |
| HCM 7th LOS | C |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 110 | 531 | 98 | 180 | 505 | 184 | 135 | 473 | 351 | 79 | 146 | 42 |
| Future Volume (vph) | 110 | 531 | 98 | 180 | 505 | 184 | 135 | 473 | 351 | 79 | 146 | 42 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.1 | 17.8 | 17.8 | 9.1 | 19.8 | 19.8 | 7.7 | 19.4 | 19.4 | 6.4 | 15.4 | 15.4 |
| Actuated g/C Ratio | 0.10 | 0.25 | 0.25 | 0.13 | 0.28 | 0.28 | 0.11 | 0.28 | 0.28 | 0.09 | 0.22 | 0.22 |
| v/c Ratio | 0.39 | 0.45 | 0.22 | 0.50 | 0.56 | 0.34 | 0.44 | 0.37 | 0.61 | 0.31 | 0.21 | 0.11 |
| Control Delay (s/veh) | 40.5 | 23.2 | 6.5 | 39.7 | 24.2 | 5.5 | 40.6 | 22.5 | 12.3 | 40.3 | 23.3 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.5 | 23.2 | 6.5 | 39.7 | 24.2 | 5.5 | 40.6 | 22.5 | 12.3 | 40.3 | 23.3 | 0.5 |
| LOS | D | C | A | D | C | A | D | C | B | D | C | A |
| Approach Delay (s/veh) | | 23.5 | | | 23.5 | | | 21.3 | | | 24.7 | |
| Approach LOS | | C | | | C | | | C | | | C | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 70.1
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay (s/veh): 22.9 — Intersection LOS: C
Intersection Capacity Utilization 50.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

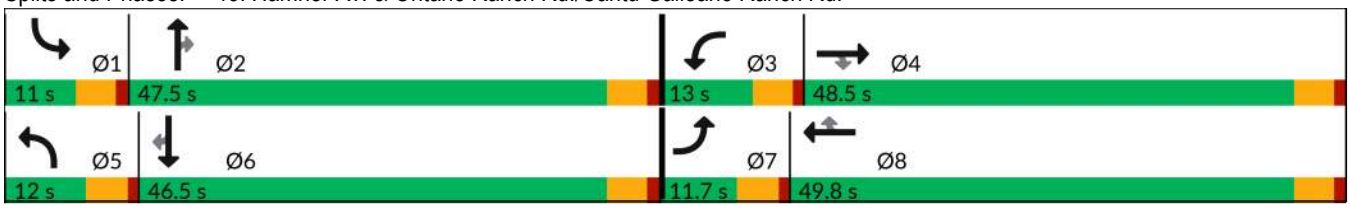

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 531 | 98 | 180 | 505 | 184 | 135 | 473 | 351 | 79 | 146 | 42 |
| Future Volume (veh/h) | 110 | 531 | 98 | 180 | 505 | 184 | 135 | 473 | 351 | 79 | 146 | 42 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 115 | 553 | 48 | 188 | 526 | 181 | 141 | 493 | 133 | 82 | 152 | 32 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 236 | 1169 | 363 | 283 | 867 | 387 | 255 | 1032 | 319 | 201 | 655 | 292 |
| Arrive On Green | 0.08 | 0.24 | 0.24 | 0.10 | 0.26 | 0.26 | 0.09 | 0.21 | 0.21 | 0.07 | 0.19 | 0.19 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 3367 | 1502 | 2910 | 4837 | 1497 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 115 | 553 | 48 | 188 | 526 | 181 | 141 | 493 | 133 | 82 | 152 | 32 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1683 | 1502 | 1455 | 1612 | 1497 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 1.8 | 4.8 | 1.2 | 3.0 | 6.7 | 4.9 | 2.3 | 4.3 | 3.7 | 1.3 | 1.8 | 0.9 |
| Cycle Q Clear(g_c), s | 1.8 | 4.8 | 1.2 | 3.0 | 6.7 | 4.9 | 2.3 | 4.3 | 3.7 | 1.3 | 1.8 | 0.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 236 | 1169 | 363 | 283 | 867 | 387 | 255 | 1032 | 319 | 201 | 655 | 292 |
| V/C Ratio(X) | 0.49 | 0.47 | 0.13 | 0.66 | 0.61 | 0.47 | 0.55 | 0.48 | 0.42 | 0.41 | 0.23 | 0.11 |
| Avail Cap(c_a), veh/h | 426 | 4375 | 1358 | 504 | 3135 | 1398 | 444 | 4275 | 1323 | 384 | 2906 | 1296 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.3 | 15.8 | 14.4 | 21.1 | 15.9 | 15.2 | 21.2 | 16.7 | 16.5 | 21.7 | 16.5 | 16.1 |
| Incr Delay (d2), s/veh | 0.6 | 0.3 | 0.2 | 1.0 | 0.7 | 0.9 | 0.7 | 0.3 | 0.9 | 0.5 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 1.3 | 0.3 | 0.9 | 2.0 | 1.3 | 0.7 | 1.3 | 1.0 | 0.4 | 0.6 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 21.9 | 16.1 | 14.6 | 22.2 | 16.5 | 16.1 | 21.9 | 17.1 | 17.4 | 22.1 | 16.7 | 16.3 |
| LnGrp LOS | C | B | B | C | B | B | C | B | B | C | B | B |
| Approach Vol, veh/h | | 716 | | | 895 | | | 767 | | | 266 | |
| Approach Delay, s/veh | | 16.9 | | | 17.6 | | | 18.0 | | | 18.3 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.9 | 15.0 | 9.3 | 16.3 | 8.9 | 14.0 | 8.5 | 17.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 6.3 | 5.0 | 6.8 | 4.3 | 3.8 | 3.8 | 8.7 |
| Green Ext Time (p_c), s | 0.0 | 3.6 | 0.1 | 3.6 | 0.1 | 0.9 | 0.0 | 3.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.6 |
| HCM 7th LOS | B |

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 793 | 38 | 477 | 130 | 245 | 0 | 799 |
| Future Volume (vph) | 793 | 38 | 477 | 130 | 245 | 0 | 799 |
| Turn Type | NA | Perm | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | | 6 | | | 4 | |
| Permitted Phases | | 2 | | Free | 4 | | 4 |
| Detector Phase | 2 | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | C-Min | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 73.3 | 73.3 | 73.3 | 120.0 | 35.6 | 35.6 | 35.6 |
| Actuated g/C Ratio | 0.61 | 0.61 | 0.61 | 1.00 | 0.30 | 0.30 | 0.30 |
| v/c Ratio | 0.26 | 0.04 | 0.23 | 0.05 | 0.49 | 0.79 | 0.78 |
| Control Delay (s/veh) | 12.8 | 4.9 | 23.5 | 0.0 | 36.3 | 33.6 | 32.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 12.8 | 4.9 | 23.5 | 0.0 | 36.3 | 33.6 | 32.6 |
| LOS | B | A | C | A | D | C | C |
| Approach Delay (s/veh) | 12.4 | | 18.5 | | | 33.8 | |
| Approach LOS | B | | B | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 37.5 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 45 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 22.9 | Intersection LOS: C |
| Intersection Capacity Utilization 58.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

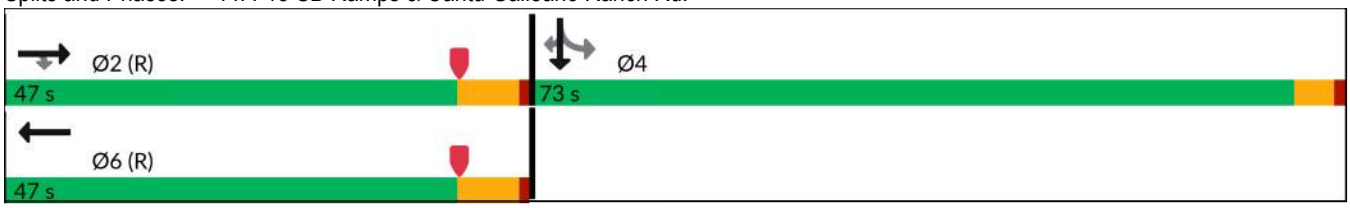

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 793 | 38 | 0 | 477 | 130 | 0 | 0 | 0 | 245 | 0 | 799 |
| Future Volume (veh/h) | 0 | 793 | 38 | 0 | 477 | 130 | 0 | 0 | 0 | 245 | 0 | 799 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 0 | 1772 | 1772 | | | | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 835 | 0 | 0 | 502 | 0 | | | | 172 | 0 | 688 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 3416 | | 0 | 2277 | | | | | 422 | 0 | 796 |
| Arrive On Green | 0.00 | 0.64 | 0.00 | 0.00 | 1.00 | 0.00 | | | | 0.26 | 0.00 | 0.26 |
| Sat Flow, veh/h | 0 | 5316 | 1502 | 0 | 3544 | 2643 | | | | 1594 | 0 | 3003 |
| Grp Volume(v), veh/h | 0 | 835 | 0 | 0 | 502 | 0 | | | | 172 | 0 | 688 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 1502 | 0 | 1772 | 1321 | | | | 1594 | 0 | 1502 |
| Q Serve(g_s), s | 0.0 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 10.7 | 0.0 | 26.2 |
| Cycle Q Clear(g_c), s | 0.0 | 8.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 10.7 | 0.0 | 26.2 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 3416 | | 0 | 2277 | | | | | 422 | 0 | 796 |
| V/C Ratio(X) | 0.00 | 0.24 | | 0.00 | 0.22 | | | | | 0.41 | 0.00 | 0.86 |
| Avail Cap(c_a), veh/h | 0 | 3416 | | 0 | 2277 | | | | | 908 | 0 | 1712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.86 | 0.00 | 0.00 | 0.91 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 36.3 | 0.0 | 42.1 |
| Incr Delay (d2), s/veh | 0.0 | 0.1 | 0.0 | 0.0 | 0.2 | 0.0 | | | | 0.6 | 0.0 | 3.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.7 | 0.0 | 0.0 | 0.1 | 0.0 | | | | 4.1 | 0.0 | 9.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 9.2 | 0.0 | 0.0 | 0.2 | 0.0 | | | | 37.0 | 0.0 | 45.0 |
| LnGrp LOS | | A | | | A | | | | | D | | D |
| Approach Vol, veh/h | | 835 | | | 502 | | | | | | 860 | |
| Approach Delay, s/veh | | 9.2 | | | 0.2 | | | | | | 43.4 | |
| Approach LOS | | A | | | A | | | | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 83.6 | 36.4 | 83.6 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 10.0 | 28.2 | 2.0 |
| Green Ext Time (p_c), s | 5.5 | 3.6 | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 389 | 650 | 185 | 284 | 310 | 186 |
| Future Volume (vph) | 389 | 650 | 185 | 284 | 310 | 186 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 73.0 | 73.0 | 13.0 | 90.5 | 18.4 | 18.4 |
| Actuated g/C Ratio | 0.61 | 0.61 | 0.11 | 0.75 | 0.15 | 0.15 |
| v/c Ratio | 0.12 | 0.57 | 0.60 | 0.07 | 0.72 | 0.44 |
| Control Delay (s/veh) | 7.5 | 5.6 | 58.4 | 4.2 | 55.9 | 10.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.5 | 5.6 | 58.4 | 4.2 | 55.9 | 10.4 |
| LOS | A | A | E | A | E | B |
| Approach Delay (s/veh) | 6.3 | | | 25.6 | 41.7 | |
| Approach LOS | A | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 44.8 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.72 | |
| Intersection Signal Delay (s/veh): 19.6 | Intersection LOS: B |
| Intersection Capacity Utilization 58.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

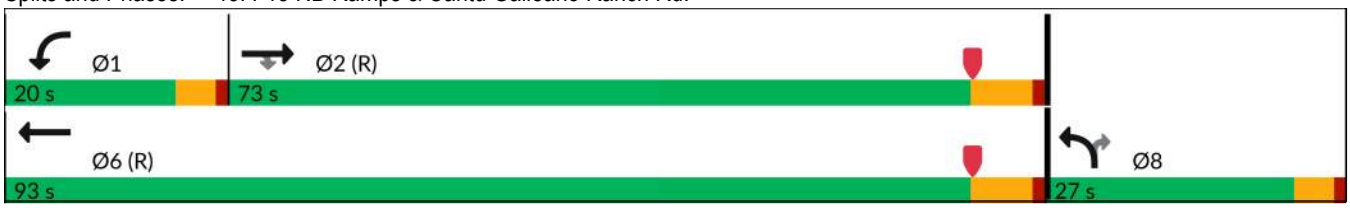

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 389 | 650 | 185 | 284 | 310 | 186 |
| Future Volume (veh/h) | 389 | 650 | 185 | 284 | 310 | 186 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1575 | 1772 | 1673 | 1772 |
| Adj Flow Rate, veh/h | 401 | 470 | 191 | 293 | 320 | 104 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3536 | 999 | 244 | 4172 | 391 | 184 |
| Arrive On Green | 1.00 | 1.00 | 0.08 | 0.78 | 0.12 | 0.12 |
| Sat Flow, veh/h | 5316 | 1502 | 3000 | 5316 | 3188 | 1502 |
| Grp Volume(v), veh/h | 401 | 470 | 191 | 293 | 320 | 104 |
| Grp Sat Flow(s),veh/h/ln | 1772 | 1502 | 1500 | 1772 | 1594 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 7.5 | 1.5 | 11.7 | 7.8 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 7.5 | 1.5 | 11.7 | 7.8 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3536 | 999 | 244 | 4172 | 391 | 184 |
| V/C Ratio(X) | 0.11 | 0.47 | 0.78 | 0.07 | 0.82 | 0.56 |
| Avail Cap(c_a), veh/h | 3536 | 999 | 385 | 4172 | 595 | 280 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.96 | 0.96 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 54.1 | 2.9 | 51.3 | 49.6 |
| Incr Delay (d2), s/veh | 0.1 | 1.5 | 5.5 | 0.0 | 5.3 | 2.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.4 | 2.9 | 0.3 | 4.9 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.1 | 1.5 | 59.6 | 3.0 | 56.7 | 52.3 |
| LnGrp LOS | A | A | E | A | E | D |
| Approach Vol, veh/h | 871 | | | 484 | 424 | |
| Approach Delay, s/veh | 0.9 | | | 25.3 | 55.6 | |
| Approach LOS | A | | | C | E | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 86.3 | | | | 100.7 | 19.3 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 2.0 | | | | 3.5 | 13.7 |
| Green Ext Time (p_c), s | 0.3 | 4.4 | | | | 1.8 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 360 | 3 | 371 | 235 | 760 | 834 | 494 |
| Future Volume (vph) | 360 | 3 | 371 | 235 | 760 | 834 | 494 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 24.0 | 61.0 | 37.0 | 37.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 26.7% | 67.8% | 41.1% | 41.1% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 20.4 | 20.4 | 20.4 | 17.3 | 56.6 | 34.1 | 34.1 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.19 | 0.63 | 0.38 | 0.38 |
| v/c Ratio | 0.80 | 0.69 | 0.54 | 0.83 | 0.38 | 0.70 | 0.60 |
| Control Delay (s/veh) | 50.9 | 33.3 | 12.9 | 49.5 | 2.0 | 28.2 | 5.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.9 | 33.3 | 12.9 | 49.5 | 2.0 | 28.2 | 5.4 |
| LOS | D | C | B | D | A | C | A |
| Approach Delay (s/veh) | | 32.9 | | | 13.3 | 19.7 | |
| Approach LOS | | C | | | B | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 72.8 (81%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 20.8 | Intersection LOS: C |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

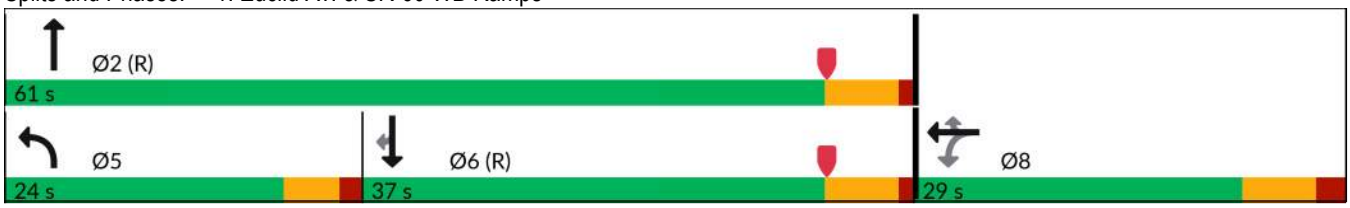

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 360 | 3 | 371 | 235 | 760 | 0 | 0 | 834 | 494 |
| Future Volume (veh/h) | 0 | 0 | 0 | 360 | 3 | 371 | 235 | 760 | 0 | 0 | 834 | 494 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 449 | 0 | 140 | 250 | 809 | 0 | 0 | 887 | 287 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 573 | 0 | 269 | 286 | 2275 | 0 | 0 | 1476 | 654 |
| Arrive On Green | | | | 0.18 | 0.00 | 0.18 | 0.06 | 0.22 | 0.00 | 0.00 | 0.44 | 0.44 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1497 | 1594 | 3455 | 0 | 0 | 3455 | 1491 |
| Grp Volume(v), veh/h | | | | 449 | 0 | 140 | 250 | 809 | 0 | 0 | 887 | 287 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1497 | 1594 | 1683 | 0 | 0 | 1683 | 1491 |
| Q Serve(g_s), s | | | | 12.1 | 0.0 | 7.6 | 14.0 | 18.3 | 0.0 | 0.0 | 18.1 | 12.0 |
| Cycle Q Clear(g_c), s | | | | 12.1 | 0.0 | 7.6 | 14.0 | 18.3 | 0.0 | 0.0 | 18.1 | 12.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 573 | 0 | 269 | 286 | 2275 | 0 | 0 | 1476 | 654 |
| V/C Ratio(X) | | | | 0.78 | 0.00 | 0.52 | 0.87 | 0.36 | 0.00 | 0.00 | 0.60 | 0.44 |
| Avail Cap(c_a), veh/h | | | | 779 | 0 | 366 | 333 | 2275 | 0 | 0 | 1476 | 654 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.71 | 0.71 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.2 | 0.0 | 33.4 | 41.3 | 18.4 | 0.0 | 0.0 | 19.3 | 17.6 |
| Incr Delay (d2), s/veh | | | | 4.5 | 0.0 | 2.2 | 14.9 | 0.3 | 0.0 | 0.0 | 1.8 | 2.1 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.0 | 0.0 | 2.9 | 7.1 | 8.1 | 0.0 | 0.0 | 6.7 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.7 | 0.0 | 35.6 | 56.2 | 18.7 | 0.0 | 0.0 | 21.1 | 19.7 |
| LnGrp LOS | | | | D | | D | E | B | | | C | B |
| Approach Vol, veh/h | | | | | 589 | | | 1059 | | | 1174 | |
| Approach Delay, s/veh | | | | | 38.7 | | | 27.6 | | | 20.8 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.8 | | 21.4 | 45.4 | | 23.2 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 18.8 | 31.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 20.3 | | 16.0 | 20.1 | | 14.1 |
| Green Ext Time (p_c), s | 8.5 | | 0.2 | 6.3 | | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.1 |
| HCM 7th LOS | C |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 238 | 2 | 216 | 757 | 379 | 342 | 852 |
| Future Volume (vph) | 238 | 2 | 216 | 757 | 379 | 342 | 852 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 9.6 | 9.6 | 29.0 | 29.0 | 14.7 | 27.0 |
| Total Split (s) | 25.0 | 25.0 | 25.0 | 33.0 | 33.0 | 32.0 | 65.0 |
| Total Split (%) | 27.8% | 27.8% | 27.8% | 36.7% | 36.7% | 35.6% | 72.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | | 4.6 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 17.8 | 0.0 | 17.8 | 33.4 | 33.4 | 23.5 | 61.6 |
| Actuated g/C Ratio | 0.20 | 0.00 | 0.20 | 0.37 | 0.37 | 0.26 | 0.68 |
| v/c Ratio | 0.77 | no cap | 0.49 | 0.62 | 0.49 | 0.84 | 0.38 |
| Control Delay (s/veh) | 50.4 | | 10.9 | 27.5 | 5.1 | 36.3 | 13.1 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.4 | Error | 10.9 | 27.5 | 5.1 | 36.3 | 13.1 |
| LOS | D | F | B | C | A | D | B |
| Approach Delay (s/veh) | | Error | | 20.0 | | | 19.7 |
| Approach LOS | | F | | C | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 42 (47%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

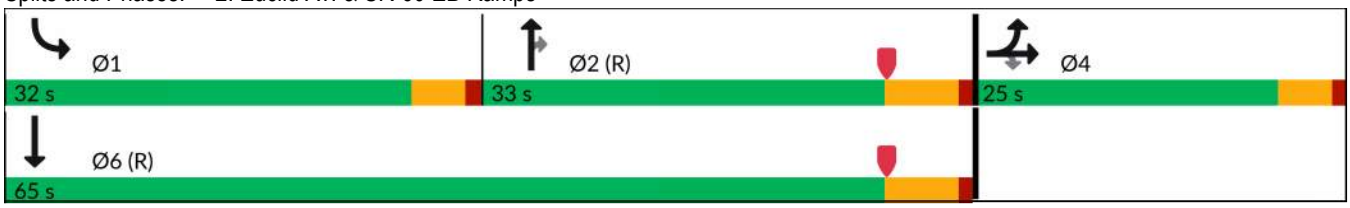

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 238 | 2 | 216 | 0 | 0 | 0 | 0 | 757 | 379 | 342 | 852 | 0 |
| Future Volume (veh/h) | 238 | 2 | 216 | 0 | 0 | 0 | 0 | 757 | 379 | 342 | 852 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 240 | 2 | 159 | | | | 0 | 765 | 268 | 345 | 861 | 0 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 280 | 0 | 263 | | | | 0 | 1406 | 625 | 377 | 2379 | 0 |
| Arrive On Green | 0.18 | 0.18 | 0.18 | | | | 0.00 | 0.42 | 0.42 | 0.31 | 0.94 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 1499 | | | | 0 | 3455 | 1496 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 240 | 0 | 159 | | | | 0 | 765 | 268 | 345 | 861 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1499 | | | | 0 | 1683 | 1496 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 13.2 | 0.0 | 8.8 | | | | 0.0 | 15.4 | 11.4 | 18.7 | 2.1 | 0.0 |
| Cycle Q Clear(g_c), s | 13.2 | 0.0 | 8.8 | | | | 0.0 | 15.4 | 11.4 | 18.7 | 2.1 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 280 | 0 | 263 | | | | 0 | 1406 | 625 | 377 | 2379 | 0 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.60 | | | | 0.00 | 0.54 | 0.43 | 0.91 | 0.36 | 0.00 |
| Avail Cap(c_a), veh/h | 361 | 0 | 340 | | | | 0 | 1406 | 625 | 483 | 2379 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.82 | 0.82 | 0.62 | 0.62 | 0.00 |
| Uniform Delay (d), s/veh | 36.0 | 0.0 | 34.2 | | | | 0.0 | 19.7 | 18.6 | 29.9 | 0.9 | 0.0 |
| Incr Delay (d2), s/veh | 14.9 | 0.0 | 2.2 | | | | 0.0 | 1.2 | 1.8 | 13.0 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.2 | 0.0 | 3.3 | | | | 0.0 | 5.7 | 3.9 | 7.3 | 0.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 51.0 | 0.0 | 36.5 | | | | 0.0 | 21.0 | 20.4 | 42.9 | 1.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | C | C | D | A | |
| Approach Vol, veh/h | | 399 | | | | | | 1033 | | | 1206 | |
| Approach Delay, s/veh | | 45.2 | | | | | | 20.8 | | | 13.1 | |
| Approach LOS | | D | | | | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.0 | 43.6 | | 20.4 | | 69.6 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 4.6 | | 6.0 |
| Max Green Setting (Gmax), s | 27.3 | 27.0 | | 20.4 | | 59.0 |
| Max Q Clear Time (g_c+I1), s | 20.7 | 17.4 | | 15.2 | | 4.1 |
| Green Ext Time (p_c), s | 0.6 | 5.6 | | 0.6 | | 10.0 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 21.0 |
| HCM 7th LOS | | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 97 | 348 | 48 | 227 | 96 | 837 | 209 | 769 |
| Future Volume (vph) | 97 | 348 | 48 | 227 | 96 | 837 | 209 | 769 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 49.0 | 49.0 | 36.0 | 85.0 |
| Total Split (%) | 29.2% | 29.2% | 29.2% | 29.2% | 40.8% | 40.8% | 30.0% | 70.8% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 17.7 | 17.7 | 17.7 | 17.7 | 24.3 | 24.3 | 10.7 | 39.9 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.25 | 0.25 | 0.35 | 0.35 | 0.15 | 0.57 |
| v/c Ratio | 0.46 | 0.60 | 0.31 | 0.43 | 0.58 | 0.56 | 0.50 | 0.33 |
| Control Delay (s/veh) | 33.4 | 25.6 | 31.0 | 19.8 | 35.3 | 19.9 | 35.1 | 8.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.4 | 25.6 | 31.0 | 19.8 | 35.3 | 19.9 | 35.1 | 8.1 |
| LOS | C | C | C | B | D | B | D | A |
| Approach Delay (s/veh) | | 26.9 | | 21.2 | | 21.5 | | 13.3 |
| Approach LOS | | C | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 70.2 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.60 | |
| Intersection Signal Delay (s/veh): 19.6 | Intersection LOS: B |
| Intersection Capacity Utilization 69.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

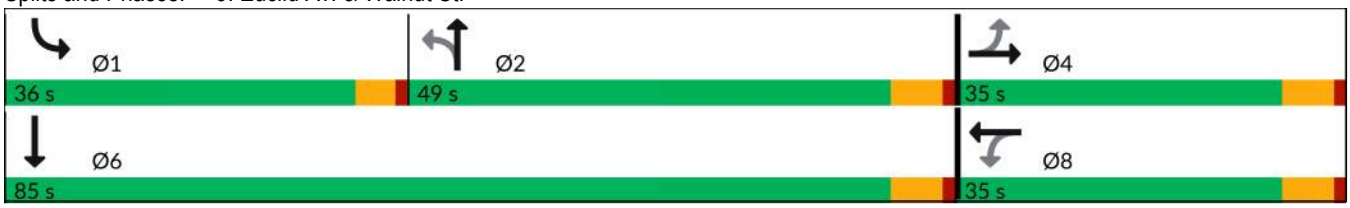

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 97 | 348 | 137 | 48 | 227 | 126 | 96 | 837 | 46 | 209 | 769 | 101 |
| Future Volume (veh/h) | 97 | 348 | 137 | 48 | 227 | 126 | 96 | 837 | 46 | 209 | 769 | 101 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 101 | 362 | 137 | 50 | 236 | 101 | 100 | 872 | 27 | 218 | 801 | 75 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 314 | 655 | 244 | 251 | 630 | 260 | 323 | 1549 | 48 | 322 | 2323 | 216 |
| Arrive On Green | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.32 | 0.32 | 0.32 | 0.11 | 0.52 | 0.52 |
| Sat Flow, veh/h | 980 | 2398 | 893 | 848 | 2306 | 952 | 597 | 4818 | 149 | 2910 | 4501 | 419 |
| Grp Volume(v), veh/h | 101 | 252 | 247 | 50 | 170 | 167 | 100 | 583 | 316 | 218 | 573 | 303 |
| Grp Sat Flow(s),veh/h/ln | 980 | 1683 | 1608 | 848 | 1683 | 1575 | 597 | 1612 | 1742 | 1455 | 1612 | 1696 |
| Q Serve(g_s), s | 5.1 | 7.1 | 7.2 | 3.0 | 4.5 | 4.7 | 7.5 | 8.2 | 8.3 | 4.0 | 5.7 | 5.8 |
| Cycle Q Clear(g_c), s | 9.9 | 7.1 | 7.2 | 10.2 | 4.5 | 4.7 | 7.5 | 8.2 | 8.3 | 4.0 | 5.7 | 5.8 |
| Prop In Lane | 1.00 | | 0.56 | 1.00 | | 0.60 | 1.00 | | 0.09 | 1.00 | | 0.25 |
| Lane Grp Cap(c), veh/h | 314 | 460 | 439 | 251 | 460 | 430 | 323 | 1037 | 560 | 322 | 1664 | 875 |
| V/C Ratio(X) | 0.32 | 0.55 | 0.56 | 0.20 | 0.37 | 0.39 | 0.31 | 0.56 | 0.56 | 0.68 | 0.34 | 0.35 |
| Avail Cap(c_a), veh/h | 567 | 894 | 854 | 470 | 894 | 836 | 600 | 2533 | 1369 | 1662 | 4644 | 2442 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.3 | 17.1 | 17.2 | 21.5 | 16.2 | 16.3 | 15.2 | 15.4 | 15.5 | 23.5 | 7.8 | 7.8 |
| Incr Delay (d2), s/veh | 0.6 | 1.0 | 1.1 | 0.4 | 0.5 | 0.6 | 0.5 | 0.5 | 0.9 | 0.9 | 0.1 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 2.4 | 2.3 | 0.5 | 1.5 | 1.5 | 0.9 | 2.5 | 2.8 | 1.2 | 1.4 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 20.9 | 18.1 | 18.3 | 21.9 | 16.7 | 16.8 | 15.7 | 15.9 | 16.4 | 24.4 | 8.0 | 8.1 |
| LnGrp LOS | C | B | B | C | B | B | B | B | B | C | A | A |
| Approach Vol, veh/h | | 600 | | | 387 | | | 999 | | | 1094 | |
| Approach Delay, s/veh | | 18.7 | | | 17.4 | | | 16.0 | | | 11.3 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.7 | 23.5 | | 20.8 | | 34.2 | | 20.8 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.4 | 43.2 | | 29.2 | | 79.2 | | 29.2 |
| Max Q Clear Time (g_c+I1), s | 6.0 | 10.3 | | 11.9 | | 7.8 | | 12.2 |
| Green Ext Time (p_c), s | 0.4 | 7.3 | | 3.0 | | 6.2 | | 1.9 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 15.0 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 125 | 402 | 151 | 383 | 61 | 758 | 168 | 93 | 705 | 144 |
| Future Volume (vph) | 125 | 402 | 151 | 383 | 61 | 758 | 168 | 93 | 705 | 144 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 20.8 | 43.0 | 21.0 | 43.2 | 15.2 | 40.0 | 40.0 | 16.0 | 40.8 | 40.8 |
| Total Split (%) | 17.3% | 35.8% | 17.5% | 36.0% | 12.7% | 33.3% | 33.3% | 13.3% | 34.0% | 34.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.0 | 32.5 | 14.8 | 33.3 | 10.1 | 30.3 | 30.3 | 10.6 | 34.6 | 34.6 |
| Actuated g/C Ratio | 0.13 | 0.29 | 0.13 | 0.30 | 0.09 | 0.27 | 0.27 | 0.10 | 0.31 | 0.31 |
| v/c Ratio | 0.63 | 0.89 | 0.73 | 0.44 | 0.43 | 0.84 | 0.34 | 0.62 | 0.68 | 0.26 |
| Control Delay (s/veh) | 63.5 | 59.3 | 69.1 | 32.8 | 61.7 | 48.1 | 12.4 | 70.2 | 39.6 | 6.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 63.5 | 59.3 | 69.1 | 32.8 | 61.7 | 48.1 | 12.4 | 70.2 | 39.6 | 6.5 |
| LOS | E | E | E | C | E | D | B | E | D | A |
| Approach Delay (s/veh) | | 60.2 | | 42.2 | | 42.9 | | | 37.6 | |
| Approach LOS | | E | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 111.4 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.89 | |
| Intersection Signal Delay (s/veh): 44.4 | Intersection LOS: D |
| Intersection Capacity Utilization 85.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

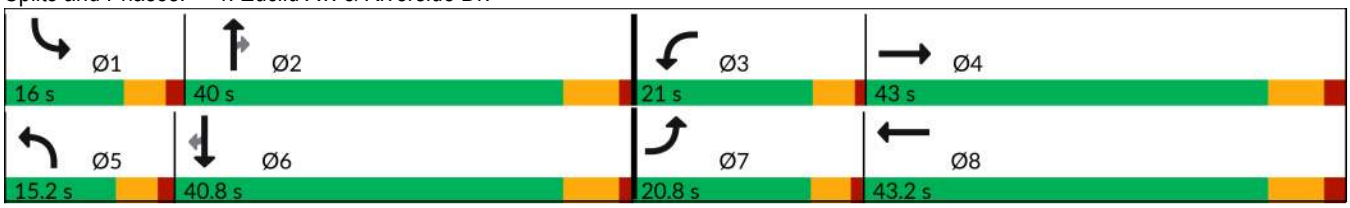

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 125 | 402 | 49 | 151 | 383 | 51 | 61 | 758 | 168 | 93 | 705 | 144 |
| Future Volume (veh/h) | 125 | 402 | 49 | 151 | 383 | 51 | 61 | 758 | 168 | 93 | 705 | 144 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 126 | 406 | 25 | 153 | 387 | 30 | 62 | 766 | 70 | 94 | 712 | 77 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 189 | 463 | 28 | 192 | 892 | 69 | 133 | 914 | 408 | 150 | 951 | 419 |
| Arrive On Green | 0.12 | 0.28 | 0.28 | 0.12 | 0.28 | 0.28 | 0.08 | 0.27 | 0.27 | 0.09 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1594 | 1652 | 102 | 1594 | 3162 | 244 | 1594 | 3367 | 1502 | 1594 | 3367 | 1482 |
| Grp Volume(v), veh/h | 126 | 0 | 431 | 153 | 205 | 212 | 62 | 766 | 70 | 94 | 712 | 77 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1754 | 1594 | 1683 | 1723 | 1594 | 1683 | 1502 | 1594 | 1683 | 1482 |
| Q Serve(g_s), s | 7.4 | 0.0 | 23.0 | 9.2 | 9.8 | 9.9 | 3.6 | 21.0 | 3.5 | 5.6 | 18.9 | 3.9 |
| Cycle Q Clear(g_c), s | 7.4 | 0.0 | 23.0 | 9.2 | 9.8 | 9.9 | 3.6 | 21.0 | 3.5 | 5.6 | 18.9 | 3.9 |
| Prop In Lane | 1.00 | | 0.06 | 1.00 | | 0.14 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 189 | 0 | 491 | 192 | 475 | 486 | 133 | 914 | 408 | 150 | 951 | 419 |
| V/C Ratio(X) | 0.67 | 0.00 | 0.88 | 0.80 | 0.43 | 0.44 | 0.47 | 0.84 | 0.17 | 0.63 | 0.75 | 0.18 |
| Avail Cap(c_a), veh/h | 262 | 0 | 644 | 265 | 622 | 636 | 163 | 1168 | 521 | 176 | 1195 | 526 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.3 | 0.0 | 33.7 | 41.9 | 28.7 | 28.8 | 42.9 | 33.7 | 27.3 | 42.7 | 32.0 | 26.6 |
| Incr Delay (d2), s/veh | 1.5 | 0.0 | 11.7 | 7.5 | 0.9 | 0.9 | 2.6 | 4.4 | 0.2 | 5.3 | 2.0 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 0.0 | 10.8 | 3.8 | 3.8 | 4.0 | 1.4 | 8.4 | 1.2 | 2.3 | 7.5 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 42.9 | 0.0 | 45.4 | 49.4 | 29.6 | 29.7 | 45.4 | 38.1 | 27.5 | 48.0 | 34.0 | 26.8 |
| LnGrp LOS | D | | D | D | C | C | D | D | C | D | C | C |
| Approach Vol, veh/h | | 557 | | | 570 | | | 898 | | | 883 | |
| Approach Delay, s/veh | | 44.8 | | | 35.0 | | | 37.8 | | | 34.9 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 32.6 | 16.5 | 34.5 | 13.4 | 33.7 | 16.3 | 34.7 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.8 | 34.0 | 16.3 | 36.0 | 10.0 | 34.8 | 16.1 | 36.2 |
| Max Q Clear Time (g_c+I1), s | 7.6 | 23.0 | 11.2 | 25.0 | 5.6 | 20.9 | 9.4 | 11.9 |
| Green Ext Time (p_c), s | 0.0 | 3.6 | 0.1 | 2.5 | 0.0 | 4.0 | 0.1 | 3.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 37.7 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 82 | 312 | 39 | 78 | 149 | 47 | 859 | 232 | 29 | 801 | 73 |
| Future Volume (vph) | 82 | 312 | 39 | 78 | 149 | 47 | 859 | 232 | 29 | 801 | 73 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 55.0 | 55.0 | 55.0 | 15.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 41.7% | 45.8% | 45.8% | 45.8% | 12.5% | 58.3% | 58.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 23.4 | 23.4 | 23.4 | | 23.4 | 29.0 | 29.0 | 29.0 | 11.8 | 33.1 | 33.1 |
| Actuated g/C Ratio | 0.33 | 0.33 | 0.33 | | 0.33 | 0.41 | 0.41 | 0.41 | 0.17 | 0.47 | 0.47 |
| v/c Ratio | 0.26 | 0.55 | 0.07 | | 0.64 | 0.21 | 0.64 | 0.36 | 0.11 | 0.52 | 0.10 |
| Control Delay (s/veh) | 24.1 | 26.2 | 1.7 | | 31.3 | 20.9 | 21.3 | 13.5 | 40.3 | 14.4 | 3.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 24.1 | 26.2 | 1.7 | | 31.3 | 20.9 | 21.3 | 13.5 | 40.3 | 14.4 | 3.4 |
| LOS | C | C | A | | C | C | C | B | D | B | A |
| Approach Delay (s/veh) | | 23.6 | | | 31.3 | | 19.7 | | | 14.3 | |
| Approach LOS | | C | | | C | | B | | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 71 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.64 | |
| Intersection Signal Delay (s/veh): 19.6 | Intersection LOS: B |
| Intersection Capacity Utilization 83.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 82 | 312 | 39 | 78 | 149 | 21 | 47 | 859 | 232 | 29 | 801 | 73 |
| Future Volume (veh/h) | 82 | 312 | 39 | 78 | 149 | 21 | 47 | 859 | 232 | 29 | 801 | 73 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 84 | 318 | 23 | 80 | 152 | 19 | 48 | 877 | 161 | 30 | 817 | 46 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 337 | 517 | 438 | 139 | 227 | 24 | 330 | 1246 | 556 | 104 | 1716 | 765 |
| Arrive On Green | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.37 | 0.37 | 0.37 | 0.07 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1147 | 1772 | 1502 | 214 | 777 | 81 | 605 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 84 | 318 | 23 | 251 | 0 | 0 | 48 | 877 | 161 | 30 | 817 | 46 |
| Grp Sat Flow(s),veh/h/ln | 1147 | 1772 | 1502 | 1072 | 0 | 0 | 605 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 0.0 | 9.6 | 0.7 | 5.2 | 0.0 | 0.0 | 3.5 | 13.7 | 4.7 | 1.1 | 9.7 | 1.0 |
| Cycle Q Clear(g_c), s | 6.3 | 9.6 | 0.7 | 14.8 | 0.0 | 0.0 | 4.5 | 13.7 | 4.7 | 1.1 | 9.7 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 0.32 | | 0.08 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 337 | 517 | 438 | 389 | 0 | 0 | 330 | 1246 | 556 | 104 | 1716 | 765 |
| V/C Ratio(X) | 0.25 | 0.62 | 0.05 | 0.64 | 0.00 | 0.00 | 0.15 | 0.70 | 0.29 | 0.29 | 0.48 | 0.06 |
| Avail Cap(c_a), veh/h | 821 | 1265 | 1072 | 994 | 0 | 0 | 580 | 2638 | 1177 | 268 | 3454 | 1540 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.7 | 18.9 | 15.8 | 20.6 | 0.0 | 0.0 | 14.1 | 16.6 | 13.7 | 27.6 | 9.8 | 7.7 |
| Incr Delay (d2), s/veh | 0.4 | 1.2 | 0.0 | 1.8 | 0.0 | 0.0 | 0.2 | 0.7 | 0.3 | 0.6 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 3.6 | 0.2 | 3.2 | 0.0 | 0.0 | 0.4 | 4.2 | 1.3 | 0.4 | 2.4 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 18.1 | 20.1 | 15.8 | 22.4 | 0.0 | 0.0 | 14.3 | 17.3 | 14.0 | 28.1 | 10.0 | 7.7 |
| LnGrp LOS | B | C | B | C | | | B | B | B | C | B | A |
| Approach Vol, veh/h | | 425 | | | 251 | | | 1086 | | | 893 | |
| Approach Delay, s/veh | | 19.5 | | | 22.4 | | | 16.7 | | | 10.5 | |
| Approach LOS | | B | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.6 | 29.4 | | 23.9 | | 38.0 | | 23.9 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 48.5 | | 44.2 | | 63.5 | | 44.2 |
| Max Q Clear Time (g_c+I1), s | 3.1 | 15.7 | | 11.6 | | 11.7 | | 16.8 |
| Green Ext Time (p_c), s | 0.0 | 7.2 | | 2.2 | | 5.8 | | 1.5 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 15.6 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 199 | 280 | 112 | 33 | 63 | 74 | 950 | 52 | 32 | 789 | 91 |
| Future Volume (vph) | 199 | 280 | 112 | 33 | 63 | 74 | 950 | 52 | 32 | 789 | 91 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 19.0 | 51.3 | 51.3 | 14.7 | 47.0 | 14.7 | 39.3 | 39.3 | 14.7 | 39.3 | 39.3 |
| Total Split (%) | 15.8% | 42.8% | 42.8% | 12.3% | 39.2% | 12.3% | 32.8% | 32.8% | 12.3% | 32.8% | 32.8% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.2 | 25.2 | 25.2 | 10.6 | 18.1 | 10.6 | 36.3 | 36.3 | 10.6 | 33.0 | 33.0 |
| Actuated g/C Ratio | 0.17 | 0.28 | 0.28 | 0.12 | 0.20 | 0.12 | 0.40 | 0.40 | 0.12 | 0.36 | 0.36 |
| v/c Ratio | 0.79 | 0.60 | 0.23 | 0.18 | 0.25 | 0.42 | 0.74 | 0.08 | 0.18 | 0.68 | 0.15 |
| Control Delay (s/veh) | 64.0 | 35.7 | 6.4 | 47.4 | 29.4 | 52.7 | 32.8 | 0.2 | 47.4 | 32.7 | 3.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 64.0 | 35.7 | 6.4 | 47.4 | 29.4 | 52.7 | 32.8 | 0.2 | 47.4 | 32.7 | 3.7 |
| LOS | E | D | A | D | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 39.7 | | | 34.5 | | 32.6 | | | 30.3 | |
| Approach LOS | | D | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 91.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 33.5 | Intersection LOS: C |
| Intersection Capacity Utilization 79.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

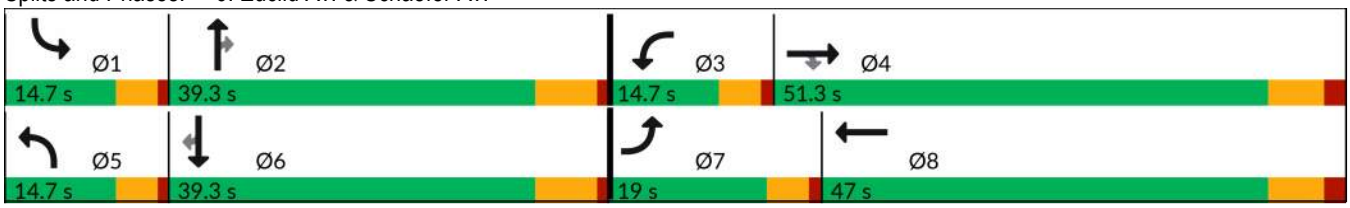

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 199 | 280 | 112 | 33 | 63 | 20 | 74 | 950 | 52 | 32 | 789 | 91 |
| Future Volume (veh/h) | 199 | 280 | 112 | 33 | 63 | 20 | 74 | 950 | 52 | 32 | 789 | 91 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 207 | 292 | 58 | 34 | 66 | 13 | 77 | 990 | 40 | 33 | 822 | 64 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 243 | 359 | 304 | 108 | 170 | 33 | 170 | 1199 | 535 | 106 | 1062 | 474 |
| Arrive On Green | 0.15 | 0.20 | 0.20 | 0.07 | 0.12 | 0.12 | 0.11 | 0.36 | 0.36 | 0.07 | 0.32 | 0.32 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1438 | 283 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 207 | 292 | 58 | 34 | 0 | 79 | 77 | 990 | 40 | 33 | 822 | 64 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1721 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 9.4 | 11.7 | 2.4 | 1.5 | 0.0 | 3.2 | 3.4 | 20.0 | 1.3 | 1.5 | 16.5 | 2.3 |
| Cycle Q Clear(g_c), s | 9.4 | 11.7 | 2.4 | 1.5 | 0.0 | 3.2 | 3.4 | 20.0 | 1.3 | 1.5 | 16.5 | 2.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 243 | 359 | 304 | 108 | 0 | 203 | 170 | 1199 | 535 | 106 | 1062 | 474 |
| V/C Ratio(X) | 0.85 | 0.81 | 0.19 | 0.31 | 0.00 | 0.39 | 0.45 | 0.83 | 0.07 | 0.31 | 0.77 | 0.14 |
| Avail Cap(c_a), veh/h | 306 | 1053 | 893 | 214 | 0 | 924 | 214 | 1482 | 661 | 214 | 1482 | 661 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.8 | 28.4 | 24.7 | 33.1 | 0.0 | 30.4 | 31.2 | 21.9 | 15.9 | 33.2 | 23.1 | 18.2 |
| Incr Delay (d2), s/veh | 14.3 | 3.4 | 0.2 | 0.6 | 0.0 | 0.9 | 0.7 | 3.3 | 0.1 | 0.6 | 1.7 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.3 | 4.9 | 0.8 | 0.6 | 0.0 | 1.3 | 1.2 | 7.1 | 0.4 | 0.5 | 5.8 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 45.1 | 31.8 | 24.9 | 33.7 | 0.0 | 31.3 | 31.9 | 25.2 | 15.9 | 33.8 | 24.8 | 18.4 |
| LnGrp LOS | D | C | C | C | | C | C | C | B | C | C | B |
| Approach Vol, veh/h | | 557 | | | 113 | | | 1107 | | | 919 | |
| Approach Delay, s/veh | | 36.0 | | | 32.0 | | | 25.3 | | | 24.7 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.6 | 33.0 | 9.8 | 22.1 | 12.7 | 30.0 | 16.0 | 15.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 32.8 | 10.0 | 44.3 | 10.0 | 32.8 | 14.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 3.5 | 22.0 | 3.5 | 13.7 | 5.4 | 18.5 | 11.4 | 5.2 |
| Green Ext Time (p_c), s | 0.0 | 4.5 | 0.0 | 1.4 | 0.0 | 4.4 | 0.1 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 117 | 361 | 126 | 63 | 192 | 130 | 937 | 156 | 118 | 729 | 119 |
| Future Volume (vph) | 117 | 361 | 126 | 63 | 192 | 130 | 937 | 156 | 118 | 729 | 119 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | 47.0 | 47.0 | 15.0 | 56.0 | 56.0 | 17.0 | 58.0 | 58.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | 39.2% | 39.2% | 12.5% | 46.7% | 46.7% | 14.2% | 48.3% | 48.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 27.3 | 27.3 | 27.3 | 27.3 | 27.3 | 10.5 | 36.5 | 36.5 | 11.9 | 37.8 | 37.8 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.11 | 0.39 | 0.39 | 0.13 | 0.40 | 0.40 |
| v/c Ratio | 0.59 | 0.77 | 0.26 | 0.46 | 0.59 | 0.44 | 0.79 | 0.27 | 0.65 | 0.59 | 0.19 |
| Control Delay (s/veh) | 42.8 | 43.1 | 6.2 | 41.3 | 33.4 | 49.5 | 31.5 | 12.7 | 60.8 | 24.8 | 4.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.8 | 43.1 | 6.2 | 41.3 | 33.4 | 49.5 | 31.5 | 12.7 | 60.8 | 24.8 | 4.4 |
| LOS | D | D | A | D | C | D | C | B | E | C | A |
| Approach Delay (s/veh) | | 35.4 | | | 34.9 | | 31.0 | | | 26.7 | |
| Approach LOS | | D | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 94.8 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 30.9 | Intersection LOS: C |
| Intersection Capacity Utilization 85.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

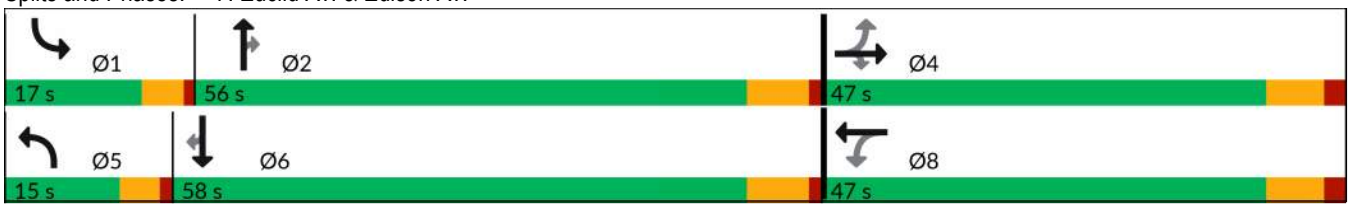

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 117 | 361 | 126 | 63 | 192 | 80 | 130 | 937 | 156 | 118 | 729 | 119 |
| Future Volume (veh/h) | 117 | 361 | 126 | 63 | 192 | 80 | 130 | 937 | 156 | 118 | 729 | 119 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 127 | 392 | 79 | 68 | 209 | 78 | 141 | 1018 | 142 | 128 | 792 | 89 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 256 | 551 | 467 | 181 | 383 | 143 | 317 | 1260 | 562 | 172 | 1255 | 552 |
| Arrive On Green | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.11 | 0.37 | 0.37 | 0.11 | 0.37 | 0.37 |
| Sat Flow, veh/h | 1031 | 1772 | 1500 | 871 | 1230 | 459 | 2910 | 3367 | 1502 | 1594 | 3367 | 1479 |
| Grp Volume(v), veh/h | 127 | 392 | 79 | 68 | 0 | 287 | 141 | 1018 | 142 | 128 | 792 | 89 |
| Grp Sat Flow(s),veh/h/ln | 1031 | 1772 | 1500 | 871 | 0 | 1689 | 1455 | 1683 | 1502 | 1594 | 1683 | 1479 |
| Q Serve(g_s), s | 10.4 | 17.4 | 3.4 | 6.7 | 0.0 | 12.5 | 4.0 | 24.1 | 5.8 | 6.9 | 17.1 | 3.6 |
| Cycle Q Clear(g_c), s | 22.9 | 17.4 | 3.4 | 24.1 | 0.0 | 12.5 | 4.0 | 24.1 | 5.8 | 6.9 | 17.1 | 3.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 256 | 551 | 467 | 181 | 0 | 525 | 317 | 1260 | 562 | 172 | 1255 | 552 |
| V/C Ratio(X) | 0.50 | 0.71 | 0.17 | 0.37 | 0.00 | 0.55 | 0.44 | 0.81 | 0.25 | 0.75 | 0.63 | 0.16 |
| Avail Cap(c_a), veh/h | 397 | 793 | 672 | 301 | 0 | 756 | 337 | 1875 | 836 | 221 | 1951 | 857 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.9 | 27.1 | 22.3 | 37.7 | 0.0 | 25.4 | 37.1 | 24.9 | 19.2 | 38.5 | 22.9 | 18.6 |
| Incr Delay (d2), s/veh | 1.5 | 1.7 | 0.2 | 1.3 | 0.0 | 0.9 | 0.4 | 1.7 | 0.2 | 6.6 | 0.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 7.0 | 1.1 | 1.4 | 0.0 | 4.8 | 1.3 | 8.6 | 1.8 | 2.8 | 6.0 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.4 | 28.8 | 22.4 | 39.0 | 0.0 | 26.3 | 37.4 | 26.6 | 19.5 | 45.1 | 23.4 | 18.7 |
| LnGrp LOS | D | C | C | D | | C | D | C | B | D | C | B |
| Approach Vol, veh/h | | 598 | | | 355 | | | 1301 | | | 1009 | |
| Approach Delay, s/veh | | 29.6 | | | 28.7 | | | 27.0 | | | 25.7 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.3 | 39.8 | | 34.8 | 14.4 | 39.6 | | 34.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 12.3 | 49.5 | | 39.8 | 10.3 | 51.5 | | 39.8 |
| Max Q Clear Time (g_c+I1), s | 8.9 | 26.1 | | 24.9 | 6.0 | 19.1 | | 26.1 |
| Green Ext Time (p_c), s | 0.0 | 7.2 | | 2.6 | 0.1 | 5.5 | | 1.6 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 27.3 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 321 | 208 | 70 | 118 | 98 | 913 | 93 | 74 | 744 | 61 |
| Future Volume (vph) | 74 | 321 | 208 | 70 | 118 | 98 | 913 | 93 | 74 | 744 | 61 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 23.1 | 23.1 | 23.1 | 23.1 | 23.1 | 12.7 | 31.2 | 31.2 | 11.9 | 30.5 | 30.5 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.16 | 0.38 | 0.38 | 0.15 | 0.38 | 0.38 |
| v/c Ratio | 0.27 | 0.67 | 0.38 | 0.38 | 0.42 | 0.42 | 0.74 | 0.16 | 0.34 | 0.62 | 0.10 |
| Control Delay (s/veh) | 28.2 | 35.4 | 5.8 | 33.2 | 24.8 | 43.6 | 27.7 | 7.6 | 43.2 | 25.5 | 4.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 28.2 | 35.4 | 5.8 | 33.2 | 24.8 | 43.6 | 27.7 | 7.6 | 43.2 | 25.5 | 4.1 |
| LOS | C | D | A | C | C | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 24.3 | | | 27.0 | | 27.4 | | | 25.5 | |
| Approach LOS | | C | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 81.1 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.74 | |
| Intersection Signal Delay (s/veh): 26.1 | Intersection LOS: C |
| Intersection Capacity Utilization 82.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

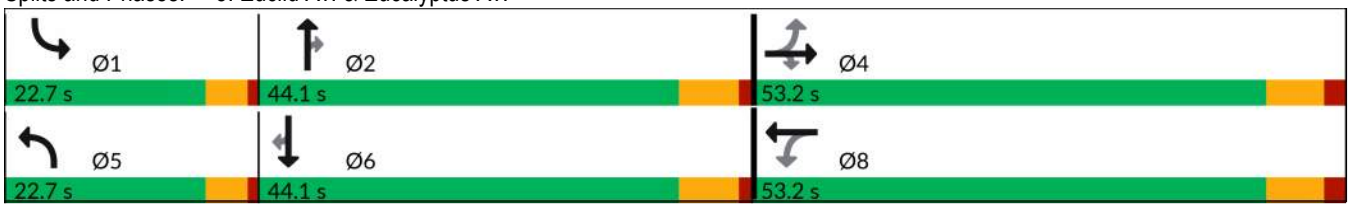

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 74 | 321 | 208 | 70 | 118 | 78 | 98 | 913 | 93 | 74 | 744 | 61 |
| Future Volume (veh/h) | 74 | 321 | 208 | 70 | 118 | 78 | 98 | 913 | 93 | 74 | 744 | 61 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 78 | 338 | 117 | 74 | 124 | 69 | 103 | 961 | 74 | 78 | 783 | 31 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 316 | 511 | 433 | 203 | 308 | 172 | 188 | 1206 | 538 | 171 | 1170 | 522 |
| Arrive On Green | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.12 | 0.36 | 0.36 | 0.11 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1124 | 1772 | 1502 | 884 | 1070 | 595 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 78 | 338 | 117 | 74 | 0 | 193 | 103 | 961 | 74 | 78 | 783 | 31 |
| Grp Sat Flow(s),veh/h/ln | 1124 | 1772 | 1502 | 884 | 0 | 1665 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 4.5 | 12.5 | 4.5 | 6.0 | 0.0 | 7.0 | 4.6 | 19.2 | 2.5 | 3.4 | 14.8 | 1.0 |
| Cycle Q Clear(g_c), s | 11.5 | 12.5 | 4.5 | 18.5 | 0.0 | 7.0 | 4.6 | 19.2 | 2.5 | 3.4 | 14.8 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.36 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 316 | 511 | 433 | 203 | 0 | 480 | 188 | 1206 | 538 | 171 | 1170 | 522 |
| V/C Ratio(X) | 0.25 | 0.66 | 0.27 | 0.36 | 0.00 | 0.40 | 0.55 | 0.80 | 0.14 | 0.46 | 0.67 | 0.06 |
| Avail Cap(c_a), veh/h | 683 | 1091 | 924 | 492 | 0 | 1025 | 384 | 1694 | 755 | 384 | 1694 | 755 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.0 | 23.4 | 20.5 | 31.5 | 0.0 | 21.4 | 31.1 | 21.5 | 16.2 | 31.3 | 20.7 | 16.3 |
| Incr Delay (d2), s/veh | 0.3 | 1.1 | 0.2 | 0.8 | 0.0 | 0.4 | 1.8 | 1.8 | 0.1 | 1.4 | 0.7 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 4.8 | 1.4 | 1.2 | 0.0 | 2.4 | 1.7 | 6.6 | 0.7 | 1.3 | 5.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.3 | 24.5 | 20.8 | 32.4 | 0.0 | 21.8 | 32.9 | 23.4 | 16.3 | 32.7 | 21.4 | 16.3 |
| LnGrp LOS | C | C | C | C | | C | C | C | B | C | C | B |
| Approach Vol, veh/h | | 533 | | | 267 | | | 1138 | | | 892 | |
| Approach Delay, s/veh | | 23.9 | | | 24.7 | | | 23.8 | | | 22.2 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.7 | 33.3 | | 28.8 | 13.5 | 32.5 | | 28.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 5.4 | 21.2 | | 14.5 | 6.6 | 16.8 | | 20.5 |
| Green Ext Time (p_c), s | 0.1 | 5.6 | | 2.0 | 0.1 | 4.7 | | 1.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 23.4 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 22 | 22 | 60 | 0 | 1 | 1138 | 58 | 187 | 1020 |
| Future Volume (vph) | 22 | 22 | 60 | 0 | 1 | 1138 | 58 | 187 | 1020 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.7 | 50.7 | 22.1 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.4% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 15.3 | | 15.3 | 10.3 | 39.4 | 39.4 | 15.7 | 57.7 |
| Actuated g/C Ratio | | 0.17 | | 0.17 | 0.12 | 0.44 | 0.44 | 0.18 | 0.65 |
| v/c Ratio | | 0.25 | | 0.58 | 0.01 | 0.80 | 0.08 | 0.70 | 0.50 |
| Control Delay (s/veh) | | 29.1 | | 21.7 | 45.0 | 28.4 | 0.2 | 52.6 | 12.6 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 29.1 | | 21.7 | 45.0 | 28.4 | 0.2 | 52.6 | 12.6 |
| LOS | | C | | C | D | C | A | D | B |
| Approach Delay (s/veh) | | 29.1 | | 21.7 | | 27.1 | | | 18.8 |
| Approach LOS | | C | | C | | C | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 89.4 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 22.9 | Intersection LOS: C |
| Intersection Capacity Utilization 74.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

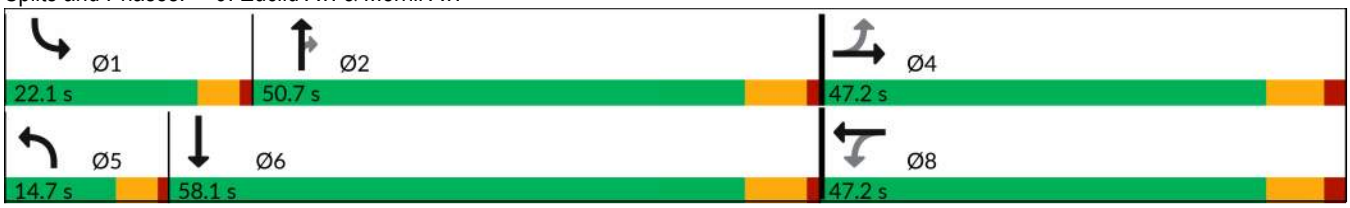

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 22 | 22 | 12 | 60 | 0 | 126 | 1 | 1138 | 58 | 187 | 1020 | 9 |
| Future Volume (veh/h) | 22 | 22 | 12 | 60 | 0 | 126 | 1 | 1138 | 58 | 187 | 1020 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 23 | 23 | 5 | 62 | 0 | 123 | 1 | 1185 | 56 | 195 | 1062 | 8 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 152 | 130 | 23 | 128 | 16 | 151 | 4 | 1488 | 664 | 233 | 2003 | 15 |
| Arrive On Green | 0.15 | 0.15 | 0.15 | 0.15 | 0.00 | 0.15 | 0.00 | 0.44 | 0.44 | 0.15 | 0.59 | 0.59 |
| Sat Flow, veh/h | 514 | 853 | 149 | 395 | 102 | 986 | 1594 | 3367 | 1502 | 1594 | 3424 | 26 |
| Grp Volume(v), veh/h | 51 | 0 | 0 | 185 | 0 | 0 | 1 | 1185 | 56 | 195 | 522 | 548 |
| Grp Sat Flow(s),veh/h/ln | 1516 | 0 | 0 | 1483 | 0 | 0 | 1594 | 1683 | 1502 | 1594 | 1683 | 1766 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 6.4 | 0.0 | 0.0 | 0.0 | 21.5 | 1.5 | 8.4 | 13.2 | 13.2 |
| Cycle Q Clear(g_c), s | 1.8 | 0.0 | 0.0 | 8.5 | 0.0 | 0.0 | 0.0 | 21.5 | 1.5 | 8.4 | 13.2 | 13.2 |
| Prop In Lane | 0.45 | | 0.10 | 0.34 | | 0.66 | 1.00 | | 1.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 305 | 0 | 0 | 294 | 0 | 0 | 4 | 1488 | 664 | 233 | 985 | 1034 |
| V/C Ratio(X) | 0.17 | 0.00 | 0.00 | 0.63 | 0.00 | 0.00 | 0.23 | 0.80 | 0.08 | 0.84 | 0.53 | 0.53 |
| Avail Cap(c_a), veh/h | 914 | 0 | 0 | 894 | 0 | 0 | 225 | 2097 | 935 | 391 | 1224 | 1284 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.2 | 0.0 | 0.0 | 29.0 | 0.0 | 0.0 | 35.3 | 17.1 | 11.5 | 29.5 | 8.9 | 8.9 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 | 9.5 | 1.5 | 0.1 | 3.1 | 0.4 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.0 | 0.0 | 2.8 | 0.0 | 0.0 | 0.0 | 6.7 | 0.4 | 3.0 | 3.3 | 3.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.3 | 0.0 | 0.0 | 29.8 | 0.0 | 0.0 | 44.8 | 18.5 | 11.5 | 32.6 | 9.3 | 9.3 |
| LnGrp LOS | C | | | C | | | D | B | B | C | A | A |
| Approach Vol, veh/h | | 51 | | | 185 | | | 1242 | | | 1265 | |
| Approach Delay, s/veh | | 26.3 | | | 29.8 | | | 18.2 | | | 12.9 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.1 | 37.9 | | 18.0 | 4.9 | 48.0 | | 18.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.4 | 44.2 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 10.4 | 23.5 | | 3.8 | 2.0 | 15.2 | | 10.5 |
| Green Ext Time (p_c), s | 0.1 | 7.8 | | 0.2 | 0.0 | 6.8 | | 0.6 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 16.7 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 246 | 625 | 57 | 38 | 431 | 197 | 92 | 581 | 36 | 442 | 439 | 153 |
| Future Volume (vph) | 246 | 625 | 57 | 38 | 431 | 197 | 92 | 581 | 36 | 442 | 439 | 153 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 37.4 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 31.2% | 12.3% | 12.3% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.4 | 28.8 | 28.8 | 10.4 | 24.9 | 24.9 | 10.4 | 22.0 | 39.1 | 10.4 | 22.1 | 39.1 |
| Actuated g/C Ratio | 0.11 | 0.31 | 0.31 | 0.11 | 0.27 | 0.27 | 0.11 | 0.24 | 0.43 | 0.11 | 0.24 | 0.43 |
| v/c Ratio | 0.79 | 0.62 | 0.11 | 0.22 | 0.50 | 0.37 | 0.54 | 0.76 | 0.06 | 1.42 | 0.57 | 0.22 |
| Control Delay (s/veh) | 61.3 | 30.7 | 0.4 | 47.1 | 29.4 | 5.5 | 56.2 | 40.2 | 0.2 | 240.3 | 34.7 | 4.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.3 | 30.7 | 0.4 | 47.1 | 29.4 | 5.5 | 56.2 | 40.2 | 0.2 | 240.3 | 34.7 | 4.3 |
| LOS | E | C | A | D | C | A | E | D | A | F | C | A |
| Approach Delay (s/veh) | | 37.0 | | | 23.4 | | | 40.3 | | | 118.1 | |
| Approach LOS | | D | | | C | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 91.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.42 | |
| Intersection Signal Delay (s/veh): 60.1 | Intersection LOS: E |
| Intersection Capacity Utilization 77.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

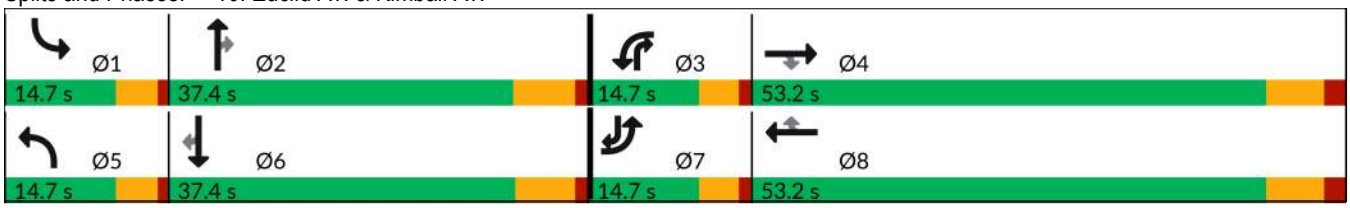

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 246 | 625 | 57 | 38 | 431 | 197 | 92 | 581 | 36 | 442 | 439 | 153 |
| Future Volume (veh/h) | 246 | 625 | 57 | 38 | 431 | 197 | 92 | 581 | 36 | 442 | 439 | 153 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 259 | 658 | 28 | 40 | 454 | 104 | 97 | 612 | 18 | 465 | 462 | 82 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 375 | 879 | 387 | 119 | 697 | 311 | 180 | 797 | 467 | 376 | 851 | 573 |
| Arrive On Green | 0.13 | 0.26 | 0.26 | 0.07 | 0.21 | 0.21 | 0.11 | 0.24 | 0.24 | 0.13 | 0.25 | 0.25 |
| Sat Flow, veh/h | 2910 | 3367 | 1482 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 259 | 658 | 28 | 40 | 454 | 104 | 97 | 612 | 18 | 465 | 462 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1482 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 6.6 | 13.9 | 1.1 | 1.8 | 9.6 | 4.6 | 4.4 | 13.1 | 0.6 | 10.0 | 9.2 | 2.8 |
| Cycle Q Clear(g_c), s | 6.6 | 13.9 | 1.1 | 1.8 | 9.6 | 4.6 | 4.4 | 13.1 | 0.6 | 10.0 | 9.2 | 2.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 375 | 879 | 387 | 119 | 697 | 311 | 180 | 797 | 467 | 376 | 851 | 573 |
| V/C Ratio(X) | 0.69 | 0.75 | 0.07 | 0.34 | 0.65 | 0.33 | 0.54 | 0.77 | 0.04 | 1.24 | 0.54 | 0.14 |
| Avail Cap(c_a), veh/h | 376 | 2001 | 881 | 206 | 2001 | 892 | 206 | 1344 | 711 | 376 | 1348 | 795 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.3 | 26.3 | 21.5 | 34.0 | 28.1 | 26.1 | 32.4 | 27.6 | 18.6 | 33.7 | 25.0 | 15.7 |
| Incr Delay (d2), s/veh | 4.5 | 1.3 | 0.1 | 1.7 | 0.4 | 0.2 | 0.9 | 1.6 | 0.0 | 127.5 | 0.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 5.1 | 0.4 | 0.7 | 3.5 | 1.5 | 1.6 | 4.8 | 0.2 | 9.8 | 3.3 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.7 | 27.6 | 21.6 | 35.7 | 28.5 | 26.4 | 33.3 | 29.2 | 18.6 | 161.2 | 25.6 | 15.8 |
| LnGrp LOS | D | C | C | D | C | C | C | C | B | F | C | B |
| Approach Vol, veh/h | | 945 | | | 598 | | | 727 | | | 1009 | |
| Approach Delay, s/veh | | 29.9 | | | 28.6 | | | 29.5 | | | 87.3 | |
| Approach LOS | | C | | | C | | | C | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 24.8 | 10.5 | 27.4 | 13.5 | 26.1 | 14.7 | 23.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 10.0 | 30.9 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 15.1 | 3.8 | 15.9 | 6.4 | 11.2 | 8.6 | 11.6 |
| Green Ext Time (p_c), s | 0.0 | 3.2 | 0.0 | 4.3 | 0.0 | 2.7 | 0.1 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 47.2 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 11 | 289 | 581 | 180 | 26 | 588 | 958 | 74 | 453 |
| Future Volume (vph) | 11 | 289 | 581 | 180 | 26 | 588 | 958 | 74 | 453 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 28.0 | 42.0 | 54.3 | 14.7 | 35.3 | 42.0 | 14.7 | 35.3 |
| Total Split (%) | 13.1% | 23.3% | 35.0% | 45.3% | 12.3% | 29.4% | 35.0% | 12.3% | 29.4% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.1 | 21.2 | 36.6 | 60.6 | 10.1 | 24.6 | 67.8 | 10.1 | 27.5 |
| Actuated g/C Ratio | 0.09 | 0.19 | 0.32 | 0.54 | 0.09 | 0.22 | 0.60 | 0.09 | 0.24 |
| v/c Ratio | 0.09 | 1.08 | 0.67 | 0.28 | 0.20 | 0.87 | 1.07 | 0.57 | 0.60 |
| Control Delay (s/veh) | 52.2 | 117.5 | 38.7 | 17.5 | 54.7 | 56.3 | 68.9 | 68.7 | 42.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.2 | 117.5 | 38.7 | 17.5 | 54.7 | 56.3 | 68.9 | 68.7 | 42.1 |
| LOS | D | F | D | B | D | E | E | E | D |
| Approach Delay (s/veh) | | 115.3 | | 32.5 | | 63.9 | | | 45.8 |
| Approach LOS | | F | | C | | E | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.08 | |
| Intersection Signal Delay (s/veh): 58.4 | Intersection LOS: E |
| Intersection Capacity Utilization 104.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

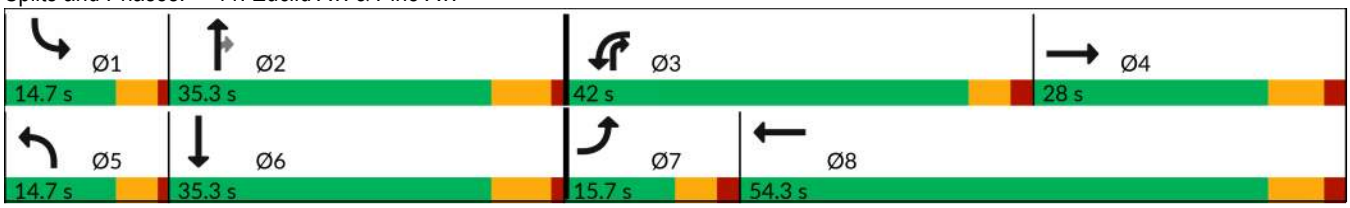

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 11 | 289 | 41 | 581 | 180 | 62 | 26 | 588 | 958 | 74 | 453 | 5 |
| Future Volume (veh/h) | 11 | 289 | 41 | 581 | 180 | 62 | 26 | 588 | 958 | 74 | 453 | 5 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 12 | 311 | 0 | 625 | 194 | 58 | 28 | 632 | 955 | 80 | 487 | 5 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 45 | 339 | | 688 | 524 | 157 | 84 | 898 | 756 | 134 | 1018 | 10 |
| Arrive On Green | 0.03 | 0.19 | 0.00 | 0.24 | 0.40 | 0.40 | 0.05 | 0.27 | 0.27 | 0.08 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1594 | 1772 | 0 | 2910 | 1310 | 392 | 1594 | 3367 | 1502 | 1594 | 3414 | 35 |
| Grp Volume(v), veh/h | 12 | 311 | 0 | 625 | 0 | 252 | 28 | 632 | 955 | 80 | 240 | 252 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 0 | 1455 | 0 | 1701 | 1594 | 1683 | 1502 | 1594 | 1683 | 1766 |
| Q Serve(g_s), s | 0.8 | 18.6 | 0.0 | 22.6 | 0.0 | 11.3 | 1.8 | 18.3 | 28.8 | 5.2 | 12.6 | 12.6 |
| Cycle Q Clear(g_c), s | 0.8 | 18.6 | 0.0 | 22.6 | 0.0 | 11.3 | 1.8 | 18.3 | 28.8 | 5.2 | 12.6 | 12.6 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.23 | 1.00 | | 1.00 | 1.00 | | 0.02 |
| Lane Grp Cap(c), veh/h | 45 | 339 | | 688 | 0 | 681 | 84 | 898 | 756 | 134 | 502 | 526 |
| V/C Ratio(X) | 0.27 | 0.92 | | 0.91 | 0.00 | 0.37 | 0.33 | 0.70 | 1.26 | 0.60 | 0.48 | 0.48 |
| Avail Cap(c_a), veh/h | 148 | 344 | | 978 | 0 | 745 | 148 | 898 | 756 | 148 | 502 | 526 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.4 | 42.8 | 0.0 | 40.1 | 0.0 | 22.8 | 49.3 | 35.8 | 26.8 | 47.7 | 31.0 | 31.0 |
| Incr Delay (d2), s/veh | 1.2 | 28.7 | 0.0 | 7.4 | 0.0 | 0.5 | 0.9 | 2.1 | 129.3 | 3.1 | 0.3 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 10.5 | 0.0 | 8.3 | 0.0 | 4.3 | 0.7 | 7.3 | 44.0 | 2.1 | 4.8 | 5.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 52.6 | 71.5 | 0.0 | 47.5 | 0.0 | 23.3 | 50.2 | 37.9 | 156.1 | 50.8 | 31.3 | 31.3 |
| LnGrp LOS | D | E | | D | | C | D | D | F | D | C | C |
| Approach Vol, veh/h | | 323 | | | 877 | | | 1615 | | | 572 | |
| Approach Delay, s/veh | | 70.8 | | | 40.5 | | | 108.0 | | | 34.0 | |
| Approach LOS | | E | | | D | | | F | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.8 | 35.3 | 31.3 | 27.7 | 10.4 | 38.7 | 8.7 | 50.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 28.8 | 36.3 | 21.0 | 10.0 | 28.8 | 10.0 | 47.3 |
| Max Q Clear Time (g_c+I1), s | 7.2 | 30.8 | 24.6 | 20.6 | 3.8 | 14.6 | 2.8 | 13.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.0 | 0.1 | 0.0 | 1.3 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 74.5 |
| HCM 7th LOS | E |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 771 | 431 | 757 | 101 | 813 |
| Future Volume (vph) | 771 | 431 | 757 | 101 | 813 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 24.5 | 9.6 | 9.6 |
| Total Split (s) | 35.2 | 31.7 | 66.9 | 33.1 | 33.1 |
| Total Split (%) | 35.2% | 31.7% | 66.9% | 33.1% | 33.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 28.7 | 27.0 | 60.4 | 28.5 | 28.5 |
| Actuated g/C Ratio | 0.29 | 0.27 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 1.04 | 1.12 | 0.42 | 0.14 | 1.11 |
| Control Delay (s/veh) | 72.3 | 116.5 | 11.2 | 27.2 | 82.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 72.3 | 116.5 | 11.2 | 27.2 | 82.7 |
| LOS | E | F | B | C | F |
| Approach Delay (s/veh) | 72.3 | | 49.5 | 76.6 | |
| Approach LOS | E | | D | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.12 | |
| Intersection Signal Delay (s/veh): 64.5 | Intersection LOS: E |
| Intersection Capacity Utilization 89.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

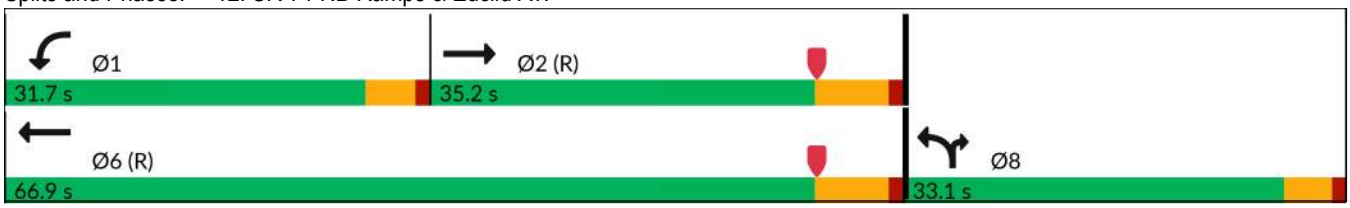

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 771 | 121 | 431 | 757 | 101 | 813 |
| Future Volume (veh/h) | 771 | 121 | 431 | 757 | 101 | 813 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1673 | 1772 | 1575 | 1772 |
| Adj Flow Rate, veh/h | 857 | 0 | 479 | 841 | 112 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1730 | | 430 | 2797 | 169 | |
| Arrive On Green | 1.00 | 0.00 | 0.27 | 0.83 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3544 | 0 | 1594 | 3455 | 2910 | 1502 |
| Grp Volume(v), veh/h | 857 | 0 | 479 | 841 | 112 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1683 | 0 | 1594 | 1683 | 1455 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 27.0 | 5.6 | 3.8 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 27.0 | 5.6 | 3.8 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1730 | | 430 | 2797 | 169 | |
| V/C Ratio(X) | 0.50 | | 1.11 | 0.30 | 0.66 | |
| Avail Cap(c_a), veh/h | 1730 | | 430 | 2797 | 829 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.80 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.5 | 1.9 | 46.1 | 0.0 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 77.8 | 0.3 | 4.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 18.9 | 0.5 | 1.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.8 | 0.0 | 114.3 | 2.2 | 50.5 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 857 | | | 1320 | 112 | |
| Approach Delay, s/veh | 0.8 | | | 42.9 | 50.5 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.7 | 57.9 | | | | 89.6 | 10.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 27.0 | 28.7 | | | | 60.4 | 28.5 |
| Max Q Clear Time (g_c+I1), s | 29.0 | 2.0 | | | | 7.6 | 5.8 |
| Green Ext Time (p_c), s | 0.0 | 4.4 | | | | 4.5 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.5 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 364 | 71 | 205 | 29 | 131 | 605 | 74 | 62 |
| Future Volume (vph) | 364 | 71 | 205 | 29 | 131 | 605 | 74 | 62 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 23.5 | 23.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 26.5 | 13.0 | 39.5 | 23.5 | 23.5 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 26.5% | 13.0% | 39.5% | 23.5% | 23.5% | 37.0% | 37.0% | 37.0% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 33.4 | 8.9 | 44.5 | 8.7 | 8.7 | 29.4 | 29.4 | 29.4 |
| Actuated g/C Ratio | 0.33 | 0.09 | 0.45 | 0.09 | 0.09 | 0.29 | 0.29 | 0.29 |
| v/c Ratio | 0.39 | 0.53 | 0.14 | 0.22 | 0.51 | 0.80 | 0.75 | 0.12 |
| Control Delay (s/veh) | 29.1 | 61.4 | 13.2 | 46.1 | 13.1 | 45.7 | 41.3 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.1 | 61.4 | 13.2 | 46.1 | 13.1 | 45.7 | 41.3 | 0.5 |
| LOS | C | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 29.1 | | 25.6 | | | | 39.9 | |
| Approach LOS | C | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 32.5 | Intersection LOS: C |
| Intersection Capacity Utilization 59.2% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

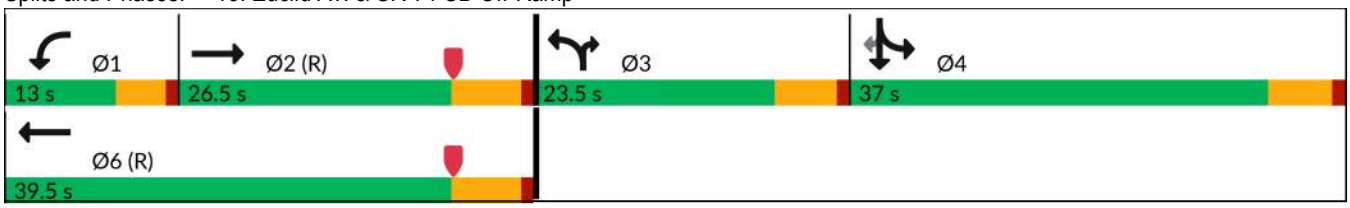

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 364 | 47 | 71 | 205 | 0 | 29 | 0 | 131 | 605 | 74 | 62 |
| Future Volume (veh/h) | 0 | 364 | 47 | 71 | 205 | 0 | 29 | 0 | 131 | 605 | 74 | 62 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 0 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 379 | 16 | 74 | 214 | 0 | 30 | 0 | 43 | 685 | 0 | 36 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1709 | 72 | 111 | 2141 | | 0 | 0 | 0 | 778 | 0 | 365 |
| Arrive On Green | 0.00 | 0.52 | 0.52 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 0.00 | 0.24 |
| Sat Flow, veh/h | 0 | 3380 | 139 | 1594 | 3455 | 0 | | 0 | | 3188 | 0 | 1496 |
| Grp Volume(v), veh/h | 0 | 193 | 202 | 74 | 214 | 0 | | 0.0 | | 685 | 0 | 36 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1683 | 1747 | 1594 | 1683 | 0 | | | | 1594 | 0 | 1496 |
| Q Serve(g_s), s | 0.0 | 6.2 | 6.3 | 4.4 | 0.0 | 0.0 | | | | 20.7 | 0.0 | 1.9 |
| Cycle Q Clear(g_c), s | 0.0 | 6.2 | 6.3 | 4.4 | 0.0 | 0.0 | | | | 20.7 | 0.0 | 1.9 |
| Prop In Lane | 0.00 | | 0.08 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 874 | 907 | 111 | 2141 | | | | | 778 | 0 | 365 |
| V/C Ratio(X) | 0.00 | 0.22 | 0.22 | 0.67 | 0.10 | | | | | 0.88 | 0.00 | 0.10 |
| Avail Cap(c_a), veh/h | 0 | 874 | 907 | 132 | 2141 | | | | | 995 | 0 | 467 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.93 | 0.93 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 13.1 | 13.1 | 41.9 | 0.0 | 0.0 | | | | 36.4 | 0.0 | 29.3 |
| Incr Delay (d2), s/veh | 0.0 | 0.6 | 0.6 | 5.5 | 0.1 | 0.0 | | | | 7.1 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.3 | 2.4 | 1.8 | 0.0 | 0.0 | | | | 8.7 | 0.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 13.7 | 13.6 | 47.4 | 0.1 | 0.0 | | | | 43.5 | 0.0 | 29.4 |
| LnGrp LOS | | B | B | D | A | | | | | D | | C |
| Approach Vol, veh/h | | 395 | | | 288 | | | | | | 721 | |
| Approach Delay, s/veh | | 13.6 | | | 12.2 | | | | | | 42.8 | |
| Approach LOS | | B | | | B | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.7 | 58.1 | | 30.2 | | 69.8 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 8.3 | 20.3 | | 31.2 | | 33.3 |
| Max Q Clear Time (g_c+I1), s | 6.4 | 8.3 | | 22.7 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | | 1.5 | | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.3 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 35 | 596 | 32 | 43 | 535 | 12 | 26 | 32 | 73 | 5 | 10 | 24 |
| Future Vol, veh/h | 35 | 596 | 32 | 43 | 535 | 12 | 26 | 32 | 73 | 5 | 10 | 24 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 36 | 614 | 33 | 44 | 552 | 12 | 27 | 33 | 75 | 5 | 10 | 25 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 567 | 0 | 0 | 647 | 0 | 0 | 1073 | 1359 | 631 | 1352 | 1369 | 285 |
| Stage 1 | - | - | - | - | - | - | 703 | 703 | - | 649 | 649 | - |
| Stage 2 | - | - | - | - | - | - | 370 | 656 | - | 703 | 720 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 1003 | - | - | 936 | - | - | 186 | 148 | 480 | 117 | 146 | 713 |
| Stage 1 | - | - | - | - | - | - | 427 | 439 | - | 425 | 464 | - |
| Stage 2 | - | - | - | - | - | - | 623 | 461 | - | 427 | 431 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1000 | - | - | 936 | - | - | 159 | 136 | 480 | 82 | 134 | 711 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 338 | 304 | - | 228 | 296 | - |
| Stage 1 | - | - | - | - | - | - | 412 | 423 | - | 404 | 441 | - |
| Stage 2 | - | - | - | - | - | - | 560 | 438 | - | 320 | 416 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.46 | 0.66 | 18.95 | 14.1 |
| HCM LOS | | | C | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 392 | 1000 | - | - | 936 | - | - | 436 |
| HCM Lane V/C Ratio | 0.345 | 0.036 | - | - | 0.047 | - | - | 0.092 |
| HCM Control Delay (s/veh) | 18.9 | 8.7 | - | - | 9 | - | - | 14.1 |
| HCM Lane LOS | C | A | - | - | A | - | - | B |
| HCM 95th %tile Q(veh) | 1.5 | 0.1 | - | - | 0.1 | - | - | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.6 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 47 | 290 | 27 | 2 | 80 | 9 | 12 | 124 | 13 | 8 | 94 | 24 |
| Future Vol, veh/h | 47 | 290 | 27 | 2 | 80 | 9 | 12 | 124 | 13 | 8 | 94 | 24 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 51 | 312 | 29 | 2 | 86 | 10 | 13 | 133 | 14 | 9 | 101 | 26 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 13.4 | 9.2 | 10.1 | 9.8 |
| HCM LOS | B | A | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 8% | 13% | 2% | 6% |
| Vol Thru, % | 83% | 80% | 88% | 75% |
| Vol Right, % | 9% | 7% | 10% | 19% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 149 | 364 | 91 | 126 |
| LT Vol | 12 | 47 | 2 | 8 |
| Through Vol | 124 | 290 | 80 | 94 |
| RT Vol | 13 | 27 | 9 | 24 |
| Lane Flow Rate | 160 | 391 | 98 | 135 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.239 | 0.533 | 0.143 | 0.202 |
| Departure Headway (Hd) | 5.381 | 4.9 | 5.252 | 5.359 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 668 | 740 | 683 | 669 |
| Service Time | 3.413 | 2.9 | 3.281 | 3.391 |
| HCM Lane V/C Ratio | 0.24 | 0.528 | 0.143 | 0.202 |
| HCM Control Delay, s/veh | 10.1 | 13.4 | 9.2 | 9.8 |
| HCM Lane LOS | B | B | A | A |
| HCM 95th-tile Q | 0.9 | 3.2 | 0.5 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 43.4 |
| Intersection LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 52 | 538 | 44 | 12 | 291 | 14 | 24 | 75 | 20 | 28 | 77 | 20 |
| Future Vol, veh/h | 52 | 538 | 44 | 12 | 291 | 14 | 24 | 75 | 20 | 28 | 77 | 20 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 57 | 585 | 48 | 13 | 316 | 15 | 26 | 82 | 22 | 30 | 84 | 22 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 68.5 | 16.7 | 12.6 | 12.7 |
| HCM LOS | F | C | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 20% | 8% | 4% | 22% |
| Vol Thru, % | 63% | 85% | 92% | 62% |
| Vol Right, % | 17% | 7% | 4% | 16% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 119 | 634 | 317 | 125 |
| LT Vol | 24 | 52 | 12 | 28 |
| Through Vol | 75 | 538 | 291 | 77 |
| RT Vol | 20 | 44 | 14 | 20 |
| Lane Flow Rate | 129 | 689 | 345 | 136 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.252 | 1.038 | 0.568 | 0.264 |
| Departure Headway (Hd) | 7.167 | 5.425 | 6.045 | 7.152 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 504 | 662 | 600 | 505 |
| Service Time | 5.167 | 3.511 | 4.045 | 5.152 |
| HCM Lane V/C Ratio | 0.256 | 1.041 | 0.575 | 0.269 |
| HCM Control Delay, s/veh | 12.6 | 68.5 | 16.7 | 12.7 |
| HCM Lane LOS | B | F | C | B |
| HCM 95th-tile Q | 1 | 17.6 | 3.6 | 1.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 31 | 146 | 16 | 0 | 60 | 3 | 10 | 24 | 3 | 3 | 13 | 18 |
| Future Vol, veh/h | 31 | 146 | 16 | 0 | 60 | 3 | 10 | 24 | 3 | 3 | 13 | 18 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 38 | 178 | 20 | 0 | 73 | 4 | 12 | 29 | 4 | 4 | 16 | 22 |
| Number of Lanes | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 2 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 2 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 2 |
| HCM Control Delay, s/veh | 8.4 | 7.9 | 8 | 7.7 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|---|
| Vol Left, % | 27% | 30% | 0% | 0% | 9% |
| Vol Thru, % | 65% | 70% | 82% | 95% | 38% |
| Vol Right, % | 8% | 0% | 18% | 5% | 53% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 37 | 104 | 89 | 63 | 34 |
| LT Vol | 10 | 31 | 0 | 0 | 3 |
| Through Vol | 24 | 73 | 73 | 60 | 13 |
| RT Vol | 3 | 0 | 16 | 3 | 18 |
| Lane Flow Rate | 45 | 127 | 109 | 77 | 41 |
| Geometry Grp | 2 | 5 | 5 | 4a | 2 |
| Degree of Util (X) | 0.059 | 0.172 | 0.139 | 0.095 | 0.051 |
| Departure Headway (Hd) | 4.706 | 4.875 | 4.599 | 4.459 | 4.407 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 764 | 728 | 771 | 807 | 816 |
| Service Time | 2.714 | 2.657 | 2.381 | 2.471 | 2.415 |
| HCM Lane V/C Ratio | 0.059 | 0.174 | 0.141 | 0.095 | 0.05 |
| HCM Control Delay, s/veh | 8 | 8.7 | 8.1 | 7.9 | 7.7 |
| HCM Lane LOS | A | A | A | A | A |
| HCM 95th-tile Q | 0.2 | 0.6 | 0.5 | 0.3 | 0.2 |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 224 | 232 | 630 | 930 | 753 |
| Future Volume (vph) | 3 | 224 | 232 | 630 | 930 | 753 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 24.8 | 24.8 | 22.0 | 65.2 | 43.2 | 43.2 |
| Total Split (%) | 27.6% | 27.6% | 24.4% | 72.4% | 48.0% | 48.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 15.6 | 15.6 | 15.9 | 62.8 | 41.1 | 41.1 |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.18 | 0.70 | 0.46 | 0.46 |
| v/c Ratio | 0.75 | 0.51 | 0.84 | 0.27 | 0.61 | 0.74 |
| Control Delay (s/veh) | 50.9 | 8.7 | 58.0 | 12.3 | 21.6 | 8.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.9 | 8.7 | 58.0 | 12.3 | 21.6 | 8.2 |
| LOS | D | A | E | B | C | A |
| Approach Delay (s/veh) | 29.4 | | | 24.6 | 15.6 | |
| Approach LOS | C | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 72.8 (81%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 20.2 | Intersection LOS: C |
| Intersection Capacity Utilization 91.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

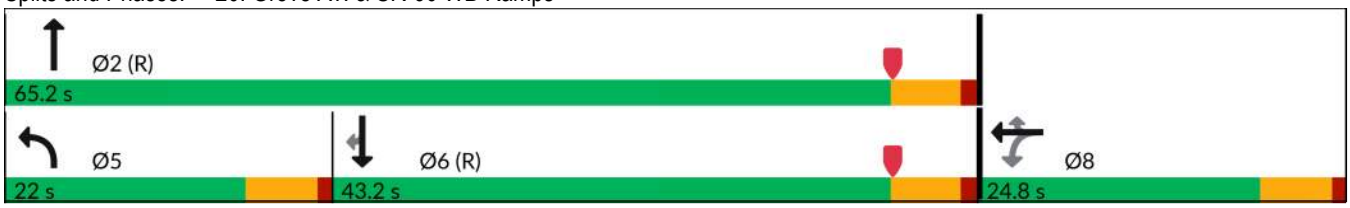

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 213 | 3 | 224 | 232 | 630 | 0 | 0 | 930 | 753 |
| Future Volume (veh/h) | 0 | 0 | 0 | 213 | 3 | 224 | 232 | 630 | 0 | 0 | 930 | 753 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 215 | 3 | 90 | 234 | 636 | 0 | 0 | 939 | 578 |
| Peak Hour Factor | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 256 | 4 | 231 | 259 | 2415 | 0 | 0 | 1651 | 718 |
| Arrive On Green | | | | 0.15 | 0.15 | 0.15 | 0.33 | 1.00 | 0.00 | 0.00 | 0.49 | 0.49 |
| Sat Flow, veh/h | | | | 1665 | 23 | 1502 | 1594 | 3455 | 0 | 0 | 3455 | 1464 |
| Grp Volume(v), veh/h | | | | 218 | 0 | 90 | 234 | 636 | 0 | 0 | 939 | 578 |
| Grp Sat Flow(s),veh/h/ln | | | | 1689 | 0 | 1502 | 1594 | 1683 | 0 | 0 | 1683 | 1464 |
| Q Serve(g_s), s | | | | 11.3 | 0.0 | 4.9 | 12.6 | 0.0 | 0.0 | 0.0 | 17.7 | 29.9 |
| Cycle Q Clear(g_c), s | | | | 11.3 | 0.0 | 4.9 | 12.6 | 0.0 | 0.0 | 0.0 | 17.7 | 29.9 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 260 | 0 | 231 | 259 | 2415 | 0 | 0 | 1651 | 718 |
| V/C Ratio(X) | | | | 0.84 | 0.00 | 0.39 | 0.90 | 0.26 | 0.00 | 0.00 | 0.57 | 0.81 |
| Avail Cap(c_a), veh/h | | | | 356 | 0 | 317 | 287 | 2415 | 0 | 0 | 1651 | 718 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.59 | 0.59 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 37.0 | 0.0 | 34.3 | 29.7 | 0.0 | 0.0 | 0.0 | 16.2 | 19.3 |
| Incr Delay (d2), s/veh | | | | 10.9 | 0.0 | 0.8 | 17.9 | 0.2 | 0.0 | 0.0 | 1.4 | 9.4 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.2 | 0.0 | 1.7 | 5.0 | 0.1 | 0.0 | 0.0 | 6.3 | 10.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 48.0 | 0.0 | 35.1 | 47.5 | 0.2 | 0.0 | 0.0 | 17.6 | 28.7 |
| LnGrp LOS | | | | D | | D | D | A | | | B | C |
| Approach Vol, veh/h | | | | | 308 | | | 870 | | | 1517 | |
| Approach Delay, s/veh | | | | | 44.2 | | | 12.9 | | | 21.8 | |
| Approach LOS | | | | | D | | | B | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 70.4 | | 20.4 | 49.9 | | 19.6 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 59.4 | | 16.2 | 37.4 | | 19.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 14.6 | 31.9 | | 13.3 |
| Green Ext Time (p_c), s | 3.5 | | 0.1 | 3.2 | | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.5 |
| HCM 7th LOS | C |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 3 | 208 | 601 | 410 | 732 |
| Future Volume (vph) | 3 | 208 | 601 | 410 | 732 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 24.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 35.8% | 26.7% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 19.1 | 19.1 | 32.2 | 21.1 | 58.3 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.36 | 0.23 | 0.65 |
| v/c Ratio | 0.76 | 0.47 | 0.74 | 1.14 | 0.35 |
| Control Delay (s/veh) | 46.5 | 10.0 | 28.7 | 126.8 | 10.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 46.5 | 10.0 | 28.7 | 126.8 | 10.4 |
| LOS | D | A | C | F | B |
| Approach Delay (s/veh) | 30.4 | | 28.7 | | 52.2 |
| Approach LOS | C | | C | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.14 | |
| Intersection Signal Delay (s/veh): 39.9 | Intersection LOS: D |
| Intersection Capacity Utilization 91.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

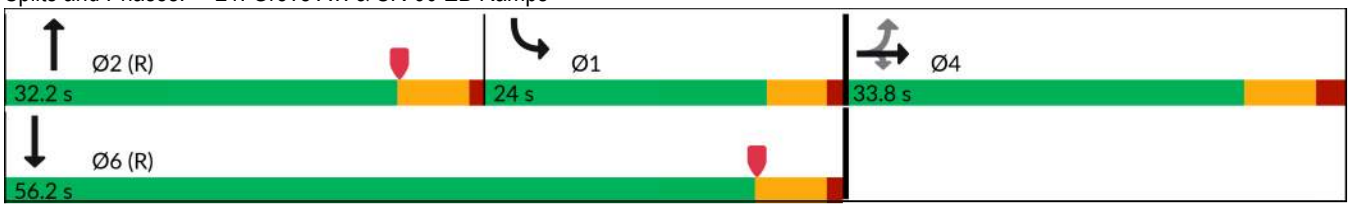

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 261 | 3 | 208 | 0 | 0 | 0 | 0 | 601 | 246 | 410 | 732 | 0 |
| Future Volume (veh/h) | 261 | 3 | 208 | 0 | 0 | 0 | 0 | 601 | 246 | 410 | 732 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 269 | 3 | 128 | | | | 0 | 620 | 191 | 423 | 755 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 316 | 4 | 283 | | | | 0 | 691 | 213 | 531 | 2259 | 0 |
| Arrive On Green | 0.19 | 0.19 | 0.19 | | | | 0.00 | 0.27 | 0.27 | 0.22 | 0.45 | 0.00 |
| Sat Flow, veh/h | 1670 | 19 | 1499 | | | | 0 | 2619 | 778 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 272 | 0 | 128 | | | | 0 | 412 | 399 | 423 | 755 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1499 | | | | 0 | 1683 | 1625 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 14.0 | 0.0 | 6.8 | | | | 0.0 | 21.2 | 21.3 | 22.6 | 13.1 | 0.0 |
| Cycle Q Clear(g_c), s | 14.0 | 0.0 | 6.8 | | | | 0.0 | 21.2 | 21.3 | 22.6 | 13.1 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 0.48 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 319 | 0 | 283 | | | | 0 | 460 | 444 | 531 | 2259 | 0 |
| V/C Ratio(X) | 0.85 | 0.00 | 0.45 | | | | 0.00 | 0.90 | 0.90 | 0.80 | 0.33 | 0.00 |
| Avail Cap(c_a), veh/h | 507 | 0 | 450 | | | | 0 | 494 | 477 | 531 | 2259 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.75 | 0.75 | 0.00 |
| Uniform Delay (d), s/veh | 35.3 | 0.0 | 32.4 | | | | 0.0 | 31.5 | 31.5 | 32.1 | 11.8 | 0.0 |
| Incr Delay (d2), s/veh | 4.5 | 0.0 | 0.4 | | | | 0.0 | 22.8 | 23.6 | 5.8 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.8 | 0.0 | 2.4 | | | | 0.0 | 10.9 | 10.6 | 9.6 | 4.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 39.8 | 0.0 | 32.8 | | | | 0.0 | 54.2 | 55.1 | 37.9 | 12.0 | 0.0 |
| LnGrp LOS | D | | C | | | | | D | E | D | B | |
| Approach Vol, veh/h | | 400 | | | | | | 811 | | | 1178 | |
| Approach Delay, s/veh | | 37.5 | | | | | | 54.7 | | | 21.3 | |
| Approach LOS | | D | | | | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 35.8 | 30.4 | | 23.8 | | 66.2 |
| Change Period (Y+Rc), s | 5.8 | * 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 19.0 | * 26 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 24.6 | 23.3 | | 16.0 | | 15.1 |
| Green Ext Time (p_c), s | 0.0 | 1.2 | | 0.9 | | 4.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 35.4 |
| HCM 7th LOS | | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 126 | 212 | 20 | 124 | 74 | 509 | 149 | 582 |
| Future Volume (vph) | 126 | 212 | 20 | 124 | 74 | 509 | 149 | 582 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.7 | 21.7 | 5.9 | 11.5 | 7.9 | 18.9 | 10.5 | 23.8 |
| Actuated g/C Ratio | 0.14 | 0.30 | 0.08 | 0.16 | 0.11 | 0.26 | 0.15 | 0.33 |
| v/c Ratio | 0.64 | 0.32 | 0.17 | 0.41 | 0.46 | 0.69 | 0.70 | 0.73 |
| Control Delay (s/veh) | 46.5 | 18.4 | 36.8 | 18.5 | 40.6 | 28.3 | 49.7 | 27.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 46.5 | 18.4 | 36.8 | 18.5 | 40.6 | 28.3 | 49.7 | 27.1 |
| LOS | D | B | D | B | D | C | D | C |
| Approach Delay (s/veh) | | 26.8 | | 20.0 | | 29.8 | | 30.9 |
| Approach LOS | | C | | C | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 71.7 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.73 | |
| Intersection Signal Delay (s/veh): 28.6 | Intersection LOS: C |
| Intersection Capacity Utilization 62.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

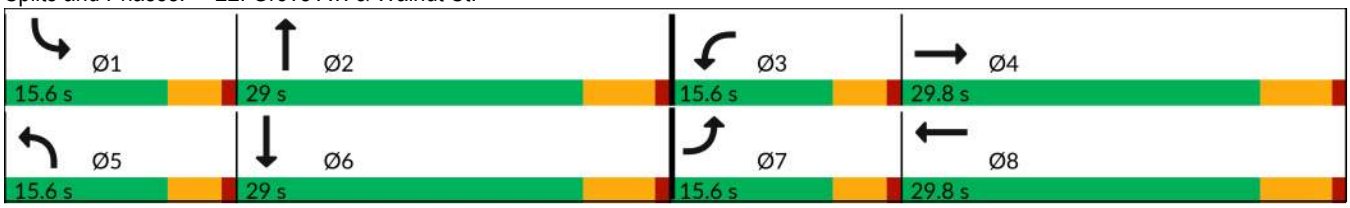

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 126 | 212 | 84 | 20 | 124 | 95 | 74 | 509 | 46 | 149 | 582 | 152 |
| Future Volume (veh/h) | 126 | 212 | 84 | 20 | 124 | 95 | 74 | 509 | 46 | 149 | 582 | 152 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 137 | 230 | 66 | 22 | 135 | 58 | 80 | 553 | 30 | 162 | 633 | 88 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 169 | 664 | 186 | 41 | 407 | 166 | 99 | 768 | 42 | 199 | 886 | 123 |
| Arrive On Green | 0.11 | 0.26 | 0.26 | 0.03 | 0.18 | 0.18 | 0.06 | 0.24 | 0.24 | 0.12 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1594 | 2591 | 725 | 1594 | 2319 | 947 | 1594 | 3247 | 176 | 1594 | 2963 | 411 |
| Grp Volume(v), veh/h | 137 | 147 | 149 | 22 | 96 | 97 | 80 | 286 | 297 | 162 | 359 | 362 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1633 | 1594 | 1683 | 1582 | 1594 | 1683 | 1739 | 1594 | 1683 | 1691 |
| Q Serve(g_s), s | 4.9 | 4.2 | 4.3 | 0.8 | 2.9 | 3.1 | 2.9 | 9.1 | 9.2 | 5.8 | 11.1 | 11.1 |
| Cycle Q Clear(g_c), s | 4.9 | 4.2 | 4.3 | 0.8 | 2.9 | 3.1 | 2.9 | 9.1 | 9.2 | 5.8 | 11.1 | 11.1 |
| Prop In Lane | 1.00 | | 0.44 | 1.00 | | 0.60 | 1.00 | | 0.10 | 1.00 | | 0.24 |
| Lane Grp Cap(c), veh/h | 169 | 431 | 418 | 41 | 295 | 278 | 99 | 398 | 411 | 199 | 503 | 506 |
| V/C Ratio(X) | 0.81 | 0.34 | 0.36 | 0.54 | 0.33 | 0.35 | 0.81 | 0.72 | 0.72 | 0.82 | 0.71 | 0.72 |
| Avail Cap(c_a), veh/h | 301 | 693 | 673 | 301 | 693 | 652 | 301 | 670 | 692 | 301 | 670 | 673 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.5 | 17.7 | 17.7 | 28.0 | 21.0 | 21.1 | 27.0 | 20.5 | 20.5 | 24.9 | 18.2 | 18.2 |
| Incr Delay (d2), s/veh | 3.5 | 0.5 | 0.5 | 4.0 | 0.6 | 0.7 | 5.7 | 2.4 | 2.4 | 5.7 | 2.4 | 2.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 1.4 | 1.4 | 0.3 | 1.0 | 1.1 | 1.1 | 3.3 | 3.4 | 2.3 | 4.0 | 4.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.9 | 18.1 | 18.2 | 32.1 | 21.6 | 21.9 | 32.6 | 22.9 | 22.9 | 30.5 | 20.6 | 20.6 |
| LnGrp LOS | C | B | B | C | C | C | C | C | C | C | C | C |
| Approach Vol, veh/h | | 433 | | | 215 | | | 663 | | | 883 | |
| Approach Delay, s/veh | | 21.6 | | | 22.8 | | | 24.1 | | | 22.4 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.9 | 19.6 | 6.1 | 20.7 | 8.2 | 23.2 | 10.8 | 16.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 7.8 | 11.2 | 2.8 | 6.3 | 4.9 | 13.1 | 6.9 | 5.1 |
| Green Ext Time (p_c), s | 0.1 | 2.5 | 0.0 | 1.4 | 0.0 | 3.0 | 0.1 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.8 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 102 | 548 | 22 | 451 | 24 | 371 | 100 | 359 | 115 |
| Future Volume (vph) | 102 | 548 | 22 | 451 | 24 | 371 | 100 | 359 | 115 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.9 | 29.1 | 6.1 | 22.6 | 6.2 | 21.8 | 8.8 | 28.3 | 28.3 |
| Actuated g/C Ratio | 0.11 | 0.37 | 0.08 | 0.29 | 0.08 | 0.28 | 0.11 | 0.36 | 0.36 |
| v/c Ratio | 0.59 | 0.90 | 0.19 | 0.61 | 0.20 | 0.85 | 0.58 | 0.58 | 0.19 |
| Control Delay (s/veh) | 50.4 | 46.7 | 41.8 | 28.7 | 41.9 | 48.0 | 50.0 | 27.4 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.4 | 46.7 | 41.8 | 28.7 | 41.9 | 48.0 | 50.0 | 27.4 | 3.3 |
| LOS | D | D | D | C | D | D | D | C | A |
| Approach Delay (s/veh) | | 47.2 | | 29.2 | | 47.6 | | 26.5 | |
| Approach LOS | | D | | C | | D | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 78.3 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.90 | |
| Intersection Signal Delay (s/veh): 37.4 | Intersection LOS: D |
| Intersection Capacity Utilization 82.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

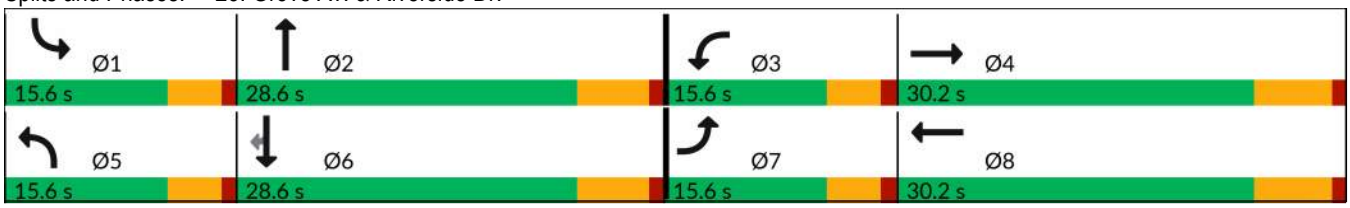

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 102 | 548 | 24 | 22 | 451 | 118 | 24 | 371 | 35 | 100 | 359 | 115 |
| Future Volume (veh/h) | 102 | 548 | 24 | 22 | 451 | 118 | 24 | 371 | 35 | 100 | 359 | 115 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 105 | 565 | 17 | 23 | 465 | 71 | 25 | 382 | 24 | 103 | 370 | 70 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 130 | 573 | 17 | 41 | 815 | 124 | 44 | 434 | 27 | 128 | 560 | 475 |
| Arrive On Green | 0.08 | 0.33 | 0.33 | 0.03 | 0.28 | 0.28 | 0.03 | 0.26 | 0.26 | 0.08 | 0.32 | 0.32 |
| Sat Flow, veh/h | 1594 | 1711 | 51 | 1594 | 2923 | 444 | 1594 | 1650 | 104 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 105 | 0 | 582 | 23 | 267 | 269 | 25 | 0 | 406 | 103 | 370 | 70 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1763 | 1594 | 1683 | 1683 | 1594 | 0 | 1753 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 4.6 | 0.0 | 23.5 | 1.0 | 9.7 | 9.8 | 1.1 | 0.0 | 15.9 | 4.6 | 12.9 | 2.4 |
| Cycle Q Clear(g_c), s | 4.6 | 0.0 | 23.5 | 1.0 | 9.7 | 9.8 | 1.1 | 0.0 | 15.9 | 4.6 | 12.9 | 2.4 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 0.26 | 1.00 | | 0.06 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 130 | 0 | 590 | 41 | 470 | 469 | 44 | 0 | 462 | 128 | 560 | 475 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.99 | 0.56 | 0.57 | 0.57 | 0.57 | 0.00 | 0.88 | 0.81 | 0.66 | 0.15 |
| Avail Cap(c_a), veh/h | 245 | 0 | 590 | 245 | 564 | 564 | 245 | 0 | 558 | 245 | 564 | 478 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.3 | 0.0 | 23.7 | 34.5 | 22.1 | 22.2 | 34.4 | 0.0 | 25.3 | 32.4 | 21.2 | 17.6 |
| Incr Delay (d2), s/veh | 4.4 | 0.0 | 33.3 | 4.5 | 1.1 | 1.1 | 4.4 | 0.0 | 13.1 | 4.5 | 2.8 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 0.0 | 13.7 | 0.4 | 3.5 | 3.5 | 0.5 | 0.0 | 7.5 | 1.8 | 5.1 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.7 | 0.0 | 56.9 | 39.0 | 23.2 | 23.3 | 38.8 | 0.0 | 38.4 | 36.9 | 24.0 | 17.7 |
| LnGrp LOS | D | | E | D | C | C | D | | D | D | C | B |
| Approach Vol, veh/h | | 687 | | | 559 | | | 431 | | | 543 | |
| Approach Delay, s/veh | | 53.8 | | | 23.9 | | | 38.4 | | | 25.6 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.3 | 24.7 | 6.4 | 30.2 | 6.6 | 28.4 | 10.5 | 26.2 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 17.9 | 3.0 | 25.5 | 3.1 | 14.9 | 6.6 | 11.8 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 2.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 36.4 |
| HCM 7th LOS | D |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 32 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 50 | 261 | 24 | 13 | 117 | 34 | 22 | 357 | 20 | 37 | 353 | 16 |
| Future Vol, veh/h | 50 | 261 | 24 | 13 | 117 | 34 | 22 | 357 | 20 | 37 | 353 | 16 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 52 | 272 | 25 | 14 | 122 | 35 | 23 | 372 | 21 | 39 | 368 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/ve | 28.6 | 16.4 | 35.8 | 37.4 |
| HCM LOS | D | C | E | E |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 6% | 15% | 8% | 9% |
| Vol Thru, % | 89% | 78% | 71% | 87% |
| Vol Right, % | 5% | 7% | 21% | 4% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 399 | 335 | 164 | 406 |
| LT Vol | 22 | 50 | 13 | 37 |
| Through Vol | 357 | 261 | 117 | 353 |
| RT Vol | 20 | 24 | 34 | 16 |
| Lane Flow Rate | 416 | 349 | 171 | 423 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.823 | 0.733 | 0.389 | 0.837 |
| Departure Headway (Hd) | 7.253 | 7.562 | 8.203 | 7.245 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 503 | 482 | 441 | 503 |
| Service Time | 5.253 | 5.562 | 6.225 | 5.245 |
| HCM Lane V/C Ratio | 0.827 | 0.724 | 0.388 | 0.841 |
| HCM Control Delay, s/veh | 35.8 | 28.6 | 16.4 | 37.4 |
| HCM Lane LOS | E | D | C | E |
| HCM 95th-tile Q | 8 | 6 | 1.8 | 8.4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 17.6 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 96 | 177 | 38 | 3 | 42 | 22 | 23 | 292 | 16 | 37 | 304 | 26 |
| Future Vol, veh/h | 96 | 177 | 38 | 3 | 42 | 22 | 23 | 292 | 16 | 37 | 304 | 26 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 102 | 188 | 40 | 3 | 45 | 23 | 24 | 311 | 17 | 39 | 323 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 17.5 | 11 | 17.3 | 19.2 |
| HCM LOS | C | B | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 7% | 31% | 4% | 10% |
| Vol Thru, % | 88% | 57% | 63% | 83% |
| Vol Right, % | 5% | 12% | 33% | 7% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 331 | 311 | 67 | 367 |
| LT Vol | 23 | 96 | 3 | 37 |
| Through Vol | 292 | 177 | 42 | 304 |
| RT Vol | 16 | 38 | 22 | 26 |
| Lane Flow Rate | 352 | 331 | 71 | 390 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.587 | 0.576 | 0.135 | 0.647 |
| Departure Headway (Hd) | 6.002 | 6.267 | 6.829 | 5.967 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 602 | 576 | 523 | 609 |
| Service Time | 4.047 | 4.314 | 4.897 | 3.967 |
| HCM Lane V/C Ratio | 0.585 | 0.575 | 0.136 | 0.64 |
| HCM Control Delay, s/veh | 17.3 | 17.5 | 11 | 19.2 |
| HCM Lane LOS | C | C | B | C |
| HCM 95th-tile Q | 3.8 | 3.6 | 0.5 | 4.7 |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 37 | 532 | 12 | 275 | 25 | 154 | 159 | 222 |
| Future Volume (vph) | 37 | 532 | 12 | 275 | 25 | 154 | 159 | 222 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 4.6 | | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 17.8 | | 17.8 | | 16.0 | | 16.0 |
| Actuated g/C Ratio | | 0.41 | | 0.41 | | 0.37 | | 0.37 |
| v/c Ratio | | 0.92 | | 0.59 | | 0.34 | | 0.81 |
| Control Delay (s/veh) | | 36.0 | | 13.4 | | 11.0 | | 27.3 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 36.0 | | 13.4 | | 11.0 | | 27.3 |
| LOS | | D | | B | | B | | C |
| Approach Delay (s/veh) | | 36.0 | | 13.4 | | 11.0 | | 27.3 |
| Approach LOS | | D | | B | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 45.2 | |
| Actuated Cycle Length: 43 | |
| Natural Cycle: 55 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.92 | |
| Intersection Signal Delay (s/veh): 25.1 | Intersection LOS: C |
| Intersection Capacity Utilization 92.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 37 | 532 | 17 | 12 | 275 | 99 | 25 | 154 | 13 | 159 | 222 | 17 |
| Future Volume (veh/h) | 37 | 532 | 17 | 12 | 275 | 99 | 25 | 154 | 13 | 159 | 222 | 17 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 40 | 578 | 18 | 13 | 299 | 108 | 27 | 167 | 14 | 173 | 241 | 18 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 123 | 680 | 20 | 105 | 522 | 183 | 142 | 507 | 39 | 311 | 323 | 22 |
| Arrive On Green | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| Sat Flow, veh/h | 55 | 1615 | 49 | 18 | 1240 | 435 | 105 | 1500 | 116 | 530 | 956 | 65 |
| Grp Volume(v), veh/h | 636 | 0 | 0 | 420 | 0 | 0 | 208 | 0 | 0 | 432 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1719 | 0 | 0 | 1693 | 0 | 0 | 1721 | 0 | 0 | 1551 | 0 | 0 |
| Q Serve(g_s), s | 5.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.1 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 12.9 | 0.0 | 0.0 | 7.3 | 0.0 | 0.0 | 3.4 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 |
| Prop In Lane | 0.06 | | 0.03 | 0.03 | | 0.26 | 0.13 | | 0.07 | 0.40 | | 0.04 |
| Lane Grp Cap(c), veh/h | 824 | 0 | 0 | 810 | 0 | 0 | 688 | 0 | 0 | 656 | 0 | 0 |
| V/C Ratio(X) | 0.77 | 0.00 | 0.00 | 0.52 | 0.00 | 0.00 | 0.30 | 0.00 | 0.00 | 0.66 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 908 | 0 | 0 | 893 | 0 | 0 | 906 | 0 | 0 | 854 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 10.1 | 0.0 | 0.0 | 8.5 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 11.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 3.8 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 2.2 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 13.8 | 0.0 | 0.0 | 9.0 | 0.0 | 0.0 | 9.7 | 0.0 | 0.0 | 12.5 | 0.0 | 0.0 |
| LnGrp LOS | B | | | A | | | A | | | B | | |
| Approach Vol, veh/h | | 636 | | | 420 | | | 208 | | | 432 | |
| Approach Delay, s/veh | | 13.8 | | | 9.0 | | | 9.7 | | | 12.5 | |
| Approach LOS | | B | | | A | | | A | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.5 | 20.7 | 17.5 | 20.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 18.0 | 18.0 | 18.0 | 18.0 |
| Max Q Clear Time (g_c+I1), s | 5.4 | 14.9 | 11.5 | 9.3 |
| Green Ext Time (p_c), s | 0.8 | 1.2 | 1.4 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 11.8 |
| HCM 7th LOS | B |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 13.2 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 10 | 181 | 2 | 1 | 71 | 197 | 1 | 15 | 1 | 306 | 12 | 6 |
| Future Vol, veh/h | 10 | 181 | 2 | 1 | 71 | 197 | 1 | 15 | 1 | 306 | 12 | 6 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 208 | 2 | 1 | 82 | 226 | 1 | 17 | 1 | 352 | 14 | 7 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 11.5 | 11.8 | 9.3 | 15.7 |
| HCM LOS | B | B | A | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 6% | 5% | 0% | 94% |
| Vol Thru, % | 88% | 94% | 26% | 4% |
| Vol Right, % | 6% | 1% | 73% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 17 | 193 | 269 | 324 |
| LT Vol | 1 | 10 | 1 | 306 |
| Through Vol | 15 | 181 | 71 | 12 |
| RT Vol | 1 | 2 | 197 | 6 |
| Lane Flow Rate | 20 | 222 | 309 | 372 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.033 | 0.342 | 0.43 | 0.572 |
| Departure Headway (Hd) | 6.011 | 5.545 | 5.001 | 5.532 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 593 | 648 | 717 | 652 |
| Service Time | 4.072 | 3.591 | 3.043 | 3.569 |
| HCM Lane V/C Ratio | 0.034 | 0.343 | 0.431 | 0.571 |
| HCM Control Delay, s/veh | 9.3 | 11.5 | 11.8 | 15.7 |
| HCM Lane LOS | A | B | B | C |
| HCM 95th-tile Q | 0.1 | 1.5 | 2.2 | 3.6 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.8 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 38 | 664 | 360 | 30 | 18 | 23 |
| Future Vol, veh/h | 38 | 664 | 360 | 30 | 18 | 23 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 722 | 391 | 33 | 20 | 25 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 424 | 0 | - | 0 | 1212 | 408 |
| Stage 1 | - | - | - | - | 408 | - |
| Stage 2 | - | - | - | - | 804 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1135 | - | - | - | 201 | 644 |
| Stage 1 | - | - | - | - | 672 | - |
| Stage 2 | - | - | - | - | 440 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1135 | - | - | - | 189 | 644 |
| Mov Cap-2 Maneuver | - | - | - | - | 319 | - |
| Stage 1 | - | - | - | - | 631 | - |
| Stage 2 | - | - | - | - | 440 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.45 | 0 | 14 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 97 | - | - | - | 445 |
| HCM Lane V/C Ratio | 0.036 | - | - | - | 0.1 |
| HCM Control Delay (s/veh) | 8.3 | 0 | - | - | 14 |
| HCM Lane LOS | A | A | - | - | B |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 0.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 31 | 594 | 58 | 70 | 537 | 28 | 41 | 29 | 113 | 8 | 11 | 13 |
| Future Vol, veh/h | 31 | 594 | 58 | 70 | 537 | 28 | 41 | 29 | 113 | 8 | 11 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 32 | 619 | 60 | 73 | 559 | 29 | 43 | 30 | 118 | 8 | 11 | 14 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 592 | 0 | 0 | 679 | 0 | 0 | 1145 | 1451 | 340 | 1112 | 1467 | 297 |
| Stage 1 | - | - | - | - | - | - | 714 | 714 | - | 723 | 723 | - |
| Stage 2 | - | - | - | - | - | - | 431 | 737 | - | 389 | 744 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 980 | - | - | 909 | - | - | 155 | 130 | 656 | 163 | 127 | 699 |
| Stage 1 | - | - | - | - | - | - | 389 | 433 | - | 384 | 429 | - |
| Stage 2 | - | - | - | - | - | - | 573 | 423 | - | 606 | 420 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 977 | - | - | 909 | - | - | 130 | 115 | 656 | 107 | 112 | 697 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 302 | 278 | - | 263 | 262 | - |
| Stage 1 | - | - | - | - | - | - | 376 | 419 | - | 352 | 394 | - |
| Stage 2 | - | - | - | - | - | - | 501 | 388 | - | 447 | 406 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.4 | 1.03 | 19.07 | 16.31 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 444 | 977 | - | - | 909 | - | - | 352 |
| HCM Lane V/C Ratio | 0.429 | 0.033 | - | - | 0.08 | - | - | 0.095 |
| HCM Control Delay (s/veh) | 19.1 | 8.8 | - | - | 9.3 | - | - | 16.3 |
| HCM Lane LOS | C | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 2.1 | 0.1 | - | - | 0.3 | - | - | 0.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.5 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 108 | 11 | 111 | 5 | 12 | 15 | 25 | 123 | 5 | 0 | 120 | 30 |
| Future Vol, veh/h | 108 | 11 | 111 | 5 | 12 | 15 | 25 | 123 | 5 | 0 | 120 | 30 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 121 | 12 | 125 | 6 | 13 | 17 | 28 | 138 | 6 | 0 | 135 | 34 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.9 | 8.1 | 9.4 | 9.1 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 16% | 47% | 16% | 0% |
| Vol Thru, % | 80% | 5% | 38% | 80% |
| Vol Right, % | 3% | 48% | 47% | 20% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 153 | 230 | 32 | 150 |
| LT Vol | 25 | 108 | 5 | 0 |
| Through Vol | 123 | 11 | 12 | 120 |
| RT Vol | 5 | 111 | 15 | 30 |
| Lane Flow Rate | 172 | 258 | 36 | 169 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.231 | 0.33 | 0.048 | 0.221 |
| Departure Headway (Hd) | 4.847 | 4.594 | 4.823 | 4.724 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 737 | 780 | 737 | 757 |
| Service Time | 2.901 | 2.639 | 2.888 | 2.777 |
| HCM Lane V/C Ratio | 0.233 | 0.331 | 0.049 | 0.223 |
| HCM Control Delay, s/veh | 9.4 | 9.9 | 8.1 | 9.1 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.9 | 1.4 | 0.2 | 0.8 |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 20 | 481 | 80 | 301 | 132 | 101 | 125 | 75 |
| Future Volume (vph) | 20 | 481 | 80 | 301 | 132 | 101 | 125 | 75 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 74.0 | 74.0 | 74.0 | 74.0 | 46.0 | 46.0 | 46.0 | 46.0 |
| Total Split (%) | 61.7% | 61.7% | 61.7% | 61.7% | 38.3% | 38.3% | 38.3% | 38.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 4.6 | | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 40.4 | | 40.4 | | 23.9 | | 23.9 |
| Actuated g/C Ratio | | 0.54 | | 0.54 | | 0.32 | | 0.32 |
| v/c Ratio | | 0.81 | | 0.58 | | 0.69 | | 0.59 |
| Control Delay (s/veh) | | 22.4 | | 15.6 | | 34.0 | | 31.8 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 22.4 | | 15.6 | | 34.0 | | 31.8 |
| LOS | | C | | B | | C | | C |
| Approach Delay (s/veh) | | 22.4 | | 15.6 | | 34.0 | | 31.8 |
| Approach LOS | | C | | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 74.8 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 23.9 | Intersection LOS: C |
| Intersection Capacity Utilization 88.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

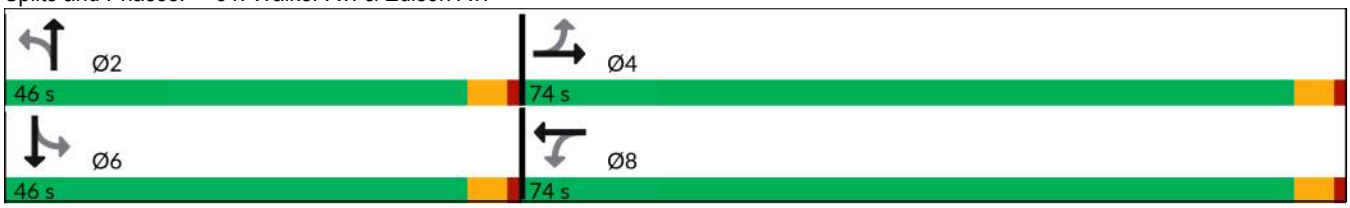

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 481 | 215 | 80 | 301 | 40 | 132 | 101 | 51 | 125 | 75 | 12 |
| Future Volume (veh/h) | 20 | 481 | 215 | 80 | 301 | 40 | 132 | 101 | 51 | 125 | 75 | 12 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 21 | 496 | 222 | 82 | 310 | 41 | 136 | 104 | 53 | 129 | 77 | 12 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 94 | 626 | 273 | 196 | 654 | 79 | 278 | 162 | 71 | 312 | 160 | 20 |
| Arrive On Green | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 |
| Sat Flow, veh/h | 18 | 1149 | 501 | 180 | 1200 | 144 | 644 | 662 | 288 | 740 | 653 | 81 |
| Grp Volume(v), veh/h | 739 | 0 | 0 | 433 | 0 | 0 | 293 | 0 | 0 | 218 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1669 | 0 | 0 | 1525 | 0 | 0 | 1594 | 0 | 0 | 1475 | 0 | 0 |
| Q Serve(g_s), s | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 15.7 | 0.0 | 0.0 | 6.6 | 0.0 | 0.0 | 7.1 | 0.0 | 0.0 | 5.5 | 0.0 | 0.0 |
| Prop In Lane | 0.03 | | 0.30 | 0.19 | | 0.09 | 0.46 | | 0.18 | 0.59 | | 0.06 |
| Lane Grp Cap(c), veh/h | 994 | 0 | 0 | 929 | 0 | 0 | 511 | 0 | 0 | 492 | 0 | 0 |
| V/C Ratio(X) | 0.74 | 0.00 | 0.00 | 0.47 | 0.00 | 0.00 | 0.57 | 0.00 | 0.00 | 0.44 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 2709 | 0 | 0 | 2363 | 0 | 0 | 1547 | 0 | 0 | 1468 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 8.1 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 | 15.1 | 0.0 | 0.0 | 14.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.2 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 2.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 9.2 | 0.0 | 0.0 | 6.4 | 0.0 | 0.0 | 16.1 | 0.0 | 0.0 | 15.1 | 0.0 | 0.0 |
| LnGrp LOS | A | | | A | | | B | | | B | | |
| Approach Vol, veh/h | | 739 | | | 433 | | | 293 | | | 218 | |
| Approach Delay, s/veh | | 9.2 | | | 6.4 | | | 16.1 | | | 15.1 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.3 | 28.5 | 15.3 | 28.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 41.4 | 69.4 | 41.4 | 69.4 |
| Max Q Clear Time (g_c+I1), s | 9.1 | 17.7 | 7.5 | 8.6 |
| Green Ext Time (p_c), s | 1.6 | 6.2 | 1.2 | 3.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 10.5 |
| HCM 7th LOS | B |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.9 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 15 | 341 | 229 | 95 | 84 | 13 |
| Future Vol, veh/h | 15 | 341 | 229 | 95 | 84 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 17 | 397 | 266 | 110 | 98 | 15 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 377 | 0 | - | 0 | 753 | 322 |
| Stage 1 | - | - | - | - | 322 | - |
| Stage 2 | - | - | - | - | 431 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1182 | - | - | - | 377 | 719 |
| Stage 1 | - | - | - | - | 735 | - |
| Stage 2 | - | - | - | - | 655 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1182 | - | - | - | 370 | 719 |
| Mov Cap-2 Maneuver | - | - | - | - | 481 | - |
| Stage 1 | - | - | - | - | 721 | - |
| Stage 2 | - | - | - | - | 655 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.34 | 0 | 14.2 |
| HCM LOS | | | B |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 76 | - | - | - | 504 |
| HCM Lane V/C Ratio | 0.015 | - | - | - | 0.224 |
| HCM Control Delay (s/veh) | 8.1 | 0 | - | - | 14.2 |
| HCM Lane LOS | A | A | - | - | B |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.9 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 360 | 9 | 168 | 465 | 516 | 1084 | 301 |
| Future Volume (vph) | 360 | 9 | 168 | 465 | 516 | 1084 | 301 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 26.0 | 26.0 | 26.0 | 22.0 | 64.0 | 42.0 | 42.0 |
| Total Split (%) | 28.9% | 28.9% | 28.9% | 24.4% | 71.1% | 46.7% | 46.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 16.9 | 16.9 | 16.9 | 18.9 | 61.5 | 37.6 | 37.6 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.19 | 0.21 | 0.68 | 0.42 | 0.42 |
| v/c Ratio | 0.74 | 0.71 | 0.41 | 0.82 | 0.17 | 0.46 | 0.40 |
| Control Delay (s/veh) | 50.1 | 46.9 | 8.3 | 44.0 | 0.5 | 20.3 | 3.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.1 | 46.9 | 8.3 | 44.0 | 0.5 | 20.3 | 3.9 |
| LOS | D | D | A | D | A | C | A |
| Approach Delay (s/veh) | | 37.2 | | | 21.1 | 16.8 | |
| Approach LOS | | D | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 71.6 (80%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 22.0 | Intersection LOS: C |
| Intersection Capacity Utilization 70.3% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

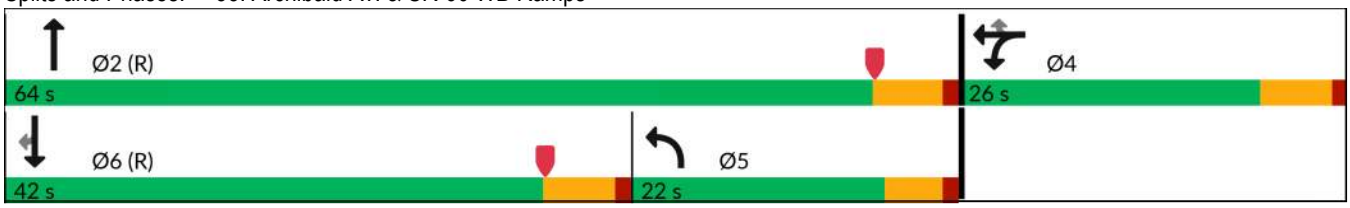

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 360 | 9 | 168 | 465 | 516 | 0 | 0 | 1084 | 301 |
| Future Volume (veh/h) | 0 | 0 | 0 | 360 | 9 | 168 | 465 | 516 | 0 | 0 | 1084 | 301 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1575 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 406 | 0 | 36 | 500 | 555 | 0 | 0 | 1166 | 201 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 497 | 0 | 234 | 1070 | 3460 | 0 | 0 | 1726 | 414 |
| Arrive On Green | | | | 0.16 | 0.00 | 0.16 | 0.12 | 0.24 | 0.00 | 0.00 | 0.28 | 0.28 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1502 | 2910 | 4997 | 0 | 0 | 6343 | 1464 |
| Grp Volume(v), veh/h | | | | 406 | 0 | 36 | 500 | 555 | 0 | 0 | 1166 | 201 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1502 | 1455 | 1612 | 0 | 0 | 1524 | 1464 |
| Q Serve(g_s), s | | | | 11.1 | 0.0 | 1.9 | 14.4 | 8.2 | 0.0 | 0.0 | 15.3 | 10.3 |
| Cycle Q Clear(g_c), s | | | | 11.1 | 0.0 | 1.9 | 14.4 | 8.2 | 0.0 | 0.0 | 15.3 | 10.3 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 497 | 0 | 234 | 1070 | 3460 | 0 | 0 | 1726 | 414 |
| V/C Ratio(X) | | | | 0.82 | 0.00 | 0.15 | 0.47 | 0.16 | 0.00 | 0.00 | 0.68 | 0.49 |
| Avail Cap(c_a), veh/h | | | | 715 | 0 | 337 | 1070 | 3460 | 0 | 0 | 2452 | 589 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.93 | 0.93 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 36.8 | 0.0 | 32.9 | 31.3 | 12.9 | 0.0 | 0.0 | 28.6 | 26.8 |
| Incr Delay (d2), s/veh | | | | 4.9 | 0.0 | 0.3 | 0.1 | 0.1 | 0.0 | 0.0 | 2.1 | 4.0 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.4 | 0.0 | 1.7 | 5.5 | 2.6 | 0.0 | 0.0 | 5.4 | 3.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 41.7 | 0.0 | 33.2 | 31.4 | 13.0 | 0.0 | 0.0 | 30.7 | 30.8 |
| LnGrp LOS | | | | D | | C | C | B | | | C | C |
| Approach Vol, veh/h | | | | | 442 | | | 1055 | | | 1367 | |
| Approach Delay, s/veh | | | | | 41.0 | | | 21.7 | | | 30.8 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 70.2 | | 19.8 | 38.9 | 31.3 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 58.2 | | 20.2 | 17.0 | * 36 |
| Max Q Clear Time (g_c+I1), s | 10.2 | | 13.1 | 16.4 | 17.3 |
| Green Ext Time (p_c), s | 3.8 | | 0.9 | 0.1 | 8.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.0 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 154 | 1 | 453 | 827 | 483 | 450 | 994 |
| Future Volume (vph) | 154 | 1 | 453 | 827 | 483 | 450 | 994 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 40.0 | 40.0 | 23.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 44.4% | 44.4% | 25.6% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 16.0 | 16.0 | 16.0 | 38.9 | 38.9 | 18.5 | 62.4 |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.43 | 0.43 | 0.21 | 0.69 |
| v/c Ratio | 0.56 | 0.75 | 0.74 | 0.34 | 0.56 | 0.82 | 0.32 |
| Control Delay (s/veh) | 40.8 | 32.1 | 31.2 | 18.8 | 4.7 | 58.8 | 2.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.8 | 32.1 | 31.2 | 18.8 | 4.7 | 58.8 | 2.2 |
| LOS | D | C | C | B | A | E | A |
| Approach Delay (s/veh) | | 33.7 | | 13.6 | | | 19.8 |
| Approach LOS | | C | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 71.6 (80%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 19.9 | Intersection LOS: B |
| Intersection Capacity Utilization 70.3% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

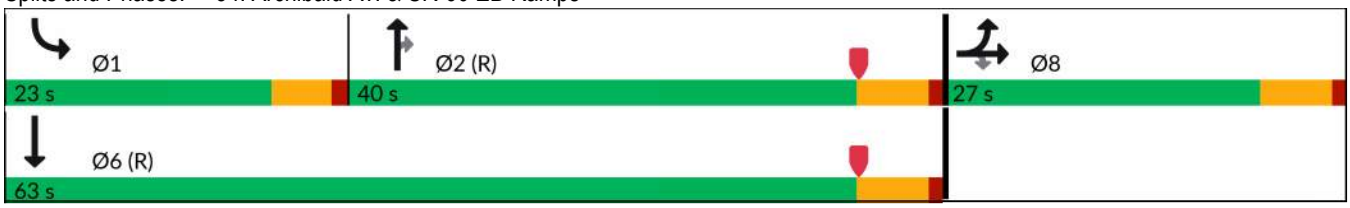

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 154 | 1 | 453 | 0 | 0 | 0 | 0 | 827 | 483 | 450 | 994 | 0 |
| Future Volume (veh/h) | 154 | 1 | 453 | 0 | 0 | 0 | 0 | 827 | 483 | 450 | 994 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1575 | 1772 | 0 |
| Adj Flow Rate, veh/h | 112 | 0 | 366 | | | | 0 | 899 | 412 | 489 | 1080 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 244 | 0 | 460 | | | | 0 | 2914 | 716 | 536 | 3473 | 0 |
| Arrive On Green | 0.15 | 0.00 | 0.15 | | | | 0.00 | 0.48 | 0.48 | 0.37 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 3003 | | | | 0 | 6343 | 1498 | 2910 | 4997 | 0 |
| Grp Volume(v), veh/h | 112 | 0 | 366 | | | | 0 | 899 | 412 | 489 | 1080 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1524 | 1498 | 1455 | 1612 | 0 |
| Q Serve(g_s), s | 5.8 | 0.0 | 10.6 | | | | 0.0 | 8.1 | 17.8 | 14.4 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 5.8 | 0.0 | 10.6 | | | | 0.0 | 8.1 | 17.8 | 14.4 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 244 | 0 | 460 | | | | 0 | 2914 | 716 | 536 | 3473 | 0 |
| V/C Ratio(X) | 0.46 | 0.00 | 0.80 | | | | 0.00 | 0.31 | 0.58 | 0.91 | 0.31 | 0.00 |
| Avail Cap(c_a), veh/h | 375 | 0 | 707 | | | | 0 | 2914 | 716 | 582 | 3473 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.86 | 0.86 | 0.00 |
| Uniform Delay (d), s/veh | 34.7 | 0.0 | 36.8 | | | | 0.0 | 14.4 | 16.9 | 27.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 3.6 | | | | 0.0 | 0.3 | 3.3 | 15.2 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 3.9 | | | | 0.0 | 2.5 | 5.9 | 4.7 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.1 | 0.0 | 40.3 | | | | 0.0 | 14.7 | 20.2 | 42.9 | 0.2 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | C | D | A | |
| Approach Vol, veh/h | | 478 | | | | | | 1311 | | | 1569 | |
| Approach Delay, s/veh | | 39.3 | | | | | | 16.4 | | | 13.5 | |
| Approach LOS | | D | | | | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.6 | 48.8 | | | | 70.4 | | 19.6 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 18.0 | 34.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 16.4 | 19.8 | | | | 2.0 | | 12.6 | | | | |
| Green Ext Time (p_c), s | 0.2 | 6.1 | | | | 8.5 | | 1.2 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 18.3 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 148 | 433 | 242 | 128 | 372 | 147 | 211 | 651 | 267 | 852 |
| Future Volume (vph) | 148 | 433 | 242 | 128 | 372 | 147 | 211 | 651 | 267 | 852 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.1 | 20.8 | 20.8 | 11.5 | 19.2 | 19.2 | 17.2 | 20.6 | 23.7 | 27.1 |
| Actuated g/C Ratio | 0.14 | 0.22 | 0.22 | 0.12 | 0.20 | 0.20 | 0.18 | 0.22 | 0.25 | 0.28 |
| v/c Ratio | 0.70 | 0.61 | 0.48 | 0.69 | 0.57 | 0.36 | 0.76 | 0.69 | 0.69 | 0.78 |
| Control Delay (s/veh) | 59.9 | 37.9 | 7.5 | 64.0 | 39.0 | 8.4 | 57.1 | 39.1 | 46.1 | 36.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 59.9 | 37.9 | 7.5 | 64.0 | 39.0 | 8.4 | 57.1 | 39.1 | 46.1 | 36.9 |
| LOS | E | D | A | E | D | A | E | D | D | D |
| Approach Delay (s/veh) | | 32.9 | | | 37.0 | | | 43.3 | | 38.8 |
| Approach LOS | | C | | | D | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 95.6 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 38.3 | Intersection LOS: D |
| Intersection Capacity Utilization 74.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

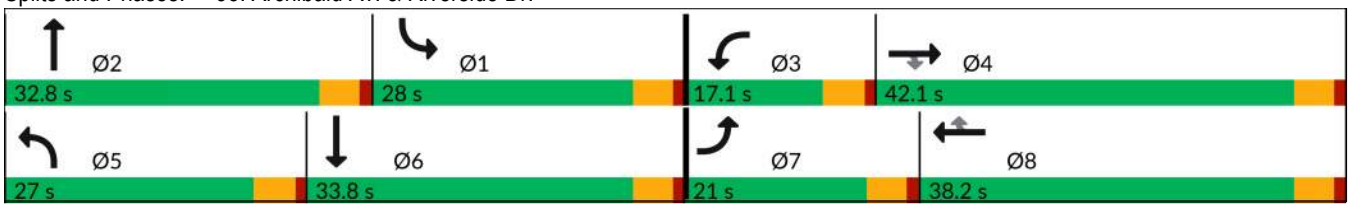

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 148 | 433 | 242 | 128 | 372 | 147 | 211 | 651 | 45 | 267 | 852 | 183 |
| Future Volume (veh/h) | 148 | 433 | 242 | 128 | 372 | 147 | 211 | 651 | 45 | 267 | 852 | 183 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 151 | 442 | 154 | 131 | 380 | 105 | 215 | 664 | 44 | 272 | 869 | 148 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 184 | 689 | 305 | 161 | 640 | 281 | 253 | 1004 | 66 | 367 | 1194 | 202 |
| Arrive On Green | 0.12 | 0.20 | 0.20 | 0.10 | 0.19 | 0.19 | 0.16 | 0.22 | 0.22 | 0.23 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1594 | 3367 | 1488 | 1594 | 3367 | 1478 | 1594 | 4634 | 305 | 1594 | 4152 | 703 |
| Grp Volume(v), veh/h | 151 | 442 | 154 | 131 | 380 | 105 | 215 | 461 | 247 | 272 | 674 | 343 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1488 | 1594 | 1683 | 1478 | 1594 | 1612 | 1714 | 1594 | 1612 | 1630 |
| Q Serve(g_s), s | 6.9 | 8.9 | 6.8 | 6.0 | 7.7 | 2.6 | 9.7 | 9.7 | 9.8 | 11.8 | 14.0 | 14.1 |
| Cycle Q Clear(g_c), s | 6.9 | 8.9 | 6.8 | 6.0 | 7.7 | 2.6 | 9.7 | 9.7 | 9.8 | 11.8 | 14.0 | 14.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.18 | 1.00 | | 0.43 |
| Lane Grp Cap(c), veh/h | 184 | 689 | 305 | 161 | 640 | 281 | 253 | 698 | 371 | 367 | 928 | 469 |
| V/C Ratio(X) | 0.82 | 0.64 | 0.51 | 0.81 | 0.59 | 0.37 | 0.85 | 0.66 | 0.67 | 0.74 | 0.73 | 0.73 |
| Avail Cap(c_a), veh/h | 352 | 1699 | 751 | 268 | 1523 | 668 | 481 | 1224 | 651 | 502 | 1268 | 641 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.1 | 27.0 | 26.2 | 32.7 | 27.5 | 8.3 | 30.4 | 26.6 | 26.6 | 26.6 | 23.8 | 23.9 |
| Incr Delay (d2), s/veh | 3.4 | 1.0 | 1.3 | 3.8 | 0.9 | 0.8 | 3.1 | 1.1 | 2.1 | 2.2 | 1.4 | 2.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 3.3 | 2.3 | 2.3 | 2.8 | 1.5 | 3.6 | 3.4 | 3.8 | 4.2 | 4.8 | 5.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.5 | 28.0 | 27.5 | 36.5 | 28.3 | 9.1 | 33.4 | 27.7 | 28.7 | 28.7 | 25.2 | 26.7 |
| LnGrp LOS | D | C | C | D | C | A | C | C | C | C | C | C |
| Approach Vol, veh/h | | 747 | | | 616 | | | 923 | | | 1289 | |
| Approach Delay, s/veh | | 29.4 | | | 26.8 | | | 29.3 | | | 26.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.7 | 20.7 | 12.1 | 19.8 | 16.4 | 26.0 | 13.2 | 18.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 13.8 | 11.8 | 8.0 | 10.9 | 11.7 | 16.1 | 8.9 | 9.7 |
| Green Ext Time (p_c), s | 0.3 | 3.6 | 0.1 | 3.1 | 0.2 | 5.0 | 0.1 | 2.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.8 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 91 | 154 | 17 | 68 | 81 | 39 | 720 | 130 | 981 |
| Future Volume (vph) | 91 | 154 | 17 | 68 | 81 | 39 | 720 | 130 | 981 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.8 | 20.1 | 5.7 | 10.2 | 10.2 | 8.1 | 19.0 | 18.4 | 35.6 |
| Actuated g/C Ratio | 0.14 | 0.27 | 0.08 | 0.13 | 0.13 | 0.11 | 0.25 | 0.24 | 0.47 |
| v/c Ratio | 0.42 | 0.50 | 0.15 | 0.30 | 0.23 | 0.24 | 0.58 | 0.35 | 0.66 |
| Control Delay (s/veh) | 41.9 | 29.1 | 46.6 | 38.5 | 1.5 | 42.5 | 29.0 | 30.1 | 21.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.9 | 29.1 | 46.6 | 38.5 | 1.5 | 42.5 | 29.0 | 30.1 | 21.3 |
| LOS | D | C | D | D | A | D | C | C | C |
| Approach Delay (s/veh) | | 32.9 | | 21.4 | | | 29.7 | | 22.3 |
| Approach LOS | | C | | C | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 75.8 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.66 | |
| Intersection Signal Delay (s/veh): 25.9 | Intersection LOS: C |
| Intersection Capacity Utilization 62.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 91 | 154 | 66 | 17 | 68 | 81 | 39 | 720 | 21 | 130 | 981 | 66 |
| Future Volume (veh/h) | 91 | 154 | 66 | 17 | 68 | 81 | 39 | 720 | 21 | 130 | 981 | 66 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 95 | 160 | 52 | 18 | 71 | 26 | 41 | 750 | 20 | 135 | 1022 | 55 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 120 | 219 | 71 | 35 | 210 | 178 | 68 | 1300 | 35 | 337 | 1402 | 75 |
| Arrive On Green | 0.08 | 0.17 | 0.17 | 0.02 | 0.12 | 0.12 | 0.04 | 0.25 | 0.25 | 0.21 | 0.42 | 0.42 |
| Sat Flow, veh/h | 1594 | 1280 | 416 | 1594 | 1772 | 1502 | 1594 | 5154 | 137 | 1594 | 3332 | 179 |
| Grp Volume(v), veh/h | 95 | 0 | 212 | 18 | 71 | 26 | 41 | 515 | 255 | 135 | 543 | 534 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1696 | 1594 | 1772 | 1502 | 1594 | 1772 | 1747 | 1594 | 1772 | 1740 |
| Q Serve(g_s), s | 3.1 | 0.0 | 6.3 | 0.6 | 2.0 | 0.5 | 1.4 | 6.8 | 6.8 | 3.9 | 13.7 | 13.7 |
| Cycle Q Clear(g_c), s | 3.1 | 0.0 | 6.3 | 0.6 | 2.0 | 0.5 | 1.4 | 6.8 | 6.8 | 3.9 | 13.7 | 13.7 |
| Prop In Lane | 1.00 | | 0.25 | 1.00 | | 1.00 | 1.00 | | 0.08 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 120 | 0 | 291 | 35 | 210 | 178 | 68 | 894 | 441 | 337 | 746 | 732 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.73 | 0.52 | 0.34 | 0.15 | 0.60 | 0.58 | 0.58 | 0.40 | 0.73 | 0.73 |
| Avail Cap(c_a), veh/h | 606 | 0 | 1246 | 155 | 800 | 678 | 428 | 2988 | 1473 | 351 | 1408 | 1382 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.4 | 0.0 | 21.0 | 25.9 | 21.7 | 6.8 | 25.2 | 17.5 | 17.6 | 18.2 | 13.0 | 13.0 |
| Incr Delay (d2), s/veh | 11.2 | 0.0 | 3.5 | 11.2 | 0.9 | 0.4 | 8.3 | 0.6 | 1.2 | 0.8 | 1.4 | 1.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 0.0 | 2.5 | 0.3 | 0.8 | 0.3 | 0.6 | 2.2 | 2.3 | 1.2 | 4.1 | 4.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.6 | 0.0 | 24.5 | 37.2 | 22.7 | 7.2 | 33.6 | 18.1 | 18.8 | 19.0 | 14.4 | 14.4 |
| LnGrp LOS | D | | C | D | C | A | C | B | B | B | B | B |
| Approach Vol, veh/h | | 307 | | | 115 | | | 811 | | | 1212 | |
| Approach Delay, s/veh | | 28.0 | | | 21.4 | | | 19.1 | | | 14.9 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.9 | 18.1 | 5.8 | 13.8 | 6.9 | 27.2 | 8.6 | 10.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 5.9 | 8.8 | 2.6 | 8.3 | 3.4 | 15.7 | 5.1 | 4.0 |
| Green Ext Time (p_c), s | 0.1 | 4.6 | 0.0 | 1.2 | 0.0 | 6.8 | 0.2 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 18.2 |
| HCM 7th LOS | B |

| Lane Group | WBL | WBT | NBL | NBT | SBL | SBT | Ø4 |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 2 | 705 | 138 | 913 | |
| Future Volume (vph) | 20 | 0 | 2 | 705 | 138 | 913 | |
| Turn Type | Split | NA | Prot | NA | Prot | NA | |
| Protected Phases | 8 | 8 | 5 | 2 | 1 | 6 | 4 |
| Permitted Phases | | | | | | | |
| Detector Phase | 8 | 8 | 5 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 |
| Minimum Split (s) | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 | 22.5 |
| Total Split (s) | 32.6 | 32.6 | 9.6 | 39.9 | 25.0 | 55.3 | 22.5 |
| Total Split (%) | 27.2% | 27.2% | 8.0% | 33.3% | 20.8% | 46.1% | 19% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | |
| Lead/Lag | | | Lead | Lag | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.4 | 10.4 | 7.1 | 21.0 | 11.1 | 33.2 | |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.16 | 0.48 | 0.25 | 0.76 | |
| v/c Ratio | 0.05 | 0.04 | 0.01 | 0.33 | 0.35 | 0.37 | |
| Control Delay (s/veh) | 19.7 | 0.1 | 31.0 | 13.1 | 23.8 | 7.0 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay (s/veh) | 19.7 | 0.1 | 31.0 | 13.1 | 23.8 | 7.0 | |
| LOS | B | A | C | B | C | A | |
| Approach Delay (s/veh) | | 7.2 | | 13.2 | | 9.3 | |
| Approach LOS | | A | | B | | A | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 43.9 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.37 | |
| Intersection Signal Delay (s/veh): 10.8 | Intersection LOS: B |
| Intersection Capacity Utilization 46.5% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 20 | 0 | 34 | 2 | 705 | 27 | 138 | 913 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 20 | 0 | 34 | 2 | 705 | 27 | 138 | 913 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 20 | 0 | 27 | 2 | 719 | 24 | 141 | 932 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 6 | 0 | 86 | 0 | 81 | 5 | 1788 | 60 | 183 | 1630 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.37 | 0.37 | 0.12 | 0.48 | 0.00 |
| Sat Flow, veh/h | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 4808 | 160 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 20 | 0 | 27 | 2 | 482 | 261 | 141 | 932 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 1612 | 1743 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.5 | 0.0 | 3.3 | 3.3 | 2.6 | 5.9 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.5 | 0.0 | 3.3 | 3.3 | 2.6 | 5.9 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 0.09 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 6 | 0 | 86 | 0 | 81 | 5 | 1199 | 648 | 183 | 1630 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.33 | 0.38 | 0.40 | 0.40 | 0.77 | 0.57 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 1055 | 0 | 1485 | 0 | 1399 | 265 | 3787 | 2047 | 1082 | 5678 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 13.6 | 0.0 | 13.7 | 15.0 | 7.0 | 7.0 | 12.9 | 5.5 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 2.4 | 39.0 | 0.2 | 0.4 | 2.6 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.2 | 0.1 | 0.4 | 0.4 | 0.7 | 0.3 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 0.0 | 15.0 | 0.0 | 16.1 | 54.0 | 7.2 | 7.4 | 15.5 | 5.8 | 0.0 |
| LnGrp LOS | | | | B | | B | D | A | A | B | A | |
| Approach Vol, veh/h | | 0 | | | 47 | | | 745 | | | 1073 | |
| Approach Delay, s/veh | | 0.0 | | | 15.6 | | | 7.4 | | | 7.1 | |
| Approach LOS | | | | | B | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.1 | 15.8 | | 0.0 | 4.7 | 19.2 | | 6.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 20.4 | 35.3 | | 17.9 | 5.0 | 50.7 | | 28.0 |
| Max Q Clear Time (g_c+I1), s | 4.6 | 5.3 | | 0.0 | 2.0 | 7.9 | | 2.5 |
| Green Ext Time (p_c), s | 0.1 | 4.3 | | 0.0 | 0.0 | 6.6 | | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 7.4 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 83 | 340 | 207 | 335 | 240 | 66 | 79 | 573 | 217 | 101 | 735 | 71 |
| Future Volume (vph) | 83 | 340 | 207 | 335 | 240 | 66 | 79 | 573 | 217 | 101 | 735 | 71 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.9 | 15.3 | 75.7 | 11.3 | 23.8 | 23.8 | 8.5 | 22.4 | 75.7 | 9.9 | 23.7 | 23.7 |
| Actuated g/C Ratio | 0.08 | 0.20 | 1.00 | 0.15 | 0.31 | 0.31 | 0.11 | 0.30 | 1.00 | 0.13 | 0.31 | 0.31 |
| v/c Ratio | 0.37 | 0.35 | 0.14 | 0.78 | 0.44 | 0.12 | 0.45 | 0.58 | 0.15 | 0.49 | 0.71 | 0.13 |
| Control Delay (s/veh) | 45.9 | 28.4 | 0.2 | 50.3 | 28.2 | 0.4 | 46.5 | 27.0 | 0.2 | 44.4 | 28.2 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.9 | 28.4 | 0.2 | 50.3 | 28.2 | 0.4 | 46.5 | 27.0 | 0.2 | 44.4 | 28.2 | 0.5 |
| LOS | D | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 21.4 | | | 36.9 | | | 22.1 | | | 27.8 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 75.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 26.8 | Intersection LOS: C |
| Intersection Capacity Utilization 61.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

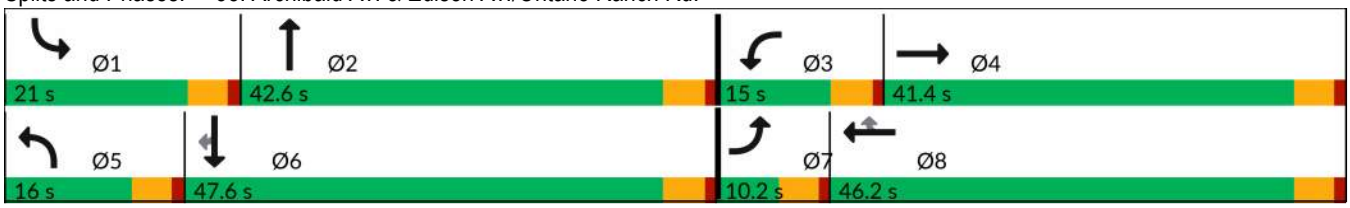

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 83 | 340 | 207 | 335 | 240 | 66 | 79 | 573 | 217 | 101 | 735 | 71 |
| Future Volume (veh/h) | 83 | 340 | 207 | 335 | 240 | 66 | 79 | 573 | 217 | 101 | 735 | 71 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 84 | 343 | 0 | 338 | 242 | 39 | 80 | 579 | 0 | 102 | 742 | 63 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 184 | 814 | | 429 | 448 | 379 | 98 | 989 | | 127 | 1049 | 468 |
| Arrive On Green | 0.06 | 0.17 | 0.00 | 0.15 | 0.25 | 0.25 | 0.06 | 0.29 | 0.00 | 0.08 | 0.31 | 0.31 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1500 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 84 | 343 | 0 | 338 | 242 | 39 | 80 | 579 | 0 | 102 | 742 | 63 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1500 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 1.6 | 3.8 | 0.0 | 6.6 | 7.0 | 1.2 | 2.9 | 8.7 | 0.0 | 3.7 | 11.5 | 1.8 |
| Cycle Q Clear(g_c), s | 1.6 | 3.8 | 0.0 | 6.6 | 7.0 | 1.2 | 2.9 | 8.7 | 0.0 | 3.7 | 11.5 | 1.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 184 | 814 | | 429 | 448 | 379 | 98 | 989 | | 127 | 1049 | 468 |
| V/C Ratio(X) | 0.46 | 0.42 | | 0.79 | 0.54 | 0.10 | 0.81 | 0.59 | | 0.80 | 0.71 | 0.13 |
| Avail Cap(c_a), veh/h | 275 | 3007 | | 511 | 1245 | 1054 | 307 | 2161 | | 442 | 2445 | 1091 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.7 | 22.0 | 0.0 | 24.3 | 19.2 | 17.0 | 27.4 | 17.8 | 0.0 | 26.8 | 18.0 | 14.6 |
| Incr Delay (d2), s/veh | 0.7 | 0.3 | 0.0 | 5.5 | 1.0 | 0.1 | 5.9 | 0.6 | 0.0 | 4.4 | 0.9 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 1.2 | 0.0 | 2.3 | 2.5 | 0.4 | 1.1 | 2.7 | 0.0 | 1.4 | 3.6 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.4 | 22.4 | 0.0 | 29.9 | 20.2 | 17.1 | 33.4 | 18.4 | 0.0 | 31.2 | 18.9 | 14.8 |
| LnGrp LOS | C | C | | C | C | B | C | B | | C | B | B |
| Approach Vol, veh/h | | 427 | | | 619 | | | 659 | | | 907 | |
| Approach Delay, s/veh | | 23.4 | | | 25.3 | | | 20.2 | | | 20.0 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.3 | 22.0 | 13.3 | 14.6 | 8.3 | 23.0 | 8.3 | 19.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 10.7 | 8.6 | 5.8 | 4.9 | 13.5 | 3.6 | 9.0 |
| Green Ext Time (p_c), s | 0.1 | 3.4 | 0.1 | 2.1 | 0.0 | 4.9 | 0.0 | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.8 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 280 | 140 | 82 | 170 | 52 | 82 | 485 | 79 | 77 | 726 | 128 |
| Future Volume (vph) | 184 | 280 | 140 | 82 | 170 | 52 | 82 | 485 | 79 | 77 | 726 | 128 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.0 | 20.3 | 72.4 | 9.6 | 15.5 | 15.5 | 5.9 | 21.4 | 21.4 | 7.6 | 23.0 | 23.0 |
| Actuated g/C Ratio | 0.15 | 0.28 | 1.00 | 0.13 | 0.21 | 0.21 | 0.08 | 0.30 | 0.30 | 0.10 | 0.32 | 0.32 |
| v/c Ratio | 0.43 | 0.30 | 0.10 | 0.41 | 0.24 | 0.13 | 0.36 | 0.33 | 0.15 | 0.26 | 0.68 | 0.24 |
| Control Delay (s/veh) | 35.4 | 24.1 | 0.1 | 42.0 | 25.8 | 0.6 | 43.6 | 22.6 | 1.2 | 39.4 | 27.0 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.4 | 24.1 | 0.1 | 42.0 | 25.8 | 0.6 | 43.6 | 22.6 | 1.2 | 39.4 | 27.0 | 5.7 |
| LOS | D | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 22.0 | | | 25.8 | | | 22.6 | | | 25.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 72.4 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.68 | |
| Intersection Signal Delay (s/veh): 23.8 | Intersection LOS: C |
| Intersection Capacity Utilization 59.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

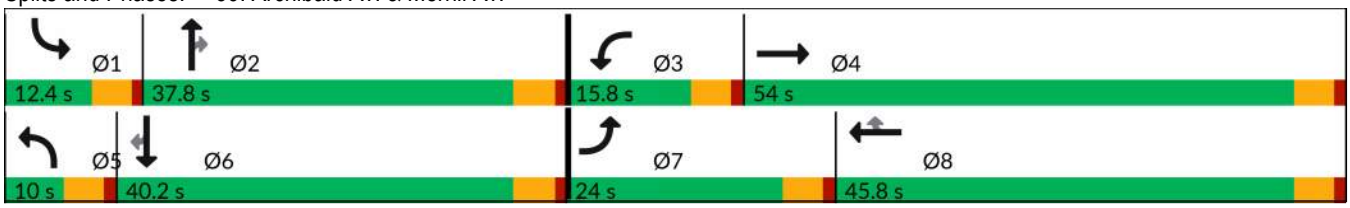

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 184 | 280 | 140 | 82 | 170 | 52 | 82 | 485 | 79 | 77 | 726 | 128 |
| Future Volume (veh/h) | 184 | 280 | 140 | 82 | 170 | 52 | 82 | 485 | 79 | 77 | 726 | 128 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 194 | 295 | 0 | 86 | 179 | 24 | 86 | 511 | 49 | 81 | 764 | 82 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 304 | 804 | | 106 | 681 | 282 | 198 | 1670 | 465 | 192 | 1106 | 469 |
| Arrive On Green | 0.10 | 0.23 | 0.00 | 0.07 | 0.19 | 0.19 | 0.07 | 0.31 | 0.31 | 0.06 | 0.31 | 0.31 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 3544 | 1470 | 3000 | 5316 | 1480 | 3000 | 3544 | 1502 |
| Grp Volume(v), veh/h | 194 | 295 | 0 | 86 | 179 | 24 | 86 | 511 | 49 | 81 | 764 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1470 | 1500 | 1772 | 1480 | 1500 | 1772 | 1502 |
| Q Serve(g_s), s | 3.5 | 3.9 | 0.0 | 3.0 | 2.4 | 0.8 | 1.5 | 4.1 | 1.3 | 1.5 | 10.6 | 2.2 |
| Cycle Q Clear(g_c), s | 3.5 | 3.9 | 0.0 | 3.0 | 2.4 | 0.8 | 1.5 | 4.1 | 1.3 | 1.5 | 10.6 | 2.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 304 | 804 | | 106 | 681 | 282 | 198 | 1670 | 465 | 192 | 1106 | 469 |
| V/C Ratio(X) | 0.64 | 0.37 | | 0.81 | 0.26 | 0.08 | 0.44 | 0.31 | 0.11 | 0.42 | 0.69 | 0.17 |
| Avail Cap(c_a), veh/h | 1039 | 3126 | | 319 | 2607 | 1082 | 289 | 3151 | 877 | 418 | 2253 | 955 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.2 | 18.3 | 0.0 | 25.8 | 19.2 | 18.6 | 25.2 | 14.6 | 13.6 | 25.2 | 16.9 | 14.0 |
| Incr Delay (d2), s/veh | 2.2 | 0.3 | 0.0 | 13.5 | 0.2 | 0.1 | 1.5 | 0.1 | 0.1 | 1.5 | 0.8 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 1.4 | 0.0 | 1.4 | 0.9 | 0.2 | 0.5 | 1.3 | 0.4 | 0.5 | 3.4 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.4 | 18.5 | 0.0 | 39.3 | 19.5 | 18.7 | 26.7 | 14.7 | 13.7 | 26.7 | 17.7 | 14.2 |
| LnGrp LOS | C | B | | D | B | B | C | B | B | C | B | B |
| Approach Vol, veh/h | | 489 | | | 289 | | | 646 | | | 927 | |
| Approach Delay, s/veh | | 21.7 | | | 25.3 | | | 16.2 | | | 18.1 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.2 | 22.2 | 8.3 | 17.3 | 8.3 | 22.1 | 10.3 | 15.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 3.5 | 6.1 | 5.0 | 5.9 | 3.5 | 12.6 | 5.5 | 4.4 |
| Green Ext Time (p_c), s | 0.1 | 3.2 | 0.1 | 1.8 | 0.0 | 4.9 | 0.5 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.2 |
| HCM 7th LOS | B |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 27 | 90 | 30 | 376 | 45 | 184 | 4 | 442 | 314 | 371 | 568 | 29 |
| Future Volume (vph) | 27 | 90 | 30 | 376 | 45 | 184 | 4 | 442 | 314 | 371 | 568 | 29 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.5 | 12.4 | 12.4 | 15.1 | 21.0 | 25.8 | 5.5 | 18.8 | 33.9 | 10.4 | 33.1 | 33.1 |
| Actuated g/C Ratio | 0.08 | 0.17 | 0.17 | 0.21 | 0.29 | 0.36 | 0.08 | 0.26 | 0.47 | 0.14 | 0.46 | 0.46 |
| v/c Ratio | 0.13 | 0.16 | 0.09 | 0.66 | 0.05 | 0.18 | 0.02 | 0.53 | 0.38 | 0.94 | 0.27 | 0.04 |
| Control Delay (s/veh) | 42.1 | 31.7 | 0.5 | 34.9 | 20.1 | 2.8 | 43.3 | 26.0 | 2.4 | 68.9 | 14.9 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.1 | 31.7 | 0.5 | 34.9 | 20.1 | 2.8 | 43.3 | 26.0 | 2.4 | 68.9 | 14.9 | 0.1 |
| LOS | D | C | A | C | C | A | D | C | A | E | B | A |
| Approach Delay (s/veh) | | 27.1 | | | 24.0 | | | 16.3 | | | 35.2 | |
| Approach LOS | | C | | | C | | | B | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 72.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay (s/veh): 26.2 | Intersection LOS: C |
| Intersection Capacity Utilization 57.8% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

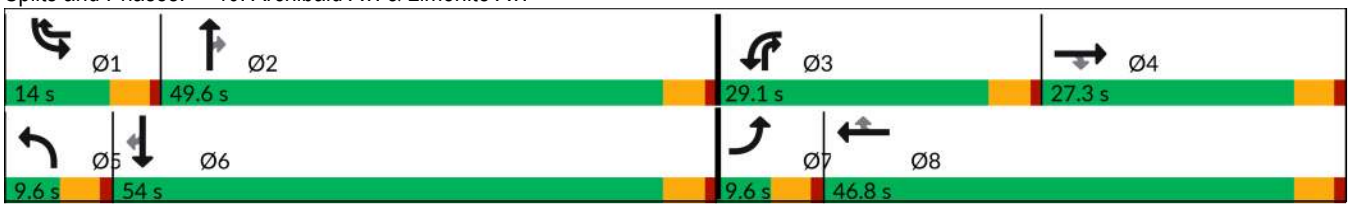

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 27 | 90 | 30 | 376 | 45 | 184 | 4 | 442 | 314 | 371 | 568 | 29 |
| Future Volume (veh/h) | 27 | 90 | 30 | 376 | 45 | 184 | 4 | 442 | 314 | 371 | 568 | 29 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 28 | 95 | 10 | 396 | 47 | 76 | 4 | 465 | 154 | 391 | 598 | 20 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 91 | 468 | 209 | 508 | 951 | 1165 | 16 | 726 | 581 | 463 | 1787 | 554 |
| Arrive On Green | 0.03 | 0.14 | 0.14 | 0.17 | 0.28 | 0.28 | 0.01 | 0.22 | 0.22 | 0.16 | 0.37 | 0.37 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 2910 | 3367 | 2634 | 2910 | 3367 | 1481 | 2910 | 4837 | 1500 |
| Grp Volume(v), veh/h | 28 | 95 | 10 | 396 | 47 | 76 | 4 | 465 | 154 | 391 | 598 | 20 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1455 | 1683 | 1317 | 1455 | 1683 | 1481 | 1455 | 1612 | 1500 |
| Q Serve(g_s), s | 0.6 | 1.5 | 0.3 | 7.7 | 0.6 | 1.0 | 0.1 | 7.4 | 4.2 | 7.7 | 5.3 | 0.5 |
| Cycle Q Clear(g_c), s | 0.6 | 1.5 | 0.3 | 7.7 | 0.6 | 1.0 | 0.1 | 7.4 | 4.2 | 7.7 | 5.3 | 0.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 91 | 468 | 209 | 508 | 951 | 1165 | 16 | 726 | 581 | 463 | 1787 | 554 |
| V/C Ratio(X) | 0.31 | 0.20 | 0.05 | 0.78 | 0.05 | 0.07 | 0.26 | 0.64 | 0.27 | 0.84 | 0.33 | 0.04 |
| Avail Cap(c_a), veh/h | 246 | 1295 | 577 | 1208 | 2407 | 2304 | 246 | 2566 | 1391 | 463 | 4048 | 1256 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.0 | 22.5 | 22.0 | 23.3 | 15.4 | 9.5 | 29.2 | 21.1 | 12.3 | 24.1 | 13.4 | 11.9 |
| Incr Delay (d2), s/veh | 0.7 | 0.2 | 0.1 | 1.0 | 0.0 | 0.0 | 3.1 | 1.0 | 0.2 | 12.7 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.5 | 0.1 | 2.4 | 0.2 | 0.2 | 0.0 | 2.5 | 1.1 | 3.0 | 1.5 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.7 | 22.7 | 22.1 | 24.3 | 15.4 | 9.5 | 32.4 | 22.0 | 12.5 | 36.8 | 13.5 | 11.9 |
| LnGrp LOS | C | C | C | C | B | A | C | C | B | D | B | B |
| Approach Vol, veh/h | | 133 | | | 519 | | | 623 | | | 1009 | |
| Approach Delay, s/veh | | 23.9 | | | 21.3 | | | 19.7 | | | 22.5 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 17.3 | 14.9 | 12.8 | 4.9 | 26.4 | 6.4 | 21.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 9.7 | 9.4 | 9.7 | 3.5 | 2.1 | 7.3 | 2.6 | 3.0 |
| Green Ext Time (p_c), s | 0.0 | 3.3 | 0.6 | 0.4 | 0.0 | 3.9 | 0.0 | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 32 | 588 | 26 | 53 | 622 | 44 | 13 | 20 | 76 | 33 |
| Future Volume (vph) | 32 | 588 | 26 | 53 | 622 | 44 | 13 | 20 | 76 | 33 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.8 | 23.1 | 23.1 | 9.6 | 25.7 | 25.7 | 8.4 | 10.9 | 10.4 | 16.1 |
| Actuated g/C Ratio | 0.17 | 0.45 | 0.45 | 0.19 | 0.51 | 0.51 | 0.17 | 0.21 | 0.20 | 0.32 |
| v/c Ratio | 0.12 | 0.39 | 0.04 | 0.19 | 0.37 | 0.06 | 0.05 | 0.19 | 0.25 | 0.12 |
| Control Delay (s/veh) | 31.2 | 17.6 | 0.1 | 29.6 | 15.0 | 0.1 | 31.8 | 13.9 | 28.8 | 12.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 31.2 | 17.6 | 0.1 | 29.6 | 15.0 | 0.1 | 31.8 | 13.9 | 28.8 | 12.3 |
| LOS | C | B | A | C | B | A | C | B | C | B |
| Approach Delay (s/veh) | | 17.6 | | | 15.2 | | | 16.8 | | 21.4 |
| Approach LOS | | B | | | B | | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 50.8 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.39 | |
| Intersection Signal Delay (s/veh): 16.8 | Intersection LOS: B |
| Intersection Capacity Utilization 45.2% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

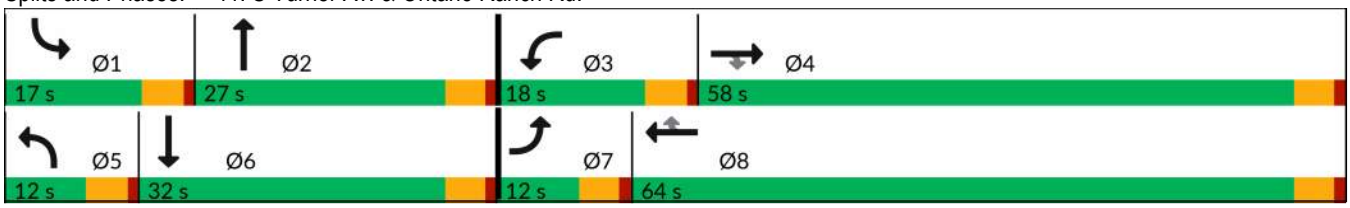

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 32 | 588 | 26 | 53 | 622 | 44 | 13 | 20 | 47 | 76 | 33 | 29 |
| Future Volume (veh/h) | 32 | 588 | 26 | 53 | 622 | 44 | 13 | 20 | 47 | 76 | 33 | 29 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 34 | 626 | 24 | 56 | 662 | 23 | 14 | 21 | 18 | 81 | 35 | 19 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 64 | 1129 | 478 | 94 | 1197 | 507 | 29 | 43 | 37 | 122 | 116 | 63 |
| Arrive On Green | 0.04 | 0.32 | 0.32 | 0.06 | 0.34 | 0.34 | 0.02 | 0.05 | 0.05 | 0.08 | 0.11 | 0.11 |
| Sat Flow, veh/h | 1594 | 3544 | 1502 | 1594 | 3544 | 1502 | 1594 | 872 | 748 | 1594 | 1080 | 586 |
| Grp Volume(v), veh/h | 34 | 626 | 24 | 56 | 662 | 23 | 14 | 0 | 39 | 81 | 0 | 54 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 1772 | 1502 | 1594 | 0 | 1620 | 1594 | 0 | 1666 |
| Q Serve(g_s), s | 0.8 | 5.4 | 0.4 | 1.3 | 5.6 | 0.4 | 0.3 | 0.0 | 0.9 | 1.8 | 0.0 | 1.1 |
| Cycle Q Clear(g_c), s | 0.8 | 5.4 | 0.4 | 1.3 | 5.6 | 0.4 | 0.3 | 0.0 | 0.9 | 1.8 | 0.0 | 1.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.46 | 1.00 | | 0.35 |
| Lane Grp Cap(c), veh/h | 64 | 1129 | 478 | 94 | 1197 | 507 | 29 | 0 | 80 | 122 | 0 | 179 |
| V/C Ratio(X) | 0.54 | 0.55 | 0.05 | 0.59 | 0.55 | 0.05 | 0.49 | 0.00 | 0.49 | 0.67 | 0.00 | 0.30 |
| Avail Cap(c_a), veh/h | 318 | 5109 | 2165 | 577 | 5683 | 2408 | 318 | 0 | 979 | 534 | 0 | 1233 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 17.4 | 10.4 | 8.7 | 17.0 | 10.0 | 8.2 | 18.0 | 0.0 | 17.2 | 16.6 | 0.0 | 15.2 |
| Incr Delay (d2), s/veh | 2.6 | 0.4 | 0.0 | 2.2 | 0.4 | 0.0 | 4.6 | 0.0 | 4.6 | 2.3 | 0.0 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 1.4 | 0.1 | 0.4 | 1.4 | 0.1 | 0.1 | 0.0 | 0.3 | 0.6 | 0.0 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 20.0 | 10.9 | 8.8 | 19.2 | 10.4 | 8.3 | 22.6 | 0.0 | 21.7 | 19.0 | 0.0 | 16.2 |
| LnGrp LOS | C | B | A | B | B | A | C | | C | B | | B |
| Approach Vol, veh/h | | 684 | | | 741 | | | 53 | | | 135 | |
| Approach Delay, s/veh | | 11.3 | | | 11.0 | | | 22.0 | | | 17.9 | |
| Approach LOS | | B | | | B | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.4 | 6.4 | 6.8 | 16.4 | 5.3 | 8.6 | 6.1 | 17.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 3.8 | 2.9 | 3.3 | 7.4 | 2.3 | 3.1 | 2.8 | 7.6 |
| Green Ext Time (p_c), s | 0.0 | 0.1 | 0.0 | 4.4 | 0.0 | 0.2 | 0.0 | 4.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 12.0 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 165 | 578 | 35 | 226 | 660 | 225 | 31 | 170 | 69 | 227 | 372 | 62 |
| Future Volume (vph) | 165 | 578 | 35 | 226 | 660 | 225 | 31 | 170 | 69 | 227 | 372 | 62 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.5 | 18.5 | 18.5 | 11.0 | 17.0 | 17.0 | 5.8 | 17.1 | 17.1 | 16.7 | 34.9 | 34.9 |
| Actuated g/C Ratio | 0.15 | 0.22 | 0.22 | 0.13 | 0.21 | 0.21 | 0.07 | 0.21 | 0.21 | 0.20 | 0.42 | 0.42 |
| v/c Ratio | 0.72 | 0.56 | 0.08 | 0.61 | 0.55 | 0.48 | 0.29 | 0.48 | 0.17 | 0.74 | 0.52 | 0.10 |
| Control Delay (s/veh) | 55.2 | 31.8 | 0.4 | 43.8 | 31.6 | 8.1 | 49.5 | 32.9 | 0.9 | 49.4 | 22.1 | 1.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.2 | 31.8 | 0.4 | 43.8 | 31.6 | 8.1 | 49.5 | 32.9 | 0.9 | 49.4 | 22.1 | 1.7 |
| LOS | E | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 35.4 | | | 29.3 | | | 26.6 | | | 29.5 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 82.4 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.74 | |
| Intersection Signal Delay (s/veh): 30.8 | Intersection LOS: C |
| Intersection Capacity Utilization 64.1% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 165 | 578 | 35 | 226 | 660 | 225 | 31 | 170 | 69 | 227 | 372 | 62 |
| Future Volume (veh/h) | 165 | 578 | 35 | 226 | 660 | 225 | 31 | 170 | 69 | 227 | 372 | 62 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 172 | 602 | 19 | 235 | 688 | 132 | 32 | 177 | 15 | 236 | 388 | 50 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 210 | 1135 | 350 | 326 | 1312 | 320 | 55 | 312 | 262 | 280 | 562 | 474 |
| Arrive On Green | 0.13 | 0.23 | 0.23 | 0.11 | 0.22 | 0.22 | 0.03 | 0.18 | 0.18 | 0.18 | 0.32 | 0.32 |
| Sat Flow, veh/h | 1594 | 4837 | 1492 | 2910 | 6095 | 1488 | 1594 | 1772 | 1491 | 1594 | 1772 | 1495 |
| Grp Volume(v), veh/h | 172 | 602 | 19 | 235 | 688 | 132 | 32 | 177 | 15 | 236 | 388 | 50 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1492 | 1455 | 1524 | 1488 | 1594 | 1772 | 1491 | 1594 | 1772 | 1495 |
| Q Serve(g_s), s | 6.4 | 6.6 | 0.6 | 4.8 | 6.1 | 4.7 | 1.2 | 5.6 | 0.5 | 8.7 | 11.7 | 1.4 |
| Cycle Q Clear(g_c), s | 6.4 | 6.6 | 0.6 | 4.8 | 6.1 | 4.7 | 1.2 | 5.6 | 0.5 | 8.7 | 11.7 | 1.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 210 | 1135 | 350 | 326 | 1312 | 320 | 55 | 312 | 262 | 280 | 562 | 474 |
| V/C Ratio(X) | 0.82 | 0.53 | 0.05 | 0.72 | 0.52 | 0.41 | 0.59 | 0.57 | 0.06 | 0.84 | 0.69 | 0.11 |
| Avail Cap(c_a), veh/h | 314 | 2311 | 713 | 611 | 2992 | 730 | 157 | 1268 | 1067 | 421 | 1562 | 1317 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.8 | 20.4 | 18.1 | 26.1 | 21.1 | 20.6 | 29.0 | 23.0 | 20.9 | 24.3 | 18.2 | 14.7 |
| Incr Delay (d2), s/veh | 6.1 | 0.4 | 0.1 | 1.1 | 0.3 | 0.8 | 3.7 | 1.6 | 0.1 | 6.1 | 1.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.5 | 2.1 | 0.2 | 1.5 | 1.8 | 1.4 | 0.5 | 2.2 | 0.2 | 3.4 | 4.2 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 31.9 | 20.8 | 18.1 | 27.3 | 21.5 | 21.4 | 32.6 | 24.6 | 21.0 | 30.4 | 19.7 | 14.8 |
| LnGrp LOS | C | C | B | C | C | C | C | C | C | C | B | B |
| Approach Vol, veh/h | | 793 | | | 1055 | | | 224 | | | 674 | |
| Approach Delay, s/veh | | 23.1 | | | 22.8 | | | 25.5 | | | 23.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.3 | 15.3 | 11.4 | 18.9 | 6.7 | 23.9 | 12.6 | 17.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 10.7 | 7.6 | 6.8 | 8.6 | 3.2 | 13.7 | 8.4 | 8.1 |
| Green Ext Time (p_c), s | 0.2 | 1.0 | 0.2 | 3.6 | 0.0 | 2.4 | 0.1 | 4.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 23.2 |
| HCM 7th LOS | C |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 96 | 554 | 226 | 340 | 781 | 142 | 349 | 305 | 261 | 171 | 358 | 85 |
| Future Volume (vph) | 96 | 554 | 226 | 340 | 781 | 142 | 349 | 305 | 261 | 171 | 358 | 85 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.8 | 23.1 | 23.1 | 8.9 | 28.0 | 28.0 | 7.9 | 18.3 | 18.3 | 6.8 | 17.3 | 17.3 |
| Actuated g/C Ratio | 0.09 | 0.30 | 0.30 | 0.12 | 0.36 | 0.36 | 0.10 | 0.24 | 0.24 | 0.09 | 0.23 | 0.23 |
| v/c Ratio | 0.39 | 0.40 | 0.39 | 1.07 | 0.67 | 0.24 | 1.24 | 0.28 | 0.52 | 0.70 | 0.50 | 0.22 |
| Control Delay (s/veh) | 44.0 | 22.1 | 5.2 | 104.5 | 25.4 | 4.9 | 166.5 | 24.8 | 9.4 | 54.6 | 28.7 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.0 | 22.1 | 5.2 | 104.5 | 25.4 | 4.9 | 166.5 | 24.8 | 9.4 | 54.6 | 28.7 | 6.3 |
| LOS | D | C | A | F | C | A | F | C | A | D | C | A |
| Approach Delay (s/veh) | | 20.2 | | | 44.4 | | | 74.4 | | | 32.8 | |
| Approach LOS | | C | | | D | | | E | | | C | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 76.8
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.24
Intersection Signal Delay (s/veh): 44.2 — Intersection LOS: D
Intersection Capacity Utilization 65.3% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

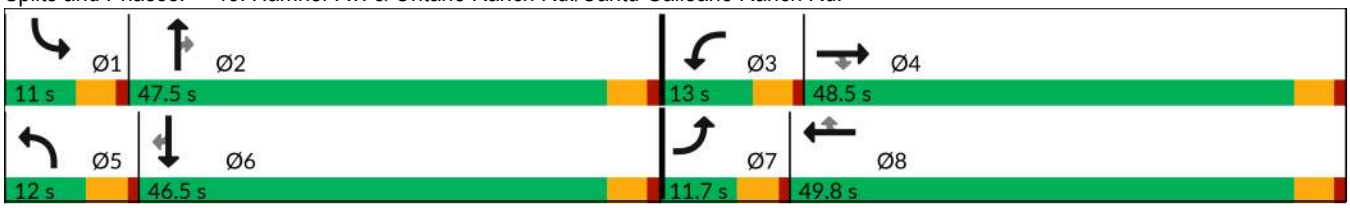

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 96 | 554 | 226 | 340 | 781 | 142 | 349 | 305 | 261 | 171 | 358 | 85 |
| Future Volume (veh/h) | 96 | 554 | 226 | 340 | 781 | 142 | 349 | 305 | 261 | 171 | 358 | 85 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 101 | 583 | 141 | 358 | 822 | 56 | 367 | 321 | 87 | 180 | 377 | 77 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 193 | 1315 | 408 | 394 | 1148 | 511 | 347 | 1003 | 305 | 258 | 594 | 261 |
| Arrive On Green | 0.07 | 0.27 | 0.27 | 0.14 | 0.34 | 0.34 | 0.12 | 0.21 | 0.21 | 0.09 | 0.18 | 0.18 |
| Sat Flow, veh/h | 2910 | 4837 | 1500 | 2910 | 3367 | 1499 | 2910 | 4837 | 1469 | 2910 | 3367 | 1480 |
| Grp Volume(v), veh/h | 101 | 583 | 141 | 358 | 822 | 56 | 367 | 321 | 87 | 180 | 377 | 77 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1500 | 1455 | 1683 | 1499 | 1455 | 1612 | 1469 | 1455 | 1683 | 1480 |
| Q Serve(g_s), s | 2.1 | 6.2 | 4.7 | 7.5 | 13.2 | 1.6 | 7.4 | 3.5 | 3.1 | 3.7 | 6.4 | 2.8 |
| Cycle Q Clear(g_c), s | 2.1 | 6.2 | 4.7 | 7.5 | 13.2 | 1.6 | 7.4 | 3.5 | 3.1 | 3.7 | 6.4 | 2.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 193 | 1315 | 408 | 394 | 1148 | 511 | 347 | 1003 | 305 | 258 | 594 | 261 |
| V/C Ratio(X) | 0.52 | 0.44 | 0.35 | 0.91 | 0.72 | 0.11 | 1.06 | 0.32 | 0.29 | 0.70 | 0.63 | 0.29 |
| Avail Cap(c_a), veh/h | 333 | 3425 | 1062 | 394 | 2455 | 1093 | 347 | 3347 | 1017 | 300 | 2275 | 1000 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.0 | 18.7 | 18.1 | 26.4 | 17.8 | 14.0 | 27.3 | 20.9 | 20.7 | 27.5 | 23.7 | 22.2 |
| Incr Delay (d2), s/veh | 0.8 | 0.2 | 0.5 | 23.8 | 0.8 | 0.1 | 64.0 | 0.2 | 0.5 | 4.1 | 1.1 | 0.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 1.9 | 1.4 | 3.5 | 4.1 | 0.4 | 5.3 | 1.1 | 0.9 | 1.3 | 2.3 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.8 | 18.9 | 18.6 | 50.2 | 18.7 | 14.1 | 91.3 | 21.0 | 21.2 | 31.6 | 24.8 | 22.8 |
| LnGrp LOS | C | B | B | D | B | B | F | C | C | C | C | C |
| Approach Vol, veh/h | | 825 | | | 1236 | | | 775 | | | 634 | |
| Approach Delay, s/veh | | 20.1 | | | 27.6 | | | 54.3 | | | 26.5 | |
| Approach LOS | | C | | | C | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.1 | 17.5 | 13.0 | 21.5 | 12.0 | 15.5 | 8.7 | 25.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 5.5 | 9.5 | 8.2 | 9.4 | 8.4 | 4.1 | 15.2 |
| Green Ext Time (p_c), s | 0.0 | 2.3 | 0.0 | 4.2 | 0.0 | 2.5 | 0.0 | 5.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 31.6 |
| HCM 7th LOS | C |

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 925 | 26 | 669 | 150 | 245 | 0 | 1217 |
| Future Volume (vph) | 925 | 26 | 669 | 150 | 245 | 0 | 1217 |
| Turn Type | NA | Perm | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | | 6 | | | 4 | |
| Permitted Phases | | 2 | | Free | 4 | | 4 |
| Detector Phase | 2 | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | C-Min | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 45.9 | 45.9 | 45.9 | 120.0 | 63.0 | 63.0 | 63.0 |
| Actuated g/C Ratio | 0.38 | 0.38 | 0.38 | 1.00 | 0.53 | 0.53 | 0.53 |
| v/c Ratio | 0.51 | 0.05 | 0.55 | 0.06 | 0.30 | 0.84 | 0.85 |
| Control Delay (s/veh) | 30.7 | 9.8 | 40.1 | 0.0 | 16.0 | 32.0 | 32.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.7 | 9.8 | 40.1 | 0.0 | 16.0 | 32.0 | 32.5 |
| LOS | C | A | D | A | B | C | C |
| Approach Delay (s/veh) | 30.2 | | 32.7 | | | 29.8 | |
| Approach LOS | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 8.1 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 30.6 | Intersection LOS: C |
| Intersection Capacity Utilization 81.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

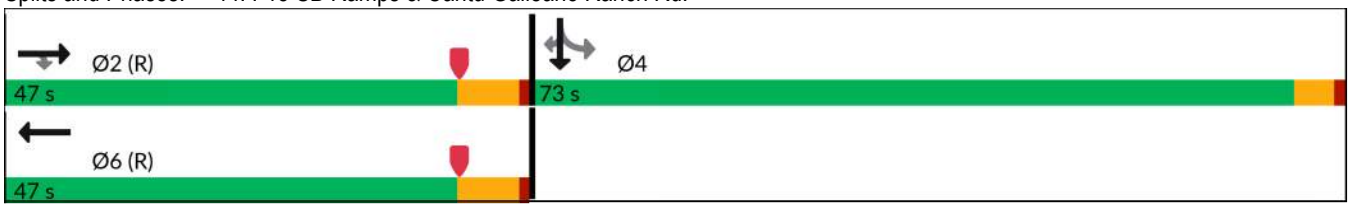

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 925 | 26 | 0 | 669 | 150 | 0 | 0 | 0 | 245 | 0 | 1217 |
| Future Volume (veh/h) | 0 | 925 | 26 | 0 | 669 | 150 | 0 | 0 | 0 | 245 | 0 | 1217 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 0 | 1772 | 1772 | | | | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 1028 | 0 | 0 | 743 | 0 | | | | 181 | 0 | 1230 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2426 | | 0 | 1618 | | | | | 719 | 0 | 1355 |
| Arrive On Green | 0.00 | 0.46 | 0.00 | 0.00 | 0.91 | 0.00 | | | | 0.45 | 0.00 | 0.45 |
| Sat Flow, veh/h | 0 | 5316 | 1502 | 0 | 3544 | 2643 | | | | 1594 | 0 | 3003 |
| Grp Volume(v), veh/h | 0 | 1028 | 0 | 0 | 743 | 0 | | | | 181 | 0 | 1230 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 1502 | 0 | 1772 | 1321 | | | | 1594 | 0 | 1502 |
| Q Serve(g_s), s | 0.0 | 15.6 | 0.0 | 0.0 | 3.8 | 0.0 | | | | 8.4 | 0.0 | 45.7 |
| Cycle Q Clear(g_c), s | 0.0 | 15.6 | 0.0 | 0.0 | 3.8 | 0.0 | | | | 8.4 | 0.0 | 45.7 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2426 | | 0 | 1618 | | | | | 719 | 0 | 1355 |
| V/C Ratio(X) | 0.00 | 0.42 | | 0.00 | 0.46 | | | | | 0.25 | 0.00 | 0.91 |
| Avail Cap(c_a), veh/h | 0 | 2426 | | 0 | 1618 | | | | | 908 | 0 | 1712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.87 | 0.00 | 0.00 | 0.88 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 22.0 | 0.0 | 0.0 | 3.0 | 0.0 | | | | 20.4 | 0.0 | 30.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.5 | 0.0 | 0.0 | 0.8 | 0.0 | | | | 0.2 | 0.0 | 6.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 6.1 | 0.0 | 0.0 | 1.1 | 0.0 | | | | 3.0 | 0.0 | 16.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 22.5 | 0.0 | 0.0 | 3.8 | 0.0 | | | | 20.6 | 0.0 | 37.0 |
| LnGrp LOS | | C | | | A | | | | | C | | D |
| Approach Vol, veh/h | | 1028 | | | 743 | | | | | | 1411 | |
| Approach Delay, s/veh | | 22.5 | | | 3.8 | | | | | | 34.9 | |
| Approach LOS | | C | | | A | | | | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 61.3 | 58.7 | 61.3 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 17.6 | 47.7 | 5.8 |
| Green Ext Time (p_c), s | 6.5 | 6.4 | 4.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 23.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 555 | 615 | 146 | 351 | 426 | 124 |
| Future Volume (vph) | 555 | 615 | 146 | 351 | 426 | 124 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 69.2 | 69.2 | 11.7 | 85.5 | 23.4 | 23.4 |
| Actuated g/C Ratio | 0.58 | 0.58 | 0.10 | 0.71 | 0.20 | 0.20 |
| v/c Ratio | 0.20 | 0.59 | 0.55 | 0.10 | 0.77 | 0.31 |
| Control Delay (s/veh) | 20.1 | 21.4 | 58.4 | 5.8 | 54.1 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.1 | 21.4 | 58.4 | 5.8 | 54.1 | 8.7 |
| LOS | C | C | E | A | D | A |
| Approach Delay (s/veh) | 20.8 | | | 21.3 | 44.9 | |
| Approach LOS | C | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 15.4 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.77 | |
| Intersection Signal Delay (s/veh): 26.9 | Intersection LOS: C |
| Intersection Capacity Utilization 54.4% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

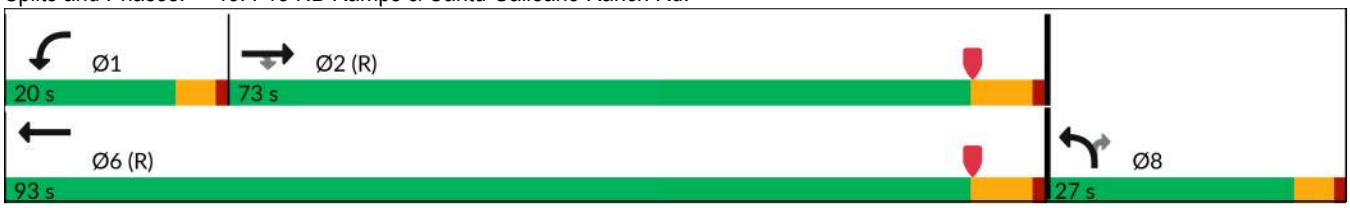

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 555 | 615 | 146 | 351 | 426 | 124 |
| Future Volume (veh/h) | 555 | 615 | 146 | 351 | 426 | 124 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 0.98 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1575 | 1772 | 1673 | 1772 |
| Adj Flow Rate, veh/h | 603 | 427 | 159 | 382 | 463 | 75 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3372 | 933 | 211 | 3950 | 524 | 247 |
| Arrive On Green | 1.00 | 1.00 | 0.07 | 0.74 | 0.16 | 0.16 |
| Sat Flow, veh/h | 5316 | 1471 | 3000 | 5316 | 3188 | 1502 |
| Grp Volume(v), veh/h | 603 | 427 | 159 | 382 | 463 | 75 |
| Grp Sat Flow(s),veh/h/ln | 1772 | 1471 | 1500 | 1772 | 1594 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 6.2 | 2.4 | 17.0 | 5.3 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 6.2 | 2.4 | 17.0 | 5.3 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3372 | 933 | 211 | 3950 | 524 | 247 |
| V/C Ratio(X) | 0.18 | 0.46 | 0.75 | 0.10 | 0.88 | 0.30 |
| Avail Cap(c_a), veh/h | 3372 | 933 | 385 | 3950 | 595 | 280 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.88 | 0.88 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 54.8 | 4.3 | 49.0 | 44.1 |
| Incr Delay (d2), s/veh | 0.1 | 1.4 | 5.4 | 0.0 | 13.5 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.4 | 2.4 | 0.6 | 7.6 | 2.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.1 | 1.4 | 60.1 | 4.3 | 62.5 | 44.8 |
| LnGrp LOS | A | A | E | A | E | D |
| Approach Vol, veh/h | 1030 | | | 541 | 538 | |
| Approach Delay, s/veh | 0.7 | | | 20.7 | 60.0 | |
| Approach LOS | A | | | C | E | |

| Timer - Assigned Phs | 1 | 2 | | | 6 | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.0 | 82.6 | | | 95.7 | 24.3 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 2.0 | | | 4.4 | 19.0 |
| Green Ext Time (p_c), s | 0.2 | 5.8 | | | 2.4 | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.9 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

# APPENDIX 5.2:

# E+P (BUILDOUT) INTERSECTION ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 310 | 1 | 434 | 364 | 717 | 772 | 458 |
| Future Volume (vph) | 310 | 1 | 434 | 364 | 717 | 772 | 458 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 27.0 | 61.0 | 34.0 | 34.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 30.0% | 67.8% | 37.8% | 37.8% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 20.8 | 20.8 | 20.8 | 23.3 | 56.2 | 27.7 | 27.7 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.26 | 0.62 | 0.31 | 0.31 |
| v/c Ratio | 0.81 | 0.55 | 0.53 | 0.96 | 0.37 | 0.80 | 0.62 |
| Control Delay (s/veh) | 51.4 | 12.6 | 11.7 | 71.8 | 10.4 | 35.7 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.4 | 12.6 | 11.7 | 71.8 | 10.4 | 35.7 | 6.3 |
| LOS | D | B | B | E | B | D | A |
| Approach Delay (s/veh) | | 25.9 | | | 31.1 | 24.8 | |
| Approach LOS | | C | | | C | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 58.8 (65%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.96 | |
| Intersection Signal Delay (s/veh): 27.3 | Intersection LOS: C |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

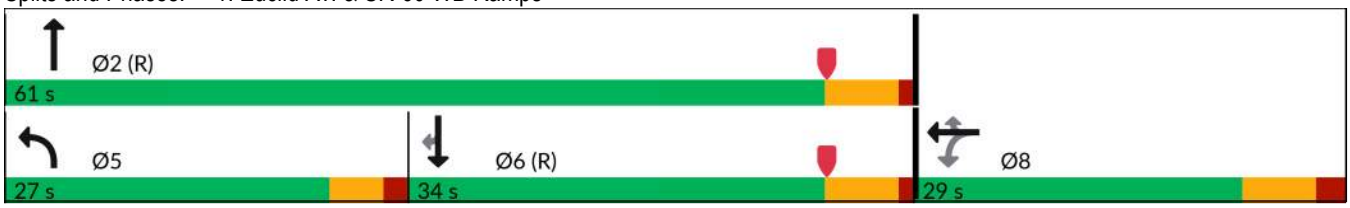

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 310 | 1 | 434 | 364 | 717 | 0 | 0 | 772 | 458 |
| Future Volume (veh/h) | 0 | 0 | 0 | 310 | 1 | 434 | 364 | 717 | 0 | 0 | 772 | 458 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 418 | 0 | 181 | 391 | 771 | 0 | 0 | 830 | 264 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 549 | 0 | 258 | 386 | 2300 | 0 | 0 | 1290 | 563 |
| Arrive On Green | | | | 0.17 | 0.00 | 0.17 | 0.48 | 1.00 | 0.00 | 0.00 | 0.38 | 0.38 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1496 | 1594 | 3455 | 0 | 0 | 3455 | 1469 |
| Grp Volume(v), veh/h | | | | 418 | 0 | 181 | 391 | 771 | 0 | 0 | 830 | 264 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1496 | 1594 | 1683 | 0 | 0 | 1683 | 1469 |
| Q Serve(g_s), s | | | | 11.2 | 0.0 | 10.3 | 21.8 | 0.0 | 0.0 | 0.0 | 18.2 | 12.2 |
| Cycle Q Clear(g_c), s | | | | 11.2 | 0.0 | 10.3 | 21.8 | 0.0 | 0.0 | 0.0 | 18.2 | 12.2 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 549 | 0 | 258 | 386 | 2300 | 0 | 0 | 1290 | 563 |
| V/C Ratio(X) | | | | 0.76 | 0.00 | 0.70 | 1.01 | 0.34 | 0.00 | 0.00 | 0.64 | 0.47 |
| Avail Cap(c_a), veh/h | | | | 779 | 0 | 366 | 386 | 2300 | 0 | 0 | 1290 | 563 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.51 | 0.51 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.5 | 0.0 | 35.1 | 23.2 | 0.0 | 0.0 | 0.0 | 22.7 | 20.9 |
| Incr Delay (d2), s/veh | | | | 3.6 | 0.0 | 4.9 | 35.9 | 0.2 | 0.0 | 0.0 | 2.5 | 2.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.6 | 0.0 | 4.0 | 8.7 | 0.1 | 0.0 | 0.0 | 7.0 | 4.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.1 | 0.0 | 40.0 | 59.1 | 0.2 | 0.0 | 0.0 | 25.2 | 23.7 |
| LnGrp LOS | | | | D | | D | F | A | | | C | C |
| Approach Vol, veh/h | | | | | 599 | | | 1162 | | | 1094 | |
| Approach Delay, s/veh | | | | | 39.4 | | | 20.0 | | | 24.8 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.5 | 27.0 | 40.5 | 22.5 |
| Change Period (Y+Rc), s | 6.0 | 5.2 | 6.0 | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | 21.8 | 28.0 | 22.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 23.8 | 20.2 | 13.2 |
| Green Ext Time (p_c), s | 8.6 | 0.0 | 4.7 | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.9 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 308 | 1 | 278 | 772 | 390 | 338 | 744 |
| Future Volume (vph) | 308 | 1 | 278 | 772 | 390 | 338 | 744 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 27.7 | 27.7 | 27.7 | 26.0 | 26.0 | 14.7 | 24.0 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 60.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 66.7% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | | 7.0 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 21.6 | 0.0 | 21.6 | 27.7 | 27.7 | 23.0 | 55.4 |
| Actuated g/C Ratio | 0.24 | 0.00 | 0.24 | 0.31 | 0.31 | 0.26 | 0.62 |
| v/c Ratio | 0.84 | no cap | 0.56 | 0.77 | 0.55 | 0.86 | 0.37 |
| Control Delay (s/veh) | 52.7 | | 14.0 | 36.0 | 6.2 | 59.8 | 8.9 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.7 | Error | 14.0 | 36.0 | 6.2 | 59.8 | 8.9 |
| LOS | D | F | B | D | A | E | A |
| Approach Delay (s/veh) | | Error | | 26.0 | | | 24.8 |
| Approach LOS | | F | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 58.6 (65%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

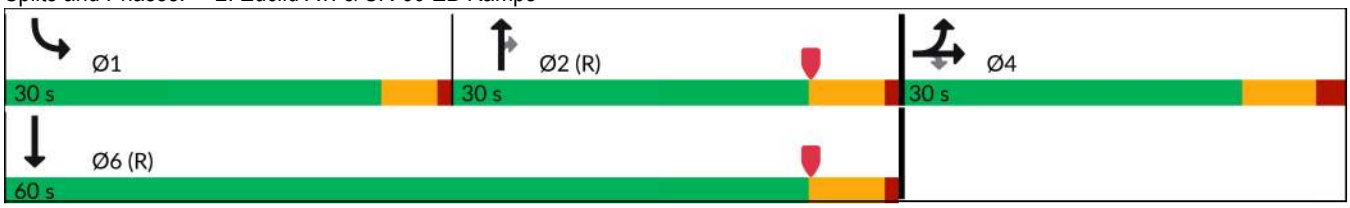

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 308 | 1 | 278 | 0 | 0 | 0 | 0 | 772 | 390 | 338 | 744 | 0 |
| Future Volume (veh/h) | 308 | 1 | 278 | 0 | 0 | 0 | 0 | 772 | 390 | 338 | 744 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 318 | 1 | 229 | | | | 0 | 796 | 299 | 348 | 767 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 361 | 0 | 340 | | | | 0 | 1155 | 514 | 373 | 2118 | 0 |
| Arrive On Green | 0.23 | 0.23 | 0.23 | | | | 0.00 | 0.34 | 0.34 | 0.47 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 1502 | | | | 0 | 3455 | 1497 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 318 | 0 | 229 | | | | 0 | 796 | 299 | 348 | 767 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1683 | 1497 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 17.4 | 0.0 | 12.5 | | | | 0.0 | 18.3 | 14.8 | 18.6 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 17.4 | 0.0 | 12.5 | | | | 0.0 | 18.3 | 14.8 | 18.6 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 361 | 0 | 340 | | | | 0 | 1155 | 514 | 373 | 2118 | 0 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.67 | | | | 0.00 | 0.69 | 0.58 | 0.93 | 0.36 | 0.00 |
| Avail Cap(c_a), veh/h | 407 | 0 | 384 | | | | 0 | 1155 | 514 | 448 | 2118 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.81 | 0.81 | 0.49 | 0.49 | 0.00 |
| Uniform Delay (d), s/veh | 33.6 | 0.0 | 31.8 | | | | 0.0 | 25.4 | 24.3 | 23.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 19.0 | 0.0 | 4.7 | | | | 0.0 | 2.7 | 3.9 | 14.6 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.4 | 0.0 | 4.9 | | | | 0.0 | 7.2 | 5.4 | 6.0 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 52.6 | 0.0 | 36.4 | | | | 0.0 | 28.2 | 28.1 | 37.9 | 0.2 | 0.0 |
| LnGrp LOS | D | | D | | | | | C | C | D | A | |
| Approach Vol, veh/h | | 547 | | | | | | 1095 | | | 1115 | |
| Approach Delay, s/veh | | 45.8 | | | | | | 28.2 | | | 12.0 | |
| Approach LOS | | D | | | | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.7 | 36.9 | | 27.4 | | 62.6 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 7.0 | | 6.0 |
| Max Green Setting (Gmax), s | 25.3 | 24.0 | | 23.0 | | 54.0 |
| Max Q Clear Time (g_c+I1), s | 20.6 | 20.3 | | 19.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.5 | 2.6 | | 1.0 | | 8.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.1 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 105 | 269 | 43 | 366 | 109 | 873 | 127 | 842 |
| Future Volume (vph) | 105 | 269 | 43 | 366 | 109 | 873 | 127 | 842 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 43.0 | 43.0 | 43.0 | 43.0 | 41.4 | 41.4 | 35.6 | 77.0 |
| Total Split (%) | 35.8% | 35.8% | 35.8% | 35.8% | 34.5% | 34.5% | 29.7% | 64.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 23.5 | 23.5 | 23.5 | 23.5 | 28.0 | 28.0 | 8.6 | 41.5 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.30 | 0.30 | 0.36 | 0.36 | 0.11 | 0.54 |
| v/c Ratio | 0.63 | 0.42 | 0.19 | 0.56 | 0.65 | 0.54 | 0.42 | 0.37 |
| Control Delay (s/veh) | 42.1 | 19.2 | 23.6 | 22.4 | 44.3 | 21.9 | 41.3 | 11.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.1 | 19.2 | 23.6 | 22.4 | 44.3 | 21.9 | 41.3 | 11.4 |
| LOS | D | B | C | C | D | C | D | B |
| Approach Delay (s/veh) | | 23.9 | | 22.5 | | 24.3 | | 15.2 |
| Approach LOS | | C | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 77.5 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.65 | |
| Intersection Signal Delay (s/veh): 20.9 | Intersection LOS: C |
| Intersection Capacity Utilization 71.0% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

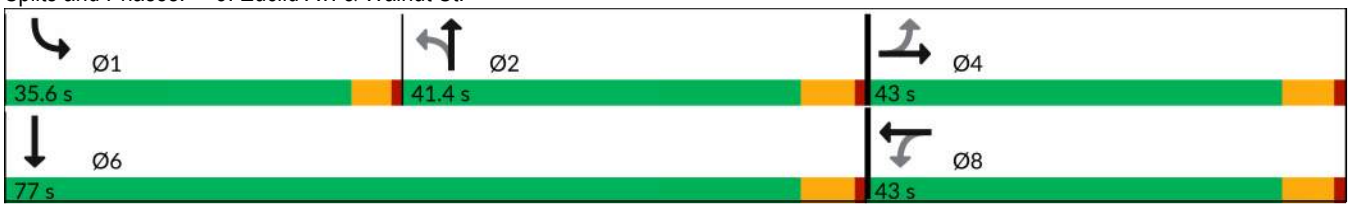

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 105 | 269 | 135 | 43 | 366 | 172 | 109 | 873 | 22 | 127 | 842 | 49 |
| Future Volume (veh/h) | 105 | 269 | 135 | 43 | 366 | 172 | 109 | 873 | 22 | 127 | 842 | 49 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 111 | 283 | 129 | 45 | 385 | 138 | 115 | 919 | 14 | 134 | 886 | 30 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 290 | 753 | 334 | 335 | 807 | 285 | 306 | 1585 | 24 | 217 | 2278 | 77 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.32 | 0.32 | 0.32 | 0.07 | 0.47 | 0.47 |
| Sat Flow, veh/h | 829 | 2264 | 1005 | 918 | 2427 | 857 | 576 | 4907 | 75 | 2910 | 4805 | 162 |
| Grp Volume(v), veh/h | 111 | 208 | 204 | 45 | 265 | 258 | 115 | 604 | 329 | 134 | 594 | 322 |
| Grp Sat Flow(s),veh/h/ln | 829 | 1683 | 1586 | 918 | 1683 | 1600 | 576 | 1612 | 1757 | 1455 | 1612 | 1743 |
| Q Serve(g_s), s | 7.4 | 5.7 | 5.9 | 2.4 | 7.5 | 7.7 | 10.1 | 9.3 | 9.4 | 2.7 | 7.1 | 7.1 |
| Cycle Q Clear(g_c), s | 15.0 | 5.7 | 5.9 | 8.3 | 7.5 | 7.7 | 10.1 | 9.3 | 9.4 | 2.7 | 7.1 | 7.1 |
| Prop In Lane | 1.00 | | 0.63 | 1.00 | | 0.54 | 1.00 | | 0.04 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 290 | 560 | 527 | 335 | 560 | 532 | 306 | 1041 | 567 | 217 | 1529 | 826 |
| V/C Ratio(X) | 0.38 | 0.37 | 0.39 | 0.13 | 0.47 | 0.48 | 0.38 | 0.58 | 0.58 | 0.62 | 0.39 | 0.39 |
| Avail Cap(c_a), veh/h | 529 | 1044 | 984 | 599 | 1044 | 993 | 462 | 1915 | 1043 | 1505 | 3830 | 2070 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.9 | 15.2 | 15.3 | 18.5 | 15.9 | 15.9 | 17.2 | 16.9 | 16.9 | 26.9 | 10.2 | 10.2 |
| Incr Delay (d2), s/veh | 0.8 | 0.4 | 0.5 | 0.2 | 0.6 | 0.7 | 0.8 | 0.5 | 0.9 | 1.1 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 1.9 | 1.8 | 0.5 | 2.5 | 2.4 | 1.2 | 2.9 | 3.3 | 0.9 | 1.9 | 2.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 22.7 | 15.7 | 15.8 | 18.7 | 16.5 | 16.6 | 17.9 | 17.4 | 17.9 | 28.0 | 10.3 | 10.5 |
| LnGrp LOS | C | B | B | B | B | B | B | B | B | C | B | B |
| Approach Vol, veh/h | | 523 | | | 568 | | | 1048 | | | 1050 | |
| Approach Delay, s/veh | | 17.2 | | | 16.7 | | | 17.6 | | | 12.6 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.1 | 25.2 | | 25.7 | | 34.2 | | 25.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.0 | 35.6 | | 37.2 | | 71.2 | | 37.2 |
| Max Q Clear Time (g_c+I1), s | 4.7 | 12.1 | | 17.0 | | 9.1 | | 10.3 |
| Green Ext Time (p_c), s | 0.2 | 7.2 | | 2.8 | | 6.5 | | 3.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 15.7 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 121 | 382 | 175 | 606 | 43 | 716 | 117 | 123 | 738 | 113 |
| Future Volume (vph) | 121 | 382 | 175 | 606 | 43 | 716 | 117 | 123 | 738 | 113 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 21.0 | 43.0 | 23.0 | 45.0 | 15.2 | 35.0 | 35.0 | 19.0 | 38.8 | 38.8 |
| Total Split (%) | 17.5% | 35.8% | 19.2% | 37.5% | 12.7% | 29.2% | 29.2% | 15.8% | 32.3% | 32.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.2 | 33.6 | 16.5 | 35.9 | 10.1 | 28.4 | 28.4 | 12.9 | 34.8 | 34.8 |
| Actuated g/C Ratio | 0.12 | 0.29 | 0.14 | 0.31 | 0.09 | 0.25 | 0.25 | 0.11 | 0.30 | 0.30 |
| v/c Ratio | 0.66 | 0.91 | 0.82 | 0.70 | 0.33 | 0.93 | 0.27 | 0.74 | 0.78 | 0.23 |
| Control Delay (s/veh) | 66.3 | 62.2 | 76.6 | 38.4 | 58.8 | 61.0 | 7.9 | 75.3 | 44.7 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 66.3 | 62.2 | 76.6 | 38.4 | 58.8 | 61.0 | 7.9 | 75.3 | 44.7 | 6.6 |
| LOS | E | E | E | D | E | E | A | E | D | A |
| Approach Delay (s/veh) | | 63.1 | | 46.2 | | 53.8 | | | 44.1 | |
| Approach LOS | | E | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 114.4 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay (s/veh): 50.5 | Intersection LOS: D |
| Intersection Capacity Utilization 84.3% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

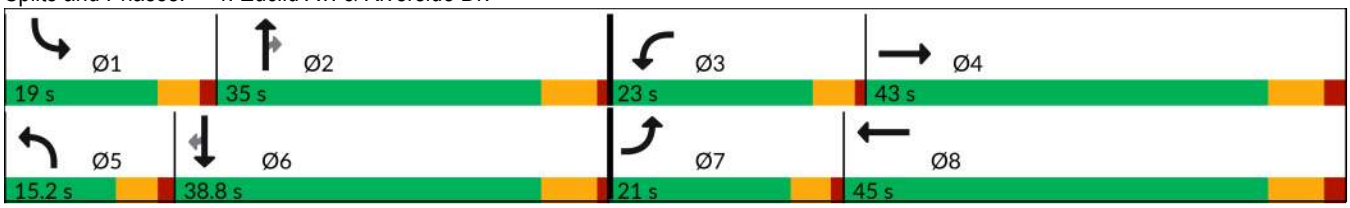

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 121 | 382 | 51 | 175 | 606 | 75 | 43 | 716 | 117 | 123 | 738 | 113 |
| Future Volume (veh/h) | 121 | 382 | 51 | 175 | 606 | 75 | 43 | 716 | 117 | 123 | 738 | 113 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 130 | 411 | 28 | 188 | 652 | 57 | 46 | 770 | 58 | 132 | 794 | 61 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 183 | 463 | 32 | 216 | 948 | 83 | 114 | 870 | 388 | 158 | 965 | 425 |
| Arrive On Green | 0.11 | 0.28 | 0.28 | 0.14 | 0.30 | 0.30 | 0.07 | 0.26 | 0.26 | 0.10 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1594 | 1640 | 112 | 1594 | 3128 | 273 | 1594 | 3367 | 1502 | 1594 | 3367 | 1482 |
| Grp Volume(v), veh/h | 130 | 0 | 439 | 188 | 351 | 358 | 46 | 770 | 58 | 132 | 794 | 61 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1752 | 1594 | 1683 | 1717 | 1594 | 1683 | 1502 | 1594 | 1683 | 1482 |
| Q Serve(g_s), s | 8.0 | 0.0 | 24.5 | 11.8 | 18.7 | 18.8 | 2.8 | 22.4 | 3.0 | 8.3 | 22.5 | 3.1 |
| Cycle Q Clear(g_c), s | 8.0 | 0.0 | 24.5 | 11.8 | 18.7 | 18.8 | 2.8 | 22.4 | 3.0 | 8.3 | 22.5 | 3.1 |
| Prop In Lane | 1.00 | | 0.06 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 183 | 0 | 494 | 216 | 510 | 521 | 114 | 870 | 388 | 158 | 965 | 425 |
| V/C Ratio(X) | 0.71 | 0.00 | 0.89 | 0.87 | 0.69 | 0.69 | 0.40 | 0.88 | 0.15 | 0.83 | 0.82 | 0.14 |
| Avail Cap(c_a), veh/h | 255 | 0 | 618 | 286 | 627 | 639 | 156 | 957 | 427 | 216 | 1082 | 476 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.6 | 0.0 | 35.1 | 43.2 | 31.3 | 31.3 | 45.3 | 36.4 | 29.2 | 45.1 | 34.0 | 27.1 |
| Incr Delay (d2), s/veh | 2.4 | 0.0 | 13.6 | 16.2 | 3.0 | 2.9 | 2.3 | 9.3 | 0.2 | 18.0 | 4.8 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.2 | 0.0 | 11.7 | 5.4 | 7.6 | 7.8 | 1.1 | 9.6 | 1.1 | 4.0 | 9.3 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 45.9 | 0.0 | 48.7 | 59.5 | 34.3 | 34.3 | 47.6 | 45.7 | 29.4 | 63.1 | 38.8 | 27.2 |
| LnGrp LOS | D | | D | E | C | C | D | D | C | E | D | C |
| Approach Vol, veh/h | | 569 | | | 897 | | | 874 | | | 987 | |
| Approach Delay, s/veh | | 48.1 | | | 39.5 | | | 44.7 | | | 41.3 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.3 | 32.4 | 18.5 | 35.8 | 12.5 | 35.2 | 16.4 | 37.9 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 13.8 | 29.0 | 18.3 | 36.0 | 10.0 | 32.8 | 16.3 | 38.0 |
| Max Q Clear Time (g_c+I1), s | 10.3 | 24.4 | 13.8 | 26.5 | 4.8 | 24.5 | 10.0 | 20.8 |
| Green Ext Time (p_c), s | 0.1 | 1.9 | 0.1 | 2.3 | 0.0 | 3.3 | 0.1 | 5.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 42.9 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 64 | 207 | 48 | 78 | 252 | 62 | 818 | 132 | 37 | 863 | 61 |
| Future Volume (vph) | 64 | 207 | 48 | 78 | 252 | 62 | 818 | 132 | 37 | 863 | 61 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 56.0 | 56.0 | 56.0 | 56.0 | 56.0 | 49.0 | 49.0 | 49.0 | 15.0 | 64.0 | 64.0 |
| Total Split (%) | 46.7% | 46.7% | 46.7% | 46.7% | 46.7% | 40.8% | 40.8% | 40.8% | 12.5% | 53.3% | 53.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 30.1 | 30.1 | 30.1 | | 30.1 | 31.1 | 31.1 | 31.1 | 11.4 | 38.3 | 38.3 |
| Actuated g/C Ratio | 0.37 | 0.37 | 0.37 | | 0.37 | 0.38 | 0.38 | 0.38 | 0.14 | 0.46 | 0.46 |
| v/c Ratio | 0.26 | 0.36 | 0.09 | | 0.72 | 0.38 | 0.72 | 0.24 | 0.19 | 0.62 | 0.10 |
| Control Delay (s/veh) | 25.0 | 23.3 | 3.0 | | 33.1 | 31.2 | 28.2 | 14.3 | 45.4 | 18.5 | 4.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.0 | 23.3 | 3.0 | | 33.1 | 31.2 | 28.2 | 14.3 | 45.4 | 18.5 | 4.2 |
| LOS | C | C | A | | C | C | C | B | D | B | A |
| Approach Delay (s/veh) | | 20.6 | | | 33.1 | | 26.6 | | | 18.7 | |
| Approach LOS | | C | | | C | | C | | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 82.4 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.72 | |
| Intersection Signal Delay (s/veh): 23.9 | Intersection LOS: C |
| Intersection Capacity Utilization 86.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 64 | 207 | 48 | 78 | 252 | 33 | 62 | 818 | 132 | 37 | 863 | 61 |
| Future Volume (veh/h) | 64 | 207 | 48 | 78 | 252 | 33 | 62 | 818 | 132 | 37 | 863 | 61 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 71 | 230 | 41 | 87 | 280 | 37 | 69 | 909 | 113 | 41 | 959 | 38 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 293 | 583 | 494 | 136 | 355 | 43 | 261 | 1215 | 542 | 123 | 1689 | 736 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.36 | 0.36 | 0.36 | 0.08 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1004 | 1772 | 1502 | 232 | 1078 | 132 | 533 | 3367 | 1502 | 1594 | 3367 | 1466 |
| Grp Volume(v), veh/h | 71 | 230 | 41 | 404 | 0 | 0 | 69 | 909 | 113 | 41 | 959 | 38 |
| Grp Sat Flow(s),veh/h/ln | 1004 | 1772 | 1502 | 1442 | 0 | 0 | 533 | 1683 | 1502 | 1594 | 1683 | 1466 |
| Q Serve(g_s), s | 0.0 | 7.3 | 1.4 | 12.1 | 0.0 | 0.0 | 7.5 | 17.2 | 3.8 | 1.8 | 14.4 | 1.0 |
| Cycle Q Clear(g_c), s | 8.2 | 7.3 | 1.4 | 19.4 | 0.0 | 0.0 | 11.7 | 17.2 | 3.8 | 1.8 | 14.4 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 0.22 | | 0.09 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 293 | 583 | 494 | 535 | 0 | 0 | 261 | 1215 | 542 | 123 | 1689 | 736 |
| V/C Ratio(X) | 0.24 | 0.39 | 0.08 | 0.76 | 0.00 | 0.00 | 0.26 | 0.75 | 0.21 | 0.33 | 0.57 | 0.05 |
| Avail Cap(c_a), veh/h | 656 | 1225 | 1038 | 1095 | 0 | 0 | 380 | 1970 | 879 | 228 | 2665 | 1161 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 19.1 | 18.8 | 16.8 | 23.0 | 0.0 | 0.0 | 20.3 | 20.3 | 16.0 | 31.7 | 12.6 | 9.3 |
| Incr Delay (d2), s/veh | 0.4 | 0.4 | 0.1 | 2.2 | 0.0 | 0.0 | 0.5 | 0.9 | 0.2 | 0.6 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 2.8 | 0.4 | 6.0 | 0.0 | 0.0 | 0.8 | 5.7 | 1.1 | 0.6 | 4.1 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 19.5 | 19.2 | 16.9 | 25.3 | 0.0 | 0.0 | 20.8 | 21.3 | 16.2 | 32.3 | 12.9 | 9.3 |
| LnGrp LOS | B | B | B | C | | | C | C | B | C | B | A |
| Approach Vol, veh/h | | 342 | | | 404 | | | 1091 | | | 1038 | |
| Approach Delay, s/veh | | 19.0 | | | 25.3 | | | 20.7 | | | 13.5 | |
| Approach LOS | | B | | | C | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.2 | 32.7 | | 29.7 | | 42.9 | | 29.7 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 42.5 | | 50.2 | | 57.5 | | 50.2 |
| Max Q Clear Time (g_c+I1), s | 3.8 | 19.2 | | 10.2 | | 16.4 | | 21.4 |
| Green Ext Time (p_c), s | 0.0 | 7.0 | | 1.8 | | 7.0 | | 2.5 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 18.6 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 111 | 68 | 100 | 47 | 145 | 127 | 832 | 23 | 43 | 893 | 80 |
| Future Volume (vph) | 111 | 68 | 100 | 47 | 145 | 127 | 832 | 23 | 43 | 893 | 80 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 17.0 | 49.3 | 49.3 | 14.7 | 47.0 | 15.0 | 41.3 | 41.3 | 14.7 | 41.0 | 41.0 |
| Total Split (%) | 14.2% | 41.1% | 41.1% | 12.3% | 39.2% | 12.5% | 34.4% | 34.4% | 12.3% | 34.2% | 34.2% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.5 | 24.2 | 24.2 | 10.1 | 19.5 | 10.4 | 41.7 | 41.7 | 10.1 | 34.9 | 34.9 |
| Actuated g/C Ratio | 0.12 | 0.24 | 0.24 | 0.10 | 0.20 | 0.10 | 0.42 | 0.42 | 0.10 | 0.35 | 0.35 |
| v/c Ratio | 0.67 | 0.17 | 0.24 | 0.33 | 0.68 | 0.85 | 0.65 | 0.04 | 0.29 | 0.83 | 0.15 |
| Control Delay (s/veh) | 63.2 | 31.3 | 6.1 | 51.4 | 42.9 | 86.0 | 29.8 | 0.1 | 50.5 | 38.7 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 63.2 | 31.3 | 6.1 | 51.4 | 42.9 | 86.0 | 29.8 | 0.1 | 50.5 | 38.7 | 2.9 |
| LOS | E | C | A | D | D | F | C | A | D | D | A |
| Approach Delay (s/veh) | | 34.9 | | | 44.4 | | 36.4 | | | 36.4 | |
| Approach LOS | | C | | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 99.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 37.0 | Intersection LOS: D |
| Intersection Capacity Utilization 74.2% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

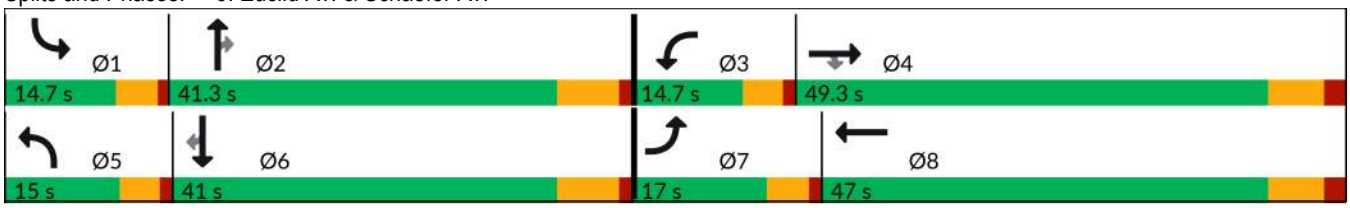

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 111 | 68 | 100 | 47 | 145 | 67 | 127 | 832 | 23 | 43 | 893 | 80 |
| Future Volume (veh/h) | 111 | 68 | 100 | 47 | 145 | 67 | 127 | 832 | 23 | 43 | 893 | 80 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 122 | 75 | 66 | 52 | 159 | 63 | 140 | 914 | 18 | 47 | 981 | 41 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 177 | 336 | 285 | 133 | 194 | 77 | 181 | 1272 | 568 | 126 | 1156 | 504 |
| Arrive On Green | 0.11 | 0.19 | 0.19 | 0.08 | 0.16 | 0.16 | 0.11 | 0.38 | 0.38 | 0.08 | 0.34 | 0.34 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1202 | 476 | 1594 | 3367 | 1502 | 1594 | 3367 | 1468 |
| Grp Volume(v), veh/h | 122 | 75 | 66 | 52 | 0 | 222 | 140 | 914 | 18 | 47 | 981 | 41 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1679 | 1594 | 1683 | 1502 | 1594 | 1683 | 1468 |
| Q Serve(g_s), s | 6.2 | 3.0 | 3.2 | 2.6 | 0.0 | 10.8 | 7.2 | 19.6 | 0.6 | 2.4 | 22.9 | 1.6 |
| Cycle Q Clear(g_c), s | 6.2 | 3.0 | 3.2 | 2.6 | 0.0 | 10.8 | 7.2 | 19.6 | 0.6 | 2.4 | 22.9 | 1.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.28 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 177 | 336 | 285 | 133 | 0 | 271 | 181 | 1272 | 568 | 126 | 1156 | 504 |
| V/C Ratio(X) | 0.69 | 0.22 | 0.23 | 0.39 | 0.00 | 0.82 | 0.77 | 0.72 | 0.03 | 0.37 | 0.85 | 0.08 |
| Avail Cap(c_a), veh/h | 231 | 885 | 750 | 188 | 0 | 792 | 194 | 1383 | 617 | 188 | 1371 | 598 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.2 | 29.1 | 29.1 | 36.8 | 0.0 | 34.3 | 36.5 | 22.5 | 16.6 | 37.0 | 25.8 | 18.8 |
| Incr Delay (d2), s/veh | 2.9 | 0.2 | 0.3 | 0.7 | 0.0 | 4.6 | 14.5 | 1.7 | 0.0 | 0.7 | 4.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 1.2 | 1.1 | 1.0 | 0.0 | 4.5 | 3.3 | 7.0 | 0.2 | 0.9 | 8.6 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 39.1 | 29.3 | 29.4 | 37.5 | 0.0 | 38.9 | 51.0 | 24.2 | 16.6 | 37.7 | 30.3 | 18.9 |
| LnGrp LOS | D | C | C | D | | D | D | C | B | D | C | B |
| Approach Vol, veh/h | | 263 | | | 274 | | | 1072 | | | 1069 | |
| Approach Delay, s/veh | | 33.9 | | | 38.6 | | | 27.6 | | | 30.2 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.4 | 38.5 | 11.8 | 23.1 | 14.3 | 35.6 | 14.1 | 20.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 34.8 | 10.0 | 42.3 | 10.3 | 34.5 | 12.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 4.4 | 21.6 | 4.6 | 5.2 | 9.2 | 24.9 | 8.2 | 12.8 |
| Green Ext Time (p_c), s | 0.0 | 4.6 | 0.0 | 0.4 | 0.0 | 4.2 | 0.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.4 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 75 | 168 | 51 | 272 | 335 | 142 | 688 | 228 | 209 | 657 | 130 |
| Future Volume (vph) | 75 | 168 | 51 | 272 | 335 | 142 | 688 | 228 | 209 | 657 | 130 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 58.0 | 58.0 | 58.0 | 58.0 | 58.0 | 14.8 | 38.0 | 38.0 | 24.0 | 47.2 | 47.2 |
| Total Split (%) | 48.3% | 48.3% | 48.3% | 48.3% | 48.3% | 12.3% | 31.7% | 31.7% | 20.0% | 39.3% | 39.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 45.8 | 45.8 | 45.8 | 45.8 | 45.8 | 10.3 | 28.8 | 28.8 | 18.1 | 36.6 | 36.6 |
| Actuated g/C Ratio | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.09 | 0.26 | 0.26 | 0.16 | 0.33 | 0.33 |
| v/c Ratio | 0.78 | 0.25 | 0.08 | 0.66 | 0.92 | 0.57 | 0.85 | 0.51 | 0.87 | 0.63 | 0.24 |
| Control Delay (s/veh) | 78.2 | 23.0 | 0.2 | 35.4 | 49.7 | 60.4 | 50.3 | 21.9 | 78.5 | 35.1 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 78.2 | 23.0 | 0.2 | 35.4 | 49.7 | 60.4 | 50.3 | 21.9 | 78.5 | 35.1 | 5.7 |
| LOS | E | C | A | D | D | E | D | C | E | D | A |
| Approach Delay (s/veh) | | 33.2 | | | 45.2 | | 45.6 | | | 40.4 | |
| Approach LOS | | C | | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 111.4 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.92 | |
| Intersection Signal Delay (s/veh): 42.7 | Intersection LOS: D |
| Intersection Capacity Utilization 99.0% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 75 | 168 | 51 | 272 | 335 | 274 | 142 | 688 | 228 | 209 | 657 | 130 |
| Future Volume (veh/h) | 75 | 168 | 51 | 272 | 335 | 274 | 142 | 688 | 228 | 209 | 657 | 130 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 80 | 179 | 26 | 289 | 356 | 281 | 151 | 732 | 226 | 222 | 699 | 102 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 125 | 779 | 660 | 481 | 403 | 318 | 250 | 831 | 371 | 246 | 1062 | 467 |
| Arrive On Green | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.09 | 0.25 | 0.25 | 0.15 | 0.32 | 0.32 |
| Sat Flow, veh/h | 747 | 1772 | 1502 | 1112 | 917 | 724 | 2910 | 3367 | 1502 | 1594 | 3367 | 1481 |
| Grp Volume(v), veh/h | 80 | 179 | 26 | 289 | 0 | 637 | 151 | 732 | 226 | 222 | 699 | 102 |
| Grp Sat Flow(s),veh/h/ln | 747 | 1772 | 1502 | 1112 | 0 | 1642 | 1455 | 1683 | 1502 | 1594 | 1683 | 1481 |
| Q Serve(g_s), s | 9.7 | 7.3 | 1.1 | 25.3 | 0.0 | 41.1 | 5.8 | 24.2 | 15.4 | 15.8 | 20.7 | 5.9 |
| Cycle Q Clear(g_c), s | 50.8 | 7.3 | 1.1 | 32.6 | 0.0 | 41.1 | 5.8 | 24.2 | 15.4 | 15.8 | 20.7 | 5.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.44 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 125 | 779 | 660 | 481 | 0 | 721 | 250 | 831 | 371 | 246 | 1062 | 467 |
| V/C Ratio(X) | 0.64 | 0.23 | 0.04 | 0.60 | 0.00 | 0.88 | 0.60 | 0.88 | 0.61 | 0.90 | 0.66 | 0.22 |
| Avail Cap(c_a), veh/h | 125 | 779 | 660 | 481 | 0 | 721 | 254 | 917 | 409 | 266 | 1185 | 521 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.0 | 20.2 | 18.5 | 30.4 | 0.0 | 29.7 | 50.9 | 41.9 | 38.6 | 48.0 | 34.2 | 29.1 |
| Incr Delay (d2), s/veh | 10.5 | 0.1 | 0.0 | 2.1 | 0.0 | 12.4 | 2.7 | 9.3 | 2.2 | 28.4 | 1.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 2.9 | 0.4 | 6.7 | 0.0 | 17.5 | 2.1 | 10.5 | 5.6 | 7.9 | 8.1 | 2.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 64.5 | 20.4 | 18.5 | 32.5 | 0.0 | 42.1 | 53.7 | 51.2 | 40.8 | 76.5 | 35.3 | 29.3 |
| LnGrp LOS | E | C | B | C | | D | D | D | D | E | D | C |
| Approach Vol, veh/h | | 285 | | | 926 | | | 1109 | | | 1023 | |
| Approach Delay, s/veh | | 32.6 | | | 39.1 | | | 49.4 | | | 43.7 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.6 | 35.1 | | 58.0 | 14.6 | 43.0 | | 58.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 19.3 | 31.5 | | 50.8 | 10.1 | 40.7 | | 50.8 |
| Max Q Clear Time (g_c+I1), s | 17.8 | 26.2 | | 52.8 | 7.8 | 22.7 | | 43.1 |
| Green Ext Time (p_c), s | 0.0 | 2.4 | | 0.0 | 0.1 | 4.2 | | 3.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 43.4 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 51 | 90 | 106 | 190 | 287 | 117 | 824 | 140 | 86 | 856 | 32 |
| Future Volume (vph) | 51 | 90 | 106 | 190 | 287 | 117 | 824 | 140 | 86 | 856 | 32 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 13.2 | 36.5 | 36.5 | 12.1 | 31.3 | 31.3 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.14 | 0.39 | 0.39 | 0.13 | 0.33 | 0.33 |
| v/c Ratio | 0.37 | 0.17 | 0.20 | 0.55 | 0.80 | 0.56 | 0.63 | 0.24 | 0.44 | 0.81 | 0.06 |
| Control Delay (s/veh) | 34.4 | 24.7 | 5.7 | 33.3 | 40.1 | 52.2 | 29.1 | 13.5 | 50.6 | 36.9 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.4 | 24.7 | 5.7 | 33.3 | 40.1 | 52.2 | 29.1 | 13.5 | 50.6 | 36.9 | 0.2 |
| LOS | C | C | A | C | D | D | C | B | D | D | A |
| Approach Delay (s/veh) | | 18.5 | | | 38.0 | | 29.6 | | | 36.9 | |
| Approach LOS | | B | | | D | | C | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 93.7 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 32.9 | Intersection LOS: C |
| Intersection Capacity Utilization 87.3% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

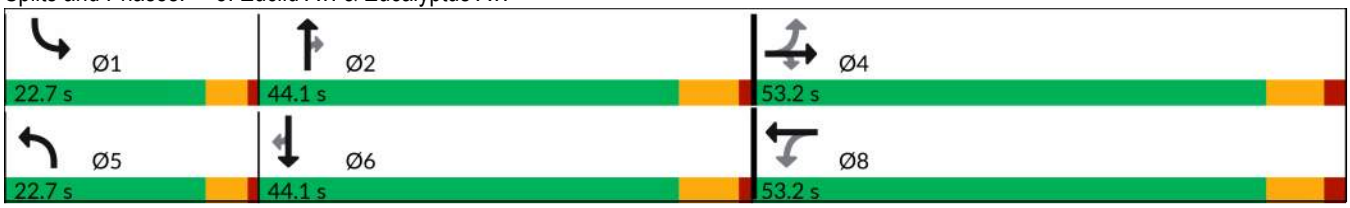

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 51 | 90 | 106 | 190 | 287 | 130 | 117 | 824 | 140 | 86 | 856 | 32 |
| Future Volume (veh/h) | 51 | 90 | 106 | 190 | 287 | 130 | 117 | 824 | 140 | 86 | 856 | 32 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 54 | 96 | 72 | 202 | 305 | 118 | 124 | 824 | 126 | 91 | 911 | 23 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 1.00 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 173 | 565 | 479 | 412 | 388 | 150 | 186 | 1155 | 515 | 173 | 1127 | 502 |
| Arrive On Green | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.12 | 0.34 | 0.34 | 0.11 | 0.33 | 0.33 |
| Sat Flow, veh/h | 911 | 1772 | 1502 | 1150 | 1217 | 471 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 54 | 96 | 72 | 202 | 0 | 423 | 124 | 824 | 126 | 91 | 911 | 23 |
| Grp Sat Flow(s),veh/h/ln | 911 | 1772 | 1502 | 1150 | 0 | 1687 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 4.6 | 3.1 | 2.7 | 12.3 | 0.0 | 18.3 | 6.0 | 17.1 | 4.8 | 4.3 | 19.8 | 0.8 |
| Cycle Q Clear(g_c), s | 22.9 | 3.1 | 2.7 | 15.4 | 0.0 | 18.3 | 6.0 | 17.1 | 4.8 | 4.3 | 19.8 | 0.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.28 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 173 | 565 | 479 | 412 | 0 | 538 | 186 | 1155 | 515 | 173 | 1127 | 502 |
| V/C Ratio(X) | 0.31 | 0.17 | 0.15 | 0.49 | 0.00 | 0.79 | 0.67 | 0.71 | 0.24 | 0.53 | 0.81 | 0.05 |
| Avail Cap(c_a), veh/h | 405 | 1017 | 862 | 705 | 0 | 969 | 358 | 1580 | 705 | 358 | 1580 | 705 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.2 | 19.7 | 19.5 | 25.2 | 0.0 | 24.8 | 33.9 | 22.9 | 18.9 | 33.8 | 24.3 | 18.0 |
| Incr Delay (d2), s/veh | 0.8 | 0.1 | 0.1 | 0.7 | 0.0 | 1.9 | 3.0 | 1.0 | 0.2 | 1.8 | 2.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 1.2 | 0.9 | 3.1 | 0.0 | 6.7 | 2.3 | 5.9 | 1.5 | 1.6 | 7.1 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.0 | 19.8 | 19.6 | 25.9 | 0.0 | 26.7 | 36.9 | 23.8 | 19.1 | 35.6 | 26.5 | 18.1 |
| LnGrp LOS | D | B | B | C | | C | D | C | B | D | C | B |
| Approach Vol, veh/h | | 222 | | | 625 | | | 1074 | | | 1025 | |
| Approach Delay, s/veh | | 23.7 | | | 26.5 | | | 24.8 | | | 27.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.4 | 34.0 | | 32.8 | 14.1 | 33.3 | | 32.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 6.3 | 19.1 | | 24.9 | 8.0 | 21.8 | | 20.3 |
| Green Ext Time (p_c), s | 0.1 | 5.1 | | 0.7 | 0.1 | 5.0 | | 2.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.9 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 7 | 2 | 59 | 25 | 21 | 1152 | 56 | 143 | 1074 |
| Future Volume (vph) | 7 | 2 | 59 | 25 | 21 | 1152 | 56 | 143 | 1074 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.8 | 50.8 | 22.0 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.3% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 18.6 | | 23.2 | 10.2 | 45.0 | 45.0 | 14.3 | 58.8 |
| Actuated g/C Ratio | | 0.18 | | 0.23 | 0.10 | 0.45 | 0.45 | 0.14 | 0.58 |
| v/c Ratio | | 0.07 | | 0.86 | 0.15 | 0.89 | 0.09 | 0.74 | 0.66 |
| Control Delay (s/veh) | | 22.9 | | 43.8 | 49.4 | 36.7 | 0.3 | 63.4 | 20.4 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 22.9 | | 43.8 | 49.4 | 36.7 | 0.3 | 63.4 | 20.4 |
| LOS | | C | | D | D | D | A | E | C |
| Approach Delay (s/veh) | | 22.9 | | 43.8 | | 35.3 | | | 25.3 |
| Approach LOS | | C | | D | | D | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 101.1 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.89 | |
| Intersection Signal Delay (s/veh): 31.7 | Intersection LOS: C |
| Intersection Capacity Utilization 84.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

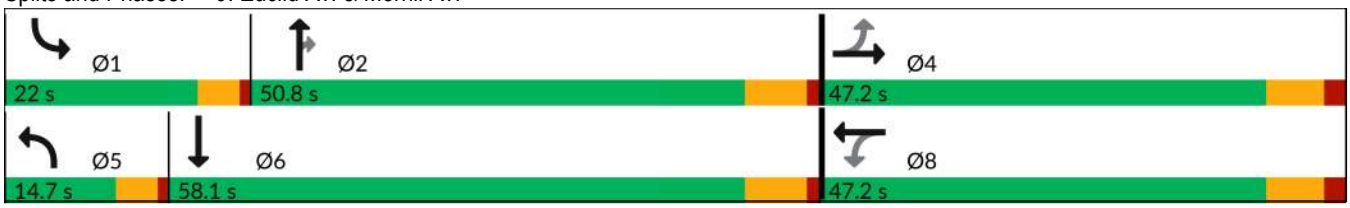

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 7 | 2 | 6 | 59 | 25 | 238 | 21 | 1152 | 56 | 143 | 1074 | 35 |
| Future Volume (veh/h) | 7 | 2 | 6 | 59 | 25 | 238 | 21 | 1152 | 56 | 143 | 1074 | 35 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 8 | 2 | 4 | 68 | 29 | 258 | 24 | 1324 | 59 | 164 | 1234 | 29 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 177 | 48 | 68 | 105 | 51 | 304 | 77 | 1417 | 629 | 191 | 1656 | 39 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.05 | 0.42 | 0.42 | 0.12 | 0.49 | 0.49 |
| Sat Flow, veh/h | 436 | 172 | 243 | 227 | 182 | 1088 | 1594 | 3367 | 1494 | 1594 | 3359 | 79 |
| Grp Volume(v), veh/h | 14 | 0 | 0 | 355 | 0 | 0 | 24 | 1324 | 59 | 164 | 618 | 645 |
| Grp Sat Flow(s),veh/h/ln | 852 | 0 | 0 | 1497 | 0 | 0 | 1594 | 1683 | 1494 | 1594 | 1683 | 1755 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 17.1 | 0.0 | 0.0 | 1.5 | 38.4 | 2.4 | 10.3 | 30.1 | 30.2 |
| Cycle Q Clear(g_c), s | 0.6 | 0.0 | 0.0 | 22.9 | 0.0 | 0.0 | 1.5 | 38.4 | 2.4 | 10.3 | 30.1 | 30.2 |
| Prop In Lane | 0.57 | | 0.29 | 0.19 | | 0.73 | 1.00 | | 1.00 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 293 | 0 | 0 | 460 | 0 | 0 | 77 | 1417 | 629 | 191 | 830 | 865 |
| V/C Ratio(X) | 0.05 | 0.00 | 0.00 | 0.77 | 0.00 | 0.00 | 0.31 | 0.93 | 0.09 | 0.86 | 0.75 | 0.75 |
| Avail Cap(c_a), veh/h | 433 | 0 | 0 | 625 | 0 | 0 | 156 | 1457 | 647 | 269 | 848 | 884 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.8 | 0.0 | 0.0 | 34.8 | 0.0 | 0.0 | 47.1 | 28.3 | 17.9 | 44.2 | 20.8 | 20.8 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 | 0.0 | 0.8 | 11.2 | 0.1 | 13.1 | 3.5 | 3.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.0 | 8.1 | 0.0 | 0.0 | 0.6 | 15.8 | 0.8 | 4.5 | 11.0 | 11.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.9 | 0.0 | 0.0 | 37.4 | 0.0 | 0.0 | 47.9 | 39.5 | 17.9 | 57.3 | 24.3 | 24.2 |
| LnGrp LOS | C | | | D | | | D | D | B | E | C | C |
| Approach Vol, veh/h | | 14 | | | 355 | | | 1407 | | | 1427 | |
| Approach Delay, s/veh | | 26.9 | | | 37.4 | | | 38.7 | | | 28.1 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 49.6 | | 35.8 | 9.6 | 57.0 | | 35.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.3 | 44.3 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 12.3 | 40.4 | | 2.6 | 3.5 | 32.2 | | 24.9 |
| Green Ext Time (p_c), s | 0.1 | 2.7 | | 0.0 | 0.0 | 7.3 | | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 33.8 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 111 | 283 | 28 | 31 | 818 | 347 | 95 | 680 | 30 | 223 | 700 | 166 |
| Future Volume (vph) | 111 | 283 | 28 | 31 | 818 | 347 | 95 | 680 | 30 | 223 | 700 | 166 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 34.6 | 14.7 | 17.5 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 28.8% | 12.3% | 14.6% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.1 | 36.8 | 36.8 | 10.1 | 33.3 | 33.3 | 10.1 | 26.2 | 38.2 | 12.0 | 28.2 | 44.8 |
| Actuated g/C Ratio | 0.10 | 0.35 | 0.35 | 0.10 | 0.32 | 0.32 | 0.10 | 0.25 | 0.36 | 0.11 | 0.27 | 0.43 |
| v/c Ratio | 0.42 | 0.25 | 0.05 | 0.22 | 0.81 | 0.56 | 0.66 | 0.85 | 0.05 | 0.71 | 0.82 | 0.25 |
| Control Delay (s/veh) | 52.8 | 26.2 | 0.1 | 52.0 | 39.7 | 11.2 | 70.0 | 49.8 | 0.2 | 59.6 | 45.3 | 12.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.8 | 26.2 | 0.1 | 52.0 | 39.7 | 11.2 | 70.0 | 49.8 | 0.2 | 59.6 | 45.3 | 12.2 |
| LOS | D | C | A | D | D | B | E | D | A | E | D | B |
| Approach Delay (s/veh) | | 31.5 | | | 31.8 | | | 50.3 | | | 43.2 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 39.5 | Intersection LOS: D |
| Intersection Capacity Utilization 80.1% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

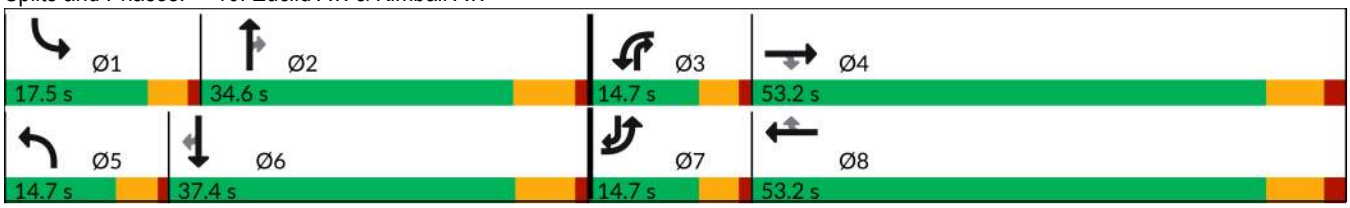

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 111 | 283 | 28 | 31 | 818 | 347 | 95 | 680 | 30 | 223 | 700 | 166 |
| Future Volume (veh/h) | 111 | 283 | 28 | 31 | 818 | 347 | 95 | 680 | 30 | 223 | 700 | 166 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 117 | 298 | 13 | 33 | 861 | 188 | 100 | 716 | 11 | 235 | 737 | 122 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 290 | 1142 | 509 | 97 | 1011 | 445 | 155 | 856 | 469 | 303 | 880 | 543 |
| Arrive On Green | 0.10 | 0.34 | 0.34 | 0.06 | 0.30 | 0.30 | 0.10 | 0.25 | 0.25 | 0.10 | 0.26 | 0.26 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 1594 | 3367 | 1482 | 1594 | 3367 | 1482 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 117 | 298 | 13 | 33 | 861 | 188 | 100 | 716 | 11 | 235 | 737 | 122 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1594 | 1683 | 1482 | 1594 | 1683 | 1482 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 3.6 | 6.1 | 0.6 | 1.9 | 23.0 | 9.7 | 5.8 | 19.3 | 0.5 | 7.5 | 19.8 | 5.4 |
| Cycle Q Clear(g_c), s | 3.6 | 6.1 | 0.6 | 1.9 | 23.0 | 9.7 | 5.8 | 19.3 | 0.5 | 7.5 | 19.8 | 5.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 290 | 1142 | 509 | 97 | 1011 | 445 | 155 | 856 | 469 | 303 | 880 | 543 |
| V/C Ratio(X) | 0.40 | 0.26 | 0.03 | 0.34 | 0.85 | 0.42 | 0.65 | 0.84 | 0.02 | 0.77 | 0.84 | 0.22 |
| Avail Cap(c_a), veh/h | 304 | 1618 | 721 | 166 | 1618 | 712 | 166 | 988 | 527 | 389 | 1090 | 636 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 40.4 | 22.9 | 21.1 | 43.1 | 31.5 | 26.8 | 41.6 | 33.8 | 22.6 | 41.8 | 33.4 | 21.3 |
| Incr Delay (d2), s/veh | 0.3 | 0.1 | 0.0 | 2.0 | 1.4 | 0.2 | 5.4 | 5.7 | 0.0 | 5.3 | 4.9 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 2.3 | 0.2 | 0.8 | 8.8 | 3.2 | 2.4 | 7.9 | 0.2 | 2.8 | 8.0 | 1.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.8 | 23.1 | 21.1 | 45.1 | 32.9 | 27.1 | 47.1 | 39.5 | 22.6 | 47.1 | 38.3 | 21.5 |
| LnGrp LOS | D | C | C | D | C | C | D | D | C | D | D | C |
| Approach Vol, veh/h | | 428 | | | 1082 | | | 827 | | | 1094 | |
| Approach Delay, s/veh | | 27.8 | | | 32.3 | | | 40.2 | | | 38.3 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 30.9 | 10.5 | 39.7 | 14.0 | 31.5 | 14.3 | 36.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 12.8 | 28.1 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 21.3 | 3.9 | 8.1 | 7.8 | 21.8 | 5.6 | 25.0 |
| Green Ext Time (p_c), s | 0.1 | 2.4 | 0.0 | 1.8 | 0.0 | 3.2 | 0.1 | 3.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 35.5 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 20 | 119 | 958 | 378 | 41 | 608 | 577 | 72 | 734 |
| Future Volume (vph) | 20 | 119 | 958 | 378 | 41 | 608 | 577 | 72 | 734 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 20.0 | 48.0 | 52.3 | 14.8 | 37.2 | 48.0 | 14.8 | 37.2 |
| Total Split (%) | 13.1% | 16.7% | 40.0% | 43.6% | 12.3% | 31.0% | 40.0% | 12.3% | 31.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.2 | 12.5 | 40.6 | 53.0 | 10.2 | 29.2 | 76.5 | 10.2 | 29.2 |
| Actuated g/C Ratio | 0.09 | 0.11 | 0.36 | 0.47 | 0.09 | 0.26 | 0.68 | 0.09 | 0.26 |
| v/c Ratio | 0.15 | 0.72 | 0.95 | 0.53 | 0.29 | 0.72 | 0.54 | 0.52 | 0.93 |
| Control Delay (s/veh) | 53.8 | 70.3 | 55.0 | 27.2 | 57.6 | 44.9 | 6.7 | 66.3 | 59.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.8 | 70.3 | 55.0 | 27.2 | 57.6 | 44.9 | 6.7 | 66.3 | 59.2 |
| LOS | D | E | D | C | E | D | A | E | E |
| Approach Delay (s/veh) | | 68.2 | | 46.5 | | 27.3 | | | 59.8 |
| Approach LOS | | E | | D | | C | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 44.0 | Intersection LOS: D |
| Intersection Capacity Utilization 91.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

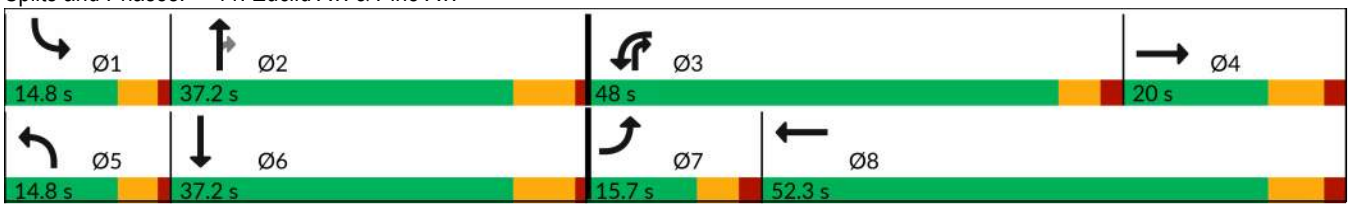

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 119 | 16 | 958 | 378 | 44 | 41 | 608 | 577 | 72 | 734 | 42 |
| Future Volume (veh/h) | 20 | 119 | 16 | 958 | 378 | 44 | 41 | 608 | 577 | 72 | 734 | 42 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 21 | 123 | 0 | 988 | 390 | 42 | 42 | 627 | 519 | 74 | 757 | 37 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 69 | 160 | | 1044 | 638 | 69 | 106 | 828 | 908 | 132 | 857 | 42 |
| Arrive On Green | 0.04 | 0.09 | 0.00 | 0.36 | 0.41 | 0.41 | 0.07 | 0.25 | 0.25 | 0.08 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1594 | 1772 | 0 | 2910 | 1572 | 169 | 1594 | 3367 | 1502 | 1594 | 3267 | 160 |
| Grp Volume(v), veh/h | 21 | 123 | 0 | 988 | 0 | 432 | 42 | 627 | 519 | 74 | 390 | 404 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 0 | 1455 | 0 | 1741 | 1594 | 1683 | 1502 | 1594 | 1683 | 1743 |
| Q Serve(g_s), s | 1.4 | 7.3 | 0.0 | 35.5 | 0.0 | 21.1 | 2.7 | 18.6 | 22.5 | 4.8 | 23.9 | 24.0 |
| Cycle Q Clear(g_c), s | 1.4 | 7.3 | 0.0 | 35.5 | 0.0 | 21.1 | 2.7 | 18.6 | 22.5 | 4.8 | 23.9 | 24.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.10 | 1.00 | | 1.00 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 69 | 160 | | 1044 | 0 | 707 | 106 | 828 | 908 | 132 | 442 | 457 |
| V/C Ratio(X) | 0.30 | 0.77 | | 0.95 | 0.00 | 0.61 | 0.40 | 0.76 | 0.57 | 0.56 | 0.88 | 0.88 |
| Avail Cap(c_a), veh/h | 148 | 214 | | 1143 | 0 | 733 | 150 | 960 | 967 | 150 | 480 | 497 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.9 | 47.9 | 0.0 | 33.5 | 0.0 | 25.3 | 48.2 | 37.6 | 12.9 | 47.5 | 38.1 | 38.1 |
| Incr Delay (d2), s/veh | 0.9 | 13.5 | 0.0 | 14.3 | 0.0 | 1.7 | 0.9 | 2.4 | 0.4 | 1.4 | 15.6 | 15.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 3.7 | 0.0 | 13.6 | 0.0 | 8.4 | 1.1 | 7.4 | 6.5 | 1.9 | 11.1 | 11.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 50.8 | 61.3 | 0.0 | 47.8 | 0.0 | 27.0 | 49.1 | 40.0 | 13.2 | 48.9 | 53.7 | 53.3 |
| LnGrp LOS | D | E | | D | | C | D | D | B | D | D | D |
| Approach Vol, veh/h | | 144 | | | 1420 | | | 1188 | | | 868 | |
| Approach Delay, s/veh | | 59.8 | | | 41.5 | | | 28.6 | | | 53.1 | |
| Approach LOS | | E | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.6 | 33.0 | 44.3 | 16.7 | 11.9 | 34.7 | 10.4 | 50.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.1 | 30.7 | 42.3 | 13.0 | 10.1 | 30.7 | 10.0 | 45.3 |
| Max Q Clear Time (g_c+I1), s | 6.8 | 24.5 | 37.5 | 9.3 | 4.7 | 26.0 | 3.4 | 23.1 |
| Green Ext Time (p_c), s | 0.0 | 2.0 | 1.1 | 0.2 | 0.0 | 1.3 | 0.0 | 3.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 40.8 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 628 | 639 | 1070 | 45 | 675 |
| Future Volume (vph) | 628 | 639 | 1070 | 45 | 675 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 14.5 | 9.6 | 9.6 |
| Total Split (s) | 35.7 | 46.2 | 81.9 | 18.1 | 18.1 |
| Total Split (%) | 35.7% | 46.2% | 81.9% | 18.1% | 18.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 29.2 | 41.5 | 75.4 | 13.5 | 13.5 |
| Actuated g/C Ratio | 0.29 | 0.42 | 0.75 | 0.14 | 0.14 |
| v/c Ratio | 0.97 | 1.09 | 0.48 | 0.13 | 0.98 |
| Control Delay (s/veh) | 53.5 | 93.5 | 5.4 | 39.1 | 36.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.5 | 93.5 | 5.4 | 39.1 | 36.7 |
| LOS | D | F | A | D | D |
| Approach Delay (s/veh) | 53.5 | | 38.4 | 36.9 | |
| Approach LOS | D | | D | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.09 | |
| Intersection Signal Delay (s/veh): 41.9 | Intersection LOS: D |
| Intersection Capacity Utilization 82.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

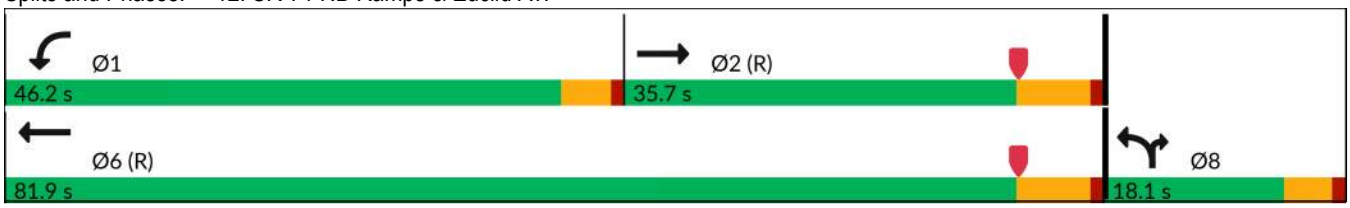

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 628 | 215 | 639 | 1070 | 45 | 675 |
| Future Volume (veh/h) | 628 | 215 | 639 | 1070 | 45 | 675 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1673 | 1772 | 1575 | 1772 |
| Adj Flow Rate, veh/h | 706 | 0 | 718 | 1202 | 51 | 0 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1310 | | 661 | 2865 | 110 | |
| Arrive On Green | 0.78 | 0.00 | 0.41 | 0.85 | 0.04 | 0.00 |
| Sat Flow, veh/h | 3544 | 0 | 1594 | 3455 | 2910 | 1502 |
| Grp Volume(v), veh/h | 706 | 0 | 718 | 1202 | 51 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1683 | 0 | 1594 | 1683 | 1455 | 1502 |
| Q Serve(g_s), s | 8.0 | 0.0 | 41.5 | 8.3 | 1.7 | 0.0 |
| Cycle Q Clear(g_c), s | 8.0 | 0.0 | 41.5 | 8.3 | 1.7 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1310 | | 661 | 2865 | 110 | |
| V/C Ratio(X) | 0.54 | | 1.09 | 0.42 | 0.46 | |
| Avail Cap(c_a), veh/h | 1310 | | 661 | 2865 | 393 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.60 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.7 | 0.0 | 29.3 | 1.7 | 47.1 | 0.0 |
| Incr Delay (d2), s/veh | 1.0 | 0.0 | 60.5 | 0.5 | 3.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 0.0 | 24.9 | 0.3 | 0.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 8.6 | 0.0 | 89.7 | 2.2 | 50.1 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 706 | | | 1920 | 51 | |
| Approach Delay, s/veh | 8.6 | | | 34.9 | 50.1 | |
| Approach LOS | A | | | C | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 46.2 | 45.4 | | | | 91.6 | 8.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 41.5 | 29.2 | | | | 75.4 | 13.5 |
| Max Q Clear Time (g_c+I1), s | 43.5 | 10.0 | | | | 10.3 | 3.7 |
| Green Ext Time (p_c), s | 0.0 | 3.2 | | | | 7.6 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.3 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 575 | 165 | 302 | 43 | 241 | 500 | 35 | 36 |
| Future Volume (vph) | 575 | 165 | 302 | 43 | 241 | 500 | 35 | 36 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 13.5 | 13.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 29.6 | 19.0 | 48.6 | 16.6 | 16.6 | 34.8 | 34.8 | 34.8 |
| Total Split (%) | 29.6% | 19.0% | 48.6% | 16.6% | 16.6% | 34.8% | 34.8% | 34.8% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 29.5 | 14.5 | 48.7 | 9.1 | 9.1 | 24.8 | 24.8 | 24.8 |
| Actuated g/C Ratio | 0.30 | 0.15 | 0.49 | 0.09 | 0.09 | 0.25 | 0.25 | 0.25 |
| v/c Ratio | 0.70 | 0.82 | 0.21 | 0.34 | 0.71 | 0.83 | 0.77 | 0.09 |
| Control Delay (s/veh) | 37.7 | 64.5 | 12.5 | 49.0 | 16.3 | 53.6 | 47.6 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.7 | 64.5 | 12.5 | 49.0 | 16.3 | 53.6 | 47.6 | 0.4 |
| LOS | D | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 37.7 | | 31.0 | | | | 47.5 | |
| Approach LOS | D | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 36.6 | Intersection LOS: D |
| Intersection Capacity Utilization 64.3% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

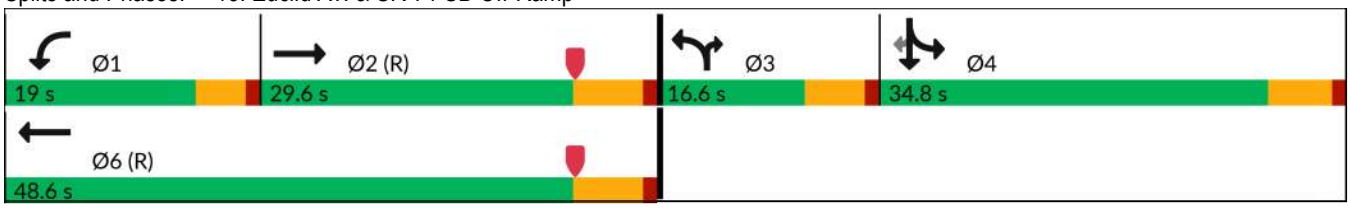

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 575 | 33 | 165 | 302 | 0 | 43 | 0 | 241 | 500 | 35 | 36 |
| Future Volume (veh/h) | 0 | 575 | 33 | 165 | 302 | 0 | 43 | 0 | 241 | 500 | 35 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 0 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 653 | 24 | 188 | 343 | 0 | 49 | 0 | 154 | 599 | 0 | 17 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.80 | 0.88 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1605 | 59 | 212 | 2237 | | 0 | 0 | 0 | 687 | 0 | 323 |
| Arrive On Green | 0.00 | 0.48 | 0.48 | 0.27 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.22 |
| Sat Flow, veh/h | 0 | 3400 | 122 | 1594 | 3455 | 0 | | 0 | | 3188 | 0 | 1500 |
| Grp Volume(v), veh/h | 0 | 332 | 345 | 188 | 343 | 0 | | 0.0 | | 599 | 0 | 17 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1683 | 1750 | 1594 | 1683 | 0 | | | | 1594 | 0 | 1500 |
| Q Serve(g_s), s | 0.0 | 12.7 | 12.7 | 11.3 | 0.0 | 0.0 | | | | 18.2 | 0.0 | 0.9 |
| Cycle Q Clear(g_c), s | 0.0 | 12.7 | 12.7 | 11.3 | 0.0 | 0.0 | | | | 18.2 | 0.0 | 0.9 |
| Prop In Lane | 0.00 | | 0.07 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 816 | 848 | 212 | 2237 | | | | | 687 | 0 | 323 |
| V/C Ratio(X) | 0.00 | 0.41 | 0.41 | 0.89 | 0.15 | | | | | 0.87 | 0.00 | 0.05 |
| Avail Cap(c_a), veh/h | 0 | 816 | 848 | 228 | 2237 | | | | | 924 | 0 | 435 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.89 | 0.89 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 16.5 | 16.6 | 36.0 | 0.0 | 0.0 | | | | 37.9 | 0.0 | 31.1 |
| Incr Delay (d2), s/veh | 0.0 | 1.5 | 1.5 | 26.6 | 0.1 | 0.0 | | | | 6.5 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 4.8 | 5.0 | 5.2 | 0.0 | 0.0 | | | | 7.6 | 0.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 18.1 | 18.0 | 62.6 | 0.1 | 0.0 | | | | 44.4 | 0.0 | 31.2 |
| LnGrp LOS | | B | B | E | A | | | | | D | | C |
| Approach Vol, veh/h | | 677 | | | 531 | | | | | | 616 | |
| Approach Delay, s/veh | | 18.0 | | | 22.2 | | | | | | 44.0 | |
| Approach LOS | | B | | | C | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.0 | 54.7 | | 27.4 | | 72.6 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 14.3 | 23.4 | | 29.0 | | 42.4 |
| Max Q Clear Time (g_c+I1), s | 13.3 | 14.7 | | 20.2 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.7 | | 1.3 | | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.0 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 30 | 546 | 30 | 0 | 801 | 45 | 39 | 0 | 0 | 59 | 0 | 39 |
| Future Vol, veh/h | 30 | 546 | 30 | 0 | 801 | 45 | 39 | 0 | 0 | 59 | 0 | 39 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 33 | 593 | 33 | 0 | 871 | 49 | 42 | 0 | 0 | 64 | 0 | 42 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 920 | 0 | 0 | 626 | 0 | 0 | 1546 | 1595 | 610 | 1554 | 1586 | 895 |
| Stage 1 | - | - | - | - | - | - | 675 | 675 | - | 895 | 895 | - |
| Stage 2 | - | - | - | - | - | - | 871 | 920 | - | 659 | 691 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 742 | - | - | 956 | - | - | 93 | 107 | 495 | 92 | 108 | 339 |
| Stage 1 | - | - | - | - | - | - | 444 | 453 | - | 335 | 359 | - |
| Stage 2 | - | - | - | - | - | - | 346 | 350 | - | 453 | 445 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 742 | - | - | 956 | - | - | 76 | 100 | 495 | 86 | 101 | 339 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 182 | 210 | - | 209 | 221 | - |
| Stage 1 | - | - | - | - | - | - | 414 | 422 | - | 335 | 359 | - |
| Stage 2 | - | - | - | - | - | - | 303 | 350 | - | 422 | 415 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.5 | 0 | 30.7 | 30.22 |
| HCM LOS | | | D | D |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 182 | 88 | - | - | 956 | - | - | 247 |
| HCM Lane V/C Ratio | 0.233 | 0.044 | - | - | - | - | - | 0.432 |
| HCM Control Delay (s/veh) | 30.7 | 10.1 | 0 | - | 0 | - | - | 30.2 |
| HCM Lane LOS | D | B | A | - | A | - | - | D |
| HCM 95th %tile Q(veh) | 0.9 | 0.1 | - | - | 0 | - | - | 2 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 8.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 82 | 496 | 44 | 71 | 737 | 48 | 48 | 48 | 69 | 6 | 35 | 71 |
| Future Vol, veh/h | 82 | 496 | 44 | 71 | 737 | 48 | 48 | 48 | 69 | 6 | 35 | 71 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 93 | 564 | 50 | 81 | 838 | 55 | 55 | 55 | 78 | 7 | 40 | 81 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 895 | 0 | 0 | 614 | 0 | 0 | 1375 | 1831 | 589 | 1806 | 1829 | 449 |
| Stage 1 | - | - | - | - | - | - | 775 | 775 | - | 1029 | 1029 | - |
| Stage 2 | - | - | - | - | - | - | 600 | 1056 | - | 777 | 800 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 756 | - | - | 964 | - | - | 113 | 76 | 507 | 55 | 76 | 558 |
| Stage 1 | - | - | - | - | - | - | 390 | 407 | - | 251 | 310 | - |
| Stage 2 | - | - | - | - | - | - | 455 | 301 | - | 389 | 396 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 754 | - | - | 964 | - | - | 64 | 61 | 507 | 26 | 61 | 556 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 180 | 160 | - | 127 | 193 | - |
| Stage 1 | - | - | - | - | - | - | 342 | 357 | - | 229 | 283 | - |
| Stage 2 | - | - | - | - | - | - | 307 | 275 | - | 244 | 347 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.38 | 0.75 | 61.7 | 24.01 |
| HCM LOS | | | F | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 235 | 754 | - | - | 964 | - | - | 315 |
| HCM Lane V/C Ratio | 0.797 | 0.124 | - | - | 0.084 | - | - | 0.405 |
| HCM Control Delay (s/veh) | 61.7 | 10.4 | - | - | 9.1 | - | - | 24 |
| HCM Lane LOS | F | B | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 5.9 | 0.4 | - | - | 0.3 | - | - | 1.9 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.7 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 33 | 87 | 14 | 10 | 172 | 15 | 37 | 195 | 11 | 7 | 110 | 50 |
| Future Vol, veh/h | 33 | 87 | 14 | 10 | 172 | 15 | 37 | 195 | 11 | 7 | 110 | 50 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 36 | 95 | 15 | 11 | 187 | 16 | 40 | 212 | 12 | 8 | 120 | 54 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 10 | 10.8 | 11.4 | 10 |
| HCM LOS | A | B | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 15% | 25% | 5% | 4% |
| Vol Thru, % | 80% | 65% | 87% | 66% |
| Vol Right, % | 5% | 10% | 8% | 30% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 243 | 134 | 197 | 167 |
| LT Vol | 37 | 33 | 10 | 7 |
| Through Vol | 195 | 87 | 172 | 110 |
| RT Vol | 11 | 14 | 15 | 50 |
| Lane Flow Rate | 264 | 146 | 214 | 182 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.382 | 0.221 | 0.316 | 0.26 |
| Departure Headway (Hd) | 5.205 | 5.456 | 5.321 | 5.163 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 692 | 658 | 675 | 695 |
| Service Time | 3.237 | 3.492 | 3.355 | 3.198 |
| HCM Lane V/C Ratio | 0.382 | 0.222 | 0.317 | 0.262 |
| HCM Control Delay, s/veh | 11.4 | 10 | 10.8 | 10 |
| HCM Lane LOS | B | A | B | A |
| HCM 95th-tile Q | 1.8 | 0.8 | 1.4 | 1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 49 | 402 | 79 | 386 | 593 | 117 | 173 | 175 | 85 |
| Future Volume (vph) | 49 | 402 | 79 | 386 | 593 | 117 | 173 | 175 | 85 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 11.6 | 23.8 | 23.8 | 32.0 | 44.2 | 22.3 | 46.2 | 18.0 | 41.9 |
| Total Split (%) | 9.7% | 19.8% | 19.8% | 26.7% | 36.8% | 18.6% | 38.5% | 15.0% | 34.9% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.6 | 17.6 | 17.6 | 27.4 | 40.3 | 13.3 | 40.8 | 13.4 | 40.9 |
| Actuated g/C Ratio | 0.06 | 0.15 | 0.15 | 0.23 | 0.34 | 0.11 | 0.34 | 0.11 | 0.34 |
| v/c Ratio | 0.60 | 0.87 | 0.24 | 1.14 | 0.68 | 0.70 | 1.08 | 1.05 | 0.22 |
| Control Delay (s/veh) | 82.6 | 68.9 | 1.8 | 131.2 | 37.4 | 71.9 | 93.1 | 133.3 | 26.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 82.6 | 68.9 | 1.8 | 131.2 | 37.4 | 71.9 | 93.1 | 133.3 | 26.1 |
| LOS | F | E | A | F | D | E | F | F | C |
| Approach Delay (s/veh) | | 60.2 | | | 70.5 | | 89.8 | | 89.0 |
| Approach LOS | | E | | | E | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.14 | |
| Intersection Signal Delay (s/veh): 75.9 | Intersection LOS: E |
| Intersection Capacity Utilization 102.5% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

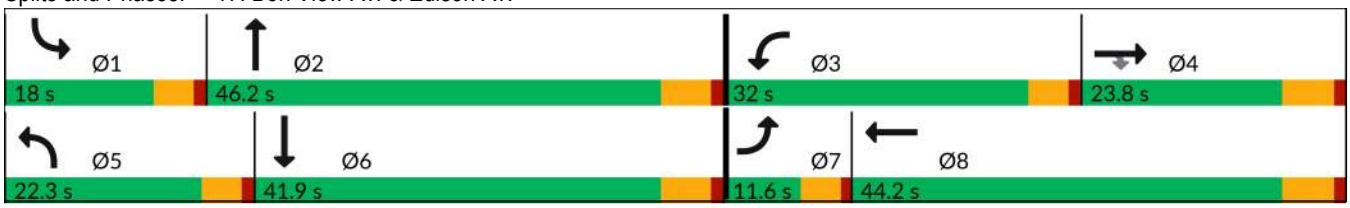

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 49 | 402 | 79 | 386 | 593 | 116 | 117 | 173 | 454 | 175 | 85 | 39 |
| Future Volume (veh/h) | 49 | 402 | 79 | 386 | 593 | 116 | 117 | 173 | 454 | 175 | 85 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 52 | 428 | 63 | 411 | 631 | 75 | 124 | 184 | 270 | 186 | 90 | 25 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 64 | 492 | 219 | 391 | 1065 | 126 | 148 | 198 | 291 | 191 | 444 | 123 |
| Arrive On Green | 0.04 | 0.22 | 0.15 | 0.25 | 0.53 | 0.35 | 0.09 | 0.46 | 0.31 | 0.12 | 0.50 | 0.33 |
| Sat Flow, veh/h | 1594 | 3367 | 1502 | 1594 | 3031 | 360 | 1594 | 649 | 952 | 1594 | 1335 | 371 |
| Grp Volume(v), veh/h | 52 | 428 | 63 | 411 | 350 | 356 | 124 | 0 | 454 | 186 | 0 | 115 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1502 | 1594 | 1683 | 1707 | 1594 | 0 | 1601 | 1594 | 0 | 1705 |
| Q Serve(g_s), s | 3.6 | 13.7 | 4.2 | 27.4 | 16.0 | 16.7 | 8.5 | 0.0 | 30.4 | 13.0 | 0.0 | 4.5 |
| Cycle Q Clear(g_c), s | 3.6 | 13.7 | 4.2 | 27.4 | 16.0 | 16.7 | 8.5 | 0.0 | 30.4 | 13.0 | 0.0 | 4.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.21 | 1.00 | | 0.59 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 64 | 492 | 219 | 391 | 591 | 600 | 148 | 0 | 489 | 191 | 0 | 567 |
| V/C Ratio(X) | 0.81 | 0.87 | 0.29 | 1.05 | 0.59 | 0.59 | 0.84 | 0.00 | 0.93 | 0.97 | 0.00 | 0.20 |
| Avail Cap(c_a), veh/h | 100 | 543 | 242 | 391 | 591 | 600 | 253 | 0 | 585 | 191 | 0 | 567 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.2 | 42.6 | 42.5 | 42.1 | 20.9 | 22.7 | 49.8 | 0.0 | 34.1 | 48.9 | 0.0 | 21.2 |
| Incr Delay (d2), s/veh | 12.3 | 13.3 | 0.7 | 59.5 | 1.6 | 1.6 | 4.7 | 0.0 | 19.3 | 56.6 | 0.0 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 5.9 | 1.5 | 16.6 | 5.2 | 5.7 | 3.5 | 0.0 | 13.2 | 8.0 | 0.0 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 65.4 | 55.9 | 43.2 | 101.6 | 22.5 | 24.3 | 54.5 | 0.0 | 53.4 | 105.6 | 0.0 | 21.4 |
| LnGrp LOS | E | E | D | F | C | C | D | | D | F | | C |
| Approach Vol, veh/h | | 543 | | | 1117 | | | 578 | | | 301 | |
| Approach Delay, s/veh | | 55.3 | | | 52.2 | | | 53.6 | | | 73.4 | |
| Approach LOS | | E | | | D | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.0 | 39.5 | 32.0 | 22.1 | 15.0 | 42.5 | 9.1 | 45.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 13.4 | 40.8 | 27.4 | 18.0 | 17.7 | 36.5 | 7.0 | 38.4 |
| Max Q Clear Time (g_c+I1), s | 15.0 | 32.4 | 29.4 | 15.7 | 10.5 | 6.5 | 5.6 | 18.7 |
| Green Ext Time (p_c), s | 0.0 | 1.7 | 0.0 | 0.6 | 0.1 | 0.5 | 0.0 | 3.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 55.7 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.6 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 70 | 89 | 7 | 3 | 119 | 12 | 19 | 22 | 4 | 8 | 21 | 89 |
| Future Vol, veh/h | 70 | 89 | 7 | 3 | 119 | 12 | 19 | 22 | 4 | 8 | 21 | 89 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 80 | 101 | 8 | 3 | 135 | 14 | 22 | 25 | 5 | 9 | 24 | 101 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.1 | 8.6 | 8.3 | 8.2 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 42% | 42% | 2% | 7% |
| Vol Thru, % | 49% | 54% | 89% | 18% |
| Vol Right, % | 9% | 4% | 9% | 75% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 45 | 166 | 134 | 118 |
| LT Vol | 19 | 70 | 3 | 8 |
| Through Vol | 22 | 89 | 119 | 21 |
| RT Vol | 4 | 7 | 12 | 89 |
| Lane Flow Rate | 51 | 189 | 152 | 134 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.07 | 0.24 | 0.191 | 0.162 |
| Departure Headway (Hd) | 4.913 | 4.588 | 4.524 | 4.347 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 728 | 781 | 792 | 825 |
| Service Time | 2.951 | 2.621 | 2.558 | 2.379 |
| HCM Lane V/C Ratio | 0.07 | 0.242 | 0.192 | 0.162 |
| HCM Control Delay, s/veh | 8.3 | 9.1 | 8.6 | 8.2 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.2 | 0.9 | 0.7 | 0.6 |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 30 | 1001 | 1115 | 118 |
| Future Volume (vph) | 30 | 1001 | 1115 | 118 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 5.0 |
| Minimum Split (s) | 23.8 | 23.8 | 23.8 | 22.6 |
| Total Split (s) | 97.0 | 97.0 | 97.0 | 23.0 |
| Total Split (%) | 80.8% | 80.8% | 80.8% | 19.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | None |
| Act Effct Green (s) | 29.8 | 29.8 | 29.8 | 10.0 |
| Actuated g/C Ratio | 0.59 | 0.59 | 0.59 | 0.20 |
| v/c Ratio | 0.21 | 0.55 | 0.67 | 0.51 |
| Control Delay (s/veh) | 9.5 | 7.9 | 9.3 | 24.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 9.5 | 7.9 | 9.3 | 24.6 |
| LOS | A | A | A | C |
| Approach Delay (s/veh) | | 7.9 | 9.3 | 24.6 |
| Approach LOS | | A | A | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 50.9 | |
| Natural Cycle: 55 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.67 | |
| Intersection Signal Delay (s/veh): 9.7 | Intersection LOS: A |
| Intersection Capacity Utilization 53.6% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 19: Edison Av. & Cucamonga Av.

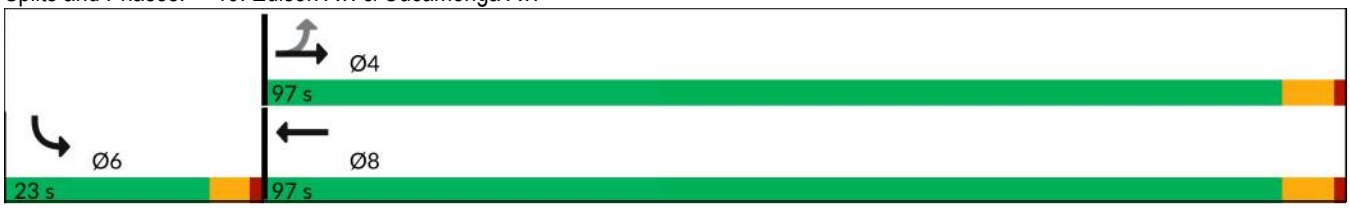

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 1001 | 1115 | 90 | 118 | 39 |
| Future Volume (veh/h) | 30 | 1001 | 1115 | 90 | 118 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 33 | 1088 | 1212 | 98 | 128 | 42 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 324 | 2038 | 1910 | 154 | 162 | 53 |
| Arrive On Green | 0.61 | 0.61 | 0.61 | 0.61 | 0.13 | 0.13 |
| Sat Flow, veh/h | 396 | 3455 | 3243 | 255 | 1226 | 402 |
| Grp Volume(v), veh/h | 33 | 1088 | 646 | 664 | 171 | 0 |
| Grp Sat Flow(s),veh/h/ln | 396 | 1683 | 1683 | 1726 | 1638 | 0 |
| Q Serve(g_s), s | 2.3 | 7.5 | 9.7 | 9.8 | 4.0 | 0.0 |
| Cycle Q Clear(g_c), s | 12.1 | 7.5 | 9.7 | 9.8 | 4.0 | 0.0 |
| Prop In Lane | 1.00 | | | 0.15 | 0.75 | 0.25 |
| Lane Grp Cap(c), veh/h | 324 | 2038 | 1019 | 1045 | 217 | 0 |
| V/C Ratio(X) | 0.10 | 0.53 | 0.63 | 0.64 | 0.79 | 0.00 |
| Avail Cap(c_a), veh/h | 996 | 7749 | 3875 | 3973 | 761 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 8.9 | 4.6 | 5.0 | 5.0 | 16.7 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.2 | 0.7 | 0.6 | 2.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.5 | 1.0 | 1.0 | 1.3 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 9.0 | 4.8 | 5.7 | 5.7 | 19.1 | 0.0 |
| LnGrp LOS | A | A | A | A | B | |
| Approach Vol, veh/h | | 1121 | 1310 | | 171 | |
| Approach Delay, s/veh | | 4.9 | 5.7 | | 19.1 | |
| Approach LOS | | A | A | | B | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 29.8 | | 9.8 | | 29.8 |
| Change Period (Y+Rc), s | | 5.8 | | 4.6 | | 5.8 |
| Max Green Setting (Gmax), s | | 91.2 | | 18.4 | | 91.2 |
| Max Q Clear Time (g_c+I1), s | | 14.1 | | 6.0 | | 11.8 |
| Green Ext Time (p_c), s | | 9.9 | | 0.2 | | 11.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 6.2 |
| HCM 7th LOS | A |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 5 | 355 | 502 | 890 | 639 | 458 |
| Future Volume (vph) | 5 | 355 | 502 | 890 | 639 | 458 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 29.0 | 29.0 | 30.0 | 61.0 | 31.0 | 31.0 |
| Total Split (%) | 32.2% | 32.2% | 33.3% | 67.8% | 34.4% | 34.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 21.0 | 21.0 | 28.4 | 57.4 | 23.2 | 23.2 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.32 | 0.64 | 0.26 | 0.26 |
| v/c Ratio | 0.85 | 0.82 | 1.07 | 0.44 | 0.79 | 0.65 |
| Control Delay (s/veh) | 53.8 | 36.0 | 71.8 | 6.1 | 38.2 | 7.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.8 | 36.0 | 71.8 | 6.5 | 38.2 | 7.2 |
| LOS | D | D | E | A | D | A |
| Approach Delay (s/veh) | 44.3 | | | 30.0 | 25.3 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 22 (24%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.07 | |
| Intersection Signal Delay (s/veh): 31.4 | Intersection LOS: C |
| Intersection Capacity Utilization 100.9% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

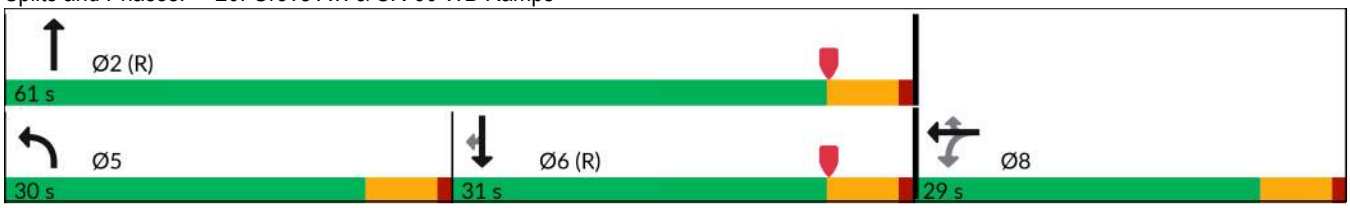

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 309 | 5 | 355 | 502 | 890 | 0 | 0 | 639 | 458 |
| Future Volume (veh/h) | 0 | 0 | 0 | 309 | 5 | 355 | 502 | 890 | 0 | 0 | 639 | 458 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 329 | 5 | 234 | 534 | 947 | 0 | 0 | 680 | 342 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 372 | 6 | 335 | 429 | 2181 | 0 | 0 | 1059 | 472 |
| Arrive On Green | | | | 0.22 | 0.22 | 0.22 | 0.54 | 1.00 | 0.00 | 0.00 | 0.31 | 0.31 |
| Sat Flow, veh/h | | | | 1663 | 25 | 1502 | 1594 | 3455 | 0 | 0 | 3455 | 1502 |
| Grp Volume(v), veh/h | | | | 334 | 0 | 234 | 534 | 947 | 0 | 0 | 680 | 342 |
| Grp Sat Flow(s),veh/h/ln | | | | 1689 | 0 | 1502 | 1594 | 1683 | 0 | 0 | 1683 | 1502 |
| Q Serve(g_s), s | | | | 17.2 | 0.0 | 12.9 | 24.2 | 0.0 | 0.0 | 0.0 | 15.6 | 18.2 |
| Cycle Q Clear(g_c), s | | | | 17.2 | 0.0 | 12.9 | 24.2 | 0.0 | 0.0 | 0.0 | 15.6 | 18.2 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 377 | 0 | 335 | 429 | 2181 | 0 | 0 | 1059 | 472 |
| V/C Ratio(X) | | | | 0.89 | 0.00 | 0.70 | 1.25 | 0.43 | 0.00 | 0.00 | 0.64 | 0.72 |
| Avail Cap(c_a), veh/h | | | | 435 | 0 | 387 | 429 | 2181 | 0 | 0 | 1059 | 472 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 33.8 | 0.0 | 32.2 | 20.8 | 0.0 | 0.0 | 0.0 | 26.5 | 27.4 |
| Incr Delay (d2), s/veh | | | | 16.9 | 0.0 | 4.0 | 112.6 | 0.1 | 0.0 | 0.0 | 3.0 | 9.3 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 8.4 | 0.0 | 4.8 | 18.2 | 0.0 | 0.0 | 0.0 | 6.2 | 7.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 50.8 | 0.0 | 36.2 | 133.4 | 0.1 | 0.0 | 0.0 | 29.5 | 36.7 |
| LnGrp LOS | | | | D | | D | F | A | | | C | D |
| Approach Vol, veh/h | | | | | 568 | | | 1481 | | | 1022 | |
| Approach Delay, s/veh | | | | | 44.8 | | | 48.1 | | | 31.9 | |
| Approach LOS | | | | | D | | | D | | | C | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 64.1 | 30.0 | 34.1 | 25.9 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | 5.8 |
| Max Green Setting (Gmax), s | 55.2 | 24.2 | 25.2 | 23.2 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 26.2 | 20.2 | 19.2 |
| Green Ext Time (p_c), s | 5.8 | 0.0 | 2.1 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 42.1 |
| HCM 7th LOS | D |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 2 | 272 | 986 | 278 | 670 |
| Future Volume (vph) | 2 | 272 | 986 | 278 | 670 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 39.2 | 17.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 43.6% | 18.9% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 25.0 | 25.0 | 33.4 | 14.0 | 52.4 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.37 | 0.16 | 0.58 |
| v/c Ratio | 0.91 | 0.50 | 1.24 | 1.18 | 0.36 |
| Control Delay (s/veh) | 56.1 | 10.6 | 139.7 | 135.3 | 25.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 56.1 | 10.6 | 139.7 | 135.3 | 25.2 |
| LOS | E | B | F | F | C |
| Approach Delay (s/veh) | 37.9 | | 139.7 | | 57.5 |
| Approach LOS | D | | F | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.24 | |
| Intersection Signal Delay (s/veh): 92.2 | Intersection LOS: F |
| Intersection Capacity Utilization 100.9% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 405 | 2 | 272 | 0 | 0 | 0 | 0 | 986 | 486 | 278 | 670 | 0 |
| Future Volume (veh/h) | 405 | 2 | 272 | 0 | 0 | 0 | 0 | 986 | 486 | 278 | 670 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 422 | 2 | 142 | | | | 0 | 1027 | 298 | 290 | 698 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 453 | 2 | 405 | | | | 0 | 1029 | 296 | 213 | 1987 | 0 |
| Arrive On Green | 0.40 | 0.27 | 0.40 | | | | 0.00 | 0.60 | 0.40 | 0.27 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1680 | 8 | 1502 | | | | 0 | 2653 | 738 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 424 | 0 | 142 | | | | 0 | 672 | 653 | 290 | 698 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1502 | | | | 0 | 1683 | 1619 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 21.6 | 0.0 | 5.9 | | | | 0.0 | 35.6 | 36.1 | 12.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 21.6 | 0.0 | 5.9 | | | | 0.0 | 35.6 | 36.1 | 12.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 0.46 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 455 | 0 | 405 | | | | 0 | 676 | 650 | 213 | 1987 | 0 |
| V/C Ratio(X) | 0.93 | 0.00 | 0.35 | | | | 0.00 | 0.99 | 1.01 | 1.36 | 0.35 | 0.00 |
| Avail Cap(c_a), veh/h | 506 | 0 | 450 | | | | 0 | 676 | 650 | 213 | 1987 | 0 |
| HCM Platoon Ratio | 1.50 | 1.00 | 1.50 | | | | 1.00 | 1.50 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.52 | 0.52 | 0.00 |
| Uniform Delay (d), s/veh | 26.0 | 0.0 | 21.3 | | | | 0.0 | 17.8 | 22.0 | 33.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 21.9 | 0.0 | 0.2 | | | | 0.0 | 33.2 | 36.6 | 179.2 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.3 | 0.0 | 1.9 | | | | 0.0 | 13.9 | 16.8 | 14.2 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 48.0 | 0.0 | 21.5 | | | | 0.0 | 51.0 | 58.7 | 212.2 | 0.3 | 0.0 |
| LnGrp LOS | D | | C | | | | | D | F | F | A | |
| Approach Vol, veh/h | | 566 | | | | | | 1325 | | | 988 | |
| Approach Delay, s/veh | | 41.3 | | | | | | 54.8 | | | 62.5 | |
| Approach LOS | | D | | | | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 41.9 | | 31.1 | | 58.9 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 12.0 | 33.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 14.0 | 38.1 | | 23.6 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.7 | | 3.9 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 54.8 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 226 | 176 | 33 | 208 | 67 | 961 | 75 | 699 |
| Future Volume (vph) | 226 | 176 | 33 | 208 | 67 | 961 | 75 | 699 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.1 | 21.6 | 6.5 | 12.6 | 7.9 | 23.5 | 8.1 | 23.7 |
| Actuated g/C Ratio | 0.15 | 0.29 | 0.09 | 0.17 | 0.11 | 0.32 | 0.11 | 0.32 |
| v/c Ratio | 1.09 | 0.28 | 0.28 | 0.66 | 0.46 | 1.09 | 0.49 | 0.83 |
| Control Delay (s/veh) | 121.0 | 19.7 | 38.9 | 19.6 | 41.8 | 84.7 | 42.8 | 33.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 121.0 | 19.7 | 38.9 | 19.6 | 41.8 | 84.7 | 42.8 | 33.0 |
| LOS | F | B | D | B | D | F | D | C |
| Approach Delay (s/veh) | | 69.0 | | 21.0 | | 82.0 | | 33.8 |
| Approach LOS | | E | | C | | F | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 74 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.09 | |
| Intersection Signal Delay (s/veh): 56.0 | Intersection LOS: E |
| Intersection Capacity Utilization 78.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

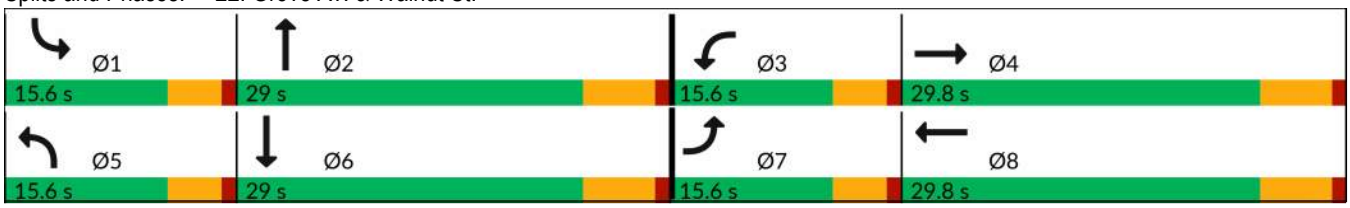

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 132 | 408 | 19 | 666 | 41 | 779 | 77 | 569 | 149 |
| Future Volume (vph) | 132 | 408 | 19 | 666 | 41 | 779 | 77 | 569 | 149 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.0 | 38.3 | 9.7 | 33.0 | 11.0 | 61.0 | 11.0 | 61.0 | 61.0 |
| Total Split (%) | 12.5% | 31.9% | 8.1% | 27.5% | 9.2% | 50.8% | 9.2% | 50.8% | 50.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.4 | 37.9 | 5.1 | 26.8 | 6.1 | 55.2 | 6.4 | 57.4 | 57.4 |
| Actuated g/C Ratio | 0.09 | 0.32 | 0.04 | 0.22 | 0.05 | 0.46 | 0.05 | 0.48 | 0.48 |
| v/c Ratio | 1.04 | 0.86 | 0.32 | 1.13 | 0.56 | 1.09 | 1.00 | 0.73 | 0.20 |
| Control Delay (s/veh) | 142.1 | 56.2 | 68.5 | 118.6 | 81.5 | 89.4 | 155.4 | 32.3 | 3.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 142.1 | 56.2 | 68.5 | 118.6 | 81.5 | 89.4 | 155.4 | 32.3 | 3.6 |
| LOS | F | E | E | F | F | F | F | C | A |
| Approach Delay (s/veh) | | 76.0 | | 117.4 | | 89.0 | | 38.9 | |
| Approach LOS | | E | | F | | F | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.13 | |
| Intersection Signal Delay (s/veh): 80.8 | Intersection LOS: F |
| Intersection Capacity Utilization 98.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

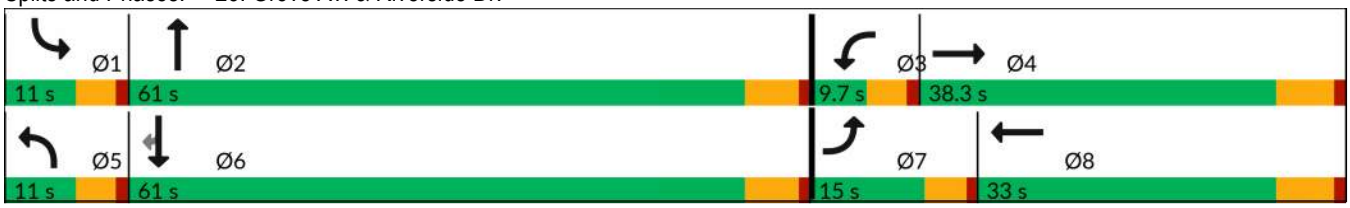

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 132 | 408 | 31 | 19 | 666 | 109 | 41 | 779 | 28 | 77 | 569 | 149 |
| Future Volume (veh/h) | 132 | 408 | 31 | 19 | 666 | 109 | 41 | 779 | 28 | 77 | 569 | 149 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 143 | 443 | 6 | 21 | 724 | 65 | 45 | 847 | 23 | 84 | 618 | 86 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 138 | 504 | 7 | 33 | 697 | 63 | 55 | 790 | 21 | 85 | 848 | 719 |
| Arrive On Green | 0.09 | 0.29 | 0.29 | 0.02 | 0.22 | 0.22 | 0.03 | 0.46 | 0.46 | 0.05 | 0.48 | 0.48 |
| Sat Flow, veh/h | 1594 | 1743 | 24 | 1594 | 3120 | 280 | 1594 | 1717 | 47 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 143 | 0 | 449 | 21 | 390 | 399 | 45 | 0 | 870 | 84 | 618 | 86 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1767 | 1594 | 1683 | 1717 | 1594 | 0 | 1764 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 10.4 | 0.0 | 29.1 | 1.6 | 26.8 | 26.8 | 3.4 | 0.0 | 55.2 | 6.3 | 33.5 | 3.8 |
| Cycle Q Clear(g_c), s | 10.4 | 0.0 | 29.1 | 1.6 | 26.8 | 26.8 | 3.4 | 0.0 | 55.2 | 6.3 | 33.5 | 3.8 |
| Prop In Lane | 1.00 | | 0.01 | 1.00 | | 0.16 | 1.00 | | 0.03 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 138 | 0 | 511 | 33 | 376 | 383 | 55 | 0 | 811 | 85 | 848 | 719 |
| V/C Ratio(X) | 1.04 | 0.00 | 0.88 | 0.63 | 1.04 | 1.04 | 0.81 | 0.00 | 1.07 | 0.99 | 0.73 | 0.12 |
| Avail Cap(c_a), veh/h | 138 | 0 | 511 | 68 | 376 | 383 | 85 | 0 | 811 | 85 | 848 | 719 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.8 | 0.0 | 40.7 | 58.3 | 46.6 | 46.6 | 57.5 | 0.0 | 32.4 | 56.8 | 25.0 | 17.3 |
| Incr Delay (d2), s/veh | 86.3 | 0.0 | 16.0 | 7.0 | 56.7 | 56.6 | 15.9 | 0.0 | 52.9 | 93.4 | 3.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.3 | 0.0 | 14.3 | 0.7 | 16.6 | 16.9 | 1.6 | 0.0 | 33.6 | 4.7 | 13.9 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 141.1 | 0.0 | 56.7 | 65.3 | 103.3 | 103.2 | 73.4 | 0.0 | 85.3 | 150.1 | 28.2 | 17.4 |
| LnGrp LOS | F | | E | E | F | F | E | | F | F | C | B |
| Approach Vol, veh/h | | 592 | | | 810 | | | 915 | | | 788 | |
| Approach Delay, s/veh | | 77.1 | | | 102.3 | | | 84.7 | | | 40.1 | |
| Approach LOS | | E | | | F | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 61.0 | 7.1 | 40.9 | 8.8 | 63.2 | 15.0 | 33.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 6.4 | 55.2 | 5.1 | 32.1 | 6.4 | 55.2 | 10.4 | 26.8 |
| Max Q Clear Time (g_c+I1), s | 8.3 | 57.2 | 3.6 | 31.1 | 5.4 | 35.5 | 12.4 | 28.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 3.9 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 76.5 |
| HCM 7th LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 226 | 176 | 63 | 33 | 208 | 198 | 67 | 961 | 46 | 75 | 699 | 67 |
| Future Volume (veh/h) | 226 | 176 | 63 | 33 | 208 | 198 | 67 | 961 | 46 | 75 | 699 | 67 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 260 | 202 | 63 | 38 | 239 | 168 | 77 | 1105 | 44 | 86 | 803 | 37 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 241 | 741 | 225 | 59 | 340 | 229 | 95 | 1052 | 42 | 107 | 1068 | 49 |
| Arrive On Green | 0.15 | 0.29 | 0.29 | 0.04 | 0.18 | 0.18 | 0.06 | 0.32 | 0.32 | 0.07 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1594 | 2543 | 771 | 1594 | 1920 | 1295 | 1594 | 3298 | 131 | 1594 | 3275 | 151 |
| Grp Volume(v), veh/h | 260 | 132 | 133 | 38 | 208 | 199 | 77 | 564 | 585 | 86 | 413 | 427 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1630 | 1594 | 1683 | 1531 | 1594 | 1683 | 1746 | 1594 | 1683 | 1742 |
| Q Serve(g_s), s | 11.0 | 4.4 | 4.6 | 1.7 | 8.5 | 8.9 | 3.5 | 23.2 | 23.2 | 3.9 | 15.9 | 15.9 |
| Cycle Q Clear(g_c), s | 11.0 | 4.4 | 4.6 | 1.7 | 8.5 | 8.9 | 3.5 | 23.2 | 23.2 | 3.9 | 15.9 | 15.9 |
| Prop In Lane | 1.00 | | 0.47 | 1.00 | | 0.85 | 1.00 | | 0.08 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 241 | 491 | 475 | 59 | 298 | 271 | 95 | 537 | 557 | 107 | 549 | 568 |
| V/C Ratio(X) | 1.08 | 0.27 | 0.28 | 0.65 | 0.70 | 0.73 | 0.81 | 1.05 | 1.05 | 0.81 | 0.75 | 0.75 |
| Avail Cap(c_a), veh/h | 241 | 555 | 538 | 241 | 555 | 505 | 241 | 537 | 557 | 241 | 549 | 568 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.9 | 19.8 | 19.9 | 34.6 | 28.1 | 28.3 | 33.8 | 24.8 | 24.8 | 33.5 | 21.9 | 21.9 |
| Incr Delay (d2), s/veh | 80.5 | 0.3 | 0.3 | 4.4 | 3.0 | 3.8 | 6.0 | 52.7 | 52.1 | 5.3 | 5.8 | 5.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.2 | 1.6 | 1.6 | 0.7 | 3.3 | 3.3 | 1.4 | 15.9 | 16.4 | 1.6 | 6.5 | 6.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 111.4 | 20.1 | 20.2 | 39.0 | 31.1 | 32.1 | 39.8 | 77.5 | 76.9 | 38.8 | 27.6 | 27.5 |
| LnGrp LOS | F | C | C | D | C | C | D | F | F | D | C | C |
| Approach Vol, veh/h | | 525 | | | 445 | | | 1226 | | | 926 | |
| Approach Delay, s/veh | | 65.3 | | | 32.2 | | | 74.8 | | | 28.6 | |
| Approach LOS | | E | | | C | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.5 | 29.0 | 7.3 | 27.0 | 8.9 | 29.5 | 15.6 | 18.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 5.9 | 25.2 | 3.7 | 6.6 | 5.5 | 17.9 | 13.0 | 10.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 2.3 | 0.0 | 1.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 53.5 |
| HCM 7th LOS | D |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 343.5 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 62 | 92 | 24 | 21 | 247 | 49 | 53 | 742 | 28 | 32 | 582 | 13 |
| Future Vol, veh/h | 62 | 92 | 24 | 21 | 247 | 49 | 53 | 742 | 28 | 32 | 582 | 13 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 72 | 107 | 28 | 24 | 287 | 57 | 62 | 863 | 33 | 37 | 677 | 15 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 31.2 | 56 | 539.6 | 320 |
| HCM LOS | D | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 6% | 35% | 7% | 5% |
| Vol Thru, % | 90% | 52% | 78% | 93% |
| Vol Right, % | 3% | 13% | 15% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 823 | 178 | 317 | 627 |
| LT Vol | 53 | 62 | 21 | 32 |
| Through Vol | 742 | 92 | 247 | 582 |
| RT Vol | 28 | 24 | 49 | 13 |
| Lane Flow Rate | 957 | 207 | 369 | 729 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 2.134 | 0.526 | 0.847 | 1.627 |
| Departure Headway (Hd) | 9.335 | 13.804 | 11.873 | 10.283 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 402 | 265 | 310 | 365 |
| Service Time | 7.335 | 11.804 | 9.873 | 8.283 |
| HCM Lane V/C Ratio | 2.381 | 0.781 | 1.19 | 1.997 |
| HCM Control Delay, s/veh | 539.6 | 31.2 | 56 | 320 |
| HCM Lane LOS | F | D | F | F |
| HCM 95th-tile Q | 59.8 | 2.8 | 7.3 | 33.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 195.2 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 53 | 16 | 9 | 119 | 20 | 55 | 772 | 4 | 15 | 564 | 23 |
| Future Vol, veh/h | 36 | 53 | 16 | 9 | 119 | 20 | 55 | 772 | 4 | 15 | 564 | 23 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 60 | 18 | 10 | 135 | 23 | 63 | 877 | 5 | 17 | 641 | 26 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 15.8 | 17 | 304.5 | 119.3 |
| HCM LOS | C | C | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 7% | 34% | 6% | 2% |
| Vol Thru, % | 93% | 50% | 80% | 94% |
| Vol Right, % | 0% | 15% | 14% | 4% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 831 | 105 | 148 | 602 |
| LT Vol | 55 | 36 | 9 | 15 |
| Through Vol | 772 | 53 | 119 | 564 |
| RT Vol | 4 | 16 | 20 | 23 |
| Lane Flow Rate | 944 | 119 | 168 | 684 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.62 | 0.263 | 0.357 | 1.168 |
| Departure Headway (Hd) | 6.49 | 9.448 | 9.037 | 7 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 567 | 383 | 400 | 527 |
| Service Time | 4.49 | 7.448 | 7.037 | 5 |
| HCM Lane V/C Ratio | 1.665 | 0.311 | 0.42 | 1.298 |
| HCM Control Delay, s/veh | 304.5 | 15.8 | 17 | 119.3 |
| HCM Lane LOS | F | C | C | F |
| HCM 95th-tile Q | 49.8 | 1 | 1.6 | 21.4 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 221 | 650 | 169 | 175 | 737 | 260 | 223 | 348 | 203 | 282 |
| Future Volume (vph) | 221 | 650 | 169 | 175 | 737 | 260 | 223 | 348 | 203 | 282 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 21.0 | 33.4 | 33.4 | 20.6 | 33.0 | 33.0 | 22.4 | 46.0 | 20.0 | 43.6 |
| Total Split (%) | 17.5% | 27.8% | 27.8% | 17.2% | 27.5% | 27.5% | 18.7% | 38.3% | 16.7% | 36.3% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 16.4 | 27.6 | 27.6 | 16.0 | 27.2 | 27.2 | 17.8 | 40.6 | 15.4 | 38.2 |
| Actuated g/C Ratio | 0.14 | 0.23 | 0.23 | 0.13 | 0.23 | 0.23 | 0.15 | 0.34 | 0.13 | 0.32 |
| v/c Ratio | 1.16 | 0.96 | 0.39 | 0.94 | 1.10 | 0.52 | 1.08 | 1.10 | 1.14 | 0.97 |
| Control Delay (s/veh) | 157.6 | 69.7 | 7.7 | 100.8 | 107.7 | 7.9 | 130.2 | 104.0 | 152.2 | 71.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 157.6 | 69.7 | 7.7 | 100.8 | 107.7 | 7.9 | 130.2 | 104.0 | 152.2 | 71.5 |
| LOS | F | E | A | F | F | A | F | F | F | E |
| Approach Delay (s/veh) | | 78.3 | | | 84.6 | | | 111.4 | | 96.0 |
| Approach LOS | | E | | | F | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.16 | |
| Intersection Signal Delay (s/veh): 90.6 | Intersection LOS: F |
| Intersection Capacity Utilization 97.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

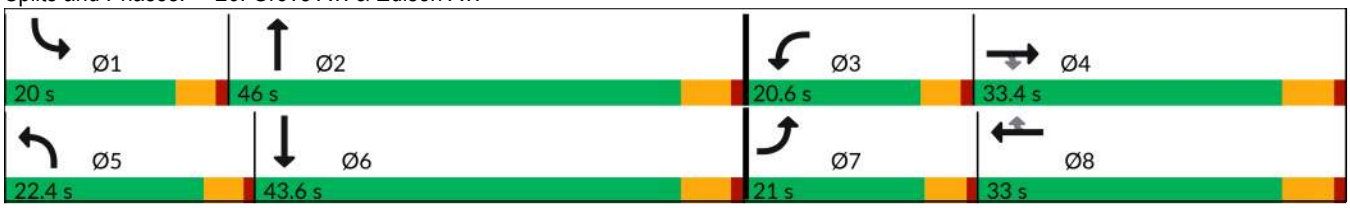

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 221 | 650 | 169 | 175 | 737 | 260 | 223 | 348 | 215 | 203 | 282 | 186 |
| Future Volume (veh/h) | 221 | 650 | 169 | 175 | 737 | 260 | 223 | 348 | 215 | 203 | 282 | 186 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 251 | 739 | 112 | 199 | 838 | 164 | 253 | 395 | 130 | 231 | 320 | 131 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 222 | 791 | 353 | 217 | 779 | 348 | 241 | 414 | 136 | 209 | 362 | 148 |
| Arrive On Green | 0.14 | 0.35 | 0.23 | 0.14 | 0.35 | 0.23 | 0.15 | 0.49 | 0.32 | 0.13 | 0.46 | 0.30 |
| Sat Flow, veh/h | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 | 1594 | 1276 | 420 | 1594 | 1190 | 487 |
| Grp Volume(v), veh/h | 251 | 739 | 112 | 199 | 838 | 164 | 253 | 0 | 525 | 231 | 0 | 451 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 | 1594 | 0 | 1696 | 1594 | 0 | 1677 |
| Q Serve(g_s), s | 16.4 | 24.9 | 7.2 | 14.5 | 27.2 | 11.1 | 17.8 | 0.0 | 35.1 | 15.4 | 0.0 | 29.3 |
| Cycle Q Clear(g_c), s | 16.4 | 24.9 | 7.2 | 14.5 | 27.2 | 11.1 | 17.8 | 0.0 | 35.1 | 15.4 | 0.0 | 29.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.25 | 1.00 | | 0.29 |
| Lane Grp Cap(c), veh/h | 222 | 791 | 353 | 217 | 779 | 348 | 241 | 0 | 550 | 209 | 0 | 510 |
| V/C Ratio(X) | 1.13 | 0.93 | 0.32 | 0.92 | 1.08 | 0.47 | 1.05 | 0.00 | 0.95 | 1.11 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 222 | 791 | 353 | 217 | 779 | 348 | 241 | 0 | 586 | 209 | 0 | 545 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.6 | 37.2 | 37.2 | 50.1 | 38.4 | 39.0 | 49.9 | 0.0 | 31.7 | 51.1 | 0.0 | 32.7 |
| Incr Delay (d2), s/veh | 99.2 | 18.1 | 0.5 | 39.0 | 54.5 | 1.0 | 71.1 | 0.0 | 25.5 | 93.6 | 0.0 | 15.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.5 | 10.7 | 2.7 | 8.0 | 15.6 | 4.1 | 11.6 | 0.0 | 15.9 | 11.4 | 0.0 | 12.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 149.8 | 55.3 | 37.7 | 89.1 | 92.8 | 40.0 | 121.0 | 0.0 | 57.2 | 144.6 | 0.0 | 47.9 |
| LnGrp LOS | F | E | D | F | F | D | F | | E | F | | D |
| Approach Vol, veh/h | | 1102 | | | 1201 | | | 778 | | | 682 | |
| Approach Delay, s/veh | | 75.0 | | | 85.0 | | | 77.9 | | | 80.7 | |
| Approach LOS | | E | | | F | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.0 | 43.5 | 20.6 | 33.4 | 22.4 | 41.1 | 21.0 | 33.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 15.4 | 40.6 | 16.0 | 27.6 | 17.8 | 38.2 | 16.4 | 27.2 |
| Max Q Clear Time (g_c+I1), s | 17.4 | 37.1 | 16.5 | 26.9 | 19.8 | 31.3 | 18.4 | 29.2 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | 0.0 | 0.4 | 0.0 | 1.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 79.8 |
| HCM 7th LOS | E |

Notes

User approved pedestrian interval to be less than phase max green.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 14.5 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 6 | 81 | 1 | 2 | 198 | 220 | 1 | 47 | 2 | 251 | 62 | 17 |
| Future Vol, veh/h | 6 | 81 | 1 | 2 | 198 | 220 | 1 | 47 | 2 | 251 | 62 | 17 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 6 | 86 | 1 | 2 | 211 | 234 | 1 | 50 | 2 | 267 | 66 | 18 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.9 | 15.6 | 9.6 | 15.1 |
| HCM LOS | A | C | A | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 2% | 7% | 0% | 76% |
| Vol Thru, % | 94% | 92% | 47% | 19% |
| Vol Right, % | 4% | 1% | 52% | 5% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 50 | 88 | 420 | 330 |
| LT Vol | 1 | 6 | 2 | 251 |
| Through Vol | 47 | 81 | 198 | 62 |
| RT Vol | 2 | 1 | 220 | 17 |
| Lane Flow Rate | 53 | 94 | 447 | 351 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.088 | 0.151 | 0.615 | 0.543 |
| Departure Headway (Hd) | 5.978 | 5.803 | 4.957 | 5.568 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 597 | 616 | 728 | 646 |
| Service Time | 4.034 | 3.855 | 2.995 | 3.605 |
| HCM Lane V/C Ratio | 0.089 | 0.153 | 0.614 | 0.543 |
| HCM Control Delay, s/veh | 9.6 | 9.9 | 15.6 | 15.1 |
| HCM Lane LOS | A | A | C | C |
| HCM 95th-tile Q | 0.3 | 0.5 | 4.3 | 3.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 30 | 1038 | 1132 | 30 | 39 | 39 |
| Future Vol, veh/h | 30 | 1038 | 1132 | 30 | 39 | 39 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 2 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 33 | 1128 | 1230 | 33 | 42 | 42 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1263 | 0 | - | 0 | 1876 | 1247 |
| Stage 1 | - | - | - | - | 1247 | - |
| Stage 2 | - | - | - | - | 629 | - |
| Critical Hdwy | 4.13 | - | - | - | 6.63 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.83 | - |
| Follow-up Hdwy | 2.219 | - | - | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | 548 | - | - | - | 71 | 211 |
| Stage 1 | - | - | - | - | 270 | - |
| Stage 2 | - | - | - | - | 494 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 548 | - | - | - | 64 | 211 |
| Mov Cap-2 Maneuver | - | - | - | - | 215 | - |
| Stage 1 | - | - | - | - | 247 | - |
| Stage 2 | - | - | - | - | 494 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 1.29 | 0 | 32.69 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 101 | - | - | - | 213 |
| HCM Lane V/C Ratio | 0.059 | - | - | - | 0.398 |
| HCM Control Delay (s/veh) | 12 | 1 | - | - | 32.7 |
| HCM Lane LOS | B | A | - | - | D |
| HCM 95th %tile Q(veh) | 0.2 | - | - | - | 1.8 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 5.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 15 | 438 | 60 | 79 | 684 | 17 | 71 | 33 | 142 | 12 | 25 | 39 |
| Future Vol, veh/h | 15 | 438 | 60 | 79 | 684 | 17 | 71 | 33 | 142 | 12 | 25 | 39 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 17 | 487 | 67 | 88 | 760 | 19 | 79 | 37 | 158 | 13 | 28 | 43 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 785 | 0 | 0 | 553 | 0 | 0 | 1123 | 1514 | 277 | 1246 | 1538 | 395 |
| Stage 1 | - | - | - | - | - | - | 553 | 553 | - | 951 | 951 | - |
| Stage 2 | - | - | - | - | - | - | 569 | 960 | - | 295 | 587 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 830 | - | - | 1013 | - | - | 160 | 119 | 721 | 130 | 115 | 604 |
| Stage 1 | - | - | - | - | - | - | 485 | 512 | - | 279 | 336 | - |
| Stage 2 | - | - | - | - | - | - | 474 | 333 | - | 689 | 495 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 825 | - | - | 1013 | - | - | 120 | 106 | 721 | 78 | 102 | 600 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 287 | 250 | - | 214 | 248 | - |
| Stage 1 | - | - | - | - | - | - | 475 | 502 | - | 254 | 306 | - |
| Stage 2 | - | - | - | - | - | - | 365 | 302 | - | 489 | 485 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.28 | 0.9 | 27.28 | 18.93 |
| HCM LOS | | | D | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 427 | 825 | - | - | 1013 | - | - | 342 |
| HCM Lane V/C Ratio | 0.641 | 0.02 | - | - | 0.087 | - | - | 0.247 |
| HCM Control Delay (s/veh) | 27.3 | 9.5 | - | - | 8.9 | - | - | 18.9 |
| HCM Lane LOS | D | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 4.4 | 0.1 | - | - | 0.3 | - | - | 1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.5 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 11 | 25 | 11 | 24 | 5 | 81 | 253 | 14 | 13 | 138 | 43 |
| Future Vol, veh/h | 36 | 11 | 25 | 11 | 24 | 5 | 81 | 253 | 14 | 13 | 138 | 43 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 40 | 12 | 27 | 12 | 26 | 5 | 89 | 278 | 15 | 14 | 152 | 47 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9 | 8.8 | 11.7 | 9.3 |
| HCM LOS | A | A | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 23% | 50% | 28% | 7% |
| Vol Thru, % | 73% | 15% | 60% | 71% |
| Vol Right, % | 4% | 35% | 13% | 22% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 348 | 72 | 40 | 194 |
| LT Vol | 81 | 36 | 11 | 13 |
| Through Vol | 253 | 11 | 24 | 138 |
| RT Vol | 14 | 25 | 5 | 43 |
| Lane Flow Rate | 382 | 79 | 44 | 213 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.48 | 0.115 | 0.066 | 0.27 |
| Departure Headway (Hd) | 4.515 | 5.224 | 5.371 | 4.558 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 795 | 682 | 662 | 785 |
| Service Time | 2.554 | 3.29 | 3.442 | 2.604 |
| HCM Lane V/C Ratio | 0.481 | 0.116 | 0.066 | 0.271 |
| HCM Control Delay, s/veh | 11.7 | 9 | 8.8 | 9.3 |
| HCM Lane LOS | B | A | A | A |
| HCM 95th-tile Q | 2.6 | 0.4 | 0.2 | 1.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 37 | 718 | 303 | 125 | 718 | 378 | 204 | 44 | 76 |
| Future Volume (vph) | 37 | 718 | 303 | 125 | 718 | 378 | 204 | 44 | 76 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 9.6 | 51.6 | 51.6 | 14.0 | 56.0 | 30.0 | 43.4 | 11.0 | 24.4 |
| Total Split (%) | 8.0% | 43.0% | 43.0% | 11.7% | 46.7% | 25.0% | 36.2% | 9.2% | 20.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.0 | 47.0 | 47.0 | 9.4 | 53.4 | 25.4 | 35.2 | 6.1 | 13.9 |
| Actuated g/C Ratio | 0.04 | 0.41 | 0.41 | 0.08 | 0.47 | 0.22 | 0.31 | 0.05 | 0.12 |
| v/c Ratio | 0.58 | 1.07 | 0.44 | 1.05 | 1.09 | 1.17 | 0.75 | 0.57 | 0.63 |
| Control Delay (s/veh) | 87.0 | 88.6 | 9.6 | 143.3 | 89.5 | 142.3 | 43.2 | 79.5 | 52.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 87.0 | 88.6 | 9.6 | 143.3 | 89.5 | 142.3 | 43.2 | 79.5 | 52.0 |
| LOS | F | F | A | F | F | F | D | E | D |
| Approach Delay (s/veh) | | 65.9 | | | 96.7 | | 93.6 | | 59.0 |
| Approach LOS | | E | | | F | | F | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 114.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.17 | |
| Intersection Signal Delay (s/veh): 82.5 | Intersection LOS: F |
| Intersection Capacity Utilization 97.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

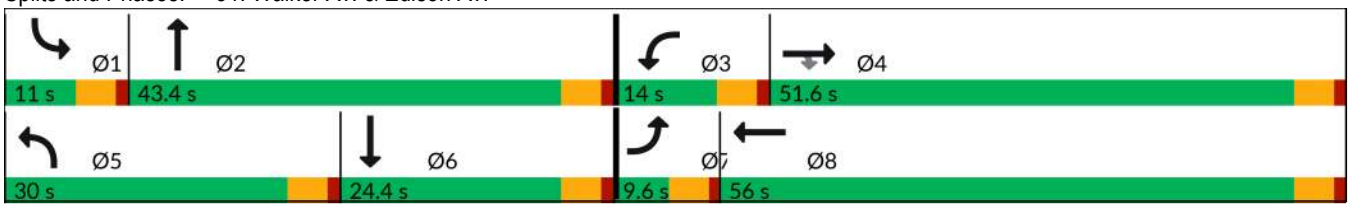

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 37 | 718 | 303 | 125 | 718 | 96 | 378 | 204 | 161 | 44 | 76 | 52 |
| Future Volume (veh/h) | 37 | 718 | 303 | 125 | 718 | 96 | 378 | 204 | 161 | 44 | 76 | 52 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 40 | 780 | 220 | 136 | 780 | 77 | 411 | 222 | 132 | 48 | 83 | 46 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 51 | 748 | 634 | 135 | 753 | 74 | 364 | 300 | 179 | 59 | 106 | 59 |
| Arrive On Green | 0.03 | 0.42 | 0.42 | 0.08 | 0.47 | 0.47 | 0.23 | 0.29 | 0.29 | 0.04 | 0.10 | 0.10 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1587 | 157 | 1594 | 1032 | 614 | 1594 | 1065 | 590 |
| Grp Volume(v), veh/h | 40 | 780 | 220 | 136 | 0 | 857 | 411 | 0 | 354 | 48 | 0 | 129 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1744 | 1594 | 0 | 1646 | 1594 | 0 | 1655 |
| Q Serve(g_s), s | 2.8 | 47.0 | 11.0 | 9.4 | 0.0 | 52.9 | 25.4 | 0.0 | 21.6 | 3.3 | 0.0 | 8.5 |
| Cycle Q Clear(g_c), s | 2.8 | 47.0 | 11.0 | 9.4 | 0.0 | 52.9 | 25.4 | 0.0 | 21.6 | 3.3 | 0.0 | 8.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.09 | 1.00 | | 0.37 | 1.00 | | 0.36 |
| Lane Grp Cap(c), veh/h | 51 | 748 | 634 | 135 | 0 | 828 | 364 | 0 | 479 | 59 | 0 | 165 |
| V/C Ratio(X) | 0.79 | 1.04 | 0.35 | 1.01 | 0.00 | 1.04 | 1.13 | 0.00 | 0.74 | 0.81 | 0.00 | 0.78 |
| Avail Cap(c_a), veh/h | 72 | 748 | 634 | 135 | 0 | 828 | 364 | 0 | 574 | 92 | 0 | 294 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.5 | 32.2 | 21.8 | 51.0 | 0.0 | 29.2 | 43.0 | 0.0 | 35.6 | 53.2 | 0.0 | 48.9 |
| Incr Delay (d2), s/veh | 20.4 | 44.5 | 0.3 | 80.4 | 0.0 | 40.8 | 87.4 | 0.0 | 4.1 | 14.1 | 0.0 | 7.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 28.1 | 3.8 | 6.7 | 0.0 | 29.7 | 18.2 | 0.0 | 8.6 | 1.5 | 0.0 | 3.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 73.9 | 76.7 | 22.1 | 131.4 | 0.0 | 70.0 | 130.4 | 0.0 | 39.8 | 67.3 | 0.0 | 56.6 |
| LnGrp LOS | E | F | C | F | | F | F | | D | E | | E |
| Approach Vol, veh/h | | 1040 | | | 993 | | | 765 | | | 177 | |
| Approach Delay, s/veh | | 65.1 | | | 78.4 | | | 88.4 | | | 59.5 | |
| Approach LOS | | E | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.7 | 37.0 | 14.0 | 51.6 | 30.0 | 15.7 | 8.1 | 57.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 38.8 | 9.4 | 47.0 | 25.4 | 19.8 | 5.0 | 51.4 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 23.6 | 11.4 | 49.0 | 27.4 | 10.5 | 4.8 | 54.9 |
| Green Ext Time (p_c), s | 0.0 | 1.6 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 75.2 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.1 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 34 | 255 | 492 | 203 | 68 | 48 |
| Future Vol, veh/h | 34 | 255 | 492 | 203 | 68 | 48 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 35 | 266 | 513 | 211 | 71 | 50 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 726 | 0 | - | 0 | 957 | 620 |
| Stage 1 | - | - | - | - | 620 | - |
| Stage 2 | - | - | - | - | 336 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 877 | - | - | - | 286 | 488 |
| Stage 1 | - | - | - | - | 536 | - |
| Stage 2 | - | - | - | - | 724 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 875 | - | - | - | 271 | 487 |
| Mov Cap-2 Maneuver | - | - | - | - | 390 | - |
| Stage 1 | - | - | - | - | 510 | - |
| Stage 2 | - | - | - | - | 722 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 1.09 | 0 | 16.8 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 212 | - | - | - | 425 |
| HCM Lane V/C Ratio | 0.04 | - | - | - | 0.284 |
| HCM Control Delay (s/veh) | 9.3 | 0 | - | - | 16.8 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.2 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 362 | 2 | 298 | 615 | 845 | 390 | 77 |
| Future Volume (vph) | 362 | 2 | 298 | 615 | 845 | 390 | 77 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 23.0 | 23.0 | 23.0 | 27.0 | 67.0 | 40.0 | 40.0 |
| Total Split (%) | 25.6% | 25.6% | 25.6% | 30.0% | 74.4% | 44.4% | 44.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 19.7 | 19.7 | 19.7 | 24.1 | 58.7 | 29.6 | 29.6 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.27 | 0.65 | 0.33 | 0.33 |
| v/c Ratio | 0.75 | 0.68 | 0.48 | 0.84 | 0.29 | 0.21 | 0.15 |
| Control Delay (s/veh) | 48.8 | 39.1 | 10.5 | 43.4 | 4.4 | 22.9 | 3.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.8 | 39.1 | 10.5 | 43.4 | 4.4 | 22.9 | 3.4 |
| LOS | D | D | B | D | A | C | A |
| Approach Delay (s/veh) | | 33.5 | | | 20.8 | 19.7 | |
| Approach LOS | | C | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 57.6 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 23.8 | Intersection LOS: C |
| Intersection Capacity Utilization 76.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

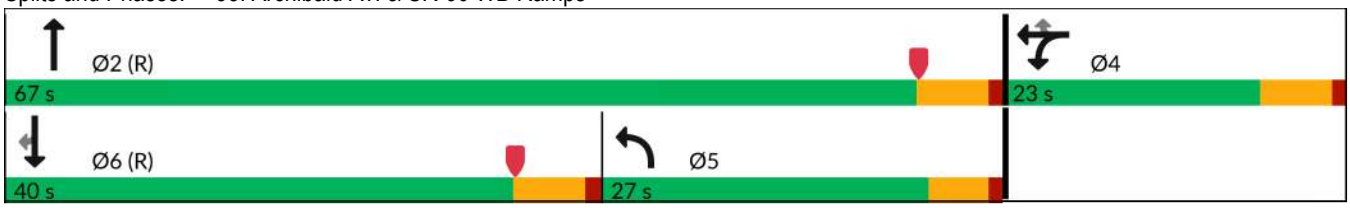

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 362 | 2 | 298 | 615 | 845 | 0 | 0 | 390 | 77 |
| Future Volume (veh/h) | 0 | 0 | 0 | 362 | 2 | 298 | 615 | 845 | 0 | 0 | 390 | 77 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.96 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1575 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 421 | 0 | 76 | 654 | 899 | 0 | 0 | 415 | 51 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 503 | 0 | 237 | 1538 | 3450 | 0 | 0 | 733 | 174 |
| Arrive On Green | | | | 0.16 | 0.00 | 0.16 | 0.17 | 0.24 | 0.00 | 0.00 | 0.12 | 0.12 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1502 | 2910 | 4997 | 0 | 0 | 6343 | 1447 |
| Grp Volume(v), veh/h | | | | 421 | 0 | 76 | 654 | 899 | 0 | 0 | 415 | 51 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1502 | 1455 | 1612 | 0 | 0 | 1524 | 1447 |
| Q Serve(g_s), s | | | | 11.5 | 0.0 | 4.0 | 18.0 | 13.6 | 0.0 | 0.0 | 5.8 | 2.9 |
| Cycle Q Clear(g_c), s | | | | 11.5 | 0.0 | 4.0 | 18.0 | 13.6 | 0.0 | 0.0 | 5.8 | 2.9 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 503 | 0 | 237 | 1538 | 3450 | 0 | 0 | 733 | 174 |
| V/C Ratio(X) | | | | 0.84 | 0.00 | 0.32 | 0.43 | 0.26 | 0.00 | 0.00 | 0.57 | 0.29 |
| Avail Cap(c_a), veh/h | | | | 609 | 0 | 287 | 1538 | 3450 | 0 | 0 | 2316 | 550 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.91 | 0.91 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 36.8 | 0.0 | 33.6 | 25.0 | 15.1 | 0.0 | 0.0 | 37.4 | 36.1 |
| Incr Delay (d2), s/veh | | | | 8.5 | 0.0 | 0.8 | 0.1 | 0.2 | 0.0 | 0.0 | 3.1 | 4.2 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.8 | 0.0 | 3.5 | 6.9 | 5.8 | 0.0 | 0.0 | 2.2 | 1.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 45.2 | 0.0 | 34.4 | 25.0 | 15.2 | 0.0 | 0.0 | 40.5 | 40.3 |
| LnGrp LOS | | | | D | | C | C | B | | | D | D |
| Approach Vol, veh/h | | | | | 497 | | | 1553 | | | 466 | |
| Approach Delay, s/veh | | | | | 43.6 | | | 19.4 | | | 40.5 | |
| Approach LOS | | | | | D | | | B | | | D | |

| Timer - Assigned Phs | 2 | | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 70.0 | | 20.0 | 53.4 | 16.6 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 61.2 | | 17.2 | 22.0 | * 34 |
| Max Q Clear Time (g_c+I1), s | 15.6 | | 13.5 | 20.0 | 7.8 |
| Green Ext Time (p_c), s | 6.8 | | 0.7 | 0.4 | 2.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.1 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 212 | 2 | 304 | 1248 | 684 | 109 | 642 |
| Future Volume (vph) | 212 | 2 | 304 | 1248 | 684 | 109 | 642 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 52.0 | 52.0 | 11.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 57.8% | 57.8% | 12.2% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 16.2 | 16.2 | 16.2 | 50.1 | 50.1 | 7.1 | 62.2 |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.56 | 0.56 | 0.08 | 0.69 |
| v/c Ratio | 0.69 | 0.48 | 0.44 | 0.38 | 0.63 | 0.50 | 0.20 |
| Control Delay (s/veh) | 47.6 | 13.0 | 8.4 | 12.3 | 3.8 | 63.8 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.6 | 13.0 | 8.4 | 12.3 | 3.8 | 63.8 | 0.7 |
| LOS | D | B | A | B | A | E | A |
| Approach Delay (s/veh) | | 23.6 | | 9.3 | | | 9.9 |
| Approach LOS | | C | | A | | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 57.6 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.69 | |
| Intersection Signal Delay (s/veh): 11.8 | Intersection LOS: B |
| Intersection Capacity Utilization 76.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

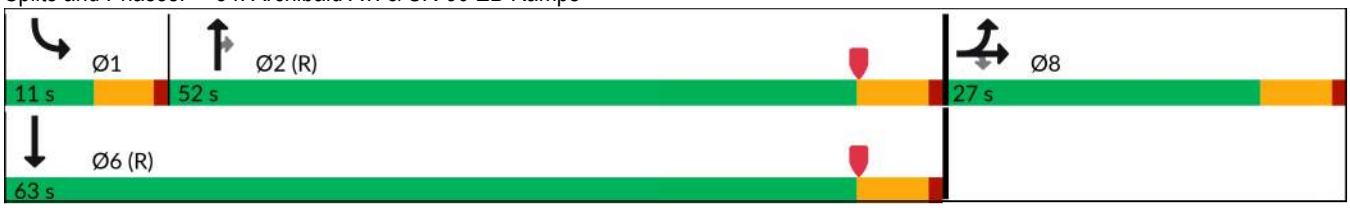

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 212 | 2 | 304 | 0 | 0 | 0 | 0 | 1248 | 684 | 109 | 642 | 0 |
| Future Volume (veh/h) | 212 | 2 | 304 | 0 | 0 | 0 | 0 | 1248 | 684 | 109 | 642 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1575 | 1772 | 0 |
| Adj Flow Rate, veh/h | 271 | 0 | 107 | | | | 0 | 1300 | 588 | 114 | 669 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 368 | 0 | 173 | | | | 0 | 3923 | 965 | 165 | 3655 | 0 |
| Arrive On Green | 0.12 | 0.00 | 0.12 | | | | 0.00 | 0.64 | 0.64 | 0.11 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3188 | 0 | 1502 | | | | 0 | 6343 | 1499 | 2910 | 4997 | 0 |
| Grp Volume(v), veh/h | 271 | 0 | 107 | | | | 0 | 1300 | 588 | 114 | 669 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1524 | 1499 | 1455 | 1612 | 0 |
| Q Serve(g_s), s | 7.4 | 0.0 | 6.1 | | | | 0.0 | 8.7 | 20.7 | 3.4 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 7.4 | 0.0 | 6.1 | | | | 0.0 | 8.7 | 20.7 | 3.4 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 368 | 0 | 173 | | | | 0 | 3923 | 965 | 165 | 3655 | 0 |
| V/C Ratio(X) | 0.74 | 0.00 | 0.62 | | | | 0.00 | 0.33 | 0.61 | 0.69 | 0.18 | 0.00 |
| Avail Cap(c_a), veh/h | 751 | 0 | 354 | | | | 0 | 3923 | 965 | 194 | 3655 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.92 | 0.92 | 0.00 |
| Uniform Delay (d), s/veh | 38.5 | 0.0 | 37.9 | | | | 0.0 | 7.3 | 9.4 | 39.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.9 | 0.0 | 3.5 | | | | 0.0 | 0.2 | 2.9 | 5.3 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 0.0 | 2.3 | | | | 0.0 | 2.2 | 5.7 | 1.2 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 41.4 | 0.0 | 41.5 | | | | 0.0 | 7.5 | 12.3 | 44.4 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | A | B | D | A | |
| Approach Vol, veh/h | | 378 | | | | | | 1888 | | | 783 | |
| Approach Delay, s/veh | | 41.4 | | | | | | 9.0 | | | 6.6 | |
| Approach LOS | | D | | | | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.1 | 63.7 | | | | 73.8 | | 16.2 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 46.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 5.4 | 22.7 | | | | 2.0 | | 9.4 | | | | |
| Green Ext Time (p_c), s | 0.0 | 11.9 | | | | 4.6 | | 1.0 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 12.4 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 162 | 283 | 104 | 84 | 484 | 264 | 213 | 1094 | 139 | 459 |
| Future Volume (vph) | 162 | 283 | 104 | 84 | 484 | 264 | 213 | 1094 | 139 | 459 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 29.3 | 29.3 | 9.5 | 21.9 | 21.9 | 18.0 | 28.7 | 13.7 | 24.5 |
| Actuated g/C Ratio | 0.15 | 0.30 | 0.30 | 0.10 | 0.22 | 0.22 | 0.18 | 0.29 | 0.14 | 0.25 |
| v/c Ratio | 0.75 | 0.30 | 0.21 | 0.58 | 0.69 | 0.52 | 0.79 | 0.88 | 0.67 | 0.55 |
| Control Delay (s/veh) | 62.2 | 28.9 | 3.6 | 60.6 | 40.3 | 7.6 | 58.9 | 42.9 | 56.6 | 32.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 62.2 | 28.9 | 3.6 | 60.6 | 40.3 | 7.6 | 58.9 | 42.9 | 56.6 | 32.0 |
| LOS | E | C | A | E | D | A | E | D | E | C |
| Approach Delay (s/veh) | | 33.9 | | | 32.0 | | | 45.4 | | 36.5 |
| Approach LOS | | C | | | C | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 97.4 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay (s/veh): 38.5 | Intersection LOS: D |
| Intersection Capacity Utilization 74.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

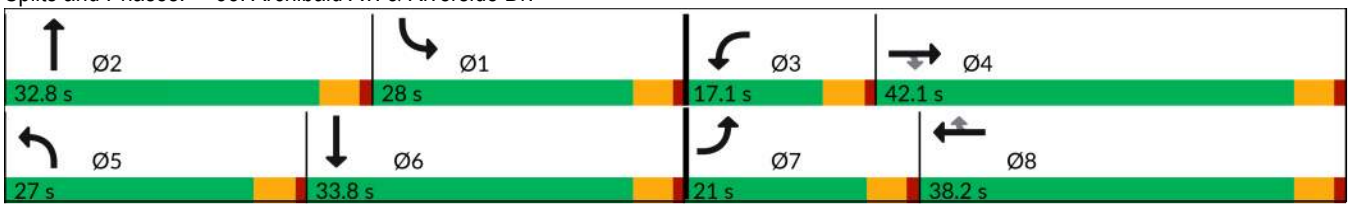

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 162 | 283 | 104 | 84 | 484 | 264 | 213 | 1094 | 60 | 139 | 459 | 163 |
| Future Volume (veh/h) | 162 | 283 | 104 | 84 | 484 | 264 | 213 | 1094 | 60 | 139 | 459 | 163 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 174 | 304 | 57 | 90 | 520 | 201 | 229 | 1176 | 64 | 149 | 494 | 114 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 207 | 961 | 420 | 112 | 761 | 336 | 264 | 1437 | 78 | 181 | 1001 | 225 |
| Arrive On Green | 0.13 | 0.29 | 0.29 | 0.07 | 0.23 | 0.23 | 0.17 | 0.31 | 0.31 | 0.11 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1594 | 3367 | 1472 | 1594 | 3367 | 1486 | 1594 | 4694 | 255 | 1594 | 3943 | 886 |
| Grp Volume(v), veh/h | 174 | 304 | 57 | 90 | 520 | 201 | 229 | 808 | 432 | 149 | 402 | 206 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1472 | 1594 | 1683 | 1486 | 1594 | 1612 | 1724 | 1594 | 1612 | 1604 |
| Q Serve(g_s), s | 8.7 | 5.8 | 2.4 | 4.6 | 11.6 | 7.0 | 11.5 | 19.0 | 19.0 | 7.5 | 8.7 | 9.0 |
| Cycle Q Clear(g_c), s | 8.7 | 5.8 | 2.4 | 4.6 | 11.6 | 7.0 | 11.5 | 19.0 | 19.0 | 7.5 | 8.7 | 9.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.15 | 1.00 | | 0.55 |
| Lane Grp Cap(c), veh/h | 207 | 961 | 420 | 112 | 761 | 336 | 264 | 987 | 528 | 181 | 819 | 407 |
| V/C Ratio(X) | 0.84 | 0.32 | 0.14 | 0.80 | 0.68 | 0.60 | 0.87 | 0.82 | 0.82 | 0.82 | 0.49 | 0.51 |
| Avail Cap(c_a), veh/h | 319 | 1540 | 673 | 243 | 1380 | 609 | 436 | 1110 | 593 | 455 | 1149 | 571 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.8 | 23.0 | 21.8 | 37.6 | 29.0 | 14.2 | 33.3 | 26.3 | 26.3 | 35.5 | 26.1 | 26.2 |
| Incr Delay (d2), s/veh | 6.9 | 0.2 | 0.1 | 5.0 | 1.1 | 1.7 | 5.2 | 4.5 | 8.0 | 3.6 | 0.5 | 1.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 2.1 | 0.8 | 1.8 | 4.4 | 3.2 | 4.4 | 7.1 | 8.1 | 2.9 | 3.1 | 3.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 41.7 | 23.2 | 21.9 | 42.6 | 30.1 | 16.0 | 38.5 | 30.8 | 34.4 | 39.1 | 26.5 | 27.2 |
| LnGrp LOS | D | C | C | D | C | B | D | C | C | D | C | C |
| Approach Vol, veh/h | | 535 | | | 811 | | | 1469 | | | 757 | |
| Approach Delay, s/veh | | 29.1 | | | 28.0 | | | 33.0 | | | 29.2 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.9 | 29.7 | 10.3 | 28.0 | 18.2 | 25.4 | 15.2 | 23.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 21.0 | 6.6 | 7.8 | 13.5 | 11.0 | 10.7 | 13.6 |
| Green Ext Time (p_c), s | 0.1 | 4.0 | 0.0 | 1.9 | 0.2 | 3.2 | 0.1 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.5 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 110 | 67 | 59 | 161 | 162 | 102 | 1151 | 84 | 486 |
| Future Volume (vph) | 110 | 67 | 59 | 161 | 162 | 102 | 1151 | 84 | 486 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.7 | 24.6 | 5.4 | 16.3 | 16.3 | 12.2 | 36.4 | 10.6 | 34.8 |
| Actuated g/C Ratio | 0.14 | 0.26 | 0.06 | 0.17 | 0.17 | 0.13 | 0.38 | 0.11 | 0.36 |
| v/c Ratio | 0.59 | 0.32 | 0.80 | 0.65 | 0.47 | 0.62 | 0.75 | 0.58 | 0.52 |
| Control Delay (s/veh) | 53.1 | 24.6 | 103.8 | 50.6 | 9.8 | 58.4 | 29.4 | 60.3 | 26.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.1 | 24.6 | 103.8 | 50.6 | 9.8 | 58.4 | 29.4 | 60.3 | 26.6 |
| LOS | D | C | F | D | A | E | C | E | C |
| Approach Delay (s/veh) | | 38.4 | | 41.5 | | | 31.6 | | 31.0 |
| Approach LOS | | D | | D | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 96.2 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 33.5 | Intersection LOS: C |
| Intersection Capacity Utilization 61.9% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 67 | 50 | 59 | 161 | 162 | 102 | 1151 | 88 | 84 | 486 | 59 |
| Future Volume (veh/h) | 110 | 67 | 50 | 59 | 161 | 162 | 102 | 1151 | 88 | 84 | 486 | 59 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 133 | 81 | 44 | 71 | 194 | 88 | 123 | 1387 | 105 | 101 | 586 | 53 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 167 | 213 | 116 | 87 | 261 | 222 | 154 | 1995 | 151 | 126 | 1252 | 113 |
| Arrive On Green | 0.10 | 0.20 | 0.20 | 0.05 | 0.15 | 0.15 | 0.10 | 0.41 | 0.41 | 0.08 | 0.39 | 0.39 |
| Sat Flow, veh/h | 1594 | 1079 | 586 | 1594 | 1772 | 1502 | 1594 | 4878 | 369 | 1594 | 3196 | 288 |
| Grp Volume(v), veh/h | 133 | 0 | 125 | 71 | 194 | 88 | 123 | 1008 | 484 | 101 | 324 | 315 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1664 | 1594 | 1772 | 1502 | 1594 | 1772 | 1704 | 1594 | 1772 | 1713 |
| Q Serve(g_s), s | 5.8 | 0.0 | 4.6 | 3.1 | 7.4 | 2.8 | 5.4 | 16.6 | 16.6 | 4.4 | 9.7 | 9.7 |
| Cycle Q Clear(g_c), s | 5.8 | 0.0 | 4.6 | 3.1 | 7.4 | 2.8 | 5.4 | 16.6 | 16.6 | 4.4 | 9.7 | 9.7 |
| Prop In Lane | 1.00 | | 0.35 | 1.00 | | 1.00 | 1.00 | | 0.22 | 1.00 | | 0.17 |
| Lane Grp Cap(c), veh/h | 167 | 0 | 329 | 87 | 261 | 222 | 154 | 1449 | 697 | 126 | 694 | 671 |
| V/C Ratio(X) | 0.80 | 0.00 | 0.38 | 0.82 | 0.74 | 0.40 | 0.80 | 0.70 | 0.70 | 0.80 | 0.47 | 0.47 |
| Avail Cap(c_a), veh/h | 459 | 0 | 925 | 117 | 605 | 513 | 324 | 2259 | 1086 | 265 | 1065 | 1029 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.0 | 0.0 | 24.7 | 33.2 | 28.9 | 15.6 | 31.4 | 17.3 | 17.3 | 32.1 | 16.1 | 16.1 |
| Incr Delay (d2), s/veh | 8.3 | 0.0 | 0.7 | 27.0 | 4.1 | 1.2 | 9.2 | 0.6 | 1.3 | 11.0 | 0.5 | 0.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.5 | 0.0 | 1.7 | 1.8 | 3.2 | 1.3 | 2.2 | 5.5 | 5.4 | 1.9 | 3.3 | 3.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 39.3 | 0.0 | 25.4 | 60.2 | 33.1 | 16.7 | 40.6 | 17.9 | 18.6 | 43.1 | 16.5 | 16.6 |
| LnGrp LOS | D | | C | E | C | B | D | B | B | D | B | B |
| Approach Vol, veh/h | | 258 | | | 353 | | | 1615 | | | 740 | |
| Approach Delay, s/veh | | 32.6 | | | 34.4 | | | 19.8 | | | 20.2 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.2 | 33.6 | 8.5 | 18.6 | 11.4 | 32.4 | 12.0 | 15.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 6.4 | 18.6 | 5.1 | 6.6 | 7.4 | 11.7 | 7.8 | 9.4 |
| Green Ext Time (p_c), s | 0.1 | 10.3 | 0.0 | 0.7 | 0.1 | 3.6 | 0.2 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.8 |
| HCM 7th LOS | C |

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 0 | 44 | 0 | 10 | 1183 | 78 | 523 |
| Future Volume (vph) | 0 | 44 | 0 | 10 | 1183 | 78 | 523 |
| Turn Type | NA | Split | NA | Prot | NA | Prot | NA |
| Protected Phases | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | |
| Detector Phase | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 22.5 | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 |
| Total Split (s) | 22.5 | 33.0 | 33.0 | 10.0 | 45.5 | 19.0 | 54.5 |
| Total Split (%) | 18.8% | 27.5% | 27.5% | 8.3% | 37.9% | 15.8% | 45.4% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.2 | 11.8 | 11.8 | 8.0 | 30.8 | 10.4 | 39.9 |
| Actuated g/C Ratio | 0.14 | 0.21 | 0.21 | 0.14 | 0.54 | 0.18 | 0.70 |
| v/c Ratio | 0.00 | 0.15 | 0.11 | 0.05 | 0.50 | 0.30 | 0.24 |
| Control Delay (s/veh) | 0.0 | 26.4 | 0.3 | 37.2 | 15.3 | 32.6 | 7.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.0 | 26.4 | 0.3 | 37.2 | 15.3 | 32.6 | 7.6 |
| LOS | A | C | A | D | B | C | A |
| Approach Delay (s/veh) | | | 10.5 | | 15.4 | | 10.9 |
| Approach LOS | | | B | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 56.7 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.50 | |
| Intersection Signal Delay (s/veh): 13.7 | Intersection LOS: B |
| Intersection Capacity Utilization 50.5% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

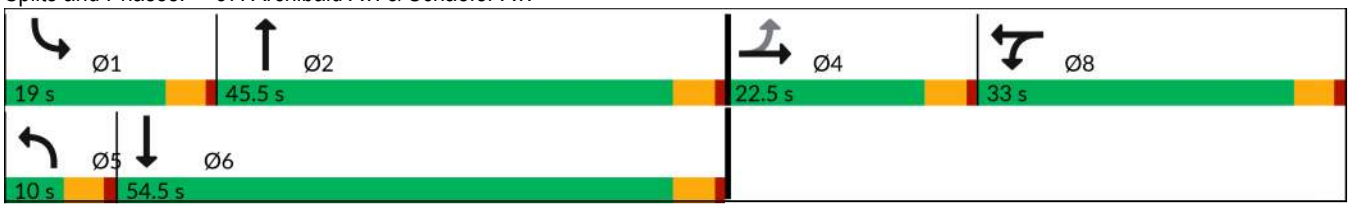

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 1 | 44 | 0 | 68 | 10 | 1183 | 18 | 78 | 523 | 1 |
| Future Volume (veh/h) | 0 | 0 | 1 | 44 | 0 | 68 | 10 | 1183 | 18 | 78 | 523 | 1 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 1 | 48 | 0 | 34 | 11 | 1300 | 18 | 86 | 575 | 1 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 0 | 3 | 113 | 0 | 107 | 23 | 2208 | 31 | 116 | 1752 | 3 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.07 | 0.01 | 0.45 | 0.45 | 0.07 | 0.51 | 0.51 |
| Sat Flow, veh/h | 0 | 0 | 1501 | 1594 | 0 | 1502 | 1594 | 4914 | 68 | 1594 | 3448 | 6 |
| Grp Volume(v), veh/h | 0 | 0 | 1 | 48 | 0 | 34 | 11 | 853 | 465 | 86 | 281 | 295 |
| Grp Sat Flow(s),veh/h/ln | 0 | 0 | 1502 | 1594 | 0 | 1502 | 1594 | 1612 | 1757 | 1594 | 1683 | 1771 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 1.0 | 0.3 | 9.0 | 9.0 | 2.4 | 4.5 | 4.5 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 1.0 | 0.3 | 9.0 | 9.0 | 2.4 | 4.5 | 4.5 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.04 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 0 | 3 | 113 | 0 | 107 | 23 | 1449 | 790 | 116 | 855 | 900 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.30 | 0.42 | 0.00 | 0.32 | 0.48 | 0.59 | 0.59 | 0.74 | 0.33 | 0.33 |
| Avail Cap(c_a), veh/h | 0 | 0 | 592 | 997 | 0 | 940 | 190 | 2906 | 1584 | 506 | 1851 | 1947 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 22.6 | 20.2 | 0.0 | 20.0 | 22.2 | 9.4 | 9.4 | 20.6 | 6.6 | 6.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 44.6 | 2.5 | 0.0 | 1.7 | 15.1 | 0.4 | 0.7 | 3.4 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.1 | 0.5 | 0.0 | 0.3 | 0.2 | 1.8 | 2.0 | 0.8 | 0.8 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 67.2 | 22.7 | 0.0 | 21.7 | 37.3 | 9.7 | 10.1 | 24.1 | 6.8 | 6.8 |
| LnGrp LOS | | | E | C | | C | D | A | B | C | A | A |
| Approach Vol, veh/h | | 1 | | | 82 | | | 1329 | | | 662 | |
| Approach Delay, s/veh | | 67.2 | | | 22.3 | | | 10.1 | | | 9.1 | |
| Approach LOS | | E | | | C | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.9 | 25.0 | | 4.7 | 5.2 | 27.7 | | 7.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 14.4 | 40.9 | | 17.9 | 5.4 | 49.9 | | 28.4 |
| Max Q Clear Time (g_c+I1), s | 4.4 | 11.0 | | 2.0 | 2.3 | 6.5 | | 3.3 |
| Green Ext Time (p_c), s | 0.1 | 9.0 | | 0.0 | 0.0 | 3.1 | | 0.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 10.3 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 194 | 638 | 78 | 317 | 644 | 76 | 132 | 831 | 187 | 72 | 333 | 178 |
| Future Volume (vph) | 194 | 638 | 78 | 317 | 644 | 76 | 132 | 831 | 187 | 72 | 333 | 178 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.7 | 37.2 | 106.6 | 10.5 | 42.1 | 42.1 | 11.3 | 33.1 | 106.6 | 9.5 | 28.9 | 28.9 |
| Actuated g/C Ratio | 0.05 | 0.35 | 1.00 | 0.10 | 0.39 | 0.39 | 0.11 | 0.31 | 1.00 | 0.09 | 0.27 | 0.27 |
| v/c Ratio | 1.32 | 0.40 | 0.05 | 1.16 | 0.96 | 0.12 | 0.82 | 0.83 | 0.13 | 0.53 | 0.38 | 0.34 |
| Control Delay (s/veh) | 222.0 | 28.7 | 0.1 | 147.7 | 60.7 | 0.5 | 85.0 | 42.7 | 0.2 | 62.4 | 31.7 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 222.0 | 28.7 | 0.1 | 147.7 | 60.7 | 0.5 | 85.0 | 42.7 | 0.2 | 62.4 | 31.7 | 5.8 |
| LOS | F | C | A | F | E | A | F | D | A | E | C | A |
| Approach Delay (s/veh) | | 67.5 | | | 82.9 | | | 40.6 | | | 27.6 | |
| Approach LOS | | E | | | F | | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 106.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.32 | |
| Intersection Signal Delay (s/veh): 57.1 | Intersection LOS: E |
| Intersection Capacity Utilization 86.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

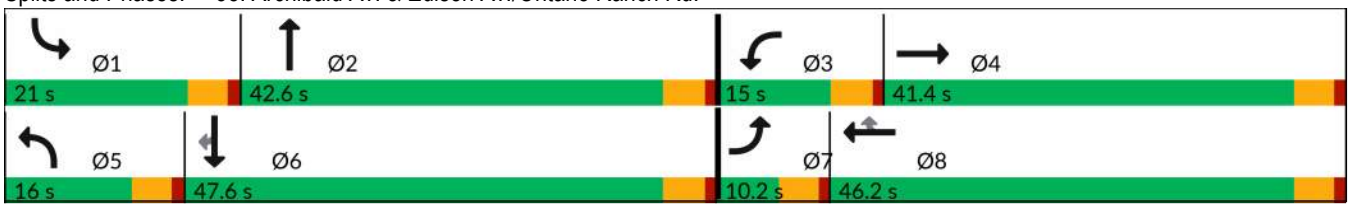

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 194 | 638 | 78 | 317 | 644 | 76 | 132 | 831 | 187 | 72 | 333 | 178 |
| Future Volume (veh/h) | 194 | 638 | 78 | 317 | 644 | 76 | 132 | 831 | 187 | 72 | 333 | 178 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 202 | 665 | 0 | 330 | 671 | 57 | 138 | 866 | 0 | 75 | 347 | 162 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 163 | 1697 | | 303 | 707 | 599 | 164 | 1018 | | 93 | 868 | 387 |
| Arrive On Green | 0.06 | 0.35 | 0.00 | 0.10 | 0.40 | 0.40 | 0.10 | 0.30 | 0.00 | 0.06 | 0.26 | 0.26 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1502 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 202 | 665 | 0 | 330 | 671 | 57 | 138 | 866 | 0 | 75 | 347 | 162 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1502 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 5.6 | 10.3 | 0.0 | 10.4 | 36.6 | 2.4 | 8.5 | 24.1 | 0.0 | 4.6 | 8.5 | 9.0 |
| Cycle Q Clear(g_c), s | 5.6 | 10.3 | 0.0 | 10.4 | 36.6 | 2.4 | 8.5 | 24.1 | 0.0 | 4.6 | 8.5 | 9.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 163 | 1697 | | 303 | 707 | 599 | 164 | 1018 | | 93 | 868 | 387 |
| V/C Ratio(X) | 1.24 | 0.39 | | 1.09 | 0.95 | 0.10 | 0.84 | 0.85 | | 0.80 | 0.40 | 0.42 |
| Avail Cap(c_a), veh/h | 163 | 1783 | | 303 | 738 | 626 | 182 | 1281 | | 262 | 1450 | 647 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.1 | 24.4 | 0.0 | 44.7 | 29.0 | 18.8 | 44.0 | 32.7 | 0.0 | 46.4 | 30.7 | 30.8 |
| Incr Delay (d2), s/veh | 148.4 | 0.1 | 0.0 | 77.5 | 21.2 | 0.1 | 24.2 | 4.6 | 0.0 | 5.9 | 0.3 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.3 | 3.7 | 0.0 | 6.8 | 18.1 | 0.8 | 4.3 | 9.6 | 0.0 | 1.9 | 3.2 | 3.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 195.5 | 24.6 | 0.0 | 122.2 | 50.3 | 18.8 | 68.1 | 37.4 | 0.0 | 52.4 | 30.9 | 31.5 |
| LnGrp LOS | F | C | | F | D | B | E | D | | D | C | C |
| Approach Vol, veh/h | | 867 | | | 1058 | | | 1004 | | | 584 | |
| Approach Delay, s/veh | | 64.4 | | | 71.0 | | | 41.6 | | | 33.9 | |
| Approach LOS | | E | | | E | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.4 | 34.8 | 15.0 | 39.6 | 14.9 | 30.4 | 10.2 | 44.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 26.1 | 12.4 | 12.3 | 10.5 | 11.0 | 7.6 | 38.6 |
| Green Ext Time (p_c), s | 0.0 | 4.1 | 0.0 | 4.1 | 0.0 | 2.5 | 0.0 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 54.8 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 131 | 157 | 99 | 104 | 311 | 189 | 749 | 82 | 26 | 420 | 86 |
| Future Volume (vph) | 131 | 157 | 99 | 104 | 311 | 189 | 749 | 82 | 26 | 420 | 86 |
| Turn Type | Prot | NA | Free | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.1 | 15.8 | 67.7 | 10.3 | 16.9 | 5.8 | 23.1 | 23.1 | 6.6 | 16.1 | 16.1 |
| Actuated g/C Ratio | 0.13 | 0.23 | 1.00 | 0.15 | 0.25 | 0.09 | 0.34 | 0.34 | 0.10 | 0.24 | 0.24 |
| v/c Ratio | 0.34 | 0.20 | 0.07 | 0.45 | 0.48 | 0.78 | 0.43 | 0.14 | 0.09 | 0.52 | 0.20 |
| Control Delay (s/veh) | 33.3 | 21.5 | 0.1 | 38.6 | 21.5 | 57.0 | 21.2 | 1.5 | 36.3 | 25.8 | 2.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.3 | 21.5 | 0.1 | 38.6 | 21.5 | 57.0 | 21.2 | 1.5 | 36.3 | 25.8 | 2.3 |
| LOS | C | C | A | D | C | E | C | A | D | C | A |
| Approach Delay (s/veh) | | 20.0 | | | 24.9 | | 26.2 | | | 22.5 | |
| Approach LOS | | C | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 67.7 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 24.2 | Intersection LOS: C |
| Intersection Capacity Utilization 52.3% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

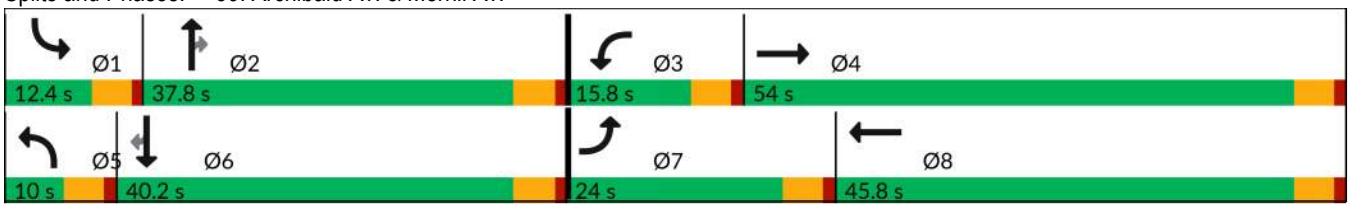

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 157 | 99 | 104 | 311 | 97 | 189 | 749 | 82 | 26 | 420 | 86 |
| Future Volume (veh/h) | 131 | 157 | 99 | 104 | 311 | 97 | 189 | 749 | 82 | 26 | 420 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 136 | 164 | 0 | 108 | 324 | 36 | 197 | 780 | 53 | 27 | 438 | 41 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 264 | 769 | | 134 | 668 | 74 | 294 | 1484 | 419 | 95 | 754 | 319 |
| Arrive On Green | 0.09 | 0.22 | 0.00 | 0.08 | 0.21 | 0.21 | 0.10 | 0.28 | 0.28 | 0.03 | 0.21 | 0.21 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 3131 | 345 | 3000 | 5316 | 1502 | 3000 | 3544 | 1500 |
| Grp Volume(v), veh/h | 136 | 164 | 0 | 108 | 182 | 178 | 197 | 780 | 53 | 27 | 438 | 41 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1704 | 1500 | 1772 | 1502 | 1500 | 1772 | 1500 |
| Q Serve(g_s), s | 2.1 | 1.8 | 0.0 | 3.2 | 4.3 | 4.3 | 3.0 | 5.9 | 1.3 | 0.4 | 5.3 | 1.0 |
| Cycle Q Clear(g_c), s | 2.1 | 1.8 | 0.0 | 3.2 | 4.3 | 4.3 | 3.0 | 5.9 | 1.3 | 0.4 | 5.3 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 264 | 769 | | 134 | 378 | 363 | 294 | 1484 | 419 | 95 | 754 | 319 |
| V/C Ratio(X) | 0.52 | 0.21 | | 0.80 | 0.48 | 0.49 | 0.67 | 0.53 | 0.13 | 0.29 | 0.58 | 0.13 |
| Avail Cap(c_a), veh/h | 1227 | 3692 | | 376 | 1540 | 1480 | 342 | 3722 | 1051 | 494 | 2661 | 1126 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 20.7 | 15.2 | 0.0 | 21.3 | 16.4 | 16.4 | 20.6 | 14.4 | 12.8 | 22.4 | 16.8 | 15.1 |
| Incr Delay (d2), s/veh | 1.6 | 0.1 | 0.0 | 10.6 | 1.0 | 1.0 | 4.0 | 0.3 | 0.1 | 1.6 | 0.7 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 0.6 | 0.0 | 1.4 | 1.5 | 1.5 | 1.0 | 1.7 | 0.3 | 0.1 | 1.7 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 22.2 | 15.4 | 0.0 | 32.0 | 17.3 | 17.4 | 24.7 | 14.7 | 12.9 | 24.1 | 17.5 | 15.3 |
| LnGrp LOS | C | B | | C | B | B | C | B | B | C | B | B |
| Approach Vol, veh/h | | 300 | | | 468 | | | 1030 | | | 506 | |
| Approach Delay, s/veh | | 18.5 | | | 20.7 | | | 16.5 | | | 17.7 | |
| Approach LOS | | B | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.1 | 17.8 | 8.6 | 14.9 | 9.3 | 14.7 | 8.8 | 14.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 2.4 | 7.9 | 5.2 | 3.8 | 5.0 | 7.3 | 4.1 | 6.3 |
| Green Ext Time (p_c), s | 0.0 | 5.0 | 0.1 | 1.0 | 0.0 | 2.6 | 0.3 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.9 |
| HCM 7th LOS | B |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 9 | 28 | 1 | 310 | 62 | 372 | 14 | 667 | 267 | 222 | 409 | 17 |
| Future Volume (vph) | 9 | 28 | 1 | 310 | 62 | 372 | 14 | 667 | 267 | 222 | 409 | 17 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.7 | 13.0 | 13.0 | 13.5 | 19.2 | 23.8 | 5.7 | 22.7 | 36.2 | 10.7 | 37.5 | 37.5 |
| Actuated g/C Ratio | 0.08 | 0.19 | 0.19 | 0.20 | 0.28 | 0.35 | 0.08 | 0.33 | 0.53 | 0.16 | 0.55 | 0.55 |
| v/c Ratio | 0.04 | 0.05 | 0.00 | 0.57 | 0.07 | 0.35 | 0.06 | 0.63 | 0.30 | 0.51 | 0.16 | 0.02 |
| Control Delay (s/veh) | 42.9 | 31.0 | 0.0 | 32.9 | 19.9 | 4.5 | 42.8 | 23.4 | 2.2 | 38.4 | 11.4 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.9 | 31.0 | 0.0 | 32.9 | 19.9 | 4.5 | 42.8 | 23.4 | 2.2 | 38.4 | 11.4 | 0.1 |
| LOS | D | C | A | C | B | A | D | C | A | D | B | A |
| Approach Delay (s/veh) | | 32.9 | | | 17.6 | | | 17.7 | | | 20.4 | |
| Approach LOS | | C | | | B | | | B | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 68.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.63 | |
| Intersection Signal Delay (s/veh): 18.6 | Intersection LOS: B |
| Intersection Capacity Utilization 56.7% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

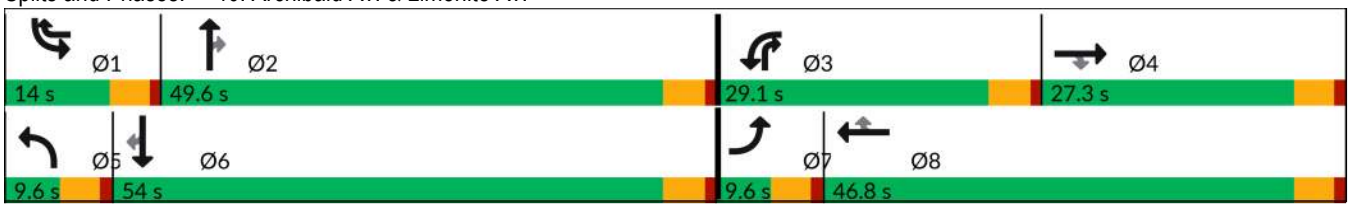

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 9 | 28 | 1 | 310 | 62 | 372 | 14 | 667 | 267 | 222 | 409 | 17 |
| Future Volume (veh/h) | 9 | 28 | 1 | 310 | 62 | 372 | 14 | 667 | 267 | 222 | 409 | 17 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 9 | 29 | 0 | 323 | 65 | 251 | 15 | 695 | 163 | 231 | 426 | 11 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 34 | 221 | 99 | 444 | 696 | 844 | 54 | 1065 | 703 | 329 | 1986 | 617 |
| Arrive On Green | 0.01 | 0.07 | 0.00 | 0.15 | 0.21 | 0.21 | 0.02 | 0.32 | 0.32 | 0.11 | 0.41 | 0.41 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 2910 | 3367 | 2639 | 2910 | 3367 | 1500 | 2910 | 4837 | 1502 |
| Grp Volume(v), veh/h | 9 | 29 | 0 | 323 | 65 | 251 | 15 | 695 | 163 | 231 | 426 | 11 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1455 | 1683 | 1320 | 1455 | 1683 | 1500 | 1455 | 1612 | 1502 |
| Q Serve(g_s), s | 0.2 | 0.4 | 0.0 | 5.5 | 0.8 | 3.7 | 0.3 | 9.3 | 3.4 | 4.0 | 3.0 | 0.2 |
| Cycle Q Clear(g_c), s | 0.2 | 0.4 | 0.0 | 5.5 | 0.8 | 3.7 | 0.3 | 9.3 | 3.4 | 4.0 | 3.0 | 0.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 34 | 221 | 99 | 444 | 696 | 844 | 54 | 1065 | 703 | 329 | 1986 | 617 |
| V/C Ratio(X) | 0.26 | 0.13 | 0.00 | 0.73 | 0.09 | 0.30 | 0.28 | 0.65 | 0.23 | 0.70 | 0.21 | 0.02 |
| Avail Cap(c_a), veh/h | 279 | 1463 | 653 | 1365 | 2720 | 2431 | 279 | 2901 | 1522 | 524 | 4575 | 1420 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.6 | 23.0 | 0.0 | 21.1 | 16.8 | 13.4 | 25.3 | 15.4 | 8.3 | 22.3 | 9.9 | 9.1 |
| Incr Delay (d2), s/veh | 1.5 | 0.3 | 0.0 | 0.9 | 0.1 | 0.2 | 1.0 | 0.7 | 0.2 | 1.0 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.2 | 0.0 | 1.6 | 0.3 | 0.9 | 0.1 | 2.7 | 0.8 | 1.2 | 0.7 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.1 | 23.3 | 0.0 | 22.0 | 16.8 | 13.5 | 26.3 | 16.1 | 8.4 | 23.3 | 10.0 | 9.1 |
| LnGrp LOS | C | C | | C | B | B | C | B | A | C | A | A |
| Approach Vol, veh/h | | 38 | | | 639 | | | 873 | | | 668 | |
| Approach Delay, s/veh | | 24.2 | | | 18.1 | | | 14.8 | | | 14.6 | |
| Approach LOS | | C | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.5 | 21.1 | 12.6 | 8.0 | 5.6 | 26.0 | 5.2 | 15.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 6.0 | 11.3 | 7.5 | 2.4 | 2.3 | 5.0 | 2.2 | 5.7 |
| Green Ext Time (p_c), s | 0.1 | 5.0 | 0.5 | 0.1 | 0.0 | 2.7 | 0.0 | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 15.9 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 71 | 823 | 29 | 28 | 875 | 45 | 47 | 81 | 55 | 45 |
| Future Volume (vph) | 71 | 823 | 29 | 28 | 875 | 45 | 47 | 81 | 55 | 45 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.1 | 32.4 | 32.4 | 6.9 | 27.3 | 27.3 | 7.2 | 11.6 | 8.0 | 12.1 |
| Actuated g/C Ratio | 0.12 | 0.50 | 0.50 | 0.11 | 0.42 | 0.42 | 0.11 | 0.18 | 0.12 | 0.19 |
| v/c Ratio | 0.39 | 0.50 | 0.04 | 0.18 | 0.63 | 0.07 | 0.29 | 0.45 | 0.30 | 0.31 |
| Control Delay (s/veh) | 42.4 | 15.2 | 0.1 | 38.4 | 19.4 | 0.2 | 40.1 | 30.6 | 37.9 | 20.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.4 | 15.2 | 0.1 | 38.4 | 19.4 | 0.2 | 40.1 | 30.6 | 37.9 | 20.1 |
| LOS | D | B | A | D | B | A | D | C | D | C |
| Approach Delay (s/veh) | | 16.8 | | | 19.1 | | | 33.1 | | 26.5 |
| Approach LOS | | B | | | B | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 65.2 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.63 | |
| Intersection Signal Delay (s/veh): 19.8 | Intersection LOS: B |
| Intersection Capacity Utilization 59.2% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

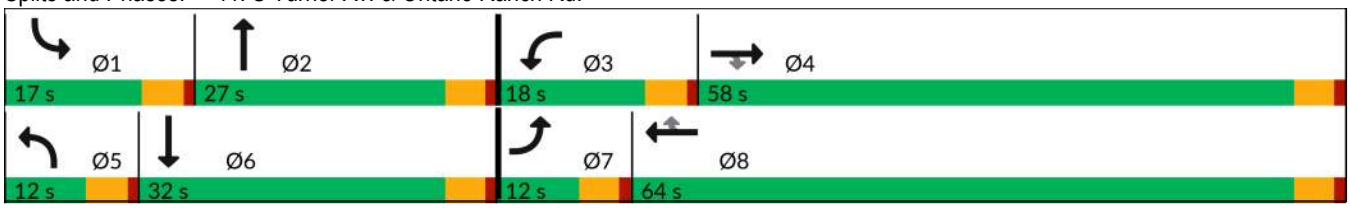

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 71 | 823 | 29 | 28 | 875 | 45 | 47 | 81 | 52 | 55 | 45 | 54 |
| Future Volume (veh/h) | 71 | 823 | 29 | 28 | 875 | 45 | 47 | 81 | 52 | 55 | 45 | 54 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 76 | 876 | 29 | 30 | 931 | 26 | 50 | 86 | 31 | 59 | 48 | 34 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 104 | 1532 | 635 | 54 | 1421 | 602 | 80 | 132 | 48 | 89 | 110 | 78 |
| Arrive On Green | 0.07 | 0.43 | 0.43 | 0.03 | 0.40 | 0.40 | 0.05 | 0.11 | 0.11 | 0.06 | 0.11 | 0.11 |
| Sat Flow, veh/h | 1594 | 3544 | 1469 | 1594 | 3544 | 1500 | 1594 | 1227 | 442 | 1594 | 965 | 684 |
| Grp Volume(v), veh/h | 76 | 876 | 29 | 30 | 931 | 26 | 50 | 0 | 117 | 59 | 0 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1469 | 1594 | 1772 | 1500 | 1594 | 0 | 1670 | 1594 | 0 | 1649 |
| Q Serve(g_s), s | 2.3 | 9.3 | 0.6 | 0.9 | 10.6 | 0.5 | 1.5 | 0.0 | 3.3 | 1.8 | 0.0 | 2.3 |
| Cycle Q Clear(g_c), s | 2.3 | 9.3 | 0.6 | 0.9 | 10.6 | 0.5 | 1.5 | 0.0 | 3.3 | 1.8 | 0.0 | 2.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.26 | 1.00 | | 0.41 |
| Lane Grp Cap(c), veh/h | 104 | 1532 | 635 | 54 | 1421 | 602 | 80 | 0 | 180 | 89 | 0 | 188 |
| V/C Ratio(X) | 0.73 | 0.57 | 0.05 | 0.55 | 0.66 | 0.04 | 0.63 | 0.00 | 0.65 | 0.66 | 0.00 | 0.44 |
| Avail Cap(c_a), veh/h | 237 | 3802 | 1576 | 429 | 4229 | 1790 | 237 | 0 | 751 | 397 | 0 | 908 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.8 | 10.7 | 8.2 | 23.7 | 12.1 | 9.1 | 23.2 | 0.0 | 21.3 | 23.0 | 0.0 | 20.6 |
| Incr Delay (d2), s/veh | 3.6 | 0.3 | 0.0 | 3.2 | 0.5 | 0.0 | 3.0 | 0.0 | 3.9 | 3.1 | 0.0 | 1.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 2.6 | 0.1 | 0.3 | 3.1 | 0.1 | 0.6 | 0.0 | 1.3 | 0.7 | 0.0 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.5 | 11.0 | 8.2 | 26.9 | 12.6 | 9.1 | 26.2 | 0.0 | 25.2 | 26.1 | 0.0 | 22.2 |
| LnGrp LOS | C | B | A | C | B | A | C | | C | C | | C |
| Approach Vol, veh/h | | 981 | | | 987 | | | 167 | | | 141 | |
| Approach Delay, s/veh | | 12.1 | | | 13.0 | | | 25.5 | | | 23.8 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.4 | 10.0 | 6.3 | 26.1 | 7.1 | 10.3 | 7.9 | 24.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 3.8 | 5.3 | 2.9 | 11.3 | 3.5 | 4.3 | 4.3 | 12.6 |
| Green Ext Time (p_c), s | 0.0 | 0.4 | 0.0 | 6.7 | 0.0 | 0.3 | 0.0 | 7.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 14.2 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 126 | 792 | 78 | 120 | 772 | 220 | 76 | 349 | 96 | 169 | 234 | 56 |
| Future Volume (vph) | 126 | 792 | 78 | 120 | 772 | 220 | 76 | 349 | 96 | 169 | 234 | 56 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.4 | 23.6 | 23.6 | 8.8 | 21.0 | 21.0 | 6.3 | 25.9 | 25.9 | 14.6 | 34.3 | 34.3 |
| Actuated g/C Ratio | 0.12 | 0.26 | 0.26 | 0.10 | 0.23 | 0.23 | 0.07 | 0.28 | 0.28 | 0.16 | 0.37 | 0.37 |
| v/c Ratio | 0.68 | 0.68 | 0.17 | 0.46 | 0.59 | 0.46 | 0.76 | 0.75 | 0.20 | 0.72 | 0.38 | 0.10 |
| Control Delay (s/veh) | 61.8 | 35.6 | 1.4 | 49.1 | 34.6 | 7.7 | 88.3 | 40.8 | 2.6 | 57.8 | 23.0 | 1.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.8 | 35.6 | 1.4 | 49.1 | 34.6 | 7.7 | 88.3 | 40.8 | 2.6 | 57.8 | 23.0 | 1.4 |
| LOS | E | D | A | D | C | A | F | D | A | E | C | A |
| Approach Delay (s/veh) | | 36.2 | | | 30.8 | | | 40.7 | | | 33.2 | |
| Approach LOS | | D | | | C | | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 92.1 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay (s/veh): 34.6 | Intersection LOS: C |
| Intersection Capacity Utilization 66.4% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 126 | 792 | 78 | 120 | 772 | 220 | 76 | 349 | 96 | 169 | 234 | 56 |
| Future Volume (veh/h) | 126 | 792 | 78 | 120 | 772 | 220 | 76 | 349 | 96 | 169 | 234 | 56 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 134 | 843 | 39 | 128 | 821 | 117 | 81 | 371 | 33 | 180 | 249 | 45 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 165 | 1290 | 395 | 196 | 1404 | 344 | 100 | 461 | 390 | 217 | 592 | 502 |
| Arrive On Green | 0.10 | 0.27 | 0.27 | 0.07 | 0.23 | 0.23 | 0.06 | 0.26 | 0.26 | 0.14 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1594 | 4837 | 1481 | 2910 | 6095 | 1492 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 134 | 843 | 39 | 128 | 821 | 117 | 81 | 371 | 33 | 180 | 249 | 45 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1481 | 1455 | 1524 | 1492 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 5.6 | 10.6 | 1.4 | 2.9 | 8.2 | 4.5 | 3.4 | 13.4 | 1.1 | 7.5 | 7.4 | 1.4 |
| Cycle Q Clear(g_c), s | 5.6 | 10.6 | 1.4 | 2.9 | 8.2 | 4.5 | 3.4 | 13.4 | 1.1 | 7.5 | 7.4 | 1.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 165 | 1290 | 395 | 196 | 1404 | 344 | 100 | 461 | 390 | 217 | 592 | 502 |
| V/C Ratio(X) | 0.81 | 0.65 | 0.10 | 0.65 | 0.58 | 0.34 | 0.81 | 0.80 | 0.08 | 0.83 | 0.42 | 0.09 |
| Avail Cap(c_a), veh/h | 280 | 2061 | 631 | 545 | 2668 | 653 | 140 | 1131 | 957 | 376 | 1393 | 1180 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.0 | 22.2 | 18.9 | 31.1 | 23.4 | 22.0 | 31.6 | 23.6 | 19.1 | 28.7 | 17.6 | 15.6 |
| Incr Delay (d2), s/veh | 3.6 | 0.6 | 0.1 | 1.4 | 0.4 | 0.6 | 15.1 | 3.3 | 0.1 | 3.1 | 0.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 3.5 | 0.4 | 1.0 | 2.5 | 1.4 | 1.6 | 5.3 | 0.3 | 2.8 | 2.7 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 33.6 | 22.8 | 19.0 | 32.5 | 23.8 | 22.5 | 46.7 | 27.0 | 19.2 | 31.8 | 18.1 | 15.7 |
| LnGrp LOS | C | C | B | C | C | C | D | C | B | C | B | B |
| Approach Vol, veh/h | | 1016 | | | 1066 | | | 485 | | | 474 | |
| Approach Delay, s/veh | | 24.1 | | | 24.7 | | | 29.7 | | | 23.1 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.9 | 22.4 | 9.2 | 22.8 | 8.9 | 27.4 | 11.7 | 20.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 15.4 | 4.9 | 12.6 | 5.4 | 9.4 | 7.6 | 10.2 |
| Green Ext Time (p_c), s | 0.1 | 2.2 | 0.1 | 4.9 | 0.0 | 1.5 | 0.1 | 5.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.0 |
| HCM 7th LOS | C |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 126 | 881 | 114 | 180 | 804 | 184 | 149 | 473 | 351 | 79 | 146 | 56 |
| Future Volume (vph) | 126 | 881 | 114 | 180 | 804 | 184 | 149 | 473 | 351 | 79 | 146 | 56 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.3 | 26.1 | 26.1 | 9.0 | 27.8 | 27.8 | 7.8 | 23.0 | 23.0 | 6.3 | 18.6 | 18.6 |
| Actuated g/C Ratio | 0.09 | 0.32 | 0.32 | 0.11 | 0.34 | 0.34 | 0.10 | 0.28 | 0.28 | 0.08 | 0.23 | 0.23 |
| v/c Ratio | 0.51 | 0.59 | 0.21 | 0.59 | 0.73 | 0.30 | 0.56 | 0.36 | 0.67 | 0.37 | 0.20 | 0.14 |
| Control Delay (s/veh) | 49.1 | 25.1 | 5.6 | 48.4 | 28.4 | 4.8 | 49.6 | 25.3 | 20.8 | 47.6 | 25.9 | 2.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.1 | 25.1 | 5.6 | 48.4 | 28.4 | 4.8 | 49.6 | 25.3 | 20.8 | 47.6 | 25.9 | 2.0 |
| LOS | D | C | A | D | C | A | D | C | C | D | C | A |
| Approach Delay (s/veh) | | 25.8 | | | 27.7 | | | 27.4 | | | 27.2 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 81.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.73 | |
| Intersection Signal Delay (s/veh): 27.0 | Intersection LOS: C |
| Intersection Capacity Utilization 58.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

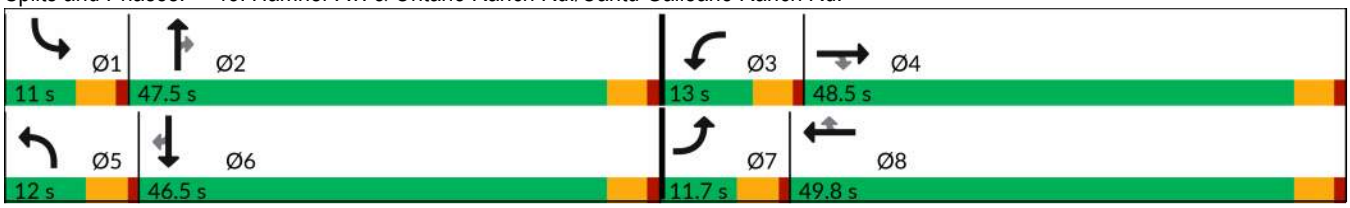

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 126 | 881 | 114 | 180 | 804 | 184 | 149 | 473 | 351 | 79 | 146 | 56 |
| Future Volume (veh/h) | 126 | 881 | 114 | 180 | 804 | 184 | 149 | 473 | 351 | 79 | 146 | 56 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 131 | 918 | 65 | 188 | 838 | 181 | 155 | 493 | 133 | 82 | 152 | 46 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 218 | 1624 | 504 | 272 | 1192 | 532 | 232 | 943 | 292 | 183 | 599 | 267 |
| Arrive On Green | 0.08 | 0.34 | 0.34 | 0.09 | 0.35 | 0.35 | 0.08 | 0.19 | 0.19 | 0.06 | 0.18 | 0.18 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 3367 | 1502 | 2910 | 4837 | 1497 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 131 | 918 | 65 | 188 | 838 | 181 | 155 | 493 | 133 | 82 | 152 | 46 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1683 | 1502 | 1455 | 1612 | 1497 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 2.6 | 9.1 | 1.8 | 3.7 | 12.6 | 5.2 | 3.0 | 5.4 | 4.6 | 1.6 | 2.3 | 1.5 |
| Cycle Q Clear(g_c), s | 2.6 | 9.1 | 1.8 | 3.7 | 12.6 | 5.2 | 3.0 | 5.4 | 4.6 | 1.6 | 2.3 | 1.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 218 | 1624 | 504 | 272 | 1192 | 532 | 232 | 943 | 292 | 183 | 599 | 267 |
| V/C Ratio(X) | 0.60 | 0.57 | 0.13 | 0.69 | 0.70 | 0.34 | 0.67 | 0.52 | 0.46 | 0.45 | 0.25 | 0.17 |
| Avail Cap(c_a), veh/h | 352 | 3615 | 1122 | 416 | 2590 | 1155 | 367 | 3532 | 1093 | 317 | 2401 | 1071 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.3 | 16.0 | 13.5 | 25.8 | 16.3 | 13.9 | 26.3 | 21.2 | 20.9 | 26.6 | 20.8 | 20.5 |
| Incr Delay (d2), s/veh | 1.0 | 0.3 | 0.1 | 1.2 | 0.8 | 0.4 | 1.2 | 0.5 | 1.1 | 0.6 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 2.6 | 0.5 | 1.1 | 3.8 | 1.4 | 1.0 | 1.8 | 1.4 | 0.5 | 0.8 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.3 | 16.3 | 13.7 | 27.0 | 17.1 | 14.3 | 27.5 | 21.7 | 22.0 | 27.2 | 21.0 | 20.8 |
| LnGrp LOS | C | B | B | C | B | B | C | C | C | C | C | C |
| Approach Vol, veh/h | | 1114 | | | 1207 | | | 781 | | | 280 | |
| Approach Delay, s/veh | | 17.4 | | | 18.2 | | | 22.9 | | | 22.8 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.3 | 16.0 | 10.1 | 24.3 | 9.3 | 15.0 | 9.0 | 25.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 3.6 | 7.4 | 5.7 | 11.1 | 5.0 | 4.3 | 4.6 | 14.6 |
| Green Ext Time (p_c), s | 0.0 | 3.6 | 0.1 | 6.5 | 0.1 | 1.0 | 0.0 | 6.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.4 |
| HCM 7th LOS | B |

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 984 | 197 | 776 | 130 | 245 | 0 | 799 |
| Future Volume (vph) | 984 | 197 | 776 | 130 | 245 | 0 | 799 |
| Turn Type | NA | Perm | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | | 6 | | | 4 | |
| Permitted Phases | | 2 | | Free | 4 | | 4 |
| Detector Phase | 2 | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | C-Min | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 65.3 | 65.3 | 65.3 | 120.0 | 43.6 | 43.6 | 43.6 |
| Actuated g/C Ratio | 0.54 | 0.54 | 0.54 | 1.00 | 0.36 | 0.36 | 0.36 |
| v/c Ratio | 0.36 | 0.23 | 0.43 | 0.05 | 0.40 | 0.76 | 0.75 |
| Control Delay (s/veh) | 17.6 | 3.4 | 31.2 | 0.0 | 28.8 | 38.0 | 37.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 17.6 | 3.4 | 31.2 | 0.0 | 28.8 | 38.0 | 37.4 |
| LOS | B | A | C | A | C | D | D |
| Approach Delay (s/veh) | 15.2 | | 26.7 | | | 35.8 | |
| Approach LOS | B | | C | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 37.5 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 45 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay (s/veh): 25.4 | Intersection LOS: C |
| Intersection Capacity Utilization 66.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

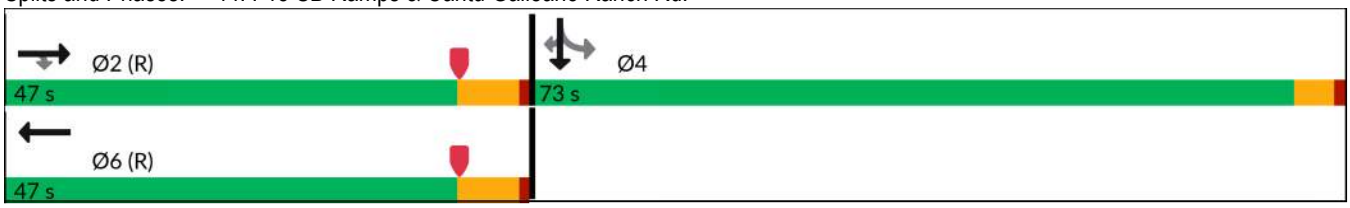

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 984 | 197 | 0 | 776 | 130 | 0 | 0 | 0 | 245 | 0 | 799 |
| Future Volume (veh/h) | 0 | 984 | 197 | 0 | 776 | 130 | 0 | 0 | 0 | 245 | 0 | 799 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 0 | 1772 | 1772 | | | | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 1036 | 0 | 0 | 817 | 0 | | | | 172 | 0 | 688 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 3416 | | 0 | 2277 | | | | | 422 | 0 | 796 |
| Arrive On Green | 0.00 | 0.64 | 0.00 | 0.00 | 1.00 | 0.00 | | | | 0.26 | 0.00 | 0.26 |
| Sat Flow, veh/h | 0 | 5316 | 1502 | 0 | 3544 | 2643 | | | | 1594 | 0 | 3003 |
| Grp Volume(v), veh/h | 0 | 1036 | 0 | 0 | 817 | 0 | | | | 172 | 0 | 688 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 1502 | 0 | 1772 | 1321 | | | | 1594 | 0 | 1502 |
| Q Serve(g_s), s | 0.0 | 10.4 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 10.7 | 0.0 | 26.2 |
| Cycle Q Clear(g_c), s | 0.0 | 10.4 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 10.7 | 0.0 | 26.2 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 3416 | | 0 | 2277 | | | | | 422 | 0 | 796 |
| V/C Ratio(X) | 0.00 | 0.30 | | 0.00 | 0.36 | | | | | 0.41 | 0.00 | 0.86 |
| Avail Cap(c_a), veh/h | 0 | 3416 | | 0 | 2277 | | | | | 908 | 0 | 1712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.77 | 0.00 | 0.00 | 0.86 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 9.5 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 36.3 | 0.0 | 42.1 |
| Incr Delay (d2), s/veh | 0.0 | 0.2 | 0.0 | 0.0 | 0.4 | 0.0 | | | | 0.6 | 0.0 | 3.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 3.4 | 0.0 | 0.0 | 0.1 | 0.0 | | | | 4.1 | 0.0 | 9.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 9.7 | 0.0 | 0.0 | 0.4 | 0.0 | | | | 37.0 | 0.0 | 45.0 |
| LnGrp LOS | | A | | | A | | | | | D | | D |
| Approach Vol, veh/h | | 1036 | | | 817 | | | | | | 860 | |
| Approach Delay, s/veh | | 9.7 | | | 0.4 | | | | | | 43.4 | |
| Approach LOS | | A | | | A | | | | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 83.6 | 36.4 | 83.6 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 12.4 | 28.2 | 2.0 |
| Green Ext Time (p_c), s | 7.0 | 3.6 | 5.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.6 |
| HCM 7th LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 421 | 809 | 185 | 311 | 446 | 186 |
| Future Volume (vph) | 421 | 809 | 185 | 311 | 446 | 186 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 68.2 | 68.2 | 12.7 | 85.5 | 23.4 | 23.4 |
| Actuated g/C Ratio | 0.57 | 0.57 | 0.11 | 0.71 | 0.20 | 0.20 |
| v/c Ratio | 0.14 | 0.72 | 0.61 | 0.09 | 0.77 | 0.40 |
| Control Delay (s/veh) | 8.5 | 14.9 | 59.3 | 5.7 | 54.2 | 8.4 |
| Queue Delay | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 8.5 | 15.1 | 59.3 | 5.7 | 54.2 | 8.4 |
| LOS | A | B | E | A | D | A |
| Approach Delay (s/veh) | 12.8 | | | 25.7 | 42.0 | |
| Approach LOS | B | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 44.8 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.77 | |
| Intersection Signal Delay (s/veh): 23.4 | Intersection LOS: C |
| Intersection Capacity Utilization 68.4% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

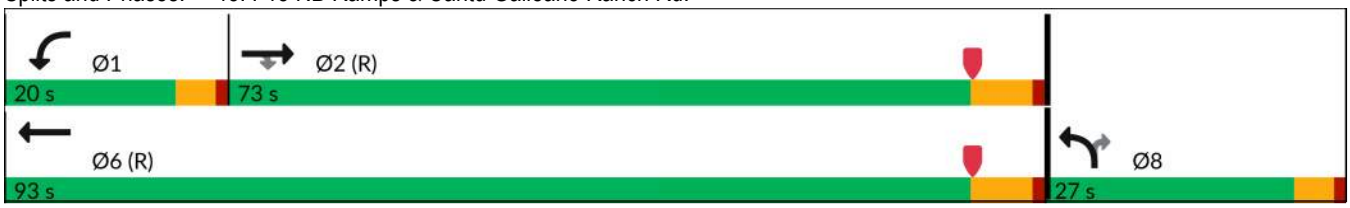

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 421 | 809 | 185 | 311 | 446 | 186 |
| Future Volume (veh/h) | 421 | 809 | 185 | 311 | 446 | 186 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1575 | 1772 | 1673 | 1772 |
| Adj Flow Rate, veh/h | 434 | 634 | 191 | 321 | 460 | 104 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3317 | 937 | 244 | 3953 | 522 | 246 |
| Arrive On Green | 1.00 | 1.00 | 0.08 | 0.74 | 0.16 | 0.16 |
| Sat Flow, veh/h | 5316 | 1502 | 3000 | 5316 | 3188 | 1502 |
| Grp Volume(v), veh/h | 434 | 634 | 191 | 321 | 460 | 104 |
| Grp Sat Flow(s),veh/h/ln | 1772 | 1502 | 1500 | 1772 | 1594 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 7.5 | 2.0 | 16.9 | 7.5 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 7.5 | 2.0 | 16.9 | 7.5 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3317 | 937 | 244 | 3953 | 522 | 246 |
| V/C Ratio(X) | 0.13 | 0.68 | 0.78 | 0.08 | 0.88 | 0.42 |
| Avail Cap(c_a), veh/h | 3317 | 937 | 385 | 3953 | 595 | 280 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.94 | 0.94 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 54.1 | 4.2 | 49.0 | 45.1 |
| Incr Delay (d2), s/veh | 0.1 | 3.7 | 5.5 | 0.0 | 13.1 | 1.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 1.0 | 2.9 | 0.5 | 7.5 | 2.8 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.1 | 3.7 | 59.6 | 4.2 | 62.1 | 46.2 |
| LnGrp LOS | A | A | E | A | E | D |
| Approach Vol, veh/h | 1068 | | | 512 | 564 | |
| Approach Delay, s/veh | 2.2 | | | 24.9 | 59.2 | |
| Approach LOS | A | | | C | E | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 81.4 | | | | 95.7 | 24.3 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 2.0 | | | | 4.0 | 18.9 |
| Green Ext Time (p_c), s | 0.3 | 5.6 | | | | 2.0 | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 360 | 3 | 371 | 296 | 784 | 866 | 494 |
| Future Volume (vph) | 360 | 3 | 371 | 296 | 784 | 866 | 494 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 24.0 | 61.0 | 37.0 | 37.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 26.7% | 67.8% | 41.1% | 41.1% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 20.4 | 20.4 | 20.4 | 19.1 | 56.6 | 32.2 | 32.2 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.21 | 0.63 | 0.36 | 0.36 |
| v/c Ratio | 0.80 | 0.69 | 0.54 | 0.94 | 0.40 | 0.77 | 0.61 |
| Control Delay (s/veh) | 50.9 | 33.3 | 14.1 | 63.8 | 1.9 | 31.2 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.9 | 33.3 | 14.1 | 63.8 | 1.9 | 31.2 | 5.6 |
| LOS | D | C | B | E | A | C | A |
| Approach Delay (s/veh) | | 33.3 | | | 18.8 | 21.9 | |
| Approach LOS | | C | | | B | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay (s/veh): 23.5 | Intersection LOS: C |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

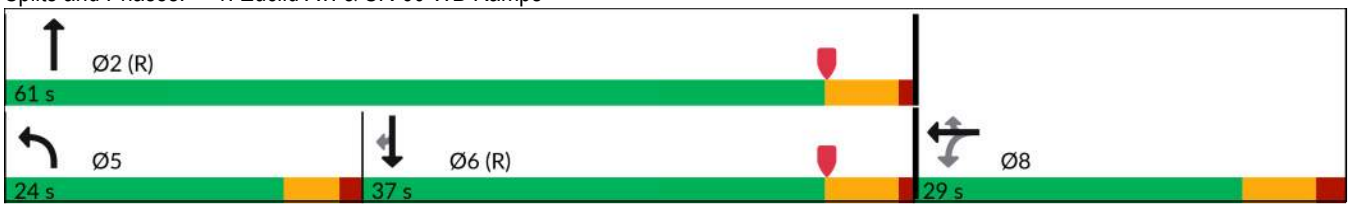

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 360 | 3 | 371 | 296 | 784 | 0 | 0 | 866 | 494 |
| Future Volume (veh/h) | 0 | 0 | 0 | 360 | 3 | 371 | 296 | 784 | 0 | 0 | 866 | 494 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 449 | 0 | 140 | 315 | 834 | 0 | 0 | 921 | 287 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 573 | 0 | 269 | 333 | 2275 | 0 | 0 | 1377 | 610 |
| Arrive On Green | | | | 0.18 | 0.00 | 0.18 | 0.07 | 0.22 | 0.00 | 0.00 | 0.41 | 0.41 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1497 | 1594 | 3455 | 0 | 0 | 3455 | 1491 |
| Grp Volume(v), veh/h | | | | 449 | 0 | 140 | 315 | 834 | 0 | 0 | 921 | 287 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1497 | 1594 | 1683 | 0 | 0 | 1683 | 1491 |
| Q Serve(g_s), s | | | | 12.1 | 0.0 | 7.6 | 17.7 | 18.9 | 0.0 | 0.0 | 20.0 | 12.7 |
| Cycle Q Clear(g_c), s | | | | 12.1 | 0.0 | 7.6 | 17.7 | 18.9 | 0.0 | 0.0 | 20.0 | 12.7 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 573 | 0 | 269 | 333 | 2275 | 0 | 0 | 1377 | 610 |
| V/C Ratio(X) | | | | 0.78 | 0.00 | 0.52 | 0.95 | 0.37 | 0.00 | 0.00 | 0.67 | 0.47 |
| Avail Cap(c_a), veh/h | | | | 779 | 0 | 366 | 333 | 2275 | 0 | 0 | 1377 | 610 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.65 | 0.65 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.2 | 0.0 | 33.4 | 41.4 | 18.7 | 0.0 | 0.0 | 21.6 | 19.5 |
| Incr Delay (d2), s/veh | | | | 4.5 | 0.0 | 2.2 | 26.8 | 0.3 | 0.0 | 0.0 | 2.6 | 2.6 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.0 | 0.0 | 2.9 | 9.9 | 8.4 | 0.0 | 0.0 | 7.6 | 4.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.7 | 0.0 | 35.6 | 68.2 | 19.0 | 0.0 | 0.0 | 24.2 | 22.1 |
| LnGrp LOS | | | | D | | D | E | B | | | C | C |
| Approach Vol, veh/h | | | | | 589 | | | 1149 | | | 1208 | |
| Approach Delay, s/veh | | | | | 38.7 | | | 32.5 | | | 23.7 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.8 | | 24.0 | 42.8 | | 23.2 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 18.8 | 31.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 20.9 | | 19.7 | 22.0 | | 14.1 |
| Green Ext Time (p_c), s | 8.8 | | 0.0 | 5.6 | | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.1 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 238 | 2 | 296 | 843 | 379 | 342 | 884 |
| Future Volume (vph) | 238 | 2 | 296 | 843 | 379 | 342 | 884 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 9.6 | 9.6 | 29.0 | 29.0 | 14.7 | 27.0 |
| Total Split (s) | 25.0 | 25.0 | 25.0 | 33.0 | 33.0 | 32.0 | 65.0 |
| Total Split (%) | 27.8% | 27.8% | 27.8% | 36.7% | 36.7% | 35.6% | 72.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | | 4.6 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 17.8 | 0.0 | 17.8 | 33.4 | 33.4 | 23.5 | 61.6 |
| Actuated g/C Ratio | 0.20 | 0.00 | 0.20 | 0.37 | 0.37 | 0.26 | 0.68 |
| v/c Ratio | 0.77 | no cap | 0.69 | 0.69 | 0.49 | 0.84 | 0.39 |
| Control Delay (s/veh) | 50.4 | | 22.2 | 29.4 | 5.1 | 34.4 | 13.9 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.4 | Error | 22.2 | 29.4 | 5.1 | 34.4 | 13.9 |
| LOS | D | F | C | C | A | C | B |
| Approach Delay (s/veh) | | Error | | 21.9 | | | 19.6 |
| Approach LOS | | F | | C | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

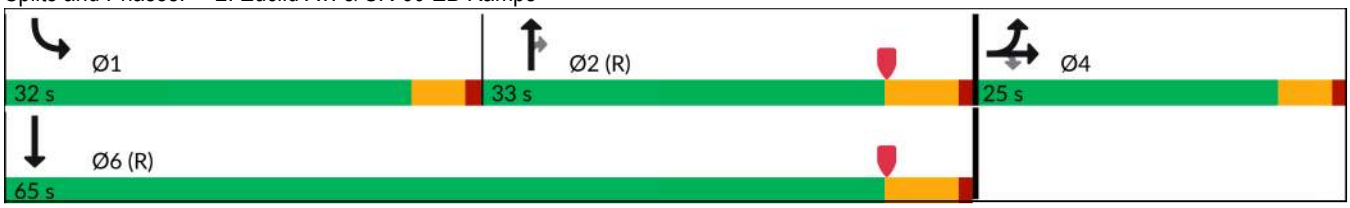

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 238 | 2 | 296 | 0 | 0 | 0 | 0 | 843 | 379 | 342 | 884 | 0 |
| Future Volume (veh/h) | 238 | 2 | 296 | 0 | 0 | 0 | 0 | 843 | 379 | 342 | 884 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 240 | 2 | 240 | | | | 0 | 852 | 268 | 345 | 893 | 0 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 296 | 0 | 278 | | | | 0 | 1386 | 616 | 371 | 2346 | 0 |
| Arrive On Green | 0.19 | 0.19 | 0.19 | | | | 0.00 | 0.41 | 0.41 | 0.47 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 1499 | | | | 0 | 3455 | 1496 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 240 | 0 | 240 | | | | 0 | 852 | 268 | 345 | 893 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1499 | | | | 0 | 1683 | 1496 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 13.0 | 0.0 | 14.0 | | | | 0.0 | 17.9 | 11.6 | 18.4 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 13.0 | 0.0 | 14.0 | | | | 0.0 | 17.9 | 11.6 | 18.4 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 296 | 0 | 278 | | | | 0 | 1386 | 616 | 371 | 2346 | 0 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.86 | | | | 0.00 | 0.61 | 0.44 | 0.93 | 0.38 | 0.00 |
| Avail Cap(c_a), veh/h | 361 | 0 | 340 | | | | 0 | 1386 | 616 | 483 | 2346 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.82 | 0.82 | 0.54 | 0.54 | 0.00 |
| Uniform Delay (d), s/veh | 35.1 | 0.0 | 35.5 | | | | 0.0 | 20.9 | 19.0 | 23.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 11.0 | 0.0 | 17.2 | | | | 0.0 | 1.7 | 1.8 | 13.4 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.8 | 0.0 | 6.3 | | | | 0.0 | 6.7 | 3.9 | 5.8 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 46.2 | 0.0 | 52.7 | | | | 0.0 | 22.5 | 20.8 | 36.8 | 0.3 | 0.0 |
| LnGrp LOS | D | | D | | | | | C | C | D | A | |
| Approach Vol, veh/h | | 480 | | | | | | 1120 | | | 1238 | |
| Approach Delay, s/veh | | 49.5 | | | | | | 22.1 | | | 10.4 | |
| Approach LOS | | D | | | | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.7 | 43.1 | | 21.3 | | 68.7 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 4.6 | | 6.0 |
| Max Green Setting (Gmax), s | 27.3 | 27.0 | | 20.4 | | 59.0 |
| Max Q Clear Time (g_c+I1), s | 20.4 | 19.9 | | 16.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.6 | 4.7 | | 0.7 | | 10.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 97 | 348 | 48 | 227 | 108 | 923 | 209 | 881 |
| Future Volume (vph) | 97 | 348 | 48 | 227 | 108 | 923 | 209 | 881 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 49.0 | 49.0 | 36.0 | 85.0 |
| Total Split (%) | 29.2% | 29.2% | 29.2% | 29.2% | 40.8% | 40.8% | 30.0% | 70.8% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 18.7 | 18.7 | 18.7 | 18.7 | 29.6 | 29.6 | 11.1 | 45.6 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.24 | 0.24 | 0.39 | 0.39 | 0.14 | 0.59 |
| v/c Ratio | 0.50 | 0.64 | 0.35 | 0.44 | 0.66 | 0.55 | 0.52 | 0.36 |
| Control Delay (s/veh) | 38.0 | 28.6 | 36.0 | 22.0 | 42.0 | 19.7 | 39.0 | 8.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.0 | 28.6 | 36.0 | 22.0 | 42.0 | 19.7 | 39.0 | 8.2 |
| LOS | D | C | D | C | D | B | D | A |
| Approach Delay (s/veh) | | 30.2 | | 23.7 | | 21.9 | | 13.6 |
| Approach LOS | | C | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 76.8 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.66 | |
| Intersection Signal Delay (s/veh): 20.6 | Intersection LOS: C |
| Intersection Capacity Utilization 72.0% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

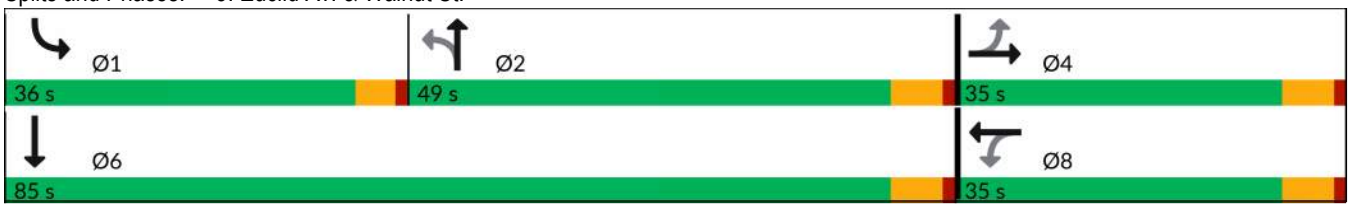

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 97 | 348 | 153 | 48 | 227 | 126 | 108 | 923 | 46 | 209 | 881 | 101 |
| Future Volume (veh/h) | 97 | 348 | 153 | 48 | 227 | 126 | 108 | 923 | 46 | 209 | 881 | 101 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 101 | 362 | 153 | 50 | 236 | 101 | 112 | 961 | 27 | 218 | 918 | 75 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 300 | 621 | 258 | 230 | 619 | 256 | 308 | 1687 | 47 | 317 | 2441 | 199 |
| Arrive On Green | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.35 | 0.35 | 0.35 | 0.11 | 0.54 | 0.54 |
| Sat Flow, veh/h | 980 | 2315 | 963 | 836 | 2305 | 952 | 535 | 4834 | 136 | 2910 | 4558 | 371 |
| Grp Volume(v), veh/h | 101 | 262 | 253 | 50 | 170 | 167 | 112 | 641 | 347 | 218 | 649 | 344 |
| Grp Sat Flow(s),veh/h/ln | 980 | 1683 | 1595 | 836 | 1683 | 1574 | 535 | 1612 | 1745 | 1455 | 1612 | 1704 |
| Q Serve(g_s), s | 5.6 | 8.0 | 8.2 | 3.3 | 4.9 | 5.1 | 10.2 | 9.6 | 9.6 | 4.3 | 6.9 | 7.0 |
| Cycle Q Clear(g_c), s | 10.7 | 8.0 | 8.2 | 11.5 | 4.9 | 5.1 | 10.2 | 9.6 | 9.6 | 4.3 | 6.9 | 7.0 |
| Prop In Lane | 1.00 | | 0.60 | 1.00 | | 0.60 | 1.00 | | 0.08 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 300 | 452 | 428 | 230 | 452 | 422 | 308 | 1125 | 609 | 317 | 1727 | 913 |
| V/C Ratio(X) | 0.34 | 0.58 | 0.59 | 0.22 | 0.38 | 0.40 | 0.36 | 0.57 | 0.57 | 0.69 | 0.38 | 0.38 |
| Avail Cap(c_a), veh/h | 520 | 831 | 787 | 419 | 831 | 777 | 513 | 2355 | 1274 | 1545 | 4317 | 2282 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.1 | 18.7 | 18.8 | 23.8 | 17.6 | 17.7 | 15.9 | 15.6 | 15.7 | 25.4 | 8.0 | 8.0 |
| Incr Delay (d2), s/veh | 0.7 | 1.2 | 1.3 | 0.5 | 0.5 | 0.6 | 0.7 | 0.5 | 0.8 | 1.0 | 0.1 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 2.8 | 2.7 | 0.6 | 1.7 | 1.6 | 1.1 | 2.9 | 3.2 | 1.3 | 1.7 | 1.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 22.8 | 19.9 | 20.1 | 24.3 | 18.1 | 18.3 | 16.6 | 16.1 | 16.5 | 26.4 | 8.1 | 8.3 |
| LnGrp LOS | C | B | C | C | B | B | B | B | B | C | A | A |
| Approach Vol, veh/h | | 616 | | | 387 | | | 1100 | | | 1211 | |
| Approach Delay, s/veh | | 20.5 | | | 19.0 | | | 16.3 | | | 11.4 | |
| Approach LOS | | C | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 26.4 | | 21.7 | | 37.5 | | 21.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.4 | 43.2 | | 29.2 | | 79.2 | | 29.2 |
| Max Q Clear Time (g_c+I1), s | 6.3 | 12.2 | | 12.7 | | 9.0 | | 13.5 |
| Green Ext Time (p_c), s | 0.4 | 8.4 | | 3.0 | | 7.3 | | 1.8 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 15.6 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 125 | 418 | 151 | 395 | 61 | 856 | 168 | 93 | 833 | 144 |
| Future Volume (vph) | 125 | 418 | 151 | 395 | 61 | 856 | 168 | 93 | 833 | 144 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 20.8 | 43.0 | 21.0 | 43.2 | 15.2 | 40.0 | 40.0 | 16.0 | 40.8 | 40.8 |
| Total Split (%) | 17.3% | 35.8% | 17.5% | 36.0% | 12.7% | 33.3% | 33.3% | 13.3% | 34.0% | 34.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.0 | 33.9 | 14.8 | 34.7 | 10.1 | 32.5 | 32.5 | 10.6 | 36.7 | 36.7 |
| Actuated g/C Ratio | 0.12 | 0.30 | 0.13 | 0.30 | 0.09 | 0.28 | 0.28 | 0.09 | 0.32 | 0.32 |
| v/c Ratio | 0.65 | 0.91 | 0.75 | 0.45 | 0.45 | 0.91 | 0.33 | 0.64 | 0.79 | 0.25 |
| Control Delay (s/veh) | 66.0 | 63.2 | 72.1 | 33.5 | 63.2 | 54.9 | 12.3 | 72.7 | 43.7 | 6.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 66.0 | 63.2 | 72.1 | 33.5 | 63.2 | 54.9 | 12.3 | 72.7 | 43.7 | 6.4 |
| LOS | E | E | E | C | E | D | B | E | D | A |
| Approach Delay (s/veh) | | 63.8 | | 43.3 | | 48.8 | | | 41.2 | |
| Approach LOS | | E | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 114.9 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.91 | |
| Intersection Signal Delay (s/veh): 48.0 | Intersection LOS: D |
| Intersection Capacity Utilization 88.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

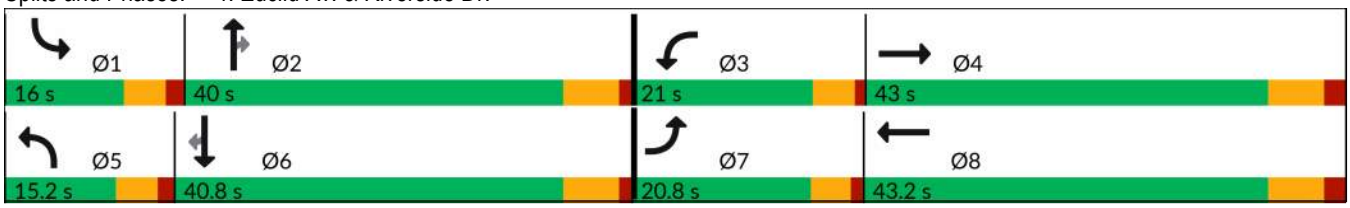

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 125 | 418 | 49 | 151 | 395 | 51 | 61 | 856 | 168 | 93 | 833 | 144 |
| Future Volume (veh/h) | 125 | 418 | 49 | 151 | 395 | 51 | 61 | 856 | 168 | 93 | 833 | 144 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 126 | 422 | 25 | 153 | 399 | 30 | 62 | 865 | 70 | 94 | 841 | 77 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 179 | 472 | 28 | 181 | 908 | 68 | 128 | 982 | 438 | 143 | 1014 | 447 |
| Arrive On Green | 0.11 | 0.28 | 0.28 | 0.11 | 0.29 | 0.29 | 0.08 | 0.29 | 0.29 | 0.09 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1594 | 1656 | 98 | 1594 | 3170 | 237 | 1594 | 3367 | 1502 | 1594 | 3367 | 1483 |
| Grp Volume(v), veh/h | 126 | 0 | 447 | 153 | 211 | 218 | 62 | 865 | 70 | 94 | 841 | 77 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1754 | 1594 | 1683 | 1724 | 1594 | 1683 | 1502 | 1594 | 1683 | 1483 |
| Q Serve(g_s), s | 7.9 | 0.0 | 25.5 | 9.8 | 10.6 | 10.8 | 3.9 | 25.5 | 3.6 | 5.9 | 24.2 | 4.0 |
| Cycle Q Clear(g_c), s | 7.9 | 0.0 | 25.5 | 9.8 | 10.6 | 10.8 | 3.9 | 25.5 | 3.6 | 5.9 | 24.2 | 4.0 |
| Prop In Lane | 1.00 | | 0.06 | 1.00 | | 0.14 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 179 | 0 | 500 | 181 | 482 | 494 | 128 | 982 | 438 | 143 | 1014 | 447 |
| V/C Ratio(X) | 0.70 | 0.00 | 0.89 | 0.84 | 0.44 | 0.44 | 0.49 | 0.88 | 0.16 | 0.66 | 0.83 | 0.17 |
| Avail Cap(c_a), veh/h | 246 | 0 | 607 | 250 | 585 | 599 | 153 | 1099 | 490 | 165 | 1125 | 496 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.5 | 0.0 | 35.7 | 45.2 | 30.3 | 30.3 | 45.8 | 35.1 | 27.4 | 45.8 | 33.9 | 26.8 |
| Incr Delay (d2), s/veh | 2.4 | 0.0 | 14.8 | 13.0 | 0.9 | 0.9 | 2.8 | 7.9 | 0.2 | 7.5 | 4.9 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.1 | 0.0 | 12.3 | 4.4 | 4.2 | 4.4 | 1.6 | 10.7 | 1.3 | 2.6 | 10.0 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 46.9 | 0.0 | 50.6 | 58.2 | 31.2 | 31.2 | 48.7 | 43.0 | 27.6 | 53.3 | 38.8 | 27.0 |
| LnGrp LOS | D | | D | E | C | C | D | D | C | D | D | C |
| Approach Vol, veh/h | | 573 | | | 582 | | | 997 | | | 1012 | |
| Approach Delay, s/veh | | 49.8 | | | 38.3 | | | 42.3 | | | 39.2 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.5 | 36.4 | 16.6 | 36.7 | 13.5 | 37.4 | 16.4 | 36.8 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.8 | 34.0 | 16.3 | 36.0 | 10.0 | 34.8 | 16.1 | 36.2 |
| Max Q Clear Time (g_c+I1), s | 7.9 | 27.5 | 11.8 | 27.5 | 5.9 | 26.2 | 9.9 | 12.8 |
| Green Ext Time (p_c), s | 0.0 | 2.9 | 0.1 | 2.2 | 0.0 | 3.6 | 0.1 | 3.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 41.9 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 82 | 312 | 55 | 78 | 149 | 59 | 957 | 232 | 29 | 929 | 73 |
| Future Volume (vph) | 82 | 312 | 55 | 78 | 149 | 59 | 957 | 232 | 29 | 929 | 73 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 55.0 | 55.0 | 55.0 | 15.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 41.7% | 45.8% | 45.8% | 45.8% | 12.5% | 58.3% | 58.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 24.4 | 24.4 | 24.4 | | 24.4 | 32.0 | 32.0 | 32.0 | 11.8 | 39.0 | 39.0 |
| Actuated g/C Ratio | 0.31 | 0.31 | 0.31 | | 0.31 | 0.41 | 0.41 | 0.41 | 0.15 | 0.50 | 0.50 |
| v/c Ratio | 0.29 | 0.58 | 0.11 | | 0.70 | 0.29 | 0.71 | 0.36 | 0.13 | 0.56 | 0.09 |
| Control Delay (s/veh) | 27.4 | 30.0 | 4.2 | | 38.6 | 24.5 | 24.4 | 15.0 | 44.0 | 14.7 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.4 | 30.0 | 4.2 | | 38.6 | 24.5 | 24.4 | 15.0 | 44.0 | 14.7 | 3.2 |
| LOS | C | C | A | | D | C | C | B | D | B | A |
| Approach Delay (s/veh) | | 26.3 | | | 38.6 | | 22.7 | | | 14.7 | |
| Approach LOS | | C | | | D | | C | | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 77.8 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.71 | |
| Intersection Signal Delay (s/veh): 21.8 | Intersection LOS: C |
| Intersection Capacity Utilization 87.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 82 | 312 | 55 | 78 | 149 | 21 | 59 | 957 | 232 | 29 | 929 | 73 |
| Future Volume (veh/h) | 82 | 312 | 55 | 78 | 149 | 21 | 59 | 957 | 232 | 29 | 929 | 73 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 84 | 318 | 39 | 80 | 152 | 19 | 60 | 977 | 161 | 30 | 948 | 46 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 317 | 523 | 443 | 133 | 220 | 23 | 287 | 1333 | 594 | 101 | 1771 | 790 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.40 | 0.40 | 0.40 | 0.06 | 0.53 | 0.53 |
| Sat Flow, veh/h | 1147 | 1772 | 1502 | 216 | 744 | 79 | 535 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 84 | 318 | 39 | 251 | 0 | 0 | 60 | 977 | 161 | 30 | 948 | 46 |
| Grp Sat Flow(s),veh/h/ln | 1147 | 1772 | 1502 | 1040 | 0 | 0 | 535 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 0.0 | 10.6 | 1.3 | 6.4 | 0.0 | 0.0 | 5.7 | 17.0 | 5.0 | 1.2 | 12.8 | 1.0 |
| Cycle Q Clear(g_c), s | 7.4 | 10.6 | 1.3 | 17.0 | 0.0 | 0.0 | 9.6 | 17.0 | 5.0 | 1.2 | 12.8 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 0.32 | | 0.08 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 317 | 523 | 443 | 376 | 0 | 0 | 287 | 1333 | 594 | 101 | 1771 | 790 |
| V/C Ratio(X) | 0.27 | 0.61 | 0.09 | 0.67 | 0.00 | 0.00 | 0.21 | 0.73 | 0.27 | 0.30 | 0.54 | 0.06 |
| Avail Cap(c_a), veh/h | 715 | 1138 | 964 | 869 | 0 | 0 | 452 | 2372 | 1058 | 241 | 3106 | 1385 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 19.7 | 20.8 | 17.6 | 23.2 | 0.0 | 0.0 | 16.9 | 17.7 | 14.1 | 30.8 | 10.8 | 8.0 |
| Incr Delay (d2), s/veh | 0.4 | 1.1 | 0.1 | 2.1 | 0.0 | 0.0 | 0.4 | 0.8 | 0.2 | 0.6 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 4.1 | 0.4 | 3.7 | 0.0 | 0.0 | 0.6 | 5.3 | 1.4 | 0.4 | 3.4 | 0.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 20.1 | 22.0 | 17.6 | 25.2 | 0.0 | 0.0 | 17.2 | 18.5 | 14.3 | 31.4 | 11.0 | 8.0 |
| LnGrp LOS | C | C | B | C | | | B | B | B | C | B | A |
| Approach Vol, veh/h | | 441 | | | 251 | | | 1198 | | | 1024 | |
| Approach Delay, s/veh | | 21.2 | | | 25.2 | | | 17.9 | | | 11.5 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.0 | 33.7 | | 26.1 | | 42.7 | | 26.1 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 48.5 | | 44.2 | | 63.5 | | 44.2 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 19.0 | | 12.6 | | 14.8 | | 19.0 |
| Green Ext Time (p_c), s | 0.0 | 8.2 | | 2.3 | | 7.0 | | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 16.8 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 199 | 280 | 144 | 33 | 63 | 98 | 1060 | 52 | 32 | 933 | 91 |
| Future Volume (vph) | 199 | 280 | 144 | 33 | 63 | 98 | 1060 | 52 | 32 | 933 | 91 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 19.0 | 51.3 | 51.3 | 14.7 | 47.0 | 14.7 | 39.3 | 39.3 | 14.7 | 39.3 | 39.3 |
| Total Split (%) | 15.8% | 42.8% | 42.8% | 12.3% | 39.2% | 12.3% | 32.8% | 32.8% | 12.3% | 32.8% | 32.8% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.7 | 25.0 | 25.0 | 10.3 | 18.1 | 10.3 | 40.6 | 40.6 | 10.3 | 33.6 | 33.6 |
| Actuated g/C Ratio | 0.15 | 0.26 | 0.26 | 0.11 | 0.19 | 0.11 | 0.42 | 0.42 | 0.11 | 0.35 | 0.35 |
| v/c Ratio | 0.86 | 0.63 | 0.30 | 0.20 | 0.26 | 0.60 | 0.78 | 0.08 | 0.20 | 0.83 | 0.16 |
| Control Delay (s/veh) | 73.9 | 38.2 | 6.1 | 48.2 | 29.8 | 61.3 | 33.8 | 0.2 | 48.1 | 38.1 | 3.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 73.9 | 38.2 | 6.1 | 48.2 | 29.8 | 61.3 | 33.8 | 0.2 | 48.1 | 38.1 | 3.7 |
| LOS | E | D | A | D | C | E | C | A | D | D | A |
| Approach Delay (s/veh) | | 42.2 | | | 35.0 | | 34.6 | | | 35.5 | |
| Approach LOS | | D | | | C | | C | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 95.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 36.5 | Intersection LOS: D |
| Intersection Capacity Utilization 82.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

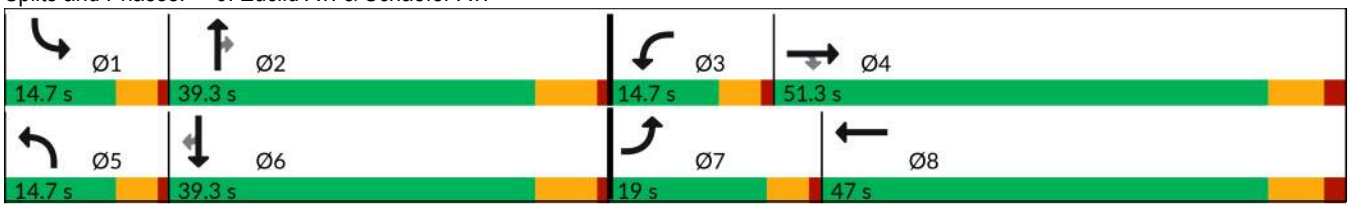

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 199 | 280 | 144 | 33 | 63 | 20 | 98 | 1060 | 52 | 32 | 933 | 91 |
| Future Volume (veh/h) | 199 | 280 | 144 | 33 | 63 | 20 | 98 | 1060 | 52 | 32 | 933 | 91 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 207 | 292 | 91 | 34 | 66 | 13 | 102 | 1104 | 40 | 33 | 972 | 64 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 240 | 355 | 301 | 105 | 166 | 33 | 176 | 1305 | 582 | 103 | 1150 | 513 |
| Arrive On Green | 0.15 | 0.20 | 0.20 | 0.07 | 0.12 | 0.12 | 0.11 | 0.39 | 0.39 | 0.06 | 0.34 | 0.34 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1438 | 283 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 207 | 292 | 91 | 34 | 0 | 79 | 102 | 1104 | 40 | 33 | 972 | 64 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1721 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 10.3 | 12.8 | 4.2 | 1.7 | 0.0 | 3.5 | 4.9 | 24.3 | 1.4 | 1.6 | 21.7 | 2.4 |
| Cycle Q Clear(g_c), s | 10.3 | 12.8 | 4.2 | 1.7 | 0.0 | 3.5 | 4.9 | 24.3 | 1.4 | 1.6 | 21.7 | 2.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 240 | 355 | 301 | 105 | 0 | 199 | 176 | 1305 | 582 | 103 | 1150 | 513 |
| V/C Ratio(X) | 0.86 | 0.82 | 0.30 | 0.32 | 0.00 | 0.40 | 0.58 | 0.85 | 0.07 | 0.32 | 0.85 | 0.12 |
| Avail Cap(c_a), veh/h | 280 | 966 | 818 | 196 | 0 | 847 | 196 | 1358 | 606 | 196 | 1358 | 606 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.7 | 31.1 | 27.7 | 36.2 | 0.0 | 33.3 | 34.3 | 22.7 | 15.7 | 36.3 | 24.8 | 18.4 |
| Incr Delay (d2), s/veh | 18.7 | 3.6 | 0.4 | 0.7 | 0.0 | 1.0 | 1.6 | 5.0 | 0.0 | 0.7 | 4.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.0 | 5.4 | 1.4 | 0.6 | 0.0 | 1.4 | 1.8 | 9.0 | 0.4 | 0.6 | 8.1 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 52.4 | 34.8 | 28.1 | 36.9 | 0.0 | 34.3 | 36.0 | 27.7 | 15.7 | 37.0 | 29.2 | 18.5 |
| LnGrp LOS | D | C | C | D | | C | D | C | B | D | C | B |
| Approach Vol, veh/h | | 590 | | | 113 | | | 1246 | | | 1069 | |
| Approach Delay, s/veh | | 39.9 | | | 35.1 | | | 28.0 | | | 28.8 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.0 | 38.0 | 10.1 | 23.3 | 13.7 | 34.3 | 16.9 | 16.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 32.8 | 10.0 | 44.3 | 10.0 | 32.8 | 14.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 3.6 | 26.3 | 3.7 | 14.8 | 6.9 | 23.7 | 12.3 | 5.5 |
| Green Ext Time (p_c), s | 0.0 | 3.5 | 0.0 | 1.4 | 0.0 | 4.0 | 0.1 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.9 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 117 | 393 | 126 | 197 | 216 | 130 | 937 | 332 | 294 | 729 | 119 |
| Future Volume (vph) | 117 | 393 | 126 | 197 | 216 | 130 | 937 | 332 | 294 | 729 | 119 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 50.1 | 50.1 | 50.1 | 50.1 | 50.1 | 14.7 | 43.3 | 43.3 | 26.6 | 55.2 | 55.2 |
| Total Split (%) | 41.8% | 41.8% | 41.8% | 41.8% | 41.8% | 12.3% | 36.1% | 36.1% | 22.2% | 46.0% | 46.0% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 42.9 | 42.9 | 42.9 | 42.9 | 42.9 | 10.0 | 36.8 | 36.8 | 21.9 | 48.7 | 48.7 |
| Actuated g/C Ratio | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.08 | 0.31 | 0.31 | 0.18 | 0.41 | 0.41 |
| v/c Ratio | 0.80 | 0.68 | 0.22 | 1.15 | 0.76 | 0.59 | 0.99 | 0.66 | 1.11 | 0.58 | 0.19 |
| Control Delay (s/veh) | 71.3 | 39.2 | 5.2 | 148.9 | 40.2 | 63.6 | 67.5 | 30.0 | 131.6 | 29.9 | 4.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 71.3 | 39.2 | 5.2 | 148.9 | 40.2 | 63.6 | 67.5 | 30.0 | 131.6 | 29.9 | 4.5 |
| LOS | E | D | A | F | D | E | E | C | F | C | A |
| Approach Delay (s/veh) | | 38.4 | | | 74.3 | | 58.2 | | | 53.5 | |
| Approach LOS | | D | | | E | | E | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.15 | |
| Intersection Signal Delay (s/veh): 56.1 | Intersection LOS: E |
| Intersection Capacity Utilization 101.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 117 | 393 | 126 | 197 | 216 | 214 | 130 | 937 | 332 | 294 | 729 | 119 |
| Future Volume (veh/h) | 117 | 393 | 126 | 197 | 216 | 214 | 130 | 937 | 332 | 294 | 729 | 119 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 127 | 427 | 79 | 214 | 235 | 224 | 141 | 1018 | 333 | 320 | 792 | 89 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 153 | 633 | 536 | 189 | 298 | 284 | 240 | 1032 | 460 | 291 | 1369 | 602 |
| Arrive On Green | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.08 | 0.31 | 0.31 | 0.18 | 0.41 | 0.41 |
| Sat Flow, veh/h | 881 | 1772 | 1500 | 843 | 834 | 795 | 2910 | 3367 | 1502 | 1594 | 3367 | 1480 |
| Grp Volume(v), veh/h | 127 | 427 | 79 | 214 | 0 | 459 | 141 | 1018 | 333 | 320 | 792 | 89 |
| Grp Sat Flow(s),veh/h/ln | 881 | 1772 | 1500 | 843 | 0 | 1629 | 1455 | 1683 | 1502 | 1594 | 1683 | 1480 |
| Q Serve(g_s), s | 12.6 | 24.5 | 4.3 | 18.4 | 0.0 | 30.3 | 5.6 | 36.1 | 23.7 | 21.9 | 21.9 | 4.6 |
| Cycle Q Clear(g_c), s | 42.9 | 24.5 | 4.3 | 42.9 | 0.0 | 30.3 | 5.6 | 36.1 | 23.7 | 21.9 | 21.9 | 4.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.49 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 153 | 633 | 536 | 189 | 0 | 582 | 240 | 1032 | 460 | 291 | 1369 | 602 |
| V/C Ratio(X) | 0.83 | 0.67 | 0.15 | 1.13 | 0.00 | 0.79 | 0.59 | 0.99 | 0.72 | 1.10 | 0.58 | 0.15 |
| Avail Cap(c_a), veh/h | 153 | 633 | 536 | 189 | 0 | 582 | 243 | 1032 | 460 | 291 | 1369 | 602 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.4 | 32.6 | 26.1 | 53.7 | 0.0 | 34.5 | 53.1 | 41.3 | 37.1 | 49.0 | 27.6 | 22.5 |
| Incr Delay (d2), s/veh | 30.4 | 2.8 | 0.1 | 104.5 | 0.0 | 7.1 | 2.4 | 24.5 | 5.5 | 82.3 | 0.6 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.1 | 10.5 | 1.5 | 11.1 | 0.0 | 12.6 | 2.0 | 17.5 | 8.9 | 14.9 | 8.3 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 85.8 | 35.5 | 26.3 | 158.2 | 0.0 | 41.6 | 55.5 | 65.9 | 42.6 | 131.3 | 28.2 | 22.6 |
| LnGrp LOS | F | D | C | F | | D | E | E | D | F | C | C |
| Approach Vol, veh/h | | 633 | | | 673 | | | 1492 | | | 1201 | |
| Approach Delay, s/veh | | 44.4 | | | 78.7 | | | 59.7 | | | 55.3 | |
| Approach LOS | | D | | | E | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.6 | 43.3 | | 50.1 | 14.6 | 55.3 | | 50.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 21.9 | 36.8 | | 42.9 | 10.0 | 48.7 | | 42.9 |
| Max Q Clear Time (g_c+I1), s | 23.9 | 38.1 | | 44.9 | 7.6 | 23.9 | | 44.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 5.2 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 59.2 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 74 | 337 | 208 | 131 | 130 | 98 | 1089 | 173 | 74 | 878 | 61 |
| Future Volume (vph) | 74 | 337 | 208 | 131 | 130 | 98 | 1089 | 173 | 74 | 878 | 61 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 24.4 | 24.4 | 24.4 | 24.4 | 24.4 | 12.2 | 39.5 | 39.5 | 11.3 | 38.7 | 38.7 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.27 | 0.27 | 0.27 | 0.14 | 0.44 | 0.44 | 0.13 | 0.43 | 0.43 |
| v/c Ratio | 0.30 | 0.75 | 0.39 | 0.90 | 0.46 | 0.48 | 0.78 | 0.26 | 0.39 | 0.64 | 0.09 |
| Control Delay (s/veh) | 30.3 | 40.7 | 5.7 | 84.0 | 27.3 | 48.3 | 29.6 | 13.1 | 47.4 | 26.4 | 4.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.3 | 40.7 | 5.7 | 84.0 | 27.3 | 48.3 | 29.6 | 13.1 | 47.4 | 26.4 | 4.2 |
| LOS | C | D | A | F | C | D | C | B | D | C | A |
| Approach Delay (s/veh) | | 27.7 | | | 49.2 | | 28.8 | | | 26.6 | |
| Approach LOS | | C | | | D | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 90.2 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.90 | |
| Intersection Signal Delay (s/veh): 30.0 | Intersection LOS: C |
| Intersection Capacity Utilization 88.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

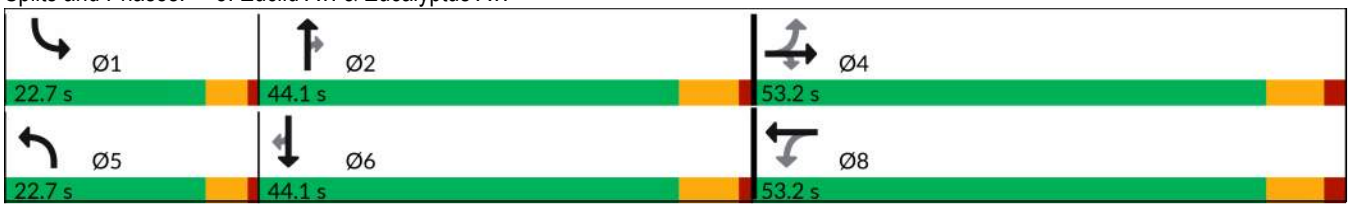

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 74 | 337 | 208 | 131 | 130 | 78 | 98 | 1089 | 173 | 74 | 878 | 61 |
| Future Volume (veh/h) | 74 | 337 | 208 | 131 | 130 | 78 | 98 | 1089 | 173 | 74 | 878 | 61 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 78 | 355 | 117 | 138 | 137 | 69 | 103 | 1146 | 158 | 78 | 924 | 31 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 360 | 619 | 524 | 236 | 388 | 196 | 154 | 1250 | 558 | 144 | 1230 | 549 |
| Arrive On Green | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.10 | 0.37 | 0.37 | 0.09 | 0.37 | 0.37 |
| Sat Flow, veh/h | 1111 | 1772 | 1502 | 870 | 1111 | 560 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 78 | 355 | 117 | 138 | 0 | 206 | 103 | 1146 | 158 | 78 | 924 | 31 |
| Grp Sat Flow(s),veh/h/ln | 1111 | 1772 | 1502 | 870 | 0 | 1671 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 5.5 | 15.9 | 5.4 | 14.9 | 0.0 | 8.9 | 6.1 | 31.6 | 7.2 | 4.6 | 23.4 | 1.3 |
| Cycle Q Clear(g_c), s | 14.4 | 15.9 | 5.4 | 30.8 | 0.0 | 8.9 | 6.1 | 31.6 | 7.2 | 4.6 | 23.4 | 1.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.33 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 360 | 619 | 524 | 236 | 0 | 584 | 154 | 1250 | 558 | 144 | 1230 | 549 |
| V/C Ratio(X) | 0.22 | 0.57 | 0.22 | 0.58 | 0.00 | 0.35 | 0.67 | 0.92 | 0.28 | 0.54 | 0.75 | 0.06 |
| Avail Cap(c_a), veh/h | 497 | 837 | 710 | 343 | 0 | 790 | 295 | 1300 | 580 | 295 | 1300 | 580 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.8 | 25.8 | 22.4 | 38.3 | 0.0 | 23.5 | 42.5 | 29.2 | 21.5 | 42.4 | 27.0 | 20.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.6 | 0.2 | 1.7 | 0.0 | 0.3 | 3.7 | 10.1 | 0.3 | 2.3 | 2.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 6.3 | 1.8 | 3.1 | 0.0 | 3.3 | 2.4 | 13.0 | 2.3 | 1.8 | 8.8 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.1 | 26.4 | 22.5 | 40.0 | 0.0 | 23.8 | 46.2 | 39.3 | 21.8 | 44.7 | 29.4 | 20.1 |
| LnGrp LOS | C | C | C | D | | C | D | D | C | D | C | C |
| Approach Vol, veh/h | | 550 | | | 344 | | | 1407 | | | 1033 | |
| Approach Delay, s/veh | | 25.9 | | | 30.3 | | | 37.8 | | | 30.3 | |
| Approach LOS | | C | | | C | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.5 | 42.7 | | 41.2 | 14.1 | 42.1 | | 41.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 33.6 | | 17.9 | 8.1 | 25.4 | | 32.8 |
| Green Ext Time (p_c), s | 0.1 | 2.6 | | 2.1 | 0.1 | 4.5 | | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 32.7 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 22 | 22 | 60 | 0 | 1 | 1394 | 58 | 187 | 1216 |
| Future Volume (vph) | 22 | 22 | 60 | 0 | 1 | 1394 | 58 | 187 | 1216 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.7 | 50.7 | 22.1 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.4% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 15.5 | | 15.5 | 10.2 | 44.9 | 44.9 | 15.6 | 63.0 |
| Actuated g/C Ratio | | 0.16 | | 0.16 | 0.11 | 0.47 | 0.47 | 0.16 | 0.67 |
| v/c Ratio | | 0.27 | | 0.60 | 0.01 | 0.91 | 0.08 | 0.75 | 0.57 |
| Control Delay (s/veh) | | 30.2 | | 22.7 | 45.0 | 34.8 | 0.2 | 57.9 | 13.7 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 30.2 | | 22.7 | 45.0 | 34.8 | 0.2 | 57.9 | 13.7 |
| LOS | | C | | C | D | C | A | E | B |
| Approach Delay (s/veh) | | 30.2 | | 22.7 | | 33.4 | | | 19.6 |
| Approach LOS | | C | | C | | C | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 94.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.91 | |
| Intersection Signal Delay (s/veh): 26.4 | Intersection LOS: C |
| Intersection Capacity Utilization 81.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

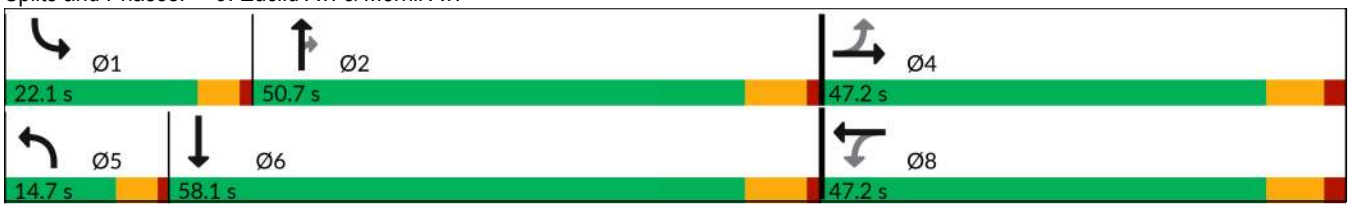

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 22 | 22 | 12 | 60 | 0 | 126 | 1 | 1394 | 58 | 187 | 1216 | 9 |
| Future Volume (veh/h) | 22 | 22 | 12 | 60 | 0 | 126 | 1 | 1394 | 58 | 187 | 1216 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 23 | 23 | 5 | 62 | 0 | 123 | 1 | 1452 | 56 | 195 | 1267 | 8 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 137 | 119 | 21 | 118 | 14 | 148 | 4 | 1638 | 731 | 228 | 2150 | 14 |
| Arrive On Green | 0.15 | 0.15 | 0.15 | 0.15 | 0.00 | 0.15 | 0.00 | 0.49 | 0.49 | 0.14 | 0.63 | 0.63 |
| Sat Flow, veh/h | 499 | 797 | 141 | 401 | 95 | 985 | 1594 | 3367 | 1502 | 1594 | 3429 | 22 |
| Grp Volume(v), veh/h | 51 | 0 | 0 | 185 | 0 | 0 | 1 | 1452 | 56 | 195 | 622 | 653 |
| Grp Sat Flow(s),veh/h/ln | 1437 | 0 | 0 | 1481 | 0 | 0 | 1594 | 1683 | 1502 | 1594 | 1683 | 1767 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 7.8 | 0.0 | 0.0 | 0.1 | 32.5 | 1.7 | 10.0 | 18.3 | 18.3 |
| Cycle Q Clear(g_c), s | 2.1 | 0.0 | 0.0 | 10.1 | 0.0 | 0.0 | 0.1 | 32.5 | 1.7 | 10.0 | 18.3 | 18.3 |
| Prop In Lane | 0.45 | | 0.10 | 0.34 | | 0.66 | 1.00 | | 1.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 278 | 0 | 0 | 280 | 0 | 0 | 4 | 1638 | 731 | 228 | 1056 | 1108 |
| V/C Ratio(X) | 0.18 | 0.00 | 0.00 | 0.66 | 0.00 | 0.00 | 0.23 | 0.89 | 0.08 | 0.85 | 0.59 | 0.59 |
| Avail Cap(c_a), veh/h | 765 | 0 | 0 | 760 | 0 | 0 | 191 | 1782 | 795 | 332 | 1056 | 1108 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.1 | 0.0 | 0.0 | 34.4 | 0.0 | 0.0 | 41.6 | 19.4 | 11.4 | 34.9 | 9.2 | 9.2 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 9.5 | 5.5 | 0.0 | 9.7 | 0.9 | 0.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 0.0 | 0.0 | 3.4 | 0.0 | 0.0 | 0.0 | 11.3 | 0.5 | 4.1 | 4.8 | 5.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 31.2 | 0.0 | 0.0 | 35.4 | 0.0 | 0.0 | 51.1 | 24.8 | 11.5 | 44.6 | 10.1 | 10.0 |
| LnGrp LOS | C | | | D | | | D | C | B | D | B | B |
| Approach Vol, veh/h | | 51 | | | 185 | | | 1509 | | | 1470 | |
| Approach Delay, s/veh | | 31.2 | | | 35.4 | | | 24.4 | | | 14.6 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.7 | 47.1 | | 19.7 | 4.9 | 58.9 | | 19.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.4 | 44.2 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 34.5 | | 4.1 | 2.1 | 20.3 | | 12.1 |
| Green Ext Time (p_c), s | 0.1 | 6.1 | | 0.2 | 0.0 | 8.7 | | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.7 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 262 | 625 | 57 | 38 | 431 | 213 | 92 | 805 | 36 | 454 | 610 | 165 |
| Future Volume (vph) | 262 | 625 | 57 | 38 | 431 | 213 | 92 | 805 | 36 | 454 | 610 | 165 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 37.4 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 31.2% | 12.3% | 12.3% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.2 | 29.6 | 29.6 | 10.2 | 26.0 | 26.0 | 10.2 | 30.2 | 47.0 | 10.2 | 30.4 | 47.0 |
| Actuated g/C Ratio | 0.10 | 0.30 | 0.30 | 0.10 | 0.26 | 0.26 | 0.10 | 0.30 | 0.47 | 0.10 | 0.30 | 0.47 |
| v/c Ratio | 0.94 | 0.66 | 0.12 | 0.25 | 0.52 | 0.40 | 0.61 | 0.84 | 0.05 | 1.63 | 0.63 | 0.22 |
| Control Delay (s/veh) | 87.0 | 35.0 | 0.5 | 50.3 | 33.0 | 5.7 | 63.5 | 42.6 | 0.1 | 330.3 | 35.0 | 4.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 87.0 | 35.0 | 0.5 | 50.3 | 33.0 | 5.7 | 63.5 | 42.6 | 0.1 | 330.3 | 35.0 | 4.0 |
| LOS | F | C | A | D | C | A | E | D | A | F | C | A |
| Approach Delay (s/veh) | | 47.3 | | | 25.4 | | | 43.0 | | | 139.9 | |
| Approach LOS | | D | | | C | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 100 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.63 | |
| Intersection Signal Delay (s/veh): 72.4 | Intersection LOS: E |
| Intersection Capacity Utilization 84.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

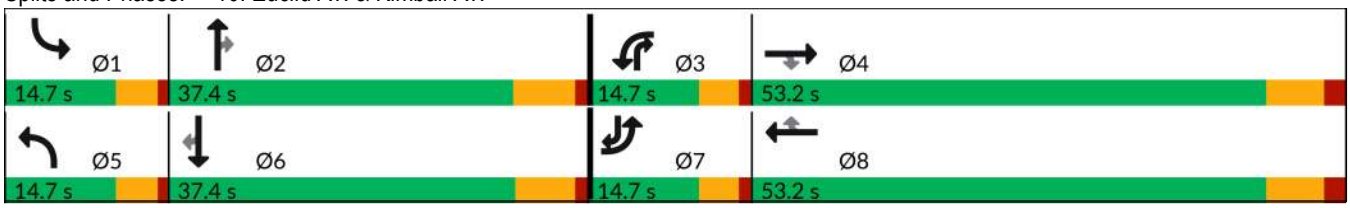

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 262 | 625 | 57 | 38 | 431 | 213 | 92 | 805 | 36 | 454 | 610 | 165 |
| Future Volume (veh/h) | 262 | 625 | 57 | 38 | 431 | 213 | 92 | 805 | 36 | 454 | 610 | 165 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 276 | 658 | 28 | 40 | 454 | 121 | 97 | 847 | 18 | 478 | 642 | 95 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 341 | 834 | 367 | 114 | 681 | 304 | 168 | 983 | 546 | 342 | 1023 | 632 |
| Arrive On Green | 0.12 | 0.37 | 0.25 | 0.07 | 0.30 | 0.20 | 0.11 | 0.44 | 0.29 | 0.12 | 0.46 | 0.30 |
| Sat Flow, veh/h | 2910 | 3367 | 1482 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 276 | 658 | 28 | 40 | 454 | 121 | 97 | 847 | 18 | 478 | 642 | 95 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1482 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 7.9 | 14.8 | 1.2 | 2.0 | 10.0 | 6.0 | 4.9 | 19.4 | 0.7 | 10.0 | 12.4 | 3.3 |
| Cycle Q Clear(g_c), s | 7.9 | 14.8 | 1.2 | 2.0 | 10.0 | 6.0 | 4.9 | 19.4 | 0.7 | 10.0 | 12.4 | 3.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 341 | 834 | 367 | 114 | 681 | 304 | 168 | 983 | 546 | 342 | 1023 | 632 |
| V/C Ratio(X) | 0.81 | 0.79 | 0.08 | 0.35 | 0.67 | 0.40 | 0.58 | 0.86 | 0.03 | 1.40 | 0.63 | 0.15 |
| Avail Cap(c_a), veh/h | 342 | 1818 | 800 | 187 | 1818 | 811 | 187 | 1221 | 652 | 342 | 1225 | 722 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.7 | 24.8 | 24.6 | 37.6 | 27.2 | 29.5 | 36.3 | 22.4 | 17.5 | 37.6 | 19.5 | 15.2 |
| Incr Delay (d2), s/veh | 12.6 | 1.7 | 0.1 | 1.8 | 0.4 | 0.3 | 1.7 | 5.5 | 0.0 | 196.7 | 0.8 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.2 | 4.8 | 0.4 | 0.8 | 3.4 | 2.0 | 1.9 | 6.1 | 0.2 | 12.6 | 3.8 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 49.3 | 26.5 | 24.7 | 39.5 | 27.6 | 29.8 | 37.9 | 27.8 | 17.5 | 234.3 | 20.3 | 15.4 |
| LnGrp LOS | D | C | C | D | C | C | D | C | B | F | C | B |
| Approach Vol, veh/h | | 962 | | | 615 | | | 962 | | | 1215 | |
| Approach Delay, s/veh | | 33.0 | | | 28.8 | | | 28.7 | | | 104.1 | |
| Approach LOS | | C | | | C | | | C | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 31.4 | 10.8 | 28.3 | 13.7 | 32.4 | 14.7 | 24.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 10.0 | 30.9 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 21.4 | 4.0 | 16.8 | 6.9 | 14.4 | 9.9 | 12.0 |
| Green Ext Time (p_c), s | 0.0 | 3.5 | 0.0 | 4.3 | 0.0 | 3.7 | 0.0 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 54.2 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 27 | 289 | 581 | 180 | 26 | 780 | 958 | 86 | 600 |
| Future Volume (vph) | 27 | 289 | 581 | 180 | 26 | 780 | 958 | 86 | 600 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 27.0 | 42.0 | 53.3 | 14.7 | 36.3 | 42.0 | 14.7 | 36.3 |
| Total Split (%) | 13.1% | 22.5% | 35.0% | 44.4% | 12.3% | 30.3% | 35.0% | 12.3% | 30.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 20.0 | 36.3 | 52.6 | 10.0 | 29.8 | 72.6 | 10.0 | 35.7 |
| Actuated g/C Ratio | 0.08 | 0.17 | 0.30 | 0.44 | 0.08 | 0.25 | 0.61 | 0.08 | 0.30 |
| v/c Ratio | 0.22 | 1.22 | 0.72 | 0.37 | 0.21 | 1.01 | 1.07 | 0.70 | 0.67 |
| Control Delay (s/veh) | 55.9 | 166.3 | 42.7 | 24.2 | 55.7 | 78.3 | 70.3 | 81.3 | 42.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.9 | 166.3 | 42.7 | 24.2 | 55.7 | 78.3 | 70.3 | 81.3 | 42.2 |
| LOS | E | F | D | C | E | E | E | F | D |
| Approach Delay (s/veh) | | 158.0 | | 37.0 | | 73.6 | | | 47.0 |
| Approach LOS | | F | | D | | E | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.22 | |
| Intersection Signal Delay (s/veh): 68.4 | Intersection LOS: E |
| Intersection Capacity Utilization 104.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

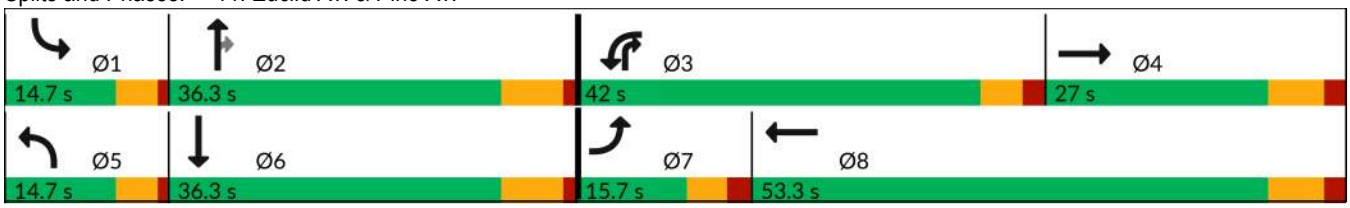

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 27 | 289 | 41 | 581 | 180 | 78 | 26 | 780 | 958 | 86 | 600 | 17 |
| Future Volume (veh/h) | 27 | 289 | 41 | 581 | 180 | 78 | 26 | 780 | 958 | 86 | 600 | 17 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 29 | 311 | 0 | 625 | 194 | 75 | 28 | 839 | 955 | 92 | 645 | 18 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 86 | 326 | | 688 | 446 | 172 | 84 | 922 | 766 | 137 | 1029 | 29 |
| Arrive On Green | 0.05 | 0.18 | 0.00 | 0.24 | 0.37 | 0.37 | 0.05 | 0.27 | 0.27 | 0.09 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1594 | 1772 | 0 | 2910 | 1217 | 470 | 1594 | 3367 | 1502 | 1594 | 3345 | 93 |
| Grp Volume(v), veh/h | 29 | 311 | 0 | 625 | 0 | 269 | 28 | 839 | 955 | 92 | 324 | 339 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 0 | 1455 | 0 | 1687 | 1594 | 1683 | 1502 | 1594 | 1683 | 1755 |
| Q Serve(g_s), s | 1.9 | 18.9 | 0.0 | 22.7 | 0.0 | 13.1 | 1.8 | 26.2 | 29.8 | 6.1 | 18.0 | 18.0 |
| Cycle Q Clear(g_c), s | 1.9 | 18.9 | 0.0 | 22.7 | 0.0 | 13.1 | 1.8 | 26.2 | 29.8 | 6.1 | 18.0 | 18.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.28 | 1.00 | | 1.00 | 1.00 | | 0.05 |
| Lane Grp Cap(c), veh/h | 86 | 326 | | 688 | 0 | 618 | 84 | 922 | 766 | 137 | 518 | 540 |
| V/C Ratio(X) | 0.34 | 0.95 | | 0.91 | 0.00 | 0.43 | 0.33 | 0.91 | 1.25 | 0.67 | 0.63 | 0.63 |
| Avail Cap(c_a), veh/h | 146 | 326 | | 971 | 0 | 718 | 146 | 922 | 766 | 146 | 518 | 540 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.6 | 43.9 | 0.0 | 40.4 | 0.0 | 26.0 | 49.7 | 38.2 | 26.6 | 48.2 | 32.3 | 32.3 |
| Incr Delay (d2), s/veh | 0.9 | 38.1 | 0.0 | 7.6 | 0.0 | 0.7 | 0.9 | 12.5 | 121.7 | 8.0 | 1.8 | 1.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 11.4 | 0.0 | 8.4 | 0.0 | 5.0 | 0.7 | 11.6 | 43.1 | 2.6 | 7.1 | 7.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 50.5 | 82.0 | 0.0 | 48.0 | 0.0 | 26.7 | 50.6 | 50.7 | 148.3 | 56.2 | 34.1 | 34.0 |
| LnGrp LOS | D | F | | D | | C | D | D | F | E | C | C |
| Approach Vol, veh/h | | 340 | | | 894 | | | 1822 | | | 755 | |
| Approach Delay, s/veh | | 79.3 | | | 41.6 | | | 101.9 | | | 36.8 | |
| Approach LOS | | E | | | D | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.1 | 36.3 | 31.4 | 27.0 | 10.4 | 40.0 | 11.5 | 46.9 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 29.8 | 36.3 | 20.0 | 10.0 | 29.8 | 10.0 | 46.3 |
| Max Q Clear Time (g_c+I1), s | 8.1 | 31.8 | 24.7 | 20.9 | 3.8 | 20.0 | 3.9 | 15.1 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 1.6 | 0.0 | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 72.8 |
| HCM 7th LOS | E |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 803 | 431 | 904 | 101 | 973 |
| Future Volume (vph) | 803 | 431 | 904 | 101 | 973 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 24.5 | 9.6 | 9.6 |
| Total Split (s) | 35.2 | 31.7 | 66.9 | 33.1 | 33.1 |
| Total Split (%) | 35.2% | 31.7% | 66.9% | 33.1% | 33.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 28.7 | 27.0 | 60.4 | 28.5 | 28.5 |
| Actuated g/C Ratio | 0.29 | 0.27 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 1.07 | 1.12 | 0.50 | 0.14 | 1.33 |
| Control Delay (s/veh) | 83.9 | 116.5 | 12.2 | 27.2 | 176.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 83.9 | 116.5 | 12.2 | 27.2 | 176.3 |
| LOS | F | F | B | C | F |
| Approach Delay (s/veh) | 83.9 | | 45.9 | 162.3 | |
| Approach LOS | F | | D | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.33 | |
| Intersection Signal Delay (s/veh): 93.9 | Intersection LOS: F |
| Intersection Capacity Utilization 100.3% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

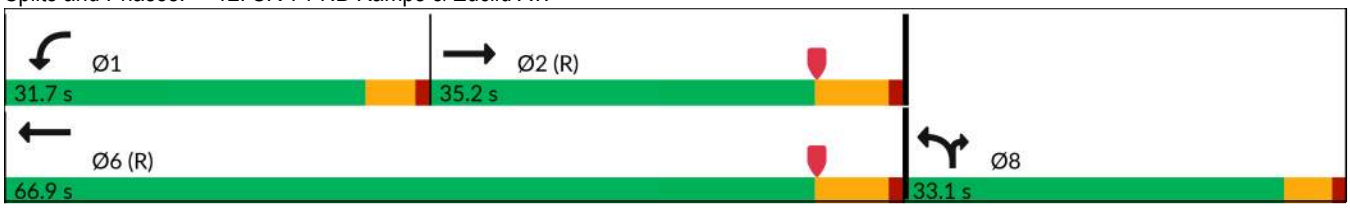

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 803 | 121 | 431 | 904 | 101 | 973 |
| Future Volume (veh/h) | 803 | 121 | 431 | 904 | 101 | 973 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1673 | 1772 | 1575 | 1772 |
| Adj Flow Rate, veh/h | 892 | 0 | 479 | 1004 | 112 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1730 | | 430 | 2797 | 169 | |
| Arrive On Green | 1.00 | 0.00 | 0.27 | 0.83 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3544 | 0 | 1594 | 3455 | 2910 | 1502 |
| Grp Volume(v), veh/h | 892 | 0 | 479 | 1004 | 112 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1683 | 0 | 1594 | 1683 | 1455 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 27.0 | 7.2 | 3.8 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 27.0 | 7.2 | 3.8 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1730 | | 430 | 2797 | 169 | |
| V/C Ratio(X) | 0.52 | | 1.11 | 0.36 | 0.66 | |
| Avail Cap(c_a), veh/h | 1730 | | 430 | 2797 | 829 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.80 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.5 | 2.0 | 46.1 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 77.8 | 0.4 | 4.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 18.9 | 0.7 | 1.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.9 | 0.0 | 114.3 | 2.4 | 50.5 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 892 | | | 1483 | 112 | |
| Approach Delay, s/veh | 0.9 | | | 38.6 | 50.5 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.7 | 57.9 | | | | 89.6 | 10.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 27.0 | 28.7 | | | | 60.4 | 28.5 |
| Max Q Clear Time (g_c+I1), s | 29.0 | 2.0 | | | | 9.2 | 5.8 |
| Green Ext Time (p_c), s | 0.0 | 4.6 | | | | 5.7 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.6 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 396 | 71 | 229 | 29 | 131 | 605 | 74 | 62 |
| Future Volume (vph) | 396 | 71 | 229 | 29 | 131 | 605 | 74 | 62 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 23.5 | 23.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 26.5 | 13.0 | 39.5 | 23.5 | 23.5 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 26.5% | 13.0% | 39.5% | 23.5% | 23.5% | 37.0% | 37.0% | 37.0% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 33.4 | 8.9 | 44.5 | 8.7 | 8.7 | 29.4 | 29.4 | 29.4 |
| Actuated g/C Ratio | 0.33 | 0.09 | 0.45 | 0.09 | 0.09 | 0.29 | 0.29 | 0.29 |
| v/c Ratio | 0.42 | 0.53 | 0.16 | 0.22 | 0.51 | 0.80 | 0.75 | 0.12 |
| Control Delay (s/veh) | 29.7 | 63.6 | 12.7 | 46.1 | 13.1 | 45.7 | 41.3 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.7 | 63.6 | 12.7 | 46.1 | 13.1 | 45.7 | 41.3 | 0.5 |
| LOS | C | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 29.7 | | 24.7 | | | | 39.9 | |
| Approach LOS | C | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 32.4 | Intersection LOS: C |
| Intersection Capacity Utilization 60.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

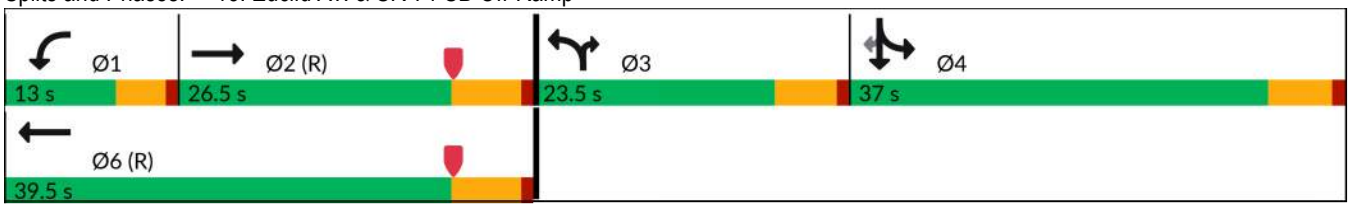

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 396 | 47 | 71 | 229 | 0 | 29 | 0 | 131 | 605 | 74 | 62 |
| Future Volume (veh/h) | 0 | 396 | 47 | 71 | 229 | 0 | 29 | 0 | 131 | 605 | 74 | 62 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 0 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 412 | 16 | 74 | 239 | 0 | 30 | 0 | 43 | 685 | 0 | 36 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1715 | 66 | 111 | 2141 | | 0 | 0 | 0 | 778 | 0 | 365 |
| Arrive On Green | 0.00 | 0.52 | 0.52 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 0.00 | 0.24 |
| Sat Flow, veh/h | 0 | 3393 | 128 | 1594 | 3455 | 0 | | 0 | | 3188 | 0 | 1496 |
| Grp Volume(v), veh/h | 0 | 209 | 219 | 74 | 239 | 0 | | 0.0 | | 685 | 0 | 36 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1683 | 1749 | 1594 | 1683 | 0 | | | | 1594 | 0 | 1496 |
| Q Serve(g_s), s | 0.0 | 6.8 | 6.9 | 4.4 | 0.0 | 0.0 | | | | 20.7 | 0.0 | 1.9 |
| Cycle Q Clear(g_c), s | 0.0 | 6.8 | 6.9 | 4.4 | 0.0 | 0.0 | | | | 20.7 | 0.0 | 1.9 |
| Prop In Lane | 0.00 | | 0.07 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 874 | 908 | 111 | 2141 | | | | | 778 | 0 | 365 |
| V/C Ratio(X) | 0.00 | 0.24 | 0.24 | 0.67 | 0.11 | | | | | 0.88 | 0.00 | 0.10 |
| Avail Cap(c_a), veh/h | 0 | 874 | 908 | 132 | 2141 | | | | | 995 | 0 | 467 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.89 | 0.89 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 13.2 | 13.2 | 41.9 | 0.0 | 0.0 | | | | 36.4 | 0.0 | 29.3 |
| Incr Delay (d2), s/veh | 0.0 | 0.6 | 0.6 | 5.3 | 0.1 | 0.0 | | | | 7.1 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.5 | 2.6 | 1.8 | 0.0 | 0.0 | | | | 8.7 | 0.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 13.9 | 13.8 | 47.2 | 0.1 | 0.0 | | | | 43.5 | 0.0 | 29.4 |
| LnGrp LOS | | B | B | D | A | | | | | D | | C |
| Approach Vol, veh/h | | 428 | | | 313 | | | | | | 721 | |
| Approach Delay, s/veh | | 13.9 | | | 11.2 | | | | | | 42.8 | |
| Approach LOS | | B | | | B | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.7 | 58.1 | | 30.2 | | 69.8 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 8.3 | 20.3 | | 31.2 | | 33.3 |
| Max Q Clear Time (g_c+I1), s | 6.4 | 8.9 | | 22.7 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.1 | | 1.5 | | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 937 | 40 | 0 | 569 | 61 | 30 | 0 | 0 | 44 | 0 | 30 |
| Future Vol, veh/h | 40 | 937 | 40 | 0 | 569 | 61 | 30 | 0 | 0 | 44 | 0 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 1018 | 43 | 0 | 618 | 66 | 33 | 0 | 0 | 48 | 0 | 33 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 685 | 0 | 0 | 1062 | 0 | 0 | 1746 | 1812 | 1040 | 1757 | 1801 | 652 |
| Stage 1 | - | - | - | - | - | - | 1127 | 1127 | - | 652 | 652 | - |
| Stage 2 | - | - | - | - | - | - | 618 | 685 | - | 1105 | 1149 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 909 | - | - | 656 | - | - | 68 | 78 | 280 | 66 | 80 | 468 |
| Stage 1 | - | - | - | - | - | - | 248 | 280 | - | 457 | 464 | - |
| Stage 2 | - | - | - | - | - | - | 476 | 448 | - | 256 | 273 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 909 | - | - | 656 | - | - | 55 | 69 | 280 | 58 | 70 | 468 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 152 | 169 | - | 161 | 173 | - |
| Stage 1 | - | - | - | - | - | - | 219 | 247 | - | 457 | 464 | - |
| Stage 2 | - | - | - | - | - | - | 443 | 448 | - | 225 | 241 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.36 | 0 | 35.07 | 30.67 |
| HCM LOS | | | E | D |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 152 | 70 | - | - | 656 | - | - | 219 |
| HCM Lane V/C Ratio | 0.215 | 0.048 | - | - | - | - | - | 0.367 |
| HCM Control Delay (s/veh) | 35.1 | 9.2 | 0 | - | 0 | - | - | 30.7 |
| HCM Lane LOS | E | A | A | - | A | - | - | D |
| HCM 95th %tile Q(veh) | 0.8 | 0.2 | - | - | 0 | - | - | 1.6 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 35 | 596 | 48 | 43 | 535 | 12 | 38 | 44 | 73 | 5 | 26 | 24 |
| Future Vol, veh/h | 35 | 596 | 48 | 43 | 535 | 12 | 38 | 44 | 73 | 5 | 26 | 24 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 36 | 614 | 49 | 44 | 552 | 12 | 39 | 45 | 75 | 5 | 27 | 25 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 567 | 0 | 0 | 664 | 0 | 0 | 1089 | 1367 | 639 | 1359 | 1385 | 285 |
| Stage 1 | - | - | - | - | - | - | 711 | 711 | - | 649 | 649 | - |
| Stage 2 | - | - | - | - | - | - | 378 | 656 | - | 709 | 736 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 1003 | - | - | 923 | - | - | 181 | 146 | 475 | 116 | 143 | 713 |
| Stage 1 | - | - | - | - | - | - | 423 | 435 | - | 425 | 464 | - |
| Stage 2 | - | - | - | - | - | - | 617 | 461 | - | 424 | 424 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1000 | - | - | 923 | - | - | 147 | 134 | 475 | 77 | 130 | 711 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 327 | 302 | - | 219 | 292 | - |
| Stage 1 | - | - | - | - | - | - | 408 | 420 | - | 404 | 441 | - |
| Stage 2 | - | - | - | - | - | - | 532 | 438 | - | 307 | 409 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.45 | 0.66 | 21.7 | 16.22 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 373 | 1000 | - | - | 923 | - | - | 377 |
| HCM Lane V/C Ratio | 0.429 | 0.036 | - | - | 0.048 | - | - | 0.15 |
| HCM Control Delay (s/veh) | 21.7 | 8.7 | - | - | 9.1 | - | - | 16.2 |
| HCM Lane LOS | C | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 2.1 | 0.1 | - | - | 0.2 | - | - | 0.5 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.1 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 47 | 290 | 27 | 2 | 80 | 9 | 12 | 148 | 13 | 8 | 126 | 24 |
| Future Vol, veh/h | 47 | 290 | 27 | 2 | 80 | 9 | 12 | 148 | 13 | 8 | 126 | 24 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 51 | 312 | 29 | 2 | 86 | 10 | 13 | 159 | 14 | 9 | 135 | 26 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 14.2 | 9.5 | 10.7 | 10.4 |
| HCM LOS | B | A | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 7% | 13% | 2% | 5% |
| Vol Thru, % | 86% | 80% | 88% | 80% |
| Vol Right, % | 8% | 7% | 10% | 15% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 173 | 364 | 91 | 158 |
| LT Vol | 12 | 47 | 2 | 8 |
| Through Vol | 148 | 290 | 80 | 126 |
| RT Vol | 13 | 27 | 9 | 24 |
| Lane Flow Rate | 186 | 391 | 98 | 170 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.284 | 0.551 | 0.149 | 0.258 |
| Departure Headway (Hd) | 5.495 | 5.068 | 5.478 | 5.475 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 653 | 712 | 654 | 656 |
| Service Time | 3.532 | 3.097 | 3.518 | 3.513 |
| HCM Lane V/C Ratio | 0.285 | 0.549 | 0.15 | 0.259 |
| HCM Control Delay, s/veh | 10.7 | 14.2 | 9.5 | 10.4 |
| HCM Lane LOS | B | B | A | B |
| HCM 95th-tile Q | 1.2 | 3.4 | 0.5 | 1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 52 | 723 | 105 | 461 | 467 | 68 | 110 | 174 | 112 |
| Future Volume (vph) | 52 | 723 | 105 | 461 | 467 | 68 | 110 | 174 | 112 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 15.0 | 31.0 | 31.0 | 36.0 | 52.0 | 16.3 | 36.0 | 17.0 | 36.7 |
| Total Split (%) | 12.5% | 25.8% | 25.8% | 30.0% | 43.3% | 13.6% | 30.0% | 14.2% | 30.6% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.3 | 25.2 | 25.2 | 31.4 | 50.2 | 9.4 | 30.6 | 12.4 | 35.6 |
| Actuated g/C Ratio | 0.07 | 0.21 | 0.21 | 0.26 | 0.42 | 0.08 | 0.26 | 0.10 | 0.30 |
| v/c Ratio | 0.52 | 1.06 | 0.26 | 1.21 | 0.42 | 0.60 | 1.08 | 1.16 | 0.28 |
| Control Delay (s/veh) | 70.4 | 95.8 | 4.3 | 154.0 | 25.5 | 72.8 | 94.0 | 167.1 | 34.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 70.4 | 95.8 | 4.3 | 154.0 | 25.5 | 72.8 | 94.0 | 167.1 | 34.3 |
| LOS | E | F | A | F | C | E | F | F | C |
| Approach Delay (s/veh) | | 83.4 | | | 83.7 | | 91.5 | | 109.7 |
| Approach LOS | | F | | | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.21 | |
| Intersection Signal Delay (s/veh): 88.1 | Intersection LOS: F |
| Intersection Capacity Utilization 108.6% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 52 | 723 | 105 | 461 | 467 | 89 | 68 | 110 | 386 | 174 | 112 | 20 |
| Future Volume (veh/h) | 52 | 723 | 105 | 461 | 467 | 89 | 68 | 110 | 386 | 174 | 112 | 20 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 57 | 786 | 87 | 501 | 508 | 54 | 74 | 120 | 257 | 189 | 122 | 14 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 71 | 748 | 317 | 419 | 1355 | 144 | 91 | 126 | 270 | 166 | 464 | 53 |
| Arrive On Green | 0.07 | 0.32 | 0.32 | 0.39 | 0.65 | 0.65 | 0.09 | 0.38 | 0.38 | 0.16 | 0.45 | 0.45 |
| Sat Flow, veh/h | 1594 | 3544 | 1502 | 1594 | 3150 | 334 | 1594 | 502 | 1076 | 1594 | 1561 | 179 |
| Grp Volume(v), veh/h | 57 | 786 | 87 | 501 | 285 | 277 | 74 | 0 | 377 | 189 | 0 | 136 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 1772 | 1712 | 1594 | 0 | 1578 | 1594 | 0 | 1740 |
| Q Serve(g_s), s | 4.2 | 25.2 | 5.2 | 31.4 | 9.0 | 9.0 | 5.4 | 0.0 | 27.7 | 12.4 | 0.0 | 5.9 |
| Cycle Q Clear(g_c), s | 4.2 | 25.2 | 5.2 | 31.4 | 9.0 | 9.0 | 5.4 | 0.0 | 27.7 | 12.4 | 0.0 | 5.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 0.68 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 71 | 748 | 317 | 419 | 762 | 736 | 91 | 0 | 396 | 166 | 0 | 518 |
| V/C Ratio(X) | 0.81 | 1.05 | 0.27 | 1.19 | 0.37 | 0.38 | 0.81 | 0.00 | 0.95 | 1.14 | 0.00 | 0.26 |
| Avail Cap(c_a), veh/h | 139 | 748 | 317 | 419 | 762 | 736 | 156 | 0 | 405 | 166 | 0 | 518 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.2 | 40.8 | 33.9 | 36.1 | 13.7 | 13.7 | 53.9 | 0.0 | 36.5 | 50.4 | 0.0 | 24.8 |
| Incr Delay (d2), s/veh | 7.9 | 46.8 | 0.5 | 108.7 | 0.3 | 0.3 | 6.4 | 0.0 | 32.4 | 112.9 | 0.0 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 14.2 | 1.8 | 22.6 | 3.0 | 3.0 | 2.2 | 0.0 | 12.6 | 9.7 | 0.0 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 63.1 | 87.6 | 34.4 | 144.8 | 14.0 | 14.0 | 60.3 | 0.0 | 68.9 | 163.3 | 0.0 | 25.1 |
| LnGrp LOS | E | F | C | F | B | B | E | | E | F | | C |
| Approach Vol, veh/h | | 930 | | | 1063 | | | 451 | | | 325 | |
| Approach Delay, s/veh | | 81.1 | | | 75.7 | | | 67.5 | | | 105.4 | |
| Approach LOS | | F | | | E | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 35.3 | 36.0 | 31.0 | 11.4 | 40.9 | 9.9 | 57.1 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 12.4 | 30.6 | 31.4 | 25.2 | 11.7 | 31.3 | 10.4 | 46.2 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 29.7 | 33.4 | 27.2 | 7.4 | 7.9 | 6.2 | 11.0 |
| Green Ext Time (p_c), s | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 79.7 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.2 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 95 | 178 | 16 | 0 | 84 | 3 | 10 | 24 | 3 | 3 | 13 | 67 |
| Future Vol, veh/h | 95 | 178 | 16 | 0 | 84 | 3 | 10 | 24 | 3 | 3 | 13 | 67 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 116 | 217 | 20 | 0 | 102 | 4 | 12 | 29 | 4 | 4 | 16 | 82 |
| Number of Lanes | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 2 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 2 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 2 |
| HCM Control Delay, s/veh | 9.8 | 8.6 | 8.5 | 8.3 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|---|
| Vol Left, % | 27% | 52% | 0% | 0% | 4% |
| Vol Thru, % | 65% | 48% | 85% | 97% | 16% |
| Vol Right, % | 8% | 0% | 15% | 3% | 81% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 37 | 184 | 105 | 87 | 83 |
| LT Vol | 10 | 95 | 0 | 0 | 3 |
| Through Vol | 24 | 89 | 89 | 84 | 13 |
| RT Vol | 3 | 0 | 16 | 3 | 67 |
| Lane Flow Rate | 45 | 224 | 128 | 106 | 101 |
| Geometry Grp | 2 | 5 | 5 | 4a | 2 |
| Degree of Util (X) | 0.064 | 0.326 | 0.173 | 0.14 | 0.129 |
| Departure Headway (Hd) | 5.135 | 5.23 | 4.864 | 4.755 | 4.581 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 696 | 687 | 738 | 752 | 781 |
| Service Time | 3.177 | 2.963 | 2.597 | 2.794 | 2.615 |
| HCM Lane V/C Ratio | 0.065 | 0.326 | 0.173 | 0.141 | 0.129 |
| HCM Control Delay, s/veh | 8.5 | 10.5 | 8.6 | 8.6 | 8.3 |
| HCM Lane LOS | A | B | A | A | A |
| HCM 95th-tile Q | 0.2 | 1.4 | 0.6 | 0.5 | 0.4 |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 40 | 1243 | 1067 | 89 |
| Future Volume (vph) | 40 | 1243 | 1067 | 89 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 5.0 |
| Minimum Split (s) | 23.8 | 23.8 | 23.8 | 22.6 |
| Total Split (s) | 97.0 | 97.0 | 97.0 | 23.0 |
| Total Split (%) | 80.8% | 80.8% | 80.8% | 19.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | None |
| Act Effct Green (s) | 32.8 | 32.8 | 32.8 | 9.3 |
| Actuated g/C Ratio | 0.69 | 0.69 | 0.69 | 0.19 |
| v/c Ratio | 0.21 | 0.59 | 0.57 | 0.39 |
| Control Delay (s/veh) | 8.6 | 7.6 | 7.2 | 22.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 8.6 | 7.6 | 7.2 | 22.4 |
| LOS | A | A | A | C |
| Approach Delay (s/veh) | | 7.7 | 7.2 | 22.4 |
| Approach LOS | | A | A | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 47.7 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.59 | |
| Intersection Signal Delay (s/veh): 8.2 | Intersection LOS: A |
| Intersection Capacity Utilization 53.0% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 19: Edison Av. & Cucamonga Av.

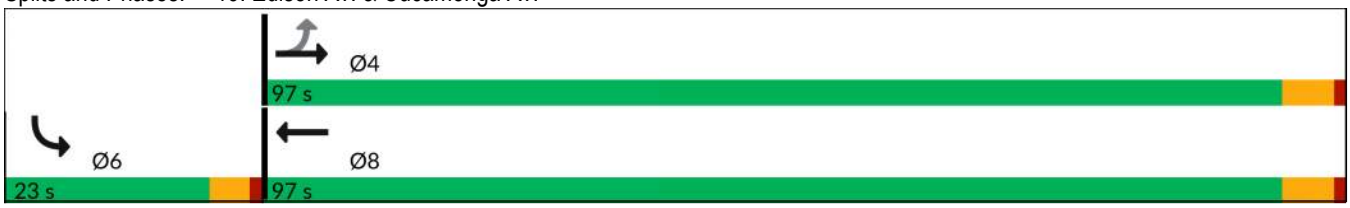

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 40 | 1243 | 1067 | 121 | 89 | 30 |
| Future Volume (veh/h) | 40 | 1243 | 1067 | 121 | 89 | 30 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 43 | 1351 | 1160 | 132 | 97 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 347 | 2215 | 2005 | 228 | 122 | 42 |
| Arrive On Green | 0.66 | 0.66 | 0.66 | 0.66 | 0.10 | 0.10 |
| Sat Flow, veh/h | 403 | 3455 | 3136 | 346 | 1212 | 412 |
| Grp Volume(v), veh/h | 43 | 1351 | 640 | 652 | 131 | 0 |
| Grp Sat Flow(s),veh/h/ln | 403 | 1683 | 1683 | 1710 | 1637 | 0 |
| Q Serve(g_s), s | 2.8 | 9.9 | 9.0 | 9.1 | 3.4 | 0.0 |
| Cycle Q Clear(g_c), s | 11.9 | 9.9 | 9.0 | 9.1 | 3.4 | 0.0 |
| Prop In Lane | 1.00 | | | 0.20 | 0.74 | 0.25 |
| Lane Grp Cap(c), veh/h | 347 | 2215 | 1108 | 1125 | 165 | 0 |
| V/C Ratio(X) | 0.12 | 0.61 | 0.58 | 0.58 | 0.79 | 0.00 |
| Avail Cap(c_a), veh/h | 934 | 7117 | 3558 | 3614 | 698 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.4 | 4.2 | 4.1 | 4.1 | 19.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.3 | 0.5 | 0.5 | 3.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.4 | 0.7 | 0.7 | 1.2 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 7.5 | 4.5 | 4.5 | 4.6 | 22.2 | 0.0 |
| LnGrp LOS | A | A | A | A | C | |
| Approach Vol, veh/h | | 1394 | 1292 | | 131 | |
| Approach Delay, s/veh | | 4.6 | 4.6 | | 22.2 | |
| Approach LOS | | A | A | | C | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 34.2 | | 9.0 | | 34.2 |
| Change Period (Y+Rc), s | | 5.8 | | 4.6 | | 5.8 |
| Max Green Setting (Gmax), s | | 91.2 | | 18.4 | | 91.2 |
| Max Q Clear Time (g_c+I1), s | | 13.9 | | 5.4 | | 11.1 |
| Green Ext Time (p_c), s | | 14.4 | | 0.1 | | 11.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 5.4 |
| HCM 7th LOS | A |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 224 | 354 | 654 | 962 | 753 |
| Future Volume (vph) | 3 | 224 | 354 | 654 | 962 | 753 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 24.8 | 24.8 | 22.0 | 65.2 | 43.2 | 43.2 |
| Total Split (%) | 27.6% | 27.6% | 24.4% | 72.4% | 48.0% | 48.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 22.1 | 22.1 | 16.2 | 56.3 | 34.3 | 34.3 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.18 | 0.63 | 0.38 | 0.38 |
| v/c Ratio | 0.92 | 0.42 | 1.26 | 0.32 | 0.76 | 0.81 |
| Control Delay (s/veh) | 64.8 | 7.0 | 165.4 | 1.3 | 28.4 | 12.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 64.8 | 7.0 | 165.4 | 1.3 | 28.4 | 12.7 |
| LOS | E | A | F | A | C | B |
| Approach Delay (s/veh) | 43.3 | | | 58.9 | 21.5 | |
| Approach LOS | D | | | E | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.26 | |
| Intersection Signal Delay (s/veh): 36.8 | Intersection LOS: D |
| Intersection Capacity Utilization 108.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

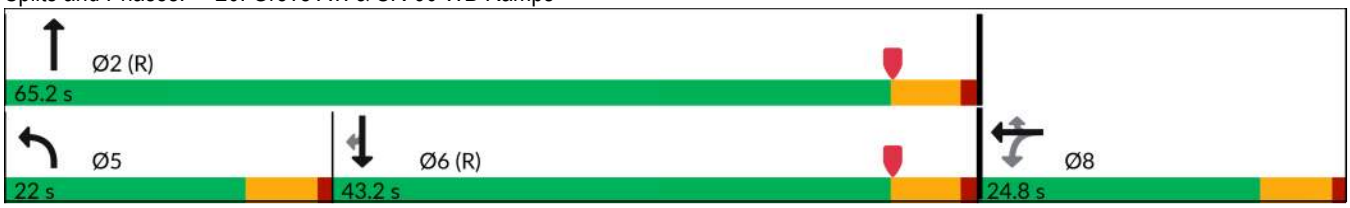

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 373 | 3 | 224 | 354 | 654 | 0 | 0 | 962 | 753 |
| Future Volume (veh/h) | 0 | 0 | 0 | 373 | 3 | 224 | 354 | 654 | 0 | 0 | 962 | 753 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 377 | 3 | 90 | 358 | 661 | 0 | 0 | 972 | 578 |
| Peak Hour Factor | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 354 | 3 | 317 | 287 | 2222 | 0 | 0 | 1399 | 608 |
| Arrive On Green | | | | 0.21 | 0.21 | 0.21 | 0.18 | 0.66 | 0.00 | 0.00 | 0.42 | 0.42 |
| Sat Flow, veh/h | | | | 1675 | 13 | 1502 | 1594 | 3455 | 0 | 0 | 3455 | 1463 |
| Grp Volume(v), veh/h | | | | 380 | 0 | 90 | 358 | 661 | 0 | 0 | 972 | 578 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1502 | 1594 | 1683 | 0 | 0 | 1683 | 1463 |
| Q Serve(g_s), s | | | | 19.0 | 0.0 | 4.5 | 16.2 | 7.5 | 0.0 | 0.0 | 21.4 | 34.3 |
| Cycle Q Clear(g_c), s | | | | 19.0 | 0.0 | 4.5 | 16.2 | 7.5 | 0.0 | 0.0 | 21.4 | 34.3 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 356 | 0 | 317 | 287 | 2222 | 0 | 0 | 1399 | 608 |
| V/C Ratio(X) | | | | 1.07 | 0.00 | 0.28 | 1.25 | 0.30 | 0.00 | 0.00 | 0.69 | 0.95 |
| Avail Cap(c_a), veh/h | | | | 356 | 0 | 317 | 287 | 2222 | 0 | 0 | 1399 | 608 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.5 | 0.0 | 29.8 | 36.9 | 6.5 | 0.0 | 0.0 | 21.6 | 25.4 |
| Incr Delay (d2), s/veh | | | | 66.3 | 0.0 | 0.4 | 114.3 | 0.0 | 0.0 | 0.0 | 2.9 | 26.2 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 13.9 | 0.0 | 1.6 | 15.0 | 2.0 | 0.0 | 0.0 | 8.1 | 15.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 101.8 | 0.0 | 30.2 | 151.2 | 6.5 | 0.0 | 0.0 | 24.5 | 51.6 |
| LnGrp LOS | | | | F | | C | F | A | | | C | D |
| Approach Vol, veh/h | | | | | 470 | | | 1019 | | | 1550 | |
| Approach Delay, s/veh | | | | | 88.1 | | | 57.3 | | | 34.6 | |
| Approach LOS | | | | | F | | | E | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 65.2 | | 22.0 | 43.2 | | 24.8 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 59.4 | | 16.2 | 37.4 | | 19.0 |
| Max Q Clear Time (g_c+I1), s | 9.5 | | 18.2 | 36.3 | | 21.0 |
| Green Ext Time (p_c), s | 3.7 | | 0.0 | 0.7 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 50.5 |
| HCM 7th LOS | D |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 3 | 368 | 748 | 410 | 924 |
| Future Volume (vph) | 3 | 368 | 748 | 410 | 924 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 24.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 35.8% | 26.7% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 21.2 | 21.2 | 26.4 | 24.8 | 56.2 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.29 | 0.28 | 0.62 |
| v/c Ratio | 0.69 | 0.88 | 1.16 | 0.97 | 0.46 |
| Control Delay (s/veh) | 39.8 | 43.8 | 110.9 | 59.4 | 23.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 |
| Total Delay (s/veh) | 39.8 | 43.8 | 110.9 | 59.4 | 24.7 |
| LOS | D | D | F | E | C |
| Approach Delay (s/veh) | 42.1 | | 110.9 | | 35.3 |
| Approach LOS | D | | F | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.16 | |
| Intersection Signal Delay (s/veh): 64.1 | Intersection LOS: E |
| Intersection Capacity Utilization 108.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 261 | 3 | 368 | 0 | 0 | 0 | 0 | 748 | 368 | 410 | 924 | 0 |
| Future Volume (veh/h) | 261 | 3 | 368 | 0 | 0 | 0 | 0 | 748 | 368 | 410 | 924 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 269 | 3 | 293 | | | | 0 | 771 | 316 | 423 | 953 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 372 | 4 | 334 | | | | 0 | 861 | 353 | 336 | 2144 | 0 |
| Arrive On Green | 0.22 | 0.22 | 0.22 | | | | 0.00 | 0.37 | 0.37 | 0.42 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1670 | 19 | 1500 | | | | 0 | 2414 | 952 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 272 | 0 | 293 | | | | 0 | 558 | 529 | 423 | 953 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1500 | | | | 0 | 1683 | 1594 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 13.4 | 0.0 | 17.0 | | | | 0.0 | 28.1 | 28.2 | 19.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 13.4 | 0.0 | 17.0 | | | | 0.0 | 28.1 | 28.2 | 19.0 | 0.0 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 0.60 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 377 | 0 | 334 | | | | 0 | 623 | 590 | 336 | 2144 | 0 |
| V/C Ratio(X) | 0.72 | 0.00 | 0.88 | | | | 0.00 | 0.90 | 0.90 | 1.26 | 0.44 | 0.00 |
| Avail Cap(c_a), veh/h | 507 | 0 | 450 | | | | 0 | 623 | 590 | 336 | 2144 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.56 | 0.56 | 0.00 |
| Uniform Delay (d), s/veh | 32.4 | 0.0 | 33.8 | | | | 0.0 | 26.7 | 26.7 | 26.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.8 | 0.0 | 11.3 | | | | 0.0 | 17.9 | 18.8 | 128.9 | 0.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.3 | 0.0 | 6.8 | | | | 0.0 | 13.2 | 12.7 | 16.7 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.2 | 0.0 | 45.1 | | | | 0.0 | 44.6 | 45.5 | 154.9 | 0.4 | 0.0 |
| LnGrp LOS | C | | D | | | | | D | D | F | A | |
| Approach Vol, veh/h | | 565 | | | | | | 1087 | | | 1376 | |
| Approach Delay, s/veh | | 39.8 | | | | | | 45.0 | | | 47.9 | |
| Approach LOS | | D | | | | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 39.1 | | 26.9 | | 63.1 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 19.0 | 26.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 30.2 | | 19.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 1.0 | | 5.9 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 45.3 |
| HCM 7th LOS | | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 126 | 212 | 36 | 124 | 86 | 778 | 149 | 934 |
| Future Volume (vph) | 126 | 212 | 36 | 124 | 86 | 778 | 149 | 934 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.8 | 18.9 | 6.5 | 11.5 | 8.4 | 23.3 | 10.5 | 27.5 |
| Actuated g/C Ratio | 0.13 | 0.25 | 0.09 | 0.15 | 0.11 | 0.31 | 0.14 | 0.36 |
| v/c Ratio | 0.67 | 0.40 | 0.29 | 0.43 | 0.53 | 0.89 | 0.74 | 0.98 |
| Control Delay (s/veh) | 49.8 | 20.5 | 39.1 | 19.1 | 44.1 | 38.5 | 54.6 | 50.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.8 | 20.5 | 39.1 | 19.1 | 44.1 | 38.5 | 54.6 | 50.8 |
| LOS | D | C | D | B | D | D | D | D |
| Approach Delay (s/veh) | | 29.0 | | 21.9 | | 39.0 | | 51.2 |
| Approach LOS | | C | | C | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 76 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.98 | |
| Intersection Signal Delay (s/veh): 41.2 | Intersection LOS: D |
| Intersection Capacity Utilization 73.1% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

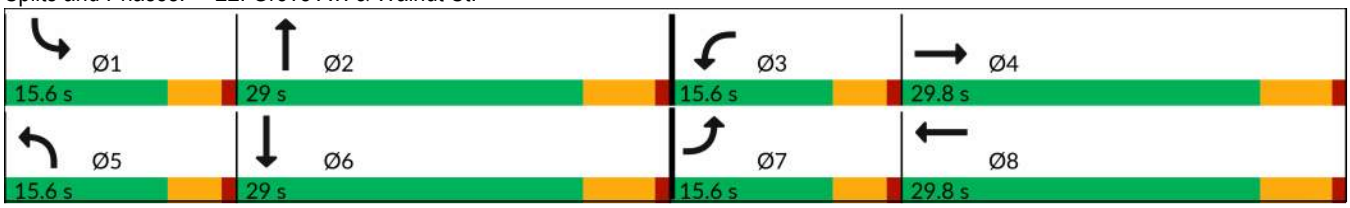

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 126 | 212 | 100 | 36 | 124 | 95 | 86 | 778 | 58 | 149 | 934 | 152 |
| Future Volume (veh/h) | 126 | 212 | 100 | 36 | 124 | 95 | 86 | 778 | 58 | 149 | 934 | 152 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 137 | 230 | 84 | 39 | 135 | 58 | 93 | 846 | 43 | 162 | 1015 | 88 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 168 | 542 | 192 | 61 | 361 | 147 | 115 | 996 | 51 | 197 | 1117 | 97 |
| Arrive On Green | 0.11 | 0.22 | 0.22 | 0.04 | 0.16 | 0.16 | 0.07 | 0.31 | 0.31 | 0.12 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1594 | 2429 | 861 | 1594 | 2318 | 945 | 1594 | 3259 | 166 | 1594 | 3131 | 271 |
| Grp Volume(v), veh/h | 137 | 157 | 157 | 39 | 96 | 97 | 93 | 437 | 452 | 162 | 546 | 557 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1606 | 1594 | 1683 | 1580 | 1594 | 1683 | 1741 | 1594 | 1683 | 1719 |
| Q Serve(g_s), s | 5.7 | 5.4 | 5.6 | 1.6 | 3.4 | 3.7 | 3.9 | 16.4 | 16.4 | 6.7 | 20.7 | 20.8 |
| Cycle Q Clear(g_c), s | 5.7 | 5.4 | 5.6 | 1.6 | 3.4 | 3.7 | 3.9 | 16.4 | 16.4 | 6.7 | 20.7 | 20.8 |
| Prop In Lane | 1.00 | | 0.54 | 1.00 | | 0.60 | 1.00 | | 0.10 | 1.00 | | 0.16 |
| Lane Grp Cap(c), veh/h | 168 | 376 | 358 | 61 | 262 | 246 | 115 | 515 | 532 | 197 | 600 | 613 |
| V/C Ratio(X) | 0.81 | 0.42 | 0.44 | 0.64 | 0.37 | 0.39 | 0.81 | 0.85 | 0.85 | 0.82 | 0.91 | 0.91 |
| Avail Cap(c_a), veh/h | 261 | 601 | 573 | 261 | 601 | 564 | 261 | 581 | 601 | 261 | 600 | 613 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.4 | 22.4 | 22.5 | 31.9 | 25.4 | 25.5 | 30.7 | 21.9 | 21.9 | 28.8 | 20.6 | 20.6 |
| Incr Delay (d2), s/veh | 5.5 | 0.7 | 0.8 | 4.0 | 0.9 | 1.0 | 4.9 | 10.4 | 10.1 | 11.4 | 17.8 | 17.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 2.0 | 2.0 | 0.6 | 1.3 | 1.3 | 1.5 | 7.0 | 7.2 | 3.0 | 10.0 | 10.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.9 | 23.1 | 23.3 | 35.9 | 26.3 | 26.5 | 35.7 | 32.3 | 32.0 | 40.1 | 38.4 | 38.2 |
| LnGrp LOS | C | C | C | D | C | C | D | C | C | D | D | D |
| Approach Vol, veh/h | | 451 | | | 232 | | | 982 | | | 1265 | |
| Approach Delay, s/veh | | 26.8 | | | 28.0 | | | 32.5 | | | 38.6 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.9 | 26.3 | 7.2 | 20.8 | 9.5 | 29.8 | 11.7 | 16.3 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 8.7 | 18.4 | 3.6 | 7.6 | 5.9 | 22.8 | 7.7 | 5.7 |
| Green Ext Time (p_c), s | 0.0 | 2.2 | 0.0 | 1.4 | 0.0 | 0.3 | 0.0 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 33.9 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 102 | 548 | 22 | 451 | 24 | 664 | 100 | 743 | 115 |
| Future Volume (vph) | 102 | 548 | 22 | 451 | 24 | 664 | 100 | 743 | 115 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 16.4 | 43.0 | 9.6 | 36.2 | 9.6 | 54.4 | 13.0 | 57.8 | 57.8 |
| Total Split (%) | 13.7% | 35.8% | 8.0% | 30.2% | 8.0% | 45.3% | 10.8% | 48.2% | 48.2% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.5 | 36.9 | 5.0 | 27.4 | 5.0 | 48.7 | 8.4 | 56.1 | 56.1 |
| Actuated g/C Ratio | 0.09 | 0.32 | 0.04 | 0.24 | 0.04 | 0.42 | 0.07 | 0.48 | 0.48 |
| v/c Ratio | 0.74 | 1.06 | 0.34 | 0.75 | 0.37 | 0.98 | 0.90 | 0.90 | 0.15 |
| Control Delay (s/veh) | 81.4 | 93.4 | 69.5 | 46.2 | 71.3 | 63.2 | 116.4 | 44.6 | 1.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 81.4 | 93.4 | 69.5 | 46.2 | 71.3 | 63.2 | 116.4 | 44.6 | 1.8 |
| LOS | F | F | E | D | E | E | F | D | A |
| Approach Delay (s/veh) | | 91.6 | | 47.1 | | 63.4 | | 46.9 | |
| Approach LOS | | F | | D | | E | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 116.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.06 | |
| Intersection Signal Delay (s/veh): 61.2 | Intersection LOS: E |
| Intersection Capacity Utilization 99.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

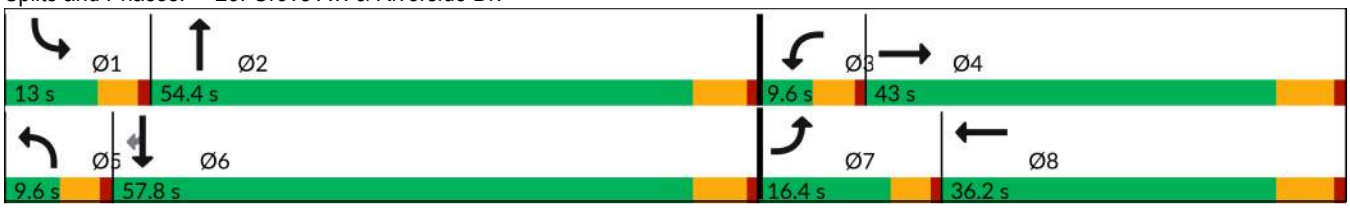

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 102 | 548 | 24 | 22 | 451 | 118 | 24 | 664 | 35 | 100 | 743 | 115 |
| Future Volume (veh/h) | 102 | 548 | 24 | 22 | 451 | 118 | 24 | 664 | 35 | 100 | 743 | 115 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 105 | 565 | 17 | 23 | 465 | 71 | 25 | 685 | 24 | 103 | 766 | 70 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 127 | 535 | 16 | 36 | 748 | 114 | 38 | 703 | 25 | 114 | 816 | 692 |
| Arrive On Green | 0.08 | 0.31 | 0.31 | 0.02 | 0.26 | 0.26 | 0.02 | 0.41 | 0.41 | 0.07 | 0.46 | 0.46 |
| Sat Flow, veh/h | 1594 | 1711 | 51 | 1594 | 2922 | 444 | 1594 | 1702 | 60 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 105 | 0 | 582 | 23 | 267 | 269 | 25 | 0 | 709 | 103 | 766 | 70 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1763 | 1594 | 1683 | 1683 | 1594 | 0 | 1761 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 7.6 | 0.0 | 36.8 | 1.7 | 16.5 | 16.7 | 1.8 | 0.0 | 46.5 | 7.5 | 48.3 | 3.1 |
| Cycle Q Clear(g_c), s | 7.6 | 0.0 | 36.8 | 1.7 | 16.5 | 16.7 | 1.8 | 0.0 | 46.5 | 7.5 | 48.3 | 3.1 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 0.26 | 1.00 | | 0.03 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 127 | 0 | 552 | 36 | 431 | 431 | 38 | 0 | 727 | 114 | 816 | 692 |
| V/C Ratio(X) | 0.83 | 0.00 | 1.06 | 0.64 | 0.62 | 0.63 | 0.66 | 0.00 | 0.97 | 0.90 | 0.94 | 0.10 |
| Avail Cap(c_a), veh/h | 160 | 0 | 552 | 68 | 431 | 431 | 68 | 0 | 728 | 114 | 816 | 692 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.3 | 0.0 | 40.4 | 57.0 | 38.7 | 38.8 | 56.9 | 0.0 | 33.9 | 54.2 | 30.1 | 17.9 |
| Incr Delay (d2), s/veh | 20.1 | 0.0 | 53.7 | 7.0 | 2.7 | 2.8 | 7.1 | 0.0 | 27.1 | 54.5 | 18.3 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.7 | 0.0 | 23.2 | 0.7 | 6.8 | 6.9 | 0.8 | 0.0 | 24.0 | 4.7 | 23.1 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 73.5 | 0.0 | 94.1 | 64.0 | 41.4 | 41.6 | 64.1 | 0.0 | 61.0 | 108.7 | 48.4 | 18.0 |
| LnGrp LOS | E | | F | E | D | D | E | | E | F | D | B |
| Approach Vol, veh/h | | 687 | | | 559 | | | 734 | | | 939 | |
| Approach Delay, s/veh | | 90.9 | | | 42.4 | | | 61.2 | | | 52.8 | |
| Approach LOS | | F | | | D | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.0 | 54.4 | 7.2 | 43.0 | 7.4 | 60.0 | 13.9 | 36.3 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 8.4 | 48.6 | 5.0 | 36.8 | 5.0 | 52.0 | 11.8 | 30.0 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 48.5 | 3.7 | 38.8 | 3.8 | 50.3 | 9.6 | 18.7 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 2.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 61.9 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 261.6 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 50 | 261 | 24 | 29 | 117 | 34 | 22 | 650 | 32 | 37 | 737 | 16 |
| Future Vol, veh/h | 50 | 261 | 24 | 29 | 117 | 34 | 22 | 650 | 32 | 37 | 737 | 16 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 52 | 272 | 25 | 30 | 122 | 35 | 23 | 677 | 33 | 39 | 768 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 45.1 | 25.8 | 294.1 | 378.1 |
| HCM LOS | E | D | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 3% | 15% | 16% | 5% |
| Vol Thru, % | 92% | 78% | 65% | 93% |
| Vol Right, % | 5% | 7% | 19% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 704 | 335 | 180 | 790 |
| LT Vol | 22 | 50 | 29 | 37 |
| Through Vol | 650 | 261 | 117 | 737 |
| RT Vol | 32 | 24 | 34 | 16 |
| Lane Flow Rate | 733 | 349 | 188 | 823 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.575 | 0.793 | 0.466 | 1.771 |
| Departure Headway (Hd) | 9.2 | 10.866 | 12.414 | 8.879 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 403 | 335 | 293 | 420 |
| Service Time | 7.2 | 8.866 | 10.414 | 6.879 |
| HCM Lane V/C Ratio | 1.819 | 1.042 | 0.642 | 1.96 |
| HCM Control Delay, s/veh | 294.1 | 45.1 | 25.8 | 378.1 |
| HCM Lane LOS | F | F | D | F |
| HCM 95th-tile Q | 34.8 | 6.5 | 2.3 | 45.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 174.8 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 96 | 177 | 38 | 3 | 42 | 22 | 23 | 598 | 16 | 37 | 704 | 26 |
| Future Vol, veh/h | 96 | 177 | 38 | 3 | 42 | 22 | 23 | 598 | 16 | 37 | 704 | 26 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 102 | 188 | 40 | 3 | 45 | 23 | 24 | 636 | 17 | 39 | 749 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 28.7 | 15.7 | 157.1 | 262.7 |
| HCM LOS | D | C | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 4% | 31% | 4% | 5% |
| Vol Thru, % | 94% | 57% | 63% | 92% |
| Vol Right, % | 3% | 12% | 33% | 3% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 637 | 311 | 67 | 767 |
| LT Vol | 23 | 96 | 3 | 37 |
| Through Vol | 598 | 177 | 42 | 704 |
| RT Vol | 16 | 38 | 22 | 26 |
| Lane Flow Rate | 678 | 331 | 71 | 816 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.261 | 0.686 | 0.17 | 1.518 |
| Departure Headway (Hd) | 7.526 | 8.708 | 10.522 | 7.184 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 488 | 417 | 344 | 514 |
| Service Time | 5.526 | 6.708 | 8.522 | 5.184 |
| HCM Lane V/C Ratio | 1.389 | 0.794 | 0.206 | 1.588 |
| HCM Control Delay, s/veh | 157.1 | 28.7 | 15.7 | 262.7 |
| HCM Lane LOS | F | D | C | F |
| HCM 95th-tile Q | 24.7 | 5 | 0.6 | 39.6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 196 | 888 | 188 | 221 | 730 | 213 | 169 | 243 | 258 | 343 |
| Future Volume (vph) | 196 | 888 | 188 | 221 | 730 | 213 | 169 | 243 | 258 | 343 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 21.8 | 37.0 | 37.0 | 21.0 | 36.2 | 36.2 | 17.0 | 37.2 | 24.8 | 45.0 |
| Total Split (%) | 18.2% | 30.8% | 30.8% | 17.5% | 30.2% | 30.2% | 14.2% | 31.0% | 20.7% | 37.5% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 17.2 | 31.2 | 31.2 | 16.4 | 30.4 | 30.4 | 12.4 | 31.8 | 20.2 | 39.6 |
| Actuated g/C Ratio | 0.14 | 0.26 | 0.26 | 0.14 | 0.25 | 0.25 | 0.10 | 0.27 | 0.17 | 0.33 |
| v/c Ratio | 0.94 | 1.11 | 0.38 | 1.11 | 0.93 | 0.42 | 1.13 | 0.98 | 1.05 | 1.06 |
| Control Delay (s/veh) | 98.1 | 106.0 | 7.0 | 141.8 | 62.7 | 7.0 | 157.8 | 80.0 | 117.9 | 91.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 98.1 | 106.0 | 7.0 | 141.8 | 62.7 | 7.0 | 157.8 | 80.0 | 117.9 | 91.7 |
| LOS | F | F | A | F | E | A | F | E | F | F |
| Approach Delay (s/veh) | | 90.2 | | | 67.5 | | | 102.5 | | 100.0 |
| Approach LOS | | F | | | E | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.13 | |
| Intersection Signal Delay (s/veh): 87.2 | Intersection LOS: F |
| Intersection Capacity Utilization 99.6% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

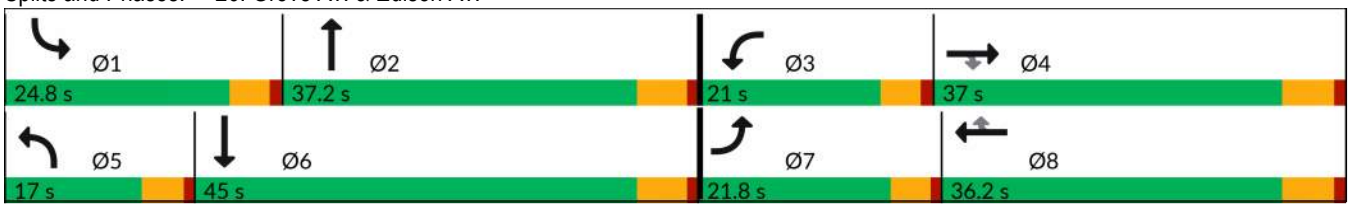

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 196 | 888 | 188 | 221 | 730 | 213 | 169 | 243 | 173 | 258 | 343 | 209 |
| Future Volume (veh/h) | 196 | 888 | 188 | 221 | 730 | 213 | 169 | 243 | 173 | 258 | 343 | 209 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 213 | 965 | 139 | 240 | 793 | 123 | 184 | 264 | 123 | 280 | 373 | 118 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 234 | 897 | 398 | 223 | 874 | 390 | 169 | 282 | 132 | 275 | 405 | 128 |
| Arrive On Green | 0.15 | 0.40 | 0.27 | 0.14 | 0.39 | 0.26 | 0.11 | 0.37 | 0.25 | 0.17 | 0.47 | 0.31 |
| Sat Flow, veh/h | 1594 | 3367 | 1496 | 1594 | 3367 | 1502 | 1594 | 1143 | 533 | 1594 | 1290 | 408 |
| Grp Volume(v), veh/h | 213 | 965 | 139 | 240 | 793 | 123 | 184 | 0 | 387 | 280 | 0 | 491 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1496 | 1594 | 1683 | 1502 | 1594 | 0 | 1676 | 1594 | 0 | 1698 |
| Q Serve(g_s), s | 15.4 | 31.2 | 8.8 | 16.4 | 26.1 | 7.7 | 12.4 | 0.0 | 26.2 | 20.2 | 0.0 | 32.0 |
| Cycle Q Clear(g_c), s | 15.4 | 31.2 | 8.8 | 16.4 | 26.1 | 7.7 | 12.4 | 0.0 | 26.2 | 20.2 | 0.0 | 32.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.32 | 1.00 | | 0.24 |
| Lane Grp Cap(c), veh/h | 234 | 897 | 398 | 223 | 874 | 390 | 169 | 0 | 414 | 275 | 0 | 533 |
| V/C Ratio(X) | 0.91 | 1.08 | 0.35 | 1.08 | 0.91 | 0.32 | 1.09 | 0.00 | 0.93 | 1.02 | 0.00 | 0.92 |
| Avail Cap(c_a), veh/h | 234 | 897 | 398 | 223 | 874 | 390 | 169 | 0 | 455 | 275 | 0 | 574 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.2 | 35.2 | 34.7 | 50.4 | 34.4 | 35.0 | 52.4 | 0.0 | 38.3 | 48.5 | 0.0 | 31.9 |
| Incr Delay (d2), s/veh | 35.6 | 52.7 | 0.5 | 81.7 | 13.1 | 0.5 | 95.5 | 0.0 | 25.5 | 59.2 | 0.0 | 19.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.3 | 17.2 | 3.2 | 11.5 | 10.7 | 2.8 | 9.3 | 0.0 | 12.5 | 12.3 | 0.0 | 14.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 84.8 | 87.9 | 35.3 | 132.1 | 47.6 | 35.4 | 147.9 | 0.0 | 63.8 | 107.6 | 0.0 | 51.6 |
| LnGrp LOS | F | F | D | F | D | D | F | | E | F | | D |
| Approach Vol, veh/h | | 1317 | | | 1156 | | | 571 | | | 771 | |
| Approach Delay, s/veh | | 81.8 | | | 63.8 | | | 90.9 | | | 72.0 | |
| Approach LOS | | F | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.8 | 34.3 | 21.0 | 37.0 | 17.0 | 42.1 | 21.8 | 36.2 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 20.2 | 31.8 | 16.4 | 31.2 | 12.4 | 39.6 | 17.2 | 30.4 |
| Max Q Clear Time (g_c+I1), s | 22.2 | 28.2 | 18.4 | 33.2 | 14.4 | 34.0 | 17.4 | 28.1 |
| Green Ext Time (p_c), s | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 75.7 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 16.6 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 10 | 213 | 2 | 1 | 95 | 197 | 1 | 63 | 1 | 306 | 49 | 6 |
| Future Vol, veh/h | 10 | 213 | 2 | 1 | 95 | 197 | 1 | 63 | 1 | 306 | 49 | 6 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 245 | 2 | 1 | 109 | 226 | 1 | 72 | 1 | 352 | 56 | 7 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 13.9 | 14.5 | 10.7 | 21 |
| HCM LOS | B | B | B | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 2% | 4% | 0% | 85% |
| Vol Thru, % | 97% | 95% | 32% | 14% |
| Vol Right, % | 2% | 1% | 67% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 65 | 225 | 293 | 361 |
| LT Vol | 1 | 10 | 1 | 306 |
| Through Vol | 63 | 213 | 95 | 49 |
| RT Vol | 1 | 2 | 197 | 6 |
| Lane Flow Rate | 75 | 259 | 337 | 415 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.138 | 0.441 | 0.517 | 0.683 |
| Departure Headway (Hd) | 6.637 | 6.145 | 5.633 | 5.925 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 542 | 590 | 643 | 606 |
| Service Time | 4.652 | 4.145 | 3.633 | 4.02 |
| HCM Lane V/C Ratio | 0.138 | 0.439 | 0.524 | 0.685 |
| HCM Control Delay, s/veh | 10.7 | 13.9 | 14.5 | 21 |
| HCM Lane LOS | B | B | B | C |
| HCM 95th-tile Q | 0.5 | 2.2 | 3 | 5.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 40 | 1279 | 1135 | 40 | 30 | 30 |
| Future Vol, veh/h | 40 | 1279 | 1135 | 40 | 30 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 2 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 1390 | 1234 | 43 | 33 | 33 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1277 | 0 | - | 0 | 2037 | 1255 |
| Stage 1 | - | - | - | - | 1255 | - |
| Stage 2 | - | - | - | - | 782 | - |
| Critical Hdwy | 4.13 | - | - | - | 6.63 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.83 | - |
| Follow-up Hdwy | 2.219 | - | - | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | 542 | - | - | - | 55 | 208 |
| Stage 1 | - | - | - | - | 267 | - |
| Stage 2 | - | - | - | - | 412 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 542 | - | - | - | 48 | 208 |
| Mov Cap-2 Maneuver | - | - | - | - | 195 | - |
| Stage 1 | - | - | - | - | 232 | - |
| Stage 2 | - | - | - | - | 412 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 1.83 | 0 | 31.17 |
| HCM LOS | | | D |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 109 | - | - | - | 202 |
| HCM Lane V/C Ratio | 0.08 | - | - | - | 0.323 |
| HCM Control Delay (s/veh) | 12.2 | 1.5 | - | - | 31.2 |
| HCM Lane LOS | B | A | - | - | D |
| HCM 95th %tile Q(veh) | 0.3 | - | - | - | 1.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 31 | 594 | 58 | 86 | 537 | 28 | 41 | 41 | 125 | 8 | 27 | 13 |
| Future Vol, veh/h | 31 | 594 | 58 | 86 | 537 | 28 | 41 | 41 | 125 | 8 | 27 | 13 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 32 | 619 | 60 | 90 | 559 | 29 | 43 | 43 | 130 | 8 | 28 | 14 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 592 | 0 | 0 | 679 | 0 | 0 | 1186 | 1484 | 340 | 1151 | 1500 | 297 |
| Stage 1 | - | - | - | - | - | - | 714 | 714 | - | 756 | 756 | - |
| Stage 2 | - | - | - | - | - | - | 473 | 771 | - | 395 | 744 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 980 | - | - | 909 | - | - | 144 | 124 | 656 | 153 | 121 | 699 |
| Stage 1 | - | - | - | - | - | - | 389 | 433 | - | 366 | 414 | - |
| Stage 2 | - | - | - | - | - | - | 541 | 408 | - | 601 | 420 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 977 | - | - | 909 | - | - | 111 | 108 | 656 | 91 | 105 | 697 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 283 | 267 | - | 237 | 248 | - |
| Stage 1 | - | - | - | - | - | - | 376 | 419 | - | 329 | 372 | - |
| Stage 2 | - | - | - | - | - | - | 442 | 367 | - | 419 | 406 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.4 | 1.24 | 22.02 | 19.5 |
| HCM LOS | | | C | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 423 | 977 | - | - | 909 | - | - | 298 |
| HCM Lane V/C Ratio | 0.51 | 0.033 | - | - | 0.099 | - | - | 0.168 |
| HCM Control Delay (s/veh) | 22 | 8.8 | - | - | 9.4 | - | - | 19.5 |
| HCM Lane LOS | C | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 2.8 | 0.1 | - | - | 0.3 | - | - | 0.6 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 108 | 11 | 111 | 5 | 12 | 15 | 25 | 147 | 5 | 0 | 152 | 30 |
| Future Vol, veh/h | 108 | 11 | 111 | 5 | 12 | 15 | 25 | 147 | 5 | 0 | 152 | 30 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 121 | 12 | 125 | 6 | 13 | 17 | 28 | 165 | 6 | 0 | 171 | 34 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 10.3 | 8.4 | 9.8 | 9.7 |
| HCM LOS | B | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 14% | 47% | 16% | 0% |
| Vol Thru, % | 83% | 5% | 38% | 84% |
| Vol Right, % | 3% | 48% | 47% | 16% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 177 | 230 | 32 | 182 |
| LT Vol | 25 | 108 | 5 | 0 |
| Through Vol | 147 | 11 | 12 | 152 |
| RT Vol | 5 | 111 | 15 | 30 |
| Lane Flow Rate | 199 | 258 | 36 | 204 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.271 | 0.341 | 0.05 | 0.273 |
| Departure Headway (Hd) | 4.911 | 4.747 | 4.998 | 4.799 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 726 | 752 | 709 | 742 |
| Service Time | 2.979 | 2.809 | 3.085 | 2.865 |
| HCM Lane V/C Ratio | 0.274 | 0.343 | 0.051 | 0.275 |
| HCM Control Delay, s/veh | 9.8 | 10.3 | 8.4 | 9.7 |
| HCM Lane LOS | A | B | A | A |
| HCM 95th-tile Q | 1.1 | 1.5 | 0.2 | 1.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 35 | 874 | 385 | 165 | 823 | 300 | 113 | 125 | 91 |
| Future Volume (vph) | 35 | 874 | 385 | 165 | 823 | 300 | 113 | 125 | 91 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 9.7 | 57.0 | 57.0 | 15.0 | 62.3 | 23.0 | 30.3 | 17.7 | 25.0 |
| Total Split (%) | 8.1% | 47.5% | 47.5% | 12.5% | 51.9% | 19.2% | 25.3% | 14.8% | 20.8% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.1 | 51.3 | 51.3 | 10.4 | 60.6 | 18.4 | 21.0 | 11.9 | 14.5 |
| Actuated g/C Ratio | 0.04 | 0.45 | 0.45 | 0.09 | 0.53 | 0.16 | 0.18 | 0.10 | 0.13 |
| v/c Ratio | 0.51 | 1.15 | 0.49 | 1.19 | 0.96 | 1.22 | 0.73 | 0.79 | 0.57 |
| Control Delay (s/veh) | 80.7 | 111.5 | 10.3 | 180.4 | 50.2 | 171.7 | 50.8 | 83.1 | 52.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 80.7 | 111.5 | 10.3 | 180.4 | 50.2 | 171.7 | 50.8 | 83.1 | 52.4 |
| LOS | F | F | B | F | D | F | D | F | D |
| Approach Delay (s/veh) | | 80.6 | | | 71.1 | | 118.5 | | 67.8 |
| Approach LOS | | F | | | E | | F | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 115 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.22 | |
| Intersection Signal Delay (s/veh): 83.0 | Intersection LOS: F |
| Intersection Capacity Utilization 102.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

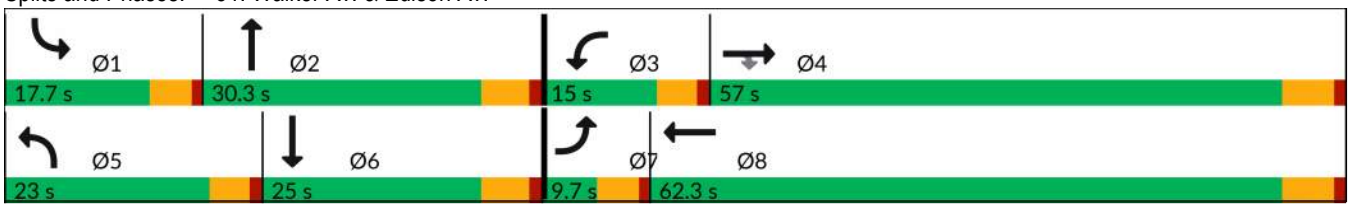

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 35 | 874 | 385 | 165 | 823 | 40 | 300 | 113 | 123 | 125 | 91 | 32 |
| Future Volume (veh/h) | 35 | 874 | 385 | 165 | 823 | 40 | 300 | 113 | 123 | 125 | 91 | 32 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 36 | 901 | 268 | 170 | 848 | 26 | 309 | 116 | 96 | 129 | 94 | 28 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 48 | 821 | 696 | 150 | 901 | 28 | 265 | 145 | 120 | 153 | 119 | 36 |
| Arrive On Green | 0.03 | 0.46 | 0.46 | 0.09 | 0.53 | 0.53 | 0.17 | 0.16 | 0.16 | 0.10 | 0.09 | 0.09 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1710 | 52 | 1594 | 896 | 742 | 1594 | 1303 | 388 |
| Grp Volume(v), veh/h | 36 | 901 | 268 | 170 | 0 | 874 | 309 | 0 | 212 | 129 | 0 | 122 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1762 | 1594 | 0 | 1638 | 1594 | 0 | 1691 |
| Q Serve(g_s), s | 2.5 | 51.2 | 12.9 | 10.4 | 0.0 | 51.4 | 18.4 | 0.0 | 13.8 | 8.8 | 0.0 | 7.8 |
| Cycle Q Clear(g_c), s | 2.5 | 51.2 | 12.9 | 10.4 | 0.0 | 51.4 | 18.4 | 0.0 | 13.8 | 8.8 | 0.0 | 7.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.03 | 1.00 | | 0.45 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 48 | 821 | 696 | 150 | 0 | 929 | 265 | 0 | 265 | 153 | 0 | 155 |
| V/C Ratio(X) | 0.75 | 1.10 | 0.39 | 1.13 | 0.00 | 0.94 | 1.16 | 0.00 | 0.80 | 0.84 | 0.00 | 0.79 |
| Avail Cap(c_a), veh/h | 74 | 821 | 696 | 150 | 0 | 929 | 265 | 0 | 369 | 189 | 0 | 300 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.2 | 29.7 | 19.4 | 50.1 | 0.0 | 24.5 | 46.1 | 0.0 | 44.6 | 49.1 | 0.0 | 49.2 |
| Incr Delay (d2), s/veh | 8.2 | 61.5 | 0.3 | 113.8 | 0.0 | 17.0 | 107.2 | 0.0 | 8.2 | 20.3 | 0.0 | 8.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 34.1 | 4.3 | 8.8 | 0.0 | 23.8 | 14.8 | 0.0 | 5.9 | 4.2 | 0.0 | 3.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 61.4 | 91.2 | 19.7 | 163.9 | 0.0 | 41.5 | 153.2 | 0.0 | 52.8 | 69.4 | 0.0 | 57.8 |
| LnGrp LOS | E | F | B | F | | D | F | | D | E | | E |
| Approach Vol, veh/h | | 1205 | | | 1044 | | | 521 | | | 251 | |
| Approach Delay, s/veh | | 74.4 | | | 61.5 | | | 112.4 | | | 63.8 | |
| Approach LOS | | E | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.2 | 23.3 | 15.0 | 57.0 | 23.0 | 15.5 | 7.9 | 64.1 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 13.1 | 24.9 | 10.4 | 51.2 | 18.4 | 19.6 | 5.1 | 56.5 |
| Max Q Clear Time (g_c+I1), s | 10.8 | 15.8 | 12.4 | 53.2 | 20.4 | 9.8 | 4.5 | 53.4 |
| Green Ext Time (p_c), s | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 1.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 75.6 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.6 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 47 | 341 | 229 | 95 | 84 | 37 |
| Future Vol, veh/h | 47 | 341 | 229 | 95 | 84 | 37 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 55 | 397 | 266 | 110 | 98 | 43 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 377 | 0 | - | 0 | 827 | 322 |
| Stage 1 | - | - | - | - | 322 | - |
| Stage 2 | - | - | - | - | 506 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1182 | - | - | - | 341 | 719 |
| Stage 1 | - | - | - | - | 735 | - |
| Stage 2 | - | - | - | - | 606 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1182 | - | - | - | 321 | 719 |
| Mov Cap-2 Maneuver | - | - | - | - | 440 | - |
| Stage 1 | - | - | - | - | 691 | - |
| Stage 2 | - | - | - | - | 606 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.99 | 0 | 15.02 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 218 | - | - | - | 499 |
| HCM Lane V/C Ratio | 0.046 | - | - | - | 0.282 |
| HCM Control Delay (s/veh) | 8.2 | 0 | - | - | 15 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 1.1 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 440 | 9 | 168 | 465 | 540 | 1116 | 301 |
| Future Volume (vph) | 440 | 9 | 168 | 465 | 540 | 1116 | 301 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 26.0 | 26.0 | 26.0 | 22.0 | 64.0 | 42.0 | 42.0 |
| Total Split (%) | 28.9% | 28.9% | 28.9% | 24.4% | 71.1% | 46.7% | 46.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 18.5 | 18.5 | 18.5 | 18.7 | 59.9 | 36.2 | 36.2 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | 0.21 | 0.67 | 0.40 | 0.40 |
| v/c Ratio | 0.81 | 0.79 | 0.39 | 0.83 | 0.18 | 0.49 | 0.41 |
| Control Delay (s/veh) | 54.8 | 51.9 | 7.9 | 44.4 | 0.8 | 21.4 | 3.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.8 | 51.9 | 7.9 | 44.4 | 0.8 | 21.4 | 3.9 |
| LOS | D | D | A | D | A | C | A |
| Approach Delay (s/veh) | | 42.2 | | | 21.0 | 17.7 | |
| Approach LOS | | D | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 23.8 | Intersection LOS: C |
| Intersection Capacity Utilization 74.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

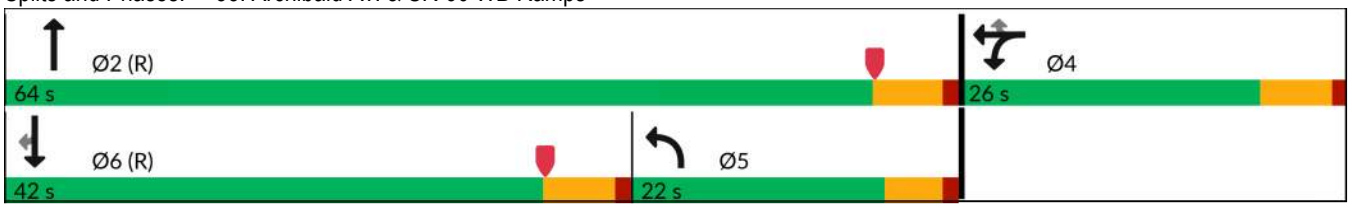

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 440 | 9 | 168 | 465 | 540 | 0 | 0 | 1116 | 301 |
| Future Volume (veh/h) | 0 | 0 | 0 | 440 | 9 | 168 | 465 | 540 | 0 | 0 | 1116 | 301 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1575 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 492 | 0 | 36 | 500 | 581 | 0 | 0 | 1200 | 201 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 578 | 0 | 273 | 977 | 3336 | 0 | 0 | 1764 | 424 |
| Arrive On Green | | | | 0.18 | 0.00 | 0.18 | 0.11 | 0.23 | 0.00 | 0.00 | 0.29 | 0.29 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1502 | 2910 | 4997 | 0 | 0 | 6343 | 1464 |
| Grp Volume(v), veh/h | | | | 492 | 0 | 36 | 500 | 581 | 0 | 0 | 1200 | 201 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1502 | 1455 | 1612 | 0 | 0 | 1524 | 1464 |
| Q Serve(g_s), s | | | | 13.4 | 0.0 | 1.8 | 14.6 | 8.7 | 0.0 | 0.0 | 15.7 | 10.2 |
| Cycle Q Clear(g_c), s | | | | 13.4 | 0.0 | 1.8 | 14.6 | 8.7 | 0.0 | 0.0 | 15.7 | 10.2 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 578 | 0 | 273 | 977 | 3336 | 0 | 0 | 1764 | 424 |
| V/C Ratio(X) | | | | 0.85 | 0.00 | 0.13 | 0.51 | 0.17 | 0.00 | 0.00 | 0.68 | 0.47 |
| Avail Cap(c_a), veh/h | | | | 715 | 0 | 337 | 977 | 3336 | 0 | 0 | 2452 | 589 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.93 | 0.93 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.7 | 0.0 | 30.9 | 33.1 | 14.1 | 0.0 | 0.0 | 28.3 | 26.3 |
| Incr Delay (d2), s/veh | | | | 8.1 | 0.0 | 0.2 | 0.2 | 0.1 | 0.0 | 0.0 | 2.1 | 3.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.6 | 0.0 | 1.7 | 5.6 | 2.9 | 0.0 | 0.0 | 5.6 | 3.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 43.7 | 0.0 | 31.1 | 33.2 | 14.3 | 0.0 | 0.0 | 30.4 | 30.1 |
| LnGrp LOS | | | | D | | C | C | B | | | C | C |
| Approach Vol, veh/h | | | | | 528 | | | 1081 | | | 1401 | |
| Approach Delay, s/veh | | | | | 42.9 | | | 23.0 | | | 30.4 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | 4 | 5 | 6 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.9 | 22.1 | 36.0 | 31.8 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 58.2 | 20.2 | 17.0 | * 36 |
| Max Q Clear Time (g_c+I1), s | 10.7 | 15.4 | 16.6 | 17.7 |
| Green Ext Time (p_c), s | 4.0 | 0.9 | 0.1 | 8.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.9 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 154 | 1 | 453 | 851 | 544 | 450 | 1106 |
| Future Volume (vph) | 154 | 1 | 453 | 851 | 544 | 450 | 1106 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 40.0 | 40.0 | 23.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 44.4% | 44.4% | 25.6% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 16.4 | 16.4 | 16.4 | 38.4 | 38.4 | 18.5 | 62.0 |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.18 | 0.43 | 0.43 | 0.21 | 0.69 |
| v/c Ratio | 0.55 | 0.79 | 0.76 | 0.36 | 0.61 | 0.82 | 0.36 |
| Control Delay (s/veh) | 39.8 | 39.2 | 35.6 | 19.1 | 4.9 | 57.2 | 2.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.8 | 39.2 | 35.6 | 19.1 | 4.9 | 57.2 | 2.1 |
| LOS | D | D | D | B | A | E | A |
| Approach Delay (s/veh) | | 38.0 | | 13.6 | | | 18.0 |
| Approach LOS | | D | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 19.7 | Intersection LOS: B |
| Intersection Capacity Utilization 74.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

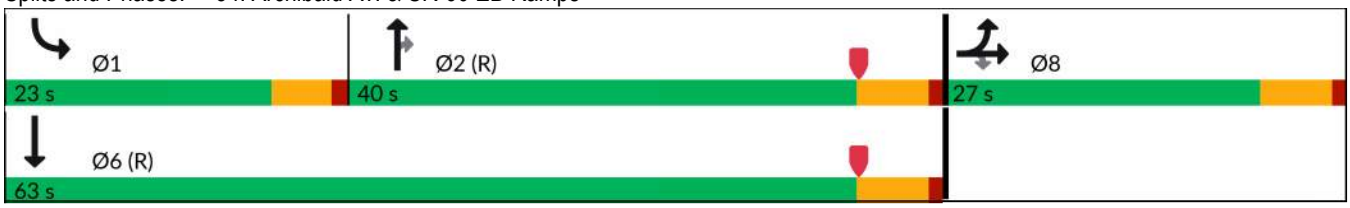

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 154 | 1 | 453 | 0 | 0 | 0 | 0 | 851 | 544 | 450 | 1106 | 0 |
| Future Volume (veh/h) | 154 | 1 | 453 | 0 | 0 | 0 | 0 | 851 | 544 | 450 | 1106 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1575 | 1772 | 0 |
| Adj Flow Rate, veh/h | 112 | 0 | 366 | | | | 0 | 925 | 478 | 489 | 1202 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 244 | 0 | 460 | | | | 0 | 2914 | 716 | 536 | 3473 | 0 |
| Arrive On Green | 0.15 | 0.00 | 0.15 | | | | 0.00 | 0.48 | 0.48 | 0.37 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 3003 | | | | 0 | 6343 | 1498 | 2910 | 4997 | 0 |
| Grp Volume(v), veh/h | 112 | 0 | 366 | | | | 0 | 925 | 478 | 489 | 1202 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1524 | 1498 | 1455 | 1612 | 0 |
| Q Serve(g_s), s | 5.8 | 0.0 | 10.6 | | | | 0.0 | 8.4 | 22.0 | 14.4 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 5.8 | 0.0 | 10.6 | | | | 0.0 | 8.4 | 22.0 | 14.4 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 244 | 0 | 460 | | | | 0 | 2914 | 716 | 536 | 3473 | 0 |
| V/C Ratio(X) | 0.46 | 0.00 | 0.80 | | | | 0.00 | 0.32 | 0.67 | 0.91 | 0.35 | 0.00 |
| Avail Cap(c_a), veh/h | 375 | 0 | 707 | | | | 0 | 2914 | 716 | 582 | 3473 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.82 | 0.82 | 0.00 |
| Uniform Delay (d), s/veh | 34.7 | 0.0 | 36.8 | | | | 0.0 | 14.4 | 18.0 | 27.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 3.6 | | | | 0.0 | 0.3 | 4.9 | 14.7 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 3.9 | | | | 0.0 | 2.6 | 7.5 | 4.7 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.1 | 0.0 | 40.3 | | | | 0.0 | 14.7 | 22.9 | 42.4 | 0.2 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | C | D | A | |
| Approach Vol, veh/h | | 478 | | | | | | 1403 | | | 1691 | |
| Approach Delay, s/veh | | 39.3 | | | | | | 17.5 | | | 12.4 | |
| Approach LOS | | D | | | | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.6 | 48.8 | | | | 70.4 | | 19.6 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 18.0 | 34.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 16.4 | 24.0 | | | | 2.0 | | 12.6 | | | | |
| Green Ext Time (p_c), s | 0.2 | 5.3 | | | | 9.9 | | 1.2 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 18.0 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 148 | 433 | 242 | 144 | 372 | 147 | 211 | 737 | 267 | 964 |
| Future Volume (vph) | 148 | 433 | 242 | 144 | 372 | 147 | 211 | 737 | 267 | 964 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.2 | 21.0 | 21.0 | 12.2 | 20.0 | 20.0 | 17.3 | 22.5 | 24.5 | 29.7 |
| Actuated g/C Ratio | 0.13 | 0.21 | 0.21 | 0.12 | 0.20 | 0.20 | 0.18 | 0.23 | 0.25 | 0.30 |
| v/c Ratio | 0.72 | 0.62 | 0.49 | 0.75 | 0.56 | 0.36 | 0.78 | 0.74 | 0.69 | 0.82 |
| Control Delay (s/veh) | 62.6 | 39.3 | 7.5 | 69.1 | 39.5 | 8.3 | 60.0 | 40.4 | 47.3 | 38.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 62.6 | 39.3 | 7.5 | 69.1 | 39.5 | 8.3 | 60.0 | 40.4 | 47.3 | 38.7 |
| LOS | E | D | A | E | D | A | E | D | D | D |
| Approach Delay (s/veh) | | 34.1 | | | 39.0 | | | 44.5 | | 40.3 |
| Approach LOS | | C | | | D | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 98.8 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 39.9 | Intersection LOS: D |
| Intersection Capacity Utilization 77.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

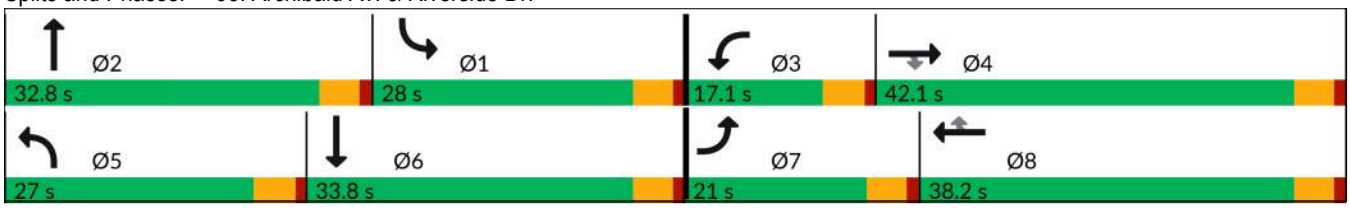

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 148 | 433 | 242 | 144 | 372 | 147 | 211 | 737 | 57 | 267 | 964 | 183 |
| Future Volume (veh/h) | 148 | 433 | 242 | 144 | 372 | 147 | 211 | 737 | 57 | 267 | 964 | 183 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 151 | 442 | 154 | 147 | 380 | 105 | 215 | 752 | 56 | 272 | 984 | 148 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 183 | 671 | 297 | 178 | 661 | 290 | 251 | 1069 | 79 | 359 | 1271 | 191 |
| Arrive On Green | 0.11 | 0.20 | 0.20 | 0.11 | 0.20 | 0.20 | 0.16 | 0.23 | 0.23 | 0.23 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1594 | 3367 | 1488 | 1594 | 3367 | 1479 | 1594 | 4592 | 340 | 1594 | 4234 | 635 |
| Grp Volume(v), veh/h | 151 | 442 | 154 | 147 | 380 | 105 | 215 | 527 | 281 | 272 | 749 | 383 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1488 | 1594 | 1683 | 1479 | 1594 | 1612 | 1708 | 1594 | 1612 | 1644 |
| Q Serve(g_s), s | 7.4 | 9.6 | 7.4 | 7.2 | 8.1 | 2.8 | 10.5 | 11.9 | 12.0 | 12.7 | 16.8 | 16.9 |
| Cycle Q Clear(g_c), s | 7.4 | 9.6 | 7.4 | 7.2 | 8.1 | 2.8 | 10.5 | 11.9 | 12.0 | 12.7 | 16.8 | 16.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 0.39 |
| Lane Grp Cap(c), veh/h | 183 | 671 | 297 | 178 | 661 | 290 | 251 | 751 | 397 | 359 | 968 | 493 |
| V/C Ratio(X) | 0.83 | 0.66 | 0.52 | 0.83 | 0.58 | 0.36 | 0.86 | 0.70 | 0.71 | 0.76 | 0.77 | 0.78 |
| Avail Cap(c_a), veh/h | 328 | 1586 | 701 | 250 | 1421 | 624 | 449 | 1143 | 605 | 469 | 1183 | 603 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.4 | 29.4 | 28.4 | 34.6 | 29.0 | 9.2 | 32.6 | 28.0 | 28.0 | 28.8 | 25.4 | 25.4 |
| Incr Delay (d2), s/veh | 3.6 | 1.1 | 1.4 | 10.3 | 0.8 | 0.8 | 3.3 | 1.2 | 2.3 | 3.5 | 2.6 | 5.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 | 3.6 | 2.5 | 3.1 | 3.1 | 1.6 | 3.9 | 4.3 | 4.7 | 4.7 | 6.1 | 6.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 38.0 | 30.5 | 29.8 | 44.9 | 29.8 | 9.9 | 35.9 | 29.2 | 30.4 | 32.3 | 28.0 | 30.6 |
| LnGrp LOS | D | C | C | D | C | A | D | C | C | C | C | C |
| Approach Vol, veh/h | | 747 | | | 632 | | | 1023 | | | 1404 | |
| Approach Delay, s/veh | | 31.9 | | | 30.0 | | | 30.9 | | | 29.5 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.5 | 23.1 | 13.5 | 20.5 | 17.1 | 28.5 | 13.7 | 20.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 14.7 | 14.0 | 9.2 | 11.6 | 12.5 | 18.9 | 9.4 | 10.1 |
| Green Ext Time (p_c), s | 0.2 | 4.0 | 0.1 | 3.1 | 0.2 | 4.8 | 0.1 | 2.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.4 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 91 | 154 | 33 | 68 | 81 | 39 | 818 | 130 | 1109 |
| Future Volume (vph) | 91 | 154 | 33 | 68 | 81 | 39 | 818 | 130 | 1109 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.9 | 18.9 | 5.7 | 10.6 | 10.6 | 8.1 | 21.6 | 19.5 | 39.4 |
| Actuated g/C Ratio | 0.14 | 0.24 | 0.07 | 0.13 | 0.13 | 0.10 | 0.27 | 0.24 | 0.49 |
| v/c Ratio | 0.44 | 0.56 | 0.30 | 0.30 | 0.24 | 0.26 | 0.62 | 0.35 | 0.71 |
| Control Delay (s/veh) | 44.6 | 33.8 | 52.0 | 40.2 | 1.6 | 44.9 | 29.8 | 31.4 | 22.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.6 | 33.8 | 52.0 | 40.2 | 1.6 | 44.9 | 29.8 | 31.4 | 22.4 |
| LOS | D | C | D | D | A | D | C | C | C |
| Approach Delay (s/veh) | | 37.0 | | 25.1 | | | 30.5 | | 23.3 |
| Approach LOS | | D | | C | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 80.1 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.71 | |
| Intersection Signal Delay (s/veh): 27.4 | Intersection LOS: C |
| Intersection Capacity Utilization 71.1% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 91 | 154 | 66 | 33 | 68 | 81 | 39 | 818 | 33 | 130 | 1109 | 66 |
| Future Volume (veh/h) | 91 | 154 | 66 | 33 | 68 | 81 | 39 | 818 | 33 | 130 | 1109 | 66 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 95 | 160 | 52 | 34 | 71 | 26 | 41 | 852 | 32 | 135 | 1155 | 55 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 120 | 215 | 70 | 57 | 228 | 193 | 66 | 1381 | 52 | 350 | 1509 | 72 |
| Arrive On Green | 0.08 | 0.17 | 0.17 | 0.04 | 0.13 | 0.13 | 0.04 | 0.27 | 0.27 | 0.22 | 0.45 | 0.45 |
| Sat Flow, veh/h | 1594 | 1280 | 416 | 1594 | 1772 | 1502 | 1594 | 5090 | 191 | 1594 | 3355 | 160 |
| Grp Volume(v), veh/h | 95 | 0 | 212 | 34 | 71 | 26 | 41 | 593 | 291 | 135 | 610 | 600 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1696 | 1594 | 1772 | 1502 | 1594 | 1772 | 1737 | 1594 | 1772 | 1743 |
| Q Serve(g_s), s | 3.5 | 0.0 | 7.2 | 1.3 | 2.2 | 0.5 | 1.5 | 8.8 | 8.8 | 4.4 | 17.4 | 17.4 |
| Cycle Q Clear(g_c), s | 3.5 | 0.0 | 7.2 | 1.3 | 2.2 | 0.5 | 1.5 | 8.8 | 8.8 | 4.4 | 17.4 | 17.4 |
| Prop In Lane | 1.00 | | 0.25 | 1.00 | | 1.00 | 1.00 | | 0.11 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 120 | 0 | 285 | 57 | 228 | 193 | 66 | 961 | 471 | 350 | 797 | 784 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.75 | 0.59 | 0.31 | 0.13 | 0.62 | 0.62 | 0.62 | 0.39 | 0.77 | 0.77 |
| Avail Cap(c_a), veh/h | 540 | 0 | 1109 | 138 | 712 | 603 | 381 | 2659 | 1303 | 350 | 1253 | 1233 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.4 | 0.0 | 23.8 | 28.6 | 23.8 | 7.6 | 28.4 | 19.2 | 19.2 | 20.0 | 13.9 | 13.9 |
| Incr Delay (d2), s/veh | 11.0 | 0.0 | 3.9 | 9.4 | 0.8 | 0.3 | 9.3 | 0.6 | 1.3 | 0.7 | 1.6 | 1.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 2.9 | 0.6 | 0.9 | 0.3 | 0.7 | 3.0 | 3.0 | 1.4 | 5.4 | 5.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 38.4 | 0.0 | 27.7 | 38.0 | 24.6 | 8.0 | 37.7 | 19.9 | 20.5 | 20.7 | 15.5 | 15.5 |
| LnGrp LOS | D | | C | D | C | A | D | B | C | C | B | B |
| Approach Vol, veh/h | | 307 | | | 131 | | | 925 | | | 1345 | |
| Approach Delay, s/veh | | 31.0 | | | 24.8 | | | 20.9 | | | 16.0 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.8 | 20.9 | 6.8 | 14.7 | 7.1 | 31.7 | 9.1 | 12.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 6.4 | 10.8 | 3.3 | 9.2 | 3.5 | 19.4 | 5.5 | 4.2 |
| Green Ext Time (p_c), s | 0.1 | 5.5 | 0.0 | 1.2 | 0.0 | 7.7 | 0.2 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.8 |
| HCM 7th LOS | B |

| Lane Group | WBL | WBT | NBL | NBT | SBL | SBT | Ø4 |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 2 | 815 | 138 | 1057 | |
| Future Volume (vph) | 20 | 0 | 2 | 815 | 138 | 1057 | |
| Turn Type | Split | NA | Prot | NA | Prot | NA | |
| Protected Phases | 8 | 8 | 5 | 2 | 1 | 6 | 4 |
| Permitted Phases | | | | | | | |
| Detector Phase | 8 | 8 | 5 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 |
| Minimum Split (s) | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 | 22.5 |
| Total Split (s) | 32.6 | 32.6 | 9.6 | 39.9 | 25.0 | 55.3 | 22.5 |
| Total Split (%) | 27.2% | 27.2% | 8.0% | 33.3% | 20.8% | 46.1% | 19% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | |
| Lead/Lag | | | Lead | Lag | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.5 | 10.5 | 7.2 | 22.2 | 11.5 | 34.5 | |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.16 | 0.49 | 0.25 | 0.76 | |
| v/c Ratio | 0.05 | 0.05 | 0.01 | 0.37 | 0.35 | 0.42 | |
| Control Delay (s/veh) | 20.4 | 0.1 | 31.5 | 13.5 | 24.2 | 7.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay (s/veh) | 20.4 | 0.1 | 31.5 | 13.5 | 24.2 | 7.5 | |
| LOS | C | A | C | B | C | A | |
| Approach Delay (s/veh) | | 7.5 | | 13.5 | | 9.4 | |
| Approach LOS | | A | | B | | A | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 45.3 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.42 | |
| Intersection Signal Delay (s/veh): 11.0 | Intersection LOS: B |
| Intersection Capacity Utilization 50.7% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 20 | 0 | 34 | 2 | 815 | 27 | 138 | 1057 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 20 | 0 | 34 | 2 | 815 | 27 | 138 | 1057 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 20 | 0 | 27 | 2 | 832 | 24 | 141 | 1079 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 5 | 0 | 84 | 0 | 80 | 5 | 2035 | 59 | 175 | 1778 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.05 | 0.00 | 0.42 | 0.42 | 0.11 | 0.53 | 0.00 |
| Sat Flow, veh/h | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 4833 | 139 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 20 | 0 | 27 | 2 | 555 | 301 | 141 | 1079 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 1612 | 1747 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.6 | 0.0 | 4.0 | 4.0 | 2.9 | 7.4 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.6 | 0.0 | 4.0 | 4.0 | 2.9 | 7.4 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 0.08 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 5 | 0 | 84 | 0 | 80 | 5 | 1358 | 736 | 175 | 1778 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.24 | 0.00 | 0.34 | 0.42 | 0.41 | 0.41 | 0.81 | 0.61 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 957 | 0 | 1346 | 0 | 1268 | 240 | 3434 | 1860 | 981 | 5149 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 15.1 | 0.0 | 15.1 | 16.5 | 6.7 | 6.7 | 14.4 | 5.4 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 2.5 | 48.6 | 0.2 | 0.4 | 3.3 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.2 | 0.1 | 0.5 | 0.6 | 0.8 | 0.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 0.0 | 16.5 | 0.0 | 17.6 | 65.1 | 6.9 | 7.1 | 17.7 | 5.8 | 0.0 |
| LnGrp LOS | | | | B | | B | E | A | A | B | A | |
| Approach Vol, veh/h | | 0 | | | 47 | | | 858 | | | 1220 | |
| Approach Delay, s/veh | | 0.0 | | | 17.1 | | | 7.1 | | | 7.2 | |
| Approach LOS | | | | | B | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.2 | 18.6 | | 0.0 | 4.7 | 22.1 | | 6.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 20.4 | 35.3 | | 17.9 | 5.0 | 50.7 | | 28.0 |
| Max Q Clear Time (g_c+I1), s | 4.9 | 6.0 | | 0.0 | 2.0 | 9.4 | | 2.6 |
| Green Ext Time (p_c), s | 0.1 | 5.1 | | 0.0 | 0.0 | 8.1 | | 0.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 7.4 |
| HCM 7th LOS | | A |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 193 | 682 | 219 | 335 | 687 | 66 | 95 | 573 | 217 | 101 | 735 | 215 |
| Future Volume (vph) | 193 | 682 | 219 | 335 | 687 | 66 | 95 | 573 | 217 | 101 | 735 | 215 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.6 | 37.0 | 105.9 | 10.5 | 41.9 | 41.9 | 9.8 | 28.8 | 105.9 | 11.1 | 30.1 | 30.1 |
| Actuated g/C Ratio | 0.05 | 0.35 | 1.00 | 0.10 | 0.40 | 0.40 | 0.09 | 0.27 | 1.00 | 0.10 | 0.28 | 0.28 |
| v/c Ratio | 1.27 | 0.41 | 0.15 | 1.19 | 1.00 | 0.10 | 0.66 | 0.64 | 0.15 | 0.62 | 0.78 | 0.41 |
| Control Delay (s/veh) | 205.7 | 28.2 | 0.2 | 156.0 | 67.0 | 0.3 | 69.8 | 37.6 | 0.2 | 62.7 | 41.0 | 13.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 205.7 | 28.2 | 0.2 | 156.0 | 67.0 | 0.3 | 69.8 | 37.6 | 0.2 | 62.7 | 41.0 | 13.6 |
| LOS | F | C | A | F | E | A | E | D | A | E | D | B |
| Approach Delay (s/veh) | | 53.9 | | | 90.3 | | | 31.9 | | | 37.4 | |
| Approach LOS | | D | | | F | | | C | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105.9 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.27 | |
| Intersection Signal Delay (s/veh): 54.6 | Intersection LOS: D |
| Intersection Capacity Utilization 87.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

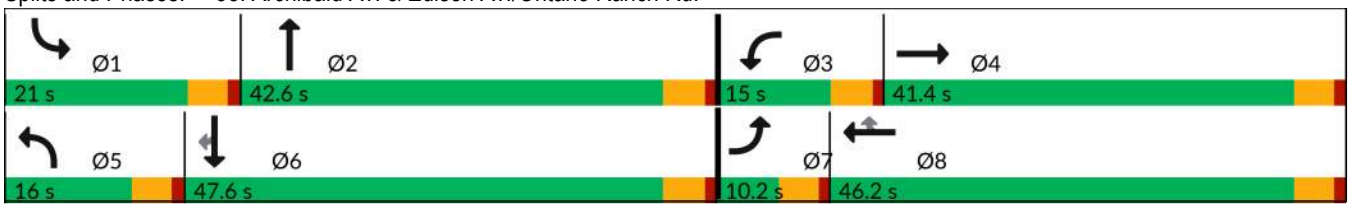

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 193 | 682 | 219 | 335 | 687 | 66 | 95 | 573 | 217 | 101 | 735 | 215 |
| Future Volume (veh/h) | 193 | 682 | 219 | 335 | 687 | 66 | 95 | 573 | 217 | 101 | 735 | 215 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 195 | 689 | 0 | 338 | 694 | 39 | 96 | 579 | 0 | 102 | 742 | 208 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 164 | 1743 | | 305 | 724 | 613 | 118 | 913 | | 125 | 928 | 414 |
| Arrive On Green | 0.06 | 0.36 | 0.00 | 0.10 | 0.41 | 0.41 | 0.07 | 0.27 | 0.00 | 0.08 | 0.28 | 0.28 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1501 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 195 | 689 | 0 | 338 | 694 | 39 | 96 | 579 | 0 | 102 | 742 | 208 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1501 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 5.6 | 10.6 | 0.0 | 10.4 | 37.8 | 1.6 | 5.9 | 15.0 | 0.0 | 6.3 | 20.3 | 11.6 |
| Cycle Q Clear(g_c), s | 5.6 | 10.6 | 0.0 | 10.4 | 37.8 | 1.6 | 5.9 | 15.0 | 0.0 | 6.3 | 20.3 | 11.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 164 | 1743 | | 305 | 724 | 613 | 118 | 913 | | 125 | 928 | 414 |
| V/C Ratio(X) | 1.19 | 0.40 | | 1.11 | 0.96 | 0.06 | 0.81 | 0.63 | | 0.81 | 0.80 | 0.50 |
| Avail Cap(c_a), veh/h | 164 | 1791 | | 305 | 742 | 628 | 183 | 1287 | | 263 | 1457 | 650 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.9 | 23.7 | 0.0 | 44.5 | 28.6 | 17.8 | 45.3 | 31.9 | 0.0 | 45.1 | 33.4 | 30.3 |
| Incr Delay (d2), s/veh | 130.2 | 0.1 | 0.0 | 84.4 | 23.1 | 0.0 | 7.7 | 0.7 | 0.0 | 4.7 | 1.7 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.9 | 3.7 | 0.0 | 7.1 | 19.0 | 0.5 | 2.5 | 5.7 | 0.0 | 2.5 | 7.8 | 4.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 177.1 | 23.9 | 0.0 | 128.9 | 51.6 | 17.9 | 53.0 | 32.6 | 0.0 | 49.8 | 35.2 | 31.2 |
| LnGrp LOS | F | C | | F | D | B | D | C | | D | D | C |
| Approach Vol, veh/h | | 884 | | | 1071 | | | 675 | | | 1052 | |
| Approach Delay, s/veh | | 57.7 | | | 74.8 | | | 35.5 | | | 35.8 | |
| Approach LOS | | E | | | E | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.4 | 31.5 | 15.0 | 40.4 | 12.0 | 32.0 | 10.2 | 45.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 8.3 | 17.0 | 12.4 | 12.6 | 7.9 | 22.3 | 7.6 | 39.8 |
| Green Ext Time (p_c), s | 0.1 | 3.2 | 0.0 | 4.3 | 0.0 | 5.0 | 0.0 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 52.3 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 184 | 292 | 164 | 82 | 186 | 52 | 114 | 501 | 79 | 77 | 738 | 128 |
| Future Volume (vph) | 184 | 292 | 164 | 82 | 186 | 52 | 114 | 501 | 79 | 77 | 738 | 128 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.9 | 19.8 | 74.8 | 9.5 | 15.5 | 15.5 | 5.8 | 24.1 | 24.1 | 7.4 | 23.0 | 23.0 |
| Actuated g/C Ratio | 0.15 | 0.26 | 1.00 | 0.13 | 0.21 | 0.21 | 0.08 | 0.32 | 0.32 | 0.10 | 0.31 | 0.31 |
| v/c Ratio | 0.44 | 0.33 | 0.12 | 0.43 | 0.27 | 0.13 | 0.52 | 0.31 | 0.15 | 0.27 | 0.72 | 0.24 |
| Control Delay (s/veh) | 36.0 | 24.6 | 0.2 | 42.8 | 26.2 | 0.7 | 48.0 | 22.3 | 1.1 | 39.9 | 28.5 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.0 | 24.6 | 0.2 | 42.8 | 26.2 | 0.7 | 48.0 | 22.3 | 1.1 | 39.9 | 28.5 | 5.6 |
| LOS | D | C | A | D | C | A | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 21.6 | | | 26.2 | | | 24.1 | | | 26.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 74.8 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.72 | |
| Intersection Signal Delay (s/veh): 24.5 | Intersection LOS: C |
| Intersection Capacity Utilization 59.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

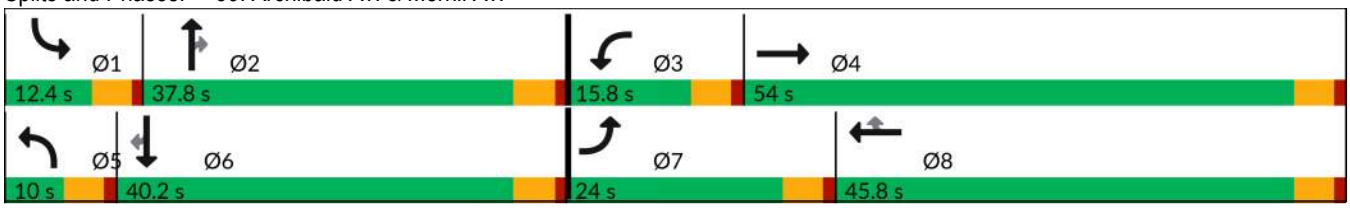

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 184 | 292 | 164 | 82 | 186 | 52 | 114 | 501 | 79 | 77 | 738 | 128 |
| Future Volume (veh/h) | 184 | 292 | 164 | 82 | 186 | 52 | 114 | 501 | 79 | 77 | 738 | 128 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 194 | 307 | 0 | 86 | 196 | 24 | 120 | 527 | 49 | 81 | 777 | 82 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 302 | 794 | | 106 | 674 | 280 | 223 | 1728 | 481 | 190 | 1113 | 472 |
| Arrive On Green | 0.10 | 0.22 | 0.00 | 0.07 | 0.19 | 0.19 | 0.07 | 0.33 | 0.33 | 0.06 | 0.31 | 0.31 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 3544 | 1470 | 3000 | 5316 | 1480 | 3000 | 3544 | 1502 |
| Grp Volume(v), veh/h | 194 | 307 | 0 | 86 | 196 | 24 | 120 | 527 | 49 | 81 | 777 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1470 | 1500 | 1772 | 1480 | 1500 | 1772 | 1502 |
| Q Serve(g_s), s | 3.6 | 4.2 | 0.0 | 3.1 | 2.7 | 0.8 | 2.2 | 4.3 | 1.3 | 1.5 | 11.0 | 2.3 |
| Cycle Q Clear(g_c), s | 3.6 | 4.2 | 0.0 | 3.1 | 2.7 | 0.8 | 2.2 | 4.3 | 1.3 | 1.5 | 11.0 | 2.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 302 | 794 | | 106 | 674 | 280 | 223 | 1728 | 481 | 190 | 1113 | 472 |
| V/C Ratio(X) | 0.64 | 0.39 | | 0.81 | 0.29 | 0.09 | 0.54 | 0.30 | 0.10 | 0.43 | 0.70 | 0.17 |
| Avail Cap(c_a), veh/h | 1015 | 3052 | | 311 | 2546 | 1056 | 282 | 3077 | 857 | 408 | 2200 | 932 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.8 | 18.9 | 0.0 | 26.4 | 19.9 | 19.1 | 25.6 | 14.5 | 13.5 | 25.9 | 17.3 | 14.3 |
| Incr Delay (d2), s/veh | 2.3 | 0.3 | 0.0 | 13.4 | 0.2 | 0.1 | 2.0 | 0.1 | 0.1 | 1.5 | 0.8 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 1.5 | 0.0 | 1.4 | 1.0 | 0.2 | 0.7 | 1.3 | 0.4 | 0.5 | 3.6 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.1 | 19.2 | 0.0 | 39.8 | 20.1 | 19.3 | 27.6 | 14.6 | 13.6 | 27.4 | 18.1 | 14.4 |
| LnGrp LOS | C | B | | D | C | B | C | B | B | C | B | B |
| Approach Vol, veh/h | | 501 | | | 306 | | | 696 | | | 940 | |
| Approach Delay, s/veh | | 22.3 | | | 25.6 | | | 16.8 | | | 18.6 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.2 | 23.2 | 8.4 | 17.5 | 8.9 | 22.6 | 10.4 | 15.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 3.5 | 6.3 | 5.1 | 6.2 | 4.2 | 13.0 | 5.6 | 4.7 |
| Green Ext Time (p_c), s | 0.1 | 3.3 | 0.1 | 1.9 | 0.0 | 5.0 | 0.5 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.7 |
| HCM 7th LOS | B |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 27 | 90 | 30 | 376 | 45 | 200 | 4 | 474 | 314 | 383 | 592 | 29 |
| Future Volume (vph) | 27 | 90 | 30 | 376 | 45 | 200 | 4 | 474 | 314 | 383 | 592 | 29 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.5 | 12.4 | 12.4 | 15.3 | 21.1 | 25.8 | 5.5 | 19.5 | 34.8 | 10.3 | 33.7 | 33.7 |
| Actuated g/C Ratio | 0.08 | 0.17 | 0.17 | 0.21 | 0.29 | 0.35 | 0.08 | 0.27 | 0.48 | 0.14 | 0.46 | 0.46 |
| v/c Ratio | 0.13 | 0.17 | 0.09 | 0.66 | 0.05 | 0.20 | 0.02 | 0.56 | 0.38 | 0.99 | 0.28 | 0.04 |
| Control Delay (s/veh) | 42.5 | 32.1 | 0.5 | 35.2 | 20.3 | 2.8 | 43.5 | 26.3 | 2.4 | 78.6 | 14.9 | 0.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.5 | 32.1 | 0.5 | 35.2 | 20.3 | 2.8 | 43.5 | 26.3 | 2.4 | 78.6 | 14.9 | 0.1 |
| LOS | D | C | A | D | C | A | D | C | A | E | B | A |
| Approach Delay (s/veh) | | 27.4 | | | 23.6 | | | 16.9 | | | 38.8 | |
| Approach LOS | | C | | | C | | | B | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 73 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.99 | |
| Intersection Signal Delay (s/veh): 27.7 | Intersection LOS: C |
| Intersection Capacity Utilization 59.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

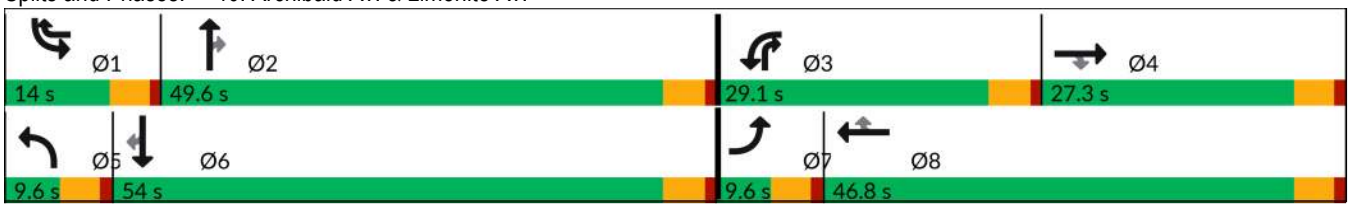

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 27 | 90 | 30 | 376 | 45 | 200 | 4 | 474 | 314 | 383 | 592 | 29 |
| Future Volume (veh/h) | 27 | 90 | 30 | 376 | 45 | 200 | 4 | 474 | 314 | 383 | 592 | 29 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 28 | 95 | 10 | 396 | 47 | 93 | 4 | 499 | 154 | 403 | 623 | 20 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 90 | 463 | 206 | 505 | 943 | 1151 | 16 | 763 | 596 | 455 | 1826 | 566 |
| Arrive On Green | 0.03 | 0.14 | 0.14 | 0.17 | 0.28 | 0.28 | 0.01 | 0.23 | 0.23 | 0.16 | 0.38 | 0.38 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 2910 | 3367 | 2634 | 2910 | 3367 | 1481 | 2910 | 4837 | 1500 |
| Grp Volume(v), veh/h | 28 | 95 | 10 | 396 | 47 | 93 | 4 | 499 | 154 | 403 | 623 | 20 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1455 | 1683 | 1317 | 1455 | 1683 | 1481 | 1455 | 1612 | 1500 |
| Q Serve(g_s), s | 0.6 | 1.5 | 0.3 | 7.8 | 0.6 | 1.2 | 0.1 | 8.1 | 4.2 | 8.2 | 5.5 | 0.5 |
| Cycle Q Clear(g_c), s | 0.6 | 1.5 | 0.3 | 7.8 | 0.6 | 1.2 | 0.1 | 8.1 | 4.2 | 8.2 | 5.5 | 0.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 90 | 463 | 206 | 505 | 943 | 1151 | 16 | 763 | 596 | 455 | 1826 | 566 |
| V/C Ratio(X) | 0.31 | 0.21 | 0.05 | 0.78 | 0.05 | 0.08 | 0.26 | 0.65 | 0.26 | 0.89 | 0.34 | 0.04 |
| Avail Cap(c_a), veh/h | 242 | 1271 | 567 | 1185 | 2362 | 2261 | 242 | 2519 | 1369 | 455 | 3973 | 1232 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.5 | 23.0 | 22.5 | 23.8 | 15.8 | 9.9 | 29.8 | 21.1 | 12.1 | 24.8 | 13.4 | 11.8 |
| Incr Delay (d2), s/veh | 0.7 | 0.2 | 0.1 | 1.0 | 0.0 | 0.0 | 3.1 | 1.0 | 0.2 | 18.0 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.5 | 0.1 | 2.4 | 0.2 | 0.3 | 0.0 | 2.7 | 1.1 | 3.5 | 1.5 | 0.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.2 | 23.2 | 22.6 | 24.8 | 15.8 | 9.9 | 32.9 | 22.1 | 12.3 | 42.9 | 13.5 | 11.8 |
| LnGrp LOS | C | C | C | C | B | A | C | C | B | D | B | B |
| Approach Vol, veh/h | | 133 | | | 536 | | | 657 | | | 1046 | |
| Approach Delay, s/veh | | 24.5 | | | 21.4 | | | 19.8 | | | 24.8 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 18.2 | 15.0 | 12.9 | 4.9 | 27.3 | 6.5 | 21.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 10.2 | 10.1 | 9.8 | 3.5 | 2.1 | 7.5 | 2.6 | 3.2 |
| Green Ext Time (p_c), s | 0.0 | 3.5 | 0.6 | 0.4 | 0.0 | 4.1 | 0.0 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 44 | 906 | 38 | 53 | 1037 | 44 | 29 | 20 | 76 | 33 |
| Future Volume (vph) | 44 | 906 | 38 | 53 | 1037 | 44 | 29 | 20 | 76 | 33 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.1 | 35.4 | 35.4 | 10.0 | 36.2 | 36.2 | 8.8 | 10.8 | 10.7 | 17.2 |
| Actuated g/C Ratio | 0.14 | 0.55 | 0.55 | 0.16 | 0.57 | 0.57 | 0.14 | 0.17 | 0.17 | 0.27 |
| v/c Ratio | 0.21 | 0.49 | 0.04 | 0.23 | 0.55 | 0.05 | 0.14 | 0.23 | 0.30 | 0.18 |
| Control Delay (s/veh) | 40.3 | 16.8 | 0.1 | 38.1 | 16.7 | 0.1 | 40.2 | 18.0 | 38.1 | 16.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.3 | 16.8 | 0.1 | 38.1 | 16.7 | 0.1 | 40.2 | 18.0 | 38.1 | 16.7 |
| LOS | D | B | A | D | B | A | D | B | D | B |
| Approach Delay (s/veh) | | 17.3 | | | 17.0 | | | 24.7 | | 27.3 |
| Approach LOS | | B | | | B | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 64 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.55 | |
| Intersection Signal Delay (s/veh): 18.1 | Intersection LOS: B |
| Intersection Capacity Utilization 57.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

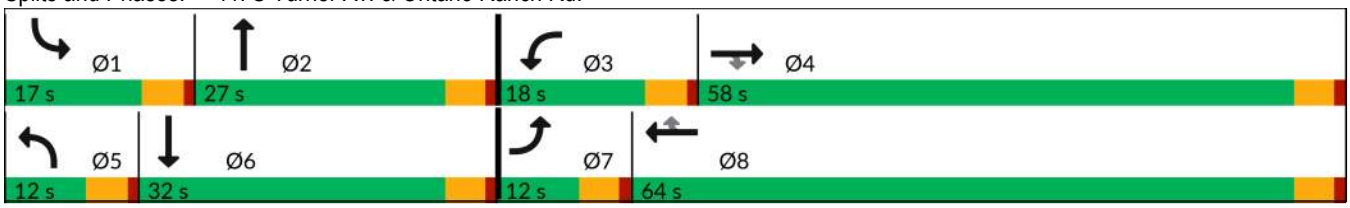

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 44 | 906 | 38 | 53 | 1037 | 44 | 29 | 20 | 47 | 76 | 33 | 45 |
| Future Volume (veh/h) | 44 | 906 | 38 | 53 | 1037 | 44 | 29 | 20 | 47 | 76 | 33 | 45 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 47 | 964 | 36 | 56 | 1103 | 23 | 31 | 21 | 18 | 81 | 35 | 36 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 77 | 1637 | 694 | 86 | 1659 | 703 | 56 | 40 | 35 | 108 | 63 | 65 |
| Arrive On Green | 0.05 | 0.46 | 0.46 | 0.05 | 0.47 | 0.47 | 0.04 | 0.05 | 0.05 | 0.07 | 0.08 | 0.08 |
| Sat Flow, veh/h | 1594 | 3544 | 1502 | 1594 | 3544 | 1502 | 1594 | 871 | 747 | 1594 | 800 | 823 |
| Grp Volume(v), veh/h | 47 | 964 | 36 | 56 | 1103 | 23 | 31 | 0 | 39 | 81 | 0 | 71 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 1772 | 1502 | 1594 | 0 | 1618 | 1594 | 0 | 1624 |
| Q Serve(g_s), s | 1.4 | 10.0 | 0.7 | 1.7 | 12.0 | 0.4 | 1.0 | 0.0 | 1.2 | 2.5 | 0.0 | 2.1 |
| Cycle Q Clear(g_c), s | 1.4 | 10.0 | 0.7 | 1.7 | 12.0 | 0.4 | 1.0 | 0.0 | 1.2 | 2.5 | 0.0 | 2.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.46 | 1.00 | | 0.51 |
| Lane Grp Cap(c), veh/h | 77 | 1637 | 694 | 86 | 1659 | 703 | 56 | 0 | 75 | 108 | 0 | 128 |
| V/C Ratio(X) | 0.61 | 0.59 | 0.05 | 0.65 | 0.66 | 0.03 | 0.56 | 0.00 | 0.52 | 0.75 | 0.00 | 0.55 |
| Avail Cap(c_a), veh/h | 237 | 3803 | 1612 | 429 | 4231 | 1793 | 237 | 0 | 728 | 397 | 0 | 894 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.2 | 9.9 | 7.4 | 23.1 | 10.2 | 7.1 | 23.6 | 0.0 | 23.2 | 22.8 | 0.0 | 22.1 |
| Incr Delay (d2), s/veh | 3.0 | 0.3 | 0.0 | 3.0 | 0.5 | 0.0 | 3.2 | 0.0 | 5.5 | 3.9 | 0.0 | 3.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 2.6 | 0.1 | 0.6 | 3.1 | 0.1 | 0.4 | 0.0 | 0.5 | 0.9 | 0.0 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.2 | 10.2 | 7.4 | 26.1 | 10.7 | 7.2 | 26.8 | 0.0 | 28.7 | 26.7 | 0.0 | 25.8 |
| LnGrp LOS | C | B | A | C | B | A | C | | C | C | | C |
| Approach Vol, veh/h | | 1047 | | | 1182 | | | 70 | | | 152 | |
| Approach Delay, s/veh | | 10.8 | | | 11.3 | | | 27.8 | | | 26.2 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.0 | 6.9 | 7.3 | 27.6 | 6.3 | 8.5 | 7.0 | 27.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 4.5 | 3.2 | 3.7 | 12.0 | 3.0 | 4.1 | 3.4 | 14.0 |
| Green Ext Time (p_c), s | 0.0 | 0.1 | 0.0 | 7.7 | 0.0 | 0.3 | 0.0 | 9.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 12.5 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 177 | 871 | 47 | 226 | 1044 | 225 | 47 | 170 | 69 | 227 | 372 | 78 |
| Future Volume (vph) | 177 | 871 | 47 | 226 | 1044 | 225 | 47 | 170 | 69 | 227 | 372 | 78 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.3 | 25.2 | 25.2 | 11.2 | 24.1 | 24.1 | 5.9 | 18.4 | 18.4 | 16.5 | 31.4 | 31.4 |
| Actuated g/C Ratio | 0.14 | 0.28 | 0.28 | 0.12 | 0.27 | 0.27 | 0.07 | 0.20 | 0.20 | 0.18 | 0.35 | 0.35 |
| v/c Ratio | 0.85 | 0.67 | 0.10 | 0.65 | 0.67 | 0.42 | 0.48 | 0.49 | 0.17 | 0.82 | 0.63 | 0.14 |
| Control Delay (s/veh) | 75.3 | 33.3 | 0.4 | 49.5 | 32.7 | 6.8 | 61.7 | 36.0 | 0.9 | 61.6 | 30.8 | 3.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 75.3 | 33.3 | 0.4 | 49.5 | 32.7 | 6.8 | 61.7 | 36.0 | 0.9 | 61.6 | 30.8 | 3.6 |
| LOS | E | C | A | D | C | A | E | D | A | E | C | A |
| Approach Delay (s/veh) | | 38.7 | | | 31.4 | | | 31.8 | | | 38.0 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 90.3 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 34.9 | Intersection LOS: C |
| Intersection Capacity Utilization 70.0% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 177 | 871 | 47 | 226 | 1044 | 225 | 47 | 170 | 69 | 227 | 372 | 78 |
| Future Volume (veh/h) | 177 | 871 | 47 | 226 | 1044 | 225 | 47 | 170 | 69 | 227 | 372 | 78 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 184 | 907 | 32 | 235 | 1088 | 132 | 49 | 177 | 15 | 236 | 388 | 66 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 219 | 1499 | 463 | 314 | 1709 | 418 | 69 | 273 | 230 | 274 | 501 | 422 |
| Arrive On Green | 0.14 | 0.31 | 0.31 | 0.11 | 0.28 | 0.28 | 0.04 | 0.15 | 0.15 | 0.17 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1594 | 4837 | 1494 | 2910 | 6095 | 1491 | 1594 | 1772 | 1490 | 1594 | 1772 | 1494 |
| Grp Volume(v), veh/h | 184 | 907 | 32 | 235 | 1088 | 132 | 49 | 177 | 15 | 236 | 388 | 66 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1494 | 1455 | 1524 | 1491 | 1594 | 1772 | 1490 | 1594 | 1772 | 1494 |
| Q Serve(g_s), s | 8.1 | 11.4 | 1.1 | 5.6 | 11.2 | 5.0 | 2.2 | 6.7 | 0.6 | 10.3 | 14.4 | 2.4 |
| Cycle Q Clear(g_c), s | 8.1 | 11.4 | 1.1 | 5.6 | 11.2 | 5.0 | 2.2 | 6.7 | 0.6 | 10.3 | 14.4 | 2.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 219 | 1499 | 463 | 314 | 1709 | 418 | 69 | 273 | 230 | 274 | 501 | 422 |
| V/C Ratio(X) | 0.84 | 0.60 | 0.07 | 0.75 | 0.64 | 0.32 | 0.71 | 0.65 | 0.07 | 0.86 | 0.77 | 0.16 |
| Avail Cap(c_a), veh/h | 266 | 1960 | 606 | 519 | 2538 | 621 | 133 | 1076 | 905 | 357 | 1325 | 1117 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.2 | 21.0 | 17.5 | 31.1 | 22.6 | 20.4 | 33.9 | 28.5 | 26.0 | 28.9 | 23.7 | 19.3 |
| Incr Delay (d2), s/veh | 15.3 | 0.4 | 0.1 | 1.4 | 0.4 | 0.4 | 4.9 | 2.6 | 0.1 | 12.7 | 2.6 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.7 | 3.8 | 0.3 | 1.8 | 3.5 | 1.5 | 0.9 | 2.8 | 0.2 | 4.6 | 5.7 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 45.5 | 21.4 | 17.5 | 32.5 | 23.0 | 20.8 | 38.8 | 31.1 | 26.1 | 41.6 | 26.3 | 19.5 |
| LnGrp LOS | D | C | B | C | C | C | D | C | C | D | C | B |
| Approach Vol, veh/h | | 1123 | | | 1455 | | | 241 | | | 690 | |
| Approach Delay, s/veh | | 25.3 | | | 24.4 | | | 32.4 | | | 30.9 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.9 | 15.7 | 12.3 | 26.9 | 7.7 | 24.9 | 14.5 | 24.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 12.3 | 8.7 | 7.6 | 13.4 | 4.2 | 16.4 | 10.1 | 13.2 |
| Green Ext Time (p_c), s | 0.1 | 1.0 | 0.2 | 5.1 | 0.0 | 2.5 | 0.0 | 6.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 26.5 |
| HCM 7th LOS | C |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 108 | 823 | 238 | 340 | 1133 | 142 | 365 | 305 | 261 | 171 | 358 | 101 |
| Future Volume (vph) | 108 | 823 | 238 | 340 | 1133 | 142 | 365 | 305 | 261 | 171 | 358 | 101 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.9 | 38.5 | 38.5 | 8.6 | 40.2 | 40.2 | 7.6 | 20.0 | 20.0 | 6.6 | 19.0 | 19.0 |
| Actuated g/C Ratio | 0.07 | 0.42 | 0.42 | 0.09 | 0.43 | 0.43 | 0.08 | 0.22 | 0.22 | 0.07 | 0.21 | 0.21 |
| v/c Ratio | 0.53 | 0.43 | 0.33 | 1.33 | 0.82 | 0.21 | 1.63 | 0.31 | 0.61 | 0.88 | 0.55 | 0.27 |
| Control Delay (s/veh) | 54.6 | 20.9 | 4.1 | 208.6 | 29.9 | 6.0 | 329.9 | 31.0 | 18.8 | 84.7 | 35.9 | 7.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.6 | 20.9 | 4.1 | 208.6 | 29.9 | 6.0 | 329.9 | 31.0 | 18.8 | 84.7 | 35.9 | 7.8 |
| LOS | D | C | A | F | C | A | F | C | B | F | D | A |
| Approach Delay (s/veh) | | 20.6 | | | 65.4 | | | 144.7 | | | 44.7 | |
| Approach LOS | | C | | | E | | | F | | | D | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 92.5
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.63
Intersection Signal Delay (s/veh): 67.3 — Intersection LOS: E
Intersection Capacity Utilization 75.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

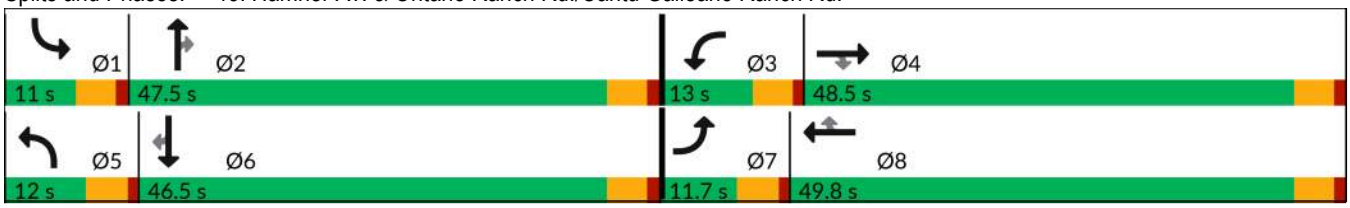

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 108 | 823 | 238 | 340 | 1133 | 142 | 365 | 305 | 261 | 171 | 358 | 101 |
| Future Volume (veh/h) | 108 | 823 | 238 | 340 | 1133 | 142 | 365 | 305 | 261 | 171 | 358 | 101 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 114 | 866 | 154 | 358 | 1193 | 56 | 384 | 321 | 87 | 180 | 377 | 94 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 173 | 1876 | 582 | 320 | 1475 | 657 | 282 | 861 | 261 | 244 | 555 | 244 |
| Arrive On Green | 0.06 | 0.39 | 0.39 | 0.11 | 0.44 | 0.44 | 0.10 | 0.18 | 0.18 | 0.08 | 0.16 | 0.16 |
| Sat Flow, veh/h | 2910 | 4837 | 1500 | 2910 | 3367 | 1500 | 2910 | 4837 | 1467 | 2910 | 3367 | 1480 |
| Grp Volume(v), veh/h | 114 | 866 | 154 | 358 | 1193 | 56 | 384 | 321 | 87 | 180 | 377 | 94 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1500 | 1455 | 1683 | 1500 | 1455 | 1612 | 1467 | 1455 | 1683 | 1480 |
| Q Serve(g_s), s | 2.9 | 10.2 | 5.4 | 8.4 | 23.6 | 1.7 | 7.4 | 4.5 | 4.0 | 4.6 | 8.1 | 4.3 |
| Cycle Q Clear(g_c), s | 2.9 | 10.2 | 5.4 | 8.4 | 23.6 | 1.7 | 7.4 | 4.5 | 4.0 | 4.6 | 8.1 | 4.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 173 | 1876 | 582 | 320 | 1475 | 657 | 282 | 861 | 261 | 244 | 555 | 244 |
| V/C Ratio(X) | 0.66 | 0.46 | 0.26 | 1.12 | 0.81 | 0.09 | 1.36 | 0.37 | 0.33 | 0.74 | 0.68 | 0.39 |
| Avail Cap(c_a), veh/h | 270 | 2778 | 862 | 320 | 1990 | 887 | 282 | 2714 | 823 | 244 | 1845 | 811 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.2 | 17.5 | 16.0 | 34.0 | 18.7 | 12.5 | 34.5 | 27.7 | 27.5 | 34.2 | 30.0 | 28.5 |
| Incr Delay (d2), s/veh | 1.6 | 0.2 | 0.2 | 86.6 | 1.9 | 0.1 | 184.7 | 0.3 | 0.7 | 10.0 | 1.5 | 1.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 3.2 | 1.6 | 6.5 | 7.7 | 0.5 | 9.6 | 1.6 | 1.3 | 1.8 | 3.1 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 36.8 | 17.6 | 16.2 | 120.6 | 20.6 | 12.6 | 219.2 | 27.9 | 28.2 | 44.2 | 31.5 | 29.5 |
| LnGrp LOS | D | B | B | F | C | B | F | C | C | D | C | C |
| Approach Vol, veh/h | | 1134 | | | 1607 | | | 792 | | | 651 | |
| Approach Delay, s/veh | | 19.4 | | | 42.6 | | | 120.7 | | | 34.7 | |
| Approach LOS | | B | | | D | | | F | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 18.2 | 13.0 | 34.3 | 12.0 | 17.2 | 9.2 | 38.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 6.5 | 10.4 | 12.2 | 9.4 | 10.1 | 4.9 | 25.6 |
| Green Ext Time (p_c), s | 0.0 | 2.3 | 0.0 | 6.4 | 0.0 | 2.6 | 0.0 | 7.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 49.9 |
| HCM 7th LOS | D |

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1072 | 148 | 1021 | 150 | 245 | 0 | 1217 |
| Future Volume (vph) | 1072 | 148 | 1021 | 150 | 245 | 0 | 1217 |
| Turn Type | NA | Perm | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | | 6 | | | 4 | |
| Permitted Phases | | 2 | | Free | 4 | | 4 |
| Detector Phase | 2 | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | C-Min | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 45.7 | 45.7 | 45.7 | 120.0 | 63.2 | 63.2 | 63.2 |
| Actuated g/C Ratio | 0.38 | 0.38 | 0.38 | 1.00 | 0.53 | 0.53 | 0.53 |
| v/c Ratio | 0.59 | 0.25 | 0.84 | 0.06 | 0.29 | 0.85 | 0.86 |
| Control Delay (s/veh) | 32.2 | 5.2 | 40.4 | 0.0 | 16.1 | 34.0 | 34.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 32.2 | 5.2 | 40.4 | 0.0 | 16.1 | 34.0 | 34.6 |
| LOS | C | A | D | A | B | C | C |
| Approach Delay (s/veh) | 28.9 | | 35.2 | | | 31.5 | |
| Approach LOS | C | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 8.1 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 31.8 | Intersection LOS: C |
| Intersection Capacity Utilization 92.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

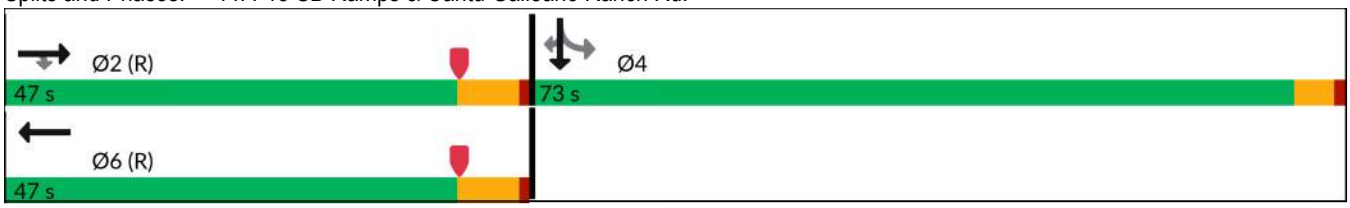

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1072 | 148 | 0 | 1021 | 150 | 0 | 0 | 0 | 245 | 0 | 1217 |
| Future Volume (veh/h) | 0 | 1072 | 148 | 0 | 1021 | 150 | 0 | 0 | 0 | 245 | 0 | 1217 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 0 | 1772 | 1772 | | | | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 1191 | 0 | 0 | 1134 | 0 | | | | 181 | 0 | 1230 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2426 | | 0 | 1618 | | | | | 719 | 0 | 1355 |
| Arrive On Green | 0.00 | 0.46 | 0.00 | 0.00 | 0.91 | 0.00 | | | | 0.45 | 0.00 | 0.45 |
| Sat Flow, veh/h | 0 | 5316 | 1502 | 0 | 3544 | 2643 | | | | 1594 | 0 | 3003 |
| Grp Volume(v), veh/h | 0 | 1191 | 0 | 0 | 1134 | 0 | | | | 181 | 0 | 1230 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 1502 | 0 | 1772 | 1321 | | | | 1594 | 0 | 1502 |
| Q Serve(g_s), s | 0.0 | 18.8 | 0.0 | 0.0 | 9.3 | 0.0 | | | | 8.4 | 0.0 | 45.7 |
| Cycle Q Clear(g_c), s | 0.0 | 18.8 | 0.0 | 0.0 | 9.3 | 0.0 | | | | 8.4 | 0.0 | 45.7 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2426 | | 0 | 1618 | | | | | 719 | 0 | 1355 |
| V/C Ratio(X) | 0.00 | 0.49 | | 0.00 | 0.70 | | | | | 0.25 | 0.00 | 0.91 |
| Avail Cap(c_a), veh/h | 0 | 2426 | | 0 | 1618 | | | | | 908 | 0 | 1712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.83 | 0.00 | 0.00 | 0.87 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 22.8 | 0.0 | 0.0 | 3.2 | 0.0 | | | | 20.4 | 0.0 | 30.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.6 | 0.0 | 0.0 | 2.2 | 0.0 | | | | 0.2 | 0.0 | 6.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 7.3 | 0.0 | 0.0 | 1.9 | 0.0 | | | | 3.0 | 0.0 | 16.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 23.4 | 0.0 | 0.0 | 5.5 | 0.0 | | | | 20.6 | 0.0 | 37.0 |
| LnGrp LOS | | C | | | A | | | | | C | | D |
| Approach Vol, veh/h | | 1191 | | | 1134 | | | | | | 1411 | |
| Approach Delay, s/veh | | 23.4 | | | 5.5 | | | | | | 34.9 | |
| Approach LOS | | C | | | A | | | | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 61.3 | 58.7 | 61.3 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 20.8 | 47.7 | 11.3 |
| Green Ext Time (p_c), s | 7.3 | 6.4 | 8.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.3 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 579 | 737 | 146 | 383 | 586 | 124 |
| Future Volume (vph) | 579 | 737 | 146 | 383 | 586 | 124 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 60.3 | 60.3 | 11.7 | 76.6 | 32.3 | 32.3 |
| Actuated g/C Ratio | 0.50 | 0.50 | 0.10 | 0.64 | 0.27 | 0.27 |
| v/c Ratio | 0.24 | 0.72 | 0.55 | 0.12 | 0.72 | 0.25 |
| Control Delay (s/veh) | 29.7 | 30.4 | 58.4 | 8.8 | 44.7 | 7.0 |
| Queue Delay | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.7 | 30.7 | 58.4 | 8.8 | 44.7 | 7.0 |
| LOS | C | C | E | A | D | A |
| Approach Delay (s/veh) | 30.2 | | | 22.5 | 38.8 | |
| Approach LOS | C | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 15.4 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.72 | |
| Intersection Signal Delay (s/veh): 31.0 | Intersection LOS: C |
| Intersection Capacity Utilization 62.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

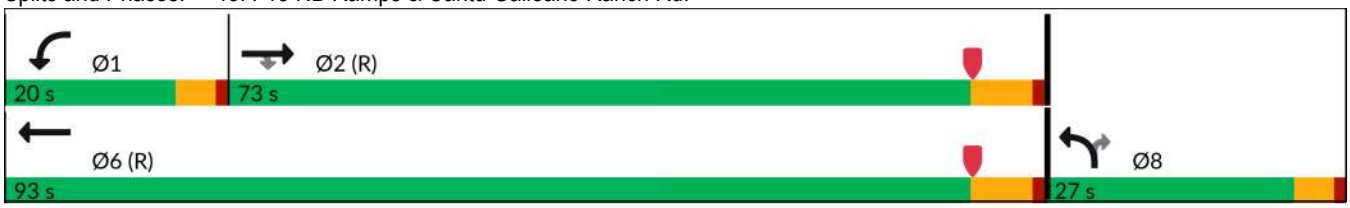

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 579 | 737 | 146 | 383 | 586 | 124 |
| Future Volume (veh/h) | 579 | 737 | 146 | 383 | 586 | 124 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 0.98 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1575 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 629 | 560 | 159 | 416 | 637 | 75 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3254 | 900 | 211 | 3832 | 630 | 280 |
| Arrive On Green | 1.00 | 1.00 | 0.07 | 0.72 | 0.19 | 0.19 |
| Sat Flow, veh/h | 5316 | 1471 | 3000 | 5316 | 3375 | 1502 |
| Grp Volume(v), veh/h | 629 | 560 | 159 | 416 | 637 | 75 |
| Grp Sat Flow(s),veh/h/ln | 1772 | 1471 | 1500 | 1772 | 1688 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 6.2 | 2.8 | 22.4 | 5.1 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 6.2 | 2.8 | 22.4 | 5.1 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3254 | 900 | 211 | 3832 | 630 | 280 |
| V/C Ratio(X) | 0.19 | 0.62 | 0.75 | 0.11 | 1.01 | 0.27 |
| Avail Cap(c_a), veh/h | 3254 | 900 | 385 | 3832 | 630 | 280 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.83 | 0.83 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 54.8 | 5.1 | 48.8 | 41.8 |
| Incr Delay (d2), s/veh | 0.1 | 2.7 | 5.4 | 0.1 | 38.6 | 0.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.7 | 2.4 | 0.8 | 12.5 | 1.9 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.1 | 2.7 | 60.1 | 5.1 | 87.4 | 42.3 |
| LnGrp LOS | A | A | E | A | F | D |
| Approach Vol, veh/h | 1189 | | | 575 | 712 | |
| Approach Delay, s/veh | 1.3 | | | 20.3 | 82.7 | |
| Approach LOS | A | | | C | F | |

| Timer - Assigned Phs | 1 | 2 | | | 6 | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.0 | 80.0 | | | 93.0 | 27.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 2.0 | | | 4.8 | 24.4 |
| Green Ext Time (p_c), s | 0.2 | 6.9 | | | 2.6 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.1 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

# APPENDIX 5.3:

# E+P (PHASE 1) SIGNAL WARRANT ANALYSIS

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# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **E+P (Phase 1) Conditions - Weekday AM Peak Hour**

Major Street Name = **Bon View Av.**

Total of Both Approaches (VPH) = **351**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **197**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

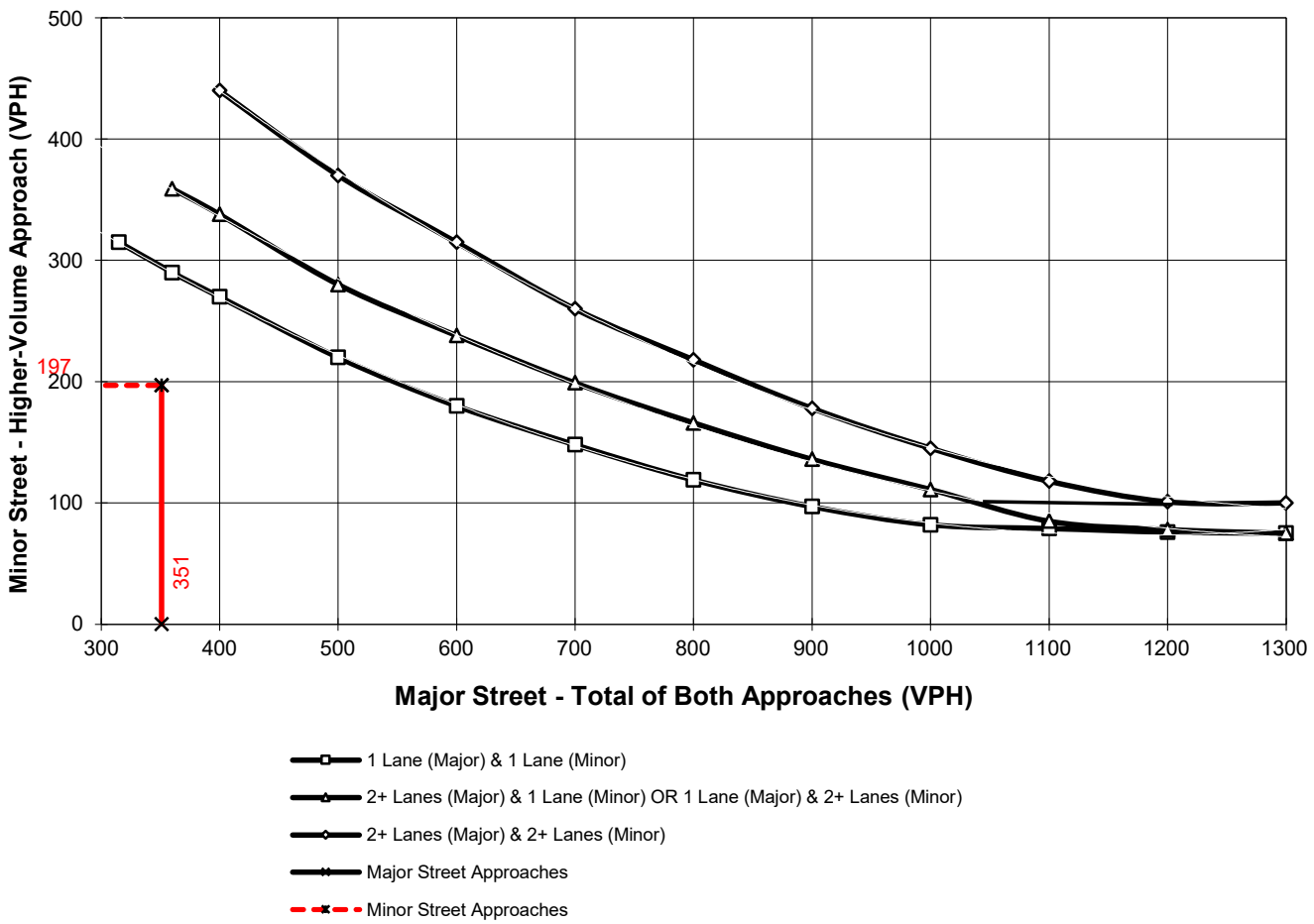


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **E + P Phase I Conditions - Weekday AM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **187**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Bon View Av.**
High Volume Approach (VPH) = **99**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

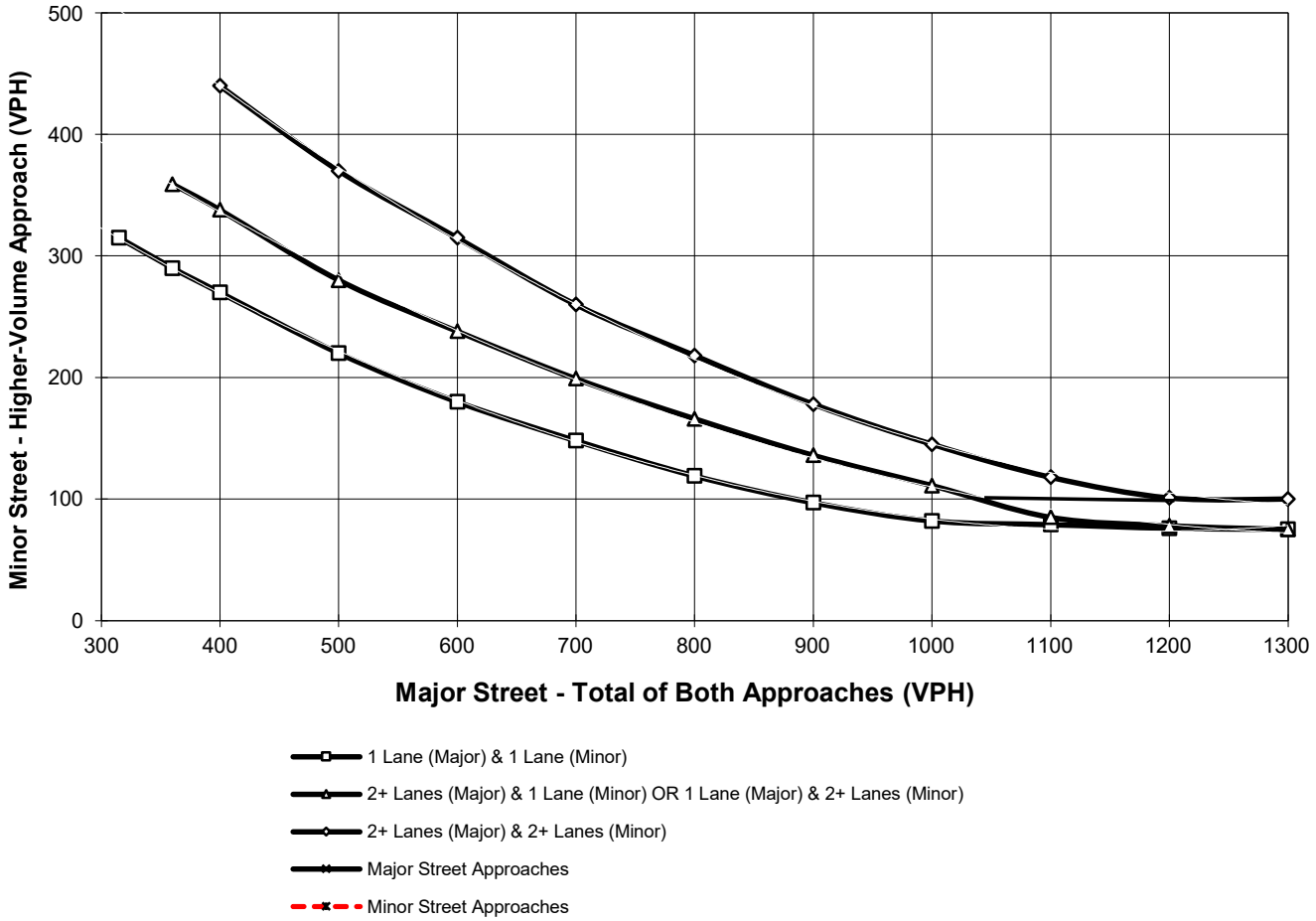


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
## (Average Traffic Estimate Form)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIST | CO | RTE | PM | TRAFFIC CONDITIONS | | | **E + P Phase I** |
| | | | | CALC | IA | DATE | 02/20/25 |
| Jurisdiction: | **City of Ontario** | | | CHK | IA | DATE | 02/20/25 |
| Major Street: | **Edison Av.** | | | Critical Approach Speed (Major) | | | 50 mph |
| Minor Street: | **Parco Av.** | | | Critical Approach Speed (Minor) | | | 25 mph |

Major Street Approach Lanes = **2** lane  Minor Street Approach Lanes **1** lane

Major Street Future ADT = **14,076** vpd  Minor Street Future ADT = **662** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……... [√]

or  **RURAL (R)**

In built up area of isolated community of < 10,000 population …….…… [ ]

**(Based on Estimated Average Daily Traffic - See Note)**

| URBAN | RURAL | Minimum Requirements EADT | | | |
|---|---|---|---|---|---|
| XX | | | | | |
| **CONDITION A - Minimum Vehicular Volume** | | | | | |
| Satisfied | Not Satisfied | Vehicles Per Day on Major Street (Total of Both Approaches) | | Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) | |
| | XX | | | | |
| Number of lanes for moving traffic on each approach | | | | | |
| Major Street | Minor Street | Urban | Rural | Urban | Rural |
| *1* | *1* | 8,000 | 5,600 | 2,400 | 1,680 |
| *2* + **14,076** | *1* **662** | 9,600 * | 6,720 | 2,400 | 1,680 |
| *2* + | *2* + | 9,600 | 6,720 | 3,200 | 2,240 |
| *1* | *2* + | 8,000 | 5,600 | 3,200 | 2,240 |
| **CONDITION B - Interruption of Continuous Traffic** | | | | | |
| Satisfied | Not Satisfied | Vehicles Per Day on Major Street (Total of Both Approaches) | | Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) | |
| | XX | | | | |
| Number of lanes for moving traffic on each approach | | | | | |
| Major Street | Minor Street | Urban | Rural | Urban | Rural |
| *1* | *1* | 12,000 | 8,400 | 1,200 | 850 |
| *2* + **14,076** | *1* **662** | 14,400 | 10,080 | 1,200 | 850 |
| *2* + | *2* + | 14,400 | 10,080 | 1,600 | 1,120 |
| *1* | *2* + | 12,000 | 8,400 | 1,600 | 1,120 |
| **Combination of CONDITIONS A + B** | | | | | |
| Satisfied | Not Satisfied | 2 CONDITIONS 80% | | 2 CONDITIONS 80% | |
| | XX | | | | |
| No one condition satisfied, but following conditions fulfilled 80% of more ….. | **A** 28% **B** 55% | | | | |

**Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.**

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **E + P Phase I Conditions - Weekday PM Peak Hour**

Major Street Name = **Walker Av.**
Total of Both Approaches (VPH) = **303**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**
High Volume Approach (VPH) = **153**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

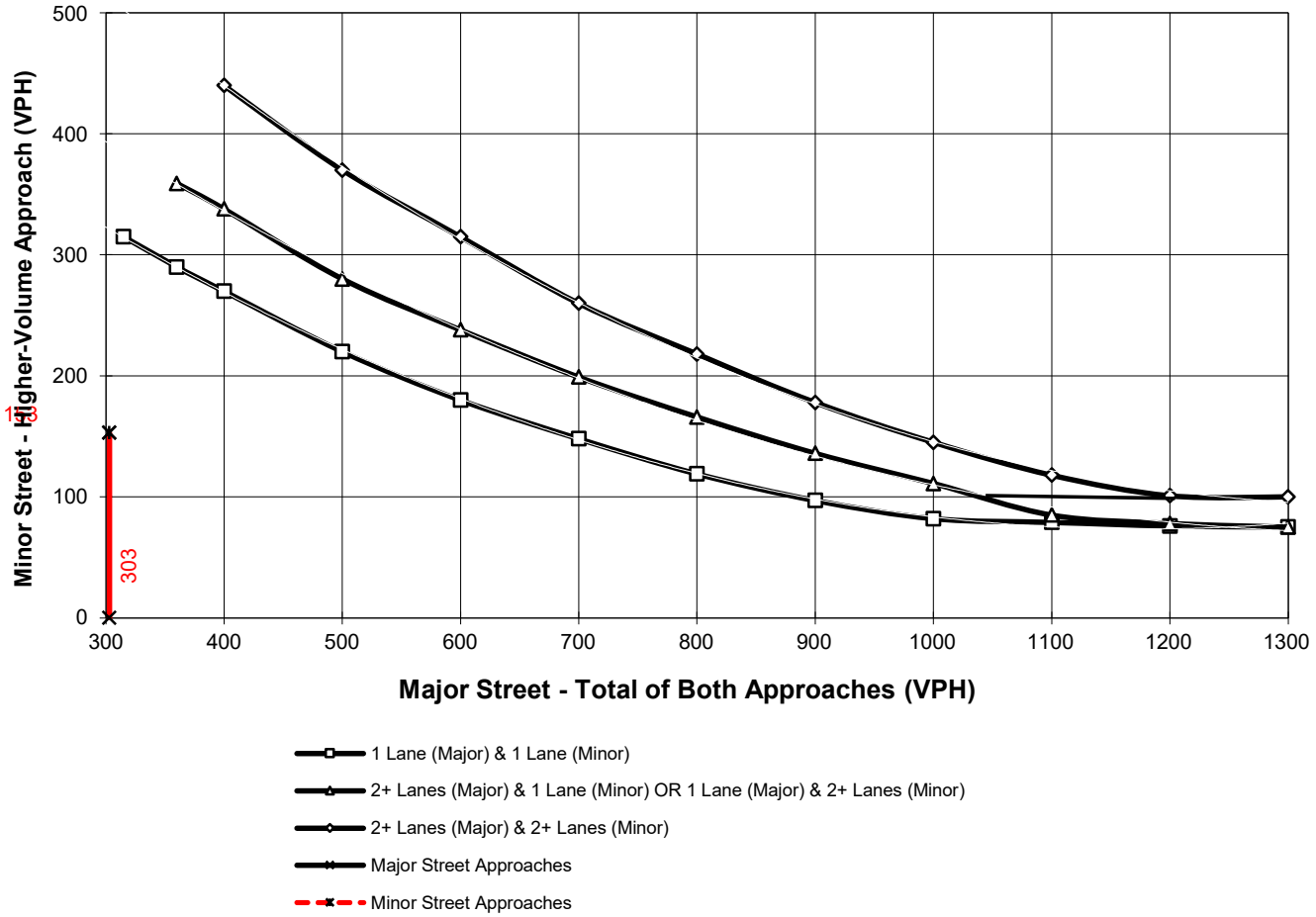


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **E + P Phase I Conditions - Weekday AM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **959**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Walker Av.**
High Volume Approach (VPH) = **83**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

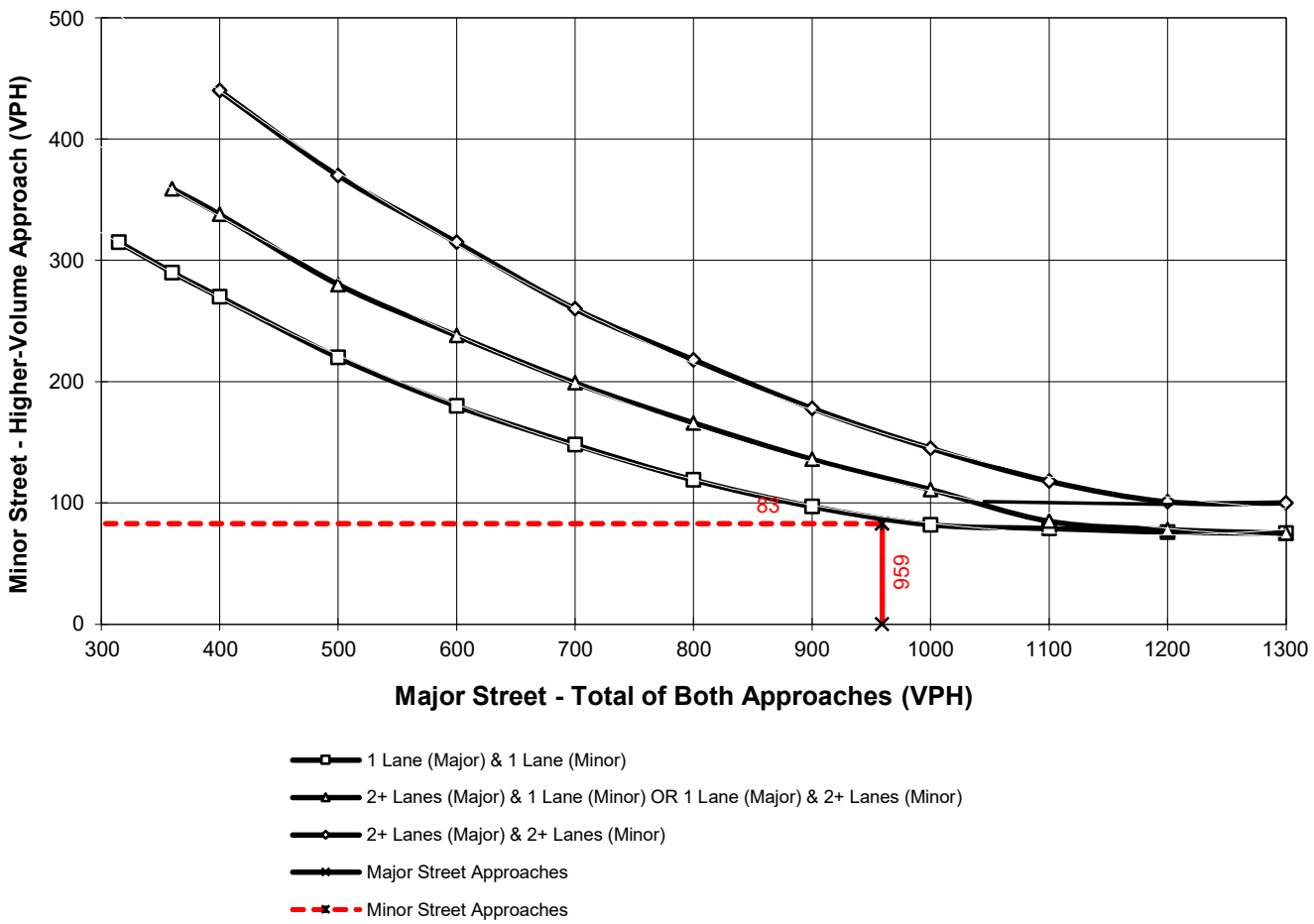


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# APPENDIX 5.4:

# E+P (BUILDOUT) SIGNAL WARRANT ANALYSIS

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# Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
## (Average Traffic Estimate Form)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIST | CO | RTE | PM | TRAFFIC CONDITIONS | | | E + P BO |
| | | | | CALC | IA | DATE | 02/20/25 |
| Jurisdiction: | City of Ontario | | | CHK | IA | DATE | 02/20/25 |
| Major Street: | Edison Av. | | | Critical Approach Speed (Major) | | | 50 mph |
| Minor Street: | Campus Av. | | | Critical Approach Speed (Minor) | | | 25 mph |

Major Street Approach Lanes = **2** lane  Minor Street Approach Lanes **1** lane

Major Street Future ADT = **21,434** vpd  Minor Street Future ADT = **1,565** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……... [√]

or

In built up area of isolated community of < 10,000 population …….…… [ ]

**RURAL (R)**

**(Based on Estimated Average Daily Traffic - See Note)**

| URBAN | RURAL | Minimum Requirements EADT | | | |
|---|---|---|---|---|---|
| | XX | | | | |
| **CONDITION A - Minimum Vehicular Volume** | | | | | |
| Satisfied | Not Satisfied | Vehicles Per Day on Major Street (Total of Both Approaches) | | Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) | |
| | XX | | | | |
| Number of lanes for moving traffic on each approach | | | | | |
| Major Street | Minor Street | Urban | Rural | Urban | Rural |
| *1* | *1* | 8,000 | 5,600 | 2,400 | 1,680 |
| *2* + **21,434** | *1* **1,565** | 9,600 | 6,720 * | 2,400 | 1,680 |
| *2* + | *2* + | 9,600 | 6,720 | 3,200 | 2,240 |
| *1* | *2* + | 8,000 | 5,600 | 3,200 | 2,240 |
| **CONDITION B - Interruption of Continuous Traffic** | | | | | |
| Satisfied | Not Satisfied | Vehicles Per Day on Major Street (Total of Both Approaches) | | Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) | |
| XX | | | | | |
| Number of lanes for moving traffic on each approach | | | | | |
| Major Street | Minor Street | Urban | Rural | Urban | Rural |
| *1* | *1* | 12,000 | 8,400 | 1,200 | 850 |
| *2* + **21,434** | *1* **1,565** | 14,400 | 10,080 * | 1,200 | 850 * |
| *2* + | *2* + | 14,400 | 10,080 | 1,600 | 1,120 |
| *1* | *2* + | 12,000 | 8,400 | 1,600 | 1,120 |
| **Combination of CONDITIONS A + B** | | | | | |
| Satisfied | Not Satisfied | 2 CONDITIONS 80% | | 2 CONDITIONS 80% | |
| XX | | | | | |
| No one condition satisfied, but following conditions fulfilled 80% of more ….. | A / B | | | | |
| | 93% / 100% | | | | |

**Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.**

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

## Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **E+P (Buildout) Conditions - Weekday AM Peak Hour**

Major Street Name = **Bon View Av.**

Total of Both Approaches (VPH) = **410**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **197**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

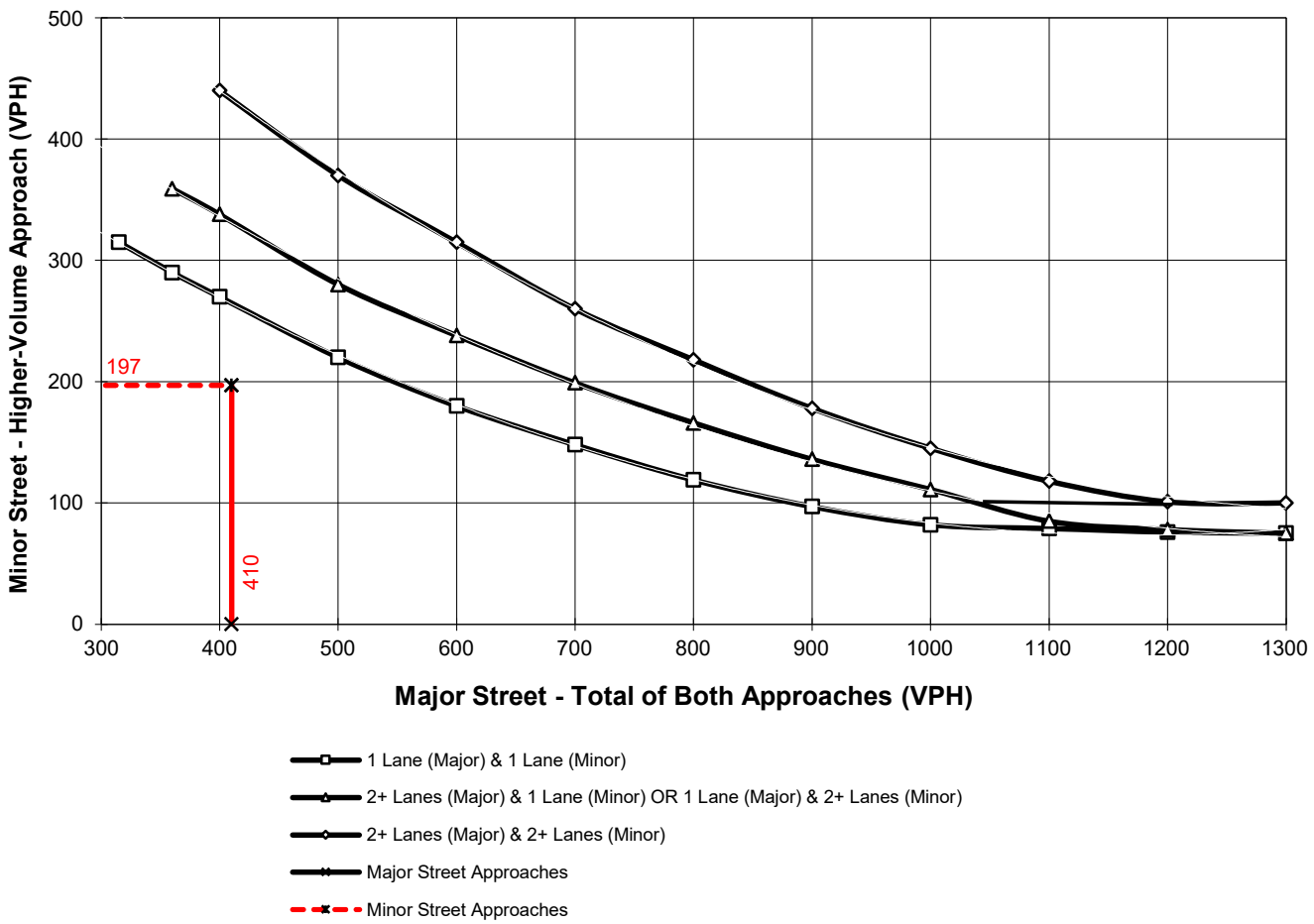


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **E + P BO Conditions - Weekday AM Peak Hour**

Major Street Name = **Eucalyptus Av.** Total of Both Approaches (VPH) = **300**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Bon View Av.** High Volume Approach (VPH) = **118**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

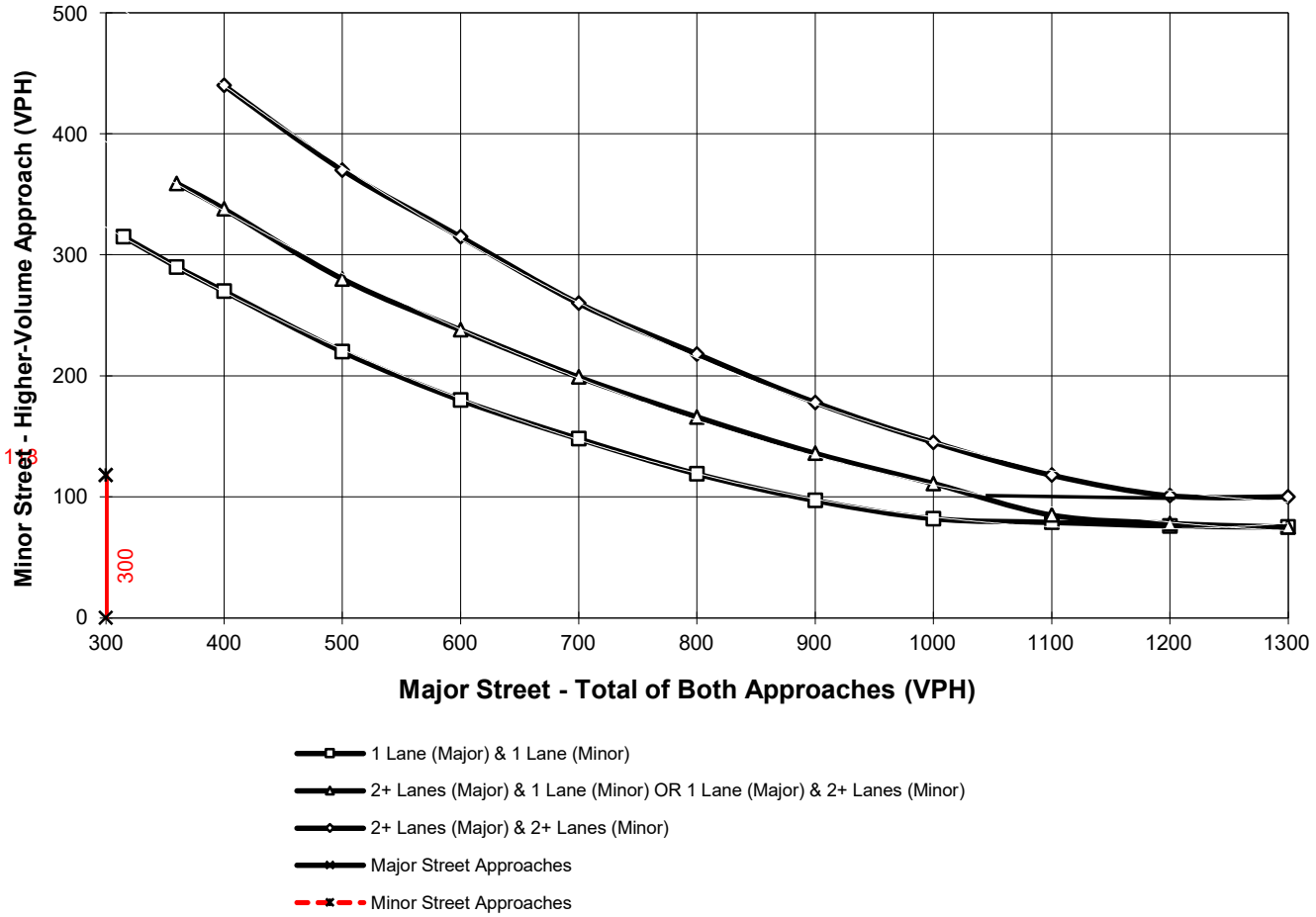


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
## (Average Traffic Estimate Form)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIST | CO | RTE | PM | TRAFFIC CONDITIONS | | | E + P BO |
| | | | | CALC | IA | DATE | 02/20/25 |
| Jurisdiction: | City of Ontario | | | CHK | IA | DATE | 02/20/25 |
| Major Street: | Edison Av. | | | Critical Approach Speed (Major) | | | 50 mph |
| Minor Street: | Cucamonga | | | Critical Approach Speed (Minor) | | | 25 mph |

Major Street Approach Lanes = **2** lane  Minor Street Approach Lanes **1** lane

Major Street Future ADT = **31,829** vpd  Minor Street Future ADT = **1,789** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……... [√]

or

In built up area of isolated community of < 10,000 population …….…… [ ]

**RURAL (R)**

**(Based on Estimated Average Daily Traffic - See Note)**

| URBAN | RURAL | Minimum Requirements EADT | | | |
|---|---|---|---|---|---|
| | XX | | | | |
| **CONDITION A - Minimum Vehicular Volume** | | | | | |
| Satisfied | Not Satisfied | Vehicles Per Day on Major Street (Total of Both Approaches) | | Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) | |
| XX | | | | | |
| Number of lanes for moving traffic on each approach | | | | | |
| Major Street | Minor Street | Urban | Rural | Urban | Rural |
| *1* | *1* | 8,000 | 5,600 | 2,400 | 1,680 |
| *2* + **31,829** | *1* **1,789** | 9,600 | 6,720 * | 2,400 | 1,680 * |
| *2* + | *2* + | 9,600 | 6,720 | 3,200 | 2,240 |
| *1* | *2* + | 8,000 | 5,600 | 3,200 | 2,240 |
| **CONDITION B - Interruption of Continuous Traffic** | | | | | |
| Satisfied | Not Satisfied | Vehicles Per Day on Major Street (Total of Both Approaches) | | Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) | |
| XX | | | | | |
| Number of lanes for moving traffic on each approach | | | | | |
| Major Street | Minor Street | Urban | Rural | Urban | Rural |
| *1* | *1* | 12,000 | 8,400 | 1,200 | 850 |
| *2* + **31,829** | *1* **1,789** | 14,400 | 10,080 * | 1,200 | 850 * |
| *2* + | *2* + | 14,400 | 10,080 | 1,600 | 1,120 |
| *1* | *2* + | 12,000 | 8,400 | 1,600 | 1,120 |
| **Combination of CONDITIONS A + B** | | | | | |
| Satisfied | Not Satisfied | 2 CONDITIONS 80% | | 2 CONDITIONS 80% | |
| XX | | | | | |
| No one condition satisfied, but following conditions fulfilled 80% of more ….. | A / B | | | | |
| | 100% / 100% | | | | |

**Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.**

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

# Figure 4C-103 (CA). Traffic Signal Warrants Worksheet
## (Average Traffic Estimate Form)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| DIST | CO | RTE | PM | TRAFFIC CONDITIONS | | | E + P BO |
| | | | | CALC | IA | DATE | 02/20/25 |
| Jurisdiction: | City of Ontario | | | CHK | IA | DATE | 02/20/25 |
| Major Street: | Edison Av. | | | Critical Approach Speed (Major) | | | 50 mph |
| Minor Street: | Parco Av. | | | Critical Approach Speed (Minor) | | | 25 mph |

Major Street Approach Lanes = **2** lane  Minor Street Approach Lanes **1** lane

Major Street Future ADT = **32,249** vpd  Minor Street Future ADT = **894** vpd

Speed limit or critical speed on major street traffic > 64 km/h (40 mph); ……... [√]

or

In built up area of isolated community of < 10,000 population …….…… [ ]

**RURAL (R)**

**(Based on Estimated Average Daily Traffic - See Note)**

| URBAN | RURAL | Minimum Requirements EADT | | | |
|---|---|---|---|---|---|
| | XX | | | | |
| **CONDITION A - Minimum Vehicular Volume** | | | | | |
| Satisfied | Not Satisfied | Vehicles Per Day on Major Street (Total of Both Approaches) | | Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) | |
| | XX | | | | |
| Number of lanes for moving traffic on each approach | | | | | |
| Major Street | Minor Street | Urban | Rural | Urban | Rural |
| *1* | *1* | 8,000 | 5,600 | 2,400 | 1,680 |
| *2* + **32,249** | *1* **894** | 9,600 | 6,720 * | 2,400 | 1,680 |
| *2* + | *2* + | 9,600 | 6,720 | 3,200 | 2,240 |
| *1* | *2* + | 8,000 | 5,600 | 3,200 | 2,240 |
| **CONDITION B - Interruption of Continuous Traffic** | | | | | |
| Satisfied | Not Satisfied | Vehicles Per Day on Major Street (Total of Both Approaches) | | Vehicles Per Day on Higher-Volume Minor Street Approach (One Direction Only) | |
| XX | | | | | |
| Number of lanes for moving traffic on each approach | | | | | |
| Major Street | Minor Street | Urban | Rural | Urban | Rural |
| *1* | *1* | 12,000 | 8,400 | 1,200 | 850 |
| *2* + **32,249** | *1* **894** | 14,400 | 10,080 * | 1,200 | 850 * |
| *2* + | *2* + | 14,400 | 10,080 | 1,600 | 1,120 |
| *1* | *2* + | 12,000 | 8,400 | 1,600 | 1,120 |
| **Combination of CONDITIONS A + B** | | | | | |
| Satisfied | Not Satisfied | 2 CONDITIONS 80% | | 2 CONDITIONS 80% | |
| | XX | | | | |
| No one condition satisfied, but following conditions fulfilled 80% of more ….. | A / B | | | | |
| | 53% / 100% | | | | |

**Note: To be used only for NEW INTERSECTIONS or other locations where it is not reasonable to count actual traffic volumes.**

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **E + P BO Conditions - Weekday PM Peak Hour**

Major Street Name = **Walker Av.**
Total of Both Approaches (VPH) = **359**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**
High Volume Approach (VPH) = **230**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

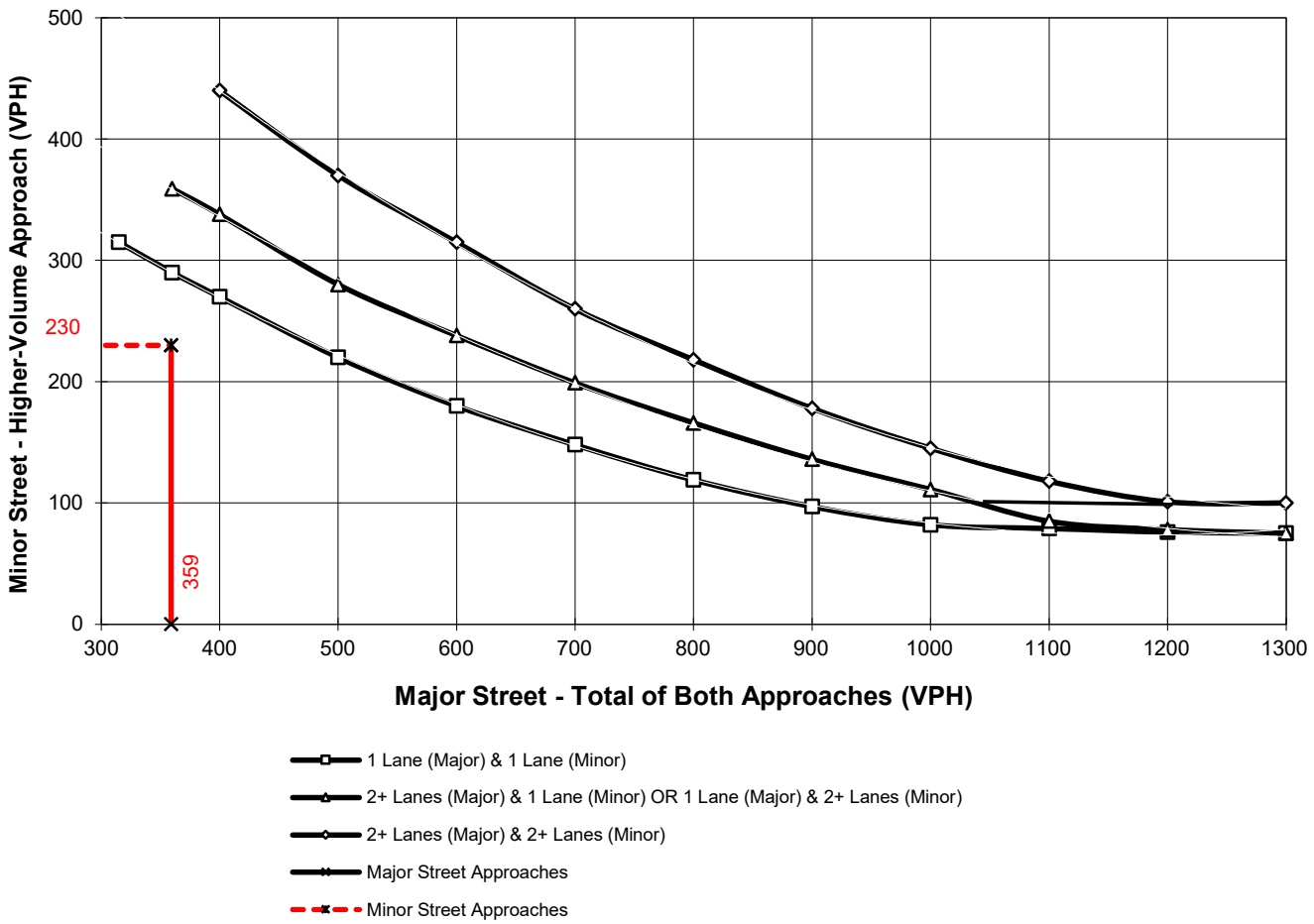


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **E + P BO Conditions - Weekday PM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **712**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Walker Av.**
High Volume Approach (VPH) = **123**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

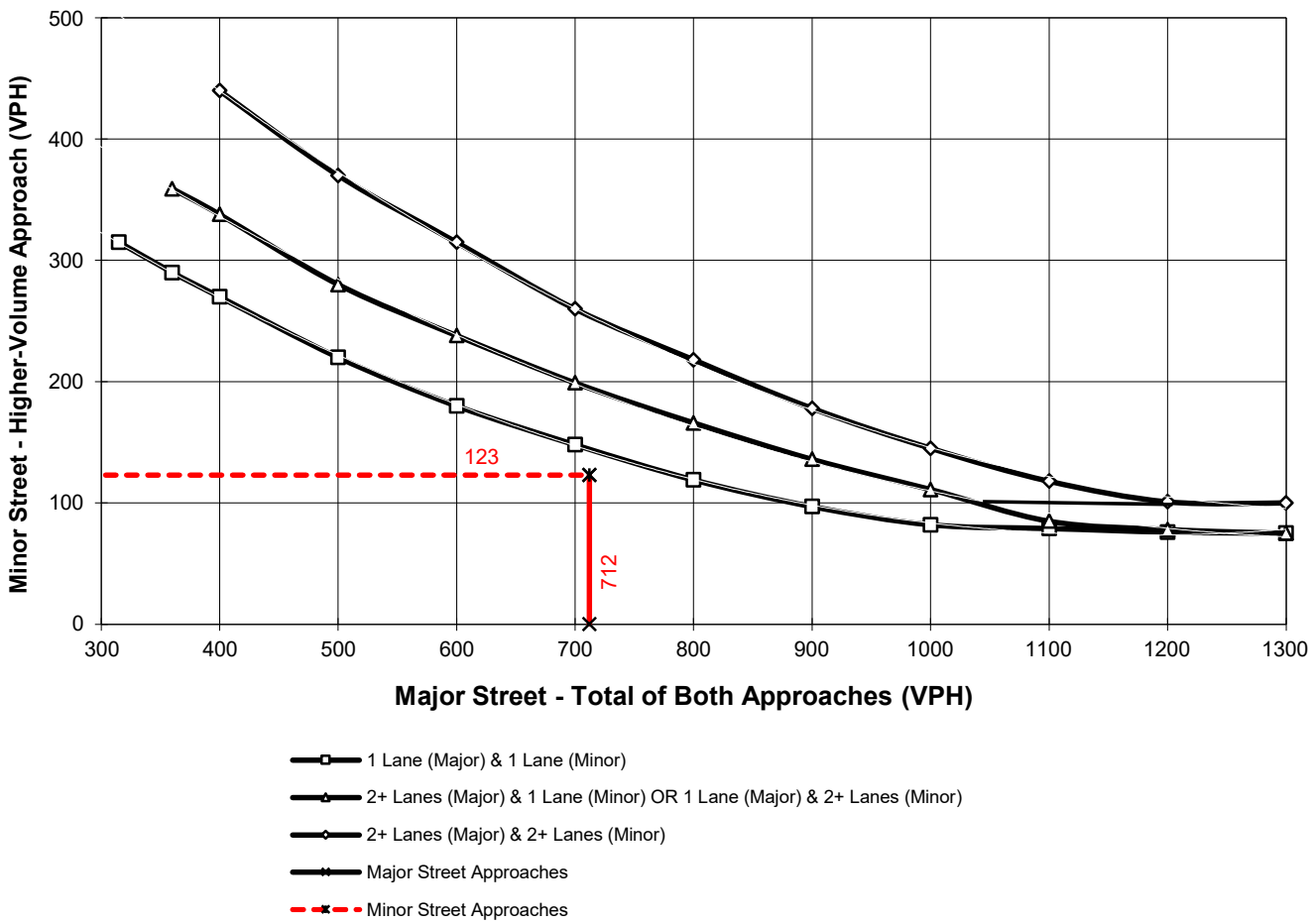


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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# APPENDIX 5.5:

# E+P (PHASE 1) OFF-RAMP QUEUING ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 280 | 264 | 257 | 305 | 737 | 801 | 492 |
| v/c Ratio | 0.81 | 0.55 | 0.52 | 0.86 | 0.35 | 0.70 | 0.60 |
| Control Delay (s/veh) | 51.4 | 12.6 | 10.2 | 60.4 | 9.4 | 30.4 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.4 | 12.6 | 10.2 | 60.4 | 9.4 | 30.4 | 5.8 |
| Queue Length 50th (ft) | 155 | 28 | 15 | 190 | 90 | 215 | 0 |
| Queue Length 95th (ft) | #283 | 107 | 85 | m#287 | 155 | 285 | 75 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 367 | 494 | 511 | 383 | 2093 | 1148 | 825 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.76 | 0.53 | 0.50 | 0.80 | 0.35 | 0.70 | 0.60 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 318 | 1 | 216 | 681 | 402 | 348 | 739 |
| v/c Ratio | 0.84 | no cap | 0.41 | 0.66 | 0.55 | 0.86 | 0.36 |
| Control Delay (s/veh) | 52.7 | | 6.8 | 32.0 | 6.2 | 62.4 | 8.7 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.7 | Error | 6.8 | 32.0 | 6.2 | 62.4 | 8.7 |
| Queue Length 50th (ft) | 169 | 0 | 1 | 187 | 0 | 217 | 80 |
| Queue Length 95th (ft) | #301 | 0 | 54 | 252 | 72 | m#324 | 140 |
| Internal Link Dist (ft) | | 1421 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 404 | 1 | 542 | 1030 | 727 | 444 | 2063 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.79 | 1.00 | 0.40 | 0.66 | 0.55 | 0.78 | 0.36 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 917 | 718 | 988 | 51 | 606 |
| v/c Ratio | 0.95 | 1.00 | 0.37 | 0.18 | 0.88 |
| Control Delay (s/veh) | 49.6 | 61.9 | 3.8 | 41.6 | 18.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.6 | 61.9 | 3.8 | 41.6 | 18.6 |
| Queue Length 50th (ft) | 235 | 424 | 64 | 15 | 0 |
| Queue Length 95th (ft) | #391 | #728 | 120 | 32 | #161 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1633 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 976 | 721 | 2655 | 390 | 726 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.94 | 1.00 | 0.37 | 0.13 | 0.83 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 661 | 188 | 307 | 49 | 274 | 307 | 305 | 41 |
| v/c Ratio | 0.67 | 0.82 | 0.19 | 0.34 | 0.71 | 0.83 | 0.77 | 0.09 |
| Control Delay (s/veh) | 36.7 | 65.2 | 13.5 | 49.0 | 16.3 | 53.6 | 47.6 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.7 | 65.2 | 13.5 | 49.0 | 16.3 | 53.6 | 47.6 | 0.4 |
| Queue Length 50th (ft) | 203 | 114 | 60 | 30 | 0 | 191 | 187 | 0 |
| Queue Length 95th (ft) | #289 | #230 | 94 | 64 | 71 | 278 | 237 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 981 | 239 | 1631 | 175 | 410 | 439 | 469 | 534 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.67 | 0.79 | 0.19 | 0.28 | 0.67 | 0.70 | 0.65 | 0.08 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 189 | 378 | 365 | 913 | 651 | 487 |
| v/c Ratio | 0.54 | 0.88 | 0.89 | 0.41 | 0.57 | 0.58 |
| Control Delay (s/veh) | 36.9 | 41.9 | 47.1 | 10.1 | 28.3 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.9 | 41.9 | 47.1 | 10.3 | 28.3 | 5.8 |
| Queue Length 50th (ft) | 94 | 125 | 226 | 154 | 171 | 0 |
| Queue Length 95th (ft) | 154 | #255 | m238 | m156 | 235 | 78 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 434 | 500 | 433 | 2229 | 1147 | 833 |
| Starvation Cap Reductn | 0 | 0 | 0 | 517 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.76 | 0.84 | 0.53 | 0.57 | 0.58 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 424 | 142 | 1169 | 290 | 528 |
| v/c Ratio | 0.91 | 0.27 | 1.04 | 0.97 | 0.27 |
| Control Delay (s/veh) | 56.1 | 5.8 | 66.4 | 91.9 | 8.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 56.1 | 5.8 | 66.4 | 91.9 | 8.5 |
| Queue Length 50th (ft) | 225 | 0 | ~365 | ~198 | 47 |
| Queue Length 95th (ft) | #384 | 41 | #496 | #361 | 87 |
| Internal Link Dist (ft) | 1339 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 504 | 549 | 1125 | 298 | 1951 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.84 | 0.26 | 1.04 | 0.97 | 0.27 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 219 | 210 | 203 | 654 | 865 | 386 | 82 |
| v/c Ratio | 0.74 | 0.64 | 0.46 | 0.84 | 0.27 | 0.18 | 0.14 |
| Control Delay (s/veh) | 50.5 | 32.7 | 8.3 | 44.0 | 3.7 | 21.4 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.5 | 32.7 | 8.3 | 44.0 | 3.7 | 21.4 | 3.3 |
| Queue Length 50th (ft) | 120 | 83 | 0 | 184 | 27 | 46 | 0 |
| Queue Length 95th (ft) | #242 | #172 | 60 | #286 | 8 | 59 | 20 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 315 | 349 | 459 | 785 | 3343 | 2399 | 646 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.60 | 0.44 | 0.83 | 0.26 | 0.16 | 0.13 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 188 | 178 | 174 | 1267 | 629 | 114 | 570 |
| v/c Ratio | 0.69 | 0.48 | 0.44 | 0.37 | 0.57 | 0.50 | 0.17 |
| Control Delay (s/veh) | 47.6 | 13.0 | 8.4 | 12.2 | 3.4 | 65.7 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.6 | 13.0 | 8.4 | 12.2 | 3.4 | 65.7 | 0.8 |
| Queue Length 50th (ft) | 106 | 18 | 0 | 113 | 0 | 36 | 1 |
| Queue Length 95th (ft) | 170 | 76 | 52 | 148 | 51 | m60 | 6 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 354 | 438 | 468 | 3405 | 1105 | 231 | 3328 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 0.41 | 0.37 | 0.37 | 0.57 | 0.49 | 0.17 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 835 | 40 | 502 | 137 | 232 | 438 | 429 |
| v/c Ratio | 0.26 | 0.04 | 0.23 | 0.05 | 0.49 | 0.79 | 0.78 |
| Control Delay (s/veh) | 12.8 | 4.9 | 23.5 | 0.0 | 36.3 | 33.6 | 32.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 12.8 | 4.9 | 23.5 | 0.0 | 36.3 | 33.6 | 32.6 |
| Queue Length 50th (ft) | 93 | 0 | 134 | 0 | 148 | 209 | 201 |
| Queue Length 95th (ft) | 161 | 19 | 215 | 0 | 180 | 270 | 261 |
| Internal Link Dist (ft) | 1992 | | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | | 180 | | | |
| Base Capacity (vph) | 3232 | 931 | 2154 | 2640 | 902 | 927 | 921 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.26 | 0.04 | 0.23 | 0.05 | 0.26 | 0.47 | 0.47 |

Intersection Summary

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 401 | 670 | 191 | 293 | 353 | 159 |
| v/c Ratio | 0.12 | 0.57 | 0.60 | 0.07 | 0.72 | 0.44 |
| Control Delay (s/veh) | 7.5 | 5.6 | 58.4 | 4.2 | 55.9 | 10.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.5 | 5.6 | 58.4 | 4.2 | 55.9 | 10.4 |
| Queue Length 50th (ft) | 30 | 130 | 71 | 17 | 129 | 0 |
| Queue Length 95th (ft) | 32 | 265 | 106 | 28 | 171 | 58 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 3238 | 1177 | 388 | 4001 | 597 | 411 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.12 | 0.57 | 0.49 | 0.07 | 0.59 | 0.39 |

Intersection Summary

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 272 | 260 | 249 | 250 | 809 | 887 | 526 |
| v/c Ratio | 0.80 | 0.69 | 0.54 | 0.83 | 0.38 | 0.70 | 0.60 |
| Control Delay (s/veh) | 50.9 | 33.3 | 12.9 | 49.5 | 2.0 | 28.2 | 5.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.9 | 33.3 | 12.9 | 49.5 | 2.0 | 28.2 | 5.4 |
| Queue Length 50th (ft) | 150 | 107 | 28 | 63 | 6 | 233 | 0 |
| Queue Length 95th (ft) | #271 | 201 | 101 | #234 | 16 | 307 | 73 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 367 | 400 | 486 | 330 | 2107 | 1269 | 875 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.74 | 0.65 | 0.51 | 0.76 | 0.38 | 0.70 | 0.60 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 240 | 2 | 218 | 765 | 383 | 345 | 861 |
| v/c Ratio | 0.77 | no cap | 0.49 | 0.62 | 0.49 | 0.84 | 0.38 |
| Control Delay (s/veh) | 50.4 | | 10.9 | 27.5 | 5.1 | 36.3 | 13.1 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.4 | Error | 10.9 | 27.5 | 5.1 | 36.3 | 13.1 |
| Queue Length 50th (ft) | 125 | 0 | 14 | 197 | 0 | 169 | 201 |
| Queue Length 95th (ft) | #208 | 0 | 74 | 275 | 65 | m262 | 250 |
| Internal Link Dist (ft) | | 1372 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 358 | 1 | 480 | 1242 | 782 | 480 | 2294 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.67 | 2.00 | 0.45 | 0.62 | 0.49 | 0.72 | 0.38 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 991 | 479 | 841 | 112 | 903 |
| v/c Ratio | 1.04 | 1.12 | 0.42 | 0.14 | 1.11 |
| Control Delay (s/veh) | 72.3 | 116.5 | 11.2 | 27.2 | 82.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 72.3 | 116.5 | 11.2 | 27.2 | 82.7 |
| Queue Length 50th (ft) | ~365 | ~354 | 137 | 27 | ~398 |
| Queue Length 95th (ft) | #471 | #550 | 178 | 48 | #639 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1637 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 955 | 427 | 2025 | 823 | 812 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.04 | 1.12 | 0.42 | 0.14 | 1.11 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 428 | 74 | 214 | 30 | 136 | 353 | 354 | 65 |
| v/c Ratio | 0.39 | 0.53 | 0.14 | 0.22 | 0.51 | 0.80 | 0.75 | 0.12 |
| Control Delay (s/veh) | 29.1 | 61.4 | 13.2 | 46.1 | 13.1 | 45.7 | 41.3 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.1 | 61.4 | 13.2 | 46.1 | 13.1 | 45.7 | 41.3 | 0.5 |
| Queue Length 50th (ft) | 110 | 49 | 25 | 18 | 0 | 215 | 212 | 0 |
| Queue Length 95th (ft) | 181 | #96 | 56 | 46 | 47 | 291 | 284 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 1110 | 142 | 1490 | 284 | 392 | 498 | 534 | 587 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.39 | 0.52 | 0.14 | 0.11 | 0.35 | 0.71 | 0.66 | 0.11 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 218 | 226 | 234 | 636 | 939 | 761 |
| v/c Ratio | 0.75 | 0.51 | 0.84 | 0.27 | 0.61 | 0.74 |
| Control Delay (s/veh) | 50.9 | 8.7 | 58.0 | 12.3 | 21.6 | 8.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.9 | 8.7 | 58.0 | 12.3 | 21.6 | 8.2 |
| Queue Length 50th (ft) | 118 | 0 | 145 | 97 | 222 | 31 |
| Queue Length 95th (ft) | 189 | 58 | m#231 | 164 | 291 | 171 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 355 | 494 | 294 | 2337 | 1530 | 1031 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.61 | 0.46 | 0.80 | 0.27 | 0.61 | 0.74 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 272 | 214 | 874 | 423 | 755 |
| v/c Ratio | 0.76 | 0.47 | 0.74 | 1.14 | 0.35 |
| Control Delay (s/veh) | 46.5 | 10.0 | 28.7 | 126.8 | 10.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 46.5 | 10.0 | 28.7 | 126.8 | 10.4 |
| Queue Length 50th (ft) | 147 | 15 | 198 | ~320 | 171 |
| Queue Length 95th (ft) | 208 | 66 | #345 | #509 | 242 |
| Internal Link Dist (ft) | 1341 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 504 | 571 | 1182 | 371 | 2170 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.54 | 0.37 | 0.74 | 1.14 | 0.35 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 209 | 206 | 163 | 500 | 555 | 1166 | 324 |
| v/c Ratio | 0.74 | 0.71 | 0.41 | 0.82 | 0.17 | 0.46 | 0.40 |
| Control Delay (s/veh) | 50.1 | 46.9 | 8.3 | 44.0 | 0.5 | 20.3 | 3.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.1 | 46.9 | 8.3 | 44.0 | 0.5 | 20.3 | 3.9 |
| Queue Length 50th (ft) | 115 | 116 | 0 | 154 | 0 | 146 | 0 |
| Queue Length 95th (ft) | 191 | 194 | 51 | #241 | 6 | 170 | 50 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 337 | 345 | 446 | 614 | 3292 | 2625 | 823 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.62 | 0.60 | 0.37 | 0.81 | 0.17 | 0.44 | 0.39 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 150 | 254 | 256 | 899 | 525 | 489 | 1080 |
| v/c Ratio | 0.56 | 0.75 | 0.74 | 0.34 | 0.56 | 0.82 | 0.32 |
| Control Delay (s/veh) | 40.8 | 32.1 | 31.2 | 18.8 | 4.7 | 58.8 | 2.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.8 | 32.1 | 31.2 | 18.8 | 4.7 | 58.8 | 2.2 |
| Queue Length 50th (ft) | 83 | 82 | 78 | 99 | 0 | 143 | 23 |
| Queue Length 95th (ft) | 132 | 161 | 153 | 138 | 69 | #220 | 21 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 361 | 418 | 429 | 2695 | 948 | 616 | 3364 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.42 | 0.61 | 0.60 | 0.33 | 0.55 | 0.79 | 0.32 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1028 | 29 | 743 | 167 | 245 | 689 | 690 |
| v/c Ratio | 0.51 | 0.05 | 0.55 | 0.06 | 0.30 | 0.84 | 0.85 |
| Control Delay (s/veh) | 30.7 | 9.8 | 40.1 | 0.0 | 16.0 | 32.0 | 32.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.7 | 9.8 | 40.1 | 0.0 | 16.0 | 32.0 | 32.5 |
| Queue Length 50th (ft) | 209 | 0 | 200 | 0 | 97 | 385 | 387 |
| Queue Length 95th (ft) | 268 | 22 | 347 | m0 | 134 | 516 | 521 |
| Internal Link Dist (ft) | 1992 | | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | | 180 | | | |
| Base Capacity (vph) | 2047 | 585 | 1365 | 2586 | 908 | 890 | 885 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.50 | 0.05 | 0.54 | 0.06 | 0.27 | 0.77 | 0.78 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 603 | 668 | 159 | 382 | 477 | 121 |
| v/c Ratio | 0.20 | 0.59 | 0.55 | 0.10 | 0.77 | 0.31 |
| Control Delay (s/veh) | 20.1 | 21.4 | 58.4 | 5.8 | 54.1 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.1 | 21.4 | 58.4 | 5.8 | 54.1 | 8.7 |
| Queue Length 50th (ft) | 128 | 334 | 59 | 27 | 176 | 0 |
| Queue Length 95th (ft) | 56 | 303 | 92 | 44 | 220 | 48 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 3118 | 1146 | 382 | 3868 | 650 | 403 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.19 | 0.58 | 0.42 | 0.10 | 0.73 | 0.30 |

Intersection Summary

# APPENDIX 5.6:

# E+P (BUILDOUT) OFF-RAMP QUEUING ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 280 | 264 | 257 | 391 | 771 | 830 | 492 |
| v/c Ratio | 0.81 | 0.55 | 0.53 | 0.96 | 0.37 | 0.80 | 0.62 |
| Control Delay (s/veh) | 51.4 | 12.6 | 11.7 | 71.8 | 10.4 | 35.7 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.4 | 12.6 | 11.7 | 71.8 | 10.4 | 35.7 | 6.3 |
| Queue Length 50th (ft) | 155 | 28 | 23 | ~249 | 110 | 225 | 0 |
| Queue Length 95th (ft) | #283 | 107 | 96 | m#392 | 154 | 298 | 75 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 367 | 494 | 499 | 409 | 2093 | 1043 | 795 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.76 | 0.53 | 0.52 | 0.96 | 0.37 | 0.80 | 0.62 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 318 | 1 | 287 | 796 | 402 | 348 | 767 |
| v/c Ratio | 0.84 | no cap | 0.56 | 0.77 | 0.55 | 0.86 | 0.37 |
| Control Delay (s/veh) | 52.7 | | 14.0 | 36.0 | 6.2 | 59.8 | 8.9 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.7 | Error | 14.0 | 36.0 | 6.2 | 59.8 | 8.9 |
| Queue Length 50th (ft) | 169 | 0 | 39 | 228 | 0 | 217 | 82 |
| Queue Length 95th (ft) | #301 | 0 | 115 | #335 | 72 | m278 | 145 |
| Internal Link Dist (ft) | | 1421 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 404 | 1 | 532 | 1030 | 727 | 444 | 2063 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.79 | 1.00 | 0.54 | 0.77 | 0.55 | 0.78 | 0.37 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 948 | 718 | 1202 | 51 | 758 |
| v/c Ratio | 0.97 | 1.09 | 0.48 | 0.13 | 0.98 |
| Control Delay (s/veh) | 53.5 | 93.5 | 5.4 | 39.1 | 36.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.5 | 93.5 | 5.4 | 39.1 | 36.7 |
| Queue Length 50th (ft) | 247 | ~520 | 127 | 14 | 60 |
| Queue Length 95th (ft) | #414 | #728 | 158 | 32 | #317 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1633 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 975 | 656 | 2528 | 390 | 771 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.97 | 1.09 | 0.48 | 0.13 | 0.98 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 691 | 188 | 343 | 49 | 274 | 307 | 305 | 41 |
| v/c Ratio | 0.70 | 0.82 | 0.21 | 0.34 | 0.71 | 0.83 | 0.77 | 0.09 |
| Control Delay (s/veh) | 37.7 | 64.5 | 12.5 | 49.0 | 16.3 | 53.6 | 47.6 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.7 | 64.5 | 12.5 | 49.0 | 16.3 | 53.6 | 47.6 | 0.4 |
| Queue Length 50th (ft) | 215 | 114 | 51 | 30 | 0 | 191 | 187 | 0 |
| Queue Length 95th (ft) | #312 | #230 | 98 | 64 | 71 | 278 | 237 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 982 | 239 | 1631 | 175 | 410 | 439 | 469 | 534 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.79 | 0.21 | 0.28 | 0.67 | 0.70 | 0.65 | 0.08 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 334 | 378 | 534 | 947 | 680 | 487 |
| v/c Ratio | 0.85 | 0.82 | 1.07 | 0.44 | 0.79 | 0.65 |
| Control Delay (s/veh) | 53.8 | 36.0 | 71.8 | 6.1 | 38.2 | 7.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.8 | 36.0 | 71.8 | 6.5 | 38.2 | 7.2 |
| Queue Length 50th (ft) | 176 | 125 | ~376 | 63 | 183 | 0 |
| Queue Length 95th (ft) | #305 | #265 | m#330 | m63 | 247 | 78 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 433 | 492 | 499 | 2139 | 938 | 770 |
| Starvation Cap Reductn | 0 | 0 | 0 | 613 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.77 | 0.77 | 1.07 | 0.62 | 0.72 | 0.63 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 424 | 283 | 1533 | 290 | 698 |
| v/c Ratio | 0.91 | 0.50 | 1.24 | 1.18 | 0.36 |
| Control Delay (s/veh) | 56.1 | 10.6 | 139.7 | 135.3 | 25.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 56.1 | 10.6 | 139.7 | 135.3 | 25.2 |
| Queue Length 50th (ft) | 225 | 30 | ~556 | ~219 | 224 |
| Queue Length 95th (ft) | #384 | 98 | #693 | m#346 | 282 |
| Internal Link Dist (ft) | 1339 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 504 | 597 | 1240 | 246 | 1951 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.84 | 0.47 | 1.24 | 1.18 | 0.36 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 246 | 236 | 222 | 654 | 899 | 415 | 82 |
| v/c Ratio | 0.75 | 0.68 | 0.48 | 0.84 | 0.29 | 0.21 | 0.15 |
| Control Delay (s/veh) | 48.8 | 39.1 | 10.5 | 43.4 | 4.4 | 22.9 | 3.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.8 | 39.1 | 10.5 | 43.4 | 4.4 | 22.9 | 3.4 |
| Queue Length 50th (ft) | 132 | 112 | 13 | 190 | 47 | 52 | 0 |
| Queue Length 95th (ft) | #282 | #249 | 82 | #286 | 8 | 63 | 20 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 338 | 355 | 470 | 785 | 3307 | 2368 | 639 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.66 | 0.47 | 0.83 | 0.27 | 0.18 | 0.13 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 188 | 178 | 174 | 1300 | 713 | 114 | 669 |
| v/c Ratio | 0.69 | 0.48 | 0.44 | 0.38 | 0.63 | 0.50 | 0.20 |
| Control Delay (s/veh) | 47.6 | 13.0 | 8.4 | 12.3 | 3.8 | 63.8 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.6 | 13.0 | 8.4 | 12.3 | 3.8 | 63.8 | 0.7 |
| Queue Length 50th (ft) | 106 | 18 | 0 | 116 | 0 | 32 | 1 |
| Queue Length 95th (ft) | 170 | 76 | 52 | 153 | 54 | m58 | 6 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 354 | 438 | 468 | 3405 | 1142 | 231 | 3328 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.53 | 0.41 | 0.37 | 0.38 | 0.62 | 0.49 | 0.20 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1036 | 207 | 817 | 137 | 232 | 438 | 429 |
| v/c Ratio | 0.36 | 0.23 | 0.43 | 0.05 | 0.40 | 0.76 | 0.75 |
| Control Delay (s/veh) | 17.6 | 3.4 | 31.2 | 0.0 | 28.8 | 38.0 | 37.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 17.6 | 3.4 | 31.2 | 0.0 | 28.8 | 38.0 | 37.4 |
| Queue Length 50th (ft) | 146 | 0 | 262 | 0 | 133 | 270 | 262 |
| Queue Length 95th (ft) | 228 | 46 | 356 | m0 | 161 | 317 | 309 |
| Internal Link Dist (ft) | 1992 | | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | | 180 | | | |
| Base Capacity (vph) | 2881 | 910 | 1921 | 2640 | 902 | 879 | 873 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.36 | 0.23 | 0.43 | 0.05 | 0.26 | 0.50 | 0.49 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 434 | 834 | 191 | 321 | 479 | 173 |
| v/c Ratio | 0.14 | 0.72 | 0.61 | 0.09 | 0.77 | 0.40 |
| Control Delay (s/veh) | 8.5 | 14.9 | 59.3 | 5.7 | 54.2 | 8.4 |
| Queue Delay | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 8.5 | 15.1 | 59.3 | 5.7 | 54.2 | 8.4 |
| Queue Length 50th (ft) | 40 | 272 | 71 | 22 | 176 | 0 |
| Queue Length 95th (ft) | 30 | 441 | 107 | 36 | 223 | 57 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 3087 | 1170 | 382 | 3867 | 650 | 444 |
| Starvation Cap Reductn | 0 | 41 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.74 | 0.50 | 0.08 | 0.74 | 0.39 |

Intersection Summary

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 272 | 260 | 249 | 315 | 834 | 921 | 526 |
| v/c Ratio | 0.80 | 0.69 | 0.54 | 0.94 | 0.40 | 0.77 | 0.61 |
| Control Delay (s/veh) | 50.9 | 33.3 | 14.1 | 63.8 | 1.9 | 31.2 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.9 | 33.3 | 14.1 | 63.8 | 1.9 | 31.2 | 5.6 |
| Queue Length 50th (ft) | 150 | 107 | 32 | 89 | 6 | 246 | 0 |
| Queue Length 95th (ft) | #271 | 201 | 107 | #325 | 15 | 323 | 73 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 367 | 400 | 479 | 336 | 2107 | 1200 | 856 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.74 | 0.65 | 0.52 | 0.94 | 0.40 | 0.77 | 0.61 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 240 | 2 | 299 | 852 | 383 | 345 | 893 |
| v/c Ratio | 0.77 | no cap | 0.69 | 0.69 | 0.49 | 0.84 | 0.39 |
| Control Delay (s/veh) | 50.4 | | 22.2 | 29.4 | 5.1 | 34.4 | 13.9 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.4 | Error | 22.2 | 29.4 | 5.1 | 34.4 | 13.9 |
| Queue Length 50th (ft) | 125 | 0 | 59 | 227 | 0 | 171 | 210 |
| Queue Length 95th (ft) | #208 | 0 | 149 | #337 | 65 | m245 | 267 |
| Internal Link Dist (ft) | | 1372 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 358 | 1 | 471 | 1242 | 782 | 480 | 2294 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.67 | 2.00 | 0.63 | 0.69 | 0.49 | 0.72 | 0.39 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1026 | 479 | 1004 | 112 | 1081 |
| v/c Ratio | 1.07 | 1.12 | 0.50 | 0.14 | 1.33 |
| Control Delay (s/veh) | 83.9 | 116.5 | 12.2 | 27.2 | 176.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 83.9 | 116.5 | 12.2 | 27.2 | 176.3 |
| Queue Length 50th (ft) | ~390 | ~354 | 176 | 27 | ~642 |
| Queue Length 95th (ft) | #497 | #550 | 225 | 48 | #892 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1637 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 955 | 427 | 2025 | 823 | 811 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.07 | 1.12 | 0.50 | 0.14 | 1.33 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 462 | 74 | 239 | 30 | 136 | 353 | 354 | 65 |
| v/c Ratio | 0.42 | 0.53 | 0.16 | 0.22 | 0.51 | 0.80 | 0.75 | 0.12 |
| Control Delay (s/veh) | 29.7 | 63.6 | 12.7 | 46.1 | 13.1 | 45.7 | 41.3 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.7 | 63.6 | 12.7 | 46.1 | 13.1 | 45.7 | 41.3 | 0.5 |
| Queue Length 50th (ft) | 121 | 48 | 26 | 18 | 0 | 215 | 212 | 0 |
| Queue Length 95th (ft) | 196 | #98 | 57 | 46 | 47 | 291 | 284 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 1110 | 142 | 1490 | 284 | 392 | 498 | 534 | 587 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.42 | 0.52 | 0.16 | 0.11 | 0.35 | 0.71 | 0.66 | 0.11 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 380 | 226 | 358 | 661 | 972 | 761 |
| v/c Ratio | 0.92 | 0.42 | 1.26 | 0.32 | 0.76 | 0.81 |
| Control Delay (s/veh) | 64.8 | 7.0 | 165.4 | 1.3 | 28.4 | 12.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 64.8 | 7.0 | 165.4 | 1.3 | 28.4 | 12.7 |
| Queue Length 50th (ft) | ~221 | 0 | ~246 | 7 | 238 | 54 |
| Queue Length 95th (ft) | #415 | 58 | m#246 | m13 | 304 | 229 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 413 | 538 | 284 | 2212 | 1393 | 966 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 0.42 | 1.26 | 0.30 | 0.70 | 0.79 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 272 | 379 | 1150 | 423 | 953 |
| v/c Ratio | 0.69 | 0.88 | 1.16 | 0.97 | 0.46 |
| Control Delay (s/veh) | 39.8 | 43.8 | 110.9 | 59.4 | 23.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 |
| Total Delay (s/veh) | 39.8 | 43.8 | 110.9 | 59.4 | 24.7 |
| Queue Length 50th (ft) | 139 | 148 | ~391 | ~237 | 255 |
| Queue Length 95th (ft) | 208 | #248 | #521 | m#450 | m365 |
| Internal Link Dist (ft) | 1341 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 504 | 522 | 994 | 436 | 2093 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 792 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.54 | 0.73 | 1.16 | 0.97 | 0.73 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 251 | 250 | 163 | 500 | 581 | 1200 | 324 |
| v/c Ratio | 0.81 | 0.79 | 0.39 | 0.83 | 0.18 | 0.49 | 0.41 |
| Control Delay (s/veh) | 54.8 | 51.9 | 7.9 | 44.4 | 0.8 | 21.4 | 3.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.8 | 51.9 | 7.9 | 44.4 | 0.8 | 21.4 | 3.9 |
| Queue Length 50th (ft) | 137 | 140 | 0 | 153 | 0 | 160 | 0 |
| Queue Length 95th (ft) | #257 | #262 | 51 | #241 | 10 | 176 | 50 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 341 | 348 | 449 | 606 | 3217 | 2553 | 809 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.74 | 0.72 | 0.36 | 0.83 | 0.18 | 0.47 | 0.40 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 150 | 254 | 256 | 925 | 591 | 489 | 1202 |
| v/c Ratio | 0.55 | 0.79 | 0.76 | 0.36 | 0.61 | 0.82 | 0.36 |
| Control Delay (s/veh) | 39.8 | 39.2 | 35.6 | 19.1 | 4.9 | 57.2 | 2.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.8 | 39.2 | 35.6 | 19.1 | 4.9 | 57.2 | 2.1 |
| Queue Length 50th (ft) | 81 | 97 | 90 | 106 | 0 | 138 | 24 |
| Queue Length 95th (ft) | 136 | 185 | 172 | 137 | 70 | #219 | 17 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 356 | 394 | 410 | 2656 | 979 | 616 | 3324 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.42 | 0.64 | 0.62 | 0.35 | 0.60 | 0.79 | 0.36 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1191 | 164 | 1134 | 167 | 245 | 689 | 690 |
| v/c Ratio | 0.59 | 0.25 | 0.84 | 0.06 | 0.29 | 0.85 | 0.86 |
| Control Delay (s/veh) | 32.2 | 5.2 | 40.4 | 0.0 | 16.1 | 34.0 | 34.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 32.2 | 5.2 | 40.4 | 0.0 | 16.1 | 34.0 | 34.6 |
| Queue Length 50th (ft) | 255 | 0 | 240 | 0 | 95 | 396 | 399 |
| Queue Length 95th (ft) | 309 | 47 | #572 | m0 | 141 | 564 | 569 |
| Internal Link Dist (ft) | 1992 | | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | | 180 | | | |
| Base Capacity (vph) | 2015 | 660 | 1343 | 2586 | 902 | 873 | 868 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.59 | 0.25 | 0.84 | 0.06 | 0.27 | 0.79 | 0.79 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 629 | 801 | 159 | 416 | 651 | 121 |
| v/c Ratio | 0.24 | 0.72 | 0.55 | 0.12 | 0.72 | 0.25 |
| Control Delay (s/veh) | 29.7 | 30.4 | 58.4 | 8.8 | 44.7 | 7.0 |
| Queue Delay | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.7 | 30.7 | 58.4 | 8.8 | 44.7 | 7.0 |
| Queue Length 50th (ft) | 158 | 497 | 59 | 38 | 229 | 0 |
| Queue Length 95th (ft) | 77 | 408 | 92 | 55 | 284 | 45 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 2933 | 1147 | 382 | 3816 | 904 | 492 |
| Starvation Cap Reductn | 0 | 62 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.21 | 0.74 | 0.42 | 0.11 | 0.72 | 0.25 |

Intersection Summary

# APPENDIX 5.7:

# E+P (PHASE 1) INTERSECTION ANALYSIS WITH IMPROVEMENTS

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| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 6 | 119 | 958 | 378 | 41 | 445 | 577 | 56 | 543 |
| Future Volume (vph) | 6 | 119 | 958 | 378 | 41 | 445 | 577 | 56 | 543 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 17.0 | 53.0 | 54.3 | 14.7 | 35.3 | 53.0 | 14.7 | 35.3 |
| Total Split (%) | 13.1% | 14.2% | 44.2% | 45.3% | 12.3% | 29.4% | 44.2% | 12.3% | 29.4% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.5 | 10.5 | 39.8 | 53.5 | 10.5 | 21.7 | 68.3 | 10.5 | 24.9 |
| Actuated g/C Ratio | 0.10 | 0.10 | 0.39 | 0.52 | 0.10 | 0.21 | 0.66 | 0.10 | 0.24 |
| v/c Ratio | 0.04 | 0.41 | 0.89 | 0.46 | 0.26 | 0.65 | 0.54 | 0.36 | 0.73 |
| Control Delay (s/veh) | 50.7 | 49.6 | 41.2 | 20.9 | 54.3 | 43.3 | 6.1 | 57.0 | 43.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.7 | 49.6 | 41.2 | 20.9 | 54.3 | 43.3 | 6.1 | 57.0 | 43.6 |
| LOS | D | D | D | C | D | D | A | E | D |
| Approach Delay (s/veh) | | 49.6 | | 35.1 | | 23.5 | | | 44.8 |
| Approach LOS | | D | | D | | C | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 103 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.89 | |
| Intersection Signal Delay (s/veh): 33.8 | Intersection LOS: C |
| Intersection Capacity Utilization 85.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

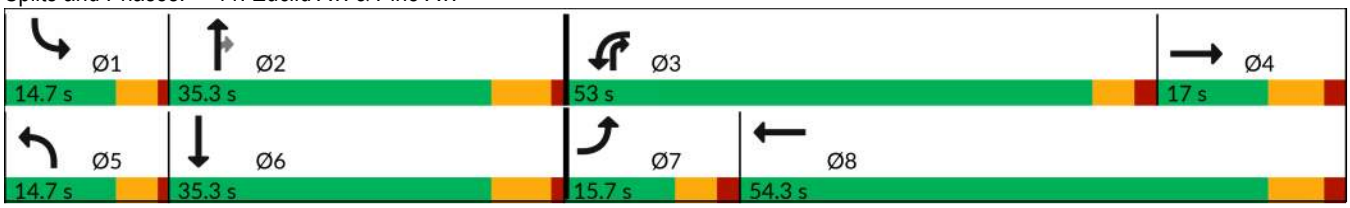

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 6 | 119 | 16 | 958 | 378 | 30 | 41 | 445 | 577 | 56 | 543 | 26 |
| Future Volume (veh/h) | 6 | 119 | 16 | 958 | 378 | 30 | 41 | 445 | 577 | 56 | 543 | 26 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 6 | 123 | 0 | 988 | 390 | 28 | 42 | 459 | 519 | 58 | 560 | 21 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 24 | 310 | | 1055 | 718 | 52 | 107 | 812 | 907 | 123 | 832 | 31 |
| Arrive On Green | 0.02 | 0.14 | 0.00 | 0.36 | 0.66 | 0.44 | 0.07 | 0.36 | 0.24 | 0.08 | 0.38 | 0.25 |
| Sat Flow, veh/h | 1594 | 3455 | 0 | 2910 | 1634 | 117 | 1594 | 3367 | 1502 | 1594 | 3309 | 124 |
| Grp Volume(v), veh/h | 6 | 123 | 0 | 988 | 0 | 418 | 42 | 459 | 519 | 58 | 285 | 296 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 0 | 1455 | 0 | 1751 | 1594 | 1683 | 1502 | 1594 | 1683 | 1750 |
| Q Serve(g_s), s | 0.4 | 3.5 | 0.0 | 34.6 | 0.0 | 13.8 | 2.7 | 11.5 | 22.1 | 3.7 | 14.9 | 15.0 |
| Cycle Q Clear(g_c), s | 0.4 | 3.5 | 0.0 | 34.6 | 0.0 | 13.8 | 2.7 | 11.5 | 22.1 | 3.7 | 14.9 | 15.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.07 | 1.00 | | 1.00 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 24 | 310 | | 1055 | 0 | 769 | 107 | 812 | 907 | 123 | 423 | 440 |
| V/C Ratio(X) | 0.25 | 0.40 | | 0.94 | 0.00 | 0.54 | 0.39 | 0.57 | 0.57 | 0.47 | 0.67 | 0.67 |
| Avail Cap(c_a), veh/h | 151 | 319 | | 1305 | 0 | 785 | 151 | 919 | 954 | 151 | 460 | 478 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.3 | 42.8 | 0.0 | 32.4 | 0.0 | 13.0 | 47.1 | 29.2 | 12.7 | 46.6 | 29.2 | 29.7 |
| Incr Delay (d2), s/veh | 1.9 | 1.2 | 0.0 | 10.2 | 0.0 | 1.0 | 0.9 | 0.2 | 0.4 | 1.0 | 2.6 | 2.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 1.4 | 0.0 | 12.7 | 0.0 | 4.2 | 1.0 | 4.0 | 6.3 | 1.4 | 5.2 | 5.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 53.3 | 43.9 | 0.0 | 42.7 | 0.0 | 13.9 | 48.0 | 29.5 | 13.1 | 47.6 | 31.8 | 32.2 |
| LnGrp LOS | D | D | | D | | B | D | C | B | D | C | C |
| Approach Vol, veh/h | | 129 | | | 1406 | | | 1020 | | | 639 | |
| Approach Delay, s/veh | | 44.4 | | | 34.1 | | | 21.9 | | | 33.4 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.9 | 31.9 | 43.9 | 16.7 | 11.8 | 33.0 | 7.3 | 53.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 28.8 | 47.3 | 10.0 | 10.0 | 28.8 | 10.0 | 47.3 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 24.1 | 36.6 | 5.5 | 4.7 | 17.0 | 2.4 | 15.8 |
| Green Ext Time (p_c), s | 0.0 | 1.4 | 1.7 | 0.3 | 0.0 | 1.4 | 0.0 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.5 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 11 | 289 | 581 | 180 | 26 | 588 | 958 | 74 | 453 |
| Future Volume (vph) | 11 | 289 | 581 | 180 | 26 | 588 | 958 | 74 | 453 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 18.0 | 52.0 | 54.3 | 14.7 | 35.3 | 52.0 | 14.7 | 35.3 |
| Total Split (%) | 13.1% | 15.0% | 43.3% | 45.3% | 12.3% | 29.4% | 43.3% | 12.3% | 29.4% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.1 | 11.1 | 46.7 | 60.6 | 12.3 | 24.3 | 73.2 | 10.1 | 25.1 |
| Actuated g/C Ratio | 0.09 | 0.10 | 0.41 | 0.54 | 0.11 | 0.22 | 0.65 | 0.09 | 0.22 |
| v/c Ratio | 0.09 | 1.05 | 0.52 | 0.28 | 0.16 | 0.86 | 1.00 | 0.57 | 0.65 |
| Control Delay (s/veh) | 52.1 | 110.5 | 28.2 | 17.4 | 50.5 | 55.3 | 43.3 | 68.3 | 45.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.1 | 110.5 | 28.2 | 17.4 | 50.5 | 55.3 | 43.3 | 68.3 | 45.3 |
| LOS | D | F | C | B | D | E | D | E | D |
| Approach Delay (s/veh) | | 108.5 | | 25.0 | | 47.9 | | | 48.6 |
| Approach LOS | | F | | C | | D | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 112.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.05 | |
| Intersection Signal Delay (s/veh): 48.6 | Intersection LOS: D |
| Intersection Capacity Utilization 95.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

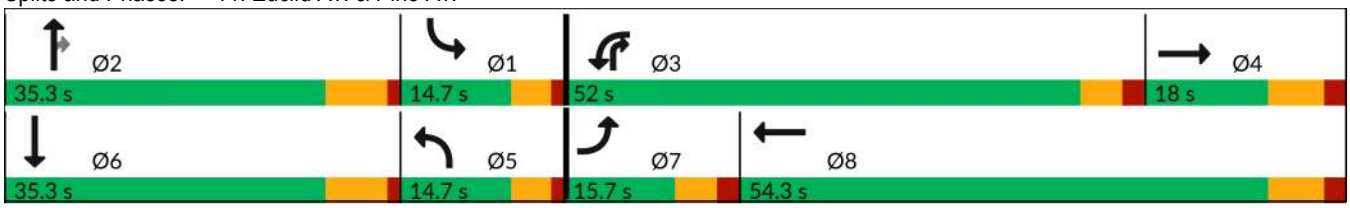

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 11 | 289 | 41 | 581 | 180 | 62 | 26 | 588 | 958 | 74 | 453 | 5 |
| Future Volume (veh/h) | 11 | 289 | 41 | 581 | 180 | 62 | 26 | 588 | 958 | 74 | 453 | 5 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 12 | 311 | 0 | 625 | 194 | 58 | 28 | 632 | 955 | 80 | 487 | 5 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 46 | 380 | | 690 | 418 | 125 | 367 | 1051 | 815 | 148 | 581 | 6 |
| Arrive On Green | 0.04 | 0.17 | 0.00 | 0.36 | 0.48 | 0.48 | 0.35 | 0.46 | 0.46 | 0.14 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1594 | 3491 | 0 | 2910 | 1310 | 392 | 1594 | 3438 | 1502 | 1594 | 3449 | 35 |
| Grp Volume(v), veh/h | 12 | 311 | 0 | 625 | 0 | 252 | 28 | 632 | 955 | 80 | 243 | 249 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1719 | 0 | 1455 | 0 | 1701 | 1594 | 1719 | 1502 | 1594 | 1719 | 1766 |
| Q Serve(g_s), s | 0.7 | 8.2 | 0.0 | 19.2 | 0.0 | 9.4 | 1.1 | 13.0 | 28.8 | 4.4 | 12.6 | 12.6 |
| Cycle Q Clear(g_c), s | 0.7 | 8.2 | 0.0 | 19.2 | 0.0 | 9.4 | 1.1 | 13.0 | 28.8 | 4.4 | 12.6 | 12.6 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.23 | 1.00 | | 1.00 | 1.00 | | 0.02 |
| Lane Grp Cap(c), veh/h | 46 | 380 | | 690 | 0 | 543 | 367 | 1051 | 815 | 148 | 290 | 298 |
| V/C Ratio(X) | 0.26 | 0.82 | | 0.91 | 0.00 | 0.46 | 0.08 | 0.60 | 1.17 | 0.54 | 0.84 | 0.84 |
| Avail Cap(c_a), veh/h | 169 | 401 | | 1430 | 0 | 854 | 367 | 1051 | 815 | 169 | 525 | 540 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.1 | 38.4 | 0.0 | 29.3 | 0.0 | 19.2 | 24.1 | 21.2 | 6.2 | 38.7 | 34.0 | 34.0 |
| Incr Delay (d2), s/veh | 1.1 | 12.8 | 0.0 | 1.9 | 0.0 | 0.9 | 0.0 | 0.7 | 90.1 | 1.1 | 2.5 | 2.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 3.8 | 0.0 | 5.4 | 0.0 | 3.2 | 0.4 | 4.2 | 23.7 | 1.6 | 4.6 | 4.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 45.3 | 51.2 | 0.0 | 31.3 | 0.0 | 20.1 | 24.1 | 21.9 | 96.3 | 39.8 | 36.5 | 36.4 |
| LnGrp LOS | D | D | | C | | C | C | C | F | D | D | D |
| Approach Vol, veh/h | | 323 | | | 877 | | | 1615 | | | 572 | |
| Approach Delay, s/veh | | 51.0 | | | 28.0 | | | 65.9 | | | 36.9 | |
| Approach LOS | | D | | | C | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.5 | 35.3 | 28.1 | 17.4 | 26.4 | 22.4 | 8.4 | 37.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 28.8 | 46.3 | 11.0 | 10.0 | 28.8 | 10.0 | 47.3 |
| Max Q Clear Time (g_c+I1), s | 6.4 | 30.8 | 21.2 | 10.2 | 3.1 | 14.6 | 2.7 | 11.4 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.1 | 0.2 | 0.0 | 1.3 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 49.8 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

# APPENDIX 5.8:

# E+P (BUILDOUT) INTERSECTION ANALYSIS WITH IMPROVEMENTS

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| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 20 | 119 | 958 | 378 | 41 | 608 | 577 | 72 | 734 |
| Future Volume (vph) | 20 | 119 | 958 | 378 | 41 | 608 | 577 | 72 | 734 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 20.0 | 48.0 | 52.3 | 14.8 | 37.2 | 48.0 | 14.8 | 37.2 |
| Total Split (%) | 13.1% | 16.7% | 40.0% | 43.6% | 12.3% | 31.0% | 40.0% | 12.3% | 31.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.2 | 11.3 | 40.6 | 51.9 | 10.2 | 27.4 | 74.6 | 10.2 | 30.4 |
| Actuated g/C Ratio | 0.09 | 0.10 | 0.37 | 0.47 | 0.09 | 0.25 | 0.68 | 0.09 | 0.28 |
| v/c Ratio | 0.14 | 0.40 | 0.93 | 0.53 | 0.29 | 0.75 | 0.54 | 0.50 | 0.87 |
| Control Delay (s/veh) | 53.1 | 49.3 | 49.8 | 26.7 | 56.4 | 45.7 | 6.5 | 64.3 | 50.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.1 | 49.3 | 49.8 | 26.7 | 56.4 | 45.7 | 6.5 | 64.3 | 50.1 |
| LOS | D | D | D | C | E | D | A | E | D |
| Approach Delay (s/veh) | | 49.8 | | 42.7 | | 27.6 | | | 51.3 |
| Approach LOS | | D | | D | | C | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 110 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay (s/veh): 39.9 | Intersection LOS: D |
| Intersection Capacity Utilization 91.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

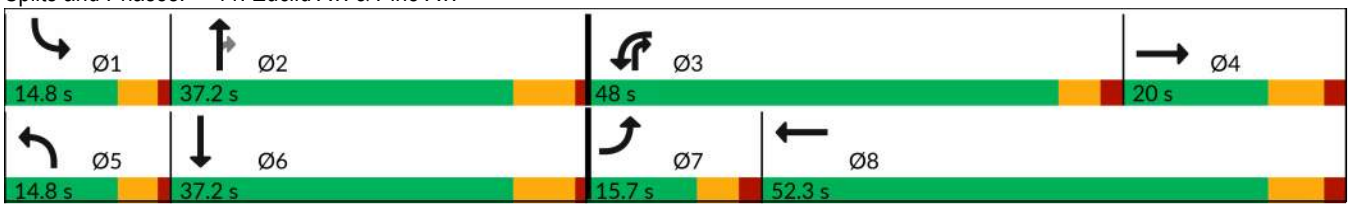

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 20 | 119 | 16 | 958 | 378 | 44 | 41 | 608 | 577 | 72 | 734 | 42 |
| Future Volume (veh/h) | 20 | 119 | 16 | 958 | 378 | 44 | 41 | 608 | 577 | 72 | 734 | 42 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 21 | 123 | 0 | 988 | 390 | 42 | 42 | 627 | 519 | 74 | 757 | 37 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 69 | 305 | | 1044 | 638 | 69 | 106 | 828 | 908 | 132 | 857 | 42 |
| Arrive On Green | 0.04 | 0.14 | 0.00 | 0.36 | 0.61 | 0.41 | 0.07 | 0.37 | 0.25 | 0.08 | 0.39 | 0.26 |
| Sat Flow, veh/h | 1594 | 3455 | 0 | 2910 | 1572 | 169 | 1594 | 3367 | 1502 | 1594 | 3267 | 160 |
| Grp Volume(v), veh/h | 21 | 123 | 0 | 988 | 0 | 432 | 42 | 627 | 519 | 74 | 390 | 404 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 0 | 1455 | 0 | 1741 | 1594 | 1683 | 1502 | 1594 | 1683 | 1743 |
| Q Serve(g_s), s | 1.4 | 3.6 | 0.0 | 35.5 | 0.0 | 17.1 | 2.7 | 17.6 | 22.5 | 4.8 | 23.2 | 23.3 |
| Cycle Q Clear(g_c), s | 1.4 | 3.6 | 0.0 | 35.5 | 0.0 | 17.1 | 2.7 | 17.6 | 22.5 | 4.8 | 23.2 | 23.3 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.10 | 1.00 | | 1.00 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 69 | 305 | | 1044 | 0 | 707 | 106 | 828 | 908 | 132 | 442 | 457 |
| V/C Ratio(X) | 0.30 | 0.40 | | 0.95 | 0.00 | 0.61 | 0.40 | 0.76 | 0.57 | 0.56 | 0.88 | 0.88 |
| Avail Cap(c_a), veh/h | 148 | 406 | | 1143 | 0 | 733 | 150 | 960 | 967 | 150 | 480 | 497 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.9 | 43.9 | 0.0 | 33.5 | 0.0 | 16.7 | 48.2 | 31.2 | 12.9 | 47.5 | 31.1 | 31.8 |
| Incr Delay (d2), s/veh | 0.9 | 1.2 | 0.0 | 14.3 | 0.0 | 1.7 | 0.9 | 2.4 | 0.4 | 1.4 | 15.6 | 15.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 1.5 | 0.0 | 13.6 | 0.0 | 5.4 | 1.1 | 6.0 | 6.5 | 1.9 | 9.2 | 9.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 50.8 | 45.1 | 0.0 | 47.8 | 0.0 | 18.4 | 49.1 | 33.6 | 13.2 | 48.9 | 46.7 | 47.0 |
| LnGrp LOS | D | D | | D | | B | D | C | B | D | D | D |
| Approach Vol, veh/h | | 144 | | | 1420 | | | 1188 | | | 868 | |
| Approach Delay, s/veh | | 45.9 | | | 38.9 | | | 25.2 | | | 47.0 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.6 | 33.0 | 44.3 | 16.7 | 11.9 | 34.7 | 10.4 | 50.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.1 | 30.7 | 42.3 | 13.0 | 10.1 | 30.7 | 10.0 | 45.3 |
| Max Q Clear Time (g_c+I1), s | 6.8 | 24.5 | 37.5 | 5.6 | 4.7 | 25.3 | 3.4 | 19.1 |
| Green Ext Time (p_c), s | 0.0 | 2.0 | 1.1 | 0.4 | 0.0 | 1.4 | 0.0 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 36.6 |
| HCM 7th LOS | D |

**Notes**

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 82 | 496 | 71 | 737 | 48 | 48 | 6 | 35 |
| Future Volume (vph) | 82 | 496 | 71 | 737 | 48 | 48 | 6 | 35 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 81.0 | 81.0 | 81.0 | 81.0 | 39.0 | 39.0 | 39.0 | 39.0 |
| Total Split (%) | 67.5% | 67.5% | 67.5% | 67.5% | 32.5% | 32.5% | 32.5% | 32.5% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 23.7 | 23.7 | 23.7 | 23.7 | | 12.6 | | 12.6 |
| Actuated g/C Ratio | 0.50 | 0.50 | 0.50 | 0.50 | | 0.26 | | 0.26 |
| v/c Ratio | 0.38 | 0.71 | 0.30 | 0.54 | | 0.47 | | 0.27 |
| Control Delay (s/veh) | 12.6 | 14.2 | 10.4 | 9.2 | | 19.1 | | 10.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 12.6 | 14.2 | 10.4 | 9.2 | | 19.1 | | 10.8 |
| LOS | B | B | B | A | | B | | B |
| Approach Delay (s/veh) | | 14.0 | | 9.3 | | 19.1 | | 10.8 |
| Approach LOS | | B | | A | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 47.7 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.71 | |
| Intersection Signal Delay (s/veh): 12.0 | Intersection LOS: B |
| Intersection Capacity Utilization 68.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 15: Bon View Av. & Riverside Dr.

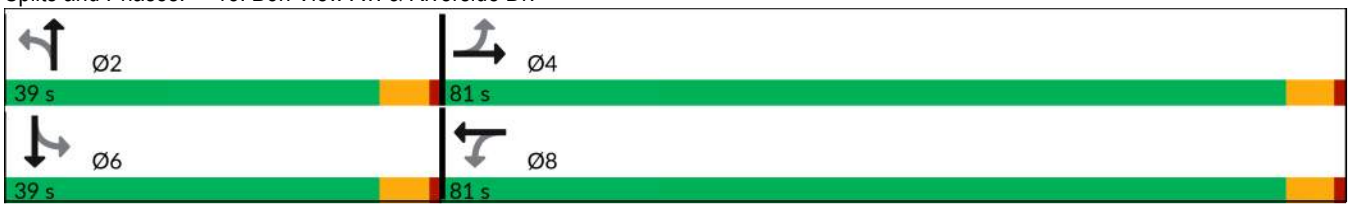

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 82 | 496 | 44 | 71 | 737 | 48 | 48 | 48 | 69 | 6 | 35 | 71 |
| Future Volume (veh/h) | 82 | 496 | 44 | 71 | 737 | 48 | 48 | 48 | 69 | 6 | 35 | 71 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 93 | 564 | 50 | 81 | 838 | 55 | 55 | 55 | 78 | 7 | 40 | 81 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 392 | 854 | 76 | 389 | 1707 | 112 | 172 | 133 | 142 | 93 | 122 | 222 |
| Arrive On Green | 0.53 | 0.53 | 0.53 | 0.53 | 0.53 | 0.53 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 |
| Sat Flow, veh/h | 623 | 1601 | 142 | 808 | 3201 | 210 | 302 | 598 | 638 | 32 | 548 | 999 |
| Grp Volume(v), veh/h | 93 | 0 | 614 | 81 | 441 | 452 | 188 | 0 | 0 | 128 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 623 | 0 | 1743 | 808 | 1683 | 1728 | 1538 | 0 | 0 | 1579 | 0 | 0 |
| Q Serve(g_s), s | 4.9 | 0.0 | 11.2 | 3.5 | 7.3 | 7.3 | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 12.2 | 0.0 | 11.2 | 14.7 | 7.3 | 7.3 | 4.6 | 0.0 | 0.0 | 3.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.08 | 1.00 | | 0.12 | 0.29 | | 0.41 | 0.05 | | 0.63 |
| Lane Grp Cap(c), veh/h | 392 | 0 | 929 | 389 | 898 | 921 | 447 | 0 | 0 | 437 | 0 | 0 |
| V/C Ratio(X) | 0.24 | 0.00 | 0.66 | 0.21 | 0.49 | 0.49 | 0.42 | 0.00 | 0.00 | 0.29 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1127 | 0 | 2987 | 1343 | 2885 | 2961 | 1250 | 0 | 0 | 1278 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 10.4 | 0.0 | 7.4 | 12.7 | 6.5 | 6.5 | 15.1 | 0.0 | 0.0 | 14.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 0.8 | 0.3 | 0.4 | 0.4 | 0.6 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 2.2 | 0.5 | 1.4 | 1.4 | 1.3 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 10.7 | 0.0 | 8.2 | 13.0 | 6.9 | 6.9 | 15.7 | 0.0 | 0.0 | 14.9 | 0.0 | 0.0 |
| LnGrp LOS | B | | A | B | A | A | B | | | B | | |
| Approach Vol, veh/h | | 707 | | | 974 | | | 188 | | | 128 | |
| Approach Delay, s/veh | | 8.6 | | | 7.4 | | | 15.7 | | | 14.9 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.2 | 28.9 | 15.2 | 28.9 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 33.6 | 75.6 | 33.6 | 75.6 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 14.2 | 5.0 | 16.7 |
| Green Ext Time (p_c), s | 1.0 | 5.4 | 0.7 | 6.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 9.1 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 62 | 92 | 21 | 247 | 53 | 742 | 32 | 582 |
| Future Volume (vph) | 62 | 92 | 21 | 247 | 53 | 742 | 32 | 582 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 36.0 | 36.0 | 36.0 | 36.0 | 84.0 | 84.0 | 84.0 | 84.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 5.4 | | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 27.8 | | 27.8 | | 68.5 | | 68.5 |
| Actuated g/C Ratio | | 0.26 | | 0.26 | | 0.64 | | 0.64 |
| v/c Ratio | | 0.84 | | 0.84 | | 0.94 | | 0.71 |
| Control Delay (s/veh) | | 68.0 | | 57.6 | | 35.0 | | 17.4 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 68.0 | | 57.6 | | 35.0 | | 17.4 |
| LOS | | E | | E | | C | | B |
| Approach Delay (s/veh) | | 68.0 | | 57.6 | | 35.0 | | 17.4 |
| Approach LOS | | E | | E | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 107.5 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay (s/veh): 36.0 | Intersection LOS: D |
| Intersection Capacity Utilization 101.6% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 24: Grove Av. & Chino Av.

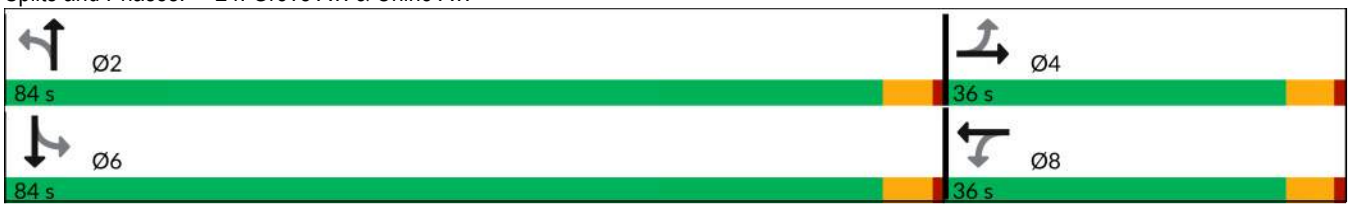

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 62 | 92 | 24 | 21 | 247 | 49 | 53 | 742 | 28 | 32 | 582 | 13 |
| Future Volume (veh/h) | 62 | 92 | 24 | 21 | 247 | 49 | 53 | 742 | 28 | 32 | 582 | 13 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 72 | 107 | 28 | 24 | 287 | 57 | 62 | 863 | 33 | 37 | 677 | 15 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 131 | 175 | 39 | 61 | 341 | 65 | 92 | 962 | 36 | 73 | 970 | 21 |
| Arrive On Green | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 |
| Sat Flow, veh/h | 299 | 712 | 158 | 61 | 1385 | 265 | 74 | 1539 | 58 | 45 | 1552 | 34 |
| Grp Volume(v), veh/h | 207 | 0 | 0 | 368 | 0 | 0 | 958 | 0 | 0 | 729 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1169 | 0 | 0 | 1710 | 0 | 0 | 1670 | 0 | 0 | 1631 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 3.6 | 0.0 | 0.0 | 19.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 13.6 | 0.0 | 0.0 | 17.3 | 0.0 | 0.0 | 41.6 | 0.0 | 0.0 | 22.2 | 0.0 | 0.0 |
| Prop In Lane | 0.35 | | 0.14 | 0.07 | | 0.15 | 0.06 | | 0.03 | 0.05 | | 0.02 |
| Lane Grp Cap(c), veh/h | 346 | 0 | 0 | 467 | 0 | 0 | 1090 | 0 | 0 | 1065 | 0 | 0 |
| V/C Ratio(X) | 0.60 | 0.00 | 0.00 | 0.79 | 0.00 | 0.00 | 0.88 | 0.00 | 0.00 | 0.68 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 510 | 0 | 0 | 664 | 0 | 0 | 1592 | 0 | 0 | 1565 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 28.2 | 0.0 | 0.0 | 30.4 | 0.0 | 0.0 | 13.3 | 0.0 | 0.0 | 10.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.7 | 0.0 | 0.0 | 4.1 | 0.0 | 0.0 | 4.2 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.6 | 0.0 | 0.0 | 6.9 | 0.0 | 0.0 | 12.4 | 0.0 | 0.0 | 6.7 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.9 | 0.0 | 0.0 | 34.5 | 0.0 | 0.0 | 17.5 | 0.0 | 0.0 | 10.8 | 0.0 | 0.0 |
| LnGrp LOS | C | | | C | | | B | | | B | | |
| Approach Vol, veh/h | | 207 | | | 368 | | | 958 | | | 729 | |
| Approach Delay, s/veh | | 29.9 | | | 34.5 | | | 17.5 | | | 10.8 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 57.9 | 26.1 | 57.9 | 26.1 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 78.6 | 30.6 | 78.6 | 30.6 |
| Max Q Clear Time (g_c+I1), s | 43.6 | 15.6 | 24.2 | 19.3 |
| Green Ext Time (p_c), s | 9.0 | 0.9 | 5.9 | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.3 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 36 | 53 | 9 | 119 | 55 | 772 | 15 | 564 |
| Future Volume (vph) | 36 | 53 | 9 | 119 | 55 | 772 | 15 | 564 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 25.0 | 25.0 | 25.0 | 25.0 | 95.0 | 95.0 | 95.0 | 95.0 |
| Total Split (%) | 20.8% | 20.8% | 20.8% | 20.8% | 79.2% | 79.2% | 79.2% | 79.2% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 5.4 | | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 14.1 | | 14.1 | | 52.3 | | 52.3 |
| Actuated g/C Ratio | | 0.18 | | 0.18 | | 0.67 | | 0.67 |
| v/c Ratio | | 0.47 | | 0.54 | | 0.87 | | 0.60 |
| Control Delay (s/veh) | | 41.1 | | 41.6 | | 19.8 | | 9.0 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 41.1 | | 41.6 | | 19.8 | | 9.0 |
| LOS | | D | | D | | B | | A |
| Approach Delay (s/veh) | | 41.1 | | 41.6 | | 19.8 | | 9.0 |
| Approach LOS | | D | | D | | B | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 78.5 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 19.2 | Intersection LOS: B |
| Intersection Capacity Utilization 98.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 25: Grove Av. & Schaefer Av.

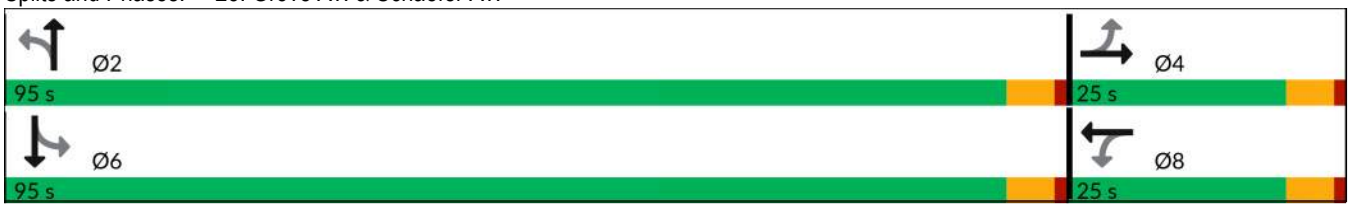

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 36 | 53 | 16 | 9 | 119 | 20 | 55 | 772 | 4 | 15 | 564 | 23 |
| Future Volume (veh/h) | 36 | 53 | 16 | 9 | 119 | 20 | 55 | 772 | 4 | 15 | 564 | 23 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 41 | 60 | 18 | 10 | 135 | 23 | 62 | 877 | 5 | 17 | 641 | 26 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 148 | 172 | 42 | 74 | 246 | 40 | 110 | 1030 | 6 | 74 | 1062 | 42 |
| Arrive On Green | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 | 0.64 |
| Sat Flow, veh/h | 372 | 1004 | 245 | 44 | 1435 | 235 | 67 | 1606 | 9 | 16 | 1656 | 66 |
| Grp Volume(v), veh/h | 119 | 0 | 0 | 168 | 0 | 0 | 944 | 0 | 0 | 684 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1621 | 0 | 0 | 1715 | 0 | 0 | 1682 | 0 | 0 | 1737 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 3.5 | 0.0 | 0.0 | 5.1 | 0.0 | 0.0 | 25.7 | 0.0 | 0.0 | 13.2 | 0.0 | 0.0 |
| Prop In Lane | 0.34 | | 0.15 | 0.06 | | 0.14 | 0.07 | | 0.01 | 0.02 | | 0.04 |
| Lane Grp Cap(c), veh/h | 362 | 0 | 0 | 360 | 0 | 0 | 1145 | 0 | 0 | 1178 | 0 | 0 |
| V/C Ratio(X) | 0.33 | 0.00 | 0.00 | 0.47 | 0.00 | 0.00 | 0.82 | 0.00 | 0.00 | 0.58 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 615 | 0 | 0 | 645 | 0 | 0 | 2632 | 0 | 0 | 2714 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 21.3 | 0.0 | 0.0 | 21.9 | 0.0 | 0.0 | 8.1 | 0.0 | 0.0 | 6.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 4.9 | 0.0 | 0.0 | 2.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 21.8 | 0.0 | 0.0 | 22.9 | 0.0 | 0.0 | 9.7 | 0.0 | 0.0 | 6.5 | 0.0 | 0.0 |
| LnGrp LOS | C | | | C | | | A | | | A | | |
| Approach Vol, veh/h | | 119 | | | 168 | | | 944 | | | 684 | |
| Approach Delay, s/veh | | 21.8 | | | 22.9 | | | 9.7 | | | 6.5 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 42.4 | 15.3 | 42.4 | 15.3 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 89.6 | 19.6 | 89.6 | 19.6 |
| Max Q Clear Time (g_c+I1), s | 27.7 | 5.5 | 15.2 | 7.1 |
| Green Ext Time (p_c), s | 9.3 | 0.4 | 5.2 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 10.5 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 27 | 289 | 581 | 180 | 26 | 780 | 958 | 86 | 600 |
| Future Volume (vph) | 27 | 289 | 581 | 180 | 26 | 780 | 958 | 86 | 600 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 19.0 | 48.3 | 51.6 | 14.7 | 38.0 | 48.3 | 14.7 | 38.0 |
| Total Split (%) | 13.1% | 15.8% | 40.3% | 43.0% | 12.3% | 31.7% | 40.3% | 12.3% | 31.7% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 12.0 | 42.6 | 50.9 | 10.9 | 31.1 | 80.2 | 10.0 | 36.1 |
| Actuated g/C Ratio | 0.08 | 0.10 | 0.36 | 0.43 | 0.09 | 0.26 | 0.67 | 0.08 | 0.30 |
| v/c Ratio | 0.22 | 1.05 | 0.61 | 0.38 | 0.20 | 0.96 | 0.98 | 0.70 | 0.66 |
| Control Delay (s/veh) | 55.8 | 112.8 | 34.8 | 25.4 | 54.1 | 66.7 | 42.2 | 80.8 | 41.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.8 | 112.8 | 34.8 | 25.4 | 54.1 | 66.7 | 42.2 | 80.8 | 41.4 |
| LOS | E | F | C | C | D | E | D | F | D |
| Approach Delay (s/veh) | | 108.5 | | 31.9 | | 53.2 | | | 46.2 |
| Approach LOS | | F | | C | | D | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.05 | |
| Intersection Signal Delay (s/veh): 52.4 | Intersection LOS: D |
| Intersection Capacity Utilization 95.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 27 | 289 | 41 | 581 | 180 | 78 | 26 | 780 | 958 | 86 | 600 | 17 |
| Future Volume (veh/h) | 27 | 289 | 41 | 581 | 180 | 78 | 26 | 780 | 958 | 86 | 600 | 17 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 29 | 311 | 0 | 625 | 194 | 75 | 28 | 839 | 955 | 92 | 645 | 18 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 88 | 377 | | 687 | 356 | 138 | 276 | 1070 | 832 | 148 | 733 | 20 |
| Arrive On Green | 0.08 | 0.17 | 0.00 | 0.35 | 0.44 | 0.44 | 0.26 | 0.48 | 0.48 | 0.14 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1594 | 3455 | 0 | 2910 | 1217 | 470 | 1594 | 3367 | 1502 | 1594 | 3345 | 93 |
| Grp Volume(v), veh/h | 29 | 311 | 0 | 625 | 0 | 269 | 28 | 839 | 955 | 92 | 324 | 339 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 0 | 1455 | 0 | 1687 | 1594 | 1683 | 1502 | 1594 | 1683 | 1755 |
| Q Serve(g_s), s | 1.7 | 8.8 | 0.0 | 20.3 | 0.0 | 11.7 | 1.3 | 20.6 | 31.5 | 5.4 | 18.0 | 18.1 |
| Cycle Q Clear(g_c), s | 1.7 | 8.8 | 0.0 | 20.3 | 0.0 | 11.7 | 1.3 | 20.6 | 31.5 | 5.4 | 18.0 | 18.1 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.28 | 1.00 | | 1.00 | 1.00 | | 0.05 |
| Lane Grp Cap(c), veh/h | 88 | 377 | | 687 | 0 | 494 | 276 | 1070 | 832 | 148 | 369 | 385 |
| V/C Ratio(X) | 0.33 | 0.82 | | 0.91 | 0.00 | 0.55 | 0.10 | 0.78 | 1.15 | 0.62 | 0.88 | 0.88 |
| Avail Cap(c_a), veh/h | 161 | 408 | | 1251 | 0 | 759 | 276 | 1070 | 832 | 161 | 535 | 558 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.7 | 40.3 | 0.0 | 31.0 | 0.0 | 22.9 | 30.8 | 23.1 | 19.7 | 41.0 | 32.0 | 32.0 |
| Incr Delay (d2), s/veh | 0.8 | 12.9 | 0.0 | 2.0 | 0.0 | 1.3 | 0.1 | 3.5 | 80.6 | 4.1 | 8.5 | 8.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 4.0 | 0.0 | 5.8 | 0.0 | 4.0 | 0.5 | 6.4 | 37.1 | 2.1 | 6.7 | 7.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 44.5 | 53.2 | 0.0 | 33.0 | 0.0 | 24.3 | 30.8 | 26.6 | 100.3 | 45.1 | 40.5 | 40.3 |
| LnGrp LOS | D | D | | C | | C | C | C | F | D | D | D |
| Approach Vol, veh/h | | 340 | | | 894 | | | 1822 | | | 755 | |
| Approach Delay, s/veh | | 52.5 | | | 30.4 | | | 65.3 | | | 41.0 | |
| Approach LOS | | D | | | C | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.9 | 38.0 | 29.1 | 18.1 | 23.7 | 28.2 | 11.2 | 36.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 6.5 | * 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 31.5 | 42.6 | 12.0 | 10.0 | * 32 | 10.0 | 44.6 |
| Max Q Clear Time (g_c+I1), s | 7.4 | 33.5 | 22.3 | 10.8 | 3.3 | 20.1 | 3.7 | 13.7 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.1 | 0.3 | 0.0 | 1.7 | 0.0 | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 51.1 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 35 | 596 | 43 | 535 | 38 | 44 | 5 | 26 |
| Future Volume (vph) | 35 | 596 | 43 | 535 | 38 | 44 | 5 | 26 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 85.0 | 85.0 | 85.0 | 85.0 | 35.0 | 35.0 | 35.0 | 35.0 |
| Total Split (%) | 70.8% | 70.8% | 70.8% | 70.8% | 29.2% | 29.2% | 29.2% | 29.2% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 28.2 | 28.2 | 28.2 | 28.2 | | 13.2 | | 13.2 |
| Actuated g/C Ratio | 0.63 | 0.63 | 0.63 | 0.63 | | 0.29 | | 0.29 |
| v/c Ratio | 0.07 | 0.60 | 0.13 | 0.27 | | 0.34 | | 0.12 |
| Control Delay (s/veh) | 6.3 | 10.9 | 7.1 | 6.2 | | 16.7 | | 12.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 6.3 | 10.9 | 7.1 | 6.2 | | 16.7 | | 12.5 |
| LOS | A | B | A | A | | B | | B |
| Approach Delay (s/veh) | | 10.6 | | 6.3 | | 16.7 | | 12.5 |
| Approach LOS | | B | | A | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 44.8 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.60 | |
| Intersection Signal Delay (s/veh): 9.6 | Intersection LOS: A |
| Intersection Capacity Utilization 62.8% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 15: Bon View Av. & Riverside Dr.

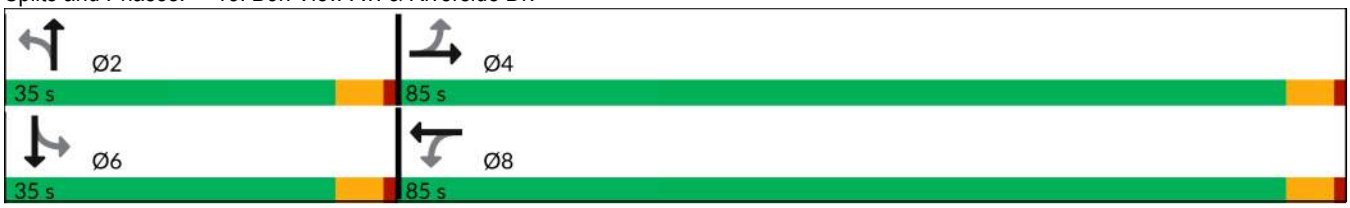

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 35 | 596 | 48 | 43 | 535 | 12 | 38 | 44 | 73 | 5 | 26 | 24 |
| Future Volume (veh/h) | 35 | 596 | 48 | 43 | 535 | 12 | 38 | 44 | 73 | 5 | 26 | 24 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 36 | 614 | 49 | 44 | 552 | 12 | 39 | 45 | 75 | 5 | 27 | 25 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 520 | 806 | 64 | 330 | 1679 | 36 | 166 | 137 | 169 | 110 | 197 | 163 |
| Arrive On Green | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 846 | 1616 | 129 | 772 | 3367 | 73 | 231 | 597 | 739 | 49 | 863 | 712 |
| Grp Volume(v), veh/h | 36 | 0 | 663 | 44 | 276 | 288 | 159 | 0 | 0 | 57 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 846 | 0 | 1745 | 772 | 1683 | 1757 | 1567 | 0 | 0 | 1624 | 0 | 0 |
| Q Serve(g_s), s | 1.1 | 0.0 | 12.2 | 1.9 | 3.9 | 3.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 5.0 | 0.0 | 12.2 | 14.1 | 3.9 | 3.9 | 3.3 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.07 | 1.00 | | 0.04 | 0.25 | | 0.47 | 0.09 | | 0.44 |
| Lane Grp Cap(c), veh/h | 520 | 0 | 871 | 330 | 840 | 876 | 472 | 0 | 0 | 470 | 0 | 0 |
| V/C Ratio(X) | 0.07 | 0.00 | 0.76 | 0.13 | 0.33 | 0.33 | 0.34 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1796 | 0 | 3504 | 1495 | 3379 | 3526 | 1262 | 0 | 0 | 1294 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.4 | 0.0 | 8.0 | 13.7 | 6.0 | 6.0 | 13.1 | 0.0 | 0.0 | 12.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 1.4 | 0.2 | 0.2 | 0.2 | 0.4 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 0.0 | 2.4 | 0.3 | 0.7 | 0.7 | 0.9 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 7.5 | 0.0 | 9.4 | 13.9 | 6.2 | 6.2 | 13.5 | 0.0 | 0.0 | 12.3 | 0.0 | 0.0 |
| LnGrp LOS | A | | A | B | A | A | B | | | B | | |
| Approach Vol, veh/h | | 699 | | | 608 | | | 159 | | | 57 | |
| Approach Delay, s/veh | | 9.3 | | | 6.7 | | | 13.5 | | | 12.3 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.5 | 25.2 | 14.5 | 25.2 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 29.6 | 79.6 | 29.6 | 79.6 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 14.2 | 3.1 | 16.1 |
| Green Ext Time (p_c), s | 0.8 | 5.0 | 0.2 | 3.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 8.8 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 50 | 261 | 29 | 117 | 22 | 650 | 37 | 737 |
| Future Volume (vph) | 50 | 261 | 29 | 117 | 22 | 650 | 37 | 737 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 40.0 | 40.0 | 40.0 | 40.0 | 80.0 | 80.0 | 80.0 | 80.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 33.3% | 66.7% | 66.7% | 66.7% | 66.7% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 5.4 | | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 24.4 | | 24.4 | | 49.9 | | 49.9 |
| Actuated g/C Ratio | | 0.28 | | 0.28 | | 0.58 | | 0.58 |
| v/c Ratio | | 0.76 | | 0.42 | | 0.75 | | 0.86 |
| Control Delay (s/veh) | | 42.6 | | 30.5 | | 19.3 | | 25.8 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 42.6 | | 30.5 | | 19.3 | | 25.8 |
| LOS | | D | | C | | B | | C |
| Approach Delay (s/veh) | | 42.6 | | 30.5 | | 19.3 | | 25.8 |
| Approach LOS | | D | | C | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 86.2 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 26.7 | Intersection LOS: C |
| Intersection Capacity Utilization 92.6% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 24: Grove Av. & Chino Av.

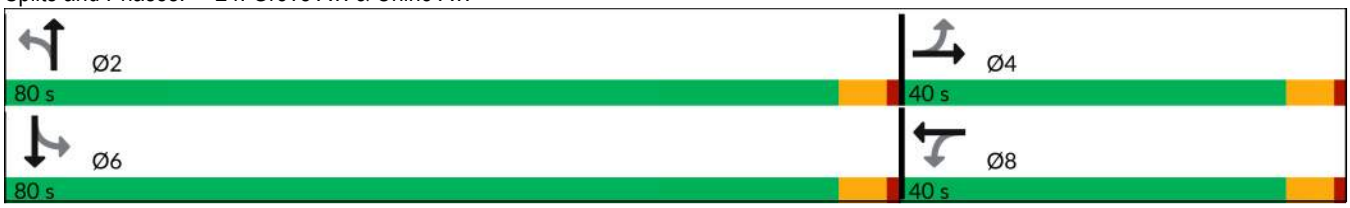

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 50 | 261 | 24 | 29 | 117 | 34 | 22 | 650 | 32 | 37 | 737 | 16 |
| Future Volume (veh/h) | 50 | 261 | 24 | 29 | 117 | 34 | 22 | 650 | 32 | 37 | 737 | 16 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 52 | 272 | 25 | 30 | 122 | 35 | 23 | 677 | 33 | 39 | 768 | 17 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 114 | 360 | 31 | 110 | 314 | 81 | 77 | 905 | 43 | 89 | 910 | 20 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 |
| Sat Flow, veh/h | 164 | 1393 | 120 | 146 | 1215 | 313 | 23 | 1631 | 78 | 43 | 1641 | 35 |
| Grp Volume(v), veh/h | 349 | 0 | 0 | 187 | 0 | 0 | 733 | 0 | 0 | 824 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1678 | 0 | 0 | 1674 | 0 | 0 | 1733 | 0 | 0 | 1719 | 0 | 0 |
| Q Serve(g_s), s | 5.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 4.6 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 11.2 | 0.0 | 0.0 | 5.3 | 0.0 | 0.0 | 18.5 | 0.0 | 0.0 | 23.1 | 0.0 | 0.0 |
| Prop In Lane | 0.15 | | 0.07 | 0.16 | | 0.19 | 0.03 | | 0.05 | 0.05 | | 0.02 |
| Lane Grp Cap(c), veh/h | 505 | 0 | 0 | 505 | 0 | 0 | 1025 | 0 | 0 | 1019 | 0 | 0 |
| V/C Ratio(X) | 0.69 | 0.00 | 0.00 | 0.37 | 0.00 | 0.00 | 0.71 | 0.00 | 0.00 | 0.81 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1062 | 0 | 0 | 1035 | 0 | 0 | 2256 | 0 | 0 | 2237 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 20.0 | 0.0 | 0.0 | 17.8 | 0.0 | 0.0 | 9.8 | 0.0 | 0.0 | 10.8 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.7 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.8 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 4.8 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 21.7 | 0.0 | 0.0 | 18.3 | 0.0 | 0.0 | 10.8 | 0.0 | 0.0 | 12.4 | 0.0 | 0.0 |
| LnGrp LOS | C | | | B | | | B | | | B | | |
| Approach Vol, veh/h | | 349 | | | 187 | | | 733 | | | 824 | |
| Approach Delay, s/veh | | 21.7 | | | 18.3 | | | 10.8 | | | 12.4 | |
| Approach LOS | | C | | | B | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 37.5 | 20.4 | 37.5 | 20.4 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 74.6 | 34.6 | 74.6 | 34.6 |
| Max Q Clear Time (g_c+I1), s | 20.5 | 13.2 | 25.1 | 7.3 |
| Green Ext Time (p_c), s | 5.7 | 1.8 | 7.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 13.9 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 96 | 177 | 3 | 42 | 23 | 598 | 37 | 704 |
| Future Volume (vph) | 96 | 177 | 3 | 42 | 23 | 598 | 37 | 704 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 39.0 | 39.0 | 39.0 | 39.0 | 81.0 | 81.0 | 81.0 | 81.0 |
| Total Split (%) | 32.5% | 32.5% | 32.5% | 32.5% | 67.5% | 67.5% | 67.5% | 67.5% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 5.4 | | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 23.8 | | 23.8 | | 49.0 | | 49.0 |
| Actuated g/C Ratio | | 0.28 | | 0.28 | | 0.58 | | 0.58 |
| v/c Ratio | | 0.77 | | 0.15 | | 0.69 | | 0.85 |
| Control Delay (s/veh) | | 44.0 | | 22.0 | | 17.0 | | 24.6 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 44.0 | | 22.0 | | 17.0 | | 24.6 |
| LOS | | D | | C | | B | | C |
| Approach Delay (s/veh) | | 44.0 | | 22.0 | | 17.0 | | 24.6 |
| Approach LOS | | D | | C | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 84.7 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 25.1 | Intersection LOS: C |
| Intersection Capacity Utilization 90.1% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 25: Grove Av. & Schaefer Av.

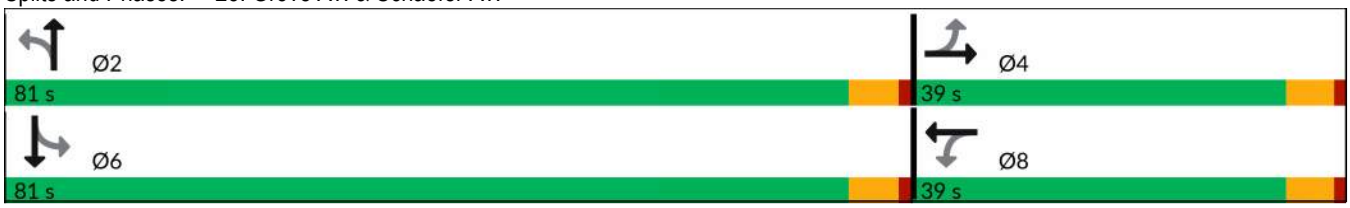

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 96 | 177 | 38 | 3 | 42 | 22 | 23 | 598 | 16 | 37 | 704 | 26 |
| Future Volume (veh/h) | 96 | 177 | 38 | 3 | 42 | 22 | 23 | 598 | 16 | 37 | 704 | 26 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 102 | 188 | 40 | 3 | 45 | 23 | 24 | 636 | 17 | 39 | 749 | 28 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 186 | 258 | 50 | 70 | 284 | 138 | 80 | 923 | 24 | 90 | 892 | 33 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 |
| Sat Flow, veh/h | 402 | 1008 | 195 | 18 | 1108 | 540 | 26 | 1666 | 44 | 42 | 1610 | 59 |
| Grp Volume(v), veh/h | 330 | 0 | 0 | 71 | 0 | 0 | 677 | 0 | 0 | 816 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1605 | 0 | 0 | 1666 | 0 | 0 | 1736 | 0 | 0 | 1711 | 0 | 0 |
| Q Serve(g_s), s | 8.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 10.9 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 15.8 | 0.0 | 0.0 | 22.6 | 0.0 | 0.0 |
| Prop In Lane | 0.31 | | 0.12 | 0.04 | | 0.32 | 0.04 | | 0.03 | 0.05 | | 0.03 |
| Lane Grp Cap(c), veh/h | 494 | 0 | 0 | 493 | 0 | 0 | 1027 | 0 | 0 | 1014 | 0 | 0 |
| V/C Ratio(X) | 0.67 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.66 | 0.00 | 0.00 | 0.80 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1021 | 0 | 0 | 1041 | 0 | 0 | 2323 | 0 | 0 | 2301 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 19.7 | 0.0 | 0.0 | 16.4 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.6 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.6 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 4.0 | 0.0 | 0.0 | 5.7 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 21.3 | 0.0 | 0.0 | 16.6 | 0.0 | 0.0 | 9.9 | 0.0 | 0.0 | 12.1 | 0.0 | 0.0 |
| LnGrp LOS | C | | | B | | | A | | | B | | |
| Approach Vol, veh/h | | 330 | | | 71 | | | 677 | | | 816 | |
| Approach Delay, s/veh | | 21.3 | | | 16.6 | | | 9.9 | | | 12.1 | |
| Approach LOS | | C | | | B | | | A | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 36.9 | 20.0 | 36.9 | 20.0 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 75.6 | 33.6 | 75.6 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 17.8 | 12.9 | 24.6 | 3.9 |
| Green Ext Time (p_c), s | 5.1 | 1.7 | 6.9 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 13.1 |
| HCM 7th LOS | B |

# APPENDIX 6.1:

# OPENING YEAR CUMULATIVE (2034) WITHOUT PROJECT INTERSECTION ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 322 | 1 | 460 | 275 | 874 | 945 | 475 |
| Future Volume (vph) | 322 | 1 | 460 | 275 | 874 | 945 | 475 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 27.0 | 61.0 | 34.0 | 34.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 30.0% | 67.8% | 37.8% | 37.8% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 21.1 | 21.1 | 21.1 | 19.9 | 55.9 | 30.8 | 30.8 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.22 | 0.62 | 0.34 | 0.34 |
| v/c Ratio | 0.84 | 0.64 | 0.62 | 0.85 | 0.45 | 0.89 | 0.61 |
| Control Delay (s/veh) | 54.4 | 22.0 | 21.2 | 53.4 | 11.3 | 40.2 | 5.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.4 | 22.0 | 21.2 | 53.4 | 11.3 | 40.2 | 5.9 |
| LOS | D | C | C | D | B | D | A |
| Approach Delay (s/veh) | | 33.1 | | | 21.4 | 28.7 | |
| Approach LOS | | C | | | C | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 17.8 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.89 | |
| Intersection Signal Delay (s/veh): 27.2 | Intersection LOS: C |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

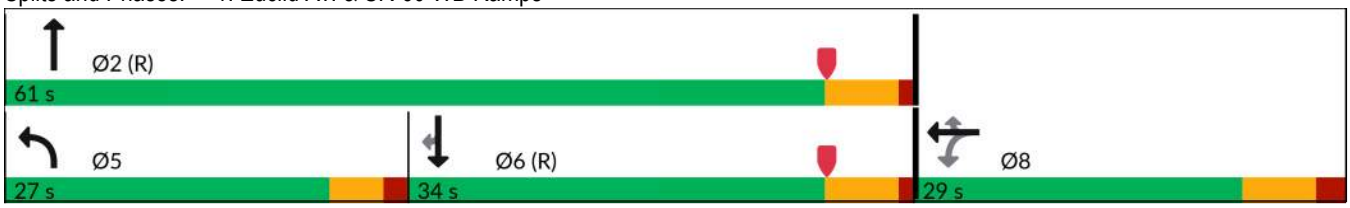

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 322 | 1 | 460 | 275 | 874 | 0 | 0 | 945 | 475 |
| Future Volume (veh/h) | 0 | 0 | 0 | 322 | 1 | 460 | 275 | 874 | 0 | 0 | 945 | 475 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 440 | 0 | 200 | 296 | 940 | 0 | 0 | 1016 | 283 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 572 | 0 | 269 | 322 | 2276 | 0 | 0 | 1402 | 612 |
| Arrive On Green | | | | 0.18 | 0.00 | 0.18 | 0.40 | 1.00 | 0.00 | 0.00 | 0.42 | 0.42 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1497 | 1594 | 3455 | 0 | 0 | 3455 | 1469 |
| Grp Volume(v), veh/h | | | | 440 | 0 | 200 | 296 | 940 | 0 | 0 | 1016 | 283 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1497 | 1594 | 1683 | 0 | 0 | 1683 | 1469 |
| Q Serve(g_s), s | | | | 11.8 | 0.0 | 11.4 | 15.9 | 0.0 | 0.0 | 0.0 | 22.7 | 12.5 |
| Cycle Q Clear(g_c), s | | | | 11.8 | 0.0 | 11.4 | 15.9 | 0.0 | 0.0 | 0.0 | 22.7 | 12.5 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 572 | 0 | 269 | 322 | 2276 | 0 | 0 | 1402 | 612 |
| V/C Ratio(X) | | | | 0.77 | 0.00 | 0.74 | 0.92 | 0.41 | 0.00 | 0.00 | 0.72 | 0.46 |
| Avail Cap(c_a), veh/h | | | | 779 | 0 | 366 | 386 | 2276 | 0 | 0 | 1402 | 612 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.36 | 0.36 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.2 | 0.0 | 35.0 | 26.1 | 0.0 | 0.0 | 0.0 | 21.9 | 19.0 |
| Incr Delay (d2), s/veh | | | | 4.0 | 0.0 | 6.9 | 11.2 | 0.2 | 0.0 | 0.0 | 3.3 | 2.5 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.8 | 0.0 | 4.6 | 5.2 | 0.1 | 0.0 | 0.0 | 8.7 | 4.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.2 | 0.0 | 41.8 | 37.3 | 0.2 | 0.0 | 0.0 | 25.2 | 21.5 |
| LnGrp LOS | | | | D | | D | D | A | | | C | C |
| Approach Vol, veh/h | | | | | 640 | | | 1236 | | | 1299 | |
| Approach Delay, s/veh | | | | | 40.0 | | | 9.1 | | | 24.4 | |
| Approach LOS | | | | | D | | | A | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.8 | | 23.4 | 43.5 | | 23.2 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 21.8 | 28.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 17.9 | 24.7 | | 13.8 |
| Green Ext Time (p_c), s | 11.3 | | 0.3 | 2.5 | | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 360 | 1 | 210 | 776 | 405 | 375 | 875 |
| Future Volume (vph) | 360 | 1 | 210 | 776 | 405 | 375 | 875 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 27.7 | 27.7 | 27.7 | 26.0 | 26.0 | 14.7 | 24.0 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 60.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 66.7% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | | 7.0 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 22.7 | 0.0 | 22.7 | 25.3 | 25.3 | 24.3 | 54.3 |
| Actuated g/C Ratio | 0.25 | 0.00 | 0.25 | 0.28 | 0.28 | 0.27 | 0.60 |
| v/c Ratio | 0.93 | no cap | 0.44 | 0.85 | 0.59 | 0.91 | 0.45 |
| Control Delay (s/veh) | 65.1 | | 12.9 | 41.3 | 6.7 | 63.5 | 10.6 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 65.1 | Error | 12.9 | 41.3 | 6.7 | 63.5 | 10.6 |
| LOS | E | F | B | D | A | E | B |
| Approach Delay (s/veh) | | Error | | 29.4 | | | 26.5 |
| Approach LOS | | F | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 17.6 (20%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

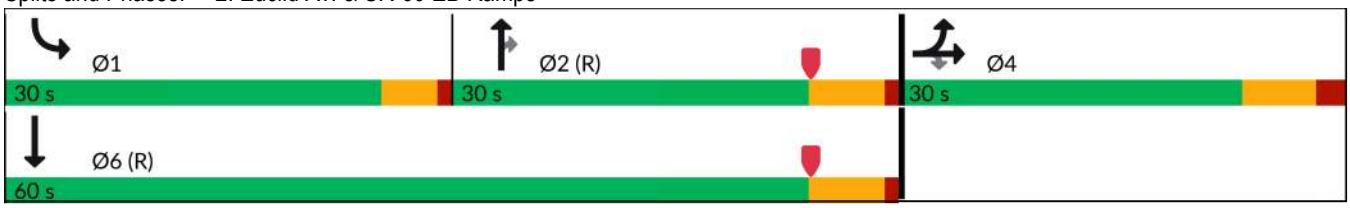

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 360 | 1 | 210 | 0 | 0 | 0 | 0 | 776 | 405 | 375 | 875 | 0 |
| Future Volume (veh/h) | 360 | 1 | 210 | 0 | 0 | 0 | 0 | 776 | 405 | 375 | 875 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 371 | 1 | 158 | | | | 0 | 800 | 315 | 387 | 902 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 401 | 0 | 377 | | | | 0 | 996 | 443 | 408 | 2034 | 0 |
| Arrive On Green | 0.25 | 0.25 | 0.25 | | | | 0.00 | 0.30 | 0.30 | 0.51 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 1502 | | | | 0 | 3455 | 1497 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 371 | 0 | 158 | | | | 0 | 800 | 315 | 387 | 902 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1683 | 1497 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 20.4 | 0.0 | 7.9 | | | | 0.0 | 19.8 | 16.9 | 20.7 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 20.4 | 0.0 | 7.9 | | | | 0.0 | 19.8 | 16.9 | 20.7 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 401 | 0 | 377 | | | | 0 | 996 | 443 | 408 | 2034 | 0 |
| V/C Ratio(X) | 0.93 | 0.00 | 0.42 | | | | 0.00 | 0.80 | 0.71 | 0.95 | 0.44 | 0.00 |
| Avail Cap(c_a), veh/h | 407 | 0 | 384 | | | | 0 | 996 | 443 | 448 | 2034 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.82 | 0.82 | 0.36 | 0.36 | 0.00 |
| Uniform Delay (d), s/veh | 32.9 | 0.0 | 28.2 | | | | 0.0 | 29.3 | 28.3 | 21.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 27.2 | 0.0 | 1.1 | | | | 0.0 | 5.7 | 7.8 | 14.2 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.7 | 0.0 | 2.9 | | | | 0.0 | 8.2 | 6.5 | 6.1 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 60.0 | 0.0 | 29.2 | | | | 0.0 | 35.0 | 36.0 | 35.5 | 0.3 | 0.0 |
| LnGrp LOS | E | | C | | | | | C | D | D | A | |
| Approach Vol, veh/h | | 529 | | | | | | 1115 | | | 1289 | |
| Approach Delay, s/veh | | 50.8 | | | | | | 35.3 | | | 10.8 | |
| Approach LOS | | D | | | | | | D | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 27.8 | 32.6 | | 29.6 | | 60.4 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 7.0 | | 6.0 |
| Max Green Setting (Gmax), s | 25.3 | 24.0 | | 23.0 | | 54.0 |
| Max Q Clear Time (g_c+I1), s | 22.7 | 21.8 | | 22.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.3 | 1.7 | | 0.2 | | 10.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.3 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 109 | 303 | 54 | 380 | 110 | 859 | 134 | 883 |
| Future Volume (vph) | 109 | 303 | 54 | 380 | 110 | 859 | 134 | 883 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 43.0 | 43.0 | 43.0 | 43.0 | 41.4 | 41.4 | 35.6 | 77.0 |
| Total Split (%) | 35.8% | 35.8% | 35.8% | 35.8% | 34.5% | 34.5% | 29.7% | 64.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 26.0 | 26.0 | 26.0 | 26.0 | 30.2 | 30.2 | 8.9 | 43.9 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.32 | 0.37 | 0.37 | 0.11 | 0.53 |
| v/c Ratio | 0.65 | 0.46 | 0.26 | 0.56 | 0.68 | 0.53 | 0.45 | 0.38 |
| Control Delay (s/veh) | 44.6 | 20.4 | 25.6 | 22.9 | 48.8 | 22.8 | 43.8 | 12.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.6 | 20.4 | 25.6 | 22.9 | 48.8 | 22.8 | 43.8 | 12.4 |
| LOS | D | C | C | C | D | C | D | B |
| Approach Delay (s/veh) | | 25.0 | | 23.1 | | 25.7 | | 16.4 |
| Approach LOS | | C | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 82.3 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.68 | |
| Intersection Signal Delay (s/veh): 22.0 | Intersection LOS: C |
| Intersection Capacity Utilization 72.4% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

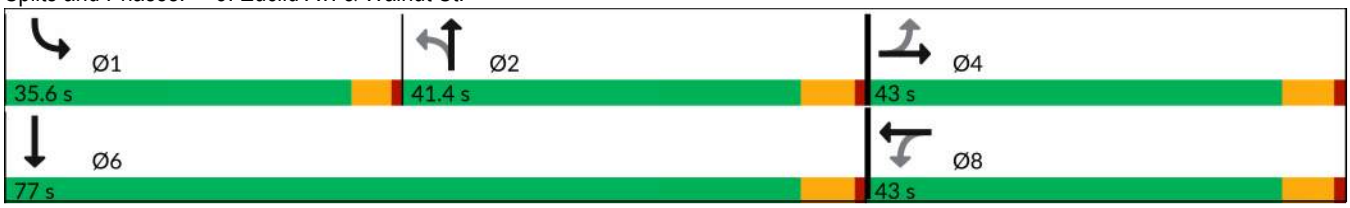

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 109 | 303 | 153 | 54 | 380 | 178 | 110 | 859 | 30 | 134 | 883 | 51 |
| Future Volume (veh/h) | 109 | 303 | 153 | 54 | 380 | 178 | 110 | 859 | 30 | 134 | 883 | 51 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 115 | 319 | 148 | 57 | 400 | 144 | 116 | 904 | 23 | 141 | 929 | 32 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 286 | 771 | 350 | 317 | 832 | 296 | 293 | 1574 | 40 | 219 | 2270 | 78 |
| Arrive On Green | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.32 | 0.32 | 0.32 | 0.08 | 0.47 | 0.47 |
| Sat Flow, veh/h | 814 | 2247 | 1020 | 873 | 2423 | 861 | 552 | 4849 | 123 | 2910 | 4802 | 165 |
| Grp Volume(v), veh/h | 115 | 237 | 230 | 57 | 276 | 268 | 116 | 601 | 326 | 141 | 624 | 337 |
| Grp Sat Flow(s),veh/h/ln | 814 | 1683 | 1583 | 873 | 1683 | 1600 | 552 | 1612 | 1748 | 1455 | 1612 | 1742 |
| Q Serve(g_s), s | 8.2 | 6.8 | 7.0 | 3.4 | 8.1 | 8.3 | 11.3 | 9.8 | 9.8 | 3.0 | 8.0 | 8.0 |
| Cycle Q Clear(g_c), s | 16.5 | 6.8 | 7.0 | 10.4 | 8.1 | 8.3 | 11.3 | 9.8 | 9.8 | 3.0 | 8.0 | 8.0 |
| Prop In Lane | 1.00 | | 0.64 | 1.00 | | 0.54 | 1.00 | | 0.07 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 286 | 578 | 544 | 317 | 578 | 549 | 293 | 1046 | 567 | 219 | 1525 | 824 |
| V/C Ratio(X) | 0.40 | 0.41 | 0.42 | 0.18 | 0.48 | 0.49 | 0.40 | 0.57 | 0.58 | 0.64 | 0.41 | 0.41 |
| Avail Cap(c_a), veh/h | 487 | 993 | 934 | 532 | 993 | 944 | 426 | 1820 | 986 | 1430 | 3641 | 1967 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.8 | 15.8 | 15.9 | 19.9 | 16.3 | 16.3 | 18.2 | 17.7 | 17.7 | 28.3 | 10.9 | 10.9 |
| Incr Delay (d2), s/veh | 0.9 | 0.5 | 0.5 | 0.3 | 0.6 | 0.7 | 0.9 | 0.5 | 0.9 | 1.2 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 2.3 | 2.2 | 0.6 | 2.7 | 2.7 | 1.3 | 3.1 | 3.5 | 1.0 | 2.2 | 2.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 23.7 | 16.3 | 16.4 | 20.2 | 16.9 | 17.0 | 19.1 | 18.2 | 18.6 | 29.5 | 11.0 | 11.2 |
| LnGrp LOS | C | B | B | C | B | B | B | B | B | C | B | B |
| Approach Vol, veh/h | | 582 | | | 601 | | | 1043 | | | 1102 | |
| Approach Delay, s/veh | | 17.8 | | | 17.2 | | | 18.4 | | | 13.5 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.4 | 26.3 | | 27.5 | | 35.6 | | 27.5 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.0 | 35.6 | | 37.2 | | 71.2 | | 37.2 |
| Max Q Clear Time (g_c+I1), s | 5.0 | 13.3 | | 18.5 | | 10.0 | | 12.4 |
| Green Ext Time (p_c), s | 0.2 | 7.1 | | 3.1 | | 6.9 | | 3.4 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 16.5 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 142 | 505 | 182 | 610 | 82 | 703 | 172 | 127 | 774 | 149 |
| Future Volume (vph) | 142 | 505 | 182 | 610 | 82 | 703 | 172 | 127 | 774 | 149 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 21.0 | 43.0 | 23.0 | 45.0 | 15.2 | 35.0 | 35.0 | 19.0 | 38.8 | 38.8 |
| Total Split (%) | 17.5% | 35.8% | 19.2% | 37.5% | 12.7% | 29.2% | 29.2% | 15.8% | 32.3% | 32.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.9 | 36.1 | 16.8 | 38.0 | 10.0 | 28.8 | 28.8 | 13.0 | 31.7 | 31.7 |
| Actuated g/C Ratio | 0.13 | 0.31 | 0.14 | 0.32 | 0.09 | 0.24 | 0.24 | 0.11 | 0.27 | 0.27 |
| v/c Ratio | 0.77 | 1.19 | 0.87 | 0.69 | 0.66 | 0.92 | 0.40 | 0.78 | 0.92 | 0.31 |
| Control Delay (s/veh) | 74.5 | 139.8 | 83.3 | 38.5 | 76.2 | 61.4 | 16.1 | 80.9 | 58.1 | 6.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 74.5 | 139.8 | 83.3 | 38.5 | 76.2 | 61.4 | 16.1 | 80.9 | 58.1 | 6.8 |
| LOS | E | F | F | D | E | E | B | F | E | A |
| Approach Delay (s/veh) | | 127.1 | | 47.8 | | 54.5 | | | 53.6 | |
| Approach LOS | | F | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 117.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.19 | |
| Intersection Signal Delay (s/veh): 67.4 | Intersection LOS: E |
| Intersection Capacity Utilization 94.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

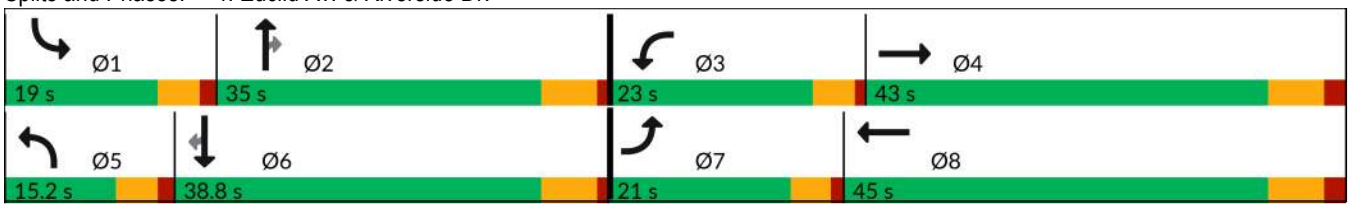

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 142 | 505 | 86 | 182 | 610 | 78 | 82 | 703 | 172 | 127 | 774 | 149 |
| Future Volume (veh/h) | 142 | 505 | 86 | 182 | 610 | 78 | 82 | 703 | 172 | 127 | 774 | 149 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 153 | 543 | 65 | 196 | 656 | 60 | 88 | 756 | 117 | 137 | 832 | 99 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 177 | 483 | 58 | 221 | 1054 | 96 | 130 | 845 | 377 | 161 | 912 | 401 |
| Arrive On Green | 0.11 | 0.31 | 0.31 | 0.14 | 0.34 | 0.34 | 0.08 | 0.25 | 0.25 | 0.10 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1594 | 1553 | 186 | 1594 | 3114 | 284 | 1594 | 3367 | 1502 | 1594 | 3367 | 1482 |
| Grp Volume(v), veh/h | 153 | 0 | 608 | 196 | 354 | 362 | 88 | 756 | 117 | 137 | 832 | 99 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1738 | 1594 | 1683 | 1715 | 1594 | 1683 | 1502 | 1594 | 1683 | 1482 |
| Q Serve(g_s), s | 10.9 | 0.0 | 36.0 | 14.0 | 20.4 | 20.4 | 6.2 | 25.1 | 7.3 | 9.8 | 27.7 | 6.0 |
| Cycle Q Clear(g_c), s | 10.9 | 0.0 | 36.0 | 14.0 | 20.4 | 20.4 | 6.2 | 25.1 | 7.3 | 9.8 | 27.7 | 6.0 |
| Prop In Lane | 1.00 | | 0.11 | 1.00 | | 0.17 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 177 | 0 | 541 | 221 | 570 | 581 | 130 | 845 | 377 | 161 | 912 | 401 |
| V/C Ratio(X) | 0.86 | 0.00 | 1.12 | 0.89 | 0.62 | 0.62 | 0.68 | 0.89 | 0.31 | 0.85 | 0.91 | 0.25 |
| Avail Cap(c_a), veh/h | 225 | 0 | 541 | 252 | 570 | 581 | 138 | 845 | 377 | 190 | 955 | 421 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.5 | 0.0 | 39.8 | 48.9 | 32.0 | 32.1 | 51.6 | 41.8 | 35.2 | 51.1 | 40.8 | 32.9 |
| Incr Delay (d2), s/veh | 19.8 | 0.0 | 77.2 | 25.5 | 2.4 | 2.4 | 11.7 | 12.0 | 0.5 | 25.8 | 12.5 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.2 | 0.0 | 26.2 | 6.9 | 8.3 | 8.5 | 2.8 | 11.2 | 2.6 | 4.9 | 12.6 | 2.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 70.3 | 0.0 | 117.0 | 74.4 | 34.5 | 34.5 | 63.4 | 53.8 | 35.6 | 76.9 | 53.3 | 33.3 |
| LnGrp LOS | E | | F | E | C | C | E | D | D | E | D | C |
| Approach Vol, veh/h | | 761 | | | 912 | | | 961 | | | 1068 | |
| Approach Delay, s/veh | | 107.6 | | | 43.1 | | | 52.5 | | | 54.5 | |
| Approach LOS | | F | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.9 | 35.0 | 20.7 | 43.0 | 14.6 | 37.3 | 17.6 | 46.1 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 13.8 | 29.0 | 18.3 | 36.0 | 10.0 | 32.8 | 16.3 | 38.0 |
| Max Q Clear Time (g_c+I1), s | 11.8 | 27.1 | 16.0 | 38.0 | 8.2 | 29.7 | 12.9 | 22.4 |
| Green Ext Time (p_c), s | 0.1 | 1.0 | 0.1 | 0.0 | 0.0 | 1.6 | 0.1 | 5.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 62.1 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 80 | 259 | 40 | 93 | 287 | 55 | 922 | 184 | 47 | 927 | 73 |
| Future Volume (vph) | 80 | 259 | 40 | 93 | 287 | 55 | 922 | 184 | 47 | 927 | 73 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 56.0 | 56.0 | 56.0 | 56.0 | 56.0 | 49.0 | 49.0 | 49.0 | 15.0 | 64.0 | 64.0 |
| Total Split (%) | 46.7% | 46.7% | 46.7% | 46.7% | 46.7% | 40.8% | 40.8% | 40.8% | 12.5% | 53.3% | 53.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 41.3 | 41.3 | 41.3 | | 41.3 | 37.4 | 37.4 | 37.4 | 10.9 | 48.0 | 48.0 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.40 | | 0.40 | 0.36 | 0.36 | 0.36 | 0.11 | 0.47 | 0.47 |
| v/c Ratio | 0.32 | 0.41 | 0.07 | | 0.87 | 0.41 | 0.84 | 0.35 | 0.31 | 0.66 | 0.11 |
| Control Delay (s/veh) | 27.5 | 25.4 | 1.8 | | 47.6 | 39.4 | 39.3 | 19.9 | 56.0 | 23.6 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 27.5 | 25.4 | 1.8 | | 47.6 | 39.4 | 39.3 | 19.9 | 56.0 | 23.6 | 5.1 |
| LOS | C | C | A | | D | D | D | B | E | C | A |
| Approach Delay (s/veh) | | 23.4 | | | 47.6 | | 36.3 | | | 23.8 | |
| Approach LOS | | C | | | D | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 102.7 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 31.9 | Intersection LOS: C |
| Intersection Capacity Utilization 94.2% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 80 | 259 | 40 | 93 | 287 | 40 | 55 | 922 | 184 | 47 | 927 | 73 |
| Future Volume (veh/h) | 80 | 259 | 40 | 93 | 287 | 40 | 55 | 922 | 184 | 47 | 927 | 73 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 89 | 288 | 32 | 103 | 319 | 44 | 61 | 1024 | 170 | 52 | 1030 | 51 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 257 | 695 | 589 | 136 | 372 | 48 | 199 | 1214 | 542 | 122 | 1629 | 709 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.36 | 0.36 | 0.36 | 0.08 | 0.48 | 0.48 |
| Sat Flow, veh/h | 962 | 1772 | 1502 | 235 | 947 | 123 | 493 | 3367 | 1502 | 1594 | 3367 | 1466 |
| Grp Volume(v), veh/h | 89 | 288 | 32 | 466 | 0 | 0 | 61 | 1024 | 170 | 52 | 1030 | 51 |
| Grp Sat Flow(s),veh/h/ln | 962 | 1772 | 1502 | 1306 | 0 | 0 | 493 | 1683 | 1502 | 1594 | 1683 | 1466 |
| Q Serve(g_s), s | 0.0 | 11.7 | 1.3 | 22.9 | 0.0 | 0.0 | 10.4 | 27.7 | 8.1 | 3.1 | 22.6 | 1.8 |
| Cycle Q Clear(g_c), s | 16.9 | 11.7 | 1.3 | 34.6 | 0.0 | 0.0 | 20.8 | 27.7 | 8.1 | 3.1 | 22.6 | 1.8 |
| Prop In Lane | 1.00 | | 1.00 | 0.22 | | 0.09 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 257 | 695 | 589 | 557 | 0 | 0 | 199 | 1214 | 542 | 122 | 1629 | 709 |
| V/C Ratio(X) | 0.35 | 0.41 | 0.05 | 0.84 | 0.00 | 0.00 | 0.31 | 0.84 | 0.31 | 0.43 | 0.63 | 0.07 |
| Avail Cap(c_a), veh/h | 365 | 896 | 759 | 729 | 0 | 0 | 232 | 1441 | 643 | 167 | 1950 | 849 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.5 | 21.9 | 18.7 | 30.3 | 0.0 | 0.0 | 31.4 | 29.2 | 22.9 | 43.7 | 19.1 | 13.7 |
| Incr Delay (d2), s/veh | 0.8 | 0.4 | 0.0 | 6.6 | 0.0 | 0.0 | 0.9 | 4.1 | 0.3 | 0.9 | 0.5 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 4.7 | 0.4 | 10.9 | 0.0 | 0.0 | 1.2 | 10.7 | 2.7 | 1.2 | 7.7 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 24.3 | 22.3 | 18.8 | 36.9 | 0.0 | 0.0 | 32.2 | 33.3 | 23.2 | 44.6 | 19.6 | 13.8 |
| LnGrp LOS | C | C | B | D | | | C | C | C | D | B | B |
| Approach Vol, veh/h | | 409 | | | 466 | | | 1255 | | | 1133 | |
| Approach Delay, s/veh | | 22.4 | | | 36.9 | | | 31.9 | | | 20.4 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.2 | 42.3 | | 44.8 | | 54.5 | | 44.8 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 42.5 | | 50.2 | | 57.5 | | 50.2 |
| Max Q Clear Time (g_c+I1), s | 5.1 | 29.7 | | 18.9 | | 24.6 | | 36.6 |
| Green Ext Time (p_c), s | 0.0 | 6.1 | | 2.2 | | 7.6 | | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.4 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 175 | 106 | 107 | 51 | 151 | 96 | 900 | 31 | 55 | 944 | 83 |
| Future Volume (vph) | 175 | 106 | 107 | 51 | 151 | 96 | 900 | 31 | 55 | 944 | 83 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 17.0 | 49.3 | 49.3 | 14.7 | 47.0 | 15.0 | 41.3 | 41.3 | 14.7 | 41.0 | 41.0 |
| Total Split (%) | 14.2% | 41.1% | 41.1% | 12.3% | 39.2% | 12.5% | 34.4% | 34.4% | 12.3% | 34.2% | 34.2% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.4 | 26.0 | 26.0 | 10.1 | 20.4 | 10.3 | 38.3 | 38.3 | 10.1 | 34.9 | 34.9 |
| Actuated g/C Ratio | 0.12 | 0.26 | 0.26 | 0.10 | 0.20 | 0.10 | 0.38 | 0.38 | 0.10 | 0.35 | 0.35 |
| v/c Ratio | 0.99 | 0.26 | 0.25 | 0.35 | 0.70 | 0.66 | 0.78 | 0.05 | 0.38 | 0.90 | 0.16 |
| Control Delay (s/veh) | 109.0 | 32.1 | 6.6 | 52.7 | 44.2 | 66.0 | 35.6 | 0.2 | 53.5 | 44.0 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 109.0 | 32.1 | 6.6 | 52.7 | 44.2 | 66.0 | 35.6 | 0.2 | 53.5 | 44.0 | 3.1 |
| LOS | F | C | A | D | D | E | D | A | D | D | A |
| Approach Delay (s/veh) | | 59.7 | | | 45.8 | | 37.3 | | | 41.3 | |
| Approach LOS | | E | | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 101 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.99 | |
| Intersection Signal Delay (s/veh): 42.9 | Intersection LOS: D |
| Intersection Capacity Utilization 79.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

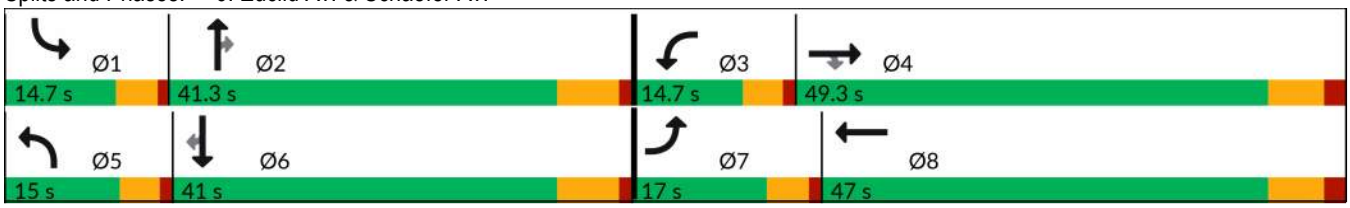

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 175 | 106 | 107 | 51 | 151 | 75 | 96 | 900 | 31 | 55 | 944 | 83 |
| Future Volume (veh/h) | 175 | 106 | 107 | 51 | 151 | 75 | 96 | 900 | 31 | 55 | 944 | 83 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 192 | 116 | 74 | 56 | 166 | 71 | 105 | 989 | 27 | 60 | 1037 | 44 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 213 | 390 | 331 | 132 | 198 | 85 | 162 | 1219 | 544 | 136 | 1165 | 508 |
| Arrive On Green | 0.13 | 0.22 | 0.22 | 0.08 | 0.17 | 0.17 | 0.10 | 0.36 | 0.36 | 0.09 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1172 | 501 | 1594 | 3367 | 1502 | 1594 | 3367 | 1468 |
| Grp Volume(v), veh/h | 192 | 116 | 74 | 56 | 0 | 237 | 105 | 989 | 27 | 60 | 1037 | 44 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1674 | 1594 | 1683 | 1502 | 1594 | 1683 | 1468 |
| Q Serve(g_s), s | 10.9 | 5.0 | 3.7 | 3.1 | 0.0 | 12.6 | 5.8 | 24.4 | 1.1 | 3.3 | 26.7 | 1.9 |
| Cycle Q Clear(g_c), s | 10.9 | 5.0 | 3.7 | 3.1 | 0.0 | 12.6 | 5.8 | 24.4 | 1.1 | 3.3 | 26.7 | 1.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.30 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 213 | 390 | 331 | 132 | 0 | 283 | 162 | 1219 | 544 | 136 | 1165 | 508 |
| V/C Ratio(X) | 0.90 | 0.30 | 0.22 | 0.42 | 0.00 | 0.84 | 0.65 | 0.81 | 0.05 | 0.44 | 0.89 | 0.09 |
| Avail Cap(c_a), veh/h | 213 | 816 | 692 | 174 | 0 | 729 | 179 | 1276 | 569 | 174 | 1265 | 551 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.2 | 29.9 | 29.4 | 40.0 | 0.0 | 36.9 | 39.7 | 26.5 | 19.0 | 39.9 | 28.4 | 20.2 |
| Incr Delay (d2), s/veh | 34.8 | 0.3 | 0.3 | 0.8 | 0.0 | 4.9 | 4.8 | 3.9 | 0.0 | 0.8 | 7.8 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.1 | 2.1 | 1.3 | 1.2 | 0.0 | 5.3 | 2.3 | 9.2 | 0.4 | 1.2 | 10.7 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 74.0 | 30.2 | 29.6 | 40.8 | 0.0 | 41.8 | 44.5 | 30.4 | 19.1 | 40.8 | 36.1 | 20.3 |
| LnGrp LOS | E | C | C | D | | D | D | C | B | D | D | C |
| Approach Vol, veh/h | | 382 | | | 293 | | | 1121 | | | 1141 | |
| Approach Delay, s/veh | | 52.1 | | | 41.6 | | | 31.4 | | | 35.8 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.5 | 39.8 | 12.3 | 27.2 | 14.0 | 38.3 | 17.0 | 22.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 34.8 | 10.0 | 42.3 | 10.3 | 34.5 | 12.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 5.3 | 26.4 | 5.1 | 7.0 | 7.8 | 28.7 | 12.9 | 14.6 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | 0.0 | 0.6 | 0.0 | 3.1 | 0.0 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 36.8 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 93 | 259 | 53 | 98 | 404 | 147 | 833 | 117 | 110 | 809 | 135 |
| Future Volume (vph) | 93 | 259 | 53 | 98 | 404 | 147 | 833 | 117 | 110 | 809 | 135 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 53.0 | 53.0 | 53.0 | 53.0 | 53.0 | 17.0 | 50.0 | 50.0 | 17.0 | 50.0 | 50.0 |
| Total Split (%) | 44.2% | 44.2% | 44.2% | 44.2% | 44.2% | 14.2% | 41.7% | 41.7% | 14.2% | 41.7% | 41.7% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 39.6 | 39.6 | 39.6 | 39.6 | 39.6 | 11.2 | 34.3 | 34.3 | 11.7 | 34.8 | 34.8 |
| Actuated g/C Ratio | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.11 | 0.33 | 0.33 | 0.11 | 0.33 | 0.33 |
| v/c Ratio | 0.82 | 0.41 | 0.09 | 0.32 | 0.87 | 0.51 | 0.81 | 0.23 | 0.66 | 0.77 | 0.25 |
| Control Delay (s/veh) | 78.9 | 27.0 | 3.4 | 27.6 | 45.9 | 54.0 | 39.0 | 11.9 | 67.8 | 37.1 | 6.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 78.9 | 27.0 | 3.4 | 27.6 | 45.9 | 54.0 | 39.0 | 11.9 | 67.8 | 37.1 | 6.5 |
| LOS | E | C | A | C | D | D | D | B | E | D | A |
| Approach Delay (s/veh) | | 35.9 | | | 43.1 | | 38.2 | | | 36.4 | |
| Approach LOS | | D | | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 104.6 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 38.3 | Intersection LOS: D |
| Intersection Capacity Utilization 93.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

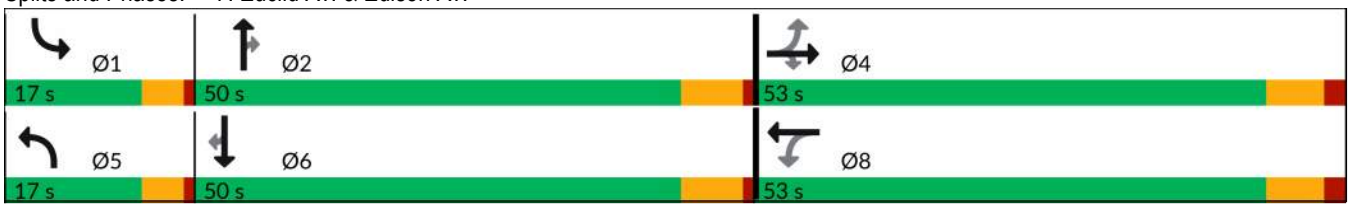

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 93 | 259 | 53 | 98 | 404 | 133 | 147 | 833 | 117 | 110 | 809 | 135 |
| Future Volume (veh/h) | 93 | 259 | 53 | 98 | 404 | 133 | 147 | 833 | 117 | 110 | 809 | 135 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 99 | 276 | 28 | 104 | 430 | 131 | 156 | 886 | 107 | 117 | 861 | 108 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 181 | 752 | 638 | 391 | 553 | 169 | 270 | 1050 | 468 | 145 | 1044 | 459 |
| Arrive On Green | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.09 | 0.31 | 0.31 | 0.09 | 0.31 | 0.31 |
| Sat Flow, veh/h | 802 | 1772 | 1502 | 1016 | 1303 | 397 | 2910 | 3367 | 1502 | 1594 | 3367 | 1481 |
| Grp Volume(v), veh/h | 99 | 276 | 28 | 104 | 0 | 561 | 156 | 886 | 107 | 117 | 861 | 108 |
| Grp Sat Flow(s),veh/h/ln | 802 | 1772 | 1502 | 1016 | 0 | 1700 | 1455 | 1683 | 1502 | 1594 | 1683 | 1481 |
| Q Serve(g_s), s | 12.9 | 11.3 | 1.2 | 8.3 | 0.0 | 30.2 | 5.5 | 26.2 | 5.6 | 7.7 | 25.3 | 5.8 |
| Cycle Q Clear(g_c), s | 43.1 | 11.3 | 1.2 | 19.6 | 0.0 | 30.2 | 5.5 | 26.2 | 5.6 | 7.7 | 25.3 | 5.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.23 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 181 | 752 | 638 | 391 | 0 | 722 | 270 | 1050 | 468 | 145 | 1044 | 459 |
| V/C Ratio(X) | 0.55 | 0.37 | 0.04 | 0.27 | 0.00 | 0.78 | 0.58 | 0.84 | 0.23 | 0.81 | 0.83 | 0.24 |
| Avail Cap(c_a), veh/h | 185 | 761 | 645 | 396 | 0 | 730 | 336 | 1374 | 613 | 184 | 1374 | 604 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.8 | 20.9 | 18.0 | 27.6 | 0.0 | 26.3 | 46.3 | 34.2 | 27.2 | 47.6 | 34.1 | 27.4 |
| Incr Delay (d2), s/veh | 3.2 | 0.3 | 0.0 | 0.4 | 0.0 | 5.3 | 0.7 | 3.9 | 0.2 | 14.8 | 3.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 4.5 | 0.4 | 2.0 | 0.0 | 12.3 | 1.9 | 10.4 | 1.9 | 3.5 | 10.0 | 1.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 48.1 | 21.2 | 18.0 | 27.9 | 0.0 | 31.6 | 47.1 | 38.1 | 27.4 | 62.3 | 37.3 | 27.6 |
| LnGrp LOS | D | C | B | C | | C | D | D | C | E | D | C |
| Approach Vol, veh/h | | 403 | | | 665 | | | 1149 | | | 1086 | |
| Approach Delay, s/veh | | 27.6 | | | 31.0 | | | 38.3 | | | 39.1 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 39.8 | | 52.5 | 14.6 | 39.5 | | 52.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 12.3 | 43.5 | | 45.8 | 12.3 | 43.5 | | 45.8 |
| Max Q Clear Time (g_c+I1), s | 9.7 | 28.2 | | 45.1 | 7.5 | 27.3 | | 32.2 |
| Green Ext Time (p_c), s | 0.0 | 5.1 | | 0.2 | 0.1 | 5.0 | | 3.3 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 35.8 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 59 | 120 | 114 | 95 | 277 | 125 | 789 | 110 | 153 | 762 | 36 |
| Future Volume (vph) | 59 | 120 | 114 | 95 | 277 | 125 | 789 | 110 | 153 | 762 | 36 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 29.6 | 13.6 | 28.3 | 28.3 | 14.6 | 29.3 | 29.3 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.15 | 0.31 | 0.31 | 0.16 | 0.32 | 0.32 |
| v/c Ratio | 0.42 | 0.23 | 0.21 | 0.28 | 0.80 | 0.57 | 0.77 | 0.23 | 0.65 | 0.76 | 0.07 |
| Control Delay (s/veh) | 35.8 | 24.9 | 5.5 | 26.9 | 39.6 | 51.7 | 35.9 | 12.0 | 53.6 | 34.8 | 0.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.8 | 24.9 | 5.5 | 26.9 | 39.6 | 51.7 | 35.9 | 12.0 | 53.6 | 34.8 | 0.3 |
| LOS | D | C | A | C | D | D | D | B | D | C | A |
| Approach Delay (s/veh) | | 19.6 | | | 37.3 | | 35.2 | | | 36.5 | |
| Approach LOS | | B | | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 92 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 34.4 | Intersection LOS: C |
| Intersection Capacity Utilization 86.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

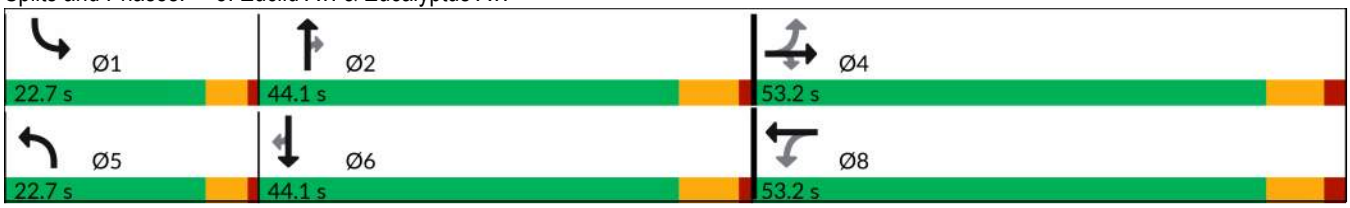

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 59 | 120 | 114 | 95 | 277 | 143 | 125 | 789 | 110 | 153 | 762 | 36 |
| Future Volume (veh/h) | 59 | 120 | 114 | 95 | 277 | 143 | 125 | 789 | 110 | 153 | 762 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 63 | 128 | 80 | 101 | 295 | 132 | 133 | 789 | 94 | 163 | 811 | 27 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 1.00 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 188 | 589 | 499 | 404 | 385 | 172 | 195 | 1022 | 456 | 200 | 1034 | 461 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.12 | 0.30 | 0.30 | 0.13 | 0.31 | 0.31 |
| Sat Flow, veh/h | 907 | 1772 | 1502 | 1109 | 1160 | 519 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 63 | 128 | 80 | 101 | 0 | 427 | 133 | 789 | 94 | 163 | 811 | 27 |
| Grp Sat Flow(s),veh/h/ln | 907 | 1772 | 1502 | 1109 | 0 | 1679 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 5.2 | 4.0 | 2.9 | 5.6 | 0.0 | 17.6 | 6.2 | 16.4 | 3.6 | 7.7 | 17.0 | 1.0 |
| Cycle Q Clear(g_c), s | 22.7 | 4.0 | 2.9 | 9.6 | 0.0 | 17.6 | 6.2 | 16.4 | 3.6 | 7.7 | 17.0 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.31 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 188 | 589 | 499 | 404 | 0 | 558 | 195 | 1022 | 456 | 200 | 1034 | 461 |
| V/C Ratio(X) | 0.34 | 0.22 | 0.16 | 0.25 | 0.00 | 0.77 | 0.68 | 0.77 | 0.21 | 0.81 | 0.78 | 0.06 |
| Avail Cap(c_a), veh/h | 428 | 1057 | 896 | 697 | 0 | 1001 | 372 | 1641 | 732 | 372 | 1641 | 732 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.2 | 18.5 | 18.2 | 22.0 | 0.0 | 23.1 | 32.4 | 24.4 | 20.0 | 32.8 | 24.4 | 18.9 |
| Incr Delay (d2), s/veh | 0.8 | 0.1 | 0.1 | 0.2 | 0.0 | 1.7 | 3.1 | 1.3 | 0.2 | 5.9 | 1.4 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 1.5 | 0.9 | 1.3 | 0.0 | 6.3 | 2.3 | 5.8 | 1.1 | 3.0 | 6.0 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.0 | 18.7 | 18.3 | 22.2 | 0.0 | 24.7 | 35.5 | 25.7 | 20.2 | 38.7 | 25.7 | 18.9 |
| LnGrp LOS | C | B | B | C | | C | D | C | C | D | C | B |
| Approach Vol, veh/h | | 271 | | | 528 | | | 1016 | | | 1001 | |
| Approach Delay, s/veh | | 22.1 | | | 24.3 | | | 26.5 | | | 27.7 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 29.9 | | 32.8 | 14.1 | 30.2 | | 32.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 9.7 | 18.4 | | 24.7 | 8.2 | 19.0 | | 19.6 |
| Green Ext Time (p_c), s | 0.2 | 4.8 | | 0.9 | 0.1 | 4.7 | | 2.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 26.1 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 7 | 3 | 83 | 26 | 29 | 1162 | 127 | 179 | 889 |
| Future Volume (vph) | 7 | 3 | 83 | 26 | 29 | 1162 | 127 | 179 | 889 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.8 | 50.8 | 22.0 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.3% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 20.3 | | 28.3 | 10.1 | 44.7 | 44.7 | 16.5 | 57.6 |
| Actuated g/C Ratio | | 0.19 | | 0.26 | 0.09 | 0.41 | 0.41 | 0.15 | 0.53 |
| v/c Ratio | | 0.08 | | 0.91 | 0.22 | 0.96 | 0.22 | 0.85 | 0.60 |
| Control Delay (s/veh) | | 21.8 | | 53.2 | 53.2 | 49.7 | 7.0 | 76.8 | 22.3 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 21.8 | | 53.2 | 53.2 | 49.7 | 7.0 | 76.8 | 22.3 |
| LOS | | C | | D | D | D | A | E | C |
| Approach Delay (s/veh) | | 21.8 | | 53.2 | | 45.6 | | | 31.2 |
| Approach LOS | | C | | D | | D | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 108 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.96 | |
| Intersection Signal Delay (s/veh): 40.7 | Intersection LOS: D |
| Intersection Capacity Utilization 89.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

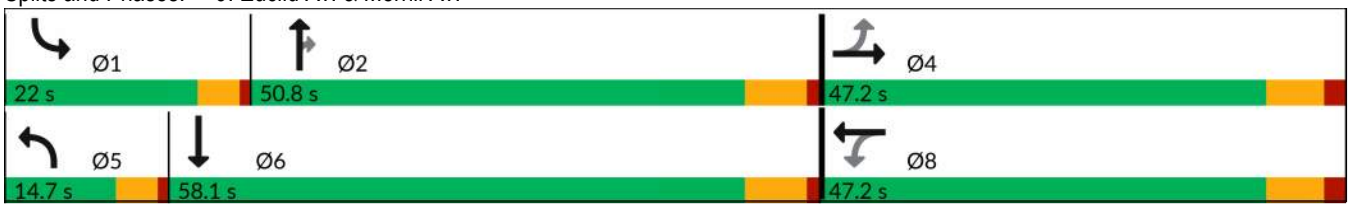

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 7 | 3 | 8 | 83 | 26 | 247 | 29 | 1162 | 127 | 179 | 889 | 36 |
| Future Volume (veh/h) | 7 | 3 | 8 | 83 | 26 | 247 | 29 | 1162 | 127 | 179 | 889 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 8 | 3 | 6 | 95 | 30 | 268 | 33 | 1336 | 141 | 206 | 1022 | 30 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 160 | 64 | 97 | 133 | 47 | 300 | 91 | 1332 | 591 | 231 | 1612 | 47 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.06 | 0.40 | 0.40 | 0.14 | 0.48 | 0.48 |
| Sat Flow, veh/h | 384 | 217 | 328 | 314 | 160 | 1015 | 1594 | 3367 | 1494 | 1594 | 3336 | 98 |
| Grp Volume(v), veh/h | 17 | 0 | 0 | 393 | 0 | 0 | 33 | 1336 | 141 | 206 | 516 | 536 |
| Grp Sat Flow(s),veh/h/ln | 928 | 0 | 0 | 1489 | 0 | 0 | 1594 | 1683 | 1494 | 1594 | 1683 | 1751 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 24.2 | 0.0 | 0.0 | 2.2 | 44.3 | 7.0 | 14.2 | 25.5 | 25.6 |
| Cycle Q Clear(g_c), s | 0.8 | 0.0 | 0.0 | 28.3 | 0.0 | 0.0 | 2.2 | 44.3 | 7.0 | 14.2 | 25.5 | 25.6 |
| Prop In Lane | 0.47 | | 0.35 | 0.24 | | 0.68 | 1.00 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 321 | 0 | 0 | 479 | 0 | 0 | 91 | 1332 | 591 | 231 | 813 | 846 |
| V/C Ratio(X) | 0.05 | 0.00 | 0.00 | 0.82 | 0.00 | 0.00 | 0.36 | 1.00 | 0.24 | 0.89 | 0.63 | 0.63 |
| Avail Cap(c_a), veh/h | 402 | 0 | 0 | 571 | 0 | 0 | 142 | 1332 | 591 | 246 | 813 | 846 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.1 | 0.0 | 0.0 | 37.7 | 0.0 | 0.0 | 50.8 | 33.8 | 22.6 | 47.0 | 21.5 | 21.5 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 6.7 | 0.0 | 0.0 | 0.9 | 25.3 | 0.2 | 28.5 | 1.6 | 1.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 0.9 | 21.0 | 2.3 | 7.2 | 9.3 | 9.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.1 | 0.0 | 0.0 | 44.4 | 0.0 | 0.0 | 51.7 | 59.2 | 22.8 | 75.5 | 23.2 | 23.1 |
| LnGrp LOS | C | | | D | | | D | F | C | E | C | C |
| Approach Vol, veh/h | | 17 | | | 393 | | | 1510 | | | 1258 | |
| Approach Delay, s/veh | | 28.1 | | | 44.4 | | | 55.6 | | | 31.7 | |
| Approach LOS | | C | | | D | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.9 | 50.8 | | 40.2 | 11.1 | 60.6 | | 40.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.3 | 44.3 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 16.2 | 46.3 | | 2.8 | 4.2 | 27.6 | | 30.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 6.2 | | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 44.6 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 176 | 336 | 70 | 57 | 849 | 344 | 139 | 589 | 46 | 210 | 574 | 221 |
| Future Volume (vph) | 176 | 336 | 70 | 57 | 849 | 344 | 139 | 589 | 46 | 210 | 574 | 221 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 34.6 | 14.7 | 17.5 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 28.8% | 12.3% | 14.6% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.2 | 37.5 | 37.5 | 10.2 | 33.8 | 33.8 | 10.2 | 23.6 | 35.6 | 11.9 | 25.3 | 42.1 |
| Actuated g/C Ratio | 0.10 | 0.36 | 0.36 | 0.10 | 0.33 | 0.33 | 0.10 | 0.23 | 0.35 | 0.12 | 0.25 | 0.41 |
| v/c Ratio | 0.65 | 0.29 | 0.12 | 0.38 | 0.81 | 0.55 | 0.94 | 0.81 | 0.08 | 0.67 | 0.73 | 0.35 |
| Control Delay (s/veh) | 59.2 | 25.6 | 1.5 | 56.2 | 38.4 | 11.8 | 106.7 | 47.6 | 1.9 | 56.6 | 42.2 | 16.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 59.2 | 25.6 | 1.5 | 56.2 | 38.4 | 11.8 | 106.7 | 47.6 | 1.9 | 56.6 | 42.2 | 16.0 |
| LOS | E | C | A | E | D | B | F | D | A | E | D | B |
| Approach Delay (s/veh) | | 32.8 | | | 31.9 | | | 55.5 | | | 39.4 | |
| Approach LOS | | C | | | C | | | E | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 103 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay (s/veh): 39.2 | Intersection LOS: D |
| Intersection Capacity Utilization 77.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

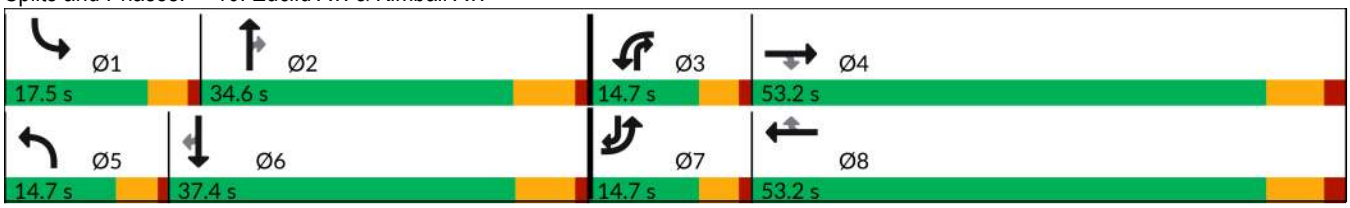

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 176 | 336 | 70 | 57 | 849 | 344 | 139 | 589 | 46 | 210 | 574 | 221 |
| Future Volume (veh/h) | 176 | 336 | 70 | 57 | 849 | 344 | 139 | 589 | 46 | 210 | 574 | 221 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 185 | 354 | 58 | 60 | 894 | 185 | 146 | 620 | 27 | 221 | 604 | 180 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 309 | 1123 | 501 | 135 | 1050 | 462 | 171 | 765 | 464 | 311 | 764 | 500 |
| Arrive On Green | 0.11 | 0.33 | 0.33 | 0.08 | 0.31 | 0.31 | 0.11 | 0.23 | 0.23 | 0.11 | 0.23 | 0.23 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 1594 | 3367 | 1483 | 1594 | 3367 | 1482 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 185 | 354 | 58 | 60 | 894 | 185 | 146 | 620 | 27 | 221 | 604 | 180 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1594 | 1683 | 1483 | 1594 | 1683 | 1482 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 5.7 | 7.3 | 2.5 | 3.3 | 23.2 | 9.2 | 8.4 | 16.3 | 1.2 | 6.8 | 15.8 | 8.5 |
| Cycle Q Clear(g_c), s | 5.7 | 7.3 | 2.5 | 3.3 | 23.2 | 9.2 | 8.4 | 16.3 | 1.2 | 6.8 | 15.8 | 8.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 309 | 1123 | 501 | 135 | 1050 | 462 | 171 | 765 | 464 | 311 | 764 | 500 |
| V/C Ratio(X) | 0.60 | 0.32 | 0.12 | 0.45 | 0.85 | 0.40 | 0.85 | 0.81 | 0.06 | 0.71 | 0.79 | 0.36 |
| Avail Cap(c_a), veh/h | 312 | 1660 | 741 | 171 | 1660 | 731 | 171 | 1014 | 574 | 399 | 1119 | 659 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.8 | 23.1 | 21.5 | 40.6 | 30.1 | 25.2 | 40.9 | 34.1 | 22.5 | 40.3 | 34.0 | 23.6 |
| Incr Delay (d2), s/veh | 2.1 | 0.2 | 0.1 | 2.3 | 1.5 | 0.2 | 30.8 | 3.8 | 0.1 | 2.5 | 2.4 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 2.7 | 0.8 | 1.3 | 8.7 | 3.0 | 4.5 | 6.5 | 0.4 | 2.4 | 6.2 | 2.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 41.9 | 23.3 | 21.6 | 42.9 | 31.5 | 25.4 | 71.7 | 37.9 | 22.5 | 42.7 | 36.4 | 24.0 |
| LnGrp LOS | D | C | C | D | C | C | E | D | C | D | D | C |
| Approach Vol, veh/h | | 597 | | | 1139 | | | 793 | | | 1005 | |
| Approach Delay, s/veh | | 28.9 | | | 31.1 | | | 43.6 | | | 35.6 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 27.7 | 12.6 | 38.3 | 14.7 | 27.7 | 14.6 | 36.3 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 12.8 | 28.1 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 8.8 | 18.3 | 5.3 | 9.3 | 10.4 | 17.8 | 7.7 | 25.2 |
| Green Ext Time (p_c), s | 0.1 | 2.6 | 0.0 | 2.3 | 0.0 | 3.4 | 0.1 | 3.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 34.8 |
| HCM 7th LOS | C |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 23 | 207 | 994 | 411 | 74 | 451 | 599 | 90 | 527 |
| Future Volume (vph) | 23 | 207 | 994 | 411 | 74 | 451 | 599 | 90 | 527 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 20.0 | 48.0 | 52.3 | 14.8 | 37.2 | 48.0 | 14.8 | 37.2 |
| Total Split (%) | 13.1% | 16.7% | 40.0% | 43.6% | 12.3% | 31.0% | 40.0% | 12.3% | 31.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 13.0 | 42.4 | 52.1 | 10.1 | 23.7 | 72.6 | 10.1 | 26.9 |
| Actuated g/C Ratio | 0.09 | 0.11 | 0.37 | 0.46 | 0.09 | 0.21 | 0.64 | 0.09 | 0.24 |
| v/c Ratio | 0.17 | 1.24 | 0.95 | 0.60 | 0.54 | 0.66 | 0.61 | 0.66 | 0.77 |
| Control Delay (s/veh) | 53.2 | 183.7 | 52.7 | 29.7 | 66.1 | 45.7 | 11.2 | 74.1 | 47.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.2 | 183.7 | 52.7 | 29.7 | 66.1 | 45.7 | 11.2 | 74.1 | 47.6 |
| LOS | D | F | D | C | E | D | B | E | D |
| Approach Delay (s/veh) | | 172.4 | | 45.4 | | 28.6 | | | 51.1 |
| Approach LOS | | F | | D | | C | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.24 | |
| Intersection Signal Delay (s/veh): 50.8 | Intersection LOS: D |
| Intersection Capacity Utilization 93.5% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

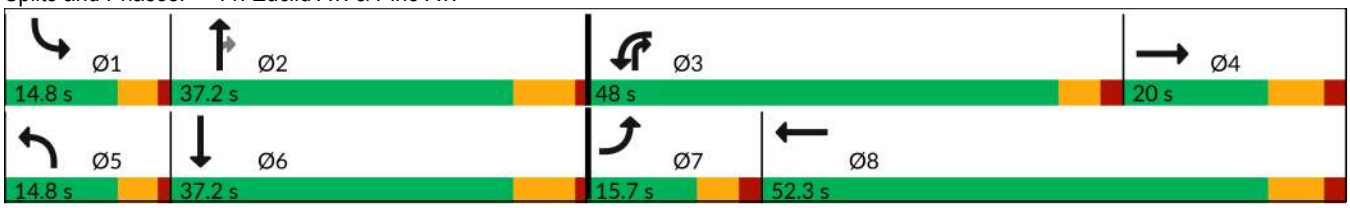

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 23 | 207 | 38 | 994 | 411 | 53 | 74 | 451 | 599 | 90 | 527 | 66 |
| Future Volume (veh/h) | 23 | 207 | 38 | 994 | 411 | 53 | 74 | 451 | 599 | 90 | 527 | 66 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 24 | 213 | 0 | 1025 | 424 | 52 | 76 | 465 | 542 | 93 | 543 | 62 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 74 | 196 | | 1045 | 655 | 80 | 124 | 831 | 910 | 129 | 761 | 87 |
| Arrive On Green | 0.05 | 0.11 | 0.00 | 0.36 | 0.42 | 0.42 | 0.08 | 0.25 | 0.25 | 0.08 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1594 | 1772 | 0 | 2910 | 1548 | 190 | 1594 | 3367 | 1502 | 1594 | 3046 | 347 |
| Grp Volume(v), veh/h | 24 | 213 | 0 | 1025 | 0 | 476 | 76 | 465 | 542 | 93 | 299 | 306 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 0 | 1455 | 0 | 1738 | 1594 | 1683 | 1502 | 1594 | 1683 | 1709 |
| Q Serve(g_s), s | 1.7 | 13.0 | 0.0 | 41.1 | 0.0 | 25.6 | 5.4 | 14.2 | 26.2 | 6.7 | 19.1 | 19.2 |
| Cycle Q Clear(g_c), s | 1.7 | 13.0 | 0.0 | 41.1 | 0.0 | 25.6 | 5.4 | 14.2 | 26.2 | 6.7 | 19.1 | 19.2 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.11 | 1.00 | | 1.00 | 1.00 | | 0.20 |
| Lane Grp Cap(c), veh/h | 74 | 196 | | 1045 | 0 | 735 | 124 | 831 | 910 | 129 | 421 | 427 |
| V/C Ratio(X) | 0.33 | 1.09 | | 0.98 | 0.00 | 0.65 | 0.61 | 0.56 | 0.60 | 0.72 | 0.71 | 0.72 |
| Avail Cap(c_a), veh/h | 135 | 196 | | 1045 | 0 | 735 | 137 | 877 | 930 | 137 | 439 | 445 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.4 | 52.4 | 0.0 | 37.4 | 0.0 | 27.0 | 52.6 | 38.8 | 14.3 | 52.9 | 40.3 | 40.4 |
| Incr Delay (d2), s/veh | 0.9 | 90.2 | 0.0 | 23.1 | 0.0 | 2.3 | 4.1 | 0.4 | 0.7 | 13.5 | 4.3 | 4.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 10.5 | 0.0 | 17.0 | 0.0 | 10.4 | 2.2 | 5.6 | 7.9 | 3.1 | 8.0 | 8.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 55.4 | 142.6 | 0.0 | 60.5 | 0.0 | 29.3 | 56.7 | 39.1 | 15.0 | 66.4 | 44.6 | 44.7 |
| LnGrp LOS | E | F | | E | | C | E | D | B | E | D | D |
| Approach Vol, veh/h | | 237 | | | 1501 | | | 1083 | | | 698 | |
| Approach Delay, s/veh | | 133.8 | | | 50.6 | | | 28.3 | | | 47.5 | |
| Approach LOS | | F | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.2 | 35.6 | 48.0 | 20.0 | 13.9 | 35.9 | 11.1 | 56.9 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.1 | 30.7 | 42.3 | 13.0 | 10.1 | 30.7 | 10.0 | 45.3 |
| Max Q Clear Time (g_c+I1), s | 8.7 | 28.2 | 43.1 | 15.0 | 7.4 | 21.2 | 3.7 | 27.6 |
| Green Ext Time (p_c), s | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 3.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 48.7 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 620 | 666 | 865 | 48 | 586 |
| Future Volume (vph) | 620 | 666 | 865 | 48 | 586 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 14.5 | 9.6 | 9.6 |
| Total Split (s) | 35.7 | 46.2 | 81.9 | 18.1 | 18.1 |
| Total Split (%) | 35.7% | 46.2% | 81.9% | 18.1% | 18.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 29.2 | 44.8 | 78.7 | 10.2 | 10.2 |
| Actuated g/C Ratio | 0.29 | 0.45 | 0.79 | 0.10 | 0.10 |
| v/c Ratio | 0.97 | 1.06 | 0.37 | 0.18 | 0.89 |
| Control Delay (s/veh) | 53.2 | 78.8 | 3.9 | 41.3 | 18.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.2 | 78.8 | 3.9 | 41.3 | 18.6 |
| LOS | D | E | A | D | B |
| Approach Delay (s/veh) | 53.2 | | 36.5 | 20.3 | |
| Approach LOS | D | | D | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.06 | |
| Intersection Signal Delay (s/veh): 37.7 | Intersection LOS: D |
| Intersection Capacity Utilization 84.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

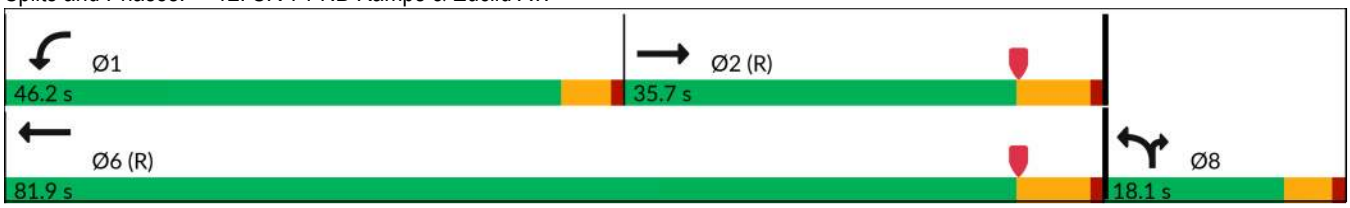

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 620 | 223 | 666 | 865 | 48 | 586 |
| Future Volume (veh/h) | 620 | 223 | 666 | 865 | 48 | 586 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1673 | 1772 | 1575 | 1772 |
| Adj Flow Rate, veh/h | 697 | 0 | 748 | 972 | 54 | 0 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1307 | | 661 | 2862 | 113 | |
| Arrive On Green | 0.78 | 0.00 | 0.41 | 0.85 | 0.04 | 0.00 |
| Sat Flow, veh/h | 3544 | 0 | 1594 | 3455 | 2910 | 1502 |
| Grp Volume(v), veh/h | 697 | 0 | 748 | 972 | 54 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1683 | 0 | 1594 | 1683 | 1455 | 1502 |
| Q Serve(g_s), s | 7.9 | 0.0 | 41.5 | 6.1 | 1.8 | 0.0 |
| Cycle Q Clear(g_c), s | 7.9 | 0.0 | 41.5 | 6.1 | 1.8 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1307 | | 661 | 2862 | 113 | |
| V/C Ratio(X) | 0.53 | | 1.13 | 0.34 | 0.48 | |
| Avail Cap(c_a), veh/h | 1307 | | 661 | 2862 | 393 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.57 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.7 | 0.0 | 29.3 | 1.6 | 47.1 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 76.9 | 0.3 | 3.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 0.0 | 27.9 | 0.2 | 0.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 8.6 | 0.0 | 106.2 | 1.9 | 50.2 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 697 | | | 1720 | 54 | |
| Approach Delay, s/veh | 8.6 | | | 47.2 | 50.2 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 46.2 | 45.3 | | | | 91.5 | 8.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 41.5 | 29.2 | | | | 75.4 | 13.5 |
| Max Q Clear Time (g_c+I1), s | 43.5 | 9.9 | | | | 8.1 | 3.8 |
| Green Ext Time (p_c), s | 0.0 | 3.2 | | | | 5.5 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 36.4 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 566 | 171 | 272 | 49 | 250 | 519 | 40 | 41 |
| Future Volume (vph) | 566 | 171 | 272 | 49 | 250 | 519 | 40 | 41 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 13.5 | 13.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 29.6 | 19.0 | 48.6 | 16.6 | 16.6 | 34.8 | 34.8 | 34.8 |
| Total Split (%) | 29.6% | 19.0% | 48.6% | 16.6% | 16.6% | 34.8% | 34.8% | 34.8% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 28.4 | 14.8 | 48.0 | 9.3 | 9.3 | 25.2 | 25.2 | 25.2 |
| Actuated g/C Ratio | 0.28 | 0.15 | 0.48 | 0.09 | 0.09 | 0.25 | 0.25 | 0.25 |
| v/c Ratio | 0.72 | 0.83 | 0.19 | 0.38 | 0.73 | 0.84 | 0.79 | 0.10 |
| Control Delay (s/veh) | 38.9 | 65.8 | 13.9 | 50.0 | 18.2 | 55.0 | 49.2 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.9 | 65.8 | 13.9 | 50.0 | 18.2 | 55.0 | 49.2 | 0.4 |
| LOS | D | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 38.9 | | 33.9 | | | | 48.5 | |
| Approach LOS | D | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 38.4 | Intersection LOS: D |
| Intersection Capacity Utilization 65.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

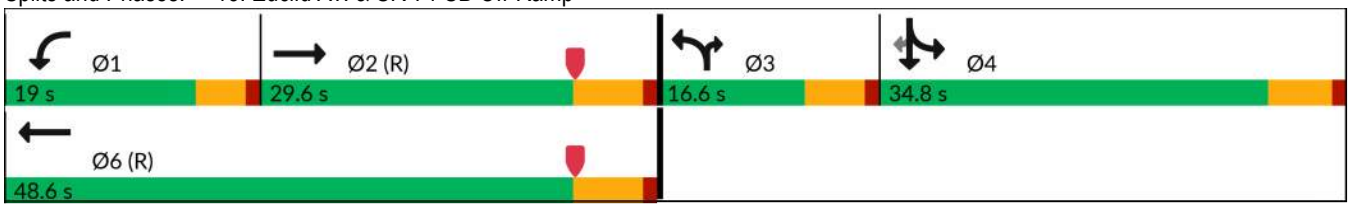

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 566 | 36 | 171 | 272 | 0 | 49 | 0 | 250 | 519 | 40 | 41 |
| Future Volume (veh/h) | 0 | 566 | 36 | 171 | 272 | 0 | 49 | 0 | 250 | 519 | 40 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 0 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 643 | 27 | 194 | 309 | 0 | 56 | 0 | 164 | 626 | 0 | 23 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.80 | 0.88 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1556 | 65 | 218 | 2209 | | 0 | 0 | 0 | 713 | 0 | 336 |
| Arrive On Green | 0.00 | 0.47 | 0.47 | 0.27 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.22 |
| Sat Flow, veh/h | 0 | 3381 | 138 | 1594 | 3455 | 0 | | 0 | | 3188 | 0 | 1500 |
| Grp Volume(v), veh/h | 0 | 329 | 341 | 194 | 309 | 0 | | 0.0 | | 626 | 0 | 23 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1683 | 1747 | 1594 | 1683 | 0 | | | | 1594 | 0 | 1500 |
| Q Serve(g_s), s | 0.0 | 12.8 | 12.8 | 11.7 | 0.0 | 0.0 | | | | 19.0 | 0.0 | 1.2 |
| Cycle Q Clear(g_c), s | 0.0 | 12.8 | 12.8 | 11.7 | 0.0 | 0.0 | | | | 19.0 | 0.0 | 1.2 |
| Prop In Lane | 0.00 | | 0.08 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 796 | 826 | 218 | 2209 | | | | | 713 | 0 | 336 |
| V/C Ratio(X) | 0.00 | 0.41 | 0.41 | 0.89 | 0.14 | | | | | 0.88 | 0.00 | 0.07 |
| Avail Cap(c_a), veh/h | 0 | 796 | 826 | 228 | 2209 | | | | | 924 | 0 | 435 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.94 | 0.94 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 17.3 | 17.3 | 35.6 | 0.0 | 0.0 | | | | 37.5 | 0.0 | 30.6 |
| Incr Delay (d2), s/veh | 0.0 | 1.6 | 1.5 | 29.1 | 0.1 | 0.0 | | | | 7.3 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 4.9 | 5.1 | 5.5 | 0.0 | 0.0 | | | | 8.0 | 0.0 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 18.9 | 18.8 | 64.7 | 0.1 | 0.0 | | | | 44.8 | 0.0 | 30.7 |
| LnGrp LOS | | B | B | E | A | | | | | D | | C |
| Approach Vol, veh/h | | 670 | | | 503 | | | | | | 649 | |
| Approach Delay, s/veh | | 18.8 | | | 25.0 | | | | | | 44.3 | |
| Approach LOS | | B | | | C | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.4 | 53.5 | | 28.2 | | 71.8 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 14.3 | 23.4 | | 29.0 | | 42.4 |
| Max Q Clear Time (g_c+I1), s | 13.7 | 14.8 | | 21.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.6 | | 1.3 | | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 7.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 93 | 673 | 33 | 74 | 811 | 50 | 29 | 36 | 78 | 7 | 21 | 74 |
| Future Vol, veh/h | 93 | 673 | 33 | 74 | 811 | 50 | 29 | 36 | 78 | 7 | 21 | 74 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 106 | 765 | 38 | 84 | 922 | 57 | 33 | 41 | 89 | 8 | 24 | 84 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 981 | 0 | 0 | 802 | 0 | 0 | 1636 | 2144 | 784 | 2118 | 2135 | 492 |
| Stage 1 | - | - | - | - | - | - | 995 | 995 | - | 1121 | 1121 | - |
| Stage 2 | - | - | - | - | - | - | 641 | 1150 | - | 997 | 1014 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 701 | - | - | 819 | - | - | 73 | 48 | 393 | 32 | 49 | 523 |
| Stage 1 | - | - | - | - | - | - | 294 | 322 | - | 220 | 281 | - |
| Stage 2 | - | - | - | - | - | - | 430 | 272 | - | 293 | 315 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 699 | - | - | 819 | - | - | 41 | ~ 37 | 393 | 14 | 37 | 522 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 147 | 120 | - | 70 | 144 | - |
| Stage 1 | - | - | - | - | - | - | 250 | 273 | - | 197 | 251 | - |
| Stage 2 | - | - | - | - | - | - | 293 | 243 | - | 164 | 268 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.29 | 0.78 | 67.63 | 28.99 |
| HCM LOS | | | F | D |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 205 | 699 | - | - | 819 | - | - | 263 |
| HCM Lane V/C Ratio | 0.792 | 0.151 | - | - | 0.103 | - | - | 0.44 |
| HCM Control Delay (s/veh) | 67.6 | 11.1 | - | - | 9.9 | - | - | 29 |
| HCM Lane LOS | F | B | - | - | A | - | - | D |
| HCM 95th %tile Q(veh) | 5.6 | 0.5 | - | - | 0.3 | - | - | 2.1 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.7 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 34 | 102 | 18 | 12 | 178 | 16 | 43 | 171 | 15 | 7 | 91 | 52 |
| Future Vol, veh/h | 34 | 102 | 18 | 12 | 178 | 16 | 43 | 171 | 15 | 7 | 91 | 52 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 37 | 111 | 20 | 13 | 193 | 17 | 47 | 186 | 16 | 8 | 99 | 57 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 10.2 | 10.9 | 11.3 | 9.8 |
| HCM LOS | B | B | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 19% | 22% | 6% | 5% |
| Vol Thru, % | 75% | 66% | 86% | 61% |
| Vol Right, % | 7% | 12% | 8% | 35% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 229 | 154 | 206 | 150 |
| LT Vol | 43 | 34 | 12 | 7 |
| Through Vol | 171 | 102 | 178 | 91 |
| RT Vol | 15 | 18 | 16 | 52 |
| Lane Flow Rate | 249 | 167 | 224 | 163 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.363 | 0.25 | 0.328 | 0.235 |
| Departure Headway (Hd) | 5.251 | 5.373 | 5.274 | 5.196 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 685 | 668 | 683 | 691 |
| Service Time | 3.282 | 3.407 | 3.306 | 3.232 |
| HCM Lane V/C Ratio | 0.364 | 0.25 | 0.328 | 0.236 |
| HCM Control Delay, s/veh | 11.3 | 10.2 | 10.9 | 9.8 |
| HCM Lane LOS | B | B | B | A |
| HCM 95th-tile Q | 1.7 | 1 | 1.4 | 0.9 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 60 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 75 | 327 | 67 | 5 | 514 | 23 | 110 | 146 | 7 | 18 | 53 | 58 |
| Future Vol, veh/h | 75 | 327 | 67 | 5 | 514 | 23 | 110 | 146 | 7 | 18 | 53 | 58 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 80 | 348 | 71 | 5 | 547 | 24 | 117 | 155 | 7 | 19 | 56 | 62 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/ve | 53.8 | 94.1 | 22.8 | 15.5 |
| HCM LOS | F | F | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 42% | 16% | 1% | 14% |
| Vol Thru, % | 56% | 70% | 95% | 41% |
| Vol Right, % | 3% | 14% | 4% | 45% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 263 | 469 | 542 | 129 |
| LT Vol | 110 | 75 | 5 | 18 |
| Through Vol | 146 | 327 | 514 | 53 |
| RT Vol | 7 | 67 | 23 | 58 |
| Lane Flow Rate | 280 | 499 | 577 | 137 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.604 | 0.944 | 1.097 | 0.312 |
| Departure Headway (Hd) | 8.138 | 7.095 | 6.848 | 8.608 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 448 | 514 | 530 | 420 |
| Service Time | 6.138 | 5.095 | 4.91 | 6.608 |
| HCM Lane V/C Ratio | 0.625 | 0.971 | 1.089 | 0.326 |
| HCM Control Delay, s/veh | 22.8 | 53.8 | 94.1 | 15.5 |
| HCM Lane LOS | C | F | F | C |
| HCM 95th-tile Q | 3.9 | 11.7 | 18.1 | 1.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.4 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 27 | 125 | 7 | 4 | 82 | 20 | 20 | 27 | 5 | 25 | 31 | 22 |
| Future Vol, veh/h | 27 | 125 | 7 | 4 | 82 | 20 | 20 | 27 | 5 | 25 | 31 | 22 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 31 | 142 | 8 | 5 | 93 | 23 | 23 | 31 | 6 | 28 | 35 | 25 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 8.7 | 8.2 | 8.2 | 8.2 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 38% | 17% | 4% | 32% |
| Vol Thru, % | 52% | 79% | 77% | 40% |
| Vol Right, % | 10% | 4% | 19% | 28% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 52 | 159 | 106 | 78 |
| LT Vol | 20 | 27 | 4 | 25 |
| Through Vol | 27 | 125 | 82 | 31 |
| RT Vol | 5 | 7 | 20 | 22 |
| Lane Flow Rate | 59 | 181 | 120 | 89 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.078 | 0.222 | 0.147 | 0.113 |
| Departure Headway (Hd) | 4.74 | 4.425 | 4.379 | 4.581 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 756 | 813 | 820 | 783 |
| Service Time | 2.77 | 2.446 | 2.401 | 2.609 |
| HCM Lane V/C Ratio | 0.078 | 0.223 | 0.146 | 0.114 |
| HCM Control Delay, s/veh | 8.2 | 8.7 | 8.2 | 8.2 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.3 | 0.8 | 0.5 | 0.4 |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 5 | 432 | 317 | 1027 | 673 | 491 |
| Future Volume (vph) | 5 | 432 | 317 | 1027 | 673 | 491 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 29.0 | 29.0 | 30.0 | 61.0 | 31.0 | 31.0 |
| Total Split (%) | 32.2% | 32.2% | 33.3% | 67.8% | 34.4% | 34.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 24.4 | 24.4 | 21.8 | 54.0 | 26.4 | 26.4 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.24 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 0.40 | 0.96 | 0.88 | 0.54 | 0.73 | 0.65 |
| Control Delay (s/veh) | 30.5 | 58.8 | 47.7 | 17.6 | 34.1 | 6.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.5 | 58.8 | 47.7 | 18.3 | 34.1 | 6.7 |
| LOS | C | E | D | B | C | A |
| Approach Delay (s/veh) | 50.8 | | | 25.2 | 22.5 | |
| Approach LOS | D | | | C | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 71 (79%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.96 | |
| Intersection Signal Delay (s/veh): 29.2 | Intersection LOS: C |
| Intersection Capacity Utilization 94.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

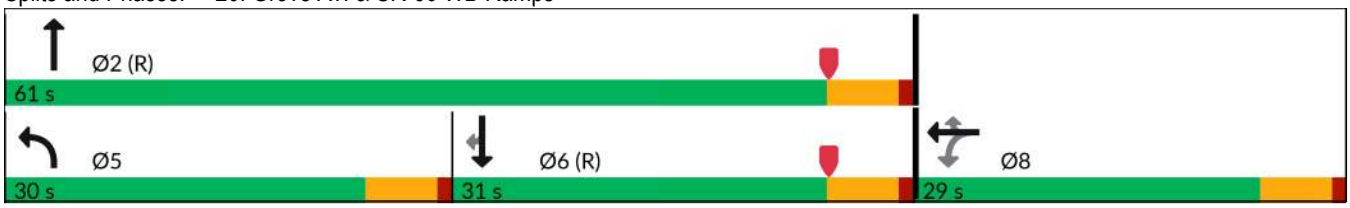

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 166 | 5 | 432 | 317 | 1027 | 0 | 0 | 673 | 491 |
| Future Volume (veh/h) | 0 | 0 | 0 | 166 | 5 | 432 | 317 | 1027 | 0 | 0 | 673 | 491 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 177 | 5 | 316 | 337 | 1093 | 0 | 0 | 716 | 377 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 382 | 11 | 349 | 368 | 2150 | 0 | 0 | 1157 | 516 |
| Arrive On Green | | | | 0.23 | 0.23 | 0.23 | 0.23 | 0.64 | 0.00 | 0.00 | 0.34 | 0.34 |
| Sat Flow, veh/h | | | | 1643 | 46 | 1502 | 1594 | 3455 | 0 | 0 | 3455 | 1502 |
| Grp Volume(v), veh/h | | | | 182 | 0 | 316 | 337 | 1093 | 0 | 0 | 716 | 377 |
| Grp Sat Flow(s),veh/h/ln | | | | 1690 | 0 | 1502 | 1594 | 1683 | 0 | 0 | 1683 | 1502 |
| Q Serve(g_s), s | | | | 8.3 | 0.0 | 18.4 | 18.6 | 15.6 | 0.0 | 0.0 | 16.0 | 19.8 |
| Cycle Q Clear(g_c), s | | | | 8.3 | 0.0 | 18.4 | 18.6 | 15.6 | 0.0 | 0.0 | 16.0 | 19.8 |
| Prop In Lane | | | | 0.97 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 393 | 0 | 349 | 368 | 2150 | 0 | 0 | 1157 | 516 |
| V/C Ratio(X) | | | | 0.46 | 0.00 | 0.91 | 0.92 | 0.51 | 0.00 | 0.00 | 0.62 | 0.73 |
| Avail Cap(c_a), veh/h | | | | 436 | 0 | 387 | 429 | 2150 | 0 | 0 | 1157 | 516 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 29.7 | 0.0 | 33.6 | 33.8 | 8.7 | 0.0 | 0.0 | 24.6 | 25.9 |
| Incr Delay (d2), s/veh | | | | 0.6 | 0.0 | 22.4 | 2.7 | 0.1 | 0.0 | 0.0 | 2.5 | 8.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 3.3 | 0.0 | 8.4 | 7.0 | 4.5 | 0.0 | 0.0 | 6.2 | 7.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 30.3 | 0.0 | 56.0 | 36.5 | 8.8 | 0.0 | 0.0 | 27.1 | 34.7 |
| LnGrp LOS | | | | C | | E | D | A | | | C | C |
| Approach Vol, veh/h | | | | | 498 | | | 1430 | | | 1093 | |
| Approach Delay, s/veh | | | | | 46.6 | | | 15.3 | | | 29.7 | |
| Approach LOS | | | | | D | | | B | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 63.3 | | 26.6 | 36.7 | | 26.7 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 55.2 | | 24.2 | 25.2 | | 23.2 |
| Max Q Clear Time (g_c+I1), s | 17.6 | | 20.6 | 21.8 | | 20.4 |
| Green Ext Time (p_c), s | 7.0 | | 0.2 | 1.6 | | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.7 |
| HCM 7th LOS | C |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 2 | 127 | 894 | 291 | 542 |
| Future Volume (vph) | 2 | 127 | 894 | 291 | 542 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 37.2 | 19.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 41.3% | 21.1% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 26.2 | 26.2 | 32.2 | 14.0 | 51.2 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.36 | 0.16 | 0.57 |
| v/c Ratio | 0.94 | 0.25 | 1.05 | 1.23 | 0.30 |
| Control Delay (s/veh) | 61.5 | 5.8 | 69.3 | 162.0 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.5 | 5.8 | 69.3 | 162.0 | 3.3 |
| LOS | E | A | E | F | A |
| Approach Delay (s/veh) | 49.1 | | 69.3 | | 58.7 |
| Approach LOS | D | | E | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.23 | |
| Intersection Signal Delay (s/veh): 61.5 | Intersection LOS: E |
| Intersection Capacity Utilization 94.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 441 | 2 | 127 | 0 | 0 | 0 | 0 | 894 | 300 | 291 | 542 | 0 |
| Future Volume (veh/h) | 441 | 2 | 127 | 0 | 0 | 0 | 0 | 894 | 300 | 291 | 542 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 459 | 2 | 58 | | | | 0 | 931 | 191 | 303 | 565 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 484 | 2 | 433 | | | | 0 | 966 | 198 | 253 | 1925 | 0 |
| Arrive On Green | 0.43 | 0.29 | 0.43 | | | | 0.00 | 0.35 | 0.35 | 0.05 | 0.19 | 0.00 |
| Sat Flow, veh/h | 1681 | 7 | 1502 | | | | 0 | 2859 | 568 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 461 | 0 | 58 | | | | 0 | 565 | 557 | 303 | 565 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1502 | | | | 0 | 1683 | 1654 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 23.6 | 0.0 | 2.1 | | | | 0.0 | 29.6 | 29.7 | 14.3 | 13.0 | 0.0 |
| Cycle Q Clear(g_c), s | 23.6 | 0.0 | 2.1 | | | | 0.0 | 29.6 | 29.7 | 14.3 | 13.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 0.34 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 487 | 0 | 433 | | | | 0 | 587 | 577 | 253 | 1925 | 0 |
| V/C Ratio(X) | 0.95 | 0.00 | 0.13 | | | | 0.00 | 0.96 | 0.96 | 1.20 | 0.29 | 0.00 |
| Avail Cap(c_a), veh/h | 506 | 0 | 450 | | | | 0 | 587 | 577 | 253 | 1925 | 0 |
| HCM Platoon Ratio | 1.50 | 1.00 | 1.50 | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.61 | 0.61 | 0.00 |
| Uniform Delay (d), s/veh | 24.9 | 0.0 | 18.8 | | | | 0.0 | 28.7 | 28.7 | 42.6 | 20.9 | 0.0 |
| Incr Delay (d2), s/veh | 26.4 | 0.0 | 0.1 | | | | 0.0 | 29.0 | 29.6 | 111.1 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.5 | 0.0 | 0.7 | | | | 0.0 | 15.6 | 15.4 | 13.8 | 5.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 51.3 | 0.0 | 18.8 | | | | 0.0 | 57.7 | 58.4 | 153.8 | 21.1 | 0.0 |
| LnGrp LOS | D | | B | | | | | E | E | F | C | |
| Approach Vol, veh/h | | 519 | | | | | | 1122 | | | 868 | |
| Approach Delay, s/veh | | 47.7 | | | | | | 58.1 | | | 67.4 | |
| Approach LOS | | D | | | | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.1 | 37.2 | | 32.7 | | 57.3 |
| Change Period (Y+Rc), s | 5.8 | * 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 14.0 | * 31 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 16.3 | 31.7 | | 25.6 | | 15.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.3 | | 3.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 59.1 |
| HCM 7th LOS | E |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 235 | 187 | 27 | 216 | 54 | 658 | 78 | 438 |
| Future Volume (vph) | 235 | 187 | 27 | 216 | 54 | 658 | 78 | 438 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.3 | 24.8 | 6.2 | 13.1 | 7.5 | 21.9 | 8.3 | 24.8 |
| Actuated g/C Ratio | 0.15 | 0.34 | 0.08 | 0.18 | 0.10 | 0.30 | 0.11 | 0.34 |
| v/c Ratio | 1.11 | 0.25 | 0.23 | 0.66 | 0.38 | 0.80 | 0.50 | 0.52 |
| Control Delay (s/veh) | 125.9 | 18.5 | 38.9 | 18.8 | 40.2 | 32.4 | 43.3 | 22.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 125.9 | 18.5 | 38.9 | 18.8 | 40.2 | 32.4 | 43.3 | 22.6 |
| LOS | F | B | D | B | D | C | D | C |
| Approach Delay (s/veh) | | 70.8 | | 20.0 | | 33.0 | | 25.4 |
| Approach LOS | | E | | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 73.3 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.11 | |
| Intersection Signal Delay (s/veh): 36.4 | Intersection LOS: D |
| Intersection Capacity Utilization 71.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

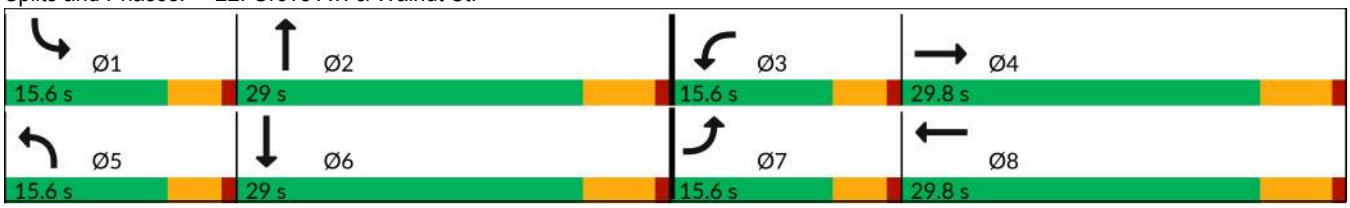

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 235 | 187 | 61 | 27 | 216 | 221 | 54 | 658 | 36 | 78 | 438 | 70 |
| Future Volume (veh/h) | 235 | 187 | 61 | 27 | 216 | 221 | 54 | 658 | 36 | 78 | 438 | 70 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 270 | 215 | 61 | 31 | 248 | 194 | 62 | 756 | 32 | 90 | 503 | 40 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 253 | 830 | 230 | 52 | 351 | 264 | 80 | 915 | 39 | 112 | 940 | 75 |
| Arrive On Green | 0.16 | 0.32 | 0.32 | 0.03 | 0.19 | 0.19 | 0.05 | 0.28 | 0.28 | 0.07 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1594 | 2603 | 720 | 1594 | 1827 | 1373 | 1594 | 3289 | 139 | 1594 | 3156 | 250 |
| Grp Volume(v), veh/h | 270 | 137 | 139 | 31 | 228 | 214 | 62 | 387 | 401 | 90 | 268 | 275 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1640 | 1594 | 1683 | 1517 | 1594 | 1683 | 1745 | 1594 | 1683 | 1723 |
| Q Serve(g_s), s | 11.0 | 4.2 | 4.4 | 1.3 | 8.7 | 9.2 | 2.7 | 14.9 | 14.9 | 3.9 | 9.2 | 9.2 |
| Cycle Q Clear(g_c), s | 11.0 | 4.2 | 4.4 | 1.3 | 8.7 | 9.2 | 2.7 | 14.9 | 14.9 | 3.9 | 9.2 | 9.2 |
| Prop In Lane | 1.00 | | 0.44 | 1.00 | | 0.91 | 1.00 | | 0.08 | 1.00 | | 0.15 |
| Lane Grp Cap(c), veh/h | 253 | 537 | 523 | 52 | 324 | 292 | 80 | 468 | 486 | 112 | 502 | 513 |
| V/C Ratio(X) | 1.07 | 0.26 | 0.27 | 0.60 | 0.70 | 0.74 | 0.77 | 0.83 | 0.83 | 0.81 | 0.53 | 0.54 |
| Avail Cap(c_a), veh/h | 253 | 584 | 569 | 253 | 584 | 526 | 253 | 564 | 585 | 253 | 564 | 578 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.1 | 17.5 | 17.5 | 33.0 | 26.1 | 26.3 | 32.5 | 23.4 | 23.4 | 31.7 | 20.3 | 20.3 |
| Incr Delay (d2), s/veh | 75.0 | 0.2 | 0.3 | 4.1 | 2.8 | 3.6 | 5.8 | 8.3 | 8.1 | 5.1 | 0.9 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.1 | 1.5 | 1.5 | 0.5 | 3.4 | 3.3 | 1.1 | 6.3 | 6.5 | 1.5 | 3.3 | 3.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 104.1 | 17.7 | 17.8 | 37.1 | 28.9 | 29.9 | 38.3 | 31.7 | 31.5 | 36.8 | 21.2 | 21.2 |
| LnGrp LOS | F | B | B | D | C | C | D | C | C | D | C | C |
| Approach Vol, veh/h | | 546 | | | 473 | | | 850 | | | 633 | |
| Approach Delay, s/veh | | 60.5 | | | 29.9 | | | 32.1 | | | 23.4 | |
| Approach LOS | | E | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.4 | 25.1 | 6.8 | 27.9 | 8.1 | 26.4 | 15.6 | 19.1 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 5.9 | 16.9 | 3.3 | 6.4 | 4.7 | 11.2 | 13.0 | 11.2 |
| Green Ext Time (p_c), s | 0.0 | 2.3 | 0.0 | 1.3 | 0.0 | 2.4 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 35.7 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 165 | 558 | 25 | 740 | 44 | 390 | 105 | 268 | 158 |
| Future Volume (vph) | 165 | 558 | 25 | 740 | 44 | 390 | 105 | 268 | 158 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.0 | 35.1 | 6.2 | 24.1 | 7.2 | 22.9 | 9.4 | 27.0 | 27.0 |
| Actuated g/C Ratio | 0.13 | 0.41 | 0.07 | 0.28 | 0.08 | 0.27 | 0.11 | 0.31 | 0.31 |
| v/c Ratio | 0.89 | 0.91 | 0.24 | 1.03 | 0.36 | 1.00 | 0.66 | 0.53 | 0.29 |
| Control Delay (s/veh) | 80.9 | 47.4 | 44.1 | 70.5 | 46.1 | 77.0 | 56.8 | 30.3 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 80.9 | 47.4 | 44.1 | 70.5 | 46.1 | 77.0 | 56.8 | 30.3 | 5.8 |
| LOS | F | D | D | E | D | E | E | C | A |
| Approach Delay (s/veh) | | 54.7 | | 69.8 | | 74.1 | | 28.2 | |
| Approach LOS | | D | | E | | E | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 86.4 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.03 | |
| Intersection Signal Delay (s/veh): 58.0 | Intersection LOS: E |
| Intersection Capacity Utilization 86.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

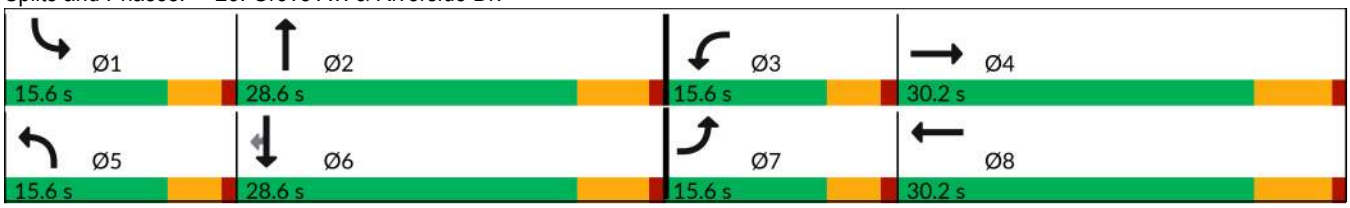

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 165 | 558 | 39 | 25 | 740 | 143 | 44 | 390 | 39 | 105 | 268 | 158 |
| Future Volume (veh/h) | 165 | 558 | 39 | 25 | 740 | 143 | 44 | 390 | 39 | 105 | 268 | 158 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 179 | 607 | 14 | 27 | 804 | 102 | 48 | 424 | 35 | 114 | 291 | 96 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 202 | 649 | 15 | 44 | 831 | 105 | 63 | 425 | 35 | 140 | 552 | 468 |
| Arrive On Green | 0.13 | 0.38 | 0.38 | 0.03 | 0.28 | 0.28 | 0.04 | 0.26 | 0.26 | 0.09 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1594 | 1724 | 40 | 1594 | 3000 | 381 | 1594 | 1615 | 133 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 179 | 0 | 621 | 27 | 451 | 455 | 48 | 0 | 459 | 114 | 291 | 96 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1764 | 1594 | 1683 | 1697 | 1594 | 0 | 1748 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 9.6 | 0.0 | 29.3 | 1.5 | 22.9 | 22.9 | 2.6 | 0.0 | 22.7 | 6.1 | 11.7 | 4.1 |
| Cycle Q Clear(g_c), s | 9.6 | 0.0 | 29.3 | 1.5 | 22.9 | 22.9 | 2.6 | 0.0 | 22.7 | 6.1 | 11.7 | 4.1 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 0.22 | 1.00 | | 0.08 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 202 | 0 | 664 | 44 | 467 | 470 | 63 | 0 | 460 | 140 | 552 | 468 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.93 | 0.61 | 0.97 | 0.97 | 0.76 | 0.00 | 1.00 | 0.82 | 0.53 | 0.21 |
| Avail Cap(c_a), veh/h | 202 | 0 | 664 | 202 | 467 | 470 | 202 | 0 | 460 | 202 | 552 | 468 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.2 | 0.0 | 26.0 | 41.6 | 30.9 | 30.9 | 41.2 | 0.0 | 31.9 | 38.8 | 24.6 | 21.9 |
| Incr Delay (d2), s/veh | 32.8 | 0.0 | 20.5 | 5.1 | 33.1 | 33.0 | 6.9 | 0.0 | 41.2 | 10.0 | 0.9 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.3 | 0.0 | 14.5 | 0.6 | 12.7 | 12.8 | 1.1 | 0.0 | 14.1 | 2.6 | 4.7 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 69.9 | 0.0 | 46.5 | 46.7 | 64.0 | 63.9 | 48.1 | 0.0 | 73.1 | 48.8 | 25.5 | 22.1 |
| LnGrp LOS | E | | D | D | E | E | D | | E | D | C | C |
| Approach Vol, veh/h | | 800 | | | 933 | | | 507 | | | 501 | |
| Approach Delay, s/veh | | 51.8 | | | 63.5 | | | 70.7 | | | 30.2 | |
| Approach LOS | | D | | | E | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.2 | 28.6 | 7.0 | 38.8 | 8.0 | 32.8 | 15.6 | 30.2 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 8.1 | 24.7 | 3.5 | 31.3 | 4.6 | 13.7 | 11.6 | 24.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 55.3 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 106.2 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 73 | 148 | 43 | 12 | 301 | 63 | 64 | 342 | 14 | 38 | 295 | 13 |
| Future Vol, veh/h | 73 | 148 | 43 | 12 | 301 | 63 | 64 | 342 | 14 | 38 | 295 | 13 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 85 | 172 | 50 | 14 | 350 | 73 | 74 | 398 | 16 | 44 | 343 | 15 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 47.9 | 107.8 | 157.8 | 86.3 |
| HCM LOS | E | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 15% | 28% | 3% | 11% |
| Vol Thru, % | 81% | 56% | 80% | 85% |
| Vol Right, % | 3% | 16% | 17% | 4% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 420 | 264 | 376 | 346 |
| LT Vol | 64 | 73 | 12 | 38 |
| Through Vol | 342 | 148 | 301 | 295 |
| RT Vol | 14 | 43 | 63 | 13 |
| Lane Flow Rate | 488 | 307 | 437 | 402 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.24 | 0.818 | 1.097 | 1.02 |
| Departure Headway (Hd) | 9.658 | 10.769 | 9.87 | 10.202 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 381 | 338 | 372 | 358 |
| Service Time | 7.658 | 8.769 | 7.87 | 8.202 |
| HCM Lane V/C Ratio | 1.281 | 0.908 | 1.175 | 1.123 |
| HCM Control Delay, s/veh | 157.8 | 47.9 | 107.8 | 86.3 |
| HCM Lane LOS | F | E | F | F |
| HCM 95th-tile Q | 19.9 | 7 | 14.7 | 12.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 20.3 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 38 | 67 | 19 | 12 | 123 | 23 | 59 | 367 | 6 | 23 | 283 | 25 |
| Future Vol, veh/h | 38 | 67 | 19 | 12 | 123 | 23 | 59 | 367 | 6 | 23 | 283 | 25 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 76 | 22 | 14 | 140 | 26 | 67 | 417 | 7 | 26 | 322 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 12.5 | 13.2 | 26.9 | 18.1 |
| HCM LOS | B | B | D | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 14% | 31% | 8% | 7% |
| Vol Thru, % | 85% | 54% | 78% | 85% |
| Vol Right, % | 1% | 15% | 15% | 8% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 432 | 124 | 158 | 331 |
| LT Vol | 59 | 38 | 12 | 23 |
| Through Vol | 367 | 67 | 123 | 283 |
| RT Vol | 6 | 19 | 23 | 25 |
| Lane Flow Rate | 491 | 141 | 180 | 376 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.787 | 0.27 | 0.336 | 0.618 |
| Departure Headway (Hd) | 5.774 | 6.908 | 6.743 | 5.919 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 628 | 519 | 533 | 609 |
| Service Time | 3.811 | 4.964 | 4.795 | 3.96 |
| HCM Lane V/C Ratio | 0.782 | 0.272 | 0.338 | 0.617 |
| HCM Control Delay, s/veh | 26.9 | 12.5 | 13.2 | 18.1 |
| HCM Lane LOS | D | B | B | C |
| HCM 95th-tile Q | 7.6 | 1.1 | 1.5 | 4.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 172.2 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 63 | 253 | 59 | 10 | 434 | 75 | 84 | 270 | 4 | 29 | 274 | 40 |
| Future Vol, veh/h | 63 | 253 | 59 | 10 | 434 | 75 | 84 | 270 | 4 | 29 | 274 | 40 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 72 | 288 | 67 | 11 | 493 | 85 | 95 | 307 | 5 | 33 | 311 | 45 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 127.1 | 293.1 | 114.7 | 98.5 |
| HCM LOS | F | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 23% | 17% | 2% | 8% |
| Vol Thru, % | 75% | 67% | 84% | 80% |
| Vol Right, % | 1% | 16% | 14% | 12% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 358 | 375 | 519 | 343 |
| LT Vol | 84 | 63 | 10 | 29 |
| Through Vol | 270 | 253 | 434 | 274 |
| RT Vol | 4 | 59 | 75 | 40 |
| Lane Flow Rate | 407 | 426 | 590 | 390 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.092 | 1.132 | 1.563 | 1.037 |
| Departure Headway (Hd) | 11.876 | 11.708 | 10.46 | 11.981 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 309 | 315 | 354 | 308 |
| Service Time | 9.876 | 9.708 | 8.46 | 9.981 |
| HCM Lane V/C Ratio | 1.317 | 1.352 | 1.667 | 1.266 |
| HCM Control Delay, s/veh | 114.7 | 127.1 | 293.1 | 98.5 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 13 | 14.2 | 30.8 | 11.5 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 22.1 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 14 | 83 | 3 | 3 | 221 | 307 | 2 | 3 | 2 | 354 | 7 | 34 |
| Future Vol, veh/h | 14 | 83 | 3 | 3 | 221 | 307 | 2 | 3 | 2 | 354 | 7 | 34 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 15 | 88 | 3 | 3 | 235 | 327 | 2 | 3 | 2 | 377 | 7 | 36 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 10.6 | 25.4 | 9.7 | 20.7 |
| HCM LOS | B | D | A | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 29% | 14% | 1% | 90% |
| Vol Thru, % | 43% | 83% | 42% | 2% |
| Vol Right, % | 29% | 3% | 58% | 9% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 7 | 100 | 531 | 395 |
| LT Vol | 2 | 14 | 3 | 354 |
| Through Vol | 3 | 83 | 221 | 7 |
| RT Vol | 2 | 3 | 307 | 34 |
| Lane Flow Rate | 7 | 106 | 565 | 420 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.013 | 0.182 | 0.8 | 0.684 |
| Departure Headway (Hd) | 6.506 | 6.145 | 5.098 | 5.858 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 546 | 580 | 706 | 618 |
| Service Time | 4.6 | 4.222 | 3.152 | 3.907 |
| HCM Lane V/C Ratio | 0.013 | 0.183 | 0.8 | 0.68 |
| HCM Control Delay, s/veh | 9.7 | 10.6 | 25.4 | 20.7 |
| HCM Lane LOS | A | B | D | C |
| HCM 95th-tile Q | 0 | 0.7 | 8.2 | 5.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 10.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 18 | 599 | 74 | 66 | 770 | 18 | 103 | 14 | 149 | 12 | 10 | 42 |
| Future Vol, veh/h | 18 | 599 | 74 | 66 | 770 | 18 | 103 | 14 | 149 | 12 | 10 | 42 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 666 | 82 | 73 | 856 | 20 | 114 | 16 | 166 | 13 | 11 | 47 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 882 | 0 | 0 | 748 | 0 | 0 | 1327 | 1775 | 374 | 1399 | 1806 | 444 |
| Stage 1 | - | - | - | - | - | - | 747 | 747 | - | 1018 | 1018 | - |
| Stage 2 | - | - | - | - | - | - | 580 | 1028 | - | 381 | 788 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 763 | - | - | 857 | - | - | ~ 113 | 82 | 624 | 100 | 78 | 562 |
| Stage 1 | - | - | - | - | - | - | 371 | 418 | - | 254 | 313 | - |
| Stage 2 | - | - | - | - | - | - | 467 | 309 | - | 613 | 401 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 758 | - | - | 857 | - | - | ~ 87 | 72 | 624 | 60 | 69 | 558 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 203 | 176 | - | 153 | 168 | - |
| Stage 1 | - | - | - | - | - | - | 361 | 407 | - | 231 | 284 | - |
| Stage 2 | - | - | - | - | - | - | 376 | 281 | - | 422 | 390 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.26 | 0.74 | 67.69 | 20.67 |
| HCM LOS | | | F | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 323 | 758 | - | - | 857 | - | - | 300 |
| HCM Lane V/C Ratio | 0.916 | 0.026 | - | - | 0.086 | - | - | 0.237 |
| HCM Control Delay (s/veh) | 67.7 | 9.9 | - | - | 9.6 | - | - | 20.7 |
| HCM Lane LOS | F | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 9 | 0.1 | - | - | 0.3 | - | - | 0.9 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.5 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 37 | 17 | 39 | 20 | 25 | 5 | 92 | 270 | 28 | 16 | 139 | 44 |
| Future Vol, veh/h | 37 | 17 | 39 | 20 | 25 | 5 | 92 | 270 | 28 | 16 | 139 | 44 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 19 | 43 | 22 | 27 | 5 | 101 | 297 | 31 | 18 | 153 | 48 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.4 | 9.2 | 13.2 | 9.7 |
| HCM LOS | A | A | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 24% | 40% | 40% | 8% |
| Vol Thru, % | 69% | 18% | 50% | 70% |
| Vol Right, % | 7% | 42% | 10% | 22% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 390 | 93 | 50 | 199 |
| LT Vol | 92 | 37 | 20 | 16 |
| Through Vol | 270 | 17 | 25 | 139 |
| RT Vol | 28 | 39 | 5 | 44 |
| Lane Flow Rate | 429 | 102 | 55 | 219 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.549 | 0.151 | 0.085 | 0.287 |
| Departure Headway (Hd) | 4.608 | 5.316 | 5.591 | 4.724 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 780 | 667 | 634 | 754 |
| Service Time | 2.664 | 3.404 | 3.688 | 2.791 |
| HCM Lane V/C Ratio | 0.55 | 0.153 | 0.087 | 0.29 |
| HCM Control Delay, s/veh | 13.2 | 9.4 | 9.2 | 9.7 |
| HCM Lane LOS | B | A | A | A |
| HCM 95th-tile Q | 3.4 | 0.5 | 0.3 | 1.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 67.4 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 18 | 262 | 17 | 16 | 455 | 120 | 22 | 235 | 9 | 73 | 86 | 38 |
| Future Vol, veh/h | 18 | 262 | 17 | 16 | 455 | 120 | 22 | 235 | 9 | 73 | 86 | 38 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 285 | 18 | 17 | 495 | 130 | 24 | 255 | 10 | 79 | 93 | 41 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 23.7 | 125.8 | 22.7 | 18.4 |
| HCM LOS | C | F | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 8% | 6% | 3% | 37% |
| Vol Thru, % | 88% | 88% | 77% | 44% |
| Vol Right, % | 3% | 6% | 20% | 19% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 266 | 297 | 591 | 197 |
| LT Vol | 22 | 18 | 16 | 73 |
| Through Vol | 235 | 262 | 455 | 86 |
| RT Vol | 9 | 17 | 120 | 38 |
| Lane Flow Rate | 289 | 323 | 642 | 214 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.605 | 0.647 | 1.189 | 0.463 |
| Departure Headway (Hd) | 8.096 | 7.675 | 6.662 | 8.393 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 448 | 475 | 546 | 433 |
| Service Time | 6.096 | 5.675 | 4.729 | 6.393 |
| HCM Lane V/C Ratio | 0.645 | 0.68 | 1.176 | 0.494 |
| HCM Control Delay, s/veh | 22.7 | 23.7 | 125.8 | 18.4 |
| HCM Lane LOS | C | C | F | C |
| HCM 95th-tile Q | 3.9 | 4.5 | 23 | 2.4 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.5 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 10 | 276 | 602 | 256 | 74 | 19 |
| Future Vol, veh/h | 10 | 276 | 602 | 256 | 74 | 19 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 288 | 627 | 267 | 77 | 20 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 896 | 0 | - | 0 | 1071 | 762 |
| Stage 1 | - | - | - | - | 762 | - |
| Stage 2 | - | - | - | - | 308 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 758 | - | - | - | 245 | 405 |
| Stage 1 | - | - | - | - | 461 | - |
| Stage 2 | - | - | - | - | 745 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 756 | - | - | - | 240 | 404 |
| Mov Cap-2 Maneuver | - | - | - | - | 355 | - |
| Stage 1 | - | - | - | - | 452 | - |
| Stage 2 | - | - | - | - | 744 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.34 | 0 | 18.43 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 63 | - | - | - | 364 |
| HCM Lane V/C Ratio | 0.014 | - | - | - | 0.266 |
| HCM Control Delay (s/veh) | 9.8 | 0 | - | - | 18.4 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 1.1 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 301 | 2 | 347 | 638 | 984 | 447 | 87 |
| Future Volume (vph) | 301 | 2 | 347 | 638 | 984 | 447 | 87 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 23.0 | 23.0 | 23.0 | 27.0 | 67.0 | 40.0 | 40.0 |
| Total Split (%) | 25.6% | 25.6% | 25.6% | 30.0% | 74.4% | 44.4% | 44.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 19.0 | 19.0 | 19.0 | 25.3 | 59.4 | 29.1 | 29.1 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | 0.28 | 0.66 | 0.32 | 0.32 |
| v/c Ratio | 0.75 | 0.62 | 0.53 | 0.84 | 0.33 | 0.24 | 0.17 |
| Control Delay (s/veh) | 49.8 | 27.2 | 16.8 | 40.8 | 3.9 | 23.4 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.8 | 27.2 | 16.8 | 40.8 | 3.9 | 23.4 | 4.6 |
| LOS | D | C | B | D | A | C | A |
| Approach Delay (s/veh) | | 31.7 | | | 18.4 | 20.4 | |
| Approach LOS | | C | | | B | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 16.6 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 21.9 | Intersection LOS: C |
| Intersection Capacity Utilization 75.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

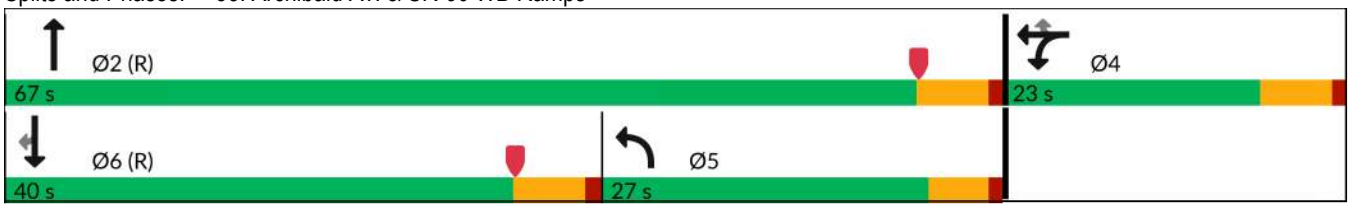

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 301 | 2 | 347 | 638 | 984 | 0 | 0 | 447 | 87 |
| Future Volume (veh/h) | 0 | 0 | 0 | 301 | 2 | 347 | 638 | 984 | 0 | 0 | 447 | 87 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1575 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 372 | 0 | 110 | 679 | 1047 | 0 | 0 | 476 | 62 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 460 | 0 | 217 | 1537 | 3516 | 0 | 0 | 818 | 194 |
| Arrive On Green | | | | 0.14 | 0.00 | 0.14 | 0.35 | 0.49 | 0.00 | 0.00 | 0.13 | 0.13 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1502 | 2910 | 4997 | 0 | 0 | 6343 | 1450 |
| Grp Volume(v), veh/h | | | | 372 | 0 | 110 | 679 | 1047 | 0 | 0 | 476 | 62 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1502 | 1455 | 1612 | 0 | 0 | 1524 | 1450 |
| Q Serve(g_s), s | | | | 10.2 | 0.0 | 6.1 | 16.1 | 11.7 | 0.0 | 0.0 | 6.6 | 3.5 |
| Cycle Q Clear(g_c), s | | | | 10.2 | 0.0 | 6.1 | 16.1 | 11.7 | 0.0 | 0.0 | 6.6 | 3.5 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 460 | 0 | 217 | 1537 | 3516 | 0 | 0 | 818 | 194 |
| V/C Ratio(X) | | | | 0.81 | 0.00 | 0.51 | 0.44 | 0.30 | 0.00 | 0.00 | 0.58 | 0.32 |
| Avail Cap(c_a), veh/h | | | | 609 | 0 | 287 | 1537 | 3516 | 0 | 0 | 2316 | 551 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.88 | 0.88 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 37.3 | 0.0 | 35.6 | 18.9 | 9.3 | 0.0 | 0.0 | 36.6 | 35.2 |
| Incr Delay (d2), s/veh | | | | 6.0 | 0.0 | 1.8 | 0.1 | 0.2 | 0.0 | 0.0 | 3.0 | 4.3 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.1 | 0.0 | 5.2 | 5.6 | 3.7 | 0.0 | 0.0 | 2.5 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 43.3 | 0.0 | 37.4 | 19.0 | 9.5 | 0.0 | 0.0 | 39.6 | 39.5 |
| LnGrp LOS | | | | D | | D | B | A | | | D | D |
| Approach Vol, veh/h | | | | | 482 | | | 1726 | | | 538 | |
| Approach Delay, s/veh | | | | | 42.0 | | | 13.2 | | | 39.6 | |
| Approach LOS | | | | | D | | | B | | | D | |

| Timer - Assigned Phs | 2 | 4 | 5 | 6 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 71.2 | 18.8 | 53.3 | 17.9 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 61.2 | 17.2 | 22.0 | * 34 |
| Max Q Clear Time (g_c+I1), s | 13.7 | 12.2 | 18.1 | 8.6 |
| Green Ext Time (p_c), s | 8.4 | 0.8 | 0.6 | 3.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 23.4 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 263 | 2 | 315 | 1349 | 607 | 135 | 597 |
| Future Volume (vph) | 263 | 2 | 315 | 1349 | 607 | 135 | 597 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 52.0 | 52.0 | 11.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 57.8% | 57.8% | 12.2% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 17.4 | 17.4 | 17.4 | 48.4 | 48.4 | 7.6 | 61.0 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.19 | 0.54 | 0.54 | 0.08 | 0.68 |
| v/c Ratio | 0.73 | 0.55 | 0.45 | 0.43 | 0.58 | 0.58 | 0.19 |
| Control Delay (s/veh) | 48.3 | 20.6 | 8.0 | 13.6 | 3.5 | 64.1 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.3 | 20.6 | 8.0 | 13.6 | 3.5 | 64.1 | 0.8 |
| LOS | D | C | A | B | A | E | A |
| Approach Delay (s/veh) | | 26.2 | | 10.4 | | | 12.5 |
| Approach LOS | | C | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 16.6 (18%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.73 | |
| Intersection Signal Delay (s/veh): 13.7 | Intersection LOS: B |
| Intersection Capacity Utilization 75.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

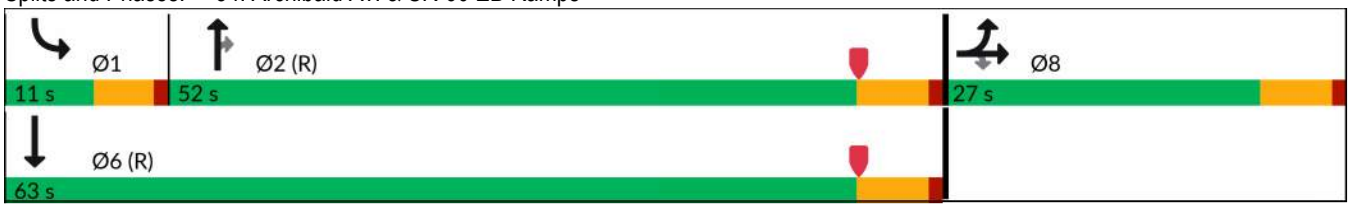

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 263 | 2 | 315 | 0 | 0 | 0 | 0 | 1349 | 607 | 135 | 597 | 0 |
| Future Volume (veh/h) | 263 | 2 | 315 | 0 | 0 | 0 | 0 | 1349 | 607 | 135 | 597 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1575 | 1772 | 0 |
| Adj Flow Rate, veh/h | 328 | 0 | 114 | | | | 0 | 1405 | 508 | 141 | 622 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 427 | 0 | 201 | | | | 0 | 3748 | 922 | 194 | 3566 | 0 |
| Arrive On Green | 0.13 | 0.00 | 0.13 | | | | 0.00 | 0.61 | 0.61 | 0.13 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3188 | 0 | 1502 | | | | 0 | 6343 | 1499 | 2910 | 4997 | 0 |
| Grp Volume(v), veh/h | 328 | 0 | 114 | | | | 0 | 1405 | 508 | 141 | 622 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1524 | 1499 | 1455 | 1612 | 0 |
| Q Serve(g_s), s | 8.9 | 0.0 | 6.4 | | | | 0.0 | 10.4 | 17.8 | 4.2 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 8.9 | 0.0 | 6.4 | | | | 0.0 | 10.4 | 17.8 | 4.2 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 427 | 0 | 201 | | | | 0 | 3748 | 922 | 194 | 3566 | 0 |
| V/C Ratio(X) | 0.77 | 0.00 | 0.57 | | | | 0.00 | 0.37 | 0.55 | 0.73 | 0.17 | 0.00 |
| Avail Cap(c_a), veh/h | 751 | 0 | 354 | | | | 0 | 3748 | 922 | 194 | 3566 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.91 | 0.91 | 0.00 |
| Uniform Delay (d), s/veh | 37.6 | 0.0 | 36.5 | | | | 0.0 | 8.7 | 10.1 | 38.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.9 | 0.0 | 2.5 | | | | 0.0 | 0.3 | 2.4 | 10.3 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 0.0 | 2.4 | | | | 0.0 | 2.7 | 5.1 | 1.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.5 | 0.0 | 39.0 | | | | 0.0 | 9.0 | 12.5 | 48.5 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | A | B | D | A | |
| Approach Vol, veh/h | | 442 | | | | | | 1913 | | | 763 | |
| Approach Delay, s/veh | | 40.1 | | | | | | 9.9 | | | 9.0 | |
| Approach LOS | | D | | | | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 61.1 | | | | 72.1 | | 17.9 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 46.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 6.2 | 19.8 | | | | 2.0 | | 10.9 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.1 | | | | 4.2 | | 1.1 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 14.0 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 168 | 418 | 161 | 108 | 547 | 274 | 267 | 1095 | 153 | 410 |
| Future Volume (vph) | 168 | 418 | 161 | 108 | 547 | 274 | 267 | 1095 | 153 | 410 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.9 | 28.6 | 28.6 | 10.9 | 24.6 | 24.6 | 22.1 | 28.7 | 15.1 | 21.7 |
| Actuated g/C Ratio | 0.15 | 0.28 | 0.28 | 0.11 | 0.24 | 0.24 | 0.22 | 0.28 | 0.15 | 0.21 |
| v/c Ratio | 0.79 | 0.48 | 0.32 | 0.69 | 0.73 | 0.51 | 0.84 | 0.93 | 0.71 | 0.60 |
| Control Delay (s/veh) | 68.2 | 32.8 | 6.2 | 68.2 | 41.8 | 7.2 | 62.4 | 49.8 | 59.1 | 34.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 68.2 | 32.8 | 6.2 | 68.2 | 41.8 | 7.2 | 62.4 | 49.8 | 59.1 | 34.6 |
| LOS | E | C | A | E | D | A | E | D | E | C |
| Approach Delay (s/veh) | | 35.1 | | | 34.7 | | | 52.2 | | 39.7 |
| Approach LOS | | D | | | C | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 102 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay (s/veh): 42.2 | Intersection LOS: D |
| Intersection Capacity Utilization 77.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

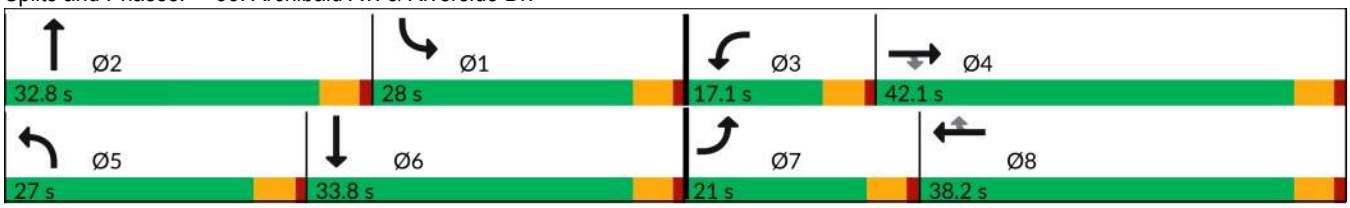

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 168 | 418 | 161 | 108 | 547 | 274 | 267 | 1095 | 66 | 153 | 410 | 169 |
| Future Volume (veh/h) | 168 | 418 | 161 | 108 | 547 | 274 | 267 | 1095 | 66 | 153 | 410 | 169 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 181 | 449 | 118 | 116 | 588 | 212 | 287 | 1177 | 70 | 165 | 441 | 121 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 212 | 957 | 418 | 142 | 809 | 357 | 319 | 1378 | 82 | 197 | 830 | 220 |
| Arrive On Green | 0.13 | 0.28 | 0.28 | 0.09 | 0.24 | 0.24 | 0.20 | 0.30 | 0.30 | 0.12 | 0.22 | 0.22 |
| Sat Flow, veh/h | 1594 | 3367 | 1472 | 1594 | 3367 | 1487 | 1594 | 4667 | 277 | 1594 | 3798 | 1006 |
| Grp Volume(v), veh/h | 181 | 449 | 118 | 116 | 588 | 212 | 287 | 813 | 434 | 165 | 372 | 190 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1472 | 1594 | 1683 | 1487 | 1594 | 1612 | 1720 | 1594 | 1612 | 1579 |
| Q Serve(g_s), s | 9.8 | 9.8 | 5.5 | 6.3 | 14.2 | 7.8 | 15.6 | 21.0 | 21.1 | 9.0 | 9.0 | 9.5 |
| Cycle Q Clear(g_c), s | 9.8 | 9.8 | 5.5 | 6.3 | 14.2 | 7.8 | 15.6 | 21.0 | 21.1 | 9.0 | 9.0 | 9.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 0.64 |
| Lane Grp Cap(c), veh/h | 212 | 957 | 418 | 142 | 809 | 357 | 319 | 952 | 508 | 197 | 705 | 345 |
| V/C Ratio(X) | 0.85 | 0.47 | 0.28 | 0.82 | 0.73 | 0.59 | 0.90 | 0.85 | 0.85 | 0.84 | 0.53 | 0.55 |
| Avail Cap(c_a), veh/h | 295 | 1426 | 623 | 225 | 1277 | 564 | 403 | 1027 | 548 | 421 | 1063 | 521 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.5 | 26.2 | 24.7 | 39.6 | 31.0 | 14.6 | 34.5 | 29.4 | 29.4 | 38.0 | 30.6 | 30.7 |
| Incr Delay (d2), s/veh | 12.0 | 0.4 | 0.4 | 5.7 | 1.3 | 1.6 | 17.2 | 6.7 | 11.9 | 3.6 | 0.6 | 1.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.3 | 3.6 | 1.8 | 2.6 | 5.4 | 3.6 | 7.1 | 8.3 | 9.5 | 3.5 | 3.3 | 3.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 49.6 | 26.5 | 25.0 | 45.4 | 32.2 | 16.2 | 51.7 | 36.1 | 41.3 | 41.6 | 31.2 | 32.1 |
| LnGrp LOS | D | C | C | D | C | B | D | D | D | D | C | C |
| Approach Vol, veh/h | | 748 | | | 916 | | | 1534 | | | 727 | |
| Approach Delay, s/veh | | 31.9 | | | 30.2 | | | 40.5 | | | 33.8 | |
| Approach LOS | | C | | | C | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.5 | 30.8 | 12.5 | 29.8 | 22.3 | 24.0 | 16.4 | 25.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 11.0 | 23.1 | 8.3 | 11.8 | 17.6 | 11.5 | 11.8 | 16.2 |
| Green Ext Time (p_c), s | 0.2 | 3.1 | 0.0 | 3.0 | 0.2 | 3.0 | 0.1 | 3.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 35.2 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 148 | 89 | 45 | 178 | 168 | 136 | 1209 | 107 | 487 |
| Future Volume (vph) | 148 | 89 | 45 | 178 | 168 | 136 | 1209 | 107 | 487 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 16.3 | 31.4 | 5.4 | 17.8 | 17.8 | 14.0 | 38.9 | 11.5 | 36.4 |
| Actuated g/C Ratio | 0.16 | 0.30 | 0.05 | 0.17 | 0.17 | 0.14 | 0.38 | 0.11 | 0.35 |
| v/c Ratio | 0.71 | 0.37 | 0.67 | 0.71 | 0.48 | 0.77 | 0.79 | 0.73 | 0.56 |
| Control Delay (s/veh) | 60.4 | 26.6 | 90.0 | 55.6 | 9.7 | 70.6 | 32.5 | 73.0 | 29.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 60.4 | 26.6 | 90.0 | 55.6 | 9.7 | 70.6 | 32.5 | 73.0 | 29.1 |
| LOS | E | C | F | E | A | E | C | E | C |
| Approach Delay (s/veh) | | 42.9 | | 39.8 | | | 36.1 | | 36.0 |
| Approach LOS | | D | | D | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 103.4 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 37.4 | Intersection LOS: D |
| Intersection Capacity Utilization 67.6% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 148 | 89 | 70 | 45 | 178 | 168 | 136 | 1209 | 82 | 107 | 487 | 83 |
| Future Volume (veh/h) | 148 | 89 | 70 | 45 | 178 | 168 | 136 | 1209 | 82 | 107 | 487 | 83 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 178 | 107 | 68 | 54 | 214 | 95 | 164 | 1457 | 98 | 129 | 587 | 82 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 214 | 247 | 157 | 68 | 271 | 230 | 196 | 1949 | 131 | 158 | 1128 | 157 |
| Arrive On Green | 0.13 | 0.24 | 0.24 | 0.04 | 0.15 | 0.15 | 0.12 | 0.40 | 0.40 | 0.10 | 0.37 | 0.37 |
| Sat Flow, veh/h | 1594 | 1012 | 643 | 1594 | 1772 | 1502 | 1594 | 4924 | 331 | 1594 | 3034 | 423 |
| Grp Volume(v), veh/h | 178 | 0 | 175 | 54 | 214 | 95 | 164 | 1049 | 506 | 129 | 342 | 327 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1654 | 1594 | 1772 | 1502 | 1594 | 1772 | 1711 | 1594 | 1772 | 1685 |
| Q Serve(g_s), s | 9.2 | 0.0 | 7.5 | 2.8 | 9.8 | 3.6 | 8.5 | 21.4 | 21.4 | 6.7 | 12.7 | 12.8 |
| Cycle Q Clear(g_c), s | 9.2 | 0.0 | 7.5 | 2.8 | 9.8 | 3.6 | 8.5 | 21.4 | 21.4 | 6.7 | 12.7 | 12.8 |
| Prop In Lane | 1.00 | | 0.39 | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 0.25 |
| Lane Grp Cap(c), veh/h | 214 | 0 | 404 | 68 | 271 | 230 | 196 | 1403 | 677 | 158 | 659 | 626 |
| V/C Ratio(X) | 0.83 | 0.00 | 0.43 | 0.80 | 0.79 | 0.41 | 0.84 | 0.75 | 0.75 | 0.82 | 0.52 | 0.52 |
| Avail Cap(c_a), veh/h | 385 | 0 | 773 | 98 | 508 | 431 | 272 | 1899 | 917 | 223 | 895 | 851 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.6 | 0.0 | 26.9 | 40.0 | 34.4 | 18.4 | 36.2 | 21.9 | 21.9 | 37.3 | 20.6 | 20.7 |
| Incr Delay (d2), s/veh | 8.2 | 0.0 | 0.7 | 24.1 | 5.1 | 1.2 | 14.7 | 1.1 | 2.3 | 14.8 | 0.6 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.9 | 0.0 | 2.9 | 1.5 | 4.4 | 1.7 | 3.8 | 7.8 | 7.7 | 3.1 | 4.8 | 4.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 43.8 | 0.0 | 27.7 | 64.2 | 39.5 | 19.6 | 50.8 | 23.0 | 24.2 | 52.0 | 21.3 | 21.3 |
| LnGrp LOS | D | | C | E | D | B | D | C | C | D | C | C |
| Approach Vol, veh/h | | 353 | | | 363 | | | 1719 | | | 798 | |
| Approach Delay, s/veh | | 35.8 | | | 38.0 | | | 26.0 | | | 26.3 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.9 | 38.0 | 8.2 | 25.2 | 15.0 | 36.0 | 15.9 | 17.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 8.7 | 23.4 | 4.8 | 9.5 | 10.5 | 14.8 | 11.2 | 11.8 |
| Green Ext Time (p_c), s | 0.1 | 10.0 | 0.0 | 1.0 | 0.1 | 3.8 | 0.3 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.5 |
| HCM 7th LOS | C |

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 0 | 52 | 0 | 14 | 1243 | 120 | 483 |
| Future Volume (vph) | 0 | 52 | 0 | 14 | 1243 | 120 | 483 |
| Turn Type | NA | Split | NA | Prot | NA | Prot | NA |
| Protected Phases | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | |
| Detector Phase | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 22.5 | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 |
| Total Split (s) | 22.5 | 33.0 | 33.0 | 10.0 | 45.5 | 19.0 | 54.5 |
| Total Split (%) | 18.8% | 27.5% | 27.5% | 8.3% | 37.9% | 15.8% | 45.4% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.3 | 10.7 | 10.7 | 6.2 | 28.7 | 11.3 | 45.9 |
| Actuated g/C Ratio | 0.10 | 0.17 | 0.17 | 0.10 | 0.45 | 0.18 | 0.72 |
| v/c Ratio | 0.01 | 0.22 | 0.16 | 0.10 | 0.64 | 0.47 | 0.22 |
| Control Delay (s/veh) | 0.0 | 28.9 | 0.6 | 39.6 | 17.8 | 36.5 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.0 | 28.9 | 0.6 | 39.6 | 17.8 | 36.5 | 7.5 |
| LOS | A | C | A | D | B | D | A |
| Approach Delay (s/veh) | | | 10.9 | | 18.0 | | 13.2 |
| Approach LOS | | | B | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 63.9 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.64 | |
| Intersection Signal Delay (s/veh): 16.1 | Intersection LOS: B |
| Intersection Capacity Utilization 54.7% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

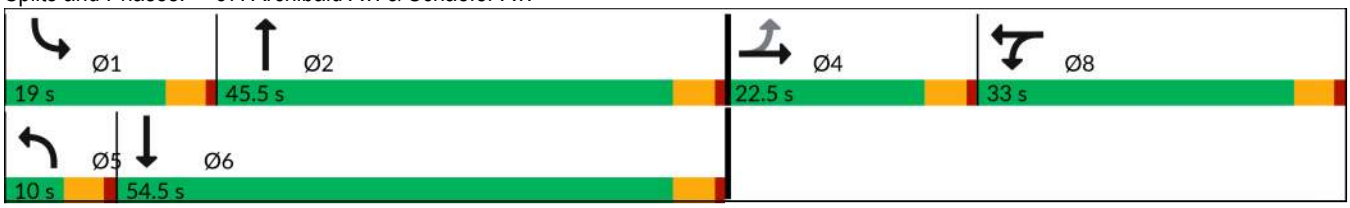

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 4 | 52 | 0 | 91 | 14 | 1243 | 24 | 120 | 483 | 2 |
| Future Volume (veh/h) | 0 | 0 | 4 | 52 | 0 | 91 | 14 | 1243 | 24 | 120 | 483 | 2 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 4 | 57 | 0 | 59 | 15 | 1366 | 24 | 132 | 531 | 2 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 0 | 8 | 127 | 0 | 119 | 30 | 2193 | 39 | 164 | 1832 | 7 |
| Arrive On Green | 0.00 | 0.00 | 0.01 | 0.08 | 0.00 | 0.08 | 0.02 | 0.45 | 0.45 | 0.10 | 0.53 | 0.53 |
| Sat Flow, veh/h | 0 | 0 | 1502 | 1594 | 0 | 1502 | 1594 | 4893 | 86 | 1594 | 3440 | 13 |
| Grp Volume(v), veh/h | 0 | 0 | 4 | 57 | 0 | 59 | 15 | 900 | 490 | 132 | 260 | 273 |
| Grp Sat Flow(s),veh/h/ln | 0 | 0 | 1502 | 1594 | 0 | 1502 | 1594 | 1612 | 1754 | 1594 | 1683 | 1769 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.1 | 1.7 | 0.0 | 1.9 | 0.5 | 10.8 | 10.8 | 4.1 | 4.3 | 4.3 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.1 | 1.7 | 0.0 | 1.9 | 0.5 | 10.8 | 10.8 | 4.1 | 4.3 | 4.3 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.05 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 0 | 0 | 8 | 127 | 0 | 119 | 30 | 1445 | 786 | 164 | 896 | 942 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.49 | 0.45 | 0.00 | 0.49 | 0.50 | 0.62 | 0.62 | 0.80 | 0.29 | 0.29 |
| Avail Cap(c_a), veh/h | 0 | 0 | 531 | 895 | 0 | 843 | 170 | 2608 | 1418 | 454 | 1661 | 1746 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 25.1 | 22.2 | 0.0 | 22.3 | 24.6 | 10.7 | 10.7 | 22.2 | 6.5 | 6.5 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 39.7 | 2.5 | 0.0 | 3.1 | 12.4 | 0.4 | 0.8 | 3.5 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.1 | 0.6 | 0.0 | 0.7 | 0.3 | 2.4 | 2.7 | 1.4 | 0.8 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 64.8 | 24.7 | 0.0 | 25.4 | 36.9 | 11.1 | 11.5 | 25.6 | 6.7 | 6.7 |
| LnGrp LOS | | | E | C | | C | D | B | B | C | A | A |
| Approach Vol, veh/h | | 4 | | | 116 | | | 1405 | | | 665 | |
| Approach Delay, s/veh | | 64.8 | | | 25.1 | | | 11.5 | | | 10.5 | |
| Approach LOS | | E | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.8 | 27.3 | | 4.9 | 5.6 | 31.5 | | 8.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 14.4 | 40.9 | | 17.9 | 5.4 | 49.9 | | 28.4 |
| Max Q Clear Time (g_c+I1), s | 6.1 | 12.8 | | 2.1 | 2.5 | 6.3 | | 3.9 |
| Green Ext Time (p_c), s | 0.1 | 9.5 | | 0.0 | 0.0 | 2.8 | | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 12.0 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 34 | 196 | 92 | 385 | 378 | 115 | 156 | 1000 | 255 | 113 | 368 | 68 |
| Future Volume (vph) | 34 | 196 | 92 | 385 | 378 | 115 | 156 | 1000 | 255 | 113 | 368 | 68 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.5 | 20.5 | 98.0 | 10.7 | 30.5 | 30.5 | 11.7 | 36.3 | 98.0 | 11.5 | 36.0 | 36.0 |
| Actuated g/C Ratio | 0.06 | 0.21 | 1.00 | 0.11 | 0.31 | 0.31 | 0.12 | 0.37 | 1.00 | 0.12 | 0.37 | 0.37 |
| v/c Ratio | 0.22 | 0.20 | 0.06 | 1.27 | 0.72 | 0.21 | 0.86 | 0.84 | 0.18 | 0.64 | 0.31 | 0.11 |
| Control Delay (s/veh) | 54.0 | 31.9 | 0.1 | 182.6 | 39.9 | 4.1 | 84.4 | 37.7 | 0.3 | 60.5 | 24.0 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.0 | 31.9 | 0.1 | 182.6 | 39.9 | 4.1 | 84.4 | 37.7 | 0.3 | 60.5 | 24.0 | 0.4 |
| LOS | D | C | A | F | D | A | F | D | A | E | C | A |
| Approach Delay (s/veh) | | 25.1 | | | 97.7 | | | 36.1 | | | 28.6 | |
| Approach LOS | | C | | | F | | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 98 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.27 | |
| Intersection Signal Delay (s/veh): 50.8 | Intersection LOS: D |
| Intersection Capacity Utilization 76.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

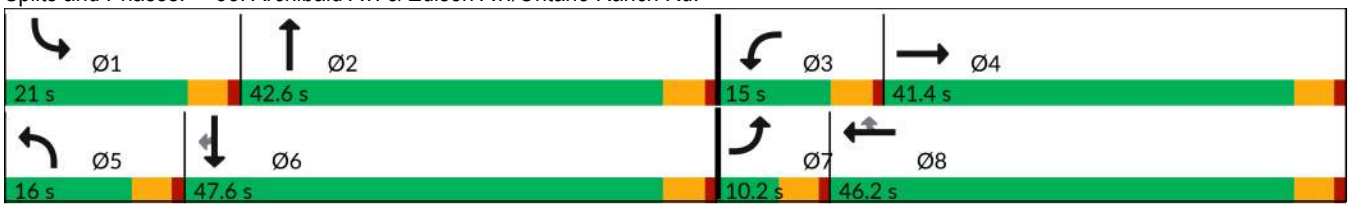

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 34 | 196 | 92 | 385 | 378 | 115 | 156 | 1000 | 255 | 113 | 368 | 68 |
| Future Volume (veh/h) | 34 | 196 | 92 | 385 | 378 | 115 | 156 | 1000 | 255 | 113 | 368 | 68 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 35 | 204 | 0 | 401 | 394 | 98 | 162 | 1042 | 0 | 118 | 383 | 48 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 99 | 809 | | 385 | 471 | 399 | 194 | 1262 | | 146 | 1161 | 518 |
| Arrive On Green | 0.03 | 0.17 | 0.00 | 0.13 | 0.27 | 0.27 | 0.12 | 0.37 | 0.00 | 0.09 | 0.34 | 0.34 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1502 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 35 | 204 | 0 | 401 | 394 | 98 | 162 | 1042 | 0 | 118 | 383 | 48 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1502 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 0.9 | 2.9 | 0.0 | 10.4 | 16.5 | 4.0 | 7.8 | 22.0 | 0.0 | 5.7 | 6.6 | 1.7 |
| Cycle Q Clear(g_c), s | 0.9 | 2.9 | 0.0 | 10.4 | 16.5 | 4.0 | 7.8 | 22.0 | 0.0 | 5.7 | 6.6 | 1.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 99 | 809 | | 385 | 471 | 399 | 194 | 1262 | | 146 | 1161 | 518 |
| V/C Ratio(X) | 0.35 | 0.25 | | 1.04 | 0.84 | 0.25 | 0.84 | 0.83 | | 0.81 | 0.33 | 0.09 |
| Avail Cap(c_a), veh/h | 207 | 2264 | | 385 | 938 | 795 | 231 | 1627 | | 332 | 1842 | 821 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.1 | 28.5 | 0.0 | 34.1 | 27.3 | 22.7 | 33.8 | 22.2 | 0.0 | 35.0 | 19.0 | 17.4 |
| Incr Delay (d2), s/veh | 0.8 | 0.2 | 0.0 | 57.1 | 4.0 | 0.3 | 17.3 | 2.8 | 0.0 | 4.0 | 0.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 1.0 | 0.0 | 6.4 | 6.7 | 1.3 | 3.7 | 7.8 | 0.0 | 2.2 | 2.3 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 37.9 | 28.6 | 0.0 | 91.2 | 31.3 | 23.0 | 51.0 | 25.1 | 0.0 | 39.0 | 19.2 | 17.5 |
| LnGrp LOS | D | C | | F | C | C | D | C | | D | B | B |
| Approach Vol, veh/h | | 239 | | | 893 | | | 1204 | | | 549 | |
| Approach Delay, s/veh | | 30.0 | | | 57.3 | | | 28.6 | | | 23.3 | |
| Approach LOS | | C | | | E | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.8 | 34.1 | 15.0 | 17.7 | 14.2 | 31.7 | 7.3 | 25.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 7.7 | 24.0 | 12.4 | 4.9 | 9.8 | 8.6 | 2.9 | 18.5 |
| Green Ext Time (p_c), s | 0.1 | 5.4 | 0.0 | 1.2 | 0.0 | 2.4 | 0.0 | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 36.6 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 166 | 171 | 83 | 143 | 357 | 198 | 937 | 103 | 30 | 529 | 100 |
| Future Volume (vph) | 166 | 171 | 83 | 143 | 357 | 198 | 937 | 103 | 30 | 529 | 100 |
| Turn Type | Prot | NA | Free | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.5 | 18.3 | 75.8 | 12.0 | 19.7 | 5.8 | 27.0 | 27.0 | 6.7 | 20.1 | 20.1 |
| Actuated g/C Ratio | 0.14 | 0.24 | 1.00 | 0.16 | 0.26 | 0.08 | 0.36 | 0.36 | 0.09 | 0.27 | 0.27 |
| v/c Ratio | 0.42 | 0.21 | 0.06 | 0.60 | 0.54 | 0.91 | 0.52 | 0.17 | 0.12 | 0.59 | 0.21 |
| Control Delay (s/veh) | 37.0 | 23.3 | 0.1 | 47.1 | 24.8 | 81.4 | 23.0 | 3.2 | 41.1 | 27.6 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.0 | 23.3 | 0.1 | 47.1 | 24.8 | 81.4 | 23.0 | 3.2 | 41.1 | 27.6 | 3.1 |
| LOS | D | C | A | D | C | F | C | A | D | C | A |
| Approach Delay (s/veh) | | 24.2 | | | 29.9 | | 30.7 | | | 24.5 | |
| Approach LOS | | C | | | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 75.8 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.91 | |
| Intersection Signal Delay (s/veh): 28.2 | Intersection LOS: C |
| Intersection Capacity Utilization 59.3% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

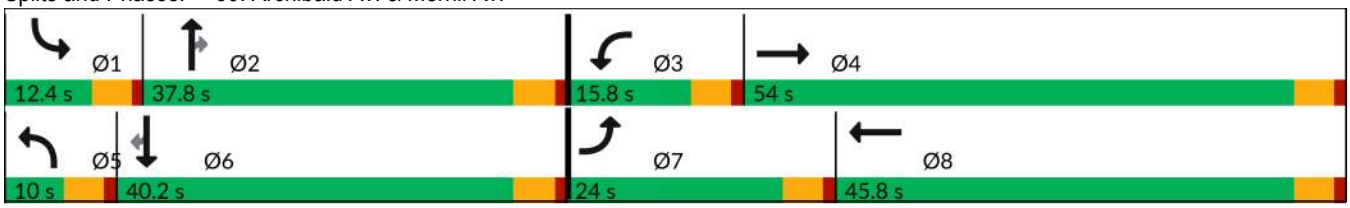

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 166 | 171 | 83 | 143 | 357 | 120 | 198 | 937 | 103 | 30 | 529 | 100 |
| Future Volume (veh/h) | 166 | 171 | 83 | 143 | 357 | 120 | 198 | 937 | 103 | 30 | 529 | 100 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 173 | 178 | 0 | 149 | 372 | 60 | 206 | 976 | 75 | 31 | 551 | 55 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 281 | 642 | | 186 | 607 | 97 | 298 | 1677 | 474 | 104 | 889 | 376 |
| Arrive On Green | 0.09 | 0.18 | 0.00 | 0.12 | 0.20 | 0.20 | 0.10 | 0.32 | 0.32 | 0.03 | 0.25 | 0.25 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 2975 | 475 | 3000 | 5316 | 1502 | 3000 | 3544 | 1500 |
| Grp Volume(v), veh/h | 173 | 178 | 0 | 149 | 220 | 212 | 206 | 976 | 75 | 31 | 551 | 55 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1678 | 1500 | 1772 | 1502 | 1500 | 1772 | 1500 |
| Q Serve(g_s), s | 2.9 | 2.3 | 0.0 | 4.8 | 5.9 | 6.0 | 3.5 | 8.0 | 1.9 | 0.5 | 7.2 | 1.5 |
| Cycle Q Clear(g_c), s | 2.9 | 2.3 | 0.0 | 4.8 | 5.9 | 6.0 | 3.5 | 8.0 | 1.9 | 0.5 | 7.2 | 1.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.28 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 281 | 642 | | 186 | 362 | 343 | 298 | 1677 | 474 | 104 | 889 | 376 |
| V/C Ratio(X) | 0.62 | 0.28 | | 0.80 | 0.61 | 0.62 | 0.69 | 0.58 | 0.16 | 0.30 | 0.62 | 0.15 |
| Avail Cap(c_a), veh/h | 1113 | 3349 | | 341 | 1396 | 1323 | 310 | 3376 | 954 | 448 | 2413 | 1021 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 22.8 | 18.5 | 0.0 | 22.5 | 18.9 | 18.9 | 22.8 | 15.0 | 12.9 | 24.6 | 17.4 | 15.2 |
| Incr Delay (d2), s/veh | 2.2 | 0.2 | 0.0 | 7.7 | 1.7 | 1.8 | 6.1 | 0.3 | 0.2 | 1.6 | 0.7 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.8 | 0.0 | 1.9 | 2.2 | 2.1 | 1.3 | 2.4 | 0.5 | 0.2 | 2.3 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 25.0 | 18.7 | 0.0 | 30.2 | 20.6 | 20.8 | 28.9 | 15.3 | 13.0 | 26.2 | 18.1 | 15.4 |
| LnGrp LOS | C | B | | C | C | C | C | B | B | C | B | B |
| Approach Vol, veh/h | | 351 | | | 581 | | | 1257 | | | 637 | |
| Approach Delay, s/veh | | 21.8 | | | 23.1 | | | 17.4 | | | 18.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.4 | 21.1 | 10.7 | 14.1 | 9.8 | 17.7 | 9.5 | 15.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 2.5 | 10.0 | 6.8 | 4.3 | 5.5 | 9.2 | 4.9 | 8.0 |
| Green Ext Time (p_c), s | 0.0 | 6.4 | 0.1 | 1.1 | 0.0 | 3.4 | 0.4 | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 19.3 |
| HCM 7th LOS | B |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 40 | 105 | 7 | 322 | 165 | 464 | 35 | 826 | 277 | 299 | 509 | 53 |
| Future Volume (vph) | 40 | 105 | 7 | 322 | 165 | 464 | 35 | 826 | 277 | 299 | 509 | 53 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.4 | 12.5 | 12.5 | 15.1 | 22.8 | 32.9 | 5.4 | 28.7 | 43.8 | 10.1 | 38.6 | 38.6 |
| Actuated g/C Ratio | 0.07 | 0.15 | 0.15 | 0.19 | 0.28 | 0.40 | 0.07 | 0.35 | 0.54 | 0.12 | 0.47 | 0.47 |
| v/c Ratio | 0.22 | 0.21 | 0.02 | 0.63 | 0.18 | 0.43 | 0.19 | 0.73 | 0.31 | 0.87 | 0.23 | 0.07 |
| Control Delay (s/veh) | 47.2 | 36.0 | 0.1 | 39.1 | 24.2 | 12.8 | 46.8 | 28.4 | 2.0 | 65.0 | 16.1 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.2 | 36.0 | 0.1 | 39.1 | 24.2 | 12.8 | 46.8 | 28.4 | 2.0 | 65.0 | 16.1 | 0.2 |
| LOS | D | D | A | D | C | B | D | C | A | E | B | A |
| Approach Delay (s/veh) | | 37.4 | | | 23.7 | | | 22.6 | | | 32.1 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 81.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 26.3 | Intersection LOS: C |
| Intersection Capacity Utilization 66.4% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

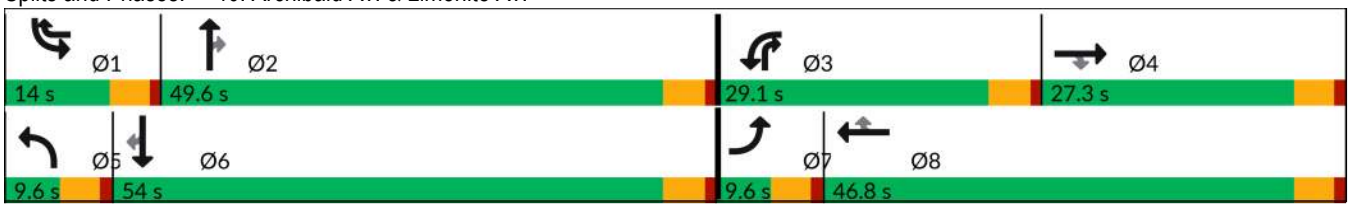

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 40 | 105 | 7 | 322 | 165 | 464 | 35 | 826 | 277 | 299 | 509 | 53 |
| Future Volume (veh/h) | 40 | 105 | 7 | 322 | 165 | 464 | 35 | 826 | 277 | 299 | 509 | 53 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 42 | 109 | 6 | 335 | 172 | 346 | 36 | 860 | 174 | 311 | 530 | 48 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 115 | 421 | 188 | 425 | 779 | 957 | 104 | 1153 | 733 | 380 | 2116 | 657 |
| Arrive On Green | 0.04 | 0.13 | 0.13 | 0.15 | 0.23 | 0.23 | 0.04 | 0.34 | 0.34 | 0.13 | 0.44 | 0.44 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 2910 | 3367 | 2639 | 2910 | 3367 | 1500 | 2910 | 4837 | 1502 |
| Grp Volume(v), veh/h | 42 | 109 | 6 | 335 | 172 | 346 | 36 | 860 | 174 | 311 | 530 | 48 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1455 | 1683 | 1320 | 1455 | 1683 | 1500 | 1455 | 1612 | 1502 |
| Q Serve(g_s), s | 1.0 | 2.1 | 0.3 | 8.0 | 3.0 | 6.9 | 0.9 | 16.2 | 4.8 | 7.5 | 5.0 | 1.3 |
| Cycle Q Clear(g_c), s | 1.0 | 2.1 | 0.3 | 8.0 | 3.0 | 6.9 | 0.9 | 16.2 | 4.8 | 7.5 | 5.0 | 1.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 115 | 421 | 188 | 425 | 779 | 957 | 104 | 1153 | 733 | 380 | 2116 | 657 |
| V/C Ratio(X) | 0.37 | 0.26 | 0.03 | 0.79 | 0.22 | 0.36 | 0.35 | 0.75 | 0.24 | 0.82 | 0.25 | 0.07 |
| Avail Cap(c_a), veh/h | 202 | 1063 | 474 | 991 | 1975 | 1894 | 202 | 2107 | 1158 | 380 | 3323 | 1031 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.7 | 28.4 | 27.6 | 29.6 | 22.4 | 16.8 | 33.9 | 20.9 | 10.6 | 30.4 | 12.8 | 11.8 |
| Incr Delay (d2), s/veh | 0.7 | 0.3 | 0.1 | 1.3 | 0.1 | 0.2 | 0.7 | 1.0 | 0.2 | 12.3 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.8 | 0.1 | 2.6 | 1.1 | 1.9 | 0.3 | 5.4 | 1.3 | 3.0 | 1.4 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.4 | 28.8 | 27.7 | 30.9 | 22.5 | 17.1 | 34.6 | 21.9 | 10.8 | 42.7 | 12.8 | 11.8 |
| LnGrp LOS | C | C | C | C | C | B | C | C | B | D | B | B |
| Approach Vol, veh/h | | 157 | | | 853 | | | 1070 | | | 889 | |
| Approach Delay, s/veh | | 30.2 | | | 23.6 | | | 20.5 | | | 23.2 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 29.2 | 15.1 | 13.6 | 7.2 | 36.1 | 7.4 | 21.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 18.2 | 10.0 | 4.1 | 2.9 | 7.0 | 3.0 | 8.9 |
| Green Ext Time (p_c), s | 0.0 | 6.2 | 0.5 | 0.5 | 0.0 | 3.5 | 0.0 | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.7 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 95 | 509 | 9 | 29 | 701 | 70 | 33 | 86 | 95 | 48 |
| Future Volume (vph) | 95 | 509 | 9 | 29 | 701 | 70 | 33 | 86 | 95 | 48 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.9 | 31.0 | 31.0 | 6.3 | 22.3 | 22.3 | 6.3 | 11.3 | 9.1 | 17.7 |
| Actuated g/C Ratio | 0.12 | 0.46 | 0.46 | 0.09 | 0.33 | 0.33 | 0.09 | 0.17 | 0.14 | 0.26 |
| v/c Ratio | 0.54 | 0.33 | 0.01 | 0.21 | 0.63 | 0.13 | 0.23 | 0.50 | 0.47 | 0.27 |
| Control Delay (s/veh) | 47.0 | 15.6 | 0.0 | 37.0 | 22.7 | 0.7 | 37.8 | 30.7 | 38.4 | 15.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.0 | 15.6 | 0.0 | 37.0 | 22.7 | 0.7 | 37.8 | 30.7 | 38.4 | 15.4 |
| LOS | D | B | A | D | C | A | D | C | D | B |
| Approach Delay (s/veh) | | 20.3 | | | 21.3 | | | 32.1 | | 25.5 |
| Approach LOS | | C | | | C | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 66.8 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.63 | |
| Intersection Signal Delay (s/veh): 22.5 | Intersection LOS: C |
| Intersection Capacity Utilization 57.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

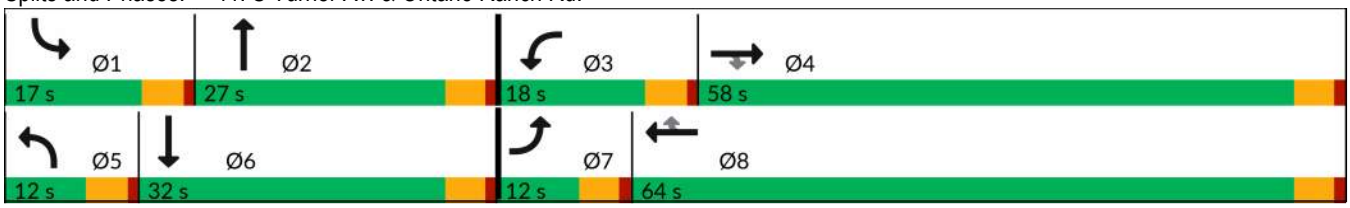

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 95 | 509 | 9 | 29 | 701 | 70 | 33 | 86 | 54 | 95 | 48 | 71 |
| Future Volume (veh/h) | 95 | 509 | 9 | 29 | 701 | 70 | 33 | 86 | 54 | 95 | 48 | 71 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 101 | 541 | 8 | 31 | 746 | 52 | 35 | 91 | 33 | 101 | 51 | 53 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 124 | 1350 | 559 | 56 | 1199 | 507 | 62 | 140 | 51 | 124 | 122 | 126 |
| Arrive On Green | 0.08 | 0.38 | 0.38 | 0.04 | 0.34 | 0.34 | 0.04 | 0.11 | 0.11 | 0.08 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1594 | 3544 | 1469 | 1594 | 3544 | 1499 | 1594 | 1226 | 444 | 1594 | 796 | 827 |
| Grp Volume(v), veh/h | 101 | 541 | 8 | 31 | 746 | 52 | 35 | 0 | 124 | 101 | 0 | 104 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1469 | 1594 | 1772 | 1499 | 1594 | 0 | 1670 | 1594 | 0 | 1623 |
| Q Serve(g_s), s | 2.9 | 5.2 | 0.2 | 0.9 | 8.3 | 1.1 | 1.0 | 0.0 | 3.3 | 2.9 | 0.0 | 2.7 |
| Cycle Q Clear(g_c), s | 2.9 | 5.2 | 0.2 | 0.9 | 8.3 | 1.1 | 1.0 | 0.0 | 3.3 | 2.9 | 0.0 | 2.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 0.51 |
| Lane Grp Cap(c), veh/h | 124 | 1350 | 559 | 56 | 1199 | 507 | 62 | 0 | 190 | 124 | 0 | 248 |
| V/C Ratio(X) | 0.81 | 0.40 | 0.01 | 0.55 | 0.62 | 0.10 | 0.56 | 0.00 | 0.65 | 0.81 | 0.00 | 0.42 |
| Avail Cap(c_a), veh/h | 251 | 4030 | 1670 | 455 | 4483 | 1897 | 251 | 0 | 797 | 421 | 0 | 947 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.3 | 10.6 | 9.1 | 22.3 | 13.0 | 10.7 | 22.2 | 0.0 | 19.9 | 21.3 | 0.0 | 18.0 |
| Incr Delay (d2), s/veh | 4.8 | 0.2 | 0.0 | 3.1 | 0.5 | 0.1 | 2.9 | 0.0 | 3.7 | 4.8 | 0.0 | 1.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 1.5 | 0.0 | 0.3 | 2.5 | 0.3 | 0.4 | 0.0 | 1.3 | 1.1 | 0.0 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 26.1 | 10.8 | 9.1 | 25.4 | 13.6 | 10.7 | 25.1 | 0.0 | 23.6 | 26.1 | 0.0 | 19.1 |
| LnGrp LOS | C | B | A | C | B | B | C | | C | C | | B |
| Approach Vol, veh/h | | 650 | | | 829 | | | 159 | | | 205 | |
| Approach Delay, s/veh | | 13.2 | | | 13.8 | | | 24.0 | | | 22.6 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.3 | 10.0 | 6.3 | 22.5 | 6.4 | 11.8 | 8.3 | 20.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 4.9 | 5.3 | 2.9 | 7.2 | 3.0 | 4.7 | 4.9 | 10.3 |
| Green Ext Time (p_c), s | 0.1 | 0.5 | 0.0 | 3.7 | 0.0 | 0.4 | 0.0 | 5.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 15.4 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 152 | 509 | 73 | 147 | 625 | 306 | 66 | 362 | 106 | 234 | 257 | 55 |
| Future Volume (vph) | 152 | 509 | 73 | 147 | 625 | 306 | 66 | 362 | 106 | 234 | 257 | 55 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.3 | 21.1 | 21.1 | 9.3 | 18.1 | 18.1 | 6.1 | 25.8 | 25.8 | 16.5 | 36.2 | 36.2 |
| Actuated g/C Ratio | 0.13 | 0.23 | 0.23 | 0.10 | 0.20 | 0.20 | 0.07 | 0.28 | 0.28 | 0.18 | 0.40 | 0.40 |
| v/c Ratio | 0.76 | 0.49 | 0.17 | 0.53 | 0.55 | 0.59 | 0.66 | 0.77 | 0.22 | 0.88 | 0.39 | 0.09 |
| Control Delay (s/veh) | 65.5 | 33.6 | 0.9 | 48.5 | 35.5 | 8.9 | 75.6 | 41.5 | 3.5 | 70.1 | 21.8 | 1.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 65.5 | 33.6 | 0.9 | 48.5 | 35.5 | 8.9 | 75.6 | 41.5 | 3.5 | 70.1 | 21.8 | 1.3 |
| LOS | E | C | A | D | D | A | E | D | A | E | C | A |
| Approach Delay (s/veh) | | 37.0 | | | 29.7 | | | 38.1 | | | 40.4 | |
| Approach LOS | | D | | | C | | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 91.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay (s/veh): 35.1 | Intersection LOS: D |
| Intersection Capacity Utilization 70.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 152 | 509 | 73 | 147 | 625 | 306 | 66 | 362 | 106 | 234 | 257 | 55 |
| Future Volume (veh/h) | 152 | 509 | 73 | 147 | 625 | 306 | 66 | 362 | 106 | 234 | 257 | 55 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 162 | 541 | 34 | 156 | 665 | 209 | 70 | 385 | 44 | 249 | 273 | 44 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 193 | 1243 | 380 | 222 | 1291 | 316 | 86 | 462 | 391 | 283 | 681 | 577 |
| Arrive On Green | 0.12 | 0.26 | 0.26 | 0.08 | 0.21 | 0.21 | 0.05 | 0.26 | 0.26 | 0.18 | 0.38 | 0.38 |
| Sat Flow, veh/h | 1594 | 4837 | 1481 | 2910 | 6095 | 1491 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 162 | 541 | 34 | 156 | 665 | 209 | 70 | 385 | 44 | 249 | 273 | 44 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1481 | 1455 | 1524 | 1491 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 8.0 | 7.5 | 1.4 | 4.2 | 7.8 | 10.3 | 3.5 | 16.5 | 1.8 | 12.3 | 9.0 | 1.5 |
| Cycle Q Clear(g_c), s | 8.0 | 7.5 | 1.4 | 4.2 | 7.8 | 10.3 | 3.5 | 16.5 | 1.8 | 12.3 | 9.0 | 1.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 193 | 1243 | 380 | 222 | 1291 | 316 | 86 | 462 | 391 | 283 | 681 | 577 |
| V/C Ratio(X) | 0.84 | 0.44 | 0.09 | 0.70 | 0.52 | 0.66 | 0.81 | 0.83 | 0.11 | 0.88 | 0.40 | 0.08 |
| Avail Cap(c_a), veh/h | 237 | 1748 | 535 | 462 | 2263 | 554 | 119 | 959 | 812 | 319 | 1181 | 1001 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.6 | 25.0 | 22.8 | 36.3 | 28.1 | 29.1 | 37.7 | 28.1 | 22.7 | 32.3 | 18.0 | 15.7 |
| Incr Delay (d2), s/veh | 16.3 | 0.2 | 0.1 | 1.5 | 0.3 | 2.4 | 18.2 | 4.0 | 0.1 | 20.4 | 0.4 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.7 | 2.6 | 0.4 | 1.4 | 2.6 | 3.5 | 1.7 | 6.9 | 0.6 | 6.0 | 3.4 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 50.9 | 25.3 | 22.9 | 37.8 | 28.4 | 31.5 | 55.9 | 32.1 | 22.8 | 52.7 | 18.4 | 15.8 |
| LnGrp LOS | D | C | C | D | C | C | E | C | C | D | B | B |
| Approach Vol, veh/h | | 737 | | | 1030 | | | 499 | | | 566 | |
| Approach Delay, s/veh | | 30.8 | | | 30.5 | | | 34.6 | | | 33.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.9 | 25.6 | 10.7 | 25.3 | 9.0 | 35.5 | 14.4 | 21.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 14.3 | 18.5 | 6.2 | 9.5 | 5.5 | 11.0 | 10.0 | 12.3 |
| Green Ext Time (p_c), s | 0.1 | 2.3 | 0.1 | 3.2 | 0.0 | 1.7 | 0.0 | 4.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 31.8 |
| HCM 7th LOS | C |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 158 | 654 | 143 | 187 | 679 | 191 | 217 | 547 | 397 | 100 | 192 | 74 |
| Future Volume (vph) | 158 | 654 | 143 | 187 | 679 | 191 | 217 | 547 | 397 | 100 | 192 | 74 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.5 | 23.5 | 23.5 | 8.9 | 24.8 | 24.8 | 7.9 | 21.7 | 21.7 | 6.5 | 20.4 | 20.4 |
| Actuated g/C Ratio | 0.09 | 0.29 | 0.29 | 0.11 | 0.31 | 0.31 | 0.10 | 0.27 | 0.27 | 0.08 | 0.25 | 0.25 |
| v/c Ratio | 0.61 | 0.48 | 0.27 | 0.61 | 0.68 | 0.33 | 0.80 | 0.44 | 0.74 | 0.44 | 0.23 | 0.17 |
| Control Delay (s/veh) | 50.6 | 24.8 | 5.6 | 47.9 | 28.3 | 5.2 | 61.5 | 25.1 | 21.8 | 47.9 | 24.5 | 4.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.6 | 24.8 | 5.6 | 47.9 | 28.3 | 5.2 | 61.5 | 25.1 | 21.8 | 47.9 | 24.5 | 4.3 |
| LOS | D | C | A | D | C | A | E | C | C | D | C | A |
| Approach Delay (s/veh) | | 26.2 | | | 27.6 | | | 30.8 | | | 26.8 | |
| Approach LOS | | C | | | C | | | C | | | C | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 80.1
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay (s/veh): 28.2 — Intersection LOS: C
Intersection Capacity Utilization 57.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

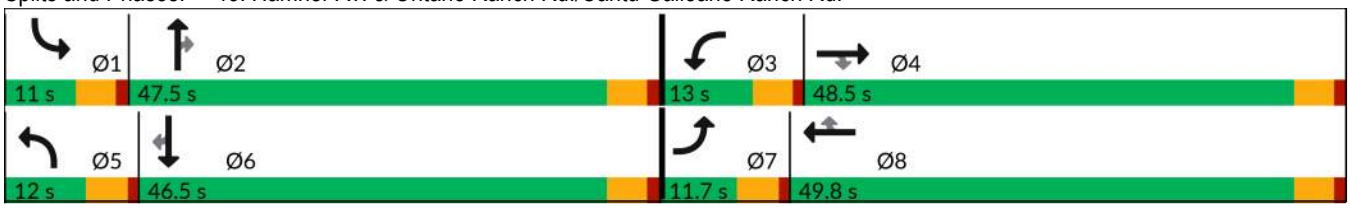

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 158 | 654 | 143 | 187 | 679 | 191 | 217 | 547 | 397 | 100 | 192 | 74 |
| Future Volume (veh/h) | 158 | 654 | 143 | 187 | 679 | 191 | 217 | 547 | 397 | 100 | 192 | 74 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 165 | 681 | 95 | 195 | 707 | 188 | 226 | 570 | 181 | 104 | 200 | 65 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 244 | 1428 | 443 | 280 | 1035 | 462 | 312 | 1080 | 334 | 203 | 625 | 279 |
| Arrive On Green | 0.08 | 0.30 | 0.30 | 0.10 | 0.31 | 0.31 | 0.11 | 0.22 | 0.22 | 0.07 | 0.19 | 0.19 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 3367 | 1502 | 2910 | 4837 | 1498 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 165 | 681 | 95 | 195 | 707 | 188 | 226 | 570 | 181 | 104 | 200 | 65 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1683 | 1502 | 1455 | 1612 | 1498 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 3.2 | 6.7 | 2.8 | 3.8 | 10.7 | 5.8 | 4.4 | 6.1 | 6.2 | 2.0 | 3.0 | 2.1 |
| Cycle Q Clear(g_c), s | 3.2 | 6.7 | 2.8 | 3.8 | 10.7 | 5.8 | 4.4 | 6.1 | 6.2 | 2.0 | 3.0 | 2.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 244 | 1428 | 443 | 280 | 1035 | 462 | 312 | 1080 | 334 | 203 | 625 | 279 |
| V/C Ratio(X) | 0.68 | 0.48 | 0.21 | 0.70 | 0.68 | 0.41 | 0.72 | 0.53 | 0.54 | 0.51 | 0.32 | 0.23 |
| Avail Cap(c_a), veh/h | 354 | 3640 | 1130 | 419 | 2608 | 1163 | 369 | 3557 | 1101 | 319 | 2418 | 1078 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.9 | 16.9 | 15.5 | 25.5 | 17.7 | 16.0 | 25.2 | 19.9 | 20.0 | 26.2 | 20.6 | 20.2 |
| Incr Delay (d2), s/veh | 1.2 | 0.2 | 0.2 | 1.2 | 0.8 | 0.6 | 4.2 | 0.4 | 1.4 | 0.7 | 0.3 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 2.0 | 0.8 | 1.2 | 3.3 | 1.6 | 1.5 | 1.9 | 1.9 | 0.6 | 1.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.2 | 17.1 | 15.7 | 26.7 | 18.5 | 16.6 | 29.4 | 20.3 | 21.4 | 26.9 | 20.9 | 20.6 |
| LnGrp LOS | C | B | B | C | B | B | C | C | C | C | C | C |
| Approach Vol, veh/h | | 941 | | | 1090 | | | 977 | | | 369 | |
| Approach Delay, s/veh | | 18.7 | | | 19.6 | | | 22.6 | | | 22.5 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.7 | 17.6 | 10.2 | 21.8 | 10.9 | 15.4 | 9.5 | 22.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 4.0 | 8.2 | 5.8 | 8.7 | 6.4 | 5.0 | 5.2 | 12.7 |
| Green Ext Time (p_c), s | 0.0 | 4.3 | 0.1 | 4.7 | 0.0 | 1.3 | 0.0 | 5.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.6 |
| HCM 7th LOS | C |

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 956 | 505 | 135 | 254 | 0 | 988 |
| Future Volume (vph) | 956 | 505 | 135 | 254 | 0 | 988 |
| Turn Type | NA | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | 6 | | | 4 | |
| Permitted Phases | | | Free | 4 | | 4 |
| Detector Phase | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 61.6 | 61.6 | 120.0 | 47.3 | 47.3 | 47.3 |
| Actuated g/C Ratio | 0.51 | 0.51 | 1.00 | 0.39 | 0.39 | 0.39 |
| v/c Ratio | 0.37 | 0.29 | 0.05 | 0.39 | 0.79 | 0.79 |
| Control Delay (s/veh) | 20.1 | 33.9 | 0.0 | 25.8 | 31.0 | 30.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.1 | 33.9 | 0.0 | 25.8 | 31.0 | 30.6 |
| LOS | C | C | A | C | C | C |
| Approach Delay (s/veh) | 20.1 | 26.7 | | | 29.9 | |
| Approach LOS | C | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 37.5 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 50 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.79 | |
| Intersection Signal Delay (s/veh): 25.9 | Intersection LOS: C |
| Intersection Capacity Utilization 67.0% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

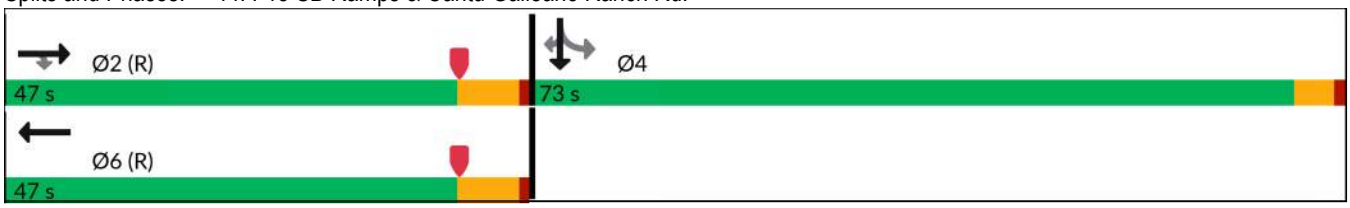

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 956 | 0 | 0 | 505 | 135 | 0 | 0 | 0 | 254 | 0 | 988 |
| Future Volume (veh/h) | 0 | 956 | 0 | 0 | 505 | 135 | 0 | 0 | 0 | 254 | 0 | 988 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 0 | 1772 | 1772 | | | | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 1006 | 0 | 0 | 532 | 0 | | | | 178 | 0 | 890 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 3038 | | 0 | 2026 | | | | | 535 | 0 | 1009 |
| Arrive On Green | 0.00 | 0.57 | 0.00 | 0.00 | 1.00 | 0.00 | | | | 0.34 | 0.00 | 0.34 |
| Sat Flow, veh/h | 0 | 5316 | 1502 | 0 | 3544 | 2643 | | | | 1594 | 0 | 3003 |
| Grp Volume(v), veh/h | 0 | 1006 | 0 | 0 | 532 | 0 | | | | 178 | 0 | 890 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 1502 | 0 | 1772 | 1321 | | | | 1594 | 0 | 1502 |
| Q Serve(g_s), s | 0.0 | 12.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 10.0 | 0.0 | 33.6 |
| Cycle Q Clear(g_c), s | 0.0 | 12.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 10.0 | 0.0 | 33.6 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 3038 | | 0 | 2026 | | | | | 535 | 0 | 1009 |
| V/C Ratio(X) | 0.00 | 0.33 | | 0.00 | 0.26 | | | | | 0.33 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 0 | 3038 | | 0 | 2026 | | | | | 908 | 0 | 1712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.80 | 0.00 | 0.00 | 0.88 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 13.6 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 29.8 | 0.0 | 37.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.2 | 0.0 | 0.0 | 0.3 | 0.0 | | | | 0.4 | 0.0 | 3.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 4.3 | 0.0 | 0.0 | 0.1 | 0.0 | | | | 3.8 | 0.0 | 12.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 13.8 | 0.0 | 0.0 | 0.3 | 0.0 | | | | 30.1 | 0.0 | 40.7 |
| LnGrp LOS | | B | | | A | | | | | C | | D |
| Approach Vol, veh/h | | 1006 | | | 532 | | | | | | 1068 | |
| Approach Delay, s/veh | | 13.8 | | | 0.3 | | | | | | 39.0 | |
| Approach LOS | | B | | | A | | | | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 75.1 | 44.9 | 75.1 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 14.0 | 35.6 | 2.0 |
| Green Ext Time (p_c), s | 6.7 | 4.7 | 3.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.4 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 436 | 740 | 213 | 301 | 364 | 232 |
| Future Volume (vph) | 436 | 740 | 213 | 301 | 364 | 232 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 69.2 | 69.2 | 14.1 | 87.9 | 21.0 | 21.0 |
| Actuated g/C Ratio | 0.58 | 0.58 | 0.12 | 0.73 | 0.18 | 0.18 |
| v/c Ratio | 0.15 | 0.66 | 0.63 | 0.08 | 0.76 | 0.45 |
| Control Delay (s/veh) | 8.4 | 14.9 | 58.4 | 5.0 | 54.6 | 9.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 8.4 | 14.9 | 58.4 | 5.0 | 54.6 | 9.2 |
| LOS | A | B | E | A | D | A |
| Approach Delay (s/veh) | 12.5 | | | 27.2 | 40.5 | |
| Approach LOS | B | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 44.8 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay (s/veh): 23.1 | Intersection LOS: C |
| Intersection Capacity Utilization 64.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

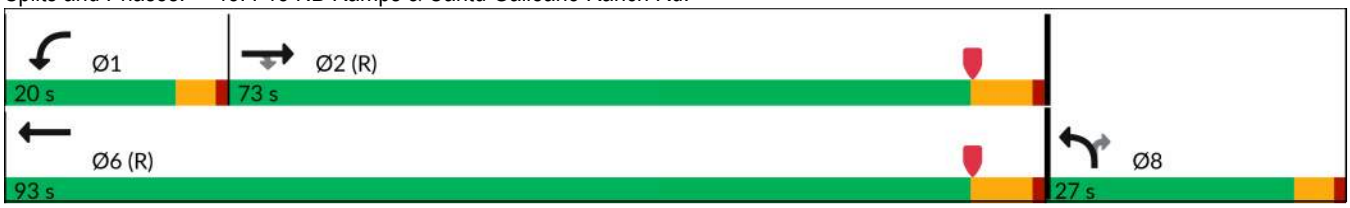

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 436 | 740 | 213 | 301 | 364 | 232 |
| Future Volume (veh/h) | 436 | 740 | 213 | 301 | 364 | 232 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1575 | 1772 | 1673 | 1772 |
| Adj Flow Rate, veh/h | 449 | 563 | 220 | 310 | 375 | 151 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3391 | 958 | 273 | 4078 | 447 | 211 |
| Arrive On Green | 1.00 | 1.00 | 0.09 | 0.77 | 0.14 | 0.14 |
| Sat Flow, veh/h | 5316 | 1502 | 3000 | 5316 | 3188 | 1502 |
| Grp Volume(v), veh/h | 449 | 563 | 220 | 310 | 375 | 151 |
| Grp Sat Flow(s),veh/h/ln | 1772 | 1502 | 1500 | 1772 | 1594 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 8.6 | 1.7 | 13.8 | 11.5 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 8.6 | 1.7 | 13.8 | 11.5 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3391 | 958 | 273 | 4078 | 447 | 211 |
| V/C Ratio(X) | 0.13 | 0.59 | 0.81 | 0.08 | 0.84 | 0.72 |
| Avail Cap(c_a), veh/h | 3391 | 958 | 385 | 4078 | 595 | 280 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.94 | 0.94 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 53.5 | 3.5 | 50.3 | 49.3 |
| Incr Delay (d2), s/veh | 0.1 | 2.5 | 8.3 | 0.0 | 7.9 | 5.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.7 | 3.4 | 0.4 | 5.8 | 4.5 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.1 | 2.5 | 61.8 | 3.5 | 58.2 | 55.0 |
| LnGrp LOS | A | A | E | A | E | E |
| Approach Vol, veh/h | 1012 | | | 530 | 526 | |
| Approach Delay, s/veh | 1.4 | | | 27.7 | 57.3 | |
| Approach LOS | A | | | C | E | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.5 | 83.1 | | | | 98.6 | 21.4 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 10.6 | 2.0 | | | | 3.7 | 15.8 |
| Green Ext Time (p_c), s | 0.3 | 5.3 | | | | 1.9 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.4 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 373 | 3 | 390 | 230 | 919 | 1058 | 527 |
| Future Volume (vph) | 373 | 3 | 390 | 230 | 919 | 1058 | 527 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 24.0 | 61.0 | 37.0 | 37.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 26.7% | 67.8% | 41.1% | 41.1% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 20.9 | 20.9 | 20.9 | 17.1 | 56.1 | 33.8 | 33.8 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.19 | 0.62 | 0.38 | 0.38 |
| v/c Ratio | 0.81 | 0.71 | 0.61 | 0.81 | 0.47 | 0.90 | 0.63 |
| Control Delay (s/veh) | 51.6 | 34.4 | 21.7 | 49.0 | 1.8 | 38.7 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.6 | 34.4 | 21.7 | 49.0 | 2.2 | 38.7 | 5.6 |
| LOS | D | C | C | D | A | D | A |
| Approach Delay (s/veh) | | 36.3 | | | 11.6 | 27.7 | |
| Approach LOS | | D | | | B | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.90 | |
| Intersection Signal Delay (s/veh): 24.3 | Intersection LOS: C |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

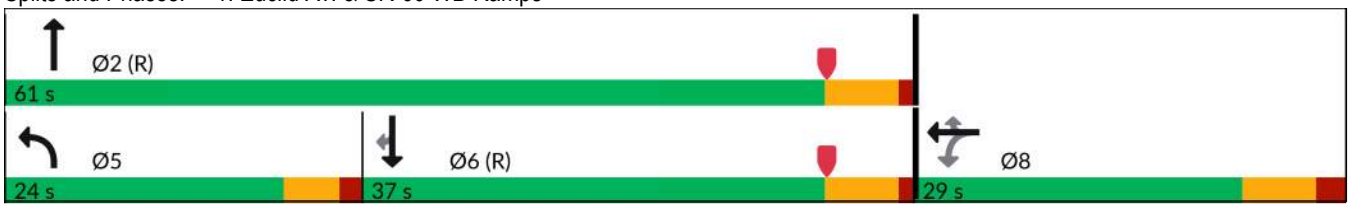

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 373 | 3 | 390 | 230 | 919 | 0 | 0 | 1058 | 527 |
| Future Volume (veh/h) | 0 | 0 | 0 | 373 | 3 | 390 | 230 | 919 | 0 | 0 | 1058 | 527 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 469 | 0 | 154 | 245 | 978 | 0 | 0 | 1126 | 322 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 593 | 0 | 279 | 281 | 2254 | 0 | 0 | 1465 | 649 |
| Arrive On Green | | | | 0.19 | 0.00 | 0.19 | 0.06 | 0.22 | 0.00 | 0.00 | 0.44 | 0.44 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1497 | 1594 | 3455 | 0 | 0 | 3455 | 1491 |
| Grp Volume(v), veh/h | | | | 469 | 0 | 154 | 245 | 978 | 0 | 0 | 1126 | 322 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1497 | 1594 | 1683 | 0 | 0 | 1683 | 1491 |
| Q Serve(g_s), s | | | | 12.6 | 0.0 | 8.4 | 13.7 | 22.5 | 0.0 | 0.0 | 25.6 | 14.0 |
| Cycle Q Clear(g_c), s | | | | 12.6 | 0.0 | 8.4 | 13.7 | 22.5 | 0.0 | 0.0 | 25.6 | 14.0 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 593 | 0 | 279 | 281 | 2254 | 0 | 0 | 1465 | 649 |
| V/C Ratio(X) | | | | 0.79 | 0.00 | 0.55 | 0.87 | 0.43 | 0.00 | 0.00 | 0.77 | 0.50 |
| Avail Cap(c_a), veh/h | | | | 779 | 0 | 366 | 333 | 2254 | 0 | 0 | 1465 | 649 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.54 | 0.54 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.0 | 0.0 | 33.2 | 41.4 | 20.4 | 0.0 | 0.0 | 21.6 | 18.3 |
| Incr Delay (d2), s/veh | | | | 4.9 | 0.0 | 2.4 | 11.4 | 0.3 | 0.0 | 0.0 | 3.9 | 2.7 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.2 | 0.0 | 3.2 | 6.7 | 10.0 | 0.0 | 0.0 | 9.7 | 4.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.8 | 0.0 | 35.7 | 52.7 | 20.7 | 0.0 | 0.0 | 25.5 | 21.0 |
| LnGrp LOS | | | | D | | D | D | C | | | C | C |
| Approach Vol, veh/h | | | | | 623 | | | 1223 | | | 1448 | |
| Approach Delay, s/veh | | | | | 38.8 | | | 27.1 | | | 24.5 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.2 | | 21.1 | 45.2 | | 23.8 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 18.8 | 31.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 24.5 | | 15.7 | 27.6 | | 14.6 |
| Green Ext Time (p_c), s | 10.4 | | 0.2 | 2.8 | | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.2 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 260 | 2 | 202 | 878 | 393 | 386 | 1027 |
| Future Volume (vph) | 260 | 2 | 202 | 878 | 393 | 386 | 1027 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 9.6 | 9.6 | 29.0 | 29.0 | 14.7 | 27.0 |
| Total Split (s) | 25.0 | 25.0 | 25.0 | 33.0 | 33.0 | 32.0 | 65.0 |
| Total Split (%) | 27.8% | 27.8% | 27.8% | 36.7% | 36.7% | 35.6% | 72.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | | 4.6 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 18.4 | 0.0 | 18.4 | 31.2 | 31.2 | 25.1 | 61.0 |
| Actuated g/C Ratio | 0.20 | 0.00 | 0.20 | 0.35 | 0.35 | 0.28 | 0.68 |
| v/c Ratio | 0.81 | no cap | 0.50 | 0.76 | 0.52 | 0.88 | 0.46 |
| Control Delay (s/veh) | 54.4 | | 16.6 | 33.1 | 5.4 | 34.3 | 15.6 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Total Delay (s/veh) | 54.4 | Error | 16.6 | 33.1 | 5.4 | 34.3 | 16.6 |
| LOS | D | F | B | C | A | C | B |
| Approach Delay (s/veh) | | Error | | 24.5 | | | 21.4 |
| Approach LOS | | F | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

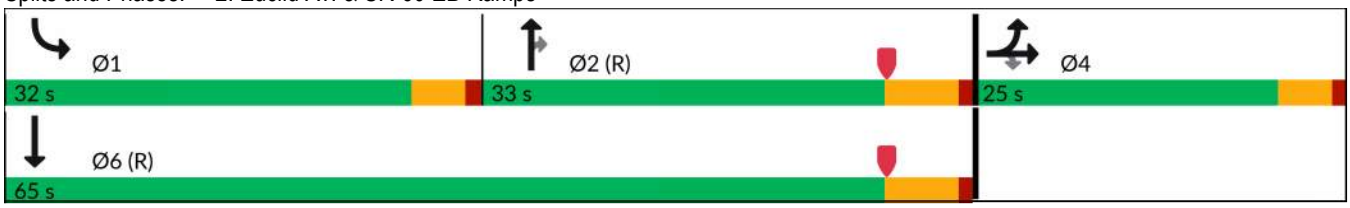

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 260 | 2 | 202 | 0 | 0 | 0 | 0 | 878 | 393 | 386 | 1027 | 0 |
| Future Volume (veh/h) | 260 | 2 | 202 | 0 | 0 | 0 | 0 | 878 | 393 | 386 | 1027 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 263 | 2 | 145 | | | | 0 | 887 | 282 | 390 | 1037 | 0 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 300 | 0 | 283 | | | | 0 | 1288 | 572 | 413 | 2335 | 0 |
| Arrive On Green | 0.19 | 0.19 | 0.19 | | | | 0.00 | 0.38 | 0.38 | 0.52 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 1499 | | | | 0 | 3455 | 1496 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 263 | 0 | 145 | | | | 0 | 887 | 282 | 390 | 1037 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1499 | | | | 0 | 1683 | 1496 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 14.4 | 0.0 | 7.8 | | | | 0.0 | 19.9 | 12.9 | 20.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.4 | 0.0 | 7.8 | | | | 0.0 | 19.9 | 12.9 | 20.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 300 | 0 | 283 | | | | 0 | 1288 | 572 | 413 | 2335 | 0 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.51 | | | | 0.00 | 0.69 | 0.49 | 0.94 | 0.44 | 0.00 |
| Avail Cap(c_a), veh/h | 361 | 0 | 340 | | | | 0 | 1288 | 572 | 483 | 2335 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.84 | 0.84 | 0.36 | 0.36 | 0.00 |
| Uniform Delay (d), s/veh | 35.5 | 0.0 | 32.8 | | | | 0.0 | 23.3 | 21.1 | 21.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 18.2 | 0.0 | 1.4 | | | | 0.0 | 2.6 | 2.5 | 12.5 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.0 | 0.0 | 2.9 | | | | 0.0 | 7.6 | 4.5 | 5.9 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 53.7 | 0.0 | 34.2 | | | | 0.0 | 25.9 | 23.7 | 33.5 | 0.2 | 0.0 |
| LnGrp LOS | D | | C | | | | | C | C | C | A | |
| Approach Vol, veh/h | | 408 | | | | | | 1169 | | | 1427 | |
| Approach Delay, s/veh | | 46.8 | | | | | | 25.3 | | | 9.3 | |
| Approach LOS | | D | | | | | | C | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 28.0 | 40.4 | | 21.6 | | 68.4 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 4.6 | | 6.0 |
| Max Green Setting (Gmax), s | 27.3 | 27.0 | | 20.4 | | 59.0 |
| Max Q Clear Time (g_c+I1), s | 22.8 | 21.9 | | 16.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.5 | 3.7 | | 0.5 | | 13.3 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 20.6 |
| HCM 7th LOS | | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 109 | 367 | 71 | 306 | 121 | 890 | 217 | 919 |
| Future Volume (vph) | 109 | 367 | 71 | 306 | 121 | 890 | 217 | 919 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 49.0 | 49.0 | 36.0 | 85.0 |
| Total Split (%) | 29.2% | 29.2% | 29.2% | 29.2% | 40.8% | 40.8% | 30.0% | 70.8% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 24.5 | 24.5 | 24.5 | 24.5 | 35.7 | 35.7 | 11.8 | 52.3 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.27 | 0.27 | 0.40 | 0.40 | 0.13 | 0.59 |
| v/c Ratio | 0.63 | 0.63 | 0.54 | 0.51 | 0.75 | 0.51 | 0.59 | 0.39 |
| Control Delay (s/veh) | 48.4 | 29.0 | 47.4 | 27.0 | 53.8 | 21.3 | 46.1 | 9.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.4 | 29.0 | 47.4 | 27.0 | 53.8 | 21.3 | 46.1 | 9.9 |
| LOS | D | C | D | C | D | C | D | A |
| Approach Delay (s/veh) | | 32.2 | | 29.8 | | 25.0 | | 16.2 |
| Approach LOS | | C | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 89.1 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay (s/veh): 23.9 | Intersection LOS: C |
| Intersection Capacity Utilization 74.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

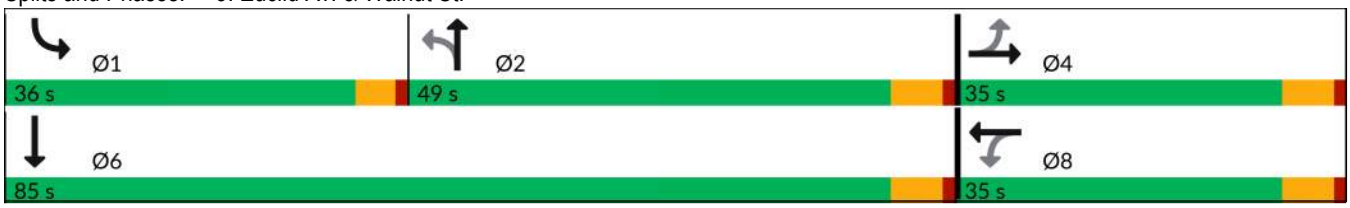

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 109 | 367 | 196 | 71 | 306 | 142 | 121 | 890 | 48 | 217 | 919 | 115 |
| Future Volume (veh/h) | 109 | 367 | 196 | 71 | 306 | 142 | 121 | 890 | 48 | 217 | 919 | 115 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 114 | 382 | 198 | 74 | 319 | 118 | 126 | 927 | 29 | 226 | 957 | 90 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 275 | 648 | 331 | 220 | 724 | 262 | 286 | 1722 | 54 | 314 | 2392 | 224 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.36 | 0.36 | 0.36 | 0.11 | 0.53 | 0.53 |
| Sat Flow, veh/h | 895 | 2153 | 1100 | 787 | 2405 | 871 | 509 | 4817 | 150 | 2910 | 4498 | 422 |
| Grp Volume(v), veh/h | 114 | 297 | 283 | 74 | 221 | 216 | 126 | 620 | 336 | 226 | 685 | 362 |
| Grp Sat Flow(s),veh/h/ln | 895 | 1683 | 1570 | 787 | 1683 | 1593 | 509 | 1612 | 1742 | 1455 | 1612 | 1695 |
| Q Serve(g_s), s | 8.2 | 10.4 | 10.6 | 6.1 | 7.3 | 7.6 | 14.7 | 10.6 | 10.6 | 5.2 | 8.8 | 8.8 |
| Cycle Q Clear(g_c), s | 15.8 | 10.4 | 10.6 | 16.8 | 7.3 | 7.6 | 14.7 | 10.6 | 10.6 | 5.2 | 8.8 | 8.8 |
| Prop In Lane | 1.00 | | 0.70 | 1.00 | | 0.55 | 1.00 | | 0.09 | 1.00 | | 0.25 |
| Lane Grp Cap(c), veh/h | 275 | 507 | 473 | 220 | 507 | 479 | 286 | 1153 | 623 | 314 | 1715 | 901 |
| V/C Ratio(X) | 0.41 | 0.59 | 0.60 | 0.34 | 0.44 | 0.45 | 0.44 | 0.54 | 0.54 | 0.72 | 0.40 | 0.40 |
| Avail Cap(c_a), veh/h | 382 | 708 | 661 | 314 | 708 | 670 | 420 | 2008 | 1085 | 1317 | 3681 | 1935 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.0 | 20.6 | 20.7 | 27.8 | 19.5 | 19.6 | 19.0 | 17.7 | 17.7 | 29.9 | 9.7 | 9.7 |
| Incr Delay (d2), s/veh | 1.0 | 1.1 | 1.2 | 0.9 | 0.6 | 0.7 | 1.1 | 0.4 | 0.7 | 1.2 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 3.7 | 3.6 | 1.1 | 2.6 | 2.6 | 1.6 | 3.4 | 3.8 | 1.7 | 2.4 | 2.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.0 | 21.7 | 21.9 | 28.7 | 20.1 | 20.3 | 20.1 | 18.1 | 18.5 | 31.1 | 9.8 | 10.0 |
| LnGrp LOS | C | C | C | C | C | C | C | B | B | C | A | A |
| Approach Vol, veh/h | | 694 | | | 511 | | | 1082 | | | 1273 | |
| Approach Delay, s/veh | | 22.6 | | | 21.4 | | | 18.5 | | | 13.6 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.1 | 30.6 | | 26.7 | | 42.7 | | 26.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.4 | 43.2 | | 29.2 | | 79.2 | | 29.2 |
| Max Q Clear Time (g_c+I1), s | 7.2 | 16.7 | | 17.8 | | 10.8 | | 18.8 |
| Green Ext Time (p_c), s | 0.4 | 8.1 | | 3.0 | | 7.9 | | 2.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 18.0 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 130 | 529 | 168 | 488 | 116 | 824 | 244 | 106 | 870 | 215 |
| Future Volume (vph) | 130 | 529 | 168 | 488 | 116 | 824 | 244 | 106 | 870 | 215 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 20.8 | 43.0 | 21.0 | 43.2 | 15.2 | 40.0 | 40.0 | 16.0 | 40.8 | 40.8 |
| Total Split (%) | 17.3% | 35.8% | 17.5% | 36.0% | 12.7% | 33.3% | 33.3% | 13.3% | 34.0% | 34.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.1 | 36.0 | 15.2 | 37.2 | 10.0 | 33.2 | 33.2 | 10.6 | 33.8 | 33.8 |
| Actuated g/C Ratio | 0.12 | 0.31 | 0.13 | 0.32 | 0.08 | 0.28 | 0.28 | 0.09 | 0.29 | 0.29 |
| v/c Ratio | 0.70 | 1.14 | 0.83 | 0.52 | 0.87 | 0.88 | 0.48 | 0.75 | 0.92 | 0.37 |
| Control Delay (s/veh) | 69.9 | 122.3 | 82.3 | 35.1 | 104.8 | 52.8 | 20.3 | 84.0 | 55.8 | 6.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 69.9 | 122.3 | 82.3 | 35.1 | 104.8 | 52.8 | 20.3 | 84.0 | 55.8 | 6.2 |
| LOS | E | F | F | D | F | D | C | F | E | A |
| Approach Delay (s/veh) | | 113.0 | | 46.3 | | 51.2 | | | 49.4 | |
| Approach LOS | | F | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.14 | |
| Intersection Signal Delay (s/veh): 61.6 | Intersection LOS: E |
| Intersection Capacity Utilization 97.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

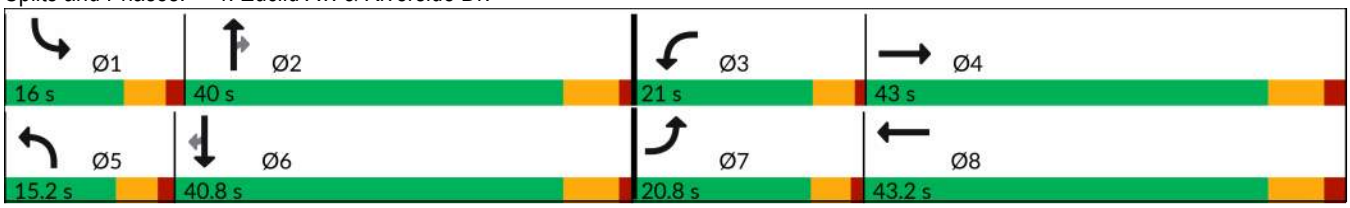

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 130 | 529 | 74 | 168 | 488 | 53 | 116 | 824 | 244 | 106 | 870 | 215 |
| Future Volume (veh/h) | 130 | 529 | 74 | 168 | 488 | 53 | 116 | 824 | 244 | 106 | 870 | 215 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 131 | 534 | 51 | 170 | 493 | 32 | 117 | 832 | 146 | 107 | 879 | 149 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 162 | 493 | 47 | 194 | 1057 | 68 | 137 | 972 | 433 | 133 | 962 | 424 |
| Arrive On Green | 0.10 | 0.31 | 0.31 | 0.12 | 0.33 | 0.33 | 0.09 | 0.29 | 0.29 | 0.08 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1594 | 1592 | 152 | 1594 | 3206 | 208 | 1594 | 3367 | 1502 | 1594 | 3367 | 1482 |
| Grp Volume(v), veh/h | 131 | 0 | 585 | 170 | 258 | 267 | 117 | 832 | 146 | 107 | 879 | 149 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1745 | 1594 | 1683 | 1730 | 1594 | 1683 | 1502 | 1594 | 1683 | 1482 |
| Q Serve(g_s), s | 9.4 | 0.0 | 36.0 | 12.2 | 14.1 | 14.2 | 8.4 | 27.2 | 8.9 | 7.7 | 29.4 | 9.3 |
| Cycle Q Clear(g_c), s | 9.4 | 0.0 | 36.0 | 12.2 | 14.1 | 14.2 | 8.4 | 27.2 | 8.9 | 7.7 | 29.4 | 9.3 |
| Prop In Lane | 1.00 | | 0.09 | 1.00 | | 0.12 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 162 | 0 | 540 | 194 | 555 | 570 | 137 | 972 | 433 | 133 | 962 | 424 |
| V/C Ratio(X) | 0.81 | 0.00 | 1.08 | 0.87 | 0.47 | 0.47 | 0.85 | 0.86 | 0.34 | 0.81 | 0.91 | 0.35 |
| Avail Cap(c_a), veh/h | 221 | 0 | 540 | 223 | 555 | 570 | 137 | 984 | 439 | 148 | 1007 | 443 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.2 | 0.0 | 40.2 | 50.2 | 30.9 | 30.9 | 52.5 | 39.1 | 32.6 | 52.4 | 40.1 | 33.0 |
| Incr Delay (d2), s/veh | 10.6 | 0.0 | 63.3 | 25.1 | 0.9 | 0.9 | 37.7 | 7.5 | 0.5 | 24.9 | 12.1 | 0.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.1 | 0.0 | 24.1 | 6.1 | 5.6 | 5.8 | 4.7 | 11.5 | 3.2 | 3.9 | 13.2 | 3.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 61.7 | 0.0 | 103.5 | 75.3 | 31.7 | 31.8 | 90.1 | 46.6 | 33.1 | 77.3 | 52.2 | 33.5 |
| LnGrp LOS | E | | F | E | C | C | F | D | C | E | D | C |
| Approach Vol, veh/h | | 716 | | | 695 | | | 1095 | | | 1135 | |
| Approach Delay, s/veh | | 95.9 | | | 42.4 | | | 49.5 | | | 52.1 | |
| Approach LOS | | F | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.9 | 39.6 | 18.9 | 43.0 | 15.2 | 39.3 | 16.5 | 45.4 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.8 | 34.0 | 16.3 | 36.0 | 10.0 | 34.8 | 16.1 | 36.2 |
| Max Q Clear Time (g_c+I1), s | 9.7 | 29.2 | 14.2 | 38.0 | 10.4 | 31.4 | 11.4 | 16.2 |
| Green Ext Time (p_c), s | 0.0 | 2.3 | 0.0 | 0.0 | 0.0 | 1.9 | 0.1 | 3.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 58.1 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 110 | 384 | 49 | 105 | 238 | 68 | 1054 | 268 | 33 | 978 | 110 |
| Future Volume (vph) | 110 | 384 | 49 | 105 | 238 | 68 | 1054 | 268 | 33 | 978 | 110 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 55.0 | 55.0 | 55.0 | 15.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 41.7% | 45.8% | 45.8% | 45.8% | 12.5% | 58.3% | 58.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 45.2 | 45.2 | 45.2 | | 45.2 | 40.7 | 40.7 | 40.7 | 10.2 | 48.6 | 48.6 |
| Actuated g/C Ratio | 0.42 | 0.42 | 0.42 | | 0.42 | 0.38 | 0.38 | 0.38 | 0.10 | 0.46 | 0.46 |
| v/c Ratio | 0.33 | 0.52 | 0.07 | | 0.84 | 0.46 | 0.84 | 0.44 | 0.22 | 0.65 | 0.15 |
| Control Delay (s/veh) | 28.5 | 29.1 | 2.8 | | 48.8 | 37.5 | 36.9 | 19.7 | 53.9 | 23.6 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 28.5 | 29.1 | 2.8 | | 48.8 | 37.5 | 36.9 | 19.7 | 53.9 | 23.6 | 3.1 |
| LOS | C | C | A | | D | D | D | B | D | C | A |
| Approach Delay (s/veh) | | 26.6 | | | 48.8 | | 33.7 | | | 22.5 | |
| Approach LOS | | C | | | D | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 106.4 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 30.5 | Intersection LOS: C |
| Intersection Capacity Utilization 100.4% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 384 | 49 | 105 | 238 | 27 | 68 | 1054 | 268 | 33 | 978 | 110 |
| Future Volume (veh/h) | 110 | 384 | 49 | 105 | 238 | 27 | 68 | 1054 | 268 | 33 | 978 | 110 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 112 | 392 | 33 | 107 | 243 | 26 | 69 | 1076 | 197 | 34 | 998 | 84 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 278 | 703 | 596 | 135 | 285 | 28 | 201 | 1283 | 572 | 96 | 1634 | 729 |
| Arrive On Green | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.38 | 0.38 | 0.38 | 0.06 | 0.49 | 0.49 |
| Sat Flow, veh/h | 1049 | 1772 | 1502 | 229 | 717 | 70 | 492 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 112 | 392 | 33 | 376 | 0 | 0 | 69 | 1076 | 197 | 34 | 998 | 84 |
| Grp Sat Flow(s),veh/h/ln | 1049 | 1772 | 1502 | 1017 | 0 | 0 | 492 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 0.0 | 17.9 | 1.4 | 20.8 | 0.0 | 0.0 | 12.4 | 30.3 | 9.8 | 2.1 | 22.6 | 3.2 |
| Cycle Q Clear(g_c), s | 18.7 | 17.9 | 1.4 | 38.7 | 0.0 | 0.0 | 24.2 | 30.3 | 9.8 | 2.1 | 22.6 | 3.2 |
| Prop In Lane | 1.00 | | 1.00 | 0.28 | | 0.07 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 278 | 703 | 596 | 448 | 0 | 0 | 201 | 1283 | 572 | 96 | 1634 | 729 |
| V/C Ratio(X) | 0.40 | 0.56 | 0.06 | 0.84 | 0.00 | 0.00 | 0.34 | 0.84 | 0.34 | 0.36 | 0.61 | 0.12 |
| Avail Cap(c_a), veh/h | 306 | 751 | 636 | 486 | 0 | 0 | 242 | 1565 | 698 | 159 | 2049 | 914 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 24.6 | 24.4 | 19.4 | 33.6 | 0.0 | 0.0 | 32.5 | 29.4 | 23.0 | 47.1 | 19.6 | 14.6 |
| Incr Delay (d2), s/veh | 0.9 | 0.8 | 0.0 | 11.7 | 0.0 | 0.0 | 1.0 | 3.5 | 0.4 | 0.8 | 0.4 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 7.3 | 0.5 | 10.3 | 0.0 | 0.0 | 1.4 | 11.6 | 3.2 | 0.8 | 7.8 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 25.6 | 25.2 | 19.4 | 45.3 | 0.0 | 0.0 | 33.5 | 32.9 | 23.4 | 47.9 | 20.0 | 14.7 |
| LnGrp LOS | C | C | B | D | | | C | C | C | D | C | B |
| Approach Vol, veh/h | | 537 | | | 376 | | | 1342 | | | 1116 | |
| Approach Delay, s/veh | | 24.9 | | | 45.3 | | | 31.5 | | | 20.5 | |
| Approach LOS | | C | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.9 | 46.3 | | 47.2 | | 57.1 | | 47.2 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 48.5 | | 44.2 | | 63.5 | | 44.2 |
| Max Q Clear Time (g_c+I1), s | 4.1 | 32.3 | | 20.7 | | 24.6 | | 40.7 |
| Green Ext Time (p_c), s | 0.0 | 7.4 | | 2.9 | | 7.6 | | 0.7 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 28.4 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 214 | 290 | 107 | 67 | 116 | 75 | 1199 | 62 | 41 | 967 | 107 |
| Future Volume (vph) | 214 | 290 | 107 | 67 | 116 | 75 | 1199 | 62 | 41 | 967 | 107 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 19.0 | 51.3 | 51.3 | 14.7 | 47.0 | 14.7 | 39.3 | 39.3 | 14.7 | 39.3 | 39.3 |
| Total Split (%) | 15.8% | 42.8% | 42.8% | 12.3% | 39.2% | 12.3% | 32.8% | 32.8% | 12.3% | 32.8% | 32.8% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.6 | 27.4 | 27.4 | 10.2 | 19.2 | 10.2 | 36.6 | 36.6 | 10.2 | 33.5 | 33.5 |
| Actuated g/C Ratio | 0.15 | 0.28 | 0.28 | 0.10 | 0.20 | 0.10 | 0.38 | 0.38 | 0.10 | 0.34 | 0.34 |
| v/c Ratio | 0.94 | 0.61 | 0.22 | 0.42 | 0.48 | 0.47 | 0.99 | 0.10 | 0.26 | 0.87 | 0.19 |
| Control Delay (s/veh) | 89.3 | 37.9 | 5.7 | 54.2 | 35.3 | 56.0 | 56.3 | 0.3 | 49.7 | 41.7 | 5.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 89.3 | 37.9 | 5.7 | 54.2 | 35.3 | 56.0 | 56.3 | 0.3 | 49.7 | 41.7 | 5.5 |
| LOS | F | D | A | D | D | E | E | A | D | D | A |
| Approach Delay (s/veh) | | 50.3 | | | 40.9 | | 53.7 | | | 38.5 | |
| Approach LOS | | D | | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 97.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.99 | |
| Intersection Signal Delay (s/veh): 47.0 | Intersection LOS: D |
| Intersection Capacity Utilization 86.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

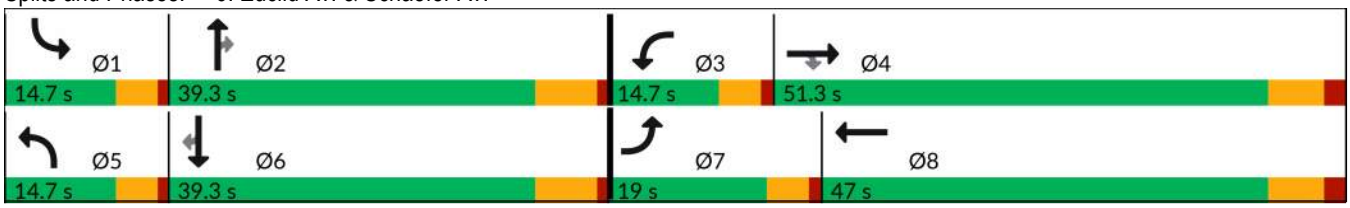

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 214 | 290 | 107 | 67 | 116 | 44 | 75 | 1199 | 62 | 41 | 967 | 107 |
| Future Volume (veh/h) | 214 | 290 | 107 | 67 | 116 | 44 | 75 | 1199 | 62 | 41 | 967 | 107 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 223 | 302 | 52 | 70 | 121 | 38 | 78 | 1249 | 51 | 43 | 1007 | 80 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 253 | 358 | 304 | 148 | 176 | 55 | 154 | 1251 | 558 | 118 | 1174 | 524 |
| Arrive On Green | 0.16 | 0.20 | 0.20 | 0.09 | 0.14 | 0.14 | 0.10 | 0.37 | 0.37 | 0.07 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1293 | 406 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 223 | 302 | 52 | 70 | 0 | 159 | 78 | 1249 | 51 | 43 | 1007 | 80 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1699 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 12.1 | 14.5 | 2.5 | 3.7 | 0.0 | 7.9 | 4.1 | 32.7 | 2.0 | 2.3 | 24.5 | 3.2 |
| Cycle Q Clear(g_c), s | 12.1 | 14.5 | 2.5 | 3.7 | 0.0 | 7.9 | 4.1 | 32.7 | 2.0 | 2.3 | 24.5 | 3.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.24 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 253 | 358 | 304 | 148 | 0 | 232 | 154 | 1251 | 558 | 118 | 1174 | 524 |
| V/C Ratio(X) | 0.88 | 0.84 | 0.17 | 0.47 | 0.00 | 0.69 | 0.51 | 1.00 | 0.09 | 0.37 | 0.86 | 0.15 |
| Avail Cap(c_a), veh/h | 258 | 889 | 754 | 181 | 0 | 770 | 181 | 1251 | 558 | 181 | 1251 | 558 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.3 | 33.9 | 29.1 | 38.0 | 0.0 | 36.3 | 37.9 | 27.7 | 18.0 | 38.9 | 26.7 | 19.8 |
| Incr Delay (d2), s/veh | 26.3 | 4.1 | 0.2 | 0.9 | 0.0 | 2.7 | 1.0 | 25.0 | 0.1 | 0.7 | 5.9 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.3 | 6.2 | 0.9 | 1.4 | 0.0 | 3.3 | 1.5 | 15.7 | 0.6 | 0.8 | 9.5 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 62.6 | 37.9 | 29.3 | 38.9 | 0.0 | 39.0 | 38.8 | 52.8 | 18.1 | 39.6 | 32.6 | 19.9 |
| LnGrp LOS | E | D | C | D | | D | D | D | B | D | C | B |
| Approach Vol, veh/h | | 577 | | | 229 | | | 1378 | | | 1130 | |
| Approach Delay, s/veh | | 46.7 | | | 39.0 | | | 50.7 | | | 31.9 | |
| Approach LOS | | D | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.2 | 39.3 | 12.9 | 24.9 | 13.2 | 37.3 | 18.7 | 19.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 32.8 | 10.0 | 44.3 | 10.0 | 32.8 | 14.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 4.3 | 34.7 | 5.7 | 16.5 | 6.1 | 26.5 | 14.1 | 9.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 3.2 | 0.0 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 42.8 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 547 | 131 | 61 | 321 | 135 | 1150 | 176 | 134 | 904 | 142 |
| Future Volume (vph) | 138 | 547 | 131 | 61 | 321 | 135 | 1150 | 176 | 134 | 904 | 142 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | 47.0 | 47.0 | 15.0 | 56.0 | 56.0 | 17.0 | 58.0 | 58.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | 39.2% | 39.2% | 12.5% | 46.7% | 46.7% | 14.2% | 48.3% | 48.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 39.9 | 39.9 | 39.9 | 39.9 | 39.9 | 10.2 | 47.7 | 47.7 | 12.1 | 49.6 | 49.6 |
| Actuated g/C Ratio | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.09 | 0.40 | 0.40 | 0.10 | 0.42 | 0.42 |
| v/c Ratio | 1.08 | 1.00 | 0.25 | 1.18 | 0.79 | 0.59 | 0.92 | 0.29 | 0.90 | 0.70 | 0.22 |
| Control Delay (s/veh) | 137.7 | 76.9 | 8.7 | 215.8 | 46.3 | 62.8 | 45.7 | 14.5 | 101.8 | 31.2 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 137.7 | 76.9 | 8.7 | 215.8 | 46.3 | 62.8 | 45.7 | 14.5 | 101.8 | 31.2 | 5.1 |
| LOS | F | E | A | F | D | E | D | B | F | C | A |
| Approach Delay (s/veh) | | 76.2 | | | 67.4 | | 43.5 | | | 36.1 | |
| Approach LOS | | E | | | E | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.1 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.18 | |
| Intersection Signal Delay (s/veh): 51.0 | Intersection LOS: D |
| Intersection Capacity Utilization 102.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

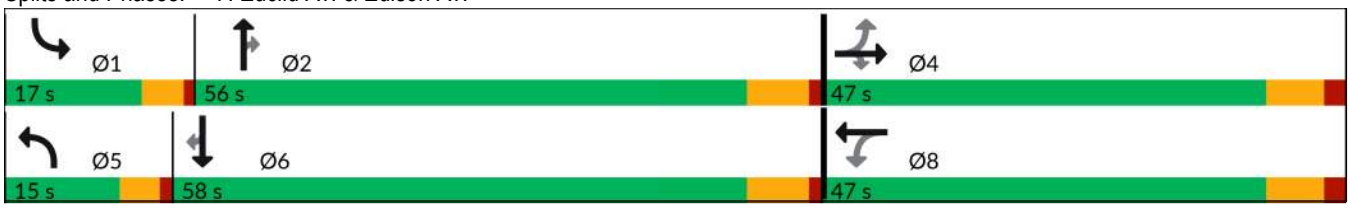

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 138 | 547 | 131 | 61 | 321 | 105 | 135 | 1150 | 176 | 134 | 904 | 142 |
| Future Volume (veh/h) | 138 | 547 | 131 | 61 | 321 | 105 | 135 | 1150 | 176 | 134 | 904 | 142 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 150 | 595 | 84 | 66 | 349 | 105 | 147 | 1250 | 163 | 146 | 983 | 114 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 146 | 598 | 506 | 63 | 441 | 133 | 245 | 1354 | 604 | 166 | 1422 | 625 |
| Arrive On Green | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.08 | 0.40 | 0.40 | 0.10 | 0.42 | 0.42 |
| Sat Flow, veh/h | 885 | 1772 | 1500 | 719 | 1308 | 393 | 2910 | 3367 | 1502 | 1594 | 3367 | 1480 |
| Grp Volume(v), veh/h | 150 | 595 | 84 | 66 | 0 | 454 | 147 | 1250 | 163 | 146 | 983 | 114 |
| Grp Sat Flow(s),veh/h/ln | 885 | 1772 | 1500 | 719 | 0 | 1701 | 1455 | 1683 | 1502 | 1594 | 1683 | 1480 |
| Q Serve(g_s), s | 11.4 | 39.5 | 4.6 | 0.3 | 0.0 | 28.4 | 5.7 | 41.6 | 8.6 | 10.7 | 28.1 | 5.7 |
| Cycle Q Clear(g_c), s | 39.8 | 39.5 | 4.6 | 39.8 | 0.0 | 28.4 | 5.7 | 41.6 | 8.6 | 10.7 | 28.1 | 5.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.23 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 146 | 598 | 506 | 63 | 0 | 574 | 245 | 1354 | 604 | 166 | 1422 | 625 |
| V/C Ratio(X) | 1.03 | 0.99 | 0.17 | 1.05 | 0.00 | 0.79 | 0.60 | 0.92 | 0.27 | 0.88 | 0.69 | 0.18 |
| Avail Cap(c_a), veh/h | 146 | 598 | 506 | 63 | 0 | 574 | 254 | 1413 | 630 | 166 | 1470 | 646 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.6 | 39.0 | 27.4 | 59.0 | 0.0 | 35.3 | 52.1 | 33.5 | 23.6 | 52.1 | 27.8 | 21.3 |
| Incr Delay (d2), s/veh | 81.2 | 35.4 | 0.2 | 127.6 | 0.0 | 7.4 | 2.4 | 10.1 | 0.2 | 36.4 | 1.3 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.6 | 22.1 | 1.6 | 4.1 | 0.0 | 12.4 | 2.1 | 17.4 | 2.9 | 5.8 | 10.6 | 1.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 136.8 | 74.4 | 27.6 | 186.6 | 0.0 | 42.7 | 54.5 | 43.7 | 23.9 | 88.5 | 29.1 | 21.5 |
| LnGrp LOS | F | E | C | F | | D | D | D | C | F | C | C |
| Approach Vol, veh/h | | 829 | | | 520 | | | 1560 | | | 1243 | |
| Approach Delay, s/veh | | 80.9 | | | 60.9 | | | 42.6 | | | 35.4 | |
| Approach LOS | | F | | | E | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 53.9 | | 47.0 | 14.6 | 56.3 | | 47.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 12.3 | 49.5 | | 39.8 | 10.3 | 51.5 | | 39.8 |
| Max Q Clear Time (g_c+I1), s | 12.7 | 43.6 | | 41.8 | 7.7 | 30.1 | | 41.8 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | | 0.0 | 0.1 | 6.6 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 50.4 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 78 | 331 | 216 | 92 | 172 | 101 | 1004 | 83 | 105 | 879 | 70 |
| Future Volume (vph) | 78 | 331 | 216 | 92 | 172 | 101 | 1004 | 83 | 105 | 879 | 70 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 23.9 | 23.9 | 23.9 | 23.9 | 23.9 | 12.1 | 37.5 | 37.5 | 12.3 | 41.2 | 41.2 |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.13 | 0.41 | 0.41 | 0.13 | 0.45 | 0.45 |
| v/c Ratio | 0.54 | 0.76 | 0.41 | 0.67 | 0.74 | 0.51 | 0.78 | 0.13 | 0.53 | 0.62 | 0.10 |
| Control Delay (s/veh) | 43.4 | 43.2 | 6.0 | 54.8 | 37.6 | 48.9 | 30.7 | 6.8 | 49.1 | 25.3 | 5.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 43.4 | 43.2 | 6.0 | 54.8 | 37.6 | 48.9 | 30.7 | 6.8 | 49.1 | 25.3 | 5.3 |
| LOS | D | D | A | D | D | D | C | A | D | C | A |
| Approach Delay (s/veh) | | 30.3 | | | 41.4 | | 30.6 | | | 26.4 | |
| Approach LOS | | C | | | D | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 92.5 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 30.5 | Intersection LOS: C |
| Intersection Capacity Utilization 86.3% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

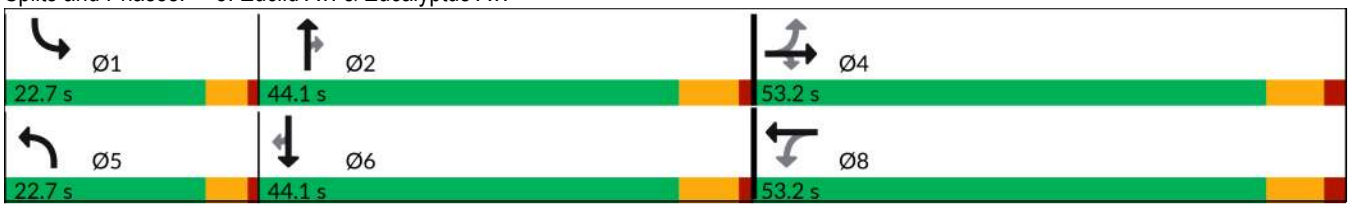

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 78 | 331 | 216 | 92 | 172 | 146 | 101 | 1004 | 83 | 105 | 879 | 70 |
| Future Volume (veh/h) | 78 | 331 | 216 | 92 | 172 | 146 | 101 | 1004 | 83 | 105 | 879 | 70 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 82 | 348 | 125 | 97 | 181 | 141 | 106 | 1057 | 63 | 111 | 925 | 41 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 232 | 561 | 476 | 212 | 292 | 228 | 168 | 1234 | 551 | 170 | 1238 | 552 |
| Arrive On Green | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.11 | 0.37 | 0.37 | 0.11 | 0.37 | 0.37 |
| Sat Flow, veh/h | 999 | 1772 | 1502 | 870 | 923 | 719 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 82 | 348 | 125 | 97 | 0 | 322 | 106 | 1057 | 63 | 111 | 925 | 41 |
| Grp Sat Flow(s),veh/h/ln | 999 | 1772 | 1502 | 870 | 0 | 1642 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 6.7 | 14.6 | 5.4 | 9.4 | 0.0 | 14.6 | 5.6 | 25.4 | 2.4 | 5.9 | 21.0 | 1.6 |
| Cycle Q Clear(g_c), s | 21.3 | 14.6 | 5.4 | 24.0 | 0.0 | 14.6 | 5.6 | 25.4 | 2.4 | 5.9 | 21.0 | 1.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.44 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 232 | 561 | 476 | 212 | 0 | 520 | 168 | 1234 | 551 | 170 | 1238 | 552 |
| V/C Ratio(X) | 0.35 | 0.62 | 0.26 | 0.46 | 0.00 | 0.62 | 0.63 | 0.86 | 0.11 | 0.65 | 0.75 | 0.07 |
| Avail Cap(c_a), veh/h | 440 | 930 | 788 | 394 | 0 | 862 | 327 | 1445 | 644 | 327 | 1445 | 644 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.5 | 25.4 | 22.3 | 35.6 | 0.0 | 25.4 | 37.5 | 25.6 | 18.3 | 37.6 | 24.1 | 18.0 |
| Incr Delay (d2), s/veh | 0.7 | 0.8 | 0.2 | 1.1 | 0.0 | 0.9 | 2.9 | 4.7 | 0.1 | 3.2 | 1.8 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 5.8 | 1.8 | 1.9 | 0.0 | 5.3 | 2.1 | 9.6 | 0.8 | 2.3 | 7.6 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.1 | 26.3 | 22.5 | 36.8 | 0.0 | 26.3 | 40.4 | 30.3 | 18.4 | 40.7 | 26.0 | 18.1 |
| LnGrp LOS | D | C | C | D | | C | D | C | B | D | C | B |
| Approach Vol, veh/h | | 555 | | | 419 | | | 1226 | | | 1077 | |
| Approach Delay, s/veh | | 26.7 | | | 28.7 | | | 30.6 | | | 27.2 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 38.6 | | 35.0 | 13.9 | 38.7 | | 35.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 7.9 | 27.4 | | 23.3 | 7.6 | 23.0 | | 26.0 |
| Green Ext Time (p_c), s | 0.1 | 4.7 | | 2.1 | 0.1 | 5.0 | | 1.8 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 28.6 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 23 | 23 | 141 | 0 | 2 | 1242 | 103 | 194 | 1283 |
| Future Volume (vph) | 23 | 23 | 141 | 0 | 2 | 1242 | 103 | 194 | 1283 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.7 | 50.7 | 22.1 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.4% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 19.8 | | 19.8 | 10.1 | 44.8 | 44.8 | 16.1 | 63.2 |
| Actuated g/C Ratio | | 0.20 | | 0.20 | 0.10 | 0.45 | 0.45 | 0.16 | 0.64 |
| v/c Ratio | | 0.24 | | 0.79 | 0.01 | 0.86 | 0.14 | 0.79 | 0.63 |
| Control Delay (s/veh) | | 26.3 | | 37.7 | 47.0 | 33.3 | 3.6 | 64.2 | 16.3 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 26.3 | | 37.7 | 47.0 | 33.3 | 3.6 | 64.2 | 16.3 |
| LOS | | C | | D | D | C | A | E | B |
| Approach Delay (s/veh) | | 26.3 | | 37.7 | | 31.0 | | | 22.6 |
| Approach LOS | | C | | D | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 99.3 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 27.5 | Intersection LOS: C |
| Intersection Capacity Utilization 87.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

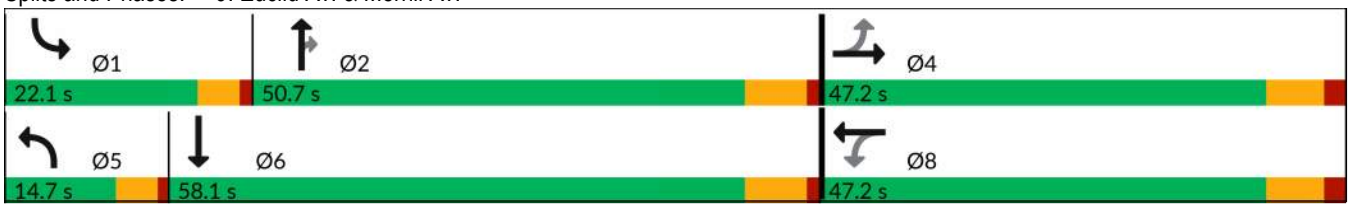

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 23 | 23 | 19 | 141 | 0 | 131 | 2 | 1242 | 103 | 194 | 1283 | 9 |
| Future Volume (veh/h) | 23 | 23 | 19 | 141 | 0 | 131 | 2 | 1242 | 103 | 194 | 1283 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 24 | 24 | 13 | 147 | 0 | 128 | 2 | 1294 | 103 | 202 | 1336 | 8 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 153 | 143 | 65 | 221 | 7 | 145 | 9 | 1475 | 658 | 233 | 1986 | 12 |
| Arrive On Green | 0.21 | 0.21 | 0.21 | 0.21 | 0.00 | 0.21 | 0.01 | 0.44 | 0.44 | 0.15 | 0.58 | 0.58 |
| Sat Flow, veh/h | 458 | 672 | 306 | 751 | 33 | 682 | 1594 | 3367 | 1502 | 1594 | 3430 | 21 |
| Grp Volume(v), veh/h | 61 | 0 | 0 | 275 | 0 | 0 | 2 | 1294 | 103 | 202 | 655 | 689 |
| Grp Sat Flow(s),veh/h/ln | 1436 | 0 | 0 | 1466 | 0 | 0 | 1594 | 1683 | 1502 | 1594 | 1683 | 1768 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 13.7 | 0.0 | 0.0 | 0.1 | 31.8 | 3.7 | 11.2 | 24.3 | 24.3 |
| Cycle Q Clear(g_c), s | 2.6 | 0.0 | 0.0 | 16.4 | 0.0 | 0.0 | 0.1 | 31.8 | 3.7 | 11.2 | 24.3 | 24.3 |
| Prop In Lane | 0.39 | | 0.21 | 0.53 | | 0.47 | 1.00 | | 1.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 360 | 0 | 0 | 372 | 0 | 0 | 9 | 1475 | 658 | 233 | 975 | 1023 |
| V/C Ratio(X) | 0.17 | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 | 0.23 | 0.88 | 0.16 | 0.87 | 0.67 | 0.67 |
| Avail Cap(c_a), veh/h | 700 | 0 | 0 | 700 | 0 | 0 | 176 | 1643 | 733 | 306 | 975 | 1023 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.1 | 0.0 | 0.0 | 34.3 | 0.0 | 0.0 | 44.9 | 23.2 | 15.3 | 37.8 | 13.1 | 13.1 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 1.1 | 0.0 | 0.0 | 5.0 | 5.3 | 0.1 | 15.1 | 1.8 | 1.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 0.0 | 0.0 | 5.5 | 0.0 | 0.0 | 0.1 | 11.7 | 1.1 | 5.0 | 7.6 | 7.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.2 | 0.0 | 0.0 | 35.4 | 0.0 | 0.0 | 49.8 | 28.5 | 15.5 | 52.9 | 15.0 | 14.9 |
| LnGrp LOS | C | | | D | | | D | C | B | D | B | B |
| Approach Vol, veh/h | | 61 | | | 275 | | | 1399 | | | 1546 | |
| Approach Delay, s/veh | | 29.2 | | | 35.4 | | | 27.6 | | | 19.9 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.9 | 46.2 | | 26.4 | 5.2 | 58.9 | | 26.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.4 | 44.2 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 13.2 | 33.8 | | 4.6 | 2.1 | 26.3 | | 18.4 |
| Green Ext Time (p_c), s | 0.1 | 5.9 | | 0.2 | 0.0 | 8.8 | | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 24.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 319 | 649 | 108 | 60 | 464 | 200 | 143 | 677 | 62 | 455 | 586 | 239 |
| Future Volume (vph) | 319 | 649 | 108 | 60 | 464 | 200 | 143 | 677 | 62 | 455 | 586 | 239 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 37.4 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 31.2% | 12.3% | 12.3% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.3 | 30.4 | 30.4 | 10.3 | 26.4 | 26.4 | 10.3 | 25.3 | 42.3 | 10.3 | 25.4 | 42.3 |
| Actuated g/C Ratio | 0.11 | 0.32 | 0.32 | 0.11 | 0.27 | 0.27 | 0.11 | 0.26 | 0.44 | 0.11 | 0.26 | 0.44 |
| v/c Ratio | 1.09 | 0.64 | 0.21 | 0.37 | 0.53 | 0.37 | 0.89 | 0.81 | 0.09 | 1.55 | 0.70 | 0.33 |
| Control Delay (s/veh) | 119.6 | 32.5 | 5.5 | 52.7 | 31.1 | 5.5 | 93.2 | 42.4 | 3.6 | 294.4 | 37.7 | 7.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 119.6 | 32.5 | 5.5 | 52.7 | 31.1 | 5.5 | 93.2 | 42.4 | 3.6 | 294.4 | 37.7 | 7.3 |
| LOS | F | C | A | D | C | A | F | D | A | F | D | A |
| Approach Delay (s/veh) | | 55.6 | | | 25.8 | | | 48.0 | | | 123.2 | |
| Approach LOS | | E | | | C | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 96.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.55 | |
| Intersection Signal Delay (s/veh): 70.3 | Intersection LOS: E |
| Intersection Capacity Utilization 81.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

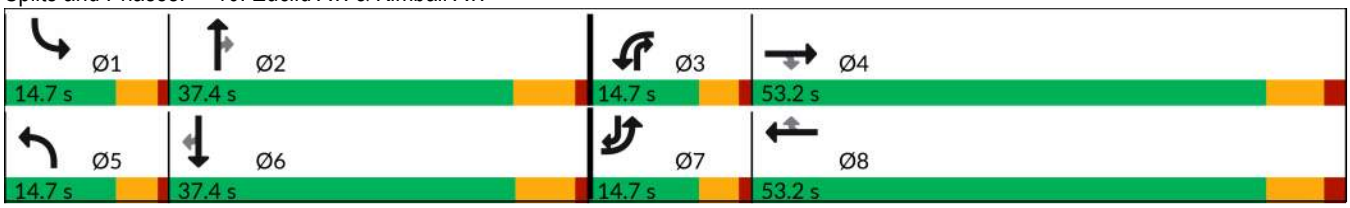

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 319 | 649 | 108 | 60 | 464 | 200 | 143 | 677 | 62 | 455 | 586 | 239 |
| Future Volume (veh/h) | 319 | 649 | 108 | 60 | 464 | 200 | 143 | 677 | 62 | 455 | 586 | 239 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 336 | 683 | 82 | 63 | 488 | 108 | 151 | 713 | 45 | 479 | 617 | 173 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 338 | 890 | 392 | 144 | 804 | 358 | 180 | 879 | 528 | 338 | 889 | 571 |
| Arrive On Green | 0.12 | 0.26 | 0.26 | 0.09 | 0.24 | 0.24 | 0.11 | 0.26 | 0.26 | 0.12 | 0.26 | 0.26 |
| Sat Flow, veh/h | 2910 | 3367 | 1482 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 336 | 683 | 82 | 63 | 488 | 108 | 151 | 713 | 45 | 479 | 617 | 173 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1482 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 9.9 | 16.1 | 3.7 | 3.2 | 11.1 | 5.1 | 8.0 | 17.1 | 1.7 | 10.0 | 14.2 | 7.0 |
| Cycle Q Clear(g_c), s | 9.9 | 16.1 | 3.7 | 3.2 | 11.1 | 5.1 | 8.0 | 17.1 | 1.7 | 10.0 | 14.2 | 7.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 338 | 890 | 392 | 144 | 804 | 358 | 180 | 879 | 528 | 338 | 889 | 571 |
| V/C Ratio(X) | 0.99 | 0.77 | 0.21 | 0.44 | 0.61 | 0.30 | 0.84 | 0.81 | 0.09 | 1.42 | 0.69 | 0.30 |
| Avail Cap(c_a), veh/h | 338 | 1798 | 791 | 185 | 1798 | 802 | 185 | 1207 | 674 | 338 | 1211 | 715 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.1 | 29.2 | 24.7 | 37.1 | 29.2 | 26.9 | 37.4 | 29.8 | 18.7 | 38.1 | 28.6 | 18.7 |
| Incr Delay (d2), s/veh | 47.4 | 1.4 | 0.3 | 2.1 | 0.3 | 0.2 | 25.5 | 3.0 | 0.1 | 204.8 | 1.1 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.5 | 6.1 | 1.2 | 1.3 | 4.1 | 1.7 | 4.1 | 6.6 | 0.6 | 12.9 | 5.3 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 85.5 | 30.7 | 24.9 | 39.2 | 29.5 | 27.1 | 62.9 | 32.9 | 18.8 | 242.8 | 29.6 | 19.0 |
| LnGrp LOS | F | C | C | D | C | C | E | C | B | F | C | B |
| Approach Vol, veh/h | | 1101 | | | 659 | | | 909 | | | 1269 | |
| Approach Delay, s/veh | | 47.0 | | | 30.0 | | | 37.2 | | | 108.6 | |
| Approach LOS | | D | | | C | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 29.0 | 12.5 | 30.0 | 14.4 | 29.3 | 14.7 | 27.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 10.0 | 30.9 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 19.1 | 5.2 | 18.1 | 10.0 | 16.2 | 11.9 | 13.1 |
| Green Ext Time (p_c), s | 0.0 | 3.4 | 0.0 | 4.7 | 0.0 | 3.6 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 61.7 |
| HCM 7th LOS | E |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 29 | 357 | 603 | 261 | 55 | 557 | 994 | 109 | 476 |
| Future Volume (vph) | 29 | 357 | 603 | 261 | 55 | 557 | 994 | 109 | 476 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 34.0 | 34.6 | 52.9 | 15.0 | 36.7 | 34.6 | 14.7 | 36.4 |
| Total Split (%) | 13.1% | 28.3% | 28.8% | 44.1% | 12.5% | 30.6% | 28.8% | 12.3% | 30.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 27.0 | 29.0 | 52.5 | 10.1 | 24.2 | 54.0 | 10.0 | 27.2 |
| Actuated g/C Ratio | 0.09 | 0.24 | 0.25 | 0.46 | 0.09 | 0.21 | 0.47 | 0.09 | 0.24 |
| v/c Ratio | 0.22 | 1.10 | 0.89 | 0.47 | 0.42 | 0.84 | 1.38 | 0.85 | 0.66 |
| Control Delay (s/veh) | 54.5 | 116.7 | 56.7 | 25.4 | 60.5 | 54.7 | 199.2 | 97.2 | 44.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.5 | 116.7 | 56.7 | 25.4 | 60.5 | 54.7 | 199.2 | 97.2 | 44.5 |
| LOS | D | F | E | C | E | D | F | F | D |
| Approach Delay (s/veh) | | 112.7 | | 45.4 | | 144.4 | | | 54.1 |
| Approach LOS | | F | | D | | F | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 114.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.38 | |
| Intersection Signal Delay (s/veh): 99.4 | Intersection LOS: F |
| Intersection Capacity Utilization 111.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

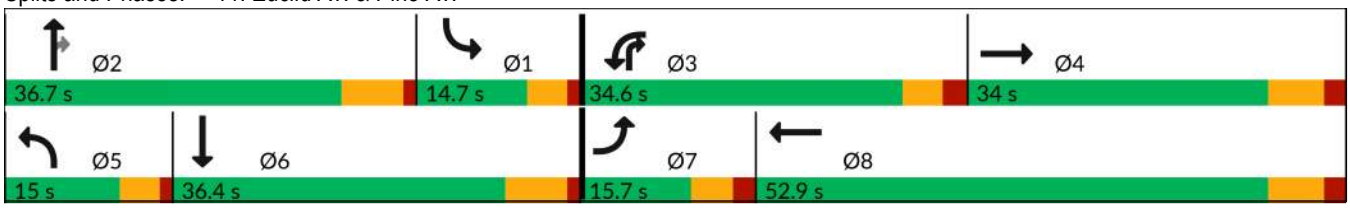

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 29 | 357 | 67 | 603 | 261 | 82 | 55 | 557 | 994 | 109 | 476 | 15 |
| Future Volume (veh/h) | 29 | 357 | 67 | 603 | 261 | 82 | 55 | 557 | 994 | 109 | 476 | 15 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 31 | 384 | 0 | 648 | 281 | 79 | 59 | 599 | 994 | 117 | 512 | 16 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 85 | 394 | | 686 | 538 | 151 | 113 | 836 | 727 | 131 | 915 | 29 |
| Arrive On Green | 0.05 | 0.22 | 0.00 | 0.24 | 0.40 | 0.40 | 0.07 | 0.25 | 0.25 | 0.08 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1594 | 1772 | 0 | 2910 | 1331 | 374 | 1594 | 3367 | 1502 | 1594 | 3332 | 104 |
| Grp Volume(v), veh/h | 31 | 384 | 0 | 648 | 0 | 360 | 59 | 599 | 994 | 117 | 258 | 270 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 0 | 1455 | 0 | 1705 | 1594 | 1683 | 1502 | 1594 | 1683 | 1753 |
| Q Serve(g_s), s | 2.3 | 26.2 | 0.0 | 26.6 | 0.0 | 19.4 | 4.3 | 19.8 | 30.2 | 8.8 | 16.0 | 16.0 |
| Cycle Q Clear(g_c), s | 2.3 | 26.2 | 0.0 | 26.6 | 0.0 | 19.4 | 4.3 | 19.8 | 30.2 | 8.8 | 16.0 | 16.0 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.22 | 1.00 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 85 | 394 | | 686 | 0 | 690 | 113 | 836 | 727 | 131 | 462 | 481 |
| V/C Ratio(X) | 0.36 | 0.98 | | 0.94 | 0.00 | 0.52 | 0.52 | 0.72 | 1.37 | 0.89 | 0.56 | 0.56 |
| Avail Cap(c_a), veh/h | 131 | 394 | | 692 | 0 | 690 | 135 | 836 | 727 | 131 | 462 | 481 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.6 | 47.0 | 0.0 | 45.7 | 0.0 | 27.3 | 54.5 | 41.8 | 11.9 | 55.3 | 37.8 | 37.8 |
| Incr Delay (d2), s/veh | 1.0 | 38.9 | 0.0 | 21.2 | 0.0 | 1.0 | 1.4 | 2.5 | 173.9 | 46.6 | 0.9 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 15.4 | 0.0 | 11.2 | 0.0 | 7.6 | 1.7 | 8.1 | 43.1 | 5.1 | 6.4 | 6.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 56.5 | 85.9 | 0.0 | 66.9 | 0.0 | 28.3 | 55.9 | 44.3 | 185.8 | 101.8 | 38.7 | 38.7 |
| LnGrp LOS | E | F | | E | | C | E | D | F | F | D | D |
| Approach Vol, veh/h | | 415 | | | 1008 | | | 1652 | | | 645 | |
| Approach Delay, s/veh | | 83.7 | | | 53.1 | | | 129.8 | | | 50.2 | |
| Approach LOS | | F | | | D | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.5 | 36.7 | 34.4 | 34.0 | 13.3 | 39.9 | 12.2 | 56.2 |
| Change Period (Y+Rc), s | 6.5 | * 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | * 30 | 28.9 | 27.0 | 10.3 | 29.9 | 10.0 | 45.9 |
| Max Q Clear Time (g_c+I1), s | 10.8 | 32.2 | 28.6 | 28.2 | 6.3 | 18.0 | 4.3 | 21.4 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 1.3 | 0.0 | 2.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 90.1 |
| HCM 7th LOS | F |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 790 | 449 | 753 | 105 | 799 |
| Future Volume (vph) | 790 | 449 | 753 | 105 | 799 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 24.5 | 9.6 | 9.6 |
| Total Split (s) | 35.2 | 31.7 | 66.9 | 33.1 | 33.1 |
| Total Split (%) | 35.2% | 31.7% | 66.9% | 33.1% | 33.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 28.7 | 27.0 | 60.4 | 28.5 | 28.5 |
| Actuated g/C Ratio | 0.29 | 0.27 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 1.06 | 1.17 | 0.41 | 0.13 | 1.09 |
| Control Delay (s/veh) | 80.7 | 133.0 | 11.2 | 27.1 | 76.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 80.7 | 133.0 | 11.2 | 27.1 | 76.2 |
| LOS | F | F | B | C | E |
| Approach Delay (s/veh) | 80.7 | | 56.7 | 70.5 | |
| Approach LOS | F | | E | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.17 | |
| Intersection Signal Delay (s/veh): 68.1 | Intersection LOS: E |
| Intersection Capacity Utilization 88.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

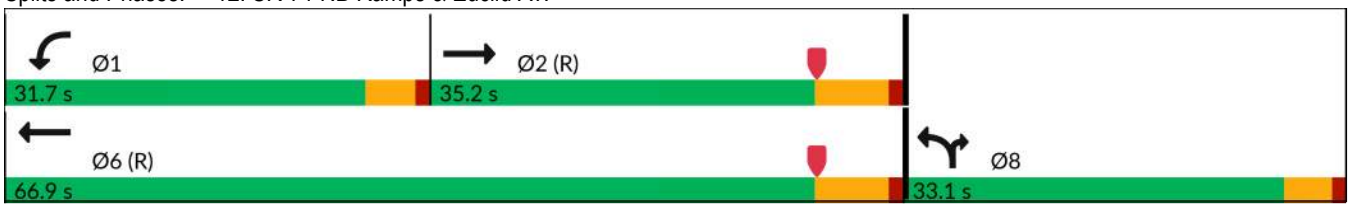

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 790 | 125 | 449 | 753 | 105 | 799 |
| Future Volume (veh/h) | 790 | 125 | 449 | 753 | 105 | 799 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1673 | 1772 | 1673 | 1772 |
| Adj Flow Rate, veh/h | 878 | 0 | 499 | 837 | 117 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1730 | | 430 | 2797 | 180 | |
| Arrive On Green | 1.00 | 0.00 | 0.27 | 0.83 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3544 | 0 | 1594 | 3455 | 3092 | 1502 |
| Grp Volume(v), veh/h | 878 | 0 | 499 | 837 | 117 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1683 | 0 | 1594 | 1683 | 1546 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 27.0 | 5.6 | 3.7 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 27.0 | 5.6 | 3.7 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1730 | | 430 | 2797 | 180 | |
| V/C Ratio(X) | 0.51 | | 1.16 | 0.30 | 0.65 | |
| Avail Cap(c_a), veh/h | 1730 | | 430 | 2797 | 881 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.79 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.5 | 1.9 | 46.1 | 0.0 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 94.8 | 0.3 | 3.9 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 20.9 | 0.5 | 1.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.8 | 0.0 | 131.3 | 2.2 | 50.1 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 878 | | | 1336 | 117 | |
| Approach Delay, s/veh | 0.8 | | | 50.4 | 50.1 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.7 | 57.9 | | | | 89.6 | 10.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 27.0 | 28.7 | | | | 60.4 | 28.5 |
| Max Q Clear Time (g_c+I1), s | 29.0 | 2.0 | | | | 7.6 | 5.7 |
| Green Ext Time (p_c), s | 0.0 | 4.5 | | | | 4.5 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 31.7 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 368 | 74 | 207 | 33 | 136 | 628 | 84 | 70 |
| Future Volume (vph) | 368 | 74 | 207 | 33 | 136 | 628 | 84 | 70 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 23.5 | 23.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 26.5 | 13.0 | 39.5 | 23.5 | 23.5 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 26.5% | 13.0% | 39.5% | 23.5% | 23.5% | 37.0% | 37.0% | 37.0% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 32.5 | 9.0 | 43.6 | 8.8 | 8.8 | 30.0 | 30.0 | 30.0 |
| Actuated g/C Ratio | 0.33 | 0.09 | 0.44 | 0.09 | 0.09 | 0.30 | 0.30 | 0.30 |
| v/c Ratio | 0.40 | 0.55 | 0.15 | 0.24 | 0.53 | 0.81 | 0.78 | 0.13 |
| Control Delay (s/veh) | 30.0 | 59.9 | 13.5 | 46.4 | 14.2 | 46.2 | 42.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.0 | 59.9 | 13.5 | 46.4 | 14.2 | 46.2 | 42.7 | 0.5 |
| LOS | C | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 30.0 | | 25.7 | | | | 40.5 | |
| Approach LOS | C | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 33.2 | Intersection LOS: C |
| Intersection Capacity Utilization 60.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

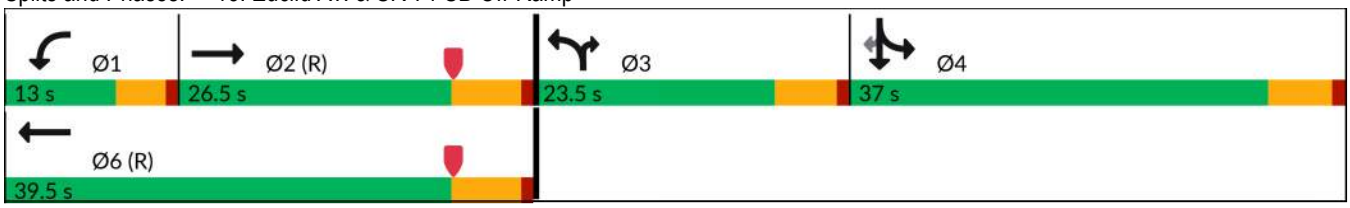

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 368 | 50 | 74 | 207 | 0 | 33 | 0 | 136 | 628 | 84 | 70 |
| Future Volume (veh/h) | 0 | 368 | 50 | 74 | 207 | 0 | 33 | 0 | 136 | 628 | 84 | 70 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 0 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 383 | 19 | 77 | 216 | 0 | 34 | 0 | 49 | 717 | 0 | 44 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1661 | 82 | 112 | 2109 | | 0 | 0 | 0 | 808 | 0 | 379 |
| Arrive On Green | 0.00 | 0.51 | 0.51 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.25 |
| Sat Flow, veh/h | 0 | 3353 | 161 | 1594 | 3455 | 0 | | 0 | | 3188 | 0 | 1496 |
| Grp Volume(v), veh/h | 0 | 197 | 205 | 77 | 216 | 0 | | 0.0 | | 717 | 0 | 44 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1683 | 1743 | 1594 | 1683 | 0 | | | | 1594 | 0 | 1496 |
| Q Serve(g_s), s | 0.0 | 6.5 | 6.5 | 4.6 | 0.0 | 0.0 | | | | 21.7 | 0.0 | 2.3 |
| Cycle Q Clear(g_c), s | 0.0 | 6.5 | 6.5 | 4.6 | 0.0 | 0.0 | | | | 21.7 | 0.0 | 2.3 |
| Prop In Lane | 0.00 | | 0.09 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 857 | 887 | 112 | 2109 | | | | | 808 | 0 | 379 |
| V/C Ratio(X) | 0.00 | 0.23 | 0.23 | 0.68 | 0.10 | | | | | 0.89 | 0.00 | 0.12 |
| Avail Cap(c_a), veh/h | 0 | 857 | 887 | 132 | 2109 | | | | | 995 | 0 | 467 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.93 | 0.93 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 13.7 | 13.7 | 41.9 | 0.0 | 0.0 | | | | 35.9 | 0.0 | 28.7 |
| Incr Delay (d2), s/veh | 0.0 | 0.6 | 0.6 | 7.1 | 0.1 | 0.0 | | | | 8.0 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.4 | 2.5 | 1.9 | 0.0 | 0.0 | | | | 9.2 | 0.0 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 14.3 | 14.3 | 49.0 | 0.1 | 0.0 | | | | 44.0 | 0.0 | 28.8 |
| LnGrp LOS | | B | B | D | A | | | | | D | | C |
| Approach Vol, veh/h | | 402 | | | 293 | | | | | | 761 | |
| Approach Delay, s/veh | | 14.3 | | | 12.9 | | | | | | 43.1 | |
| Approach LOS | | B | | | B | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.8 | 57.1 | | 31.2 | | 68.8 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 8.3 | 20.3 | | 31.2 | | 33.3 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 8.5 | | 23.7 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | | 1.5 | | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.1 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 804 | 29 | 47 | 676 | 14 | 24 | 30 | 80 | 7 | 6 | 29 |
| Future Vol, veh/h | 40 | 804 | 29 | 47 | 676 | 14 | 24 | 30 | 80 | 7 | 6 | 29 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 829 | 30 | 48 | 697 | 14 | 25 | 31 | 82 | 7 | 6 | 30 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 714 | 0 | 0 | 859 | 0 | 0 | 1375 | 1738 | 844 | 1731 | 1745 | 359 |
| Stage 1 | - | - | - | - | - | - | 926 | 926 | - | 804 | 804 | - |
| Stage 2 | - | - | - | - | - | - | 448 | 811 | - | 927 | 941 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 884 | - | - | 780 | - | - | 113 | 87 | 362 | 63 | 86 | 639 |
| Stage 1 | - | - | - | - | - | - | 321 | 346 | - | 344 | 395 | - |
| Stage 2 | - | - | - | - | - | - | 560 | 392 | - | 321 | 341 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 881 | - | - | 780 | - | - | 94 | 77 | 362 | 38 | 77 | 637 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 254 | 232 | - | 142 | 221 | - |
| Stage 1 | - | - | - | - | - | - | 306 | 330 | - | 321 | 369 | - |
| Stage 2 | - | - | - | - | - | - | 492 | 366 | - | 214 | 325 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.43 | 0.63 | 26.67 | 16.94 |
| HCM LOS | | | D | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 301 | 881 | - | - | 780 | - | - | 345 |
| HCM Lane V/C Ratio | 0.458 | 0.047 | - | - | 0.062 | - | - | 0.126 |
| HCM Control Delay (s/veh) | 26.7 | 9.3 | - | - | 9.9 | - | - | 16.9 |
| HCM Lane LOS | D | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 2.3 | 0.1 | - | - | 0.2 | - | - | 0.4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 13.3 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 49 | 328 | 38 | 3 | 124 | 11 | 17 | 129 | 16 | 8 | 97 | 25 |
| Future Vol, veh/h | 49 | 328 | 38 | 3 | 124 | 11 | 17 | 129 | 16 | 8 | 97 | 25 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 53 | 353 | 41 | 3 | 133 | 12 | 18 | 139 | 17 | 9 | 104 | 27 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 16.2 | 10.1 | 11 | 10.4 |
| HCM LOS | C | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 10% | 12% | 2% | 6% |
| Vol Thru, % | 80% | 79% | 90% | 75% |
| Vol Right, % | 10% | 9% | 8% | 19% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 162 | 415 | 138 | 130 |
| LT Vol | 17 | 49 | 3 | 8 |
| Through Vol | 129 | 328 | 124 | 97 |
| RT Vol | 16 | 38 | 11 | 25 |
| Lane Flow Rate | 174 | 446 | 148 | 140 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.277 | 0.626 | 0.226 | 0.222 |
| Departure Headway (Hd) | 5.718 | 5.054 | 5.474 | 5.722 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 627 | 714 | 654 | 626 |
| Service Time | 3.765 | 3.089 | 3.52 | 3.773 |
| HCM Lane V/C Ratio | 0.278 | 0.625 | 0.226 | 0.224 |
| HCM Control Delay, s/veh | 11 | 16.2 | 10.1 | 10.4 |
| HCM Lane LOS | B | C | B | B |
| HCM 95th-tile Q | 1.1 | 4.4 | 0.9 | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 171.3 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 65 | 736 | 85 | 3 | 401 | 9 | 49 | 88 | 5 | 20 | 94 | 28 |
| Future Vol, veh/h | 65 | 736 | 85 | 3 | 401 | 9 | 49 | 88 | 5 | 20 | 94 | 28 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 71 | 800 | 92 | 3 | 436 | 10 | 53 | 96 | 5 | 22 | 102 | 30 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 287.2 | 29.6 | 15.8 | 15.5 |
| HCM LOS | F | D | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 35% | 7% | 1% | 14% |
| Vol Thru, % | 62% | 83% | 97% | 66% |
| Vol Right, % | 4% | 10% | 2% | 20% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 142 | 886 | 413 | 142 |
| LT Vol | 49 | 65 | 3 | 20 |
| Through Vol | 88 | 736 | 401 | 94 |
| RT Vol | 5 | 85 | 9 | 28 |
| Lane Flow Rate | 154 | 963 | 449 | 154 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.32 | 1.584 | 0.769 | 0.315 |
| Departure Headway (Hd) | 8.709 | 5.922 | 7.009 | 8.581 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 415 | 616 | 521 | 421 |
| Service Time | 6.709 | 3.994 | 5.009 | 6.581 |
| HCM Lane V/C Ratio | 0.371 | 1.563 | 0.862 | 0.366 |
| HCM Control Delay, s/veh | 15.8 | 287.2 | 29.6 | 15.5 |
| HCM Lane LOS | C | F | D | C |
| HCM 95th-tile Q | 1.4 | 50.9 | 6.8 | 1.3 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 8.9 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 28 | 155 | 17 | 0 | 133 | 14 | 11 | 35 | 4 | 9 | 20 | 22 |
| Future Vol, veh/h | 28 | 155 | 17 | 0 | 133 | 14 | 11 | 35 | 4 | 9 | 20 | 22 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 34 | 189 | 21 | 0 | 162 | 17 | 13 | 43 | 5 | 11 | 24 | 27 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.3 | 8.7 | 8.5 | 8.2 |
| HCM LOS | A | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 22% | 14% | 0% | 18% |
| Vol Thru, % | 70% | 77% | 90% | 39% |
| Vol Right, % | 8% | 9% | 10% | 43% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 50 | 200 | 147 | 51 |
| LT Vol | 11 | 28 | 0 | 9 |
| Through Vol | 35 | 155 | 133 | 20 |
| RT Vol | 4 | 17 | 14 | 22 |
| Lane Flow Rate | 61 | 244 | 179 | 62 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.084 | 0.299 | 0.221 | 0.082 |
| Departure Headway (Hd) | 4.957 | 4.408 | 4.442 | 4.739 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 721 | 815 | 808 | 754 |
| Service Time | 2.996 | 2.433 | 2.47 | 2.777 |
| HCM Lane V/C Ratio | 0.085 | 0.299 | 0.222 | 0.082 |
| HCM Control Delay, s/veh | 8.5 | 9.3 | 8.7 | 8.2 |
| HCM Lane LOS | A | A | A | A |
| HCM 95th-tile Q | 0.3 | 1.3 | 0.8 | 0.3 |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 232 | 214 | 681 | 1139 | 781 |
| Future Volume (vph) | 3 | 232 | 214 | 681 | 1139 | 781 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 24.8 | 24.8 | 22.0 | 65.2 | 43.2 | 43.2 |
| Total Split (%) | 27.6% | 27.6% | 24.4% | 72.4% | 48.0% | 48.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 14.5 | 14.5 | 15.4 | 63.9 | 42.7 | 42.7 |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.17 | 0.71 | 0.47 | 0.47 |
| v/c Ratio | 0.67 | 0.54 | 0.80 | 0.29 | 0.72 | 0.75 |
| Control Delay (s/veh) | 47.7 | 9.3 | 63.9 | 1.0 | 23.5 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.7 | 9.3 | 63.9 | 1.0 | 23.5 | 8.7 |
| LOS | D | A | E | A | C | A |
| Approach Delay (s/veh) | 26.1 | | | 16.0 | 17.5 | |
| Approach LOS | C | | | B | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 18.2 | Intersection LOS: B |
| Intersection Capacity Utilization 89.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

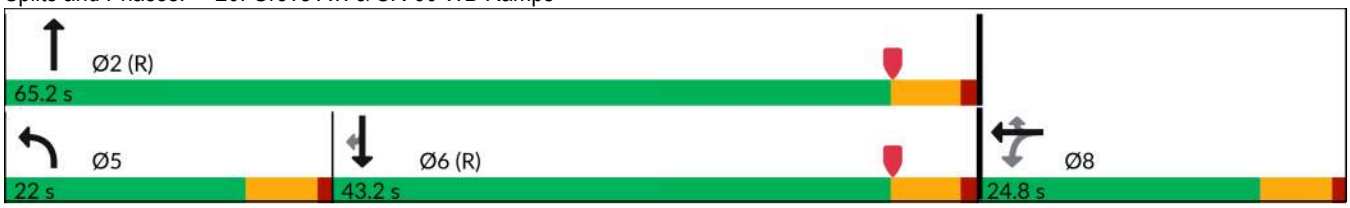

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 177 | 3 | 232 | 214 | 681 | 0 | 0 | 1139 | 781 |
| Future Volume (veh/h) | 0 | 0 | 0 | 177 | 3 | 232 | 214 | 681 | 0 | 0 | 1139 | 781 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 179 | 3 | 98 | 216 | 688 | 0 | 0 | 1151 | 606 |
| Peak Hour Factor | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 221 | 4 | 200 | 247 | 2484 | 0 | 0 | 1746 | 760 |
| Arrive On Green | | | | 0.13 | 0.13 | 0.13 | 0.15 | 0.74 | 0.00 | 0.00 | 0.52 | 0.52 |
| Sat Flow, veh/h | | | | 1661 | 28 | 1502 | 1594 | 3455 | 0 | 0 | 3455 | 1465 |
| Grp Volume(v), veh/h | | | | 182 | 0 | 98 | 216 | 688 | 0 | 0 | 1151 | 606 |
| Grp Sat Flow(s),veh/h/ln | | | | 1689 | 0 | 1502 | 1594 | 1683 | 0 | 0 | 1683 | 1465 |
| Q Serve(g_s), s | | | | 9.4 | 0.0 | 5.4 | 11.9 | 6.1 | 0.0 | 0.0 | 22.5 | 30.6 |
| Cycle Q Clear(g_c), s | | | | 9.4 | 0.0 | 5.4 | 11.9 | 6.1 | 0.0 | 0.0 | 22.5 | 30.6 |
| Prop In Lane | | | | 0.98 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 225 | 0 | 200 | 247 | 2484 | 0 | 0 | 1746 | 760 |
| V/C Ratio(X) | | | | 0.81 | 0.00 | 0.49 | 0.88 | 0.28 | 0.00 | 0.00 | 0.66 | 0.80 |
| Avail Cap(c_a), veh/h | | | | 357 | 0 | 317 | 287 | 2484 | 0 | 0 | 1746 | 760 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.29 | 0.29 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 37.9 | 0.0 | 36.2 | 37.2 | 3.9 | 0.0 | 0.0 | 15.8 | 17.8 |
| Incr Delay (d2), s/veh | | | | 5.7 | 0.0 | 1.4 | 7.2 | 0.1 | 0.0 | 0.0 | 2.0 | 8.5 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.0 | 0.0 | 2.0 | 4.9 | 1.3 | 0.0 | 0.0 | 7.9 | 10.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 43.6 | 0.0 | 37.5 | 44.4 | 4.0 | 0.0 | 0.0 | 17.8 | 26.3 |
| LnGrp LOS | | | | D | | D | D | A | | | B | C |
| Approach Vol, veh/h | | | | | 280 | | | 904 | | | 1757 | |
| Approach Delay, s/veh | | | | | 41.5 | | | 13.6 | | | 20.7 | |
| Approach LOS | | | | | D | | | B | | | C | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 72.2 | 19.7 | 52.5 | 17.8 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | 5.8 |
| Max Green Setting (Gmax), s | 59.4 | 16.2 | 37.4 | 19.0 |
| Max Q Clear Time (g_c+I1), s | 8.1 | 13.9 | 32.6 | 11.4 |
| Green Ext Time (p_c), s | 3.8 | 0.1 | 3.3 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.5 |
| HCM 7th LOS | C |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 3 | 171 | 620 | 488 | 831 |
| Future Volume (vph) | 3 | 171 | 620 | 488 | 831 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 24.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 35.8% | 26.7% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 19.6 | 19.6 | 25.8 | 27.0 | 57.8 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.29 | 0.30 | 0.64 |
| v/c Ratio | 0.78 | 0.41 | 0.91 | 1.06 | 0.40 |
| Control Delay (s/veh) | 47.1 | 10.4 | 44.1 | 85.4 | 20.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.1 | 10.4 | 44.1 | 85.4 | 20.4 |
| LOS | D | B | D | F | C |
| Approach Delay (s/veh) | 33.0 | | 44.1 | | 44.5 |
| Approach LOS | C | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.06 | |
| Intersection Signal Delay (s/veh): 42.4 | Intersection LOS: D |
| Intersection Capacity Utilization 89.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 273 | 3 | 171 | 0 | 0 | 0 | 0 | 620 | 228 | 488 | 831 | 0 |
| Future Volume (veh/h) | 273 | 3 | 171 | 0 | 0 | 0 | 0 | 620 | 228 | 488 | 831 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 281 | 3 | 90 | | | | 0 | 639 | 172 | 503 | 857 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 326 | 3 | 293 | | | | 0 | 1043 | 280 | 336 | 2237 | 0 |
| Arrive On Green | 0.20 | 0.20 | 0.20 | | | | 0.00 | 0.00 | 0.40 | 0.42 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1671 | 18 | 1499 | | | | 0 | 2709 | 704 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 284 | 0 | 90 | | | | 0 | 410 | 401 | 503 | 857 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1499 | | | | 0 | 1683 | 1641 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 14.6 | 0.0 | 4.6 | | | | 0.0 | 21.9 | 20.4 | 19.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.6 | 0.0 | 4.6 | | | | 0.0 | 21.9 | 20.4 | 19.0 | 0.0 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 0.43 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 330 | 0 | 293 | | | | 0 | 670 | 653 | 336 | 2237 | 0 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.31 | | | | 0.00 | 0.61 | 0.61 | 1.49 | 0.38 | 0.00 |
| Avail Cap(c_a), veh/h | 507 | 0 | 450 | | | | 0 | 670 | 653 | 336 | 2237 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 0.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.62 | 0.62 | 0.00 |
| Uniform Delay (d), s/veh | 35.0 | 0.0 | 31.0 | | | | 0.0 | 38.1 | 30.9 | 26.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 5.9 | 0.0 | 0.2 | | | | 0.0 | 4.1 | 4.3 | 232.3 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.2 | 0.0 | 1.6 | | | | 0.0 | 0.8 | 9.4 | 26.4 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.9 | 0.0 | 31.2 | | | | 0.0 | 42.2 | 35.2 | 258.3 | 0.3 | 0.0 |
| LnGrp LOS | D | | C | | | | | D | D | F | A | |
| Approach Vol, veh/h | | 374 | | | | | | 811 | | | 1360 | |
| Approach Delay, s/veh | | 38.6 | | | | | | 38.7 | | | 95.7 | |
| Approach LOS | | D | | | | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 41.6 | | 24.4 | | 65.6 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 19.0 | 26.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 23.9 | | 16.6 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | | 0.8 | | 5.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 69.2 |
| HCM 7th LOS | | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 131 | 220 | 21 | 142 | 99 | 514 | 155 | 601 |
| Future Volume (vph) | 131 | 220 | 21 | 142 | 99 | 514 | 155 | 601 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.8 | 21.9 | 5.9 | 11.6 | 8.8 | 19.9 | 10.6 | 24.2 |
| Actuated g/C Ratio | 0.13 | 0.30 | 0.08 | 0.16 | 0.12 | 0.27 | 0.15 | 0.33 |
| v/c Ratio | 0.67 | 0.34 | 0.18 | 0.45 | 0.57 | 0.68 | 0.73 | 0.76 |
| Control Delay (s/veh) | 48.8 | 18.4 | 37.4 | 19.5 | 44.4 | 28.0 | 52.6 | 28.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.8 | 18.4 | 37.4 | 19.5 | 44.4 | 28.0 | 52.6 | 28.6 |
| LOS | D | B | D | B | D | C | D | C |
| Approach Delay (s/veh) | | 27.3 | | 21.0 | | 30.5 | | 32.6 |
| Approach LOS | | C | | C | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 73.1 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay (s/veh): 29.6 | Intersection LOS: C |
| Intersection Capacity Utilization 64.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

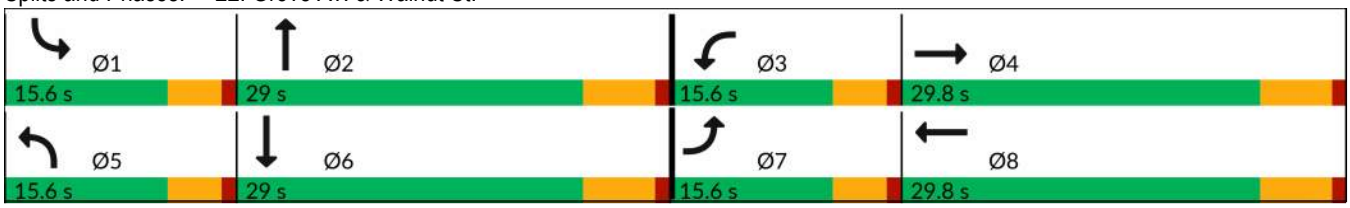

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 220 | 98 | 21 | 142 | 99 | 99 | 514 | 55 | 155 | 601 | 162 |
| Future Volume (veh/h) | 131 | 220 | 98 | 21 | 142 | 99 | 99 | 514 | 55 | 155 | 601 | 162 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 142 | 239 | 82 | 23 | 154 | 63 | 108 | 559 | 40 | 168 | 653 | 99 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 175 | 634 | 212 | 42 | 407 | 159 | 134 | 773 | 55 | 205 | 840 | 127 |
| Arrive On Green | 0.11 | 0.26 | 0.26 | 0.03 | 0.17 | 0.17 | 0.08 | 0.24 | 0.24 | 0.13 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1594 | 2472 | 825 | 1594 | 2352 | 919 | 1594 | 3185 | 228 | 1594 | 2925 | 443 |
| Grp Volume(v), veh/h | 142 | 161 | 160 | 23 | 108 | 109 | 108 | 295 | 304 | 168 | 375 | 377 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1614 | 1594 | 1683 | 1587 | 1594 | 1683 | 1730 | 1594 | 1683 | 1685 |
| Q Serve(g_s), s | 5.2 | 4.7 | 4.9 | 0.9 | 3.4 | 3.7 | 4.0 | 9.7 | 9.7 | 6.2 | 12.3 | 12.3 |
| Cycle Q Clear(g_c), s | 5.2 | 4.7 | 4.9 | 0.9 | 3.4 | 3.7 | 4.0 | 9.7 | 9.7 | 6.2 | 12.3 | 12.3 |
| Prop In Lane | 1.00 | | 0.51 | 1.00 | | 0.58 | 1.00 | | 0.13 | 1.00 | | 0.26 |
| Lane Grp Cap(c), veh/h | 175 | 432 | 414 | 42 | 291 | 275 | 134 | 409 | 420 | 205 | 484 | 484 |
| V/C Ratio(X) | 0.81 | 0.37 | 0.39 | 0.54 | 0.37 | 0.40 | 0.81 | 0.72 | 0.72 | 0.82 | 0.78 | 0.78 |
| Avail Cap(c_a), veh/h | 291 | 672 | 644 | 291 | 672 | 633 | 291 | 649 | 667 | 291 | 649 | 650 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.2 | 18.4 | 18.5 | 28.9 | 22.0 | 22.1 | 27.1 | 20.9 | 20.9 | 25.5 | 19.7 | 19.7 |
| Incr Delay (d2), s/veh | 3.4 | 0.5 | 0.6 | 4.0 | 0.8 | 0.9 | 4.3 | 2.4 | 2.4 | 8.0 | 4.2 | 4.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 1.6 | 1.6 | 0.3 | 1.2 | 1.3 | 1.5 | 3.5 | 3.6 | 2.6 | 4.7 | 4.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.6 | 18.9 | 19.1 | 32.9 | 22.8 | 23.0 | 31.3 | 23.3 | 23.3 | 33.5 | 23.9 | 23.9 |
| LnGrp LOS | C | B | B | C | C | C | C | C | C | C | C | C |
| Approach Vol, veh/h | | 463 | | | 240 | | | 707 | | | 920 | |
| Approach Delay, s/veh | | 22.2 | | | 23.9 | | | 24.6 | | | 25.7 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.3 | 20.4 | 6.2 | 21.2 | 9.7 | 23.1 | 11.2 | 16.2 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 11.7 | 2.9 | 6.9 | 6.0 | 14.3 | 7.2 | 5.7 |
| Green Ext Time (p_c), s | 0.1 | 2.5 | 0.0 | 1.5 | 0.0 | 2.9 | 0.1 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 24.5 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 110 | 747 | 46 | 603 | 25 | 361 | 122 | 347 | 119 |
| Future Volume (vph) | 110 | 747 | 46 | 603 | 25 | 361 | 122 | 347 | 119 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.3 | 28.3 | 7.2 | 24.3 | 6.2 | 22.3 | 9.7 | 32.1 | 32.1 |
| Actuated g/C Ratio | 0.11 | 0.33 | 0.09 | 0.29 | 0.07 | 0.26 | 0.11 | 0.38 | 0.38 |
| v/c Ratio | 0.65 | 1.37 | 0.35 | 0.84 | 0.23 | 0.92 | 0.70 | 0.53 | 0.19 |
| Control Delay (s/veh) | 55.5 | 205.7 | 45.4 | 37.7 | 43.7 | 59.2 | 58.9 | 27.1 | 3.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.5 | 205.7 | 45.4 | 37.7 | 43.7 | 59.2 | 58.9 | 27.1 | 3.5 |
| LOS | E | F | D | D | D | E | E | C | A |
| Approach Delay (s/veh) | | 187.3 | | 38.1 | | 58.3 | | 28.9 | |
| Approach LOS | | F | | D | | E | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 84.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.37 | |
| Intersection Signal Delay (s/veh): 87.9 | Intersection LOS: F |
| Intersection Capacity Utilization 96.6% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

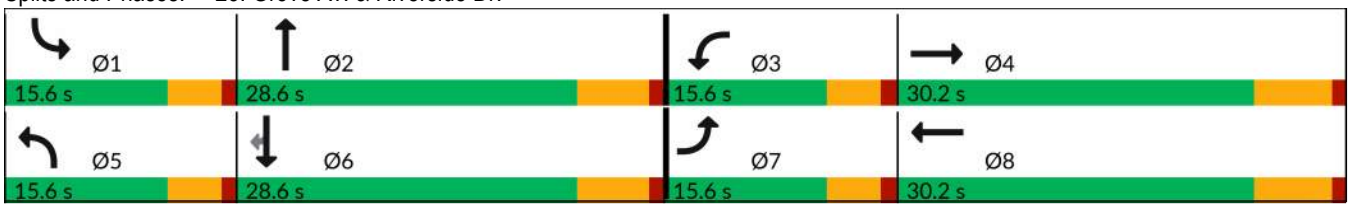

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 747 | 36 | 46 | 603 | 173 | 25 | 361 | 52 | 122 | 347 | 119 |
| Future Volume (veh/h) | 110 | 747 | 36 | 46 | 603 | 173 | 25 | 361 | 52 | 122 | 347 | 119 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 113 | 770 | 29 | 47 | 622 | 127 | 26 | 372 | 42 | 126 | 358 | 74 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 140 | 537 | 20 | 66 | 751 | 153 | 44 | 415 | 47 | 155 | 593 | 503 |
| Arrive On Green | 0.09 | 0.32 | 0.32 | 0.04 | 0.27 | 0.27 | 0.03 | 0.27 | 0.27 | 0.10 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1594 | 1697 | 64 | 1594 | 2776 | 566 | 1594 | 1564 | 177 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 113 | 0 | 799 | 47 | 377 | 372 | 26 | 0 | 414 | 126 | 358 | 74 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1760 | 1594 | 1683 | 1658 | 1594 | 0 | 1740 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 5.3 | 0.0 | 24.0 | 2.2 | 15.9 | 16.0 | 1.2 | 0.0 | 17.4 | 5.9 | 12.8 | 2.6 |
| Cycle Q Clear(g_c), s | 5.3 | 0.0 | 24.0 | 2.2 | 15.9 | 16.0 | 1.2 | 0.0 | 17.4 | 5.9 | 12.8 | 2.6 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.34 | 1.00 | | 0.10 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 140 | 0 | 557 | 66 | 455 | 448 | 44 | 0 | 462 | 155 | 593 | 503 |
| V/C Ratio(X) | 0.81 | 0.00 | 1.43 | 0.71 | 0.83 | 0.83 | 0.59 | 0.00 | 0.90 | 0.81 | 0.60 | 0.15 |
| Avail Cap(c_a), veh/h | 231 | 0 | 557 | 231 | 533 | 525 | 231 | 0 | 523 | 231 | 593 | 503 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.0 | 0.0 | 25.9 | 35.9 | 26.0 | 26.0 | 36.4 | 0.0 | 26.8 | 33.6 | 21.0 | 17.7 |
| Incr Delay (d2), s/veh | 4.2 | 0.0 | 205.5 | 5.2 | 9.2 | 9.5 | 4.5 | 0.0 | 16.7 | 7.6 | 1.7 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 0.0 | 40.5 | 0.9 | 6.8 | 6.8 | 0.5 | 0.0 | 8.6 | 2.4 | 5.0 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 38.2 | 0.0 | 231.4 | 41.1 | 35.2 | 35.5 | 40.9 | 0.0 | 43.5 | 41.2 | 22.8 | 17.8 |
| LnGrp LOS | D | | F | D | D | D | D | | D | D | C | B |
| Approach Vol, veh/h | | 912 | | | 796 | | | 440 | | | 558 | |
| Approach Delay, s/veh | | 207.5 | | | 35.7 | | | 43.4 | | | 26.3 | |
| Approach LOS | | F | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.0 | 25.9 | 7.7 | 30.2 | 6.7 | 31.2 | 11.2 | 26.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 7.9 | 19.4 | 4.2 | 26.0 | 3.2 | 14.8 | 7.3 | 18.0 |
| Green Ext Time (p_c), s | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 92.9 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 90.1 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 52 | 337 | 33 | 18 | 184 | 45 | 32 | 361 | 29 | 51 | 369 | 19 |
| Future Vol, veh/h | 52 | 337 | 33 | 18 | 184 | 45 | 32 | 361 | 29 | 51 | 369 | 19 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 54 | 351 | 34 | 19 | 192 | 47 | 33 | 376 | 30 | 53 | 384 | 20 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 96.9 | 32.5 | 97.1 | 109.2 |
| HCM LOS | F | D | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 8% | 12% | 7% | 12% |
| Vol Thru, % | 86% | 80% | 74% | 84% |
| Vol Right, % | 7% | 8% | 18% | 4% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 422 | 422 | 247 | 439 |
| LT Vol | 32 | 52 | 18 | 51 |
| Through Vol | 361 | 337 | 184 | 369 |
| RT Vol | 29 | 33 | 45 | 19 |
| Lane Flow Rate | 440 | 440 | 257 | 457 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.07 | 1.07 | 0.675 | 1.109 |
| Departure Headway (Hd) | 9.364 | 9.334 | 10.41 | 9.299 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 391 | 391 | 350 | 393 |
| Service Time | 7.364 | 7.334 | 8.41 | 7.299 |
| HCM Lane V/C Ratio | 1.125 | 1.125 | 0.734 | 1.163 |
| HCM Control Delay, s/veh | 97.1 | 96.9 | 32.5 | 109.2 |
| HCM Lane LOS | F | F | D | F |
| HCM 95th-tile Q | 14.2 | 14.2 | 4.7 | 15.6 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 25.5 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 100 | 210 | 43 | 5 | 65 | 31 | 35 | 310 | 26 | 58 | 296 | 38 |
| Future Vol, veh/h | 100 | 210 | 43 | 5 | 65 | 31 | 35 | 310 | 26 | 58 | 296 | 38 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 106 | 223 | 46 | 5 | 69 | 33 | 37 | 330 | 28 | 62 | 315 | 40 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 25.2 | 13.1 | 26.1 | 28.5 |
| HCM LOS | D | B | D | D |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 9% | 28% | 5% | 15% |
| Vol Thru, % | 84% | 59% | 64% | 76% |
| Vol Right, % | 7% | 12% | 31% | 10% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 371 | 353 | 101 | 392 |
| LT Vol | 35 | 100 | 5 | 58 |
| Through Vol | 310 | 210 | 65 | 296 |
| RT Vol | 26 | 43 | 31 | 38 |
| Lane Flow Rate | 395 | 376 | 107 | 417 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.735 | 0.71 | 0.23 | 0.77 |
| Departure Headway (Hd) | 6.702 | 6.944 | 7.702 | 6.647 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 541 | 526 | 465 | 546 |
| Service Time | 4.718 | 4.944 | 5.756 | 4.664 |
| HCM Lane V/C Ratio | 0.73 | 0.715 | 0.23 | 0.764 |
| HCM Control Delay, s/veh | 26.1 | 25.2 | 13.1 | 28.5 |
| HCM Lane LOS | D | D | B | D |
| HCM 95th-tile Q | 6.2 | 5.6 | 0.9 | 6.9 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 280.3 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 58 | 690 | 24 | 5 | 351 | 45 | 48 | 222 | 6 | 80 | 286 | 32 |
| Future Vol, veh/h | 58 | 690 | 24 | 5 | 351 | 45 | 48 | 222 | 6 | 80 | 286 | 32 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 63 | 750 | 26 | 5 | 382 | 49 | 52 | 241 | 7 | 87 | 311 | 35 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 531.5 | 115.6 | 55 | 115 |
| HCM LOS | F | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 17% | 8% | 1% | 20% |
| Vol Thru, % | 80% | 89% | 88% | 72% |
| Vol Right, % | 2% | 3% | 11% | 8% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 276 | 772 | 401 | 398 |
| LT Vol | 48 | 58 | 5 | 80 |
| Through Vol | 222 | 690 | 351 | 286 |
| RT Vol | 6 | 24 | 45 | 32 |
| Lane Flow Rate | 300 | 839 | 436 | 433 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.804 | 2.113 | 1.09 | 1.089 |
| Departure Headway (Hd) | 13.473 | 9.758 | 12.247 | 12.178 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 273 | 378 | 301 | 303 |
| Service Time | 11.473 | 7.758 | 10.247 | 10.178 |
| HCM Lane V/C Ratio | 1.099 | 2.22 | 1.449 | 1.429 |
| HCM Control Delay, s/veh | 55 | 531.5 | 115.6 | 115 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 6.3 | 56.5 | 12.7 | 12.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 28.7 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 19 | 242 | 2 | 1 | 138 | 285 | 2 | 3 | 1 | 399 | 5 | 15 |
| Future Vol, veh/h | 19 | 242 | 2 | 1 | 138 | 285 | 2 | 3 | 1 | 399 | 5 | 15 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 278 | 2 | 1 | 159 | 328 | 2 | 3 | 1 | 459 | 6 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 17.5 | 27.7 | 10.9 | 37.1 |
| HCM LOS | C | D | B | E |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 33% | 7% | 0% | 95% |
| Vol Thru, % | 50% | 92% | 33% | 1% |
| Vol Right, % | 17% | 1% | 67% | 4% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 6 | 263 | 424 | 419 |
| LT Vol | 2 | 19 | 1 | 399 |
| Through Vol | 3 | 242 | 138 | 5 |
| RT Vol | 1 | 2 | 285 | 15 |
| Lane Flow Rate | 7 | 302 | 487 | 482 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.015 | 0.552 | 0.793 | 0.86 |
| Departure Headway (Hd) | 7.723 | 6.57 | 5.859 | 6.425 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 461 | 547 | 619 | 563 |
| Service Time | 5.816 | 4.625 | 3.906 | 4.469 |
| HCM Lane V/C Ratio | 0.015 | 0.552 | 0.787 | 0.856 |
| HCM Control Delay, s/veh | 10.9 | 17.5 | 27.7 | 37.1 |
| HCM Lane LOS | B | C | D | E |
| HCM 95th-tile Q | 0 | 3.3 | 7.7 | 9.4 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 808 | 74 | 69 | 751 | 29 | 61 | 27 | 127 | 8 | 7 | 15 |
| Future Vol, veh/h | 36 | 808 | 74 | 69 | 751 | 29 | 61 | 27 | 127 | 8 | 7 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 38 | 842 | 77 | 72 | 782 | 30 | 64 | 28 | 132 | 8 | 7 | 16 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 816 | 0 | 0 | 919 | 0 | 0 | 1494 | 1914 | 459 | 1454 | 1938 | 409 |
| Stage 1 | - | - | - | - | - | - | 955 | 955 | - | 944 | 944 | - |
| Stage 2 | - | - | - | - | - | - | 539 | 959 | - | 510 | 994 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 808 | - | - | 738 | - | - | 85 | 67 | 549 | 91 | 65 | 591 |
| Stage 1 | - | - | - | - | - | - | 278 | 335 | - | 282 | 339 | - |
| Stage 2 | - | - | - | - | - | - | 495 | 333 | - | 514 | 321 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 805 | - | - | 738 | - | - | 68 | 58 | 549 | 50 | 56 | 590 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 173 | 157 | - | 142 | 146 | - |
| Stage 1 | - | - | - | - | - | - | 265 | 319 | - | 254 | 305 | - |
| Stage 2 | - | - | - | - | - | - | 424 | 300 | - | 339 | 306 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.38 | 0.85 | 51.99 | 23.01 |
| HCM LOS | | | F | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 285 | 805 | - | - | 738 | - | - | 231 |
| HCM Lane V/C Ratio | 0.787 | 0.047 | - | - | 0.097 | - | - | 0.135 |
| HCM Control Delay (s/veh) | 52 | 9.7 | - | - | 10.4 | - | - | 23 |
| HCM Lane LOS | F | A | - | - | B | - | - | C |
| HCM 95th %tile Q(veh) | 6.1 | 0.1 | - | - | 0.3 | - | - | 0.5 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.6 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 113 | 17 | 151 | 9 | 21 | 22 | 39 | 149 | 9 | 0 | 136 | 34 |
| Future Vol, veh/h | 113 | 17 | 151 | 9 | 21 | 22 | 39 | 149 | 9 | 0 | 136 | 34 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 127 | 19 | 170 | 10 | 24 | 25 | 44 | 167 | 10 | 0 | 153 | 38 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 11.4 | 8.8 | 10.6 | 10 |
| HCM LOS | B | A | B | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 20% | 40% | 17% | 0% |
| Vol Thru, % | 76% | 6% | 40% | 80% |
| Vol Right, % | 5% | 54% | 42% | 20% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 197 | 281 | 52 | 170 |
| LT Vol | 39 | 113 | 9 | 0 |
| Through Vol | 149 | 17 | 21 | 136 |
| RT Vol | 9 | 151 | 22 | 34 |
| Lane Flow Rate | 221 | 316 | 58 | 191 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.32 | 0.42 | 0.086 | 0.272 |
| Departure Headway (Hd) | 5.21 | 4.891 | 5.281 | 5.118 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 695 | 742 | 680 | 705 |
| Service Time | 3.21 | 2.891 | 3.305 | 3.128 |
| HCM Lane V/C Ratio | 0.318 | 0.426 | 0.085 | 0.271 |
| HCM Control Delay, s/veh | 10.6 | 11.4 | 8.8 | 10 |
| HCM Lane LOS | B | B | A | A |
| HCM 95th-tile Q | 1.4 | 2.1 | 0.3 | 1.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 149.4 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 21 | 759 | 24 | 15 | 388 | 76 | 7 | 111 | 9 | 139 | 100 | 12 |
| Future Vol, veh/h | 21 | 759 | 24 | 15 | 388 | 76 | 7 | 111 | 9 | 139 | 100 | 12 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 782 | 25 | 15 | 400 | 78 | 7 | 114 | 9 | 143 | 103 | 12 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 269.3 | 50 | 16.6 | 22.2 |
| HCM LOS | F | E | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 6% | 3% | 3% | 55% |
| Vol Thru, % | 87% | 94% | 81% | 40% |
| Vol Right, % | 7% | 3% | 16% | 5% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 127 | 804 | 479 | 251 |
| LT Vol | 7 | 21 | 15 | 139 |
| Through Vol | 111 | 759 | 388 | 100 |
| RT Vol | 9 | 24 | 76 | 12 |
| Lane Flow Rate | 131 | 829 | 494 | 259 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.299 | 1.537 | 0.914 | 0.554 |
| Departure Headway (Hd) | 9.535 | 6.674 | 7.497 | 8.826 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 380 | 547 | 489 | 411 |
| Service Time | 7.535 | 4.726 | 5.497 | 6.826 |
| HCM Lane V/C Ratio | 0.345 | 1.516 | 1.01 | 0.63 |
| HCM Control Delay, s/veh | 16.6 | 269.3 | 50 | 22.2 |
| HCM Lane LOS | C | F | F | C |
| HCM 95th-tile Q | 1.2 | 43.1 | 10.5 | 3.3 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.8 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 10 | 457 | 284 | 104 | 129 | 17 |
| Future Vol, veh/h | 10 | 457 | 284 | 104 | 129 | 17 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 12 | 531 | 330 | 121 | 150 | 20 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 451 | 0 | - | 0 | 945 | 391 |
| Stage 1 | - | - | - | - | 391 | - |
| Stage 2 | - | - | - | - | 555 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1109 | - | - | - | 290 | 658 |
| Stage 1 | - | - | - | - | 684 | - |
| Stage 2 | - | - | - | - | 575 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1109 | - | - | - | 286 | 658 |
| Mov Cap-2 Maneuver | - | - | - | - | 412 | - |
| Stage 1 | - | - | - | - | 673 | - |
| Stage 2 | - | - | - | - | 575 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.18 | 0 | 18.68 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 39 | - | - | - | 431 |
| HCM Lane V/C Ratio | 0.01 | - | - | - | 0.394 |
| HCM Control Delay (s/veh) | 8.3 | 0 | - | - | 18.7 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 1.8 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 352 | 9 | 192 | 483 | 602 | 1297 | 330 |
| Future Volume (vph) | 352 | 9 | 192 | 483 | 602 | 1297 | 330 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 26.0 | 26.0 | 26.0 | 22.0 | 64.0 | 42.0 | 42.0 |
| Total Split (%) | 28.9% | 28.9% | 28.9% | 24.4% | 71.1% | 46.7% | 46.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 16.8 | 16.8 | 16.8 | 18.4 | 61.6 | 38.3 | 38.3 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.19 | 0.20 | 0.68 | 0.43 | 0.43 |
| v/c Ratio | 0.73 | 0.71 | 0.44 | 0.88 | 0.20 | 0.54 | 0.43 |
| Control Delay (s/veh) | 49.4 | 47.0 | 8.3 | 49.6 | 0.8 | 20.7 | 3.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.4 | 47.0 | 8.3 | 49.6 | 0.8 | 20.7 | 3.9 |
| LOS | D | D | A | D | A | C | A |
| Approach Delay (s/veh) | | 35.8 | | | 22.5 | 17.3 | |
| Approach LOS | | D | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay (s/veh): 22.2 | Intersection LOS: C |
| Intersection Capacity Utilization 73.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

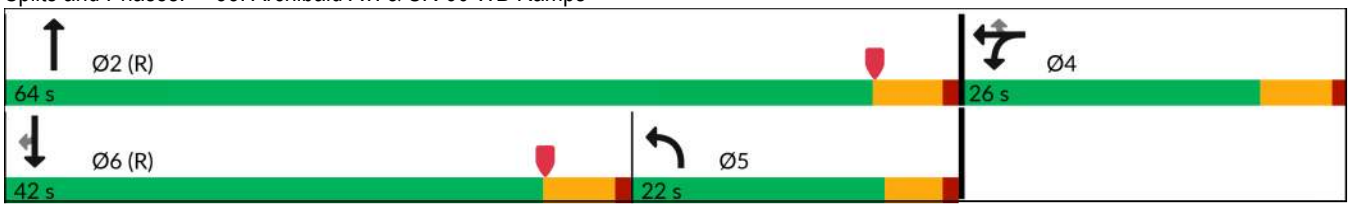

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 352 | 9 | 192 | 483 | 602 | 0 | 0 | 1297 | 330 |
| Future Volume (veh/h) | 0 | 0 | 0 | 352 | 9 | 192 | 483 | 602 | 0 | 0 | 1297 | 330 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1575 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 405 | 0 | 52 | 519 | 647 | 0 | 0 | 1395 | 232 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 497 | 0 | 234 | 952 | 3460 | 0 | 0 | 1972 | 474 |
| Arrive On Green | | | | 0.16 | 0.00 | 0.16 | 0.11 | 0.24 | 0.00 | 0.00 | 0.32 | 0.32 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1502 | 2910 | 4997 | 0 | 0 | 6343 | 1465 |
| Grp Volume(v), veh/h | | | | 405 | 0 | 52 | 519 | 647 | 0 | 0 | 1395 | 232 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1502 | 1455 | 1612 | 0 | 0 | 1524 | 1465 |
| Q Serve(g_s), s | | | | 11.1 | 0.0 | 2.7 | 15.2 | 9.6 | 0.0 | 0.0 | 18.1 | 11.5 |
| Cycle Q Clear(g_c), s | | | | 11.1 | 0.0 | 2.7 | 15.2 | 9.6 | 0.0 | 0.0 | 18.1 | 11.5 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 497 | 0 | 234 | 952 | 3460 | 0 | 0 | 1972 | 474 |
| V/C Ratio(X) | | | | 0.82 | 0.00 | 0.22 | 0.55 | 0.19 | 0.00 | 0.00 | 0.71 | 0.49 |
| Avail Cap(c_a), veh/h | | | | 715 | 0 | 337 | 952 | 3460 | 0 | 0 | 2452 | 589 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.90 | 0.90 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 36.7 | 0.0 | 33.2 | 33.8 | 13.5 | 0.0 | 0.0 | 26.7 | 24.5 |
| Incr Delay (d2), s/veh | | | | 4.8 | 0.0 | 0.5 | 0.3 | 0.1 | 0.0 | 0.0 | 2.2 | 3.6 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.4 | 0.0 | 2.4 | 5.9 | 3.3 | 0.0 | 0.0 | 6.3 | 4.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 41.6 | 0.0 | 33.7 | 34.1 | 13.6 | 0.0 | 0.0 | 28.9 | 28.0 |
| LnGrp LOS | | | | D | | C | C | B | | | C | C |
| Approach Vol, veh/h | | | | | 457 | | | 1166 | | | 1627 | |
| Approach Delay, s/veh | | | | | 40.7 | | | 22.7 | | | 28.8 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 70.2 | | 19.8 | 35.2 | 34.9 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 58.2 | | 20.2 | 17.0 | * 36 |
| Max Q Clear Time (g_c+I1), s | 11.6 | | 13.1 | 17.2 | 20.1 |
| Green Ext Time (p_c), s | 4.6 | | 1.0 | 0.0 | 9.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.3 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 166 | 1 | 470 | 887 | 488 | 520 | 1130 |
| Future Volume (vph) | 166 | 1 | 470 | 887 | 488 | 520 | 1130 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 40.0 | 40.0 | 23.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 44.4% | 44.4% | 25.6% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 17.2 | 17.2 | 17.2 | 34.9 | 34.9 | 21.3 | 61.2 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.19 | 0.39 | 0.39 | 0.24 | 0.68 |
| v/c Ratio | 0.57 | 0.80 | 0.76 | 0.41 | 0.59 | 0.82 | 0.37 |
| Control Delay (s/veh) | 39.9 | 40.9 | 35.9 | 21.5 | 5.0 | 54.7 | 2.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.9 | 40.9 | 35.9 | 21.5 | 5.0 | 54.7 | 2.7 |
| LOS | D | D | D | C | A | D | A |
| Approach Delay (s/veh) | | 38.8 | | 15.6 | | | 19.1 |
| Approach LOS | | D | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 21.2 | Intersection LOS: C |
| Intersection Capacity Utilization 73.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

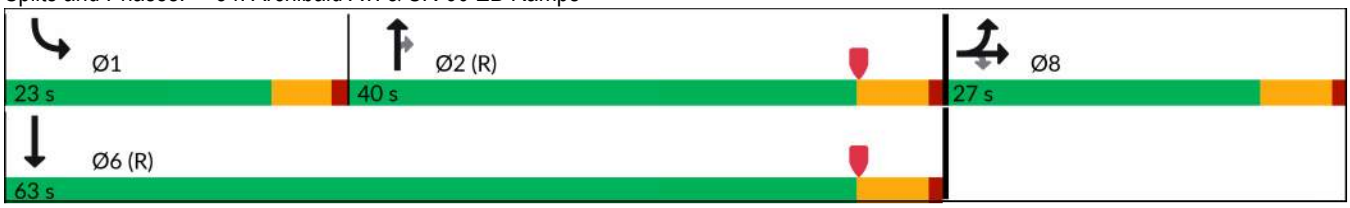

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 166 | 1 | 470 | 0 | 0 | 0 | 0 | 887 | 488 | 520 | 1130 | 0 |
| Future Volume (veh/h) | 166 | 1 | 470 | 0 | 0 | 0 | 0 | 887 | 488 | 520 | 1130 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1575 | 1772 | 0 |
| Adj Flow Rate, veh/h | 120 | 0 | 390 | | | | 0 | 964 | 417 | 565 | 1228 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 257 | 0 | 484 | | | | 0 | 2770 | 681 | 582 | 3434 | 0 |
| Arrive On Green | 0.16 | 0.00 | 0.16 | | | | 0.00 | 0.45 | 0.45 | 0.40 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 3003 | | | | 0 | 6343 | 1498 | 2910 | 4997 | 0 |
| Grp Volume(v), veh/h | 120 | 0 | 390 | | | | 0 | 964 | 417 | 565 | 1228 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1524 | 1498 | 1455 | 1612 | 0 |
| Q Serve(g_s), s | 6.1 | 0.0 | 11.3 | | | | 0.0 | 9.2 | 18.9 | 17.1 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 6.1 | 0.0 | 11.3 | | | | 0.0 | 9.2 | 18.9 | 17.1 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 257 | 0 | 484 | | | | 0 | 2770 | 681 | 582 | 3434 | 0 |
| V/C Ratio(X) | 0.47 | 0.00 | 0.81 | | | | 0.00 | 0.35 | 0.61 | 0.97 | 0.36 | 0.00 |
| Avail Cap(c_a), veh/h | 375 | 0 | 707 | | | | 0 | 2770 | 681 | 582 | 3434 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.80 | 0.80 | 0.00 |
| Uniform Delay (d), s/veh | 34.2 | 0.0 | 36.4 | | | | 0.0 | 15.9 | 18.6 | 26.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 4.4 | | | | 0.0 | 0.3 | 4.1 | 26.1 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 0.0 | 4.2 | | | | 0.0 | 2.9 | 6.5 | 6.1 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.6 | 0.0 | 40.7 | | | | 0.0 | 16.3 | 22.6 | 52.8 | 0.2 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | C | D | A | |
| Approach Vol, veh/h | | 510 | | | | | | 1381 | | | 1793 | |
| Approach Delay, s/veh | | 39.5 | | | | | | 18.2 | | | 16.8 | |
| Approach LOS | | D | | | | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.0 | 46.7 | | | | 69.7 | | 20.3 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 18.0 | 34.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 19.1 | 20.9 | | | | 2.0 | | 13.3 | | | | |
| Green Ext Time (p_c), s | 0.0 | 6.2 | | | | 10.2 | | 1.2 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 20.5 |
| HCM 7th LOS | | | C |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 164 | 576 | 338 | 169 | 502 | 159 | 268 | 657 | 289 | 934 |
| Future Volume (vph) | 164 | 576 | 338 | 169 | 502 | 159 | 268 | 657 | 289 | 934 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 26.4 | 26.4 | 12.6 | 24.5 | 24.5 | 21.4 | 22.0 | 28.7 | 29.4 |
| Actuated g/C Ratio | 0.13 | 0.24 | 0.24 | 0.12 | 0.23 | 0.23 | 0.20 | 0.20 | 0.27 | 0.27 |
| v/c Ratio | 0.79 | 0.72 | 0.56 | 0.94 | 0.67 | 0.35 | 0.87 | 0.74 | 0.70 | 0.90 |
| Control Delay (s/veh) | 72.5 | 42.8 | 7.1 | 101.7 | 43.4 | 7.6 | 70.7 | 45.0 | 48.7 | 47.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 72.5 | 42.8 | 7.1 | 101.7 | 43.4 | 7.6 | 70.7 | 45.0 | 48.7 | 47.9 |
| LOS | E | D | A | F | D | A | E | D | D | D |
| Approach Delay (s/veh) | | 36.1 | | | 48.4 | | | 52.0 | | 48.1 |
| Approach LOS | | D | | | D | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 108.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay (s/veh): 46.1 | Intersection LOS: D |
| Intersection Capacity Utilization 85.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

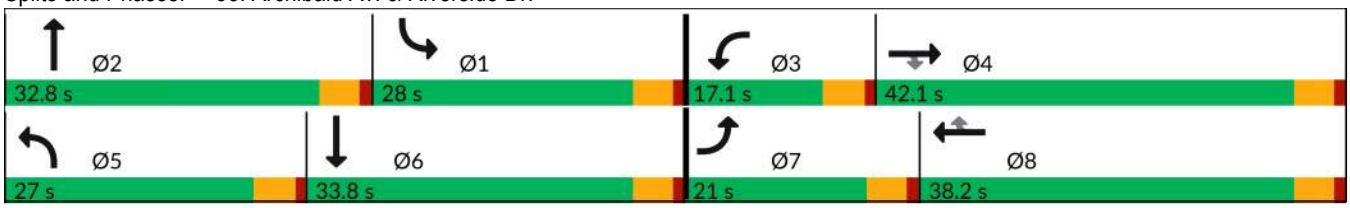

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 164 | 576 | 338 | 169 | 502 | 159 | 268 | 657 | 51 | 289 | 934 | 206 |
| Future Volume (veh/h) | 164 | 576 | 338 | 169 | 502 | 159 | 268 | 657 | 51 | 289 | 934 | 206 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 167 | 588 | 252 | 172 | 512 | 117 | 273 | 670 | 50 | 295 | 953 | 171 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 195 | 782 | 346 | 199 | 791 | 348 | 301 | 903 | 67 | 418 | 1109 | 198 |
| Arrive On Green | 0.12 | 0.23 | 0.23 | 0.12 | 0.23 | 0.23 | 0.19 | 0.20 | 0.20 | 0.26 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1594 | 3367 | 1490 | 1594 | 3367 | 1482 | 1594 | 4591 | 340 | 1594 | 4112 | 735 |
| Grp Volume(v), veh/h | 167 | 588 | 252 | 172 | 512 | 117 | 273 | 469 | 251 | 295 | 747 | 377 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1490 | 1594 | 1683 | 1482 | 1594 | 1612 | 1707 | 1594 | 1612 | 1623 |
| Q Serve(g_s), s | 10.3 | 16.2 | 15.6 | 10.6 | 13.7 | 3.5 | 16.8 | 13.7 | 13.8 | 16.8 | 22.0 | 22.1 |
| Cycle Q Clear(g_c), s | 10.3 | 16.2 | 15.6 | 10.6 | 13.7 | 3.5 | 16.8 | 13.7 | 13.8 | 16.8 | 22.0 | 22.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 0.45 |
| Lane Grp Cap(c), veh/h | 195 | 782 | 346 | 199 | 791 | 348 | 301 | 634 | 336 | 418 | 870 | 438 |
| V/C Ratio(X) | 0.86 | 0.75 | 0.73 | 0.86 | 0.65 | 0.34 | 0.91 | 0.74 | 0.75 | 0.71 | 0.86 | 0.86 |
| Avail Cap(c_a), veh/h | 262 | 1263 | 559 | 199 | 1132 | 498 | 357 | 910 | 482 | 418 | 942 | 474 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.0 | 35.7 | 35.4 | 42.9 | 34.5 | 9.2 | 39.7 | 37.7 | 37.8 | 33.4 | 34.7 | 34.7 |
| Incr Delay (d2), s/veh | 15.0 | 1.5 | 2.9 | 29.2 | 0.9 | 0.6 | 21.7 | 1.9 | 3.8 | 4.6 | 7.6 | 14.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.6 | 6.4 | 5.6 | 5.6 | 5.4 | 2.2 | 8.0 | 5.2 | 5.8 | 6.6 | 8.9 | 9.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 58.0 | 37.2 | 38.4 | 72.1 | 35.4 | 9.7 | 61.3 | 39.6 | 41.6 | 38.0 | 42.2 | 49.0 |
| LnGrp LOS | E | D | D | E | D | A | E | D | D | D | D | D |
| Approach Vol, veh/h | | 1007 | | | 801 | | | 993 | | | 1419 | |
| Approach Delay, s/veh | | 40.9 | | | 39.5 | | | 46.1 | | | 43.1 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 30.8 | 24.3 | 17.1 | 27.8 | 23.5 | 31.6 | 16.8 | 28.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 18.8 | 15.8 | 12.6 | 18.2 | 18.8 | 24.1 | 12.3 | 15.7 |
| Green Ext Time (p_c), s | 0.2 | 3.3 | 0.0 | 4.2 | 0.1 | 2.8 | 0.1 | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 42.6 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 94 | 208 | 24 | 122 | 89 | 72 | 795 | 145 | 1202 |
| Future Volume (vph) | 94 | 208 | 24 | 122 | 89 | 72 | 795 | 145 | 1202 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.4 | 24.6 | 5.4 | 15.1 | 15.1 | 10.0 | 22.6 | 28.7 | 44.4 |
| Actuated g/C Ratio | 0.12 | 0.26 | 0.06 | 0.16 | 0.16 | 0.11 | 0.24 | 0.31 | 0.47 |
| v/c Ratio | 0.51 | 0.71 | 0.27 | 0.45 | 0.24 | 0.45 | 0.68 | 0.31 | 0.80 |
| Control Delay (s/veh) | 51.8 | 39.3 | 57.2 | 44.3 | 1.4 | 52.3 | 35.9 | 32.3 | 29.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.8 | 39.3 | 57.2 | 44.3 | 1.4 | 52.3 | 35.9 | 32.3 | 29.8 |
| LOS | D | D | E | D | A | D | D | C | C |
| Approach Delay (s/veh) | | 42.2 | | 29.3 | | | 37.2 | | 30.1 |
| Approach LOS | | D | | C | | | D | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 93.6 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 33.8 | Intersection LOS: C |
| Intersection Capacity Utilization 79.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 94 | 208 | 101 | 24 | 122 | 89 | 72 | 795 | 31 | 145 | 1202 | 80 |
| Future Volume (veh/h) | 94 | 208 | 101 | 24 | 122 | 89 | 72 | 795 | 31 | 145 | 1202 | 80 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 98 | 217 | 88 | 25 | 127 | 35 | 75 | 828 | 30 | 151 | 1252 | 69 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 124 | 265 | 107 | 43 | 302 | 256 | 94 | 1236 | 45 | 427 | 1502 | 83 |
| Arrive On Green | 0.08 | 0.22 | 0.22 | 0.03 | 0.17 | 0.17 | 0.06 | 0.24 | 0.24 | 0.27 | 0.45 | 0.45 |
| Sat Flow, veh/h | 1594 | 1198 | 486 | 1594 | 1772 | 1502 | 1594 | 5098 | 184 | 1594 | 3328 | 183 |
| Grp Volume(v), veh/h | 98 | 0 | 305 | 25 | 127 | 35 | 75 | 575 | 283 | 151 | 666 | 655 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1684 | 1594 | 1772 | 1502 | 1594 | 1772 | 1738 | 1594 | 1772 | 1739 |
| Q Serve(g_s), s | 4.6 | 0.0 | 13.1 | 1.2 | 4.9 | 0.8 | 3.5 | 11.2 | 11.2 | 5.8 | 25.1 | 25.2 |
| Cycle Q Clear(g_c), s | 4.6 | 0.0 | 13.1 | 1.2 | 4.9 | 0.8 | 3.5 | 11.2 | 11.2 | 5.8 | 25.1 | 25.2 |
| Prop In Lane | 1.00 | | 0.29 | 1.00 | | 1.00 | 1.00 | | 0.11 | 1.00 | | 0.11 |
| Lane Grp Cap(c), veh/h | 124 | 0 | 372 | 43 | 302 | 256 | 94 | 859 | 421 | 427 | 800 | 785 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.82 | 0.58 | 0.42 | 0.14 | 0.80 | 0.67 | 0.67 | 0.35 | 0.83 | 0.83 |
| Avail Cap(c_a), veh/h | 427 | 0 | 872 | 109 | 564 | 478 | 302 | 2106 | 1033 | 427 | 992 | 974 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.5 | 0.0 | 28.2 | 36.6 | 28.2 | 7.6 | 35.4 | 26.1 | 26.1 | 22.5 | 18.3 | 18.4 |
| Incr Delay (d2), s/veh | 10.7 | 0.0 | 4.5 | 11.8 | 0.9 | 0.2 | 14.5 | 0.9 | 1.9 | 0.5 | 5.1 | 5.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 0.0 | 5.4 | 0.6 | 2.0 | 0.5 | 1.6 | 4.2 | 4.3 | 2.0 | 9.5 | 9.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 45.2 | 0.0 | 32.7 | 48.4 | 29.1 | 7.8 | 49.8 | 27.0 | 27.9 | 23.0 | 23.4 | 23.6 |
| LnGrp LOS | D | | C | D | C | A | D | C | C | C | C | C |
| Approach Vol, veh/h | | 403 | | | 187 | | | 933 | | | 1472 | |
| Approach Delay, s/veh | | 35.7 | | | 27.7 | | | 29.1 | | | 23.5 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.0 | 23.0 | 6.7 | 21.4 | 9.1 | 38.9 | 10.5 | 17.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 7.8 | 13.2 | 3.2 | 15.1 | 5.5 | 27.2 | 6.6 | 6.9 |
| Green Ext Time (p_c), s | 0.1 | 5.2 | 0.0 | 1.7 | 0.1 | 7.1 | 0.2 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.1 |
| HCM 7th LOS | C |

| Lane Group | WBL | WBT | NBL | NBT | SBL | SBT | Ø4 |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 45 | 0 | 5 | 804 | 224 | 1094 | |
| Future Volume (vph) | 45 | 0 | 5 | 804 | 224 | 1094 | |
| Turn Type | Split | NA | Prot | NA | Prot | NA | |
| Protected Phases | 8 | 8 | 5 | 2 | 1 | 6 | 4 |
| Permitted Phases | | | | | | | |
| Detector Phase | 8 | 8 | 5 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 |
| Minimum Split (s) | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 | 22.5 |
| Total Split (s) | 32.6 | 32.6 | 9.6 | 39.9 | 25.0 | 55.3 | 22.5 |
| Total Split (%) | 27.2% | 27.2% | 8.0% | 33.3% | 20.8% | 46.1% | 19% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | |
| Lead/Lag | | | Lead | Lag | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.2 | 10.2 | 5.7 | 18.7 | 15.5 | 40.2 | |
| Actuated g/C Ratio | 0.18 | 0.18 | 0.10 | 0.33 | 0.27 | 0.71 | |
| v/c Ratio | 0.16 | 0.09 | 0.03 | 0.55 | 0.53 | 0.47 | |
| Control Delay (s/veh) | 23.8 | 0.3 | 34.4 | 18.4 | 27.0 | 8.1 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay (s/veh) | 23.8 | 0.3 | 34.4 | 18.4 | 27.0 | 8.1 | |
| LOS | C | A | C | B | C | A | |
| Approach Delay (s/veh) | | 9.9 | | 18.5 | | 11.3 | |
| Approach LOS | | A | | B | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 56.4 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.55 | |
| Intersection Signal Delay (s/veh): 14.0 | Intersection LOS: B |
| Intersection Capacity Utilization 51.8% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 45 | 0 | 65 | 5 | 804 | 49 | 224 | 1094 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 45 | 0 | 65 | 5 | 804 | 49 | 224 | 1094 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 46 | 0 | 58 | 5 | 820 | 46 | 229 | 1116 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 5 | 0 | 142 | 0 | 134 | 11 | 1649 | 92 | 286 | 1766 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.09 | 0.00 | 0.09 | 0.01 | 0.35 | 0.35 | 0.18 | 0.52 | 0.00 |
| Sat Flow, veh/h | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 4687 | 262 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 46 | 0 | 58 | 5 | 563 | 303 | 229 | 1116 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 1612 | 1725 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.3 | 0.1 | 5.0 | 5.0 | 5.0 | 8.6 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 1.3 | 0.1 | 5.0 | 5.0 | 5.0 | 8.6 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 0.15 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 5 | 0 | 142 | 0 | 134 | 11 | 1135 | 607 | 286 | 1766 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.32 | 0.00 | 0.43 | 0.46 | 0.50 | 0.50 | 0.80 | 0.63 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 872 | 0 | 1227 | 0 | 1156 | 219 | 3129 | 1674 | 894 | 4692 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 15.5 | 0.0 | 15.7 | 18.0 | 9.3 | 9.3 | 14.3 | 6.2 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 2.2 | 27.9 | 0.3 | 0.6 | 2.0 | 0.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.4 | 0.1 | 0.9 | 1.0 | 1.3 | 0.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 0.0 | 16.8 | 0.0 | 17.9 | 45.9 | 9.6 | 9.9 | 16.3 | 6.5 | 0.0 |
| LnGrp LOS | | | | B | | B | D | A | A | B | A | |
| Approach Vol, veh/h | | 0 | | | 104 | | | 871 | | | 1345 | |
| Approach Delay, s/veh | | 0.0 | | | 17.4 | | | 9.9 | | | 8.2 | |
| Approach LOS | | | | | B | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.1 | 17.4 | | 0.0 | 4.8 | 23.7 | | 7.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 20.4 | 35.3 | | 17.9 | 5.0 | 50.7 | | 28.0 |
| Max Q Clear Time (g_c+I1), s | 7.0 | 7.0 | | 0.0 | 2.1 | 10.6 | | 3.3 |
| Green Ext Time (p_c), s | 0.2 | 5.2 | | 0.0 | 0.0 | 8.5 | | 0.4 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 9.3 |
| HCM 7th LOS | | A |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 104 | 472 | 287 | 433 | 270 | 105 | 119 | 643 | 249 | 152 | 883 | 69 |
| Future Volume (vph) | 104 | 472 | 287 | 433 | 270 | 105 | 119 | 643 | 249 | 152 | 883 | 69 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.8 | 17.2 | 87.3 | 10.8 | 22.2 | 22.2 | 10.6 | 27.3 | 87.3 | 13.0 | 29.6 | 29.6 |
| Actuated g/C Ratio | 0.07 | 0.20 | 1.00 | 0.12 | 0.25 | 0.25 | 0.12 | 0.31 | 1.00 | 0.15 | 0.34 | 0.34 |
| v/c Ratio | 0.55 | 0.50 | 0.19 | 1.22 | 0.61 | 0.22 | 0.63 | 0.62 | 0.17 | 0.66 | 0.78 | 0.12 |
| Control Delay (s/veh) | 56.0 | 33.3 | 0.3 | 159.4 | 35.9 | 3.1 | 56.3 | 29.7 | 0.2 | 52.5 | 32.2 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 56.0 | 33.3 | 0.3 | 159.4 | 35.9 | 3.1 | 56.3 | 29.7 | 0.2 | 52.5 | 32.2 | 0.4 |
| LOS | E | C | A | F | D | A | E | C | A | D | C | A |
| Approach Delay (s/veh) | | 25.1 | | | 97.8 | | | 25.6 | | | 33.0 | |
| Approach LOS | | C | | | F | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.3 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.22 | |
| Intersection Signal Delay (s/veh): 43.0 | Intersection LOS: D |
| Intersection Capacity Utilization 72.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

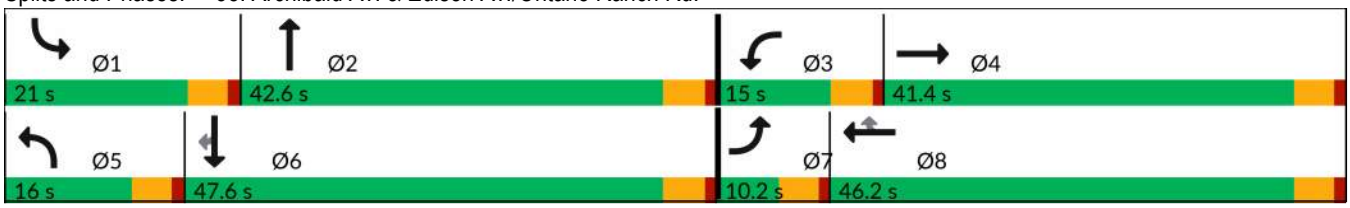

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 104 | 472 | 287 | 433 | 270 | 105 | 119 | 643 | 249 | 152 | 883 | 69 |
| Future Volume (veh/h) | 104 | 472 | 287 | 433 | 270 | 105 | 119 | 643 | 249 | 152 | 883 | 69 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 105 | 477 | 0 | 437 | 273 | 78 | 120 | 649 | 0 | 154 | 892 | 61 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 178 | 777 | | 421 | 433 | 367 | 148 | 1079 | | 188 | 1163 | 519 |
| Arrive On Green | 0.06 | 0.16 | 0.00 | 0.14 | 0.24 | 0.24 | 0.09 | 0.32 | 0.00 | 0.12 | 0.35 | 0.35 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1500 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 105 | 477 | 0 | 437 | 273 | 78 | 120 | 649 | 0 | 154 | 892 | 61 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1500 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 2.5 | 6.6 | 0.0 | 10.4 | 9.9 | 3.0 | 5.3 | 11.7 | 0.0 | 6.8 | 16.9 | 2.0 |
| Cycle Q Clear(g_c), s | 2.5 | 6.6 | 0.0 | 10.4 | 9.9 | 3.0 | 5.3 | 11.7 | 0.0 | 6.8 | 16.9 | 2.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 178 | 777 | | 421 | 433 | 367 | 148 | 1079 | | 188 | 1163 | 519 |
| V/C Ratio(X) | 0.59 | 0.61 | | 1.04 | 0.63 | 0.21 | 0.81 | 0.60 | | 0.82 | 0.77 | 0.12 |
| Avail Cap(c_a), veh/h | 227 | 2478 | | 421 | 1026 | 869 | 253 | 1781 | | 364 | 2015 | 899 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.8 | 28.1 | 0.0 | 30.7 | 24.2 | 21.6 | 32.0 | 20.5 | 0.0 | 30.9 | 20.9 | 16.0 |
| Incr Delay (d2), s/veh | 1.2 | 0.8 | 0.0 | 53.8 | 1.5 | 0.3 | 4.0 | 0.5 | 0.0 | 3.4 | 1.1 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 2.3 | 0.0 | 6.4 | 3.8 | 1.0 | 2.0 | 3.9 | 0.0 | 2.5 | 5.7 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.0 | 28.9 | 0.0 | 84.5 | 25.8 | 21.9 | 35.9 | 21.1 | 0.0 | 34.3 | 22.0 | 16.1 |
| LnGrp LOS | C | C | | F | C | C | D | C | | C | C | B |
| Approach Vol, veh/h | | 582 | | | 788 | | | 769 | | | 1107 | |
| Approach Delay, s/veh | | 29.8 | | | 58.0 | | | 23.4 | | | 23.4 | |
| Approach LOS | | C | | | E | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.1 | 27.6 | 15.0 | 16.1 | 11.3 | 29.4 | 9.0 | 22.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 8.8 | 13.7 | 12.4 | 8.6 | 7.3 | 18.9 | 4.5 | 11.9 |
| Green Ext Time (p_c), s | 0.1 | 3.9 | 0.0 | 2.9 | 0.0 | 5.9 | 0.0 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 32.9 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 221 | 379 | 176 | 109 | 205 | 64 | 95 | 621 | 116 | 109 | 969 | 160 |
| Future Volume (vph) | 221 | 379 | 176 | 109 | 205 | 64 | 95 | 621 | 116 | 109 | 969 | 160 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.3 | 19.2 | 87.9 | 10.8 | 17.6 | 17.6 | 5.6 | 31.3 | 31.3 | 7.7 | 33.5 | 33.5 |
| Actuated g/C Ratio | 0.14 | 0.22 | 1.00 | 0.12 | 0.20 | 0.20 | 0.06 | 0.36 | 0.36 | 0.09 | 0.38 | 0.38 |
| v/c Ratio | 0.56 | 0.52 | 0.12 | 0.60 | 0.31 | 0.17 | 0.53 | 0.35 | 0.20 | 0.44 | 0.76 | 0.25 |
| Control Delay (s/veh) | 42.7 | 32.0 | 0.2 | 54.2 | 31.0 | 0.9 | 55.3 | 23.2 | 4.5 | 48.0 | 30.1 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.7 | 32.0 | 0.2 | 54.2 | 31.0 | 0.9 | 55.3 | 23.2 | 4.5 | 48.0 | 30.1 | 6.3 |
| LOS | D | C | A | D | C | A | E | C | A | D | C | A |
| Approach Delay (s/veh) | | 27.9 | | | 32.6 | | | 24.2 | | | 28.6 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.9 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.76 | |
| Intersection Signal Delay (s/veh): 27.8 | Intersection LOS: C |
| Intersection Capacity Utilization 67.4% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

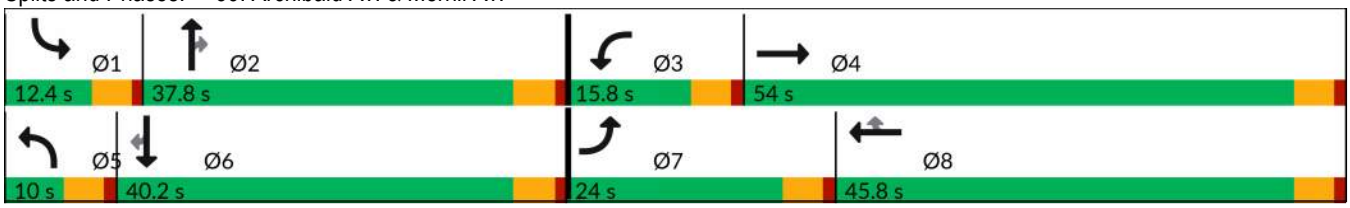

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 221 | 379 | 176 | 109 | 205 | 64 | 95 | 621 | 116 | 109 | 969 | 160 |
| Future Volume (veh/h) | 221 | 379 | 176 | 109 | 205 | 64 | 95 | 621 | 116 | 109 | 969 | 160 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 233 | 399 | 0 | 115 | 216 | 36 | 100 | 654 | 88 | 115 | 1020 | 115 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 336 | 682 | | 143 | 604 | 250 | 191 | 1984 | 553 | 199 | 1333 | 565 |
| Arrive On Green | 0.11 | 0.19 | 0.00 | 0.09 | 0.17 | 0.17 | 0.06 | 0.37 | 0.37 | 0.07 | 0.38 | 0.38 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 3544 | 1469 | 3000 | 5316 | 1481 | 3000 | 3544 | 1502 |
| Grp Volume(v), veh/h | 233 | 399 | 0 | 115 | 216 | 36 | 100 | 654 | 88 | 115 | 1020 | 115 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1469 | 1500 | 1772 | 1481 | 1500 | 1772 | 1502 |
| Q Serve(g_s), s | 5.0 | 6.8 | 0.0 | 4.7 | 3.6 | 1.4 | 2.1 | 5.8 | 2.6 | 2.5 | 16.7 | 3.4 |
| Cycle Q Clear(g_c), s | 5.0 | 6.8 | 0.0 | 4.7 | 3.6 | 1.4 | 2.1 | 5.8 | 2.6 | 2.5 | 16.7 | 3.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 336 | 682 | | 143 | 604 | 250 | 191 | 1984 | 553 | 199 | 1333 | 565 |
| V/C Ratio(X) | 0.69 | 0.58 | | 0.80 | 0.36 | 0.14 | 0.52 | 0.33 | 0.16 | 0.58 | 0.77 | 0.20 |
| Avail Cap(c_a), veh/h | 879 | 2644 | | 270 | 2205 | 914 | 245 | 2665 | 742 | 353 | 1905 | 807 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.3 | 24.3 | 0.0 | 29.5 | 24.3 | 23.4 | 30.0 | 14.8 | 13.8 | 30.0 | 18.1 | 14.0 |
| Incr Delay (d2), s/veh | 2.6 | 0.8 | 0.0 | 9.9 | 0.4 | 0.3 | 2.2 | 0.1 | 0.1 | 2.6 | 1.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.7 | 2.6 | 0.0 | 2.0 | 1.4 | 0.4 | 0.7 | 1.9 | 0.8 | 0.9 | 5.6 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 30.9 | 25.1 | 0.0 | 39.4 | 24.6 | 23.6 | 32.3 | 14.9 | 14.0 | 32.6 | 19.3 | 14.1 |
| LnGrp LOS | C | C | | D | C | C | C | B | B | C | B | B |
| Approach Vol, veh/h | | 632 | | | 367 | | | 842 | | | 1250 | |
| Approach Delay, s/veh | | 27.2 | | | 29.2 | | | 16.9 | | | 20.0 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.0 | 29.3 | 10.6 | 17.3 | 8.8 | 29.5 | 12.0 | 15.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 4.5 | 7.8 | 6.7 | 8.8 | 4.1 | 18.7 | 7.0 | 5.6 |
| Green Ext Time (p_c), s | 0.1 | 4.3 | 0.1 | 2.5 | 0.0 | 6.2 | 0.6 | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.7 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 69 | 217 | 58 | 390 | 141 | 290 | 16 | 580 | 326 | 473 | 751 | 76 |
| Future Volume (vph) | 69 | 217 | 58 | 390 | 141 | 290 | 16 | 580 | 326 | 473 | 751 | 76 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.2 | 12.8 | 12.8 | 16.1 | 26.1 | 36.0 | 5.2 | 22.7 | 38.8 | 9.9 | 34.1 | 34.1 |
| Actuated g/C Ratio | 0.06 | 0.16 | 0.16 | 0.20 | 0.32 | 0.45 | 0.06 | 0.28 | 0.48 | 0.12 | 0.42 | 0.42 |
| v/c Ratio | 0.39 | 0.43 | 0.17 | 0.71 | 0.14 | 0.24 | 0.09 | 0.65 | 0.42 | 1.41 | 0.39 | 0.11 |
| Control Delay (s/veh) | 48.9 | 35.8 | 1.1 | 39.4 | 22.0 | 4.9 | 45.4 | 29.1 | 6.2 | 231.7 | 18.3 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.9 | 35.8 | 1.1 | 39.4 | 22.0 | 4.9 | 45.4 | 29.1 | 6.2 | 231.7 | 18.3 | 0.5 |
| LOS | D | D | A | D | C | A | D | C | A | F | B | A |
| Approach Delay (s/veh) | | 32.6 | | | 24.3 | | | 21.3 | | | 94.9 | |
| Approach LOS | | C | | | C | | | C | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 80.7 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.41 | |
| Intersection Signal Delay (s/veh): 51.4 | Intersection LOS: D |
| Intersection Capacity Utilization 69.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

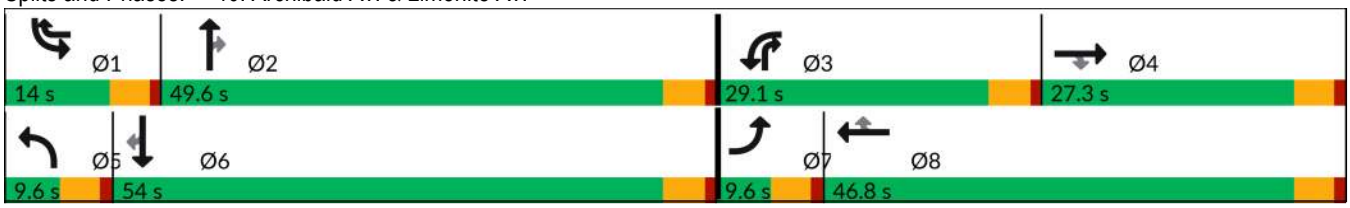

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 69 | 217 | 58 | 390 | 141 | 290 | 16 | 580 | 326 | 473 | 751 | 76 |
| Future Volume (veh/h) | 69 | 217 | 58 | 390 | 141 | 290 | 16 | 580 | 326 | 473 | 751 | 76 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 73 | 228 | 39 | 411 | 148 | 187 | 17 | 611 | 166 | 498 | 791 | 69 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 162 | 501 | 223 | 510 | 904 | 1079 | 59 | 874 | 648 | 410 | 1839 | 570 |
| Arrive On Green | 0.06 | 0.15 | 0.15 | 0.18 | 0.27 | 0.27 | 0.02 | 0.26 | 0.26 | 0.14 | 0.38 | 0.38 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 2910 | 3367 | 2634 | 2910 | 3367 | 1481 | 2910 | 4837 | 1500 |
| Grp Volume(v), veh/h | 73 | 228 | 39 | 411 | 148 | 187 | 17 | 611 | 166 | 498 | 791 | 69 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1455 | 1683 | 1317 | 1455 | 1683 | 1481 | 1455 | 1612 | 1500 |
| Q Serve(g_s), s | 1.6 | 4.1 | 1.5 | 9.1 | 2.2 | 3.0 | 0.4 | 11.0 | 4.8 | 9.4 | 8.1 | 2.0 |
| Cycle Q Clear(g_c), s | 1.6 | 4.1 | 1.5 | 9.1 | 2.2 | 3.0 | 0.4 | 11.0 | 4.8 | 9.4 | 8.1 | 2.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 162 | 501 | 223 | 510 | 904 | 1079 | 59 | 874 | 648 | 410 | 1839 | 570 |
| V/C Ratio(X) | 0.45 | 0.46 | 0.17 | 0.81 | 0.16 | 0.17 | 0.29 | 0.70 | 0.26 | 1.22 | 0.43 | 0.12 |
| Avail Cap(c_a), veh/h | 218 | 1145 | 511 | 1068 | 2128 | 2037 | 218 | 2270 | 1262 | 410 | 3580 | 1110 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.5 | 25.9 | 24.8 | 26.4 | 18.7 | 12.5 | 32.2 | 22.4 | 12.0 | 28.7 | 15.3 | 13.4 |
| Incr Delay (d2), s/veh | 0.7 | 0.6 | 0.4 | 1.2 | 0.1 | 0.1 | 1.0 | 1.0 | 0.2 | 117.3 | 0.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 1.5 | 0.5 | 2.9 | 0.8 | 0.8 | 0.1 | 3.7 | 1.3 | 9.5 | 2.4 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 31.3 | 26.6 | 25.2 | 27.6 | 18.8 | 12.6 | 33.2 | 23.4 | 12.2 | 146.0 | 15.5 | 13.5 |
| LnGrp LOS | C | C | C | C | B | B | C | C | B | F | B | B |
| Approach Vol, veh/h | | 340 | | | 746 | | | 794 | | | 1358 | |
| Approach Delay, s/veh | | 27.4 | | | 22.1 | | | 21.3 | | | 63.2 | |
| Approach LOS | | C | | | C | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 21.9 | 16.3 | 14.5 | 6.0 | 30.0 | 8.3 | 22.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 11.4 | 13.0 | 11.1 | 6.1 | 2.4 | 10.1 | 3.6 | 5.0 |
| Green Ext Time (p_c), s | 0.0 | 4.4 | 0.6 | 1.2 | 0.0 | 5.6 | 0.0 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 39.7 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 63 | 772 | 24 | 55 | 808 | 80 | 10 | 26 | 130 | 39 |
| Future Volume (vph) | 63 | 772 | 24 | 55 | 808 | 80 | 10 | 26 | 130 | 39 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.6 | 26.4 | 26.4 | 8.0 | 24.6 | 24.6 | 6.2 | 9.0 | 12.0 | 19.2 |
| Actuated g/C Ratio | 0.12 | 0.40 | 0.40 | 0.12 | 0.37 | 0.37 | 0.09 | 0.14 | 0.18 | 0.29 |
| v/c Ratio | 0.37 | 0.58 | 0.04 | 0.31 | 0.65 | 0.13 | 0.07 | 0.31 | 0.48 | 0.19 |
| Control Delay (s/veh) | 41.4 | 19.8 | 0.1 | 37.7 | 21.2 | 1.1 | 38.2 | 18.5 | 38.2 | 13.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.4 | 19.8 | 0.1 | 37.7 | 21.2 | 1.1 | 38.2 | 18.5 | 38.2 | 13.0 |
| LOS | D | B | A | D | C | A | D | B | D | B |
| Approach Delay (s/veh) | | 20.8 | | | 20.5 | | | 20.9 | | 27.7 |
| Approach LOS | | C | | | C | | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 65.7 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.65 | |
| Intersection Signal Delay (s/veh): 21.4 | Intersection LOS: C |
| Intersection Capacity Utilization 54.0% | ICU Level of Service A |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

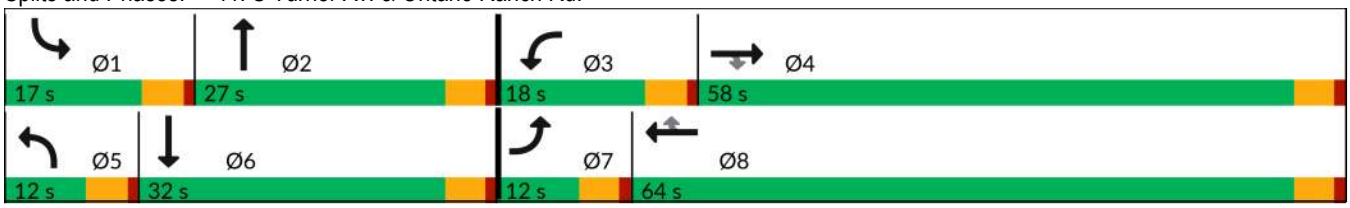

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 63 | 772 | 24 | 55 | 808 | 80 | 10 | 26 | 49 | 130 | 39 | 54 |
| Future Volume (veh/h) | 63 | 772 | 24 | 55 | 808 | 80 | 10 | 26 | 49 | 130 | 39 | 54 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 67 | 821 | 22 | 59 | 860 | 61 | 11 | 28 | 20 | 138 | 41 | 45 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 99 | 1378 | 584 | 91 | 1361 | 577 | 23 | 51 | 37 | 172 | 114 | 125 |
| Arrive On Green | 0.06 | 0.39 | 0.39 | 0.06 | 0.38 | 0.38 | 0.01 | 0.05 | 0.05 | 0.11 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1594 | 3544 | 1502 | 1594 | 3544 | 1502 | 1594 | 952 | 680 | 1594 | 772 | 847 |
| Grp Volume(v), veh/h | 67 | 821 | 22 | 59 | 860 | 61 | 11 | 0 | 48 | 138 | 0 | 86 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 1772 | 1502 | 1594 | 0 | 1632 | 1594 | 0 | 1619 |
| Q Serve(g_s), s | 1.9 | 8.6 | 0.4 | 1.7 | 9.3 | 1.2 | 0.3 | 0.0 | 1.3 | 4.0 | 0.0 | 2.2 |
| Cycle Q Clear(g_c), s | 1.9 | 8.6 | 0.4 | 1.7 | 9.3 | 1.2 | 0.3 | 0.0 | 1.3 | 4.0 | 0.0 | 2.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.42 | 1.00 | | 0.52 |
| Lane Grp Cap(c), veh/h | 99 | 1378 | 584 | 91 | 1361 | 577 | 23 | 0 | 88 | 172 | 0 | 239 |
| V/C Ratio(X) | 0.68 | 0.60 | 0.04 | 0.65 | 0.63 | 0.11 | 0.48 | 0.00 | 0.54 | 0.80 | 0.00 | 0.36 |
| Avail Cap(c_a), veh/h | 252 | 4036 | 1710 | 455 | 4489 | 1902 | 252 | 0 | 780 | 421 | 0 | 946 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 21.5 | 11.4 | 8.9 | 21.6 | 11.7 | 9.3 | 22.9 | 0.0 | 21.6 | 20.4 | 0.0 | 18.0 |
| Incr Delay (d2), s/veh | 3.0 | 0.4 | 0.0 | 2.9 | 0.5 | 0.1 | 5.8 | 0.0 | 5.2 | 3.3 | 0.0 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 2.4 | 0.1 | 0.6 | 2.6 | 0.3 | 0.1 | 0.0 | 0.6 | 1.4 | 0.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 24.5 | 11.8 | 8.9 | 24.5 | 12.2 | 9.4 | 28.8 | 0.0 | 26.8 | 23.8 | 0.0 | 18.9 |
| LnGrp LOS | C | B | A | C | B | A | C | | C | C | | B |
| Approach Vol, veh/h | | 910 | | | 980 | | | 59 | | | 224 | |
| Approach Delay, s/veh | | 12.7 | | | 12.8 | | | 27.2 | | | 21.9 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.6 | 7.1 | 7.3 | 22.8 | 5.3 | 11.5 | 7.5 | 22.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 6.0 | 3.3 | 3.7 | 10.6 | 2.3 | 4.2 | 3.9 | 11.3 |
| Green Ext Time (p_c), s | 0.1 | 0.1 | 0.0 | 6.1 | 0.0 | 0.4 | 0.0 | 6.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 14.1 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 232 | 778 | 40 | 235 | 839 | 261 | 40 | 196 | 84 | 287 | 389 | 90 |
| Future Volume (vph) | 232 | 778 | 40 | 235 | 839 | 261 | 40 | 196 | 84 | 287 | 389 | 90 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.4 | 22.5 | 22.5 | 11.4 | 21.5 | 21.5 | 5.9 | 19.0 | 19.0 | 16.6 | 34.5 | 34.5 |
| Actuated g/C Ratio | 0.14 | 0.25 | 0.25 | 0.13 | 0.24 | 0.24 | 0.07 | 0.21 | 0.21 | 0.19 | 0.39 | 0.39 |
| v/c Ratio | 1.03 | 0.66 | 0.09 | 0.66 | 0.59 | 0.49 | 0.38 | 0.54 | 0.21 | 0.95 | 0.59 | 0.15 |
| Control Delay (s/veh) | 109.4 | 33.9 | 0.4 | 48.5 | 32.1 | 7.3 | 55.8 | 35.9 | 1.9 | 79.9 | 27.1 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 109.4 | 33.9 | 0.4 | 48.5 | 32.1 | 7.3 | 55.8 | 35.9 | 1.9 | 79.9 | 27.1 | 4.6 |
| LOS | F | C | A | D | C | A | E | D | A | E | C | A |
| Approach Delay (s/veh) | | 49.3 | | | 30.1 | | | 29.5 | | | 44.2 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 88.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.03 | |
| Intersection Signal Delay (s/veh): 39.0 | Intersection LOS: D |
| Intersection Capacity Utilization 73.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 232 | 778 | 40 | 235 | 839 | 261 | 40 | 196 | 84 | 287 | 389 | 90 |
| Future Volume (veh/h) | 232 | 778 | 40 | 235 | 839 | 261 | 40 | 196 | 84 | 287 | 389 | 90 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1575 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 242 | 810 | 25 | 245 | 874 | 170 | 42 | 204 | 31 | 299 | 405 | 79 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 267 | 1365 | 422 | 320 | 1426 | 348 | 65 | 294 | 248 | 336 | 579 | 488 |
| Arrive On Green | 0.16 | 0.28 | 0.28 | 0.11 | 0.23 | 0.23 | 0.04 | 0.17 | 0.17 | 0.20 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1688 | 4837 | 1494 | 2910 | 6095 | 1489 | 1688 | 1772 | 1491 | 1688 | 1772 | 1495 |
| Grp Volume(v), veh/h | 242 | 810 | 25 | 245 | 874 | 170 | 42 | 204 | 31 | 299 | 405 | 79 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1612 | 1494 | 1455 | 1524 | 1489 | 1688 | 1772 | 1491 | 1688 | 1772 | 1495 |
| Q Serve(g_s), s | 10.7 | 11.0 | 0.9 | 6.2 | 9.7 | 7.5 | 1.9 | 8.2 | 1.3 | 13.1 | 15.1 | 2.9 |
| Cycle Q Clear(g_c), s | 10.7 | 11.0 | 0.9 | 6.2 | 9.7 | 7.5 | 1.9 | 8.2 | 1.3 | 13.1 | 15.1 | 2.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 267 | 1365 | 422 | 320 | 1426 | 348 | 65 | 294 | 248 | 336 | 579 | 488 |
| V/C Ratio(X) | 0.91 | 0.59 | 0.06 | 0.77 | 0.61 | 0.49 | 0.64 | 0.69 | 0.13 | 0.89 | 0.70 | 0.16 |
| Avail Cap(c_a), veh/h | 267 | 1856 | 573 | 491 | 2403 | 587 | 133 | 1018 | 857 | 358 | 1254 | 1058 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.4 | 23.5 | 19.9 | 32.8 | 26.0 | 25.1 | 35.9 | 29.8 | 26.9 | 29.6 | 22.3 | 18.2 |
| Incr Delay (d2), s/veh | 31.1 | 0.4 | 0.1 | 1.5 | 0.4 | 1.1 | 3.9 | 2.9 | 0.2 | 21.1 | 1.6 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.2 | 3.7 | 0.3 | 2.0 | 3.1 | 2.4 | 0.8 | 3.5 | 0.4 | 6.8 | 5.8 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 62.5 | 23.9 | 19.9 | 34.3 | 26.4 | 26.2 | 39.8 | 32.7 | 27.2 | 50.6 | 23.8 | 18.3 |
| LnGrp LOS | E | C | B | C | C | C | D | C | C | D | C | B |
| Approach Vol, veh/h | | 1077 | | | 1289 | | | 277 | | | 783 | |
| Approach Delay, s/veh | | 32.5 | | | 27.9 | | | 33.2 | | | 33.5 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.7 | 17.2 | 12.9 | 26.0 | 7.5 | 29.4 | 16.6 | 22.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 15.1 | 10.2 | 8.2 | 13.0 | 3.9 | 17.1 | 12.7 | 11.7 |
| Green Ext Time (p_c), s | 0.1 | 1.2 | 0.2 | 4.6 | 0.0 | 2.6 | 0.0 | 5.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 31.0 |
| HCM 7th LOS | C |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

03/18/2025

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 149 | 722 | 311 | 378 | 910 | 181 | 437 | 371 | 289 | 229 | 461 | 124 |
| Future Volume (vph) | 149 | 722 | 311 | 378 | 910 | 181 | 437 | 371 | 289 | 229 | 461 | 124 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.4 | 30.3 | 30.3 | 8.7 | 31.6 | 31.6 | 7.7 | 22.0 | 22.0 | 6.6 | 21.0 | 21.0 |
| Actuated g/C Ratio | 0.09 | 0.35 | 0.35 | 0.10 | 0.36 | 0.36 | 0.09 | 0.25 | 0.25 | 0.08 | 0.24 | 0.24 |
| v/c Ratio | 0.64 | 0.45 | 0.48 | 1.37 | 0.78 | 0.29 | 1.80 | 0.32 | 0.59 | 1.09 | 0.60 | 0.29 |
| Control Delay (s/veh) | 55.5 | 23.2 | 8.2 | 221.1 | 30.4 | 4.6 | 402.5 | 27.0 | 16.4 | 128.7 | 32.5 | 6.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.5 | 23.2 | 8.2 | 221.1 | 30.4 | 4.6 | 402.5 | 27.0 | 16.4 | 128.7 | 32.5 | 6.8 |
| LOS | E | C | A | F | C | A | F | C | B | F | C | A |
| Approach Delay (s/veh) | | 23.3 | | | 76.3 | | | 173.8 | | | 55.6 | |
| Approach LOS | | C | | | E | | | F | | | E | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 86.7
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.80
Intersection Signal Delay (s/veh): 82.3 — Intersection LOS: F
Intersection Capacity Utilization 75.7% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

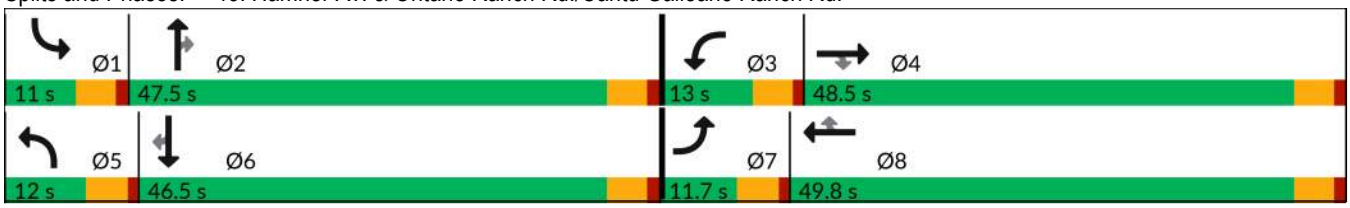

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 149 | 722 | 311 | 378 | 910 | 181 | 437 | 371 | 289 | 229 | 461 | 124 |
| Future Volume (veh/h) | 149 | 722 | 311 | 378 | 910 | 181 | 437 | 371 | 289 | 229 | 461 | 124 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 157 | 760 | 230 | 398 | 958 | 98 | 460 | 391 | 116 | 241 | 485 | 119 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 224 | 1615 | 501 | 329 | 1246 | 555 | 290 | 1061 | 322 | 251 | 693 | 305 |
| Arrive On Green | 0.08 | 0.33 | 0.33 | 0.11 | 0.37 | 0.37 | 0.10 | 0.22 | 0.22 | 0.09 | 0.21 | 0.21 |
| Sat Flow, veh/h | 2910 | 4837 | 1500 | 2910 | 3367 | 1499 | 2910 | 4837 | 1470 | 2910 | 3367 | 1480 |
| Grp Volume(v), veh/h | 157 | 760 | 230 | 398 | 958 | 98 | 460 | 391 | 116 | 241 | 485 | 119 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1500 | 1455 | 1683 | 1499 | 1455 | 1612 | 1470 | 1455 | 1683 | 1480 |
| Q Serve(g_s), s | 3.9 | 9.2 | 9.0 | 8.4 | 18.6 | 3.3 | 7.4 | 5.1 | 5.0 | 6.1 | 9.9 | 5.2 |
| Cycle Q Clear(g_c), s | 3.9 | 9.2 | 9.0 | 8.4 | 18.6 | 3.3 | 7.4 | 5.1 | 5.0 | 6.1 | 9.9 | 5.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 224 | 1615 | 501 | 329 | 1246 | 555 | 290 | 1061 | 322 | 251 | 693 | 305 |
| V/C Ratio(X) | 0.70 | 0.47 | 0.46 | 1.21 | 0.77 | 0.18 | 1.59 | 0.37 | 0.36 | 0.96 | 0.70 | 0.39 |
| Avail Cap(c_a), veh/h | 278 | 2858 | 886 | 329 | 2048 | 912 | 290 | 2793 | 849 | 251 | 1898 | 835 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.5 | 19.6 | 19.5 | 33.0 | 20.6 | 15.8 | 33.5 | 24.6 | 24.6 | 33.8 | 27.4 | 25.5 |
| Incr Delay (d2), s/veh | 3.7 | 0.2 | 0.7 | 119.4 | 1.0 | 0.2 | 280.2 | 0.2 | 0.7 | 45.8 | 1.3 | 0.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 3.0 | 2.7 | 8.1 | 6.2 | 1.0 | 13.7 | 1.8 | 1.6 | 3.6 | 3.7 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 37.2 | 19.8 | 20.1 | 152.4 | 21.6 | 15.9 | 313.6 | 24.9 | 25.3 | 79.6 | 28.7 | 26.3 |
| LnGrp LOS | D | B | C | F | C | B | F | C | C | E | C | C |
| Approach Vol, veh/h | | 1147 | | | 1454 | | | 967 | | | 845 | |
| Approach Delay, s/veh | | 22.2 | | | 57.0 | | | 162.3 | | | 42.9 | |
| Approach LOS | | C | | | E | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 20.9 | 13.0 | 29.4 | 12.0 | 19.9 | 10.3 | 32.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 8.1 | 7.1 | 10.4 | 11.2 | 9.4 | 11.9 | 5.9 | 20.6 |
| Green Ext Time (p_c), s | 0.0 | 2.8 | 0.0 | 5.9 | 0.0 | 3.4 | 0.0 | 6.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 68.3 |
| HCM 7th LOS | E |

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1157 | 756 | 156 | 257 | 0 | 1337 |
| Future Volume (vph) | 1157 | 756 | 156 | 257 | 0 | 1337 |
| Turn Type | NA | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | 6 | | | 4 | |
| Permitted Phases | | | Free | 4 | | 4 |
| Detector Phase | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 42.7 | 42.7 | 120.0 | 66.2 | 66.2 | 66.2 |
| Actuated g/C Ratio | 0.36 | 0.36 | 1.00 | 0.55 | 0.55 | 0.55 |
| v/c Ratio | 0.68 | 0.67 | 0.07 | 0.29 | 0.89 | 0.90 |
| Control Delay (s/veh) | 35.7 | 52.0 | 0.0 | 15.0 | 36.6 | 37.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.7 | 52.0 | 0.0 | 15.0 | 36.6 | 37.4 |
| LOS | D | D | A | B | D | D |
| Approach Delay (s/veh) | 35.7 | 43.1 | | | 33.8 | |
| Approach LOS | D | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 8.1 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.90 | |
| Intersection Signal Delay (s/veh): 36.7 | Intersection LOS: D |
| Intersection Capacity Utilization 89.6% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

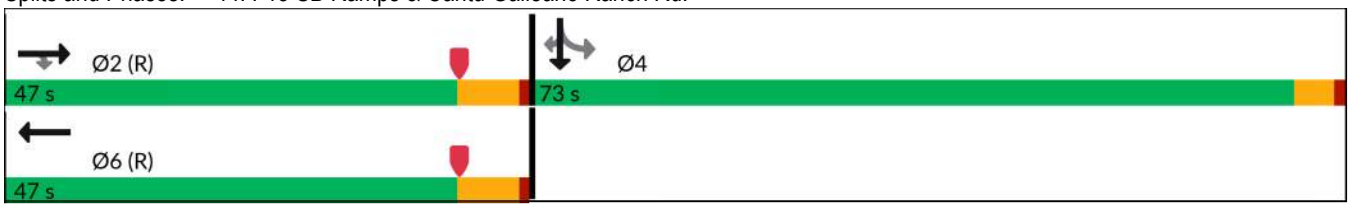

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1157 | 0 | 0 | 756 | 156 | 0 | 0 | 0 | 257 | 0 | 1337 |
| Future Volume (veh/h) | 0 | 1157 | 0 | 0 | 756 | 156 | 0 | 0 | 0 | 257 | 0 | 1337 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 0 | 1772 | 1772 | | | | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 1286 | 0 | 0 | 840 | 0 | | | | 191 | 0 | 1369 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2195 | | 0 | 1463 | | | | | 788 | 0 | 1485 |
| Arrive On Green | 0.00 | 0.41 | 0.00 | 0.00 | 0.83 | 0.00 | | | | 0.49 | 0.00 | 0.49 |
| Sat Flow, veh/h | 0 | 5316 | 1502 | 0 | 3544 | 2643 | | | | 1594 | 0 | 3003 |
| Grp Volume(v), veh/h | 0 | 1286 | 0 | 0 | 840 | 0 | | | | 191 | 0 | 1369 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 1502 | 0 | 1772 | 1321 | | | | 1594 | 0 | 1502 |
| Q Serve(g_s), s | 0.0 | 22.5 | 0.0 | 0.0 | 9.4 | 0.0 | | | | 8.3 | 0.0 | 50.8 |
| Cycle Q Clear(g_c), s | 0.0 | 22.5 | 0.0 | 0.0 | 9.4 | 0.0 | | | | 8.3 | 0.0 | 50.8 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2195 | | 0 | 1463 | | | | | 788 | 0 | 1485 |
| V/C Ratio(X) | 0.00 | 0.59 | | 0.00 | 0.57 | | | | | 0.24 | 0.00 | 0.92 |
| Avail Cap(c_a), veh/h | 0 | 2195 | | 0 | 1463 | | | | | 908 | 0 | 1712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.77 | 0.00 | 0.00 | 0.85 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 27.3 | 0.0 | 0.0 | 7.0 | 0.0 | | | | 17.4 | 0.0 | 28.2 |
| Incr Delay (d2), s/veh | 0.0 | 0.9 | 0.0 | 0.0 | 1.4 | 0.0 | | | | 0.2 | 0.0 | 8.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 9.0 | 0.0 | 0.0 | 2.4 | 0.0 | | | | 2.9 | 0.0 | 18.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 28.2 | 0.0 | 0.0 | 8.3 | 0.0 | | | | 17.6 | 0.0 | 36.2 |
| LnGrp LOS | | C | | | A | | | | | B | | D |
| Approach Vol, veh/h | | 1286 | | | 840 | | | | | | 1560 | |
| Approach Delay, s/veh | | 28.2 | | | 8.3 | | | | | | 33.9 | |
| Approach LOS | | C | | | A | | | | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 56.1 | 63.9 | 56.1 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 24.5 | 52.8 | 11.4 |
| Green Ext Time (p_c), s | 7.2 | 6.5 | 5.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 26.1 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 584 | 802 | 160 | 438 | 558 | 128 |
| Future Volume (vph) | 584 | 802 | 160 | 438 | 558 | 128 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 62.0 | 62.0 | 11.0 | 73.0 | 47.0 | 47.0 |
| Total Split (%) | 51.7% | 51.7% | 9.2% | 60.8% | 39.2% | 39.2% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 60.4 | 60.4 | 14.5 | 79.5 | 29.4 | 29.4 |
| Actuated g/C Ratio | 0.50 | 0.50 | 0.12 | 0.66 | 0.25 | 0.25 |
| v/c Ratio | 0.24 | 0.74 | 0.48 | 0.14 | 0.80 | 0.27 |
| Control Delay (s/veh) | 25.8 | 27.6 | 54.3 | 8.1 | 50.4 | 7.0 |
| Queue Delay | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.8 | 28.5 | 54.3 | 8.1 | 50.4 | 7.0 |
| LOS | C | C | D | A | D | A |
| Approach Delay (s/veh) | 27.4 | | | 20.5 | 43.1 | |
| Approach LOS | C | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 15.4 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 29.9 | Intersection LOS: C |
| Intersection Capacity Utilization 67.1% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

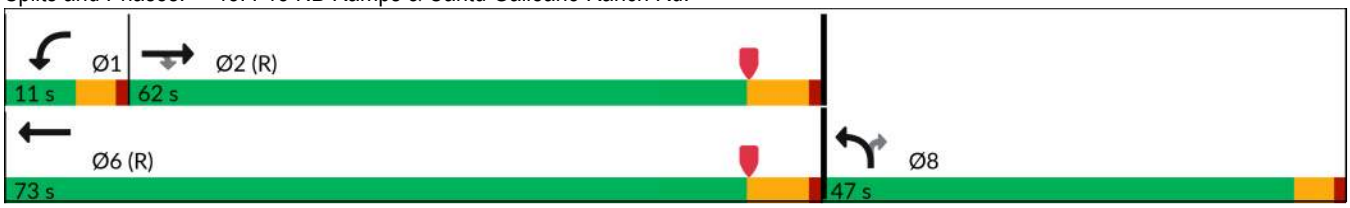

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 584 | 802 | 160 | 438 | 558 | 128 |
| Future Volume (veh/h) | 584 | 802 | 160 | 438 | 558 | 128 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 0.98 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1575 | 1772 | 1673 | 1772 |
| Adj Flow Rate, veh/h | 635 | 631 | 174 | 476 | 607 | 79 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3169 | 877 | 160 | 3657 | 700 | 330 |
| Arrive On Green | 1.00 | 1.00 | 0.05 | 0.69 | 0.22 | 0.22 |
| Sat Flow, veh/h | 5316 | 1471 | 3000 | 5316 | 3188 | 1502 |
| Grp Volume(v), veh/h | 635 | 631 | 174 | 476 | 607 | 79 |
| Grp Sat Flow(s),veh/h/ln | 1772 | 1471 | 1500 | 1772 | 1594 | 1502 |
| Q Serve(g_s), s | 0.1 | 0.8 | 6.4 | 3.7 | 22.0 | 5.2 |
| Cycle Q Clear(g_c), s | 0.1 | 0.8 | 6.4 | 3.7 | 22.0 | 5.2 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3169 | 877 | 160 | 3657 | 700 | 330 |
| V/C Ratio(X) | 0.20 | 0.72 | 1.09 | 0.13 | 0.87 | 0.24 |
| Avail Cap(c_a), veh/h | 3169 | 877 | 160 | 3657 | 1126 | 531 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.75 | 0.75 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.1 | 0.1 | 56.8 | 6.4 | 45.1 | 38.6 |
| Incr Delay (d2), s/veh | 0.1 | 3.8 | 96.4 | 0.1 | 4.3 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 1.0 | 4.5 | 1.1 | 8.8 | 1.9 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.2 | 3.9 | 153.2 | 6.5 | 49.5 | 38.9 |
| LnGrp LOS | A | A | F | A | D | D |
| Approach Vol, veh/h | 1266 | | | 650 | 686 | |
| Approach Delay, s/veh | 2.1 | | | 45.8 | 48.3 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 78.0 | | | | 89.0 | 31.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 55.5 | | | | 66.5 | 42.4 |
| Max Q Clear Time (g_c+I1), s | 8.4 | 2.8 | | | | 5.7 | 24.0 |
| Green Ext Time (p_c), s | 0.0 | 7.5 | | | | 3.0 | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.2 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

# APPENDIX 6.2:

# OPENING YEAR CUMULATIVE (2034) WITH PROJECT INTERSECTION ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 322 | 1 | 460 | 374 | 914 | 975 | 475 |
| Future Volume (vph) | 322 | 1 | 460 | 374 | 914 | 975 | 475 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 27.0 | 61.0 | 34.0 | 34.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 30.0% | 67.8% | 37.8% | 37.8% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 21.1 | 21.1 | 21.1 | 22.7 | 55.9 | 28.0 | 28.0 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.25 | 0.62 | 0.31 | 0.31 |
| v/c Ratio | 0.84 | 0.65 | 0.64 | 1.00 | 0.47 | 1.00 | 0.63 |
| Control Delay (s/veh) | 54.4 | 24.1 | 23.2 | 73.1 | 12.1 | 61.3 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.4 | 24.1 | 23.2 | 73.1 | 12.2 | 61.3 | 6.3 |
| LOS | D | C | C | E | B | E | A |
| Approach Delay (s/veh) | | 34.4 | | | 29.9 | 43.3 | |
| Approach LOS | | C | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 58.8 (65%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.01 | |
| Intersection Signal Delay (s/veh): 36.4 | Intersection LOS: D |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

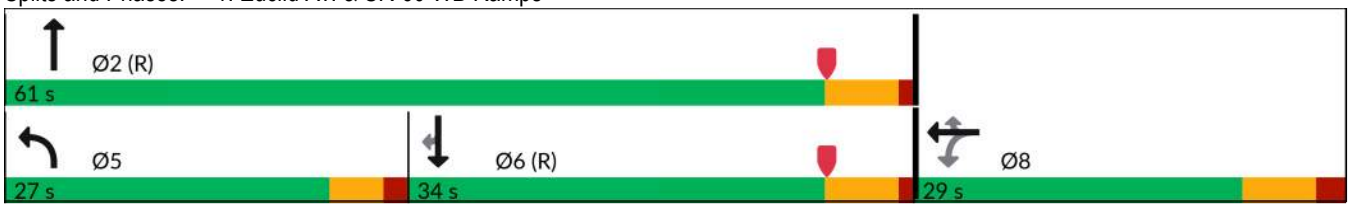

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 322 | 1 | 460 | 374 | 914 | 0 | 0 | 975 | 475 |
| Future Volume (veh/h) | 0 | 0 | 0 | 322 | 1 | 460 | 374 | 914 | 0 | 0 | 975 | 475 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 440 | 0 | 200 | 402 | 983 | 0 | 0 | 1048 | 283 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 572 | 0 | 269 | 386 | 2276 | 0 | 0 | 1266 | 552 |
| Arrive On Green | | | | 0.18 | 0.00 | 0.18 | 0.48 | 1.00 | 0.00 | 0.00 | 0.38 | 0.38 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1497 | 1594 | 3455 | 0 | 0 | 3455 | 1469 |
| Grp Volume(v), veh/h | | | | 440 | 0 | 200 | 402 | 983 | 0 | 0 | 1048 | 283 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1497 | 1594 | 1683 | 0 | 0 | 1683 | 1469 |
| Q Serve(g_s), s | | | | 11.8 | 0.0 | 11.4 | 21.8 | 0.0 | 0.0 | 0.0 | 25.4 | 13.4 |
| Cycle Q Clear(g_c), s | | | | 11.8 | 0.0 | 11.4 | 21.8 | 0.0 | 0.0 | 0.0 | 25.4 | 13.4 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 572 | 0 | 269 | 386 | 2276 | 0 | 0 | 1266 | 552 |
| V/C Ratio(X) | | | | 0.77 | 0.00 | 0.74 | 1.04 | 0.43 | 0.00 | 0.00 | 0.83 | 0.51 |
| Avail Cap(c_a), veh/h | | | | 779 | 0 | 366 | 386 | 2276 | 0 | 0 | 1266 | 552 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.14 | 0.14 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.2 | 0.0 | 35.0 | 23.2 | 0.0 | 0.0 | 0.0 | 25.4 | 21.7 |
| Incr Delay (d2), s/veh | | | | 4.0 | 0.0 | 6.9 | 29.1 | 0.1 | 0.0 | 0.0 | 6.3 | 3.4 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.8 | 0.0 | 4.6 | 8.0 | 0.0 | 0.0 | 0.0 | 10.3 | 4.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.2 | 0.0 | 41.8 | 52.3 | 0.1 | 0.0 | 0.0 | 31.7 | 25.1 |
| LnGrp LOS | | | | D | | D | F | A | | | C | C |
| Approach Vol, veh/h | | | | | 640 | | | 1385 | | | 1331 | |
| Approach Delay, s/veh | | | | | 40.0 | | | 15.2 | | | 30.3 | |
| Approach LOS | | | | | D | | | B | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.8 | | 27.0 | 39.8 | | 23.2 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 21.8 | 28.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 23.8 | 27.4 | | 13.8 |
| Green Ext Time (p_c), s | 12.1 | | 0.0 | 0.5 | | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.9 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 360 | 1 | 285 | 914 | 405 | 375 | 905 |
| Future Volume (vph) | 360 | 1 | 285 | 914 | 405 | 375 | 905 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 27.7 | 27.7 | 27.7 | 26.0 | 26.0 | 14.7 | 24.0 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 30.0 | 60.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 66.7% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | | 7.0 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 22.7 | 0.0 | 22.7 | 25.3 | 25.3 | 24.3 | 54.3 |
| Actuated g/C Ratio | 0.25 | 0.00 | 0.25 | 0.28 | 0.28 | 0.27 | 0.60 |
| v/c Ratio | 0.93 | no cap | 0.61 | 1.00 | 0.59 | 0.91 | 0.46 |
| Control Delay (s/veh) | 65.1 | | 21.4 | 63.7 | 6.7 | 58.3 | 11.2 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 65.1 | Error | 21.4 | 63.7 | 6.7 | 58.3 | 11.2 |
| LOS | E | F | C | E | A | E | B |
| Approach Delay (s/veh) | | Error | | 46.2 | | | 25.0 |
| Approach LOS | | F | | D | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 58.6 (65%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

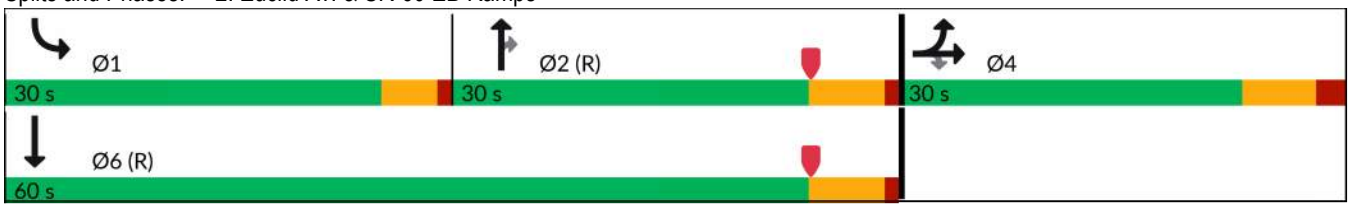

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 360 | 1 | 285 | 0 | 0 | 0 | 0 | 914 | 405 | 375 | 905 | 0 |
| Future Volume (veh/h) | 360 | 1 | 285 | 0 | 0 | 0 | 0 | 914 | 405 | 375 | 905 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 371 | 1 | 236 | | | | 0 | 942 | 315 | 387 | 933 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 401 | 0 | 378 | | | | 0 | 995 | 442 | 408 | 2033 | 0 |
| Arrive On Green | 0.25 | 0.25 | 0.25 | | | | 0.00 | 0.30 | 0.30 | 0.51 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 1502 | | | | 0 | 3455 | 1497 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 371 | 0 | 236 | | | | 0 | 942 | 315 | 387 | 933 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1683 | 1497 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 20.4 | 0.0 | 12.6 | | | | 0.0 | 24.6 | 16.9 | 20.7 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 20.4 | 0.0 | 12.6 | | | | 0.0 | 24.6 | 16.9 | 20.7 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 401 | 0 | 378 | | | | 0 | 995 | 442 | 408 | 2033 | 0 |
| V/C Ratio(X) | 0.93 | 0.00 | 0.62 | | | | 0.00 | 0.95 | 0.71 | 0.95 | 0.46 | 0.00 |
| Avail Cap(c_a), veh/h | 407 | 0 | 384 | | | | 0 | 995 | 442 | 448 | 2033 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.80 | 0.80 | 0.17 | 0.17 | 0.00 |
| Uniform Delay (d), s/veh | 32.8 | 0.0 | 29.9 | | | | 0.0 | 31.0 | 28.3 | 21.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 27.0 | 0.0 | 3.6 | | | | 0.0 | 15.6 | 7.6 | 8.0 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.7 | 0.0 | 4.8 | | | | 0.0 | 11.4 | 6.5 | 5.4 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 59.8 | 0.0 | 33.5 | | | | 0.0 | 46.6 | 35.9 | 29.4 | 0.1 | 0.0 |
| LnGrp LOS | E | | C | | | | | D | D | C | A | |
| Approach Vol, veh/h | | 607 | | | | | | 1257 | | | 1320 | |
| Approach Delay, s/veh | | 49.6 | | | | | | 43.9 | | | 8.7 | |
| Approach LOS | | D | | | | | | D | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 27.8 | 32.6 | | 29.6 | | 60.4 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 7.0 | | 6.0 |
| Max Green Setting (Gmax), s | 25.3 | 24.0 | | 23.0 | | 54.0 |
| Max Q Clear Time (g_c+I1), s | 22.7 | 26.6 | | 22.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.3 | 0.0 | | 0.2 | | 11.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.4 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 109 | 303 | 54 | 380 | 130 | 997 | 134 | 987 |
| Future Volume (vph) | 109 | 303 | 54 | 380 | 130 | 997 | 134 | 987 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 43.0 | 43.0 | 43.0 | 43.0 | 41.4 | 41.4 | 35.6 | 77.0 |
| Total Split (%) | 35.8% | 35.8% | 35.8% | 35.8% | 34.5% | 34.5% | 29.7% | 64.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 26.4 | 26.4 | 26.4 | 26.4 | 36.2 | 36.2 | 8.8 | 49.7 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.30 | 0.30 | 0.41 | 0.41 | 0.10 | 0.57 |
| v/c Ratio | 0.72 | 0.49 | 0.29 | 0.59 | 0.80 | 0.55 | 0.49 | 0.40 |
| Control Delay (s/veh) | 53.4 | 21.4 | 27.2 | 24.9 | 63.2 | 22.7 | 45.4 | 12.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.4 | 21.4 | 27.2 | 24.9 | 63.2 | 22.7 | 45.4 | 12.4 |
| LOS | D | C | C | C | E | C | D | B |
| Approach Delay (s/veh) | | 27.4 | | 25.1 | | 27.3 | | 16.2 |
| Approach LOS | | C | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.9 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.80 | |
| Intersection Signal Delay (s/veh): 23.2 | Intersection LOS: C |
| Intersection Capacity Utilization 74.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

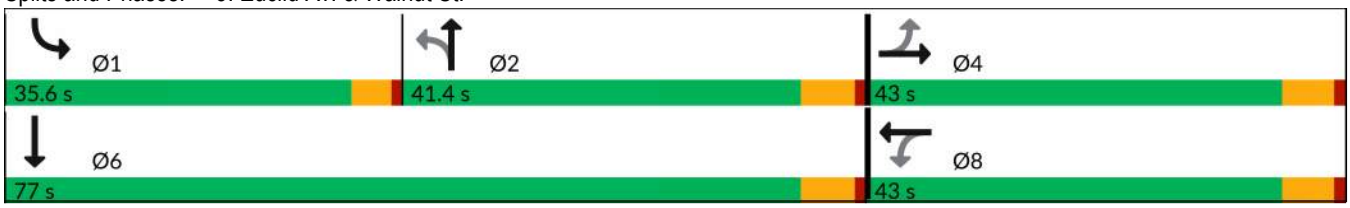

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 109 | 303 | 168 | 54 | 380 | 178 | 130 | 997 | 30 | 134 | 987 | 51 |
| Future Volume (veh/h) | 109 | 303 | 168 | 54 | 380 | 178 | 130 | 997 | 30 | 134 | 987 | 51 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 115 | 319 | 164 | 57 | 400 | 144 | 137 | 1049 | 23 | 141 | 1039 | 32 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 263 | 725 | 364 | 286 | 811 | 288 | 283 | 1798 | 39 | 213 | 2438 | 75 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.37 | 0.37 | 0.37 | 0.07 | 0.51 | 0.51 |
| Sat Flow, veh/h | 814 | 2165 | 1088 | 860 | 2423 | 861 | 498 | 4869 | 107 | 2910 | 4822 | 148 |
| Grp Volume(v), veh/h | 115 | 246 | 237 | 57 | 276 | 268 | 137 | 695 | 377 | 141 | 695 | 376 |
| Grp Sat Flow(s),veh/h/ln | 814 | 1683 | 1570 | 860 | 1683 | 1600 | 498 | 1612 | 1751 | 1455 | 1612 | 1745 |
| Q Serve(g_s), s | 9.6 | 8.3 | 8.6 | 4.0 | 9.5 | 9.7 | 17.4 | 12.6 | 12.6 | 3.4 | 9.9 | 9.9 |
| Cycle Q Clear(g_c), s | 19.3 | 8.3 | 8.6 | 12.6 | 9.5 | 9.7 | 17.4 | 12.6 | 12.6 | 3.4 | 9.9 | 9.9 |
| Prop In Lane | 1.00 | | 0.69 | 1.00 | | 0.54 | 1.00 | | 0.06 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 263 | 564 | 526 | 286 | 564 | 536 | 283 | 1191 | 646 | 213 | 1631 | 882 |
| V/C Ratio(X) | 0.44 | 0.44 | 0.45 | 0.20 | 0.49 | 0.50 | 0.48 | 0.58 | 0.58 | 0.66 | 0.43 | 0.43 |
| Avail Cap(c_a), veh/h | 407 | 861 | 803 | 438 | 861 | 819 | 343 | 1579 | 857 | 1241 | 3158 | 1709 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.0 | 18.8 | 18.9 | 23.9 | 19.2 | 19.3 | 20.0 | 18.4 | 18.4 | 32.8 | 11.3 | 11.3 |
| Incr Delay (d2), s/veh | 1.1 | 0.5 | 0.6 | 0.3 | 0.7 | 0.7 | 1.3 | 0.5 | 0.8 | 1.3 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 2.9 | 2.8 | 0.8 | 3.4 | 3.3 | 1.8 | 4.1 | 4.6 | 1.2 | 2.9 | 3.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.2 | 19.4 | 19.5 | 24.2 | 19.9 | 20.0 | 21.3 | 18.9 | 19.3 | 34.1 | 11.5 | 11.7 |
| LnGrp LOS | C | B | B | C | B | C | C | B | B | C | B | B |
| Approach Vol, veh/h | | 598 | | | 601 | | | 1209 | | | 1212 | |
| Approach Delay, s/veh | | 21.1 | | | 20.4 | | | 19.3 | | | 14.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 32.6 | | 30.1 | | 42.6 | | 30.1 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.0 | 35.6 | | 37.2 | | 71.2 | | 37.2 |
| Max Q Clear Time (g_c+I1), s | 5.4 | 19.4 | | 21.3 | | 11.9 | | 14.6 |
| Green Ext Time (p_c), s | 0.2 | 7.4 | | 3.1 | | 8.0 | | 3.4 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 18.1 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 142 | 520 | 182 | 630 | 82 | 860 | 172 | 127 | 894 | 149 |
| Future Volume (vph) | 142 | 520 | 182 | 630 | 82 | 860 | 172 | 127 | 894 | 149 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 21.0 | 43.0 | 23.0 | 45.0 | 15.2 | 35.0 | 35.0 | 19.0 | 38.8 | 38.8 |
| Total Split (%) | 17.5% | 35.8% | 19.2% | 37.5% | 12.7% | 29.2% | 29.2% | 15.8% | 32.3% | 32.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.9 | 36.0 | 16.9 | 38.0 | 10.0 | 29.8 | 29.8 | 13.0 | 32.8 | 32.8 |
| Actuated g/C Ratio | 0.13 | 0.30 | 0.14 | 0.32 | 0.08 | 0.25 | 0.25 | 0.11 | 0.28 | 0.28 |
| v/c Ratio | 0.77 | 1.23 | 0.87 | 0.72 | 0.66 | 1.10 | 0.39 | 0.79 | 1.04 | 0.31 |
| Control Delay (s/veh) | 75.5 | 155.5 | 84.3 | 39.7 | 77.1 | 103.3 | 16.0 | 82.1 | 81.8 | 8.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 75.5 | 155.5 | 84.3 | 39.7 | 77.1 | 103.3 | 16.0 | 82.1 | 81.8 | 8.9 |
| LOS | E | F | F | D | E | F | B | F | F | A |
| Approach Delay (s/veh) | | 140.3 | | 48.8 | | 87.9 | | | 72.6 | |
| Approach LOS | | F | | D | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.23 | |
| Intersection Signal Delay (s/veh): 84.4 | Intersection LOS: F |
| Intersection Capacity Utilization 99.2% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

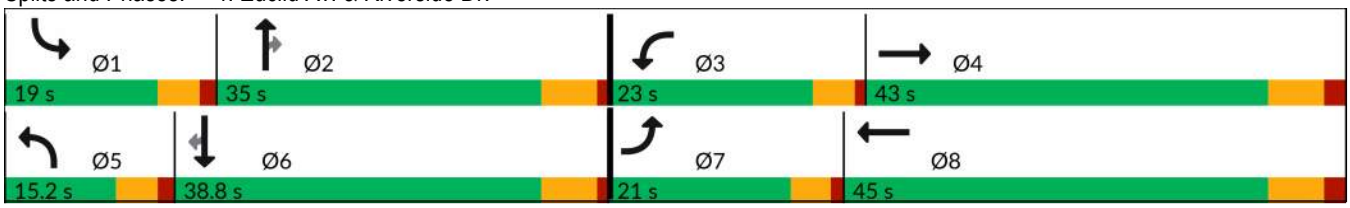

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 142 | 520 | 86 | 182 | 630 | 78 | 82 | 860 | 172 | 127 | 894 | 149 |
| Future Volume (veh/h) | 142 | 520 | 86 | 182 | 630 | 78 | 82 | 860 | 172 | 127 | 894 | 149 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 153 | 559 | 65 | 196 | 677 | 60 | 88 | 925 | 117 | 137 | 961 | 99 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 177 | 478 | 56 | 220 | 1043 | 92 | 128 | 872 | 389 | 161 | 941 | 414 |
| Arrive On Green | 0.11 | 0.31 | 0.31 | 0.14 | 0.33 | 0.33 | 0.08 | 0.26 | 0.26 | 0.10 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1594 | 1558 | 181 | 1594 | 3124 | 277 | 1594 | 3367 | 1502 | 1594 | 3367 | 1482 |
| Grp Volume(v), veh/h | 153 | 0 | 624 | 196 | 365 | 372 | 88 | 925 | 117 | 137 | 961 | 99 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1739 | 1594 | 1683 | 1717 | 1594 | 1683 | 1502 | 1594 | 1683 | 1482 |
| Q Serve(g_s), s | 11.1 | 0.0 | 36.0 | 14.2 | 21.6 | 21.7 | 6.3 | 30.4 | 7.3 | 9.9 | 32.8 | 6.1 |
| Cycle Q Clear(g_c), s | 11.1 | 0.0 | 36.0 | 14.2 | 21.6 | 21.7 | 6.3 | 30.4 | 7.3 | 9.9 | 32.8 | 6.1 |
| Prop In Lane | 1.00 | | 0.10 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 177 | 0 | 534 | 220 | 562 | 573 | 128 | 872 | 389 | 161 | 941 | 414 |
| V/C Ratio(X) | 0.86 | 0.00 | 1.17 | 0.89 | 0.65 | 0.65 | 0.69 | 1.06 | 0.30 | 0.85 | 1.02 | 0.24 |
| Avail Cap(c_a), veh/h | 221 | 0 | 534 | 249 | 562 | 573 | 136 | 872 | 389 | 187 | 941 | 414 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.3 | 0.0 | 40.7 | 49.7 | 33.2 | 33.3 | 52.5 | 43.5 | 34.9 | 51.9 | 42.3 | 32.6 |
| Incr Delay (d2), s/veh | 20.8 | 0.0 | 94.9 | 26.4 | 3.0 | 3.0 | 12.7 | 47.9 | 0.4 | 26.6 | 34.8 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.3 | 0.0 | 28.7 | 7.1 | 8.9 | 9.1 | 2.9 | 17.6 | 2.7 | 5.0 | 17.6 | 2.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 72.0 | 0.0 | 135.6 | 76.1 | 36.2 | 36.2 | 65.2 | 91.4 | 35.4 | 78.5 | 77.1 | 32.9 |
| LnGrp LOS | E | | F | E | D | D | E | F | D | E | F | C |
| Approach Vol, veh/h | | 777 | | | 933 | | | 1130 | | | 1197 | |
| Approach Delay, s/veh | | 123.1 | | | 44.6 | | | 83.5 | | | 73.6 | |
| Approach LOS | | F | | | D | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 36.4 | 20.9 | 43.0 | 14.6 | 38.8 | 17.7 | 46.2 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 13.8 | 29.0 | 18.3 | 36.0 | 10.0 | 32.8 | 16.3 | 38.0 |
| Max Q Clear Time (g_c+I1), s | 11.9 | 32.4 | 16.2 | 38.0 | 8.3 | 34.8 | 13.1 | 23.7 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.1 | 4.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 79.2 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 80 | 259 | 55 | 93 | 287 | 75 | 1079 | 184 | 47 | 1047 | 73 |
| Future Volume (vph) | 80 | 259 | 55 | 93 | 287 | 75 | 1079 | 184 | 47 | 1047 | 73 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 56.0 | 56.0 | 56.0 | 56.0 | 56.0 | 49.0 | 49.0 | 49.0 | 15.0 | 64.0 | 64.0 |
| Total Split (%) | 46.7% | 46.7% | 46.7% | 46.7% | 46.7% | 40.8% | 40.8% | 40.8% | 12.5% | 53.3% | 53.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 41.8 | 41.8 | 41.8 | | 41.8 | 43.2 | 43.2 | 43.2 | 10.3 | 54.2 | 54.2 |
| Actuated g/C Ratio | 0.38 | 0.38 | 0.38 | | 0.38 | 0.40 | 0.40 | 0.40 | 0.09 | 0.50 | 0.50 |
| v/c Ratio | 0.35 | 0.42 | 0.10 | | 0.95 | 0.65 | 0.90 | 0.32 | 0.35 | 0.70 | 0.11 |
| Control Delay (s/veh) | 28.6 | 26.8 | 3.9 | | 62.0 | 60.0 | 43.8 | 19.3 | 57.9 | 24.7 | 6.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 28.6 | 26.8 | 3.9 | | 62.0 | 60.0 | 43.8 | 19.3 | 57.9 | 24.7 | 6.1 |
| LOS | C | C | A | | E | E | D | B | E | C | A |
| Approach Delay (s/veh) | | 24.0 | | | 62.0 | | 41.4 | | | 24.9 | |
| Approach LOS | | C | | | E | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 108.6 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 36.1 | Intersection LOS: D |
| Intersection Capacity Utilization 97.7% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 80 | 259 | 55 | 93 | 287 | 40 | 75 | 1079 | 184 | 47 | 1047 | 73 |
| Future Volume (veh/h) | 80 | 259 | 55 | 93 | 287 | 40 | 75 | 1079 | 184 | 47 | 1047 | 73 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 89 | 288 | 49 | 103 | 319 | 44 | 83 | 1199 | 170 | 52 | 1163 | 51 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 241 | 697 | 591 | 132 | 363 | 47 | 164 | 1280 | 571 | 115 | 1665 | 725 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.38 | 0.38 | 0.38 | 0.07 | 0.49 | 0.49 |
| Sat Flow, veh/h | 962 | 1772 | 1502 | 234 | 922 | 121 | 434 | 3367 | 1502 | 1594 | 3367 | 1466 |
| Grp Volume(v), veh/h | 89 | 288 | 49 | 466 | 0 | 0 | 83 | 1199 | 170 | 52 | 1163 | 51 |
| Grp Sat Flow(s),veh/h/ln | 962 | 1772 | 1502 | 1277 | 0 | 0 | 434 | 1683 | 1502 | 1594 | 1683 | 1466 |
| Q Serve(g_s), s | 0.0 | 12.9 | 2.2 | 26.5 | 0.0 | 0.0 | 20.0 | 37.7 | 8.7 | 3.4 | 29.3 | 2.0 |
| Cycle Q Clear(g_c), s | 19.3 | 12.9 | 2.2 | 39.4 | 0.0 | 0.0 | 36.8 | 37.7 | 8.7 | 3.4 | 29.3 | 2.0 |
| Prop In Lane | 1.00 | | 1.00 | 0.22 | | 0.09 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 241 | 697 | 591 | 543 | 0 | 0 | 164 | 1280 | 571 | 115 | 1665 | 725 |
| V/C Ratio(X) | 0.37 | 0.41 | 0.08 | 0.86 | 0.00 | 0.00 | 0.50 | 0.94 | 0.30 | 0.45 | 0.70 | 0.07 |
| Avail Cap(c_a), veh/h | 302 | 810 | 686 | 639 | 0 | 0 | 167 | 1302 | 581 | 151 | 1762 | 767 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.1 | 24.1 | 20.9 | 34.1 | 0.0 | 0.0 | 40.5 | 32.8 | 23.8 | 48.9 | 21.5 | 14.5 |
| Incr Delay (d2), s/veh | 0.9 | 0.4 | 0.1 | 10.0 | 0.0 | 0.0 | 2.4 | 12.6 | 0.3 | 1.0 | 1.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 5.3 | 0.8 | 12.8 | 0.0 | 0.0 | 2.1 | 16.1 | 2.9 | 1.3 | 10.4 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.0 | 24.5 | 20.9 | 44.1 | 0.0 | 0.0 | 42.9 | 45.4 | 24.1 | 49.9 | 22.6 | 14.6 |
| LnGrp LOS | C | C | C | D | | | D | D | C | D | C | B |
| Approach Vol, veh/h | | 426 | | | 466 | | | 1452 | | | 1266 | |
| Approach Delay, s/veh | | 24.6 | | | 44.1 | | | 42.8 | | | 23.4 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.6 | 48.3 | | 49.0 | | 60.8 | | 49.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 42.5 | | 50.2 | | 57.5 | | 50.2 |
| Max Q Clear Time (g_c+I1), s | 5.4 | 39.7 | | 21.3 | | 31.3 | | 41.4 |
| Green Ext Time (p_c), s | 0.0 | 2.1 | | 2.2 | | 8.4 | | 1.9 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 34.0 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 175 | 106 | 137 | 51 | 151 | 136 | 1077 | 31 | 55 | 1078 | 83 |
| Future Volume (vph) | 175 | 106 | 137 | 51 | 151 | 136 | 1077 | 31 | 55 | 1078 | 83 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 17.0 | 49.3 | 49.3 | 14.7 | 47.0 | 15.0 | 41.3 | 41.3 | 14.7 | 41.0 | 41.0 |
| Total Split (%) | 14.2% | 41.1% | 41.1% | 12.3% | 39.2% | 12.5% | 34.4% | 34.4% | 12.3% | 34.2% | 34.2% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.4 | 26.0 | 26.0 | 10.1 | 20.4 | 10.4 | 38.4 | 38.4 | 10.1 | 34.8 | 34.8 |
| Actuated g/C Ratio | 0.12 | 0.26 | 0.26 | 0.10 | 0.20 | 0.10 | 0.38 | 0.38 | 0.10 | 0.34 | 0.34 |
| v/c Ratio | 0.99 | 0.26 | 0.30 | 0.36 | 0.70 | 0.92 | 0.93 | 0.05 | 0.38 | 1.03 | 0.16 |
| Control Delay (s/veh) | 109.3 | 32.1 | 6.3 | 52.7 | 44.2 | 99.8 | 46.4 | 0.2 | 53.5 | 67.7 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 109.3 | 32.1 | 6.3 | 52.7 | 44.2 | 99.8 | 46.4 | 0.2 | 53.5 | 67.7 | 3.1 |
| LOS | F | C | A | D | D | F | D | A | D | E | A |
| Approach Delay (s/veh) | | 55.9 | | | 45.8 | | 51.0 | | | 62.6 | |
| Approach LOS | | E | | | D | | D | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 101.1 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.03 | |
| Intersection Signal Delay (s/veh): 55.7 | Intersection LOS: E |
| Intersection Capacity Utilization 83.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

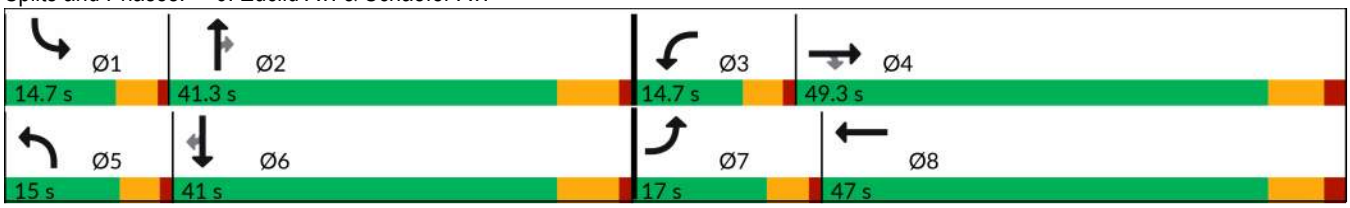

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 175 | 106 | 137 | 51 | 151 | 75 | 136 | 1077 | 31 | 55 | 1078 | 83 |
| Future Volume (veh/h) | 175 | 106 | 137 | 51 | 151 | 75 | 136 | 1077 | 31 | 55 | 1078 | 83 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 192 | 116 | 107 | 56 | 166 | 71 | 149 | 1184 | 27 | 60 | 1185 | 44 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 204 | 381 | 323 | 129 | 197 | 84 | 171 | 1289 | 575 | 132 | 1208 | 527 |
| Arrive On Green | 0.13 | 0.22 | 0.22 | 0.08 | 0.17 | 0.17 | 0.11 | 0.38 | 0.38 | 0.08 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1172 | 501 | 1594 | 3367 | 1502 | 1594 | 3367 | 1468 |
| Grp Volume(v), veh/h | 192 | 116 | 107 | 56 | 0 | 237 | 149 | 1184 | 27 | 60 | 1185 | 44 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1674 | 1594 | 1683 | 1502 | 1594 | 1683 | 1468 |
| Q Serve(g_s), s | 11.5 | 5.3 | 5.8 | 3.2 | 0.0 | 13.2 | 8.9 | 32.2 | 1.1 | 3.4 | 33.5 | 1.9 |
| Cycle Q Clear(g_c), s | 11.5 | 5.3 | 5.8 | 3.2 | 0.0 | 13.2 | 8.9 | 32.2 | 1.1 | 3.4 | 33.5 | 1.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.30 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 204 | 381 | 323 | 129 | 0 | 281 | 171 | 1289 | 575 | 132 | 1208 | 527 |
| V/C Ratio(X) | 0.94 | 0.30 | 0.33 | 0.44 | 0.00 | 0.84 | 0.87 | 0.92 | 0.05 | 0.45 | 0.98 | 0.08 |
| Avail Cap(c_a), veh/h | 204 | 779 | 661 | 166 | 0 | 696 | 171 | 1289 | 575 | 166 | 1208 | 527 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.6 | 31.7 | 31.9 | 42.1 | 0.0 | 38.8 | 42.3 | 28.2 | 18.6 | 42.0 | 30.5 | 20.4 |
| Incr Delay (d2), s/veh | 46.2 | 0.3 | 0.4 | 0.9 | 0.0 | 5.1 | 34.5 | 10.7 | 0.0 | 0.9 | 21.4 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.9 | 2.2 | 2.0 | 1.2 | 0.0 | 5.5 | 4.9 | 13.3 | 0.4 | 1.3 | 15.6 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 87.7 | 32.0 | 32.3 | 43.0 | 0.0 | 43.9 | 76.8 | 38.9 | 18.7 | 42.9 | 51.9 | 20.4 |
| LnGrp LOS | F | C | C | D | | D | E | D | B | D | D | C |
| Approach Vol, veh/h | | 415 | | | 293 | | | 1360 | | | 1289 | |
| Approach Delay, s/veh | | 57.9 | | | 43.7 | | | 42.7 | | | 50.4 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.7 | 43.3 | 12.5 | 27.7 | 15.0 | 41.0 | 17.0 | 23.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 34.8 | 10.0 | 42.3 | 10.3 | 34.5 | 12.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 5.4 | 34.2 | 5.2 | 7.8 | 10.9 | 35.5 | 13.5 | 15.2 |
| Green Ext Time (p_c), s | 0.0 | 0.4 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 47.6 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 93 | 289 | 53 | 315 | 444 | 147 | 833 | 281 | 274 | 809 | 135 |
| Future Volume (vph) | 93 | 289 | 53 | 315 | 444 | 147 | 833 | 281 | 274 | 809 | 135 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 58.0 | 58.0 | 58.0 | 58.0 | 58.0 | 14.8 | 38.0 | 38.0 | 24.0 | 47.2 | 47.2 |
| Total Split (%) | 48.3% | 48.3% | 48.3% | 48.3% | 48.3% | 12.3% | 31.7% | 31.7% | 20.0% | 39.3% | 39.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 50.8 | 50.8 | 50.8 | 50.8 | 50.8 | 10.1 | 31.5 | 31.5 | 19.3 | 40.7 | 40.7 |
| Actuated g/C Ratio | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.08 | 0.26 | 0.26 | 0.16 | 0.34 | 0.34 |
| v/c Ratio | 1.80 | 0.41 | 0.08 | 0.96 | 1.17 | 0.64 | 1.01 | 0.62 | 1.15 | 0.76 | 0.25 |
| Control Delay (s/veh) | 448.5 | 26.3 | 0.2 | 74.7 | 122.5 | 66.2 | 76.3 | 28.5 | 146.7 | 40.4 | 7.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 448.5 | 26.3 | 0.2 | 74.7 | 122.5 | 66.2 | 76.3 | 28.5 | 146.7 | 40.4 | 7.2 |
| LOS | F | C | A | E | F | E | E | C | F | D | A |
| Approach Delay (s/veh) | | 113.6 | | | 108.9 | | 64.5 | | | 60.6 | |
| Approach LOS | | F | | | F | | E | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.80 | |
| Intersection Signal Delay (s/veh): 80.8 | Intersection LOS: F |
| Intersection Capacity Utilization 118.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 93 | 289 | 53 | 315 | 444 | 350 | 147 | 833 | 281 | 274 | 809 | 135 |
| Future Volume (veh/h) | 93 | 289 | 53 | 315 | 444 | 350 | 147 | 833 | 281 | 274 | 809 | 135 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 99 | 307 | 28 | 335 | 472 | 362 | 156 | 886 | 282 | 291 | 861 | 108 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 60 | 750 | 636 | 359 | 394 | 302 | 241 | 884 | 394 | 256 | 1146 | 504 |
| Arrive On Green | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.08 | 0.26 | 0.26 | 0.16 | 0.34 | 0.34 |
| Sat Flow, veh/h | 622 | 1772 | 1502 | 987 | 930 | 713 | 2910 | 3367 | 1502 | 1594 | 3367 | 1481 |
| Grp Volume(v), veh/h | 99 | 307 | 28 | 335 | 0 | 834 | 156 | 886 | 282 | 291 | 861 | 108 |
| Grp Sat Flow(s),veh/h/ln | 622 | 1772 | 1502 | 987 | 0 | 1644 | 1455 | 1683 | 1502 | 1594 | 1683 | 1481 |
| Q Serve(g_s), s | 0.0 | 14.5 | 1.3 | 36.3 | 0.0 | 50.8 | 6.2 | 31.5 | 20.5 | 19.3 | 27.2 | 6.2 |
| Cycle Q Clear(g_c), s | 50.8 | 14.5 | 1.3 | 50.8 | 0.0 | 50.8 | 6.2 | 31.5 | 20.5 | 19.3 | 27.2 | 6.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.43 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 60 | 750 | 636 | 359 | 0 | 696 | 241 | 884 | 394 | 256 | 1146 | 504 |
| V/C Ratio(X) | 1.65 | 0.41 | 0.04 | 0.93 | 0.00 | 1.20 | 0.65 | 1.00 | 0.72 | 1.14 | 0.75 | 0.21 |
| Avail Cap(c_a), veh/h | 60 | 750 | 636 | 359 | 0 | 696 | 245 | 884 | 394 | 256 | 1146 | 504 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 60.0 | 24.1 | 20.3 | 43.8 | 0.0 | 34.6 | 53.3 | 44.3 | 40.2 | 50.3 | 35.1 | 28.2 |
| Incr Delay (d2), s/veh | 355.2 | 0.4 | 0.0 | 31.1 | 0.0 | 103.0 | 4.4 | 30.9 | 6.1 | 97.6 | 2.8 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.7 | 5.9 | 0.5 | 13.1 | 0.0 | 38.8 | 2.3 | 16.1 | 7.8 | 14.3 | 10.8 | 2.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 415.2 | 24.5 | 20.4 | 75.0 | 0.0 | 137.6 | 57.7 | 75.1 | 46.2 | 148.0 | 37.9 | 28.4 |
| LnGrp LOS | F | C | C | E | | F | E | F | D | F | D | C |
| Approach Vol, veh/h | | 434 | | | 1169 | | | 1324 | | | 1260 | |
| Approach Delay, s/veh | | 113.4 | | | 119.6 | | | 66.9 | | | 62.5 | |
| Approach LOS | | F | | | F | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 38.0 | | 58.0 | 14.6 | 47.4 | | 58.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 19.3 | 31.5 | | 50.8 | 10.1 | 40.7 | | 50.8 |
| Max Q Clear Time (g_c+I1), s | 21.3 | 33.5 | | 52.8 | 8.2 | 29.2 | | 52.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 4.2 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 85.1 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 59 | 135 | 114 | 194 | 297 | 125 | 953 | 185 | 153 | 979 | 36 |
| Future Volume (vph) | 59 | 135 | 114 | 194 | 297 | 125 | 953 | 185 | 153 | 979 | 36 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 32.5 | 32.5 | 32.5 | 32.5 | 32.5 | 13.7 | 36.8 | 36.8 | 14.8 | 37.9 | 37.9 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.32 | 0.32 | 0.13 | 0.36 | 0.36 | 0.14 | 0.37 | 0.37 |
| v/c Ratio | 0.53 | 0.26 | 0.22 | 0.59 | 0.86 | 0.63 | 0.79 | 0.34 | 0.72 | 0.84 | 0.06 |
| Control Delay (s/veh) | 46.2 | 27.3 | 5.4 | 37.1 | 47.4 | 59.0 | 37.6 | 18.0 | 62.6 | 39.2 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 46.2 | 27.3 | 5.4 | 37.1 | 47.4 | 59.0 | 37.6 | 18.0 | 62.6 | 39.2 | 0.2 |
| LOS | D | C | A | D | D | E | D | B | E | D | A |
| Approach Delay (s/veh) | | 22.9 | | | 44.3 | | 36.8 | | | 41.1 | |
| Approach LOS | | C | | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 102.9 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 38.4 | Intersection LOS: D |
| Intersection Capacity Utilization 92.6% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

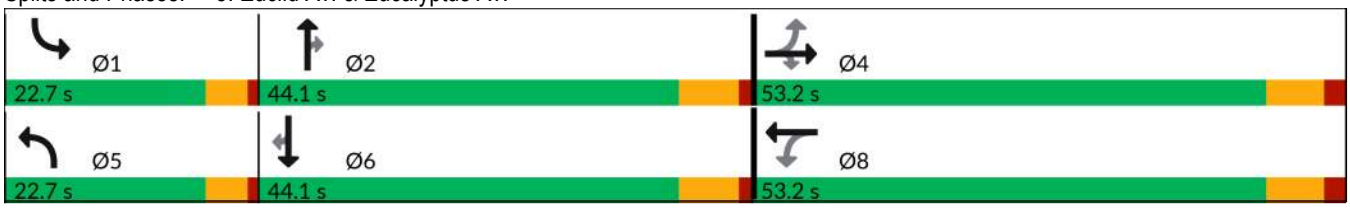

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 59 | 135 | 114 | 194 | 297 | 143 | 125 | 953 | 185 | 153 | 979 | 36 |
| Future Volume (veh/h) | 59 | 135 | 114 | 194 | 297 | 143 | 125 | 953 | 185 | 153 | 979 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 63 | 144 | 80 | 206 | 316 | 132 | 133 | 953 | 174 | 163 | 1041 | 27 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 1.00 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 167 | 602 | 510 | 385 | 403 | 168 | 167 | 1142 | 509 | 194 | 1198 | 534 |
| Arrive On Green | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.10 | 0.34 | 0.34 | 0.12 | 0.36 | 0.36 |
| Sat Flow, veh/h | 890 | 1772 | 1502 | 1093 | 1187 | 496 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 63 | 144 | 80 | 206 | 0 | 448 | 133 | 953 | 174 | 163 | 1041 | 27 |
| Grp Sat Flow(s),veh/h/ln | 890 | 1772 | 1502 | 1093 | 0 | 1683 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 6.3 | 5.4 | 3.4 | 15.4 | 0.0 | 22.1 | 7.5 | 24.0 | 8.0 | 9.2 | 26.6 | 1.1 |
| Cycle Q Clear(g_c), s | 28.4 | 5.4 | 3.4 | 20.8 | 0.0 | 22.1 | 7.5 | 24.0 | 8.0 | 9.2 | 26.6 | 1.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.29 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 167 | 602 | 510 | 385 | 0 | 571 | 167 | 1142 | 509 | 194 | 1198 | 534 |
| V/C Ratio(X) | 0.38 | 0.24 | 0.16 | 0.53 | 0.00 | 0.78 | 0.80 | 0.83 | 0.34 | 0.84 | 0.87 | 0.05 |
| Avail Cap(c_a), veh/h | 309 | 885 | 750 | 560 | 0 | 840 | 311 | 1374 | 613 | 311 | 1374 | 613 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 40.2 | 21.9 | 21.2 | 29.3 | 0.0 | 27.4 | 40.3 | 28.0 | 22.7 | 39.6 | 27.7 | 19.5 |
| Incr Delay (d2), s/veh | 1.0 | 0.2 | 0.1 | 0.9 | 0.0 | 2.4 | 6.3 | 3.9 | 0.4 | 8.8 | 5.6 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.4 | 2.1 | 1.1 | 3.8 | 0.0 | 8.4 | 3.0 | 9.2 | 2.6 | 3.8 | 10.3 | 0.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 41.2 | 22.0 | 21.3 | 30.2 | 0.0 | 29.8 | 46.5 | 32.0 | 23.1 | 48.4 | 33.3 | 19.5 |
| LnGrp LOS | D | C | C | C | | C | D | C | C | D | C | B |
| Approach Vol, veh/h | | 287 | | | 654 | | | 1260 | | | 1231 | |
| Approach Delay, s/veh | | 26.0 | | | 29.9 | | | 32.3 | | | 35.0 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.9 | 37.8 | | 38.5 | 14.4 | 39.3 | | 38.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 11.2 | 26.0 | | 30.4 | 9.5 | 28.6 | | 24.1 |
| Green Ext Time (p_c), s | 0.2 | 4.9 | | 0.9 | 0.1 | 4.2 | | 2.7 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 32.3 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 7 | 3 | 83 | 26 | 29 | 1400 | 127 | 179 | 1204 |
| Future Volume (vph) | 7 | 3 | 83 | 26 | 29 | 1400 | 127 | 179 | 1204 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.8 | 50.8 | 22.0 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.3% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 20.3 | | 28.3 | 10.1 | 44.7 | 44.7 | 16.5 | 57.6 |
| Actuated g/C Ratio | | 0.19 | | 0.26 | 0.09 | 0.41 | 0.41 | 0.15 | 0.53 |
| v/c Ratio | | 0.08 | | 0.91 | 0.22 | 1.16 | 0.22 | 0.85 | 0.80 |
| Control Delay (s/veh) | | 21.8 | | 53.2 | 53.2 | 111.7 | 7.0 | 76.8 | 28.5 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 21.8 | | 53.2 | 53.2 | 111.7 | 7.0 | 76.8 | 28.5 |
| LOS | | C | | D | D | F | A | E | C |
| Approach Delay (s/veh) | | 21.8 | | 53.2 | | 102.1 | | | 34.6 |
| Approach LOS | | C | | D | | F | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 108 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.16 | |
| Intersection Signal Delay (s/veh): 67.9 | Intersection LOS: E |
| Intersection Capacity Utilization 96.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

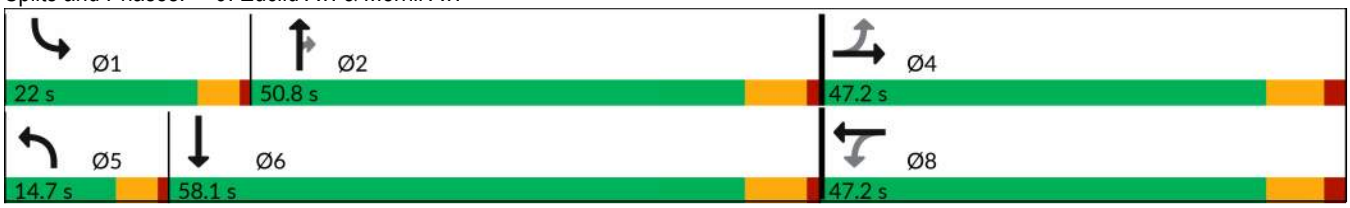

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 7 | 3 | 8 | 83 | 26 | 247 | 29 | 1400 | 127 | 179 | 1204 | 36 |
| Future Volume (veh/h) | 7 | 3 | 8 | 83 | 26 | 247 | 29 | 1400 | 127 | 179 | 1204 | 36 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 8 | 3 | 6 | 95 | 30 | 268 | 33 | 1609 | 141 | 206 | 1384 | 30 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 160 | 64 | 97 | 133 | 47 | 300 | 91 | 1332 | 591 | 231 | 1627 | 35 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.06 | 0.40 | 0.40 | 0.14 | 0.48 | 0.48 |
| Sat Flow, veh/h | 384 | 217 | 328 | 314 | 160 | 1015 | 1594 | 3367 | 1494 | 1594 | 3366 | 73 |
| Grp Volume(v), veh/h | 17 | 0 | 0 | 393 | 0 | 0 | 33 | 1609 | 141 | 206 | 691 | 723 |
| Grp Sat Flow(s),veh/h/ln | 928 | 0 | 0 | 1489 | 0 | 0 | 1594 | 1683 | 1494 | 1594 | 1683 | 1756 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 24.2 | 0.0 | 0.0 | 2.2 | 44.3 | 7.0 | 14.2 | 40.3 | 40.5 |
| Cycle Q Clear(g_c), s | 0.8 | 0.0 | 0.0 | 28.3 | 0.0 | 0.0 | 2.2 | 44.3 | 7.0 | 14.2 | 40.3 | 40.5 |
| Prop In Lane | 0.47 | | 0.35 | 0.24 | | 0.68 | 1.00 | | 1.00 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 321 | 0 | 0 | 479 | 0 | 0 | 91 | 1332 | 591 | 231 | 813 | 849 |
| V/C Ratio(X) | 0.05 | 0.00 | 0.00 | 0.82 | 0.00 | 0.00 | 0.36 | 1.21 | 0.24 | 0.89 | 0.85 | 0.85 |
| Avail Cap(c_a), veh/h | 402 | 0 | 0 | 571 | 0 | 0 | 142 | 1332 | 591 | 246 | 813 | 849 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.1 | 0.0 | 0.0 | 37.7 | 0.0 | 0.0 | 50.8 | 33.8 | 22.6 | 47.0 | 25.4 | 25.4 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 6.7 | 0.0 | 0.0 | 0.9 | 100.8 | 0.2 | 28.5 | 8.5 | 8.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 0.0 | 0.0 | 10.6 | 0.0 | 0.0 | 0.9 | 34.9 | 2.3 | 7.2 | 16.1 | 16.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.1 | 0.0 | 0.0 | 44.4 | 0.0 | 0.0 | 51.7 | 134.6 | 22.8 | 75.5 | 33.9 | 33.7 |
| LnGrp LOS | C | | | D | | | D | F | C | E | C | C |
| Approach Vol, veh/h | | 17 | | | 393 | | | 1783 | | | 1620 | |
| Approach Delay, s/veh | | 28.1 | | | 44.4 | | | 124.2 | | | 39.1 | |
| Approach LOS | | C | | | D | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.9 | 50.8 | | 40.2 | 11.1 | 60.6 | | 40.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.3 | 44.3 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 16.2 | 46.3 | | 2.8 | 4.2 | 42.5 | | 30.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 5.3 | | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 79.4 |
| HCM 7th LOS | E |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 191 | 336 | 70 | 57 | 849 | 359 | 139 | 798 | 46 | 230 | 850 | 241 |
| Future Volume (vph) | 191 | 336 | 70 | 57 | 849 | 359 | 139 | 798 | 46 | 230 | 850 | 241 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 34.6 | 14.7 | 17.5 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 28.8% | 12.3% | 14.6% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 38.1 | 38.1 | 10.0 | 34.9 | 34.9 | 10.0 | 29.0 | 40.9 | 12.0 | 31.1 | 47.6 |
| Actuated g/C Ratio | 0.09 | 0.35 | 0.35 | 0.09 | 0.32 | 0.32 | 0.09 | 0.27 | 0.37 | 0.11 | 0.28 | 0.44 |
| v/c Ratio | 0.76 | 0.30 | 0.12 | 0.41 | 0.83 | 0.59 | 1.01 | 0.94 | 0.08 | 0.76 | 0.94 | 0.36 |
| Control Delay (s/veh) | 68.5 | 27.2 | 1.5 | 58.6 | 41.9 | 14.6 | 128.1 | 59.9 | 1.8 | 64.4 | 56.8 | 16.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 68.5 | 27.2 | 1.5 | 58.6 | 41.9 | 14.6 | 128.1 | 59.9 | 1.8 | 64.4 | 56.8 | 16.6 |
| LOS | E | C | A | E | D | B | F | E | A | E | E | B |
| Approach Delay (s/veh) | | 37.4 | | | 34.9 | | | 66.8 | | | 50.8 | |
| Approach LOS | | D | | | C | | | E | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.01 | |
| Intersection Signal Delay (s/veh): 47.8 | Intersection LOS: D |
| Intersection Capacity Utilization 85.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

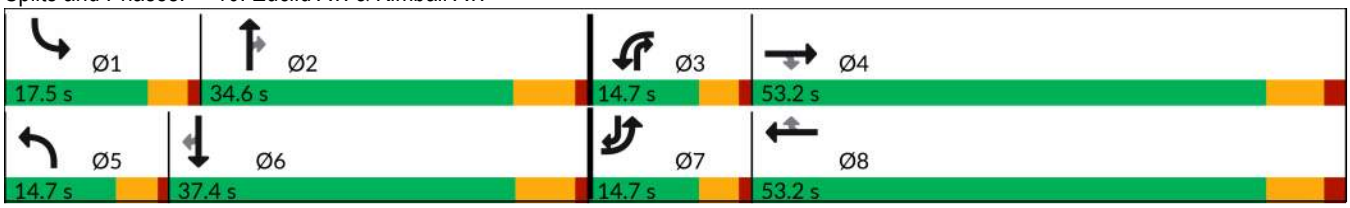

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 191 | 336 | 70 | 57 | 849 | 359 | 139 | 798 | 46 | 230 | 850 | 241 |
| Future Volume (veh/h) | 191 | 336 | 70 | 57 | 849 | 359 | 139 | 798 | 46 | 230 | 850 | 241 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 201 | 354 | 58 | 60 | 894 | 201 | 146 | 840 | 27 | 242 | 895 | 201 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 275 | 1083 | 483 | 125 | 1029 | 453 | 151 | 943 | 533 | 295 | 966 | 572 |
| Arrive On Green | 0.09 | 0.32 | 0.32 | 0.08 | 0.31 | 0.31 | 0.09 | 0.28 | 0.28 | 0.10 | 0.29 | 0.29 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 1594 | 3367 | 1483 | 1594 | 3367 | 1482 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 201 | 354 | 58 | 60 | 894 | 201 | 146 | 840 | 27 | 242 | 895 | 201 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1594 | 1683 | 1483 | 1594 | 1683 | 1482 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 7.1 | 8.4 | 2.9 | 3.8 | 26.5 | 11.5 | 9.6 | 25.3 | 1.3 | 8.6 | 27.3 | 10.1 |
| Cycle Q Clear(g_c), s | 7.1 | 8.4 | 2.9 | 3.8 | 26.5 | 11.5 | 9.6 | 25.3 | 1.3 | 8.6 | 27.3 | 10.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 275 | 1083 | 483 | 125 | 1029 | 453 | 151 | 943 | 533 | 295 | 966 | 572 |
| V/C Ratio(X) | 0.73 | 0.33 | 0.12 | 0.48 | 0.87 | 0.44 | 0.97 | 0.89 | 0.05 | 0.82 | 0.93 | 0.35 |
| Avail Cap(c_a), veh/h | 275 | 1465 | 654 | 151 | 1465 | 645 | 151 | 943 | 533 | 352 | 988 | 582 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.6 | 27.2 | 25.3 | 46.6 | 34.7 | 29.5 | 47.7 | 36.5 | 22.1 | 46.5 | 36.6 | 23.4 |
| Incr Delay (d2), s/veh | 8.4 | 0.2 | 0.1 | 2.8 | 3.1 | 0.3 | 63.1 | 10.6 | 0.0 | 10.5 | 14.1 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 | 3.2 | 1.0 | 1.5 | 10.5 | 3.9 | 6.3 | 11.0 | 0.4 | 3.4 | 12.2 | 3.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 55.0 | 27.4 | 25.4 | 49.5 | 37.8 | 29.7 | 110.8 | 47.0 | 22.2 | 57.0 | 50.7 | 23.7 |
| LnGrp LOS | D | C | C | D | D | C | F | D | C | E | D | C |
| Approach Vol, veh/h | | 613 | | | 1155 | | | 1013 | | | 1338 | |
| Approach Delay, s/veh | | 36.2 | | | 37.0 | | | 55.6 | | | 47.8 | |
| Approach LOS | | D | | | D | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.4 | 36.1 | 13.0 | 41.2 | 14.7 | 36.8 | 14.7 | 39.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 12.8 | 28.1 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 10.6 | 27.3 | 5.8 | 10.4 | 11.6 | 29.3 | 9.1 | 28.5 |
| Green Ext Time (p_c), s | 0.1 | 0.4 | 0.0 | 2.3 | 0.0 | 1.0 | 0.0 | 3.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 45.0 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 38 | 207 | 994 | 411 | 74 | 630 | 599 | 110 | 763 |
| Future Volume (vph) | 38 | 207 | 994 | 411 | 74 | 630 | 599 | 110 | 763 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 21.3 | 45.4 | 51.0 | 14.8 | 36.5 | 45.4 | 16.8 | 38.5 |
| Total Split (%) | 13.1% | 17.8% | 37.8% | 42.5% | 12.3% | 30.4% | 37.8% | 14.0% | 32.1% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 14.3 | 39.8 | 50.6 | 10.1 | 27.9 | 74.2 | 11.5 | 32.5 |
| Actuated g/C Ratio | 0.09 | 0.12 | 0.34 | 0.43 | 0.09 | 0.24 | 0.63 | 0.10 | 0.28 |
| v/c Ratio | 0.29 | 1.17 | 1.05 | 0.66 | 0.56 | 0.82 | 0.61 | 0.73 | 0.95 |
| Control Delay (s/veh) | 57.8 | 160.1 | 80.3 | 34.2 | 69.2 | 51.5 | 12.1 | 79.3 | 62.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 57.8 | 160.1 | 80.3 | 34.2 | 69.2 | 51.5 | 12.1 | 79.3 | 62.2 |
| LOS | E | F | F | C | E | D | B | E | E |
| Approach Delay (s/veh) | | 146.4 | | 65.3 | | 34.4 | | | 64.1 |
| Approach LOS | | F | | E | | C | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 117.4 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.17 | |
| Intersection Signal Delay (s/veh): 60.7 | Intersection LOS: E |
| Intersection Capacity Utilization 101.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

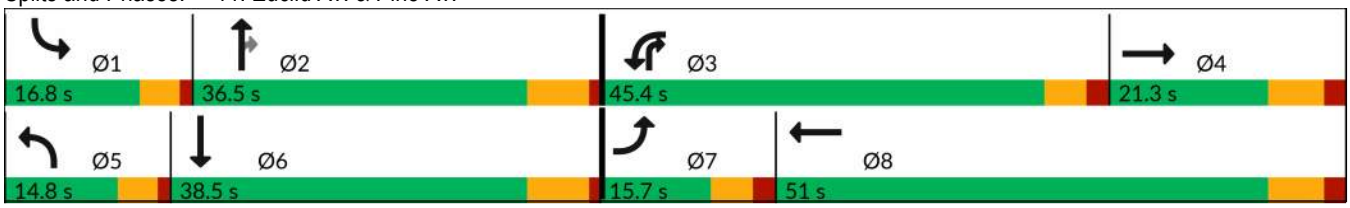

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 38 | 207 | 38 | 994 | 411 | 68 | 74 | 630 | 599 | 110 | 763 | 86 |
| Future Volume (veh/h) | 38 | 207 | 38 | 994 | 411 | 68 | 74 | 630 | 599 | 110 | 763 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 39 | 213 | 0 | 1025 | 424 | 49 | 76 | 649 | 463 | 113 | 787 | 58 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 97 | 215 | | 980 | 619 | 71 | 124 | 859 | 889 | 134 | 832 | 61 |
| Arrive On Green | 0.09 | 0.18 | 0.00 | 0.51 | 0.60 | 0.60 | 0.12 | 0.38 | 0.38 | 0.13 | 0.39 | 0.39 |
| Sat Flow, veh/h | 1594 | 1772 | 0 | 2910 | 1559 | 180 | 1594 | 3367 | 1502 | 1594 | 3179 | 234 |
| Grp Volume(v), veh/h | 39 | 213 | 0 | 1025 | 0 | 473 | 76 | 649 | 463 | 113 | 417 | 428 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 0 | 1455 | 0 | 1739 | 1594 | 1683 | 1502 | 1594 | 1683 | 1730 |
| Q Serve(g_s), s | 2.7 | 14.1 | 0.0 | 39.7 | 0.0 | 21.9 | 5.3 | 19.7 | 22.9 | 8.2 | 28.2 | 28.2 |
| Cycle Q Clear(g_c), s | 2.7 | 14.1 | 0.0 | 39.7 | 0.0 | 21.9 | 5.3 | 19.7 | 22.9 | 8.2 | 28.2 | 28.2 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.10 | 1.00 | | 1.00 | 1.00 | | 0.14 |
| Lane Grp Cap(c), veh/h | 97 | 215 | | 980 | 0 | 690 | 124 | 859 | 889 | 134 | 440 | 453 |
| V/C Ratio(X) | 0.40 | 0.99 | | 1.05 | 0.00 | 0.69 | 0.61 | 0.76 | 0.52 | 0.84 | 0.95 | 0.95 |
| Avail Cap(c_a), veh/h | 135 | 215 | | 980 | 0 | 690 | 137 | 859 | 889 | 164 | 457 | 469 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.5 | 48.2 | 0.0 | 29.2 | 0.0 | 18.8 | 50.4 | 33.2 | 12.0 | 50.7 | 35.0 | 35.0 |
| Incr Delay (d2), s/veh | 1.0 | 58.8 | 0.0 | 41.6 | 0.0 | 3.1 | 4.2 | 3.5 | 0.3 | 23.1 | 28.0 | 27.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 9.1 | 0.0 | 16.1 | 0.0 | 6.8 | 2.1 | 6.9 | 5.0 | 3.9 | 12.6 | 12.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 52.5 | 107.0 | 0.0 | 70.8 | 0.0 | 22.0 | 54.5 | 36.7 | 12.3 | 73.8 | 63.0 | 62.6 |
| LnGrp LOS | D | F | | F | | C | D | D | B | E | E | E |
| Approach Vol, veh/h | | 252 | | | 1498 | | | 1188 | | | 958 | |
| Approach Delay, s/veh | | 98.6 | | | 55.4 | | | 28.3 | | | 64.1 | |
| Approach LOS | | F | | | E | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.6 | 36.6 | 45.4 | 21.3 | 13.9 | 37.3 | 12.9 | 53.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 12.1 | 30.0 | 39.7 | 14.3 | 10.1 | 32.0 | 10.0 | 44.0 |
| Max Q Clear Time (g_c+I1), s | 10.2 | 24.9 | 41.7 | 16.1 | 7.3 | 30.2 | 4.7 | 23.9 |
| Green Ext Time (p_c), s | 0.0 | 1.7 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 3.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 52.1 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 650 | 666 | 1101 | 48 | 735 |
| Future Volume (vph) | 650 | 666 | 1101 | 48 | 735 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 14.5 | 9.6 | 9.6 |
| Total Split (s) | 35.7 | 46.2 | 81.9 | 18.1 | 18.1 |
| Total Split (%) | 35.7% | 46.2% | 81.9% | 18.1% | 18.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 29.2 | 41.5 | 75.4 | 13.5 | 13.5 |
| Actuated g/C Ratio | 0.29 | 0.42 | 0.75 | 0.14 | 0.14 |
| v/c Ratio | 1.01 | 1.14 | 0.49 | 0.14 | 1.07 |
| Control Delay (s/veh) | 60.6 | 109.9 | 5.6 | 39.2 | 64.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 60.6 | 109.9 | 5.6 | 39.2 | 64.8 |
| LOS | E | F | A | D | E |
| Approach Delay (s/veh) | 60.6 | | 44.9 | 63.2 | |
| Approach LOS | E | | D | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.14 | |
| Intersection Signal Delay (s/veh): 53.1 | Intersection LOS: D |
| Intersection Capacity Utilization 85.1% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

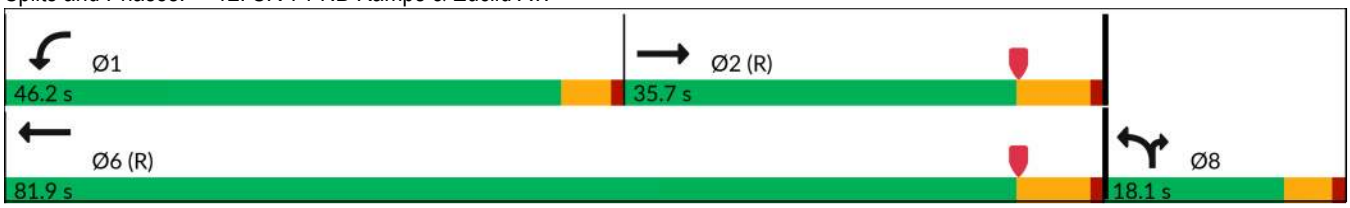

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 650 | 223 | 666 | 1101 | 48 | 735 |
| Future Volume (veh/h) | 650 | 223 | 666 | 1101 | 48 | 735 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1673 | 1772 | 1575 | 1772 |
| Adj Flow Rate, veh/h | 730 | 0 | 748 | 1237 | 54 | 0 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1307 | | 661 | 2862 | 113 | |
| Arrive On Green | 0.78 | 0.00 | 0.41 | 0.85 | 0.04 | 0.00 |
| Sat Flow, veh/h | 3544 | 0 | 1594 | 3455 | 2910 | 1502 |
| Grp Volume(v), veh/h | 730 | 0 | 748 | 1237 | 54 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1683 | 0 | 1594 | 1683 | 1455 | 1502 |
| Q Serve(g_s), s | 8.6 | 0.0 | 41.5 | 8.7 | 1.8 | 0.0 |
| Cycle Q Clear(g_c), s | 8.6 | 0.0 | 41.5 | 8.7 | 1.8 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1307 | | 661 | 2862 | 113 | |
| V/C Ratio(X) | 0.56 | | 1.13 | 0.43 | 0.48 | |
| Avail Cap(c_a), veh/h | 1307 | | 661 | 2862 | 393 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.54 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.8 | 0.0 | 29.3 | 1.8 | 47.1 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 76.9 | 0.5 | 3.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 0.0 | 27.9 | 0.3 | 0.7 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 8.7 | 0.0 | 106.2 | 2.3 | 50.2 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 730 | | | 1985 | 54 | |
| Approach Delay, s/veh | 8.7 | | | 41.4 | 50.2 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 46.2 | 45.3 | | | | 91.5 | 8.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 41.5 | 29.2 | | | | 75.4 | 13.5 |
| Max Q Clear Time (g_c+I1), s | 43.5 | 10.6 | | | | 10.7 | 3.8 |
| Green Ext Time (p_c), s | 0.0 | 3.3 | | | | 7.9 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 33.0 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 596 | 171 | 312 | 49 | 250 | 519 | 40 | 41 |
| Future Volume (vph) | 596 | 171 | 312 | 49 | 250 | 519 | 40 | 41 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 13.5 | 13.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 29.6 | 19.0 | 48.6 | 16.6 | 16.6 | 34.8 | 34.8 | 34.8 |
| Total Split (%) | 29.6% | 19.0% | 48.6% | 16.6% | 16.6% | 34.8% | 34.8% | 34.8% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 28.4 | 14.8 | 48.0 | 9.3 | 9.3 | 25.2 | 25.2 | 25.2 |
| Actuated g/C Ratio | 0.28 | 0.15 | 0.48 | 0.09 | 0.09 | 0.25 | 0.25 | 0.25 |
| v/c Ratio | 0.76 | 0.83 | 0.22 | 0.38 | 0.73 | 0.84 | 0.79 | 0.10 |
| Control Delay (s/veh) | 40.3 | 64.4 | 12.8 | 49.9 | 18.3 | 55.1 | 49.2 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.3 | 64.4 | 12.8 | 49.9 | 18.3 | 55.1 | 49.2 | 0.4 |
| LOS | D | E | B | D | B | E | D | A |
| Approach Delay (s/veh) | 40.3 | | 31.1 | | | | 48.6 | |
| Approach LOS | D | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 38.1 | Intersection LOS: D |
| Intersection Capacity Utilization 66.1% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

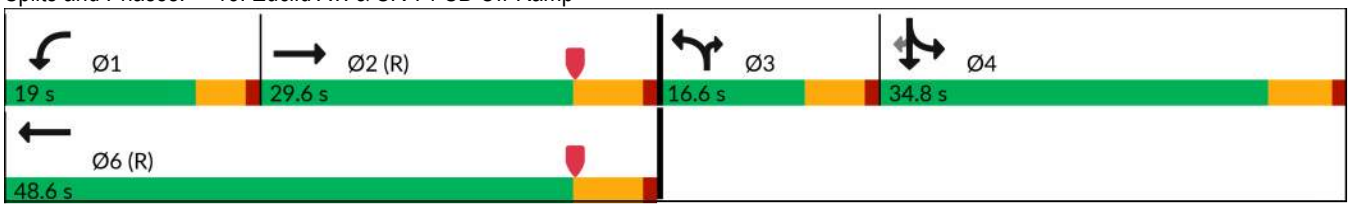

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 596 | 36 | 171 | 312 | 0 | 49 | 0 | 250 | 519 | 40 | 41 |
| Future Volume (veh/h) | 0 | 596 | 36 | 171 | 312 | 0 | 49 | 0 | 250 | 519 | 40 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 0 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 677 | 27 | 194 | 355 | 0 | 56 | 0 | 164 | 626 | 0 | 23 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.80 | 0.88 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1560 | 62 | 218 | 2209 | | 0 | 0 | 0 | 713 | 0 | 336 |
| Arrive On Green | 0.00 | 0.47 | 0.47 | 0.27 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.22 | 0.00 | 0.22 |
| Sat Flow, veh/h | 0 | 3388 | 132 | 1594 | 3455 | 0 | | 0 | | 3188 | 0 | 1500 |
| Grp Volume(v), veh/h | 0 | 345 | 359 | 194 | 355 | 0 | | 0.0 | | 626 | 0 | 23 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1683 | 1748 | 1594 | 1683 | 0 | | | | 1594 | 0 | 1500 |
| Q Serve(g_s), s | 0.0 | 13.6 | 13.6 | 11.7 | 0.0 | 0.0 | | | | 19.0 | 0.0 | 1.2 |
| Cycle Q Clear(g_c), s | 0.0 | 13.6 | 13.6 | 11.7 | 0.0 | 0.0 | | | | 19.0 | 0.0 | 1.2 |
| Prop In Lane | 0.00 | | 0.08 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 796 | 826 | 218 | 2209 | | | | | 713 | 0 | 336 |
| V/C Ratio(X) | 0.00 | 0.43 | 0.43 | 0.89 | 0.16 | | | | | 0.88 | 0.00 | 0.07 |
| Avail Cap(c_a), veh/h | 0 | 796 | 826 | 228 | 2209 | | | | | 924 | 0 | 435 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.88 | 0.88 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 17.5 | 17.5 | 35.6 | 0.0 | 0.0 | | | | 37.5 | 0.0 | 30.6 |
| Incr Delay (d2), s/veh | 0.0 | 1.7 | 1.7 | 27.7 | 0.1 | 0.0 | | | | 7.3 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 5.2 | 5.4 | 5.4 | 0.0 | 0.0 | | | | 8.0 | 0.0 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 19.2 | 19.2 | 63.4 | 0.1 | 0.0 | | | | 44.8 | 0.0 | 30.7 |
| LnGrp LOS | | B | B | E | A | | | | | D | | C |
| Approach Vol, veh/h | | 704 | | | 549 | | | | | | 649 | |
| Approach Delay, s/veh | | 19.2 | | | 22.5 | | | | | | 44.3 | |
| Approach LOS | | B | | | C | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.4 | 53.5 | | 28.2 | | 71.8 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 14.3 | 23.4 | | 29.0 | | 42.4 |
| Max Q Clear Time (g_c+I1), s | 13.7 | 15.6 | | 21.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.6 | | 1.3 | | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.7 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 30 | 807 | 30 | 0 | 1154 | 45 | 39 | 0 | 0 | 59 | 0 | 39 |
| Future Vol, veh/h | 30 | 807 | 30 | 0 | 1154 | 45 | 39 | 0 | 0 | 59 | 0 | 39 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 33 | 877 | 33 | 0 | 1254 | 49 | 42 | 0 | 0 | 64 | 0 | 42 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1303 | 0 | 0 | 910 | 0 | 0 | 2213 | 2262 | 893 | 2221 | 2254 | 1279 |
| Stage 1 | - | - | - | - | - | - | 959 | 959 | - | 1279 | 1279 | - |
| Stage 2 | - | - | - | - | - | - | 1254 | 1303 | - | 942 | 975 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6 | 5.52 | - | 6 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6 | 5.52 | - | 6 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 531 | - | - | 749 | - | - | ~ 31 | 41 | 340 | ~ 31 | 41 | 203 |
| Stage 1 | - | - | - | - | - | - | 319 | 336 | - | 213 | 237 | - |
| Stage 2 | - | - | - | - | - | - | 219 | 230 | - | 326 | 330 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 531 | - | - | 749 | - | - | ~ 22 | 36 | 340 | ~ 27 | 36 | 203 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 119 | 158 | - | 161 | 175 | - |
| Stage 1 | - | - | - | - | - | - | 279 | 294 | - | 213 | 237 | - |
| Stage 2 | - | - | - | - | - | - | 174 | 230 | - | 285 | 288 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.42 | 0 | 50.94 | 52.97 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 119 | 62 | - | - | 749 | - | - | 175 |
| HCM Lane V/C Ratio | 0.355 | 0.061 | - | - | - | - | - | 0.607 |
| HCM Control Delay (s/veh) | 50.9 | 12.2 | 0 | - | 0 | - | - | 53 |
| HCM Lane LOS | F | B | A | - | A | - | - | F |
| HCM 95th %tile Q(veh) | 1.4 | 0.2 | - | - | 0 | - | - | 3.3 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 19.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 93 | 673 | 48 | 74 | 811 | 50 | 49 | 56 | 78 | 7 | 36 | 74 |
| Future Vol, veh/h | 93 | 673 | 48 | 74 | 811 | 50 | 49 | 56 | 78 | 7 | 36 | 74 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 106 | 765 | 55 | 84 | 922 | 57 | 56 | 64 | 89 | 8 | 41 | 84 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 981 | 0 | 0 | 819 | 0 | 0 | 1653 | 2153 | 792 | 2129 | 2152 | 492 |
| Stage 1 | - | - | - | - | - | - | 1003 | 1003 | - | 1121 | 1121 | - |
| Stage 2 | - | - | - | - | - | - | 649 | 1150 | - | 1008 | 1031 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 701 | - | - | 807 | - | - | 71 | ~ 48 | 388 | 32 | 48 | 523 |
| Stage 1 | - | - | - | - | - | - | 291 | 319 | - | 220 | 281 | - |
| Stage 2 | - | - | - | - | - | - | 425 | 272 | - | 289 | 310 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 699 | - | - | 807 | - | - | ~ 35 | ~ 36 | 388 | 10 | ~ 36 | 522 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 131 | 119 | - | 55 | 141 | - |
| Stage 1 | - | - | - | - | - | - | 247 | 271 | - | 197 | 251 | - |
| Stage 2 | - | - | - | - | - | - | 268 | 243 | - | 145 | 263 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.26 | 0.79 | 179.93 | 42.37 |
| HCM LOS | | | F | E |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 175 | 699 | - | - | 807 | - | - | 223 |
| HCM Lane V/C Ratio | 1.186 | 0.151 | - | - | 0.104 | - | - | 0.595 |
| HCM Control Delay (s/veh) | 179.9 | 11.1 | - | - | 10 | - | - | 42.4 |
| HCM Lane LOS | F | B | - | - | A | - | - | E |
| HCM 95th %tile Q(veh) | 11.1 | 0.5 | - | - | 0.3 | - | - | 3.4 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.5 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 34 | 102 | 18 | 12 | 178 | 16 | 43 | 211 | 15 | 7 | 121 | 52 |
| Future Vol, veh/h | 34 | 102 | 18 | 12 | 178 | 16 | 43 | 211 | 15 | 7 | 121 | 52 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 37 | 111 | 20 | 13 | 193 | 17 | 47 | 229 | 16 | 8 | 132 | 57 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 10.7 | 11.4 | 12.5 | 10.6 |
| HCM LOS | B | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 16% | 22% | 6% | 4% |
| Vol Thru, % | 78% | 66% | 86% | 67% |
| Vol Right, % | 6% | 12% | 8% | 29% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 269 | 154 | 206 | 180 |
| LT Vol | 43 | 34 | 12 | 7 |
| Through Vol | 211 | 102 | 178 | 121 |
| RT Vol | 15 | 18 | 16 | 52 |
| Lane Flow Rate | 292 | 167 | 224 | 196 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.435 | 0.262 | 0.343 | 0.291 |
| Departure Headway (Hd) | 5.358 | 5.631 | 5.521 | 5.357 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 670 | 636 | 649 | 669 |
| Service Time | 3.401 | 3.68 | 3.568 | 3.405 |
| HCM Lane V/C Ratio | 0.436 | 0.263 | 0.345 | 0.293 |
| HCM Control Delay, s/veh | 12.5 | 10.7 | 11.4 | 10.6 |
| HCM Lane LOS | B | B | B | B |
| HCM 95th-tile Q | 2.2 | 1 | 1.5 | 1.2 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 75 | 565 | 111 | 387 | 795 | 169 | 180 | 177 | 88 |
| Future Volume (vph) | 75 | 565 | 111 | 387 | 795 | 169 | 180 | 177 | 88 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 17.2 | 23.8 | 23.8 | 31.0 | 37.6 | 26.7 | 48.2 | 17.0 | 38.5 |
| Total Split (%) | 14.3% | 19.8% | 19.8% | 25.8% | 31.3% | 22.3% | 40.2% | 14.2% | 32.1% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.9 | 18.0 | 18.0 | 26.4 | 36.5 | 17.3 | 42.8 | 12.4 | 37.9 |
| Actuated g/C Ratio | 0.08 | 0.15 | 0.15 | 0.22 | 0.30 | 0.14 | 0.36 | 0.10 | 0.32 |
| v/c Ratio | 0.61 | 1.20 | 0.31 | 1.18 | 0.96 | 0.79 | 1.06 | 1.15 | 0.29 |
| Control Delay (s/veh) | 72.3 | 150.7 | 2.4 | 149.6 | 61.7 | 72.6 | 84.5 | 165.2 | 28.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 72.3 | 150.7 | 2.4 | 149.6 | 61.7 | 72.6 | 84.5 | 165.2 | 28.4 |
| LOS | E | F | A | F | E | E | F | F | C |
| Approach Delay (s/veh) | | 120.9 | | | 87.9 | | 82.0 | | 103.2 |
| Approach LOS | | F | | | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.20 | |
| Intersection Signal Delay (s/veh): 95.8 | Intersection LOS: F |
| Intersection Capacity Utilization 108.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

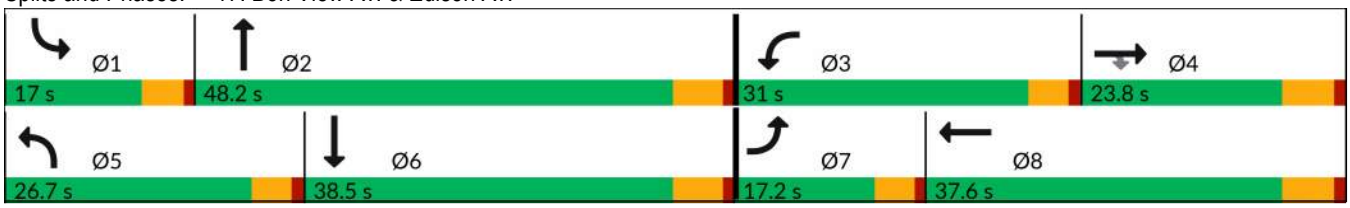

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 75 | 565 | 111 | 387 | 795 | 116 | 169 | 180 | 456 | 177 | 88 | 58 |
| Future Volume (veh/h) | 75 | 565 | 111 | 387 | 795 | 116 | 169 | 180 | 456 | 177 | 88 | 58 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 80 | 601 | 97 | 412 | 846 | 75 | 180 | 191 | 272 | 188 | 94 | 46 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 99 | 539 | 240 | 374 | 1041 | 92 | 206 | 207 | 295 | 176 | 331 | 162 |
| Arrive On Green | 0.06 | 0.16 | 0.16 | 0.23 | 0.33 | 0.33 | 0.13 | 0.31 | 0.31 | 0.11 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1594 | 3367 | 1502 | 1594 | 3128 | 277 | 1594 | 661 | 941 | 1594 | 1123 | 550 |
| Grp Volume(v), veh/h | 80 | 601 | 97 | 412 | 455 | 466 | 180 | 0 | 463 | 188 | 0 | 140 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1502 | 1594 | 1683 | 1722 | 1594 | 0 | 1602 | 1594 | 0 | 1673 |
| Q Serve(g_s), s | 5.6 | 18.0 | 6.5 | 26.4 | 27.8 | 27.8 | 12.5 | 0.0 | 31.4 | 12.4 | 0.0 | 7.2 |
| Cycle Q Clear(g_c), s | 5.6 | 18.0 | 6.5 | 26.4 | 27.8 | 27.8 | 12.5 | 0.0 | 31.4 | 12.4 | 0.0 | 7.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 0.59 | 1.00 | | 0.33 |
| Lane Grp Cap(c), veh/h | 99 | 539 | 240 | 374 | 560 | 573 | 206 | 0 | 503 | 176 | 0 | 493 |
| V/C Ratio(X) | 0.81 | 1.12 | 0.40 | 1.10 | 0.81 | 0.81 | 0.87 | 0.00 | 0.92 | 1.07 | 0.00 | 0.28 |
| Avail Cap(c_a), veh/h | 179 | 539 | 240 | 374 | 560 | 573 | 313 | 0 | 610 | 176 | 0 | 493 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 52.1 | 47.2 | 42.4 | 43.0 | 34.3 | 34.3 | 48.1 | 0.0 | 37.3 | 50.0 | 0.0 | 30.5 |
| Incr Delay (d2), s/veh | 5.8 | 74.5 | 1.1 | 76.7 | 8.9 | 8.7 | 11.0 | 0.0 | 17.5 | 87.7 | 0.0 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.3 | 12.8 | 2.4 | 17.8 | 12.0 | 12.3 | 5.4 | 0.0 | 14.1 | 9.1 | 0.0 | 2.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 57.9 | 121.8 | 43.5 | 119.8 | 43.3 | 43.1 | 59.0 | 0.0 | 54.7 | 137.8 | 0.0 | 30.9 |
| LnGrp LOS | E | F | D | F | D | D | E | | D | F | | C |
| Approach Vol, veh/h | | 778 | | | 1333 | | | 643 | | | 328 | |
| Approach Delay, s/veh | | 105.4 | | | 66.8 | | | 55.9 | | | 92.1 | |
| Approach LOS | | F | | | E | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 40.7 | 31.0 | 23.8 | 19.2 | 38.5 | 11.6 | 43.2 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 12.4 | 42.8 | 26.4 | 18.0 | 22.1 | 33.1 | 12.6 | 31.8 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 33.4 | 28.4 | 20.0 | 14.5 | 9.2 | 7.6 | 29.8 |
| Green Ext Time (p_c), s | 0.0 | 1.9 | 0.0 | 0.0 | 0.1 | 0.6 | 0.0 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 77.0 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 9.8 |
| Intersection LOS | A |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 86 | 155 | 7 | 4 | 122 | 20 | 20 | 27 | 5 | 25 | 31 | 101 |
| Future Vol, veh/h | 86 | 155 | 7 | 4 | 122 | 20 | 20 | 27 | 5 | 25 | 31 | 101 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 98 | 176 | 8 | 5 | 139 | 23 | 23 | 31 | 6 | 28 | 35 | 115 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 10.7 | 9.2 | 8.8 | 9.2 |
| HCM LOS | B | A | A | A |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 38% | 35% | 3% | 16% |
| Vol Thru, % | 52% | 63% | 84% | 20% |
| Vol Right, % | 10% | 3% | 14% | 64% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 52 | 248 | 146 | 157 |
| LT Vol | 20 | 86 | 4 | 25 |
| Through Vol | 27 | 155 | 122 | 31 |
| RT Vol | 5 | 7 | 20 | 101 |
| Lane Flow Rate | 59 | 282 | 166 | 178 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.086 | 0.373 | 0.22 | 0.234 |
| Departure Headway (Hd) | 5.254 | 4.76 | 4.775 | 4.719 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 676 | 752 | 747 | 755 |
| Service Time | 3.333 | 2.819 | 2.84 | 2.783 |
| HCM Lane V/C Ratio | 0.087 | 0.375 | 0.222 | 0.236 |
| HCM Control Delay, s/veh | 8.8 | 10.7 | 9.2 | 9.2 |
| HCM Lane LOS | A | B | A | A |
| HCM 95th-tile Q | 0.3 | 1.7 | 0.8 | 0.9 |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 30 | 1247 | 1444 | 118 |
| Future Volume (vph) | 30 | 1247 | 1444 | 118 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 5.0 |
| Minimum Split (s) | 23.8 | 23.8 | 23.8 | 22.6 |
| Total Split (s) | 85.0 | 85.0 | 85.0 | 35.0 |
| Total Split (%) | 70.8% | 70.8% | 70.8% | 29.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | None |
| Act Effct Green (s) | 44.4 | 44.4 | 44.4 | 12.6 |
| Actuated g/C Ratio | 0.65 | 0.65 | 0.65 | 0.18 |
| v/c Ratio | 0.33 | 0.62 | 0.77 | 0.54 |
| Control Delay (s/veh) | 16.1 | 8.5 | 11.2 | 33.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 16.1 | 8.5 | 11.2 | 33.5 |
| LOS | B | A | B | C |
| Approach Delay (s/veh) | | 8.6 | 11.2 | 33.5 |
| Approach LOS | | A | B | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 68.2 | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.77 | |
| Intersection Signal Delay (s/veh): 11.3 | Intersection LOS: B |
| Intersection Capacity Utilization 63.2% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 19: Edison Av. & Cucamonga Av.

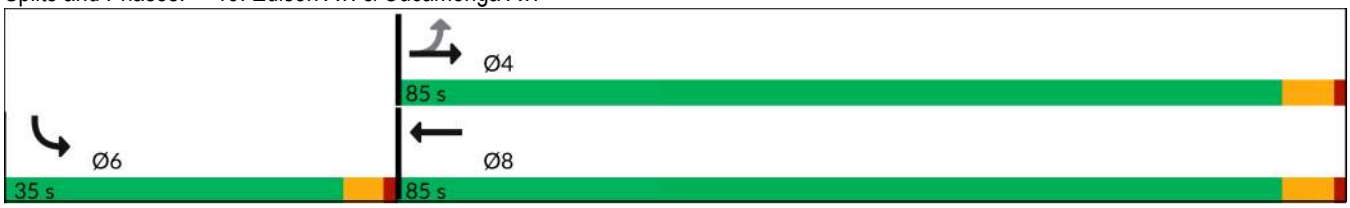

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 1247 | 1444 | 90 | 118 | 39 |
| Future Volume (veh/h) | 30 | 1247 | 1444 | 90 | 118 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 33 | 1355 | 1570 | 98 | 128 | 42 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 235 | 2296 | 2195 | 136 | 161 | 53 |
| Arrive On Green | 0.68 | 0.68 | 0.68 | 0.68 | 0.13 | 0.13 |
| Sat Flow, veh/h | 281 | 3455 | 3308 | 200 | 1226 | 402 |
| Grp Volume(v), veh/h | 33 | 1355 | 817 | 851 | 171 | 0 |
| Grp Sat Flow(s),veh/h/ln | 281 | 1683 | 1683 | 1736 | 1638 | 0 |
| Q Serve(g_s), s | 4.6 | 11.9 | 16.7 | 17.0 | 5.6 | 0.0 |
| Cycle Q Clear(g_c), s | 21.6 | 11.9 | 16.7 | 17.0 | 5.6 | 0.0 |
| Prop In Lane | 1.00 | | | 0.12 | 0.75 | 0.25 |
| Lane Grp Cap(c), veh/h | 235 | 2296 | 1148 | 1184 | 215 | 0 |
| V/C Ratio(X) | 0.14 | 0.59 | 0.71 | 0.72 | 0.80 | 0.00 |
| Avail Cap(c_a), veh/h | 444 | 4798 | 2399 | 2474 | 896 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 12.3 | 4.7 | 5.5 | 5.5 | 23.4 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.2 | 0.8 | 0.8 | 2.6 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 1.4 | 2.4 | 2.5 | 2.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 12.5 | 5.0 | 6.3 | 6.4 | 26.0 | 0.0 |
| LnGrp LOS | B | A | A | A | C | |
| Approach Vol, veh/h | | 1388 | 1668 | | 171 | |
| Approach Delay, s/veh | | 5.1 | 6.3 | | 26.0 | |
| Approach LOS | | A | A | | C | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 43.7 | | 11.9 | | 43.7 |
| Change Period (Y+Rc), s | | 5.8 | | 4.6 | | 5.8 |
| Max Green Setting (Gmax), s | | 79.2 | | 30.4 | | 79.2 |
| Max Q Clear Time (g_c+I1), s | | 23.6 | | 7.6 | | 19.0 |
| Green Ext Time (p_c), s | | 14.3 | | 0.2 | | 18.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 6.9 |
| HCM 7th LOS | A |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 5 | 432 | 514 | 1067 | 703 | 491 |
| Future Volume (vph) | 5 | 432 | 514 | 1067 | 703 | 491 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 29.0 | 29.0 | 30.0 | 61.0 | 31.0 | 31.0 |
| Total Split (%) | 32.2% | 32.2% | 33.3% | 67.8% | 34.4% | 34.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 24.0 | 24.0 | 24.4 | 54.4 | 24.2 | 24.2 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.27 | 0.60 | 0.27 | 0.27 |
| v/c Ratio | 0.76 | 0.97 | 1.28 | 0.56 | 0.83 | 0.66 |
| Control Delay (s/veh) | 43.5 | 61.6 | 158.8 | 6.2 | 39.9 | 7.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| Total Delay (s/veh) | 43.5 | 61.6 | 158.8 | 7.2 | 39.9 | 7.2 |
| LOS | D | E | F | A | D | A |
| Approach Delay (s/veh) | 53.9 | | | 56.5 | 26.5 | |
| Approach LOS | D | | | E | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 22 (24%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.28 | |
| Intersection Signal Delay (s/veh): 45.8 | Intersection LOS: D |
| Intersection Capacity Utilization 108.4% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

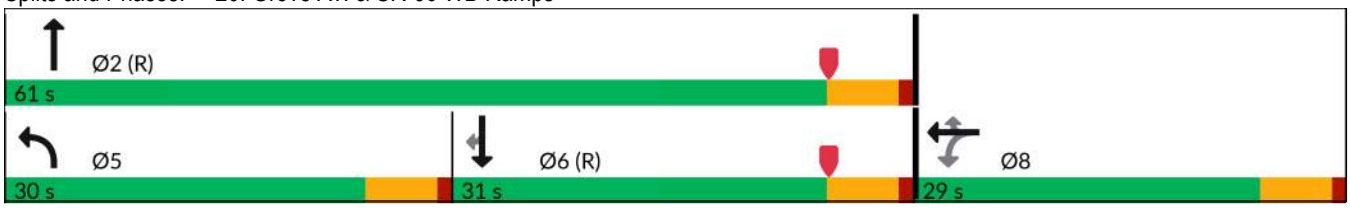

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 315 | 5 | 432 | 514 | 1067 | 0 | 0 | 703 | 491 |
| Future Volume (veh/h) | 0 | 0 | 0 | 315 | 5 | 432 | 514 | 1067 | 0 | 0 | 703 | 491 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 335 | 5 | 316 | 547 | 1135 | 0 | 0 | 748 | 377 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 390 | 6 | 352 | 429 | 2143 | 0 | 0 | 1020 | 455 |
| Arrive On Green | | | | 0.23 | 0.23 | 0.23 | 0.54 | 1.00 | 0.00 | 0.00 | 0.30 | 0.30 |
| Sat Flow, veh/h | | | | 1664 | 25 | 1502 | 1594 | 3455 | 0 | 0 | 3455 | 1502 |
| Grp Volume(v), veh/h | | | | 340 | 0 | 316 | 547 | 1135 | 0 | 0 | 748 | 377 |
| Grp Sat Flow(s),veh/h/ln | | | | 1689 | 0 | 1502 | 1594 | 1683 | 0 | 0 | 1683 | 1502 |
| Q Serve(g_s), s | | | | 17.4 | 0.0 | 18.4 | 24.2 | 0.0 | 0.0 | 0.0 | 17.9 | 21.0 |
| Cycle Q Clear(g_c), s | | | | 17.4 | 0.0 | 18.4 | 24.2 | 0.0 | 0.0 | 0.0 | 17.9 | 21.0 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 396 | 0 | 352 | 429 | 2143 | 0 | 0 | 1020 | 455 |
| V/C Ratio(X) | | | | 0.86 | 0.00 | 0.90 | 1.28 | 0.53 | 0.00 | 0.00 | 0.73 | 0.83 |
| Avail Cap(c_a), veh/h | | | | 435 | 0 | 387 | 429 | 2143 | 0 | 0 | 1020 | 455 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 33.0 | 0.0 | 33.4 | 20.8 | 0.0 | 0.0 | 0.0 | 28.1 | 29.2 |
| Incr Delay (d2), s/veh | | | | 14.2 | 0.0 | 21.1 | 126.1 | 0.1 | 0.0 | 0.0 | 4.7 | 15.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 8.2 | 0.0 | 8.3 | 19.8 | 0.0 | 0.0 | 0.0 | 7.3 | 9.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 47.2 | 0.0 | 54.5 | 146.9 | 0.1 | 0.0 | 0.0 | 32.8 | 45.0 |
| LnGrp LOS | | | | D | | D | F | A | | | C | D |
| Approach Vol, veh/h | | | | | 656 | | | 1682 | | | 1125 | |
| Approach Delay, s/veh | | | | | 50.7 | | | 47.8 | | | 36.9 | |
| Approach LOS | | | | | D | | | D | | | D | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 63.1 | | 30.0 | 33.1 | | 26.9 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 55.2 | | 24.2 | 25.2 | | 23.2 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 26.2 | 23.0 | | 20.4 |
| Green Ext Time (p_c), s | 7.6 | | 0.0 | 1.1 | | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 44.8 |
| HCM 7th LOS | D |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 2 | 276 | 1130 | 291 | 721 |
| Future Volume (vph) | 2 | 276 | 1130 | 291 | 721 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 39.2 | 17.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 43.6% | 18.9% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 26.2 | 26.2 | 33.4 | 12.8 | 51.2 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.37 | 0.14 | 0.57 |
| v/c Ratio | 0.94 | 0.51 | 1.37 | 1.34 | 0.39 |
| Control Delay (s/veh) | 61.5 | 12.9 | 199.1 | 198.8 | 26.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.5 | 12.9 | 199.1 | 198.8 | 26.4 |
| LOS | E | B | F | F | C |
| Approach Delay (s/veh) | 42.8 | | 199.1 | | 76.0 |
| Approach LOS | D | | F | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.37 | |
| Intersection Signal Delay (s/veh): 128.5 | Intersection LOS: F |
| Intersection Capacity Utilization 108.4% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 441 | 2 | 276 | 0 | 0 | 0 | 0 | 1130 | 497 | 291 | 721 | 0 |
| Future Volume (veh/h) | 441 | 2 | 276 | 0 | 0 | 0 | 0 | 1130 | 497 | 291 | 721 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 459 | 2 | 214 | | | | 0 | 1177 | 397 | 303 | 751 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 490 | 2 | 438 | | | | 0 | 939 | 309 | 213 | 1913 | 0 |
| Arrive On Green | 0.29 | 0.29 | 0.29 | | | | 0.00 | 0.38 | 0.38 | 0.27 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1681 | 7 | 1502 | | | | 0 | 2562 | 814 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 461 | 0 | 214 | | | | 0 | 792 | 782 | 303 | 751 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1502 | | | | 0 | 1683 | 1604 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 24.0 | 0.0 | 10.6 | | | | 0.0 | 34.2 | 34.2 | 12.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 24.0 | 0.0 | 10.6 | | | | 0.0 | 34.2 | 34.2 | 12.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 0.51 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 492 | 0 | 438 | | | | 0 | 639 | 609 | 213 | 1913 | 0 |
| V/C Ratio(X) | 0.94 | 0.00 | 0.49 | | | | 0.00 | 1.24 | 1.29 | 1.43 | 0.39 | 0.00 |
| Avail Cap(c_a), veh/h | 506 | 0 | 450 | | | | 0 | 639 | 609 | 213 | 1913 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.45 | 0.45 | 0.00 |
| Uniform Delay (d), s/veh | 31.1 | 0.0 | 26.3 | | | | 0.0 | 27.9 | 27.9 | 33.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 24.3 | 0.0 | 0.3 | | | | 0.0 | 120.7 | 140.8 | 203.6 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.3 | 0.0 | 3.6 | | | | 0.0 | 33.7 | 35.5 | 15.7 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 55.4 | 0.0 | 26.6 | | | | 0.0 | 148.6 | 168.7 | 236.6 | 0.3 | 0.0 |
| LnGrp LOS | E | | C | | | | | F | F | F | A | |
| Approach Vol, veh/h | | 675 | | | | | | 1574 | | | 1054 | |
| Approach Delay, s/veh | | 46.3 | | | | | | 158.6 | | | 68.2 | |
| Approach LOS | | D | | | | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 40.0 | | 33.0 | | 57.0 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 12.0 | 33.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 14.0 | 36.2 | | 26.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.3 | | 4.3 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 106.8 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 235 | 187 | 42 | 216 | 74 | 1091 | 78 | 766 |
| Future Volume (vph) | 235 | 187 | 42 | 216 | 74 | 1091 | 78 | 766 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 17.0 | 28.8 | 12.0 | 23.8 | 10.8 | 39.2 | 10.0 | 38.4 |
| Total Split (%) | 18.9% | 32.0% | 13.3% | 26.4% | 12.0% | 43.6% | 11.1% | 42.7% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.4 | 25.0 | 6.5 | 14.9 | 6.2 | 33.4 | 5.4 | 32.7 |
| Actuated g/C Ratio | 0.14 | 0.29 | 0.07 | 0.17 | 0.07 | 0.38 | 0.06 | 0.38 |
| v/c Ratio | 1.19 | 0.31 | 0.41 | 0.77 | 0.76 | 1.03 | 0.92 | 0.77 |
| Control Delay (s/veh) | 159.2 | 21.1 | 49.7 | 32.5 | 80.7 | 60.9 | 116.6 | 29.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 159.2 | 21.1 | 49.7 | 32.5 | 80.7 | 60.9 | 116.6 | 29.1 |
| LOS | F | C | D | C | F | E | F | C |
| Approach Delay (s/veh) | | 86.3 | | 34.0 | | 62.1 | | 36.6 |
| Approach LOS | | F | | C | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 87 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.19 | |
| Intersection Signal Delay (s/veh): 54.2 | Intersection LOS: D |
| Intersection Capacity Utilization 84.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

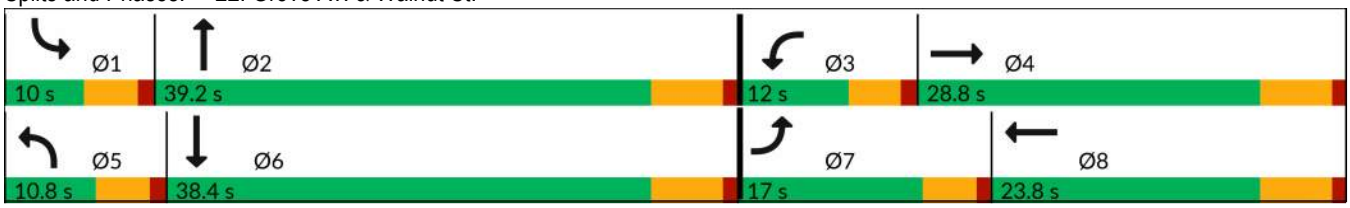

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 235 | 187 | 76 | 42 | 216 | 221 | 74 | 1091 | 56 | 78 | 766 | 70 |
| Future Volume (veh/h) | 235 | 187 | 76 | 42 | 216 | 221 | 74 | 1091 | 56 | 78 | 766 | 70 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 270 | 215 | 78 | 48 | 248 | 194 | 85 | 1254 | 55 | 90 | 880 | 40 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 227 | 670 | 236 | 63 | 313 | 235 | 105 | 1262 | 55 | 99 | 1247 | 57 |
| Arrive On Green | 0.14 | 0.27 | 0.27 | 0.04 | 0.17 | 0.17 | 0.07 | 0.38 | 0.38 | 0.06 | 0.38 | 0.38 |
| Sat Flow, veh/h | 1594 | 2439 | 858 | 1594 | 1827 | 1373 | 1594 | 3283 | 144 | 1594 | 3277 | 149 |
| Grp Volume(v), veh/h | 270 | 146 | 147 | 48 | 228 | 214 | 85 | 642 | 667 | 90 | 452 | 468 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1614 | 1594 | 1683 | 1516 | 1594 | 1683 | 1744 | 1594 | 1683 | 1743 |
| Q Serve(g_s), s | 12.4 | 6.0 | 6.3 | 2.6 | 11.3 | 11.9 | 4.6 | 33.0 | 33.1 | 4.9 | 19.8 | 19.8 |
| Cycle Q Clear(g_c), s | 12.4 | 6.0 | 6.3 | 2.6 | 11.3 | 11.9 | 4.6 | 33.0 | 33.1 | 4.9 | 19.8 | 19.8 |
| Prop In Lane | 1.00 | | 0.53 | 1.00 | | 0.91 | 1.00 | | 0.08 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 227 | 462 | 443 | 63 | 289 | 260 | 105 | 647 | 670 | 99 | 641 | 663 |
| V/C Ratio(X) | 1.19 | 0.32 | 0.33 | 0.76 | 0.79 | 0.82 | 0.81 | 0.99 | 0.99 | 0.91 | 0.71 | 0.71 |
| Avail Cap(c_a), veh/h | 227 | 462 | 443 | 136 | 349 | 314 | 114 | 647 | 670 | 99 | 641 | 663 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.3 | 25.0 | 25.1 | 41.3 | 34.5 | 34.7 | 40.0 | 26.6 | 26.7 | 40.5 | 22.8 | 22.8 |
| Incr Delay (d2), s/veh | 119.6 | 0.4 | 0.4 | 6.9 | 9.6 | 13.9 | 29.1 | 33.5 | 33.3 | 60.7 | 3.5 | 3.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.1 | 2.3 | 2.3 | 1.1 | 5.1 | 5.1 | 2.6 | 17.8 | 18.4 | 3.5 | 7.8 | 8.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 156.9 | 25.4 | 25.6 | 48.3 | 44.1 | 48.6 | 69.1 | 60.1 | 60.0 | 101.3 | 26.3 | 26.2 |
| LnGrp LOS | F | C | C | D | D | D | E | E | E | F | C | C |
| Approach Vol, veh/h | | 563 | | | 490 | | | 1394 | | | 1010 | |
| Approach Delay, s/veh | | 88.5 | | | 46.5 | | | 60.6 | | | 32.9 | |
| Approach LOS | | F | | | D | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.0 | 39.2 | 8.0 | 29.7 | 10.3 | 38.9 | 17.0 | 20.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 5.4 | 33.4 | 7.4 | 23.0 | 6.2 | 32.6 | 12.4 | 18.0 |
| Max Q Clear Time (g_c+I1), s | 6.9 | 35.1 | 4.6 | 8.3 | 6.6 | 21.8 | 14.4 | 13.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.3 | 0.0 | 4.1 | 0.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 55.1 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 165 | 558 | 25 | 740 | 44 | 863 | 105 | 626 | 158 |
| Future Volume (vph) | 165 | 558 | 25 | 740 | 44 | 863 | 105 | 626 | 158 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.0 | 35.1 | 6.2 | 24.1 | 7.2 | 22.9 | 9.4 | 27.0 | 27.0 |
| Actuated g/C Ratio | 0.13 | 0.41 | 0.07 | 0.28 | 0.08 | 0.27 | 0.11 | 0.31 | 0.31 |
| v/c Ratio | 0.89 | 0.91 | 0.24 | 1.03 | 0.36 | 2.10 | 0.66 | 1.24 | 0.30 |
| Control Delay (s/veh) | 80.9 | 47.4 | 44.1 | 70.5 | 46.1 | 524.8 | 56.8 | 150.6 | 7.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 80.9 | 47.4 | 44.1 | 70.5 | 46.1 | 524.8 | 56.8 | 150.6 | 7.9 |
| LOS | F | D | D | E | D | F | E | F | A |
| Approach Delay (s/veh) | | 54.7 | | 69.8 | | 502.5 | | 114.1 | |
| Approach LOS | | D | | E | | F | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 86.4 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.10 | |
| Intersection Signal Delay (s/veh): 194.5 | Intersection LOS: F |
| Intersection Capacity Utilization 112.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

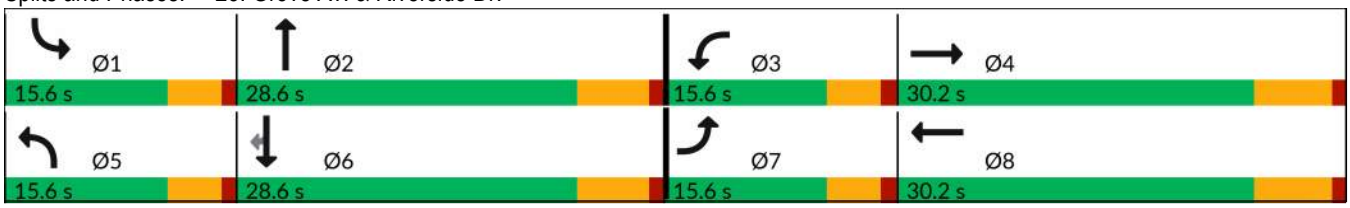

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 165 | 558 | 39 | 25 | 740 | 143 | 44 | 863 | 39 | 105 | 626 | 158 |
| Future Volume (veh/h) | 165 | 558 | 39 | 25 | 740 | 143 | 44 | 863 | 39 | 105 | 626 | 158 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 179 | 607 | 14 | 27 | 804 | 102 | 48 | 938 | 35 | 114 | 680 | 96 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 202 | 649 | 15 | 44 | 831 | 105 | 63 | 447 | 17 | 140 | 552 | 468 |
| Arrive On Green | 0.13 | 0.38 | 0.38 | 0.03 | 0.28 | 0.28 | 0.04 | 0.26 | 0.26 | 0.09 | 0.31 | 0.31 |
| Sat Flow, veh/h | 1594 | 1724 | 40 | 1594 | 3000 | 381 | 1594 | 1697 | 63 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 179 | 0 | 621 | 27 | 451 | 455 | 48 | 0 | 973 | 114 | 680 | 96 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1764 | 1594 | 1683 | 1697 | 1594 | 0 | 1761 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 9.6 | 0.0 | 29.3 | 1.5 | 22.9 | 22.9 | 2.6 | 0.0 | 22.8 | 6.1 | 27.0 | 4.1 |
| Cycle Q Clear(g_c), s | 9.6 | 0.0 | 29.3 | 1.5 | 22.9 | 22.9 | 2.6 | 0.0 | 22.8 | 6.1 | 27.0 | 4.1 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 0.22 | 1.00 | | 0.04 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 202 | 0 | 664 | 44 | 467 | 470 | 63 | 0 | 464 | 140 | 552 | 468 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.93 | 0.61 | 0.97 | 0.97 | 0.76 | 0.00 | 2.10 | 0.82 | 1.23 | 0.21 |
| Avail Cap(c_a), veh/h | 202 | 0 | 664 | 202 | 467 | 470 | 202 | 0 | 464 | 202 | 552 | 468 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.2 | 0.0 | 26.0 | 41.6 | 30.9 | 30.9 | 41.2 | 0.0 | 31.9 | 38.8 | 29.8 | 21.9 |
| Incr Delay (d2), s/veh | 32.8 | 0.0 | 20.5 | 5.1 | 33.1 | 33.0 | 6.9 | 0.0 | 501.9 | 10.0 | 119.6 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.3 | 0.0 | 14.5 | 0.6 | 12.7 | 12.8 | 1.1 | 0.0 | 73.5 | 2.6 | 28.8 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 69.9 | 0.0 | 46.5 | 46.7 | 64.0 | 63.9 | 48.1 | 0.0 | 533.8 | 48.8 | 149.4 | 22.1 |
| LnGrp LOS | E | | D | D | E | E | D | | F | D | F | C |
| Approach Vol, veh/h | | 800 | | | 933 | | | 1021 | | | 890 | |
| Approach Delay, s/veh | | 51.8 | | | 63.5 | | | 511.0 | | | 122.8 | |
| Approach LOS | | D | | | E | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.2 | 28.6 | 7.0 | 38.8 | 8.0 | 32.8 | 15.6 | 30.2 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 8.1 | 24.8 | 3.5 | 31.3 | 4.6 | 29.0 | 11.6 | 24.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 200.8 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 514.9 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 73 | 148 | 43 | 27 | 301 | 63 | 64 | 815 | 34 | 38 | 653 | 13 |
| Future Vol, veh/h | 73 | 148 | 43 | 27 | 301 | 63 | 64 | 815 | 34 | 38 | 653 | 13 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 85 | 172 | 50 | 31 | 350 | 73 | 74 | 948 | 40 | 44 | 759 | 15 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 73.4 | 146.6 | 792.6 | 524.8 |
| HCM LOS | F | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 7% | 28% | 7% | 5% |
| Vol Thru, % | 89% | 56% | 77% | 93% |
| Vol Right, % | 4% | 16% | 16% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 913 | 264 | 391 | 704 |
| LT Vol | 64 | 73 | 27 | 38 |
| Through Vol | 815 | 148 | 301 | 653 |
| RT Vol | 34 | 43 | 63 | 13 |
| Lane Flow Rate | 1062 | 307 | 455 | 819 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 2.684 | 0.818 | 1.14 | 2.071 |
| Departure Headway (Hd) | 12.462 | 18.739 | 16.051 | 14.051 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 308 | 196 | 232 | 270 |
| Service Time | 10.462 | 16.739 | 14.051 | 12.051 |
| HCM Lane V/C Ratio | 3.448 | 1.566 | 1.961 | 3.033 |
| HCM Control Delay, s/veh | 792.6 | 73.4 | 146.6 | 524.8 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 65.3 | 5.8 | 11.9 | 39.4 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 282.9 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 38 | 67 | 19 | 12 | 123 | 23 | 59 | 860 | 6 | 23 | 657 | 25 |
| Future Vol, veh/h | 38 | 67 | 19 | 12 | 123 | 23 | 59 | 860 | 6 | 23 | 657 | 25 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 76 | 22 | 14 | 140 | 26 | 67 | 977 | 7 | 26 | 747 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 18 | 19 | 412 | 219.3 |
| HCM LOS | C | C | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 6% | 31% | 8% | 3% |
| Vol Thru, % | 93% | 54% | 78% | 93% |
| Vol Right, % | 1% | 15% | 15% | 4% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 925 | 124 | 158 | 705 |
| LT Vol | 59 | 38 | 12 | 23 |
| Through Vol | 860 | 67 | 123 | 657 |
| RT Vol | 6 | 19 | 23 | 25 |
| Lane Flow Rate | 1051 | 141 | 180 | 801 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.861 | 0.313 | 0.383 | 1.413 |
| Departure Headway (Hd) | 6.994 | 10.335 | 9.957 | 7.53 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 526 | 351 | 364 | 489 |
| Service Time | 4.994 | 8.335 | 7.957 | 5.53 |
| HCM Lane V/C Ratio | 1.998 | 0.402 | 0.495 | 1.638 |
| HCM Control Delay, s/veh | 412 | 18 | 19 | 219.3 |
| HCM Lane LOS | F | C | C | F |
| HCM 95th-tile Q | 61.3 | 1.3 | 1.8 | 32.5 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 250 | 777 | 203 | 179 | 914 | 278 | 252 | 388 | 208 | 364 |
| Future Volume (vph) | 250 | 777 | 203 | 179 | 914 | 278 | 252 | 388 | 208 | 364 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 23.0 | 29.4 | 29.4 | 21.6 | 28.0 | 28.0 | 23.0 | 49.0 | 20.0 | 46.0 |
| Total Split (%) | 19.2% | 24.5% | 24.5% | 18.0% | 23.3% | 23.3% | 19.2% | 40.8% | 16.7% | 38.3% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 18.4 | 23.8 | 23.8 | 16.8 | 22.2 | 22.2 | 18.4 | 43.6 | 15.4 | 40.6 |
| Actuated g/C Ratio | 0.15 | 0.20 | 0.20 | 0.14 | 0.19 | 0.19 | 0.15 | 0.36 | 0.13 | 0.34 |
| v/c Ratio | 1.17 | 1.33 | 0.48 | 0.92 | 1.68 | 0.59 | 1.18 | 1.10 | 1.16 | 1.10 |
| Control Delay (s/veh) | 157.5 | 196.5 | 8.8 | 93.6 | 343.0 | 9.6 | 160.2 | 102.9 | 159.9 | 105.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 157.5 | 196.5 | 8.8 | 93.6 | 343.0 | 9.6 | 160.2 | 102.9 | 159.9 | 105.5 |
| LOS | F | F | A | F | F | A | F | F | F | F |
| Approach Delay (s/veh) | | 157.6 | | | 242.9 | | | 119.8 | | 120.2 |
| Approach LOS | | F | | | F | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.68 | |
| Intersection Signal Delay (s/veh): 170.8 | Intersection LOS: F |
| Intersection Capacity Utilization 107.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 250 | 777 | 203 | 179 | 914 | 278 | 252 | 388 | 216 | 208 | 364 | 198 |
| Future Volume (veh/h) | 250 | 777 | 203 | 179 | 914 | 278 | 252 | 388 | 216 | 208 | 364 | 198 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 284 | 883 | 117 | 203 | 1039 | 168 | 286 | 441 | 131 | 236 | 414 | 123 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 248 | 676 | 301 | 226 | 631 | 281 | 248 | 466 | 138 | 207 | 431 | 128 |
| Arrive On Green | 0.16 | 0.30 | 0.20 | 0.14 | 0.28 | 0.19 | 0.16 | 0.53 | 0.35 | 0.13 | 0.49 | 0.33 |
| Sat Flow, veh/h | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 | 1594 | 1312 | 390 | 1594 | 1308 | 388 |
| Grp Volume(v), veh/h | 284 | 883 | 117 | 203 | 1039 | 168 | 286 | 0 | 572 | 236 | 0 | 537 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 | 1594 | 0 | 1702 | 1594 | 0 | 1696 |
| Q Serve(g_s), s | 18.4 | 23.8 | 8.0 | 14.8 | 22.2 | 12.1 | 18.4 | 0.0 | 37.9 | 15.4 | 0.0 | 36.3 |
| Cycle Q Clear(g_c), s | 18.4 | 23.8 | 8.0 | 14.8 | 22.2 | 12.1 | 18.4 | 0.0 | 37.9 | 15.4 | 0.0 | 36.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.23 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 248 | 676 | 301 | 226 | 631 | 281 | 248 | 0 | 604 | 207 | 0 | 559 |
| V/C Ratio(X) | 1.15 | 1.31 | 0.39 | 0.90 | 1.65 | 0.60 | 1.16 | 0.00 | 0.95 | 1.14 | 0.00 | 0.96 |
| Avail Cap(c_a), veh/h | 248 | 676 | 301 | 229 | 631 | 281 | 248 | 0 | 626 | 207 | 0 | 581 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.0 | 41.4 | 41.0 | 50.0 | 42.6 | 44.0 | 50.0 | 0.0 | 29.0 | 51.5 | 0.0 | 31.4 |
| Incr Delay (d2), s/veh | 102.7 | 148.4 | 0.8 | 33.2 | 298.0 | 3.4 | 105.6 | 0.0 | 23.3 | 104.9 | 0.0 | 27.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 14.2 | 22.5 | 3.0 | 7.9 | 34.3 | 4.7 | 14.4 | 0.0 | 16.5 | 12.0 | 0.0 | 16.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 152.7 | 189.8 | 41.8 | 83.1 | 340.6 | 47.4 | 155.6 | 0.0 | 52.3 | 156.4 | 0.0 | 58.7 |
| LnGrp LOS | F | F | D | F | F | D | F | | D | F | | E |
| Approach Vol, veh/h | | 1284 | | | 1410 | | | 858 | | | 773 | |
| Approach Delay, s/veh | | 168.1 | | | 268.6 | | | 86.7 | | | 88.5 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.0 | 47.4 | 21.4 | 29.6 | 23.0 | 44.4 | 23.0 | 28.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 15.4 | 43.6 | 17.0 | 23.6 | 18.4 | 40.6 | 18.4 | 22.2 |
| Max Q Clear Time (g_c+I1), s | 17.4 | 39.9 | 16.8 | 25.8 | 20.4 | 38.3 | 20.4 | 24.2 |
| Green Ext Time (p_c), s | 0.0 | 1.2 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 170.5 |
| HCM 7th LOS | F |

**Notes**

User approved pedestrian interval to be less than phase max green.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 41.6 |
| Intersection LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 14 | 113 | 3 | 3 | 261 | 307 | 2 | 48 | 2 | 354 | 66 | 34 |
| Future Vol, veh/h | 14 | 113 | 3 | 3 | 261 | 307 | 2 | 48 | 2 | 354 | 66 | 34 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 15 | 120 | 3 | 3 | 278 | 327 | 2 | 51 | 2 | 377 | 70 | 36 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 12.7 | 54.1 | 11.6 | 37.7 |
| HCM LOS | B | F | B | E |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 4% | 11% | 1% | 78% |
| Vol Thru, % | 92% | 87% | 46% | 15% |
| Vol Right, % | 4% | 2% | 54% | 7% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 52 | 130 | 571 | 454 |
| LT Vol | 2 | 14 | 3 | 354 |
| Through Vol | 48 | 113 | 261 | 66 |
| RT Vol | 2 | 3 | 307 | 34 |
| Lane Flow Rate | 55 | 138 | 607 | 483 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.115 | 0.271 | 0.975 | 0.864 |
| Departure Headway (Hd) | 7.498 | 7.044 | 5.779 | 6.443 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 475 | 508 | 626 | 560 |
| Service Time | 5.587 | 5.115 | 3.824 | 4.496 |
| HCM Lane V/C Ratio | 0.116 | 0.272 | 0.97 | 0.863 |
| HCM Control Delay, s/veh | 11.6 | 12.7 | 54.1 | 37.7 |
| HCM Lane LOS | B | B | F | E |
| HCM 95th-tile Q | 0.4 | 1.1 | 14.1 | 9.5 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.9 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 30 | 1277 | 1482 | 30 | 39 | 39 |
| Future Vol, veh/h | 30 | 1277 | 1482 | 30 | 39 | 39 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 2 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 33 | 1388 | 1611 | 33 | 42 | 42 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1643 | 0 | - | 0 | 2386 | 1627 |
| Stage 1 | - | - | - | - | 1627 | - |
| Stage 2 | - | - | - | - | 759 | - |
| Critical Hdwy | 4.13 | - | - | - | 6.63 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | 6.3 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 6.5 | - |
| Follow-up Hdwy | 2.219 | - | - | - | 3.5 | 3.319 |
| Pot Cap-1 Maneuver | 392 | - | - | - | ~ 33 | 125 |
| Stage 1 | - | - | - | - | 119 | - |
| Stage 2 | - | - | - | - | 369 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 392 | - | - | - | ~ 28 | 125 |
| Mov Cap-2 Maneuver | - | - | - | - | 95 | - |
| Stage 1 | - | - | - | - | 103 | - |
| Stage 2 | - | - | - | - | 369 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 2.25 | 0 | 108.88 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 83 | - | - | - | 108 |
| HCM Lane V/C Ratio | 0.083 | - | - | - | 0.785 |
| HCM Control Delay (s/veh) | 15 | 1.9 | - | - | 108.9 |
| HCM Lane LOS | C | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.3 | - | - | - | 4.4 |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 18 | 599 | 74 | 81 | 770 | 18 | 103 | 34 | 169 | 12 | 25 | 42 |
| Future Vol, veh/h | 18 | 599 | 74 | 81 | 770 | 18 | 103 | 34 | 169 | 12 | 25 | 42 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 20 | 666 | 82 | 90 | 856 | 20 | 114 | 38 | 188 | 13 | 28 | 47 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 882 | 0 | 0 | 748 | 0 | 0 | 1368 | 1808 | 374 | 1443 | 1839 | 444 |
| Stage 1 | - | - | - | - | - | - | 747 | 747 | - | 1052 | 1052 | - |
| Stage 2 | - | - | - | - | - | - | 622 | 1062 | - | 392 | 788 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 6.5 | 6.54 | 6.94 | 6.5 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 5.5 | 5.54 | - | 5.5 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 5.5 | 5.54 | - | 5.5 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 763 | - | - | 857 | - | - | 157 | 78 | 624 | 141 | 75 | 562 |
| Stage 1 | - | - | - | - | - | - | 461 | 418 | - | 328 | 302 | - |
| Stage 2 | - | - | - | - | - | - | 528 | 298 | - | 677 | 401 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 758 | - | - | 857 | - | - | ~ 110 | 68 | 624 | 71 | 65 | 558 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 289 | 207 | - | 218 | 199 | - |
| Stage 1 | - | - | - | - | - | - | 448 | 407 | - | 292 | 268 | - |
| Stage 2 | - | - | - | - | - | - | 388 | 266 | - | 418 | 390 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.26 | 0.9 | 53.79 | 21.22 |
| HCM LOS | | | F | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 386 | 758 | - | - | 857 | - | - | 309 |
| HCM Lane V/C Ratio | 0.88 | 0.026 | - | - | 0.105 | - | - | 0.284 |
| HCM Control Delay (s/veh) | 53.8 | 9.9 | - | - | 9.7 | - | - | 21.2 |
| HCM Lane LOS | F | A | - | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 8.8 | 0.1 | - | - | 0.4 | - | - | 1.1 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.7 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 37 | 17 | 39 | 20 | 25 | 5 | 92 | 310 | 28 | 16 | 169 | 44 |
| Future Vol, veh/h | 37 | 17 | 39 | 20 | 25 | 5 | 92 | 310 | 28 | 16 | 169 | 44 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 19 | 43 | 22 | 27 | 5 | 101 | 341 | 31 | 18 | 186 | 48 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 9.7 | 9.5 | 14.9 | 10.4 |
| HCM LOS | A | A | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 21% | 40% | 40% | 7% |
| Vol Thru, % | 72% | 18% | 50% | 74% |
| Vol Right, % | 7% | 42% | 10% | 19% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 430 | 93 | 50 | 229 |
| LT Vol | 92 | 37 | 20 | 16 |
| Through Vol | 310 | 17 | 25 | 169 |
| RT Vol | 28 | 39 | 5 | 44 |
| Lane Flow Rate | 473 | 102 | 55 | 252 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.612 | 0.159 | 0.09 | 0.336 |
| Departure Headway (Hd) | 4.66 | 5.603 | 5.896 | 4.804 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 765 | 644 | 611 | 740 |
| Service Time | 2.737 | 3.606 | 3.901 | 2.895 |
| HCM Lane V/C Ratio | 0.618 | 0.158 | 0.09 | 0.341 |
| HCM Control Delay, s/veh | 14.9 | 9.7 | 9.5 | 10.4 |
| HCM Lane LOS | B | A | A | B |
| HCM 95th-tile Q | 4.2 | 0.6 | 0.3 | 1.5 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 37 | 853 | 311 | 135 | 903 | 387 | 255 | 73 | 100 |
| Future Volume (vph) | 37 | 853 | 311 | 135 | 903 | 387 | 255 | 73 | 100 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 9.8 | 40.0 | 40.0 | 17.0 | 47.2 | 38.0 | 49.2 | 13.8 | 25.0 |
| Total Split (%) | 8.2% | 33.3% | 33.3% | 14.2% | 39.3% | 31.7% | 41.0% | 11.5% | 20.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.2 | 35.5 | 35.5 | 12.2 | 44.6 | 32.2 | 41.5 | 8.4 | 15.3 |
| Actuated g/C Ratio | 0.05 | 0.31 | 0.31 | 0.11 | 0.39 | 0.28 | 0.36 | 0.07 | 0.13 |
| v/c Ratio | 0.56 | 1.68 | 0.57 | 0.87 | 1.63 | 0.94 | 0.74 | 0.68 | 0.70 |
| Control Delay (s/veh) | 83.8 | 343.4 | 19.5 | 93.5 | 317.7 | 70.8 | 38.4 | 81.2 | 57.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 83.8 | 343.4 | 19.5 | 93.5 | 317.7 | 70.8 | 38.4 | 81.2 | 57.5 |
| LOS | F | F | B | F | F | E | D | F | E |
| Approach Delay (s/veh) | | 251.6 | | | 291.5 | | 53.9 | | 65.1 |
| Approach LOS | | F | | | F | | D | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.7 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.68 | |
| Intersection Signal Delay (s/veh): 205.6 | Intersection LOS: F |
| Intersection Capacity Utilization 111.0% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 37 | 853 | 311 | 135 | 903 | 120 | 387 | 255 | 167 | 73 | 100 | 53 |
| Future Volume (veh/h) | 37 | 853 | 311 | 135 | 903 | 120 | 387 | 255 | 167 | 73 | 100 | 53 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 40 | 927 | 229 | 147 | 982 | 103 | 421 | 277 | 139 | 79 | 109 | 47 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 52 | 580 | 491 | 172 | 635 | 67 | 445 | 368 | 185 | 98 | 135 | 58 |
| Arrive On Green | 0.03 | 0.33 | 0.33 | 0.11 | 0.40 | 0.40 | 0.28 | 0.33 | 0.33 | 0.06 | 0.12 | 0.12 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1577 | 165 | 1594 | 1104 | 554 | 1594 | 1169 | 504 |
| Grp Volume(v), veh/h | 40 | 927 | 229 | 147 | 0 | 1085 | 421 | 0 | 416 | 79 | 0 | 156 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1742 | 1594 | 0 | 1658 | 1594 | 0 | 1673 |
| Q Serve(g_s), s | 2.7 | 35.4 | 13.1 | 9.8 | 0.0 | 43.6 | 28.0 | 0.0 | 24.1 | 5.3 | 0.0 | 9.8 |
| Cycle Q Clear(g_c), s | 2.7 | 35.4 | 13.1 | 9.8 | 0.0 | 43.6 | 28.0 | 0.0 | 24.1 | 5.3 | 0.0 | 9.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.09 | 1.00 | | 0.33 | 1.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | 52 | 580 | 491 | 172 | 0 | 702 | 445 | 0 | 553 | 98 | 0 | 193 |
| V/C Ratio(X) | 0.78 | 1.60 | 0.47 | 0.85 | 0.00 | 1.55 | 0.95 | 0.00 | 0.75 | 0.81 | 0.00 | 0.81 |
| Avail Cap(c_a), veh/h | 77 | 580 | 491 | 183 | 0 | 702 | 492 | 0 | 683 | 136 | 0 | 315 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 52.0 | 36.4 | 28.9 | 47.4 | 0.0 | 32.3 | 38.2 | 0.0 | 32.1 | 50.2 | 0.0 | 46.7 |
| Incr Delay (d2), s/veh | 13.0 | 277.6 | 0.7 | 27.7 | 0.0 | 253.0 | 25.3 | 0.0 | 3.7 | 15.4 | 0.0 | 7.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 59.3 | 4.7 | 5.1 | 0.0 | 66.5 | 13.2 | 0.0 | 9.5 | 2.4 | 0.0 | 4.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 65.0 | 314.0 | 29.6 | 75.1 | 0.0 | 285.3 | 63.5 | 0.0 | 35.8 | 65.6 | 0.0 | 54.4 |
| LnGrp LOS | E | F | C | E | | F | E | | D | E | | D |
| Approach Vol, veh/h | | 1196 | | | 1232 | | | 837 | | | 235 | |
| Approach Delay, s/veh | | 251.2 | | | 260.2 | | | 49.7 | | | 58.2 | |
| Approach LOS | | F | | | F | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.2 | 40.7 | 16.3 | 40.0 | 34.8 | 17.1 | 8.1 | 48.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.2 | 44.6 | 12.4 | 35.4 | 33.4 | 20.4 | 5.2 | 42.6 |
| Max Q Clear Time (g_c+I1), s | 7.3 | 26.1 | 11.8 | 37.4 | 30.0 | 11.8 | 4.7 | 45.6 |
| Green Ext Time (p_c), s | 0.0 | 2.1 | 0.0 | 0.0 | 0.2 | 0.4 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 193.3 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 40 | 276 | 602 | 256 | 74 | 59 |
| Future Vol, veh/h | 40 | 276 | 602 | 256 | 74 | 59 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 42 | 288 | 627 | 267 | 77 | 61 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 896 | 0 | - | 0 | 1133 | 762 |
| Stage 1 | - | - | - | - | 762 | - |
| Stage 2 | - | - | - | - | 371 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 758 | - | - | - | 224 | 405 |
| Stage 1 | - | - | - | - | 461 | - |
| Stage 2 | - | - | - | - | 698 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 756 | - | - | - | 209 | 404 |
| Mov Cap-2 Maneuver | - | - | - | - | 329 | - |
| Stage 1 | - | - | - | - | 430 | - |
| Stage 2 | - | - | - | - | 697 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 1.27 | 0 | 21.22 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 228 | - | - | - | 359 |
| HCM Lane V/C Ratio | 0.055 | - | - | - | 0.386 |
| HCM Control Delay (s/veh) | 10 | 0 | - | - | 21.2 |
| HCM Lane LOS | B | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.2 | - | - | - | 1.8 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 376 | 2 | 347 | 638 | 1024 | 477 | 87 |
| Future Volume (vph) | 376 | 2 | 347 | 638 | 1024 | 477 | 87 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 23.0 | 23.0 | 23.0 | 27.0 | 67.0 | 40.0 | 40.0 |
| Total Split (%) | 25.6% | 25.6% | 25.6% | 30.0% | 74.4% | 44.4% | 44.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 22.0 | 22.0 | 22.0 | 25.3 | 56.4 | 26.2 | 26.2 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.24 | 0.28 | 0.63 | 0.29 | 0.29 |
| v/c Ratio | 0.73 | 0.67 | 0.55 | 0.84 | 0.36 | 0.29 | 0.18 |
| Control Delay (s/veh) | 45.2 | 35.2 | 18.7 | 40.6 | 5.5 | 25.8 | 4.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.2 | 35.2 | 18.7 | 40.6 | 5.5 | 25.8 | 4.9 |
| LOS | D | D | B | D | A | C | A |
| Approach Delay (s/veh) | | 33.5 | | | 19.0 | 22.5 | |
| Approach LOS | | C | | | B | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 57.6 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 23.2 | Intersection LOS: C |
| Intersection Capacity Utilization 77.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

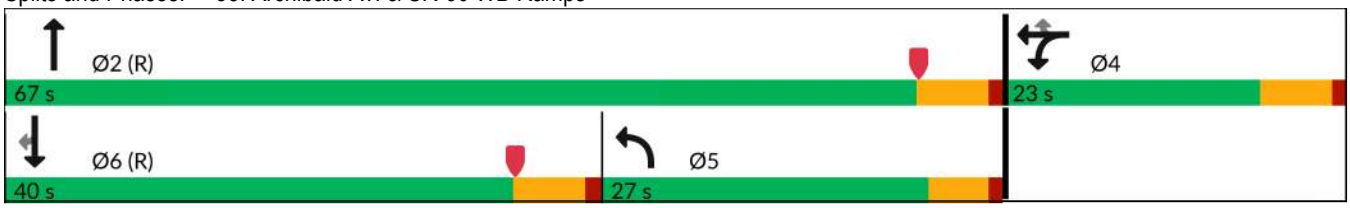

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 376 | 2 | 347 | 638 | 1024 | 0 | 0 | 477 | 87 |
| Future Volume (veh/h) | 0 | 0 | 0 | 376 | 2 | 347 | 638 | 1024 | 0 | 0 | 477 | 87 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1575 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 452 | 0 | 110 | 679 | 1089 | 0 | 0 | 507 | 62 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 532 | 0 | 251 | 1452 | 3407 | 0 | 0 | 859 | 204 |
| Arrive On Green | | | | 0.17 | 0.00 | 0.17 | 0.50 | 0.70 | 0.00 | 0.00 | 0.14 | 0.14 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1502 | 2910 | 4997 | 0 | 0 | 6343 | 1451 |
| Grp Volume(v), veh/h | | | | 452 | 0 | 110 | 679 | 1089 | 0 | 0 | 507 | 62 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1502 | 1455 | 1612 | 0 | 0 | 1524 | 1451 |
| Q Serve(g_s), s | | | | 12.4 | 0.0 | 5.9 | 13.7 | 7.7 | 0.0 | 0.0 | 7.0 | 3.5 |
| Cycle Q Clear(g_c), s | | | | 12.4 | 0.0 | 5.9 | 13.7 | 7.7 | 0.0 | 0.0 | 7.0 | 3.5 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 532 | 0 | 251 | 1452 | 3407 | 0 | 0 | 859 | 204 |
| V/C Ratio(X) | | | | 0.85 | 0.00 | 0.44 | 0.47 | 0.32 | 0.00 | 0.00 | 0.59 | 0.30 |
| Avail Cap(c_a), veh/h | | | | 609 | 0 | 287 | 1452 | 3407 | 0 | 0 | 2316 | 551 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.88 | 0.88 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 36.4 | 0.0 | 33.7 | 14.7 | 5.1 | 0.0 | 0.0 | 36.2 | 34.7 |
| Incr Delay (d2), s/veh | | | | 9.9 | 0.0 | 1.2 | 0.1 | 0.2 | 0.0 | 0.0 | 3.0 | 3.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.3 | 0.0 | 5.1 | 4.0 | 1.9 | 0.0 | 0.0 | 2.7 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 46.3 | 0.0 | 34.9 | 14.8 | 5.3 | 0.0 | 0.0 | 39.2 | 38.5 |
| LnGrp LOS | | | | D | | C | B | A | | | D | D |
| Approach Vol, veh/h | | | | | 562 | | | 1768 | | | 569 | |
| Approach Delay, s/veh | | | | | 44.1 | | | 9.0 | | | 39.1 | |
| Approach LOS | | | | | D | | | A | | | D | |

| Timer - Assigned Phs | 2 | 4 | 5 | 6 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 69.2 | 20.8 | 50.7 | 18.5 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 61.2 | 17.2 | 22.0 | * 34 |
| Max Q Clear Time (g_c+I1), s | 9.7 | 14.4 | 15.7 | 9.0 |
| Green Ext Time (p_c), s | 8.9 | 0.6 | 0.9 | 3.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.7 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 263 | 2 | 315 | 1389 | 706 | 135 | 701 |
| Future Volume (vph) | 263 | 2 | 315 | 1389 | 706 | 135 | 701 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 52.0 | 52.0 | 11.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 57.8% | 57.8% | 12.2% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 17.4 | 17.4 | 17.4 | 49.0 | 49.0 | 7.0 | 61.0 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.19 | 0.54 | 0.54 | 0.08 | 0.68 |
| v/c Ratio | 0.73 | 0.55 | 0.45 | 0.44 | 0.65 | 0.62 | 0.22 |
| Control Delay (s/veh) | 48.3 | 20.6 | 8.0 | 13.3 | 4.0 | 65.9 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.3 | 20.6 | 8.0 | 13.3 | 4.0 | 65.9 | 0.8 |
| LOS | D | C | A | B | A | E | A |
| Approach Delay (s/veh) | | 26.3 | | 10.2 | | | 11.4 |
| Approach LOS | | C | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 57.6 (64%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.73 | |
| Intersection Signal Delay (s/veh): 13.1 | Intersection LOS: B |
| Intersection Capacity Utilization 77.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

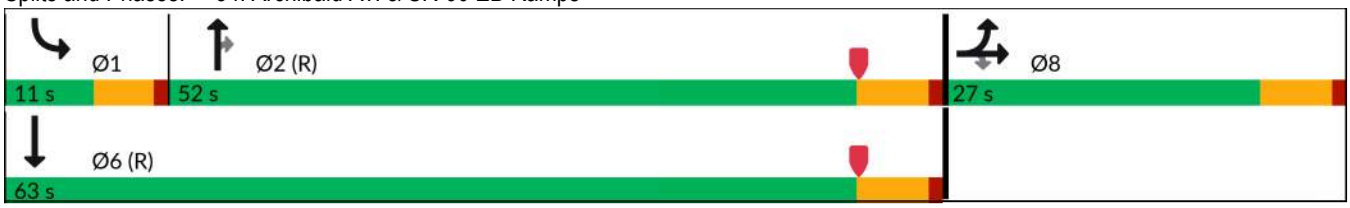

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 263 | 2 | 315 | 0 | 0 | 0 | 0 | 1389 | 706 | 135 | 701 | 0 |
| Future Volume (veh/h) | 263 | 2 | 315 | 0 | 0 | 0 | 0 | 1389 | 706 | 135 | 701 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1575 | 1772 | 0 |
| Adj Flow Rate, veh/h | 328 | 0 | 114 | | | | 0 | 1447 | 611 | 141 | 730 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 427 | 0 | 201 | | | | 0 | 3748 | 922 | 194 | 3566 | 0 |
| Arrive On Green | 0.13 | 0.00 | 0.13 | | | | 0.00 | 0.61 | 0.61 | 0.13 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3188 | 0 | 1502 | | | | 0 | 6343 | 1499 | 2910 | 4997 | 0 |
| Grp Volume(v), veh/h | 328 | 0 | 114 | | | | 0 | 1447 | 611 | 141 | 730 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1524 | 1499 | 1455 | 1612 | 0 |
| Q Serve(g_s), s | 8.9 | 0.0 | 6.4 | | | | 0.0 | 10.8 | 23.8 | 4.2 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 8.9 | 0.0 | 6.4 | | | | 0.0 | 10.8 | 23.8 | 4.2 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 427 | 0 | 201 | | | | 0 | 3748 | 922 | 194 | 3566 | 0 |
| V/C Ratio(X) | 0.77 | 0.00 | 0.57 | | | | 0.00 | 0.39 | 0.66 | 0.73 | 0.20 | 0.00 |
| Avail Cap(c_a), veh/h | 751 | 0 | 354 | | | | 0 | 3748 | 922 | 194 | 3566 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.90 | 0.90 | 0.00 |
| Uniform Delay (d), s/veh | 37.6 | 0.0 | 36.5 | | | | 0.0 | 8.8 | 11.3 | 38.2 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.9 | 0.0 | 2.5 | | | | 0.0 | 0.3 | 3.7 | 10.2 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 0.0 | 2.4 | | | | 0.0 | 2.8 | 7.0 | 1.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.5 | 0.0 | 39.0 | | | | 0.0 | 9.1 | 15.0 | 48.4 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | A | B | D | A | |
| Approach Vol, veh/h | | 442 | | | | | | 2058 | | | 871 | |
| Approach Delay, s/veh | | 40.1 | | | | | | 10.8 | | | 7.9 | |
| Approach LOS | | D | | | | | | B | | | A | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 61.1 | | | | 72.1 | | 17.9 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 46.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 6.2 | 25.8 | | | | 2.0 | | 10.9 | | | | |
| Green Ext Time (p_c), s | 0.0 | 12.2 | | | | 5.1 | | 1.1 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 13.9 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 168 | 418 | 161 | 123 | 547 | 274 | 267 | 1233 | 153 | 514 |
| Future Volume (vph) | 168 | 418 | 161 | 123 | 547 | 274 | 267 | 1233 | 153 | 514 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.9 | 28.1 | 28.1 | 11.6 | 24.8 | 24.8 | 22.2 | 28.7 | 15.5 | 22.0 |
| Actuated g/C Ratio | 0.15 | 0.27 | 0.27 | 0.11 | 0.24 | 0.24 | 0.22 | 0.28 | 0.15 | 0.21 |
| v/c Ratio | 0.79 | 0.49 | 0.33 | 0.74 | 0.73 | 0.51 | 0.84 | 1.06 | 0.69 | 0.71 |
| Control Delay (s/veh) | 68.8 | 33.5 | 6.3 | 71.7 | 42.0 | 7.2 | 63.2 | 79.6 | 57.8 | 38.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 68.8 | 33.5 | 6.3 | 71.7 | 42.0 | 7.2 | 63.2 | 79.6 | 57.8 | 38.5 |
| LOS | E | C | A | E | D | A | E | E | E | D |
| Approach Delay (s/veh) | | 35.6 | | | 35.8 | | | 76.8 | | 42.1 |
| Approach LOS | | D | | | D | | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 102.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.06 | |
| Intersection Signal Delay (s/veh): 52.8 | Intersection LOS: D |
| Intersection Capacity Utilization 80.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

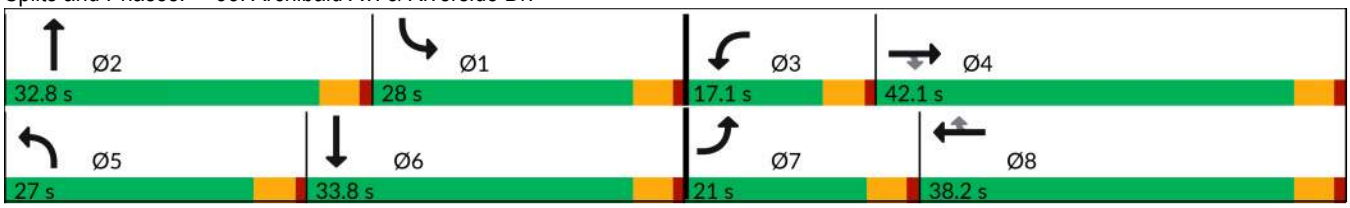

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 168 | 418 | 161 | 123 | 547 | 274 | 267 | 1233 | 86 | 153 | 514 | 169 |
| Future Volume (veh/h) | 168 | 418 | 161 | 123 | 547 | 274 | 267 | 1233 | 86 | 153 | 514 | 169 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 181 | 449 | 118 | 132 | 588 | 212 | 287 | 1326 | 91 | 165 | 553 | 121 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 211 | 910 | 398 | 159 | 800 | 353 | 318 | 1415 | 97 | 196 | 914 | 196 |
| Arrive On Green | 0.13 | 0.27 | 0.27 | 0.10 | 0.24 | 0.24 | 0.20 | 0.31 | 0.31 | 0.12 | 0.23 | 0.23 |
| Sat Flow, veh/h | 1594 | 3367 | 1471 | 1594 | 3367 | 1486 | 1594 | 4620 | 317 | 1594 | 3982 | 852 |
| Grp Volume(v), veh/h | 181 | 449 | 118 | 132 | 588 | 212 | 287 | 925 | 492 | 165 | 446 | 228 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1471 | 1594 | 1683 | 1486 | 1594 | 1612 | 1713 | 1594 | 1612 | 1609 |
| Q Serve(g_s), s | 10.2 | 10.3 | 5.8 | 7.4 | 14.8 | 8.2 | 16.1 | 25.6 | 25.6 | 9.3 | 11.3 | 11.7 |
| Cycle Q Clear(g_c), s | 10.2 | 10.3 | 5.8 | 7.4 | 14.8 | 8.2 | 16.1 | 25.6 | 25.6 | 9.3 | 11.3 | 11.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 0.53 |
| Lane Grp Cap(c), veh/h | 211 | 910 | 398 | 159 | 800 | 353 | 318 | 987 | 524 | 196 | 741 | 370 |
| V/C Ratio(X) | 0.86 | 0.49 | 0.30 | 0.83 | 0.73 | 0.60 | 0.90 | 0.94 | 0.94 | 0.84 | 0.60 | 0.62 |
| Avail Cap(c_a), veh/h | 285 | 1377 | 602 | 217 | 1234 | 545 | 390 | 992 | 527 | 407 | 1027 | 513 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.9 | 28.2 | 26.5 | 40.5 | 32.3 | 15.5 | 35.8 | 30.9 | 30.9 | 39.3 | 31.6 | 31.7 |
| Incr Delay (d2), s/veh | 13.8 | 0.4 | 0.4 | 13.0 | 1.3 | 1.6 | 19.0 | 15.7 | 24.6 | 3.7 | 0.8 | 1.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.5 | 3.9 | 1.9 | 3.3 | 5.7 | 3.8 | 7.5 | 11.1 | 13.1 | 3.6 | 4.2 | 4.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 52.7 | 28.6 | 26.9 | 53.5 | 33.6 | 17.2 | 54.8 | 46.6 | 55.5 | 43.1 | 32.3 | 33.4 |
| LnGrp LOS | D | C | C | D | C | B | D | D | E | D | C | C |
| Approach Vol, veh/h | | 748 | | | 932 | | | 1704 | | | 839 | |
| Approach Delay, s/veh | | 34.1 | | | 32.7 | | | 50.6 | | | 34.7 | |
| Approach LOS | | C | | | C | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.9 | 32.7 | 13.8 | 29.4 | 22.9 | 25.6 | 16.8 | 26.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 11.3 | 27.6 | 9.4 | 12.3 | 18.1 | 13.7 | 12.2 | 16.8 |
| Green Ext Time (p_c), s | 0.2 | 0.5 | 0.0 | 3.0 | 0.2 | 3.4 | 0.1 | 3.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 40.6 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 148 | 89 | 60 | 178 | 168 | 136 | 1366 | 107 | 607 |
| Future Volume (vph) | 148 | 89 | 60 | 178 | 168 | 136 | 1366 | 107 | 607 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 16.5 | 29.2 | 5.3 | 18.0 | 18.0 | 13.9 | 42.6 | 11.5 | 40.2 |
| Actuated g/C Ratio | 0.15 | 0.27 | 0.05 | 0.17 | 0.17 | 0.13 | 0.40 | 0.11 | 0.37 |
| v/c Ratio | 0.74 | 0.41 | 0.92 | 0.72 | 0.48 | 0.80 | 0.85 | 0.76 | 0.64 |
| Control Delay (s/veh) | 63.4 | 28.4 | 139.3 | 58.1 | 9.8 | 75.9 | 34.9 | 78.0 | 30.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 63.4 | 28.4 | 139.3 | 58.1 | 9.8 | 75.9 | 34.9 | 78.0 | 30.8 |
| LOS | E | C | F | E | A | E | C | E | C |
| Approach Delay (s/veh) | | 45.3 | | 50.1 | | | 38.4 | | 37.2 |
| Approach LOS | | D | | D | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 107.3 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.92 | |
| Intersection Signal Delay (s/veh): 40.3 | Intersection LOS: D |
| Intersection Capacity Utilization 71.3% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 148 | 89 | 70 | 60 | 178 | 168 | 136 | 1366 | 102 | 107 | 607 | 83 |
| Future Volume (veh/h) | 148 | 89 | 70 | 60 | 178 | 168 | 136 | 1366 | 102 | 107 | 607 | 83 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 178 | 107 | 68 | 72 | 214 | 95 | 164 | 1646 | 122 | 129 | 731 | 82 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 211 | 229 | 145 | 89 | 265 | 225 | 194 | 2056 | 152 | 156 | 1239 | 139 |
| Arrive On Green | 0.13 | 0.23 | 0.23 | 0.06 | 0.15 | 0.15 | 0.12 | 0.42 | 0.42 | 0.10 | 0.40 | 0.40 |
| Sat Flow, veh/h | 1594 | 1011 | 643 | 1594 | 1772 | 1502 | 1594 | 4887 | 362 | 1594 | 3122 | 350 |
| Grp Volume(v), veh/h | 178 | 0 | 175 | 72 | 214 | 95 | 164 | 1193 | 575 | 129 | 415 | 398 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1654 | 1594 | 1772 | 1502 | 1594 | 1772 | 1705 | 1594 | 1772 | 1700 |
| Q Serve(g_s), s | 10.1 | 0.0 | 8.5 | 4.1 | 10.8 | 4.1 | 9.3 | 27.2 | 27.2 | 7.3 | 17.0 | 17.0 |
| Cycle Q Clear(g_c), s | 10.1 | 0.0 | 8.5 | 4.1 | 10.8 | 4.1 | 9.3 | 27.2 | 27.2 | 7.3 | 17.0 | 17.0 |
| Prop In Lane | 1.00 | | 0.39 | 1.00 | | 1.00 | 1.00 | | 0.21 | 1.00 | | 0.21 |
| Lane Grp Cap(c), veh/h | 211 | 0 | 374 | 89 | 265 | 225 | 194 | 1491 | 717 | 156 | 703 | 675 |
| V/C Ratio(X) | 0.84 | 0.00 | 0.47 | 0.81 | 0.81 | 0.42 | 0.85 | 0.80 | 0.80 | 0.83 | 0.59 | 0.59 |
| Avail Cap(c_a), veh/h | 352 | 0 | 705 | 90 | 464 | 393 | 248 | 1734 | 834 | 204 | 817 | 784 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.2 | 0.0 | 30.9 | 43.1 | 38.0 | 21.0 | 39.7 | 23.4 | 23.4 | 40.9 | 21.9 | 21.9 |
| Incr Delay (d2), s/veh | 9.2 | 0.0 | 0.9 | 40.2 | 5.7 | 1.3 | 18.7 | 2.4 | 4.9 | 18.7 | 0.8 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.3 | 0.0 | 3.3 | 2.6 | 4.9 | 1.9 | 4.4 | 10.3 | 10.4 | 3.5 | 6.5 | 6.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 48.3 | 0.0 | 31.8 | 83.3 | 43.7 | 22.3 | 58.4 | 25.8 | 28.3 | 59.6 | 22.8 | 22.8 |
| LnGrp LOS | D | | C | F | D | C | E | C | C | E | C | C |
| Approach Vol, veh/h | | 353 | | | 381 | | | 1932 | | | 942 | |
| Approach Delay, s/veh | | 40.2 | | | 45.8 | | | 29.3 | | | 27.8 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.7 | 43.5 | 9.8 | 25.5 | 15.8 | 41.3 | 16.8 | 18.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 9.3 | 29.2 | 6.1 | 10.5 | 11.3 | 19.0 | 12.1 | 12.8 |
| Green Ext Time (p_c), s | 0.1 | 9.6 | 0.0 | 0.9 | 0.1 | 4.6 | 0.3 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 31.7 |
| HCM 7th LOS | C |

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 0 | 52 | 0 | 14 | 1420 | 120 | 617 |
| Future Volume (vph) | 0 | 52 | 0 | 14 | 1420 | 120 | 617 |
| Turn Type | NA | Split | NA | Prot | NA | Prot | NA |
| Protected Phases | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | |
| Detector Phase | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 22.5 | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 |
| Total Split (s) | 22.5 | 33.0 | 33.0 | 10.0 | 45.5 | 19.0 | 54.5 |
| Total Split (%) | 18.8% | 27.5% | 27.5% | 8.3% | 37.9% | 15.8% | 45.4% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.0 | 10.6 | 10.6 | 5.9 | 36.2 | 11.1 | 52.5 |
| Actuated g/C Ratio | 0.08 | 0.15 | 0.15 | 0.08 | 0.51 | 0.16 | 0.74 |
| v/c Ratio | 0.01 | 0.24 | 0.17 | 0.11 | 0.65 | 0.53 | 0.27 |
| Control Delay (s/veh) | 0.0 | 32.1 | 0.6 | 42.4 | 17.4 | 41.9 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.0 | 32.1 | 0.6 | 42.4 | 17.4 | 41.9 | 7.5 |
| LOS | A | C | A | D | B | D | A |
| Approach Delay (s/veh) | | | 12.0 | | 17.7 | | 13.1 |
| Approach LOS | | | B | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 70.9 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.65 | |
| Intersection Signal Delay (s/veh): 15.9 | Intersection LOS: B |
| Intersection Capacity Utilization 58.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

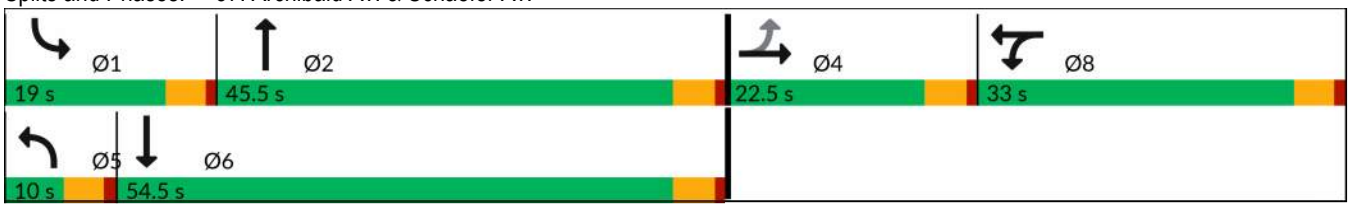

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 4 | 52 | 0 | 91 | 14 | 1420 | 24 | 120 | 617 | 2 |
| Future Volume (veh/h) | 0 | 0 | 4 | 52 | 0 | 91 | 14 | 1420 | 24 | 120 | 617 | 2 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 4 | 57 | 0 | 59 | 15 | 1560 | 24 | 132 | 678 | 2 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 0 | 8 | 120 | 0 | 113 | 30 | 2360 | 36 | 164 | 1947 | 6 |
| Arrive On Green | 0.00 | 0.00 | 0.01 | 0.08 | 0.00 | 0.08 | 0.02 | 0.48 | 0.48 | 0.10 | 0.57 | 0.57 |
| Sat Flow, veh/h | 0 | 0 | 1502 | 1594 | 0 | 1502 | 1594 | 4905 | 75 | 1594 | 3443 | 10 |
| Grp Volume(v), veh/h | 0 | 0 | 4 | 57 | 0 | 59 | 15 | 1026 | 558 | 132 | 331 | 349 |
| Grp Sat Flow(s),veh/h/ln | 0 | 0 | 1502 | 1594 | 0 | 1502 | 1594 | 1612 | 1756 | 1594 | 1683 | 1770 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.1 | 1.9 | 0.0 | 2.1 | 0.5 | 13.3 | 13.3 | 4.4 | 5.9 | 5.9 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.1 | 1.9 | 0.0 | 2.1 | 0.5 | 13.3 | 13.3 | 4.4 | 5.9 | 5.9 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.04 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 0 | 0 | 8 | 120 | 0 | 113 | 30 | 1552 | 845 | 164 | 952 | 1001 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.49 | 0.47 | 0.00 | 0.52 | 0.51 | 0.66 | 0.66 | 0.80 | 0.35 | 0.35 |
| Avail Cap(c_a), veh/h | 0 | 0 | 489 | 824 | 0 | 776 | 157 | 2401 | 1307 | 418 | 1529 | 1607 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 27.2 | 24.3 | 0.0 | 24.4 | 26.7 | 10.8 | 10.8 | 24.1 | 6.5 | 6.5 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 40.0 | 2.9 | 0.0 | 3.7 | 12.7 | 0.5 | 0.9 | 3.5 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.1 | 0.7 | 0.0 | 0.8 | 0.3 | 3.1 | 3.4 | 1.5 | 1.1 | 1.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 67.2 | 27.2 | 0.0 | 28.1 | 39.4 | 11.3 | 11.7 | 27.6 | 6.7 | 6.7 |
| LnGrp LOS | | | E | C | | C | D | B | B | C | A | A |
| Approach Vol, veh/h | | 4 | | | 116 | | | 1599 | | | 812 | |
| Approach Delay, s/veh | | 67.2 | | | 27.7 | | | 11.7 | | | 10.1 | |
| Approach LOS | | E | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.3 | 31.0 | | 4.9 | 5.6 | 35.7 | | 8.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 14.4 | 40.9 | | 17.9 | 5.4 | 49.9 | | 28.4 |
| Max Q Clear Time (g_c+I1), s | 6.4 | 15.3 | | 2.1 | 2.5 | 7.9 | | 4.1 |
| Green Ext Time (p_c), s | 0.1 | 10.9 | | 0.0 | 0.0 | 3.8 | | 0.4 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 12.0 |
| HCM 7th LOS | | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 211 | 747 | 112 | 385 | 797 | 115 | 171 | 1000 | 255 | 113 | 368 | 202 |
| Future Volume (vph) | 211 | 747 | 112 | 385 | 797 | 115 | 171 | 1000 | 255 | 113 | 368 | 202 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 12.0 | 43.2 | | 15.0 | 46.2 | 46.2 | 14.0 | 47.6 | | 14.2 | 47.8 | 47.8 |
| Total Split (%) | 10.0% | 36.0% | | 12.5% | 38.5% | 38.5% | 11.7% | 39.7% | | 11.8% | 39.8% | 39.8% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lead | | Lag | Lag | Lag | Lag | Lead | | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 7.4 | 26.0 | 117.5 | 23.0 | 41.6 | 41.6 | 27.7 | 40.4 | 117.5 | 9.6 | 22.3 | 22.3 |
| Actuated g/C Ratio | 0.06 | 0.22 | 1.00 | 0.20 | 0.35 | 0.35 | 0.24 | 0.34 | 1.00 | 0.08 | 0.19 | 0.19 |
| v/c Ratio | 1.21 | 0.73 | 0.08 | 0.71 | 1.33 | 0.20 | 0.48 | 0.90 | 0.18 | 0.91 | 0.60 | 0.48 |
| Control Delay (s/veh) | 180.6 | 46.6 | 0.1 | 53.5 | 191.3 | 8.7 | 46.3 | 48.5 | 0.3 | 113.8 | 46.6 | 10.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 180.6 | 46.6 | 0.1 | 53.5 | 191.3 | 8.7 | 46.3 | 48.5 | 0.3 | 113.8 | 46.6 | 10.6 |
| LOS | F | D | A | D | F | A | D | D | A | F | D | B |
| Approach Delay (s/veh) | | 68.2 | | | 134.2 | | | 39.6 | | | 47.1 | |
| Approach LOS | | E | | | F | | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 117.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.33 | |
| Intersection Signal Delay (s/veh): 75.0 | Intersection LOS: E |
| Intersection Capacity Utilization 102.9% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

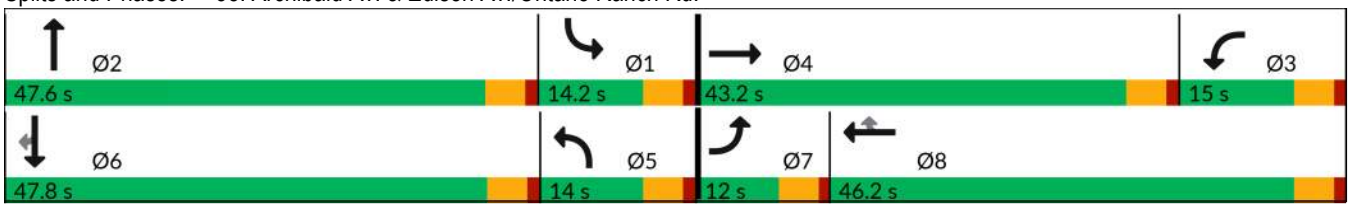

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 211 | 747 | 112 | 385 | 797 | 115 | 171 | 1000 | 255 | 113 | 368 | 202 |
| Future Volume (veh/h) | 211 | 747 | 112 | 385 | 797 | 115 | 171 | 1000 | 255 | 113 | 368 | 202 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 220 | 778 | 0 | 401 | 830 | 68 | 178 | 1042 | 0 | 118 | 383 | 106 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 186 | 988 | | 635 | 636 | 539 | 435 | 1132 | | 132 | 492 | 219 |
| Arrive On Green | 0.06 | 0.31 | 0.00 | 0.22 | 0.54 | 0.36 | 0.27 | 0.50 | 0.00 | 0.08 | 0.22 | 0.15 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1502 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 220 | 778 | 0 | 401 | 830 | 68 | 178 | 1042 | 0 | 118 | 383 | 106 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1502 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 7.4 | 17.1 | 0.0 | 14.5 | 41.6 | 2.6 | 10.6 | 33.2 | 0.0 | 8.5 | 12.4 | 6.3 |
| Cycle Q Clear(g_c), s | 7.4 | 17.1 | 0.0 | 14.5 | 41.6 | 2.6 | 10.6 | 33.2 | 0.0 | 8.5 | 12.4 | 6.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 186 | 988 | | 635 | 636 | 539 | 435 | 1132 | | 132 | 492 | 219 |
| V/C Ratio(X) | 1.18 | 0.79 | | 0.63 | 1.31 | 0.13 | 0.41 | 0.92 | | 0.89 | 0.78 | 0.48 |
| Avail Cap(c_a), veh/h | 186 | 1610 | | 635 | 636 | 539 | 435 | 1248 | | 132 | 1254 | 559 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.3 | 37.9 | 0.0 | 41.1 | 26.8 | 14.0 | 34.5 | 27.3 | 0.0 | 52.7 | 43.5 | 31.5 |
| Incr Delay (d2), s/veh | 124.7 | 1.4 | 0.0 | 1.6 | 148.9 | 0.1 | 0.2 | 10.6 | 0.0 | 46.9 | 2.7 | 1.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.8 | 5.9 | 0.0 | 5.1 | 38.9 | 1.2 | 3.9 | 11.3 | 0.0 | 5.0 | 4.8 | 2.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 179.0 | 39.4 | 0.0 | 42.7 | 175.7 | 14.1 | 34.7 | 37.9 | 0.0 | 99.6 | 46.2 | 33.2 |
| LnGrp LOS | F | D | | D | F | B | C | D | | F | D | C |
| Approach Vol, veh/h | | 998 | | | 1299 | | | 1220 | | | 607 | |
| Approach Delay, s/veh | | 70.1 | | | 126.1 | | | 37.4 | | | 54.3 | |
| Approach LOS | | E | | | F | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.2 | 43.6 | 29.9 | 28.3 | 36.2 | 21.5 | 12.0 | 46.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.6 | 43.0 | 10.4 | 38.6 | 9.4 | 43.2 | 7.4 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 10.5 | 35.2 | 16.5 | 19.1 | 12.6 | 14.4 | 9.4 | 43.6 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | 0.0 | 4.6 | 0.0 | 2.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 75.8 |
| HCM 7th LOS | E |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 166 | 191 | 123 | 143 | 372 | 228 | 952 | 103 | 30 | 549 | 100 |
| Future Volume (vph) | 166 | 191 | 123 | 143 | 372 | 228 | 952 | 103 | 30 | 549 | 100 |
| Turn Type | Prot | NA | Free | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.5 | 18.6 | 76.5 | 12.0 | 20.1 | 5.8 | 27.4 | 27.4 | 6.7 | 20.5 | 20.5 |
| Actuated g/C Ratio | 0.14 | 0.24 | 1.00 | 0.16 | 0.26 | 0.08 | 0.36 | 0.36 | 0.09 | 0.27 | 0.27 |
| v/c Ratio | 0.42 | 0.23 | 0.09 | 0.60 | 0.56 | 1.06 | 0.52 | 0.17 | 0.12 | 0.61 | 0.21 |
| Control Delay (s/veh) | 37.4 | 23.6 | 0.1 | 47.8 | 25.4 | 116.8 | 23.2 | 3.2 | 41.4 | 28.0 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.4 | 23.6 | 0.1 | 47.8 | 25.4 | 116.8 | 23.2 | 3.2 | 41.4 | 28.0 | 3.1 |
| LOS | D | C | A | D | C | F | C | A | D | C | A |
| Approach Delay (s/veh) | | 22.4 | | | 30.4 | | 38.2 | | | 24.9 | |
| Approach LOS | | C | | | C | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 76.5 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.06 | |
| Intersection Signal Delay (s/veh): 31.2 | Intersection LOS: C |
| Intersection Capacity Utilization 60.4% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

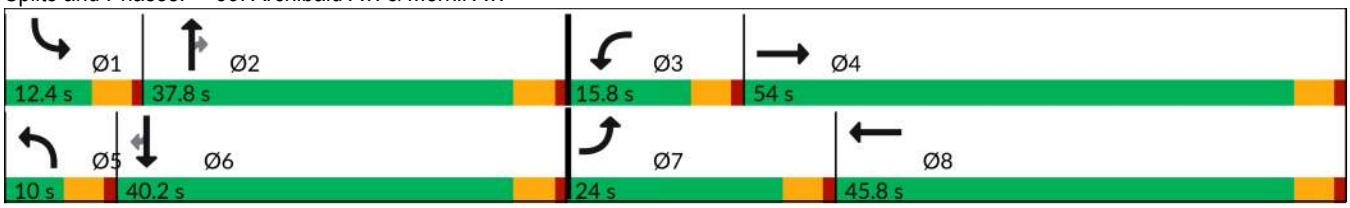

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 166 | 191 | 123 | 143 | 372 | 120 | 228 | 952 | 103 | 30 | 549 | 100 |
| Future Volume (veh/h) | 166 | 191 | 123 | 143 | 372 | 120 | 228 | 952 | 103 | 30 | 549 | 100 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 173 | 199 | 0 | 149 | 388 | 60 | 238 | 992 | 75 | 31 | 572 | 55 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 280 | 654 | | 186 | 623 | 95 | 305 | 1688 | 477 | 104 | 887 | 376 |
| Arrive On Green | 0.09 | 0.18 | 0.00 | 0.12 | 0.21 | 0.21 | 0.10 | 0.32 | 0.32 | 0.03 | 0.25 | 0.25 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 2994 | 459 | 3000 | 5316 | 1502 | 3000 | 3544 | 1500 |
| Grp Volume(v), veh/h | 173 | 199 | 0 | 149 | 228 | 220 | 238 | 992 | 75 | 31 | 572 | 55 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1681 | 1500 | 1772 | 1502 | 1500 | 1772 | 1500 |
| Q Serve(g_s), s | 2.9 | 2.6 | 0.0 | 4.8 | 6.2 | 6.3 | 4.1 | 8.3 | 1.9 | 0.5 | 7.7 | 1.5 |
| Cycle Q Clear(g_c), s | 2.9 | 2.6 | 0.0 | 4.8 | 6.2 | 6.3 | 4.1 | 8.3 | 1.9 | 0.5 | 7.7 | 1.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 280 | 654 | | 186 | 368 | 350 | 305 | 1688 | 477 | 104 | 887 | 376 |
| V/C Ratio(X) | 0.62 | 0.30 | | 0.80 | 0.62 | 0.63 | 0.78 | 0.59 | 0.16 | 0.30 | 0.64 | 0.15 |
| Avail Cap(c_a), veh/h | 1096 | 3298 | | 336 | 1375 | 1305 | 305 | 3325 | 939 | 441 | 2377 | 1006 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 23.2 | 18.7 | 0.0 | 22.8 | 19.1 | 19.2 | 23.3 | 15.2 | 13.0 | 25.0 | 17.8 | 15.5 |
| Incr Delay (d2), s/veh | 2.2 | 0.3 | 0.0 | 7.8 | 1.7 | 1.9 | 12.2 | 0.3 | 0.2 | 1.6 | 0.8 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.9 | 0.0 | 2.0 | 2.3 | 2.2 | 1.7 | 2.5 | 0.5 | 0.2 | 2.5 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 25.4 | 19.0 | 0.0 | 30.6 | 20.8 | 21.0 | 35.4 | 15.5 | 13.2 | 26.6 | 18.6 | 15.7 |
| LnGrp LOS | C | B | | C | C | C | D | B | B | C | B | B |
| Approach Vol, veh/h | | 372 | | | 597 | | | 1305 | | | 658 | |
| Approach Delay, s/veh | | 21.9 | | | 23.3 | | | 19.0 | | | 18.7 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.4 | 21.5 | 10.8 | 14.4 | 10.0 | 17.9 | 9.6 | 15.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 2.5 | 10.3 | 6.8 | 4.6 | 6.1 | 9.7 | 4.9 | 8.3 |
| Green Ext Time (p_c), s | 0.0 | 6.5 | 0.1 | 1.2 | 0.0 | 3.5 | 0.4 | 2.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.2 |
| HCM 7th LOS | C |

**Notes**

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 40 | 105 | 7 | 322 | 165 | 479 | 35 | 856 | 277 | 319 | 549 | 53 |
| Future Volume (vph) | 40 | 105 | 7 | 322 | 165 | 479 | 35 | 856 | 277 | 319 | 549 | 53 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.4 | 12.5 | 12.5 | 15.2 | 22.9 | 33.0 | 5.4 | 29.7 | 44.9 | 10.1 | 39.5 | 39.5 |
| Actuated g/C Ratio | 0.07 | 0.15 | 0.15 | 0.18 | 0.28 | 0.40 | 0.07 | 0.36 | 0.54 | 0.12 | 0.48 | 0.48 |
| v/c Ratio | 0.22 | 0.22 | 0.02 | 0.63 | 0.18 | 0.45 | 0.19 | 0.74 | 0.31 | 0.95 | 0.25 | 0.07 |
| Control Delay (s/veh) | 47.9 | 36.6 | 0.1 | 39.6 | 24.7 | 13.7 | 47.4 | 28.7 | 2.0 | 77.3 | 16.1 | 0.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.9 | 36.6 | 0.1 | 39.6 | 24.7 | 13.7 | 47.4 | 28.7 | 2.0 | 77.3 | 16.1 | 0.2 |
| LOS | D | D | A | D | C | B | D | C | A | E | B | A |
| Approach Delay (s/veh) | | 38.0 | | | 24.2 | | | 22.9 | | | 36.4 | |
| Approach LOS | | D | | | C | | | C | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 82.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 27.9 | Intersection LOS: C |
| Intersection Capacity Utilization 68.0% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

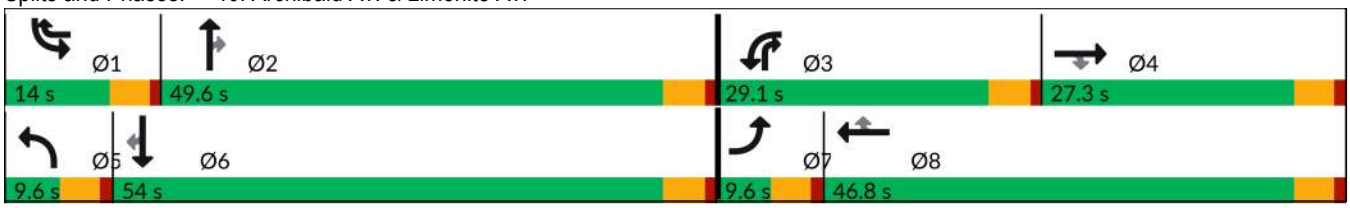

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 40 | 105 | 7 | 322 | 165 | 479 | 35 | 856 | 277 | 319 | 549 | 53 |
| Future Volume (veh/h) | 40 | 105 | 7 | 322 | 165 | 479 | 35 | 856 | 277 | 319 | 549 | 53 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 42 | 109 | 6 | 335 | 172 | 362 | 36 | 892 | 174 | 332 | 572 | 48 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 114 | 416 | 185 | 423 | 773 | 945 | 103 | 1183 | 746 | 374 | 2150 | 667 |
| Arrive On Green | 0.04 | 0.12 | 0.12 | 0.15 | 0.23 | 0.23 | 0.04 | 0.35 | 0.35 | 0.13 | 0.44 | 0.44 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 2910 | 3367 | 2639 | 2910 | 3367 | 1500 | 2910 | 4837 | 1502 |
| Grp Volume(v), veh/h | 42 | 109 | 6 | 335 | 172 | 362 | 36 | 892 | 174 | 332 | 572 | 48 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1455 | 1683 | 1320 | 1455 | 1683 | 1500 | 1455 | 1612 | 1502 |
| Q Serve(g_s), s | 1.0 | 2.1 | 0.3 | 8.1 | 3.0 | 7.5 | 0.9 | 17.1 | 4.8 | 8.2 | 5.5 | 1.3 |
| Cycle Q Clear(g_c), s | 1.0 | 2.1 | 0.3 | 8.1 | 3.0 | 7.5 | 0.9 | 17.1 | 4.8 | 8.2 | 5.5 | 1.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 114 | 416 | 185 | 423 | 773 | 945 | 103 | 1183 | 746 | 374 | 2150 | 667 |
| V/C Ratio(X) | 0.37 | 0.26 | 0.03 | 0.79 | 0.22 | 0.38 | 0.35 | 0.75 | 0.23 | 0.89 | 0.27 | 0.07 |
| Avail Cap(c_a), veh/h | 199 | 1044 | 466 | 974 | 1941 | 1861 | 199 | 2070 | 1141 | 374 | 3264 | 1013 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.3 | 29.1 | 28.2 | 30.2 | 22.9 | 17.5 | 34.5 | 20.9 | 10.5 | 31.4 | 12.8 | 11.7 |
| Incr Delay (d2), s/veh | 0.7 | 0.3 | 0.1 | 1.3 | 0.1 | 0.3 | 0.7 | 1.0 | 0.2 | 21.4 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.8 | 0.1 | 2.7 | 1.1 | 2.0 | 0.3 | 5.7 | 1.3 | 3.7 | 1.6 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.0 | 29.4 | 28.3 | 31.5 | 23.0 | 17.7 | 35.2 | 21.9 | 10.6 | 52.8 | 12.9 | 11.7 |
| LnGrp LOS | D | C | C | C | C | B | D | C | B | D | B | B |
| Approach Vol, veh/h | | 157 | | | 869 | | | 1102 | | | 952 | |
| Approach Delay, s/veh | | 30.9 | | | 24.1 | | | 20.6 | | | 26.7 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 30.3 | 15.2 | 13.6 | 7.2 | 37.1 | 7.5 | 21.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 10.2 | 19.1 | 10.1 | 4.1 | 2.9 | 7.5 | 3.0 | 9.5 |
| Green Ext Time (p_c), s | 0.0 | 6.4 | 0.5 | 0.5 | 0.0 | 3.8 | 0.0 | 2.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 24.0 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 115 | 1021 | 29 | 29 | 1089 | 70 | 48 | 86 | 95 | 48 |
| Future Volume (vph) | 115 | 1021 | 29 | 29 | 1089 | 70 | 48 | 86 | 95 | 48 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.9 | 43.9 | 43.9 | 6.7 | 37.4 | 37.4 | 6.8 | 12.5 | 9.8 | 17.6 |
| Actuated g/C Ratio | 0.09 | 0.52 | 0.52 | 0.08 | 0.45 | 0.45 | 0.08 | 0.15 | 0.12 | 0.21 |
| v/c Ratio | 0.82 | 0.59 | 0.04 | 0.25 | 0.74 | 0.10 | 0.40 | 0.56 | 0.55 | 0.37 |
| Control Delay (s/veh) | 83.8 | 18.8 | 0.1 | 48.2 | 23.4 | 0.3 | 53.1 | 40.3 | 52.3 | 21.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 83.8 | 18.8 | 0.1 | 48.2 | 23.4 | 0.3 | 53.1 | 40.3 | 52.3 | 21.3 |
| LOS | F | B | A | D | C | A | D | D | D | C |
| Approach Delay (s/veh) | | 24.8 | | | 22.7 | | | 43.6 | | 34.2 |
| Approach LOS | | C | | | C | | | D | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 83.9 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.82 | |
| Intersection Signal Delay (s/veh): 25.9 | Intersection LOS: C |
| Intersection Capacity Utilization 70.2% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

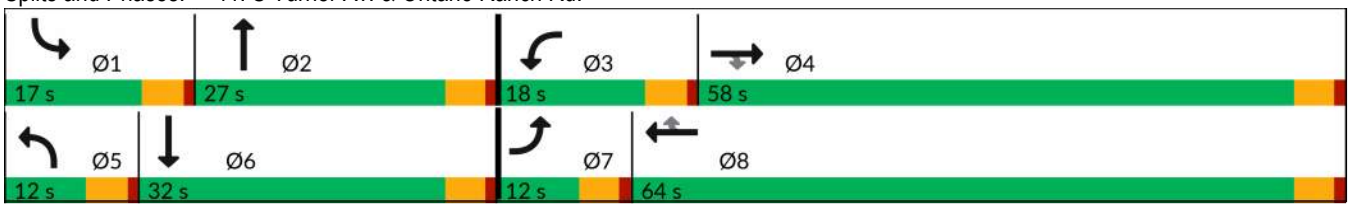

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 115 | 1021 | 29 | 29 | 1089 | 70 | 48 | 86 | 54 | 95 | 48 | 86 |
| Future Volume (veh/h) | 115 | 1021 | 29 | 29 | 1089 | 70 | 48 | 86 | 54 | 95 | 48 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 122 | 1086 | 29 | 31 | 1159 | 52 | 51 | 91 | 33 | 101 | 51 | 68 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 150 | 1798 | 746 | 52 | 1580 | 669 | 73 | 134 | 49 | 126 | 98 | 131 |
| Arrive On Green | 0.09 | 0.51 | 0.51 | 0.03 | 0.45 | 0.45 | 0.05 | 0.11 | 0.11 | 0.08 | 0.14 | 0.14 |
| Sat Flow, veh/h | 1594 | 3544 | 1469 | 1594 | 3544 | 1500 | 1594 | 1225 | 444 | 1594 | 689 | 918 |
| Grp Volume(v), veh/h | 122 | 1086 | 29 | 31 | 1159 | 52 | 51 | 0 | 124 | 101 | 0 | 119 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1469 | 1594 | 1772 | 1500 | 1594 | 0 | 1669 | 1594 | 0 | 1607 |
| Q Serve(g_s), s | 5.1 | 14.7 | 0.7 | 1.3 | 18.2 | 1.3 | 2.1 | 0.0 | 4.8 | 4.2 | 0.0 | 4.6 |
| Cycle Q Clear(g_c), s | 5.1 | 14.7 | 0.7 | 1.3 | 18.2 | 1.3 | 2.1 | 0.0 | 4.8 | 4.2 | 0.0 | 4.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 0.57 |
| Lane Grp Cap(c), veh/h | 150 | 1798 | 746 | 52 | 1580 | 669 | 73 | 0 | 183 | 126 | 0 | 230 |
| V/C Ratio(X) | 0.81 | 0.60 | 0.04 | 0.60 | 0.73 | 0.08 | 0.70 | 0.00 | 0.68 | 0.80 | 0.00 | 0.52 |
| Avail Cap(c_a), veh/h | 174 | 2793 | 1158 | 315 | 3107 | 1315 | 174 | 0 | 552 | 292 | 0 | 650 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.1 | 11.9 | 8.4 | 32.3 | 15.5 | 10.8 | 31.9 | 0.0 | 29.0 | 30.7 | 0.0 | 26.9 |
| Incr Delay (d2), s/veh | 19.1 | 0.3 | 0.0 | 4.0 | 0.7 | 0.0 | 4.5 | 0.0 | 4.3 | 4.5 | 0.0 | 1.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 4.5 | 0.2 | 0.5 | 6.1 | 0.4 | 0.8 | 0.0 | 2.0 | 1.6 | 0.0 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 49.2 | 12.2 | 8.4 | 36.3 | 16.1 | 10.8 | 36.4 | 0.0 | 33.3 | 35.2 | 0.0 | 28.7 |
| LnGrp LOS | D | B | A | D | B | B | D | | C | D | | C |
| Approach Vol, veh/h | | 1237 | | | 1242 | | | 175 | | | 220 | |
| Approach Delay, s/veh | | 15.7 | | | 16.4 | | | 34.2 | | | 31.7 | |
| Approach LOS | | B | | | B | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.9 | 12.0 | 6.8 | 39.0 | 7.7 | 14.3 | 11.0 | 34.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 6.2 | 6.8 | 3.3 | 16.7 | 4.1 | 6.6 | 7.1 | 20.2 |
| Green Ext Time (p_c), s | 0.0 | 0.5 | 0.0 | 8.9 | 0.0 | 0.5 | 0.0 | 10.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 18.4 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 172 | 982 | 93 | 147 | 983 | 306 | 81 | 362 | 106 | 234 | 257 | 70 |
| Future Volume (vph) | 172 | 982 | 93 | 147 | 983 | 306 | 81 | 362 | 106 | 234 | 257 | 70 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.2 | 28.1 | 28.1 | 9.7 | 25.6 | 25.6 | 6.1 | 27.8 | 27.8 | 16.4 | 38.0 | 38.0 |
| Actuated g/C Ratio | 0.12 | 0.28 | 0.28 | 0.10 | 0.25 | 0.25 | 0.06 | 0.28 | 0.28 | 0.16 | 0.38 | 0.38 |
| v/c Ratio | 0.95 | 0.78 | 0.19 | 0.56 | 0.68 | 0.53 | 0.90 | 0.79 | 0.22 | 0.97 | 0.41 | 0.12 |
| Control Delay (s/veh) | 102.0 | 39.4 | 2.9 | 53.8 | 36.9 | 7.3 | 119.0 | 46.2 | 3.5 | 94.3 | 25.1 | 2.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 102.0 | 39.4 | 2.9 | 53.8 | 36.9 | 7.3 | 119.0 | 46.2 | 3.5 | 94.3 | 25.1 | 2.5 |
| LOS | F | D | A | D | D | A | F | D | A | F | C | A |
| Approach Delay (s/veh) | | 45.3 | | | 32.3 | | | 48.7 | | | 51.2 | |
| Approach LOS | | D | | | C | | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 100.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.97 | |
| Intersection Signal Delay (s/veh): 41.7 | Intersection LOS: D |
| Intersection Capacity Utilization 76.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 172 | 982 | 93 | 147 | 983 | 306 | 81 | 362 | 106 | 234 | 257 | 70 |
| Future Volume (veh/h) | 172 | 982 | 93 | 147 | 983 | 306 | 81 | 362 | 106 | 234 | 257 | 70 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 183 | 1045 | 55 | 156 | 1046 | 209 | 86 | 385 | 44 | 249 | 273 | 59 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 206 | 1448 | 443 | 215 | 1486 | 364 | 103 | 451 | 382 | 277 | 644 | 546 |
| Arrive On Green | 0.13 | 0.30 | 0.30 | 0.07 | 0.24 | 0.24 | 0.06 | 0.25 | 0.25 | 0.17 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1594 | 4837 | 1481 | 2910 | 6095 | 1492 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 183 | 1045 | 55 | 156 | 1046 | 209 | 86 | 385 | 44 | 249 | 273 | 59 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1481 | 1455 | 1524 | 1492 | 1594 | 1772 | 1500 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 10.5 | 17.9 | 2.5 | 4.9 | 14.5 | 11.4 | 4.9 | 19.2 | 2.1 | 14.2 | 10.7 | 2.4 |
| Cycle Q Clear(g_c), s | 10.5 | 17.9 | 2.5 | 4.9 | 14.5 | 11.4 | 4.9 | 19.2 | 2.1 | 14.2 | 10.7 | 2.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 206 | 1448 | 443 | 215 | 1486 | 364 | 103 | 451 | 382 | 277 | 644 | 546 |
| V/C Ratio(X) | 0.89 | 0.72 | 0.12 | 0.73 | 0.70 | 0.57 | 0.83 | 0.85 | 0.12 | 0.90 | 0.42 | 0.11 |
| Avail Cap(c_a), veh/h | 206 | 1518 | 465 | 402 | 1965 | 481 | 103 | 833 | 705 | 277 | 1026 | 870 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.7 | 29.0 | 23.6 | 42.0 | 32.0 | 30.8 | 42.9 | 32.9 | 26.5 | 37.5 | 22.2 | 19.5 |
| Incr Delay (d2), s/veh | 33.0 | 1.6 | 0.1 | 1.7 | 0.8 | 1.4 | 39.7 | 4.7 | 0.1 | 29.0 | 0.4 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.7 | 6.5 | 0.8 | 1.7 | 5.0 | 3.9 | 3.0 | 8.3 | 0.7 | 7.5 | 4.2 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 72.7 | 30.7 | 23.8 | 43.8 | 32.8 | 32.3 | 82.6 | 37.6 | 26.7 | 66.5 | 22.6 | 19.6 |
| LnGrp LOS | E | C | C | D | C | C | F | D | C | E | C | B |
| Approach Vol, veh/h | | 1283 | | | 1411 | | | 515 | | | 581 | |
| Approach Delay, s/veh | | 36.4 | | | 33.9 | | | 44.2 | | | 41.1 | |
| Approach LOS | | D | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.7 | 28.2 | 11.5 | 32.4 | 10.6 | 38.3 | 16.6 | 27.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 16.2 | 21.2 | 6.9 | 19.9 | 6.9 | 12.7 | 12.5 | 16.5 |
| Green Ext Time (p_c), s | 0.0 | 2.2 | 0.1 | 4.4 | 0.0 | 1.7 | 0.0 | 5.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 37.2 |
| HCM 7th LOS | D |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

03/18/2025

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 178 | 1087 | 163 | 187 | 1007 | 191 | 232 | 547 | 397 | 100 | 192 | 89 |
| Future Volume (vph) | 178 | 1087 | 163 | 187 | 1007 | 191 | 232 | 547 | 397 | 100 | 192 | 89 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.0 | 48.5 | 48.5 | 12.0 | 49.5 | 49.5 | 13.0 | 48.4 | 48.4 | 11.1 | 46.5 | 46.5 |
| Total Split (%) | 9.2% | 40.4% | 40.4% | 10.0% | 41.3% | 41.3% | 10.8% | 40.3% | 40.3% | 9.3% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.7 | 35.1 | 35.1 | 7.7 | 36.2 | 36.2 | 8.8 | 27.3 | 27.3 | 6.5 | 25.0 | 25.0 |
| Actuated g/C Ratio | 0.07 | 0.37 | 0.37 | 0.08 | 0.38 | 0.38 | 0.09 | 0.28 | 0.28 | 0.07 | 0.26 | 0.26 |
| v/c Ratio | 0.92 | 0.64 | 0.26 | 0.84 | 0.83 | 0.29 | 0.92 | 0.42 | 0.79 | 0.53 | 0.23 | 0.20 |
| Control Delay (s/veh) | 94.8 | 27.7 | 4.9 | 77.3 | 34.7 | 5.2 | 85.3 | 28.5 | 32.0 | 59.5 | 28.3 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 94.8 | 27.7 | 4.9 | 77.3 | 34.7 | 5.2 | 85.3 | 28.5 | 32.0 | 59.5 | 28.3 | 6.3 |
| LOS | F | C | A | E | C | A | F | C | C | E | C | A |
| Approach Delay (s/veh) | | 33.5 | | | 36.4 | | | 40.9 | | | 31.3 | |
| Approach LOS | | C | | | D | | | D | | | C | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 95.9
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay (s/veh): 36.2 — Intersection LOS: D
Intersection Capacity Utilization 67.5% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

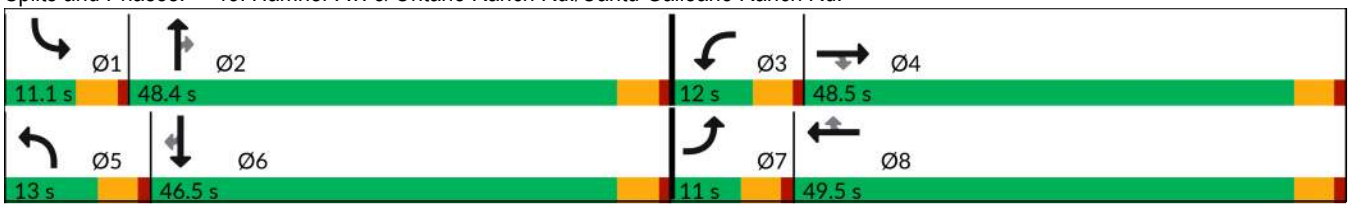

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 178 | 1087 | 163 | 187 | 1007 | 191 | 232 | 547 | 397 | 100 | 192 | 89 |
| Future Volume (veh/h) | 178 | 1087 | 163 | 187 | 1007 | 191 | 232 | 547 | 397 | 100 | 192 | 89 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 185 | 1132 | 116 | 195 | 1049 | 188 | 242 | 570 | 181 | 104 | 200 | 81 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 253 | 1919 | 596 | 265 | 1349 | 602 | 313 | 981 | 304 | 174 | 522 | 233 |
| Arrive On Green | 0.09 | 0.40 | 0.40 | 0.09 | 0.40 | 0.40 | 0.11 | 0.20 | 0.20 | 0.06 | 0.15 | 0.15 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 3367 | 1502 | 2910 | 4837 | 1497 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 185 | 1132 | 116 | 195 | 1049 | 188 | 242 | 570 | 181 | 104 | 200 | 81 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1683 | 1502 | 1455 | 1612 | 1497 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 4.6 | 13.6 | 3.7 | 4.8 | 20.0 | 6.3 | 6.0 | 7.8 | 8.1 | 2.6 | 3.9 | 3.6 |
| Cycle Q Clear(g_c), s | 4.6 | 13.6 | 3.7 | 4.8 | 20.0 | 6.3 | 6.0 | 7.8 | 8.1 | 2.6 | 3.9 | 3.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 253 | 1919 | 596 | 265 | 1349 | 602 | 313 | 981 | 304 | 174 | 522 | 233 |
| V/C Ratio(X) | 0.73 | 0.59 | 0.19 | 0.74 | 0.78 | 0.31 | 0.77 | 0.58 | 0.60 | 0.60 | 0.38 | 0.35 |
| Avail Cap(c_a), veh/h | 253 | 2882 | 895 | 292 | 2052 | 915 | 332 | 2876 | 890 | 257 | 1914 | 854 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.8 | 17.5 | 14.5 | 32.6 | 19.2 | 15.1 | 32.0 | 26.5 | 26.6 | 33.8 | 28.0 | 27.8 |
| Incr Delay (d2), s/veh | 9.2 | 0.3 | 0.2 | 7.0 | 1.1 | 0.3 | 9.0 | 0.5 | 1.9 | 1.2 | 0.5 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 4.1 | 1.1 | 1.8 | 6.5 | 1.8 | 2.3 | 2.8 | 2.7 | 0.9 | 1.5 | 1.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 42.0 | 17.8 | 14.7 | 39.6 | 20.3 | 15.4 | 41.0 | 27.1 | 28.5 | 35.0 | 28.4 | 28.7 |
| LnGrp LOS | D | B | B | D | C | B | D | C | C | D | C | C |
| Approach Vol, veh/h | | 1433 | | | 1432 | | | 993 | | | 385 | |
| Approach Delay, s/veh | | 20.7 | | | 22.3 | | | 30.7 | | | 30.3 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.0 | 19.5 | 11.3 | 33.8 | 12.5 | 16.0 | 11.0 | 34.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.5 | 43.8 | 7.4 | 43.9 | 8.4 | 41.9 | 6.4 | 44.9 |
| Max Q Clear Time (g_c+I1), s | 4.6 | 10.1 | 6.8 | 15.6 | 8.0 | 5.9 | 6.6 | 22.0 |
| Green Ext Time (p_c), s | 0.0 | 4.3 | 0.0 | 8.4 | 0.0 | 1.4 | 0.0 | 7.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 24.4 |
| HCM 7th LOS | C |

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1192 | 197 | 833 | 135 | 254 | 0 | 988 |
| Future Volume (vph) | 1192 | 197 | 833 | 135 | 254 | 0 | 988 |
| Turn Type | NA | Perm | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | | 6 | | | 4 | |
| Permitted Phases | | 2 | | Free | 4 | | 4 |
| Detector Phase | 2 | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | C-Min | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 55.6 | 55.6 | 55.6 | 120.0 | 53.3 | 53.3 | 53.3 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.46 | 1.00 | 0.44 | 0.44 | 0.44 |
| v/c Ratio | 0.51 | 0.26 | 0.54 | 0.05 | 0.34 | 0.78 | 0.77 |
| Control Delay (s/veh) | 25.5 | 4.3 | 38.3 | 0.0 | 21.6 | 33.8 | 33.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.5 | 4.3 | 38.3 | 0.0 | 21.6 | 33.8 | 33.5 |
| LOS | C | A | D | A | C | C | C |
| Approach Delay (s/veh) | 22.5 | | 33.0 | | | 31.4 | |
| Approach LOS | C | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 37.5 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 45 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 28.4 | Intersection LOS: C |
| Intersection Capacity Utilization 76.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

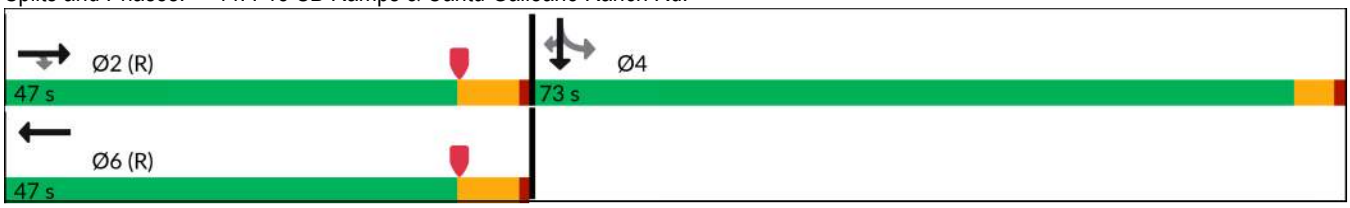

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1192 | 197 | 0 | 833 | 135 | 0 | 0 | 0 | 254 | 0 | 988 |
| Future Volume (veh/h) | 0 | 1192 | 197 | 0 | 833 | 135 | 0 | 0 | 0 | 254 | 0 | 988 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 0 | 1772 | 1772 | | | | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 1255 | 0 | 0 | 877 | 0 | | | | 178 | 0 | 890 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 3038 | | 0 | 2026 | | | | | 535 | 0 | 1009 |
| Arrive On Green | 0.00 | 0.57 | 0.00 | 0.00 | 1.00 | 0.00 | | | | 0.34 | 0.00 | 0.34 |
| Sat Flow, veh/h | 0 | 5316 | 1502 | 0 | 3544 | 2643 | | | | 1594 | 0 | 3003 |
| Grp Volume(v), veh/h | 0 | 1255 | 0 | 0 | 877 | 0 | | | | 178 | 0 | 890 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 1502 | 0 | 1772 | 1321 | | | | 1594 | 0 | 1502 |
| Q Serve(g_s), s | 0.0 | 15.9 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 10.0 | 0.0 | 33.6 |
| Cycle Q Clear(g_c), s | 0.0 | 15.9 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 10.0 | 0.0 | 33.6 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 3038 | | 0 | 2026 | | | | | 535 | 0 | 1009 |
| V/C Ratio(X) | 0.00 | 0.41 | | 0.00 | 0.43 | | | | | 0.33 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 0 | 3038 | | 0 | 2026 | | | | | 908 | 0 | 1712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.69 | 0.00 | 0.00 | 0.80 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 14.4 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 29.8 | 0.0 | 37.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.3 | 0.0 | 0.0 | 0.5 | 0.0 | | | | 0.4 | 0.0 | 3.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 5.7 | 0.0 | 0.0 | 0.2 | 0.0 | | | | 3.8 | 0.0 | 12.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 14.7 | 0.0 | 0.0 | 0.5 | 0.0 | | | | 30.1 | 0.0 | 40.7 |
| LnGrp LOS | | B | | | A | | | | | C | | D |
| Approach Vol, veh/h | | 1255 | | | 877 | | | | | | 1068 | |
| Approach Delay, s/veh | | 14.7 | | | 0.5 | | | | | | 39.0 | |
| Approach LOS | | B | | | A | | | | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 75.1 | 44.9 | 75.1 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 17.9 | 35.6 | 2.0 |
| Green Ext Time (p_c), s | 8.3 | 4.7 | 6.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 18.9 |
| HCM 7th LOS | B |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 476 | 937 | 213 | 331 | 513 | 232 |
| Future Volume (vph) | 476 | 937 | 213 | 331 | 513 | 232 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 66.5 | 66.5 | 13.5 | 84.6 | 24.3 | 24.3 |
| Actuated g/C Ratio | 0.55 | 0.55 | 0.11 | 0.71 | 0.20 | 0.20 |
| v/c Ratio | 0.17 | 0.85 | 0.66 | 0.09 | 0.86 | 0.45 |
| Control Delay (s/veh) | 7.4 | 27.1 | 60.7 | 5.7 | 60.7 | 8.8 |
| Queue Delay | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.4 | 27.5 | 60.7 | 5.7 | 60.7 | 8.8 |
| LOS | A | C | E | A | E | A |
| Approach Delay (s/veh) | 20.8 | | | 27.2 | 46.2 | |
| Approach LOS | C | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 44.8 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 29.1 | Intersection LOS: C |
| Intersection Capacity Utilization 77.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

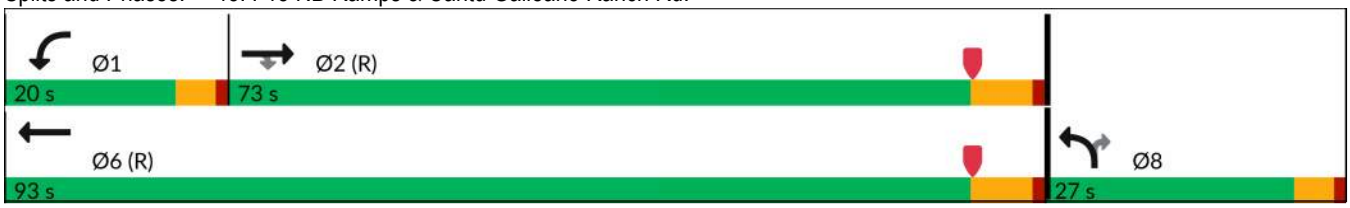

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 476 | 937 | 213 | 331 | 513 | 232 |
| Future Volume (veh/h) | 476 | 937 | 213 | 331 | 513 | 232 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1575 | 1772 | 1673 | 1772 |
| Adj Flow Rate, veh/h | 491 | 766 | 220 | 341 | 529 | 151 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3171 | 896 | 273 | 3858 | 579 | 273 |
| Arrive On Green | 1.00 | 1.00 | 0.09 | 0.73 | 0.18 | 0.18 |
| Sat Flow, veh/h | 5316 | 1502 | 3000 | 5316 | 3188 | 1502 |
| Grp Volume(v), veh/h | 491 | 766 | 220 | 341 | 529 | 151 |
| Grp Sat Flow(s),veh/h/ln | 1772 | 1502 | 1500 | 1772 | 1594 | 1502 |
| Q Serve(g_s), s | 0.0 | 1.6 | 8.6 | 2.3 | 19.5 | 11.0 |
| Cycle Q Clear(g_c), s | 0.0 | 1.6 | 8.6 | 2.3 | 19.5 | 11.0 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3171 | 896 | 273 | 3858 | 579 | 273 |
| V/C Ratio(X) | 0.15 | 0.86 | 0.81 | 0.09 | 0.91 | 0.55 |
| Avail Cap(c_a), veh/h | 3171 | 896 | 385 | 3858 | 595 | 280 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.87 | 0.87 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.1 | 0.1 | 53.5 | 4.8 | 48.2 | 44.7 |
| Incr Delay (d2), s/veh | 0.1 | 9.1 | 8.3 | 0.0 | 18.4 | 2.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.3 | 3.4 | 0.6 | 9.0 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.2 | 9.2 | 61.8 | 4.9 | 66.5 | 46.9 |
| LnGrp LOS | A | A | E | A | E | D |
| Approach Vol, veh/h | 1257 | | | 561 | 680 | |
| Approach Delay, s/veh | 5.7 | | | 27.2 | 62.2 | |
| Approach LOS | A | | | C | E | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.5 | 78.1 | | | | 93.6 | 26.4 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 10.6 | 3.6 | | | | 4.3 | 21.5 |
| Green Ext Time (p_c), s | 0.3 | 7.2 | | | | 2.1 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.9 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 373 | 3 | 390 | 304 | 948 | 1099 | 527 |
| Future Volume (vph) | 373 | 3 | 390 | 304 | 948 | 1099 | 527 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 24.0 | 61.0 | 37.0 | 37.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 26.7% | 67.8% | 41.1% | 41.1% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 20.9 | 20.9 | 20.9 | 19.4 | 56.1 | 31.5 | 31.5 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.22 | 0.62 | 0.35 | 0.35 |
| v/c Ratio | 0.81 | 0.71 | 0.62 | 0.95 | 0.48 | 1.00 | 0.64 |
| Control Delay (s/veh) | 51.6 | 34.4 | 23.0 | 62.6 | 1.5 | 56.2 | 5.9 |
| Queue Delay | 0.9 | 0.3 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.5 | 34.7 | 23.0 | 62.6 | 1.9 | 56.2 | 5.9 |
| LOS | D | C | C | E | A | E | A |
| Approach Delay (s/veh) | | 37.1 | | | 16.6 | 39.9 | |
| Approach LOS | | D | | | B | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.00 | |
| Intersection Signal Delay (s/veh): 31.3 | Intersection LOS: C |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

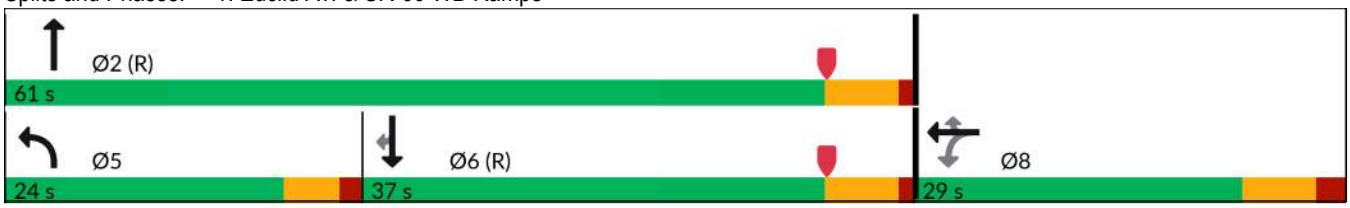

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 373 | 3 | 390 | 304 | 948 | 0 | 0 | 1099 | 527 |
| Future Volume (veh/h) | 0 | 0 | 0 | 373 | 3 | 390 | 304 | 948 | 0 | 0 | 1099 | 527 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 469 | 0 | 154 | 323 | 1009 | 0 | 0 | 1169 | 322 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 593 | 0 | 279 | 333 | 2254 | 0 | 0 | 1356 | 600 |
| Arrive On Green | | | | 0.19 | 0.00 | 0.19 | 0.07 | 0.22 | 0.00 | 0.00 | 0.40 | 0.40 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1497 | 1594 | 3455 | 0 | 0 | 3455 | 1490 |
| Grp Volume(v), veh/h | | | | 469 | 0 | 154 | 323 | 1009 | 0 | 0 | 1169 | 322 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1497 | 1594 | 1683 | 0 | 0 | 1683 | 1490 |
| Q Serve(g_s), s | | | | 12.6 | 0.0 | 8.4 | 18.2 | 23.3 | 0.0 | 0.0 | 28.6 | 14.8 |
| Cycle Q Clear(g_c), s | | | | 12.6 | 0.0 | 8.4 | 18.2 | 23.3 | 0.0 | 0.0 | 28.6 | 14.8 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 593 | 0 | 279 | 333 | 2254 | 0 | 0 | 1356 | 600 |
| V/C Ratio(X) | | | | 0.79 | 0.00 | 0.55 | 0.97 | 0.45 | 0.00 | 0.00 | 0.86 | 0.54 |
| Avail Cap(c_a), veh/h | | | | 779 | 0 | 366 | 333 | 2254 | 0 | 0 | 1356 | 600 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.42 | 0.42 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.0 | 0.0 | 33.2 | 41.6 | 20.7 | 0.0 | 0.0 | 24.6 | 20.5 |
| Incr Delay (d2), s/veh | | | | 4.9 | 0.0 | 2.4 | 24.8 | 0.3 | 0.0 | 0.0 | 7.4 | 3.4 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.2 | 0.0 | 3.2 | 9.9 | 10.3 | 0.0 | 0.0 | 11.6 | 5.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.8 | 0.0 | 35.7 | 66.4 | 20.9 | 0.0 | 0.0 | 32.0 | 23.9 |
| LnGrp LOS | | | | D | | D | E | C | | | C | C |
| Approach Vol, veh/h | | | | | 623 | | | 1332 | | | 1491 | |
| Approach Delay, s/veh | | | | | 38.8 | | | 32.0 | | | 30.2 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.2 | 24.0 | 42.2 | 23.8 |
| Change Period (Y+Rc), s | 6.0 | 5.2 | 6.0 | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | 18.8 | 31.0 | 22.0 |
| Max Q Clear Time (g_c+I1), s | 25.3 | 20.2 | 30.6 | 14.6 |
| Green Ext Time (p_c), s | 10.7 | 0.0 | 0.4 | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 32.5 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 260 | 2 | 303 | 982 | 393 | 386 | 1068 |
| Future Volume (vph) | 260 | 2 | 303 | 982 | 393 | 386 | 1068 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 9.6 | 9.6 | 29.0 | 29.0 | 14.7 | 27.0 |
| Total Split (s) | 25.0 | 25.0 | 25.0 | 33.0 | 33.0 | 32.0 | 65.0 |
| Total Split (%) | 27.8% | 27.8% | 27.8% | 36.7% | 36.7% | 35.6% | 72.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | | 4.6 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 18.4 | 0.0 | 18.4 | 31.2 | 31.2 | 25.1 | 61.0 |
| Actuated g/C Ratio | 0.20 | 0.00 | 0.20 | 0.35 | 0.35 | 0.28 | 0.68 |
| v/c Ratio | 0.81 | no cap | 0.77 | 0.86 | 0.52 | 0.88 | 0.47 |
| Control Delay (s/veh) | 54.4 | | 34.1 | 38.0 | 5.4 | 30.7 | 15.7 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 |
| Total Delay (s/veh) | 54.4 | Error | 34.1 | 38.0 | 5.4 | 30.7 | 16.9 |
| LOS | D | F | C | D | A | C | B |
| Approach Delay (s/veh) | | Error | | 28.7 | | | 20.5 |
| Approach LOS | | F | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

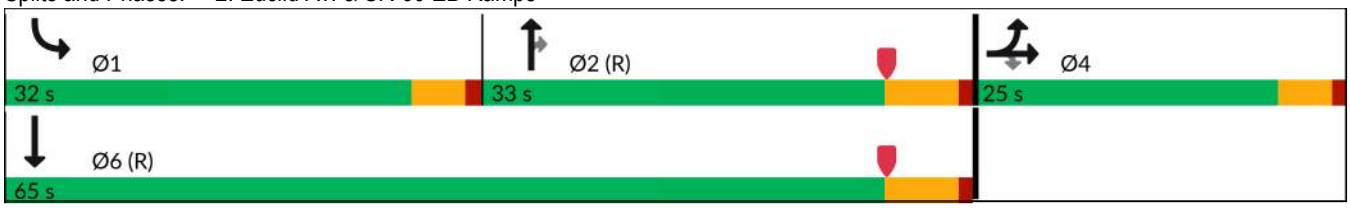

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 260 | 2 | 303 | 0 | 0 | 0 | 0 | 982 | 393 | 386 | 1068 | 0 |
| Future Volume (veh/h) | 260 | 2 | 303 | 0 | 0 | 0 | 0 | 982 | 393 | 386 | 1068 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 263 | 2 | 247 | | | | 0 | 992 | 282 | 390 | 1079 | 0 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 303 | 0 | 285 | | | | 0 | 1282 | 569 | 413 | 2330 | 0 |
| Arrive On Green | 0.19 | 0.19 | 0.19 | | | | 0.00 | 0.38 | 0.38 | 0.52 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 1499 | | | | 0 | 3455 | 1496 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 263 | 0 | 247 | | | | 0 | 992 | 282 | 390 | 1079 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1499 | | | | 0 | 1683 | 1496 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 14.4 | 0.0 | 14.4 | | | | 0.0 | 23.3 | 12.9 | 20.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.4 | 0.0 | 14.4 | | | | 0.0 | 23.3 | 12.9 | 20.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 303 | 0 | 285 | | | | 0 | 1282 | 569 | 413 | 2330 | 0 |
| V/C Ratio(X) | 0.87 | 0.00 | 0.87 | | | | 0.00 | 0.77 | 0.50 | 0.94 | 0.46 | 0.00 |
| Avail Cap(c_a), veh/h | 361 | 0 | 340 | | | | 0 | 1282 | 569 | 483 | 2330 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.84 | 0.84 | 0.18 | 0.18 | 0.00 |
| Uniform Delay (d), s/veh | 35.3 | 0.0 | 35.3 | | | | 0.0 | 24.5 | 21.3 | 21.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 17.3 | 0.0 | 18.0 | | | | 0.0 | 3.9 | 2.6 | 7.2 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.9 | 0.0 | 6.6 | | | | 0.0 | 9.1 | 4.6 | 5.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 52.6 | 0.0 | 53.3 | | | | 0.0 | 28.4 | 23.8 | 28.3 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | C | C | C | A | |
| Approach Vol, veh/h | | 510 | | | | | | 1274 | | | 1469 | |
| Approach Delay, s/veh | | 52.9 | | | | | | 27.4 | | | 7.6 | |
| Approach LOS | | D | | | | | | C | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 28.0 | 40.3 | | 21.7 | | 68.3 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 4.6 | | 6.0 |
| Max Green Setting (Gmax), s | 27.3 | 27.0 | | 20.4 | | 59.0 |
| Max Q Clear Time (g_c+I1), s | 22.8 | 25.3 | | 16.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.5 | 1.4 | | 0.7 | | 14.1 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 22.4 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 109 | 367 | 71 | 306 | 136 | 994 | 217 | 1061 |
| Future Volume (vph) | 109 | 367 | 71 | 306 | 136 | 994 | 217 | 1061 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 49.0 | 49.0 | 36.0 | 85.0 |
| Total Split (%) | 29.2% | 29.2% | 29.2% | 29.2% | 40.8% | 40.8% | 30.0% | 70.8% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 24.9 | 24.9 | 24.9 | 24.9 | 43.5 | 43.5 | 12.0 | 60.2 |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.26 | 0.26 | 0.45 | 0.45 | 0.12 | 0.62 |
| v/c Ratio | 0.71 | 0.69 | 0.67 | 0.54 | 0.87 | 0.50 | 0.63 | 0.41 |
| Control Delay (s/veh) | 57.8 | 31.6 | 63.5 | 29.3 | 74.7 | 21.0 | 49.4 | 10.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 57.8 | 31.6 | 63.5 | 29.3 | 74.7 | 21.0 | 49.4 | 10.0 |
| LOS | E | C | E | C | E | C | D | B |
| Approach Delay (s/veh) | | 35.8 | | 34.0 | | 27.2 | | 16.2 |
| Approach LOS | | D | | C | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 96.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 25.6 | Intersection LOS: C |
| Intersection Capacity Utilization 78.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

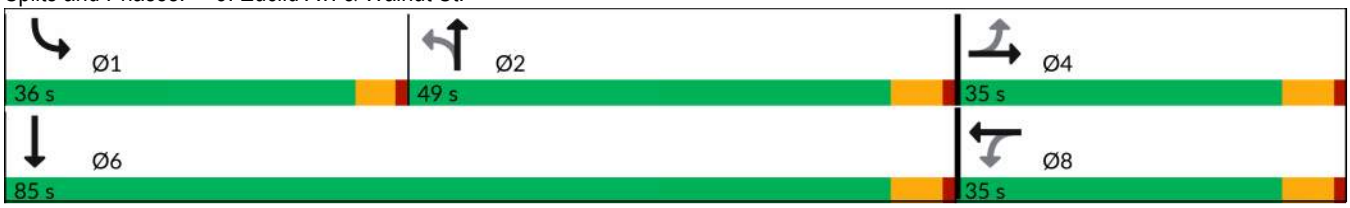

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 109 | 367 | 216 | 71 | 306 | 142 | 136 | 994 | 48 | 217 | 1061 | 115 |
| Future Volume (veh/h) | 109 | 367 | 216 | 71 | 306 | 142 | 136 | 994 | 48 | 217 | 1061 | 115 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 114 | 382 | 219 | 74 | 319 | 118 | 142 | 1035 | 29 | 226 | 1105 | 90 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 254 | 614 | 347 | 191 | 713 | 258 | 266 | 1953 | 55 | 301 | 2568 | 209 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.40 | 0.40 | 0.40 | 0.10 | 0.56 | 0.56 |
| Sat Flow, veh/h | 896 | 2071 | 1170 | 772 | 2405 | 871 | 442 | 4835 | 135 | 2910 | 4558 | 371 |
| Grp Volume(v), veh/h | 114 | 310 | 291 | 74 | 221 | 216 | 142 | 690 | 374 | 226 | 781 | 414 |
| Grp Sat Flow(s),veh/h/ln | 896 | 1683 | 1557 | 772 | 1683 | 1592 | 442 | 1612 | 1745 | 1455 | 1612 | 1704 |
| Q Serve(g_s), s | 9.8 | 13.1 | 13.4 | 7.6 | 8.8 | 9.1 | 23.3 | 13.4 | 13.4 | 6.2 | 11.5 | 11.6 |
| Cycle Q Clear(g_c), s | 18.9 | 13.1 | 13.4 | 21.0 | 8.8 | 9.1 | 23.3 | 13.4 | 13.4 | 6.2 | 11.5 | 11.6 |
| Prop In Lane | 1.00 | | 0.75 | 1.00 | | 0.55 | 1.00 | | 0.08 | 1.00 | | 0.22 |
| Lane Grp Cap(c), veh/h | 254 | 499 | 461 | 191 | 499 | 472 | 266 | 1303 | 705 | 301 | 1817 | 960 |
| V/C Ratio(X) | 0.45 | 0.62 | 0.63 | 0.39 | 0.44 | 0.46 | 0.53 | 0.53 | 0.53 | 0.75 | 0.43 | 0.43 |
| Avail Cap(c_a), veh/h | 305 | 595 | 550 | 235 | 595 | 563 | 318 | 1686 | 912 | 1106 | 3091 | 1634 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.4 | 25.1 | 25.2 | 34.2 | 23.6 | 23.7 | 21.6 | 18.7 | 18.7 | 36.0 | 10.4 | 10.4 |
| Incr Delay (d2), s/veh | 1.2 | 1.5 | 1.7 | 1.3 | 0.6 | 0.7 | 1.7 | 0.3 | 0.6 | 1.4 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 5.0 | 4.7 | 1.4 | 3.3 | 3.2 | 2.2 | 4.5 | 4.9 | 2.1 | 3.4 | 3.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 32.6 | 26.5 | 26.9 | 35.5 | 24.2 | 24.4 | 23.3 | 19.0 | 19.3 | 37.4 | 10.6 | 10.7 |
| LnGrp LOS | C | C | C | D | C | C | C | B | B | D | B | B |
| Approach Vol, veh/h | | 715 | | | 511 | | | 1206 | | | 1421 | |
| Approach Delay, s/veh | | 27.6 | | | 25.9 | | | 19.6 | | | 14.9 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.2 | 39.2 | | 30.3 | | 52.3 | | 30.3 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.4 | 43.2 | | 29.2 | | 79.2 | | 29.2 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 25.3 | | 20.9 | | 13.6 | | 23.0 |
| Green Ext Time (p_c), s | 0.4 | 8.1 | | 2.6 | | 9.6 | | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.2 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 130 | 549 | 168 | 503 | 116 | 943 | 244 | 106 | 1032 | 215 |
| Future Volume (vph) | 130 | 549 | 168 | 503 | 116 | 943 | 244 | 106 | 1032 | 215 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 20.8 | 43.0 | 21.0 | 43.2 | 15.2 | 40.0 | 40.0 | 16.0 | 40.8 | 40.8 |
| Total Split (%) | 17.3% | 35.8% | 17.5% | 36.0% | 12.7% | 33.3% | 33.3% | 13.3% | 34.0% | 34.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.1 | 36.0 | 15.2 | 37.1 | 10.0 | 34.2 | 34.2 | 10.6 | 34.8 | 34.8 |
| Actuated g/C Ratio | 0.12 | 0.30 | 0.13 | 0.31 | 0.08 | 0.29 | 0.29 | 0.09 | 0.29 | 0.29 |
| v/c Ratio | 0.70 | 1.19 | 0.84 | 0.54 | 0.89 | 0.99 | 0.47 | 0.76 | 1.06 | 0.39 |
| Control Delay (s/veh) | 70.6 | 141.0 | 83.4 | 35.8 | 106.7 | 69.2 | 20.1 | 85.1 | 87.6 | 9.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 70.6 | 141.0 | 83.4 | 35.8 | 106.7 | 69.2 | 20.1 | 85.1 | 87.6 | 9.4 |
| LOS | E | F | F | D | F | E | C | F | F | A |
| Approach Delay (s/veh) | | 128.9 | | 46.9 | | 63.4 | | | 75.0 | |
| Approach LOS | | F | | D | | E | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.9 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.19 | |
| Intersection Signal Delay (s/veh): 76.2 | Intersection LOS: E |
| Intersection Capacity Utilization 103.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

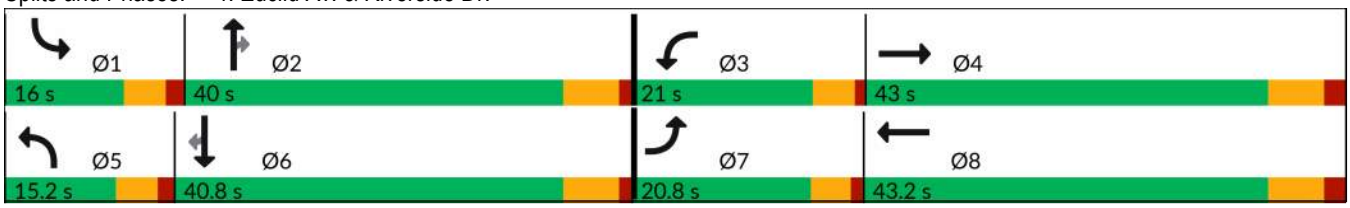

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 130 | 549 | 74 | 168 | 503 | 53 | 116 | 943 | 244 | 106 | 1032 | 215 |
| Future Volume (veh/h) | 130 | 549 | 74 | 168 | 503 | 53 | 116 | 943 | 244 | 106 | 1032 | 215 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 131 | 555 | 51 | 170 | 508 | 32 | 117 | 953 | 146 | 107 | 1042 | 149 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 160 | 487 | 45 | 194 | 1048 | 66 | 135 | 1001 | 446 | 131 | 992 | 437 |
| Arrive On Green | 0.10 | 0.30 | 0.30 | 0.12 | 0.33 | 0.33 | 0.08 | 0.30 | 0.30 | 0.08 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1594 | 1599 | 147 | 1594 | 3213 | 202 | 1594 | 3367 | 1502 | 1594 | 3367 | 1482 |
| Grp Volume(v), veh/h | 131 | 0 | 606 | 170 | 266 | 274 | 117 | 953 | 146 | 107 | 1042 | 149 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1745 | 1594 | 1683 | 1731 | 1594 | 1683 | 1502 | 1594 | 1683 | 1482 |
| Q Serve(g_s), s | 9.5 | 0.0 | 36.0 | 12.4 | 14.9 | 15.0 | 8.6 | 32.8 | 8.9 | 7.8 | 34.8 | 9.3 |
| Cycle Q Clear(g_c), s | 9.5 | 0.0 | 36.0 | 12.4 | 14.9 | 15.0 | 8.6 | 32.8 | 8.9 | 7.8 | 34.8 | 9.3 |
| Prop In Lane | 1.00 | | 0.08 | 1.00 | | 0.12 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 160 | 0 | 532 | 194 | 549 | 565 | 135 | 1001 | 446 | 131 | 992 | 437 |
| V/C Ratio(X) | 0.82 | 0.00 | 1.14 | 0.88 | 0.48 | 0.49 | 0.87 | 0.95 | 0.33 | 0.82 | 1.05 | 0.34 |
| Avail Cap(c_a), veh/h | 217 | 0 | 532 | 220 | 549 | 565 | 135 | 1001 | 446 | 146 | 992 | 437 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 52.1 | 0.0 | 41.0 | 51.0 | 31.8 | 31.8 | 53.4 | 40.7 | 32.3 | 53.3 | 41.6 | 32.6 |
| Incr Delay (d2), s/veh | 12.0 | 0.0 | 83.2 | 26.1 | 0.9 | 0.9 | 40.8 | 18.0 | 0.4 | 27.0 | 42.6 | 0.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.2 | 0.0 | 27.0 | 6.2 | 6.0 | 6.2 | 4.8 | 15.1 | 3.2 | 4.0 | 19.6 | 3.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 64.1 | 0.0 | 124.3 | 77.1 | 32.7 | 32.8 | 94.2 | 58.7 | 32.7 | 80.3 | 84.3 | 33.1 |
| LnGrp LOS | E | | F | E | C | C | F | E | C | F | F | C |
| Approach Vol, veh/h | | 737 | | | 710 | | | 1216 | | | 1298 | |
| Approach Delay, s/veh | | 113.6 | | | 43.4 | | | 59.0 | | | 78.1 | |
| Approach LOS | | F | | | D | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.9 | 41.1 | 19.1 | 43.0 | 15.2 | 40.8 | 16.5 | 45.5 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.8 | 34.0 | 16.3 | 36.0 | 10.0 | 34.8 | 16.1 | 36.2 |
| Max Q Clear Time (g_c+I1), s | 9.8 | 34.8 | 14.4 | 38.0 | 10.6 | 36.8 | 11.5 | 17.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 4.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 72.6 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 110 | 384 | 69 | 105 | 238 | 83 | 1173 | 268 | 33 | 1140 | 110 |
| Future Volume (vph) | 110 | 384 | 69 | 105 | 238 | 83 | 1173 | 268 | 33 | 1140 | 110 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 55.0 | 55.0 | 55.0 | 15.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 41.7% | 45.8% | 45.8% | 45.8% | 12.5% | 58.3% | 58.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 44.9 | 44.9 | 44.9 | | 44.9 | 43.6 | 43.6 | 43.6 | 10.2 | 51.6 | 51.6 |
| Actuated g/C Ratio | 0.41 | 0.41 | 0.41 | | 0.41 | 0.40 | 0.40 | 0.40 | 0.09 | 0.47 | 0.47 |
| v/c Ratio | 0.34 | 0.54 | 0.11 | | 0.89 | 0.75 | 0.89 | 0.43 | 0.23 | 0.73 | 0.15 |
| Control Delay (s/veh) | 29.6 | 30.4 | 5.8 | | 57.7 | 68.7 | 40.7 | 20.1 | 54.7 | 25.5 | 4.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.6 | 30.4 | 5.8 | | 57.7 | 68.7 | 40.7 | 20.1 | 54.7 | 25.5 | 4.0 |
| LOS | C | C | A | | E | E | D | C | D | C | A |
| Approach Delay (s/veh) | | 27.2 | | | 57.7 | | 38.6 | | | 24.4 | |
| Approach LOS | | C | | | E | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.89 | |
| Intersection Signal Delay (s/veh): 33.9 | Intersection LOS: C |
| Intersection Capacity Utilization 104.5% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 384 | 69 | 105 | 238 | 27 | 83 | 1173 | 268 | 33 | 1140 | 110 |
| Future Volume (veh/h) | 110 | 384 | 69 | 105 | 238 | 27 | 83 | 1173 | 268 | 33 | 1140 | 110 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 112 | 392 | 53 | 107 | 243 | 26 | 85 | 1197 | 197 | 34 | 1163 | 84 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 250 | 685 | 581 | 125 | 263 | 26 | 166 | 1372 | 612 | 92 | 1702 | 759 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.41 | 0.41 | 0.41 | 0.06 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1049 | 1772 | 1502 | 220 | 680 | 67 | 421 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 112 | 392 | 53 | 376 | 0 | 0 | 85 | 1197 | 197 | 34 | 1163 | 84 |
| Grp Sat Flow(s),veh/h/ln | 1049 | 1772 | 1502 | 966 | 0 | 0 | 421 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 0.0 | 19.9 | 2.6 | 24.3 | 0.0 | 0.0 | 21.8 | 37.4 | 10.2 | 2.3 | 29.8 | 3.3 |
| Cycle Q Clear(g_c), s | 21.1 | 19.9 | 2.6 | 44.2 | 0.0 | 0.0 | 40.5 | 37.4 | 10.2 | 2.3 | 29.8 | 3.3 |
| Prop In Lane | 1.00 | | 1.00 | 0.28 | | 0.07 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 250 | 685 | 581 | 414 | 0 | 0 | 166 | 1372 | 612 | 92 | 1702 | 759 |
| V/C Ratio(X) | 0.45 | 0.57 | 0.09 | 0.91 | 0.00 | 0.00 | 0.51 | 0.87 | 0.32 | 0.37 | 0.68 | 0.11 |
| Avail Cap(c_a), veh/h | 250 | 685 | 581 | 414 | 0 | 0 | 173 | 1429 | 637 | 145 | 1870 | 834 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.0 | 27.6 | 22.3 | 39.2 | 0.0 | 0.0 | 40.8 | 31.1 | 23.1 | 51.8 | 21.3 | 14.8 |
| Incr Delay (d2), s/veh | 1.3 | 1.1 | 0.1 | 23.4 | 0.0 | 0.0 | 2.4 | 6.0 | 0.3 | 0.9 | 0.9 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 8.3 | 0.9 | 12.8 | 0.0 | 0.0 | 2.2 | 14.9 | 3.4 | 0.9 | 10.6 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 29.2 | 28.7 | 22.3 | 62.6 | 0.0 | 0.0 | 43.3 | 37.2 | 23.4 | 52.8 | 22.3 | 14.9 |
| LnGrp LOS | C | C | C | E | | | D | D | C | D | C | B |
| Approach Vol, veh/h | | 557 | | | 376 | | | 1479 | | | 1281 | |
| Approach Delay, s/veh | | 28.2 | | | 62.6 | | | 35.7 | | | 22.6 | |
| Approach LOS | | C | | | E | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.2 | 53.1 | | 50.0 | | 64.3 | | 50.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 48.5 | | 44.2 | | 63.5 | | 44.2 |
| Max Q Clear Time (g_c+I1), s | 4.3 | 42.5 | | 23.1 | | 31.8 | | 46.2 |
| Green Ext Time (p_c), s | 0.0 | 4.1 | | 2.9 | | 9.0 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 32.8 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 214 | 290 | 148 | 67 | 116 | 104 | 1332 | 62 | 41 | 1149 | 107 |
| Future Volume (vph) | 214 | 290 | 148 | 67 | 116 | 104 | 1332 | 62 | 41 | 1149 | 107 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 19.0 | 51.3 | 51.3 | 14.7 | 47.0 | 14.7 | 39.3 | 39.3 | 14.7 | 39.3 | 39.3 |
| Total Split (%) | 15.8% | 42.8% | 42.8% | 12.3% | 39.2% | 12.3% | 32.8% | 32.8% | 12.3% | 32.8% | 32.8% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 26.9 | 26.9 | 10.1 | 19.3 | 10.1 | 39.5 | 39.5 | 10.1 | 33.1 | 33.1 |
| Actuated g/C Ratio | 0.14 | 0.27 | 0.27 | 0.10 | 0.19 | 0.10 | 0.39 | 0.39 | 0.10 | 0.33 | 0.33 |
| v/c Ratio | 0.98 | 0.64 | 0.30 | 0.44 | 0.49 | 0.68 | 1.05 | 0.10 | 0.27 | 1.08 | 0.19 |
| Control Delay (s/veh) | 99.9 | 39.5 | 5.9 | 55.1 | 36.0 | 67.8 | 71.2 | 0.3 | 50.0 | 84.8 | 5.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 99.9 | 39.5 | 5.9 | 55.1 | 36.0 | 67.8 | 71.2 | 0.3 | 50.0 | 84.8 | 5.5 |
| LOS | F | D | A | E | D | E | E | A | D | F | A |
| Approach Delay (s/veh) | | 51.7 | | | 41.6 | | 68.0 | | | 77.1 | |
| Approach LOS | | D | | | D | | E | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 100.1 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.08 | |
| Intersection Signal Delay (s/veh): 66.7 | Intersection LOS: E |
| Intersection Capacity Utilization 90.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

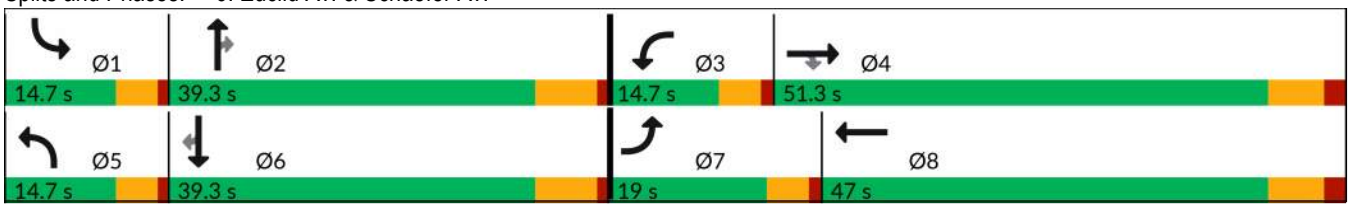

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 214 | 290 | 148 | 67 | 116 | 44 | 104 | 1332 | 62 | 41 | 1149 | 107 |
| Future Volume (veh/h) | 214 | 290 | 148 | 67 | 116 | 44 | 104 | 1332 | 62 | 41 | 1149 | 107 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 223 | 302 | 95 | 70 | 121 | 38 | 108 | 1388 | 51 | 43 | 1197 | 80 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 248 | 358 | 303 | 144 | 177 | 56 | 162 | 1300 | 580 | 116 | 1201 | 536 |
| Arrive On Green | 0.16 | 0.20 | 0.20 | 0.09 | 0.14 | 0.14 | 0.10 | 0.39 | 0.39 | 0.07 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1293 | 406 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 223 | 302 | 95 | 70 | 0 | 159 | 108 | 1388 | 51 | 43 | 1197 | 80 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1699 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 12.6 | 15.1 | 5.0 | 3.8 | 0.0 | 8.2 | 6.0 | 35.5 | 2.0 | 2.4 | 32.6 | 3.3 |
| Cycle Q Clear(g_c), s | 12.6 | 15.1 | 5.0 | 3.8 | 0.0 | 8.2 | 6.0 | 35.5 | 2.0 | 2.4 | 32.6 | 3.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.24 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 248 | 358 | 303 | 144 | 0 | 233 | 162 | 1300 | 580 | 116 | 1201 | 536 |
| V/C Ratio(X) | 0.90 | 0.84 | 0.31 | 0.49 | 0.00 | 0.68 | 0.67 | 1.07 | 0.09 | 0.37 | 1.00 | 0.15 |
| Avail Cap(c_a), veh/h | 248 | 854 | 723 | 173 | 0 | 739 | 173 | 1300 | 580 | 173 | 1201 | 536 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.1 | 35.3 | 31.3 | 39.8 | 0.0 | 37.8 | 39.8 | 28.2 | 17.9 | 40.7 | 29.5 | 20.1 |
| Incr Delay (d2), s/veh | 31.4 | 4.1 | 0.4 | 0.9 | 0.0 | 2.6 | 6.5 | 45.3 | 0.1 | 0.7 | 25.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.8 | 6.5 | 1.7 | 1.5 | 0.0 | 3.4 | 2.5 | 20.5 | 0.6 | 0.9 | 15.7 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 69.5 | 39.4 | 31.7 | 40.7 | 0.0 | 40.4 | 46.3 | 73.5 | 18.0 | 41.4 | 54.7 | 20.2 |
| LnGrp LOS | E | D | C | D | | D | D | F | B | D | D | C |
| Approach Vol, veh/h | | 620 | | | 229 | | | 1547 | | | 1320 | |
| Approach Delay, s/veh | | 49.1 | | | 40.5 | | | 69.8 | | | 52.2 | |
| Approach LOS | | D | | | D | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.4 | 42.0 | 13.0 | 25.6 | 14.1 | 39.3 | 19.0 | 19.6 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 32.8 | 10.0 | 44.3 | 10.0 | 32.8 | 14.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 4.4 | 37.5 | 5.8 | 17.1 | 8.0 | 34.6 | 14.6 | 10.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 58.3 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 588 | 131 | 224 | 350 | 135 | 1150 | 399 | 357 | 904 | 142 |
| Future Volume (vph) | 138 | 588 | 131 | 224 | 350 | 135 | 1150 | 399 | 357 | 904 | 142 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 50.1 | 50.1 | 50.1 | 50.1 | 50.1 | 14.7 | 43.3 | 43.3 | 26.6 | 55.2 | 55.2 |
| Total Split (%) | 41.8% | 41.8% | 41.8% | 41.8% | 41.8% | 12.3% | 36.1% | 36.1% | 22.2% | 46.0% | 46.0% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 42.9 | 42.9 | 42.9 | 42.9 | 42.9 | 10.0 | 36.8 | 36.8 | 21.9 | 48.7 | 48.7 |
| Actuated g/C Ratio | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.08 | 0.31 | 0.31 | 0.18 | 0.41 | 0.41 |
| v/c Ratio | 2.73 | 1.01 | 0.24 | 4.42 | 1.09 | 0.61 | 1.22 | 0.80 | 1.35 | 0.72 | 0.23 |
| Control Delay (s/veh) | 845.0 | 78.2 | 8.1 | Error | 100.1 | 64.7 | 143.1 | 39.1 | 216.1 | 33.7 | 6.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 845.0 | 78.2 | 8.1 | Error | 100.1 | 64.7 | 143.1 | 39.1 | 216.1 | 33.7 | 6.0 |
| LOS | F | E | A | F | F | E | F | D | F | C | A |
| Approach Delay (s/veh) | | 191.0 | | | 496.7 | | 112.1 | | | 77.3 | |
| Approach LOS | | F | | | F | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 4.42 | |
| Intersection Signal Delay (s/veh): 183.6 | Intersection LOS: F |
| Intersection Capacity Utilization 123.5% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 138 | 588 | 131 | 224 | 350 | 268 | 135 | 1150 | 399 | 357 | 904 | 142 |
| Future Volume (veh/h) | 138 | 588 | 131 | 224 | 350 | 268 | 135 | 1150 | 399 | 357 | 904 | 142 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 150 | 639 | 84 | 243 | 380 | 282 | 147 | 1250 | 406 | 388 | 983 | 114 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 60 | 633 | 536 | 60 | 338 | 251 | 241 | 1032 | 460 | 291 | 1368 | 601 |
| Arrive On Green | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.08 | 0.31 | 0.31 | 0.18 | 0.41 | 0.41 |
| Sat Flow, veh/h | 730 | 1772 | 1500 | 690 | 945 | 701 | 2910 | 3367 | 1502 | 1594 | 3367 | 1480 |
| Grp Volume(v), veh/h | 150 | 639 | 84 | 243 | 0 | 662 | 147 | 1250 | 406 | 388 | 983 | 114 |
| Grp Sat Flow(s),veh/h/ln | 730 | 1772 | 1500 | 690 | 0 | 1646 | 1455 | 1683 | 1502 | 1594 | 1683 | 1480 |
| Q Serve(g_s), s | 0.0 | 42.9 | 4.6 | 0.0 | 0.0 | 42.9 | 5.9 | 36.8 | 30.8 | 21.9 | 29.4 | 5.9 |
| Cycle Q Clear(g_c), s | 42.9 | 42.9 | 4.6 | 42.9 | 0.0 | 42.9 | 5.9 | 36.8 | 30.8 | 21.9 | 29.4 | 5.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.43 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 60 | 633 | 536 | 60 | 0 | 588 | 241 | 1032 | 460 | 291 | 1368 | 601 |
| V/C Ratio(X) | 2.50 | 1.01 | 0.16 | 4.05 | 0.00 | 1.13 | 0.61 | 1.21 | 0.88 | 1.33 | 0.72 | 0.19 |
| Avail Cap(c_a), veh/h | 60 | 633 | 536 | 60 | 0 | 588 | 243 | 1032 | 460 | 291 | 1368 | 601 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 60.0 | 38.5 | 26.2 | 60.0 | 0.0 | 38.6 | 53.2 | 41.6 | 39.5 | 49.0 | 29.9 | 22.9 |
| Incr Delay (d2), s/veh | 721.8 | 37.9 | 0.1 | 1411.2 | 0.0 | 76.6 | 3.2 | 104.0 | 17.8 | 171.9 | 1.8 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.8 | 24.3 | 1.6 | 25.3 | 0.0 | 28.8 | 2.2 | 29.1 | 12.9 | 22.2 | 11.3 | 2.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 781.8 | 76.5 | 26.4 | 1471.2 | 0.0 | 115.1 | 56.3 | 145.6 | 57.3 | 220.9 | 31.7 | 23.1 |
| LnGrp LOS | F | F | C | F | | F | E | F | E | F | C | C |
| Approach Vol, veh/h | | 873 | | | 905 | | | 1803 | | | 1485 | |
| Approach Delay, s/veh | | 192.8 | | | 479.2 | | | 118.4 | | | 80.5 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.6 | 43.3 | | 50.1 | 14.6 | 55.3 | | 50.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 21.9 | 36.8 | | 42.9 | 10.0 | 48.7 | | 42.9 |
| Max Q Clear Time (g_c+I1), s | 23.9 | 38.8 | | 44.9 | 7.9 | 31.4 | | 44.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 6.0 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 184.6 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 78 | 351 | 216 | 166 | 187 | 101 | 1227 | 184 | 105 | 1042 | 70 |
| Future Volume (vph) | 78 | 351 | 216 | 166 | 187 | 101 | 1227 | 184 | 105 | 1042 | 70 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 30.2 | 30.2 | 30.2 | 30.2 | 30.2 | 12.6 | 38.4 | 38.4 | 12.8 | 42.1 | 42.1 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.13 | 0.38 | 0.38 | 0.13 | 0.42 | 0.42 |
| v/c Ratio | 0.44 | 0.69 | 0.37 | 1.02 | 0.67 | 0.53 | 1.01 | 0.31 | 0.55 | 0.78 | 0.11 |
| Control Delay (s/veh) | 35.5 | 37.6 | 5.1 | 108.0 | 33.2 | 54.0 | 59.8 | 16.7 | 54.6 | 34.1 | 6.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.5 | 37.6 | 5.1 | 108.0 | 33.2 | 54.0 | 59.8 | 16.7 | 54.6 | 34.1 | 6.0 |
| LOS | D | D | A | F | C | D | E | B | D | C | A |
| Approach Delay (s/veh) | | 26.4 | | | 58.1 | | 54.1 | | | 34.3 | |
| Approach LOS | | C | | | E | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 100.1 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.02 | |
| Intersection Signal Delay (s/veh): 43.8 | Intersection LOS: D |
| Intersection Capacity Utilization 95.2% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

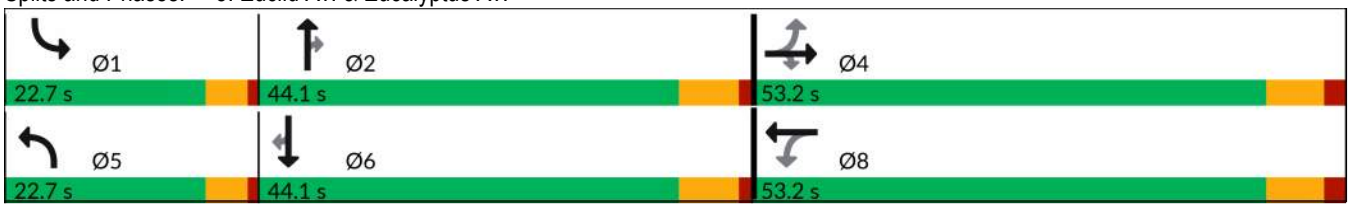

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 78 | 351 | 216 | 166 | 187 | 146 | 101 | 1227 | 184 | 105 | 1042 | 70 |
| Future Volume (veh/h) | 78 | 351 | 216 | 166 | 187 | 146 | 101 | 1227 | 184 | 105 | 1042 | 70 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 82 | 369 | 125 | 175 | 197 | 141 | 106 | 1292 | 170 | 111 | 1097 | 41 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 295 | 690 | 584 | 262 | 374 | 268 | 142 | 1178 | 525 | 143 | 1180 | 526 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.09 | 0.35 | 0.35 | 0.09 | 0.35 | 0.35 |
| Sat Flow, veh/h | 984 | 1772 | 1502 | 853 | 961 | 688 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 82 | 369 | 125 | 175 | 0 | 338 | 106 | 1292 | 170 | 111 | 1097 | 41 |
| Grp Sat Flow(s),veh/h/ln | 984 | 1772 | 1502 | 853 | 0 | 1648 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 7.5 | 17.3 | 6.0 | 21.4 | 0.0 | 16.9 | 7.0 | 37.6 | 8.9 | 7.3 | 33.7 | 2.0 |
| Cycle Q Clear(g_c), s | 24.4 | 17.3 | 6.0 | 38.7 | 0.0 | 16.9 | 7.0 | 37.6 | 8.9 | 7.3 | 33.7 | 2.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.42 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 295 | 690 | 584 | 262 | 0 | 641 | 142 | 1178 | 525 | 143 | 1180 | 526 |
| V/C Ratio(X) | 0.28 | 0.54 | 0.21 | 0.67 | 0.00 | 0.53 | 0.75 | 1.10 | 0.32 | 0.78 | 0.93 | 0.08 |
| Avail Cap(c_a), veh/h | 333 | 759 | 643 | 295 | 0 | 706 | 267 | 1178 | 525 | 267 | 1180 | 526 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 34.6 | 25.3 | 21.9 | 40.2 | 0.0 | 25.2 | 47.8 | 34.9 | 25.6 | 47.9 | 33.6 | 23.3 |
| Incr Delay (d2), s/veh | 0.4 | 0.5 | 0.1 | 4.3 | 0.0 | 0.5 | 5.7 | 56.8 | 0.4 | 6.6 | 12.8 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 6.9 | 2.0 | 4.5 | 0.0 | 6.2 | 2.9 | 23.2 | 3.0 | 3.0 | 14.6 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.0 | 25.8 | 22.0 | 44.5 | 0.0 | 25.7 | 53.4 | 91.7 | 26.0 | 54.4 | 46.4 | 23.4 |
| LnGrp LOS | C | C | C | D | | C | D | F | C | D | D | C |
| Approach Vol, veh/h | | 576 | | | 513 | | | 1568 | | | 1249 | |
| Approach Delay, s/veh | | 26.3 | | | 32.1 | | | 82.0 | | | 46.4 | |
| Approach LOS | | C | | | C | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.3 | 44.1 | | 49.0 | 14.3 | 44.2 | | 49.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 9.3 | 39.6 | | 26.4 | 9.0 | 35.7 | | 40.7 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | | 2.1 | 0.1 | 1.2 | | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 55.9 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 23 | 23 | 141 | 0 | 2 | 1566 | 103 | 194 | 1521 |
| Future Volume (vph) | 23 | 23 | 141 | 0 | 2 | 1566 | 103 | 194 | 1521 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.7 | 50.7 | 22.1 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.4% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 19.8 | | 19.8 | 10.1 | 44.8 | 44.8 | 16.1 | 63.2 |
| Actuated g/C Ratio | | 0.20 | | 0.20 | 0.10 | 0.45 | 0.45 | 0.16 | 0.64 |
| v/c Ratio | | 0.24 | | 0.79 | 0.01 | 1.08 | 0.14 | 0.79 | 0.75 |
| Control Delay (s/veh) | | 26.3 | | 37.7 | 47.0 | 76.0 | 3.6 | 64.2 | 18.8 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 26.3 | | 37.7 | 47.0 | 76.0 | 3.6 | 64.2 | 18.8 |
| LOS | | C | | D | D | E | A | E | B |
| Approach Delay (s/veh) | | 26.3 | | 37.7 | | 71.5 | | | 23.9 |
| Approach LOS | | C | | D | | E | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 99.3 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.08 | |
| Intersection Signal Delay (s/veh): 46.3 | Intersection LOS: D |
| Intersection Capacity Utilization 96.4% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

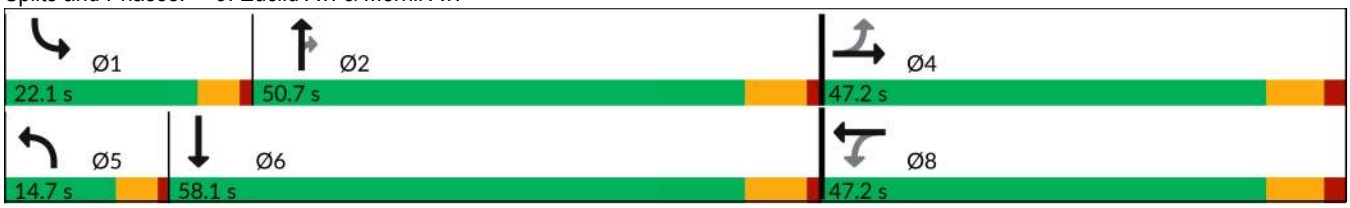

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 23 | 23 | 19 | 141 | 0 | 131 | 2 | 1566 | 103 | 194 | 1521 | 9 |
| Future Volume (veh/h) | 23 | 23 | 19 | 141 | 0 | 131 | 2 | 1566 | 103 | 194 | 1521 | 9 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 24 | 24 | 13 | 147 | 0 | 128 | 2 | 1631 | 103 | 202 | 1584 | 8 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 148 | 139 | 64 | 216 | 6 | 144 | 9 | 1532 | 683 | 231 | 2042 | 10 |
| Arrive On Green | 0.21 | 0.21 | 0.21 | 0.21 | 0.00 | 0.21 | 0.01 | 0.46 | 0.46 | 0.14 | 0.59 | 0.59 |
| Sat Flow, veh/h | 460 | 661 | 304 | 757 | 28 | 683 | 1594 | 3367 | 1502 | 1594 | 3434 | 17 |
| Grp Volume(v), veh/h | 61 | 0 | 0 | 275 | 0 | 0 | 2 | 1631 | 103 | 202 | 776 | 816 |
| Grp Sat Flow(s),veh/h/ln | 1424 | 0 | 0 | 1467 | 0 | 0 | 1594 | 1683 | 1502 | 1594 | 1683 | 1768 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 14.8 | 0.0 | 0.0 | 0.1 | 44.2 | 3.9 | 12.1 | 33.7 | 33.7 |
| Cycle Q Clear(g_c), s | 2.8 | 0.0 | 0.0 | 17.6 | 0.0 | 0.0 | 0.1 | 44.2 | 3.9 | 12.1 | 33.7 | 33.7 |
| Prop In Lane | 0.39 | | 0.21 | 0.53 | | 0.47 | 1.00 | | 1.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 352 | 0 | 0 | 366 | 0 | 0 | 9 | 1532 | 683 | 231 | 1001 | 1051 |
| V/C Ratio(X) | 0.17 | 0.00 | 0.00 | 0.75 | 0.00 | 0.00 | 0.23 | 1.06 | 0.15 | 0.87 | 0.78 | 0.78 |
| Avail Cap(c_a), veh/h | 649 | 0 | 0 | 653 | 0 | 0 | 164 | 1532 | 683 | 286 | 1001 | 1051 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.4 | 0.0 | 0.0 | 37.0 | 0.0 | 0.0 | 48.1 | 26.5 | 15.5 | 40.7 | 14.8 | 14.8 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 | 5.0 | 42.4 | 0.1 | 18.8 | 3.9 | 3.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 | 0.1 | 24.1 | 1.2 | 5.6 | 11.0 | 11.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 31.5 | 0.0 | 0.0 | 38.2 | 0.0 | 0.0 | 53.1 | 68.8 | 15.6 | 59.5 | 18.7 | 18.5 |
| LnGrp LOS | C | | | D | | | D | F | B | E | B | B |
| Approach Vol, veh/h | | 61 | | | 275 | | | 1736 | | | 1794 | |
| Approach Delay, s/veh | | 31.5 | | | 38.2 | | | 65.6 | | | 23.2 | |
| Approach LOS | | C | | | D | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.8 | 50.7 | | 27.7 | 5.2 | 64.3 | | 27.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.4 | 44.2 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 14.1 | 46.2 | | 4.8 | 2.1 | 35.7 | | 19.6 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | | 0.2 | 0.0 | 8.8 | | 0.9 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 43.5 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 339 | 649 | 108 | 60 | 464 | 220 | 143 | 961 | 62 | 470 | 794 | 254 |
| Future Volume (vph) | 339 | 649 | 108 | 60 | 464 | 220 | 143 | 961 | 62 | 470 | 794 | 254 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 52.6 | 52.6 | 15.3 | 53.2 | 53.2 | 14.7 | 37.4 | 15.3 | 14.7 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 43.8% | 43.8% | 12.8% | 44.3% | 44.3% | 12.3% | 31.2% | 12.8% | 12.3% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lag | Lead | Lead | Lag | Lead | Lead | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.7 | 29.5 | 29.5 | 11.2 | 22.6 | 22.6 | 10.1 | 31.2 | 44.3 | 10.1 | 31.3 | 47.8 |
| Actuated g/C Ratio | 0.14 | 0.29 | 0.29 | 0.11 | 0.22 | 0.22 | 0.10 | 0.31 | 0.43 | 0.10 | 0.31 | 0.47 |
| v/c Ratio | 0.86 | 0.70 | 0.22 | 0.36 | 0.66 | 0.46 | 0.97 | 0.99 | 0.09 | 1.73 | 0.81 | 0.33 |
| Control Delay (s/veh) | 64.2 | 37.5 | 6.1 | 51.0 | 39.8 | 8.0 | 112.5 | 61.8 | 2.3 | 372.9 | 41.6 | 5.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 64.2 | 37.5 | 6.1 | 51.0 | 39.8 | 8.0 | 112.5 | 61.8 | 2.3 | 372.9 | 41.6 | 5.2 |
| LOS | E | D | A | D | D | A | F | E | A | F | D | A |
| Approach Delay (s/veh) | | 42.7 | | | 31.3 | | | 64.9 | | | 138.2 | |
| Approach LOS | | D | | | C | | | E | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 102 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.73 | |
| Intersection Signal Delay (s/veh): 78.6 | Intersection LOS: E |
| Intersection Capacity Utilization 90.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 339 | 649 | 108 | 60 | 464 | 220 | 143 | 961 | 62 | 470 | 794 | 254 |
| Future Volume (veh/h) | 339 | 649 | 108 | 60 | 464 | 220 | 143 | 961 | 62 | 470 | 794 | 254 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 357 | 683 | 61 | 63 | 488 | 127 | 151 | 1012 | 39 | 495 | 836 | 141 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 458 | 843 | 371 | 136 | 599 | 267 | 167 | 1069 | 605 | 305 | 1069 | 713 |
| Arrive On Green | 0.16 | 0.38 | 0.25 | 0.09 | 0.27 | 0.18 | 0.10 | 0.48 | 0.32 | 0.10 | 0.48 | 0.32 |
| Sat Flow, veh/h | 2910 | 3367 | 1482 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 357 | 683 | 61 | 63 | 488 | 127 | 151 | 1012 | 39 | 495 | 836 | 141 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1482 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 11.2 | 17.4 | 2.1 | 3.6 | 13.0 | 5.2 | 8.9 | 27.3 | 0.4 | 10.0 | 19.8 | 1.5 |
| Cycle Q Clear(g_c), s | 11.2 | 17.4 | 2.1 | 3.6 | 13.0 | 5.2 | 8.9 | 27.3 | 0.4 | 10.0 | 19.8 | 1.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 458 | 843 | 371 | 136 | 599 | 267 | 167 | 1069 | 605 | 305 | 1069 | 713 |
| V/C Ratio(X) | 0.78 | 0.81 | 0.16 | 0.46 | 0.81 | 0.48 | 0.90 | 0.95 | 0.06 | 1.62 | 0.78 | 0.20 |
| Avail Cap(c_a), veh/h | 458 | 1602 | 705 | 177 | 1623 | 724 | 167 | 1091 | 614 | 305 | 1094 | 725 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.6 | 27.8 | 13.5 | 41.6 | 33.5 | 18.3 | 42.2 | 24.2 | 6.4 | 42.7 | 22.2 | 4.6 |
| Incr Delay (d2), s/veh | 7.6 | 1.9 | 0.2 | 2.5 | 1.0 | 0.5 | 42.2 | 15.9 | 0.0 | 294.8 | 3.7 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.3 | 5.7 | 1.0 | 1.4 | 4.6 | 2.5 | 5.2 | 9.6 | 0.2 | 15.9 | 6.1 | 0.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 46.2 | 29.7 | 13.7 | 44.0 | 34.5 | 18.8 | 84.4 | 40.1 | 6.4 | 337.5 | 25.9 | 4.8 |
| LnGrp LOS | D | C | B | D | C | B | F | D | A | F | C | A |
| Approach Vol, veh/h | | 1101 | | | 678 | | | 1202 | | | 1472 | |
| Approach Delay, s/veh | | 34.1 | | | 32.5 | | | 44.6 | | | 128.7 | |
| Approach LOS | | C | | | C | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 36.8 | 12.8 | 31.1 | 14.7 | 36.8 | 19.7 | 24.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 10.0 | 30.9 | 10.6 | 45.4 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 29.3 | 5.6 | 19.4 | 10.9 | 21.8 | 13.2 | 15.0 |
| Green Ext Time (p_c), s | 0.0 | 0.9 | 0.0 | 4.5 | 0.0 | 3.7 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 68.0 |
| HCM 7th LOS | E |

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 49 | 357 | 603 | 261 | 55 | 800 | 994 | 124 | 654 |
| Future Volume (vph) | 49 | 357 | 603 | 261 | 55 | 800 | 994 | 124 | 654 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 16.0 | 36.0 | 31.0 | 51.0 | 15.4 | 38.0 | 31.0 | 15.0 | 37.6 |
| Total Split (%) | 13.3% | 30.0% | 25.8% | 42.5% | 12.8% | 31.7% | 25.8% | 12.5% | 31.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 16.7 | 29.0 | 25.3 | 40.9 | 10.2 | 30.7 | 62.5 | 10.3 | 33.7 |
| Actuated g/C Ratio | 0.14 | 0.24 | 0.21 | 0.34 | 0.09 | 0.26 | 0.52 | 0.09 | 0.28 |
| v/c Ratio | 0.24 | 1.08 | 1.06 | 0.66 | 0.44 | 0.95 | 1.25 | 0.98 | 0.74 |
| Control Delay (s/veh) | 49.9 | 108.0 | 97.5 | 39.6 | 62.7 | 63.4 | 148.0 | 126.6 | 44.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.9 | 108.0 | 97.5 | 39.6 | 62.7 | 63.4 | 148.0 | 126.6 | 44.8 |
| LOS | D | F | F | D | E | E | F | F | D |
| Approach Delay (s/veh) | | 102.0 | | 75.7 | | 108.9 | | | 57.3 |
| Approach LOS | | F | | E | | F | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.25 | |
| Intersection Signal Delay (s/veh): 90.1 | Intersection LOS: F |
| Intersection Capacity Utilization 111.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

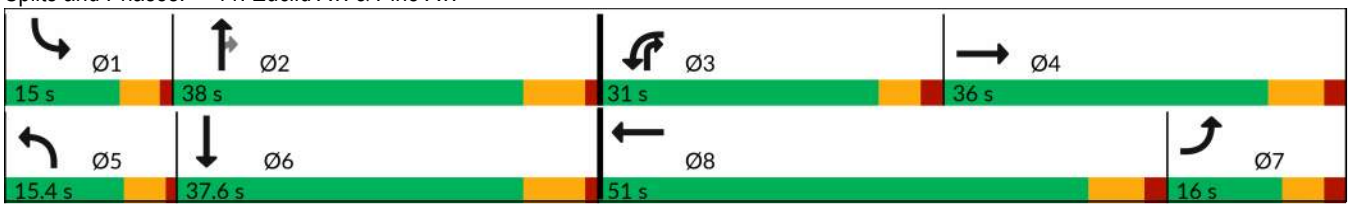

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 49 | 357 | 67 | 603 | 261 | 102 | 55 | 800 | 994 | 124 | 654 | 30 |
| Future Volume (veh/h) | 49 | 357 | 67 | 603 | 261 | 102 | 55 | 800 | 994 | 124 | 654 | 30 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 53 | 384 | 0 | 648 | 281 | 56 | 59 | 860 | 994 | 133 | 703 | 21 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 338 | 410 | | 622 | 319 | 64 | 115 | 943 | 720 | 139 | 961 | 29 |
| Arrive On Green | 0.32 | 0.35 | 0.00 | 0.32 | 0.33 | 0.33 | 0.11 | 0.40 | 0.40 | 0.13 | 0.42 | 0.42 |
| Sat Flow, veh/h | 1594 | 1772 | 0 | 2910 | 1435 | 286 | 1594 | 3544 | 1502 | 1594 | 3423 | 102 |
| Grp Volume(v), veh/h | 53 | 384 | 0 | 648 | 0 | 337 | 59 | 860 | 994 | 133 | 364 | 360 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 0 | 1455 | 0 | 1720 | 1594 | 1772 | 1502 | 1594 | 1772 | 1754 |
| Q Serve(g_s), s | 2.8 | 24.8 | 0.0 | 25.3 | 0.0 | 21.9 | 4.1 | 27.2 | 31.5 | 9.8 | 20.3 | 20.4 |
| Cycle Q Clear(g_c), s | 2.8 | 24.8 | 0.0 | 25.3 | 0.0 | 21.9 | 4.1 | 27.2 | 31.5 | 9.8 | 20.3 | 20.4 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.17 | 1.00 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 338 | 410 | | 622 | 0 | 382 | 115 | 943 | 720 | 139 | 497 | 492 |
| V/C Ratio(X) | 0.16 | 0.94 | | 1.04 | 0.00 | 0.88 | 0.51 | 0.91 | 1.38 | 0.96 | 0.73 | 0.73 |
| Avail Cap(c_a), veh/h | 338 | 434 | | 622 | 0 | 639 | 144 | 943 | 720 | 139 | 497 | 492 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.8 | 37.8 | 0.0 | 40.2 | 0.0 | 38.0 | 50.8 | 34.3 | 27.5 | 51.3 | 30.5 | 30.6 |
| Incr Delay (d2), s/veh | 0.1 | 27.6 | 0.0 | 47.5 | 0.0 | 10.1 | 1.3 | 12.6 | 179.6 | 63.4 | 4.8 | 4.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.1 | 12.3 | 0.0 | 11.7 | 0.0 | 8.8 | 1.6 | 11.0 | 56.0 | 6.0 | 7.6 | 7.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 32.9 | 65.4 | 0.0 | 87.8 | 0.0 | 48.1 | 52.1 | 46.9 | 207.1 | 114.7 | 35.3 | 35.4 |
| LnGrp LOS | C | E | | F | | D | D | D | F | F | D | D |
| Approach Vol, veh/h | | 437 | | | 985 | | | 1913 | | | 857 | |
| Approach Delay, s/veh | | 61.5 | | | 74.2 | | | 130.3 | | | 47.7 | |
| Approach LOS | | E | | | E | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.0 | 38.0 | 31.0 | 34.4 | 13.3 | 39.7 | 32.1 | 33.3 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 7.0 | * 7 |
| Max Green Setting (Gmax), s | 10.3 | 31.5 | 25.3 | 29.0 | 10.7 | 31.1 | 10.3 | * 44 |
| Max Q Clear Time (g_c+I1), s | 11.8 | 33.5 | 27.3 | 26.8 | 6.1 | 22.4 | 4.8 | 23.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 1.6 | 0.0 | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 93.1 |
| HCM 7th LOS | F |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 831 | 449 | 931 | 105 | 1002 |
| Future Volume (vph) | 831 | 449 | 931 | 105 | 1002 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 24.5 | 9.6 | 9.6 |
| Total Split (s) | 35.2 | 31.7 | 66.9 | 33.1 | 33.1 |
| Total Split (%) | 35.2% | 31.7% | 66.9% | 33.1% | 33.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 28.7 | 27.0 | 60.4 | 28.5 | 28.5 |
| Actuated g/C Ratio | 0.29 | 0.27 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 1.11 | 1.17 | 0.51 | 0.14 | 1.37 |
| Control Delay (s/veh) | 97.2 | 133.0 | 12.4 | 27.3 | 194.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 97.2 | 133.0 | 12.4 | 27.3 | 194.4 |
| LOS | F | F | B | C | F |
| Approach Delay (s/veh) | 97.2 | | 51.7 | 178.5 | |
| Approach LOS | F | | D | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.37 | |
| Intersection Signal Delay (s/veh): 105.1 | Intersection LOS: F |
| Intersection Capacity Utilization 103.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

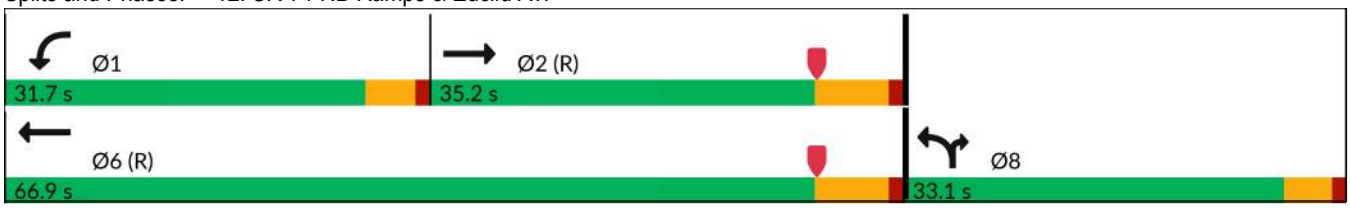

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 831 | 125 | 449 | 931 | 105 | 1002 |
| Future Volume (veh/h) | 831 | 125 | 449 | 931 | 105 | 1002 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1673 | 1772 | 1575 | 1772 |
| Adj Flow Rate, veh/h | 923 | 0 | 499 | 1034 | 117 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1723 | | 430 | 2790 | 175 | |
| Arrive On Green | 1.00 | 0.00 | 0.27 | 0.83 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3544 | 0 | 1594 | 3455 | 2910 | 1502 |
| Grp Volume(v), veh/h | 923 | 0 | 499 | 1034 | 117 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1683 | 0 | 1594 | 1683 | 1455 | 1502 |
| Q Serve(g_s), s | 0.0 | 0.0 | 27.0 | 7.6 | 3.9 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 27.0 | 7.6 | 3.9 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1723 | | 430 | 2790 | 175 | |
| V/C Ratio(X) | 0.54 | | 1.16 | 0.37 | 0.67 | |
| Avail Cap(c_a), veh/h | 1723 | | 430 | 2790 | 829 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.78 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.5 | 2.1 | 46.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 94.8 | 0.4 | 4.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 20.9 | 0.7 | 1.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.9 | 0.0 | 131.3 | 2.5 | 50.3 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 923 | | | 1533 | 117 | |
| Approach Delay, s/veh | 0.9 | | | 44.4 | 50.3 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | 6 | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.7 | 57.7 | | | 89.4 | 10.6 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 27.0 | 28.7 | | | 60.4 | 28.5 |
| Max Q Clear Time (g_c+I1), s | 29.0 | 2.0 | | | 9.6 | 5.9 |
| Green Ext Time (p_c), s | 0.0 | 4.8 | | | 6.0 | 0.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.1 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 409 | 74 | 236 | 33 | 136 | 628 | 84 | 70 |
| Future Volume (vph) | 409 | 74 | 236 | 33 | 136 | 628 | 84 | 70 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 23.5 | 23.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 26.5 | 13.0 | 39.5 | 23.5 | 23.5 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 26.5% | 13.0% | 39.5% | 23.5% | 23.5% | 37.0% | 37.0% | 37.0% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 32.5 | 9.0 | 43.6 | 8.8 | 8.8 | 30.0 | 30.0 | 30.0 |
| Actuated g/C Ratio | 0.33 | 0.09 | 0.44 | 0.09 | 0.09 | 0.30 | 0.30 | 0.30 |
| v/c Ratio | 0.44 | 0.55 | 0.17 | 0.24 | 0.53 | 0.81 | 0.78 | 0.13 |
| Control Delay (s/veh) | 30.7 | 62.8 | 12.9 | 46.4 | 14.2 | 46.2 | 42.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.7 | 62.8 | 12.9 | 46.4 | 14.2 | 46.2 | 42.7 | 0.5 |
| LOS | C | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 30.7 | | 24.8 | | | | 40.5 | |
| Approach LOS | C | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 33.1 | Intersection LOS: C |
| Intersection Capacity Utilization 61.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

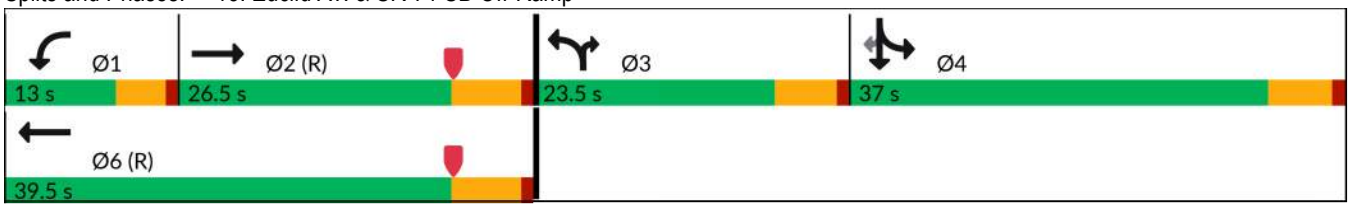

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 409 | 50 | 74 | 236 | 0 | 33 | 0 | 136 | 628 | 84 | 70 |
| Future Volume (veh/h) | 0 | 409 | 50 | 74 | 236 | 0 | 33 | 0 | 136 | 628 | 84 | 70 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 0 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 426 | 19 | 77 | 246 | 0 | 34 | 0 | 49 | 717 | 0 | 44 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1671 | 74 | 112 | 2109 | | 0 | 0 | 0 | 808 | 0 | 379 |
| Arrive On Green | 0.00 | 0.51 | 0.51 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.25 |
| Sat Flow, veh/h | 0 | 3371 | 146 | 1594 | 3455 | 0 | | 0 | | 3188 | 0 | 1496 |
| Grp Volume(v), veh/h | 0 | 218 | 227 | 77 | 246 | 0 | | 0.0 | | 717 | 0 | 44 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1683 | 1746 | 1594 | 1683 | 0 | | | | 1594 | 0 | 1496 |
| Q Serve(g_s), s | 0.0 | 7.3 | 7.3 | 4.6 | 0.0 | 0.0 | | | | 21.7 | 0.0 | 2.3 |
| Cycle Q Clear(g_c), s | 0.0 | 7.3 | 7.3 | 4.6 | 0.0 | 0.0 | | | | 21.7 | 0.0 | 2.3 |
| Prop In Lane | 0.00 | | 0.08 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 857 | 888 | 112 | 2109 | | | | | 808 | 0 | 379 |
| V/C Ratio(X) | 0.00 | 0.25 | 0.26 | 0.68 | 0.12 | | | | | 0.89 | 0.00 | 0.12 |
| Avail Cap(c_a), veh/h | 0 | 857 | 888 | 132 | 2109 | | | | | 995 | 0 | 467 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.88 | 0.88 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 13.9 | 13.9 | 41.9 | 0.0 | 0.0 | | | | 35.9 | 0.0 | 28.7 |
| Incr Delay (d2), s/veh | 0.0 | 0.7 | 0.7 | 6.7 | 0.1 | 0.0 | | | | 8.0 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.7 | 2.8 | 1.9 | 0.0 | 0.0 | | | | 9.2 | 0.0 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 14.6 | 14.6 | 48.6 | 0.1 | 0.0 | | | | 44.0 | 0.0 | 28.8 |
| LnGrp LOS | | B | B | D | A | | | | | D | | C |
| Approach Vol, veh/h | | 445 | | | 323 | | | | | | 761 | |
| Approach Delay, s/veh | | 14.6 | | | 11.7 | | | | | | 43.1 | |
| Approach LOS | | B | | | B | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.8 | 57.1 | | 31.2 | | 68.8 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 8.3 | 20.3 | | 31.2 | | 33.3 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 9.3 | | 23.7 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.1 | | 1.5 | | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.2 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 1340 | 40 | 0 | 873 | 61 | 30 | 0 | 0 | 44 | 0 | 30 |
| Future Vol, veh/h | 40 | 1340 | 40 | 0 | 873 | 61 | 30 | 0 | 0 | 44 | 0 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 1457 | 43 | 0 | 949 | 66 | 33 | 0 | 0 | 48 | 0 | 33 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1015 | 0 | 0 | 1500 | 0 | 0 | 2514 | 2580 | 1478 | 2526 | 2569 | 982 |
| Stage 1 | - | - | - | - | - | - | 1565 | 1565 | - | 982 | 982 | - |
| Stage 2 | - | - | - | - | - | - | 949 | 1015 | - | 1543 | 1587 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6 | 5.52 | - | 6 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6 | 5.52 | - | 6 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 683 | - | - | 447 | - | - | ~ 19 | 26 | 155 | ~ 19 | 26 | 302 |
| Stage 1 | - | - | - | - | - | - | 147 | 172 | - | 310 | 327 | - |
| Stage 2 | - | - | - | - | - | - | 323 | 316 | - | 151 | 168 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 683 | - | - | 447 | - | - | ~ 10 | 15 | 155 | ~ 11 | 16 | 302 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 79 | 92 | - | 83 | 92 | - |
| Stage 1 | - | - | - | - | - | - | 89 | 104 | - | 310 | 327 | - |
| Stage 2 | - | - | - | - | - | - | 288 | 316 | - | 92 | 102 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.3 | 0 | 79.66 | 84.86 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 79 | 50 | - | - | 447 | - | - | 118 |
| HCM Lane V/C Ratio | 0.414 | 0.064 | - | - | - | - | - | 0.684 |
| HCM Control Delay (s/veh) | 79.7 | 10.6 | 0 | - | 0 | - | - | 84.9 |
| HCM Lane LOS | F | B | A | - | A | - | - | F |
| HCM 95th %tile Q(veh) | 1.6 | 0.2 | - | - | 0 | - | - | 3.6 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 804 | 49 | 47 | 676 | 14 | 39 | 45 | 80 | 7 | 26 | 29 |
| Future Vol, veh/h | 40 | 804 | 49 | 47 | 676 | 14 | 39 | 45 | 80 | 7 | 26 | 29 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 41 | 829 | 51 | 48 | 697 | 14 | 40 | 46 | 82 | 7 | 27 | 30 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 714 | 0 | 0 | 879 | 0 | 0 | 1395 | 1748 | 854 | 1739 | 1766 | 359 |
| Stage 1 | - | - | - | - | - | - | 937 | 937 | - | 804 | 804 | - |
| Stage 2 | - | - | - | - | - | - | 459 | 811 | - | 935 | 962 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 884 | - | - | 766 | - | - | 109 | 86 | 357 | 62 | 83 | 639 |
| Stage 1 | - | - | - | - | - | - | 317 | 343 | - | 344 | 395 | - |
| Stage 2 | - | - | - | - | - | - | 552 | 392 | - | 318 | 333 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 881 | - | - | 766 | - | - | 83 | 76 | 357 | 35 | 74 | 637 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 244 | 230 | - | 132 | 217 | - |
| Stage 1 | - | - | - | - | - | - | 302 | 327 | - | 321 | 369 | - |
| Stage 2 | - | - | - | - | - | - | 457 | 366 | - | 200 | 318 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.42 | 0.64 | 34.96 | 21.33 |
| HCM LOS | | | D | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 283 | 881 | - | - | 766 | - | - | 284 |
| HCM Lane V/C Ratio | 0.597 | 0.047 | - | - | 0.063 | - | - | 0.225 |
| HCM Control Delay (s/veh) | 35 | 9.3 | - | - | 10 | - | - | 21.3 |
| HCM Lane LOS | D | A | - | - | B | - | - | C |
| HCM 95th %tile Q(veh) | 3.6 | 0.1 | - | - | 0.2 | - | - | 0.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 14.5 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 49 | 328 | 38 | 3 | 124 | 11 | 17 | 158 | 16 | 8 | 138 | 25 |
| Future Vol, veh/h | 49 | 328 | 38 | 3 | 124 | 11 | 17 | 158 | 16 | 8 | 138 | 25 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 53 | 353 | 41 | 3 | 133 | 12 | 18 | 170 | 17 | 9 | 148 | 27 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 18.1 | 10.7 | 12 | 11.5 |
| HCM LOS | C | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 9% | 12% | 2% | 5% |
| Vol Thru, % | 83% | 79% | 90% | 81% |
| Vol Right, % | 8% | 9% | 8% | 15% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 191 | 415 | 138 | 171 |
| LT Vol | 17 | 49 | 3 | 8 |
| Through Vol | 158 | 328 | 124 | 138 |
| RT Vol | 16 | 38 | 11 | 25 |
| Lane Flow Rate | 205 | 446 | 148 | 184 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.336 | 0.659 | 0.239 | 0.301 |
| Departure Headway (Hd) | 5.896 | 5.317 | 5.792 | 5.896 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 606 | 678 | 616 | 607 |
| Service Time | 3.967 | 3.37 | 3.865 | 3.968 |
| HCM Lane V/C Ratio | 0.338 | 0.658 | 0.24 | 0.303 |
| HCM Control Delay, s/veh | 12 | 18.1 | 10.7 | 11.5 |
| HCM Lane LOS | B | C | B | B |
| HCM 95th-tile Q | 1.5 | 4.9 | 0.9 | 1.3 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 65 | 1024 | 146 | 462 | 640 | 93 | 123 | 176 | 130 |
| Future Volume (vph) | 65 | 1024 | 146 | 462 | 640 | 93 | 123 | 176 | 130 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 15.5 | 28.0 | 28.0 | 36.0 | 48.5 | 18.7 | 39.0 | 17.0 | 37.3 |
| Total Split (%) | 12.9% | 23.3% | 23.3% | 30.0% | 40.4% | 15.6% | 32.5% | 14.2% | 31.1% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.0 | 22.2 | 22.2 | 31.4 | 46.6 | 29.3 | 33.6 | 12.4 | 16.7 |
| Actuated g/C Ratio | 0.08 | 0.19 | 0.19 | 0.26 | 0.39 | 0.24 | 0.28 | 0.10 | 0.14 |
| v/c Ratio | 0.61 | 1.80 | 0.40 | 1.21 | 0.62 | 0.26 | 1.05 | 1.17 | 0.69 |
| Control Delay (s/veh) | 74.5 | 394.2 | 11.6 | 154.9 | 32.5 | 40.8 | 84.0 | 171.0 | 60.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 74.5 | 394.2 | 11.6 | 154.9 | 32.5 | 40.8 | 84.0 | 171.0 | 60.6 |
| LOS | E | F | B | F | C | D | F | F | E |
| Approach Delay (s/veh) | | 332.0 | | | 79.9 | | 77.3 | | 118.9 |
| Approach LOS | | F | | | E | | E | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.80 | |
| Intersection Signal Delay (s/veh): 175.9 | Intersection LOS: F |
| Intersection Capacity Utilization 118.4% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

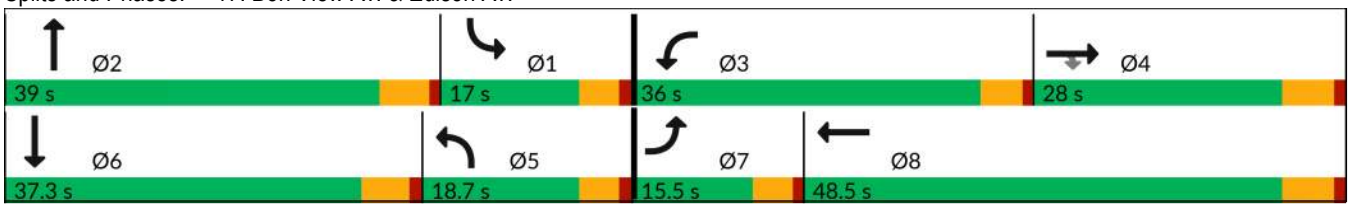

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 65 | 1024 | 146 | 462 | 640 | 89 | 93 | 123 | 388 | 176 | 130 | 28 |
| Future Volume (veh/h) | 65 | 1024 | 146 | 462 | 640 | 89 | 93 | 123 | 388 | 176 | 130 | 28 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 71 | 1113 | 105 | 502 | 696 | 21 | 101 | 134 | 259 | 191 | 141 | 8 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 88 | 636 | 284 | 426 | 1338 | 40 | 424 | 143 | 276 | 168 | 172 | 10 |
| Arrive On Green | 0.06 | 0.28 | 0.19 | 0.27 | 0.60 | 0.40 | 0.27 | 0.40 | 0.26 | 0.11 | 0.16 | 0.10 |
| Sat Flow, veh/h | 1594 | 3367 | 1502 | 1594 | 3336 | 101 | 1594 | 540 | 1044 | 1594 | 1661 | 94 |
| Grp Volume(v), veh/h | 71 | 1113 | 105 | 502 | 351 | 366 | 101 | 0 | 393 | 191 | 0 | 149 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1502 | 1594 | 1683 | 1754 | 1594 | 0 | 1584 | 1594 | 0 | 1755 |
| Q Serve(g_s), s | 5.2 | 22.2 | 4.0 | 31.4 | 14.2 | 14.5 | 5.8 | 0.0 | 28.4 | 12.4 | 0.0 | 9.7 |
| Cycle Q Clear(g_c), s | 5.2 | 22.2 | 4.0 | 31.4 | 14.2 | 14.5 | 5.8 | 0.0 | 28.4 | 12.4 | 0.0 | 9.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.06 | 1.00 | | 0.66 | 1.00 | | 0.05 |
| Lane Grp Cap(c), veh/h | 88 | 636 | 284 | 426 | 675 | 703 | 424 | 0 | 419 | 168 | 0 | 182 |
| V/C Ratio(X) | 0.81 | 1.75 | 0.37 | 1.18 | 0.52 | 0.52 | 0.24 | 0.00 | 0.94 | 1.14 | 0.00 | 0.82 |
| Avail Cap(c_a), veh/h | 148 | 636 | 284 | 426 | 675 | 703 | 424 | 0 | 453 | 168 | 0 | 477 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.9 | 42.1 | 13.1 | 43.0 | 16.8 | 17.4 | 33.8 | 0.0 | 39.6 | 52.5 | 0.0 | 48.7 |
| Incr Delay (d2), s/veh | 6.4 | 343.6 | 0.8 | 102.2 | 0.7 | 0.7 | 0.1 | 0.0 | 26.5 | 110.4 | 0.0 | 8.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 38.2 | 2.5 | 23.8 | 4.4 | 4.7 | 2.2 | 0.0 | 13.2 | 10.0 | 0.0 | 4.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 61.3 | 385.7 | 13.9 | 145.2 | 17.6 | 18.1 | 33.9 | 0.0 | 66.1 | 162.9 | 0.0 | 57.4 |
| LnGrp LOS | E | F | B | F | B | B | C | | E | F | | E |
| Approach Vol, veh/h | | 1289 | | | 1219 | | | 494 | | | 340 | |
| Approach Delay, s/veh | | 337.6 | | | 70.3 | | | 59.5 | | | 116.7 | |
| Approach LOS | | F | | | E | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 36.5 | 36.0 | 28.0 | 35.9 | 17.6 | 11.1 | 52.9 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 12.4 | 33.6 | 31.4 | 22.2 | 14.1 | 31.9 | 10.9 | 42.7 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 30.4 | 33.4 | 24.2 | 7.8 | 11.7 | 7.2 | 16.5 |
| Green Ext Time (p_c), s | 0.0 | 0.7 | 0.0 | 0.0 | 0.1 | 0.6 | 0.0 | 4.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 176.5 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 10.2 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 109 | 196 | 17 | 0 | 162 | 14 | 11 | 35 | 4 | 9 | 20 | 81 |
| Future Vol, veh/h | 109 | 196 | 17 | 0 | 162 | 14 | 11 | 35 | 4 | 9 | 20 | 81 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 133 | 239 | 21 | 0 | 198 | 17 | 13 | 43 | 5 | 11 | 24 | 99 |
| Number of Lanes | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 2 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 2 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 2 |
| HCM Control Delay, s/veh | 10.8 | 10.1 | 9.2 | 9.3 |
| HCM LOS | B | B | A | A |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|---|
| Vol Left, % | 22% | 53% | 0% | 0% | 8% |
| Vol Thru, % | 70% | 47% | 85% | 92% | 18% |
| Vol Right, % | 8% | 0% | 15% | 8% | 74% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 50 | 207 | 115 | 176 | 110 |
| LT Vol | 11 | 109 | 0 | 0 | 9 |
| Through Vol | 35 | 98 | 98 | 162 | 20 |
| RT Vol | 4 | 0 | 17 | 14 | 81 |
| Lane Flow Rate | 61 | 252 | 140 | 215 | 134 |
| Geometry Grp | 2 | 5 | 5 | 4a | 2 |
| Degree of Util (X) | 0.094 | 0.385 | 0.199 | 0.295 | 0.187 |
| Departure Headway (Hd) | 5.543 | 5.488 | 5.119 | 4.94 | 5.008 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 640 | 651 | 696 | 721 | 710 |
| Service Time | 3.637 | 3.262 | 2.892 | 3.018 | 3.086 |
| HCM Lane V/C Ratio | 0.095 | 0.387 | 0.201 | 0.298 | 0.189 |
| HCM Control Delay, s/veh | 9.2 | 11.7 | 9.2 | 10.1 | 9.3 |
| HCM Lane LOS | A | B | A | B | A |
| HCM 95th-tile Q | 0.3 | 1.8 | 0.7 | 1.2 | 0.7 |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 40 | 1638 | 1357 | 89 |
| Future Volume (vph) | 40 | 1638 | 1357 | 89 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 5.0 |
| Minimum Split (s) | 23.8 | 23.8 | 23.8 | 22.6 |
| Total Split (s) | 88.0 | 88.0 | 88.0 | 32.0 |
| Total Split (%) | 73.3% | 73.3% | 73.3% | 26.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | None |
| Act Effct Green (s) | 47.5 | 47.5 | 47.5 | 10.8 |
| Actuated g/C Ratio | 0.68 | 0.68 | 0.68 | 0.16 |
| v/c Ratio | 0.34 | 0.78 | 0.71 | 0.49 |
| Control Delay (s/veh) | 13.0 | 10.2 | 8.6 | 35.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 13.0 | 10.2 | 8.6 | 35.3 |
| LOS | B | B | A | D |
| Approach Delay (s/veh) | | 10.3 | 8.6 | 35.3 |
| Approach LOS | | B | A | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 69.5 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 10.5 | Intersection LOS: B |
| Intersection Capacity Utilization 63.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 19: Edison Av. & Cucamonga Av.

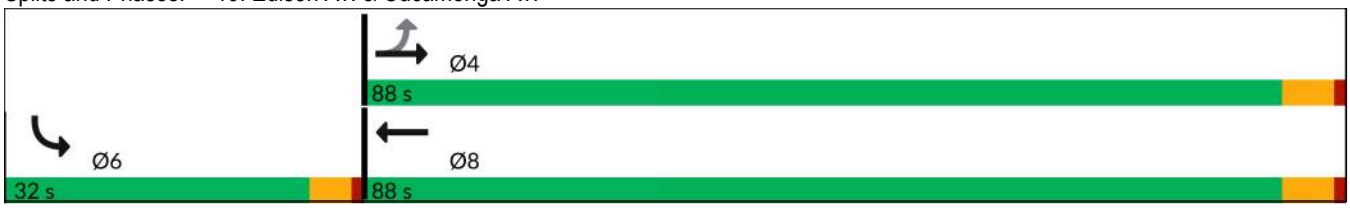

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 40 | 1638 | 1357 | 121 | 89 | 30 |
| Future Volume (veh/h) | 40 | 1638 | 1357 | 121 | 89 | 30 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 43 | 1780 | 1475 | 132 | 97 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 261 | 2473 | 2297 | 204 | 122 | 42 |
| Arrive On Green | 0.73 | 0.73 | 0.73 | 0.73 | 0.10 | 0.10 |
| Sat Flow, veh/h | 298 | 3455 | 3216 | 278 | 1212 | 412 |
| Grp Volume(v), veh/h | 43 | 1780 | 790 | 817 | 131 | 0 |
| Grp Sat Flow(s),veh/h/ln | 298 | 1683 | 1683 | 1722 | 1637 | 0 |
| Q Serve(g_s), s | 5.4 | 18.8 | 14.8 | 15.2 | 4.9 | 0.0 |
| Cycle Q Clear(g_c), s | 20.6 | 18.8 | 14.8 | 15.2 | 4.9 | 0.0 |
| Prop In Lane | 1.00 | | | 0.16 | 0.74 | 0.25 |
| Lane Grp Cap(c), veh/h | 261 | 2473 | 1237 | 1265 | 165 | 0 |
| V/C Ratio(X) | 0.16 | 0.72 | 0.64 | 0.65 | 0.79 | 0.00 |
| Avail Cap(c_a), veh/h | 430 | 4376 | 2188 | 2238 | 709 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 9.4 | 4.7 | 4.2 | 4.2 | 27.8 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.4 | 0.6 | 0.6 | 3.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.3 | 1.8 | 1.8 | 1.9 | 1.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 9.7 | 5.1 | 4.7 | 4.8 | 31.0 | 0.0 |
| LnGrp LOS | A | A | A | A | C | |
| Approach Vol, veh/h | | 1823 | 1607 | | 131 | |
| Approach Delay, s/veh | | 5.2 | 4.8 | | 31.0 | |
| Approach LOS | | A | A | | C | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 52.3 | | 11.0 | | 52.3 |
| Change Period (Y+Rc), s | | 5.8 | | 4.6 | | 5.8 |
| Max Green Setting (Gmax), s | | 82.2 | | 27.4 | | 82.2 |
| Max Q Clear Time (g_c+I1), s | | 22.6 | | 6.9 | | 17.2 |
| Green Ext Time (p_c), s | | 23.9 | | 0.2 | | 17.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 6.0 |
| HCM 7th LOS | A |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 232 | 362 | 710 | 1180 | 781 |
| Future Volume (vph) | 3 | 232 | 362 | 710 | 1180 | 781 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 24.8 | 24.8 | 25.0 | 65.2 | 40.2 | 40.2 |
| Total Split (%) | 27.6% | 27.6% | 27.8% | 72.4% | 44.7% | 44.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 19.0 | 19.0 | 19.2 | 59.4 | 34.4 | 34.4 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | 0.66 | 0.38 | 0.38 |
| v/c Ratio | 1.09 | 0.47 | 1.09 | 0.32 | 0.93 | 0.86 |
| Control Delay (s/veh) | 109.9 | 7.7 | 86.9 | 1.1 | 40.9 | 17.4 |
| Queue Delay | 5.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 115.7 | 7.7 | 86.9 | 1.1 | 40.9 | 17.4 |
| LOS | F | A | F | A | D | B |
| Approach Delay (s/veh) | 75.0 | | | 30.1 | 31.5 | |
| Approach LOS | E | | | C | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.09 | |
| Intersection Signal Delay (s/veh): 38.4 | Intersection LOS: D |
| Intersection Capacity Utilization 110.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

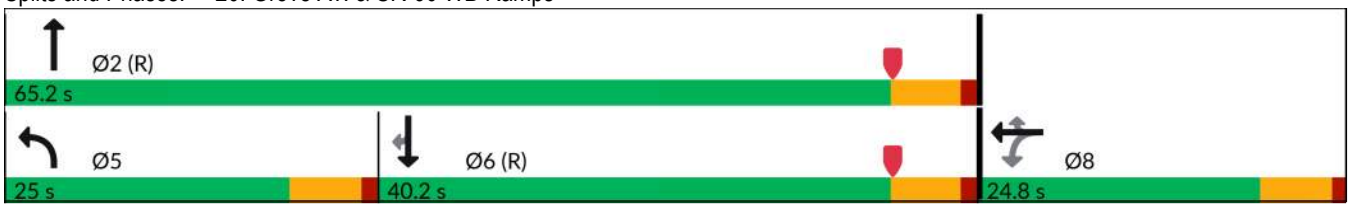

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 380 | 3 | 232 | 362 | 710 | 0 | 0 | 1180 | 781 |
| Future Volume (veh/h) | 0 | 0 | 0 | 380 | 3 | 232 | 362 | 710 | 0 | 0 | 1180 | 781 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1673 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 384 | 3 | 98 | 366 | 717 | 0 | 0 | 1192 | 486 |
| Peak Hour Factor | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 354 | 3 | 317 | 340 | 2222 | 0 | 0 | 1287 | 559 |
| Arrive On Green | | | | 0.21 | 0.21 | 0.21 | 0.21 | 0.66 | 0.00 | 0.00 | 0.38 | 0.38 |
| Sat Flow, veh/h | | | | 1675 | 13 | 1502 | 1594 | 3455 | 0 | 0 | 3455 | 1462 |
| Grp Volume(v), veh/h | | | | 387 | 0 | 98 | 366 | 717 | 0 | 0 | 1192 | 486 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1502 | 1594 | 1683 | 0 | 0 | 1683 | 1462 |
| Q Serve(g_s), s | | | | 19.0 | 0.0 | 5.0 | 19.2 | 8.3 | 0.0 | 0.0 | 30.5 | 27.7 |
| Cycle Q Clear(g_c), s | | | | 19.0 | 0.0 | 5.0 | 19.2 | 8.3 | 0.0 | 0.0 | 30.5 | 27.7 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 356 | 0 | 317 | 340 | 2222 | 0 | 0 | 1287 | 559 |
| V/C Ratio(X) | | | | 1.09 | 0.00 | 0.31 | 1.08 | 0.32 | 0.00 | 0.00 | 0.93 | 0.87 |
| Avail Cap(c_a), veh/h | | | | 356 | 0 | 317 | 340 | 2222 | 0 | 0 | 1287 | 559 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.5 | 0.0 | 30.0 | 35.4 | 6.6 | 0.0 | 0.0 | 26.6 | 25.7 |
| Incr Delay (d2), s/veh | | | | 72.6 | 0.0 | 0.4 | 40.1 | 0.0 | 0.0 | 0.0 | 12.7 | 16.7 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 14.5 | 0.0 | 1.7 | 10.7 | 2.3 | 0.0 | 0.0 | 13.2 | 11.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 108.1 | 0.0 | 30.4 | 75.5 | 6.6 | 0.0 | 0.0 | 39.3 | 42.4 |
| LnGrp LOS | | | | F | | C | F | A | | | D | D |
| Approach Vol, veh/h | | | | | 485 | | | 1083 | | | 1678 | |
| Approach Delay, s/veh | | | | | 92.4 | | | 29.9 | | | 40.2 | |
| Approach LOS | | | | | F | | | C | | | D | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 65.2 | | 25.0 | 40.2 | | 24.8 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 59.4 | | 19.2 | 34.4 | | 19.0 |
| Max Q Clear Time (g_c+I1), s | 10.3 | | 21.2 | 32.5 | | 21.0 |
| Green Ext Time (p_c), s | 4.0 | | 0.0 | 1.4 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 44.6 |
| HCM 7th LOS | D |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 3 | 374 | 798 | 488 | 1074 |
| Future Volume (vph) | 3 | 374 | 798 | 488 | 1074 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 24.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 35.8% | 26.7% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 22.2 | 22.2 | 26.4 | 23.8 | 55.2 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.29 | 0.26 | 0.61 |
| v/c Ratio | 0.69 | 0.89 | 1.22 | 1.20 | 0.54 |
| Control Delay (s/veh) | 38.9 | 46.5 | 138.0 | 126.1 | 23.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 |
| Total Delay (s/veh) | 38.9 | 46.5 | 138.0 | 126.1 | 25.6 |
| LOS | D | D | F | F | C |
| Approach Delay (s/veh) | 43.3 | | 138.0 | | 57.0 |
| Approach LOS | D | | F | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.22 | |
| Intersection Signal Delay (s/veh): 82.5 | Intersection LOS: F |
| Intersection Capacity Utilization 110.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 273 | 3 | 374 | 0 | 0 | 0 | 0 | 798 | 376 | 488 | 1074 | 0 |
| Future Volume (veh/h) | 273 | 3 | 374 | 0 | 0 | 0 | 0 | 798 | 376 | 488 | 1074 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 281 | 3 | 300 | | | | 0 | 823 | 325 | 503 | 1107 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 380 | 4 | 341 | | | | 0 | 861 | 339 | 336 | 2129 | 0 |
| Arrive On Green | 0.23 | 0.23 | 0.23 | | | | 0.00 | 0.37 | 0.37 | 0.42 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1671 | 18 | 1500 | | | | 0 | 2443 | 928 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 284 | 0 | 300 | | | | 0 | 588 | 560 | 503 | 1107 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1500 | | | | 0 | 1683 | 1599 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 14.1 | 0.0 | 17.4 | | | | 0.0 | 30.6 | 30.8 | 19.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.1 | 0.0 | 17.4 | | | | 0.0 | 30.6 | 30.8 | 19.0 | 0.0 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 0.58 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 384 | 0 | 341 | | | | 0 | 616 | 585 | 336 | 2129 | 0 |
| V/C Ratio(X) | 0.74 | 0.00 | 0.88 | | | | 0.00 | 0.96 | 0.96 | 1.49 | 0.52 | 0.00 |
| Avail Cap(c_a), veh/h | 507 | 0 | 450 | | | | 0 | 616 | 585 | 336 | 2129 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.25 | 0.25 | 0.00 |
| Uniform Delay (d), s/veh | 32.3 | 0.0 | 33.6 | | | | 0.0 | 27.8 | 27.9 | 26.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.5 | 0.0 | 12.1 | | | | 0.0 | 26.7 | 28.2 | 226.7 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.6 | 0.0 | 7.1 | | | | 0.0 | 15.7 | 15.2 | 25.9 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.8 | 0.0 | 45.7 | | | | 0.0 | 54.6 | 56.1 | 252.7 | 0.2 | 0.0 |
| LnGrp LOS | C | | D | | | | | D | E | F | A | |
| Approach Vol, veh/h | | 584 | | | | | | 1148 | | | 1610 | |
| Approach Delay, s/veh | | 40.4 | | | | | | 55.3 | | | 79.1 | |
| Approach LOS | | D | | | | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 38.7 | | 27.3 | | 62.7 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 19.0 | 26.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 32.8 | | 19.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 1.0 | | 7.3 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 64.2 |
| HCM 7th LOS | | | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 131 | 220 | 41 | 142 | 114 | 840 | 155 | 1047 |
| Future Volume (vph) | 131 | 220 | 41 | 142 | 114 | 840 | 155 | 1047 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 13.1 | 24.9 | 12.0 | 23.8 | 12.2 | 37.7 | 15.4 | 40.9 |
| Total Split (%) | 14.6% | 27.7% | 13.3% | 26.4% | 13.6% | 41.9% | 17.1% | 45.4% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.5 | 18.5 | 6.4 | 12.3 | 7.6 | 32.1 | 10.7 | 35.2 |
| Actuated g/C Ratio | 0.10 | 0.22 | 0.08 | 0.15 | 0.09 | 0.38 | 0.13 | 0.42 |
| v/c Ratio | 0.89 | 0.48 | 0.38 | 0.48 | 0.87 | 0.78 | 0.84 | 0.95 |
| Control Delay (s/veh) | 88.6 | 24.1 | 47.0 | 22.0 | 89.1 | 28.8 | 72.1 | 40.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 88.6 | 24.1 | 47.0 | 22.0 | 89.1 | 28.8 | 72.1 | 40.5 |
| LOS | F | C | D | C | F | C | E | D |
| Approach Delay (s/veh) | | 42.1 | | 25.6 | | 35.5 | | 44.1 |
| Approach LOS | | D | | C | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 84.4 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 39.3 | Intersection LOS: D |
| Intersection Capacity Utilization 78.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

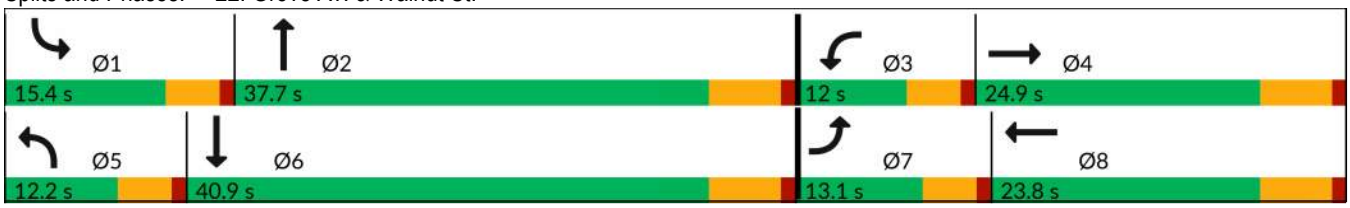

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 220 | 118 | 41 | 142 | 99 | 114 | 840 | 70 | 155 | 1047 | 162 |
| Future Volume (veh/h) | 131 | 220 | 118 | 41 | 142 | 99 | 114 | 840 | 70 | 155 | 1047 | 162 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 142 | 239 | 103 | 45 | 154 | 63 | 124 | 913 | 56 | 168 | 1138 | 99 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 168 | 462 | 193 | 63 | 315 | 123 | 150 | 1215 | 75 | 199 | 1276 | 111 |
| Arrive On Green | 0.11 | 0.20 | 0.20 | 0.04 | 0.13 | 0.13 | 0.09 | 0.38 | 0.38 | 0.13 | 0.41 | 0.41 |
| Sat Flow, veh/h | 1594 | 2307 | 962 | 1594 | 2349 | 916 | 1594 | 3221 | 198 | 1594 | 3130 | 272 |
| Grp Volume(v), veh/h | 142 | 172 | 170 | 45 | 108 | 109 | 124 | 477 | 492 | 168 | 611 | 626 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1585 | 1594 | 1683 | 1582 | 1594 | 1683 | 1736 | 1594 | 1683 | 1719 |
| Q Serve(g_s), s | 7.0 | 7.3 | 7.7 | 2.2 | 4.8 | 5.1 | 6.2 | 19.8 | 19.8 | 8.3 | 27.2 | 27.3 |
| Cycle Q Clear(g_c), s | 7.0 | 7.3 | 7.7 | 2.2 | 4.8 | 5.1 | 6.2 | 19.8 | 19.8 | 8.3 | 27.2 | 27.3 |
| Prop In Lane | 1.00 | | 0.61 | 1.00 | | 0.58 | 1.00 | | 0.11 | 1.00 | | 0.16 |
| Lane Grp Cap(c), veh/h | 168 | 337 | 317 | 63 | 226 | 212 | 150 | 635 | 654 | 199 | 686 | 701 |
| V/C Ratio(X) | 0.84 | 0.51 | 0.54 | 0.72 | 0.48 | 0.51 | 0.82 | 0.75 | 0.75 | 0.84 | 0.89 | 0.89 |
| Avail Cap(c_a), veh/h | 168 | 399 | 376 | 146 | 376 | 354 | 150 | 667 | 687 | 214 | 734 | 749 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.4 | 28.7 | 28.9 | 38.2 | 32.3 | 32.4 | 35.8 | 21.8 | 21.8 | 34.5 | 22.2 | 22.2 |
| Incr Delay (d2), s/veh | 29.2 | 1.2 | 1.4 | 5.6 | 1.6 | 1.9 | 28.1 | 4.6 | 4.4 | 22.3 | 12.6 | 12.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.9 | 2.9 | 2.8 | 0.9 | 1.9 | 2.0 | 3.4 | 7.7 | 7.9 | 4.3 | 11.9 | 12.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 64.6 | 29.9 | 30.3 | 43.8 | 33.9 | 34.3 | 63.9 | 26.4 | 26.2 | 56.8 | 34.7 | 34.8 |
| LnGrp LOS | E | C | C | D | C | C | E | C | C | E | C | C |
| Approach Vol, veh/h | | 484 | | | 262 | | | 1093 | | | 1405 | |
| Approach Delay, s/veh | | 40.2 | | | 35.8 | | | 30.6 | | | 37.4 | |
| Approach LOS | | D | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 36.2 | 7.8 | 21.9 | 12.2 | 38.6 | 13.1 | 16.6 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 10.8 | 31.9 | 7.4 | 19.1 | 7.6 | 35.1 | 8.5 | 18.0 |
| Max Q Clear Time (g_c+I1), s | 10.3 | 21.8 | 4.2 | 9.7 | 8.2 | 29.3 | 9.0 | 7.1 |
| Green Ext Time (p_c), s | 0.0 | 4.0 | 0.0 | 1.2 | 0.0 | 3.5 | 0.0 | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 35.4 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 110 | 747 | 46 | 603 | 25 | 717 | 122 | 833 | 119 |
| Future Volume (vph) | 110 | 747 | 46 | 603 | 25 | 717 | 122 | 833 | 119 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.3 | 28.2 | 7.2 | 24.2 | 6.2 | 23.0 | 9.7 | 32.7 | 32.7 |
| Actuated g/C Ratio | 0.11 | 0.33 | 0.08 | 0.28 | 0.07 | 0.27 | 0.11 | 0.38 | 0.38 |
| v/c Ratio | 0.65 | 1.39 | 0.35 | 0.84 | 0.23 | 1.67 | 0.70 | 1.27 | 0.18 |
| Control Delay (s/veh) | 55.9 | 211.5 | 45.5 | 38.4 | 43.8 | 335.8 | 59.4 | 158.4 | 3.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.9 | 211.5 | 45.5 | 38.4 | 43.8 | 335.8 | 59.4 | 158.4 | 3.5 |
| LOS | E | F | D | D | D | F | E | F | A |
| Approach Delay (s/veh) | | 192.4 | | 38.8 | | 326.6 | | 129.9 | |
| Approach LOS | | F | | D | | F | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 85.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.67 | |
| Intersection Signal Delay (s/veh): 168.2 | Intersection LOS: F |
| Intersection Capacity Utilization 116.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

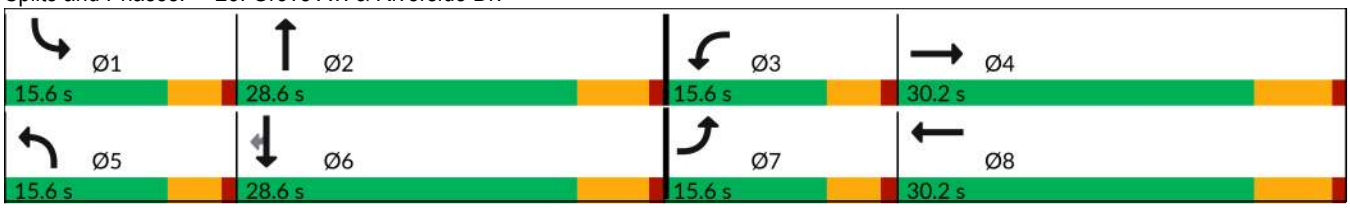

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 747 | 36 | 46 | 603 | 173 | 25 | 717 | 52 | 122 | 833 | 119 |
| Future Volume (veh/h) | 110 | 747 | 36 | 46 | 603 | 173 | 25 | 717 | 52 | 122 | 833 | 119 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 113 | 770 | 29 | 47 | 622 | 127 | 26 | 739 | 42 | 126 | 859 | 74 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 139 | 524 | 20 | 65 | 728 | 148 | 44 | 476 | 27 | 154 | 631 | 535 |
| Arrive On Green | 0.09 | 0.31 | 0.31 | 0.04 | 0.26 | 0.26 | 0.03 | 0.29 | 0.29 | 0.10 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1594 | 1697 | 64 | 1594 | 2776 | 566 | 1594 | 1661 | 94 | 1594 | 1772 | 1502 |
| Grp Volume(v), veh/h | 113 | 0 | 799 | 47 | 377 | 372 | 26 | 0 | 781 | 126 | 859 | 74 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1760 | 1594 | 1683 | 1658 | 1594 | 0 | 1755 | 1594 | 1772 | 1502 |
| Q Serve(g_s), s | 5.5 | 0.0 | 24.6 | 2.3 | 16.9 | 17.0 | 1.3 | 0.0 | 22.8 | 6.2 | 28.3 | 2.7 |
| Cycle Q Clear(g_c), s | 5.5 | 0.0 | 24.6 | 2.3 | 16.9 | 17.0 | 1.3 | 0.0 | 22.8 | 6.2 | 28.3 | 2.7 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.34 | 1.00 | | 0.05 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 139 | 0 | 544 | 65 | 441 | 435 | 44 | 0 | 503 | 154 | 631 | 535 |
| V/C Ratio(X) | 0.81 | 0.00 | 1.47 | 0.73 | 0.85 | 0.86 | 0.59 | 0.00 | 1.55 | 0.82 | 1.36 | 0.14 |
| Avail Cap(c_a), veh/h | 221 | 0 | 544 | 221 | 508 | 501 | 221 | 0 | 503 | 221 | 631 | 535 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 35.6 | 0.0 | 27.5 | 37.7 | 27.9 | 27.9 | 38.2 | 0.0 | 28.3 | 35.2 | 25.6 | 17.3 |
| Incr Delay (d2), s/veh | 5.4 | 0.0 | 221.0 | 5.7 | 11.9 | 12.4 | 4.7 | 0.0 | 257.7 | 9.8 | 172.6 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 42.4 | 0.9 | 7.5 | 7.5 | 0.5 | 0.0 | 44.6 | 2.7 | 40.7 | 0.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 41.0 | 0.0 | 248.4 | 43.3 | 39.8 | 40.3 | 42.9 | 0.0 | 286.1 | 45.0 | 198.2 | 17.4 |
| LnGrp LOS | D | | F | D | D | D | D | | F | D | F | B |
| Approach Vol, veh/h | | 912 | | | 796 | | | 807 | | | 1059 | |
| Approach Delay, s/veh | | 222.7 | | | 40.2 | | | 278.2 | | | 167.3 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.3 | 28.6 | 7.8 | 30.8 | 6.8 | 34.1 | 11.5 | 27.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 24.8 | 4.3 | 26.6 | 3.3 | 30.3 | 7.5 | 19.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 178.2 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 445.3 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 52 | 337 | 33 | 38 | 184 | 45 | 32 | 717 | 44 | 51 | 855 | 19 |
| Future Vol, veh/h | 52 | 337 | 33 | 38 | 184 | 45 | 32 | 717 | 44 | 51 | 855 | 19 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 54 | 351 | 34 | 40 | 192 | 47 | 33 | 747 | 46 | 53 | 891 | 20 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 122.6 | 56.9 | 504.1 | 654.2 |
| HCM LOS | F | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 4% | 12% | 14% | 6% |
| Vol Thru, % | 90% | 80% | 69% | 92% |
| Vol Right, % | 6% | 8% | 17% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 793 | 422 | 267 | 925 |
| LT Vol | 32 | 52 | 38 | 51 |
| Through Vol | 717 | 337 | 184 | 855 |
| RT Vol | 44 | 33 | 45 | 19 |
| Lane Flow Rate | 826 | 440 | 278 | 964 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 2.033 | 1.082 | 0.738 | 2.377 |
| Departure Headway (Hd) | 12.608 | 14.661 | 17.142 | 11.811 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 297 | 251 | 214 | 318 |
| Service Time | 10.608 | 12.661 | 15.142 | 9.811 |
| HCM Lane V/C Ratio | 2.781 | 1.753 | 1.299 | 3.031 |
| HCM Control Delay, s/veh | 504.1 | 122.6 | 56.9 | 654.2 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 42 | 11.3 | 4.9 | 57.2 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 300.8 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 100 | 210 | 43 | 5 | 65 | 31 | 35 | 681 | 26 | 58 | 803 | 38 |
| Future Vol, veh/h | 100 | 210 | 43 | 5 | 65 | 31 | 35 | 681 | 26 | 58 | 803 | 38 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 106 | 223 | 46 | 5 | 69 | 33 | 37 | 724 | 28 | 62 | 854 | 40 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 43.5 | 20.3 | 294.3 | 438.7 |
| HCM LOS | E | C | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 5% | 28% | 5% | 6% |
| Vol Thru, % | 92% | 59% | 64% | 89% |
| Vol Right, % | 4% | 12% | 31% | 4% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 742 | 353 | 101 | 899 |
| LT Vol | 35 | 100 | 5 | 58 |
| Through Vol | 681 | 210 | 65 | 803 |
| RT Vol | 26 | 43 | 31 | 38 |
| Lane Flow Rate | 789 | 376 | 107 | 956 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.579 | 0.802 | 0.266 | 1.913 |
| Departure Headway (Hd) | 8.745 | 10.073 | 12.715 | 8.242 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 426 | 364 | 285 | 450 |
| Service Time | 6.745 | 8.073 | 10.715 | 6.242 |
| HCM Lane V/C Ratio | 1.852 | 1.033 | 0.375 | 2.124 |
| HCM Control Delay, s/veh | 294.3 | 43.5 | 20.3 | 438.7 |
| HCM Lane LOS | F | F | C | F |
| HCM 95th-tile Q | 36.5 | 6.8 | 1 | 55.5 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 217 | 1175 | 196 | 222 | 884 | 225 | 192 | 311 | 287 | 408 |
| Future Volume (vph) | 217 | 1175 | 196 | 222 | 884 | 225 | 192 | 311 | 287 | 408 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 22.9 | 31.0 | 31.0 | 21.0 | 29.1 | 29.1 | 18.0 | 43.0 | 25.0 | 50.0 |
| Total Split (%) | 19.1% | 25.8% | 25.8% | 17.5% | 24.3% | 24.3% | 15.0% | 35.8% | 20.8% | 41.7% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 18.3 | 25.2 | 25.2 | 16.4 | 23.3 | 23.3 | 13.4 | 37.6 | 20.4 | 44.6 |
| Actuated g/C Ratio | 0.15 | 0.21 | 0.21 | 0.14 | 0.19 | 0.19 | 0.11 | 0.31 | 0.17 | 0.37 |
| v/c Ratio | 0.98 | 1.81 | 0.47 | 1.12 | 1.48 | 0.50 | 1.19 | 0.98 | 1.16 | 1.08 |
| Control Delay (s/veh) | 104.1 | 401.1 | 12.7 | 143.2 | 257.8 | 9.0 | 173.2 | 73.1 | 149.4 | 93.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 104.1 | 401.1 | 12.7 | 143.2 | 257.8 | 9.0 | 173.2 | 73.1 | 149.4 | 93.6 |
| LOS | F | F | B | F | F | A | F | E | F | F |
| Approach Delay (s/veh) | | 312.6 | | | 196.6 | | | 101.5 | | 111.0 |
| Approach LOS | | F | | | F | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.81 | |
| Intersection Signal Delay (s/veh): 205.7 | Intersection LOS: F |
| Intersection Capacity Utilization 114.0% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 217 | 1175 | 196 | 222 | 884 | 225 | 192 | 311 | 175 | 287 | 408 | 224 |
| Future Volume (veh/h) | 217 | 1175 | 196 | 222 | 884 | 225 | 192 | 311 | 175 | 287 | 408 | 224 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 236 | 1277 | 126 | 241 | 961 | 136 | 209 | 338 | 103 | 312 | 443 | 134 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 250 | 727 | 323 | 224 | 672 | 300 | 183 | 383 | 117 | 279 | 462 | 140 |
| Arrive On Green | 0.16 | 0.32 | 0.22 | 0.14 | 0.30 | 0.30 | 0.11 | 0.44 | 0.29 | 0.17 | 0.53 | 0.53 |
| Sat Flow, veh/h | 1594 | 3367 | 1495 | 1594 | 3367 | 1502 | 1594 | 1303 | 397 | 1594 | 1306 | 395 |
| Grp Volume(v), veh/h | 236 | 1277 | 126 | 241 | 961 | 136 | 209 | 0 | 441 | 312 | 0 | 577 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1495 | 1594 | 1683 | 1502 | 1594 | 0 | 1700 | 1594 | 0 | 1701 |
| Q Serve(g_s), s | 17.1 | 25.2 | 8.4 | 16.4 | 23.3 | 8.6 | 13.4 | 0.0 | 28.0 | 20.4 | 0.0 | 37.8 |
| Cycle Q Clear(g_c), s | 17.1 | 25.2 | 8.4 | 16.4 | 23.3 | 8.6 | 13.4 | 0.0 | 28.0 | 20.4 | 0.0 | 37.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.23 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 250 | 727 | 323 | 224 | 672 | 300 | 183 | 0 | 500 | 279 | 0 | 602 |
| V/C Ratio(X) | 0.94 | 1.76 | 0.39 | 1.08 | 1.43 | 0.45 | 1.14 | 0.00 | 0.88 | 1.12 | 0.00 | 0.96 |
| Avail Cap(c_a), veh/h | 250 | 727 | 323 | 224 | 672 | 300 | 183 | 0 | 548 | 279 | 0 | 650 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.50 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.7 | 39.5 | 39.2 | 50.2 | 40.9 | 35.7 | 51.7 | 0.0 | 32.8 | 48.2 | 0.0 | 26.6 |
| Incr Delay (d2), s/veh | 41.8 | 346.2 | 0.8 | 81.8 | 202.0 | 1.1 | 110.0 | 0.0 | 14.7 | 90.1 | 0.0 | 24.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.5 | 43.9 | 3.1 | 11.5 | 27.3 | 3.0 | 10.8 | 0.0 | 11.9 | 14.8 | 0.0 | 15.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 90.5 | 385.7 | 40.0 | 132.0 | 242.9 | 36.8 | 161.6 | 0.0 | 47.4 | 138.3 | 0.0 | 51.1 |
| LnGrp LOS | F | F | D | F | F | D | F | | D | F | | D |
| Approach Vol, veh/h | | 1639 | | | 1338 | | | 650 | | | 889 | |
| Approach Delay, s/veh | | 316.6 | | | 201.9 | | | 84.1 | | | 81.7 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.0 | 39.7 | 21.0 | 31.0 | 18.0 | 46.7 | 22.9 | 29.1 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 20.4 | 37.6 | 16.4 | 25.2 | 13.4 | 44.6 | 18.3 | 23.3 |
| Max Q Clear Time (g_c+I1), s | 22.4 | 30.0 | 18.4 | 27.2 | 15.4 | 39.8 | 19.1 | 25.3 |
| Green Ext Time (p_c), s | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 202.9 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 61 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 19 | 283 | 2 | 1 | 167 | 285 | 2 | 64 | 1 | 399 | 50 | 15 |
| Future Vol, veh/h | 19 | 283 | 2 | 1 | 167 | 285 | 2 | 64 | 1 | 399 | 50 | 15 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 325 | 2 | 1 | 192 | 328 | 2 | 74 | 1 | 459 | 57 | 17 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Righ | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/ve | 28.7 | 59.1 | 14.3 | 90.8 |
| HCM LOS | D | F | B | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 3% | 6% | 0% | 86% |
| Vol Thru, % | 96% | 93% | 37% | 11% |
| Vol Right, % | 1% | 1% | 63% | 3% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 67 | 304 | 453 | 464 |
| LT Vol | 2 | 19 | 1 | 399 |
| Through Vol | 64 | 283 | 167 | 50 |
| RT Vol | 1 | 2 | 285 | 15 |
| Lane Flow Rate | 77 | 349 | 521 | 533 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.188 | 0.723 | 0.97 | 1.08 |
| Departure Headway (Hd) | 9.188 | 7.823 | 7.034 | 7.293 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 393 | 465 | 521 | 496 |
| Service Time | 7.188 | 5.823 | 5.034 | 5.348 |
| HCM Lane V/C Ratio | 0.196 | 0.751 | 1 | 1.075 |
| HCM Control Delay, s/veh | 14.3 | 28.7 | 59.1 | 90.8 |
| HCM Lane LOS | B | D | F | F |
| HCM 95th-tile Q | 0.7 | 5.8 | 12.7 | 16.7 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.3 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 40 | 1688 | 1442 | 40 | 30 | 30 |
| Future Vol, veh/h | 40 | 1688 | 1442 | 40 | 30 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 2 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 1835 | 1567 | 43 | 33 | 33 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1611 | 0 | - | 0 | 2593 | 1589 |
| Stage 1 | - | - | - | - | 1589 | - |
| Stage 2 | - | - | - | - | 1004 | - |
| Critical Hdwy | 4.13 | - | - | - | 6.63 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | 6.3 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 6.5 | - |
| Follow-up Hdwy | 2.219 | - | - | - | 3.3 | 3.319 |
| Pot Cap-1 Maneuver | 403 | - | - | - | ~ 24 | 132 |
| Stage 1 | - | - | - | - | 128 | - |
| Stage 2 | - | - | - | - | 272 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 403 | - | - | - | ~ 19 | 132 |
| Mov Cap-2 Maneuver | - | - | - | - | 89 | - |
| Stage 1 | - | - | - | - | 100 | - |
| Stage 2 | - | - | - | - | 272 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 3.43 | 0 | 81.4 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 83 | - | - | - | 107 |
| HCM Lane V/C Ratio | 0.108 | - | - | - | 0.611 |
| HCM Control Delay (s/veh) | 15 | 3.2 | - | - | 81.4 |
| HCM Lane LOS | C | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.4 | - | - | - | 3 |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Int Delay, s/veh | 7.6 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 808 | 74 | 89 | 751 | 29 | 61 | 42 | 142 | 8 | 27 | 15 |
| Future Vol, veh/h | 36 | 808 | 74 | 89 | 751 | 29 | 61 | 42 | 142 | 8 | 27 | 15 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 38 | 842 | 77 | 93 | 782 | 30 | 64 | 44 | 148 | 8 | 28 | 16 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 816 | 0 | 0 | 919 | 0 | 0 | 1546 | 1956 | 459 | 1504 | 1980 | 409 |
| Stage 1 | - | - | - | - | - | - | 955 | 955 | - | 986 | 986 | - |
| Stage 2 | - | - | - | - | - | - | 591 | 1001 | - | 518 | 994 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 808 | - | - | 738 | - | - | 78 | 63 | 549 | 84 | 61 | 591 |
| Stage 1 | - | - | - | - | - | - | 278 | 335 | - | 266 | 324 | - |
| Stage 2 | - | - | - | - | - | - | 460 | 319 | - | 509 | 321 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 805 | - | - | 738 | - | - | ~ 54 | 52 | 549 | 41 | 51 | 590 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 198 | 188 | - | 153 | 168 | - |
| Stage 1 | - | - | - | - | - | - | 265 | 319 | - | 232 | 283 | - |
| Stage 2 | - | - | - | - | - | - | 353 | 278 | - | 306 | 306 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.38 | 1.08 | 53.45 | 27.75 |
| HCM LOS | | | F | D |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 310 | 805 | - | - | 738 | - | - | 210 |
| HCM Lane V/C Ratio | 0.823 | 0.047 | - | - | 0.126 | - | - | 0.248 |
| HCM Control Delay (s/veh) | 53.5 | 9.7 | - | - | 10.6 | - | - | 27.7 |
| HCM Lane LOS | F | A | - | - | B | - | - | D |
| HCM 95th %tile Q(veh) | 6.9 | 0.1 | - | - | 0.4 | - | - | 0.9 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 11.5 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 113 | 17 | 151 | 9 | 21 | 22 | 39 | 178 | 9 | 0 | 177 | 34 |
| Future Vol, veh/h | 113 | 17 | 151 | 9 | 21 | 22 | 39 | 178 | 9 | 0 | 177 | 34 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 127 | 19 | 170 | 10 | 24 | 25 | 44 | 200 | 10 | 0 | 199 | 38 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 12.2 | 9.2 | 11.5 | 11 |
| HCM LOS | B | A | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 17% | 40% | 17% | 0% |
| Vol Thru, % | 79% | 6% | 40% | 84% |
| Vol Right, % | 4% | 54% | 42% | 16% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 226 | 281 | 52 | 211 |
| LT Vol | 39 | 113 | 9 | 0 |
| Through Vol | 178 | 17 | 21 | 177 |
| RT Vol | 9 | 151 | 22 | 34 |
| Lane Flow Rate | 254 | 316 | 58 | 237 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.375 | 0.447 | 0.09 | 0.345 |
| Departure Headway (Hd) | 5.318 | 5.094 | 5.556 | 5.242 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 675 | 707 | 644 | 685 |
| Service Time | 3.351 | 3.126 | 3.601 | 3.276 |
| HCM Lane V/C Ratio | 0.376 | 0.447 | 0.09 | 0.346 |
| HCM Control Delay, s/veh | 11.5 | 12.2 | 9.2 | 11 |
| HCM Lane LOS | B | B | A | B |
| HCM 95th-tile Q | 1.7 | 2.3 | 0.3 | 1.5 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 36 | 1204 | 398 | 177 | 995 | 300 | 125 | 139 | 120 |
| Future Volume (vph) | 36 | 1204 | 398 | 177 | 995 | 300 | 125 | 139 | 120 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 9.7 | 50.0 | 50.0 | 18.0 | 58.3 | 27.0 | 33.0 | 19.0 | 25.0 |
| Total Split (%) | 8.1% | 41.7% | 41.7% | 15.0% | 48.6% | 22.5% | 27.5% | 15.8% | 20.8% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.1 | 44.2 | 44.2 | 13.4 | 54.6 | 22.4 | 24.5 | 13.0 | 15.0 |
| Actuated g/C Ratio | 0.04 | 0.38 | 0.38 | 0.12 | 0.47 | 0.19 | 0.21 | 0.11 | 0.13 |
| v/c Ratio | 0.54 | 1.84 | 0.59 | 0.99 | 1.34 | 1.01 | 0.69 | 0.81 | 0.69 |
| Control Delay (s/veh) | 82.6 | 408.0 | 19.2 | 116.7 | 188.2 | 100.5 | 46.2 | 82.0 | 60.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 82.6 | 408.0 | 19.2 | 116.7 | 188.2 | 100.5 | 46.2 | 82.0 | 60.5 |
| LOS | F | F | B | F | F | F | D | F | E |
| Approach Delay (s/veh) | | 306.4 | | | 178.1 | | 75.7 | | 70.7 |
| Approach LOS | | F | | | F | | E | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 115.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.84 | |
| Intersection Signal Delay (s/veh): 210.9 | Intersection LOS: F |
| Intersection Capacity Utilization 122.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

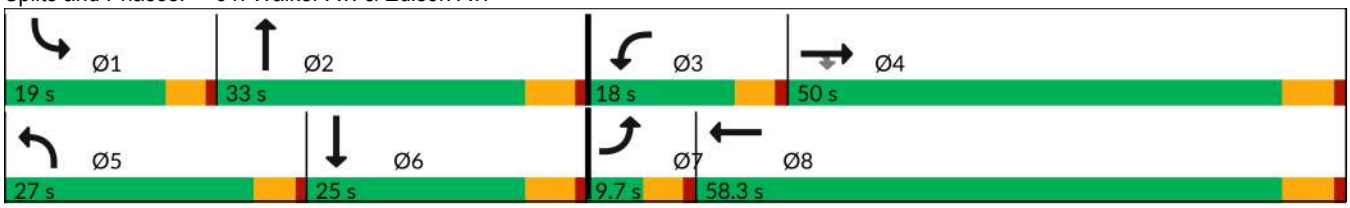

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 36 | 1204 | 398 | 177 | 995 | 76 | 300 | 125 | 128 | 139 | 120 | 33 |
| Future Volume (veh/h) | 36 | 1204 | 398 | 177 | 995 | 76 | 300 | 125 | 128 | 139 | 120 | 33 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 37 | 1241 | 281 | 182 | 1026 | 63 | 309 | 129 | 101 | 143 | 124 | 29 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 49 | 695 | 589 | 190 | 795 | 49 | 317 | 187 | 146 | 167 | 150 | 35 |
| Arrive On Green | 0.03 | 0.39 | 0.39 | 0.12 | 0.48 | 0.48 | 0.20 | 0.20 | 0.20 | 0.11 | 0.11 | 0.11 |
| Sat Flow, veh/h | 1594 | 1772 | 1502 | 1594 | 1652 | 101 | 1594 | 921 | 721 | 1594 | 1382 | 323 |
| Grp Volume(v), veh/h | 37 | 1241 | 281 | 182 | 0 | 1089 | 309 | 0 | 230 | 143 | 0 | 153 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 0 | 1754 | 1594 | 0 | 1642 | 1594 | 0 | 1705 |
| Q Serve(g_s), s | 2.6 | 44.2 | 15.8 | 12.8 | 0.0 | 54.2 | 21.7 | 0.0 | 14.6 | 9.9 | 0.0 | 9.9 |
| Cycle Q Clear(g_c), s | 2.6 | 44.2 | 15.8 | 12.8 | 0.0 | 54.2 | 21.7 | 0.0 | 14.6 | 9.9 | 0.0 | 9.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.06 | 1.00 | | 0.44 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 49 | 695 | 589 | 190 | 0 | 843 | 317 | 0 | 333 | 167 | 0 | 185 |
| V/C Ratio(X) | 0.76 | 1.78 | 0.48 | 0.96 | 0.00 | 1.29 | 0.98 | 0.00 | 0.69 | 0.85 | 0.00 | 0.83 |
| Avail Cap(c_a), veh/h | 72 | 695 | 589 | 190 | 0 | 843 | 317 | 0 | 402 | 204 | 0 | 297 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.2 | 34.2 | 25.6 | 49.4 | 0.0 | 29.2 | 44.8 | 0.0 | 41.7 | 49.6 | 0.0 | 49.2 |
| Incr Delay (d2), s/veh | 11.2 | 359.0 | 0.6 | 53.3 | 0.0 | 140.0 | 43.5 | 0.0 | 3.9 | 21.4 | 0.0 | 9.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 87.3 | 5.5 | 7.8 | 0.0 | 53.7 | 11.9 | 0.0 | 6.0 | 4.8 | 0.0 | 4.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 65.4 | 393.3 | 26.2 | 102.6 | 0.0 | 169.2 | 88.3 | 0.0 | 45.5 | 70.9 | 0.0 | 59.0 |
| LnGrp LOS | E | F | C | F | | F | F | | D | E | | E |
| Approach Vol, veh/h | | 1559 | | | 1271 | | | 539 | | | 296 | |
| Approach Delay, s/veh | | 319.3 | | | 159.7 | | | 70.1 | | | 64.8 | |
| Approach LOS | | F | | | F | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.4 | 28.2 | 18.0 | 50.0 | 27.0 | 17.6 | 8.0 | 60.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 14.4 | 27.6 | 13.4 | 44.2 | 22.4 | 19.6 | 5.1 | 52.5 |
| Max Q Clear Time (g_c+I1), s | 11.9 | 16.6 | 14.8 | 46.2 | 23.7 | 11.9 | 4.6 | 56.2 |
| Green Ext Time (p_c), s | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 206.7 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 51 | 457 | 284 | 104 | 129 | 46 |
| Future Vol, veh/h | 51 | 457 | 284 | 104 | 129 | 46 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 59 | 531 | 330 | 121 | 150 | 53 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 451 | 0 | - | 0 | 1041 | 391 |
| Stage 1 | - | - | - | - | 391 | - |
| Stage 2 | - | - | - | - | 650 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1109 | - | - | - | 255 | 658 |
| Stage 1 | - | - | - | - | 684 | - |
| Stage 2 | - | - | - | - | 520 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1109 | - | - | - | 236 | 658 |
| Mov Cap-2 Maneuver | - | - | - | - | 366 | - |
| Stage 1 | - | - | - | - | 632 | - |
| Stage 2 | - | - | - | - | 520 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.85 | 0 | 21.79 |
| HCM LOS | | | C |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 181 | - | - | - | 414 |
| HCM Lane V/C Ratio | 0.053 | - | - | - | 0.491 |
| HCM Control Delay (s/veh) | 8.4 | 0 | - | - | 21.8 |
| HCM Lane LOS | A | A | - | - | C |
| HCM 95th %tile Q(veh) | 0.2 | - | - | - | 2.6 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 453 | 9 | 192 | 483 | 631 | 1338 | 330 |
| Future Volume (vph) | 453 | 9 | 192 | 483 | 631 | 1338 | 330 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 26.0 | 26.0 | 26.0 | 22.0 | 64.0 | 42.0 | 42.0 |
| Total Split (%) | 28.9% | 28.9% | 28.9% | 24.4% | 71.1% | 46.7% | 46.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 18.5 | 18.5 | 18.5 | 18.0 | 59.9 | 36.9 | 36.9 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | 0.20 | 0.67 | 0.41 | 0.41 |
| v/c Ratio | 0.84 | 0.82 | 0.42 | 0.90 | 0.21 | 0.58 | 0.44 |
| Control Delay (s/veh) | 57.9 | 55.2 | 7.8 | 51.2 | 0.9 | 21.9 | 4.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 57.9 | 55.2 | 7.8 | 51.2 | 0.9 | 21.9 | 4.4 |
| LOS | E | E | A | D | A | C | A |
| Approach Delay (s/veh) | | 43.7 | | | 22.7 | 18.4 | |
| Approach LOS | | D | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.90 | |
| Intersection Signal Delay (s/veh): 24.6 | Intersection LOS: C |
| Intersection Capacity Utilization 78.4% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

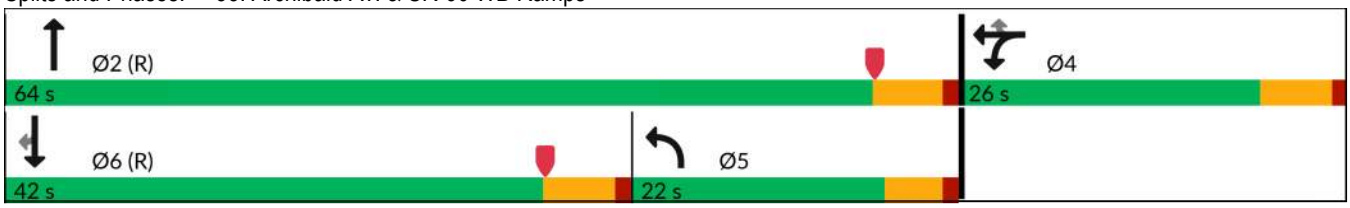

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 453 | 9 | 192 | 483 | 631 | 0 | 0 | 1338 | 330 |
| Future Volume (veh/h) | 0 | 0 | 0 | 453 | 9 | 192 | 483 | 631 | 0 | 0 | 1338 | 330 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1673 | 1772 | 1772 | 1575 | 1772 | 0 | 0 | 1772 | 1772 |
| Adj Flow Rate, veh/h | | | | 514 | 0 | 52 | 519 | 678 | 0 | 0 | 1439 | 232 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 599 | 0 | 282 | 839 | 3304 | 0 | 0 | 2014 | 484 |
| Arrive On Green | | | | 0.19 | 0.00 | 0.19 | 0.10 | 0.23 | 0.00 | 0.00 | 0.33 | 0.33 |
| Sat Flow, veh/h | | | | 3188 | 0 | 1502 | 2910 | 4997 | 0 | 0 | 6343 | 1465 |
| Grp Volume(v), veh/h | | | | 514 | 0 | 52 | 519 | 678 | 0 | 0 | 1439 | 232 |
| Grp Sat Flow(s),veh/h/ln | | | | 1594 | 0 | 1502 | 1455 | 1612 | 0 | 0 | 1524 | 1465 |
| Q Serve(g_s), s | | | | 14.0 | 0.0 | 2.6 | 15.4 | 10.2 | 0.0 | 0.0 | 18.6 | 11.3 |
| Cycle Q Clear(g_c), s | | | | 14.0 | 0.0 | 2.6 | 15.4 | 10.2 | 0.0 | 0.0 | 18.6 | 11.3 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 599 | 0 | 282 | 839 | 3304 | 0 | 0 | 2014 | 484 |
| V/C Ratio(X) | | | | 0.86 | 0.00 | 0.18 | 0.62 | 0.21 | 0.00 | 0.00 | 0.71 | 0.48 |
| Avail Cap(c_a), veh/h | | | | 715 | 0 | 337 | 839 | 3304 | 0 | 0 | 2452 | 589 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.90 | 0.90 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.4 | 0.0 | 30.7 | 36.0 | 15.0 | 0.0 | 0.0 | 26.4 | 24.0 |
| Incr Delay (d2), s/veh | | | | 8.9 | 0.0 | 0.3 | 0.9 | 0.1 | 0.0 | 0.0 | 2.2 | 3.4 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.9 | 0.0 | 2.4 | 6.0 | 3.7 | 0.0 | 0.0 | 6.5 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 44.3 | 0.0 | 31.0 | 36.9 | 15.1 | 0.0 | 0.0 | 28.6 | 27.4 |
| LnGrp LOS | | | | D | | C | D | B | | | C | C |
| Approach Vol, veh/h | | | | | 566 | | | 1197 | | | 1671 | |
| Approach Delay, s/veh | | | | | 43.0 | | | 24.6 | | | 28.4 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.3 | | 22.7 | 31.7 | 35.5 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 58.2 | | 20.2 | 17.0 | * 36 |
| Max Q Clear Time (g_c+I1), s | 12.2 | | 16.0 | 17.4 | 20.6 |
| Green Ext Time (p_c), s | 4.8 | | 0.9 | 0.0 | 9.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.5 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 166 | 1 | 470 | 916 | 562 | 520 | 1272 |
| Future Volume (vph) | 166 | 1 | 470 | 916 | 562 | 520 | 1272 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 40.0 | 40.0 | 23.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 44.4% | 44.4% | 25.6% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 18.5 | 18.5 | 18.5 | 34.2 | 34.2 | 20.6 | 59.9 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | 0.38 | 0.38 | 0.23 | 0.67 |
| v/c Ratio | 0.52 | 0.80 | 0.72 | 0.43 | 0.66 | 0.85 | 0.43 |
| Control Delay (s/veh) | 37.2 | 44.2 | 32.2 | 22.0 | 6.0 | 55.5 | 2.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.2 | 44.2 | 32.2 | 22.0 | 6.0 | 55.5 | 2.7 |
| LOS | D | D | C | C | A | E | A |
| Approach Delay (s/veh) | | 37.9 | | 15.9 | | | 18.0 |
| Approach LOS | | D | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 20.4 | Intersection LOS: C |
| Intersection Capacity Utilization 78.4% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

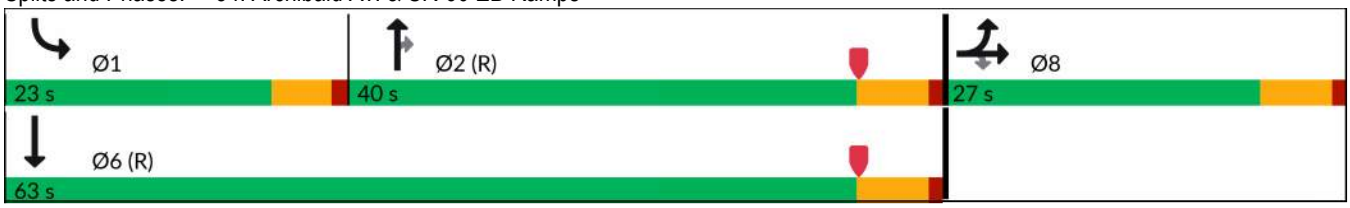

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 166 | 1 | 470 | 0 | 0 | 0 | 0 | 916 | 562 | 520 | 1272 | 0 |
| Future Volume (veh/h) | 166 | 1 | 470 | 0 | 0 | 0 | 0 | 916 | 562 | 520 | 1272 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1575 | 1772 | 0 |
| Adj Flow Rate, veh/h | 120 | 0 | 390 | | | | 0 | 996 | 498 | 565 | 1383 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 257 | 0 | 484 | | | | 0 | 2770 | 681 | 582 | 3434 | 0 |
| Arrive On Green | 0.16 | 0.00 | 0.16 | | | | 0.00 | 0.45 | 0.45 | 0.40 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1594 | 0 | 3003 | | | | 0 | 6343 | 1498 | 2910 | 4997 | 0 |
| Grp Volume(v), veh/h | 120 | 0 | 390 | | | | 0 | 996 | 498 | 565 | 1383 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1502 | | | | 0 | 1524 | 1498 | 1455 | 1612 | 0 |
| Q Serve(g_s), s | 6.1 | 0.0 | 11.3 | | | | 0.0 | 9.6 | 24.4 | 17.1 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 6.1 | 0.0 | 11.3 | | | | 0.0 | 9.6 | 24.4 | 17.1 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 257 | 0 | 484 | | | | 0 | 2770 | 681 | 582 | 3434 | 0 |
| V/C Ratio(X) | 0.47 | 0.00 | 0.81 | | | | 0.00 | 0.36 | 0.73 | 0.97 | 0.40 | 0.00 |
| Avail Cap(c_a), veh/h | 375 | 0 | 707 | | | | 0 | 2770 | 681 | 582 | 3434 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.75 | 0.75 | 0.00 |
| Uniform Delay (d), s/veh | 34.2 | 0.0 | 36.4 | | | | 0.0 | 16.0 | 20.1 | 26.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 4.4 | | | | 0.0 | 0.4 | 6.8 | 25.1 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 0.0 | 4.2 | | | | 0.0 | 3.0 | 8.6 | 6.0 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.6 | 0.0 | 40.7 | | | | 0.0 | 16.4 | 26.9 | 51.8 | 0.3 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | C | D | A | |
| Approach Vol, veh/h | | 510 | | | | | | 1494 | | | 1948 | |
| Approach Delay, s/veh | | 39.5 | | | | | | 19.9 | | | 15.2 | |
| Approach LOS | | D | | | | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.0 | 46.7 | | | | 69.7 | | 20.3 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 18.0 | 34.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 19.1 | 26.4 | | | | 2.0 | | 13.3 | | | | |
| Green Ext Time (p_c), s | 0.0 | 4.6 | | | | 12.4 | | 1.2 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 20.1 |
| HCM 7th LOS | | | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 164 | 576 | 338 | 189 | 502 | 159 | 268 | 761 | 289 | 1076 |
| Future Volume (vph) | 164 | 576 | 338 | 189 | 502 | 159 | 268 | 761 | 289 | 1076 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 21.0 | 42.1 | 42.1 | 17.1 | 38.2 | 38.2 | 27.0 | 32.8 | 28.0 | 33.8 |
| Total Split (%) | 17.5% | 35.1% | 35.1% | 14.3% | 31.8% | 31.8% | 22.5% | 27.3% | 23.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 26.4 | 26.4 | 12.6 | 24.5 | 24.5 | 21.4 | 24.4 | 26.4 | 29.4 |
| Actuated g/C Ratio | 0.13 | 0.24 | 0.24 | 0.12 | 0.23 | 0.23 | 0.20 | 0.23 | 0.24 | 0.27 |
| v/c Ratio | 0.79 | 0.72 | 0.56 | 1.05 | 0.67 | 0.35 | 0.87 | 0.78 | 0.77 | 1.01 |
| Control Delay (s/veh) | 72.5 | 42.8 | 7.1 | 128.8 | 43.4 | 7.6 | 70.7 | 44.9 | 54.8 | 67.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 72.5 | 42.8 | 7.1 | 128.8 | 43.4 | 7.6 | 70.7 | 44.9 | 54.8 | 67.1 |
| LOS | E | D | A | F | D | A | E | D | D | E |
| Approach Delay (s/veh) | | 36.1 | | | 55.8 | | | 51.2 | | 64.8 |
| Approach LOS | | D | | | E | | | D | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 108.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.05 | |
| Intersection Signal Delay (s/veh): 53.2 | Intersection LOS: D |
| Intersection Capacity Utilization 89.1% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

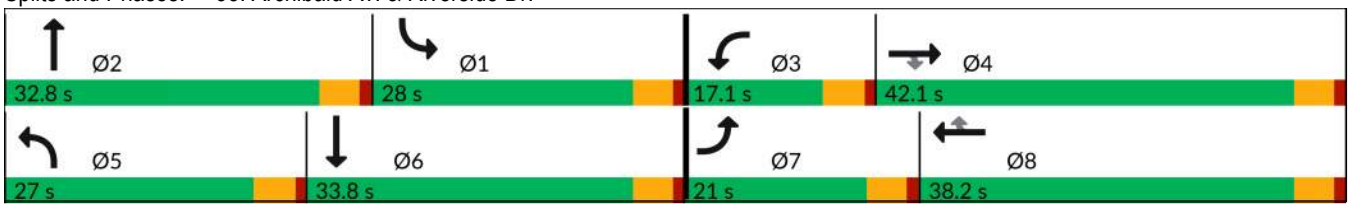

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 164 | 576 | 338 | 189 | 502 | 159 | 268 | 761 | 66 | 289 | 1076 | 206 |
| Future Volume (veh/h) | 164 | 576 | 338 | 189 | 502 | 159 | 268 | 761 | 66 | 289 | 1076 | 206 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 167 | 588 | 252 | 193 | 512 | 117 | 273 | 777 | 65 | 295 | 1098 | 171 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 194 | 775 | 343 | 194 | 774 | 341 | 300 | 989 | 82 | 401 | 1182 | 184 |
| Arrive On Green | 0.12 | 0.23 | 0.23 | 0.12 | 0.23 | 0.23 | 0.19 | 0.22 | 0.22 | 0.25 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1594 | 3367 | 1490 | 1594 | 3367 | 1482 | 1594 | 4547 | 378 | 1594 | 4209 | 655 |
| Grp Volume(v), veh/h | 167 | 588 | 252 | 193 | 512 | 117 | 273 | 550 | 292 | 295 | 841 | 428 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1490 | 1594 | 1683 | 1482 | 1594 | 1612 | 1700 | 1594 | 1612 | 1639 |
| Q Serve(g_s), s | 10.6 | 16.8 | 16.1 | 12.4 | 14.2 | 3.8 | 17.3 | 16.5 | 16.7 | 17.5 | 26.1 | 26.1 |
| Cycle Q Clear(g_c), s | 10.6 | 16.8 | 16.1 | 12.4 | 14.2 | 3.8 | 17.3 | 16.5 | 16.7 | 17.5 | 26.1 | 26.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.22 | 1.00 | | 0.40 |
| Lane Grp Cap(c), veh/h | 194 | 775 | 343 | 194 | 774 | 341 | 300 | 701 | 370 | 401 | 906 | 460 |
| V/C Ratio(X) | 0.86 | 0.76 | 0.73 | 1.00 | 0.66 | 0.34 | 0.91 | 0.78 | 0.79 | 0.74 | 0.93 | 0.93 |
| Avail Cap(c_a), veh/h | 254 | 1228 | 543 | 194 | 1100 | 484 | 347 | 884 | 466 | 401 | 916 | 465 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.3 | 36.9 | 36.7 | 45.2 | 36.0 | 10.3 | 40.9 | 38.0 | 38.0 | 35.3 | 36.0 | 36.0 |
| Incr Delay (d2), s/veh | 16.6 | 1.6 | 3.1 | 63.5 | 1.0 | 0.6 | 23.3 | 3.7 | 7.1 | 6.1 | 15.2 | 25.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.9 | 6.6 | 5.8 | 8.1 | 5.6 | 2.3 | 8.3 | 6.5 | 7.3 | 7.0 | 11.4 | 12.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 60.9 | 38.5 | 39.7 | 108.7 | 36.9 | 10.9 | 64.1 | 41.6 | 45.1 | 41.4 | 51.2 | 61.1 |
| LnGrp LOS | E | D | D | F | D | B | E | D | D | D | D | E |
| Approach Vol, veh/h | | 1007 | | | 822 | | | 1115 | | | 1564 | |
| Approach Delay, s/veh | | 42.5 | | | 50.1 | | | 48.0 | | | 52.1 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 30.5 | 27.0 | 17.1 | 28.3 | 24.0 | 33.5 | 17.1 | 28.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 23.4 | 28.2 | 12.5 | 37.5 | 22.4 | 29.2 | 16.4 | 33.6 |
| Max Q Clear Time (g_c+I1), s | 19.5 | 18.7 | 14.4 | 18.8 | 19.3 | 28.1 | 12.6 | 16.2 |
| Green Ext Time (p_c), s | 0.2 | 3.3 | 0.0 | 4.2 | 0.1 | 0.8 | 0.1 | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 48.6 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 94 | 208 | 44 | 122 | 89 | 72 | 914 | 145 | 1364 |
| Future Volume (vph) | 94 | 208 | 44 | 122 | 89 | 72 | 914 | 145 | 1364 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.5 | 22.6 | 5.4 | 17.0 | 17.0 | 10.0 | 25.6 | 25.6 | 44.4 |
| Actuated g/C Ratio | 0.12 | 0.24 | 0.06 | 0.18 | 0.18 | 0.10 | 0.27 | 0.27 | 0.46 |
| v/c Ratio | 0.52 | 0.78 | 0.52 | 0.41 | 0.22 | 0.45 | 0.71 | 0.36 | 0.92 |
| Control Delay (s/veh) | 53.0 | 46.7 | 70.6 | 42.5 | 1.2 | 53.5 | 35.1 | 36.7 | 38.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.0 | 46.7 | 70.6 | 42.5 | 1.2 | 53.5 | 35.1 | 36.7 | 38.8 |
| LOS | D | D | E | D | A | D | D | D | D |
| Approach Delay (s/veh) | | 48.1 | | 32.9 | | | 36.3 | | 38.6 |
| Approach LOS | | D | | C | | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 95.5 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.92 | |
| Intersection Signal Delay (s/veh): 38.6 | Intersection LOS: D |
| Intersection Capacity Utilization 84.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 94 | 208 | 101 | 44 | 122 | 89 | 72 | 914 | 46 | 145 | 1364 | 80 |
| Future Volume (veh/h) | 94 | 208 | 101 | 44 | 122 | 89 | 72 | 914 | 46 | 145 | 1364 | 80 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 98 | 217 | 88 | 46 | 127 | 35 | 75 | 952 | 46 | 151 | 1421 | 69 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 123 | 259 | 105 | 62 | 315 | 267 | 94 | 1345 | 65 | 417 | 1577 | 76 |
| Arrive On Green | 0.08 | 0.22 | 0.22 | 0.04 | 0.18 | 0.18 | 0.06 | 0.27 | 0.27 | 0.26 | 0.47 | 0.47 |
| Sat Flow, veh/h | 1594 | 1198 | 486 | 1594 | 1772 | 1502 | 1594 | 5029 | 243 | 1594 | 3352 | 162 |
| Grp Volume(v), veh/h | 98 | 0 | 305 | 46 | 127 | 35 | 75 | 670 | 328 | 151 | 749 | 741 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1684 | 1594 | 1772 | 1502 | 1594 | 1772 | 1728 | 1594 | 1772 | 1743 |
| Q Serve(g_s), s | 5.2 | 0.0 | 14.8 | 2.4 | 5.4 | 0.9 | 4.0 | 14.6 | 14.6 | 6.6 | 33.2 | 33.4 |
| Cycle Q Clear(g_c), s | 5.2 | 0.0 | 14.8 | 2.4 | 5.4 | 0.9 | 4.0 | 14.6 | 14.6 | 6.6 | 33.2 | 33.4 |
| Prop In Lane | 1.00 | | 0.29 | 1.00 | | 1.00 | 1.00 | | 0.14 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 123 | 0 | 364 | 62 | 315 | 267 | 94 | 948 | 462 | 417 | 833 | 820 |
| V/C Ratio(X) | 0.79 | 0.00 | 0.84 | 0.74 | 0.40 | 0.13 | 0.80 | 0.71 | 0.71 | 0.36 | 0.90 | 0.90 |
| Avail Cap(c_a), veh/h | 381 | 0 | 777 | 97 | 502 | 426 | 269 | 1876 | 915 | 417 | 884 | 869 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.7 | 0.0 | 32.0 | 40.6 | 31.1 | 9.0 | 39.7 | 28.3 | 28.3 | 25.7 | 20.8 | 20.8 |
| Incr Delay (d2), s/veh | 10.9 | 0.0 | 5.1 | 15.9 | 0.8 | 0.2 | 14.3 | 1.0 | 2.0 | 0.5 | 11.7 | 12.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.3 | 0.0 | 6.2 | 1.2 | 2.3 | 0.6 | 1.8 | 5.7 | 5.7 | 2.4 | 14.1 | 14.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 49.6 | 0.0 | 37.1 | 56.5 | 31.9 | 9.2 | 54.0 | 29.2 | 30.3 | 26.2 | 32.4 | 33.1 |
| LnGrp LOS | D | | D | E | C | A | D | C | C | C | C | C |
| Approach Vol, veh/h | | 403 | | | 208 | | | 1073 | | | 1641 | |
| Approach Delay, s/veh | | 40.2 | | | 33.5 | | | 31.3 | | | 32.2 | |
| Approach LOS | | D | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.9 | 27.4 | 7.9 | 23.1 | 9.6 | 44.8 | 11.2 | 19.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 8.6 | 16.6 | 4.4 | 16.8 | 6.0 | 35.4 | 7.2 | 7.4 |
| Green Ext Time (p_c), s | 0.1 | 6.2 | 0.0 | 1.7 | 0.1 | 4.7 | 0.2 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 32.9 |
| HCM 7th LOS | C |

| Lane Group | WBL | WBT | NBL | NBT | SBL | SBT | Ø4 |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 45 | 0 | 5 | 937 | 224 | 1276 | |
| Future Volume (vph) | 45 | 0 | 5 | 937 | 224 | 1276 | |
| Turn Type | Split | NA | Prot | NA | Prot | NA | |
| Protected Phases | 8 | 8 | 5 | 2 | 1 | 6 | 4 |
| Permitted Phases | | | | | | | |
| Detector Phase | 8 | 8 | 5 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 |
| Minimum Split (s) | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 | 22.5 |
| Total Split (s) | 32.6 | 32.6 | 9.6 | 39.9 | 25.0 | 55.3 | 22.5 |
| Total Split (%) | 27.2% | 27.2% | 8.0% | 33.3% | 20.8% | 46.1% | 19% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | |
| Lead/Lag | | | Lead | Lag | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.3 | 10.3 | 5.8 | 21.5 | 16.2 | 43.6 | |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.10 | 0.36 | 0.27 | 0.73 | |
| v/c Ratio | 0.17 | 0.09 | 0.03 | 0.58 | 0.54 | 0.53 | |
| Control Delay (s/veh) | 26.0 | 0.3 | 36.4 | 18.6 | 29.1 | 8.6 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay (s/veh) | 26.0 | 0.3 | 36.4 | 18.6 | 29.1 | 8.6 | |
| LOS | C | A | D | B | C | A | |
| Approach Delay (s/veh) | | 10.8 | | 18.7 | | 11.7 | |
| Approach LOS | | B | | B | | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 59.9 | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.58 | |
| Intersection Signal Delay (s/veh): 14.3 | Intersection LOS: B |
| Intersection Capacity Utilization 57.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 45 | 0 | 65 | 5 | 937 | 49 | 224 | 1276 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 45 | 0 | 65 | 5 | 937 | 49 | 224 | 1276 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 46 | 0 | 58 | 5 | 956 | 46 | 229 | 1302 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 4 | 0 | 135 | 0 | 127 | 11 | 1905 | 92 | 284 | 1933 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.08 | 0.00 | 0.08 | 0.01 | 0.40 | 0.40 | 0.18 | 0.57 | 0.00 |
| Sat Flow, veh/h | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 4729 | 227 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 46 | 0 | 58 | 5 | 651 | 351 | 229 | 1302 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 0 | 1594 | 0 | 1502 | 1594 | 1612 | 1731 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 1.1 | 0.0 | 1.5 | 0.1 | 6.2 | 6.3 | 5.7 | 11.1 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 1.1 | 0.0 | 1.5 | 0.1 | 6.2 | 6.3 | 5.7 | 11.1 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 0.13 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 4 | 0 | 135 | 0 | 127 | 11 | 1299 | 697 | 284 | 1933 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.34 | 0.00 | 0.46 | 0.46 | 0.50 | 0.50 | 0.81 | 0.67 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 769 | 0 | 1082 | 0 | 1020 | 193 | 2760 | 1482 | 788 | 4139 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 17.8 | 0.0 | 18.0 | 20.4 | 9.2 | 9.2 | 16.3 | 6.1 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 2.6 | 28.1 | 0.3 | 0.6 | 2.1 | 0.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.5 | 0.1 | 1.2 | 1.4 | 1.6 | 1.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 0.0 | 19.3 | 0.0 | 20.5 | 48.5 | 9.5 | 9.8 | 18.3 | 6.5 | 0.0 |
| LnGrp LOS | | | | B | | C | D | A | A | B | A | |
| Approach Vol, veh/h | | 0 | | | 104 | | | 1007 | | | 1531 | |
| Approach Delay, s/veh | | 0.0 | | | 20.0 | | | 9.8 | | | 8.3 | |
| Approach LOS | | | | | B | | | A | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.9 | 21.2 | | 0.0 | 4.9 | 28.3 | | 8.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 20.4 | 35.3 | | 17.9 | 5.0 | 50.7 | | 28.0 |
| Max Q Clear Time (g_c+I1), s | 7.7 | 8.3 | | 0.0 | 2.1 | 13.1 | | 3.5 |
| Green Ext Time (p_c), s | 0.2 | 6.1 | | 0.0 | 0.0 | 10.6 | | 0.4 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 9.3 |
| HCM 7th LOS | | A |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 237 | 887 | 302 | 433 | 836 | 105 | 139 | 643 | 249 | 152 | 883 | 251 |
| Future Volume (vph) | 237 | 887 | 302 | 433 | 836 | 105 | 139 | 643 | 249 | 152 | 883 | 251 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 13.0 | 41.2 | | 18.0 | 46.2 | 46.2 | 13.0 | 41.0 | | 19.8 | 47.8 | 47.8 |
| Total Split (%) | 10.8% | 34.3% | | 15.0% | 38.5% | 38.5% | 10.8% | 34.2% | | 16.5% | 39.8% | 39.8% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 8.4 | 36.7 | 113.5 | 13.4 | 41.7 | 41.7 | 8.4 | 31.3 | 113.5 | 13.6 | 36.5 | 36.5 |
| Actuated g/C Ratio | 0.07 | 0.32 | 1.00 | 0.12 | 0.37 | 0.37 | 0.07 | 0.28 | 1.00 | 0.12 | 0.32 | 0.32 |
| v/c Ratio | 1.12 | 0.58 | 0.20 | 1.28 | 1.30 | 0.17 | 1.20 | 0.70 | 0.17 | 0.81 | 0.83 | 0.44 |
| Control Delay (s/veh) | 144.6 | 34.4 | 0.3 | 187.7 | 179.2 | 2.5 | 192.0 | 41.6 | 0.2 | 80.2 | 42.8 | 15.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 144.6 | 34.4 | 0.3 | 187.7 | 179.2 | 2.5 | 192.0 | 41.6 | 0.2 | 80.2 | 42.8 | 15.3 |
| LOS | F | C | A | F | F | A | F | D | A | F | D | B |
| Approach Delay (s/veh) | | 45.5 | | | 168.4 | | | 51.8 | | | 41.8 | |
| Approach LOS | | D | | | F | | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.30 | |
| Intersection Signal Delay (s/veh): 78.8 | Intersection LOS: E |
| Intersection Capacity Utilization 104.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

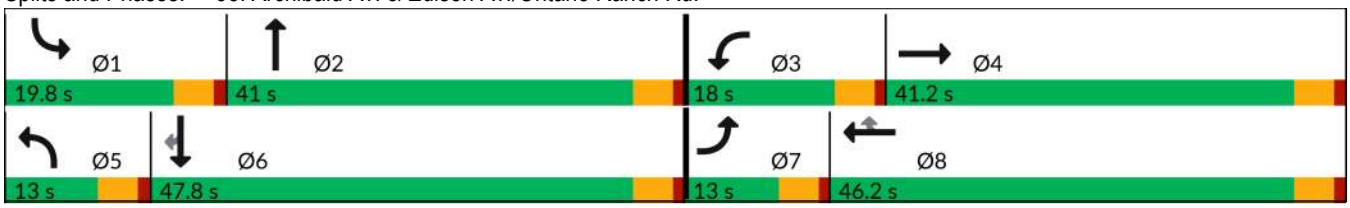

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 237 | 887 | 302 | 433 | 836 | 105 | 139 | 643 | 249 | 152 | 883 | 251 |
| Future Volume (veh/h) | 237 | 887 | 302 | 433 | 836 | 105 | 139 | 643 | 249 | 152 | 883 | 251 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 239 | 896 | 0 | 437 | 844 | 78 | 140 | 649 | 0 | 154 | 892 | 245 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 221 | 1601 | | 353 | 666 | 564 | 121 | 906 | | 179 | 1029 | 459 |
| Arrive On Green | 0.08 | 0.50 | 0.00 | 0.12 | 0.56 | 0.38 | 0.08 | 0.40 | 0.00 | 0.11 | 0.46 | 0.31 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 1772 | 1500 | 1594 | 3367 | 1502 | 1594 | 3367 | 1502 |
| Grp Volume(v), veh/h | 239 | 896 | 0 | 437 | 844 | 78 | 140 | 649 | 0 | 154 | 892 | 245 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1772 | 1500 | 1594 | 1683 | 1502 | 1594 | 1683 | 1502 |
| Q Serve(g_s), s | 8.4 | 14.3 | 0.0 | 13.4 | 41.6 | 3.8 | 8.4 | 17.9 | 0.0 | 10.5 | 26.3 | 15.0 |
| Cycle Q Clear(g_c), s | 8.4 | 14.3 | 0.0 | 13.4 | 41.6 | 3.8 | 8.4 | 17.9 | 0.0 | 10.5 | 26.3 | 15.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 221 | 1601 | | 353 | 666 | 564 | 121 | 906 | | 179 | 1029 | 459 |
| V/C Ratio(X) | 1.08 | 0.56 | | 1.24 | 1.27 | 0.14 | 1.16 | 0.72 | | 0.86 | 0.87 | 0.53 |
| Avail Cap(c_a), veh/h | 221 | 1601 | | 353 | 666 | 564 | 121 | 1108 | | 219 | 1315 | 586 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.1 | 22.2 | 0.0 | 48.6 | 24.1 | 22.7 | 51.1 | 29.4 | 0.0 | 48.2 | 27.9 | 31.9 |
| Incr Delay (d2), s/veh | 83.9 | 0.4 | 0.0 | 129.7 | 131.6 | 0.1 | 130.0 | 1.7 | 0.0 | 20.9 | 5.2 | 1.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.5 | 4.4 | 0.0 | 11.0 | 36.2 | 1.3 | 7.6 | 6.0 | 0.0 | 5.0 | 8.6 | 5.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 135.0 | 22.7 | 0.0 | 178.3 | 155.7 | 22.8 | 181.1 | 31.2 | 0.0 | 69.2 | 33.1 | 32.8 |
| LnGrp LOS | F | C | | F | F | C | F | C | | E | C | C |
| Approach Vol, veh/h | | 1135 | | | 1359 | | | 789 | | | 1291 | |
| Approach Delay, s/veh | | 46.3 | | | 155.4 | | | 57.8 | | | 37.4 | |
| Approach LOS | | D | | | F | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 34.4 | 18.0 | 41.2 | 13.0 | 38.4 | 13.0 | 46.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 15.2 | 36.4 | 13.4 | 36.6 | 8.4 | 43.2 | 8.4 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 12.5 | 19.9 | 15.4 | 16.3 | 10.4 | 28.3 | 10.4 | 43.6 |
| Green Ext Time (p_c), s | 0.0 | 3.4 | 0.0 | 5.5 | 0.0 | 5.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 78.2 |
| HCM 7th LOS | E |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 221 | 394 | 205 | 109 | 225 | 64 | 136 | 641 | 116 | 109 | 984 | 160 |
| Future Volume (vph) | 221 | 394 | 205 | 109 | 225 | 64 | 136 | 641 | 116 | 109 | 984 | 160 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.3 | 19.5 | 89.3 | 10.7 | 17.9 | 17.9 | 5.5 | 32.5 | 32.5 | 7.7 | 34.7 | 34.7 |
| Actuated g/C Ratio | 0.14 | 0.22 | 1.00 | 0.12 | 0.20 | 0.20 | 0.06 | 0.36 | 0.36 | 0.09 | 0.39 | 0.39 |
| v/c Ratio | 0.57 | 0.54 | 0.14 | 0.61 | 0.34 | 0.16 | 0.78 | 0.35 | 0.19 | 0.45 | 0.76 | 0.25 |
| Control Delay (s/veh) | 43.4 | 32.7 | 0.2 | 55.4 | 31.6 | 0.9 | 71.8 | 23.2 | 4.5 | 48.6 | 30.0 | 6.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 43.4 | 32.7 | 0.2 | 55.4 | 31.6 | 0.9 | 71.8 | 23.2 | 4.5 | 48.6 | 30.0 | 6.5 |
| LOS | D | C | A | E | C | A | E | C | A | D | C | A |
| Approach Delay (s/veh) | | 27.5 | | | 33.2 | | | 28.2 | | | 28.6 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 89.3 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 28.8 | Intersection LOS: C |
| Intersection Capacity Utilization 68.3% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

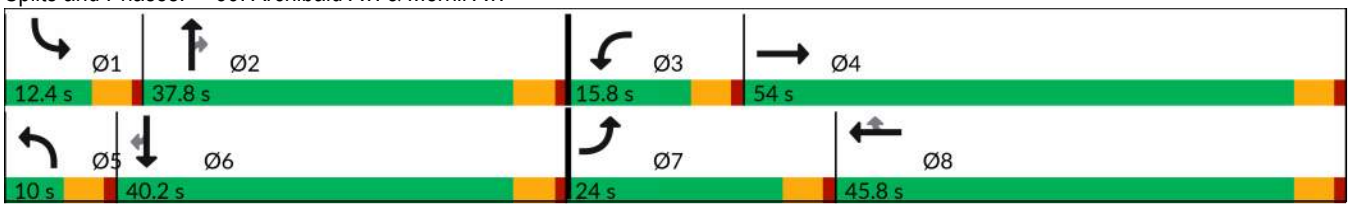

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 221 | 394 | 205 | 109 | 225 | 64 | 136 | 641 | 116 | 109 | 984 | 160 |
| Future Volume (veh/h) | 221 | 394 | 205 | 109 | 225 | 64 | 136 | 641 | 116 | 109 | 984 | 160 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 233 | 415 | 0 | 115 | 237 | 36 | 143 | 675 | 88 | 115 | 1036 | 115 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 334 | 671 | | 143 | 594 | 246 | 213 | 2039 | 568 | 196 | 1339 | 568 |
| Arrive On Green | 0.11 | 0.19 | 0.00 | 0.09 | 0.17 | 0.17 | 0.07 | 0.38 | 0.38 | 0.07 | 0.38 | 0.38 |
| Sat Flow, veh/h | 3000 | 3544 | 1502 | 1594 | 3544 | 1468 | 3000 | 5316 | 1481 | 3000 | 3544 | 1502 |
| Grp Volume(v), veh/h | 233 | 415 | 0 | 115 | 237 | 36 | 143 | 675 | 88 | 115 | 1036 | 115 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1502 | 1594 | 1772 | 1468 | 1500 | 1772 | 1481 | 1500 | 1772 | 1502 |
| Q Serve(g_s), s | 5.1 | 7.3 | 0.0 | 4.8 | 4.0 | 1.4 | 3.1 | 6.1 | 2.6 | 2.5 | 17.4 | 3.5 |
| Cycle Q Clear(g_c), s | 5.1 | 7.3 | 0.0 | 4.8 | 4.0 | 1.4 | 3.1 | 6.1 | 2.6 | 2.5 | 17.4 | 3.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 334 | 671 | | 143 | 594 | 246 | 213 | 2039 | 568 | 196 | 1339 | 568 |
| V/C Ratio(X) | 0.70 | 0.62 | | 0.80 | 0.40 | 0.15 | 0.67 | 0.33 | 0.15 | 0.59 | 0.77 | 0.20 |
| Avail Cap(c_a), veh/h | 860 | 2587 | | 264 | 2157 | 894 | 239 | 2608 | 726 | 346 | 1864 | 790 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 29.0 | 25.2 | 0.0 | 30.2 | 25.1 | 24.0 | 30.7 | 14.7 | 13.7 | 30.7 | 18.5 | 14.2 |
| Incr Delay (d2), s/veh | 2.6 | 0.9 | 0.0 | 9.9 | 0.4 | 0.3 | 6.1 | 0.1 | 0.1 | 2.8 | 1.4 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 2.8 | 0.0 | 2.1 | 1.6 | 0.5 | 1.2 | 2.0 | 0.8 | 0.9 | 5.9 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 31.6 | 26.1 | 0.0 | 40.1 | 25.6 | 24.3 | 36.8 | 14.8 | 13.8 | 33.5 | 19.9 | 14.4 |
| LnGrp LOS | C | C | | D | C | C | D | B | B | C | B | B |
| Approach Vol, veh/h | | 648 | | | 388 | | | 906 | | | 1266 | |
| Approach Delay, s/veh | | 28.1 | | | 29.8 | | | 18.2 | | | 20.6 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 9.0 | 30.6 | 10.7 | 17.4 | 9.4 | 30.2 | 12.1 | 15.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 4.5 | 8.1 | 6.8 | 9.3 | 5.1 | 19.4 | 7.1 | 6.0 |
| Green Ext Time (p_c), s | 0.1 | 4.4 | 0.1 | 2.7 | 0.0 | 6.2 | 0.6 | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.5 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 69 | 217 | 58 | 390 | 141 | 310 | 16 | 621 | 326 | 488 | 780 | 76 |
| Future Volume (vph) | 69 | 217 | 58 | 390 | 141 | 310 | 16 | 621 | 326 | 488 | 780 | 76 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.2 | 12.8 | 12.8 | 16.3 | 26.4 | 36.2 | 5.2 | 23.7 | 40.0 | 9.8 | 35.1 | 35.1 |
| Actuated g/C Ratio | 0.06 | 0.16 | 0.16 | 0.20 | 0.32 | 0.44 | 0.06 | 0.29 | 0.49 | 0.12 | 0.43 | 0.43 |
| v/c Ratio | 0.40 | 0.44 | 0.17 | 0.71 | 0.14 | 0.26 | 0.09 | 0.67 | 0.42 | 1.48 | 0.40 | 0.11 |
| Control Delay (s/veh) | 49.7 | 36.4 | 1.1 | 39.9 | 22.4 | 6.6 | 45.9 | 29.6 | 6.1 | 261.5 | 18.4 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.7 | 36.4 | 1.1 | 39.9 | 22.4 | 6.6 | 45.9 | 29.6 | 6.1 | 261.5 | 18.4 | 0.5 |
| LOS | D | D | A | D | C | A | D | C | A | F | B | A |
| Approach Delay (s/veh) | | 33.1 | | | 24.7 | | | 21.9 | | | 105.7 | |
| Approach LOS | | C | | | C | | | C | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 81.9 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.48 | |
| Intersection Signal Delay (s/veh): 55.9 | Intersection LOS: E |
| Intersection Capacity Utilization 71.5% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

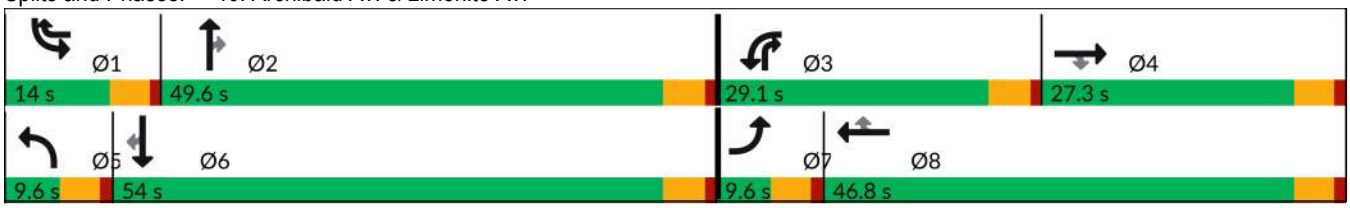

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 69 | 217 | 58 | 390 | 141 | 310 | 16 | 621 | 326 | 488 | 780 | 76 |
| Future Volume (veh/h) | 69 | 217 | 58 | 390 | 141 | 310 | 16 | 621 | 326 | 488 | 780 | 76 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 73 | 228 | 39 | 411 | 148 | 208 | 17 | 654 | 166 | 514 | 821 | 69 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 160 | 490 | 218 | 507 | 892 | 1062 | 59 | 919 | 666 | 401 | 1889 | 586 |
| Arrive On Green | 0.05 | 0.15 | 0.15 | 0.17 | 0.27 | 0.27 | 0.02 | 0.27 | 0.27 | 0.14 | 0.39 | 0.39 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 2910 | 3367 | 2634 | 2910 | 3367 | 1481 | 2910 | 4837 | 1500 |
| Grp Volume(v), veh/h | 73 | 228 | 39 | 411 | 148 | 208 | 17 | 654 | 166 | 514 | 821 | 69 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1455 | 1683 | 1317 | 1455 | 1683 | 1481 | 1455 | 1612 | 1500 |
| Q Serve(g_s), s | 1.7 | 4.2 | 1.6 | 9.3 | 2.3 | 3.5 | 0.4 | 12.0 | 4.8 | 9.4 | 8.5 | 2.0 |
| Cycle Q Clear(g_c), s | 1.7 | 4.2 | 1.6 | 9.3 | 2.3 | 3.5 | 0.4 | 12.0 | 4.8 | 9.4 | 8.5 | 2.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 160 | 490 | 218 | 507 | 892 | 1062 | 59 | 919 | 666 | 401 | 1889 | 586 |
| V/C Ratio(X) | 0.46 | 0.47 | 0.18 | 0.81 | 0.17 | 0.20 | 0.29 | 0.71 | 0.25 | 1.28 | 0.43 | 0.12 |
| Avail Cap(c_a), veh/h | 213 | 1119 | 499 | 1044 | 2080 | 1991 | 213 | 2218 | 1238 | 401 | 3499 | 1085 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.3 | 26.7 | 25.6 | 27.1 | 19.3 | 13.2 | 33.0 | 22.4 | 11.7 | 29.4 | 15.3 | 13.3 |
| Incr Delay (d2), s/veh | 0.8 | 0.7 | 0.4 | 1.2 | 0.1 | 0.1 | 1.0 | 1.0 | 0.2 | 145.3 | 0.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 1.6 | 0.5 | 3.0 | 0.8 | 0.9 | 0.1 | 4.1 | 1.3 | 11.0 | 2.5 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 32.0 | 27.4 | 26.0 | 28.3 | 19.4 | 13.3 | 34.0 | 23.4 | 11.9 | 174.8 | 15.4 | 13.4 |
| LnGrp LOS | C | C | C | C | B | B | C | C | B | F | B | B |
| Approach Vol, veh/h | | 340 | | | 767 | | | 837 | | | 1404 | |
| Approach Delay, s/veh | | 28.3 | | | 22.5 | | | 21.4 | | | 73.7 | |
| Approach LOS | | C | | | C | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 23.2 | 16.5 | 14.5 | 6.0 | 31.3 | 8.3 | 22.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 11.4 | 14.0 | 11.3 | 6.2 | 2.4 | 10.5 | 3.7 | 5.5 |
| Green Ext Time (p_c), s | 0.0 | 4.7 | 0.6 | 1.2 | 0.0 | 5.8 | 0.0 | 1.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 44.3 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 78 | 1158 | 39 | 55 | 1334 | 80 | 30 | 26 | 130 | 39 |
| Future Volume (vph) | 78 | 1158 | 39 | 55 | 1334 | 80 | 30 | 26 | 130 | 39 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.8 | 46.8 | 46.8 | 8.3 | 44.2 | 44.2 | 6.5 | 8.8 | 11.9 | 16.2 |
| Actuated g/C Ratio | 0.09 | 0.53 | 0.53 | 0.09 | 0.50 | 0.50 | 0.07 | 0.10 | 0.13 | 0.18 |
| v/c Ratio | 0.60 | 0.66 | 0.05 | 0.40 | 0.81 | 0.10 | 0.28 | 0.40 | 0.66 | 0.34 |
| Control Delay (s/veh) | 65.2 | 20.3 | 0.1 | 52.1 | 23.7 | 0.6 | 52.7 | 25.6 | 58.2 | 20.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 65.2 | 20.3 | 0.1 | 52.1 | 23.7 | 0.6 | 52.7 | 25.6 | 58.2 | 20.1 |
| LOS | E | C | A | D | C | A | D | C | E | C |
| Approach Delay (s/veh) | | 22.5 | | | 23.5 | | | 33.3 | | 40.5 |
| Approach LOS | | C | | | C | | | C | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 89 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 24.7 | Intersection LOS: C |
| Intersection Capacity Utilization 70.0% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

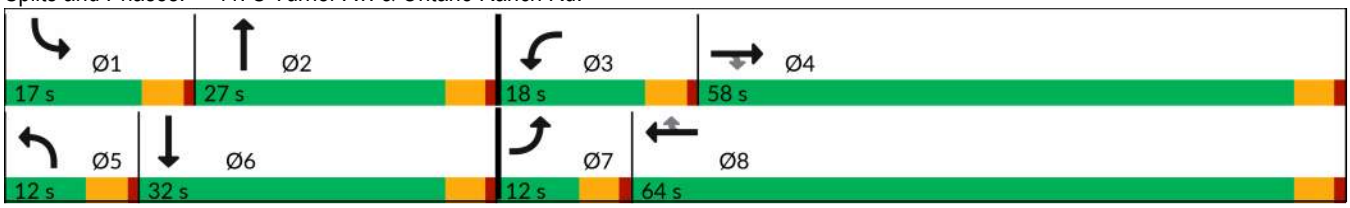

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 78 | 1158 | 39 | 55 | 1334 | 80 | 30 | 26 | 49 | 130 | 39 | 74 |
| Future Volume (veh/h) | 78 | 1158 | 39 | 55 | 1334 | 80 | 30 | 26 | 49 | 130 | 39 | 74 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 83 | 1232 | 37 | 59 | 1419 | 61 | 32 | 28 | 20 | 138 | 41 | 67 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 102 | 1922 | 815 | 77 | 1865 | 790 | 52 | 45 | 32 | 169 | 73 | 119 |
| Arrive On Green | 0.06 | 0.54 | 0.54 | 0.05 | 0.53 | 0.53 | 0.03 | 0.05 | 0.05 | 0.11 | 0.12 | 0.12 |
| Sat Flow, veh/h | 1594 | 3544 | 1502 | 1594 | 3544 | 1502 | 1594 | 950 | 678 | 1594 | 605 | 989 |
| Grp Volume(v), veh/h | 83 | 1232 | 37 | 59 | 1419 | 61 | 32 | 0 | 48 | 138 | 0 | 108 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 1772 | 1502 | 1594 | 0 | 1628 | 1594 | 0 | 1594 |
| Q Serve(g_s), s | 3.7 | 17.5 | 0.8 | 2.6 | 22.7 | 1.4 | 1.4 | 0.0 | 2.1 | 6.1 | 0.0 | 4.6 |
| Cycle Q Clear(g_c), s | 3.7 | 17.5 | 0.8 | 2.6 | 22.7 | 1.4 | 1.4 | 0.0 | 2.1 | 6.1 | 0.0 | 4.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.42 | 1.00 | | 0.62 |
| Lane Grp Cap(c), veh/h | 102 | 1922 | 815 | 77 | 1865 | 790 | 52 | 0 | 77 | 169 | 0 | 192 |
| V/C Ratio(X) | 0.81 | 0.64 | 0.05 | 0.77 | 0.76 | 0.08 | 0.61 | 0.00 | 0.63 | 0.82 | 0.00 | 0.56 |
| Avail Cap(c_a), veh/h | 164 | 2634 | 1116 | 297 | 2930 | 1242 | 164 | 0 | 508 | 275 | 0 | 608 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.2 | 11.5 | 7.7 | 33.8 | 13.4 | 8.4 | 34.3 | 0.0 | 33.6 | 31.4 | 0.0 | 29.8 |
| Incr Delay (d2), s/veh | 6.3 | 0.4 | 0.0 | 5.9 | 0.7 | 0.0 | 4.2 | 0.0 | 8.1 | 3.7 | 0.0 | 2.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 5.3 | 0.2 | 1.1 | 7.1 | 0.4 | 0.6 | 0.0 | 0.9 | 2.3 | 0.0 | 1.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 39.5 | 11.9 | 7.7 | 39.7 | 14.1 | 8.4 | 38.5 | 0.0 | 41.7 | 35.2 | 0.0 | 32.4 |
| LnGrp LOS | D | B | A | D | B | A | D | | D | D | | C |
| Approach Vol, veh/h | | 1352 | | | 1539 | | | 80 | | | 246 | |
| Approach Delay, s/veh | | 13.5 | | | 14.9 | | | 40.4 | | | 33.9 | |
| Approach LOS | | B | | | B | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.2 | 8.0 | 8.1 | 43.6 | 7.0 | 13.3 | 9.2 | 42.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 8.1 | 4.1 | 4.6 | 19.5 | 3.4 | 6.6 | 5.7 | 24.7 |
| Green Ext Time (p_c), s | 0.1 | 0.1 | 0.0 | 10.4 | 0.0 | 0.5 | 0.0 | 13.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 16.4 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 247 | 1134 | 55 | 235 | 1325 | 261 | 60 | 196 | 84 | 287 | 389 | 110 |
| Future Volume (vph) | 247 | 1134 | 55 | 235 | 1325 | 261 | 60 | 196 | 84 | 287 | 389 | 110 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.2 | 29.8 | 29.8 | 11.6 | 29.2 | 29.2 | 6.1 | 19.5 | 19.5 | 16.3 | 32.2 | 32.2 |
| Actuated g/C Ratio | 0.13 | 0.31 | 0.31 | 0.12 | 0.30 | 0.30 | 0.06 | 0.20 | 0.20 | 0.17 | 0.34 | 0.34 |
| v/c Ratio | 1.28 | 0.79 | 0.10 | 0.70 | 0.75 | 0.43 | 0.63 | 0.57 | 0.21 | 1.11 | 0.68 | 0.20 |
| Control Delay (s/veh) | 195.7 | 36.5 | 0.4 | 53.8 | 34.3 | 6.3 | 75.1 | 39.8 | 2.0 | 127.3 | 34.4 | 4.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 195.7 | 36.5 | 0.4 | 53.8 | 34.3 | 6.3 | 75.1 | 39.8 | 2.0 | 127.3 | 34.4 | 4.9 |
| LOS | F | D | A | D | C | A | E | D | A | F | C | A |
| Approach Delay (s/veh) | | 62.5 | | | 32.8 | | | 36.7 | | | 64.2 | |
| Approach LOS | | E | | | C | | | D | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 95.9 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.28 | |
| Intersection Signal Delay (s/veh): 48.5 | Intersection LOS: D |
| Intersection Capacity Utilization 82.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 247 | 1134 | 55 | 235 | 1325 | 261 | 60 | 196 | 84 | 287 | 389 | 110 |
| Future Volume (veh/h) | 247 | 1134 | 55 | 235 | 1325 | 261 | 60 | 196 | 84 | 287 | 389 | 110 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 257 | 1181 | 40 | 245 | 1380 | 170 | 62 | 204 | 31 | 299 | 405 | 100 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 221 | 1609 | 497 | 311 | 1832 | 448 | 76 | 286 | 240 | 297 | 531 | 448 |
| Arrive On Green | 0.14 | 0.33 | 0.33 | 0.11 | 0.30 | 0.30 | 0.05 | 0.16 | 0.16 | 0.19 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1594 | 4837 | 1495 | 2910 | 6095 | 1492 | 1594 | 1772 | 1490 | 1594 | 1772 | 1494 |
| Grp Volume(v), veh/h | 257 | 1181 | 40 | 245 | 1380 | 170 | 62 | 204 | 31 | 299 | 405 | 100 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1612 | 1495 | 1455 | 1524 | 1492 | 1594 | 1772 | 1490 | 1594 | 1772 | 1494 |
| Q Serve(g_s), s | 12.0 | 18.6 | 1.6 | 7.1 | 17.7 | 7.8 | 3.3 | 9.4 | 1.5 | 16.1 | 17.9 | 4.3 |
| Cycle Q Clear(g_c), s | 12.0 | 18.6 | 1.6 | 7.1 | 17.7 | 7.8 | 3.3 | 9.4 | 1.5 | 16.1 | 17.9 | 4.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 221 | 1609 | 497 | 311 | 1832 | 448 | 76 | 286 | 240 | 297 | 531 | 448 |
| V/C Ratio(X) | 1.16 | 0.73 | 0.08 | 0.79 | 0.75 | 0.38 | 0.81 | 0.71 | 0.13 | 1.01 | 0.76 | 0.22 |
| Avail Cap(c_a), veh/h | 221 | 1629 | 503 | 431 | 2109 | 516 | 111 | 894 | 752 | 297 | 1101 | 929 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.2 | 25.5 | 19.8 | 37.6 | 27.3 | 23.9 | 40.8 | 34.3 | 31.0 | 35.2 | 27.4 | 22.7 |
| Incr Delay (d2), s/veh | 110.8 | 1.7 | 0.1 | 4.3 | 1.4 | 0.5 | 16.5 | 3.3 | 0.2 | 54.0 | 2.3 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.2 | 6.6 | 0.5 | 2.5 | 5.9 | 2.5 | 1.6 | 4.1 | 0.5 | 10.3 | 7.3 | 1.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 148.0 | 27.2 | 19.8 | 41.9 | 28.7 | 24.4 | 57.3 | 37.6 | 31.3 | 89.1 | 29.7 | 22.9 |
| LnGrp LOS | F | C | B | D | C | C | E | D | C | F | C | C |
| Approach Vol, veh/h | | 1478 | | | 1795 | | | 297 | | | 804 | |
| Approach Delay, s/veh | | 48.0 | | | 30.1 | | | 41.1 | | | 51.0 | |
| Approach LOS | | D | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.7 | 18.5 | 13.8 | 33.3 | 8.7 | 30.5 | 16.6 | 30.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 18.1 | 11.4 | 9.1 | 20.6 | 5.3 | 19.9 | 14.0 | 19.7 |
| Green Ext Time (p_c), s | 0.0 | 1.2 | 0.2 | 4.6 | 0.0 | 2.7 | 0.0 | 6.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 40.7 |
| HCM 7th LOS | D |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 164 | 1048 | 326 | 378 | 1356 | 181 | 457 | 371 | 289 | 229 | 461 | 144 |
| Future Volume (vph) | 164 | 1048 | 326 | 378 | 1356 | 181 | 457 | 371 | 289 | 229 | 461 | 144 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 10.0 | 48.5 | 48.5 | 12.0 | 50.5 | 50.5 | 13.0 | 49.5 | 49.5 | 10.0 | 46.5 | 46.5 |
| Total Split (%) | 8.3% | 40.4% | 40.4% | 10.0% | 42.1% | 42.1% | 10.8% | 41.3% | 41.3% | 8.3% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.4 | 44.2 | 44.2 | 7.5 | 46.2 | 46.2 | 8.5 | 25.2 | 25.2 | 5.4 | 22.1 | 22.1 |
| Actuated g/C Ratio | 0.05 | 0.44 | 0.44 | 0.07 | 0.46 | 0.46 | 0.08 | 0.25 | 0.25 | 0.05 | 0.22 | 0.22 |
| v/c Ratio | 1.12 | 0.52 | 0.43 | 1.87 | 0.93 | 0.25 | 1.99 | 0.33 | 0.66 | 1.55 | 0.66 | 0.37 |
| Control Delay (s/veh) | 151.4 | 22.9 | 8.2 | 435.6 | 38.6 | 7.5 | 484.0 | 30.9 | 26.6 | 310.8 | 39.8 | 12.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 151.4 | 22.9 | 8.2 | 435.6 | 38.6 | 7.5 | 484.0 | 30.9 | 26.6 | 310.8 | 39.8 | 12.4 |
| LOS | F | C | A | F | D | A | F | C | C | F | D | B |
| Approach Delay (s/veh) | | 33.5 | | | 114.1 | | | 215.1 | | | 109.4 | |
| Approach LOS | | C | | | F | | | F | | | F | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 100.8
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.99
Intersection Signal Delay (s/veh): 111.3 — Intersection LOS: F
Intersection Capacity Utilization 89.4% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

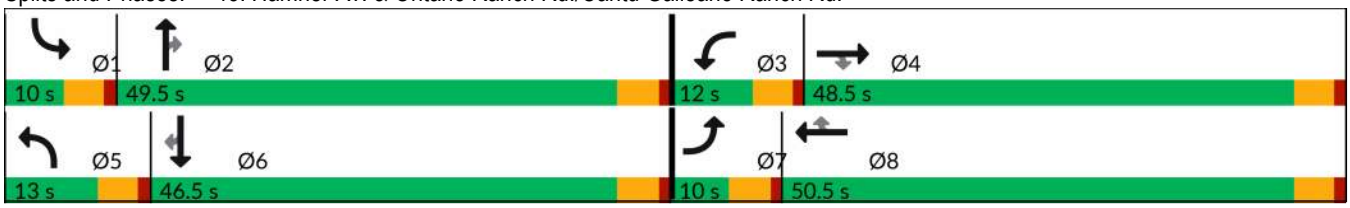

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 164 | 1048 | 326 | 378 | 1356 | 181 | 457 | 371 | 289 | 229 | 461 | 144 |
| Future Volume (veh/h) | 164 | 1048 | 326 | 378 | 1356 | 181 | 457 | 371 | 289 | 229 | 461 | 144 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 173 | 1103 | 246 | 398 | 1427 | 98 | 481 | 391 | 116 | 241 | 485 | 140 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 167 | 2145 | 665 | 229 | 1564 | 697 | 260 | 1088 | 331 | 167 | 650 | 286 |
| Arrive On Green | 0.06 | 0.44 | 0.44 | 0.08 | 0.46 | 0.46 | 0.09 | 0.22 | 0.22 | 0.06 | 0.19 | 0.19 |
| Sat Flow, veh/h | 2910 | 4837 | 1501 | 2910 | 3367 | 1500 | 2910 | 4837 | 1470 | 2910 | 3367 | 1480 |
| Grp Volume(v), veh/h | 173 | 1103 | 246 | 398 | 1427 | 98 | 481 | 391 | 116 | 241 | 485 | 140 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1501 | 1455 | 1683 | 1500 | 1455 | 1612 | 1470 | 1455 | 1683 | 1480 |
| Q Serve(g_s), s | 5.4 | 15.5 | 10.3 | 7.4 | 37.1 | 3.5 | 8.4 | 6.4 | 6.2 | 5.4 | 12.8 | 7.9 |
| Cycle Q Clear(g_c), s | 5.4 | 15.5 | 10.3 | 7.4 | 37.1 | 3.5 | 8.4 | 6.4 | 6.2 | 5.4 | 12.8 | 7.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 167 | 2145 | 665 | 229 | 1564 | 697 | 260 | 1088 | 331 | 167 | 650 | 286 |
| V/C Ratio(X) | 1.04 | 0.51 | 0.37 | 1.74 | 0.91 | 0.14 | 1.85 | 0.36 | 0.35 | 1.44 | 0.75 | 0.49 |
| Avail Cap(c_a), veh/h | 167 | 2257 | 700 | 229 | 1643 | 732 | 260 | 2309 | 702 | 167 | 1500 | 659 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.3 | 18.9 | 17.4 | 43.3 | 23.4 | 14.4 | 42.8 | 30.7 | 30.7 | 44.3 | 35.8 | 33.8 |
| Incr Delay (d2), s/veh | 79.3 | 0.2 | 0.3 | 349.9 | 7.9 | 0.1 | 397.5 | 0.2 | 0.6 | 229.7 | 1.7 | 1.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.7 | 5.1 | 3.2 | 13.6 | 14.1 | 1.1 | 17.2 | 2.4 | 2.1 | 7.2 | 5.1 | 2.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 123.7 | 19.1 | 17.8 | 393.3 | 31.3 | 14.5 | 440.3 | 30.9 | 31.3 | 274.0 | 37.5 | 35.1 |
| LnGrp LOS | F | B | B | F | C | B | F | C | C | F | D | D |
| Approach Vol, veh/h | | 1522 | | | 1923 | | | 988 | | | 866 | |
| Approach Delay, s/veh | | 30.8 | | | 105.4 | | | 230.3 | | | 102.9 | |
| Approach LOS | | C | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.0 | 25.8 | 12.0 | 46.3 | 13.0 | 22.8 | 10.0 | 48.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 5.4 | 44.9 | 7.4 | 43.9 | 8.4 | 41.9 | 5.4 | 45.9 |
| Max Q Clear Time (g_c+I1), s | 7.4 | 8.4 | 9.4 | 17.5 | 10.4 | 14.8 | 7.4 | 39.1 |
| Green Ext Time (p_c), s | 0.0 | 2.8 | 0.0 | 8.5 | 0.0 | 3.4 | 0.0 | 4.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 106.8 |
| HCM 7th LOS | F |

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1335 | 148 | 1202 | 156 | 257 | 0 | 1337 |
| Future Volume (vph) | 1335 | 148 | 1202 | 156 | 257 | 0 | 1337 |
| Turn Type | NA | Perm | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | | 6 | | | 4 | |
| Permitted Phases | | 2 | | Free | 4 | | 4 |
| Detector Phase | 2 | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | C-Min | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 42.9 | 42.9 | 42.9 | 120.0 | 66.0 | 66.0 | 66.0 |
| Actuated g/C Ratio | 0.36 | 0.36 | 0.36 | 1.00 | 0.55 | 0.55 | 0.55 |
| v/c Ratio | 0.78 | 0.26 | 1.06 | 0.07 | 0.30 | 0.90 | 0.90 |
| Control Delay (s/veh) | 38.5 | 5.3 | 86.4 | 0.0 | 15.1 | 37.7 | 38.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.5 | 5.3 | 86.4 | 0.0 | 15.1 | 37.7 | 38.6 |
| LOS | D | A | F | A | B | D | D |
| Approach Delay (s/veh) | 35.2 | | 76.5 | | | 34.8 | |
| Approach LOS | D | | E | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 8.1 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.06 | |
| Intersection Signal Delay (s/veh): 47.7 | Intersection LOS: D |
| Intersection Capacity Utilization 102.6% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

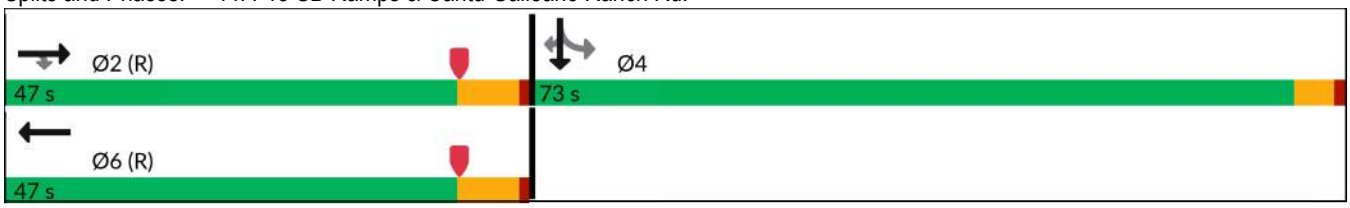

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1335 | 148 | 0 | 1202 | 156 | 0 | 0 | 0 | 257 | 0 | 1337 |
| Future Volume (veh/h) | 0 | 1335 | 148 | 0 | 1202 | 156 | 0 | 0 | 0 | 257 | 0 | 1337 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1772 | 1772 | 0 | 1772 | 1772 | | | | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 0 | 1483 | 0 | 0 | 1336 | 0 | | | | 191 | 0 | 1369 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2195 | | 0 | 1463 | | | | | 788 | 0 | 1485 |
| Arrive On Green | 0.00 | 0.41 | 0.00 | 0.00 | 0.83 | 0.00 | | | | 0.49 | 0.00 | 0.49 |
| Sat Flow, veh/h | 0 | 5316 | 1502 | 0 | 3544 | 2643 | | | | 1594 | 0 | 3003 |
| Grp Volume(v), veh/h | 0 | 1483 | 0 | 0 | 1336 | 0 | | | | 191 | 0 | 1369 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1772 | 1502 | 0 | 1772 | 1321 | | | | 1594 | 0 | 1502 |
| Q Serve(g_s), s | 0.0 | 27.3 | 0.0 | 0.0 | 32.0 | 0.0 | | | | 8.3 | 0.0 | 50.8 |
| Cycle Q Clear(g_c), s | 0.0 | 27.3 | 0.0 | 0.0 | 32.0 | 0.0 | | | | 8.3 | 0.0 | 50.8 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2195 | | 0 | 1463 | | | | | 788 | 0 | 1485 |
| V/C Ratio(X) | 0.00 | 0.68 | | 0.00 | 0.91 | | | | | 0.24 | 0.00 | 0.92 |
| Avail Cap(c_a), veh/h | 0 | 2195 | | 0 | 1463 | | | | | 908 | 0 | 1712 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.65 | 0.00 | 0.00 | 0.78 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 28.7 | 0.0 | 0.0 | 8.9 | 0.0 | | | | 17.4 | 0.0 | 28.2 |
| Incr Delay (d2), s/veh | 0.0 | 1.1 | 0.0 | 0.0 | 8.3 | 0.0 | | | | 0.2 | 0.0 | 8.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 10.9 | 0.0 | 0.0 | 5.2 | 0.0 | | | | 2.9 | 0.0 | 18.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 29.8 | 0.0 | 0.0 | 17.2 | 0.0 | | | | 17.6 | 0.0 | 36.2 |
| LnGrp LOS | | C | | | B | | | | | B | | D |
| Approach Vol, veh/h | | 1483 | | | 1336 | | | | | | 1560 | |
| Approach Delay, s/veh | | 29.8 | | | 17.2 | | | | | | 33.9 | |
| Approach LOS | | C | | | B | | | | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 56.1 | 63.9 | 56.1 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 29.3 | 52.8 | 34.0 |
| Green Ext Time (p_c), s | 6.7 | 6.5 | 4.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.4 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 613 | 950 | 160 | 479 | 761 | 128 |
| Future Volume (vph) | 613 | 950 | 160 | 479 | 761 | 128 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 62.0 | 62.0 | 11.0 | 73.0 | 47.0 | 47.0 |
| Total Split (%) | 51.7% | 51.7% | 9.2% | 60.8% | 39.2% | 39.2% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 55.5 | 55.5 | 11.6 | 71.7 | 37.2 | 37.2 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.10 | 0.60 | 0.31 | 0.31 |
| v/c Ratio | 0.27 | 0.87 | 0.60 | 0.16 | 0.85 | 0.23 |
| Control Delay (s/veh) | 23.9 | 34.4 | 62.5 | 11.5 | 47.8 | 5.7 |
| Queue Delay | 0.0 | 10.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 23.9 | 45.1 | 62.5 | 11.5 | 47.8 | 5.7 |
| LOS | C | D | E | B | D | A |
| Approach Delay (s/veh) | 36.8 | | | 24.3 | 42.3 | |
| Approach LOS | D | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 15.4 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 35.8 | Intersection LOS: D |
| Intersection Capacity Utilization 76.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

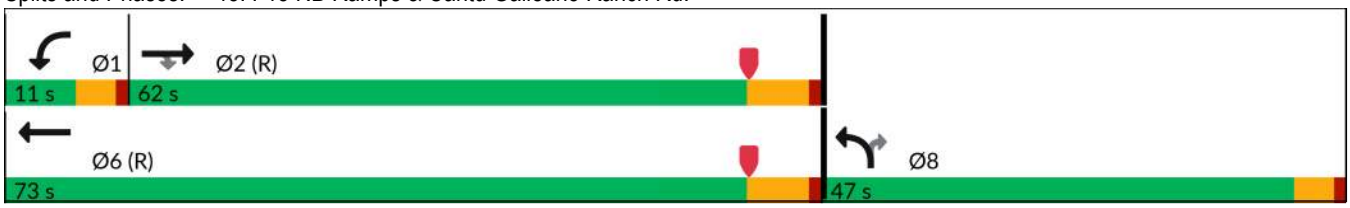

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 613 | 950 | 160 | 479 | 761 | 128 |
| Future Volume (veh/h) | 613 | 950 | 160 | 479 | 761 | 128 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 0.98 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1575 | 1772 | 1673 | 1772 |
| Adj Flow Rate, veh/h | 666 | 792 | 174 | 521 | 827 | 79 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 2805 | 776 | 160 | 3292 | 919 | 433 |
| Arrive On Green | 0.88 | 0.88 | 0.05 | 0.62 | 0.29 | 0.29 |
| Sat Flow, veh/h | 5316 | 1471 | 3000 | 5316 | 3188 | 1502 |
| Grp Volume(v), veh/h | 666 | 792 | 174 | 521 | 827 | 79 |
| Grp Sat Flow(s),veh/h/ln | 1772 | 1471 | 1500 | 1772 | 1594 | 1502 |
| Q Serve(g_s), s | 2.3 | 63.3 | 6.4 | 5.0 | 29.9 | 4.7 |
| Cycle Q Clear(g_c), s | 2.3 | 63.3 | 6.4 | 5.0 | 29.9 | 4.7 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 2805 | 776 | 160 | 3292 | 919 | 433 |
| V/C Ratio(X) | 0.24 | 1.02 | 1.09 | 0.16 | 0.90 | 0.18 |
| Avail Cap(c_a), veh/h | 2805 | 776 | 160 | 3292 | 1126 | 531 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.64 | 0.64 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 3.5 | 7.1 | 56.8 | 9.6 | 41.1 | 32.1 |
| Incr Delay (d2), s/veh | 0.1 | 31.2 | 96.4 | 0.1 | 8.7 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 9.4 | 4.5 | 1.7 | 12.4 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 3.6 | 38.3 | 153.2 | 9.7 | 49.7 | 32.3 |
| LnGrp LOS | A | F | F | A | D | C |
| Approach Vol, veh/h | 1458 | | | 695 | 906 | |
| Approach Delay, s/veh | 22.5 | | | 45.7 | 48.2 | |
| Approach LOS | C | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 69.8 | | | | 80.8 | 39.2 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 55.5 | | | | 66.5 | 42.4 |
| Max Q Clear Time (g_c+I1), s | 8.4 | 65.3 | | | | 7.0 | 31.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | | | 3.3 | 2.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 35.4 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

# APPENDIX 6.3:

# OPENING YEAR CUMULATIVE (2034) WITHOUT PROJECT SIGNAL WARRANT ANALYSIS

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# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **OYC (2034) Conditions - Weekday AM Peak Hour**

Major Street Name = **Bon View Av.**

Total of Both Approaches (VPH) = **379**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **206**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

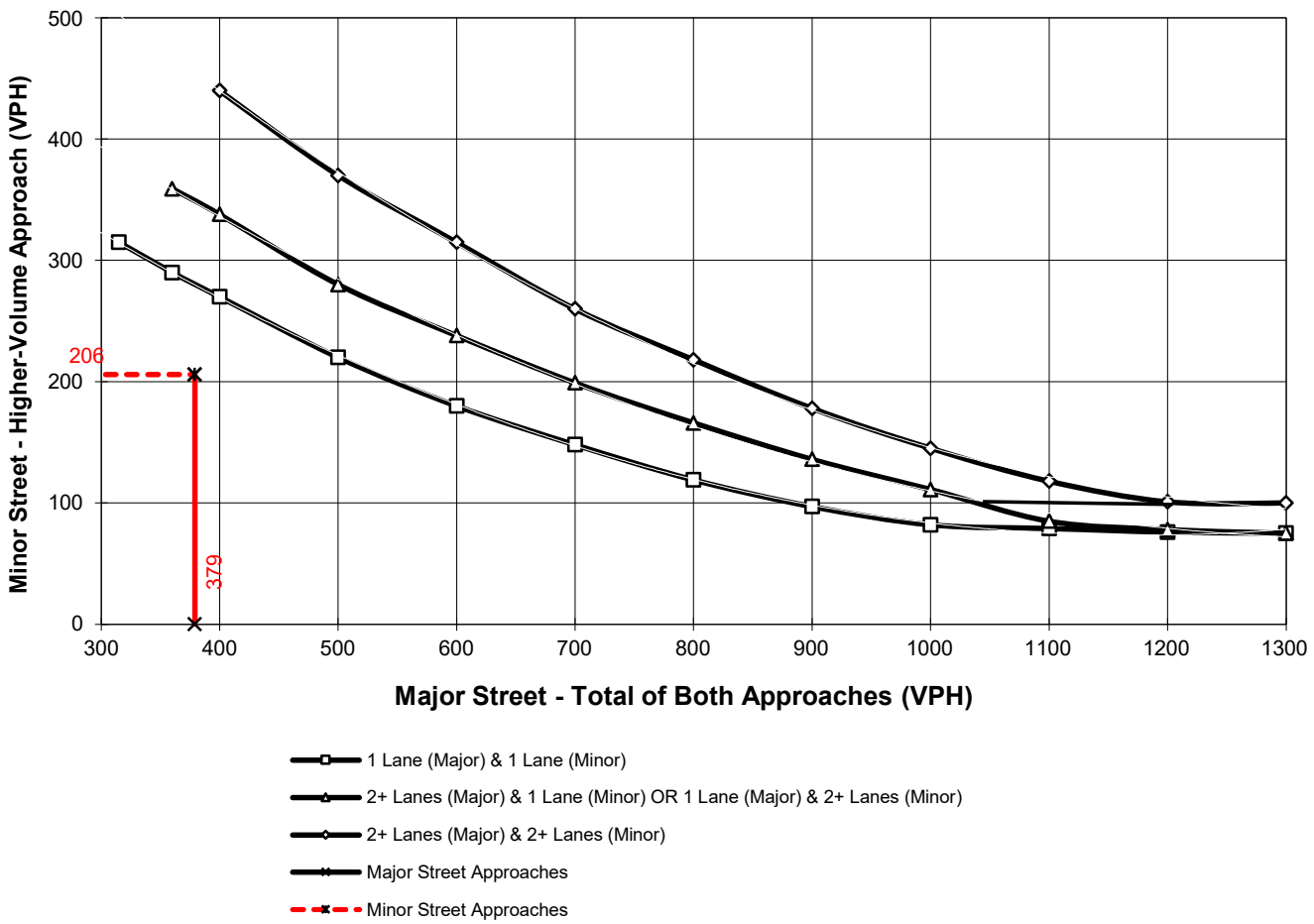


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **OYC (2034) NP Conditions - Weekday PM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **346**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Bon View Av.**
High Volume Approach (VPH) = **52**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

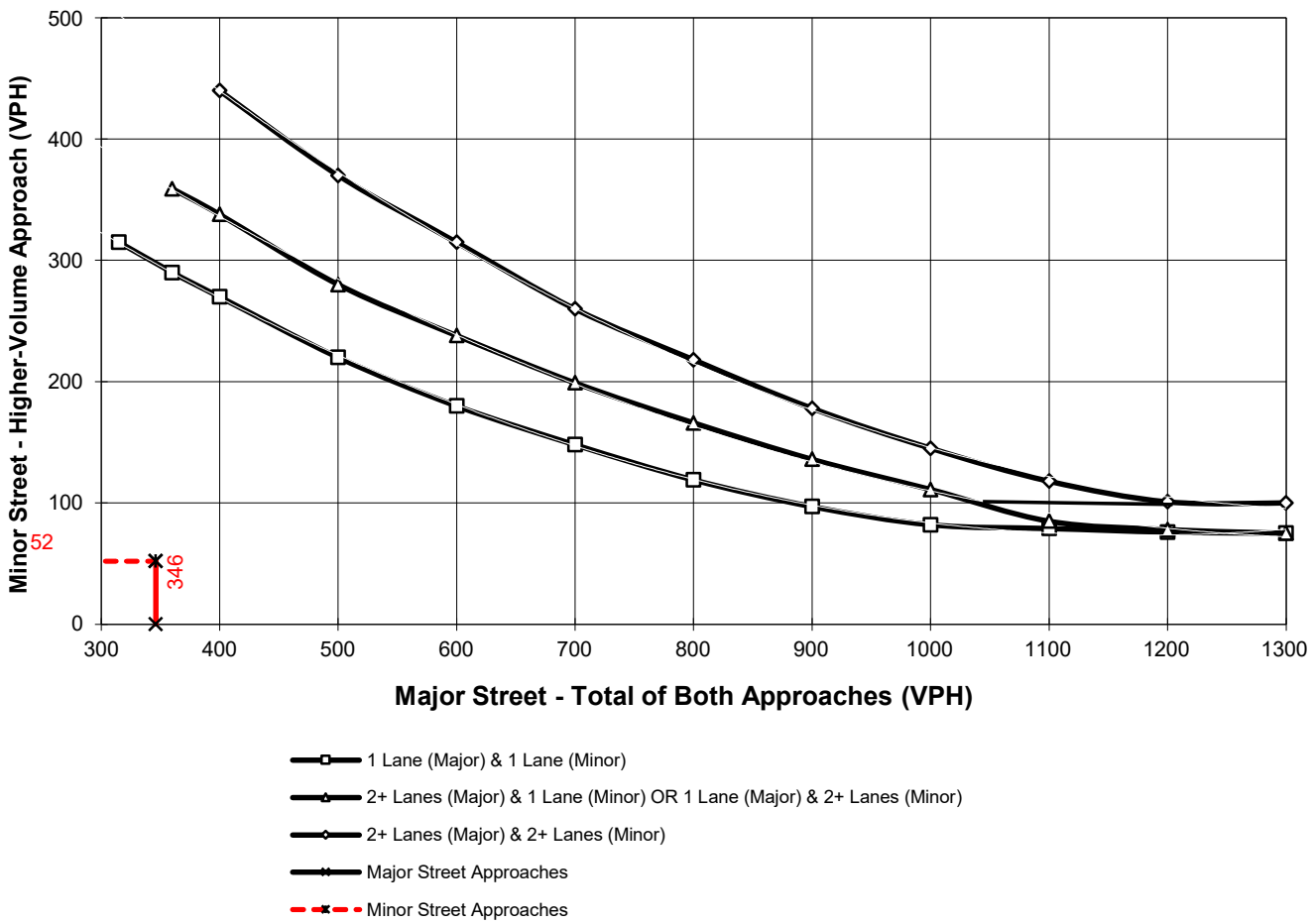


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **OYC (2034) NP Conditions - Weekday PM Peak Hour**

Major Street Name = **Walker Av.**

Total of Both Approaches (VPH) = **368**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **280**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

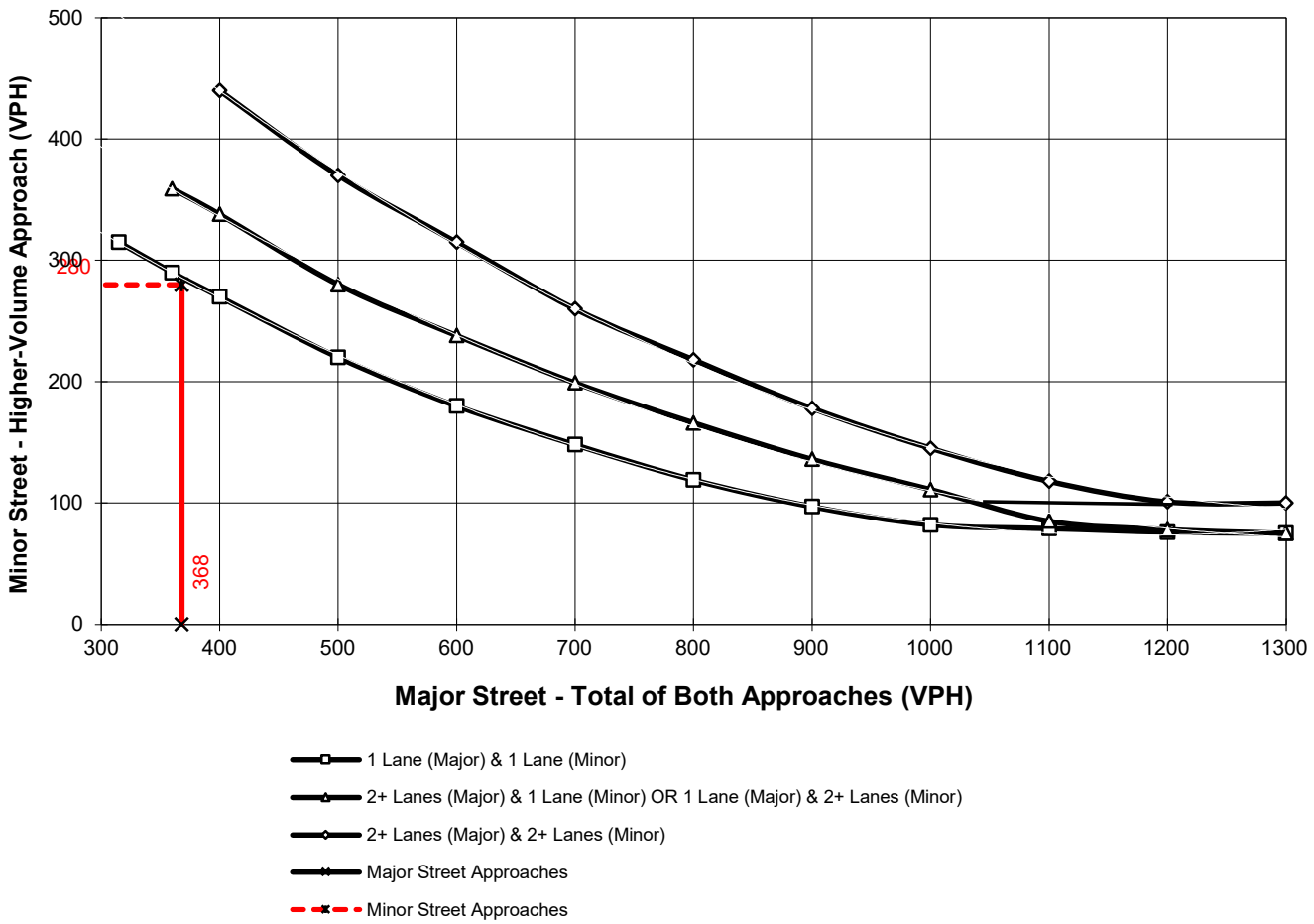


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **OYC (2034) NP Conditions - Weekday PM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **877**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Walker Av.**
High Volume Approach (VPH) = **148**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

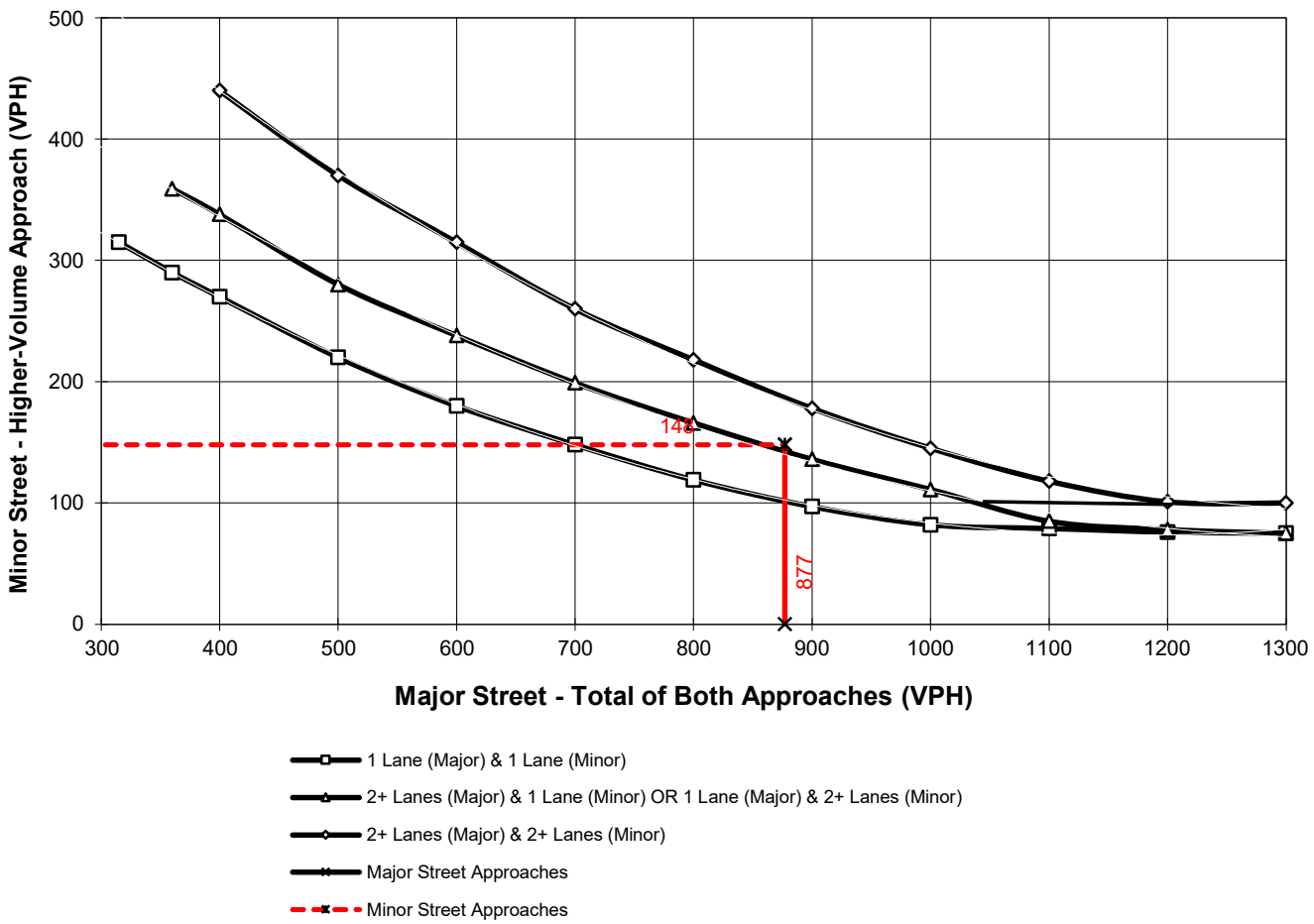


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# APPENDIX 6.4:

# OPENING YEAR CUMULATIVE (2034) WITH PROJECT SIGNAL WARRANT ANALYSIS

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# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **OYC (2034) With Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Bon View Av.**

Total of Both Approaches (VPH) = **553**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **191**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

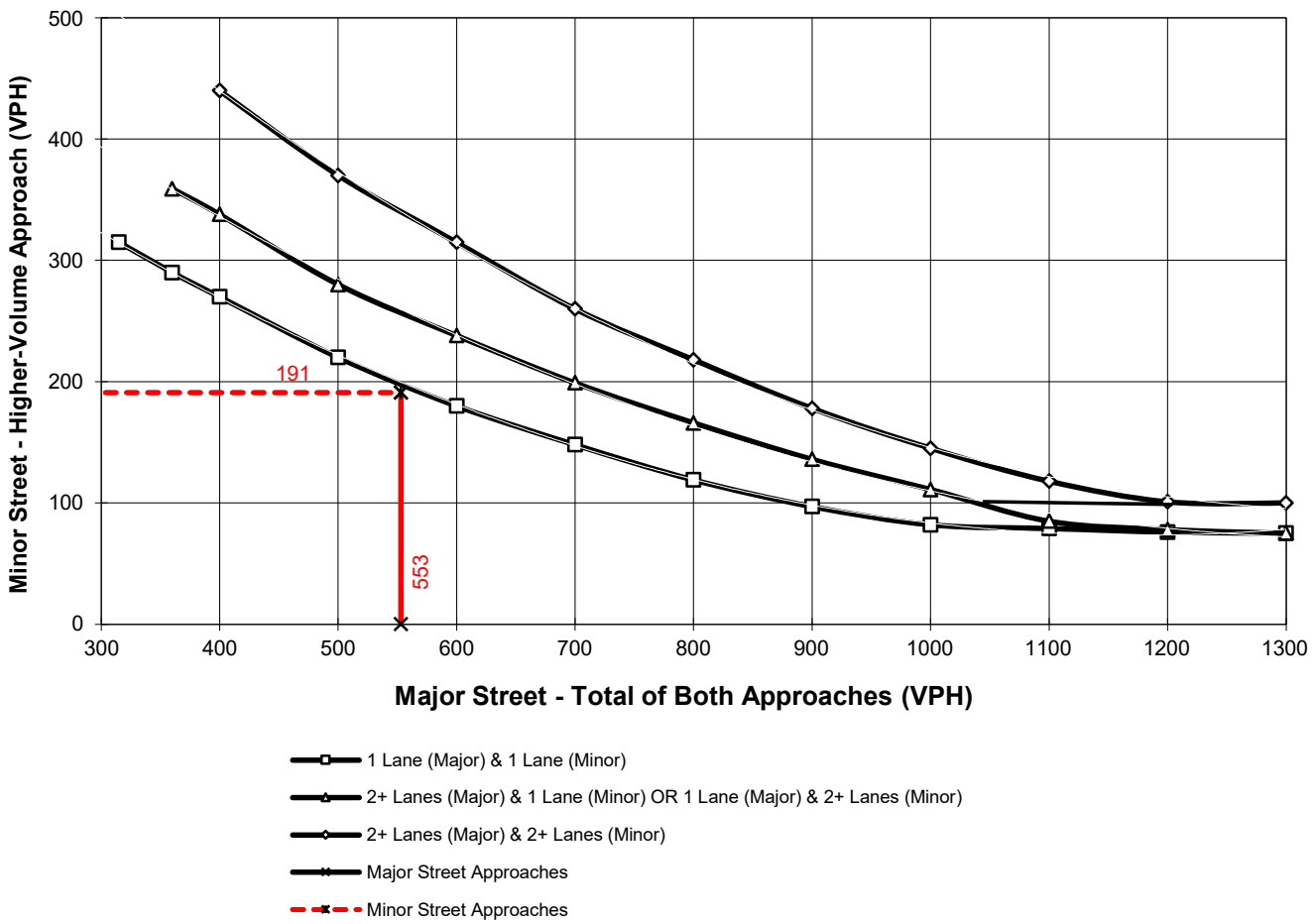


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

## Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **OYC (2034) WP Conditions - Weekday AM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **393**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Bon View Av.**
High Volume Approach (VPH) = **157**
Number of Approach Lanes Minor Street = **1**

**SIGNAL WARRANT NOT SATISFIED**

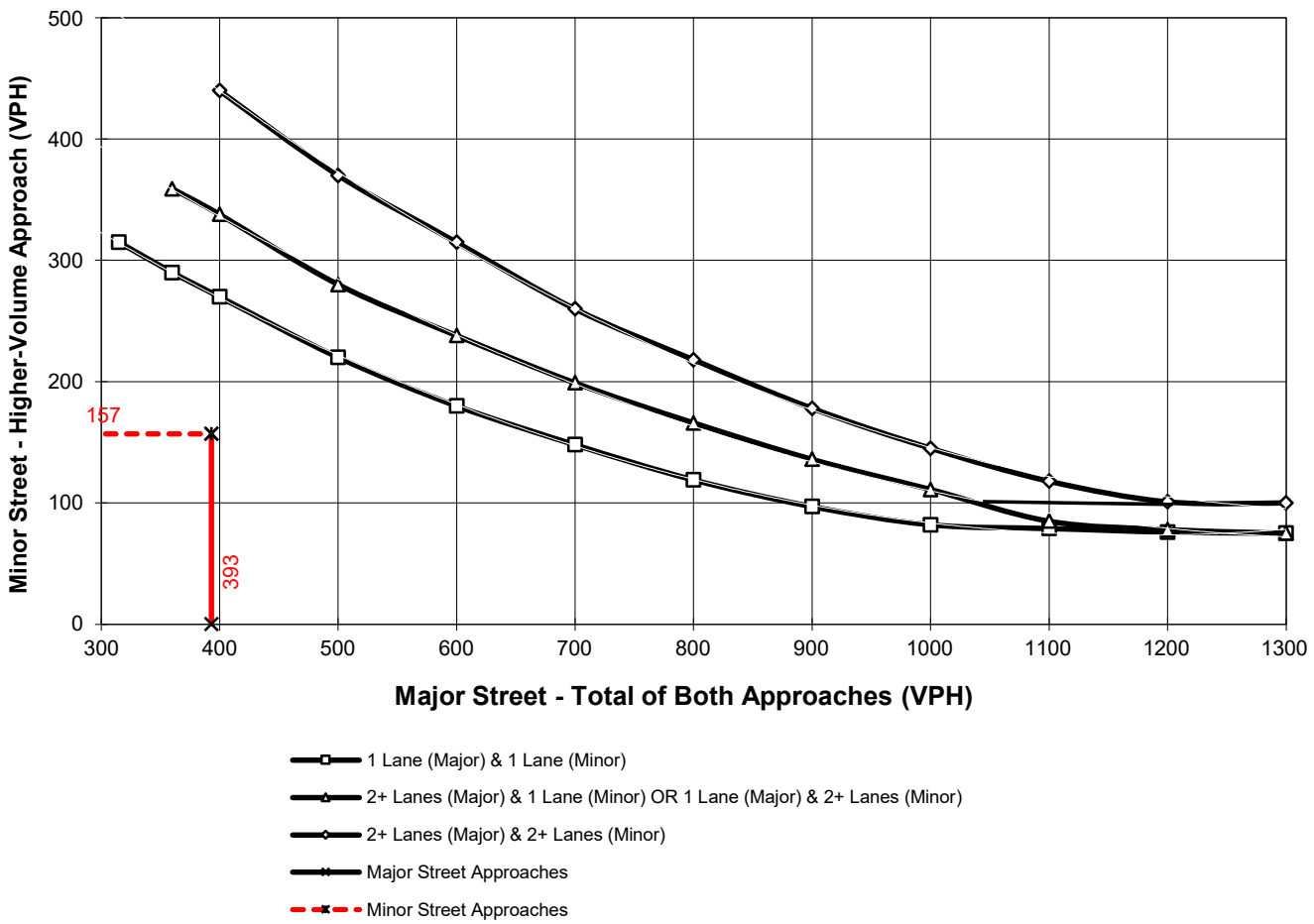


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **OYC (2034) WP Conditions - Weekday PM Peak Hour**

Major Street Name = **Walker Av.**

Total of Both Approaches (VPH) = **438**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **280**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

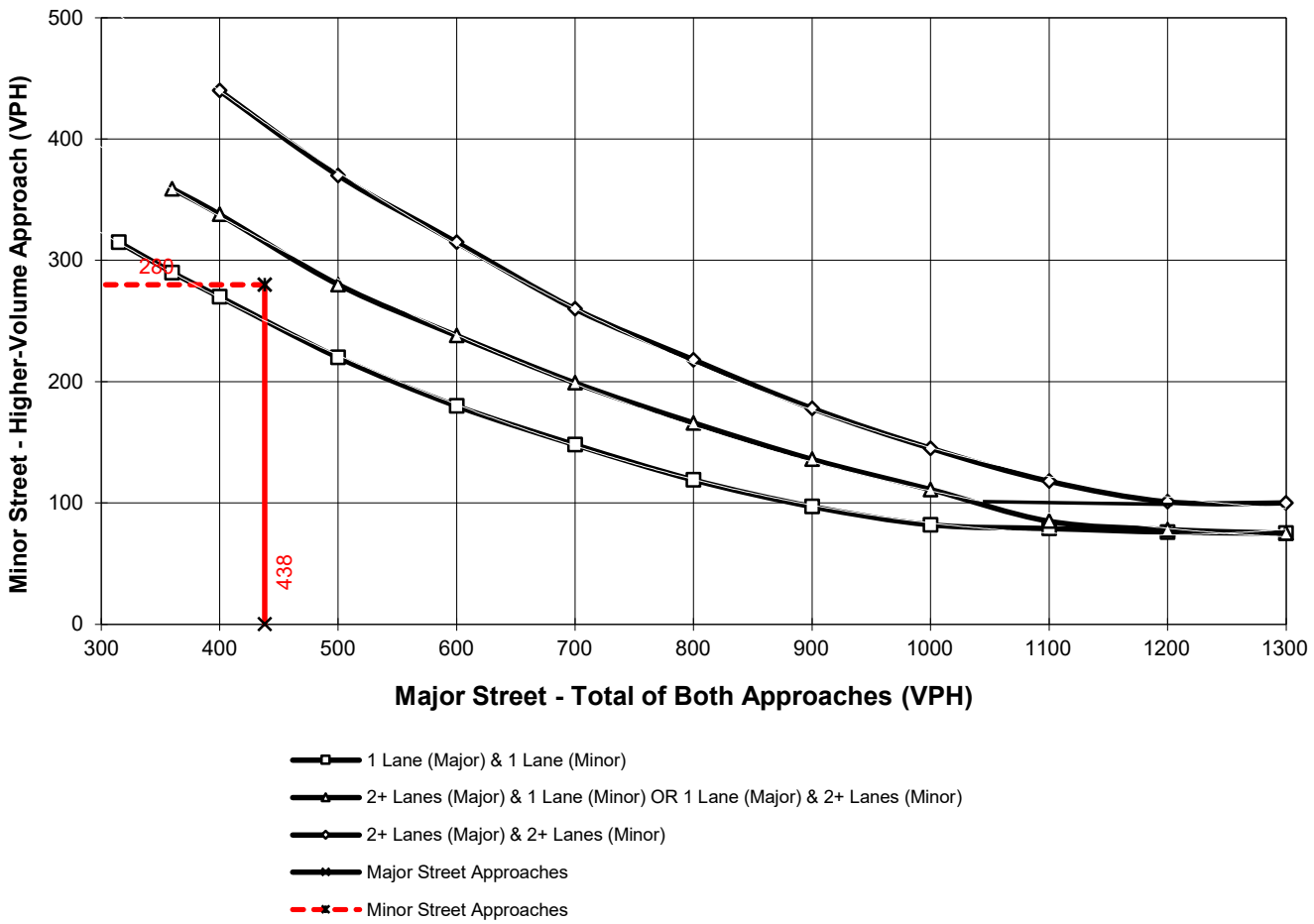


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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# APPENDIX 6.5:

# OPENING YEAR CUMULATIVE (2034) WITHOUT PROJECT OFF-RAMP QUEUING ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 294 | 276 | 272 | 296 | 940 | 1016 | 511 |
| v/c Ratio | 0.84 | 0.64 | 0.62 | 0.85 | 0.45 | 0.89 | 0.61 |
| Control Delay (s/veh) | 54.4 | 22.0 | 21.2 | 53.4 | 11.3 | 40.2 | 5.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.4 | 22.0 | 21.2 | 53.4 | 11.3 | 40.2 | 5.9 |
| Queue Length 50th (ft) | 166 | 71 | 65 | 184 | 142 | 298 | 0 |
| Queue Length 95th (ft) | #303 | 165 | 154 | m215 | m184 | #434 | 76 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 367 | 445 | 450 | 383 | 2084 | 1147 | 838 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.62 | 0.60 | 0.77 | 0.45 | 0.89 | 0.61 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 371 | 1 | 216 | 800 | 418 | 387 | 902 |
| v/c Ratio | 0.93 | no cap | 0.44 | 0.85 | 0.59 | 0.91 | 0.45 |
| Control Delay (s/veh) | 65.1 | | 12.9 | 41.3 | 6.7 | 63.5 | 10.6 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 65.1 | Error | 12.9 | 41.3 | 6.7 | 63.5 | 10.6 |
| Queue Length 50th (ft) | 206 | 0 | 30 | 230 | 0 | 242 | 127 |
| Queue Length 95th (ft) | #373 | 0 | 92 | #338 | 74 | m#286 | m152 |
| Internal Link Dist (ft) | | 1421 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 404 | 1 | 493 | 942 | 711 | 444 | 2021 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 1.00 | 0.44 | 0.85 | 0.59 | 0.87 | 0.45 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 948 | 748 | 972 | 54 | 658 |
| v/c Ratio | 0.97 | 1.06 | 0.37 | 0.18 | 0.89 |
| Control Delay (s/veh) | 53.2 | 78.8 | 3.9 | 41.3 | 18.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.2 | 78.8 | 3.9 | 41.3 | 18.6 |
| Queue Length 50th (ft) | 263 | ~511 | 70 | 17 | 0 |
| Queue Length 95th (ft) | #414 | #770 | 117 | 34 | #173 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1633 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 976 | 708 | 2638 | 390 | 771 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.97 | 1.06 | 0.37 | 0.14 | 0.85 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 684 | 194 | 309 | 56 | 284 | 319 | 321 | 47 |
| v/c Ratio | 0.72 | 0.83 | 0.19 | 0.38 | 0.73 | 0.84 | 0.79 | 0.10 |
| Control Delay (s/veh) | 38.9 | 65.8 | 13.9 | 50.0 | 18.2 | 55.0 | 49.2 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.9 | 65.8 | 13.9 | 50.0 | 18.2 | 55.0 | 49.2 | 0.4 |
| Queue Length 50th (ft) | 219 | 117 | 62 | 34 | 6 | 198 | 196 | 0 |
| Queue Length 95th (ft) | #306 | #240 | 95 | 71 | 80 | 291 | 251 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 948 | 242 | 1607 | 175 | 410 | 438 | 468 | 534 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.72 | 0.80 | 0.19 | 0.32 | 0.69 | 0.73 | 0.69 | 0.09 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 182 | 460 | 337 | 1093 | 716 | 522 |
| v/c Ratio | 0.40 | 0.96 | 0.88 | 0.54 | 0.73 | 0.65 |
| Control Delay (s/veh) | 30.5 | 58.8 | 47.7 | 17.6 | 34.1 | 6.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.5 | 58.8 | 47.7 | 18.3 | 34.1 | 6.7 |
| Queue Length 50th (ft) | 86 | 211 | 187 | 195 | 195 | 0 |
| Queue Length 95th (ft) | 148 | #414 | m191 | m196 | 262 | 82 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 456 | 481 | 425 | 2056 | 983 | 808 |
| Starvation Cap Reductn | 0 | 0 | 0 | 583 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.40 | 0.96 | 0.79 | 0.74 | 0.73 | 0.65 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 461 | 132 | 1244 | 303 | 565 |
| v/c Ratio | 0.94 | 0.25 | 1.05 | 1.23 | 0.30 |
| Control Delay (s/veh) | 61.5 | 5.8 | 69.3 | 162.0 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.5 | 5.8 | 69.3 | 162.0 | 3.3 |
| Queue Length 50th (ft) | 251 | 0 | ~408 | ~225 | 0 |
| Queue Length 95th (ft) | #435 | 40 | #541 | m#371 | 0 |
| Internal Link Dist (ft) | 1339 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 504 | 542 | 1184 | 246 | 1908 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.91 | 0.24 | 1.05 | 1.23 | 0.30 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 240 | 230 | 221 | 679 | 1047 | 476 | 93 |
| v/c Ratio | 0.75 | 0.62 | 0.53 | 0.84 | 0.33 | 0.24 | 0.17 |
| Control Delay (s/veh) | 49.8 | 27.2 | 16.8 | 40.8 | 3.9 | 23.4 | 4.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.8 | 27.2 | 16.8 | 40.8 | 3.9 | 23.4 | 4.6 |
| Queue Length 50th (ft) | 130 | 74 | 36 | 194 | 14 | 61 | 0 |
| Queue Length 95th (ft) | #273 | #174 | 115 | #302 | 13 | 72 | 26 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 329 | 382 | 424 | 811 | 3313 | 2352 | 635 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.60 | 0.52 | 0.84 | 0.32 | 0.20 | 0.15 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 211 | 199 | 194 | 1405 | 632 | 141 | 622 |
| v/c Ratio | 0.73 | 0.55 | 0.45 | 0.43 | 0.58 | 0.58 | 0.19 |
| Control Delay (s/veh) | 48.3 | 20.6 | 8.0 | 13.6 | 3.5 | 64.1 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.3 | 20.6 | 8.0 | 13.6 | 3.5 | 64.1 | 0.8 |
| Queue Length 50th (ft) | 116 | 48 | 0 | 141 | 0 | 38 | 1 |
| Queue Length 95th (ft) | 191 | 118 | 55 | 168 | 51 | m#82 | 8 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 354 | 417 | 483 | 3310 | 1093 | 242 | 3266 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 0.48 | 0.40 | 0.42 | 0.58 | 0.58 | 0.19 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1006 | 532 | 142 | 240 | 537 | 530 |
| v/c Ratio | 0.37 | 0.29 | 0.05 | 0.39 | 0.79 | 0.79 |
| Control Delay (s/veh) | 20.1 | 33.9 | 0.0 | 25.8 | 31.0 | 30.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 20.1 | 33.9 | 0.0 | 25.8 | 31.0 | 30.6 |
| Queue Length 50th (ft) | 152 | 141 | 0 | 130 | 276 | 270 |
| Queue Length 95th (ft) | 238 | 244 | m0 | 152 | 323 | 317 |
| Internal Link Dist (ft) | 1992 | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | 180 | | | |
| Base Capacity (vph) | 2717 | 1811 | 2640 | 902 | 919 | 913 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.37 | 0.29 | 0.05 | 0.27 | 0.58 | 0.58 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 449 | 763 | 220 | 310 | 423 | 191 |
| v/c Ratio | 0.15 | 0.66 | 0.63 | 0.08 | 0.76 | 0.45 |
| Control Delay (s/veh) | 8.4 | 14.9 | 58.4 | 5.0 | 54.6 | 9.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 8.4 | 14.9 | 58.4 | 5.0 | 54.6 | 9.2 |
| Queue Length 50th (ft) | 37 | 230 | 82 | 19 | 154 | 0 |
| Queue Length 95th (ft) | 34 | 371 | 119 | 34 | 196 | 60 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 3126 | 1168 | 397 | 3923 | 621 | 446 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.14 | 0.65 | 0.55 | 0.08 | 0.68 | 0.43 |

Intersection Summary

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 282 | 272 | 261 | 245 | 978 | 1126 | 561 |
| v/c Ratio | 0.81 | 0.71 | 0.61 | 0.81 | 0.47 | 0.90 | 0.63 |
| Control Delay (s/veh) | 51.6 | 34.4 | 21.7 | 49.0 | 1.8 | 38.7 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Total Delay (s/veh) | 51.6 | 34.4 | 21.7 | 49.0 | 2.2 | 38.7 | 5.6 |
| Queue Length 50th (ft) | 156 | 115 | 66 | 85 | 8 | 328 | 0 |
| Queue Length 95th (ft) | #286 | 213 | 152 | m134 | 19 | #472 | 75 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 367 | 400 | 441 | 330 | 2090 | 1257 | 893 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 520 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.77 | 0.68 | 0.59 | 0.74 | 0.62 | 0.90 | 0.63 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 263 | 2 | 204 | 887 | 397 | 390 | 1037 |
| v/c Ratio | 0.81 | no cap | 0.50 | 0.76 | 0.52 | 0.88 | 0.46 |
| Control Delay (s/veh) | 54.4 | | 16.6 | 33.1 | 5.4 | 34.3 | 15.6 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 |
| Total Delay (s/veh) | 54.4 | Error | 16.6 | 33.1 | 5.4 | 34.3 | 16.6 |
| Queue Length 50th (ft) | 139 | 0 | 34 | 251 | 0 | 192 | 272 |
| Queue Length 95th (ft) | #251 | 0 | 99 | #361 | 66 | m252 | m321 |
| Internal Link Dist (ft) | | 1372 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 358 | 1 | 436 | 1160 | 765 | 480 | 2272 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 901 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 2.00 | 0.47 | 0.76 | 0.52 | 0.81 | 0.76 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1017 | 499 | 837 | 117 | 888 |
| v/c Ratio | 1.06 | 1.17 | 0.41 | 0.13 | 1.09 |
| Control Delay (s/veh) | 80.7 | 133.0 | 11.2 | 27.1 | 76.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 80.7 | 133.0 | 11.2 | 27.1 | 76.2 |
| Queue Length 50th (ft) | ~383 | ~381 | 136 | 28 | ~379 |
| Queue Length 95th (ft) | #491 | #578 | 177 | 50 | #618 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1637 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 955 | 427 | 2025 | 875 | 811 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.06 | 1.17 | 0.41 | 0.13 | 1.09 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 435 | 77 | 216 | 34 | 142 | 366 | 376 | 73 |
| v/c Ratio | 0.40 | 0.55 | 0.15 | 0.24 | 0.53 | 0.81 | 0.78 | 0.13 |
| Control Delay (s/veh) | 30.0 | 59.9 | 13.5 | 46.4 | 14.2 | 46.2 | 42.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.0 | 59.9 | 13.5 | 46.4 | 14.2 | 46.2 | 42.7 | 0.5 |
| Queue Length 50th (ft) | 114 | 48 | 25 | 21 | 0 | 223 | 226 | 0 |
| Queue Length 95th (ft) | 183 | #103 | 58 | 50 | 52 | 308 | 307 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 1079 | 143 | 1462 | 284 | 392 | 499 | 535 | 588 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.40 | 0.54 | 0.15 | 0.12 | 0.36 | 0.73 | 0.70 | 0.12 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 182 | 234 | 216 | 688 | 1151 | 789 |
| v/c Ratio | 0.67 | 0.54 | 0.80 | 0.29 | 0.72 | 0.75 |
| Control Delay (s/veh) | 47.7 | 9.3 | 63.9 | 1.0 | 23.5 | 8.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.7 | 9.3 | 63.9 | 1.0 | 23.5 | 8.7 |
| Queue Length 50th (ft) | 99 | 0 | 122 | 3 | 276 | 34 |
| Queue Length 95th (ft) | 158 | 59 | m139 | m19 | 386 | 196 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 355 | 501 | 295 | 2381 | 1592 | 1053 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.51 | 0.47 | 0.73 | 0.29 | 0.72 | 0.75 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 284 | 176 | 874 | 503 | 857 |
| v/c Ratio | 0.78 | 0.41 | 0.91 | 1.06 | 0.40 |
| Control Delay (s/veh) | 47.1 | 10.4 | 44.1 | 85.4 | 20.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.1 | 10.4 | 44.1 | 85.4 | 20.4 |
| Queue Length 50th (ft) | 153 | 16 | 234 | ~337 | 220 |
| Queue Length 95th (ft) | 217 | 62 | #348 | #605 | 341 |
| Internal Link Dist (ft) | 1341 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 504 | 543 | 979 | 475 | 2152 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.56 | 0.32 | 0.89 | 1.06 | 0.40 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 204 | 205 | 185 | 519 | 647 | 1395 | 355 |
| v/c Ratio | 0.73 | 0.71 | 0.44 | 0.88 | 0.20 | 0.54 | 0.43 |
| Control Delay (s/veh) | 49.4 | 47.0 | 8.3 | 49.6 | 0.8 | 20.7 | 3.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.4 | 47.0 | 8.3 | 49.6 | 0.8 | 20.7 | 3.9 |
| Queue Length 50th (ft) | 113 | 115 | 0 | 164 | 1 | 177 | 1 |
| Queue Length 95th (ft) | 188 | 192 | 54 | #254 | 13 | 211 | 53 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 337 | 345 | 463 | 589 | 3299 | 2592 | 832 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.61 | 0.59 | 0.40 | 0.88 | 0.20 | 0.54 | 0.43 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 162 | 264 | 266 | 964 | 530 | 565 | 1228 |
| v/c Ratio | 0.57 | 0.80 | 0.76 | 0.41 | 0.59 | 0.82 | 0.37 |
| Control Delay (s/veh) | 39.9 | 40.9 | 35.9 | 21.5 | 5.0 | 54.7 | 2.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.9 | 40.9 | 35.9 | 21.5 | 5.0 | 54.7 | 2.7 |
| Queue Length 50th (ft) | 87 | 106 | 95 | 122 | 0 | 150 | 34 |
| Queue Length 95th (ft) | 147 | 198 | 182 | 144 | 65 | #274 | 20 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 360 | 394 | 413 | 2476 | 917 | 685 | 3297 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.45 | 0.67 | 0.64 | 0.39 | 0.58 | 0.82 | 0.37 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1286 | 840 | 173 | 257 | 757 | 758 |
| v/c Ratio | 0.68 | 0.67 | 0.07 | 0.29 | 0.89 | 0.90 |
| Control Delay (s/veh) | 35.7 | 52.0 | 0.0 | 15.0 | 36.6 | 37.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.7 | 52.0 | 0.0 | 15.0 | 36.6 | 37.4 |
| Queue Length 50th (ft) | 293 | 278 | 0 | 95 | 442 | 446 |
| Queue Length 95th (ft) | 339 | 391 | 0 | 148 | #740 | #744 |
| Internal Link Dist (ft) | 1992 | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | 180 | | | |
| Base Capacity (vph) | 1899 | 1266 | 2586 | 907 | 880 | 875 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.66 | 0.07 | 0.28 | 0.86 | 0.87 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 635 | 872 | 174 | 476 | 621 | 125 |
| v/c Ratio | 0.24 | 0.74 | 0.48 | 0.14 | 0.80 | 0.27 |
| Control Delay (s/veh) | 25.8 | 27.6 | 54.3 | 8.1 | 50.4 | 7.0 |
| Queue Delay | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.8 | 28.5 | 54.3 | 8.1 | 50.4 | 7.0 |
| Queue Length 50th (ft) | 150 | 506 | 64 | 41 | 227 | 0 |
| Queue Length 95th (ft) | m41 | m458 | 100 | 65 | 269 | 44 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 2678 | 1180 | 360 | 3508 | 1120 | 610 |
| Starvation Cap Reductn | 0 | 108 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.24 | 0.81 | 0.48 | 0.14 | 0.55 | 0.20 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

# APPENDIX 6.6:

# OPENING YEAR CUMULATIVE (2034) WITH PROJECT OFF-RAMP QUEUING ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 294 | 276 | 272 | 402 | 983 | 1048 | 511 |
| v/c Ratio | 0.84 | 0.65 | 0.64 | 1.00 | 0.47 | 1.00 | 0.63 |
| Control Delay (s/veh) | 54.4 | 24.1 | 23.2 | 73.1 | 12.1 | 61.3 | 6.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay (s/veh) | 54.4 | 24.1 | 23.2 | 73.1 | 12.2 | 61.3 | 6.3 |
| Queue Length 50th (ft) | 166 | 79 | 73 | ~263 | 159 | ~314 | 0 |
| Queue Length 95th (ft) | #303 | 175 | 164 | m#285 | m164 | #456 | 76 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 367 | 435 | 440 | 400 | 2084 | 1043 | 808 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 308 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 0.63 | 0.62 | 1.01 | 0.55 | 1.00 | 0.63 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 371 | 1 | 294 | 942 | 418 | 387 | 933 |
| v/c Ratio | 0.93 | no cap | 0.61 | 1.00 | 0.59 | 0.91 | 0.46 |
| Control Delay (s/veh) | 65.1 | | 21.4 | 63.7 | 6.7 | 58.3 | 11.2 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 65.1 | Error | 21.4 | 63.7 | 6.7 | 58.3 | 11.2 |
| Queue Length 50th (ft) | 206 | 0 | 75 | ~311 | 0 | 242 | 134 |
| Queue Length 95th (ft) | #373 | 0 | 162 | #432 | 74 | m258 | m142 |
| Internal Link Dist (ft) | | 1421 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 404 | 1 | 486 | 942 | 711 | 444 | 2021 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.92 | 1.00 | 0.60 | 1.00 | 0.59 | 0.87 | 0.46 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 981 | 748 | 1237 | 54 | 826 |
| v/c Ratio | 1.01 | 1.14 | 0.49 | 0.14 | 1.07 |
| Control Delay (s/veh) | 60.6 | 109.9 | 5.6 | 39.2 | 64.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 60.6 | 109.9 | 5.6 | 39.2 | 64.8 |
| Queue Length 50th (ft) | ~277 | ~560 | 133 | 15 | ~196 |
| Queue Length 95th (ft) | #437 | #770 | 165 | 34 | #416 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1633 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 975 | 656 | 2528 | 390 | 769 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.01 | 1.14 | 0.49 | 0.14 | 1.07 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 718 | 194 | 355 | 56 | 284 | 319 | 321 | 47 |
| v/c Ratio | 0.76 | 0.83 | 0.22 | 0.38 | 0.73 | 0.84 | 0.79 | 0.10 |
| Control Delay (s/veh) | 40.3 | 64.4 | 12.8 | 49.9 | 18.3 | 55.1 | 49.2 | 0.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.3 | 64.4 | 12.8 | 49.9 | 18.3 | 55.1 | 49.2 | 0.4 |
| Queue Length 50th (ft) | 233 | 117 | 59 | 34 | 7 | 198 | 196 | 0 |
| Queue Length 95th (ft) | #332 | #239 | 100 | 71 | 81 | 291 | 251 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 948 | 242 | 1607 | 175 | 409 | 437 | 468 | 533 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.76 | 0.80 | 0.22 | 0.32 | 0.69 | 0.73 | 0.69 | 0.09 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 340 | 460 | 547 | 1135 | 748 | 522 |
| v/c Ratio | 0.76 | 0.97 | 1.28 | 0.56 | 0.83 | 0.66 |
| Control Delay (s/veh) | 43.5 | 61.6 | 158.8 | 6.2 | 39.9 | 7.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |
| Total Delay (s/veh) | 43.5 | 61.6 | 158.8 | 7.2 | 39.9 | 7.2 |
| Queue Length 50th (ft) | 180 | 211 | ~390 | 75 | 206 | 0 |
| Queue Length 95th (ft) | #313 | #414 | m#289 | m66 | 276 | 82 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 448 | 475 | 428 | 2056 | 938 | 795 |
| Starvation Cap Reductn | 0 | 0 | 0 | 595 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.76 | 0.97 | 1.28 | 0.78 | 0.80 | 0.66 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 461 | 288 | 1695 | 303 | 751 |
| v/c Ratio | 0.94 | 0.51 | 1.37 | 1.34 | 0.39 |
| Control Delay (s/veh) | 61.5 | 12.9 | 199.1 | 198.8 | 26.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.5 | 12.9 | 199.1 | 198.8 | 26.4 |
| Queue Length 50th (ft) | 251 | 43 | ~666 | ~235 | 243 |
| Queue Length 95th (ft) | #435 | 117 | #805 | m#340 | 306 |
| Internal Link Dist (ft) | 1339 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 504 | 580 | 1234 | 226 | 1908 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.91 | 0.50 | 1.37 | 1.34 | 0.39 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 268 | 259 | 244 | 679 | 1089 | 507 | 93 |
| v/c Ratio | 0.73 | 0.67 | 0.55 | 0.84 | 0.36 | 0.29 | 0.18 |
| Control Delay (s/veh) | 45.2 | 35.2 | 18.7 | 40.6 | 5.5 | 25.8 | 4.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.2 | 35.2 | 18.7 | 40.6 | 5.5 | 25.8 | 4.9 |
| Queue Length 50th (ft) | 140 | 114 | 52 | 197 | 24 | 70 | 0 |
| Queue Length 95th (ft) | #314 | #272 | 146 | #303 | 13 | 77 | 26 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 367 | 389 | 447 | 811 | 3276 | 2306 | 625 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.67 | 0.55 | 0.84 | 0.33 | 0.22 | 0.15 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 211 | 199 | 194 | 1447 | 735 | 141 | 730 |
| v/c Ratio | 0.73 | 0.55 | 0.45 | 0.44 | 0.65 | 0.62 | 0.22 |
| Control Delay (s/veh) | 48.3 | 20.6 | 8.0 | 13.3 | 4.0 | 65.9 | 0.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.3 | 20.6 | 8.0 | 13.3 | 4.0 | 65.9 | 0.8 |
| Queue Length 50th (ft) | 116 | 48 | 0 | 147 | 0 | 33 | 1 |
| Queue Length 95th (ft) | 191 | 118 | 55 | 174 | 54 | m#80 | 8 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 354 | 417 | 483 | 3310 | 1140 | 226 | 3266 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.60 | 0.48 | 0.40 | 0.44 | 0.64 | 0.62 | 0.22 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1255 | 207 | 877 | 142 | 240 | 537 | 530 |
| v/c Ratio | 0.51 | 0.26 | 0.54 | 0.05 | 0.34 | 0.78 | 0.77 |
| Control Delay (s/veh) | 25.5 | 4.3 | 38.3 | 0.0 | 21.6 | 33.8 | 33.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 25.5 | 4.3 | 38.3 | 0.0 | 21.6 | 33.8 | 33.5 |
| Queue Length 50th (ft) | 226 | 0 | 314 | 0 | 117 | 322 | 316 |
| Queue Length 95th (ft) | 323 | 51 | m402 | m0 | 142 | 372 | 366 |
| Internal Link Dist (ft) | 1992 | | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | | 180 | | | |
| Base Capacity (vph) | 2451 | 805 | 1633 | 2640 | 902 | 874 | 869 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.51 | 0.26 | 0.54 | 0.05 | 0.27 | 0.61 | 0.61 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 491 | 966 | 220 | 341 | 553 | 215 |
| v/c Ratio | 0.17 | 0.85 | 0.66 | 0.09 | 0.86 | 0.45 |
| Control Delay (s/veh) | 7.4 | 27.1 | 60.7 | 5.7 | 60.7 | 8.8 |
| Queue Delay | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.4 | 27.5 | 60.7 | 5.7 | 60.7 | 8.8 |
| Queue Length 50th (ft) | 31 | 453 | 82 | 28 | 198 | 0 |
| Queue Length 95th (ft) | 28 | 560 | 122 | 31 | #317 | 67 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 2984 | 1147 | 382 | 3819 | 643 | 476 |
| Starvation Cap Reductn | 0 | 26 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.16 | 0.86 | 0.58 | 0.09 | 0.86 | 0.45 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 282 | 272 | 261 | 323 | 1009 | 1169 | 561 |
| v/c Ratio | 0.81 | 0.71 | 0.62 | 0.95 | 0.48 | 1.00 | 0.64 |
| Control Delay (s/veh) | 51.6 | 34.4 | 23.0 | 62.6 | 1.5 | 56.2 | 5.9 |
| Queue Delay | 0.9 | 0.3 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Total Delay (s/veh) | 52.5 | 34.7 | 23.0 | 62.6 | 1.9 | 56.2 | 5.9 |
| Queue Length 50th (ft) | 156 | 115 | 70 | 124 | 8 | ~354 | 0 |
| Queue Length 95th (ft) | #286 | 213 | 157 | m#261 | m18 | #500 | 75 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 367 | 400 | 435 | 341 | 2090 | 1173 | 871 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 532 | 0 | 0 |
| Spillback Cap Reductn | 12 | 11 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.79 | 0.70 | 0.60 | 0.95 | 0.65 | 1.00 | 0.64 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 263 | 2 | 306 | 992 | 397 | 390 | 1079 |
| v/c Ratio | 0.81 | no cap | 0.77 | 0.86 | 0.52 | 0.88 | 0.47 |
| Control Delay (s/veh) | 54.4 | | 34.1 | 38.0 | 5.4 | 30.7 | 15.7 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 |
| Total Delay (s/veh) | 54.4 | Error | 34.1 | 38.0 | 5.4 | 30.7 | 16.9 |
| Queue Length 50th (ft) | 139 | 0 | 98 | 293 | 0 | 194 | 294 |
| Queue Length 95th (ft) | #251 | 0 | #212 | #431 | 66 | m228 | m304 |
| Internal Link Dist (ft) | | 1372 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 358 | 1 | 427 | 1160 | 765 | 480 | 2272 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 901 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 2.00 | 0.72 | 0.86 | 0.52 | 0.81 | 0.79 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1062 | 499 | 1034 | 117 | 1113 |
| v/c Ratio | 1.11 | 1.17 | 0.51 | 0.14 | 1.37 |
| Control Delay (s/veh) | 97.2 | 133.0 | 12.4 | 27.3 | 194.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 97.2 | 133.0 | 12.4 | 27.3 | 194.4 |
| Queue Length 50th (ft) | ~415 | ~381 | 183 | 28 | ~686 |
| Queue Length 95th (ft) | #525 | #578 | 234 | 51 | #938 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1637 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 955 | 427 | 2025 | 823 | 810 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.11 | 1.17 | 0.51 | 0.14 | 1.37 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 478 | 77 | 246 | 34 | 142 | 366 | 376 | 73 |
| v/c Ratio | 0.44 | 0.55 | 0.17 | 0.24 | 0.53 | 0.81 | 0.78 | 0.13 |
| Control Delay (s/veh) | 30.7 | 62.8 | 12.9 | 46.4 | 14.2 | 46.2 | 42.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.7 | 62.8 | 12.9 | 46.4 | 14.2 | 46.2 | 42.7 | 0.5 |
| Queue Length 50th (ft) | 128 | 47 | 26 | 21 | 0 | 223 | 226 | 0 |
| Queue Length 95th (ft) | 203 | #105 | 58 | 50 | 52 | 308 | 307 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 1080 | 143 | 1462 | 284 | 392 | 499 | 535 | 588 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.54 | 0.17 | 0.12 | 0.36 | 0.73 | 0.70 | 0.12 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 387 | 234 | 366 | 717 | 1192 | 789 |
| v/c Ratio | 1.09 | 0.47 | 1.09 | 0.32 | 0.93 | 0.86 |
| Control Delay (s/veh) | 109.9 | 7.7 | 86.9 | 1.1 | 40.9 | 17.4 |
| Queue Delay | 5.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 115.7 | 7.7 | 86.9 | 1.1 | 40.9 | 17.4 |
| Queue Length 50th (ft) | ~250 | 0 | ~223 | 8 | 335 | 97 |
| Queue Length 95th (ft) | #425 | 59 | m#177 | m15 | #475 | #386 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 355 | 501 | 337 | 2212 | 1281 | 922 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 59 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.31 | 0.47 | 1.09 | 0.32 | 0.93 | 0.86 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 284 | 386 | 1211 | 503 | 1107 |
| v/c Ratio | 0.69 | 0.89 | 1.22 | 1.20 | 0.54 |
| Control Delay (s/veh) | 38.9 | 46.5 | 138.0 | 126.1 | 23.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 |
| Total Delay (s/veh) | 38.9 | 46.5 | 138.0 | 126.1 | 25.6 |
| Queue Length 50th (ft) | 143 | 160 | ~433 | ~368 | 341 |
| Queue Length 95th (ft) | 217 | #288 | #564 | m#430 | m376 |
| Internal Link Dist (ft) | 1341 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 504 | 510 | 990 | 418 | 2056 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 754 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.56 | 0.76 | 1.22 | 1.20 | 0.85 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 258 | 260 | 185 | 519 | 678 | 1439 | 355 |
| v/c Ratio | 0.84 | 0.82 | 0.42 | 0.90 | 0.21 | 0.58 | 0.44 |
| Control Delay (s/veh) | 57.9 | 55.2 | 7.8 | 51.2 | 0.9 | 21.9 | 4.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 57.9 | 55.2 | 7.8 | 51.2 | 0.9 | 21.9 | 4.4 |
| Queue Length 50th (ft) | 145 | 149 | 0 | 164 | 2 | 185 | 5 |
| Queue Length 95th (ft) | #269 | #278 | 54 | #254 | 13 | 218 | 58 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 337 | 345 | 463 | 577 | 3207 | 2523 | 813 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.77 | 0.75 | 0.40 | 0.90 | 0.21 | 0.57 | 0.44 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 162 | 264 | 266 | 996 | 611 | 565 | 1383 |
| v/c Ratio | 0.52 | 0.80 | 0.72 | 0.43 | 0.66 | 0.85 | 0.43 |
| Control Delay (s/veh) | 37.2 | 44.2 | 32.2 | 22.0 | 6.0 | 55.5 | 2.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.2 | 44.2 | 32.2 | 22.0 | 6.0 | 55.5 | 2.7 |
| Queue Length 50th (ft) | 84 | 119 | 92 | 131 | 5 | 139 | 34 |
| Queue Length 95th (ft) | 147 | #238 | 182 | 149 | 82 | #273 | 20 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 365 | 378 | 417 | 2425 | 949 | 663 | 3238 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 187 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.44 | 0.70 | 0.64 | 0.41 | 0.64 | 0.85 | 0.45 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1483 | 164 | 1336 | 173 | 257 | 757 | 758 |
| v/c Ratio | 0.78 | 0.26 | 1.06 | 0.07 | 0.30 | 0.90 | 0.90 |
| Control Delay (s/veh) | 38.5 | 5.3 | 86.4 | 0.0 | 15.1 | 37.7 | 38.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.5 | 5.3 | 86.4 | 0.0 | 15.1 | 37.7 | 38.6 |
| Queue Length 50th (ft) | 350 | 0 | ~616 | 0 | 97 | 459 | 462 |
| Queue Length 95th (ft) | 407 | 47 | #744 | m0 | 148 | #744 | #748 |
| Internal Link Dist (ft) | 1992 | | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | | 180 | | | |
| Base Capacity (vph) | 1894 | 630 | 1263 | 2586 | 902 | 873 | 868 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.78 | 0.26 | 1.06 | 0.07 | 0.28 | 0.87 | 0.87 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 666 | 1033 | 174 | 521 | 841 | 125 |
| v/c Ratio | 0.27 | 0.87 | 0.60 | 0.16 | 0.85 | 0.23 |
| Control Delay (s/veh) | 23.9 | 34.4 | 62.5 | 11.5 | 47.8 | 5.7 |
| Queue Delay | 0.0 | 10.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 23.9 | 45.1 | 62.5 | 11.5 | 47.8 | 5.7 |
| Queue Length 50th (ft) | 119 | 682 | 64 | 57 | 302 | 0 |
| Queue Length 95th (ft) | m47 | 578 | #148 | 82 | 358 | 41 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 2484 | 1199 | 288 | 3161 | 1121 | 610 |
| Starvation Cap Reductn | 0 | 157 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 0.99 | 0.60 | 0.16 | 0.75 | 0.20 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# APPENDIX 6.7:

# OPENING YEAR CUMULATIVE (2034) WITH PROJECT INTERSECTION ANALYSIS WITH IMPROVEMENTS

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| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 93 | 289 | 53 | 315 | 444 | 350 | 147 | 833 | 281 | 274 | 809 | 135 |
| Future Volume (vph) | 93 | 289 | 53 | 315 | 444 | 350 | 147 | 833 | 281 | 274 | 809 | 135 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 67.0 | 67.0 | 67.0 | 67.0 | 67.0 | 67.0 | 14.8 | 33.2 | 33.2 | 19.8 | 38.2 | 38.2 |
| Total Split (%) | 55.8% | 55.8% | 55.8% | 55.8% | 55.8% | 55.8% | 12.3% | 27.7% | 27.7% | 16.5% | 31.8% | 31.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 10.4 | 24.4 | 24.4 | 13.5 | 27.5 | 27.5 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.10 | 0.24 | 0.24 | 0.13 | 0.27 | 0.27 |
| v/c Ratio | 0.38 | 0.39 | 0.08 | 0.87 | 0.60 | 0.44 | 0.53 | 0.78 | 0.67 | 0.72 | 0.67 | 0.29 |
| Control Delay (s/veh) | 23.7 | 20.4 | 0.2 | 49.3 | 24.9 | 5.4 | 56.0 | 44.0 | 30.7 | 56.8 | 37.8 | 7.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 23.7 | 20.4 | 0.2 | 49.3 | 24.9 | 5.4 | 56.0 | 44.0 | 30.7 | 56.8 | 37.8 | 7.4 |
| LOS | C | C | A | D | C | A | E | D | C | E | D | A |
| Approach Delay (s/veh) | | 18.7 | | | 25.6 | | | 42.4 | | | 38.7 | |
| Approach LOS | | B | | | C | | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 103 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 34.1 | Intersection LOS: C |
| Intersection Capacity Utilization 82.6% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

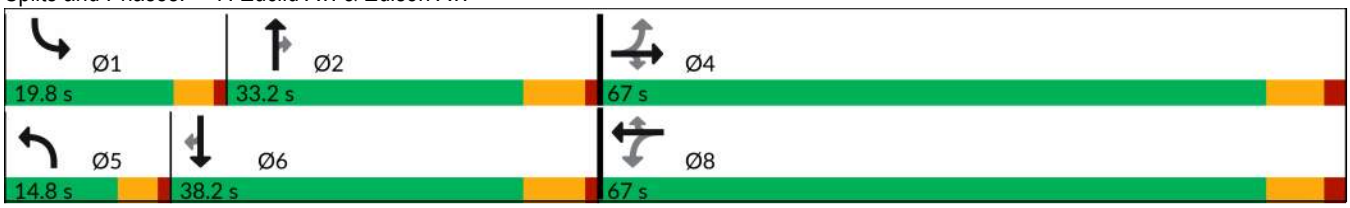

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 93 | 289 | 53 | 315 | 444 | 350 | 147 | 833 | 281 | 274 | 809 | 135 |
| Future Volume (veh/h) | 93 | 289 | 53 | 315 | 444 | 350 | 147 | 833 | 281 | 274 | 809 | 135 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 99 | 307 | 28 | 335 | 472 | 362 | 156 | 886 | 282 | 291 | 861 | 108 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 277 | 821 | 696 | 460 | 821 | 696 | 293 | 1134 | 352 | 354 | 1201 | 368 |
| Arrive On Green | 0.46 | 0.70 | 0.46 | 0.46 | 0.70 | 0.46 | 0.10 | 0.35 | 0.23 | 0.11 | 0.37 | 0.25 |
| Sat Flow, veh/h | 622 | 1772 | 1502 | 987 | 1772 | 1502 | 2910 | 4837 | 1502 | 3092 | 4837 | 1480 |
| Grp Volume(v), veh/h | 99 | 307 | 28 | 335 | 472 | 362 | 156 | 886 | 282 | 291 | 861 | 108 |
| Grp Sat Flow(s),veh/h/ln | 622 | 1772 | 1502 | 987 | 1772 | 1502 | 1455 | 1612 | 1502 | 1546 | 1612 | 1480 |
| Q Serve(g_s), s | 12.5 | 7.0 | 1.0 | 30.6 | 13.3 | 16.7 | 5.0 | 16.0 | 17.3 | 9.0 | 14.9 | 5.8 |
| Cycle Q Clear(g_c), s | 25.7 | 7.0 | 1.0 | 37.6 | 13.3 | 16.7 | 5.0 | 16.0 | 17.3 | 9.0 | 14.9 | 5.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 277 | 821 | 696 | 460 | 821 | 696 | 293 | 1134 | 352 | 354 | 1201 | 368 |
| V/C Ratio(X) | 0.36 | 0.37 | 0.04 | 0.73 | 0.57 | 0.52 | 0.53 | 0.78 | 0.80 | 0.82 | 0.72 | 0.29 |
| Avail Cap(c_a), veh/h | 369 | 1082 | 917 | 606 | 1082 | 917 | 300 | 1318 | 409 | 477 | 1565 | 479 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 26.3 | 9.1 | 14.4 | 27.4 | 10.0 | 18.6 | 41.9 | 29.5 | 35.4 | 42.4 | 27.8 | 29.9 |
| Incr Delay (d2), s/veh | 0.8 | 0.3 | 0.0 | 3.1 | 0.6 | 0.6 | 0.8 | 2.7 | 9.6 | 6.2 | 1.1 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 2.2 | 0.3 | 7.0 | 3.6 | 5.4 | 1.7 | 5.3 | 6.8 | 3.5 | 4.7 | 2.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.1 | 9.4 | 14.4 | 30.5 | 10.7 | 19.2 | 42.7 | 32.2 | 44.9 | 48.6 | 28.9 | 30.3 |
| LnGrp LOS | C | A | B | C | B | B | D | C | D | D | C | C |
| Approach Vol, veh/h | | 434 | | | 1169 | | | 1324 | | | 1260 | |
| Approach Delay, s/veh | | 13.7 | | | 19.0 | | | 36.2 | | | 33.6 | |
| Approach LOS | | B | | | B | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.9 | 29.5 | | 52.6 | 14.6 | 30.8 | | 52.6 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 15.1 | 26.7 | | 59.8 | 10.1 | 31.7 | | 59.8 |
| Max Q Clear Time (g_c+I1), s | 11.0 | 19.3 | | 27.7 | 7.0 | 16.9 | | 39.6 |
| Green Ext Time (p_c), s | 0.2 | 3.6 | | 2.8 | 0.1 | 4.8 | | 5.8 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 28.3 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 191 | 336 | 70 | 57 | 849 | 359 | 139 | 798 | 46 | 230 | 850 | 241 |
| Future Volume (vph) | 191 | 336 | 70 | 57 | 849 | 359 | 139 | 798 | 46 | 230 | 850 | 241 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.8 | 52.4 | 52.4 | 15.6 | 53.2 | 53.2 | 15.4 | 45.2 | 15.6 | 16.8 | 46.6 | 14.8 |
| Total Split (%) | 11.4% | 40.3% | 40.3% | 12.0% | 40.9% | 40.9% | 11.8% | 34.8% | 12.0% | 12.9% | 35.8% | 11.4% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.2 | 40.3 | 40.3 | 10.4 | 37.0 | 37.0 | 10.8 | 34.7 | 46.9 | 11.9 | 35.8 | 52.5 |
| Actuated g/C Ratio | 0.09 | 0.34 | 0.34 | 0.09 | 0.32 | 0.32 | 0.09 | 0.30 | 0.40 | 0.10 | 0.31 | 0.45 |
| v/c Ratio | 0.80 | 0.31 | 0.13 | 0.43 | 0.84 | 0.61 | 1.00 | 0.85 | 0.08 | 0.83 | 0.87 | 0.36 |
| Control Delay (s/veh) | 77.8 | 30.6 | 2.3 | 64.5 | 46.0 | 18.5 | 130.3 | 48.5 | 2.0 | 76.2 | 49.5 | 17.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 77.8 | 30.6 | 2.3 | 64.5 | 46.0 | 18.5 | 130.3 | 48.5 | 2.0 | 76.2 | 49.5 | 17.0 |
| LOS | E | C | A | E | D | B | F | D | A | E | D | B |
| Approach Delay (s/veh) | | 42.3 | | | 39.0 | | | 57.9 | | | 48.2 | |
| Approach LOS | | D | | | D | | | E | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 130 | |
| Actuated Cycle Length: 117.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.00 | |
| Intersection Signal Delay (s/veh): 46.9 | Intersection LOS: D |
| Intersection Capacity Utilization 85.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

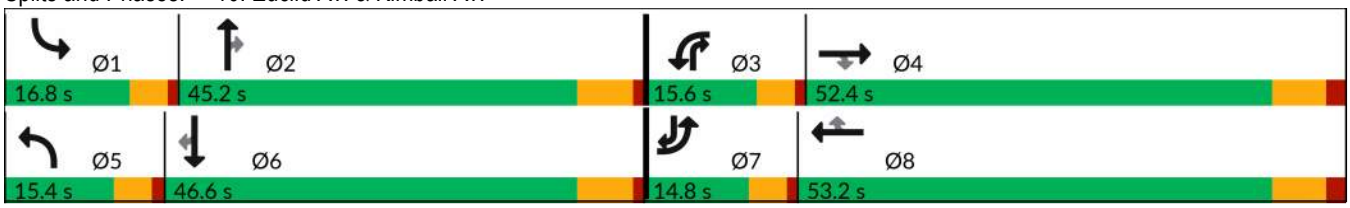

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 191 | 336 | 70 | 57 | 849 | 359 | 139 | 798 | 46 | 230 | 850 | 241 |
| Future Volume (veh/h) | 191 | 336 | 70 | 57 | 849 | 359 | 139 | 798 | 46 | 230 | 850 | 241 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 201 | 354 | 58 | 60 | 894 | 201 | 146 | 840 | 27 | 242 | 895 | 201 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 259 | 1064 | 475 | 120 | 1018 | 448 | 152 | 1019 | 562 | 291 | 1034 | 595 |
| Arrive On Green | 0.09 | 0.32 | 0.32 | 0.08 | 0.30 | 0.30 | 0.10 | 0.30 | 0.30 | 0.10 | 0.31 | 0.31 |
| Sat Flow, veh/h | 2910 | 3367 | 1502 | 1594 | 3367 | 1483 | 1594 | 3367 | 1483 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 201 | 354 | 58 | 60 | 894 | 201 | 146 | 840 | 27 | 242 | 895 | 201 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1683 | 1502 | 1594 | 1683 | 1483 | 1594 | 1683 | 1483 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 7.6 | 9.0 | 3.1 | 4.1 | 28.3 | 12.3 | 10.2 | 26.0 | 1.3 | 9.2 | 28.1 | 10.5 |
| Cycle Q Clear(g_c), s | 7.6 | 9.0 | 3.1 | 4.1 | 28.3 | 12.3 | 10.2 | 26.0 | 1.3 | 9.2 | 28.1 | 10.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 259 | 1064 | 475 | 120 | 1018 | 448 | 152 | 1019 | 562 | 291 | 1034 | 595 |
| V/C Ratio(X) | 0.78 | 0.33 | 0.12 | 0.50 | 0.88 | 0.45 | 0.96 | 0.82 | 0.05 | 0.83 | 0.87 | 0.34 |
| Avail Cap(c_a), veh/h | 262 | 1357 | 605 | 155 | 1381 | 608 | 152 | 1162 | 625 | 314 | 1207 | 672 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.0 | 29.3 | 27.3 | 49.8 | 37.1 | 31.6 | 50.5 | 36.3 | 22.1 | 49.6 | 36.7 | 23.6 |
| Incr Delay (d2), s/veh | 12.3 | 0.2 | 0.1 | 3.2 | 4.2 | 0.3 | 60.4 | 4.4 | 0.0 | 14.9 | 6.1 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.1 | 3.5 | 1.1 | 1.7 | 11.5 | 4.2 | 6.4 | 10.5 | 0.4 | 3.8 | 11.6 | 3.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 62.3 | 29.5 | 27.4 | 53.0 | 41.3 | 31.8 | 111.0 | 40.8 | 22.1 | 64.5 | 42.7 | 23.9 |
| LnGrp LOS | E | C | C | D | D | C | F | D | C | E | D | C |
| Approach Vol, veh/h | | 613 | | | 1155 | | | 1013 | | | 1338 | |
| Approach Delay, s/veh | | 40.0 | | | 40.3 | | | 50.4 | | | 43.8 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.9 | 40.4 | 13.2 | 42.6 | 15.4 | 40.9 | 14.7 | 41.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 12.1 | 38.7 | 10.9 | 45.2 | 10.7 | * 40 | 10.1 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 11.2 | 28.0 | 6.1 | 11.0 | 12.2 | 30.1 | 9.6 | 30.3 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | 0.0 | 2.3 | 0.0 | 4.3 | 0.0 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 43.9 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 38 | 207 | 994 | 411 | 74 | 630 | 599 | 110 | 763 |
| Future Volume (vph) | 38 | 207 | 994 | 411 | 74 | 630 | 599 | 110 | 763 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 21.0 | 46.0 | 51.3 | 14.8 | 38.2 | 46.0 | 14.8 | 38.2 |
| Total Split (%) | 13.1% | 17.5% | 38.3% | 42.8% | 12.3% | 31.8% | 38.3% | 12.3% | 31.8% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 13.1 | 40.5 | 50.1 | 10.1 | 28.7 | 75.7 | 10.1 | 32.0 |
| Actuated g/C Ratio | 0.09 | 0.11 | 0.35 | 0.43 | 0.09 | 0.25 | 0.65 | 0.09 | 0.28 |
| v/c Ratio | 0.29 | 0.66 | 1.02 | 0.66 | 0.55 | 0.75 | 0.60 | 0.82 | 0.91 |
| Control Delay (s/veh) | 57.6 | 56.4 | 72.1 | 34.0 | 68.6 | 46.3 | 11.7 | 94.6 | 55.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 57.6 | 56.4 | 72.1 | 34.0 | 68.6 | 46.3 | 11.7 | 94.6 | 55.4 |
| LOS | E | E | E | C | E | D | B | F | E |
| Approach Delay (s/veh) | | 56.6 | | 59.7 | | 31.6 | | | 59.9 |
| Approach LOS | | E | | E | | C | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 116.3 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.02 | |
| Intersection Signal Delay (s/veh): 50.4 | Intersection LOS: D |
| Intersection Capacity Utilization 95.4% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 38 | 207 | 38 | 994 | 411 | 68 | 74 | 630 | 599 | 110 | 763 | 86 |
| Future Volume (veh/h) | 38 | 207 | 38 | 994 | 411 | 68 | 74 | 630 | 599 | 110 | 763 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 39 | 213 | 0 | 1025 | 424 | 67 | 76 | 649 | 463 | 113 | 787 | 83 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 99 | 297 | | 1034 | 569 | 90 | 128 | 921 | 924 | 137 | 837 | 88 |
| Arrive On Green | 0.09 | 0.13 | 0.00 | 0.53 | 0.57 | 0.57 | 0.12 | 0.39 | 0.39 | 0.13 | 0.40 | 0.40 |
| Sat Flow, veh/h | 1594 | 3455 | 0 | 2910 | 1493 | 236 | 1594 | 3544 | 1502 | 1594 | 3152 | 332 |
| Grp Volume(v), veh/h | 39 | 213 | 0 | 1025 | 0 | 491 | 76 | 649 | 463 | 113 | 442 | 428 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 0 | 1455 | 0 | 1729 | 1594 | 1772 | 1502 | 1594 | 1772 | 1712 |
| Q Serve(g_s), s | 2.6 | 6.9 | 0.0 | 39.5 | 0.0 | 24.0 | 5.1 | 17.5 | 20.6 | 7.8 | 27.2 | 27.2 |
| Cycle Q Clear(g_c), s | 2.6 | 6.9 | 0.0 | 39.5 | 0.0 | 24.0 | 5.1 | 17.5 | 20.6 | 7.8 | 27.2 | 27.2 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.14 | 1.00 | | 1.00 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 99 | 297 | | 1034 | 0 | 659 | 128 | 921 | 924 | 137 | 470 | 455 |
| V/C Ratio(X) | 0.39 | 0.72 | | 0.99 | 0.00 | 0.74 | 0.59 | 0.70 | 0.50 | 0.83 | 0.94 | 0.94 |
| Avail Cap(c_a), veh/h | 141 | 416 | | 1034 | 0 | 676 | 142 | 991 | 954 | 142 | 495 | 479 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.4 | 47.8 | 0.0 | 26.3 | 0.0 | 20.2 | 48.1 | 30.9 | 10.2 | 48.6 | 33.2 | 33.3 |
| Incr Delay (d2), s/veh | 0.9 | 4.8 | 0.0 | 25.7 | 0.0 | 4.8 | 3.0 | 1.7 | 0.2 | 28.8 | 25.1 | 25.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 2.9 | 0.0 | 13.5 | 0.0 | 7.5 | 2.0 | 6.3 | 4.3 | 4.0 | 12.4 | 12.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 50.3 | 52.7 | 0.0 | 51.9 | 0.0 | 24.9 | 51.1 | 32.6 | 10.3 | 77.4 | 58.3 | 59.0 |
| LnGrp LOS | D | D | | D | | C | D | C | B | E | E | E |
| Approach Vol, veh/h | | 252 | | | 1516 | | | 1188 | | | 983 | |
| Approach Delay, s/veh | | 52.3 | | | 43.2 | | | 25.1 | | | 60.8 | |
| Approach LOS | | D | | | D | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 36.0 | 46.0 | 17.0 | 13.8 | 36.6 | 12.8 | 50.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.1 | 31.7 | 40.3 | 14.0 | 10.1 | 31.7 | 10.0 | 44.3 |
| Max Q Clear Time (g_c+I1), s | 9.8 | 22.6 | 41.5 | 8.9 | 7.1 | 29.2 | 4.6 | 26.0 |
| Green Ext Time (p_c), s | 0.0 | 2.4 | 0.0 | 0.6 | 0.0 | 0.9 | 0.0 | 3.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 42.7 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 30 | 807 | 30 | 0 | 1154 | 45 | 39 | 0 | 0 | 59 | 0 | 39 |
| Future Vol, veh/h | 30 | 807 | 30 | 0 | 1154 | 45 | 39 | 0 | 0 | 59 | 0 | 39 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 33 | 877 | 33 | 0 | 1254 | 49 | 42 | 0 | 0 | 64 | 0 | 42 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1303 | 0 | 0 | 910 | 0 | 0 | 1586 | 2262 | 455 | 1783 | 2254 | 652 |
| Stage 1 | - | - | - | - | - | - | 959 | 959 | - | 1279 | 1279 | - |
| Stage 2 | - | - | - | - | - | - | 627 | 1303 | - | 504 | 975 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6 | 5.54 | - | 6 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6 | 5.54 | - | 6 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 527 | - | - | 744 | - | - | 73 | 40 | 552 | ~ 52 | 41 | 411 |
| Stage 1 | - | - | - | - | - | - | 319 | 334 | - | 213 | 235 | - |
| Stage 2 | - | - | - | - | - | - | 481 | 229 | - | 559 | 328 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 527 | - | - | 744 | - | - | 60 | 37 | 552 | ~ 47 | 37 | 411 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 229 | 159 | - | 188 | 177 | - |
| Stage 1 | - | - | - | - | - | - | 292 | 306 | - | 213 | 235 | - |
| Stage 2 | - | - | - | - | - | - | 431 | 229 | - | 513 | 301 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.31 | 0 | 24.23 | 31.4 |
| HCM LOS | | | C | D |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 229 | 119 | - | - | 744 | - | - | 240 |
| HCM Lane V/C Ratio | 0.185 | 0.062 | - | - | - | - | - | 0.443 |
| HCM Control Delay (s/veh) | 24.2 | 12.3 | 0.9 | - | 0 | - | - | 31.4 |
| HCM Lane LOS | C | B | A | - | A | - | - | D |
| HCM 95th %tile Q(veh) | 0.7 | 0.2 | - | - | 0 | - | - | 2.1 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 93 | 673 | 74 | 811 | 49 | 56 | 7 | 36 |
| Future Volume (vph) | 93 | 673 | 74 | 811 | 49 | 56 | 7 | 36 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 83.0 | 83.0 | 83.0 | 83.0 | 37.0 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 69.2% | 69.2% | 69.2% | 69.2% | 30.8% | 30.8% | 30.8% | 30.8% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 38.3 | 38.3 | 38.3 | 38.3 | | 15.8 | | 15.8 |
| Actuated g/C Ratio | 0.58 | 0.58 | 0.58 | 0.58 | | 0.24 | | 0.24 |
| v/c Ratio | 0.41 | 0.81 | 0.41 | 0.51 | | 0.56 | | 0.31 |
| Control Delay (s/veh) | 13.5 | 18.1 | 15.0 | 8.9 | | 28.7 | | 16.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 13.5 | 18.1 | 15.0 | 8.9 | | 28.7 | | 16.1 |
| LOS | B | B | B | A | | C | | B |
| Approach Delay (s/veh) | | 17.6 | | 9.4 | | 28.7 | | 16.1 |
| Approach LOS | | B | | A | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 66.1 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 14.8 | Intersection LOS: B |
| Intersection Capacity Utilization 80.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 15: Bon View Av. & Riverside Dr.

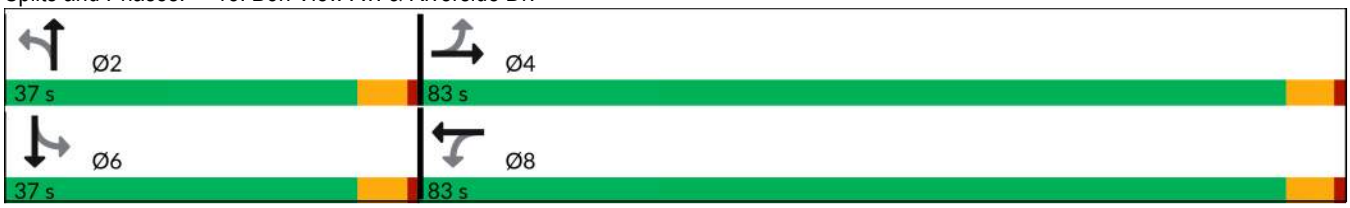

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 93 | 673 | 48 | 74 | 811 | 50 | 49 | 56 | 78 | 7 | 36 | 74 |
| Future Volume (veh/h) | 93 | 673 | 48 | 74 | 811 | 50 | 49 | 56 | 78 | 7 | 36 | 74 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 106 | 765 | 55 | 84 | 922 | 57 | 56 | 64 | 89 | 8 | 41 | 84 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 400 | 1012 | 73 | 322 | 1995 | 123 | 139 | 108 | 122 | 77 | 100 | 183 |
| Arrive On Green | 0.62 | 0.62 | 0.62 | 0.62 | 0.62 | 0.62 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 | 0.18 |
| Sat Flow, veh/h | 574 | 1631 | 117 | 667 | 3215 | 199 | 307 | 596 | 670 | 39 | 548 | 1006 |
| Grp Volume(v), veh/h | 106 | 0 | 820 | 84 | 483 | 496 | 209 | 0 | 0 | 133 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 574 | 0 | 1748 | 667 | 1683 | 1730 | 1573 | 0 | 0 | 1592 | 0 | 0 |
| Q Serve(g_s), s | 6.6 | 0.0 | 18.3 | 5.6 | 8.3 | 8.3 | 2.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.9 | 0.0 | 18.3 | 24.0 | 8.3 | 8.3 | 6.7 | 0.0 | 0.0 | 4.1 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.07 | 1.00 | | 0.11 | 0.27 | | 0.43 | 0.06 | | 0.63 |
| Lane Grp Cap(c), veh/h | 400 | 0 | 1084 | 322 | 1044 | 1074 | 370 | 0 | 0 | 360 | 0 | 0 |
| V/C Ratio(X) | 0.26 | 0.00 | 0.76 | 0.26 | 0.46 | 0.46 | 0.57 | 0.00 | 0.00 | 0.37 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 860 | 0 | 2482 | 855 | 2390 | 2457 | 963 | 0 | 0 | 976 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 9.5 | 0.0 | 7.4 | 16.0 | 5.5 | 5.5 | 20.9 | 0.0 | 0.0 | 20.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 1.1 | 0.4 | 0.3 | 0.3 | 1.4 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 0.0 | 3.7 | 0.7 | 1.6 | 1.6 | 2.2 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 9.8 | 0.0 | 8.5 | 16.4 | 5.8 | 5.8 | 22.3 | 0.0 | 0.0 | 20.6 | 0.0 | 0.0 |
| LnGrp LOS | A | | A | B | A | A | C | | | C | | |
| Approach Vol, veh/h | | 926 | | | 1063 | | | 209 | | | 133 | |
| Approach Delay, s/veh | | 8.7 | | | 6.7 | | | 22.3 | | | 20.6 | |
| Approach LOS | | A | | | A | | | C | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.3 | 39.3 | 15.3 | 39.3 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 31.6 | 77.6 | 31.6 | 77.6 |
| Max Q Clear Time (g_c+I1), s | 8.7 | 20.3 | 6.1 | 26.0 |
| Green Ext Time (p_c), s | 1.1 | 8.5 | 0.7 | 7.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 9.7 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 75 | 565 | 387 | 795 | 169 | 180 | 177 | 88 |
| Future Volume (vph) | 75 | 565 | 387 | 795 | 169 | 180 | 177 | 88 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 11.6 | 23.8 | 31.0 | 43.2 | 26.7 | 48.2 | 17.0 | 38.5 |
| Total Split (%) | 9.7% | 19.8% | 25.8% | 36.0% | 22.3% | 40.2% | 14.2% | 32.1% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.0 | 18.0 | 26.4 | 37.4 | 16.8 | 42.8 | 12.4 | 38.4 |
| Actuated g/C Ratio | 0.06 | 0.15 | 0.22 | 0.31 | 0.14 | 0.36 | 0.10 | 0.32 |
| v/c Ratio | 0.82 | 0.99 | 1.12 | 0.94 | 0.77 | 1.06 | 1.09 | 0.28 |
| Control Delay (s/veh) | 108.9 | 79.1 | 126.6 | 56.4 | 70.2 | 84.5 | 143.7 | 28.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 108.9 | 79.1 | 126.6 | 56.4 | 70.2 | 84.5 | 143.7 | 28.0 |
| LOS | F | E | F | E | E | F | F | C |
| Approach Delay (s/veh) | | 82.1 | | 77.3 | | 81.5 | | 91.2 |
| Approach LOS | | F | | E | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.12 | |
| Intersection Signal Delay (s/veh): 80.9 | Intersection LOS: F |
| Intersection Capacity Utilization 103.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

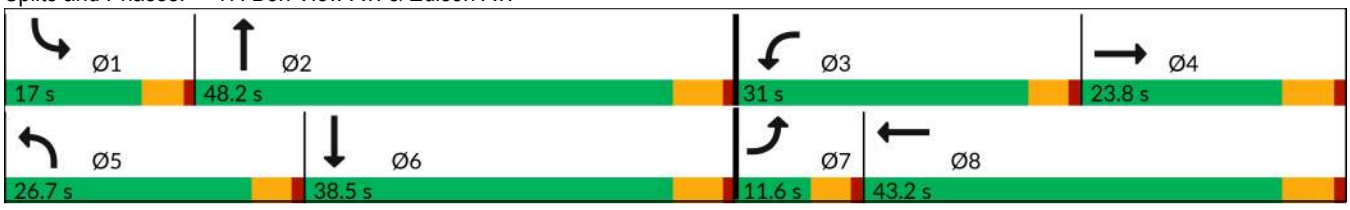

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 75 | 565 | 111 | 387 | 795 | 116 | 169 | 180 | 456 | 177 | 88 | 58 |
| Future Volume (veh/h) | 75 | 565 | 111 | 387 | 795 | 116 | 169 | 180 | 456 | 177 | 88 | 58 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 80 | 601 | 97 | 412 | 846 | 75 | 180 | 191 | 272 | 188 | 94 | 46 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 100 | 673 | 107 | 396 | 1049 | 93 | 208 | 207 | 295 | 186 | 338 | 165 |
| Arrive On Green | 0.06 | 0.16 | 0.16 | 0.23 | 0.34 | 0.34 | 0.12 | 0.31 | 0.31 | 0.11 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1688 | 4207 | 669 | 1688 | 3128 | 277 | 1688 | 661 | 941 | 1688 | 1123 | 550 |
| Grp Volume(v), veh/h | 80 | 459 | 239 | 412 | 455 | 466 | 180 | 0 | 463 | 188 | 0 | 140 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1612 | 1651 | 1688 | 1683 | 1722 | 1688 | 0 | 1602 | 1688 | 0 | 1673 |
| Q Serve(g_s), s | 5.3 | 15.7 | 16.0 | 26.4 | 27.7 | 27.7 | 11.8 | 0.0 | 31.4 | 12.4 | 0.0 | 7.2 |
| Cycle Q Clear(g_c), s | 5.3 | 15.7 | 16.0 | 26.4 | 27.7 | 27.7 | 11.8 | 0.0 | 31.4 | 12.4 | 0.0 | 7.2 |
| Prop In Lane | 1.00 | | 0.41 | 1.00 | | 0.16 | 1.00 | | 0.59 | 1.00 | | 0.33 |
| Lane Grp Cap(c), veh/h | 100 | 516 | 264 | 396 | 565 | 578 | 208 | 0 | 503 | 186 | 0 | 503 |
| V/C Ratio(X) | 0.80 | 0.89 | 0.91 | 1.04 | 0.81 | 0.81 | 0.87 | 0.00 | 0.92 | 1.01 | 0.00 | 0.28 |
| Avail Cap(c_a), veh/h | 105 | 516 | 264 | 396 | 565 | 578 | 332 | 0 | 610 | 186 | 0 | 503 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 52.2 | 46.3 | 46.4 | 43.0 | 34.0 | 34.0 | 48.4 | 0.0 | 37.3 | 50.0 | 0.0 | 30.0 |
| Incr Delay (d2), s/veh | 30.2 | 17.1 | 31.8 | 56.1 | 8.4 | 8.3 | 7.8 | 0.0 | 17.5 | 68.8 | 0.0 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 7.2 | 8.6 | 16.6 | 11.9 | 12.2 | 5.3 | 0.0 | 14.1 | 8.6 | 0.0 | 2.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 82.4 | 63.4 | 78.2 | 99.1 | 42.5 | 42.3 | 56.2 | 0.0 | 54.7 | 118.8 | 0.0 | 30.3 |
| LnGrp LOS | F | E | E | F | D | D | E | | D | F | | C |
| Approach Vol, veh/h | | 778 | | | 1333 | | | 643 | | | 328 | |
| Approach Delay, s/veh | | 69.9 | | | 59.9 | | | 55.1 | | | 81.0 | |
| Approach LOS | | E | | | E | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 40.7 | 31.0 | 23.8 | 18.5 | 39.2 | 11.3 | 43.5 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 12.4 | 42.8 | 26.4 | 18.0 | 22.1 | 33.1 | 7.0 | 37.4 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 33.4 | 28.4 | 18.0 | 13.8 | 9.2 | 7.3 | 29.7 |
| Green Ext Time (p_c), s | 0.0 | 1.9 | 0.0 | 0.0 | 0.1 | 0.6 | 0.0 | 3.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 63.7 |
| HCM 7th LOS | E |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 2 | 276 | 1130 | 497 | 291 | 721 |
| Future Volume (vph) | 2 | 276 | 1130 | 497 | 291 | 721 |
| Turn Type | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 36.2 | 36.2 | 20.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 40.2% | 40.2% | 22.2% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | |
| Recall Mode | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 26.2 | 26.2 | 30.4 | 30.4 | 15.8 | 51.2 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.34 | 0.34 | 0.18 | 0.57 |
| v/c Ratio | 0.94 | 0.51 | 1.04 | 0.62 | 1.09 | 0.39 |
| Control Delay (s/veh) | 61.5 | 12.9 | 68.3 | 5.8 | 124.7 | 7.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.5 | 12.9 | 68.3 | 5.8 | 124.7 | 7.7 |
| LOS | E | B | E | A | F | A |
| Approach Delay (s/veh) | 42.8 | | 49.2 | | | 41.3 |
| Approach LOS | D | | D | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.09 | |
| Intersection Signal Delay (s/veh): 45.5 | Intersection LOS: D |
| Intersection Capacity Utilization 97.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 441 | 2 | 276 | 0 | 0 | 0 | 0 | 1130 | 497 | 291 | 721 | 0 |
| Future Volume (veh/h) | 441 | 2 | 276 | 0 | 0 | 0 | 0 | 1130 | 497 | 291 | 721 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 459 | 2 | 214 | | | | 0 | 1177 | 258 | 303 | 751 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 490 | 2 | 438 | | | | 0 | 1165 | 508 | 266 | 1913 | 0 |
| Arrive On Green | 0.29 | 0.29 | 0.29 | | | | 0.00 | 0.35 | 0.35 | 0.11 | 0.38 | 0.00 |
| Sat Flow, veh/h | 1681 | 7 | 1502 | | | | 0 | 3455 | 1468 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 461 | 0 | 214 | | | | 0 | 1177 | 258 | 303 | 751 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1502 | | | | 0 | 1683 | 1468 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 24.0 | 0.0 | 10.6 | | | | 0.0 | 31.2 | 12.5 | 15.0 | 14.6 | 0.0 |
| Cycle Q Clear(g_c), s | 24.0 | 0.0 | 10.6 | | | | 0.0 | 31.2 | 12.5 | 15.0 | 14.6 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 492 | 0 | 438 | | | | 0 | 1165 | 508 | 266 | 1913 | 0 |
| V/C Ratio(X) | 0.94 | 0.00 | 0.49 | | | | 0.00 | 1.01 | 0.51 | 1.14 | 0.39 | 0.00 |
| Avail Cap(c_a), veh/h | 506 | 0 | 450 | | | | 0 | 1165 | 508 | 266 | 1913 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.45 | 0.45 | 0.00 |
| Uniform Delay (d), s/veh | 31.1 | 0.0 | 26.3 | | | | 0.0 | 29.4 | 23.3 | 40.0 | 16.6 | 0.0 |
| Incr Delay (d2), s/veh | 24.3 | 0.0 | 0.3 | | | | 0.0 | 28.8 | 3.6 | 82.3 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.3 | 0.0 | 3.6 | | | | 0.0 | 16.1 | 4.5 | 12.0 | 5.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 55.4 | 0.0 | 26.6 | | | | 0.0 | 58.3 | 26.9 | 122.3 | 16.8 | 0.0 |
| LnGrp LOS | E | | C | | | | | F | C | F | B | |
| Approach Vol, veh/h | | 675 | | | | | | 1435 | | | 1054 | |
| Approach Delay, s/veh | | 46.3 | | | | | | 52.6 | | | 47.1 | |
| Approach LOS | | D | | | | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.0 | 37.0 | | 33.0 | | 57.0 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 15.0 | 30.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 17.0 | 33.2 | | 26.0 | | 16.6 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.3 | | 4.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 49.5 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 165 | 558 | 25 | 740 | 44 | 863 | 105 | 626 |
| Future Volume (vph) | 165 | 558 | 25 | 740 | 44 | 863 | 105 | 626 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 19.6 | 50.9 | 9.7 | 41.0 | 11.4 | 44.9 | 14.5 | 48.0 |
| Total Split (%) | 16.3% | 42.4% | 8.1% | 34.2% | 9.5% | 37.4% | 12.1% | 40.0% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.6 | 48.3 | 5.1 | 34.8 | 6.4 | 37.8 | 9.8 | 43.2 |
| Actuated g/C Ratio | 0.12 | 0.41 | 0.04 | 0.29 | 0.05 | 0.32 | 0.08 | 0.37 |
| v/c Ratio | 0.92 | 0.91 | 0.40 | 0.98 | 0.56 | 0.92 | 0.87 | 0.71 |
| Control Delay (s/veh) | 98.0 | 52.3 | 73.3 | 66.6 | 80.3 | 52.7 | 105.2 | 35.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 98.0 | 52.3 | 73.3 | 66.6 | 80.3 | 52.7 | 105.2 | 35.5 |
| LOS | F | D | E | E | F | D | F | D |
| Approach Delay (s/veh) | | 62.2 | | 66.7 | | 54.0 | | 43.7 |
| Approach LOS | | E | | E | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.3 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.98 | |
| Intersection Signal Delay (s/veh): 56.5 | Intersection LOS: E |
| Intersection Capacity Utilization 88.3% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

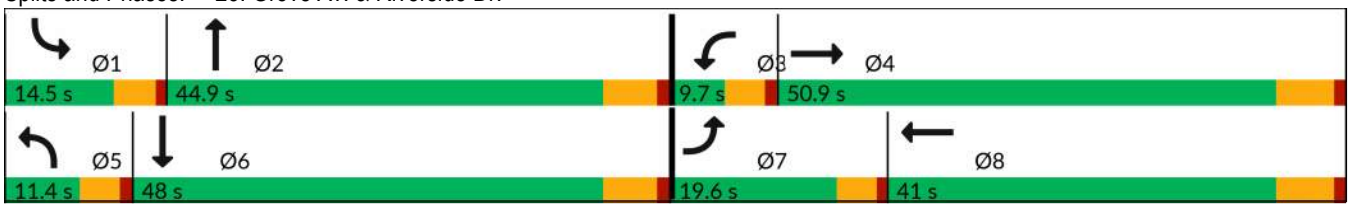

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 165 | 558 | 39 | 25 | 740 | 143 | 44 | 863 | 39 | 105 | 626 | 158 |
| Future Volume (veh/h) | 165 | 558 | 39 | 25 | 740 | 143 | 44 | 863 | 39 | 105 | 626 | 158 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 179 | 607 | 14 | 27 | 804 | 102 | 48 | 938 | 35 | 114 | 680 | 96 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 203 | 675 | 16 | 40 | 868 | 110 | 59 | 1027 | 38 | 137 | 1063 | 150 |
| Arrive On Green | 0.13 | 0.59 | 0.39 | 0.03 | 0.43 | 0.29 | 0.04 | 0.47 | 0.31 | 0.09 | 0.54 | 0.36 |
| Sat Flow, veh/h | 1594 | 1724 | 40 | 1594 | 3000 | 381 | 1594 | 3310 | 123 | 1594 | 2962 | 418 |
| Grp Volume(v), veh/h | 179 | 0 | 621 | 27 | 451 | 455 | 48 | 477 | 496 | 114 | 386 | 390 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1764 | 1594 | 1683 | 1697 | 1594 | 1683 | 1750 | 1594 | 1683 | 1697 |
| Q Serve(g_s), s | 12.5 | 0.0 | 34.9 | 1.9 | 28.7 | 28.9 | 3.4 | 29.9 | 29.9 | 8.0 | 18.3 | 19.3 |
| Cycle Q Clear(g_c), s | 12.5 | 0.0 | 34.9 | 1.9 | 28.7 | 28.9 | 3.4 | 29.9 | 29.9 | 8.0 | 18.3 | 19.3 |
| Prop In Lane | 1.00 | | 0.02 | 1.00 | | 0.22 | 1.00 | | 0.07 | 1.00 | | 0.25 |
| Lane Grp Cap(c), veh/h | 203 | 0 | 691 | 40 | 487 | 491 | 59 | 522 | 543 | 137 | 604 | 609 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.90 | 0.67 | 0.93 | 0.93 | 0.81 | 0.91 | 0.91 | 0.84 | 0.64 | 0.64 |
| Avail Cap(c_a), veh/h | 211 | 0 | 696 | 72 | 517 | 521 | 96 | 581 | 604 | 139 | 627 | 632 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.6 | 0.0 | 21.7 | 54.7 | 30.9 | 32.8 | 54.1 | 28.9 | 29.5 | 51.0 | 21.0 | 23.2 |
| Incr Delay (d2), s/veh | 30.0 | 0.0 | 14.6 | 7.0 | 22.3 | 22.2 | 9.8 | 17.9 | 17.4 | 31.3 | 2.1 | 2.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.5 | 0.0 | 12.6 | 0.8 | 12.2 | 12.9 | 1.5 | 12.1 | 12.7 | 4.3 | 5.9 | 6.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 78.5 | 0.0 | 36.2 | 61.7 | 53.2 | 54.9 | 64.0 | 46.8 | 46.9 | 82.3 | 23.1 | 25.3 |
| LnGrp LOS | E | | D | E | D | D | E | D | D | F | C | C |
| Approach Vol, veh/h | | 800 | | | 933 | | | 1021 | | | 890 | |
| Approach Delay, s/veh | | 45.7 | | | 54.3 | | | 47.6 | | | 31.6 | |
| Approach LOS | | D | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.3 | 41.0 | 7.5 | 50.6 | 8.8 | 46.5 | 19.1 | 39.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 9.9 | 39.1 | 5.1 | 44.7 | 6.8 | 42.2 | 15.0 | 34.8 |
| Max Q Clear Time (g_c+I1), s | 10.0 | 31.9 | 3.9 | 36.9 | 5.4 | 21.3 | 14.5 | 30.9 |
| Green Ext Time (p_c), s | 0.0 | 3.2 | 0.0 | 2.2 | 0.0 | 4.4 | 0.0 | 1.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 45.0 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 73 | 148 | 27 | 301 | 64 | 815 | 38 | 653 |
| Future Volume (vph) | 73 | 148 | 27 | 301 | 64 | 815 | 38 | 653 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 38.0 | 38.0 | 38.0 | 38.0 | 82.0 | 82.0 | 82.0 | 82.0 |
| Total Split (%) | 31.7% | 31.7% | 31.7% | 31.7% | 68.3% | 68.3% | 68.3% | 68.3% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 33.0 | 33.0 | 33.0 | 33.0 | 65.3 | 65.3 | 65.3 | 65.3 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.30 | 0.30 | 0.60 | 0.60 | 0.60 | 0.60 |
| v/c Ratio | 0.68 | 0.42 | 0.11 | 0.81 | 0.33 | 0.94 | 0.52 | 0.74 |
| Control Delay (s/veh) | 67.0 | 34.4 | 33.3 | 50.2 | 14.9 | 37.2 | 37.1 | 20.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 67.0 | 34.4 | 33.3 | 50.2 | 14.9 | 37.2 | 37.1 | 20.2 |
| LOS | E | C | C | D | B | D | D | C |
| Approach Delay (s/veh) | | 43.5 | | 49.0 | | 35.6 | | 21.1 |
| Approach LOS | | D | | D | | D | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.3 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay (s/veh): 34.3 | Intersection LOS: C |
| Intersection Capacity Utilization 98.7% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 24: Grove Av. & Chino Av.

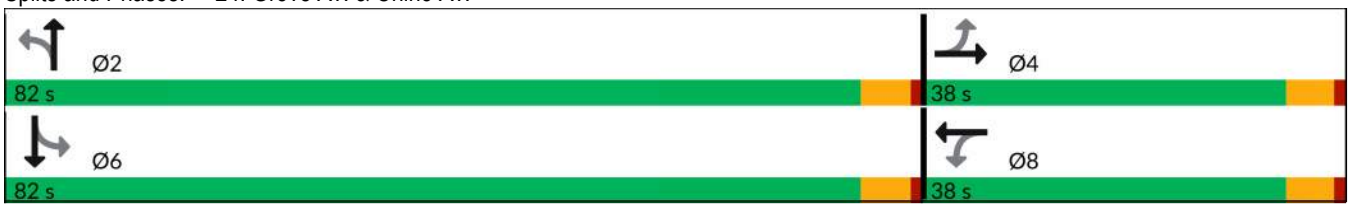

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 73 | 148 | 43 | 27 | 301 | 63 | 64 | 815 | 34 | 38 | 653 | 13 |
| Future Volume (veh/h) | 73 | 148 | 43 | 27 | 301 | 63 | 64 | 815 | 34 | 38 | 653 | 13 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 85 | 172 | 38 | 31 | 350 | 50 | 74 | 948 | 28 | 44 | 759 | 15 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 142 | 410 | 91 | 291 | 442 | 63 | 279 | 1047 | 31 | 139 | 1058 | 21 |
| Arrive On Green | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 |
| Sat Flow, veh/h | 985 | 1406 | 311 | 1172 | 1513 | 216 | 696 | 1712 | 51 | 576 | 1731 | 34 |
| Grp Volume(v), veh/h | 85 | 0 | 210 | 31 | 0 | 400 | 74 | 0 | 976 | 44 | 0 | 774 |
| Grp Sat Flow(s),veh/h/ln | 985 | 0 | 1716 | 1172 | 0 | 1730 | 696 | 0 | 1763 | 576 | 0 | 1765 |
| Q Serve(g_s), s | 8.8 | 0.0 | 11.0 | 2.4 | 0.0 | 23.8 | 9.2 | 0.0 | 53.8 | 8.0 | 0.0 | 33.9 |
| Cycle Q Clear(g_c), s | 32.6 | 0.0 | 11.0 | 13.5 | 0.0 | 23.8 | 43.1 | 0.0 | 53.8 | 61.9 | 0.0 | 33.9 |
| Prop In Lane | 1.00 | | 0.18 | 1.00 | | 0.13 | 1.00 | | 0.03 | 1.00 | | 0.02 |
| Lane Grp Cap(c), veh/h | 142 | 0 | 501 | 291 | 0 | 505 | 279 | 0 | 1078 | 139 | 0 | 1079 |
| V/C Ratio(X) | 0.60 | 0.00 | 0.42 | 0.11 | 0.00 | 0.79 | 0.27 | 0.00 | 0.91 | 0.32 | 0.00 | 0.72 |
| Avail Cap(c_a), veh/h | 142 | 0 | 501 | 291 | 0 | 505 | 331 | 0 | 1209 | 182 | 0 | 1210 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.8 | 0.0 | 31.9 | 37.4 | 0.0 | 36.4 | 29.9 | 0.0 | 18.9 | 45.8 | 0.0 | 15.0 |
| Incr Delay (d2), s/veh | 6.7 | 0.0 | 0.6 | 0.2 | 0.0 | 8.4 | 0.5 | 0.0 | 9.2 | 1.3 | 0.0 | 1.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.6 | 0.0 | 4.4 | 0.7 | 0.0 | 10.5 | 1.5 | 0.0 | 21.3 | 1.2 | 0.0 | 12.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 58.6 | 0.0 | 32.5 | 37.5 | 0.0 | 44.9 | 30.4 | 0.0 | 28.1 | 47.1 | 0.0 | 16.8 |
| LnGrp LOS | E | | C | D | | D | C | | C | D | | B |
| Approach Vol, veh/h | | 295 | | | 431 | | | 1050 | | | 818 | |
| Approach Delay, s/veh | | 40.0 | | | 44.3 | | | 28.2 | | | 18.5 | |
| Approach LOS | | D | | | D | | | C | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 73.7 | 38.0 | 73.7 | 38.0 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 76.6 | 32.6 | 76.6 | 32.6 |
| Max Q Clear Time (g_c+I1), s | 55.8 | 34.6 | 63.9 | 25.8 |
| Green Ext Time (p_c), s | 7.9 | 0.0 | 4.4 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.2 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 38 | 67 | 12 | 123 | 59 | 860 | 23 | 657 |
| Future Volume (vph) | 38 | 67 | 12 | 123 | 59 | 860 | 23 | 657 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 96.6 | 96.6 | 96.6 | 96.6 |
| Total Split (%) | 19.5% | 19.5% | 19.5% | 19.5% | 80.5% | 80.5% | 80.5% | 80.5% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 5.4 | | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 16.0 | | 16.0 | | 69.2 | | 69.2 |
| Actuated g/C Ratio | | 0.17 | | 0.17 | | 0.71 | | 0.71 |
| v/c Ratio | | 0.66 | | 0.64 | | 0.92 | | 0.67 |
| Control Delay (s/veh) | | 56.9 | | 52.5 | | 25.0 | | 10.3 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 56.9 | | 52.5 | | 25.0 | | 10.3 |
| LOS | | E | | D | | C | | B |
| Approach Delay (s/veh) | | 56.9 | | 52.5 | | 25.0 | | 10.3 |
| Approach LOS | | E | | D | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 96.8 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.92 | |
| Intersection Signal Delay (s/veh): 23.9 | Intersection LOS: C |
| Intersection Capacity Utilization 102.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 25: Grove Av. & Schaefer Av.

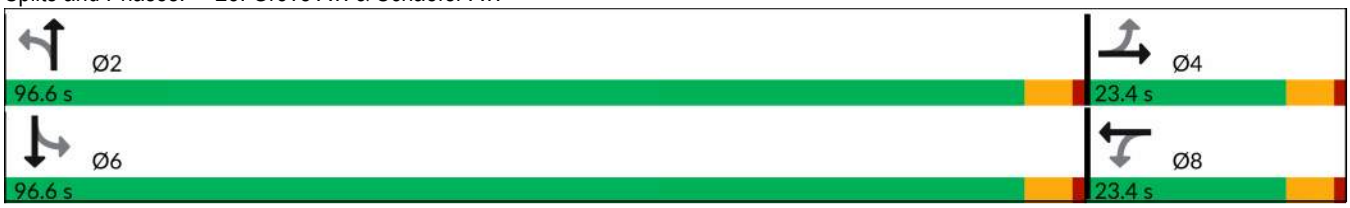

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 38 | 67 | 19 | 12 | 123 | 23 | 59 | 860 | 6 | 23 | 657 | 25 |
| Future Volume (veh/h) | 38 | 67 | 19 | 12 | 123 | 23 | 59 | 860 | 6 | 23 | 657 | 25 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 43 | 76 | 22 | 14 | 140 | 26 | 67 | 977 | 7 | 26 | 747 | 28 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 121 | 149 | 37 | 66 | 202 | 36 | 104 | 1108 | 8 | 72 | 1139 | 42 |
| Arrive On Green | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 |
| Sat Flow, veh/h | 361 | 1028 | 257 | 67 | 1393 | 247 | 70 | 1588 | 11 | 25 | 1633 | 60 |
| Grp Volume(v), veh/h | 141 | 0 | 0 | 180 | 0 | 0 | 1051 | 0 | 0 | 801 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1646 | 0 | 0 | 1707 | 0 | 0 | 1668 | 0 | 0 | 1718 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 16.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 5.3 | 0.0 | 0.0 | 6.9 | 0.0 | 0.0 | 34.1 | 0.0 | 0.0 | 17.3 | 0.0 | 0.0 |
| Prop In Lane | 0.30 | | 0.16 | 0.08 | | 0.14 | 0.06 | | 0.01 | 0.03 | | 0.03 |
| Lane Grp Cap(c), veh/h | 307 | 0 | 0 | 304 | 0 | 0 | 1220 | 0 | 0 | 1253 | 0 | 0 |
| V/C Ratio(X) | 0.46 | 0.00 | 0.00 | 0.59 | 0.00 | 0.00 | 0.86 | 0.00 | 0.00 | 0.64 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 485 | 0 | 0 | 500 | 0 | 0 | 2234 | 0 | 0 | 2291 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 27.4 | 0.0 | 0.0 | 28.0 | 0.0 | 0.0 | 8.0 | 0.0 | 0.0 | 5.8 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.1 | 0.0 | 0.0 | 1.8 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 0.0 | 0.0 | 2.7 | 0.0 | 0.0 | 6.3 | 0.0 | 0.0 | 3.4 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 28.4 | 0.0 | 0.0 | 29.9 | 0.0 | 0.0 | 9.9 | 0.0 | 0.0 | 6.3 | 0.0 | 0.0 |
| LnGrp LOS | C | | | C | | | A | | | A | | |
| Approach Vol, veh/h | | 141 | | | 180 | | | 1051 | | | 801 | |
| Approach Delay, s/veh | | 28.4 | | | 29.9 | | | 9.9 | | | 6.3 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 53.3 | 15.4 | 53.3 | 15.4 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 91.2 | 18.0 | 91.2 | 18.0 |
| Max Q Clear Time (g_c+I1), s | 36.1 | 7.3 | 19.3 | 8.9 |
| Green Ext Time (p_c), s | 11.9 | 0.4 | 6.8 | 0.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 11.4 |
| HCM 7th LOS | B |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 250 | 777 | 203 | 179 | 914 | 278 | 252 | 388 | 208 | 364 |
| Future Volume (vph) | 250 | 777 | 203 | 179 | 914 | 278 | 252 | 388 | 208 | 364 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 23.0 | 30.8 | 30.8 | 21.2 | 29.0 | 29.0 | 23.0 | 46.0 | 22.0 | 45.0 |
| Total Split (%) | 19.2% | 25.7% | 25.7% | 17.7% | 24.2% | 24.2% | 19.2% | 38.3% | 18.3% | 37.5% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 18.4 | 25.0 | 25.0 | 16.6 | 23.2 | 23.2 | 18.4 | 40.6 | 17.4 | 39.6 |
| Actuated g/C Ratio | 0.15 | 0.21 | 0.21 | 0.14 | 0.19 | 0.19 | 0.15 | 0.34 | 0.15 | 0.33 |
| v/c Ratio | 1.17 | 0.80 | 0.47 | 0.93 | 1.02 | 0.58 | 1.18 | 1.18 | 1.03 | 1.13 |
| Control Delay (s/veh) | 157.5 | 51.6 | 8.4 | 97.1 | 80.0 | 9.2 | 160.2 | 133.2 | 118.0 | 115.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 157.5 | 51.6 | 8.4 | 97.1 | 80.0 | 9.2 | 160.2 | 133.2 | 118.0 | 115.7 |
| LOS | F | D | A | F | F | A | F | F | F | F |
| Approach Delay (s/veh) | | 65.9 | | | 67.9 | | | 141.1 | | 116.4 |
| Approach LOS | | E | | | E | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.18 | |
| Intersection Signal Delay (s/veh): 91.0 | Intersection LOS: F |
| Intersection Capacity Utilization 99.7% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

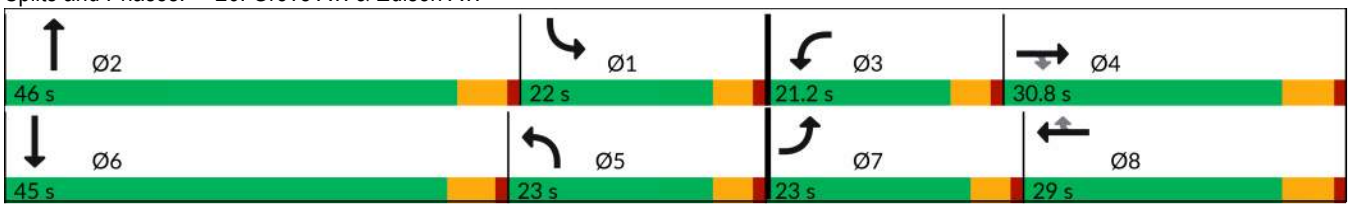

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 250 | 777 | 203 | 179 | 914 | 278 | 252 | 388 | 216 | 208 | 364 | 198 |
| Future Volume (veh/h) | 250 | 777 | 203 | 179 | 914 | 278 | 252 | 388 | 216 | 208 | 364 | 198 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 284 | 883 | 117 | 203 | 1039 | 168 | 286 | 441 | 131 | 236 | 414 | 123 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 244 | 1107 | 313 | 220 | 1028 | 290 | 250 | 444 | 132 | 231 | 427 | 127 |
| Arrive On Green | 0.23 | 0.31 | 0.31 | 0.21 | 0.29 | 0.29 | 0.24 | 0.51 | 0.51 | 0.22 | 0.49 | 0.49 |
| Sat Flow, veh/h | 1594 | 5316 | 1502 | 1594 | 5316 | 1502 | 1594 | 1312 | 390 | 1594 | 1308 | 388 |
| Grp Volume(v), veh/h | 284 | 883 | 117 | 203 | 1039 | 168 | 286 | 0 | 572 | 236 | 0 | 537 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1502 | 1594 | 1772 | 1502 | 1594 | 0 | 1702 | 1594 | 0 | 1696 |
| Q Serve(g_s), s | 18.4 | 18.3 | 5.0 | 15.0 | 23.2 | 8.2 | 18.8 | 0.0 | 40.1 | 17.4 | 0.0 | 36.9 |
| Cycle Q Clear(g_c), s | 18.4 | 18.3 | 5.0 | 15.0 | 23.2 | 8.2 | 18.8 | 0.0 | 40.1 | 17.4 | 0.0 | 36.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.23 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 244 | 1107 | 313 | 220 | 1028 | 290 | 250 | 0 | 576 | 231 | 0 | 554 |
| V/C Ratio(X) | 1.16 | 0.80 | 0.37 | 0.92 | 1.01 | 0.58 | 1.14 | 0.00 | 0.99 | 1.02 | 0.00 | 0.97 |
| Avail Cap(c_a), veh/h | 244 | 1107 | 313 | 220 | 1028 | 290 | 250 | 0 | 576 | 231 | 0 | 560 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.2 | 38.9 | 16.8 | 46.9 | 42.6 | 19.5 | 45.9 | 0.0 | 29.4 | 47.0 | 0.0 | 30.1 |
| Incr Delay (d2), s/veh | 108.5 | 4.2 | 0.7 | 39.4 | 30.8 | 2.8 | 101.1 | 0.0 | 35.8 | 64.8 | 0.0 | 30.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.8 | 7.3 | 2.5 | 7.8 | 11.9 | 2.8 | 13.6 | 0.0 | 18.5 | 10.3 | 0.0 | 16.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 154.7 | 43.1 | 17.6 | 86.3 | 73.4 | 22.4 | 147.0 | 0.0 | 65.2 | 111.7 | 0.0 | 60.4 |
| LnGrp LOS | F | D | B | F | F | C | F | | E | F | | E |
| Approach Vol, veh/h | | 1284 | | | 1410 | | | 858 | | | 773 | |
| Approach Delay, s/veh | | 65.5 | | | 69.2 | | | 92.4 | | | 76.1 | |
| Approach LOS | | E | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.0 | 46.0 | 21.2 | 30.8 | 23.4 | 44.6 | 23.0 | 29.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 17.4 | 40.6 | 16.6 | 25.0 | 18.4 | 39.6 | 18.4 | 23.2 |
| Max Q Clear Time (g_c+I1), s | 19.4 | 42.1 | 17.0 | 20.3 | 20.8 | 38.9 | 20.4 | 25.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 2.4 | 0.0 | 0.2 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 73.9 |
| HCM 7th LOS | E |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 14 | 113 | 3 | 261 | 2 | 48 | 354 | 66 |
| Future Volume (vph) | 14 | 113 | 3 | 261 | 2 | 48 | 354 | 66 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 57.0 | 57.0 | 57.0 | 57.0 | 63.0 | 63.0 | 63.0 | 63.0 |
| Total Split (%) | 47.5% | 47.5% | 47.5% | 47.5% | 52.5% | 52.5% | 52.5% | 52.5% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 5.4 | | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 37.6 | | 37.6 | | 39.9 | | 39.9 |
| Actuated g/C Ratio | | 0.42 | | 0.42 | | 0.45 | | 0.45 |
| v/c Ratio | | 0.20 | | 0.84 | | 0.07 | | 0.84 |
| Control Delay (s/veh) | | 19.4 | | 34.6 | | 15.7 | | 37.5 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 19.4 | | 34.6 | | 15.7 | | 37.5 |
| LOS | | B | | C | | B | | D |
| Approach Delay (s/veh) | | 19.4 | | 34.6 | | 15.7 | | 37.5 |
| Approach LOS | | B | | C | | B | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 89.5 | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 33.3 | Intersection LOS: C |
| Intersection Capacity Utilization 77.2% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 27: Grove Av. & Eucalyptus Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 14 | 113 | 3 | 3 | 261 | 307 | 2 | 48 | 2 | 354 | 66 | 34 |
| Future Volume (veh/h) | 14 | 113 | 3 | 3 | 261 | 307 | 2 | 48 | 2 | 354 | 66 | 34 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 15 | 120 | 3 | 3 | 278 | 327 | 2 | 51 | 2 | 377 | 70 | 36 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 102 | 671 | 16 | 57 | 327 | 381 | 64 | 657 | 25 | 536 | 81 | 42 |
| Arrive On Green | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 |
| Sat Flow, veh/h | 90 | 1528 | 36 | 2 | 745 | 869 | 14 | 1678 | 64 | 1112 | 207 | 106 |
| Grp Volume(v), veh/h | 138 | 0 | 0 | 608 | 0 | 0 | 55 | 0 | 0 | 483 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1654 | 0 | 0 | 1615 | 0 | 0 | 1756 | 0 | 0 | 1425 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 18.6 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 3.0 | 0.0 | 0.0 | 21.6 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 | 19.8 | 0.0 | 0.0 |
| Prop In Lane | 0.11 | | 0.02 | 0.00 | | 0.54 | 0.04 | | 0.04 | 0.78 | | 0.07 |
| Lane Grp Cap(c), veh/h | 789 | 0 | 0 | 766 | 0 | 0 | 746 | 0 | 0 | 658 | 0 | 0 |
| V/C Ratio(X) | 0.17 | 0.00 | 0.00 | 0.79 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.73 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1369 | 0 | 0 | 1364 | 0 | 0 | 1636 | 0 | 0 | 1381 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 10.9 | 0.0 | 0.0 | 16.1 | 0.0 | 0.0 | 12.2 | 0.0 | 0.0 | 17.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.0 | 0.0 | 6.8 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 5.5 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 11.0 | 0.0 | 0.0 | 18.0 | 0.0 | 0.0 | 12.2 | 0.0 | 0.0 | 19.3 | 0.0 | 0.0 |
| LnGrp LOS | B | | | B | | | B | | | B | | |
| Approach Vol, veh/h | | 138 | | | 608 | | | 55 | | | 483 | |
| Approach Delay, s/veh | | 11.0 | | | 18.0 | | | 12.2 | | | 19.3 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 30.3 | 33.4 | 30.3 | 33.4 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 57.6 | 51.6 | 57.6 | 51.6 |
| Max Q Clear Time (g_c+I1), s | 3.3 | 5.0 | 21.8 | 23.6 |
| Green Ext Time (p_c), s | 0.3 | 0.8 | 3.1 | 4.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.5 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 30 | 1277 | 1482 | 39 |
| Future Volume (vph) | 30 | 1277 | 1482 | 39 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 96.0 | 96.0 | 96.0 | 24.0 |
| Total Split (%) | 80.0% | 80.0% | 80.0% | 20.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | Min |
| Act Effct Green (s) | 91.5 | 91.5 | 91.5 | 9.8 |
| Actuated g/C Ratio | 0.83 | 0.83 | 0.83 | 0.09 |
| v/c Ratio | 0.55 | 0.50 | 1.13 | 0.48 |
| Control Delay (s/veh) | 44.3 | 3.9 | 81.1 | 38.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.3 | 3.9 | 81.1 | 38.1 |
| LOS | D | A | F | D |
| Approach Delay (s/veh) | | 4.8 | 81.1 | 38.1 |
| Approach LOS | | A | F | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 110.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.13 | |
| Intersection Signal Delay (s/veh): 45.5 | Intersection LOS: D |
| Intersection Capacity Utilization 96.7% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 28: Edison Av. & Parco Av.

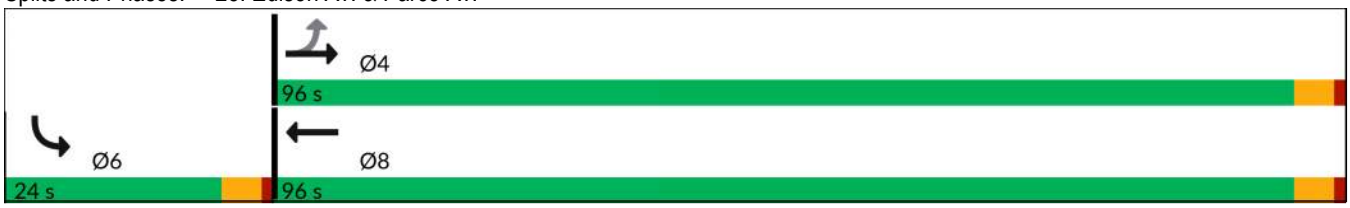

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 1277 | 1482 | 30 | 39 | 39 |
| Future Volume (veh/h) | 30 | 1277 | 1482 | 30 | 39 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 33 | 1388 | 1611 | 33 | 42 | 42 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 66 | 2838 | 1459 | 30 | 57 | 57 |
| Arrive On Green | 0.84 | 0.84 | 0.84 | 0.84 | 0.07 | 0.07 |
| Sat Flow, veh/h | 288 | 3455 | 1730 | 35 | 786 | 786 |
| Grp Volume(v), veh/h | 33 | 1388 | 0 | 1644 | 85 | 0 |
| Grp Sat Flow(s),veh/h/ln | 288 | 1683 | 0 | 1766 | 1591 | 0 |
| Q Serve(g_s), s | 0.0 | 11.9 | 0.0 | 91.4 | 5.7 | 0.0 |
| Cycle Q Clear(g_c), s | 91.4 | 11.9 | 0.0 | 91.4 | 5.7 | 0.0 |
| Prop In Lane | 1.00 | | | 0.02 | 0.49 | 0.49 |
| Lane Grp Cap(c), veh/h | 66 | 2838 | 0 | 1489 | 115 | 0 |
| V/C Ratio(X) | 0.50 | 0.49 | 0.00 | 1.10 | 0.74 | 0.00 |
| Avail Cap(c_a), veh/h | 66 | 2838 | 0 | 1489 | 285 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 54.2 | 2.3 | 0.0 | 8.5 | 49.3 | 0.0 |
| Incr Delay (d2), s/veh | 5.6 | 0.1 | 0.0 | 57.5 | 9.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 1.7 | 0.0 | 37.2 | 2.5 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 59.8 | 2.4 | 0.0 | 66.0 | 58.4 | 0.0 |
| LnGrp LOS | E | A | | F | E | |
| Approach Vol, veh/h | | 1421 | 1644 | | 85 | |
| Approach Delay, s/veh | | 3.7 | 66.0 | | 58.4 | |
| Approach LOS | | A | E | | E | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 96.0 | 12.4 | 96.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 91.4 | 19.4 | 91.4 |
| Max Q Clear Time (g_c+I1), s | 93.4 | 7.7 | 93.4 |
| Green Ext Time (p_c), s | 0.0 | 0.1 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 37.7 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 18 | 599 | 81 | 770 | 103 | 34 | 12 | 25 |
| Future Volume (vph) | 18 | 599 | 81 | 770 | 103 | 34 | 12 | 25 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 | 60.0 |
| Total Split (%) | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% | 50.0% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 21.7 | 21.7 | 21.7 | 21.7 | | 17.9 | | 17.9 |
| Actuated g/C Ratio | 0.42 | 0.42 | 0.42 | 0.42 | | 0.35 | | 0.35 |
| v/c Ratio | 0.10 | 0.53 | 0.37 | 0.62 | | 0.64 | | 0.16 |
| Control Delay (s/veh) | 12.2 | 12.8 | 16.9 | 14.2 | | 18.0 | | 8.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 12.2 | 12.8 | 16.9 | 14.2 | | 18.0 | | 8.0 |
| LOS | B | B | B | B | | B | | A |
| Approach Delay (s/veh) | | 12.8 | | 14.4 | | 18.0 | | 8.0 |
| Approach LOS | | B | | B | | B | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 51.2 | |
| Natural Cycle: 50 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.64 | |
| Intersection Signal Delay (s/veh): 14.2 | Intersection LOS: B |
| Intersection Capacity Utilization 70.4% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 29: Walker Av. & Riverside Dr.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 18 | 599 | 74 | 81 | 770 | 18 | 103 | 34 | 169 | 12 | 25 | 42 |
| Future Volume (veh/h) | 18 | 599 | 74 | 81 | 770 | 18 | 103 | 34 | 169 | 12 | 25 | 42 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 20 | 666 | 82 | 90 | 856 | 20 | 114 | 38 | 188 | 13 | 28 | 47 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 335 | 1364 | 168 | 379 | 1520 | 36 | 229 | 81 | 245 | 125 | 192 | 254 |
| Arrive On Green | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| Sat Flow, veh/h | 632 | 3017 | 371 | 713 | 3362 | 79 | 394 | 272 | 824 | 98 | 647 | 854 |
| Grp Volume(v), veh/h | 20 | 371 | 377 | 90 | 429 | 447 | 340 | 0 | 0 | 88 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 632 | 1683 | 1705 | 713 | 1683 | 1757 | 1490 | 0 | 0 | 1599 | 0 | 0 |
| Q Serve(g_s), s | 1.0 | 6.7 | 6.7 | 4.4 | 8.1 | 8.1 | 6.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 9.1 | 6.7 | 6.7 | 11.1 | 8.1 | 8.1 | 8.8 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.22 | 1.00 | | 0.04 | 0.34 | | 0.55 | 0.15 | | 0.53 |
| Lane Grp Cap(c), veh/h | 335 | 761 | 771 | 379 | 761 | 794 | 554 | 0 | 0 | 571 | 0 | 0 |
| V/C Ratio(X) | 0.06 | 0.49 | 0.49 | 0.24 | 0.56 | 0.56 | 0.61 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 850 | 2134 | 2161 | 961 | 2134 | 2227 | 1972 | 0 | 0 | 2034 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 12.0 | 8.3 | 8.3 | 12.2 | 8.7 | 8.7 | 13.7 | 0.0 | 0.0 | 11.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.5 | 0.5 | 0.3 | 0.7 | 0.6 | 1.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 1.4 | 1.4 | 0.5 | 1.7 | 1.8 | 2.1 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 12.1 | 8.8 | 8.8 | 12.5 | 9.3 | 9.3 | 14.8 | 0.0 | 0.0 | 11.4 | 0.0 | 0.0 |
| LnGrp LOS | B | A | A | B | A | A | B | | | B | | |
| Approach Vol, veh/h | | 768 | | | 966 | | | 340 | | | 88 | |
| Approach Delay, s/veh | | 8.9 | | | 9.6 | | | 14.8 | | | 11.4 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.2 | 24.9 | 18.2 | 24.9 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 54.6 | 54.6 | 54.6 | 54.6 |
| Max Q Clear Time (g_c+I1), s | 10.8 | 11.1 | 3.7 | 13.1 |
| Green Ext Time (p_c), s | 2.0 | 4.7 | 0.6 | 6.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 10.2 |
| HCM 7th LOS | B |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 178 | 1087 | 163 | 187 | 1007 | 232 | 547 | 397 | 100 | 192 | 89 |
| Future Volume (vph) | 178 | 1087 | 163 | 187 | 1007 | 232 | 547 | 397 | 100 | 192 | 89 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.4 | 30.5 | 30.5 | 8.8 | 31.9 | 7.8 | 25.6 | 25.6 | 6.4 | 24.3 | 24.3 |
| Actuated g/C Ratio | 0.08 | 0.34 | 0.34 | 0.10 | 0.35 | 0.09 | 0.28 | 0.28 | 0.07 | 0.27 | 0.27 |
| v/c Ratio | 0.78 | 0.70 | 0.28 | 0.70 | 0.74 | 0.98 | 0.42 | 0.78 | 0.51 | 0.22 | 0.20 |
| Control Delay (s/veh) | 68.2 | 29.2 | 5.2 | 58.2 | 28.7 | 99.0 | 27.2 | 29.7 | 55.7 | 26.3 | 6.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 68.2 | 29.2 | 5.2 | 58.2 | 28.7 | 99.0 | 27.2 | 29.7 | 55.7 | 26.3 | 6.2 |
| LOS | E | C | A | E | C | F | C | C | E | C | A |
| Approach Delay (s/veh) | | 31.3 | | | 32.7 | | 42.2 | | | 29.3 | |
| Approach LOS | | C | | | C | | D | | | C | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 90.6
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay (s/veh): 34.5 — Intersection LOS: C
Intersection Capacity Utilization 64.5% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

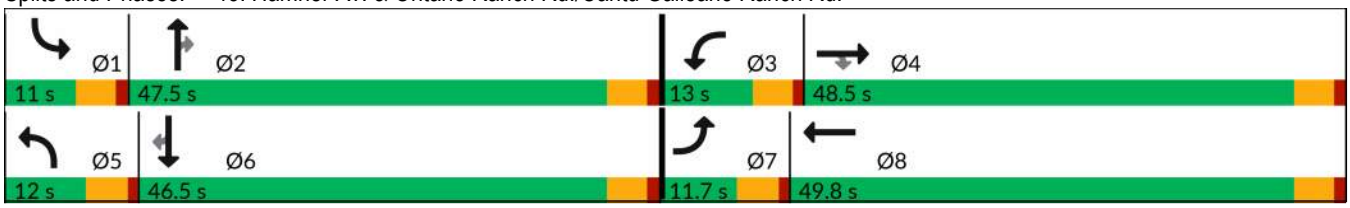

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 178 | 1087 | 163 | 187 | 1007 | 191 | 232 | 547 | 397 | 100 | 192 | 89 |
| Future Volume (veh/h) | 178 | 1087 | 163 | 187 | 1007 | 191 | 232 | 547 | 397 | 100 | 192 | 89 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 185 | 1132 | 116 | 195 | 1049 | 188 | 242 | 570 | 181 | 104 | 200 | 81 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 259 | 1760 | 546 | 271 | 1518 | 272 | 317 | 1012 | 313 | 184 | 551 | 246 |
| Arrive On Green | 0.09 | 0.36 | 0.36 | 0.09 | 0.37 | 0.37 | 0.11 | 0.21 | 0.21 | 0.06 | 0.16 | 0.16 |
| Sat Flow, veh/h | 2910 | 4837 | 1502 | 2910 | 4126 | 738 | 2910 | 4837 | 1497 | 2910 | 3367 | 1502 |
| Grp Volume(v), veh/h | 185 | 1132 | 116 | 195 | 820 | 417 | 242 | 570 | 181 | 104 | 200 | 81 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1502 | 1455 | 1612 | 1639 | 1455 | 1612 | 1497 | 1455 | 1683 | 1502 |
| Q Serve(g_s), s | 4.2 | 13.2 | 3.6 | 4.4 | 14.6 | 14.7 | 5.5 | 7.2 | 7.4 | 2.4 | 3.6 | 3.2 |
| Cycle Q Clear(g_c), s | 4.2 | 13.2 | 3.6 | 4.4 | 14.6 | 14.7 | 5.5 | 7.2 | 7.4 | 2.4 | 3.6 | 3.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.45 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 259 | 1760 | 546 | 271 | 1187 | 603 | 317 | 1012 | 313 | 184 | 551 | 246 |
| V/C Ratio(X) | 0.72 | 0.64 | 0.21 | 0.72 | 0.69 | 0.69 | 0.76 | 0.56 | 0.58 | 0.57 | 0.36 | 0.33 |
| Avail Cap(c_a), veh/h | 304 | 3124 | 970 | 360 | 2144 | 1090 | 317 | 3053 | 945 | 274 | 2075 | 926 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.1 | 18.0 | 14.9 | 30.0 | 18.2 | 18.2 | 29.4 | 24.1 | 24.2 | 30.9 | 25.3 | 25.1 |
| Incr Delay (d2), s/veh | 4.7 | 0.4 | 0.2 | 2.6 | 0.7 | 1.4 | 9.5 | 0.5 | 1.7 | 1.0 | 0.4 | 0.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 4.0 | 1.0 | 1.5 | 4.5 | 4.7 | 2.1 | 2.4 | 2.4 | 0.8 | 1.3 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.8 | 18.4 | 15.1 | 32.6 | 18.9 | 19.7 | 39.0 | 24.6 | 25.9 | 31.9 | 25.7 | 25.9 |
| LnGrp LOS | C | B | B | C | B | B | D | C | C | C | C | C |
| Approach Vol, veh/h | | 1433 | | | 1432 | | | 993 | | | 385 | |
| Approach Delay, s/veh | | 20.2 | | | 21.0 | | | 28.3 | | | 27.4 | |
| Approach LOS | | C | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.9 | 18.8 | 10.9 | 29.3 | 12.0 | 15.7 | 10.6 | 29.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 4.4 | 9.4 | 6.4 | 15.2 | 7.5 | 5.6 | 6.2 | 16.7 |
| Green Ext Time (p_c), s | 0.0 | 4.3 | 0.1 | 8.4 | 0.0 | 1.4 | 0.0 | 8.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 23.0 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 588 | 131 | 224 | 350 | 268 | 135 | 1150 | 399 | 357 | 904 | 142 |
| Future Volume (vph) | 138 | 588 | 131 | 224 | 350 | 268 | 135 | 1150 | 399 | 357 | 904 | 142 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 65.0 | 14.7 | 37.0 | 37.0 | 18.0 | 40.3 | 40.3 |
| Total Split (%) | 54.2% | 54.2% | 54.2% | 54.2% | 54.2% | 54.2% | 12.3% | 30.8% | 30.8% | 15.0% | 33.6% | 33.6% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 57.8 | 57.8 | 57.8 | 57.8 | 57.8 | 57.8 | 10.0 | 30.5 | 30.5 | 13.3 | 33.8 | 33.8 |
| Actuated g/C Ratio | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.08 | 0.25 | 0.25 | 0.11 | 0.28 | 0.28 |
| v/c Ratio | 0.42 | 0.75 | 0.18 | 1.35 | 0.45 | 0.34 | 0.61 | 1.02 | 0.92 | 1.14 | 0.72 | 0.29 |
| Control Delay (s/veh) | 24.7 | 32.2 | 3.4 | 218.4 | 22.7 | 3.9 | 64.7 | 75.4 | 57.4 | 140.3 | 42.6 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 24.7 | 32.2 | 3.4 | 218.4 | 22.7 | 3.9 | 64.7 | 75.4 | 57.4 | 140.3 | 42.6 | 6.6 |
| LOS | C | C | A | F | C | A | E | E | E | F | D | A |
| Approach Delay (s/veh) | | 26.6 | | | 68.7 | | | 70.3 | | | 63.8 | |
| Approach LOS | | C | | | E | | | E | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.35 | |
| Intersection Signal Delay (s/veh): 60.3 | Intersection LOS: E |
| Intersection Capacity Utilization 102.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 138 | 588 | 131 | 224 | 350 | 268 | 135 | 1150 | 399 | 357 | 904 | 142 |
| Future Volume (veh/h) | 138 | 588 | 131 | 224 | 350 | 268 | 135 | 1150 | 399 | 357 | 904 | 142 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 150 | 639 | 84 | 243 | 380 | 182 | 147 | 1250 | 217 | 388 | 983 | 114 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 332 | 853 | 723 | 191 | 853 | 723 | 241 | 1229 | 382 | 343 | 1366 | 417 |
| Arrive On Green | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.48 | 0.08 | 0.25 | 0.25 | 0.11 | 0.28 | 0.28 |
| Sat Flow, veh/h | 801 | 1772 | 1501 | 690 | 1772 | 1502 | 2910 | 4837 | 1502 | 3092 | 4837 | 1478 |
| Grp Volume(v), veh/h | 150 | 639 | 84 | 243 | 380 | 182 | 147 | 1250 | 217 | 388 | 983 | 114 |
| Grp Sat Flow(s),veh/h/ln | 801 | 1772 | 1501 | 690 | 1772 | 1502 | 1455 | 1612 | 1502 | 1546 | 1612 | 1478 |
| Q Serve(g_s), s | 18.2 | 35.1 | 3.7 | 22.7 | 17.0 | 8.6 | 5.9 | 30.5 | 15.1 | 13.3 | 22.0 | 7.2 |
| Cycle Q Clear(g_c), s | 35.2 | 35.1 | 3.7 | 57.8 | 17.0 | 8.6 | 5.9 | 30.5 | 15.1 | 13.3 | 22.0 | 7.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 332 | 853 | 723 | 191 | 853 | 723 | 241 | 1229 | 382 | 343 | 1366 | 417 |
| V/C Ratio(X) | 0.45 | 0.75 | 0.12 | 1.28 | 0.45 | 0.25 | 0.61 | 1.02 | 0.57 | 1.13 | 0.72 | 0.27 |
| Avail Cap(c_a), veh/h | 332 | 853 | 723 | 191 | 853 | 723 | 243 | 1229 | 382 | 343 | 1366 | 417 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.1 | 25.2 | 17.1 | 52.2 | 20.5 | 18.3 | 53.2 | 44.8 | 39.0 | 53.3 | 38.8 | 33.5 |
| Incr Delay (d2), s/veh | 1.0 | 3.7 | 0.1 | 158.1 | 0.4 | 0.2 | 3.2 | 29.9 | 2.0 | 89.4 | 1.9 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 14.6 | 1.2 | 14.0 | 6.7 | 2.9 | 2.2 | 14.8 | 5.5 | 9.2 | 8.4 | 2.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 33.1 | 28.9 | 17.1 | 210.3 | 20.9 | 18.5 | 56.3 | 74.7 | 41.0 | 142.8 | 40.7 | 33.8 |
| LnGrp LOS | C | C | B | F | C | B | E | F | D | F | D | C |
| Approach Vol, veh/h | | 873 | | | 805 | | | 1614 | | | 1485 | |
| Approach Delay, s/veh | | 28.5 | | | 77.5 | | | 68.5 | | | 66.8 | |
| Approach LOS | | C | | | E | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.0 | 37.0 | | 65.0 | 14.6 | 40.4 | | 65.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 13.3 | 30.5 | | 57.8 | 10.0 | 33.8 | | 57.8 |
| Max Q Clear Time (g_c+I1), s | 15.3 | 32.5 | | 37.2 | 7.9 | 24.0 | | 59.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 5.2 | 0.0 | 4.4 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 62.2 |
| HCM 7th LOS | | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 339 | 649 | 108 | 60 | 464 | 220 | 143 | 961 | 62 | 470 | 794 | 254 |
| Future Volume (vph) | 339 | 649 | 108 | 60 | 464 | 220 | 143 | 961 | 62 | 470 | 794 | 254 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 17.0 | 55.0 | 55.0 | 15.2 | 53.2 | 53.2 | 14.7 | 40.8 | 15.2 | 19.0 | 45.1 | 17.0 |
| Total Split (%) | 13.1% | 42.3% | 42.3% | 11.7% | 40.9% | 40.9% | 11.3% | 31.4% | 11.7% | 14.6% | 34.7% | 13.1% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.8 | 31.9 | 31.9 | 10.3 | 23.0 | 23.0 | 10.1 | 34.6 | 51.4 | 14.4 | 39.0 | 56.5 |
| Actuated g/C Ratio | 0.14 | 0.29 | 0.29 | 0.09 | 0.21 | 0.21 | 0.09 | 0.31 | 0.46 | 0.13 | 0.35 | 0.51 |
| v/c Ratio | 0.85 | 0.68 | 0.23 | 0.43 | 0.67 | 0.49 | 1.06 | 0.92 | 0.08 | 1.28 | 0.67 | 0.32 |
| Control Delay (s/veh) | 66.0 | 39.1 | 6.3 | 61.0 | 44.5 | 10.2 | 140.6 | 52.1 | 0.2 | 184.9 | 35.6 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 66.0 | 39.1 | 6.3 | 61.0 | 44.5 | 10.2 | 140.6 | 52.1 | 0.2 | 184.9 | 35.6 | 5.6 |
| LOS | E | D | A | E | D | B | F | D | A | F | D | A |
| Approach Delay (s/veh) | | 44.2 | | | 35.7 | | | 60.3 | | | 76.8 | |
| Approach LOS | | D | | | D | | | E | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 130 | |
| Actuated Cycle Length: 111.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.28 | |
| Intersection Signal Delay (s/veh): 57.9 | Intersection LOS: E |
| Intersection Capacity Utilization 90.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

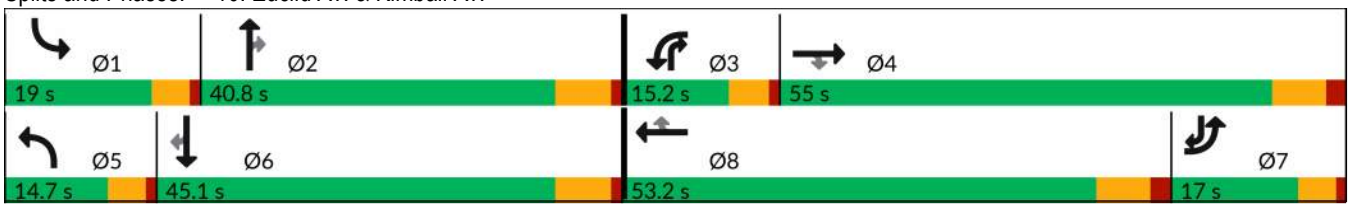

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 339 | 649 | 108 | 60 | 464 | 220 | 143 | 961 | 62 | 470 | 794 | 254 |
| Future Volume (veh/h) | 339 | 649 | 108 | 60 | 464 | 220 | 143 | 961 | 62 | 470 | 794 | 254 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 357 | 683 | 82 | 63 | 488 | 106 | 151 | 1012 | 39 | 495 | 836 | 141 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 383 | 848 | 355 | 130 | 598 | 253 | 156 | 1107 | 591 | 421 | 1256 | 724 |
| Arrive On Green | 0.19 | 0.36 | 0.36 | 0.12 | 0.25 | 0.25 | 0.15 | 0.47 | 0.47 | 0.21 | 0.53 | 0.53 |
| Sat Flow, veh/h | 3000 | 3544 | 1482 | 1594 | 3544 | 1502 | 1594 | 3544 | 1502 | 3000 | 3544 | 1502 |
| Grp Volume(v), veh/h | 357 | 683 | 82 | 63 | 488 | 106 | 151 | 1012 | 39 | 495 | 836 | 141 |
| Grp Sat Flow(s),veh/h/ln | 1500 | 1772 | 1482 | 1594 | 1772 | 1502 | 1594 | 1772 | 1502 | 1500 | 1772 | 1502 |
| Q Serve(g_s), s | 11.9 | 17.7 | 3.9 | 3.8 | 13.2 | 4.2 | 9.6 | 27.1 | 1.3 | 14.3 | 17.4 | 1.2 |
| Cycle Q Clear(g_c), s | 11.9 | 17.7 | 3.9 | 3.8 | 13.2 | 4.2 | 9.6 | 27.1 | 1.3 | 14.3 | 17.4 | 1.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 383 | 848 | 355 | 130 | 598 | 253 | 156 | 1107 | 591 | 421 | 1256 | 724 |
| V/C Ratio(X) | 0.93 | 0.81 | 0.23 | 0.48 | 0.82 | 0.42 | 0.97 | 0.91 | 0.07 | 1.18 | 0.67 | 0.19 |
| Avail Cap(c_a), veh/h | 383 | 1662 | 695 | 164 | 1599 | 678 | 156 | 1193 | 628 | 421 | 1346 | 762 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 40.8 | 30.5 | 26.1 | 42.7 | 36.6 | 16.2 | 43.3 | 25.8 | 14.8 | 40.2 | 19.5 | 3.1 |
| Incr Delay (d2), s/veh | 29.2 | 1.9 | 0.3 | 2.8 | 1.1 | 0.4 | 61.2 | 10.4 | 0.0 | 101.5 | 1.1 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.4 | 6.3 | 1.3 | 1.5 | 5.0 | 2.0 | 6.0 | 9.6 | 0.4 | 10.4 | 5.4 | 0.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 70.0 | 32.4 | 26.5 | 45.5 | 37.6 | 16.6 | 104.5 | 36.3 | 14.8 | 141.7 | 20.6 | 3.2 |
| LnGrp LOS | E | C | C | D | D | B | F | D | B | F | C | A |
| Approach Vol, veh/h | | 1122 | | | 657 | | | 1202 | | | 1472 | |
| Approach Delay, s/veh | | 43.9 | | | 35.0 | | | 44.1 | | | 59.7 | |
| Approach LOS | | D | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.0 | 38.3 | 13.0 | 31.6 | 14.7 | 42.6 | 20.2 | 24.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 7.2 | * 7.2 |
| Max Green Setting (Gmax), s | 14.3 | 34.3 | 10.5 | 47.8 | 10.0 | * 39 | 12.3 | * 46 |
| Max Q Clear Time (g_c+I1), s | 16.3 | 29.1 | 5.8 | 19.7 | 11.6 | 19.4 | 13.9 | 15.2 |
| Green Ext Time (p_c), s | 0.0 | 2.8 | 0.0 | 4.7 | 0.0 | 5.3 | 0.0 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 47.9 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 49 | 357 | 603 | 261 | 55 | 800 | 994 | 124 | 654 |
| Future Volume (vph) | 49 | 357 | 603 | 261 | 55 | 800 | 994 | 124 | 654 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 27.0 | 42.0 | 53.3 | 14.7 | 36.3 | 42.0 | 14.7 | 36.3 |
| Total Split (%) | 13.1% | 22.5% | 35.0% | 44.4% | 12.3% | 30.3% | 35.0% | 12.3% | 30.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 19.4 | 36.3 | 48.9 | 10.0 | 29.8 | 72.6 | 10.0 | 32.8 |
| Actuated g/C Ratio | 0.08 | 0.16 | 0.30 | 0.41 | 0.08 | 0.25 | 0.61 | 0.08 | 0.27 |
| v/c Ratio | 0.40 | 0.84 | 0.74 | 0.56 | 0.45 | 1.03 | 1.13 | 1.01 | 0.80 |
| Control Delay (s/veh) | 61.8 | 61.6 | 43.4 | 30.4 | 63.8 | 82.8 | 96.8 | 135.7 | 49.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.8 | 61.6 | 43.4 | 30.4 | 63.8 | 82.8 | 96.8 | 135.7 | 49.0 |
| LOS | E | E | D | C | E | F | F | F | D |
| Approach Delay (s/veh) | | 61.6 | | 38.5 | | 89.8 | | | 62.3 |
| Approach LOS | | E | | D | | F | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.4 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.13 | |
| Intersection Signal Delay (s/veh): 69.0 | Intersection LOS: E |
| Intersection Capacity Utilization 100.5% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

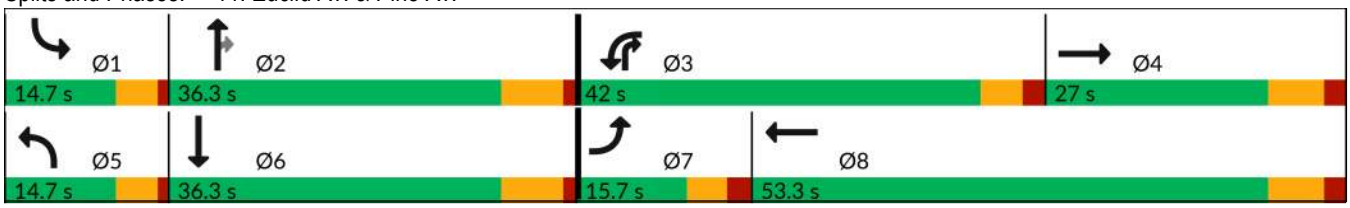

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 49 | 357 | 67 | 603 | 261 | 102 | 55 | 800 | 994 | 124 | 654 | 30 |
| Future Volume (veh/h) | 49 | 357 | 67 | 603 | 261 | 102 | 55 | 800 | 994 | 124 | 654 | 30 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1575 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 53 | 384 | 0 | 648 | 281 | 56 | 59 | 860 | 585 | 133 | 703 | 32 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 120 | 485 | | 714 | 451 | 90 | 125 | 962 | 797 | 153 | 994 | 45 |
| Arrive On Green | 0.08 | 0.14 | 0.00 | 0.25 | 0.31 | 0.31 | 0.08 | 0.29 | 0.29 | 0.10 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1594 | 3455 | 0 | 2910 | 1435 | 286 | 1594 | 3367 | 1502 | 1594 | 3279 | 149 |
| Grp Volume(v), veh/h | 53 | 384 | 0 | 648 | 0 | 337 | 59 | 860 | 585 | 133 | 361 | 374 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 0 | 1455 | 0 | 1720 | 1594 | 1683 | 1502 | 1594 | 1683 | 1745 |
| Q Serve(g_s), s | 3.3 | 11.5 | 0.0 | 22.6 | 0.0 | 17.4 | 3.7 | 25.6 | 29.8 | 8.6 | 19.8 | 19.9 |
| Cycle Q Clear(g_c), s | 3.3 | 11.5 | 0.0 | 22.6 | 0.0 | 17.4 | 3.7 | 25.6 | 29.8 | 8.6 | 19.8 | 19.9 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.17 | 1.00 | | 1.00 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 120 | 485 | | 714 | 0 | 541 | 125 | 962 | 797 | 153 | 510 | 529 |
| V/C Ratio(X) | 0.44 | 0.79 | | 0.91 | 0.00 | 0.62 | 0.47 | 0.89 | 0.73 | 0.87 | 0.71 | 0.71 |
| Avail Cap(c_a), veh/h | 153 | 645 | | 1013 | 0 | 764 | 153 | 962 | 797 | 153 | 510 | 529 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.1 | 43.1 | 0.0 | 38.2 | 0.0 | 30.5 | 46.0 | 35.8 | 18.8 | 46.5 | 32.3 | 32.3 |
| Incr Delay (d2), s/veh | 1.0 | 5.8 | 0.0 | 7.1 | 0.0 | 1.7 | 1.0 | 10.5 | 3.1 | 37.0 | 3.8 | 3.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 5.0 | 0.0 | 8.2 | 0.0 | 7.0 | 1.4 | 11.0 | 10.1 | 4.8 | 8.0 | 8.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 47.1 | 49.0 | 0.0 | 45.4 | 0.0 | 32.2 | 47.0 | 46.2 | 21.9 | 83.5 | 36.1 | 36.0 |
| LnGrp LOS | D | D | | D | | C | D | D | C | F | D | D |
| Approach Vol, veh/h | | 437 | | | 985 | | | 1504 | | | 868 | |
| Approach Delay, s/veh | | 48.7 | | | 40.9 | | | 36.8 | | | 43.3 | |
| Approach LOS | | D | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 36.3 | 31.3 | 22.0 | 12.9 | 38.1 | 13.5 | 39.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 29.8 | 36.3 | 20.0 | 10.0 | 29.8 | 10.0 | 46.3 |
| Max Q Clear Time (g_c+I1), s | 10.6 | 31.8 | 24.6 | 13.5 | 5.7 | 21.9 | 5.3 | 19.4 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.0 | 1.5 | 0.0 | 1.6 | 0.0 | 2.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 40.7 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 1340 | 40 | 0 | 873 | 61 | 30 | 0 | 0 | 44 | 0 | 30 |
| Future Vol, veh/h | 40 | 1340 | 40 | 0 | 873 | 61 | 30 | 0 | 0 | 44 | 0 | 30 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 43 | 1457 | 43 | 0 | 949 | 66 | 33 | 0 | 0 | 48 | 0 | 33 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1015 | 0 | 0 | 1500 | 0 | 0 | 2040 | 2580 | 750 | 1797 | 2569 | 508 |
| Stage 1 | - | - | - | - | - | - | 1565 | 1565 | - | 982 | 982 | - |
| Stage 2 | - | - | - | - | - | - | 474 | 1015 | - | 815 | 1587 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6 | 5.54 | - | 6 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6 | 5.54 | - | 6 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 679 | - | - | 443 | - | - | 33 | 25 | 354 | 50 | 26 | 510 |
| Stage 1 | - | - | - | - | - | - | 147 | 170 | - | 310 | 325 | - |
| Stage 2 | - | - | - | - | - | - | 580 | 314 | - | 381 | 166 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 679 | - | - | 443 | - | - | ~ 27 | 22 | 354 | ~ 45 | 23 | 510 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 120 | 125 | - | 219 | 128 | - |
| Stage 1 | - | - | - | - | - | - | 131 | 152 | - | 310 | 325 | - |
| Stage 2 | - | - | - | - | - | - | 543 | 314 | - | 339 | 148 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.35 | 0 | 45.62 | 22.54 |
| HCM LOS | | | E | C |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 120 | 97 | - | - | 443 | - | - | 285 |
| HCM Lane V/C Ratio | 0.271 | 0.064 | - | - | - | - | - | 0.282 |
| HCM Control Delay (s/veh) | 45.6 | 10.7 | 1.1 | - | 0 | - | - | 22.5 |
| HCM Lane LOS | E | B | A | - | A | - | - | C |
| HCM 95th %tile Q(veh) | 1 | 0.2 | - | - | 0 | - | - | 1.1 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 40 | 804 | 47 | 676 | 39 | 45 | 7 | 26 |
| Future Volume (vph) | 40 | 804 | 47 | 676 | 39 | 45 | 7 | 26 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 89.0 | 89.0 | 89.0 | 89.0 | 31.0 | 31.0 | 31.0 | 31.0 |
| Total Split (%) | 74.2% | 74.2% | 74.2% | 74.2% | 25.8% | 25.8% | 25.8% | 25.8% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 39.0 | 39.0 | 39.0 | 39.0 | | 13.5 | | 13.5 |
| Actuated g/C Ratio | 0.61 | 0.61 | 0.61 | 0.61 | | 0.21 | | 0.21 |
| v/c Ratio | 0.10 | 0.83 | 0.25 | 0.35 | | 0.49 | | 0.18 |
| Control Delay (s/veh) | 5.7 | 17.4 | 9.1 | 6.4 | | 27.3 | | 18.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 5.7 | 17.4 | 9.1 | 6.4 | | 27.3 | | 18.4 |
| LOS | A | B | A | A | | C | | B |
| Approach Delay (s/veh) | | 16.9 | | 6.6 | | 27.3 | | 18.4 |
| Approach LOS | | B | | A | | C | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 64.3 | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 13.7 | Intersection LOS: B |
| Intersection Capacity Utilization 73.4% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 15: Bon View Av. & Riverside Dr.

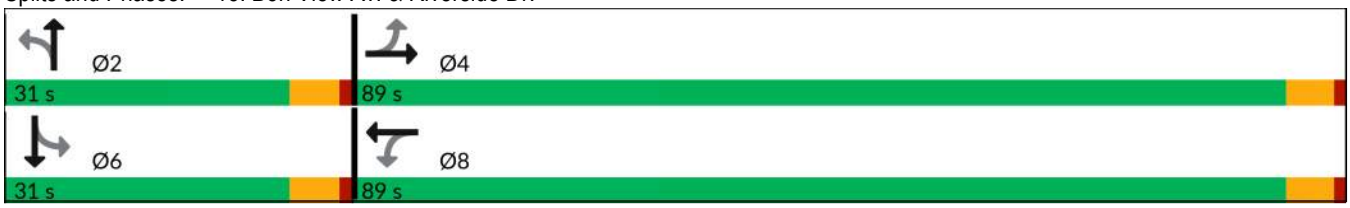

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 40 | 804 | 49 | 47 | 676 | 14 | 39 | 45 | 80 | 7 | 26 | 29 |
| Future Volume (veh/h) | 40 | 804 | 49 | 47 | 676 | 14 | 39 | 45 | 80 | 7 | 26 | 29 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 41 | 829 | 51 | 48 | 697 | 14 | 40 | 46 | 82 | 7 | 27 | 30 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 508 | 994 | 61 | 267 | 2033 | 41 | 132 | 105 | 143 | 90 | 148 | 141 |
| Arrive On Green | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| Sat Flow, veh/h | 738 | 1650 | 101 | 631 | 3373 | 68 | 240 | 558 | 761 | 67 | 788 | 754 |
| Grp Volume(v), veh/h | 41 | 0 | 880 | 48 | 348 | 363 | 168 | 0 | 0 | 64 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 738 | 0 | 1751 | 631 | 1683 | 1758 | 1559 | 0 | 0 | 1609 | 0 | 0 |
| Q Serve(g_s), s | 1.5 | 0.0 | 20.6 | 3.4 | 5.3 | 5.3 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 6.8 | 0.0 | 20.6 | 24.0 | 5.3 | 5.3 | 4.9 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.06 | 1.00 | | 0.04 | 0.24 | | 0.49 | 0.11 | | 0.47 |
| Lane Grp Cap(c), veh/h | 508 | 0 | 1055 | 267 | 1014 | 1059 | 379 | 0 | 0 | 379 | 0 | 0 |
| V/C Ratio(X) | 0.08 | 0.00 | 0.83 | 0.18 | 0.34 | 0.34 | 0.44 | 0.00 | 0.00 | 0.17 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1263 | 0 | 2846 | 912 | 2736 | 2857 | 852 | 0 | 0 | 866 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 6.8 | 0.0 | 8.2 | 17.8 | 5.1 | 5.1 | 19.0 | 0.0 | 0.0 | 17.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 1.8 | 0.3 | 0.2 | 0.2 | 0.8 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 4.3 | 0.4 | 1.0 | 1.0 | 1.6 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 6.9 | 0.0 | 10.0 | 18.1 | 5.3 | 5.3 | 19.8 | 0.0 | 0.0 | 17.9 | 0.0 | 0.0 |
| LnGrp LOS | A | | A | B | A | A | B | | | B | | |
| Approach Vol, veh/h | | 921 | | | 759 | | | 168 | | | 64 | |
| Approach Delay, s/veh | | 9.8 | | | 6.1 | | | 19.8 | | | 17.9 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.0 | 36.4 | 15.0 | 36.4 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 25.6 | 83.6 | 25.6 | 83.6 |
| Max Q Clear Time (g_c+I1), s | 6.9 | 22.6 | 3.7 | 26.0 |
| Green Ext Time (p_c), s | 0.8 | 8.1 | 0.2 | 5.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 9.5 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 65 | 1024 | 462 | 640 | 93 | 123 | 176 | 130 |
| Future Volume (vph) | 65 | 1024 | 462 | 640 | 93 | 123 | 176 | 130 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 15.5 | 37.0 | 32.0 | 53.5 | 18.4 | 35.0 | 16.0 | 32.6 |
| Total Split (%) | 12.9% | 30.8% | 26.7% | 44.6% | 15.3% | 29.2% | 13.3% | 27.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 8.9 | 31.2 | 27.4 | 51.7 | 24.3 | 29.6 | 11.4 | 16.7 |
| Actuated g/C Ratio | 0.07 | 0.26 | 0.23 | 0.43 | 0.20 | 0.25 | 0.10 | 0.14 |
| v/c Ratio | 0.57 | 0.93 | 1.31 | 0.53 | 0.30 | 1.16 | 1.20 | 0.70 |
| Control Delay (s/veh) | 71.3 | 55.2 | 196.6 | 27.1 | 45.4 | 125.4 | 181.8 | 61.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 71.3 | 55.2 | 196.6 | 27.1 | 45.4 | 125.4 | 181.8 | 61.2 |
| LOS | E | E | F | C | D | F | F | E |
| Approach Delay (s/veh) | | 56.1 | | 92.8 | | 113.1 | | 124.8 |
| Approach LOS | | E | | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.31 | |
| Intersection Signal Delay (s/veh): 86.1 | Intersection LOS: F |
| Intersection Capacity Utilization 110.7% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

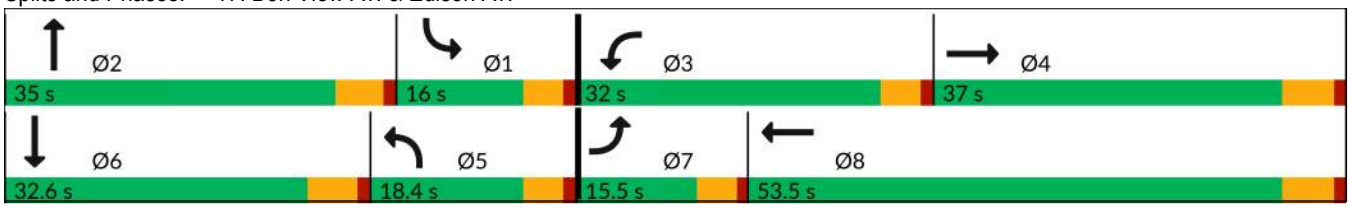

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 65 | 1024 | 146 | 462 | 640 | 89 | 93 | 123 | 388 | 176 | 130 | 28 |
| Future Volume (veh/h) | 65 | 1024 | 146 | 462 | 640 | 89 | 93 | 123 | 388 | 176 | 130 | 28 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 71 | 1113 | 105 | 502 | 696 | 21 | 101 | 134 | 259 | 191 | 141 | 8 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 89 | 1214 | 114 | 389 | 1476 | 45 | 408 | 134 | 260 | 162 | 171 | 10 |
| Arrive On Green | 0.08 | 0.38 | 0.38 | 0.35 | 0.65 | 0.65 | 0.36 | 0.37 | 0.37 | 0.14 | 0.15 | 0.15 |
| Sat Flow, veh/h | 1688 | 4784 | 451 | 1688 | 3422 | 103 | 1688 | 540 | 1044 | 1688 | 1661 | 94 |
| Grp Volume(v), veh/h | 71 | 824 | 394 | 502 | 360 | 357 | 101 | 0 | 393 | 191 | 0 | 149 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1772 | 1691 | 1688 | 1772 | 1753 | 1688 | 0 | 1584 | 1688 | 0 | 1755 |
| Q Serve(g_s), s | 4.9 | 26.3 | 26.4 | 27.4 | 12.3 | 12.3 | 5.0 | 0.0 | 29.5 | 11.4 | 0.0 | 9.8 |
| Cycle Q Clear(g_c), s | 4.9 | 26.3 | 26.4 | 27.4 | 12.3 | 12.3 | 5.0 | 0.0 | 29.5 | 11.4 | 0.0 | 9.8 |
| Prop In Lane | 1.00 | | 0.27 | 1.00 | | 0.06 | 1.00 | | 0.66 | 1.00 | | 0.05 |
| Lane Grp Cap(c), veh/h | 89 | 899 | 429 | 389 | 764 | 756 | 408 | 0 | 394 | 162 | 0 | 181 |
| V/C Ratio(X) | 0.80 | 0.92 | 0.92 | 1.29 | 0.47 | 0.47 | 0.25 | 0.00 | 1.00 | 1.18 | 0.00 | 0.82 |
| Avail Cap(c_a), veh/h | 155 | 929 | 443 | 389 | 764 | 756 | 408 | 0 | 394 | 162 | 0 | 401 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.2 | 35.7 | 35.7 | 38.9 | 14.1 | 14.1 | 30.4 | 0.0 | 37.3 | 50.9 | 0.0 | 49.3 |
| Incr Delay (d2), s/veh | 6.0 | 13.4 | 23.6 | 149.4 | 0.5 | 0.5 | 0.1 | 0.0 | 44.6 | 127.9 | 0.0 | 9.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 11.0 | 11.8 | 25.6 | 3.9 | 3.9 | 1.9 | 0.0 | 14.5 | 10.2 | 0.0 | 4.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 60.2 | 49.0 | 59.2 | 188.3 | 14.6 | 14.6 | 30.5 | 0.0 | 81.9 | 178.9 | 0.0 | 58.4 |
| LnGrp LOS | E | D | E | F | B | B | C | | F | F | | E |
| Approach Vol, veh/h | | 1289 | | | 1219 | | | 494 | | | 340 | |
| Approach Delay, s/veh | | 52.7 | | | 86.1 | | | 71.4 | | | 126.0 | |
| Approach LOS | | D | | | F | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.0 | 35.0 | 32.0 | 36.0 | 33.3 | 17.7 | 10.9 | 57.1 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.4 | 29.6 | 27.4 | 31.2 | 13.8 | 27.2 | 10.9 | 47.7 |
| Max Q Clear Time (g_c+I1), s | 13.4 | 31.5 | 29.4 | 28.4 | 7.0 | 11.8 | 6.9 | 14.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.8 | 0.1 | 0.6 | 0.0 | 4.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 75.1 |
| HCM 7th LOS | E |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 374 | 798 | 376 | 488 | 1074 |
| Future Volume (vph) | 3 | 374 | 798 | 376 | 488 | 1074 |
| Turn Type | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 32.2 | 24.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 35.8% | 35.8% | 26.7% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | |
| Recall Mode | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 22.2 | 22.2 | 25.5 | 25.5 | 24.7 | 55.2 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.28 | 0.28 | 0.27 | 0.61 |
| v/c Ratio | 0.69 | 0.89 | 0.87 | 0.56 | 1.16 | 0.54 |
| Control Delay (s/veh) | 38.9 | 46.5 | 41.6 | 6.3 | 111.9 | 25.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.0 |
| Total Delay (s/veh) | 38.9 | 46.5 | 41.6 | 6.3 | 111.9 | 27.0 |
| LOS | D | D | D | A | F | C |
| Approach Delay (s/veh) | 43.3 | | 30.2 | | | 53.6 |
| Approach LOS | D | | C | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.16 | |
| Intersection Signal Delay (s/veh): 43.5 | Intersection LOS: D |
| Intersection Capacity Utilization 110.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 273 | 3 | 374 | 0 | 0 | 0 | 0 | 798 | 376 | 488 | 1074 | 0 |
| Future Volume (veh/h) | 273 | 3 | 374 | 0 | 0 | 0 | 0 | 798 | 376 | 488 | 1074 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | | | | 0 | 1772 | 1772 | 1673 | 1772 | 0 |
| Adj Flow Rate, veh/h | 281 | 3 | 300 | | | | 0 | 823 | 325 | 503 | 1107 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 380 | 4 | 341 | | | | 0 | 1231 | 546 | 336 | 2129 | 0 |
| Arrive On Green | 0.23 | 0.23 | 0.23 | | | | 0.00 | 0.37 | 0.37 | 0.42 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1671 | 18 | 1500 | | | | 0 | 3455 | 1493 | 1594 | 3455 | 0 |
| Grp Volume(v), veh/h | 284 | 0 | 300 | | | | 0 | 823 | 325 | 503 | 1107 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1500 | | | | 0 | 1683 | 1493 | 1594 | 1683 | 0 |
| Q Serve(g_s), s | 14.1 | 0.0 | 17.4 | | | | 0.0 | 18.5 | 15.9 | 19.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.1 | 0.0 | 17.4 | | | | 0.0 | 18.5 | 15.9 | 19.0 | 0.0 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 384 | 0 | 341 | | | | 0 | 1231 | 546 | 336 | 2129 | 0 |
| V/C Ratio(X) | 0.74 | 0.00 | 0.88 | | | | 0.00 | 0.67 | 0.60 | 1.49 | 0.52 | 0.00 |
| Avail Cap(c_a), veh/h | 507 | 0 | 450 | | | | 0 | 1231 | 546 | 336 | 2129 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.37 | 0.37 | 0.00 |
| Uniform Delay (d), s/veh | 32.3 | 0.0 | 33.6 | | | | 0.0 | 24.0 | 23.1 | 26.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 2.5 | 0.0 | 12.1 | | | | 0.0 | 2.9 | 4.7 | 228.6 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.6 | 0.0 | 7.1 | | | | 0.0 | 7.2 | 5.8 | 26.1 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.8 | 0.0 | 45.7 | | | | 0.0 | 26.9 | 27.9 | 254.6 | 0.3 | 0.0 |
| LnGrp LOS | C | | D | | | | | C | C | F | A | |
| Approach Vol, veh/h | | 584 | | | | | | 1148 | | | 1610 | |
| Approach Delay, s/veh | | 40.4 | | | | | | 27.1 | | | 79.8 | |
| Approach LOS | | D | | | | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 38.7 | | 27.3 | | 62.7 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 19.0 | 26.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 20.5 | | 19.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 2.7 | | 1.0 | | 7.3 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 54.8 |
| HCM 7th LOS | | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 110 | 747 | 46 | 603 | 25 | 717 | 122 | 833 |
| Future Volume (vph) | 110 | 747 | 46 | 603 | 25 | 717 | 122 | 833 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 18.9 | 56.0 | 9.8 | 46.9 | 9.8 | 39.0 | 15.2 | 44.4 |
| Total Split (%) | 15.8% | 46.7% | 8.2% | 39.1% | 8.2% | 32.5% | 12.7% | 37.0% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.6 | 50.0 | 5.2 | 41.3 | 5.2 | 31.0 | 10.6 | 40.5 |
| Actuated g/C Ratio | 0.10 | 0.43 | 0.04 | 0.36 | 0.04 | 0.27 | 0.09 | 0.35 |
| v/c Ratio | 0.71 | 1.07 | 0.67 | 0.68 | 0.37 | 0.89 | 0.88 | 0.85 |
| Control Delay (s/veh) | 75.1 | 85.1 | 97.6 | 34.6 | 70.8 | 53.9 | 102.3 | 43.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 75.1 | 85.1 | 97.6 | 34.6 | 70.8 | 53.9 | 102.3 | 43.7 |
| LOS | E | F | F | C | E | D | F | D |
| Approach Delay (s/veh) | | 83.8 | | 38.1 | | 54.4 | | 50.4 |
| Approach LOS | | F | | D | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 115.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.07 | |
| Intersection Signal Delay (s/veh): 56.8 | Intersection LOS: E |
| Intersection Capacity Utilization 98.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

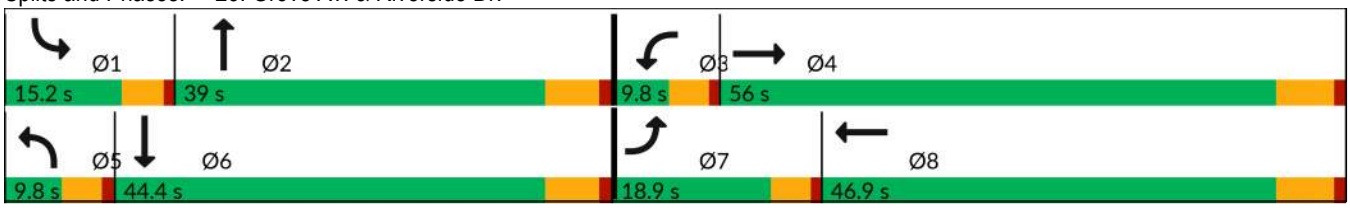

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 110 | 747 | 36 | 46 | 603 | 173 | 25 | 717 | 52 | 122 | 833 | 119 |
| Future Volume (veh/h) | 110 | 747 | 36 | 46 | 603 | 173 | 25 | 717 | 52 | 122 | 833 | 119 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 113 | 770 | 29 | 47 | 622 | 127 | 26 | 739 | 42 | 126 | 859 | 74 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 136 | 735 | 28 | 58 | 1067 | 218 | 39 | 821 | 47 | 147 | 1008 | 87 |
| Arrive On Green | 0.09 | 0.65 | 0.43 | 0.04 | 0.58 | 0.38 | 0.02 | 0.38 | 0.25 | 0.09 | 0.48 | 0.32 |
| Sat Flow, veh/h | 1594 | 1697 | 64 | 1594 | 2777 | 566 | 1594 | 3238 | 184 | 1594 | 3136 | 270 |
| Grp Volume(v), veh/h | 113 | 0 | 799 | 47 | 377 | 372 | 26 | 384 | 397 | 126 | 461 | 472 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 0 | 1760 | 1594 | 1683 | 1659 | 1594 | 1683 | 1739 | 1594 | 1683 | 1723 |
| Q Serve(g_s), s | 8.0 | 0.0 | 49.8 | 3.4 | 16.4 | 18.0 | 1.9 | 24.7 | 24.8 | 9.0 | 27.7 | 28.0 |
| Cycle Q Clear(g_c), s | 8.0 | 0.0 | 49.8 | 3.4 | 16.4 | 18.0 | 1.9 | 24.7 | 24.8 | 9.0 | 27.7 | 28.0 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.34 | 1.00 | | 0.11 | 1.00 | | 0.16 |
| Lane Grp Cap(c), veh/h | 136 | 0 | 763 | 58 | 647 | 638 | 39 | 427 | 441 | 147 | 541 | 554 |
| V/C Ratio(X) | 0.83 | 0.00 | 1.05 | 0.81 | 0.58 | 0.58 | 0.66 | 0.90 | 0.90 | 0.86 | 0.85 | 0.85 |
| Avail Cap(c_a), veh/h | 198 | 0 | 763 | 72 | 647 | 638 | 72 | 486 | 502 | 147 | 565 | 579 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.8 | 0.0 | 20.6 | 55.0 | 18.4 | 21.7 | 55.6 | 34.2 | 35.0 | 51.4 | 27.4 | 28.8 |
| Incr Delay (d2), s/veh | 11.8 | 0.0 | 45.7 | 34.5 | 1.3 | 1.4 | 7.0 | 18.0 | 17.7 | 35.0 | 11.6 | 11.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 0.0 | 22.1 | 1.9 | 5.1 | 6.0 | 0.8 | 10.6 | 11.1 | 4.9 | 10.5 | 11.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 63.6 | 0.0 | 66.2 | 89.5 | 19.8 | 23.1 | 62.6 | 52.3 | 52.7 | 86.5 | 39.0 | 40.2 |
| LnGrp LOS | E | | F | F | B | C | E | D | D | F | D | D |
| Approach Vol, veh/h | | 912 | | | 796 | | | 807 | | | 1059 | |
| Approach Delay, s/veh | | 65.9 | | | 25.4 | | | 52.8 | | | 45.1 | |
| Approach LOS | | E | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.2 | 35.0 | 8.8 | 56.0 | 7.4 | 42.7 | 14.4 | 50.4 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 10.6 | 33.2 | 5.2 | 49.8 | 5.2 | 38.6 | 14.3 | 40.7 |
| Max Q Clear Time (g_c+I1), s | 11.0 | 26.8 | 5.4 | 51.8 | 3.9 | 30.0 | 10.0 | 20.0 |
| Green Ext Time (p_c), s | 0.0 | 2.4 | 0.0 | 0.0 | 0.0 | 3.5 | 0.0 | 4.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 47.8 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 52 | 337 | 38 | 184 | 32 | 717 | 51 | 855 |
| Future Volume (vph) | 52 | 337 | 38 | 184 | 32 | 717 | 51 | 855 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 36.0 | 36.0 | 36.0 | 36.0 | 84.0 | 84.0 | 84.0 | 84.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 30.0% | 70.0% | 70.0% | 70.0% | 70.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 24.6 | 24.6 | 24.6 | 24.6 | 53.2 | 53.2 | 53.2 | 53.2 |
| Actuated g/C Ratio | 0.28 | 0.28 | 0.28 | 0.28 | 0.61 | 0.61 | 0.61 | 0.61 |
| v/c Ratio | 0.23 | 0.79 | 0.31 | 0.49 | 0.22 | 0.75 | 0.23 | 0.85 |
| Control Delay (s/veh) | 32.5 | 44.9 | 38.4 | 32.7 | 12.3 | 17.7 | 11.2 | 23.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 32.5 | 44.9 | 38.4 | 32.7 | 12.3 | 17.7 | 11.2 | 23.5 |
| LOS | C | D | D | C | B | B | B | C |
| Approach Delay (s/veh) | | 43.4 | | 33.5 | | 17.4 | | 22.9 |
| Approach LOS | | D | | C | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.9 | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 25.9 | Intersection LOS: C |
| Intersection Capacity Utilization 89.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 24: Grove Av. & Chino Av.

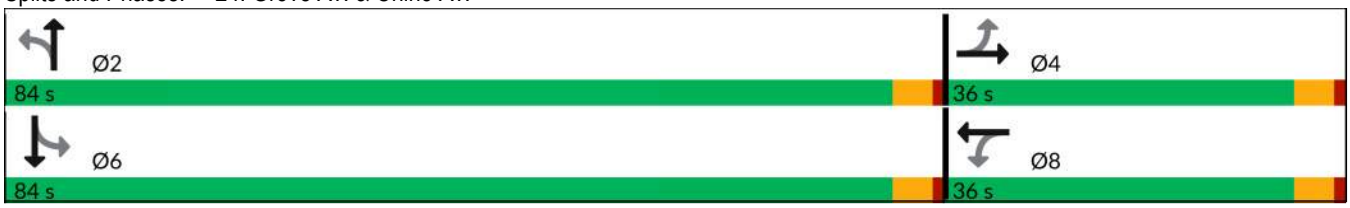

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 52 | 337 | 33 | 38 | 184 | 45 | 32 | 717 | 44 | 51 | 855 | 19 |
| Future Volume (veh/h) | 52 | 337 | 33 | 38 | 184 | 45 | 32 | 717 | 44 | 51 | 855 | 19 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 54 | 351 | 34 | 40 | 192 | 47 | 33 | 747 | 46 | 53 | 891 | 20 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 285 | 448 | 43 | 174 | 388 | 95 | 196 | 981 | 60 | 274 | 1027 | 23 |
| Arrive On Green | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.28 | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 |
| Sat Flow, veh/h | 1141 | 1587 | 154 | 998 | 1375 | 337 | 613 | 1650 | 102 | 684 | 1726 | 39 |
| Grp Volume(v), veh/h | 54 | 0 | 385 | 40 | 0 | 239 | 33 | 0 | 793 | 53 | 0 | 911 |
| Grp Sat Flow(s),veh/h/ln | 1141 | 0 | 1740 | 998 | 0 | 1711 | 613 | 0 | 1751 | 684 | 0 | 1765 |
| Q Serve(g_s), s | 3.1 | 0.0 | 15.3 | 2.9 | 0.0 | 8.7 | 3.6 | 0.0 | 25.1 | 4.7 | 0.0 | 32.4 |
| Cycle Q Clear(g_c), s | 11.8 | 0.0 | 15.3 | 18.1 | 0.0 | 8.7 | 35.9 | 0.0 | 25.1 | 29.8 | 0.0 | 32.4 |
| Prop In Lane | 1.00 | | 0.09 | 1.00 | | 0.20 | 1.00 | | 0.06 | 1.00 | | 0.02 |
| Lane Grp Cap(c), veh/h | 285 | 0 | 491 | 174 | 0 | 483 | 196 | 0 | 1042 | 274 | 0 | 1050 |
| V/C Ratio(X) | 0.19 | 0.00 | 0.78 | 0.23 | 0.00 | 0.50 | 0.17 | 0.00 | 0.76 | 0.19 | 0.00 | 0.87 |
| Avail Cap(c_a), veh/h | 442 | 0 | 730 | 311 | 0 | 718 | 481 | 0 | 1857 | 592 | 0 | 1872 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.4 | 0.0 | 24.8 | 33.1 | 0.0 | 22.4 | 27.7 | 0.0 | 11.2 | 22.2 | 0.0 | 12.7 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 3.3 | 0.7 | 0.0 | 0.8 | 0.4 | 0.0 | 1.2 | 0.3 | 0.0 | 2.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.0 | 6.0 | 0.7 | 0.0 | 3.1 | 0.5 | 0.0 | 7.4 | 0.7 | 0.0 | 9.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.7 | 0.0 | 28.1 | 33.8 | 0.0 | 23.2 | 28.1 | 0.0 | 12.4 | 22.6 | 0.0 | 15.0 |
| LnGrp LOS | C | | C | C | | C | C | | B | C | | B |
| Approach Vol, veh/h | | 439 | | | 279 | | | 826 | | | 964 | |
| Approach Delay, s/veh | | 28.1 | | | 24.7 | | | 13.0 | | | 15.4 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 49.1 | 25.7 | 49.1 | 25.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 79.4 | 31.4 | 79.4 | 31.4 |
| Max Q Clear Time (g_c+I1), s | 37.9 | 17.3 | 34.4 | 20.1 |
| Green Ext Time (p_c), s | 6.6 | 1.9 | 8.6 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.9 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 100 | 210 | 5 | 65 | 35 | 681 | 58 | 803 |
| Future Volume (vph) | 100 | 210 | 5 | 65 | 35 | 681 | 58 | 803 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 34.0 | 34.0 | 34.0 | 34.0 | 86.0 | 86.0 | 86.0 | 86.0 |
| Total Split (%) | 28.3% | 28.3% | 28.3% | 28.3% | 71.7% | 71.7% | 71.7% | 71.7% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 5.4 | | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 29.1 | | 29.1 | | 68.8 | | 68.8 |
| Actuated g/C Ratio | | 0.27 | | 0.27 | | 0.63 | | 0.63 |
| v/c Ratio | | 0.93 | | 0.24 | | 0.77 | | 0.95 |
| Control Delay (s/veh) | | 71.0 | | 30.9 | | 19.6 | | 37.4 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 71.0 | | 30.9 | | 19.6 | | 37.4 |
| LOS | | E | | C | | B | | D |
| Approach Delay (s/veh) | | 71.0 | | 30.9 | | 19.6 | | 37.4 |
| Approach LOS | | E | | C | | B | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 108.8 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 36.4 | Intersection LOS: D |
| Intersection Capacity Utilization 104.8% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 25: Grove Av. & Schaefer Av.

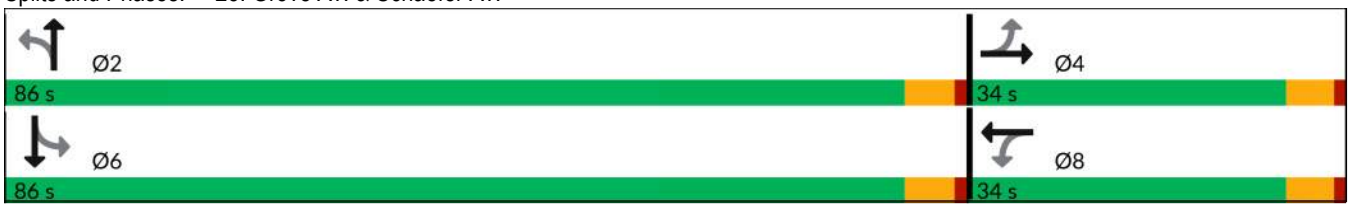

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 100 | 210 | 43 | 5 | 65 | 31 | 35 | 681 | 26 | 58 | 803 | 38 |
| Future Volume (veh/h) | 100 | 210 | 43 | 5 | 65 | 31 | 35 | 681 | 26 | 58 | 803 | 38 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 106 | 223 | 46 | 5 | 69 | 33 | 37 | 724 | 28 | 62 | 854 | 40 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 150 | 258 | 50 | 45 | 292 | 133 | 66 | 945 | 36 | 86 | 936 | 43 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 | 0.63 |
| Sat Flow, veh/h | 400 | 1008 | 197 | 24 | 1143 | 520 | 42 | 1494 | 57 | 74 | 1480 | 68 |
| Grp Volume(v), veh/h | 375 | 0 | 0 | 107 | 0 | 0 | 789 | 0 | 0 | 956 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1606 | 0 | 0 | 1688 | 0 | 0 | 1593 | 0 | 0 | 1622 | 0 | 0 |
| Q Serve(g_s), s | 17.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 19.4 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 21.9 | 0.0 | 0.0 | 4.9 | 0.0 | 0.0 | 31.4 | 0.0 | 0.0 | 50.8 | 0.0 | 0.0 |
| Prop In Lane | 0.28 | | 0.12 | 0.05 | | 0.31 | 0.05 | | 0.04 | 0.06 | | 0.04 |
| Lane Grp Cap(c), veh/h | 458 | 0 | 0 | 471 | 0 | 0 | 1047 | 0 | 0 | 1066 | 0 | 0 |
| V/C Ratio(X) | 0.82 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.75 | 0.00 | 0.00 | 0.90 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 521 | 0 | 0 | 536 | 0 | 0 | 1372 | 0 | 0 | 1387 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 34.7 | 0.0 | 0.0 | 28.6 | 0.0 | 0.0 | 11.9 | 0.0 | 0.0 | 15.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 8.9 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.7 | 0.0 | 0.0 | 6.6 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.2 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 16.5 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 43.7 | 0.0 | 0.0 | 28.9 | 0.0 | 0.0 | 13.6 | 0.0 | 0.0 | 22.0 | 0.0 | 0.0 |
| LnGrp LOS | D | | | C | | | B | | | C | | |
| Approach Vol, veh/h | | 375 | | | 107 | | | 789 | | | 956 | |
| Approach Delay, s/veh | | 43.7 | | | 28.9 | | | 13.6 | | | 22.0 | |
| Approach LOS | | D | | | C | | | B | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.6 | 30.1 | 66.6 | 30.1 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 80.6 | 28.6 | 80.6 | 28.6 |
| Max Q Clear Time (g_c+I1), s | 33.4 | 23.9 | 52.8 | 6.9 |
| Green Ext Time (p_c), s | 6.6 | 0.9 | 8.4 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 23.0 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 217 | 1175 | 196 | 222 | 884 | 225 | 192 | 311 | 287 | 408 |
| Future Volume (vph) | 217 | 1175 | 196 | 222 | 884 | 225 | 192 | 311 | 287 | 408 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 23.4 | 34.0 | 34.0 | 20.0 | 30.6 | 30.6 | 18.0 | 42.0 | 24.0 | 48.0 |
| Total Split (%) | 19.5% | 28.3% | 28.3% | 16.7% | 25.5% | 25.5% | 15.0% | 35.0% | 20.0% | 40.0% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 18.8 | 28.2 | 28.2 | 15.4 | 24.8 | 24.8 | 13.4 | 36.6 | 19.4 | 42.6 |
| Actuated g/C Ratio | 0.16 | 0.24 | 0.24 | 0.13 | 0.21 | 0.21 | 0.11 | 0.31 | 0.16 | 0.36 |
| v/c Ratio | 0.95 | 1.03 | 0.42 | 1.19 | 0.88 | 0.49 | 1.19 | 1.01 | 1.22 | 1.13 |
| Control Delay (s/veh) | 96.6 | 77.7 | 7.7 | 168.0 | 56.4 | 8.5 | 173.2 | 80.9 | 173.0 | 111.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 96.6 | 77.7 | 7.7 | 168.0 | 56.4 | 8.5 | 173.2 | 80.9 | 173.0 | 111.8 |
| LOS | F | E | A | F | E | A | F | F | F | F |
| Approach Delay (s/veh) | | 71.6 | | | 66.9 | | | 107.0 | | 130.9 |
| Approach LOS | | E | | | E | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.22 | |
| Intersection Signal Delay (s/veh): 87.6 | Intersection LOS: F |
| Intersection Capacity Utilization 103.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

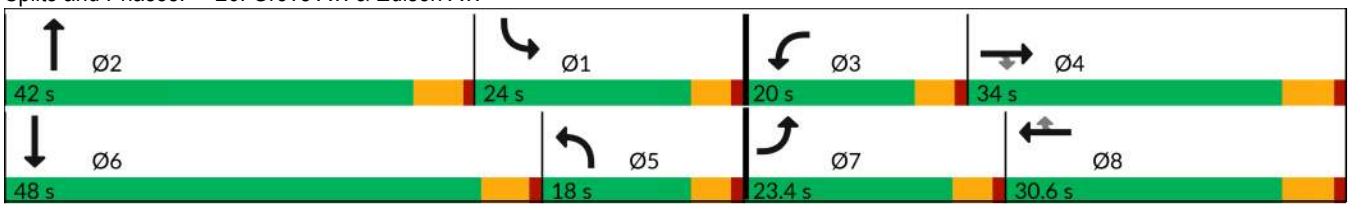

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 217 | 1175 | 196 | 222 | 884 | 225 | 192 | 311 | 175 | 287 | 408 | 224 |
| Future Volume (veh/h) | 217 | 1175 | 196 | 222 | 884 | 225 | 192 | 311 | 175 | 287 | 408 | 224 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 236 | 1277 | 126 | 241 | 961 | 136 | 209 | 338 | 103 | 312 | 443 | 134 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 252 | 1259 | 354 | 206 | 1107 | 313 | 179 | 359 | 109 | 298 | 457 | 138 |
| Arrive On Green | 0.24 | 0.36 | 0.36 | 0.19 | 0.31 | 0.31 | 0.17 | 0.41 | 0.41 | 0.28 | 0.52 | 0.52 |
| Sat Flow, veh/h | 1594 | 5316 | 1495 | 1594 | 5316 | 1502 | 1594 | 1303 | 397 | 1594 | 1306 | 395 |
| Grp Volume(v), veh/h | 236 | 1277 | 126 | 241 | 961 | 136 | 209 | 0 | 441 | 312 | 0 | 577 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1772 | 1495 | 1594 | 1772 | 1502 | 1594 | 0 | 1700 | 1594 | 0 | 1701 |
| Q Serve(g_s), s | 17.3 | 28.2 | 5.5 | 15.4 | 20.3 | 5.6 | 13.4 | 0.0 | 29.7 | 22.3 | 0.0 | 39.1 |
| Cycle Q Clear(g_c), s | 17.3 | 28.2 | 5.5 | 15.4 | 20.3 | 5.6 | 13.4 | 0.0 | 29.7 | 22.3 | 0.0 | 39.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.23 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 252 | 1259 | 354 | 206 | 1107 | 313 | 179 | 0 | 468 | 298 | 0 | 595 |
| V/C Ratio(X) | 0.94 | 1.01 | 0.36 | 1.17 | 0.87 | 0.43 | 1.16 | 0.00 | 0.94 | 1.05 | 0.00 | 0.97 |
| Avail Cap(c_a), veh/h | 252 | 1259 | 354 | 206 | 1107 | 313 | 179 | 0 | 523 | 298 | 0 | 609 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.8 | 38.4 | 17.2 | 48.0 | 39.4 | 15.1 | 49.5 | 0.0 | 34.0 | 42.8 | 0.0 | 27.7 |
| Incr Delay (d2), s/veh | 40.0 | 28.9 | 0.6 | 115.7 | 7.5 | 1.0 | 118.6 | 0.0 | 24.4 | 64.8 | 0.0 | 28.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.8 | 13.8 | 2.5 | 12.2 | 8.6 | 2.9 | 10.7 | 0.0 | 13.3 | 13.0 | 0.0 | 16.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 84.8 | 67.3 | 17.9 | 163.6 | 46.9 | 16.0 | 168.0 | 0.0 | 58.4 | 107.6 | 0.0 | 56.4 |
| LnGrp LOS | F | F | B | F | D | B | F | | E | F | | E |
| Approach Vol, veh/h | | 1639 | | | 1338 | | | 650 | | | 889 | |
| Approach Delay, s/veh | | 66.0 | | | 64.8 | | | 93.7 | | | 74.3 | |
| Approach LOS | | E | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.9 | 38.2 | 20.0 | 34.0 | 18.0 | 47.0 | 23.4 | 30.6 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 19.4 | 36.6 | 15.4 | 28.2 | 13.4 | 42.6 | 18.8 | 24.8 |
| Max Q Clear Time (g_c+I1), s | 24.3 | 31.7 | 17.4 | 30.2 | 15.4 | 41.1 | 19.3 | 22.3 |
| Green Ext Time (p_c), s | 0.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 71.3 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 19 | 283 | 1 | 167 | 2 | 64 | 399 | 50 |
| Future Volume (vph) | 19 | 283 | 1 | 167 | 2 | 64 | 399 | 50 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 58.3% | 58.3% | 58.3% | 58.3% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 5.4 | | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 31.8 | | 31.8 | | 44.8 | | 44.8 |
| Actuated g/C Ratio | | 0.36 | | 0.36 | | 0.51 | | 0.51 |
| v/c Ratio | | 0.58 | | 0.83 | | 0.09 | | 0.85 |
| Control Delay (s/veh) | | 29.6 | | 36.1 | | 12.7 | | 34.9 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 29.6 | | 36.1 | | 12.7 | | 34.9 |
| LOS | | C | | D | | B | | C |
| Approach Delay (s/veh) | | 29.6 | | 36.1 | | 12.7 | | 34.9 |
| Approach LOS | | C | | D | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 88.7 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 32.9 | Intersection LOS: C |
| Intersection Capacity Utilization 74.1% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 27: Grove Av. & Eucalyptus Av.

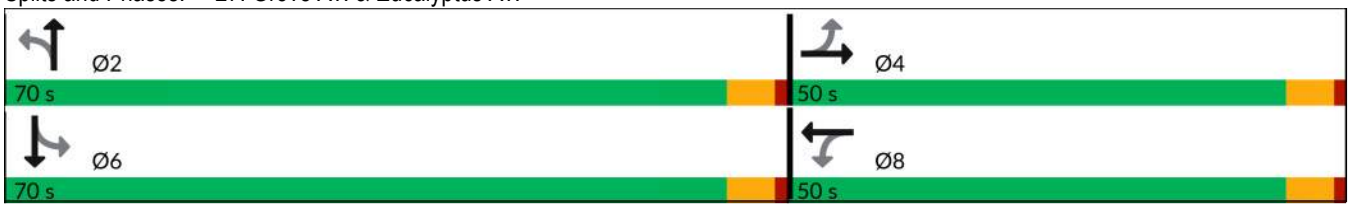

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 19 | 283 | 2 | 1 | 167 | 285 | 2 | 64 | 1 | 399 | 50 | 15 |
| Future Volume (veh/h) | 19 | 283 | 2 | 1 | 167 | 285 | 2 | 64 | 1 | 399 | 50 | 15 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 22 | 325 | 2 | 1 | 192 | 328 | 2 | 74 | 1 | 459 | 57 | 17 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 80 | 648 | 4 | 58 | 228 | 388 | 63 | 762 | 10 | 632 | 65 | 19 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 | 0.44 |
| Sat Flow, veh/h | 49 | 1675 | 10 | 0 | 589 | 1002 | 8 | 1734 | 23 | 1193 | 148 | 44 |
| Grp Volume(v), veh/h | 349 | 0 | 0 | 521 | 0 | 0 | 77 | 0 | 0 | 533 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1733 | 0 | 0 | 1591 | 0 | 0 | 1765 | 0 | 0 | 1386 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 20.1 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 9.4 | 0.0 | 0.0 | 18.6 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 21.7 | 0.0 | 0.0 |
| Prop In Lane | 0.06 | | 0.01 | 0.00 | | 0.63 | 0.03 | | 0.01 | 0.86 | | 0.03 |
| Lane Grp Cap(c), veh/h | 732 | 0 | 0 | 674 | 0 | 0 | 835 | 0 | 0 | 717 | 0 | 0 |
| V/C Ratio(X) | 0.48 | 0.00 | 0.00 | 0.77 | 0.00 | 0.00 | 0.09 | 0.00 | 0.00 | 0.74 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1282 | 0 | 0 | 1198 | 0 | 0 | 1885 | 0 | 0 | 1536 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 14.6 | 0.0 | 0.0 | 17.4 | 0.0 | 0.0 | 10.2 | 0.0 | 0.0 | 15.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.5 | 0.0 | 0.0 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.2 | 0.0 | 0.0 | 6.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 5.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 15.0 | 0.0 | 0.0 | 19.3 | 0.0 | 0.0 | 10.3 | 0.0 | 0.0 | 17.2 | 0.0 | 0.0 |
| LnGrp LOS | B | | | B | | | B | | | B | | |
| Approach Vol, veh/h | | 349 | | | 521 | | | 77 | | | 533 | |
| Approach Delay, s/veh | | 15.0 | | | 19.3 | | | 10.3 | | | 17.2 | |
| Approach LOS | | B | | | B | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 32.7 | 29.5 | 32.7 | 29.5 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 64.6 | 44.6 | 64.6 | 44.6 |
| Max Q Clear Time (g_c+I1), s | 3.6 | 11.4 | 23.7 | 20.6 |
| Green Ext Time (p_c), s | 0.4 | 2.1 | 3.7 | 3.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 17.1 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 40 | 1688 | 1442 | 30 |
| Future Volume (vph) | 40 | 1688 | 1442 | 30 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 96.0 | 96.0 | 96.0 | 24.0 |
| Total Split (%) | 80.0% | 80.0% | 80.0% | 20.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | Min |
| Act Effct Green (s) | 91.5 | 91.5 | 91.5 | 9.2 |
| Actuated g/C Ratio | 0.83 | 0.83 | 0.83 | 0.08 |
| v/c Ratio | 0.72 | 0.66 | 1.10 | 0.40 |
| Control Delay (s/veh) | 69.5 | 5.3 | 68.9 | 34.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 69.5 | 5.3 | 68.9 | 34.2 |
| LOS | E | A | E | C |
| Approach Delay (s/veh) | | 6.8 | 68.9 | 34.2 |
| Approach LOS | | A | E | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.9 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.10 | |
| Intersection Signal Delay (s/veh): 35.4 | Intersection LOS: D |
| Intersection Capacity Utilization 94.5% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 28: Edison Av. & Parco Av.

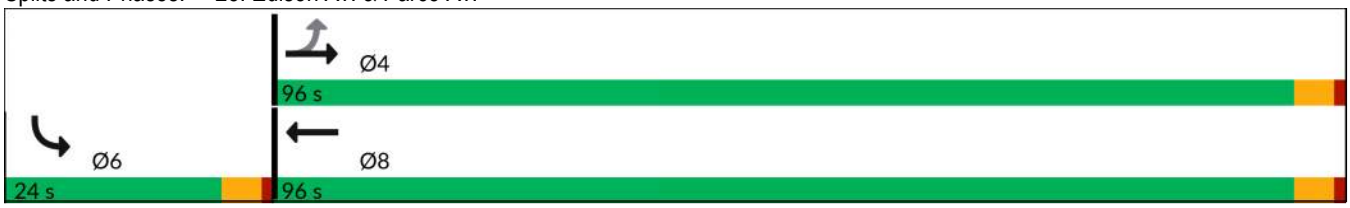

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 40 | 1688 | 1442 | 40 | 30 | 30 |
| Future Volume (veh/h) | 40 | 1688 | 1442 | 40 | 30 | 30 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 43 | 1835 | 1567 | 43 | 33 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 67 | 2873 | 1464 | 40 | 48 | 48 |
| Arrive On Green | 0.85 | 0.85 | 0.85 | 0.85 | 0.06 | 0.06 |
| Sat Flow, veh/h | 297 | 3455 | 1716 | 47 | 784 | 784 |
| Grp Volume(v), veh/h | 43 | 1835 | 0 | 1610 | 67 | 0 |
| Grp Sat Flow(s),veh/h/ln | 297 | 1683 | 0 | 1763 | 1592 | 0 |
| Q Serve(g_s), s | 0.0 | 18.8 | 0.0 | 91.4 | 4.4 | 0.0 |
| Cycle Q Clear(g_c), s | 91.4 | 18.8 | 0.0 | 91.4 | 4.4 | 0.0 |
| Prop In Lane | 1.00 | | | 0.03 | 0.49 | 0.49 |
| Lane Grp Cap(c), veh/h | 67 | 2873 | 0 | 1505 | 97 | 0 |
| V/C Ratio(X) | 0.64 | 0.64 | 0.00 | 1.07 | 0.69 | 0.00 |
| Avail Cap(c_a), veh/h | 67 | 2873 | 0 | 1505 | 288 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 53.6 | 2.5 | 0.0 | 7.9 | 49.3 | 0.0 |
| Incr Delay (d2), s/veh | 18.6 | 0.5 | 0.0 | 44.5 | 8.5 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 2.3 | 0.0 | 29.3 | 1.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 72.1 | 3.0 | 0.0 | 52.3 | 57.8 | 0.0 |
| LnGrp LOS | E | A | | F | E | |
| Approach Vol, veh/h | | 1878 | 1610 | | 67 | |
| Approach Delay, s/veh | | 4.6 | 52.3 | | 57.8 | |
| Approach LOS | | A | D | | E | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 96.0 | 11.1 | 96.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 91.4 | 19.4 | 91.4 |
| Max Q Clear Time (g_c+I1), s | 93.4 | 6.4 | 93.4 |
| Green Ext Time (p_c), s | 0.0 | 0.1 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.2 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 36 | 808 | 89 | 751 | 61 | 42 | 8 | 27 |
| Future Volume (vph) | 36 | 808 | 89 | 751 | 61 | 42 | 8 | 27 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 72.0 | 72.0 | 72.0 | 72.0 | 48.0 | 48.0 | 48.0 | 48.0 |
| Total Split (%) | 60.0% | 60.0% | 60.0% | 60.0% | 40.0% | 40.0% | 40.0% | 40.0% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 20.9 | 20.9 | 20.9 | 20.9 | | 13.4 | | 13.4 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.46 | 0.46 | | 0.29 | | 0.29 |
| v/c Ratio | 0.15 | 0.61 | 0.44 | 0.53 | | 0.54 | | 0.11 |
| Control Delay (s/veh) | 9.4 | 11.1 | 16.9 | 10.3 | | 16.1 | | 11.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 9.4 | 11.1 | 16.9 | 10.3 | | 16.1 | | 11.3 |
| LOS | A | B | B | B | | B | | B |
| Approach Delay (s/veh) | | 11.0 | | 11.0 | | 16.1 | | 11.3 |
| Approach LOS | | B | | B | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 45.7 | |
| Natural Cycle: 50 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.61 | |
| Intersection Signal Delay (s/veh): 11.6 | Intersection LOS: B |
| Intersection Capacity Utilization 69.7% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 29: Walker Av. & Riverside Dr.

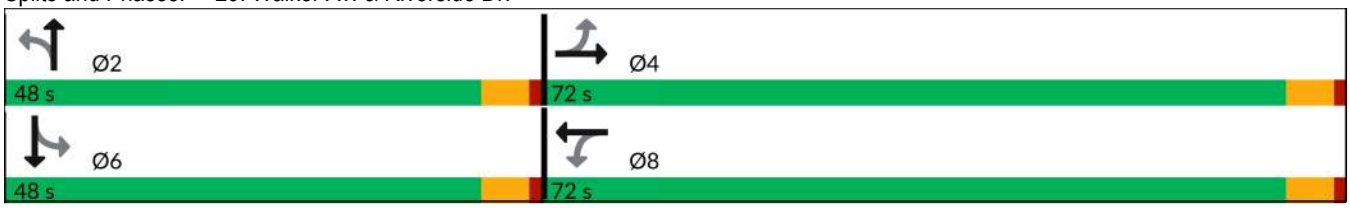

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 36 | 808 | 74 | 89 | 751 | 29 | 61 | 42 | 142 | 8 | 27 | 15 |
| Future Volume (veh/h) | 36 | 808 | 74 | 89 | 751 | 29 | 61 | 42 | 142 | 8 | 27 | 15 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 38 | 842 | 77 | 93 | 782 | 30 | 64 | 44 | 148 | 8 | 28 | 16 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 410 | 1572 | 144 | 369 | 1667 | 64 | 171 | 89 | 208 | 122 | 245 | 118 |
| Arrive On Green | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 | 0.23 |
| Sat Flow, veh/h | 672 | 3112 | 285 | 608 | 3302 | 127 | 268 | 378 | 886 | 93 | 1044 | 505 |
| Grp Volume(v), veh/h | 38 | 455 | 464 | 93 | 399 | 413 | 256 | 0 | 0 | 52 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 672 | 1683 | 1714 | 608 | 1683 | 1746 | 1532 | 0 | 0 | 1642 | 0 | 0 |
| Q Serve(g_s), s | 1.6 | 7.6 | 7.6 | 5.1 | 6.4 | 6.4 | 3.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 8.0 | 7.6 | 7.6 | 12.7 | 6.4 | 6.4 | 6.3 | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 0.07 | 0.25 | | 0.58 | 0.15 | | 0.31 |
| Lane Grp Cap(c), veh/h | 410 | 850 | 865 | 369 | 850 | 881 | 468 | 0 | 0 | 485 | 0 | 0 |
| V/C Ratio(X) | 0.09 | 0.54 | 0.54 | 0.25 | 0.47 | 0.47 | 0.55 | 0.00 | 0.00 | 0.11 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1150 | 2706 | 2754 | 1039 | 2706 | 2806 | 1660 | 0 | 0 | 1729 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 9.2 | 7.0 | 7.0 | 11.3 | 6.7 | 6.7 | 14.5 | 0.0 | 0.0 | 12.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 1.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 1.3 | 1.3 | 0.5 | 1.1 | 1.1 | 1.6 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 9.3 | 7.5 | 7.5 | 11.6 | 7.1 | 7.0 | 15.5 | 0.0 | 0.0 | 12.6 | 0.0 | 0.0 |
| LnGrp LOS | A | A | A | B | A | A | B | | | B | | |
| Approach Vol, veh/h | | 957 | | | 905 | | | 256 | | | 52 | |
| Approach Delay, s/veh | | 7.6 | | | 7.5 | | | 15.5 | | | 12.6 | |
| Approach LOS | | A | | | A | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.1 | 26.3 | 15.1 | 26.3 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 42.6 | 66.6 | 42.6 | 66.6 |
| Max Q Clear Time (g_c+I1), s | 8.3 | 10.0 | 3.0 | 14.7 |
| Green Ext Time (p_c), s | 1.4 | 6.4 | 0.3 | 6.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 8.6 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 36 | 1204 | 177 | 995 | 300 | 125 | 139 | 120 |
| Future Volume (vph) | 36 | 1204 | 177 | 995 | 300 | 125 | 139 | 120 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 9.6 | 55.6 | 16.0 | 62.0 | 24.0 | 31.8 | 16.6 | 24.4 |
| Total Split (%) | 8.0% | 46.3% | 13.3% | 51.7% | 20.0% | 26.5% | 13.8% | 20.3% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.0 | 49.9 | 11.4 | 58.3 | 19.4 | 22.5 | 11.9 | 15.0 |
| Actuated g/C Ratio | 0.04 | 0.43 | 0.10 | 0.50 | 0.17 | 0.19 | 0.10 | 0.13 |
| v/c Ratio | 0.54 | 1.17 | 1.17 | 0.66 | 1.17 | 0.75 | 0.89 | 0.69 |
| Control Delay (s/veh) | 84.6 | 115.0 | 172.3 | 24.8 | 152.6 | 51.6 | 98.5 | 61.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 84.6 | 115.0 | 172.3 | 24.8 | 152.6 | 51.6 | 98.5 | 61.4 |
| LOS | F | F | F | C | F | D | F | E |
| Approach Delay (s/veh) | | 114.3 | | 45.7 | | 106.3 | | 79.0 |
| Approach LOS | | F | | D | | F | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 116.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.17 | |
| Intersection Signal Delay (s/veh): 87.4 | Intersection LOS: F |
| Intersection Capacity Utilization 103.9% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

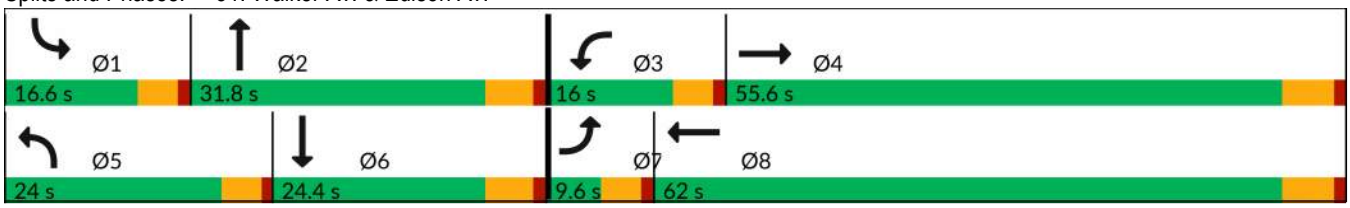

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 36 | 1204 | 398 | 177 | 995 | 76 | 300 | 125 | 128 | 139 | 120 | 33 |
| Future Volume (veh/h) | 36 | 1204 | 398 | 177 | 995 | 76 | 300 | 125 | 128 | 139 | 120 | 33 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 | 1673 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 37 | 1241 | 224 | 182 | 1026 | 37 | 309 | 129 | 70 | 143 | 124 | 29 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 48 | 1254 | 225 | 160 | 1690 | 61 | 273 | 189 | 103 | 167 | 150 | 35 |
| Arrive On Green | 0.03 | 0.66 | 0.44 | 0.10 | 0.76 | 0.51 | 0.17 | 0.17 | 0.17 | 0.10 | 0.11 | 0.11 |
| Sat Flow, veh/h | 1594 | 2852 | 511 | 1594 | 3314 | 120 | 1594 | 1080 | 586 | 1594 | 1382 | 323 |
| Grp Volume(v), veh/h | 37 | 728 | 737 | 182 | 521 | 542 | 309 | 0 | 199 | 143 | 0 | 153 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1683 | 1680 | 1594 | 1683 | 1750 | 1594 | 0 | 1666 | 1594 | 0 | 1705 |
| Q Serve(g_s), s | 2.6 | 47.6 | 49.5 | 11.4 | 15.4 | 16.2 | 19.4 | 0.0 | 12.7 | 10.0 | 0.0 | 10.0 |
| Cycle Q Clear(g_c), s | 2.6 | 47.6 | 49.5 | 11.4 | 15.4 | 16.2 | 19.4 | 0.0 | 12.7 | 10.0 | 0.0 | 10.0 |
| Prop In Lane | 1.00 | | 0.30 | 1.00 | | 0.07 | 1.00 | | 0.35 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 48 | 740 | 739 | 160 | 858 | 892 | 273 | 0 | 292 | 167 | 0 | 185 |
| V/C Ratio(X) | 0.76 | 0.98 | 1.00 | 1.13 | 0.61 | 0.61 | 1.13 | 0.00 | 0.68 | 0.86 | 0.00 | 0.83 |
| Avail Cap(c_a), veh/h | 70 | 740 | 739 | 160 | 858 | 892 | 273 | 0 | 388 | 169 | 0 | 286 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.5 | 18.9 | 23.0 | 50.9 | 8.3 | 9.1 | 46.9 | 0.0 | 43.8 | 49.9 | 0.0 | 49.5 |
| Incr Delay (d2), s/veh | 13.7 | 29.1 | 32.5 | 111.9 | 1.2 | 1.2 | 94.9 | 0.0 | 3.1 | 31.2 | 0.0 | 11.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.2 | 17.8 | 21.6 | 9.4 | 3.8 | 4.3 | 14.5 | 0.0 | 5.2 | 5.2 | 0.0 | 4.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 68.2 | 48.0 | 55.5 | 162.8 | 9.6 | 10.3 | 141.8 | 0.0 | 46.8 | 81.1 | 0.0 | 60.6 |
| LnGrp LOS | E | D | E | F | A | B | F | | D | F | | E |
| Approach Vol, veh/h | | 1502 | | | 1245 | | | 508 | | | 296 | |
| Approach Delay, s/veh | | 52.2 | | | 32.3 | | | 104.6 | | | 70.5 | |
| Approach LOS | | D | | | C | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.5 | 25.2 | 16.0 | 55.6 | 24.0 | 17.7 | 8.0 | 63.6 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 12.0 | 26.4 | 11.4 | 49.8 | 19.4 | 19.0 | 5.0 | 56.2 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 14.7 | 13.4 | 51.5 | 21.4 | 12.0 | 4.6 | 18.2 |
| Green Ext Time (p_c), s | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 7.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 54.2 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 164 | 1048 | 326 | 378 | 1356 | 457 | 371 | 289 | 229 | 461 | 144 |
| Future Volume (vph) | 164 | 1048 | 326 | 378 | 1356 | 457 | 371 | 289 | 229 | 461 | 144 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 10.8 | 48.5 | 48.5 | 12.0 | 49.7 | 13.0 | 49.9 | 49.9 | 9.6 | 46.5 | 46.5 |
| Total Split (%) | 9.0% | 40.4% | 40.4% | 10.0% | 41.4% | 10.8% | 41.6% | 41.6% | 8.0% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | Lead | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.3 | 31.6 | 31.6 | 14.9 | 40.2 | 8.6 | 20.2 | 20.2 | 10.3 | 21.9 | 21.9 |
| Actuated g/C Ratio | 0.07 | 0.33 | 0.33 | 0.16 | 0.42 | 0.09 | 0.21 | 0.21 | 0.11 | 0.23 | 0.23 |
| v/c Ratio | 0.91 | 0.70 | 0.53 | 0.88 | 0.81 | 1.86 | 0.39 | 0.73 | 0.77 | 0.63 | 0.35 |
| Control Delay (s/veh) | 93.3 | 30.8 | 11.3 | 63.6 | 28.9 | 429.4 | 32.9 | 29.1 | 63.2 | 37.1 | 10.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 93.3 | 30.8 | 11.3 | 63.6 | 28.9 | 429.4 | 32.9 | 29.1 | 63.2 | 37.1 | 10.3 |
| LOS | F | C | B | E | C | F | C | C | E | D | B |
| Approach Delay (s/veh) | | 33.3 | | | 35.7 | | 194.1 | | | 39.6 | |
| Approach LOS | | C | | | D | | F | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 95.8 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.86 | |
| Intersection Signal Delay (s/veh): 68.4 | Intersection LOS: E |
| Intersection Capacity Utilization 82.0% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

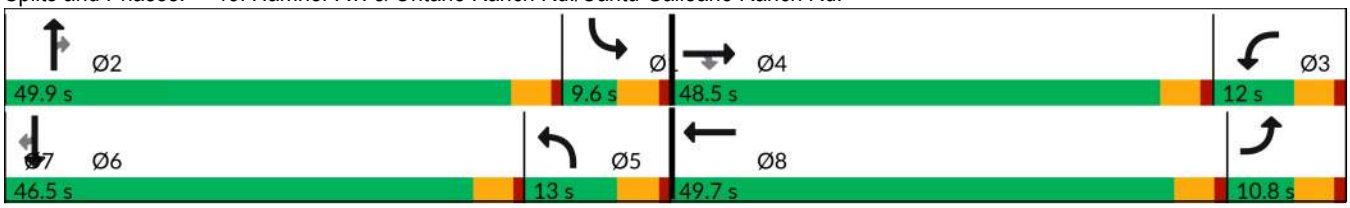

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 164 | 1048 | 326 | 378 | 1356 | 181 | 457 | 371 | 289 | 229 | 461 | 144 |
| Future Volume (veh/h) | 164 | 1048 | 326 | 378 | 1356 | 181 | 457 | 371 | 289 | 229 | 461 | 144 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 | 1575 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 173 | 1103 | 246 | 398 | 1427 | 98 | 481 | 391 | 116 | 241 | 485 | 140 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 223 | 1528 | 474 | 453 | 1825 | 125 | 302 | 757 | 229 | 419 | 662 | 291 |
| Arrive On Green | 0.08 | 0.47 | 0.32 | 0.16 | 0.59 | 0.39 | 0.10 | 0.23 | 0.16 | 0.14 | 0.30 | 0.20 |
| Sat Flow, veh/h | 2910 | 4837 | 1500 | 2910 | 4622 | 317 | 2910 | 4837 | 1465 | 2910 | 3367 | 1480 |
| Grp Volume(v), veh/h | 173 | 1103 | 246 | 398 | 996 | 529 | 481 | 391 | 116 | 241 | 485 | 140 |
| Grp Sat Flow(s),veh/h/ln | 1455 | 1612 | 1500 | 1455 | 1612 | 1714 | 1455 | 1612 | 1465 | 1455 | 1683 | 1480 |
| Q Serve(g_s), s | 4.7 | 14.7 | 10.8 | 10.8 | 18.9 | 19.6 | 8.4 | 5.7 | 5.9 | 6.2 | 10.5 | 6.8 |
| Cycle Q Clear(g_c), s | 4.7 | 14.7 | 10.8 | 10.8 | 18.9 | 19.6 | 8.4 | 5.7 | 5.9 | 6.2 | 10.5 | 6.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 223 | 1528 | 474 | 453 | 1274 | 677 | 302 | 757 | 229 | 419 | 662 | 291 |
| V/C Ratio(X) | 0.77 | 0.72 | 0.52 | 0.88 | 0.78 | 0.78 | 1.59 | 0.52 | 0.51 | 0.57 | 0.73 | 0.48 |
| Avail Cap(c_a), veh/h | 223 | 2628 | 815 | 453 | 1800 | 957 | 302 | 2711 | 821 | 419 | 1745 | 767 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.6 | 18.4 | 22.6 | 33.4 | 13.8 | 15.2 | 36.2 | 28.3 | 31.2 | 32.3 | 26.6 | 28.8 |
| Incr Delay (d2), s/veh | 14.3 | 0.7 | 0.9 | 17.0 | 1.5 | 2.8 | 280.8 | 0.5 | 1.7 | 1.3 | 1.6 | 1.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.0 | 4.0 | 3.5 | 4.5 | 4.3 | 5.3 | 14.6 | 2.0 | 2.0 | 2.1 | 3.6 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 50.9 | 19.1 | 23.5 | 50.3 | 15.3 | 18.0 | 317.0 | 28.8 | 32.9 | 33.5 | 28.2 | 30.0 |
| LnGrp LOS | D | B | C | D | B | B | F | C | C | C | C | C |
| Approach Vol, veh/h | | 1522 | | | 1923 | | | 988 | | | 866 | |
| Approach Delay, s/veh | | 23.4 | | | 23.3 | | | 169.6 | | | 30.0 | |
| Approach LOS | | C | | | C | | | F | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.2 | 17.3 | 17.2 | 30.1 | 13.0 | 20.5 | 10.8 | 36.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 5.0 | 45.3 | 7.4 | 43.9 | 8.4 | 41.9 | 6.2 | 45.1 |
| Max Q Clear Time (g_c+I1), s | 8.2 | 7.9 | 12.8 | 16.7 | 10.4 | 12.5 | 6.7 | 21.6 |
| Green Ext Time (p_c), s | 0.0 | 2.8 | 0.0 | 8.6 | 0.0 | 3.4 | 0.0 | 10.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 51.7 |
| HCM 7th LOS | D |

# APPENDIX 7.1:

# HORIZON YEAR (2050) WITHOUT PROJECT INTERSECTION ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 341 | 1 | 505 | 292 | 1315 | 1393 | 504 |
| Future Volume (vph) | 341 | 1 | 505 | 292 | 1315 | 1393 | 504 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 27.0 | 61.0 | 34.0 | 34.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 30.0% | 67.8% | 37.8% | 37.8% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 21.2 | 21.2 | 21.2 | 20.0 | 55.8 | 30.6 | 30.6 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.24 | 0.22 | 0.62 | 0.34 | 0.34 |
| v/c Ratio | 0.85 | 0.79 | 0.69 | 0.84 | 0.64 | 1.25 | 0.66 |
| Control Delay (s/veh) | 55.0 | 43.3 | 29.7 | 42.5 | 14.6 | 146.7 | 10.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.0 | 43.3 | 29.7 | 42.5 | 14.9 | 146.7 | 10.2 |
| LOS | D | D | C | D | B | F | B |
| Approach Delay (s/veh) | | 43.0 | | | 19.9 | 110.4 | |
| Approach LOS | | D | | | B | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 36.8 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.25 | |
| Intersection Signal Delay (s/veh): 63.9 | Intersection LOS: E |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

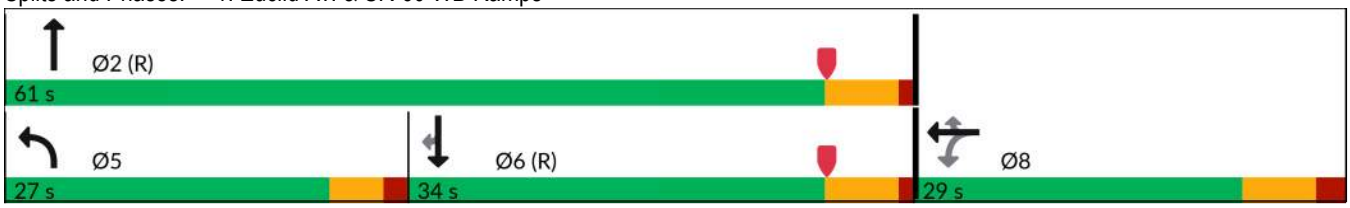

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 341 | 1 | 505 | 292 | 1315 | 0 | 0 | 1393 | 504 |
| Future Volume (veh/h) | 0 | 0 | 0 | 341 | 1 | 505 | 292 | 1315 | 0 | 0 | 1393 | 504 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 475 | 0 | 232 | 314 | 1414 | 0 | 0 | 1498 | 314 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 637 | 0 | 298 | 342 | 2370 | 0 | 0 | 1445 | 630 |
| Arrive On Green | | | | 0.19 | 0.00 | 0.19 | 0.40 | 1.00 | 0.00 | 0.00 | 0.41 | 0.41 |
| Sat Flow, veh/h | | | | 3375 | 0 | 1580 | 1688 | 3647 | 0 | 0 | 3647 | 1550 |
| Grp Volume(v), veh/h | | | | 475 | 0 | 232 | 314 | 1414 | 0 | 0 | 1498 | 314 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1580 | 1688 | 1777 | 0 | 0 | 1777 | 1550 |
| Q Serve(g_s), s | | | | 12.0 | 0.0 | 12.6 | 15.9 | 0.0 | 0.0 | 0.0 | 36.6 | 13.6 |
| Cycle Q Clear(g_c), s | | | | 12.0 | 0.0 | 12.6 | 15.9 | 0.0 | 0.0 | 0.0 | 36.6 | 13.6 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 637 | 0 | 298 | 342 | 2370 | 0 | 0 | 1445 | 630 |
| V/C Ratio(X) | | | | 0.75 | 0.00 | 0.78 | 0.92 | 0.60 | 0.00 | 0.00 | 1.04 | 0.50 |
| Avail Cap(c_a), veh/h | | | | 825 | 0 | 386 | 409 | 2370 | 0 | 0 | 1445 | 630 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 34.5 | 0.0 | 34.7 | 26.1 | 0.0 | 0.0 | 0.0 | 26.7 | 19.9 |
| Incr Delay (d2), s/veh | | | | 3.3 | 0.0 | 8.7 | 3.2 | 0.1 | 0.0 | 0.0 | 33.7 | 2.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.1 | 0.0 | 5.5 | 4.8 | 0.0 | 0.0 | 0.0 | 20.5 | 4.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 37.8 | 0.0 | 43.4 | 29.2 | 0.1 | 0.0 | 0.0 | 60.4 | 22.7 |
| LnGrp LOS | | | | D | | D | C | A | | | F | C |
| Approach Vol, veh/h | | | | | 707 | | | 1728 | | | 1812 | |
| Approach Delay, s/veh | | | | | 39.6 | | | 5.4 | | | 53.9 | |
| Approach LOS | | | | | D | | | A | | | D | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.0 | | 23.4 | 42.6 | | 24.0 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 21.8 | 28.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 17.9 | 38.6 | | 14.6 |
| Green Ext Time (p_c), s | 21.6 | | 0.4 | 0.0 | | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 31.8 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 461 | 1 | 223 | 1073 | 429 | 442 | 1210 |
| Future Volume (vph) | 461 | 1 | 223 | 1073 | 429 | 442 | 1210 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 27.7 | 27.7 | 27.7 | 26.0 | 26.0 | 14.7 | 24.0 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 31.0 | 31.0 | 29.0 | 60.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 34.4% | 34.4% | 32.2% | 66.7% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | | 7.0 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 23.0 | 0.0 | 23.0 | 25.0 | 25.0 | 24.3 | 54.0 |
| Actuated g/C Ratio | 0.26 | 0.00 | 0.26 | 0.28 | 0.28 | 0.27 | 0.60 |
| v/c Ratio | 1.11 | no cap | 0.49 | 1.13 | 0.59 | 1.01 | 0.59 |
| Control Delay (s/veh) | 110.4 | | 20.6 | 101.6 | 6.3 | 64.5 | 12.3 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 110.4 | Error | 20.6 | 101.6 | 6.3 | 64.5 | 12.6 |
| LOS | F | F | C | F | A | E | B |
| Approach Delay (s/veh) | | Error | | 74.4 | | | 26.5 |
| Approach LOS | | F | | E | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 36.6 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

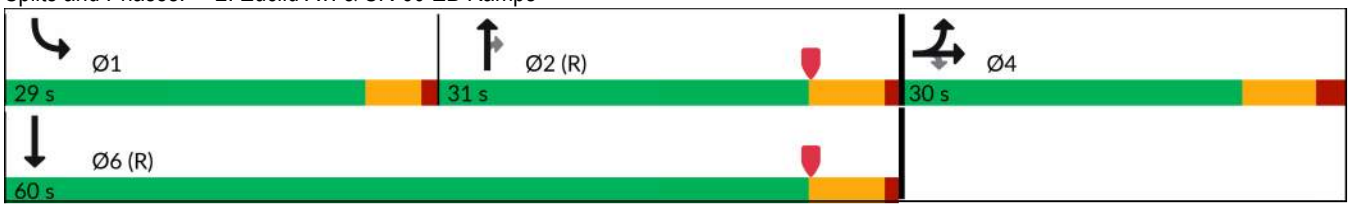

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 461 | 1 | 223 | 0 | 0 | 0 | 0 | 1073 | 429 | 442 | 1210 | 0 |
| Future Volume (veh/h) | 461 | 1 | 223 | 0 | 0 | 0 | 0 | 1073 | 429 | 442 | 1210 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 475 | 1 | 172 | | | | 0 | 1106 | 339 | 456 | 1247 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 431 | 0 | 405 | | | | 0 | 987 | 439 | 456 | 2132 | 0 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | | | | 0.00 | 0.42 | 0.28 | 0.54 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1688 | 0 | 1585 | | | | 0 | 3647 | 1579 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 475 | 0 | 172 | | | | 0 | 1106 | 339 | 456 | 1247 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1585 | | | | 0 | 1777 | 1579 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 23.0 | 0.0 | 8.2 | | | | 0.0 | 25.0 | 17.8 | 24.3 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 23.0 | 0.0 | 8.2 | | | | 0.0 | 25.0 | 17.8 | 24.3 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 431 | 0 | 405 | | | | 0 | 987 | 439 | 456 | 2132 | 0 |
| V/C Ratio(X) | 1.10 | 0.00 | 0.42 | | | | 0.00 | 1.12 | 0.77 | 1.00 | 0.58 | 0.00 |
| Avail Cap(c_a), veh/h | 431 | 0 | 405 | | | | 0 | 987 | 439 | 456 | 2132 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.50 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.75 | 0.75 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 33.5 | 0.0 | 28.0 | | | | 0.0 | 26.3 | 29.9 | 20.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 73.7 | 0.0 | 1.0 | | | | 0.0 | 64.8 | 9.6 | 12.8 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 17.9 | 0.0 | 3.1 | | | | 0.0 | 16.7 | 7.4 | 6.7 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 107.2 | 0.0 | 29.0 | | | | 0.0 | 91.1 | 39.5 | 33.5 | 0.1 | 0.0 |
| LnGrp LOS | F | | C | | | | | F | D | F | A | |
| Approach Vol, veh/h | | 647 | | | | | | 1445 | | | 1703 | |
| Approach Delay, s/veh | | 86.4 | | | | | | 79.0 | | | 9.1 | |
| Approach LOS | | F | | | | | | E | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 29.0 | 31.0 | | 30.0 | | 60.0 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 7.0 | | 6.0 |
| Max Green Setting (Gmax), s | 24.3 | 25.0 | | 23.0 | | 54.0 |
| Max Q Clear Time (g_c+I1), s | 26.3 | 27.0 | | 25.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 17.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 48.9 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 116 | 366 | 78 | 403 | 153 | 1104 | 147 | 1177 |
| Future Volume (vph) | 116 | 366 | 78 | 403 | 153 | 1104 | 147 | 1177 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 43.0 | 43.0 | 43.0 | 43.0 | 41.4 | 41.4 | 35.6 | 77.0 |
| Total Split (%) | 35.8% | 35.8% | 35.8% | 35.8% | 34.5% | 34.5% | 29.7% | 64.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 29.6 | 29.6 | 29.6 | 29.6 | 36.1 | 36.1 | 9.1 | 49.8 |
| Actuated g/C Ratio | 0.32 | 0.32 | 0.32 | 0.32 | 0.40 | 0.40 | 0.10 | 0.55 |
| v/c Ratio | 0.70 | 0.56 | 0.47 | 0.55 | 1.15 | 0.61 | 0.51 | 0.47 |
| Control Delay (s/veh) | 49.4 | 24.1 | 34.2 | 24.0 | 154.0 | 24.9 | 46.5 | 14.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 49.4 | 24.1 | 34.2 | 24.0 | 154.0 | 24.9 | 46.5 | 14.2 |
| LOS | D | C | C | C | F | C | D | B |
| Approach Delay (s/veh) | | 28.2 | | 25.2 | | 40.1 | | 17.6 |
| Approach LOS | | C | | C | | D | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 91.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.15 | |
| Intersection Signal Delay (s/veh): 27.9 | Intersection LOS: C |
| Intersection Capacity Utilization 78.1% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

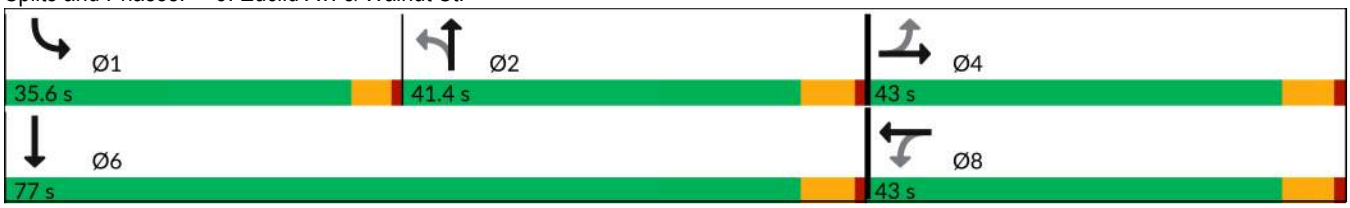

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 116 | 366 | 225 | 78 | 403 | 189 | 153 | 1104 | 48 | 147 | 1177 | 54 |
| Future Volume (veh/h) | 116 | 366 | 225 | 78 | 403 | 189 | 153 | 1104 | 48 | 147 | 1177 | 54 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 122 | 385 | 224 | 82 | 424 | 156 | 161 | 1162 | 42 | 155 | 1239 | 35 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 243 | 735 | 422 | 231 | 860 | 313 | 238 | 2046 | 74 | 225 | 2703 | 76 |
| Arrive On Green | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.40 | 0.40 | 0.40 | 0.07 | 0.53 | 0.53 |
| Sat Flow, veh/h | 790 | 2171 | 1245 | 769 | 2539 | 924 | 412 | 5056 | 183 | 3092 | 5104 | 144 |
| Grp Volume(v), veh/h | 122 | 314 | 295 | 82 | 295 | 285 | 161 | 782 | 422 | 155 | 826 | 448 |
| Grp Sat Flow(s),veh/h/ln | 790 | 1777 | 1640 | 769 | 1777 | 1686 | 412 | 1702 | 1834 | 1546 | 1702 | 1844 |
| Q Serve(g_s), s | 12.8 | 12.5 | 12.8 | 8.5 | 11.6 | 11.8 | 33.3 | 15.6 | 15.6 | 4.3 | 13.3 | 13.3 |
| Cycle Q Clear(g_c), s | 24.6 | 12.5 | 12.8 | 21.2 | 11.6 | 11.8 | 35.6 | 15.6 | 15.6 | 4.3 | 13.3 | 13.3 |
| Prop In Lane | 1.00 | | 0.76 | 1.00 | | 0.55 | 1.00 | | 0.10 | 1.00 | | 0.08 |
| Lane Grp Cap(c), veh/h | 243 | 602 | 555 | 231 | 602 | 571 | 238 | 1377 | 742 | 225 | 1803 | 977 |
| V/C Ratio(X) | 0.50 | 0.52 | 0.53 | 0.36 | 0.49 | 0.50 | 0.68 | 0.57 | 0.57 | 0.69 | 0.46 | 0.46 |
| Avail Cap(c_a), veh/h | 310 | 751 | 693 | 295 | 751 | 713 | 238 | 1377 | 742 | 1089 | 2755 | 1493 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.0 | 23.4 | 23.5 | 32.0 | 23.1 | 23.2 | 27.9 | 20.2 | 20.3 | 39.8 | 12.9 | 12.9 |
| Incr Delay (d2), s/veh | 1.6 | 0.7 | 0.8 | 0.9 | 0.6 | 0.7 | 7.5 | 0.6 | 1.0 | 1.4 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 4.9 | 4.7 | 1.5 | 4.6 | 4.4 | 3.6 | 5.7 | 6.2 | 1.6 | 4.4 | 4.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.6 | 24.1 | 24.3 | 33.0 | 23.7 | 23.8 | 35.3 | 20.8 | 21.3 | 41.2 | 13.0 | 13.2 |
| LnGrp LOS | C | C | C | C | C | C | D | C | C | D | B | B |
| Approach Vol, veh/h | | 731 | | | 662 | | | 1365 | | | 1429 | |
| Approach Delay, s/veh | | 25.9 | | | 24.9 | | | 22.7 | | | 16.1 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 41.4 | | 35.6 | | 52.4 | | 35.6 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.0 | 35.6 | | 37.2 | | 71.2 | | 37.2 |
| Max Q Clear Time (g_c+I1), s | 6.3 | 37.6 | | 26.6 | | 15.3 | | 23.2 |
| Green Ext Time (p_c), s | 0.2 | 0.0 | | 3.2 | | 10.4 | | 3.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 21.4 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 843 | 193 | 651 | 228 | 1016 | 319 | 135 | 1109 | 231 |
| Future Volume (vph) | 185 | 843 | 193 | 651 | 228 | 1016 | 319 | 135 | 1109 | 231 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 21.0 | 43.0 | 23.0 | 45.0 | 15.2 | 35.0 | 35.0 | 19.0 | 38.8 | 38.8 |
| Total Split (%) | 17.5% | 35.8% | 19.2% | 37.5% | 12.7% | 29.2% | 29.2% | 15.8% | 32.3% | 32.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.7 | 36.0 | 17.0 | 37.3 | 10.0 | 29.8 | 29.8 | 13.0 | 32.8 | 32.8 |
| Actuated g/C Ratio | 0.13 | 0.30 | 0.14 | 0.31 | 0.08 | 0.25 | 0.25 | 0.11 | 0.28 | 0.28 |
| v/c Ratio | 0.90 | 2.02 | 0.87 | 0.72 | 1.74 | 1.23 | 0.70 | 0.79 | 1.22 | 0.44 |
| Control Delay (s/veh) | 91.0 | 489.9 | 82.7 | 39.9 | 394.4 | 151.8 | 34.2 | 80.9 | 145.7 | 13.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 91.0 | 489.9 | 82.7 | 39.9 | 394.4 | 151.8 | 34.2 | 80.9 | 145.7 | 13.3 |
| LOS | F | F | F | D | F | F | C | F | F | B |
| Approach Delay (s/veh) | | 429.7 | | 48.8 | | 163.2 | | | 119.0 | |
| Approach LOS | | F | | D | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.02 | |
| Intersection Signal Delay (s/veh): 193.3 | Intersection LOS: F |
| Intersection Capacity Utilization 130.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

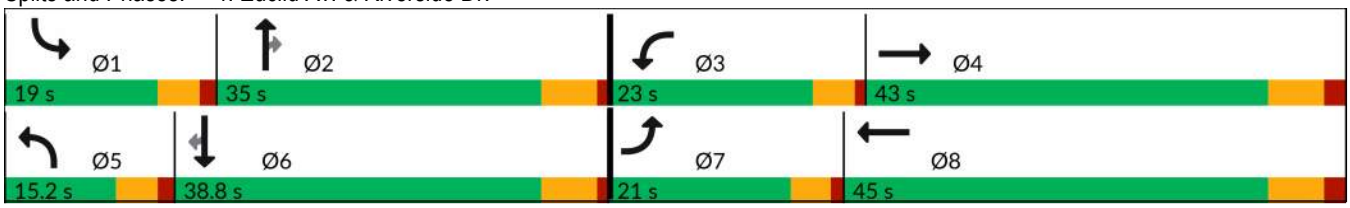

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 185 | 843 | 200 | 193 | 651 | 83 | 228 | 1016 | 319 | 135 | 1109 | 231 |
| Future Volume (veh/h) | 185 | 843 | 200 | 193 | 651 | 83 | 228 | 1016 | 319 | 135 | 1109 | 231 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 199 | 906 | 188 | 208 | 700 | 65 | 245 | 1092 | 275 | 145 | 1192 | 187 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 224 | 458 | 95 | 234 | 1019 | 95 | 143 | 929 | 415 | 171 | 987 | 435 |
| Arrive On Green | 0.13 | 0.30 | 0.30 | 0.14 | 0.31 | 0.31 | 0.08 | 0.26 | 0.26 | 0.10 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1688 | 1502 | 312 | 1688 | 3282 | 305 | 1688 | 3554 | 1585 | 1688 | 3554 | 1565 |
| Grp Volume(v), veh/h | 199 | 0 | 1094 | 208 | 379 | 386 | 245 | 1092 | 275 | 145 | 1192 | 187 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1814 | 1688 | 1777 | 1810 | 1688 | 1777 | 1585 | 1688 | 1777 | 1565 |
| Q Serve(g_s), s | 13.7 | 0.0 | 36.0 | 14.3 | 22.0 | 22.1 | 10.0 | 30.9 | 18.3 | 10.0 | 32.8 | 11.6 |
| Cycle Q Clear(g_c), s | 13.7 | 0.0 | 36.0 | 14.3 | 22.0 | 22.1 | 10.0 | 30.9 | 18.3 | 10.0 | 32.8 | 11.6 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 0.17 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 224 | 0 | 553 | 234 | 552 | 562 | 143 | 929 | 415 | 171 | 987 | 435 |
| V/C Ratio(X) | 0.89 | 0.00 | 1.98 | 0.89 | 0.69 | 0.69 | 1.71 | 1.17 | 0.66 | 0.85 | 1.21 | 0.43 |
| Avail Cap(c_a), veh/h | 233 | 0 | 553 | 262 | 572 | 583 | 143 | 929 | 415 | 197 | 987 | 435 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.3 | 0.0 | 41.0 | 50.0 | 35.7 | 35.7 | 54.0 | 43.6 | 38.9 | 52.2 | 42.6 | 35.0 |
| Incr Delay (d2), s/veh | 29.4 | 0.0 | 446.2 | 25.7 | 3.7 | 3.7 | 349.0 | 90.1 | 3.9 | 25.4 | 102.8 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.4 | 0.0 | 83.9 | 7.5 | 9.7 | 9.9 | 17.9 | 24.3 | 7.3 | 5.3 | 27.8 | 4.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 79.7 | 0.0 | 487.2 | 75.6 | 39.4 | 39.3 | 403.0 | 133.7 | 42.9 | 77.6 | 145.4 | 35.6 |
| LnGrp LOS | E | | F | E | D | D | F | F | D | E | F | D |
| Approach Vol, veh/h | | 1293 | | | 973 | | | 1612 | | | 1524 | |
| Approach Delay, s/veh | | 424.5 | | | 47.1 | | | 159.1 | | | 125.5 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.1 | 36.9 | 21.0 | 43.0 | 15.2 | 38.8 | 20.4 | 43.7 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 13.8 | 29.0 | 18.3 | 36.0 | 10.0 | 32.8 | 16.3 | 38.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 32.9 | 16.3 | 38.0 | 12.0 | 34.8 | 15.7 | 24.1 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 193.0 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 115 | 370 | 56 | 123 | 352 | 84 | 1569 | 311 | 69 | 1321 | 96 |
| Future Volume (vph) | 115 | 370 | 56 | 123 | 352 | 84 | 1569 | 311 | 69 | 1321 | 96 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 56.0 | 56.0 | 56.0 | 56.0 | 56.0 | 49.0 | 49.0 | 49.0 | 15.0 | 64.0 | 64.0 |
| Total Split (%) | 46.7% | 46.7% | 46.7% | 46.7% | 46.7% | 40.8% | 40.8% | 40.8% | 12.5% | 53.3% | 53.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 50.3 | 50.3 | 50.3 | | 50.3 | 42.9 | 42.9 | 42.9 | 10.2 | 54.4 | 54.4 |
| Actuated g/C Ratio | 0.43 | 0.43 | 0.43 | | 0.43 | 0.37 | 0.37 | 0.37 | 0.09 | 0.46 | 0.46 |
| v/c Ratio | 0.47 | 0.51 | 0.09 | | 1.30 | 1.55 | 1.35 | 0.56 | 0.53 | 0.89 | 0.14 |
| Control Delay (s/veh) | 31.9 | 28.0 | 3.9 | | 181.1 | 346.9 | 192.7 | 28.3 | 66.3 | 36.7 | 7.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 31.9 | 28.0 | 3.9 | | 181.1 | 346.9 | 192.7 | 28.3 | 66.3 | 36.7 | 7.7 |
| LOS | C | C | A | | F | F | F | C | E | D | A |
| Approach Delay (s/veh) | | 26.4 | | | 181.1 | | 173.2 | | | 36.2 | |
| Approach LOS | | C | | | F | | F | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 117.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.55 | |
| Intersection Signal Delay (s/veh): 111.5 | Intersection LOS: F |
| Intersection Capacity Utilization 118.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 115 | 370 | 56 | 123 | 352 | 55 | 84 | 1569 | 311 | 69 | 1321 | 96 |
| Future Volume (veh/h) | 115 | 370 | 56 | 123 | 352 | 55 | 84 | 1569 | 311 | 69 | 1321 | 96 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 128 | 411 | 50 | 137 | 391 | 61 | 93 | 1743 | 312 | 77 | 1468 | 77 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 239 | 790 | 670 | 128 | 305 | 46 | 94 | 1271 | 567 | 131 | 1684 | 733 |
| Arrive On Green | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.36 | 0.36 | 0.36 | 0.08 | 0.47 | 0.47 |
| Sat Flow, veh/h | 889 | 1870 | 1585 | 213 | 722 | 108 | 317 | 3554 | 1585 | 1688 | 3554 | 1547 |
| Grp Volume(v), veh/h | 128 | 411 | 50 | 589 | 0 | 0 | 93 | 1743 | 312 | 77 | 1468 | 77 |
| Grp Sat Flow(s),veh/h/ln | 889 | 1870 | 1585 | 1044 | 0 | 0 | 317 | 1777 | 1585 | 1688 | 1777 | 1547 |
| Q Serve(g_s), s | 0.0 | 19.3 | 2.2 | 30.9 | 0.0 | 0.0 | 12.3 | 42.5 | 18.7 | 5.2 | 44.0 | 3.3 |
| Cycle Q Clear(g_c), s | 29.8 | 19.3 | 2.2 | 50.2 | 0.0 | 0.0 | 42.5 | 42.5 | 18.7 | 5.2 | 44.0 | 3.3 |
| Prop In Lane | 1.00 | | 1.00 | 0.23 | | 0.10 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 239 | 790 | 670 | 478 | 0 | 0 | 94 | 1271 | 567 | 131 | 1684 | 733 |
| V/C Ratio(X) | 0.54 | 0.52 | 0.07 | 1.23 | 0.00 | 0.00 | 0.99 | 1.37 | 0.55 | 0.59 | 0.87 | 0.11 |
| Avail Cap(c_a), veh/h | 239 | 790 | 670 | 478 | 0 | 0 | 94 | 1271 | 567 | 148 | 1720 | 749 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.4 | 25.4 | 20.5 | 41.5 | 0.0 | 0.0 | 57.2 | 38.2 | 30.5 | 53.0 | 28.0 | 17.3 |
| Incr Delay (d2), s/veh | 2.3 | 0.6 | 0.0 | 121.3 | 0.0 | 0.0 | 91.2 | 172.1 | 1.1 | 2.3 | 5.1 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 8.4 | 0.8 | 30.0 | 0.0 | 0.0 | 5.1 | 47.4 | 6.9 | 2.2 | 17.9 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 30.7 | 26.0 | 20.5 | 162.8 | 0.0 | 0.0 | 148.4 | 210.3 | 31.7 | 55.3 | 33.1 | 17.4 |
| LnGrp LOS | C | C | C | F | | | F | F | C | E | C | B |
| Approach Vol, veh/h | | 589 | | | 589 | | | 2148 | | | 1622 | |
| Approach Delay, s/veh | | 26.6 | | | 162.8 | | | 181.6 | | | 33.4 | |
| Approach LOS | | C | | | F | | | F | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.8 | 49.0 | | 56.0 | | 62.8 | | 56.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 42.5 | | 50.2 | | 57.5 | | 50.2 |
| Max Q Clear Time (g_c+I1), s | 7.2 | 44.5 | | 31.8 | | 46.0 | | 52.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 3.1 | | 7.1 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 112.4 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 363 | 218 | 212 | 59 | 160 | 112 | 1496 | 51 | 80 | 1339 | 88 |
| Future Volume (vph) | 363 | 218 | 212 | 59 | 160 | 112 | 1496 | 51 | 80 | 1339 | 88 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 17.0 | 49.3 | 49.3 | 14.7 | 47.0 | 15.0 | 41.3 | 41.3 | 14.7 | 41.0 | 41.0 |
| Total Split (%) | 14.2% | 41.1% | 41.1% | 12.3% | 39.2% | 12.5% | 34.4% | 34.4% | 12.3% | 34.2% | 34.2% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.4 | 26.7 | 26.7 | 10.1 | 21.1 | 10.3 | 38.3 | 38.3 | 10.1 | 34.8 | 34.8 |
| Actuated g/C Ratio | 0.12 | 0.26 | 0.26 | 0.10 | 0.21 | 0.10 | 0.38 | 0.38 | 0.10 | 0.34 | 0.34 |
| v/c Ratio | 1.96 | 0.49 | 0.40 | 0.39 | 0.72 | 0.72 | 1.23 | 0.08 | 0.53 | 1.21 | 0.16 |
| Control Delay (s/veh) | 474.8 | 36.1 | 5.8 | 53.7 | 44.2 | 70.8 | 142.6 | 0.2 | 58.8 | 136.0 | 3.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 474.8 | 36.1 | 5.8 | 53.7 | 44.2 | 70.8 | 142.6 | 0.2 | 58.8 | 136.0 | 3.8 |
| LOS | F | D | A | D | D | E | F | A | E | F | A |
| Approach Delay (s/veh) | | 228.8 | | | 46.0 | | 133.3 | | | 124.1 | |
| Approach LOS | | F | | | D | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 101.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.96 | |
| Intersection Signal Delay (s/veh): 141.5 | Intersection LOS: F |
| Intersection Capacity Utilization 104.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

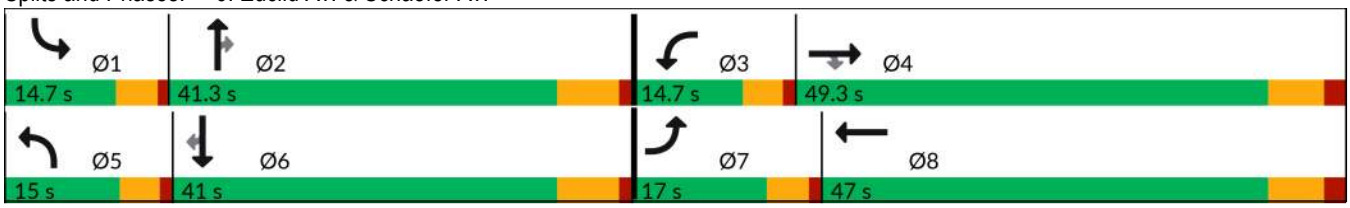

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 363 | 218 | 212 | 59 | 160 | 91 | 112 | 1496 | 51 | 80 | 1339 | 88 |
| Future Volume (veh/h) | 363 | 218 | 212 | 59 | 160 | 91 | 112 | 1496 | 51 | 80 | 1339 | 88 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 399 | 240 | 189 | 65 | 176 | 89 | 123 | 1644 | 49 | 88 | 1471 | 50 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 215 | 412 | 349 | 144 | 208 | 105 | 168 | 1291 | 576 | 158 | 1270 | 554 |
| Arrive On Green | 0.13 | 0.22 | 0.22 | 0.09 | 0.18 | 0.18 | 0.10 | 0.36 | 0.36 | 0.09 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1166 | 589 | 1688 | 3554 | 1585 | 1688 | 3554 | 1550 |
| Grp Volume(v), veh/h | 399 | 240 | 189 | 65 | 0 | 265 | 123 | 1644 | 49 | 88 | 1471 | 50 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1755 | 1688 | 1777 | 1585 | 1688 | 1777 | 1550 |
| Q Serve(g_s), s | 12.3 | 11.1 | 10.2 | 3.5 | 0.0 | 14.1 | 6.8 | 35.1 | 2.0 | 4.8 | 34.5 | 2.1 |
| Cycle Q Clear(g_c), s | 12.3 | 11.1 | 10.2 | 3.5 | 0.0 | 14.1 | 6.8 | 35.1 | 2.0 | 4.8 | 34.5 | 2.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.34 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 215 | 412 | 349 | 144 | 0 | 313 | 168 | 1291 | 576 | 158 | 1270 | 554 |
| V/C Ratio(X) | 1.86 | 0.58 | 0.54 | 0.45 | 0.00 | 0.85 | 0.73 | 1.27 | 0.09 | 0.56 | 1.16 | 0.09 |
| Avail Cap(c_a), veh/h | 215 | 819 | 694 | 175 | 0 | 727 | 180 | 1291 | 576 | 175 | 1270 | 554 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.1 | 33.7 | 33.3 | 42.0 | 0.0 | 38.4 | 42.2 | 30.7 | 20.2 | 41.8 | 31.0 | 20.6 |
| Incr Delay (d2), s/veh | 402.5 | 1.0 | 1.0 | 0.8 | 0.0 | 4.8 | 11.1 | 129.2 | 0.1 | 1.2 | 80.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 28.9 | 4.9 | 3.8 | 1.4 | 0.0 | 6.2 | 3.2 | 36.4 | 0.7 | 1.9 | 27.3 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 444.7 | 34.6 | 34.3 | 42.8 | 0.0 | 43.2 | 53.3 | 160.0 | 20.3 | 43.0 | 111.5 | 20.7 |
| LnGrp LOS | F | C | C | D | | D | D | F | C | D | F | C |
| Approach Vol, veh/h | | 828 | | | 330 | | | 1816 | | | 1609 | |
| Approach Delay, s/veh | | 232.1 | | | 43.1 | | | 149.0 | | | 104.9 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.8 | 41.6 | 13.0 | 28.3 | 14.3 | 41.0 | 17.0 | 24.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 34.8 | 10.0 | 42.3 | 10.3 | 34.5 | 12.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 6.8 | 37.1 | 5.5 | 13.1 | 8.8 | 36.5 | 14.3 | 16.1 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 0.0 | 0.0 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 140.9 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 131 | 711 | 56 | 249 | 670 | 156 | 1130 | 310 | 459 | 1127 | 143 |
| Future Volume (vph) | 131 | 711 | 56 | 249 | 670 | 156 | 1130 | 310 | 459 | 1127 | 143 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 58.0 | 58.0 | 58.0 | 58.0 | 58.0 | 14.8 | 38.0 | 38.0 | 24.0 | 47.2 | 47.2 |
| Total Split (%) | 48.3% | 48.3% | 48.3% | 48.3% | 48.3% | 12.3% | 31.7% | 31.7% | 20.0% | 39.3% | 39.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 50.8 | 50.8 | 50.8 | 50.8 | 50.8 | 10.1 | 31.5 | 31.5 | 19.3 | 40.7 | 40.7 |
| Actuated g/C Ratio | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.08 | 0.26 | 0.26 | 0.16 | 0.34 | 0.34 |
| v/c Ratio | 2.40 | 0.96 | 0.08 | 4.57 | 1.67 | 0.65 | 1.30 | 0.65 | 1.81 | 1.00 | 0.26 |
| Control Delay (s/veh) | 698.4 | 57.9 | 0.2 | Error | 332.6 | 65.5 | 177.8 | 30.9 | 410.8 | 65.4 | 12.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 698.4 | 57.9 | 0.2 | Error | 332.6 | 65.5 | 177.8 | 30.9 | 410.8 | 65.4 | 12.3 |
| LOS | F | E | A | F | F | E | F | C | F | E | B |
| Approach Delay (s/veh) | | 147.5 | | | 561.8 | | 138.3 | | | 152.7 | |
| Approach LOS | | F | | | F | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 4.57 | |
| Intersection Signal Delay (s/veh): 251.8 | Intersection LOS: F |
| Intersection Capacity Utilization 154.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 711 | 56 | 249 | 670 | 520 | 156 | 1130 | 310 | 459 | 1127 | 143 |
| Future Volume (veh/h) | 131 | 711 | 56 | 249 | 670 | 520 | 156 | 1130 | 310 | 459 | 1127 | 143 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 139 | 756 | 32 | 265 | 713 | 543 | 166 | 1202 | 313 | 488 | 1199 | 116 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 60 | 792 | 671 | 81 | 417 | 318 | 257 | 933 | 416 | 271 | 1209 | 532 |
| Arrive On Green | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.08 | 0.26 | 0.26 | 0.16 | 0.34 | 0.34 |
| Sat Flow, veh/h | 419 | 1870 | 1585 | 651 | 985 | 750 | 3092 | 3554 | 1585 | 1688 | 3554 | 1564 |
| Grp Volume(v), veh/h | 139 | 756 | 32 | 265 | 0 | 1256 | 166 | 1202 | 313 | 488 | 1199 | 116 |
| Grp Sat Flow(s),veh/h/ln | 419 | 1870 | 1585 | 651 | 0 | 1735 | 1546 | 1777 | 1585 | 1688 | 1777 | 1564 |
| Q Serve(g_s), s | 0.0 | 46.9 | 1.4 | 3.9 | 0.0 | 50.8 | 6.2 | 31.5 | 21.8 | 19.3 | 40.3 | 6.3 |
| Cycle Q Clear(g_c), s | 50.8 | 46.9 | 1.4 | 50.8 | 0.0 | 50.8 | 6.2 | 31.5 | 21.8 | 19.3 | 40.3 | 6.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.43 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 60 | 792 | 671 | 81 | 0 | 735 | 257 | 933 | 416 | 271 | 1209 | 532 |
| V/C Ratio(X) | 2.32 | 0.95 | 0.05 | 3.28 | 0.00 | 1.71 | 0.65 | 1.29 | 0.75 | 1.80 | 0.99 | 0.22 |
| Avail Cap(c_a), veh/h | 60 | 792 | 671 | 81 | 0 | 735 | 260 | 933 | 416 | 271 | 1209 | 532 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 60.0 | 33.5 | 20.4 | 59.5 | 0.0 | 34.6 | 53.3 | 44.3 | 40.7 | 50.3 | 39.4 | 28.2 |
| Incr Delay (d2), s/veh | 641.3 | 21.6 | 0.0 | 1054.9 | 0.0 | 325.2 | 4.2 | 138.0 | 7.5 | 373.5 | 23.7 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.5 | 24.6 | 0.5 | 26.1 | 0.0 | 86.3 | 2.5 | 30.9 | 8.9 | 35.9 | 20.3 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 701.3 | 55.1 | 20.4 | 1114.4 | 0.0 | 359.8 | 57.5 | 182.2 | 48.2 | 423.8 | 63.1 | 28.4 |
| LnGrp LOS | F | E | C | F | | F | E | F | D | F | E | C |
| Approach Vol, veh/h | | 927 | | | 1521 | | | 1681 | | | 1803 | |
| Approach Delay, s/veh | | 150.8 | | | 491.3 | | | 144.9 | | | 158.5 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 38.0 | | 58.0 | 14.7 | 47.3 | | 58.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 19.3 | 31.5 | | 50.8 | 10.1 | 40.7 | | 50.8 |
| Max Q Clear Time (g_c+I1), s | 21.3 | 33.5 | | 52.8 | 8.2 | 42.3 | | 52.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 238.8 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 72 | 254 | 129 | 101 | 294 | 140 | 1051 | 253 | 383 | 1010 | 43 |
| Future Volume (vph) | 72 | 254 | 129 | 101 | 294 | 140 | 1051 | 253 | 383 | 1010 | 43 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 32.9 | 32.9 | 32.9 | 32.9 | 32.9 | 14.0 | 36.0 | 36.0 | 18.2 | 40.2 | 40.2 |
| Actuated g/C Ratio | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.13 | 0.34 | 0.34 | 0.17 | 0.38 | 0.38 |
| v/c Ratio | 0.74 | 0.47 | 0.23 | 0.40 | 0.87 | 0.67 | 0.87 | 0.46 | 1.41 | 0.80 | 0.07 |
| Control Delay (s/veh) | 73.3 | 31.8 | 5.2 | 33.1 | 48.5 | 61.0 | 43.0 | 22.8 | 238.7 | 36.6 | 1.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 73.3 | 31.8 | 5.2 | 33.1 | 48.5 | 61.0 | 43.0 | 22.8 | 238.7 | 36.6 | 1.8 |
| LOS | E | C | A | C | D | E | D | C | F | D | A |
| Approach Delay (s/veh) | | 30.9 | | | 45.8 | | 41.2 | | | 89.4 | |
| Approach LOS | | C | | | D | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105.7 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.41 | |
| Intersection Signal Delay (s/veh): 58.7 | Intersection LOS: E |
| Intersection Capacity Utilization 106.8% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

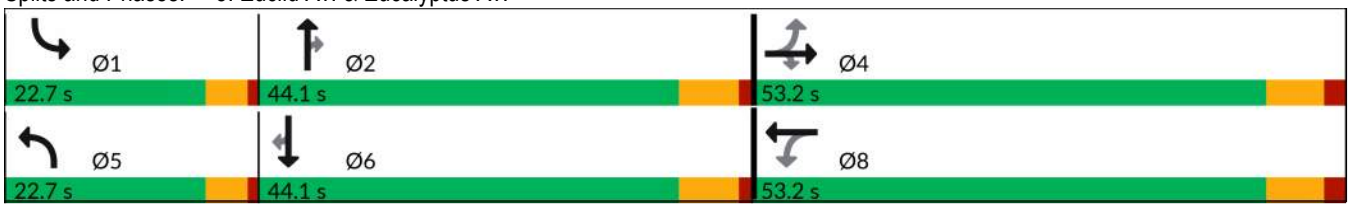

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 72 | 254 | 129 | 101 | 294 | 167 | 140 | 1051 | 253 | 383 | 1010 | 43 |
| Future Volume (veh/h) | 72 | 254 | 129 | 101 | 294 | 167 | 140 | 1051 | 253 | 383 | 1010 | 43 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 77 | 270 | 96 | 107 | 313 | 158 | 149 | 1051 | 246 | 407 | 1074 | 35 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 1.00 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 164 | 655 | 555 | 296 | 410 | 207 | 177 | 1151 | 513 | 272 | 1351 | 603 |
| Arrive On Green | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.35 | 0.10 | 0.32 | 0.32 | 0.16 | 0.38 | 0.38 |
| Sat Flow, veh/h | 874 | 1870 | 1585 | 962 | 1172 | 592 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 77 | 270 | 96 | 107 | 0 | 471 | 149 | 1051 | 246 | 407 | 1074 | 35 |
| Grp Sat Flow(s),veh/h/ln | 874 | 1870 | 1585 | 962 | 0 | 1764 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 9.6 | 12.2 | 4.7 | 10.6 | 0.0 | 26.4 | 9.7 | 31.7 | 13.9 | 18.0 | 30.0 | 1.6 |
| Cycle Q Clear(g_c), s | 36.0 | 12.2 | 4.7 | 22.8 | 0.0 | 26.4 | 9.7 | 31.7 | 13.9 | 18.0 | 30.0 | 1.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.34 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 164 | 655 | 555 | 296 | 0 | 618 | 177 | 1151 | 513 | 272 | 1351 | 603 |
| V/C Ratio(X) | 0.47 | 0.41 | 0.17 | 0.36 | 0.00 | 0.76 | 0.84 | 0.91 | 0.48 | 1.50 | 0.79 | 0.06 |
| Avail Cap(c_a), veh/h | 218 | 771 | 653 | 356 | 0 | 727 | 272 | 1197 | 534 | 272 | 1351 | 603 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.1 | 27.5 | 25.1 | 36.2 | 0.0 | 32.2 | 49.1 | 36.2 | 30.2 | 46.8 | 30.7 | 21.9 |
| Incr Delay (d2), s/veh | 1.6 | 0.3 | 0.1 | 0.6 | 0.0 | 3.7 | 11.3 | 10.5 | 0.7 | 241.6 | 3.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 5.3 | 1.7 | 2.4 | 0.0 | 11.1 | 4.4 | 14.3 | 5.0 | 25.4 | 12.3 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 49.7 | 27.9 | 25.2 | 36.8 | 0.0 | 35.9 | 60.4 | 46.8 | 30.9 | 288.4 | 34.1 | 22.0 |
| LnGrp LOS | D | C | C | D | | D | E | D | C | F | C | C |
| Approach Vol, veh/h | | 443 | | | 578 | | | 1446 | | | 1516 | |
| Approach Delay, s/veh | | 31.1 | | | 36.0 | | | 45.5 | | | 102.1 | |
| Approach LOS | | C | | | D | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.7 | 42.6 | | 46.3 | 16.4 | 49.0 | | 46.3 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 20.0 | 33.7 | | 38.0 | 11.7 | 32.0 | | 28.4 |
| Green Ext Time (p_c), s | 0.0 | 2.4 | | 1.1 | 0.1 | 3.1 | | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 64.1 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 8 | 5 | 145 | 28 | 47 | 1705 | 467 | 258 | 1145 |
| Future Volume (vph) | 8 | 5 | 145 | 28 | 47 | 1705 | 467 | 258 | 1145 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.8 | 50.8 | 22.0 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.3% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 27.7 | | 37.9 | 10.0 | 44.4 | 44.4 | 17.3 | 54.8 |
| Actuated g/C Ratio | | 0.23 | | 0.32 | 0.08 | 0.38 | 0.38 | 0.15 | 0.46 |
| v/c Ratio | | 0.08 | | 0.96 | 0.38 | 1.47 | 0.82 | 1.21 | 0.83 |
| Control Delay (s/veh) | | 18.0 | | 65.3 | 60.4 | 247.3 | 37.6 | 169.2 | 34.7 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 18.0 | | 65.3 | 60.4 | 247.3 | 37.6 | 169.2 | 34.7 |
| LOS | | B | | E | E | F | D | F | C |
| Approach Delay (s/veh) | | 18.0 | | 65.3 | | 199.2 | | | 58.8 |
| Approach LOS | | B | | E | | F | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.47 | |
| Intersection Signal Delay (s/veh): 134.8 | Intersection LOS: F |
| Intersection Capacity Utilization 110.7% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

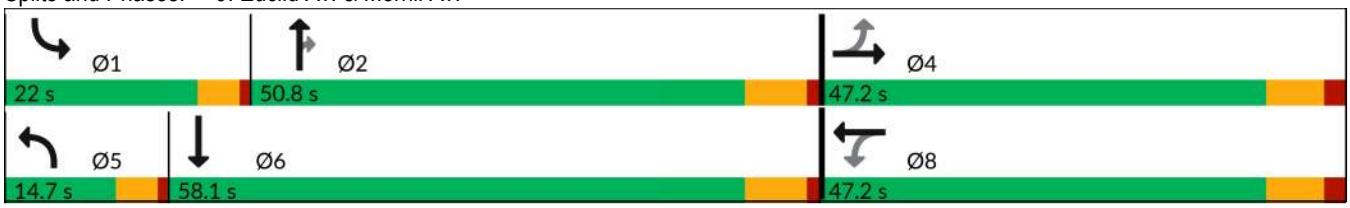

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 8 | 5 | 12 | 145 | 28 | 262 | 47 | 1705 | 467 | 258 | 1145 | 39 |
| Future Volume (veh/h) | 8 | 5 | 12 | 145 | 28 | 262 | 47 | 1705 | 467 | 258 | 1145 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 9 | 6 | 11 | 167 | 32 | 285 | 54 | 1960 | 532 | 297 | 1316 | 34 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 160 | 111 | 170 | 209 | 39 | 297 | 118 | 1317 | 584 | 244 | 1575 | 41 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.07 | 0.37 | 0.37 | 0.14 | 0.45 | 0.45 |
| Sat Flow, veh/h | 362 | 337 | 512 | 508 | 118 | 896 | 1688 | 3554 | 1576 | 1688 | 3536 | 91 |
| Grp Volume(v), veh/h | 26 | 0 | 0 | 484 | 0 | 0 | 54 | 1960 | 532 | 297 | 661 | 689 |
| Grp Sat Flow(s),veh/h/ln | 1211 | 0 | 0 | 1522 | 0 | 0 | 1688 | 1777 | 1576 | 1688 | 1777 | 1850 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 36.1 | 0.0 | 0.0 | 3.7 | 44.3 | 38.3 | 17.3 | 39.3 | 39.4 |
| Cycle Q Clear(g_c), s | 1.2 | 0.0 | 0.0 | 37.3 | 0.0 | 0.0 | 3.7 | 44.3 | 38.3 | 17.3 | 39.3 | 39.4 |
| Prop In Lane | 0.35 | | 0.42 | 0.35 | | 0.59 | 1.00 | | 1.00 | 1.00 | | 0.05 |
| Lane Grp Cap(c), veh/h | 441 | 0 | 0 | 544 | 0 | 0 | 118 | 1317 | 584 | 244 | 791 | 824 |
| V/C Ratio(X) | 0.06 | 0.00 | 0.00 | 0.89 | 0.00 | 0.00 | 0.46 | 1.49 | 0.91 | 1.22 | 0.83 | 0.84 |
| Avail Cap(c_a), veh/h | 446 | 0 | 0 | 549 | 0 | 0 | 141 | 1317 | 584 | 244 | 791 | 824 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.2 | 0.0 | 0.0 | 39.2 | 0.0 | 0.0 | 53.5 | 37.6 | 35.8 | 51.1 | 29.3 | 29.3 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 15.8 | 0.0 | 0.0 | 1.0 | 224.0 | 18.5 | 128.8 | 7.7 | 7.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 0.0 | 15.5 | 0.0 | 0.0 | 1.5 | 58.6 | 16.6 | 15.7 | 16.9 | 17.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.2 | 0.0 | 0.0 | 55.0 | 0.0 | 0.0 | 54.5 | 261.7 | 54.3 | 179.9 | 37.0 | 36.8 |
| LnGrp LOS | C | | | D | | | D | F | D | F | D | D |
| Approach Vol, veh/h | | 26 | | | 484 | | | 2546 | | | 1647 | |
| Approach Delay, s/veh | | 27.2 | | | 55.0 | | | 213.9 | | | 62.7 | |
| Approach LOS | | C | | | D | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.0 | 50.8 | | 46.8 | 13.0 | 59.8 | | 46.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.3 | 44.3 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 19.3 | 46.3 | | 3.2 | 5.7 | 41.4 | | 39.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.1 | 0.0 | 5.5 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 143.6 |
| HCM 7th LOS | F |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 463 | 441 | 306 | 153 | 900 | 365 | 256 | 844 | 89 | 223 | 931 | 429 |
| Future Volume (vph) | 463 | 441 | 306 | 153 | 900 | 365 | 256 | 844 | 89 | 223 | 931 | 429 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 34.6 | 14.7 | 17.5 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 28.8% | 12.3% | 14.6% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 35.3 | 35.3 | 10.0 | 35.3 | 35.3 | 10.0 | 29.2 | 41.1 | 11.9 | 31.1 | 47.6 |
| Actuated g/C Ratio | 0.09 | 0.32 | 0.32 | 0.09 | 0.32 | 0.32 | 0.09 | 0.27 | 0.38 | 0.11 | 0.28 | 0.43 |
| v/c Ratio | 1.73 | 0.41 | 0.48 | 1.05 | 0.83 | 0.58 | 1.76 | 0.94 | 0.15 | 0.71 | 0.98 | 0.62 |
| Control Delay (s/veh) | 375.0 | 29.7 | 9.5 | 136.8 | 41.3 | 15.1 | 397.4 | 59.0 | 7.4 | 60.6 | 63.1 | 25.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 375.0 | 29.7 | 9.5 | 136.8 | 41.3 | 15.1 | 397.4 | 59.0 | 7.4 | 60.6 | 63.1 | 25.0 |
| LOS | F | C | A | F | D | B | F | E | A | E | E | C |
| Approach Delay (s/veh) | | 156.7 | | | 44.9 | | | 127.9 | | | 52.4 | |
| Approach LOS | | F | | | D | | | F | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.76 | |
| Intersection Signal Delay (s/veh): 90.4 | Intersection LOS: F |
| Intersection Capacity Utilization 99.5% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

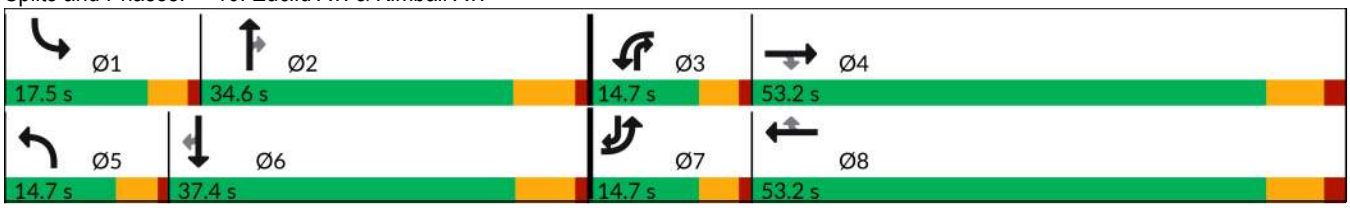

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 463 | 441 | 306 | 153 | 900 | 365 | 256 | 844 | 89 | 223 | 931 | 429 |
| Future Volume (veh/h) | 463 | 441 | 306 | 153 | 900 | 365 | 256 | 844 | 89 | 223 | 931 | 429 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 487 | 464 | 306 | 161 | 947 | 207 | 269 | 888 | 73 | 235 | 980 | 399 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 289 | 1093 | 487 | 158 | 1093 | 481 | 158 | 1027 | 600 | 291 | 1029 | 607 |
| Arrive On Green | 0.09 | 0.31 | 0.31 | 0.09 | 0.31 | 0.31 | 0.09 | 0.29 | 0.29 | 0.09 | 0.29 | 0.29 |
| Sat Flow, veh/h | 3092 | 3554 | 1585 | 1688 | 3554 | 1565 | 1688 | 3554 | 1565 | 3092 | 3554 | 1585 |
| Grp Volume(v), veh/h | 487 | 464 | 306 | 161 | 947 | 207 | 269 | 888 | 73 | 235 | 980 | 399 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1777 | 1585 | 1688 | 1777 | 1565 | 1688 | 1777 | 1565 | 1546 | 1777 | 1585 |
| Q Serve(g_s), s | 10.0 | 11.1 | 17.7 | 10.0 | 26.9 | 11.3 | 10.0 | 25.3 | 3.2 | 8.0 | 28.9 | 22.2 |
| Cycle Q Clear(g_c), s | 10.0 | 11.1 | 17.7 | 10.0 | 26.9 | 11.3 | 10.0 | 25.3 | 3.2 | 8.0 | 28.9 | 22.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 289 | 1093 | 487 | 158 | 1093 | 481 | 158 | 1027 | 600 | 291 | 1029 | 607 |
| V/C Ratio(X) | 1.69 | 0.42 | 0.63 | 1.02 | 0.87 | 0.43 | 1.71 | 0.86 | 0.12 | 0.81 | 0.95 | 0.66 |
| Avail Cap(c_a), veh/h | 289 | 1528 | 682 | 158 | 1528 | 673 | 158 | 1027 | 600 | 370 | 1030 | 607 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.5 | 29.5 | 31.8 | 48.5 | 35.0 | 29.6 | 48.5 | 36.1 | 21.4 | 47.5 | 37.3 | 27.2 |
| Incr Delay (d2), s/veh | 322.9 | 0.3 | 1.3 | 77.2 | 3.1 | 0.2 | 342.9 | 7.8 | 0.1 | 7.8 | 17.7 | 2.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 16.6 | 4.5 | 6.5 | 7.4 | 11.3 | 4.0 | 19.0 | 11.2 | 1.1 | 3.2 | 14.1 | 8.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 371.4 | 29.8 | 33.1 | 125.7 | 38.0 | 29.8 | 391.4 | 43.9 | 21.5 | 55.3 | 55.0 | 29.8 |
| LnGrp LOS | F | C | C | F | D | C | F | D | C | E | D | C |
| Approach Vol, veh/h | | 1257 | | | 1315 | | | 1230 | | | 1614 | |
| Approach Delay, s/veh | | 162.9 | | | 47.5 | | | 118.6 | | | 48.8 | |
| Approach LOS | | F | | | D | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.8 | 37.4 | 14.7 | 40.1 | 14.7 | 37.5 | 14.7 | 40.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 12.8 | 28.1 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 10.0 | 27.3 | 12.0 | 19.7 | 12.0 | 30.9 | 12.0 | 28.9 |
| Green Ext Time (p_c), s | 0.1 | 0.4 | 0.0 | 3.9 | 0.0 | 0.0 | 0.0 | 4.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 90.8 |
| HCM 7th LOS | F |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 272 | 499 | 1054 | 471 | 189 | 489 | 635 | 214 | 576 |
| Future Volume (vph) | 272 | 499 | 1054 | 471 | 189 | 489 | 635 | 214 | 576 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 20.0 | 48.0 | 52.3 | 14.8 | 37.2 | 48.0 | 14.8 | 37.2 |
| Total Split (%) | 13.1% | 16.7% | 40.0% | 43.6% | 12.3% | 31.0% | 40.0% | 12.3% | 31.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 13.0 | 42.3 | 45.3 | 10.1 | 30.7 | 79.5 | 10.1 | 30.7 |
| Actuated g/C Ratio | 0.08 | 0.11 | 0.35 | 0.38 | 0.08 | 0.26 | 0.66 | 0.08 | 0.26 |
| v/c Ratio | 2.01 | 3.29 | 1.00 | 0.92 | 1.38 | 0.56 | 0.61 | 1.57 | 1.05 |
| Control Delay (s/veh) | 509.4 | Error | 67.5 | 54.9 | 250.9 | 41.5 | 12.8 | 322.9 | 80.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 509.4 | Error | 67.5 | 54.9 | 250.9 | 41.5 | 12.8 | 322.9 | 80.8 |
| LOS | F | F | E | D | F | D | B | F | F |
| Approach Delay (s/veh) | | 897.9 | | 62.9 | | 57.8 | | | 124.7 |
| Approach LOS | | F | | E | | E | | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 3.29 | |
| Intersection Signal Delay (s/veh): 227.1 | Intersection LOS: F |
| Intersection Capacity Utilization 128.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

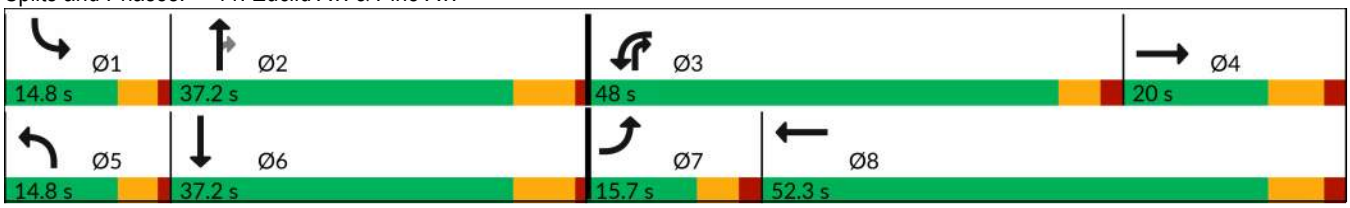

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 272 | 499 | 149 | 1054 | 471 | 141 | 189 | 489 | 635 | 214 | 576 | 390 |
| Future Volume (veh/h) | 272 | 499 | 149 | 1054 | 471 | 141 | 189 | 489 | 635 | 214 | 576 | 390 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 280 | 514 | 0 | 1087 | 486 | 142 | 195 | 504 | 579 | 221 | 594 | 396 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 141 | 203 | | 1090 | 525 | 153 | 142 | 909 | 964 | 142 | 522 | 348 |
| Arrive On Green | 0.08 | 0.11 | 0.00 | 0.35 | 0.38 | 0.38 | 0.08 | 0.26 | 0.26 | 0.08 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1688 | 1870 | 0 | 3092 | 1391 | 406 | 1688 | 3554 | 1585 | 1688 | 2041 | 1361 |
| Grp Volume(v), veh/h | 280 | 514 | 0 | 1087 | 0 | 628 | 195 | 504 | 579 | 221 | 517 | 473 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 0 | 1546 | 0 | 1797 | 1688 | 1777 | 1585 | 1688 | 1777 | 1625 |
| Q Serve(g_s), s | 10.0 | 13.0 | 0.0 | 42.1 | 0.0 | 40.1 | 10.1 | 14.8 | 27.0 | 10.1 | 30.7 | 30.7 |
| Cycle Q Clear(g_c), s | 10.0 | 13.0 | 0.0 | 42.1 | 0.0 | 40.1 | 10.1 | 14.8 | 27.0 | 10.1 | 30.7 | 30.7 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.23 | 1.00 | | 1.00 | 1.00 | | 0.84 |
| Lane Grp Cap(c), veh/h | 141 | 203 | | 1090 | 0 | 678 | 142 | 909 | 964 | 142 | 455 | 416 |
| V/C Ratio(X) | 1.99 | 2.54 | | 1.00 | 0.00 | 0.93 | 1.37 | 0.55 | 0.60 | 1.56 | 1.14 | 1.14 |
| Avail Cap(c_a), veh/h | 141 | 203 | | 1090 | 0 | 678 | 142 | 909 | 964 | 142 | 455 | 416 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.0 | 53.5 | 0.0 | 38.8 | 0.0 | 35.7 | 54.9 | 38.7 | 14.5 | 54.9 | 44.7 | 44.7 |
| Incr Delay (d2), s/veh | 470.4 | 705.9 | 0.0 | 26.6 | 0.0 | 18.9 | 205.8 | 0.4 | 0.7 | 281.7 | 85.5 | 87.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 22.5 | 45.7 | 0.0 | 18.9 | 0.0 | 19.9 | 12.2 | 6.2 | 8.7 | 15.2 | 23.5 | 21.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 525.4 | 759.4 | 0.0 | 65.4 | 0.0 | 54.7 | 260.8 | 39.2 | 15.2 | 336.6 | 130.2 | 131.9 |
| LnGrp LOS | F | F | | E | | D | F | D | B | F | F | F |
| Approach Vol, veh/h | | 794 | | | 1715 | | | 1278 | | | 1211 | |
| Approach Delay, s/veh | | 676.9 | | | 61.4 | | | 62.1 | | | 168.5 | |
| Approach LOS | | F | | | E | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.8 | 37.2 | 48.0 | 20.0 | 14.8 | 37.2 | 15.7 | 52.3 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.1 | 30.7 | 42.3 | 13.0 | 10.1 | 30.7 | 10.0 | 45.3 |
| Max Q Clear Time (g_c+I1), s | 12.1 | 29.0 | 44.1 | 15.0 | 12.1 | 32.7 | 12.0 | 42.1 |
| Green Ext Time (p_c), s | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 185.3 |
| HCM 7th LOS | F |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 658 | 712 | 917 | 53 | 698 |
| Future Volume (vph) | 658 | 712 | 917 | 53 | 698 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 14.5 | 9.6 | 9.6 |
| Total Split (s) | 35.7 | 46.2 | 81.9 | 18.1 | 18.1 |
| Total Split (%) | 35.7% | 46.2% | 81.9% | 18.1% | 18.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 29.2 | 41.5 | 75.4 | 13.5 | 13.5 |
| Actuated g/C Ratio | 0.29 | 0.42 | 0.75 | 0.14 | 0.14 |
| v/c Ratio | 0.98 | 1.15 | 0.39 | 0.14 | 1.01 |
| Control Delay (s/veh) | 53.6 | 113.2 | 4.7 | 39.2 | 42.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.6 | 113.2 | 4.7 | 39.2 | 42.8 |
| LOS | D | F | A | D | D |
| Approach Delay (s/veh) | 53.6 | | 52.2 | 42.5 | |
| Approach LOS | D | | D | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.15 | |
| Intersection Signal Delay (s/veh): 50.3 | Intersection LOS: D |
| Intersection Capacity Utilization 84.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

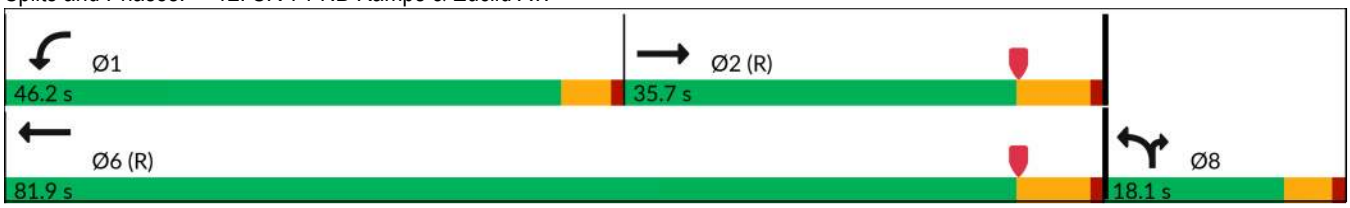

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 658 | 237 | 712 | 917 | 53 | 698 |
| Future Volume (veh/h) | 658 | 237 | 712 | 917 | 53 | 698 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1772 | 1870 | 1673 | 1870 |
| Adj Flow Rate, veh/h | 739 | 0 | 800 | 1030 | 60 | 0 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1373 | | 700 | 3015 | 125 | |
| Arrive On Green | 0.77 | 0.00 | 0.41 | 0.85 | 0.04 | 0.00 |
| Sat Flow, veh/h | 3741 | 0 | 1688 | 3647 | 3092 | 1585 |
| Grp Volume(v), veh/h | 739 | 0 | 800 | 1030 | 60 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1777 | 0 | 1688 | 1777 | 1546 | 1585 |
| Q Serve(g_s), s | 8.1 | 0.0 | 41.5 | 6.2 | 1.9 | 0.0 |
| Cycle Q Clear(g_c), s | 8.1 | 0.0 | 41.5 | 6.2 | 1.9 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1373 | | 700 | 3015 | 125 | |
| V/C Ratio(X) | 0.54 | | 1.14 | 0.34 | 0.48 | |
| Avail Cap(c_a), veh/h | 1373 | | 700 | 3015 | 417 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.55 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.9 | 0.0 | 29.3 | 1.6 | 46.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 80.5 | 0.3 | 2.8 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 0.0 | 30.3 | 0.3 | 0.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 8.7 | 0.0 | 109.7 | 1.9 | 49.7 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 739 | | | 1830 | 60 | |
| Approach Delay, s/veh | 8.7 | | | 49.0 | 49.7 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 46.2 | 45.1 | | | | 91.3 | 8.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 41.5 | 29.2 | | | | 75.4 | 13.5 |
| Max Q Clear Time (g_c+I1), s | 43.5 | 10.1 | | | | 8.2 | 3.9 |
| Green Ext Time (p_c), s | 0.0 | 3.4 | | | | 6.0 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 37.7 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 600 | 182 | 288 | 61 | 265 | 550 | 49 | 52 |
| Future Volume (vph) | 600 | 182 | 288 | 61 | 265 | 550 | 49 | 52 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 13.5 | 13.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 29.6 | 19.0 | 48.6 | 16.6 | 16.6 | 34.8 | 34.8 | 34.8 |
| Total Split (%) | 29.6% | 19.0% | 48.6% | 16.6% | 16.6% | 34.8% | 34.8% | 34.8% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 28.1 | 14.6 | 47.4 | 9.5 | 9.5 | 25.6 | 25.6 | 25.6 |
| Actuated g/C Ratio | 0.28 | 0.15 | 0.47 | 0.10 | 0.10 | 0.26 | 0.26 | 0.26 |
| v/c Ratio | 0.74 | 0.84 | 0.20 | 0.43 | 0.77 | 0.85 | 0.79 | 0.12 |
| Control Delay (s/veh) | 39.3 | 67.1 | 13.6 | 51.0 | 22.1 | 54.2 | 47.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.3 | 67.1 | 13.6 | 51.0 | 22.1 | 54.2 | 47.7 | 0.5 |
| LOS | D | E | B | D | C | D | D | A |
| Approach Delay (s/veh) | 39.3 | | 34.3 | | | | 47.0 | |
| Approach LOS | D | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 38.7 | Intersection LOS: D |
| Intersection Capacity Utilization 65.6% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

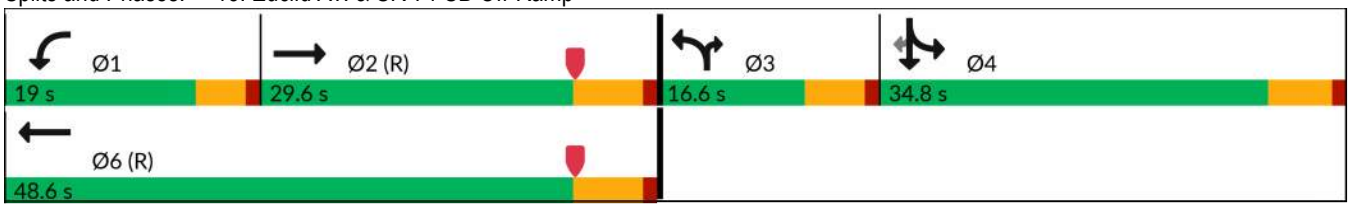

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 600 | 40 | 182 | 288 | 0 | 61 | 0 | 265 | 550 | 49 | 52 |
| Future Volume (veh/h) | 0 | 600 | 40 | 182 | 288 | 0 | 61 | 0 | 265 | 550 | 49 | 52 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 0 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 682 | 31 | 207 | 327 | 0 | 69 | 0 | 181 | 669 | 0 | 35 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.80 | 0.88 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1623 | 74 | 232 | 2323 | | 0 | 0 | 0 | 764 | 0 | 358 |
| Arrive On Green | 0.00 | 0.47 | 0.47 | 0.28 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.23 |
| Sat Flow, veh/h | 0 | 3555 | 157 | 1688 | 3647 | 0 | | 0 | | 3375 | 0 | 1583 |
| Grp Volume(v), veh/h | 0 | 350 | 363 | 207 | 327 | 0 | | 0.0 | | 669 | 0 | 35 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1777 | 1842 | 1688 | 1777 | 0 | | | | 1688 | 0 | 1583 |
| Q Serve(g_s), s | 0.0 | 13.0 | 13.0 | 11.8 | 0.0 | 0.0 | | | | 19.1 | 0.0 | 1.7 |
| Cycle Q Clear(g_c), s | 0.0 | 13.0 | 13.0 | 11.8 | 0.0 | 0.0 | | | | 19.1 | 0.0 | 1.7 |
| Prop In Lane | 0.00 | | 0.09 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 833 | 864 | 232 | 2323 | | | | | 764 | 0 | 358 |
| V/C Ratio(X) | 0.00 | 0.42 | 0.42 | 0.89 | 0.14 | | | | | 0.88 | 0.00 | 0.10 |
| Avail Cap(c_a), veh/h | 0 | 833 | 864 | 241 | 2323 | | | | | 979 | 0 | 459 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.94 | 0.94 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 17.6 | 17.6 | 35.5 | 0.0 | 0.0 | | | | 37.3 | 0.0 | 30.6 |
| Incr Delay (d2), s/veh | 0.0 | 1.6 | 1.5 | 28.1 | 0.1 | 0.0 | | | | 6.9 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 5.2 | 5.4 | 5.8 | 0.0 | 0.0 | | | | 8.5 | 0.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 19.1 | 19.1 | 63.6 | 0.1 | 0.0 | | | | 44.2 | 0.0 | 30.7 |
| LnGrp LOS | | B | B | E | A | | | | | D | | C |
| Approach Vol, veh/h | | 713 | | | 534 | | | | | | 704 | |
| Approach Delay, s/veh | | 19.1 | | | 24.7 | | | | | | 43.5 | |
| Approach LOS | | B | | | C | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.5 | 53.1 | | 28.4 | | 71.6 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 14.3 | 23.4 | | 29.0 | | 42.4 |
| Max Q Clear Time (g_c+I1), s | 13.8 | 15.0 | | 21.1 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.7 | | 1.4 | | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.5 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 32.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 56 | 1611 | 69 | 121 | 2065 | 97 | 18 | 8 | 25 | 104 | 40 | 77 |
| Future Vol, veh/h | 56 | 1611 | 69 | 121 | 2065 | 97 | 18 | 8 | 25 | 104 | 40 | 77 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 61 | 1751 | 75 | 132 | 2245 | 105 | 20 | 9 | 27 | 113 | 43 | 84 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2350 | 0 | 0 | 1826 | 0 | 0 | 4440 | 4523 | 1789 | 4438 | 4508 | 2297 |
| Stage 1 | - | - | - | - | - | - | 1910 | 1910 | - | 2560 | 2560 | - |
| Stage 2 | - | - | - | - | - | - | 2529 | 2613 | - | 1877 | 1948 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 209 | - | - | 334 | - | - | ~ 1 | ~ 1 | 101 | ~ 1 | ~ 1 | ~ 49 |
| Stage 1 | - | - | - | - | - | - | 88 | 116 | - | ~ 36 | 54 | - |
| Stage 2 | - | - | - | - | - | - | 37 | 50 | - | ~ 92 | 111 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 209 | - | - | 334 | - | - | ~ 2 | ~ 1 | 101 | ~ 1 | ~ 1 | ~ 49 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ -218 | ~ -11 | - | ~ 64 | ~ -33 | - |
| Stage 1 | - | - | - | - | - | - | 88 | 116 | - | ~ 36 | 54 | - |
| Stage 2 | - | - | - | - | - | - | - | 50 | - | ~ 62 | 111 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.94 | 1.2 | | $ 607.76 |
| HCM LOS | | | - | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | + | ~ 58 | - | - | ~ 95 | - | - | 112 |
| HCM Lane V/C Ratio | - | 0.292 | - | - | 0.393 | - | - | 2.147 |
| HCM Control Delay (s/veh) | - | 29.2 | 0 | - | 22.6 | 0 | - | $ 607.8 |
| HCM Lane LOS | - | D | A | - | C | A | - | F |
| HCM 95th %tile Q(veh) | - | 1.2 | - | - | 1.8 | - | - | 20.4 |

**Notes**

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 49.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 115 | 1095 | 40 | 78 | 944 | 53 | 31 | 55 | 96 | 8 | 22 | 78 |
| Future Vol, veh/h | 115 | 1095 | 40 | 78 | 944 | 53 | 31 | 55 | 96 | 8 | 22 | 78 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 131 | 1244 | 45 | 89 | 1073 | 60 | 35 | 63 | 109 | 9 | 25 | 89 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1136 | 0 | 0 | 1290 | 0 | 0 | 2255 | 2842 | 1267 | 2820 | 2834 | 569 |
| Stage 1 | - | - | - | - | - | - | 1528 | 1528 | - | 1283 | 1283 | - |
| Stage 2 | - | - | - | - | - | - | 726 | 1313 | - | 1537 | 1551 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 613 | - | - | 536 | - | - | ~ 26 | ~ 17 | 205 | 10 | ~ 17 | 466 |
| Stage 1 | - | - | - | - | - | - | 146 | 178 | - | 175 | 235 | - |
| Stage 2 | - | - | - | - | - | - | 383 | 227 | - | 144 | 174 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 611 | - | - | 536 | - | - | ~ 7 | ~ 11 | 205 | ~ 3 | ~ 11 | 465 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 68 | ~ 51 | - | ~ -41 | 45 | - |
| Stage 1 | - | - | - | - | - | - | 115 | 140 | - | 146 | 195 | - |
| Stage 2 | - | - | - | - | - | - | 225 | 189 | - | 29 | 137 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.15 | 0.95 | $ 678.8 | 37.07 |
| HCM LOS | | | F | E |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 91 | 611 | - | - | 536 | - | - | 231 |
| HCM Lane V/C Ratio | 2.268 | 0.214 | - | - | 0.166 | - | - | 0.532 |
| HCM Control Delay (s/veh) | $ 678.8 | 12.5 | - | - | 13.1 | - | - | 37.1 |
| HCM Lane LOS | F | B | - | - | B | - | - | E |
| HCM 95th %tile Q(veh) | 18.6 | 0.8 | - | - | 0.6 | - | - | 2.8 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 12.3 |
| Intersection LOS | B |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 133 | 26 | 17 | 189 | 17 | 55 | 201 | 23 | 8 | 111 | 55 |
| Future Vol, veh/h | 36 | 133 | 26 | 17 | 189 | 17 | 55 | 201 | 23 | 8 | 111 | 55 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 39 | 145 | 28 | 18 | 205 | 18 | 60 | 218 | 25 | 9 | 121 | 60 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 11.7 | 12.2 | 13.5 | 11 |
| HCM LOS | B | B | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 20% | 18% | 8% | 5% |
| Vol Thru, % | 72% | 68% | 85% | 64% |
| Vol Right, % | 8% | 13% | 8% | 32% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 279 | 195 | 223 | 174 |
| LT Vol | 55 | 36 | 17 | 8 |
| Through Vol | 201 | 133 | 189 | 111 |
| RT Vol | 23 | 26 | 17 | 55 |
| Lane Flow Rate | 303 | 212 | 242 | 189 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.468 | 0.337 | 0.382 | 0.294 |
| Departure Headway (Hd) | 5.556 | 5.716 | 5.673 | 5.595 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 646 | 625 | 630 | 637 |
| Service Time | 3.618 | 3.785 | 3.739 | 3.666 |
| HCM Lane V/C Ratio | 0.469 | 0.339 | 0.384 | 0.297 |
| HCM Control Delay, s/veh | 13.5 | 11.7 | 12.2 | 11 |
| HCM Lane LOS | B | B | B | B |
| HCM 95th-tile Q | 2.5 | 1.5 | 1.8 | 1.2 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 148 | 983 | 196 | 6 | 1140 | 308 | 159 | 21 | 59 |
| Future Volume (vph) | 148 | 983 | 196 | 6 | 1140 | 308 | 159 | 21 | 59 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 14.8 | 28.0 | 28.0 | 41.0 | 54.2 | 20.5 | 27.0 | 24.0 | 30.5 |
| Total Split (%) | 12.3% | 23.3% | 23.3% | 34.2% | 45.2% | 17.1% | 22.5% | 20.0% | 25.4% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.3 | 55.2 | 55.2 | 5.3 | 42.1 | 16.0 | 29.6 | 6.1 | 13.3 |
| Actuated g/C Ratio | 0.10 | 0.54 | 0.54 | 0.05 | 0.41 | 0.16 | 0.29 | 0.06 | 0.13 |
| v/c Ratio | 0.93 | 0.55 | 0.22 | 0.07 | 0.85 | 1.25 | 0.34 | 0.22 | 0.65 |
| Control Delay (s/veh) | 103.0 | 17.7 | 3.9 | 52.5 | 34.2 | 178.4 | 33.4 | 54.5 | 37.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 103.0 | 17.7 | 3.9 | 52.5 | 34.2 | 178.4 | 33.4 | 54.5 | 37.4 |
| LOS | F | B | A | D | C | F | C | D | D |
| Approach Delay (s/veh) | | 25.2 | | | 34.3 | | 126.9 | | 39.2 |
| Approach LOS | | C | | | C | | F | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 102.4 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.25 | |
| Intersection Signal Delay (s/veh): 44.7 | Intersection LOS: D |
| Intersection Capacity Utilization 85.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

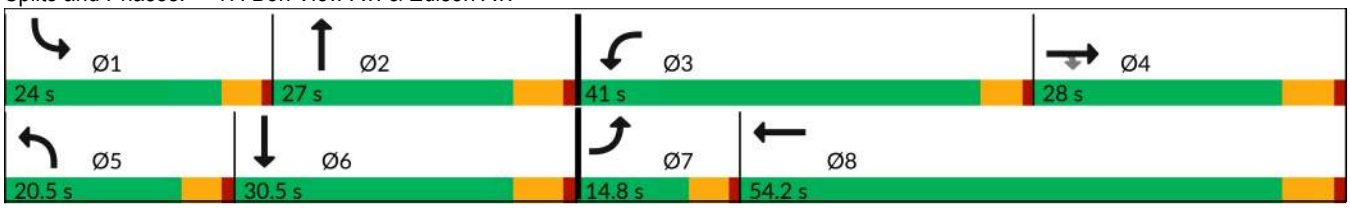

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 148 | 983 | 196 | 6 | 1140 | 24 | 308 | 159 | 11 | 21 | 59 | 111 |
| Future Volume (veh/h) | 148 | 983 | 196 | 6 | 1140 | 24 | 308 | 159 | 11 | 21 | 59 | 111 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 157 | 1046 | 188 | 6 | 1213 | -22 | 328 | 169 | -105 | 22 | 63 | 102 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 178 | 1763 | 786 | 13 | 1416 | 0 | 277 | 491 | 0 | 39 | 78 | 126 |
| Arrive On Green | 0.11 | 0.50 | 0.50 | 0.01 | 0.40 | 0.00 | 0.16 | 0.26 | 0.00 | 0.02 | 0.12 | 0.12 |
| Sat Flow, veh/h | 1688 | 3554 | 1585 | 1688 | 3647 | 0 | 1688 | 1870 | 0 | 1688 | 643 | 1040 |
| Grp Volume(v), veh/h | 157 | 1046 | 188 | 6 | 1191 | 0 | 328 | 64 | 0 | 22 | 0 | 165 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1585 | 1688 | 1777 | 0 | 1688 | 1870 | 0 | 1688 | 0 | 1683 |
| Q Serve(g_s), s | 8.9 | 20.4 | 6.6 | 0.3 | 29.4 | 0.0 | 15.9 | 2.5 | 0.0 | 1.2 | 0.0 | 9.2 |
| Cycle Q Clear(g_c), s | 8.9 | 20.4 | 6.6 | 0.3 | 29.4 | 0.0 | 15.9 | 2.5 | 0.0 | 1.2 | 0.0 | 9.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 0.00 | 1.00 | | 0.62 |
| Lane Grp Cap(c), veh/h | 178 | 1763 | 786 | 13 | 1416 | 0 | 277 | 491 | 0 | 39 | 0 | 204 |
| V/C Ratio(X) | 0.88 | 0.59 | 0.24 | 0.46 | 0.84 | 0.00 | 1.18 | 0.13 | 0.00 | 0.57 | 0.00 | 0.81 |
| Avail Cap(c_a), veh/h | 178 | 1763 | 786 | 634 | 1776 | 0 | 277 | 491 | 0 | 338 | 0 | 436 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.7 | 17.4 | 13.9 | 47.8 | 26.3 | 0.0 | 40.5 | 27.3 | 0.0 | 46.8 | 0.0 | 41.4 |
| Incr Delay (d2), s/veh | 35.8 | 0.5 | 0.2 | 9.2 | 3.1 | 0.0 | 113.2 | 0.1 | 0.0 | 4.7 | 0.0 | 7.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.3 | 7.4 | 2.1 | 0.2 | 11.7 | 0.0 | 15.0 | 1.1 | 0.0 | 0.6 | 0.0 | 4.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 78.5 | 18.0 | 14.1 | 57.0 | 29.5 | 0.0 | 153.7 | 27.4 | 0.0 | 51.5 | 0.0 | 48.8 |
| LnGrp LOS | E | B | B | E | C | | F | C | | D | | D |
| Approach Vol, veh/h | | 1391 | | | 1197 | | | 392 | | | 187 | |
| Approach Delay, s/veh | | 24.3 | | | 29.6 | | | 133.1 | | | 49.2 | |
| Approach LOS | | C | | | C | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.8 | 30.8 | 5.3 | 53.8 | 20.5 | 17.1 | 14.8 | 44.4 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 19.4 | 21.6 | 36.4 | 22.2 | 15.9 | 25.1 | 10.2 | 48.4 |
| Max Q Clear Time (g_c+I1), s | 3.2 | 4.5 | 2.3 | 22.4 | 17.9 | 11.2 | 10.9 | 31.4 |
| Green Ext Time (p_c), s | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.6 | 0.0 | 7.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 41.2 |
| HCM 7th LOS | D |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 32.6 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 112 | 423 | 7 | 4 | 87 | 42 | 21 | 36 | 5 | 161 | 56 | 82 |
| Future Vol, veh/h | 112 | 423 | 7 | 4 | 87 | 42 | 21 | 36 | 5 | 161 | 56 | 82 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 127 | 481 | 8 | 5 | 99 | 48 | 24 | 41 | 6 | 183 | 64 | 93 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 48.3 | 11.5 | 11.3 | 18.1 |
| HCM LOS | E | B | B | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 34% | 21% | 3% | 54% |
| Vol Thru, % | 58% | 78% | 65% | 19% |
| Vol Right, % | 8% | 1% | 32% | 27% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 62 | 542 | 133 | 299 |
| LT Vol | 21 | 112 | 4 | 161 |
| Through Vol | 36 | 423 | 87 | 56 |
| RT Vol | 5 | 7 | 42 | 82 |
| Lane Flow Rate | 70 | 616 | 151 | 340 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.139 | 0.952 | 0.263 | 0.595 |
| Departure Headway (Hd) | 7.091 | 5.674 | 6.27 | 6.308 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 507 | 647 | 573 | 574 |
| Service Time | 5.117 | 3.674 | 4.302 | 4.308 |
| HCM Lane V/C Ratio | 0.138 | 0.952 | 0.264 | 0.592 |
| HCM Control Delay, s/veh | 11.3 | 48.3 | 11.5 | 18.1 |
| HCM Lane LOS | B | E | B | C |
| HCM 95th-tile Q | 0.5 | 13.3 | 1 | 3.9 |

| Lane Group | EBT | WBT | Ø6 |
|---|---|---|---|
| Lane Configurations | | | |
| Traffic Volume (vph) | 1665 | 1981 | |
| Future Volume (vph) | 1665 | 1981 | |
| Turn Type | NA | NA | |
| Protected Phases | 4 | 8 | 6 |
| Permitted Phases | | | |
| Detector Phase | 4 | 8 | |
| Switch Phase | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 5.0 |
| Minimum Split (s) | 23.8 | 23.8 | 22.6 |
| Total Split (s) | 85.0 | 85.0 | 35.0 |
| Total Split (%) | 70.8% | 70.8% | 29% |
| Yellow Time (s) | 4.8 | 4.8 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.8 | 5.8 | |
| Lead/Lag | | | |
| Lead-Lag Optimize? | | | |
| Recall Mode | None | None | None |
| Act Effct Green (s) | 55.4 | 55.4 | |
| Actuated g/C Ratio | 0.95 | 0.95 | |
| v/c Ratio | 0.54 | 0.64 | |
| Control Delay (s/veh) | 2.9 | 4.0 | |
| Queue Delay | 0.0 | 0.0 | |
| Total Delay (s/veh) | 2.9 | 4.0 | |
| LOS | A | A | |
| Approach Delay (s/veh) | 2.9 | 4.0 | |
| Approach LOS | A | A | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 58.5 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.64 | |
| Intersection Signal Delay (s/veh): 3.5 | Intersection LOS: A |
| Intersection Capacity Utilization 59.6% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 19: Edison Av. & Cucamonga Av.

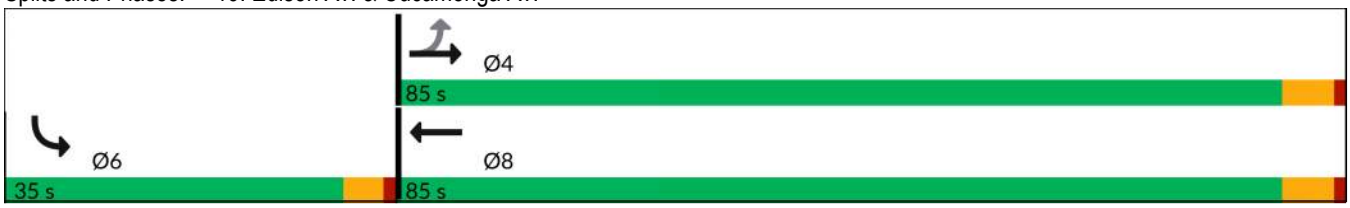

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 1665 | 1981 | 0 | 0 | 0 |
| Future Volume (veh/h) | 0 | 1665 | 1981 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 1810 | 2153 | 0 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 140 | 3153 | 3153 | 0 | 0 | 0 |
| Arrive On Green | 0.00 | 0.89 | 0.89 | 0.00 | 0.00 | 0.00 |
| Sat Flow, veh/h | 185 | 3647 | 3741 | 0 | 0 | 0 |
| Grp Volume(v), veh/h | 0 | 1810 | 2153 | 0 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 185 | 1777 | 1777 | 0 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 6.0 | 8.9 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 6.0 | 8.9 | 0.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap(c), veh/h | 140 | 3153 | 3153 | 0 | 0 | 0 |
| V/C Ratio(X) | 0.00 | 0.57 | 0.68 | 0.00 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 260 | 5466 | 5466 | 0 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.7 | 0.8 | 0.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.2 | 0.3 | 0.0 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.8 | 1.1 | 0.0 | 0.0 | 0.0 |
| LnGrp LOS | | A | A | | | |
| Approach Vol, veh/h | | 1810 | 2153 | | 0 | |
| Approach Delay, s/veh | | 0.8 | 1.1 | | 0.0 | |
| Approach LOS | | A | A | | | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 51.5 | 0.0 | 51.5 |
| Change Period (Y+Rc), s | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 79.2 | 30.4 | 79.2 |
| Max Q Clear Time (g_c+I1), s | 8.0 | 0.0 | 10.9 |
| Green Ext Time (p_c), s | 23.2 | 0.0 | 34.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 1.0 |
| HCM 7th LOS | A |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 6 | 591 | 336 | 1389 | 790 | 549 |
| Future Volume (vph) | 6 | 591 | 336 | 1389 | 790 | 549 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 29.0 | 29.0 | 30.0 | 61.0 | 31.0 | 31.0 |
| Total Split (%) | 32.2% | 32.2% | 33.3% | 67.8% | 34.4% | 34.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 24.2 | 24.2 | 21.9 | 54.2 | 26.5 | 26.5 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.24 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 0.40 | 1.26 | 0.88 | 0.69 | 0.81 | 0.67 |
| Control Delay (s/veh) | 30.6 | 157.5 | 46.2 | 12.3 | 37.0 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.6 | 157.5 | 46.2 | 13.1 | 37.0 | 6.6 |
| LOS | C | F | D | B | D | A |
| Approach Delay (s/veh) | 127.7 | | | 19.5 | 24.5 | |
| Approach LOS | F | | | B | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.26 | |
| Intersection Signal Delay (s/veh): 43.0 | Intersection LOS: D |
| Intersection Capacity Utilization 104.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

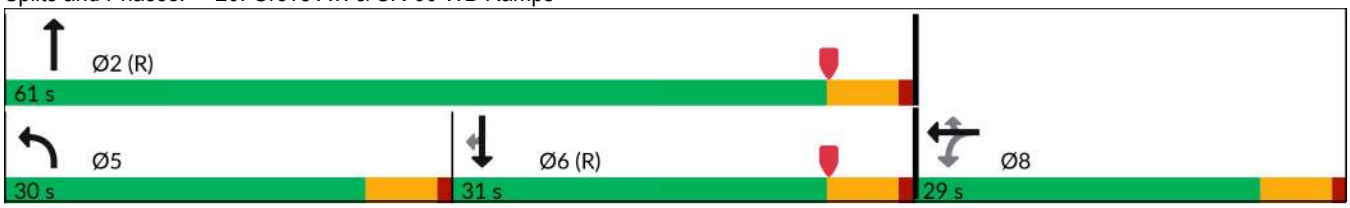

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 176 | 6 | 591 | 336 | 1389 | 0 | 0 | 790 | 549 |
| Future Volume (veh/h) | 0 | 0 | 0 | 176 | 6 | 591 | 336 | 1389 | 0 | 0 | 790 | 549 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 187 | 6 | 485 | 357 | 1478 | 0 | 0 | 840 | 439 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 446 | 14 | 409 | 381 | 2180 | 0 | 0 | 1148 | 512 |
| Arrive On Green | | | | 0.26 | 0.26 | 0.26 | 0.45 | 1.00 | 0.00 | 0.00 | 0.32 | 0.32 |
| Sat Flow, veh/h | | | | 1728 | 55 | 1585 | 1688 | 3647 | 0 | 0 | 3647 | 1585 |
| Grp Volume(v), veh/h | | | | 193 | 0 | 485 | 357 | 1478 | 0 | 0 | 840 | 439 |
| Grp Sat Flow(s),veh/h/ln | | | | 1784 | 0 | 1585 | 1688 | 1777 | 0 | 0 | 1777 | 1585 |
| Q Serve(g_s), s | | | | 8.1 | 0.0 | 23.2 | 18.1 | 0.0 | 0.0 | 0.0 | 18.9 | 23.3 |
| Cycle Q Clear(g_c), s | | | | 8.1 | 0.0 | 23.2 | 18.1 | 0.0 | 0.0 | 0.0 | 18.9 | 23.3 |
| Prop In Lane | | | | 0.97 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 460 | 0 | 409 | 381 | 2180 | 0 | 0 | 1148 | 512 |
| V/C Ratio(X) | | | | 0.42 | 0.00 | 1.19 | 0.94 | 0.68 | 0.00 | 0.00 | 0.73 | 0.86 |
| Avail Cap(c_a), veh/h | | | | 460 | 0 | 409 | 454 | 2180 | 0 | 0 | 1148 | 512 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 27.8 | 0.0 | 33.4 | 24.1 | 0.0 | 0.0 | 0.0 | 27.0 | 28.5 |
| Incr Delay (d2), s/veh | | | | 0.5 | 0.0 | 106.3 | 3.4 | 0.2 | 0.0 | 0.0 | 4.1 | 16.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 3.3 | 0.0 | 20.3 | 5.1 | 0.0 | 0.0 | 0.0 | 8.0 | 10.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 28.3 | 0.0 | 139.7 | 27.5 | 0.2 | 0.0 | 0.0 | 31.1 | 45.3 |
| LnGrp LOS | | | | C | | F | C | A | | | C | D |
| Approach Vol, veh/h | | | | | 678 | | | 1835 | | | 1279 | |
| Approach Delay, s/veh | | | | | 108.0 | | | 5.5 | | | 36.0 | |
| Approach LOS | | | | | F | | | A | | | D | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 61.0 | 26.1 | 34.9 | 29.0 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | 5.8 |
| Max Green Setting (Gmax), s | 55.2 | 24.2 | 25.2 | 23.2 |
| Max Q Clear Time (g_c+I1), s | 2.0 | 20.1 | 25.3 | 25.2 |
| Green Ext Time (p_c), s | 11.7 | 0.2 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 34.1 |
| HCM 7th LOS | C |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 2 | 135 | 1183 | 314 | 634 |
| Future Volume (vph) | 2 | 135 | 1183 | 314 | 634 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 39.2 | 17.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 43.6% | 18.9% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 27.0 | 27.0 | 33.4 | 12.0 | 50.4 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.37 | 0.13 | 0.56 |
| v/c Ratio | 0.99 | 0.25 | 1.21 | 1.47 | 0.33 |
| Control Delay (s/veh) | 71.0 | 5.5 | 129.5 | 261.8 | 10.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 71.0 | 5.5 | 129.5 | 261.8 | 10.4 |
| LOS | E | A | F | F | B |
| Approach Delay (s/veh) | 57.2 | | 129.5 | | 93.7 |
| Approach LOS | E | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.47 | |
| Intersection Signal Delay (s/veh): 103.5 | Intersection LOS: F |
| Intersection Capacity Utilization 104.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 506 | 2 | 135 | 0 | 0 | 0 | 0 | 1183 | 319 | 314 | 634 | 0 |
| Future Volume (veh/h) | 506 | 2 | 135 | 0 | 0 | 0 | 0 | 1183 | 319 | 314 | 634 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 527 | 2 | 67 | | | | 0 | 1232 | 211 | 327 | 660 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 532 | 2 | 476 | | | | 0 | 1123 | 191 | 225 | 1990 | 0 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | | | | 0.00 | 0.37 | 0.37 | 0.27 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1775 | 7 | 1585 | | | | 0 | 3120 | 514 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 529 | 0 | 67 | | | | 0 | 719 | 724 | 327 | 660 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1782 | 0 | 1585 | | | | 0 | 1777 | 1764 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 26.6 | 0.0 | 2.8 | | | | 0.0 | 33.4 | 33.4 | 12.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 26.6 | 0.0 | 2.8 | | | | 0.0 | 33.4 | 33.4 | 12.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 0.29 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 534 | 0 | 476 | | | | 0 | 659 | 655 | 225 | 1990 | 0 |
| V/C Ratio(X) | 0.99 | 0.00 | 0.14 | | | | 0.00 | 1.09 | 1.11 | 1.45 | 0.33 | 0.00 |
| Avail Cap(c_a), veh/h | 534 | 0 | 476 | | | | 0 | 659 | 655 | 225 | 1990 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.49 | 0.49 | 0.00 |
| Uniform Delay (d), s/veh | 31.4 | 0.0 | 23.0 | | | | 0.0 | 28.3 | 28.3 | 33.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 36.1 | 0.0 | 0.0 | | | | 0.0 | 62.4 | 67.7 | 215.9 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 15.8 | 0.0 | 1.0 | | | | 0.0 | 24.2 | 24.9 | 17.4 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 67.5 | 0.0 | 23.1 | | | | 0.0 | 90.7 | 96.0 | 248.9 | 0.2 | 0.0 |
| LnGrp LOS | E | | C | | | | | F | F | F | A | |
| Approach Vol, veh/h | | 596 | | | | | | 1443 | | | 987 | |
| Approach Delay, s/veh | | 62.5 | | | | | | 93.3 | | | 82.6 | |
| Approach LOS | | E | | | | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 39.2 | | 33.8 | | 56.2 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 12.0 | 33.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 14.0 | 35.4 | | 28.6 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 3.6 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 83.8 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 249 | 207 | 50 | 229 | 66 | 937 | 83 | 570 |
| Future Volume (vph) | 249 | 207 | 50 | 229 | 66 | 937 | 83 | 570 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.2 | 22.5 | 7.2 | 13.9 | 7.8 | 23.6 | 8.3 | 24.1 |
| Actuated g/C Ratio | 0.15 | 0.30 | 0.10 | 0.18 | 0.10 | 0.31 | 0.11 | 0.32 |
| v/c Ratio | 1.16 | 0.32 | 0.36 | 0.69 | 0.44 | 1.05 | 0.52 | 0.66 |
| Control Delay (s/veh) | 141.6 | 19.7 | 40.7 | 19.3 | 42.3 | 69.6 | 44.3 | 27.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 141.6 | 19.7 | 40.7 | 19.3 | 42.3 | 69.6 | 44.3 | 27.2 |
| LOS | F | B | D | B | D | E | D | C |
| Approach Delay (s/veh) | | 75.3 | | 21.2 | | 67.9 | | 29.1 |
| Approach LOS | | E | | C | | E | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 75.7 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.16 | |
| Intersection Signal Delay (s/veh): 50.7 | Intersection LOS: D |
| Intersection Capacity Utilization 79.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

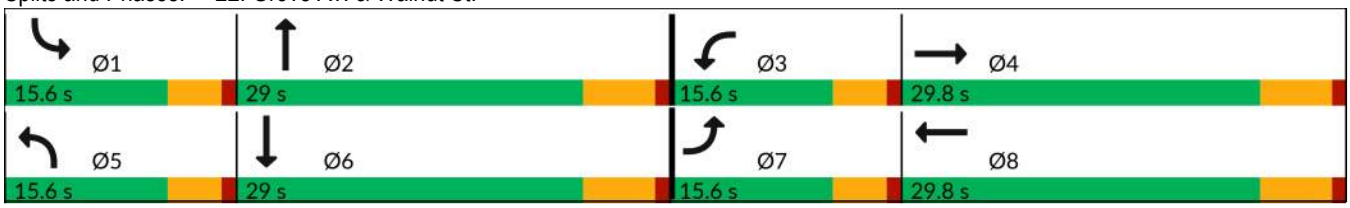

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 249 | 207 | 90 | 50 | 229 | 262 | 66 | 937 | 61 | 83 | 570 | 74 |
| Future Volume (veh/h) | 249 | 207 | 90 | 50 | 229 | 262 | 66 | 937 | 61 | 83 | 570 | 74 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 286 | 238 | 94 | 57 | 263 | 241 | 76 | 1077 | 61 | 95 | 655 | 45 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 246 | 753 | 289 | 78 | 357 | 316 | 96 | 1049 | 59 | 120 | 1084 | 74 |
| Arrive On Green | 0.15 | 0.30 | 0.30 | 0.05 | 0.20 | 0.20 | 0.06 | 0.31 | 0.31 | 0.07 | 0.32 | 0.32 |
| Sat Flow, veh/h | 1688 | 2509 | 962 | 1688 | 1782 | 1574 | 1688 | 3416 | 193 | 1688 | 3370 | 231 |
| Grp Volume(v), veh/h | 286 | 167 | 165 | 57 | 262 | 242 | 76 | 560 | 578 | 95 | 345 | 355 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1694 | 1688 | 1777 | 1579 | 1688 | 1777 | 1833 | 1688 | 1777 | 1825 |
| Q Serve(g_s), s | 11.0 | 5.5 | 5.7 | 2.5 | 10.5 | 10.9 | 3.4 | 23.2 | 23.2 | 4.2 | 12.3 | 12.4 |
| Cycle Q Clear(g_c), s | 11.0 | 5.5 | 5.7 | 2.5 | 10.5 | 10.9 | 3.4 | 23.2 | 23.2 | 4.2 | 12.3 | 12.4 |
| Prop In Lane | 1.00 | | 0.57 | 1.00 | | 1.00 | 1.00 | | 0.11 | 1.00 | | 0.13 |
| Lane Grp Cap(c), veh/h | 246 | 533 | 508 | 78 | 356 | 317 | 96 | 546 | 563 | 120 | 571 | 587 |
| V/C Ratio(X) | 1.16 | 0.31 | 0.33 | 0.73 | 0.74 | 0.76 | 0.79 | 1.03 | 1.03 | 0.79 | 0.60 | 0.61 |
| Avail Cap(c_a), veh/h | 246 | 565 | 538 | 246 | 565 | 502 | 246 | 546 | 563 | 246 | 571 | 587 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.3 | 20.4 | 20.5 | 35.6 | 28.3 | 28.5 | 35.2 | 26.2 | 26.2 | 34.5 | 21.6 | 21.6 |
| Incr Delay (d2), s/veh | 108.8 | 0.3 | 0.4 | 4.9 | 3.0 | 3.8 | 5.4 | 45.3 | 44.9 | 4.4 | 1.8 | 1.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.6 | 2.1 | 2.1 | 1.1 | 4.4 | 4.1 | 1.4 | 15.5 | 15.9 | 1.8 | 4.9 | 5.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 141.1 | 20.7 | 20.9 | 40.4 | 31.3 | 32.3 | 40.6 | 71.5 | 71.0 | 38.9 | 23.4 | 23.4 |
| LnGrp LOS | F | C | C | D | C | C | D | F | F | D | C | C |
| Approach Vol, veh/h | | 618 | | | 561 | | | 1214 | | | 795 | |
| Approach Delay, s/veh | | 76.5 | | | 32.7 | | | 69.3 | | | 25.2 | |
| Approach LOS | | E | | | C | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.0 | 29.0 | 8.1 | 28.5 | 8.9 | 30.1 | 15.6 | 20.9 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 6.2 | 25.2 | 4.5 | 7.7 | 5.4 | 14.4 | 13.0 | 12.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 2.7 | 0.0 | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 53.3 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 237 | 921 | 40 | 875 | 50 | 574 | 173 | 392 | 174 |
| Future Volume (vph) | 237 | 921 | 40 | 875 | 50 | 574 | 173 | 392 | 174 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.0 | 32.0 | 6.9 | 24.0 | 7.5 | 22.8 | 11.0 | 28.3 | 28.3 |
| Actuated g/C Ratio | 0.12 | 0.36 | 0.08 | 0.27 | 0.08 | 0.25 | 0.12 | 0.31 | 0.31 |
| v/c Ratio | 1.26 | 1.62 | 0.33 | 1.27 | 0.39 | 1.49 | 0.92 | 0.73 | 0.30 |
| Control Delay (s/veh) | 187.5 | 310.1 | 45.7 | 159.3 | 46.6 | 258.6 | 87.0 | 38.1 | 5.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 187.5 | 310.1 | 45.7 | 159.3 | 46.6 | 258.6 | 87.0 | 38.1 | 5.6 |
| LOS | F | F | D | F | D | F | F | D | A |
| Approach Delay (s/veh) | | 286.1 | | 155.4 | | 243.3 | | 41.9 | |
| Approach LOS | | F | | F | | F | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.62 | |
| Intersection Signal Delay (s/veh): 191.3 | Intersection LOS: F |
| Intersection Capacity Utilization 118.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

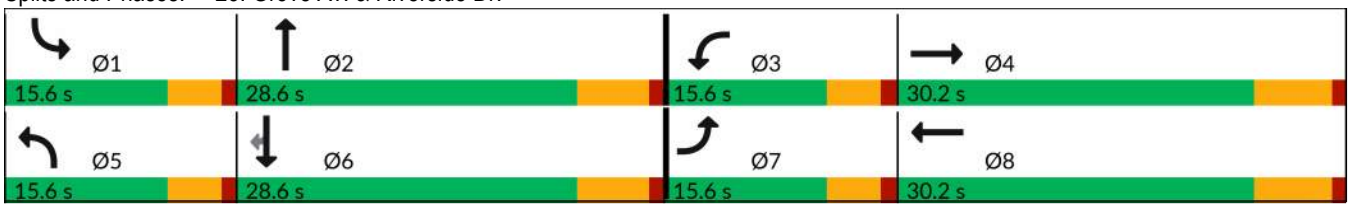

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 237 | 921 | 58 | 40 | 875 | 219 | 50 | 574 | 66 | 173 | 392 | 174 |
| Future Volume (veh/h) | 237 | 921 | 58 | 40 | 875 | 219 | 50 | 574 | 66 | 173 | 392 | 174 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 258 | 1001 | 35 | 43 | 951 | 185 | 54 | 624 | 65 | 188 | 426 | 113 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 206 | 632 | 22 | 62 | 789 | 153 | 69 | 422 | 44 | 206 | 625 | 530 |
| Arrive On Green | 0.12 | 0.35 | 0.35 | 0.04 | 0.27 | 0.27 | 0.04 | 0.25 | 0.25 | 0.12 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1688 | 1795 | 63 | 1688 | 2959 | 575 | 1688 | 1666 | 174 | 1688 | 1870 | 1585 |
| Grp Volume(v), veh/h | 258 | 0 | 1036 | 43 | 571 | 565 | 54 | 0 | 689 | 188 | 426 | 113 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1857 | 1688 | 1777 | 1757 | 1688 | 0 | 1839 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 11.0 | 0.0 | 31.7 | 2.3 | 24.0 | 24.0 | 2.9 | 0.0 | 22.8 | 9.9 | 17.7 | 4.6 |
| Cycle Q Clear(g_c), s | 11.0 | 0.0 | 31.7 | 2.3 | 24.0 | 24.0 | 2.9 | 0.0 | 22.8 | 9.9 | 17.7 | 4.6 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 0.33 | 1.00 | | 0.09 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 206 | 0 | 654 | 62 | 474 | 469 | 69 | 0 | 466 | 206 | 625 | 530 |
| V/C Ratio(X) | 1.25 | 0.00 | 1.58 | 0.70 | 1.20 | 1.21 | 0.78 | 0.00 | 1.48 | 0.91 | 0.68 | 0.21 |
| Avail Cap(c_a), veh/h | 206 | 0 | 654 | 206 | 474 | 469 | 206 | 0 | 466 | 206 | 625 | 530 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.5 | 0.0 | 29.1 | 42.9 | 33.0 | 33.0 | 42.7 | 0.0 | 33.6 | 39.0 | 25.8 | 21.5 |
| Incr Delay (d2), s/veh | 146.4 | 0.0 | 269.7 | 5.2 | 110.6 | 111.6 | 6.8 | 0.0 | 226.8 | 38.3 | 3.0 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.7 | 0.0 | 61.5 | 1.0 | 23.9 | 23.8 | 1.3 | 0.0 | 38.8 | 6.1 | 7.7 | 1.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 185.9 | 0.0 | 298.8 | 48.0 | 143.6 | 144.6 | 49.5 | 0.0 | 260.4 | 77.4 | 28.8 | 21.7 |
| LnGrp LOS | F | | F | D | F | F | D | | F | E | C | C |
| Approach Vol, veh/h | | 1294 | | | 1179 | | | 743 | | | 727 | |
| Approach Delay, s/veh | | 276.3 | | | 140.6 | | | 245.1 | | | 40.3 | |
| Approach LOS | | F | | | F | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.6 | 28.6 | 7.9 | 37.9 | 8.3 | 35.9 | 15.6 | 30.2 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 11.9 | 24.8 | 4.3 | 33.7 | 4.9 | 19.7 | 13.0 | 26.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 186.3 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 380.3 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 96 | 316 | 107 | 33 | 414 | 93 | 87 | 501 | 33 | 51 | 460 | 14 |
| Future Vol, veh/h | 96 | 316 | 107 | 33 | 414 | 93 | 87 | 501 | 33 | 51 | 460 | 14 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 112 | 367 | 124 | 38 | 481 | 108 | 101 | 583 | 38 | 59 | 535 | 16 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 331.5 | 357.5 | 469.8 | 346.2 |
| HCM LOS | F | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 14% | 18% | 6% | 10% |
| Vol Thru, % | 81% | 61% | 77% | 88% |
| Vol Right, % | 5% | 21% | 17% | 3% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 621 | 519 | 540 | 525 |
| LT Vol | 87 | 96 | 33 | 51 |
| Through Vol | 501 | 316 | 414 | 460 |
| RT Vol | 33 | 107 | 93 | 14 |
| Lane Flow Rate | 722 | 603 | 628 | 610 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.931 | 1.6 | 1.664 | 1.634 |
| Departure Headway (Hd) | 16.335 | 17.641 | 17.291 | 17.768 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 231 | 211 | 220 | 214 |
| Service Time | 14.335 | 15.641 | 15.291 | 15.768 |
| HCM Lane V/C Ratio | 3.126 | 2.858 | 2.855 | 2.85 |
| HCM Control Delay, s/veh | 469.8 | 331.5 | 357.5 | 346.2 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 30.8 | 21.1 | 22.9 | 21.8 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 154.4 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 42 | 99 | 26 | 19 | 131 | 30 | 66 | 568 | 13 | 48 | 535 | 28 |
| Future Vol, veh/h | 42 | 99 | 26 | 19 | 131 | 30 | 66 | 568 | 13 | 48 | 535 | 28 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 48 | 113 | 30 | 22 | 149 | 34 | 75 | 645 | 15 | 55 | 608 | 32 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 19.7 | 20.2 | 207.4 | 174.5 |
| HCM LOS | C | C | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 10% | 25% | 11% | 8% |
| Vol Thru, % | 88% | 59% | 73% | 88% |
| Vol Right, % | 2% | 16% | 17% | 5% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 647 | 167 | 180 | 611 |
| LT Vol | 66 | 42 | 19 | 48 |
| Through Vol | 568 | 99 | 131 | 535 |
| RT Vol | 13 | 26 | 30 | 28 |
| Lane Flow Rate | 735 | 190 | 205 | 694 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.386 | 0.429 | 0.457 | 1.305 |
| Departure Headway (Hd) | 7.381 | 9.624 | 9.482 | 7.475 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 500 | 378 | 383 | 493 |
| Service Time | 5.381 | 7.624 | 7.482 | 5.475 |
| HCM Lane V/C Ratio | 1.47 | 0.503 | 0.535 | 1.408 |
| HCM Control Delay, s/veh | 207.4 | 19.7 | 20.2 | 174.5 |
| HCM Lane LOS | F | C | C | F |
| HCM 95th-tile Q | 31.6 | 2.1 | 2.3 | 27.1 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 169 | 765 | 230 | 22 | 1009 | 115 | 166 | 350 | 40 | 486 |
| Future Volume (vph) | 169 | 765 | 230 | 22 | 1009 | 115 | 166 | 350 | 40 | 486 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 22.2 | 45.8 | 45.8 | 22.4 | 46.0 | 46.0 | 23.0 | 30.8 | 21.0 | 28.8 |
| Total Split (%) | 18.5% | 38.2% | 38.2% | 18.7% | 38.3% | 38.3% | 19.2% | 25.7% | 17.5% | 24.0% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 16.3 | 53.1 | 53.1 | 7.3 | 39.8 | 39.8 | 16.5 | 33.7 | 8.6 | 23.5 |
| Actuated g/C Ratio | 0.14 | 0.46 | 0.46 | 0.06 | 0.34 | 0.34 | 0.14 | 0.29 | 0.07 | 0.20 |
| v/c Ratio | 0.82 | 0.54 | 0.30 | 0.24 | 0.95 | 0.21 | 0.80 | 0.75 | 0.37 | 1.71 |
| Control Delay (s/veh) | 76.6 | 25.8 | 3.7 | 58.3 | 54.4 | 5.6 | 73.0 | 49.6 | 60.4 | 360.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 76.6 | 25.8 | 3.7 | 58.3 | 54.4 | 5.6 | 73.0 | 49.6 | 60.4 | 360.8 |
| LOS | E | C | A | E | D | A | E | D | E | F |
| Approach Delay (s/veh) | | 28.8 | | | 49.5 | | | 57.0 | | 340.9 |
| Approach LOS | | C | | | D | | | E | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 116.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.71 | |
| Intersection Signal Delay (s/veh): 94.5 | Intersection LOS: F |
| Intersection Capacity Utilization 94.5% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

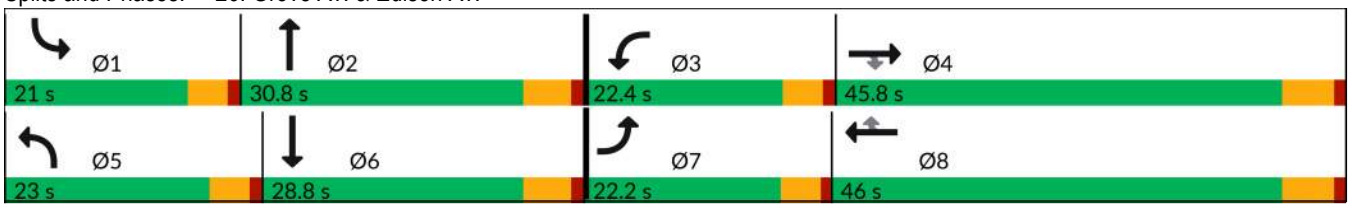

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 169 | 765 | 230 | 22 | 1009 | 115 | 166 | 350 | 6 | 40 | 486 | 73 |
| Future Volume (veh/h) | 169 | 765 | 230 | 22 | 1009 | 115 | 166 | 350 | 6 | 40 | 486 | 73 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 192 | 869 | 181 | 25 | 1147 | 17 | 189 | 398 | -107 | 45 | 552 | 3 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 220 | 1607 | 717 | 41 | 1229 | 548 | 218 | 572 | 0 | 57 | 392 | 2 |
| Arrive On Green | 0.13 | 0.68 | 0.45 | 0.02 | 0.52 | 0.35 | 0.13 | 0.31 | 0.00 | 0.03 | 0.21 | 0.21 |
| Sat Flow, veh/h | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 | 1688 | 1870 | 0 | 1688 | 1858 | 10 |
| Grp Volume(v), veh/h | 192 | 869 | 181 | 25 | 1147 | 17 | 189 | 291 | 0 | 45 | 0 | 555 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 | 1688 | 1870 | 0 | 1688 | 0 | 1868 |
| Q Serve(g_s), s | 12.4 | 13.8 | 7.8 | 1.6 | 33.4 | 0.8 | 12.2 | 14.2 | 0.0 | 2.9 | 0.0 | 23.4 |
| Cycle Q Clear(g_c), s | 12.4 | 13.8 | 7.8 | 1.6 | 33.4 | 0.8 | 12.2 | 14.2 | 0.0 | 2.9 | 0.0 | 23.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 220 | 1607 | 717 | 41 | 1229 | 548 | 218 | 572 | 0 | 57 | 0 | 394 |
| V/C Ratio(X) | 0.87 | 0.54 | 0.25 | 0.61 | 0.93 | 0.03 | 0.87 | 0.51 | 0.00 | 0.79 | 0.00 | 1.41 |
| Avail Cap(c_a), veh/h | 267 | 1607 | 717 | 270 | 1286 | 574 | 280 | 572 | 0 | 249 | 0 | 394 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.4 | 12.0 | 18.8 | 53.7 | 25.5 | 24.0 | 47.4 | 31.7 | 0.0 | 53.3 | 0.0 | 43.8 |
| Incr Delay (d2), s/veh | 22.3 | 0.4 | 0.2 | 13.9 | 12.1 | 0.0 | 20.0 | 0.7 | 0.0 | 20.9 | 0.0 | 198.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.4 | 4.1 | 2.8 | 0.8 | 13.0 | 0.3 | 6.2 | 6.3 | 0.0 | 1.5 | 0.0 | 32.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 69.6 | 12.4 | 19.0 | 67.6 | 37.6 | 24.0 | 67.4 | 32.4 | 0.0 | 74.2 | 0.0 | 242.8 |
| LnGrp LOS | E | B | B | E | D | C | E | C | | E | | F |
| Approach Vol, veh/h | | 1242 | | | 1189 | | | 480 | | | 600 | |
| Approach Delay, s/veh | | 22.2 | | | 38.1 | | | 46.2 | | | 230.1 | |
| Approach LOS | | C | | | D | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 8.4 | 39.4 | 7.3 | 56.0 | 18.9 | 28.8 | 19.1 | 44.2 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 16.4 | 25.4 | 17.8 | 40.0 | 18.4 | 23.4 | 17.6 | 40.2 |
| Max Q Clear Time (g_c+I1), s | 4.9 | 16.2 | 3.6 | 15.8 | 14.2 | 25.4 | 14.4 | 35.4 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | 0.0 | 6.6 | 0.2 | 0.0 | 0.1 | 3.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 66.4 |
| HCM 7th LOS | E |

Notes

User approved pedestrian interval to be less than phase max green.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 239.9 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 52 | 180 | 14 | 8 | 376 | 525 | 3 | 5 | 2 | 614 | 29 | 102 |
| Future Vol, veh/h | 52 | 180 | 14 | 8 | 376 | 525 | 3 | 5 | 2 | 614 | 29 | 102 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 55 | 191 | 15 | 9 | 400 | 559 | 3 | 5 | 2 | 653 | 31 | 109 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 21.6 | 311.6 | 14.5 | 227.6 |
| HCM LOS | C | F | B | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 30% | 21% | 1% | 82% |
| Vol Thru, % | 50% | 73% | 41% | 4% |
| Vol Right, % | 20% | 6% | 58% | 14% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 10 | 246 | 909 | 745 |
| LT Vol | 3 | 52 | 8 | 614 |
| Through Vol | 5 | 180 | 376 | 29 |
| RT Vol | 2 | 14 | 525 | 102 |
| Lane Flow Rate | 11 | 262 | 967 | 793 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.025 | 0.515 | 1.631 | 1.431 |
| Departure Headway (Hd) | 11.181 | 9.227 | 7.182 | 7.712 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 322 | 395 | 513 | 476 |
| Service Time | 9.181 | 7.227 | 5.182 | 5.712 |
| HCM Lane V/C Ratio | 0.034 | 0.663 | 1.885 | 1.666 |
| HCM Control Delay, s/veh | 14.5 | 21.6 | 311.6 | 227.6 |
| HCM Lane LOS | B | C | F | F |
| HCM 95th-tile Q | 0.1 | 2.8 | 46.2 | 32.8 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 21 | 1755 | 2185 | 19 | 25 | 35 |
| Future Vol, veh/h | 21 | 1755 | 2185 | 19 | 25 | 35 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 2 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 23 | 1908 | 2375 | 21 | 27 | 38 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 2396 | 0 | - | 0 | 3385 | 2385 |
| Stage 1 | - | - | - | - | 2385 | - |
| Stage 2 | - | - | - | - | 999 | - |
| Critical Hdwy | 4.13 | - | - | - | 6.63 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.83 | - |
| Follow-up Hdwy | 2.219 | - | - | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | 199 | - | - | - | ~ 7 | 43 |
| Stage 1 | - | - | - | - | 72 | - |
| Stage 2 | - | - | - | - | 318 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 199 | - | - | - | ~ 5 | 43 |
| Mov Cap-2 Maneuver | - | - | - | - | 51 | - |
| Stage 1 | - | - | - | - | 55 | - |
| Stage 2 | - | - | - | - | 318 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 6.3 | 0 | $ 417.63 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 43 | - | - | - | 46 |
| HCM Lane V/C Ratio | 0.115 | - | - | - | 1.414 |
| HCM Control Delay (s/veh) | 25.4 | 6.1 | - | - | $ 417.6 |
| HCM Lane LOS | D | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.4 | - | - | - | 6.3 |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Int Delay, s/veh | 86 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 24 | 990 | 103 | 70 | 930 | 19 | 189 | 16 | 206 | 13 | 11 | 46 |
| Future Vol, veh/h | 24 | 990 | 103 | 70 | 930 | 19 | 189 | 16 | 206 | 13 | 11 | 46 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 27 | 1100 | 114 | 78 | 1033 | 21 | 210 | 18 | 229 | 14 | 12 | 51 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1060 | 0 | 0 | 1214 | 0 | 0 | 1889 | 2427 | 607 | 1818 | 2473 | 533 |
| Stage 1 | - | - | - | - | - | - | 1211 | 1211 | - | 1205 | 1205 | - |
| Stage 2 | - | - | - | - | - | - | 678 | 1216 | - | 612 | 1268 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 653 | - | - | 570 | - | - | ~ 43 | 32 | 439 | 49 | 30 | 491 |
| Stage 1 | - | - | - | - | - | - | ~ 193 | 254 | - | 195 | 255 | - |
| Stage 2 | - | - | - | - | - | - | 408 | 252 | - | 447 | 238 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 649 | - | - | 570 | - | - | ~ 29 | 26 | 439 | 17 | 24 | 488 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 146 | 142 | - | 89 | 118 | - |
| Stage 1 | - | - | - | - | - | - | ~ 186 | 243 | - | 167 | 219 | - |
| Stage 2 | - | - | - | - | - | - | 298 | 216 | - | 190 | 228 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.23 | 0.85 | $ 539.13 | 31.9 |
| HCM LOS | | | F | D |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 219 | 649 | - | - | 570 | - | - | 210 |
| HCM Lane V/C Ratio | 2.084 | 0.041 | - | - | 0.136 | - | - | 0.37 |
| HCM Control Delay (s/veh) | $ 539.1 | 10.8 | - | - | 12.3 | - | - | 31.9 |
| HCM Lane LOS | F | B | - | - | B | - | - | D |
| HCM 95th %tile Q(veh) | 34.6 | 0.1 | - | - | 0.5 | - | - | 1.6 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 30.2 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 32 | 82 | 50 | 26 | 6 | 112 | 393 | 86 | 22 | 208 | 47 |
| Future Vol, veh/h | 40 | 32 | 82 | 50 | 26 | 6 | 112 | 393 | 86 | 22 | 208 | 47 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 44 | 35 | 90 | 55 | 29 | 7 | 123 | 432 | 95 | 24 | 229 | 52 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 12.3 | 11.6 | 44.9 | 14.2 |
| HCM LOS | B | B | E | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 19% | 26% | 61% | 8% |
| Vol Thru, % | 66% | 21% | 32% | 75% |
| Vol Right, % | 15% | 53% | 7% | 17% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 591 | 154 | 82 | 277 |
| LT Vol | 112 | 40 | 50 | 22 |
| Through Vol | 393 | 32 | 26 | 208 |
| RT Vol | 86 | 82 | 6 | 47 |
| Lane Flow Rate | 649 | 169 | 90 | 304 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.944 | 0.304 | 0.177 | 0.489 |
| Departure Headway (Hd) | 5.233 | 6.467 | 7.058 | 5.786 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 688 | 557 | 510 | 627 |
| Service Time | 3.325 | 4.487 | 5.083 | 3.786 |
| HCM Lane V/C Ratio | 0.943 | 0.303 | 0.176 | 0.485 |
| HCM Control Delay, s/veh | 44.9 | 12.3 | 11.6 | 14.2 |
| HCM Lane LOS | E | B | B | B |
| HCM 95th-tile Q | 13.3 | 1.3 | 0.6 | 2.7 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 19 | 835 | 42 | 71 | 1048 | 53 | 347 | 166 | 147 |
| Future Volume (vph) | 19 | 835 | 42 | 71 | 1048 | 53 | 347 | 166 | 147 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 10.1 | 44.0 | 44.0 | 14.4 | 48.3 | 36.0 | 48.2 | 13.4 | 25.6 |
| Total Split (%) | 8.4% | 36.7% | 36.7% | 12.0% | 40.3% | 30.0% | 40.2% | 11.2% | 21.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.3 | 41.0 | 41.0 | 8.2 | 47.8 | 8.2 | 29.8 | 8.9 | 32.9 |
| Actuated g/C Ratio | 0.05 | 0.39 | 0.39 | 0.08 | 0.46 | 0.08 | 0.29 | 0.09 | 0.32 |
| v/c Ratio | 0.25 | 1.24 | 0.07 | 0.58 | 1.58 | 0.44 | 0.84 | 1.26 | 0.36 |
| Control Delay (s/veh) | 59.3 | 150.2 | 0.2 | 67.3 | 292.5 | 59.4 | 49.2 | 202.1 | 29.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 59.3 | 150.2 | 0.2 | 67.3 | 292.5 | 59.4 | 49.2 | 202.1 | 29.9 |
| LOS | E | F | A | E | F | E | D | F | C |
| Approach Delay (s/veh) | | 141.2 | | | 280.2 | | 50.4 | | 110.4 |
| Approach LOS | | F | | | F | | D | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 104.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.58 | |
| Intersection Signal Delay (s/veh): 183.4 | Intersection LOS: F |
| Intersection Capacity Utilization 108.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

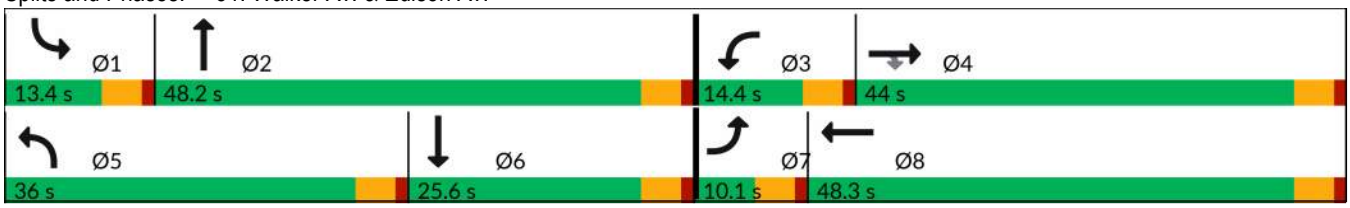

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 19 | 835 | 42 | 71 | 1048 | 172 | 53 | 347 | 59 | 166 | 147 | 41 |
| Future Volume (veh/h) | 19 | 835 | 42 | 71 | 1048 | 172 | 53 | 347 | 59 | 166 | 147 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 21 | 908 | -63 | 77 | 1139 | 160 | 58 | 377 | 21 | 180 | 160 | 34 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 38 | 776 | 658 | 97 | 722 | 101 | 74 | 433 | 24 | 153 | 440 | 93 |
| Arrive On Green | 0.02 | 0.41 | 0.00 | 0.06 | 0.45 | 0.45 | 0.04 | 0.25 | 0.25 | 0.09 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1604 | 225 | 1688 | 1754 | 98 | 1688 | 1494 | 317 |
| Grp Volume(v), veh/h | 21 | 908 | -63 | 77 | 0 | 1299 | 58 | 0 | 398 | 180 | 0 | 194 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1830 | 1688 | 0 | 1851 | 1688 | 0 | 1811 |
| Q Serve(g_s), s | 1.2 | 40.3 | 0.0 | 4.4 | 0.0 | 43.7 | 3.3 | 0.0 | 20.0 | 8.8 | 0.0 | 8.2 |
| Cycle Q Clear(g_c), s | 1.2 | 40.3 | 0.0 | 4.4 | 0.0 | 43.7 | 3.3 | 0.0 | 20.0 | 8.8 | 0.0 | 8.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.12 | 1.00 | | 0.05 | 1.00 | | 0.18 |
| Lane Grp Cap(c), veh/h | 38 | 776 | 658 | 97 | 0 | 824 | 74 | 0 | 458 | 153 | 0 | 533 |
| V/C Ratio(X) | 0.56 | 1.17 | -0.10 | 0.79 | 0.00 | 1.58 | 0.79 | 0.00 | 0.87 | 1.18 | 0.00 | 0.36 |
| Avail Cap(c_a), veh/h | 96 | 776 | 658 | 170 | 0 | 824 | 546 | 0 | 832 | 153 | 0 | 533 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.0 | 28.4 | 0.0 | 45.2 | 0.0 | 26.7 | 46.0 | 0.0 | 35.0 | 44.1 | 0.0 | 27.1 |
| Incr Delay (d2), s/veh | 4.8 | 90.0 | 0.0 | 5.4 | 0.0 | 265.4 | 6.8 | 0.0 | 5.2 | 128.0 | 0.0 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 35.9 | 0.0 | 1.9 | 0.0 | 77.9 | 1.4 | 0.0 | 8.9 | 8.9 | 0.0 | 3.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 51.7 | 118.4 | 0.0 | 50.5 | 0.0 | 292.1 | 52.8 | 0.0 | 40.2 | 172.1 | 0.0 | 27.5 |
| LnGrp LOS | D | F | | D | | F | D | | D | F | | C |
| Approach Vol, veh/h | | 866 | | | 1376 | | | 456 | | | 374 | |
| Approach Delay, s/veh | | 125.4 | | | 278.6 | | | 41.8 | | | 97.1 | |
| Approach LOS | | F | | | F | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.4 | 28.6 | 10.2 | 44.9 | 8.8 | 33.2 | 6.8 | 48.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 8.8 | 43.6 | 9.8 | 39.4 | 31.4 | 21.0 | 5.5 | 43.7 |
| Max Q Clear Time (g_c+I1), s | 10.8 | 22.0 | 6.4 | 42.3 | 5.3 | 10.2 | 3.2 | 45.7 |
| Green Ext Time (p_c), s | 0.0 | 2.0 | 0.0 | 0.0 | 0.1 | 0.6 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 178.2 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.5 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 40 | 314 | 833 | 370 | 86 | 77 |
| Future Vol, veh/h | 40 | 314 | 833 | 370 | 86 | 77 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 42 | 327 | 868 | 385 | 90 | 80 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1255 | 0 | - | 0 | 1473 | 1062 |
| Stage 1 | - | - | - | - | 1062 | - |
| Stage 2 | - | - | - | - | 410 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 554 | - | - | - | 140 | 271 |
| Stage 1 | - | - | - | - | 332 | - |
| Stage 2 | - | - | - | - | 670 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 553 | - | - | - | 126 | 271 |
| Mov Cap-2 Maneuver | - | - | - | - | 236 | - |
| Stage 1 | - | - | - | - | 301 | - |
| Stage 2 | - | - | - | - | 668 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 1.36 | 0 | 44.76 |
| HCM LOS | | | E |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 203 | - | - | - | 251 |
| HCM Lane V/C Ratio | 0.075 | - | - | - | 0.676 |
| HCM Control Delay (s/veh) | 12 | 0 | - | - | 44.8 |
| HCM Lane LOS | B | A | - | - | E |
| HCM 95th %tile Q(veh) | 0.2 | - | - | - | 4.4 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 325 | 2 | 443 | 677 | 1356 | 632 | 107 |
| Future Volume (vph) | 325 | 2 | 443 | 677 | 1356 | 632 | 107 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 23.0 | 23.0 | 23.0 | 27.0 | 67.0 | 40.0 | 40.0 |
| Total Split (%) | 25.6% | 25.6% | 25.6% | 30.0% | 74.4% | 44.4% | 44.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 21.9 | 21.9 | 21.9 | 25.2 | 56.5 | 26.4 | 26.4 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.24 | 0.28 | 0.63 | 0.29 | 0.29 |
| v/c Ratio | 0.73 | 0.66 | 0.59 | 0.84 | 0.45 | 0.36 | 0.21 |
| Control Delay (s/veh) | 44.8 | 32.7 | 24.5 | 39.1 | 6.2 | 26.3 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.8 | 32.7 | 24.5 | 39.1 | 6.3 | 26.3 | 5.7 |
| LOS | D | C | C | D | A | C | A |
| Approach Delay (s/veh) | | 34.3 | | | 17.2 | 23.3 | |
| Approach LOS | | C | | | B | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 35.6 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 22.2 | Intersection LOS: C |
| Intersection Capacity Utilization 76.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

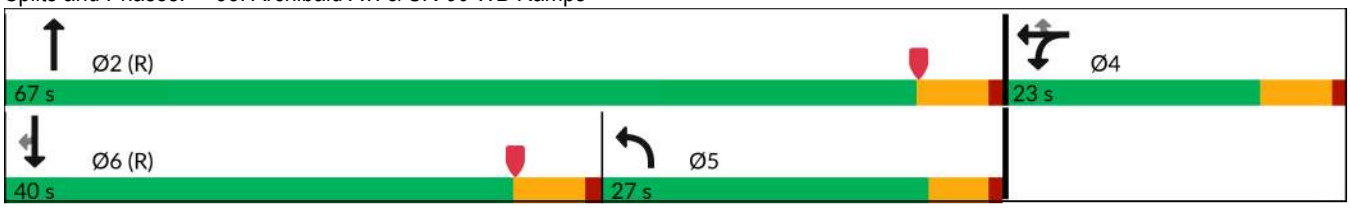

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 325 | 2 | 443 | 677 | 1356 | 0 | 0 | 632 | 107 |
| Future Volume (veh/h) | 0 | 0 | 0 | 325 | 2 | 443 | 677 | 1356 | 0 | 0 | 632 | 107 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1673 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 430 | 0 | 178 | 720 | 1443 | 0 | 0 | 672 | 83 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 526 | 0 | 247 | 1480 | 3653 | 0 | 0 | 1109 | 265 |
| Arrive On Green | | | | 0.16 | 0.00 | 0.16 | 0.16 | 0.24 | 0.00 | 0.00 | 0.17 | 0.17 |
| Sat Flow, veh/h | | | | 3375 | 0 | 1585 | 3092 | 5274 | 0 | 0 | 6696 | 1535 |
| Grp Volume(v), veh/h | | | | 430 | 0 | 178 | 720 | 1443 | 0 | 0 | 672 | 83 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1585 | 1546 | 1702 | 0 | 0 | 1609 | 1535 |
| Q Serve(g_s), s | | | | 11.1 | 0.0 | 9.6 | 19.1 | 21.4 | 0.0 | 0.0 | 8.7 | 4.3 |
| Cycle Q Clear(g_c), s | | | | 11.1 | 0.0 | 9.6 | 19.1 | 21.4 | 0.0 | 0.0 | 8.7 | 4.3 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 526 | 0 | 247 | 1480 | 3653 | 0 | 0 | 1109 | 265 |
| V/C Ratio(X) | | | | 0.82 | 0.00 | 0.72 | 0.49 | 0.40 | 0.00 | 0.00 | 0.61 | 0.31 |
| Avail Cap(c_a), veh/h | | | | 645 | 0 | 303 | 1480 | 3653 | 0 | 0 | 2445 | 583 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.83 | 0.83 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 36.8 | 0.0 | 36.1 | 27.8 | 18.0 | 0.0 | 0.0 | 34.4 | 32.6 |
| Incr Delay (d2), s/veh | | | | 6.8 | 0.0 | 6.3 | 0.1 | 0.3 | 0.0 | 0.0 | 2.5 | 3.1 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.8 | 0.0 | 8.6 | 7.8 | 9.6 | 0.0 | 0.0 | 3.4 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 43.6 | 0.0 | 42.5 | 27.9 | 18.2 | 0.0 | 0.0 | 36.9 | 35.7 |
| LnGrp LOS | | | | D | | D | C | B | | | D | D |
| Approach Vol, veh/h | | | | | 608 | | | 2163 | | | 755 | |
| Approach Delay, s/veh | | | | | 43.2 | | | 21.4 | | | 36.7 | |
| Approach LOS | | | | | D | | | C | | | D | |

| Timer - Assigned Phs | 2 | 4 | 5 | 6 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 70.2 | 19.8 | 48.9 | 21.3 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 61.2 | 17.2 | 22.0 | * 34 |
| Max Q Clear Time (g_c+I1), s | 23.4 | 13.1 | 21.1 | 10.7 |
| Green Ext Time (p_c), s | 12.8 | 0.9 | 0.2 | 4.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.5 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 371 | 3 | 334 | 1609 | 644 | 191 | 705 |
| Future Volume (vph) | 371 | 3 | 334 | 1609 | 644 | 191 | 705 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 52.0 | 52.0 | 11.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 57.8% | 57.8% | 12.2% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 18.6 | 18.6 | 18.6 | 46.9 | 46.9 | 7.9 | 59.8 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | 0.52 | 0.52 | 0.09 | 0.66 |
| v/c Ratio | 0.78 | 0.71 | 0.47 | 0.50 | 0.59 | 0.74 | 0.22 |
| Control Delay (s/veh) | 50.0 | 38.0 | 7.5 | 14.8 | 3.4 | 69.0 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.0 | 38.0 | 7.5 | 14.8 | 3.4 | 69.0 | 0.7 |
| LOS | D | D | A | B | A | E | A |
| Approach Delay (s/veh) | | 32.5 | | 11.5 | | | 15.2 |
| Approach LOS | | C | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 35.6 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 16.2 | Intersection LOS: B |
| Intersection Capacity Utilization 76.5% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

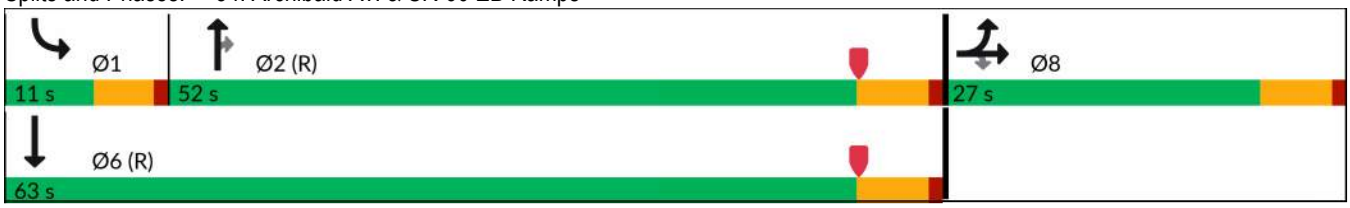

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 371 | 3 | 334 | 0 | 0 | 0 | 0 | 1609 | 644 | 191 | 705 | 0 |
| Future Volume (veh/h) | 371 | 3 | 334 | 0 | 0 | 0 | 0 | 1609 | 644 | 191 | 705 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1673 | 1870 | 0 |
| Adj Flow Rate, veh/h | 447 | 0 | 128 | | | | 0 | 1676 | 547 | 199 | 734 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 555 | 0 | 261 | | | | 0 | 3761 | 925 | 206 | 3608 | 0 |
| Arrive On Green | 0.16 | 0.00 | 0.16 | | | | 0.00 | 0.58 | 0.58 | 0.13 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3375 | 0 | 1585 | | | | 0 | 6696 | 1582 | 3092 | 5274 | 0 |
| Grp Volume(v), veh/h | 447 | 0 | 128 | | | | 0 | 1676 | 547 | 199 | 734 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1585 | | | | 0 | 1609 | 1582 | 1546 | 1702 | 0 |
| Q Serve(g_s), s | 11.5 | 0.0 | 6.6 | | | | 0.0 | 13.2 | 19.8 | 5.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 11.5 | 0.0 | 6.6 | | | | 0.0 | 13.2 | 19.8 | 5.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 555 | 0 | 261 | | | | 0 | 3761 | 925 | 206 | 3608 | 0 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.49 | | | | 0.00 | 0.45 | 0.59 | 0.97 | 0.20 | 0.00 |
| Avail Cap(c_a), veh/h | 795 | 0 | 373 | | | | 0 | 3761 | 925 | 206 | 3608 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.88 | 0.88 | 0.00 |
| Uniform Delay (d), s/veh | 36.2 | 0.0 | 34.2 | | | | 0.0 | 10.5 | 11.9 | 38.9 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 4.0 | 0.0 | 1.4 | | | | 0.0 | 0.4 | 2.8 | 48.7 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.8 | 0.0 | 2.5 | | | | 0.0 | 3.8 | 6.2 | 3.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.2 | 0.0 | 35.6 | | | | 0.0 | 10.9 | 14.6 | 87.6 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | B | F | A | |
| Approach Vol, veh/h | | 575 | | | | | | 2223 | | | 933 | |
| Approach Delay, s/veh | | 39.2 | | | | | | 11.8 | | | 18.8 | |
| Approach LOS | | D | | | | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 58.4 | | | | 69.4 | | 20.6 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 46.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 7.8 | 21.8 | | | | 2.0 | | 13.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 15.2 | | | | 5.1 | | 1.3 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 17.8 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 178 | 782 | 323 | 221 | 666 | 290 | 382 | 1360 | 179 | 516 |
| Future Volume (vph) | 178 | 782 | 323 | 221 | 666 | 290 | 382 | 1360 | 179 | 516 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 18.6 | 38.2 | 38.2 | 19.0 | 38.6 | 38.6 | 29.0 | 43.6 | 19.2 | 33.8 |
| Total Split (%) | 15.5% | 31.8% | 31.8% | 15.8% | 32.2% | 32.2% | 24.2% | 36.3% | 16.0% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.0 | 32.3 | 32.3 | 14.4 | 32.7 | 32.7 | 24.4 | 39.0 | 14.6 | 29.2 |
| Actuated g/C Ratio | 0.12 | 0.27 | 0.27 | 0.12 | 0.28 | 0.28 | 0.21 | 0.33 | 0.12 | 0.25 |
| v/c Ratio | 0.97 | 0.87 | 0.55 | 1.17 | 0.74 | 0.49 | 1.19 | 0.98 | 0.94 | 0.60 |
| Control Delay (s/veh) | 109.1 | 52.5 | 10.3 | 163.2 | 44.3 | 8.5 | 154.1 | 57.6 | 100.3 | 38.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 109.1 | 52.5 | 10.3 | 163.2 | 44.3 | 8.5 | 154.1 | 57.6 | 100.3 | 38.3 |
| LOS | F | D | B | F | D | A | F | E | F | D |
| Approach Delay (s/veh) | | 49.7 | | | 57.8 | | | 77.1 | | 50.9 |
| Approach LOS | | D | | | E | | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.19 | |
| Intersection Signal Delay (s/veh): 61.6 | Intersection LOS: E |
| Intersection Capacity Utilization 91.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

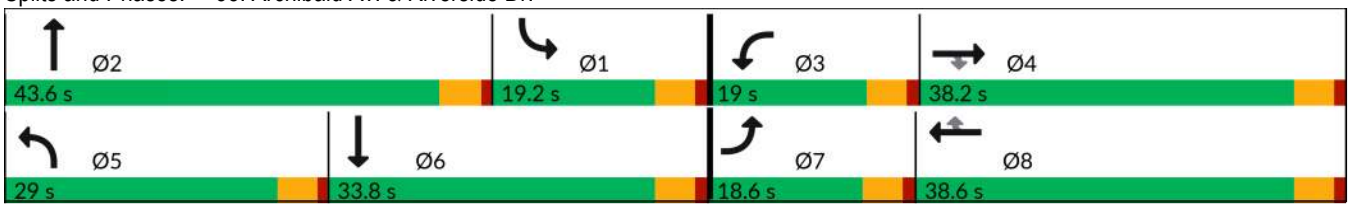

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 178 | 782 | 323 | 221 | 666 | 290 | 382 | 1360 | 149 | 179 | 516 | 179 |
| Future Volume (veh/h) | 178 | 782 | 323 | 221 | 666 | 290 | 382 | 1360 | 149 | 179 | 516 | 179 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 191 | 841 | 292 | 238 | 716 | 229 | 411 | 1462 | 159 | 192 | 555 | 131 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 201 | 949 | 415 | 207 | 961 | 425 | 350 | 1541 | 168 | 209 | 1020 | 235 |
| Arrive On Green | 0.12 | 0.27 | 0.27 | 0.12 | 0.27 | 0.27 | 0.21 | 0.33 | 0.33 | 0.12 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1688 | 3554 | 1553 | 1688 | 3554 | 1571 | 1688 | 4672 | 508 | 1688 | 4138 | 955 |
| Grp Volume(v), veh/h | 191 | 841 | 292 | 238 | 716 | 229 | 411 | 1065 | 556 | 192 | 454 | 232 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1553 | 1688 | 1777 | 1571 | 1688 | 1702 | 1776 | 1688 | 1702 | 1689 |
| Q Serve(g_s), s | 13.2 | 26.7 | 20.0 | 14.4 | 21.6 | 10.6 | 24.4 | 35.9 | 35.9 | 13.2 | 13.6 | 14.1 |
| Cycle Q Clear(g_c), s | 13.2 | 26.7 | 20.0 | 14.4 | 21.6 | 10.6 | 24.4 | 35.9 | 35.9 | 13.2 | 13.6 | 14.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.29 | 1.00 | | 0.57 |
| Lane Grp Cap(c), veh/h | 201 | 949 | 415 | 207 | 961 | 425 | 350 | 1123 | 586 | 209 | 839 | 416 |
| V/C Ratio(X) | 0.95 | 0.89 | 0.70 | 1.15 | 0.74 | 0.54 | 1.17 | 0.95 | 0.95 | 0.92 | 0.54 | 0.56 |
| Avail Cap(c_a), veh/h | 201 | 1015 | 444 | 207 | 1027 | 454 | 350 | 1129 | 589 | 209 | 845 | 419 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.5 | 41.4 | 38.9 | 51.6 | 39.2 | 19.1 | 46.6 | 38.4 | 38.4 | 50.9 | 38.5 | 38.7 |
| Incr Delay (d2), s/veh | 49.0 | 9.2 | 4.6 | 109.6 | 2.8 | 1.1 | 104.3 | 15.9 | 25.0 | 39.1 | 0.7 | 1.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.1 | 12.3 | 7.8 | 12.1 | 9.4 | 3.7 | 19.9 | 16.5 | 18.7 | 7.7 | 5.5 | 5.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 100.5 | 50.5 | 43.5 | 161.2 | 42.0 | 20.2 | 150.9 | 54.4 | 63.4 | 90.0 | 39.2 | 40.3 |
| LnGrp LOS | F | D | D | F | D | C | F | D | E | F | D | D |
| Approach Vol, veh/h | | 1324 | | | 1183 | | | 2032 | | | 878 | |
| Approach Delay, s/veh | | 56.2 | | | 61.8 | | | 76.4 | | | 50.6 | |
| Approach LOS | | E | | | E | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.2 | 43.4 | 19.0 | 36.0 | 29.0 | 33.6 | 18.6 | 36.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 14.6 | 39.0 | 14.4 | 33.6 | 24.4 | 29.2 | 14.0 | 34.0 |
| Max Q Clear Time (g_c+I1), s | 15.2 | 37.9 | 16.4 | 28.7 | 26.4 | 16.1 | 15.2 | 23.6 |
| Green Ext Time (p_c), s | 0.0 | 0.9 | 0.0 | 2.6 | 0.0 | 3.2 | 0.0 | 3.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 64.1 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 240 | 141 | 48 | 208 | 178 | 217 | 1653 | 157 | 769 |
| Future Volume (vph) | 240 | 141 | 48 | 208 | 178 | 217 | 1653 | 157 | 769 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 20.4 | 35.1 | 5.2 | 19.9 | 19.9 | 14.4 | 45.2 | 11.8 | 42.6 |
| Actuated g/C Ratio | 0.18 | 0.30 | 0.04 | 0.17 | 0.17 | 0.12 | 0.39 | 0.10 | 0.37 |
| v/c Ratio | 0.98 | 0.57 | 0.77 | 0.78 | 0.48 | 1.25 | 0.98 | 1.11 | 0.82 |
| Control Delay (s/veh) | 96.2 | 34.0 | 111.3 | 63.4 | 9.2 | 189.5 | 50.4 | 149.6 | 38.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 96.2 | 34.0 | 111.3 | 63.4 | 9.2 | 189.5 | 50.4 | 149.6 | 38.9 |
| LOS | F | C | F | E | A | F | D | F | D |
| Approach Delay (s/veh) | | 63.8 | | 46.5 | | | 65.7 | | 55.1 |
| Approach LOS | | E | | D | | | E | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 115.8 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.25 | |
| Intersection Signal Delay (s/veh): 60.5 | Intersection LOS: E |
| Intersection Capacity Utilization 83.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 240 | 141 | 119 | 48 | 208 | 178 | 217 | 1653 | 109 | 157 | 769 | 145 |
| Future Volume (veh/h) | 240 | 141 | 119 | 48 | 208 | 178 | 217 | 1653 | 109 | 157 | 769 | 145 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 289 | 170 | 127 | 58 | 251 | 107 | 261 | 1992 | 130 | 189 | 927 | 157 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 303 | 291 | 217 | 73 | 293 | 249 | 214 | 2071 | 135 | 175 | 1164 | 197 |
| Arrive On Green | 0.18 | 0.29 | 0.29 | 0.04 | 0.16 | 0.16 | 0.13 | 0.40 | 0.40 | 0.10 | 0.37 | 0.37 |
| Sat Flow, veh/h | 1688 | 993 | 742 | 1688 | 1870 | 1585 | 1688 | 5210 | 338 | 1688 | 3107 | 526 |
| Grp Volume(v), veh/h | 289 | 0 | 297 | 58 | 251 | 107 | 261 | 1427 | 695 | 189 | 558 | 526 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1735 | 1688 | 1870 | 1585 | 1688 | 1870 | 1808 | 1688 | 1870 | 1762 |
| Q Serve(g_s), s | 19.3 | 0.0 | 16.6 | 3.9 | 14.8 | 5.4 | 14.4 | 42.2 | 42.7 | 11.8 | 30.2 | 30.2 |
| Cycle Q Clear(g_c), s | 19.3 | 0.0 | 16.6 | 3.9 | 14.8 | 5.4 | 14.4 | 42.2 | 42.7 | 11.8 | 30.2 | 30.2 |
| Prop In Lane | 1.00 | | 0.43 | 1.00 | | 1.00 | 1.00 | | 0.19 | 1.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | 303 | 0 | 509 | 73 | 293 | 249 | 214 | 1487 | 719 | 175 | 701 | 660 |
| V/C Ratio(X) | 0.95 | 0.00 | 0.58 | 0.79 | 0.86 | 0.43 | 1.22 | 0.96 | 0.97 | 1.08 | 0.80 | 0.80 |
| Avail Cap(c_a), veh/h | 303 | 0 | 602 | 77 | 399 | 338 | 214 | 1489 | 720 | 175 | 702 | 661 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.1 | 0.0 | 34.2 | 53.8 | 46.6 | 26.4 | 49.6 | 33.3 | 33.5 | 50.9 | 31.6 | 31.7 |
| Incr Delay (d2), s/veh | 39.2 | 0.0 | 1.1 | 40.0 | 12.7 | 1.2 | 133.5 | 14.8 | 25.4 | 90.3 | 6.4 | 6.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.2 | 0.0 | 6.9 | 2.4 | 7.8 | 2.7 | 13.7 | 20.4 | 22.0 | 9.2 | 13.9 | 13.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 85.4 | 0.0 | 35.3 | 93.9 | 59.3 | 27.6 | 183.1 | 48.2 | 58.9 | 141.2 | 38.0 | 38.4 |
| LnGrp LOS | F | | D | F | E | C | F | D | E | F | D | D |
| Approach Vol, veh/h | | 586 | | | 416 | | | 2383 | | | 1273 | |
| Approach Delay, s/veh | | 60.0 | | | 56.0 | | | 66.1 | | | 53.5 | |
| Approach LOS | | E | | | E | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.4 | 49.8 | 9.5 | 37.9 | 19.0 | 47.2 | 25.0 | 22.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 13.8 | 44.7 | 5.9 | 18.6 | 16.4 | 32.2 | 21.3 | 16.8 |
| Green Ext Time (p_c), s | 0.0 | 0.5 | 0.0 | 1.6 | 0.0 | 4.6 | 0.0 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 61.0 |
| HCM 7th LOS | E |

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 0 | 67 | 0 | 26 | 1745 | 241 | 683 |
| Future Volume (vph) | 0 | 67 | 0 | 26 | 1745 | 241 | 683 |
| Turn Type | NA | Split | NA | Prot | NA | Prot | NA |
| Protected Phases | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | |
| Detector Phase | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 22.5 | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 |
| Total Split (s) | 22.5 | 33.0 | 33.0 | 10.0 | 45.5 | 19.0 | 54.5 |
| Total Split (%) | 18.8% | 27.5% | 27.5% | 8.3% | 37.9% | 15.8% | 45.4% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.6 | 11.6 | 11.6 | 5.5 | 41.6 | 14.6 | 57.3 |
| Actuated g/C Ratio | 0.06 | 0.13 | 0.13 | 0.06 | 0.48 | 0.17 | 0.65 |
| v/c Ratio | 0.07 | 0.33 | 0.27 | 0.28 | 0.81 | 0.95 | 0.33 |
| Control Delay (s/veh) | 0.3 | 38.5 | 1.1 | 50.8 | 25.2 | 81.8 | 10.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.3 | 38.5 | 1.1 | 50.8 | 25.2 | 81.8 | 10.2 |
| LOS | A | D | A | D | C | F | B |
| Approach Delay (s/veh) | 0.3 | | 13.0 | | 25.6 | | 28.8 |
| Approach LOS | A | | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 25.5 | Intersection LOS: C |
| Intersection Capacity Utilization 70.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

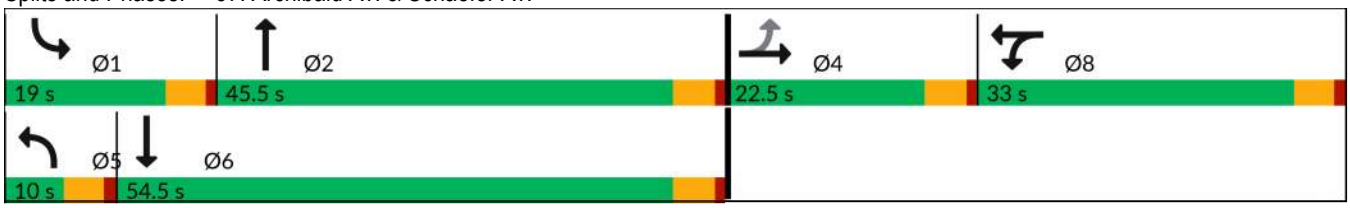

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 30 | 67 | 0 | 145 | 26 | 1745 | 39 | 241 | 683 | 4 |
| Future Volume (veh/h) | 0 | 0 | 30 | 67 | 0 | 145 | 26 | 1745 | 39 | 241 | 683 | 4 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 33 | 74 | 0 | 118 | 29 | 1918 | 41 | 265 | 751 | 4 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 0 | 51 | 177 | 0 | 166 | 50 | 2356 | 50 | 299 | 2197 | 12 |
| Arrive On Green | 0.00 | 0.00 | 0.03 | 0.10 | 0.00 | 0.10 | 0.03 | 0.46 | 0.46 | 0.18 | 0.61 | 0.61 |
| Sat Flow, veh/h | 0 | 0 | 1585 | 1688 | 0 | 1585 | 1688 | 5141 | 110 | 1688 | 3624 | 19 |
| Grp Volume(v), veh/h | 0 | 0 | 33 | 74 | 0 | 118 | 29 | 1269 | 690 | 265 | 368 | 387 |
| Grp Sat Flow(s),veh/h/ln | 0 | 0 | 1585 | 1688 | 0 | 1585 | 1688 | 1702 | 1847 | 1688 | 1777 | 1866 |
| Q Serve(g_s), s | 0.0 | 0.0 | 1.7 | 3.3 | 0.0 | 5.8 | 1.4 | 26.1 | 26.1 | 12.4 | 8.3 | 8.3 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 1.7 | 3.3 | 0.0 | 5.8 | 1.4 | 26.1 | 26.1 | 12.4 | 8.3 | 8.3 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.06 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 0 | 0 | 51 | 177 | 0 | 166 | 50 | 1560 | 847 | 299 | 1077 | 1131 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.64 | 0.42 | 0.00 | 0.71 | 0.58 | 0.81 | 0.81 | 0.88 | 0.34 | 0.34 |
| Avail Cap(c_a), veh/h | 0 | 0 | 350 | 592 | 0 | 556 | 113 | 1720 | 933 | 300 | 1095 | 1150 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 38.7 | 33.9 | 0.0 | 35.1 | 38.8 | 18.9 | 19.0 | 32.5 | 7.9 | 7.9 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 12.7 | 1.6 | 0.0 | 5.6 | 10.2 | 2.9 | 5.2 | 24.6 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.8 | 1.4 | 0.0 | 2.4 | 0.7 | 8.9 | 10.2 | 6.6 | 2.3 | 2.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 51.4 | 35.5 | 0.0 | 40.6 | 49.0 | 21.8 | 24.2 | 57.1 | 8.1 | 8.1 |
| LnGrp LOS | | | D | D | | D | D | C | C | E | A | A |
| Approach Vol, veh/h | | 33 | | | 192 | | | 1988 | | | 1020 | |
| Approach Delay, s/veh | | 51.4 | | | 38.7 | | | 23.0 | | | 20.8 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.0 | 41.7 | | 7.2 | 7.0 | 53.7 | | 13.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 14.4 | 40.9 | | 17.9 | 5.4 | 49.9 | | 28.4 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 28.1 | | 3.7 | 3.4 | 10.3 | | 7.8 |
| Green Ext Time (p_c), s | 0.0 | 9.0 | | 0.1 | 0.0 | 4.3 | | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 23.5 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 101 | 717 | 192 | 525 | 869 | 225 | 247 | 1344 | 420 | 233 | 433 | 134 |
| Future Volume (vph) | 101 | 717 | 192 | 525 | 869 | 225 | 247 | 1344 | 420 | 233 | 433 | 134 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.6 | 36.8 | 120.0 | 10.4 | 41.6 | 41.6 | 11.4 | 38.0 | 120.0 | 16.4 | 43.0 | 43.0 |
| Actuated g/C Ratio | 0.05 | 0.31 | 1.00 | 0.09 | 0.35 | 0.35 | 0.10 | 0.32 | 1.00 | 0.14 | 0.36 | 0.36 |
| v/c Ratio | 0.73 | 0.48 | 0.13 | 2.06 | 1.40 | 0.37 | 1.62 | 1.25 | 0.28 | 1.06 | 0.36 | 0.21 |
| Control Delay (s/veh) | 85.0 | 35.1 | 0.2 | 516.1 | 222.8 | 13.4 | 339.3 | 155.8 | 0.4 | 126.1 | 29.3 | 5.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 85.0 | 35.1 | 0.2 | 516.1 | 222.8 | 13.4 | 339.3 | 155.8 | 0.4 | 126.1 | 29.3 | 5.1 |
| LOS | F | D | A | F | F | B | F | F | A | F | C | A |
| Approach Delay (s/veh) | | 33.4 | | | 288.9 | | | 145.9 | | | 53.4 | |
| Approach LOS | | C | | | F | | | F | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.06 | |
| Intersection Signal Delay (s/veh): 153.9 | Intersection LOS: F |
| Intersection Capacity Utilization 116.0% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

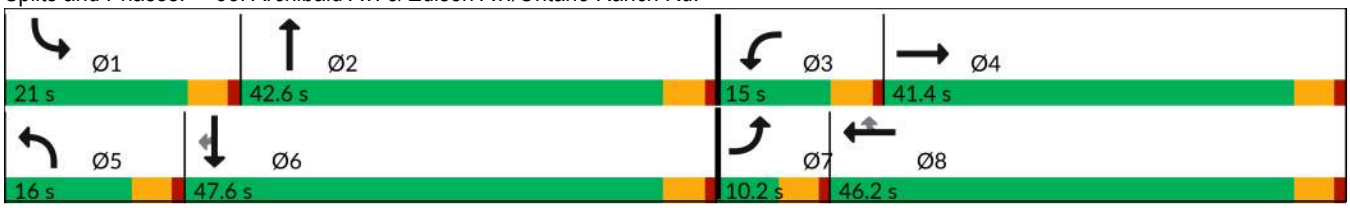

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 101 | 717 | 192 | 525 | 869 | 225 | 247 | 1344 | 420 | 233 | 433 | 134 |
| Future Volume (veh/h) | 101 | 717 | 192 | 525 | 869 | 225 | 247 | 1344 | 420 | 233 | 433 | 134 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 105 | 747 | 0 | 547 | 905 | 212 | 257 | 1400 | 0 | 243 | 451 | 117 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 144 | 1566 | | 268 | 648 | 549 | 160 | 1125 | | 231 | 1273 | 568 |
| Arrive On Green | 0.05 | 0.31 | 0.00 | 0.09 | 0.35 | 0.35 | 0.09 | 0.32 | 0.00 | 0.14 | 0.36 | 0.36 |
| Sat Flow, veh/h | 3092 | 5106 | 1585 | 3092 | 1870 | 1585 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 105 | 747 | 0 | 547 | 905 | 212 | 257 | 1400 | 0 | 243 | 451 | 117 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1585 | 1546 | 1870 | 1585 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 4.0 | 14.3 | 0.0 | 10.4 | 41.6 | 12.1 | 11.4 | 38.0 | 0.0 | 16.4 | 11.2 | 6.1 |
| Cycle Q Clear(g_c), s | 4.0 | 14.3 | 0.0 | 10.4 | 41.6 | 12.1 | 11.4 | 38.0 | 0.0 | 16.4 | 11.2 | 6.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 144 | 1566 | | 268 | 648 | 549 | 160 | 1125 | | 231 | 1273 | 568 |
| V/C Ratio(X) | 0.73 | 0.48 | | 2.04 | 1.40 | 0.39 | 1.60 | 1.24 | | 1.05 | 0.35 | 0.21 |
| Avail Cap(c_a), veh/h | 144 | 1566 | | 268 | 648 | 549 | 160 | 1125 | | 231 | 1273 | 568 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 56.4 | 33.8 | 0.0 | 54.8 | 39.2 | 29.6 | 54.3 | 41.0 | 0.0 | 51.8 | 28.3 | 26.7 |
| Incr Delay (d2), s/veh | 14.8 | 0.2 | 0.0 | 481.4 | 187.4 | 0.4 | 298.5 | 117.5 | 0.0 | 74.1 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 5.7 | 0.0 | 21.8 | 51.6 | 4.5 | 17.9 | 33.8 | 0.0 | 11.4 | 4.5 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 71.3 | 34.0 | 0.0 | 536.2 | 226.6 | 30.0 | 352.8 | 158.5 | 0.0 | 125.9 | 28.5 | 26.9 |
| LnGrp LOS | E | C | | F | F | C | F | F | | F | C | C |
| Approach Vol, veh/h | | 852 | | | 1664 | | | 1657 | | | 811 | |
| Approach Delay, s/veh | | 38.6 | | | 303.3 | | | 188.6 | | | 57.4 | |
| Approach LOS | | D | | | F | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.0 | 42.6 | 15.0 | 41.4 | 16.0 | 47.6 | 10.2 | 46.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 18.4 | 40.0 | 12.4 | 16.3 | 13.4 | 13.2 | 6.0 | 43.6 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 4.5 | 0.0 | 3.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 179.9 |
| HCM 7th LOS | F |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 241 | 243 | 145 | 240 | 483 | 283 | 1385 | 149 | 39 | 828 | 126 |
| Future Volume (vph) | 241 | 243 | 145 | 240 | 483 | 283 | 1385 | 149 | 39 | 828 | 126 |
| Turn Type | Prot | NA | Free | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.0 | 25.6 | 91.1 | 11.7 | 24.2 | 5.6 | 33.2 | 33.2 | 6.8 | 29.0 | 29.0 |
| Actuated g/C Ratio | 0.14 | 0.28 | 1.00 | 0.13 | 0.27 | 0.06 | 0.36 | 0.36 | 0.07 | 0.32 | 0.32 |
| v/c Ratio | 0.56 | 0.24 | 0.10 | 1.16 | 0.69 | 1.51 | 0.71 | 0.23 | 0.17 | 0.73 | 0.22 |
| Control Delay (s/veh) | 44.0 | 25.4 | 0.1 | 152.8 | 32.2 | 287.5 | 30.0 | 5.9 | 47.8 | 32.7 | 5.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.0 | 25.4 | 0.1 | 152.8 | 32.2 | 287.5 | 30.0 | 5.9 | 47.8 | 32.7 | 5.3 |
| LOS | D | C | A | F | C | F | C | A | D | C | A |
| Approach Delay (s/veh) | | 26.7 | | | 64.7 | | 68.2 | | | 29.8 | |
| Approach LOS | | C | | | E | | E | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 91.1 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.51 | |
| Intersection Signal Delay (s/veh): 52.6 | Intersection LOS: D |
| Intersection Capacity Utilization 74.2% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

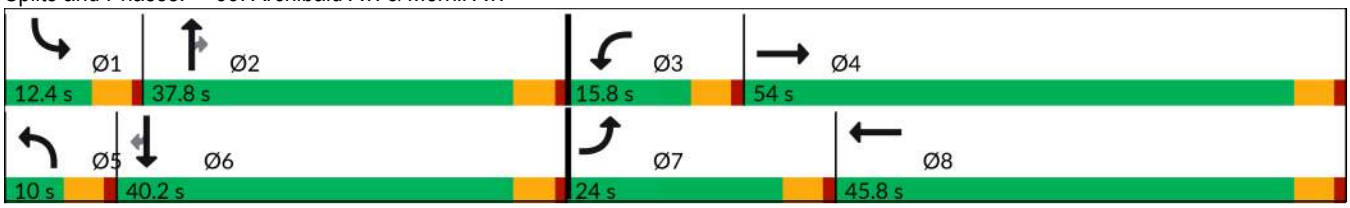

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 241 | 243 | 145 | 240 | 483 | 168 | 283 | 1385 | 149 | 39 | 828 | 126 |
| Future Volume (veh/h) | 241 | 243 | 145 | 240 | 483 | 168 | 283 | 1385 | 149 | 39 | 828 | 126 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 251 | 253 | 0 | 250 | 503 | 110 | 295 | 1443 | 123 | 41 | 862 | 82 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 354 | 725 | | 259 | 702 | 153 | 236 | 2027 | 573 | 123 | 1219 | 516 |
| Arrive On Green | 0.11 | 0.19 | 0.00 | 0.15 | 0.24 | 0.24 | 0.07 | 0.36 | 0.36 | 0.04 | 0.33 | 0.33 |
| Sat Flow, veh/h | 3188 | 3741 | 1585 | 1688 | 2968 | 645 | 3188 | 5611 | 1585 | 3188 | 3741 | 1584 |
| Grp Volume(v), veh/h | 251 | 253 | 0 | 250 | 316 | 297 | 295 | 1443 | 123 | 41 | 862 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1585 | 1688 | 1870 | 1743 | 1594 | 1870 | 1585 | 1594 | 1870 | 1584 |
| Q Serve(g_s), s | 5.5 | 4.3 | 0.0 | 10.7 | 11.3 | 11.4 | 5.4 | 16.1 | 3.9 | 0.9 | 14.7 | 2.7 |
| Cycle Q Clear(g_c), s | 5.5 | 4.3 | 0.0 | 10.7 | 11.3 | 11.4 | 5.4 | 16.1 | 3.9 | 0.9 | 14.7 | 2.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.37 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 354 | 725 | | 259 | 442 | 412 | 236 | 2027 | 573 | 123 | 1219 | 516 |
| V/C Ratio(X) | 0.71 | 0.35 | | 0.96 | 0.71 | 0.72 | 1.25 | 0.71 | 0.21 | 0.33 | 0.71 | 0.16 |
| Avail Cap(c_a), veh/h | 848 | 2535 | | 259 | 1057 | 985 | 236 | 2555 | 722 | 341 | 1827 | 773 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.3 | 25.4 | 0.0 | 30.6 | 25.6 | 25.6 | 33.7 | 20.0 | 16.1 | 34.1 | 21.5 | 17.5 |
| Incr Delay (d2), s/veh | 2.6 | 0.3 | 0.0 | 45.9 | 2.2 | 2.4 | 142.3 | 0.7 | 0.2 | 1.6 | 0.8 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 1.8 | 0.0 | 7.3 | 4.8 | 4.5 | 6.5 | 5.9 | 1.3 | 0.3 | 5.5 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 33.9 | 25.7 | 0.0 | 76.5 | 27.7 | 28.0 | 176.1 | 20.7 | 16.3 | 35.7 | 22.3 | 17.6 |
| LnGrp LOS | C | C | | E | C | C | F | C | B | D | C | B |
| Approach Vol, veh/h | | 504 | | | 863 | | | 1861 | | | 985 | |
| Approach Delay, s/veh | | 29.8 | | | 42.0 | | | 45.0 | | | 22.5 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.4 | 30.9 | 15.8 | 18.7 | 10.0 | 28.4 | 12.7 | 21.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 2.9 | 18.1 | 12.7 | 6.3 | 7.4 | 16.7 | 7.5 | 13.4 |
| Green Ext Time (p_c), s | 0.0 | 8.2 | 0.0 | 1.6 | 0.0 | 5.3 | 0.6 | 3.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 37.3 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 441 | 866 | 146 | 341 | 793 | 706 | 156 | 1253 | 294 | 561 | 851 | 321 |
| Future Volume (vph) | 441 | 866 | 146 | 341 | 793 | 706 | 156 | 1253 | 294 | 561 | 851 | 321 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.0 | 22.8 | 22.8 | 17.3 | 35.1 | 44.5 | 5.0 | 44.8 | 62.1 | 9.4 | 49.2 | 49.2 |
| Actuated g/C Ratio | 0.04 | 0.20 | 0.20 | 0.15 | 0.31 | 0.39 | 0.04 | 0.40 | 0.55 | 0.08 | 0.44 | 0.44 |
| v/c Ratio | 3.38 | 1.26 | 0.35 | 0.76 | 0.75 | 0.65 | 1.20 | 0.93 | 0.34 | 2.28 | 0.40 | 0.43 |
| Control Delay (s/veh) | Error | 166.1 | 10.7 | 56.5 | 39.7 | 25.4 | 187.3 | 45.4 | 10.5 | 613.5 | 22.8 | 14.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | Error | 166.1 | 10.7 | 56.5 | 39.7 | 25.4 | 187.3 | 45.4 | 10.5 | 613.5 | 22.8 | 14.0 |
| LOS | F | F | B | E | D | C | F | D | B | F | C | B |
| Approach Delay (s/veh) | | 435.8 | | | 37.3 | | | 52.4 | | | 212.4 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 112.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 3.38 | |
| Intersection Signal Delay (s/veh): 172.3 | Intersection LOS: F |
| Intersection Capacity Utilization 104.3% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

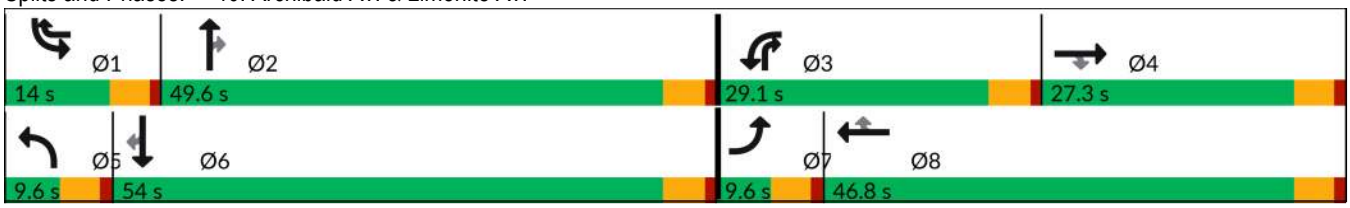

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 441 | 866 | 146 | 341 | 793 | 706 | 156 | 1253 | 294 | 561 | 851 | 321 |
| Future Volume (veh/h) | 441 | 866 | 146 | 341 | 793 | 706 | 156 | 1253 | 294 | 561 | 851 | 321 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 459 | 902 | 151 | 355 | 826 | 598 | 162 | 1305 | 191 | 584 | 886 | 327 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 142 | 747 | 333 | 418 | 1064 | 1076 | 142 | 1418 | 846 | 267 | 2244 | 697 |
| Arrive On Green | 0.05 | 0.21 | 0.21 | 0.14 | 0.30 | 0.30 | 0.05 | 0.40 | 0.40 | 0.09 | 0.44 | 0.44 |
| Sat Flow, veh/h | 3092 | 3554 | 1585 | 3092 | 3554 | 2787 | 3092 | 3554 | 1584 | 3092 | 5106 | 1585 |
| Grp Volume(v), veh/h | 459 | 902 | 151 | 355 | 826 | 598 | 162 | 1305 | 191 | 584 | 886 | 327 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1777 | 1585 | 1546 | 1777 | 1393 | 1546 | 1777 | 1584 | 1546 | 1702 | 1585 |
| Q Serve(g_s), s | 5.0 | 22.9 | 9.0 | 12.2 | 23.1 | 18.3 | 5.0 | 37.9 | 7.0 | 9.4 | 12.8 | 15.8 |
| Cycle Q Clear(g_c), s | 5.0 | 22.9 | 9.0 | 12.2 | 23.1 | 18.3 | 5.0 | 37.9 | 7.0 | 9.4 | 12.8 | 15.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 142 | 747 | 333 | 418 | 1064 | 1076 | 142 | 1418 | 846 | 267 | 2244 | 697 |
| V/C Ratio(X) | 3.23 | 1.21 | 0.45 | 0.85 | 0.78 | 0.56 | 1.14 | 0.92 | 0.23 | 2.19 | 0.39 | 0.47 |
| Avail Cap(c_a), veh/h | 142 | 747 | 333 | 696 | 1378 | 1322 | 142 | 1470 | 869 | 267 | 2319 | 720 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.9 | 43.0 | 37.5 | 46.0 | 34.8 | 26.1 | 51.9 | 31.0 | 13.4 | 49.7 | 20.7 | 21.5 |
| Incr Delay (d2), s/veh | 1021.6 | 105.4 | 1.0 | 2.3 | 2.1 | 0.5 | 118.1 | 9.5 | 0.1 | 545.9 | 0.1 | 0.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 22.0 | 20.6 | 3.5 | 4.7 | 9.8 | 5.8 | 4.2 | 16.5 | 2.3 | 23.7 | 4.6 | 5.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 1073.5 | 148.4 | 38.5 | 48.3 | 36.9 | 26.6 | 170.0 | 40.6 | 13.6 | 595.5 | 20.8 | 22.0 |
| LnGrp LOS | F | F | D | D | D | C | F | D | B | F | C | C |
| Approach Vol, veh/h | | 1512 | | | 1779 | | | 1658 | | | 1797 | |
| Approach Delay, s/veh | | 418.2 | | | 35.7 | | | 50.1 | | | 207.8 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 48.0 | 19.3 | 27.5 | 9.6 | 52.4 | 9.6 | 37.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 11.4 | 39.9 | 14.2 | 24.9 | 7.0 | 17.8 | 7.0 | 25.1 |
| Green Ext Time (p_c), s | 0.0 | 3.5 | 0.5 | 0.0 | 0.0 | 7.4 | 0.0 | 7.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 170.8 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 257 | 1121 | 10 | 31 | 1255 | 140 | 35 | 95 | 229 | 53 |
| Future Volume (vph) | 257 | 1121 | 10 | 31 | 1255 | 140 | 35 | 95 | 229 | 53 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.6 | 51.5 | 51.5 | 6.8 | 46.0 | 46.0 | 6.4 | 14.2 | 12.7 | 25.2 |
| Actuated g/C Ratio | 0.08 | 0.52 | 0.52 | 0.07 | 0.46 | 0.46 | 0.06 | 0.14 | 0.13 | 0.25 |
| v/c Ratio | 2.15 | 0.65 | 0.01 | 0.29 | 0.82 | 0.20 | 0.34 | 0.64 | 1.14 | 0.51 |
| Control Delay (s/veh) | 564.4 | 21.1 | 0.0 | 55.4 | 27.8 | 3.3 | 58.5 | 48.1 | 146.9 | 21.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 564.4 | 21.1 | 0.0 | 55.4 | 27.8 | 3.3 | 58.5 | 48.1 | 146.9 | 21.2 |
| LOS | F | C | A | E | C | A | E | D | F | C |
| Approach Delay (s/veh) | | 121.4 | | | 26.0 | | | 50.1 | | 82.6 |
| Approach LOS | | F | | | C | | | D | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 99.3 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.15 | |
| Intersection Signal Delay (s/veh): 73.1 | Intersection LOS: E |
| Intersection Capacity Utilization 91.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

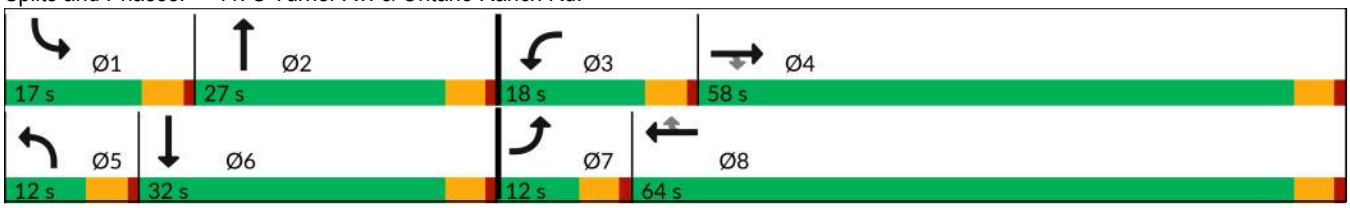

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 257 | 1121 | 10 | 31 | 1255 | 140 | 35 | 95 | 57 | 229 | 53 | 188 |
| Future Volume (veh/h) | 257 | 1121 | 10 | 31 | 1255 | 140 | 35 | 95 | 57 | 229 | 53 | 188 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 273 | 1193 | 9 | 33 | 1335 | 127 | 37 | 101 | 37 | 244 | 56 | 177 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 137 | 1837 | 762 | 52 | 1659 | 702 | 56 | 138 | 51 | 229 | 81 | 255 |
| Arrive On Green | 0.08 | 0.52 | 0.52 | 0.03 | 0.47 | 0.47 | 0.03 | 0.11 | 0.11 | 0.14 | 0.22 | 0.22 |
| Sat Flow, veh/h | 1688 | 3544 | 1469 | 1688 | 3544 | 1500 | 1688 | 1222 | 448 | 1688 | 375 | 1184 |
| Grp Volume(v), veh/h | 273 | 1193 | 9 | 33 | 1335 | 127 | 37 | 0 | 138 | 244 | 0 | 233 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1772 | 1469 | 1688 | 1772 | 1500 | 1688 | 0 | 1669 | 1688 | 0 | 1559 |
| Q Serve(g_s), s | 7.4 | 22.3 | 0.3 | 1.8 | 29.3 | 4.5 | 2.0 | 0.0 | 7.3 | 12.4 | 0.0 | 12.6 |
| Cycle Q Clear(g_c), s | 7.4 | 22.3 | 0.3 | 1.8 | 29.3 | 4.5 | 2.0 | 0.0 | 7.3 | 12.4 | 0.0 | 12.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 0.76 |
| Lane Grp Cap(c), veh/h | 137 | 1837 | 762 | 52 | 1659 | 702 | 56 | 0 | 189 | 229 | 0 | 336 |
| V/C Ratio(X) | 1.99 | 0.65 | 0.01 | 0.63 | 0.80 | 0.18 | 0.66 | 0.00 | 0.73 | 1.06 | 0.00 | 0.69 |
| Avail Cap(c_a), veh/h | 137 | 2074 | 860 | 248 | 2308 | 977 | 137 | 0 | 410 | 229 | 0 | 468 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.9 | 16.0 | 10.6 | 43.7 | 20.7 | 14.1 | 43.6 | 0.0 | 39.1 | 39.4 | 0.0 | 33.0 |
| Incr Delay (d2), s/veh | 472.4 | 0.6 | 0.0 | 4.6 | 1.5 | 0.1 | 4.8 | 0.0 | 5.4 | 77.3 | 0.0 | 2.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 20.9 | 7.9 | 0.1 | 0.8 | 11.0 | 1.4 | 0.9 | 0.0 | 3.1 | 9.8 | 0.0 | 4.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 514.3 | 16.6 | 10.7 | 48.2 | 22.2 | 14.2 | 48.4 | 0.0 | 44.5 | 116.7 | 0.0 | 35.6 |
| LnGrp LOS | F | B | B | D | C | B | D | | D | F | | D |
| Approach Vol, veh/h | | 1475 | | | 1495 | | | 175 | | | 477 | |
| Approach Delay, s/veh | | 108.6 | | | 22.1 | | | 45.3 | | | 77.1 | |
| Approach LOS | | F | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 14.9 | 7.4 | 51.9 | 7.6 | 24.3 | 12.0 | 47.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 9.3 | 3.8 | 24.3 | 4.0 | 14.6 | 9.4 | 31.3 |
| Green Ext Time (p_c), s | 0.0 | 0.5 | 0.0 | 9.4 | 0.0 | 1.0 | 0.0 | 11.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 65.7 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 269 | 1074 | 107 | 205 | 1207 | 517 | 74 | 384 | 125 | 393 | 299 | 89 |
| Future Volume (vph) | 269 | 1074 | 107 | 205 | 1207 | 517 | 74 | 384 | 125 | 393 | 299 | 89 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.1 | 30.0 | 30.0 | 10.9 | 28.9 | 28.9 | 6.1 | 28.4 | 28.4 | 16.2 | 38.6 | 38.6 |
| Actuated g/C Ratio | 0.12 | 0.29 | 0.29 | 0.10 | 0.28 | 0.28 | 0.06 | 0.27 | 0.27 | 0.16 | 0.37 | 0.37 |
| v/c Ratio | 1.47 | 0.78 | 0.21 | 0.68 | 0.72 | 0.81 | 0.81 | 0.81 | 0.25 | 1.60 | 0.46 | 0.15 |
| Control Delay (s/veh) | 273.8 | 39.9 | 4.2 | 57.5 | 37.6 | 23.4 | 103.5 | 47.9 | 5.3 | 320.2 | 27.0 | 4.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 273.8 | 39.9 | 4.2 | 57.5 | 37.6 | 23.4 | 103.5 | 47.9 | 5.3 | 320.2 | 27.0 | 4.4 |
| LOS | F | D | A | E | D | C | F | D | A | F | C | A |
| Approach Delay (s/veh) | | 80.6 | | | 35.9 | | | 45.9 | | | 171.9 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 104.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.60 | |
| Intersection Signal Delay (s/veh): 73.2 | Intersection LOS: E |
| Intersection Capacity Utilization 92.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 269 | 1074 | 107 | 205 | 1207 | 517 | 74 | 384 | 125 | 393 | 299 | 89 |
| Future Volume (veh/h) | 269 | 1074 | 107 | 205 | 1207 | 517 | 74 | 384 | 125 | 393 | 299 | 89 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 286 | 1143 | 70 | 218 | 1284 | 433 | 79 | 409 | 64 | 418 | 318 | 80 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 198 | 1630 | 499 | 277 | 1876 | 460 | 99 | 475 | 402 | 266 | 659 | 559 |
| Arrive On Green | 0.12 | 0.32 | 0.32 | 0.09 | 0.29 | 0.29 | 0.06 | 0.25 | 0.25 | 0.16 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1688 | 5106 | 1563 | 3092 | 6434 | 1577 | 1688 | 1870 | 1583 | 1688 | 1870 | 1585 |
| Grp Volume(v), veh/h | 286 | 1143 | 70 | 218 | 1284 | 433 | 79 | 409 | 64 | 418 | 318 | 80 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1702 | 1563 | 1546 | 1609 | 1577 | 1688 | 1870 | 1583 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 12.0 | 20.1 | 3.3 | 7.1 | 18.1 | 27.4 | 4.7 | 21.4 | 3.2 | 16.1 | 13.6 | 3.5 |
| Cycle Q Clear(g_c), s | 12.0 | 20.1 | 3.3 | 7.1 | 18.1 | 27.4 | 4.7 | 21.4 | 3.2 | 16.1 | 13.6 | 3.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 198 | 1630 | 499 | 277 | 1876 | 460 | 99 | 475 | 402 | 266 | 659 | 559 |
| V/C Ratio(X) | 1.44 | 0.70 | 0.14 | 0.79 | 0.68 | 0.94 | 0.80 | 0.86 | 0.16 | 1.57 | 0.48 | 0.14 |
| Avail Cap(c_a), veh/h | 198 | 1630 | 499 | 387 | 1881 | 461 | 99 | 797 | 675 | 266 | 982 | 832 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 45.1 | 30.5 | 24.8 | 45.6 | 32.1 | 35.4 | 47.5 | 36.4 | 29.7 | 43.1 | 25.8 | 22.6 |
| Incr Delay (d2), s/veh | 226.1 | 1.4 | 0.1 | 4.5 | 1.0 | 27.8 | 33.1 | 5.2 | 0.2 | 275.4 | 0.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 17.2 | 7.8 | 1.1 | 2.7 | 6.6 | 13.2 | 2.8 | 9.9 | 1.2 | 26.7 | 5.8 | 1.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 271.2 | 31.9 | 24.9 | 50.1 | 33.1 | 63.2 | 80.6 | 41.6 | 29.9 | 318.5 | 26.4 | 22.7 |
| LnGrp LOS | F | C | C | D | C | E | F | D | C | F | C | C |
| Approach Vol, veh/h | | 1499 | | | 1935 | | | 552 | | | 816 | |
| Approach Delay, s/veh | | 77.2 | | | 41.7 | | | 45.8 | | | 175.7 | |
| Approach LOS | | E | | | D | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.7 | 30.6 | 13.8 | 37.2 | 10.6 | 40.7 | 16.6 | 34.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 18.1 | 23.4 | 9.1 | 22.1 | 6.7 | 15.6 | 14.0 | 29.4 |
| Green Ext Time (p_c), s | 0.0 | 2.4 | 0.1 | 3.9 | 0.0 | 2.0 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 76.0 |
| HCM 7th LOS | E |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 300 | 1198 | 279 | 199 | 1200 | 202 | 467 | 689 | 484 | 144 | 296 | 189 |
| Future Volume (vph) | 300 | 1198 | 279 | 199 | 1200 | 202 | 467 | 689 | 484 | 144 | 296 | 189 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.2 | 41.4 | 41.4 | 8.5 | 42.7 | 42.7 | 7.5 | 34.1 | 34.1 | 6.5 | 33.1 | 33.1 |
| Actuated g/C Ratio | 0.07 | 0.38 | 0.38 | 0.08 | 0.39 | 0.39 | 0.07 | 0.31 | 0.31 | 0.06 | 0.30 | 0.30 |
| v/c Ratio | 1.55 | 0.65 | 0.37 | 0.86 | 0.90 | 0.29 | 2.30 | 0.45 | 0.86 | 0.82 | 0.29 | 0.34 |
| Control Delay (s/veh) | 304.2 | 30.6 | 4.5 | 84.0 | 42.6 | 7.5 | 625.3 | 30.7 | 40.2 | 86.5 | 29.5 | 10.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 304.2 | 30.6 | 4.5 | 84.0 | 42.6 | 7.5 | 625.3 | 30.7 | 40.2 | 86.5 | 29.5 | 10.5 |
| LOS | F | C | A | F | D | A | F | C | D | F | C | B |
| Approach Delay (s/veh) | | 72.7 | | | 43.3 | | | 202.7 | | | 36.8 | |
| Approach LOS | | E | | | D | | | F | | | D | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 109.2
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.30
Intersection Signal Delay (s/veh): 98.1 — Intersection LOS: F
Intersection Capacity Utilization 81.1% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

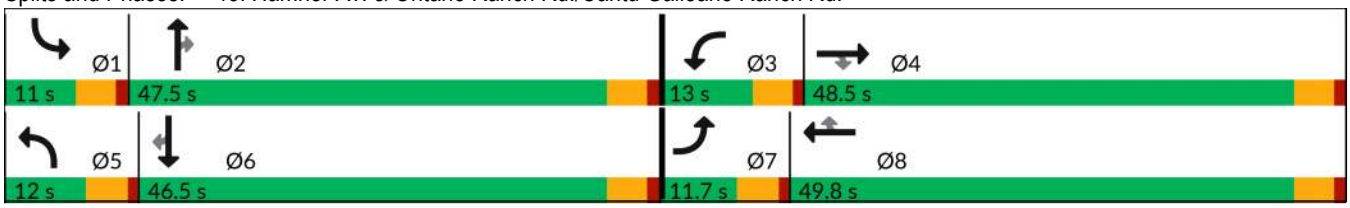

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 300 | 1198 | 279 | 199 | 1200 | 202 | 467 | 689 | 484 | 144 | 296 | 189 |
| Future Volume (veh/h) | 300 | 1198 | 279 | 199 | 1200 | 202 | 467 | 689 | 484 | 144 | 296 | 189 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 312 | 1248 | 237 | 207 | 1250 | 199 | 486 | 718 | 271 | 150 | 308 | 185 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 236 | 2066 | 641 | 268 | 1475 | 658 | 246 | 1244 | 385 | 209 | 823 | 367 |
| Arrive On Green | 0.08 | 0.40 | 0.40 | 0.09 | 0.42 | 0.42 | 0.08 | 0.24 | 0.24 | 0.07 | 0.23 | 0.23 |
| Sat Flow, veh/h | 3092 | 5106 | 1585 | 3092 | 3554 | 1585 | 3092 | 5106 | 1581 | 3092 | 3554 | 1585 |
| Grp Volume(v), veh/h | 312 | 1248 | 237 | 207 | 1250 | 199 | 486 | 718 | 271 | 150 | 308 | 185 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1585 | 1546 | 1777 | 1585 | 1546 | 1702 | 1581 | 1546 | 1777 | 1585 |
| Q Serve(g_s), s | 7.1 | 17.9 | 9.7 | 6.1 | 29.6 | 7.8 | 7.4 | 11.5 | 14.6 | 4.4 | 6.8 | 9.5 |
| Cycle Q Clear(g_c), s | 7.1 | 17.9 | 9.7 | 6.1 | 29.6 | 7.8 | 7.4 | 11.5 | 14.6 | 4.4 | 6.8 | 9.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 236 | 2066 | 641 | 268 | 1475 | 658 | 246 | 1244 | 385 | 209 | 823 | 367 |
| V/C Ratio(X) | 1.32 | 0.60 | 0.37 | 0.77 | 0.85 | 0.30 | 1.98 | 0.58 | 0.70 | 0.72 | 0.37 | 0.50 |
| Avail Cap(c_a), veh/h | 236 | 2407 | 747 | 279 | 1725 | 769 | 246 | 2352 | 728 | 212 | 1599 | 713 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.0 | 21.9 | 19.4 | 41.6 | 24.6 | 18.2 | 42.9 | 31.0 | 32.2 | 42.5 | 30.1 | 31.1 |
| Incr Delay (d2), s/veh | 172.1 | 0.3 | 0.4 | 10.8 | 3.7 | 0.3 | 454.5 | 0.4 | 2.4 | 9.4 | 0.3 | 1.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.2 | 6.3 | 0.1 | 2.6 | 11.5 | 2.6 | 18.2 | 4.4 | 5.3 | 1.9 | 2.7 | 3.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 215.1 | 22.2 | 19.8 | 52.4 | 28.2 | 18.5 | 497.4 | 31.4 | 34.5 | 51.9 | 30.4 | 32.2 |
| LnGrp LOS | F | C | B | D | C | B | F | C | C | D | C | C |
| Approach Vol, veh/h | | 1797 | | | 1656 | | | 1475 | | | 643 | |
| Approach Delay, s/veh | | 55.4 | | | 30.1 | | | 185.5 | | | 35.9 | |
| Approach LOS | | E | | | C | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.9 | 27.3 | 12.7 | 42.3 | 12.0 | 26.2 | 11.7 | 43.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 6.4 | 16.6 | 8.1 | 19.9 | 9.4 | 11.5 | 9.1 | 31.6 |
| Green Ext Time (p_c), s | 0.0 | 5.7 | 0.0 | 9.4 | 0.0 | 2.4 | 0.0 | 7.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 80.1 |
| HCM 7th LOS | F |

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1416 | 613 | 143 | 270 | 0 | 1387 |
| Future Volume (vph) | 1416 | 613 | 143 | 270 | 0 | 1387 |
| Turn Type | NA | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | 6 | | | 4 | |
| Permitted Phases | | | Free | 4 | | 4 |
| Detector Phase | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 46.1 | 46.1 | 120.0 | 62.8 | 62.8 | 62.8 |
| Actuated g/C Ratio | 0.38 | 0.38 | 1.00 | 0.52 | 0.52 | 0.52 |
| v/c Ratio | 0.70 | 0.45 | 0.05 | 0.29 | 0.85 | 0.86 |
| Control Delay (s/veh) | 34.3 | 44.1 | 0.0 | 16.2 | 31.5 | 32.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.3 | 44.1 | 0.0 | 16.2 | 31.5 | 32.1 |
| LOS | C | D | A | B | C | C |
| Approach Delay (s/veh) | 34.3 | 35.8 | | | 29.5 | |
| Approach LOS | C | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 37.5 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 65 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 32.5 | Intersection LOS: C |
| Intersection Capacity Utilization 83.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

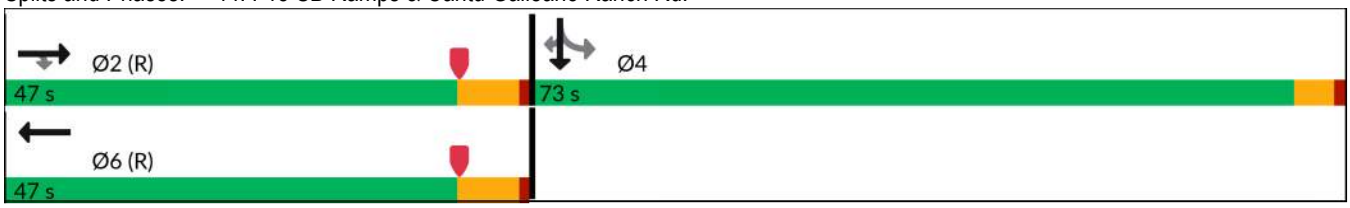

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1416 | 0 | 0 | 613 | 143 | 0 | 0 | 0 | 270 | 0 | 1387 |
| Future Volume (veh/h) | 0 | 1416 | 0 | 0 | 613 | 143 | 0 | 0 | 0 | 270 | 0 | 1387 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 0 | 1870 | 1870 | | | | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 1491 | 0 | 0 | 645 | 0 | | | | 189 | 0 | 1316 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2519 | | 0 | 1679 | | | | | 774 | 0 | 1454 |
| Arrive On Green | 0.00 | 0.45 | 0.00 | 0.00 | 0.90 | 0.00 | | | | 0.46 | 0.00 | 0.46 |
| Sat Flow, veh/h | 0 | 5611 | 1585 | 0 | 3741 | 2790 | | | | 1688 | 0 | 3170 |
| Grp Volume(v), veh/h | 0 | 1491 | 0 | 0 | 645 | 0 | | | | 189 | 0 | 1316 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 0 | 1870 | 1395 | | | | 1688 | 0 | 1585 |
| Q Serve(g_s), s | 0.0 | 23.9 | 0.0 | 0.0 | 3.2 | 0.0 | | | | 8.2 | 0.0 | 46.1 |
| Cycle Q Clear(g_c), s | 0.0 | 23.9 | 0.0 | 0.0 | 3.2 | 0.0 | | | | 8.2 | 0.0 | 46.1 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2519 | | 0 | 1679 | | | | | 774 | 0 | 1454 |
| V/C Ratio(X) | 0.00 | 0.59 | | 0.00 | 0.38 | | | | | 0.24 | 0.00 | 0.91 |
| Avail Cap(c_a), veh/h | 0 | 2519 | | 0 | 1679 | | | | | 962 | 0 | 1807 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.63 | 0.00 | 0.00 | 0.79 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 24.8 | 0.0 | 0.0 | 3.5 | 0.0 | | | | 19.8 | 0.0 | 30.1 |
| Incr Delay (d2), s/veh | 0.0 | 0.7 | 0.0 | 0.0 | 0.5 | 0.0 | | | | 0.2 | 0.0 | 6.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 9.9 | 0.0 | 0.0 | 1.0 | 0.0 | | | | 3.1 | 0.0 | 17.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 25.5 | 0.0 | 0.0 | 4.1 | 0.0 | | | | 20.0 | 0.0 | 36.0 |
| LnGrp LOS | | C | | | A | | | | | B | | D |
| Approach Vol, veh/h | | 1491 | | | 645 | | | | | | 1505 | |
| Approach Delay, s/veh | | 25.5 | | | 4.1 | | | | | | 34.0 | |
| Approach LOS | | C | | | A | | | | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 60.4 | 59.6 | 60.4 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 25.9 | 48.1 | 5.2 |
| Green Ext Time (p_c), s | 8.0 | 6.9 | 4.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.2 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 541 | 1004 | 266 | 336 | 504 | 329 |
| Future Volume (vph) | 541 | 1004 | 266 | 336 | 504 | 329 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 65.8 | 65.8 | 14.3 | 84.7 | 24.2 | 24.2 |
| Actuated g/C Ratio | 0.55 | 0.55 | 0.12 | 0.71 | 0.20 | 0.20 |
| v/c Ratio | 0.18 | 0.88 | 0.73 | 0.09 | 0.87 | 0.50 |
| Control Delay (s/veh) | 7.1 | 35.0 | 62.6 | 5.6 | 60.1 | 8.5 |
| Queue Delay | 0.0 | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.1 | 36.6 | 62.6 | 5.6 | 60.1 | 8.5 |
| LOS | A | D | E | A | E | A |
| Approach Delay (s/veh) | 26.2 | | | 30.8 | 44.0 | |
| Approach LOS | C | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 44.8 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 95 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay (s/veh): 32.1 | Intersection LOS: C |
| Intersection Capacity Utilization 79.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

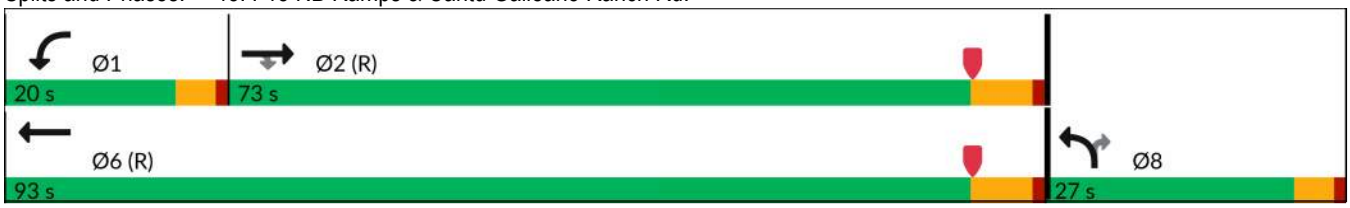

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 541 | 1004 | 266 | 336 | 504 | 329 |
| Future Volume (veh/h) | 541 | 1004 | 266 | 336 | 504 | 329 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1673 | 1870 | 1772 | 1870 |
| Adj Flow Rate, veh/h | 558 | 835 | 274 | 346 | 520 | 251 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3306 | 934 | 329 | 4101 | 596 | 280 |
| Arrive On Green | 0.98 | 0.98 | 0.10 | 0.73 | 0.18 | 0.18 |
| Sat Flow, veh/h | 5611 | 1585 | 3188 | 5611 | 3375 | 1585 |
| Grp Volume(v), veh/h | 558 | 835 | 274 | 346 | 520 | 251 |
| Grp Sat Flow(s),veh/h/ln | 1870 | 1585 | 1594 | 1870 | 1688 | 1585 |
| Q Serve(g_s), s | 0.2 | 8.5 | 10.1 | 2.1 | 18.0 | 18.6 |
| Cycle Q Clear(g_c), s | 0.2 | 8.5 | 10.1 | 2.1 | 18.0 | 18.6 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3306 | 934 | 329 | 4101 | 596 | 280 |
| V/C Ratio(X) | 0.17 | 0.89 | 0.83 | 0.08 | 0.87 | 0.90 |
| Avail Cap(c_a), veh/h | 3306 | 934 | 409 | 4101 | 630 | 296 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.73 | 0.73 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.4 | 0.5 | 52.8 | 4.6 | 48.1 | 48.3 |
| Incr Delay (d2), s/veh | 0.1 | 9.8 | 11.3 | 0.0 | 12.3 | 26.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.1 | 2.9 | 4.4 | 0.6 | 8.3 | 9.2 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.5 | 10.3 | 64.1 | 4.7 | 60.4 | 75.2 |
| LnGrp LOS | A | B | E | A | E | E |
| Approach Vol, veh/h | 1393 | | | 620 | 771 | |
| Approach Delay, s/veh | 6.4 | | | 30.9 | 65.2 | |
| Approach LOS | A | | | C | E | |

| Timer - Assigned Phs | 1 | 2 | | | 6 | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 77.2 | | | 94.2 | 25.8 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 12.1 | 10.5 | | | 4.1 | 20.6 |
| Green Ext Time (p_c), s | 0.3 | 8.4 | | | 2.1 | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.1 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 396 | 3 | 423 | 244 | 1257 | 1577 | 584 |
| Future Volume (vph) | 396 | 3 | 423 | 244 | 1257 | 1577 | 584 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 24.0 | 61.0 | 37.0 | 37.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 26.7% | 67.8% | 41.1% | 41.1% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 21.0 | 21.0 | 21.0 | 17.2 | 56.0 | 33.7 | 33.7 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.19 | 0.62 | 0.37 | 0.37 |
| v/c Ratio | 0.82 | 0.74 | 0.66 | 0.82 | 0.61 | 1.27 | 0.72 |
| Control Delay (s/veh) | 51.4 | 38.0 | 28.0 | 46.9 | 2.0 | 154.9 | 11.7 |
| Queue Delay | 59.1 | 58.9 | 0.0 | 0.0 | 1.3 | 0.1 | 0.0 |
| Total Delay (s/veh) | 110.4 | 96.9 | 28.0 | 46.9 | 3.2 | 155.0 | 11.7 |
| LOS | F | F | C | D | A | F | B |
| Approach Delay (s/veh) | | 79.6 | | | 10.3 | 116.3 | |
| Approach LOS | | E | | | B | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.27 | |
| Intersection Signal Delay (s/veh): 74.1 | Intersection LOS: E |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

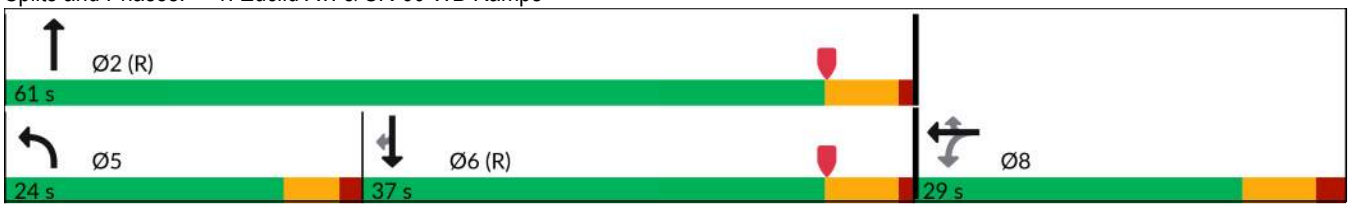

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 396 | 3 | 423 | 244 | 1257 | 0 | 0 | 1577 | 584 |
| Future Volume (veh/h) | 0 | 0 | 0 | 396 | 3 | 423 | 244 | 1257 | 0 | 0 | 1577 | 584 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 504 | 0 | 177 | 260 | 1337 | 0 | 0 | 1678 | 382 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 641 | 0 | 300 | 297 | 2366 | 0 | 0 | 1535 | 680 |
| Arrive On Green | | | | 0.19 | 0.00 | 0.19 | 0.12 | 0.45 | 0.00 | 0.00 | 0.43 | 0.43 |
| Sat Flow, veh/h | | | | 3375 | 0 | 1580 | 1688 | 3647 | 0 | 0 | 3647 | 1574 |
| Grp Volume(v), veh/h | | | | 504 | 0 | 177 | 260 | 1337 | 0 | 0 | 1678 | 382 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1580 | 1688 | 1777 | 0 | 0 | 1777 | 1574 |
| Q Serve(g_s), s | | | | 12.8 | 0.0 | 9.2 | 13.6 | 25.1 | 0.0 | 0.0 | 38.9 | 16.4 |
| Cycle Q Clear(g_c), s | | | | 12.8 | 0.0 | 9.2 | 13.6 | 25.1 | 0.0 | 0.0 | 38.9 | 16.4 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 641 | 0 | 300 | 297 | 2366 | 0 | 0 | 1535 | 680 |
| V/C Ratio(X) | | | | 0.79 | 0.00 | 0.59 | 0.88 | 0.57 | 0.00 | 0.00 | 1.09 | 0.56 |
| Avail Cap(c_a), veh/h | | | | 825 | 0 | 386 | 353 | 2366 | 0 | 0 | 1535 | 680 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 34.7 | 0.0 | 33.3 | 38.7 | 15.3 | 0.0 | 0.0 | 25.6 | 19.2 |
| Incr Delay (d2), s/veh | | | | 4.6 | 0.0 | 2.6 | 2.2 | 0.1 | 0.0 | 0.0 | 52.8 | 3.3 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.6 | 0.0 | 3.7 | 5.9 | 10.3 | 0.0 | 0.0 | 25.7 | 6.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 39.3 | 0.0 | 35.9 | 40.9 | 15.4 | 0.0 | 0.0 | 78.4 | 22.5 |
| LnGrp LOS | | | | D | | D | D | B | | | F | C |
| Approach Vol, veh/h | | | | | 681 | | | 1597 | | | 2060 | |
| Approach Delay, s/veh | | | | | 38.4 | | | 19.5 | | | 68.0 | |
| Approach LOS | | | | | D | | | B | | | E | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 65.9 | | 21.0 | 44.9 | | 24.1 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 18.8 | 31.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 27.1 | | 15.6 | 40.9 | | 14.8 |
| Green Ext Time (p_c), s | 14.8 | | 0.2 | 0.0 | | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 45.5 |
| HCM 7th LOS | D |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 301 | 2 | 215 | 1156 | 417 | 467 | 1410 |
| Future Volume (vph) | 301 | 2 | 215 | 1156 | 417 | 467 | 1410 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 9.6 | 9.6 | 29.0 | 29.0 | 14.7 | 27.0 |
| Total Split (s) | 25.0 | 25.0 | 25.0 | 33.0 | 33.0 | 32.0 | 65.0 |
| Total Split (%) | 27.8% | 27.8% | 27.8% | 36.7% | 36.7% | 35.6% | 72.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | | 4.6 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 19.0 | 0.0 | 19.0 | 28.6 | 28.6 | 27.0 | 60.4 |
| Actuated g/C Ratio | 0.21 | 0.00 | 0.21 | 0.32 | 0.32 | 0.30 | 0.67 |
| v/c Ratio | 0.86 | no cap | 0.54 | 1.04 | 0.54 | 0.94 | 0.60 |
| Control Delay (s/veh) | 57.9 | | 22.7 | 69.6 | 5.5 | 26.6 | 20.5 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 22.6 |
| Total Delay (s/veh) | 57.9 | Error | 22.7 | 69.6 | 5.5 | 26.6 | 43.1 |
| LOS | E | F | C | E | A | C | D |
| Approach Delay (s/veh) | | Error | | 52.6 | | | 39.0 |
| Approach LOS | | F | | D | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

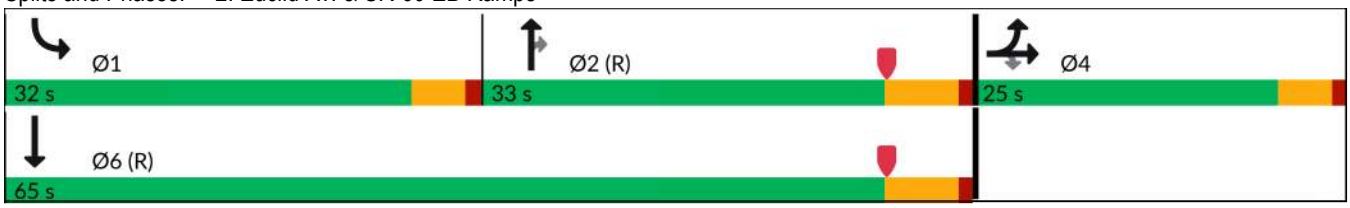

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 301 | 2 | 215 | 0 | 0 | 0 | 0 | 1156 | 417 | 467 | 1410 | 0 |
| Future Volume (veh/h) | 301 | 2 | 215 | 0 | 0 | 0 | 0 | 1156 | 417 | 467 | 1410 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 304 | 2 | 158 | | | | 0 | 1168 | 306 | 472 | 1424 | 0 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 342 | 0 | 320 | | | | 0 | 1197 | 532 | 491 | 2416 | 0 |
| Arrive On Green | 0.20 | 0.20 | 0.20 | | | | 0.00 | 0.34 | 0.34 | 0.58 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1688 | 0 | 1583 | | | | 0 | 3647 | 1578 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 304 | 0 | 158 | | | | 0 | 1168 | 306 | 472 | 1424 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1583 | | | | 0 | 1777 | 1578 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 15.8 | 0.0 | 8.0 | | | | 0.0 | 29.2 | 14.4 | 23.9 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 15.8 | 0.0 | 8.0 | | | | 0.0 | 29.2 | 14.4 | 23.9 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 342 | 0 | 320 | | | | 0 | 1197 | 532 | 491 | 2416 | 0 |
| V/C Ratio(X) | 0.89 | 0.00 | 0.49 | | | | 0.00 | 0.98 | 0.58 | 0.96 | 0.59 | 0.00 |
| Avail Cap(c_a), veh/h | 383 | 0 | 359 | | | | 0 | 1197 | 532 | 512 | 2416 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.78 | 0.78 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 34.9 | 0.0 | 31.8 | | | | 0.0 | 29.5 | 24.6 | 18.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 20.4 | 0.0 | 1.2 | | | | 0.0 | 17.9 | 3.5 | 5.5 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.3 | 0.0 | 3.1 | | | | 0.0 | 14.3 | 5.5 | 5.5 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 55.4 | 0.0 | 33.0 | | | | 0.0 | 47.4 | 28.1 | 23.9 | 0.1 | 0.0 |
| LnGrp LOS | E | | C | | | | | D | C | C | A | |
| Approach Vol, veh/h | | 462 | | | | | | 1474 | | | 1896 | |
| Approach Delay, s/veh | | 47.7 | | | | | | 43.4 | | | 6.0 | |
| Approach LOS | | D | | | | | | D | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 30.9 | 36.3 | | 22.8 | | 67.2 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 4.6 | | 6.0 |
| Max Green Setting (Gmax), s | 27.3 | 27.0 | | 20.4 | | 59.0 |
| Max Q Clear Time (g_c+I1), s | 25.9 | 31.2 | | 17.8 | | 2.0 |
| Green Ext Time (p_c), s | 0.3 | 0.0 | | 0.4 | | 22.4 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 25.4 |
| HCM 7th LOS | | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 131 | 399 | 132 | 494 | 186 | 1018 | 230 | 1302 |
| Future Volume (vph) | 131 | 399 | 132 | 494 | 186 | 1018 | 230 | 1302 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 49.0 | 49.0 | 36.0 | 85.0 |
| Total Split (%) | 29.2% | 29.2% | 29.2% | 29.2% | 40.8% | 40.8% | 30.0% | 70.8% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 29.2 | 29.2 | 29.2 | 29.2 | 43.2 | 43.2 | 12.2 | 60.0 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.29 | 0.29 | 0.43 | 0.43 | 0.12 | 0.60 |
| v/c Ratio | 1.19 | 0.80 | 1.70 | 0.69 | 1.59 | 0.51 | 0.65 | 0.50 |
| Control Delay (s/veh) | 182.1 | 37.9 | 391.0 | 34.5 | 325.4 | 22.3 | 50.7 | 12.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 182.1 | 37.9 | 391.0 | 34.5 | 325.4 | 22.3 | 50.7 | 12.1 |
| LOS | F | D | F | C | F | C | D | B |
| Approach Delay (s/veh) | | 58.9 | | 93.7 | | 67.3 | | 17.5 |
| Approach LOS | | E | | F | | E | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 100.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.70 | |
| Intersection Signal Delay (s/veh): 52.2 | Intersection LOS: D |
| Intersection Capacity Utilization 89.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

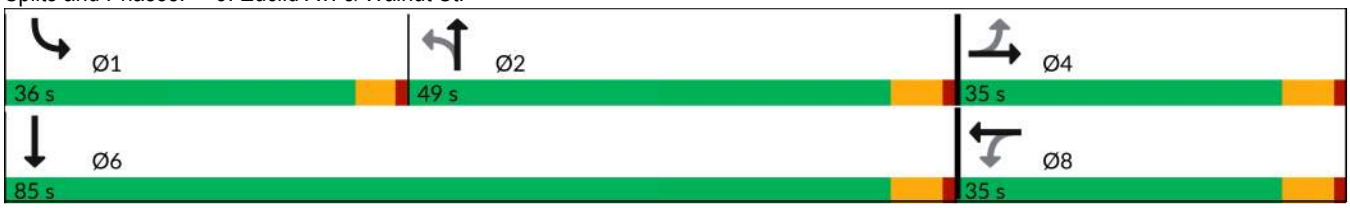

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 399 | 366 | 132 | 494 | 171 | 186 | 1018 | 51 | 230 | 1302 | 141 |
| Future Volume (veh/h) | 131 | 399 | 366 | 132 | 494 | 171 | 186 | 1018 | 51 | 230 | 1302 | 141 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 136 | 416 | 375 | 138 | 515 | 148 | 194 | 1060 | 32 | 240 | 1356 | 117 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 169 | 527 | 469 | 124 | 805 | 230 | 217 | 2234 | 67 | 309 | 2802 | 242 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.44 | 0.44 | 0.44 | 0.10 | 0.59 | 0.59 |
| Sat Flow, veh/h | 731 | 1777 | 1580 | 649 | 2712 | 775 | 340 | 5091 | 154 | 3092 | 4786 | 413 |
| Grp Volume(v), veh/h | 136 | 416 | 375 | 138 | 336 | 327 | 194 | 709 | 383 | 240 | 964 | 509 |
| Grp Sat Flow(s),veh/h/ln | 731 | 1777 | 1580 | 649 | 1777 | 1711 | 340 | 1702 | 1840 | 1546 | 1702 | 1795 |
| Q Serve(g_s), s | 12.9 | 21.2 | 21.5 | 7.7 | 16.2 | 16.3 | 41.5 | 14.5 | 14.5 | 7.5 | 16.1 | 16.1 |
| Cycle Q Clear(g_c), s | 29.2 | 21.2 | 21.5 | 29.2 | 16.2 | 16.3 | 43.2 | 14.5 | 14.5 | 7.5 | 16.1 | 16.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.45 | 1.00 | | 0.08 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 169 | 527 | 469 | 124 | 527 | 507 | 217 | 1494 | 808 | 309 | 1993 | 1051 |
| V/C Ratio(X) | 0.81 | 0.79 | 0.80 | 1.12 | 0.64 | 0.64 | 0.90 | 0.47 | 0.47 | 0.78 | 0.48 | 0.48 |
| Avail Cap(c_a), veh/h | 169 | 527 | 469 | 124 | 527 | 507 | 217 | 1494 | 808 | 986 | 2739 | 1445 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.7 | 31.8 | 31.9 | 47.6 | 30.0 | 30.1 | 33.9 | 19.6 | 19.6 | 43.2 | 11.8 | 11.8 |
| Incr Delay (d2), s/veh | 24.2 | 7.9 | 9.5 | 115.4 | 2.6 | 2.8 | 34.5 | 0.2 | 0.4 | 1.6 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.4 | 9.7 | 8.9 | 6.9 | 6.9 | 6.7 | 6.7 | 5.3 | 5.8 | 2.8 | 5.3 | 5.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 68.9 | 39.7 | 41.4 | 163.1 | 32.6 | 32.9 | 68.3 | 19.8 | 20.0 | 44.8 | 12.0 | 12.1 |
| LnGrp LOS | E | D | D | F | C | C | E | B | C | D | B | B |
| Approach Vol, veh/h | | 927 | | | 801 | | | 1286 | | | 1713 | |
| Approach Delay, s/veh | | 44.7 | | | 55.2 | | | 27.2 | | | 16.6 | |
| Approach LOS | | D | | | E | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 49.0 | | 35.0 | | 63.4 | | 35.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.4 | 43.2 | | 29.2 | | 79.2 | | 29.2 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 45.2 | | 31.2 | | 18.1 | | 31.2 |
| Green Ext Time (p_c), s | 0.4 | 0.0 | | 0.0 | | 13.4 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 31.5 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 833 | 200 | 728 | 324 | 984 | 445 | 132 | 1318 | 408 |
| Future Volume (vph) | 138 | 833 | 200 | 728 | 324 | 984 | 445 | 132 | 1318 | 408 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 20.8 | 43.0 | 21.0 | 43.2 | 15.2 | 40.0 | 40.0 | 16.0 | 40.8 | 40.8 |
| Total Split (%) | 17.3% | 35.8% | 17.5% | 36.0% | 12.7% | 33.3% | 33.3% | 13.3% | 34.0% | 34.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.1 | 36.0 | 15.8 | 37.7 | 10.0 | 34.0 | 34.0 | 10.8 | 34.8 | 34.8 |
| Actuated g/C Ratio | 0.12 | 0.30 | 0.13 | 0.32 | 0.08 | 0.28 | 0.28 | 0.09 | 0.29 | 0.29 |
| v/c Ratio | 0.71 | 1.78 | 0.91 | 0.72 | 2.34 | 0.99 | 0.83 | 0.88 | 1.29 | 0.63 |
| Control Delay (s/veh) | 70.1 | 385.2 | 93.6 | 40.4 | 650.5 | 68.4 | 43.2 | 101.7 | 174.4 | 17.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 70.1 | 385.2 | 93.6 | 40.4 | 650.5 | 68.4 | 43.2 | 101.7 | 174.4 | 17.0 |
| LOS | E | F | F | D | F | E | D | F | F | B |
| Approach Delay (s/veh) | | 346.2 | | 51.2 | | 169.6 | | | 134.7 | |
| Approach LOS | | F | | D | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.34 | |
| Intersection Signal Delay (s/veh): 172.2 | Intersection LOS: F |
| Intersection Capacity Utilization 138.6% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

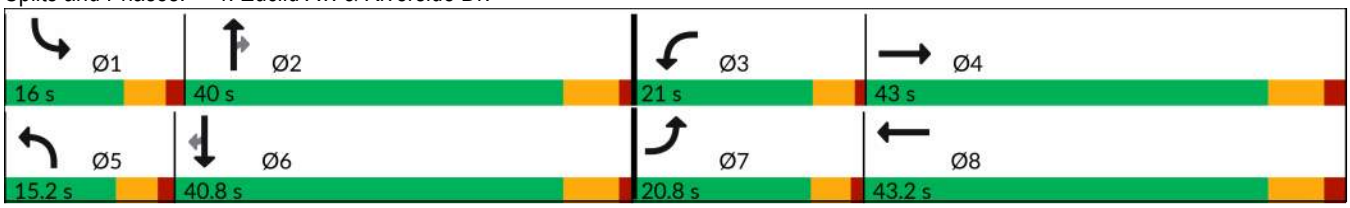

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 138 | 833 | 142 | 200 | 728 | 56 | 324 | 984 | 445 | 132 | 1318 | 408 |
| Future Volume (veh/h) | 138 | 833 | 142 | 200 | 728 | 56 | 324 | 984 | 445 | 132 | 1318 | 408 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 139 | 841 | 119 | 202 | 735 | 35 | 327 | 994 | 349 | 133 | 1331 | 344 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 167 | 482 | 68 | 227 | 1158 | 55 | 141 | 1009 | 450 | 152 | 1032 | 455 |
| Arrive On Green | 0.10 | 0.30 | 0.30 | 0.13 | 0.34 | 0.34 | 0.08 | 0.28 | 0.28 | 0.09 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1688 | 1603 | 227 | 1688 | 3450 | 164 | 1688 | 3554 | 1585 | 1688 | 3554 | 1565 |
| Grp Volume(v), veh/h | 139 | 0 | 960 | 202 | 378 | 392 | 327 | 994 | 349 | 133 | 1331 | 344 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1830 | 1688 | 1777 | 1837 | 1688 | 1777 | 1585 | 1688 | 1777 | 1565 |
| Q Serve(g_s), s | 9.7 | 0.0 | 36.0 | 14.1 | 21.5 | 21.6 | 10.0 | 33.3 | 24.2 | 9.3 | 34.8 | 23.9 |
| Cycle Q Clear(g_c), s | 9.7 | 0.0 | 36.0 | 14.1 | 21.5 | 21.6 | 10.0 | 33.3 | 24.2 | 9.3 | 34.8 | 23.9 |
| Prop In Lane | 1.00 | | 0.12 | 1.00 | | 0.09 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 167 | 0 | 550 | 227 | 596 | 617 | 141 | 1009 | 450 | 152 | 1032 | 455 |
| V/C Ratio(X) | 0.83 | 0.00 | 1.75 | 0.89 | 0.63 | 0.64 | 2.32 | 0.99 | 0.78 | 0.87 | 1.29 | 0.76 |
| Avail Cap(c_a), veh/h | 227 | 0 | 550 | 230 | 596 | 617 | 141 | 1009 | 450 | 152 | 1032 | 455 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.0 | 0.0 | 41.9 | 51.0 | 33.6 | 33.6 | 54.9 | 42.6 | 39.4 | 53.8 | 42.5 | 38.6 |
| Incr Delay (d2), s/veh | 13.0 | 0.0 | 343.2 | 31.0 | 2.5 | 2.5 | 616.2 | 24.7 | 8.3 | 39.0 | 137.5 | 7.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.6 | 0.0 | 67.9 | 7.7 | 9.3 | 9.6 | 28.2 | 17.1 | 10.1 | 5.5 | 34.3 | 9.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 65.9 | 0.0 | 385.1 | 82.0 | 36.1 | 36.1 | 671.1 | 67.4 | 47.7 | 92.9 | 180.0 | 45.8 |
| LnGrp LOS | E | | F | F | D | D | F | E | D | F | F | D |
| Approach Vol, veh/h | | 1099 | | | 972 | | | 1670 | | | 1808 | |
| Approach Delay, s/veh | | 344.7 | | | 45.6 | | | 181.5 | | | 148.1 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.0 | 40.0 | 20.8 | 43.0 | 15.2 | 40.8 | 16.6 | 47.2 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.8 | 34.0 | 16.3 | 36.0 | 10.0 | 34.8 | 16.1 | 36.2 |
| Max Q Clear Time (g_c+I1), s | 11.3 | 35.3 | 16.1 | 38.0 | 12.0 | 36.8 | 11.7 | 23.6 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 4.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 179.1 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 176 | 537 | 83 | 170 | 503 | 137 | 1520 | 338 | 40 | 1443 | 213 |
| Future Volume (vph) | 176 | 537 | 83 | 170 | 503 | 137 | 1520 | 338 | 40 | 1443 | 213 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 55.0 | 55.0 | 55.0 | 15.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 41.7% | 45.8% | 45.8% | 45.8% | 12.5% | 58.3% | 58.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 44.3 | 44.3 | 44.3 | | 44.3 | 48.7 | 48.7 | 48.7 | 10.1 | 60.2 | 60.2 |
| Actuated g/C Ratio | 0.38 | 0.38 | 0.38 | | 0.38 | 0.42 | 0.42 | 0.42 | 0.09 | 0.52 | 0.52 |
| v/c Ratio | 0.90 | 0.78 | 0.13 | | 3.40 | 2.09 | 1.05 | 0.49 | 0.28 | 0.81 | 0.24 |
| Control Delay (s/veh) | 80.7 | 41.7 | 7.8 | | Error | 563.1 | 72.4 | 23.3 | 57.0 | 27.6 | 5.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 80.7 | 41.7 | 7.8 | | Error | 563.1 | 72.4 | 23.3 | 57.0 | 27.6 | 5.5 |
| LOS | F | D | A | | F | F | E | C | E | C | A |
| Approach Delay (s/veh) | | 46.8 | | | 1109.6 | | 97.8 | | | 25.6 | |
| Approach LOS | | D | | | F | | F | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 116.8 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 3.40 | |
| Intersection Signal Delay (s/veh): 205.2 | Intersection LOS: F |
| Intersection Capacity Utilization 135.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 176 | 537 | 83 | 170 | 503 | 41 | 137 | 1520 | 338 | 40 | 1443 | 213 |
| Future Volume (veh/h) | 176 | 537 | 83 | 170 | 503 | 41 | 137 | 1520 | 338 | 40 | 1443 | 213 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 180 | 548 | 68 | 173 | 513 | 40 | 140 | 1551 | 269 | 41 | 1472 | 189 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 227 | 707 | 599 | 79 | 142 | 11 | 111 | 1474 | 657 | 106 | 1837 | 819 |
| Arrive On Green | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.41 | 0.41 | 0.41 | 0.06 | 0.52 | 0.52 |
| Sat Flow, veh/h | 810 | 1870 | 1585 | 107 | 375 | 28 | 284 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 180 | 548 | 68 | 726 | 0 | 0 | 140 | 1551 | 269 | 41 | 1472 | 189 |
| Grp Sat Flow(s),veh/h/ln | 810 | 1870 | 1585 | 510 | 0 | 0 | 284 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 0.0 | 30.2 | 3.3 | 14.0 | 0.0 | 0.0 | 20.5 | 48.5 | 14.0 | 2.7 | 40.0 | 7.6 |
| Cycle Q Clear(g_c), s | 44.2 | 30.2 | 3.3 | 44.2 | 0.0 | 0.0 | 48.5 | 48.5 | 14.0 | 2.7 | 40.0 | 7.6 |
| Prop In Lane | 1.00 | | 1.00 | 0.24 | | 0.06 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 227 | 707 | 599 | 231 | 0 | 0 | 111 | 1474 | 657 | 106 | 1837 | 819 |
| V/C Ratio(X) | 0.79 | 0.78 | 0.11 | 3.14 | 0.00 | 0.00 | 1.26 | 1.05 | 0.41 | 0.39 | 0.80 | 0.23 |
| Avail Cap(c_a), veh/h | 227 | 707 | 599 | 231 | 0 | 0 | 111 | 1474 | 657 | 150 | 1929 | 861 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.2 | 32.0 | 23.6 | 49.0 | 0.0 | 0.0 | 53.9 | 34.2 | 24.1 | 52.6 | 23.3 | 15.5 |
| Incr Delay (d2), s/veh | 17.3 | 5.4 | 0.1 | 976.3 | 0.0 | 0.0 | 169.8 | 38.6 | 0.4 | 0.9 | 2.4 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.2 | 14.1 | 1.2 | 69.3 | 0.0 | 0.0 | 8.4 | 26.8 | 4.9 | 1.1 | 15.3 | 2.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 55.5 | 37.4 | 23.7 | 1025.3 | 0.0 | 0.0 | 223.7 | 72.8 | 24.5 | 53.5 | 25.7 | 15.6 |
| LnGrp LOS | E | D | C | F | | | F | F | C | D | C | B |
| Approach Vol, veh/h | | 796 | | | 726 | | | 1960 | | | 1702 | |
| Approach Delay, s/veh | | 40.3 | | | 1025.3 | | | 77.0 | | | 25.3 | |
| Approach LOS | | D | | | F | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.0 | 55.0 | | 50.0 | | 67.0 | | 50.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 48.5 | | 44.2 | | 63.5 | | 44.2 |
| Max Q Clear Time (g_c+I1), s | 4.7 | 50.5 | | 46.2 | | 42.0 | | 46.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 11.0 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 187.2 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 241 | 308 | 113 | 207 | 308 | 86 | 1811 | 83 | 62 | 1451 | 137 |
| Future Volume (vph) | 241 | 308 | 113 | 207 | 308 | 86 | 1811 | 83 | 62 | 1451 | 137 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 19.0 | 51.3 | 51.3 | 14.7 | 47.0 | 14.7 | 39.3 | 39.3 | 14.7 | 39.3 | 39.3 |
| Total Split (%) | 15.8% | 42.8% | 42.8% | 12.3% | 39.2% | 12.3% | 32.8% | 32.8% | 12.3% | 32.8% | 32.8% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 37.6 | 37.6 | 10.0 | 33.3 | 10.0 | 36.2 | 36.2 | 10.0 | 32.9 | 32.9 |
| Actuated g/C Ratio | 0.13 | 0.33 | 0.33 | 0.09 | 0.29 | 0.09 | 0.32 | 0.32 | 0.09 | 0.29 | 0.29 |
| v/c Ratio | 1.19 | 0.52 | 0.20 | 1.47 | 0.90 | 0.61 | 1.67 | 0.15 | 0.44 | 1.47 | 0.26 |
| Control Delay (s/veh) | 165.9 | 33.7 | 5.3 | 280.0 | 57.7 | 69.9 | 335.2 | 2.7 | 61.2 | 250.1 | 9.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 165.9 | 33.7 | 5.3 | 280.0 | 57.7 | 69.9 | 335.2 | 2.7 | 61.2 | 250.1 | 9.7 |
| LOS | F | C | A | F | E | E | F | A | E | F | A |
| Approach Delay (s/veh) | | 76.9 | | | 126.6 | | 309.8 | | | 223.0 | |
| Approach LOS | | E | | | F | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.67 | |
| Intersection Signal Delay (s/veh): 225.1 | Intersection LOS: F |
| Intersection Capacity Utilization 117.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

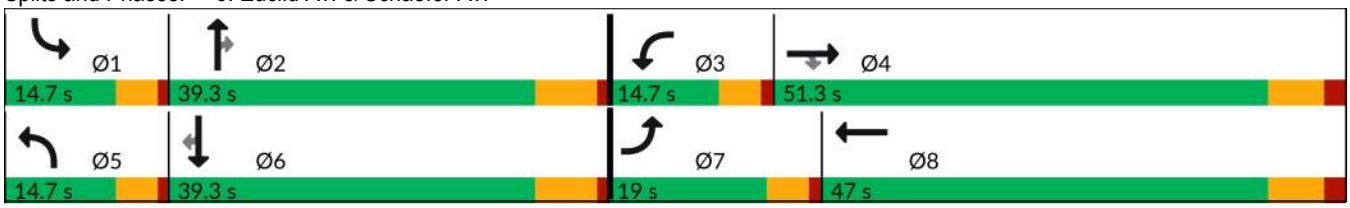

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 241 | 308 | 113 | 207 | 308 | 154 | 86 | 1811 | 83 | 62 | 1451 | 137 |
| Future Volume (veh/h) | 241 | 308 | 113 | 207 | 308 | 154 | 86 | 1811 | 83 | 62 | 1451 | 137 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 251 | 321 | 59 | 216 | 321 | 152 | 90 | 1886 | 72 | 65 | 1511 | 112 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 216 | 615 | 522 | 151 | 349 | 165 | 142 | 1064 | 475 | 131 | 1041 | 465 |
| Arrive On Green | 0.13 | 0.33 | 0.33 | 0.09 | 0.29 | 0.29 | 0.08 | 0.30 | 0.30 | 0.08 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1200 | 568 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 251 | 321 | 59 | 216 | 0 | 473 | 90 | 1886 | 72 | 65 | 1511 | 112 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1768 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 14.3 | 15.6 | 2.9 | 10.0 | 0.0 | 29.0 | 5.8 | 33.5 | 3.7 | 4.1 | 32.8 | 6.0 |
| Cycle Q Clear(g_c), s | 14.3 | 15.6 | 2.9 | 10.0 | 0.0 | 29.0 | 5.8 | 33.5 | 3.7 | 4.1 | 32.8 | 6.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.32 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 216 | 615 | 522 | 151 | 0 | 514 | 142 | 1064 | 475 | 131 | 1041 | 465 |
| V/C Ratio(X) | 1.16 | 0.52 | 0.11 | 1.43 | 0.00 | 0.92 | 0.64 | 1.77 | 0.15 | 0.50 | 1.45 | 0.24 |
| Avail Cap(c_a), veh/h | 216 | 740 | 627 | 151 | 0 | 632 | 151 | 1064 | 475 | 151 | 1041 | 465 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.8 | 30.4 | 26.2 | 51.0 | 0.0 | 38.4 | 49.6 | 39.2 | 28.8 | 49.5 | 39.6 | 30.1 |
| Incr Delay (d2), s/veh | 112.7 | 0.5 | 0.1 | 228.3 | 0.0 | 16.1 | 5.5 | 351.3 | 0.1 | 1.1 | 208.3 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.6 | 6.8 | 1.1 | 13.7 | 0.0 | 14.2 | 2.5 | 65.4 | 1.4 | 1.7 | 43.4 | 2.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 161.5 | 30.9 | 26.2 | 279.3 | 0.0 | 54.6 | 55.2 | 390.5 | 28.9 | 50.6 | 247.9 | 30.4 |
| LnGrp LOS | F | C | C | F | | D | E | F | C | D | F | C |
| Approach Vol, veh/h | | 631 | | | 689 | | | 2048 | | | 1688 | |
| Approach Delay, s/veh | | 82.4 | | | 125.0 | | | 363.1 | | | 225.8 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.4 | 40.0 | 14.7 | 43.8 | 14.1 | 39.3 | 19.0 | 39.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 32.8 | 10.0 | 44.3 | 10.0 | 32.8 | 14.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 6.1 | 35.5 | 12.0 | 17.6 | 7.8 | 34.8 | 16.3 | 31.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 249.8 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 180 | 1110 | 139 | 153 | 763 | 143 | 1596 | 380 | 369 | 1274 | 189 |
| Future Volume (vph) | 180 | 1110 | 139 | 153 | 763 | 143 | 1596 | 380 | 369 | 1274 | 189 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 50.1 | 50.1 | 50.1 | 50.1 | 50.1 | 14.7 | 43.3 | 43.3 | 26.6 | 55.2 | 55.2 |
| Total Split (%) | 41.8% | 41.8% | 41.8% | 41.8% | 41.8% | 12.3% | 36.1% | 36.1% | 22.2% | 46.0% | 46.0% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 42.9 | 42.9 | 42.9 | 42.9 | 42.9 | 10.0 | 36.8 | 36.8 | 21.9 | 48.7 | 48.7 |
| Actuated g/C Ratio | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.08 | 0.31 | 0.31 | 0.18 | 0.41 | 0.41 |
| v/c Ratio | 3.38 | 1.81 | 0.24 | 2.86 | 1.84 | 0.61 | 1.60 | 0.72 | 1.31 | 0.96 | 0.30 |
| Control Delay (s/veh) | Error | 398.0 | 8.7 | 901.5 | 409.7 | 63.7 | 304.3 | 33.8 | 202.4 | 51.9 | 15.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | Error | 398.0 | 8.7 | 901.5 | 409.7 | 63.7 | 304.3 | 33.8 | 202.4 | 51.9 | 15.6 |
| LOS | F | F | A | F | F | E | F | C | F | D | B |
| Approach Delay (s/veh) | | 452.4 | | | 469.8 | | 239.6 | | | 78.4 | |
| Approach LOS | | F | | | F | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 3.38 | |
| Intersection Signal Delay (s/veh): 284.3 | Intersection LOS: F |
| Intersection Capacity Utilization 158.1% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 180 | 1110 | 139 | 153 | 763 | 334 | 143 | 1596 | 380 | 369 | 1274 | 189 |
| Future Volume (veh/h) | 180 | 1110 | 139 | 153 | 763 | 334 | 143 | 1596 | 380 | 369 | 1274 | 189 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 196 | 1207 | 93 | 166 | 829 | 354 | 155 | 1735 | 385 | 401 | 1385 | 165 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 60 | 669 | 566 | 60 | 445 | 190 | 256 | 1090 | 486 | 308 | 1444 | 635 |
| Arrive On Green | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.08 | 0.31 | 0.31 | 0.18 | 0.41 | 0.41 |
| Sat Flow, veh/h | 449 | 1870 | 1584 | 402 | 1244 | 531 | 3092 | 3554 | 1585 | 1688 | 3554 | 1562 |
| Grp Volume(v), veh/h | 196 | 1207 | 93 | 166 | 0 | 1183 | 155 | 1735 | 385 | 401 | 1385 | 165 |
| Grp Sat Flow(s),veh/h/ln | 449 | 1870 | 1584 | 402 | 0 | 1775 | 1546 | 1777 | 1585 | 1688 | 1777 | 1562 |
| Q Serve(g_s), s | 0.0 | 42.9 | 4.8 | 0.0 | 0.0 | 42.9 | 5.8 | 36.8 | 26.7 | 21.9 | 45.5 | 8.4 |
| Cycle Q Clear(g_c), s | 42.9 | 42.9 | 4.8 | 42.9 | 0.0 | 42.9 | 5.8 | 36.8 | 26.7 | 21.9 | 45.5 | 8.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.30 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 60 | 669 | 566 | 60 | 0 | 634 | 256 | 1090 | 486 | 308 | 1444 | 635 |
| V/C Ratio(X) | 3.27 | 1.81 | 0.16 | 2.77 | 0.00 | 1.86 | 0.61 | 1.59 | 0.79 | 1.30 | 0.96 | 0.26 |
| Avail Cap(c_a), veh/h | 60 | 669 | 566 | 60 | 0 | 634 | 258 | 1090 | 486 | 308 | 1444 | 635 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 60.0 | 38.5 | 26.3 | 60.0 | 0.0 | 38.6 | 53.1 | 41.6 | 38.1 | 49.0 | 34.7 | 23.6 |
| Incr Delay (d2), s/veh | 1061.5 | 368.2 | 0.1 | 839.5 | 0.0 | 395.1 | 2.8 | 270.8 | 8.7 | 157.6 | 15.1 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 19.5 | 87.0 | 1.8 | 15.8 | 0.0 | 87.3 | 2.3 | 56.0 | 10.9 | 22.2 | 20.9 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 1121.5 | 406.8 | 26.4 | 899.5 | 0.0 | 433.6 | 56.0 | 312.4 | 46.8 | 206.7 | 49.7 | 23.9 |
| LnGrp LOS | F | F | C | F | | F | E | F | D | F | D | C |
| Approach Vol, veh/h | | 1496 | | | 1349 | | | 2275 | | | 1951 | |
| Approach Delay, s/veh | | 476.8 | | | 490.9 | | | 250.0 | | | 79.8 | |
| Approach LOS | | F | | | F | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.6 | 43.3 | | 50.1 | 14.6 | 55.3 | | 50.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 21.9 | 36.8 | | 42.9 | 10.0 | 48.7 | | 42.9 |
| Max Q Clear Time (g_c+I1), s | 23.9 | 38.8 | | 44.9 | 7.8 | 47.5 | | 44.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 1.0 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 297.0 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 84 | 354 | 229 | 197 | 326 | 107 | 1272 | 104 | 183 | 1225 | 86 |
| Future Volume (vph) | 84 | 354 | 229 | 197 | 326 | 107 | 1272 | 104 | 183 | 1225 | 86 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 13.3 | 37.6 | 37.6 | 16.4 | 40.7 | 40.7 |
| Actuated g/C Ratio | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.11 | 0.32 | 0.32 | 0.14 | 0.34 | 0.34 |
| v/c Ratio | 1.47 | 0.52 | 0.32 | 0.75 | 1.09 | 0.60 | 1.19 | 0.20 | 0.83 | 1.06 | 0.15 |
| Control Delay (s/veh) | 315.9 | 31.2 | 4.2 | 51.0 | 93.6 | 63.5 | 132.0 | 11.0 | 78.3 | 81.1 | 6.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 315.9 | 31.2 | 4.2 | 51.0 | 93.6 | 63.5 | 132.0 | 11.0 | 78.3 | 81.1 | 6.5 |
| LOS | F | C | A | D | F | E | F | B | E | F | A |
| Approach Delay (s/veh) | | 57.6 | | | 84.5 | | 118.6 | | | 76.4 | |
| Approach LOS | | E | | | F | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.4 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.47 | |
| Intersection Signal Delay (s/veh): 89.0 | Intersection LOS: F |
| Intersection Capacity Utilization 117.1% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

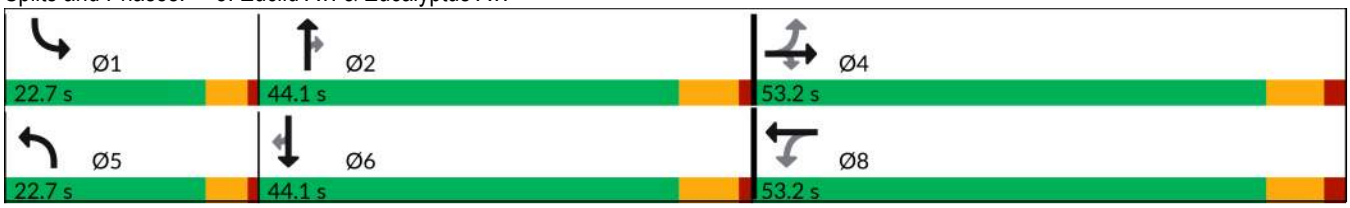

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 84 | 354 | 229 | 197 | 326 | 398 | 107 | 1272 | 104 | 183 | 1225 | 86 |
| Future Volume (veh/h) | 84 | 354 | 229 | 197 | 326 | 398 | 107 | 1272 | 104 | 183 | 1225 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 88 | 373 | 139 | 207 | 343 | 406 | 113 | 1339 | 85 | 193 | 1289 | 58 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 61 | 734 | 622 | 264 | 306 | 362 | 140 | 1140 | 508 | 219 | 1306 | 583 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.08 | 0.32 | 0.32 | 0.13 | 0.37 | 0.37 |
| Sat Flow, veh/h | 675 | 1870 | 1585 | 841 | 780 | 924 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 88 | 373 | 139 | 207 | 0 | 749 | 113 | 1339 | 85 | 193 | 1289 | 58 |
| Grp Sat Flow(s),veh/h/ln | 675 | 1870 | 1585 | 841 | 0 | 1704 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 0.0 | 17.7 | 6.8 | 28.3 | 0.0 | 46.0 | 7.7 | 37.6 | 4.5 | 13.2 | 42.2 | 2.8 |
| Cycle Q Clear(g_c), s | 46.0 | 17.7 | 6.8 | 46.0 | 0.0 | 46.0 | 7.7 | 37.6 | 4.5 | 13.2 | 42.2 | 2.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.54 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 61 | 734 | 622 | 264 | 0 | 669 | 140 | 1140 | 508 | 219 | 1306 | 583 |
| V/C Ratio(X) | 1.43 | 0.51 | 0.22 | 0.78 | 0.00 | 1.12 | 0.81 | 1.17 | 0.17 | 0.88 | 0.99 | 0.10 |
| Avail Cap(c_a), veh/h | 61 | 734 | 622 | 264 | 0 | 669 | 259 | 1140 | 508 | 259 | 1306 | 583 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 58.6 | 27.0 | 23.7 | 44.8 | 0.0 | 35.6 | 52.8 | 39.8 | 28.6 | 50.1 | 36.8 | 24.3 |
| Incr Delay (d2), s/veh | 265.9 | 0.4 | 0.1 | 13.8 | 0.0 | 72.8 | 7.8 | 88.2 | 0.2 | 23.8 | 21.7 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.3 | 7.6 | 2.5 | 6.8 | 0.0 | 31.1 | 3.4 | 29.2 | 1.6 | 6.7 | 20.7 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 324.5 | 27.5 | 23.9 | 58.5 | 0.0 | 108.4 | 60.6 | 128.0 | 28.7 | 73.9 | 58.5 | 24.4 |
| LnGrp LOS | F | C | C | E | | F | E | F | C | E | E | C |
| Approach Vol, veh/h | | 600 | | | 956 | | | 1537 | | | 1540 | |
| Approach Delay, s/veh | | 70.2 | | | 97.6 | | | 117.5 | | | 59.1 | |
| Approach LOS | | E | | | F | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.9 | 44.1 | | 53.2 | 14.4 | 49.6 | | 53.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 15.2 | 39.6 | | 48.0 | 9.7 | 44.2 | | 48.0 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | | 0.0 | 0.1 | 0.0 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 87.9 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 24 | 24 | 558 | 0 | 5 | 1578 | 259 | 206 | 1981 |
| Future Volume (vph) | 24 | 24 | 558 | 0 | 5 | 1578 | 259 | 206 | 1981 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.7 | 50.7 | 22.1 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.4% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 40.0 | | 40.0 | 10.0 | 44.2 | 44.2 | 16.8 | 62.8 |
| Actuated g/C Ratio | | 0.34 | | 0.34 | 0.08 | 0.37 | 0.37 | 0.14 | 0.53 |
| v/c Ratio | | 0.17 | | 1.40 | 0.04 | 1.25 | 0.41 | 0.91 | 1.12 |
| Control Delay (s/veh) | | 18.0 | | 217.7 | 51.4 | 154.7 | 16.7 | 90.9 | 88.6 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 18.0 | | 217.7 | 51.4 | 154.7 | 16.7 | 90.9 | 88.6 |
| LOS | | B | | F | D | F | B | F | F |
| Approach Delay (s/veh) | | 18.0 | | 217.7 | | 135.0 | | | 88.8 |
| Approach LOS | | B | | F | | F | | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.4 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.40 | |
| Intersection Signal Delay (s/veh): 123.7 | Intersection LOS: F |
| Intersection Capacity Utilization 124.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

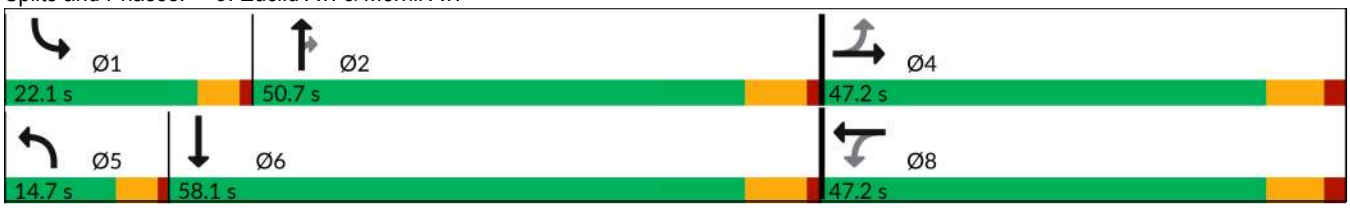

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 24 | 24 | 41 | 558 | 0 | 139 | 5 | 1578 | 259 | 206 | 1981 | 10 |
| Future Volume (veh/h) | 24 | 24 | 41 | 558 | 0 | 139 | 5 | 1578 | 259 | 206 | 1981 | 10 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 25 | 25 | 36 | 581 | 0 | 137 | 5 | 1644 | 266 | 215 | 2064 | 9 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 188 | 191 | 245 | 438 | 0 | 90 | 22 | 1314 | 586 | 240 | 1810 | 8 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.00 | 0.33 | 0.01 | 0.37 | 0.37 | 0.14 | 0.50 | 0.50 |
| Sat Flow, veh/h | 447 | 570 | 732 | 1145 | 0 | 270 | 1688 | 3554 | 1585 | 1688 | 3628 | 16 |
| Grp Volume(v), veh/h | 86 | 0 | 0 | 718 | 0 | 0 | 5 | 1644 | 266 | 215 | 1010 | 1063 |
| Grp Sat Flow(s),veh/h/ln | 1749 | 0 | 0 | 1415 | 0 | 0 | 1688 | 1777 | 1585 | 1688 | 1777 | 1867 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 35.9 | 0.0 | 0.0 | 0.4 | 44.2 | 15.2 | 15.0 | 59.7 | 59.7 |
| Cycle Q Clear(g_c), s | 4.1 | 0.0 | 0.0 | 40.0 | 0.0 | 0.0 | 0.4 | 44.2 | 15.2 | 15.0 | 59.7 | 59.7 |
| Prop In Lane | 0.29 | | 0.42 | 0.81 | | 0.19 | 1.00 | | 1.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 624 | 0 | 0 | 528 | 0 | 0 | 22 | 1314 | 586 | 240 | 886 | 931 |
| V/C Ratio(X) | 0.14 | 0.00 | 0.00 | 1.36 | 0.00 | 0.00 | 0.23 | 1.25 | 0.45 | 0.90 | 1.14 | 1.14 |
| Avail Cap(c_a), veh/h | 624 | 0 | 0 | 528 | 0 | 0 | 141 | 1314 | 586 | 246 | 886 | 931 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.9 | 0.0 | 0.0 | 41.5 | 0.0 | 0.0 | 58.4 | 37.7 | 28.6 | 50.4 | 30.0 | 30.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 174.1 | 0.0 | 0.0 | 2.0 | 119.7 | 0.6 | 30.5 | 76.4 | 76.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 0.0 | 0.0 | 41.0 | 0.0 | 0.0 | 0.2 | 39.5 | 5.5 | 8.1 | 41.2 | 43.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.9 | 0.0 | 0.0 | 215.6 | 0.0 | 0.0 | 60.4 | 157.4 | 29.1 | 80.9 | 106.3 | 106.6 |
| LnGrp LOS | C | | | F | | | E | F | C | F | F | F |
| Approach Vol, veh/h | | 86 | | | 718 | | | 1915 | | | 2288 | |
| Approach Delay, s/veh | | 27.9 | | | 215.6 | | | 139.3 | | | 104.1 | |
| Approach LOS | | C | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.7 | 50.7 | | 47.2 | 6.2 | 66.2 | | 47.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.4 | 44.2 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 17.0 | 46.2 | | 6.1 | 2.4 | 61.7 | | 42.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.3 | 0.0 | 0.0 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 132.2 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 497 | 688 | 297 | 123 | 522 | 212 | 291 | 1028 | 151 | 483 | 1070 | 506 |
| Future Volume (vph) | 497 | 688 | 297 | 123 | 522 | 212 | 291 | 1028 | 151 | 483 | 1070 | 506 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 37.4 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 31.2% | 12.3% | 12.3% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.1 | 29.6 | 29.6 | 10.1 | 29.6 | 29.6 | 10.1 | 31.1 | 47.7 | 10.1 | 31.2 | 47.7 |
| Actuated g/C Ratio | 0.10 | 0.28 | 0.28 | 0.10 | 0.28 | 0.28 | 0.10 | 0.30 | 0.46 | 0.10 | 0.30 | 0.46 |
| v/c Ratio | 1.76 | 0.72 | 0.51 | 0.80 | 0.55 | 0.37 | 1.89 | 1.02 | 0.21 | 1.71 | 1.06 | 0.67 |
| Control Delay (s/veh) | 386.7 | 37.4 | 10.1 | 81.3 | 33.1 | 5.7 | 452.4 | 71.0 | 10.7 | 365.2 | 82.1 | 22.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 386.7 | 37.4 | 10.1 | 81.3 | 33.1 | 5.7 | 452.4 | 71.0 | 10.7 | 365.2 | 82.1 | 22.3 |
| LOS | F | D | B | F | C | A | F | E | B | F | F | C |
| Approach Delay (s/veh) | | 149.0 | | | 33.2 | | | 140.3 | | | 133.7 | |
| Approach LOS | | F | | | C | | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 104.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.89 | |
| Intersection Signal Delay (s/veh): 124.6 | Intersection LOS: F |
| Intersection Capacity Utilization 96.0% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

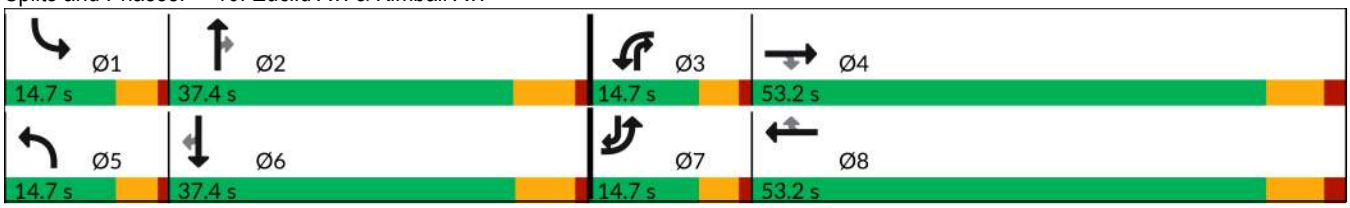

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 497 | 688 | 297 | 123 | 522 | 212 | 291 | 1028 | 151 | 483 | 1070 | 506 |
| Future Volume (veh/h) | 497 | 688 | 297 | 123 | 522 | 212 | 291 | 1028 | 151 | 483 | 1070 | 506 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 523 | 724 | 281 | 129 | 549 | 120 | 306 | 1082 | 139 | 508 | 1126 | 454 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 308 | 940 | 414 | 163 | 931 | 415 | 168 | 1097 | 643 | 308 | 1097 | 647 |
| Arrive On Green | 0.10 | 0.26 | 0.26 | 0.10 | 0.26 | 0.26 | 0.10 | 0.31 | 0.31 | 0.10 | 0.31 | 0.31 |
| Sat Flow, veh/h | 3092 | 3554 | 1565 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 | 3092 | 3554 | 1585 |
| Grp Volume(v), veh/h | 523 | 724 | 281 | 129 | 549 | 120 | 306 | 1082 | 139 | 508 | 1126 | 454 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1777 | 1565 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 | 1546 | 1777 | 1585 |
| Q Serve(g_s), s | 10.0 | 18.9 | 16.2 | 7.5 | 13.5 | 6.1 | 10.0 | 30.4 | 5.7 | 10.0 | 31.0 | 23.8 |
| Cycle Q Clear(g_c), s | 10.0 | 18.9 | 16.2 | 7.5 | 13.5 | 6.1 | 10.0 | 30.4 | 5.7 | 10.0 | 31.0 | 23.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 308 | 940 | 414 | 163 | 931 | 415 | 168 | 1097 | 643 | 308 | 1097 | 647 |
| V/C Ratio(X) | 1.70 | 0.77 | 0.68 | 0.79 | 0.59 | 0.29 | 1.82 | 0.99 | 0.22 | 1.65 | 1.03 | 0.70 |
| Avail Cap(c_a), veh/h | 308 | 1628 | 717 | 168 | 1628 | 726 | 168 | 1097 | 643 | 308 | 1097 | 647 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 45.2 | 34.1 | 33.1 | 44.3 | 32.3 | 29.6 | 45.2 | 34.5 | 19.4 | 45.2 | 34.7 | 24.6 |
| Incr Delay (d2), s/veh | 327.7 | 1.4 | 2.0 | 21.4 | 0.2 | 0.1 | 391.5 | 23.7 | 0.2 | 306.4 | 34.0 | 3.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 17.7 | 7.8 | 5.9 | 4.0 | 5.5 | 2.2 | 22.2 | 15.5 | 2.0 | 16.7 | 17.3 | 8.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 372.9 | 35.5 | 35.0 | 65.7 | 32.6 | 29.7 | 436.7 | 58.2 | 19.6 | 351.5 | 68.7 | 28.0 |
| LnGrp LOS | F | D | D | E | C | C | F | E | B | F | F | C |
| Approach Vol, veh/h | | 1528 | | | 798 | | | 1527 | | | 2088 | |
| Approach Delay, s/veh | | 150.9 | | | 37.5 | | | 130.5 | | | 128.7 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 37.5 | 14.4 | 33.8 | 14.7 | 37.5 | 14.7 | 33.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 10.0 | 30.9 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 32.4 | 9.5 | 20.9 | 12.0 | 33.0 | 12.0 | 15.5 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 5.7 | 0.0 | 0.0 | 0.0 | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 122.6 |
| HCM 7th LOS | F |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 272 | 499 | 639 | 471 | 181 | 591 | 1054 | 214 | 576 |
| Future Volume (vph) | 272 | 499 | 639 | 471 | 181 | 591 | 1054 | 214 | 576 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 27.0 | 42.0 | 53.3 | 14.7 | 36.3 | 42.0 | 14.7 | 36.3 |
| Total Split (%) | 13.1% | 22.5% | 35.0% | 44.4% | 12.3% | 30.3% | 35.0% | 12.3% | 30.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 20.0 | 36.3 | 46.3 | 10.0 | 29.8 | 72.6 | 10.0 | 29.8 |
| Actuated g/C Ratio | 0.08 | 0.17 | 0.30 | 0.39 | 0.08 | 0.25 | 0.61 | 0.08 | 0.25 |
| v/c Ratio | 2.10 | 2.26 | 0.74 | 0.94 | 1.40 | 0.72 | 1.15 | 1.65 | 1.12 |
| Control Delay (s/veh) | 546.3 | 599.6 | 43.3 | 57.0 | 258.9 | 46.8 | 101.4 | 358.8 | 106.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 546.3 | 599.6 | 43.3 | 57.0 | 258.9 | 46.8 | 101.4 | 358.8 | 106.2 |
| LOS | F | F | D | E | F | D | F | F | F |
| Approach Delay (s/veh) | | 583.9 | | 50.0 | | 99.4 | | | 152.0 |
| Approach LOS | | F | | D | | F | | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.26 | |
| Intersection Signal Delay (s/veh): 185.6 | Intersection LOS: F |
| Intersection Capacity Utilization 127.6% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

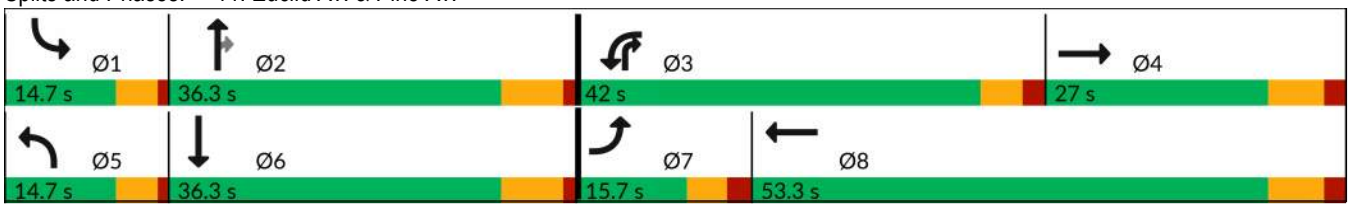

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 272 | 499 | 149 | 639 | 471 | 141 | 181 | 591 | 1054 | 214 | 576 | 390 |
| Future Volume (veh/h) | 272 | 499 | 149 | 639 | 471 | 141 | 181 | 591 | 1054 | 214 | 576 | 390 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 292 | 537 | 0 | 687 | 506 | 143 | 195 | 635 | 1058 | 230 | 619 | 419 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 142 | 414 | | 748 | 531 | 150 | 142 | 893 | 782 | 142 | 510 | 345 |
| Arrive On Green | 0.08 | 0.22 | 0.00 | 0.24 | 0.38 | 0.38 | 0.08 | 0.25 | 0.25 | 0.08 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1688 | 1870 | 0 | 3092 | 1403 | 396 | 1688 | 3554 | 1585 | 1688 | 2028 | 1372 |
| Grp Volume(v), veh/h | 292 | 537 | 0 | 687 | 0 | 649 | 195 | 635 | 1058 | 230 | 542 | 496 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 0 | 1546 | 0 | 1799 | 1688 | 1777 | 1585 | 1688 | 1777 | 1623 |
| Q Serve(g_s), s | 10.0 | 26.2 | 0.0 | 25.7 | 0.0 | 41.6 | 10.0 | 19.3 | 29.8 | 10.0 | 29.8 | 29.8 |
| Cycle Q Clear(g_c), s | 10.0 | 26.2 | 0.0 | 25.7 | 0.0 | 41.6 | 10.0 | 19.3 | 29.8 | 10.0 | 29.8 | 29.8 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.22 | 1.00 | | 1.00 | 1.00 | | 0.85 |
| Lane Grp Cap(c), veh/h | 142 | 414 | | 748 | 0 | 681 | 142 | 893 | 782 | 142 | 446 | 408 |
| V/C Ratio(X) | 2.05 | 1.30 | | 0.92 | 0.00 | 0.95 | 1.37 | 0.71 | 1.35 | 1.62 | 1.21 | 1.22 |
| Avail Cap(c_a), veh/h | 142 | 414 | | 946 | 0 | 702 | 142 | 893 | 782 | 142 | 446 | 408 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.3 | 46.2 | 0.0 | 43.8 | 0.0 | 35.8 | 54.3 | 40.5 | 30.1 | 54.3 | 44.4 | 44.4 |
| Incr Delay (d2), s/veh | 497.0 | 151.2 | 0.0 | 10.5 | 0.0 | 23.0 | 204.8 | 2.3 | 167.5 | 307.4 | 115.6 | 117.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 23.8 | 29.1 | 0.0 | 10.5 | 0.0 | 21.3 | 12.2 | 8.3 | 56.3 | 16.2 | 26.7 | 24.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 551.3 | 197.4 | 0.0 | 54.3 | 0.0 | 58.8 | 259.1 | 42.8 | 197.6 | 361.7 | 160.0 | 161.9 |
| LnGrp LOS | F | F | | D | | E | F | D | F | F | F | F |
| Approach Vol, veh/h | | 829 | | | 1336 | | | 1888 | | | 1268 | |
| Approach Delay, s/veh | | 322.1 | | | 56.5 | | | 151.9 | | | 197.3 | |
| Approach LOS | | F | | | E | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 36.3 | 34.4 | 33.2 | 14.7 | 36.3 | 15.7 | 51.9 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 29.8 | 36.3 | 20.0 | 10.0 | 29.8 | 10.0 | 46.3 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 31.8 | 27.7 | 28.2 | 12.0 | 31.8 | 12.0 | 43.6 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 165.3 |
| HCM 7th LOS | F |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 838 | 480 | 799 | 111 | 847 |
| Future Volume (vph) | 838 | 480 | 799 | 111 | 847 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 24.5 | 9.6 | 9.6 |
| Total Split (s) | 35.2 | 31.7 | 66.9 | 33.1 | 33.1 |
| Total Split (%) | 35.2% | 31.7% | 66.9% | 33.1% | 33.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 28.7 | 27.0 | 60.4 | 28.5 | 28.5 |
| Actuated g/C Ratio | 0.29 | 0.27 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 1.07 | 1.18 | 0.42 | 0.14 | 1.13 |
| Control Delay (s/veh) | 82.4 | 135.9 | 11.2 | 27.2 | 89.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 82.4 | 135.9 | 11.2 | 27.2 | 89.9 |
| LOS | F | F | B | C | F |
| Approach Delay (s/veh) | 82.4 | | 58.0 | 82.6 | |
| Approach LOS | F | | E | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.18 | |
| Intersection Signal Delay (s/veh): 72.7 | Intersection LOS: E |
| Intersection Capacity Utilization 89.1% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

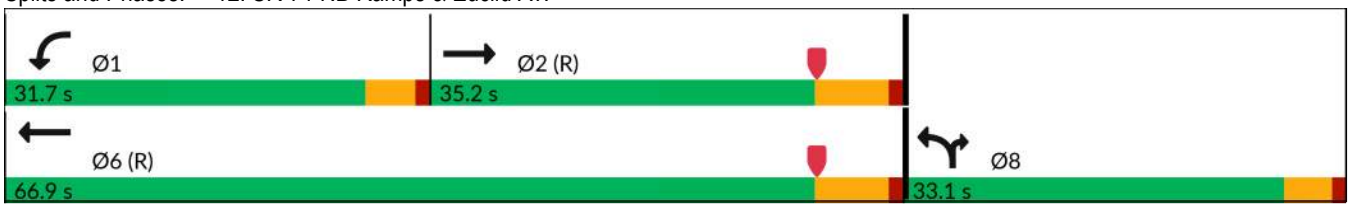

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 838 | 133 | 480 | 799 | 111 | 847 |
| Future Volume (veh/h) | 838 | 133 | 480 | 799 | 111 | 847 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1772 | 1870 | 1673 | 1870 |
| Adj Flow Rate, veh/h | 931 | 0 | 533 | 888 | 123 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1818 | | 456 | 2944 | 187 | |
| Arrive On Green | 1.00 | 0.00 | 0.27 | 0.83 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3741 | 0 | 1688 | 3647 | 3092 | 1585 |
| Grp Volume(v), veh/h | 931 | 0 | 533 | 888 | 123 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1777 | 0 | 1688 | 1777 | 1546 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 27.0 | 5.7 | 3.9 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 27.0 | 5.7 | 3.9 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1818 | | 456 | 2944 | 187 | |
| V/C Ratio(X) | 0.51 | | 1.17 | 0.30 | 0.66 | |
| Avail Cap(c_a), veh/h | 1818 | | 456 | 2944 | 881 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.78 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.5 | 2.0 | 46.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.8 | 0.0 | 97.7 | 0.3 | 3.9 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 22.5 | 0.6 | 1.6 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.8 | 0.0 | 134.2 | 2.2 | 49.9 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 931 | | | 1421 | 123 | |
| Approach Delay, s/veh | 0.8 | | | 51.7 | 49.9 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.7 | 57.7 | | | | 89.4 | 10.6 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 27.0 | 28.7 | | | | 60.4 | 28.5 |
| Max Q Clear Time (g_c+I1), s | 29.0 | 2.0 | | | | 7.7 | 5.9 |
| Green Ext Time (p_c), s | 0.0 | 4.9 | | | | 4.9 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 32.5 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 391 | 78 | 220 | 40 | 144 | 666 | 104 | 84 |
| Future Volume (vph) | 391 | 78 | 220 | 40 | 144 | 666 | 104 | 84 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 23.5 | 23.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 26.5 | 13.0 | 39.5 | 23.5 | 23.5 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 26.5% | 13.0% | 39.5% | 23.5% | 23.5% | 37.0% | 37.0% | 37.0% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 31.5 | 8.9 | 42.6 | 9.0 | 9.0 | 30.9 | 30.9 | 30.9 |
| Actuated g/C Ratio | 0.32 | 0.09 | 0.43 | 0.09 | 0.09 | 0.31 | 0.31 | 0.31 |
| v/c Ratio | 0.42 | 0.54 | 0.15 | 0.28 | 0.54 | 0.81 | 0.77 | 0.15 |
| Control Delay (s/veh) | 30.7 | 57.2 | 13.8 | 46.8 | 14.7 | 44.3 | 41.1 | 1.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.7 | 57.2 | 13.8 | 46.8 | 14.7 | 44.3 | 41.1 | 1.2 |
| LOS | C | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 30.7 | | 25.2 | | | | 38.6 | |
| Approach LOS | C | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 32.6 | Intersection LOS: C |
| Intersection Capacity Utilization 61.0% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

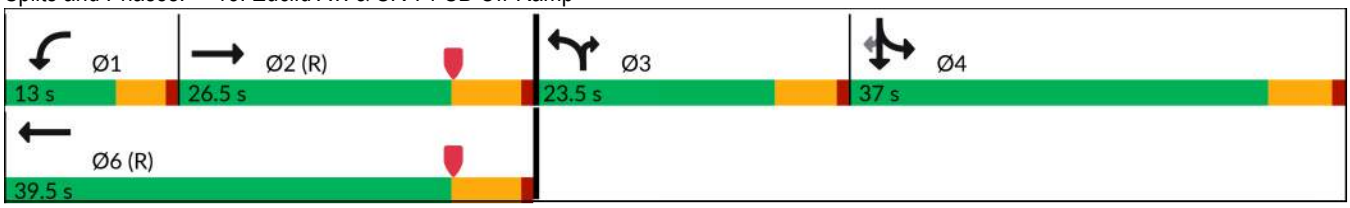

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 391 | 56 | 78 | 220 | 0 | 40 | 0 | 144 | 666 | 104 | 84 |
| Future Volume (veh/h) | 0 | 391 | 56 | 78 | 220 | 0 | 40 | 0 | 144 | 666 | 104 | 84 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 0 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 407 | 25 | 81 | 229 | 0 | 42 | 0 | 57 | 771 | 0 | 59 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1714 | 105 | 121 | 2212 | | 0 | 0 | 0 | 870 | 0 | 407 |
| Arrive On Green | 0.00 | 0.50 | 0.50 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.26 |
| Sat Flow, veh/h | 0 | 3495 | 208 | 1688 | 3647 | 0 | | 0 | | 3375 | 0 | 1580 |
| Grp Volume(v), veh/h | 0 | 212 | 220 | 81 | 229 | 0 | | 0.0 | | 771 | 0 | 59 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1777 | 1833 | 1688 | 1777 | 0 | | | | 1688 | 0 | 1580 |
| Q Serve(g_s), s | 0.0 | 6.7 | 6.8 | 4.5 | 0.0 | 0.0 | | | | 22.0 | 0.0 | 2.9 |
| Cycle Q Clear(g_c), s | 0.0 | 6.7 | 6.8 | 4.5 | 0.0 | 0.0 | | | | 22.0 | 0.0 | 2.9 |
| Prop In Lane | 0.00 | | 0.11 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 895 | 923 | 121 | 2212 | | | | | 870 | 0 | 407 |
| V/C Ratio(X) | 0.00 | 0.24 | 0.24 | 0.67 | 0.10 | | | | | 0.89 | 0.00 | 0.14 |
| Avail Cap(c_a), veh/h | 0 | 895 | 923 | 140 | 2212 | | | | | 1053 | 0 | 493 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.93 | 0.93 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 14.0 | 14.0 | 41.7 | 0.0 | 0.0 | | | | 35.7 | 0.0 | 28.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.6 | 0.6 | 6.1 | 0.1 | 0.0 | | | | 7.7 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.6 | 2.7 | 1.9 | 0.0 | 0.0 | | | | 9.8 | 0.0 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 14.6 | 14.6 | 47.8 | 0.1 | 0.0 | | | | 43.5 | 0.0 | 28.7 |
| LnGrp LOS | | B | B | D | A | | | | | D | | C |
| Approach Vol, veh/h | | 432 | | | 310 | | | | | | 830 | |
| Approach Delay, s/veh | | 14.6 | | | 12.6 | | | | | | 42.4 | |
| Approach LOS | | B | | | B | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.9 | 56.6 | | 31.6 | | 68.4 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 8.3 | 20.3 | | 31.2 | | 33.3 |
| Max Q Clear Time (g_c+I1), s | 6.5 | 8.8 | | 24.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.1 | | 1.6 | | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.9 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 80.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 88 | 2304 | 21 | 30 | 1916 | 130 | 68 | 42 | 121 | 116 | 9 | 65 |
| Future Vol, veh/h | 88 | 2304 | 21 | 30 | 1916 | 130 | 68 | 42 | 121 | 116 | 9 | 65 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 96 | 2504 | 23 | 33 | 2083 | 141 | 74 | 46 | 132 | 126 | 10 | 71 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2224 | 0 | 0 | 2527 | 0 | 0 | 4860 | 4996 | 2516 | 4937 | 4937 | 2153 |
| Stage 1 | - | - | - | - | - | - | 2707 | 2707 | - | 2218 | 2218 | - |
| Stage 2 | - | - | - | - | - | - | 2153 | 2289 | - | 2718 | 2718 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 234 | - | - | 178 | - | - | ~ 0 | ~ 1 | ~ 36 | ~ 0 | ~ 1 | ~ 60 |
| Stage 1 | - | - | - | - | - | - | ~ 29 | ~ 45 | - | ~ 58 | 81 | - |
| Stage 2 | - | - | - | - | - | - | ~ 63 | 74 | - | ~ 29 | 44 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 234 | - | - | 178 | - | - | ~ 0 | ~ 1 | ~ 36 | ~ 1 | ~ 1 | ~ 60 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 38 | ~ -40 | - | ~ -65 | ~ 9 | - |
| Stage 1 | - | - | - | - | - | - | ~ 29 | ~ 45 | - | ~ 58 | 81 | - |
| Stage 2 | - | - | - | - | - | - | - | 74 | - | ~ 1 | 44 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.12 | 0.43 | $ 1693.28 | 11.6 |
| HCM LOS | | | F | B |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 57 | ~ 66 | - | - | ~ 26 | - | - | 751 |
| HCM Lane V/C Ratio | 4.437 | 0.409 | - | - | 0.184 | - | - | 0.275 |
| HCM Control Delay (s/veh) | $ 1693.3 | 30.6 | 0 | - | 29.8 | 0 | - | 11.6 |
| HCM Lane LOS | F | D | A | - | D | A | - | B |
| HCM 95th %tile Q(veh) | 27.7 | 1.9 | - | - | 0.7 | - | - | 1.1 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 60 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 49 | 1296 | 31 | 53 | 982 | 19 | 25 | 32 | 94 | 11 | 7 | 41 |
| Future Vol, veh/h | 49 | 1296 | 31 | 53 | 982 | 19 | 25 | 32 | 94 | 11 | 7 | 41 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 51 | 1336 | 32 | 55 | 1012 | 20 | 26 | 33 | 97 | 11 | 7 | 42 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1035 | 0 | 0 | 1368 | 0 | 0 | 2072 | 2597 | 1352 | 2588 | 2604 | 519 |
| Stage 1 | - | - | - | - | - | - | 1453 | 1453 | - | 1134 | 1134 | - |
| Stage 2 | - | - | - | - | - | - | 619 | 1144 | - | 1454 | 1469 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 669 | - | - | 500 | - | - | 35 | ~ 25 | 183 | 14 | 24 | 503 |
| Stage 1 | - | - | - | - | - | - | 161 | 194 | - | 216 | 277 | - |
| Stage 2 | - | - | - | - | - | - | 444 | 274 | - | 161 | 191 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 667 | - | - | 500 | - | - | ~ 25 | ~ 20 | 183 | ~ 4 | 20 | 501 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 127 | 124 | - | ~ 2 | 104 | - |
| Stage 1 | - | - | - | - | - | - | 149 | 180 | - | 192 | 246 | - |
| Stage 2 | - | - | - | - | - | - | 351 | 243 | - | 57 | 176 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.39 | 0.66 | 129.81 | $ 2332.99 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 156 | 667 | - | - | 500 | - | - | 13 |
| HCM Lane V/C Ratio | 0.999 | 0.076 | - | - | 0.109 | - | - | 4.852 |
| HCM Control Delay (s/veh) | 129.8 | 10.8 | - | - | 13.1 | - | - | $ 2333 |
| HCM Lane LOS | F | B | - | - | B | - | - | F |
| HCM 95th %tile Q(veh) | 7.6 | 0.2 | - | - | 0.4 | - | - | 8.7 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 26.2 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 52 | 398 | 66 | 8 | 250 | 14 | 30 | 146 | 24 | 9 | 119 | 26 |
| Future Vol, veh/h | 52 | 398 | 66 | 8 | 250 | 14 | 30 | 146 | 24 | 9 | 119 | 26 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 56 | 428 | 71 | 9 | 269 | 15 | 32 | 157 | 26 | 10 | 128 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 39.8 | 16 | 14.7 | 13.4 |
| HCM LOS | E | C | B | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 15% | 10% | 3% | 6% |
| Vol Thru, % | 73% | 77% | 92% | 77% |
| Vol Right, % | 12% | 13% | 5% | 17% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 200 | 516 | 272 | 154 |
| LT Vol | 30 | 52 | 8 | 9 |
| Through Vol | 146 | 398 | 250 | 119 |
| RT Vol | 24 | 66 | 14 | 26 |
| Lane Flow Rate | 215 | 555 | 292 | 166 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.411 | 0.898 | 0.515 | 0.322 |
| Departure Headway (Hd) | 6.881 | 5.828 | 6.337 | 6.994 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 520 | 621 | 567 | 512 |
| Service Time | 4.951 | 3.881 | 4.403 | 5.071 |
| HCM Lane V/C Ratio | 0.413 | 0.894 | 0.515 | 0.324 |
| HCM Control Delay, s/veh | 14.7 | 39.8 | 16 | 13.4 |
| HCM Lane LOS | B | E | C | B |
| HCM 95th-tile Q | 2 | 11 | 2.9 | 1.4 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 93 | 1702 | 245 | 6 | 989 | 152 | 114 | 23 | 131 |
| Future Volume (vph) | 93 | 1702 | 245 | 6 | 989 | 152 | 114 | 23 | 131 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 16.4 | 37.0 | 37.0 | 39.0 | 59.6 | 15.2 | 25.0 | 19.0 | 28.8 |
| Total Split (%) | 13.7% | 30.8% | 30.8% | 32.5% | 49.7% | 12.7% | 20.8% | 15.8% | 24.0% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.5 | 48.0 | 48.0 | 5.4 | 38.3 | 11.0 | 26.9 | 6.3 | 15.3 |
| Actuated g/C Ratio | 0.10 | 0.52 | 0.52 | 0.06 | 0.41 | 0.12 | 0.29 | 0.07 | 0.17 |
| v/c Ratio | 0.59 | 1.01 | 0.30 | 0.07 | 0.74 | 0.83 | 0.25 | 0.22 | 0.63 |
| Control Delay (s/veh) | 58.2 | 45.6 | 7.1 | 50.8 | 27.6 | 77.0 | 31.7 | 51.7 | 45.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 58.2 | 45.6 | 7.1 | 50.8 | 27.6 | 77.0 | 31.7 | 51.7 | 45.1 |
| LOS | E | D | A | D | C | E | C | D | D |
| Approach Delay (s/veh) | | 41.5 | | | 27.8 | | 56.6 | | 45.9 |
| Approach LOS | | D | | | C | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 92.4 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.01 | |
| Intersection Signal Delay (s/veh): 39.0 | Intersection LOS: D |
| Intersection Capacity Utilization 86.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

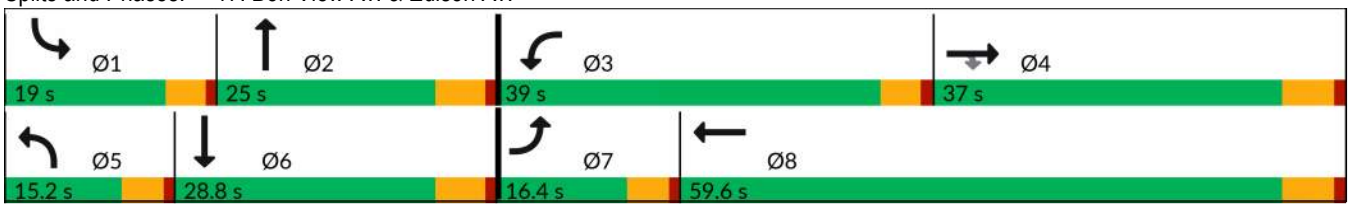

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 93 | 1702 | 245 | 6 | 989 | 10 | 152 | 114 | 10 | 23 | 131 | 46 |
| Future Volume (veh/h) | 93 | 1702 | 245 | 6 | 989 | 10 | 152 | 114 | 10 | 23 | 131 | 46 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 101 | 1850 | 239 | 7 | 1075 | -32 | 165 | 124 | -98 | 25 | 142 | 42 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 128 | 1618 | 722 | 15 | 1382 | 0 | 201 | 424 | 0 | 46 | 187 | 55 |
| Arrive On Green | 0.08 | 0.46 | 0.46 | 0.01 | 0.39 | 0.00 | 0.12 | 0.23 | 0.00 | 0.03 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1688 | 3554 | 1585 | 1688 | 3647 | 0 | 1688 | 1870 | 0 | 1688 | 1386 | 410 |
| Grp Volume(v), veh/h | 101 | 1850 | 239 | 7 | 1043 | 0 | 165 | 26 | 0 | 25 | 0 | 184 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1585 | 1688 | 1777 | 0 | 1688 | 1870 | 0 | 1688 | 0 | 1797 |
| Q Serve(g_s), s | 4.3 | 33.0 | 7.0 | 0.3 | 18.4 | 0.0 | 6.9 | 0.8 | 0.0 | 1.1 | 0.0 | 7.1 |
| Cycle Q Clear(g_c), s | 4.3 | 33.0 | 7.0 | 0.3 | 18.4 | 0.0 | 6.9 | 0.8 | 0.0 | 1.1 | 0.0 | 7.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 0.00 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 128 | 1618 | 722 | 15 | 1382 | 0 | 201 | 424 | 0 | 46 | 0 | 242 |
| V/C Ratio(X) | 0.79 | 1.14 | 0.33 | 0.46 | 0.75 | 0.00 | 0.82 | 0.06 | 0.00 | 0.54 | 0.00 | 0.76 |
| Avail Cap(c_a), veh/h | 275 | 1618 | 722 | 802 | 2641 | 0 | 247 | 506 | 0 | 336 | 0 | 581 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.9 | 19.7 | 12.6 | 35.7 | 19.1 | 0.0 | 31.1 | 22.0 | 0.0 | 34.8 | 0.0 | 30.2 |
| Incr Delay (d2), s/veh | 4.1 | 72.3 | 0.3 | 7.7 | 0.9 | 0.0 | 13.7 | 0.1 | 0.0 | 3.7 | 0.0 | 4.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.7 | 26.9 | 2.1 | 0.1 | 6.4 | 0.0 | 3.3 | 0.3 | 0.0 | 0.5 | 0.0 | 3.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 37.0 | 92.1 | 12.9 | 43.4 | 20.0 | 0.0 | 44.8 | 22.0 | 0.0 | 38.4 | 0.0 | 35.1 |
| LnGrp LOS | D | F | B | D | C | | D | C | | D | | D |
| Approach Vol, veh/h | | 2190 | | | 1050 | | | 191 | | | 209 | |
| Approach Delay, s/veh | | 80.9 | | | 20.2 | | | 41.7 | | | 35.5 | |
| Approach LOS | | F | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 6.6 | 21.8 | 5.3 | 38.8 | 13.2 | 15.2 | 10.1 | 34.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 14.4 | 19.6 | 34.4 | 31.2 | 10.6 | 23.4 | 11.8 | 53.8 |
| Max Q Clear Time (g_c+I1), s | 3.1 | 2.8 | 2.3 | 35.0 | 8.9 | 9.1 | 6.3 | 20.4 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 7.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 58.7 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 91.6 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 86 | 188 | 18 | 0 | 537 | 124 | 11 | 61 | 4 | 40 | 44 | 116 |
| Future Vol, veh/h | 86 | 188 | 18 | 0 | 537 | 124 | 11 | 61 | 4 | 40 | 44 | 116 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 105 | 229 | 22 | 0 | 655 | 151 | 13 | 74 | 5 | 49 | 54 | 141 |
| Number of Lanes | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 2 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 2 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 2 |
| HCM Control Delay, s/veh | 13.9 | 158 | 12.9 | 15.7 |
| HCM LOS | B | F | B | C |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|---|
| Vol Left, % | 14% | 48% | 0% | 0% | 20% |
| Vol Thru, % | 80% | 52% | 84% | 81% | 22% |
| Vol Right, % | 5% | 0% | 16% | 19% | 58% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 76 | 180 | 112 | 661 | 200 |
| LT Vol | 11 | 86 | 0 | 0 | 40 |
| Through Vol | 61 | 94 | 94 | 537 | 44 |
| RT Vol | 4 | 0 | 18 | 124 | 116 |
| Lane Flow Rate | 93 | 220 | 137 | 806 | 244 |
| Geometry Grp | 2 | 5 | 5 | 4a | 2 |
| Degree of Util (X) | 0.189 | 0.417 | 0.246 | 1.282 | 0.443 |
| Departure Headway (Hd) | 8.074 | 7.274 | 6.913 | 5.727 | 7.163 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 448 | 498 | 523 | 637 | 507 |
| Service Time | 6.074 | 4.974 | 4.613 | 3.775 | 5.163 |
| HCM Lane V/C Ratio | 0.208 | 0.442 | 0.262 | 1.265 | 0.481 |
| HCM Control Delay, s/veh | 12.9 | 15.1 | 11.9 | 158 | 15.7 |
| HCM Lane LOS | B | C | B | F | C |
| HCM 95th-tile Q | 0.7 | 2 | 1 | 31.5 | 2.2 |

| Lane Group | EBT | WBT | Ø6 |
|---|---|---|---|
| Lane Configurations | | | |
| Traffic Volume (vph) | 2305 | 1880 | |
| Future Volume (vph) | 2305 | 1880 | |
| Turn Type | NA | NA | |
| Protected Phases | 4 | 8 | 6 |
| Permitted Phases | | | |
| Detector Phase | 4 | 8 | |
| Switch Phase | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 5.0 |
| Minimum Split (s) | 23.8 | 23.8 | 22.6 |
| Total Split (s) | 88.0 | 88.0 | 32.0 |
| Total Split (%) | 73.3% | 73.3% | 27% |
| Yellow Time (s) | 4.8 | 4.8 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | |
| Total Lost Time (s) | 5.8 | 5.8 | |
| Lead/Lag | | | |
| Lead-Lag Optimize? | | | |
| Recall Mode | None | None | None |
| Act Effct Green (s) | 87.7 | 87.7 | |
| Actuated g/C Ratio | 0.95 | 0.95 | |
| v/c Ratio | 0.75 | 0.61 | |
| Control Delay (s/veh) | 5.7 | 3.4 | |
| Queue Delay | 0.0 | 0.0 | |
| Total Delay (s/veh) | 5.7 | 3.4 | |
| LOS | A | A | |
| Approach Delay (s/veh) | 5.7 | 3.4 | |
| Approach LOS | A | A | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 92.5 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.75 | |
| Intersection Signal Delay (s/veh): 4.7 | Intersection LOS: A |
| Intersection Capacity Utilization 68.5% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 19: Edison Av. & Cucamonga Av.

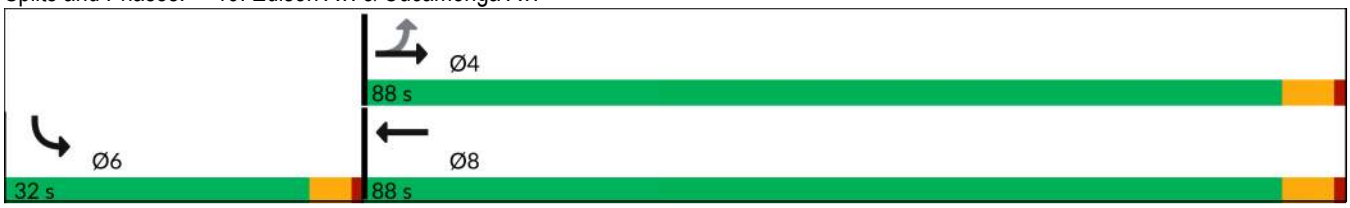

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 2305 | 1880 | 0 | 0 | 0 |
| Future Volume (veh/h) | 0 | 2305 | 1880 | 0 | 0 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 2505 | 2043 | 0 | 0 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 110 | 3240 | 3240 | 0 | 0 | 0 |
| Arrive On Green | 0.00 | 0.91 | 0.91 | 0.00 | 0.00 | 0.00 |
| Sat Flow, veh/h | 206 | 3647 | 3741 | 0 | 0 | 0 |
| Grp Volume(v), veh/h | 0 | 2505 | 2043 | 0 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 206 | 1777 | 1777 | 0 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 13.9 | 7.8 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 13.9 | 7.8 | 0.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | | 0.00 | 0.00 | 0.00 |
| Lane Grp Cap(c), veh/h | 110 | 3240 | 3240 | 0 | 0 | 0 |
| V/C Ratio(X) | 0.00 | 0.77 | 0.63 | 0.00 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 179 | 4443 | 4443 | 0 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.9 | 0.6 | 0.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.6 | 0.2 | 0.0 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.3 | 0.1 | 0.0 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 1.5 | 0.8 | 0.0 | 0.0 | 0.0 |
| LnGrp LOS | | A | A | | | |
| Approach Vol, veh/h | | 2505 | 2043 | | 0 | |
| Approach Delay, s/veh | | 1.5 | 0.8 | | 0.0 | |
| Approach LOS | | A | A | | | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 65.7 | 0.0 | 65.7 |
| Change Period (Y+Rc), s | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 82.2 | 27.4 | 82.2 |
| Max Q Clear Time (g_c+I1), s | 15.9 | 0.0 | 9.8 |
| Green Ext Time (p_c), s | 44.1 | 0.0 | 31.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 1.2 |
| HCM 7th LOS | A |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 246 | 227 | 781 | 1600 | 828 |
| Future Volume (vph) | 3 | 246 | 227 | 781 | 1600 | 828 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 24.8 | 24.8 | 22.0 | 65.2 | 43.2 | 43.2 |
| Total Split (%) | 27.6% | 27.6% | 24.4% | 72.4% | 48.0% | 48.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 14.6 | 14.6 | 15.4 | 63.8 | 42.6 | 42.6 |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.17 | 0.71 | 0.47 | 0.47 |
| v/c Ratio | 0.68 | 0.56 | 0.80 | 0.31 | 0.96 | 0.77 |
| Control Delay (s/veh) | 47.2 | 11.4 | 63.7 | 0.9 | 40.5 | 10.3 |
| Queue Delay | 5.6 | 0.0 | 0.0 | 0.0 | 2.8 | 0.0 |
| Total Delay (s/veh) | 52.8 | 11.4 | 63.7 | 0.9 | 43.3 | 10.3 |
| LOS | D | B | E | A | D | B |
| Approach Delay (s/veh) | 29.6 | | | 15.0 | 32.0 | |
| Approach LOS | C | | | B | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.96 | |
| Intersection Signal Delay (s/veh): 27.3 | Intersection LOS: C |
| Intersection Capacity Utilization 96.4% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

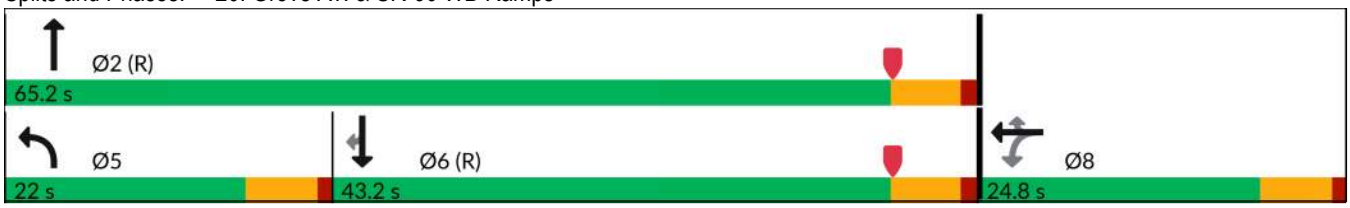

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 190 | 3 | 246 | 227 | 781 | 0 | 0 | 1600 | 828 |
| Future Volume (veh/h) | 0 | 0 | 0 | 190 | 3 | 246 | 227 | 781 | 0 | 0 | 1600 | 828 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 192 | 3 | 112 | 229 | 789 | 0 | 0 | 1616 | 653 |
| Peak Hour Factor | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 238 | 4 | 215 | 260 | 2614 | 0 | 0 | 1837 | 799 |
| Arrive On Green | | | | 0.14 | 0.14 | 0.14 | 0.21 | 0.98 | 0.00 | 0.00 | 0.52 | 0.52 |
| Sat Flow, veh/h | | | | 1755 | 27 | 1585 | 1688 | 3647 | 0 | 0 | 3647 | 1546 |
| Grp Volume(v), veh/h | | | | 195 | 0 | 112 | 229 | 789 | 0 | 0 | 1616 | 653 |
| Grp Sat Flow(s),veh/h/ln | | | | 1783 | 0 | 1585 | 1688 | 1777 | 0 | 0 | 1777 | 1546 |
| Q Serve(g_s), s | | | | 9.6 | 0.0 | 5.9 | 11.8 | 0.6 | 0.0 | 0.0 | 36.2 | 31.8 |
| Cycle Q Clear(g_c), s | | | | 9.6 | 0.0 | 5.9 | 11.8 | 0.6 | 0.0 | 0.0 | 36.2 | 31.8 |
| Prop In Lane | | | | 0.98 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 241 | 0 | 215 | 260 | 2614 | 0 | 0 | 1837 | 799 |
| V/C Ratio(X) | | | | 0.81 | 0.00 | 0.52 | 0.88 | 0.30 | 0.00 | 0.00 | 0.88 | 0.82 |
| Avail Cap(c_a), veh/h | | | | 376 | 0 | 335 | 304 | 2614 | 0 | 0 | 1837 | 799 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.20 | 0.20 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 37.8 | 0.0 | 36.2 | 35.0 | 0.3 | 0.0 | 0.0 | 19.2 | 18.2 |
| Incr Delay (d2), s/veh | | | | 5.6 | 0.0 | 1.5 | 5.1 | 0.1 | 0.0 | 0.0 | 6.4 | 9.0 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.3 | 0.0 | 2.3 | 4.7 | 0.1 | 0.0 | 0.0 | 14.2 | 11.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 43.4 | 0.0 | 37.7 | 40.0 | 0.3 | 0.0 | 0.0 | 25.6 | 27.2 |
| LnGrp LOS | | | | D | | D | D | A | | | C | C |
| Approach Vol, veh/h | | | | | 307 | | | 1018 | | | 2269 | |
| Approach Delay, s/veh | | | | | 41.3 | | | 9.3 | | | 26.1 | |
| Approach LOS | | | | | D | | | A | | | C | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 72.0 | | 19.7 | 52.3 | | 18.0 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 59.4 | | 16.2 | 37.4 | | 19.0 |
| Max Q Clear Time (g_c+I1), s | 2.6 | | 13.8 | 38.2 | | 11.6 |
| Green Ext Time (p_c), s | 4.6 | | 0.1 | 0.0 | | 0.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.6 |
| HCM 7th LOS | C |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 3 | 182 | 708 | 644 | 1141 |
| Future Volume (vph) | 3 | 182 | 708 | 644 | 1141 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 24.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 35.8% | 26.7% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 19.9 | 19.9 | 26.4 | 26.2 | 57.5 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.29 | 0.29 | 0.64 |
| v/c Ratio | 0.78 | 0.45 | 0.95 | 1.36 | 0.52 |
| Control Delay (s/veh) | 46.6 | 17.5 | 49.4 | 196.6 | 24.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 |
| Total Delay (s/veh) | 46.6 | 17.5 | 49.4 | 196.6 | 26.5 |
| LOS | D | B | D | F | C |
| Approach Delay (s/veh) | 35.5 | | 49.4 | | 87.9 |
| Approach LOS | D | | D | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.36 | |
| Intersection Signal Delay (s/veh): 68.7 | Intersection LOS: E |
| Intersection Capacity Utilization 96.4% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 294 | 3 | 182 | 0 | 0 | 0 | 0 | 708 | 242 | 644 | 1141 | 0 |
| Future Volume (veh/h) | 294 | 3 | 182 | 0 | 0 | 0 | 0 | 708 | 242 | 644 | 1141 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 303 | 3 | 102 | | | | 0 | 730 | 186 | 664 | 1176 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 352 | 3 | 316 | | | | 0 | 1103 | 281 | 356 | 2347 | 0 |
| Arrive On Green | 0.20 | 0.20 | 0.20 | | | | 0.00 | 0.39 | 0.39 | 0.42 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1765 | 17 | 1583 | | | | 0 | 2894 | 714 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 306 | 0 | 102 | | | | 0 | 463 | 453 | 664 | 1176 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1782 | 0 | 1583 | | | | 0 | 1777 | 1738 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 14.9 | 0.0 | 5.0 | | | | 0.0 | 19.2 | 19.2 | 19.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.9 | 0.0 | 5.0 | | | | 0.0 | 19.2 | 19.2 | 19.0 | 0.0 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 0.41 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 355 | 0 | 316 | | | | 0 | 700 | 684 | 356 | 2347 | 0 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.32 | | | | 0.00 | 0.66 | 0.66 | 1.86 | 0.50 | 0.00 |
| Avail Cap(c_a), veh/h | 535 | 0 | 475 | | | | 0 | 700 | 684 | 356 | 2347 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.17 | 0.17 | 0.00 |
| Uniform Delay (d), s/veh | 34.8 | 0.0 | 30.8 | | | | 0.0 | 22.4 | 22.4 | 26.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 6.1 | 0.0 | 0.2 | | | | 0.0 | 4.9 | 5.0 | 390.6 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.7 | 0.0 | 1.8 | | | | 0.0 | 8.2 | 8.1 | 43.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.9 | 0.0 | 31.0 | | | | 0.0 | 27.2 | 27.3 | 416.6 | 0.1 | 0.0 |
| LnGrp LOS | D | | C | | | | | C | C | F | A | |
| Approach Vol, veh/h | | 408 | | | | | | 916 | | | 1840 | |
| Approach Delay, s/veh | | 38.4 | | | | | | 27.3 | | | 150.4 | |
| Approach LOS | | D | | | | | | C | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 41.3 | | 24.7 | | 65.3 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 19.0 | 26.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 21.2 | | 16.9 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 2.1 | | 0.9 | | 8.0 |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 100.3 |
| HCM 7th LOS | | | F |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 139 | 233 | 33 | 177 | 170 | 632 | 164 | 838 |
| Future Volume (vph) | 139 | 233 | 33 | 177 | 170 | 632 | 164 | 838 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.6 | 29.8 | 15.6 | 29.8 | 15.6 | 29.0 | 15.6 | 29.0 |
| Total Split (%) | 17.3% | 33.1% | 17.3% | 33.1% | 17.3% | 32.2% | 17.3% | 32.2% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 19.5 | 6.3 | 11.7 | 10.9 | 23.4 | 10.7 | 23.3 |
| Actuated g/C Ratio | 0.13 | 0.25 | 0.08 | 0.15 | 0.14 | 0.31 | 0.14 | 0.30 |
| v/c Ratio | 0.69 | 0.43 | 0.26 | 0.51 | 0.78 | 0.72 | 0.76 | 1.04 |
| Control Delay (s/veh) | 50.6 | 18.7 | 38.7 | 21.6 | 57.1 | 28.9 | 55.7 | 67.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.6 | 18.7 | 38.7 | 21.6 | 57.1 | 28.9 | 55.7 | 67.5 |
| LOS | D | B | D | C | E | C | E | E |
| Approach Delay (s/veh) | | 27.4 | | 23.4 | | 34.3 | | 65.8 |
| Approach LOS | | C | | C | | C | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 76.7 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.04 | |
| Intersection Signal Delay (s/veh): 44.8 | Intersection LOS: D |
| Intersection Capacity Utilization 74.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

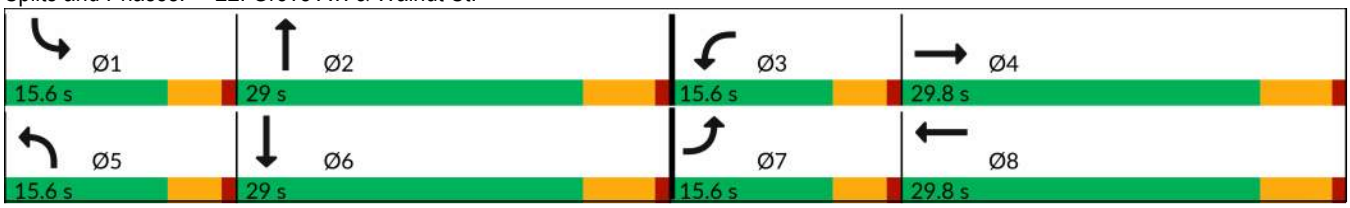

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 139 | 233 | 137 | 33 | 177 | 105 | 170 | 632 | 82 | 164 | 838 | 179 |
| Future Volume (veh/h) | 139 | 233 | 137 | 33 | 177 | 105 | 170 | 632 | 82 | 164 | 838 | 179 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 151 | 253 | 124 | 36 | 192 | 69 | 185 | 687 | 69 | 178 | 911 | 118 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 186 | 523 | 248 | 60 | 386 | 134 | 223 | 1047 | 105 | 215 | 1001 | 130 |
| Arrive On Green | 0.11 | 0.22 | 0.22 | 0.04 | 0.15 | 0.15 | 0.13 | 0.32 | 0.32 | 0.13 | 0.32 | 0.32 |
| Sat Flow, veh/h | 1688 | 2330 | 1105 | 1688 | 2574 | 892 | 1688 | 3260 | 327 | 1688 | 3158 | 409 |
| Grp Volume(v), veh/h | 151 | 191 | 186 | 36 | 130 | 131 | 185 | 374 | 382 | 178 | 513 | 516 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1657 | 1688 | 1777 | 1688 | 1688 | 1777 | 1810 | 1688 | 1777 | 1790 |
| Q Serve(g_s), s | 6.3 | 6.7 | 7.0 | 1.5 | 4.8 | 5.1 | 7.6 | 12.9 | 13.0 | 7.4 | 19.8 | 19.8 |
| Cycle Q Clear(g_c), s | 6.3 | 6.7 | 7.0 | 1.5 | 4.8 | 5.1 | 7.6 | 12.9 | 13.0 | 7.4 | 19.8 | 19.8 |
| Prop In Lane | 1.00 | | 0.67 | 1.00 | | 0.53 | 1.00 | | 0.18 | 1.00 | | 0.23 |
| Lane Grp Cap(c), veh/h | 186 | 399 | 372 | 60 | 266 | 253 | 223 | 571 | 582 | 215 | 563 | 567 |
| V/C Ratio(X) | 0.81 | 0.48 | 0.50 | 0.60 | 0.49 | 0.52 | 0.83 | 0.66 | 0.66 | 0.83 | 0.91 | 0.91 |
| Avail Cap(c_a), veh/h | 260 | 596 | 556 | 260 | 596 | 567 | 260 | 577 | 587 | 260 | 577 | 581 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.1 | 24.1 | 24.2 | 34.0 | 27.9 | 28.0 | 30.3 | 20.9 | 20.9 | 30.4 | 23.4 | 23.4 |
| Incr Delay (d2), s/veh | 8.7 | 0.9 | 1.0 | 3.5 | 1.4 | 1.6 | 15.6 | 2.7 | 2.6 | 14.2 | 18.4 | 18.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 | 2.6 | 2.6 | 0.6 | 2.0 | 2.0 | 3.8 | 5.1 | 5.2 | 3.6 | 10.3 | 10.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 39.8 | 25.0 | 25.3 | 37.4 | 29.3 | 29.6 | 45.8 | 23.5 | 23.5 | 44.6 | 41.8 | 41.7 |
| LnGrp LOS | D | C | C | D | C | C | D | C | C | D | D | D |
| Approach Vol, veh/h | | 528 | | | 297 | | | 941 | | | 1207 | |
| Approach Delay, s/veh | | 29.3 | | | 30.4 | | | 27.9 | | | 42.2 | |
| Approach LOS | | C | | | C | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.7 | 28.8 | 7.2 | 21.9 | 14.0 | 28.5 | 12.5 | 16.5 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.0 | 23.2 | 11.0 | 24.0 | 11.0 | 23.2 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 9.4 | 15.0 | 3.5 | 9.0 | 9.6 | 21.8 | 8.3 | 7.1 |
| Green Ext Time (p_c), s | 0.0 | 2.7 | 0.0 | 1.7 | 0.0 | 0.9 | 0.0 | 1.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 34.2 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 123 | 1226 | 146 | 961 | 28 | 466 | 166 | 563 | 127 |
| Future Volume (vph) | 123 | 1226 | 146 | 961 | 28 | 466 | 166 | 563 | 127 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.7 | 24.0 | 10.3 | 24.6 | 6.2 | 22.8 | 10.6 | 33.2 | 33.2 |
| Actuated g/C Ratio | 0.11 | 0.27 | 0.12 | 0.28 | 0.07 | 0.26 | 0.12 | 0.37 | 0.37 |
| v/c Ratio | 0.69 | 2.67 | 0.78 | 1.36 | 0.25 | 1.23 | 0.86 | 0.83 | 0.19 |
| Control Delay (s/veh) | 58.6 | 775.2 | 66.2 | 197.7 | 44.3 | 151.5 | 75.6 | 40.6 | 4.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 58.6 | 775.2 | 66.2 | 197.7 | 44.3 | 151.5 | 75.6 | 40.6 | 4.0 |
| LOS | E | F | E | F | D | F | E | D | A |
| Approach Delay (s/veh) | | 713.0 | | 184.2 | | 146.4 | | 41.9 | |
| Approach LOS | | F | | F | | F | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 88.9 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.67 | |
| Intersection Signal Delay (s/veh): 325.5 | Intersection LOS: F |
| Intersection Capacity Utilization 135.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

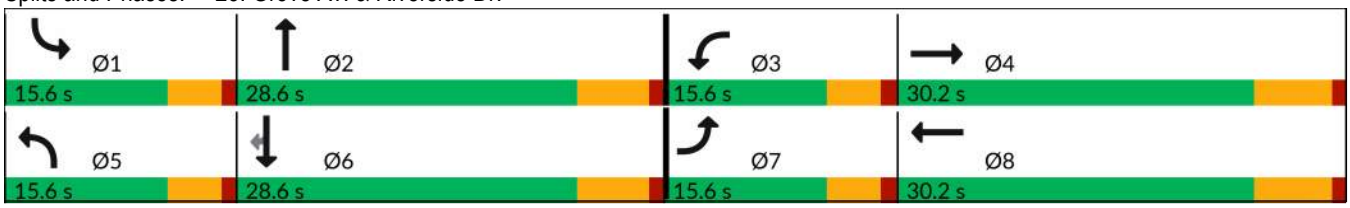

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 123 | 1226 | 71 | 146 | 961 | 321 | 28 | 466 | 98 | 166 | 563 | 127 |
| Future Volume (veh/h) | 123 | 1226 | 71 | 146 | 961 | 321 | 28 | 466 | 98 | 166 | 563 | 127 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 127 | 1264 | 65 | 151 | 991 | 280 | 29 | 480 | 89 | 171 | 580 | 82 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 156 | 480 | 25 | 182 | 785 | 221 | 49 | 397 | 74 | 203 | 655 | 555 |
| Arrive On Green | 0.09 | 0.27 | 0.27 | 0.11 | 0.29 | 0.29 | 0.03 | 0.26 | 0.26 | 0.12 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1688 | 1763 | 91 | 1688 | 2727 | 767 | 1688 | 1535 | 285 | 1688 | 1870 | 1585 |
| Grp Volume(v), veh/h | 127 | 0 | 1329 | 151 | 644 | 627 | 29 | 0 | 569 | 171 | 580 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1854 | 1688 | 1777 | 1717 | 1688 | 0 | 1819 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 6.5 | 0.0 | 24.0 | 7.7 | 25.3 | 25.3 | 1.5 | 0.0 | 22.8 | 8.7 | 25.7 | 3.1 |
| Cycle Q Clear(g_c), s | 6.5 | 0.0 | 24.0 | 7.7 | 25.3 | 25.3 | 1.5 | 0.0 | 22.8 | 8.7 | 25.7 | 3.1 |
| Prop In Lane | 1.00 | | 0.05 | 1.00 | | 0.45 | 1.00 | | 0.16 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 156 | 0 | 505 | 182 | 511 | 494 | 49 | 0 | 471 | 203 | 655 | 555 |
| V/C Ratio(X) | 0.81 | 0.00 | 2.63 | 0.83 | 1.26 | 1.27 | 0.60 | 0.00 | 1.21 | 0.84 | 0.89 | 0.15 |
| Avail Cap(c_a), veh/h | 211 | 0 | 505 | 211 | 511 | 494 | 211 | 0 | 471 | 211 | 655 | 555 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.2 | 0.0 | 32.0 | 38.5 | 31.4 | 31.4 | 42.3 | 0.0 | 32.6 | 37.9 | 27.0 | 19.6 |
| Incr Delay (d2), s/veh | 11.8 | 0.0 | 739.6 | 18.5 | 131.9 | 136.4 | 4.3 | 0.0 | 112.3 | 23.5 | 13.8 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 0.0 | 113.5 | 3.9 | 28.5 | 28.2 | 0.7 | 0.0 | 23.9 | 4.7 | 12.9 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 51.0 | 0.0 | 771.6 | 57.0 | 163.2 | 167.8 | 46.5 | 0.0 | 144.9 | 61.4 | 40.7 | 19.7 |
| LnGrp LOS | D | | F | E | F | F | D | | F | E | D | B |
| Approach Vol, veh/h | | 1456 | | | 1422 | | | 598 | | | 833 | |
| Approach Delay, s/veh | | 708.8 | | | 153.9 | | | 140.2 | | | 42.9 | |
| Approach LOS | | F | | | F | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.2 | 28.6 | 14.1 | 30.2 | 7.1 | 36.6 | 12.8 | 31.5 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 10.7 | 24.8 | 9.7 | 26.0 | 3.5 | 27.7 | 8.5 | 27.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 318.0 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 425 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 55 | 507 | 55 | 51 | 380 | 72 | 58 | 503 | 67 | 85 | 685 | 25 |
| Future Vol, veh/h | 55 | 507 | 55 | 51 | 380 | 72 | 58 | 503 | 67 | 85 | 685 | 25 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 57 | 528 | 57 | 53 | 396 | 75 | 60 | 524 | 70 | 89 | 714 | 26 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 379.5 | 252.6 | 393.5 | 594.4 |
| HCM LOS | F | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 9% | 9% | 10% | 11% |
| Vol Thru, % | 80% | 82% | 76% | 86% |
| Vol Right, % | 11% | 9% | 14% | 3% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 628 | 617 | 503 | 795 |
| LT Vol | 58 | 55 | 51 | 85 |
| Through Vol | 503 | 507 | 380 | 685 |
| RT Vol | 67 | 55 | 72 | 25 |
| Lane Flow Rate | 654 | 643 | 524 | 828 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.742 | 1.713 | 1.392 | 2.216 |
| Departure Headway (Hd) | 18.222 | 17.686 | 19.658 | 16.157 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 209 | 212 | 189 | 232 |
| Service Time | 16.222 | 15.686 | 17.658 | 14.157 |
| HCM Lane V/C Ratio | 3.129 | 3.033 | 2.772 | 3.569 |
| HCM Control Delay, s/veh | 393.5 | 379.5 | 252.6 | 594.4 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 23.8 | 23.7 | 15.2 | 38.7 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 278.1 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 106 | 275 | 52 | 10 | 130 | 52 | 68 | 511 | 55 | 120 | 568 | 72 |
| Future Vol, veh/h | 106 | 275 | 52 | 10 | 130 | 52 | 68 | 511 | 55 | 120 | 568 | 72 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 113 | 293 | 55 | 11 | 138 | 55 | 72 | 544 | 59 | 128 | 604 | 77 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 105.2 | 32.1 | 293 | 426.4 |
| HCM LOS | F | D | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 11% | 24% | 5% | 16% |
| Vol Thru, % | 81% | 64% | 68% | 75% |
| Vol Right, % | 9% | 12% | 27% | 9% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 634 | 433 | 192 | 760 |
| LT Vol | 68 | 106 | 10 | 120 |
| Through Vol | 511 | 275 | 130 | 568 |
| RT Vol | 55 | 52 | 52 | 72 |
| Lane Flow Rate | 674 | 461 | 204 | 809 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.562 | 1.068 | 0.538 | 1.874 |
| Departure Headway (Hd) | 10.559 | 11.385 | 13.965 | 9.915 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 351 | 322 | 261 | 372 |
| Service Time | 8.559 | 9.385 | 11.965 | 7.915 |
| HCM Lane V/C Ratio | 1.92 | 1.432 | 0.782 | 2.175 |
| HCM Control Delay, s/veh | 293 | 105.2 | 32.1 | 426.4 |
| HCM Lane LOS | F | F | D | F |
| HCM 95th-tile Q | 30.5 | 12.7 | 2.9 | 45.3 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 119 | 1627 | 43 | 7 | 884 | 72 | 137 | 399 | 160 | 430 |
| Future Volume (vph) | 119 | 1627 | 43 | 7 | 884 | 72 | 137 | 399 | 160 | 430 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 20.3 | 48.0 | 48.0 | 22.2 | 49.9 | 49.9 | 18.4 | 24.8 | 25.0 | 31.4 |
| Total Split (%) | 16.9% | 40.0% | 40.0% | 18.5% | 41.6% | 41.6% | 15.3% | 20.7% | 20.8% | 26.2% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.8 | 52.6 | 52.6 | 6.2 | 37.4 | 37.4 | 12.8 | 23.1 | 16.0 | 26.2 |
| Actuated g/C Ratio | 0.12 | 0.48 | 0.48 | 0.06 | 0.34 | 0.34 | 0.12 | 0.21 | 0.15 | 0.24 |
| v/c Ratio | 0.66 | 1.04 | 0.06 | 0.09 | 0.80 | 0.12 | 0.76 | 1.15 | 0.72 | 1.28 |
| Control Delay (s/veh) | 64.8 | 62.7 | 0.1 | 55.0 | 38.7 | 0.4 | 73.6 | 133.3 | 62.5 | 180.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 64.8 | 62.7 | 0.1 | 55.0 | 38.7 | 0.4 | 73.6 | 133.3 | 62.5 | 180.1 |
| LOS | E | E | A | D | D | A | E | F | E | F |
| Approach Delay (s/veh) | | 61.3 | | | 36.0 | | | 118.4 | | 152.3 |
| Approach LOS | | E | | | D | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.28 | |
| Intersection Signal Delay (s/veh): 78.6 | Intersection LOS: E |
| Intersection Capacity Utilization 102.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 119 | 1627 | 43 | 7 | 884 | 72 | 137 | 399 | 13 | 160 | 430 | 89 |
| Future Volume (veh/h) | 119 | 1627 | 43 | 7 | 884 | 72 | 137 | 399 | 13 | 160 | 430 | 89 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 129 | 1768 | -18 | 8 | 961 | 2 | 149 | 434 | -51 | 174 | 467 | 15 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 158 | 1497 | 668 | 17 | 1199 | 535 | 179 | 454 | 0 | 207 | 468 | 15 |
| Arrive On Green | 0.09 | 0.63 | 0.00 | 0.01 | 0.51 | 0.34 | 0.11 | 0.24 | 0.00 | 0.12 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 | 1688 | 1870 | 0 | 1688 | 1802 | 58 |
| Grp Volume(v), veh/h | 129 | 1768 | -18 | 8 | 961 | 2 | 149 | 383 | 0 | 174 | 0 | 482 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 | 1688 | 1870 | 0 | 1688 | 0 | 1860 |
| Q Serve(g_s), s | 7.5 | 42.2 | 0.0 | 0.5 | 22.5 | 0.1 | 8.7 | 19.5 | 0.0 | 10.1 | 0.0 | 26.0 |
| Cycle Q Clear(g_c), s | 7.5 | 42.2 | 0.0 | 0.5 | 22.5 | 0.1 | 8.7 | 19.5 | 0.0 | 10.1 | 0.0 | 26.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.00 | 1.00 | | 0.03 |
| Lane Grp Cap(c), veh/h | 158 | 1497 | 668 | 17 | 1199 | 535 | 179 | 454 | 0 | 207 | 0 | 483 |
| V/C Ratio(X) | 0.82 | 1.18 | -0.03 | 0.48 | 0.80 | 0.00 | 0.83 | 0.84 | 0.00 | 0.84 | 0.00 | 1.00 |
| Avail Cap(c_a), veh/h | 264 | 1497 | 668 | 296 | 1564 | 698 | 232 | 454 | 0 | 344 | 0 | 483 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.6 | 18.5 | 0.0 | 49.3 | 22.0 | 22.0 | 43.9 | 36.1 | 0.0 | 43.0 | 0.0 | 37.1 |
| Incr Delay (d2), s/veh | 9.7 | 88.8 | 0.0 | 19.4 | 2.3 | 0.0 | 17.9 | 13.5 | 0.0 | 9.3 | 0.0 | 40.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 28.5 | 0.0 | 0.3 | 7.4 | 0.0 | 4.4 | 10.1 | 0.0 | 4.6 | 0.0 | 16.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 54.3 | 107.3 | 0.0 | 68.8 | 24.3 | 22.0 | 61.8 | 49.6 | 0.0 | 52.3 | 0.0 | 77.7 |
| LnGrp LOS | D | F | | E | C | C | E | D | | D | | E |
| Approach Vol, veh/h | | 1879 | | | 971 | | | 532 | | | 656 | |
| Approach Delay, s/veh | | 104.6 | | | 24.7 | | | 53.0 | | | 71.0 | |
| Approach LOS | | F | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.9 | 29.7 | 5.6 | 48.0 | 15.2 | 31.4 | 14.0 | 39.6 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 20.4 | 19.4 | 17.6 | 42.2 | 13.8 | 26.0 | 15.7 | 44.1 |
| Max Q Clear Time (g_c+I1), s | 12.1 | 21.5 | 2.5 | 44.2 | 10.7 | 28.0 | 9.5 | 24.5 |
| Green Ext Time (p_c), s | 0.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.1 | 6.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 73.1 |
| HCM 7th LOS | E |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 348.3 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 52 | 420 | 3 | 1 | 448 | 513 | 7 | 5 | 1 | 609 | 6 | 66 |
| Future Vol, veh/h | 52 | 420 | 3 | 1 | 448 | 513 | 7 | 5 | 1 | 609 | 6 | 66 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 60 | 483 | 3 | 1 | 515 | 590 | 8 | 6 | 1 | 700 | 7 | 76 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 105.3 | 513.6 | 19.1 | 290.5 |
| HCM LOS | F | F | C | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 54% | 11% | 0% | 89% |
| Vol Thru, % | 38% | 88% | 47% | 1% |
| Vol Right, % | 8% | 1% | 53% | 10% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 13 | 475 | 962 | 681 |
| LT Vol | 7 | 52 | 1 | 609 |
| Through Vol | 5 | 420 | 448 | 6 |
| RT Vol | 1 | 3 | 513 | 66 |
| Lane Flow Rate | 15 | 546 | 1106 | 783 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.04 | 1.082 | 2.081 | 1.569 |
| Departure Headway (Hd) | 15.494 | 10.389 | 8.438 | 8.884 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 233 | 355 | 442 | 415 |
| Service Time | 13.494 | 8.389 | 6.438 | 6.884 |
| HCM Lane V/C Ratio | 0.064 | 1.538 | 2.502 | 1.887 |
| HCM Control Delay, s/veh | 19.1 | 105.3 | 513.6 | 290.5 |
| HCM Lane LOS | C | F | F | F |
| HCM 95th-tile Q | 0.1 | 13.8 | 62.9 | 35.5 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.4 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 10 | 2408 | 2062 | 10 | 42 | 38 |
| Future Vol, veh/h | 10 | 2408 | 2062 | 10 | 42 | 38 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 2 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 11 | 2617 | 2241 | 11 | 46 | 41 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 2252 | 0 | - | 0 | 3577 | 2247 |
| Stage 1 | - | - | - | - | 2247 | - |
| Stage 2 | - | - | - | - | 1330 | - |
| Critical Hdwy | 4.13 | - | - | - | 6.63 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.83 | - |
| Follow-up Hdwy | 2.219 | - | - | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | 227 | - | - | - | ~ 5 | 53 |
| Stage 1 | - | - | - | - | 85 | - |
| Stage 2 | - | - | - | - | 212 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 227 | - | - | - | ~ 4 | 53 |
| Mov Cap-2 Maneuver | - | - | - | - | 62 | - |
| Stage 1 | - | - | - | - | 70 | - |
| Stage 2 | - | - | - | - | 212 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 3.86 | 0 | $ 421.94 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 15 | - | - | - | 57 |
| HCM Lane V/C Ratio | 0.048 | - | - | - | 1.518 |
| HCM Control Delay (s/veh) | 21.7 | 3.8 | - | - | $ 421.9 |
| HCM Lane LOS | C | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.2 | - | - | - | 7.9 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 58.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 45 | 1323 | 109 | 73 | 1283 | 31 | 116 | 29 | 159 | 9 | 8 | 20 |
| Future Vol, veh/h | 45 | 1323 | 109 | 73 | 1283 | 31 | 116 | 29 | 159 | 9 | 8 | 20 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 47 | 1378 | 114 | 76 | 1336 | 32 | 121 | 30 | 166 | 9 | 8 | 21 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1372 | 0 | 0 | 1492 | 0 | 0 | 2353 | 3052 | 746 | 2306 | 3093 | 687 |
| Stage 1 | - | - | - | - | - | - | 1529 | 1529 | - | 1508 | 1508 | - |
| Stage 2 | - | - | - | - | - | - | 824 | 1524 | - | 798 | 1585 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 496 | - | - | 446 | - | - | ~ 19 | ~ 12 | 356 | 21 | 12 | 389 |
| Stage 1 | - | - | - | - | - | - | 123 | 178 | - | 126 | 182 | - |
| Stage 2 | - | - | - | - | - | - | 333 | 179 | - | 346 | 167 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 495 | - | - | 446 | - | - | ~ 12 | ~ 9 | 356 | ~ 6 | 9 | 388 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 91 | 80 | - | 48 | 63 | - |
| Stage 1 | - | - | - | - | - | - | ~ 111 | 161 | - | 105 | 150 | - |
| Stage 2 | - | - | - | - | - | - | 247 | 148 | - | 136 | 151 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.4 | 0.77 | $ 600.01 | 60.7 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 146 | 495 | - | - | 446 | - | - | 102 |
| HCM Lane V/C Ratio | 2.173 | 0.095 | - | - | 0.17 | - | - | 0.38 |
| HCM Control Delay (s/veh) | $ 600 | 13 | - | - | 14.7 | - | - | 60.7 |
| HCM Lane LOS | F | B | - | - | B | - | - | F |
| HCM 95th %tile Q(veh) | 25.9 | 0.3 | - | - | 0.6 | - | - | 1.5 |

**Notes**

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 19.6 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 121 | 33 | 246 | 26 | 53 | 40 | 77 | 218 | 25 | 0 | 188 | 43 |
| Future Vol, veh/h | 121 | 33 | 246 | 26 | 53 | 40 | 77 | 218 | 25 | 0 | 188 | 43 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 136 | 37 | 276 | 29 | 60 | 45 | 87 | 245 | 28 | 0 | 211 | 48 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 24.1 | 12.3 | 20 | 15.2 |
| HCM LOS | C | B | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 24% | 30% | 22% | 0% |
| Vol Thru, % | 68% | 8% | 45% | 81% |
| Vol Right, % | 8% | 62% | 34% | 19% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 320 | 400 | 119 | 231 |
| LT Vol | 77 | 121 | 26 | 0 |
| Through Vol | 218 | 33 | 53 | 188 |
| RT Vol | 25 | 246 | 40 | 43 |
| Lane Flow Rate | 360 | 449 | 134 | 260 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.636 | 0.74 | 0.254 | 0.468 |
| Departure Headway (Hd) | 6.365 | 5.924 | 6.826 | 6.485 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 564 | 607 | 523 | 553 |
| Service Time | 4.432 | 3.984 | 4.914 | 4.559 |
| HCM Lane V/C Ratio | 0.638 | 0.74 | 0.256 | 0.47 |
| HCM Control Delay, s/veh | 20 | 24.1 | 12.3 | 15.2 |
| HCM Lane LOS | C | C | B | C |
| HCM 95th-tile Q | 4.5 | 6.4 | 1 | 2.5 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 22 | 1890 | 88 | 196 | 989 | 8 | 134 | 166 | 172 |
| Future Volume (vph) | 22 | 1890 | 88 | 196 | 989 | 8 | 134 | 166 | 172 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 10.3 | 51.0 | 51.0 | 16.2 | 56.9 | 28.6 | 31.9 | 20.9 | 24.2 |
| Total Split (%) | 8.6% | 42.5% | 42.5% | 13.5% | 47.4% | 23.8% | 26.6% | 17.4% | 20.2% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.4 | 45.4 | 45.4 | 11.6 | 57.7 | 5.4 | 15.2 | 14.2 | 32.0 |
| Actuated g/C Ratio | 0.05 | 0.42 | 0.42 | 0.11 | 0.54 | 0.05 | 0.14 | 0.13 | 0.30 |
| v/c Ratio | 0.27 | 2.47 | 0.12 | 1.11 | 1.26 | 0.10 | 0.66 | 0.77 | 0.34 |
| Control Delay (s/veh) | 59.5 | 682.6 | 0.3 | 145.1 | 151.3 | 53.6 | 53.2 | 68.6 | 31.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 59.5 | 682.6 | 0.3 | 145.1 | 151.3 | 53.6 | 53.2 | 68.6 | 31.2 |
| LOS | E | F | A | F | F | D | D | E | C |
| Approach Delay (s/veh) | | 645.6 | | | 150.5 | | 53.2 | | 48.9 |
| Approach LOS | | F | | | F | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 106.9 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.47 | |
| Intersection Signal Delay (s/veh): 389.1 | Intersection LOS: F |
| Intersection Capacity Utilization 146.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

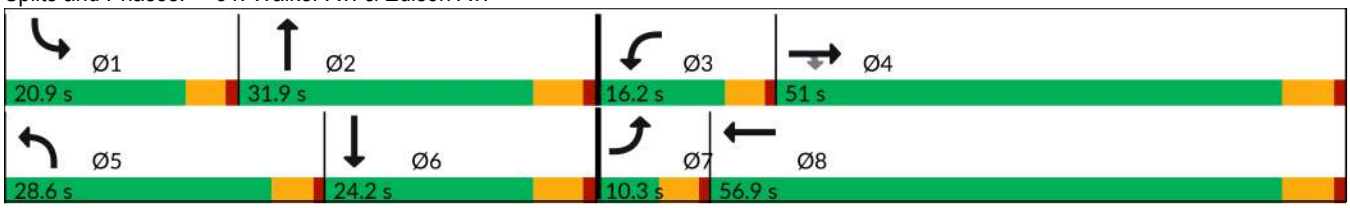

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 22 | 1890 | 88 | 196 | 989 | 214 | 8 | 134 | 37 | 166 | 172 | 13 |
| Future Volume (veh/h) | 22 | 1890 | 88 | 196 | 989 | 214 | 8 | 134 | 37 | 166 | 172 | 13 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 23 | 1948 | -38 | 202 | 1020 | 206 | 8 | 138 | 7 | 171 | 177 | 8 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 40 | 853 | 723 | 198 | 830 | 168 | 17 | 179 | 9 | 201 | 374 | 17 |
| Arrive On Green | 0.02 | 0.46 | 0.00 | 0.12 | 0.55 | 0.55 | 0.01 | 0.10 | 0.10 | 0.12 | 0.21 | 0.21 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1510 | 305 | 1688 | 1765 | 90 | 1688 | 1774 | 80 |
| Grp Volume(v), veh/h | 23 | 1948 | -38 | 202 | 0 | 1226 | 8 | 0 | 145 | 171 | 0 | 185 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1815 | 1688 | 0 | 1854 | 1688 | 0 | 1854 |
| Q Serve(g_s), s | 1.3 | 45.2 | 0.0 | 11.6 | 0.0 | 54.5 | 0.5 | 0.0 | 7.6 | 9.8 | 0.0 | 8.7 |
| Cycle Q Clear(g_c), s | 1.3 | 45.2 | 0.0 | 11.6 | 0.0 | 54.5 | 0.5 | 0.0 | 7.6 | 9.8 | 0.0 | 8.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.17 | 1.00 | | 0.05 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 40 | 853 | 723 | 198 | 0 | 998 | 17 | 0 | 188 | 201 | 0 | 391 |
| V/C Ratio(X) | 0.58 | 2.28 | -0.05 | 1.02 | 0.00 | 1.23 | 0.48 | 0.00 | 0.77 | 0.85 | 0.00 | 0.47 |
| Avail Cap(c_a), veh/h | 97 | 853 | 723 | 198 | 0 | 998 | 409 | 0 | 496 | 278 | 0 | 391 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.9 | 26.9 | 0.0 | 43.7 | 0.0 | 22.3 | 48.8 | 0.0 | 43.4 | 42.8 | 0.0 | 34.3 |
| Incr Delay (d2), s/veh | 4.8 | 581.1 | 0.0 | 70.0 | 0.0 | 111.9 | 7.5 | 0.0 | 6.5 | 12.5 | 0.0 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.6 | 156.0 | 0.0 | 8.5 | 0.0 | 51.1 | 0.2 | 0.0 | 3.6 | 4.5 | 0.0 | 3.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 52.7 | 608.1 | 0.0 | 113.7 | 0.0 | 134.2 | 56.3 | 0.0 | 49.9 | 55.3 | 0.0 | 35.2 |
| LnGrp LOS | D | F | | F | | F | E | | D | E | | D |
| Approach Vol, veh/h | | 1933 | | | 1428 | | | 153 | | | 356 | |
| Approach Delay, s/veh | | 613.4 | | | 131.3 | | | 50.2 | | | 44.8 | |
| Approach LOS | | F | | | F | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.4 | 15.5 | 16.2 | 51.0 | 5.6 | 26.3 | 6.9 | 60.3 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 16.3 | 26.5 | 11.6 | 45.2 | 24.0 | 18.8 | 5.7 | 51.1 |
| Max Q Clear Time (g_c+I1), s | 11.8 | 9.6 | 13.6 | 47.2 | 2.5 | 10.7 | 3.3 | 56.5 |
| Green Ext Time (p_c), s | 0.1 | 0.5 | 0.0 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 360.9 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 32.3 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 23 | 730 | 402 | 119 | 255 | 61 |
| Future Vol, veh/h | 23 | 730 | 402 | 119 | 255 | 61 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 27 | 849 | 467 | 138 | 297 | 71 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 606 | 0 | - | 0 | 1439 | 537 |
| Stage 1 | - | - | - | - | 537 | - |
| Stage 2 | - | - | - | - | 902 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 972 | - | - | - | ~ 146 | 544 |
| Stage 1 | - | - | - | - | 586 | - |
| Stage 2 | - | - | - | - | 396 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 972 | - | - | - | ~ 139 | 544 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 272 | - |
| Stage 1 | - | - | - | - | 556 | - |
| Stage 2 | - | - | - | - | 396 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.27 | 0 | 161.84 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 55 | - | - | - | 301 |
| HCM Lane V/C Ratio | 0.028 | - | - | - | 1.221 |
| HCM Control Delay (s/veh) | 8.8 | 0 | - | - | 161.8 |
| HCM Lane LOS | A | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.1 | - | - | - | 16.6 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 373 | 10 | 237 | 512 | 783 | 1753 | 381 |
| Future Volume (vph) | 373 | 10 | 237 | 512 | 783 | 1753 | 381 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 26.0 | 26.0 | 26.0 | 22.0 | 64.0 | 42.0 | 42.0 |
| Total Split (%) | 28.9% | 28.9% | 28.9% | 24.4% | 71.1% | 46.7% | 46.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 17.2 | 17.2 | 17.2 | 17.1 | 61.2 | 39.1 | 39.1 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.19 | 0.19 | 0.68 | 0.43 | 0.43 |
| v/c Ratio | 0.75 | 0.73 | 0.47 | 0.95 | 0.24 | 0.68 | 0.48 |
| Control Delay (s/veh) | 50.0 | 46.0 | 9.2 | 56.1 | 1.2 | 22.4 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.0 | 46.0 | 9.2 | 56.1 | 1.2 | 22.4 | 7.5 |
| LOS | D | D | A | E | A | C | A |
| Approach Delay (s/veh) | | 35.8 | | | 22.9 | 19.7 | |
| Approach LOS | | D | | | C | B | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 23.2 | Intersection LOS: C |
| Intersection Capacity Utilization 77.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

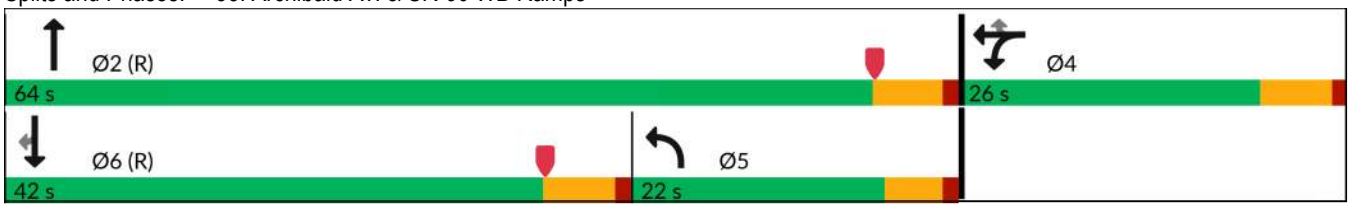

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 373 | 10 | 237 | 512 | 783 | 0 | 0 | 1753 | 381 |
| Future Volume (veh/h) | 0 | 0 | 0 | 373 | 10 | 237 | 512 | 783 | 0 | 0 | 1753 | 381 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1673 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 444 | 0 | 85 | 551 | 842 | 0 | 0 | 1885 | 287 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 545 | 0 | 256 | 830 | 3623 | 0 | 0 | 2424 | 583 |
| Arrive On Green | | | | 0.16 | 0.00 | 0.16 | 0.18 | 0.48 | 0.00 | 0.00 | 0.38 | 0.38 |
| Sat Flow, veh/h | | | | 3375 | 0 | 1585 | 3092 | 5274 | 0 | 0 | 6696 | 1547 |
| Grp Volume(v), veh/h | | | | 444 | 0 | 85 | 551 | 842 | 0 | 0 | 1885 | 287 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1585 | 1546 | 1702 | 0 | 0 | 1609 | 1547 |
| Q Serve(g_s), s | | | | 11.4 | 0.0 | 4.3 | 14.9 | 8.8 | 0.0 | 0.0 | 23.2 | 12.8 |
| Cycle Q Clear(g_c), s | | | | 11.4 | 0.0 | 4.3 | 14.9 | 8.8 | 0.0 | 0.0 | 23.2 | 12.8 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 545 | 0 | 256 | 830 | 3623 | 0 | 0 | 2424 | 583 |
| V/C Ratio(X) | | | | 0.81 | 0.00 | 0.33 | 0.66 | 0.23 | 0.00 | 0.00 | 0.78 | 0.49 |
| Avail Cap(c_a), veh/h | | | | 758 | 0 | 356 | 830 | 3623 | 0 | 0 | 2588 | 622 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.83 | 0.83 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 36.4 | 0.0 | 33.4 | 33.1 | 9.2 | 0.0 | 0.0 | 24.7 | 21.5 |
| Incr Delay (d2), s/veh | | | | 4.8 | 0.0 | 0.8 | 1.3 | 0.1 | 0.0 | 0.0 | 2.5 | 3.0 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 4.8 | 0.0 | 4.0 | 5.8 | 2.7 | 0.0 | 0.0 | 8.4 | 4.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 41.2 | 0.0 | 34.2 | 34.5 | 9.3 | 0.0 | 0.0 | 27.3 | 24.4 |
| LnGrp LOS | | | | D | | C | C | A | | | C | C |
| Approach Vol, veh/h | | | | | 529 | | | 1393 | | | 2172 | |
| Approach Delay, s/veh | | | | | 40.1 | | | 19.2 | | | 26.9 | |
| Approach LOS | | | | | D | | | B | | | C | |

| Timer - Assigned Phs | 2 | | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 69.7 | | 20.3 | 30.0 | 39.7 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 58.2 | | 20.2 | 17.0 | * 36 |
| Max Q Clear Time (g_c+I1), s | 10.8 | | 13.4 | 16.9 | 25.2 |
| Green Ext Time (p_c), s | 6.3 | | 1.1 | 0.0 | 8.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 26.0 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 188 | 1 | 498 | 1002 | 517 | 656 | 1457 |
| Future Volume (vph) | 188 | 1 | 498 | 1002 | 517 | 656 | 1457 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 40.0 | 40.0 | 23.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 44.4% | 44.4% | 25.6% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 19.7 | 19.7 | 19.7 | 28.7 | 28.7 | 25.0 | 58.7 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.32 | 0.32 | 0.28 | 0.65 |
| v/c Ratio | 0.53 | 0.81 | 0.70 | 0.53 | 0.64 | 0.83 | 0.48 |
| Control Delay (s/veh) | 36.3 | 47.4 | 30.6 | 25.8 | 5.6 | 53.2 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.3 | 47.4 | 30.6 | 25.8 | 5.6 | 53.2 | 3.2 |
| LOS | D | D | C | C | A | D | A |
| Approach Delay (s/veh) | | 38.3 | | 18.9 | | | 18.7 |
| Approach LOS | | D | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 21.9 | Intersection LOS: C |
| Intersection Capacity Utilization 77.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

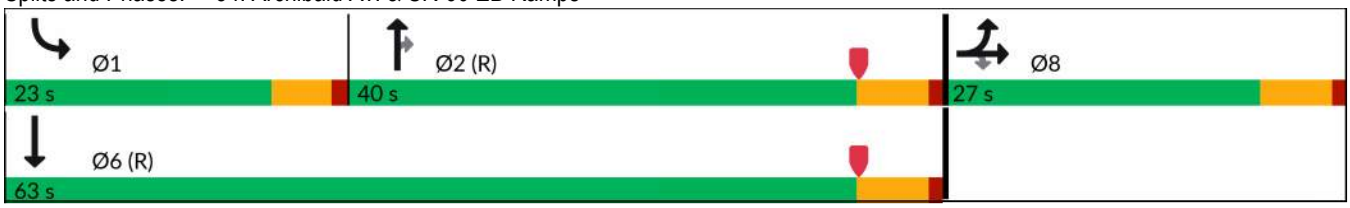

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 188 | 1 | 498 | 0 | 0 | 0 | 0 | 1002 | 517 | 656 | 1457 | 0 |
| Future Volume (veh/h) | 188 | 1 | 498 | 0 | 0 | 0 | 0 | 1002 | 517 | 656 | 1457 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1673 | 1870 | 0 |
| Adj Flow Rate, veh/h | 136 | 0 | 428 | | | | 0 | 1089 | 449 | 713 | 1584 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 282 | 0 | 530 | | | | 0 | 2885 | 709 | 618 | 3595 | 0 |
| Arrive On Green | 0.17 | 0.00 | 0.17 | | | | 0.00 | 0.45 | 0.45 | 0.40 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1688 | 0 | 3170 | | | | 0 | 6696 | 1582 | 3092 | 5274 | 0 |
| Grp Volume(v), veh/h | 136 | 0 | 428 | | | | 0 | 1089 | 449 | 713 | 1584 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1585 | | | | 0 | 1609 | 1582 | 1546 | 1702 | 0 |
| Q Serve(g_s), s | 6.6 | 0.0 | 11.7 | | | | 0.0 | 10.1 | 19.7 | 18.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 6.6 | 0.0 | 11.7 | | | | 0.0 | 10.1 | 19.7 | 18.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 282 | 0 | 530 | | | | 0 | 2885 | 709 | 618 | 3595 | 0 |
| V/C Ratio(X) | 0.48 | 0.00 | 0.81 | | | | 0.00 | 0.38 | 0.63 | 1.15 | 0.44 | 0.00 |
| Avail Cap(c_a), veh/h | 398 | 0 | 747 | | | | 0 | 2885 | 709 | 618 | 3595 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.67 | 0.67 | 0.00 |
| Uniform Delay (d), s/veh | 34.0 | 0.0 | 36.1 | | | | 0.0 | 16.5 | 19.1 | 27.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 4.5 | | | | 0.0 | 0.4 | 4.3 | 81.3 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.7 | 0.0 | 4.6 | | | | 0.0 | 3.4 | 7.1 | 11.4 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.2 | 0.0 | 40.6 | | | | 0.0 | 16.9 | 23.4 | 108.3 | 0.3 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | C | F | A | |
| Approach Vol, veh/h | | 564 | | | | | | 1538 | | | 2297 | |
| Approach Delay, s/veh | | 39.3 | | | | | | 18.8 | | | 33.8 | |
| Approach LOS | | D | | | | | | B | | | C | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.0 | 46.2 | | | | 69.2 | | 20.8 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 18.0 | 34.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 20.0 | 21.7 | | | | 2.0 | | 13.7 | | | | |
| Green Ext Time (p_c), s | 0.0 | 6.7 | | | | 15.5 | | 1.3 | | | | |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.2 |
| HCM 7th LOS | C |

**Notes**

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 193 | 911 | 578 | 278 | 811 | 180 | 394 | 696 | 328 | 1145 |
| Future Volume (vph) | 193 | 911 | 578 | 278 | 811 | 180 | 394 | 696 | 328 | 1145 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 19.6 | 38.2 | 38.2 | 20.0 | 38.6 | 38.6 | 26.0 | 36.8 | 25.0 | 35.8 |
| Total Split (%) | 16.3% | 31.8% | 31.8% | 16.7% | 32.2% | 32.2% | 21.7% | 30.7% | 20.8% | 29.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.0 | 33.6 | 33.6 | 15.4 | 34.0 | 34.0 | 21.4 | 25.2 | 27.4 | 31.2 |
| Actuated g/C Ratio | 0.13 | 0.28 | 0.28 | 0.13 | 0.28 | 0.28 | 0.18 | 0.21 | 0.23 | 0.26 |
| v/c Ratio | 0.94 | 0.94 | 0.83 | 1.32 | 0.83 | 0.33 | 1.35 | 0.74 | 0.88 | 1.09 |
| Control Delay (s/veh) | 101.5 | 59.8 | 24.9 | 214.2 | 48.4 | 9.1 | 216.3 | 47.7 | 69.5 | 92.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 101.5 | 59.8 | 24.9 | 214.2 | 48.4 | 9.1 | 216.3 | 47.7 | 69.5 | 92.5 |
| LOS | F | E | C | F | D | A | F | D | E | F |
| Approach Delay (s/veh) | | 52.6 | | | 79.2 | | | 104.9 | | 88.1 |
| Approach LOS | | D | | | E | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.35 | |
| Intersection Signal Delay (s/veh): 79.3 | Intersection LOS: E |
| Intersection Capacity Utilization 107.8% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

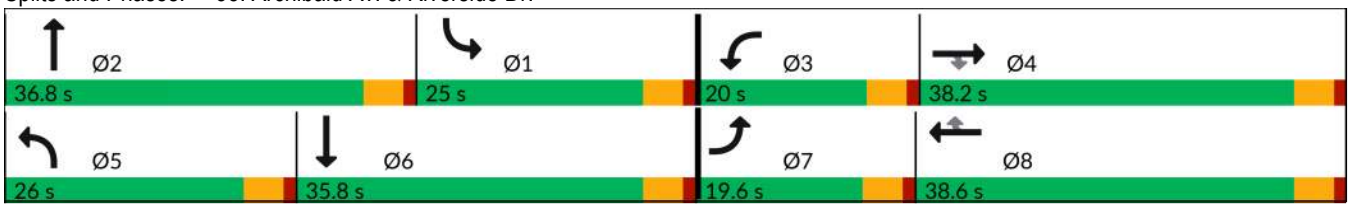

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 193 | 911 | 578 | 278 | 811 | 180 | 394 | 696 | 71 | 328 | 1145 | 248 |
| Future Volume (veh/h) | 193 | 911 | 578 | 278 | 811 | 180 | 394 | 696 | 71 | 328 | 1145 | 248 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 197 | 930 | 386 | 284 | 828 | 139 | 402 | 710 | 70 | 335 | 1168 | 151 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 212 | 985 | 436 | 217 | 997 | 440 | 302 | 901 | 88 | 421 | 1192 | 154 |
| Arrive On Green | 0.19 | 0.42 | 0.42 | 0.19 | 0.42 | 0.42 | 0.27 | 0.29 | 0.29 | 0.37 | 0.39 | 0.39 |
| Sat Flow, veh/h | 1688 | 3554 | 1575 | 1688 | 3554 | 1568 | 1688 | 4724 | 462 | 1688 | 4565 | 590 |
| Grp Volume(v), veh/h | 197 | 930 | 386 | 284 | 828 | 139 | 402 | 510 | 270 | 335 | 871 | 448 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1575 | 1688 | 1777 | 1568 | 1688 | 1702 | 1782 | 1688 | 1702 | 1750 |
| Q Serve(g_s), s | 13.7 | 30.1 | 27.1 | 15.4 | 24.8 | 3.9 | 21.4 | 16.5 | 16.7 | 21.1 | 30.2 | 30.2 |
| Cycle Q Clear(g_c), s | 13.7 | 30.1 | 27.1 | 15.4 | 24.8 | 3.9 | 21.4 | 16.5 | 16.7 | 21.1 | 30.2 | 30.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.26 | 1.00 | | 0.34 |
| Lane Grp Cap(c), veh/h | 212 | 985 | 436 | 217 | 997 | 440 | 302 | 649 | 340 | 421 | 889 | 457 |
| V/C Ratio(X) | 0.93 | 0.94 | 0.88 | 1.31 | 0.83 | 0.32 | 1.33 | 0.79 | 0.79 | 0.80 | 0.98 | 0.98 |
| Avail Cap(c_a), veh/h | 212 | 999 | 443 | 217 | 1011 | 446 | 302 | 917 | 480 | 421 | 889 | 457 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.0 | 34.0 | 33.2 | 48.2 | 32.1 | 8.1 | 43.7 | 40.4 | 40.5 | 34.7 | 36.1 | 36.1 |
| Incr Delay (d2), s/veh | 42.1 | 16.6 | 18.6 | 166.9 | 5.9 | 0.4 | 169.7 | 3.0 | 6.0 | 9.5 | 25.3 | 36.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.7 | 12.8 | 10.6 | 15.8 | 9.4 | 2.4 | 21.9 | 6.3 | 6.9 | 8.3 | 13.4 | 15.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 90.1 | 50.7 | 51.8 | 215.1 | 38.0 | 8.5 | 213.4 | 43.4 | 46.5 | 44.2 | 61.3 | 73.0 |
| LnGrp LOS | F | D | D | F | D | A | F | D | D | D | E | E |
| Approach Vol, veh/h | | 1513 | | | 1251 | | | 1182 | | | 1654 | |
| Approach Delay, s/veh | | 56.1 | | | 74.9 | | | 101.9 | | | 61.0 | |
| Approach LOS | | E | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 34.4 | 27.4 | 20.0 | 37.7 | 26.0 | 35.8 | 19.6 | 38.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 20.4 | 32.2 | 15.4 | 33.6 | 21.4 | 31.2 | 15.0 | 34.0 |
| Max Q Clear Time (g_c+I1), s | 23.1 | 18.7 | 17.4 | 32.1 | 23.4 | 32.2 | 15.7 | 26.8 |
| Green Ext Time (p_c), s | 0.0 | 3.7 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 3.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 71.4 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 100 | 335 | 67 | 308 | 103 | 194 | 978 | 173 | 1762 |
| Future Volume (vph) | 100 | 335 | 67 | 308 | 103 | 194 | 978 | 173 | 1762 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.7 | 38.2 | 5.2 | 30.7 | 30.7 | 14.4 | 31.7 | 25.4 | 42.6 |
| Actuated g/C Ratio | 0.11 | 0.32 | 0.04 | 0.26 | 0.26 | 0.12 | 0.27 | 0.21 | 0.36 |
| v/c Ratio | 0.58 | 0.96 | 0.96 | 0.67 | 0.20 | 1.00 | 0.74 | 0.50 | 1.47 |
| Control Delay (s/veh) | 63.3 | 67.2 | 152.8 | 48.2 | 0.8 | 114.9 | 42.4 | 49.0 | 245.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 63.3 | 67.2 | 152.8 | 48.2 | 0.8 | 114.9 | 42.4 | 49.0 | 245.3 |
| LOS | E | E | F | D | A | F | D | D | F |
| Approach Delay (s/veh) | | 66.6 | | 52.7 | | | 53.7 | | 228.7 |
| Approach LOS | | E | | D | | | D | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.47 | |
| Intersection Signal Delay (s/veh): 136.7 | Intersection LOS: F |
| Intersection Capacity Utilization 112.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 100 | 335 | 201 | 67 | 308 | 103 | 194 | 978 | 73 | 173 | 1762 | 108 |
| Future Volume (veh/h) | 100 | 335 | 201 | 67 | 308 | 103 | 194 | 978 | 73 | 173 | 1762 | 108 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 104 | 349 | 192 | 70 | 321 | 49 | 202 | 1019 | 74 | 180 | 1835 | 98 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 129 | 366 | 201 | 74 | 543 | 460 | 204 | 1315 | 95 | 379 | 1261 | 67 |
| Arrive On Green | 0.08 | 0.32 | 0.32 | 0.04 | 0.29 | 0.29 | 0.12 | 0.25 | 0.25 | 0.22 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1688 | 1134 | 624 | 1688 | 1870 | 1585 | 1688 | 5168 | 375 | 1688 | 3521 | 186 |
| Grp Volume(v), veh/h | 104 | 0 | 541 | 70 | 321 | 49 | 202 | 737 | 356 | 180 | 967 | 966 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1757 | 1688 | 1870 | 1585 | 1688 | 1870 | 1802 | 1688 | 1870 | 1837 |
| Q Serve(g_s), s | 7.2 | 0.0 | 35.8 | 4.9 | 17.5 | 1.5 | 14.2 | 21.8 | 21.8 | 11.0 | 42.6 | 42.6 |
| Cycle Q Clear(g_c), s | 7.2 | 0.0 | 35.8 | 4.9 | 17.5 | 1.5 | 14.2 | 21.8 | 21.8 | 11.0 | 42.6 | 42.6 |
| Prop In Lane | 1.00 | | 0.35 | 1.00 | | 1.00 | 1.00 | | 0.21 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 129 | 0 | 567 | 74 | 543 | 460 | 204 | 951 | 458 | 379 | 670 | 658 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.95 | 0.95 | 0.59 | 0.11 | 0.99 | 0.77 | 0.78 | 0.47 | 1.44 | 1.47 |
| Avail Cap(c_a), veh/h | 289 | 0 | 582 | 74 | 543 | 460 | 204 | 1421 | 685 | 379 | 670 | 658 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.1 | 0.0 | 39.4 | 56.8 | 36.2 | 10.2 | 52.2 | 41.2 | 41.2 | 40.0 | 38.2 | 38.2 |
| Incr Delay (d2), s/veh | 11.2 | 0.0 | 26.0 | 87.2 | 1.7 | 0.1 | 59.7 | 1.6 | 3.3 | 0.9 | 208.1 | 219.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.4 | 0.0 | 19.0 | 3.9 | 8.1 | 1.0 | 9.1 | 9.7 | 9.6 | 4.5 | 56.9 | 58.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 65.3 | 0.0 | 65.4 | 143.9 | 37.9 | 10.3 | 111.9 | 42.8 | 44.5 | 41.0 | 246.3 | 257.7 |
| LnGrp LOS | E | | E | F | D | B | F | D | D | D | F | F |
| Approach Vol, veh/h | | 645 | | | 440 | | | 1295 | | | 2113 | |
| Approach Delay, s/veh | | 65.4 | | | 51.7 | | | 54.0 | | | 234.0 | |
| Approach LOS | | E | | | D | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.3 | 34.9 | 9.8 | 43.0 | 19.0 | 47.2 | 13.7 | 39.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 13.0 | 23.8 | 6.9 | 37.8 | 16.2 | 44.6 | 9.2 | 19.5 |
| Green Ext Time (p_c), s | 0.0 | 6.4 | 0.0 | 0.5 | 0.0 | 0.0 | 0.2 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 140.1 |
| HCM 7th LOS | F |

| Lane Group | WBL | WBT | NBL | NBT | SBL | SBT | Ø4 |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 166 | 0 | 20 | 1045 | 486 | 1564 | |
| Future Volume (vph) | 166 | 0 | 20 | 1045 | 486 | 1564 | |
| Turn Type | Split | NA | Prot | NA | Prot | NA | |
| Protected Phases | 8 | 8 | 5 | 2 | 1 | 6 | 4 |
| Permitted Phases | | | | | | | |
| Detector Phase | 8 | 8 | 5 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 |
| Minimum Split (s) | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 | 22.5 |
| Total Split (s) | 32.6 | 32.6 | 9.6 | 39.9 | 25.0 | 55.3 | 22.5 |
| Total Split (%) | 27.2% | 27.2% | 8.0% | 33.3% | 20.8% | 46.1% | 19% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | |
| Lead/Lag | | | Lead | Lag | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.9 | 14.9 | 5.1 | 29.3 | 20.8 | 51.4 | |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.06 | 0.37 | 0.26 | 0.65 | |
| v/c Ratio | 0.54 | 0.26 | 0.19 | 0.64 | 1.13 | 0.69 | |
| Control Delay (s/veh) | 35.7 | 0.8 | 44.3 | 22.5 | 113.6 | 13.4 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay (s/veh) | 35.7 | 0.8 | 44.3 | 22.5 | 113.6 | 13.4 | |
| LOS | D | A | D | C | F | B | |
| Approach Delay (s/veh) | | 17.3 | | 22.9 | | 37.2 | |
| Approach LOS | | B | | C | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 79 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.13 | |
| Intersection Signal Delay (s/veh): 30.5 | Intersection LOS: C |
| Intersection Capacity Utilization 74.3% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 166 | 0 | 185 | 20 | 1045 | 124 | 486 | 1564 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 166 | 0 | 185 | 20 | 1045 | 124 | 486 | 1564 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 169 | 0 | 181 | 20 | 1066 | 123 | 496 | 1596 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 3 | 0 | 267 | 0 | 251 | 39 | 1544 | 178 | 512 | 2178 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.16 | 0.02 | 0.33 | 0.33 | 0.30 | 0.61 | 0.00 |
| Sat Flow, veh/h | 0 | 1870 | 0 | 1688 | 0 | 1585 | 1688 | 4643 | 535 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 169 | 0 | 181 | 20 | 781 | 408 | 496 | 1596 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 0 | 1688 | 0 | 1585 | 1688 | 1702 | 1774 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 6.3 | 0.0 | 7.3 | 0.8 | 13.4 | 13.4 | 19.5 | 21.2 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 6.3 | 0.0 | 7.3 | 0.8 | 13.4 | 13.4 | 19.5 | 21.2 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 0.30 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 3 | 0 | 267 | 0 | 251 | 39 | 1132 | 590 | 512 | 2178 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.63 | 0.00 | 0.72 | 0.51 | 0.69 | 0.69 | 0.97 | 0.73 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 498 | 0 | 703 | 0 | 661 | 126 | 1789 | 932 | 512 | 2682 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 26.4 | 0.0 | 26.9 | 32.4 | 19.4 | 19.4 | 23.1 | 9.1 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 2.5 | 0.0 | 3.9 | 9.9 | 0.8 | 1.5 | 31.4 | 0.8 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 2.5 | 0.0 | 2.8 | 0.4 | 4.4 | 4.7 | 10.8 | 4.9 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 0.0 | 28.9 | 0.0 | 30.7 | 42.4 | 20.2 | 20.9 | 54.5 | 10.0 | 0.0 |
| LnGrp LOS | | | | C | | C | D | C | C | D | A | |
| Approach Vol, veh/h | | 0 | | | 350 | | | 1209 | | | 2092 | |
| Approach Delay, s/veh | | 0.0 | | | 29.8 | | | 20.8 | | | 20.5 | |
| Approach LOS | | | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.0 | 26.9 | | 0.0 | 6.2 | 45.8 | | 15.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 20.4 | 35.3 | | 17.9 | 5.0 | 50.7 | | 28.0 |
| Max Q Clear Time (g_c+I1), s | 21.5 | 15.4 | | 0.0 | 2.8 | 23.2 | | 9.3 |
| Green Ext Time (p_c), s | 0.0 | 6.9 | | 0.0 | 0.0 | 12.9 | | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.5 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 248 | 1175 | 496 | 652 | 979 | 219 | 247 | 772 | 311 | 294 | 1184 | 221 |
| Future Volume (vph) | 248 | 1175 | 496 | 652 | 979 | 219 | 247 | 772 | 311 | 294 | 1184 | 221 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.6 | 36.8 | 119.6 | 10.4 | 41.6 | 41.6 | 11.4 | 37.6 | 119.6 | 16.4 | 42.6 | 42.6 |
| Actuated g/C Ratio | 0.05 | 0.31 | 1.00 | 0.09 | 0.35 | 0.35 | 0.10 | 0.31 | 1.00 | 0.14 | 0.36 | 0.36 |
| v/c Ratio | 1.74 | 0.76 | 0.32 | 2.47 | 1.53 | 0.35 | 1.56 | 0.70 | 0.20 | 1.29 | 0.95 | 0.34 |
| Control Delay (s/veh) | 397.0 | 41.2 | 0.5 | 695.2 | 275.5 | 12.5 | 316.3 | 40.1 | 0.3 | 201.5 | 53.7 | 12.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 397.0 | 41.2 | 0.5 | 695.2 | 275.5 | 12.5 | 316.3 | 40.1 | 0.3 | 201.5 | 53.7 | 12.1 |
| LOS | F | D | A | F | F | B | F | D | A | F | D | B |
| Approach Delay (s/veh) | | 76.8 | | | 392.4 | | | 82.0 | | | 73.9 | |
| Approach LOS | | E | | | F | | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.47 | |
| Intersection Signal Delay (s/veh): 163.0 | Intersection LOS: F |
| Intersection Capacity Utilization 121.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

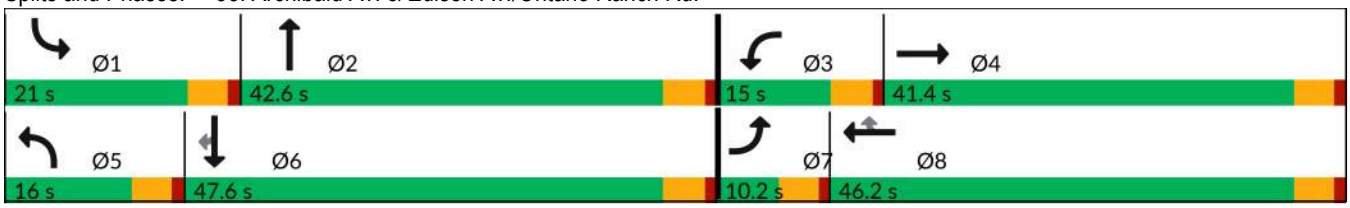

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 248 | 1175 | 496 | 652 | 979 | 219 | 247 | 772 | 311 | 294 | 1184 | 221 |
| Future Volume (veh/h) | 248 | 1175 | 496 | 652 | 979 | 219 | 247 | 772 | 311 | 294 | 1184 | 221 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 251 | 1187 | 0 | 659 | 989 | 193 | 249 | 780 | 0 | 297 | 1196 | 214 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 145 | 1573 | | 269 | 651 | 552 | 161 | 1114 | | 232 | 1263 | 563 |
| Arrive On Green | 0.05 | 0.31 | 0.00 | 0.09 | 0.35 | 0.35 | 0.10 | 0.31 | 0.00 | 0.14 | 0.36 | 0.36 |
| Sat Flow, veh/h | 3092 | 5106 | 1585 | 3092 | 1870 | 1584 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 251 | 1187 | 0 | 659 | 989 | 193 | 249 | 780 | 0 | 297 | 1196 | 214 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1585 | 1546 | 1870 | 1584 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 5.6 | 25.0 | 0.0 | 10.4 | 41.6 | 10.8 | 11.4 | 23.1 | 0.0 | 16.4 | 39.1 | 12.0 |
| Cycle Q Clear(g_c), s | 5.6 | 25.0 | 0.0 | 10.4 | 41.6 | 10.8 | 11.4 | 23.1 | 0.0 | 16.4 | 39.1 | 12.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 145 | 1573 | | 269 | 651 | 552 | 161 | 1114 | | 232 | 1263 | 563 |
| V/C Ratio(X) | 1.73 | 0.75 | | 2.45 | 1.52 | 0.35 | 1.55 | 0.70 | | 1.28 | 0.95 | 0.38 |
| Avail Cap(c_a), veh/h | 145 | 1573 | | 269 | 651 | 552 | 161 | 1130 | | 232 | 1279 | 571 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 56.9 | 37.3 | 0.0 | 54.5 | 38.9 | 28.9 | 54.0 | 36.1 | 0.0 | 51.5 | 37.4 | 28.7 |
| Incr Delay (d2), s/veh | 356.4 | 2.1 | 0.0 | 662.8 | 241.1 | 0.4 | 274.1 | 1.9 | 0.0 | 155.7 | 14.3 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.3 | 10.2 | 0.0 | 28.7 | 61.4 | 4.0 | 16.9 | 9.7 | 0.0 | 16.6 | 18.2 | 4.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 413.3 | 39.4 | 0.0 | 717.3 | 280.1 | 29.3 | 328.2 | 38.0 | 0.0 | 207.2 | 51.7 | 29.1 |
| LnGrp LOS | F | D | | F | F | C | F | D | | F | D | C |
| Approach Vol, veh/h | | 1438 | | | 1841 | | | 1029 | | | 1707 | |
| Approach Delay, s/veh | | 104.7 | | | 410.3 | | | 108.2 | | | 75.9 | |
| Approach LOS | | F | | | F | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.0 | 42.1 | 15.0 | 41.4 | 16.0 | 47.1 | 10.2 | 46.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 18.4 | 25.1 | 12.4 | 27.0 | 13.4 | 41.1 | 7.6 | 43.6 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | 0.0 | 5.0 | 0.0 | 1.4 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 190.6 |
| HCM 7th LOS | F |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 298 | 627 | 268 | 173 | 289 | 89 | 144 | 933 | 215 | 189 | 1550 | 227 |
| Future Volume (vph) | 298 | 627 | 268 | 173 | 289 | 89 | 144 | 933 | 215 | 189 | 1550 | 227 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.3 | 25.4 | 96.8 | 11.3 | 22.4 | 22.4 | 5.5 | 33.6 | 33.6 | 7.9 | 36.0 | 36.0 |
| Actuated g/C Ratio | 0.15 | 0.26 | 1.00 | 0.12 | 0.23 | 0.23 | 0.06 | 0.35 | 0.35 | 0.08 | 0.37 | 0.37 |
| v/c Ratio | 0.67 | 0.68 | 0.18 | 0.93 | 0.35 | 0.20 | 0.85 | 0.51 | 0.33 | 0.77 | 1.18 | 0.35 |
| Control Delay (s/veh) | 47.6 | 34.9 | 0.2 | 93.6 | 32.0 | 2.2 | 85.5 | 27.6 | 5.4 | 65.8 | 117.6 | 12.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.6 | 34.9 | 0.2 | 93.6 | 32.0 | 2.2 | 85.5 | 27.6 | 5.4 | 65.8 | 117.6 | 12.4 |
| LOS | D | C | A | F | C | A | F | C | A | E | F | B |
| Approach Delay (s/veh) | | 30.3 | | | 46.5 | | | 30.4 | | | 100.5 | |
| Approach LOS | | C | | | D | | | C | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 96.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.18 | |
| Intersection Signal Delay (s/veh): 59.7 | Intersection LOS: E |
| Intersection Capacity Utilization 90.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

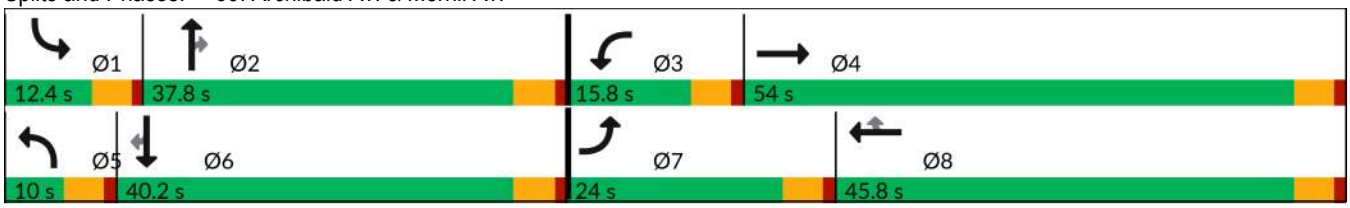

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 298 | 627 | 268 | 173 | 289 | 89 | 144 | 933 | 215 | 189 | 1550 | 227 |
| Future Volume (veh/h) | 298 | 627 | 268 | 173 | 289 | 89 | 144 | 933 | 215 | 189 | 1550 | 227 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 314 | 660 | 0 | 182 | 304 | 63 | 152 | 982 | 192 | 199 | 1632 | 186 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 398 | 876 | | 205 | 864 | 359 | 187 | 2033 | 566 | 263 | 1445 | 612 |
| Arrive On Green | 0.12 | 0.23 | 0.00 | 0.12 | 0.23 | 0.23 | 0.06 | 0.36 | 0.36 | 0.08 | 0.39 | 0.39 |
| Sat Flow, veh/h | 3188 | 3741 | 1585 | 1688 | 3741 | 1554 | 3188 | 5611 | 1563 | 3188 | 3741 | 1585 |
| Grp Volume(v), veh/h | 314 | 660 | 0 | 182 | 304 | 63 | 152 | 982 | 192 | 199 | 1632 | 186 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1585 | 1688 | 1870 | 1554 | 1594 | 1870 | 1563 | 1594 | 1870 | 1585 |
| Q Serve(g_s), s | 8.8 | 15.1 | 0.0 | 9.8 | 6.3 | 3.0 | 4.3 | 12.5 | 8.2 | 5.6 | 35.6 | 7.5 |
| Cycle Q Clear(g_c), s | 8.8 | 15.1 | 0.0 | 9.8 | 6.3 | 3.0 | 4.3 | 12.5 | 8.2 | 5.6 | 35.6 | 7.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 398 | 876 | | 205 | 864 | 359 | 187 | 2033 | 566 | 263 | 1445 | 612 |
| V/C Ratio(X) | 0.79 | 0.75 | | 0.89 | 0.35 | 0.18 | 0.81 | 0.48 | 0.34 | 0.76 | 1.13 | 0.30 |
| Avail Cap(c_a), veh/h | 671 | 2005 | | 205 | 1672 | 695 | 187 | 2033 | 566 | 270 | 1445 | 612 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.2 | 32.8 | 0.0 | 39.9 | 29.7 | 28.4 | 42.9 | 22.7 | 21.4 | 41.4 | 28.3 | 19.7 |
| Incr Delay (d2), s/veh | 3.5 | 1.3 | 0.0 | 34.1 | 0.2 | 0.2 | 23.4 | 0.2 | 0.4 | 11.4 | 67.7 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 6.6 | 0.0 | 5.8 | 2.7 | 1.1 | 2.2 | 4.9 | 0.1 | 2.5 | 27.4 | 2.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 42.7 | 34.2 | 0.0 | 74.0 | 29.9 | 28.6 | 66.3 | 22.9 | 21.7 | 52.8 | 96.0 | 20.0 |
| LnGrp LOS | D | C | | E | C | C | E | C | C | D | F | B |
| Approach Vol, veh/h | | 974 | | | 549 | | | 1326 | | | 2017 | |
| Approach Delay, s/veh | | 36.9 | | | 44.4 | | | 27.7 | | | 84.7 | |
| Approach LOS | | D | | | D | | | C | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.2 | 38.0 | 15.8 | 26.2 | 10.0 | 40.2 | 16.1 | 25.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 7.6 | 14.5 | 11.8 | 17.1 | 6.3 | 37.6 | 10.8 | 8.3 |
| Green Ext Time (p_c), s | 0.0 | 6.4 | 0.0 | 4.5 | 0.0 | 0.0 | 0.7 | 2.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 55.1 |
| HCM 7th LOS | E |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 313 | 890 | 167 | 414 | 876 | 623 | 144 | 924 | 345 | 708 | 1192 | 350 |
| Future Volume (vph) | 313 | 890 | 167 | 414 | 876 | 623 | 144 | 924 | 345 | 708 | 1192 | 350 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.5 | 22.5 | 9.6 | 46.8 | 9.6 | 9.6 | 49.5 | 9.6 | 9.6 | 39.5 | 39.5 |
| Total Split (s) | 9.6 | 27.3 | 27.3 | 29.1 | 46.8 | 14.0 | 9.6 | 49.6 | 29.1 | 14.0 | 54.0 | 54.0 |
| Total Split (%) | 8.0% | 22.8% | 22.8% | 24.3% | 39.0% | 11.7% | 8.0% | 41.3% | 24.3% | 11.7% | 45.0% | 45.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.1 | 23.0 | 23.0 | 18.9 | 36.8 | 46.4 | 5.1 | 35.1 | 54.1 | 9.5 | 39.6 | 39.6 |
| Actuated g/C Ratio | 0.05 | 0.22 | 0.22 | 0.18 | 0.35 | 0.44 | 0.05 | 0.33 | 0.51 | 0.09 | 0.38 | 0.38 |
| v/c Ratio | 2.22 | 1.21 | 0.39 | 0.79 | 0.74 | 0.53 | 1.03 | 0.82 | 0.44 | 2.69 | 0.66 | 0.55 |
| Control Delay (s/veh) | 599.1 | 144.5 | 13.7 | 53.0 | 35.1 | 19.2 | 133.8 | 38.9 | 12.3 | 789.3 | 29.0 | 18.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 599.1 | 144.5 | 13.7 | 53.0 | 35.1 | 19.2 | 133.8 | 38.9 | 12.3 | 789.3 | 29.0 | 18.7 |
| LOS | F | F | B | D | D | B | F | D | B | F | C | B |
| Approach Delay (s/veh) | | 232.3 | | | 33.8 | | | 42.1 | | | 266.6 | |
| Approach LOS | | F | | | C | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.69 | |
| Intersection Signal Delay (s/veh): 150.0 | Intersection LOS: F |
| Intersection Capacity Utilization 101.3% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

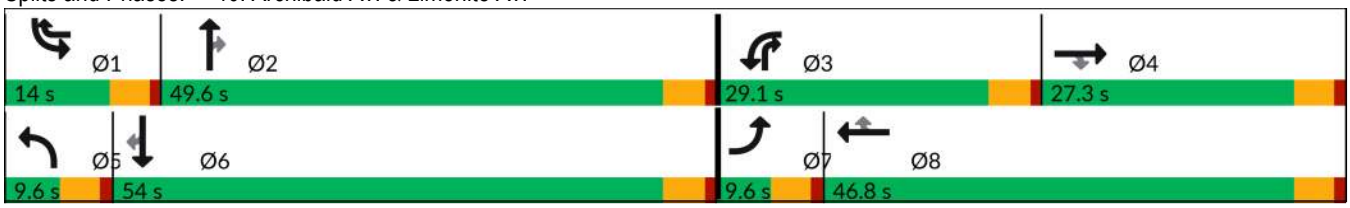

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 313 | 890 | 167 | 414 | 876 | 623 | 144 | 924 | 345 | 708 | 1192 | 350 |
| Future Volume (veh/h) | 313 | 890 | 167 | 414 | 876 | 623 | 144 | 924 | 345 | 708 | 1192 | 350 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 329 | 937 | 154 | 436 | 922 | 538 | 152 | 973 | 186 | 745 | 1255 | 357 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 154 | 804 | 358 | 504 | 1207 | 1206 | 154 | 1186 | 780 | 290 | 1928 | 598 |
| Arrive On Green | 0.05 | 0.23 | 0.23 | 0.16 | 0.34 | 0.34 | 0.05 | 0.33 | 0.33 | 0.09 | 0.38 | 0.38 |
| Sat Flow, veh/h | 3092 | 3554 | 1585 | 3092 | 3554 | 2782 | 3092 | 3554 | 1564 | 3092 | 5106 | 1584 |
| Grp Volume(v), veh/h | 329 | 937 | 154 | 436 | 922 | 538 | 152 | 973 | 186 | 745 | 1255 | 357 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1777 | 1585 | 1546 | 1777 | 1391 | 1546 | 1777 | 1564 | 1546 | 1702 | 1584 |
| Q Serve(g_s), s | 5.0 | 22.7 | 8.4 | 13.8 | 23.2 | 13.6 | 4.9 | 25.2 | 6.8 | 9.4 | 20.4 | 18.2 |
| Cycle Q Clear(g_c), s | 5.0 | 22.7 | 8.4 | 13.8 | 23.2 | 13.6 | 4.9 | 25.2 | 6.8 | 9.4 | 20.4 | 18.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 154 | 804 | 358 | 504 | 1207 | 1206 | 154 | 1186 | 780 | 290 | 1928 | 598 |
| V/C Ratio(X) | 2.14 | 1.17 | 0.43 | 0.86 | 0.76 | 0.45 | 0.99 | 0.82 | 0.24 | 2.57 | 0.65 | 0.60 |
| Avail Cap(c_a), veh/h | 154 | 804 | 358 | 755 | 1494 | 1431 | 154 | 1593 | 960 | 290 | 2513 | 780 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.7 | 38.8 | 33.3 | 40.9 | 29.6 | 20.0 | 47.6 | 30.7 | 14.4 | 45.5 | 25.8 | 25.1 |
| Incr Delay (d2), s/veh | 532.2 | 88.0 | 0.8 | 4.7 | 1.9 | 0.3 | 68.2 | 2.6 | 0.2 | 717.7 | 0.4 | 1.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.2 | 19.2 | 3.1 | 5.3 | 9.6 | 4.1 | 3.3 | 10.2 | 2.2 | 32.3 | 7.5 | 6.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 579.9 | 126.8 | 34.1 | 45.6 | 31.5 | 20.2 | 115.9 | 33.3 | 14.6 | 763.2 | 26.2 | 26.1 |
| LnGrp LOS | F | F | C | D | C | C | F | C | B | F | C | C |
| Approach Vol, veh/h | | 1420 | | | 1896 | | | 1311 | | | 2357 | |
| Approach Delay, s/veh | | 221.7 | | | 31.5 | | | 40.2 | | | 259.1 | |
| Approach LOS | | F | | | C | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 38.1 | 21.0 | 27.3 | 9.6 | 42.5 | 9.6 | 38.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 45.0 | 24.5 | 22.7 | 5.0 | 49.4 | 5.0 | 42.2 |
| Max Q Clear Time (g_c+I1), s | 11.4 | 27.2 | 15.8 | 24.7 | 6.9 | 22.4 | 7.0 | 25.2 |
| Green Ext Time (p_c), s | 0.0 | 6.3 | 0.6 | 0.0 | 0.0 | 10.6 | 0.0 | 7.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 148.6 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 221 | 1452 | 25 | 58 | 1680 | 211 | 12 | 38 | 305 | 50 |
| Future Volume (vph) | 221 | 1452 | 25 | 58 | 1680 | 211 | 12 | 38 | 305 | 50 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.4 | 59.2 | 59.2 | 8.3 | 58.0 | 58.0 | 5.6 | 9.4 | 12.5 | 24.4 |
| Actuated g/C Ratio | 0.07 | 0.56 | 0.56 | 0.08 | 0.55 | 0.55 | 0.05 | 0.09 | 0.12 | 0.23 |
| v/c Ratio | 2.01 | 0.74 | 0.03 | 0.47 | 0.88 | 0.23 | 0.15 | 0.48 | 1.64 | 0.52 |
| Control Delay (s/veh) | 506.8 | 22.3 | 0.0 | 59.4 | 27.4 | 2.4 | 53.8 | 32.2 | 344.8 | 19.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 506.8 | 22.3 | 0.0 | 59.4 | 27.4 | 2.4 | 53.8 | 32.2 | 344.8 | 19.9 |
| LOS | F | C | A | E | C | A | D | C | F | B |
| Approach Delay (s/veh) | | 85.0 | | | 25.7 | | | 34.8 | | 202.0 |
| Approach LOS | | F | | | C | | | C | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.01 | |
| Intersection Signal Delay (s/veh): 71.7 | Intersection LOS: E |
| Intersection Capacity Utilization 95.4% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

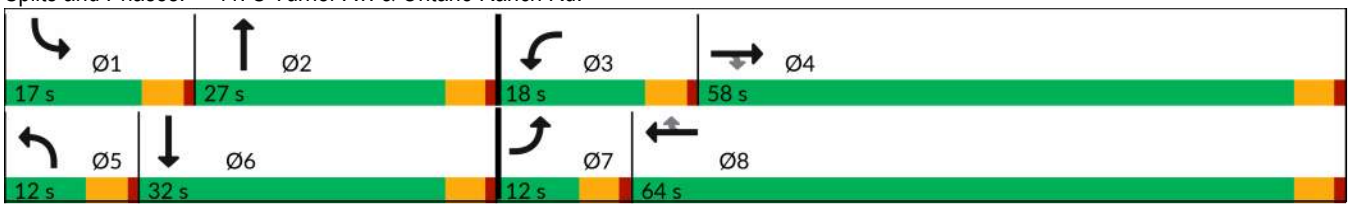

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 221 | 1452 | 25 | 58 | 1680 | 211 | 12 | 38 | 52 | 305 | 50 | 189 |
| Future Volume (veh/h) | 221 | 1452 | 25 | 58 | 1680 | 211 | 12 | 38 | 52 | 305 | 50 | 189 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 235 | 1545 | 23 | 62 | 1787 | 200 | 13 | 40 | 23 | 324 | 53 | 189 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 126 | 2168 | 919 | 78 | 2062 | 874 | 26 | 69 | 40 | 211 | 62 | 221 |
| Arrive On Green | 0.07 | 0.58 | 0.58 | 0.05 | 0.55 | 0.55 | 0.02 | 0.06 | 0.06 | 0.13 | 0.17 | 0.17 |
| Sat Flow, veh/h | 1688 | 3741 | 1585 | 1688 | 3741 | 1585 | 1688 | 1101 | 633 | 1688 | 359 | 1281 |
| Grp Volume(v), veh/h | 235 | 1545 | 23 | 62 | 1787 | 200 | 13 | 0 | 63 | 324 | 0 | 242 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 1870 | 1585 | 1688 | 0 | 1735 | 1688 | 0 | 1640 |
| Q Serve(g_s), s | 7.4 | 29.3 | 0.6 | 3.6 | 40.6 | 6.4 | 0.8 | 0.0 | 3.5 | 12.4 | 0.0 | 14.2 |
| Cycle Q Clear(g_c), s | 7.4 | 29.3 | 0.6 | 3.6 | 40.6 | 6.4 | 0.8 | 0.0 | 3.5 | 12.4 | 0.0 | 14.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.37 | 1.00 | | 0.78 |
| Lane Grp Cap(c), veh/h | 126 | 2168 | 919 | 78 | 2062 | 874 | 26 | 0 | 109 | 211 | 0 | 283 |
| V/C Ratio(X) | 1.86 | 0.71 | 0.03 | 0.79 | 0.87 | 0.23 | 0.51 | 0.00 | 0.58 | 1.53 | 0.00 | 0.85 |
| Avail Cap(c_a), veh/h | 126 | 2168 | 919 | 229 | 2246 | 952 | 126 | 0 | 393 | 211 | 0 | 454 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 45.8 | 14.9 | 8.9 | 46.7 | 19.1 | 11.4 | 48.4 | 0.0 | 45.1 | 43.3 | 0.0 | 39.7 |
| Incr Delay (d2), s/veh | 416.6 | 1.1 | 0.0 | 6.5 | 3.6 | 0.1 | 5.7 | 0.0 | 4.8 | 261.8 | 0.0 | 8.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 17.6 | 10.9 | 0.2 | 1.6 | 16.1 | 2.0 | 0.3 | 0.0 | 1.6 | 20.3 | 0.0 | 6.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 462.3 | 16.0 | 8.9 | 53.2 | 22.7 | 11.5 | 54.0 | 0.0 | 49.9 | 305.1 | 0.0 | 48.5 |
| LnGrp LOS | F | B | A | D | C | B | D | | D | F | | D |
| Approach Vol, veh/h | | 1803 | | | 2049 | | | 76 | | | 566 | |
| Approach Delay, s/veh | | 74.1 | | | 22.5 | | | 50.6 | | | 195.4 | |
| Approach LOS | | E | | | C | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 10.8 | 9.2 | 61.9 | 6.1 | 21.7 | 12.0 | 59.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 5.5 | 5.6 | 31.3 | 2.8 | 16.2 | 9.4 | 42.6 |
| Green Ext Time (p_c), s | 0.0 | 0.2 | 0.0 | 11.8 | 0.0 | 1.0 | 0.0 | 11.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 65.5 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 411 | 1505 | 57 | 249 | 1611 | 332 | 77 | 247 | 116 | 419 | 419 | 182 |
| Future Volume (vph) | 411 | 1505 | 57 | 249 | 1611 | 332 | 77 | 247 | 116 | 419 | 419 | 182 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.1 | 30.7 | 30.7 | 11.7 | 30.2 | 30.2 | 6.1 | 21.0 | 21.0 | 16.3 | 31.2 | 31.2 |
| Actuated g/C Ratio | 0.12 | 0.31 | 0.31 | 0.12 | 0.31 | 0.31 | 0.06 | 0.21 | 0.21 | 0.17 | 0.32 | 0.32 |
| v/c Ratio | 2.08 | 0.99 | 0.10 | 0.71 | 0.85 | 0.49 | 0.78 | 0.65 | 0.27 | 1.57 | 0.74 | 0.30 |
| Control Delay (s/veh) | 525.1 | 55.1 | 0.4 | 54.6 | 38.1 | 6.1 | 92.2 | 42.1 | 4.9 | 305.4 | 37.3 | 4.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 525.1 | 55.1 | 0.4 | 54.6 | 38.1 | 6.1 | 92.2 | 42.1 | 4.9 | 305.4 | 37.3 | 4.4 |
| LOS | F | E | A | D | D | A | F | D | A | F | D | A |
| Approach Delay (s/veh) | | 151.4 | | | 35.1 | | | 41.0 | | | 141.5 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 98.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.08 | |
| Intersection Signal Delay (s/veh): 95.7 | Intersection LOS: F |
| Intersection Capacity Utilization 103.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 411 | 1505 | 57 | 249 | 1611 | 332 | 77 | 247 | 116 | 419 | 419 | 182 |
| Future Volume (veh/h) | 411 | 1505 | 57 | 249 | 1611 | 332 | 77 | 247 | 116 | 419 | 419 | 182 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 428 | 1568 | 42 | 259 | 1678 | 244 | 80 | 257 | 64 | 436 | 436 | 175 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 220 | 1721 | 532 | 325 | 2006 | 491 | 101 | 343 | 289 | 295 | 558 | 471 |
| Arrive On Green | 0.13 | 0.34 | 0.34 | 0.11 | 0.31 | 0.31 | 0.06 | 0.18 | 0.18 | 0.17 | 0.30 | 0.30 |
| Sat Flow, veh/h | 1688 | 5106 | 1578 | 3092 | 6434 | 1575 | 1688 | 1870 | 1575 | 1688 | 1870 | 1577 |
| Grp Volume(v), veh/h | 428 | 1568 | 42 | 259 | 1678 | 244 | 80 | 257 | 64 | 436 | 436 | 175 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1702 | 1578 | 1546 | 1609 | 1575 | 1688 | 1870 | 1575 | 1688 | 1870 | 1577 |
| Q Serve(g_s), s | 12.0 | 27.1 | 1.7 | 7.5 | 22.4 | 11.6 | 4.3 | 12.0 | 3.2 | 16.1 | 19.6 | 8.1 |
| Cycle Q Clear(g_c), s | 12.0 | 27.1 | 1.7 | 7.5 | 22.4 | 11.6 | 4.3 | 12.0 | 3.2 | 16.1 | 19.6 | 8.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 220 | 1721 | 532 | 325 | 2006 | 491 | 101 | 343 | 289 | 295 | 558 | 471 |
| V/C Ratio(X) | 1.95 | 0.91 | 0.08 | 0.80 | 0.84 | 0.50 | 0.79 | 0.75 | 0.22 | 1.48 | 0.78 | 0.37 |
| Avail Cap(c_a), veh/h | 220 | 1721 | 532 | 430 | 2089 | 511 | 110 | 885 | 745 | 295 | 1091 | 920 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 40.1 | 29.2 | 20.8 | 40.3 | 29.5 | 25.8 | 42.7 | 35.6 | 32.0 | 38.0 | 29.6 | 25.5 |
| Incr Delay (d2), s/veh | 442.2 | 7.7 | 0.1 | 5.5 | 3.0 | 0.8 | 26.8 | 3.3 | 0.4 | 232.5 | 2.4 | 0.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 31.7 | 11.2 | 0.6 | 2.9 | 8.1 | 4.0 | 2.5 | 5.5 | 1.2 | 25.3 | 8.6 | 2.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 482.2 | 36.9 | 20.9 | 45.8 | 32.5 | 26.6 | 69.5 | 38.9 | 32.4 | 270.5 | 32.0 | 26.0 |
| LnGrp LOS | F | D | C | D | C | C | E | D | C | F | C | C |
| Approach Vol, veh/h | | 2038 | | | 2181 | | | 401 | | | 1047 | |
| Approach Delay, s/veh | | 130.1 | | | 33.5 | | | 44.0 | | | 130.3 | |
| Approach LOS | | F | | | C | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.7 | 21.5 | 14.3 | 35.6 | 10.1 | 32.1 | 16.6 | 33.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 18.1 | 14.0 | 9.5 | 29.1 | 6.3 | 21.6 | 14.0 | 24.4 |
| Green Ext Time (p_c), s | 0.0 | 1.6 | 0.1 | 0.0 | 0.0 | 3.2 | 0.0 | 4.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 86.9 |
| HCM 7th LOS | F |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 315 | 1313 | 531 | 448 | 1426 | 266 | 638 | 509 | 340 | 366 | 691 | 246 |
| Future Volume (vph) | 315 | 1313 | 531 | 448 | 1426 | 266 | 638 | 509 | 340 | 366 | 691 | 246 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.1 | 44.1 | 44.1 | 8.4 | 45.4 | 45.4 | 7.4 | 30.5 | 30.5 | 6.4 | 29.5 | 29.5 |
| Actuated g/C Ratio | 0.07 | 0.41 | 0.41 | 0.08 | 0.42 | 0.42 | 0.07 | 0.28 | 0.28 | 0.06 | 0.27 | 0.27 |
| v/c Ratio | 1.64 | 0.67 | 0.75 | 1.97 | 1.01 | 0.37 | 3.18 | 0.37 | 0.66 | 2.12 | 0.75 | 0.49 |
| Control Delay (s/veh) | 342.4 | 28.7 | 26.8 | 479.7 | 57.9 | 9.4 | Error | 31.3 | 26.4 | 544.2 | 40.9 | 17.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 342.4 | 28.7 | 26.8 | 479.7 | 57.9 | 9.4 | Error | 31.3 | 26.4 | 544.2 | 40.9 | 17.6 |
| LOS | F | C | C | F | E | A | F | C | C | F | D | B |
| Approach Delay (s/veh) | | 74.1 | | | 140.2 | | | 451.6 | | | 177.8 | |
| Approach LOS | | E | | | F | | | F | | | F | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 107.9
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 3.18
Intersection Signal Delay (s/veh): 192.3 — Intersection LOS: F
Intersection Capacity Utilization 104.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

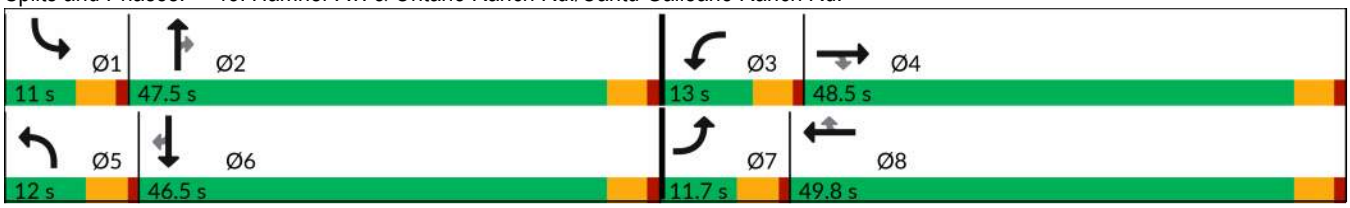

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 315 | 1313 | 531 | 448 | 1426 | 266 | 638 | 509 | 340 | 366 | 691 | 246 |
| Future Volume (veh/h) | 315 | 1313 | 531 | 448 | 1426 | 266 | 638 | 509 | 340 | 366 | 691 | 246 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 332 | 1382 | 462 | 472 | 1501 | 187 | 672 | 536 | 170 | 385 | 727 | 247 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 208 | 2127 | 660 | 246 | 1524 | 679 | 217 | 1370 | 417 | 188 | 920 | 405 |
| Arrive On Green | 0.07 | 0.42 | 0.42 | 0.08 | 0.43 | 0.43 | 0.07 | 0.27 | 0.27 | 0.06 | 0.26 | 0.26 |
| Sat Flow, veh/h | 3092 | 5106 | 1584 | 3092 | 3554 | 1583 | 3092 | 5106 | 1554 | 3092 | 3554 | 1563 |
| Grp Volume(v), veh/h | 332 | 1382 | 462 | 472 | 1501 | 187 | 672 | 536 | 170 | 385 | 727 | 247 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1584 | 1546 | 1777 | 1583 | 1546 | 1702 | 1554 | 1546 | 1777 | 1563 |
| Q Serve(g_s), s | 7.1 | 22.8 | 25.3 | 8.4 | 44.0 | 8.1 | 7.4 | 9.0 | 9.5 | 6.4 | 20.1 | 14.7 |
| Cycle Q Clear(g_c), s | 7.1 | 22.8 | 25.3 | 8.4 | 44.0 | 8.1 | 7.4 | 9.0 | 9.5 | 6.4 | 20.1 | 14.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 208 | 2127 | 660 | 246 | 1524 | 679 | 217 | 1370 | 417 | 188 | 920 | 405 |
| V/C Ratio(X) | 1.59 | 0.65 | 0.70 | 1.91 | 0.98 | 0.28 | 3.09 | 0.39 | 0.41 | 2.05 | 0.79 | 0.61 |
| Avail Cap(c_a), veh/h | 208 | 2127 | 660 | 246 | 1524 | 679 | 217 | 2079 | 633 | 188 | 1413 | 622 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.1 | 24.6 | 25.3 | 48.5 | 29.7 | 19.5 | 49.0 | 31.5 | 31.7 | 49.5 | 36.4 | 34.4 |
| Incr Delay (d2), s/veh | 288.6 | 0.7 | 3.3 | 426.5 | 19.4 | 0.2 | 954.7 | 0.2 | 0.6 | 490.5 | 1.7 | 1.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.9 | 8.4 | 9.1 | 17.7 | 20.6 | 2.7 | 31.5 | 3.5 | 3.4 | 15.2 | 8.4 | 5.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 337.7 | 25.3 | 28.6 | 474.9 | 49.1 | 19.7 | 1003.7 | 31.7 | 32.3 | 540.0 | 38.1 | 35.9 |
| LnGrp LOS | F | C | C | F | D | B | F | C | C | F | D | D |
| Approach Vol, veh/h | | 2176 | | | 2160 | | | 1378 | | | 1359 | |
| Approach Delay, s/veh | | 73.7 | | | 139.6 | | | 505.8 | | | 179.9 | |
| Approach LOS | | E | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 32.9 | 13.0 | 48.5 | 12.0 | 31.9 | 11.7 | 49.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 8.4 | 11.5 | 10.4 | 27.3 | 9.4 | 22.1 | 9.1 | 46.0 |
| Green Ext Time (p_c), s | 0.0 | 4.0 | 0.0 | 9.5 | 0.0 | 5.2 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 198.4 |
| HCM 7th LOS | F |

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 1746 | 1172 | 165 | 278 | 0 | 1554 |
| Future Volume (vph) | 1746 | 1172 | 165 | 278 | 0 | 1554 |
| Turn Type | NA | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | 6 | | | 4 | |
| Permitted Phases | | | Free | 4 | | 4 |
| Detector Phase | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | |
| Lead-Lag Optimize? | | | | | | |
| Recall Mode | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 40.8 | 40.8 | 120.0 | 68.1 | 68.1 | 68.1 |
| Actuated g/C Ratio | 0.34 | 0.34 | 1.00 | 0.57 | 0.57 | 0.57 |
| v/c Ratio | 1.02 | 1.03 | 0.07 | 0.29 | 0.96 | 0.96 |
| Control Delay (s/veh) | 65.9 | 72.4 | 0.0 | 14.4 | 45.7 | 47.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.1 | 17.9 | 0.0 |
| Total Delay (s/veh) | 65.9 | 72.4 | 0.0 | 14.5 | 63.6 | 47.3 |
| LOS | E | E | A | B | E | D |
| Approach Delay (s/veh) | 65.9 | 63.5 | | | 49.8 | |
| Approach LOS | E | E | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 8.1 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.03 | |
| Intersection Signal Delay (s/veh): 59.3 | Intersection LOS: E |
| Intersection Capacity Utilization 105.8% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

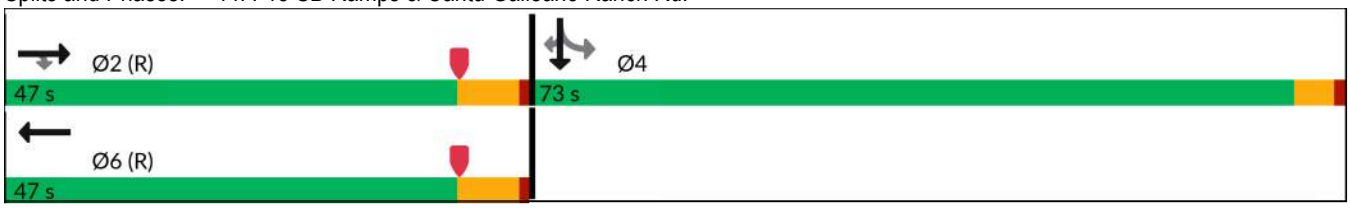

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1746 | 0 | 0 | 1172 | 165 | 0 | 0 | 0 | 278 | 0 | 1554 |
| Future Volume (veh/h) | 0 | 1746 | 0 | 0 | 1172 | 165 | 0 | 0 | 0 | 278 | 0 | 1554 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 0 | 1870 | 1870 | | | | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 1940 | 0 | 0 | 1302 | 0 | | | | 206 | 0 | 1618 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2056 | | 0 | 1371 | | | | | 913 | 0 | 1715 |
| Arrive On Green | 0.00 | 0.37 | 0.00 | 0.00 | 0.73 | 0.00 | | | | 0.54 | 0.00 | 0.54 |
| Sat Flow, veh/h | 0 | 5611 | 1585 | 0 | 3741 | 2790 | | | | 1688 | 0 | 3170 |
| Grp Volume(v), veh/h | 0 | 1940 | 0 | 0 | 1302 | 0 | | | | 206 | 0 | 1618 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 0 | 1870 | 1395 | | | | 1688 | 0 | 1585 |
| Q Serve(g_s), s | 0.0 | 40.2 | 0.0 | 0.0 | 36.7 | 0.0 | | | | 7.7 | 0.0 | 57.4 |
| Cycle Q Clear(g_c), s | 0.0 | 40.2 | 0.0 | 0.0 | 36.7 | 0.0 | | | | 7.7 | 0.0 | 57.4 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2056 | | 0 | 1371 | | | | | 913 | 0 | 1715 |
| V/C Ratio(X) | 0.00 | 0.94 | | 0.00 | 0.95 | | | | | 0.23 | 0.00 | 0.94 |
| Avail Cap(c_a), veh/h | 0 | 2056 | | 0 | 1371 | | | | | 962 | 0 | 1807 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.25 | 0.00 | 0.00 | 0.68 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 36.8 | 0.0 | 0.0 | 15.1 | 0.0 | | | | 14.4 | 0.0 | 25.8 |
| Incr Delay (d2), s/veh | 0.0 | 3.2 | 0.0 | 0.0 | 11.3 | 0.0 | | | | 0.1 | 0.0 | 10.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 17.6 | 0.0 | 0.0 | 7.6 | 0.0 | | | | 2.8 | 0.0 | 21.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 40.0 | 0.0 | 0.0 | 26.3 | 0.0 | | | | 14.5 | 0.0 | 36.2 |
| LnGrp LOS | | D | | | C | | | | | B | | D |
| Approach Vol, veh/h | | 1940 | | | 1302 | | | | | | 1824 | |
| Approach Delay, s/veh | | 40.0 | | | 26.3 | | | | | | 33.7 | |
| Approach LOS | | D | | | C | | | | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 50.5 | 69.5 | 50.5 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 42.2 | 59.4 | 38.7 |
| Green Ext Time (p_c), s | 0.0 | 5.5 | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 34.3 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 644 | 1314 | 186 | 652 | 1018 | 136 |
| Future Volume (vph) | 644 | 1314 | 186 | 652 | 1018 | 136 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 62.0 | 62.0 | 11.0 | 73.0 | 47.0 | 47.0 |
| Total Split (%) | 51.7% | 51.7% | 9.2% | 60.8% | 39.2% | 39.2% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 55.5 | 55.5 | 6.9 | 67.0 | 41.9 | 41.9 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.06 | 0.56 | 0.35 | 0.35 |
| v/c Ratio | 0.27 | 1.16 | 1.12 | 0.23 | 0.96 | 0.21 |
| Control Delay (s/veh) | 9.5 | 104.8 | 152.3 | 13.7 | 56.3 | 6.3 |
| Queue Delay | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 9.5 | 105.3 | 152.3 | 13.7 | 56.3 | 6.3 |
| LOS | A | F | F | B | E | A |
| Approach Delay (s/veh) | 73.8 | | | 44.4 | 51.0 | |
| Approach LOS | E | | | D | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 15.4 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.16 | |
| Intersection Signal Delay (s/veh): 60.9 | Intersection LOS: E |
| Intersection Capacity Utilization 96.5% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

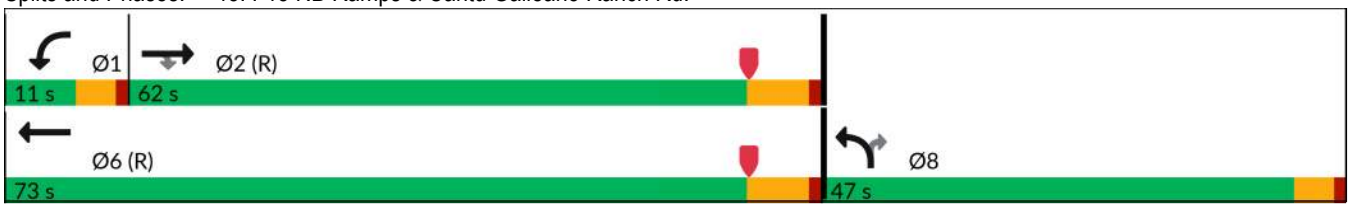

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 644 | 1314 | 186 | 652 | 1018 | 136 |
| Future Volume (veh/h) | 644 | 1314 | 186 | 652 | 1018 | 136 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 0.98 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1673 | 1870 | 1772 | 1870 |
| Adj Flow Rate, veh/h | 700 | 776 | 202 | 709 | 1107 | 88 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 2657 | 735 | 170 | 3171 | 1155 | 543 |
| Arrive On Green | 0.79 | 0.79 | 0.05 | 0.57 | 0.51 | 0.51 |
| Sat Flow, veh/h | 5611 | 1552 | 3188 | 5611 | 3375 | 1585 |
| Grp Volume(v), veh/h | 700 | 776 | 202 | 709 | 1107 | 88 |
| Grp Sat Flow(s),veh/h/ln | 1870 | 1552 | 1594 | 1870 | 1688 | 1585 |
| Q Serve(g_s), s | 4.0 | 56.8 | 6.4 | 7.5 | 37.7 | 3.5 |
| Cycle Q Clear(g_c), s | 4.0 | 56.8 | 6.4 | 7.5 | 37.7 | 3.5 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 2657 | 735 | 170 | 3171 | 1155 | 543 |
| V/C Ratio(X) | 0.26 | 1.06 | 1.19 | 0.22 | 0.96 | 0.16 |
| Avail Cap(c_a), veh/h | 2657 | 735 | 170 | 3171 | 1193 | 560 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.50 | 1.50 |
| Upstream Filter(I) | 0.25 | 0.25 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 7.0 | 12.6 | 56.8 | 13.0 | 28.4 | 20.1 |
| Incr Delay (d2), s/veh | 0.1 | 33.8 | 128.7 | 0.2 | 16.8 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 11.8 | 5.5 | 2.9 | 14.5 | 1.3 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 7.1 | 46.3 | 185.5 | 13.1 | 45.1 | 20.2 |
| LnGrp LOS | A | F | F | B | D | C |
| Approach Vol, veh/h | 1476 | | | 911 | 1195 | |
| Approach Delay, s/veh | 27.7 | | | 51.4 | 43.3 | |
| Approach LOS | C | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 63.3 | | | | 74.3 | 45.7 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 55.5 | | | | 66.5 | 42.4 |
| Max Q Clear Time (g_c+I1), s | 8.4 | 58.8 | | | | 9.5 | 39.7 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | | | 4.7 | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 38.9 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

# APPENDIX 7.2:

# HORIZON YEAR (2050) WITH PROJECT INTERSECTION ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 341 | 1 | 505 | 390 | 1354 | 1423 | 504 |
| Future Volume (vph) | 341 | 1 | 505 | 390 | 1354 | 1423 | 504 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 29.0 | 29.0 | 29.0 | 27.0 | 61.0 | 34.0 | 34.0 |
| Total Split (%) | 32.2% | 32.2% | 32.2% | 30.0% | 67.8% | 37.8% | 37.8% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 21.2 | 21.2 | 21.2 | 22.6 | 55.8 | 28.0 | 28.0 |
| Actuated g/C Ratio | 0.24 | 0.24 | 0.24 | 0.25 | 0.62 | 0.31 | 0.31 |
| v/c Ratio | 0.85 | 0.80 | 0.69 | 1.00 | 0.66 | 1.39 | 0.70 |
| Control Delay (s/veh) | 55.0 | 44.4 | 29.7 | 57.6 | 12.2 | 209.1 | 11.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.0 | 44.4 | 29.7 | 57.6 | 12.4 | 209.1 | 11.5 |
| LOS | D | D | C | E | B | F | B |
| Approach Delay (s/veh) | | 43.4 | | | 22.5 | 157.4 | |
| Approach LOS | | D | | | C | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 36.8 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.39 | |
| Intersection Signal Delay (s/veh): 84.0 | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

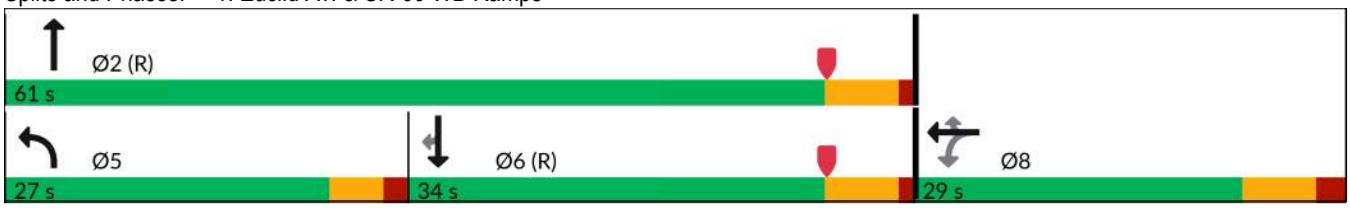

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 341 | 1 | 505 | 390 | 1354 | 0 | 0 | 1423 | 504 |
| Future Volume (veh/h) | 0 | 0 | 0 | 341 | 1 | 505 | 390 | 1354 | 0 | 0 | 1423 | 504 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 475 | 0 | 232 | 419 | 1456 | 0 | 0 | 1530 | 314 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 637 | 0 | 298 | 409 | 2370 | 0 | 0 | 1304 | 569 |
| Arrive On Green | | | | 0.19 | 0.00 | 0.19 | 0.48 | 1.00 | 0.00 | 0.00 | 0.37 | 0.37 |
| Sat Flow, veh/h | | | | 3375 | 0 | 1580 | 1688 | 3647 | 0 | 0 | 3647 | 1550 |
| Grp Volume(v), veh/h | | | | 475 | 0 | 232 | 419 | 1456 | 0 | 0 | 1530 | 314 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1580 | 1688 | 1777 | 0 | 0 | 1777 | 1550 |
| Q Serve(g_s), s | | | | 12.0 | 0.0 | 12.6 | 21.8 | 0.0 | 0.0 | 0.0 | 33.0 | 14.5 |
| Cycle Q Clear(g_c), s | | | | 12.0 | 0.0 | 12.6 | 21.8 | 0.0 | 0.0 | 0.0 | 33.0 | 14.5 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 637 | 0 | 298 | 409 | 2370 | 0 | 0 | 1304 | 569 |
| V/C Ratio(X) | | | | 0.75 | 0.00 | 0.78 | 1.03 | 0.61 | 0.00 | 0.00 | 1.17 | 0.55 |
| Avail Cap(c_a), veh/h | | | | 825 | 0 | 386 | 409 | 2370 | 0 | 0 | 1304 | 569 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 34.5 | 0.0 | 34.7 | 23.2 | 0.0 | 0.0 | 0.0 | 28.5 | 22.6 |
| Incr Delay (d2), s/veh | | | | 3.3 | 0.0 | 8.7 | 20.3 | 0.1 | 0.0 | 0.0 | 86.6 | 3.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.1 | 0.0 | 5.5 | 7.4 | 0.0 | 0.0 | 0.0 | 28.3 | 5.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 37.8 | 0.0 | 43.4 | 43.5 | 0.1 | 0.0 | 0.0 | 115.1 | 26.5 |
| LnGrp LOS | | | | D | | D | F | A | | | F | C |
| Approach Vol, veh/h | | | | | 707 | | | 1875 | | | 1844 | |
| Approach Delay, s/veh | | | | | 39.6 | | | 9.8 | | | 100.0 | |
| Approach LOS | | | | | D | | | A | | | F | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 66.0 | | 27.0 | 39.0 | | 24.0 |
| Change Period (Y+Rc), s | 6.0 | | 5.2 | 6.0 | | 7.0 |
| Max Green Setting (Gmax), s | 55.0 | | 21.8 | 28.0 | | 22.0 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 23.8 | 35.0 | | 14.6 |
| Green Ext Time (p_c), s | 22.7 | | 0.0 | 0.0 | | 2.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 52.1 |
| HCM 7th LOS | D |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 461 | 1 | 298 | 1211 | 429 | 442 | 1240 |
| Future Volume (vph) | 461 | 1 | 298 | 1211 | 429 | 442 | 1240 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 27.7 | 27.7 | 27.7 | 26.0 | 26.0 | 14.7 | 24.0 |
| Total Split (s) | 30.0 | 30.0 | 30.0 | 35.0 | 35.0 | 25.0 | 60.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 38.9% | 38.9% | 27.8% | 66.7% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | | 7.0 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 23.0 | 0.0 | 23.0 | 29.0 | 29.0 | 20.3 | 54.0 |
| Actuated g/C Ratio | 0.26 | 0.00 | 0.26 | 0.32 | 0.32 | 0.23 | 0.60 |
| v/c Ratio | 1.11 | no cap | 0.65 | 1.09 | 0.56 | 1.21 | 0.60 |
| Control Delay (s/veh) | 110.4 | | 27.9 | 87.1 | 5.6 | 136.4 | 13.8 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 110.4 | Error | 27.9 | 87.1 | 5.6 | 136.4 | 14.1 |
| LOS | F | F | C | F | A | F | B |
| Approach Delay (s/veh) | | Error | | 65.8 | | | 46.3 |
| Approach LOS | | F | | E | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 36.6 (41%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

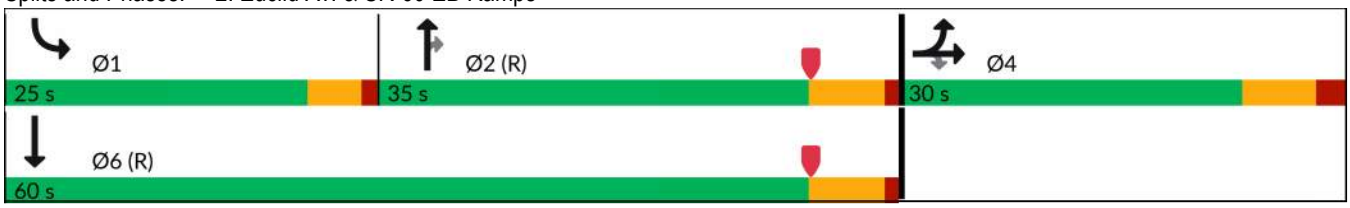

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 461 | 1 | 298 | 0 | 0 | 0 | 0 | 1211 | 429 | 442 | 1240 | 0 |
| Future Volume (veh/h) | 461 | 1 | 298 | 0 | 0 | 0 | 0 | 1211 | 429 | 442 | 1240 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 475 | 1 | 249 | | | | 0 | 1248 | 339 | 456 | 1278 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 431 | 0 | 405 | | | | 0 | 1145 | 509 | 381 | 2132 | 0 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | | | | 0.00 | 0.48 | 0.32 | 0.45 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1688 | 0 | 1585 | | | | 0 | 3647 | 1580 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 475 | 0 | 249 | | | | 0 | 1248 | 339 | 456 | 1278 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1585 | | | | 0 | 1777 | 1580 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 23.0 | 0.0 | 12.5 | | | | 0.0 | 29.0 | 16.7 | 20.3 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 23.0 | 0.0 | 12.5 | | | | 0.0 | 29.0 | 16.7 | 20.3 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 431 | 0 | 405 | | | | 0 | 1145 | 509 | 381 | 2132 | 0 |
| V/C Ratio(X) | 1.10 | 0.00 | 0.61 | | | | 0.00 | 1.09 | 0.67 | 1.20 | 0.60 | 0.00 |
| Avail Cap(c_a), veh/h | 431 | 0 | 405 | | | | 0 | 1145 | 509 | 381 | 2132 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.50 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.67 | 0.67 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 33.5 | 0.0 | 29.6 | | | | 0.0 | 23.3 | 26.3 | 24.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 73.7 | 0.0 | 3.2 | | | | 0.0 | 50.6 | 4.6 | 91.6 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 17.9 | 0.0 | 5.0 | | | | 0.0 | 16.5 | 6.4 | 14.8 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 107.2 | 0.0 | 32.8 | | | | 0.0 | 73.9 | 30.9 | 116.3 | 0.1 | 0.0 |
| LnGrp LOS | F | | C | | | | | F | C | F | A | |
| Approach Vol, veh/h | | 724 | | | | | | 1587 | | | 1734 | |
| Approach Delay, s/veh | | 81.6 | | | | | | 64.7 | | | 30.7 | |
| Approach LOS | | F | | | | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.0 | 35.0 | | 30.0 | | 60.0 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 7.0 | | 6.0 |
| Max Green Setting (Gmax), s | 20.3 | 29.0 | | 23.0 | | 54.0 |
| Max Q Clear Time (g_c+I1), s | 22.3 | 31.0 | | 25.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 18.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 53.1 |
| HCM 7th LOS | D |

**Notes**

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 116 | 366 | 78 | 403 | 173 | 1242 | 147 | 1282 |
| Future Volume (vph) | 116 | 366 | 78 | 403 | 173 | 1242 | 147 | 1282 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 43.0 | 43.0 | 43.0 | 43.0 | 41.4 | 41.4 | 35.6 | 77.0 |
| Total Split (%) | 35.8% | 35.8% | 35.8% | 35.8% | 34.5% | 34.5% | 29.7% | 64.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 29.8 | 29.8 | 29.8 | 29.8 | 36.1 | 36.1 | 9.1 | 49.8 |
| Actuated g/C Ratio | 0.33 | 0.33 | 0.33 | 0.33 | 0.39 | 0.39 | 0.10 | 0.54 |
| v/c Ratio | 0.69 | 0.57 | 0.48 | 0.55 | 1.47 | 0.68 | 0.51 | 0.51 |
| Control Delay (s/veh) | 48.7 | 25.1 | 35.1 | 23.9 | 274.8 | 26.5 | 46.6 | 14.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 48.7 | 25.1 | 35.1 | 23.9 | 274.8 | 26.5 | 46.6 | 14.8 |
| LOS | D | C | D | C | F | C | D | B |
| Approach Delay (s/veh) | | 28.9 | | 25.2 | | 55.9 | | 18.0 |
| Approach LOS | | C | | C | | E | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 91.4 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.47 | |
| Intersection Signal Delay (s/veh): 33.7 | Intersection LOS: C |
| Intersection Capacity Utilization 81.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

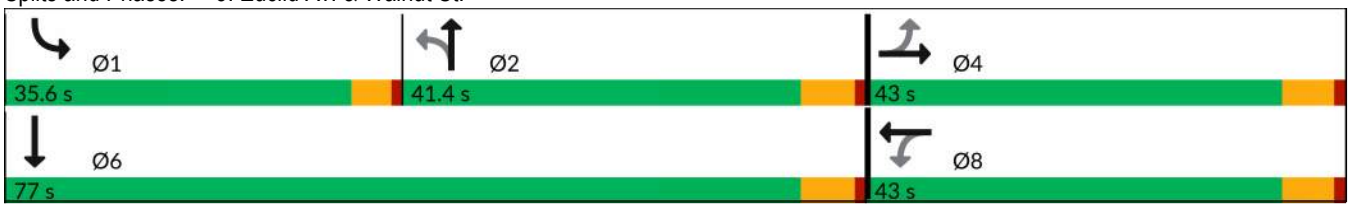

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 116 | 366 | 240 | 78 | 403 | 189 | 173 | 1242 | 48 | 147 | 1282 | 54 |
| Future Volume (veh/h) | 116 | 366 | 240 | 78 | 403 | 189 | 173 | 1242 | 48 | 147 | 1282 | 54 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 122 | 385 | 240 | 82 | 424 | 156 | 182 | 1307 | 42 | 155 | 1349 | 35 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 244 | 716 | 440 | 225 | 861 | 313 | 215 | 2053 | 66 | 225 | 2708 | 70 |
| Arrive On Green | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.40 | 0.40 | 0.40 | 0.07 | 0.53 | 0.53 |
| Sat Flow, veh/h | 790 | 2110 | 1297 | 757 | 2539 | 924 | 371 | 5079 | 163 | 3092 | 5118 | 133 |
| Grp Volume(v), veh/h | 122 | 323 | 302 | 82 | 295 | 285 | 182 | 876 | 473 | 155 | 897 | 487 |
| Grp Sat Flow(s),veh/h/ln | 790 | 1777 | 1630 | 757 | 1777 | 1686 | 371 | 1702 | 1838 | 1546 | 1702 | 1846 |
| Q Serve(g_s), s | 12.8 | 12.9 | 13.2 | 8.7 | 11.6 | 11.8 | 31.8 | 18.2 | 18.2 | 4.3 | 14.8 | 14.8 |
| Cycle Q Clear(g_c), s | 24.6 | 12.9 | 13.2 | 21.9 | 11.6 | 11.8 | 35.6 | 18.2 | 18.2 | 4.3 | 14.8 | 14.8 |
| Prop In Lane | 1.00 | | 0.80 | 1.00 | | 0.55 | 1.00 | | 0.09 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 244 | 603 | 553 | 225 | 603 | 572 | 215 | 1376 | 743 | 225 | 1801 | 977 |
| V/C Ratio(X) | 0.50 | 0.54 | 0.55 | 0.36 | 0.49 | 0.50 | 0.85 | 0.64 | 0.64 | 0.69 | 0.50 | 0.50 |
| Avail Cap(c_a), veh/h | 309 | 750 | 689 | 288 | 750 | 712 | 215 | 1376 | 743 | 1088 | 2752 | 1493 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 32.9 | 23.5 | 23.6 | 32.5 | 23.1 | 23.1 | 32.4 | 21.0 | 21.0 | 39.9 | 13.3 | 13.3 |
| Incr Delay (d2), s/veh | 1.6 | 0.7 | 0.8 | 1.0 | 0.6 | 0.7 | 25.3 | 1.0 | 1.8 | 1.4 | 0.2 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.4 | 5.1 | 4.8 | 1.6 | 4.6 | 4.4 | 5.3 | 6.7 | 7.4 | 1.6 | 4.9 | 5.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.5 | 24.3 | 24.4 | 33.5 | 23.7 | 23.8 | 57.7 | 22.0 | 22.9 | 41.3 | 13.5 | 13.7 |
| LnGrp LOS | C | C | C | C | C | C | E | C | C | D | B | B |
| Approach Vol, veh/h | | 747 | | | 662 | | | 1531 | | | 1539 | |
| Approach Delay, s/veh | | 26.0 | | | 25.0 | | | 26.5 | | | 16.3 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 41.4 | | 35.7 | | 52.4 | | 35.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.0 | 35.6 | | 37.2 | | 71.2 | | 37.2 |
| Max Q Clear Time (g_c+I1), s | 6.3 | 37.6 | | 26.6 | | 16.8 | | 23.9 |
| Green Ext Time (p_c), s | 0.2 | 0.0 | | 3.2 | | 11.8 | | 3.2 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 22.7 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 185 | 858 | 193 | 671 | 228 | 1174 | 319 | 135 | 1228 | 231 |
| Future Volume (vph) | 185 | 858 | 193 | 671 | 228 | 1174 | 319 | 135 | 1228 | 231 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 21.0 | 43.0 | 23.0 | 45.0 | 15.2 | 35.0 | 35.0 | 19.0 | 38.8 | 38.8 |
| Total Split (%) | 17.5% | 35.8% | 19.2% | 37.5% | 12.7% | 29.2% | 29.2% | 15.8% | 32.3% | 32.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.7 | 36.0 | 17.0 | 37.3 | 10.0 | 29.8 | 29.8 | 13.0 | 32.8 | 32.8 |
| Actuated g/C Ratio | 0.13 | 0.30 | 0.14 | 0.31 | 0.08 | 0.25 | 0.25 | 0.11 | 0.28 | 0.28 |
| v/c Ratio | 0.90 | 2.05 | 0.87 | 0.74 | 1.74 | 1.42 | 0.70 | 0.79 | 1.35 | 0.45 |
| Control Delay (s/veh) | 91.0 | 502.0 | 82.7 | 40.6 | 394.4 | 230.6 | 34.2 | 80.9 | 199.3 | 15.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 91.0 | 502.0 | 82.7 | 40.6 | 394.4 | 230.6 | 34.2 | 80.9 | 199.3 | 15.6 |
| LOS | F | F | F | D | F | F | C | F | F | B |
| Approach Delay (s/veh) | | 440.8 | | 49.2 | | 215.9 | | | 162.7 | |
| Approach LOS | | F | | D | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.05 | |
| Intersection Signal Delay (s/veh): 222.6 | Intersection LOS: F |
| Intersection Capacity Utilization 135.0% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

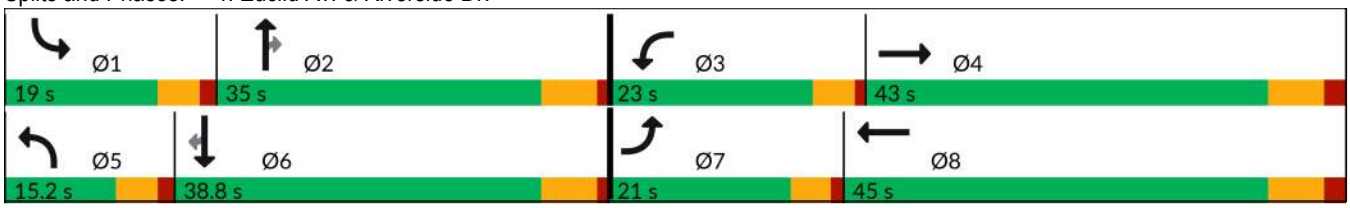

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 185 | 858 | 200 | 193 | 671 | 83 | 228 | 1174 | 319 | 135 | 1228 | 231 |
| Future Volume (veh/h) | 185 | 858 | 200 | 193 | 671 | 83 | 228 | 1174 | 319 | 135 | 1228 | 231 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 199 | 923 | 188 | 208 | 722 | 65 | 245 | 1262 | 275 | 145 | 1320 | 187 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 224 | 460 | 94 | 234 | 1022 | 92 | 143 | 929 | 415 | 171 | 987 | 435 |
| Arrive On Green | 0.13 | 0.30 | 0.30 | 0.14 | 0.31 | 0.31 | 0.08 | 0.26 | 0.26 | 0.10 | 0.28 | 0.28 |
| Sat Flow, veh/h | 1688 | 1508 | 307 | 1688 | 3292 | 296 | 1688 | 3554 | 1585 | 1688 | 3554 | 1565 |
| Grp Volume(v), veh/h | 199 | 0 | 1111 | 208 | 389 | 398 | 245 | 1262 | 275 | 145 | 1320 | 187 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1815 | 1688 | 1777 | 1811 | 1688 | 1777 | 1585 | 1688 | 1777 | 1565 |
| Q Serve(g_s), s | 13.7 | 0.0 | 36.0 | 14.3 | 22.8 | 22.9 | 10.0 | 30.9 | 18.3 | 10.0 | 32.8 | 11.6 |
| Cycle Q Clear(g_c), s | 13.7 | 0.0 | 36.0 | 14.3 | 22.8 | 22.9 | 10.0 | 30.9 | 18.3 | 10.0 | 32.8 | 11.6 |
| Prop In Lane | 1.00 | | 0.17 | 1.00 | | 0.16 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 224 | 0 | 554 | 234 | 552 | 563 | 143 | 929 | 415 | 171 | 987 | 435 |
| V/C Ratio(X) | 0.89 | 0.00 | 2.01 | 0.89 | 0.71 | 0.71 | 1.71 | 1.36 | 0.66 | 0.85 | 1.34 | 0.43 |
| Avail Cap(c_a), veh/h | 233 | 0 | 554 | 262 | 572 | 583 | 143 | 929 | 415 | 197 | 987 | 435 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.3 | 0.0 | 41.0 | 50.0 | 35.9 | 35.9 | 54.0 | 43.6 | 38.9 | 52.2 | 42.6 | 35.0 |
| Incr Delay (d2), s/veh | 29.4 | 0.0 | 459.5 | 25.7 | 4.2 | 4.2 | 349.0 | 168.1 | 3.9 | 25.4 | 158.4 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.4 | 0.0 | 86.0 | 7.5 | 10.1 | 10.3 | 17.9 | 34.4 | 7.3 | 5.3 | 35.5 | 4.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 79.7 | 0.0 | 500.5 | 75.6 | 40.2 | 40.1 | 403.0 | 211.7 | 42.9 | 77.6 | 201.1 | 35.6 |
| LnGrp LOS | E | | F | E | D | D | F | F | D | E | F | D |
| Approach Vol, veh/h | | 1310 | | | 995 | | | 1782 | | | 1652 | |
| Approach Delay, s/veh | | 436.6 | | | 47.6 | | | 211.9 | | | 171.5 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.1 | 36.9 | 21.0 | 43.0 | 15.2 | 38.8 | 20.4 | 43.7 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 13.8 | 29.0 | 18.3 | 36.0 | 10.0 | 32.8 | 16.3 | 38.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 32.9 | 16.3 | 38.0 | 12.0 | 34.8 | 15.7 | 24.9 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 223.1 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 115 | 370 | 71 | 123 | 352 | 104 | 1727 | 311 | 69 | 1440 | 96 |
| Future Volume (vph) | 115 | 370 | 71 | 123 | 352 | 104 | 1727 | 311 | 69 | 1440 | 96 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 56.0 | 56.0 | 56.0 | 56.0 | 56.0 | 49.0 | 49.0 | 49.0 | 15.0 | 64.0 | 64.0 |
| Total Split (%) | 46.7% | 46.7% | 46.7% | 46.7% | 46.7% | 40.8% | 40.8% | 40.8% | 12.5% | 53.3% | 53.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 50.2 | 50.2 | 50.2 | | 50.2 | 44.8 | 44.8 | 44.8 | 10.2 | 56.6 | 56.6 |
| Actuated g/C Ratio | 0.42 | 0.42 | 0.42 | | 0.42 | 0.38 | 0.38 | 0.38 | 0.09 | 0.48 | 0.48 |
| v/c Ratio | 0.48 | 0.52 | 0.11 | | 1.35 | 1.97 | 1.44 | 0.54 | 0.54 | 0.95 | 0.14 |
| Control Delay (s/veh) | 32.7 | 28.8 | 5.8 | | 201.8 | 520.8 | 233.5 | 27.9 | 67.2 | 43.6 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 32.7 | 28.8 | 5.8 | | 201.8 | 520.8 | 233.5 | 27.9 | 67.2 | 43.6 | 8.4 |
| LOS | C | C | A | | F | F | F | C | E | D | A |
| Approach Delay (s/veh) | | 26.6 | | | 201.8 | | 217.6 | | | 42.5 | |
| Approach LOS | | C | | | F | | F | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.97 | |
| Intersection Signal Delay (s/veh): 135.8 | Intersection LOS: F |
| Intersection Capacity Utilization 123.1% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 115 | 370 | 71 | 123 | 352 | 55 | 104 | 1727 | 311 | 69 | 1440 | 96 |
| Future Volume (veh/h) | 115 | 370 | 71 | 123 | 352 | 55 | 104 | 1727 | 311 | 69 | 1440 | 96 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 128 | 411 | 67 | 137 | 391 | 61 | 116 | 1919 | 312 | 77 | 1600 | 77 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 239 | 789 | 668 | 127 | 302 | 45 | 73 | 1275 | 569 | 131 | 1688 | 735 |
| Arrive On Green | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.36 | 0.36 | 0.36 | 0.08 | 0.47 | 0.47 |
| Sat Flow, veh/h | 889 | 1870 | 1585 | 212 | 717 | 107 | 279 | 3554 | 1585 | 1688 | 3554 | 1547 |
| Grp Volume(v), veh/h | 128 | 411 | 67 | 589 | 0 | 0 | 116 | 1919 | 312 | 77 | 1600 | 77 |
| Grp Sat Flow(s),veh/h/ln | 889 | 1870 | 1585 | 1036 | 0 | 0 | 279 | 1777 | 1585 | 1688 | 1777 | 1547 |
| Q Serve(g_s), s | 0.0 | 19.4 | 3.0 | 30.8 | 0.0 | 0.0 | 5.4 | 42.7 | 18.7 | 5.3 | 51.2 | 3.3 |
| Cycle Q Clear(g_c), s | 29.9 | 19.4 | 3.0 | 50.2 | 0.0 | 0.0 | 42.7 | 42.7 | 18.7 | 5.3 | 51.2 | 3.3 |
| Prop In Lane | 1.00 | | 1.00 | 0.23 | | 0.10 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 239 | 789 | 668 | 474 | 0 | 0 | 73 | 1275 | 569 | 131 | 1688 | 735 |
| V/C Ratio(X) | 0.54 | 0.52 | 0.10 | 1.24 | 0.00 | 0.00 | 1.59 | 1.50 | 0.55 | 0.59 | 0.95 | 0.10 |
| Avail Cap(c_a), veh/h | 239 | 789 | 668 | 474 | 0 | 0 | 73 | 1275 | 569 | 147 | 1717 | 747 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.6 | 25.5 | 20.8 | 41.6 | 0.0 | 0.0 | 59.1 | 38.2 | 30.5 | 53.1 | 29.8 | 17.3 |
| Incr Delay (d2), s/veh | 2.4 | 0.6 | 0.1 | 125.9 | 0.0 | 0.0 | 319.6 | 231.2 | 1.1 | 2.4 | 11.6 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.1 | 8.4 | 1.1 | 30.4 | 0.0 | 0.0 | 8.6 | 58.1 | 6.8 | 2.2 | 22.1 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 30.9 | 26.1 | 20.8 | 167.5 | 0.0 | 0.0 | 378.6 | 269.3 | 31.6 | 55.5 | 41.4 | 17.3 |
| LnGrp LOS | C | C | C | F | | | F | F | C | E | D | B |
| Approach Vol, veh/h | | 606 | | | 589 | | | 2347 | | | 1754 | |
| Approach Delay, s/veh | | 26.6 | | | 167.5 | | | 243.1 | | | 41.0 | |
| Approach LOS | | C | | | F | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.8 | 49.2 | | 56.0 | | 63.0 | | 56.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 42.5 | | 50.2 | | 57.5 | | 50.2 |
| Max Q Clear Time (g_c+I1), s | 7.3 | 44.7 | | 31.9 | | 53.2 | | 52.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 3.1 | | 3.4 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 143.0 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 363 | 218 | 242 | 59 | 160 | 151 | 1673 | 51 | 80 | 1473 | 88 |
| Future Volume (vph) | 363 | 218 | 242 | 59 | 160 | 151 | 1673 | 51 | 80 | 1473 | 88 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 17.0 | 49.3 | 49.3 | 14.7 | 47.0 | 15.0 | 41.3 | 41.3 | 14.7 | 41.0 | 41.0 |
| Total Split (%) | 14.2% | 41.1% | 41.1% | 12.3% | 39.2% | 12.5% | 34.4% | 34.4% | 12.3% | 34.2% | 34.2% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.4 | 26.6 | 26.6 | 10.1 | 21.1 | 10.4 | 38.3 | 38.3 | 10.1 | 34.8 | 34.8 |
| Actuated g/C Ratio | 0.12 | 0.26 | 0.26 | 0.10 | 0.21 | 0.10 | 0.38 | 0.38 | 0.10 | 0.34 | 0.34 |
| v/c Ratio | 1.96 | 0.49 | 0.44 | 0.39 | 0.72 | 0.97 | 1.38 | 0.08 | 0.53 | 1.34 | 0.16 |
| Control Delay (s/veh) | 475.7 | 36.2 | 5.9 | 53.7 | 44.2 | 110.2 | 203.6 | 0.2 | 58.8 | 187.7 | 3.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 475.7 | 36.2 | 5.9 | 53.7 | 44.2 | 110.2 | 203.6 | 0.2 | 58.8 | 187.7 | 3.8 |
| LOS | F | D | A | D | D | F | F | A | E | F | A |
| Approach Delay (s/veh) | | 221.0 | | | 46.0 | | 190.5 | | | 171.5 | |
| Approach LOS | | F | | | D | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 101.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.96 | |
| Intersection Signal Delay (s/veh): 179.6 | Intersection LOS: F |
| Intersection Capacity Utilization 108.9% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

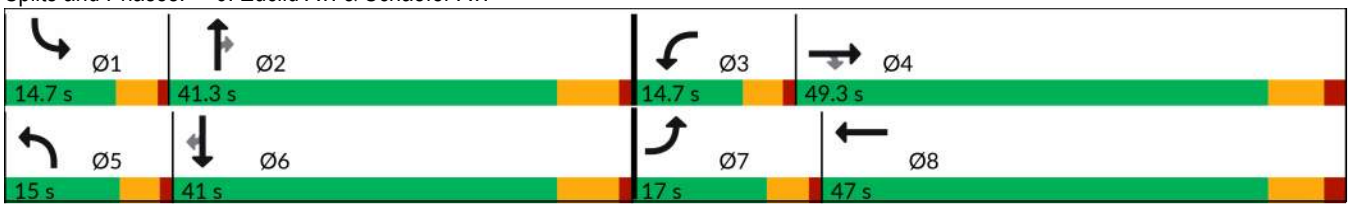

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 363 | 218 | 242 | 59 | 160 | 91 | 151 | 1673 | 51 | 80 | 1473 | 88 |
| Future Volume (veh/h) | 363 | 218 | 242 | 59 | 160 | 91 | 151 | 1673 | 51 | 80 | 1473 | 88 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 399 | 240 | 222 | 65 | 176 | 89 | 166 | 1838 | 49 | 88 | 1619 | 50 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 213 | 410 | 348 | 143 | 208 | 105 | 179 | 1304 | 582 | 157 | 1260 | 549 |
| Arrive On Green | 0.13 | 0.22 | 0.22 | 0.09 | 0.18 | 0.18 | 0.11 | 0.37 | 0.37 | 0.09 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1166 | 589 | 1688 | 3554 | 1585 | 1688 | 3554 | 1550 |
| Grp Volume(v), veh/h | 399 | 240 | 222 | 65 | 0 | 265 | 166 | 1838 | 49 | 88 | 1619 | 50 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1755 | 1688 | 1777 | 1585 | 1688 | 1777 | 1550 |
| Q Serve(g_s), s | 12.3 | 11.2 | 12.4 | 3.6 | 0.0 | 14.2 | 9.5 | 35.7 | 2.0 | 4.9 | 34.5 | 2.1 |
| Cycle Q Clear(g_c), s | 12.3 | 11.2 | 12.4 | 3.6 | 0.0 | 14.2 | 9.5 | 35.7 | 2.0 | 4.9 | 34.5 | 2.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.34 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 213 | 410 | 348 | 143 | 0 | 313 | 179 | 1304 | 582 | 157 | 1260 | 549 |
| V/C Ratio(X) | 1.87 | 0.58 | 0.64 | 0.45 | 0.00 | 0.85 | 0.93 | 1.41 | 0.08 | 0.56 | 1.29 | 0.09 |
| Avail Cap(c_a), veh/h | 213 | 813 | 689 | 173 | 0 | 721 | 179 | 1304 | 582 | 173 | 1260 | 549 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.5 | 34.0 | 34.5 | 42.4 | 0.0 | 38.7 | 43.2 | 30.8 | 20.1 | 42.2 | 31.4 | 21.0 |
| Incr Delay (d2), s/veh | 409.3 | 1.0 | 1.5 | 0.8 | 0.0 | 4.8 | 46.8 | 188.7 | 0.1 | 1.4 | 134.6 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 29.1 | 4.9 | 4.7 | 1.5 | 0.0 | 6.2 | 6.0 | 47.7 | 0.7 | 2.0 | 36.7 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 451.9 | 35.0 | 35.9 | 43.2 | 0.0 | 43.5 | 89.9 | 219.6 | 20.2 | 43.6 | 166.0 | 21.0 |
| LnGrp LOS | F | D | D | D | | D | F | F | C | D | F | C |
| Approach Vol, veh/h | | 861 | | | 330 | | | 2053 | | | 1757 | |
| Approach Delay, s/veh | | 228.4 | | | 43.5 | | | 204.3 | | | 155.7 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.8 | 42.2 | 13.0 | 28.4 | 15.0 | 41.0 | 17.0 | 24.3 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 34.8 | 10.0 | 42.3 | 10.3 | 34.5 | 12.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 6.9 | 37.7 | 5.6 | 14.4 | 11.5 | 36.5 | 14.3 | 16.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 | 0.0 | 1.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 180.8 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 131 | 741 | 56 | 367 | 709 | 156 | 1130 | 400 | 623 | 1127 | 143 |
| Future Volume (vph) | 131 | 741 | 56 | 367 | 709 | 156 | 1130 | 400 | 623 | 1127 | 143 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 58.0 | 58.0 | 58.0 | 58.0 | 58.0 | 14.8 | 38.0 | 38.0 | 24.0 | 47.2 | 47.2 |
| Total Split (%) | 48.3% | 48.3% | 48.3% | 48.3% | 48.3% | 12.3% | 31.7% | 31.7% | 20.0% | 39.3% | 39.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 50.8 | 50.8 | 50.8 | 50.8 | 50.8 | 10.1 | 31.5 | 31.5 | 19.3 | 40.7 | 40.7 |
| Actuated g/C Ratio | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.08 | 0.26 | 0.26 | 0.16 | 0.34 | 0.34 |
| v/c Ratio | 2.40 | 1.00 | 0.08 | 6.72 | 2.03 | 0.65 | 1.30 | 0.84 | 2.46 | 1.00 | 0.26 |
| Control Delay (s/veh) | 698.4 | 67.2 | 0.2 | Error | 489.3 | 65.5 | 177.8 | 45.6 | 692.9 | 65.4 | 12.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 698.4 | 67.2 | 0.2 | Error | 489.3 | 65.5 | 177.8 | 45.6 | 692.9 | 65.4 | 12.3 |
| LOS | F | E | A | F | F | E | F | D | F | E | B |
| Approach Delay (s/veh) | | 152.0 | | | 920.3 | | 136.0 | | | 268.0 | |
| Approach LOS | | F | | | F | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 6.72 | |
| Intersection Signal Delay (s/veh): 402.8 | Intersection LOS: F |
| Intersection Capacity Utilization 179.7% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 741 | 56 | 367 | 709 | 737 | 156 | 1130 | 400 | 623 | 1127 | 143 |
| Future Volume (veh/h) | 131 | 741 | 56 | 367 | 709 | 737 | 156 | 1130 | 400 | 623 | 1127 | 143 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 139 | 788 | 32 | 390 | 754 | 774 | 166 | 1202 | 409 | 663 | 1199 | 116 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 60 | 792 | 671 | 62 | 358 | 368 | 257 | 933 | 416 | 271 | 1209 | 532 |
| Arrive On Green | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.42 | 0.08 | 0.26 | 0.26 | 0.16 | 0.34 | 0.34 |
| Sat Flow, veh/h | 323 | 1870 | 1585 | 632 | 846 | 868 | 3092 | 3554 | 1585 | 1688 | 3554 | 1564 |
| Grp Volume(v), veh/h | 139 | 788 | 32 | 390 | 0 | 1528 | 166 | 1202 | 409 | 663 | 1199 | 116 |
| Grp Sat Flow(s),veh/h/ln | 323 | 1870 | 1585 | 632 | 0 | 1714 | 1546 | 1777 | 1585 | 1688 | 1777 | 1564 |
| Q Serve(g_s), s | 0.0 | 50.4 | 1.4 | 0.4 | 0.0 | 50.8 | 6.2 | 31.5 | 30.8 | 19.3 | 40.3 | 6.3 |
| Cycle Q Clear(g_c), s | 50.8 | 50.4 | 1.4 | 50.8 | 0.0 | 50.8 | 6.2 | 31.5 | 30.8 | 19.3 | 40.3 | 6.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.51 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 60 | 792 | 671 | 62 | 0 | 726 | 257 | 933 | 416 | 271 | 1209 | 532 |
| V/C Ratio(X) | 2.32 | 1.00 | 0.05 | 6.27 | 0.00 | 2.11 | 0.65 | 1.29 | 0.98 | 2.44 | 0.99 | 0.22 |
| Avail Cap(c_a), veh/h | 60 | 792 | 671 | 62 | 0 | 726 | 260 | 933 | 416 | 271 | 1209 | 532 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 60.0 | 34.5 | 20.4 | 60.0 | 0.0 | 34.6 | 53.3 | 44.3 | 44.0 | 50.3 | 39.4 | 28.2 |
| Incr Delay (d2), s/veh | 641.3 | 30.7 | 0.0 | 2405.0 | 0.0 | 502.3 | 4.2 | 138.0 | 39.5 | 660.3 | 23.7 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.5 | 28.1 | 0.5 | 43.4 | 0.0 | 121.0 | 2.5 | 30.9 | 15.9 | 57.5 | 20.3 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 701.3 | 65.2 | 20.4 | 2465.0 | 0.0 | 536.9 | 57.5 | 182.2 | 83.5 | 710.6 | 63.1 | 28.4 |
| LnGrp LOS | F | E | C | F | | F | E | F | F | F | E | C |
| Approach Vol, veh/h | | 959 | | | 1918 | | | 1777 | | | 1978 | |
| Approach Delay, s/veh | | 155.9 | | | 928.9 | | | 147.8 | | | 278.1 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 38.0 | | 58.0 | 14.7 | 47.3 | | 58.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 19.3 | 31.5 | | 50.8 | 10.1 | 40.7 | | 50.8 |
| Max Q Clear Time (g_c+I1), s | 21.3 | 33.5 | | 52.8 | 8.2 | 42.3 | | 52.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 413.8 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 72 | 269 | 129 | 298 | 314 | 140 | 1141 | 402 | 383 | 1128 | 43 |
| Future Volume (vph) | 72 | 269 | 129 | 298 | 314 | 140 | 1141 | 402 | 383 | 1128 | 43 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 44.0 | 44.0 | 44.0 | 44.0 | 44.0 | 14.8 | 37.6 | 37.6 | 18.0 | 40.8 | 40.8 |
| Actuated g/C Ratio | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.13 | 0.32 | 0.32 | 0.15 | 0.35 | 0.35 |
| v/c Ratio | 0.50 | 0.41 | 0.20 | 0.98 | 0.76 | 0.71 | 1.01 | 0.75 | 1.60 | 0.98 | 0.08 |
| Control Delay (s/veh) | 41.6 | 29.4 | 4.8 | 81.5 | 39.0 | 68.3 | 70.5 | 38.1 | 319.1 | 60.8 | 1.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.6 | 29.4 | 4.8 | 81.5 | 39.0 | 68.3 | 70.5 | 38.1 | 319.1 | 60.8 | 1.8 |
| LOS | D | C | A | F | D | E | E | D | F | E | A |
| Approach Delay (s/veh) | | 24.5 | | | 55.2 | | 62.2 | | | 122.8 | |
| Approach LOS | | C | | | E | | E | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.60 | |
| Intersection Signal Delay (s/veh): 78.3 | Intersection LOS: E |
| Intersection Capacity Utilization 110.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

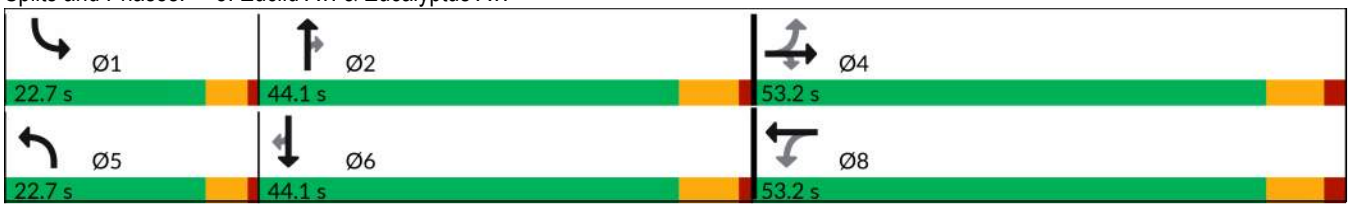

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 72 | 269 | 129 | 298 | 314 | 167 | 140 | 1141 | 402 | 383 | 1128 | 43 |
| Future Volume (veh/h) | 72 | 269 | 129 | 298 | 314 | 167 | 140 | 1141 | 402 | 383 | 1128 | 43 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 77 | 286 | 96 | 317 | 334 | 158 | 149 | 1141 | 405 | 407 | 1200 | 35 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 1.00 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 185 | 717 | 608 | 318 | 460 | 218 | 175 | 1113 | 497 | 253 | 1278 | 570 |
| Arrive On Green | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.10 | 0.31 | 0.31 | 0.15 | 0.36 | 0.36 |
| Sat Flow, veh/h | 857 | 1870 | 1585 | 948 | 1200 | 568 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 77 | 286 | 96 | 317 | 0 | 492 | 149 | 1141 | 405 | 407 | 1200 | 35 |
| Grp Sat Flow(s),veh/h/ln | 857 | 1870 | 1585 | 948 | 0 | 1768 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 10.1 | 13.4 | 4.8 | 32.6 | 0.0 | 28.5 | 10.4 | 37.6 | 28.3 | 18.0 | 39.2 | 1.7 |
| Cycle Q Clear(g_c), s | 38.6 | 13.4 | 4.8 | 46.0 | 0.0 | 28.5 | 10.4 | 37.6 | 28.3 | 18.0 | 39.2 | 1.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.32 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 185 | 717 | 608 | 318 | 0 | 678 | 175 | 1113 | 497 | 253 | 1278 | 570 |
| V/C Ratio(X) | 0.42 | 0.40 | 0.16 | 1.00 | 0.00 | 0.73 | 0.85 | 1.02 | 0.82 | 1.61 | 0.94 | 0.06 |
| Avail Cap(c_a), veh/h | 185 | 717 | 608 | 318 | 0 | 678 | 253 | 1113 | 497 | 253 | 1278 | 570 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.1 | 26.9 | 24.3 | 46.7 | 0.0 | 31.6 | 52.9 | 41.2 | 38.0 | 51.0 | 37.1 | 25.2 |
| Incr Delay (d2), s/veh | 1.1 | 0.3 | 0.1 | 49.6 | 0.0 | 3.7 | 14.9 | 33.4 | 10.1 | 291.2 | 13.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 5.8 | 1.7 | 13.7 | 0.0 | 12.1 | 5.0 | 20.5 | 11.7 | 27.7 | 18.0 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 49.2 | 27.2 | 24.4 | 96.3 | 0.0 | 35.3 | 67.8 | 74.6 | 48.1 | 342.2 | 50.4 | 25.2 |
| LnGrp LOS | D | C | C | F | | D | E | F | D | F | D | C |
| Approach Vol, veh/h | | 459 | | | 809 | | | 1695 | | | 1642 | |
| Approach Delay, s/veh | | 30.3 | | | 59.2 | | | 67.7 | | | 122.2 | |
| Approach LOS | | C | | | E | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.7 | 44.1 | | 53.2 | 17.1 | 49.7 | | 53.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 20.0 | 39.6 | | 40.6 | 12.4 | 41.2 | | 48.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.9 | 0.1 | 0.0 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 81.9 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 8 | 5 | 145 | 28 | 47 | 1944 | 467 | 258 | 1460 |
| Future Volume (vph) | 8 | 5 | 145 | 28 | 47 | 1944 | 467 | 258 | 1460 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.8 | 50.8 | 22.0 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.3% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 27.7 | | 37.9 | 10.0 | 44.4 | 44.4 | 17.3 | 54.8 |
| Actuated g/C Ratio | | 0.23 | | 0.32 | 0.08 | 0.38 | 0.38 | 0.15 | 0.46 |
| v/c Ratio | | 0.08 | | 0.96 | 0.38 | 1.68 | 0.82 | 1.21 | 1.05 |
| Control Delay (s/veh) | | 18.0 | | 65.3 | 60.4 | 336.6 | 37.6 | 169.2 | 70.0 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 18.0 | | 65.3 | 60.4 | 336.6 | 37.6 | 169.2 | 70.0 |
| LOS | | B | | E | E | F | D | F | E |
| Approach Delay (s/veh) | | 18.0 | | 65.3 | | 274.5 | | | 84.6 |
| Approach LOS | | B | | E | | F | | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.68 | |
| Intersection Signal Delay (s/veh): 182.3 | Intersection LOS: F |
| Intersection Capacity Utilization 117.4% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

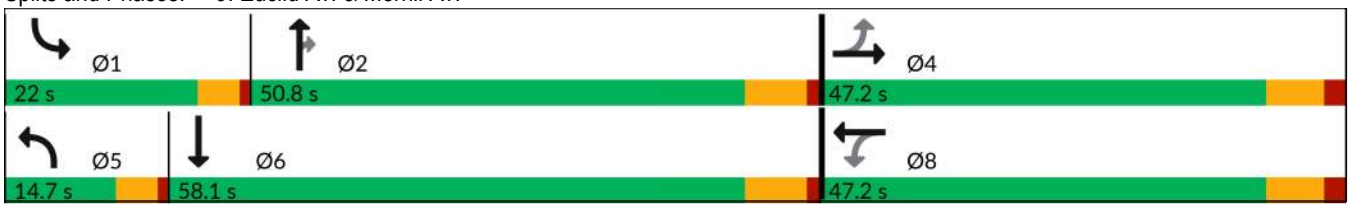

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 8 | 5 | 12 | 145 | 28 | 262 | 47 | 1944 | 467 | 258 | 1460 | 39 |
| Future Volume (veh/h) | 8 | 5 | 12 | 145 | 28 | 262 | 47 | 1944 | 467 | 258 | 1460 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 9 | 6 | 11 | 167 | 32 | 285 | 54 | 2234 | 532 | 297 | 1678 | 34 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 160 | 111 | 170 | 209 | 39 | 297 | 118 | 1317 | 584 | 244 | 1585 | 32 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.07 | 0.37 | 0.37 | 0.14 | 0.45 | 0.45 |
| Sat Flow, veh/h | 362 | 337 | 512 | 508 | 118 | 896 | 1688 | 3554 | 1576 | 1688 | 3559 | 72 |
| Grp Volume(v), veh/h | 26 | 0 | 0 | 484 | 0 | 0 | 54 | 2234 | 532 | 297 | 836 | 876 |
| Grp Sat Flow(s),veh/h/ln | 1211 | 0 | 0 | 1522 | 0 | 0 | 1688 | 1777 | 1576 | 1688 | 1777 | 1855 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 36.1 | 0.0 | 0.0 | 3.7 | 44.3 | 38.3 | 17.3 | 53.3 | 53.3 |
| Cycle Q Clear(g_c), s | 1.2 | 0.0 | 0.0 | 37.3 | 0.0 | 0.0 | 3.7 | 44.3 | 38.3 | 17.3 | 53.3 | 53.3 |
| Prop In Lane | 0.35 | | 0.42 | 0.35 | | 0.59 | 1.00 | | 1.00 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 441 | 0 | 0 | 544 | 0 | 0 | 118 | 1317 | 584 | 244 | 791 | 826 |
| V/C Ratio(X) | 0.06 | 0.00 | 0.00 | 0.89 | 0.00 | 0.00 | 0.46 | 1.70 | 0.91 | 1.22 | 1.06 | 1.06 |
| Avail Cap(c_a), veh/h | 446 | 0 | 0 | 549 | 0 | 0 | 141 | 1317 | 584 | 244 | 791 | 826 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.2 | 0.0 | 0.0 | 39.2 | 0.0 | 0.0 | 53.5 | 37.6 | 35.8 | 51.1 | 33.2 | 33.2 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 15.8 | 0.0 | 0.0 | 1.0 | 316.9 | 18.5 | 128.8 | 47.7 | 48.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 0.0 | 15.5 | 0.0 | 0.0 | 1.5 | 75.6 | 16.6 | 15.7 | 31.1 | 32.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.2 | 0.0 | 0.0 | 55.0 | 0.0 | 0.0 | 54.5 | 354.5 | 54.3 | 179.9 | 80.9 | 81.9 |
| LnGrp LOS | C | | | D | | | D | F | D | F | F | F |
| Approach Vol, veh/h | | 26 | | | 484 | | | 2820 | | | 2009 | |
| Approach Delay, s/veh | | 27.2 | | | 55.0 | | | 292.1 | | | 96.0 | |
| Approach LOS | | C | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.0 | 50.8 | | 46.8 | 13.0 | 59.8 | | 46.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.3 | 44.3 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 19.3 | 46.3 | | 3.2 | 5.7 | 55.3 | | 39.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.1 | 0.0 | 0.0 | | 0.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 195.5 |
| HCM 7th LOS | F |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 478 | 441 | 306 | 153 | 900 | 380 | 256 | 1053 | 89 | 243 | 1207 | 449 |
| Future Volume (vph) | 478 | 441 | 306 | 153 | 900 | 380 | 256 | 1053 | 89 | 243 | 1207 | 449 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 34.6 | 14.7 | 17.5 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 28.8% | 12.3% | 14.6% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 35.3 | 35.3 | 10.0 | 35.3 | 35.3 | 10.0 | 29.1 | 40.9 | 12.0 | 31.1 | 47.6 |
| Actuated g/C Ratio | 0.09 | 0.32 | 0.32 | 0.09 | 0.32 | 0.32 | 0.09 | 0.27 | 0.37 | 0.11 | 0.28 | 0.43 |
| v/c Ratio | 1.79 | 0.41 | 0.48 | 1.05 | 0.83 | 0.61 | 1.76 | 1.18 | 0.15 | 0.76 | 1.26 | 0.65 |
| Control Delay (s/veh) | 399.2 | 29.7 | 9.6 | 136.8 | 41.3 | 16.6 | 397.4 | 129.7 | 7.4 | 63.6 | 161.7 | 26.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 399.2 | 29.7 | 9.6 | 136.8 | 41.3 | 16.6 | 397.4 | 129.7 | 7.4 | 63.6 | 161.7 | 26.1 |
| LOS | F | C | A | F | D | B | F | F | A | E | F | C |
| Approach Delay (s/veh) | | 168.8 | | | 44.9 | | | 170.8 | | | 117.0 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.79 | |
| Intersection Signal Delay (s/veh): 123.0 | Intersection LOS: F |
| Intersection Capacity Utilization 107.6% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

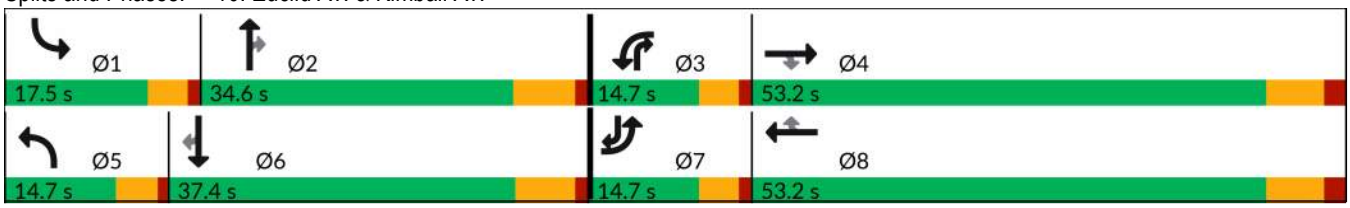

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 478 | 441 | 306 | 153 | 900 | 380 | 256 | 1053 | 89 | 243 | 1207 | 449 |
| Future Volume (veh/h) | 478 | 441 | 306 | 153 | 900 | 380 | 256 | 1053 | 89 | 243 | 1207 | 449 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 503 | 464 | 306 | 161 | 947 | 223 | 269 | 1108 | 73 | 256 | 1271 | 420 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 289 | 1093 | 488 | 158 | 1093 | 482 | 158 | 1003 | 590 | 312 | 1029 | 607 |
| Arrive On Green | 0.09 | 0.31 | 0.31 | 0.09 | 0.31 | 0.31 | 0.09 | 0.28 | 0.28 | 0.10 | 0.29 | 0.29 |
| Sat Flow, veh/h | 3092 | 3554 | 1585 | 1688 | 3554 | 1565 | 1688 | 3554 | 1565 | 3092 | 3554 | 1585 |
| Grp Volume(v), veh/h | 503 | 464 | 306 | 161 | 947 | 223 | 269 | 1108 | 73 | 256 | 1271 | 420 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1777 | 1585 | 1688 | 1777 | 1565 | 1688 | 1777 | 1565 | 1546 | 1777 | 1585 |
| Q Serve(g_s), s | 10.0 | 11.1 | 17.7 | 10.0 | 26.9 | 12.3 | 10.0 | 30.2 | 3.3 | 8.7 | 31.0 | 23.8 |
| Cycle Q Clear(g_c), s | 10.0 | 11.1 | 17.7 | 10.0 | 26.9 | 12.3 | 10.0 | 30.2 | 3.3 | 8.7 | 31.0 | 23.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 289 | 1093 | 488 | 158 | 1093 | 482 | 158 | 1003 | 590 | 312 | 1029 | 607 |
| V/C Ratio(X) | 1.74 | 0.42 | 0.63 | 1.02 | 0.87 | 0.46 | 1.71 | 1.10 | 0.12 | 0.82 | 1.23 | 0.69 |
| Avail Cap(c_a), veh/h | 289 | 1527 | 681 | 158 | 1527 | 673 | 158 | 1003 | 590 | 370 | 1029 | 607 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.5 | 29.5 | 31.8 | 48.5 | 35.0 | 29.9 | 48.5 | 38.4 | 21.9 | 47.2 | 38.0 | 27.7 |
| Incr Delay (d2), s/veh | 347.6 | 0.3 | 1.3 | 77.4 | 3.0 | 0.3 | 343.3 | 61.5 | 0.1 | 10.2 | 114.2 | 3.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 17.6 | 4.5 | 6.5 | 7.4 | 11.3 | 4.4 | 19.0 | 20.7 | 1.1 | 3.6 | 28.7 | 8.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 396.1 | 29.8 | 33.1 | 125.9 | 38.0 | 30.2 | 391.8 | 99.9 | 22.0 | 57.4 | 152.2 | 31.1 |
| LnGrp LOS | F | C | C | F | D | C | F | F | C | E | F | C |
| Approach Vol, veh/h | | 1273 | | | 1331 | | | 1450 | | | 1947 | |
| Approach Delay, s/veh | | 175.3 | | | 47.3 | | | 150.2 | | | 113.6 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.5 | 36.7 | 14.7 | 40.1 | 14.7 | 37.5 | 14.7 | 40.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 12.8 | 28.1 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 10.7 | 32.2 | 12.0 | 19.7 | 12.0 | 33.0 | 12.0 | 28.9 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | 0.0 | 3.9 | 0.0 | 0.0 | 0.0 | 4.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 120.8 |
| HCM 7th LOS | F |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 287 | 499 | 1054 | 471 | 189 | 638 | 635 | 253 | 773 |
| Future Volume (vph) | 287 | 499 | 1054 | 471 | 189 | 638 | 635 | 253 | 773 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 20.0 | 48.0 | 52.3 | 14.8 | 37.2 | 48.0 | 14.8 | 37.2 |
| Total Split (%) | 13.1% | 16.7% | 40.0% | 43.6% | 12.3% | 31.0% | 40.0% | 12.3% | 31.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 13.0 | 42.3 | 45.3 | 10.1 | 30.7 | 79.5 | 10.1 | 30.7 |
| Actuated g/C Ratio | 0.08 | 0.11 | 0.35 | 0.38 | 0.08 | 0.26 | 0.66 | 0.08 | 0.26 |
| v/c Ratio | 2.13 | 3.29 | 1.00 | 0.97 | 1.38 | 0.73 | 0.61 | 1.85 | 1.33 |
| Control Delay (s/veh) | 558.7 | Error | 67.5 | 63.4 | 250.9 | 46.3 | 12.8 | 439.9 | 191.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 558.7 | Error | 67.5 | 63.4 | 250.9 | 46.3 | 12.8 | 439.9 | 191.1 |
| LOS | F | F | E | E | F | D | B | F | F |
| Approach Delay (s/veh) | | 906.6 | | 66.0 | | 58.2 | | | 234.9 |
| Approach LOS | | F | | E | | E | | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 3.29 | |
| Intersection Signal Delay (s/veh): 249.9 | Intersection LOS: F |
| Intersection Capacity Utilization 134.4% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

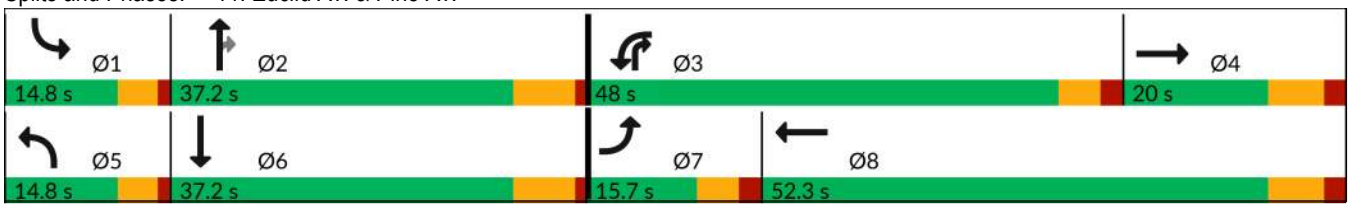

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 287 | 499 | 149 | 1054 | 471 | 171 | 189 | 638 | 635 | 253 | 773 | 410 |
| Future Volume (veh/h) | 287 | 499 | 149 | 1054 | 471 | 171 | 189 | 638 | 635 | 253 | 773 | 410 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 296 | 514 | 0 | 1087 | 486 | 173 | 195 | 658 | 579 | 261 | 797 | 417 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 141 | 203 | | 1090 | 497 | 177 | 142 | 909 | 964 | 142 | 578 | 301 |
| Arrive On Green | 0.08 | 0.11 | 0.00 | 0.35 | 0.38 | 0.38 | 0.08 | 0.26 | 0.26 | 0.08 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1688 | 1870 | 0 | 3092 | 1317 | 469 | 1688 | 3554 | 1585 | 1688 | 2260 | 1176 |
| Grp Volume(v), veh/h | 296 | 514 | 0 | 1087 | 0 | 659 | 195 | 658 | 579 | 261 | 626 | 588 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 0 | 1546 | 0 | 1786 | 1688 | 1777 | 1585 | 1688 | 1777 | 1659 |
| Q Serve(g_s), s | 10.0 | 13.0 | 0.0 | 42.1 | 0.0 | 43.7 | 10.1 | 20.3 | 27.0 | 10.1 | 30.7 | 30.7 |
| Cycle Q Clear(g_c), s | 10.0 | 13.0 | 0.0 | 42.1 | 0.0 | 43.7 | 10.1 | 20.3 | 27.0 | 10.1 | 30.7 | 30.7 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.26 | 1.00 | | 1.00 | 1.00 | | 0.71 |
| Lane Grp Cap(c), veh/h | 141 | 203 | | 1090 | 0 | 674 | 142 | 909 | 964 | 142 | 455 | 424 |
| V/C Ratio(X) | 2.10 | 2.54 | | 1.00 | 0.00 | 0.98 | 1.37 | 0.72 | 0.60 | 1.84 | 1.38 | 1.39 |
| Avail Cap(c_a), veh/h | 141 | 203 | | 1090 | 0 | 674 | 142 | 909 | 964 | 142 | 455 | 424 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.0 | 53.5 | 0.0 | 38.8 | 0.0 | 36.8 | 54.9 | 40.8 | 14.5 | 54.9 | 44.7 | 44.7 |
| Incr Delay (d2), s/veh | 520.5 | 705.9 | 0.0 | 26.6 | 0.0 | 29.0 | 205.8 | 2.5 | 0.7 | 402.9 | 182.9 | 187.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 24.5 | 45.7 | 0.0 | 18.9 | 0.0 | 23.1 | 12.2 | 8.7 | 8.7 | 20.0 | 35.8 | 34.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 575.5 | 759.4 | 0.0 | 65.4 | 0.0 | 65.9 | 260.8 | 43.3 | 15.2 | 457.9 | 227.5 | 232.5 |
| LnGrp LOS | F | F | | E | | E | F | D | B | F | F | F |
| Approach Vol, veh/h | | 810 | | | 1746 | | | 1432 | | | 1475 | |
| Approach Delay, s/veh | | 692.2 | | | 65.6 | | | 61.6 | | | 270.3 | |
| Approach LOS | | F | | | E | | | E | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.8 | 37.2 | 48.0 | 20.0 | 14.8 | 37.2 | 15.7 | 52.3 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.1 | 30.7 | 42.3 | 13.0 | 10.1 | 30.7 | 10.0 | 45.3 |
| Max Q Clear Time (g_c+I1), s | 12.1 | 29.0 | 44.1 | 15.0 | 12.1 | 32.7 | 12.0 | 45.7 |
| Green Ext Time (p_c), s | 0.0 | 0.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 212.7 |
| HCM 7th LOS | F |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 688 | 712 | 1114 | 53 | 817 |
| Future Volume (vph) | 688 | 712 | 1114 | 53 | 817 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 14.5 | 9.6 | 9.6 |
| Total Split (s) | 35.7 | 46.2 | 81.9 | 18.1 | 18.1 |
| Total Split (%) | 35.7% | 46.2% | 81.9% | 18.1% | 18.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 29.2 | 41.5 | 75.4 | 13.5 | 13.5 |
| Actuated g/C Ratio | 0.29 | 0.42 | 0.75 | 0.14 | 0.14 |
| v/c Ratio | 1.01 | 1.15 | 0.47 | 0.14 | 1.18 |
| Control Delay (s/veh) | 61.2 | 113.2 | 5.4 | 39.2 | 107.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.2 | 113.2 | 5.4 | 39.2 | 107.0 |
| LOS | E | F | A | D | F |
| Approach Delay (s/veh) | 61.2 | | 47.4 | 102.9 | |
| Approach LOS | E | | D | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.18 | |
| Intersection Signal Delay (s/veh): 64.3 | Intersection LOS: E |
| Intersection Capacity Utilization 86.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

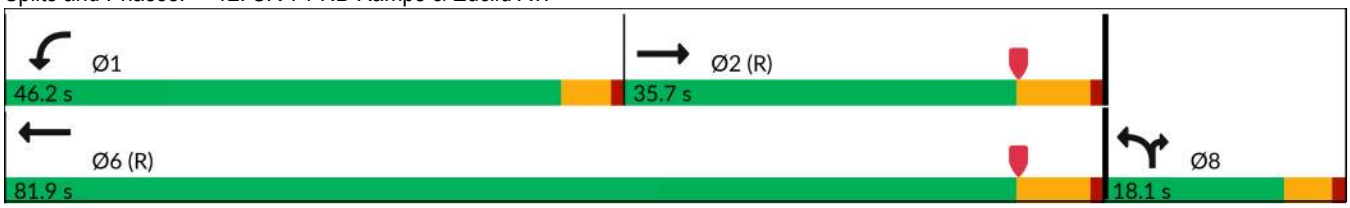

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 688 | 237 | 712 | 1114 | 53 | 817 |
| Future Volume (veh/h) | 688 | 237 | 712 | 1114 | 53 | 817 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1772 | 1870 | 1673 | 1870 |
| Adj Flow Rate, veh/h | 773 | 0 | 800 | 1252 | 60 | 0 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1373 | | 700 | 3015 | 125 | |
| Arrive On Green | 0.77 | 0.00 | 0.41 | 0.85 | 0.04 | 0.00 |
| Sat Flow, veh/h | 3741 | 0 | 1688 | 3647 | 3092 | 1585 |
| Grp Volume(v), veh/h | 773 | 0 | 800 | 1252 | 60 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1777 | 0 | 1688 | 1777 | 1546 | 1585 |
| Q Serve(g_s), s | 8.7 | 0.0 | 41.5 | 8.2 | 1.9 | 0.0 |
| Cycle Q Clear(g_c), s | 8.7 | 0.0 | 41.5 | 8.2 | 1.9 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1373 | | 700 | 3015 | 125 | |
| V/C Ratio(X) | 0.56 | | 1.14 | 0.42 | 0.48 | |
| Avail Cap(c_a), veh/h | 1373 | | 700 | 3015 | 417 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.52 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 8.0 | 0.0 | 29.3 | 1.8 | 46.9 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 80.5 | 0.4 | 2.8 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 0.0 | 30.3 | 0.4 | 0.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 8.8 | 0.0 | 109.7 | 2.2 | 49.7 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 773 | | | 2052 | 60 | |
| Approach Delay, s/veh | 8.8 | | | 44.1 | 49.7 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 46.2 | 45.1 | | | | 91.3 | 8.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 41.5 | 29.2 | | | | 75.4 | 13.5 |
| Max Q Clear Time (g_c+I1), s | 43.5 | 10.7 | | | | 10.2 | 3.9 |
| Green Ext Time (p_c), s | 0.0 | 3.5 | | | | 8.1 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 34.8 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 630 | 182 | 327 | 61 | 265 | 550 | 49 | 52 |
| Future Volume (vph) | 630 | 182 | 327 | 61 | 265 | 550 | 49 | 52 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 13.5 | 13.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 29.6 | 19.0 | 48.6 | 16.6 | 16.6 | 34.8 | 34.8 | 34.8 |
| Total Split (%) | 29.6% | 19.0% | 48.6% | 16.6% | 16.6% | 34.8% | 34.8% | 34.8% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 28.1 | 14.6 | 47.4 | 9.5 | 9.5 | 25.6 | 25.6 | 25.6 |
| Actuated g/C Ratio | 0.28 | 0.15 | 0.47 | 0.10 | 0.10 | 0.26 | 0.26 | 0.26 |
| v/c Ratio | 0.77 | 0.84 | 0.22 | 0.43 | 0.77 | 0.85 | 0.79 | 0.12 |
| Control Delay (s/veh) | 40.8 | 65.9 | 13.2 | 51.0 | 22.3 | 54.2 | 47.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.8 | 65.9 | 13.2 | 51.0 | 22.3 | 54.2 | 47.7 | 0.5 |
| LOS | D | E | B | D | C | D | D | A |
| Approach Delay (s/veh) | 40.8 | | 32.1 | | | | 47.0 | |
| Approach LOS | D | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 38.6 | Intersection LOS: D |
| Intersection Capacity Utilization 66.5% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

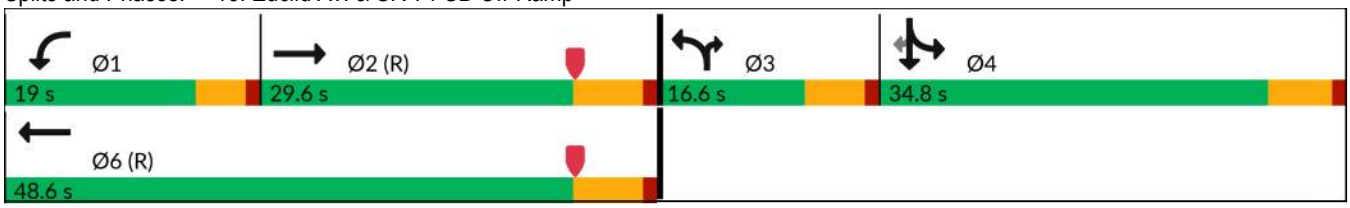

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 630 | 40 | 182 | 327 | 0 | 61 | 0 | 265 | 550 | 49 | 52 |
| Future Volume (veh/h) | 0 | 630 | 40 | 182 | 327 | 0 | 61 | 0 | 265 | 550 | 49 | 52 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 0 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 716 | 31 | 207 | 372 | 0 | 69 | 0 | 181 | 669 | 0 | 35 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.80 | 0.88 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1627 | 70 | 232 | 2323 | | 0 | 0 | 0 | 764 | 0 | 358 |
| Arrive On Green | 0.00 | 0.47 | 0.47 | 0.28 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.23 | 0.00 | 0.23 |
| Sat Flow, veh/h | 0 | 3563 | 150 | 1688 | 3647 | 0 | | 0 | | 3375 | 0 | 1583 |
| Grp Volume(v), veh/h | 0 | 367 | 380 | 207 | 372 | 0 | | 0.0 | | 669 | 0 | 35 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1777 | 1843 | 1688 | 1777 | 0 | | | | 1688 | 0 | 1583 |
| Q Serve(g_s), s | 0.0 | 13.8 | 13.8 | 11.8 | 0.0 | 0.0 | | | | 19.1 | 0.0 | 1.7 |
| Cycle Q Clear(g_c), s | 0.0 | 13.8 | 13.8 | 11.8 | 0.0 | 0.0 | | | | 19.1 | 0.0 | 1.7 |
| Prop In Lane | 0.00 | | 0.08 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 833 | 864 | 232 | 2323 | | | | | 764 | 0 | 358 |
| V/C Ratio(X) | 0.00 | 0.44 | 0.44 | 0.89 | 0.16 | | | | | 0.88 | 0.00 | 0.10 |
| Avail Cap(c_a), veh/h | 0 | 833 | 864 | 241 | 2323 | | | | | 979 | 0 | 459 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.89 | 0.89 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 17.8 | 17.8 | 35.5 | 0.0 | 0.0 | | | | 37.3 | 0.0 | 30.6 |
| Incr Delay (d2), s/veh | 0.0 | 1.7 | 1.6 | 27.0 | 0.1 | 0.0 | | | | 6.9 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 5.5 | 5.7 | 5.7 | 0.0 | 0.0 | | | | 8.5 | 0.0 | 0.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 19.4 | 19.4 | 62.5 | 0.1 | 0.0 | | | | 44.2 | 0.0 | 30.7 |
| LnGrp LOS | | B | B | E | A | | | | | D | | C |
| Approach Vol, veh/h | | 747 | | | 579 | | | | | | 704 | |
| Approach Delay, s/veh | | 19.4 | | | 22.4 | | | | | | 43.5 | |
| Approach LOS | | B | | | C | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.5 | 53.1 | | 28.4 | | 71.6 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 14.3 | 23.4 | | 29.0 | | 42.4 |
| Max Q Clear Time (g_c+I1), s | 13.8 | 15.8 | | 21.1 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.7 | | 1.4 | | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.6 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 175 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 71 | 1850 | 99 | 121 | 2380 | 97 | 57 | 8 | 25 | 104 | 40 | 97 |
| Future Vol, veh/h | 71 | 1850 | 99 | 121 | 2380 | 97 | 57 | 8 | 25 | 104 | 40 | 97 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 77 | 2011 | 108 | 132 | 2587 | 105 | 62 | 9 | 27 | 113 | 43 | 105 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2692 | 0 | 0 | 2118 | 0 | 0 | 5091 | 5174 | 2065 | 5072 | 5176 | 2640 |
| Stage 1 | - | - | - | - | - | - | 2219 | 2219 | - | 2903 | 2903 | - |
| Stage 2 | - | - | - | - | - | - | 2872 | 2955 | - | 2170 | 2273 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 153 | - | - | 257 | - | - | ~ 0 | ~ 0 | 69 | ~ 0 | ~ 0 | ~ 30 |
| Stage 1 | - | - | - | - | - | - | ~ 58 | 81 | - | ~ 22 | ~ 35 | - |
| Stage 2 | - | - | - | - | - | - | ~ 23 | 33 | - | ~ 62 | 76 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 153 | - | - | 257 | - | - | ~ 0 | ~ 0 | 69 | ~ 0 | ~ 0 | ~ 30 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 530 | ~ -91 | - | ~ 26 | 84 | - |
| Stage 1 | - | - | - | - | - | - | ~ 58 | 81 | - | ~ 22 | ~ 35 | - |
| Stage 2 | - | - | - | - | - | - | ~ 13 | 33 | - | ~ 33 | 76 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.78 | 1.53 | 31.02 | $ 3550.95 |
| HCM LOS | | | D | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 234 | ~ 63 | - | - | ~ 83 | - | - | 31 |
| HCM Lane V/C Ratio | 0.418 | 0.506 | - | - | 0.511 | - | - | 8.346 |
| HCM Control Delay (s/veh) | 31 | 50.5 | 0 | - | 32.8 | 0 | | $ 3550.9 |
| HCM Lane LOS | D | F | A | - | D | A | - | F |
| HCM 95th %tile Q(veh) | 1.9 | 2.4 | - | - | 2.7 | - | - | 31.9 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 149.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 115 | 1095 | 55 | 78 | 944 | 53 | 51 | 94 | 96 | 8 | 52 | 78 |
| Future Vol, veh/h | 115 | 1095 | 55 | 78 | 944 | 53 | 51 | 94 | 96 | 8 | 52 | 78 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 | 88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 131 | 1244 | 63 | 89 | 1073 | 60 | 58 | 107 | 109 | 9 | 59 | 89 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1136 | 0 | 0 | 1307 | 0 | 0 | 2280 | 2850 | 1276 | 2842 | 2851 | 569 |
| Stage 1 | - | - | - | - | - | - | 1537 | 1537 | - | 1283 | 1283 | - |
| Stage 2 | - | - | - | - | - | - | 743 | 1313 | - | 1559 | 1568 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 613 | - | - | 528 | - | - | ~ 25 | ~ 17 | 203 | 9 | ~ 17 | 466 |
| Stage 1 | - | - | - | - | - | - | 144 | 177 | - | 175 | 235 | - |
| Stage 2 | - | - | - | - | - | - | 374 | 227 | - | 140 | 171 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 611 | - | - | 528 | - | - | ~ 13 | ~ 11 | 203 | ~ 3 | ~ 11 | 465 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 40 | ~ 51 | - | ~ -42 | ~ 42 | - |
| Stage 1 | - | - | - | - | - | - | 113 | 139 | - | 145 | 195 | - |
| Stage 2 | - | - | - | - | - | - | 175 | 188 | - | 12 | 134 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 1.14 | 0.96 | $ 1511.11 | 282.31 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 67 | 611 | - | - | 528 | - | - | 114 |
| HCM Lane V/C Ratio | 4.077 | 0.214 | - | - | 0.168 | - | - | 1.371 |
| HCM Control Delay (s/veh) | $ 1511.1 | 12.5 | - | - | 13.2 | - | - | 282.3 |
| HCM Lane LOS | F | B | - | - | B | - | - | F |
| HCM 95th %tile Q(veh) | 29.3 | 0.8 | - | - | 0.6 | - | - | 10.8 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 16.9 |
| Intersection LOS | C |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 36 | 133 | 41 | 17 | 189 | 17 | 75 | 280 | 23 | 8 | 171 | 55 |
| Future Vol, veh/h | 36 | 133 | 41 | 17 | 189 | 17 | 75 | 280 | 23 | 8 | 171 | 55 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 39 | 145 | 45 | 18 | 205 | 18 | 82 | 304 | 25 | 9 | 186 | 60 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 14.1 | 14.6 | 21.5 | 14.1 |
| HCM LOS | B | B | C | B |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 20% | 17% | 8% | 3% |
| Vol Thru, % | 74% | 63% | 85% | 73% |
| Vol Right, % | 6% | 20% | 8% | 24% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 378 | 210 | 223 | 234 |
| LT Vol | 75 | 36 | 17 | 8 |
| Through Vol | 280 | 133 | 189 | 171 |
| RT Vol | 23 | 41 | 17 | 55 |
| Lane Flow Rate | 411 | 228 | 242 | 254 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.689 | 0.412 | 0.438 | 0.44 |
| Departure Headway (Hd) | 6.035 | 6.499 | 6.511 | 6.228 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 596 | 552 | 550 | 577 |
| Service Time | 4.085 | 4.561 | 4.573 | 4.287 |
| HCM Lane V/C Ratio | 0.69 | 0.413 | 0.44 | 0.44 |
| HCM Control Delay, s/veh | 21.5 | 14.1 | 14.6 | 14.1 |
| HCM Lane LOS | C | B | B | B |
| HCM 95th-tile Q | 5.4 | 2 | 2.2 | 2.2 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 163 | 1221 | 241 | 373 | 1421 | 367 | 194 | 179 | 94 |
| Future Volume (vph) | 163 | 1221 | 241 | 373 | 1421 | 367 | 194 | 179 | 94 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 14.0 | 37.0 | 37.0 | 26.0 | 49.0 | 25.0 | 42.0 | 15.0 | 32.0 |
| Total Split (%) | 11.7% | 30.8% | 30.8% | 21.7% | 40.8% | 20.8% | 35.0% | 12.5% | 26.7% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.4 | 31.2 | 31.2 | 21.4 | 43.2 | 20.4 | 36.6 | 10.4 | 26.6 |
| Actuated g/C Ratio | 0.08 | 0.26 | 0.26 | 0.18 | 0.36 | 0.17 | 0.31 | 0.09 | 0.22 |
| v/c Ratio | 1.32 | 1.41 | 0.46 | 1.33 | 1.35 | 1.37 | 1.17 | 1.31 | 0.57 |
| Control Delay (s/veh) | 230.6 | 226.5 | 12.6 | 209.7 | 194.9 | 227.0 | 126.1 | 223.1 | 38.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 230.6 | 226.5 | 12.6 | 209.7 | 194.9 | 227.0 | 126.1 | 223.1 | 38.0 |
| LOS | F | F | B | F | F | F | F | F | D |
| Approach Delay (s/veh) | | 195.2 | | | 197.7 | | 163.1 | | 119.9 |
| Approach LOS | | F | | | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.41 | |
| Intersection Signal Delay (s/veh): 183.7 | Intersection LOS: F |
| Intersection Capacity Utilization 120.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

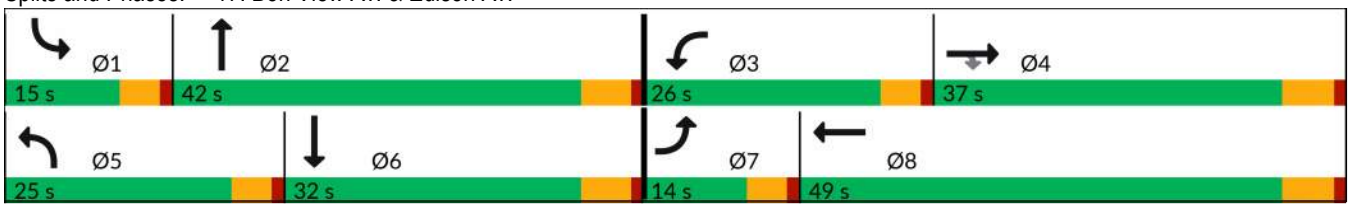

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 163 | 1221 | 241 | 373 | 1421 | 177 | 367 | 194 | 440 | 179 | 94 | 131 |
| Future Volume (veh/h) | 163 | 1221 | 241 | 373 | 1421 | 177 | 367 | 194 | 440 | 179 | 94 | 131 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 173 | 1299 | 150 | 397 | 1512 | 103 | 390 | 206 | 255 | 190 | 100 | 86 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 135 | 945 | 421 | 308 | 1243 | 84 | 293 | 220 | 272 | 150 | 189 | 163 |
| Arrive On Green | 0.08 | 0.40 | 0.27 | 0.18 | 0.55 | 0.37 | 0.17 | 0.29 | 0.29 | 0.09 | 0.20 | 0.20 |
| Sat Flow, veh/h | 1688 | 3554 | 1585 | 1688 | 3377 | 229 | 1688 | 760 | 941 | 1688 | 928 | 798 |
| Grp Volume(v), veh/h | 173 | 1299 | 150 | 397 | 792 | 823 | 390 | 0 | 461 | 190 | 0 | 186 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1585 | 1688 | 1777 | 1829 | 1688 | 0 | 1701 | 1688 | 0 | 1727 |
| Q Serve(g_s), s | 9.4 | 31.2 | 9.0 | 21.4 | 43.2 | 43.2 | 20.4 | 0.0 | 31.0 | 10.4 | 0.0 | 11.3 |
| Cycle Q Clear(g_c), s | 9.4 | 31.2 | 9.0 | 21.4 | 43.2 | 43.2 | 20.4 | 0.0 | 31.0 | 10.4 | 0.0 | 11.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.13 | 1.00 | | 0.55 | 1.00 | | 0.46 |
| Lane Grp Cap(c), veh/h | 135 | 945 | 421 | 308 | 654 | 673 | 293 | 0 | 492 | 150 | 0 | 352 |
| V/C Ratio(X) | 1.28 | 1.37 | 0.36 | 1.29 | 1.21 | 1.22 | 1.33 | 0.00 | 0.94 | 1.27 | 0.00 | 0.53 |
| Avail Cap(c_a), veh/h | 135 | 945 | 421 | 308 | 654 | 673 | 293 | 0 | 531 | 150 | 0 | 391 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.0 | 35.3 | 34.9 | 48.0 | 26.3 | 27.6 | 48.5 | 0.0 | 40.7 | 53.5 | 0.0 | 41.7 |
| Incr Delay (d2), s/veh | 170.8 | 175.3 | 0.5 | 152.7 | 108.5 | 113.0 | 169.8 | 0.0 | 23.6 | 163.7 | 0.0 | 1.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.3 | 33.9 | 3.4 | 21.7 | 32.8 | 35.3 | 22.1 | 0.0 | 15.6 | 11.1 | 0.0 | 4.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 224.7 | 210.6 | 35.4 | 200.7 | 134.8 | 140.6 | 218.3 | 0.0 | 64.3 | 217.1 | 0.0 | 42.9 |
| LnGrp LOS | F | F | D | F | F | F | F | | E | F | | D |
| Approach Vol, veh/h | | 1622 | | | 2012 | | | 851 | | | 376 | |
| Approach Delay, s/veh | | 195.9 | | | 150.2 | | | 134.8 | | | 130.9 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.0 | 39.3 | 26.0 | 37.0 | 25.0 | 29.3 | 14.0 | 49.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 36.6 | 21.4 | 31.2 | 20.4 | 26.6 | 9.4 | 43.2 |
| Max Q Clear Time (g_c+I1), s | 12.4 | 33.0 | 23.4 | 33.2 | 22.4 | 13.3 | 11.4 | 45.2 |
| Green Ext Time (p_c), s | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 161.3 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 130.5 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 202 | 498 | 7 | 4 | 185 | 42 | 21 | 36 | 5 | 161 | 56 | 200 |
| Future Vol, veh/h | 202 | 498 | 7 | 4 | 185 | 42 | 21 | 36 | 5 | 161 | 56 | 200 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 230 | 566 | 8 | 5 | 210 | 48 | 24 | 41 | 6 | 183 | 64 | 227 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 230.6 | 18.4 | 14 | 40.1 |
| HCM LOS | F | C | B | E |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 34% | 29% | 2% | 39% |
| Vol Thru, % | 58% | 70% | 80% | 13% |
| Vol Right, % | 8% | 1% | 18% | 48% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 62 | 707 | 231 | 417 |
| LT Vol | 21 | 202 | 4 | 161 |
| Through Vol | 36 | 498 | 185 | 56 |
| RT Vol | 5 | 7 | 42 | 200 |
| Lane Flow Rate | 70 | 803 | 263 | 474 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.156 | 1.448 | 0.505 | 0.853 |
| Departure Headway (Hd) | 9.313 | 6.489 | 7.74 | 7.413 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 387 | 562 | 470 | 493 |
| Service Time | 7.313 | 4.581 | 5.74 | 5.413 |
| HCM Lane V/C Ratio | 0.181 | 1.429 | 0.56 | 0.961 |
| HCM Control Delay, s/veh | 14 | 230.6 | 18.4 | 40.1 |
| HCM Lane LOS | B | F | C | E |
| HCM 95th-tile Q | 0.5 | 38.4 | 2.8 | 8.8 |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 30 | 2461 | 2743 | 118 |
| Future Volume (vph) | 30 | 2461 | 2743 | 118 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 5.0 |
| Minimum Split (s) | 23.8 | 23.8 | 23.8 | 22.6 |
| Total Split (s) | 96.0 | 96.0 | 96.0 | 24.0 |
| Total Split (%) | 80.0% | 80.0% | 80.0% | 20.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | None |
| Act Effct Green (s) | 90.3 | 90.3 | 90.3 | 14.8 |
| Actuated g/C Ratio | 0.78 | 0.78 | 0.78 | 0.13 |
| v/c Ratio | 0.54 | 0.97 | 1.12 | 0.75 |
| Control Delay (s/veh) | 45.0 | 23.9 | 74.8 | 67.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 45.0 | 23.9 | 74.8 | 67.9 |
| LOS | D | C | E | E |
| Approach Delay (s/veh) | | 24.2 | 74.8 | 67.9 |
| Approach LOS | | C | E | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 115.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.12 | |
| Intersection Signal Delay (s/veh): 51.6 | Intersection LOS: D |
| Intersection Capacity Utilization 96.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 19: Edison Av. & Cucamonga Av.

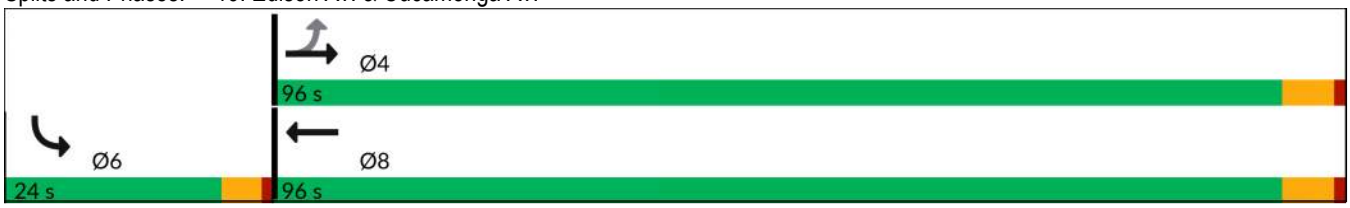

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 2461 | 2743 | 90 | 118 | 39 |
| Future Volume (veh/h) | 30 | 2461 | 2743 | 90 | 118 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 33 | 2675 | 2982 | 98 | 128 | 42 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 63 | 2819 | 2786 | 91 | 149 | 49 |
| Arrive On Green | 0.79 | 0.79 | 0.79 | 0.79 | 0.12 | 0.12 |
| Sat Flow, veh/h | 69 | 3647 | 3605 | 115 | 1294 | 425 |
| Grp Volume(v), veh/h | 33 | 2675 | 1501 | 1579 | 171 | 0 |
| Grp Sat Flow(s),veh/h/ln | 69 | 1777 | 1777 | 1850 | 1729 | 0 |
| Q Serve(g_s), s | 0.0 | 71.5 | 90.2 | 90.2 | 11.0 | 0.0 |
| Cycle Q Clear(g_c), s | 90.2 | 71.5 | 90.2 | 90.2 | 11.0 | 0.0 |
| Prop In Lane | 1.00 | | | 0.06 | 0.75 | 0.25 |
| Lane Grp Cap(c), veh/h | 63 | 2819 | 1410 | 1467 | 199 | 0 |
| V/C Ratio(X) | 0.52 | 0.95 | 1.06 | 1.08 | 0.86 | 0.00 |
| Avail Cap(c_a), veh/h | 63 | 2819 | 1410 | 1467 | 295 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 56.8 | 9.8 | 11.7 | 11.7 | 49.4 | 0.0 |
| Incr Delay (d2), s/veh | 7.4 | 8.1 | 43.2 | 47.0 | 10.6 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 18.0 | 37.1 | 40.2 | 5.2 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 64.3 | 17.9 | 54.9 | 58.7 | 60.0 | 0.0 |
| LnGrp LOS | E | B | F | F | E | |
| Approach Vol, veh/h | | 2708 | 3080 | | 171 | |
| Approach Delay, s/veh | | 18.4 | 56.9 | | 60.0 | |
| Approach LOS | | B | E | | E | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 96.0 | | 17.7 | | 96.0 |
| Change Period (Y+Rc), s | | 5.8 | | 4.6 | | 5.8 |
| Max Green Setting (Gmax), s | | 90.2 | | 19.4 | | 90.2 |
| Max Q Clear Time (g_c+I1), s | | 92.2 | | 13.0 | | 92.2 |
| Green Ext Time (p_c), s | | 0.0 | | 0.1 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 39.5 |
| HCM 7th LOS | D |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 6 | 591 | 494 | 1428 | 820 | 549 |
| Future Volume (vph) | 6 | 591 | 494 | 1428 | 820 | 549 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 29.0 | 29.0 | 30.0 | 61.0 | 31.0 | 31.0 |
| Total Split (%) | 32.2% | 32.2% | 33.3% | 67.8% | 34.4% | 34.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 23.6 | 23.6 | 24.2 | 54.8 | 24.8 | 24.8 |
| Actuated g/C Ratio | 0.26 | 0.26 | 0.27 | 0.61 | 0.28 | 0.28 |
| v/c Ratio | 0.69 | 1.28 | 1.17 | 0.71 | 0.90 | 0.69 |
| Control Delay (s/veh) | 39.0 | 167.4 | 119.6 | 11.6 | 44.5 | 8.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.0 | 167.4 | 119.6 | 13.1 | 44.5 | 8.1 |
| LOS | D | F | F | B | D | A |
| Approach Delay (s/veh) | 124.1 | | | 40.5 | 29.9 | |
| Approach LOS | F | | | D | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.28 | |
| Intersection Signal Delay (s/veh): 54.8 | Intersection LOS: D |
| Intersection Capacity Utilization 114.6% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

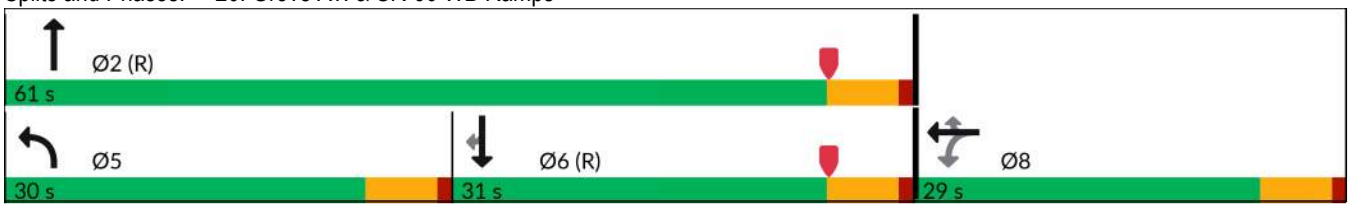

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 295 | 6 | 591 | 494 | 1428 | 0 | 0 | 820 | 549 |
| Future Volume (veh/h) | 0 | 0 | 0 | 295 | 6 | 591 | 494 | 1428 | 0 | 0 | 820 | 549 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 314 | 6 | 485 | 526 | 1519 | 0 | 0 | 872 | 439 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 451 | 9 | 409 | 454 | 2180 | 0 | 0 | 995 | 444 |
| Arrive On Green | | | | 0.26 | 0.26 | 0.26 | 0.54 | 1.00 | 0.00 | 0.00 | 0.28 | 0.28 |
| Sat Flow, veh/h | | | | 1749 | 33 | 1585 | 1688 | 3647 | 0 | 0 | 3647 | 1585 |
| Grp Volume(v), veh/h | | | | 320 | 0 | 485 | 526 | 1519 | 0 | 0 | 872 | 439 |
| Grp Sat Flow(s),veh/h/ln | | | | 1783 | 0 | 1585 | 1688 | 1777 | 0 | 0 | 1777 | 1585 |
| Q Serve(g_s), s | | | | 14.6 | 0.0 | 23.2 | 24.2 | 0.0 | 0.0 | 0.0 | 21.1 | 24.8 |
| Cycle Q Clear(g_c), s | | | | 14.6 | 0.0 | 23.2 | 24.2 | 0.0 | 0.0 | 0.0 | 21.1 | 24.8 |
| Prop In Lane | | | | 0.98 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 460 | 0 | 409 | 454 | 2180 | 0 | 0 | 995 | 444 |
| V/C Ratio(X) | | | | 0.70 | 0.00 | 1.19 | 1.16 | 0.70 | 0.00 | 0.00 | 0.88 | 0.99 |
| Avail Cap(c_a), veh/h | | | | 460 | 0 | 409 | 454 | 2180 | 0 | 0 | 995 | 444 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 30.2 | 0.0 | 33.4 | 20.8 | 0.0 | 0.0 | 0.0 | 30.9 | 32.3 |
| Incr Delay (d2), s/veh | | | | 4.3 | 0.0 | 106.3 | 74.2 | 0.2 | 0.0 | 0.0 | 10.7 | 40.1 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 6.4 | 0.0 | 20.3 | 14.4 | 0.1 | 0.0 | 0.0 | 9.8 | 13.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 34.5 | 0.0 | 139.7 | 95.0 | 0.2 | 0.0 | 0.0 | 41.7 | 72.4 |
| LnGrp LOS | | | | C | | F | F | A | | | D | E |
| Approach Vol, veh/h | | | | | 805 | | | 2045 | | | 1311 | |
| Approach Delay, s/veh | | | | | 97.9 | | | 24.5 | | | 51.9 | |
| Approach LOS | | | | | F | | | C | | | D | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 61.0 | | 30.0 | 31.0 | | 29.0 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 55.2 | | 24.2 | 25.2 | | 23.2 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 26.2 | 26.8 | | 25.2 |
| Green Ext Time (p_c), s | 12.3 | | 0.0 | 0.0 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 47.4 |
| HCM 7th LOS | D |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 2 | 254 | 1380 | 314 | 783 |
| Future Volume (vph) | 2 | 254 | 1380 | 314 | 783 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 39.2 | 17.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 43.6% | 18.9% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 27.0 | 27.0 | 33.4 | 12.0 | 50.4 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.37 | 0.13 | 0.56 |
| v/c Ratio | 0.99 | 0.45 | 1.50 | 1.47 | 0.41 |
| Control Delay (s/veh) | 71.0 | 13.1 | 252.9 | 256.8 | 12.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 71.0 | 13.1 | 252.9 | 256.8 | 12.1 |
| LOS | E | B | F | F | B |
| Approach Delay (s/veh) | 51.7 | | 252.9 | | 82.1 |
| Approach LOS | D | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.50 | |
| Intersection Signal Delay (s/veh): 161.2 | Intersection LOS: F |
| Intersection Capacity Utilization 114.6% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 506 | 2 | 254 | 0 | 0 | 0 | 0 | 1380 | 477 | 314 | 783 | 0 |
| Future Volume (veh/h) | 506 | 2 | 254 | 0 | 0 | 0 | 0 | 1380 | 477 | 314 | 783 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 527 | 2 | 191 | | | | 0 | 1438 | 376 | 327 | 816 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 532 | 2 | 476 | | | | 0 | 1038 | 261 | 225 | 1990 | 0 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | | | | 0.00 | 0.37 | 0.37 | 0.27 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1775 | 7 | 1585 | | | | 0 | 2891 | 704 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 529 | 0 | 191 | | | | 0 | 893 | 921 | 327 | 816 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1782 | 0 | 1585 | | | | 0 | 1777 | 1725 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 26.6 | 0.0 | 8.6 | | | | 0.0 | 33.4 | 33.4 | 12.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 26.6 | 0.0 | 8.6 | | | | 0.0 | 33.4 | 33.4 | 12.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 0.41 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 534 | 0 | 476 | | | | 0 | 659 | 640 | 225 | 1990 | 0 |
| V/C Ratio(X) | 0.99 | 0.00 | 0.40 | | | | 0.00 | 1.35 | 1.44 | 1.45 | 0.41 | 0.00 |
| Avail Cap(c_a), veh/h | 534 | 0 | 476 | | | | 0 | 659 | 640 | 225 | 1990 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.32 | 0.32 | 0.00 |
| Uniform Delay (d), s/veh | 31.4 | 0.0 | 25.1 | | | | 0.0 | 28.3 | 28.3 | 33.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 36.1 | 0.0 | 0.2 | | | | 0.0 | 169.5 | 206.2 | 211.9 | 0.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 15.8 | 0.0 | 3.1 | | | | 0.0 | 43.8 | 49.0 | 17.1 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 67.5 | 0.0 | 25.3 | | | | 0.0 | 197.8 | 234.5 | 244.9 | 0.2 | 0.0 |
| LnGrp LOS | E | | C | | | | | F | F | F | A | |
| Approach Vol, veh/h | | 720 | | | | | | 1814 | | | 1143 | |
| Approach Delay, s/veh | | 56.3 | | | | | | 216.4 | | | 70.2 | |
| Approach LOS | | E | | | | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 39.2 | | 33.8 | | 56.2 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 12.0 | 33.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 14.0 | 35.4 | | 28.6 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 4.8 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 139.6 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 249 | 207 | 65 | 229 | 86 | 1291 | 83 | 839 |
| Future Volume (vph) | 249 | 207 | 65 | 229 | 86 | 1291 | 83 | 839 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 17.0 | 26.3 | 14.5 | 23.8 | 11.0 | 39.2 | 10.0 | 38.2 |
| Total Split (%) | 18.9% | 29.2% | 16.1% | 26.4% | 12.2% | 43.6% | 11.1% | 42.4% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.4 | 22.5 | 8.0 | 16.0 | 6.4 | 33.4 | 5.4 | 32.4 |
| Actuated g/C Ratio | 0.14 | 0.26 | 0.09 | 0.18 | 0.07 | 0.38 | 0.06 | 0.37 |
| v/c Ratio | 1.22 | 0.39 | 0.50 | 0.81 | 0.81 | 1.18 | 0.93 | 0.81 |
| Control Delay (s/veh) | 164.7 | 22.4 | 49.7 | 35.4 | 86.7 | 117.2 | 116.5 | 31.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 164.7 | 22.4 | 49.7 | 35.4 | 86.7 | 117.2 | 116.5 | 31.3 |
| LOS | F | C | D | D | F | F | F | C |
| Approach Delay (s/veh) | | 85.5 | | 37.1 | | 115.4 | | 38.4 |
| Approach LOS | | F | | D | | F | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 88.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.22 | |
| Intersection Signal Delay (s/veh): 77.0 | Intersection LOS: E |
| Intersection Capacity Utilization 89.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

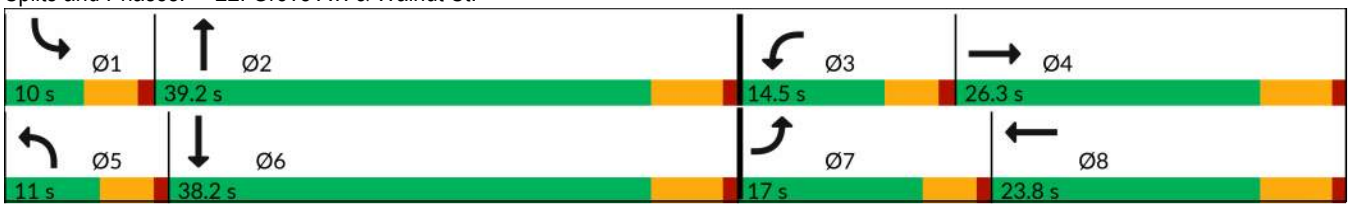

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 249 | 207 | 105 | 65 | 229 | 262 | 86 | 1291 | 81 | 83 | 839 | 74 |
| Future Volume (veh/h) | 249 | 207 | 105 | 65 | 229 | 262 | 86 | 1291 | 81 | 83 | 839 | 74 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 286 | 238 | 112 | 75 | 263 | 241 | 99 | 1484 | 84 | 95 | 964 | 45 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 238 | 630 | 287 | 95 | 323 | 285 | 123 | 1298 | 73 | 104 | 1273 | 59 |
| Arrive On Green | 0.14 | 0.27 | 0.27 | 0.06 | 0.18 | 0.18 | 0.07 | 0.38 | 0.38 | 0.06 | 0.37 | 0.37 |
| Sat Flow, veh/h | 1688 | 2370 | 1079 | 1688 | 1781 | 1573 | 1688 | 3417 | 193 | 1688 | 3454 | 161 |
| Grp Volume(v), veh/h | 286 | 176 | 174 | 75 | 262 | 242 | 99 | 769 | 799 | 95 | 496 | 513 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1672 | 1688 | 1777 | 1578 | 1688 | 1777 | 1833 | 1688 | 1777 | 1839 |
| Q Serve(g_s), s | 12.4 | 7.1 | 7.5 | 3.9 | 12.5 | 13.0 | 5.1 | 33.4 | 33.4 | 4.9 | 21.5 | 21.5 |
| Cycle Q Clear(g_c), s | 12.4 | 7.1 | 7.5 | 3.9 | 12.5 | 13.0 | 5.1 | 33.4 | 33.4 | 4.9 | 21.5 | 21.5 |
| Prop In Lane | 1.00 | | 0.65 | 1.00 | | 1.00 | 1.00 | | 0.11 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 238 | 473 | 445 | 95 | 322 | 286 | 123 | 675 | 696 | 104 | 655 | 678 |
| V/C Ratio(X) | 1.20 | 0.37 | 0.39 | 0.79 | 0.81 | 0.85 | 0.81 | 1.14 | 1.15 | 0.92 | 0.76 | 0.76 |
| Avail Cap(c_a), veh/h | 238 | 473 | 445 | 190 | 364 | 323 | 123 | 675 | 696 | 104 | 655 | 678 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.8 | 26.3 | 26.4 | 41.0 | 34.6 | 34.8 | 40.2 | 27.3 | 27.3 | 41.0 | 24.3 | 24.3 |
| Incr Delay (d2), s/veh | 123.8 | 0.5 | 0.6 | 5.5 | 12.1 | 16.8 | 29.3 | 79.8 | 82.7 | 61.4 | 5.1 | 4.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.0 | 2.9 | 2.9 | 1.7 | 6.1 | 6.0 | 3.0 | 27.6 | 29.0 | 3.7 | 9.2 | 9.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 161.6 | 26.8 | 27.0 | 46.4 | 46.7 | 51.6 | 69.5 | 107.1 | 110.0 | 102.4 | 29.4 | 29.2 |
| LnGrp LOS | F | C | C | D | D | D | E | F | F | F | C | C |
| Approach Vol, veh/h | | 636 | | | 579 | | | 1667 | | | 1104 | |
| Approach Delay, s/veh | | 87.5 | | | 48.7 | | | 106.2 | | | 35.6 | |
| Approach LOS | | F | | | D | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 10.0 | 39.2 | 9.5 | 29.2 | 11.0 | 38.2 | 17.0 | 21.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 5.4 | 33.4 | 9.9 | 20.5 | 6.4 | 32.4 | 12.4 | 18.0 |
| Max Q Clear Time (g_c+I1), s | 6.9 | 35.4 | 5.9 | 9.5 | 7.1 | 23.5 | 14.4 | 15.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.4 | 0.0 | 4.0 | 0.0 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 75.3 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 237 | 921 | 40 | 875 | 50 | 968 | 173 | 691 | 174 |
| Future Volume (vph) | 237 | 921 | 40 | 875 | 50 | 968 | 173 | 691 | 174 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.0 | 32.0 | 6.9 | 24.0 | 7.5 | 22.8 | 11.0 | 28.3 | 28.3 |
| Actuated g/C Ratio | 0.12 | 0.36 | 0.08 | 0.27 | 0.08 | 0.25 | 0.12 | 0.31 | 0.31 |
| v/c Ratio | 1.26 | 1.62 | 0.33 | 1.27 | 0.39 | 2.39 | 0.92 | 1.29 | 0.32 |
| Control Delay (s/veh) | 187.5 | 310.1 | 45.7 | 159.3 | 46.6 | 653.1 | 87.0 | 171.0 | 8.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 187.5 | 310.1 | 45.7 | 159.3 | 46.6 | 653.1 | 87.0 | 171.0 | 8.9 |
| LOS | F | F | D | F | D | F | F | F | A |
| Approach Delay (s/veh) | | 286.1 | | 155.4 | | 625.3 | | 129.8 | |
| Approach LOS | | F | | F | | F | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.39 | |
| Intersection Signal Delay (s/veh): 298.9 | Intersection LOS: F |
| Intersection Capacity Utilization 138.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

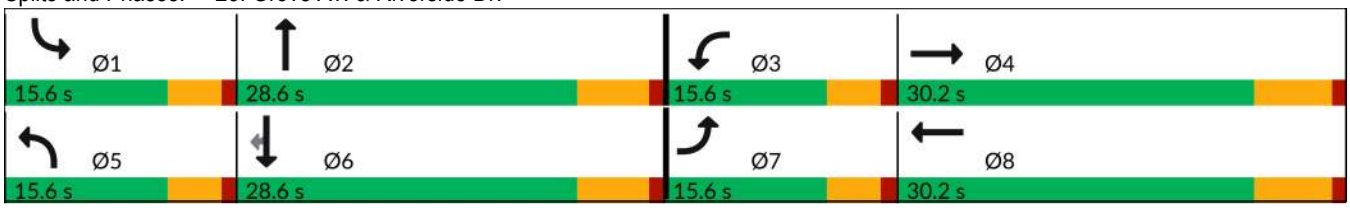

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 237 | 921 | 58 | 40 | 875 | 219 | 50 | 968 | 66 | 173 | 691 | 174 |
| Future Volume (veh/h) | 237 | 921 | 58 | 40 | 875 | 219 | 50 | 968 | 66 | 173 | 691 | 174 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 258 | 1001 | 35 | 43 | 951 | 185 | 54 | 1052 | 65 | 188 | 751 | 113 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 206 | 632 | 22 | 62 | 789 | 153 | 69 | 442 | 27 | 206 | 625 | 530 |
| Arrive On Green | 0.12 | 0.35 | 0.35 | 0.04 | 0.27 | 0.27 | 0.04 | 0.25 | 0.25 | 0.12 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1688 | 1795 | 63 | 1688 | 2959 | 575 | 1688 | 1743 | 108 | 1688 | 1870 | 1585 |
| Grp Volume(v), veh/h | 258 | 0 | 1036 | 43 | 571 | 565 | 54 | 0 | 1117 | 188 | 751 | 113 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1857 | 1688 | 1777 | 1757 | 1688 | 0 | 1851 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 11.0 | 0.0 | 31.7 | 2.3 | 24.0 | 24.0 | 2.9 | 0.0 | 22.8 | 9.9 | 30.1 | 4.6 |
| Cycle Q Clear(g_c), s | 11.0 | 0.0 | 31.7 | 2.3 | 24.0 | 24.0 | 2.9 | 0.0 | 22.8 | 9.9 | 30.1 | 4.6 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 0.33 | 1.00 | | 0.06 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 206 | 0 | 654 | 62 | 474 | 469 | 69 | 0 | 469 | 206 | 625 | 530 |
| V/C Ratio(X) | 1.25 | 0.00 | 1.58 | 0.70 | 1.20 | 1.21 | 0.78 | 0.00 | 2.38 | 0.91 | 1.20 | 0.21 |
| Avail Cap(c_a), veh/h | 206 | 0 | 654 | 206 | 474 | 469 | 206 | 0 | 469 | 206 | 625 | 530 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.5 | 0.0 | 29.1 | 42.9 | 33.0 | 33.0 | 42.7 | 0.0 | 33.6 | 39.0 | 30.0 | 21.5 |
| Incr Delay (d2), s/veh | 146.4 | 0.0 | 269.7 | 5.2 | 110.6 | 111.6 | 6.8 | 0.0 | 628.5 | 38.3 | 105.1 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.7 | 0.0 | 61.5 | 1.0 | 23.9 | 23.8 | 1.3 | 0.0 | 91.3 | 6.1 | 30.6 | 1.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 185.9 | 0.0 | 298.8 | 48.0 | 143.6 | 144.6 | 49.5 | 0.0 | 662.1 | 77.4 | 135.1 | 21.7 |
| LnGrp LOS | F | | F | D | F | F | D | | F | E | F | C |
| Approach Vol, veh/h | | 1294 | | | 1179 | | | 1171 | | | 1052 | |
| Approach Delay, s/veh | | 276.3 | | | 140.6 | | | 633.8 | | | 112.6 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.6 | 28.6 | 7.9 | 37.9 | 8.3 | 35.9 | 15.6 | 30.2 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 11.9 | 24.8 | 4.3 | 33.7 | 4.9 | 32.1 | 13.0 | 26.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 294.7 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 713.5 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 96 | 316 | 107 | 33 | 414 | 93 | 87 | 895 | 33 | 51 | 759 | 14 |
| Future Vol, veh/h | 96 | 316 | 107 | 33 | 414 | 93 | 87 | 895 | 33 | 51 | 759 | 14 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 112 | 367 | 124 | 38 | 481 | 108 | 101 | 1041 | 38 | 59 | 883 | 16 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 361.5 | 386.1 | 1024 | 767.3 |
| HCM LOS | F | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 9% | 18% | 6% | 6% |
| Vol Thru, % | 88% | 61% | 77% | 92% |
| Vol Right, % | 3% | 21% | 17% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 1015 | 519 | 540 | 824 |
| LT Vol | 87 | 96 | 33 | 51 |
| Through Vol | 895 | 316 | 414 | 759 |
| RT Vol | 33 | 107 | 93 | 14 |
| Lane Flow Rate | 1180 | 603 | 628 | 958 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 3.157 | 1.6 | 1.664 | 2.564 |
| Departure Headway (Hd) | 20.8 | 27.865 | 27.153 | 23.65 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 189 | 139 | 144 | 163 |
| Service Time | 18.8 | 25.865 | 25.153 | 21.65 |
| HCM Lane V/C Ratio | 6.243 | 4.338 | 4.361 | 5.877 |
| HCM Control Delay, s/veh | 1024 | 361.5 | 386.1 | 767.3 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 50.7 | 14.9 | 16.1 | 34.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 450 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 42 | 99 | 26 | 19 | 131 | 30 | 66 | 962 | 13 | 48 | 834 | 28 |
| Future Vol, veh/h | 42 | 99 | 26 | 19 | 131 | 30 | 66 | 962 | 13 | 48 | 834 | 28 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 48 | 113 | 30 | 22 | 149 | 34 | 75 | 1093 | 15 | 55 | 948 | 32 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 24.2 | 24.8 | 584.4 | 458.6 |
| HCM LOS | C | C | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 6% | 25% | 11% | 5% |
| Vol Thru, % | 92% | 59% | 73% | 92% |
| Vol Right, % | 1% | 16% | 17% | 3% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 1041 | 167 | 180 | 910 |
| LT Vol | 66 | 42 | 19 | 48 |
| Through Vol | 962 | 99 | 131 | 834 |
| RT Vol | 13 | 26 | 30 | 28 |
| Lane Flow Rate | 1183 | 190 | 205 | 1034 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 2.241 | 0.43 | 0.459 | 1.955 |
| Departure Headway (Hd) | 8.303 | 12.235 | 11.998 | 8.693 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 450 | 298 | 303 | 434 |
| Service Time | 6.303 | 10.235 | 9.998 | 6.693 |
| HCM Lane V/C Ratio | 2.629 | 0.638 | 0.677 | 2.382 |
| HCM Control Delay, s/veh | 584.4 | 24.2 | 24.8 | 458.6 |
| HCM Lane LOS | F | C | C | F |
| HCM 95th-tile Q | 72.3 | 2.1 | 2.3 | 55 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 356 | 1347 | 374 | 191 | 1534 | 317 | 334 | 429 | 219 | 546 |
| Future Volume (vph) | 356 | 1347 | 374 | 191 | 1534 | 317 | 334 | 429 | 219 | 546 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 22.0 | 38.0 | 38.0 | 15.0 | 31.0 | 31.0 | 21.0 | 51.0 | 16.0 | 46.0 |
| Total Split (%) | 18.3% | 31.7% | 31.7% | 12.5% | 25.8% | 25.8% | 17.5% | 42.5% | 13.3% | 38.3% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 17.4 | 32.2 | 32.2 | 10.4 | 25.2 | 25.2 | 16.4 | 45.6 | 11.4 | 40.6 |
| Actuated g/C Ratio | 0.15 | 0.27 | 0.27 | 0.09 | 0.21 | 0.21 | 0.14 | 0.38 | 0.10 | 0.34 |
| v/c Ratio | 1.67 | 1.53 | 0.68 | 1.50 | 2.23 | 0.69 | 1.66 | 1.07 | 1.57 | 1.44 |
| Control Delay (s/veh) | 350.4 | 277.0 | 19.7 | 293.9 | 581.5 | 22.9 | 348.5 | 90.2 | 318.9 | 240.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 350.4 | 277.0 | 19.7 | 293.9 | 581.5 | 22.9 | 348.5 | 90.2 | 318.9 | 240.3 |
| LOS | F | F | B | F | F | C | F | F | F | F |
| Approach Delay (s/veh) | | 243.3 | | | 467.9 | | | 178.2 | | 257.6 |
| Approach LOS | | F | | | F | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.23 | |
| Intersection Signal Delay (s/veh): 310.3 | Intersection LOS: F |
| Intersection Capacity Utilization 142.6% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

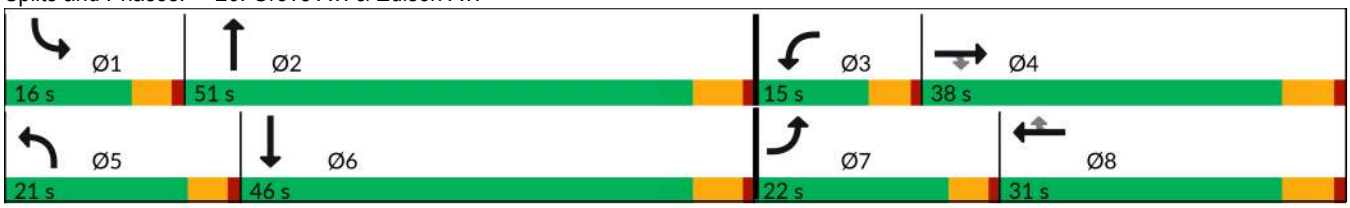

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 356 | 1347 | 374 | 191 | 1534 | 317 | 334 | 429 | 218 | 219 | 546 | 232 |
| Future Volume (veh/h) | 356 | 1347 | 374 | 191 | 1534 | 317 | 334 | 429 | 218 | 219 | 546 | 232 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 405 | 1531 | 255 | 217 | 1743 | 190 | 380 | 488 | 134 | 249 | 620 | 150 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 245 | 1004 | 425 | 146 | 786 | 333 | 231 | 537 | 147 | 160 | 491 | 119 |
| Arrive On Green | 0.22 | 0.40 | 0.40 | 0.13 | 0.32 | 0.32 | 0.20 | 0.57 | 0.57 | 0.14 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1688 | 3741 | 1585 | 1688 | 3741 | 1585 | 1688 | 1413 | 388 | 1688 | 1451 | 351 |
| Grp Volume(v), veh/h | 405 | 1531 | 255 | 217 | 1743 | 190 | 380 | 0 | 622 | 249 | 0 | 770 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 1870 | 1585 | 1688 | 0 | 1801 | 1688 | 0 | 1802 |
| Q Serve(g_s), s | 17.4 | 32.2 | 15.2 | 10.4 | 25.2 | 12.0 | 16.4 | 0.0 | 37.0 | 11.4 | 0.0 | 40.6 |
| Cycle Q Clear(g_c), s | 17.4 | 32.2 | 15.2 | 10.4 | 25.2 | 12.0 | 16.4 | 0.0 | 37.0 | 11.4 | 0.0 | 40.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.22 | 1.00 | | 0.19 |
| Lane Grp Cap(c), veh/h | 245 | 1004 | 425 | 146 | 786 | 333 | 231 | 0 | 684 | 160 | 0 | 610 |
| V/C Ratio(X) | 1.66 | 1.53 | 0.60 | 1.48 | 2.22 | 0.57 | 1.65 | 0.00 | 0.91 | 1.55 | 0.00 | 1.26 |
| Avail Cap(c_a), veh/h | 245 | 1004 | 425 | 146 | 786 | 333 | 231 | 0 | 684 | 160 | 0 | 610 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.0 | 35.8 | 30.8 | 52.2 | 41.1 | 36.6 | 47.7 | 0.0 | 24.0 | 51.5 | 0.0 | 29.6 |
| Incr Delay (d2), s/veh | 312.3 | 241.5 | 2.3 | 250.5 | 552.6 | 2.3 | 310.1 | 0.0 | 16.2 | 277.2 | 0.0 | 131.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 27.7 | 45.9 | 5.3 | 14.3 | 70.5 | 4.4 | 26.0 | 0.0 | 14.7 | 16.8 | 0.0 | 35.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 359.3 | 277.3 | 33.1 | 302.7 | 593.7 | 38.9 | 357.8 | 0.0 | 40.1 | 328.7 | 0.0 | 160.7 |
| LnGrp LOS | F | F | C | F | F | D | F | | D | F | | F |
| Approach Vol, veh/h | | 2191 | | | 2150 | | | 1002 | | | 1019 | |
| Approach Delay, s/veh | | 264.0 | | | 515.3 | | | 160.6 | | | 201.8 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.0 | 51.0 | 15.0 | 38.0 | 21.0 | 46.0 | 22.0 | 31.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.4 | 45.6 | 10.4 | 32.2 | 16.4 | 40.6 | 17.4 | 25.2 |
| Max Q Clear Time (g_c+I1), s | 13.4 | 39.0 | 12.4 | 34.2 | 18.4 | 42.6 | 19.4 | 27.2 |
| Green Ext Time (p_c), s | 0.0 | 2.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 322.7 |
| HCM 7th LOS | F |

Notes

User approved pedestrian interval to be less than phase max green.

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 340.1 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 82 | 225 | 14 | 8 | 435 | 525 | 3 | 50 | 2 | 614 | 88 | 141 |
| Future Vol, veh/h | 82 | 225 | 14 | 8 | 435 | 525 | 3 | 50 | 2 | 614 | 88 | 141 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 87 | 239 | 15 | 9 | 463 | 559 | 3 | 53 | 2 | 653 | 94 | 150 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 36.3 | 434.9 | 19.1 | 367.8 |
| HCM LOS | E | F | C | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 5% | 26% | 1% | 73% |
| Vol Thru, % | 91% | 70% | 45% | 10% |
| Vol Right, % | 4% | 4% | 54% | 17% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 55 | 321 | 968 | 843 |
| LT Vol | 3 | 82 | 8 | 614 |
| Through Vol | 50 | 225 | 435 | 88 |
| RT Vol | 2 | 14 | 525 | 141 |
| Lane Flow Rate | 59 | 341 | 1030 | 897 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.144 | 0.699 | 1.903 | 1.749 |
| Departure Headway (Hd) | 13.773 | 11.118 | 8.462 | 8.632 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 262 | 328 | 443 | 430 |
| Service Time | 11.773 | 9.118 | 6.462 | 6.632 |
| HCM Lane V/C Ratio | 0.225 | 1.04 | 2.325 | 2.086 |
| HCM Control Delay, s/veh | 19.1 | 36.3 | 434.9 | 367.8 |
| HCM Lane LOS | C | F | F | F |
| HCM 95th-tile Q | 0.5 | 5 | 53.7 | 45.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 163 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 51 | 2698 | 3042 | 49 | 64 | 74 |
| Future Vol, veh/h | 51 | 2698 | 3042 | 49 | 64 | 74 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 2 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 55 | 2933 | 3307 | 53 | 70 | 80 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 3360 | 0 | - | 0 | 4910 | 3333 |
| Stage 1 | - | - | - | - | 3333 | - |
| Stage 2 | - | - | - | - | 1577 | - |
| Critical Hdwy | 4.13 | - | - | - | 6.63 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.83 | - |
| Follow-up Hdwy | 2.219 | - | - | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | 81 | - | - | - | ~ 1 | ~ 11 |
| Stage 1 | - | - | - | - | ~ 23 | - |
| Stage 2 | - | - | - | - | 156 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 81 | - | - | - | 0 | ~ 11 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 21 | - |
| Stage 1 | - | - | - | - | ~ 23 | - |
| Stage 2 | - | - | - | - | 156 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/veh | 10.01 | 0 | $ 4868.52 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | ~ 15 | - | - | - | 14 |
| HCM Lane V/C Ratio | 0.681 | - | - | - | 10.649 |
| HCM Control Delay (s/veh) | 114.1 | 109.9 | - | $ | 4868.5 |
| HCM Lane LOS | F | F | - | - | F |
| HCM 95th %tile Q(veh) | 3.2 | - | - | - | 19.8 |

| Notes | | | |
|---|---|---|---|
| ~: Volume exceeds capacity | $: Delay exceeds 300s | +: Computation Not Defined | *: All major volume in platoon |

| Intersection | |
|---|---|
| Int Delay, s/veh | 138.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 24 | 990 | 103 | 100 | 930 | 19 | 189 | 36 | 245 | 13 | 26 | 46 |
| Future Vol, veh/h | 24 | 990 | 103 | 100 | 930 | 19 | 189 | 36 | 245 | 13 | 26 | 46 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 90 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 27 | 1100 | 114 | 111 | 1033 | 21 | 210 | 40 | 272 | 14 | 29 | 51 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1060 | 0 | 0 | 1214 | 0 | 0 | 1964 | 2493 | 607 | 1895 | 2540 | 533 |
| Stage 1 | - | - | - | - | - | - | 1211 | 1211 | - | 1272 | 1272 | - |
| Stage 2 | - | - | - | - | - | - | 753 | 1283 | - | 623 | 1268 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 653 | - | - | 570 | - | - | ~ 38 | ~ 29 | 439 | 42 | ~ 27 | 491 |
| Stage 1 | - | - | - | - | - | - | ~ 193 | 254 | - | 177 | 237 | - |
| Stage 2 | - | - | - | - | - | - | 368 | 234 | - | 440 | 238 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 649 | - | - | 570 | - | - | ~ 19 | ~ 22 | 439 | ~ 9 | ~ 21 | 488 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 127 | 127 | - | 22 | 95 | - |
| Stage 1 | - | - | - | - | - | - | ~ 186 | 243 | - | 142 | 190 | - |
| Stage 2 | - | - | - | - | - | - | 225 | 187 | - | 134 | 228 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.23 | 1.22 | $ 763.76 | 204.12 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 202 | 649 | - | - | 570 | - | - | 88 |
| HCM Lane V/C Ratio | 2.584 | 0.041 | - | - | 0.195 | - | - | 1.074 |
| HCM Control Delay (s/veh) | $ 763.8 | 10.8 | - | - | 12.8 | - | - | 204.1 |
| HCM Lane LOS | F | B | - | - | B | - | - | F |
| HCM 95th %tile Q(veh) | 44.4 | 0.1 | - | - | 0.7 | - | - | 6.4 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 66.8 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 32 | 82 | 65 | 26 | 6 | 112 | 472 | 106 | 22 | 268 | 47 |
| Future Vol, veh/h | 40 | 32 | 82 | 65 | 26 | 6 | 112 | 472 | 106 | 22 | 268 | 47 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 44 | 35 | 90 | 71 | 29 | 7 | 123 | 519 | 116 | 24 | 295 | 52 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 13.4 | 12.8 | 110 | 18.2 |
| HCM LOS | B | B | F | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 16% | 26% | 67% | 7% |
| Vol Thru, % | 68% | 21% | 27% | 80% |
| Vol Right, % | 15% | 53% | 6% | 14% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 690 | 154 | 97 | 337 |
| LT Vol | 112 | 40 | 65 | 22 |
| Through Vol | 472 | 32 | 26 | 268 |
| RT Vol | 106 | 82 | 6 | 47 |
| Lane Flow Rate | 758 | 169 | 107 | 370 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.162 | 0.315 | 0.215 | 0.605 |
| Departure Headway (Hd) | 5.515 | 7.127 | 7.731 | 6.166 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 660 | 508 | 467 | 589 |
| Service Time | 3.549 | 5.127 | 5.731 | 4.166 |
| HCM Lane V/C Ratio | 1.148 | 0.333 | 0.229 | 0.628 |
| HCM Control Delay, s/veh | 110 | 13.4 | 12.8 | 18.2 |
| HCM Lane LOS | F | B | B | C |
| HCM 95th-tile Q | 24.6 | 1.3 | 0.8 | 4 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 19 | 1426 | 355 | 176 | 1496 | 433 | 367 | 166 | 162 |
| Future Volume (vph) | 19 | 1426 | 355 | 176 | 1496 | 433 | 367 | 166 | 162 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 9.6 | 48.6 | 48.6 | 16.0 | 55.0 | 30.0 | 40.4 | 15.0 | 25.4 |
| Total Split (%) | 8.0% | 40.5% | 40.5% | 13.3% | 45.8% | 25.0% | 33.7% | 12.5% | 21.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.0 | 44.0 | 44.0 | 11.4 | 56.2 | 25.4 | 35.8 | 10.4 | 20.8 |
| Actuated g/C Ratio | 0.04 | 0.37 | 0.37 | 0.10 | 0.47 | 0.21 | 0.30 | 0.09 | 0.17 |
| v/c Ratio | 0.30 | 2.27 | 0.56 | 1.20 | 2.11 | 1.33 | 1.14 | 1.24 | 0.69 |
| Control Delay (s/veh) | 67.4 | 598.1 | 18.7 | 181.8 | 525.1 | 204.9 | 120.1 | 198.8 | 57.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 67.4 | 598.1 | 18.7 | 181.8 | 525.1 | 204.9 | 120.1 | 198.8 | 57.3 |
| LOS | E | F | B | F | F | F | F | F | E |
| Approach Delay (s/veh) | | 478.1 | | | 492.4 | | 157.0 | | 120.8 |
| Approach LOS | | F | | | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.27 | |
| Intersection Signal Delay (s/veh): 393.1 | Intersection LOS: F |
| Intersection Capacity Utilization 149.7% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

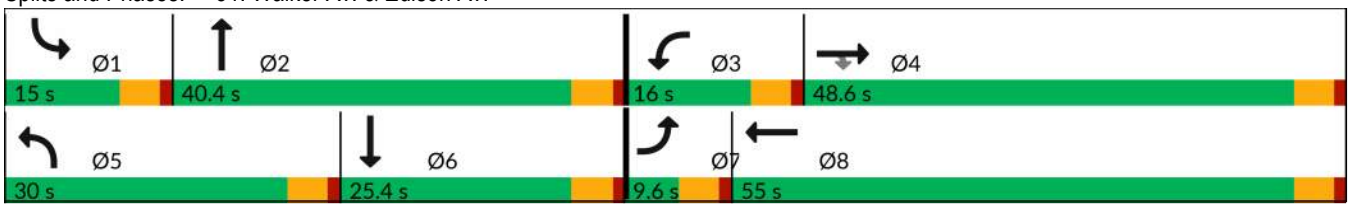

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 19 | 1426 | 355 | 176 | 1496 | 172 | 433 | 367 | 197 | 166 | 162 | 41 |
| Future Volume (veh/h) | 19 | 1426 | 355 | 176 | 1496 | 172 | 433 | 367 | 197 | 166 | 162 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 21 | 1550 | 277 | 191 | 1626 | 160 | 471 | 399 | 171 | 180 | 176 | 34 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 35 | 686 | 581 | 160 | 738 | 73 | 357 | 368 | 158 | 146 | 264 | 51 |
| Arrive On Green | 0.02 | 0.37 | 0.37 | 0.09 | 0.44 | 0.44 | 0.21 | 0.30 | 0.30 | 0.09 | 0.17 | 0.17 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1676 | 165 | 1688 | 1233 | 529 | 1688 | 1521 | 294 |
| Grp Volume(v), veh/h | 21 | 1550 | 277 | 191 | 0 | 1786 | 471 | 0 | 570 | 180 | 0 | 210 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1840 | 1688 | 0 | 1762 | 1688 | 0 | 1814 |
| Q Serve(g_s), s | 1.5 | 44.0 | 16.1 | 11.4 | 0.0 | 52.9 | 25.4 | 0.0 | 35.8 | 10.4 | 0.0 | 13.0 |
| Cycle Q Clear(g_c), s | 1.5 | 44.0 | 16.1 | 11.4 | 0.0 | 52.9 | 25.4 | 0.0 | 35.8 | 10.4 | 0.0 | 13.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.09 | 1.00 | | 0.30 | 1.00 | | 0.16 |
| Lane Grp Cap(c), veh/h | 35 | 686 | 581 | 160 | 0 | 811 | 357 | 0 | 526 | 146 | 0 | 315 |
| V/C Ratio(X) | 0.59 | 2.26 | 0.48 | 1.19 | 0.00 | 2.20 | 1.32 | 0.00 | 1.08 | 1.23 | 0.00 | 0.67 |
| Avail Cap(c_a), veh/h | 70 | 686 | 581 | 160 | 0 | 811 | 357 | 0 | 526 | 146 | 0 | 315 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 58.2 | 38.0 | 29.2 | 54.3 | 0.0 | 33.6 | 47.3 | 0.0 | 42.1 | 54.8 | 0.0 | 46.4 |
| Incr Delay (d2), s/veh | 5.8 | 571.7 | 0.6 | 131.8 | 0.0 | 544.9 | 161.8 | 0.0 | 64.1 | 149.4 | 0.0 | 5.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 128.2 | 6.1 | 10.6 | 0.0 | 145.0 | 26.1 | 0.0 | 23.9 | 10.3 | 0.0 | 6.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 64.0 | 609.7 | 29.8 | 186.1 | 0.0 | 578.5 | 209.1 | 0.0 | 106.2 | 204.2 | 0.0 | 51.7 |
| LnGrp LOS | E | F | C | F | | F | F | | F | F | | D |
| Approach Vol, veh/h | | 1848 | | | 1977 | | | 1041 | | | 390 | |
| Approach Delay, s/veh | | 516.6 | | | 540.6 | | | 152.8 | | | 122.1 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.0 | 40.4 | 16.0 | 48.6 | 30.0 | 25.4 | 7.1 | 57.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 10.4 | 35.8 | 11.4 | 44.0 | 25.4 | 20.8 | 5.0 | 50.4 |
| Max Q Clear Time (g_c+I1), s | 12.4 | 37.8 | 13.4 | 46.0 | 27.4 | 15.0 | 3.5 | 54.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 424.3 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 11.8 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 85 | 314 | 833 | 370 | 86 | 136 |
| Future Vol, veh/h | 85 | 314 | 833 | 370 | 86 | 136 |
| Conflicting Peds, #/hr | 2 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 89 | 327 | 868 | 385 | 90 | 142 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1255 | 0 | - | 0 | 1567 | 1062 |
| Stage 1 | - | - | - | - | 1062 | - |
| Stage 2 | - | - | - | - | 504 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 554 | - | - | - | 122 | 271 |
| Stage 1 | - | - | - | - | 332 | - |
| Stage 2 | - | - | - | - | 607 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 553 | - | - | - | 98 | 271 |
| Mov Cap-2 Maneuver | - | - | - | - | 205 | - |
| Stage 1 | - | - | - | - | 267 | - |
| Stage 2 | - | - | - | - | 606 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 2.72 | 0 | 91.74 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 383 | - | - | - | 241 |
| HCM Lane V/C Ratio | 0.16 | - | - | - | 0.96 |
| HCM Control Delay (s/veh) | 12.7 | 0 | - | - | 91.7 |
| HCM Lane LOS | B | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.6 | - | - | - | 8.7 |

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 400 | 2 | 443 | 677 | 1395 | 662 | 107 |
| Future Volume (vph) | 400 | 2 | 443 | 677 | 1395 | 662 | 107 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 23.0 | 23.0 | 23.0 | 27.0 | 67.0 | 40.0 | 40.0 |
| Total Split (%) | 25.6% | 25.6% | 25.6% | 30.0% | 74.4% | 44.4% | 44.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 24.3 | 24.3 | 24.3 | 25.2 | 54.1 | 24.0 | 24.0 |
| Actuated g/C Ratio | 0.27 | 0.27 | 0.27 | 0.28 | 0.60 | 0.27 | 0.27 |
| v/c Ratio | 0.72 | 0.67 | 0.60 | 0.84 | 0.49 | 0.41 | 0.23 |
| Control Delay (s/veh) | 42.7 | 33.3 | 25.0 | 39.1 | 7.6 | 28.0 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.7 | 33.3 | 25.0 | 39.1 | 7.6 | 28.0 | 5.8 |
| LOS | D | C | C | D | A | C | A |
| Approach Delay (s/veh) | | 33.9 | | | 17.9 | 24.9 | |
| Approach LOS | | C | | | B | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 35.6 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.84 | |
| Intersection Signal Delay (s/veh): 23.0 | Intersection LOS: C |
| Intersection Capacity Utilization 79.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

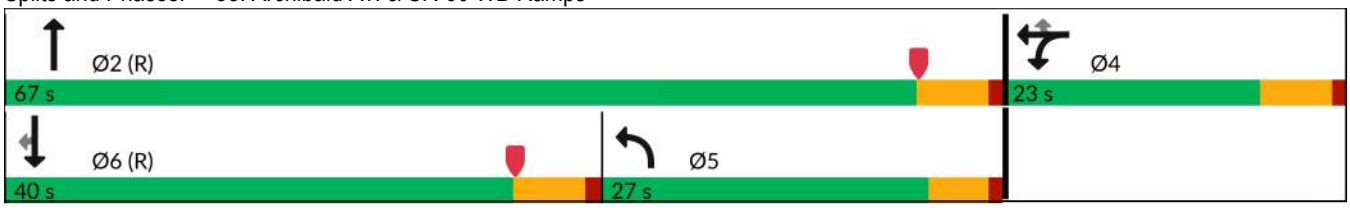

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 400 | 2 | 443 | 677 | 1395 | 0 | 0 | 662 | 107 |
| Future Volume (veh/h) | 0 | 0 | 0 | 400 | 2 | 443 | 677 | 1395 | 0 | 0 | 662 | 107 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1673 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 510 | 0 | 178 | 720 | 1484 | 0 | 0 | 704 | 83 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 592 | 0 | 278 | 1398 | 3552 | 0 | 0 | 1152 | 275 |
| Arrive On Green | | | | 0.18 | 0.00 | 0.18 | 0.15 | 0.23 | 0.00 | 0.00 | 0.18 | 0.18 |
| Sat Flow, veh/h | | | | 3375 | 0 | 1585 | 3092 | 5274 | 0 | 0 | 6696 | 1536 |
| Grp Volume(v), veh/h | | | | 510 | 0 | 178 | 720 | 1484 | 0 | 0 | 704 | 83 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1585 | 1546 | 1702 | 0 | 0 | 1609 | 1536 |
| Q Serve(g_s), s | | | | 13.2 | 0.0 | 9.4 | 19.3 | 22.3 | 0.0 | 0.0 | 9.1 | 4.2 |
| Cycle Q Clear(g_c), s | | | | 13.2 | 0.0 | 9.4 | 19.3 | 22.3 | 0.0 | 0.0 | 9.1 | 4.2 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 592 | 0 | 278 | 1398 | 3552 | 0 | 0 | 1152 | 275 |
| V/C Ratio(X) | | | | 0.86 | 0.00 | 0.64 | 0.52 | 0.42 | 0.00 | 0.00 | 0.61 | 0.30 |
| Avail Cap(c_a), veh/h | | | | 645 | 0 | 303 | 1398 | 3552 | 0 | 0 | 2445 | 584 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.33 | 0.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.82 | 0.82 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 36.0 | 0.0 | 34.5 | 29.2 | 19.1 | 0.0 | 0.0 | 34.1 | 32.1 |
| Incr Delay (d2), s/veh | | | | 10.8 | 0.0 | 4.0 | 0.1 | 0.3 | 0.0 | 0.0 | 2.4 | 2.8 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 6.0 | 0.0 | 8.4 | 7.9 | 10.0 | 0.0 | 0.0 | 3.5 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 46.8 | 0.0 | 38.4 | 29.3 | 19.4 | 0.0 | 0.0 | 36.5 | 34.9 |
| LnGrp LOS | | | | D | | D | C | B | | | D | C |
| Approach Vol, veh/h | | | | | 688 | | | 2204 | | | 787 | |
| Approach Delay, s/veh | | | | | 44.6 | | | 22.7 | | | 36.3 | |
| Approach LOS | | | | | D | | | C | | | D | |

| Timer - Assigned Phs | 2 | 4 | 5 | 6 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 68.4 | 21.6 | 46.5 | 21.9 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 61.2 | 17.2 | 22.0 | * 34 |
| Max Q Clear Time (g_c+I1), s | 24.3 | 15.2 | 21.3 | 11.1 |
| Green Ext Time (p_c), s | 13.2 | 0.6 | 0.2 | 4.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 29.7 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 371 | 3 | 334 | 1648 | 742 | 191 | 810 |
| Future Volume (vph) | 371 | 3 | 334 | 1648 | 742 | 191 | 810 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 52.0 | 52.0 | 11.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 57.8% | 57.8% | 12.2% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 18.6 | 18.6 | 18.6 | 47.0 | 47.0 | 7.9 | 59.8 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | 0.52 | 0.52 | 0.09 | 0.66 |
| v/c Ratio | 0.78 | 0.71 | 0.50 | 0.51 | 0.65 | 0.74 | 0.25 |
| Control Delay (s/veh) | 50.0 | 38.0 | 11.3 | 14.9 | 4.0 | 68.5 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.0 | 38.0 | 11.3 | 14.9 | 4.0 | 68.5 | 0.7 |
| LOS | D | D | B | B | A | E | A |
| Approach Delay (s/veh) | | 33.7 | | 11.5 | | | 13.6 |
| Approach LOS | | C | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 35.6 (40%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.78 | |
| Intersection Signal Delay (s/veh): 15.9 | Intersection LOS: B |
| Intersection Capacity Utilization 79.8% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

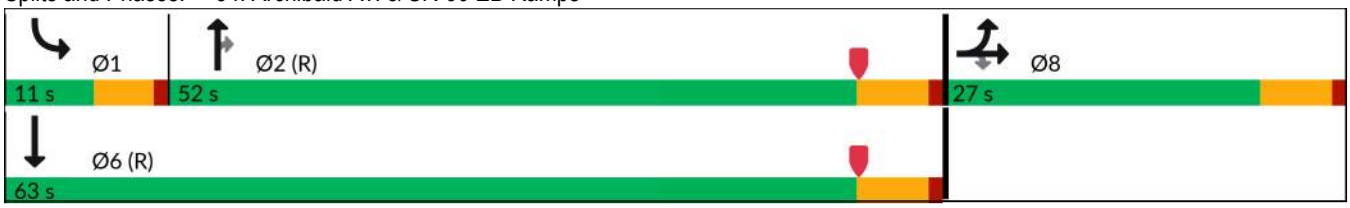

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 371 | 3 | 334 | 0 | 0 | 0 | 0 | 1648 | 742 | 191 | 810 | 0 |
| Future Volume (veh/h) | 371 | 3 | 334 | 0 | 0 | 0 | 0 | 1648 | 742 | 191 | 810 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1673 | 1870 | 0 |
| Adj Flow Rate, veh/h | 447 | 0 | 128 | | | | 0 | 1717 | 649 | 199 | 844 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 555 | 0 | 261 | | | | 0 | 3761 | 925 | 206 | 3608 | 0 |
| Arrive On Green | 0.16 | 0.00 | 0.16 | | | | 0.00 | 0.58 | 0.58 | 0.13 | 1.00 | 0.00 |
| Sat Flow, veh/h | 3375 | 0 | 1585 | | | | 0 | 6696 | 1582 | 3092 | 5274 | 0 |
| Grp Volume(v), veh/h | 447 | 0 | 128 | | | | 0 | 1717 | 649 | 199 | 844 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1585 | | | | 0 | 1609 | 1582 | 1546 | 1702 | 0 |
| Q Serve(g_s), s | 11.5 | 0.0 | 6.6 | | | | 0.0 | 13.6 | 26.0 | 5.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 11.5 | 0.0 | 6.6 | | | | 0.0 | 13.6 | 26.0 | 5.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 555 | 0 | 261 | | | | 0 | 3761 | 925 | 206 | 3608 | 0 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.49 | | | | 0.00 | 0.46 | 0.70 | 0.97 | 0.23 | 0.00 |
| Avail Cap(c_a), veh/h | 795 | 0 | 373 | | | | 0 | 3761 | 925 | 206 | 3608 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.85 | 0.85 | 0.00 |
| Uniform Delay (d), s/veh | 36.2 | 0.0 | 34.2 | | | | 0.0 | 10.6 | 13.2 | 38.9 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 4.0 | 0.0 | 1.4 | | | | 0.0 | 0.4 | 4.4 | 47.7 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.8 | 0.0 | 2.5 | | | | 0.0 | 4.0 | 8.4 | 3.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.2 | 0.0 | 35.6 | | | | 0.0 | 11.0 | 17.6 | 86.6 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | B | F | A | |
| Approach Vol, veh/h | | 575 | | | | | | 2366 | | | 1043 | |
| Approach Delay, s/veh | | 39.2 | | | | | | 12.8 | | | 16.6 | |
| Approach LOS | | D | | | | | | B | | | B | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 58.4 | | | | 69.4 | | 20.6 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 6.0 | 46.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 7.8 | 28.0 | | | | 2.0 | | 13.5 | | | | |
| Green Ext Time (p_c), s | 0.0 | 13.0 | | | | 6.1 | | 1.3 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 17.6 | | | | | | | | | |
| HCM 7th LOS | | | B | | | | | | | | | |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 178 | 782 | 323 | 236 | 666 | 290 | 382 | 1498 | 179 | 621 |
| Future Volume (vph) | 178 | 782 | 323 | 236 | 666 | 290 | 382 | 1498 | 179 | 621 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 19.3 | 38.2 | 38.2 | 20.0 | 38.9 | 38.9 | 28.0 | 45.8 | 16.0 | 33.8 |
| Total Split (%) | 16.1% | 31.8% | 31.8% | 16.7% | 32.4% | 32.4% | 23.3% | 38.2% | 13.3% | 28.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.6 | 32.3 | 32.3 | 15.4 | 33.1 | 33.1 | 23.4 | 41.2 | 11.4 | 29.2 |
| Actuated g/C Ratio | 0.12 | 0.27 | 0.27 | 0.13 | 0.28 | 0.28 | 0.20 | 0.35 | 0.10 | 0.25 |
| v/c Ratio | 0.93 | 0.87 | 0.55 | 1.17 | 0.73 | 0.52 | 1.25 | 1.03 | 1.19 | 0.69 |
| Control Delay (s/veh) | 99.2 | 52.5 | 10.3 | 159.9 | 43.6 | 13.1 | 174.0 | 66.7 | 179.3 | 41.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 99.2 | 52.5 | 10.3 | 159.9 | 43.6 | 13.1 | 174.0 | 66.7 | 179.3 | 41.4 |
| LOS | F | D | B | F | D | B | F | E | F | D |
| Approach Delay (s/veh) | | 48.3 | | | 59.2 | | | 86.7 | | 66.6 |
| Approach LOS | | D | | | E | | | F | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.25 | |
| Intersection Signal Delay (s/veh): 68.2 | Intersection LOS: E |
| Intersection Capacity Utilization 95.0% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

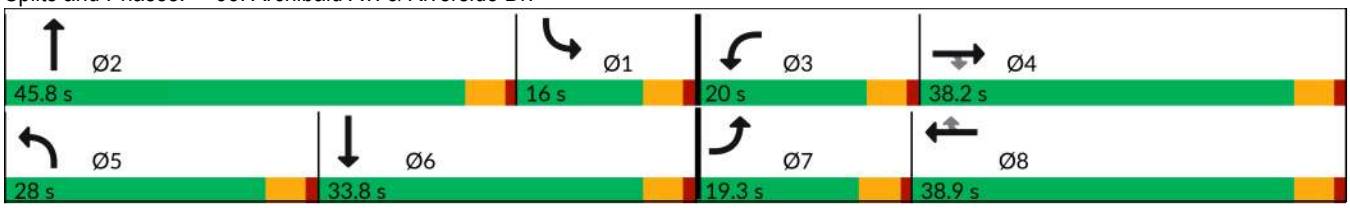

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 178 | 782 | 323 | 236 | 666 | 290 | 382 | 1498 | 169 | 179 | 621 | 179 |
| Future Volume (veh/h) | 178 | 782 | 323 | 236 | 666 | 290 | 382 | 1498 | 169 | 179 | 621 | 179 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 191 | 841 | 292 | 254 | 716 | 229 | 411 | 1611 | 181 | 192 | 668 | 131 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 211 | 948 | 414 | 221 | 969 | 429 | 335 | 1628 | 183 | 163 | 1062 | 205 |
| Arrive On Green | 0.12 | 0.27 | 0.27 | 0.13 | 0.27 | 0.27 | 0.20 | 0.35 | 0.35 | 0.10 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1688 | 3554 | 1553 | 1688 | 3554 | 1571 | 1688 | 4655 | 522 | 1688 | 4287 | 829 |
| Grp Volume(v), veh/h | 191 | 841 | 292 | 254 | 716 | 229 | 411 | 1177 | 615 | 192 | 528 | 271 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1553 | 1688 | 1777 | 1571 | 1688 | 1702 | 1773 | 1688 | 1702 | 1713 |
| Q Serve(g_s), s | 13.2 | 26.8 | 20.0 | 15.4 | 21.6 | 11.1 | 23.4 | 40.5 | 40.7 | 11.4 | 16.3 | 16.6 |
| Cycle Q Clear(g_c), s | 13.2 | 26.8 | 20.0 | 15.4 | 21.6 | 11.1 | 23.4 | 40.5 | 40.7 | 11.4 | 16.3 | 16.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.29 | 1.00 | | 0.48 |
| Lane Grp Cap(c), veh/h | 211 | 948 | 414 | 221 | 969 | 429 | 335 | 1190 | 620 | 163 | 843 | 424 |
| V/C Ratio(X) | 0.91 | 0.89 | 0.70 | 1.15 | 0.74 | 0.53 | 1.23 | 0.99 | 0.99 | 1.18 | 0.63 | 0.64 |
| Avail Cap(c_a), veh/h | 211 | 1013 | 443 | 221 | 1034 | 457 | 335 | 1190 | 620 | 163 | 843 | 424 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.9 | 41.5 | 39.0 | 51.2 | 39.0 | 21.1 | 47.2 | 38.1 | 38.2 | 53.2 | 39.5 | 39.6 |
| Incr Delay (d2), s/veh | 36.9 | 9.2 | 4.7 | 107.6 | 2.7 | 1.0 | 125.5 | 23.4 | 34.0 | 125.7 | 1.5 | 3.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.5 | 12.3 | 7.8 | 12.8 | 9.3 | 4.0 | 21.1 | 19.6 | 22.3 | 10.4 | 6.7 | 7.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 87.8 | 50.7 | 43.7 | 158.8 | 41.7 | 22.1 | 172.8 | 61.5 | 72.1 | 178.9 | 40.9 | 42.8 |
| LnGrp LOS | F | D | D | F | D | C | F | E | E | F | D | D |
| Approach Vol, veh/h | | 1324 | | | 1199 | | | 2203 | | | 991 | |
| Approach Delay, s/veh | | 54.5 | | | 62.8 | | | 85.2 | | | 68.2 | |
| Approach LOS | | D | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.0 | 45.8 | 20.0 | 36.0 | 28.0 | 33.8 | 19.3 | 36.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.4 | 41.2 | 15.4 | 33.6 | 23.4 | 29.2 | 14.7 | 34.3 |
| Max Q Clear Time (g_c+I1), s | 13.4 | 42.7 | 17.4 | 28.8 | 25.4 | 18.6 | 15.2 | 23.6 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 | 3.4 | 0.0 | 3.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 70.4 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 240 | 141 | 63 | 208 | 178 | 217 | 1811 | 157 | 888 |
| Future Volume (vph) | 240 | 141 | 63 | 208 | 178 | 217 | 1811 | 157 | 888 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 20.4 | 35.1 | 5.2 | 19.9 | 19.9 | 14.4 | 45.2 | 11.8 | 42.6 |
| Actuated g/C Ratio | 0.18 | 0.30 | 0.04 | 0.17 | 0.17 | 0.12 | 0.39 | 0.10 | 0.37 |
| v/c Ratio | 0.98 | 0.57 | 1.01 | 0.78 | 0.48 | 1.25 | 1.08 | 1.11 | 0.92 |
| Control Delay (s/veh) | 96.2 | 34.0 | 165.3 | 63.4 | 9.2 | 189.5 | 79.3 | 149.6 | 47.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 96.2 | 34.0 | 165.3 | 63.4 | 9.2 | 189.5 | 79.3 | 149.6 | 47.2 |
| LOS | F | C | F | E | A | F | E | F | D |
| Approach Delay (s/veh) | | 63.8 | | 56.3 | | | 90.4 | | 60.7 |
| Approach LOS | | E | | E | | | F | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 115.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.25 | |
| Intersection Signal Delay (s/veh): 75.5 | Intersection LOS: E |
| Intersection Capacity Utilization 87.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 240 | 141 | 119 | 63 | 208 | 178 | 217 | 1811 | 129 | 157 | 888 | 145 |
| Future Volume (veh/h) | 240 | 141 | 119 | 63 | 208 | 178 | 217 | 1811 | 129 | 157 | 888 | 145 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 289 | 170 | 127 | 76 | 251 | 107 | 261 | 2182 | 154 | 189 | 1070 | 157 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 303 | 289 | 216 | 77 | 293 | 249 | 214 | 2061 | 144 | 175 | 1192 | 175 |
| Arrive On Green | 0.18 | 0.29 | 0.29 | 0.05 | 0.16 | 0.16 | 0.13 | 0.40 | 0.40 | 0.10 | 0.37 | 0.37 |
| Sat Flow, veh/h | 1688 | 993 | 742 | 1688 | 1870 | 1585 | 1688 | 5182 | 362 | 1688 | 3180 | 466 |
| Grp Volume(v), veh/h | 289 | 0 | 297 | 76 | 251 | 107 | 261 | 1569 | 767 | 189 | 629 | 598 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1735 | 1688 | 1870 | 1585 | 1688 | 1870 | 1804 | 1688 | 1870 | 1775 |
| Q Serve(g_s), s | 19.3 | 0.0 | 16.6 | 5.1 | 14.8 | 5.4 | 14.4 | 45.2 | 45.2 | 11.8 | 35.9 | 36.1 |
| Cycle Q Clear(g_c), s | 19.3 | 0.0 | 16.6 | 5.1 | 14.8 | 5.4 | 14.4 | 45.2 | 45.2 | 11.8 | 35.9 | 36.1 |
| Prop In Lane | 1.00 | | 0.43 | 1.00 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 0.26 |
| Lane Grp Cap(c), veh/h | 303 | 0 | 504 | 77 | 293 | 249 | 214 | 1488 | 717 | 175 | 701 | 665 |
| V/C Ratio(X) | 0.95 | 0.00 | 0.59 | 0.98 | 0.86 | 0.43 | 1.22 | 1.05 | 1.07 | 1.08 | 0.90 | 0.90 |
| Avail Cap(c_a), veh/h | 303 | 0 | 602 | 77 | 398 | 338 | 214 | 1488 | 717 | 175 | 701 | 665 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.1 | 0.0 | 34.5 | 54.2 | 46.6 | 26.4 | 49.6 | 34.2 | 34.2 | 50.9 | 33.4 | 33.5 |
| Incr Delay (d2), s/veh | 39.4 | 0.0 | 1.1 | 96.8 | 12.7 | 1.2 | 133.7 | 39.3 | 53.4 | 90.4 | 14.2 | 15.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.2 | 0.0 | 7.0 | 4.2 | 7.8 | 2.7 | 13.7 | 26.7 | 28.5 | 9.2 | 17.9 | 17.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 85.5 | 0.0 | 35.6 | 151.0 | 59.4 | 27.6 | 183.4 | 73.5 | 87.6 | 141.3 | 47.7 | 48.7 |
| LnGrp LOS | F | | D | F | E | C | F | F | F | F | D | D |
| Approach Vol, veh/h | | 586 | | | 434 | | | 2597 | | | 1416 | |
| Approach Delay, s/veh | | 60.2 | | | 67.6 | | | 88.7 | | | 60.6 | |
| Approach LOS | | E | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.4 | 49.8 | 9.8 | 37.6 | 19.0 | 47.2 | 25.0 | 22.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 13.8 | 47.2 | 7.1 | 18.6 | 16.4 | 38.1 | 21.3 | 16.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 2.7 | 0.0 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 75.7 |
| HCM 7th LOS | E |

| Lane Group | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 0 | 67 | 0 | 26 | 1922 | 241 | 817 |
| Future Volume (vph) | 0 | 67 | 0 | 26 | 1922 | 241 | 817 |
| Turn Type | NA | Split | NA | Prot | NA | Prot | NA |
| Protected Phases | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | |
| Detector Phase | 4 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 22.5 | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 |
| Total Split (s) | 22.5 | 33.0 | 33.0 | 10.0 | 45.5 | 19.0 | 54.5 |
| Total Split (%) | 18.8% | 27.5% | 27.5% | 8.3% | 37.9% | 15.8% | 45.4% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.6 | 11.6 | 11.6 | 5.5 | 41.6 | 14.6 | 57.3 |
| Actuated g/C Ratio | 0.06 | 0.13 | 0.13 | 0.06 | 0.48 | 0.17 | 0.65 |
| v/c Ratio | 0.07 | 0.33 | 0.27 | 0.28 | 0.89 | 0.95 | 0.39 |
| Control Delay (s/veh) | 0.3 | 38.5 | 1.1 | 50.8 | 29.0 | 81.8 | 10.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 0.3 | 38.5 | 1.1 | 50.8 | 29.0 | 81.8 | 10.9 |
| LOS | A | D | A | D | C | F | B |
| Approach Delay (s/veh) | 0.3 | | 13.0 | | 29.3 | | 27.0 |
| Approach LOS | A | | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 87.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 27.2 | Intersection LOS: C |
| Intersection Capacity Utilization 74.2% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

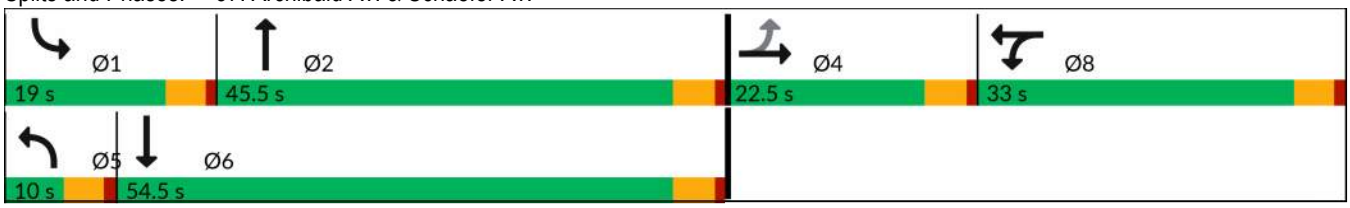

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 30 | 67 | 0 | 145 | 26 | 1922 | 39 | 241 | 817 | 4 |
| Future Volume (veh/h) | 0 | 0 | 30 | 67 | 0 | 145 | 26 | 1922 | 39 | 241 | 817 | 4 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 33 | 74 | 0 | 118 | 29 | 2112 | 41 | 265 | 898 | 4 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 0 | 51 | 175 | 0 | 165 | 49 | 2430 | 47 | 291 | 2229 | 10 |
| Arrive On Green | 0.00 | 0.00 | 0.03 | 0.10 | 0.00 | 0.10 | 0.03 | 0.47 | 0.47 | 0.17 | 0.61 | 0.61 |
| Sat Flow, veh/h | 0 | 0 | 1585 | 1688 | 0 | 1585 | 1688 | 5153 | 100 | 1688 | 3628 | 16 |
| Grp Volume(v), veh/h | 0 | 0 | 33 | 74 | 0 | 118 | 29 | 1394 | 759 | 265 | 440 | 462 |
| Grp Sat Flow(s),veh/h/ln | 0 | 0 | 1585 | 1688 | 0 | 1585 | 1688 | 1702 | 1849 | 1688 | 1777 | 1867 |
| Q Serve(g_s), s | 0.0 | 0.0 | 1.7 | 3.4 | 0.0 | 6.0 | 1.4 | 30.6 | 30.7 | 12.9 | 10.6 | 10.6 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 1.7 | 3.4 | 0.0 | 6.0 | 1.4 | 30.6 | 30.7 | 12.9 | 10.6 | 10.6 |
| Prop In Lane | 0.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.05 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 0 | 0 | 51 | 175 | 0 | 165 | 49 | 1605 | 872 | 291 | 1092 | 1147 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.65 | 0.42 | 0.00 | 0.72 | 0.59 | 0.87 | 0.87 | 0.91 | 0.40 | 0.40 |
| Avail Cap(c_a), veh/h | 0 | 0 | 340 | 574 | 0 | 539 | 109 | 1667 | 906 | 291 | 1092 | 1147 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 40.0 | 35.1 | 0.0 | 36.2 | 40.0 | 19.8 | 19.8 | 33.9 | 8.2 | 8.2 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 13.1 | 1.6 | 0.0 | 5.7 | 10.5 | 5.1 | 9.0 | 30.1 | 0.2 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.8 | 1.4 | 0.0 | 2.5 | 0.7 | 10.9 | 12.8 | 7.2 | 2.9 | 3.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 53.1 | 36.7 | 0.0 | 42.0 | 50.6 | 24.8 | 28.8 | 64.1 | 8.5 | 8.5 |
| LnGrp LOS | | | D | D | | D | D | C | C | E | A | A |
| Approach Vol, veh/h | | 33 | | | 192 | | | 2182 | | | 1167 | |
| Approach Delay, s/veh | | 53.1 | | | 39.9 | | | 26.5 | | | 21.1 | |
| Approach LOS | | D | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.0 | 44.0 | | 7.3 | 7.0 | 55.9 | | 13.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | 14.4 | 40.9 | | 17.9 | 5.4 | 49.9 | | 28.4 |
| Max Q Clear Time (g_c+I1), s | 14.9 | 32.7 | | 3.7 | 3.4 | 12.6 | | 8.0 |
| Green Ext Time (p_c), s | 0.0 | 6.6 | | 0.1 | 0.0 | 5.4 | | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.7 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 278 | 1229 | 231 | 525 | 1257 | 225 | 277 | 1344 | 420 | 233 | 433 | 268 |
| Future Volume (vph) | 278 | 1229 | 231 | 525 | 1257 | 225 | 277 | 1344 | 420 | 233 | 433 | 268 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.6 | 36.8 | 120.0 | 10.4 | 41.6 | 41.6 | 11.4 | 38.0 | 120.0 | 16.4 | 43.0 | 43.0 |
| Actuated g/C Ratio | 0.05 | 0.31 | 1.00 | 0.09 | 0.35 | 0.35 | 0.10 | 0.32 | 1.00 | 0.14 | 0.36 | 0.36 |
| v/c Ratio | 2.03 | 0.82 | 0.15 | 2.06 | 2.03 | 0.37 | 1.82 | 1.25 | 0.28 | 1.06 | 0.36 | 0.42 |
| Control Delay (s/veh) | 515.1 | 43.8 | 0.2 | 516.1 | 493.2 | 13.4 | 422.8 | 155.8 | 0.4 | 126.1 | 29.3 | 16.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 515.1 | 43.8 | 0.2 | 516.1 | 493.2 | 13.4 | 422.8 | 155.8 | 0.4 | 126.1 | 29.3 | 16.2 |
| LOS | F | D | A | F | F | B | F | F | A | F | C | B |
| Approach Delay (s/veh) | | 113.5 | | | 445.5 | | | 160.1 | | | 49.7 | |
| Approach LOS | | F | | | F | | | F | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.06 | |
| Intersection Signal Delay (s/veh): 217.9 | Intersection LOS: F |
| Intersection Capacity Utilization 141.1% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

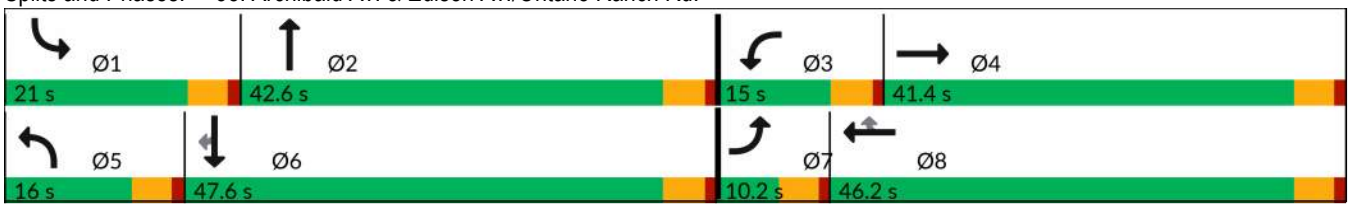

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 278 | 1229 | 231 | 525 | 1257 | 225 | 277 | 1344 | 420 | 233 | 433 | 268 |
| Future Volume (veh/h) | 278 | 1229 | 231 | 525 | 1257 | 225 | 277 | 1344 | 420 | 233 | 433 | 268 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 290 | 1280 | 0 | 547 | 1309 | 212 | 289 | 1400 | 0 | 243 | 451 | 256 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 144 | 1566 | | 268 | 648 | 549 | 160 | 1125 | | 231 | 1273 | 568 |
| Arrive On Green | 0.05 | 0.31 | 0.00 | 0.09 | 0.35 | 0.35 | 0.09 | 0.32 | 0.00 | 0.14 | 0.36 | 0.36 |
| Sat Flow, veh/h | 3092 | 5106 | 1585 | 3092 | 1870 | 1585 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 290 | 1280 | 0 | 547 | 1309 | 212 | 289 | 1400 | 0 | 243 | 451 | 256 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1585 | 1546 | 1870 | 1585 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 5.6 | 27.8 | 0.0 | 10.4 | 41.6 | 12.1 | 11.4 | 38.0 | 0.0 | 16.4 | 11.2 | 14.8 |
| Cycle Q Clear(g_c), s | 5.6 | 27.8 | 0.0 | 10.4 | 41.6 | 12.1 | 11.4 | 38.0 | 0.0 | 16.4 | 11.2 | 14.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 144 | 1566 | | 268 | 648 | 549 | 160 | 1125 | | 231 | 1273 | 568 |
| V/C Ratio(X) | 2.01 | 0.82 | | 2.04 | 2.02 | 0.39 | 1.80 | 1.24 | | 1.05 | 0.35 | 0.45 |
| Avail Cap(c_a), veh/h | 144 | 1566 | | 268 | 648 | 549 | 160 | 1125 | | 231 | 1273 | 568 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 57.2 | 38.5 | 0.0 | 54.8 | 39.2 | 29.6 | 54.3 | 41.0 | 0.0 | 51.8 | 28.3 | 29.5 |
| Incr Delay (d2), s/veh | 478.0 | 3.5 | 0.0 | 481.4 | 463.9 | 0.4 | 384.9 | 117.5 | 0.0 | 74.1 | 0.2 | 0.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.7 | 11.5 | 0.0 | 21.8 | 101.4 | 4.5 | 21.8 | 33.8 | 0.0 | 11.4 | 4.5 | 5.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 535.2 | 42.0 | 0.0 | 536.2 | 503.1 | 30.0 | 439.2 | 158.5 | 0.0 | 125.9 | 28.5 | 30.0 |
| LnGrp LOS | F | D | | F | F | C | F | F | | F | C | C |
| Approach Vol, veh/h | | 1570 | | | 2068 | | | 1689 | | | 950 | |
| Approach Delay, s/veh | | 133.1 | | | 463.4 | | | 206.5 | | | 53.8 | |
| Approach LOS | | F | | | F | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.0 | 42.6 | 15.0 | 41.4 | 16.0 | 47.6 | 10.2 | 46.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 18.4 | 40.0 | 12.4 | 29.8 | 13.4 | 16.8 | 7.6 | 43.6 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 4.2 | 0.0 | 3.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 249.7 |
| HCM 7th LOS | F |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 241 | 263 | 184 | 240 | 498 | 313 | 1415 | 149 | 39 | 867 | 126 |
| Future Volume (vph) | 241 | 263 | 184 | 240 | 498 | 313 | 1415 | 149 | 39 | 867 | 126 |
| Turn Type | Prot | NA | Free | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.1 | 26.2 | 92.2 | 11.6 | 24.8 | 5.6 | 33.7 | 33.7 | 6.8 | 29.6 | 29.6 |
| Actuated g/C Ratio | 0.14 | 0.28 | 1.00 | 0.13 | 0.27 | 0.06 | 0.37 | 0.37 | 0.07 | 0.32 | 0.32 |
| v/c Ratio | 0.56 | 0.26 | 0.12 | 1.18 | 0.70 | 1.70 | 0.72 | 0.23 | 0.18 | 0.76 | 0.22 |
| Control Delay (s/veh) | 44.5 | 25.6 | 0.2 | 159.4 | 32.9 | 364.5 | 30.5 | 5.9 | 48.2 | 33.8 | 5.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.5 | 25.6 | 0.2 | 159.4 | 32.9 | 364.5 | 30.5 | 5.9 | 48.2 | 33.8 | 5.3 |
| LOS | D | C | A | F | C | F | C | A | D | C | A |
| Approach Delay (s/veh) | | 25.4 | | | 66.4 | | 84.3 | | | 30.9 | |
| Approach LOS | | C | | | E | | F | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 92.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.70 | |
| Intersection Signal Delay (s/veh): 59.4 | Intersection LOS: E |
| Intersection Capacity Utilization 76.6% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

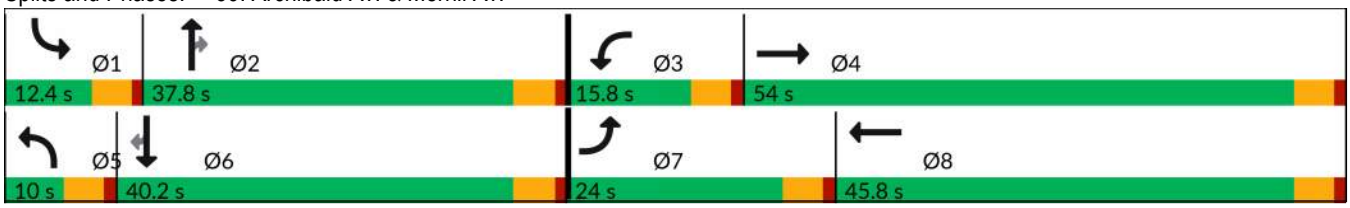

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 241 | 263 | 184 | 240 | 498 | 168 | 313 | 1415 | 149 | 39 | 867 | 126 |
| Future Volume (veh/h) | 241 | 263 | 184 | 240 | 498 | 168 | 313 | 1415 | 149 | 39 | 867 | 126 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 251 | 274 | 0 | 250 | 519 | 110 | 326 | 1474 | 123 | 41 | 903 | 82 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 353 | 748 | | 254 | 717 | 151 | 232 | 2038 | 576 | 122 | 1230 | 521 |
| Arrive On Green | 0.11 | 0.20 | 0.00 | 0.15 | 0.24 | 0.24 | 0.07 | 0.36 | 0.36 | 0.04 | 0.33 | 0.33 |
| Sat Flow, veh/h | 3188 | 3741 | 1585 | 1688 | 2987 | 630 | 3188 | 5611 | 1585 | 3188 | 3741 | 1584 |
| Grp Volume(v), veh/h | 251 | 274 | 0 | 250 | 324 | 305 | 326 | 1474 | 123 | 41 | 903 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1585 | 1688 | 1870 | 1746 | 1594 | 1870 | 1585 | 1594 | 1870 | 1584 |
| Q Serve(g_s), s | 5.6 | 4.7 | 0.0 | 11.0 | 11.8 | 11.9 | 5.4 | 16.9 | 4.0 | 0.9 | 15.9 | 2.7 |
| Cycle Q Clear(g_c), s | 5.6 | 4.7 | 0.0 | 11.0 | 11.8 | 11.9 | 5.4 | 16.9 | 4.0 | 0.9 | 15.9 | 2.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.36 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 353 | 748 | | 254 | 449 | 419 | 232 | 2038 | 576 | 122 | 1230 | 521 |
| V/C Ratio(X) | 0.71 | 0.37 | | 0.98 | 0.72 | 0.73 | 1.41 | 0.72 | 0.21 | 0.33 | 0.73 | 0.16 |
| Avail Cap(c_a), veh/h | 832 | 2488 | | 254 | 1037 | 969 | 232 | 2508 | 708 | 335 | 1793 | 759 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.9 | 25.7 | 0.0 | 31.4 | 25.9 | 26.0 | 34.4 | 20.4 | 16.3 | 34.8 | 22.0 | 17.6 |
| Incr Delay (d2), s/veh | 2.7 | 0.3 | 0.0 | 51.4 | 2.2 | 2.4 | 206.9 | 0.8 | 0.2 | 1.6 | 0.9 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 1.9 | 0.0 | 7.7 | 5.0 | 4.8 | 8.5 | 6.2 | 1.3 | 0.4 | 6.0 | 0.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 34.6 | 26.0 | 0.0 | 82.8 | 28.1 | 28.4 | 241.3 | 21.2 | 16.5 | 36.4 | 22.9 | 17.8 |
| LnGrp LOS | C | C | | F | C | C | F | C | B | D | C | B |
| Approach Vol, veh/h | | 525 | | | 879 | | | 1923 | | | 1026 | |
| Approach Delay, s/veh | | 30.1 | | | 43.8 | | | 58.2 | | | 23.1 | |
| Approach LOS | | C | | | D | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 7.5 | 31.6 | 15.8 | 19.5 | 10.0 | 29.0 | 12.8 | 22.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 2.9 | 18.9 | 13.0 | 6.7 | 7.4 | 17.9 | 7.6 | 13.9 |
| Green Ext Time (p_c), s | 0.0 | 8.1 | 0.0 | 1.7 | 0.0 | 5.4 | 0.6 | 3.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 43.6 |
| HCM 7th LOS | D |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 441 | 866 | 146 | 341 | 793 | 736 | 156 | 1283 | 294 | 600 | 890 | 321 |
| Future Volume (vph) | 441 | 866 | 146 | 341 | 793 | 736 | 156 | 1283 | 294 | 600 | 890 | 321 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 14.6 | 14.6 | 9.6 | 41.6 | 9.6 | 9.6 | 41.6 | 9.6 | 9.6 | 37.6 | 37.6 |
| Total Split (s) | 10.0 | 27.6 | 27.6 | 29.0 | 46.6 | 14.0 | 10.0 | 49.4 | 29.0 | 14.0 | 53.4 | 53.4 |
| Total Split (%) | 8.3% | 23.0% | 23.0% | 24.2% | 38.8% | 11.7% | 8.3% | 41.2% | 24.2% | 11.7% | 44.5% | 44.5% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.4 | 23.2 | 23.2 | 17.3 | 35.1 | 44.5 | 5.4 | 44.9 | 62.2 | 9.4 | 48.9 | 48.9 |
| Actuated g/C Ratio | 0.05 | 0.20 | 0.20 | 0.15 | 0.31 | 0.39 | 0.05 | 0.40 | 0.55 | 0.08 | 0.43 | 0.43 |
| v/c Ratio | 3.14 | 1.25 | 0.35 | 0.76 | 0.75 | 0.69 | 1.12 | 0.95 | 0.35 | 2.45 | 0.42 | 0.43 |
| Control Delay (s/veh) | 999.0 | 160.7 | 10.6 | 56.6 | 40.0 | 26.5 | 158.2 | 49.1 | 10.6 | 688.6 | 23.5 | 13.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 999.0 | 160.7 | 10.6 | 56.6 | 40.0 | 26.5 | 158.2 | 49.1 | 10.6 | 688.6 | 23.5 | 13.8 |
| LOS | F | F | B | E | D | C | F | D | B | F | C | B |
| Approach Delay (s/veh) | | 399.9 | | | 37.7 | | | 52.4 | | | 242.2 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 3.14 | |
| Intersection Signal Delay (s/veh): 172.0 | Intersection LOS: F |
| Intersection Capacity Utilization 106.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

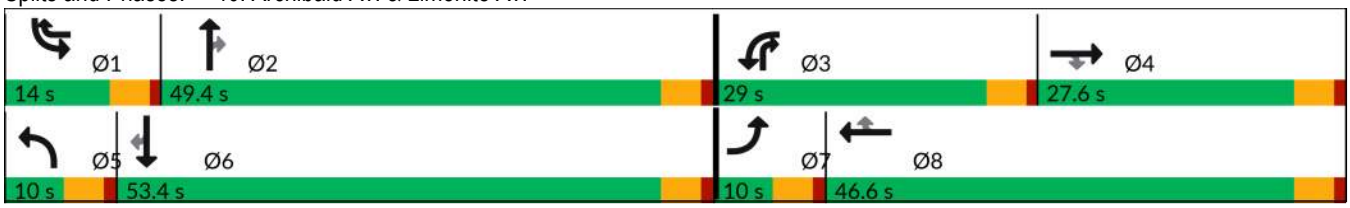

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 441 | 866 | 146 | 341 | 793 | 736 | 156 | 1283 | 294 | 600 | 890 | 321 |
| Future Volume (veh/h) | 441 | 866 | 146 | 341 | 793 | 736 | 156 | 1283 | 294 | 600 | 890 | 321 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 459 | 902 | 151 | 355 | 826 | 630 | 162 | 1336 | 191 | 625 | 927 | 327 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 152 | 756 | 337 | 417 | 1061 | 1070 | 152 | 1421 | 847 | 264 | 2228 | 692 |
| Arrive On Green | 0.05 | 0.21 | 0.21 | 0.13 | 0.30 | 0.30 | 0.05 | 0.40 | 0.40 | 0.09 | 0.44 | 0.44 |
| Sat Flow, veh/h | 3092 | 3554 | 1585 | 3092 | 3554 | 2787 | 3092 | 3554 | 1584 | 3092 | 5106 | 1585 |
| Grp Volume(v), veh/h | 459 | 902 | 151 | 355 | 826 | 630 | 162 | 1336 | 191 | 625 | 927 | 327 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1777 | 1585 | 1546 | 1777 | 1393 | 1546 | 1777 | 1584 | 1546 | 1702 | 1585 |
| Q Serve(g_s), s | 5.4 | 23.4 | 9.1 | 12.4 | 23.4 | 19.8 | 5.4 | 39.8 | 7.0 | 9.4 | 13.8 | 16.1 |
| Cycle Q Clear(g_c), s | 5.4 | 23.4 | 9.1 | 12.4 | 23.4 | 19.8 | 5.4 | 39.8 | 7.0 | 9.4 | 13.8 | 16.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 152 | 756 | 337 | 417 | 1061 | 1070 | 152 | 1421 | 847 | 264 | 2228 | 692 |
| V/C Ratio(X) | 3.03 | 1.19 | 0.45 | 0.85 | 0.78 | 0.59 | 1.07 | 0.94 | 0.23 | 2.37 | 0.42 | 0.47 |
| Avail Cap(c_a), veh/h | 152 | 756 | 337 | 685 | 1356 | 1302 | 152 | 1446 | 858 | 264 | 2264 | 703 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 52.3 | 43.3 | 37.7 | 46.5 | 35.3 | 27.0 | 52.3 | 31.8 | 13.5 | 50.3 | 21.4 | 22.0 |
| Incr Delay (d2), s/veh | 929.0 | 99.8 | 0.9 | 2.7 | 2.3 | 0.5 | 92.3 | 12.1 | 0.1 | 626.7 | 0.1 | 0.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 21.6 | 20.3 | 3.5 | 4.7 | 10.0 | 6.3 | 3.9 | 17.7 | 2.3 | 26.4 | 5.0 | 5.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 981.3 | 143.1 | 38.6 | 49.2 | 37.6 | 27.5 | 144.7 | 43.8 | 13.7 | 677.0 | 21.5 | 22.5 |
| LnGrp LOS | F | F | D | D | D | C | F | D | B | F | C | C |
| Approach Vol, veh/h | | 1512 | | | 1811 | | | 1689 | | | 1879 | |
| Approach Delay, s/veh | | 387.1 | | | 36.4 | | | 50.1 | | | 239.7 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 48.6 | 19.4 | 28.0 | 10.0 | 52.6 | 10.0 | 37.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 44.8 | 24.4 | 23.0 | 5.4 | 48.8 | 5.4 | 42.0 |
| Max Q Clear Time (g_c+I1), s | 11.4 | 41.8 | 14.4 | 25.4 | 7.4 | 18.1 | 7.4 | 25.4 |
| Green Ext Time (p_c), s | 0.0 | 2.2 | 0.5 | 0.0 | 0.0 | 7.7 | 0.0 | 7.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 172.1 |
| HCM 7th LOS | F |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 277 | 1594 | 30 | 31 | 1613 | 140 | 50 | 95 | 229 | 53 |
| Future Volume (vph) | 277 | 1594 | 30 | 31 | 1613 | 140 | 50 | 95 | 229 | 53 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.5 | 61.6 | 61.6 | 6.8 | 56.7 | 56.7 | 6.7 | 14.2 | 12.5 | 22.3 |
| Actuated g/C Ratio | 0.07 | 0.56 | 0.56 | 0.06 | 0.52 | 0.52 | 0.06 | 0.13 | 0.11 | 0.20 |
| v/c Ratio | 2.59 | 0.81 | 0.03 | 0.32 | 0.89 | 0.17 | 0.52 | 0.66 | 1.28 | 0.60 |
| Control Delay (s/veh) | 765.2 | 25.2 | 0.1 | 59.3 | 31.0 | 2.9 | 70.4 | 52.8 | 200.1 | 24.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 765.2 | 25.2 | 0.1 | 59.3 | 31.0 | 2.9 | 70.4 | 52.8 | 200.1 | 24.7 |
| LOS | F | C | A | E | C | A | E | D | F | C |
| Approach Delay (s/veh) | | 132.7 | | | 29.3 | | | 57.1 | | 107.7 |
| Approach LOS | | F | | | C | | | E | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.4 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.59 | |
| Intersection Signal Delay (s/veh): 84.3 | Intersection LOS: F |
| Intersection Capacity Utilization 99.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

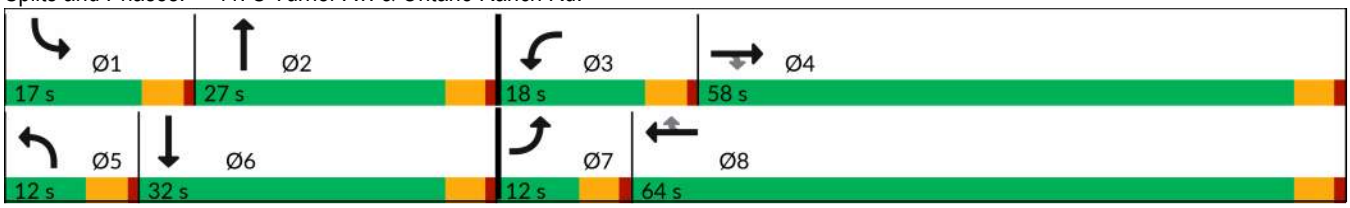

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 277 | 1594 | 30 | 31 | 1613 | 140 | 50 | 95 | 57 | 229 | 53 | 203 |
| Future Volume (veh/h) | 277 | 1594 | 30 | 31 | 1613 | 140 | 50 | 95 | 57 | 229 | 53 | 203 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 295 | 1696 | 30 | 33 | 1716 | 127 | 53 | 101 | 37 | 244 | 56 | 193 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 120 | 2122 | 880 | 50 | 1965 | 832 | 67 | 137 | 50 | 202 | 69 | 237 |
| Arrive On Green | 0.07 | 0.57 | 0.57 | 0.03 | 0.53 | 0.53 | 0.04 | 0.11 | 0.11 | 0.12 | 0.19 | 0.19 |
| Sat Flow, veh/h | 1688 | 3741 | 1551 | 1688 | 3741 | 1584 | 1688 | 1289 | 472 | 1688 | 369 | 1272 |
| Grp Volume(v), veh/h | 295 | 1696 | 30 | 33 | 1716 | 127 | 53 | 0 | 138 | 244 | 0 | 249 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1551 | 1688 | 1870 | 1584 | 1688 | 0 | 1761 | 1688 | 0 | 1641 |
| Q Serve(g_s), s | 7.4 | 37.2 | 0.9 | 2.0 | 41.7 | 4.3 | 3.2 | 0.0 | 7.9 | 12.4 | 0.0 | 15.1 |
| Cycle Q Clear(g_c), s | 7.4 | 37.2 | 0.9 | 2.0 | 41.7 | 4.3 | 3.2 | 0.0 | 7.9 | 12.4 | 0.0 | 15.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 0.78 |
| Lane Grp Cap(c), veh/h | 120 | 2122 | 880 | 50 | 1965 | 832 | 67 | 0 | 187 | 202 | 0 | 306 |
| V/C Ratio(X) | 2.45 | 0.80 | 0.03 | 0.66 | 0.87 | 0.15 | 0.79 | 0.00 | 0.74 | 1.21 | 0.00 | 0.81 |
| Avail Cap(c_a), veh/h | 120 | 2122 | 880 | 218 | 2143 | 907 | 120 | 0 | 380 | 202 | 0 | 434 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.1 | 17.8 | 9.9 | 49.8 | 21.6 | 12.7 | 49.4 | 0.0 | 44.9 | 45.6 | 0.0 | 40.5 |
| Incr Delay (d2), s/veh | 676.6 | 2.3 | 0.0 | 5.4 | 4.0 | 0.1 | 7.7 | 0.0 | 5.6 | 131.1 | 0.0 | 7.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 25.6 | 14.5 | 0.3 | 0.9 | 17.2 | 1.4 | 1.5 | 0.0 | 3.6 | 12.3 | 0.0 | 6.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 724.8 | 20.0 | 9.9 | 55.2 | 25.6 | 12.8 | 57.1 | 0.0 | 50.5 | 176.8 | 0.0 | 48.3 |
| LnGrp LOS | F | C | A | E | C | B | E | | D | F | | D |
| Approach Vol, veh/h | | 2021 | | | 1876 | | | 191 | | | 493 | |
| Approach Delay, s/veh | | 122.8 | | | 25.3 | | | 52.3 | | | 111.9 | |
| Approach LOS | | F | | | C | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 15.6 | 7.7 | 63.4 | 8.7 | 23.9 | 12.0 | 59.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 9.9 | 4.0 | 39.2 | 5.2 | 17.1 | 9.4 | 43.7 |
| Green Ext Time (p_c), s | 0.0 | 0.5 | 0.0 | 9.7 | 0.0 | 0.9 | 0.0 | 10.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 78.7 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 289 | 1507 | 127 | 205 | 1535 | 517 | 89 | 384 | 125 | 393 | 299 | 104 |
| Future Volume (vph) | 289 | 1507 | 127 | 205 | 1535 | 517 | 89 | 384 | 125 | 393 | 299 | 104 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.1 | 31.2 | 31.2 | 11.0 | 30.1 | 30.1 | 6.0 | 28.5 | 28.5 | 16.2 | 38.7 | 38.7 |
| Actuated g/C Ratio | 0.11 | 0.30 | 0.30 | 0.10 | 0.29 | 0.29 | 0.06 | 0.27 | 0.27 | 0.15 | 0.37 | 0.37 |
| v/c Ratio | 1.61 | 1.07 | 0.24 | 0.68 | 0.89 | 0.80 | 1.00 | 0.81 | 0.25 | 1.63 | 0.47 | 0.17 |
| Control Delay (s/veh) | 327.1 | 79.9 | 6.5 | 58.1 | 44.4 | 22.8 | 143.8 | 48.8 | 5.3 | 329.5 | 27.4 | 4.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 327.1 | 79.9 | 6.5 | 58.1 | 44.4 | 22.8 | 143.8 | 48.8 | 5.3 | 329.5 | 27.4 | 4.4 |
| LOS | F | E | A | E | D | C | F | D | A | F | C | A |
| Approach Delay (s/veh) | | 112.1 | | | 40.7 | | | 53.9 | | | 173.5 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105.4 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.63 | |
| Intersection Signal Delay (s/veh): 85.7 | Intersection LOS: F |
| Intersection Capacity Utilization 98.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 289 | 1507 | 127 | 205 | 1535 | 517 | 89 | 384 | 125 | 393 | 299 | 104 |
| Future Volume (veh/h) | 289 | 1507 | 127 | 205 | 1535 | 517 | 89 | 384 | 125 | 393 | 299 | 104 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 307 | 1603 | 91 | 218 | 1633 | 433 | 95 | 409 | 64 | 418 | 318 | 96 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 198 | 1631 | 499 | 277 | 1877 | 460 | 99 | 475 | 402 | 266 | 659 | 559 |
| Arrive On Green | 0.12 | 0.32 | 0.32 | 0.09 | 0.29 | 0.29 | 0.06 | 0.25 | 0.25 | 0.16 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1688 | 5106 | 1563 | 3092 | 6434 | 1577 | 1688 | 1870 | 1583 | 1688 | 1870 | 1585 |
| Grp Volume(v), veh/h | 307 | 1603 | 91 | 218 | 1633 | 433 | 95 | 409 | 64 | 418 | 318 | 96 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1702 | 1563 | 1546 | 1609 | 1577 | 1688 | 1870 | 1583 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 12.0 | 31.9 | 4.3 | 7.1 | 24.6 | 27.4 | 5.7 | 21.4 | 3.2 | 16.1 | 13.6 | 4.3 |
| Cycle Q Clear(g_c), s | 12.0 | 31.9 | 4.3 | 7.1 | 24.6 | 27.4 | 5.7 | 21.4 | 3.2 | 16.1 | 13.6 | 4.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 198 | 1631 | 499 | 277 | 1877 | 460 | 99 | 475 | 402 | 266 | 659 | 559 |
| V/C Ratio(X) | 1.55 | 0.98 | 0.18 | 0.79 | 0.87 | 0.94 | 0.96 | 0.86 | 0.16 | 1.57 | 0.48 | 0.17 |
| Avail Cap(c_a), veh/h | 198 | 1631 | 499 | 387 | 1880 | 461 | 99 | 797 | 675 | 266 | 982 | 832 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 45.2 | 34.5 | 25.2 | 45.6 | 34.4 | 35.4 | 48.0 | 36.5 | 29.7 | 43.1 | 25.8 | 22.8 |
| Incr Delay (d2), s/veh | 271.3 | 18.3 | 0.2 | 4.5 | 4.7 | 27.7 | 76.8 | 5.2 | 0.2 | 275.7 | 0.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 19.7 | 14.9 | 1.5 | 2.7 | 9.4 | 13.2 | 4.4 | 9.9 | 1.2 | 26.8 | 5.8 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 316.5 | 52.9 | 25.3 | 50.1 | 39.1 | 63.1 | 124.8 | 41.6 | 29.9 | 318.8 | 26.4 | 23.0 |
| LnGrp LOS | F | D | C | D | D | E | F | D | C | F | C | C |
| Approach Vol, veh/h | | 2001 | | | 2284 | | | 568 | | | 832 | |
| Approach Delay, s/veh | | 92.1 | | | 44.7 | | | 54.2 | | | 172.9 | |
| Approach LOS | | F | | | D | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.7 | 30.6 | 13.8 | 37.3 | 10.6 | 40.7 | 16.6 | 34.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 18.1 | 23.4 | 9.1 | 33.9 | 7.7 | 15.6 | 14.0 | 29.4 |
| Green Ext Time (p_c), s | 0.0 | 2.4 | 0.1 | 0.0 | 0.0 | 2.1 | 0.0 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 81.1 |
| HCM 7th LOS | F |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 339 | 1552 | 318 | 199 | 1469 | 202 | 497 | 689 | 484 | 144 | 296 | 219 |
| Future Volume (vph) | 339 | 1552 | 318 | 199 | 1469 | 202 | 497 | 689 | 484 | 144 | 296 | 219 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.1 | 44.1 | 44.1 | 8.4 | 45.5 | 45.5 | 7.4 | 34.7 | 34.7 | 6.4 | 33.7 | 33.7 |
| Actuated g/C Ratio | 0.06 | 0.39 | 0.39 | 0.07 | 0.41 | 0.41 | 0.07 | 0.31 | 0.31 | 0.06 | 0.30 | 0.30 |
| v/c Ratio | 1.81 | 0.81 | 0.42 | 0.90 | 1.07 | 0.29 | 2.55 | 0.46 | 0.87 | 0.85 | 0.29 | 0.40 |
| Control Delay (s/veh) | 415.0 | 35.3 | 8.4 | 90.8 | 77.6 | 10.3 | 733.7 | 31.6 | 42.6 | 92.5 | 30.2 | 13.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 415.0 | 35.3 | 8.4 | 90.8 | 77.6 | 10.3 | 733.7 | 31.6 | 42.6 | 92.5 | 30.2 | 13.9 |
| LOS | F | D | A | F | E | B | F | C | D | F | C | B |
| Approach Delay (s/veh) | | 89.7 | | | 71.7 | | | 243.8 | | | 38.4 | |
| Approach LOS | | F | | | E | | | F | | | D | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 112.2
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 2.55
Intersection Signal Delay (s/veh): 119.4 — Intersection LOS: F
Intersection Capacity Utilization 90.8% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

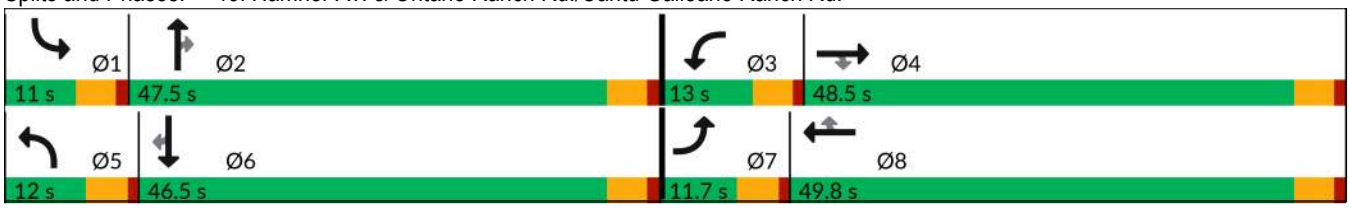

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 339 | 1552 | 318 | 199 | 1469 | 202 | 497 | 689 | 484 | 144 | 296 | 219 |
| Future Volume (veh/h) | 339 | 1552 | 318 | 199 | 1469 | 202 | 497 | 689 | 484 | 144 | 296 | 219 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 353 | 1617 | 277 | 207 | 1530 | 199 | 518 | 718 | 271 | 150 | 308 | 216 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 218 | 2214 | 687 | 257 | 1586 | 708 | 227 | 1213 | 375 | 196 | 809 | 361 |
| Arrive On Green | 0.07 | 0.43 | 0.43 | 0.08 | 0.45 | 0.45 | 0.07 | 0.24 | 0.24 | 0.06 | 0.23 | 0.23 |
| Sat Flow, veh/h | 3092 | 5106 | 1585 | 3092 | 3554 | 1585 | 3092 | 5106 | 1581 | 3092 | 3554 | 1585 |
| Grp Volume(v), veh/h | 353 | 1617 | 277 | 207 | 1530 | 199 | 518 | 718 | 271 | 150 | 308 | 216 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1585 | 1546 | 1777 | 1585 | 1546 | 1702 | 1581 | 1546 | 1777 | 1585 |
| Q Serve(g_s), s | 7.1 | 26.5 | 12.1 | 6.6 | 42.2 | 8.0 | 7.4 | 12.6 | 15.9 | 4.8 | 7.4 | 12.3 |
| Cycle Q Clear(g_c), s | 7.1 | 26.5 | 12.1 | 6.6 | 42.2 | 8.0 | 7.4 | 12.6 | 15.9 | 4.8 | 7.4 | 12.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 218 | 2214 | 687 | 257 | 1586 | 708 | 227 | 1213 | 375 | 196 | 809 | 361 |
| V/C Ratio(X) | 1.62 | 0.73 | 0.40 | 0.80 | 0.96 | 0.28 | 2.28 | 0.59 | 0.72 | 0.76 | 0.38 | 0.60 |
| Avail Cap(c_a), veh/h | 218 | 2221 | 690 | 257 | 1592 | 710 | 227 | 2171 | 672 | 196 | 1476 | 658 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.9 | 23.7 | 19.6 | 45.4 | 27.2 | 17.7 | 46.8 | 34.1 | 35.4 | 46.5 | 33.0 | 34.9 |
| Incr Delay (d2), s/veh | 300.3 | 1.3 | 0.4 | 15.6 | 15.0 | 0.2 | 591.8 | 0.5 | 2.6 | 14.9 | 0.3 | 1.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.7 | 9.6 | 4.1 | 3.0 | 18.7 | 2.7 | 21.4 | 4.9 | 6.0 | 2.2 | 3.0 | 4.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 347.2 | 24.9 | 20.0 | 61.1 | 42.1 | 17.9 | 638.6 | 34.6 | 38.0 | 61.4 | 33.3 | 36.4 |
| LnGrp LOS | F | C | C | E | D | B | F | C | D | E | C | D |
| Approach Vol, veh/h | | 2247 | | | 1936 | | | 1507 | | | 674 | |
| Approach Delay, s/veh | | 75.0 | | | 41.6 | | | 242.8 | | | 40.5 | |
| Approach LOS | | E | | | D | | | F | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 28.6 | 13.0 | 48.3 | 12.0 | 27.6 | 11.7 | 49.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 6.8 | 17.9 | 8.6 | 28.5 | 9.4 | 14.3 | 9.1 | 44.2 |
| Green Ext Time (p_c), s | 0.0 | 5.6 | 0.0 | 9.7 | 0.0 | 2.5 | 0.0 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 100.9 |
| HCM 7th LOS | F |

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1613 | 158 | 882 | 143 | 270 | 0 | 1387 |
| Future Volume (vph) | 1613 | 158 | 882 | 143 | 270 | 0 | 1387 |
| Turn Type | NA | Perm | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | | 6 | | | 4 | |
| Permitted Phases | | 2 | | Free | 4 | | 4 |
| Detector Phase | 2 | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 5.5 | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | C-Min | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 44.6 | 44.6 | 44.6 | 120.0 | 64.3 | 64.3 | 64.3 |
| Actuated g/C Ratio | 0.37 | 0.37 | 0.37 | 1.00 | 0.54 | 0.54 | 0.54 |
| v/c Ratio | 0.82 | 0.24 | 0.67 | 0.05 | 0.29 | 0.86 | 0.86 |
| Control Delay (s/veh) | 38.9 | 7.1 | 45.3 | 0.0 | 15.5 | 33.6 | 34.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.9 | 7.1 | 45.3 | 0.0 | 15.5 | 33.6 | 34.2 |
| LOS | D | A | D | A | B | C | C |
| Approach Delay (s/veh) | 36.0 | | 39.0 | | | 31.2 | |
| Approach LOS | D | | D | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 37.5 (31%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 70 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.86 | |
| Intersection Signal Delay (s/veh): 34.9 | Intersection LOS: C |
| Intersection Capacity Utilization 90.9% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

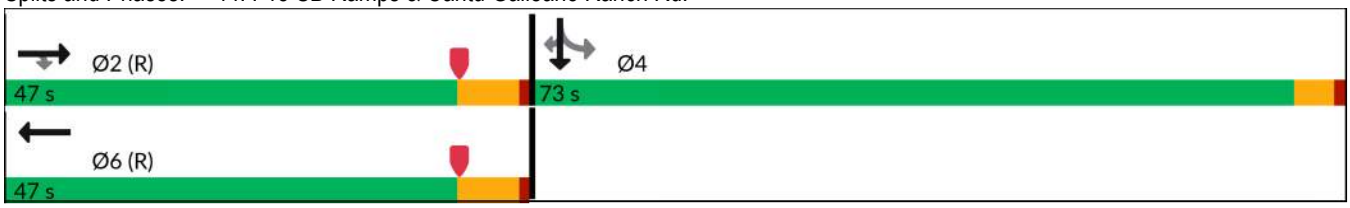

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1613 | 158 | 0 | 882 | 143 | 0 | 0 | 0 | 270 | 0 | 1387 |
| Future Volume (veh/h) | 0 | 1613 | 158 | 0 | 882 | 143 | 0 | 0 | 0 | 270 | 0 | 1387 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 0 | 1870 | 1870 | | | | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 1698 | 0 | 0 | 928 | 0 | | | | 189 | 0 | 1316 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | | | | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2519 | | 0 | 1679 | | | | | 774 | 0 | 1454 |
| Arrive On Green | 0.00 | 0.45 | 0.00 | 0.00 | 0.90 | 0.00 | | | | 0.46 | 0.00 | 0.46 |
| Sat Flow, veh/h | 0 | 5611 | 1585 | 0 | 3741 | 2790 | | | | 1688 | 0 | 3170 |
| Grp Volume(v), veh/h | 0 | 1698 | 0 | 0 | 928 | 0 | | | | 189 | 0 | 1316 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 0 | 1870 | 1395 | | | | 1688 | 0 | 1585 |
| Q Serve(g_s), s | 0.0 | 28.7 | 0.0 | 0.0 | 6.0 | 0.0 | | | | 8.2 | 0.0 | 46.1 |
| Cycle Q Clear(g_c), s | 0.0 | 28.7 | 0.0 | 0.0 | 6.0 | 0.0 | | | | 8.2 | 0.0 | 46.1 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2519 | | 0 | 1679 | | | | | 774 | 0 | 1454 |
| V/C Ratio(X) | 0.00 | 0.67 | | 0.00 | 0.55 | | | | | 0.24 | 0.00 | 0.91 |
| Avail Cap(c_a), veh/h | 0 | 2519 | | 0 | 1679 | | | | | 962 | 0 | 1807 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.46 | 0.00 | 0.00 | 0.61 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 26.1 | 0.0 | 0.0 | 3.7 | 0.0 | | | | 19.8 | 0.0 | 30.1 |
| Incr Delay (d2), s/veh | 0.0 | 0.7 | 0.0 | 0.0 | 0.8 | 0.0 | | | | 0.2 | 0.0 | 6.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 11.8 | 0.0 | 0.0 | 1.5 | 0.0 | | | | 3.1 | 0.0 | 17.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 26.8 | 0.0 | 0.0 | 4.5 | 0.0 | | | | 20.0 | 0.0 | 36.0 |
| LnGrp LOS | | C | | | A | | | | | B | | D |
| Approach Vol, veh/h | | 1698 | | | 928 | | | | | | 1505 | |
| Approach Delay, s/veh | | 26.8 | | | 4.5 | | | | | | 34.0 | |
| Approach LOS | | C | | | A | | | | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 60.4 | 59.6 | 60.4 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 40.5 | 68.4 | 40.5 |
| Max Q Clear Time (g_c+I1), s | 30.7 | 48.1 | 8.0 |
| Green Ext Time (p_c), s | 6.7 | 6.9 | 6.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 24.4 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 580 | 1162 | 266 | 366 | 623 | 329 |
| Future Volume (vph) | 580 | 1162 | 266 | 366 | 623 | 329 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 73.0 | 73.0 | 20.0 | 93.0 | 27.0 | 27.0 |
| Total Split (%) | 60.8% | 60.8% | 16.7% | 77.5% | 22.5% | 22.5% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 67.6 | 67.6 | 14.3 | 86.5 | 22.4 | 22.4 |
| Actuated g/C Ratio | 0.56 | 0.56 | 0.12 | 0.72 | 0.19 | 0.19 |
| v/c Ratio | 0.19 | 1.01 | 0.73 | 0.09 | 1.08 | 0.56 |
| Control Delay (s/veh) | 6.2 | 53.4 | 62.7 | 5.1 | 104.7 | 9.1 |
| Queue Delay | 0.0 | 16.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 6.2 | 70.1 | 62.7 | 5.1 | 104.7 | 9.1 |
| LOS | A | E | E | A | F | A |
| Approach Delay (s/veh) | 48.8 | | | 29.3 | 74.9 | |
| Approach LOS | D | | | C | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 44.8 (37%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 105 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.08 | |
| Intersection Signal Delay (s/veh): 52.6 | Intersection LOS: D |
| Intersection Capacity Utilization 89.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

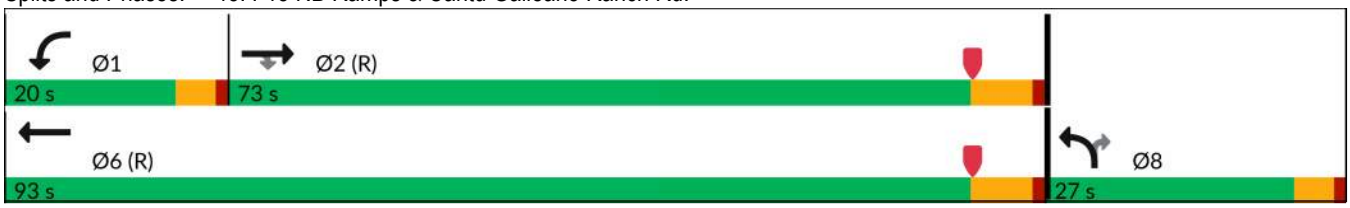

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 580 | 1162 | 266 | 366 | 623 | 329 |
| Future Volume (veh/h) | 580 | 1162 | 266 | 366 | 623 | 329 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1673 | 1870 | 1772 | 1870 |
| Adj Flow Rate, veh/h | 598 | 998 | 274 | 377 | 642 | 251 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 3250 | 918 | 329 | 4045 | 630 | 296 |
| Arrive On Green | 0.97 | 0.97 | 0.10 | 0.72 | 0.19 | 0.19 |
| Sat Flow, veh/h | 5611 | 1585 | 3188 | 5611 | 3375 | 1585 |
| Grp Volume(v), veh/h | 598 | 998 | 274 | 377 | 642 | 251 |
| Grp Sat Flow(s),veh/h/ln | 1870 | 1585 | 1594 | 1870 | 1688 | 1585 |
| Q Serve(g_s), s | 0.5 | 69.5 | 10.1 | 2.4 | 22.4 | 18.4 |
| Cycle Q Clear(g_c), s | 0.5 | 69.5 | 10.1 | 2.4 | 22.4 | 18.4 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 3250 | 918 | 329 | 4045 | 630 | 296 |
| V/C Ratio(X) | 0.18 | 1.09 | 0.83 | 0.09 | 1.02 | 0.85 |
| Avail Cap(c_a), veh/h | 3250 | 918 | 409 | 4045 | 630 | 296 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.58 | 0.58 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.8 | 2.0 | 52.8 | 5.0 | 48.8 | 47.2 |
| Incr Delay (d2), s/veh | 0.1 | 50.3 | 11.3 | 0.0 | 40.7 | 20.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 13.6 | 4.4 | 0.7 | 12.7 | 8.7 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.9 | 52.2 | 64.1 | 5.1 | 89.5 | 67.2 |
| LnGrp LOS | A | F | E | A | F | E |
| Approach Vol, veh/h | 1596 | | | 651 | 893 | |
| Approach Delay, s/veh | 33.0 | | | 29.9 | 83.3 | |
| Approach LOS | C | | | C | F | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 76.0 | | | | 93.0 | 27.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 66.5 | | | | 86.5 | 22.4 |
| Max Q Clear Time (g_c+I1), s | 12.1 | 71.5 | | | | 4.4 | 24.4 |
| Green Ext Time (p_c), s | 0.3 | 0.0 | | | | 2.3 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 46.7 |
| HCM 7th LOS | D |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 396 | 3 | 423 | 318 | 1287 | 1617 | 584 |
| Future Volume (vph) | 396 | 3 | 423 | 318 | 1287 | 1617 | 584 |
| Turn Type | Perm | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | | 8 | | 5 | 2 | 6 | |
| Permitted Phases | 8 | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.0 | 17.0 | 17.0 | 15.2 | 28.0 | 27.0 | 27.0 |
| Total Split (s) | 24.0 | 24.0 | 24.0 | 22.0 | 66.0 | 44.0 | 44.0 |
| Total Split (%) | 26.7% | 26.7% | 26.7% | 24.4% | 73.3% | 48.9% | 48.9% |
| Yellow Time (s) | 5.0 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 | 5.0 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.0 | 7.0 | 7.0 | 5.2 | 6.0 | 6.0 | 6.0 |
| Lead/Lag | | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 17.0 | 17.0 | 17.0 | 16.8 | 60.0 | 38.0 | 38.0 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.19 | 0.19 | 0.67 | 0.42 | 0.42 |
| v/c Ratio | 1.01 | 0.86 | 0.78 | 1.08 | 0.58 | 1.15 | 0.66 |
| Control Delay (s/veh) | 93.2 | 52.5 | 38.4 | 96.5 | 1.7 | 102.9 | 7.3 |
| Queue Delay | 40.2 | 57.7 | 0.0 | 0.0 | 1.1 | 0.1 | 0.0 |
| Total Delay (s/veh) | 133.4 | 110.2 | 38.4 | 96.5 | 2.8 | 103.0 | 7.3 |
| LOS | F | F | D | F | A | F | A |
| Approach Delay (s/veh) | | 95.3 | | | 21.3 | 77.6 | |
| Approach LOS | | F | | | C | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.15 | |
| Intersection Signal Delay (s/veh): 61.2 | Intersection LOS: E |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 1: Euclid Av. & SR-60 WB Ramps

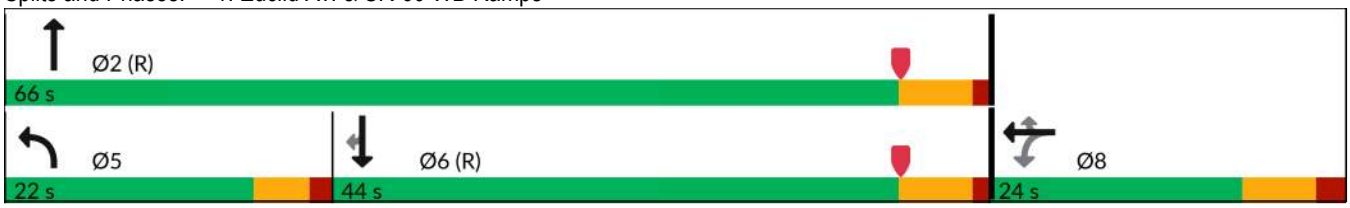

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 396 | 3 | 423 | 318 | 1287 | 0 | 0 | 1617 | 584 |
| Future Volume (veh/h) | 0 | 0 | 0 | 396 | 3 | 423 | 318 | 1287 | 0 | 0 | 1617 | 584 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 504 | 0 | 177 | 338 | 1369 | 0 | 0 | 1720 | 382 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 593 | 0 | 278 | 315 | 2416 | 0 | 0 | 1547 | 685 |
| Arrive On Green | | | | 0.18 | 0.00 | 0.18 | 0.19 | 0.68 | 0.00 | 0.00 | 0.44 | 0.44 |
| Sat Flow, veh/h | | | | 3375 | 0 | 1580 | 1688 | 3647 | 0 | 0 | 3647 | 1574 |
| Grp Volume(v), veh/h | | | | 504 | 0 | 177 | 338 | 1369 | 0 | 0 | 1720 | 382 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1580 | 1688 | 1777 | 0 | 0 | 1777 | 1574 |
| Q Serve(g_s), s | | | | 13.0 | 0.0 | 9.4 | 16.8 | 18.1 | 0.0 | 0.0 | 39.2 | 16.3 |
| Cycle Q Clear(g_c), s | | | | 13.0 | 0.0 | 9.4 | 16.8 | 18.1 | 0.0 | 0.0 | 39.2 | 16.3 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 593 | 0 | 278 | 315 | 2416 | 0 | 0 | 1547 | 685 |
| V/C Ratio(X) | | | | 0.85 | 0.00 | 0.64 | 1.07 | 0.57 | 0.00 | 0.00 | 1.11 | 0.56 |
| Avail Cap(c_a), veh/h | | | | 638 | 0 | 298 | 315 | 2416 | 0 | 0 | 1547 | 685 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.9 | 0.0 | 34.4 | 36.6 | 7.5 | 0.0 | 0.0 | 25.4 | 18.9 |
| Incr Delay (d2), s/veh | | | | 10.5 | 0.0 | 4.8 | 39.2 | 0.1 | 0.0 | 0.0 | 60.0 | 3.3 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 6.1 | 0.0 | 3.9 | 9.9 | 5.0 | 0.0 | 0.0 | 27.4 | 6.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 46.5 | 0.0 | 39.3 | 75.8 | 7.6 | 0.0 | 0.0 | 85.4 | 22.2 |
| LnGrp LOS | | | | D | | D | F | A | | | F | C |
| Approach Vol, veh/h | | | | | 681 | | | 1707 | | | 2102 | |
| Approach Delay, s/veh | | | | | 44.6 | | | 21.1 | | | 73.9 | |
| Approach LOS | | | | | D | | | C | | | E | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.2 | 22.0 | 45.2 | 22.8 |
| Change Period (Y+Rc), s | 6.0 | 5.2 | 6.0 | 7.0 |
| Max Green Setting (Gmax), s | 60.0 | 16.8 | 38.0 | 17.0 |
| Max Q Clear Time (g_c+I1), s | 20.1 | 18.8 | 41.2 | 15.0 |
| Green Ext Time (p_c), s | 18.3 | 0.0 | 0.0 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 49.4 |
| HCM 7th LOS | D |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 301 | 2 | 316 | 1260 | 417 | 467 | 1450 |
| Future Volume (vph) | 301 | 2 | 316 | 1260 | 417 | 467 | 1450 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 9.6 | 9.6 | 29.0 | 29.0 | 14.7 | 27.0 |
| Total Split (s) | 25.0 | 25.0 | 25.0 | 33.0 | 33.0 | 32.0 | 65.0 |
| Total Split (%) | 27.8% | 27.8% | 27.8% | 36.7% | 36.7% | 35.6% | 72.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 5.0 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | | 4.6 | 6.0 | 6.0 | 4.7 | 6.0 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 19.2 | 0.0 | 19.2 | 28.6 | 28.6 | 26.9 | 60.2 |
| Actuated g/C Ratio | 0.21 | 0.00 | 0.21 | 0.32 | 0.32 | 0.30 | 0.67 |
| v/c Ratio | 0.85 | no cap | 0.79 | 1.13 | 0.55 | 0.94 | 0.62 |
| Control Delay (s/veh) | 56.6 | | 38.2 | 102.0 | 6.7 | 27.8 | 24.1 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 48.3 |
| Total Delay (s/veh) | 56.6 | Error | 38.2 | 102.0 | 6.7 | 27.8 | 72.4 |
| LOS | E | F | D | F | A | C | E |
| Approach Delay (s/veh) | | Error | | 78.3 | | | 61.5 |
| Approach LOS | | F | | E | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: Err | |
| Intersection Signal Delay (s/veh): Err | Intersection LOS: F |
| Intersection Capacity Utilization Err% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 2: Euclid Av. & SR-60 EB Ramps

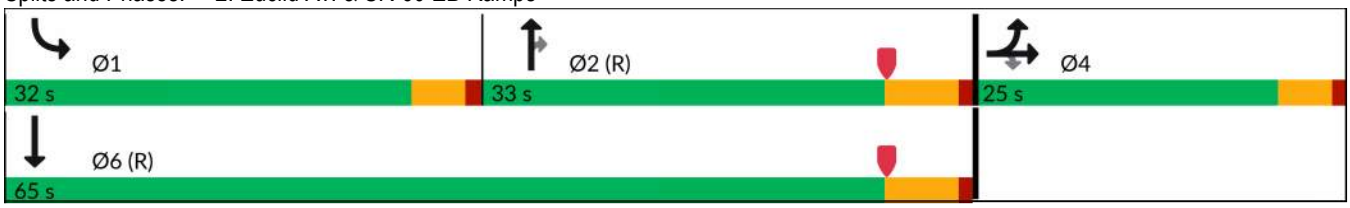

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 301 | 2 | 316 | 0 | 0 | 0 | 0 | 1260 | 417 | 467 | 1450 | 0 |
| Future Volume (veh/h) | 301 | 2 | 316 | 0 | 0 | 0 | 0 | 1260 | 417 | 467 | 1450 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 304 | 2 | 260 | | | | 0 | 1273 | 306 | 472 | 1465 | 0 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 344 | 0 | 322 | | | | 0 | 1193 | 530 | 491 | 2411 | 0 |
| Arrive On Green | 0.20 | 0.20 | 0.20 | | | | 0.00 | 0.34 | 0.34 | 0.58 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1688 | 0 | 1583 | | | | 0 | 3647 | 1578 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 304 | 0 | 260 | | | | 0 | 1273 | 306 | 472 | 1465 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1583 | | | | 0 | 1777 | 1578 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 15.7 | 0.0 | 14.1 | | | | 0.0 | 30.2 | 14.4 | 23.9 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 15.7 | 0.0 | 14.1 | | | | 0.0 | 30.2 | 14.4 | 23.9 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 344 | 0 | 322 | | | | 0 | 1193 | 530 | 491 | 2411 | 0 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.81 | | | | 0.00 | 1.07 | 0.58 | 0.96 | 0.61 | 0.00 |
| Avail Cap(c_a), veh/h | 383 | 0 | 359 | | | | 0 | 1193 | 530 | 512 | 2411 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 0.74 | 0.74 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 34.8 | 0.0 | 34.1 | | | | 0.0 | 29.9 | 24.6 | 18.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 19.7 | 0.0 | 11.7 | | | | 0.0 | 42.9 | 3.4 | 5.5 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.2 | 0.0 | 6.3 | | | | 0.0 | 18.8 | 5.5 | 5.5 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 54.5 | 0.0 | 45.8 | | | | 0.0 | 72.8 | 28.0 | 23.9 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | F | C | C | A | |
| Approach Vol, veh/h | | 564 | | | | | | 1579 | | | 1937 | |
| Approach Delay, s/veh | | 50.5 | | | | | | 64.1 | | | 5.9 | |
| Approach LOS | | D | | | | | | E | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 30.9 | 36.2 | | 22.9 | | 67.1 |
| Change Period (Y+Rc), s | 4.7 | 6.0 | | 4.6 | | 6.0 |
| Max Green Setting (Gmax), s | 27.3 | 27.0 | | 20.4 | | 59.0 |
| Max Q Clear Time (g_c+I1), s | 25.9 | 32.2 | | 17.7 | | 2.0 |
| Green Ext Time (p_c), s | 0.3 | 0.0 | | 0.6 | | 23.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 34.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 131 | 399 | 132 | 494 | 201 | 1122 | 230 | 1444 |
| Future Volume (vph) | 131 | 399 | 132 | 494 | 201 | 1122 | 230 | 1444 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 26.8 | 26.8 | 26.8 | 26.8 | 36.8 | 36.8 | 35.6 | 36.8 |
| Total Split (s) | 35.0 | 35.0 | 35.0 | 35.0 | 49.0 | 49.0 | 36.0 | 85.0 |
| Total Split (%) | 29.2% | 29.2% | 29.2% | 29.2% | 40.8% | 40.8% | 30.0% | 70.8% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 29.2 | 29.2 | 29.2 | 29.2 | 43.2 | 43.2 | 12.2 | 60.0 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.29 | 0.29 | 0.43 | 0.43 | 0.12 | 0.60 |
| v/c Ratio | 1.19 | 0.84 | 1.84 | 0.69 | 2.01 | 0.56 | 0.65 | 0.55 |
| Control Delay (s/veh) | 182.1 | 40.8 | 455.0 | 34.5 | 508.6 | 23.1 | 50.7 | 12.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 182.1 | 40.8 | 455.0 | 34.5 | 508.6 | 23.1 | 50.7 | 12.8 |
| LOS | F | D | F | C | F | C | D | B |
| Approach Delay (s/veh) | | 61.0 | | 104.4 | | 94.1 | | 17.7 |
| Approach LOS | | E | | F | | F | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 100.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.01 | |
| Intersection Signal Delay (s/veh): 61.3 | Intersection LOS: E |
| Intersection Capacity Utilization 94.1% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 3: Euclid Av. & Walnut St.

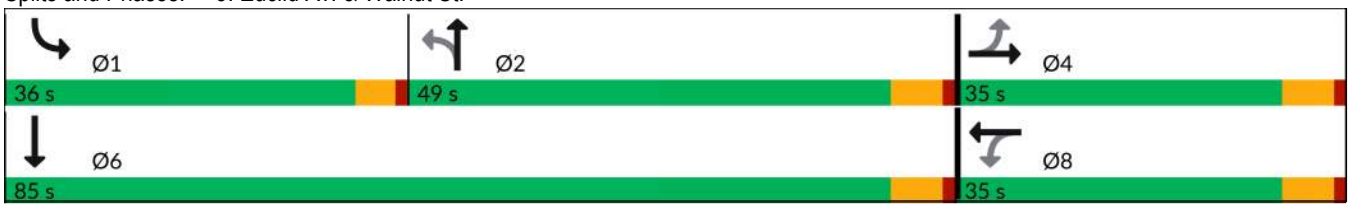

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 399 | 386 | 132 | 494 | 171 | 201 | 1122 | 51 | 230 | 1444 | 141 |
| Future Volume (veh/h) | 131 | 399 | 386 | 132 | 494 | 171 | 201 | 1122 | 51 | 230 | 1444 | 141 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 136 | 416 | 396 | 138 | 515 | 148 | 209 | 1169 | 32 | 240 | 1504 | 117 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 169 | 527 | 469 | 112 | 805 | 230 | 191 | 2241 | 61 | 309 | 2828 | 220 |
| Arrive On Green | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.44 | 0.44 | 0.44 | 0.10 | 0.59 | 0.59 |
| Sat Flow, veh/h | 731 | 1777 | 1580 | 637 | 2712 | 775 | 295 | 5107 | 140 | 3092 | 4830 | 376 |
| Grp Volume(v), veh/h | 136 | 416 | 396 | 138 | 336 | 327 | 209 | 779 | 422 | 240 | 1060 | 561 |
| Grp Sat Flow(s),veh/h/ln | 731 | 1777 | 1580 | 637 | 1777 | 1711 | 295 | 1702 | 1843 | 1546 | 1702 | 1802 |
| Q Serve(g_s), s | 12.9 | 21.2 | 23.1 | 6.1 | 16.2 | 16.3 | 39.2 | 16.4 | 16.4 | 7.5 | 18.4 | 18.5 |
| Cycle Q Clear(g_c), s | 29.2 | 21.2 | 23.1 | 29.2 | 16.2 | 16.3 | 43.2 | 16.4 | 16.4 | 7.5 | 18.4 | 18.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.45 | 1.00 | | 0.08 | 1.00 | | 0.21 |
| Lane Grp Cap(c), veh/h | 169 | 527 | 469 | 112 | 527 | 507 | 191 | 1494 | 809 | 309 | 1993 | 1055 |
| V/C Ratio(X) | 0.81 | 0.79 | 0.84 | 1.23 | 0.64 | 0.64 | 1.10 | 0.52 | 0.52 | 0.78 | 0.53 | 0.53 |
| Avail Cap(c_a), veh/h | 169 | 527 | 469 | 112 | 527 | 507 | 191 | 1494 | 809 | 986 | 2739 | 1450 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.7 | 31.8 | 32.5 | 48.2 | 30.0 | 30.1 | 37.1 | 20.1 | 20.1 | 43.2 | 12.3 | 12.3 |
| Incr Delay (d2), s/veh | 24.2 | 7.9 | 13.3 | 158.9 | 2.6 | 2.8 | 93.5 | 0.3 | 0.6 | 1.6 | 0.2 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.4 | 9.7 | 10.0 | 7.6 | 6.9 | 6.7 | 9.5 | 6.0 | 6.6 | 2.8 | 6.0 | 6.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 68.9 | 39.7 | 45.8 | 207.0 | 32.6 | 32.9 | 130.6 | 20.4 | 20.7 | 44.8 | 12.5 | 12.7 |
| LnGrp LOS | E | D | D | F | C | C | F | C | C | D | B | B |
| Approach Vol, veh/h | | 948 | | | 801 | | | 1410 | | | 1861 | |
| Approach Delay, s/veh | | 46.4 | | | 62.8 | | | 36.8 | | | 16.7 | |
| Approach LOS | | D | | | E | | | D | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.4 | 49.0 | | 35.0 | | 63.4 | | 35.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | | 5.8 | | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 31.4 | 43.2 | | 29.2 | | 79.2 | | 29.2 |
| Max Q Clear Time (g_c+I1), s | 9.5 | 45.2 | | 31.2 | | 20.5 | | 31.2 |
| Green Ext Time (p_c), s | 0.4 | 0.0 | | 0.0 | | 15.8 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 35.3 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 138 | 853 | 200 | 743 | 324 | 1103 | 445 | 132 | 1480 | 408 |
| Future Volume (vph) | 138 | 853 | 200 | 743 | 324 | 1103 | 445 | 132 | 1480 | 408 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 33.0 | 15.2 | 36.0 | 36.0 |
| Total Split (s) | 20.8 | 43.0 | 21.0 | 43.2 | 15.2 | 40.0 | 40.0 | 16.0 | 40.8 | 40.8 |
| Total Split (%) | 17.3% | 35.8% | 17.5% | 36.0% | 12.7% | 33.3% | 33.3% | 13.3% | 34.0% | 34.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.0 | 1.5 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 6.0 | 5.2 | 6.0 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.1 | 36.0 | 15.8 | 37.7 | 10.0 | 34.0 | 34.0 | 10.8 | 34.8 | 34.8 |
| Actuated g/C Ratio | 0.12 | 0.30 | 0.13 | 0.32 | 0.08 | 0.28 | 0.28 | 0.09 | 0.29 | 0.29 |
| v/c Ratio | 0.71 | 1.81 | 0.91 | 0.73 | 2.34 | 1.11 | 0.83 | 0.88 | 1.45 | 0.66 |
| Control Delay (s/veh) | 70.1 | 400.5 | 93.6 | 41.0 | 650.5 | 102.6 | 43.2 | 101.7 | 241.3 | 20.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 70.1 | 400.5 | 93.6 | 41.0 | 650.5 | 102.6 | 43.2 | 101.7 | 241.3 | 20.3 |
| LOS | E | F | F | D | F | F | D | F | F | C |
| Approach Delay (s/veh) | | 360.4 | | 51.5 | | 183.3 | | | 187.6 | |
| Approach LOS | | F | | D | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.34 | |
| Intersection Signal Delay (s/veh): 196.1 | Intersection LOS: F |
| Intersection Capacity Utilization 144.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

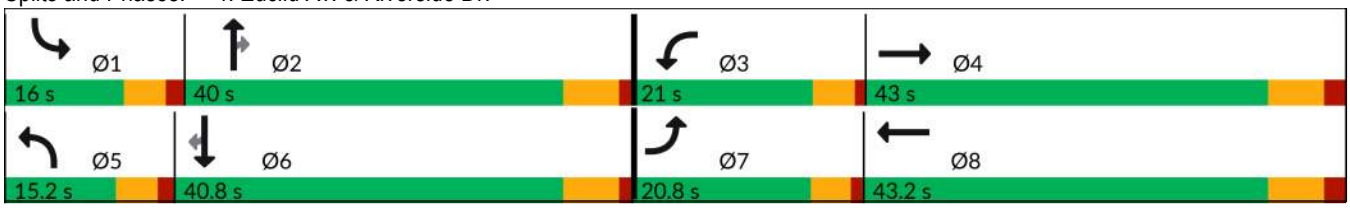

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 138 | 853 | 142 | 200 | 743 | 56 | 324 | 1103 | 445 | 132 | 1480 | 408 |
| Future Volume (veh/h) | 138 | 853 | 142 | 200 | 743 | 56 | 324 | 1103 | 445 | 132 | 1480 | 408 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 139 | 862 | 119 | 202 | 751 | 35 | 327 | 1114 | 349 | 133 | 1495 | 344 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 167 | 483 | 67 | 227 | 1159 | 54 | 141 | 1009 | 450 | 152 | 1032 | 455 |
| Arrive On Green | 0.10 | 0.30 | 0.30 | 0.13 | 0.34 | 0.34 | 0.08 | 0.28 | 0.28 | 0.09 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1688 | 1608 | 222 | 1688 | 3454 | 161 | 1688 | 3554 | 1585 | 1688 | 3554 | 1565 |
| Grp Volume(v), veh/h | 139 | 0 | 981 | 202 | 386 | 400 | 327 | 1114 | 349 | 133 | 1495 | 344 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1830 | 1688 | 1777 | 1838 | 1688 | 1777 | 1585 | 1688 | 1777 | 1565 |
| Q Serve(g_s), s | 9.7 | 0.0 | 36.0 | 14.1 | 22.1 | 22.1 | 10.0 | 34.0 | 24.2 | 9.3 | 34.8 | 23.9 |
| Cycle Q Clear(g_c), s | 9.7 | 0.0 | 36.0 | 14.1 | 22.1 | 22.1 | 10.0 | 34.0 | 24.2 | 9.3 | 34.8 | 23.9 |
| Prop In Lane | 1.00 | | 0.12 | 1.00 | | 0.09 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 167 | 0 | 550 | 227 | 596 | 617 | 141 | 1009 | 450 | 152 | 1032 | 455 |
| V/C Ratio(X) | 0.83 | 0.00 | 1.78 | 0.89 | 0.65 | 0.65 | 2.32 | 1.10 | 0.78 | 0.87 | 1.45 | 0.76 |
| Avail Cap(c_a), veh/h | 227 | 0 | 550 | 230 | 596 | 617 | 141 | 1009 | 450 | 152 | 1032 | 455 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.0 | 0.0 | 41.9 | 51.0 | 33.8 | 33.8 | 54.9 | 42.9 | 39.4 | 53.8 | 42.5 | 38.6 |
| Incr Delay (d2), s/veh | 13.0 | 0.0 | 359.8 | 31.0 | 2.8 | 2.7 | 616.2 | 61.4 | 8.3 | 39.0 | 207.1 | 7.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.6 | 0.0 | 70.5 | 7.7 | 9.6 | 9.9 | 28.2 | 22.5 | 10.1 | 5.5 | 44.3 | 9.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 65.9 | 0.0 | 401.7 | 82.0 | 36.6 | 36.5 | 671.1 | 104.3 | 47.7 | 92.9 | 249.6 | 45.8 |
| LnGrp LOS | E | | F | F | D | D | F | F | D | F | F | D |
| Approach Vol, veh/h | | 1120 | | | 988 | | | 1790 | | | 1972 | |
| Approach Delay, s/veh | | 360.0 | | | 45.8 | | | 196.8 | | | 203.5 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.0 | 40.0 | 20.8 | 43.0 | 15.2 | 40.8 | 16.6 | 47.2 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.8 | 34.0 | 16.3 | 36.0 | 10.0 | 34.8 | 16.1 | 36.2 |
| Max Q Clear Time (g_c+I1), s | 11.3 | 36.0 | 16.1 | 38.0 | 12.0 | 36.8 | 11.7 | 24.1 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 4.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 204.8 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 176 | 537 | 103 | 170 | 503 | 152 | 1639 | 338 | 40 | 1605 | 213 |
| Future Volume (vph) | 176 | 537 | 103 | 170 | 503 | 152 | 1639 | 338 | 40 | 1605 | 213 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 50.0 | 55.0 | 55.0 | 55.0 | 15.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 41.7% | 45.8% | 45.8% | 45.8% | 12.5% | 58.3% | 58.3% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 44.3 | 44.3 | 44.3 | | 44.3 | 48.9 | 48.9 | 48.9 | 10.1 | 60.3 | 60.3 |
| Actuated g/C Ratio | 0.38 | 0.38 | 0.38 | | 0.38 | 0.42 | 0.42 | 0.42 | 0.09 | 0.52 | 0.52 |
| v/c Ratio | 0.91 | 0.78 | 0.16 | | 3.42 | 2.58 | 1.13 | 0.49 | 0.28 | 0.90 | 0.25 |
| Control Delay (s/veh) | 81.4 | 41.8 | 10.0 | | Error | 773.9 | 101.4 | 23.4 | 57.1 | 33.3 | 6.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 81.4 | 41.8 | 10.0 | | Error | 773.9 | 101.4 | 23.4 | 57.1 | 33.3 | 6.4 |
| LOS | F | D | B | | F | F | F | C | E | C | A |
| Approach Delay (s/veh) | | 46.4 | | | 1115.3 | | 137.0 | | | 30.7 | |
| Approach LOS | | D | | | F | | F | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 117 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 3.42 | |
| Intersection Signal Delay (s/veh): 214.3 | Intersection LOS: F |
| Intersection Capacity Utilization 140.4% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 176 | 537 | 103 | 170 | 503 | 41 | 152 | 1639 | 338 | 40 | 1605 | 213 |
| Future Volume (veh/h) | 176 | 537 | 103 | 170 | 503 | 41 | 152 | 1639 | 338 | 40 | 1605 | 213 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 180 | 548 | 88 | 173 | 513 | 40 | 155 | 1672 | 269 | 41 | 1638 | 189 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 227 | 707 | 599 | 78 | 141 | 11 | 87 | 1474 | 657 | 106 | 1837 | 819 |
| Arrive On Green | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.41 | 0.41 | 0.41 | 0.06 | 0.52 | 0.52 |
| Sat Flow, veh/h | 810 | 1870 | 1585 | 106 | 373 | 28 | 242 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 180 | 548 | 88 | 726 | 0 | 0 | 155 | 1672 | 269 | 41 | 1638 | 189 |
| Grp Sat Flow(s),veh/h/ln | 810 | 1870 | 1585 | 507 | 0 | 0 | 242 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 0.0 | 30.2 | 4.3 | 14.0 | 0.0 | 0.0 | 12.2 | 48.5 | 14.0 | 2.7 | 48.3 | 7.6 |
| Cycle Q Clear(g_c), s | 44.2 | 30.2 | 4.3 | 44.2 | 0.0 | 0.0 | 48.5 | 48.5 | 14.0 | 2.7 | 48.3 | 7.6 |
| Prop In Lane | 1.00 | | 1.00 | 0.24 | | 0.06 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 227 | 707 | 599 | 230 | 0 | 0 | 87 | 1474 | 657 | 106 | 1837 | 819 |
| V/C Ratio(X) | 0.79 | 0.78 | 0.15 | 3.16 | 0.00 | 0.00 | 1.79 | 1.13 | 0.41 | 0.39 | 0.89 | 0.23 |
| Avail Cap(c_a), veh/h | 227 | 707 | 599 | 230 | 0 | 0 | 87 | 1474 | 657 | 150 | 1929 | 861 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.2 | 32.0 | 24.0 | 49.0 | 0.0 | 0.0 | 56.7 | 34.2 | 24.1 | 52.6 | 25.3 | 15.5 |
| Incr Delay (d2), s/veh | 17.3 | 5.4 | 0.1 | 984.5 | 0.0 | 0.0 | 397.1 | 69.6 | 0.4 | 0.9 | 5.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.2 | 14.1 | 1.6 | 69.4 | 0.0 | 0.0 | 12.0 | 33.1 | 4.9 | 1.1 | 19.1 | 2.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 55.5 | 37.4 | 24.1 | 1033.4 | 0.0 | 0.0 | 453.8 | 103.8 | 24.5 | 53.5 | 30.8 | 15.6 |
| LnGrp LOS | E | D | C | F | | | F | F | C | D | C | B |
| Approach Vol, veh/h | | 816 | | | 726 | | | 2096 | | | 1868 | |
| Approach Delay, s/veh | | 40.0 | | | 1033.4 | | | 119.5 | | | 29.8 | |
| Approach LOS | | D | | | F | | | F | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.0 | 55.0 | | 50.0 | | 67.0 | | 50.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 48.5 | | 44.2 | | 63.5 | | 44.2 |
| Max Q Clear Time (g_c+I1), s | 4.7 | 50.5 | | 46.2 | | 50.3 | | 46.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 8.9 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 197.8 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 241 | 308 | 153 | 207 | 308 | 116 | 1944 | 83 | 62 | 1633 | 137 |
| Future Volume (vph) | 241 | 308 | 153 | 207 | 308 | 116 | 1944 | 83 | 62 | 1633 | 137 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 19.0 | 51.3 | 51.3 | 14.7 | 47.0 | 14.7 | 39.3 | 39.3 | 14.7 | 39.3 | 39.3 |
| Total Split (%) | 15.8% | 42.8% | 42.8% | 12.3% | 39.2% | 12.3% | 32.8% | 32.8% | 12.3% | 32.8% | 32.8% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 37.6 | 37.6 | 10.0 | 33.3 | 10.0 | 36.2 | 36.2 | 10.0 | 32.9 | 32.9 |
| Actuated g/C Ratio | 0.13 | 0.33 | 0.33 | 0.09 | 0.29 | 0.09 | 0.32 | 0.32 | 0.09 | 0.29 | 0.29 |
| v/c Ratio | 1.19 | 0.52 | 0.25 | 1.47 | 0.90 | 0.82 | 1.80 | 0.15 | 0.44 | 1.66 | 0.26 |
| Control Delay (s/veh) | 165.9 | 33.7 | 5.0 | 280.0 | 57.7 | 91.1 | 389.0 | 2.7 | 61.2 | 329.9 | 9.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 165.9 | 33.7 | 5.0 | 280.0 | 57.7 | 91.1 | 389.0 | 2.7 | 61.2 | 329.9 | 9.7 |
| LOS | F | C | A | F | E | F | F | A | E | F | A |
| Approach Delay (s/veh) | | 72.8 | | | 126.6 | | 357.9 | | | 296.8 | |
| Approach LOS | | E | | | F | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.80 | |
| Intersection Signal Delay (s/veh): 270.6 | Intersection LOS: F |
| Intersection Capacity Utilization 120.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

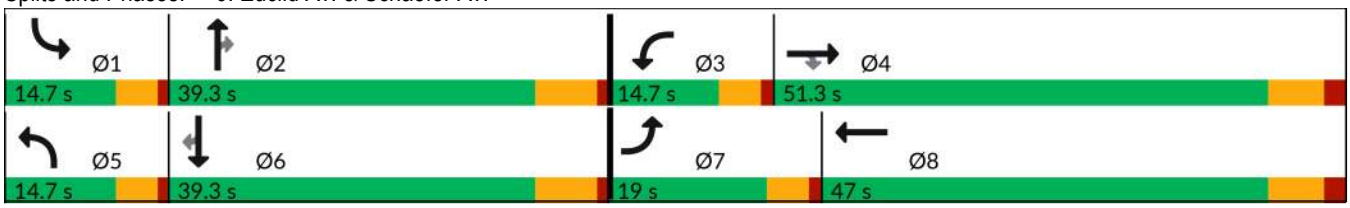

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 241 | 308 | 153 | 207 | 308 | 154 | 116 | 1944 | 83 | 62 | 1633 | 137 |
| Future Volume (veh/h) | 241 | 308 | 153 | 207 | 308 | 154 | 116 | 1944 | 83 | 62 | 1633 | 137 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 251 | 321 | 100 | 216 | 321 | 152 | 121 | 2025 | 72 | 65 | 1701 | 112 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 215 | 615 | 521 | 150 | 349 | 165 | 147 | 1071 | 478 | 130 | 1037 | 462 |
| Arrive On Green | 0.13 | 0.33 | 0.33 | 0.09 | 0.29 | 0.29 | 0.09 | 0.30 | 0.30 | 0.08 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1200 | 568 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 251 | 321 | 100 | 216 | 0 | 473 | 121 | 2025 | 72 | 65 | 1701 | 112 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1768 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 14.3 | 15.6 | 5.1 | 10.0 | 0.0 | 29.1 | 7.9 | 33.9 | 3.7 | 4.2 | 32.8 | 6.1 |
| Cycle Q Clear(g_c), s | 14.3 | 15.6 | 5.1 | 10.0 | 0.0 | 29.1 | 7.9 | 33.9 | 3.7 | 4.2 | 32.8 | 6.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.32 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 215 | 615 | 521 | 150 | 0 | 514 | 147 | 1071 | 478 | 130 | 1037 | 462 |
| V/C Ratio(X) | 1.17 | 0.52 | 0.19 | 1.44 | 0.00 | 0.92 | 0.82 | 1.89 | 0.15 | 0.50 | 1.64 | 0.24 |
| Avail Cap(c_a), veh/h | 215 | 737 | 625 | 150 | 0 | 629 | 150 | 1071 | 478 | 150 | 1037 | 462 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.1 | 30.6 | 27.0 | 51.2 | 0.0 | 38.6 | 50.5 | 39.3 | 28.7 | 49.8 | 39.8 | 30.3 |
| Incr Delay (d2), s/veh | 114.7 | 0.5 | 0.1 | 231.2 | 0.0 | 16.3 | 27.6 | 404.3 | 0.1 | 1.1 | 292.7 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.7 | 6.8 | 1.9 | 13.7 | 0.0 | 14.3 | 4.3 | 73.8 | 1.4 | 1.7 | 55.4 | 2.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 163.8 | 31.1 | 27.2 | 282.4 | 0.0 | 55.0 | 78.1 | 443.6 | 28.9 | 50.9 | 332.5 | 30.6 |
| LnGrp LOS | F | C | C | F | | D | E | F | C | D | F | C |
| Approach Vol, veh/h | | 672 | | | 689 | | | 2218 | | | 1878 | |
| Approach Delay, s/veh | | 80.1 | | | 126.3 | | | 410.2 | | | 304.7 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.4 | 40.4 | 14.7 | 44.0 | 14.5 | 39.3 | 19.0 | 39.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 4.7 | 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 32.8 | 10.0 | 44.3 | 10.0 | 32.8 | 14.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 6.2 | 35.9 | 12.0 | 17.6 | 9.9 | 34.8 | 16.3 | 31.1 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 | 0.0 | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 297.4 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 180 | 1150 | 139 | 242 | 793 | 143 | 1596 | 501 | 592 | 1274 | 189 |
| Future Volume (vph) | 180 | 1150 | 139 | 242 | 793 | 143 | 1596 | 501 | 592 | 1274 | 189 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 44.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 50.1 | 50.1 | 50.1 | 50.1 | 50.1 | 14.7 | 43.3 | 43.3 | 26.6 | 55.2 | 55.2 |
| Total Split (%) | 41.8% | 41.8% | 41.8% | 41.8% | 41.8% | 12.3% | 36.1% | 36.1% | 22.2% | 46.0% | 46.0% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 42.9 | 42.9 | 42.9 | 42.9 | 42.9 | 10.0 | 36.8 | 36.8 | 21.9 | 48.7 | 48.7 |
| Actuated g/C Ratio | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.08 | 0.31 | 0.31 | 0.18 | 0.41 | 0.41 |
| v/c Ratio | 3.38 | 1.88 | 0.24 | 4.53 | 2.17 | 0.61 | 1.60 | 0.95 | 2.11 | 0.96 | 0.30 |
| Control Delay (s/veh) | Error | 426.2 | 8.7 | Error | 554.5 | 63.7 | 304.3 | 60.0 | 535.7 | 51.9 | 15.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | Error | 426.2 | 8.7 | Error | 554.5 | 63.7 | 304.3 | 60.0 | 535.7 | 51.9 | 15.6 |
| LOS | F | F | A | F | F | E | F | E | F | D | B |
| Approach Delay (s/veh) | | 472.9 | | | 726.2 | | 234.3 | | | 187.8 | |
| Approach LOS | | F | | | F | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 4.53 | |
| Intersection Signal Delay (s/veh): 372.5 | Intersection LOS: F |
| Intersection Capacity Utilization 182.7% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 180 | 1150 | 139 | 242 | 793 | 497 | 143 | 1596 | 501 | 592 | 1274 | 189 |
| Future Volume (veh/h) | 180 | 1150 | 139 | 242 | 793 | 497 | 143 | 1596 | 501 | 592 | 1274 | 189 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 196 | 1250 | 93 | 263 | 862 | 531 | 155 | 1735 | 517 | 643 | 1385 | 165 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 60 | 669 | 566 | 60 | 387 | 239 | 256 | 1090 | 486 | 308 | 1444 | 635 |
| Arrive On Green | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.36 | 0.08 | 0.31 | 0.31 | 0.18 | 0.41 | 0.41 |
| Sat Flow, veh/h | 367 | 1870 | 1584 | 385 | 1083 | 667 | 3092 | 3554 | 1585 | 1688 | 3554 | 1562 |
| Grp Volume(v), veh/h | 196 | 1250 | 93 | 263 | 0 | 1393 | 155 | 1735 | 517 | 643 | 1385 | 165 |
| Grp Sat Flow(s),veh/h/ln | 367 | 1870 | 1584 | 385 | 0 | 1750 | 1546 | 1777 | 1585 | 1688 | 1777 | 1562 |
| Q Serve(g_s), s | 0.0 | 42.9 | 4.8 | 0.0 | 0.0 | 42.9 | 5.8 | 36.8 | 36.8 | 21.9 | 45.5 | 8.4 |
| Cycle Q Clear(g_c), s | 42.9 | 42.9 | 4.8 | 42.9 | 0.0 | 42.9 | 5.8 | 36.8 | 36.8 | 21.9 | 45.5 | 8.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.38 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 60 | 669 | 566 | 60 | 0 | 626 | 256 | 1090 | 486 | 308 | 1444 | 635 |
| V/C Ratio(X) | 3.27 | 1.87 | 0.16 | 4.38 | 0.00 | 2.23 | 0.61 | 1.59 | 1.06 | 2.09 | 0.96 | 0.26 |
| Avail Cap(c_a), veh/h | 60 | 669 | 566 | 60 | 0 | 626 | 258 | 1090 | 486 | 308 | 1444 | 635 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 60.0 | 38.5 | 26.3 | 60.0 | 0.0 | 38.6 | 53.1 | 41.6 | 41.6 | 49.0 | 34.7 | 23.6 |
| Incr Delay (d2), s/veh | 1061.5 | 396.9 | 0.1 | 1560.4 | 0.0 | 557.0 | 2.8 | 270.8 | 58.8 | 500.5 | 15.1 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 19.5 | 92.3 | 1.8 | 27.8 | 0.0 | 114.2 | 2.3 | 56.0 | 21.3 | 51.6 | 20.9 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 1121.5 | 435.5 | 26.4 | 1620.4 | 0.0 | 595.5 | 56.0 | 312.4 | 100.4 | 549.5 | 49.7 | 23.9 |
| LnGrp LOS | F | F | C | F | | F | E | F | F | F | D | C |
| Approach Vol, veh/h | | 1539 | | | 1656 | | | 2407 | | | 2193 | |
| Approach Delay, s/veh | | 498.2 | | | 758.3 | | | 250.3 | | | 194.3 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 26.6 | 43.3 | | 50.1 | 14.6 | 55.3 | | 50.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 21.9 | 36.8 | | 42.9 | 10.0 | 48.7 | | 42.9 |
| Max Q Clear Time (g_c+I1), s | 23.9 | 38.8 | | 44.9 | 7.8 | 47.5 | | 44.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 1.0 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 391.4 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 84 | 374 | 229 | 345 | 341 | 107 | 1393 | 306 | 183 | 1314 | 86 |
| Future Volume (vph) | 84 | 374 | 229 | 345 | 341 | 107 | 1393 | 306 | 183 | 1314 | 86 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 | 35.5 |
| Total Split (s) | 53.2 | 53.2 | 53.2 | 53.2 | 53.2 | 22.7 | 44.1 | 44.1 | 22.7 | 44.1 | 44.1 |
| Total Split (%) | 44.3% | 44.3% | 44.3% | 44.3% | 44.3% | 18.9% | 36.8% | 36.8% | 18.9% | 36.8% | 36.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 13.3 | 37.6 | 37.6 | 16.4 | 40.7 | 40.7 |
| Actuated g/C Ratio | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.11 | 0.32 | 0.32 | 0.14 | 0.34 | 0.34 |
| v/c Ratio | 1.47 | 0.54 | 0.32 | 1.40 | 1.11 | 0.60 | 1.31 | 0.58 | 0.83 | 1.14 | 0.15 |
| Control Delay (s/veh) | 315.9 | 31.9 | 4.2 | 232.2 | 101.7 | 63.5 | 178.3 | 29.9 | 78.3 | 108.5 | 7.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 315.9 | 31.9 | 4.2 | 232.2 | 101.7 | 63.5 | 178.3 | 29.9 | 78.3 | 108.5 | 7.4 |
| LOS | F | C | A | F | F | E | F | C | E | F | A |
| Approach Delay (s/veh) | | 57.2 | | | 143.2 | | 146.4 | | | 99.5 | |
| Approach LOS | | E | | | F | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.4 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.47 | |
| Intersection Signal Delay (s/veh): 119.4 | Intersection LOS: F |
| Intersection Capacity Utilization 121.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

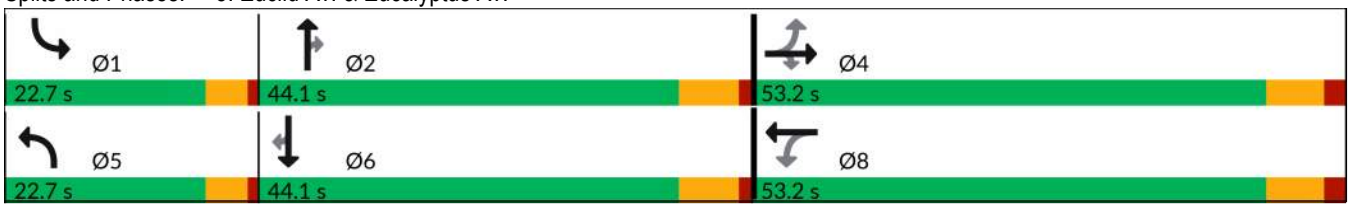

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 84 | 374 | 229 | 345 | 341 | 398 | 107 | 1393 | 306 | 183 | 1314 | 86 |
| Future Volume (veh/h) | 84 | 374 | 229 | 345 | 341 | 398 | 107 | 1393 | 306 | 183 | 1314 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 88 | 394 | 139 | 363 | 359 | 406 | 113 | 1466 | 298 | 193 | 1383 | 58 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 61 | 734 | 622 | 251 | 314 | 356 | 140 | 1140 | 508 | 219 | 1306 | 583 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.08 | 0.32 | 0.32 | 0.13 | 0.37 | 0.37 |
| Sat Flow, veh/h | 665 | 1870 | 1585 | 825 | 801 | 906 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 88 | 394 | 139 | 363 | 0 | 765 | 113 | 1466 | 298 | 193 | 1383 | 58 |
| Grp Sat Flow(s),veh/h/ln | 665 | 1870 | 1585 | 825 | 0 | 1707 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 0.0 | 19.0 | 6.8 | 27.0 | 0.0 | 46.0 | 7.7 | 37.6 | 18.4 | 13.2 | 43.1 | 2.8 |
| Cycle Q Clear(g_c), s | 46.0 | 19.0 | 6.8 | 46.0 | 0.0 | 46.0 | 7.7 | 37.6 | 18.4 | 13.2 | 43.1 | 2.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.53 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 61 | 734 | 622 | 251 | 0 | 670 | 140 | 1140 | 508 | 219 | 1306 | 583 |
| V/C Ratio(X) | 1.43 | 0.54 | 0.22 | 1.44 | 0.00 | 1.14 | 0.81 | 1.29 | 0.59 | 0.88 | 1.06 | 0.10 |
| Avail Cap(c_a), veh/h | 61 | 734 | 622 | 251 | 0 | 670 | 259 | 1140 | 508 | 259 | 1306 | 583 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 58.6 | 27.4 | 23.7 | 48.4 | 0.0 | 35.6 | 52.8 | 39.8 | 33.3 | 50.1 | 37.1 | 24.3 |
| Incr Delay (d2), s/veh | 265.9 | 0.6 | 0.1 | 220.9 | 0.0 | 81.0 | 7.8 | 135.6 | 1.7 | 23.8 | 42.1 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.3 | 8.2 | 2.5 | 22.7 | 0.0 | 32.7 | 3.4 | 36.7 | 6.9 | 6.7 | 24.8 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 324.5 | 28.1 | 23.9 | 269.3 | 0.0 | 116.6 | 60.6 | 175.4 | 35.1 | 73.9 | 79.1 | 24.4 |
| LnGrp LOS | F | C | C | F | | F | E | F | D | E | F | C |
| Approach Vol, veh/h | | 621 | | | 1128 | | | 1877 | | | 1634 | |
| Approach Delay, s/veh | | 69.1 | | | 165.7 | | | 146.2 | | | 76.6 | |
| Approach LOS | | E | | | F | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.9 | 44.1 | | 53.2 | 14.4 | 49.6 | | 53.2 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 18.0 | 37.6 | | 46.0 | 18.0 | 37.6 | | 46.0 |
| Max Q Clear Time (g_c+I1), s | 15.2 | 39.6 | | 48.0 | 9.7 | 45.1 | | 48.0 |
| Green Ext Time (p_c), s | 0.1 | 0.0 | | 0.0 | 0.1 | 0.0 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 119.7 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 24 | 24 | 558 | 0 | 5 | 1902 | 259 | 206 | 2218 |
| Future Volume (vph) | 24 | 24 | 558 | 0 | 5 | 1902 | 259 | 206 | 2218 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.7 | 50.7 | 22.1 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.4% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | | 7.2 | | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | | 40.0 | | 40.0 | 10.0 | 44.2 | 44.2 | 16.8 | 62.8 |
| Actuated g/C Ratio | | 0.34 | | 0.34 | 0.08 | 0.37 | 0.37 | 0.14 | 0.53 |
| v/c Ratio | | 0.17 | | 1.40 | 0.04 | 1.51 | 0.41 | 0.91 | 1.25 |
| Control Delay (s/veh) | | 18.0 | | 217.7 | 51.4 | 264.3 | 16.7 | 90.9 | 144.1 |
| Queue Delay | | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | | 18.0 | | 217.7 | 51.4 | 264.3 | 16.7 | 90.9 | 144.1 |
| LOS | | B | | F | D | F | B | F | F |
| Approach Delay (s/veh) | | 18.0 | | 217.7 | | 234.2 | | | 139.6 |
| Approach LOS | | B | | F | | F | | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.4 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.51 | |
| Intersection Signal Delay (s/veh): 185.7 | Intersection LOS: F |
| Intersection Capacity Utilization 131.4% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

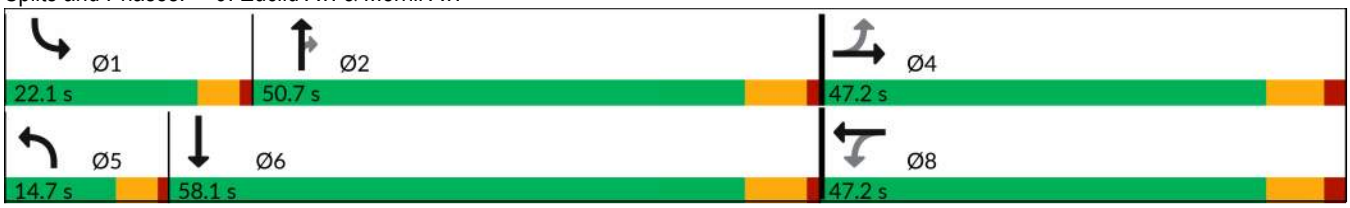

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 24 | 24 | 41 | 558 | 0 | 139 | 5 | 1902 | 259 | 206 | 2218 | 10 |
| Future Volume (veh/h) | 24 | 24 | 41 | 558 | 0 | 139 | 5 | 1902 | 259 | 206 | 2218 | 10 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 25 | 25 | 36 | 581 | 0 | 137 | 5 | 1981 | 266 | 215 | 2310 | 9 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 188 | 191 | 245 | 438 | 0 | 90 | 22 | 1314 | 586 | 240 | 1811 | 7 |
| Arrive On Green | 0.33 | 0.33 | 0.33 | 0.33 | 0.00 | 0.33 | 0.01 | 0.37 | 0.37 | 0.14 | 0.50 | 0.50 |
| Sat Flow, veh/h | 447 | 570 | 732 | 1145 | 0 | 270 | 1688 | 3554 | 1585 | 1688 | 3630 | 14 |
| Grp Volume(v), veh/h | 86 | 0 | 0 | 718 | 0 | 0 | 5 | 1981 | 266 | 215 | 1130 | 1189 |
| Grp Sat Flow(s),veh/h/ln | 1749 | 0 | 0 | 1415 | 0 | 0 | 1688 | 1777 | 1585 | 1688 | 1777 | 1867 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 35.9 | 0.0 | 0.0 | 0.4 | 44.2 | 15.2 | 15.0 | 59.7 | 59.7 |
| Cycle Q Clear(g_c), s | 4.1 | 0.0 | 0.0 | 40.0 | 0.0 | 0.0 | 0.4 | 44.2 | 15.2 | 15.0 | 59.7 | 59.7 |
| Prop In Lane | 0.29 | | 0.42 | 0.81 | | 0.19 | 1.00 | | 1.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 624 | 0 | 0 | 528 | 0 | 0 | 22 | 1314 | 586 | 240 | 886 | 931 |
| V/C Ratio(X) | 0.14 | 0.00 | 0.00 | 1.36 | 0.00 | 0.00 | 0.23 | 1.51 | 0.45 | 0.90 | 1.27 | 1.28 |
| Avail Cap(c_a), veh/h | 624 | 0 | 0 | 528 | 0 | 0 | 141 | 1314 | 586 | 246 | 886 | 931 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 27.9 | 0.0 | 0.0 | 41.5 | 0.0 | 0.0 | 58.4 | 37.7 | 28.6 | 50.4 | 30.0 | 30.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 174.1 | 0.0 | 0.0 | 2.0 | 232.7 | 0.6 | 30.5 | 132.4 | 132.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 0.0 | 0.0 | 41.0 | 0.0 | 0.0 | 0.2 | 60.1 | 5.5 | 8.1 | 55.0 | 57.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 27.9 | 0.0 | 0.0 | 215.6 | 0.0 | 0.0 | 60.4 | 270.4 | 29.1 | 80.9 | 162.4 | 162.8 |
| LnGrp LOS | C | | | F | | | E | F | C | F | F | F |
| Approach Vol, veh/h | | 86 | | | 718 | | | 2252 | | | 2534 | |
| Approach Delay, s/veh | | 27.9 | | | 215.6 | | | 241.4 | | | 155.7 | |
| Approach LOS | | C | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.7 | 50.7 | | 47.2 | 6.2 | 66.2 | | 47.2 | | | | |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 | | | | |
| Max Green Setting (Gmax), s | 17.4 | 44.2 | | 40.0 | 10.0 | 51.6 | | 40.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 17.0 | 46.2 | | 6.1 | 2.4 | 61.7 | | 42.0 | | | | |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.3 | 0.0 | 0.0 | | 0.0 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | 195.9 | |
| HCM 7th LOS | | F | |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 517 | 688 | 297 | 123 | 522 | 232 | 291 | 1311 | 151 | 498 | 1278 | 521 |
| Future Volume (vph) | 517 | 688 | 297 | 123 | 522 | 232 | 291 | 1311 | 151 | 498 | 1278 | 521 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 14.7 | 53.2 | 53.2 | 14.7 | 53.2 | 53.2 | 14.7 | 37.4 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (%) | 12.3% | 44.3% | 44.3% | 12.3% | 44.3% | 44.3% | 12.3% | 31.2% | 12.3% | 12.3% | 31.2% | 12.3% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.1 | 29.6 | 29.6 | 10.1 | 29.6 | 29.6 | 10.1 | 31.1 | 47.7 | 10.1 | 31.2 | 47.7 |
| Actuated g/C Ratio | 0.10 | 0.28 | 0.28 | 0.10 | 0.28 | 0.28 | 0.10 | 0.30 | 0.46 | 0.10 | 0.30 | 0.46 |
| v/c Ratio | 1.83 | 0.72 | 0.51 | 0.80 | 0.55 | 0.40 | 1.89 | 1.31 | 0.21 | 1.76 | 1.27 | 0.69 |
| Control Delay (s/veh) | 417.0 | 37.4 | 10.2 | 81.3 | 33.1 | 7.3 | 452.4 | 176.4 | 10.7 | 388.1 | 161.0 | 23.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 417.0 | 37.4 | 10.2 | 81.3 | 33.1 | 7.3 | 452.4 | 176.4 | 10.7 | 388.1 | 161.0 | 23.1 |
| LOS | F | D | B | F | C | A | F | F | B | F | F | C |
| Approach Delay (s/veh) | | 162.6 | | | 33.0 | | | 207.9 | | | 179.0 | |
| Approach LOS | | F | | | C | | | F | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 104.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.89 | |
| Intersection Signal Delay (s/veh): 163.2 | Intersection LOS: F |
| Intersection Capacity Utilization 102.4% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

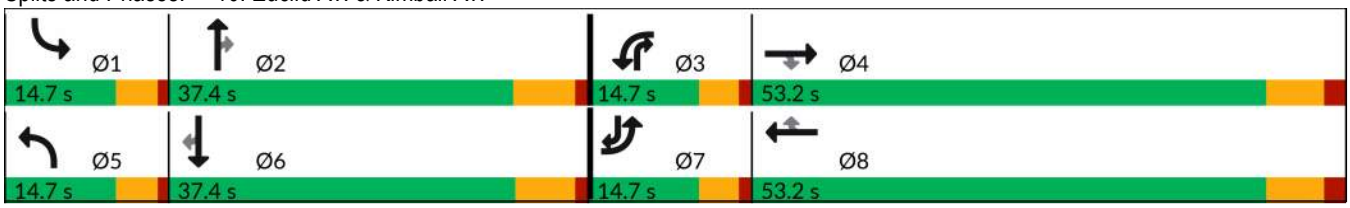

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 517 | 688 | 297 | 123 | 522 | 232 | 291 | 1311 | 151 | 498 | 1278 | 521 |
| Future Volume (veh/h) | 517 | 688 | 297 | 123 | 522 | 232 | 291 | 1311 | 151 | 498 | 1278 | 521 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 544 | 724 | 281 | 129 | 549 | 141 | 306 | 1380 | 139 | 524 | 1345 | 469 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 308 | 940 | 414 | 163 | 931 | 415 | 168 | 1097 | 643 | 308 | 1097 | 647 |
| Arrive On Green | 0.10 | 0.26 | 0.26 | 0.10 | 0.26 | 0.26 | 0.10 | 0.31 | 0.31 | 0.10 | 0.31 | 0.31 |
| Sat Flow, veh/h | 3092 | 3554 | 1565 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 | 3092 | 3554 | 1585 |
| Grp Volume(v), veh/h | 544 | 724 | 281 | 129 | 549 | 141 | 306 | 1380 | 139 | 524 | 1345 | 469 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1777 | 1565 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 | 1546 | 1777 | 1585 |
| Q Serve(g_s), s | 10.0 | 18.9 | 16.2 | 7.5 | 13.5 | 7.2 | 10.0 | 31.0 | 5.7 | 10.0 | 31.0 | 25.0 |
| Cycle Q Clear(g_c), s | 10.0 | 18.9 | 16.2 | 7.5 | 13.5 | 7.2 | 10.0 | 31.0 | 5.7 | 10.0 | 31.0 | 25.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 308 | 940 | 414 | 163 | 931 | 415 | 168 | 1097 | 643 | 308 | 1097 | 647 |
| V/C Ratio(X) | 1.77 | 0.77 | 0.68 | 0.79 | 0.59 | 0.34 | 1.82 | 1.26 | 0.22 | 1.70 | 1.23 | 0.72 |
| Avail Cap(c_a), veh/h | 308 | 1628 | 717 | 168 | 1628 | 726 | 168 | 1097 | 643 | 308 | 1097 | 647 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 45.2 | 34.1 | 33.1 | 44.3 | 32.3 | 30.0 | 45.2 | 34.7 | 19.4 | 45.2 | 34.7 | 24.9 |
| Incr Delay (d2), s/veh | 357.8 | 1.4 | 2.0 | 21.4 | 0.2 | 0.2 | 391.5 | 123.4 | 0.2 | 329.2 | 109.8 | 4.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 18.9 | 7.8 | 5.9 | 4.0 | 5.5 | 2.6 | 22.2 | 30.9 | 2.0 | 17.7 | 28.8 | 9.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 403.0 | 35.5 | 35.0 | 65.7 | 32.6 | 30.2 | 436.7 | 158.1 | 19.6 | 374.4 | 144.5 | 29.0 |
| LnGrp LOS | F | D | D | E | C | C | F | F | B | F | F | C |
| Approach Vol, veh/h | | 1549 | | | 819 | | | 1825 | | | 2338 | |
| Approach Delay, s/veh | | 164.5 | | | 37.4 | | | 194.3 | | | 172.8 | |
| Approach LOS | | F | | | D | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 37.5 | 14.4 | 33.8 | 14.7 | 37.5 | 14.7 | 33.5 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 10.0 | 30.9 | 10.0 | 46.0 | 10.0 | * 31 | 10.0 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 33.0 | 9.5 | 20.9 | 12.0 | 33.0 | 12.0 | 15.5 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 5.7 | 0.0 | 0.0 | 0.0 | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 159.8 |
| HCM 7th LOS | F |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 292 | 499 | 639 | 471 | 181 | 793 | 1054 | 244 | 724 |
| Future Volume (vph) | 292 | 499 | 639 | 471 | 181 | 793 | 1054 | 244 | 724 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | pm+ov | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Permitted Phases | | | | | | | 2 | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 |
| Total Split (s) | 15.7 | 27.0 | 42.0 | 53.3 | 14.7 | 36.3 | 42.0 | 14.7 | 36.3 |
| Total Split (%) | 13.1% | 22.5% | 35.0% | 44.4% | 12.3% | 30.3% | 35.0% | 12.3% | 30.3% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.0 | 20.0 | 36.3 | 46.3 | 10.0 | 29.8 | 72.6 | 10.0 | 29.8 |
| Actuated g/C Ratio | 0.08 | 0.17 | 0.30 | 0.39 | 0.08 | 0.25 | 0.61 | 0.08 | 0.25 |
| v/c Ratio | 2.26 | 2.26 | 0.74 | 1.00 | 1.40 | 0.97 | 1.15 | 1.88 | 1.35 |
| Control Delay (s/veh) | 614.5 | 599.6 | 43.3 | 70.7 | 258.9 | 69.2 | 101.4 | 454.5 | 200.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 614.5 | 599.6 | 43.3 | 70.7 | 258.9 | 69.2 | 101.4 | 454.5 | 200.4 |
| LOS | F | F | D | E | F | E | F | F | F |
| Approach Delay (s/veh) | | 604.2 | | 57.2 | | 102.9 | | | 245.5 |
| Approach LOS | | F | | E | | F | | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.26 | |
| Intersection Signal Delay (s/veh): 210.9 | Intersection LOS: F |
| Intersection Capacity Utilization 129.4% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

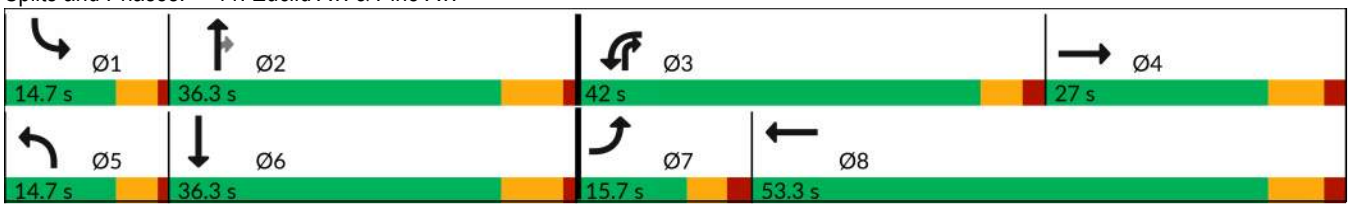

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 292 | 499 | 149 | 639 | 471 | 181 | 181 | 793 | 1054 | 244 | 724 | 405 |
| Future Volume (veh/h) | 292 | 499 | 149 | 639 | 471 | 181 | 181 | 793 | 1054 | 244 | 724 | 405 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 314 | 537 | 0 | 687 | 506 | 186 | 195 | 853 | 1058 | 262 | 778 | 435 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 141 | 426 | | 747 | 503 | 185 | 141 | 882 | 776 | 141 | 547 | 304 |
| Arrive On Green | 0.08 | 0.23 | 0.00 | 0.24 | 0.39 | 0.39 | 0.08 | 0.25 | 0.25 | 0.08 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1688 | 1870 | 0 | 3092 | 1305 | 480 | 1688 | 3554 | 1585 | 1688 | 2202 | 1224 |
| Grp Volume(v), veh/h | 314 | 537 | 0 | 687 | 0 | 692 | 195 | 853 | 1058 | 262 | 627 | 586 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 0 | 1546 | 0 | 1784 | 1688 | 1777 | 1585 | 1688 | 1777 | 1650 |
| Q Serve(g_s), s | 10.0 | 27.3 | 0.0 | 26.0 | 0.0 | 46.3 | 10.0 | 28.5 | 29.8 | 10.0 | 29.8 | 29.8 |
| Cycle Q Clear(g_c), s | 10.0 | 27.3 | 0.0 | 26.0 | 0.0 | 46.3 | 10.0 | 28.5 | 29.8 | 10.0 | 29.8 | 29.8 |
| Prop In Lane | 1.00 | | 0.00 | 1.00 | | 0.27 | 1.00 | | 1.00 | 1.00 | | 0.74 |
| Lane Grp Cap(c), veh/h | 141 | 426 | | 747 | 0 | 688 | 141 | 882 | 776 | 141 | 441 | 410 |
| V/C Ratio(X) | 2.23 | 1.26 | | 0.92 | 0.00 | 1.01 | 1.39 | 0.97 | 1.36 | 1.86 | 1.42 | 1.43 |
| Avail Cap(c_a), veh/h | 141 | 426 | | 935 | 0 | 688 | 141 | 882 | 776 | 141 | 441 | 410 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.0 | 46.3 | 0.0 | 44.4 | 0.0 | 36.9 | 55.0 | 44.6 | 30.6 | 55.0 | 45.1 | 45.1 |
| Incr Delay (d2), s/veh | 577.1 | 135.2 | 0.0 | 10.9 | 0.0 | 35.6 | 211.7 | 22.3 | 171.5 | 414.3 | 202.1 | 207.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 26.7 | 28.2 | 0.0 | 10.6 | 0.0 | 25.5 | 12.3 | 14.5 | 57.1 | 20.2 | 37.1 | 35.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 632.1 | 181.6 | 0.0 | 55.3 | 0.0 | 72.5 | 266.7 | 66.9 | 202.1 | 469.3 | 247.2 | 252.6 |
| LnGrp LOS | F | F | | E | | F | F | E | F | F | F | F |
| Approach Vol, veh/h | | 851 | | | 1379 | | | 2106 | | | 1475 | |
| Approach Delay, s/veh | | 347.8 | | | 63.9 | | | 153.3 | | | 288.8 | |
| Approach LOS | | F | | | E | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 36.3 | 34.7 | 34.3 | 14.7 | 36.3 | 15.7 | 53.3 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 29.8 | 36.3 | 20.0 | 10.0 | 29.8 | 10.0 | 46.3 |
| Max Q Clear Time (g_c+I1), s | 12.0 | 31.8 | 28.0 | 29.3 | 12.0 | 31.8 | 12.0 | 48.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 195.0 |
| HCM 7th LOS | F |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 878 | 480 | 947 | 111 | 1009 |
| Future Volume (vph) | 878 | 480 | 947 | 111 | 1009 |
| Turn Type | NA | Prot | NA | Prot | Prot |
| Protected Phases | 2 | 1 | 6 | 8 | 8 |
| Permitted Phases | | | | | |
| Detector Phase | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 5.0 | 5.0 |
| Minimum Split (s) | 31.5 | 12.7 | 24.5 | 9.6 | 9.6 |
| Total Split (s) | 35.2 | 31.7 | 66.9 | 33.1 | 33.1 |
| Total Split (%) | 35.2% | 31.7% | 66.9% | 33.1% | 33.1% |
| Yellow Time (s) | 5.5 | 3.7 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 4.7 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | | | |
| Recall Mode | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 28.7 | 27.0 | 60.4 | 28.5 | 28.5 |
| Actuated g/C Ratio | 0.29 | 0.27 | 0.60 | 0.29 | 0.29 |
| v/c Ratio | 1.12 | 1.18 | 0.49 | 0.14 | 1.35 |
| Control Delay (s/veh) | 98.2 | 135.9 | 12.1 | 27.2 | 182.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 98.2 | 135.9 | 12.1 | 27.2 | 182.8 |
| LOS | F | F | B | C | F |
| Approach Delay (s/veh) | 98.2 | | 53.7 | 167.4 | |
| Approach LOS | F | | D | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.35 | |
| Intersection Signal Delay (s/veh): 102.2 | Intersection LOS: F |
| Intersection Capacity Utilization 100.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 12: SR-71 NB Ramps & Euclid Av.

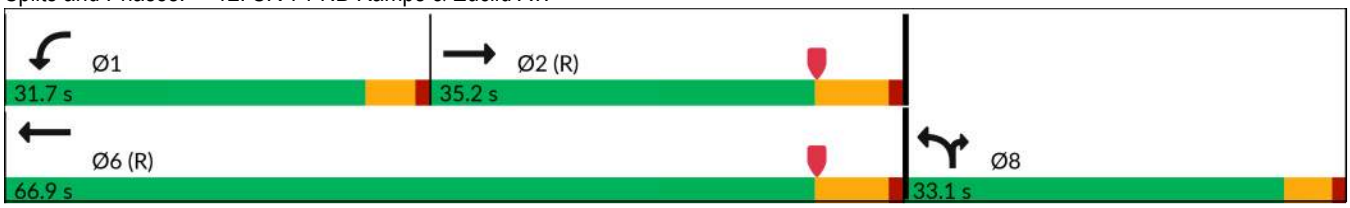

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 878 | 133 | 480 | 947 | 111 | 1009 |
| Future Volume (veh/h) | 878 | 133 | 480 | 947 | 111 | 1009 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1772 | 1870 | 1673 | 1870 |
| Adj Flow Rate, veh/h | 976 | 0 | 533 | 1052 | 123 | 0 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 1818 | | 456 | 2944 | 187 | |
| Arrive On Green | 1.00 | 0.00 | 0.27 | 0.83 | 0.06 | 0.00 |
| Sat Flow, veh/h | 3741 | 0 | 1688 | 3647 | 3092 | 1585 |
| Grp Volume(v), veh/h | 976 | 0 | 533 | 1052 | 123 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1777 | 0 | 1688 | 1777 | 1546 | 1585 |
| Q Serve(g_s), s | 0.0 | 0.0 | 27.0 | 7.2 | 3.9 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 27.0 | 7.2 | 3.9 | 0.0 |
| Prop In Lane | | 0.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 1818 | | 456 | 2944 | 187 | |
| V/C Ratio(X) | 0.54 | | 1.17 | 0.36 | 0.66 | |
| Avail Cap(c_a), veh/h | 1818 | | 456 | 2944 | 881 | |
| HCM Platoon Ratio | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.77 | 0.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 36.5 | 2.1 | 46.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.9 | 0.0 | 97.7 | 0.3 | 3.9 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 22.5 | 0.7 | 1.6 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 0.9 | 0.0 | 134.2 | 2.4 | 49.9 | 0.0 |
| LnGrp LOS | A | | F | A | D | |
| Approach Vol, veh/h | 976 | | | 1585 | 123 | |
| Approach Delay, s/veh | 0.9 | | | 46.7 | 49.9 | |
| Approach LOS | A | | | D | D | |

| Timer - Assigned Phs | 1 | 2 | | | 6 | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.7 | 57.7 | | | 89.4 | 10.6 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 27.0 | 28.7 | | | 60.4 | 28.5 |
| Max Q Clear Time (g_c+I1), s | 29.0 | 2.0 | | | 9.2 | 5.9 |
| Green Ext Time (p_c), s | 0.0 | 5.2 | | | 6.1 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 30.2 |
| HCM 7th LOS | C |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 431 | 78 | 250 | 40 | 144 | 666 | 104 | 84 |
| Future Volume (vph) | 431 | 78 | 250 | 40 | 144 | 666 | 104 | 84 |
| Turn Type | NA | Prot | NA | Prot | Prot | Split | NA | Perm |
| Protected Phases | 2 | 1 | 6 | 3 | 3 | 4 | 4 | |
| Permitted Phases | | | | | | | | 4 |
| Detector Phase | 2 | 1 | 6 | 3 | 3 | 4 | 4 | 4 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 25.2 | 12.7 | 27.2 | 23.5 | 23.5 | 34.8 | 34.8 | 34.8 |
| Total Split (s) | 26.5 | 13.0 | 39.5 | 23.5 | 23.5 | 37.0 | 37.0 | 37.0 |
| Total Split (%) | 26.5% | 13.0% | 39.5% | 23.5% | 23.5% | 37.0% | 37.0% | 37.0% |
| Yellow Time (s) | 5.2 | 3.7 | 5.2 | 4.5 | 4.5 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.2 | 4.7 | 6.2 | 5.5 | 5.5 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | Lag | Lead | | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | C-Min | None | C-Min | None | None | None | None | None |
| Act Effct Green (s) | 31.5 | 9.0 | 42.6 | 9.0 | 9.0 | 30.9 | 30.9 | 30.9 |
| Actuated g/C Ratio | 0.32 | 0.09 | 0.43 | 0.09 | 0.09 | 0.31 | 0.31 | 0.31 |
| v/c Ratio | 0.46 | 0.54 | 0.17 | 0.28 | 0.54 | 0.81 | 0.77 | 0.15 |
| Control Delay (s/veh) | 31.4 | 60.0 | 13.3 | 46.8 | 14.7 | 44.3 | 41.1 | 1.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 31.4 | 60.0 | 13.3 | 46.8 | 14.7 | 44.3 | 41.1 | 1.2 |
| LOS | C | E | B | D | B | D | D | A |
| Approach Delay (s/veh) | 31.4 | | 24.4 | | | | 38.6 | |
| Approach LOS | C | | C | | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.81 | |
| Intersection Signal Delay (s/veh): 32.5 | Intersection LOS: C |
| Intersection Capacity Utilization 62.1% | ICU Level of Service B |
| Analysis Period (min) 15 | |

Splits and Phases: 13: Euclid Av. & SR-71 SB Off-Ramp

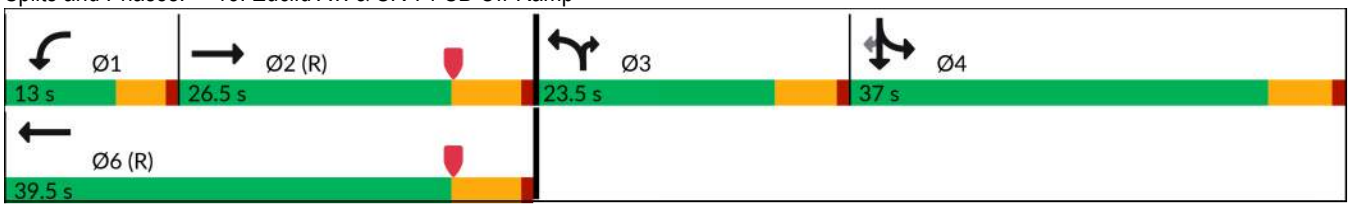

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 431 | 56 | 78 | 250 | 0 | 40 | 0 | 144 | 666 | 104 | 84 |
| Future Volume (veh/h) | 0 | 431 | 56 | 78 | 250 | 0 | 40 | 0 | 144 | 666 | 104 | 84 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 0 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 449 | 25 | 81 | 260 | 0 | 42 | 0 | 57 | 771 | 0 | 59 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 1724 | 96 | 121 | 2212 | | 0 | 0 | 0 | 870 | 0 | 407 |
| Arrive On Green | 0.00 | 0.50 | 0.50 | 0.14 | 1.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.26 | 0.00 | 0.26 |
| Sat Flow, veh/h | 0 | 3516 | 190 | 1688 | 3647 | 0 | | 0 | | 3375 | 0 | 1580 |
| Grp Volume(v), veh/h | 0 | 233 | 241 | 81 | 260 | 0 | | 0.0 | | 771 | 0 | 59 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1777 | 1836 | 1688 | 1777 | 0 | | | | 1688 | 0 | 1580 |
| Q Serve(g_s), s | 0.0 | 7.5 | 7.5 | 4.5 | 0.0 | 0.0 | | | | 22.0 | 0.0 | 2.9 |
| Cycle Q Clear(g_c), s | 0.0 | 7.5 | 7.5 | 4.5 | 0.0 | 0.0 | | | | 22.0 | 0.0 | 2.9 |
| Prop In Lane | 0.00 | | 0.10 | 1.00 | | 0.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 895 | 925 | 121 | 2212 | | | | | 870 | 0 | 407 |
| V/C Ratio(X) | 0.00 | 0.26 | 0.26 | 0.67 | 0.12 | | | | | 0.89 | 0.00 | 0.14 |
| Avail Cap(c_a), veh/h | 0 | 895 | 925 | 140 | 2212 | | | | | 1053 | 0 | 493 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 1.00 | 1.00 | 0.89 | 0.89 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 14.2 | 14.2 | 41.7 | 0.0 | 0.0 | | | | 35.7 | 0.0 | 28.6 |
| Incr Delay (d2), s/veh | 0.0 | 0.7 | 0.7 | 5.8 | 0.1 | 0.0 | | | | 7.7 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 2.9 | 3.0 | 1.9 | 0.0 | 0.0 | | | | 9.8 | 0.0 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 14.9 | 14.9 | 47.6 | 0.1 | 0.0 | | | | 43.5 | 0.0 | 28.7 |
| LnGrp LOS | | B | B | D | A | | | | | D | | C |
| Approach Vol, veh/h | | 474 | | | 341 | | | | | | 830 | |
| Approach Delay, s/veh | | 14.9 | | | 11.4 | | | | | | 42.4 | |
| Approach LOS | | B | | | B | | | | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.9 | 56.6 | | 31.6 | | 68.4 |
| Change Period (Y+Rc), s | 4.7 | 6.2 | | 5.8 | | 6.2 |
| Max Green Setting (Gmax), s | 8.3 | 20.3 | | 31.2 | | 33.3 |
| Max Q Clear Time (g_c+I1), s | 6.5 | 9.5 | | 24.0 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 1.2 | | 1.6 | | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.0 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

| Intersection | |
|---|---|
| Int Delay, s/veh | 427.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 108 | 2628 | 61 | 30 | 2153 | 130 | 98 | 42 | 121 | 116 | 9 | 80 |
| Future Vol, veh/h | 108 | 2628 | 61 | 30 | 2153 | 130 | 98 | 42 | 121 | 116 | 9 | 80 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 1 | - | - | 1 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 117 | 2857 | 66 | 33 | 2340 | 141 | 107 | 46 | 132 | 126 | 10 | 87 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 2482 | 0 | 0 | 2923 | 0 | 0 | 5535 | 5671 | 2890 | 5590 | 5634 | 2411 |
| Stage 1 | - | - | - | - | - | - | 3124 | 3124 | - | 2476 | 2476 | - |
| Stage 2 | - | - | - | - | - | - | 2410 | 2547 | - | 3114 | 3158 | - |
| Critical Hdwy | 4.12 | - | - | 4.12 | - | - | 7.12 | 6.52 | 6.22 | 7.12 | 6.52 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.12 | 5.52 | - | 6.12 | 5.52 | - |
| Follow-up Hdwy | 2.218 | - | - | 2.218 | - | - | 3.518 | 4.018 | 3.318 | 3.518 | 4.018 | 3.318 |
| Pot Cap-1 Maneuver | 185 | - | - | 123 | - | - | ~ 0 | ~ 0 | ~ 21 | ~ 0 | ~ 0 | ~ 42 |
| Stage 1 | - | - | - | - | - | - | ~ 16 | ~ 27 | - | ~ 40 | 59 | - |
| Stage 2 | - | - | - | - | - | - | ~ 44 | 54 | - | ~ 16 | 26 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 185 | - | - | 123 | - | - | ~ 0 | ~ 0 | ~ 21 | ~ 0 | ~ 0 | ~ 42 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 17 | ~ 42 | - | ~ 15 | ~ -7 | - |
| Stage 1 | - | - | - | - | - | - | ~ 16 | ~ 27 | - | ~ 40 | 59 | - |
| Stage 2 | - | - | - | - | - | - | - | 54 | - | ~ 61 | 26 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 2.05 | 0.57 | $ 6017.76 | $ 3924.9 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 21 | ~ 69 | - | - | ~ 23 | - | - | 25 |
| HCM Lane V/C Ratio | 13.578 | 0.634 | - | - | 0.264 | - | - | 9.037 |
| HCM Control Delay (s/veh) | $ 6017.8 | 53.1 | 0 | - | 44.3 | 0 | | $ 3924.9 |
| HCM Lane LOS | F | F | A | - | E | A | - | F |
| HCM 95th %tile Q(veh) | 35.8 | 3.6 | - | - | 1 | - | - | 27.8 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 20.5 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 49 | 1296 | 51 | 53 | 982 | 19 | 40 | 62 | 94 | 11 | 47 | 41 |
| Future Vol, veh/h | 49 | 1296 | 51 | 53 | 982 | 19 | 40 | 62 | 94 | 11 | 47 | 41 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 130 | - | - | 150 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 | 97 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 51 | 1336 | 53 | 55 | 1012 | 20 | 41 | 64 | 97 | 11 | 48 | 42 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1035 | 0 | 0 | 1389 | 0 | 0 | 2103 | 2608 | 1362 | 2604 | 2624 | 519 |
| Stage 1 | - | - | - | - | - | - | 1463 | 1463 | - | 1134 | 1134 | - |
| Stage 2 | - | - | - | - | - | - | 640 | 1144 | - | 1469 | 1490 | - |
| Critical Hdwy | 4.13 | - | - | 4.13 | - | - | 7.33 | 6.53 | 6.23 | 7.33 | 6.53 | 6.93 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.13 | 5.53 | - | 6.53 | 5.53 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.53 | 5.53 | - | 6.13 | 5.53 | - |
| Follow-up Hdwy | 2.219 | - | - | 2.219 | - | - | 3.519 | 4.019 | 3.319 | 3.519 | 4.019 | 3.319 |
| Pot Cap-1 Maneuver | 669 | - | - | 491 | - | - | ~ 33 | ~ 24 | 180 | 14 | ~ 24 | 503 |
| Stage 1 | - | - | - | - | - | - | 159 | 192 | - | 216 | 277 | - |
| Stage 2 | - | - | - | - | - | - | 431 | 274 | - | 158 | 186 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 667 | - | - | 491 | - | - | ~ 14 | ~ 20 | 180 | ~ 3 | ~ 19 | 501 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 116 | 123 | - | ~ -11 | 101 | - |
| Stage 1 | - | - | - | - | - | - | 147 | 178 | - | 192 | 245 | - |
| Stage 2 | - | - | - | - | - | - | 282 | 242 | - | 43 | 172 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.38 | 0.67 | 280.36 | |
| HCM LOS | | | F | - |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 143 | 667 | - | - | 491 | - | - | + |
| HCM Lane V/C Ratio | 1.414 | 0.076 | - | - | 0.111 | - | - | - |
| HCM Control Delay (s/veh) | 280.4 | 10.8 | - | - | 13.3 | - | - | - |
| HCM Lane LOS | F | B | - | - | B | - | - | - |
| HCM 95th %tile Q(veh) | 13.2 | 0.2 | - | - | 0.4 | - | - | - |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 50.9 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 52 | 398 | 86 | 8 | 250 | 14 | 45 | 205 | 24 | 9 | 200 | 26 |
| Future Vol, veh/h | 52 | 398 | 86 | 8 | 250 | 14 | 45 | 205 | 24 | 9 | 200 | 26 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 56 | 428 | 92 | 9 | 269 | 15 | 48 | 220 | 26 | 10 | 215 | 28 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 93.1 | 21.9 | 23.2 | 20.3 |
| HCM LOS | F | C | C | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 16% | 10% | 3% | 4% |
| Vol Thru, % | 75% | 74% | 92% | 85% |
| Vol Right, % | 9% | 16% | 5% | 11% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 274 | 536 | 272 | 235 |
| LT Vol | 45 | 52 | 8 | 9 |
| Through Vol | 205 | 398 | 250 | 200 |
| RT Vol | 24 | 86 | 14 | 26 |
| Lane Flow Rate | 295 | 576 | 292 | 253 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.621 | 1.094 | 0.604 | 0.542 |
| Departure Headway (Hd) | 7.982 | 6.833 | 7.775 | 8.116 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 457 | 530 | 468 | 447 |
| Service Time | 5.982 | 4.907 | 5.775 | 6.116 |
| HCM Lane V/C Ratio | 0.646 | 1.087 | 0.624 | 0.566 |
| HCM Control Delay, s/veh | 23.2 | 93.1 | 21.9 | 20.3 |
| HCM Lane LOS | C | F | C | C |
| HCM 95th-tile Q | 4.1 | 18 | 3.9 | 3.2 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 113 | 1989 | 306 | 444 | 1228 | 196 | 149 | 178 | 166 |
| Future Volume (vph) | 113 | 1989 | 306 | 444 | 1228 | 196 | 149 | 178 | 166 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 14.0 | 41.0 | 41.0 | 28.0 | 55.0 | 21.0 | 36.0 | 15.0 | 30.0 |
| Total Split (%) | 11.7% | 34.2% | 34.2% | 23.3% | 45.8% | 17.5% | 30.0% | 12.5% | 25.0% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.4 | 35.2 | 35.2 | 23.4 | 49.2 | 16.3 | 30.6 | 10.4 | 24.7 |
| Actuated g/C Ratio | 0.08 | 0.29 | 0.29 | 0.20 | 0.41 | 0.14 | 0.26 | 0.09 | 0.21 |
| v/c Ratio | 0.94 | 2.08 | 0.56 | 1.48 | 1.06 | 0.94 | 1.15 | 1.33 | 0.65 |
| Control Delay (s/veh) | 119.2 | 515.3 | 18.9 | 267.7 | 76.1 | 97.5 | 121.8 | 230.6 | 50.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 119.2 | 515.3 | 18.9 | 267.7 | 76.1 | 97.5 | 121.8 | 230.6 | 50.1 |
| LOS | F | F | B | F | E | F | F | F | D |
| Approach Delay (s/veh) | | 433.6 | | | 122.3 | | 115.2 | | 129.5 |
| Approach LOS | | F | | | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.08 | |
| Intersection Signal Delay (s/veh): 261.3 | Intersection LOS: F |
| Intersection Capacity Utilization 139.4% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

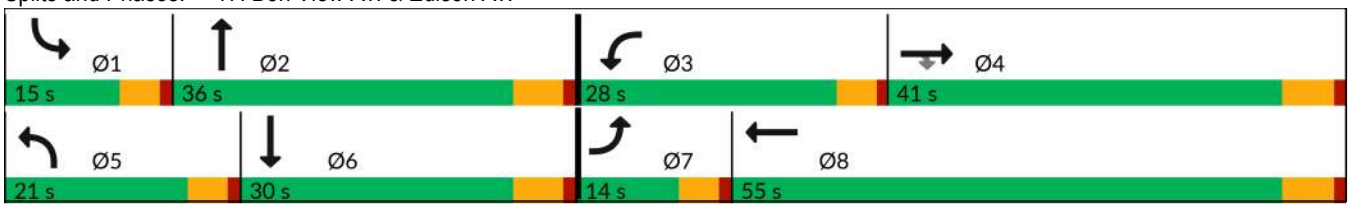

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 113 | 1989 | 306 | 444 | 1228 | 171 | 196 | 149 | 378 | 178 | 166 | 61 |
| Future Volume (veh/h) | 113 | 1989 | 306 | 444 | 1228 | 171 | 196 | 149 | 378 | 178 | 166 | 61 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 123 | 2162 | 170 | 483 | 1335 | 99 | 213 | 162 | 248 | 193 | 180 | 44 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 132 | 1042 | 465 | 329 | 1375 | 102 | 231 | 170 | 260 | 146 | 298 | 73 |
| Arrive On Green | 0.08 | 0.44 | 0.29 | 0.19 | 0.62 | 0.41 | 0.14 | 0.25 | 0.25 | 0.09 | 0.20 | 0.20 |
| Sat Flow, veh/h | 1688 | 3554 | 1585 | 1688 | 3354 | 248 | 1688 | 666 | 1020 | 1688 | 1452 | 355 |
| Grp Volume(v), veh/h | 123 | 2162 | 170 | 483 | 705 | 729 | 213 | 0 | 410 | 193 | 0 | 224 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1585 | 1688 | 1777 | 1826 | 1688 | 0 | 1687 | 1688 | 0 | 1806 |
| Q Serve(g_s), s | 8.7 | 35.2 | 10.2 | 23.4 | 45.3 | 46.1 | 15.0 | 0.0 | 28.7 | 10.4 | 0.0 | 13.5 |
| Cycle Q Clear(g_c), s | 8.7 | 35.2 | 10.2 | 23.4 | 45.3 | 46.1 | 15.0 | 0.0 | 28.7 | 10.4 | 0.0 | 13.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.14 | 1.00 | | 0.60 | 1.00 | | 0.20 |
| Lane Grp Cap(c), veh/h | 132 | 1042 | 465 | 329 | 729 | 749 | 231 | 0 | 430 | 146 | 0 | 370 |
| V/C Ratio(X) | 0.93 | 2.07 | 0.37 | 1.47 | 0.97 | 0.97 | 0.92 | 0.00 | 0.95 | 1.32 | 0.00 | 0.60 |
| Avail Cap(c_a), veh/h | 132 | 1042 | 465 | 329 | 729 | 749 | 231 | 0 | 430 | 146 | 0 | 370 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.0 | 33.6 | 33.6 | 48.3 | 22.4 | 24.1 | 51.2 | 0.0 | 44.0 | 54.8 | 0.0 | 43.3 |
| Incr Delay (d2), s/veh | 56.6 | 486.6 | 0.5 | 226.5 | 25.6 | 26.4 | 38.3 | 0.0 | 31.6 | 183.6 | 0.0 | 2.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.7 | 82.5 | 3.8 | 30.1 | 17.7 | 19.7 | 8.6 | 0.0 | 15.3 | 11.8 | 0.0 | 6.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 111.6 | 520.2 | 34.0 | 274.8 | 48.0 | 50.5 | 89.5 | 0.0 | 75.6 | 238.4 | 0.0 | 46.1 |
| LnGrp LOS | F | F | C | F | D | D | F | | E | F | | D |
| Approach Vol, veh/h | | 2455 | | | 1917 | | | 623 | | | 417 | |
| Approach Delay, s/veh | | 466.1 | | | 106.1 | | | 80.4 | | | 135.1 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.0 | 36.0 | 28.0 | 41.0 | 21.0 | 30.0 | 14.0 | 55.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 10.4 | 30.6 | 23.4 | 35.2 | 16.4 | 24.6 | 9.4 | 49.2 |
| Max Q Clear Time (g_c+I1), s | 12.4 | 30.7 | 25.4 | 37.2 | 17.0 | 15.5 | 10.7 | 48.1 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 268.7 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 178.5 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 207 | 289 | 18 | 0 | 611 | 124 | 11 | 61 | 4 | 40 | 44 | 205 |
| Future Vol, veh/h | 207 | 289 | 18 | 0 | 611 | 124 | 11 | 61 | 4 | 40 | 44 | 205 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 252 | 352 | 22 | 0 | 745 | 151 | 13 | 74 | 5 | 49 | 54 | 250 |
| Number of Lanes | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 2 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 2 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 2 |
| HCM Control Delay, s/veh | 40.8 | 350.6 | 16.5 | 28.2 |
| HCM LOS | E | F | C | D |

| Lane | NBLn1 | EBLn1 | EBLn2 | WBLn1 | SBLn1 |
|---|---|---|---|---|---|
| Vol Left, % | 14% | 59% | 0% | 0% | 14% |
| Vol Thru, % | 80% | 41% | 89% | 83% | 15% |
| Vol Right, % | 5% | 0% | 11% | 17% | 71% |
| Sign Control | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 76 | 352 | 163 | 735 | 289 |
| LT Vol | 11 | 207 | 0 | 0 | 40 |
| Through Vol | 61 | 145 | 145 | 611 | 44 |
| RT Vol | 4 | 0 | 18 | 124 | 205 |
| Lane Flow Rate | 93 | 429 | 198 | 896 | 352 |
| Geometry Grp | 2 | 5 | 5 | 4a | 2 |
| Degree of Util (X) | 0.224 | 0.899 | 0.395 | 1.722 | 0.69 |
| Departure Headway (Hd) | 10.493 | 8.668 | 8.281 | 6.918 | 8.423 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes |
| Cap | 345 | 420 | 438 | 529 | 433 |
| Service Time | 8.493 | 6.368 | 5.981 | 4.926 | 6.423 |
| HCM Lane V/C Ratio | 0.27 | 1.021 | 0.452 | 1.694 | 0.813 |
| HCM Control Delay, s/veh | 16.5 | 52.1 | 16.3 | 350.6 | 28.2 |
| HCM Lane LOS | C | F | C | F | D |
| HCM 95th-tile Q | 0.8 | 9.5 | 1.9 | 53.2 | 5.1 |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 40 | 3075 | 2688 | 89 |
| Future Volume (vph) | 40 | 3075 | 2688 | 89 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 5.0 |
| Minimum Split (s) | 23.8 | 23.8 | 23.8 | 22.6 |
| Total Split (s) | 96.0 | 96.0 | 96.0 | 24.0 |
| Total Split (%) | 80.0% | 80.0% | 80.0% | 20.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | None |
| Act Effct Green (s) | 90.3 | 90.3 | 90.3 | 12.5 |
| Actuated g/C Ratio | 0.80 | 0.80 | 0.80 | 0.11 |
| v/c Ratio | 0.69 | 1.18 | 1.09 | 0.67 |
| Control Delay (s/veh) | 66.4 | 102.7 | 60.7 | 62.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 66.4 | 102.7 | 60.7 | 62.9 |
| LOS | E | F | E | E |
| Approach Delay (s/veh) | | 102.2 | 60.7 | 62.9 |
| Approach LOS | | F | E | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.18 | |
| Intersection Signal Delay (s/veh): 82.1 | Intersection LOS: F |
| Intersection Capacity Utilization 100.4% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 19: Edison Av. & Cucamonga Av.

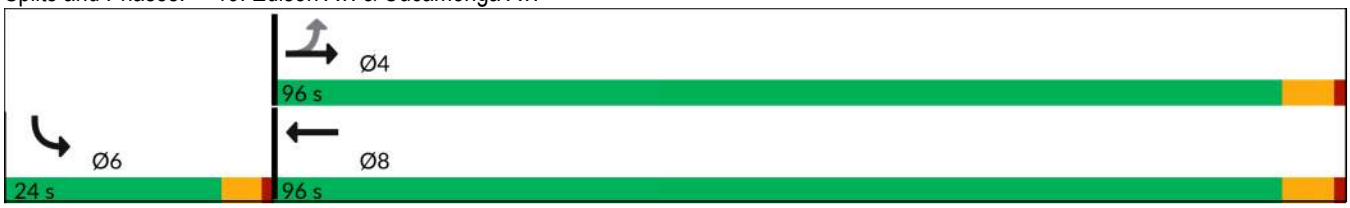

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 40 | 3075 | 2688 | 121 | 89 | 30 |
| Future Volume (veh/h) | 40 | 3075 | 2688 | 121 | 89 | 30 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 43 | 3342 | 2922 | 132 | 97 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 65 | 2894 | 2821 | 126 | 117 | 40 |
| Arrive On Green | 0.81 | 0.81 | 0.81 | 0.81 | 0.09 | 0.09 |
| Sat Flow, veh/h | 71 | 3647 | 3557 | 155 | 1280 | 435 |
| Grp Volume(v), veh/h | 43 | 3342 | 1488 | 1566 | 131 | 0 |
| Grp Sat Flow(s),veh/h/ln | 71 | 1777 | 1777 | 1842 | 1728 | 0 |
| Q Serve(g_s), s | 0.0 | 90.2 | 90.2 | 90.2 | 8.3 | 0.0 |
| Cycle Q Clear(g_c), s | 90.2 | 90.2 | 90.2 | 90.2 | 8.3 | 0.0 |
| Prop In Lane | 1.00 | | | 0.08 | 0.74 | 0.25 |
| Lane Grp Cap(c), veh/h | 65 | 2894 | 1447 | 1500 | 159 | 0 |
| V/C Ratio(X) | 0.66 | 1.15 | 1.03 | 1.04 | 0.83 | 0.00 |
| Avail Cap(c_a), veh/h | 65 | 2894 | 1447 | 1500 | 303 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 55.4 | 10.3 | 10.3 | 10.3 | 49.4 | 0.0 |
| Incr Delay (d2), s/veh | 22.2 | 74.1 | 31.2 | 35.6 | 4.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 44.8 | 29.4 | 32.3 | 3.6 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 77.6 | 84.3 | 41.5 | 45.9 | 53.5 | 0.0 |
| LnGrp LOS | E | F | F | F | D | |
| Approach Vol, veh/h | | 3385 | 3054 | | 131 | |
| Approach Delay, s/veh | | 84.3 | 43.7 | | 53.5 | |
| Approach LOS | | F | D | | D | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 96.0 | | 14.8 | | 96.0 |
| Change Period (Y+Rc), s | | 5.8 | | 4.6 | | 5.8 |
| Max Green Setting (Gmax), s | | 90.2 | | 19.4 | | 90.2 |
| Max Q Clear Time (g_c+I1), s | | 92.2 | | 10.3 | | 92.2 |
| Green Ext Time (p_c), s | | 0.0 | | 0.1 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 64.8 |
| HCM 7th LOS | E |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 246 | 346 | 811 | 1640 | 828 |
| Future Volume (vph) | 3 | 246 | 346 | 811 | 1640 | 828 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 24.8 | 24.8 | 22.0 | 65.2 | 43.2 | 43.2 |
| Total Split (%) | 27.6% | 27.6% | 24.4% | 72.4% | 48.0% | 48.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 19.0 | 19.0 | 16.2 | 59.4 | 37.4 | 37.4 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.18 | 0.66 | 0.42 | 0.42 |
| v/c Ratio | 0.96 | 0.50 | 1.16 | 0.35 | 1.13 | 0.84 |
| Control Delay (s/veh) | 74.7 | 10.7 | 120.3 | 0.9 | 93.5 | 15.0 |
| Queue Delay | 72.5 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 |
| Total Delay (s/veh) | 147.1 | 10.7 | 120.3 | 0.9 | 93.7 | 15.0 |
| LOS | F | B | F | A | F | B |
| Approach Delay (s/veh) | 91.4 | | | 36.6 | 67.3 | |
| Approach LOS | F | | | D | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 30.8 (34%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.16 | |
| Intersection Signal Delay (s/veh): 62.3 | Intersection LOS: E |
| Intersection Capacity Utilization 106.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

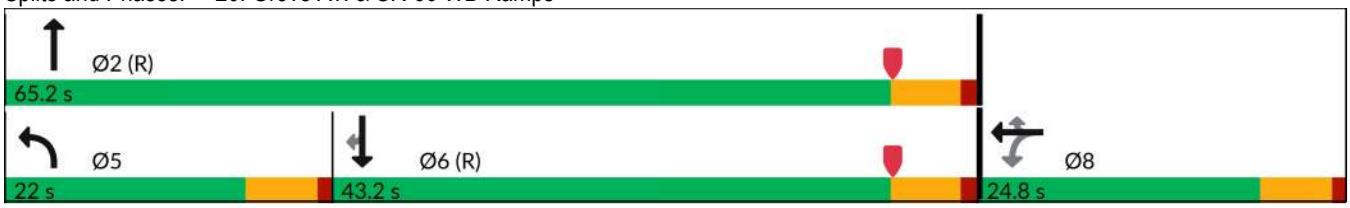

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 352 | 3 | 246 | 346 | 811 | 0 | 0 | 1640 | 828 |
| Future Volume (veh/h) | 0 | 0 | 0 | 352 | 3 | 246 | 346 | 811 | 0 | 0 | 1640 | 828 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 356 | 3 | 112 | 349 | 819 | 0 | 0 | 1657 | 653 |
| Peak Hour Factor | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 373 | 3 | 335 | 304 | 2345 | 0 | 0 | 1477 | 642 |
| Arrive On Green | | | | 0.21 | 0.21 | 0.21 | 0.24 | 0.88 | 0.00 | 0.00 | 0.42 | 0.42 |
| Sat Flow, veh/h | | | | 1767 | 15 | 1585 | 1688 | 3647 | 0 | 0 | 3647 | 1544 |
| Grp Volume(v), veh/h | | | | 359 | 0 | 112 | 349 | 819 | 0 | 0 | 1657 | 653 |
| Grp Sat Flow(s),veh/h/ln | | | | 1782 | 0 | 1585 | 1688 | 1777 | 0 | 0 | 1777 | 1544 |
| Q Serve(g_s), s | | | | 17.9 | 0.0 | 5.4 | 16.2 | 3.7 | 0.0 | 0.0 | 37.4 | 37.4 |
| Cycle Q Clear(g_c), s | | | | 17.9 | 0.0 | 5.4 | 16.2 | 3.7 | 0.0 | 0.0 | 37.4 | 37.4 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 376 | 0 | 335 | 304 | 2345 | 0 | 0 | 1477 | 642 |
| V/C Ratio(X) | | | | 0.95 | 0.00 | 0.33 | 1.15 | 0.35 | 0.00 | 0.00 | 1.12 | 1.02 |
| Avail Cap(c_a), veh/h | | | | 376 | 0 | 335 | 304 | 2345 | 0 | 0 | 1477 | 642 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.1 | 0.0 | 30.1 | 34.2 | 2.1 | 0.0 | 0.0 | 26.3 | 26.3 |
| Incr Delay (d2), s/veh | | | | 34.5 | 0.0 | 0.4 | 70.9 | 0.0 | 0.0 | 0.0 | 64.5 | 40.0 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 10.9 | 0.0 | 2.0 | 11.7 | 0.8 | 0.0 | 0.0 | 27.2 | 19.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 69.5 | 0.0 | 30.6 | 105.1 | 2.1 | 0.0 | 0.0 | 90.8 | 66.3 |
| LnGrp LOS | | | | E | | C | F | A | | | F | F |
| Approach Vol, veh/h | | | | | 471 | | | 1168 | | | 2310 | |
| Approach Delay, s/veh | | | | | 60.3 | | | 32.9 | | | 83.8 | |
| Approach LOS | | | | | E | | | C | | | F | |

| Timer - Assigned Phs | 2 | 5 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 65.2 | 22.0 | 43.2 | 24.8 |
| Change Period (Y+Rc), s | 5.8 | 5.8 | 5.8 | 5.8 |
| Max Green Setting (Gmax), s | 59.4 | 16.2 | 37.4 | 19.0 |
| Max Q Clear Time (g_c+I1), s | 5.7 | 18.2 | 39.4 | 19.9 |
| Green Ext Time (p_c), s | 4.8 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 66.0 |
| HCM 7th LOS | E |

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Configurations | | | | | |
| Traffic Volume (vph) | 3 | 344 | 856 | 644 | 1343 |
| Future Volume (vph) | 3 | 344 | 856 | 644 | 1343 |
| Turn Type | NA | Perm | NA | Prot | NA |
| Protected Phases | 4 | | 2 | 1 | 6 |
| Permitted Phases | | 4 | | | |
| Detector Phase | 4 | 4 | 2 | 1 | 6 |
| Switch Phase | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 24.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 35.8% | 26.7% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | |
| Recall Mode | None | None | C-Min | None | C-Min |
| Act Effct Green (s) | 20.4 | 20.4 | 26.4 | 25.6 | 57.0 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.29 | 0.28 | 0.63 |
| v/c Ratio | 0.76 | 0.83 | 1.21 | 1.39 | 0.62 |
| Control Delay (s/veh) | 44.5 | 40.4 | 132.7 | 203.1 | 26.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 36.7 |
| Total Delay (s/veh) | 44.5 | 40.4 | 132.7 | 203.1 | 63.5 |
| LOS | D | D | F | F | E |
| Approach Delay (s/veh) | 42.3 | | 132.7 | | 108.7 |
| Approach LOS | D | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.39 | |
| Intersection Signal Delay (s/veh): 105.2 | Intersection LOS: F |
| Intersection Capacity Utilization 106.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 294 | 3 | 344 | 0 | 0 | 0 | 0 | 856 | 361 | 644 | 1343 | 0 |
| Future Volume (veh/h) | 294 | 3 | 344 | 0 | 0 | 0 | 0 | 856 | 361 | 644 | 1343 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 303 | 3 | 269 | | | | 0 | 882 | 309 | 664 | 1385 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 356 | 4 | 320 | | | | 0 | 1009 | 353 | 356 | 2338 | 0 |
| Arrive On Green | 0.20 | 0.20 | 0.20 | | | | 0.00 | 0.39 | 0.39 | 0.42 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1765 | 17 | 1583 | | | | 0 | 2672 | 901 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 306 | 0 | 269 | | | | 0 | 607 | 584 | 664 | 1385 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1782 | 0 | 1583 | | | | 0 | 1777 | 1703 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 14.9 | 0.0 | 14.7 | | | | 0.0 | 28.4 | 28.6 | 19.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 14.9 | 0.0 | 14.7 | | | | 0.0 | 28.4 | 28.6 | 19.0 | 0.0 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 0.53 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 360 | 0 | 320 | | | | 0 | 695 | 666 | 356 | 2338 | 0 |
| V/C Ratio(X) | 0.85 | 0.00 | 0.84 | | | | 0.00 | 0.87 | 0.88 | 1.86 | 0.59 | 0.00 |
| Avail Cap(c_a), veh/h | 535 | 0 | 475 | | | | 0 | 695 | 666 | 356 | 2338 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 34.6 | 0.0 | 34.5 | | | | 0.0 | 25.3 | 25.4 | 26.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 5.6 | 0.0 | 5.6 | | | | 0.0 | 14.2 | 15.1 | 389.7 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.6 | 0.0 | 5.8 | | | | 0.0 | 13.5 | 13.1 | 43.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.2 | 0.0 | 40.1 | | | | 0.0 | 39.5 | 40.5 | 415.7 | 0.1 | 0.0 |
| LnGrp LOS | D | | D | | | | | D | D | F | A | |
| Approach Vol, veh/h | | 575 | | | | | | 1191 | | | 2049 | |
| Approach Delay, s/veh | | 40.2 | | | | | | 40.0 | | | 134.8 | |
| Approach LOS | | D | | | | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 41.0 | | 25.0 | | 65.0 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 19.0 | 26.4 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 21.0 | 30.6 | | 16.9 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 1.2 | | 10.4 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 90.9 |
| HCM 7th LOS | | F |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 139 | 233 | 53 | 177 | 185 | 899 | 164 | 1202 |
| Future Volume (vph) | 139 | 233 | 53 | 177 | 185 | 899 | 164 | 1202 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 25.4 | 10.4 | 23.8 | 14.0 | 38.8 | 15.4 | 40.2 |
| Total Split (%) | 13.3% | 28.2% | 11.6% | 26.4% | 15.6% | 43.1% | 17.1% | 44.7% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.4 | 15.8 | 5.6 | 12.0 | 9.4 | 33.2 | 10.6 | 34.4 |
| Actuated g/C Ratio | 0.09 | 0.19 | 0.07 | 0.14 | 0.11 | 0.39 | 0.13 | 0.41 |
| v/c Ratio | 1.03 | 0.56 | 0.52 | 0.54 | 1.07 | 0.78 | 0.84 | 1.05 |
| Control Delay (s/veh) | 122.9 | 22.1 | 56.2 | 24.1 | 125.8 | 27.6 | 70.0 | 64.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 122.9 | 22.1 | 56.2 | 24.1 | 125.8 | 27.6 | 70.0 | 64.0 |
| LOS | F | C | E | C | F | C | E | E |
| Approach Delay (s/veh) | | 48.6 | | 29.2 | | 43.0 | | 64.6 |
| Approach LOS | | D | | C | | D | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 84.1 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.07 | |
| Intersection Signal Delay (s/veh): 51.8 | Intersection LOS: D |
| Intersection Capacity Utilization 85.7% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 22: Grove Av. & Walnut St.

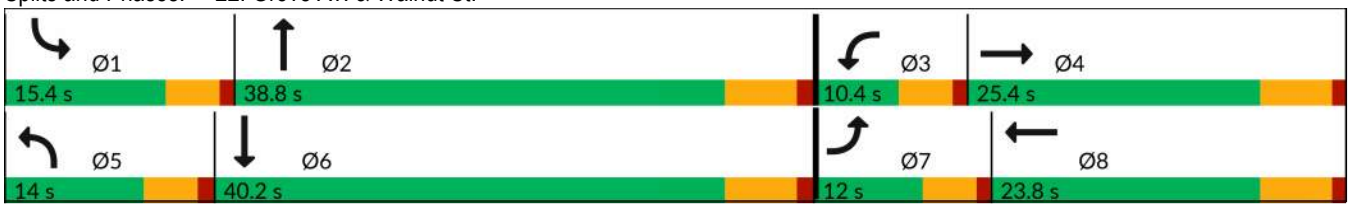

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 139 | 233 | 157 | 53 | 177 | 105 | 185 | 899 | 97 | 164 | 1202 | 179 |
| Future Volume (veh/h) | 139 | 233 | 157 | 53 | 177 | 105 | 185 | 899 | 97 | 164 | 1202 | 179 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 151 | 253 | 146 | 58 | 192 | 69 | 201 | 977 | 85 | 178 | 1307 | 118 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 151 | 386 | 215 | 75 | 337 | 117 | 192 | 1333 | 116 | 211 | 1366 | 123 |
| Arrive On Green | 0.09 | 0.18 | 0.18 | 0.04 | 0.13 | 0.13 | 0.11 | 0.40 | 0.40 | 0.13 | 0.41 | 0.41 |
| Sat Flow, veh/h | 1688 | 2190 | 1218 | 1688 | 2572 | 890 | 1688 | 3307 | 288 | 1688 | 3293 | 296 |
| Grp Volume(v), veh/h | 151 | 203 | 196 | 58 | 130 | 131 | 201 | 525 | 537 | 178 | 703 | 722 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1631 | 1688 | 1777 | 1685 | 1688 | 1777 | 1818 | 1688 | 1777 | 1812 |
| Q Serve(g_s), s | 7.4 | 8.8 | 9.3 | 2.8 | 5.7 | 6.0 | 9.4 | 20.7 | 20.7 | 8.5 | 31.7 | 32.1 |
| Cycle Q Clear(g_c), s | 7.4 | 8.8 | 9.3 | 2.8 | 5.7 | 6.0 | 9.4 | 20.7 | 20.7 | 8.5 | 31.7 | 32.1 |
| Prop In Lane | 1.00 | | 0.75 | 1.00 | | 0.53 | 1.00 | | 0.16 | 1.00 | | 0.16 |
| Lane Grp Cap(c), veh/h | 151 | 313 | 287 | 75 | 233 | 221 | 192 | 716 | 732 | 211 | 737 | 752 |
| V/C Ratio(X) | 1.00 | 0.65 | 0.68 | 0.77 | 0.56 | 0.59 | 1.05 | 0.73 | 0.73 | 0.84 | 0.95 | 0.96 |
| Avail Cap(c_a), veh/h | 151 | 421 | 386 | 118 | 386 | 366 | 192 | 716 | 732 | 220 | 738 | 753 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.7 | 31.7 | 31.9 | 39.1 | 33.7 | 33.9 | 36.7 | 20.9 | 20.9 | 35.4 | 23.5 | 23.6 |
| Incr Delay (d2), s/veh | 73.6 | 2.3 | 3.0 | 6.2 | 2.1 | 2.5 | 78.6 | 3.9 | 3.8 | 22.4 | 22.5 | 23.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.0 | 3.7 | 3.7 | 1.2 | 2.4 | 2.5 | 7.8 | 8.3 | 8.5 | 4.7 | 16.4 | 17.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 111.3 | 34.0 | 34.9 | 45.3 | 35.8 | 36.4 | 115.3 | 24.8 | 24.8 | 57.8 | 46.0 | 47.1 |
| LnGrp LOS | F | C | C | D | D | D | F | C | C | E | D | D |
| Approach Vol, veh/h | | 550 | | | 319 | | | 1263 | | | 1603 | |
| Approach Delay, s/veh | | 55.5 | | | 37.8 | | | 39.2 | | | 47.8 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.0 | 39.2 | 8.3 | 20.4 | 14.0 | 40.1 | 12.0 | 16.7 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 10.8 | 33.0 | 5.8 | 19.6 | 9.4 | 34.4 | 7.4 | 18.0 |
| Max Q Clear Time (g_c+I1), s | 10.5 | 22.7 | 4.8 | 11.3 | 11.4 | 34.1 | 9.4 | 8.0 |
| Green Ext Time (p_c), s | 0.0 | 4.5 | 0.0 | 1.4 | 0.0 | 0.3 | 0.0 | 0.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 45.2 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 123 | 1226 | 146 | 961 | 28 | 763 | 166 | 968 | 127 |
| Future Volume (vph) | 123 | 1226 | 146 | 961 | 28 | 763 | 166 | 968 | 127 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA | Perm |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | |
| Permitted Phases | | | | | | | | | 6 |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 |
| Total Split (s) | 15.6 | 30.2 | 15.6 | 30.2 | 15.6 | 28.6 | 15.6 | 28.6 | 28.6 |
| Total Split (%) | 17.3% | 33.6% | 17.3% | 33.6% | 17.3% | 31.8% | 17.3% | 31.8% | 31.8% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 9.7 | 24.0 | 10.3 | 24.6 | 6.2 | 22.8 | 10.6 | 33.2 | 33.2 |
| Actuated g/C Ratio | 0.11 | 0.27 | 0.12 | 0.28 | 0.07 | 0.26 | 0.12 | 0.37 | 0.37 |
| v/c Ratio | 0.69 | 2.67 | 0.78 | 1.36 | 0.25 | 1.87 | 0.86 | 1.44 | 0.19 |
| Control Delay (s/veh) | 58.6 | 775.2 | 66.2 | 197.7 | 44.3 | 424.2 | 75.6 | 230.3 | 4.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 58.6 | 775.2 | 66.2 | 197.7 | 44.3 | 424.2 | 75.6 | 230.3 | 4.0 |
| LOS | E | F | E | F | D | F | E | F | A |
| Approach Delay (s/veh) | | 713.0 | | 184.2 | | 412.1 | | 187.1 | |
| Approach LOS | | F | | F | | F | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 88.9 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.67 | |
| Intersection Signal Delay (s/veh): 375.7 | Intersection LOS: F |
| Intersection Capacity Utilization 150.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

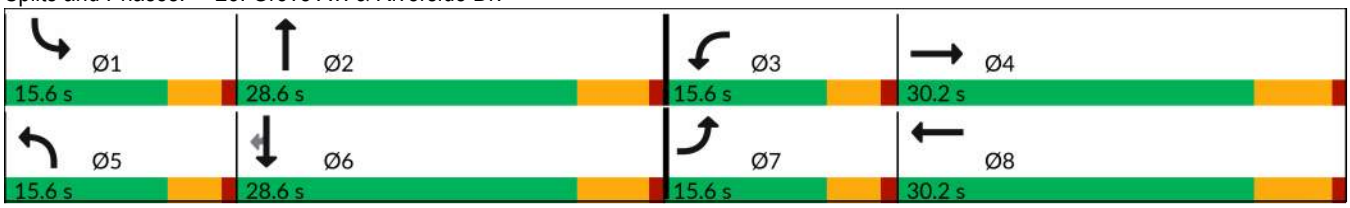

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 123 | 1226 | 71 | 146 | 961 | 321 | 28 | 763 | 98 | 166 | 968 | 127 |
| Future Volume (veh/h) | 123 | 1226 | 71 | 146 | 961 | 321 | 28 | 763 | 98 | 166 | 968 | 127 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 127 | 1264 | 65 | 151 | 991 | 280 | 29 | 787 | 89 | 171 | 998 | 82 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 156 | 480 | 25 | 182 | 785 | 221 | 49 | 427 | 48 | 203 | 655 | 555 |
| Arrive On Green | 0.09 | 0.27 | 0.27 | 0.11 | 0.29 | 0.29 | 0.03 | 0.26 | 0.26 | 0.12 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1688 | 1763 | 91 | 1688 | 2727 | 767 | 1688 | 1650 | 187 | 1688 | 1870 | 1585 |
| Grp Volume(v), veh/h | 127 | 0 | 1329 | 151 | 644 | 627 | 29 | 0 | 876 | 171 | 998 | 82 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1854 | 1688 | 1777 | 1717 | 1688 | 0 | 1837 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 6.5 | 0.0 | 24.0 | 7.7 | 25.3 | 25.3 | 1.5 | 0.0 | 22.8 | 8.7 | 30.8 | 3.1 |
| Cycle Q Clear(g_c), s | 6.5 | 0.0 | 24.0 | 7.7 | 25.3 | 25.3 | 1.5 | 0.0 | 22.8 | 8.7 | 30.8 | 3.1 |
| Prop In Lane | 1.00 | | 0.05 | 1.00 | | 0.45 | 1.00 | | 0.10 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 156 | 0 | 505 | 182 | 511 | 494 | 49 | 0 | 475 | 203 | 655 | 555 |
| V/C Ratio(X) | 0.81 | 0.00 | 2.63 | 0.83 | 1.26 | 1.27 | 0.60 | 0.00 | 1.84 | 0.84 | 1.52 | 0.15 |
| Avail Cap(c_a), veh/h | 211 | 0 | 505 | 211 | 511 | 494 | 211 | 0 | 475 | 211 | 655 | 555 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.2 | 0.0 | 32.0 | 38.5 | 31.4 | 31.4 | 42.3 | 0.0 | 32.6 | 37.9 | 28.6 | 19.6 |
| Incr Delay (d2), s/veh | 11.8 | 0.0 | 739.6 | 18.5 | 131.9 | 136.4 | 4.3 | 0.0 | 387.2 | 23.5 | 243.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.0 | 0.0 | 113.5 | 3.9 | 28.5 | 28.2 | 0.7 | 0.0 | 60.5 | 4.7 | 56.7 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 51.0 | 0.0 | 771.6 | 57.0 | 163.2 | 167.8 | 46.5 | 0.0 | 419.9 | 61.4 | 272.2 | 19.7 |
| LnGrp LOS | D | | F | E | F | F | D | | F | E | F | B |
| Approach Vol, veh/h | | 1456 | | | 1422 | | | 905 | | | 1251 | |
| Approach Delay, s/veh | | 708.8 | | | 153.9 | | | 407.9 | | | 226.8 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.2 | 28.6 | 14.1 | 30.2 | 7.1 | 36.6 | 12.8 | 31.5 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 11.0 | 22.8 | 11.0 | 24.0 | 11.0 | 22.8 | 11.0 | 24.0 |
| Max Q Clear Time (g_c+I1), s | 10.7 | 24.8 | 9.7 | 26.0 | 3.5 | 32.8 | 8.5 | 27.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 378.2 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 748.3 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 55 | 507 | 55 | 51 | 380 | 72 | 58 | 800 | 67 | 85 | 1090 | 25 |
| Future Vol, veh/h | 55 | 507 | 55 | 51 | 380 | 72 | 58 | 800 | 67 | 85 | 1090 | 25 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 57 | 528 | 57 | 53 | 396 | 75 | 60 | 833 | 70 | 89 | 1135 | 26 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 402.6 | 282.5 | 768.6 | 1105.7 |
| HCM LOS | F | F | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 6% | 9% | 10% | 7% |
| Vol Thru, % | 86% | 82% | 76% | 91% |
| Vol Right, % | 7% | 9% | 14% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 925 | 617 | 503 | 1200 |
| LT Vol | 58 | 55 | 51 | 85 |
| Through Vol | 800 | 507 | 380 | 1090 |
| RT Vol | 67 | 55 | 72 | 25 |
| Lane Flow Rate | 964 | 643 | 524 | 1250 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 2.569 | 1.713 | 1.392 | 3.345 |
| Departure Headway (Hd) | 23.278 | 25.726 | 29.422 | 19.849 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 173 | 148 | 131 | 200 |
| Service Time | 21.278 | 23.726 | 27.422 | 17.849 |
| HCM Lane V/C Ratio | 5.572 | 4.345 | 4 | 6.25 |
| HCM Control Delay, s/veh | 768.6 | 402.6 | 282.5 | 1105.7 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 34.6 | 17.6 | 11.5 | 57.1 |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 613.2 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 106 | 275 | 52 | 10 | 130 | 52 | 68 | 808 | 55 | 120 | 973 | 72 |
| Future Vol, veh/h | 106 | 275 | 52 | 10 | 130 | 52 | 68 | 808 | 55 | 120 | 973 | 72 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 113 | 293 | 55 | 11 | 138 | 55 | 72 | 860 | 59 | 128 | 1035 | 77 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 119.2 | 43.1 | 625 | 881.3 |
| HCM LOS | F | E | F | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 7% | 24% | 5% | 10% |
| Vol Thru, % | 87% | 64% | 68% | 84% |
| Vol Right, % | 6% | 12% | 27% | 6% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 931 | 433 | 192 | 1165 |
| LT Vol | 68 | 106 | 10 | 120 |
| Through Vol | 808 | 275 | 130 | 973 |
| RT Vol | 55 | 52 | 52 | 72 |
| Lane Flow Rate | 990 | 461 | 204 | 1239 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 2.306 | 1.072 | 0.538 | 2.888 |
| Departure Headway (Hd) | 12.699 | 14.585 | 19.495 | 11.489 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 297 | 253 | 188 | 335 |
| Service Time | 10.699 | 12.585 | 17.495 | 9.489 |
| HCM Lane V/C Ratio | 3.333 | 1.822 | 1.085 | 3.699 |
| HCM Control Delay, s/veh | 625 | 119.2 | 43.1 | 881.3 |
| HCM Lane LOS | F | F | F | F |
| HCM 95th-tile Q | 51.1 | 11.1 | 2.8 | 78.3 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 278 | 2156 | 214 | 224 | 1478 | 251 | 281 | 458 | 366 | 511 |
| Future Volume (vph) | 278 | 2156 | 214 | 224 | 1478 | 251 | 281 | 458 | 366 | 511 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 18.0 | 39.0 | 39.0 | 16.0 | 37.0 | 37.0 | 19.0 | 43.0 | 22.0 | 46.0 |
| Total Split (%) | 15.0% | 32.5% | 32.5% | 13.3% | 30.8% | 30.8% | 15.8% | 35.8% | 18.3% | 38.3% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 13.4 | 33.2 | 33.2 | 11.4 | 31.2 | 31.2 | 14.4 | 37.6 | 17.4 | 40.6 |
| Actuated g/C Ratio | 0.11 | 0.28 | 0.28 | 0.10 | 0.26 | 0.26 | 0.12 | 0.31 | 0.15 | 0.34 |
| v/c Ratio | 1.61 | 2.39 | 0.46 | 1.53 | 1.75 | 0.49 | 1.52 | 1.22 | 1.64 | 1.40 |
| Control Delay (s/veh) | 334.6 | 652.3 | 20.4 | 303.7 | 369.8 | 14.5 | 293.1 | 150.3 | 338.3 | 222.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 334.6 | 652.3 | 20.4 | 303.7 | 369.8 | 14.5 | 293.1 | 150.3 | 338.3 | 222.6 |
| LOS | F | F | C | F | F | B | F | F | F | F |
| Approach Delay (s/veh) | | 567.8 | | | 316.5 | | | 193.8 | | 259.2 |
| Approach LOS | | F | | | F | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.39 | |
| Intersection Signal Delay (s/veh): 389.3 | Intersection LOS: F |
| Intersection Capacity Utilization 150.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

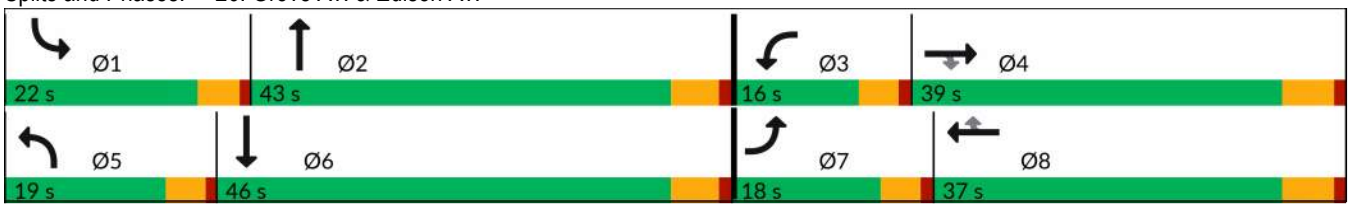

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 278 | 2156 | 214 | 224 | 1478 | 251 | 281 | 458 | 182 | 366 | 511 | 281 |
| Future Volume (veh/h) | 278 | 2156 | 214 | 224 | 1478 | 251 | 281 | 458 | 182 | 366 | 511 | 281 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 302 | 2343 | 168 | 243 | 1607 | 197 | 305 | 498 | 133 | 398 | 555 | 223 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 188 | 983 | 437 | 160 | 924 | 412 | 203 | 446 | 119 | 245 | 429 | 172 |
| Arrive On Green | 0.17 | 0.42 | 0.42 | 0.14 | 0.39 | 0.39 | 0.18 | 0.47 | 0.47 | 0.22 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1688 | 3554 | 1579 | 1688 | 3554 | 1585 | 1688 | 1422 | 380 | 1688 | 1269 | 510 |
| Grp Volume(v), veh/h | 302 | 2343 | 168 | 243 | 1607 | 197 | 305 | 0 | 631 | 398 | 0 | 778 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1579 | 1688 | 1777 | 1585 | 1688 | 0 | 1802 | 1688 | 0 | 1779 |
| Q Serve(g_s), s | 13.4 | 33.2 | 8.9 | 11.4 | 31.2 | 11.2 | 14.4 | 0.0 | 37.6 | 17.4 | 0.0 | 40.6 |
| Cycle Q Clear(g_c), s | 13.4 | 33.2 | 8.9 | 11.4 | 31.2 | 11.2 | 14.4 | 0.0 | 37.6 | 17.4 | 0.0 | 40.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.21 | 1.00 | | 0.29 |
| Lane Grp Cap(c), veh/h | 188 | 983 | 437 | 160 | 924 | 412 | 203 | 0 | 565 | 245 | 0 | 602 |
| V/C Ratio(X) | 1.60 | 2.38 | 0.38 | 1.52 | 1.74 | 0.48 | 1.51 | 0.00 | 1.12 | 1.63 | 0.00 | 1.29 |
| Avail Cap(c_a), veh/h | 188 | 983 | 437 | 160 | 924 | 412 | 203 | 0 | 565 | 245 | 0 | 602 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.9 | 35.1 | 28.0 | 51.5 | 36.6 | 30.5 | 49.2 | 0.0 | 31.8 | 47.0 | 0.0 | 29.6 |
| Incr Delay (d2), s/veh | 294.6 | 625.5 | 0.6 | 261.4 | 337.2 | 0.9 | 251.7 | 0.0 | 74.4 | 299.9 | 0.0 | 143.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 20.6 | 97.3 | 3.2 | 16.1 | 54.9 | 4.0 | 19.6 | 0.0 | 24.8 | 26.9 | 0.0 | 37.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 344.5 | 660.6 | 28.5 | 312.8 | 373.8 | 31.4 | 300.9 | 0.0 | 106.2 | 346.8 | 0.0 | 173.4 |
| LnGrp LOS | F | F | C | F | F | C | F | | F | F | | F |
| Approach Vol, veh/h | | 2813 | | | 2047 | | | 936 | | | 1176 | |
| Approach Delay, s/veh | | 588.9 | | | 333.6 | | | 169.7 | | | 232.1 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.0 | 43.0 | 16.0 | 39.0 | 19.0 | 46.0 | 18.0 | 37.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 17.4 | 37.6 | 11.4 | 33.2 | 14.4 | 40.6 | 13.4 | 31.2 |
| Max Q Clear Time (g_c+I1), s | 19.4 | 39.6 | 13.4 | 35.2 | 16.4 | 42.6 | 15.4 | 33.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 397.5 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 445.1 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 92 | 481 | 3 | 1 | 492 | 513 | 7 | 66 | 1 | 609 | 50 | 96 |
| Future Vol, veh/h | 92 | 481 | 3 | 1 | 492 | 513 | 7 | 66 | 1 | 609 | 50 | 96 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 106 | 553 | 3 | 1 | 566 | 590 | 8 | 76 | 1 | 700 | 57 | 110 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 228.5 | 625.4 | 27.7 | 411 |
| HCM LOS | F | F | D | F |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 9% | 16% | 0% | 81% |
| Vol Thru, % | 89% | 84% | 49% | 7% |
| Vol Right, % | 1% | 1% | 51% | 13% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 74 | 576 | 1006 | 755 |
| LT Vol | 7 | 92 | 1 | 609 |
| Through Vol | 66 | 481 | 492 | 50 |
| RT Vol | 1 | 3 | 513 | 96 |
| Lane Flow Rate | 85 | 662 | 1156 | 868 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.228 | 1.39 | 2.321 | 1.836 |
| Departure Headway (Hd) | 19.153 | 12.68 | 10.336 | 10.336 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 189 | 291 | 370 | 364 |
| Service Time | 17.153 | 10.68 | 8.336 | 8.336 |
| HCM Lane V/C Ratio | 0.45 | 2.275 | 3.124 | 2.385 |
| HCM Control Delay, s/veh | 27.7 | 228.5 | 625.4 | 411 |
| HCM Lane LOS | D | F | F | F |
| HCM 95th-tile Q | 0.8 | 20.9 | 62.4 | 42.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 153.2 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 50 | 3271 | 3023 | 50 | 72 | 68 |
| Future Vol, veh/h | 50 | 3271 | 3023 | 50 | 72 | 68 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 2 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 54 | 3555 | 3286 | 54 | 78 | 74 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 3340 | 0 | - | 0 | 5199 | 3313 |
| Stage 1 | - | - | - | - | 3313 | - |
| Stage 2 | - | - | - | - | 1886 | - |
| Critical Hdwy | 4.13 | - | - | - | 6.63 | 6.23 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.43 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.83 | - |
| Follow-up Hdwy | 2.219 | - | - | - | 3.519 | 3.319 |
| Pot Cap-1 Maneuver | 83 | - | - | - | ~ 0 | ~ 11 |
| Stage 1 | - | - | - | - | ~ 23 | - |
| Stage 2 | - | - | - | - | 106 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 83 | - | - | - | 0 | ~ 11 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 21 | - |
| Stage 1 | - | - | - | - | ~ 23 | - |
| Stage 2 | - | - | - | - | 106 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/veh | 104.81 | 0 | $ 4662.86 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | ~ 1 | - | - | - | 15 |
| HCM Lane V/C Ratio | 0.655 | - | - | - | 10.249 |
| HCM Control Delay (s/veh) | 108 | 104.8 | - | $ | 4662.9 |
| HCM Lane LOS | F | F | - | - | F |
| HCM 95th %tile Q(veh) | 3.1 | - | - | - | 20 |

**Notes**

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Int Delay, s/veh | 106.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 45 | 1323 | 109 | 113 | 1283 | 31 | 116 | 44 | 189 | 9 | 28 | 20 |
| Future Vol, veh/h | 45 | 1323 | 109 | 113 | 1283 | 31 | 116 | 44 | 189 | 9 | 28 | 20 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Free | Free | Stop | Stop | Stop | Stop | Stop | Stop |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | 100 | - | - | 70 | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 2 | - | - | 2 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 | 96 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 47 | 1378 | 114 | 118 | 1336 | 32 | 121 | 46 | 197 | 9 | 29 | 21 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1372 | 0 | 0 | 1492 | 0 | 0 | 2447 | 3136 | 746 | 2397 | 3176 | 687 |
| Stage 1 | - | - | - | - | - | - | 1529 | 1529 | - | 1591 | 1591 | - |
| Stage 2 | - | - | - | - | - | - | 918 | 1607 | - | 806 | 1585 | - |
| Critical Hdwy | 4.14 | - | - | 4.14 | - | - | 7.54 | 6.54 | 6.94 | 7.54 | 6.54 | 6.94 |
| Critical Hdwy Stg 1 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Critical Hdwy Stg 2 | - | - | - | - | - | - | 6.54 | 5.54 | - | 6.54 | 5.54 | - |
| Follow-up Hdwy | 2.22 | - | - | 2.22 | - | - | 3.52 | 4.02 | 3.32 | 3.52 | 4.02 | 3.32 |
| Pot Cap-1 Maneuver | 496 | - | - | 446 | - | - | ~ 16 | ~ 11 | 356 | 18 | ~ 10 | 389 |
| Stage 1 | - | - | - | - | - | - | 123 | 178 | - | 112 | 166 | - |
| Stage 2 | - | - | - | - | - | - | 292 | 163 | - | 342 | 167 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 495 | - | - | 446 | - | - | ~ 1 | ~ 7 | 356 | ~ 2 | ~ 7 | 388 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | ~ 69 | 62 | - | ~ -16 | 30 | - |
| Stage 1 | - | - | - | - | - | - | ~ 111 | 161 | - | 82 | 122 | - |
| Stage 2 | - | - | - | - | - | - | 155 | 119 | - | 99 | 151 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s/v | 0.4 | 1.26 | $ 993.9 | 50.41 |
| HCM LOS | | | F | F |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 120 | 495 | - | - | 446 | - | - | 136 |
| HCM Lane V/C Ratio | 3.036 | 0.095 | - | - | 0.264 | - | - | 0.436 |
| HCM Control Delay (s/veh) | $ 993.9 | 13 | - | - | 15.9 | - | - | 50.4 |
| HCM Lane LOS | F | B | - | - | C | - | - | F |
| HCM 95th %tile Q(veh) | 34.4 | 0.3 | - | - | 1 | - | - | 1.9 |

**Notes**

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 38.6 |
| Intersection LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 121 | 33 | 246 | 46 | 53 | 40 | 77 | 277 | 40 | 0 | 269 | 43 |
| Future Vol, veh/h | 121 | 33 | 246 | 46 | 53 | 40 | 77 | 277 | 40 | 0 | 269 | 43 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 136 | 37 | 276 | 52 | 60 | 45 | 87 | 311 | 45 | 0 | 302 | 48 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay, s/veh | 44.8 | 16.4 | 47.9 | 28.9 |
| HCM LOS | E | C | E | D |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 20% | 30% | 33% | 0% |
| Vol Thru, % | 70% | 8% | 38% | 86% |
| Vol Right, % | 10% | 62% | 29% | 14% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 394 | 400 | 139 | 312 |
| LT Vol | 77 | 121 | 46 | 0 |
| Through Vol | 277 | 33 | 53 | 269 |
| RT Vol | 40 | 246 | 40 | 43 |
| Lane Flow Rate | 443 | 449 | 156 | 351 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.905 | 0.892 | 0.366 | 0.735 |
| Departure Headway (Hd) | 7.362 | 7.142 | 8.529 | 7.543 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 491 | 508 | 425 | 477 |
| Service Time | 5.398 | 5.172 | 6.529 | 5.623 |
| HCM Lane V/C Ratio | 0.902 | 0.884 | 0.367 | 0.736 |
| HCM Control Delay, s/veh | 47.9 | 44.8 | 16.4 | 28.9 |
| HCM Lane LOS | E | E | C | D |
| HCM 95th-tile Q | 10.3 | 10 | 1.7 | 6 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 22 | 2335 | 477 | 338 | 1596 | 321 | 149 | 166 | 192 |
| Future Volume (vph) | 22 | 2335 | 477 | 338 | 1596 | 321 | 149 | 166 | 192 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 10.3 | 51.0 | 51.0 | 16.2 | 56.9 | 28.6 | 31.9 | 20.9 | 24.2 |
| Total Split (%) | 8.6% | 42.5% | 42.5% | 13.5% | 47.4% | 23.8% | 26.6% | 17.4% | 20.2% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.4 | 45.2 | 45.2 | 11.6 | 55.4 | 24.0 | 26.3 | 14.7 | 16.9 |
| Actuated g/C Ratio | 0.05 | 0.38 | 0.38 | 0.10 | 0.47 | 0.20 | 0.22 | 0.12 | 0.14 |
| v/c Ratio | 0.30 | 3.38 | 0.68 | 2.12 | 2.17 | 0.97 | 0.73 | 0.83 | 0.80 |
| Control Delay (s/veh) | 65.6 | Error | 24.0 | 549.3 | 552.1 | 90.1 | 49.0 | 80.6 | 70.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 65.6 | Error | 24.0 | 549.3 | 552.1 | 90.1 | 49.0 | 80.6 | 70.3 |
| LOS | E | F | C | F | F | F | D | F | E |
| Approach Delay (s/veh) | | 902.2 | | | 551.7 | | 70.6 | | 74.9 |
| Approach LOS | | F | | | F | | E | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 3.38 | |
| Intersection Signal Delay (s/veh): 639.3 | Intersection LOS: F |
| Intersection Capacity Utilization 189.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

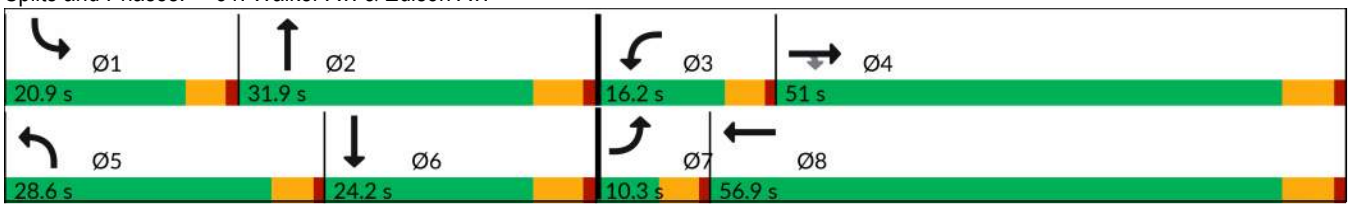

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 22 | 2335 | 477 | 338 | 1596 | 214 | 321 | 149 | 141 | 166 | 192 | 13 |
| Future Volume (veh/h) | 22 | 2335 | 477 | 338 | 1596 | 214 | 321 | 149 | 141 | 166 | 192 | 13 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 23 | 2407 | 363 | 348 | 1645 | 206 | 331 | 154 | 114 | 171 | 198 | 8 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 38 | 728 | 617 | 169 | 760 | 95 | 349 | 218 | 162 | 197 | 230 | 9 |
| Arrive On Green | 0.02 | 0.39 | 0.39 | 0.10 | 0.47 | 0.47 | 0.21 | 0.22 | 0.22 | 0.12 | 0.13 | 0.13 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1630 | 204 | 1688 | 998 | 739 | 1688 | 1783 | 72 |
| Grp Volume(v), veh/h | 23 | 2407 | 363 | 348 | 0 | 1851 | 331 | 0 | 268 | 171 | 0 | 206 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1834 | 1688 | 0 | 1737 | 1688 | 0 | 1855 |
| Q Serve(g_s), s | 1.6 | 45.2 | 21.1 | 11.6 | 0.0 | 54.2 | 22.5 | 0.0 | 16.6 | 11.6 | 0.0 | 12.6 |
| Cycle Q Clear(g_c), s | 1.6 | 45.2 | 21.1 | 11.6 | 0.0 | 54.2 | 22.5 | 0.0 | 16.6 | 11.6 | 0.0 | 12.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.11 | 1.00 | | 0.43 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 38 | 728 | 617 | 169 | 0 | 855 | 349 | 0 | 380 | 197 | 0 | 239 |
| V/C Ratio(X) | 0.60 | 3.31 | 0.59 | 2.06 | 0.00 | 2.16 | 0.95 | 0.00 | 0.71 | 0.87 | 0.00 | 0.86 |
| Avail Cap(c_a), veh/h | 83 | 728 | 617 | 169 | 0 | 855 | 349 | 0 | 396 | 237 | 0 | 300 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 56.3 | 35.5 | 28.1 | 52.3 | 0.0 | 31.0 | 45.5 | 0.0 | 41.9 | 50.4 | 0.0 | 49.6 |
| Incr Delay (d2), s/veh | 5.6 | 1041.8 | 1.5 | 499.1 | 0.0 | 527.8 | 34.7 | 0.0 | 5.4 | 21.5 | 0.0 | 18.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 230.1 | 8.0 | 28.2 | 0.0 | 147.6 | 12.2 | 0.0 | 7.3 | 5.8 | 0.0 | 6.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 61.9 | 1077.3 | 29.6 | 551.4 | 0.0 | 558.8 | 80.2 | 0.0 | 47.3 | 71.9 | 0.0 | 68.0 |
| LnGrp LOS | E | F | C | F | | F | F | | D | E | | E |
| Approach Vol, veh/h | | 2793 | | | 2199 | | | 599 | | | 377 | |
| Approach Delay, s/veh | | 932.7 | | | 557.6 | | | 65.5 | | | 69.8 | |
| Approach LOS | | F | | | F | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.2 | 30.8 | 16.2 | 51.0 | 28.6 | 20.4 | 7.2 | 60.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 16.3 | 26.5 | 11.6 | 45.2 | 24.0 | 18.8 | 5.7 | 51.1 |
| Max Q Clear Time (g_c+I1), s | 13.6 | 18.6 | 13.6 | 47.2 | 24.5 | 14.6 | 3.6 | 56.2 |
| Green Ext Time (p_c), s | 0.1 | 0.8 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 653.0 |
| HCM 7th LOS | F |

| Intersection | |
|---|---|
| Int Delay, s/veh | 64.2 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 84 | 730 | 402 | 119 | 255 | 105 |
| Future Vol, veh/h | 84 | 730 | 402 | 119 | 255 | 105 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 1 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 86 | 86 | 86 | 86 | 86 | 86 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 98 | 849 | 467 | 138 | 297 | 122 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 606 | 0 | - | 0 | 1581 | 537 |
| Stage 1 | - | - | - | - | 537 | - |
| Stage 2 | - | - | - | - | 1044 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 972 | - | - | - | ~ 120 | 544 |
| Stage 1 | - | - | - | - | 586 | - |
| Stage 2 | - | - | - | - | 339 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 972 | - | - | - | ~ 97 | 544 |
| Mov Cap-2 Maneuver | - | - | - | - | ~ 223 | - |
| Stage 1 | - | - | - | - | 475 | - |
| Stage 2 | - | - | - | - | 339 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s/v | 0.94 | 0 | $ 300.2 |
| HCM LOS | | | F |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 186 | - | - | - | 270 |
| HCM Lane V/C Ratio | 0.1 | - | - | - | 1.553 |
| HCM Control Delay (s/veh) | 9.1 | 0 | - | - | $ 300.2 |
| HCM Lane LOS | A | A | - | - | F |
| HCM 95th %tile Q(veh) | 0.3 | - | - | - | 24.9 |

Notes

~: Volume exceeds capacity  $: Delay exceeds 300s  +: Computation Not Defined  *: All major volume in platoon

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 474 | 10 | 237 | 512 | 813 | 1793 | 381 |
| Future Volume (vph) | 474 | 10 | 237 | 512 | 813 | 1793 | 381 |
| Turn Type | Split | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 4 | 4 | | 5 | 2 | 6 | |
| Permitted Phases | | | 4 | | | | 6 |
| Detector Phase | 4 | 4 | 4 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 10.0 | 43.8 | 38.8 | 38.8 |
| Total Split (s) | 26.0 | 26.0 | 26.0 | 22.0 | 64.0 | 42.0 | 42.0 |
| Total Split (%) | 28.9% | 28.9% | 28.9% | 24.4% | 71.1% | 46.7% | 46.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | | Lag | | Lead | Lead |
| Lead-Lag Optimize? | | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 18.7 | 18.7 | 18.7 | 17.1 | 59.7 | 37.6 | 37.6 |
| Actuated g/C Ratio | 0.21 | 0.21 | 0.21 | 0.19 | 0.66 | 0.42 | 0.42 |
| v/c Ratio | 0.83 | 0.81 | 0.50 | 0.95 | 0.26 | 0.72 | 0.50 |
| Control Delay (s/veh) | 55.8 | 52.4 | 11.9 | 55.7 | 1.4 | 24.1 | 8.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.8 | 52.4 | 11.9 | 55.7 | 1.4 | 24.1 | 8.0 |
| LOS | E | D | B | E | A | C | A |
| Approach Delay (s/veh) | | 41.7 | | | 22.4 | 21.2 | |
| Approach LOS | | D | | | C | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.95 | |
| Intersection Signal Delay (s/veh): 25.1 | Intersection LOS: C |
| Intersection Capacity Utilization 81.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 33: Archibald Av. & SR-60 WB Ramps

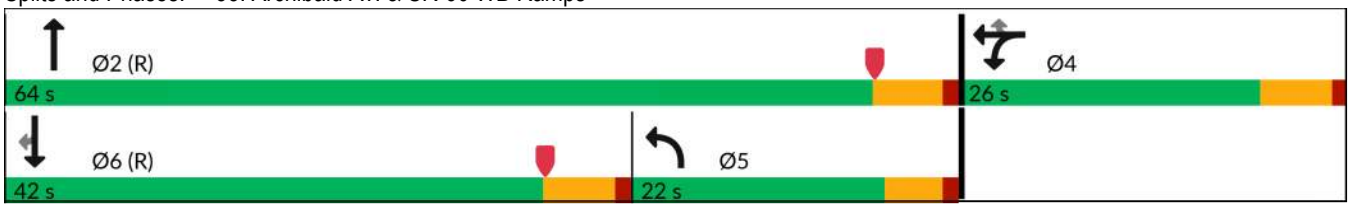

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 474 | 10 | 237 | 512 | 813 | 0 | 0 | 1793 | 381 |
| Future Volume (veh/h) | 0 | 0 | 0 | 474 | 10 | 237 | 512 | 813 | 0 | 0 | 1793 | 381 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1673 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 553 | 0 | 85 | 551 | 874 | 0 | 0 | 1928 | 287 |
| Peak Hour Factor | | | | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 646 | 0 | 303 | 727 | 3471 | 0 | 0 | 2446 | 588 |
| Arrive On Green | | | | 0.19 | 0.00 | 0.19 | 0.16 | 0.46 | 0.00 | 0.00 | 0.38 | 0.38 |
| Sat Flow, veh/h | | | | 3375 | 0 | 1585 | 3092 | 5274 | 0 | 0 | 6696 | 1547 |
| Grp Volume(v), veh/h | | | | 553 | 0 | 85 | 551 | 874 | 0 | 0 | 1928 | 287 |
| Grp Sat Flow(s),veh/h/ln | | | | 1688 | 0 | 1585 | 1546 | 1702 | 0 | 0 | 1609 | 1547 |
| Q Serve(g_s), s | | | | 14.3 | 0.0 | 4.1 | 15.3 | 9.5 | 0.0 | 0.0 | 23.9 | 12.7 |
| Cycle Q Clear(g_c), s | | | | 14.3 | 0.0 | 4.1 | 15.3 | 9.5 | 0.0 | 0.0 | 23.9 | 12.7 |
| Prop In Lane | | | | 1.00 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 646 | 0 | 303 | 727 | 3471 | 0 | 0 | 2446 | 588 |
| V/C Ratio(X) | | | | 0.86 | 0.00 | 0.28 | 0.76 | 0.25 | 0.00 | 0.00 | 0.79 | 0.49 |
| Avail Cap(c_a), veh/h | | | | 758 | 0 | 356 | 727 | 3471 | 0 | 0 | 2588 | 622 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 0.67 | 0.67 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.83 | 0.83 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.2 | 0.0 | 31.1 | 35.5 | 10.4 | 0.0 | 0.0 | 24.7 | 21.2 |
| Incr Delay (d2), s/veh | | | | 8.5 | 0.0 | 0.5 | 3.5 | 0.1 | 0.0 | 0.0 | 2.7 | 2.9 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 6.3 | 0.0 | 3.9 | 6.2 | 3.2 | 0.0 | 0.0 | 8.6 | 4.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 43.7 | 0.0 | 31.6 | 38.9 | 10.6 | 0.0 | 0.0 | 27.3 | 24.1 |
| LnGrp LOS | | | | D | | C | D | B | | | C | C |
| Approach Vol, veh/h | | | | | 638 | | | 1425 | | | 2215 | |
| Approach Delay, s/veh | | | | | 42.1 | | | 21.5 | | | 26.9 | |
| Approach LOS | | | | | D | | | C | | | C | |

| Timer - Assigned Phs | 2 | | 4 | 5 | 6 |
|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 67.0 | | 23.0 | 27.0 | 40.0 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | * 5.8 |
| Max Green Setting (Gmax), s | 58.2 | | 20.2 | 17.0 | * 36 |
| Max Q Clear Time (g_c+I1), s | 11.5 | | 16.3 | 17.3 | 25.9 |
| Green Ext Time (p_c), s | 6.6 | | 1.0 | 0.0 | 8.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.4 |
| HCM 7th LOS | C |

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 188 | 1 | 498 | 1032 | 591 | 656 | 1599 |
| Future Volume (vph) | 188 | 1 | 498 | 1032 | 591 | 656 | 1599 |
| Turn Type | Split | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 8 | 8 | | 2 | | 1 | 6 |
| Permitted Phases | | | 8 | | 2 | | |
| Detector Phase | 8 | 8 | 8 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 8.0 | 8.0 | 5.0 | 8.0 |
| Minimum Split (s) | 10.8 | 10.8 | 10.8 | 32.8 | 32.8 | 10.0 | 33.8 |
| Total Split (s) | 27.0 | 27.0 | 27.0 | 40.0 | 40.0 | 23.0 | 63.0 |
| Total Split (%) | 30.0% | 30.0% | 30.0% | 44.4% | 44.4% | 25.6% | 70.0% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | | Yes | Yes | Yes | |
| Recall Mode | None | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 19.7 | 19.7 | 19.7 | 29.6 | 29.6 | 24.1 | 58.7 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.22 | 0.33 | 0.33 | 0.27 | 0.65 |
| v/c Ratio | 0.53 | 0.83 | 0.70 | 0.53 | 0.71 | 0.87 | 0.52 |
| Control Delay (s/veh) | 36.5 | 51.2 | 30.7 | 25.2 | 7.7 | 53.0 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.5 | 51.2 | 30.7 | 25.2 | 7.7 | 53.0 | 2.9 |
| LOS | D | D | C | C | A | D | A |
| Approach Delay (s/veh) | | 39.8 | | 18.8 | | | 17.5 |
| Approach LOS | | D | | B | | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 29.6 (33%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 21.3 | Intersection LOS: C |
| Intersection Capacity Utilization 81.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 34: Archibald Av. & SR-60 EB Ramps

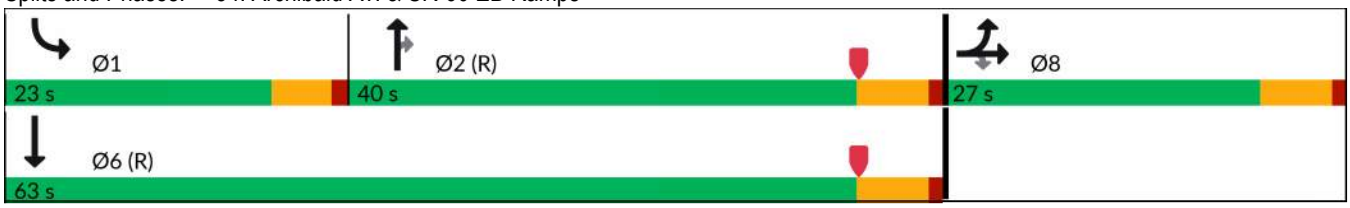

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 188 | 1 | 498 | 0 | 0 | 0 | 0 | 1032 | 591 | 656 | 1599 | 0 |
| Future Volume (veh/h) | 188 | 1 | 498 | 0 | 0 | 0 | 0 | 1032 | 591 | 656 | 1599 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1673 | 1870 | 0 |
| Adj Flow Rate, veh/h | 136 | 0 | 428 | | | | 0 | 1122 | 529 | 713 | 1738 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | | | | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 282 | 0 | 530 | | | | 0 | 2885 | 709 | 618 | 3595 | 0 |
| Arrive On Green | 0.17 | 0.00 | 0.17 | | | | 0.00 | 0.45 | 0.45 | 0.40 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1688 | 0 | 3170 | | | | 0 | 6696 | 1582 | 3092 | 5274 | 0 |
| Grp Volume(v), veh/h | 136 | 0 | 428 | | | | 0 | 1122 | 529 | 713 | 1738 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1585 | | | | 0 | 1609 | 1582 | 1546 | 1702 | 0 |
| Q Serve(g_s), s | 6.6 | 0.0 | 11.7 | | | | 0.0 | 10.5 | 24.9 | 18.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 6.6 | 0.0 | 11.7 | | | | 0.0 | 10.5 | 24.9 | 18.0 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 282 | 0 | 530 | | | | 0 | 2885 | 709 | 618 | 3595 | 0 |
| V/C Ratio(X) | 0.48 | 0.00 | 0.81 | | | | 0.00 | 0.39 | 0.75 | 1.15 | 0.48 | 0.00 |
| Avail Cap(c_a), veh/h | 398 | 0 | 747 | | | | 0 | 2885 | 709 | 618 | 3595 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.60 | 0.60 | 0.00 |
| Uniform Delay (d), s/veh | 34.0 | 0.0 | 36.1 | | | | 0.0 | 16.6 | 20.6 | 27.0 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 1.3 | 0.0 | 4.5 | | | | 0.0 | 0.4 | 7.0 | 80.2 | 0.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.7 | 0.0 | 4.6 | | | | 0.0 | 3.5 | 9.3 | 11.3 | 0.1 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 35.2 | 0.0 | 40.6 | | | | 0.0 | 17.0 | 27.6 | 107.2 | 0.3 | 0.0 |
| LnGrp LOS | D | | D | | | | | B | C | F | A | |
| Approach Vol, veh/h | | 564 | | | | | | 1651 | | | 2451 | |
| Approach Delay, s/veh | | 39.3 | | | | | | 20.4 | | | 31.4 | |
| Approach LOS | | D | | | | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.0 | 46.2 | | | | 69.2 | | 20.8 | | | | |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | | | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | 18.0 | 34.2 | | | | 57.2 | | 21.2 | | | | |
| Max Q Clear Time (g_c+I1), s | 20.0 | 26.9 | | | | 2.0 | | 13.7 | | | | |
| Green Ext Time (p_c), s | 0.0 | 4.8 | | | | 18.3 | | 1.3 | | | | |

| Intersection Summary | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 28.4 | | | | | | | | | |
| HCM 7th LOS | | | C | | | | | | | | | |

Notes

User approved volume balancing among the lanes for turning movement.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 193 | 911 | 578 | 298 | 811 | 180 | 394 | 800 | 328 | 1287 |
| Future Volume (vph) | 193 | 911 | 578 | 298 | 811 | 180 | 394 | 800 | 328 | 1287 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 38.2 | 38.2 | 9.6 | 38.2 | 38.2 | 9.6 | 32.2 | 9.6 | 33.2 |
| Total Split (s) | 19.6 | 38.2 | 38.2 | 20.0 | 38.6 | 38.6 | 24.0 | 35.6 | 26.2 | 37.8 |
| Total Split (%) | 16.3% | 31.8% | 31.8% | 16.7% | 32.2% | 32.2% | 20.0% | 29.7% | 21.8% | 31.5% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 16.7 | 33.6 | 33.6 | 15.4 | 32.3 | 32.3 | 19.4 | 27.7 | 24.9 | 33.2 |
| Actuated g/C Ratio | 0.14 | 0.28 | 0.28 | 0.13 | 0.27 | 0.27 | 0.16 | 0.23 | 0.21 | 0.28 |
| v/c Ratio | 0.85 | 0.94 | 0.88 | 1.41 | 0.87 | 0.35 | 1.49 | 0.78 | 0.97 | 1.13 |
| Control Delay (s/veh) | 81.6 | 59.8 | 33.0 | 250.1 | 52.5 | 9.3 | 274.6 | 47.3 | 88.4 | 105.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 81.6 | 59.8 | 33.0 | 250.1 | 52.5 | 9.3 | 274.6 | 47.3 | 88.4 | 105.5 |
| LOS | F | E | C | F | D | A | F | D | F | F |
| Approach Delay (s/veh) | | 53.1 | | | 92.1 | | | 117.3 | | 102.5 |
| Approach LOS | | D | | | F | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.49 | |
| Intersection Signal Delay (s/veh): 89.8 | Intersection LOS: F |
| Intersection Capacity Utilization 111.7% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 35: Archibald Av. & Riverside Dr.

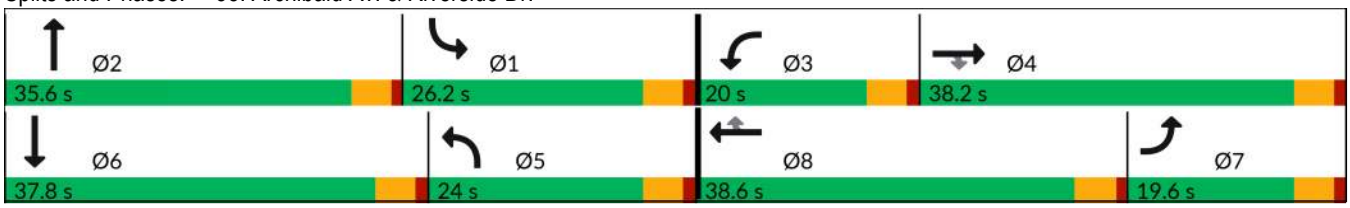

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 193 | 911 | 578 | 298 | 811 | 180 | 394 | 800 | 86 | 328 | 1287 | 248 |
| Future Volume (veh/h) | 193 | 911 | 578 | 298 | 811 | 180 | 394 | 800 | 86 | 328 | 1287 | 248 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 197 | 930 | 386 | 304 | 828 | 102 | 402 | 816 | 47 | 335 | 1313 | 151 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 247 | 985 | 436 | 217 | 922 | 406 | 274 | 1000 | 57 | 401 | 1287 | 148 |
| Arrive On Green | 0.22 | 0.42 | 0.42 | 0.19 | 0.39 | 0.39 | 0.24 | 0.30 | 0.30 | 0.36 | 0.42 | 0.42 |
| Sat Flow, veh/h | 1688 | 3554 | 1575 | 1688 | 3554 | 1567 | 1688 | 4937 | 283 | 1688 | 4634 | 533 |
| Grp Volume(v), veh/h | 197 | 930 | 386 | 304 | 828 | 102 | 402 | 562 | 301 | 335 | 965 | 499 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1575 | 1688 | 1777 | 1567 | 1688 | 1702 | 1816 | 1688 | 1702 | 1762 |
| Q Serve(g_s), s | 13.2 | 30.1 | 18.1 | 15.4 | 26.2 | 5.3 | 19.4 | 18.2 | 18.4 | 21.8 | 33.2 | 33.2 |
| Cycle Q Clear(g_c), s | 13.2 | 30.1 | 18.1 | 15.4 | 26.2 | 5.3 | 19.4 | 18.2 | 18.4 | 21.8 | 33.2 | 33.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.16 | 1.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | 247 | 985 | 436 | 217 | 922 | 406 | 274 | 690 | 368 | 401 | 946 | 490 |
| V/C Ratio(X) | 0.80 | 0.94 | 0.88 | 1.40 | 0.90 | 0.25 | 1.47 | 0.81 | 0.82 | 0.84 | 1.02 | 1.02 |
| Avail Cap(c_a), veh/h | 247 | 999 | 443 | 217 | 1011 | 446 | 274 | 883 | 471 | 401 | 946 | 490 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.9 | 34.0 | 14.8 | 48.2 | 35.0 | 28.7 | 45.2 | 39.5 | 39.6 | 36.3 | 34.9 | 34.9 |
| Incr Delay (d2), s/veh | 15.2 | 16.6 | 18.6 | 204.6 | 10.1 | 0.3 | 229.3 | 4.7 | 8.7 | 13.5 | 34.4 | 45.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.0 | 12.8 | 7.0 | 18.1 | 10.6 | 1.9 | 24.5 | 6.9 | 7.9 | 9.0 | 15.6 | 17.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 60.2 | 50.7 | 33.4 | 252.8 | 45.2 | 29.0 | 274.5 | 44.2 | 48.2 | 49.8 | 69.3 | 80.7 |
| LnGrp LOS | E | D | C | F | D | C | F | D | D | D | F | F |
| Approach Vol, veh/h | | 1513 | | | 1234 | | | 1265 | | | 1799 | |
| Approach Delay, s/veh | | 47.5 | | | 95.0 | | | 118.4 | | | 68.8 | |
| Approach LOS | | D | | | F | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 33.0 | 28.8 | 20.0 | 37.7 | 24.0 | 37.8 | 22.1 | 35.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 21.6 | 31.0 | 15.4 | 33.6 | 19.4 | 33.2 | 15.0 | 34.0 |
| Max Q Clear Time (g_c+I1), s | 23.8 | 20.4 | 17.4 | 32.1 | 21.4 | 35.2 | 15.2 | 28.2 |
| Green Ext Time (p_c), s | 0.0 | 3.7 | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 2.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 79.6 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 100 | 335 | 87 | 308 | 103 | 194 | 1097 | 173 | 1924 |
| Future Volume (vph) | 100 | 335 | 87 | 308 | 103 | 194 | 1097 | 173 | 1924 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.0 | 44.0 | 9.8 | 28.8 | 28.8 | 19.0 | 49.8 | 16.4 | 47.2 |
| Total Split (%) | 20.8% | 36.7% | 8.2% | 24.0% | 24.0% | 15.8% | 41.5% | 13.7% | 39.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.7 | 38.2 | 5.2 | 30.7 | 30.7 | 14.4 | 34.9 | 22.1 | 42.6 |
| Actuated g/C Ratio | 0.11 | 0.32 | 0.04 | 0.26 | 0.26 | 0.12 | 0.29 | 0.19 | 0.36 |
| v/c Ratio | 0.58 | 0.96 | 1.25 | 0.67 | 0.20 | 1.00 | 0.76 | 0.58 | 1.59 |
| Control Delay (s/veh) | 63.3 | 67.2 | 233.3 | 48.2 | 0.8 | 114.9 | 40.7 | 54.7 | 299.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 63.3 | 67.2 | 233.3 | 48.2 | 0.8 | 114.9 | 40.7 | 54.7 | 299.7 |
| LOS | E | E | F | D | A | F | D | D | F |
| Approach Delay (s/veh) | | 66.6 | | 70.9 | | | 51.1 | | 280.5 |
| Approach LOS | | E | | E | | | D | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.59 | |
| Intersection Signal Delay (s/veh): 162.5 | Intersection LOS: F |
| Intersection Capacity Utilization 118.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 100 | 335 | 201 | 87 | 308 | 103 | 194 | 1097 | 88 | 173 | 1924 | 108 |
| Future Volume (veh/h) | 100 | 335 | 201 | 87 | 308 | 103 | 194 | 1097 | 88 | 173 | 1924 | 108 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 104 | 349 | 192 | 91 | 321 | 49 | 202 | 1143 | 90 | 180 | 2004 | 98 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 129 | 366 | 201 | 74 | 543 | 460 | 204 | 1447 | 114 | 333 | 1267 | 61 |
| Arrive On Green | 0.08 | 0.32 | 0.32 | 0.04 | 0.29 | 0.29 | 0.12 | 0.28 | 0.28 | 0.20 | 0.36 | 0.36 |
| Sat Flow, veh/h | 1688 | 1134 | 624 | 1688 | 1870 | 1585 | 1688 | 5134 | 404 | 1688 | 3538 | 172 |
| Grp Volume(v), veh/h | 104 | 0 | 541 | 91 | 321 | 49 | 202 | 833 | 400 | 180 | 1051 | 1051 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 0 | 1757 | 1688 | 1870 | 1585 | 1688 | 1870 | 1797 | 1688 | 1870 | 1839 |
| Q Serve(g_s), s | 7.2 | 0.0 | 35.8 | 5.2 | 17.5 | 1.7 | 14.2 | 24.5 | 24.5 | 11.4 | 42.6 | 42.6 |
| Cycle Q Clear(g_c), s | 7.2 | 0.0 | 35.8 | 5.2 | 17.5 | 1.7 | 14.2 | 24.5 | 24.5 | 11.4 | 42.6 | 42.6 |
| Prop In Lane | 1.00 | | 0.35 | 1.00 | | 1.00 | 1.00 | | 0.22 | 1.00 | | 0.09 |
| Lane Grp Cap(c), veh/h | 129 | 0 | 567 | 74 | 543 | 460 | 204 | 1054 | 507 | 333 | 670 | 659 |
| V/C Ratio(X) | 0.81 | 0.00 | 0.95 | 1.23 | 0.59 | 0.11 | 0.99 | 0.79 | 0.79 | 0.54 | 1.57 | 1.60 |
| Avail Cap(c_a), veh/h | 289 | 0 | 582 | 74 | 543 | 460 | 204 | 1421 | 683 | 333 | 670 | 659 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 54.1 | 0.0 | 39.4 | 56.9 | 36.2 | 11.6 | 52.2 | 39.5 | 39.5 | 42.9 | 38.2 | 38.2 |
| Incr Delay (d2), s/veh | 11.2 | 0.0 | 26.0 | 180.4 | 1.7 | 0.1 | 59.7 | 2.2 | 4.5 | 1.8 | 263.5 | 275.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.4 | 0.0 | 19.0 | 5.9 | 8.1 | 1.0 | 9.1 | 10.9 | 10.8 | 4.7 | 67.2 | 68.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 65.3 | 0.0 | 65.4 | 237.3 | 37.9 | 11.7 | 111.9 | 41.7 | 44.0 | 44.7 | 301.7 | 313.5 |
| LnGrp LOS | E | | E | F | D | B | F | D | D | D | F | F |
| Approach Vol, veh/h | | 645 | | | 461 | | | 1435 | | | 2282 | |
| Approach Delay, s/veh | | 65.4 | | | 74.5 | | | 52.2 | | | 286.9 | |
| Approach LOS | | E | | | E | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 28.1 | 38.1 | 9.8 | 43.0 | 19.0 | 47.2 | 13.7 | 39.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 11.8 | 45.2 | 5.2 | 39.4 | 14.4 | 42.6 | 20.4 | 24.2 |
| Max Q Clear Time (g_c+I1), s | 13.4 | 26.5 | 7.2 | 37.8 | 16.2 | 44.6 | 9.2 | 19.5 |
| Green Ext Time (p_c), s | 0.0 | 7.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.2 | 0.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 167.1 |
| HCM 7th LOS | F |

| Lane Group | WBL | WBT | NBL | NBT | SBL | SBT | Ø4 |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 166 | 0 | 20 | 1178 | 486 | 1746 | |
| Future Volume (vph) | 166 | 0 | 20 | 1178 | 486 | 1746 | |
| Turn Type | Split | NA | Prot | NA | Prot | NA | |
| Protected Phases | 8 | 8 | 5 | 2 | 1 | 6 | 4 |
| Permitted Phases | | | | | | | |
| Detector Phase | 8 | 8 | 5 | 2 | 1 | 6 | |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 |
| Minimum Split (s) | 32.6 | 32.6 | 9.6 | 37.5 | 9.6 | 23.5 | 22.5 |
| Total Split (s) | 32.6 | 32.6 | 9.6 | 39.9 | 25.0 | 55.3 | 22.5 |
| Total Split (%) | 27.2% | 27.2% | 8.0% | 33.3% | 20.8% | 46.1% | 19% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | |
| Lead/Lag | | | Lead | Lag | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | Yes | |
| Recall Mode | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.9 | 14.9 | 5.1 | 30.5 | 20.7 | 52.5 | |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.06 | 0.38 | 0.26 | 0.65 | |
| v/c Ratio | 0.54 | 0.26 | 0.19 | 0.69 | 1.15 | 0.77 | |
| Control Delay (s/veh) | 36.5 | 0.9 | 44.9 | 23.5 | 121.5 | 15.5 | |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | |
| Total Delay (s/veh) | 36.5 | 0.9 | 44.9 | 23.5 | 121.5 | 15.5 | |
| LOS | D | A | D | C | F | B | |
| Approach Delay (s/veh) | | 17.7 | | 23.8 | | 38.6 | |
| Approach LOS | | B | | C | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 80.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.15 | |
| Intersection Signal Delay (s/veh): 31.7 | Intersection LOS: C |
| Intersection Capacity Utilization 76.9% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 37: Archibald Av. & Schaefer Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 166 | 0 | 185 | 20 | 1178 | 124 | 486 | 1746 | 0 |
| Future Volume (veh/h) | 0 | 0 | 0 | 166 | 0 | 185 | 20 | 1178 | 124 | 486 | 1746 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 0 | 0 | 169 | 0 | 181 | 20 | 1202 | 123 | 496 | 1782 | 0 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 0 | 3 | 0 | 264 | 0 | 248 | 39 | 1676 | 171 | 491 | 2217 | 0 |
| Arrive On Green | 0.00 | 0.00 | 0.00 | 0.16 | 0.00 | 0.16 | 0.02 | 0.36 | 0.36 | 0.29 | 0.62 | 0.00 |
| Sat Flow, veh/h | 0 | 1870 | 0 | 1688 | 0 | 1585 | 1688 | 4706 | 481 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 0 | 0 | 0 | 169 | 0 | 181 | 20 | 869 | 456 | 496 | 1782 | 0 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 0 | 1688 | 0 | 1585 | 1688 | 1702 | 1784 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 6.6 | 0.0 | 7.6 | 0.8 | 15.5 | 15.5 | 20.4 | 26.6 | 0.0 |
| Cycle Q Clear(g_c), s | 0.0 | 0.0 | 0.0 | 6.6 | 0.0 | 7.6 | 0.8 | 15.5 | 15.5 | 20.4 | 26.6 | 0.0 |
| Prop In Lane | 0.00 | | 0.00 | 1.00 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 0 | 3 | 0 | 264 | 0 | 248 | 39 | 1212 | 635 | 491 | 2217 | 0 |
| V/C Ratio(X) | 0.00 | 0.00 | 0.00 | 0.64 | 0.00 | 0.73 | 0.52 | 0.72 | 0.72 | 1.01 | 0.80 | 0.00 |
| Avail Cap(c_a), veh/h | 0 | 477 | 0 | 673 | 0 | 632 | 120 | 1712 | 897 | 491 | 2567 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.00 | 0.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 0.0 | 0.0 | 0.0 | 27.7 | 0.0 | 28.2 | 33.9 | 19.5 | 19.5 | 24.9 | 10.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 | 4.1 | 10.2 | 0.9 | 1.6 | 43.4 | 1.7 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 0.0 | 0.0 | 2.6 | 0.0 | 2.9 | 0.4 | 5.1 | 5.5 | 12.7 | 6.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 0.0 | 0.0 | 30.3 | 0.0 | 32.3 | 44.1 | 20.4 | 21.2 | 68.3 | 11.7 | 0.0 |
| LnGrp LOS | | | | C | | C | D | C | C | F | B | |
| Approach Vol, veh/h | | 0 | | | 350 | | | 1345 | | | 2278 | |
| Approach Delay, s/veh | | 0.0 | | | 31.3 | | | 21.0 | | | 24.0 | |
| Approach LOS | | | | | C | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.0 | 29.6 | | 0.0 | 6.2 | 48.4 | | 15.6 | | | | |
| Change Period (Y+Rc), s | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | | 4.6 | | | | |
| Max Green Setting (Gmax), s | 20.4 | 35.3 | | 17.9 | 5.0 | 50.7 | | 28.0 | | | | |
| Max Q Clear Time (g_c+I1), s | 22.4 | 17.5 | | 0.0 | 2.8 | 28.6 | | 9.6 | | | | |
| Green Ext Time (p_c), s | 0.0 | 7.5 | | 0.0 | 0.0 | 13.2 | | 1.4 | | | | |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 23.6 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 381 | 1561 | 526 | 652 | 1505 | 219 | 287 | 772 | 311 | 294 | 1184 | 403 |
| Future Volume (vph) | 381 | 1561 | 526 | 652 | 1505 | 219 | 287 | 772 | 311 | 294 | 1184 | 403 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 10.2 | 41.4 | | 15.0 | 46.2 | 46.2 | 16.0 | 42.6 | | 21.0 | 47.6 | 47.6 |
| Total Split (%) | 8.5% | 34.5% | | 12.5% | 38.5% | 38.5% | 13.3% | 35.5% | | 17.5% | 39.7% | 39.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 5.6 | 36.8 | 119.8 | 10.4 | 41.6 | 41.6 | 11.4 | 37.8 | 119.8 | 16.4 | 42.8 | 42.8 |
| Actuated g/C Ratio | 0.05 | 0.31 | 1.00 | 0.09 | 0.35 | 0.35 | 0.10 | 0.32 | 1.00 | 0.14 | 0.36 | 0.36 |
| v/c Ratio | 2.69 | 1.01 | 0.34 | 2.48 | 2.35 | 0.35 | 1.82 | 0.70 | 0.20 | 1.30 | 0.95 | 0.62 |
| Control Delay (s/veh) | 801.3 | 66.5 | 0.6 | 697.7 | 634.7 | 12.5 | 424.5 | 40.0 | 0.3 | 202.4 | 53.2 | 25.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 801.3 | 66.5 | 0.6 | 697.7 | 634.7 | 12.5 | 424.5 | 40.0 | 0.3 | 202.4 | 53.2 | 25.0 |
| LOS | F | E | A | F | F | B | F | D | A | F | D | C |
| Approach Delay (s/veh) | | 166.0 | | | 594.7 | | | 111.6 | | | 70.5 | |
| Approach LOS | | F | | | F | | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.8 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.69 | |
| Intersection Signal Delay (s/veh): 260.4 | Intersection LOS: F |
| Intersection Capacity Utilization 156.2% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

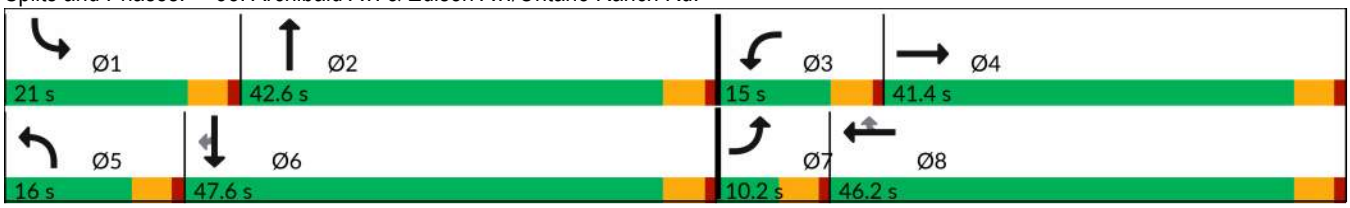

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 381 | 1561 | 526 | 652 | 1505 | 219 | 287 | 772 | 311 | 294 | 1184 | 403 |
| Future Volume (veh/h) | 381 | 1561 | 526 | 652 | 1505 | 219 | 287 | 772 | 311 | 294 | 1184 | 403 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 385 | 1577 | 0 | 659 | 1520 | 193 | 290 | 780 | 0 | 297 | 1196 | 398 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 145 | 1572 | | 269 | 651 | 551 | 161 | 1116 | | 232 | 1265 | 564 |
| Arrive On Green | 0.05 | 0.31 | 0.00 | 0.09 | 0.35 | 0.35 | 0.10 | 0.31 | 0.00 | 0.14 | 0.36 | 0.36 |
| Sat Flow, veh/h | 3092 | 5106 | 1585 | 3092 | 1870 | 1584 | 1688 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 385 | 1577 | 0 | 659 | 1520 | 193 | 290 | 780 | 0 | 297 | 1196 | 398 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1585 | 1546 | 1870 | 1584 | 1688 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 5.6 | 36.8 | 0.0 | 10.4 | 41.6 | 10.8 | 11.4 | 23.1 | 0.0 | 16.4 | 39.1 | 25.8 |
| Cycle Q Clear(g_c), s | 5.6 | 36.8 | 0.0 | 10.4 | 41.6 | 10.8 | 11.4 | 23.1 | 0.0 | 16.4 | 39.1 | 25.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 145 | 1572 | | 269 | 651 | 551 | 161 | 1116 | | 232 | 1265 | 564 |
| V/C Ratio(X) | 2.66 | 1.00 | | 2.45 | 2.34 | 0.35 | 1.80 | 0.70 | | 1.28 | 0.95 | 0.71 |
| Avail Cap(c_a), veh/h | 145 | 1572 | | 269 | 651 | 551 | 161 | 1130 | | 232 | 1278 | 570 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 57.0 | 41.4 | 0.0 | 54.6 | 39.0 | 28.9 | 54.1 | 36.0 | 0.0 | 51.6 | 37.4 | 33.1 |
| Incr Delay (d2), s/veh | 765.4 | 23.5 | 0.0 | 663.5 | 605.6 | 0.4 | 384.4 | 1.9 | 0.0 | 156.0 | 14.1 | 3.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 17.5 | 17.9 | 0.0 | 28.7 | 127.3 | 4.0 | 21.8 | 9.7 | 0.0 | 16.6 | 18.1 | 10.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 822.4 | 64.8 | 0.0 | 718.0 | 644.6 | 29.3 | 438.5 | 37.9 | 0.0 | 207.6 | 51.5 | 37.0 |
| LnGrp LOS | F | F | | F | F | C | F | D | | F | D | D |
| Approach Vol, veh/h | | 1962 | | | 2372 | | | 1070 | | | 1891 | |
| Approach Delay, s/veh | | 213.5 | | | 614.9 | | | 146.5 | | | 73.0 | |
| Approach LOS | | F | | | F | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.0 | 42.1 | 15.0 | 41.4 | 16.0 | 47.1 | 10.2 | 46.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.4 | 38.0 | 10.4 | 36.8 | 11.4 | 43.0 | 5.6 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 18.4 | 25.1 | 12.4 | 38.8 | 13.4 | 41.1 | 7.6 | 43.6 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 297.8 |
| HCM 7th LOS | F |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 298 | 642 | 298 | 173 | 309 | 89 | 184 | 973 | 215 | 189 | 1580 | 227 |
| Future Volume (vph) | 298 | 642 | 298 | 173 | 309 | 89 | 184 | 973 | 215 | 189 | 1580 | 227 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 44.8 | | 9.6 | 45.8 | 45.8 | 9.6 | 32.5 | 32.5 | 9.6 | 31.5 | 31.5 |
| Total Split (s) | 24.0 | 54.0 | | 15.8 | 45.8 | 45.8 | 10.0 | 37.8 | 37.8 | 12.4 | 40.2 | 40.2 |
| Total Split (%) | 20.0% | 45.0% | | 13.2% | 38.2% | 38.2% | 8.3% | 31.5% | 31.5% | 10.3% | 33.5% | 33.5% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.3 | 25.8 | 97.2 | 11.3 | 22.8 | 22.8 | 5.5 | 33.6 | 33.6 | 7.9 | 36.0 | 36.0 |
| Actuated g/C Ratio | 0.15 | 0.27 | 1.00 | 0.12 | 0.23 | 0.23 | 0.06 | 0.35 | 0.35 | 0.08 | 0.37 | 0.37 |
| v/c Ratio | 0.67 | 0.68 | 0.20 | 0.93 | 0.37 | 0.20 | 1.09 | 0.53 | 0.33 | 0.77 | 1.21 | 0.35 |
| Control Delay (s/veh) | 47.8 | 35.1 | 0.3 | 94.4 | 32.2 | 2.2 | 139.3 | 28.1 | 5.4 | 66.4 | 128.9 | 12.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 47.8 | 35.1 | 0.3 | 94.4 | 32.2 | 2.2 | 139.3 | 28.1 | 5.4 | 66.4 | 128.9 | 12.5 |
| LOS | D | D | A | F | C | A | F | C | A | E | F | B |
| Approach Delay (s/veh) | | 29.8 | | | 46.4 | | | 39.5 | | | 109.8 | |
| Approach LOS | | C | | | D | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 97.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.21 | |
| Intersection Signal Delay (s/veh): 65.0 | Intersection LOS: E |
| Intersection Capacity Utilization 92.7% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 39: Archibald Av. & Merrill Av.

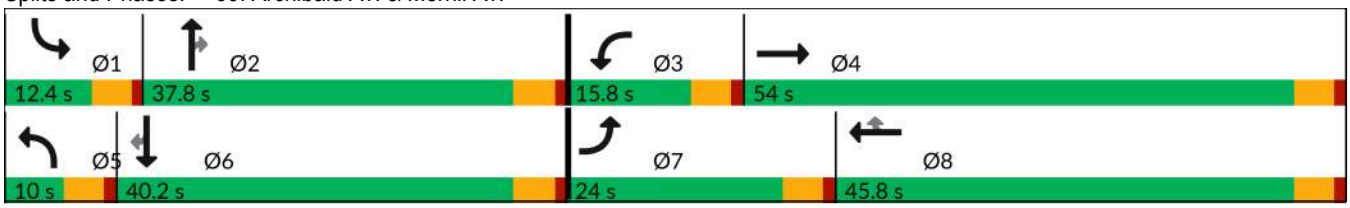

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 298 | 642 | 298 | 173 | 309 | 89 | 184 | 973 | 215 | 189 | 1580 | 227 |
| Future Volume (veh/h) | 298 | 642 | 298 | 173 | 309 | 89 | 184 | 973 | 215 | 189 | 1580 | 227 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 314 | 676 | 0 | 182 | 325 | 63 | 194 | 1024 | 192 | 199 | 1663 | 186 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 397 | 893 | | 204 | 879 | 365 | 186 | 2019 | 562 | 262 | 1436 | 608 |
| Arrive On Green | 0.12 | 0.24 | 0.00 | 0.12 | 0.23 | 0.23 | 0.06 | 0.36 | 0.36 | 0.08 | 0.38 | 0.38 |
| Sat Flow, veh/h | 3188 | 3741 | 1585 | 1688 | 3741 | 1555 | 3188 | 5611 | 1563 | 3188 | 3741 | 1585 |
| Grp Volume(v), veh/h | 314 | 676 | 0 | 182 | 325 | 63 | 194 | 1024 | 192 | 199 | 1663 | 186 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1585 | 1688 | 1870 | 1555 | 1594 | 1870 | 1563 | 1594 | 1870 | 1585 |
| Q Serve(g_s), s | 8.9 | 15.6 | 0.0 | 9.9 | 6.8 | 3.0 | 5.4 | 13.3 | 8.3 | 5.7 | 35.6 | 7.6 |
| Cycle Q Clear(g_c), s | 8.9 | 15.6 | 0.0 | 9.9 | 6.8 | 3.0 | 5.4 | 13.3 | 8.3 | 5.7 | 35.6 | 7.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 397 | 893 | | 204 | 879 | 365 | 186 | 2019 | 562 | 262 | 1436 | 608 |
| V/C Ratio(X) | 0.79 | 0.76 | | 0.89 | 0.37 | 0.17 | 1.05 | 0.51 | 0.34 | 0.76 | 1.16 | 0.31 |
| Avail Cap(c_a), veh/h | 667 | 1992 | | 204 | 1662 | 691 | 186 | 2019 | 562 | 268 | 1436 | 608 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.4 | 32.8 | 0.0 | 40.2 | 29.7 | 28.3 | 43.7 | 23.3 | 21.7 | 41.7 | 28.6 | 19.9 |
| Incr Delay (d2), s/veh | 3.6 | 1.3 | 0.0 | 35.4 | 0.3 | 0.2 | 78.5 | 0.2 | 0.4 | 11.6 | 79.4 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.5 | 6.8 | 0.0 | 5.9 | 2.9 | 1.1 | 4.0 | 5.2 | 2.9 | 2.5 | 29.7 | 2.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 43.0 | 34.1 | 0.0 | 75.6 | 30.0 | 28.5 | 122.2 | 23.5 | 22.0 | 53.3 | 108.0 | 20.2 |
| LnGrp LOS | D | C | | E | C | C | F | C | C | D | F | C |
| Approach Vol, veh/h | | 990 | | | 570 | | | 1410 | | | 2048 | |
| Approach Delay, s/veh | | 36.9 | | | 44.4 | | | 36.9 | | | 94.7 | |
| Approach LOS | | D | | | D | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.2 | 38.0 | 15.8 | 26.8 | 10.0 | 40.2 | 16.2 | 26.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 7.8 | 33.2 | 11.2 | 49.4 | 5.4 | 35.6 | 19.4 | 41.2 |
| Max Q Clear Time (g_c+I1), s | 7.7 | 15.3 | 11.9 | 17.6 | 7.4 | 37.6 | 10.9 | 8.8 |
| Green Ext Time (p_c), s | 0.0 | 6.6 | 0.0 | 4.6 | 0.0 | 0.0 | 0.7 | 2.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 61.3 |
| HCM 7th LOS | E |

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 313 | 890 | 167 | 414 | 876 | 663 | 144 | 964 | 345 | 738 | 1222 | 350 |
| Future Volume (vph) | 313 | 890 | 167 | 414 | 876 | 663 | 144 | 964 | 345 | 738 | 1222 | 350 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 14.6 | 14.6 | 9.6 | 41.6 | 9.6 | 9.6 | 41.6 | 9.6 | 9.6 | 41.6 | 41.6 |
| Total Split (s) | 13.0 | 38.6 | 38.6 | 16.0 | 41.6 | 14.0 | 14.0 | 51.4 | 16.0 | 14.0 | 51.4 | 51.4 |
| Total Split (%) | 10.8% | 32.2% | 32.2% | 13.3% | 34.7% | 11.7% | 11.7% | 42.8% | 13.3% | 11.7% | 42.8% | 42.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 11.0 | 32.8 | 32.8 | 11.5 | 33.3 | 42.7 | 8.6 | 38.0 | 49.5 | 9.5 | 38.9 | 38.9 |
| Actuated g/C Ratio | 0.10 | 0.30 | 0.30 | 0.10 | 0.30 | 0.39 | 0.08 | 0.34 | 0.45 | 0.09 | 0.35 | 0.35 |
| v/c Ratio | 1.08 | 0.89 | 0.31 | 1.37 | 0.86 | 0.63 | 0.64 | 0.83 | 0.48 | 2.95 | 0.72 | 0.54 |
| Control Delay (s/veh) | 122.0 | 49.5 | 11.1 | 222.0 | 46.2 | 18.2 | 63.6 | 39.9 | 15.2 | 908.9 | 33.5 | 14.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 122.0 | 49.5 | 11.1 | 222.0 | 46.2 | 18.2 | 63.6 | 39.9 | 15.2 | 908.9 | 33.5 | 14.7 |
| LOS | F | D | B | F | D | B | E | D | B | F | C | B |
| Approach Delay (s/veh) | | 61.4 | | | 74.0 | | | 36.4 | | | 310.4 | |
| Approach LOS | | E | | | E | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 110.3 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.95 | |
| Intersection Signal Delay (s/veh): 140.9 | Intersection LOS: F |
| Intersection Capacity Utilization 103.3% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 313 | 890 | 167 | 414 | 876 | 663 | 144 | 964 | 345 | 738 | 1222 | 350 |
| Future Volume (veh/h) | 313 | 890 | 167 | 414 | 876 | 663 | 144 | 964 | 345 | 738 | 1222 | 350 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 329 | 937 | 102 | 436 | 922 | 382 | 152 | 1015 | 186 | 777 | 1286 | 184 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 290 | 1049 | 468 | 327 | 1091 | 1098 | 206 | 1211 | 701 | 270 | 1846 | 573 |
| Arrive On Green | 0.09 | 0.30 | 0.30 | 0.11 | 0.31 | 0.31 | 0.07 | 0.34 | 0.34 | 0.09 | 0.36 | 0.36 |
| Sat Flow, veh/h | 3092 | 3554 | 1585 | 3092 | 3554 | 2782 | 3092 | 3554 | 1564 | 3092 | 5106 | 1584 |
| Grp Volume(v), veh/h | 329 | 937 | 102 | 436 | 922 | 382 | 152 | 1015 | 186 | 777 | 1286 | 184 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1777 | 1585 | 1546 | 1777 | 1391 | 1546 | 1777 | 1564 | 1546 | 1702 | 1584 |
| Q Serve(g_s), s | 10.1 | 27.2 | 5.2 | 11.4 | 26.1 | 6.6 | 5.2 | 28.4 | 8.0 | 9.4 | 23.1 | 6.5 |
| Cycle Q Clear(g_c), s | 10.1 | 27.2 | 5.2 | 11.4 | 26.1 | 6.6 | 5.2 | 28.4 | 8.0 | 9.4 | 23.1 | 6.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 290 | 1049 | 468 | 327 | 1091 | 1098 | 206 | 1211 | 701 | 270 | 1846 | 573 |
| V/C Ratio(X) | 1.13 | 0.89 | 0.22 | 1.33 | 0.84 | 0.35 | 0.74 | 0.84 | 0.27 | 2.88 | 0.70 | 0.32 |
| Avail Cap(c_a), veh/h | 290 | 1122 | 501 | 327 | 1221 | 1199 | 270 | 1545 | 848 | 270 | 2219 | 688 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.8 | 36.3 | 28.6 | 48.1 | 34.9 | 10.3 | 49.3 | 32.7 | 18.7 | 49.1 | 29.3 | 12.8 |
| Incr Delay (d2), s/veh | 94.2 | 9.0 | 0.2 | 168.8 | 5.1 | 0.2 | 4.7 | 3.4 | 0.2 | 855.4 | 0.8 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.6 | 12.5 | 1.9 | 11.9 | 11.5 | 2.3 | 2.0 | 11.7 | 2.8 | 35.5 | 8.8 | 3.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 143.0 | 45.3 | 28.8 | 217.0 | 40.0 | 10.5 | 54.0 | 36.1 | 18.9 | 904.5 | 30.1 | 13.2 |
| LnGrp LOS | F | D | C | F | D | B | D | D | B | F | C | B |
| Approach Vol, veh/h | | 1368 | | | 1740 | | | 1353 | | | 2247 | |
| Approach Delay, s/veh | | 67.6 | | | 77.9 | | | 35.8 | | | 331.1 | |
| Approach LOS | | E | | | E | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.0 | 41.3 | 16.0 | 36.4 | 11.8 | 43.5 | 14.7 | 37.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.4 | 46.8 | 11.4 | 34.0 | 9.4 | 46.8 | 8.4 | 37.0 |
| Max Q Clear Time (g_c+I1), s | 11.4 | 30.4 | 13.4 | 29.2 | 7.2 | 25.1 | 12.1 | 28.1 |
| Green Ext Time (p_c), s | 0.0 | 6.3 | 0.0 | 2.6 | 0.0 | 9.1 | 0.0 | 4.8 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 152.1 |
| HCM 7th LOS | F |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 236 | 1808 | 40 | 58 | 2166 | 211 | 32 | 38 | 305 | 50 |
| Future Volume (vph) | 236 | 1808 | 40 | 58 | 2166 | 211 | 32 | 38 | 305 | 50 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 12.0 | 58.0 | 58.0 | 18.0 | 64.0 | 64.0 | 12.0 | 27.0 | 17.0 | 32.0 |
| Total Split (%) | 10.0% | 48.3% | 48.3% | 15.0% | 53.3% | 53.3% | 10.0% | 22.5% | 14.2% | 26.7% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.4 | 60.5 | 60.5 | 8.4 | 59.5 | 59.5 | 6.4 | 9.8 | 12.4 | 20.0 |
| Actuated g/C Ratio | 0.07 | 0.56 | 0.56 | 0.08 | 0.55 | 0.55 | 0.06 | 0.09 | 0.12 | 0.19 |
| v/c Ratio | 2.18 | 0.92 | 0.04 | 0.48 | 1.12 | 0.23 | 0.34 | 0.48 | 1.68 | 0.63 |
| Control Delay (s/veh) | 583.3 | 31.7 | 0.1 | 60.0 | 85.8 | 3.9 | 59.6 | 31.4 | 359.0 | 24.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 583.3 | 31.7 | 0.1 | 60.0 | 85.8 | 3.9 | 59.6 | 31.4 | 359.0 | 24.4 |
| LOS | F | C | A | E | F | A | E | C | F | C |
| Approach Delay (s/veh) | | 93.6 | | | 78.1 | | | 38.8 | | 205.4 |
| Approach LOS | | F | | | E | | | D | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 107.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.18 | |
| Intersection Signal Delay (s/veh): 97.1 | Intersection LOS: F |
| Intersection Capacity Utilization 112.8% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

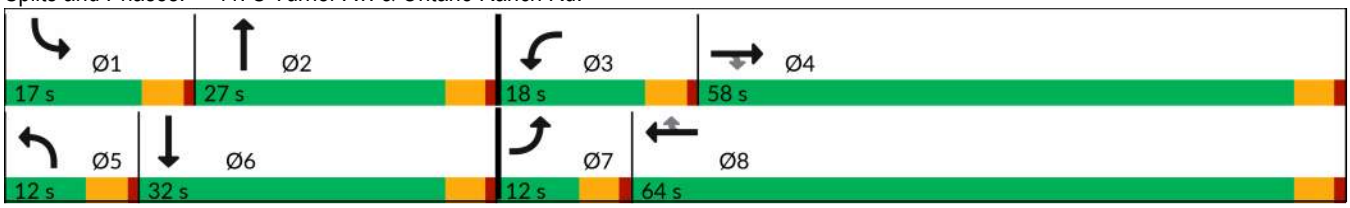

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 236 | 1808 | 40 | 58 | 2166 | 211 | 32 | 38 | 52 | 305 | 50 | 209 |
| Future Volume (veh/h) | 236 | 1808 | 40 | 58 | 2166 | 211 | 32 | 38 | 52 | 305 | 50 | 209 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 251 | 1923 | 39 | 62 | 2304 | 200 | 34 | 40 | 23 | 324 | 53 | 210 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 115 | 2135 | 905 | 79 | 2053 | 870 | 50 | 108 | 62 | 193 | 60 | 239 |
| Arrive On Green | 0.07 | 0.57 | 0.57 | 0.05 | 0.55 | 0.55 | 0.03 | 0.10 | 0.10 | 0.11 | 0.18 | 0.18 |
| Sat Flow, veh/h | 1688 | 3741 | 1585 | 1688 | 3741 | 1585 | 1688 | 1104 | 635 | 1688 | 330 | 1306 |
| Grp Volume(v), veh/h | 251 | 1923 | 39 | 62 | 2304 | 200 | 34 | 0 | 63 | 324 | 0 | 263 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 1870 | 1585 | 1688 | 0 | 1739 | 1688 | 0 | 1635 |
| Q Serve(g_s), s | 7.4 | 49.2 | 1.2 | 3.9 | 59.4 | 7.1 | 2.2 | 0.0 | 3.7 | 12.4 | 0.0 | 16.9 |
| Cycle Q Clear(g_c), s | 7.4 | 49.2 | 1.2 | 3.9 | 59.4 | 7.1 | 2.2 | 0.0 | 3.7 | 12.4 | 0.0 | 16.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.37 | 1.00 | | 0.80 |
| Lane Grp Cap(c), veh/h | 115 | 2135 | 905 | 79 | 2053 | 870 | 50 | 0 | 171 | 193 | 0 | 300 |
| V/C Ratio(X) | 2.18 | 0.90 | 0.04 | 0.79 | 1.12 | 0.23 | 0.68 | 0.00 | 0.37 | 1.68 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 115 | 2135 | 905 | 209 | 2053 | 870 | 115 | 0 | 360 | 193 | 0 | 414 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.4 | 20.5 | 10.2 | 51.1 | 24.4 | 12.6 | 52.0 | 0.0 | 45.7 | 47.9 | 0.0 | 43.0 |
| Incr Delay (d2), s/veh | 556.3 | 5.7 | 0.0 | 6.4 | 62.1 | 0.1 | 5.9 | 0.0 | 1.3 | 325.6 | 0.0 | 14.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 20.9 | 20.2 | 0.4 | 1.8 | 40.5 | 2.3 | 1.0 | 0.0 | 1.6 | 22.5 | 0.0 | 7.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 606.7 | 26.3 | 10.2 | 57.5 | 86.5 | 12.7 | 57.9 | 0.0 | 47.0 | 373.5 | 0.0 | 57.6 |
| LnGrp LOS | F | C | B | E | F | B | E | | D | F | | E |
| Approach Vol, veh/h | | 2213 | | | 2566 | | | 97 | | | 587 | |
| Approach Delay, s/veh | | 91.8 | | | 80.1 | | | 50.8 | | | 232.0 | |
| Approach LOS | | F | | | F | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 15.2 | 9.6 | 66.4 | 7.8 | 24.4 | 12.0 | 64.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 22.4 | 13.4 | 53.4 | 7.4 | 27.4 | 7.4 | 59.4 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 5.7 | 5.9 | 51.2 | 4.2 | 18.9 | 9.4 | 61.4 |
| Green Ext Time (p_c), s | 0.0 | 0.2 | 0.0 | 2.0 | 0.0 | 0.9 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 100.6 |
| HCM 7th LOS | F |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 426 | 1831 | 72 | 249 | 2056 | 332 | 97 | 247 | 116 | 419 | 419 | 202 |
| Future Volume (vph) | 426 | 1831 | 72 | 249 | 2056 | 332 | 97 | 247 | 116 | 419 | 419 | 202 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 16.6 | 33.7 | 33.7 | 17.4 | 34.5 | 34.5 | 10.6 | 48.2 | 48.2 | 20.7 | 58.3 | 58.3 |
| Total Split (%) | 13.8% | 28.1% | 28.1% | 14.5% | 28.8% | 28.8% | 8.8% | 40.2% | 40.2% | 17.3% | 48.6% | 48.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.1 | 30.7 | 30.7 | 11.7 | 30.2 | 30.2 | 6.1 | 21.0 | 21.0 | 16.3 | 31.2 | 31.2 |
| Actuated g/C Ratio | 0.12 | 0.31 | 0.31 | 0.12 | 0.31 | 0.31 | 0.06 | 0.21 | 0.21 | 0.17 | 0.32 | 0.32 |
| v/c Ratio | 2.16 | 1.20 | 0.13 | 0.71 | 1.09 | 0.49 | 0.98 | 0.65 | 0.27 | 1.57 | 0.74 | 0.33 |
| Control Delay (s/veh) | 558.8 | 128.7 | 0.5 | 54.6 | 81.9 | 6.1 | 134.0 | 42.1 | 4.9 | 305.4 | 37.3 | 4.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 558.8 | 128.7 | 0.5 | 54.6 | 81.9 | 6.1 | 134.0 | 42.1 | 4.9 | 305.4 | 37.3 | 4.4 |
| LOS | F | F | A | D | F | A | F | D | A | F | D | A |
| Approach Delay (s/veh) | | 203.4 | | | 69.8 | | | 52.1 | | | 138.9 | |
| Approach LOS | | F | | | E | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 98.2 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.16 | |
| Intersection Signal Delay (s/veh): 127.8 | Intersection LOS: F |
| Intersection Capacity Utilization 110.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 426 | 1831 | 72 | 249 | 2056 | 332 | 97 | 247 | 116 | 419 | 419 | 202 |
| Future Volume (veh/h) | 426 | 1831 | 72 | 249 | 2056 | 332 | 97 | 247 | 116 | 419 | 419 | 202 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 444 | 1907 | 58 | 259 | 2142 | 244 | 101 | 257 | 64 | 436 | 436 | 195 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 217 | 1754 | 542 | 324 | 2058 | 504 | 108 | 342 | 288 | 291 | 544 | 458 |
| Arrive On Green | 0.13 | 0.34 | 0.34 | 0.10 | 0.32 | 0.32 | 0.06 | 0.18 | 0.18 | 0.17 | 0.29 | 0.29 |
| Sat Flow, veh/h | 1688 | 5106 | 1578 | 3092 | 6434 | 1575 | 1688 | 1870 | 1575 | 1688 | 1870 | 1577 |
| Grp Volume(v), veh/h | 444 | 1907 | 58 | 259 | 2142 | 244 | 101 | 257 | 64 | 436 | 436 | 195 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1702 | 1578 | 1546 | 1609 | 1575 | 1688 | 1870 | 1575 | 1688 | 1870 | 1577 |
| Q Serve(g_s), s | 12.0 | 32.1 | 2.3 | 7.7 | 29.9 | 11.7 | 5.6 | 12.2 | 3.2 | 16.1 | 20.2 | 9.4 |
| Cycle Q Clear(g_c), s | 12.0 | 32.1 | 2.3 | 7.7 | 29.9 | 11.7 | 5.6 | 12.2 | 3.2 | 16.1 | 20.2 | 9.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 217 | 1754 | 542 | 324 | 2058 | 504 | 108 | 342 | 288 | 291 | 544 | 458 |
| V/C Ratio(X) | 2.05 | 1.09 | 0.11 | 0.80 | 1.04 | 0.48 | 0.93 | 0.75 | 0.22 | 1.50 | 0.80 | 0.43 |
| Avail Cap(c_a), veh/h | 217 | 1754 | 542 | 423 | 2058 | 504 | 108 | 872 | 734 | 291 | 1074 | 906 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 40.7 | 30.7 | 20.9 | 40.9 | 31.8 | 25.6 | 43.5 | 36.2 | 32.5 | 38.7 | 30.7 | 26.8 |
| Incr Delay (d2), s/veh | 488.0 | 49.4 | 0.1 | 6.0 | 31.4 | 0.7 | 64.4 | 3.4 | 0.4 | 242.3 | 2.8 | 0.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 34.1 | 19.8 | 0.8 | 3.0 | 14.8 | 4.0 | 4.2 | 5.6 | 1.2 | 25.9 | 8.9 | 3.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 528.7 | 80.0 | 21.0 | 46.9 | 63.2 | 26.3 | 107.9 | 39.5 | 32.9 | 281.0 | 33.5 | 27.5 |
| LnGrp LOS | F | F | C | D | F | C | F | D | C | F | C | C |
| Approach Vol, veh/h | | 2409 | | | 2645 | | | 422 | | | 1067 | |
| Approach Delay, s/veh | | 161.3 | | | 58.2 | | | 54.9 | | | 133.5 | |
| Approach LOS | | F | | | E | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.7 | 21.7 | 14.4 | 36.7 | 10.6 | 31.8 | 16.6 | 34.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.1 | 43.6 | 12.8 | 29.1 | 6.0 | 53.7 | 12.0 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 18.1 | 14.2 | 9.7 | 34.1 | 7.6 | 22.2 | 14.0 | 31.9 |
| Green Ext Time (p_c), s | 0.0 | 1.6 | 0.1 | 0.0 | 0.0 | 3.2 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 108.2 |
| HCM 7th LOS | F |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 345 | 1580 | 561 | 448 | 1790 | 266 | 678 | 509 | 340 | 366 | 691 | 286 |
| Future Volume (vph) | 345 | 1580 | 561 | 448 | 1790 | 266 | 678 | 509 | 340 | 366 | 691 | 286 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 11.7 | 48.5 | 48.5 | 13.0 | 49.8 | 49.8 | 12.0 | 47.5 | 47.5 | 11.0 | 46.5 | 46.5 |
| Total Split (%) | 9.8% | 40.4% | 40.4% | 10.8% | 41.5% | 41.5% | 10.0% | 39.6% | 39.6% | 9.2% | 38.8% | 38.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.1 | 44.1 | 44.1 | 8.4 | 45.4 | 45.4 | 7.4 | 30.5 | 30.5 | 6.4 | 29.5 | 29.5 |
| Actuated g/C Ratio | 0.07 | 0.41 | 0.41 | 0.08 | 0.42 | 0.42 | 0.07 | 0.28 | 0.28 | 0.06 | 0.27 | 0.27 |
| v/c Ratio | 1.80 | 0.80 | 0.80 | 1.97 | 1.27 | 0.38 | 3.38 | 0.37 | 0.67 | 2.12 | 0.75 | 0.57 |
| Control Delay (s/veh) | 406.5 | 32.6 | 29.6 | 479.7 | 154.9 | 12.2 | Error | 31.3 | 26.8 | 544.2 | 40.9 | 22.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 406.5 | 32.6 | 29.6 | 479.7 | 154.9 | 12.2 | Error | 31.3 | 26.8 | 544.2 | 40.9 | 22.0 |
| LOS | F | C | C | F | F | B | F | C | C | F | D | C |
| Approach Delay (s/veh) | | 83.8 | | | 197.9 | | | 505.6 | | | 174.0 | |
| Approach LOS | | F | | | F | | | F | | | F | |

### Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 107.9
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 3.38
Intersection Signal Delay (s/veh): 217.5 — Intersection LOS: F
Intersection Capacity Utilization 116.5% — ICU Level of Service H
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

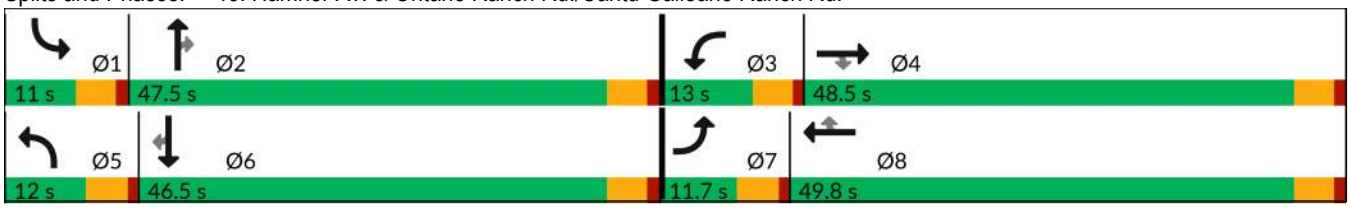

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 345 | 1580 | 561 | 448 | 1790 | 266 | 678 | 509 | 340 | 366 | 691 | 286 |
| Future Volume (veh/h) | 345 | 1580 | 561 | 448 | 1790 | 266 | 678 | 509 | 340 | 366 | 691 | 286 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 363 | 1663 | 494 | 472 | 1884 | 187 | 714 | 536 | 170 | 385 | 727 | 289 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 208 | 2124 | 659 | 246 | 1522 | 678 | 217 | 1376 | 419 | 187 | 924 | 406 |
| Arrive On Green | 0.07 | 0.42 | 0.42 | 0.08 | 0.43 | 0.43 | 0.07 | 0.27 | 0.27 | 0.06 | 0.26 | 0.26 |
| Sat Flow, veh/h | 3092 | 5106 | 1584 | 3092 | 3554 | 1583 | 3092 | 5106 | 1554 | 3092 | 3554 | 1563 |
| Grp Volume(v), veh/h | 363 | 1663 | 494 | 472 | 1884 | 187 | 714 | 536 | 170 | 385 | 727 | 289 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1584 | 1546 | 1777 | 1583 | 1546 | 1702 | 1554 | 1546 | 1777 | 1563 |
| Q Serve(g_s), s | 7.1 | 29.8 | 27.9 | 8.4 | 45.2 | 8.1 | 7.4 | 9.0 | 9.5 | 6.4 | 20.1 | 17.7 |
| Cycle Q Clear(g_c), s | 7.1 | 29.8 | 27.9 | 8.4 | 45.2 | 8.1 | 7.4 | 9.0 | 9.5 | 6.4 | 20.1 | 17.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 208 | 2124 | 659 | 246 | 1522 | 678 | 217 | 1376 | 419 | 187 | 924 | 406 |
| V/C Ratio(X) | 1.75 | 0.78 | 0.75 | 1.92 | 1.24 | 0.28 | 3.29 | 0.39 | 0.41 | 2.05 | 0.79 | 0.71 |
| Avail Cap(c_a), veh/h | 208 | 2124 | 659 | 246 | 1522 | 678 | 217 | 2076 | 632 | 187 | 1411 | 621 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.2 | 26.7 | 26.2 | 48.6 | 30.2 | 19.6 | 49.1 | 31.5 | 31.6 | 49.6 | 36.3 | 35.5 |
| Incr Delay (d2), s/veh | 354.5 | 2.0 | 4.8 | 427.9 | 112.9 | 0.2 | 1043.8 | 0.2 | 0.6 | 492.0 | 1.7 | 2.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.8 | 11.2 | 10.3 | 17.7 | 40.8 | 2.7 | 34.2 | 3.5 | 3.4 | 15.2 | 8.4 | 6.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 403.7 | 28.7 | 30.9 | 476.4 | 143.1 | 19.8 | 1092.9 | 31.6 | 32.3 | 541.6 | 38.0 | 37.8 |
| LnGrp LOS | F | C | C | F | F | B | F | C | C | F | D | D |
| Approach Vol, veh/h | | 2520 | | | 2543 | | | 1420 | | | 1401 | |
| Approach Delay, s/veh | | 83.1 | | | 195.9 | | | 565.3 | | | 176.4 | |
| Approach LOS | | F | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 33.0 | 13.0 | 48.5 | 12.0 | 32.0 | 11.7 | 49.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 42.9 | 8.4 | 43.9 | 7.4 | 41.9 | 7.1 | 45.2 |
| Max Q Clear Time (g_c+I1), s | 8.4 | 11.5 | 10.4 | 31.8 | 9.4 | 22.1 | 9.1 | 47.2 |
| Green Ext Time (p_c), s | 0.0 | 4.0 | 0.0 | 8.8 | 0.0 | 5.4 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 222.9 |
| HCM 7th LOS | F |

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 1894 | 119 | 1536 | 165 | 278 | 0 | 1554 |
| Future Volume (vph) | 1894 | 119 | 1536 | 165 | 278 | 0 | 1554 |
| Turn Type | NA | Perm | NA | Free | Perm | NA | Perm |
| Protected Phases | 2 | | 6 | | | 4 | |
| Permitted Phases | | 2 | | Free | 4 | | 4 |
| Detector Phase | 2 | 2 | 6 | | 4 | 4 | 4 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.5 | 22.5 | 22.5 | | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 55.0 | 55.0 | 55.0 | | 65.0 | 65.0 | 65.0 |
| Total Split (%) | 45.8% | 45.8% | 45.8% | | 54.2% | 54.2% | 54.2% |
| Yellow Time (s) | 5.5 | 5.5 | 5.5 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 6.5 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | C-Min | C-Min | C-Min | | Min | Min | Min |
| Act Effct Green (s) | 48.5 | 48.5 | 48.5 | 120.0 | 60.4 | 60.4 | 60.4 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.40 | 1.00 | 0.50 | 0.50 | 0.50 |
| v/c Ratio | 0.93 | 0.19 | 1.13 | 0.07 | 0.33 | 1.08 | 1.08 |
| Control Delay (s/veh) | 43.0 | 7.4 | 102.9 | 0.0 | 19.1 | 83.0 | 86.1 |
| Queue Delay | 0.2 | 0.0 | 0.0 | 0.0 | 0.1 | 10.1 | 0.0 |
| Total Delay (s/veh) | 43.2 | 7.4 | 102.9 | 0.0 | 19.2 | 93.0 | 86.1 |
| LOS | D | A | F | A | B | F | F |
| Approach Delay (s/veh) | 41.1 | | 92.9 | | | 79.9 | |
| Approach LOS | D | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 8.1 (7%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.13 | |
| Intersection Signal Delay (s/veh): 69.8 | Intersection LOS: E |
| Intersection Capacity Utilization 115.9% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

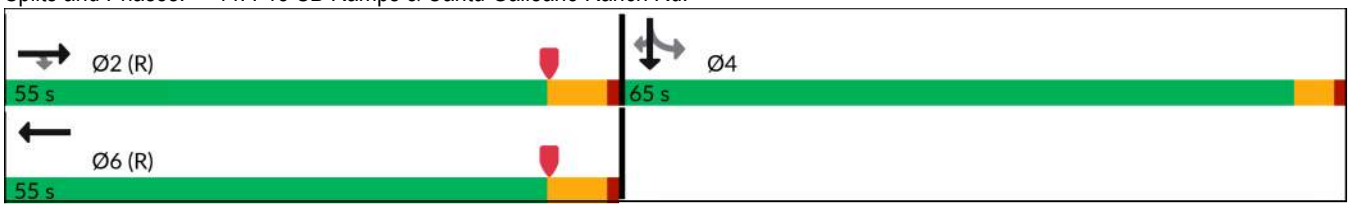

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 1894 | 119 | 0 | 1536 | 165 | 0 | 0 | 0 | 278 | 0 | 1554 |
| Future Volume (veh/h) | 0 | 1894 | 119 | 0 | 1536 | 165 | 0 | 0 | 0 | 278 | 0 | 1554 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | | | | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | | | | No | |
| Adj Sat Flow, veh/h/ln | 0 | 1870 | 1870 | 0 | 1870 | 1870 | | | | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 0 | 2104 | 0 | 0 | 1707 | 0 | | | | 206 | 0 | 1618 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | | | | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 0 | 2 | 2 | 0 | 2 | 2 | | | | 2 | 2 | 2 |
| Cap, veh/h | 0 | 2268 | | 0 | 1512 | | | | | 849 | 0 | 1596 |
| Arrive On Green | 0.00 | 0.40 | 0.00 | 0.00 | 0.81 | 0.00 | | | | 0.50 | 0.00 | 0.50 |
| Sat Flow, veh/h | 0 | 5611 | 1585 | 0 | 3741 | 2790 | | | | 1688 | 0 | 3170 |
| Grp Volume(v), veh/h | 0 | 2104 | 0 | 0 | 1707 | 0 | | | | 206 | 0 | 1618 |
| Grp Sat Flow(s),veh/h/ln | 0 | 1870 | 1585 | 0 | 1870 | 1395 | | | | 1688 | 0 | 1585 |
| Q Serve(g_s), s | 0.0 | 42.9 | 0.0 | 0.0 | 48.5 | 0.0 | | | | 8.3 | 0.0 | 60.4 |
| Cycle Q Clear(g_c), s | 0.0 | 42.9 | 0.0 | 0.0 | 48.5 | 0.0 | | | | 8.3 | 0.0 | 60.4 |
| Prop In Lane | 0.00 | | 1.00 | 0.00 | | 1.00 | | | | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 0 | 2268 | | 0 | 1512 | | | | | 849 | 0 | 1596 |
| V/C Ratio(X) | 0.00 | 0.93 | | 0.00 | 1.13 | | | | | 0.24 | 0.00 | 1.01 |
| Avail Cap(c_a), veh/h | 0 | 2268 | | 0 | 1512 | | | | | 849 | 0 | 1596 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | | | | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 0.00 | 0.11 | 0.00 | 0.00 | 0.53 | 0.00 | | | | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 0.0 | 34.1 | 0.0 | 0.0 | 11.5 | 0.0 | | | | 16.9 | 0.0 | 29.8 |
| Incr Delay (d2), s/veh | 0.0 | 1.1 | 0.0 | 0.0 | 63.2 | 0.0 | | | | 0.1 | 0.0 | 26.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.0 | 18.0 | 0.0 | 0.0 | 17.7 | 0.0 | | | | 3.1 | 0.0 | 26.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 0.0 | 35.2 | 0.0 | 0.0 | 74.7 | 0.0 | | | | 17.0 | 0.0 | 55.9 |
| LnGrp LOS | | D | | | F | | | | | B | | F |
| Approach Vol, veh/h | | 2104 | | | 1707 | | | | | | 1824 | |
| Approach Delay, s/veh | | 35.2 | | | 74.7 | | | | | | 51.5 | |
| Approach LOS | | D | | | E | | | | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 55.0 | 65.0 | 55.0 |
| Change Period (Y+Rc), s | 6.5 | 4.6 | 6.5 |
| Max Green Setting (Gmax), s | 48.5 | 60.4 | 48.5 |
| Max Q Clear Time (g_c+I1), s | 44.9 | 62.4 | 50.5 |
| Green Ext Time (p_c), s | 3.2 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 52.4 |
| HCM 7th LOS | D |

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 674 | 1433 | 186 | 692 | 1180 | 136 |
| Future Volume (vph) | 674 | 1433 | 186 | 692 | 1180 | 136 |
| Turn Type | NA | Perm | Prot | NA | Prot | Perm |
| Protected Phases | 2 | | 1 | 6 | 8 | |
| Permitted Phases | | 2 | | | | 8 |
| Detector Phase | 2 | 2 | 1 | 6 | 8 | 8 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 61.3 | 61.3 | 11.0 | 22.5 | 22.5 | 22.5 |
| Total Split (s) | 62.0 | 62.0 | 11.0 | 73.0 | 47.0 | 47.0 |
| Total Split (%) | 51.7% | 51.7% | 9.2% | 60.8% | 39.2% | 39.2% |
| Yellow Time (s) | 5.5 | 5.5 | 3.6 | 5.5 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.5 | 6.5 | 4.6 | 6.5 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lead | | | |
| Lead-Lag Optimize? | Yes | Yes | Yes | | | |
| Recall Mode | C-Min | C-Min | None | C-Min | None | None |
| Act Effct Green (s) | 55.5 | 55.5 | 6.4 | 66.5 | 42.4 | 42.4 |
| Actuated g/C Ratio | 0.46 | 0.46 | 0.05 | 0.55 | 0.35 | 0.35 |
| v/c Ratio | 0.28 | 1.26 | 1.20 | 0.24 | 1.09 | 0.21 |
| Control Delay (s/veh) | 7.9 | 148.4 | 182.0 | 14.0 | 93.0 | 8.4 |
| Queue Delay | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.9 | 148.7 | 182.0 | 14.0 | 93.0 | 8.4 |
| LOS | A | F | F | B | F | A |
| Approach Delay (s/veh) | 103.6 | | | 49.6 | 85.2 | |
| Approach LOS | F | | | D | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Offset: 15.4 (13%), Referenced to phase 2:EBT and 6:WBT, Start of Yellow | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.26 | |
| Intersection Signal Delay (s/veh): 87.0 | Intersection LOS: F |
| Intersection Capacity Utilization 103.9% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 45: I-15 NB Ramps & Cantu Galleano Ranch Rd.

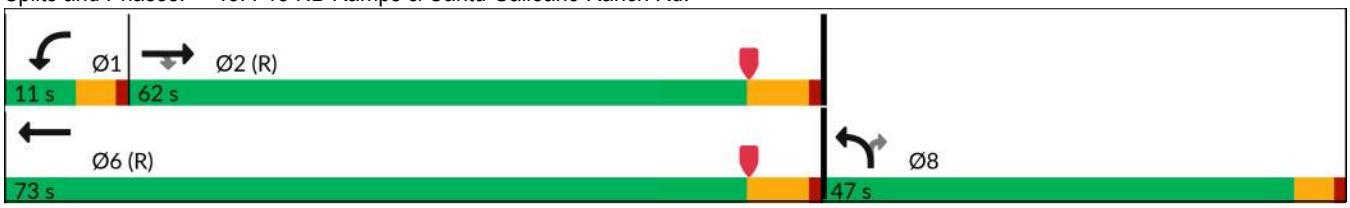

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 674 | 1433 | 186 | 692 | 1180 | 136 |
| Future Volume (veh/h) | 674 | 1433 | 186 | 692 | 1180 | 136 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | 0.98 | 1.00 | | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | No | | | No | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1673 | 1870 | 1772 | 1870 |
| Adj Flow Rate, veh/h | 733 | 797 | 202 | 752 | 1283 | 88 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 2595 | 718 | 170 | 3109 | 1193 | 560 |
| Arrive On Green | 0.77 | 0.77 | 0.05 | 0.55 | 0.53 | 0.53 |
| Sat Flow, veh/h | 5611 | 1552 | 3188 | 5611 | 3375 | 1585 |
| Grp Volume(v), veh/h | 733 | 797 | 202 | 752 | 1283 | 88 |
| Grp Sat Flow(s),veh/h/ln | 1870 | 1552 | 1594 | 1870 | 1688 | 1585 |
| Q Serve(g_s), s | 4.6 | 55.5 | 6.4 | 8.3 | 42.4 | 3.4 |
| Cycle Q Clear(g_c), s | 4.6 | 55.5 | 6.4 | 8.3 | 42.4 | 3.4 |
| Prop In Lane | | 1.00 | 1.00 | | 1.00 | 1.00 |
| Lane Grp Cap(c), veh/h | 2595 | 718 | 170 | 3109 | 1193 | 560 |
| V/C Ratio(X) | 0.28 | 1.11 | 1.19 | 0.24 | 1.08 | 0.16 |
| Avail Cap(c_a), veh/h | 2595 | 718 | 170 | 3109 | 1193 | 560 |
| HCM Platoon Ratio | 1.67 | 1.67 | 1.00 | 1.00 | 1.50 | 1.50 |
| Upstream Filter(I) | 0.39 | 0.39 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 7.9 | 13.7 | 56.8 | 13.8 | 28.2 | 19.0 |
| Incr Delay (d2), s/veh | 0.1 | 58.0 | 128.7 | 0.2 | 49.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.5 | 16.8 | 5.5 | 3.2 | 21.2 | 1.2 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 8.0 | 71.7 | 185.5 | 14.0 | 77.2 | 19.2 |
| LnGrp LOS | A | F | F | B | F | B |
| Approach Vol, veh/h | 1530 | | | 954 | 1371 | |
| Approach Delay, s/veh | 41.2 | | | 50.3 | 73.5 | |
| Approach LOS | D | | | D | E | |

| Timer - Assigned Phs | 1 | 2 | | | | 6 | 8 |
|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.0 | 62.0 | | | | 73.0 | 47.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | | | 6.5 | 4.6 |
| Max Green Setting (Gmax), s | 6.4 | 55.5 | | | | 66.5 | 42.4 |
| Max Q Clear Time (g_c+I1), s | 8.4 | 57.5 | | | | 10.3 | 44.4 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | | | 5.1 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 54.9 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

# APPENDIX 7.3:

# HORIZON YEAR (2050) WITHOUT PROJECT SIGNAL WARRANT ANALYSIS

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# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **HY (2050) Without Project Conditions - Weekday PM Peak Hour**

Major Street Name = **Bon View Av.**

Total of Both Approaches (VPH) = **788**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Schaefer Av.**

High Volume Approach (VPH) = **200**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

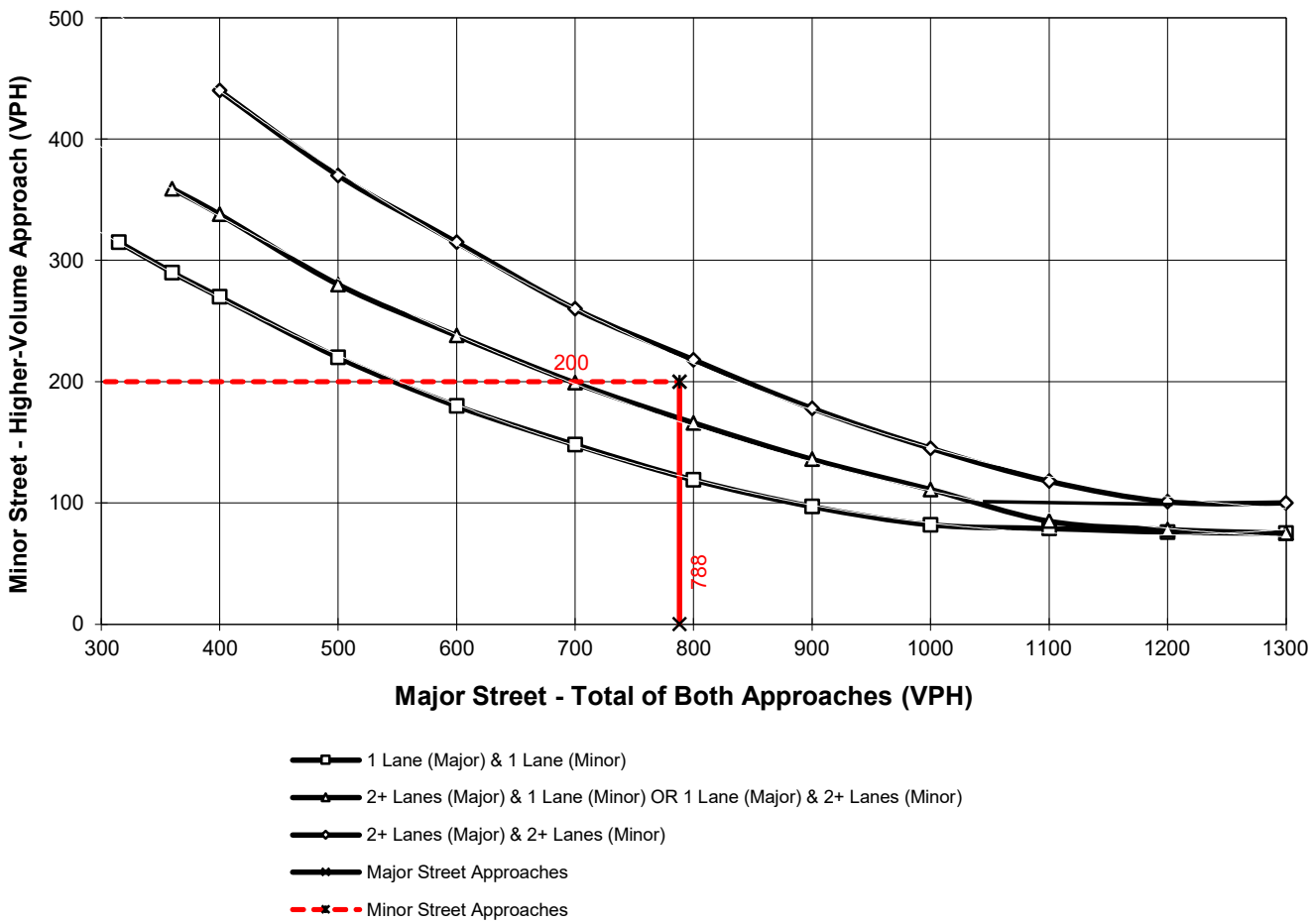


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

**(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)**

Traffic Conditions = **HY (2050) NP Conditions - Weekday PM Peak Hour**

Major Street Name = **Eucalyptus Av.**
Total of Both Approaches (VPH) = **953**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Bon View Av.**
High Volume Approach (VPH) = **200**
Number of Approach Lanes Minor Street = **1**

**WARRANTED FOR A SIGNAL**

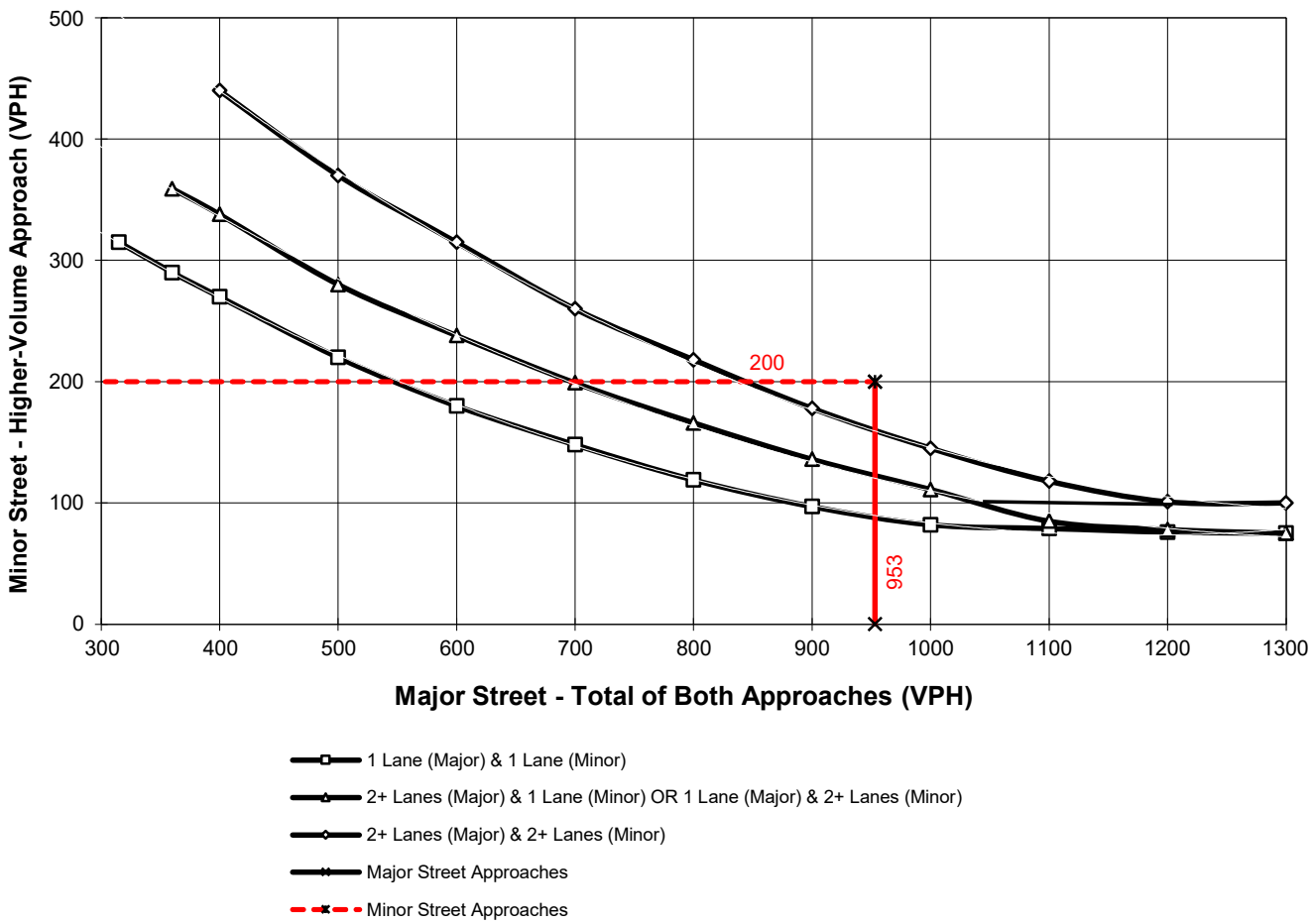


*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

# APPENDIX 7.4:

# HORIZON YEAR (2050) WITHOUT PROJECT OFF-RAMP QUEUING ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 319 | 299 | 293 | 314 | 1414 | 1498 | 542 |
| v/c Ratio | 0.85 | 0.79 | 0.69 | 0.84 | 0.64 | 1.25 | 0.66 |
| Control Delay (s/veh) | 55.0 | 43.3 | 29.7 | 42.5 | 14.6 | 146.7 | 10.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.0 | 43.3 | 29.7 | 42.5 | 14.9 | 146.7 | 10.2 |
| Queue Length 50th (ft) | 181 | 147 | 104 | 195 | 232 | ~595 | 43 |
| Queue Length 95th (ft) | #327 | #284 | 200 | m182 | m212 | #730 | 157 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 389 | 391 | 437 | 405 | 2194 | 1203 | 816 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 277 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.76 | 0.67 | 0.78 | 0.74 | 1.25 | 0.66 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 475 | 1 | 230 | 1106 | 442 | 456 | 1247 |
| v/c Ratio | 1.11 | no cap | 0.49 | 1.13 | 0.59 | 1.01 | 0.59 |
| Control Delay (s/veh) | 110.4 | | 20.6 | 101.6 | 6.3 | 64.5 | 12.3 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 110.4 | Error | 20.6 | 101.6 | 6.3 | 64.5 | 12.6 |
| Queue Length 50th (ft) | ~312 | 0 | 64 | ~386 | 0 | ~288 | 167 |
| Queue Length 95th (ft) | #499 | 0 | 134 | #513 | 72 | m253 | m146 |
| Internal Link Dist (ft) | | 1421 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 428 | 1 | 473 | 983 | 748 | 452 | 2123 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 298 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.11 | 1.00 | 0.49 | 1.13 | 0.59 | 1.01 | 0.68 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1005 | 800 | 1030 | 60 | 784 |
| v/c Ratio | 0.98 | 1.15 | 0.39 | 0.14 | 1.01 |
| Control Delay (s/veh) | 53.6 | 113.2 | 4.7 | 39.2 | 42.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 53.6 | 113.2 | 4.7 | 39.2 | 42.8 |
| Queue Length 50th (ft) | 285 | ~603 | 98 | 17 | ~95 |
| Queue Length 95th (ft) | #437 | #817 | 123 | 36 | #349 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1633 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 1028 | 695 | 2668 | 414 | 780 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.98 | 1.15 | 0.39 | 0.14 | 1.01 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 727 | 207 | 327 | 69 | 301 | 344 | 342 | 59 |
| v/c Ratio | 0.74 | 0.84 | 0.20 | 0.43 | 0.77 | 0.85 | 0.79 | 0.12 |
| Control Delay (s/veh) | 39.3 | 67.1 | 13.6 | 51.0 | 22.1 | 54.2 | 47.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.3 | 67.1 | 13.6 | 51.0 | 22.1 | 54.2 | 47.7 | 0.5 |
| Queue Length 50th (ft) | 234 | 128 | 67 | 42 | 20 | 211 | 206 | 0 |
| Queue Length 95th (ft) | #323 | #252 | 100 | 83 | #102 | #313 | 265 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 987 | 253 | 1676 | 186 | 413 | 461 | 493 | 556 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.74 | 0.82 | 0.20 | 0.37 | 0.73 | 0.75 | 0.69 | 0.11 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 193 | 629 | 357 | 1478 | 840 | 584 |
| v/c Ratio | 0.40 | 1.26 | 0.88 | 0.69 | 0.81 | 0.67 |
| Control Delay (s/veh) | 30.6 | 157.5 | 46.2 | 12.3 | 37.0 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.6 | 157.5 | 46.2 | 13.1 | 37.0 | 6.6 |
| Queue Length 50th (ft) | 91 | ~417 | 222 | 222 | 235 | 0 |
| Queue Length 95th (ft) | 155 | #628 | m199 | m197 | #334 | 85 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 477 | 501 | 450 | 2170 | 1043 | 878 |
| Starvation Cap Reductn | 0 | 0 | 0 | 359 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.40 | 1.26 | 0.79 | 0.82 | 0.81 | 0.67 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 529 | 141 | 1564 | 327 | 660 |
| v/c Ratio | 0.99 | 0.25 | 1.21 | 1.47 | 0.33 |
| Control Delay (s/veh) | 71.0 | 5.5 | 129.5 | 261.8 | 10.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 71.0 | 5.5 | 129.5 | 261.8 | 10.4 |
| Queue Length 50th (ft) | 298 | 0 | ~572 | ~270 | 65 |
| Queue Length 95th (ft) | #508 | 41 | #710 | m#381 | m111 |
| Internal Link Dist (ft) | 1339 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 532 | 573 | 1292 | 223 | 1981 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.99 | 0.25 | 1.21 | 1.47 | 0.33 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 284 | 271 | 264 | 720 | 1443 | 672 | 114 |
| v/c Ratio | 0.73 | 0.66 | 0.59 | 0.84 | 0.45 | 0.36 | 0.21 |
| Control Delay (s/veh) | 44.8 | 32.7 | 24.5 | 39.1 | 6.2 | 26.3 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay (s/veh) | 44.8 | 32.7 | 24.5 | 39.1 | 6.3 | 26.3 | 5.7 |
| Queue Length 50th (ft) | 148 | 109 | 77 | 212 | 57 | 95 | 0 |
| Queue Length 95th (ft) | #328 | #269 | #202 | #314 | 81 | 100 | 34 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 387 | 409 | 444 | 858 | 3457 | 2435 | 663 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 648 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.73 | 0.66 | 0.59 | 0.84 | 0.51 | 0.28 | 0.17 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 255 | 249 | 233 | 1676 | 671 | 199 | 734 |
| v/c Ratio | 0.78 | 0.71 | 0.47 | 0.50 | 0.59 | 0.74 | 0.22 |
| Control Delay (s/veh) | 50.0 | 38.0 | 7.5 | 14.8 | 3.4 | 69.0 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.0 | 38.0 | 7.5 | 14.8 | 3.4 | 69.0 | 0.7 |
| Queue Length 50th (ft) | 141 | 115 | 0 | 174 | 0 | 53 | 0 |
| Queue Length 95th (ft) | #231 | 204 | 60 | 204 | 52 | m#126 | 8 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 375 | 396 | 532 | 3362 | 1137 | 269 | 3379 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.63 | 0.44 | 0.50 | 0.59 | 0.74 | 0.22 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

## 44: I-15 SB Ramps & Cantu Galleano Ranch Rd.

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1491 | 645 | 151 | 256 | 743 | 745 |
| v/c Ratio | 0.70 | 0.45 | 0.05 | 0.29 | 0.85 | 0.86 |
| Control Delay (s/veh) | 34.3 | 44.1 | 0.0 | 16.2 | 31.5 | 32.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 34.3 | 44.1 | 0.0 | 16.2 | 31.5 | 32.1 |
| Queue Length 50th (ft) | 336 | 241 | 0 | 100 | 401 | 405 |
| Queue Length 95th (ft) | 400 | m291 | m0 | 145 | 570 | 577 |
| Internal Link Dist (ft) | 1992 | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | 180 | | | |
| Base Capacity (vph) | 2145 | 1430 | 2787 | 955 | 943 | 939 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.70 | 0.45 | 0.05 | 0.27 | 0.79 | 0.79 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 558 | 1035 | 274 | 346 | 591 | 268 |
| v/c Ratio | 0.18 | 0.88 | 0.73 | 0.09 | 0.87 | 0.50 |
| Control Delay (s/veh) | 7.1 | 35.0 | 62.6 | 5.6 | 60.1 | 8.5 |
| Queue Delay | 0.0 | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.1 | 36.6 | 62.6 | 5.6 | 60.1 | 8.5 |
| Queue Length 50th (ft) | 29 | 494 | 102 | 28 | 209 | 0 |
| Queue Length 95th (ft) | 29 | #546 | 148 | 32 | #331 | 74 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 3136 | 1183 | 407 | 4030 | 680 | 533 |
| Starvation Cap Reductn | 0 | 53 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.18 | 0.92 | 0.67 | 0.09 | 0.87 | 0.50 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 303 | 292 | 279 | 260 | 1337 | 1678 | 621 |
| v/c Ratio | 0.82 | 0.74 | 0.66 | 0.82 | 0.61 | 1.27 | 0.72 |
| Control Delay (s/veh) | 51.4 | 38.0 | 28.0 | 46.9 | 2.0 | 154.9 | 11.7 |
| Queue Delay | 59.1 | 58.9 | 0.0 | 0.0 | 1.3 | 0.1 | 0.0 |
| Total Delay (s/veh) | 110.4 | 96.9 | 28.0 | 46.9 | 3.2 | 155.0 | 11.7 |
| Queue Length 50th (ft) | 169 | 135 | 94 | 97 | 14 | ~672 | 61 |
| Queue Length 95th (ft) | #303 | #257 | 187 | m103 | m24 | #807 | 204 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 389 | 410 | 437 | 350 | 2202 | 1323 | 866 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 595 | 0 | 0 |
| Spillback Cap Reductn | 165 | 157 | 0 | 0 | 0 | 21 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.35 | 1.15 | 0.64 | 0.74 | 0.83 | 1.29 | 0.72 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 304 | 2 | 217 | 1168 | 421 | 472 | 1424 |
| v/c Ratio | 0.86 | no cap | 0.54 | 1.04 | 0.54 | 0.94 | 0.60 |
| Control Delay (s/veh) | 57.9 | | 22.7 | 69.6 | 5.5 | 26.6 | 20.5 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 22.6 |
| Total Delay (s/veh) | 57.9 | Error | 22.7 | 69.6 | 5.5 | 26.6 | 43.1 |
| Queue Length 50th (ft) | 164 | 0 | 60 | ~401 | 0 | 258 | 462 |
| Queue Length 95th (ft) | #295 | 0 | 130 | #528 | 67 | m232 | m353 |
| Internal Link Dist (ft) | | 1372 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 379 | 1 | 425 | 1125 | 777 | 513 | 2373 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 995 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 2.00 | 0.51 | 1.04 | 0.54 | 0.92 | 1.03 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1079 | 533 | 888 | 123 | 941 |
| v/c Ratio | 1.07 | 1.18 | 0.42 | 0.14 | 1.13 |
| Control Delay (s/veh) | 82.4 | 135.9 | 11.2 | 27.2 | 89.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 82.4 | 135.9 | 11.2 | 27.2 | 89.9 |
| Queue Length 50th (ft) | ~410 | ~409 | 145 | 29 | ~437 |
| Queue Length 95th (ft) | #517 | #612 | 187 | 52 | #680 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1637 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 1007 | 452 | 2137 | 875 | 833 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.07 | 1.18 | 0.42 | 0.14 | 1.13 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 465 | 81 | 229 | 42 | 150 | 396 | 406 | 88 |
| v/c Ratio | 0.42 | 0.54 | 0.15 | 0.28 | 0.54 | 0.81 | 0.77 | 0.15 |
| Control Delay (s/veh) | 30.7 | 57.2 | 13.8 | 46.8 | 14.7 | 44.3 | 41.1 | 1.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 30.7 | 57.2 | 13.8 | 46.8 | 14.7 | 44.3 | 41.1 | 1.2 |
| Queue Length 50th (ft) | 124 | 47 | 26 | 26 | 0 | 237 | 241 | 0 |
| Queue Length 95th (ft) | 194 | #105 | 61 | 57 | 57 | 331 | 331 | 7 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 1104 | 152 | 1508 | 301 | 407 | 534 | 572 | 620 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.42 | 0.53 | 0.15 | 0.14 | 0.37 | 0.74 | 0.71 | 0.14 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 195 | 248 | 229 | 789 | 1616 | 836 |
| v/c Ratio | 0.68 | 0.56 | 0.80 | 0.31 | 0.96 | 0.77 |
| Control Delay (s/veh) | 47.2 | 11.4 | 63.7 | 0.9 | 40.5 | 10.3 |
| Queue Delay | 5.6 | 0.0 | 0.0 | 0.0 | 2.8 | 0.0 |
| Total Delay (s/veh) | 52.8 | 11.4 | 63.7 | 0.9 | 43.3 | 10.3 |
| Queue Length 50th (ft) | 106 | 12 | 130 | 4 | ~472 | 55 |
| Queue Length 95th (ft) | 167 | 75 | m140 | m21 | #689 | 254 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 374 | 510 | 312 | 2509 | 1676 | 1085 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 124 | 0 | 0 | 0 | 34 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.78 | 0.49 | 0.73 | 0.31 | 0.98 | 0.77 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 306 | 188 | 979 | 664 | 1176 |
| v/c Ratio | 0.78 | 0.45 | 0.95 | 1.36 | 0.52 |
| Control Delay (s/veh) | 46.6 | 17.5 | 49.4 | 196.6 | 24.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 2.3 |
| Total Delay (s/veh) | 46.6 | 17.5 | 49.4 | 196.6 | 26.5 |
| Queue Length 50th (ft) | 165 | 44 | 273 | ~525 | 357 |
| Queue Length 95th (ft) | 231 | 95 | #405 | m#652 | m406 |
| Internal Link Dist (ft) | 1341 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 532 | 535 | 1029 | 487 | 2261 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 912 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.58 | 0.35 | 0.95 | 1.36 | 0.87 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 229 | 229 | 209 | 551 | 842 | 1885 | 410 |
| v/c Ratio | 0.75 | 0.73 | 0.47 | 0.95 | 0.24 | 0.68 | 0.48 |
| Control Delay (s/veh) | 50.0 | 46.0 | 9.2 | 56.1 | 1.2 | 22.4 | 7.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.0 | 46.0 | 9.2 | 56.1 | 1.2 | 22.4 | 7.5 |
| Queue Length 50th (ft) | 127 | 125 | 5 | 174 | 5 | 250 | 38 |
| Queue Length 95th (ft) | 207 | 207 | 64 | #265 | 21 | 302 | 115 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 357 | 365 | 490 | 583 | 3459 | 2786 | 848 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.64 | 0.63 | 0.43 | 0.95 | 0.24 | 0.68 | 0.48 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 184 | 281 | 281 | 1089 | 562 | 713 | 1584 |
| v/c Ratio | 0.53 | 0.81 | 0.70 | 0.53 | 0.64 | 0.83 | 0.48 |
| Control Delay (s/veh) | 36.3 | 47.4 | 30.6 | 25.8 | 5.6 | 53.2 | 3.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.3 | 47.4 | 30.6 | 25.8 | 5.6 | 53.2 | 3.2 |
| Queue Length 50th (ft) | 94 | 140 | 98 | 148 | 0 | 210 | 43 |
| Queue Length 95th (ft) | 165 | #275 | 193 | 162 | 64 | #367 | 25 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 387 | 381 | 436 | 2435 | 941 | 854 | 3355 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 173 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.74 | 0.64 | 0.45 | 0.60 | 0.83 | 0.50 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1940 | 1302 | 183 | 278 | 877 | 881 |
| v/c Ratio | 1.25 | 1.26 | 0.07 | 0.26 | 0.87 | 0.87 |
| Control Delay (s/veh) | 154.7 | 161.4 | 0.0 | 10.3 | 28.0 | 28.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.1 | 12.1 | 0.0 |
| Total Delay (s/veh) | 154.8 | 161.4 | 0.0 | 10.4 | 40.0 | 28.7 |
| Queue Length 50th (ft) | ~648 | ~671 | 0 | 85 | 477 | 484 |
| Queue Length 95th (ft) | #736 | m#761 | m0 | 127 | 718 | #731 |
| Internal Link Dist (ft) | 1992 | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | 180 | | | |
| Base Capacity (vph) | 1554 | 1036 | 2730 | 1081 | 1036 | 1032 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 9 | 0 | 0 | 161 | 152 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.26 | 1.26 | 0.07 | 0.30 | 0.99 | 0.85 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 700 | 1428 | 202 | 709 | 1122 | 133 |
| v/c Ratio | 0.27 | 1.16 | 1.12 | 0.23 | 0.96 | 0.21 |
| Control Delay (s/veh) | 9.5 | 104.8 | 152.3 | 13.7 | 56.3 | 6.3 |
| Queue Delay | 0.0 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 9.5 | 105.3 | 152.3 | 13.7 | 56.3 | 6.3 |
| Queue Length 50th (ft) | 40 | ~960 | ~95 | 89 | 418 | 5 |
| Queue Length 95th (ft) | m40 | m#951 | #171 | 110 | #556 | 47 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 2584 | 1233 | 181 | 3119 | 1186 | 639 |
| Starvation Cap Reductn | 0 | 119 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.27 | 1.28 | 1.12 | 0.23 | 0.95 | 0.21 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# APPENDIX 7.5:

# HORIZON YEAR (2050) WITH PROJECT OFF-RAMP QUEUING ANALYSIS

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| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 319 | 299 | 293 | 419 | 1456 | 1530 | 542 |
| v/c Ratio | 0.85 | 0.80 | 0.69 | 1.00 | 0.66 | 1.39 | 0.70 |
| Control Delay (s/veh) | 55.0 | 44.4 | 29.7 | 57.6 | 12.2 | 209.1 | 11.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.0 | 44.4 | 29.7 | 57.6 | 12.4 | 209.1 | 11.5 |
| Queue Length 50th (ft) | 181 | 149 | 104 | ~270 | 218 | ~616 | 47 |
| Queue Length 95th (ft) | #327 | #289 | 200 | m247 | m202 | #750 | 165 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 389 | 388 | 437 | 420 | 2194 | 1101 | 777 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 183 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.77 | 0.67 | 1.00 | 0.72 | 1.39 | 0.70 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 475 | 1 | 307 | 1248 | 442 | 456 | 1278 |
| v/c Ratio | 1.11 | no cap | 0.65 | 1.09 | 0.56 | 1.21 | 0.60 |
| Control Delay (s/veh) | 110.4 | | 27.9 | 87.1 | 5.6 | 136.4 | 13.8 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 110.4 | Error | 27.9 | 87.1 | 5.6 | 136.4 | 14.1 |
| Queue Length 50th (ft) | ~312 | 0 | 108 | ~426 | 2 | ~334 | 171 |
| Queue Length 95th (ft) | #499 | 0 | 198 | #555 | 69 | m233 | m137 |
| Internal Link Dist (ft) | | 1421 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 428 | 1 | 473 | 1140 | 794 | 378 | 2123 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 294 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.11 | 1.00 | 0.65 | 1.09 | 0.56 | 1.21 | 0.70 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1039 | 800 | 1252 | 60 | 918 |
| v/c Ratio | 1.01 | 1.15 | 0.47 | 0.14 | 1.18 |
| Control Delay (s/veh) | 61.2 | 113.2 | 5.4 | 39.2 | 107.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 61.2 | 113.2 | 5.4 | 39.2 | 107.0 |
| Queue Length 50th (ft) | ~302 | ~603 | 132 | 17 | ~317 |
| Queue Length 95th (ft) | #461 | #817 | 162 | 36 | #542 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1633 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 1028 | 695 | 2668 | 414 | 778 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.01 | 1.15 | 0.47 | 0.14 | 1.18 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 761 | 207 | 372 | 69 | 301 | 344 | 342 | 59 |
| v/c Ratio | 0.77 | 0.84 | 0.22 | 0.43 | 0.77 | 0.85 | 0.79 | 0.12 |
| Control Delay (s/veh) | 40.8 | 65.9 | 13.2 | 51.0 | 22.3 | 54.2 | 47.7 | 0.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 40.8 | 65.9 | 13.2 | 51.0 | 22.3 | 54.2 | 47.7 | 0.5 |
| Queue Length 50th (ft) | 248 | 128 | 73 | 42 | 21 | 211 | 206 | 0 |
| Queue Length 95th (ft) | #348 | #252 | 108 | 83 | #104 | #313 | 265 | 0 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 987 | 253 | 1676 | 186 | 412 | 461 | 493 | 556 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.77 | 0.82 | 0.22 | 0.37 | 0.73 | 0.75 | 0.69 | 0.11 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 320 | 629 | 526 | 1519 | 872 | 584 |
| v/c Ratio | 0.69 | 1.28 | 1.17 | 0.71 | 0.90 | 0.69 |
| Control Delay (s/veh) | 39.0 | 167.4 | 119.6 | 11.6 | 44.5 | 8.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 |
| Total Delay (s/veh) | 39.0 | 167.4 | 119.6 | 13.1 | 44.5 | 8.1 |
| Queue Length 50th (ft) | 165 | ~417 | ~375 | 217 | 248 | 10 |
| Queue Length 95th (ft) | 258 | #628 | m255 | m167 | #355 | 105 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 465 | 492 | 450 | 2170 | 990 | 846 |
| Starvation Cap Reductn | 0 | 0 | 0 | 438 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.69 | 1.28 | 1.17 | 0.88 | 0.88 | 0.69 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 529 | 265 | 1935 | 327 | 816 |
| v/c Ratio | 0.99 | 0.45 | 1.50 | 1.47 | 0.41 |
| Control Delay (s/veh) | 71.0 | 13.1 | 252.9 | 256.8 | 12.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 71.0 | 13.1 | 252.9 | 256.8 | 12.1 |
| Queue Length 50th (ft) | 298 | 45 | ~807 | ~269 | 106 |
| Queue Length 95th (ft) | #508 | 113 | #947 | m#356 | m147 |
| Internal Link Dist (ft) | 1339 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 532 | 586 | 1293 | 223 | 1981 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.99 | 0.45 | 1.50 | 1.47 | 0.41 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 311 | 301 | 287 | 720 | 1484 | 704 | 114 |
| v/c Ratio | 0.72 | 0.67 | 0.60 | 0.84 | 0.49 | 0.41 | 0.23 |
| Control Delay (s/veh) | 42.7 | 33.3 | 25.0 | 39.1 | 7.6 | 28.0 | 5.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Total Delay (s/veh) | 42.7 | 33.3 | 25.0 | 39.1 | 7.6 | 28.0 | 5.8 |
| Queue Length 50th (ft) | 158 | 126 | 87 | 212 | 195 | 104 | 0 |
| Queue Length 95th (ft) | #368 | #319 | #236 | #313 | 85 | 105 | 34 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 429 | 450 | 481 | 858 | 3457 | 2435 | 663 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 640 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.72 | 0.67 | 0.60 | 0.84 | 0.53 | 0.29 | 0.17 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 255 | 249 | 233 | 1717 | 773 | 199 | 844 |
| v/c Ratio | 0.78 | 0.71 | 0.50 | 0.51 | 0.65 | 0.74 | 0.25 |
| Control Delay (s/veh) | 50.0 | 38.0 | 11.3 | 14.9 | 4.0 | 68.5 | 0.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 50.0 | 38.0 | 11.3 | 14.9 | 4.0 | 68.5 | 0.7 |
| Queue Length 50th (ft) | 141 | 115 | 20 | 179 | 0 | 53 | 1 |
| Queue Length 95th (ft) | #231 | 204 | 85 | 211 | 54 | m#127 | 9 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 375 | 396 | 501 | 3362 | 1186 | 268 | 3379 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.68 | 0.63 | 0.47 | 0.51 | 0.65 | 0.74 | 0.25 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1698 | 166 | 928 | 151 | 256 | 743 | 745 |
| v/c Ratio | 0.82 | 0.24 | 0.67 | 0.05 | 0.29 | 0.86 | 0.86 |
| Control Delay (s/veh) | 38.9 | 7.1 | 45.3 | 0.0 | 15.5 | 33.6 | 34.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 38.9 | 7.1 | 45.3 | 0.0 | 15.5 | 33.6 | 34.2 |
| Queue Length 50th (ft) | 411 | 10 | 362 | 0 | 97 | 427 | 430 |
| Queue Length 95th (ft) | 475 | 59 | m372 | m0 | 145 | 614 | 622 |
| Internal Link Dist (ft) | 1992 | | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | | 180 | | | |
| Base Capacity (vph) | 2077 | 680 | 1385 | 2787 | 955 | 920 | 916 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.82 | 0.24 | 0.67 | 0.05 | 0.27 | 0.81 | 0.81 |

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 598 | 1198 | 274 | 377 | 676 | 305 |
| v/c Ratio | 0.19 | 1.01 | 0.73 | 0.09 | 1.08 | 0.56 |
| Control Delay (s/veh) | 6.2 | 53.4 | 62.7 | 5.1 | 104.7 | 9.1 |
| Queue Delay | 0.0 | 16.7 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 6.2 | 70.1 | 62.7 | 5.1 | 104.7 | 9.1 |
| Queue Length 50th (ft) | 23 | ~601 | 102 | 25 | ~291 | 0 |
| Queue Length 95th (ft) | m40 | #864 | 148 | 34 | #408 | 79 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 3149 | 1185 | 406 | 4028 | 627 | 543 |
| Starvation Cap Reductn | 0 | 55 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.19 | 1.06 | 0.67 | 0.09 | 1.08 | 0.56 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 303 | 292 | 279 | 338 | 1369 | 1720 | 621 |
| v/c Ratio | 1.01 | 0.86 | 0.78 | 1.08 | 0.58 | 1.15 | 0.66 |
| Control Delay (s/veh) | 93.2 | 52.5 | 38.4 | 96.5 | 1.7 | 102.9 | 7.3 |
| Queue Delay | 40.2 | 57.7 | 0.0 | 0.0 | 1.1 | 0.1 | 0.0 |
| Total Delay (s/veh) | 133.4 | 110.2 | 38.4 | 96.5 | 2.8 | 103.0 | 7.3 |
| Queue Length 50th (ft) | ~185 | 137 | 103 | ~204 | 12 | ~612 | 34 |
| Queue Length 95th (ft) | #358 | #296 | #235 | m#198 | m20 | #747 | 134 |
| Internal Link Dist (ft) | | 1545 | | | 405 | 1085 | |
| Turn Bay Length (ft) | 345 | | 340 | 285 | | | |
| Base Capacity (vph) | 300 | 339 | 360 | 312 | 2359 | 1494 | 947 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 674 | 0 | 0 |
| Spillback Cap Reductn | 156 | 151 | 0 | 0 | 0 | 36 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 2.10 | 1.55 | 0.78 | 1.08 | 0.81 | 1.18 | 0.66 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 304 | 2 | 319 | 1273 | 421 | 472 | 1465 |
| v/c Ratio | 0.85 | no cap | 0.79 | 1.13 | 0.55 | 0.94 | 0.62 |
| Control Delay (s/veh) | 56.6 | | 38.2 | 102.0 | 6.7 | 27.8 | 24.1 |
| Queue Delay | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 48.3 |
| Total Delay (s/veh) | 56.6 | Error | 38.2 | 102.0 | 6.7 | 27.8 | 72.4 |
| Queue Length 50th (ft) | 164 | 0 | 121 | ~466 | 10 | 258 | 480 |
| Queue Length 95th (ft) | #295 | 0 | #245 | #596 | 85 | m225 | m412 |
| Internal Link Dist (ft) | | 1372 | | 1087 | | | 405 |
| Turn Bay Length (ft) | 900 | | | | | | |
| Base Capacity (vph) | 379 | 1 | 425 | 1125 | 760 | 509 | 2366 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 1033 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.80 | 2.00 | 0.75 | 1.13 | 0.55 | 0.93 | 1.10 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 1124 | 533 | 1052 | 123 | 1121 |
| v/c Ratio | 1.12 | 1.18 | 0.49 | 0.14 | 1.35 |
| Control Delay (s/veh) | 98.2 | 135.9 | 12.1 | 27.2 | 182.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 98.2 | 135.9 | 12.1 | 27.2 | 182.8 |
| Queue Length 50th (ft) | ~442 | ~409 | 184 | 29 | ~683 |
| Queue Length 95th (ft) | #551 | #612 | 233 | 52 | #935 |
| Internal Link Dist (ft) | 1137 | | 1275 | 1637 | |
| Turn Bay Length (ft) | | 300 | | | 415 |
| Base Capacity (vph) | 1007 | 452 | 2137 | 875 | 832 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.12 | 1.18 | 0.49 | 0.14 | 1.35 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | WBL | WBT | NBL | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 507 | 81 | 260 | 42 | 150 | 396 | 406 | 88 |
| v/c Ratio | 0.46 | 0.54 | 0.17 | 0.28 | 0.54 | 0.81 | 0.77 | 0.15 |
| Control Delay (s/veh) | 31.4 | 60.0 | 13.3 | 46.8 | 14.7 | 44.3 | 41.1 | 1.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 31.4 | 60.0 | 13.3 | 46.8 | 14.7 | 44.3 | 41.1 | 1.2 |
| Queue Length 50th (ft) | 138 | 47 | 28 | 26 | 0 | 237 | 241 | 0 |
| Queue Length 95th (ft) | 213 | #106 | 62 | 57 | 57 | 331 | 331 | 7 |
| Internal Link Dist (ft) | 366 | | 1137 | | | | 1576 | |
| Turn Bay Length (ft) | | 315 | | | | | | |
| Base Capacity (vph) | 1105 | 152 | 1508 | 301 | 407 | 534 | 572 | 620 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.46 | 0.53 | 0.17 | 0.14 | 0.37 | 0.74 | 0.71 | 0.14 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 359 | 248 | 349 | 819 | 1657 | 836 |
| v/c Ratio | 0.96 | 0.50 | 1.16 | 0.35 | 1.13 | 0.84 |
| Control Delay (s/veh) | 74.7 | 10.7 | 120.3 | 0.9 | 93.5 | 15.0 |
| Queue Delay | 72.5 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 |
| Total Delay (s/veh) | 147.1 | 10.7 | 120.3 | 0.9 | 93.7 | 15.0 |
| Queue Length 50th (ft) | 203 | 17 | ~225 | 5 | ~580 | 100 |
| Queue Length 95th (ft) | #374 | 83 | m#214 | m17 | #715 | #357 |
| Internal Link Dist (ft) | 1375 | | | 390 | 854 | |
| Turn Bay Length (ft) | | 230 | 100 | | | |
| Base Capacity (vph) | 374 | 500 | 301 | 2335 | 1470 | 1001 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 308 | 0 | 0 | 0 | 62 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 5.44 | 0.50 | 1.16 | 0.35 | 1.18 | 0.84 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | NBT | SBL | SBT |
|---|---|---|---|---|---|
| Lane Group Flow (vph) | 306 | 355 | 1254 | 664 | 1385 |
| v/c Ratio | 0.76 | 0.83 | 1.21 | 1.39 | 0.62 |
| Control Delay (s/veh) | 44.5 | 40.4 | 132.7 | 203.1 | 26.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 36.7 |
| Total Delay (s/veh) | 44.5 | 40.4 | 132.7 | 203.1 | 63.5 |
| Queue Length 50th (ft) | 163 | 143 | ~448 | ~517 | 452 |
| Queue Length 95th (ft) | 231 | 227 | #581 | m#531 | m417 |
| Internal Link Dist (ft) | 1341 | | 540 | | 390 |
| Turn Bay Length (ft) | | 310 | | 100 | |
| Base Capacity (vph) | 532 | 535 | 1036 | 477 | 2242 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 948 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.58 | 0.66 | 1.21 | 1.39 | 1.07 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | WBL | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 275 | 272 | 229 | 551 | 874 | 1928 | 410 |
| v/c Ratio | 0.83 | 0.81 | 0.50 | 0.95 | 0.26 | 0.72 | 0.50 |
| Control Delay (s/veh) | 55.8 | 52.4 | 11.9 | 55.7 | 1.4 | 24.1 | 8.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.8 | 52.4 | 11.9 | 55.7 | 1.4 | 24.1 | 8.0 |
| Queue Length 50th (ft) | 154 | 156 | 22 | 169 | 7 | 265 | 42 |
| Queue Length 95th (ft) | #282 | #284 | 88 | #267 | 21 | 311 | 118 |
| Internal Link Dist (ft) | | 1318 | | | 395 | 822 | |
| Turn Bay Length (ft) | 360 | | 360 | | | | 125 |
| Base Capacity (vph) | 357 | 363 | 480 | 583 | 3372 | 2675 | 823 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.77 | 0.75 | 0.48 | 0.95 | 0.26 | 0.72 | 0.50 |

Intersection Summary

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBL | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 184 | 281 | 281 | 1122 | 642 | 713 | 1738 |
| v/c Ratio | 0.53 | 0.83 | 0.70 | 0.53 | 0.71 | 0.87 | 0.52 |
| Control Delay (s/veh) | 36.5 | 51.2 | 30.7 | 25.2 | 7.7 | 53.0 | 2.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 36.5 | 51.2 | 30.7 | 25.2 | 7.7 | 53.0 | 2.9 |
| Queue Length 50th (ft) | 93 | 146 | 97 | 148 | 20 | ~213 | 38 |
| Queue Length 95th (ft) | 165 | #286 | 193 | 167 | 111 | #365 | 26 |
| Internal Link Dist (ft) | | 1347 | | 1217 | | | 395 |
| Turn Bay Length (ft) | 325 | | 325 | | 250 | | |
| Base Capacity (vph) | 382 | 369 | 432 | 2435 | 959 | 823 | 3339 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 140 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.48 | 0.76 | 0.65 | 0.46 | 0.67 | 0.87 | 0.54 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

| Lane Group | EBT | EBR | WBT | WBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 2104 | 132 | 1707 | 183 | 278 | 877 | 881 |
| v/c Ratio | 1.36 | 0.27 | 1.66 | 0.07 | 0.27 | 0.87 | 0.88 |
| Control Delay (s/veh) | 202.3 | 15.8 | 330.4 | 0.0 | 10.3 | 28.6 | 29.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 40.5 | 0.0 |
| Total Delay (s/veh) | 202.4 | 15.8 | 330.4 | 0.0 | 10.4 | 69.1 | 29.4 |
| Queue Length 50th (ft) | ~736 | 28 | ~1007 | 0 | 85 | 486 | 493 |
| Queue Length 95th (ft) | #823 | 81 | m#981 | m0 | 128 | #746 | #775 |
| Internal Link Dist (ft) | 1992 | | 847 | | | 2051 | |
| Turn Bay Length (ft) | | | | 180 | | | |
| Base Capacity (vph) | 1544 | 488 | 1029 | 2730 | 1070 | 1026 | 1022 |
| Starvation Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 21 | 0 | 0 | 0 | 225 | 214 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 1.38 | 0.27 | 1.66 | 0.07 | 0.33 | 1.08 | 0.86 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

| Lane Group | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Group Flow (vph) | 733 | 1558 | 202 | 752 | 1298 | 133 |
| v/c Ratio | 0.28 | 1.26 | 1.20 | 0.24 | 1.09 | 0.21 |
| Control Delay (s/veh) | 7.9 | 148.4 | 182.0 | 14.0 | 93.0 | 8.4 |
| Queue Delay | 0.0 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 7.9 | 148.7 | 182.0 | 14.0 | 93.0 | 8.4 |
| Queue Length 50th (ft) | 29 | ~1102 | ~95 | 95 | ~569 | 13 |
| Queue Length 95th (ft) | m42 | m#671 | #171 | 118 | #702 | 57 |
| Internal Link Dist (ft) | 847 | | | 2113 | 1664 | |
| Turn Bay Length (ft) | | | 255 | | | |
| Base Capacity (vph) | 2584 | 1233 | 168 | 3096 | 1186 | 628 |
| Starvation Cap Reductn | 0 | 88 | 0 | 0 | 0 | 0 |
| Spillback Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Storage Cap Reductn | 0 | 0 | 0 | 0 | 0 | 0 |
| Reduced v/c Ratio | 0.28 | 1.36 | 1.20 | 0.24 | 1.09 | 0.21 |

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

# APPENDIX 7.6:

# HORIZON YEAR (2050) WITH PROJECT INTERSECTION ANALYSIS WITH IMPROVEMENTS

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| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 185 | 858 | 193 | 671 | 228 | 1174 | 135 | 1228 |
| Future Volume (vph) | 185 | 858 | 193 | 671 | 228 | 1174 | 135 | 1228 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 15.2 | 36.0 |
| Total Split (s) | 23.6 | 42.0 | 20.4 | 38.8 | 15.4 | 42.4 | 15.2 | 42.2 |
| Total Split (%) | 19.7% | 35.0% | 17.0% | 32.3% | 12.8% | 35.3% | 12.7% | 35.2% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.5 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 5.2 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 17.0 | 35.0 | 15.7 | 33.7 | 10.2 | 36.4 | 10.0 | 36.2 |
| Actuated g/C Ratio | 0.14 | 0.29 | 0.13 | 0.28 | 0.09 | 0.30 | 0.08 | 0.30 |
| v/c Ratio | 0.84 | 1.07 | 0.95 | 0.79 | 0.89 | 0.96 | 0.54 | 0.95 |
| Control Delay (s/veh) | 78.9 | 88.5 | 101.3 | 46.4 | 86.3 | 54.9 | 60.5 | 53.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 78.9 | 88.5 | 101.3 | 46.4 | 86.3 | 54.9 | 60.5 | 53.2 |
| LOS | E | F | F | D | F | D | E | D |
| Approach Delay (s/veh) | | 87.1 | | 57.6 | | 59.0 | | 53.8 |
| Approach LOS | | F | | E | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.07 | |
| Intersection Signal Delay (s/veh): 63.6 | Intersection LOS: E |
| Intersection Capacity Utilization 98.6% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

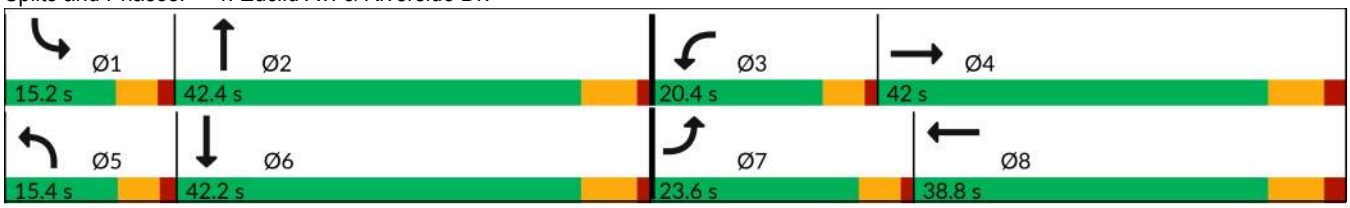

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 185 | 858 | 200 | 193 | 671 | 83 | 228 | 1174 | 319 | 135 | 1228 | 231 |
| Future Volume (veh/h) | 185 | 858 | 200 | 193 | 671 | 83 | 228 | 1174 | 319 | 135 | 1228 | 231 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 199 | 923 | 129 | 208 | 722 | 46 | 245 | 1262 | 182 | 145 | 1320 | 140 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 223 | 943 | 132 | 223 | 1021 | 65 | 282 | 1410 | 203 | 274 | 1452 | 154 |
| Arrive On Green | 0.20 | 0.44 | 0.44 | 0.20 | 0.44 | 0.44 | 0.13 | 0.44 | 0.44 | 0.13 | 0.44 | 0.44 |
| Sat Flow, veh/h | 1688 | 3195 | 446 | 1688 | 3458 | 220 | 3274 | 4763 | 687 | 3274 | 4947 | 525 |
| Grp Volume(v), veh/h | 199 | 535 | 517 | 208 | 386 | 382 | 245 | 981 | 463 | 145 | 988 | 472 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1852 | 1790 | 1688 | 1852 | 1826 | 1637 | 1852 | 1747 | 1637 | 1852 | 1768 |
| Q Serve(g_s), s | 13.6 | 33.7 | 33.7 | 14.4 | 20.1 | 20.1 | 8.7 | 29.0 | 29.0 | 4.9 | 29.5 | 29.5 |
| Cycle Q Clear(g_c), s | 13.6 | 33.7 | 33.7 | 14.4 | 20.1 | 20.1 | 8.7 | 29.0 | 29.0 | 4.9 | 29.5 | 29.5 |
| Prop In Lane | 1.00 | | 0.25 | 1.00 | | 0.12 | 1.00 | | 0.39 | 1.00 | | 0.30 |
| Lane Grp Cap(c), veh/h | 223 | 546 | 528 | 223 | 547 | 539 | 282 | 1096 | 517 | 274 | 1087 | 519 |
| V/C Ratio(X) | 0.89 | 0.98 | 0.98 | 0.93 | 0.71 | 0.71 | 0.87 | 0.90 | 0.90 | 0.53 | 0.91 | 0.91 |
| Avail Cap(c_a), veh/h | 269 | 546 | 528 | 223 | 547 | 539 | 282 | 1136 | 536 | 276 | 1130 | 540 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.7 | 32.7 | 32.7 | 47.0 | 28.9 | 28.9 | 51.0 | 31.3 | 31.3 | 49.7 | 31.7 | 31.7 |
| Incr Delay (d2), s/veh | 23.4 | 33.1 | 33.8 | 41.0 | 4.6 | 4.6 | 24.2 | 9.2 | 17.2 | 1.9 | 10.6 | 19.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.6 | 17.3 | 16.8 | 8.0 | 8.0 | 7.9 | 4.2 | 11.4 | 11.9 | 2.0 | 12.4 | 13.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 70.2 | 65.8 | 66.5 | 88.0 | 33.5 | 33.5 | 75.2 | 40.5 | 48.4 | 51.6 | 42.3 | 50.7 |
| LnGrp LOS | E | E | E | F | C | C | E | D | D | D | D | D |
| Approach Vol, veh/h | | 1251 | | | 976 | | | 1689 | | | 1605 | |
| Approach Delay, s/veh | | 66.8 | | | 45.1 | | | 47.7 | | | 45.6 | |
| Approach LOS | | E | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.1 | 41.1 | 20.4 | 42.0 | 15.4 | 40.8 | 20.4 | 42.0 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 36.4 | 15.7 | 35.0 | 10.2 | 36.2 | 18.9 | 31.8 |
| Max Q Clear Time (g_c+I1), s | 6.9 | 31.0 | 16.4 | 35.7 | 10.7 | 31.5 | 15.6 | 22.1 |
| Green Ext Time (p_c), s | 0.1 | 3.6 | 0.0 | 0.0 | 0.0 | 3.3 | 0.1 | 4.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 51.0 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 115 | 370 | 71 | 123 | 352 | 104 | 1727 | 311 | 69 | 1440 | 96 |
| Future Volume (vph) | 115 | 370 | 71 | 123 | 352 | 104 | 1727 | 311 | 69 | 1440 | 96 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 40.0 | 40.0 | 40.0 | 40.0 | 40.0 | 65.4 | 65.4 | 65.4 | 14.6 | 80.0 | 80.0 |
| Total Split (%) | 33.3% | 33.3% | 33.3% | 33.3% | 33.3% | 54.5% | 54.5% | 54.5% | 12.2% | 66.7% | 66.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 34.3 | 34.3 | 34.3 | 34.3 | 34.3 | 59.1 | 59.1 | 59.1 | 10.0 | 70.5 | 70.5 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.29 | 0.29 | 0.29 | 0.50 | 0.50 | 0.50 | 0.09 | 0.60 | 0.60 |
| v/c Ratio | 1.42 | 0.75 | 0.15 | 1.09 | 0.84 | 1.35 | 1.08 | 0.42 | 0.54 | 0.75 | 0.11 |
| Control Delay (s/veh) | 274.1 | 48.5 | 9.0 | 146.1 | 54.2 | 242.8 | 74.2 | 16.8 | 67.2 | 19.6 | 3.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 274.1 | 48.5 | 9.0 | 146.1 | 54.2 | 242.8 | 74.2 | 16.8 | 67.2 | 19.6 | 3.3 |
| LOS | F | D | A | F | D | F | E | B | E | B | A |
| Approach Delay (s/veh) | | 90.2 | | | 75.5 | | 74.1 | | | 20.7 | |
| Approach LOS | | F | | | E | | E | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 117.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.42 | |
| Intersection Signal Delay (s/veh): 58.4 | Intersection LOS: E |
| Intersection Capacity Utilization 105.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

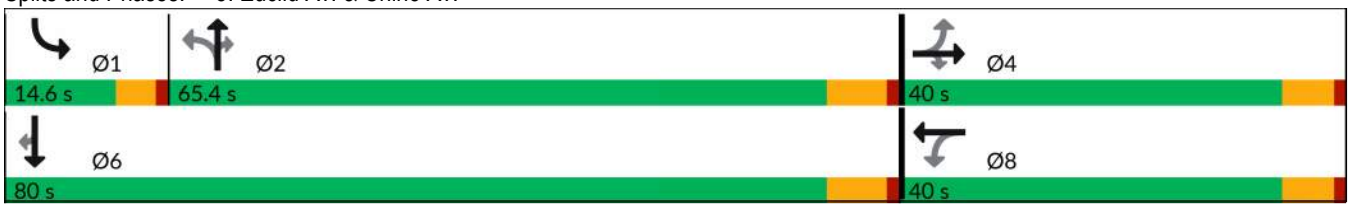

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 115 | 370 | 71 | 123 | 352 | 55 | 104 | 1727 | 311 | 69 | 1440 | 96 |
| Future Volume (veh/h) | 115 | 370 | 71 | 123 | 352 | 55 | 104 | 1727 | 311 | 69 | 1440 | 96 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 128 | 411 | 51 | 137 | 391 | 61 | 116 | 1919 | 235 | 77 | 1600 | 63 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 115 | 537 | 455 | 154 | 453 | 71 | 200 | 1756 | 783 | 130 | 2168 | 945 |
| Arrive On Green | 0.29 | 0.43 | 0.29 | 0.29 | 0.43 | 0.29 | 0.49 | 0.74 | 0.49 | 0.08 | 0.91 | 0.61 |
| Sat Flow, veh/h | 889 | 1870 | 1585 | 930 | 1580 | 246 | 283 | 3554 | 1585 | 1688 | 3554 | 1549 |
| Grp Volume(v), veh/h | 128 | 411 | 51 | 137 | 0 | 452 | 116 | 1919 | 235 | 77 | 1600 | 63 |
| Grp Sat Flow(s),veh/h/ln | 889 | 1870 | 1585 | 930 | 0 | 1826 | 283 | 1777 | 1585 | 1688 | 1777 | 1549 |
| Q Serve(g_s), s | 7.3 | 22.3 | 2.8 | 11.9 | 0.0 | 26.9 | 42.0 | 58.9 | 10.5 | 5.3 | 14.1 | 2.0 |
| Cycle Q Clear(g_c), s | 34.2 | 22.3 | 2.8 | 34.2 | 0.0 | 26.9 | 42.3 | 58.9 | 10.5 | 5.3 | 14.1 | 2.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.13 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 115 | 537 | 455 | 154 | 0 | 524 | 200 | 1756 | 783 | 130 | 2168 | 945 |
| V/C Ratio(X) | 1.12 | 0.77 | 0.11 | 0.89 | 0.00 | 0.86 | 0.58 | 1.09 | 0.30 | 0.59 | 0.74 | 0.07 |
| Avail Cap(c_a), veh/h | 115 | 537 | 455 | 154 | 0 | 524 | 200 | 1756 | 783 | 142 | 2191 | 955 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 57.9 | 30.6 | 31.3 | 55.6 | 0.0 | 33.0 | 26.1 | 15.4 | 17.9 | 53.2 | 2.6 | 9.5 |
| Incr Delay (d2), s/veh | 119.0 | 6.5 | 0.1 | 42.9 | 0.0 | 13.9 | 4.2 | 51.6 | 0.2 | 3.1 | 1.3 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.2 | 9.5 | 1.1 | 5.9 | 0.0 | 12.1 | 2.7 | 21.3 | 3.6 | 2.3 | 2.1 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 176.9 | 37.1 | 31.4 | 98.4 | 0.0 | 46.8 | 30.2 | 67.1 | 18.1 | 56.3 | 3.9 | 9.5 |
| LnGrp LOS | F | D | C | F | | D | C | F | B | E | A | A |
| Approach Vol, veh/h | | 590 | | | 589 | | | 2270 | | | 1740 | |
| Approach Delay, s/veh | | 66.9 | | | 58.8 | | | 60.1 | | | 6.4 | |
| Approach LOS | | E | | | E | | | E | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.8 | 65.4 | | 40.0 | | 79.2 | | 40.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.0 | 58.9 | | 34.2 | | 73.5 | | 34.2 |
| Max Q Clear Time (g_c+I1), s | 7.3 | 60.9 | | 36.2 | | 16.1 | | 36.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 17.0 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 42.7 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 363 | 218 | 242 | 59 | 160 | 151 | 1673 | 51 | 80 | 1473 | 88 |
| Future Volume (vph) | 363 | 218 | 242 | 59 | 160 | 151 | 1673 | 51 | 80 | 1473 | 88 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 19.0 | 50.8 | 50.8 | 15.2 | 47.0 | 15.0 | 39.3 | 39.3 | 14.7 | 39.0 | 39.0 |
| Total Split (%) | 15.8% | 42.3% | 42.3% | 12.7% | 39.2% | 12.5% | 32.8% | 32.8% | 12.3% | 32.5% | 32.5% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 28.6 | 28.6 | 10.2 | 21.1 | 10.4 | 36.3 | 36.3 | 10.1 | 32.8 | 32.8 |
| Actuated g/C Ratio | 0.14 | 0.28 | 0.28 | 0.10 | 0.21 | 0.10 | 0.36 | 0.36 | 0.10 | 0.32 | 0.32 |
| v/c Ratio | 1.68 | 0.46 | 0.42 | 0.39 | 0.72 | 0.97 | 0.92 | 0.09 | 0.53 | 0.90 | 0.16 |
| Control Delay (s/veh) | 355.0 | 33.9 | 5.5 | 53.4 | 44.2 | 110.2 | 42.3 | 0.3 | 58.8 | 41.8 | 2.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 355.0 | 33.9 | 5.5 | 53.4 | 44.2 | 110.2 | 42.3 | 0.3 | 58.8 | 41.8 | 2.5 |
| LOS | F | C | A | D | D | F | D | A | E | D | A |
| Approach Delay (s/veh) | | 167.1 | | | 45.9 | | 46.6 | | | 40.6 | |
| Approach LOS | | F | | | D | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 101.7 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.68 | |
| Intersection Signal Delay (s/veh): 65.8 | Intersection LOS: E |
| Intersection Capacity Utilization 94.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

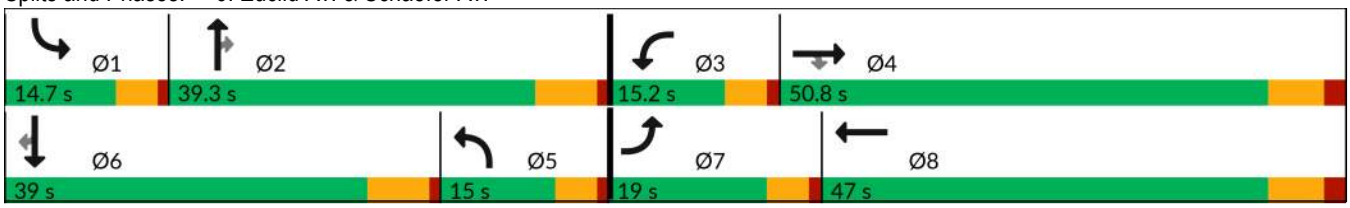

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 363 | 218 | 242 | 59 | 160 | 91 | 151 | 1673 | 51 | 80 | 1473 | 88 |
| Future Volume (veh/h) | 363 | 218 | 242 | 59 | 160 | 91 | 151 | 1673 | 51 | 80 | 1473 | 88 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 399 | 240 | 156 | 65 | 176 | 56 | 166 | 1838 | 34 | 88 | 1619 | 50 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 254 | 410 | 347 | 146 | 210 | 67 | 183 | 2012 | 568 | 160 | 1830 | 505 |
| Arrive On Green | 0.23 | 0.33 | 0.33 | 0.13 | 0.23 | 0.23 | 0.16 | 0.54 | 0.54 | 0.14 | 0.49 | 0.49 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1355 | 431 | 1688 | 5611 | 1585 | 1688 | 5611 | 1549 |
| Grp Volume(v), veh/h | 399 | 240 | 156 | 65 | 0 | 232 | 166 | 1838 | 34 | 88 | 1619 | 50 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1786 | 1688 | 1870 | 1585 | 1688 | 1870 | 1549 |
| Q Serve(g_s), s | 14.3 | 10.1 | 5.0 | 3.4 | 0.0 | 11.8 | 9.2 | 28.3 | 1.0 | 4.6 | 24.7 | 1.0 |
| Cycle Q Clear(g_c), s | 14.3 | 10.1 | 5.0 | 3.4 | 0.0 | 11.8 | 9.2 | 28.3 | 1.0 | 4.6 | 24.7 | 1.0 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.24 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 254 | 410 | 347 | 146 | 0 | 276 | 183 | 2012 | 568 | 160 | 1830 | 505 |
| V/C Ratio(X) | 1.57 | 0.59 | 0.45 | 0.45 | 0.00 | 0.84 | 0.91 | 0.91 | 0.06 | 0.55 | 0.88 | 0.10 |
| Avail Cap(c_a), veh/h | 254 | 863 | 731 | 187 | 0 | 752 | 183 | 2012 | 568 | 178 | 1920 | 530 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.8 | 28.3 | 12.6 | 39.2 | 0.0 | 35.3 | 39.3 | 20.6 | 14.3 | 38.8 | 22.7 | 6.1 |
| Incr Delay (d2), s/veh | 274.8 | 1.0 | 0.7 | 0.8 | 0.0 | 5.1 | 40.4 | 6.9 | 0.0 | 1.1 | 5.2 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 24.5 | 4.1 | 2.5 | 1.4 | 0.0 | 4.9 | 5.4 | 8.7 | 0.3 | 1.8 | 8.1 | 0.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 311.5 | 29.3 | 13.3 | 40.0 | 0.0 | 40.4 | 79.7 | 27.5 | 14.3 | 39.9 | 27.8 | 6.2 |
| LnGrp LOS | F | C | B | D | | D | E | C | B | D | C | A |
| Approach Vol, veh/h | | 795 | | | 297 | | | 2038 | | | 1757 | |
| Approach Delay, s/veh | | 167.8 | | | 40.3 | | | 31.6 | | | 27.8 | |
| Approach LOS | | F | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.7 | 40.5 | 12.9 | 27.8 | 16.8 | 37.5 | 19.0 | 21.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 6.5 | * 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 32.8 | 10.5 | 43.8 | 10.3 | * 33 | 14.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 30.3 | 5.4 | 12.1 | 11.2 | 26.7 | 16.3 | 13.8 |
| Green Ext Time (p_c), s | 0.0 | 2.1 | 0.0 | 1.4 | 0.0 | 4.3 | 0.0 | 1.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 52.9 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 131 | 741 | 367 | 709 | 737 | 156 | 1130 | 400 | 623 | 1127 | 143 |
| Future Volume (vph) | 131 | 741 | 367 | 709 | 737 | 156 | 1130 | 400 | 623 | 1127 | 143 |
| Turn Type | Perm | NA | Perm | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 8 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 45.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 55.0 | 55.0 | 55.0 | 55.0 | 55.0 | 16.6 | 35.4 | 35.4 | 29.6 | 48.4 | 48.4 |
| Total Split (%) | 45.8% | 45.8% | 45.8% | 45.8% | 45.8% | 13.8% | 29.5% | 29.5% | 24.7% | 40.3% | 40.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 47.6 | 47.6 | 47.6 | 47.6 | 47.6 | 10.9 | 28.9 | 28.9 | 24.9 | 42.9 | 42.9 |
| Actuated g/C Ratio | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | 0.09 | 0.24 | 0.24 | 0.21 | 0.36 | 0.36 |
| v/c Ratio | 0.36 | 0.39 | 0.95 | 0.51 | 0.87 | 0.59 | 0.89 | 0.89 | 0.98 | 0.60 | 0.25 |
| Control Delay (s/veh) | 28.8 | 25.9 | 69.9 | 28.8 | 25.8 | 61.4 | 53.4 | 53.8 | 77.9 | 33.1 | 12.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 28.8 | 25.9 | 69.9 | 28.8 | 25.8 | 61.4 | 53.4 | 53.8 | 77.9 | 33.1 | 12.3 |
| LOS | C | C | E | C | C | E | D | D | E | C | B |
| Approach Delay (s/veh) | | 26.3 | | 35.9 | | | 54.3 | | | 46.3 | |
| Approach LOS | | C | | D | | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.8 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.98 | |
| Intersection Signal Delay (s/veh): 42.5 | Intersection LOS: D |
| Intersection Capacity Utilization 93.2% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 131 | 741 | 56 | 367 | 709 | 737 | 156 | 1130 | 400 | 623 | 1127 | 143 |
| Future Volume (veh/h) | 131 | 741 | 56 | 367 | 709 | 737 | 156 | 1130 | 400 | 623 | 1127 | 143 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 139 | 788 | 32 | 390 | 754 | 465 | 166 | 1202 | 240 | 663 | 1199 | 83 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 361 | 2147 | 87 | 520 | 1500 | 635 | 258 | 1324 | 374 | 684 | 2027 | 565 |
| Arrive On Green | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.13 | 0.35 | 0.35 | 0.31 | 0.54 | 0.54 |
| Sat Flow, veh/h | 841 | 5355 | 217 | 1226 | 3741 | 1585 | 3092 | 5611 | 1585 | 3274 | 5611 | 1564 |
| Grp Volume(v), veh/h | 139 | 550 | 270 | 390 | 754 | 465 | 166 | 1202 | 240 | 663 | 1199 | 83 |
| Grp Sat Flow(s),veh/h/ln | 421 | 1870 | 1831 | 613 | 1870 | 1585 | 1546 | 1870 | 1585 | 1637 | 1870 | 1564 |
| Q Serve(g_s), s | 15.0 | 9.0 | 9.0 | 37.1 | 13.7 | 24.9 | 6.1 | 24.3 | 15.1 | 23.8 | 17.2 | 3.1 |
| Cycle Q Clear(g_c), s | 28.7 | 9.0 | 9.0 | 46.2 | 13.7 | 24.9 | 6.1 | 24.3 | 15.1 | 23.8 | 17.2 | 3.1 |
| Prop In Lane | 1.00 | | 0.12 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 361 | 1500 | 734 | 520 | 1500 | 635 | 258 | 1324 | 374 | 684 | 2027 | 565 |
| V/C Ratio(X) | 0.38 | 0.37 | 0.37 | 0.75 | 0.50 | 0.73 | 0.64 | 0.91 | 0.64 | 0.97 | 0.59 | 0.15 |
| Avail Cap(c_a), veh/h | 361 | 1500 | 734 | 520 | 1500 | 635 | 309 | 1360 | 384 | 684 | 2027 | 565 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 25.2 | 16.0 | 16.0 | 27.9 | 17.0 | 19.2 | 50.5 | 37.3 | 34.3 | 40.6 | 21.4 | 18.2 |
| Incr Delay (d2), s/veh | 0.7 | 0.2 | 0.3 | 6.0 | 0.3 | 4.3 | 1.9 | 9.0 | 3.5 | 26.8 | 0.5 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.3 | 3.3 | 3.3 | 4.8 | 4.8 | 7.3 | 2.3 | 10.2 | 5.3 | 10.5 | 5.9 | 1.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 25.9 | 16.2 | 16.3 | 33.9 | 17.2 | 23.5 | 52.3 | 46.3 | 37.8 | 67.4 | 21.8 | 18.3 |
| LnGrp LOS | C | B | B | C | B | C | D | D | D | E | C | B |
| Approach Vol, veh/h | | 959 | | | 1609 | | | 1608 | | | 1945 | |
| Approach Delay, s/veh | | 17.6 | | | 23.1 | | | 45.6 | | | 37.2 | |
| Approach LOS | | B | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 29.6 | 34.6 | | 55.0 | 14.7 | 49.6 | | 55.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 24.9 | 28.9 | | 47.8 | 11.9 | 41.9 | | 47.8 |
| Max Q Clear Time (g_c+I1), s | 25.8 | 26.3 | | 30.7 | 8.1 | 19.2 | | 48.2 |
| Green Ext Time (p_c), s | 0.0 | 1.8 | | 6.6 | 0.1 | 8.2 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 32.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 72 | 269 | 129 | 298 | 314 | 140 | 1141 | 402 | 383 | 1128 |
| Future Volume (vph) | 72 | 269 | 129 | 298 | 314 | 140 | 1141 | 402 | 383 | 1128 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 |
| Total Split (s) | 51.0 | 51.0 | 51.0 | 51.0 | 51.0 | 19.5 | 35.0 | 35.0 | 34.0 | 49.5 |
| Total Split (%) | 42.5% | 42.5% | 42.5% | 42.5% | 42.5% | 16.3% | 29.2% | 29.2% | 28.3% | 41.3% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 43.8 | 43.8 | 43.8 | 43.8 | 43.8 | 13.6 | 28.5 | 28.5 | 29.3 | 44.2 |
| Actuated g/C Ratio | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.11 | 0.24 | 0.24 | 0.24 | 0.37 |
| v/c Ratio | 0.53 | 0.42 | 0.21 | 1.01 | 0.78 | 0.79 | 0.95 | 0.91 | 1.00 | 0.67 |
| Control Delay (s/veh) | 46.3 | 31.0 | 5.0 | 92.1 | 41.5 | 79.5 | 60.9 | 56.4 | 89.1 | 34.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 46.3 | 31.0 | 5.0 | 92.1 | 41.5 | 79.5 | 60.9 | 56.4 | 89.1 | 34.0 |
| LOS | D | C | A | F | D | E | E | E | F | C |
| Approach Delay (s/veh) | | 26.2 | | | 60.8 | | 61.4 | | | 47.6 |
| Approach LOS | | C | | | E | | E | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.01 | |
| Intersection Signal Delay (s/veh): 52.7 | Intersection LOS: D |
| Intersection Capacity Utilization 100.8% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 72 | 269 | 129 | 298 | 314 | 167 | 140 | 1141 | 402 | 383 | 1128 | 43 |
| Future Volume (veh/h) | 72 | 269 | 129 | 298 | 314 | 167 | 140 | 1141 | 402 | 383 | 1128 | 43 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 77 | 286 | 84 | 317 | 334 | 125 | 149 | 1141 | 242 | 407 | 1200 | 35 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 1.00 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 207 | 683 | 579 | 324 | 474 | 177 | 174 | 1208 | 375 | 413 | 1926 | 56 |
| Arrive On Green | 0.37 | 0.55 | 0.37 | 0.37 | 0.55 | 0.37 | 0.10 | 0.35 | 0.24 | 0.24 | 0.57 | 0.38 |
| Sat Flow, veh/h | 884 | 1870 | 1585 | 959 | 1297 | 486 | 1688 | 5106 | 1585 | 1688 | 5099 | 149 |
| Grp Volume(v), veh/h | 77 | 286 | 84 | 317 | 0 | 459 | 149 | 1141 | 242 | 407 | 801 | 434 |
| Grp Sat Flow(s),veh/h/ln | 884 | 1870 | 1585 | 959 | 0 | 1783 | 1688 | 1702 | 1585 | 1688 | 1702 | 1844 |
| Q Serve(g_s), s | 9.5 | 10.7 | 4.3 | 33.1 | 0.0 | 23.9 | 10.4 | 26.0 | 16.5 | 28.8 | 18.9 | 19.3 |
| Cycle Q Clear(g_c), s | 33.4 | 10.7 | 4.3 | 43.8 | 0.0 | 23.9 | 10.4 | 26.0 | 16.5 | 28.8 | 18.9 | 19.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.27 | 1.00 | | 1.00 | 1.00 | | 0.08 |
| Lane Grp Cap(c), veh/h | 207 | 683 | 579 | 324 | 0 | 652 | 174 | 1208 | 375 | 413 | 1286 | 697 |
| V/C Ratio(X) | 0.37 | 0.42 | 0.15 | 0.98 | 0.00 | 0.70 | 0.85 | 0.94 | 0.65 | 0.99 | 0.62 | 0.62 |
| Avail Cap(c_a), veh/h | 207 | 683 | 579 | 324 | 0 | 652 | 208 | 1214 | 377 | 413 | 1286 | 697 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 45.6 | 19.6 | 25.5 | 46.1 | 0.0 | 25.1 | 52.9 | 37.9 | 41.2 | 45.1 | 20.2 | 21.0 |
| Incr Delay (d2), s/veh | 0.8 | 0.3 | 0.1 | 43.5 | 0.0 | 3.2 | 23.4 | 14.5 | 3.7 | 40.6 | 0.9 | 1.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.1 | 4.1 | 1.5 | 13.3 | 0.0 | 8.8 | 5.4 | 10.5 | 6.5 | 16.0 | 5.7 | 6.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 46.4 | 19.9 | 25.6 | 89.6 | 0.0 | 28.3 | 76.2 | 52.4 | 45.0 | 85.7 | 21.2 | 22.8 |
| LnGrp LOS | D | B | C | F | | C | E | D | D | F | C | C |
| Approach Vol, veh/h | | 447 | | | 776 | | | 1532 | | | 1642 | |
| Approach Delay, s/veh | | 25.6 | | | 53.4 | | | 53.5 | | | 37.6 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 34.0 | 34.9 | | 51.0 | 17.1 | 51.8 | | 51.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 29.3 | 28.5 | | 43.8 | 14.8 | 43.0 | | 43.8 |
| Max Q Clear Time (g_c+I1), s | 30.8 | 28.0 | | 35.4 | 12.4 | 21.3 | | 45.8 |
| Green Ext Time (p_c), s | 0.0 | 0.4 | | 1.2 | 0.1 | 7.4 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 44.7 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 8 | 5 | 145 | 28 | 47 | 1944 | 467 | 258 | 1460 |
| Future Volume (vph) | 8 | 5 | 145 | 28 | 47 | 1944 | 467 | 258 | 1460 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 50.8 | 50.8 | 22.0 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 42.3% | 42.3% | 18.3% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.9 | 15.9 | 16.0 | 16.0 | 10.1 | 44.9 | 44.9 | 17.5 | 55.4 |
| Actuated g/C Ratio | 0.16 | 0.16 | 0.16 | 0.16 | 0.10 | 0.46 | 0.46 | 0.18 | 0.57 |
| v/c Ratio | 0.12 | 0.07 | 0.38 | 0.72 | 0.31 | 0.95 | 0.68 | 0.98 | 0.60 |
| Control Delay (s/veh) | 35.1 | 17.9 | 37.1 | 19.9 | 48.9 | 36.5 | 21.1 | 89.4 | 17.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 35.1 | 17.9 | 37.1 | 19.9 | 48.9 | 36.5 | 21.1 | 89.4 | 17.2 |
| LOS | D | B | D | B | D | D | C | F | B |
| Approach Delay (s/veh) | | 23.2 | | 25.7 | | 33.8 | | | 27.9 |
| Approach LOS | | C | | C | | C | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 97 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.98 | |
| Intersection Signal Delay (s/veh): 30.7 | Intersection LOS: C |
| Intersection Capacity Utilization 92.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

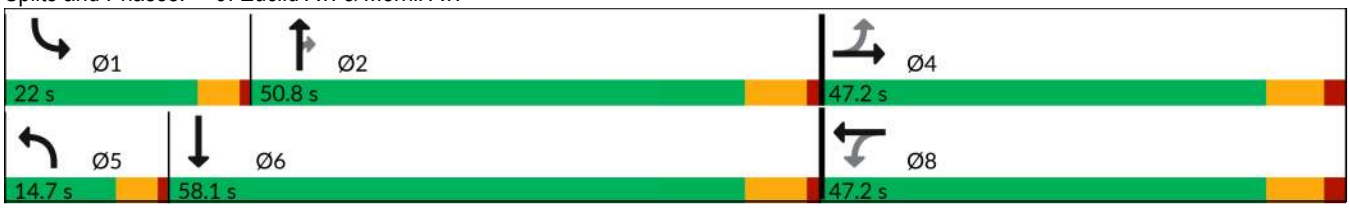

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 8 | 5 | 12 | 145 | 28 | 262 | 47 | 1944 | 467 | 258 | 1460 | 39 |
| Future Volume (veh/h) | 8 | 5 | 12 | 145 | 28 | 262 | 47 | 1944 | 467 | 258 | 1460 | 39 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 0.99 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 9 | 6 | 11 | 167 | 32 | 285 | 54 | 2234 | 532 | 297 | 1678 | 34 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 132 | 147 | 269 | 787 | 40 | 355 | 126 | 2123 | 656 | 274 | 2591 | 52 |
| Arrive On Green | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.25 | 0.07 | 0.42 | 0.42 | 0.16 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1055 | 590 | 1081 | 2699 | 160 | 1425 | 1688 | 5106 | 1577 | 1688 | 5147 | 104 |
| Grp Volume(v), veh/h | 9 | 0 | 17 | 167 | 0 | 317 | 54 | 2234 | 532 | 297 | 1110 | 602 |
| Grp Sat Flow(s),veh/h/ln | 1055 | 0 | 1671 | 1349 | 0 | 1585 | 1688 | 1702 | 1577 | 1688 | 1702 | 1848 |
| Q Serve(g_s), s | 0.9 | 0.0 | 0.8 | 5.3 | 0.0 | 20.0 | 3.3 | 44.3 | 31.7 | 17.3 | 25.6 | 25.6 |
| Cycle Q Clear(g_c), s | 20.9 | 0.0 | 0.8 | 6.2 | 0.0 | 20.0 | 3.3 | 44.3 | 31.7 | 17.3 | 25.6 | 25.6 |
| Prop In Lane | 1.00 | | 0.65 | 1.00 | | 0.90 | 1.00 | | 1.00 | 1.00 | | 0.06 |
| Lane Grp Cap(c), veh/h | 132 | 0 | 416 | 787 | 0 | 395 | 126 | 2123 | 656 | 274 | 1713 | 930 |
| V/C Ratio(X) | 0.07 | 0.00 | 0.04 | 0.21 | 0.00 | 0.80 | 0.43 | 1.05 | 0.81 | 1.08 | 0.65 | 0.65 |
| Avail Cap(c_a), veh/h | 266 | 0 | 627 | 1128 | 0 | 595 | 158 | 2123 | 656 | 274 | 1713 | 930 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.3 | 0.0 | 30.3 | 32.7 | 0.0 | 37.5 | 47.1 | 31.1 | 27.4 | 44.6 | 19.5 | 19.5 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 | 0.9 | 35.0 | 7.6 | 78.5 | 0.9 | 1.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.2 | 0.0 | 0.3 | 1.7 | 0.0 | 7.6 | 1.3 | 23.0 | 12.0 | 12.8 | 9.0 | 10.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 47.4 | 0.0 | 30.4 | 32.7 | 0.0 | 40.1 | 47.9 | 66.1 | 35.0 | 123.1 | 20.4 | 21.1 |
| LnGrp LOS | D | | C | C | | D | D | F | D | F | C | C |
| Approach Vol, veh/h | | 26 | | | 484 | | | 2820 | | | 2009 | |
| Approach Delay, s/veh | | 36.3 | | | 37.5 | | | 59.9 | | | 35.8 | |
| Approach LOS | | D | | | D | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 22.0 | 50.8 | | 33.7 | 12.7 | 60.1 | | 33.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 17.3 | 44.3 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 19.3 | 46.3 | | 22.9 | 5.3 | 27.6 | | 22.0 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 11.7 | | 1.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 48.7 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 478 | 441 | 306 | 153 | 900 | 380 | 256 | 1053 | 89 | 243 | 1207 | 449 |
| Future Volume (vph) | 478 | 441 | 306 | 153 | 900 | 380 | 256 | 1053 | 89 | 243 | 1207 | 449 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 19.0 | 50.9 | 50.9 | 21.3 | 53.2 | 53.2 | 19.0 | 39.2 | 21.3 | 18.6 | 38.8 | 19.0 |
| Total Split (%) | 14.6% | 39.2% | 39.2% | 16.4% | 40.9% | 40.9% | 14.6% | 30.2% | 16.4% | 14.3% | 29.8% | 14.6% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.4 | 35.9 | 35.9 | 15.0 | 36.5 | 36.5 | 14.4 | 29.5 | 46.3 | 16.2 | 31.5 | 47.6 |
| Actuated g/C Ratio | 0.12 | 0.30 | 0.30 | 0.13 | 0.30 | 0.30 | 0.12 | 0.25 | 0.39 | 0.14 | 0.26 | 0.40 |
| v/c Ratio | 1.37 | 0.42 | 0.47 | 0.77 | 0.84 | 0.61 | 1.35 | 0.81 | 0.14 | 0.62 | 0.87 | 0.70 |
| Control Delay (s/veh) | 221.6 | 35.0 | 7.1 | 75.8 | 46.1 | 16.6 | 224.5 | 48.0 | 3.2 | 58.0 | 50.0 | 21.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 221.6 | 35.0 | 7.1 | 75.8 | 46.1 | 16.6 | 224.5 | 48.0 | 3.2 | 58.0 | 50.0 | 21.3 |
| LOS | F | C | A | E | D | B | F | D | A | E | D | C |
| Approach Delay (s/veh) | | 100.8 | | | 41.5 | | | 77.4 | | | 44.2 | |
| Approach LOS | | F | | | D | | | E | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 130 | |
| Actuated Cycle Length: 119.8 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.37 | |
| Intersection Signal Delay (s/veh): 63.0 | Intersection LOS: E |
| Intersection Capacity Utilization 97.6% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

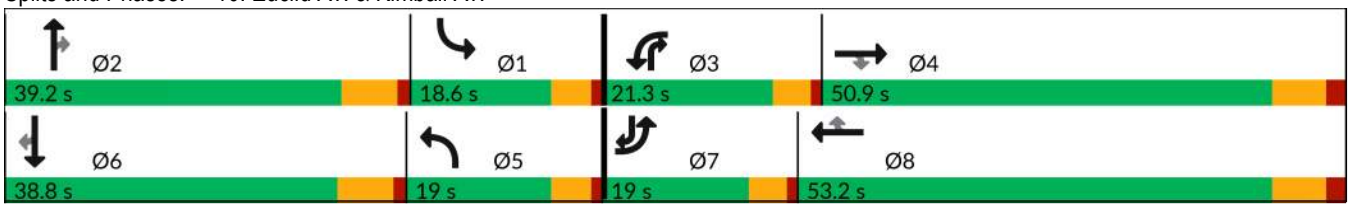

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 478 | 441 | 306 | 153 | 900 | 380 | 256 | 1053 | 89 | 243 | 1207 | 449 |
| Future Volume (veh/h) | 478 | 441 | 306 | 153 | 900 | 380 | 256 | 1053 | 89 | 243 | 1207 | 449 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 503 | 464 | 269 | 161 | 947 | 295 | 269 | 1108 | 73 | 256 | 1271 | 368 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 386 | 1124 | 476 | 187 | 1072 | 448 | 210 | 1345 | 550 | 457 | 1479 | 615 |
| Arrive On Green | 0.19 | 0.45 | 0.45 | 0.17 | 0.43 | 0.43 | 0.19 | 0.36 | 0.36 | 0.22 | 0.40 | 0.40 |
| Sat Flow, veh/h | 3092 | 3741 | 1585 | 1688 | 3741 | 1565 | 1688 | 5611 | 1565 | 3092 | 5611 | 1585 |
| Grp Volume(v), veh/h | 503 | 464 | 269 | 161 | 947 | 295 | 269 | 1108 | 73 | 256 | 1271 | 368 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1870 | 1585 | 1688 | 1870 | 1565 | 1688 | 1870 | 1565 | 1546 | 1870 | 1585 |
| Q Serve(g_s), s | 14.3 | 9.6 | 9.7 | 10.6 | 26.7 | 11.1 | 14.3 | 20.6 | 1.8 | 8.4 | 23.8 | 11.7 |
| Cycle Q Clear(g_c), s | 14.3 | 9.6 | 9.7 | 10.6 | 26.7 | 11.1 | 14.3 | 20.6 | 1.8 | 8.4 | 23.8 | 11.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 386 | 1124 | 476 | 187 | 1072 | 448 | 210 | 1345 | 550 | 457 | 1479 | 615 |
| V/C Ratio(X) | 1.30 | 0.41 | 0.56 | 0.86 | 0.88 | 0.66 | 1.28 | 0.82 | 0.13 | 0.56 | 0.86 | 0.60 |
| Avail Cap(c_a), veh/h | 386 | 1425 | 604 | 244 | 1500 | 628 | 210 | 1600 | 622 | 457 | 1585 | 645 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.6 | 24.7 | 11.8 | 47.0 | 30.9 | 11.8 | 46.6 | 34.5 | 8.4 | 41.3 | 32.7 | 9.0 |
| Incr Delay (d2), s/veh | 154.8 | 0.2 | 1.1 | 20.9 | 3.8 | 0.6 | 156.7 | 3.1 | 0.1 | 1.0 | 4.8 | 1.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.2 | 3.8 | 4.4 | 5.2 | 10.1 | 3.1 | 14.4 | 7.9 | 0.7 | 3.0 | 9.1 | 3.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 201.5 | 24.9 | 12.8 | 67.8 | 34.8 | 12.5 | 203.3 | 37.7 | 8.5 | 42.3 | 37.5 | 10.4 |
| LnGrp LOS | F | C | B | E | C | B | F | D | A | D | D | B |
| Approach Vol, veh/h | | 1236 | | | 1403 | | | 1450 | | | 1895 | |
| Approach Delay, s/veh | | 94.1 | | | 33.9 | | | 66.9 | | | 32.9 | |
| Approach LOS | | F | | | C | | | E | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.6 | 34.0 | 17.4 | 41.7 | 19.0 | 36.6 | 19.0 | 40.1 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | 6.4 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 13.9 | 32.7 | 16.6 | 43.7 | 14.3 | 32.4 | 14.3 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 10.4 | 22.6 | 12.6 | 11.7 | 16.3 | 25.8 | 16.3 | 28.7 |
| Green Ext Time (p_c), s | 0.2 | 4.9 | 0.1 | 3.8 | 0.0 | 4.4 | 0.0 | 4.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 54.0 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 287 | 499 | 149 | 1054 | 471 | 189 | 638 | 635 | 253 | 773 | 410 |
| Future Volume (vph) | 287 | 499 | 149 | 1054 | 471 | 189 | 638 | 635 | 253 | 773 | 410 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | 17.0 | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 | 30.5 |
| Total Split (s) | 19.0 | 24.2 | 24.2 | 45.8 | 51.0 | 14.7 | 35.3 | 45.8 | 14.7 | 35.3 | 35.3 |
| Total Split (%) | 15.8% | 20.2% | 20.2% | 38.2% | 42.5% | 12.3% | 29.4% | 38.2% | 12.3% | 29.4% | 29.4% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | 7.0 | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 27.2 | 17.2 | 17.2 | 40.1 | 30.1 | 10.0 | 27.9 | 74.5 | 10.0 | 27.9 | 27.9 |
| Actuated g/C Ratio | 0.23 | 0.14 | 0.14 | 0.34 | 0.25 | 0.08 | 0.23 | 0.63 | 0.08 | 0.23 | 0.23 |
| v/c Ratio | 0.77 | 0.96 | 0.43 | 1.02 | 0.70 | 0.69 | 0.75 | 0.64 | 0.93 | 0.91 | 0.67 |
| Control Delay (s/veh) | 59.5 | 80.6 | 12.1 | 72.2 | 40.5 | 66.9 | 48.7 | 15.5 | 92.8 | 60.2 | 14.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 59.5 | 80.6 | 12.1 | 72.2 | 40.5 | 66.9 | 48.7 | 15.5 | 92.8 | 60.2 | 14.4 |
| LOS | E | F | B | E | D | E | D | B | F | E | B |
| Approach Delay (s/veh) | | 63.2 | | | 60.2 | | 36.6 | | | 52.9 | |
| Approach LOS | | E | | | E | | D | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.1 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.02 | |
| Intersection Signal Delay (s/veh): 52.6 | Intersection LOS: D |
| Intersection Capacity Utilization 97.0% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

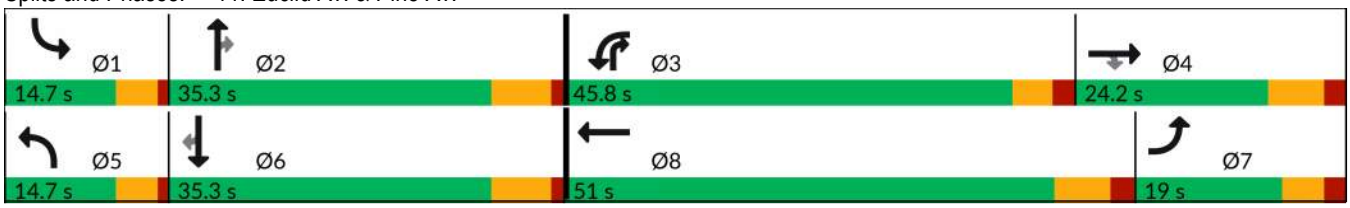

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 287 | 499 | 149 | 1054 | 471 | 171 | 189 | 638 | 635 | 253 | 773 | 410 |
| Future Volume (veh/h) | 287 | 499 | 149 | 1054 | 471 | 171 | 189 | 638 | 635 | 253 | 773 | 410 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 296 | 514 | 0 | 1087 | 486 | 88 | 195 | 658 | 346 | 261 | 797 | 217 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 459 | 543 | | 1079 | 619 | 111 | 284 | 861 | 901 | 285 | 862 | 365 |
| Arrive On Green | 0.41 | 0.22 | 0.00 | 0.51 | 0.30 | 0.30 | 0.13 | 0.35 | 0.35 | 0.13 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1688 | 3741 | 1585 | 3188 | 3085 | 556 | 3375 | 3741 | 1585 | 3375 | 3741 | 1585 |
| Grp Volume(v), veh/h | 296 | 514 | 0 | 1087 | 294 | 280 | 195 | 658 | 346 | 261 | 797 | 217 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1594 | 1870 | 1770 | 1688 | 1870 | 1585 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 16.7 | 16.0 | 0.0 | 40.1 | 17.0 | 17.2 | 6.5 | 18.5 | 14.1 | 9.1 | 24.3 | 6.7 |
| Cycle Q Clear(g_c), s | 16.7 | 16.0 | 0.0 | 40.1 | 17.0 | 17.2 | 6.5 | 18.5 | 14.1 | 9.1 | 24.3 | 6.7 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.31 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 459 | 543 | | 1079 | 375 | 355 | 284 | 861 | 901 | 285 | 862 | 365 |
| V/C Ratio(X) | 0.64 | 0.95 | | 1.01 | 0.78 | 0.79 | 0.69 | 0.76 | 0.38 | 0.92 | 0.92 | 0.59 |
| Avail Cap(c_a), veh/h | 459 | 543 | | 1079 | 695 | 657 | 285 | 909 | 922 | 285 | 909 | 385 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 30.5 | 45.9 | 0.0 | 29.2 | 39.1 | 39.1 | 50.3 | 35.9 | 12.0 | 51.3 | 37.8 | 8.5 |
| Incr Delay (d2), s/veh | 2.4 | 26.1 | 0.0 | 29.3 | 5.1 | 5.5 | 5.6 | 3.2 | 0.1 | 31.7 | 14.0 | 1.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.0 | 8.6 | 0.0 | 15.9 | 7.2 | 7.0 | 2.8 | 7.4 | 3.8 | 4.8 | 10.8 | 4.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 32.9 | 72.0 | 0.0 | 58.4 | 44.1 | 44.7 | 55.8 | 39.1 | 12.1 | 83.1 | 51.8 | 9.9 |
| LnGrp LOS | C | E | | F | D | D | E | D | B | F | D | A |
| Approach Vol, veh/h | | 810 | | | 1661 | | | 1199 | | | 1275 | |
| Approach Delay, s/veh | | 57.7 | | | 53.6 | | | 34.0 | | | 51.1 | |
| Approach LOS | | E | | | D | | | C | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 33.8 | 45.8 | 24.2 | 14.7 | 33.8 | 39.2 | 30.8 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 7.0 | * 7 |
| Max Green Setting (Gmax), s | 10.0 | 28.8 | 40.1 | 17.2 | 10.0 | 28.8 | 13.3 | * 44 |
| Max Q Clear Time (g_c+I1), s | 11.1 | 20.5 | 42.1 | 18.0 | 8.5 | 26.3 | 18.7 | 19.2 |
| Green Ext Time (p_c), s | 0.0 | 2.2 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0 | 4.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 48.9 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 71 | 1850 | 121 | 2380 | 57 | 8 | 104 | 40 |
| Future Volume (vph) | 71 | 1850 | 121 | 2380 | 57 | 8 | 104 | 40 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 96.0 | 96.0 | 96.0 | 96.0 | 24.0 | 24.0 | 24.0 | 24.0 |
| Total Split (%) | 80.0% | 80.0% | 80.0% | 80.0% | 20.0% | 20.0% | 20.0% | 20.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 91.4 | 91.4 | 91.4 | 91.4 | | 19.4 | | 19.4 |
| Actuated g/C Ratio | 0.76 | 0.76 | 0.76 | 0.76 | | 0.16 | | 0.16 |
| v/c Ratio | 1.31 | 0.79 | 1.97 | 1.00 | | 0.55 | | 1.08 |
| Control Delay (s/veh) | 242.0 | 11.4 | 504.6 | 33.3 | | 52.3 | | 127.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 242.0 | 11.4 | 504.6 | 33.3 | | 52.3 | | 127.5 |
| LOS | F | B | F | C | | D | | F |
| Approach Delay (s/veh) | | 19.5 | | 55.3 | | 52.3 | | 127.5 |
| Approach LOS | | B | | E | | D | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.97 | |
| Intersection Signal Delay (s/veh): 44.1 | Intersection LOS: D |
| Intersection Capacity Utilization 99.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 14: Campus Av. & Edison Av.

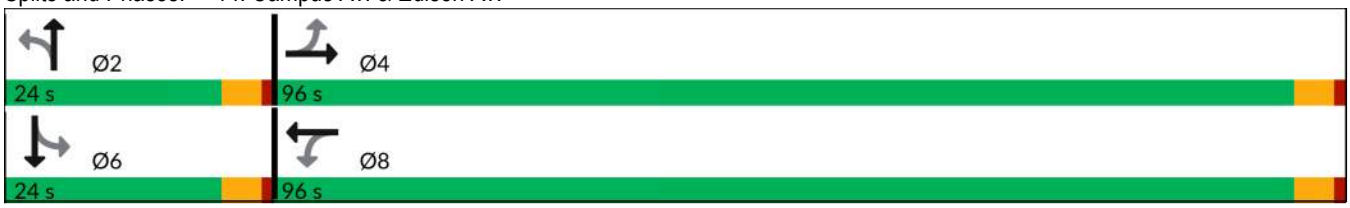

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 71 | 1850 | 99 | 121 | 2380 | 97 | 57 | 8 | 25 | 104 | 40 | 97 |
| Future Volume (veh/h) | 71 | 1850 | 99 | 121 | 2380 | 97 | 57 | 8 | 25 | 104 | 40 | 97 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 77 | 2011 | 108 | 132 | 2587 | 105 | 62 | 9 | 27 | 113 | 43 | 105 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 65 | 2614 | 139 | 136 | 2652 | 107 | 152 | 27 | 50 | 147 | 46 | 101 |
| Arrive On Green | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.76 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| Sat Flow, veh/h | 103 | 3432 | 183 | 181 | 3482 | 140 | 637 | 170 | 307 | 646 | 282 | 624 |
| Grp Volume(v), veh/h | 77 | 1032 | 1087 | 132 | 1311 | 1381 | 98 | 0 | 0 | 261 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 103 | 1777 | 1837 | 181 | 1777 | 1845 | 1114 | 0 | 0 | 1552 | 0 | 0 |
| Q Serve(g_s), s | 6.4 | 39.7 | 41.4 | 50.0 | 80.6 | 85.0 | 0.0 | 0.0 | 0.0 | 10.1 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 91.4 | 39.7 | 41.4 | 91.4 | 80.6 | 85.0 | 9.3 | 0.0 | 0.0 | 19.4 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.10 | 1.00 | | 0.08 | 0.63 | | 0.28 | 0.43 | | 0.40 |
| Lane Grp Cap(c), veh/h | 65 | 1353 | 1400 | 136 | 1353 | 1405 | 229 | 0 | 0 | 294 | 0 | 0 |
| V/C Ratio(X) | 1.18 | 0.76 | 0.78 | 0.97 | 0.97 | 0.98 | 0.43 | 0.00 | 0.00 | 0.89 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 65 | 1353 | 1400 | 136 | 1353 | 1405 | 229 | 0 | 0 | 294 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 59.7 | 8.1 | 8.3 | 45.7 | 13.0 | 13.5 | 45.8 | 0.0 | 0.0 | 50.6 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 166.5 | 2.6 | 2.8 | 68.9 | 17.5 | 19.8 | 1.3 | 0.0 | 0.0 | 26.3 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.0 | 11.2 | 12.2 | 6.5 | 27.4 | 30.6 | 2.7 | 0.0 | 0.0 | 9.8 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 226.2 | 10.8 | 11.2 | 114.6 | 30.6 | 33.4 | 47.0 | 0.0 | 0.0 | 76.9 | 0.0 | 0.0 |
| LnGrp LOS | F | B | B | F | C | C | D | | | E | | |
| Approach Vol, veh/h | | 2196 | | | 2824 | | | 98 | | | 261 | |
| Approach Delay, s/veh | | 18.5 | | | 35.8 | | | 47.0 | | | 76.9 | |
| Approach LOS | | B | | | D | | | D | | | E | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 96.0 | 24.0 | 96.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 19.4 | 91.4 | 19.4 | 91.4 |
| Max Q Clear Time (g_c+I1), s | 11.3 | 93.4 | 21.4 | 93.4 |
| Green Ext Time (p_c), s | 0.2 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 31.0 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 115 | 1095 | 78 | 944 | 51 | 94 | 8 | 52 |
| Future Volume (vph) | 115 | 1095 | 78 | 944 | 51 | 94 | 8 | 52 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 |
| Total Split (s) | 95.0 | 95.0 | 95.0 | 95.0 | 25.0 | 25.0 | 25.0 | 25.0 |
| Total Split (%) | 79.2% | 79.2% | 79.2% | 79.2% | 20.8% | 20.8% | 20.8% | 20.8% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | | 5.4 | | 5.4 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 89.6 | 89.6 | 89.6 | 89.6 | | 19.6 | | 19.6 |
| Actuated g/C Ratio | 0.75 | 0.75 | 0.75 | 0.75 | | 0.16 | | 0.16 |
| v/c Ratio | 0.42 | 0.95 | 1.44 | 0.43 | | 1.16 | | 0.52 |
| Control Delay (s/veh) | 10.5 | 28.8 | 288.6 | 6.2 | | 148.1 | | 38.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 10.5 | 28.8 | 288.6 | 6.2 | | 148.1 | | 38.5 |
| LOS | B | C | F | A | | F | | D |
| Approach Delay (s/veh) | | 27.1 | | 26.8 | | 148.1 | | 38.5 |
| Approach LOS | | C | | C | | F | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.44 | |
| Intersection Signal Delay (s/veh): 38.3 | Intersection LOS: D |
| Intersection Capacity Utilization 109.3% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 15: Bon View Av. & Riverside Dr.

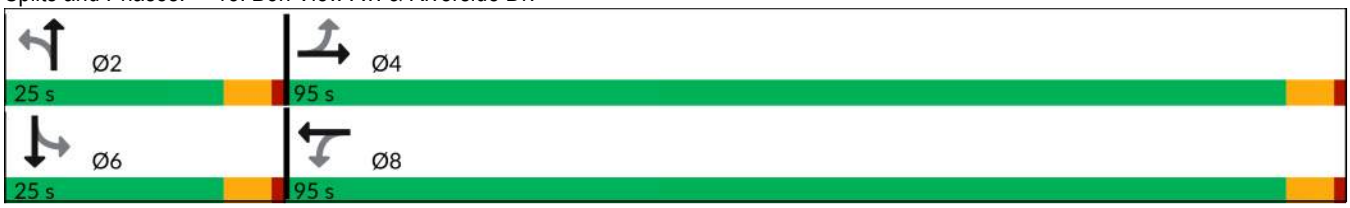

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 115 | 1095 | 55 | 78 | 944 | 53 | 51 | 94 | 96 | 8 | 52 | 78 |
| Future Volume (veh/h) | 115 | 1095 | 55 | 78 | 944 | 53 | 51 | 94 | 96 | 8 | 52 | 78 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 131 | 1244 | 62 | 89 | 1073 | 60 | 58 | 107 | 109 | 9 | 59 | 89 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 373 | 1317 | 66 | 119 | 2551 | 143 | 82 | 113 | 105 | 39 | 115 | 160 |
| Arrive On Green | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 |
| Sat Flow, veh/h | 497 | 1764 | 88 | 421 | 3417 | 191 | 278 | 692 | 641 | 44 | 704 | 979 |
| Grp Volume(v), veh/h | 131 | 0 | 1306 | 89 | 558 | 575 | 274 | 0 | 0 | 157 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 497 | 0 | 1852 | 421 | 1777 | 1831 | 1611 | 0 | 0 | 1727 | 0 | 0 |
| Q Serve(g_s), s | 15.9 | 0.0 | 72.7 | 16.9 | 13.9 | 13.9 | 9.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 29.8 | 0.0 | 72.7 | 89.6 | 13.9 | 13.9 | 19.6 | 0.0 | 0.0 | 10.2 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.05 | 1.00 | | 0.10 | 0.21 | | 0.40 | 0.06 | | 0.57 |
| Lane Grp Cap(c), veh/h | 373 | 0 | 1383 | 119 | 1327 | 1367 | 299 | 0 | 0 | 314 | 0 | 0 |
| V/C Ratio(X) | 0.35 | 0.00 | 0.94 | 0.74 | 0.42 | 0.42 | 0.91 | 0.00 | 0.00 | 0.50 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 373 | 0 | 1383 | 119 | 1327 | 1367 | 299 | 0 | 0 | 314 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 11.1 | 0.0 | 13.1 | 54.3 | 5.6 | 5.6 | 50.5 | 0.0 | 0.0 | 46.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 13.2 | 22.1 | 0.2 | 0.2 | 31.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.6 | 0.0 | 26.8 | 3.4 | 4.1 | 4.2 | 10.6 | 0.0 | 0.0 | 4.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 11.7 | 0.0 | 26.2 | 76.5 | 5.8 | 5.8 | 81.4 | 0.0 | 0.0 | 47.5 | 0.0 | 0.0 |
| LnGrp LOS | B | | C | E | A | A | F | | | D | | |
| Approach Vol, veh/h | | 1437 | | | 1222 | | | 274 | | | 157 | |
| Approach Delay, s/veh | | 24.9 | | | 11.0 | | | 81.4 | | | 47.5 | |
| Approach LOS | | C | | | B | | | F | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 25.0 | 95.0 | 25.0 | 95.0 |
| Change Period (Y+Rc), s | 5.4 | 5.4 | 5.4 | 5.4 |
| Max Green Setting (Gmax), s | 19.6 | 89.6 | 19.6 | 89.6 |
| Max Q Clear Time (g_c+I1), s | 21.6 | 74.7 | 12.2 | 91.6 |
| Green Ext Time (p_c), s | 0.0 | 10.6 | 0.4 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 25.6 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 36 | 133 | 17 | 189 | 75 | 280 | 8 | 171 |
| Future Volume (vph) | 36 | 133 | 17 | 189 | 75 | 280 | 8 | 171 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 47.0 | 47.0 | 47.0 | 47.0 | 73.0 | 73.0 | 73.0 | 73.0 |
| Total Split (%) | 39.2% | 39.2% | 39.2% | 39.2% | 60.8% | 60.8% | 60.8% | 60.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 4.6 | | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 11.5 | | 11.5 | | 16.0 | | 16.0 |
| Actuated g/C Ratio | | 0.31 | | 0.31 | | 0.43 | | 0.43 |
| v/c Ratio | | 0.44 | | 0.44 | | 0.58 | | 0.33 |
| Control Delay (s/veh) | | 13.9 | | 13.9 | | 12.1 | | 8.0 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 13.9 | | 13.9 | | 12.1 | | 8.0 |
| LOS | | B | | B | | B | | A |
| Approach Delay (s/veh) | | 13.9 | | 13.9 | | 12.1 | | 8.0 |
| Approach LOS | | B | | B | | B | | A |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 37.2 | |
| Natural Cycle: 50 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.58 | |
| Intersection Signal Delay (s/veh): 11.9 | Intersection LOS: B |
| Intersection Capacity Utilization 64.8% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 16: Bon View Av. & Schaefer Av.

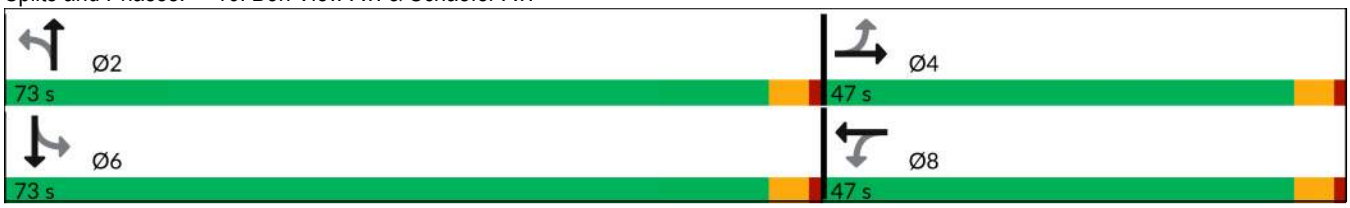

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 36 | 133 | 41 | 17 | 189 | 17 | 75 | 280 | 23 | 8 | 171 | 55 |
| Future Volume (veh/h) | 36 | 133 | 41 | 17 | 189 | 17 | 75 | 280 | 23 | 8 | 171 | 55 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 39 | 145 | 23 | 18 | 205 | 13 | 82 | 304 | 14 | 9 | 186 | 38 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 231 | 317 | 46 | 182 | 389 | 24 | 268 | 534 | 22 | 168 | 552 | 109 |
| Arrive On Green | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 |
| Sat Flow, veh/h | 211 | 1334 | 193 | 76 | 1636 | 100 | 226 | 1433 | 60 | 25 | 1481 | 293 |
| Grp Volume(v), veh/h | 207 | 0 | 0 | 236 | 0 | 0 | 400 | 0 | 0 | 233 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1738 | 0 | 0 | 1812 | 0 | 0 | 1720 | 0 | 0 | 1799 | 0 | 0 |
| Q Serve(g_s), s | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 2.3 | 0.0 | 0.0 | 2.6 | 0.0 | 0.0 | 4.3 | 0.0 | 0.0 | 2.2 | 0.0 | 0.0 |
| Prop In Lane | 0.19 | | 0.11 | 0.08 | | 0.06 | 0.20 | | 0.03 | 0.04 | | 0.16 |
| Lane Grp Cap(c), veh/h | 594 | 0 | 0 | 595 | 0 | 0 | 825 | 0 | 0 | 829 | 0 | 0 |
| V/C Ratio(X) | 0.35 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 | 0.49 | 0.00 | 0.00 | 0.28 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 3165 | 0 | 0 | 3370 | 0 | 0 | 4995 | 0 | 0 | 5291 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 7.7 | 0.0 | 0.0 | 7.9 | 0.0 | 0.0 | 5.9 | 0.0 | 0.0 | 5.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.0 | 0.0 | 0.5 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 8.1 | 0.0 | 0.0 | 8.3 | 0.0 | 0.0 | 6.4 | 0.0 | 0.0 | 5.5 | 0.0 | 0.0 |
| LnGrp LOS | A | | | A | | | A | | | A | | |
| Approach Vol, veh/h | | 207 | | | 236 | | | 400 | | | 233 | |
| Approach Delay, s/veh | | 8.1 | | | 8.3 | | | 6.4 | | | 5.5 | |
| Approach LOS | | A | | | A | | | A | | | A | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.4 | 10.2 | 13.4 | 10.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 68.4 | 42.4 | 68.4 | 42.4 |
| Max Q Clear Time (g_c+I1), s | 6.3 | 4.3 | 4.2 | 4.6 |
| Green Ext Time (p_c), s | 2.5 | 1.2 | 1.3 | 1.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 6.9 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 163 | 1221 | 373 | 1421 | 177 | 367 | 194 | 179 | 94 |
| Future Volume (vph) | 163 | 1221 | 373 | 1421 | 177 | 367 | 194 | 179 | 94 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 17.3 | 33.0 | 27.0 | 42.7 | 42.7 | 17.0 | 43.0 | 17.0 | 43.0 |
| Total Split (%) | 14.4% | 27.5% | 22.5% | 35.6% | 35.6% | 14.2% | 35.8% | 14.2% | 35.8% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lag | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.7 | 27.2 | 22.4 | 36.9 | 36.9 | 30.8 | 37.6 | 12.4 | 19.2 |
| Actuated g/C Ratio | 0.11 | 0.23 | 0.19 | 0.31 | 0.31 | 0.26 | 0.31 | 0.10 | 0.16 |
| v/c Ratio | 0.98 | 0.98 | 1.27 | 0.93 | 0.32 | 0.91 | 1.20 | 1.10 | 0.77 |
| Control Delay (s/veh) | 115.9 | 63.1 | 185.6 | 51.4 | 6.8 | 70.5 | 137.1 | 146.9 | 51.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 115.9 | 63.1 | 185.6 | 51.4 | 6.8 | 70.5 | 137.1 | 146.9 | 51.7 |
| LOS | F | E | F | D | A | E | F | F | D |
| Approach Delay (s/veh) | | 68.4 | | 72.8 | | | 112.7 | | 93.9 |
| Approach LOS | | E | | E | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.27 | |
| Intersection Signal Delay (s/veh): 81.1 | Intersection LOS: F |
| Intersection Capacity Utilization 111.5% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

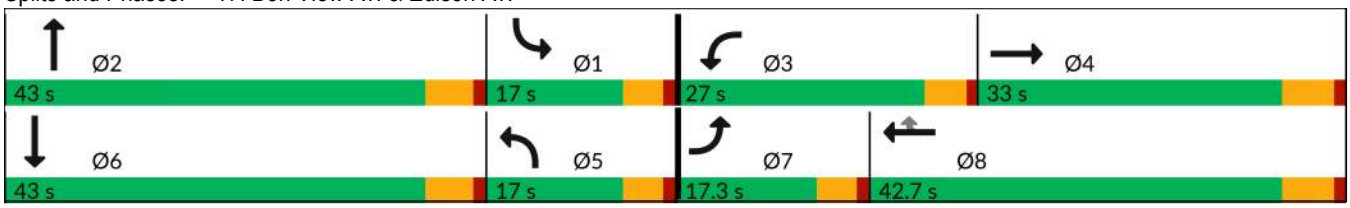

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 163 | 1221 | 241 | 373 | 1421 | 177 | 367 | 194 | 440 | 179 | 94 | 131 |
| Future Volume (veh/h) | 163 | 1221 | 241 | 373 | 1421 | 177 | 367 | 194 | 440 | 179 | 94 | 131 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 | 1772 |
| Adj Flow Rate, veh/h | 173 | 1299 | 150 | 397 | 1512 | 103 | 390 | 206 | 255 | 190 | 100 | 86 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 183 | 1426 | 164 | 323 | 1655 | 468 | 459 | 216 | 267 | 179 | 118 | 101 |
| Arrive On Green | 0.16 | 0.34 | 0.34 | 0.29 | 0.47 | 0.47 | 0.41 | 0.45 | 0.45 | 0.16 | 0.20 | 0.20 |
| Sat Flow, veh/h | 1688 | 6241 | 718 | 1688 | 5316 | 1502 | 1688 | 720 | 891 | 1688 | 879 | 756 |
| Grp Volume(v), veh/h | 173 | 1106 | 343 | 397 | 1512 | 103 | 390 | 0 | 461 | 190 | 0 | 186 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1772 | 1643 | 1688 | 1772 | 1502 | 1688 | 0 | 1611 | 1688 | 0 | 1636 |
| Q Serve(g_s), s | 11.9 | 23.3 | 23.4 | 22.4 | 31.0 | 3.4 | 24.5 | 0.0 | 32.3 | 12.4 | 0.0 | 12.8 |
| Cycle Q Clear(g_c), s | 11.9 | 23.3 | 23.4 | 22.4 | 31.0 | 3.4 | 24.5 | 0.0 | 32.3 | 12.4 | 0.0 | 12.8 |
| Prop In Lane | 1.00 | | 0.44 | 1.00 | | 1.00 | 1.00 | | 0.55 | 1.00 | | 0.46 |
| Lane Grp Cap(c), veh/h | 183 | 1215 | 375 | 323 | 1655 | 468 | 459 | 0 | 484 | 179 | 0 | 219 |
| V/C Ratio(X) | 0.95 | 0.91 | 0.91 | 1.23 | 0.91 | 0.22 | 0.85 | 0.00 | 0.95 | 1.06 | 0.00 | 0.85 |
| Avail Cap(c_a), veh/h | 183 | 1235 | 382 | 323 | 1675 | 473 | 459 | 0 | 517 | 179 | 0 | 525 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.7 | 37.3 | 37.4 | 41.7 | 29.7 | 11.7 | 32.5 | 0.0 | 31.4 | 49.2 | 0.0 | 45.6 |
| Incr Delay (d2), s/veh | 50.2 | 10.1 | 25.9 | 127.6 | 8.1 | 0.2 | 13.4 | 0.0 | 27.4 | 85.1 | 0.0 | 8.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.1 | 9.5 | 10.5 | 19.4 | 11.5 | 1.6 | 10.0 | 0.0 | 13.8 | 9.0 | 0.0 | 5.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 98.9 | 47.4 | 63.3 | 169.3 | 37.8 | 11.9 | 45.9 | 0.0 | 58.8 | 134.3 | 0.0 | 54.4 |
| LnGrp LOS | F | D | E | F | D | B | D | | E | F | | D |
| Approach Vol, veh/h | | 1622 | | | 2012 | | | 851 | | | 376 | |
| Approach Delay, s/veh | | 56.2 | | | 62.4 | | | 52.9 | | | 94.8 | |
| Approach LOS | | E | | | E | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 40.5 | 27.0 | 32.6 | 36.4 | 21.1 | 17.3 | 42.3 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 12.4 | 37.6 | 22.4 | 27.2 | 12.4 | 37.6 | 12.7 | 36.9 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 34.3 | 24.4 | 25.4 | 26.5 | 14.8 | 13.9 | 33.0 |
| Green Ext Time (p_c), s | 0.0 | 0.9 | 0.0 | 1.3 | 0.0 | 0.9 | 0.0 | 3.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 61.2 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 202 | 498 | 4 | 185 | 21 | 36 | 161 | 56 |
| Future Volume (vph) | 202 | 498 | 4 | 185 | 21 | 36 | 161 | 56 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 75.0 | 75.0 | 75.0 | 75.0 | 45.0 | 45.0 | 45.0 | 45.0 |
| Total Split (%) | 62.5% | 62.5% | 62.5% | 62.5% | 37.5% | 37.5% | 37.5% | 37.5% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 4.6 | | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 62.2 | | 62.2 | | 35.9 | | 35.9 |
| Actuated g/C Ratio | | 0.58 | | 0.58 | | 0.33 | | 0.33 |
| v/c Ratio | | 0.93 | | 0.25 | | 0.14 | | 0.91 |
| Control Delay (s/veh) | | 40.0 | | 11.6 | | 27.0 | | 55.1 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 40.0 | | 11.6 | | 27.0 | | 55.1 |
| LOS | | D | | B | | C | | E |
| Approach Delay (s/veh) | | 40.0 | | 11.6 | | 27.0 | | 55.1 |
| Approach LOS | | D | | B | | C | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 107.7 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay (s/veh): 39.3 | Intersection LOS: D |
| Intersection Capacity Utilization 92.6% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 18: Bon View Av. & Eucalyptus Av.

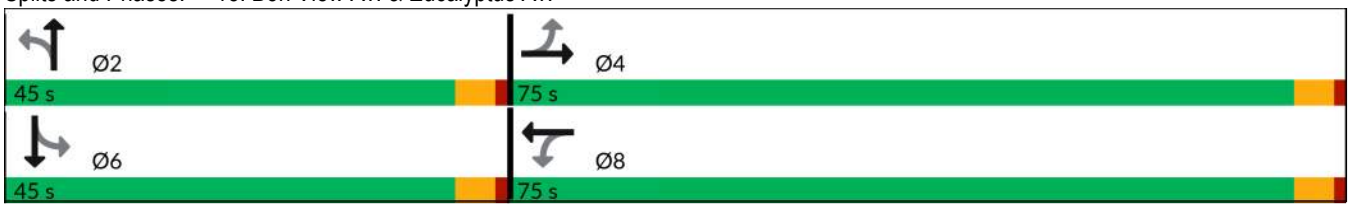

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 202 | 498 | 7 | 4 | 185 | 42 | 21 | 36 | 5 | 161 | 56 | 200 |
| Future Volume (veh/h) | 202 | 498 | 7 | 4 | 185 | 42 | 21 | 36 | 5 | 161 | 56 | 200 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 230 | 566 | 8 | 5 | 210 | 48 | 24 | 41 | 6 | 183 | 64 | 227 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 293 | 629 | 9 | 47 | 808 | 181 | 186 | 299 | 40 | 251 | 82 | 253 |
| Arrive On Green | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 |
| Sat Flow, veh/h | 435 | 1144 | 16 | 8 | 1470 | 330 | 380 | 873 | 116 | 563 | 238 | 736 |
| Grp Volume(v), veh/h | 804 | 0 | 0 | 263 | 0 | 0 | 71 | 0 | 0 | 474 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1595 | 0 | 0 | 1808 | 0 | 0 | 1369 | 0 | 0 | 1538 | 0 | 0 |
| Q Serve(g_s), s | 32.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 22.8 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 39.0 | 0.0 | 0.0 | 6.6 | 0.0 | 0.0 | 2.3 | 0.0 | 0.0 | 25.1 | 0.0 | 0.0 |
| Prop In Lane | 0.29 | | 0.01 | 0.02 | | 0.18 | 0.34 | | 0.08 | 0.39 | | 0.48 |
| Lane Grp Cap(c), veh/h | 931 | 0 | 0 | 1037 | 0 | 0 | 526 | 0 | 0 | 585 | 0 | 0 |
| V/C Ratio(X) | 0.86 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.14 | 0.00 | 0.00 | 0.81 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 1354 | 0 | 0 | 1515 | 0 | 0 | 715 | 0 | 0 | 779 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 17.2 | 0.0 | 0.0 | 10.2 | 0.0 | 0.0 | 19.3 | 0.0 | 0.0 | 26.6 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 4.2 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 4.8 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.2 | 0.0 | 0.0 | 2.2 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 9.1 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 21.3 | 0.0 | 0.0 | 10.3 | 0.0 | 0.0 | 19.4 | 0.0 | 0.0 | 31.4 | 0.0 | 0.0 |
| LnGrp LOS | C | | | B | | | B | | | C | | |
| Approach Vol, veh/h | | 804 | | | 263 | | | 71 | | | 474 | |
| Approach Delay, s/veh | | 21.3 | | | 10.3 | | | 19.4 | | | 31.4 | |
| Approach LOS | | C | | | B | | | B | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 34.1 | 51.8 | 34.1 | 51.8 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 40.4 | 70.4 | 40.4 | 70.4 |
| Max Q Clear Time (g_c+I1), s | 4.3 | 41.0 | 27.1 | 8.6 |
| Green Ext Time (p_c), s | 0.3 | 6.2 | 2.4 | 1.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.4 |
| HCM 7th LOS | C |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 6 | 591 | 494 | 1428 | 820 | 549 |
| Future Volume (vph) | 6 | 591 | 494 | 1428 | 820 | 549 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 32.0 | 32.0 | 30.0 | 58.0 | 28.0 | 28.0 |
| Total Split (%) | 35.6% | 35.6% | 33.3% | 64.4% | 31.1% | 31.1% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 26.2 | 26.2 | 24.2 | 52.2 | 22.2 | 22.2 |
| Actuated g/C Ratio | 0.29 | 0.29 | 0.27 | 0.58 | 0.25 | 0.25 |
| v/c Ratio | 0.62 | 1.18 | 1.17 | 0.74 | 1.00 | 0.70 |
| Control Delay (s/veh) | 33.8 | 125.0 | 118.4 | 8.1 | 65.7 | 7.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Total Delay (s/veh) | 33.8 | 125.0 | 118.4 | 8.6 | 65.7 | 7.9 |
| LOS | C | F | F | A | E | A |
| Approach Delay (s/veh) | 94.2 | | | 36.8 | 42.5 | |
| Approach LOS | F | | | D | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.18 | |
| Intersection Signal Delay (s/veh): 50.9 | Intersection LOS: D |
| Intersection Capacity Utilization 99.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 295 | 6 | 591 | 494 | 1428 | 0 | 0 | 820 | 549 |
| Future Volume (veh/h) | 0 | 0 | 0 | 295 | 6 | 591 | 494 | 1428 | 0 | 0 | 820 | 549 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 314 | 6 | 485 | 526 | 1519 | 0 | 0 | 872 | 439 |
| Peak Hour Factor | | | | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 509 | 10 | 461 | 454 | 2061 | 0 | 0 | 877 | 391 |
| Arrive On Green | | | | 0.29 | 0.29 | 0.29 | 0.54 | 1.00 | 0.00 | 0.00 | 0.25 | 0.25 |
| Sat Flow, veh/h | | | | 1749 | 33 | 1585 | 1688 | 3647 | 0 | 0 | 3647 | 1585 |
| Grp Volume(v), veh/h | | | | 320 | 0 | 485 | 526 | 1519 | 0 | 0 | 872 | 439 |
| Grp Sat Flow(s),veh/h/ln | | | | 1783 | 0 | 1585 | 1688 | 1777 | 0 | 0 | 1777 | 1585 |
| Q Serve(g_s), s | | | | 14.0 | 0.0 | 26.2 | 24.2 | 0.0 | 0.0 | 0.0 | 22.0 | 22.2 |
| Cycle Q Clear(g_c), s | | | | 14.0 | 0.0 | 26.2 | 24.2 | 0.0 | 0.0 | 0.0 | 22.0 | 22.2 |
| Prop In Lane | | | | 0.98 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 519 | 0 | 461 | 454 | 2061 | 0 | 0 | 877 | 391 |
| V/C Ratio(X) | | | | 0.62 | 0.00 | 1.05 | 1.16 | 0.74 | 0.00 | 0.00 | 0.99 | 1.12 |
| Avail Cap(c_a), veh/h | | | | 519 | 0 | 461 | 454 | 2061 | 0 | 0 | 877 | 391 |
| HCM Platoon Ratio | | | | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.09 | 0.09 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 27.6 | 0.0 | 31.9 | 20.8 | 0.0 | 0.0 | 0.0 | 33.8 | 33.9 |
| Incr Delay (d2), s/veh | | | | 2.0 | 0.0 | 56.0 | 74.2 | 0.2 | 0.0 | 0.0 | 29.2 | 83.2 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 5.8 | 0.0 | 16.4 | 14.4 | 0.1 | 0.0 | 0.0 | 12.4 | 17.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 29.5 | 0.0 | 87.9 | 95.0 | 0.2 | 0.0 | 0.0 | 63.0 | 117.1 |
| LnGrp LOS | | | | C | | F | F | A | | | E | F |
| Approach Vol, veh/h | | | | | 805 | | | 2045 | | | 1311 | |
| Approach Delay, s/veh | | | | | 64.7 | | | 24.6 | | | 81.1 | |
| Approach LOS | | | | | E | | | C | | | F | |

| Timer - Assigned Phs | | 2 | | | 5 | 6 | | 8 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 58.0 | | | 30.0 | 28.0 | | 32.0 | | | | |
| Change Period (Y+Rc), s | | 5.8 | | | 5.8 | 5.8 | | 5.8 | | | | |
| Max Green Setting (Gmax), s | | 52.2 | | | 24.2 | 22.2 | | 26.2 | | | | |
| Max Q Clear Time (g_c+I1), s | | 2.0 | | | 26.2 | 24.2 | | 28.2 | | | | |
| Green Ext Time (p_c), s | | 12.3 | | | 0.0 | 0.0 | | 0.0 | | | | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 7th Control Delay, s/veh | | | 50.2 |
| HCM 7th LOS | | | D |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 2 | 254 | 1380 | 477 | 314 | 783 |
| Future Volume (vph) | 2 | 254 | 1380 | 477 | 314 | 783 |
| Turn Type | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 37.2 | 37.2 | 19.0 | 56.2 |
| Total Split (%) | 37.6% | 37.6% | 41.3% | 41.3% | 21.1% | 62.4% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lead | Lead | Lag | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | |
| Recall Mode | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 27.0 | 27.0 | 31.4 | 31.4 | 14.0 | 50.4 |
| Actuated g/C Ratio | 0.30 | 0.30 | 0.35 | 0.35 | 0.16 | 0.56 |
| v/c Ratio | 0.99 | 0.45 | 1.11 | 0.59 | 1.26 | 0.39 |
| Control Delay (s/veh) | 71.0 | 13.1 | 89.2 | 6.1 | 154.5 | 5.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 71.0 | 13.1 | 89.2 | 6.1 | 154.5 | 5.7 |
| LOS | E | B | F | A | F | A |
| Approach Delay (s/veh) | 51.7 | | 67.9 | | | 48.3 |
| Approach LOS | D | | E | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.26 | |
| Intersection Signal Delay (s/veh): 58.8 | Intersection LOS: E |
| Intersection Capacity Utilization 99.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 506 | 2 | 254 | 0 | 0 | 0 | 0 | 1380 | 477 | 314 | 783 | 0 |
| Future Volume (veh/h) | 506 | 2 | 254 | 0 | 0 | 0 | 0 | 1380 | 477 | 314 | 783 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.98 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 527 | 2 | 135 | | | | 0 | 1438 | 257 | 327 | 816 | 0 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | | | | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 532 | 2 | 476 | | | | 0 | 1305 | 541 | 758 | 3225 | 0 |
| Arrive On Green | 0.45 | 0.45 | 0.45 | | | | 0.00 | 0.52 | 0.52 | 0.45 | 0.86 | 0.00 |
| Sat Flow, veh/h | 1775 | 7 | 1585 | | | | 0 | 3741 | 1549 | 1688 | 3741 | 0 |
| Grp Volume(v), veh/h | 529 | 0 | 135 | | | | 0 | 1438 | 257 | 327 | 816 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1782 | 0 | 1585 | | | | 0 | 1870 | 1549 | 1688 | 1870 | 0 |
| Q Serve(g_s), s | 26.5 | 0.0 | 4.8 | | | | 0.0 | 31.4 | 9.5 | 11.9 | 3.5 | 0.0 |
| Cycle Q Clear(g_c), s | 26.5 | 0.0 | 4.8 | | | | 0.0 | 31.4 | 9.5 | 11.9 | 3.5 | 0.0 |
| Prop In Lane | 1.00 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 534 | 0 | 476 | | | | 0 | 1305 | 541 | 758 | 3225 | 0 |
| V/C Ratio(X) | 0.99 | 0.00 | 0.28 | | | | 0.00 | 1.10 | 0.48 | 0.43 | 0.25 | 0.00 |
| Avail Cap(c_a), veh/h | 534 | 0 | 476 | | | | 0 | 1305 | 541 | 758 | 3225 | 0 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | | | | 1.00 | 1.50 | 1.50 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 24.6 | 0.0 | 18.7 | | | | 0.0 | 21.4 | 16.2 | 17.0 | 1.1 | 0.0 |
| Incr Delay (d2), s/veh | 36.1 | 0.0 | 0.1 | | | | 0.0 | 57.7 | 3.0 | 0.0 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.4 | 0.0 | 1.6 | | | | 0.0 | 19.4 | 3.2 | 4.1 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 60.7 | 0.0 | 18.8 | | | | 0.0 | 79.1 | 19.2 | 17.0 | 1.1 | 0.0 |
| LnGrp LOS | E | | B | | | | | F | B | B | A | |
| Approach Vol, veh/h | | 664 | | | | | | 1695 | | | 1143 | |
| Approach Delay, s/veh | | 52.2 | | | | | | 70.0 | | | 5.6 | |
| Approach LOS | | D | | | | | | E | | | A | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 46.9 | 37.2 | | 33.8 | | 84.1 |
| Change Period (Y+Rc), s | 5.8 | * 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 14.0 | * 31 | | 27.0 | | 50.4 |
| Max Q Clear Time (g_c+I1), s | 13.9 | 33.4 | | 28.5 | | 5.5 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 4.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 45.6 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 237 | 921 | 40 | 875 | 50 | 968 | 173 | 691 |
| Future Volume (vph) | 237 | 921 | 40 | 875 | 50 | 968 | 173 | 691 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 15.0 | 34.3 | 9.7 | 29.0 | 9.8 | 33.0 | 13.0 | 36.2 |
| Total Split (%) | 16.7% | 38.1% | 10.8% | 32.2% | 10.9% | 36.7% | 14.4% | 40.2% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.4 | 32.0 | 5.1 | 22.8 | 5.2 | 27.2 | 8.4 | 32.4 |
| Actuated g/C Ratio | 0.12 | 0.36 | 0.06 | 0.25 | 0.06 | 0.30 | 0.09 | 0.36 |
| v/c Ratio | 1.34 | 0.85 | 0.46 | 1.27 | 0.57 | 1.06 | 1.21 | 0.75 |
| Control Delay (s/veh) | 216.5 | 36.2 | 57.2 | 158.5 | 65.1 | 75.5 | 175.7 | 29.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 216.5 | 36.2 | 57.2 | 158.5 | 65.1 | 75.5 | 175.7 | 29.3 |
| LOS | F | D | E | F | E | E | F | C |
| Approach Delay (s/veh) | | 71.4 | | 154.9 | | 75.0 | | 53.7 |
| Approach LOS | | E | | F | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.34 | |
| Intersection Signal Delay (s/veh): 89.3 | Intersection LOS: F |
| Intersection Capacity Utilization 101.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

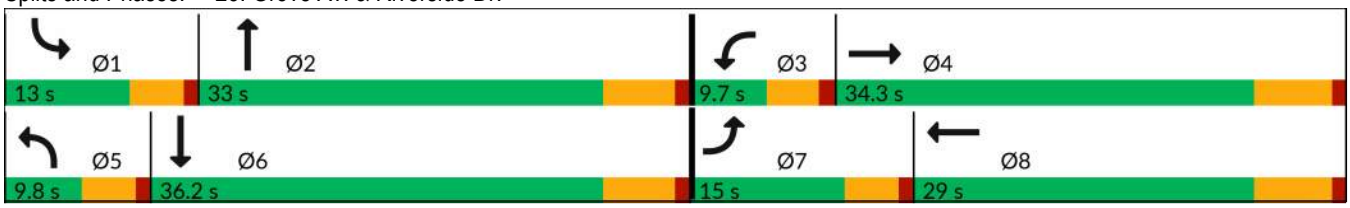

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 237 | 921 | 58 | 40 | 875 | 219 | 50 | 968 | 66 | 173 | 691 | 174 |
| Future Volume (veh/h) | 237 | 921 | 58 | 40 | 875 | 219 | 50 | 968 | 66 | 173 | 691 | 174 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 258 | 1001 | 35 | 43 | 951 | 129 | 54 | 1052 | 39 | 188 | 751 | 102 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 195 | 1163 | 41 | 62 | 815 | 111 | 69 | 1056 | 39 | 158 | 1114 | 151 |
| Arrive On Green | 0.17 | 0.50 | 0.50 | 0.05 | 0.38 | 0.38 | 0.06 | 0.45 | 0.45 | 0.14 | 0.53 | 0.53 |
| Sat Flow, veh/h | 1688 | 3501 | 122 | 1688 | 3219 | 436 | 1688 | 3494 | 130 | 1688 | 3144 | 427 |
| Grp Volume(v), veh/h | 258 | 508 | 528 | 43 | 553 | 527 | 54 | 535 | 556 | 188 | 424 | 429 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1846 | 1688 | 1870 | 1785 | 1688 | 1777 | 1847 | 1688 | 1777 | 1794 |
| Q Serve(g_s), s | 10.4 | 22.6 | 22.6 | 2.3 | 22.8 | 22.8 | 2.8 | 27.0 | 27.0 | 8.4 | 15.7 | 15.7 |
| Cycle Q Clear(g_c), s | 10.4 | 22.6 | 22.6 | 2.3 | 22.8 | 22.8 | 2.8 | 27.0 | 27.0 | 8.4 | 15.7 | 15.7 |
| Prop In Lane | 1.00 | | 0.07 | 1.00 | | 0.24 | 1.00 | | 0.07 | 1.00 | | 0.24 |
| Lane Grp Cap(c), veh/h | 195 | 590 | 614 | 62 | 474 | 452 | 69 | 537 | 558 | 158 | 630 | 636 |
| V/C Ratio(X) | 1.32 | 0.86 | 0.86 | 0.70 | 1.17 | 1.17 | 0.78 | 1.00 | 1.00 | 1.19 | 0.67 | 0.67 |
| Avail Cap(c_a), veh/h | 195 | 590 | 614 | 96 | 474 | 452 | 98 | 537 | 558 | 158 | 630 | 636 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 37.2 | 20.7 | 20.7 | 42.0 | 27.9 | 27.9 | 41.8 | 24.5 | 24.5 | 38.7 | 17.3 | 17.3 |
| Incr Delay (d2), s/veh | 176.5 | 12.3 | 11.9 | 5.2 | 95.6 | 96.7 | 14.2 | 37.8 | 37.1 | 133.2 | 2.8 | 2.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.3 | 8.3 | 8.5 | 1.0 | 20.1 | 19.3 | 1.4 | 13.7 | 14.2 | 9.0 | 5.2 | 5.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 213.7 | 33.0 | 32.6 | 47.2 | 123.5 | 124.6 | 56.0 | 62.3 | 61.6 | 171.9 | 20.1 | 20.1 |
| LnGrp LOS | F | C | C | D | F | F | E | E | E | F | C | C |
| Approach Vol, veh/h | | 1294 | | | 1123 | | | 1145 | | | 1041 | |
| Approach Delay, s/veh | | 68.9 | | | 121.1 | | | 61.7 | | | 47.5 | |
| Approach LOS | | E | | | F | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.0 | 33.0 | 7.9 | 36.1 | 8.3 | 37.7 | 15.0 | 29.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 8.4 | 27.2 | 5.1 | 28.1 | 5.2 | 30.4 | 10.4 | 22.8 |
| Max Q Clear Time (g_c+I1), s | 10.4 | 29.0 | 4.3 | 24.6 | 4.8 | 17.7 | 12.4 | 24.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.9 | 0.0 | 4.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 75.0 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 96 | 316 | 33 | 414 | 87 | 895 | 51 | 759 |
| Future Volume (vph) | 96 | 316 | 33 | 414 | 87 | 895 | 51 | 759 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 50.0 | 50.0 | 50.0 | 50.0 | 70.0 | 70.0 | 70.0 | 70.0 |
| Total Split (%) | 41.7% | 41.7% | 41.7% | 41.7% | 58.3% | 58.3% | 58.3% | 58.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Max | Max | Max | Max |
| Act Effct Green (s) | 45.4 | 45.4 | 45.4 | 45.4 | 65.4 | 65.4 | 65.4 | 65.4 |
| Actuated g/C Ratio | 0.38 | 0.38 | 0.38 | 0.38 | 0.55 | 0.55 | 0.55 | 0.55 |
| v/c Ratio | 1.19 | 0.71 | 0.23 | 0.85 | 1.26 | 1.07 | 0.95 | 0.89 |
| Control Delay (s/veh) | 188.9 | 37.7 | 30.1 | 47.2 | 215.7 | 76.1 | 134.5 | 36.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 188.9 | 37.7 | 30.1 | 47.2 | 215.7 | 76.1 | 134.5 | 36.5 |
| LOS | F | D | C | D | F | E | F | D |
| Approach Delay (s/veh) | | 65.7 | | 46.1 | | 88.1 | | 42.6 |
| Approach LOS | | E | | D | | F | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 75 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.26 | |
| Intersection Signal Delay (s/veh): 63.3 | Intersection LOS: E |
| Intersection Capacity Utilization 101.4% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 24: Grove Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 96 | 316 | 107 | 33 | 414 | 93 | 87 | 895 | 33 | 51 | 759 | 14 |
| Future Volume (veh/h) | 96 | 316 | 107 | 33 | 414 | 93 | 87 | 895 | 33 | 51 | 759 | 14 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 112 | 367 | 124 | 38 | 481 | 108 | 101 | 1041 | 38 | 59 | 883 | 16 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 124 | 506 | 171 | 190 | 558 | 125 | 135 | 977 | 36 | 60 | 998 | 18 |
| Arrive On Green | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.38 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 | 0.55 |
| Sat Flow, veh/h | 827 | 1337 | 452 | 906 | 1475 | 331 | 619 | 1793 | 65 | 523 | 1831 | 33 |
| Grp Volume(v), veh/h | 112 | 0 | 491 | 38 | 0 | 589 | 101 | 0 | 1079 | 59 | 0 | 899 |
| Grp Sat Flow(s),veh/h/ln | 827 | 0 | 1789 | 906 | 0 | 1806 | 619 | 0 | 1859 | 523 | 0 | 1864 |
| Q Serve(g_s), s | 9.3 | 0.0 | 28.2 | 4.5 | 0.0 | 36.1 | 14.5 | 0.0 | 65.4 | 0.0 | 0.0 | 50.9 |
| Cycle Q Clear(g_c), s | 45.4 | 0.0 | 28.2 | 32.7 | 0.0 | 36.1 | 65.4 | 0.0 | 65.4 | 65.4 | 0.0 | 50.9 |
| Prop In Lane | 1.00 | | 0.25 | 1.00 | | 0.18 | 1.00 | | 0.04 | 1.00 | | 0.02 |
| Lane Grp Cap(c), veh/h | 124 | 0 | 677 | 190 | 0 | 683 | 135 | 0 | 1013 | 60 | 0 | 1016 |
| V/C Ratio(X) | 0.90 | 0.00 | 0.73 | 0.20 | 0.00 | 0.86 | 0.75 | 0.00 | 1.07 | 0.98 | 0.00 | 0.88 |
| Avail Cap(c_a), veh/h | 124 | 0 | 677 | 190 | 0 | 683 | 135 | 0 | 1013 | 60 | 0 | 1016 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 57.3 | 0.0 | 32.0 | 46.0 | 0.0 | 34.4 | 54.6 | 0.0 | 27.3 | 60.0 | 0.0 | 24.0 |
| Incr Delay (d2), s/veh | 52.2 | 0.0 | 3.9 | 0.5 | 0.0 | 11.0 | 31.1 | 0.0 | 47.3 | 111.5 | 0.0 | 11.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.1 | 0.0 | 12.2 | 1.0 | 0.0 | 16.7 | 4.2 | 0.0 | 39.2 | 3.6 | 0.0 | 23.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 109.5 | 0.0 | 35.8 | 46.5 | 0.0 | 45.4 | 85.7 | 0.0 | 74.6 | 171.5 | 0.0 | 35.2 |
| LnGrp LOS | F | | D | D | | D | F | | F | F | | D |
| Approach Vol, veh/h | | 603 | | | 627 | | | 1180 | | | 958 | |
| Approach Delay, s/veh | | 49.5 | | | 45.5 | | | 75.6 | | | 43.6 | |
| Approach LOS | | D | | | D | | | E | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 70.0 | 50.0 | 70.0 | 50.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 65.4 | 45.4 | 65.4 | 45.4 |
| Max Q Clear Time (g_c+I1), s | 67.4 | 47.4 | 67.4 | 38.1 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 2.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 56.2 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 42 | 99 | 19 | 131 | 66 | 962 | 48 | 834 |
| Future Volume (vph) | 42 | 99 | 19 | 131 | 66 | 962 | 48 | 834 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 24.0 | 24.0 | 24.0 | 24.0 | 96.0 | 96.0 | 96.0 | 96.0 |
| Total Split (%) | 20.0% | 20.0% | 20.0% | 20.0% | 80.0% | 80.0% | 80.0% | 80.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 13.3 | 13.3 | 13.3 | 13.3 | 55.4 | 55.4 | 55.4 | 55.4 |
| Actuated g/C Ratio | 0.17 | 0.17 | 0.17 | 0.17 | 0.70 | 0.70 | 0.70 | 0.70 |
| v/c Ratio | 0.30 | 0.46 | 0.11 | 0.59 | 0.31 | 0.85 | 0.36 | 0.75 |
| Control Delay (s/veh) | 41.6 | 38.0 | 37.7 | 42.3 | 8.3 | 15.8 | 11.9 | 11.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 41.6 | 38.0 | 37.7 | 42.3 | 8.3 | 15.8 | 11.9 | 11.4 |
| LOS | D | D | D | D | A | B | B | B |
| Approach Delay (s/veh) | | 38.9 | | 41.8 | | 15.3 | | 11.5 |
| Approach LOS | | D | | D | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 78.9 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.85 | |
| Intersection Signal Delay (s/veh): 17.6 | Intersection LOS: B |
| Intersection Capacity Utilization 79.2% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 25: Grove Av. & Schaefer Av.

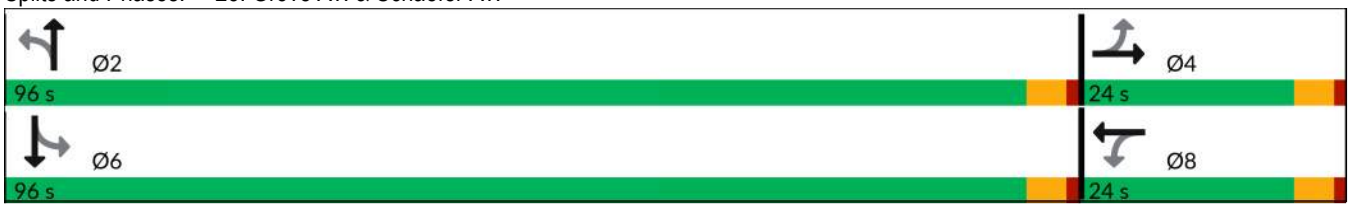

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 42 | 99 | 26 | 19 | 131 | 30 | 66 | 962 | 13 | 48 | 834 | 28 |
| Future Volume (veh/h) | 42 | 99 | 26 | 19 | 131 | 30 | 66 | 962 | 13 | 48 | 834 | 28 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 48 | 112 | 30 | 22 | 149 | 34 | 75 | 1093 | 15 | 55 | 948 | 32 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 191 | 238 | 64 | 222 | 247 | 56 | 315 | 1292 | 18 | 238 | 1263 | 43 |
| Arrive On Green | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.17 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 | 0.70 |
| Sat Flow, veh/h | 1201 | 1421 | 381 | 1246 | 1474 | 336 | 574 | 1841 | 25 | 509 | 1799 | 61 |
| Grp Volume(v), veh/h | 48 | 0 | 142 | 22 | 0 | 183 | 75 | 0 | 1108 | 55 | 0 | 980 |
| Grp Sat Flow(s),veh/h/ln | 1201 | 0 | 1802 | 1246 | 0 | 1810 | 574 | 0 | 1866 | 509 | 0 | 1859 |
| Q Serve(g_s), s | 2.7 | 0.0 | 5.0 | 1.1 | 0.0 | 6.6 | 6.7 | 0.0 | 30.7 | 6.3 | 0.0 | 23.4 |
| Cycle Q Clear(g_c), s | 9.3 | 0.0 | 5.0 | 6.2 | 0.0 | 6.6 | 30.0 | 0.0 | 30.7 | 36.9 | 0.0 | 23.4 |
| Prop In Lane | 1.00 | | 0.21 | 1.00 | | 0.19 | 1.00 | | 0.01 | 1.00 | | 0.03 |
| Lane Grp Cap(c), veh/h | 191 | 0 | 301 | 222 | 0 | 303 | 315 | 0 | 1310 | 238 | 0 | 1305 |
| V/C Ratio(X) | 0.25 | 0.00 | 0.47 | 0.10 | 0.00 | 0.60 | 0.24 | 0.00 | 0.85 | 0.23 | 0.00 | 0.75 |
| Avail Cap(c_a), veh/h | 321 | 0 | 497 | 357 | 0 | 499 | 657 | 0 | 2423 | 541 | 0 | 2415 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 31.5 | 0.0 | 26.5 | 29.3 | 0.0 | 27.1 | 16.1 | 0.0 | 7.7 | 21.2 | 0.0 | 6.6 |
| Incr Delay (d2), s/veh | 0.7 | 0.0 | 1.1 | 0.2 | 0.0 | 1.9 | 0.4 | 0.0 | 1.6 | 0.5 | 0.0 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.8 | 0.0 | 2.1 | 0.3 | 0.0 | 2.8 | 0.8 | 0.0 | 6.8 | 0.7 | 0.0 | 5.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 32.1 | 0.0 | 27.6 | 29.5 | 0.0 | 29.1 | 16.5 | 0.0 | 9.3 | 21.7 | 0.0 | 7.5 |
| LnGrp LOS | C | | C | C | | C | B | | A | C | | A |
| Approach Vol, veh/h | | 190 | | | 205 | | | 1183 | | | 1035 | |
| Approach Delay, s/veh | | 28.8 | | | 29.1 | | | 9.7 | | | 8.3 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 54.0 | 16.4 | 54.0 | 16.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 91.4 | 19.4 | 91.4 | 19.4 |
| Max Q Clear Time (g_c+I1), s | 32.7 | 11.3 | 38.9 | 8.6 |
| Green Ext Time (p_c), s | 14.0 | 0.5 | 10.5 | 0.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 12.1 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 356 | 1347 | 191 | 1534 | 334 | 429 | 219 | 546 |
| Future Volume (vph) | 356 | 1347 | 191 | 1534 | 334 | 429 | 219 | 546 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 19.4 | 41.0 | 15.4 | 37.0 | 30.8 | 36.2 | 27.4 | 32.8 |
| Total Split (%) | 16.2% | 34.2% | 12.8% | 30.8% | 25.7% | 30.2% | 22.8% | 27.3% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.8 | 35.4 | 10.6 | 31.2 | 26.2 | 32.6 | 21.0 | 27.4 |
| Actuated g/C Ratio | 0.12 | 0.30 | 0.09 | 0.26 | 0.22 | 0.27 | 0.18 | 0.23 |
| v/c Ratio | 1.01 | 0.90 | 0.76 | 1.10 | 1.04 | 0.72 | 0.85 | 1.04 |
| Control Delay (s/veh) | 99.8 | 46.3 | 70.7 | 93.4 | 104.1 | 40.0 | 73.6 | 82.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 99.8 | 46.3 | 70.7 | 93.4 | 104.1 | 40.0 | 73.6 | 82.9 |
| LOS | F | D | E | F | F | D | E | F |
| Approach Delay (s/veh) | | 55.5 | | 91.3 | | 61.8 | | 80.9 |
| Approach LOS | | E | | F | | E | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.10 | |
| Intersection Signal Delay (s/veh): 72.6 | Intersection LOS: E |
| Intersection Capacity Utilization 97.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

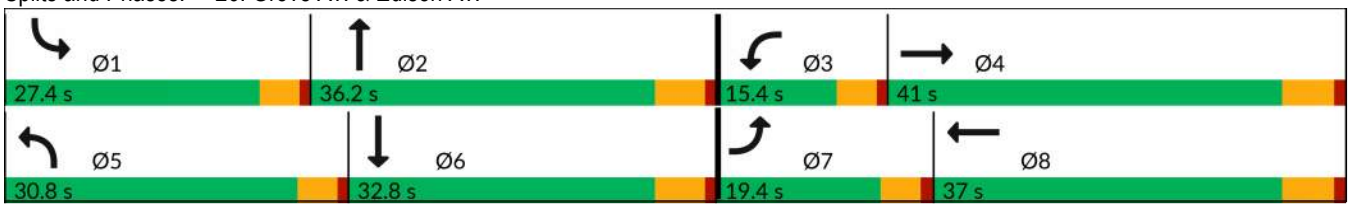

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 356 | 1347 | 374 | 191 | 1534 | 317 | 334 | 429 | 218 | 219 | 546 | 232 |
| Future Volume (veh/h) | 356 | 1347 | 374 | 191 | 1534 | 317 | 334 | 429 | 218 | 219 | 546 | 232 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 405 | 1531 | 220 | 217 | 1743 | 184 | 380 | 488 | 129 | 249 | 620 | 133 |
| Peak Hour Factor | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 406 | 1943 | 279 | 268 | 1740 | 184 | 371 | 803 | 211 | 274 | 666 | 143 |
| Arrive On Green | 0.19 | 0.46 | 0.46 | 0.12 | 0.39 | 0.39 | 0.33 | 0.42 | 0.42 | 0.24 | 0.34 | 0.34 |
| Sat Flow, veh/h | 3274 | 6398 | 919 | 3274 | 6653 | 702 | 1688 | 2856 | 750 | 1688 | 2978 | 638 |
| Grp Volume(v), veh/h | 405 | 1343 | 408 | 217 | 1470 | 457 | 380 | 319 | 298 | 249 | 389 | 364 |
| Grp Sat Flow(s),veh/h/ln | 1637 | 1870 | 1705 | 1637 | 1870 | 1744 | 1688 | 1870 | 1735 | 1688 | 1870 | 1746 |
| Q Serve(g_s), s | 14.7 | 24.2 | 24.3 | 7.7 | 31.2 | 31.2 | 26.2 | 15.8 | 16.0 | 17.1 | 23.9 | 24.1 |
| Cycle Q Clear(g_c), s | 14.7 | 24.2 | 24.3 | 7.7 | 31.2 | 31.2 | 26.2 | 15.8 | 16.0 | 17.1 | 23.9 | 24.1 |
| Prop In Lane | 1.00 | | 0.54 | 1.00 | | 0.40 | 1.00 | | 0.43 | 1.00 | | 0.37 |
| Lane Grp Cap(c), veh/h | 406 | 1704 | 518 | 268 | 1468 | 456 | 371 | 526 | 488 | 274 | 418 | 390 |
| V/C Ratio(X) | 1.00 | 0.79 | 0.79 | 0.81 | 1.00 | 1.00 | 1.03 | 0.61 | 0.61 | 0.91 | 0.93 | 0.93 |
| Avail Cap(c_a), veh/h | 406 | 1704 | 518 | 296 | 1468 | 456 | 371 | 526 | 488 | 323 | 430 | 401 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.5 | 29.2 | 29.2 | 51.4 | 36.2 | 36.2 | 40.0 | 29.4 | 29.4 | 44.3 | 38.7 | 38.8 |
| Incr Delay (d2), s/veh | 43.8 | 2.5 | 8.0 | 14.2 | 23.9 | 42.5 | 53.3 | 2.0 | 2.2 | 26.0 | 26.4 | 28.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.9 | 9.3 | 9.3 | 3.5 | 15.4 | 16.7 | 14.8 | 6.3 | 5.9 | 8.3 | 12.5 | 11.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 92.3 | 31.7 | 37.2 | 65.6 | 60.1 | 78.8 | 93.3 | 31.3 | 31.7 | 70.3 | 65.1 | 67.1 |
| LnGrp LOS | F | C | D | E | F | F | F | C | C | E | E | E |
| Approach Vol, veh/h | | 2156 | | | 2144 | | | 997 | | | 1002 | |
| Approach Delay, s/veh | | 44.2 | | | 64.6 | | | 55.1 | | | 67.1 | |
| Approach LOS | | D | | | E | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.9 | 38.9 | 14.4 | 42.0 | 30.8 | 32.1 | 19.4 | 37.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 22.8 | 30.8 | 10.8 | 35.2 | 26.2 | 27.4 | 14.8 | 31.2 |
| Max Q Clear Time (g_c+I1), s | 19.1 | 18.0 | 9.7 | 26.3 | 28.2 | 26.1 | 16.7 | 33.2 |
| Green Ext Time (p_c), s | 0.2 | 2.8 | 0.1 | 6.4 | 0.0 | 0.6 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 56.5 |
| HCM 7th LOS | E |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 82 | 225 | 8 | 435 | 525 | 3 | 50 | 614 | 88 |
| Future Volume (vph) | 82 | 225 | 8 | 435 | 525 | 3 | 50 | 614 | 88 |
| Turn Type | Perm | NA | Perm | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 8 | | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 42.0 | 42.0 | 42.0 | 42.0 | 42.0 | 9.6 | 26.0 | 52.0 | 68.4 |
| Total Split (%) | 35.0% | 35.0% | 35.0% | 35.0% | 35.0% | 8.0% | 21.7% | 43.3% | 57.0% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | | | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 32.6 | 32.6 | 32.6 | 32.6 | 32.6 | 5.5 | 12.3 | 41.6 | 51.5 |
| Actuated g/C Ratio | 0.33 | 0.33 | 0.33 | 0.33 | 0.33 | 0.06 | 0.13 | 0.43 | 0.53 |
| v/c Ratio | 0.63 | 0.41 | 0.03 | 0.74 | 0.62 | 0.03 | 0.24 | 0.87 | 0.26 |
| Control Delay (s/veh) | 55.4 | 30.2 | 27.0 | 40.2 | 6.0 | 53.0 | 47.0 | 41.3 | 8.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 55.4 | 30.2 | 27.0 | 40.2 | 6.0 | 53.0 | 47.0 | 41.3 | 8.4 |
| LOS | E | C | C | D | A | D | D | D | A |
| Approach Delay (s/veh) | | 36.7 | | 21.5 | | | 47.3 | | 32.3 |
| Approach LOS | | D | | C | | | D | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 97.5 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.87 | |
| Intersection Signal Delay (s/veh): 28.5 | Intersection LOS: C |
| Intersection Capacity Utilization 85.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 27: Grove Av. & Eucalyptus Av.

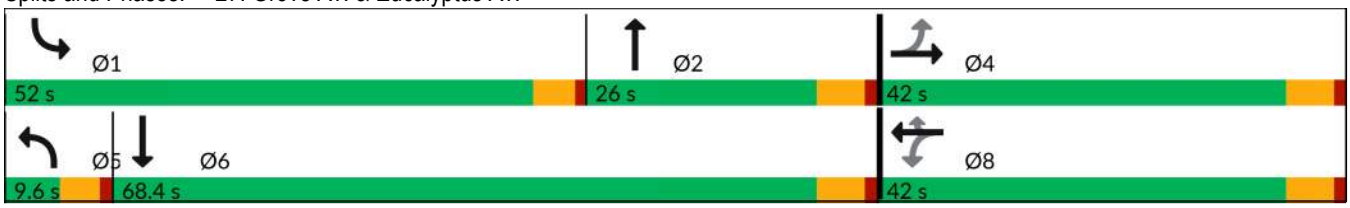

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 82 | 225 | 14 | 8 | 435 | 525 | 3 | 50 | 2 | 614 | 88 | 141 |
| Future Volume (veh/h) | 82 | 225 | 14 | 8 | 435 | 525 | 3 | 50 | 2 | 614 | 88 | 141 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 87 | 239 | 15 | 9 | 463 | 293 | 3 | 53 | 2 | 653 | 94 | 97 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 183 | 596 | 37 | 366 | 640 | 542 | 7 | 191 | 7 | 688 | 412 | 426 |
| Arrive On Green | 0.34 | 0.51 | 0.34 | 0.34 | 0.51 | 0.34 | 0.00 | 0.16 | 0.11 | 0.39 | 0.73 | 0.49 |
| Sat Flow, veh/h | 708 | 1741 | 109 | 1126 | 1870 | 1585 | 1781 | 1791 | 68 | 1781 | 843 | 870 |
| Grp Volume(v), veh/h | 87 | 0 | 254 | 9 | 463 | 293 | 3 | 0 | 55 | 653 | 0 | 191 |
| Grp Sat Flow(s),veh/h/ln | 708 | 0 | 1851 | 1126 | 1870 | 1585 | 1781 | 0 | 1858 | 1781 | 0 | 1714 |
| Q Serve(g_s), s | 11.1 | 0.0 | 8.0 | 0.6 | 17.9 | 13.9 | 0.2 | 0.0 | 2.4 | 33.2 | 0.0 | 4.7 |
| Cycle Q Clear(g_c), s | 29.0 | 0.0 | 8.0 | 8.5 | 17.9 | 13.9 | 0.2 | 0.0 | 2.4 | 33.2 | 0.0 | 4.7 |
| Prop In Lane | 1.00 | | 0.06 | 1.00 | | 1.00 | 1.00 | | 0.04 | 1.00 | | 0.51 |
| Lane Grp Cap(c), veh/h | 183 | 0 | 633 | 366 | 640 | 542 | 7 | 0 | 199 | 688 | 0 | 838 |
| V/C Ratio(X) | 0.47 | 0.00 | 0.40 | 0.02 | 0.72 | 0.54 | 0.42 | 0.00 | 0.28 | 0.95 | 0.00 | 0.23 |
| Avail Cap(c_a), veh/h | 219 | 0 | 725 | 422 | 733 | 621 | 95 | 0 | 410 | 904 | 0 | 1156 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.4 | 0.0 | 17.3 | 26.0 | 19.3 | 24.8 | 46.4 | 0.0 | 36.1 | 27.8 | 0.0 | 10.2 |
| Incr Delay (d2), s/veh | 1.9 | 0.0 | 0.4 | 0.0 | 3.0 | 0.8 | 13.9 | 0.0 | 0.7 | 14.6 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.9 | 0.0 | 3.0 | 0.1 | 6.3 | 5.1 | 0.1 | 0.0 | 1.1 | 15.6 | 0.0 | 1.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 40.3 | 0.0 | 17.7 | 26.0 | 22.4 | 25.6 | 60.3 | 0.0 | 36.9 | 42.4 | 0.0 | 10.4 |
| LnGrp LOS | D | | B | C | C | C | E | | D | D | | B |
| Approach Vol, veh/h | | 341 | | | 765 | | | 58 | | | 844 | |
| Approach Delay, s/veh | | 23.4 | | | 23.7 | | | 38.1 | | | 35.1 | |
| Approach LOS | | C | | | C | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 40.7 | 15.4 | | 37.3 | 5.0 | 51.1 | | 37.3 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | | 5.4 | 4.6 | 5.4 | | 5.4 |
| Max Green Setting (Gmax), s | 47.4 | 20.6 | | 36.6 | 5.0 | 63.0 | | 36.6 |
| Max Q Clear Time (g_c+I1), s | 35.2 | 4.4 | | 31.0 | 2.2 | 6.7 | | 19.9 |
| Green Ext Time (p_c), s | 0.9 | 0.1 | | 0.9 | 0.0 | 1.1 | | 3.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 28.9 |
| HCM 7th LOS | C |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 51 | 2698 | 3042 | 64 |
| Future Volume (vph) | 51 | 2698 | 3042 | 64 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 97.0 | 97.0 | 97.0 | 23.0 |
| Total Split (%) | 80.8% | 80.8% | 80.8% | 19.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | Min |
| Act Effct Green (s) | 92.5 | 92.5 | 92.5 | 14.7 |
| Actuated g/C Ratio | 0.79 | 0.79 | 0.79 | 0.13 |
| v/c Ratio | 0.92 | 1.04 | 1.20 | 0.69 |
| Control Delay (s/veh) | 116.8 | 43.8 | 109.1 | 64.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 116.8 | 43.8 | 109.1 | 64.8 |
| LOS | F | D | F | E |
| Approach Delay (s/veh) | | 45.1 | 109.1 | 64.8 |
| Approach LOS | | D | F | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 116.4 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.20 | |
| Intersection Signal Delay (s/veh): 78.7 | Intersection LOS: E |
| Intersection Capacity Utilization 101.4% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 28: Edison Av. & Parco Av.

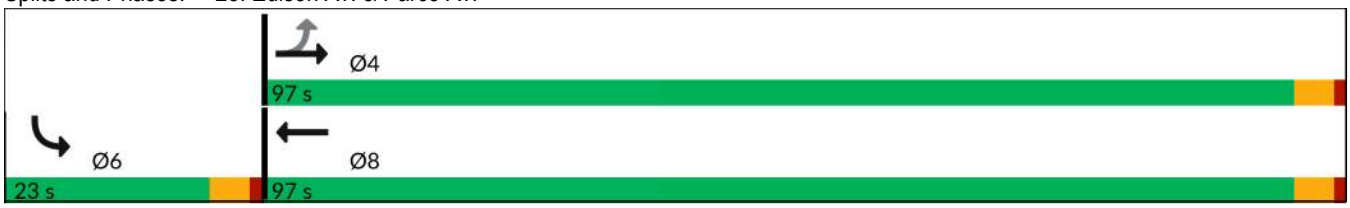

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 51 | 2698 | 3042 | 49 | 64 | 74 |
| Future Volume (veh/h) | 51 | 2698 | 3042 | 49 | 64 | 74 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 55 | 2933 | 3307 | 53 | 70 | 80 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 63 | 2883 | 2905 | 46 | 84 | 96 |
| Arrive On Green | 0.81 | 1.00 | 1.00 | 0.81 | 0.11 | 0.11 |
| Sat Flow, veh/h | 52 | 3647 | 3673 | 57 | 775 | 886 |
| Grp Volume(v), veh/h | 55 | 2933 | 1637 | 1723 | 151 | 0 |
| Grp Sat Flow(s),veh/h/ln | 52 | 1777 | 1777 | 1860 | 1672 | 0 |
| Q Serve(g_s), s | 0.0 | 92.4 | 92.4 | 92.4 | 10.1 | 0.0 |
| Cycle Q Clear(g_c), s | 92.4 | 92.4 | 92.4 | 92.4 | 10.1 | 0.0 |
| Prop In Lane | 1.00 | | | 0.03 | 0.46 | 0.53 |
| Lane Grp Cap(c), veh/h | 63 | 2883 | 1442 | 1509 | 180 | 0 |
| V/C Ratio(X) | 0.87 | 1.02 | 1.14 | 1.14 | 0.84 | 0.00 |
| Avail Cap(c_a), veh/h | 63 | 2883 | 1442 | 1509 | 270 | 0 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.50 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 56.9 | 0.0 | 0.0 | 0.3 | 49.8 | 0.0 |
| Incr Delay (d2), s/veh | 69.4 | 21.2 | 70.0 | 72.2 | 13.4 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 | 8.5 | 28.0 | 30.4 | 4.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 126.3 | 21.2 | 70.0 | 72.6 | 63.2 | 0.0 |
| LnGrp LOS | F | F | F | F | E | |
| Approach Vol, veh/h | | 2988 | 3360 | | 151 | |
| Approach Delay, s/veh | | 23.1 | 71.3 | | 63.2 | |
| Approach LOS | | C | E | | E | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 97.0 | | 16.9 | | 97.0 |
| Change Period (Y+Rc), s | | 4.6 | | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | | 92.4 | | 18.4 | | 92.4 |
| Max Q Clear Time (g_c+I1), s | | 94.4 | | 12.1 | | 94.4 |
| Green Ext Time (p_c), s | | 0.0 | | 0.2 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 49.0 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 24 | 990 | 100 | 930 | 189 | 36 | 13 | 26 |
| Future Volume (vph) | 24 | 990 | 100 | 930 | 189 | 36 | 13 | 26 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 69.0 | 69.0 | 69.0 | 69.0 | 51.0 | 51.0 | 51.0 | 51.0 |
| Total Split (%) | 57.5% | 57.5% | 57.5% | 57.5% | 42.5% | 42.5% | 42.5% | 42.5% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 51.5 | 51.5 | 51.5 | 51.5 | | 38.6 | | 38.6 |
| Actuated g/C Ratio | 0.51 | 0.51 | 0.51 | 0.51 | | 0.39 | | 0.39 |
| v/c Ratio | 0.15 | 0.67 | 0.87 | 0.58 | | 0.88 | | 0.15 |
| Control Delay (s/veh) | 16.6 | 20.2 | 78.2 | 18.4 | | 46.0 | | 13.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 16.6 | 20.2 | 78.2 | 18.4 | | 46.0 | | 13.1 |
| LOS | B | C | E | B | | D | | B |
| Approach Delay (s/veh) | | 20.1 | | 24.1 | | 46.0 | | 13.1 |
| Approach LOS | | C | | C | | D | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 100.2 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.88 | |
| Intersection Signal Delay (s/veh): 25.9 | Intersection LOS: C |
| Intersection Capacity Utilization 81.7% | ICU Level of Service D |
| Analysis Period (min) 15 | |

Splits and Phases: 29: Walker Av. & Riverside Dr.

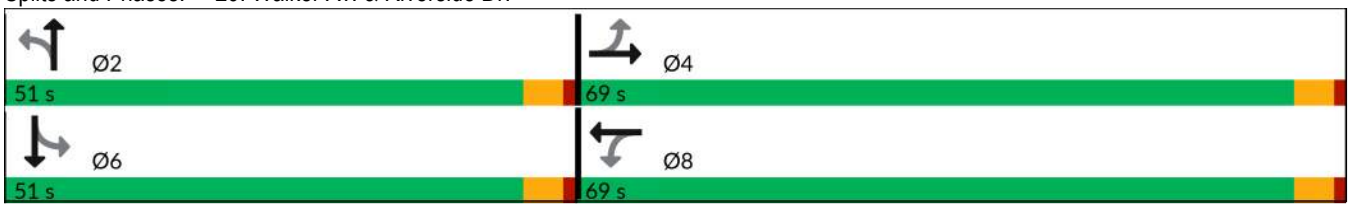

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 24 | 990 | 103 | 100 | 930 | 19 | 189 | 36 | 245 | 13 | 26 | 46 |
| Future Volume (veh/h) | 24 | 990 | 103 | 100 | 930 | 19 | 189 | 36 | 245 | 13 | 26 | 46 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 27 | 1100 | 114 | 111 | 1033 | 21 | 210 | 40 | 272 | 14 | 29 | 51 |
| Peak Hour Factor | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 258 | 1756 | 182 | 210 | 1924 | 39 | 270 | 48 | 293 | 101 | 209 | 320 |
| Arrive On Green | 0.54 | 0.54 | 0.54 | 0.54 | 0.54 | 0.54 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 | 0.37 |
| Sat Flow, veh/h | 535 | 3250 | 336 | 460 | 3561 | 72 | 597 | 128 | 789 | 165 | 564 | 864 |
| Grp Volume(v), veh/h | 27 | 601 | 613 | 111 | 515 | 539 | 522 | 0 | 0 | 94 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 535 | 1777 | 1810 | 460 | 1777 | 1857 | 1515 | 0 | 0 | 1593 | 0 | 0 |
| Q Serve(g_s), s | 3.6 | 24.3 | 24.3 | 22.8 | 19.4 | 19.4 | 30.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 23.0 | 24.3 | 24.3 | 47.2 | 19.4 | 19.4 | 34.1 | 0.0 | 0.0 | 3.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.19 | 1.00 | | 0.04 | 0.40 | | 0.52 | 0.15 | | 0.54 |
| Lane Grp Cap(c), veh/h | 258 | 960 | 978 | 210 | 960 | 1003 | 610 | 0 | 0 | 630 | 0 | 0 |
| V/C Ratio(X) | 0.10 | 0.63 | 0.63 | 0.53 | 0.54 | 0.54 | 0.86 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 303 | 1108 | 1128 | 248 | 1108 | 1157 | 726 | 0 | 0 | 752 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 22.8 | 16.5 | 16.5 | 32.9 | 15.4 | 15.4 | 30.8 | 0.0 | 0.0 | 21.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.2 | 0.9 | 0.9 | 2.1 | 0.5 | 0.4 | 8.6 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 8.8 | 9.0 | 2.5 | 7.0 | 7.3 | 12.6 | 0.0 | 0.0 | 1.6 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 23.0 | 17.4 | 17.4 | 35.0 | 15.8 | 15.8 | 39.4 | 0.0 | 0.0 | 21.8 | 0.0 | 0.0 |
| LnGrp LOS | C | B | B | C | B | B | D | | | C | | |
| Approach Vol, veh/h | | 1241 | | | 1165 | | | 522 | | | 94 | |
| Approach Delay, s/veh | | 17.5 | | | 17.7 | | | 39.4 | | | 21.8 | |
| Approach LOS | | B | | | B | | | D | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 42.9 | 60.4 | 42.9 | 60.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 46.4 | 64.4 | 46.4 | 64.4 |
| Max Q Clear Time (g_c+I1), s | 36.1 | 26.3 | 5.8 | 49.2 |
| Green Ext Time (p_c), s | 2.2 | 9.3 | 0.6 | 6.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 21.5 |
| HCM 7th LOS | C |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 43.7 |
| Intersection LOS | E |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 40 | 32 | 82 | 65 | 26 | 6 | 112 | 472 | 106 | 22 | 268 | 47 |
| Future Vol, veh/h | 40 | 32 | 82 | 65 | 26 | 6 | 112 | 472 | 106 | 22 | 268 | 47 |
| Peak Hour Factor | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 | 0.91 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 44 | 35 | 90 | 71 | 29 | 7 | 123 | 519 | 116 | 24 | 295 | 52 |
| Number of Lanes | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 2 | 2 | 2 | 2 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 2 | 2 | 2 | 2 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 2 | 2 | 2 | 2 |
| HCM Control Delay, s/veh | 12.4 | 12.4 | 67.2 | 18.9 |
| HCM LOS | B | B | F | C |

| Lane | NBLn1 | NBLn2 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 100% | 0% | 100% | 0% | 100% | 0% |
| Vol Thru, % | 0% | 82% | 0% | 28% | 0% | 81% | 0% | 85% |
| Vol Right, % | 0% | 18% | 0% | 72% | 0% | 19% | 0% | 15% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 112 | 578 | 40 | 114 | 65 | 32 | 22 | 315 |
| LT Vol | 112 | 0 | 40 | 0 | 65 | 0 | 22 | 0 |
| Through Vol | 0 | 472 | 0 | 32 | 0 | 26 | 0 | 268 |
| RT Vol | 0 | 106 | 0 | 82 | 0 | 6 | 0 | 47 |
| Lane Flow Rate | 123 | 635 | 44 | 125 | 71 | 35 | 24 | 346 |
| Geometry Grp | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| Degree of Util (X) | 0.227 | 1.061 | 0.099 | 0.248 | 0.164 | 0.075 | 0.047 | 0.62 |
| Departure Headway (Hd) | 6.65 | 6.013 | 8.407 | 7.373 | 8.586 | 7.934 | 7.243 | 6.626 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 539 | 603 | 429 | 490 | 421 | 454 | 497 | 547 |
| Service Time | 4.399 | 3.761 | 6.107 | 5.073 | 6.286 | 5.634 | 4.943 | 4.326 |
| HCM Lane V/C Ratio | 0.228 | 1.053 | 0.103 | 0.255 | 0.169 | 0.077 | 0.048 | 0.633 |
| HCM Control Delay, s/veh | 11.4 | 78 | 12 | 12.5 | 13 | 11.3 | 10.3 | 19.5 |
| HCM Lane LOS | B | F | B | B | B | B | B | C |
| HCM 95th-tile Q | 0.9 | 17.8 | 0.3 | 1 | 0.6 | 0.2 | 0.1 | 4.2 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 19 | 1426 | 355 | 176 | 1496 | 433 | 367 | 166 | 162 |
| Future Volume (vph) | 19 | 1426 | 355 | 176 | 1496 | 433 | 367 | 166 | 162 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 9.6 | 44.4 | 44.4 | 19.2 | 54.0 | 31.0 | 41.4 | 15.0 | 25.4 |
| Total Split (%) | 8.0% | 37.0% | 37.0% | 16.0% | 45.0% | 25.8% | 34.5% | 12.5% | 21.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.0 | 39.8 | 39.8 | 14.6 | 55.2 | 26.4 | 36.8 | 10.4 | 20.8 |
| Actuated g/C Ratio | 0.04 | 0.33 | 0.33 | 0.12 | 0.46 | 0.22 | 0.31 | 0.09 | 0.17 |
| v/c Ratio | 0.30 | 0.92 | 0.49 | 0.94 | 1.13 | 1.28 | 1.10 | 1.24 | 0.69 |
| Control Delay (s/veh) | 67.4 | 48.5 | 5.2 | 102.2 | 98.2 | 184.2 | 108.0 | 198.8 | 57.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 67.4 | 48.5 | 5.2 | 102.2 | 98.2 | 184.2 | 108.0 | 198.8 | 57.1 |
| LOS | E | D | A | F | F | F | F | F | E |
| Approach Delay (s/veh) | | 40.1 | | | 98.6 | | 141.1 | | 120.7 |
| Approach LOS | | D | | | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.28 | |
| Intersection Signal Delay (s/veh): 87.7 | Intersection LOS: F |
| Intersection Capacity Utilization 107.4% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

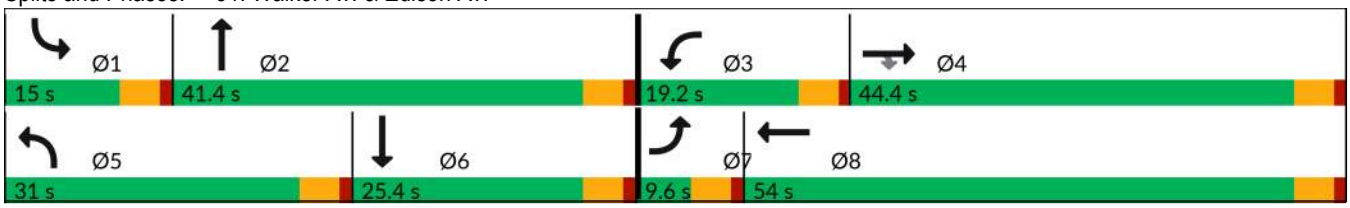

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 19 | 1426 | 355 | 176 | 1496 | 172 | 433 | 367 | 197 | 166 | 162 | 41 |
| Future Volume (veh/h) | 19 | 1426 | 355 | 176 | 1496 | 172 | 433 | 367 | 197 | 166 | 162 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 21 | 1550 | 223 | 191 | 1626 | 100 | 471 | 399 | 116 | 180 | 176 | 23 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 36 | 1687 | 524 | 210 | 1475 | 90 | 379 | 417 | 121 | 149 | 266 | 35 |
| Arrive On Green | 0.03 | 0.50 | 0.50 | 0.19 | 0.65 | 0.65 | 0.34 | 0.45 | 0.45 | 0.13 | 0.25 | 0.25 |
| Sat Flow, veh/h | 1688 | 5106 | 1585 | 1688 | 3402 | 208 | 1688 | 1388 | 404 | 1688 | 1619 | 212 |
| Grp Volume(v), veh/h | 21 | 1550 | 223 | 191 | 844 | 882 | 471 | 0 | 515 | 180 | 0 | 199 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1702 | 1585 | 1688 | 1777 | 1833 | 1688 | 0 | 1792 | 1688 | 0 | 1831 |
| Q Serve(g_s), s | 1.4 | 33.0 | 10.6 | 13.0 | 50.9 | 50.9 | 26.4 | 0.0 | 32.6 | 10.4 | 0.0 | 11.5 |
| Cycle Q Clear(g_c), s | 1.4 | 33.0 | 10.6 | 13.0 | 50.9 | 50.9 | 26.4 | 0.0 | 32.6 | 10.4 | 0.0 | 11.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.11 | 1.00 | | 0.23 | 1.00 | | 0.12 |
| Lane Grp Cap(c), veh/h | 36 | 1687 | 524 | 210 | 770 | 794 | 379 | 0 | 538 | 149 | 0 | 300 |
| V/C Ratio(X) | 0.59 | 0.92 | 0.43 | 0.91 | 1.10 | 1.11 | 1.24 | 0.00 | 0.96 | 1.20 | 0.00 | 0.66 |
| Avail Cap(c_a), veh/h | 72 | 1730 | 537 | 210 | 770 | 794 | 379 | 0 | 561 | 149 | 0 | 324 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 56.4 | 28.2 | 22.5 | 47.1 | 20.5 | 20.5 | 38.9 | 0.0 | 31.6 | 50.9 | 0.0 | 41.4 |
| Incr Delay (d2), s/veh | 5.6 | 8.3 | 0.5 | 37.7 | 62.0 | 66.4 | 129.3 | 0.0 | 27.1 | 139.1 | 0.0 | 4.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 12.2 | 3.6 | 7.2 | 27.4 | 29.2 | 22.6 | 0.0 | 14.8 | 9.8 | 0.0 | 5.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 62.0 | 36.4 | 23.1 | 84.9 | 82.5 | 87.0 | 168.3 | 0.0 | 58.7 | 190.0 | 0.0 | 45.9 |
| LnGrp LOS | E | D | C | F | F | F | F | | E | F | | D |
| Approach Vol, veh/h | | 1794 | | | 1917 | | | 986 | | | 379 | |
| Approach Delay, s/veh | | 35.1 | | | 84.8 | | | 111.0 | | | 114.3 | |
| Approach LOS | | D | | | F | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.0 | 39.9 | 19.2 | 43.4 | 31.0 | 23.9 | 7.1 | 55.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 10.4 | 36.8 | 14.6 | 39.8 | 26.4 | 20.8 | 5.0 | 49.4 |
| Max Q Clear Time (g_c+I1), s | 12.4 | 34.6 | 15.0 | 35.0 | 28.4 | 13.5 | 3.4 | 52.9 |
| Green Ext Time (p_c), s | 0.0 | 0.6 | 0.0 | 3.8 | 0.0 | 0.5 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 74.5 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 85 | 314 | 833 | 86 |
| Future Volume (vph) | 85 | 314 | 833 | 86 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 95.0 | 95.0 | 95.0 | 25.0 |
| Total Split (%) | 79.2% | 79.2% | 79.2% | 20.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | Min |
| Act Effct Green (s) | 79.3 | 79.3 | 79.3 | 16.2 |
| Actuated g/C Ratio | 0.75 | 0.75 | 0.75 | 0.15 |
| v/c Ratio | 0.83 | 0.23 | 0.93 | 0.76 |
| Control Delay (s/veh) | 67.7 | 4.4 | 24.2 | 51.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 67.7 | 4.4 | 24.2 | 51.2 |
| LOS | E | A | C | D |
| Approach Delay (s/veh) | | 18.0 | 24.2 | 51.2 |
| Approach LOS | | B | C | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 105.3 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.93 | |
| Intersection Signal Delay (s/veh): 26.1 | Intersection LOS: C |
| Intersection Capacity Utilization 91.4% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 32: Eucalyptus Av. & Walker Av.

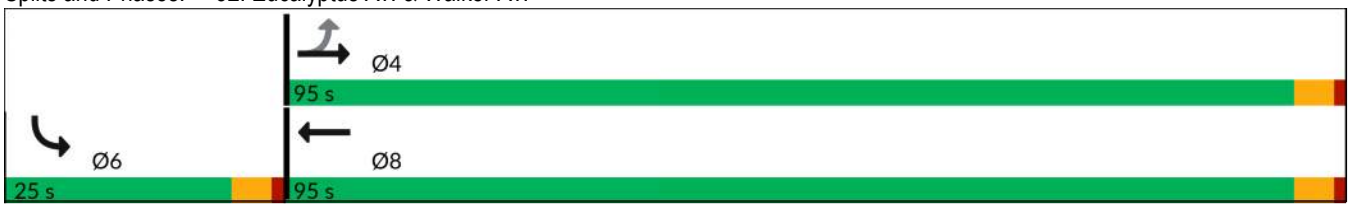

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 85 | 314 | 833 | 370 | 86 | 136 |
| Future Volume (veh/h) | 85 | 314 | 833 | 370 | 86 | 136 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 0.98 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 89 | 327 | 868 | 385 | 90 | 142 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 144 | 1432 | 934 | 414 | 100 | 158 |
| Arrive On Green | 0.77 | 0.77 | 0.77 | 0.77 | 0.16 | 0.16 |
| Sat Flow, veh/h | 443 | 1870 | 1219 | 541 | 640 | 1010 |
| Grp Volume(v), veh/h | 89 | 327 | 0 | 1253 | 233 | 0 |
| Grp Sat Flow(s),veh/h/ln | 443 | 1870 | 0 | 1760 | 1657 | 0 |
| Q Serve(g_s), s | 22.0 | 5.9 | 0.0 | 68.4 | 16.3 | 0.0 |
| Cycle Q Clear(g_c), s | 90.4 | 5.9 | 0.0 | 68.4 | 16.3 | 0.0 |
| Prop In Lane | 1.00 | | | 0.31 | 0.39 | 0.61 |
| Lane Grp Cap(c), veh/h | 144 | 1432 | 0 | 1348 | 259 | 0 |
| V/C Ratio(X) | 0.62 | 0.23 | 0.00 | 0.93 | 0.90 | 0.00 |
| Avail Cap(c_a), veh/h | 144 | 1432 | 0 | 1348 | 286 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 48.8 | 3.9 | 0.0 | 11.2 | 48.9 | 0.0 |
| Incr Delay (d2), s/veh | 7.8 | 0.1 | 0.0 | 11.5 | 27.5 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 1.7 | 0.0 | 23.3 | 8.4 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 56.6 | 4.0 | 0.0 | 22.8 | 76.4 | 0.0 |
| LnGrp LOS | E | A | | C | E | |
| Approach Vol, veh/h | | 416 | 1253 | | 233 | |
| Approach Delay, s/veh | | 15.3 | 22.8 | | 76.4 | |
| Approach LOS | | B | C | | E | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 95.0 | | 23.0 | | 95.0 |
| Change Period (Y+Rc), s | | 4.6 | | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | | 90.4 | | 20.4 | | 90.4 |
| Max Q Clear Time (g_c+I1), s | | 92.4 | | 18.3 | | 70.4 |
| Green Ext Time (p_c), s | | 0.0 | | 0.1 | | 11.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 27.7 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 240 | 141 | 119 | 63 | 208 | 178 | 217 | 1811 | 157 | 888 |
| Future Volume (vph) | 240 | 141 | 119 | 63 | 208 | 178 | 217 | 1811 | 157 | 888 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 25.2 | 31.1 | 31.1 | 16.9 | 22.8 | 22.8 | 24.2 | 53.6 | 18.4 | 47.8 |
| Total Split (%) | 21.0% | 25.9% | 25.9% | 14.1% | 19.0% | 19.0% | 20.2% | 44.7% | 15.3% | 39.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lead | Lag | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 20.6 | 30.5 | 30.5 | 10.2 | 17.8 | 17.8 | 20.1 | 49.0 | 13.8 | 42.7 |
| Actuated g/C Ratio | 0.17 | 0.26 | 0.26 | 0.09 | 0.15 | 0.15 | 0.17 | 0.41 | 0.12 | 0.36 |
| v/c Ratio | 1.00 | 0.36 | 0.28 | 0.54 | 0.91 | 0.51 | 0.93 | 1.03 | 0.98 | 0.95 |
| Control Delay (s/veh) | 103.8 | 41.0 | 7.7 | 66.0 | 85.4 | 10.7 | 88.4 | 61.9 | 113.2 | 52.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 103.8 | 41.0 | 7.7 | 66.0 | 85.4 | 10.7 | 88.4 | 61.9 | 113.2 | 52.4 |
| LOS | F | D | A | E | F | B | F | E | F | D |
| Approach Delay (s/veh) | | 63.2 | | | 53.1 | | | 64.6 | | 60.4 |
| Approach LOS | | E | | | D | | | E | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.03 | |
| Intersection Signal Delay (s/veh): 62.1 | Intersection LOS: E |
| Intersection Capacity Utilization 87.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

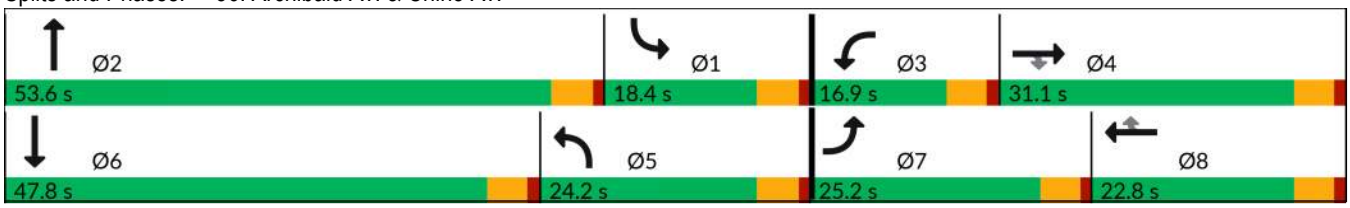

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 240 | 141 | 119 | 63 | 208 | 178 | 217 | 1811 | 129 | 157 | 888 | 145 |
| Future Volume (veh/h) | 240 | 141 | 119 | 63 | 208 | 178 | 217 | 1811 | 129 | 157 | 888 | 145 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 289 | 170 | 83 | 76 | 251 | 154 | 261 | 2182 | 95 | 189 | 1070 | 115 |
| Peak Hour Factor | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 | 0.83 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 290 | 495 | 419 | 96 | 279 | 237 | 299 | 2185 | 95 | 195 | 1153 | 124 |
| Arrive On Green | 0.17 | 0.26 | 0.26 | 0.06 | 0.15 | 0.15 | 0.18 | 0.41 | 0.41 | 0.12 | 0.35 | 0.35 |
| Sat Flow, veh/h | 1688 | 1870 | 1581 | 1688 | 1870 | 1585 | 1688 | 5337 | 231 | 1688 | 3315 | 356 |
| Grp Volume(v), veh/h | 289 | 170 | 83 | 76 | 251 | 154 | 261 | 1526 | 751 | 189 | 603 | 582 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1581 | 1688 | 1870 | 1585 | 1688 | 1870 | 1828 | 1688 | 1870 | 1801 |
| Q Serve(g_s), s | 20.5 | 8.8 | 3.2 | 5.3 | 15.8 | 8.5 | 18.0 | 48.7 | 49.0 | 13.4 | 37.1 | 37.2 |
| Cycle Q Clear(g_c), s | 20.5 | 8.8 | 3.2 | 5.3 | 15.8 | 8.5 | 18.0 | 48.7 | 49.0 | 13.4 | 37.1 | 37.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.13 | 1.00 | | 0.20 |
| Lane Grp Cap(c), veh/h | 290 | 495 | 419 | 96 | 279 | 237 | 299 | 1532 | 748 | 195 | 651 | 626 |
| V/C Ratio(X) | 0.99 | 0.34 | 0.20 | 0.79 | 0.90 | 0.65 | 0.87 | 1.00 | 1.00 | 0.97 | 0.93 | 0.93 |
| Avail Cap(c_a), veh/h | 290 | 495 | 419 | 173 | 284 | 241 | 299 | 1532 | 748 | 195 | 675 | 650 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.5 | 35.6 | 14.6 | 55.8 | 50.0 | 28.7 | 48.0 | 35.2 | 35.3 | 52.7 | 37.6 | 37.6 |
| Incr Delay (d2), s/veh | 51.3 | 0.4 | 0.2 | 13.7 | 28.6 | 5.9 | 23.7 | 22.1 | 33.7 | 56.0 | 18.7 | 19.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 12.6 | 4.0 | 1.8 | 2.6 | 9.5 | 3.6 | 9.2 | 24.8 | 26.8 | 8.5 | 19.3 | 18.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 100.8 | 36.0 | 14.9 | 69.4 | 78.7 | 34.7 | 71.6 | 57.3 | 69.1 | 108.7 | 56.2 | 57.1 |
| LnGrp LOS | F | D | B | E | E | C | E | E | F | F | E | E |
| Approach Vol, veh/h | | 542 | | | 481 | | | 2538 | | | 1374 | |
| Approach Delay, s/veh | | 67.3 | | | 63.1 | | | 62.3 | | | 63.8 | |
| Approach LOS | | E | | | E | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 18.4 | 53.6 | 11.4 | 36.3 | 25.8 | 46.2 | 25.2 | 22.5 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 13.8 | 49.0 | 12.3 | 26.5 | 19.6 | 43.2 | 20.6 | 18.2 |
| Max Q Clear Time (g_c+I1), s | 15.4 | 51.0 | 7.3 | 10.8 | 20.0 | 39.2 | 22.5 | 17.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.1 | 1.0 | 0.0 | 2.4 | 0.0 | 0.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 63.3 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 278 | 1229 | 231 | 525 | 1257 | 225 | 277 | 1344 | 420 | 233 | 433 | 268 |
| Future Volume (vph) | 278 | 1229 | 231 | 525 | 1257 | 225 | 277 | 1344 | 420 | 233 | 433 | 268 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 11.0 | 40.0 | | 17.2 | 46.2 | 46.2 | 14.0 | 49.8 | | 13.0 | 48.8 | 48.8 |
| Total Split (%) | 9.2% | 33.3% | | 14.3% | 38.5% | 38.5% | 11.7% | 41.5% | | 10.8% | 40.7% | 40.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | Lag | Lead | | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 8.6 | 33.3 | 118.0 | 12.6 | 37.4 | 37.4 | 30.2 | 45.2 | 118.0 | 8.4 | 23.5 | 23.5 |
| Actuated g/C Ratio | 0.07 | 0.28 | 1.00 | 0.11 | 0.32 | 0.32 | 0.26 | 0.38 | 1.00 | 0.07 | 0.20 | 0.20 |
| v/c Ratio | 1.26 | 0.81 | 0.15 | 1.62 | 0.74 | 0.38 | 0.35 | 0.98 | 0.28 | 1.05 | 0.61 | 0.65 |
| Control Delay (s/veh) | 191.1 | 44.1 | 0.2 | 325.8 | 38.6 | 11.8 | 40.4 | 56.2 | 0.4 | 126.3 | 45.8 | 27.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 191.1 | 44.1 | 0.2 | 325.8 | 38.6 | 11.8 | 40.4 | 56.2 | 0.4 | 126.3 | 45.8 | 27.5 |
| LOS | F | D | A | F | D | B | D | E | A | F | D | C |
| Approach Delay (s/veh) | | 61.8 | | | 110.8 | | | 42.6 | | | 60.7 | |
| Approach LOS | | E | | | F | | | D | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.62 | |
| Intersection Signal Delay (s/veh): 70.4 | Intersection LOS: E |
| Intersection Capacity Utilization 100.0% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

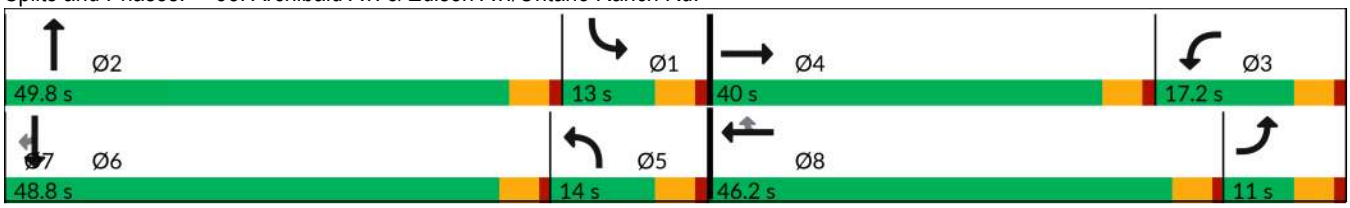

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 278 | 1229 | 231 | 525 | 1257 | 225 | 277 | 1344 | 420 | 233 | 433 | 268 |
| Future Volume (veh/h) | 278 | 1229 | 231 | 525 | 1257 | 225 | 277 | 1344 | 420 | 233 | 433 | 268 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 290 | 1280 | 0 | 547 | 1309 | 130 | 289 | 1400 | 0 | 243 | 451 | 164 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 286 | 1515 | | 349 | 1626 | 459 | 994 | 1451 | | 239 | 588 | 249 |
| Arrive On Green | 0.13 | 0.41 | 0.00 | 0.16 | 0.43 | 0.43 | 0.46 | 0.58 | 0.00 | 0.11 | 0.24 | 0.24 |
| Sat Flow, veh/h | 3188 | 5611 | 1585 | 3188 | 5611 | 1585 | 3274 | 3741 | 1585 | 3274 | 3741 | 1585 |
| Grp Volume(v), veh/h | 290 | 1280 | 0 | 547 | 1309 | 130 | 289 | 1400 | 0 | 243 | 451 | 164 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1585 | 1594 | 1870 | 1585 | 1637 | 1870 | 1585 | 1637 | 1870 | 1585 |
| Q Serve(g_s), s | 10.3 | 23.8 | 0.0 | 12.6 | 23.4 | 6.1 | 6.4 | 41.1 | 0.0 | 8.4 | 13.0 | 10.8 |
| Cycle Q Clear(g_c), s | 10.3 | 23.8 | 0.0 | 12.6 | 23.4 | 6.1 | 6.4 | 41.1 | 0.0 | 8.4 | 13.0 | 10.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 286 | 1515 | | 349 | 1626 | 459 | 994 | 1451 | | 239 | 588 | 249 |
| V/C Ratio(X) | 1.01 | 0.84 | | 1.57 | 0.81 | 0.28 | 0.29 | 0.96 | | 1.02 | 0.77 | 0.66 |
| Avail Cap(c_a), veh/h | 286 | 1725 | | 349 | 2027 | 573 | 994 | 1468 | | 239 | 1436 | 608 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 49.8 | 32.1 | 0.0 | 48.1 | 29.7 | 24.8 | 23.6 | 23.3 | 0.0 | 51.3 | 42.0 | 41.2 |
| Incr Delay (d2), s/veh | 57.1 | 3.7 | 0.0 | 269.3 | 2.0 | 0.3 | 0.1 | 15.8 | 0.0 | 62.8 | 2.1 | 2.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.0 | 9.2 | 0.0 | 17.5 | 8.6 | 2.1 | 2.2 | 14.9 | 0.0 | 5.2 | 5.4 | 4.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 106.9 | 35.7 | 0.0 | 317.5 | 31.7 | 25.2 | 23.6 | 39.2 | 0.0 | 114.1 | 44.2 | 44.1 |
| LnGrp LOS | F | D | | F | C | C | C | D | | F | D | D |
| Approach Vol, veh/h | | 1570 | | | 1986 | | | 1689 | | | 858 | |
| Approach Delay, s/veh | | 48.9 | | | 110.0 | | | 36.5 | | | 64.0 | |
| Approach LOS | | D | | | F | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.0 | 49.3 | 17.2 | 35.7 | 39.6 | 22.7 | 14.9 | 38.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 8.4 | 45.2 | 12.6 | 35.4 | 9.4 | 44.2 | 6.4 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 10.4 | 43.1 | 14.6 | 25.8 | 8.4 | 15.0 | 12.3 | 25.4 |
| Green Ext Time (p_c), s | 0.0 | 1.6 | 0.0 | 5.3 | 0.1 | 3.2 | 0.0 | 8.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 67.5 |
| HCM 7th LOS | E |

Notes

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 441 | 866 | 146 | 341 | 793 | 736 | 156 | 1283 | 294 | 600 | 890 | 321 |
| Future Volume (vph) | 441 | 866 | 146 | 341 | 793 | 736 | 156 | 1283 | 294 | 600 | 890 | 321 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 14.6 | 14.6 | 9.6 | 43.6 | 9.6 | 9.6 | 43.6 | 9.6 | 9.6 | 37.6 | 37.6 |
| Total Split (s) | 19.0 | 42.4 | 42.4 | 20.2 | 43.6 | 23.0 | 16.6 | 44.4 | 20.2 | 23.0 | 50.8 | 50.8 |
| Total Split (%) | 14.6% | 32.6% | 32.6% | 15.5% | 33.5% | 17.7% | 12.8% | 34.2% | 15.5% | 17.7% | 39.1% | 39.1% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | Lead | Lag | Lead | Lead | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 17.0 | 34.9 | 34.9 | 15.4 | 33.3 | 51.9 | 10.2 | 36.5 | 52.0 | 18.5 | 44.8 | 44.8 |
| Actuated g/C Ratio | 0.14 | 0.28 | 0.28 | 0.12 | 0.27 | 0.42 | 0.08 | 0.29 | 0.42 | 0.15 | 0.36 | 0.36 |
| v/c Ratio | 1.06 | 0.86 | 0.28 | 0.90 | 0.82 | 0.57 | 0.62 | 0.81 | 0.43 | 1.32 | 0.46 | 0.44 |
| Control Delay (s/veh) | 110.2 | 51.8 | 9.9 | 80.6 | 50.4 | 15.7 | 67.0 | 45.2 | 11.4 | 200.5 | 31.6 | 8.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 110.2 | 51.8 | 9.9 | 80.6 | 50.4 | 15.7 | 67.0 | 45.2 | 11.4 | 200.5 | 31.6 | 8.0 |
| LOS | F | D | A | F | D | B | E | D | B | F | C | A |
| Approach Delay (s/veh) | | 65.3 | | | 42.2 | | | 41.5 | | | 83.4 | |
| Approach LOS | | E | | | D | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 130 | |
| Actuated Cycle Length: 123.9 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.32 | |
| Intersection Signal Delay (s/veh): 57.8 | Intersection LOS: E |
| Intersection Capacity Utilization 95.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 441 | 866 | 146 | 341 | 793 | 736 | 156 | 1283 | 294 | 600 | 890 | 321 |
| Future Volume (veh/h) | 441 | 866 | 146 | 341 | 793 | 736 | 156 | 1283 | 294 | 600 | 890 | 321 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 459 | 902 | 151 | 355 | 826 | 630 | 162 | 1336 | 191 | 625 | 927 | 327 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 415 | 1028 | 436 | 401 | 1012 | 1350 | 213 | 1616 | 656 | 496 | 2114 | 597 |
| Arrive On Green | 0.20 | 0.41 | 0.41 | 0.19 | 0.41 | 0.41 | 0.10 | 0.43 | 0.43 | 0.23 | 0.57 | 0.57 |
| Sat Flow, veh/h | 3188 | 3741 | 1585 | 3188 | 3741 | 3167 | 3188 | 5611 | 1583 | 3188 | 5611 | 1585 |
| Grp Volume(v), veh/h | 459 | 902 | 151 | 355 | 826 | 630 | 162 | 1336 | 191 | 625 | 927 | 327 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1585 | 1594 | 1870 | 1583 | 1594 | 1870 | 1583 | 1594 | 1870 | 1585 |
| Q Serve(g_s), s | 15.4 | 26.3 | 6.2 | 12.8 | 23.2 | 8.9 | 5.9 | 24.9 | 2.7 | 18.4 | 11.3 | 10.2 |
| Cycle Q Clear(g_c), s | 15.4 | 26.3 | 6.2 | 12.8 | 23.2 | 8.9 | 5.9 | 24.9 | 2.7 | 18.4 | 11.3 | 10.2 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 415 | 1028 | 436 | 401 | 1012 | 1350 | 213 | 1616 | 656 | 496 | 2114 | 597 |
| V/C Ratio(X) | 1.11 | 0.88 | 0.35 | 0.88 | 0.82 | 0.47 | 0.76 | 0.83 | 0.29 | 1.26 | 0.44 | 0.55 |
| Avail Cap(c_a), veh/h | 415 | 1195 | 507 | 420 | 1233 | 1537 | 323 | 1888 | 732 | 496 | 2192 | 619 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 47.6 | 32.9 | 17.6 | 47.1 | 32.5 | 8.0 | 52.3 | 31.0 | 7.1 | 45.3 | 18.5 | 8.6 |
| Incr Delay (d2), s/veh | 75.7 | 6.8 | 0.5 | 18.1 | 3.6 | 0.3 | 2.2 | 2.8 | 0.2 | 132.7 | 0.1 | 0.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.8 | 10.8 | 2.7 | 5.6 | 9.3 | 2.9 | 2.3 | 9.2 | 1.2 | 15.4 | 4.0 | 4.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 123.3 | 39.8 | 18.1 | 65.3 | 36.2 | 8.2 | 54.4 | 33.8 | 7.4 | 178.1 | 18.6 | 9.5 |
| LnGrp LOS | F | D | B | E | D | A | D | C | A | F | B | A |
| Approach Vol, veh/h | | 1512 | | | 1811 | | | 1689 | | | 1879 | |
| Approach Delay, s/veh | | 63.0 | | | 32.2 | | | 32.8 | | | 70.1 | |
| Approach LOS | | E | | | C | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.0 | 38.7 | 19.5 | 37.1 | 12.5 | 49.2 | 20.0 | 36.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 18.4 | 39.8 | 15.6 | 37.8 | 12.0 | 46.2 | 14.4 | 39.0 |
| Max Q Clear Time (g_c+I1), s | 20.4 | 26.9 | 14.8 | 28.3 | 7.9 | 13.3 | 17.4 | 25.2 |
| Green Ext Time (p_c), s | 0.0 | 7.1 | 0.1 | 4.3 | 0.1 | 7.8 | 0.0 | 6.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 49.4 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 277 | 1594 | 31 | 1613 | 50 | 95 | 229 | 53 |
| Future Volume (vph) | 277 | 1594 | 31 | 1613 | 50 | 95 | 229 | 53 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 27.2 | 60.8 | 11.4 | 45.0 | 14.2 | 24.2 | 23.6 | 33.6 |
| Total Split (%) | 22.7% | 50.7% | 9.5% | 37.5% | 11.8% | 20.2% | 19.7% | 28.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 21.8 | 60.4 | 6.1 | 40.5 | 7.7 | 14.2 | 18.4 | 27.0 |
| Actuated g/C Ratio | 0.19 | 0.53 | 0.05 | 0.36 | 0.07 | 0.13 | 0.16 | 0.24 |
| v/c Ratio | 0.92 | 0.58 | 0.37 | 0.94 | 0.47 | 0.68 | 0.90 | 0.54 |
| Control Delay (s/veh) | 78.9 | 20.5 | 65.2 | 46.7 | 65.8 | 56.1 | 82.2 | 21.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 78.9 | 20.5 | 65.2 | 46.7 | 65.8 | 56.1 | 82.2 | 21.3 |
| LOS | E | C | E | D | E | E | F | C |
| Approach Delay (s/veh) | | 29.0 | | 47.0 | | 58.5 | | 50.1 |
| Approach LOS | | C | | D | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.4 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.94 | |
| Intersection Signal Delay (s/veh): 40.0 | Intersection LOS: D |
| Intersection Capacity Utilization 89.5% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

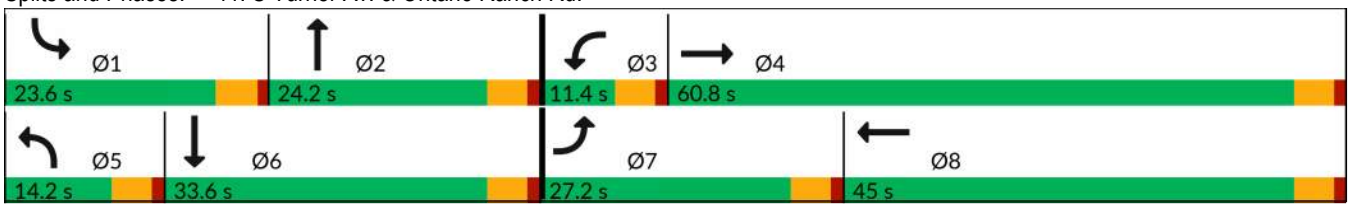

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 277 | 1594 | 30 | 31 | 1613 | 140 | 50 | 95 | 57 | 229 | 53 | 203 |
| Future Volume (veh/h) | 277 | 1594 | 30 | 31 | 1613 | 140 | 50 | 95 | 57 | 229 | 53 | 203 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.96 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 295 | 1696 | 30 | 33 | 1716 | 127 | 53 | 101 | 37 | 244 | 56 | 193 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 323 | 2923 | 52 | 49 | 1910 | 141 | 67 | 135 | 50 | 272 | 84 | 288 |
| Arrive On Green | 0.19 | 0.53 | 0.53 | 0.03 | 0.37 | 0.37 | 0.04 | 0.10 | 0.10 | 0.16 | 0.23 | 0.23 |
| Sat Flow, veh/h | 1688 | 5494 | 97 | 1688 | 5161 | 381 | 1688 | 1289 | 472 | 1688 | 369 | 1272 |
| Grp Volume(v), veh/h | 295 | 1155 | 571 | 33 | 1243 | 600 | 53 | 0 | 138 | 244 | 0 | 249 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1850 | 1688 | 1870 | 1801 | 1688 | 0 | 1761 | 1688 | 0 | 1641 |
| Q Serve(g_s), s | 18.3 | 22.3 | 22.3 | 2.1 | 33.4 | 33.5 | 3.3 | 0.0 | 8.1 | 15.1 | 0.0 | 14.7 |
| Cycle Q Clear(g_c), s | 18.3 | 22.3 | 22.3 | 2.1 | 33.4 | 33.5 | 3.3 | 0.0 | 8.1 | 15.1 | 0.0 | 14.7 |
| Prop In Lane | 1.00 | | 0.05 | 1.00 | | 0.21 | 1.00 | | 0.27 | 1.00 | | 0.78 |
| Lane Grp Cap(c), veh/h | 323 | 1990 | 985 | 49 | 1385 | 667 | 67 | 0 | 185 | 272 | 0 | 372 |
| V/C Ratio(X) | 0.91 | 0.58 | 0.58 | 0.67 | 0.90 | 0.90 | 0.79 | 0.00 | 0.75 | 0.90 | 0.00 | 0.67 |
| Avail Cap(c_a), veh/h | 358 | 1990 | 985 | 108 | 1417 | 682 | 152 | 0 | 324 | 301 | 0 | 446 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.3 | 16.9 | 16.9 | 51.2 | 31.7 | 31.7 | 50.8 | 0.0 | 46.3 | 43.9 | 0.0 | 37.6 |
| Incr Delay (d2), s/veh | 24.7 | 0.4 | 0.9 | 5.7 | 7.9 | 14.8 | 7.6 | 0.0 | 5.9 | 24.7 | 0.0 | 3.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.5 | 8.7 | 8.7 | 0.9 | 15.5 | 16.3 | 1.5 | 0.0 | 3.7 | 7.9 | 0.0 | 6.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 66.9 | 17.3 | 17.7 | 56.9 | 39.5 | 46.5 | 58.4 | 0.0 | 52.2 | 68.5 | 0.0 | 40.6 |
| LnGrp LOS | E | B | B | E | D | D | E | | D | E | | D |
| Approach Vol, veh/h | | 2021 | | | 1876 | | | 191 | | | 493 | |
| Approach Delay, s/veh | | 24.7 | | | 42.1 | | | 53.9 | | | 54.4 | |
| Approach LOS | | C | | | D | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 21.8 | 15.8 | 7.7 | 61.3 | 8.8 | 28.7 | 25.0 | 44.1 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 19.0 | 19.6 | 6.8 | 56.2 | 9.6 | 29.0 | 22.6 | 40.4 |
| Max Q Clear Time (g_c+I1), s | 17.1 | 10.1 | 4.1 | 24.3 | 5.3 | 16.7 | 20.3 | 35.5 |
| Green Ext Time (p_c), s | 0.1 | 0.4 | 0.0 | 14.5 | 0.0 | 1.0 | 0.1 | 3.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 36.2 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 289 | 1507 | 127 | 205 | 1535 | 517 | 89 | 384 | 125 | 393 | 299 | 104 |
| Future Volume (vph) | 289 | 1507 | 127 | 205 | 1535 | 517 | 89 | 384 | 125 | 393 | 299 | 104 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 17.0 | 40.5 | 40.5 | 11.0 | 34.5 | 34.5 | 18.3 | 48.5 | 48.5 | 20.0 | 50.2 | 50.2 |
| Total Split (%) | 14.2% | 33.8% | 33.8% | 9.2% | 28.8% | 28.8% | 15.3% | 40.4% | 40.4% | 16.7% | 41.8% | 41.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.5 | 36.3 | 36.3 | 6.5 | 30.2 | 30.2 | 9.5 | 19.5 | 19.5 | 15.6 | 27.9 | 27.9 |
| Actuated g/C Ratio | 0.13 | 0.38 | 0.38 | 0.07 | 0.31 | 0.31 | 0.10 | 0.20 | 0.20 | 0.16 | 0.29 | 0.29 |
| v/c Ratio | 1.41 | 0.84 | 0.21 | 1.06 | 0.81 | 0.72 | 0.58 | 0.57 | 0.31 | 1.55 | 0.31 | 0.20 |
| Control Delay (s/veh) | 244.7 | 33.6 | 8.4 | 124.8 | 35.7 | 15.3 | 57.6 | 37.0 | 6.3 | 294.3 | 28.4 | 3.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 244.7 | 33.6 | 8.4 | 124.8 | 35.7 | 15.3 | 57.6 | 37.0 | 6.3 | 294.3 | 28.4 | 3.1 |
| LOS | F | C | A | F | D | B | E | D | A | F | C | A |
| Approach Delay (s/veh) | | 63.7 | | | 39.1 | | | 33.7 | | | 156.3 | |
| Approach LOS | | E | | | D | | | C | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 96.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.55 | |
| Intersection Signal Delay (s/veh): 63.7 | Intersection LOS: E |
| Intersection Capacity Utilization 89.0% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

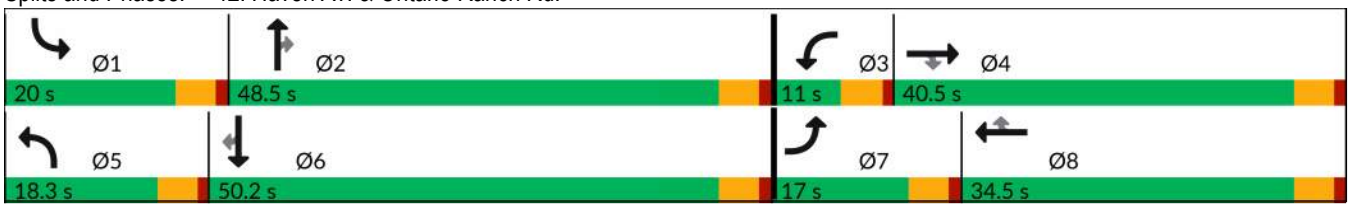

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 289 | 1507 | 127 | 205 | 1535 | 517 | 89 | 384 | 125 | 393 | 299 | 104 |
| Future Volume (veh/h) | 289 | 1507 | 127 | 205 | 1535 | 517 | 89 | 384 | 125 | 393 | 299 | 104 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 307 | 1603 | 91 | 218 | 1633 | 433 | 95 | 409 | 64 | 418 | 318 | 96 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 232 | 1984 | 608 | 220 | 2071 | 509 | 120 | 587 | 261 | 288 | 943 | 421 |
| Arrive On Green | 0.14 | 0.58 | 0.39 | 0.07 | 0.48 | 0.32 | 0.07 | 0.17 | 0.17 | 0.17 | 0.27 | 0.27 |
| Sat Flow, veh/h | 1688 | 5106 | 1564 | 3092 | 6434 | 1581 | 1688 | 3554 | 1582 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 307 | 1603 | 91 | 218 | 1633 | 433 | 95 | 409 | 64 | 418 | 318 | 96 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1702 | 1564 | 1546 | 1609 | 1581 | 1688 | 1777 | 1582 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 12.4 | 22.3 | 3.4 | 6.3 | 19.1 | 23.0 | 5.0 | 9.8 | 3.2 | 15.4 | 6.5 | 4.3 |
| Cycle Q Clear(g_c), s | 12.4 | 22.3 | 3.4 | 6.3 | 19.1 | 23.0 | 5.0 | 9.8 | 3.2 | 15.4 | 6.5 | 4.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 232 | 1984 | 608 | 220 | 2071 | 509 | 120 | 587 | 261 | 288 | 943 | 421 |
| V/C Ratio(X) | 1.32 | 0.81 | 0.15 | 0.99 | 0.79 | 0.85 | 0.79 | 0.70 | 0.24 | 1.45 | 0.34 | 0.23 |
| Avail Cap(c_a), veh/h | 232 | 2035 | 623 | 220 | 2135 | 525 | 257 | 1732 | 771 | 288 | 1799 | 802 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.8 | 16.1 | 17.9 | 41.8 | 20.7 | 28.5 | 41.2 | 35.5 | 32.7 | 37.3 | 26.7 | 25.9 |
| Incr Delay (d2), s/veh | 171.6 | 2.5 | 0.1 | 58.4 | 2.0 | 12.4 | 4.4 | 1.5 | 0.5 | 220.5 | 0.2 | 0.3 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 15.9 | 5.8 | 1.1 | 4.0 | 5.3 | 9.5 | 2.1 | 4.1 | 1.2 | 23.6 | 2.6 | 1.5 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 210.5 | 18.6 | 18.0 | 100.2 | 22.7 | 40.9 | 45.6 | 37.0 | 33.2 | 257.8 | 26.9 | 26.2 |
| LnGrp LOS | F | B | B | F | C | D | D | D | C | F | C | C |
| Approach Vol, veh/h | | 2001 | | | 2284 | | | 568 | | | 832 | |
| Approach Delay, s/veh | | 48.0 | | | 33.6 | | | 38.0 | | | 142.8 | |
| Approach LOS | | D | | | C | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.0 | 19.5 | 11.0 | 39.6 | 11.0 | 28.5 | 17.0 | 33.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 15.4 | 43.9 | 6.4 | 35.9 | 13.7 | 45.6 | 12.4 | 29.9 |
| Max Q Clear Time (g_c+I1), s | 17.4 | 11.8 | 8.3 | 24.3 | 7.0 | 8.5 | 14.4 | 25.0 |
| Green Ext Time (p_c), s | 0.0 | 2.8 | 0.0 | 7.6 | 0.0 | 2.3 | 0.0 | 4.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 55.1 |
| HCM 7th LOS | E |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 339 | 1552 | 318 | 199 | 1469 | 202 | 497 | 689 | 484 | 144 | 296 | 219 |
| Future Volume (vph) | 339 | 1552 | 318 | 199 | 1469 | 202 | 497 | 689 | 484 | 144 | 296 | 219 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 48.5 | 48.5 | 9.6 | 48.5 | 48.5 | 9.6 | 46.2 | 46.2 | 9.6 | 46.2 | 46.2 |
| Total Split (s) | 15.0 | 49.1 | 49.1 | 14.4 | 48.5 | 48.5 | 19.0 | 52.9 | 52.9 | 13.6 | 47.5 | 47.5 |
| Total Split (%) | 11.5% | 37.8% | 37.8% | 11.1% | 37.3% | 37.3% | 14.6% | 40.7% | 40.7% | 10.5% | 36.5% | 36.5% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 10.6 | 42.8 | 42.8 | 9.9 | 42.1 | 42.1 | 14.7 | 34.4 | 34.4 | 8.5 | 28.3 | 28.3 |
| Actuated g/C Ratio | 0.09 | 0.37 | 0.37 | 0.09 | 0.37 | 0.37 | 0.13 | 0.30 | 0.30 | 0.07 | 0.25 | 0.25 |
| v/c Ratio | 1.24 | 0.85 | 0.45 | 0.78 | 0.65 | 0.29 | 1.32 | 0.47 | 0.85 | 0.66 | 0.25 | 0.44 |
| Control Delay (s/veh) | 179.5 | 39.3 | 11.4 | 74.5 | 32.7 | 5.1 | 199.5 | 33.1 | 37.5 | 68.6 | 34.0 | 12.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 179.5 | 39.3 | 11.4 | 74.5 | 32.7 | 5.1 | 199.5 | 33.1 | 37.5 | 68.6 | 34.0 | 12.5 |
| LOS | F | D | B | E | C | A | F | C | D | E | C | B |
| Approach Delay (s/veh) | | 56.8 | | | 34.2 | | | 83.9 | | | 34.4 | |
| Approach LOS | | E | | | C | | | F | | | C | |

### Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 114.4
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.32
Intersection Signal Delay (s/veh): 55.0 — Intersection LOS: D
Intersection Capacity Utilization 76.5% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

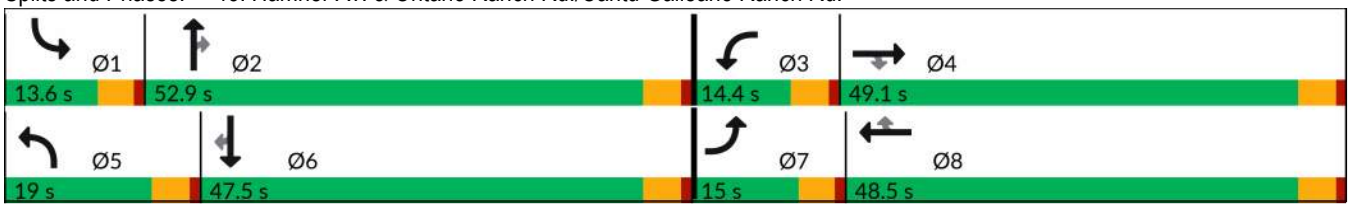

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 339 | 1552 | 318 | 199 | 1469 | 202 | 497 | 689 | 484 | 144 | 296 | 219 |
| Future Volume (veh/h) | 339 | 1552 | 318 | 199 | 1469 | 202 | 497 | 689 | 484 | 144 | 296 | 219 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 353 | 1617 | 277 | 207 | 1530 | 199 | 518 | 718 | 271 | 150 | 308 | 216 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 331 | 2039 | 633 | 267 | 2436 | 600 | 458 | 1315 | 407 | 209 | 902 | 280 |
| Arrive On Green | 0.11 | 0.40 | 0.40 | 0.09 | 0.38 | 0.38 | 0.15 | 0.26 | 0.26 | 0.07 | 0.18 | 0.18 |
| Sat Flow, veh/h | 3092 | 5106 | 1585 | 3092 | 6434 | 1585 | 3092 | 5106 | 1581 | 3092 | 5106 | 1585 |
| Grp Volume(v), veh/h | 353 | 1617 | 277 | 207 | 1530 | 199 | 518 | 718 | 271 | 150 | 308 | 216 |
| Grp Sat Flow(s),veh/h/ln | 1546 | 1702 | 1585 | 1546 | 1609 | 1585 | 1546 | 1702 | 1581 | 1546 | 1702 | 1585 |
| Q Serve(g_s), s | 10.4 | 27.0 | 12.4 | 6.4 | 18.8 | 8.7 | 14.4 | 11.8 | 14.9 | 4.6 | 5.1 | 12.6 |
| Cycle Q Clear(g_c), s | 10.4 | 27.0 | 12.4 | 6.4 | 18.8 | 8.7 | 14.4 | 11.8 | 14.9 | 4.6 | 5.1 | 12.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 331 | 2039 | 633 | 267 | 2436 | 600 | 458 | 1315 | 407 | 209 | 902 | 280 |
| V/C Ratio(X) | 1.07 | 0.79 | 0.44 | 0.78 | 0.63 | 0.33 | 1.13 | 0.55 | 0.67 | 0.72 | 0.34 | 0.77 |
| Avail Cap(c_a), veh/h | 331 | 2339 | 726 | 312 | 2908 | 716 | 458 | 2539 | 786 | 286 | 2255 | 700 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.4 | 25.6 | 21.2 | 43.5 | 24.6 | 21.4 | 41.4 | 31.2 | 32.3 | 44.4 | 35.0 | 38.1 |
| Incr Delay (d2), s/veh | 68.1 | 1.7 | 0.5 | 8.2 | 0.3 | 0.3 | 82.7 | 0.4 | 1.9 | 2.7 | 0.2 | 4.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 6.9 | 9.9 | 4.2 | 2.6 | 6.5 | 3.0 | 10.4 | 4.6 | 5.5 | 1.8 | 2.0 | 4.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 111.5 | 27.4 | 21.7 | 51.6 | 24.9 | 21.8 | 124.1 | 31.5 | 34.2 | 47.1 | 35.3 | 42.6 |
| LnGrp LOS | F | C | C | D | C | C | F | C | C | D | D | D |
| Approach Vol, veh/h | | 2247 | | | 1936 | | | 1507 | | | 674 | |
| Approach Delay, s/veh | | 39.9 | | | 27.5 | | | 63.8 | | | 40.2 | |
| Approach LOS | | D | | | C | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 11.2 | 29.6 | 13.0 | 43.4 | 19.0 | 21.8 | 15.0 | 41.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 9.0 | 48.3 | 9.8 | 44.5 | 14.4 | 42.9 | 10.4 | 43.9 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 16.9 | 8.4 | 29.0 | 16.4 | 14.6 | 12.4 | 20.8 |
| Green Ext Time (p_c), s | 0.1 | 5.8 | 0.1 | 9.7 | 0.0 | 2.5 | 0.0 | 11.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 41.8 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 138 | 853 | 200 | 743 | 324 | 1103 | 132 | 1480 |
| Future Volume (vph) | 138 | 853 | 200 | 743 | 324 | 1103 | 132 | 1480 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 12.0 | 12.0 | 12.0 | 12.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 16.7 | 33.0 | 16.7 | 37.0 | 15.2 | 33.0 | 15.2 | 36.0 |
| Total Split (s) | 17.8 | 36.0 | 19.4 | 37.6 | 17.8 | 49.4 | 15.2 | 46.8 |
| Total Split (%) | 14.8% | 30.0% | 16.2% | 31.3% | 14.8% | 41.2% | 12.7% | 39.0% |
| Yellow Time (s) | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 | 3.7 | 5.0 |
| All-Red Time (s) | 1.0 | 2.0 | 1.0 | 2.0 | 1.5 | 1.0 | 1.5 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 4.7 | 7.0 | 5.2 | 6.0 | 5.2 | 6.0 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.8 | 29.0 | 14.7 | 30.9 | 12.6 | 43.4 | 10.0 | 40.8 |
| Actuated g/C Ratio | 0.11 | 0.24 | 0.12 | 0.26 | 0.11 | 0.36 | 0.08 | 0.34 |
| v/c Ratio | 0.78 | 1.14 | 0.99 | 0.86 | 0.98 | 0.79 | 0.51 | 1.03 |
| Control Delay (s/veh) | 81.1 | 116.4 | 112.2 | 52.4 | 99.6 | 35.6 | 59.8 | 66.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 81.1 | 116.4 | 112.2 | 52.4 | 99.6 | 35.6 | 59.8 | 66.0 |
| LOS | F | F | F | D | F | D | E | E |
| Approach Delay (s/veh) | | 112.1 | | 64.3 | | 46.7 | | 65.6 |
| Approach LOS | | F | | E | | D | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.14 | |
| Intersection Signal Delay (s/veh): 68.2 | Intersection LOS: E |
| Intersection Capacity Utilization 106.9% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 4: Euclid Av. & Riverside Dr.

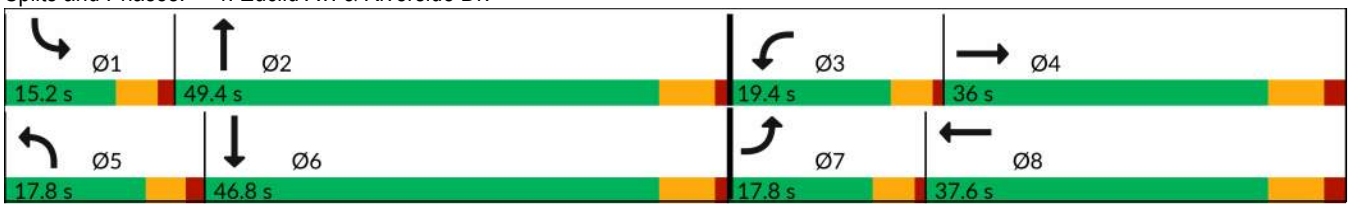

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 138 | 853 | 142 | 200 | 743 | 56 | 324 | 1103 | 445 | 132 | 1480 | 408 |
| Future Volume (veh/h) | 138 | 853 | 142 | 200 | 743 | 56 | 324 | 1103 | 445 | 132 | 1480 | 408 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 139 | 862 | 92 | 202 | 751 | 35 | 327 | 1114 | 247 | 133 | 1495 | 210 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 168 | 804 | 86 | 208 | 941 | 44 | 337 | 1584 | 351 | 264 | 1603 | 225 |
| Arrive On Green | 0.10 | 0.36 | 0.24 | 0.12 | 0.40 | 0.27 | 0.16 | 0.54 | 0.54 | 0.12 | 0.50 | 0.50 |
| Sat Flow, veh/h | 1688 | 3306 | 353 | 1688 | 3524 | 164 | 3188 | 4418 | 979 | 3188 | 4774 | 670 |
| Grp Volume(v), veh/h | 139 | 483 | 471 | 202 | 394 | 392 | 327 | 934 | 427 | 133 | 1159 | 546 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1852 | 1807 | 1688 | 1852 | 1837 | 1594 | 1852 | 1694 | 1594 | 1852 | 1740 |
| Q Serve(g_s), s | 9.6 | 29.0 | 29.0 | 14.2 | 22.4 | 22.5 | 12.2 | 22.3 | 22.4 | 4.6 | 34.9 | 35.1 |
| Cycle Q Clear(g_c), s | 9.6 | 29.0 | 29.0 | 14.2 | 22.4 | 22.5 | 12.2 | 22.3 | 22.4 | 4.6 | 34.9 | 35.1 |
| Prop In Lane | 1.00 | | 0.20 | 1.00 | | 0.09 | 1.00 | | 0.58 | 1.00 | | 0.38 |
| Lane Grp Cap(c), veh/h | 168 | 450 | 439 | 208 | 494 | 490 | 337 | 1328 | 607 | 264 | 1243 | 584 |
| V/C Ratio(X) | 0.83 | 1.07 | 1.07 | 0.97 | 0.80 | 0.80 | 0.97 | 0.70 | 0.70 | 0.50 | 0.93 | 0.93 |
| Avail Cap(c_a), veh/h | 185 | 450 | 439 | 208 | 494 | 490 | 337 | 1348 | 617 | 267 | 1267 | 595 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 52.7 | 37.9 | 39.3 | 52.1 | 32.9 | 33.6 | 50.0 | 22.8 | 22.8 | 49.9 | 28.3 | 28.4 |
| Incr Delay (d2), s/veh | 21.6 | 63.0 | 63.5 | 53.6 | 9.4 | 9.5 | 41.1 | 1.6 | 3.6 | 1.5 | 12.3 | 21.9 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.0 | 19.0 | 19.0 | 8.9 | 9.7 | 9.9 | 6.3 | 7.4 | 7.1 | 1.8 | 14.2 | 15.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 74.2 | 100.9 | 102.8 | 105.7 | 42.3 | 43.1 | 91.0 | 24.5 | 26.4 | 51.4 | 40.6 | 50.2 |
| LnGrp LOS | E | F | F | F | D | D | F | C | C | D | D | D |
| Approach Vol, veh/h | | 1093 | | | 988 | | | 1688 | | | 1838 | |
| Approach Delay, s/veh | | 98.3 | | | 55.6 | | | 37.9 | | | 44.3 | |
| Approach LOS | | F | | | E | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 15.1 | 48.8 | 19.4 | 36.0 | 17.8 | 46.0 | 16.6 | 38.8 |
| Change Period (Y+Rc), s | 5.2 | 6.0 | 4.7 | 7.0 | 5.2 | 6.0 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 43.4 | 14.7 | 29.0 | 12.6 | 40.8 | 13.1 | 30.6 |
| Max Q Clear Time (g_c+I1), s | 6.6 | 24.4 | 16.2 | 31.0 | 14.2 | 37.1 | 11.6 | 24.5 |
| Green Ext Time (p_c), s | 0.1 | 8.1 | 0.0 | 0.0 | 0.0 | 3.0 | 0.0 | 2.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 54.9 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 176 | 537 | 103 | 170 | 503 | 152 | 1639 | 338 | 40 | 1605 | 213 |
| Future Volume (vph) | 176 | 537 | 103 | 170 | 503 | 152 | 1639 | 338 | 40 | 1605 | 213 |
| Turn Type | Perm | NA | Perm | Perm | NA | Perm | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | | 8 | | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 4 | 8 | | 2 | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 2 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 20.8 | 20.8 | 20.8 | 20.8 | 20.8 | 21.5 | 21.5 | 21.5 | 14.6 | 21.5 | 21.5 |
| Total Split (s) | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 59.4 | 59.4 | 59.4 | 14.6 | 74.0 | 74.0 |
| Total Split (%) | 38.3% | 38.3% | 38.3% | 38.3% | 38.3% | 49.5% | 49.5% | 49.5% | 12.2% | 61.7% | 61.7% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 5.5 | 5.5 | 5.5 | 3.6 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 6.5 | 6.5 | 6.5 | 4.6 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lag | Lag | Lag | Lead | | |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | | |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 40.3 | 40.3 | 40.3 | 40.3 | 40.3 | 53.1 | 53.1 | 53.1 | 10.0 | 64.4 | 64.4 |
| Actuated g/C Ratio | 0.34 | 0.34 | 0.34 | 0.34 | 0.34 | 0.45 | 0.45 | 0.45 | 0.09 | 0.55 | 0.55 |
| v/c Ratio | 2.31 | 0.85 | 0.18 | 1.97 | 0.87 | 2.58 | 1.04 | 0.46 | 0.29 | 0.84 | 0.23 |
| Control Delay (s/veh) | 646.0 | 50.9 | 11.2 | 494.0 | 52.6 | 785.3 | 67.0 | 20.5 | 57.4 | 26.9 | 5.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 646.0 | 50.9 | 11.2 | 494.0 | 52.6 | 785.3 | 67.0 | 20.5 | 57.4 | 26.9 | 5.2 |
| LOS | F | D | B | F | D | F | E | C | E | C | A |
| Approach Delay (s/veh) | | 174.5 | | | 157.5 | | 110.9 | | | 25.0 | |
| Approach LOS | | F | | | F | | F | | | C | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 117.1 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.58 | |
| Intersection Signal Delay (s/veh): 97.4 | Intersection LOS: F |
| Intersection Capacity Utilization 113.0% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 5: Euclid Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 176 | 537 | 103 | 170 | 503 | 41 | 152 | 1639 | 338 | 40 | 1605 | 213 |
| Future Volume (veh/h) | 176 | 537 | 103 | 170 | 503 | 41 | 152 | 1639 | 338 | 40 | 1605 | 213 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 180 | 548 | 64 | 173 | 513 | 27 | 155 | 1672 | 192 | 41 | 1638 | 140 |
| Peak Hour Factor | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 | 0.98 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 135 | 641 | 543 | 133 | 603 | 32 | 137 | 1602 | 714 | 106 | 1964 | 876 |
| Arrive On Green | 0.34 | 0.51 | 0.34 | 0.34 | 0.51 | 0.34 | 0.45 | 0.68 | 0.45 | 0.06 | 0.83 | 0.55 |
| Sat Flow, veh/h | 820 | 1870 | 1585 | 810 | 1761 | 93 | 253 | 3554 | 1585 | 1688 | 3554 | 1585 |
| Grp Volume(v), veh/h | 180 | 548 | 64 | 173 | 0 | 540 | 155 | 1672 | 192 | 41 | 1638 | 140 |
| Grp Sat Flow(s),veh/h/ln | 820 | 1870 | 1585 | 810 | 0 | 1854 | 253 | 1777 | 1585 | 1688 | 1777 | 1585 |
| Q Serve(g_s), s | 10.5 | 29.8 | 3.2 | 10.4 | 0.0 | 29.7 | 34.9 | 52.9 | 8.9 | 2.7 | 30.0 | 5.1 |
| Cycle Q Clear(g_c), s | 40.2 | 29.8 | 3.2 | 40.2 | 0.0 | 29.7 | 52.9 | 52.9 | 8.9 | 2.7 | 30.0 | 5.1 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.05 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 135 | 641 | 543 | 133 | 0 | 635 | 137 | 1602 | 714 | 106 | 1964 | 876 |
| V/C Ratio(X) | 1.33 | 0.86 | 0.12 | 1.30 | 0.00 | 0.85 | 1.13 | 1.04 | 0.27 | 0.39 | 0.83 | 0.16 |
| Avail Cap(c_a), veh/h | 135 | 641 | 543 | 133 | 0 | 635 | 137 | 1602 | 714 | 144 | 2044 | 912 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.8 | 26.0 | 26.4 | 55.9 | 0.0 | 26.4 | 49.1 | 19.0 | 20.1 | 52.8 | 7.0 | 12.9 |
| Incr Delay (d2), s/veh | 192.0 | 11.0 | 0.1 | 180.1 | 0.0 | 10.7 | 117.5 | 34.9 | 0.2 | 0.9 | 3.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 11.1 | 12.6 | 1.2 | 10.5 | 0.0 | 12.2 | 8.4 | 19.0 | 3.1 | 1.1 | 4.8 | 1.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 247.8 | 37.0 | 26.5 | 236.0 | 0.0 | 37.1 | 166.6 | 53.9 | 20.3 | 53.7 | 10.1 | 13.0 |
| LnGrp LOS | F | D | C | F | | D | F | F | C | D | B | B |
| Approach Vol, veh/h | | 792 | | | 713 | | | 2019 | | | 1819 | |
| Approach Delay, s/veh | | 84.1 | | | 85.3 | | | 59.4 | | | 11.3 | |
| Approach LOS | | F | | | F | | | E | | | B | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.0 | 59.4 | | 46.0 | | 71.4 | | 46.0 |
| Change Period (Y+Rc), s | 4.6 | 6.5 | | 5.8 | | 6.5 | | 5.8 |
| Max Green Setting (Gmax), s | 10.0 | 52.9 | | 40.2 | | 67.5 | | 40.2 |
| Max Q Clear Time (g_c+I1), s | 4.7 | 54.9 | | 42.2 | | 32.0 | | 42.2 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | | 15.8 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 50.1 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 241 | 308 | 153 | 207 | 308 | 116 | 1944 | 83 | 62 | 1633 | 137 |
| Future Volume (vph) | 241 | 308 | 153 | 207 | 308 | 116 | 1944 | 83 | 62 | 1633 | 137 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 45.0 | 45.0 | 14.7 | 47.0 | 14.7 | 29.5 | 29.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 17.0 | 49.3 | 49.3 | 14.7 | 47.0 | 14.7 | 41.3 | 41.3 | 14.7 | 41.3 | 41.3 |
| Total Split (%) | 14.2% | 41.1% | 41.1% | 12.3% | 39.2% | 12.3% | 34.4% | 34.4% | 12.3% | 34.4% | 34.4% |
| Yellow Time (s) | 3.7 | 5.0 | 5.0 | 3.7 | 5.0 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.0 | 7.0 | 4.7 | 7.0 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lag | Lead | Lead | Lag | Lead | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.3 | 25.4 | 25.4 | 20.2 | 33.3 | 10.0 | 38.2 | 38.2 | 10.0 | 34.9 | 34.9 |
| Actuated g/C Ratio | 0.11 | 0.22 | 0.22 | 0.18 | 0.29 | 0.09 | 0.34 | 0.34 | 0.09 | 0.31 | 0.31 |
| v/c Ratio | 1.38 | 0.77 | 0.32 | 0.72 | 0.90 | 0.82 | 1.08 | 0.14 | 0.44 | 0.99 | 0.25 |
| Control Delay (s/veh) | 241.2 | 53.7 | 5.3 | 60.6 | 57.7 | 91.1 | 83.1 | 2.6 | 61.2 | 59.5 | 7.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 241.2 | 53.7 | 5.3 | 60.6 | 57.7 | 91.1 | 83.1 | 2.6 | 61.2 | 59.5 | 7.0 |
| LOS | F | D | A | E | E | F | F | A | E | E | A |
| Approach Delay (s/veh) | | 107.5 | | | 58.6 | | 80.4 | | | 55.6 | |
| Approach LOS | | F | | | E | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 113.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.38 | |
| Intersection Signal Delay (s/veh): 72.7 | Intersection LOS: E |
| Intersection Capacity Utilization 104.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 6: Euclid Av. & Schaefer Av.

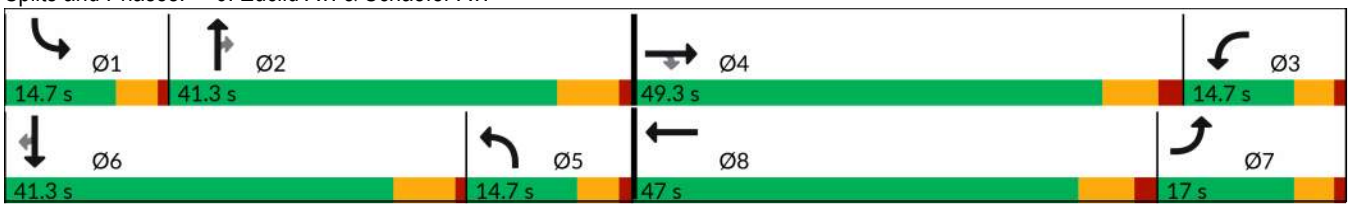

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 241 | 308 | 153 | 207 | 308 | 154 | 116 | 1944 | 83 | 62 | 1633 | 137 |
| Future Volume (veh/h) | 241 | 308 | 153 | 207 | 308 | 154 | 116 | 1944 | 83 | 62 | 1633 | 137 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 251 | 321 | 81 | 216 | 321 | 82 | 121 | 2025 | 44 | 65 | 1701 | 75 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 193 | 366 | 310 | 277 | 353 | 90 | 153 | 1953 | 552 | 134 | 1799 | 508 |
| Arrive On Green | 0.17 | 0.29 | 0.29 | 0.25 | 0.37 | 0.37 | 0.14 | 0.52 | 0.52 | 0.12 | 0.48 | 0.48 |
| Sat Flow, veh/h | 1688 | 1870 | 1585 | 1688 | 1437 | 367 | 1688 | 5611 | 1585 | 1688 | 5611 | 1585 |
| Grp Volume(v), veh/h | 251 | 321 | 81 | 216 | 0 | 403 | 121 | 2025 | 44 | 65 | 1701 | 75 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 0 | 1804 | 1688 | 1870 | 1585 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 12.3 | 17.6 | 4.2 | 12.9 | 0.0 | 22.9 | 7.5 | 37.5 | 0.9 | 3.9 | 31.1 | 2.8 |
| Cycle Q Clear(g_c), s | 12.3 | 17.6 | 4.2 | 12.9 | 0.0 | 22.9 | 7.5 | 37.5 | 0.9 | 3.9 | 31.1 | 2.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.20 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 193 | 366 | 310 | 277 | 0 | 443 | 153 | 1953 | 552 | 134 | 1799 | 508 |
| V/C Ratio(X) | 1.30 | 0.88 | 0.26 | 0.78 | 0.00 | 0.91 | 0.79 | 1.04 | 0.08 | 0.48 | 0.95 | 0.15 |
| Avail Cap(c_a), veh/h | 193 | 735 | 623 | 277 | 0 | 670 | 157 | 1953 | 552 | 157 | 1813 | 512 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.6 | 36.8 | 32.1 | 38.8 | 0.0 | 32.9 | 45.6 | 25.7 | 5.9 | 45.3 | 27.1 | 19.7 |
| Incr Delay (d2), s/veh | 168.5 | 5.1 | 0.3 | 12.3 | 0.0 | 10.7 | 21.4 | 30.6 | 0.1 | 1.0 | 10.9 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.6 | 7.3 | 1.6 | 5.7 | 0.0 | 9.5 | 3.8 | 16.9 | 0.5 | 1.6 | 11.7 | 1.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 213.1 | 41.9 | 32.4 | 51.1 | 0.0 | 43.6 | 67.0 | 56.4 | 6.0 | 46.4 | 37.9 | 19.9 |
| LnGrp LOS | F | D | C | D | | D | E | F | A | D | D | B |
| Approach Vol, veh/h | | 653 | | | 619 | | | 2190 | | | 1841 | |
| Approach Delay, s/veh | | 106.5 | | | 46.2 | | | 55.9 | | | 37.5 | |
| Approach LOS | | F | | | D | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.3 | 44.0 | 22.4 | 28.1 | 16.2 | 41.0 | 17.0 | 33.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.0 | 6.5 | * 6.5 | 4.7 | 7.0 |
| Max Green Setting (Gmax), s | 10.0 | 34.8 | 10.0 | 42.3 | 10.0 | * 35 | 12.3 | 40.0 |
| Max Q Clear Time (g_c+I1), s | 5.9 | 39.5 | 14.9 | 19.6 | 9.5 | 33.1 | 14.3 | 24.9 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 1.5 | 0.0 | 1.4 | 0.0 | 1.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 54.6 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 180 | 1150 | 242 | 793 | 497 | 143 | 1596 | 501 | 592 | 1274 | 189 |
| Future Volume (vph) | 180 | 1150 | 242 | 793 | 497 | 143 | 1596 | 501 | 592 | 1274 | 189 |
| Turn Type | Perm | NA | Perm | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | | 4 | | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | 4 | | 8 | | 8 | | | 2 | | | 6 |
| Detector Phase | 4 | 4 | 8 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 44.2 | 44.2 | 45.2 | 45.2 | 45.2 | 14.7 | 26.5 | 26.5 | 14.7 | 37.5 | 37.5 |
| Total Split (s) | 56.0 | 56.0 | 56.0 | 56.0 | 56.0 | 17.0 | 40.0 | 40.0 | 24.0 | 47.0 | 47.0 |
| Total Split (%) | 46.7% | 46.7% | 46.7% | 46.7% | 46.7% | 14.2% | 33.3% | 33.3% | 20.0% | 39.2% | 39.2% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 48.8 | 48.8 | 48.8 | 48.8 | 48.8 | 10.9 | 33.5 | 33.5 | 19.3 | 41.9 | 41.9 |
| Actuated g/C Ratio | 0.41 | 0.41 | 0.41 | 0.41 | 0.41 | 0.09 | 0.28 | 0.28 | 0.16 | 0.35 | 0.35 |
| v/c Ratio | 0.60 | 0.62 | 1.45 | 0.57 | 0.64 | 0.56 | 1.11 | 1.03 | 1.23 | 0.71 | 0.34 |
| Control Delay (s/veh) | 37.1 | 29.3 | 258.4 | 29.3 | 14.3 | 60.1 | 100.8 | 79.3 | 161.6 | 36.4 | 19.1 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 37.1 | 29.3 | 258.4 | 29.3 | 14.3 | 60.1 | 100.8 | 79.3 | 161.6 | 36.4 | 19.1 |
| LOS | D | C | F | C | B | E | F | E | F | D | B |
| Approach Delay (s/veh) | | 30.2 | | 60.6 | | | 93.4 | | | 70.9 | |
| Approach LOS | | C | | E | | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.45 | |
| Intersection Signal Delay (s/veh): 67.4 | Intersection LOS: E |
| Intersection Capacity Utilization 103.8% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 7: Euclid Av. & Edison Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 180 | 1150 | 139 | 242 | 793 | 497 | 143 | 1596 | 501 | 592 | 1274 | 189 |
| Future Volume (veh/h) | 180 | 1150 | 139 | 242 | 793 | 497 | 143 | 1596 | 501 | 592 | 1274 | 189 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 196 | 1250 | 93 | 263 | 862 | 279 | 155 | 1735 | 300 | 643 | 1385 | 129 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 364 | 2098 | 156 | 313 | 1521 | 645 | 256 | 1566 | 442 | 527 | 2004 | 558 |
| Arrive On Green | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 | 0.61 | 0.12 | 0.42 | 0.42 | 0.24 | 0.54 | 0.54 |
| Sat Flow, veh/h | 906 | 5158 | 384 | 748 | 3741 | 1585 | 3092 | 5611 | 1585 | 3274 | 5611 | 1561 |
| Grp Volume(v), veh/h | 196 | 906 | 437 | 263 | 862 | 279 | 155 | 1735 | 300 | 643 | 1385 | 129 |
| Grp Sat Flow(s),veh/h/ln | 453 | 1870 | 1801 | 374 | 1870 | 1585 | 1546 | 1870 | 1585 | 1637 | 1870 | 1561 |
| Q Serve(g_s), s | 22.9 | 17.8 | 17.8 | 31.0 | 16.5 | 11.2 | 5.7 | 33.5 | 18.4 | 19.3 | 21.8 | 5.3 |
| Cycle Q Clear(g_c), s | 39.4 | 17.8 | 17.8 | 48.8 | 16.5 | 11.2 | 5.7 | 33.5 | 18.4 | 19.3 | 21.8 | 5.3 |
| Prop In Lane | 1.00 | | 0.21 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 364 | 1521 | 732 | 313 | 1521 | 645 | 256 | 1566 | 442 | 527 | 2004 | 558 |
| V/C Ratio(X) | 0.54 | 0.60 | 0.60 | 0.84 | 0.57 | 0.43 | 0.61 | 1.11 | 0.68 | 1.22 | 0.69 | 0.23 |
| Avail Cap(c_a), veh/h | 364 | 1521 | 732 | 313 | 1521 | 645 | 317 | 1566 | 442 | 527 | 2004 | 558 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 28.8 | 17.4 | 17.4 | 36.4 | 17.1 | 16.1 | 50.7 | 34.9 | 30.5 | 45.5 | 23.0 | 19.1 |
| Incr Delay (d2), s/veh | 1.6 | 0.6 | 1.3 | 18.1 | 0.5 | 0.5 | 0.9 | 58.3 | 4.1 | 115.8 | 1.0 | 0.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.2 | 5.9 | 5.8 | 4.5 | 5.5 | 3.4 | 2.1 | 20.4 | 6.2 | 15.2 | 7.3 | 1.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 30.4 | 18.0 | 18.7 | 54.6 | 17.6 | 16.5 | 51.5 | 93.1 | 34.6 | 161.3 | 24.0 | 19.3 |
| LnGrp LOS | C | B | B | D | B | B | D | F | C | F | C | B |
| Approach Vol, veh/h | | 1539 | | | 1404 | | | 2190 | | | 2157 | |
| Approach Delay, s/veh | | 19.8 | | | 24.3 | | | 82.2 | | | 64.6 | |
| Approach LOS | | B | | | C | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 40.0 | | 56.0 | 14.6 | 49.4 | | 56.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 19.3 | 33.5 | | 48.8 | 12.3 | 40.5 | | 48.8 |
| Max Q Clear Time (g_c+I1), s | 21.3 | 35.5 | | 41.4 | 7.7 | 23.8 | | 50.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 5.4 | 0.1 | 8.4 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 52.7 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 84 | 374 | 229 | 345 | 341 | 107 | 1393 | 306 | 183 | 1314 |
| Future Volume (vph) | 84 | 374 | 229 | 345 | 341 | 107 | 1393 | 306 | 183 | 1314 |
| Turn Type | Perm | NA | Perm | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 4 | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 45.2 | 45.2 | 45.2 | 44.2 | 44.2 | 14.7 | 28.5 | 28.5 | 14.7 | 35.5 |
| Total Split (s) | 61.0 | 61.0 | 61.0 | 61.0 | 61.0 | 16.0 | 42.0 | 42.0 | 17.0 | 43.0 |
| Total Split (%) | 50.8% | 50.8% | 50.8% | 50.8% | 50.8% | 13.3% | 35.0% | 35.0% | 14.2% | 35.8% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 53.8 | 53.8 | 53.8 | 53.8 | 53.8 | 11.0 | 35.5 | 35.5 | 12.3 | 36.8 |
| Actuated g/C Ratio | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.09 | 0.30 | 0.30 | 0.10 | 0.31 |
| v/c Ratio | 1.52 | 0.47 | 0.29 | 1.10 | 0.97 | 0.74 | 0.97 | 0.61 | 1.13 | 0.95 |
| Control Delay (s/veh) | 331.6 | 25.5 | 3.4 | 112.0 | 55.7 | 80.4 | 59.9 | 32.6 | 156.1 | 54.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 331.6 | 25.5 | 3.4 | 112.0 | 55.7 | 80.4 | 59.9 | 32.6 | 156.1 | 54.7 |
| LOS | F | C | A | F | E | F | E | C | F | D |
| Approach Delay (s/veh) | | 55.4 | | | 73.6 | | 56.5 | | | 66.4 |
| Approach LOS | | E | | | E | | E | | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 100 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.52 | |
| Intersection Signal Delay (s/veh): 63.0 | Intersection LOS: E |
| Intersection Capacity Utilization 109.6% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 8: Euclid Av. & Eucalyptus Av.

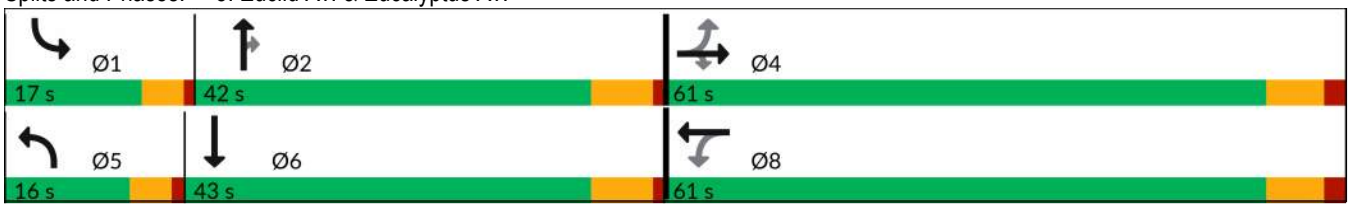

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 84 | 374 | 229 | 345 | 341 | 398 | 107 | 1393 | 306 | 183 | 1314 | 86 |
| Future Volume (veh/h) | 84 | 374 | 229 | 345 | 341 | 398 | 107 | 1393 | 306 | 183 | 1314 | 86 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 88 | 394 | 125 | 363 | 359 | 314 | 113 | 1466 | 190 | 193 | 1383 | 49 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 144 | 839 | 711 | 350 | 413 | 361 | 137 | 1511 | 469 | 173 | 1605 | 57 |
| Arrive On Green | 0.45 | 0.67 | 0.45 | 0.45 | 0.67 | 0.45 | 0.08 | 0.44 | 0.30 | 0.10 | 0.48 | 0.32 |
| Sat Flow, veh/h | 725 | 1870 | 1585 | 836 | 920 | 805 | 1688 | 5106 | 1585 | 1688 | 5063 | 179 |
| Grp Volume(v), veh/h | 88 | 394 | 125 | 363 | 0 | 673 | 113 | 1466 | 190 | 193 | 930 | 502 |
| Grp Sat Flow(s),veh/h/ln | 725 | 1870 | 1585 | 836 | 0 | 1725 | 1688 | 1702 | 1585 | 1688 | 1702 | 1838 |
| Q Serve(g_s), s | 13.8 | 12.1 | 5.7 | 41.7 | 0.0 | 40.0 | 7.9 | 33.7 | 11.5 | 12.3 | 29.1 | 29.3 |
| Cycle Q Clear(g_c), s | 53.8 | 12.1 | 5.7 | 53.8 | 0.0 | 40.0 | 7.9 | 33.7 | 11.5 | 12.3 | 29.1 | 29.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.47 | 1.00 | | 1.00 | 1.00 | | 0.10 |
| Lane Grp Cap(c), veh/h | 144 | 839 | 711 | 350 | 0 | 774 | 137 | 1511 | 469 | 173 | 1079 | 583 |
| V/C Ratio(X) | 0.61 | 0.47 | 0.18 | 1.04 | 0.00 | 0.87 | 0.82 | 0.97 | 0.41 | 1.12 | 0.86 | 0.86 |
| Avail Cap(c_a), veh/h | 144 | 839 | 711 | 350 | 0 | 774 | 159 | 1511 | 469 | 173 | 1079 | 583 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 53.4 | 12.8 | 19.8 | 42.7 | 0.0 | 22.9 | 54.3 | 32.9 | 33.8 | 53.8 | 29.1 | 30.1 |
| Incr Delay (d2), s/veh | 6.7 | 0.3 | 0.1 | 57.6 | 0.0 | 10.3 | 24.0 | 16.6 | 0.6 | 102.9 | 7.3 | 12.6 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.9 | 4.0 | 2.0 | 16.0 | 0.0 | 15.0 | 4.1 | 13.1 | 4.3 | 9.9 | 10.1 | 12.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 60.1 | 13.1 | 19.9 | 100.3 | 0.0 | 33.3 | 78.3 | 49.5 | 34.4 | 156.7 | 36.4 | 42.6 |
| LnGrp LOS | E | B | B | F | | C | E | D | C | F | D | D |
| Approach Vol, veh/h | | 607 | | | 1036 | | | 1769 | | | 1625 | |
| Approach Delay, s/veh | | 21.3 | | | 56.8 | | | 49.7 | | | 52.6 | |
| Approach LOS | | C | | | E | | | D | | | D | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 42.0 | | 61.0 | 14.5 | 44.5 | | 61.0 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 12.3 | 35.5 | | 53.8 | 11.3 | 36.5 | | 53.8 |
| Max Q Clear Time (g_c+I1), s | 14.3 | 35.7 | | 55.8 | 9.9 | 31.3 | | 55.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | | 0.0 | 0.0 | 3.4 | | 0.0 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 48.7 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 24 | 24 | 558 | 0 | 5 | 1902 | 259 | 206 | 2218 |
| Future Volume (vph) | 24 | 24 | 558 | 0 | 5 | 1902 | 259 | 206 | 2218 |
| Turn Type | Perm | NA | Perm | NA | Prot | NA | Perm | Prot | NA |
| Protected Phases | | 4 | | 8 | 5 | 2 | | 1 | 6 |
| Permitted Phases | 4 | | 8 | | | | 2 | | |
| Detector Phase | 4 | 4 | 8 | 8 | 5 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 17.2 | 17.2 | 47.2 | 47.2 | 14.7 | 28.5 | 28.5 | 14.7 | 28.5 |
| Total Split (s) | 47.2 | 47.2 | 47.2 | 47.2 | 14.7 | 52.5 | 52.5 | 20.3 | 58.1 |
| Total Split (%) | 39.3% | 39.3% | 39.3% | 39.3% | 12.3% | 43.8% | 43.8% | 16.9% | 48.4% |
| Yellow Time (s) | 5.2 | 5.2 | 5.2 | 5.2 | 3.7 | 5.5 | 5.5 | 3.7 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 7.2 | 7.2 | 7.2 | 7.2 | 4.7 | 6.5 | 6.5 | 4.7 | 6.5 |
| Lead/Lag | | | | | Lead | Lag | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 26.9 | 26.9 | 29.1 | 29.1 | 10.0 | 46.2 | 46.2 | 15.7 | 63.9 |
| Actuated g/C Ratio | 0.25 | 0.25 | 0.27 | 0.27 | 0.09 | 0.42 | 0.42 | 0.14 | 0.58 |
| v/c Ratio | 0.08 | 0.15 | 0.85 | 0.25 | 0.03 | 0.92 | 0.36 | 0.90 | 0.78 |
| Control Delay (s/veh) | 29.5 | 14.2 | 50.3 | 1.8 | 49.4 | 39.2 | 13.8 | 84.9 | 22.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 29.5 | 14.2 | 50.3 | 1.8 | 49.4 | 39.2 | 13.8 | 84.9 | 22.0 |
| LOS | C | B | D | A | D | D | B | F | C |
| Approach Delay (s/veh) | | 18.3 | | 40.6 | | 36.2 | | | 27.3 |
| Approach LOS | | B | | D | | D | | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.4 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.92 | |
| Intersection Signal Delay (s/veh): 32.5 | Intersection LOS: C |
| Intersection Capacity Utilization 89.3% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 9: Euclid Av. & Merrill Av.

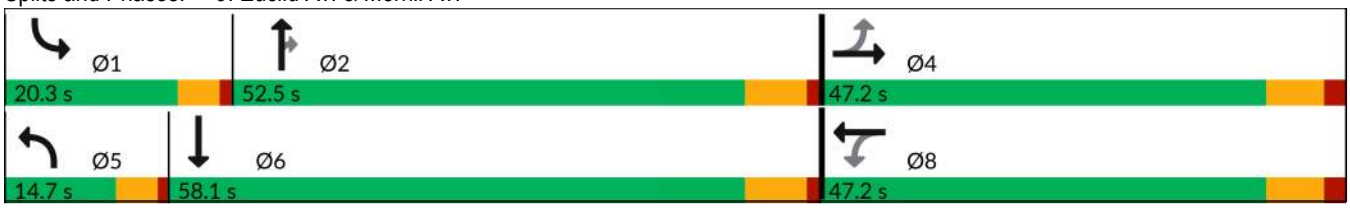

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 24 | 24 | 41 | 558 | 0 | 139 | 5 | 1902 | 259 | 206 | 2218 | 10 |
| Future Volume (veh/h) | 24 | 24 | 41 | 558 | 0 | 139 | 5 | 1902 | 259 | 206 | 2218 | 10 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 25 | 25 | 22 | 581 | 0 | 83 | 5 | 1981 | 166 | 215 | 2310 | 9 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 362 | 243 | 214 | 777 | 0 | 420 | 22 | 2150 | 667 | 242 | 2896 | 11 |
| Arrive On Green | 0.26 | 0.26 | 0.26 | 0.26 | 0.00 | 0.26 | 0.01 | 0.42 | 0.42 | 0.14 | 0.55 | 0.55 |
| Sat Flow, veh/h | 1315 | 918 | 807 | 2636 | 0 | 1585 | 1688 | 5106 | 1585 | 1688 | 5250 | 20 |
| Grp Volume(v), veh/h | 25 | 0 | 47 | 581 | 0 | 83 | 5 | 1981 | 166 | 215 | 1497 | 822 |
| Grp Sat Flow(s),veh/h/ln | 1315 | 0 | 1725 | 1318 | 0 | 1585 | 1688 | 1702 | 1585 | 1688 | 1702 | 1866 |
| Q Serve(g_s), s | 1.6 | 0.0 | 2.2 | 23.0 | 0.0 | 4.4 | 0.3 | 39.6 | 7.3 | 13.5 | 38.0 | 38.0 |
| Cycle Q Clear(g_c), s | 6.0 | 0.0 | 2.2 | 25.3 | 0.0 | 4.4 | 0.3 | 39.6 | 7.3 | 13.5 | 38.0 | 38.0 |
| Prop In Lane | 1.00 | | 0.47 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.01 |
| Lane Grp Cap(c), veh/h | 362 | 0 | 457 | 777 | 0 | 420 | 22 | 2150 | 667 | 242 | 1878 | 1029 |
| V/C Ratio(X) | 0.07 | 0.00 | 0.10 | 0.75 | 0.00 | 0.20 | 0.23 | 0.92 | 0.25 | 0.89 | 0.80 | 0.80 |
| Avail Cap(c_a), veh/h | 501 | 0 | 640 | 1058 | 0 | 588 | 157 | 2179 | 677 | 244 | 1878 | 1029 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 33.1 | 0.0 | 29.9 | 39.5 | 0.0 | 30.7 | 52.7 | 29.5 | 20.2 | 45.3 | 19.3 | 19.4 |
| Incr Delay (d2), s/veh | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.1 | 2.0 | 7.0 | 0.2 | 29.2 | 2.5 | 4.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.5 | 0.0 | 0.9 | 7.1 | 0.0 | 1.6 | 0.1 | 15.8 | 2.5 | 7.3 | 13.3 | 15.1 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 33.1 | 0.0 | 30.0 | 40.6 | 0.0 | 30.8 | 54.6 | 36.5 | 20.4 | 74.5 | 21.9 | 23.9 |
| LnGrp LOS | C | | C | D | | C | D | D | C | E | C | C |
| Approach Vol, veh/h | | 72 | | | 664 | | | 2152 | | | 2534 | |
| Approach Delay, s/veh | | 31.1 | | | 39.4 | | | 35.3 | | | 27.0 | |
| Approach LOS | | C | | | D | | | D | | | C | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.2 | 51.9 | | 35.7 | 6.1 | 65.9 | | 35.7 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | | 7.2 | 4.7 | 6.5 | | 7.2 |
| Max Green Setting (Gmax), s | 15.6 | 46.0 | | 40.0 | 10.0 | 51.6 | | 40.0 |
| Max Q Clear Time (g_c+I1), s | 15.5 | 41.6 | | 8.0 | 2.3 | 40.0 | | 27.3 |
| Green Ext Time (p_c), s | 0.0 | 3.8 | | 0.2 | 0.0 | 9.4 | | 1.3 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 31.9 |
| HCM 7th LOS | | C |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 517 | 688 | 297 | 123 | 522 | 232 | 291 | 1311 | 151 | 498 | 1278 | 521 |
| Future Volume (vph) | 517 | 688 | 297 | 123 | 522 | 232 | 291 | 1311 | 151 | 498 | 1278 | 521 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 3 | 1 | 6 | 7 |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 3 | 1 | 6 | 7 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 14.7 | 47.2 | 47.2 | 14.7 | 53.2 | 53.2 | 14.7 | 32.5 | 14.7 | 14.7 | 37.4 | 14.7 |
| Total Split (s) | 19.0 | 49.0 | 49.0 | 23.2 | 53.2 | 53.2 | 19.0 | 38.8 | 23.2 | 19.0 | 38.8 | 19.0 |
| Total Split (%) | 14.6% | 37.7% | 37.7% | 17.8% | 40.9% | 40.9% | 14.6% | 29.8% | 17.8% | 14.6% | 29.8% | 14.6% |
| Yellow Time (s) | 3.7 | 5.2 | 5.2 | 3.7 | 5.2 | 5.2 | 3.7 | 5.5 | 3.7 | 3.7 | 5.4 | 3.7 |
| All-Red Time (s) | 1.0 | 2.0 | 2.0 | 1.0 | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.7 | 7.2 | 7.2 | 4.7 | 7.2 | 7.2 | 4.7 | 6.5 | 4.7 | 4.7 | 6.4 | 4.7 |
| Lead/Lag | Lag | Lead | Lead | Lag | Lead | Lead | Lead | Lag | Lag | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 17.1 | 29.7 | 29.7 | 15.9 | 28.4 | 28.4 | 14.5 | 32.7 | 50.3 | 14.5 | 32.8 | 51.6 |
| Actuated g/C Ratio | 0.15 | 0.26 | 0.26 | 0.14 | 0.24 | 0.24 | 0.13 | 0.28 | 0.43 | 0.13 | 0.28 | 0.44 |
| v/c Ratio | 1.17 | 0.76 | 0.50 | 0.56 | 0.60 | 0.43 | 1.47 | 0.88 | 0.22 | 1.33 | 0.85 | 0.72 |
| Control Delay (s/veh) | 139.8 | 45.7 | 6.5 | 57.9 | 40.5 | 5.9 | 271.6 | 48.4 | 7.2 | 204.3 | 46.9 | 23.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 139.8 | 45.7 | 6.5 | 57.9 | 40.5 | 5.9 | 271.6 | 48.4 | 7.2 | 204.3 | 46.9 | 23.0 |
| LOS | F | D | A | E | D | A | F | D | A | F | D | C |
| Approach Delay (s/veh) | | 70.3 | | | 33.7 | | | 81.9 | | | 75.6 | |
| Approach LOS | | E | | | C | | | F | | | E | |

| Intersection Summary | |
|---|---|
| Cycle Length: 130 | |
| Actuated Cycle Length: 116 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.47 | |
| Intersection Signal Delay (s/veh): 70.4 | Intersection LOS: E |
| Intersection Capacity Utilization 91.8% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 10: Euclid Av. & Kimball Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 517 | 688 | 297 | 123 | 522 | 232 | 291 | 1311 | 151 | 498 | 1278 | 521 |
| Future Volume (veh/h) | 517 | 688 | 297 | 123 | 522 | 232 | 291 | 1311 | 151 | 498 | 1278 | 521 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 544 | 724 | 229 | 129 | 549 | 139 | 306 | 1380 | 106 | 524 | 1345 | 390 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 513 | 915 | 383 | 162 | 673 | 285 | 238 | 1626 | 612 | 450 | 1626 | 714 |
| Arrive On Green | 0.24 | 0.37 | 0.37 | 0.14 | 0.27 | 0.27 | 0.21 | 0.43 | 0.43 | 0.21 | 0.43 | 0.43 |
| Sat Flow, veh/h | 3188 | 3741 | 1565 | 1688 | 3741 | 1585 | 1688 | 5611 | 1585 | 3188 | 5611 | 1585 |
| Grp Volume(v), veh/h | 544 | 724 | 229 | 129 | 549 | 139 | 306 | 1380 | 106 | 524 | 1345 | 390 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1565 | 1688 | 1870 | 1585 | 1688 | 1870 | 1585 | 1594 | 1870 | 1585 |
| Q Serve(g_s), s | 16.3 | 17.5 | 7.9 | 7.5 | 13.9 | 5.1 | 14.3 | 22.3 | 1.1 | 14.3 | 21.4 | 5.9 |
| Cycle Q Clear(g_c), s | 16.3 | 17.5 | 7.9 | 7.5 | 13.9 | 5.1 | 14.3 | 22.3 | 1.1 | 14.3 | 21.4 | 5.9 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 513 | 915 | 383 | 162 | 673 | 285 | 238 | 1626 | 612 | 450 | 1626 | 714 |
| V/C Ratio(X) | 1.06 | 0.79 | 0.60 | 0.79 | 0.82 | 0.49 | 1.28 | 0.85 | 0.17 | 1.16 | 0.83 | 0.55 |
| Avail Cap(c_a), veh/h | 513 | 1545 | 646 | 308 | 1700 | 720 | 238 | 1790 | 658 | 450 | 1796 | 762 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 38.4 | 29.7 | 12.1 | 42.3 | 35.4 | 15.5 | 39.9 | 26.6 | 5.7 | 39.9 | 26.4 | 5.0 |
| Incr Delay (d2), s/veh | 56.8 | 1.6 | 1.5 | 8.5 | 0.9 | 0.5 | 155.6 | 3.8 | 0.1 | 95.6 | 3.1 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 9.4 | 6.5 | 3.8 | 3.2 | 5.5 | 2.5 | 15.4 | 7.8 | 0.5 | 10.8 | 7.5 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 95.2 | 31.3 | 13.6 | 50.9 | 36.3 | 16.0 | 195.5 | 30.4 | 5.9 | 135.5 | 29.5 | 5.7 |
| LnGrp LOS | F | C | B | D | D | B | F | C | A | F | C | A |
| Approach Vol, veh/h | | 1497 | | | 817 | | | 1792 | | | 2259 | |
| Approach Delay, s/veh | | 51.8 | | | 35.2 | | | 57.1 | | | 50.0 | |
| Approach LOS | | D | | | D | | | E | | | D | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.0 | 35.8 | 14.4 | 32.0 | 19.0 | 35.8 | 21.0 | 25.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 4.7 | 7.2 | 4.7 | * 6.5 | 4.7 | 7.2 |
| Max Green Setting (Gmax), s | 14.3 | 32.3 | 18.5 | 41.8 | 14.3 | * 32 | 14.3 | 46.0 |
| Max Q Clear Time (g_c+I1), s | 16.3 | 24.3 | 9.5 | 19.5 | 16.3 | 23.4 | 18.3 | 15.9 |
| Green Ext Time (p_c), s | 0.0 | 5.0 | 0.2 | 5.3 | 0.0 | 5.9 | 0.0 | 2.3 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 50.5 |
| HCM 7th LOS | D |

Notes

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | |
| Traffic Volume (vph) | 292 | 499 | 149 | 639 | 471 | 181 | 793 | 1054 | 244 | 724 | 405 |
| Future Volume (vph) | 292 | 499 | 149 | 639 | 471 | 181 | 793 | 1054 | 244 | 724 | 405 |
| Turn Type | Prot | NA | Free | Prot | NA | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | Free | | | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 15.7 | 17.0 | | 15.7 | 51.0 | 14.7 | 34.5 | 15.7 | 14.7 | 30.5 | 30.5 |
| Total Split (s) | 19.0 | 23.2 | | 46.8 | 51.0 | 14.7 | 35.3 | 46.8 | 14.7 | 35.3 | 35.3 |
| Total Split (%) | 15.8% | 19.3% | | 39.0% | 42.5% | 12.3% | 29.4% | 39.0% | 12.3% | 29.4% | 29.4% |
| Yellow Time (s) | 3.7 | 5.0 | | 3.7 | 5.0 | 3.7 | 5.5 | 3.7 | 3.7 | 5.5 | 5.5 |
| All-Red Time (s) | 2.0 | 2.0 | | 2.0 | 2.0 | 1.0 | 1.0 | 2.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.7 | 7.0 | | 5.7 | 7.0 | 4.7 | 6.5 | 5.7 | 4.7 | 6.5 | 6.5 |
| Lead/Lag | Lag | Lag | | Lead | Lead | Lead | Lag | Lead | Lead | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 25.8 | 16.2 | 119.7 | 41.1 | 31.5 | 10.0 | 28.5 | 76.1 | 10.0 | 28.5 | 28.5 |
| Actuated g/C Ratio | 0.22 | 0.14 | 1.00 | 0.34 | 0.26 | 0.08 | 0.24 | 0.64 | 0.08 | 0.24 | 0.24 |
| v/c Ratio | 0.87 | 1.07 | 0.10 | 0.63 | 0.71 | 0.72 | 0.96 | 1.09 | 0.96 | 0.88 | 0.69 |
| Control Delay (s/veh) | 70.8 | 108.3 | 0.1 | 36.2 | 40.1 | 69.0 | 67.5 | 79.4 | 101.3 | 56.2 | 16.7 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 70.8 | 108.3 | 0.1 | 36.2 | 40.1 | 69.0 | 67.5 | 79.4 | 101.3 | 56.2 | 16.7 |
| LOS | E | F | A | D | D | E | E | E | F | E | B |
| Approach Delay (s/veh) | | 79.5 | | | 38.2 | | 73.8 | | | 52.5 | |
| Approach LOS | | E | | | D | | E | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 119.7 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.09 | |
| Intersection Signal Delay (s/veh): 61.4 | Intersection LOS: E |
| Intersection Capacity Utilization 101.9% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 11: Euclid Av. & Pine Av.

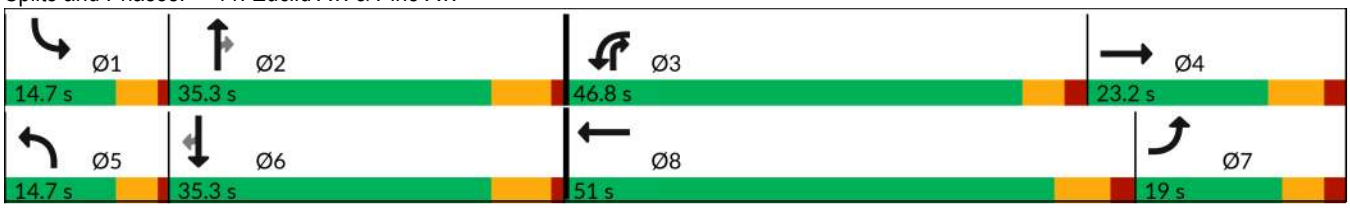

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 292 | 499 | 149 | 639 | 471 | 181 | 181 | 793 | 1054 | 244 | 724 | 405 |
| Future Volume (veh/h) | 292 | 499 | 149 | 639 | 471 | 181 | 181 | 793 | 1054 | 244 | 724 | 405 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 314 | 537 | 0 | 687 | 506 | 98 | 195 | 853 | 595 | 262 | 778 | 274 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 276 | 586 | | 754 | 662 | 128 | 316 | 1042 | 817 | 317 | 1044 | 442 |
| Arrive On Green | 0.25 | 0.24 | 0.00 | 0.35 | 0.33 | 0.33 | 0.14 | 0.42 | 0.42 | 0.15 | 0.42 | 0.42 |
| Sat Flow, veh/h | 1688 | 3741 | 1585 | 3188 | 3048 | 587 | 3274 | 3741 | 1585 | 3274 | 3741 | 1585 |
| Grp Volume(v), veh/h | 314 | 537 | 0 | 687 | 310 | 294 | 195 | 853 | 595 | 262 | 778 | 274 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1594 | 1870 | 1765 | 1637 | 1870 | 1585 | 1637 | 1870 | 1585 |
| Q Serve(g_s), s | 16.9 | 14.5 | 0.0 | 21.2 | 15.3 | 15.5 | 5.8 | 20.8 | 28.8 | 8.0 | 18.2 | 8.3 |
| Cycle Q Clear(g_c), s | 16.9 | 14.5 | 0.0 | 21.2 | 15.3 | 15.5 | 5.8 | 20.8 | 28.8 | 8.0 | 18.2 | 8.3 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.33 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 276 | 586 | | 754 | 406 | 383 | 316 | 1042 | 817 | 317 | 1044 | 442 |
| V/C Ratio(X) | 1.14 | 0.92 | | 0.91 | 0.76 | 0.77 | 0.62 | 0.82 | 0.73 | 0.83 | 0.75 | 0.62 |
| Avail Cap(c_a), veh/h | 276 | 586 | | 1268 | 796 | 751 | 317 | 1042 | 817 | 317 | 1044 | 442 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 39.0 | 38.9 | 0.0 | 32.3 | 32.5 | 32.5 | 42.4 | 27.8 | 16.5 | 43.3 | 26.9 | 9.0 |
| Incr Delay (d2), s/veh | 96.4 | 19.5 | 0.0 | 3.5 | 4.2 | 4.6 | 2.7 | 4.9 | 2.9 | 15.5 | 2.6 | 2.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 13.4 | 7.4 | 0.0 | 6.9 | 6.3 | 6.0 | 2.3 | 7.7 | 8.2 | 3.6 | 6.7 | 4.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 135.4 | 58.3 | 0.0 | 35.8 | 36.7 | 37.1 | 45.1 | 32.6 | 19.4 | 58.8 | 29.6 | 11.0 |
| LnGrp LOS | F | E | | D | D | D | D | C | B | E | C | B |
| Approach Vol, veh/h | | 851 | | | 1291 | | | 1643 | | | 1314 | |
| Approach Delay, s/veh | | 86.8 | | | 36.3 | | | 29.3 | | | 31.5 | |
| Approach LOS | | F | | | D | | | C | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 14.7 | 35.3 | 30.1 | 23.2 | 14.7 | 35.3 | 23.9 | 29.4 |
| Change Period (Y+Rc), s | 4.7 | 6.5 | 5.7 | 7.0 | 4.7 | 6.5 | 7.0 | * 7 |
| Max Green Setting (Gmax), s | 10.0 | 28.8 | 41.1 | 16.2 | 10.0 | 28.8 | 13.3 | * 44 |
| Max Q Clear Time (g_c+I1), s | 10.0 | 30.8 | 23.2 | 16.5 | 7.8 | 20.2 | 18.9 | 17.5 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 1.2 | 0.0 | 0.1 | 2.5 | 0.0 | 4.9 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 41.2 |
| HCM 7th LOS | D |

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 7th computational engine requires equal clearance times for the phases crossing the barrier.

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 108 | 2628 | 30 | 2153 | 98 | 42 | 116 | 9 |
| Future Volume (vph) | 108 | 2628 | 30 | 2153 | 98 | 42 | 116 | 9 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 93.0 | 93.0 | 93.0 | 93.0 | 27.0 | 27.0 | 27.0 | 27.0 |
| Total Split (%) | 77.5% | 77.5% | 77.5% | 77.5% | 22.5% | 22.5% | 22.5% | 22.5% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 88.4 | 88.4 | 88.4 | 88.4 | | 22.4 | | 22.4 |
| Actuated g/C Ratio | 0.74 | 0.74 | 0.74 | 0.74 | | 0.19 | | 0.19 |
| v/c Ratio | 2.02 | 1.12 | 0.57 | 0.96 | | 1.11 | | 1.15 |
| Control Delay (s/veh) | 531.9 | 79.8 | 50.4 | 25.3 | | 133.0 | | 152.0 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 531.9 | 79.8 | 50.4 | 25.3 | | 133.0 | | 152.0 |
| LOS | F | E | D | C | | F | | F |
| Approach Delay (s/veh) | | 97.2 | | 25.6 | | 133.0 | | 152.0 |
| Approach LOS | | F | | C | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 2.02 | |
| Intersection Signal Delay (s/veh): 71.2 | Intersection LOS: E |
| Intersection Capacity Utilization 108.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 14: Campus Av. & Edison Av.

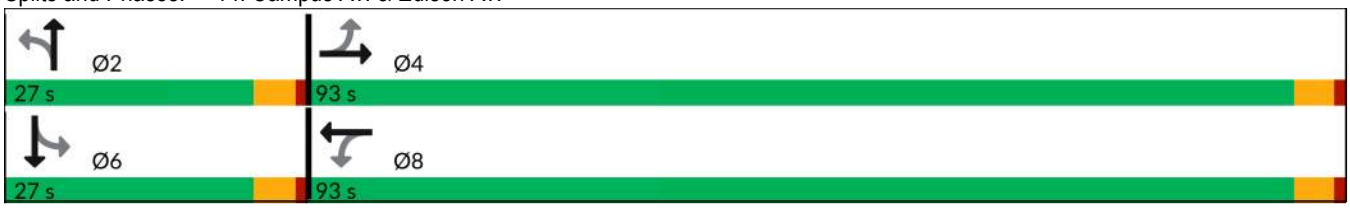

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 108 | 2628 | 61 | 30 | 2153 | 130 | 98 | 42 | 121 | 116 | 9 | 80 |
| Future Volume (veh/h) | 108 | 2628 | 61 | 30 | 2153 | 130 | 98 | 42 | 121 | 116 | 9 | 80 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 117 | 2857 | 66 | 33 | 2340 | 141 | 107 | 46 | 132 | 126 | 10 | 87 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 78 | 2616 | 60 | 60 | 2510 | 150 | 137 | 51 | 127 | 150 | 14 | 75 |
| Arrive On Green | 0.74 | 0.74 | 0.74 | 0.74 | 0.74 | 0.74 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 | 0.19 |
| Sat Flow, veh/h | 127 | 3551 | 82 | 81 | 3407 | 203 | 515 | 275 | 682 | 553 | 77 | 403 |
| Grp Volume(v), veh/h | 117 | 1424 | 1499 | 33 | 1209 | 1272 | 285 | 0 | 0 | 223 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 127 | 1777 | 1856 | 81 | 1777 | 1834 | 1472 | 0 | 0 | 1033 | 0 | 0 |
| Q Serve(g_s), s | 16.8 | 88.4 | 88.4 | 0.0 | 67.2 | 71.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 88.4 | 88.4 | 88.4 | 88.4 | 67.2 | 71.6 | 22.4 | 0.0 | 0.0 | 22.4 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.11 | 0.38 | | 0.46 | 0.57 | | 0.39 |
| Lane Grp Cap(c), veh/h | 78 | 1309 | 1367 | 60 | 1309 | 1351 | 316 | 0 | 0 | 240 | 0 | 0 |
| V/C Ratio(X) | 1.51 | 1.09 | 1.10 | 0.55 | 0.92 | 0.94 | 0.90 | 0.00 | 0.00 | 0.93 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 78 | 1309 | 1367 | 60 | 1309 | 1351 | 316 | 0 | 0 | 240 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 58.1 | 15.8 | 15.8 | 60.0 | 13.0 | 13.6 | 49.1 | 0.0 | 0.0 | 50.1 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 282.8 | 52.4 | 55.2 | 10.3 | 11.0 | 13.1 | 27.3 | 0.0 | 0.0 | 39.5 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.4 | 43.9 | 46.9 | 1.1 | 22.9 | 25.7 | 10.7 | 0.0 | 0.0 | 9.3 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 340.8 | 68.2 | 71.0 | 70.3 | 24.1 | 26.7 | 76.4 | 0.0 | 0.0 | 89.6 | 0.0 | 0.0 |
| LnGrp LOS | F | F | F | E | C | C | E | | | F | | |
| Approach Vol, veh/h | | 3040 | | | 2514 | | | 285 | | | 223 | |
| Approach Delay, s/veh | | 80.1 | | | 26.0 | | | 76.4 | | | 89.6 | |
| Approach LOS | | F | | | C | | | E | | | F | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 27.0 | 93.0 | 27.0 | 93.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 22.4 | 88.4 | 22.4 | 88.4 |
| Max Q Clear Time (g_c+I1), s | 24.4 | 90.4 | 24.4 | 90.4 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 57.8 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 49 | 1296 | 53 | 982 | 40 | 62 | 11 | 47 |
| Future Volume (vph) | 49 | 1296 | 53 | 982 | 40 | 62 | 11 | 47 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 95.3 | 95.3 | 95.3 | 95.3 | 24.7 | 24.7 | 24.7 | 24.7 |
| Total Split (%) | 79.4% | 79.4% | 79.4% | 79.4% | 20.6% | 20.6% | 20.6% | 20.6% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 88.8 | 88.8 | 88.8 | 88.8 | | 16.5 | | 16.5 |
| Actuated g/C Ratio | 0.77 | 0.77 | 0.77 | 0.77 | | 0.14 | | 0.14 |
| v/c Ratio | 0.14 | 0.97 | 0.85 | 0.38 | | 0.80 | | 0.39 |
| Control Delay (s/veh) | 4.8 | 31.0 | 96.8 | 4.8 | | 63.3 | | 37.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 4.8 | 31.0 | 96.8 | 4.8 | | 63.3 | | 37.9 |
| LOS | A | C | F | A | | E | | D |
| Approach Delay (s/veh) | | 30.1 | | 9.4 | | 63.3 | | 37.9 |
| Approach LOS | | C | | A | | E | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 114.6 | |
| Natural Cycle: 110 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.97 | |
| Intersection Signal Delay (s/veh): 24.8 | Intersection LOS: C |
| Intersection Capacity Utilization 96.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 15: Bon View Av. & Riverside Dr.

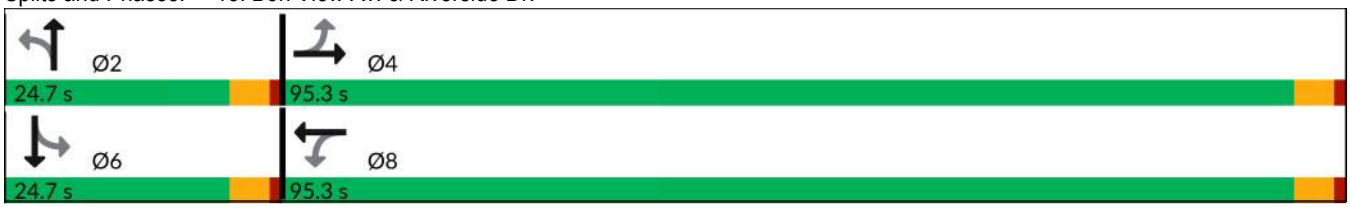

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 49 | 1296 | 51 | 53 | 982 | 19 | 40 | 62 | 94 | 11 | 47 | 41 |
| Future Volume (veh/h) | 49 | 1296 | 51 | 53 | 982 | 19 | 40 | 62 | 94 | 11 | 47 | 41 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 51 | 1336 | 53 | 55 | 1012 | 20 | 41 | 64 | 97 | 11 | 48 | 42 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 442 | 1396 | 55 | 114 | 2786 | 55 | 73 | 84 | 111 | 47 | 128 | 101 |
| Arrive On Green | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.78 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| Sat Flow, veh/h | 547 | 1785 | 71 | 389 | 3562 | 70 | 255 | 608 | 798 | 92 | 926 | 725 |
| Grp Volume(v), veh/h | 51 | 0 | 1389 | 55 | 505 | 527 | 202 | 0 | 0 | 101 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 547 | 0 | 1856 | 389 | 1777 | 1856 | 1662 | 0 | 0 | 1743 | 0 | 0 |
| Q Serve(g_s), s | 3.6 | 0.0 | 75.2 | 15.5 | 10.0 | 10.0 | 7.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 13.7 | 0.0 | 75.2 | 90.7 | 10.0 | 10.0 | 13.7 | 0.0 | 0.0 | 6.2 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.04 | 1.00 | | 0.04 | 0.20 | | 0.48 | 0.11 | | 0.42 |
| Lane Grp Cap(c), veh/h | 442 | 0 | 1451 | 114 | 1389 | 1451 | 268 | 0 | 0 | 276 | 0 | 0 |
| V/C Ratio(X) | 0.12 | 0.00 | 0.96 | 0.48 | 0.36 | 0.36 | 0.75 | 0.00 | 0.00 | 0.37 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 442 | 0 | 1451 | 114 | 1389 | 1451 | 323 | 0 | 0 | 333 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 5.9 | 0.0 | 11.0 | 50.7 | 3.8 | 3.8 | 48.8 | 0.0 | 0.0 | 45.7 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.1 | 0.0 | 14.7 | 3.1 | 0.2 | 0.2 | 8.0 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.4 | 0.0 | 25.0 | 1.7 | 2.5 | 2.6 | 6.1 | 0.0 | 0.0 | 2.7 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 6.0 | 0.0 | 25.6 | 53.8 | 4.0 | 4.0 | 56.7 | 0.0 | 0.0 | 46.5 | 0.0 | 0.0 |
| LnGrp LOS | A | | C | D | A | A | E | | | D | | |
| Approach Vol, veh/h | | 1440 | | | 1087 | | | 202 | | | 101 | |
| Approach Delay, s/veh | | 24.9 | | | 6.5 | | | 56.7 | | | 46.5 | |
| Approach LOS | | C | | | A | | | E | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 20.7 | 95.3 | 20.7 | 95.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 20.1 | 90.7 | 20.1 | 90.7 |
| Max Q Clear Time (g_c+I1), s | 15.7 | 77.2 | 8.2 | 92.7 |
| Green Ext Time (p_c), s | 0.4 | 10.0 | 0.3 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 20.9 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 52 | 398 | 8 | 250 | 45 | 205 | 9 | 200 |
| Future Volume (vph) | 52 | 398 | 8 | 250 | 45 | 205 | 9 | 200 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 73.0 | 73.0 | 73.0 | 73.0 | 47.0 | 47.0 | 47.0 | 47.0 |
| Total Split (%) | 60.8% | 60.8% | 60.8% | 60.8% | 39.2% | 39.2% | 39.2% | 39.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 4.6 | | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 23.8 | | 23.8 | | 15.5 | | 15.5 |
| Actuated g/C Ratio | | 0.48 | | 0.48 | | 0.31 | | 0.31 |
| v/c Ratio | | 0.69 | | 0.33 | | 0.55 | | 0.44 |
| Control Delay (s/veh) | | 14.8 | | 9.2 | | 19.9 | | 17.6 |
| Queue Delay | | 0.0 | | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 14.8 | | 9.2 | | 19.9 | | 17.6 |
| LOS | | B | | A | | B | | B |
| Approach Delay (s/veh) | | 14.8 | | 9.2 | | 19.9 | | 17.6 |
| Approach LOS | | B | | A | | B | | B |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 49.3 | |
| Natural Cycle: 55 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.69 | |
| Intersection Signal Delay (s/veh): 15.2 | Intersection LOS: B |
| Intersection Capacity Utilization 86.2% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 16: Bon View Av. & Schaefer Av.

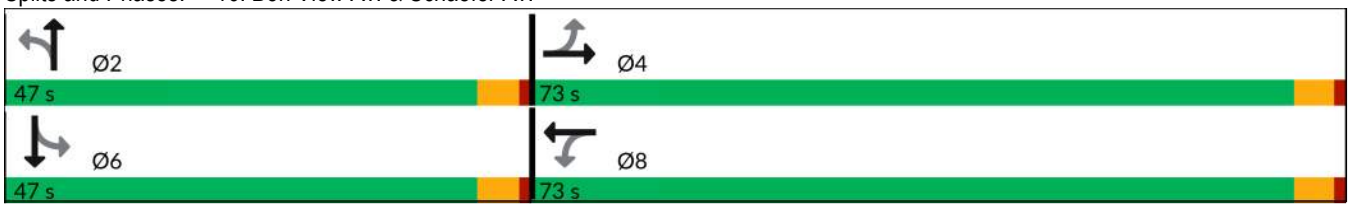

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 52 | 398 | 86 | 8 | 250 | 14 | 45 | 205 | 24 | 9 | 200 | 26 |
| Future Volume (veh/h) | 52 | 398 | 86 | 8 | 250 | 14 | 45 | 205 | 24 | 9 | 200 | 26 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 56 | 428 | 49 | 9 | 269 | 10 | 48 | 220 | 15 | 10 | 215 | 17 |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 179 | 644 | 70 | 133 | 754 | 27 | 191 | 383 | 24 | 135 | 433 | 33 |
| Arrive On Green | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.43 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| Sat Flow, veh/h | 102 | 1504 | 163 | 18 | 1759 | 64 | 184 | 1475 | 93 | 32 | 1667 | 128 |
| Grp Volume(v), veh/h | 533 | 0 | 0 | 288 | 0 | 0 | 283 | 0 | 0 | 242 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1769 | 0 | 0 | 1841 | 0 | 0 | 1752 | 0 | 0 | 1827 | 0 | 0 |
| Q Serve(g_s), s | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 7.0 | 0.0 | 0.0 | 3.1 | 0.0 | 0.0 | 4.0 | 0.0 | 0.0 | 3.3 | 0.0 | 0.0 |
| Prop In Lane | 0.11 | | 0.09 | 0.03 | | 0.03 | 0.17 | | 0.05 | 0.04 | | 0.07 |
| Lane Grp Cap(c), veh/h | 893 | 0 | 0 | 914 | 0 | 0 | 598 | 0 | 0 | 602 | 0 | 0 |
| V/C Ratio(X) | 0.60 | 0.00 | 0.00 | 0.31 | 0.00 | 0.00 | 0.47 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 4138 | 0 | 0 | 4320 | 0 | 0 | 2572 | 0 | 0 | 2723 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 6.8 | 0.0 | 0.0 | 5.7 | 0.0 | 0.0 | 9.5 | 0.0 | 0.0 | 9.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.6 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.6 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 0.9 | 0.0 | 0.0 | 0.8 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 7.4 | 0.0 | 0.0 | 5.9 | 0.0 | 0.0 | 10.1 | 0.0 | 0.0 | 9.7 | 0.0 | 0.0 |
| LnGrp LOS | A | | | A | | | B | | | A | | |
| Approach Vol, veh/h | | 533 | | | 288 | | | 283 | | | 242 | |
| Approach Delay, s/veh | | 7.4 | | | 5.9 | | | 10.1 | | | 9.7 | |
| Approach LOS | | A | | | A | | | B | | | A | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 12.3 | 17.2 | 12.3 | 17.2 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 42.4 | 68.4 | 42.4 | 68.4 |
| Max Q Clear Time (g_c+I1), s | 6.0 | 9.0 | 5.3 | 5.1 |
| Green Ext Time (p_c), s | 1.6 | 3.6 | 1.3 | 1.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 8.1 |
| HCM 7th LOS | A |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 113 | 1989 | 444 | 1228 | 171 | 196 | 149 | 178 | 166 |
| Future Volume (vph) | 113 | 1989 | 444 | 1228 | 171 | 196 | 149 | 178 | 166 |
| Turn Type | Prot | NA | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | 8 | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 21.3 | 47.0 | 30.0 | 55.7 | 55.7 | 17.0 | 27.0 | 16.0 | 26.0 |
| Total Split (%) | 17.8% | 39.2% | 25.0% | 46.4% | 46.4% | 14.2% | 22.5% | 13.3% | 21.7% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.7 | 41.2 | 25.4 | 53.9 | 53.9 | 12.4 | 21.6 | 11.4 | 20.6 |
| Actuated g/C Ratio | 0.11 | 0.34 | 0.21 | 0.45 | 0.45 | 0.10 | 0.18 | 0.10 | 0.17 |
| v/c Ratio | 0.69 | 0.99 | 1.36 | 0.53 | 0.23 | 1.23 | 1.53 | 1.21 | 0.78 |
| Control Delay (s/veh) | 71.1 | 53.6 | 218.4 | 25.4 | 3.8 | 188.8 | 280.2 | 186.0 | 62.5 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 71.1 | 53.6 | 218.4 | 25.4 | 3.8 | 188.8 | 280.2 | 186.0 | 62.5 |
| LOS | E | D | F | C | A | F | F | F | E |
| Approach Delay (s/veh) | | 54.5 | | 69.9 | | | 255.4 | | 116.8 |
| Approach LOS | | D | | E | | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.53 | |
| Intersection Signal Delay (s/veh): 91.4 | Intersection LOS: F |
| Intersection Capacity Utilization 118.4% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 17: Bon View Av. & Edison Av.

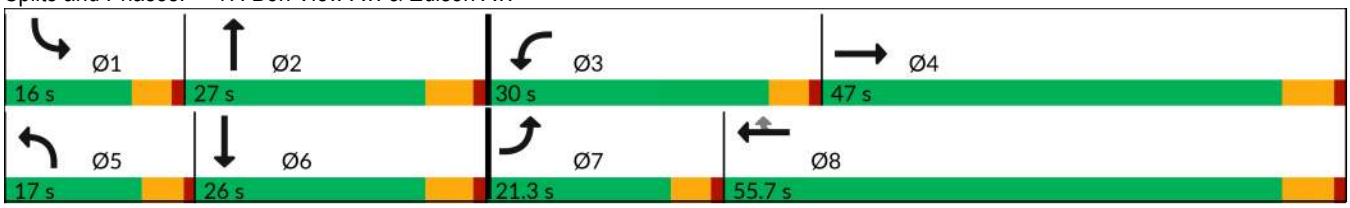

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 113 | 1989 | 306 | 444 | 1228 | 171 | 196 | 149 | 378 | 178 | 166 | 61 |
| Future Volume (veh/h) | 113 | 1989 | 306 | 444 | 1228 | 171 | 196 | 149 | 378 | 178 | 166 | 61 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 123 | 2162 | 170 | 483 | 1335 | 99 | 213 | 162 | 226 | 193 | 180 | 33 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 147 | 2335 | 183 | 358 | 2617 | 739 | 175 | 128 | 178 | 161 | 265 | 49 |
| Arrive On Green | 0.13 | 0.51 | 0.51 | 0.32 | 0.70 | 0.70 | 0.16 | 0.27 | 0.27 | 0.14 | 0.26 | 0.26 |
| Sat Flow, veh/h | 1688 | 6847 | 538 | 1688 | 5611 | 1585 | 1688 | 707 | 986 | 1688 | 1538 | 282 |
| Grp Volume(v), veh/h | 123 | 1771 | 561 | 483 | 1335 | 99 | 213 | 0 | 388 | 193 | 0 | 213 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1774 | 1688 | 1870 | 1585 | 1688 | 0 | 1693 | 1688 | 0 | 1820 |
| Q Serve(g_s), s | 8.5 | 35.0 | 35.2 | 25.4 | 13.3 | 2.5 | 12.4 | 0.0 | 21.6 | 11.4 | 0.0 | 12.6 |
| Cycle Q Clear(g_c), s | 8.5 | 35.0 | 35.2 | 25.4 | 13.3 | 2.5 | 12.4 | 0.0 | 21.6 | 11.4 | 0.0 | 12.6 |
| Prop In Lane | 1.00 | | 0.30 | 1.00 | | 1.00 | 1.00 | | 0.58 | 1.00 | | 0.15 |
| Lane Grp Cap(c), veh/h | 147 | 1913 | 605 | 358 | 2617 | 739 | 175 | 0 | 306 | 161 | 0 | 313 |
| V/C Ratio(X) | 0.84 | 0.93 | 0.93 | 1.35 | 0.51 | 0.13 | 1.22 | 0.00 | 1.27 | 1.20 | 0.00 | 0.68 |
| Avail Cap(c_a), veh/h | 236 | 1933 | 611 | 358 | 2617 | 739 | 175 | 0 | 306 | 161 | 0 | 313 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 51.2 | 27.8 | 27.8 | 40.7 | 11.6 | 10.0 | 50.5 | 0.0 | 43.6 | 51.2 | 0.0 | 41.4 |
| Incr Delay (d2), s/veh | 7.0 | 8.2 | 20.4 | 173.8 | 0.2 | 0.1 | 138.4 | 0.0 | 144.3 | 134.7 | 0.0 | 5.8 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.6 | 13.3 | 14.7 | 26.2 | 4.1 | 0.8 | 11.5 | 0.0 | 20.2 | 10.5 | 0.0 | 5.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 58.2 | 36.0 | 48.2 | 214.6 | 11.7 | 10.0 | 188.9 | 0.0 | 187.8 | 185.9 | 0.0 | 47.2 |
| LnGrp LOS | E | D | D | F | B | B | F | | F | F | | D |
| Approach Vol, veh/h | | 2455 | | | 1917 | | | 601 | | | 406 | |
| Approach Delay, s/veh | | 39.9 | | | 62.8 | | | 188.2 | | | 113.1 | |
| Approach LOS | | D | | | E | | | F | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 16.0 | 27.0 | 30.0 | 46.6 | 17.0 | 26.0 | 15.0 | 61.6 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 11.4 | 21.6 | 25.4 | 41.2 | 12.4 | 20.6 | 16.7 | 49.9 |
| Max Q Clear Time (g_c+I1), s | 13.4 | 23.6 | 27.4 | 37.2 | 14.4 | 14.6 | 10.5 | 15.3 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 3.6 | 0.0 | 0.5 | 0.1 | 11.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 70.1 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | |
| Traffic Volume (vph) | 207 | 289 | 611 | 11 | 61 | 40 | 44 |
| Future Volume (vph) | 207 | 289 | 611 | 11 | 61 | 40 | 44 |
| Turn Type | Perm | NA | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 81.0 | 81.0 | 81.0 | 39.0 | 39.0 | 39.0 | 39.0 |
| Total Split (%) | 67.5% | 67.5% | 67.5% | 32.5% | 32.5% | 32.5% | 32.5% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | | 4.6 | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | |
| Lead-Lag Optimize? | | | | | | | |
| Recall Mode | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | | 43.8 | 43.8 | | 19.6 | | 19.6 |
| Actuated g/C Ratio | | 0.59 | 0.59 | | 0.26 | | 0.26 |
| v/c Ratio | | 1.49dl | 0.83 | | 0.20 | | 0.71 |
| Control Delay (s/veh) | | 11.7 | 19.9 | | 26.2 | | 28.8 |
| Queue Delay | | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | | 11.7 | 19.9 | | 26.2 | | 28.8 |
| LOS | | B | B | | C | | C |
| Approach Delay (s/veh) | | 11.7 | 19.9 | | 26.2 | | 28.8 |
| Approach LOS | | B | B | | C | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 74 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 19.2 | Intersection LOS: B |
| Intersection Capacity Utilization 88.4% | ICU Level of Service E |
| Analysis Period (min) 15 | |

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 18: Bon View Av. & Eucalyptus Av.

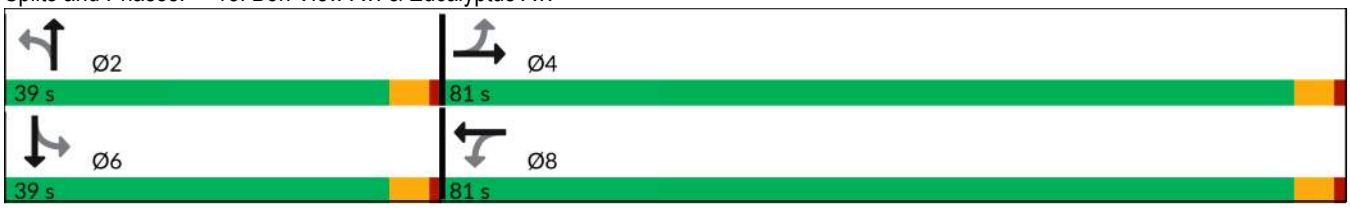

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 207 | 289 | 18 | 0 | 611 | 124 | 11 | 61 | 4 | 40 | 44 | 205 |
| Future Volume (veh/h) | 207 | 289 | 18 | 0 | 611 | 124 | 11 | 61 | 4 | 40 | 44 | 205 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 252 | 352 | 22 | 0 | 745 | 151 | 13 | 74 | 5 | 49 | 54 | 250 |
| Peak Hour Factor | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 | 0.82 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 287 | 1071 | 67 | 0 | 1020 | 207 | 68 | 343 | 22 | 76 | 73 | 275 |
| Arrive On Green | 0.68 | 0.68 | 0.68 | 0.00 | 0.68 | 0.68 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 | 0.24 |
| Sat Flow, veh/h | 331 | 1585 | 99 | 0 | 1509 | 306 | 129 | 1412 | 89 | 164 | 302 | 1132 |
| Grp Volume(v), veh/h | 252 | 0 | 374 | 0 | 0 | 896 | 92 | 0 | 0 | 353 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 331 | 0 | 1684 | 0 | 0 | 1815 | 1629 | 0 | 0 | 1598 | 0 | 0 |
| Q Serve(g_s), s | 40.6 | 0.0 | 10.5 | 0.0 | 0.0 | 35.8 | 0.0 | 0.0 | 0.0 | 17.3 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 76.4 | 0.0 | 10.5 | 0.0 | 0.0 | 35.8 | 4.5 | 0.0 | 0.0 | 24.2 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.06 | 0.00 | | 0.17 | 0.14 | | 0.05 | 0.14 | | 0.71 |
| Lane Grp Cap(c), veh/h | 287 | 0 | 1138 | 0 | 0 | 1226 | 432 | 0 | 0 | 425 | 0 | 0 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.33 | 0.00 | 0.00 | 0.73 | 0.21 | 0.00 | 0.00 | 0.83 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 287 | 0 | 1138 | 0 | 0 | 1226 | 535 | 0 | 0 | 521 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 0.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 38.5 | 0.0 | 7.6 | 0.0 | 0.0 | 11.7 | 34.1 | 0.0 | 0.0 | 41.4 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 25.1 | 0.0 | 0.2 | 0.0 | 0.0 | 2.3 | 0.2 | 0.0 | 0.0 | 9.2 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.9 | 0.0 | 3.1 | 0.0 | 0.0 | 12.5 | 2.0 | 0.0 | 0.0 | 10.2 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 63.6 | 0.0 | 7.8 | 0.0 | 0.0 | 14.0 | 34.3 | 0.0 | 0.0 | 50.6 | 0.0 | 0.0 |
| LnGrp LOS | E | | A | | | B | C | | | D | | |
| Approach Vol, veh/h | | 626 | | | 896 | | | 92 | | | 353 | |
| Approach Delay, s/veh | | 30.3 | | | 14.0 | | | 34.3 | | | 50.6 | |
| Approach LOS | | C | | | B | | | C | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 32.1 | 81.0 | 32.1 | 81.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 34.4 | 76.4 | 34.4 | 76.4 |
| Max Q Clear Time (g_c+I1), s | 6.5 | 78.4 | 26.2 | 37.8 |
| Green Ext Time (p_c), s | 0.4 | 0.0 | 1.3 | 7.7 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 26.7 |
| HCM 7th LOS | C |

| Lane Group | WBT | WBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 246 | 346 | 811 | 1640 | 828 |
| Future Volume (vph) | 3 | 246 | 346 | 811 | 1640 | 828 |
| Turn Type | NA | Perm | Prot | NA | NA | Perm |
| Protected Phases | 8 | | 5 | 2 | 6 | |
| Permitted Phases | | 8 | | | | 6 |
| Detector Phase | 8 | 8 | 5 | 2 | 6 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 24.8 | 24.8 | 15.8 | 24.8 | 15.8 | 15.8 |
| Total Split (s) | 25.0 | 25.0 | 25.5 | 75.0 | 49.5 | 49.5 |
| Total Split (%) | 25.0% | 25.0% | 25.5% | 75.0% | 49.5% | 49.5% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 | 5.8 |
| Lead/Lag | | | Lead | | Lag | Lag |
| Lead-Lag Optimize? | | | Yes | | Yes | Yes |
| Recall Mode | None | None | None | C-Min | C-Min | C-Min |
| Act Effct Green (s) | 19.2 | 19.2 | 19.7 | 69.2 | 43.7 | 43.7 |
| Actuated g/C Ratio | 0.19 | 0.19 | 0.20 | 0.69 | 0.44 | 0.44 |
| v/c Ratio | 1.06 | 0.51 | 1.06 | 0.33 | 1.07 | 0.84 |
| Control Delay (s/veh) | 104.7 | 10.4 | 90.6 | 8.7 | 73.4 | 16.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |
| Total Delay (s/veh) | 104.7 | 10.4 | 90.6 | 9.0 | 73.4 | 16.2 |
| LOS | F | B | F | A | E | B |
| Approach Delay (s/veh) | 66.1 | | | 33.4 | 54.2 | |
| Approach LOS | E | | | C | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.07 | |
| Intersection Signal Delay (s/veh): 50.2 | Intersection LOS: D |
| Intersection Capacity Utilization 106.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 20: Grove Av. & SR-60 WB Ramps

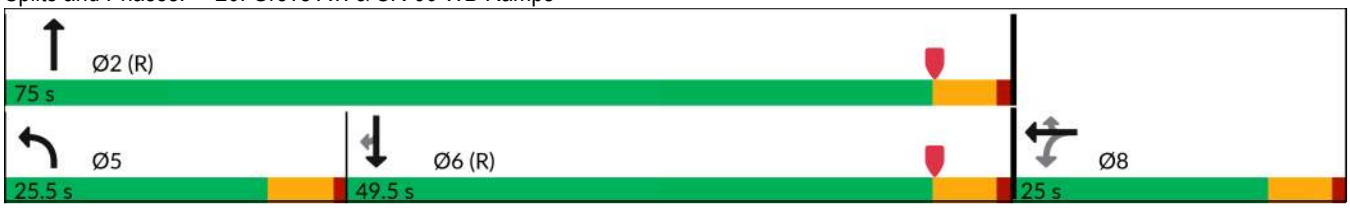

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 0 | 0 | 0 | 352 | 3 | 246 | 346 | 811 | 0 | 0 | 1640 | 828 |
| Future Volume (veh/h) | 0 | 0 | 0 | 352 | 3 | 246 | 346 | 811 | 0 | 0 | 1640 | 828 |
| Initial Q (Qb), veh | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | | | | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 |
| Parking Bus, Adj | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | | | | 1772 | 1870 | 1870 | 1772 | 1870 | 0 | 0 | 1870 | 1870 |
| Adj Flow Rate, veh/h | | | | 356 | 3 | 112 | 349 | 819 | 0 | 0 | 1657 | 432 |
| Peak Hour Factor | | | | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | | | | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 2 | 2 |
| Cap, veh/h | | | | 339 | 3 | 304 | 332 | 2459 | 0 | 0 | 1553 | 675 |
| Arrive On Green | | | | 0.29 | 0.29 | 0.29 | 0.30 | 1.00 | 0.00 | 0.00 | 0.66 | 0.66 |
| Sat Flow, veh/h | | | | 1767 | 15 | 1585 | 1688 | 3647 | 0 | 0 | 3647 | 1545 |
| Grp Volume(v), veh/h | | | | 359 | 0 | 112 | 349 | 819 | 0 | 0 | 1657 | 432 |
| Grp Sat Flow(s),veh/h/ln | | | | 1782 | 0 | 1585 | 1688 | 1777 | 0 | 0 | 1777 | 1545 |
| Q Serve(g_s), s | | | | 19.2 | 0.0 | 5.6 | 19.7 | 0.0 | 0.0 | 0.0 | 43.7 | 16.6 |
| Cycle Q Clear(g_c), s | | | | 19.2 | 0.0 | 5.6 | 19.7 | 0.0 | 0.0 | 0.0 | 43.7 | 16.6 |
| Prop In Lane | | | | 0.99 | | 1.00 | 1.00 | | 0.00 | 0.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | | | | 342 | 0 | 304 | 332 | 2459 | 0 | 0 | 1553 | 675 |
| V/C Ratio(X) | | | | 1.05 | 0.00 | 0.37 | 1.05 | 0.33 | 0.00 | 0.00 | 1.07 | 0.64 |
| Avail Cap(c_a), veh/h | | | | 342 | 0 | 304 | 332 | 2459 | 0 | 0 | 1553 | 675 |
| HCM Platoon Ratio | | | | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.00 | 1.00 | 1.50 | 1.50 |
| Upstream Filter(I) | | | | 1.00 | 0.00 | 1.00 | 0.22 | 0.22 | 0.00 | 0.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | | | | 35.6 | 0.0 | 30.8 | 35.2 | 0.0 | 0.0 | 0.0 | 17.2 | 12.6 |
| Incr Delay (d2), s/veh | | | | 62.1 | 0.0 | 0.6 | 37.4 | 0.1 | 0.0 | 0.0 | 43.1 | 4.6 |
| Initial Q Delay(d3), s/veh | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | | | | 12.8 | 0.0 | 2.0 | 10.2 | 0.0 | 0.0 | 0.0 | 18.8 | 4.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | | | | 97.7 | 0.0 | 31.3 | 72.7 | 0.1 | 0.0 | 0.0 | 60.3 | 17.2 |
| LnGrp LOS | | | | F | | C | F | A | | | F | B |
| Approach Vol, veh/h | | | | | 471 | | | 1168 | | | 2089 | |
| Approach Delay, s/veh | | | | | 81.9 | | | 21.8 | | | 51.4 | |
| Approach LOS | | | | | F | | | C | | | D | |

| Timer - Assigned Phs | 2 | | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 75.0 | | 25.5 | 49.5 | | 25.0 |
| Change Period (Y+Rc), s | 5.8 | | 5.8 | 5.8 | | 5.8 |
| Max Green Setting (Gmax), s | 69.2 | | 19.7 | 43.7 | | 19.2 |
| Max Q Clear Time (g_c+I1), s | 2.0 | | 21.7 | 45.7 | | 21.2 |
| Green Ext Time (p_c), s | 4.8 | | 0.0 | 0.0 | | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 46.0 |
| HCM 7th LOS | D |

| Lane Group | EBT | EBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (vph) | 3 | 344 | 856 | 361 | 644 | 1343 |
| Future Volume (vph) | 3 | 344 | 856 | 361 | 644 | 1343 |
| Turn Type | NA | Perm | NA | Perm | Prot | NA |
| Protected Phases | 4 | | 2 | | 1 | 6 |
| Permitted Phases | | 4 | | 2 | | |
| Detector Phase | 4 | 4 | 2 | 2 | 1 | 6 |
| Switch Phase | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Minimum Split (s) | 33.8 | 33.8 | 31.8 | 31.8 | 15.0 | 25.8 |
| Total Split (s) | 33.8 | 33.8 | 32.2 | 32.2 | 34.0 | 66.2 |
| Total Split (%) | 33.8% | 33.8% | 32.2% | 32.2% | 34.0% | 66.2% |
| Yellow Time (s) | 4.8 | 4.8 | 4.8 | 4.8 | 4.0 | 4.8 |
| All-Red Time (s) | 2.0 | 2.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 6.8 | 6.8 | 5.8 | 5.8 | 5.0 | 5.8 |
| Lead/Lag | | | Lag | Lag | Lead | |
| Lead-Lag Optimize? | | | Yes | Yes | Yes | |
| Recall Mode | None | None | C-Min | C-Min | None | C-Min |
| Act Effct Green (s) | 22.0 | 22.0 | 26.4 | 26.4 | 34.0 | 65.4 |
| Actuated g/C Ratio | 0.22 | 0.22 | 0.26 | 0.26 | 0.34 | 0.65 |
| v/c Ratio | 0.79 | 0.87 | 0.94 | 0.55 | 1.16 | 0.60 |
| Control Delay (s/veh) | 50.8 | 49.3 | 55.6 | 6.6 | 120.0 | 8.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 |
| Total Delay (s/veh) | 50.8 | 49.3 | 55.6 | 6.6 | 120.0 | 8.6 |
| LOS | D | D | E | A | F | A |
| Approach Delay (s/veh) | 50.0 | | 41.1 | | | 44.7 |
| Approach LOS | D | | D | | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 100 | |
| Actuated Cycle Length: 100 | |
| Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBT, Start of Yellow, Master Intersection | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Coordinated | |
| Maximum v/c Ratio: 1.16 | |
| Intersection Signal Delay (s/veh): 44.4 | Intersection LOS: D |
| Intersection Capacity Utilization 106.1% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 21: Grove Av. & SR-60 EB Ramps

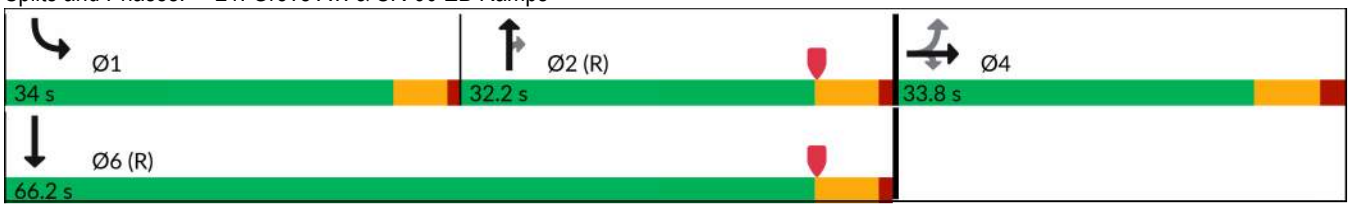

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 294 | 3 | 344 | 0 | 0 | 0 | 0 | 856 | 361 | 644 | 1343 | 0 |
| Future Volume (veh/h) | 294 | 3 | 344 | 0 | 0 | 0 | 0 | 856 | 361 | 644 | 1343 | 0 |
| Initial Q (Qb), veh | 0 | 0 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | | | | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | | | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | | | | 0 | 1870 | 1870 | 1772 | 1870 | 0 |
| Adj Flow Rate, veh/h | 303 | 3 | 180 | | | | 0 | 882 | 217 | 664 | 1385 | 0 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | | | | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | | | | 0 | 2 | 2 | 2 | 2 | 0 |
| Cap, veh/h | 343 | 3 | 308 | | | | 0 | 1207 | 535 | 489 | 2415 | 0 |
| Arrive On Green | 0.29 | 0.29 | 0.29 | | | | 0.00 | 0.51 | 0.51 | 0.44 | 1.00 | 0.00 |
| Sat Flow, veh/h | 1765 | 17 | 1583 | | | | 0 | 3647 | 1576 | 1688 | 3647 | 0 |
| Grp Volume(v), veh/h | 306 | 0 | 180 | | | | 0 | 882 | 217 | 664 | 1385 | 0 |
| Grp Sat Flow(s),veh/h/ln | 1782 | 0 | 1583 | | | | 0 | 1777 | 1576 | 1688 | 1777 | 0 |
| Q Serve(g_s), s | 16.4 | 0.0 | 9.7 | | | | 0.0 | 19.4 | 8.5 | 29.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 16.4 | 0.0 | 9.7 | | | | 0.0 | 19.4 | 8.5 | 29.0 | 0.0 | 0.0 |
| Prop In Lane | 0.99 | | 1.00 | | | | 0.00 | | 1.00 | 1.00 | | 0.00 |
| Lane Grp Cap(c), veh/h | 346 | 0 | 308 | | | | 0 | 1207 | 535 | 489 | 2415 | 0 |
| V/C Ratio(X) | 0.88 | 0.00 | 0.59 | | | | 0.00 | 0.73 | 0.41 | 1.36 | 0.57 | 0.00 |
| Avail Cap(c_a), veh/h | 481 | 0 | 427 | | | | 0 | 1207 | 535 | 489 | 2415 | 0 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | | | | 1.00 | 1.50 | 1.50 | 1.50 | 2.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | | | | 0.00 | 1.00 | 1.00 | 0.09 | 0.09 | 0.00 |
| Uniform Delay (d), s/veh | 34.3 | 0.0 | 32.0 | | | | 0.0 | 21.0 | 18.3 | 28.3 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 10.8 | 0.0 | 0.7 | | | | 0.0 | 3.9 | 2.3 | 161.8 | 0.1 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | | | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 7.0 | 0.0 | 3.4 | | | | 0.0 | 6.6 | 3.0 | 31.0 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 45.1 | 0.0 | 32.6 | | | | 0.0 | 24.9 | 20.6 | 190.1 | 0.1 | 0.0 |
| LnGrp LOS | D | | C | | | | | C | C | F | A | |
| Approach Vol, veh/h | | 486 | | | | | | 1099 | | | 2049 | |
| Approach Delay, s/veh | | 40.5 | | | | | | 24.0 | | | 61.7 | |
| Approach LOS | | D | | | | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | | 6 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 34.0 | 39.8 | | 26.2 | | 73.8 |
| Change Period (Y+Rc), s | 5.0 | 5.8 | | 6.8 | | 5.8 |
| Max Green Setting (Gmax), s | 29.0 | 26.4 | | 27.0 | | 60.4 |
| Max Q Clear Time (g_c+I1), s | 31.0 | 21.4 | | 18.4 | | 2.0 |
| Green Ext Time (p_c), s | 0.0 | 2.4 | | 1.0 | | 10.6 |

| Intersection Summary | | |
|---|---|---|
| HCM 7th Control Delay, s/veh | | 47.4 |
| HCM 7th LOS | | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 123 | 1226 | 146 | 961 | 28 | 763 | 166 | 968 |
| Future Volume (vph) | 123 | 1226 | 146 | 961 | 28 | 763 | 166 | 968 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 24.2 | 9.6 | 24.2 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 11.0 | 35.0 | 12.0 | 36.0 | 9.6 | 30.0 | 13.0 | 33.4 |
| Total Split (%) | 12.2% | 38.9% | 13.3% | 40.0% | 10.7% | 33.3% | 14.4% | 37.1% |
| Yellow Time (s) | 3.6 | 5.2 | 3.6 | 5.2 | 3.6 | 4.8 | 3.6 | 4.8 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 6.2 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 5.8 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 6.4 | 28.8 | 7.4 | 29.8 | 5.0 | 24.2 | 8.4 | 33.4 |
| Actuated g/C Ratio | 0.07 | 0.32 | 0.08 | 0.33 | 0.06 | 0.27 | 0.09 | 0.37 |
| v/c Ratio | 1.07 | 1.19 | 1.10 | 1.14 | 0.31 | 0.94 | 1.10 | 0.87 |
| Control Delay (s/veh) | 144.7 | 122.3 | 148.3 | 103.3 | 50.0 | 50.4 | 141.0 | 36.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 144.7 | 122.3 | 148.3 | 103.3 | 50.0 | 50.4 | 141.0 | 36.4 |
| LOS | F | F | F | F | D | D | F | D |
| Approach Delay (s/veh) | | 124.2 | | 107.9 | | 50.4 | | 50.2 |
| Approach LOS | | F | | F | | D | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 90 | |
| Actuated Cycle Length: 90 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.19 | |
| Intersection Signal Delay (s/veh): 87.7 | Intersection LOS: F |
| Intersection Capacity Utilization 97.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 23: Grove Av. & Riverside Dr.

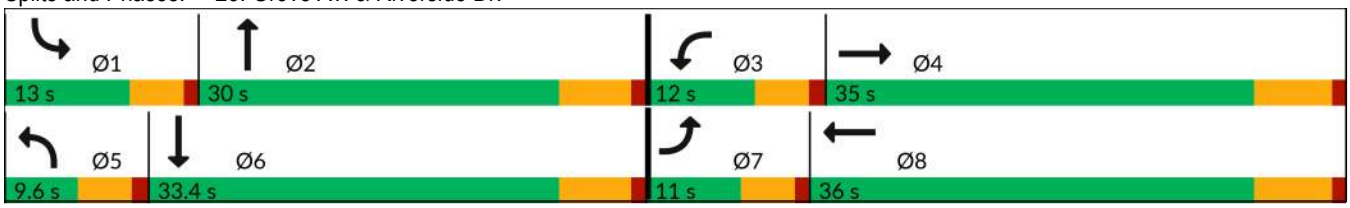

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 123 | 1226 | 71 | 146 | 961 | 321 | 28 | 763 | 98 | 166 | 968 | 127 |
| Future Volume (veh/h) | 123 | 1226 | 71 | 146 | 961 | 321 | 28 | 763 | 98 | 166 | 968 | 127 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 127 | 1264 | 65 | 151 | 991 | 176 | 29 | 787 | 60 | 171 | 998 | 69 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 121 | 1113 | 57 | 140 | 1007 | 179 | 49 | 872 | 66 | 159 | 1100 | 76 |
| Arrive On Green | 0.07 | 0.32 | 0.32 | 0.08 | 0.33 | 0.33 | 0.03 | 0.26 | 0.26 | 0.09 | 0.33 | 0.33 |
| Sat Flow, veh/h | 1688 | 3439 | 177 | 1688 | 3007 | 533 | 1688 | 3346 | 255 | 1688 | 3372 | 233 |
| Grp Volume(v), veh/h | 127 | 652 | 677 | 151 | 585 | 582 | 29 | 418 | 429 | 171 | 526 | 541 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1777 | 1839 | 1688 | 1777 | 1764 | 1688 | 1777 | 1824 | 1688 | 1777 | 1828 |
| Q Serve(g_s), s | 6.4 | 28.8 | 28.8 | 7.4 | 29.1 | 29.2 | 1.5 | 20.2 | 20.2 | 8.4 | 25.2 | 25.2 |
| Cycle Q Clear(g_c), s | 6.4 | 28.8 | 28.8 | 7.4 | 29.1 | 29.2 | 1.5 | 20.2 | 20.2 | 8.4 | 25.2 | 25.2 |
| Prop In Lane | 1.00 | | 0.10 | 1.00 | | 0.30 | 1.00 | | 0.14 | 1.00 | | 0.13 |
| Lane Grp Cap(c), veh/h | 121 | 575 | 595 | 140 | 595 | 591 | 49 | 463 | 476 | 159 | 580 | 597 |
| V/C Ratio(X) | 1.05 | 1.13 | 1.14 | 1.08 | 0.98 | 0.99 | 0.60 | 0.90 | 0.90 | 1.07 | 0.91 | 0.91 |
| Avail Cap(c_a), veh/h | 121 | 575 | 595 | 140 | 595 | 591 | 95 | 483 | 496 | 159 | 580 | 597 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 41.3 | 30.1 | 30.1 | 40.8 | 29.4 | 29.4 | 42.7 | 31.8 | 31.8 | 40.3 | 28.7 | 28.7 |
| Incr Delay (d2), s/veh | 94.7 | 80.5 | 80.9 | 97.8 | 32.5 | 33.2 | 4.3 | 19.5 | 19.2 | 92.3 | 18.0 | 17.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.7 | 23.9 | 24.8 | 6.7 | 16.4 | 16.5 | 0.7 | 10.5 | 10.8 | 7.4 | 12.7 | 13.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 136.0 | 110.6 | 111.0 | 138.6 | 61.9 | 62.6 | 47.0 | 51.3 | 51.0 | 132.6 | 46.7 | 46.4 |
| LnGrp LOS | F | F | F | F | E | E | D | D | D | F | D | D |
| Approach Vol, veh/h | | 1456 | | | 1318 | | | 876 | | | 1238 | |
| Approach Delay, s/veh | | 113.0 | | | 71.0 | | | 51.0 | | | 58.4 | |
| Approach LOS | | F | | | E | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 13.0 | 29.0 | 12.0 | 35.0 | 7.2 | 34.8 | 11.0 | 36.0 |
| Change Period (Y+Rc), s | 4.6 | 5.8 | 4.6 | 6.2 | 4.6 | 5.8 | 4.6 | 6.2 |
| Max Green Setting (Gmax), s | 8.4 | 24.2 | 7.4 | 28.8 | 5.0 | 27.6 | 6.4 | 29.8 |
| Max Q Clear Time (g_c+I1), s | 10.4 | 22.2 | 9.4 | 30.8 | 3.5 | 27.2 | 8.4 | 31.2 |
| Green Ext Time (p_c), s | 0.0 | 1.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 76.7 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 55 | 507 | 51 | 380 | 58 | 800 | 85 | 1090 |
| Future Volume (vph) | 55 | 507 | 51 | 380 | 58 | 800 | 85 | 1090 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 41.4 | 41.4 | 41.4 | 41.4 | 78.6 | 78.6 | 78.6 | 78.6 |
| Total Split (%) | 34.5% | 34.5% | 34.5% | 34.5% | 65.5% | 65.5% | 65.5% | 65.5% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 36.8 | 36.8 | 36.8 | 36.8 | 74.0 | 74.0 | 74.0 | 74.0 |
| Actuated g/C Ratio | 0.31 | 0.31 | 0.31 | 0.31 | 0.62 | 0.62 | 0.62 | 0.62 |
| v/c Ratio | 0.63 | 1.04 | 0.85 | 0.84 | 0.97 | 0.79 | 0.54 | 1.01 |
| Control Delay (s/veh) | 68.1 | 88.1 | 121.7 | 52.7 | 135.6 | 23.8 | 28.1 | 53.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 68.1 | 88.1 | 121.7 | 52.7 | 135.6 | 23.8 | 28.1 | 53.9 |
| LOS | E | F | F | D | F | C | C | D |
| Approach Delay (s/veh) | | 86.3 | | 59.7 | | 30.7 | | 52.0 |
| Approach LOS | | F | | E | | C | | D |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.04 | |
| Intersection Signal Delay (s/veh): 53.6 | Intersection LOS: D |
| Intersection Capacity Utilization 112.6% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 24: Grove Av. & Chino Av.

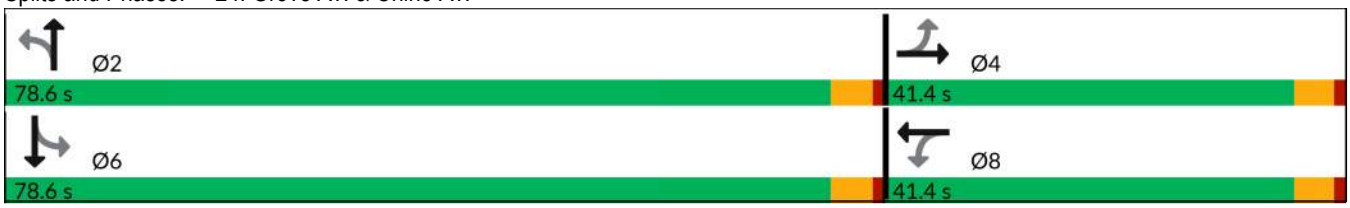

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 55 | 507 | 55 | 51 | 380 | 72 | 58 | 800 | 67 | 85 | 1090 | 25 |
| Future Volume (veh/h) | 55 | 507 | 55 | 51 | 380 | 72 | 58 | 800 | 67 | 85 | 1090 | 25 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.99 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 57 | 528 | 57 | 53 | 396 | 75 | 60 | 833 | 70 | 89 | 1135 | 26 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 119 | 508 | 55 | 60 | 469 | 89 | 60 | 1048 | 88 | 213 | 1123 | 26 |
| Arrive On Green | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.31 | 0.62 | 0.62 | 0.62 | 0.62 | 0.62 | 0.62 |
| Sat Flow, veh/h | 922 | 1657 | 179 | 830 | 1529 | 290 | 484 | 1700 | 143 | 617 | 1821 | 42 |
| Grp Volume(v), veh/h | 57 | 0 | 585 | 53 | 0 | 471 | 60 | 0 | 903 | 89 | 0 | 1161 |
| Grp Sat Flow(s),veh/h/ln | 922 | 0 | 1835 | 830 | 0 | 1818 | 484 | 0 | 1843 | 617 | 0 | 1863 |
| Q Serve(g_s), s | 7.4 | 0.0 | 36.8 | 0.0 | 0.0 | 29.1 | 0.0 | 0.0 | 44.2 | 15.2 | 0.0 | 74.0 |
| Cycle Q Clear(g_c), s | 36.5 | 0.0 | 36.8 | 36.8 | 0.0 | 29.1 | 74.0 | 0.0 | 44.2 | 59.4 | 0.0 | 74.0 |
| Prop In Lane | 1.00 | | 0.10 | 1.00 | | 0.16 | 1.00 | | 0.08 | 1.00 | | 0.02 |
| Lane Grp Cap(c), veh/h | 119 | 0 | 563 | 60 | 0 | 558 | 60 | 0 | 1136 | 213 | 0 | 1149 |
| V/C Ratio(X) | 0.48 | 0.00 | 1.04 | 0.88 | 0.00 | 0.84 | 1.00 | 0.00 | 0.79 | 0.42 | 0.00 | 1.01 |
| Avail Cap(c_a), veh/h | 119 | 0 | 563 | 60 | 0 | 558 | 60 | 0 | 1136 | 213 | 0 | 1149 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 56.0 | 0.0 | 41.6 | 60.0 | 0.0 | 38.9 | 60.0 | 0.0 | 17.3 | 39.6 | 0.0 | 23.0 |
| Incr Delay (d2), s/veh | 2.9 | 0.0 | 48.5 | 75.9 | 0.0 | 11.4 | 116.2 | 0.0 | 4.0 | 1.3 | 0.0 | 29.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 1.8 | 0.0 | 23.3 | 2.8 | 0.0 | 13.9 | 3.7 | 0.0 | 17.6 | 2.3 | 0.0 | 36.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 58.9 | 0.0 | 90.1 | 135.9 | 0.0 | 50.3 | 176.2 | 0.0 | 21.3 | 40.9 | 0.0 | 52.2 |
| LnGrp LOS | E | | F | F | | D | F | | C | D | | F |
| Approach Vol, veh/h | | 642 | | | 524 | | | 963 | | | 1250 | |
| Approach Delay, s/veh | | 87.3 | | | 59.0 | | | 30.9 | | | 51.4 | |
| Approach LOS | | F | | | E | | | C | | | D | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 78.6 | 41.4 | 78.6 | 41.4 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 74.0 | 36.8 | 74.0 | 36.8 |
| Max Q Clear Time (g_c+I1), s | 76.0 | 38.8 | 76.0 | 38.8 |
| Green Ext Time (p_c), s | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 53.6 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 106 | 275 | 10 | 130 | 68 | 808 | 120 | 973 |
| Future Volume (vph) | 106 | 275 | 10 | 130 | 68 | 808 | 120 | 973 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 32.0 | 32.0 | 32.0 | 32.0 | 88.0 | 88.0 | 88.0 | 88.0 |
| Total Split (%) | 26.7% | 26.7% | 26.7% | 26.7% | 73.3% | 73.3% | 73.3% | 73.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 23.0 | 23.0 | 23.0 | 23.0 | 66.0 | 66.0 | 66.0 | 66.0 |
| Actuated g/C Ratio | 0.23 | 0.23 | 0.23 | 0.23 | 0.67 | 0.67 | 0.67 | 0.67 |
| v/c Ratio | 0.51 | 0.81 | 0.11 | 0.45 | 0.77 | 0.75 | 0.57 | 0.90 |
| Control Delay (s/veh) | 46.8 | 54.1 | 39.4 | 37.1 | 62.8 | 15.3 | 20.8 | 25.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 46.8 | 54.1 | 39.4 | 37.1 | 62.8 | 15.3 | 20.8 | 25.3 |
| LOS | D | D | D | D | E | B | C | C |
| Approach Delay (s/veh) | | 52.3 | | 37.2 | | 18.8 | | 24.9 |
| Approach LOS | | D | | D | | B | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 98.8 | |
| Natural Cycle: 80 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.90 | |
| Intersection Signal Delay (s/veh): 28.0 | Intersection LOS: C |
| Intersection Capacity Utilization 96.9% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 25: Grove Av. & Schaefer Av.

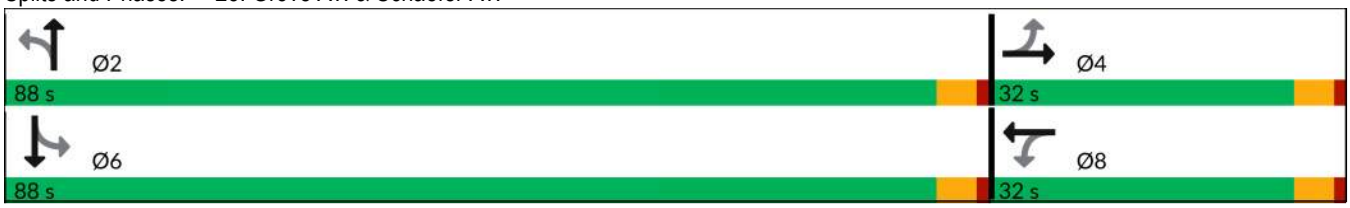

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 106 | 275 | 52 | 10 | 130 | 52 | 68 | 808 | 55 | 120 | 973 | 72 |
| Future Volume (veh/h) | 106 | 275 | 52 | 10 | 130 | 52 | 68 | 808 | 55 | 120 | 973 | 72 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 113 | 293 | 55 | 11 | 138 | 55 | 72 | 860 | 59 | 128 | 1035 | 77 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 218 | 335 | 63 | 106 | 279 | 111 | 184 | 1195 | 82 | 305 | 1187 | 88 |
| Arrive On Green | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.22 | 0.69 | 0.69 | 0.69 | 0.69 | 0.69 | 0.69 |
| Sat Flow, veh/h | 1190 | 1531 | 287 | 1033 | 1272 | 507 | 507 | 1730 | 119 | 608 | 1719 | 128 |
| Grp Volume(v), veh/h | 113 | 0 | 348 | 11 | 0 | 193 | 72 | 0 | 919 | 128 | 0 | 1112 |
| Grp Sat Flow(s),veh/h/ln | 1190 | 0 | 1819 | 1033 | 0 | 1779 | 507 | 0 | 1849 | 608 | 0 | 1847 |
| Q Serve(g_s), s | 9.4 | 0.0 | 18.8 | 1.1 | 0.0 | 9.7 | 13.1 | 0.0 | 31.1 | 16.7 | 0.0 | 47.6 |
| Cycle Q Clear(g_c), s | 19.0 | 0.0 | 18.8 | 19.9 | 0.0 | 9.7 | 60.8 | 0.0 | 31.1 | 47.8 | 0.0 | 47.6 |
| Prop In Lane | 1.00 | | 0.16 | 1.00 | | 0.28 | 1.00 | | 0.06 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 218 | 0 | 398 | 106 | 0 | 390 | 184 | 0 | 1277 | 305 | 0 | 1276 |
| V/C Ratio(X) | 0.52 | 0.00 | 0.87 | 0.10 | 0.00 | 0.50 | 0.39 | 0.00 | 0.72 | 0.42 | 0.00 | 0.87 |
| Avail Cap(c_a), veh/h | 278 | 0 | 489 | 158 | 0 | 479 | 249 | 0 | 1514 | 383 | 0 | 1513 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 43.2 | 0.0 | 38.4 | 48.0 | 0.0 | 34.8 | 35.9 | 0.0 | 9.7 | 24.4 | 0.0 | 12.2 |
| Incr Delay (d2), s/veh | 1.9 | 0.0 | 13.7 | 0.4 | 0.0 | 1.0 | 1.4 | 0.0 | 1.4 | 0.9 | 0.0 | 5.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.8 | 0.0 | 9.5 | 0.3 | 0.0 | 4.1 | 1.6 | 0.0 | 10.0 | 2.3 | 0.0 | 16.4 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 45.1 | 0.0 | 52.1 | 48.4 | 0.0 | 35.8 | 37.2 | 0.0 | 11.1 | 25.3 | 0.0 | 17.4 |
| LnGrp LOS | D | | D | D | | D | D | | B | C | | B |
| Approach Vol, veh/h | | 461 | | | 204 | | | 991 | | | 1240 | |
| Approach Delay, s/veh | | 50.4 | | | 36.5 | | | 13.0 | | | 18.2 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 74.9 | 26.9 | 74.9 | 26.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 83.4 | 27.4 | 83.4 | 27.4 |
| Max Q Clear Time (g_c+I1), s | 62.8 | 21.0 | 49.8 | 21.9 |
| Green Ext Time (p_c), s | 7.6 | 1.2 | 13.1 | 0.4 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 22.8 |
| HCM 7th LOS | C |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 278 | 2156 | 224 | 1478 | 281 | 458 | 366 | 511 |
| Future Volume (vph) | 278 | 2156 | 224 | 1478 | 281 | 458 | 366 | 511 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 19.2 | 45.0 | 14.0 | 39.8 | 26.4 | 28.8 | 32.2 | 34.6 |
| Total Split (%) | 16.0% | 37.5% | 11.7% | 33.2% | 22.0% | 24.0% | 26.8% | 28.8% |
| Yellow Time (s) | 3.6 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 14.1 | 39.2 | 9.4 | 34.5 | 21.8 | 23.4 | 27.6 | 29.2 |
| Actuated g/C Ratio | 0.12 | 0.33 | 0.08 | 0.29 | 0.18 | 0.20 | 0.23 | 0.24 |
| v/c Ratio | 0.79 | 1.07 | 0.96 | 0.89 | 1.00 | 0.95 | 1.03 | 0.92 |
| Control Delay (s/veh) | 67.0 | 78.4 | 101.7 | 46.3 | 101.8 | 67.4 | 100.3 | 55.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 67.0 | 78.4 | 101.7 | 46.3 | 101.8 | 67.4 | 100.3 | 55.6 |
| LOS | E | E | F | D | F | E | F | E |
| Approach Delay (s/veh) | | 77.2 | | 52.7 | | 77.9 | | 69.7 |
| Approach LOS | | E | | D | | E | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.07 | |
| Intersection Signal Delay (s/veh): 68.8 | Intersection LOS: E |
| Intersection Capacity Utilization 98.5% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 26: Grove Av. & Edison Av.

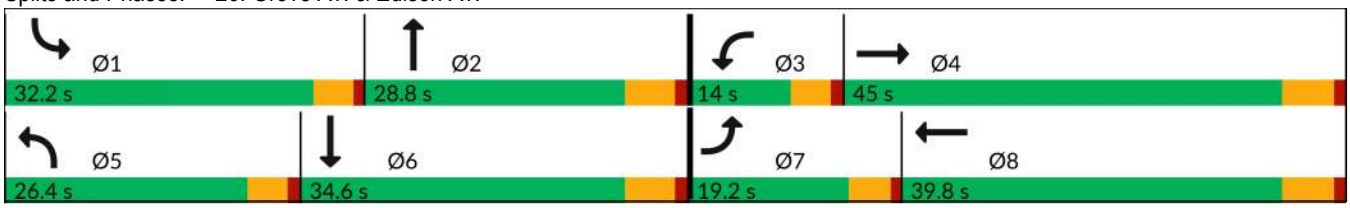

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 278 | 2156 | 214 | 224 | 1478 | 251 | 281 | 458 | 182 | 366 | 511 | 281 |
| Future Volume (veh/h) | 278 | 2156 | 214 | 224 | 1478 | 251 | 281 | 458 | 182 | 366 | 511 | 281 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 302 | 2343 | 124 | 243 | 1607 | 137 | 305 | 498 | 100 | 398 | 555 | 153 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 355 | 2333 | 123 | 260 | 2056 | 175 | 311 | 556 | 111 | 394 | 657 | 180 |
| Arrive On Green | 0.16 | 0.50 | 0.50 | 0.12 | 0.45 | 0.45 | 0.28 | 0.28 | 0.28 | 0.35 | 0.35 | 0.35 |
| Sat Flow, veh/h | 3274 | 7042 | 372 | 3274 | 6798 | 579 | 1688 | 3027 | 605 | 1688 | 2825 | 776 |
| Grp Volume(v), veh/h | 302 | 1866 | 601 | 243 | 1326 | 418 | 305 | 307 | 291 | 398 | 367 | 341 |
| Grp Sat Flow(s),veh/h/ln | 1637 | 1870 | 1803 | 1637 | 1870 | 1766 | 1688 | 1870 | 1762 | 1688 | 1870 | 1731 |
| Q Serve(g_s), s | 10.6 | 39.2 | 39.2 | 8.7 | 23.7 | 23.7 | 21.2 | 18.6 | 18.9 | 27.6 | 21.4 | 21.6 |
| Cycle Q Clear(g_c), s | 10.6 | 39.2 | 39.2 | 8.7 | 23.7 | 23.7 | 21.2 | 18.6 | 18.9 | 27.6 | 21.4 | 21.6 |
| Prop In Lane | 1.00 | | 0.21 | 1.00 | | 0.33 | 1.00 | | 0.34 | 1.00 | | 0.45 |
| Lane Grp Cap(c), veh/h | 355 | 1859 | 597 | 260 | 1697 | 534 | 311 | 343 | 323 | 394 | 435 | 402 |
| V/C Ratio(X) | 0.85 | 1.00 | 1.01 | 0.93 | 0.78 | 0.78 | 0.98 | 0.89 | 0.90 | 1.01 | 0.84 | 0.85 |
| Avail Cap(c_a), veh/h | 404 | 1859 | 597 | 260 | 1697 | 534 | 311 | 370 | 348 | 394 | 462 | 427 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.6 | 29.8 | 29.8 | 51.8 | 29.0 | 29.0 | 42.6 | 41.8 | 41.8 | 38.5 | 36.5 | 36.6 |
| Incr Delay (d2), s/veh | 14.4 | 21.8 | 38.4 | 38.4 | 2.4 | 7.4 | 45.7 | 22.1 | 24.4 | 48.1 | 12.8 | 14.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.7 | 17.5 | 19.6 | 4.8 | 9.3 | 9.5 | 11.7 | 9.6 | 9.3 | 15.0 | 9.9 | 9.3 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 63.0 | 51.5 | 68.1 | 90.2 | 31.4 | 36.4 | 88.3 | 63.8 | 66.2 | 86.6 | 49.3 | 50.7 |
| LnGrp LOS | E | F | F | F | C | D | F | E | E | F | D | D |
| Approach Vol, veh/h | | 2769 | | | 1987 | | | 903 | | | 1106 | |
| Approach Delay, s/veh | | 56.4 | | | 39.7 | | | 72.9 | | | 63.2 | |
| Approach LOS | | E | | | D | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 32.2 | 27.1 | 14.0 | 45.0 | 26.4 | 32.9 | 17.4 | 41.6 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 27.6 | 23.4 | 9.4 | 39.2 | 21.8 | 29.2 | 14.6 | 34.0 |
| Max Q Clear Time (g_c+I1), s | 29.6 | 20.9 | 10.7 | 41.2 | 23.2 | 23.6 | 12.6 | 25.7 |
| Green Ext Time (p_c), s | 0.0 | 0.9 | 0.0 | 0.0 | 0.0 | 2.0 | 0.2 | 6.1 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 54.8 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 92 | 481 | 1 | 492 | 513 | 7 | 66 | 609 | 50 |
| Future Volume (vph) | 92 | 481 | 1 | 492 | 513 | 7 | 66 | 609 | 50 |
| Turn Type | Perm | NA | Perm | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | | 4 | | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | 4 | | 8 | | 8 | | | | |
| Detector Phase | 4 | 4 | 8 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 23.4 | 23.4 | 23.4 | 23.4 | 23.4 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 48.0 | 48.0 | 48.0 | 48.0 | 48.0 | 9.6 | 25.0 | 47.0 | 62.4 |
| Total Split (%) | 40.0% | 40.0% | 40.0% | 40.0% | 40.0% | 8.0% | 20.8% | 39.2% | 52.0% |
| Yellow Time (s) | 4.4 | 4.4 | 4.4 | 4.4 | 4.4 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 5.4 | 5.4 | 5.4 | 5.4 | 5.4 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | | | | | | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | | | | | | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 42.8 | 42.8 | 42.8 | 42.8 | 42.8 | 5.0 | 11.8 | 42.6 | 53.7 |
| Actuated g/C Ratio | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.05 | 0.11 | 0.39 | 0.49 |
| v/c Ratio | 0.85 | 0.76 | 0.01 | 0.78 | 0.63 | 0.10 | 0.39 | 1.01 | 0.19 |
| Control Delay (s/veh) | 85.5 | 38.4 | 24.0 | 39.1 | 7.0 | 55.7 | 52.2 | 72.8 | 6.6 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 85.5 | 38.4 | 24.0 | 39.1 | 7.0 | 55.7 | 52.2 | 72.8 | 6.6 |
| LOS | F | D | C | D | A | E | D | E | A |
| Approach Delay (s/veh) | | 45.9 | | 22.7 | | | 52.6 | | 60.0 |
| Approach LOS | | D | | C | | | D | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 109.2 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.01 | |
| Intersection Signal Delay (s/veh): 40.9 | Intersection LOS: D |
| Intersection Capacity Utilization 88.1% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 27: Grove Av. & Eucalyptus Av.

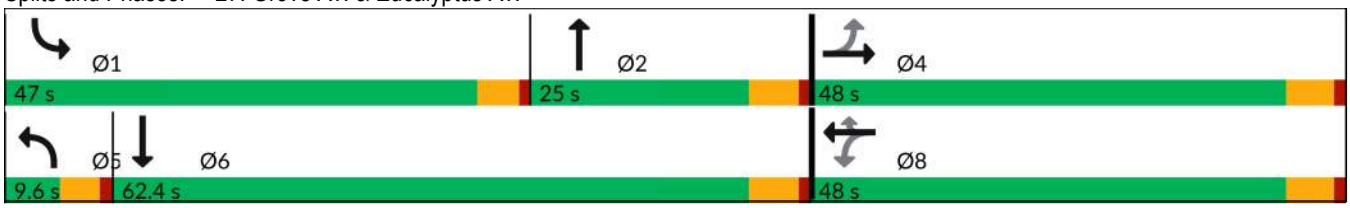

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 92 | 481 | 3 | 1 | 492 | 513 | 7 | 66 | 1 | 609 | 50 | 96 |
| Future Volume (veh/h) | 92 | 481 | 3 | 1 | 492 | 513 | 7 | 66 | 1 | 609 | 50 | 96 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 106 | 553 | 3 | 1 | 566 | 303 | 8 | 76 | 1 | 700 | 57 | 64 |
| Peak Hour Factor | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 141 | 717 | 4 | 173 | 722 | 612 | 18 | 167 | 2 | 684 | 374 | 420 |
| Arrive On Green | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.39 | 0.01 | 0.09 | 0.09 | 0.38 | 0.46 | 0.46 |
| Sat Flow, veh/h | 637 | 1858 | 10 | 853 | 1870 | 1585 | 1781 | 1842 | 24 | 1781 | 804 | 903 |
| Grp Volume(v), veh/h | 106 | 0 | 556 | 1 | 566 | 303 | 8 | 0 | 77 | 700 | 0 | 121 |
| Grp Sat Flow(s),veh/h/ln | 637 | 0 | 1869 | 853 | 1870 | 1585 | 1781 | 0 | 1866 | 1781 | 0 | 1708 |
| Q Serve(g_s), s | 13.2 | 0.0 | 28.7 | 0.1 | 29.4 | 16.0 | 0.5 | 0.0 | 4.3 | 42.4 | 0.0 | 4.5 |
| Cycle Q Clear(g_c), s | 42.6 | 0.0 | 28.7 | 28.8 | 29.4 | 16.0 | 0.5 | 0.0 | 4.3 | 42.4 | 0.0 | 4.5 |
| Prop In Lane | 1.00 | | 0.01 | 1.00 | | 1.00 | 1.00 | | 0.01 | 1.00 | | 0.53 |
| Lane Grp Cap(c), veh/h | 141 | 0 | 721 | 173 | 722 | 612 | 18 | 0 | 169 | 684 | 0 | 794 |
| V/C Ratio(X) | 0.75 | 0.00 | 0.77 | 0.01 | 0.78 | 0.50 | 0.46 | 0.00 | 0.46 | 1.02 | 0.00 | 0.15 |
| Avail Cap(c_a), veh/h | 141 | 0 | 721 | 173 | 722 | 612 | 81 | 0 | 331 | 684 | 0 | 882 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 50.5 | 0.0 | 29.6 | 42.2 | 29.8 | 25.7 | 54.4 | 0.0 | 47.6 | 34.0 | 0.0 | 17.0 |
| Incr Delay (d2), s/veh | 19.7 | 0.0 | 5.1 | 0.0 | 5.7 | 0.6 | 6.7 | 0.0 | 1.9 | 40.4 | 0.0 | 0.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 3.6 | 0.0 | 13.1 | 0.0 | 13.7 | 5.9 | 0.2 | 0.0 | 2.0 | 24.7 | 0.0 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 70.2 | 0.0 | 34.8 | 42.2 | 35.5 | 26.4 | 61.1 | 0.0 | 49.5 | 74.4 | 0.0 | 17.1 |
| LnGrp LOS | E | | C | D | D | C | E | | D | F | | B |
| Approach Vol, veh/h | | 662 | | | 870 | | | 85 | | | 821 | |
| Approach Delay, s/veh | | 40.4 | | | 32.3 | | | 50.6 | | | 65.9 | |
| Approach LOS | | D | | | C | | | D | | | E | |

| Timer - Assigned Phs | 1 | 2 | | 4 | 5 | 6 | | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 47.0 | 15.4 | | 48.0 | 5.7 | 56.7 | | 48.0 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | | 5.4 | 4.6 | 5.4 | | 5.4 |
| Max Green Setting (Gmax), s | 42.4 | 19.6 | | 42.6 | 5.0 | 57.0 | | 42.6 |
| Max Q Clear Time (g_c+I1), s | 44.4 | 6.3 | | 44.6 | 2.5 | 6.5 | | 31.4 |
| Green Ext Time (p_c), s | 0.0 | 0.2 | | 0.0 | 0.0 | 0.7 | | 3.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 46.5 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 50 | 3271 | 3023 | 72 |
| Future Volume (vph) | 50 | 3271 | 3023 | 72 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 97.0 | 97.0 | 97.0 | 23.0 |
| Total Split (%) | 80.8% | 80.8% | 80.8% | 19.2% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | Min |
| Act Effct Green (s) | 92.5 | 92.5 | 92.5 | 14.8 |
| Actuated g/C Ratio | 0.79 | 0.79 | 0.79 | 0.13 |
| v/c Ratio | 0.90 | 1.20 | 1.13 | 0.70 |
| Control Delay (s/veh) | 113.5 | 111.1 | 79.6 | 64.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 113.5 | 111.1 | 79.6 | 64.8 |
| LOS | F | F | E | E |
| Approach Delay (s/veh) | | 111.2 | 79.6 | 64.8 |
| Approach LOS | | F | E | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 116.5 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.20 | |
| Intersection Signal Delay (s/veh): 95.3 | Intersection LOS: F |
| Intersection Capacity Utilization 106.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 28: Edison Av. & Parco Av.

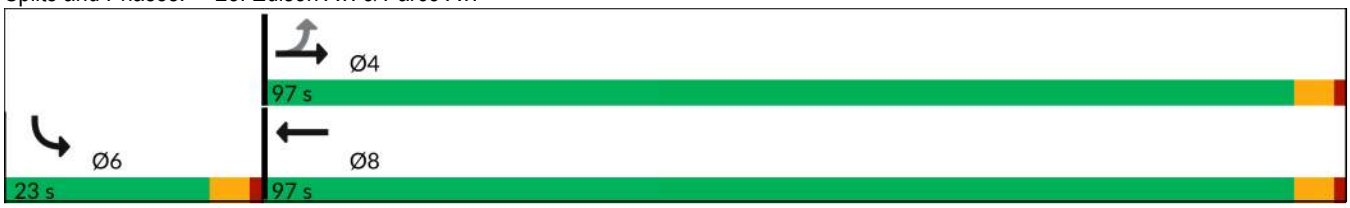

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 50 | 3271 | 3023 | 50 | 72 | 68 |
| Future Volume (veh/h) | 50 | 3271 | 3023 | 50 | 72 | 68 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 54 | 3555 | 3286 | 54 | 78 | 74 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 63 | 3033 | 2975 | 49 | 93 | 88 |
| Arrive On Green | 0.81 | 1.00 | 1.00 | 0.81 | 0.11 | 0.11 |
| Sat Flow, veh/h | 53 | 3741 | 3670 | 60 | 857 | 813 |
| Grp Volume(v), veh/h | 54 | 3555 | 1670 | 1670 | 153 | 0 |
| Grp Sat Flow(s),veh/h/ln | 53 | 1870 | 1870 | 1860 | 1681 | 0 |
| Q Serve(g_s), s | 0.0 | 92.4 | 92.4 | 92.4 | 10.2 | 0.0 |
| Cycle Q Clear(g_c), s | 92.4 | 92.4 | 92.4 | 92.4 | 10.2 | 0.0 |
| Prop In Lane | 1.00 | | | 0.03 | 0.51 | 0.48 |
| Lane Grp Cap(c), veh/h | 63 | 3033 | 1516 | 1508 | 182 | 0 |
| V/C Ratio(X) | 0.85 | 1.17 | 1.10 | 1.11 | 0.84 | 0.00 |
| Avail Cap(c_a), veh/h | 63 | 3033 | 1516 | 1508 | 271 | 0 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.50 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 57.0 | 0.0 | 0.0 | 0.3 | 49.8 | 0.0 |
| Incr Delay (d2), s/veh | 64.9 | 81.3 | 56.1 | 58.6 | 13.7 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 2.7 | 34.3 | 23.6 | 24.7 | 4.8 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 121.9 | 81.3 | 56.1 | 59.0 | 63.5 | 0.0 |
| LnGrp LOS | F | F | F | F | E | |
| Approach Vol, veh/h | | 3609 | 3340 | | 153 | |
| Approach Delay, s/veh | | 81.9 | 57.5 | | 63.5 | |
| Approach LOS | | F | E | | E | |

| Timer - Assigned Phs | 4 | 6 | 8 |
|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 97.0 | 17.0 | 97.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 92.4 | 18.4 | 92.4 |
| Max Q Clear Time (g_c+I1), s | 94.4 | 12.2 | 94.4 |
| Green Ext Time (p_c), s | 0.0 | 0.2 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 70.0 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 45 | 1323 | 113 | 1283 | 116 | 44 | 9 | 28 |
| Future Volume (vph) | 45 | 1323 | 113 | 1283 | 116 | 44 | 9 | 28 |
| Turn Type | Perm | NA | Perm | NA | Perm | NA | Perm | NA |
| Protected Phases | | 4 | | 8 | | 2 | | 6 |
| Permitted Phases | 4 | | 8 | | 2 | | 6 | |
| Detector Phase | 4 | 4 | 8 | 8 | 2 | 2 | 6 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 84.0 | 84.0 | 84.0 | 84.0 | 36.0 | 36.0 | 36.0 | 36.0 |
| Total Split (%) | 70.0% | 70.0% | 70.0% | 70.0% | 30.0% | 30.0% | 30.0% | 30.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | | 4.6 |
| Lead/Lag | | | | | | | | |
| Lead-Lag Optimize? | | | | | | | | |
| Recall Mode | None | None | None | None | Min | Min | Min | Min |
| Act Effct Green (s) | 64.1 | 64.1 | 64.1 | 64.1 | | 26.0 | | 26.0 |
| Actuated g/C Ratio | 0.64 | 0.64 | 0.64 | 0.64 | | 0.26 | | 0.26 |
| v/c Ratio | 0.28 | 0.67 | 0.89 | 0.61 | | 0.85 | | 0.13 |
| Control Delay (s/veh) | 13.6 | 12.8 | 74.1 | 11.8 | | 53.0 | | 24.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | | 0.0 |
| Total Delay (s/veh) | 13.6 | 12.8 | 74.1 | 11.8 | | 53.0 | | 24.3 |
| LOS | B | B | E | B | | D | | C |
| Approach Delay (s/veh) | | 12.8 | | 16.8 | | 53.0 | | 24.3 |
| Approach LOS | | B | | B | | D | | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 100.2 | |
| Natural Cycle: 90 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.89 | |
| Intersection Signal Delay (s/veh): 19.0 | Intersection LOS: B |
| Intersection Capacity Utilization 84.8% | ICU Level of Service E |
| Analysis Period (min) 15 | |

Splits and Phases: 29: Walker Av. & Riverside Dr.

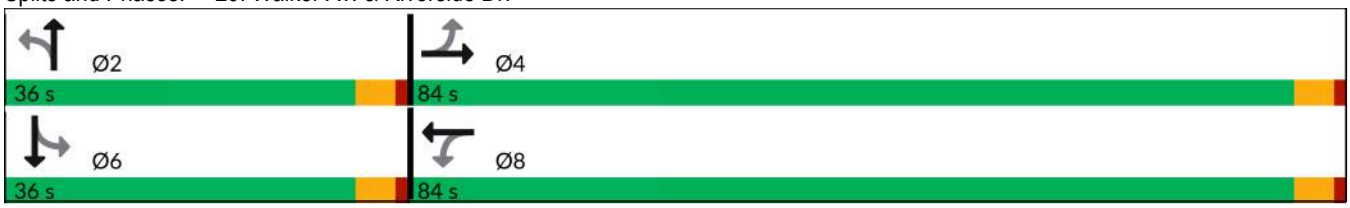

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 45 | 1323 | 109 | 113 | 1283 | 31 | 116 | 44 | 189 | 9 | 28 | 20 |
| Future Volume (veh/h) | 45 | 1323 | 109 | 113 | 1283 | 31 | 116 | 44 | 189 | 9 | 28 | 20 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 0.98 | 1.00 | | 0.98 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 47 | 1378 | 114 | 118 | 1336 | 32 | 121 | 46 | 197 | 9 | 29 | 21 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 247 | 2184 | 180 | 214 | 2334 | 56 | 166 | 61 | 214 | 77 | 229 | 148 |
| Arrive On Green | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.66 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 | 0.26 |
| Sat Flow, veh/h | 397 | 3318 | 273 | 353 | 3545 | 85 | 474 | 237 | 839 | 150 | 898 | 579 |
| Grp Volume(v), veh/h | 47 | 735 | 757 | 118 | 669 | 699 | 364 | 0 | 0 | 59 | 0 | 0 |
| Grp Sat Flow(s),veh/h/ln | 397 | 1777 | 1814 | 353 | 1777 | 1853 | 1550 | 0 | 0 | 1627 | 0 | 0 |
| Q Serve(g_s), s | 7.8 | 25.6 | 26.0 | 31.4 | 22.0 | 22.0 | 21.5 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Cycle Q Clear(g_c), s | 29.8 | 25.6 | 26.0 | 57.4 | 22.0 | 22.0 | 24.3 | 0.0 | 0.0 | 2.8 | 0.0 | 0.0 |
| Prop In Lane | 1.00 | | 0.15 | 1.00 | | 0.05 | 0.33 | | 0.54 | 0.15 | | 0.36 |
| Lane Grp Cap(c), veh/h | 247 | 1170 | 1194 | 214 | 1170 | 1220 | 441 | 0 | 0 | 454 | 0 | 0 |
| V/C Ratio(X) | 0.19 | 0.63 | 0.63 | 0.55 | 0.57 | 0.57 | 0.83 | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 |
| Avail Cap(c_a), veh/h | 282 | 1326 | 1354 | 245 | 1326 | 1383 | 502 | 0 | 0 | 519 | 0 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 0.00 | 1.00 | 0.00 | 0.00 |
| Uniform Delay (d), s/veh | 18.2 | 10.6 | 10.7 | 27.5 | 10.0 | 10.0 | 38.4 | 0.0 | 0.0 | 30.5 | 0.0 | 0.0 |
| Incr Delay (d2), s/veh | 0.4 | 0.8 | 0.8 | 2.2 | 0.5 | 0.4 | 9.8 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 8.2 | 8.5 | 2.5 | 6.9 | 7.3 | 9.8 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 18.5 | 11.4 | 11.5 | 29.7 | 10.4 | 10.4 | 48.2 | 0.0 | 0.0 | 30.7 | 0.0 | 0.0 |
| LnGrp LOS | B | B | B | C | B | B | D | | | C | | |
| Approach Vol, veh/h | | 1539 | | | 1486 | | | 364 | | | 59 | |
| Approach Delay, s/veh | | 11.6 | | | 11.9 | | | 48.2 | | | 30.7 | |
| Approach LOS | | B | | | B | | | D | | | C | |

| Timer - Assigned Phs | 2 | 4 | 6 | 8 |
|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 31.7 | 74.6 | 31.7 | 74.6 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 31.4 | 79.4 | 31.4 | 79.4 |
| Max Q Clear Time (g_c+I1), s | 26.3 | 31.8 | 4.8 | 59.4 |
| Green Ext Time (p_c), s | 0.9 | 14.6 | 0.3 | 10.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 16.0 |
| HCM 7th LOS | B |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 31.6 |
| Intersection LOS | D |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 121 | 33 | 246 | 46 | 53 | 40 | 77 | 277 | 40 | 0 | 269 | 43 |
| Future Vol, veh/h | 121 | 33 | 246 | 46 | 53 | 40 | 77 | 277 | 40 | 0 | 269 | 43 |
| Peak Hour Factor | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 | 0.89 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 136 | 37 | 276 | 52 | 60 | 45 | 87 | 311 | 45 | 0 | 302 | 48 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 2 | 2 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 2 | 2 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 2 | 2 | 1 | 1 |
| HCM Control Delay, s/veh | 40.7 | 15.9 | 27.8 | 31.7 |
| HCM LOS | E | C | D | D |

| Lane | NBLn1 | NBLn2 | EBLn1 | WBLn1 | SBLn1 | SBLn2 |
|---|---|---|---|---|---|---|
| Vol Left, % | 100% | 0% | 30% | 33% | 0% | 0% |
| Vol Thru, % | 0% | 87% | 8% | 38% | 100% | 86% |
| Vol Right, % | 0% | 13% | 62% | 29% | 0% | 14% |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 77 | 317 | 400 | 139 | 0 | 312 |
| LT Vol | 77 | 0 | 121 | 46 | 0 | 0 |
| Through Vol | 0 | 277 | 33 | 53 | 0 | 269 |
| RT Vol | 0 | 40 | 246 | 40 | 0 | 43 |
| Lane Flow Rate | 87 | 356 | 449 | 156 | 0 | 351 |
| Geometry Grp | 5 | 5 | 2 | 2 | 5 | 5 |
| Degree of Util (X) | 0.2 | 0.763 | 0.869 | 0.357 | 0 | 0.762 |
| Departure Headway (Hd) | 8.316 | 7.71 | 6.958 | 8.223 | 7.93 | 7.83 |
| Convergence, Y/N | Yes | Yes | Yes | Yes | Yes | Yes |
| Cap | 431 | 467 | 521 | 436 | 0 | 459 |
| Service Time | 6.089 | 5.482 | 5.022 | 6.318 | 5.702 | 5.602 |
| HCM Lane V/C Ratio | 0.202 | 0.762 | 0.862 | 0.358 | 0 | 0.765 |
| HCM Control Delay, s/veh | 13.2 | 31.4 | 40.7 | 15.9 | 10.7 | 31.7 |
| HCM Lane LOS | B | D | E | C | N | D |
| HCM 95th-tile Q | 0.7 | 6.5 | 9.4 | 1.6 | 0 | 6.5 |

| Lane Group | EBL | EBT | EBR | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | |
| Traffic Volume (vph) | 22 | 2335 | 477 | 338 | 1596 | 321 | 149 | 166 | 192 |
| Future Volume (vph) | 22 | 2335 | 477 | 338 | 1596 | 321 | 149 | 166 | 192 |
| Turn Type | Prot | NA | Perm | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 | 5.0 | 10.0 |
| Minimum Split (s) | 9.6 | 23.8 | 23.8 | 9.6 | 23.8 | 9.6 | 23.4 | 9.6 | 23.4 |
| Total Split (s) | 10.7 | 53.0 | 53.0 | 21.0 | 63.3 | 21.0 | 28.2 | 17.8 | 25.0 |
| Total Split (%) | 8.9% | 44.2% | 44.2% | 17.5% | 52.8% | 17.5% | 23.5% | 14.8% | 20.8% |
| Yellow Time (s) | 3.6 | 4.8 | 4.8 | 3.6 | 4.8 | 3.6 | 4.4 | 3.6 | 4.4 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 5.8 | 5.8 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.4 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 5.7 | 47.2 | 47.2 | 16.4 | 61.9 | 16.4 | 21.1 | 13.1 | 17.9 |
| Actuated g/C Ratio | 0.05 | 0.40 | 0.40 | 0.14 | 0.52 | 0.14 | 0.18 | 0.11 | 0.15 |
| v/c Ratio | 0.29 | 1.08 | 0.55 | 1.50 | 0.97 | 1.43 | 0.89 | 0.92 | 0.76 |
| Control Delay (s/veh) | 64.2 | 79.3 | 6.8 | 281.7 | 43.3 | 252.3 | 69.6 | 101.0 | 65.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 64.2 | 79.3 | 6.8 | 281.7 | 43.3 | 252.3 | 69.6 | 101.0 | 65.2 |
| LOS | E | E | A | F | D | F | E | F | E |
| Approach Delay (s/veh) | | 67.0 | | | 80.7 | | 165.6 | | 81.2 |
| Approach LOS | | E | | | F | | F | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.3 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.50 | |
| Intersection Signal Delay (s/veh): 82.9 | Intersection LOS: F |
| Intersection Capacity Utilization 111.5% | ICU Level of Service H |
| Analysis Period (min) 15 | |

Splits and Phases: 31: Walker Av. & Edison Av.

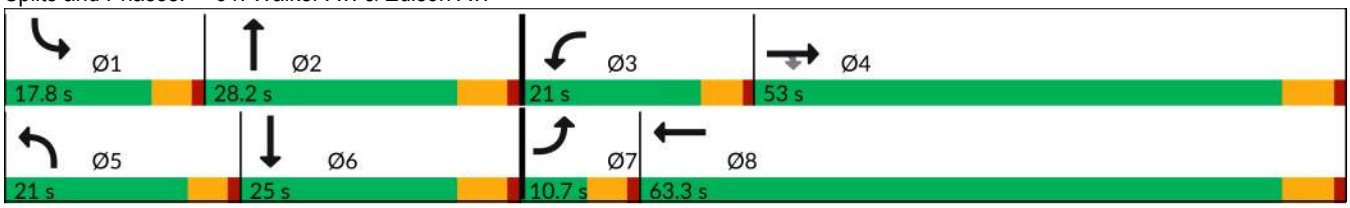

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 22 | 2335 | 477 | 338 | 1596 | 214 | 321 | 149 | 141 | 166 | 192 | 13 |
| Future Volume (veh/h) | 22 | 2335 | 477 | 338 | 1596 | 214 | 321 | 149 | 141 | 166 | 192 | 13 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 23 | 2407 | 286 | 348 | 1645 | 118 | 331 | 154 | 73 | 171 | 198 | 8 |
| Peak Hour Factor | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 | 0.97 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 38 | 2300 | 650 | 240 | 1828 | 130 | 240 | 187 | 89 | 193 | 229 | 9 |
| Arrive On Green | 0.03 | 0.61 | 0.61 | 0.21 | 0.79 | 0.79 | 0.21 | 0.23 | 0.23 | 0.17 | 0.19 | 0.19 |
| Sat Flow, veh/h | 1688 | 5611 | 1585 | 1688 | 3451 | 245 | 1688 | 1199 | 569 | 1688 | 1784 | 72 |
| Grp Volume(v), veh/h | 23 | 2407 | 286 | 348 | 885 | 878 | 331 | 0 | 227 | 171 | 0 | 206 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1585 | 1688 | 1870 | 1826 | 1688 | 0 | 1768 | 1688 | 0 | 1856 |
| Q Serve(g_s), s | 1.5 | 47.2 | 11.0 | 16.4 | 38.6 | 40.8 | 16.4 | 0.0 | 14.0 | 11.4 | 0.0 | 12.4 |
| Cycle Q Clear(g_c), s | 1.5 | 47.2 | 11.0 | 16.4 | 38.6 | 40.8 | 16.4 | 0.0 | 14.0 | 11.4 | 0.0 | 12.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 0.13 | 1.00 | | 0.32 | 1.00 | | 0.04 |
| Lane Grp Cap(c), veh/h | 38 | 2300 | 650 | 240 | 991 | 967 | 240 | 0 | 276 | 193 | 0 | 238 |
| V/C Ratio(X) | 0.60 | 1.05 | 0.44 | 1.45 | 0.89 | 0.91 | 1.38 | 0.00 | 0.82 | 0.88 | 0.00 | 0.87 |
| Avail Cap(c_a), veh/h | 89 | 2300 | 650 | 240 | 991 | 967 | 240 | 0 | 350 | 193 | 0 | 316 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 55.1 | 22.2 | 15.2 | 45.3 | 9.5 | 9.8 | 45.3 | 0.0 | 42.6 | 46.9 | 0.0 | 45.5 |
| Incr Delay (d2), s/veh | 5.6 | 32.4 | 0.5 | 223.5 | 10.4 | 12.1 | 193.8 | 0.0 | 11.9 | 33.9 | 0.0 | 17.2 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.7 | 21.5 | 3.4 | 21.1 | 8.6 | 8.9 | 18.9 | 0.0 | 6.3 | 6.1 | 0.0 | 6.2 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 60.7 | 54.6 | 15.7 | 268.8 | 20.0 | 21.9 | 239.1 | 0.0 | 54.5 | 80.8 | 0.0 | 62.8 |
| LnGrp LOS | E | F | B | F | B | C | F | | D | F | | E |
| Approach Vol, veh/h | | 2716 | | | 2111 | | | 558 | | | 377 | |
| Approach Delay, s/veh | | 50.5 | | | 61.8 | | | 164.0 | | | 70.9 | |
| Approach LOS | | D | | | E | | | F | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.8 | 23.4 | 21.0 | 53.0 | 21.0 | 20.2 | 7.2 | 66.8 |
| Change Period (Y+Rc), s | 4.6 | 5.4 | 4.6 | 5.8 | 4.6 | 5.4 | 4.6 | 5.8 |
| Max Green Setting (Gmax), s | 13.2 | 22.8 | 16.4 | 47.2 | 16.4 | 19.6 | 6.1 | 57.5 |
| Max Q Clear Time (g_c+I1), s | 13.4 | 16.0 | 18.4 | 49.2 | 18.4 | 14.4 | 3.5 | 42.8 |
| Green Ext Time (p_c), s | 0.0 | 0.6 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 10.2 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 67.0 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | WBT | SBL |
|---|---|---|---|---|
| Lane Configurations | | | | |
| Traffic Volume (vph) | 84 | 730 | 402 | 255 |
| Future Volume (vph) | 84 | 730 | 402 | 255 |
| Turn Type | Perm | NA | NA | Prot |
| Protected Phases | | 4 | 8 | 6 |
| Permitted Phases | 4 | | | |
| Detector Phase | 4 | 4 | 8 | 6 |
| Switch Phase | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 22.6 | 22.6 | 22.6 | 22.6 |
| Total Split (s) | 74.0 | 74.0 | 74.0 | 46.0 |
| Total Split (%) | 61.7% | 61.7% | 61.7% | 38.3% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | | | | |
| Lead-Lag Optimize? | | | | |
| Recall Mode | None | None | None | Min |
| Act Effct Green (s) | 44.5 | 44.5 | 44.5 | 26.0 |
| Actuated g/C Ratio | 0.55 | 0.55 | 0.55 | 0.32 |
| v/c Ratio | 0.31 | 0.83 | 0.60 | 0.74 |
| Control Delay (s/veh) | 14.4 | 24.0 | 15.3 | 34.2 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 14.4 | 24.0 | 15.3 | 34.2 |
| LOS | B | C | B | C |
| Approach Delay (s/veh) | | 23.0 | 15.3 | 34.2 |
| Approach LOS | | C | B | C |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 80.8 | |
| Natural Cycle: 60 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 0.83 | |
| Intersection Signal Delay (s/veh): 23.0 | Intersection LOS: C |
| Intersection Capacity Utilization 66.6% | ICU Level of Service C |
| Analysis Period (min) 15 | |

Splits and Phases: 32: Eucalyptus Av. & Walker Av.

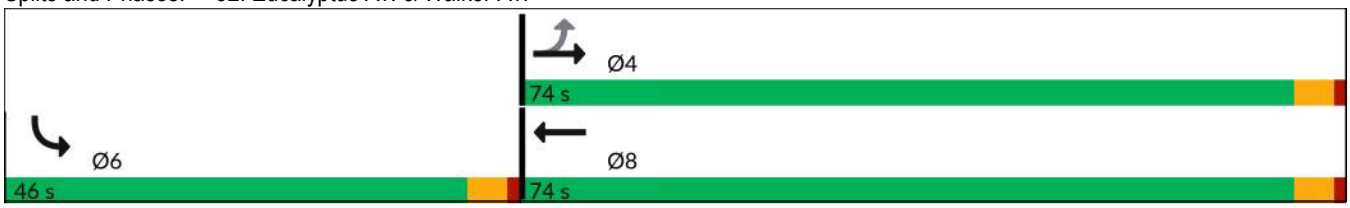

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 84 | 730 | 402 | 119 | 255 | 105 |
| Future Volume (veh/h) | 84 | 730 | 402 | 119 | 255 | 105 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | | 1.00 | 1.00 | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | No | | No | |
| Adj Sat Flow, veh/h/ln | 1870 | 1870 | 1870 | 1870 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 98 | 849 | 467 | 138 | 297 | 122 |
| Peak Hour Factor | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 | 0.86 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 390 | 1032 | 765 | 226 | 349 | 144 |
| Arrive On Green | 0.55 | 0.55 | 0.55 | 0.55 | 0.29 | 0.29 |
| Sat Flow, veh/h | 815 | 1870 | 1387 | 410 | 1216 | 500 |
| Grp Volume(v), veh/h | 98 | 849 | 0 | 605 | 420 | 0 |
| Grp Sat Flow(s),veh/h/ln | 815 | 1870 | 0 | 1797 | 1720 | 0 |
| Q Serve(g_s), s | 5.3 | 21.3 | 0.0 | 13.0 | 13.2 | 0.0 |
| Cycle Q Clear(g_c), s | 18.3 | 21.3 | 0.0 | 13.0 | 13.2 | 0.0 |
| Prop In Lane | 1.00 | | | 0.23 | 0.71 | 0.29 |
| Lane Grp Cap(c), veh/h | 390 | 1032 | 0 | 991 | 494 | 0 |
| V/C Ratio(X) | 0.25 | 0.82 | 0.00 | 0.61 | 0.85 | 0.00 |
| Avail Cap(c_a), veh/h | 929 | 2270 | 0 | 2180 | 1245 | 0 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 |
| Uniform Delay (d), s/veh | 14.8 | 10.5 | 0.0 | 8.7 | 19.2 | 0.0 |
| Incr Delay (d2), s/veh | 0.3 | 1.7 | 0.0 | 0.6 | 4.2 | 0.0 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 0.9 | 6.4 | 0.0 | 3.6 | 4.6 | 0.0 |
| Unsig. Movement Delay, s/veh | | | | | | |
| LnGrp Delay(d), s/veh | 15.2 | 12.2 | 0.0 | 9.3 | 23.4 | 0.0 |
| LnGrp LOS | B | B | | A | C | |
| Approach Vol, veh/h | | 947 | 605 | | 420 | |
| Approach Delay, s/veh | | 12.5 | 9.3 | | 23.4 | |
| Approach LOS | | B | A | | C | |

| Timer - Assigned Phs | | 4 | | 6 | | 8 |
|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | | 36.2 | | 21.0 | | 36.2 |
| Change Period (Y+Rc), s | | 4.6 | | 4.6 | | 4.6 |
| Max Green Setting (Gmax), s | | 69.4 | | 41.4 | | 69.4 |
| Max Q Clear Time (g_c+I1), s | | 23.3 | | 15.2 | | 15.0 |
| Green Ext Time (p_c), s | | 8.2 | | 1.3 | | 4.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 13.9 |
| HCM 7th LOS | B |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | |
| Traffic Volume (vph) | 100 | 335 | 201 | 87 | 308 | 103 | 194 | 1097 | 173 | 1924 |
| Future Volume (vph) | 100 | 335 | 201 | 87 | 308 | 103 | 194 | 1097 | 173 | 1924 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | 1 | 6 |
| Permitted Phases | | | 4 | | | 8 | | | | |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 22.6 | 9.6 | 22.6 | 9.6 | 22.6 |
| Total Split (s) | 12.0 | 25.0 | 25.0 | 11.0 | 24.0 | 24.0 | 18.0 | 57.3 | 26.7 | 66.0 |
| Total Split (%) | 10.0% | 20.8% | 20.8% | 9.2% | 20.0% | 20.0% | 15.0% | 47.8% | 22.3% | 55.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lag | Lead | Lag | Lag | Lag | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 7.4 | 20.4 | 20.4 | 6.4 | 19.4 | 19.4 | 13.4 | 57.2 | 17.6 | 61.4 |
| Actuated g/C Ratio | 0.06 | 0.17 | 0.17 | 0.05 | 0.16 | 0.16 | 0.11 | 0.48 | 0.15 | 0.51 |
| v/c Ratio | 1.01 | 1.10 | 0.48 | 1.02 | 1.07 | 0.29 | 1.08 | 0.47 | 0.73 | 1.12 |
| Control Delay (s/veh) | 147.5 | 127.8 | 10.5 | 157.6 | 118.5 | 5.2 | 138.8 | 22.1 | 66.1 | 89.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 147.5 | 127.8 | 10.5 | 157.6 | 118.5 | 5.2 | 138.8 | 22.1 | 66.1 | 89.9 |
| LOS | F | F | B | F | F | A | F | C | E | F |
| Approach Delay (s/veh) | | 93.9 | | | 102.0 | | | 38.5 | | 88.0 |
| Approach LOS | | F | | | F | | | D | | F |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 120 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.12 | |
| Intersection Signal Delay (s/veh): 75.8 | Intersection LOS: E |
| Intersection Capacity Utilization 106.0% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 36: Archibald Av. & Chino Av.

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 100 | 335 | 201 | 87 | 308 | 103 | 194 | 1097 | 88 | 173 | 1924 | 108 |
| Future Volume (veh/h) | 100 | 335 | 201 | 87 | 308 | 103 | 194 | 1097 | 88 | 173 | 1924 | 108 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 104 | 349 | 105 | 91 | 321 | 49 | 202 | 1143 | 50 | 180 | 2004 | 70 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 104 | 318 | 269 | 90 | 302 | 256 | 188 | 2669 | 117 | 208 | 1839 | 64 |
| Arrive On Green | 0.06 | 0.17 | 0.17 | 0.05 | 0.16 | 0.16 | 0.11 | 0.50 | 0.50 | 0.12 | 0.51 | 0.51 |
| Sat Flow, veh/h | 1688 | 1870 | 1582 | 1688 | 1870 | 1585 | 1688 | 5336 | 233 | 1688 | 3594 | 125 |
| Grp Volume(v), veh/h | 104 | 349 | 105 | 91 | 321 | 49 | 202 | 801 | 392 | 180 | 1037 | 1037 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1582 | 1688 | 1870 | 1585 | 1688 | 1870 | 1828 | 1688 | 1870 | 1848 |
| Q Serve(g_s), s | 7.4 | 20.4 | 5.5 | 6.4 | 19.4 | 3.2 | 13.4 | 16.3 | 16.4 | 12.6 | 61.4 | 61.4 |
| Cycle Q Clear(g_c), s | 7.4 | 20.4 | 5.5 | 6.4 | 19.4 | 3.2 | 13.4 | 16.3 | 16.4 | 12.6 | 61.4 | 61.4 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.13 | 1.00 | | 0.07 |
| Lane Grp Cap(c), veh/h | 104 | 318 | 269 | 90 | 302 | 256 | 188 | 1871 | 914 | 208 | 957 | 946 |
| V/C Ratio(X) | 1.00 | 1.10 | 0.39 | 1.01 | 1.06 | 0.19 | 1.07 | 0.43 | 0.43 | 0.87 | 1.08 | 1.10 |
| Avail Cap(c_a), veh/h | 104 | 318 | 269 | 90 | 302 | 256 | 188 | 1871 | 914 | 311 | 957 | 946 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 56.3 | 49.8 | 26.5 | 56.8 | 50.3 | 43.5 | 53.3 | 19.1 | 19.1 | 51.6 | 29.3 | 29.3 |
| Incr Delay (d2), s/veh | 88.0 | 79.2 | 0.9 | 97.9 | 69.0 | 0.4 | 86.0 | 0.2 | 0.3 | 15.2 | 54.5 | 59.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.6 | 16.3 | 2.8 | 5.1 | 14.7 | 1.3 | 9.9 | 6.5 | 6.4 | 6.0 | 38.9 | 39.8 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 144.3 | 129.0 | 27.4 | 154.7 | 119.3 | 43.9 | 139.3 | 19.2 | 19.4 | 66.8 | 83.8 | 88.7 |
| LnGrp LOS | F | F | C | F | F | D | F | B | B | E | F | F |
| Approach Vol, veh/h | | 558 | | | 461 | | | 1395 | | | 2254 | |
| Approach Delay, s/veh | | 112.7 | | | 118.2 | | | 36.7 | | | 84.7 | |
| Approach LOS | | F | | | F | | | D | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 19.4 | 64.6 | 11.0 | 25.0 | 18.0 | 66.0 | 12.0 | 24.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 22.1 | 52.7 | 6.4 | 20.4 | 13.4 | 61.4 | 7.4 | 19.4 |
| Max Q Clear Time (g_c+I1), s | 14.6 | 18.4 | 8.4 | 22.4 | 15.4 | 63.4 | 9.4 | 21.4 |
| Green Ext Time (p_c), s | 0.3 | 8.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 77.0 |
| HCM 7th LOS | E |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 381 | 1561 | 526 | 652 | 1505 | 219 | 287 | 772 | 311 | 294 | 1184 | 403 |
| Future Volume (vph) | 381 | 1561 | 526 | 652 | 1505 | 219 | 287 | 772 | 311 | 294 | 1184 | 403 |
| Turn Type | Prot | NA | Free | Prot | NA | Perm | Prot | NA | Free | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | Free | | | 8 | | | Free | | | 6 |
| Detector Phase | 7 | 4 | | 3 | 8 | 8 | 5 | 2 | | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 39.2 | | 9.6 | 46.2 | 46.2 | 9.6 | 39.5 | | 9.6 | 46.5 | 46.5 |
| Total Split (s) | 13.0 | 40.0 | | 19.2 | 46.2 | 46.2 | 12.0 | 46.0 | | 14.8 | 48.8 | 48.8 |
| Total Split (%) | 10.8% | 33.3% | | 16.0% | 38.5% | 38.5% | 10.0% | 38.3% | | 12.3% | 40.7% | 40.7% |
| Yellow Time (s) | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | | Lag | Lead | Lead | Lag | Lead | | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | | Yes | Yes | Yes | Yes | Yes | | Yes | Yes | Yes |
| Recall Mode | None | None | | None | None | None | None | Min | | None | Min | Min |
| Act Effct Green (s) | 10.0 | 35.4 | 118.6 | 14.6 | 40.0 | 40.0 | 7.4 | 31.2 | 118.6 | 18.9 | 42.7 | 42.7 |
| Actuated g/C Ratio | 0.08 | 0.30 | 1.00 | 0.12 | 0.34 | 0.34 | 0.06 | 0.26 | 1.00 | 0.16 | 0.36 | 0.36 |
| v/c Ratio | 1.45 | 0.94 | 0.34 | 1.69 | 0.81 | 0.34 | 1.39 | 0.80 | 0.20 | 0.56 | 0.89 | 0.62 |
| Control Delay (s/veh) | 259.6 | 53.4 | 0.6 | 354.4 | 39.6 | 8.4 | 243.2 | 47.1 | 0.3 | 51.7 | 45.2 | 24.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 259.6 | 53.4 | 0.6 | 354.4 | 39.6 | 8.4 | 243.2 | 47.1 | 0.3 | 51.7 | 45.2 | 24.3 |
| LOS | F | D | A | F | D | A | F | D | A | D | D | C |
| Approach Delay (s/veh) | | 74.0 | | | 123.2 | | | 77.5 | | | 41.8 | |
| Approach LOS | | E | | | F | | | E | | | D | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 118.6 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.69 | |
| Intersection Signal Delay (s/veh): 81.5 | Intersection LOS: F |
| Intersection Capacity Utilization 107.7% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 38: Archibald Av. & Edison Av./Ontario Ranch Rd.

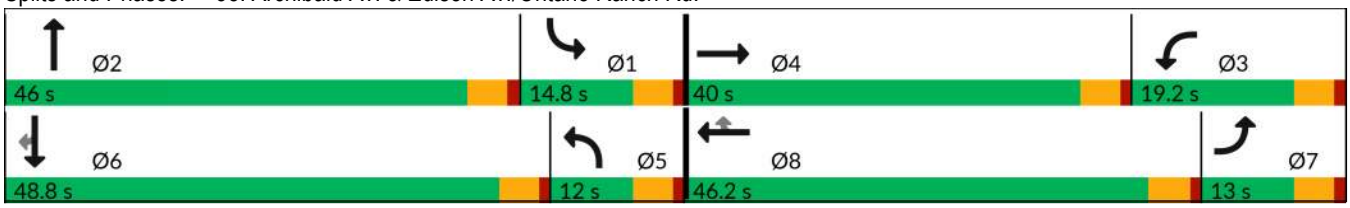

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 381 | 1561 | 526 | 652 | 1505 | 219 | 287 | 772 | 311 | 294 | 1184 | 403 |
| Future Volume (veh/h) | 381 | 1561 | 526 | 652 | 1505 | 219 | 287 | 772 | 311 | 294 | 1184 | 403 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 385 | 1577 | 0 | 659 | 1520 | 120 | 290 | 780 | 0 | 297 | 1196 | 205 |
| Peak Hour Factor | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 | 0.99 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 340 | 1688 | | 401 | 1796 | 507 | 215 | 920 | | 570 | 1312 | 556 |
| Arrive On Green | 0.16 | 0.45 | 0.00 | 0.19 | 0.48 | 0.48 | 0.10 | 0.37 | 0.00 | 0.25 | 0.53 | 0.53 |
| Sat Flow, veh/h | 3188 | 5611 | 1585 | 3188 | 5611 | 1584 | 3375 | 3741 | 1585 | 3375 | 3741 | 1585 |
| Grp Volume(v), veh/h | 385 | 1577 | 0 | 659 | 1520 | 120 | 290 | 780 | 0 | 297 | 1196 | 205 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1585 | 1594 | 1870 | 1584 | 1688 | 1870 | 1585 | 1688 | 1870 | 1585 |
| Q Serve(g_s), s | 12.4 | 30.9 | 0.0 | 14.6 | 27.5 | 5.2 | 7.4 | 22.2 | 0.0 | 8.8 | 33.8 | 8.8 |
| Cycle Q Clear(g_c), s | 12.4 | 30.9 | 0.0 | 14.6 | 27.5 | 5.2 | 7.4 | 22.2 | 0.0 | 8.8 | 33.8 | 8.8 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 340 | 1688 | | 401 | 1796 | 507 | 215 | 920 | | 570 | 1312 | 556 |
| V/C Ratio(X) | 1.13 | 0.93 | | 1.64 | 0.85 | 0.24 | 1.35 | 0.85 | | 0.52 | 0.91 | 0.37 |
| Avail Cap(c_a), veh/h | 340 | 1713 | | 401 | 2013 | 568 | 215 | 1336 | | 570 | 1426 | 604 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 48.7 | 30.7 | 0.0 | 47.0 | 27.6 | 21.8 | 52.4 | 34.6 | 0.0 | 39.3 | 25.8 | 19.9 |
| Incr Delay (d2), s/veh | 90.2 | 10.0 | 0.0 | 299.9 | 3.2 | 0.2 | 183.5 | 3.6 | 0.0 | 0.4 | 8.7 | 0.4 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 8.7 | 12.5 | 0.0 | 21.9 | 10.0 | 1.8 | 8.4 | 8.6 | 0.0 | 3.3 | 12.2 | 2.9 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 138.9 | 40.7 | 0.0 | 346.9 | 30.9 | 22.1 | 235.9 | 38.2 | 0.0 | 39.7 | 34.5 | 20.3 |
| LnGrp LOS | F | D | | F | C | C | F | D | | D | C | C |
| Approach Vol, veh/h | | 1962 | | | 2299 | | | 1070 | | | 1698 | |
| Approach Delay, s/veh | | 60.0 | | | 121.0 | | | 91.8 | | | 33.7 | |
| Approach LOS | | E | | | F | | | F | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.2 | 33.1 | 19.2 | 39.5 | 12.0 | 45.3 | 17.0 | 41.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 10.2 | 41.4 | 14.6 | 35.4 | 7.4 | 44.2 | 8.4 | 41.6 |
| Max Q Clear Time (g_c+I1), s | 10.8 | 24.2 | 16.6 | 32.9 | 9.4 | 35.8 | 14.4 | 29.5 |
| Green Ext Time (p_c), s | 0.0 | 4.3 | 0.0 | 2.0 | 0.0 | 4.9 | 0.0 | 7.6 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 78.4 |
| HCM 7th LOS | E |

Notes

User approved pedestrian interval to be less than phase max green.

Unsignalized Delay for [NBR, EBR] is excluded from calculations of the approach delay and intersection delay.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 313 | 890 | 167 | 414 | 876 | 663 | 144 | 964 | 345 | 738 | 1222 | 350 |
| Future Volume (vph) | 313 | 890 | 167 | 414 | 876 | 663 | 144 | 964 | 345 | 738 | 1222 | 350 |
| Turn Type | Prot | NA | Perm | Prot | NA | pm+ov | Prot | NA | pm+ov | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 1 | 5 | 2 | 3 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 5.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 14.6 | 14.6 | 9.6 | 43.6 | 9.6 | 9.6 | 43.6 | 9.6 | 9.6 | 37.6 | 37.6 |
| Total Split (s) | 15.0 | 36.9 | 36.9 | 21.7 | 43.6 | 27.0 | 15.8 | 44.4 | 21.7 | 27.0 | 55.6 | 55.6 |
| Total Split (%) | 11.5% | 28.4% | 28.4% | 16.7% | 33.5% | 20.8% | 12.2% | 34.2% | 16.7% | 20.8% | 42.8% | 42.8% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lag | Lag | Lead | Lead | Lag | Lag | Lead | Lead | Lag | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.1 | 32.4 | 32.4 | 17.1 | 34.4 | 56.9 | 13.0 | 29.2 | 46.3 | 22.5 | 38.7 | 38.7 |
| Actuated g/C Ratio | 0.13 | 0.27 | 0.27 | 0.14 | 0.29 | 0.48 | 0.11 | 0.24 | 0.39 | 0.19 | 0.32 | 0.32 |
| v/c Ratio | 0.82 | 0.93 | 0.34 | 0.96 | 0.86 | 0.46 | 0.44 | 0.74 | 0.53 | 1.31 | 0.71 | 0.56 |
| Control Delay (s/veh) | 69.9 | 59.0 | 13.5 | 85.2 | 49.5 | 17.8 | 56.3 | 45.2 | 11.7 | 189.4 | 37.6 | 14.4 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 69.9 | 59.0 | 13.5 | 85.2 | 49.5 | 17.8 | 56.3 | 45.2 | 11.7 | 189.4 | 37.6 | 14.4 |
| LOS | E | E | B | F | D | B | E | D | B | F | D | B |
| Approach Delay (s/veh) | | 55.9 | | | 46.3 | | | 38.4 | | | 82.6 | |
| Approach LOS | | E | | | D | | | D | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 130 | |
| Actuated Cycle Length: 119.6 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.31 | |
| Intersection Signal Delay (s/veh): 58.4 | Intersection LOS: E |
| Intersection Capacity Utilization 95.3% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 40: Archibald Av. & Limonite Av.

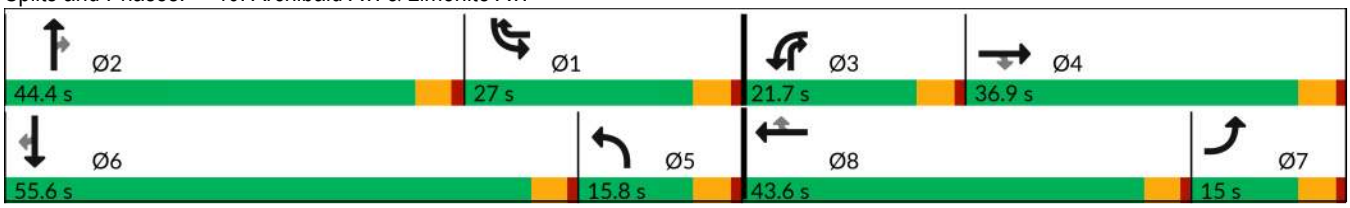

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 313 | 890 | 167 | 414 | 876 | 663 | 144 | 964 | 345 | 738 | 1222 | 350 |
| Future Volume (veh/h) | 313 | 890 | 167 | 414 | 876 | 663 | 144 | 964 | 345 | 738 | 1222 | 350 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 329 | 937 | 102 | 436 | 922 | 382 | 152 | 1015 | 186 | 777 | 1286 | 342 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 403 | 1005 | 426 | 467 | 1080 | 1521 | 403 | 1319 | 600 | 612 | 1687 | 476 |
| Arrive On Green | 0.19 | 0.40 | 0.40 | 0.22 | 0.43 | 0.43 | 0.19 | 0.35 | 0.35 | 0.29 | 0.45 | 0.45 |
| Sat Flow, veh/h | 3188 | 3741 | 1585 | 3188 | 3741 | 3160 | 3188 | 5611 | 1563 | 3188 | 5611 | 1583 |
| Grp Volume(v), veh/h | 329 | 937 | 102 | 436 | 922 | 382 | 152 | 1015 | 186 | 777 | 1286 | 342 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1585 | 1594 | 1870 | 1580 | 1594 | 1870 | 1563 | 1594 | 1870 | 1583 |
| Q Serve(g_s), s | 11.5 | 28.0 | 3.6 | 15.7 | 25.9 | 0.0 | 4.9 | 18.7 | 4.4 | 22.4 | 22.4 | 20.5 |
| Cycle Q Clear(g_c), s | 11.5 | 28.0 | 3.6 | 15.7 | 25.9 | 0.0 | 4.9 | 18.7 | 4.4 | 22.4 | 22.4 | 20.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 403 | 1005 | 426 | 467 | 1080 | 1521 | 403 | 1319 | 600 | 612 | 1687 | 476 |
| V/C Ratio(X) | 0.82 | 0.93 | 0.24 | 0.93 | 0.85 | 0.25 | 0.38 | 0.77 | 0.31 | 1.27 | 0.76 | 0.72 |
| Avail Cap(c_a), veh/h | 403 | 1036 | 439 | 467 | 1250 | 1665 | 403 | 1914 | 765 | 612 | 2453 | 692 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 46.0 | 33.8 | 13.9 | 45.0 | 30.9 | 13.9 | 43.3 | 35.0 | 8.2 | 41.5 | 28.5 | 28.0 |
| Incr Delay (d2), s/veh | 11.5 | 14.3 | 0.3 | 25.5 | 5.3 | 0.1 | 0.2 | 1.2 | 0.3 | 133.9 | 0.9 | 2.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 4.8 | 12.5 | 1.8 | 7.1 | 10.3 | 2.3 | 1.8 | 7.2 | 1.6 | 18.7 | 7.8 | 6.6 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 57.4 | 48.1 | 14.2 | 70.5 | 36.2 | 14.0 | 43.5 | 36.1 | 8.5 | 175.4 | 29.4 | 30.1 |
| LnGrp LOS | E | D | B | E | D | B | D | D | A | F | C | C |
| Approach Vol, veh/h | | 1368 | | | 1740 | | | 1353 | | | 2405 | |
| Approach Delay, s/veh | | 47.8 | | | 39.9 | | | 33.2 | | | 76.7 | |
| Approach LOS | | D | | | D | | | C | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 27.0 | 32.0 | 21.7 | 35.9 | 19.4 | 39.7 | 19.4 | 38.3 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 22.4 | 39.8 | 17.1 | 32.3 | 11.2 | 51.0 | 10.4 | 39.0 |
| Max Q Clear Time (g_c+I1), s | 24.4 | 20.7 | 17.7 | 30.0 | 6.9 | 24.4 | 13.5 | 27.9 |
| Green Ext Time (p_c), s | 0.0 | 6.7 | 0.0 | 1.4 | 0.1 | 10.7 | 0.0 | 5.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 53.0 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | WBL | WBT | NBL | NBT | SBL | SBT |
|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | |
| Traffic Volume (vph) | 236 | 1808 | 58 | 2166 | 32 | 38 | 305 | 50 |
| Future Volume (vph) | 236 | 1808 | 58 | 2166 | 32 | 38 | 305 | 50 |
| Turn Type | Prot | NA | Prot | NA | Prot | NA | Prot | NA |
| Protected Phases | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Permitted Phases | | | | | | | | |
| Detector Phase | 7 | 4 | 3 | 8 | 5 | 2 | 1 | 6 |
| Switch Phase | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 | 9.6 | 23.8 |
| Total Split (s) | 20.0 | 58.0 | 12.0 | 50.0 | 11.5 | 26.0 | 24.0 | 38.5 |
| Total Split (%) | 16.7% | 48.3% | 10.0% | 41.7% | 9.6% | 21.7% | 20.0% | 32.1% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lag | Lead | Lag | Lead | Lag | Lead | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 15.4 | 56.0 | 6.9 | 45.5 | 6.2 | 9.5 | 19.4 | 26.9 |
| Actuated g/C Ratio | 0.14 | 0.52 | 0.06 | 0.42 | 0.06 | 0.09 | 0.18 | 0.25 |
| v/c Ratio | 1.05 | 0.68 | 0.58 | 1.09 | 0.36 | 0.49 | 1.08 | 0.51 |
| Control Delay (s/veh) | 119.0 | 22.2 | 72.5 | 78.1 | 61.1 | 32.8 | 117.8 | 17.3 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 119.0 | 22.2 | 72.5 | 78.1 | 61.1 | 32.8 | 117.8 | 17.3 |
| LOS | F | C | E | E | E | C | F | B |
| Approach Delay (s/veh) | | 33.1 | | 78.0 | | 40.3 | | 71.6 |
| Approach LOS | | C | | E | | D | | E |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 108.3 | |
| Natural Cycle: 120 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.09 | |
| Intersection Signal Delay (s/veh): 58.5 | Intersection LOS: E |
| Intersection Capacity Utilization 99.5% | ICU Level of Service F |
| Analysis Period (min) 15 | |

Splits and Phases: 41: S Turner Av. & Ontario Ranch Rd.

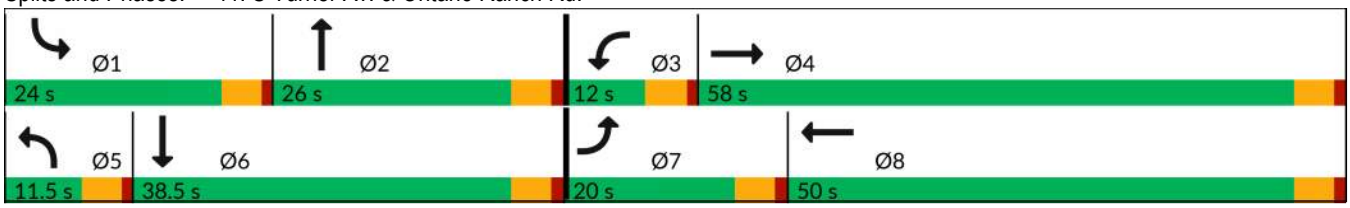

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 236 | 1808 | 40 | 58 | 2166 | 211 | 32 | 38 | 52 | 305 | 50 | 209 |
| Future Volume (veh/h) | 236 | 1808 | 40 | 58 | 2166 | 211 | 32 | 38 | 52 | 305 | 50 | 209 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.97 | 1.00 | | 1.00 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 251 | 1923 | 22 | 62 | 2304 | 118 | 34 | 40 | 23 | 324 | 53 | 116 |
| Peak Hour Factor | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 250 | 2982 | 34 | 78 | 2313 | 117 | 51 | 56 | 32 | 315 | 108 | 237 |
| Arrive On Green | 0.15 | 0.54 | 0.54 | 0.05 | 0.44 | 0.44 | 0.03 | 0.05 | 0.05 | 0.19 | 0.21 | 0.21 |
| Sat Flow, veh/h | 1688 | 5536 | 63 | 1688 | 5294 | 269 | 1688 | 1100 | 632 | 1688 | 522 | 1143 |
| Grp Volume(v), veh/h | 251 | 1299 | 646 | 62 | 1623 | 799 | 34 | 0 | 63 | 324 | 0 | 169 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1870 | 1859 | 1688 | 1870 | 1822 | 1688 | 0 | 1732 | 1688 | 0 | 1665 |
| Q Serve(g_s), s | 15.4 | 25.5 | 25.5 | 3.8 | 44.8 | 45.4 | 2.1 | 0.0 | 3.7 | 19.4 | 0.0 | 9.3 |
| Cycle Q Clear(g_c), s | 15.4 | 25.5 | 25.5 | 3.8 | 44.8 | 45.4 | 2.1 | 0.0 | 3.7 | 19.4 | 0.0 | 9.3 |
| Prop In Lane | 1.00 | | 0.03 | 1.00 | | 0.15 | 1.00 | | 0.37 | 1.00 | | 0.69 |
| Lane Grp Cap(c), veh/h | 250 | 2015 | 1001 | 78 | 1634 | 796 | 51 | 0 | 89 | 315 | 0 | 346 |
| V/C Ratio(X) | 1.00 | 0.64 | 0.65 | 0.79 | 0.99 | 1.00 | 0.67 | 0.00 | 0.71 | 1.03 | 0.00 | 0.49 |
| Avail Cap(c_a), veh/h | 250 | 2015 | 1001 | 120 | 1634 | 796 | 112 | 0 | 357 | 315 | 0 | 543 |
| HCM Platoon Ratio | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 1.00 |
| Uniform Delay (d), s/veh | 44.3 | 16.9 | 16.9 | 49.1 | 29.1 | 29.3 | 49.9 | 0.0 | 48.5 | 42.3 | 0.0 | 36.3 |
| Incr Delay (d2), s/veh | 57.9 | 0.7 | 1.4 | 8.8 | 20.5 | 32.9 | 5.6 | 0.0 | 10.0 | 58.2 | 0.0 | 1.1 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 10.2 | 9.9 | 10.1 | 1.7 | 22.8 | 25.2 | 0.9 | 0.0 | 1.8 | 12.8 | 0.0 | 3.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 102.1 | 17.7 | 18.4 | 57.8 | 49.6 | 62.2 | 55.4 | 0.0 | 58.5 | 100.5 | 0.0 | 37.4 |
| LnGrp LOS | F | B | B | E | D | F | E | | E | F | | D |
| Approach Vol, veh/h | | 2196 | | | 2484 | | | 97 | | | 493 | |
| Approach Delay, s/veh | | 27.5 | | | 53.9 | | | 57.4 | | | 78.9 | |
| Approach LOS | | C | | | D | | | E | | | E | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 24.0 | 9.9 | 9.4 | 60.6 | 7.7 | 26.2 | 20.0 | 50.0 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 19.4 | 21.4 | 7.4 | 53.4 | 6.9 | 33.9 | 15.4 | 45.4 |
| Max Q Clear Time (g_c+I1), s | 21.4 | 5.7 | 5.8 | 27.5 | 4.1 | 11.3 | 17.4 | 47.4 |
| Green Ext Time (p_c), s | 0.0 | 0.2 | 0.0 | 15.2 | 0.0 | 0.8 | 0.0 | 0.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 45.3 |
| HCM 7th LOS | D |

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 426 | 1831 | 72 | 249 | 2056 | 332 | 97 | 247 | 116 | 419 | 419 | 202 |
| Future Volume (vph) | 426 | 1831 | 72 | 249 | 2056 | 332 | 97 | 247 | 116 | 419 | 419 | 202 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 | 5.0 | 10.0 | 10.0 |
| Minimum Split (s) | 9.6 | 29.2 | 29.2 | 9.6 | 34.5 | 34.5 | 9.6 | 47.8 | 47.8 | 9.6 | 45.8 | 45.8 |
| Total Split (s) | 17.0 | 42.0 | 42.0 | 11.0 | 36.0 | 36.0 | 15.4 | 50.0 | 50.0 | 17.0 | 51.6 | 51.6 |
| Total Split (%) | 14.2% | 35.0% | 35.0% | 9.2% | 30.0% | 30.0% | 12.8% | 41.7% | 41.7% | 14.2% | 43.0% | 43.0% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lead | Lead | Lead | Lag | Lag | Lag | Lag | Lag | Lag | Lead | Lead | Lead |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.6 | 37.9 | 37.9 | 6.5 | 31.9 | 31.9 | 10.7 | 17.8 | 17.8 | 12.6 | 19.6 | 19.6 |
| Actuated g/C Ratio | 0.13 | 0.41 | 0.41 | 0.07 | 0.34 | 0.34 | 0.11 | 0.19 | 0.19 | 0.13 | 0.21 | 0.21 |
| v/c Ratio | 1.97 | 0.92 | 0.11 | 1.22 | 0.98 | 0.46 | 0.53 | 0.38 | 0.30 | 1.94 | 0.59 | 0.43 |
| Control Delay (s/veh) | 478.8 | 36.6 | 0.3 | 171.8 | 47.3 | 5.5 | 51.7 | 33.3 | 5.2 | 463.5 | 35.9 | 6.8 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 478.8 | 36.6 | 0.3 | 171.8 | 47.3 | 5.5 | 51.7 | 33.3 | 5.2 | 463.5 | 35.9 | 6.8 |
| LOS | F | D | A | F | D | A | D | C | A | F | D | A |
| Approach Delay (s/veh) | | 116.4 | | | 53.7 | | | 30.1 | | | 202.5 | |
| Approach LOS | | F | | | D | | | C | | | F | |

| Intersection Summary | |
|---|---|
| Cycle Length: 120 | |
| Actuated Cycle Length: 93.5 | |
| Natural Cycle: 115 | |
| Control Type: Actuated-Uncoordinated | |
| Maximum v/c Ratio: 1.97 | |
| Intersection Signal Delay (s/veh): 98.5 | Intersection LOS: F |
| Intersection Capacity Utilization 106.2% | ICU Level of Service G |
| Analysis Period (min) 15 | |

Splits and Phases: 42: Haven Av. & Ontario Ranch Rd.

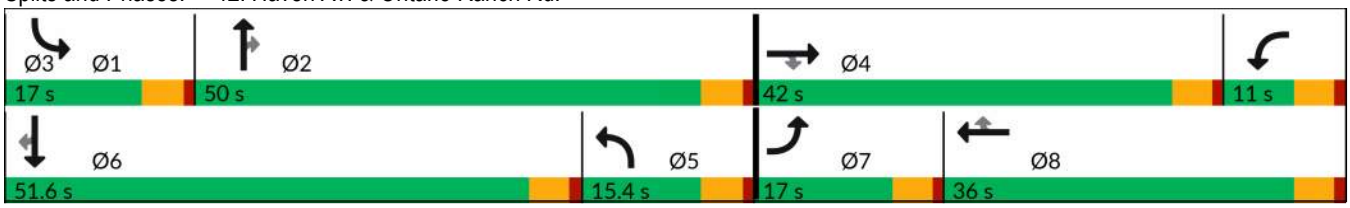

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 426 | 1831 | 72 | 249 | 2056 | 332 | 97 | 247 | 116 | 419 | 419 | 202 |
| Future Volume (veh/h) | 426 | 1831 | 72 | 249 | 2056 | 332 | 97 | 247 | 116 | 419 | 419 | 202 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.99 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1772 | 1870 | 1870 | 1673 | 1870 | 1870 | 1772 | 1870 | 1870 | 1772 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 444 | 1907 | 44 | 259 | 2142 | 190 | 101 | 257 | 64 | 436 | 436 | 106 |
| Peak Hour Factor | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 244 | 2126 | 657 | 280 | 2330 | 572 | 149 | 477 | 211 | 244 | 676 | 299 |
| Arrive On Green | 0.14 | 0.62 | 0.42 | 0.09 | 0.54 | 0.36 | 0.09 | 0.13 | 0.13 | 0.14 | 0.19 | 0.19 |
| Sat Flow, veh/h | 1688 | 5106 | 1579 | 3092 | 6434 | 1580 | 1688 | 3554 | 1571 | 1688 | 3554 | 1573 |
| Grp Volume(v), veh/h | 444 | 1907 | 44 | 259 | 2142 | 190 | 101 | 257 | 64 | 436 | 436 | 106 |
| Grp Sat Flow(s),veh/h/ln | 1688 | 1702 | 1579 | 1546 | 1609 | 1580 | 1688 | 1777 | 1571 | 1688 | 1777 | 1573 |
| Q Serve(g_s), s | 12.4 | 27.4 | 1.4 | 7.1 | 26.1 | 7.5 | 5.0 | 5.8 | 2.4 | 12.4 | 9.7 | 3.5 |
| Cycle Q Clear(g_c), s | 12.4 | 27.4 | 1.4 | 7.1 | 26.1 | 7.5 | 5.0 | 5.8 | 2.4 | 12.4 | 9.7 | 3.5 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 244 | 2126 | 657 | 280 | 2330 | 572 | 149 | 477 | 211 | 244 | 676 | 299 |
| V/C Ratio(X) | 1.82 | 0.90 | 0.07 | 0.93 | 0.92 | 0.33 | 0.68 | 0.54 | 0.30 | 1.79 | 0.64 | 0.35 |
| Avail Cap(c_a), veh/h | 244 | 2226 | 689 | 280 | 2355 | 578 | 212 | 1881 | 831 | 244 | 1947 | 862 |
| HCM Platoon Ratio | 1.00 | 1.50 | 1.00 | 1.00 | 1.50 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 36.7 | 14.5 | 15.0 | 38.7 | 18.4 | 19.8 | 37.9 | 34.7 | 20.0 | 36.7 | 32.1 | 14.3 |
| Incr Delay (d2), s/veh | 384.8 | 5.2 | 0.0 | 34.3 | 6.4 | 0.3 | 2.0 | 0.9 | 0.8 | 370.4 | 1.0 | 0.7 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 30.8 | 6.5 | 0.5 | 3.8 | 6.7 | 2.5 | 2.0 | 2.4 | 1.1 | 29.9 | 4.0 | 1.7 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 421.5 | 19.7 | 15.1 | 73.0 | 24.8 | 20.2 | 39.9 | 35.6 | 20.8 | 407.1 | 33.1 | 15.0 |
| LnGrp LOS | F | B | B | E | C | C | D | D | C | F | C | B |
| Approach Vol, veh/h | | 2395 | | | 2591 | | | 422 | | | 978 | |
| Approach Delay, s/veh | | 94.1 | | | 29.3 | | | 34.4 | | | 197.9 | |
| Approach LOS | | F | | | C | | | C | | | F | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 17.0 | 16.1 | 12.4 | 40.3 | 12.2 | 20.9 | 17.0 | 35.7 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 12.4 | 45.4 | 6.4 | 37.4 | 10.8 | 47.0 | 12.4 | 31.4 |
| Max Q Clear Time (g_c+I1), s | 14.4 | 7.8 | 9.1 | 29.4 | 7.0 | 11.7 | 14.4 | 28.1 |
| Green Ext Time (p_c), s | 0.0 | 1.8 | 0.0 | 6.4 | 0.0 | 3.1 | 0.0 | 3.0 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 79.8 |
| HCM 7th LOS | E |

## 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

| Lane Group | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 345 | 1580 | 561 | 448 | 1790 | 266 | 678 | 509 | 340 | 366 | 691 | 286 |
| Future Volume (vph) | 345 | 1580 | 561 | 448 | 1790 | 266 | 678 | 509 | 340 | 366 | 691 | 286 |
| Turn Type | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm | Prot | NA | Perm |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | 8 | | | 2 | | | 6 |
| Detector Phase | 7 | 4 | 4 | 3 | 8 | 8 | 5 | 2 | 2 | 1 | 6 | 6 |
| Switch Phase | | | | | | | | | | | | |
| Minimum Initial (s) | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | 5.0 |
| Minimum Split (s) | 9.6 | 46.6 | 46.6 | 9.6 | 46.6 | 46.6 | 9.6 | 44.6 | 44.6 | 9.6 | 44.6 | 44.6 |
| Total Split (s) | 14.0 | 44.6 | 44.6 | 17.0 | 47.6 | 47.6 | 23.0 | 47.0 | 47.0 | 21.4 | 45.4 | 45.4 |
| Total Split (%) | 10.8% | 34.3% | 34.3% | 13.1% | 36.6% | 36.6% | 17.7% | 36.2% | 36.2% | 16.5% | 34.9% | 34.9% |
| Yellow Time (s) | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| All-Red Time (s) | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 | 1.0 |
| Lost Time Adjust (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Lost Time (s) | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Lead/Lag | Lag | Lead | Lead | Lag | Lead | Lead | Lead | Lead | Lead | Lag | Lag | Lag |
| Lead-Lag Optimize? | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Recall Mode | None | None | None | None | None | None | None | None | None | None | None | None |
| Act Effct Green (s) | 12.6 | 40.6 | 40.6 | 12.5 | 40.4 | 40.4 | 18.5 | 24.0 | 24.0 | 19.0 | 24.5 | 24.5 |
| Actuated g/C Ratio | 0.11 | 0.35 | 0.35 | 0.11 | 0.35 | 0.35 | 0.16 | 0.21 | 0.21 | 0.17 | 0.21 | 0.21 |
| v/c Ratio | 1.04 | 0.84 | 0.76 | 1.37 | 0.72 | 0.38 | 1.40 | 0.46 | 0.79 | 0.73 | 0.61 | 0.66 |
| Control Delay (s/veh) | 110.0 | 39.6 | 21.6 | 223.5 | 34.3 | 5.0 | 226.8 | 40.1 | 36.0 | 56.1 | 42.5 | 26.9 |
| Queue Delay | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Total Delay (s/veh) | 110.0 | 39.6 | 21.6 | 223.5 | 34.3 | 5.0 | 226.8 | 40.1 | 36.0 | 56.1 | 42.5 | 26.9 |
| LOS | F | D | C | F | C | A | F | D | D | E | D | C |
| Approach Delay (s/veh) | | 45.3 | | | 65.1 | | | 122.1 | | | 42.9 | |
| Approach LOS | | D | | | E | | | F | | | D | |

### Intersection Summary

Cycle Length: 130
Actuated Cycle Length: 114.5
Natural Cycle: 115
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.40
Intersection Signal Delay (s/veh): 66.1 — Intersection LOS: E
Intersection Capacity Utilization 95.3% — ICU Level of Service F
Analysis Period (min) 15

Splits and Phases: 43: Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.

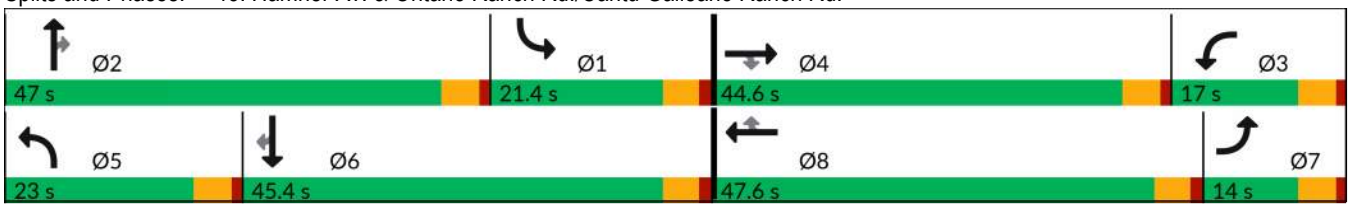

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 345 | 1580 | 561 | 448 | 1790 | 266 | 678 | 509 | 340 | 366 | 691 | 286 |
| Future Volume (veh/h) | 345 | 1580 | 561 | 448 | 1790 | 266 | 678 | 509 | 340 | 366 | 691 | 286 |
| Initial Q (Qb), veh | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lane Width Adj. | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Ped-Bike Adj(A_pbT) | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 0.98 | 1.00 | | 0.99 |
| Parking Bus, Adj | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach | | No | | | No | | | No | | | No | |
| Adj Sat Flow, veh/h/ln | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 | 1673 | 1870 | 1870 |
| Adj Flow Rate, veh/h | 363 | 1663 | 296 | 472 | 1884 | 280 | 714 | 536 | 179 | 385 | 727 | 154 |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Cap, veh/h | 388 | 1956 | 552 | 375 | 2577 | 545 | 556 | 1001 | 276 | 577 | 1038 | 289 |
| Arrive On Green | 0.18 | 0.52 | 0.52 | 0.18 | 0.52 | 0.52 | 0.26 | 0.27 | 0.27 | 0.27 | 0.28 | 0.28 |
| Sat Flow, veh/h | 3188 | 5611 | 1584 | 3188 | 7481 | 1582 | 3188 | 5611 | 1548 | 3188 | 5611 | 1562 |
| Grp Volume(v), veh/h | 363 | 1663 | 296 | 472 | 1884 | 280 | 714 | 536 | 179 | 385 | 727 | 154 |
| Grp Sat Flow(s),veh/h/ln | 1594 | 1870 | 1584 | 1594 | 1870 | 1582 | 1594 | 1870 | 1548 | 1594 | 1870 | 1562 |
| Q Serve(g_s), s | 11.8 | 26.9 | 7.8 | 12.4 | 20.6 | 12.3 | 18.4 | 8.6 | 10.8 | 11.3 | 12.3 | 6.6 |
| Cycle Q Clear(g_c), s | 11.8 | 26.9 | 7.8 | 12.4 | 20.6 | 12.3 | 18.4 | 8.6 | 10.8 | 11.3 | 12.3 | 6.6 |
| Prop In Lane | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 | 1.00 | | 1.00 |
| Lane Grp Cap(c), veh/h | 388 | 1956 | 552 | 375 | 2577 | 545 | 556 | 1001 | 276 | 577 | 1038 | 289 |
| V/C Ratio(X) | 0.94 | 0.85 | 0.54 | 1.26 | 0.73 | 0.51 | 1.28 | 0.54 | 0.65 | 0.67 | 0.70 | 0.53 |
| Avail Cap(c_a), veh/h | 388 | 2128 | 601 | 375 | 3050 | 645 | 556 | 2256 | 622 | 577 | 2170 | 604 |
| HCM Platoon Ratio | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |
| Upstream Filter(I) | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh | 42.7 | 22.8 | 7.0 | 43.4 | 21.7 | 19.7 | 38.9 | 34.9 | 35.7 | 35.6 | 35.5 | 18.9 |
| Incr Delay (d2), s/veh | 29.6 | 3.3 | 0.8 | 136.7 | 0.8 | 0.8 | 141.1 | 0.4 | 2.6 | 2.4 | 0.9 | 1.5 |
| Initial Q Delay(d3), s/veh | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| %ile BackOfQ(50%),veh/ln | 5.7 | 8.5 | 3.6 | 11.4 | 6.6 | 3.7 | 16.9 | 3.6 | 3.8 | 4.1 | 5.0 | 3.0 |
| Unsig. Movement Delay, s/veh | | | | | | | | | | | | |
| LnGrp Delay(d), s/veh | 72.3 | 26.1 | 7.8 | 180.2 | 22.4 | 20.4 | 180.0 | 35.3 | 38.2 | 38.0 | 36.4 | 20.5 |
| LnGrp LOS | E | C | A | F | C | C | F | D | D | D | D | C |
| Approach Vol, veh/h | | 2322 | | | 2636 | | | 1429 | | | 1266 | |
| Approach Delay, s/veh | | 31.0 | | | 50.5 | | | 108.0 | | | 34.9 | |
| Approach LOS | | C | | | D | | | F | | | C | |

| Timer - Assigned Phs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Phs Duration (G+Y+Rc), s | 23.7 | 23.4 | 17.0 | 41.4 | 23.0 | 24.1 | 17.4 | 40.9 |
| Change Period (Y+Rc), s | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 | 4.6 |
| Max Green Setting (Gmax), s | 16.8 | 42.4 | 12.4 | 40.0 | 18.4 | 40.8 | 9.4 | 43.0 |
| Max Q Clear Time (g_c+I1), s | 13.3 | 12.8 | 14.4 | 28.9 | 20.4 | 14.3 | 13.8 | 22.6 |
| Green Ext Time (p_c), s | 0.3 | 4.0 | 0.0 | 7.9 | 0.0 | 5.3 | 0.0 | 13.5 |

| Intersection Summary | |
|---|---|
| HCM 7th Control Delay, s/veh | 52.7 |
| HCM 7th LOS | D |

**Notes**

User approved pedestrian interval to be less than phase max green.

# APPENDIX I2

## VEHICLE MILES TRAVELED ANALYSIS

MEMORANDUM

URBAN | CROSSROADS

**DATE:** November 27, 2024
**TO:** Rafael Torres, City of Ontario
**FROM:** Alex So, Urban Crossroads, Inc.
**JOB NO:** 16036-01 VMT

## CENTER PARK SPECIFIC PLAN VEHICLE MILES TRAVELED (VMT) ANALYSIS

Urban Crossroads, Inc. is pleased to provide the following Vehicle Miles Traveled (VMT) Analysis for the Center Park Specific Plan (**Project**). The Project is bounded by Campus Avenue to the west, Walker Avenue to the east, and lies on either side of Edison Avenue in the City of Ontario.

## PROJECT OVERVIEW

It is our understanding that the Project is to consist of the following:

- 802 Single-Family Detached dwelling units
- 3,491 Multi-Family (Low-Rise) dwelling units
- 115,809 square feet of Commercial Retail use
- 135,111 square feet of General Office use
- 55.98 acres of Parkland use

A land use plan can be found in Attachment A.

## BACKGROUND

The California Environmental Quality Act (CEQA) requires all lead agencies to adopt VMT as the measure for identifying transportation impacts for land use projects. To comply with CEQA, the City of Ontario adopted analytical procedures, screening tools, and impact thresholds for VMT, which are documented in The City of Ontario Resolution No. 2020-071 (June 2020) (**City Guidelines**) (1). This VMT analysis has been developed based on the adopted City Guidelines.

## TRAFFIC MODELING METHODOLOGY

Consistent with City Guidelines, the San Bernardino Traffic Analysis Model (SBTAM) is identified as the appropriate tool for conducting VMT analysis for land use projects within the City of Ontario. SBTAM is a useful tool to estimate VMT as it considers interaction between different land uses based on socio-economic data

such as population, households, and employment.

As part of The Ontario Plan (TOP) 2050 (2) implementation, the City of Ontario adopted an updated version of SBTAM, also referred to as the TOP 2050 model. The TOP 2050 model includes the latest roadway network and socio-economic data specific to the City of Ontario, in alignment with the City's adopted TOP. The model encompasses a base year of 2019 and a General Plan Buildout projection for 2050.

## VMT ANALYSIS METHODOLOGY

Consistent with City Guidelines, VMT has been estimated using the Origin/Destination method and Boundary method. For both methods, VMT is presented as total VMT and VMT per service population. Total VMT is an estimate of total vehicle travel and considers all vehicle trips and trip purposes, whereas VMT per service population is an efficiency metric that represents VMT generated on a typical weekday per person who lives and/or works in the City of Ontario or, in the case of the Project, per person who resides or works within the Project. Total VMT provides an estimate of the total vehicle travel, while VMT per service population measures the efficiency of travel. Consistent with City Guidelines, the efficiency metric VMT per service population has been adopted by the City of Ontario for transportation impact analysis.

### ORIGIN/DESTINATION VMT

The Origin/Destination (OD) method for calculating VMT sums all weekday VMT generated by trips with at least one trip end in the study area (i.e., Project boundary) and tracks those trips to their estimated origins/destinations. Origins are all vehicle trips that start in a specific traffic analysis zone (TAZ) and destinations are all trips that end in a specific TAZ.

### BOUNDARY VMT

City Guidelines also state that the VMT analysis should also contain an evaluation of a project's effect on VMT, which can be performed using the boundary method of calculating VMT. The boundary method is the sum of all weekday VMT on the roadway network within a designated boundary (i.e., City boundary or subregional boundary). The boundary method estimates VMT by multiplying vehicle trips on each roadway segment within the boundary by that segment's length. This approach consists of all trips, including those trips that do not begin or end in the designated boundary. As the Project lies near the boundary of the City of Ontario, an assessment of a 10-mile boundary area surrounding the Project site has been conducted to ensure trips associated with the Project are not omitted.

## VMT METRIC AND SIGNIFICANCE THRESHOLD

The City of Ontario has adopted the following thresholds of significance related to VMT for land use projects:

The SBTAM model should be used to forecast total daily VMT per Service Population and is the required method for estimating VMT.

- A significant impact would occur if the project VMT per service population exceeds the Citywide average VMT per service population under General Plan Buildout Conditions.

- A significant impact would occur if the project caused total daily VMT per service population within the City to be higher than the no project scenario under cumulative conditions.

The City of Ontario's average VMT per service population under General Plan Buildout conditions has been calculated using the TOP General Plan Buildout (2050) model. Table 1 presents the Citywide average VMT per SP for General Plan Buildout (2050) conditions.

**TABLE 1: CITYWIDE VMT PER SERVICE POPULATION**

| Ontario | TOP 2050 |
|---|---|
| Service Population | 707,369 |
| VMT | 19,506,377 |
| VMT per service population | 27.6 |

As shown in Table 1, the City of Ontario's VMT per service population for General Plan Buildout (2050) conditions has been calculated as **27.6 VMT per service population**.

## PROJECT VMT ESTIMATES

In order to evaluate Project-generated VMT, standard land use information such as dwelling units must first be converted into a SBTAM-compatible dataset. The SBTAM model utilizes socio-economic data (SED) (e.g., population and employment) as key inputs for the purposes of vehicle trip estimation. Table 2 presents the SED inputs used to represent the Project in the Project's TAZ within SBTAM.

**TABLE 2: POPULATION ESTIMATES**

| Land Use | Quantity | Conversion Factor | SED Estimates |
|---|---|---|---|
| Single Family | 802 Dwelling Units | 3.47 people per household[1] | 2,783 People |
| Multi-Family | 3,491 Dwelling Units | 3.47 people per household | 12,114 People |
| Commercial Retail | 115,809 Square Feet | 413.3 SF per employee[2] | 280 Employees |
| Office | 135,111 Square Feet | 434.6 SF per employee[2] | 311 Employees |

[1] Factors obtained consistent with land use assumptions within the TOP 2050 model.
[2] TOP SEIR, Table 3-1

## PROJECT-GENERATED VMT

Table 3 presents Project-generated total VMT and the resulting VMT per service population for baseline and buildout conditions. As shown in Table 3, the Project-generated VMT per service population would not exceed the City's threshold of 27.6 VMT per service population.

**TABLE 3: PROJECT-GENERATED VMT SUMMARY**

| | Baseline | General Plan Buildout (2050) |
|---|---|---|
| Service Population | 15,488 | 15,488 |
| OD VMT | 133,142 | 183,186 |
| OD VMT per Service Population | 8.6 | 11.8 |
| City Threshold | 27.6 | 27.6 |
| Potentially Significant? | No | No |

As shown in Table 3, Project-generated VMT is forecast to be below the City's adopted threshold.

## PROJECT EFFECT ON VMT

The Project's effect on VMT has been calculated using the boundary method. Land use information representing the proposed land use changes contemplated by the Project were coded into the Project TAZ to represent the "With Project" condition. Table 4 summarizes the boundary VMT under the No Project and With Project scenarios for both baseline and cumulative conditions using the City boundary and a 10-mile radius from the Project site.

**TABLE 4: GENERAL PLAN BUILDOUT (2050) BOUNDARY VMT RESULTS**

| | City Boundary | | 10-Mile Boundary | |
|---|---|---|---|---|
| Scenario | No Project | With Project | No Project | With Project |
| Service Population | 928,110 | 924,537 | 2,439,439 | 2,435,866 |
| Boundary VMT | 14,819,593 | 14,823,705 | 43,392,708 | 43,394,355 |
| VMT per SP | 16.0 | 16.0 | 17.8 | 17.8 |
| Change in VMT | 0.0 | | 0.0 | |
| Potentially Significant? | No | | No | |

VMT per service population was found to not increase in the With Project scenario using the City's boundary and a 10-mile regional boundary. Therefore, the Project's cumulative effect on VMT does not exceed the City's impact threshold.

## SUMMARY

Based on the results of this analysis, the following findings are made:

- The Project-generated VMT was estimated under baseline and buildout conditions and was found to be below the City's impact threshold.
- The Project's link-level boundary effect on VMT was found to not increase under the With Project scenario as compared to the No Project scenario using the City's boundary or a 10-mile boundary, which is below the City's impact threshold.

If you have any questions, please contact me directly at aso@urbanxroads.com.

## REFERENCES

1. **City of Ontario.** *The City of Ontario Resolution No. 2020-071.* City of Ontario : s.n., June 2020.

# ATTACHMENT A

# PROJECT LAND USE PLAN

**EXHIBIT A-1: LAND USE PLAN**

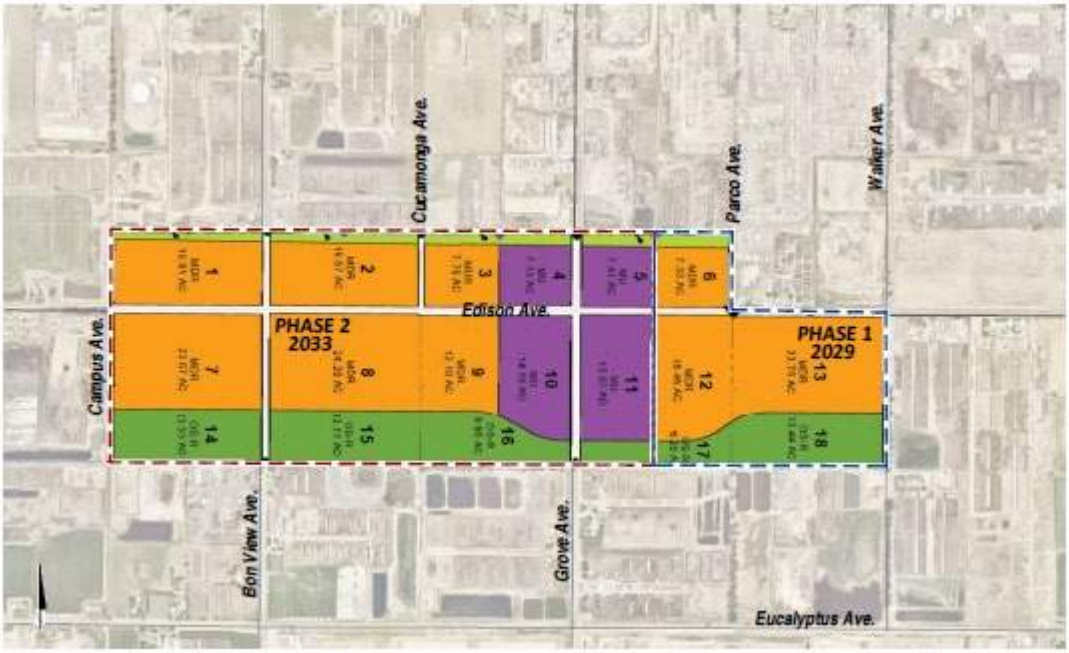

# APPENDIX J

## WATER SUPPLY ASSESSMENT

ALBERT A. WEBB ASSOCIATES

# WATER SUPPLY ASSESSMENT AND WRITTEN VERIFICATION OF SUFFICIENT WATER SUPPLY

CENTERPARK SPECIFIC PLAN
CITY OF ONTARIO

Prepared for:

ONTARIO MUNICIPAL UTILITIES COMPANY

**December 5, 2024**

W.O. 2024-0614

www.webbassociates.com

ALBERT A. WEBB ASSOCIATES

W.O.: 2024-0614

December 5, 2024

Alexis Mascarinas, P.E.
Associate Engineer
**ONTARIO MUNICIPAL UTILITIES COMPANY**
1425 S. Bon View Avenue
Ontario, CA 91761

Re: Water Supply Assessment and Written Verification of Sufficient Water Supply for CenterPark Specific Plan

Dear Ms. Mascarinas,
Pursuant to our agreement and notice to proceed received on October 28, 2024, transmitted herewith is the Water Supply Assessment (WSA) and Written Verification (WV) for the subject project prepared pursuant to Senate Bill 610 and Senate Bill 221.

Sincerely,

**ALBERT A. WEBB ASSOCIATES**

Autumn DeWoody
Senior Environmental Analyst

Sam I. Gershon, RCE
Senior Vice President

REGISTERED PROFESSIONAL ENGINEER
SAM I. GERSHON
NO. C14489
CIVIL
STATE OF CALIFORNIA

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F Water Facilities Authority (WFA) 2020 UWMP

G Chino Basin Desalter Authority 2020 UWMP

H San Antonio Water Company 2020 UWMP

I IEUA Resolution No. 2014-12-1

J 1985 Installment Purchase Agreement Relating to WFA Water Treatment Plan by and between WFA and the City of Ontario

K WFA Ordinance No. 99-07-02

L 2003 Local Agency Agreement by and between IEUA and the City of Ontario

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# SB 610 WATER SUPPLY ASSESSMENT

## SECTION 1 - INTRODUCTION

Senate Bill 610 (SB 610) was signed into California state law with an effective date of January 1, 2002. SB 610 amended existing legal requirements for confirmation of water supply sufficiency as a condition of approval for development projects. The confirmation of water supply sufficiency is achieved through an assessment of the water supplier's existing and future water sources, and existing and projected water demand in relation to a "project" as defined by California Water Code (CWC) section 10912, resulting in the production of a project-specific Water Supply Assessment ("WSA" or "Assessment"). Additional analysis is required in the WSA if any portion of the water supply includes groundwater. The WSA is prepared and adopted by the water supplier and included in the California Environmental Quality Act (CEQA) analysis for the project. The CEQA Lead Agency must then independently determine, based on the entire record, whether water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses (CWC section 10911). The WSA is not a commitment by the water supplier to serve the proposed project.

**Law**

CWC section 10910:

> *(a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.*

CWC section 10912:

*For the purpose of this part, the following terms have the following meanings:*

> *(a) "Project" means any of the following:*

*(1) A proposed residential development of more than 500 dwelling units.*

*(2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*

*(3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*

*(4) A proposed hotel or motel, or both, having more than 500 rooms.*

*(5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.*

*(6) A mixed-use project that includes one or more of the projects specified in this subdivision.*

*(7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.*

CWC section 10914:

*(a) Nothing in this part is intended to create a right or entitlement to water service or any specific level of water service.*

*(b) Nothing in this part is intended to either impose, expand, or limit any duty concerning the obligation of a public water system to provide certain service to its existing customers or to any future potential customers.*

*(c) Nothing in this part is intended to modify or otherwise change existing law with respect to projects which are not subject to this part.*

*(d) This part applies only to a project for which a notice of preparation is submitted on or after January 1, 1996.*

## 1.1 Purpose

The Ontario Municipal Utilities Company (OMUC) is a department of the City of Ontario (City) and the City water supplier (see **Figure 1 – Regional Map**). OMUC commissioned this Assessment from Albert A. Webb Associates (WEBB) on October 28, 2024, to answer the following key question pursuant to SB 610: whether the projected supply for the next 20 years, based on normal, single dry and multiple dry years, will meet the demand projected for the project plus existing and planned future uses, including agricultural and manufacturing uses.

## 1.2 Background

The CenterPark Specific Plan (CenterPark or "Project") is located in the 8,200-acre Ontario Ranch region of the City, which is undergoing a planned transition from agricultural uses to urban development (**Figure 1 – Regional Map**). CenterPark encompasses approximately 257 acres that is bounded to the north by a Southern California Edison (SCE) Easement located approximately 300 feet north of Edison Avenue/Ontario Ranch Road, bordered on the south by Euclyptus Avenue, by Campus Avenue to the west, and Walker Avenue to the east (**Figure 2 – Aerial View**). Although the proposed Specific Plan follows the Land Use Element of the City's current General Plan (i.e., The Ontario Plan 2050) that was adopted in August 2022, the City's current water demand projections are found in its most recent 2020 Urban Water Management Plan (UWMP) and 2020 Water Master Plan, which are based on the City's Land Use Plan from June 2020.

## 1.3 Proposed Project

The City is preparing a CEQA document for the proposed *CenterPark Specific Plan,* which proposes a new planned community on approximately 257 acres. According to the proposed Specific Plan, "The community of CenterPark will provide a pedestrian friendly mixed-use retail/office center and up to 4,293 new residential dwelling units within 13 distinct planning areas designed in conjunction with a comprehensively

planned open space system consisting of regional and neighborhood park facilities (p. 1-1)." The proposed land use plan is shown on **Figure 3 - Proposed Land Use Plan**. This Project is considered to be "subject to CEQA" pursuant to CWC section 10910. The Project is considered a "project" under SB 610 pursuant to the following CWC section 10912 definitions:

- *A proposed residential development of more than 500 dwelling units.*

The Project land use plan that was provided for this analysis is reflected below in **Table 1-1**. The City has assumed for this WSA that recycled water will be available for outdoor irrigation. City Ordinance No. 2689 requires all new developments to connect to and use recycled water for all approved uses (codified in City Municipal Code Chapter 8C). "Recycled water uses may include agricultural irrigation, commercial uses, construction uses, industrial processes, landscape irrigation, landscape and/or recreational impoundments, wildlife habitat, and groundwater recharge, as approved by the SWRCB and RWQCB" (Municipal Code Section 6-8.703).

## Table 1-1 Proposed Land Use Plan

| PA | LAND USE | TOP 2050 ACREAGE | DENSITY PER EIR | MAXIMUM UNITS | MAXIMUM RETAIL | MAXIMUM OFFICE |
|---|---|---|---|---|---|---|
| 1 | MDR (11.1 - 25.0 DU/AC) | 15.91 AC | 22.0 DU/AC | 350 DU | | |
| 2 | MDR (11.1 - 25.0 DU/AC) | 15.57 AC | 22.0 DU/AC | 343 DU | | |
| 3 | MDR (11.1 - 25.0 DU/AC) | 7.70 AC | 22.0 DU/AC | 169 DU | | |
| 4 | MIXED-USE RESIDENTIAL | 4.99 AC | 35.0 DU/AC | 175 DU | | |
| 4 | MIXED-USE RETAIL | 1.43 AC | | | 18,635 SF | |
| 4 | MIXED-USE OFFICE | 0.71 AC | | | | 21,741 SF |
| 5 | MIXED-USE RESIDENTIAL | 5.19 AC | 35.0 DU/AC | 182 DU | | |
| 5 | MIXED-USE RETAIL | 1.48 AC | | | 19,367 SF | |
| 5 | MIXED-USE OFFICE | 0.74 AC | | | | 22,595 SF |
| 6 | MDR (11.1 - 25.0 DU/AC) | 7.33 AC | 22.0 DU/AC | 161 DU | | |
| 7 | MDR (11.1 - 25.0 DU/AC) | 23.67 AC | 22.0 DU/AC | 521 DU | | |
| 8 | MDR (11.1 - 25.0 DU/AC) | 24.20 AC | 22.0 DU/AC | 532 DU | | |
| 9 | MDR (11.1 - 25.0 DU/AC) | 12.18 AC | 22.0 DU/AC | 268 DU | | |
| 10 | MIXED-USE RESIDENTIAL | 9.87 AC | 35.0 DU/AC | 345 DU | | |
| 10 | MIXED-USE RETAIL | 2.82 AC | | | 36,852 SF | |
| 10 | MIXED-USE OFFICE | 1.41 AC | | | | 42,994 SF |
| 11 | MIXED-USE RESIDENTIAL | 10.97 AC | 35.0 DU/AC | 384 DU | | |
| 11 | MIXED-USE RETAIL | 3.13 AC | | | 40,955 SF | |
| 11 | MIXED-USE OFFICE | 1.57 AC | | | | 47,781 SF |
| 12 | MDR (11.1 - 25.0 DU/AC) | 15.46 AC | 22.0 DU/AC | 340 DU | | |
| 13 | MDR (11.1 - 25.0 DU/AC) | 23.75 AC | 22.0 DU/AC | 523 DU | | |
| | **RESIDENTIAL TOTAL** | **176.79 AC** | **24.3 DU/AC** | **4,293 DU** | | |
| | **RETAIL TOTAL** | **8.86 AC** | | | **115,809 SF** | |
| | **OFFICE TOTAL** | **4.43 AC** | | | | **135,110 SF** |
| 14 | OS-R (PARKLAND) | 13.33 AC | | | | |
| 15 | OS-R (PARKLAND) | 13.11 AC | | | | |
| 16 | OS-R (PARKLAND) | 9.90 AC | | | | |
| 17 | OS-R (PARKLAND) | 6.20 AC | | | | |
| 18 | OS-R (PARKLAND) | 13.44 AC | | | | |
| 19 | OS-NR (NON-RECREATION) | 2.26 AC | | | | |
| 20 | OS-NR (NON-RECREATION) | 2.68 AC | | | | |
| 21 | OS-NR (NON-RECREATION) | 2.96 AC | | | | |
| 22 | OS-NR (NON-RECREATION) | 3.38 AC | | | | |
| | **OPEN SPACE TOTAL** | **67.26 AC** | | | | |
| | **PROJECT TOTAL** | **257.34 AC** | **16.7 DU/AC** | **4,293 DU** | **115,809 SF** | **135,110 SF** |

RETAIL in Mixed-Use areas = 20% of Mixed-Use acreage x 0.30 FAR

OFFICE in Mixed-Use areas = 10% of Mixed-Use acreage x 0.70 FAR

*Source: CenterPark Specific Plan, Table 1-1 Land Use Plan Summary, p. 1-7.*

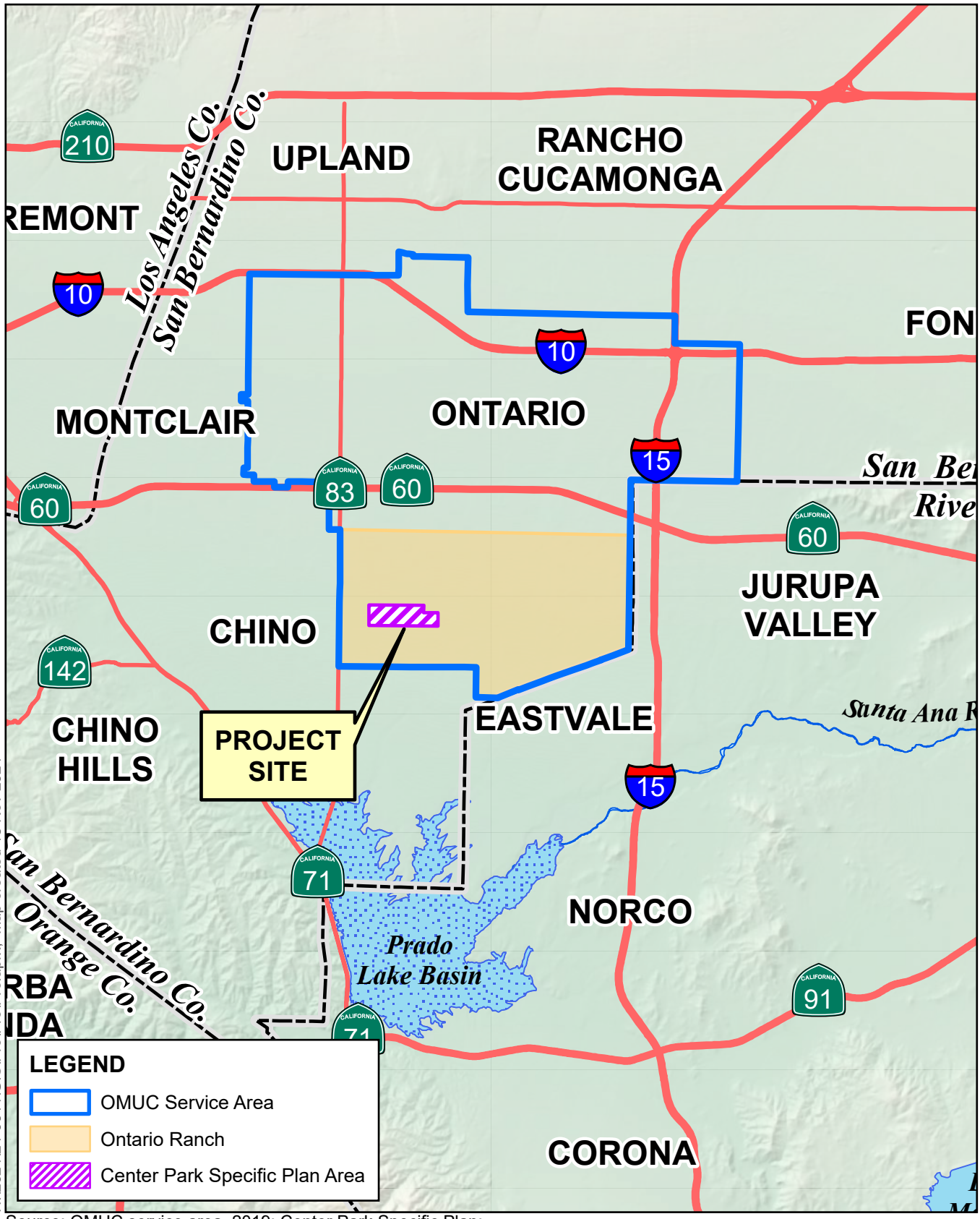


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Source: OMUC service area, 2019; Center Park Specific Plan; San Bernardino Co., 2023.

**Figure 1 – Regional Map**
WSA for Center Park Specific Plan

0 2 4 6 Miles

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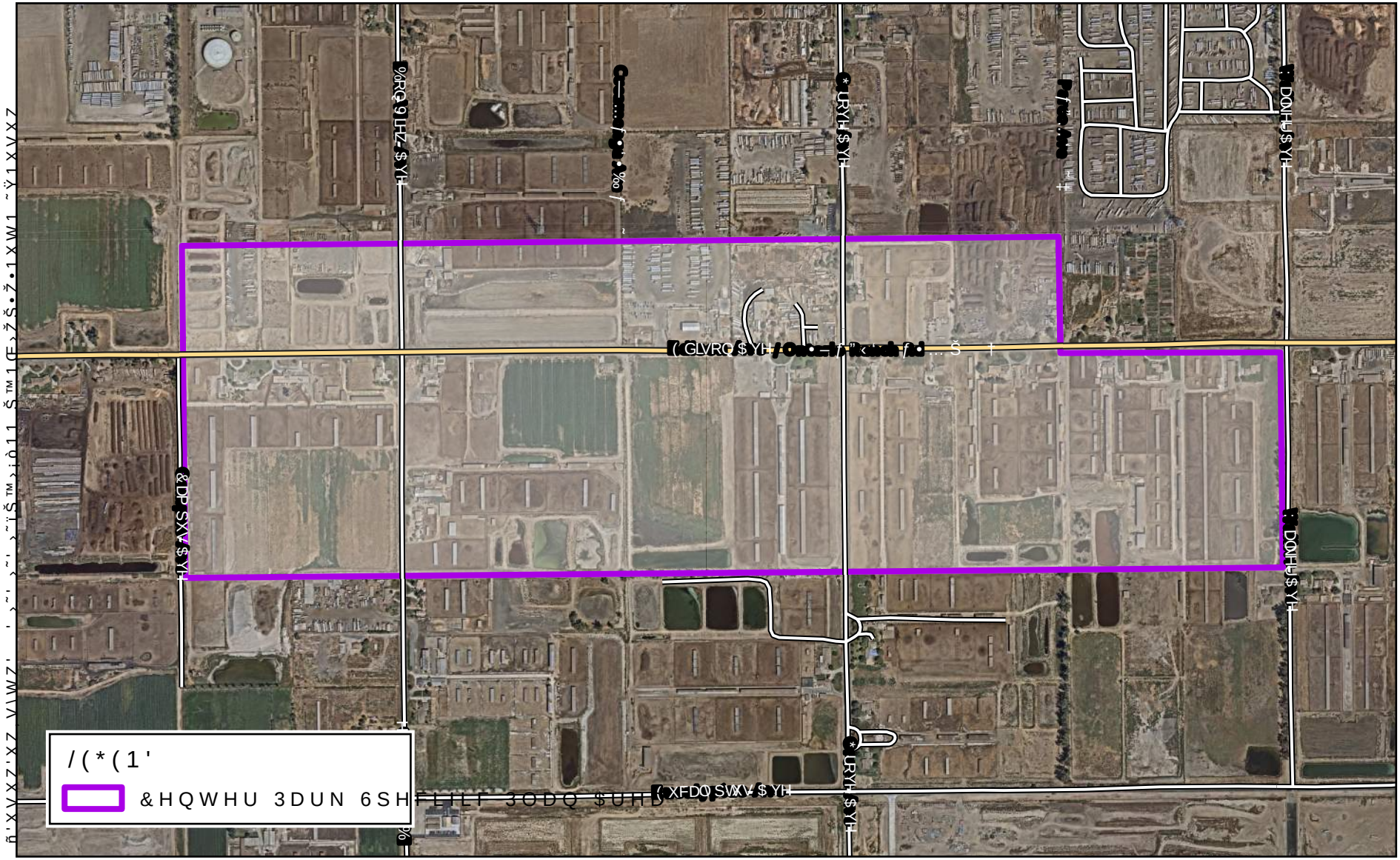
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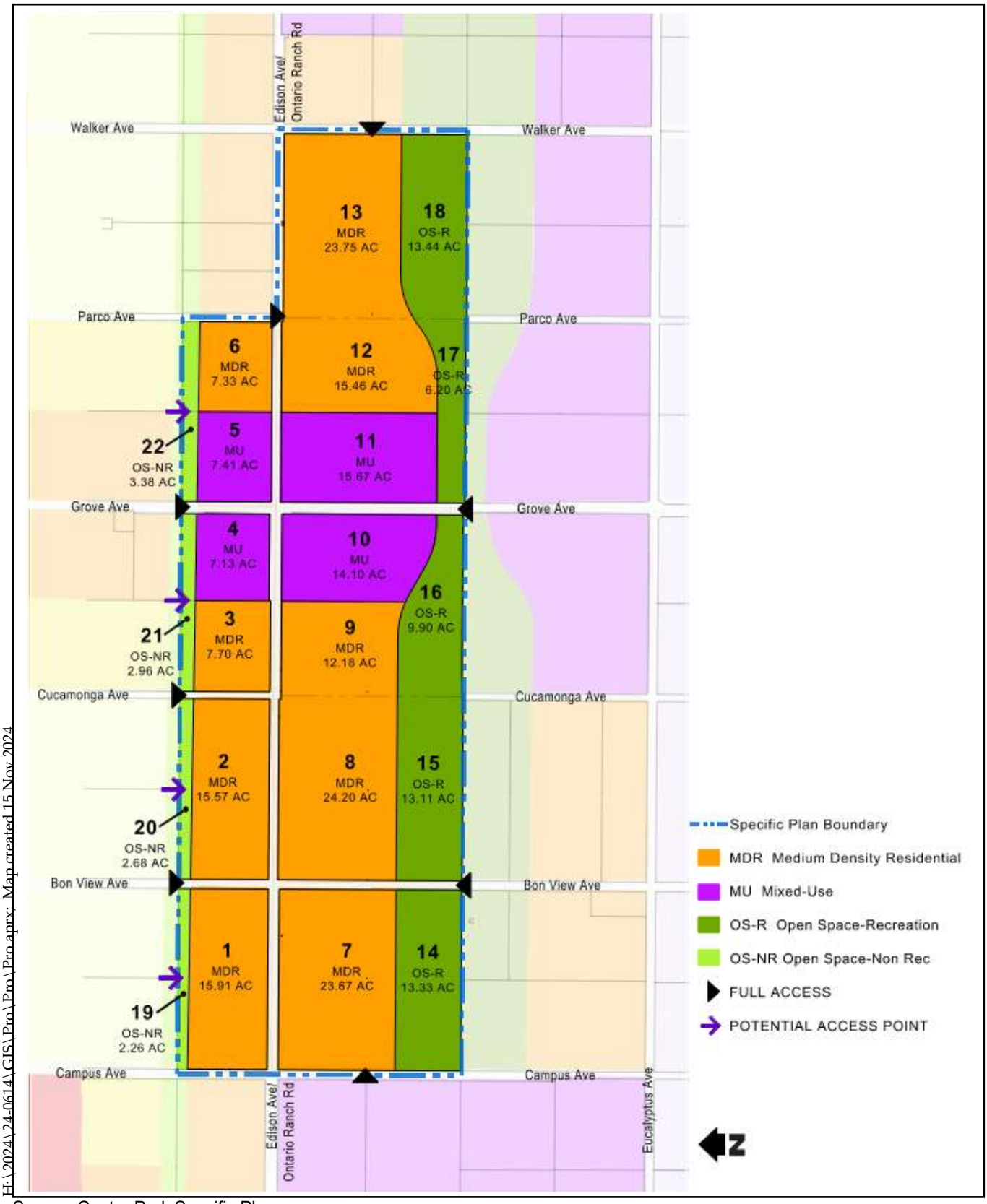


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Source: Center Park Specific Plan

**Figure 3 - Proposed Land Use Plan**

WSA for Center Park Specific Plan

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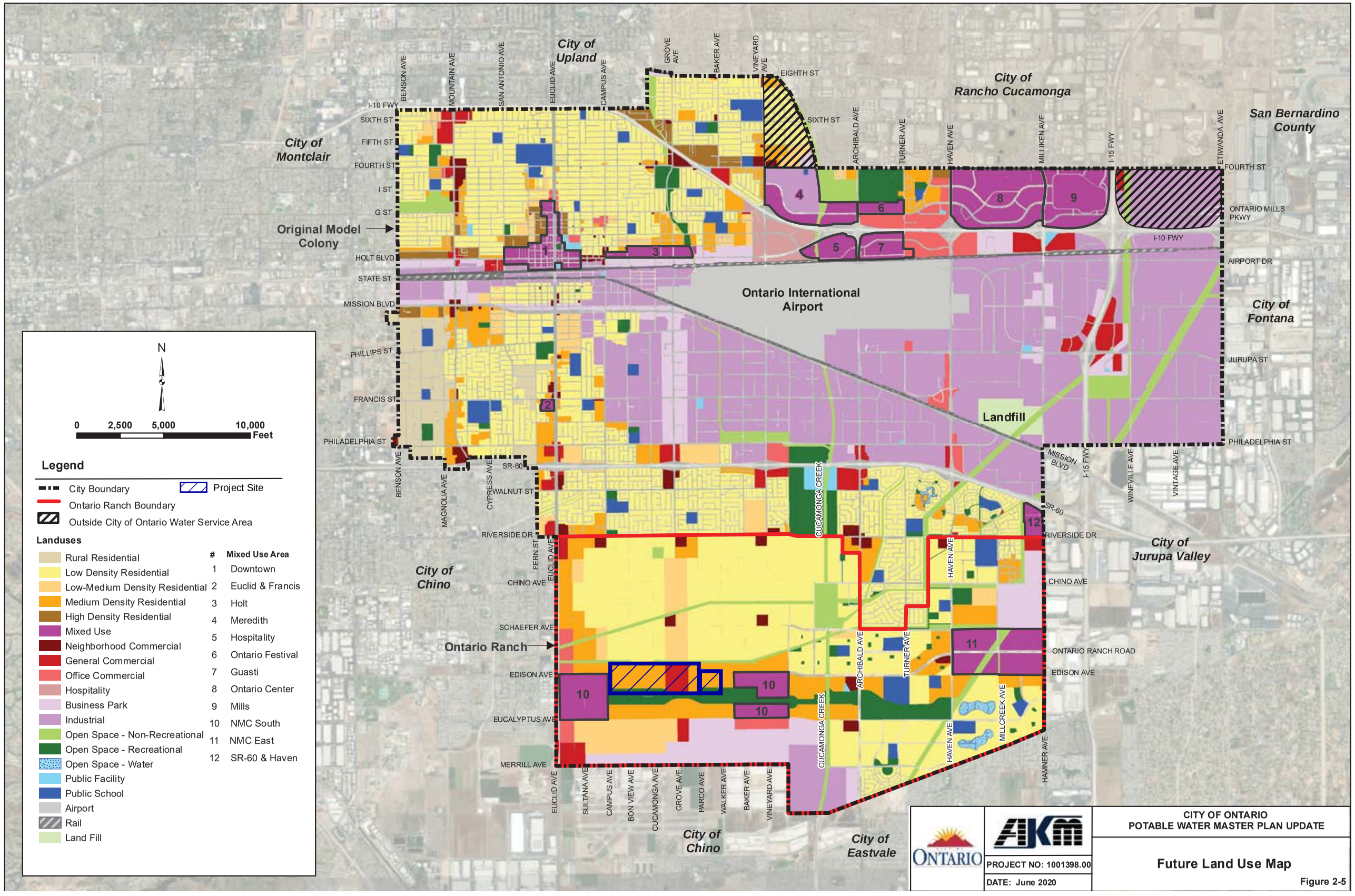


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Sources: Center Park Specific Plan; Ontario 2020 UWMP

**Figure 4 - Land Use Plan for 2020 UWMP**

WSA for Center Park Specific Plan Area

ALBERT A. WEBB ASSOCIATES

## 1.4 Prior Water Supply Assessment

A WSA and Written Verification of Sufficient Water Supply (WV) dated October 27, 2004, were prepared for the 8,200-acre Ontario Ranch by WEBB on behalf of the City. Because the Project proposes different land uses than those analyzed in the 2004 WSA/WV, and the City has updated its water use factors and water supply information since 2004, a new WSA is prepared herein consistent with CWC section 10910(3).

**Law**

CWC Section 10910:

> *(h) Notwithstanding any other provision of this part, if a project has been the subject of a water supply assessment that complies with the requirements of this part, no additional water supply assessment shall be required for subsequent projects that were part of a larger project for which a water supply assessment was completed and that has complied with the requirements of this part and for which the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has concluded that its water supplies are sufficient to meet the projected water demand associated with the proposed project, in addition to the existing and planned future uses, including, but not limited to, agricultural and industrial uses, unless one or more of the following changes occurs:*
>
> > *(1) Changes in the project that result in a substantial increase in water demand for the project.*
> >
> > *(2) Changes in the circumstances or conditions substantially affecting the ability of the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), to provide a sufficient supply of water for the project.*
> >
> > *(3) Significant new information becomes available that was not known and could not have been known at the time when the assessment was prepared.*

## 1.5 Project Relation to the Urban Water Management Plan

On June 15, 2021, the City adopted its *2020 Urban Water Management Plan* (UWMP) by Resolution No. 2021-059, a copy of which is located in Appendix A.[1] The City prepared updates to its *Water Master Plan* and *Recycled Water Master Plan* in June 2020, which include the current unit water demand factors for potable and recycled water as well as ultimate buildout water demand projections (AKM and Stantec, respectively) .The projected water demands of the 2020 UWMP are based on the City's 2020 master plan updates (pertinent excerpts of the master plans are located in Appendix E and K of the 2020 UWMP). This WSA will rely on the 2020 UWMP and updated fiscal year 2023-2024 data from OMUC where possible. The Project land use plan that was used in the master plan updates and 2020 UWMP is shown on Figure 4.

As stated in the 2020 Water Master Plan, "For future developments, water unit demand factors were used to estimate future water use. Potable water unit demand factors are generally based on the factors that were developed as a part of a study completed in May 2016 entitled "Ultimate Citywide Water Demand Estimate" (AKM, p. 4-9). Further, "The residential unit demand factors were first developed in terms of gpd/person. Then the maximum densities (people/du and du/ac) were applied to determine the factors in other units. The resulting unit factors in terms of gpd/du and gpd/ac represent the maximum expected demand factors" (*ibid*). Lastly, the unit water demand factors used for the 2020 UWMP, 2020 Water Master Plan, and herein use recent actual projections of residential densities that are more than those included in the TOP (2010 General Plan) at the time the plans were written (*ibid*).

Pursuant to Water Code, if a project's water demand has been accounted for in the water supplier's most recent UWMP, then the WSA may use the UWMP as the source of the information required in the WSA. The determination as to whether the Project's

[1] The City Council also passed on June 15, 2021, Resolution No. 2021-061 to amend the 2015 UWMP to reflect consistency with the Delta Plan, and Resolution No. 2021-060 to adopt the 2020 Water Shortage Contingency Plan.

water demand has been accounted for in the most recent UWMP is located in Section 2 – Water Demand Analysis.

***Relation of Water Supplier to other Urban Water Management Plans***

The City is a member agency of several water suppliers: Inland Empire Utilities Agency (IEUA), Water Facilities Authority (WFA), Chino Basin Desalter Authority (CDA), and San Antonio Water Company (SAWCo). IEUA obtains water from The Metropolitan Water District of Southern California (MWD). In addition, WFA obtains MWD water through IEUA. Each of these water suppliers has adopted individual 2020 UWMPs (copies of said plans are provided in Appendix D through Appendix H). Further, each of these agencies documented coordination with the City for preparation of said UWMP's and included the City's projected water demands into their individual UWMPs (MWD (p. 1-9), IEUA (p. 2-7), SAWCO (p. 4-6), WFA (p. 4-10), and CDA (p. 4-8)).

**Law**

CWC Section 10910:

> *(c) (1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code* [CEQA]*, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).*
>
> *(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).*
>
> *(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the*

*public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.*

*(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.*

## 1.6 Statewide and Local Water Conservation Efforts

On September 1, 2015, the Ontario City Council adopted Ordinance No. 3027 in response to the statewide Emergency Conservation Regulations mandated at that time by the State Water Resources Control Board. Ordinance 3027 updated the City's Water Conservation Plan that is codified in Chapter 8A, Title 6 of the City's Municipal Code ("Water Conservation Plan").

The City Council adopted its 2020 Water Shortage Contingency Plan in June 2021, which describes the methods to achieve and the implications of reducing water supplies to at least 50 percent (the plan is located in Chapter 8 of the 2020 UWMP). The City and OMUC implement various programs to reduce customer water consumption, including stringent use restrictions, actions, and penalties, as well as public outreach, education, and communication programs.

As of November 2024, the City is in a Voluntary Conservation Stage where the public is encouraged to voluntarily conserve water by reducing the amount of potable water used through various water saving strategies. This includes the following (WSCP, p. 8-8):

- *Avoid hose-washing of sidewalks, driveways, and other parking/paved surfaces.*
- *Cars and other vehicles should be washed by hand, rinsed with a hose with a positive shutoff nozzle, at a commercial car wash, or with recycled water.*
- *Avoid using water to clean, fill or maintain levels in decorative fountains or ponds unless it has a water recycling system.*
- *Encourage restaurants to serve drinking water only to customers who request it.*
- *Promptly repair leaks from indoor and outdoor plumbing fixtures.*
- *Avoid watering lawns, and the like, between 6:00 AM and 6:00 PM.*
- *Prevent water from running off from landscaped areas due to incorrectly directed or maintained sprinklers or excessive watering.*

With the signing of Assembly Bill (AB) 1668 and SB 606, the state has set an Indoor Residential Standard of 55 gallons per capita per day (GPCD) until January 1, 2025, which will decrease to 47 GPCD until January 1, 2030 (CWC section 10609.4(a)). For reference, the per person unit water use factors used by the City in the 2020 UWMP for water demand planning purposes are based on a minimum of 60 gpd/person for high density residential with recycled water, up to 172 gpd/person for rural residential (UWMP, p. 4-10).

## 1.7 Methodology of Analysis

This Assessment follows DWR's, *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001* (DWR 2003). Water Code citations contained herein are current as of January 1, 2023. Section 1 of this Assessment describes the existing and proposed land use designations of the Project site, the proposed Project's relation to a previous WSA and the water supplier's most recent UWMP. Section 2 provides the water demand analysis of the Project; Section 3 reviews the projected water supplies

for the Project; Section 4 contains the required discussion of the water supplier's groundwater supplies; and Section 5 concludes the Assessment by answering the primary question at hand.

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# SECTION 2 - WATER DEMAND ANALYSIS

The purpose of this section is to evaluate whether the proposed Project was considered in the water supplier's planning for water demand. This section will: 1) identify the various water use sectors, 2) identify water demand by those sectors for the next twenty years, and 3) compare the calculated water demand of the proposed Project to the water demand assumed in the most recent UWMP for the same property.

**Law**

CWC Section 10910:

> *(c) (2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).*
>
> *(3) If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.*

## 2.1 Citywide Factors

In addition to climate, a variety of demographic factors may affect water use. The UWMP Act lists several factors that affect water use to be detailed in UWMP's

including climate, current and projected population, density, income, and the mix of customer types (CWC sections 10631(e)(1)-(2)). As suggested by DWR, these data are provided herein and are taken generally from City's 2020 UWMP (Appendix A).

***Climate***

The climate of the City including the Project site can be described as generally mild temperatures and virtually no days below freezing. Summers are dry with average maximum daily temperatures in the high 80s to low 90s. The average annual rainfall is roughly 10.68 inches. (UWMP, p. 3-5)

***Population***

The City is divided into two distinct areas: Old Model Colony (OMC) and Ontario Ranch, which is where the Project is located (Figure 1). The OMC mostly consists of residential, commercial, and industrial developments including the Ontario Airport. Ontario Ranch is currently in the process of a planned conversion from agriculture to residential, commercial, industrial, and public uses.

According to the 2020 UWMP, the OMUC water service area population as of 2020, including both OMC and Ontario Ranch, is estimated at 178,409 persons (UWMP, p. 3-6). Furthermore, the anticipated population at citywide buildout in 2040 is estimated at 362,903 persons as shown in **Table 2-1**, which is an increase of more than 103 percent over 20 years. Most of the anticipated growth will occur through infill, densification in the OMC, and development in Ontario Ranch.

**Table 2-1 OMUC Service Area Population Estimates, 2010-2040**

| | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040[b] |
|---|---|---|---|---|---|---|---|
| Population Served[a] | 163,924 | 168,777 | 178,409 | 232,583 | 266,339 | 300,095 | 362,903 |

Source: UWMP, p. 3-7.
(a) Does not include the portion of the City that receives water service from Cucamonga Valley Water District.
(b) The City estimates buildout by 2040.

The City has considered certain demographic factors in its water management planning, including special housing needs (e.g., low-income earners, single-parent

families, large families, seniors, people with disabilities, and homeless persons) (UWMP, p. 3-7).

## 2.2 City of Ontario's Current and Future Water Demand

As shown in **Table 2-2** (next page), OMUC serves at least 43,280 potable water connections and 551 non-potable connections. The total potable water demand in FY 2023/2024 in the OMUC service area was 28,172 AF and the recycled water demand was 9,180 AF.

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## Table 2-2 Recorded Citywide Water Demand

| Customer Type | 2005[a] | | 2010[a] | | 2015[b] | | 2020[d] | | Current FY 23/24[e] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Volume (AF) | No. of Connections | Volume (AF) | No. of Connections | Volume (AF) | No. of Connections [c] | Volume (AF) | No. of Connections | Volume (AF) | No. of Connections |
| Single-Family Residential | 16,421 | 28,932 | 13,253 | 29,473 | 10,941 | 26,838 | 12,502 | 31,626 | 11,549 | 35,510 |
| Multi-Family Residential | 6,147 | 2,244 | 5,425 | 2,069 | 4,839 | 1,968 | 5,068 | 2,164 | 5,039 | 2,307 |
| Commercial | 8,369 | 3,095 | 6,692 | 3,285 | 6,584 | 3,201 | 5,359 | 3,255 | 4,528 | 3,176 |
| Industrial | 2,402 | 327 | 2,044 | 278 | 1,471 | 268 | 2,078 | 332 | 2,159 | 431 |
| Governmental | 1,178 | 320 | 0 | - | - | - | 538 | - | 456 | 63 |
| Landscape | 6,813 | 1,246 | 7,170 | 1,245 | 4,564 | 1,100 | 4,631 | 1,469 | 4,102 | 1,498 |
| Agriculture | 0 | 0 | 0 | - | - | - | - | - | - | - |
| Other | 378 | 161 | 819 | 308 | 340 | 66 | 368 | - | 339 | 295 |
| Loss | 3,154 | - | - | - | - | - | 1,565 | - | - | - |
| S/T/E | 0 | - | 0 | - | 206 | - | - | - | - | - |
| Subtotal Potable | 44,863 | 36,325 | 35,403 | 36,658 | 28,945 | 33,441 | 32,109 | 38,846 | 28,172 | 43,280 |
| Recycled Water | 1,829 | - | 1,547 | 178 | 7,208 | 279 | 7,812 | 444 | 9,180 | 551 |
| Total Potable and Recycled | 46,692 | 36,325 | 36,950 | 36,836 | 36,153 | 33,720 | 39,921 | 39,290 | 37,352 | 43,831 |

Note: AFY = acre feet; S/T/E = sales/transfers/exchanges.
(a) AKM 2011, pp. 3-2, 3-5.
(b) UWMP 2016, pp. 2-1, 4-2, Appendix B.
(c) CY 2015 Annual Report to Division of Drinking Water.
(d) 2020 UWMP, pp. 4-3 and 4-5. These values represent data from fiscal year 19/20.
(e) From OMUC(e), 2024.

The OMUC water demands from 2025 to 2045 as forecasted in the 2020 UWMP are shown in **Table 2-3** (UWMP, p. 4-3).

### Table 2-3 Future Citywide Water Demand (AFY)

| Customer Type | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Single Family Residential | 15,723 | 17,540 | 19,109 | 22,431 | 22,431 |
| Multifamily Residential | 6,374 | 7,110 | 7,746 | 9,093 | 9,093 |
| Commercial | 6,740 | 7,519 | 8,191 | 9,615 | 9,615 |
| Industrial | 2,613 | 2,915 | 3,176 | 3,728 | 3,728 |
| Institutional / Governmental | 677 | 755 | 822 | 965 | 965 |
| Landscape | 5,824 | 6,497 | 7,078 | 8,309 | 8,309 |
| Losses | 1,968 | 2,196 | 2,392 | 2,808 | 2,808 |
| Other | 463 | 5156 | 562 | 660 | 660 |
| Subtotal Potable Demand[(a)] | 40,382 | 45,048 | 49,076 | 57,609 | 57,609 |
| Recycled Water Demand[(b)] | 12,168 | 13,465 | 14,762 | 16,059 | 16,059 |
| Total Water Demand | 52,550 | 58,513 | 63,838 | 73,668 | 73,668 |

Notes: AFY = acre-feet per year; Does not include areas within the City that are not served by OMUC. Buildout assumed for 2040.

(a) 2020 UWMP, p. 4-4.

(b) 2020 UWMP, p. 4-5. Agricultural water demands are included in recycled water retail demands.

Water use patterns change during dry years. The expected changes to water demand and water supply during dry years are provided in Section 3 – Water Supply Analysis.

The City's 2020 UWMP and 2020 Water Master Plan assume the same trends in future land use changes within the City. In 2017, the City land use was nearly an equal balance of residential, commercial / industrial, and agricultural as shown in **Figure 5**. Agricultural use is projected to be completely replaced with residential, commercial, and industrial by buildout (2040) as shown in **Figure 6**.

**Figure 5 – Existing (2017) Land Uses in the City (acres)**

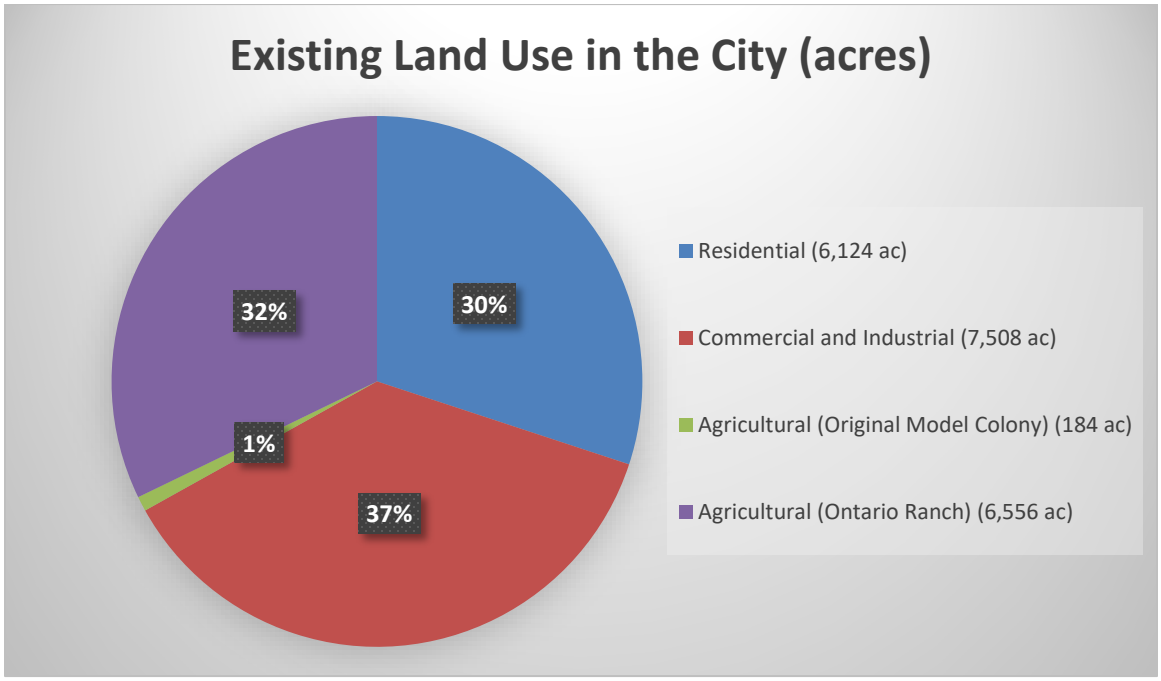


*Source: 2020 UWMP, p. 3-8.*

**Figure 6 – Land Use in the City at Buildout (acres)**

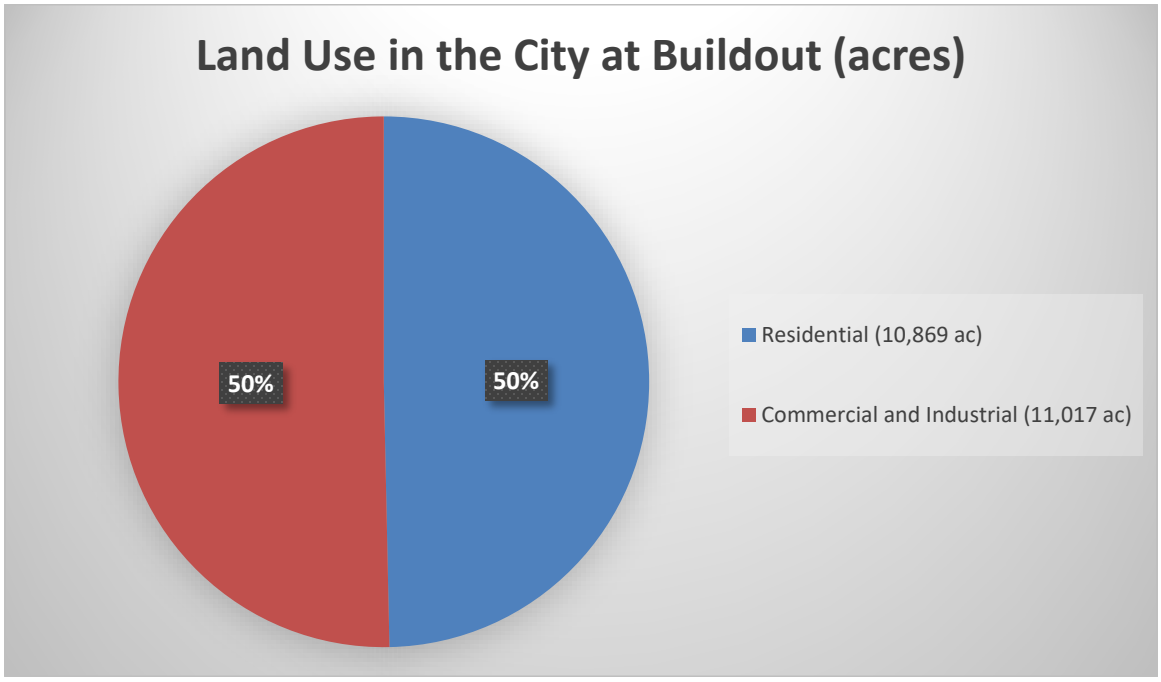


*Source: 2020 UWMP, p. 3-8.*

## 2.3 Project Site Land Use Assumed in the UWMP

The City's 2020 Water Master Plan and 2020 UWMP used the General Plan land use plan (current as of May 2017) to calculate projected water demands, which is shown in Figure 4. Using the City's unit water demand factors, the estimated potable and recycled water demands for the parcels within the Project limits that was accounted for in the 2020 UWMP are shown in **Table 2-4**. Refer to **Spreadsheet 1** at the end of the report for detailed calculations.

**Table 2-4 Water Demand of the Project Site Land Uses Assumed in the UWMP**

| Land Use Designation[a] | Gross Acres | Potable Water Demand (AFY)[b] | Recycled Water Demand (AFY)[c] | Total Water Demand (AFY) |
|---|---|---|---|---|
| Medium Density Residential (11.1 – 25.0 du/ac) | 146 | 1,092 | 123 | 1,215 |
| Open Space-Recreational | 67 | 75 | 177 | 252 |
| General Commercial (0.30 FAR) | 44 | 89 | 55 | 144 |
| **Total** | **257** | **1,257** | **355** | **1,611** |

Notes: AFY = acre feet per year; FAR = floor to area ratio; du/ac = dwelling unit per acre. Refer to Spreadsheet 1. Values are rounded.

(a) Source: "Future Land Use Map Figure 2-5" from City of Ontario Potable Water Master Plan Update located in Appendix E of the 2020 Ontario Water Master Plan.

(b) Potable unit water demand factors from AKM 2020, p. 4-10.

(c) Recycled water demand factors from Stantec 2020, p. 5.26.

## 2.4 Proposed Project Water Demand

The potable and recycled water demands of the proposed Project (Figure 3) using the City's current unit water demand factors for potable and recycled water is detailed in **Spreadsheet 2** and summarized in **Table 2-5**.

### Table 2-5 Proposed Project Water Demand

| Land Use Designation | Gross Acres | Potable Water Demand (AFY) | Recycled Water Demand (AFY) | Total Water Demand (AFY) |
|---|---|---|---|---|
| Medium Density Residential (11.1 – 25.0 du/ac) | 145.8 | 1,092 | 123 | 1,215 |
| Mixed Use – Residential | 31.0 | 167 | 52 | 219 |
| Mixed Use – Retail | 8.9 | 18 | 15 | 33 |
| Mixed Use - Office | 4.4 | 12 | 7 | 20 |
| Open Space - Recreational | 56.0 | 63 | 147 | 210 |
| Open Space - Non-Recreational | 11.3 | 13 | - | 13 |
| **Total** | **257.34** | **1,365** | **344** | **1,709** |

Notes: PA = Planning Area; AFY = acre feet per year. Refer to Spreadsheet 2. Values are rounded.
(a) Potable unit water demand factors from AKM 2020, p. 4-10.
(b) Recycled water demand factors from Stantec 2020, p. 5.26.

#### *Conclusion*

The Project analyzed by this WSA is the proposed CenterPark Specific Plan. The estimated total water demand (potable plus non-potable) of the Project area as presented in the 2020 UWMP is approximately 1,611 AFY (Table 2-4). The estimated total water demand of the proposed CenterPark Specific Plan as currently proposed is approximately 1,709 AFY (Table 2-5), which is an increase of 98 AFY compared to what was assumed in the demand projections of the UWMP. Because the City's water demand projections in the 2020 UWMP were based on a land use scenario with a lower water demand than that which is proposed by the Project, it can be deduced that the water demand for the proposed Project was not fully accounted for in the most recently adopted 2020 UWMP.

# SECTION 3 - WATER SUPPLY ANALYSIS

This section identifies the sources of potable water that are available to the water supplier of the proposed Project. The purpose of this section is to evaluate the water supplies that could be used by the proposed Project during normal, single-dry, and multiple-dry water years during a 20-year projection.

OMUC is the City's water supplier and the water supplier for the proposed Project. OMUC has the following sources of water supply: City wells in the Chino Groundwater Basin; treated groundwater from the Chino Desalter Authority (CDA); recycled water from Inland Empire Utilities Agency (IEUA); purchased water from San Antonio Water Company (SAWCo); and imported water from the Water Facilities Authority (WFA).

**Law**

CWC Section 10910:

> (d) (1) *The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts.*
>
> *(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:*
>
> *(A) Written contracts or other proof of entitlement to an identified water supply.*
>
> *(B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.*

*(C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.*

*(D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.*

## 3.1. Documenting Wholesale Water Supplies

Many retail water suppliers in California including OMUC, receive supplies from one or more water wholesalers. SB 610 requires the WSA to document wholesale supplies by: 1) describing the quantities of water received from each wholesaler in prior years; 2) identifying existing entitlements, water rights, and/or water service contracts held by the City for the wholesale supply; 3) provide proof of entitlements, water rights, service contracts, relevant capital outlay programs, and construction permits for necessary infrastructure to deliver wholesale supplies, if any; and 4) regulatory approvals required to convey or deliver the wholesale supply.

***Wholesale Supplies Received***

OMUC receives wholesale water from the WFA who purchases untreated imported water from IEUA, who in turn obtains it from The Metropolitan Water District of Southern California (MWD). WFA and IEUA are both wholesale water suppliers and IEUA is a member agency of MWD. MWD is a wholesaler and contractor for State Water Project water imported from northern California. State Water Project water is available as stipulated by DWR in response to the hydrology and environmental regulations that can change available supply.[2] Therefore, imported water supplies to southern California can be highly variable; in December 2021 for example, the allocation of State Water Project water to all contractors was temporarily reduced to 0 percent due to persistent drought conditions.[3] And on April 20, 2023, DWR announced 100 percent of requested water supplies throughout the year would be available. The

[2] DWR, *State Water Project Delivery Capability Report*, published every 2 years, as well as "Notice to State Water Project Contractors" issued as often as needed.
[3] Source: *State Water Project Historical Table A Allocations* (available at https://water.ca.gov/programs/state-water-project/management/swp-water-contractors)

current SWP allocation is 40 percent.[4] Nonetheless, MWD has projected 100 percent water supply reliability over the next 20 years (2025-2045) during average, single-dry, and multiple-dry years in its 2020 UWMP (MWD UWMP, pp. ES-6 and ES-7).

The amount of imported water purchased by IEUA from MWD is limited by a purchase order agreement that allows IEUA to purchase up to 93,283 acre-feet per year (AFY) at its lowest rate (Tier I) through Dec. 31, 2024 (IEUA Resolution no. 2014-12-1 located in Appendix I). The purchase order agreement includes an annual minimum purchase commitment of 39,835 AFY, which is slightly less than the minimum operational need of the region's water treatment facilities (i.e., 40,000 AFY; WFA's Agua de Lajos Treatment Plant (81 mgd capacity), Fontana Water Company's Sandhill Surface Water Treatment Plant (29 mgd capacity), CVWD's Lloyd W. Michael Water Treatment Plant (60 mgd capacity) (IEUA 2016 IWRP, p. 36). Resolution 2014-12-1 also establishes how much water WFA, Cucamonga Valley Water District, and Fontana Water Company may purchase from IEUA, up to 69,572 AFY (IEUA 2020 UWMP, p. 2-6).

The WFA was formed in 1980 as a Joint Powers Authority by the cities of Chino, Chino Hills, Ontario, Upland, and the Monte Vista Water District in order to construct and operate water treatment facilities for providing supplemental potable water to the member agencies. In 1985, the City established an agreement to purchase capacity in the WFA water treatment plant; a copy of which is located in Appendix J. Then, in 1988 the WFA finished construction of the Agua de Lejos Water Treatment Plant (WTP) in Upland to treat the imported water from IEUA and MWD to meet drinking water standards.

Currently, the Agua de Lejos WTP has the capacity to treat and disinfect 81 million gallons per day (mgd). Recorded flows through the Agua de Lejos WTP have ranged from 40 to 50 mgd during the peak summer months and can be as low as 9-12 mgd

[4] Department of Water Resources, *Notice to State Water Project Contractors No. 24-04*, April 23, 2024 https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/SWP-Water-Contractors/Files/24-04-2024-allocation-increase--40-percent-042304.pdf ).

during winter months.[5] As documented in WFA Ordinance No. 99-07-02 (located in Appendix K), the City owns 31.4 percent of the plant capacity of the Agua de Lejos WTP. As of 2020, that proportion is equivalent to approximately 25 mgd (28,004 AFY) (AKM 2020, p. 3-2). OMUC can purchase up to 9,915 AFY (8.9 mgd) of imported supply through WFA at Tier 1 rates. Beyond that amount, OMUC could continue to purchase at Tier 2 rates.

In FY 23/24, OMUC purchased 5,505 AF of wholesale water from the WFA (OMUC(e), 2024). The actual and projected wholesale water supplies available to WFA through 2045 are shown in **Table 3-1**.

### Table 3-1 Wholesale Water Supplies Available to WFA (AFY)

| Wholesale Water | 2015[(a)] | 2020[(b)] | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|
| | Actual | | Projected[(b)] | | | | |
| WFA (potable) | 14,864 | 25,492 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |

Note: WFA = Water Facilities Authority; AFY = acre feet per year.
(a) Data for 2015 Actual from *IEUA and WFA 2015 UWMP*, pp. 3-9 – 3-10.
(b) Data for 2020 Actual and 2025 through 2045 Projected from *WFA 2020 UWMP* (p. 6-18, (Appendix F)).

To reduce dependence on imported water supplies, OMUC joined the "Dry Year Yield Storage Program," which is described below.

#### *Dry Year Yield Storage Program*

The Dry Year Yield (DYY) storage program is a cooperative Conjunctive Use Program Agreement between MWD, IEUA, Chino Basin Watermaster, Three Valleys Municipal Water District, and the Chino Basin groundwater producers (Agreement No. 49960 [DYY 2014]). Under the DYY Program, MWD can store up to 100,000 AFY of water in the Chino Groundwater Basin during wet years when surplus water is available, and to reduce imported water deliveries up to 33,000 AFY in dry, drought, or emergency

[5] Source: (http://www.wfajpa.org/#Facilities)

periods, but not to exceed the amount of water in the MWD storage account (OMUC 2020 UWMP, p. 6-18). The program expires in 2028.

In 2003, the City executed an agreement with IEUA to participate in the DYY program. The DYY Agreement was amended in September 2014 to clarify storage measurement and extraction from the MWD storage account, define baseline conditions in calculations of performance targets, define procedures for variances in performance targets, revise administrative milestones, and make miscellaneous updates (refer to Appendix L for original agreement and amendments). The 2014 DYY amendments also provided for a minimum imported water delivery of 40,000 AFY during "call" years, establishing minimum needs for direct deliveries from MWD. As of June 30, 2020, the storage balance in the DYY account is 45,961 AF (OMUC 2020 UWMP, p. 6-18).

Participation in the DYY program obligates OMUC to reduce its use of imported water from WFA by a fixed amount, known as the "shift obligation" when MWD makes a "call" for their water stored in the Chino Basin. OMUC's shift obligation is 8,076 AFY, which is the amount OMUC purchases from WFA during a baseline year (OMUC 2020 UWMP, p. 6-33). OMUC purchases an additional 2,000 AFY from WFA that is then sold to neighboring water supplier Jurupa Community Services District (JCSD) who does not have an imported water connection.

In 2014, JCSD entered into an agreement with the City to participate in the DYY program (a copy of which is located in Appendix L). During years when MWD makes a "call" for the water in their storage account, OMUC will decrease its purchase of WFA imported water by a combined total of 10,076 AF (8,076 AF plus 2,000 AF) compared to the previous year. To meet its obligation in the DYY program during a "call" year, JCSD will deliver 2,000 AF to OMUC from the Chino Basin Desalter Authority (CDA).[6]

DYY funds from DWR local assistance grants were used for the construction of three OMUC groundwater wells (Wells 45, 46, and 47) and an ion-exchange facility located at

[6] Assuming JCSD's imported water baseline is 2,000 AFY (JCSD 2014).

John Galvin Park to treat water extracted from Wells 44 and 52. When MWD makes a "call" for its stored water, OMUC can operate these facilities to meet its shift obligation. MWD will then pay for the cost of operations and OMUC would pay MWD (through IEUA) the full-service water rate. OMUC can use the DYY facilities to meet its normal water demands during other periods, but OMUC is responsible for the well operation and maintenance costs (OMUC 2020 UWMP, p. 6-33).

The additional groundwater capacity provided by this program allows OMUC to increase the percentage supply used to meet peak demands and allow OMUC to be less reliant upon imported water supplies (OMUC 2020 UWMP, p. 6-33).

### 3.2. Documenting Water Supplies

The 2020 UWMP states approximately 46 percent of OMUC's water supply comes from groundwater, 34 percent from imported water, and 20 percent of supply is from recycled water (OMUC 2020 UWMP, p. 6-37).

The recorded water supplies available to OMUC from 2000 through FY 2023/2024 are provided in **Table 3-2** (next page) and the projected water supplies available to OMUC from 2025-2045 according to the 2020 UWMP are provided in **Table 3-3.** Each water supply source is identified as a water supply entitlement, water right, or water service contract per SB 610 guidance. Appropriative rights to groundwater are discussed in Chapter 4 – Groundwater Analysis.

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## Table 3-2 Recorded OMUC Water Supplies (AFY)

| Source | 2000[a] | 2005[b] | 2010[c] | 2015[d] | 2020[e] | 2021[f] | 2022[f] | 2023[j] | 2024[k] | Form of Right | Amount of Right |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Wells | 36,862 | 28,799 | 20,955 | 19,544 | 18,395 | 17,171 | 14,390 | 16,933 | 14,502 | Appropriative | Varies (see Sec. 4) |
| Purchased WFA | 9,258 | 13,406 | 8,923 | 6,413 | 6,513 | 5,851 | 5,687 | 4,056 | 5,505 | Capacity Ownership | 25 mgd (31.4% of plant capacity) |
| CDA | - | - | 5,000 | 3,543 | 6,636 | 7,337 | 8,927 | 8,668 | 8,680 | Capacity Ownership | 8,533 AFY |
| SAWCo | - | - | - | 443 | 565 | 500 | 430 | 413 | 485 | Share-holder Entitlement | 600 AFY |
| Subtotal Potable | 46,120 | 42,205 | 34,878 | 29,943 | 32,109 | 30,859 | 29,434 | 30,070 | 29,172 | -- | -- |
| Recycled Water | 700[g] | - | 1,547 | 3,859[h] | 7,812[i] | 8,557[i] | 9,593[i] | 8,790[i] | 9,180[i] | Contract | Ontario's share of sewage flows. |
| Total Supply | 46,820 | 42,205 | 36,425 | 33,802 | 39,921 | 39,416 | 39,027 | 38,860 | 38,352 | -- | -- |

Notes: WFA = Water Facilities Authority; CDA = Chino Basin Desalter Authority; SAWCo = San Antonio Water Company; FY = fiscal year; AFY = acre-feet per year; mgd = million gallons per day.

(a) Webb 2004, p. 21.

(b) AKM 2011, pp. 3-8 and 5-12.

(c) AKM 2011, p. 4-2.

(d) OMUC UWMP 2016, p. 6-16.

(e) OMUC 2020 UWMP, Table 6-8. These values represent fiscal year 19/20.

(f) Provided by OMUC(b). These values represent fiscal year 20/21 and fiscal year 21/22, respectively.

(g) Webb 2004, p. 29.

(h) Does not include recycled water for agriculture deliveries (3,349 AF).

(i) The City's recycled water usage.

(j) Provided by OMUC(d), 2023.

(k) Provided by OMUC(e), 2024.

## Table 3-3 Projected OMUC Water Supplies (AFY)

| Source | 2025 | 2030 | 2035 | 2040 | 2045 | Form of Right | Amount of Right |
|---|---|---|---|---|---|---|---|
| Wells | 20,249 | 22,915 | 24,943 | 31,476 | 31,476 | Appropriative | Varies (see Sec. 4) |
| Purchased | | | | | | | |
| WFA | 11,000 | 13,000 | 15,000 | 17,000 | 17,000 | Capacity ownership | 25 mgd (31.4% of plant capacity) |
| CDA | 8,533 | 8,533 | 8,533 | 8,533 | 8,533 | Capacity Ownership | 8,533 AFY |
| SAWCo[(a)] | 600 | 600 | 600 | 600 | 600 | Shareholder entitlement | 600 AFY |
| Subtotal Potable | 40,382 | 45,048 | 49,076 | 57,609 | 57,609 | -- | -- |
| Recycled | 12,168 | 13,465 | 14,762 | 16,059 | 16,059 | Contract | Ontario's share of sewage flow. |
| Total Supply | 52,550 | 58,513 | 63,838 | 73,668 | 73,668 | -- | -- |

Note: AFY = acre feet per year; FY = fiscal year; mgd = million gallons per day.
Source: OMUC 2020 UWMP, Table 6-9, p. 6-38.
(a) According to SAWCo's 2020 UWMP, the estimated projected annual water demands for OMUC for 2025 through 2045 is 601 AFY.

OMUC anticipates increasing its total water supply by pursuing: 1) full utilization of OMUC's groundwater rights in the Chino Basin allowed under the Chino Basin Groundwater Adjudication Judgment (including increased groundwater recharge with stormwater and recycled water described in Section 4); 2) expanding use of recycled water; and 3) expanding use of desalter water (OMUC 2020 UWMP, p. 6-38).

### *Water Supply Capacities*

The capacity of each source of supply available to OMUC is provided in the 2020 Ontario Water Master Plan (AKM 2020), which is provided in Appendix B. The capacity of the supply system refers to the maximum production or conveyance rate based on the pumps and infrastructure. For example, the capacity of groundwater wells refers to a pumping rate based on running the pumps at full utilization, 24-hours a day, 7 days a week. Although this maximum rate of pumping is assumed in terms of comparing capacities, pumps are rarely used at more than two-thirds capacity. Knowing the

system capacity is important to ensure OMUC can meet all demands imposed upon the system, specifically meeting "average day demand" and "maximum day demand." Demand can be met with multiple supply sources, storage, or a combination of both. OMUC's reservoirs are not discussed in this Assessment, however, according to the master plan reservoirs are used to regulate hourly fluctuations in demand, provide fire flow, and supplement supply during an extended outage of a source including emergency storage (AKM 2020, p. 7-3). The City's emergency storage capacity criterion is set at one average day demand (AKM 2020, p. 10-2).

According to the 2020 Water Master Plan, OMUC is required to meet the following water supply criterion from the California Code of Regulations Related to Drinking Water: "a minimum source of supply equal of one maximum day demand of the service area" (AKM 2020, p. 10-1). Further, OMUC has set a design criterion in its 2020 Water Master Plan that "requires a source of supply equal to one average day demand (19,280 gpm) from local sources" (AKM 2020, p. 10-1). As the land uses and population change in OMUC service area, so do the average and maximum day demands. The existing (2020) maximum capacities of existing sources of supply available to OMUC are provided in **Table 3-4**.

### Table 3-4 Existing (2020) Supply Capacities

| Source | AFY | mgd | gpm |
|---|---|---|---|
| Existing Wells[(a)] | 62,269 | 55.6 | 38,604 |
| WFA at Aqua de Lejos WTP | 17,259 | 15.4 | 10,700 |
| CDA from Chino I & II Desalter | 8,533 | 7.62 | 5,290 |
| Total Existing Capacity[(a)] | 88,061 | 78.62 | 54,594 |

Note: AFY = acre-feet per year; mgd = million gallons per day; gpm = gallons per minute.

Source: Table 10-2 of AKM 2020 (Appendix B). OMUC confirmed for this Assessment that as of 4/12/23, these capacities have not changed.

(a) Assuming wells operate 24 hours per day for 365 days per year.

The maximum capacities of the 'ultimate' sources of supply available to OMUC according to the City's 2020 Water Master Plan, are provided in **Table 3-5**.

### Table 3-5 Ultimate Supply Capacities

| Source | AFY | mgd | gpm |
|---|---|---|---|
| Existing Wells | 62,269 | 55.6 | 38,604 |
| Future Wells | 48,068 | 42.9 | 29,800 |
| Subtotal[(a)] | 110,337 | 99 | 68,404 |
| WFA at Aqua de Lejos WTP | 17,259 | 15.4 | 10,700 |
| CDA from Chino I & II Desalter | 8,533 | 7.62 | 5,291 |
| Total | 136,129 | 121.52 | 84,395 |

Note: AFY = acre-feet per year; mgd = million gallons per day; gpm = gallons per minute.
Source: Table 12-2 of AKM, 2020 (Appendix B).
(a) Assuming wells operate 24 hours per day for 365 days per year.

As described in the 2020 Ontario Water Master Plan, the combined ultimate capacity of existing and future wells is approximately 68,404 gpm (Table 3-5), which is about 192% of the future average day demand (35,716 gpm) and therefore meets the City and state supply criterion for average day demand coming from local sources (p. 12-1). OMUC confirmed for this Assessment that the capacities shown in Tables 3-4 and 3-5 have not changed since the 2020 Water Master Plan (OMUC 2024).

In addition, the ultimate supply capacity is equivalent to 84,395 gpm, which is about 154% of the City's future maximum day demand (54,778 gpm); therefore, the City is capable of providing the full projected maximum day demand (AKM 2020, p. 12-1). However, under ultimate conditions the supply capacity will require additional future wells, as shown in Table 3-5 to meet the water supply criterion for maximum day demand.

## 3.3. Descriptions of All Water Supply Projects

### *City Well Production*

OMUC currently owns 17 active groundwater wells in the Chino Basin (AKM 2020, p. 6-1). The Chino Basin is one of the largest groundwater basins in southern California,

with an estimated 5 million AF,[7] with another 1 million AF in additional storage capacity. OMUC is planning future wells in the 925 Pressure Zone serving Ontario Ranch with a combined additional supply capacity of 29,800 gpm (48,068 AFY) (Table 3-5) (AKM 2020, p. 12-1).

During FY 23/24, OMUC wells produced 14,502 AF from the Chino Basin (OMUC(e), 2024). OMUC's existing well capacity is approximately 62,269 AFY (Table 3-4).[8] The recorded extractions from OMUC wells between FY 2016 and 2024 are shown in **Table 3-6.**

### Table 3-6 Recorded Groundwater Production, FY 2016-2024 (AFY)

| Supply | 2016 | 2017 | 2018 | 2019 | 2020 | 2021[(a)] | 2022[(b)] | 2023[(c)] | 2024[(d)] |
|---|---|---|---|---|---|---|---|---|---|
| City wells in Chino Basin | 22,751 | 24,672 | 26,109 | 19,604 | 18,395 | 17,171.1 | 14,390 | 16,933 | 14,502 |

Note: AFY = acre feet per year. Data shown are Fiscal Years.
Source (2016-2020): OMUC 2020 UWMP, p. 6-19, Table 6-1 (Appendix A).
(a) CBWM 2021, p. 9.1.
(b) CBWM 2022, p. 9.1
(c) CBWM 2023, p. 9.1
(d) CBWM 2024 (draft).

As of 2020, approximately 46 percent of OMUC water supply came from groundwater pumped by OMUC wells in the Chino Basin. OMUC strives to maximize local water supplies and minimize the need for imported water from other regions (OMUC 2020 UWMP, p. 1-5). A thorough description of the City's groundwater rights pursuant to SB 610 guidance is provided in Section 4 – Groundwater Analysis.

#### *Chino Basin Desalter Authority (CDA) Groundwater Production*

OMUC is a member of the CDA, a joint exercise of powers agency created on September 25, 2001, along with JCSD, Santa Ana River Water Company, IEUA, and

[7] The *2020 Safe Yield Recalculation Final Report* (May 15, 2020) indicates the estimated total volume of water in storage was 12.6 million AF in July 2018 (WEI 2020, p. 6-15).
[8] Assuming wells operate 24 hours per day for 365 days per year.

the cities of Chino, Chino Hills, and Norco. Western Municipal Water District joined CDA on April 2, 2009. The goals of the CDA are:

- Achieve hydraulic control of the Chino Basin to prevent contaminated Chino Basin groundwater from entering Santa Ana River;
- Remove contamination (primarily nitrates, as well as TCE, PCE, and TCP) from groundwater in the southern portion of the Chino Basin; and
- Deliver the treated water to member agencies to offset the need for imported water.

CDA provides high-quality drinking water to CDA members through "take or pay" contracts. CDA operates 30 wells and two desalters (salt removers) that treated approximately 35,003 AF of Chino Basin groundwater in 2020 (CDA 2020 UWMP, p. 6-27). In the future, "CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Santa Ana Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies" (CDA 2020 UWMP, p. 6-27). Capacity ownership by member agencies is a percentage based on the CDA capacity, of which 40,000 AFY correlates to 8,533 AFY for Ontario; therefore, when CDA's capacity increases (or decreases), OMUC can purchase more (or less) than 8,533 AFY.

The Chino I Desalter, located at 6905 Kimball Avenue in Chino, was completed in 2000 and expanded in August 2005 to its current rated capacity of 14.2 mgd (CDA 2020 UWMP p. 6-8). However, the Chino I Desalter cannot provide this rated capacity due to the high Total Dissolved Solids (TDS) in the raw groundwater supply. The Chino II Desalter was completed in 2006 and is located at 11202 Harrel Street in the City of Jurupa Valley. The current rated capacity of Chino II Desalter is 33 mgd (CDA 2020 UWMP, p. 6-8).

Although Chino Desalter I capacity will not be increased, additional raw water capacity is provided by five new CDA wells in the Chino Creek Well Field. All five wells have been drilled and equipped.

In FY 23/24, OMUC purchased approximately 8,680 AF from CDA (Table 3-2). As shown in Table 3-3, the water supply from CDA to OMUC is projected to stay at the City's current capacity ownership amount of 8,533 AFY. The City's capacity rights to CDA are described in Section 4 – Groundwater Analysis.

***Inland Empire Utilities Agency (IEUA) Recycled Water Supply***

OMUC purchases recycled water supplies from IEUA. IEUA treats the City's wastewater at its four regional wastewater reclamation plants. IEUA provides wastewater treatment services to seven Contracting Agencies, including the City of Ontario. OMUC has been using recycled water produced by IEUA since 1972. Currently, recycled water is used in the City for agricultural irrigation, landscape irrigation, golf course irrigation, and industrial purposes.

As stated in the City's 2020 UWMP, the City has the right of first purchase of their Base Entitlement. "Base Entitlement is defined as the total quantity of sewage delivered into the Regional Sewerage System by the Contracting Agency less normal processing losses resulting from the treatment of sewage" (OMUC 2020 UWMP, p. 6-21). In FY 23/24, this amount was 14,104 AF (OMUC(e), 2024). OMUC's utilization of the recycled water available to them (proportion of their base entitlement) has varied between 62 percent in FY 19/20 to 73 percent in FY 21/22 to 65 percent in FY 23/24 (Table 3-2). Recorded and projected supplies of recycled water available to OMUC are listed in **Table 3-7**.

### Table 3-7 Recorded and Future Recycled Water Supply (AFY)

| Beneficial Use Type | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Agricultural irrigation | 2,905 | 1,704 | 1,136 | 568 | 0 | 0 |
| Landscape irrigation | 3,290 | 7,088 | 8,612 | 10,136 | 11,659 | 11,659 |
| Golf course irrigation | 631 | 660 | 680 | 700 | 720 | 720 |
| Industrial use | 986 | 2,716 | 3,037 | 3,358 | 3,680 | 3,680 |
| Total | 7,812 | 12,168 | 13,465 | 14,762 | 16,059 | 16,059 |

Note: AFY = acre feet per year

Source: OMUC 2020 UWMP, p. 6-28 (Appendix A). Ontario reports in Fiscal Years. Buildout estimated for 2040.

Over the next 20 years, landscape irrigation is projected to have the greatest increase in demand for recycled water followed by industrial use within the OMUC service area. Agricultural properties are expected to convert to more urban land uses, while supplies to golf courses are expected to remain relatively stable. (OMUC 2020 UWMP, p. 6-28).

IEUA has prepared recycled water studies, plans, and strategy documents to bring a regional recycled water delivery system to fruition. OMUC updated their Recycled Water Master Plan in 2020 (located in Appendix C) to fully coordinate with IEUA's recycled water planning efforts.

***San Antonio Water Company (SAWCo) Potable Water Supply***

SAWCo is a mutual water company and corporation located in Upland. SAWCo has provided water service to its active shareholders for over 135 years. Although SAWCo does not technically meet the threshold as a retailer or wholesale water agency that needs to prepare an UWMP, they have done so nonetheless in 2020.

SAWCo supplies water based on entitlement only, which is based on the number of shares held. The number of shares is finite and considered a commodity that can be divided or sold. The "entire water of the company" and the current entitlement for

2020 is equivalent to 12,570 AFY, which distributed among the 6,178 shares. The volume per share is subject to change (OMUC 2020 UWMP, p. 6-8).

The City owns 295 shares of SAWCo, which equates to a current entitlement of 600 AFY of potable water to OMUC (OMUC 2020 UWMP, p. 6-8). In FY 23/24, OMUC received an actual volume of 485 AF (Table 3-2). OMUC has forecasted that future available supplies will be 600 AFY from 2025 to 2045 (Table 3-3). The City receives water from SAWCo indirectly through a connection made in 2015 from SAWCo to the WFA.

SAWCo water supplies are a mixture of potable and non-potable water from San Antonio Creek, the San Antonio Tunnel and three groundwater basins: Chino Basin, Cucamonga Basin, and Six Basins (OMUC 2020 UWMP, p. 6-9). No new sources of supply are anticipated to be developed by SAWCo over the planning horizon. Actual supply available to SAWCo in 2020 totaled 2,584 AF of potable supply and 13,762 AF of non-potable supply. In their 2020 UWMP, SAWCo estimates for 2025 and 2030 that reasonably available supplies will be 15,260 AFY (SAWCo 2020 UWMP, p. 5-10).

In terms of future reliability, SAWCo has stated the following in its 2020 UWMP (p. 6-4): "SAWCo expects to meet demands under all water year scenarios with existing supply sources." In addition, SAWCo has future transfer and exchange projects planned to mutually benefit certain shareholders during an emergency, including OMUC. SAWCo has completed projects in 2022 to increase storage and capture all raw water released through the Frankish Tunnel (SAWCo 2020 UWMP, p. 5-7).

## 3.4 Documenting Normal Year Water Supply and Demand

OMUC has assumed in its 2020 UWMP that customer water demand and available water supply are equal during "normal" precipitation years. The normal year water supplies available to OMUC, as well as the normal year water demand projections are compared in **Table 3-8,** which are based on the City's 2020 Water Use Target of 196 GPCD for potable water demands (OMUC 2020 UWMP, p. 7-9). OMUC has estimated

that sufficient supply will be available during any normal year occurring between 2025 and 2045.

**Table 3-8 OMUC Projected Normal Year Supply and Demand (AFY)**

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 52,550 | 58,513 | 63,838 | 73,668 | 73,668 |
| Demand | 52,550 | 58,513 | 63,838 | 73,668 | 73,668 |
| Difference | 0 | 0 | 0 | 0 | 0 |

Note: AFY = acre feet per year
From OMUC 2020 UWMP, p. 7-10 (Appendix A).

## 3.5 Documenting Dry Year Water Supply and Demand

The following assumptions are made in OMUC's 2020 UWMP to estimate future water supplies and demands during a single dry year:

- *The ratio of total water supplies (including potable and recycled water supplies) available to the City during a historical normal year in FY 19/20 (39,921 AF) and during a historical single dry year in FY 17/18 (43,346 AF) were used to estimate the City's projected water demands during single dry years (p. 7-9).*
- *Water losses have been included in the potable water demands as 7 percent of the annual demand.*

OMUC has determined that the water demands during single dry years over the next 25 years will be met, as shown in **Table 3-9**.

### Table 3-9 OMUC Projected Single Dry Year Supply and Demand (AFY)

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply | 57,058 | 63,534 | 68,847 | 79,989 | 79,989 |
| Demand | 57,058 | 63,534 | 68,847 | 79,989 | 79,989 |
| Difference | 0 | 0 | 0 | 0 | 0 |

Note: AFY = acre feet per year
From OMUC 2020 UWMP, p. 7-10 (Appendix A).

## 3.6 Documenting Multiple Dry Year Supply and Demand

OMUC has projected that the City can meet water demands during future five consecutive year drought periods, as shown in **Table 3-10** (next page).

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### Table 3-10 OMUC Projected Multiple Dry Year Supply and Demand (AFY)

| | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| **First Year** | Supply | 56,080 | 62,445 | 67,667 | 78,618 | 78,618 |
| | Demand | 56,080 | 62,445 | 67,667 | 78,618 | 78,618 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| **Second Year** | Supply | 56,248 | 62,632 | 67,870 | 78,853 | 78,853 |
| | Demand | 56,248 | 62,632 | 67,870 | 78,853 | 78,853 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| **Third Year** | Supply | 59,493 | 66,246 | 71,786 | 83,403 | 83,403 |
| | Demand | 59,493 | 66,246 | 71,786 | 83,403 | 83,403 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| **Fourth Year** | Supply | 54,268 | 60,428 | 65,481 | 76,078 | 76,078 |
| | Demand | 54,268 | 60,428 | 65,481 | 76,078 | 76,078 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| **Fifth Year** | Supply | 47,436 | 52,820 | 57,237 | 66,500 | 66,500 |
| | Demand | 47,436 | 52,820 | 57,237 | 66,500 | 66,500 |
| | Difference | 0 | 0 | 0 | 0 | 0 |

Note: AFY = acre-feet per year
From OMUC 2020 UWMP, p. 7-11, Table 7-4 (Appendix A).

## 3.7 Comparison of Available Water Supply and Demand

As shown in Table 3-3 and Table 3-9, the future water supplies available to OMUC are projected to meet the projected water demands for the service area. As of 2020, OMUC can purchase up to 9,915 AFY (8.9 mgd) of imported supply through WFA at Tier 1 rates. Beyond that amount, OMUC could continue to purchase at Tier 2 rates (ultimate capacity for WFA supply is 15.4 mgd [Table 3-5]). In FY 23/24, OMUC purchased about 5,505 AF from the WFA plant (Agua de Lejos WTP), which is well

within their conveyance capacity of 15.4 mgd and within their rights of approximately 25 mgd. There is ample availability for OMUC to purchase additional imported water from the WFA that is within their rights to meet the needs of their service area.

In regard to future agricultural water needs, agricultural properties within the OMUC service area are expected to convert to urban land uses, which is consistent with the City's General Plan Land Use Plan. Many agricultural operations in the City are on private wells and/or use recycled water. As shown in Table 3-7, recycled water deliveries for agricultural irrigation are projected to decrease to zero in less than 20 years. In regard to future industrial water needs, industrial land uses (which may include some manufacturing uses) are the third most common type in the City (Table 3-7) and they are planned by the City General Plan to increase (Table 2-3).

Table 3-9 and Table 3-10 show that OMUC projects water supplies during single-dry and multiple-dry years in volumes sufficient enough to meet the demand of the service area over the next 20 years. Section 4 will describe the supply available to OMUC through rights held to Chino Basin groundwater that are greater than the amount currently extracted. OMUC can also bank water and pump in excess of their rights in the Chino Basin with payment of a replenishment fee.

Section 4 will discuss the City's water rights in light of this water supply and capacity analysis.

# SECTION 4 - GROUNDWATER ANALYSIS

SB 610 requires specific groundwater information to be included in the WSA if groundwater will be a source of water for the proposed project. As discussed in Section 3, groundwater is one of the sources of supply for OMUC and therefore part of the water supply for the proposed Project.

**Law**

CWC Section 10910:

> *(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:*
>
> *(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.*
>
> *(2)(A) A description of any groundwater basin or basins from which the proposed project will be supplied.*
>
> *(B) For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater in the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree.*
>
> *(C) For a basin that has not been adjudicated that is a basin designated as a high- or medium- priority pursuant to Section 10722.4, information regarding the following: (i) Whether the department has identified the basin as being subject to critical conditions of overdraft pursuant to Section 12924. (ii) If a groundwater sustainability agency has adopted a groundwater sustainability plan or has an approved alternative, a copy of that alternative or plan.*

*(D) For a basin that has not been adjudicated that is a basin designated as low- or very low priority pursuant to Section 10722.4, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.*

*(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

*(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

*(5) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project. A water supply assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water*

*demand associated with the project was addressed in the description and analysis required by subparagraph D, paragraph (4) of subdivision (b) of Section 10631.*

## 4.1 Review of Urban Water Management Plan (CWC Section 10910(f)(1))

The City's 2020 UWMP, prepared by AKM on behalf of the City of Ontario (OMUC) was adopted by City Council Resolution 2021-036 and 2021-037 on June 1, 2021 (located in Appendix A). The UWMP includes information relevant to the identified water supply for the proposed Project and is incorporated herein. Relevant information includes: 1) current and projected water demands (*Water Use Characterization*) through year 2045; 2) a description of the Chino Groundwater Basin (*Water Supply Characterization*); 3) the reliability of the water supply, projected supply and demand comparisons, and water shortage plans (*Water Service Reliability and Drought Risk Assessment and Water Shortage Contingency Plan*); and 4) water demand management efforts (*Demand Management Measures*).[9] The ultimate water demand projections of the 2020 UWMP are based on the findings of the City's 2020 Water Master Plan (AKM 2020) and 2020 Recycled Water Master Plan (Stantec 2020).

## 4.2 Groundwater Basin Descriptions (CWC Section 10910(f)(2))

The Chino Groundwater Basin is the direct source of groundwater for OMUC. Although water supplied to OMUC from SAWCo may include a combination of groundwater from other basins (i.e., San Antonio Tunnel, Cucamonga Basin, and Six Basins), the amount is minimal, and the basins are described in the 2020 SAWCo UWMP (located in Appendix H).

### *Chino Groundwater Basin Description*

The Chino Basin covers approximately 240 square miles in the upper Santa Ana River Watershed, and underlies parts of Los Angeles, San Bernardino, and Riverside Counties. The state Department of Water Resources (DWR) identifies the Chino Basin as Basin No. 8-002.01, which is a sub-basin of the Upper Santa Ana Valley Basin

[9] Words and phrases italicized in parentheses are in reference to chapters so titled in the 2015 UWMP.

(Bulletin 118).[10] It is estimated the Chino Basin has approximately 5 million AF of water in storage, and an estimated 1 million AF of additional unused storage capacity.[11] While still considered a single basin for hydrologic purposes, the Chino Basin is divided into five management zones by the California Regional Water Quality Control Board , Santa Ana Region based on similar hydrologic conditions (**Figure 7**). Geographically speaking, the City is located in the approximate center of the Chino Basin. DWR Bulletin 118 (2016 update, p. 1) describes the Chino Basin as follows:

> *The subbasin* [Chino Basin] *is bound on the northwest by the San Jose fault, on the north by the Cucamonga fault and impermeable rocks of the San Gabriel Mountains, and on the east by the Rialto-Colton fault. The basin is bound on the southeast by the Jurupa Mountains, Pedley Hills, La Sierra Hills, and the approximate location of the Santa Ana River. The Chino fault and impermeable rocks of the Chino Hills and Puente Hills bound the southwest side of the basin. In some areas, the basin boundary coincides with the Chino Basin (1978) groundwater adjudication boundary.*

*Remainder of page intentionally left blank*

[10] DWR collects, summarizes, and evaluates groundwater data in the "Bulletin 118" series, which present the results of basin evaluations and defines the boundaries of California's 515 alluvial groundwater basins. An update was provided in 2016. In Bulletin 118, DWR identifies each basin and sub-basin with a number code.
[11] The *2020 Safe Yield Recalculation Final Report* (May 15, 2020) indicates the estimated total volume of water in storage was 12.6 million AF in July 2018 (WEI 2020, p. 6-15).

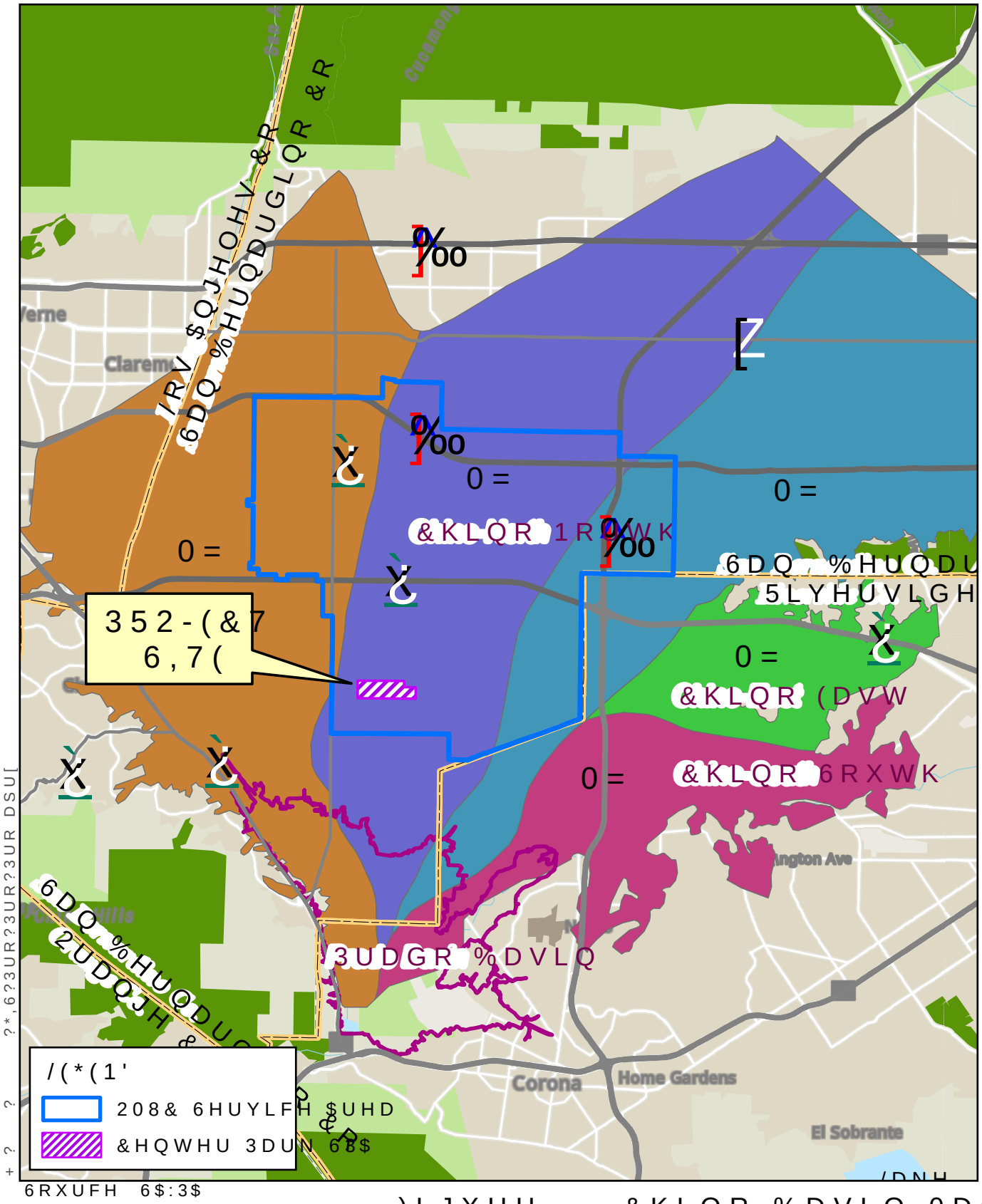
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The Chino Basin is an adjudicated basin and has been studied extensively by the court-appointed Chino Basin Watermaster (CBWM), with reports available at www.cbwm.org. The following is an excerpt that describes the Chino Basin geology from the Chino Basin Watermaster's management plan called the "Optimum Basin Management Program" or "OBMP" (1999, p. 2-2):

> *Chino Basin was formed when eroded sediments from the San Gabriel Mountains, the Chino Hills, Puente Hills, and the San Bernardino Mountains filled a structural depression…The bottom of the Basin – the effective base of the freshwater aquifer – consists of impermeable sedimentary and igneous rocks. The base of the aquifer is overlain by older alluvium of the Pleistocene period followed by younger alluvium of the Holocene period.*
>
> *The younger alluvium varies in thickness from over 100 feet near the mountains to a just few feet, south of Interstate 10 and generally covers most of the north half of the Basin in undisturbed areas. The younger alluvium is not saturated and thus does not yield water directly to wells. Water percolates readily in the younger alluvium and most of the large spreading basins are located in the younger alluvium.*
>
> *The older alluvium varies in thickness from about 200 feet thick near the southwestern end of the Basin to over 1,100 feet thick southwest of Fontana, and averages about 500 feet throughout the Basin.*

### *Legal Right to Pump from the Chino Basin*

Water rights to the Chino Basin were adjudicated by the Superior Court of the State of California for the County of San Bernardino in 1978 (a copy of the Judgment and amendments thereto are provided in Appendix M). The court's Judgment declared the Safe Yield of the Chino Basin at 140,000 AFY.[12] Withdrawal in excess of Safe Yield is

[12] Judgment (1978) defines Safe Yield as, "The long-term average annual quantity of groundwater (excluding replenishment or stored water but including return flow to the Basin from use of replenishment or stored water), which can be produced from the basin under cultural conditions of a particular year without causing an undesirable result."

termed Overdraft. The Chino Basin Watermaster may determine that the Operating Safe Yield (OSY) can be higher from year-to-year depending on factors including favorable precipitation and management efforts that maximize the beneficial use of the groundwater Basin.[13] The Chino Basin Watermaster has undertaken a safe yield redetermination. In July 2020, the court ordered that the safe yield be reduced by 3% and reset to 131,000 AFY for the period of July 1, 2020, to June 30, 2030. The court previously reset the safe yield from its initial 140,000 AFY to 135,000 AFY in 2017 for the period of 2010 to 2020.

The Chino Basin Watermaster is comprised of three stakeholder groups (or "pools"): Overlying Agricultural Pool Committee (representing dairymen, farmers, and the State of California); the Overlying Non-Agricultural Pool Committee (representing businesses and industries); and the Appropriative Pool Committee (representing local cities, public water districts, and private water companies). The Chino Basin Watermaster carries out the provisions of the Judgment including monitoring of the Chino Basin and files an annual report on pumping and replenishment.

The City is a member of both the Overlying Non-Agricultural Pool and the Appropriative Pool. The Judgment allocates a portion of the Safe Yield to the Overlying Non-Agricultural Pool and a portion of the OSY to the Appropriative Pool. Pursuant to the Judgment, the City has appropriative rights to 20.742% of the OSY allocated to the Appropriative Pool (CBWM 2023, p. 10.1). The City has gained 53.338% of the Safe Yield assigned to the Overlying Non-Agricultural Pool (CBWM 2023, p. 4.1). The assigned share of the Safe Yield and OSY change depending on the Safe Yield set by the court.

The Judgment allocates the Safe Yield of the Chino Basin according to the three pools as described above (Appendix M, Paragraph 13). The members of each pool are then enjoined from producing water from the Chino Basin in excess of such allocated

[13] Judgment (1978) defines Operating Safe Yield (OSY) as, "The annual amount of groundwater which Watermaster shall determine, pursuant to criteria specified in Exhibit "I", can be produced from Chino Basin by the Appropriative Pool parties free of replenishment obligation under the physical solution herein."

amount "except pursuant to the provisions of the Physical Solution" (Appendix M, Paragraph 13(a)-(c)).

The Physical Solution of the Judgment is described in broad terms by Paragraphs 39 through 57 of the Judgment. Paragraph 45 provides the Chino Basin Watermaster with the authority to levy and collect assessments for the purchase of water necessary to balance the production by any party in excess of that party's allocated share of Safe Yield of the Chino Basin. Paragraphs 49 and 50 then describe the sources of water which are authorized to function as sources of replenishment water and methods by which water can be replenished to the Chino Basin. Exhibit H, Paragraph 7, of the Judgment describes the way in which costs for replenishment water will spread among the members of the Appropriative Pool.

The afore-cited paragraphs of the Judgment evince a clear expectation that parties, including the City/OMUC, would produce water in excess of their adjudicated production rights. The injunction in Paragraph 13 of the Judgment should thus be interpreted to mean that parties are enjoined from producing water in excess of their adjudicated rights except to the extent that they will pay a replenishment assessment.

The ability to produce water from the Chino Basin is accordingly not a matter of availability, as contemplated and sanctioned by the Judgment for the reasons discussed above, but rather a matter of cost. Water produced in excess of production rights will cost more than water produced within a party's production rights. Thus, the quantity and reliability of groundwater supplies under the Judgment for purposes of this Assessment is a matter of cost of the water produced from the Chino Basin rather than limitations on production which may otherwise operate to reduce the sufficiency of the groundwater supply.

In addition to the water supplies described in Section 3, OMUC has rights to groundwater held in the Chino Basin as described below and in **Table 4-1**:

- **Appropriative Right.** The City has appropriative rights to 20.742 percent of the OSY that is allocated to the Appropriative Pool. As of FY 23/24, the OSY is 40,834 AF; therefore, the City's assigned share is 8,469.8 AF. To supplement the 2017 decrease in safe yield, the City currently receives an additional 1,866.8 AFY transferred from unproduced Agricultural Pool rights ("Safe Yield Reduction") (CBWM 2023, p. 16.1).

- **Overlying Non-Agricultural Right.** The City has purchased and has rights to 53.338 percent of the Safe Yield assigned to the Overlying Non-Agricultural Pool. The Safe Yield is 7,350.3 AF and as of FY 23/24, the City's assigned share is 3,920.6 AF (CBWM 2024, p. 4.1).

- **Land Use Conversions.** The City gains rights to additional Chino Basin groundwater as a result of land use conversions from agricultural to non-agricultural uses. This is expected to increase from development of Ontario Ranch; the total of which is adjusted annually by the Watermaster. As of FY 23/24, the City received 6,531.5 AF from land use conversions (CBWM 2024).

- **Annual Early Transfers.** Pursuant to the Peace Agreement,[14] the Chino Basin Watermaster can approve an "Early Transfer" of water to the Appropriative Pool that is equal to the quantity of water not produced by the Overlying Agricultural Pool that is remaining after all land use conversions are satisfied. The Early Transfer Water is annually allocated among the Appropriative Pool members in accordance with their pro-rata share of the initial Safe Yield. For the City, this is 20.742 percent of the "early transfer" water that the Watermaster may transfer from the Overlying Agricultural Pool (OMUC 2020 UWMP, p. 6-10). The amount

[14] In 2007, the parties to the Chino Basin Judgement approved the "Peace Agreement" which is a set of measures proposed by Chino Basin Watermaster to supplement the OBMP Implementation Plan. Focus for the measures were placed on achieving hydraulic control (reduction of groundwater discharge from the Chino North Management Zone to the Santa Ana River). To achieve hydraulic control, re-operation (controlled overdraft) of the groundwater basin is proposed. Strategically placed wells would be constructed in the basin and the groundwater would be pumped to the Desalter to improve the long-term reliability of the basin.

available for transfer changes from year to year but is projected to increase. In FY 23/24, the City received 4,456.8 AF as its share of Early Transfer (CBWM 2024).

- **Groundwater Recharge Credits.** The City is entitled to water rights due to groundwater recharge with stormwater and recycled water in the Chino Basin. The credited amount is based on the volume recharged and therefore varies annually but is projected to increase over time. For example, in FY 19/20 and FY 20/21, no recharge was credited; however, in FY 21/22, 6,400.7 AF of recycled water was credited and most to the City and included as part of the City's local supplemental storage account. In FY 23/24, 6,523 AF was credited. (OMUC 2020 UWMP, p. 6-11; CBWM 2023, p. 12.1; OMUC(c), 2023).

- **Fontana Recycled Water Rights.** The City has a long-term contract to purchase up to 3,000 AFY of recharged recycled water rights from the City of Fontana (a copy of which is in Appendix N). The City of Fontana does not operate a water system and the amount purchased by OMUC each year will vary. For example, in FY 19/20 and FY 20/21 no recharged water rights were purchased (OMUC 2020 UWMP p. 6-12; CBWM 2021, p. 12.1). However, in FY 23/24, the City purchased 2,751 AF from City of Fontana (OMUC(c), 2023).

- **Groundwater Storage Accounts.** The City has rights to store water in the Chino Basin (Appropriative and Overlying Non-Agricultural) and has been increasing its various storage accounts in recent years. The City holds water in both local storage accounts (excess carryover accounts) and supplemental accounts. Excess carryover accounts hold un-pumped OSY groundwater rights and stormwater that has been recharged into the Chino Basin. Supplemental accounts hold both imported water and recycled water that has been recharged into the Chino Basin. As of June 30, 2024, the City has 136,870 AF (63,413.2 AF + 73,456.5 AF) in storage pursuant to Appropriative rights (OMUC(e), 2024).

## Table 4-1 Ontario Groundwater Rights Summary

| Right | Current FY 2023-2024 (AF) | Future (AFY) | Notes |
|---|---|---|---|
| Carryover Beginning Balance | 8,469.8 | Varies | Varies annually. |
| Assigned Share of OSY | 8,469.8 (20.742% of OSY) | 8,470 (20.742% of OSY) | OSY determined by Watermaster. |
| Safe Yield Reduction | 1,866.8 | Varies | Part of New Ag Pool Reallocation. |
| Land Use Conversions | 6,531.5 | 16,602 | Varies annually. Part of New Ag Pool Reallocation. |
| Annual Early Transfer [a] | 4,456.8 | 20.742% of Early Transfer | Subject to change. Part of New Ag Pool Reallocation. |
| Annual Production Right for Appropriative Pool Subtotal (AFY) | 29,794.6 | Varies | |
| Annual Production Right for Overlying Non-Agricultural Pool (AFY) | 1,066.3 | At least 3,920.6 (53.338% of SY) | |
| SAWCo (AFY) | 484.9 | At least 600 | Entitlement. Volume per share is subject to change. |
| Groundwater Storage Accounts | 63,413.2 (Excess Carry Over Account) | Varies (Excess Carry Over Account) | Dependent on annual availability of un-pumped OSY water, stormwater, imported water, and recharged recycled water. |
| | 73,456.5 (Local Supplemental Account) | Varies (Local Supplemental Account) | |
| Total Storage (AF) | 136,870 | ±85,000 | |

Note: AF = acre-feet; AFY = acre-feet per year; OSY = operating safe yield; SY = safe yield.
Source: OMUC(e), 2024.

### 4.3. Recorded Use of Groundwater by City of Ontario (CWC Section 10910 (f)(3))

The City's groundwater supply currently comes from 17 active groundwater wells located throughout the OMUC service area within the Chino Basin. As of FY 23/24, 14,502 AF was produced from City wells (OMUC(e), 2024). The recorded groundwater production has generally decreased from 36,842 AFY in 2000, as shown in **Chart 4-1.**

**Chart 4-1 - Annual OMUC Groundwater Production, FY 2000 - 2024, (AFY)**

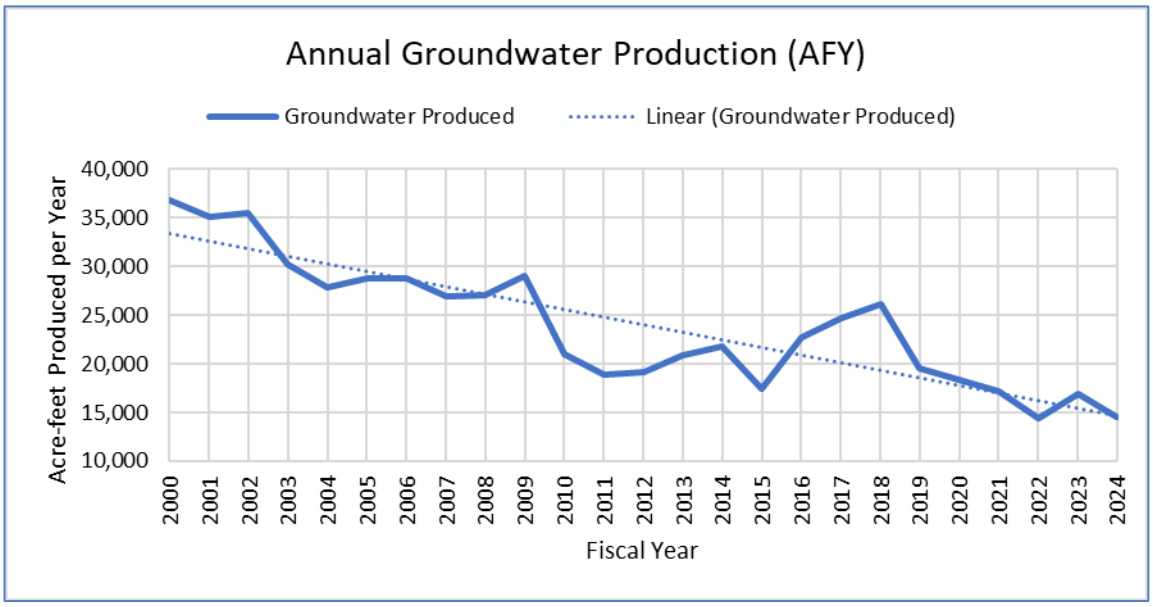


(Sources: 2000-2009 from the *2012 Ontario Water Master Plan*; 2010 from *OMUC 2010 UWMP*; 2011-2020 from *OMUC 2020 UWMP*, p. 6-3; 2021 from CBWM 2021, p. 8.1; 2022 from CBWM 2022, p. 8.1; 2023 from OMUC(d), 2023; 2024 from OMUC(e) 2024.)

## 4.4. Projected Use of Groundwater by the City of Ontario (CWC Section 10910(f)(4))

The proposed Project will receive water from a combination of the City's supply sources including groundwater wells, imported water from WFA, treated groundwater from CDA, and recycled water from IEUA.

Projected groundwater use by OMUC will continue as noted in Table 3-3. The use of groundwater will continue to be dependent upon the cost of extracting, treating, and transporting the water to customers. Groundwater from the Chino Basin will be utilized by OMUC either directly by pumping into its distribution system or by treating the groundwater (Wells 44 and 52) at the John Galvin Ion Exchange Plant and then pumping the treated groundwater into the City distribution system. The current and ultimate production capacity of OMUC wells is sufficient to meet current and ultimate demand (Table 3-4).

As shown in Table 4-1, the amount of water that OMUC expects to withdraw from the Chino Basin is well within appropriate right pursuant to the Chino Basin Adjudication of 1978 (Appendix M). In addition to its well production, OMUC will also purchase treated Chino Basin groundwater from CDA. OMUC has 1,500 AFY capacity rights in the Chino I Desalter and 7,033 AFY capacity rights in the Chino II Desalter. Projected use of groundwater via CDA is projected to remain at 8,533 AFY (OMUC 2020 UWMP, p. 6-6).

### 4.5. Sufficiency of Groundwater Basin (CWC Section 10910(f)(5))

The City's legal right to pump water in an amount necessary to meet all demands as sanctioned and protected by the Judgment as discussed above, is buttressed by several programs and projects directed at ensuring the sufficiency of groundwater supplies from the Chino Basin, particularly during dry years. An adjudicated water right has perhaps the most substantial indicia of reliability of any water right that currently exists in California. An adjudicated right is based upon long-term studies whose purpose is to protect the long-term functionality of the water source. These rights are coordinated in an established and binding manner with all the other users of the Chino Basin and are overseen by Chino Basin Watermaster which has the authority to mandate and proscribe activities whose purpose is to protect the water source and maximize its long-term beneficial use.

All Chino Basin Watermaster processes are governed by Rules and Regulations and receive active oversight from the Court which, as noted above, retains continuing jurisdiction over the administration of the Judgment. Consequently, the sufficiency of the groundwater is not only directed by rigorous Chino Basin Watermaster management processes but validated and ensured by continuing Court oversight.

The OBMP for the Chino Basin has guided the Chino Basin Watermaster's activities since its adoption in 1998. Chino Basin Watermaster-led basin management activities to ensure the maximization of safe yield and OSY of the Chino Basin include objectives, projects, and programs identified in the Peace Agreement and the OBMP.

Progress is reported in annual reports, biennial, and triennial reports. The key programs include:

1) a comprehensive monitoring program.
2) a comprehensive recharge program.
3) development and implementation of a water supply plan for impaired areas of the Chino Basin.
4) development and implementation of a comprehensive groundwater management plan for Management Zone 1.
5) development and implementation of a regional supplemental water program.
6) development and implementation of cooperative programs with the California Regional Water Quality Control Board – Santa Ana Region and other agencies to improve Basin management.
7) development and implementation of a salt management program.
8) development and implementation of a groundwater storage program; and
9) development and implementation of storage and recovery programs.

As stated, the referenced elements of the OBMP collectively comprise a comprehensive regimen directed to ensuring and maximizing the long-term beneficial use of water in the Chino Basin. In particular, and specific to the location of current and future groundwater production facilities upon which the City relies or will rely to provide water to meet water demands within its service area, OBMP Program Element No. 3, "Develop and Implement Water Supply Plan for the Impaired Areas of the Chino Basin" and Program Element No. 5, "Develop and Implement Regional Supplemental Water Program", address the sufficiency of groundwater from the Chino Basin. The goals of Program Elements 3 and 5 are (2020 OBMP, p. 6):

> *To maintain and enhance Safe Yield with a groundwater desalting program that is designed to replace declining agricultural groundwater pumping in the southern part of the basin with new pumping to meet increasing municipal water demands*

*in the same area, to minimize groundwater outflow to the Santa River, and to increase Santa Ana River recharge into the basin.*

*To improve the regional conveyance and availability of imported water and recycled waters throughout the basin.*

The achievements from the implementation of the 2000 OBMP for Elements 3 and 5 are summarized below (2020 OBMP, Appendix A, pp. 5 – 6).

*Program Element 3 Develop and Implement Water Supply Plan for Impaired Areas (Groundwater Desalting): The objectives of this Program Element are to maintain and enhance the Safe Yield of the basin. The groundwater desalting program was designed to replace declining agricultural groundwater pumping in the southern part of the basin with new groundwater pumping to meet increasing municipal water demands in the same area. The new wells used in the groundwater desalting program were constructed in strategic locations to minimize groundwater outflow to the Santa Ana River and to increase the Santa Ana River recharge into the basin. In 2000, the groundwater desalting program included a 6,000 AFY treatment plant and a series of wells constructed in the southern part of the Chino Basin near the Chino Airport. Under the OBMP, as of 2018, the desalting program has grown to two treatment plants and additional wells that in aggregate pump and treat about 30,000 AFY degraded groundwater, and the program will reach the OBMP objective of 40,000 AFY in 2019. The groundwater desalting program facilities are owned by the Chino Basin Desalter Authority (CDA).*

*Program Element 5: Develop and Implement Regional Supplemental Water Program (Recycled Water Reuse): The objective of this Program Element is to improve the regional conveyance and availability of imported and recycled waters throughout the basin. Since 2000, the IEUA has constructed and operated a recycled water conveyance system throughout the basin enabling it to provide recycled water to its member agencies. Recycled water deliveries grew from about 3,400 AFY in 2000 to about 34,000 AFY in 2017. The recycled water provided by*

> *the IEUA has replaced a like amount of groundwater and imported water that would have been otherwise been used for non-potable purposes. Much of the post-2000 increase in supplemental water storage in the Chino Basin is attributable to the increased availability of recycled water. Recycled water is more reliable than imported water, and thus using it in lieu of imported water has improved the sustainability of the Chino Basin and water supply reliability. Improvements in the regional conveyance and availability of imported water were not achieved.*

As indicated in the foregoing OBMP text, the City overlies groundwater supplies in the southern part of the Chino Basin which must be pumped for purposes of meeting new demands, maintaining safe yield, and to protect water quality in the Santa Ana River. As agricultural production in the southern part of the Chino Basin has declined, it is necessary for these reasons to increase production for municipal uses. This is being achieved through CDA's Chino I and Chino II Desalters, of which the City has a contractual right to purchase 8,533 AFY pursuant to the 2001 "Joint Exercise of Powers Agreement Creating the Chino Basin Desalter Authority" and subsequent agreements. Thus, not only was increased Chino Basin water production by the City foreseen in the OBMP but sanctioned and encouraged for purposes of achieving OBMP objectives.

The sufficiency of the groundwater supply that is available to OMUC is assured due to the abundance of groundwater in the central and southern portion of the Chino Basin, OBMP objectives that prioritize and assure production from the southern Chino Basin, coupled with desalting and ion-exchange treatment facilities that enable the use of this abundant supply for municipal (potable) purposes. As indicated in the quoted text of the OBMP, southern basin production, where the City is partially located, is the linchpin of several critical OBMP objectives. Thus, the sufficiency of groundwater is heightened and prioritized by the necessity of continued pumping from the southern Chino Basin under the OBMP which is administered by the Chino Basin Watermaster and ultimately enforced by continuing court jurisdiction over the Judgment.

The other referenced OBMP Program Elements are collectively directed to ensuring the sufficiency of Chino Basin groundwater supplies, particularly during dry years, and comprehensively address water quality and quantity, thus maximizing beneficial use over the long-term. Sufficiency of groundwater from the Chino Basin is further assured for the following reasons:

- IEUA is a member agency of MWD, which provides imported water from the State Water Project for direct use by parties to the Judgment in the Chino Basin and for Chino Basin recharge purposes (when supplies are available). IEUA has also reviewed the sufficiency of supplies for its service territory that includes the City in connection with its 2020 UWMP.

- IEUA's UWMP is consistent with, and reiterative of, OBMP projects and programs (see Section 4 of IEUA 2020 UWMP in Appendix E). IEUA anticipates increased limitations for imported water for direct and recharge use while noting reductions during dry years (due to increased reliance on groundwater from the Chino Basin) and in the higher amount otherwise required in the absence of OBMP projects and programs. The UWMP also analyzes the sufficiency of water supplies for single and multiple year drought scenarios and concludes the region is expected to meet 100 percent of its dry year demand under every scenario. Key assumptions included:

    - Reliance on assurances provided by MWD in its 2020 UWMP that it could meet 100 percent of projected supplemental full-service water supply demands through 2040;
    - Implementation of MWD's Chino Basin DYY Storage Program consistent with the contractual shift obligations of the participating agencies of up to 33,000 AF in a twelve-month period; and
    - Sustain per capita water use reductions of 20 percent.

IEUA concluded in its 2020 UWMP that the projected available water supply will meet projected water demand due to diversified water supply and water conservation

measures. Based on IEUA water supply projections, there are sufficient water supplies to meet normal year water demands, single dry year and multiple dry year demands (IEUA 2020 UWMP, p. 7-7).

CWC section 10631(j) provides that urban water suppliers that rely upon a wholesale agency for a source of water, such as IEUA, may rely upon water supply information provided by the wholesale agency in fulfilling UWMP informational requirements.

IEUA's independent analysis of contemporary regional water conditions in conjunction with MWD's most recent report, provide additional and reliable assurances concerning the sufficiency of imported water supplies that comprise a portion of overall Chino Basin supply sufficiency.

The City's participation in the DYY Storage Program described in Section 3, along with future water storage and recovery projects will drought-proof the Chino Basin and all other appropriative pool members from imported water shortages. This program is consistent with OBMP Program Element No. 9, "Develop and Implement Storage and Recovery Program." Benefits to the Chino Basin associated with this program include the construction of facilities to enhance imported water deliveries and the production of water from the Chino Basin. Further demonstrating the sufficiency of Chino Basin groundwater is MWD's DYY program to use the Chino Basin for dry year supply purposes, thus underscoring that sufficient Chino Basin groundwater is available during dry years not only for local use by agencies such as the City but also in connection with MWD's regional reliability programs.

The sufficiency of groundwater supplies available to OMUC is assured because of the OBMP programs overseen by the Chino Basin Watermaster and conducted under the auspices of continuing Court jurisdiction that specifically direct and assure the long-term production of water pursuant to the City's legal rights to produce such water necessary to meet ultimate water demands.

***Conclusion***

Between 2010 and 2020, the City's total annual groundwater production held relatively stable at roughly 20,000 AFY (OMUC 2020 UWMP, p. 6-3). FY 23/24 groundwater production was 14,502 AF. The City's water production capacity meets water demands and is projected to increase to meet ultimate water demand. The current (FY 23/24) water supply utilized by the City totals approximately 28,172 AFY (potable) and 9,180 AFY (recycled water) (Table 3-2). Currently, the City's water rights in the Chino Basin as recorded by the Chino Basin Watermaster total approximately 30,861 AF (Annual Production Rights for Non-Ag Pool plus Appropriative Pool), with an additional 136,870 AF in storage (Table 4-1). Although annual fluctuations will occur, the City's rights are projected to increase over the next 20 years due to more land use conversions and credits from recharge.

The water supplies available to OMUC currently meet and exceed citywide water demands. Groundwater production by OMUC is currently less than their existing rights and within their production capacity. Regardless, OMUC has the means and right to exceed their groundwater allocation in the Chino Basin when required to meet demand pursuant to the Judgment. Further, OMUC has rights to water held in storage that would supply all City demands for more than two years. In addition to groundwater, OMUC can supply water to the Project purchased from the WFA that is within their existing entitlements and capacities.

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# SECTION 5 - PRIMARY ISSUE FOR ASSESSMENT

The lead agency for a proposed project …shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy demands of the project, in addition to existing and planned future uses (CWC section 10911). The lead agency is expected to approve or disapprove the project based on several factors, including but not limited to the WSA.

**Law**

CWC Section 10910:

> (g) (1) *Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.*
>
> *(2) Prior to the expiration of the 90-day period, if the public water system intends to request an extension of time to prepare and adopt the assessment, the public water system shall meet with the city or county to request an extension of time, which shall not exceed 30 days, to prepare and adopt the assessment.*
>
> *(3) If the public water system fails to request an extension of time, or fails to submit the assessment notwithstanding the extension of time granted pursuant to paragraph (2), the city or county may seek a writ of mandamus to compel the governing body of the public water system to comply with the requirements of this part relating to the submission of the water supply assessment.*

CWC Section 10911:

> (b) *The city or county shall include the water assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any*

*environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.*

*(c) The city or county may include in any environmental document an evaluation of any information included in that environmental document provided pursuant to subdivision (b). The city or county shall determine, based on the entire record, whether projected water supplies will be sufficient to satisfy the demands of the project, in addition to existing and planned future uses. If the city or county determines that water supplies will not be sufficient, the city or county shall include that determination in its findings for the project.*

The lead agency is expected to review the WSA and decide whether additional water supply information is needed for its consideration of the proposed Project.

## 5.1 Findings

Whereas:

1. The City of Ontario Municipal Utilities Company (OMUC) has been identified as the water supplier for the proposed *CenterPark Specific Plan* ("Project"). The Project proposes to develop up to 3,207 medium density residential units, 1,086 mixed-use high density residential units, 115,809 square feet of mixed-use retail, 135,111 square feet of mixed-use office, 56 acres of open space-recreational, and 11.3 acres of open space-non-recreational on approximately 257 acres.
2. A previous WSA/WV was prepared in 2004 for the 8,200-acre New Model Colony (now called Ontario Ranch) that includes the Project site; however, the City and OMUC no longer consider it valid.
3. The City's 2020 Water Master Plan included projections of the water demand of the property according to the TOP Land Use Plan approved at the time, which this report estimates as 1,257 AFY of potable water and 354 AFY of recycled water for a total water demand of 1,611 AFY.

4. The estimated potable water demand for the proposed Project is 1,365 AFY and the recycled water demand is 344 AFY for a total water demand of 1,709 AFY, which is 98 AFY more than accounted for in the most recent UWMP.
5. Because the water demand of the Project is more than the water demand according to the prior land use plans for the site, it can be assumed the Project was not fully accounted for in the 2020 UWMP dated July 2021 and adopted by the Ontario City Council by Resolution 2021-059 on June 15, 2021 (Appendix A).
6. As a result of the land use conversion of the Project site from agricultural to non-agricultural, the City will receive a credit to its water supply portfolio from the Chino Basin Watermaster of 2.0 AF of groundwater rights per acre converted. Therefore, approximately 257 acres of the Project is estimated to be eligible for conversion credits.
7. OMUC has an Annual Production Right of 29,794.6 AF currently in the Chino Groundwater Basin as a member of the Appropriative Pool, as well as groundwater storage accounts that total 136,870 AF (Table 4-1). The water supply production capacity from City wells is currently 62,269 AFY,[15] which is projected to increase to 110,337 AFY to meet demand (Table 3-4 and 3-5). OMUC produced 14,502 AF of groundwater in FY 23/24 (Table 3-2).
8. In addition to Chino Basin production rights, OMUC holds shareholder entitlements to potable water from SAWCo in the amount of 600 AFY, and capacity rights to imported water from the WFA in the amount of approximately 28,000 AFY. OMUC also has capacity rights to potable water from the CDA in the amount of 8,533 AFY (Table 3-2 and 3-4). In FY 23/24, OMUC purchased 485 AF from SAWCo, 5,505 AF from WFA, and 8,680 AF from CDA (Table 3-2).
9. OMUC is entitled to the recycled water generated by IEUA from the City's annual share of sewer flows. In FY 23/24, the City delivered 14,104 AF of

[15] Assuming wells operate 24 hours per day for 365 days per year.

wastewater to IEUA wastewater treatment plants, of which 9,180 AF was put to non-potable direct recycled water use by the City (Table 3-2).

10. As of FY 23/24, citywide potable water demands were less than the prior four years at approximately 28,172 AF and the number of recycled water connections increased from the prior year from 444 to 551 (Table 2-2); ultimate potable and recycled water demands are projected to be 57,609 AFY and 16,059 AFY, respectively (Table 2-3).
11. The current production capacities are greater than needed to meet the average day demands under citywide buildout conditions. Additional wells are planned to supply the anticipated ultimate maximum day demand.
12. OMUC has forecasted excess water supplies will be available to meet citywide demand during single-dry and multiple dry water years over the next 20 years (Table 3-9 and Table 3-10).
13. Water demands for agricultural land uses in Ontario Ranch are planned to reduce to zero by 2040 as a result of land use conversions, and water demands for industrial uses in Ontario Ranch, which may include some manufacturing, are expected to increase and partly replace former agricultural uses.
14. Based on the evidence provided herein, the total projected potable and recycled water supplies available to the OMUC during normal, single dry, and multiple dry water years over a 20-year projection will be sufficient to meet the projected water demand associated with the proposed Project in addition to the water supplier's existing and planned future uses, including agricultural and manufacturing uses.

# SECTION 6 - REFERENCES


| | |
|---|---|
| AKM 2011 | AKM Consulting Engineers, *City of Ontario 2010 Urban Water Management Plan*. April 2011. |
| AKM 2020 | AKM Consulting Engineers, *City of Ontario 2020 Water Master Plan Update.* June 2020. |
| CBWM 2021 | Chino Basin Watermaster, *Approved 2021/2022 Assessment Package (Production Year 2020/2021)*, Nov. 18, 2021. |
| CBWM 2022 | Chino Basin Watermaster, *Approved 2022/2023 Assessment Package (Production Year 2021/2022)*, Nov. 17, 2022. |
| CBWM 2023 | Chino Basin Watermaster, *Approved 2023/2024 Assessment Package (Production Year 2022/2023)*, Nov. 16, 2023. |
| CBWM 2024 | Chino Basin Watermaster, *Draft 2024/2025 Assessment Package (Production Year 2023/2024).* (draft) |
| CBWM 46th Annual Report | Chino Basin Watermaster, 46th Annual Report, Fiscal Year 2022-2023. |
| CDA 2020 | Stetson Engineers, Inc. *Chino Basin Desalter Authority 2020 Urban Water Management Plan.* June 2021. (Appendix G) |
| DWR 2003 | California Department of Water Resources, *Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 to assist water suppliers, cities, and counties in integrating water and land use planning.* October 8, 2003. |
| DWR Bulletin 118 | Department of Water Resources. *8-002.01 Upper Santa Ana Valley – Chino Bulletin 118 Basin Boundaries.* Dated March 5, 2018. |
| DYY 2014 | *Amendment No. 8 to Groundwater Storage Program Funding Agreement No. 49960 By and Among The Metropolitan Water District of Southern California and Inland Empire Utilities Agency and Chino Basin Watermaster.* September 17, 2014. (Appendix J) |
| Fontana 2008 | *Agreement by and between the City of Ontario and the City of Fontana regarding transfer of right of first purchase of recharged reclaimed water.* Dated Jan. 15, 2008. (Appendix N) |
| IEUA 2016 IRWP | Inland Empire Utilities Agency. *Integrated Water Resources Plan: Water Supply & Climate Change Impacts 2015-2040*. Dated 2016. (Located in Appendix B to the IEUA 2020 UWMP.) |
| IEUA/WFA 2015 | Arcadis. *Inland Empire Utilities Agency and Water Facilities Authority 2015 Urban Water Management Plan Final*. June 2016. (Appendix C) |
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| IEUA Resolution No. 2014-12-1 | *Purchase Order for System Water to be Provided by The Metropolitan Water District of Southern California (Purchaser: Inland Empire Utilities Agency) and IEUA Resolution No. 2014-12-1.* Effective January 1, 2015. (Appendix F) |

| | |
|---|---|
| JCSD 2014 | *Amendment Number 1 to Agreement by and between City of Ontario and Jurupa Community Services District Establishing an Operational Plan for Metropolitan Water District/Chino Basin Groundwater Storage Program, Providing for Water Supply to Ontario's New Model Colony and Interconnection to Increase Water Supply Reliability.* November 21, 2014. (Appendix L) |
| Judgment | Judgment, *Chino Basin Municipal Water District v. City of Chino, et al.,* San Bernardino Ct. No. 164327 (filed Jan. 30, 1978). Includes amendments thereto. (Appendix M) |
| MWD | The Metropolitan Water District of Southern California, *2020 Urban Water Management Plan*. June 2021. (Appendix D) |
| OBMP 1999 | Wildermuth Environmental, *Optimum Basin Management Program Phase I report prepared for Chino Basin Watermaster*. August 19, 1999. |
| OBMP 2020 | Wildermuth Environmental, *2020 Optimum Basin Management Program Update Report,* January 2020. |
| OMUC 2020 UWMP | Stetson Engineers, *City of Ontario 2020 Urban Water Management Plan* (Appendix A) |
| OMUC(a) | Ontario Municipal Utility Company. *Personal communication with Christopher Quach, P.E., Senior Associate Engineer, information from "FY 20/21 Production Spreadsheet".* May 2, 2022. |
| OMUC(b) | Ontario Municipal Utility Company. *Personal communication with Christopher Quach, P.E., Senior Associate Engineer, information from "FY 20/21 IEUA RW Reconciliation Spreadsheet".* May 2, 2022. |
| OMUC(c) | Ontario Municipal Utility Company. *Personal communication with Alexis Mascarinas, Associate Engineer*, September 11, 2023. |
| OMUC(d) | Ontario Municipal Utility Company. *FY 2022-23 Exhibit for Recycled Water Reconciliation from IEUA from Alexis Mascarinas, Associate Engineer.* September 11, 2023. |
| OMUC(e) | Ontario Municipal Utility Company. *FY 2023-23 Exhibit for Recycled Water Reconciliation from IEUA from Alexis Mascarinas, Associate Engineer.* October 10, 2024. |
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| OMUC 2024 | Ontario Municipal Utility Company. *Personal communication with Alexis Mascarinas, P.E., Associate Engineer,* October 10, 2024. |
| Ord. 2689 | Ontario Municipal Code, *Chapter 8C: Recycled Water Use*, effective Jun. 17, 1999. |
| Ord. 3027 | Ontario Municipal Code, *Chapter 8A: Water Conservation Plan*, effective Oct. 1, 2015. |
| Ord. 99-07-02 | *Ordinance No. 99-07-02 Ordinance of the Water Facilities Authority-JPA Repealing Ordinance 96-09-01.* (Appendix H) |
| Project | Sares Regis. *CenterPark Specific Plan. July 2024 Draft.* |
| SAWCO 2021 | Water Systems Consulting. *San Antonio Water Company 2020 Urban Water Management Plan.* September 2021. (Appendix H) |

| | |
|---|---|
| Stantec | Stantec Consulting Services, Inc. *Recycled Water Master Plan Update for City of Ontario Municipal Water Utilities Company*. Final June 22, 2020. |
| WEBB 2004 | Albert A. Webb Associates, *Water Supply Assessment and Written Verification of Sufficient Water Supply for the New Model Colony*. October 27, 2004. |
| WEI 2020 | Wildermuth Environmental, Inc. *2020 Safe Yield Recalculation Final Report* prepared for the Chino Basin Watermaster. May 15, 2020. |
| WFA 1985 | *Installment Purchase Agreement Relating to Water Facilities Authority Water Treatment Plant by and between Water Facilities Authority, as Seller and City of Ontario, as Purchaser*. Dated as of October 1, 1985. (Appendix J) |
| WFA 2020 | Stetson Engineers. *2020 Urban Water Management Plan for Water Facilities Authority*. June 2021 (Appendix F) |

# SECTION 7 - SPREADSHEETS

| Future Land Use Map, Appendix E of 2020 UWMP [1] | | | Current Water Demand Factors[2] | | | | Potable and Recycled Water Demands (GPD and AFY) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Land Use | Estimated Gross Acres (AC)[3] | Corresponding General Plan (TOP) Land Use | General Plan Max Density (DU/AC) | Ontario Potable Water Demand Factor (GPD/AC) or GPD/unit | Ontario Recycled Water Demand Factor (GPD/AC) | Potable Water Demand (GPD) | Potable Water Demand (AFY) | Recycled Water Demand (GPD) | Recycled Water Demand (AFY) | Total Water Demand (AFY) |
| Ontario Ranch | Medium Density Residential (11.1 - 25.0 du/ac) | 146 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 975,201 | 1,092.4 | 109,328 | 122.5 | 1,214.8 |
| | Open Space- Recreational | 67 | Open Space Recreational (w/ RW) | - | 1,000 | 2,350 | 67,260 | 75.3 | 158,061 | 177.1 | 252.4 |
| | General Commercial (0.30 FAR) | 44 | General Commercial (w/ RW) | - | 1,800 | 1,100 | 79,758 | 89.3 | 48,741 | 54.6 | 143.94 |
| | **Total** | **257** | **-** | **25.0** | **-** | **-** | **1,122,219** | **1,257.0** | **316,130** | **354.1** | **1,611.2** |

w/RW = with recycled water; UWMP = Urban Water Management Plan; WMP = Water Master Plan; TOP = The Ontario Plan; DU = dwelling unit; AC = acre; gpd = gallons per day; AFY = acre-feet per year.

1. Sources: "Future Land Use Map Figure 2-5" from City of Ontario Potable Water Master Plan Update located in Appendix E of the 2020 Ontario Water Master Plan.

2. Sources for Unit Water Demand Factors are Appendix E and Appendix K of 2020 Ontario UWMP ("City of Ontario Water Master Plan Update" (AKM), June 2020, pp. 4-10-4-11; "Recycled Water Master Plan Update" (Stantec), June 22, 2020, p. 5.26.)

3. The Future Land Use Map located in Appendix E of the 2020 UWMP shows MDR, OS-Rec, and General Commercial land uses planned within the Project limits. Since the locations of the proposed Project land uses generally align with the location of the land uses used for the 2020 UWMP (with General Commercial swapped out for Mixed Use) the total acreages of the Project's land uses are used here to represent the previously planned land uses.

| Proposed CenterPark Specific Plan[1] | | | | | | | Current Water Demand Factors[2] | | | | Potable and Recycled Water Demands (GPD and AFY) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Proposed Planning Area (PA) | Built or Under Construction? [3] | Proposed Land Use | Proposed Maximum Dwelling Units (DU) [4] | Proposed Gross Acres (AC) | Proposed Maximum Non-Residential Square Footage (SF) | Proposed Maximum Density (DU/AC) [5] | Corresponding General Plan Land Use | General Plan Max Density (DU/AC) | Ontario Potable Water Demand Factor (GPD/AC) | Ontario Recycled Water Demand Factor (GPD/AC) | Potable Water Demand (GPD) | Potable Water Demand (AFY) | Recycled Water Demand (GPD) | Recycled Water Demand (AFY) | Total Water Demand (AFY) |
| 1 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 350 | 15.91 | - | 22.0 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 106,438 | 119.23 | 11,933 | 13.37 | 132.59 |
| 2 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 343 | 15.57 | - | 22.0 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 104,163 | 116.68 | 11,678 | 13.08 | 129.76 |
| 3 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 169 | 7.70 | - | 21.9 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 51,513 | 57.70 | 5,775 | 6.47 | 64.17 |
| 4 | **Yes** | Mixed-Use Residential | 175 | 4.99 | - | 35.1 | MU-High Density Residential (w/ RW) | 40 | 4,800 | 1,500 | 23,952 | 26.83 | 7,485 | 8.38 | 35.21 |
| | **Yes** | Mixed-Use Retail | - | 1.43 | 18,635 | - | MU-Non-Office (w/ RW) | - | 1,800 | 1,500 | 2,574 | 2.88 | 2,145 | 2.40 | 5.29 |
| | **Yes** | Mixed-Use Office | - | 0.71 | 21,741 | - | MU-Office (w/ RW) | - | 2,500 | 1,500 | 1,775 | 1.99 | 1,065 | 1.19 | 3.18 |
| 5 | **Yes** | Mixed-Use Residential | 182 | 5.19 | - | 35.1 | MU-High Density Residential (w/ RW) | 40 | 4,800 | 1,500 | 24,912 | 27.90 | 7,785 | 8.72 | 36.63 |
| | **Yes** | Mixed-Use Retail | - | 1.48 | 19,367 | - | MU-Non-Office (w/ RW) | - | 1,800 | 1,500 | 2,664 | 2.98 | 2,220 | 2.49 | 5.47 |
| | No | Mixed-Use Office | - | 0.74 | 22,595 | - | MU-Office (w/ RW) | - | 2,500 | 1,500 | 1,850 | 2.07 | 1,110 | 1.24 | 3.32 |
| 6 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 161 | 7.33 | - | 22.0 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 49,038 | 54.93 | 5,498 | 6.16 | 61.09 |
| 7 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 521 | 23.67 | - | 22.0 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 158,352 | 177.38 | 17,753 | 19.89 | 197.26 |
| 8 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 532 | 24.20 | - | 22.0 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 161,898 | 181.35 | 18,150 | 20.33 | 201.68 |
| 9 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 268 | 12.18 | - | 22.0 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 81,484 | 91.27 | 9,135 | 10.23 | 101.51 |
| 10 | No | Mixed-Use Residential | 345 | 9.87 | - | 35.0 | MU-High Density Residential (w/ RW) | 40 | 4,800 | 1,500 | 47,376 | 53.07 | 14,805 | 16.58 | 69.65 |
| 10 | No | Mixed-Use Retail | - | 2.82 | 36,852 | - | MU-Non-Office (w/ RW) | - | 1,800 | 1,500 | 5,076 | 5.69 | 4,230 | 4.74 | 10.42 |
| 10 | No | Mixed-Use Office | - | 1.41 | 42,994 | - | MU-Office (w/ RW) | - | 2,500 | 1,500 | 3,525 | 3.95 | 2,115 | 2.37 | 6.32 |
| 11 | No | Mixed-Use Residential | 384 | 10.97 | - | 35.0 | MU-High Density Residential (w/ RW) | 40 | 4,800 | 1,500 | 52,656 | 58.98 | 16,455 | 18.43 | 77.41 |
| 11 | No | Mixed-Use Retail | - | 3.13 | 40,955 | - | MU-Non-Office (w/ RW) | - | 1,800 | 1,500 | 5,634 | 6.31 | 4,695 | 5.26 | 11.57 |
| 11 | No | Mixed-Use Office | - | 1.57 | 47,781 | - | MU-Office (w/ RW) | - | 2,500 | 1,500 | 3,925 | 4.40 | 2,355 | 2.64 | 7.03 |
| 12 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 340 | 15.46 | - | 22.0 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 103,427 | 115.85 | 11,595 | 12.99 | 128.84 |
| 13 | No | Medium Density Residential (11.1-25.0 DU/AC gross max.) | 523 | 23.75 | - | 22.0 | Medium Density Residential (w/ RW) | 25 | 6,690 | 750 | 158,888 | 177.98 | 17,813 | 19.95 | 197.93 |
| | | **Subtotal Non-Open Space** | **4,293** | **190.08** | **250,920** | **26.0** | - | - | - | - | **1,151,120** | **1,289** | **175,793** | **197** | **1,486** |
| 14 | No | Open Space - Recreational (Parkland) | - | 13.33 | - | - | Open Space Recreational (w/ RW) | - | 1,000 | 2,350 | 13,330 | 14.93 | 31,326 | 35.09 | 50.02 |
| 15 | No | Open Space - Recreational (Parkland) | - | 13.11 | - | - | Open Space Recreational (w/ RW) | - | 1,000 | 2,350 | 13,110 | 14.69 | 30,809 | 34.51 | 49.19 |
| 16 | No | Open Space - Recreational (Parkland) | - | 9.90 | - | - | Open Space Recreational (w/ RW) | - | 1,000 | 2,350 | 9,900 | 11.09 | 23,265 | 26.06 | 37.15 |
| 17 | No | Open Space - Recreational (Parkland) | - | 6.20 | - | - | Open Space Recreational (w/ RW) | - | 1,000 | 2,350 | 6,200 | 6.94 | 14,570 | 16.32 | 23.27 |
| 18 | | Open Space - Recreational (Parkland) | - | 13.44 | - | - | Open Space Recreational (w/ RW) | - | 1,000 | 2,350 | 13,440 | 15.05 | 31,584 | 35.38 | 50.43 |
| 19 | | Open Space - Non-Recreation | - | 2.26 | - | - | Open Space Non-Recreational (w/ RW) | - | 1,000 | 0 | 2,260 | 2.53 | 0 | 0.00 | 2.53 |
| 20 | | Open Space - Non-Recreation | - | 2.68 | - | - | Open Space Non-Recreational (w/ RW) | - | 1,000 | 0 | 2,680 | 3.00 | 0 | 0.00 | 3.00 |
| 21 | | Open Space - Non-Recreation | - | 2.96 | - | - | Open Space Non-Recreational (w/ RW) | - | 1,000 | 0 | 2,960 | 3.32 | 0 | 0.00 | 3.32 |
| 22 | | Open Space - Non-Recreation | - | 3.38 | - | - | Open Space Non-Recreational (w/ RW) | - | 1,000 | 0 | 3,380 | 3.79 | 0 | 0.00 | 3.79 |
| | | **Subtotal Open Space** | **-** | **67** | **-** | **-** | - | - | - | - | **67,260** | **75** | **131,553** | **147** | **223** |
| | | **Grand Total** | **4,293** | **257.34** | **250,920** | **26.0** | - | - | - | - | **1,218,380** | **1,365** | **307,346** | **344** | **1,709** |

w/RW = with recycled water; UWMP = Urban Water Management Plan; WMP = Water Master Plan; TOP = The Ontario Plan; DU = dwelling unit; AC = acre; gpd = gallons per day; AFY = acre-feet per year.

[1] Source: Table 1-1, Land Use Plan Summary of the CenterPark Specific Plan (Draft July 2024).

[2] Sources for Unit Water Demand Factors are Appendix E and Appendix K of 2020 Ontario UWMP ("City of Ontario Water Master Plan Update" (AKM), June 2020, pp. 4-10-4-11; "Recycled Water Master Plan Update" (Stantec), June 22, 2020, p. 5.26.)

# WRITTEN VERIFICATION OF SUFFICIENT WATER SUPPLY

## FOR CENTERPARK SPECIFIC PLAN

## DECEMBER 5, 2024

ONTARIO
MUNICIPAL
UTILITIES
COMPANY

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# SB 221 Written Verification of Sufficient Water Supply

## 1.1 Introduction

Senate Bill 221 (SB 221) was enacted in 2001 and became effective as of January 1, 2002. SB 221 establishes the relationship between the Water Supply Assessment (WSA) prepared for a project pursuant to Senate Bill 610 (SB 610), and the project approval under the Subdivision Map Act. SB 221 amends Section 11010 of the Business and Professional Code, and amends Section 65867.5 to add Sections 66455.3 and 66473.7 to the California Government Code (Gov. Code).

Pursuant to Gov. Code Section 66473.7, the public water supplier must provide a written verification of sufficient water supply (WV) prior to the approval of a tentative subdivision map, or a parcel map for which a tentative map was not required, or a development agreement for a subdivision of property of more than 500 dwelling units, except as specified, including the design of the subdivision or similar type of improvement.

## 1.2 Purpose

The purpose of the WV is to provide the legislative body of a city, county, or the designated advisory agency with written verification from the applicable public water supplier that a sufficient water supply is available, or, in addition, a specified finding is made by the local agency that sufficient water supplies are, or will be, available prior to completion of the project.

The WV shall be supported by substantial evidence, which may include relevant portions of an applicable Urban Water Management Plan (UWMP) or a WSA prepared per SB 610. Many of the requirements for SB 610 compliance will satisfy the requirements of SB 221. There are four factors to be considered in a WV which are not required in a WSA as specified by Gov. Code Section 66473.7. Those four factors, which are specifically addressed in this WV are as follows:

1. Historical water supplies for at least 20 years;

2. Urban Water Shortage Contingency Analysis prepared for the water supplier's UWMP;

3. Supply reduction for "specific water use sector" per water supplier's resolution, ordinance, or contract; and

4. Amount of water that can be reasonably relied upon from specific supply projects, subject to the determinations outlined in Government Code Section 66473.7.

### 1.3 Project Description and Water Demand

This WV has been prepared in conjunction with a WSA for the proposed *CenterPark Specific Plan* (CenterPark or "Project"). CenterPark and adjacent properties are within the City of Ontario's 8,200-acre Ontario Ranch: "Annexed in 1999, the presently agricultural Ontario Ranch is planned to be developed into residential, commercial, industrial, and public uses" (UWMP, p. 3-1). The Project site has historically been used for agricultural purposes, including dairy and field crop farming (SP, p. 3-3).

The Project proposes a new planned community on approximately 257 acres. According to the proposed Specific Plan, "The community of CenterPark will provide a pedestrian friendly mixed-use retail/office center and up to 4,293 new residential dwelling units within 13 distinct planning areas designed in conjunction with a comprehensively planned open space system consisting of regional and neighborhood park facilities (SP, p. 1-1). Specifically, the Project proposes to develop up to 3,207 medium density residential units, 1,086 mixed-use high density residential units, 115,809 square feet of mixed-use retail, 135,111 square feet of mixed-use office, 56 acres of open space-recreational, and 11.3 acres of open space-non-recreational uses (WSA, p. 64). Refer to WSA Figure 3 – Proposed Land Use Plan and Figure 4 – Land Use Plan used for 2020 UWMP Projections.

The City of Ontario Municipal Utilities Company (OMUC)[1] is the water supplier for the Project and for the City. OMUC commissioned a WSA and WV from Albert A. Webb Associates (WEBB) on October 28, 2024. The purpose of preparing this WV for the Project is to preclude the need for individual "Written Verification" letters being prepared for the individual residential development projects that will qualify for a WV within the Project area. Because the Project has more than 500 units, which is the criteria set in Gov. Code Section 66473.7(a), a WV per SB 221 can be prepared concurrently with the WSA.

The key question for this WV to address per SB 221 is whether the water supplier is able to provide a sufficient water supply based upon an analysis as to whether water supplies available during normal, single-dry, and multiple-dry years within a 20-year projection will meet the projected demand associated with the proposed subdivision(s), in addition to existing and planned future uses, including, but not limited to, agriculture and industrial uses (DWR 2003).

### 1.4 Verification of Sufficient Water Supply

A detailed evaluation of OMUC's water supply was performed under the attached WSA for the Project. Attached to the WSA is the adopted City of Ontario 2020 UWMP which addresses normal, single dry, and multiple dry year conditions over the 20-year period from 2020 through 2040 (WSA Appendix A). The 2020 UWMP determined that sufficient water supply exists to support the demands of the OMUC service area. The attached WSA determined that the estimated water demand of the Project is approximately 98 acre-feet per year (AFY) more than the water demand for the same site that was assumed in the 2020 UWMP; therefore, the water demand for the Project was not fully accounted for in the 2020 UWMP. However, through evaluation of the City's water supply capacities, rights/entitlements, and water use trends, the WSA concludes that sufficient water supply exists to support the additional demands of the Project.

[1] OMUC is a department of the City of Ontario and the terms may be used interchangeably herein.

### *20-Year Water Supply Availability*

OMUC has been able to meet all water demands with its available water supplies for the past 20 years. Table 3-2 of the attached WSA shows the recorded water supplies from 2000-2024 that were utilized to meet the demand within OMUC's service area. A supply source that is available to OMUC but is not included in Table 3-2 are the groundwater storage accounts to which OMUC has rights to store water in the Chino Basin. As of FY 23/24, the City has approximately 136,870 AF held in groundwater storage (WSA Table 4-1).

### *Urban Water Shortage Contingency Analysis (Plan)*

The urban water shortage contingency analysis (aka Water Shortage Contingency Plan [WSCP]) prepared for the most recent UWMP is contained within Chapter 8 of Ontario's 2020 UWMP (Appendix A). The WSCP is based on the City's Water Conservation Plan located in Appendix N of the 2020 UWMP and codified in Chapter 8A of the City Municipal Code is an update of the City's Ordinance No. 3027 (adopted September 1, 2015). The WSCP includes stages of action, prohibitions on end uses, penalties and enforcement measures, determination of water shortage reductions, revenue and expenditure impacts, and catastrophic supply interruption.

The 2020 WSCP and Water Conservation Plan are consistent with the stringent emergency conservation regulations mandated by the State Water Resources Control Board in response to statewide drought conditions. The purpose of the ordinance and the Water Conservation Plan are to minimize the potential for a water shortage through the practice of water conservation, and to minimize the effect of a shortage of water supplies on the water customers of the City. In addition, it is the intent of the ordinance and the Water Conservation Plan to adopt provisions that will significantly reduce the inefficient consumption of water, thereby extending the available water resources necessary for domestic, sanitation, and fire protection of the community to the greatest extent possible (Municipal Code Sec. 6-8.21).

The 2020 WSCP and Water Conservation Plan describe the methods to respond to a water supply shortage of more than 50 percent. Six stages of conservation are described (Stages 1-6) with increasing conservation requirements and penalties depending on the severity of the shortage (UWMP, p. 8-8). As of November 2024, the City is in the Voluntary Conservation Stage where customers are encouraged to voluntarily conserve water.[2]

### *Supply Reduction for Specific Water Use Sector*

OMUC's 2020 WSCP and Water Conservation Plan establish voluntary and mandatory water conservation requirements which shall take effect upon implementation. During a water shortage crisis, certain mandatory restrictions on water use will be imposed on the public. The voluntary water use prohibitions apply at all times. Stage 1 to 6 prohibitions will be progressively implemented according to the severity of the water crisis (OMUC 2020 UWMP, Appendix N). The restrictions and prohibitions on end users that correspond to Stages 1 to 6 are outlined in Table 8-2 of the City's 2020 UWMP (p. 8-3). OMUC does not have a water supply allocation plan. No single water use sector is identified in the 2020 WSCP or Water Conservation Plan for supply reductions in the event of a water shortage crisis.

### *Amount of Water That Can Be Reasonably Relied Upon from Specific Supply Project(s)*

This requirement of the WV pertains to projected water supplies that the water supplier can reasonably rely on that are not currently available to the public water system. All projected water supplies are currently available to OMUC but may not be fully utilized to date. Descriptions of the supplies available to OMUC are in Section 3 of the attached WSA.

[2] City of Ontario Drought Updates Website: https://www.ontarioca.gov/ontariowaterwise/droughtupdates

## 1.5 Substantial Evidence of Verification of Sufficient Water Supply

This WV does not rely on projected water supplies that are not currently available to OMUC. The water supplies that OMUC will continue to rely on are projected to be sufficient to meet current and future needs are described in Section 3 of the attached WSA. Because projected supply sources are currently available to OMUC, supporting information pursuant to Gov. Code section 66473.7 is not provided herein. This would include written contracts or other proof of valid rights to supplies under development, an adopted capital outlay program to finance delivery of supplies under development, permits to construct supply infrastructure for supplies under development, and regulatory approvals for conveyance or delivery of supplies under development. Copies of the rights, contracts, and other entitlements to water supplies available to OMUC are provided in the appendices to the attached WSA.

## 1.6 Impacts to Agricultural and Industrial Users

Gov. Code section 66473.7 requires this WV to contain a description of reasonably foreseeable impacts of the proposed subdivision on the availability of water resources for agricultural and industrial uses within the water supplier's service area that are not currently receiving water from the water supplier but are utilizing the same sources of water.

Water used by industrial and agricultural users that is not provided to them by OMUC would come from their private wells to access the Chino Groundwater Basin, which OMUC also utilizes. Adverse impacts to such entities as a result of the Project is not anticipated because the Chino Basin is an adjudicated basin with a court appointed Watermaster who monitors and enforces the provisions of the 1978 Judgment and subsequent orders of the court. As discussed in Section 4 of the attached WSA, the Watermaster develops and implements an Optimum Basin Management Program to sustainably manage the basin for all users.

In regard to agricultural use, the *Ontario General Plan Amendment for the New Model Colony* [Ontario Ranch] (1998) projects a nearly 100 percent conversion of existing agricultural land to non-agricultural uses, except for approximately 200 acres of land that are owned by the County of San Bernardino and managed by the Southern California Agricultural Land Foundation. This does not include the CenterPark Specific Plan. As planned for by the City and discussed in the attached WSA, agricultural properties are projected to decrease with the conversion of Ontario Ranch to non-agricultural activities (WSA Figures 5 and 6). Table 3-7 of the attached WSA also forecasts declines in recycled water use by agriculture, reaching zero use by 2040. As of 2020, there are 20 agricultural recycled water irrigation sites in the City (2020 Annual Report to DDW). The proposed subdivision is not anticipated to have adverse impacts on the shared water supply source because the 2020 UWMP has incorporated planned future declines in agricultural use in the water demand projections, which includes declines in private wells and conversion to OMUC supplies.

In regard to industrial uses, they are the third most common land use type in the City (after Agricultural, Multi-Use at 21.2 percent, and Residential at 19.3 percent), making up approximately 5,498 acres or 17.3 percent of the total area as of the 2020 Water Master Plan (AKM 2020, p. 2-5). The ultimate citywide land use plan on which the current water master plan and UWMP are based (*The Ontario Plan 2010)*, plans for an increase of business parks and industrial uses to cover about 7,818 acres or 24.6 percent at buildout (AKM 2020, p. 2-7). Further, the 2020 UWMP citywide projections in the attached WSA show potable water use by industrial uses increasing from 2,078 AFY in 2020 (WSA Table 2-2) to 3,728 AFY in 2040 (WSA Table 2-3) and industrial use of recycled water is projected to increase from 986 AFY in 2020 to 3,680 AFY in 2045 (WSA Table 3-7). As of 2020, there are three industrial recycled water sites in the City (2020 Annual Report to DDW). The proposed subdivision is not anticipated to have adverse impacts on the shared water supply source because the 2020 UWMP water demand projections have accounted for future increases in potable and recycled water use by industrial uses, in addition to other uses.

For each acre of agricultural land that converts to urban use, the initial Safe Yield of the appropriative pool member serving the converted land is increased by 2 acre-feet. In addition, properties that were on private wells are expected to connect to OMUC infrastructure. Therefore, OMUC's share of the Safe Yield will continue to increase as Ontario Ranch develops, concurrent with a decline in private wells in the Chino Basin, including wells within the Project that will be decommissioned.

### 1.7 Priority to Proposed Lower Income Housing Projects

Pursuant to Gov. Code section 65589.7, the determinations made by the WV shall be consistent with the obligation of a public water system to grant a priority for the provision of available and future water resources or services to proposed housing developments that help meet the City's (or County's) share of the regional housing needs allocation (RHNA) for lower income households.

The 2020 UWMP states that the City has considered the demographic factors of severely low-income earners, single-parent families, large families, seniors, people with disabilities, and homeless persons "which can affect the City's water management planning" (p. 3-7). Further, the 2020 UWMP indicates that lower income residential demands are included in water use projections (*ibid,* p. 4-12).

If the Project or a portion thereof helps meet the City's share of the RHNA for lower income households, the City is obligated to grant priority to supply water thereto.

### 1.8 Verification That Relies on Groundwater

Law

Gov. Code Sec. 66473.7 (h)

> *Where a water supply for a proposed subdivision includes groundwater, the public water system serving the proposed subdivision shall evaluate, based on substantial evidence, the extent to which it or the landowner has the right to extract the additional groundwater needed to supply the proposed subdivision.*

> *Nothing in this subdivision is intended to modify state law with regard to groundwater rights.*

Section 4 of the attached WSA describes OMUC's legal right to extract groundwater from the Chino Basin.

### 1.9 Finding of Sufficient Water Supply

The estimated potable water demand for the proposed Project is 1,365 AFY and the recycled water demand is 344 AFY for a total water demand of 1,709 AFY. As depicted in Table 3-2 and Table 3-3 of the attached WSA, the City's current (FY 23/24) and ultimate total water supply are sufficient to meet the existing and anticipated water demands from its service area including the proposed Project's potable and recycled water demands. Furthermore, the Project will bring 2.0 acre-feet per eligible acre of additional groundwater rights to the City as a result of the land use conversion. Based on the analysis herein and the attached WSA, OMUC finds that "sufficient water supply" is available to support the projected subdivisions within the Planning Areas of CenterPark Specific Plan as they are currently described herein.

## References


| | |
|---|---|
| AKM 2020 | AKM Consulting Engineers, *City of Ontario 2020 Water Master Plan Update.* June 2020. (WSA Appendix B) |
| Judgment | Judgment, *Chino Basin Municipal Water District v. City of Chino, et al., San Bernardino Ct. No. 164327* (filed Jan. 30, 1978). Includes amendments thereto. (WSA Appendix M) |
| OMUC | Ontario Municipal Utilities Company. *Personal communication with Alexis, Mascarinas, Associate Engineer.* October 10, 2024 |
| Project | Sares Regis. *CenterPark Specific Plan*. July 2024 Draft. |
| UWMP | Stetson Engineers. *City of Ontario 2020 Urban Water Management Plan*. June 2021. (WSA Appendix A) |
| WSA | Albert A. Webb Associates. *Water Supply Assessment for CenterPark Specific Plan.* November 2024. |

# CITY OF ONTARIO

CITY OF ONTARIO

JUNE 2021

FINAL

# 2020 URBAN WATER MANAGEMENT PLAN

STETSON ENGINEERS INC.

Northern California • Southern California • Arizona • Colorado • Oregon

# City of Ontario
# 2020 Urban Water Management Plan

**JUNE 2021**

STETSON ENGINEERS INC.

861 Village Oaks Drive, Suite 100 • Covina , California 91724
Phone: (626) 967-6202 • FAX: (626) 331-7065 • Web site: www.stetsonengineers.com

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|---|---|
| 1,2,3-TCP | 1,2,3-Trichloropropane |
| AB | Assembly Bill |
| AF | Acre-feet |
| AFY | Acre-feet per year |
| Annual Assessment | Annual Water Supply and Demand Assessment |
| AWWA | American Water Works Association |
| CBWCD | Chino Basin Water Conservation District |
| CCWRF | Carbon Canyon Water Recycling Facility |
| CEQA | California Environmental Quality Act |
| CDA | Chino Basin Desalter Authority |
| CIMIS | California Irrigation Management Information System |
| City | City of Ontario |
| CPUC | California Public Utilities Commission |
| CWC | California Water Code |
| DACs | Disadvantaged Communities |
| Delta | Sacramento-San Joaquin Delta |
| DMMs | Demand Management Measures |
| DOF | Department of Finance |
| DRA | Drought Risk Assessment |
| DWR | Department of Water Resources |
| DYYP | Dry-Year Yield Program |
| ERP | Emergency Response Plan |
| ETo | Evapotranspiration |
| FEMA | Federal Emergency Management Agency |
| FY | Fiscal Year |
| GCMs | General Circulation Models |
| GIS | Geographical Information Systems |
| GPCD | Gallons per capita per day |
| GSP | Groundwater Sustainability Plan |
| IEUA | Inland Empire Utilities Agency |
| JPA | Joint Exercise of Powers Agreement |
| kWh | Kilowatt Hours |
| LSLS | Local Storage Limitation Solution |
| M&I | Municipal and Industrial |
| MGD | Million Gallons Per Day |
| MWD | Metropolitan Water District of Southern California |
| NRWS | Non-Reclaimable Wastewater System |
| OBMP | Optimum Basin Management Program |
| OMC | Old Model Colony |
| OR | Ontario Ranch |
| Plan | Urban Water Management Plan |
| RCP | Representative Concentration Pathway |
| PCE | Perchloroethylene |
| RP-1 | Regional Water Recycling Plant No. 1 |

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| RP-4 | Regional Water Recycling Plant No. 4 |
| RP-5 | Regional Water Recycling Plant No. 5 |
| RRA | Risk and Resilience Assessment |
| RWQCB | Regional Water Quality Control Board |
| SAWCo | San Antonio Water Company |
| SB | Senate Bill |
| SBCFCD | San Bernardino County Flood Control District |
| SCAG | Southern California Association of Governments |
| SGMA | Sustainable Groundwater Management Act of 2014 |
| SWRCB | State Water Resources Control Board |
| SWRCB - DDW | State Water Resources Control Board – Division of Drinking Water |
| TCE | Trichloroethylene |
| TDS | Total Dissolved Solids |
| USEPA | U.S. Environmental Protection Agency |
| UWMP | Urban Water Management Plan |
| VOCs | Volatile Organic Compounds |
| WFA | Water Facilities Authority |
| WRCC | Western Regional Climate Center |
| WSAP | Water Supply Allocation Plan |
| WSCP | Water Shortage Contingency Plan |
| WUCA | Water Utilities Climate Alliance |
| WUE | Water Use Efficiency |

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# Chapter 1

## URBAN WATER MANAGEMENT PLAN INTRODUCTION AND OVERVIEW

## INTRODUCTION

An urban water supplier is defined (pursuant to Section 10617 of the California Water Code or CWC[1]) as "*a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers.*"

The City of Ontario (City) is classified as an urban water supplier because it serves more than 3,000 customers (i.e. individual metered accounts) and it supplies more than 3,000 acre-feet of water annually to its customers for municipal purposes.

In accordance with the "Urban Water Management Planning Act", which was enacted by the California Legislature in 1983, every urban water supplier (including the City) is required to prepare and adopt an Urban Water Management Plan (UWMP), periodically review its UWMP, and incorporate updated and new information into an updated UWMP at least once every five years.

The City's most recent update was its 2015 UWMP (or 2015 Plan) which was submitted to, and approved by, the California Department of Water Resources (DWR) in 2016. Urban water suppliers (including the City) are required to complete and submit their 2020 UWMPs to DWR by July 1st, 2021.

The current requirements for preparing the UWMP are included in CWC Sections 10608 through 10657. The City's 2020 UWMP (or 2020 Plan) was prepared consistent with the CWC and the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020" (Final 2020 UWMP Guidebook), dated March 2021.

The UWMP provides urban water suppliers (including the City) with a planning document for long-term resource planning to ensure adequate water supplies are available to meet existing and future water supply needs. In addition, the 2020 UMWP incorporates water supply reliability determinations resulting from potential prolonged drought, regulatory revisions, and/or changing climatic conditions.

[1] References to CWC Sections in this 2020 UWMP were obtained from https://leginfo.legislature.ca.gov/

The City's 2020 Plan consists of the following Chapters:

Chapter 1 Urban Water Management Plan Introduction and Overview
Chapter 2 Plan Preparation
Chapter 3 System Description
Chapter 4 Water Use Characterization
Chapter 5 SB X7-7 Baseline, Targets, and 2020 Compliance
Chapter 6 Water Supply Characterization
Chapter 7 Water Service Reliability and Drought Risk Assessment
Chapter 8 Water Shortage Contingency Plan
Chapter 9 Demand Management Measures
Chapter 10 Plan Adoption, Submittal, and Implementation

Lay descriptions are presented at the beginning of each of these Chapters that offer a succinct, executive summary type overview.

## LAY DESCRIPTION – CHAPTER 1

### URBAN WATER MANAGEMENT PLAN INTRODUCTION AND OVERVIEW

Chapter 1 (Urban Water Management Plan Introduction and Overview) of the City's 2020 Plan discusses and provides the following:

- An analysis of the City's ability to provide sufficient water supplies to meet the projected water demands of its customers, including during a five consecutive year drought period.
- An overall lay description of the 2020 Plan, including California Water Code and Urban Water Management Plan Act requirements, is provided. The City is required to prepare an Urban Water Management Plan.
- The City's 2020 Plan was prepared consistent with the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020", dated March 2021. A description regarding the organization of the 2020 Plan, including a summary of each Chapter, is provided. The City's Water Shortage Contingency Plan (discussed in Chapter 8) is also included in the 2020 Plan.
- The 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data. These tables are included within the respective sections of the 2020 Plan and in Appendix A.
- The City's coordination efforts with other planning agencies are discussed, including coordination efforts with the City of Ontario's Planning Division, Inland Empire Utilities Agency, Water Facilities Authority, and the Southern California Association of Governments
- The City's eligibility to receive grants and loans administered by the State of California and/or DWR, as a result of preparing the 2020 Plan, is discussed.

- Information is provided which demonstrates the City's prior, continued, and projected reduction on imported water supplies obtained (either directly or indirectly) from the Sacramento-San Joaquin Delta (Delta). The City has reduced its reliance on imported water supplies through a reduction of GPCD water demand and increased recycled water use for Fiscal Year 2014-15 through Fiscal Year 2019-2020. In addition, the City is projected to continue reducing its reliance on imported water supplies through Fiscal Year 2044-45. Further discussion which demonstrates the City's measurable reduction in imported water supplies and improvement in regional self-reliance is provided in Appendix B.
- The checklist developed by DWR and used by the City to incorporate the specific UWMP requirements is discussed. The completed checklist is provided in Appendix C.

## 1.1 RECOMMENDED UWMP ORGANIZATION

The City's 2020 Urban Water Management Plan (2020 Plan) was prepared consistent with the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020" (Final 2020 UWMP Guidebook), dated March 2021. The City's 2020 Plan consists of the following Chapters:

| | |
|---|---|
| Chapter 1 | Urban Water Management Plan Introduction and Overview |
| Chapter 2 | Plan Preparation |
| Chapter 3 | System Description |
| Chapter 4 | Water Use Characterization |
| Chapter 5 | SB X7-7 Baselines, Targets, and 2020 Compliance |
| Chapter 6 | Water Supply Characterization |
| Chapter 7 | Water Service Reliability and Drought Risk Assessment |
| Chapter 8 | Water Shortage Contingency Plan |
| Chapter 9 | Demand Management Measures |
| Chapter 10 | Plan Adoption, Submittal, and Implementation |

Pursuant to CWC requirements, the City's 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data. DWR's standardized tables are provided within the body of the 2020 Plan text as well as in Appendix A. The City also submitted the UWMP data (standardized tables) electronically through DWR's Online Submittal Tool.

The City's 2020 Plan also provides supporting documents (appendices) including notification letters of the Plan update, public notice of the Plan hearing, and adoption resolution from the City's governing body. Further discussions regarding these supporting documents are provided within the individual Chapters of the City's 2020 Plan.

## 1.2 UWMPS IN RELATION TO OTHER EFFORTS

The City's 2020 Plan was prepared in coordination with planning agencies including the City of Ontario's Planning Division and the Southern California Association of Governments (SCAG). In addition, the City's 2020 Plan was prepared using management documents including the City's "*2020 Water System Master Plan*", the City's *"2018 Hazard Mitigation Plan"*, and the San Bernardino County's "*2017 San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan*".

The City is a member agency of various wholesale agencies including the Chino Basin Desalter Authority (CDA), Inland Empire Utilities Agency (IEUA), and the Water Facilities Authority (WFA). CDA, IEUA, and WFA have each individually prepared a 2020 Plan which are incorporated in the City's 2020 Plan by reference. In addition, the City provided its 2020 Plan to CDA, IEUA, and WFA, which includes water use projections in five-year increments for a normal year, a single dry year, and a five consecutive year drought over the next 25 years.

The City is a shareholder in, and purchases water from, San Antonio Water Company (SAWCo). The City receives water from SAWCo based upon the City's proportional number of shares and the water supply available to SAWCo.

## 1.3 UWMPS AND GRANT OR LOAN ELIGIBILITY

Pursuant to DWR's Final 2020 UWMP Guidebook:

"*In order for a Supplier to be eligible for any water grant or loan administered by DWR, the Supplier must have a current UWMP on file that has been determined by DWR to address the requirements of the Water Code. A current UWMP must also be maintained by the Supplier throughout the term of any grant or loan administered by DWR. A UWMP may also be required in order to be eligible for other state funding, depending on the conditions that are specified in the funding guidelines. Suppliers are encouraged to seek guidance on the specifics of any state funding source from the respective funding agencies. The following sections of the Water Code are pertinent to Suppliers considering pursuit of grants or loans*."

The City's 2020 Plan has been prepared to meet eligibility requirements for grants and loans administered by the State and/or DWR.

## 1.4 DEMONSTRATION OF CONSISTENCY WITH THE DELTA PLAN FOR PARTICIPANTS IN COVERED ACTIONS

Pursuant to DWR, an urban water supplier that anticipates participating in or receiving water from a proposed project (or "covered action") such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in

the Sacramento-San Joaquin Delta (Delta) should provide information in their 2015 and 2020 UWMPs for use in demonstrating consistency with Delta Plan Policy WR P1, "*Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance"*. In addition, pursuant to California Code of Regulations, Title 23, § 5003:

> *(c)(1) Water suppliers that have done all of the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*
>
> > *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
> >
> > *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*
> >
> > *(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

The City has reduced its reliance on imported water supplies for FY 2014-15 and FY 2019-20. In addition, the City is projected to continue reducing its reliance on imported water supplies through FY 2044-45. A further discussion which demonstrates the City's measurable reduction imported water reliance and improvement in regional self-reliance is provided in Appendix B.

## 1.5 TIPS FOR UWMP PREPARERS

The City's 2020 Plan (which includes the City's 2020 Water Shortage Contingency Plan (WSCP) is considered an update to the City's 2015 Plan. However, the 2020 Plan and the WSCP are considered stand-alone documents. As discussed in Section 1.1, the City's 2020 Plan was prepared consistent with the recommended organization provided in DWR's Final 2020 UWMP Guidebook.

A checklist of specific UWMP requirements is included in Appendix C. The checklist includes the page number where the required elements are addressed to assist in DWR's review of the submitted Plan.

Chapter 2

# PLAN PREPARATION

## LAY DESCRIPTION – CHAPTER 2

**PLAN PREPARATION**

Chapter 2 (Plan Preparation) of the City's 2020 Plan discusses and provides the following:

- The basis for preparing an Urban Water Management Plan is provided. The City is required to prepare the 2020 Plan because it is an "urban water supplier" (the City serves more than 3,000 customers and it supplies more than 3,000 acre-feet of water annually to its customers for municipal purposes).
- The City is a "Public Water System" and is regulated by the State Water Resources Control Board - Division of Drinking Water. The City's Public Water System number is provided in Table 2-1.
- The City's Plan has been prepared as an "individual" plan rather than a "regional" plan in an effort to provide information specific to the City to best inform its employees, management, and customers.
- Information presented in the City's 2020 Plan is provided on "fiscal year" basis which is from July 1 through June 30 of the following year.
- Water quantities presented in the City's 2020 Plan are provided on an "acre-foot" basis.
- The City's coordination and outreach efforts with wholesale water agencies, other retail water agencies, and the community are described. The City coordinated the preparation of its 2020 Plan with the Chino Basin Watermaster, Chino Basin Desalter Authority, Cucamonga Valley Water District, Fontana Water Company, Inland Empire Utilities Agencies, Monte Vista Water District, Metropolitan Water District (MWD) of Southern California, Santa Ana Watershed Project Authority, San Antonio Water Company, and Water Facilities Authority.
- The City's notification process to the cities and county which the City provides water to is discussed.

## 2.1 PLAN PREPARATION

As discussed in Section 1.1, the City's 2020 UWMP was prepared consistently with the recommended organization provided in DWR's Final 2020 UWMP Guidebook. Pursuant to DWR's Final 2020 UWMP Guidebook:

"*The [CWC] specifies several requirements for preparing a UWMP, including who is required to prepare a UWMP; how to prepare a UWMP, depending on whether the Supplier choses to*

*participate in a regional or individual planning effort; selection of reporting year-type; and coordination, notification, and outreach.*"

Pursuant to CWC requirements, the City's 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data.

## 2.2 BASIS FOR PREPARING A PLAN

**CWC 10617.**

*"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.*

**CWC 10620.**

*(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*

**CWC 10621.**

*(a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.*

The City's 2020 Plan was prepared in accordance with the UWMP Act which was established in 1983. The UWMP Act requires every "urban water supplier" to prepare and adopt a Plan, to review its Plan at least once every five years and make any amendments or changes which are indicated by the review. An "urban water supplier" is defined as "a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually." (CWC 10617.)

Section 10621(a) of the CWC states, "*[e]ach urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update".* As a result, DWR requires the 2020 Plans be submitted by July 1, 2021.

The City is an "urban water supplier" pursuant to Section 10617 of the CWC and directly serves potable water to more than 3,000 customers and supplies more than 3,000 acre-feet per year (AFY) at retail for municipal purposes. The City's 2020 Plan is an update to the City's 2015 Plan.

### 2.2.1 PUBLIC WATER SYSTEMS

**CWC 10644.**

*(a)(2) The plan, or amendments to the plan, submitted to the department ... shall include any standardized forms, tables, or displays specified by the department.*

**California Health and Safety Code 116275.**

*(h) "Public Water System" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.*

Pursuant to CWC requirements, the City's 2020 Plan incorporates DWR's standardized tables for the reporting and submittal of UWMP data. The standardized tables are provided within the body of the 2020 Plan text as well as in Appendix A. The City also submitted the UWMP data (from the standardized tables) electronically through DWR's Online Submittal Tool.

In addition, the City is a Public Water System and is regulated by the State Water Resources Control Board - Division of Drinking Water (SWRCB-DDW). The SWRCB-DDW requires water agencies to provide the number of connections, water usage, and other information annually. The information provided to SWRCB-DDW indicates the City serves potable water to more than 3,000 customers and supplies more than 3,000 AFY. Table 2-1 provides the City's Public Water System name and number.

### 2.2.2 SUPPLIERS SERVING MULTIPLE SERVICE AREAS / PUBLIC WATER SYSTEMS

The City serves only a single Public Water System. Table 2-1 provides the City's Public Water System name and number.

**Table 2-1 Public Water Systems**

| Submittal Table 2-1 Retail Only: Public Water Systems | | | |
|---|---|---|---|
| Public Water System Number | Public Water System Name | Number of Municipal Connections 2020 | Volume of Water Supplied 2020 * |
| *Add additional rows as needed* | | | |
| 3610034 | Ontario Municipal Utilities Company | 36,514 | 39,921 |
| | | | |
| | | | |
| | TOTAL | 36,514 | 39,921 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | |
| NOTES: The "Volume of Water Supplied 2020" includes recycled water supplies of 7,812 AF. Source for "Number of Municipal Connections 2020": https://sdwis.waterboards.ca.gov/PDWW/ | | | |

## 2.3 REGIONAL PLANNING

The City has developed its 2020 Plan reporting solely on its service area to address all requirements of the California Water Code. The City's 2020 Plan was not developed as a Regional Plan.

## 2.4 INDIVIDUAL OR REGIONAL PLANNING AND COMPLIANCE

As shown in Table 2-2, the City's 2020 Plan is an "Individual UWMP". The City has developed its 2020 Plan reporting solely on its service area to address all requirements of the California Water Code, including water use targets and baselines pursuant to SB X7-7 Water Conservation Act of 2009 reporting (discussed further in Chapter 5). The City notified and coordinated with appropriate regional agencies and constituents (See Section 2.6).

**Table 2-2 Plan Identification Type**

| Submittal Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list) |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☐ | Water Supplier is also a member of a Regional Alliance | |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

## 2.4.1 REGIONAL UWMP

**CWC 10620.**

*(d)(1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.*

As indicated in Table 2-2, the City's 2020 Plan was developed as an "Individual UWMP" and not as part of a Regional Plan.

### 2.4.2 REGIONAL ALLIANCE

**CWC 10608.20.**

*(a)(1) …Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28…*

**CWC 10608.28.**

*(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:*

*(1) Through an urban wholesale water supplier.*

*(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).*

*(3) Through a regional water management group as defined in Section 10537.*

*(4) By an integrated regional water management funding area.*

*(5) By hydrologic region.*

*(6) Through other appropriate geographic scales for which computation methods have been developed by the department.*

*(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.*

As indicated in Table 2-2, the City's 2020 Plan was developed as an "Individual UWMP" and not part of a Regional Alliance.

## 2.5 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

**CWC 10608.20.**

*(a)(1) Urban retail water suppliers…may determine the targets on a fiscal or calendar year basis.*

### 2.5.1 FISCAL OR CALENDAR YEAR

The data provided in the City's 2020 Plan is reported on a fiscal year (FY) basis, unless noted otherwise, as shown in Table 2-3. A fiscal year begins on July 1st of every year.

**Table 2-3 Supplier Identification**

| Submittal Table 2-3: Supplier Identification | |
|---|---|
| Type of Supplier (select one or both) | |
| ☐ | Supplier is a wholesaler |
| ☑ | Supplier is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☐ | UWMP Tables are in calendar years |
| ☑ | UWMP Tables are in fiscal years |
| If using fiscal years provide month and date that the fiscal year begins (mm/dd) | |
| *07/01* | |
| Units of measure used in UWMP * (select from drop down) | |
| Unit | AF |
| **** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | |
| NOTES: | |

### 2.5.2 REPORTING COMPLETE 2020 DATA

The data provided in the City's 2020 Plan is provided on a fiscal year basis through June 30, 2020.

### 2.5.3 UNITS OF MEASURE

As shown in Table 2-3, the data provided in the City's 2020 Plan is reported in units of acre-feet (AF), unless noted otherwise.

## 2.6 COORDINATION AND OUTREACH

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

### *2.6.1 WHOLESALE AND RETAIL COORDINATION*

The City is a member agency of CDA, IEUA, and WFA. As indicated in Table 2-4, the City has provided its 2020 Plan to CDA, IEUA, and WFA, which includes water use projections in five-year increments for a normal year, a single dry year, and a five consecutive year drought over the next 25 years.

The City is a shareholder in SAWCo, a private water company. The City obtains water supply based on its proportional number of shares and the amount of water available to SAWCo.

**Table 2-4 Water Supplier Information Exchange**

| Submittal Table 2-4 Retail: Water Supplier Information Exchange |
|---|
| The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631. |
| Wholesale Water Supplier Name |
| *Add additional rows as needed* |
| Chino Basin Desalter Authority |
| Inland Empire Utilities Agency |
| San Antonio Water Company |
| Water Facilities Authority |
| NOTES: |

### 2.6.2 COORDINATION WITH OTHER AGENCIES AND THE COMMUNITY

**CWC 10620.**

*(d)(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

**CWC 10642.**

*Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan…*

The City of Ontario is a retail water supplier that serves customers in the City of Ontario. The City is required to coordinate the preparation of the Plan with appropriate agencies in the area, including appropriate water suppliers that share a common source. Therefore, the City coordinated the preparation of its 2020 Plan with the Chino Basin Watermaster, CDA, Cucamonga Valley Water District, Fontana Water Company, IEUA, Monte Vista Water District, MWD, Santa Ana Watershed Project Authority, SAWCo, and WFA. As discussed in Section 10.2, the City notified these agencies, as well as the cities and county within which the City provides water supplies, at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited them to participate in the development of the 2020 Plan. A copy of the notification letters sent to these agencies is provided in Appendix D.

### 2.6.3 NOTICE TO CITIES AND COUNTIES

**CWC 10621.**

*(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

As discussed in Section 10.2, notification that the City was reviewing and considering amendments (updates) to the previous 2015 Plan, and preparing the 2020 Plan was provided to the cities and counties for which the City provides water supplies. Notification was provided at least 60 days prior to the public hearing (see Appendix D).

Chapter 3

# SYSTEM DESCRIPTION

## LAY DESCRIPTION – CHAPTER 3

### SYSTEM DESCRIPTION

Chapter 3 (System Description) of the City's 2020 Plan discusses and provides the following:

- A description of the City's service area is provided. The City is located approximately 35 miles easterly of downtown Los Angeles in the County of San Bernardino. The City is bounded by the Cities of Chino and Montclair to the west; the Cities of Rancho Cucamonga and Upland to the north; the City of Fontana to the east; and the Cities of Chino and Eastvale to the south.
- The City's water service area encompasses an area of approximately 49 square miles. The location of the City's water service area is provided in Figure 1.
- A description regarding the City's water service area climate is provided. The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly evapotranspiration (ETo) in the vicinity of the City's service area is summarized. The sources of the climate information are also discussed.
- The population within the City's water service area is discussed and projected. The sources of the population information are also discussed. The City provides water service to an area with a current population of 178,409. The City is projected to have a population of 362,903 by Fiscal Year 2044-45.
- A discussion of land use information used by the City to develop the 2020 Plan is provided. The City reviewed the current and projected land uses within its service area. The City also reviewed data provided by the Southern California of Governments, the Department of Finance, and the United States Census Bureau and prepared for counties, cities, and unincorporated areas within Southern California.

**Figure 1 – Water Service Area and City Boundaries**

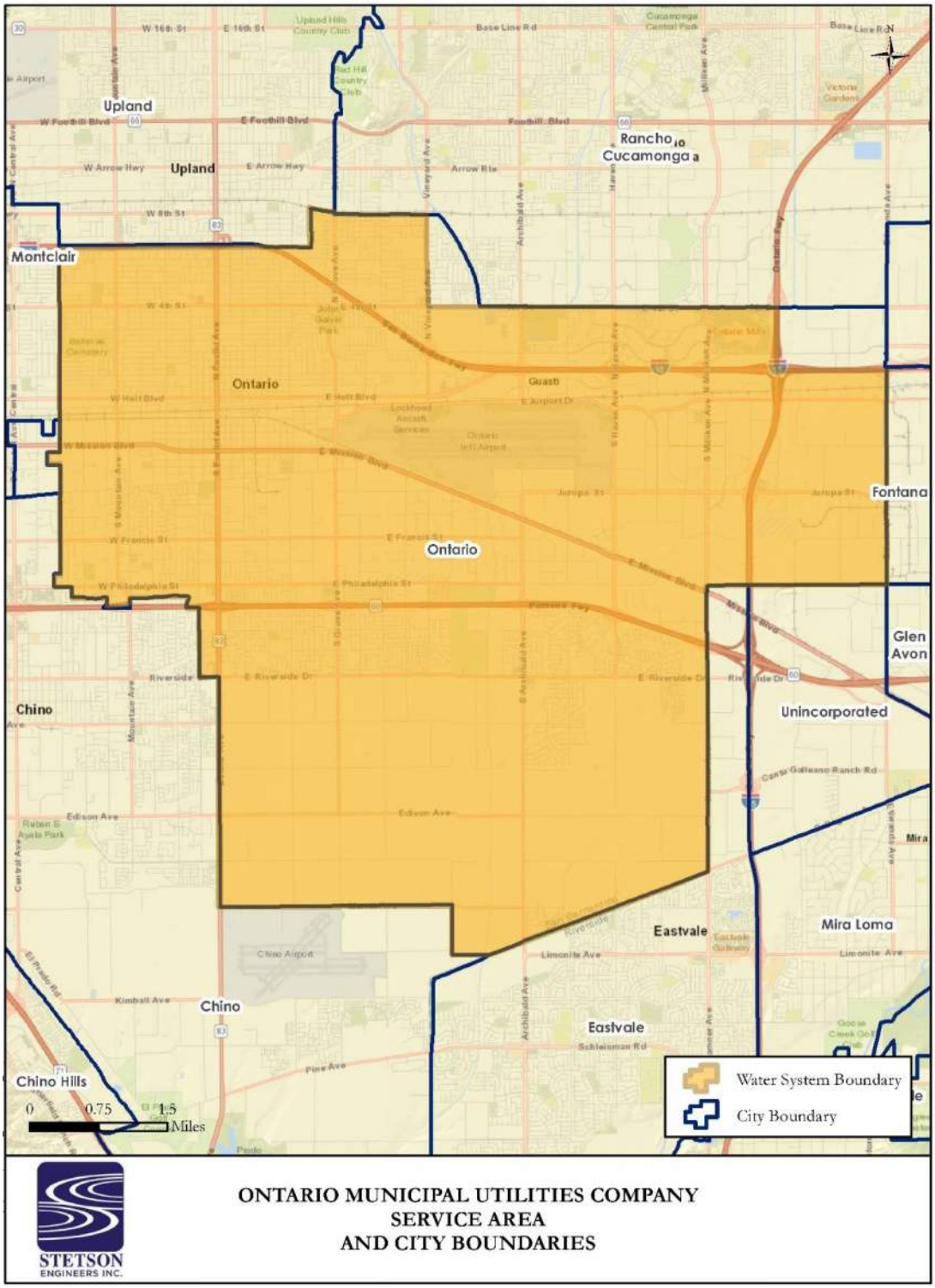

## 3.1 GENERAL DESCRIPTION

**CWC 10631.**

*(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.*

The City of Ontario was founded in 1881 and was officially incorporated in 1891. The City is located approximately 35 miles easterly of downtown Los Angeles in the County of San Bernardino. The City is bounded by the Cities of Chino and Montclair to the west; the Cities of Rancho Cucamonga and Upland to the north; the City of Fontana to the east; and the Cities of Chino and Eastvale to the south.

The predominant land developments found within the City's service area are residential, commercial, industrial, and agricultural. Since acquiring new land in 1999, the City's service area is divided between two districts known as the Old Model Colony (OMC) and the Ontario Ranch (OR). The OMC area is mostly composed of residential, commercial, and industrial developments, including the Ontario International Airport, whereas the OR area is predominantly an agricultural development with plans to be redeveloped for residential, commercial, industrial, and public uses. Large areas of the OR already have been or are currently undergoing redevelopment.

## 3.2 SERVICE AREA BOUNDARY MAPS

The City's service area covers approximately 49 square miles encompassing most of the City of Ontario. The City's water service area boundary relative to the City of Ontario's municipal boundary is provided in Figure 1.

The City's service area map was submitted online through DWR's Population Tool in a "KML" file format (i.e. Google Earth format). The KML file was originally created in a Geographical Information Systems (GIS) shape file format and converted into a KML format. To the extent information was available, metadata was included in the KML file (including map projection, contact information, start and end dates for which the map is valid, constraints, attribute table definitions, and digitizing base).

## 3.3 SERVICE AREA CLIMATE

**CWC 10631.**

*(a) Describe the service area of the supplier, including … climate…*

**CWC 10630.**

*It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.*

The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly evapotranspiration in the vicinity of the City's service area is summarized in the tabulation below. Historical climate information was obtained from the Western Regional Climate Center (WRCC), the National Oceanic and Atmospheric Administration, and from DWR's California Irrigation Management Information System (CIMIS).

## Service Area Climate Information

| Month | Average Temperature (F) | Average Minimum Temperature (F) | Average Maximum Temperature (F) | Average Total Precipitation (Inches) | ETo (Inches) |
|---|---|---|---|---|---|
| **January** | 55.47 | 44.06 | 67.63 | 2.17 | 1.95 |
| **February** | 55.12 | 44.85 | 67.44 | 2.69 | 2.41 |
| **March** | 58.82 | 48.21 | 58.82 | 1.27 | 3.75 |
| **April** | 60.93 | 51.00 | 74.85 | 0.87 | 4.55 |
| **May** | 67.88 | 55.61 | 79.62 | 0.30 | 5.19 |
| **June** | 71.22 | 59.78 | 86.23 | 0.01 | 5.97 |
| **July** | 77.76 | 64.70 | 93.08 | 0.05 | 6.60 |
| **August** | 78.88 | 65.16 | 94.20 | 0.03 | 6.41 |
| **September** | 75.39 | 62.90 | 90.75 | 0.11 | 4.88 |
| **October** | 67.78 | 56.58 | 82.00 | 0.46 | 3.46 |
| **November** | 58.87 | 48.62 | 73.87 | 0.85 | 2.31 |
| **December** | 54.68 | 43.22 | 66.20 | 1.86 | 1.72 |
| **Annual** | 65.23 | 53.73 | 77.89 | 10.68 | 49.20 |

**Source:**

Historical average monthly precipitation and temperature information was obtained from the National Oceanic and Atmospheric Administration (https://search.usa.gov/search?utf8=%E2%9C%93&affiliate=noaa.gov&query=ontario+ca) from 1998 through 2020 (for Ontario International Airport). Historical monthly average ETo information was obtained from the California Irrigation Management Information Systems (http://wwwcimis.water.ca.gov) and is based on data collected from Station 255 (Chino).

The historical average rainfall in the vicinity of the City's service area is 10.68 inches. The City's service area has a dry climate and summers can reach average maximum daily temperatures in the high 80s to low 90s. The City's water supplies and demands are projected during average year, single dry year and a five consecutive year drought (See Chapter 7), and are based on historical data and projected demands. Nonetheless, it is recognized changes in climatic conditions may have an impact on water supplies (as discussed in Section 4.5). Precipitation within the vicinity of the City's service area is discussed further in Section 7.2.

A discussion of the City's sources of supply, how those sources may be impacted by climate change, and the proactive actions the City and other local/regional water managers may take to address the potential climate change on water supplies is provided in Section 4.5.

## 3.4 SERVICE AREA POPULATION AND DEMOGRAPHICS

### *3.4.1 SERVICE AREA POPULATION*

**CWC 10631.**

> *(a) Describe the service area of the supplier, including current and projected population… The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

The City provides water service to an area with a current population of 178,409. Table 3-1 presents the current and projected population of the area encompassed by the City's service area from FY 2019-20 to FY 2044-45. The City is projected to have a population of 362,903 by FY 2044-45.

The City initially reviewed the available historical populations within its service area for population growth trends. The City determined historical U.S. Census populations within its service area using DWR's Population Tool (https://wuedata.water.ca.gov/). The City's service area boundary was uploaded to DWR's Population Tool in a "KML" file format (i.e., Google Earth format). The KML file was originally created in a GIS shapefile format and converted into a KML format. The uploaded KML file represents the City's service area boundary from 1990 to present (2020). DWR's Population Tool utilized U.S. Census data from 1990, 2000, and 2010. The calculated FY 2019-20 population (discussed in Section 5.4) was used to determine compliance with the City's SB X7-7 water use target for 2020 (discussed in Section 5.5).

Projected populations in the City's service area were based on growth rate projections obtained from data provided by SCAG. The data provided by SCAG was based on their "*The 2020-2045 Regional Transportation Plan / Sustainable Communities Strategy of the SCAG*", dated September 2020, and incorporates demographic trends, existing land use, general plan land use policies, and input and projections through the year 2045 from the Department of Finance (DOF) and the US Census Bureau for counties, cities and unincorporated areas within Southern California.

**Table 3-1 Population – Current and Projected**

| Submittal Table 3-1 Retail: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2020 | 2025 | 2030 | 2035 | 2040 | 2045*(opt)* |
| | 178,409 | 232,583 | 266,339 | 300,095 | 362,903 | 362,903 |
| NOTES: The 2020 population and the populations projected through 2045 were obtained the City of Ontario's 2020 Water Master Plan (See Section 3.4.1 and Section 5.4.1). Population is equal for years 2040 and 2045 because the City anticipates buildout to occur in 2040. | | | | | | |

### *3.4.2 OTHER SOCIAL, ECONOMIC, AND DEMOGRAPHIC FACTORS*

**CWC 10631.**

*(a) Describe the service area of the supplier, including… other social, economic, and demographic factors affecting the supplier's water management planning.*

Many families within the City's water service area have special housing needs. They are the severely low-income earners, single-parent families, large families, seniors, people with disabilities, and homeless persons. Pursuant to the California Census' "Census 2020 California Hard-to-Count Fact Sheet, Census 2020 California Hard-to-Count Fact Sheet" approximately 28.1 percent of the population within the City has an income level below 150 percent of the poverty level. The City current has a vacancy rate of approximately 6.2 percent. In addition, approximately 46.5 percent of households are renter occupied. Extremely low income earners account for most renters because homeownership is essentially infeasible for them. Significant financial subsidies are necessary to assist extremely low-income earners in acquiring affordable housing. The City's efforts in providing this assistance are concentrated on rental housing vouchers. Large families are typically more prone to overpayment since they require bigger houses. Those who live in cheaper, smaller apartments experience overcrowding and substandard living conditions. To solve the housing problem among large families and single-parent households, the City offers low cost units at mobile home parks, deed restricted apartments, and units in publicly assisted multi-family housing projects. Additional units, part of the Ontario Town Square project, are also planned to be built. The City has considered these demographic factors which can affect the City's water management planning. Increased population will also have an impact on water demand.

## 3.5 LAND USES WITHIN SERVICE AREA

**CWC 10631.**

*(a) The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities.*

The City reviewed the current and projected land uses within its service area during the preparation of this 2020 Plan. Information regarding current and projected land uses is included in the City's General Plan and the City's 2020 Water Master Plan. Information regarding current and projected land uses identified in the City's 2020 Water Master Plan is provided in Appendix E. The existing land uses within the City's service area include residential (single-family and multi-family), commercial, industrial, and agricultural developments. Pursuant to the City's 2020 Water Master Plan Update, approximately 6,124 acres of the City's total land area use is currently attributed to residential use. Commercial and industrial use accounts for approximately 7,508 acres. Additionally, agricultural use comprises of 6,740 acres (184 acres within the Original Model Colony and 6,556 acres within the Ontario Ranch area).

The City anticipates the Ontario Ranch area will be converted from primarily agricultural land use to other land uses as the City transitions to buildout. As a result, land area for residential purposes is estimated to increase from its current amount of 6,124 acres to 10,869 acres at buildout. Additionally, land area for commercial and industrial purposes is projected to increase from 7,508 acres to 11,017 acres at buildout. In addition, the projected population within the City's service area is anticipated to increase (as discussed in Section 3.4). A discussion of the existing and projected water uses for the individual water use sectors within the City's service area, which includes the different land uses, is provided in Section 4.2. As discussed in Section 2.6, the City coordinated the preparation of the 2020 Plan with the City of Ontario, the County of San Bernardino, and other agencies.

As discussed in Section 3.4, the City obtained data from the Southern California Association of Governments document entitled "*The 2020-2045 Regional Transportation Plan / Sustainable Communities Strategy of the SCAG*", dated September 2020. Projected populations in the City's service area were based on growth rate projections developed by SCAG. The data provided by SCAG incorporates demographic trends, existing land use, general plan land use policies, and input and projections through the year 2045 from the Department of Finance and the US Census Bureau for counties, cities and unincorporated areas within Southern California.

Chapter 4

# WATER USE CHARACTERIZATION

## LAY DESCRIPTION – CHAPTER 4

### WATER USE CHARACTERIZATION

Chapter 4 (Water Use Characterization) of the City's 2020 Plan discusses and provides the following:

- The City provides water service to individual "water use sectors". These water use sectors include single-family residential, multi-family, commercial, institutional (and governmental), landscape, and industrial. Individual descriptions for these water use sectors are provided in Section 4.2.1.
- The City's total water demands (including potable and recycled water) over the past 10 years have ranged from 36,036 AFY to 45,196 AFY, with an average of 40,831 AFY. The City currently measures its water use through meter data and billing records.
- The City conducts an annual water loss audit to identify distribution system water losses. Water losses can result from pipeline leaks and inaccurate metering due to faulty meters. Water loss estimates are incorporated into the City's projected water demands.
- The City's current and projected water demands are provided in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 4-3.
- The City's water demand projections incorporate water savings which are the result of implementation of new plumbing codes along with consumer awareness of the need to conserve water.
- The projected water demands for lower income households are identified and are included in the City's total projected water demands
- The City's sources of water supply and how those sources may be impacted by climate change are discussed. The proactive actions the City and other local/regional water managers may take to address the potential climate change impacts on water supplies are also discussed.

The City will be able to provide sufficient water supplies to meet the projected water demands of its customers, including during a five consecutive year drought period.

## 4.1 NON-POTABLE VERSUS POTABLE WATER USE

The Water Code requires a description and quantification of water uses within the City's service area, including both non-potable and potable water. Recycled water (non-potable) uses are addressed in Section 6.5; however, a summary is provided in Table 4-3. Furthermore, Chapter 4 addresses the City's potable water demands.

## 4.2 PAST, CURRENT, AND PROJECTED WATER USES BY SECTOR

**CWC 10635.**

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following…*

*(2) The water use projections shall be in the same five-year increments described in subdivision (a).*

*(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

*(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:*

*(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.*

*(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

The City's current and projected water demands are provided in five-year increments over the next 25 years (through FY 2044-45) in Tables 4-1, 4-2, and 4-3. The City's total water demands were projected based on a review of the SB X7-7 calculations which are discussed in Chapter 5 (including the SB X7-7 water use target for 2020), current water use factors based on recent water

demands, the City of Ontario's Water Master Plan Update 2020, the City of Ontario Recycled Water Master Plan Update 2020, and the total population projections based on land use trends within the City.

The City provides water service to individual "water use sectors" as identified by the California Water Code. The water use sectors supplied by the City are discussed in Section 4.2.1. The water use for each of these sectors during FY 2019-20 is provided in Table 4-1. The projected water use for each individual water use sector is provided in Table 4-2 and is based on the percentage breakdown of water use from each individual water use sector in FY 2019-20 (the percentages were then applied to the projected total water use).

**Table 4-1 Demands for Potable and Non-Potable Water - Actual**

| Submittal Table 4-1 Retail: Demands for Potable and Non-Potable[1] Water - Actual | | | |
|---|---|---|---|
| Use Type | 2020 Actual | | |
| **Drop down list**<br>May select each use multiple times<br>These are the only Use Types that will be recognized by the WUEdata online submittal tool | Additional Description<br>(as needed) | Level of Treatment When Delivered<br>Drop down list | Volume[2] |
| Add additional rows as needed | | | |
| Single Family | | Drinking Water | 12,502 |
| Multi-Family | | Drinking Water | 5,068 |
| Commercial | | Drinking Water | 5,359 |
| Industrial | | Drinking Water | 2,078 |
| Institutional/Governmental | | Drinking Water | 538 |
| Landscape | | Drinking Water | 4,631 |
| Losses | | Drinking Water | 1,565 |
| Other | Hydrant | Drinking Water | 368 |
| | | **TOTAL** | 32,109 |

*[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
*[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Recycled water demands are provided in Table 4-3 and Table 6-4.

**Table 4-2 Use for Potable and Non-Potable Water - Projected**

| Submittal Table 4-2 Retail: Use for Potable and Non-Potable[1] Water - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type | Additional Description (as needed) | Projected Water Use[2] *Report To the Extent that Records are Available* | | | | |
| Drop down list<br>May select each use multiple times<br>These are the only Use Types that will be recognized by the WUEdata online submittal tool | | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Add additional rows as needed | | | | | | |
| Single Family | | 15,723 | 17,540 | 19,109 | 22,431 | 22,431 |
| Multi-Family | | 6,374 | 7,110 | 7,746 | 9,093 | 9,093 |
| Commercial | | 6,740 | 7,519 | 8,191 | 9,615 | 9,615 |
| Industrial | | 2,613 | 2,915 | 3,176 | 3,728 | 3,728 |
| Institutional/Governmental | | 677 | 755 | 822 | 965 | 965 |
| Landscape | | 5,824 | 6,497 | 7,078 | 8,309 | 8,309 |
| Losses | | 1,968 | 2,196 | 2,392 | 2,808 | 2,808 |
| Other | | 463 | 516 | 562 | 660 | 660 |
| | **TOTAL** | 40,382 | 45,048 | 49,076 | 57,609 | 57,609 |

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.* [2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Projected water use are equal for years 2040 and 2045 because the City anticipates buildout to occur in 2040.

**Table 4-3 Total Gross Water Use (Potable and Non-Potable)**

| Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable) | | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R* | 32,109 | 40,382 | 45,048 | 49,076 | 57,609 | 57,609 |
| Recycled Water Demand[1] *From Table 6-4* | 7,812 | 12,168 | 13,465 | 14,762 | 16,059 | 16,059 |
| Optional Deduction of Recycled Water Put Into Long-Term Storage[2] | | | | | | |
| **TOTAL WATER USE** | 39,921 | 52,550 | 58,513 | 63,838 | 73,668 | 73,668 |

*[1] Recycled water demand fields will be blank until Table 6-4 is complete*

*[2] Long term storage means water placed into groundwater or surface storage that is not removed from storage in the same year. Supplier **may** deduct recycled water placed in long-term storage from their reported demand. This value is manually entered into Table 4-3.*

NOTES: Projected total water use are equal for years 2040 and 2045 because the City anticipates buildout to occur in 2040.

### 4.2.1 WATER USE SECTORS LISTED IN WATER CODE

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:*

*(A) Single-family residential.*
*(B) Multifamily.*
*(C) Commercial.*
*(D) Industrial.*
*(E) Institutional and governmental.*
*(F) Landscape.*
*(G) Sales to other agencies.*
*(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.*
*(I) Agricultural.*
*(J) Distribution system water loss.*

As shown in Table 4-1, the City's service area includes the following water use sectors listed in the California Water Code:

- Single-family residential
  (A single-family dwelling unit is a lot with a free-standing building containing one dwelling unit that may include a detached secondary dwelling. Single-family residential water demands are included in retail demands.)

- Multi-family
  (Multiple dwelling units are contained within one building or several buildings within one complex. Multi-family residential water demands are included in retail demands.)

- Commercial
  (Commercial users are defined as water users that provide or distribute a product or service)

- Institutional (and governmental)
  (Institutional users are defined as water user dedicated to public service. Institutional users include, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.)

- Landscape
  (Landscape connections supply water solely for landscape irrigation. Landscape users may be associated with multi-family, commercial, industrial, or institutional/governmental sites, but are considered a separate water use sector if the connection is solely for landscape irrigation. Landscape water demands are included in retail demands.)

- Industrial
  (Industrial users are defined as water users that are primarily a manufacturer or processor of materials as defined by the North American Industry Classification System (NAICS) code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development. Industrial water demands are included in retail demands.)

- Agricultural
  (Water used for commercial agricultural irrigation. Agricultural water demands are included in recycled water retail demands.)

- Distribution system losses
  (Distribution system losses represent the potable water losses from the pressurized water distribution system and water storage facilities, up to the point of delivery to the customers. Additional information is discussed in Section 4.2.4)

### *4.2.2 WATER USE SECTORS IN ADDITION TO THOSE LISTED IN WATER CODE*

The City's service area does not include other water demand sectors which are not listed in the California Water Code (including exchanges, surface water augmentation, transfers, and wetlands or wildlife habitat).

### *4.2.3 PAST WATER USE*

Chapter 6 provides a discussion of the sources of water supply the City uses to meet its water demands. Section 6.1 provides a tabulation of the City's historical annual water demands for each water supply source. Over the past ten years, the City's total water demands (including potable and recycled water demands) have ranged from 36,036 AFY to 45,196 AFY, with an average of 40,831 AFY. In addition, the City recently experienced a five-consecutive-year-drought within its service area from FY 2011-12 to FY 2015-16. The City also reviewed its historical water demands to determine the projected water demands and water supply reliability (discussed in Chapter 7). The City is able to provide sufficient water supplies to meet the projected water demands of its customers, including during a five consecutive year drought period.

### 4.2.4 DISTRIBUTION SYSTEM WATER LOSS

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following…*

*(J) Distribution system water loss.*

**CWC 10631.**

*(3)(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.*

*(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.*

*(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.*

Distribution system water losses represent the potable water losses from the pressurized water distribution system and water storage facilities, up to the point of delivery to the customers. Sources of distribution system water loss can include: inaccurate metering due to faulty meters; water use not metered such as firefighting, flushing of the water system; and pipeline leaks.

The California Water Code Section 10608.34(b)(1) requires "[o]n or before October 1of each year until October 1, 2023, each urban retail water supplier shall submit a completed and validated water loss audit report for the previous calendar year or the previous fiscal year..." The water loss audits must follow American Water Works Association (AWWA) guidance and be validated by a certified water audit validator. The City has completed the annual water loss audit process through October 1, 2020, as required by the California Water Code (i.e. the City has completed water loss audits representing calendar years 2016, 2017, 2018, and 2019). The City's water loss audits were prepared and validated pursuant to DWR requirements. The annual water loss audit reports submitted by retail water agencies in California, including the City (provided in Appendix F), are available on DWR's website (https://wuedata.water.ca.gov/awwa_plans).

The City's annual water loss audits identify real water losses (e.g. leaks and main failures) and apparent water losses (e.g. customer meter inaccuracies, systematic data handling errors in customer billing systems, and unauthorized consumption). The City's distribution system water losses are based on the sum of the real and apparent water losses and are summarized in Table 4-4 for the past five years. Over the past five years, the City's average distribution system water

losses represent approximately 2.9 percent of its total water demands. This average water loss factor was incorporated into the City's total potable water demand projections (Tables 4-2 and 4-3).

**Table 4-4 12 Month Water Loss Audit Report**

| Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting | |
|---|---|
| Reporting Period Start Date (mm/yyyy) | Volume of Water Loss [1,2] |
| 07/2015 | 618 |
| 07/2016 | 1,325 |
| 07/2017 | 1,282 |
| 07/2018 | 1,031 |
| 07/2019 | 1,565 |
| *[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.* *[2] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | |
| NOTES: The "Volume of Water Losses" from FY 2016-17 through FY 2018-19 are based on the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheets. Because the water loss audits are reported in calendar years, the volume of water losses were calculated to be an average of the two calendar years as part of that fiscal year. The volume of water losses for FY 2015-16 and FY 2019-20 (calendar years 2016 and 2020) were estimated based on water system metered production and sales data. | |

The California Water Code Section 10608.34(i) directs the SWRCB to "adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses." Pursuant to this law, and as discussed above, urban retail water suppliers (including the City) have been submitting water loss audits to DWR annually since October 2017. Pursuant to (SB) Senate Bill 606, urban retail water suppliers are required to calculate an "urban water use objective" that includes indoor, outdoor, commercial, industrial and institutional irrigation uses, and allowed system water loss by November 1, 2023. The City will continue to develop its water loss standard and urban water use objective pursuant to SWRCB requirements.

### 4.2.5 CURRENT WATER USE

The City currently measures its water use through meter data and billing records. The water use for the City's individual water use sectors during FY 2019-20 are provided in Table 4-1. Recycled water uses are addressed separately in Section 6.5; however, a summary of projected recycled water uses is provided in Table 4-3. The City's total water uses during FY 2019-20 have been reviewed for compliance with the SB X7-7 water use target for 2020 adopted in the City's 2015 Plan (discussed in Section 5.5).

DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and assess monthly water use trends. DWR has deemed the tool as optional, and the City is not required by DWR to use the tool. Section 6.1 provides a tabulation of the City's historical annual water uses for each water supply source. During the past 10 years, the City experienced a five-consecutive-year-drought within its service area from FY 2011-12 to FY 2015-16. Historical records indicate the City's annual water demands had been greater prior to FY 2011-12. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, the City has been able to provide water service to meet maximum day water demands for these years, including during the summer months. A further discussion regarding the reliability of the City's water supply sources is provided in Chapter 7.

### 4.2.6 PROJECTED WATER USE

**CWC 10635.**

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

**CWC 10631.**

*(d)(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

*(d)(4)(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:*

*(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.*
*(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

The City's projected water demands are provided in five-year increments over the next 25 years (through FY 2044-45) in Table 4-3. The City's projected water demands and water supplies during a normal year, a single dry year, and a five consecutive year drought are provided in Chapter 7. The projected water demands for each of the City's water use sectors are provided in Table 4-2.

The City's water demands were projected based on a review of the SB X7-7 calculations discussed in Chapter 5 (including the SB X7-7 water use target for 2020), existing water use factors based on recent water demands, the total population projections based on projected land uses; and information identified in the City's 2020 Water Master Plan. The projected ultimate water demands at buildout (anticipated to occur in year 2040) for the water use sectors were determined using projected land uses and water & recycled water demand factors obtained from the City's 2020 Water Master Plan (see Appendix E) and 2020 Recycled Water Master Plan (see Section 6.2.5.4). A discussion of the City's water supplies from wholesalers CDA, IEUA, and WFA, are discussed in Section 6.2. As discussed in Section 2.6, the City has coordinated its water demand projections with CDA, IEUA, and WFA for each water use sector.

The City's water demand projections incorporate water savings, or "passive savings", which are the result of implementation of new plumbing codes along with consumer awareness of the need to conserve water. The City's Municipal Code Title 6, Chapter 8A "Water Conservation Plan", which was created through the adoption of Ordinance No. 3027 in October 2015 (discussed in Section 9.2), includes methods for current and ongoing reduction in water use and water waste. Prior to adoption of Ordinance No. 3027, the City's water use rate ranged from approximately 224 gallons per capita day to 264 gallons per capita day (from 1995 through 2004). As identified in Section 5.5, the City's actual water use rate during FY 2019-20 was 161 gallons per capita per day which is a decrease of up to 103 gallons per capita per day from the recent historical water use . The City's projected water demands use GPCD water use rates which are less than the City's established SB X7-7 water use target for 2020 and incorporate ongoing water passive savings and reduced water use resulting from the City's existing Water Conservation Plan. As indicated in Table 4-5, estimated future water savings have been considered as part of the City's water use projections.

**Table 4-5 Inclusion in Water Use Projections**

| Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections | |
|---|---|
| **Are Future Water Savings Included in Projections?**<br>(Refer to Appendix K of UWMP Guidebook)<br>*Drop down list (y/n)* | Yes |
| If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found. | Section 4.2.6 and Chapter 8 |
| **Are Lower Income Residential Demands Included In Projections?**<br>*Drop down list (y/n)* | Yes |
| NOTES: | |

### 4.2.7 CHARACTERISTIC FIVE-YEAR WATER USE

**CWC 10635.**

*(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following. . .*

*(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.*

*(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

The City's projected water demands are provided in five-year increments over the next 25 years (and through FY 2044-45) in Table 4-3. The City's projected water demands and water supplies during a normal year, a single dry year, and a five consecutive year drought over the next 25 years (and through FY 2044-45) are provided in Chapter 7.

The City's "Drought Risk Assessment" (DRA) for the next five years (from FY 2020-21 through FY 2024-25) is discussed in Section 7.3. The DRA includes the City's projected annual water demands and supplies for each of the next five years and was prepared based on the five driest consecutive years on record. The DRA provides an assessment of the City's water service reliability during a drought lasting five years. The DRA reflects anticipated water demands and

supplies prior to any expected benefits associated with water supply shortage responses included in the City's Water Shortage Contingency Plan (provided in Chapter 8). In addition to historical drought hydrology, the City considered impacts to water supplies and demands based on climate change conditions (discussed in Section 4.5) and anticipated regulatory changes, including the urban water use objectives (discussed in Section 4.2.4)

## 4.3 WORKSHEETS AND REPORTING TABLES

The City's current and projected water demands, including the water demands for each of the City's water use sectors, are provided in five-year increments over the next 25 years (and through FY 2044-45) in Tables 4-1, 4-2, and 4-3.

### *4.3.1 OPTIONAL PLANNING TOOL USE ANALYSIS WORKSHEET*

As discussed in Section 4.2.5, DWR has deemed the "Planning Tool Worksheet" as optional and the City is not required by DWR to use the tool. In addition, the City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. The City has also been able to provide water service to meet maximum day water demands for these years, including during the summer months. For these reasons, the City chose not to use the optional worksheet. A further discussion regarding the reliability of the City's water supply sources is provided in Chapter 7.

### *4.3.2 DWR 2020 UWMP SUBMITTAL TABLES*

The City's current water demands for each of the water use sectors during FY 2019-20 are provided in Table 4-1. The City's projected water demands for each of the water use sectors, in five-year increments over the next 25 years (and through FY 2044-45), are provided in Table 4-2. The City's total projected water demands, including potable and recycled water, in five-year increments over the next 25 years (and through FY 2044-45), are summarized in Table 4-3. The City's distribution system water losses over the past five years, based on the sum of the real and apparent water losses, are summarized in Table 4-4. The City's annual AWWA water loss audits are provided in Appendix F.

## 4.4 WATER USE FOR LOWER INCOME HOUSEHOLDS

**CWC 10631.1.**

*(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.*

**California Health and Safety Code 50079.5.**

> *(a) "Lower income households" means persons and families whose income does not exceed the qualifying limits for lower income families… In the event the federal standards are discontinued, the department shall, by regulation, establish income limits for lower income households for all geographic areas of the state at 80 percent of area median income, adjusted for family size and revised annually.*

The City's water demands projections provided in Table 4-3 include projected water demands for lower income single-family and multi-family households. A lower income household is defined as a household with an income less than 80 percent of the area median income, adjusted for family size. For the purpose of this evaluation the entire San Bernardino County was used for the "area median income". The median household income within San Bernardino County was $67,903. The total number of lower income households within the City's service area was estimated based on billing records provided by the City, a review of the City's General Plan, a review of median household income range statistics provided by the US Census Bureau, and a review of GIS maps of Disadvantaged Communities[2] (DACs), including block groups, tracts, and places, provided by DWR. The estimated number of lower income households (i.e. with a median household income less than 80 percent of $67,903) located within the City's service area is approximately 34.5 percent of the total number of households. As indicated in Table 4-2, the total projected residential (single family and multi-family) water demands within the City in 2045 is estimated at about 31,524 AFY. Based on a 34.5 percent use factor of total residential water demands, the projected water demand for lower income households will be about 10,876 AFY by the FY 2044-2045. The projected water demands for lower income households were included in the City's total projected water demands, as indicated in Table 4-5.

## 4.5 CLIMATE CHANGE CONSIDERATIONS

**CWC 10630.**

> *It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.*

**CWC 10635.**

> *(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…*

[2] GIS information for DACs is based on data from the US Census showing census block groups, tracts, and places identified as disadvantaged communities (less than 80 percent of the State's median household income) or severely disadvantaged communities (less than 60 percent of the State's median household income)

*(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

Climate is defined as "the average course or condition of the weather at a place usually over a period of years as exhibited by temperature, wind velocity and precipitation[3]". A change in the climate which produces a greater amount of precipitation (i.e. more runoff and/or snowpack) and lower temperatures is generally a benefit to water supplies. However, drought conditions which may result in decreased precipitation, decreased runoff, and increased temperature may adversely affect an urban water supplier's ability to meet demands by potentially impacting supplies. Consequently, the focus of impacts of climate change is on these adverse consequences.

Section 6.2 of this Plan describes the City's sources of water supply, management practices associated with those sources, and the long-term reliability of those sources. Section 7.3 includes a Drought Risk Assessment which considers the potential impacts of climate change to the City's water supply sources. Chapter 8 provides a detailed discussion of the City's Water Shortage Contingency Plan, including but not limited to, the six standard water shortage levels in the event climate change results in a reduction to water supplies associated with a periodic drought condition. The following is a discussion of the City's sources of supply, how those sources may be impacted by climate change, and the proactive actions the City and other local/regional water managers may take to address the potential climate change impacts on water supplies.

Imported Water Supplies

The City receives treated imported water (see Section 6.2.1 for a more in depth discussion). Consequently, the City directly and/or indirectly relies on the Metropolitan Water District of Southern California for those imported water supplies. MWD has prepared a Regional 2020 Urban Water Management Plan which includes a discussion (Section 2.6 in MWD's 2020 UWMP) of the reliability of its water supplies and the impacts of climate change and is incorporated by reference in this Plan. Furthermore, the City is a retail agency of the Inland Empire Utilities Agency which has also provided a discussion of climate change considerations and that discussion is included by reference. The following is a brief summary of MWD's efforts:

Resource Planning

- MWD has established the Robust Decision Making (RDM) approach to identify vulnerabilities to its water supplies. Climate change information was applied to MWD's simulated water supply scenarios to demonstrate the vulnerability of water supplies to climate change.

[3] www.merriam-webster.com

Knowledge Sharing and Research Support

- MWD is an active and founding member of the Water Utility Climate Alliance (WUCA) which includes 12 nationwide partners collaborating on climate change considerations. As such, MWD shares agency actions on climate change and adaptation. WUCA has also released numerous research papers on climate change.

Implementation of Programs and Policies

- MWD's programs include the use of solar energy, use of ride share programs, and reduction of greenhouse emissions. Collectively these actions are intended to impact the effects of climate change.

Groundwater Supplies

The City relies on groundwater produced from the Chino Basin as discussed in Section 6.2.2. The Chino Basin (Basin Number 8-2.01 pursuant to DWR Bulletin 118) has been identified by DWR as a very low-priority groundwater basin partially due to the fact it is adjudicated. In that regard, the Chino Basin is actively managed by the Chino Basin Watermaster and those management activities are described in detail in Section 6.2.2.

Recognizing the potential impacts of climate change on the Chino Basin groundwater supplies (decreased local runoff and replenishment, along with increased groundwater production which may lead to decreased groundwater levels), the City has used climate tools available on the California' Energy Commission's Cal-Adapt website (https://cal-adapt.org/) to identify potential future climate change cycles for the Chino Basin. The Cal-Adapt website has been developed by the Geospatial Innovation Facility at the University of California, Berkeley with funding and advisory oversight by the California Energy Commission and California Strategic Growth Council.

To address the uncertainty in future greenhouse gas emissions, Cal-Adapt has developed a Representative Concentration Pathway 4.5 (RCP 4.5) scenario and a Representative Concentration Pathway 8.5 (RCP 8.5) scenario. RCP 4.5 represents a scenario in which greenhouse gas emissions peak around 2040, then decline and stabilize. RCP 8.5 represents a scenario in which emissions continue to strongly rise through 2050 and plateau around 2100. RCP 4.5 is a "medium" emissions scenario that models in future in which there is an effort made by societies to reduce greenhouse gas emissions, whereas RCP 8.5 is a "business-as-usual" scenario. For the City's climate change analysis, the RCP 4.5 scenario was selected.

The Cal-Adapt climate tools also incorporate several General Circulation Models (GCMs), which represent physical processes in the atmosphere, ocean, and land surface. These GCMs projected future climates under conditions such as warm/dry, cooler/wetter, and average simulations. For the City's climate change analysis, the average condition GCM (CanESM2) was selected.

The climate tools available on the Cal-Adapt website were to simulate projected annual precipitation and annual average maximum temperature in the Chino Basin. An electronic boundary of the Chino Basin was submitted online through the Cal-Adapt website in a "KML" file format (i.e. Google Earth format) and data using several of the available climate tools was generated.

Based on the data generated by the Cal-Adapt simulations (see Appendix G), the average annual rainfall in the Chino Basin is projected to be 16.00 over the next 25 years (through 2045), inches compared to a historical average of 14.82 inches (from 1950 through 2019). In addition, the average maximum temperature is projected to be 82.1 degrees Fahrenheit compared to a historical average of 78.5 degrees Fahrenheit. Although there may be more precipitation in the future, it may be more likely to fall as rainfall compared to snowfall. The simulation does not denote the duration or intensity of the storms contributing to the annual precipitation. Notwithstanding, the Santa Ana River watershed (including the area of the Chino Bain) has a complex and interconnected series of dams, reservoirs and replenishment basins to capture stormwater runoff in the Santa Ana River watershed. Most if not all precipitation (whether it is rain or snowfall) likely will be captured during normal and dry year conditions and will not be adversely impacted by a potentially higher average annual temperature.

Recognizing these potential impacts to local hydrology resulting from climate change and the resultant impacts to the groundwater supplies, the Chino Basin Watermaster has taken (and may reinstate as needed) the following proactive actions to anticipate and circumvent the potential impacts of climate change. These actions will enable the City to rely on the Chino Basin as a reliable source of supply.

Chino Basin – Storage Management Plan

The Chino Basin Judgment parties adopted as part of the 2000 Chino Basin Peace Agreement a storage management plan, which consists of three types of storage agreements that result in five types of storage accounts: 1) Excess Carryover, 2) Local Supplemental-Recycled, 3) Local Supplemental-Imported, 4) Pre-2000 Quantified Supplemental, and 5) Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield and Basin Water purchased or transferred from other Parties. A Local Supplemental Water account includes any imported and/or recycled water that is recharged by a producer and similar water acquired from other Parties. A Storage and Recovery Account includes Supplemental Water and is intended to produce a broad and mutual benefit to the Judgment Parties. The Chino Basin Watermaster maintains records of the replenishment, production, losses, and end-of-year storage totals for all storage accounts and reports this accounting on an annual basis.

Individual Parties are involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Chino Basin Watermaster has an application and review process for these transfers. The Parties engage in conjunctive-use activities individually by storing

Chino Basin and Supplemental Water that are in excess of their demands and may recover that water in the future as the need arises. These activities collectively cause temporary adjustment in the managed storage. The Parties' aggregate amount of water in managed storage was 541,845 AF during FY 2019-20.

MWD's Dry-Year Yield Program (DYYP), a water exchange, is the only active Storage and Recovery Program in the Chino Basin. The DYYP can store up to 100,000 AF with maximum replenishment of 25,000 AFY and maximum extraction of 33,000 AFY. During FY 2019-20, there was 45,961 AF within the DYYP account, resulting in a total managed storage volume of 587,806 AF (541,845 AF + 45,961 AF). The agreement that authorized the DYYP will expire in 2028.

Inland Empire Utilities Agency's "Addendum No. 2 to the Optimum Basin Management Program Project", completed in February 2021, amends the 2000 Chino Basin Peace Agreement's Programmatic Environmental Impact Report to address managed storage within the Chino Basin, consistent with the Local Storage Limitation Solution (LSLS). Consistent with Addendum No. 1, from July 1, 2017 through June 30, 2021, the Safe Storage Capacity of the Chino Basin is 600,000 AF. The LSLS proposes a change in the Safe Storage Capacity to 700,000 AF through June 30, 2030, and to 620,000 AFY from July 1, 2030 through June 30, 2035. Full utilization of the allowable increased storage space is expected to occur gradually as additional water is stored and less groundwater is produced. The Safe Storage Capacity of the Chino Basin will revert to 500,000 AF after June 30, 2035.

Chino Basin Safe Yield

The Chino Basin Judgment assessed the initial Safe Yield for the Chino Basin at 140,000 AFY, but reserved to re-determine the Safe Yield after ten years. Pursuant to the most recent Safe Yield reset effective July 2020, the Safe Yield in the Chino Basin is determined to be 131,000 AFY (through June 30, 2030). The Safe Yield is recalculated every 10 years and is defined in the Chino Basin Judgment as "the long-term average annual quantity of ground water (excluding replenishment of stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Chino Basin under conditions of a particular year without causing an undesirable result".

Chapter 5

# SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

## LAY DESCRIPTION – CHAPTER 5

### SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

Chapter 5 (SB X7-7 Baselines, Targets, and 2020 Compliance) of the City's 2020 Plan discusses and provides the following:

- The Water Conservation Act of 2009 (or SB X7-7) required the State of California achieve a 20 percent reduction in urban water use by the year 2020.
- SB X7-7 required urban water suppliers, including the City, to develop a "2020 Water Use Target" to assist the State of California to achieve the 20 percent reduction. The 2020 Water Use Target represents the amount of water each person should use per day (i.e. gallons per capita per day or GPCD) by the year 2020.
- The City previously determined its 2020 Water Use Target during the preparation of its 2015 Plan by completing standardized tables (or the SB X7-7 Verification Form) to demonstrate compliance with the Water Conservation Act of 2009. The City's SB X7-7 Verification Form has not been modified and is included as part of this 2020 Plan as Appendix H. The City's 2020 Water Use Target is 196 GPCD.
- The City's 2020 Plan incorporates the 2020 Water Use Target and determines compliance based on actual water use.
- The population within the City's service area during Fiscal Year 2019-20 is estimated at 178,409. The City's population was estimated using the City's 2020 Water Master Plan Update. The 2020 Water Master Plan Update reviewed population data from the Southern California Association of Governments and land use data for residential, retail/service, mixed use, and public use areas to estimate the FY 2019-20 population with the City's municipal boundaries.
- The City's "gross water" use represents the total volume of water entering its distribution system from its water supply sources. The City's gross water use excludes recycled water deliveries or water conveyed to another supplier. The City's annual gross water during Fiscal Year 2019-20 was 32,109 AF.
- The City's per-capita water use is based on the gross water use divided by the population. The City's per-capita water use during Fiscal Year 2019-20 was 161 GPCD. The City's confirmed 2020 Water Use Target is 196 GPCD. The City's per-capita water use during Fiscal Year 2019-20 meets the 2020 Water Use Target.
- The City has also demonstrated compliance with the 2020 Water Use Target by completing the SB X7-7 2020 Compliance Form (provided in Appendix I).

## 5.1 GUIDANCE FOR WHOLESALE SUPPLIERS

**CWC 10608.12.**

> *(w) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.*

The City is not a wholesale agency and is not required by DWR to complete Section 5.1.

## 5.2 SB X7-7 FORMS AND SUMMARY TABLES

The City previously calculated its "Baseline" water periods and a "2020 Water Use Target" in its 2015 Plan. There were two different Baseline periods identified (consisting of a "10-year Baseline" period and a "5-year Baseline" period). The average water use for each of these two Baseline periods, expressed in GPCD, represents the Baseline water use for each period. A 10-year Baseline period was identified by the City and information regarding the starting year, ending year, and average year water use rate during this period is provided in Table 5-1. The City determined its 2020 Water Use Target by calculating 80 percent of the 10-year Baseline water use.

According to Section 10608.22 of the California Water Code, if an urban retail water supplier's 5-year Baseline period water use is greater than 100 GPCD, the calculated 2020 Water Use Target may need to be reduced. A 5-year Baseline period was identified by the City and information regarding the starting year, ending year, and average water use rate during this period is provided in Table 5-1. The average water use rate during the identified 5-year Baseline period was greater than 100 GPCD. As a result, the 5-year Baseline period was used to determine if the 2020 Water Use Target required any adjustments.

The City's calculated 2020 Water Use Target was compared with the 95 percent of the average water use within the 5-year Baseline to determine if any adjustments were required. As shown in Table 5-2, no adjustments were required. The Baseline water uses were used to confirm the City's 2020 Water Use Target (which represents the per capita water use target for 2020 pursuant to SB X7-7).

### *5.2.1 SB X7-7 VERIFICATION FORM (BASELINES AND TARGETS)*

The City's service area has not changed (i.e. expansion or contraction) since the 2015 Plan was prepared. The City's 2020 Plan incorporates the Baseline water uses and 2020 Water Use Target calculated in the 2015 Plan. The City previously prepared standardized tables (SB X7-7 Verification Form) to demonstrate compliance with the Water Conservation Act of 2009 in its 2015 Plan, including compliance with the City's 2015 Interim Water Use Target. The City's SB X7-7 Verification Form has not been modified and is included as part of this 2020 Plan as Appendix H.

### 5.2.2 SB X7-7 2020 COMPLIANCE FORM

The City's compliance with its 2020 Water Use Target is summarized in the following sections. The City has also demonstrated compliance with the 2020 Water Use Target by completing the SB X7-7 2020 Compliance Form (provided in Appendix I).

### 5.2.3 SUBMITTAL TABLES 5-1 AND 5-2

Summary information from the SB X7-7 Verification Form and from the SB X7-7 2020 Compliance Form is provided in Tables 5-1 and 5-2 below.

**Table 5-1 Baselines and Targets Summary from SB X7-7 Verification Form**

| **Submittal Table 5-1 Baselines and Targets Summary From SB X7-7 Verification Form** *Retail Supplier or Regional Alliance Only* | | | | |
|---|---|---|---|---|
| Baseline Period | Start Year * | End Year * | Average Baseline GPCD* | Confirmed 2020 Target* |
| 10-15 year | *1995* | *2004* | *245* | *196* |
| 5 Year | *2003* | *2007* | *237* | |
| **All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)* | | | | |
| NOTES: | | | | |

**Table 5-2 2020 Compliance from SB X7-7 2020 Compliance Form**

| Submittal Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form *Retail Supplier or Regional Alliance Only* | | | | |
|---|---|---|---|---|
| 2020 GPCD | | | 2020 Confirmed Target GPCD* | Did Supplier Achieve Targeted Reduction for 2020? Y/N |
| Actual 2020 GPCD* | 2020 TOTAL Adjustments* | Adjusted 2020 GPCD* *(Adjusted if applicable)* | | |
| *161* | *0* | *161* | *196* | *Y* |
| **All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)* | | | | |
| NOTES: | | | | |

### 5.2.4 REGIONAL UWMP/REGIONAL ALLIANCE

As discussed in Section 2.4, the City's 2020 Plan was not developed as part of a Regional Alliance. Information from the City's 2020 Plan is not required to be reported in a Regional Alliance report.

## 5.3 BASELINE AND TARGET CALCULATIONS FOR 2020 UWMPS

### 5.3.1 SUPPLIER SUBMITTED 2015 UWMP, NO CHANGE TO SERVICE AREA

The general requirements associated with determining the Baseline periods, Baseline water uses, and 2020 Water Use Target were previously provided by DWR. Based on the requirements, the City calculated the Baseline water uses and 2020 Water Use Target in its 2015 Plan. The City's service area has not changed (i.e. expansion or contraction) since the 2015 Plan was prepared. The City's 2020 Plan incorporates the Baseline water uses and 2020 Water Use Target calculated in the 2015 Plan. The City's SB X7-7 Verification Form is included in Appendix H.

As discussed in Section 5.2.1, the City prepared standardized tables (SB X7-7 Verification Form) to demonstrate compliance with the Water Conservation Act of 2009. The City's SB X7-7

Verification Form is provided in Appendix H and includes Baseline water uses and the 2020 Water Use Target. A summary of the Baseline water uses and 2020 Water Use Target is provided below.

The California Water Code allows an urban water supplier to calculate up to a 15-year Baseline period if at least 10 percent of its 2008 retail water demands were met through recycled water deliveries within its service area, otherwise calculation of a 10-year Baseline period is required. The City's recycled water deliveries were less than 10 percent of its retail water demands during FY 2007-08. Consequently, a 10-year Baseline period was identified by the City and information regarding the starting year, ending year, and average water use rate during this period is provided in Table 5-1. Water systems could potentially identify their 2020 Water Use Target by calculating 80 percent of the 10-year Baseline water use.

According to Section 10608.22 of the California Water Code, if an urban retail water supplier's 5-year Baseline period water use is greater than 100 GPCD, the calculated 2020 Water Use Target may need to be reduced. A 5-year Baseline period was identified by the City and information regarding the starting year, ending year, and average water use rate during this period is provided in Table 5-1. The average was use rate during the identified 5-year Baseline period was greater than 100 GPCD. As a result, the 5-year Baseline period was used to determine whether the 2020 Water Use Target required any adjustments.

The City's calculated 2020 Water Use Target was compared with the 95 percent of the average water use within the 5-year Baseline to determine whether any adjustments were required. The City's confirmed 2020 Water Use Target is 196 GPCD and is summarized in Table 5-1.

## 5.4 METHODS FOR CALCULATING POPULATION AND GROSS WATER USE

### *5.4.1 SERVICE AREA POPULATION*

**CWC 10608.20.**

*(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

*(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.*

**CWC 10644.**

*(a)(2) The plan… shall include any standardized forms, tables, or displays specified by the department.*

A discussion regarding the City's compliance with the 2020 Water Use Target is provided in Section 5.5. Compliance with the 2020 Water Use Target is based on the total estimated population within the City's water service during FY 2019-20. Because U.S. Census 2020 population data was not available during the preparation of the 2020 Plan, the City reviewed the methodologies recommended by DWR to estimate the FY 2019-20 population. The population methodology used by the City in the 2020 Plan is provided below.

The City initially reviewed the available historical populations within its service area for population growth trends. The City determined historical U.S. Census populations within its service area using DWR's Population Tool (https://wuedata.water.ca.gov/). The City's service area boundary was uploaded to DWR's Population Tool in a "KML" file format (i.e. Google Earth format). The KML file was originally created in a GIS shapefile format and converted into a KML format. The uploaded KML file represents the City's service area boundary from 1990 to present (2020). DWR's Population Tool utilized U.S. Census data from 1990, 2000, and 2010, along with the City's service area boundary, to estimate the population served by the City in the years 1990, 2000, and 2010.

The population within the City's service area in FY 2019-20 was estimated using data prepared in the City's 2020 Water Master Plan Update, which is a method allowed by DWR. The 2020 Water Master Plan Update reviewed population data from the Southern California Association of Governments and land use data for residential, retail/service, mixed use, and public use areas to estimate the FY 2019-20 population with the City's municipal boundaries. Based on Geographical Information Systems data, the area within the City's water service boundary is approximately 97.6 percent of the area within the City's municipal boundaries. The estimated population within the City's water service area for FY 2019-20 is 178,409 (or approximately 97.6 percent of the estimated FY 2019-20 population within the City's municipal boundaries) and is consistent with the historical population growth trends. The City's FY 2019-20 population is presented in Table 3 of the SB X7-7 2020 Compliance Form.

### 5.4.2 GROSS WATER USE

**CWC 10608.12.**

*(h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*

*(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.*
*(2) The net volume of water that the urban retail water supplier places into long-term storage.*
*(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.*
*(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*

**California Code of Regulations Title 23 Division 2 Chapter 5.1 Article 1, Section 596.**

*(a) An urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.*

Gross water use represents the total volume of water entering a distribution system (but excludes recycled water deliveries, indirect potable use, water placed into long term storage, water conveyed to another supplier, water delivered for agricultural use, and process water if there is a substantial percentage used for industrial purposes) over a 12-month period. The City's annual gross water use amounts are based on the total amount of water entering the City's distribution system from its water supply sources (including groundwater production wells, purchased water, and purchased treated imported water). The annual gross water use by the City during FY 2019-20 was 32,109 AF.

The annual gross water use amounts within the City for each year of the Baseline periods (discussed in Section 5.6) are provided in SB X7-7 Verification Form, Table 4 (Appendix H). A further discussion of the Baseline periods is provided in Section 5.6.

The City currently does not use indirect recycled water within its service area. The City is not required by DWR to complete SB X7-7 Verification Form, Table 4-B.

Industrial process water is not subtracted from the City's gross water use provided in SB X7-7 Verification Form, Table 4. The City is not required by DWR to complete SB X7-7 Verification Form, Table 4-C.1, Table 4-C.2, Table 4-C.3, Table 4-C.4, and Table 4-D.

## 5.5 2020 COMPLIANCE DAILY PER CAPITA WATER USE (GPCD)

**CWC 10608.12.**

*(f) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.*

**CWC 10608.20.**

*(e) An urban retail water supplier shall include in its urban water management plan due in 2010… compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

As discussed in Section 5.4.2, the annual gross water use by the City during FY 2019-20 was 32,109 AF. As discussed in Section 5.4.1, the estimated population within the City's service area for FY 2019-20 is 178,409. As a result, the City's per-capita water use during FY 2019-20 was 161 GPCD. As discussed in Section 5.3.1, the City's confirmed 2020 Water Use Target is 196 GPCD. The City's per-capita water use during FY 2019-20 meets the 2020 Water Use Target and is in compliance. The City has also demonstrated compliance with the 2020 Water Use Target by completing the SB X7-7 2020 Compliance Form (provided in Appendix I).

### *5.5.1 2020 ADJUSTMENTS FOR FACTORS OUTSIDE OF SUPPLIER'S CONTROL*

**CWC 10608.24.**

*(d)(1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:*

*(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.*

*(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.*

*(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.*

*(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.*

**Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use, Methodology 4.**

*This section discusses adjustments to compliance-year GPCD because of changes in distribution area caused by mergers, annexation, and other scenarios that occur between the baseline and compliance years.*

The City has determined its compliance with the 2020 Water Use Target without adjusting its annual gross water use during FY 2019-20.

### *5.5.2 SPECIAL SITUATIONS*

The City's 2020 Plan incorporates the Baseline water uses and 2020 Water Use Target calculated in the 2015 Plan. There were no special situations that required the City to recalculate the Baseline water uses and 2020 Water Use Target.

### *5.5.3 IF SUPPLIER DOES NOT MEET 2020 TARGET*

The City's per-capita water use during FY 2019-20 meets the 2020 Water Use Target and is in compliance.

## 5.6 REGIONAL ALLIANCE

As discussed in Section 2.4, the City's 2020 Plan was not developed as part of a Regional Alliance. Information from the City's 2020 Plan is not required to be reported in a Regional Alliance report.

Chapter 6

# WATER SUPPLY CHARACTERIZATION

## LAY DESCRIPTION – CHAPTER 6

### WATER SUPPLY CHARACTERIZATION

Chapter 6 (Water Supply Characterization) of the City's 2020 Plan discusses and provides the following:

- The City's water supply sources include: groundwater pumped from the Chino Basin; treated groundwater from the Chino Basin produced by the Chino Basin Desalter Authority; imported water from Metropolitan Water District of Southern California treated and purchased through Water Facilities Authority; groundwater and/or surface water purchased from San Antonio Water Company; and recycled water purchased from Inland Empire Utilities Agency.
- The City's main source of water supply is groundwater pumped from the Chino Basin.
- A tabulation of the City's historical water supplies is provided in Section 6.1.
- A discussion regarding the City's imported water supplies from the Water Facilities Authority is provided. Information regarding imported water connections, capacities, reliability, and historical production is provided.
- A discussion regarding the City's purchased water supplies from San Antonio Water Company is provided. Information regarding purchased water connections, capacities, and historical production is provided.
- A discussion regarding the City's groundwater supplies from the Chino Basin is provided. Information regarding basin location, adjudication, management, water levels, water quality, water rights, and historical production is provided.
- A discussion regarding the City's recycled water supply is provided. The City's recycled water supplies are produced by Inland Empire Utilities Agency. The City uses recycled water for industrial processes, landscape irrigation, agricultural irrigation, and golf course irrigation.
- The City's proposed future projects to maximize its water supply resources are discussed.
- The City's "energy intensity" is discussed and represents the quantity of energy consumed, measured in kilowatt hours, divided by the volume of water, measured in acre-feet over a one-year period. The total energy intensity associated with the City's water management processes was estimated during FY 2019-20.

In this Chapter, the City will identify and describe each of its sources of water supply. In addition, the City will describe the following:

- Management of each water supply source;
- Current provisions of a basin adjudication or Groundwater Sustainability Plan (GSP), as applicable, pertaining to management of groundwater supplies;
- Measures the City is taking to develop potential new sources of water supply (as applicable); and
- Opportunities for exchanges and transfers on a long- or short-term basis.

The characterization of the City's water supply sources will account for the anticipated availability during a normal year, a single dry year, a five consecutive year drought, along with projections through FY 2044-45.

## 6.1 WATER SUPPLY ANALYSIS OVERVIEW

**CWC 10631.**

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:*

*(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.*

*(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.*

*(3) For any planned sources of water supply, a description of the measures that are being undertaken to acquire and develop those water supplies.*

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

The City's water supply sources include: groundwater pumped from the Chino Basin; treated groundwater from the Chino Basin produced by the Chino Basin Desalter Authority; treated, imported water purchased from MWD through Water Facilities Authority; groundwater and/or surface water purchased from San Antonio Water Company; and recycled water purchased from Inland Empire Utilities Agency. The City's main source of water supply is groundwater pumped from the Chino Basin. A tabulation of the City's historical water uses is provided below in Figure 2.

**Figure 2 - Historical Water Use by Source**

| Fiscal Year | System Water Supply Sources (AF) | | | | | | Total |
|---|---|---|---|---|---|---|---|
| | Potable Water | | | | | Recycled Water | |
| | Groundwater | Purchased Water | | | Subtotal | | |
| | Chino Basin | Chino Basin Desalter Authority | Water Facilities Authority | San Antonio Water Company | | | |
| 2010-11 | 18,938 | 5,176 | 9,824 | 0 | 33,938 | 5,743 | 39,681 |
| 2011-12 | 19,164 | 5,127 | 10,820 | 0 | 35,111 | 7,492 | 42,603 |
| 2012-13 | 20,801 | 4,793 | 10,243 | 0 | 35,837 | 6,894 | 42,730 |
| 2013-14 | 21,724 | 5,141 | 9,904 | 0 | 36,769 | 8,427 | 45,196 |
| 2014-15 | 17,425 | 4,827 | 10,703 | 172 | 33,128 | 8,098 | 41,226 |
| 2015-16 | 22,751 | 2,682 | 2,755 | 338 | 28,526 | 7,510 | 36,036 |
| 2016-17 | 24,672 | 3,069 | 2,327 | 171 | 30,238 | 8,351 | 38,589 |
| 2017-18 | 26,109 | 4,032 | 3,211 | 341 | 33,693 | 9,653 | 43,346 |
| 2018-19 | 19,604 | 5,724 | 5,737 | 403 | 31,467 | 7,511 | 38,978 |
| 2019-20 | 18,395 | 6,636 | 6,513 | 565 | 32,109 | 7,812 | 39,921 |

Source: Data provided by Ontario Municipal Utility Company

### *6.1.1 SPECIFIC ANALYSIS APPLICABLE TO ALL WATER SUPPLY SOURCES*

The section below provides a discussion of the following information to the extent practical:

- The City's existing and planned sources of water supply are identified;
- Each source of supply is quantified in five-year increments through FY 2044-45;
- The anticipated supply availability under normal, single dry, and five consecutive dry years, and any other water year conditions included in the Drought Risk Assessment (see Chapter 7) are described;
- The management of each water supply in correlation with other identified supplies is described.
- Information pertinent to the reliability analysis, including climate change effects, is considered.

The City historically has relied on groundwater pumped from the Chino Basin; treated groundwater from the Chino Basin produced by the Chino Basin Desalter Authority; treated, imported water purchased from MWD through Water Facilities Authority; groundwater and/or surface water purchased from San Antonio Water Company; and recycled water purchased from Inland Empire Utilities Agency. The following descriptions summarize the City's sources of supply (detailed descriptions are provided in Section 6.2).

**Existing and Planned Sources of Supply**

Purchased Treated Imported Water

The City has historically purchased treated imported water from the Water Facilities Authority (from IEUA), as described in Section 6.2.1. In addition, Section 6.2.1 provides a detailed discussion of the existing and planned supply of the treated imported water, including a description of the management and reliability of those treated imported water supplies. Table 6-8 summarizes the actual treated imported water supply for FY 2019-20. Table 6-9 summarizes the projected water supply, in five-year increments, through FY 2044-45 under varying water supply conditions.

Groundwater

The City has historically pumped groundwater from the Chino Basin as described in Section 6.2.2. In addition, Section 6.2.2 provides a detailed discussion of the existing and planned supply of the groundwater, including a description of the management and reliability of those groundwater supplies. Table 6-8 summarizes the actual groundwater supplies for FY 2019-20. Table 6-9 summarizes the projected water supply, in five-year increments, through FY 2044-45 under varying water supply conditions.

Surface Water

The City does not use self-supplied surface water sources to meet its water demands. The City purchases treated surface water supplies from SAWCo.

Storm Water

The City has historically produced groundwater from the Chino Basin. Management and use of the stormwater runoff from the Chino Basin watershed is crucial to groundwater management. However, the City currently does not have its own program to beneficially use stormwater runoff as a direct source of supply.

Wastewater and Recycled Water

The City has historically purchased recycled water supplies from Inland Empire Utilities Agency as described in Section 6.2.5. In addition, Section 6.2.5 provides a detailed discussion of the existing and planned use of the recycled water, including a description of the management and reliability of those recycled water supplies. Table 6-8 summarizes the actual recycled water supplies for FY 2019-20. In addition, Table 6-9 summarizes the projected recycled water supply, in five-year increments, through FY 2044-45 under varying water supply conditions.

### *6.1.2 OTHER CHARACTERIZATION CONSIDERATIONS*

A description of the City's water system along with a map of its service area is included in Chapter 3. In addition, the agencies which manage the water supplies used by the City are identified in Section 6.2.1 (imported water), 6.2.2 (groundwater), 6.2.3 (surface water), 6.2.4 (stormwater), and 6.2.5 (recycled water).

### *6.1.3 OPTIONAL PLANNING TOOL*

As discussed in Section 4.2.5, DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and assess monthly water use trends. DWR has deemed the tool as optional, and the City is not required by DWR to use the tool. Section 6.1 provides a tabulation of the City's historical annual water uses for each water supply source. During the past 10 years, the City experienced a five-consecutive-year-drought within its service area from FY 2011-12 to FY 2015-16. Historical records indicate the City's annual water demands had been greater prior to FY 2011-12. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, the City has been able to provide water service to meet maximum day water demands for these years, including during the summer months. A further discussion regarding the reliability of the City's water supply sources is provided in Chapter 7.

## 6.2 NARRATIVE SECTIONS FOR SUPPLIER'S UWMP WATER SUPPLY CHARACTERIZATION

### *6.2.1 PURCHASED OR IMPORTED WATER*

**CHINO BASIN DESALTER AUTHORITY**

The City purchases treated groundwater from the Chino Basin Desalter Authority (through the "*Amended and Restated Water Purchase Agreement, January 1, 2011*" contract between the City and CDA). On September 25, 2001, CDA was formed under a Joint Exercise of Powers Agreement (JPA) to remove salts from brackish groundwater extracted from the lower Chino Basin. The area which receives water supplies from CDA is 304 square miles. A further discussion of CDA's treatment facilities is provided in Section 6.2.2.

Treated water is distributed to CDA's member agencies which include the City of Chino, City of Chino Hills, City of Norco, City of Ontario, Inland Empire Utilities Agency, Jurupa Community Services District, Santa Ana River Water Company, and Western Municipal Water District. Western Municipal Water District joined the CDA member agencies in 2010. CDA's member agencies provide water service within Riverside County and San Bernardino County. The member agencies have contract entitlements to receive a total of 35,200 AFY of treated water from CDA[4]. The City has a contract entitlement to receive a total of 8,533 AFY of treated water from CDA. A further discussion of CDA's water supplies, and the management of these supplies in the Chino Basin, is provided in Section 6.2.2.

The City purchases treated groundwater supplies from CDA. The City's purchases over the past five years have been tabulated in Figure 2 above. Over the past five years, the City has purchased 2,682 AFY to 6,636 AFY, with an average of 4,429 AFY from CDA. The City's projected purchases from the CDA, over the next 25 years in five-year increments, is provided in Table 6-9.

**WATER FACILITIES AUTHORITY**

The City purchases treated, imported surface water from the Water Facilities Authority (through the "*Installment Purchase Agreement Relating to Water Facilities Authority Water Treatment Plant, October 1, 1985*" contract between the City and WFA). On February 19, 1980, WFA was formed under a Joint Exercise of Powers Agreement to acquire and construct facilities to supply and distribute potable water to its member agencies. WFA's service area is located within Chino Basin's boundaries at the western portion of San Bernardino county. WFA's member agencies include the Cities of Chino, Chino Hills, Ontario, Upland, and the Monte Vista Water District. The area which receives water supplies from WFA is approximately 148 square miles.

[4] https://www.chinodesalter.org/98/Member-Agencies

WFA purchases untreated imported water from Metropolitan Water District of Southern California through Inland Empire Utilities Agency. WFA owns and operates the Agua de Lejos Treatment Plant located in the City of Upland. The Agua de Lejos Treatment Plant is a conventional surface water treatment facility that treats and disinfects imported water supplies from the State Water Project delivered by MWD through IEUA. The Agua de Lejos Treatment Plant began operating in 1988 and has a treatment capacity of 81 million of gallons per day (MGD).

The City purchases treated, imported water supplies from the Water Facilities Authority. The City's purchases over the past five years has been tabulated in Section 6.1. Over the past five years, the City has purchased 2,327 AFY to 6,513 AFY, with an average of 4,109 AFY from WFA. The City's projected purchases from the WFA, over the next 25 years in five-year increments, are provided in Table 6-9.

The City's treated imported water supplies from MWD, through WFA, may be impacted during a multi-year drought or other conditions which limits MWD from delivering sufficient water supplies to all of its member agencies, and consequently to the City. In anticipation of such a reduction in supplies, MWD developed a Water Supply Allocation Plan (WSAP) which is briefly described below. The WSAP provides a means of equitably providing reduced water supplies to each of MWD's member agencies for up to 10 levels of reduction representing up to a 50 percent reduction.

During calendar year 2007, critically dry conditions impacted MWD's water supply sources. In addition, a ruling in the Federal Courts in August 2007 provided protective measures for the Delta Smelt (and subsequently other aquatic species) in the Sacramento-San Joaquin River Delta resulting in restrictions on the availability of State Water Project water. As a result, MWD adopted a WSAP in February 2008 to allocate available water supplies to its member agencies. MWD revised the WSAP in December 2014.

The WSAP establishes ten different shortage levels and a corresponding Allocation to each member agency. Based on the shortage levels established by MWD, the WSAP provides a separate reduced Allocation to a member agency for its 1) Municipal and Industrial (M&I) retail demand and 2) replenishment demand. The WSAP formula considers historical local water production, full service treated water deliveries, agricultural deliveries and water conservation efforts when calculating each member agency's Allocation.

In general, the WSAP process calculates total historical member agency demand. That historical demand is then compared to member agency projected local supply for a specific Allocation year. The balance required from MWD, less an Allocation reduction factor, is the member agency's "Water Supply Allocation" of imported water from MWD. When a member agency reduces its local demand through conservation or other means, the Allocation of imported water will increase. Depending on MWD's available supply, MWD can establish a specific WSAP shortage level. The shortage level causes a regional reduction and calculates an allocation for each of its member

agency. Additional information about MWD's WSAP is provided in MWD's Regional 2020 UWMP which is incorporated by reference. The following is a summary of MWD's water shortage levels:

Level 1 – Regional Percent Reduction of 5%
Level 2 – Regional Percent Reduction of 10%
Level 3 – Regional Percent Reduction of 15%
Level 4 – Regional Percent Reduction of 20%
Level 5 – Regional Percent Reduction of 25%
Level 6 – Regional Percent Reduction of 30%
Level 7 – Regional Percent Reduction of 35%
Level 8 – Regional Percent Reduction of 40%
Level 9 – Regional Percent Reduction of 45%
Level 10 – Regional Percent Reduction of 50%

In response to a fourth consecutive year of below average rainfall and critically dry conditions, MWD declared a WSAP Allocation Level 3 for FY 2015-16, which represented a regional reduction of 15 percent. MWD rescinded the WSAP for FY 2016-17 and has not reinstated the WSAP since that time.

## SAN ANTONIO WATER COMPANY

The City purchases water from SAWCo (through the "*Water Service Agreement, January 1, 2017*" contract between the City and SAWCo) which delivers domestic and irrigation water to a variety of shareholders. These shareholders include most residents of San Antonio Heights (an unincorporated area of San Bernardino County), the Cities of Upland and Ontario, Monte Vista Water District, the United States Forest Service, the San Bernardino County Flood Control District, local golf courses, rock quarries, and grove irrigators. SAWCo is governed by a seven-member Board of Directors that is elected by shareholders at the end of each calendar year.

Pursuant to SAWCo's "*Approved FY 2020 Budget Report*[5]", there are 6,178 Active Shares and a total of 6,389 Company Shares (Inactive Shares are those shares currently not utilizing entitlement water). In 2020, each Active Share was equal to 2.035 AF of entitlement water from SAWCo, making the total active share entitlement 12,570 AF. The City of Upland is the largest shareholder with an entitlement of 9,186 AF and the domestic customers of San Antonio Heights as a group represent the second largest block of shareholders, with an entitlement of 1,269 AF. Monte Vista Water District has an entitlement of 671 AF and the City has an entitlement of 600 AF based on Active Share entitlements (volume per share is subject to change).

[5] https://www.sawaterco.com/2020-approved-budget

SAWCo's water supply sources include surface water obtained from the San Antonio Canyon, water from the San Antonio Tunnel, and groundwater sources from the Chino Basin, Six Basins, and Cucamonga Basin. The majority of SAWCo's water supplies are obtained from groundwater produced from the Cucamonga Basin and surface water from San Antonio Creek. A description regarding of the reliability of SAWCo's individual water supply sources is included in SAWCo's 2020 UWMP, which is incorporated by reference.

The City's purchase of treated water from SAWCo over the past five years has been tabulated in Section 6.1. Over the past five years, the City has purchased 171 AFY to 565 AFY, with an average of 364 AFY from SAWCo. The City's projected purchased water from SAWCo, over the next 25 years in five-year increments, is provided in Table 6-9.

### *6.2.2 GROUNDWATER*

**CWC 10631.**

*(b)(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:*

*(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.*

*(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).*

*(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

*(D) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

## CHINO BASIN

### Chino Basin - Sustainable Groundwater Management Act

The Chino Basin is a sub-basin of the Upper Santa Ana Valley Groundwater Basin pursuant to DWR Bulletin 118, Basin Number 8-2.01. Pursuant to the Sustainable Groundwater Management Act of 2014 (SGMA), the Chino Basin was named as an adjudicated groundwater basin and is exempt from the requirements of developing a GSP and subsequently was designated a very-low-priority basin in DWR's 2019 SGMA Basin Prioritization report. In compliance with SGMA, the Chino Basin Watermaster submits its Annual Report to DWR.

### Chino Basin - Adjudication

The Chino Basin was adjudicated under the Chino Basin Judgment, entered on January 27, 1978 by the Superior Court for the County of San Bernardino. A copy of the Chino Basin Judgment is provided in Appendix J. The Chino Basin Watermaster was created by the Judgement to administer the provisions of the Judgement as an arm of the Court.

The Chino Basin Judgment originally established a Safe Yield for the Chino Basin of 140,000 AFY. Pursuant to the most recent Safe Yield reset effective in 2020, the Safe Yield in the Chino Basin is currently 131,000 AFY (July 1 to June 30, 2030). The Safe Yield is recalculated every 10 years and is defined in the Chino Basin Judgment as "the long-term average annual quantity of ground water (excluding replenishment of stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Chino Basin under conditions of a particular year without causing an undesirable result". The Chino Basin Judgment's allocation of the Safe Yield includes three separate Pools: (1) the "Overlying Agricultural Pool"; (2) the "Overlying Non-Agricultural Pool"; and (3) the "Appropriative Pool". The Operating Safe Yield (OSY) is defined as "The annual amount of groundwater which Watermaster shall determine, pursuant to criteria specified in Exhibit "I", can be produced from Chino Basin by the Appropriative Pool parties free of replenishment obligation under the physical solution herein."

The City is a member of both the Overlying Non-Agricultural Pool and the Appropriative Pool. The Judgment allocates a portion of the safe yield to the Overlying Non-Agricultural Pool and a portion of the OSY to the Appropriative Pool. Pursuant to the Judgment, the City has appropriative rights to 20.742 percent of the OSY allocated to the Appropriative Pool. The City has gained 53.338 percent of the Safe Yield assigned to the Overlying Non-Agricultural Pool.

As of July, 2020 the Safe Yield is allocated at 82,800 AFY to the Overlying Agricultural Pool, 7,366 AFY to the Overlying Non-Agricultural Pool, and 40,834 AFY to the Appropriative Pool. Per the Judgment, the City has appropriative rights to 20.742 percent of the OSY. With an OSY

of 40,834 AF, the City's current appropriative right is approximately 8,470 AFY as of July 2020. The City has purchased and has rights to 3,921 AF of Overlying Non-Agricultural Pool water.

Appropriators who are Parties to the Chino Basin Judgment, are authorized to produce groundwater in excess of their rights. Appropriators pay assessments for groundwater produced in excess of their rights to the Chino Basin Watermaster. The assessments are used to purchase water to replenish the Chino Basin. The Chino Basin Watermaster purchases water from Metropolitan Water District of Southern California through Inland Empire Utilities Agency and/or Three Valleys Municipal Water District, on behalf of the Parties, to replenish the Chino Basin. Occasionally, Watermaster has purchased water from storage accounts from parties within the Chino Basin.

In addition to the water rights described above, the City of Ontario has rights to groundwater held in the Chino Basin as described below:

Land Use Conversion and Annual Early Transfers

The City gains rights to additional Chino Basin groundwater as a result of land use conversions from agricultural to non-agricultural uses. This is expected to increase from development of Ontario Ranch; the total of which is adjusted annually by the Watermaster. As of FY 19/20, the City receives 4,254 AFY from land use conversions.

The Chino Basin Watermaster reallocates the unused portion of the Chino Basin Safe Yield from the Overlying Agricultural Pool to the Appropriative Pool members as a supplement to the Appropriative Pool share of Operating Safe Yield rights in any year. These transfers are permanent if agricultural land has been converted to non-agricultural use, or temporary if agricultural pool extractions are less than their share of the Safe Yield. From FY 2000-01 to FY 2019-20, the annual quantity of the Agricultural Pool's share available for reallocation to Appropriative Pool members[6] ranged from 40,822 AF to 61,014 AF, with an annual average of approximately 50,457 AF. As Agricultural Pool production declines within the Chino Basin, the reallocation of water to the Appropriative Pool will increase.

Groundwater Recharge Credits

The City is entitled to water rights due to groundwater recharge with stormwater and recycled water in the Chino Basin. The credited amount is based on the volume recharged and therefore varies annually but is projected to increase over time. Stormwater recharge credit is assigned based on OSY percentage. Recycled water recharge credit is assigned based on wastewater contribution percentage. In FY 2018/2019, 2,544 AF of recycled water was recharged for the City. In FY

[6] Pursuant to the Chino Basin Watermaster "*Fiscal Year 2019-20, 43rd Annual Report*", Appendix G

19/20, no recharge credits were purchased by the City due to limitations on groundwater storage capacity.

Fontana Recycled Water Rights

The City has a long-term contract to purchase up to 3,000 AFY of recharged recycled water rights from the City of Fontana. The City of Fontana does not operate a water system. The amount purchased by OMUC each year will vary. In FY 2018/2019, the City purchased 2,157 AF of Fontana's recycled water entitlement. In FY 19/20, no recharged water rights were purchased due to limitations on groundwater storage capacity.

Groundwater Storage Accounts

The City has rights to store water in the Chino Basin (Appropriative and Overlying Non-Agricultural) and has been increasing its various storage accounts in recent years. The City holds water in both local storage accounts and supplemental accounts. Local storage accounts hold un-pumped OSY groundwater rights and stormwater that has been recharged into the Chino Basin. Supplemental accounts hold both imported water and recycled water that has been recharged into the Chino Basin. As of June 30, 2020, the City has 96,544 AF in storage pursuant to Appropriative rights and 3,461 AF in storage pursuant to Overlying Non-Agricultural rights.

**Chino Basin - Description**

The Chino Basin is located within the Upper Santa Ana Valley, which is located in San Bernardino County and is bounded on the east by the Rialto-Colton fault; on the southeast by the contact with impermeable rocks forming the Jurupa Mountains; on the south by impermeable rocks of the Puente Hills and by the Chino fault; on the northwest by the San Jose fault; and on the north by the impermeable rocks of the San Gabriel Mountains and by the Cucamonga fault. The location of the Chino Basin is provided in Figure 3. The surface area of the Chino Basin is approximately 154,000 acres (or 240 square miles). The San Antonio Creek and Cucamonga Creek drain the Chino Basin area southward and flow into the Santa Ana River. Pursuant to DWR Bulletin 118 (for Basin Number 8-2.01), the total storage capacity of the Chino Basin is approximately 18,300,000 AF.

The water-bearing units in the Chino Basin includes Holocene and Upper Pleistocene alluvium. This Holocene alluvium consists mainly of alluvial-fan deposits, with maximum thickness of 150 feet that are coarsest in and near the mouths of the canyons and are finer away from canyon mouths in the southern part of the Chino Basin. The Pleistocene alluvium is exposed mainly in the northern part of the subbasin and supplies most of the water to wells located within the Chino Basin. The Pleistocene alluvium is about 600 to 700 feet thick throughout most of the Chino Basin. The alluvium contains interfingering finer, alluvial-fan deposits and coarser, fluvial deposits.

**Figure 3 – Chino Basin Location**

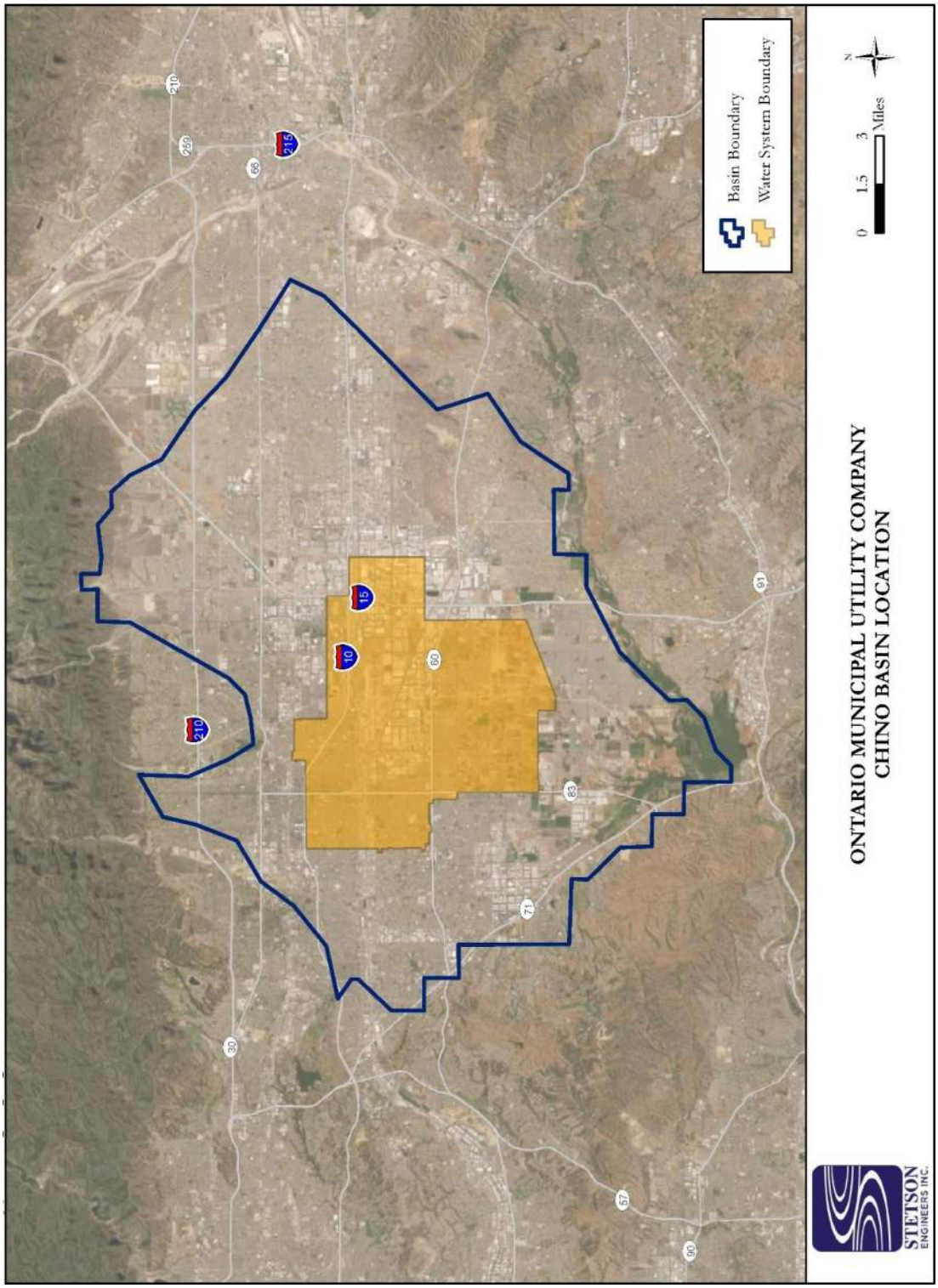

The Chino Basin is bounded by three major fault systems. Many of the faults within the Chino Basin form groundwater barriers marked by discontinuities in groundwater elevations. The Rialto-Colton fault forms the eastern boundary of the Chino Basin. Although it has no surface expression, it forms a major barrier to groundwater movement. The San Jose fault forms the northwest boundary of the Chino Basin. The Cucamonga fault zone forms part of the northern boundary of the Chino Basin. Displacement on the Cucamonga fault amounts to about 1,000 feet on its west end to 4,000 feet at its east end.

**Chino Basin - Management**

Basin Production

Over the past 20 years, total groundwater production from the Chino Basin has ranged from approximately 133,275 AFY to 188,910 AFY[7]. A majority of production currently is pumped for municipal and agricultural purposes while the remaining production is pumped by non-agricultural Parties.

Groundwater Level Monitoring

Groundwater elevation contours in the Chino Basin Watermaster's 2018 State of the Basin Report show a regional depression of groundwater surrounding the Chino-II Desalter well field and the eastern half of the Chino-I Desalter well field. Hydraulic Control of the Chino Basin is achieved east of Chino Desalter Well I-20. The contours also indicate groundwater flowing past the desalter wells west of Chino Desalter Well I-20, indicating only partial Hydraulic Control; however, losses are currently considered de minimis.

Chino Basin Desalter Authority

On September 25, 2001, the Chino Basin Desalter Authority was formed under a Joint Exercise of Powers Agreement to remove salts from brackish groundwater extracted from the lower Chino Basin. The area which receives water supplies from CDA is 304 square miles. A map showing CDA Desalter facilities and associated wells is provided in Figure 4 below.

CDA removes salts from brackish groundwater extracted from the lower Chino Basin through the Chino I and II Desalter facilities. The Chino I Desalter is located in the City of Chino and commenced operation in 2001 and was expanded in 2005 to have a total capacity of 14.2 MGD. The Chino I Desalter includes reverse osmosis, ion exchange, and air stripper treatment for treating brackish water and removing nitrate and volatile organic chemicals (VOCs). The Chino II Desalter is located in Jurupa Valley and began operation in 2006 and was expanded in 2011 and again in

[7] Pursuant to the Chino Basin Watermaster "*Fiscal Year 2019-20, 43rd Annual Report*", Appendix H http://www.cbwm.org/docs/annualrep/43rd%20Annual%20Report.pdf

2017 to have a total capacity of 33 MGD. The Chino II Desalter includes reverse osmosis and ion exchange treatment for treating brackish water and removing nitrate. Following the expansion, CDA constructed the Concentrate Reduction Facility in 2017, which utilizes chemical softening to remove the limiting foulants (specifically, calcium and silica) from the reverse osmosis concentrate. Additional components of the Chino II Desalter were constructed as part of the South Archibald Plume Project which will be operational in 2021, with the goal of removing and treated trichloroethylene (from groundwater wells impacted by the South Archibald Plume.

**Figure 4 - Location of CDA Facilities**

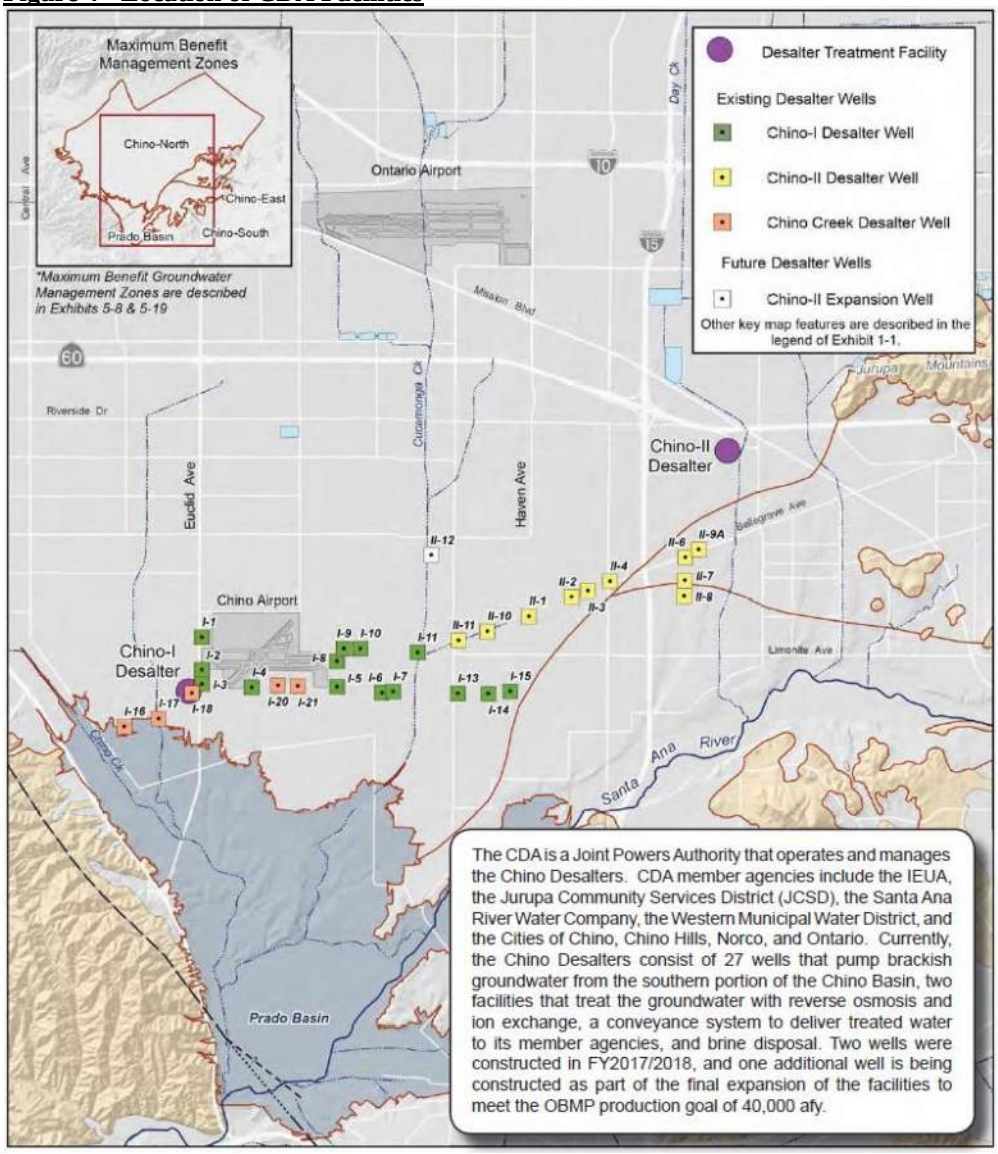


(source: Chino Basin Optimum Basin Management Program 2018 State of the Basin Report)

Treated water is distributed to CDA's member agencies which include the City of Chino, City of Chino Hills, City of Norco, City of Ontario, Inland Empire Utilities Agency, Jurupa Community Services District, Santa Ana River Water Company, and Western Municipal Water District through "take or pay" contracts. CDA's member agencies provide water service within Riverside County and San Bernardino County. CDA can produce up to 40,000 AF from the Chino Basin every year for the purpose of groundwater cleanup and control of contaminant migration. This production is fixed to achieve the desired groundwater cleanup goal. The member agencies have contract entitlements to receive a total of 35,200 AFY of treated water from CDA. The City's current contract entitlement is 8,533 AFY.

A portion of the production is in-lieu of those CDA member agencies producing an equal amount of groundwater from their own groundwater wells using their individual water rights. An additional portion of the production is temporarily assigned as "controlled overdraft". Pursuant to the Chino Basin Judgment, a total of 200,000 AF was authorized for controlled overdraft between the period of 1978 through 2017. In 2007, the Peace II Agreement was adopted to establish measures for achieving hydraulic control of the Chino Basin. One of the measures put forth included increasing the authorized controlled overdraft to 600,000 AF. This increase in controlled overdraft is separate from, and in addition to, the 200,000 AF authorized in the Chino Basin Judgment and is available for utilization until December 31, 2030. For the balance of the production, the Chino Basin Watermaster levies an annual Replenishment Assessment to purchase replenishment water to replace that overproduced water. Each of CDA's member agencies is responsible to pay a Replenishment Assessment for their purchases in excess of their respective water rights allocated to the program.

Chino Basin Optimum Basin Management Program

In 2000, the Chino Basin Watermaster developed the Chino Basin Optimum Basin Management Program (OBMP). The OBMP was developed in a collaborative process that identified the needs of the stakeholders, described the physical state of the basin, defined a set of management goals, identified impediments to these goals, and established a series of actions that would remove these impediments and achieve the management goals. The goals identified in the OBMP included: (1) Enhance Basin Water Supplied; (2) Protect and Enhance Water Quality; (3) Enhance Management of the Basin; and (4) Equitably Finance the OBMP.

The OBMP defines nine Program Elements which were incorporated into the OBMP Implementation Plan as part of the Court-ordered Peace Agreement (2000):

- Program Element 1 - Develop and Implement Comprehensive Monitoring Program
- Program Element 2 - Develop and Implement Comprehensive Recharge Program
- Program Element 3 - Develop and Implement a Water Supply Plan for Impaired Areas
- Program Element 4 - Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1

- Program Element 5 - Develop and Implement Regional Supplemental Water Program
- Program Element 6 - Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin
- Program Element 7 - Develop and Implement Salt Management Plan
- Program Element 8 - Develop and Implement Groundwater Storage Management Program
- Program Element 9 - Develop and Implement Storage and Recovery Programs

The "Peace Agreement" (2000) and the "Peace II Agreement" (2007) are agreements among the Parties that allow the implementation of the OBMP and guides the management of the Chino Basin, including the construction and operations of the Desalters, hydraulic control of the Basin, groundwater production and replenishment for the Desalters, yield accounting and recharge.

Chino Basin Storage Management Plan

The Peace Agreement (2000) establishes rules and regulations, standard storage agreements, and related forms for storage in the Chino Basin. Since 2000, Chino Basin Watermaster administers groundwater storage in the Chino Basin pursuant to the storage management plan described in Program 8 of the 2000 OBMP and evaluated in the Programmatic Environmental Impact Report.

The three types of storage agreements resulted in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield and Basin Water purchased or transferred from other Parties. A Local Supplemental Water account includes any imported and/or recycled water that is recharged by a producer and similar water acquired from other Parties. A Storage and Recovery Account includes Supplemental Water and is intended to provide a broad and mutual benefit to the Parties of the Judgement. The Chino Basin Watermaster tracks the puts, takes, losses, and end-of-year storage totals for all storage accounts and reports on this accounting on an annual basis. The Chino Basin Watermaster assesses losses by considering water in managed storage (excluding Carryover) and offsets the increases in groundwater discharge to the Santa Ana River and from the Chino Basin attributable to managed storage (excluding Carryover). Chino Basin Watermaster also considers losses due to evaporation on the puts when water is recharged in spreading basins.

The individual Parties are involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Chino Basin Watermaster has an application and review process for these transfers. The Parties engage in conjunctive-use activities individually by storing Chino Basin and Supplemental Water that are in excess of their demands and recover that water as necessary. These activities collectively cause a temporary increase in the storage. The Parties' aggregate amount of water in managed storage was 541,845 AF as of June 30, 2020.

MWD's Dry-Year Yield Program is the only active storage and Recovery Program in Chino Basin. This program is a water exchange as discussed in 6.2.7.1. The DYYP can store up to 100,000 AF

with maximum replenishment of 25,000 AFY and maximum extraction of 33,000 AFY. As of June 30, 2020, there was 45,961 AF within the DYYP account, resulting in a total managed storage volume of 587,806 AF (541,845 AF + 45,961 AF). The agreement that authorized the DYYP will expire in 2028. The combined volume of managed storage by MWD's DYYP and the Parties is projected to have a maximum of 790,000 AF in 2028, assuming DYYP has 100,000 AF in storage and that MWD removes the contract rate of 33,000 AFY starting in 2029.

As discussed in Section 4.5, Inland Empire Utilities Agency's "Addendum No. 2 to the Optimum Basin Management Program Project", completed in February 2021, amends the 2000 Chino Basin Peace Agreement's Programmatic Environmental Impact Report to address managed storage within the Chino Basin consistent with the Local Storage Limitation Solution. Consistent with Addendum No. 1, from July 1, 2017 through June 30, 2021 the Safe Storage Capacity of the Chino Basin is 600,000 AF. The LSLS proposes a change in the Safe Storage Capacity to 700,000 AF through June 30, 2030, and to 620,000 AFY from July 1, 2030 through June 30, 2035. Full utilization of the allowable increased storage space is expected to occur gradually as additional water is stored and less groundwater is produced. The Safe Storage Capacity of the Chino Basin will revert to 500,000 AF after June 30, 2035.

Groundwater Clean-up

Groundwater in areas of the Chino Basin is currently contaminated with Perchlorate and VOCs, including 1,2,3-Trichloropropane (1,2,3-TCP), trichloroethylene (TCE), and perchloroethylene (PCE). In addition, nitrates and TDS concentrations in areas of the Chino Basin exceed drinking water quality standards. Wellhead treatment is necessary in these areas to allow delivery of the groundwater for potable purposes.

**Chino Basin - Historical and Projected Basin Production**

The City currently produces groundwater from the Chino Basin. The City's share of the Operating Safe Yield is 20.742 percent; Ontario's current appropriative right is 8,470 AFY as of July 2020. In addition, the City has purchased and has rights to 3,921 AF of Overlying Non-Agricultural Pool water.

Over the past five years, the City has produced 18,395 AFY to 26,109 AFY, with an average of 22,306 AFY from the Chino Basin. The City's projected production from the Chino Basin, over the next 25 years in five-year increments, is provided in Table 6-9.

**Table 6-1 Groundwater Volume Pumped**

| Submittal Table 6-1 Retail: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | Supplier does not pump groundwater.<br>The supplier will not complete the table below. | | | | | |
| ☐ | All or part of the groundwater described below is desalinated. | | | | | |
| Groundwater Type<br>***Drop Down List***<br>*May use each category multiple times* | Location or Basin Name | 2016* | 2017* | 2018* | 2019* | 2020* |
| *Add additional rows as needed* | | | | | | |
| Alluvial Basin | Chino Basin | 22,751 | 24,672 | 26,109 | 19,604 | 18,395 |
| | **TOTAL** | 22,751 | 24,672 | 26,109 | 19,604 | 18,395 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

### 6.2.3 SURFACE WATER

The City does not use surface water supplies to meet its water demands.

### 6.2.4 STORMWATER

The City has historically received groundwater from the Chino Basin. Management and use of the stormwater runoff from the Chino Basin watershed, which is crucial to groundwater management. However, the City currently does not have its own program to beneficially use stormwater runoff as a direct source of supply.

### 6.2.5 WASTEWATER AND RECYCLED WATER

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:*

*(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

*(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

*(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

*(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

*(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

*(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*

*(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

As a local water purveyor, the City delivers water to its customers from its potable and recycled water supplies. Table 6-4 summarizes current and projected recycled water use within the City from FY 2019-20 to FY 2044-45. The following sections provide a description of the City's current recycled water use and its plans to expand the use of recycled water as a source of water supply over the next 25 years.

### *6.2.5.1 RECYCLED WATER COORDINATION*

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area…*

The City's recycled water supplies are produced by IEUA. Pursuant to the Chino Basin Regional Sewage Service Contract, each Contracting Agency has the right of first purchase of their Base Entitlement. Base Entitlement is defined as the total quantity of sewage delivered into the Regional Sewerage System by the Contracting Agency less normal processing losses resulting from the treatment of sewage. IEUA owns and operates five regional wastewater treatment plants including the Regional Water Recycling Plant No. 1 (RP-1), Regional Water Recycling Plant No. 2 (RP-2), Regional Water Recycling Plant No. 4 (RP-4), Regional Water Recycling Plant No. 5 (RP-5), and Carbon Canyon Water Recycling Facility (CCWRF). RP-1 has a wastewater treatment capacity of 44 MGD; RP-2 does not have any liquid treatment processes and does not produce any recycled water; RP-4 has a wastewater treatment capacity of 14 MGD; RP-5 has a wastewater treatment capacity of 15 MGD; and CCWRF has a wastewater treatment capacity of approximately 9.5 MGD. IEUA is currently planning an expansion of RP-5 which will increase its hydraulic capacity up to 22.5 MGD. The locations of IEUA's regional plants are provided in Figure 5 below.

**Figure 5 - Location of IEUA Regional Water Recycling Plants**

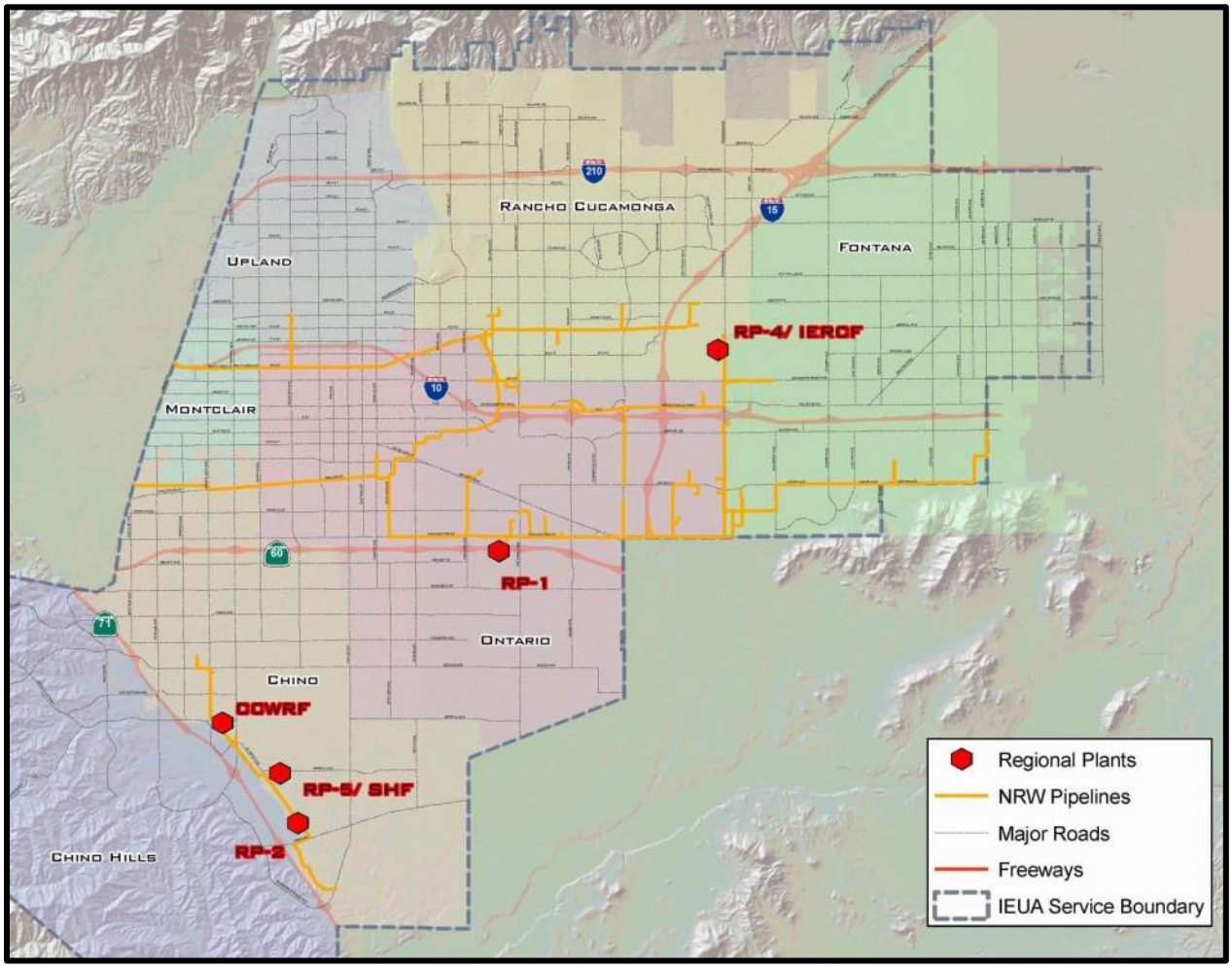


Source: IEUA (https://www.ieua.org/everything-water/recycled-water/)

IEUA's regional plants (with the exception of RP-2 which does not have any liquid treatment processes) can produce tertiary-treated, Title 22-quality recycled water. Information regarding recycled water effluent monitoring data and compliance data is provided in IEUA's annual "*Recycled Water Quality Reports*" and "*Recycled Water Annual Reports*[8]"

Table 6-4 summarizes current and projected recycled water use within the City from FY 2019-20 to FY 2044-45. The City works closely with IEUA regarding the development of recycled water infrastructure in its service area and the identification of new recycled water users. As discussed in Section 2.6, the City has coordinated the preparation of its 2020 Plan with IEUA.

[8] https://www.ieua.org/read-our-reports/recycled-water-reports/

### 6.2.5.2 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

**CWC 10633.**

*(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

Wastewater generated by the City is treated by IEUA. IEUA provides sewage utility services to seven contracting agencies including the Cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Upland, and Cucamonga Valley Water District. Wastewater is collected within the City's local sewer collection system. The City's local sewers tie into IEUA's regional trunk sewers, including 90 miles of regional sewage interceptors. The regional sewer lines deliver wastewater to one or more regional plants owned by IEUA for treatment. IEUA owns and operates five regional water recycling plants including the Regional Water Recycling Plant No. 1, Regional Water Recycling Plant No. 2, Regional Water Recycling Plant No. 4, Regional Water Recycling Plant No. 5, and Carbon Canyon Water Recycling Facility. Wastewater is treated through various processes including preliminary screening, grit removal, primary clarification, secondary treatment, tertiary treatment, dechlorinating, solids thickening, anaerobic digestion, and dewatering. With the exception of RP-2, the regional plants can produce tertiary-treated, Title 22-quality recycled water.

IEUA operates a Non-Reclaimable Wastewater System (NRWS) which conveys high strength wastewater to treatment facilities in Los Angeles and Orange counties for eventual discharge to the Pacific Ocean. The NRWS consists of two trunk lines which convey wastewater to the Los Angeles County Sanitation Districts' sewer system, and one trunk line which conveys wastewater to the Orange County Sanitation District's sewer system. Treated wastewater is ultimately disinfected prior to being discharged to the Pacific Ocean. All water discharged to the ocean is monitored to ensure compliance with applicable local, state, and federal standards for discharge water

According to information provided by IEUA, IEUA treated approximately 49.1 MGD of wastewater at its regional plants during FY 2019-20. In addition, IEUA estimates that the total estimated amount of wastewater collected within the City's service area during FY 2019-20 was approximately 12,650 AFY), as shown in Table 6-2. As indicated in Table 6-2 and Table 6-3, the City's wastewater is treated at RP-1 and RP-5.

**Table 6-2 Wastewater Collected Within Area in 2020**

| Submittal Table 6-2 Retail: Wastewater Collected Within Service Area in 2020 | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | There is no wastewater collection system. The supplier will not complete the table below. | | | | | |
| 100 | Percentage of 2020 service area covered by wastewater collection system *(optional)* | | | | | |
| 100 | Percentage of 2020 service area population covered by wastewater collection system *(optional)* | | | | | |
| **Wastewater Collection** | | | **Recipient of Collected Wastewater** | | | |
| Name of Wastewater Collection Agency | Wastewater Volume Metered or Estimated? *Drop Down List* | Volume of Wastewater Collected from UWMP Service Area 2020 * | Name of Wastewater Treatment Agency Receiving Collected Wastewater | Treatment Plant Name | Is WWTP Located Within UWMP Area? *Drop Down List* | Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List* |
| IEUA | Estimated | 12,645 | IEUA | RP-1 and RP-5 | Yes | No |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| **Total Wastewater Collected from Service Area in 2020:** | | 12,645 | | | | |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3* **.** | | | | | | |
| NOTES: | | | | | | |

**Table 6-3 Wastewater Treatment and Discharge within Service Area in 2020**

| Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | **No wastewater is treated or disposed of within the UWMP service area.** The supplier will not complete the table below. | | | | | | | | | | |
| | | | | | | | 2020 volumes [1] | | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* [2] | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list* | Treatment Level *Drop down list* | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area | Instream Flow Permit Requirement |
| RP-1 | Santa Ana River | San Ana River | | River or creek outfall | Yes | Tertiary | 31,000 | 14,200 | 7,812 | 8,988 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | **Total** | 31,000 | 14,200 | 7,812 | 8,988 | 0 |

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES: RP-1 are located within the City's service area; however; the water reclamation plant is wholly owned and operated by IEUA. Information regarding "2020 volumes" is estimated based IEUA's Recycled Water Annual Report FY 2019-20. Recycled water volume (within the serviced area) is for fiscal year 2019-20. Because the City does not own the water reclamation plant, information regarding "Instream Flow Permit Requirement" is not available and is not applicable.

## *6.2.5.3 RECYCLED WATER SYSTEM DESCRIPTION*

**CWC 10633.**

*(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

The City's recycled water supplies are produced by IEUA. Pursuant to the Chino Basin Regional Sewage Service Contract, each Contracting Agency has the right of first purchase of their Base Entitlement. Base Entitlement is defined as the total quantity of sewage delivered into the Regional Sewerage System by the Contracting Agency less normal processing losses resulting from the treatment of sewage. The City has received recycled water from IEUA since 1972. The City uses recycled water for industrial, landscape irrigation, agricultural irrigation, and golf course irrigation. The recycled water pipelines operated and maintained by the City total approximately 173,000 feet. The pipelines range from 6-inch to 36-inch and consist of polyvinyl chloride and cement mortar lined and coated materials. The location of the City's recycled water distribution system is provided in Appendix K.

Identification of Agencies Involved in the Recycled Water System

As part of the Chino Basin Watermaster's development of the OBMP, recycled water use was identified as a critical component in drought-proofing and maintaining the region's economic

growth. The OBMP established the path for the development of IEUA's regional recycled water distribution system and a Recycled Water Implementation Plan. IEUA in partnership with its member agencies and the Central Basin Watermaster have invested approximately $625 million since 2000 to increase the availability of local water supplies through water recycling, conservation, recharge improvements, the MWD groundwater storage and recovery project, the Chino Desalter, and other water management programs.

As previously discussed, IEUA owns and operates five regional wastewater treatment plants consisting of Regional Water Recycling Plant No. 1, Regional Water Recycling Plant No. 2, Regional Water Recycling Plant No. 4, Regional Water Recycling Plant No. 5, and Carbon Canyon Water Recycling Facility. IEUA began providing recycled water services in the 1970s at the Whispering Lakes Golf Course adjacent to RP-1 in the City Ontario and at the El Prado Park and Golf Course in the City of Chino. RP-2 does not have any liquid treatment processes and does not produce any recycled water. In the 1980s, IEUA expanded its recycled water system with the construction of the CCWRF and RP-4 recycling plants.

Those regional wastewater treatment plant capacities are:

- RP-1 has a wastewater treatment capacity of 44 MGD.
- RP-2 does not have any liquid treatment processes and does not produce any recycled water.
- RP-4 has a wastewater treatment capacity of 14 MGD.
- RP-5 has a wastewater treatment capacity of 15 MGD.
- CCWRF has a wastewater treatment capacity of approximately 9.5 MGD.

<u>Information on Recycled Water System History and Operation</u>

IEUA, in coordination with their member agencies, began providing recycled water services in the 1970s at the Whispering Lakes Golf Course adjacent to RP-1 in the City Ontario and at the El Prado Park and Golf Course in the City of Chino. In the 1980s, IEUA continued the implementation of its recycled water system with the construction of the CCWRF and RP-4 recycling plants. IEUA installed a backbone recycled water distribution system into the Cities of Chino and Chino Hills from the CCWRF in 1997. IEUA began groundwater recharge with recycled water at Ely Basin in 1999. In 2002, IEUA Board of Directors adopted Ordinance No. 75, the Mandatory Use Ordinance, to establish incentives and encourage recycled water use from the regional distributions system. A brief summary of recycled water project is provided below.

- In 2002, the Chino Basin Watermaster, Chino Basin Water Conservation District (CBWCD), San Bernardino County Flood Control District (SBCFCD) and IEUA combined efforts to greatly expand groundwater recharge capacity through the Chino Basin Facilities Improvement Program.

- In 2005, IEUA was permitted by the Regional Water Quality Control Board (RWQCB) to operate its recycled water groundwater recharge programs at six additional recharge sites (Banana, Hickory, Etiwanda Conservation Ponds, Declez, RP3, and Turner Basins).
- In 2007, IEUA was permitted to operate its recycled water groundwater recharge program at seven more recharge sites (Brooks, 8th Street, Victoria, Lower Day, San Sevaine, Etiwanda Spreading Grounds (later reconfigured as the Etiwanda Debris Basin) and Ely Basins).
- November 2007, IEUA and its member agencies unanimously adopted the Three-Year Recycled Water Business Plan. IEUA and its member agencies committed to implementing the plan, which laid out a focused and cost-effective approach to rapidly increase the availability and use of recycled water within IEUA's service area.
- Recycled water use within the IEUA service area increased from approximately 5,396 AF in FY 2004-05 up to 38,251 AF in FY 2013-14. However, with the conversion of land use from agricultural to urban, recycled water demand has decreased in recent years due to a reduction in irrigation demands.

#### *6.2.5.4 POTENTIAL, CURRENT, AND PROJECTED RECYCLED WATER USES*

**CWC 10633.**

*(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use. A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

*(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

*(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

The City's "2020 Recycled Water Master Plan" identified potential recycled water customers within the City based on recycled water use for large-volume irrigation purposes (e.g. municipal parks, fields, golf courses, etc.). Recycled water use factors were applied to the ultimate land uses for these customers to determine the potential ultimate recycled water demands (see Appendix K).

The City uses recycled water for agricultural irrigation, landscape irrigation, golf course irrigation and industrial purposes. The City plans to increase recycled water use within its service area by expanding the recycled water system to additional parks, schools, nurseries, and commercial landscaping areas not currently using recycled water.

The City continues to retrofit landscape irrigation systems to use recycled water where available. Future recycled water use projections are based on current recycled water use and planned recycled water projects. As shown in Table 6-4, the current and projected deliveries reflect the volume of municipal recycled wastewater from IEUA to customers through the City's recycled water distribution system.

The City's recycled water supplies are produced by IEUA. Pursuant to the Chino Basin Regional Sewage Service Contract, each Contracting Agency has the right of first purchase of their Base Entitlement. Base Entitlement is defined as the total quantity of sewage delivered into the Regional Sewerage System by the Contracting Agency less normal processing losses resulting from the treatment of sewage. A tabulation of the City's recycled water demands over the past five years are provided in Section 6.1. Over the past five years, the City recycled water demands have ranged from 7,510 AFY to 9,653 AFY, with an average of 8,167 AFY. The City's actual use of recycled water in FY 2019-20 was 7,812 acre-feet and the 2015 Plan projected a recycled water use of 7,929 acre-feet for FY 2019-20, as shown in Table 6-5. The City's projected recycled water demands, over the next 25 years in five-year increments, are provided in Table 6-4 and Table 6-9.

**Table 6-4 Current and Projected Recycled Water Direct Beneficial Uses Within Service Area**

**Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area**

☐ Recycled water is not used and is not planned for use within the service area of the supplier.
The supplier will not complete the table below.

| | |
|---|---|
| Name of Supplier Producing (Treating) the Recycled Water: | Inland Empire Utilities Agency |
| Name of Supplier Operating the Recycled Water Distribution System: | Ontario Municipal Utilities Company |
| Supplemental Water Added in 2020 (volume) *Include units* | 0 |
| Source of 2020 Supplemental Water | N/A |

| Beneficial Use Type *Insert additional rows if needed.* | **Potential** Beneficial Uses of Recycled Water (Describe) | Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units* [1] | General Description of 2020 Uses | Level of Treatment *Drop down list* | 2020 [1] | 2025 [1] | 2030[1] | 2035[1] | 2040[1] | 2045[1] (opt) |
|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural irrigation | | 5,971 | | Tertiary | 2,905 | 1,704 | 1,136 | 568 | 0 | 0 |
| Landscape irrigation (exc golf courses) | Schools, Parks, City Landscape | 6,764 | Schools, Parks, City Landscape | Tertiary | 3,290 | 7,088 | 8,612 | 10,136 | 11,659 | 11,659 |
| Golf course irrigation | | 1,297 | | Tertiary | 631 | 660 | 680 | 700 | 720 | 720 |
| Commercial use | | | | | | | | | | |
| Industrial use | | 2,027 | | Tertiary | 986 | 2,716 | 3,037 | 3,358 | 3,680 | 3,680 |
| Geothermal and other energy production | | | | | | | | | | |
| Seawater intrusion barrier | | | | | | | | | | |
| Recreational impoundment | | | | | | | | | | |
| Wetlands or wildlife habitat | | | | | | | | | | |
| Groundwater recharge (IPR) | | | | | | | | | | |
| Reservoir water augmentation (IPR) | | | | | | | | | | |
| Direct potable reuse | | | | | | | | | | |
| Other (Description Required) | | | | | | | | | | |
| | | | | **Total:** | 7,812 | 12,168 | 13,465 | 14,762 | 16,059 | 16,059 |
| | | | | **2020 Internal Reuse** | | | | | | |

[1] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Projected recycled water use is equal for years 2040 and 2045 because the City anticipates buildout to occur in 2040. Pursuant to the City's 2020 Recycled Water Master Plan, the City anticipates agricultural recycled water use will decrease to 0 AFY at buildout.

**Table 6-5 2015 Recycled Water Use Projection Compared to 2020 Actual**

| Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual | | |
|---|---|---|
| ☐ | Recycled water was not used in 2015 nor projected for use in 2020.<br>The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table. | |
| **Beneficial Use Type** | **2015 Projection for 2020** [1] | **2020 Actual Use**[1] |
| *Insert additional rows as needed.* | | |
| Agricultural irrigation | 2,177 | 2,905 |
| Landscape irrigation (exc golf courses) | 4,195 | 3,290 |
| Golf course irrigation | 600 | 631 |
| Commercial use | | |
| Industrial use | 957 | 986 |
| Geothermal and other energy production | | |
| Seawater intrusion barrier | | |
| Recreational impoundment | | |
| Wetlands or wildlife habitat | | |
| Groundwater recharge (IPR) | | |
| Reservoir water augmentation (IPR) | | |
| Direct potable reuse | | |
| Other (Description Required) | | |
| **Total** | 7,929 | 7,812 |
| [1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3. | | |
| NOTE: | | |

### *6.2.5.5 ACTIONS TO ENCOURAGE AND OPTIMIZE FUTURE RECYCLED WATER USE*

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:*

*(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

The City plans to continue to increase delivery capacity and expand the recycled water system to serve additional customers. Because the City is reliant on imported water supplies from IEUA, the economic value of a recycled water system continues to increase. Any additional water supplies that can offset imported water purchases will make these projects more viable. As discussed previously, the City's "2020 Recycled Water Master Plan" identified potential recycled water customers within the City based on recycled water use for large-volume irrigation purposes (e.g. municipal parks, fields, golf courses, etc.). The City is evaluating the following potential methods to expand future recycled water use. These potential methods are tabulated in Table 6-6.

- As a retail water supplier, the City will offer its customers (with non-potable water demands) an economic incentive to convert its use to recycled water.
- The City's potable and recycled water rates are a combination of a Readiness-to-Serve Charge, which is based on meter size, and a Usage Charge, which is based on the amount of water use. The Readiness-to-Serve Charge for a recycled water meter is approximately 55 percent of the Readiness-to-Serve Charge for a potable water meter. The variable Usage Charge for recycled water is approximately 60% of the charge for potable water. (The City's current and future recycled water charges largely depend on the rate that IEUA sells the recycled water for.)
- The City's Municipal Code Sec. 6-8.715 Rates, fees, charges and deposits provides that "*Under certain circumstances, the City may contribute to the cost of designing and/or constructing the facilities needed to deliver recycled water to an applicant's property. Subject to the availability of funds, the City may:*
    - *(1) Reimburse an applicant for costs incurred to install oversized facilities in the public right-of-way*
    - (2) *Elect to participate in or construct pipelines, reservoirs, pumping stations or other facilities, as it determines necessary, and/or as funds are available.*
- The City's Municipal Code Sec. Section 6-8.703, Policy states "*It is the policy of the City that recycled water be used for any purposes approved for recycled water use, when it is economically, technically, and institutionally feasible. Recycled water shall be the primary*

*source of supply for commercial and industrial uses, whenever available and/or feasible. Use of potable water for commercial and industrial uses shall be contrary to City policy; shall not be considered the most beneficial use of a natural resource; and shall be avoided to the maximum extent feasible."*

- As a contracting agency of IEUA, the City will investigate the availability of financial assistance for plumbing retrofits necessary to receive recycled water.
- The City will evaluate the viability of making conversion to recycled water mandatory for those customers with non-potable supplies that are in proximity to an existing or planned recycled water pipeline.

**Table 6-6 Methods to Expand Future Recycled Water Use**

| Submittal Table 6-6 Retail: Methods to Expand Future Recycled Water Use | | | |
|---|---|---|---|
| ☐ | Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation. | | |
| Section 6.2.5 | Provide page location of narrative in UWMP | | |
| Name of Action | Description | Planned Implementation Year | Expected Increase in Recycled Water Use * |
| *Add additional rows as needed* | | | |
| Recycled Water Expansion | Expand recycled water distribution system pursuant to City's "2020 Recycled Water Master Plan" (Near Phase) | 2025 | 4,356 |
| Recycled Water Expansion | Expand recycled water distribution system pursuant to City's "2020 Recycled Water Master Plan" (Future Phase) | 2045 | 3,891 |
| | | | |
| | | **Total** | 8,247 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | |
| NOTES: | | | |

### 6.2.6 DESALINATED WATER OPPORTUNITIES

**CWC 10631.**

*(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

Chino Basin

As discussed in Section 6.2.2, the Central Basin Desalter Authority removes salts from brackish groundwater extracted from the lower Chino Basin through the Chino I and II Desalter facilities. The Chino I Desalter is located in the City of Chino and commenced operation in 2001 and was expanded in 2005 to have a total capacity of 14.2 MGD. The Chino I Desalter includes reverse osmosis, ion exchange, and air stripper treatment for treating brackish water and removing nitrate and VOCs. The Chino II Desalter is located in Jurupa Valley and began operation in 2006 and was expanded in 2011, and again in 2017 to have a total capacity of 33 MGD. The Chino II Desalter includes reverse osmosis and ion exchange treatment for treating brackish water and removing nitrate. Following the expansion, CDA constructed the Concentrate Reduction Facility in 2017, which utilizes chemical softening to remove the limiting foulants (specifically, calcium and silica) from the reverse osmosis concentrate. Additional components of the Chino II Desalter were constructed as part of the South Archibald Plume Project which will be operational in 2021, with the goal of removing and treated TCE from groundwater wells impacted by the South Archibald Plume.

Treated water is distributed to CDA's member agencies which include the City of Chino, City of Chino Hills, City of Norco, City of Ontario, Inland Empire Utilities Agency, Jurupa Community Services District, Santa Ana River Water Company, and Western Municipal Water District. The member agencies have contract entitlements to receive a total of 35,200 AFY of treated water from CDA. A portion of the production is in-lieu of those CDA member agencies producing an equal amount of groundwater from their own groundwater wells from the Chino Basin using their individual water rights.

## 6.2.7 WATER EXCHANGES AND TRANSFERS

**CWC 10631.**

*(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

### 6.2.7.1 EXCHANGES

Pursuant to DWR's Final 2020 UWMP Guidebook, "*[w]ater exchanges are typically water delivered by one water user to another water user, with the receiving water user providing water in return at a specified time or when the conditions of the parties' agreement are met. Water exchanges can be strictly a return of water on a basis agreed upon by the participants or it can include payment and the return of water.*"

As discussed in Section 4.5, the City participates in MWD's Dry-Year Yield Program. The DYYP is a groundwater storage and recovery program where supplemental water is stored in the Chino Basin during surplus years and could be recovered in-lieu of imported water from MWD through IEUA. The DYYP allows maximum use of imported water supplies available during wet years and stored groundwater in the Chino Basin during dry years. The DYYP can store up to 100,000 AF with maximum replenishment of 25,000 AFY and maximum extraction of 33,000 AFY. During FY 2019-20, there was 45,961 AF within the DYYP account. The agreement that authorized the DYYP will expire in 2028.

The City authorized execution of an agreement with IEUA to participate in the DYY program in 2003. Participation obligates the City to reduce its use of imported water compared to the previous year by a fixed amount, known as the "shift obligation." The City's shift obligation is 8,076 AFY. During years when MWD calls for extraction, the City's WFA purchases would be reduced by 8,076 AFY compared to the previous year. Since Jurupa Community Services District does not have an imported water connection, it has entered into an agreement with the City for meeting its shift obligation. Under this agreement, Jurupa Community Services District conveys groundwater to the City in an amount equal to its shift obligation.

DYY funds were used for the construction of three groundwater wells (Wells 45, 46, and 47) and an ion-exchange facility located at John Galvin Park to treat water extracted from Well 44 and Well 52. When the City is required to extract MWD's stored water, MWD will pay for the operation and maintenance costs and the City would pay MWD (through IEUA) the full-service water rate. The City can use the DYY facilities to meet its normal water demands during other periods but is responsible for the cost of well operation and maintenance.

The program allows the City to be less reliant upon imported water supplies. The additional groundwater capacity allows the City to increase the percentage of groundwater supply used to meet peak demands.

### *6.2.7.2 TRANSFERS*

Pursuant to DWR's Final 2020 UWMP Guidebook, "*[t]he Water Code defines a water transfer as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights.*"

Pursuant to the Chino Basin Peace Agreement (discussed in Section 4.5), transfers include the assignment, lease, or sale of a right to produce water to another producer within the Chino Basin or to another person or entity for use outside the basin whether the transfer is temporary or permanent. The leasing of water rights is also permissible. In addition, the Chino Basin Watermaster accounts for transfers of stored water between producers. The City can utilize the transfer opportunities available for Chino Basin water when necessary.

### *6.2.7.3 EMERGENCY INTERTIES*

The City has emergency interties with other water agencies that service short-term emergency water supplies. Emergency interconnections are distribution system interconnections between water agencies for use during critical situations where one system or the other is temporarily unable to provide sufficient potable water to meet its water demands and/or fire protection needs. An emergency interconnection will allow a water system to continue serving water during critical situations such as local water supply shortages as a result of earthquakes, fires, prolonged power outages, and droughts.

The City has Mutual Aid Agreements with the following agencies: Chino, Chino Hills, Fontana, Monte Vista Water District, Cucamonga Valley Water District and IEUA.

The City also has several existing inter-agency and emergency interconnections with neighboring cities and water agencies. There are additional inter-agency and emergency interconnections planned as the City continues to expand. Currently, the City has two interconnections to WFA and five interconnections to CDA for imported water and can be utilized in times of emergency. Additionally, the City has one interconnection with Cucamonga Valley Water District and one interconnection with the City of Chino. The connection size between the City and Cucamonga Valley Water District is 4 inches and 8 inches through a Pressure Reducing Station. The interconnection size between the City and the City of Chino is 10 inches and the interconnection is located at the City of Chino Reservoir. These interconnections provide reliable water supply, in the event of a catastrophic supply interruption, from multiple sources of supply.

## 6.2.8 FUTURE WATER PROJECTS

**CWC 10631.**

*(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

The City's water supply sources include: groundwater pumped from the Chino Basin; treated groundwater from the Chino Basin produced by the Chino Basin Desalter Authority; treated, imported water purchased from MWD through Water Facilities Authority; groundwater and/or surface water purchased from San Antonio Water Company; and recycled water purchased from Inland Empire Utilities Agency. These water supply sources will allow the City to provide sufficient water service in the present moment, and in the future. Although the City has no plans for future water supply projects, the City will construct new groundwater production wells to replace existing wells when necessary.

**Table 6-7 Expected Future Water Supply Projects or Programs**

| Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other suppliers? | | Description (if needed) | Planned Implementation Year | Planned for Use in Year Type *Drop Down List* | Expected Increase in Water Supply to Supplier* *This may be a range* |
| | *Drop Down List (y/n)* | *If Yes, Supplier Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

## 6.2.9 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

**CWC 10631.**

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following…*

*(b)(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.*

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

### 6.2.9.1 DESCRIPTION OF SUPPLIES

As discussed in Section 6.2, the City's water supply sources consist of purchased groundwater treated by CDA (see Section 6.2.1), treated imported water purchased from WFA (see Section 6.2.1), treated groundwater and/or surface water from SAWCo (see Section 6.2.1), groundwater from the Chino Basin (see Section 6.2.2), and recycled water from IEUA (see Section 6.2.5). The actual quantities of the water supply sources available to the City during FY 2019-20 are summarized in Table 6-8. The reliable quantities of projected water supply sources available to the City in five-year increments through FY 2044-45 during normal or average years are summarized in Table 6-9. The reliability of these sources of supply are addressed in Section 7.2.3, including during normal years, single dry years, and five consecutive year droughts.

The order of use of the City's projected reliable water supplies from FY 2019-20 through FY 2044-45 in five-year increments is based on historical practices, water supply availability, and the cost of water. It is anticipated the City will initially use groundwater produced from the Chino Basin. At the same time the City will continue to use recycled water for non-potable demands. The City will then use purchased treated water from CDA and SAWCo, to the extent it is available. The City will also use treated imported water. It is important to note that the Chino Basin is adjudicated (as discussed in Section 6.2.2) and that there is no limit to the amount of groundwater which can be produced annually. Consequently, in the event purchased treated water supplies from CDA and SAWCo and/or treated imported water may be limited, the City has the flexibility to increase groundwater production from the Chino Basin.

### *6.2.9.2 QUANTIFICATION OF SUPPLIES*

The actual quantities of the water supply sources available to the City during FY 2019-20 are summarized in Table 6-8. The reliable quantities of projected water supply sources available to the City in five-year increments through FY 2044-45 during average years are summarized in Table 6-9. The reliability of these sources of supply are addressed in Section 7.2.3, including during normal years, single dry years, and five consecutive year droughts.

The City's projected quantities of purchased treated water supplies from CDA and SAWCo are based on historical long-term averages and available supplies during previous dry year conditions. The City's projected quantities of recycled water supplies to meet non-potable demands are based on historical long-term averages. The City's projected quantities of treated imported water and groundwater supplies from the Chino Basin are based on meeting the remainder of the City's total water demands. As noted above, in the event purchased treated water and/or treated imported water may be limited, the City has the flexibility to increase groundwater production from the Chino Basin. Consequently, it is anticipated the City will have sufficient water supplies available to meet projected demands.

**Table 6-8 Water Supplies - Actual**

| Submittal Table 6-8 Retail: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | 2020 | | |
| **Drop down list** May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool | | Actual Volume* | Water Quality Drop Down List | Total Right or Safe Yield* (optional) |
| Add additional rows as needed | | | | |
| Groundwater (not desalinated) | Chino Basin | 18,395 | Drinking Water | |
| Purchased or Imported Water | Chino Basin Desalter Authority | 6,636 | Drinking Water | |
| Purchased or Imported Water | Water Facilities Authority | 6,513 | Drinking Water | |
| Purchased or Imported Water | San Antonio Water Company | 565 | Drinking Water | |
| Recycled Water | Inland Empire Utilities Agency | 7,812 | Recycled Water | |
| | **Total** | 39,921 | | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | |
| NOTES: | | | | |

**Table 6-9 Water Supplies - Projected**

| Submittal Table 6-9 Retail: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | Projected Water Supply * Report To the Extent Practicable | | | | | | | | | |
| Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool | | 2025 | | 2030 | | 2035 | | 2040 | | 2045 (opt) | |
| | | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Add additional rows as needed | | | | | | | | | | | |
| Groundwater (not desalinated) | Chino Basin | 20,249 | | 22,915 | | 24,943 | | 31,476 | | 31,476 | |
| Purchased or Imported Water | Water Facilities Authority | 11,000 | | 13,000 | | 15,000 | | 17,000 | | 17,000 | |
| Purchased or Imported Water | Chino Basin Desalter Authority | 8,533 | | 8,533 | | 8,533 | | 8,533 | | 8,533 | |
| Purchased or Imported Water | San Antonio Water Company | 600 | | 600 | | 600 | | 600 | | 600 | |
| Recycled Water | Inland Empire Utilities Agency | 12,168 | | 13,465 | | 14,762 | | 16,059 | | 16,059 | |
| | Total | 52,550 | 0 | 58,513 | 0 | 63,838 | 0 | 73,668 | 0 | 73,668 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | |

## 6.2.10 SPECIAL CONDITIONS

The City considered the issues described below when developing its planned sources of water supply.

### 6.2.10.1 CLIMATE CHANGE EFFECTS

Climate Change has the possibility of impacting the availability of planned water supplies, particularly during a drought period. Section 4.5 of this Plan provides a discussion regarding climate change effects on the City's various sources of supply.

### 6.2.10.2 REGULATORY CONDITIONS AND PROJECT DEVELOPMENT

The City has considered the implications of changing regulatory conditions and project development on the availability of planned water supplies. Section 1.4 provides a discussion the reduced reliance on Delta water supplies.

### 6.2.10.3 OTHER LOCALLY APPLICABLE CRITERIA

There are no locally applicable criteria which applies to the City.

## 6.3 SUBMITTAL TABLES COMPLETION USING THE OPTIONAL PLANNING TOOL

As discussed in Section 4.2.5, DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and assess monthly water use trends. DWR has deemed the tool as optional and the City is not required by DWR to use the tool. Section 6.1 provides a tabulation of the City's historical annual water uses for each water supply source. During the past 10 years, the City experienced a five-consecutive-year-drought within its service area from FY 2011-12 to FY 2015-16. Historical records indicate the City's annual water demands had been greater prior to FY 2011-12. The City has been able to provide sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, the City has been able to provide water service to meet maximum day water demands for these years, including during the summer months. A further discussion regarding the reliability of the City's water supply sources is provided in Chapter 7.

## 6.4 ENERGY USE

**CWC 10631.2.**

*(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:*

*(1) An estimate of the amount of energy used to extract or divert water supplies.*

*(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.*

*(3) An estimate of the amount of energy used to treat water supplies.*

*(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.*

*(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.*

*(6) An estimate of the amount of energy used to place water into or withdraw from storage.*

*(7) Any other energy-related information the urban water supplier deems appropriate.*

Pursuant to DWR's Final 2020 UWMP Guidebook "Energy intensity" is defined as the quantity of energy consumed or generated divided by volume of water entering a water management process. The energy intensity can be calculated based on the quantity of energy consumed, measured in kilowatt hours (kWh), divided by the volume of water, measured in AF for a water management process over a one-year period. The information used to calculate the estimated energy intensity associated with the City's water system is provided below. The energy intensity

information is based on readily obtainable energy and water use data for the following water management processes: 1) extraction or diversion of water supplies; 2) placement into storage; 3) conveyance to distribution; 4) treatment; and 5) water system distribution.

The City has tabulated its energy intensity using readily obtainable energy consumption data obtained from monthly electricity bills from Southern California Edison (SCE) for the whole water system and the corresponding water use data obtained from available water meter readings. The City has reported the energy intensity associated with the water management processes which occur within its operational control. Because the City does not track individual energy usage for each water management process identified above, the City has estimated the energy intensity using the a "total utility approach" (i.e. sum of all water management processes). The total energy consumed was approximately 18,152,675 kWh during FY 2019-20.

The total volume of water entering the potable water system was approximately 32,109 AF during FY 2019-20 and is consistent with the total volume of water provided in Table 4-1 (less recycled water supplies).

The total energy intensity associated with the City's water management processes is estimated at 565 kWh/AF. The energy intensity data and calculations based on the "total utility approach" are provided in Table O-1B below.

The City's water management processes do not include "consequential hydropower generation" where the energy generation is a direct consequence of water delivery (i.e. all water passing through the energy generation devices is delivered to users). The City's water management processes do not include "non-consequential hydropower generation" where the energy generation is not a direct consequence of water delivery (i.e. energy could be generated even if no water was being delivered to water users). In addition, the City's water management processes do not include any substantial "self-generated energy sources" including solar, wind, geothermal, biomass, co-generation, and diesel generator sources.

**Table O-1B. Recommended Energy Reporting — Total Utility Approach**

***Urban Water Supplier:*** *City of Ontario*

**Water Delivery Product** (If delivering more than one type of product use Table O-1C)

*Retail Potable Deliveries*

**Table O-1B: Recommended Energy Reporting - Total Utility Approach**

| | | | | |
|---|---|---|---|---|
| Enter Start Date for Reporting Period | 7/1/2019 | **Urban Water Supplier Operational Control** | | |
| End Date | 6/30/2020 | | | |
| ☐ Is upstream embedded in the values reported? | | **Sum of All Water Management Processes** | **Non-Consequential Hydropower** | |
| *Water Volume Units Used* | *AF* | Total Utility | Hydropower | Net Utility |
| *Volume of Water Entering Process (volume unit)* | | *32109* | *0* | *32109* |
| *Energy Consumed (kWh)* | | *18152675* | *0* | *18152675* |
| *Energy Intensity (kWh/volume)* | | *565.3* | *0.0* | *565.3* |

**Quantity of Self-Generated Renewable Energy**

0 kWh

**Data Quality** *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

*Combination of Estimates and Metered Data*

**Data Quality Narrative:**

The total energy consumed was identified based on Southern California Edison (SCE) billing records. The total energy consumed excludes electricity usage for general administration (which is not an identified water management process).

**Narrative:**

The total energy consumption includes energy associated with operating groundwater production wells and booster pumps to deliver water in the distribution system. Energy consumption is associated with operating groundwater treatment. Energy consumption is also associated with plant lighting and air conditioning, and operating the Supervisory Control and Data Acquisition (SCADA) system and chlorination injection pumps.

Chapter 7

# WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

## LAY DESCRIPTION – CHAPTER 7

### WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

Chapter 7 (Water Service Reliability and Drought Risk Assessment) of the City's 2020 Plan discusses and provides the following:

- FY 2019-20 represents an "average" or "normal" water year for the City in which the total amount of rainfall was similar to the historical average rainfall.
- A "single dry" year for the City was represented in FY 2017-18, in which the total amount of rainfall was below the historical average rainfall.
- A "five consecutive year drought" period for the City is represented from FY 2011-12 to FY 2015-16, where the total amount of rainfall during each of these years was less than the historical average rainfall.
- The City's current and projected water supplies available during normal years in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-2.
- The City's current and projected water supplies available during single dry years in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-3.
- The City's current and projected water supplies available during each year of a five consecutive year drought in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-4.
- The reliability of the City's water supply sources, including a review of water supply constraints, is provided. A single dry year or a five consecutive year drought period will not compromise the City's ability to provide a reliable supply of water to its customers.
- A Drought Risk Assessment is provided which includes an assessment of the City's water supply reliability over a five-year consecutive drought period. The City's DRA assumes a five-year consecutive drought from FY 2020-21 through FY 2024-25 and includes a review of water supplies, water uses, and water supply reliability for each water supply source during this period. The City's water system has experienced a prior five consecutive year drought with no limitation to its collective water supplies. However, the cost of those water supplies may have increased based on the mix of water supplies which are used. Consequently, the City has the ability to enact varying water shortage levels (see Chapter 8) to help educate its customers and provide an economic incentive for the retail customers to reduce their water consumption.

## 7.1 INTRODUCTION

This section of the City's UWMP describes the City's ability to meet retail customer water demands by analyzing a variety of factors which affect the City's water supply. This section assesses the City's water service reliability during average years, single dry years, and during a five consecutive year drought period to meet the water needs of its customers. This section also includes the discussion of a DRA which provides a mechanism for the City to evaluate the risk to its water supply under a drought lasting for the next five consecutive years.

## 7.2 WATER SERVICE RELIABILITY ASSESSMENT

**CWC 10635.**

> *(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

Information regarding the reliability of the City's water supplies is based on the historical precipitation data in the Chino Basin area. Historical annual precipitation in the Chino Basin area is discussed in Section 3.3 and is based on historical data collected from the National Oceanic and Atmospheric Administration (Ontario International Airport). Furthermore, Section 4.5 of this Plan notes that potential future climate change impacts may result in an increase in the average annual precipitation within the City's service area, thus indicating use of historical data is a reasonable and conservative approach. As indicated in Section 3.3, the historical average rainfall in the vicinity of the City's service area is 10.68 inches. FY 2019-20 represents an average or normal water year for the City in which the total amount of rainfall was similar to the historical average rainfall. A single dry year for the City was represented in FY 2017-18, in which the total amount of rainfall was below the historical average rainfall. A five consecutive year drought period for the City is represented from FY 2011-12 to FY 2015-16, where the total amount of rainfall during each of these years was less than the historical average rainfall. Table 7-1 summarizes these "base years" for average, single dry, and five consecutive year drought and provides the total amount of water supplies available to the City during those base years. The following discussion assesses the water service reliability of the City's water supply sources.

**Water Service Reliability - Imported Water**

The City's treated imported water supplies from MWD, through WFA (also IEUA, but this is untreated), may be impacted during a multi-year drought or other conditions which limits MWD from delivering sufficient water supplies to all of its member agencies, and consequently to the

City. In anticipation of such a reduction in supplies, MWD developed a WSAP which is briefly described below. The WSAP provides a means of equitably providing reduced water supplies to each of MWD's member agencies for up to 10 levels of reduction representing up to a 50 percent reduction.

During calendar year 2007, critically dry conditions impacted MWD's water supply sources. In addition, a ruling in the Federal Courts in August 2007 provided protective measures for the Delta Smelt (and subsequently other aquatic species) in the Sacramento-San Joaquin River Delta resulting in restrictions on the availability of State Water Project water. As a result, MWD adopted a WSAP in February 2008 to allocate available water supplies to its member agencies. MWD revised the WSAP in December 2014.

The WSAP establishes ten different shortage levels and a corresponding Allocation to each member agency. Based on the shortage levels established by MWD, the WSAP provides a separate reduced Allocation to a member agency for its 1) Municipal and Industrial retail demand and 2) replenishment demand. The WSAP formula considers historical local water production, full service treated water deliveries, agricultural deliveries and water conservation efforts when calculating each member agency's Allocation.

In general, the WSAP process calculates total historical member agency demand. That historical demand is then compared to member agency projected local supply for a specific Allocation year. The balance required from MWD, less an Allocation reduction factor, is the member agency's "Water Supply Allocation" of imported water from MWD. When a member agency reduces its local demand through conservation or other means, the Allocation of imported water will increase. Depending on MWD's available supply, MWD can establish a specific WSAP shortage level. The shortage level causes a regional reduction and calculates an allocation for each of its member agency. Additional information about MWD's WSAP is provided in MWD's Regional 2020 UWMP which is incorporated by reference. The following is a summary of MWD's water shortage levels:

Level 1 – Regional Percent Reduction of 5%
Level 2 – Regional Percent Reduction of 10%
Level 3 – Regional Percent Reduction of 15%
Level 4 – Regional Percent Reduction of 20%
Level 5 – Regional Percent Reduction of 25%
Level 6 – Regional Percent Reduction of 30%
Level 7 – Regional Percent Reduction of 35%
Level 8 – Regional Percent Reduction of 40%
Level 9 – Regional Percent Reduction of 45%
Level 10 – Regional Percent Reduction of 50%

In response to a fourth consecutive year of below average rainfall and critically dry conditions, MWD declared a WSAP Allocation Level 3 for fiscal year 2015-16, which represented a regional reduction of 15 percent. MWD rescinded the WSAP for fiscal year 2016-17 and has not reinstated the WSAP since that time.

**Water Service Reliability - Groundwater**

The Chino Basin groundwater supplies are managed by the Chino Basin Watermaster, as discussed in Section 6.2.2. During a normal year (FY 2019-20), the City met about 46 percent of its total demands with supplies from the Chino Basin. During a single dry year (FY 2017-18), the City met about 60 percent of its total demands with supplies from the Chino Basin. During a five consecutive year drought multiple dry year period (FY 2011-12 to FY 2015-16), the City met between 42 and 63 percent of its total demands with supplies from the Chino Basin.

**Water Service Reliability Summary**

Table 7-1 shows the water supplies during the base years (for average year, single dry year and a five consecutive year drought). As a result of the City's diverse water supply portfolio, water supplies may be re-apportioned during a five consecutive year drought to meet the City's water demands.

### *7.2.1 SERVICE RELIABILITY - CONSTRAINTS ON WATER SOURCES*

**CWC 10631.**

> *(b)(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.*

The City's sources of supplies consist of groundwater pumped from the Chino Basin; treated groundwater from the Chino Basin produced by the Chino Basin Desalter Authority; treated, imported surface water purchased from MWD through Water Facilities Authority; groundwater and/or surface water purchased from San Antonio Water Company; and recycled water purchased from Inland Empire Utilities Agency, as described in Section 6.2. Although all of these supplies are managed, the following constraints may occur which the City has considered in this reliability analysis.

Chino Basin

The City produces groundwater from the Chino Basin. The groundwater historically had been impacted by contamination. However, the City has developed and implemented appropriate

treatment (blending and/or treatment facilities) which have been approved by SWRCB-DDW. These groundwater supplies are considered reliable both from a water quality and quantity standpoint.

Overall, groundwater quality in Chino Basin is generally good with better quality in the northern portion of the basin where recharge occurs. However, salinity (TDS) and nitrate-nitrogen concentrations increase in the southern portion of the basin. CDA treats the impaired groundwater by means of reverse osmosis, ion exchange, and air stripping, resulting in high quality drinking water. VOC plumes throughout Chino Basin, several of which are located within the City, are constantly being monitored.

The City has already inactivated several wells (Well 3, 4, 9, 15, 31, 35, and 50) due to high nitrate and perchlorate concentrations detected above the maximum contaminant levels (MCL). Well 34 was removed from service due to (TCP) water quality issues. The operations of Wells 44 and 52 are limited due to the migration of the bacterial groundwater plume when these wells are used too frequently. Well 25 was taken out of service due to a Perfluorooctanoic acid (PFOA) detection, which was below the PFOA interim notification level. The impact on supply due to the closure of these wells is minimized by constructing replacement wells at other locations where contaminant levels are low and constructing wellhead treatment facilities.

High levels (maximum concentration of 5,620 µg/L at one site) of TCE and chromium (485 µg/L) were found at one of the City's inactive well sites in 1987. They were found to have come from the General Electric Flatiron Facility, which operated a clothes iron manufacturing plant in the City from the early 1900s to 1982. Detectable, but low, concentrations of tetrachloroethene (PCE), toluene, and total xylenes were also found. The plant is no longer in operation, but an industrial park occupies the site. Since 1991, that area has been regularly monitored, and in 1995, two wells were constructed to extract groundwater, treat it, and direct it to the Ely Basins via the West Cucamonga Channel. The Ely Basins allowed the treated water to percolate back into the Chino Basin until 2005 when the basins became fully dedicated to the recharge of storm water, recycled water, and imported water pursuant to the long-term recharge plan executed by Watermaster and IEUA. As an alternative, three injection wells and conveyance pipelines were constructed in July 2011 to inject treated water into the Chino Basin. VOCs are also removed from contaminated soil through a Soil Vapor Extraction (SVE) system, which began in 2003.

VOCs were also located at the General Electric Test Facility, whose operations include testing and maintenance of commercial and military aircraft engines. In the past, hazardous wastes were disposed in dry wells, and this activity caused VOCs, such as TCE, PCE, cis-1,2-DCE, 1,2-dichloropropane, 1,1-DCE, 1,1-DCA, and chloroform, to appear in the soils and groundwater. A maximum concentration of 1,240 µg/L of TCE was measured at the site and 190 µg/L was quantified at an offsite monitoring well. Groundwater and soil remediation began in 1988 after a Consent Order was agreed upon by General Electric and the California Department of Public Health (CDPH). Since then, regular monitoring has been conducted, and status reports have been

submitted. In 1996, vapor extraction treatment began, and as recently as 2008, contaminant levels in shallow soils have been deemed acceptable. The remediation process will continue until most, if not all, of the VOCs have been eliminated.

Quantities of TCE are found in private wells south of the Ontario International Airport in the area bounded by State Route 60 on the north, Bellegrave Ave. to the south, Turner Avenue on the east, and Grove Avenue on the west. The maximum concentration detected was 156 ug/L in 1990. Since 2016, the highest detected concentration was 90 ug/L. This area of TCE groundwater contamination is known as the South Archibald Plume and is believed to have come from several parties related to various activities within the airport. In September 2016, the Santa Ana Regional Water Quality Control Board issued a Final Stipulated Settlement and Cleanup & Abatement Order (CAO R8-2016-0016). The plume remediation alternative involves the use of existing and proposed CDA production wells and facilities. The remediation project is currently underway and includes the construction and operation of three new CDA production wells and a dedicated pipeline to convey groundwater produced from the wells to CDA's Chino II Desalter facility where TCE and other VOCs would be removed via air stripping. The project is anticipated to be operational in 2021.

Additionally, organic and inorganic compounds were discovered in the underlying groundwater when groundwater monitoring at the Milliken Sanitary Landfill began in 1987 as part of Solid Waste Assessment Test. An Evaluation Monitoring Program (EMP) was then launched, and 29 monitoring wells were drilled to assess the extent of damage of the compounds on the groundwater. Amounts of TCE, PCE, and dichlorodifluoromethane were found in combined concentrations as high as 159.6 µg/L. Other VOCs found at the site are vinyl chloride, benzene, 1,1-dichloroethane, and 1,2- dichloropropane. The landfill is owned by the County of San Bernardino and managed by the County's Waste System Division. It was inactivated in 1999.

Water quality in the Chino Basin is closely monitored by the Chino Basin Watermaster in compliance with the Optimum Basin Management Plan (OBMP). Data are collected by the Regional Water Quality Control Board (RWQBC) and other agencies that obtain groundwater from Chino Basin. The Chino Basin Watermaster then combines all data into a comprehensive database.

Imported water

The City also receives treated surface water from MWD through WFA. WFA purchases untreated water from IEUA (a MWD wholesale supplier). Constraints to water supplies from MWD relating to supply reliability is addressed in MWD's 2020 Regional Urban Water Management Plan. The relevant MWD discussion relating to supply reliability is provided in Appendix L.

## 7.2.2 SERVICE RELIABILITY - YEAR TYPE CHARACTERIZATION

### 7.2.2.1 TYPES OF YEARS

The City's base years for an average year, a single dry year, and a five consecutive year drought are discussed in Section 7.2 and are summarized in Table 7-1. As indicated in Chapter 6, the City's water supplies sources have been sufficient in meeting the City's historical water demands during an average year, a single dry year, and a five consecutive year drought. An average year was based on a historical year during the past 10 years with a total precipitation similar to the historical average precipitation in the vicinity of the City's service area. Because a single dry year or a five consecutive year drought period will not compromise the City's ability to provide a reliable supply of water to its customers, a single dry year in this Plan was selected based on one of the driest years during the past 10 years. The five consecutive year drought period was based on a period of five consecutive dry years during the past 10 years.

As indicated in Section 3.3, the historical average rainfall in the vicinity of the City's service area is 10.68 inches. FY 2019-20 represents an average or normal water year for the City in which the total amount of rainfall was similar to the historical average rainfall. A single dry year for the City was represented in FY 2017-18, in which the total amount of rainfall was less than the historical average rainfall. A five consecutive year drought period for the City is represented from FY 2011-12 to FY 2015-16, where the total amount of rainfall during each of these years was less than the historical average rainfall. Table 7-1 summarizes these "base years" for an average year, a single dry year and a five consecutive year drought period and provides the total amount of water supplies available to the City during those base years.

**Table 7-1 Basis of Water Year Data (Reliability Assessment)**

| Submittal Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment) | | | |
|---|---|---|---|
| **Year Type** | **Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020 | **Available Supplies if Year Type Repeats** | |
| | | ☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ | |
| | | ☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | **Volume Available *** | **% of Average Supply** |
| Average Year | 2020 | 39,921 | 100% |
| Single-Dry Year | 2018 | 43,346 | 108.6% |
| Consecutive Dry Years 1st Year | 2012 | 42,603 | 106.7% |
| Consecutive Dry Years 2nd Year | 2013 | 42,730 | 107.0% |
| Consecutive Dry Years 3rd Year | 2014 | 45,196 | 113.2% |
| Consecutive Dry Years 4th Year | 2015 | 41,226 | 103.3% |
| Consecutive Dry Years 5th Year | 2016 | 36,036 | 90.3% |
| | | | |
| *Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.* | | | |
| ***Units of measure (AF, CCF, MG** ) must remain consistent throughout the UWMP as reported in Table 2-3.* | | | |
| NOTES: | | | |

### 7.2.2.2 SOURCES FOR WATER DATA

The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly evapotranspiration in the vicinity of the City's service area are discussed in Section 3.3 Historical climate information was obtained from the WRCC, the National Oceanic and Atmospheric Administration, and from DWR's CIMIS.

### 7.2.3 WATER SERVICE RELIABILITY – SUPPLY AND DEMAND COMPARISON

**CWC 10635.**

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

The City primarily obtains its water supplies from groundwater wells located in the Chino Basin. As discussed in Section 7.3 and shown in Table 7-2, Table 7-3, and Table 7-4, each of the City's water supply sources share the same base years. As previously discussed in Section 7.2.1, a single dry year or a five consecutive year drought period will not compromise the City's ability to provide a reliable supply of water to its customers.

As previously discussed in Section 4.2.6, the City's projected normal year water demands over the next 25 years, in five-year increments, were based on the City's 2020 Water Use Target of 196 GPCD for potable water demands. The ratio of total water supplies (including potable and recycled water supplies) available to the City during a historical normal year in FY 2019-20 (or 39,921 AF) and during a historical single dry year in FY 2017-18 (or 43,346 AF) was used to estimate the City's projected water demands during single dry years. The ratio of water supplies available to the City during a historical normal year in FY 2019-20 (or 39,921AF) and a historical five consecutive year drought period from FY 2011-12 to FY 2015-16 (or 42,603 AF, 42,730 AF, 45,196 AF, 41,226 AF and 36,036 AF, respectively) was used to estimate the City's projected water demands during a five consecutive year drought period. The City's projected dry year water supplies over the next 25 years were based on the minimum supplies needed by the City to meet projected single-dry year demands. Table 7-2, Table 7-3, and Table 7-4 summarize the City's projected water demands and supplies over the next 25 years in five-year increments, including during normal years, single dry years, and a five consecutive year drought periods. These tables indicate the City can meet water demands during normal years, single dry years, and a five consecutive year drought periods over the next 25 years.

#### 7.2.3.1 WATER SERVICE RELIABILITY – NORMAL YEAR

Table 7-2 summarizes the City's projected water demands and supplies over the next 25 years in five-year increments during normal years. Table 7-2 indicates the City can meet water demands during normal years over the next 25 years.

**Table 7-2 Normal Year Supply and Demand Comparison**

| Submittal Table 7-2 Retail: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 52,550 | 58,513 | 63,838 | 73,668 | 73,668 |
| Demand totals *(autofill from Table 4-3)* | 52,550 | 58,513 | 63,838 | 73,668 | 73,668 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| NOTES: Supply and demand are equal for years 2040 and 2045 because the City anticipates buildout to occur in 2040. | | | | | |

### *7.2.3.2 WATER SERVICE RELIABILITY – SINGLE DRY YEAR*

Table 7-3 summarizes the City's projected water demands and supplies over the next 25 years in five-year increments during single dry years. Table 7-3 indicates the City can meet water demands during single dry years over the next 25 years.

**Table 7-3 Single Dry Year Supply and Demand Comparison**

| Submittal Table 7-3 Retail: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 (Opt) |
| Supply totals* | 57,058 | 63,534 | 68,847 | 79,989 | 79,989 |
| Demand totals* | 57,058 | 63,534 | 68,847 | 79,989 | 79,989 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | |
| NOTES: Supply and demand are equal for years 2040 and 2045 because the City anticipates buildout to occur in 2040. | | | | | |

### *7.2.3.3 WATER SERVICE RELIABILITY – FIVE CONSECUTIVE DRY YEARS*

Table 7-4 summarizes the City's projected water demands and supplies over the next 25 years in five-year increments during five consecutive year drought periods. Table 7-4 indicates the City can meet water demands during five consecutive year drought periods over the next 25 years.

**Table 7-4 Multiple Dry Years Supply and Demand Comparison**

| Submittal Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2025* | 2030* | 2035* | 2040* | 2045* (Opt) |
| First year | Supply totals | 56,080 | 62,445 | 67,667 | 78,618 | 78,618 |
| | Demand totals | 56,080 | 62,445 | 67,667 | 78,618 | 78,618 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Second year | Supply totals | 56,248 | 62,632 | 67,870 | 78,853 | 78,853 |
| | Demand totals | 56,248 | 62,632 | 67,870 | 78,853 | 78,853 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Third year | Supply totals | 59,493 | 66,246 | 71,786 | 83,403 | 83,403 |
| | Demand totals | 59,493 | 66,246 | 71,786 | 83,403 | 83,403 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fourth year | Supply totals | 54,268 | 60,428 | 65,481 | 76,078 | 76,078 |
| | Demand totals | 54,268 | 60,428 | 65,481 | 76,078 | 76,078 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fifth year | Supply totals | 47,436 | 52,820 | 57,237 | 66,500 | 66,500 |
| | Demand totals | 47,436 | 52,820 | 57,237 | 66,500 | 66,500 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Sixth year *(optional)* | Supply totals | | | | | |
| | Demand totals | | | | | |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: Supply and demand are equal for years 2040 and 2045 because the City anticipates buildout to occur in 2040. | | | | | | |

### 7.2.4 DESCRIPTION OF MANAGEMENT TOOLS AND OPTIONS

**CWC 10620.**

*(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

As noted in Section 6.2.2, the Chino Basin is managed under the Chino Basin adjudication. During the period of management under the Judgment, significant drought events have occurred. In each drought cycle the Chino Basin has been managed to maintain water levels. Therefore, based on historical and on-going management practices, the City will be able to rely on the Chino Basin for adequate supply over the next 25 years under single dry years and a five consecutive year drought periods.

Section 6.2.2 provides a description of the management of groundwater resources in the Chino Basin, as well as information on basin management. Chapter 6 also demonstrates the management structure of the Chino Basin provides a reliable source of groundwater supply for the City during a normal year, a single-dry year and a five consecutive year drought. Historical data indicates the Chino Basin has been well managed for the full period of the adjudication, resulting in a stable and reliable water supply. Basin management changes are discussed in Section 6.2.2 and include increased direct use of recycled water (see Section 6.5) and the continued use of recycled water for groundwater replenishment in the Chino Basin to reduce the need to import water from other regions. Therefore, the groundwater supplies in the Chino Basin are deemed reliable.

## 7.3 DROUGHT RISK ASSESSMENT

**CWC 10635.**

*(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:*

*(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.*

*(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.*

*(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.*

*(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

The City's sources of supplies consist of groundwater from the Chino Basin (which is managed under the Chino Basin adjudication), treated import water purchased through Water Facilities Authority and managed by the Metropolitan Water District of Southern California, groundwater and/or surface water purchased from San Antonio Water Company, and recycled water purchased from inland Empire Utilities Agency. The following discussion provides a DRA which assesses the City's water supply reliability over a five-year consecutive drought period. The City's DRA incorporates a five-year consecutive drought from FY 2020-21 through FY 2024-25 and includes a review of water supplies, water uses, and water supply reliability.

### *7.3.1 DRA DATA, METHODS, AND BASIS FOR WATER SHORTAGE CONDITIONS*

The City's DRA was prepared using historical production data from the City's water supply sources. The following assumptions were considered during the preparation of the City's DRA for each year of the five-year consecutive drought.

- The five consecutive year drought period associated with the 2020 UWMP is based on five consecutive dry years from FY 2020-21 through FY 2024-25.
- The projected water supplies available during each year of this five consecutive year drought are assumed to be identical to the water supplies produced during each year between FY 2011-12 and FY 2015-16 (which represents the most recent and historical five consecutive year drought).
- The projected demands during this five consecutive year drought are based on water demands from FY 2019-20 (a normal year) which were adjusted based on projected population over the next five years along with the ratio of the normal year demands to actual demands over each year of the most recent and historical five consecutive year drought period (from FY 2011-12 and FY 2015-16).
- The projected demands were compared to the projected supplies to identify potential water supply deficits which may require implementation of the Water Shortage Contingency Plan (discussed further in Chapter 8).

The following hypothetical methodologies were considered during the preparation of the City's DRA during for each year of the five consecutive year drought:

- Drought Year 1: The region had experienced an average to above average year of precipitation in the prior year. Water use in the prior year had been below average due to a reduced need for outdoor water use, the groundwater basin had been replenished from above average local stormwater runoff, and imported water supplies were not restricted.
- Drought Year 2: The region experienced a second year of below average precipitation and runoff. Retail customers increase water use for outdoor irrigation to compensate for lack of precipitation, however, this increased use is partially offset by conservation measures. Groundwater and imported water supplies have not been impacted.
- Drought Year 3: The region experienced a third year of below average precipitation and runoff. Retail customers increase water use for outdoor irrigation to compensate for lack of precipitation; however, this increased use is partially offset by heightened conservation messaging. Groundwater and imported water supplies have not been impacted. However, there is an increased demand on both groundwater and treated imported water.
- Drought Year 4: The region experienced a fourth year of below average precipitation and runoff. Groundwater supplies have not been impacted. However, there is an increased demand on groundwater.
- Drought Year 5: Fifth year of below average precipitation and runoff. Groundwater supplies have not been impacted. However, there is an increased demand on groundwater.

### *7.3.2 DRA INDIVIDUAL WATER SOURCE RELIABILITY*

The City's DRA incorporates a five-year consecutive drought based on five consecutive dry years commencing in FY 2021-22. The quantity of water supplies available for each year during this five-year consecutive drought period included in the City's DRA is assumed to be the same as the quantity of water supplies produced by the City (i.e. demands) during the most recent and historical five-year consecutive drought which occurred from FY 2011-12 through FY 2015-16. Production data for those years have been tabulated in Section 6.1. The following describes the anticipated reliability of each water source for each year of the five consecutive year drought based on recent experience.

Groundwater

The City receives water supplies from the Chino Basin, which is actively managed under the Chino Basin adjudication, as described in Section 6.2.2. Each year the Chino Basin Watermaster reviews water supply conditions including local rainfall, groundwater levels, local stormwater runoff available for replenishment, imported water availability and the amount of water stored in the groundwater basin for future demands, to ensure the Basin is responsibly managed. Regardless of the annual safe yield adopted (a new safe yield is adopted every ten years) there is never a restriction on the amount of water which may be pumped from the Chino Basin, subject to

replenishment requirements under the Chino Basin Watermaster's oversight. The quantity of groundwater used (and reliably available) during the most recent and historical five consecutive year drought period have been tabulated in Section 6.1. During this period, the City was able to increase its production of its groundwater supplies from an adjudicated and managed groundwater basin. The City also had the ability to systematically implement aspects of its Water Shortage Contingency Plan (see Chapter 8). As a result of these collective actions (and experience during prior consecutive five-year droughts), the City does not anticipate a water supply shortage from the Chino Basin.

Imported Water

The City obtains imported water from the Metropolitan Water District of Southern California through Water Facilities Authority. Section 6.2.1 describes the planning conducted by the Metropolitan Water District of Southern California regarding treated imported water supplies available to the City. The reliability of MWD's supplies is also discussed in its 2020 Regional UWMP and is incorporated by reference. The City purchases treated imported water which is delivered directly within its distribution system. The City's purchases of treated, imported water over the past ten years have been tabulated in Section 6.1. In the event of a drought which limits imported water supplies, the City will rely on its groundwater production and will pay the applicable assessments to purchase untreated imported water to be delivered in the future when supplies are available.

The imported water purchases by the City during the most recent and historical five consecutive year drought period have been tabulated in Section 6.1. Because the City's DRA assumes the most recent and historical five consecutive year drought scenario will be repeated over the next five years, it is assumed the quantity of treated imported water supplies purchased during the most recent and historical five consecutive year drought scenario will be available. Furthermore, this constitutes the minimum amount of treated imported water which may be available in a future five consecutive year drought absent MWD's programs which it has since implemented.

Recycled Water

The City has a recycled water distribution system which it has developed over the years to reduced demands on its potable water supplies as described in Section 6.2.5. The availability of recycled water supplies is not adversely impacted by drought conditions and are locally available.

The quantity of recycled water used during the most recent and historical five consecutive year drought period have been tabulated in Section 6.1. The quantity of recycled water available during each year of the most recent and historical five consecutive year drought is expected to be available during a future five consecutive year drought.

Summary

The City's water system has experienced a prior five consecutive year drought with no limitation to its collective water supplies. However, the cost of those water supplies may have increased based on the mix of supplies which are used. Consequently, the City has the ability to enact varying water shortage levels (see Chapter 8) to help educate its customers and provide an economic incentive for the retail customers to reduce their water consumption.

### *7.3.3 DRA TOTAL WATER SUPPLY AND USE COMPARISON*

Gross water use for the projected five consecutive year drought is shown on Table 7-5. Section 7.3.2 describes the water source reliability for each source of supply the City will rely on during a five consecutive year drought. The annual quantities are summed and are also provided on Table 7-5. The most important aspect of the City's water supplies is the groundwater which can be produced from a managed groundwater basin without restriction on the amount the City is allowed to produce. However, for the purposes of the City's DRA, as a worst-case scenario, the City has considered no water supply augmentation (as indicated in Table 7-5) from its groundwater supplies. When necessary, the City can implement various water shortage levels of its Water Shortage Contingency Plan (as discussed in Chapter 8) in order to reduce its water demands. The total water supplies available to the City shown in Table 7-5 are based on the quantity of supplies produced by the City (i.e. demands) during the most recent historical five consecutive drought period (from FY 2011-12 through FY 2015-16) as provided in Table 7-1. As shown in Table 7-5, assuming no additional water supply benefits will be available from groundwater supplies, the City will implement various stages of its Water Shortage Contingency Plan to balance water demands with available supplies during years 1, 2, 3, 4, and 5 of the projected five consecutive year drought.

**Table 7-5 Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b)**

| Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b) | |
|---|---|
| **2021** | **Total** |
| Total Water Use | 45,299 |
| Total Supplies | 42,603 |
| Surplus/Shortfall w/o WSCP Action | (2,696) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 2,696 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 6% |
| | |
| **2022** | **Total** |
| Total Water Use | 48,138 |
| Total Supplies | 42,730 |
| Surplus/Shortfall w/o WSCP Action | (5,408) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 5,408 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 11% |
| | |
| **2023** | **Total** |
| Total Water Use | 53,774 |
| Total Supplies | 45,196 |
| Surplus/Shortfall w/o WSCP Action | (8,578) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 8,578 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 16% |
| | |
| **2024** | **Total** |
| Total Water Use | 51,660 |
| Total Supplies | 41,226 |
| Surplus/Shortfall w/o WSCP Action | (10,434) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 10,434 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 20% |
| | |
| **2025** | **Total** |
| Total Water Use | 47,436 |
| Total Supplies | 36,036 |
| Surplus/Shortfall w/o WSCP Action | (11,400) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 11,400 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 24% |

### 7.3.4 OPTIONAL PLANNING TOOL WORKBOOK

DWR has deemed the "Planning Tool Worksheet" as optional and the City is not required by DWR to use the tool. The City has provided sufficient water supplies to its customers, including during long-term droughts and years with historically high water demands. The City has also been able to provide water service to meet maximum day water demands for these years, including during the summer months. The City obtains the majority of its water supplies from a managed groundwater basin which is not subject to seasonal fluctuation. Consequently, an evaluation regarding water supplies on a monthly basis was not considered.

Chapter 8

# WATER SHORTAGE CONTINGENCY PLAN

## LAY DESCRIPTION – CHAPTER 8

### WATER SHORTAGE CONTINGENCY PLAN

Chapter 8 (Water Shortage Contingency Plan) of the City's 2020 Plan discusses and provides the following:

- The City's Water Shortage Contingency Plan is a detailed approach which presents how the City intends to act, or respond, in the case of an actual water shortage contingency.
- Preparation of the City's "Annual Water Supply and Demand Assessment" (or Annual Assessment) is discussed. Commencing July 1, 2022, the City is required to submit the Annual Assessment. The Annual Assessment will include a review of the City's "unconstrained" water demands for the current year and for a potential upcoming single dry year. Unconstrained water demands represent the City's water demands prior to any "response actions" the City may invoke pursuant to the City's Water Shortage Contingency Plan.
- The City will manage water supplies to minimize the adverse impacts of water shortages. The City's plan for water usage during periods of shortage is designed to incorporate <u>six standard water shortage levels</u> corresponding to progressive ranges from up to a 10, 20, 30, 40, and 50 percent shortage, and greater than a 50 percent shortage.
- For each declared water supply shortage level, customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level.
- For each declared water supply shortage level, the City has established response actions to reduce demand on water supplies and to reduce any shortage gaps in water supplies. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.
- The operational changes the City will consider in addressing water shortages on a short-term basis are discussed and include improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures.
- The City's Emergency Response Plan is summarized. The Emergency Response Plan provides the management, procedures, and designated actions the City and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of the City's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of the City's water service area are provided.
- The effectiveness of the shortage response actions for each of the City's standard water shortage levels is presented. The City has been able to provide sufficient water supplies to

its customers, including during long-term droughts and years with historically high water demands.

- The communication protocols implemented by the City when it declares any water shortage level are presented.
- The compliance and enforcement procedures associated with City's standard water shortage levels are presented.
- The legal authorities associated with City's standard water shortage levels are presented.
- The financial consequences associated with City's standard water shortage levels are presented.
- The City will evaluate the need for revising the Water Shortage Contingency Plan in order to resolve any water shortage gaps, as necessary. The steps necessary for the City to adopt and amend its Water Shortage Contingency Plan are presented.

The following Water Shortage Contingency Plan includes references to Chapters and Sections from the City of Ontario's 2020 Urban Water Management Plan:

## 8.1 WATER SUPPLY RELIABILITY ANALYSIS

**CWC 10632.**

*(a)(1)* The analysis of water supply reliability conducted pursuant to Section 10635.

The City's sources of supply were discussed in Section 6.2 of the 2020 UWMP and consist of groundwater pumped from the Chino Basin; treated groundwater from the Chino Basin produced by the Chino Basin Desalter Authority; treated, imported water purchased from MWD through Water Facilities Authority; groundwater and/or surface water purchased from San Antonio Water Company; and recycled water purchased from Inland Empire Utilities Agency. The City provides recycled water for irrigation instead of potable supplies. The Chino Basin is adjudicated, and groundwater supplies are managed. The reliability of the various sources of supply are discussed in Chapter 7 of the 2020 UWMP. Based on the adjudication provisions in the Chino Basin, the City is able to produce groundwater without limitation, provided any amount produced in excess of the production rights is replenished. Imported water supplies (both treated and untreated) may be impacted in the event MWD implements its WSAP due to a water supply shortage. Finally, recycled water is locally generated and generally is not impacted by drought conditions. Section 7.2.3 summarizes the City's projected water demands and supplies over the next 25 years in five-year increments, including during normal years, single dry years, and a five consecutive year drought periods. These tables indicate the City can meet water demands during normal years, single dry years, and a five consecutive year drought periods over the next 25 years. Consequently, it is anticipated the City will have sufficient water supplies available to meet projected demands.

## 8.2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

**CWC 10632.**

*(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:*

*(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.*

*(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:*

*(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.*

*(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.*

*(iii) Existing infrastructure capabilities and plausible constraints.*

*(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.*

*(v) A description and quantification of each source of water supply.*

**CWC 10632.1.**

*An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.*

Commencing July 1, 2022, the City is required to submit an "Annual Water Supply and Demand Assessment" (Annual Assessment) in accordance with DWR's guidance and requirements. The Annual Assessment will include a review of the City's unconstrained water demands (i.e. water demands prior to any projected response actions the City may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. The City will also include information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the City's WSCP.

For each Annual Assessment, the City plans to prepare a preliminary assessment which evaluates the adequacy of its water supplies for the current and upcoming years by April of each year. The preliminary assessment will include a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

### 8.2.1 DECISION MAKING PROCESS

The City produces groundwater from the Chino Basin as its primary source of water supply and that basin is managed on a fiscal year basis. Consequently, during the third quarter of each fiscal year the City will review its water demands from the initial six months along with the current groundwater basin conditions and local hydrology. This information will be used to help develop the Annual Assessment. A draft of the Annual Assessment will be circulated internally within the City for peer review and comment. Based on comments received, a redraft will be prepared and provided to City managers during the Spring of each year. The draft subsequently will be provided to the City Manager for final review. Subsequently, a final draft of the Annual Assessment will be provided to the City Council as necessary for review and included in the agenda as part of a City Council meeting such that it can be reviewed or approved and any recommended specific shortage response actions may be enacted. The final Annual Assessment will be provided to DWR no later than July 1 of each year.

The Annual Assessments will be instrumental in providing guidance to the City for decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, adopting and implementing water rates and drought rate surcharges, and pursuing alternative water supplies when necessary. This process will help ensure adequate water supplies resources are available to the City.

### 8.2.2 DATA AND METHODOLOGIES

The key data inputs and methodologies which will be evaluated by the City during the preparation of the preliminary assessment will include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment will be identified. The evaluation criteria will include, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels), current water demands, a review of water system improvement plans which may impact infrastructure availability, and water quality regulations which may impact groundwater availability.

2) Water Supply: A description of each available water supply source will be provided. The descriptions will include a quantification of each available water supply source and will be based on review of current production capacities, historical production, Urban Water Management Plans, and prior water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, will be reviewed. The review will include factors such as weather, existing and projected land uses and populations, actual customer consumption and water use factors, monthly Urban Water Supplier Monthly Reports, existing water shortage levels (see Section 8.3), and existing water conservation ordinances (see Section 9.2.1).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available and projected for use to meet the demands during the current year and the upcoming (potential single dry) year will be considered and identified by each type of supply. The evaluation will include factors such as estimated water demands, weather, groundwater basin operating safe yields, water quality results, existing available pumping capacities, imported water allocations, contractual obligations, regulatory issues, use of emergency interconnections, and the costs associated with producing each water supply source.

5) Infrastructure Considerations: The capabilities of the water system infrastructure to meet the water demands during the current year and the upcoming (potential single dry) year will be considered. Available production capacities (e.g. groundwater well capacities) and distribution system water losses (see Section 4.2.4) will be reviewed. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and production capacities (see Section 6.2.8), will be considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies will be described.

## 8.3 SIX STANDARD WATER SHORTAGE LEVELS

**CWC 10632.**

*(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.*

*(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and indicating a cross-reference relating its existing categories to the six standardized water shortage levels.*

The City has a legal responsibility to provide water utility services, including water for residential, commercial, industrial, public authority, and for public fire hydrants and private fire services. The City will manage water supplies prudently to minimize the adverse impacts of water shortages. In its 2015 Plan, the City's WSCP was designed to provide a minimum of 50 percent of normal supply during a severe or extended water shortage. For its 2020 Plan, the City's WSCP is designed to provide water supplies in the event there is less than 50 percent of normal supply during a severe or extended water shortage. Water shortage trigger mechanisms have been established to ensure that this policy is implemented. This includes structured stages of action referred to as water supply shortage planning levels.

Table 8-1 provides a description of the six standard stages of action which may be triggered by a shortage in one or more of the City's water supply sources, depending on the severity of the shortage and its anticipated duration.

**Table 8-1 Water Shortage Contingency Planning Levels**

| Submittal Table 8-1<br>Water Shortage Contingency Plan Levels | | |
|---|---|---|
| **Shortage Level** | **Percent Shortage Range** | **Shortage Response Actions**<br>*(Narrative description)* |
| 1 | Up to 10% | Washing of motor vehicles, trailers, boats or other types of mobile equipment shall be done only with a hand-held bucket or a hose equipped with a positive shutoff nozzle for quick rinses, except that washing may be done at the immediate premises of a commercial car wash or with reclaimed wastewater. No person shall sprinkle, water, or irrigate any landscaped or vegetated areas between the hours of 9:00 a.m. and 4:00 p.m. |
| 2 | Up to 20% | In addition to Shortage Level 1, operators of hotels and motels must provide the option of choosing not to have towels and linens laundered daily. Irrigation is prohibited during and within 48 hours of rainfall. |
| 3 | Up to 30% | In addition to Shortage Level 2, the use of fire hydrants shall be limited to fire fighting and related activities and other uses of water for municipal purposes shall be limited to activities necessary to maintain the public health, safety, and welfare. Unless written permission has been granted by the City Manager or his/her designee, the use of potable water for construction activities and grading shall be prohibited. |
| 4 | Up to 40% | In addition to Shortage Level 3, residents and CII customers will be prohibited from irrigating turf or other landscaping more than two days a week. No person shall irrigate any turf or landscaped area more than fifteen minutes (15) on watering days. No vehicles shall be washed unless it is taken to a carwash. |
| 5 | Up to 50% | In addition to Shortage Level 4, residents and CII customers will be prohibited from irrigating turf or other landscaping more than one day a week. |
| 6 | >50% | In addition to Shortage Level 5, unless otherwise permitted by a resolution of the City Council, there shall be no use of potable water for irrigation of outdoor landscape or turf. Commercial nurseries shall be prohibited from the use of potable water for irrigation of outdoor, landscape and turf except by use of a hand-held hose equipped with a positive shutoff nozzle. The following nonessential use of water shall be prohibited: the filling, cycling, filtering, or refilling of swimming pools, spas, Jacuzzis, fountains or other like devices. |
| NOTES: | | |

The 2020 Plan requires urban water suppliers to have six standardized water shortage response actions in accordance with DWR. The City's previous WSCP, originally included in the City's 2015 Plan as Ordinance No. 3027 (see Appendix M), established a voluntary stage followed by four water supply shortage levels that would be mandatory once put into effect: Stage 1 addresses a water supply shortage of up to 10 percent; Stage 2 addresses a water supply shortage of up to 20 percent; Stage 3 addresses a water supply shortage of anywhere between 20 percent to 50 percent; and Stage 4 addresses a water supply shortage of more than 50 percent.

For its 2020 Plan, the City has prepared a draft Water Conservation Plan (see Appendix N) that will address the six standard stages of action in accordance with DWR. Under this draft Water Conservation Plan, the City will continue to incorporate Ordinance No. 3027's voluntary stage

during normal water supply conditions as well as the existing Stage 1 and Stage 2 water supply shortage levels as is. However, the City has amended Stage 3 to address a water supply shortage of up to 30 percent. In addition, the City has included a Stage 4 and Stage 5 that will be used to address a water supply shortage of up to 40 percent, and 50 percent, respectively. The City's existing Stage 4 has been amended to a Stage 6 level which addresses a water supply shortage of more than 50 percent.

## 8.4 SHORTAGE RESPONSE ACTIONS

**CWC 10632.**

*(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:*

*(A) Locally appropriate supply augmentation actions.*

*(B) Locally appropriate demand reduction actions to adequately respond to shortages.*

*(C) Locally appropriate operational changes.*

*(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.*

*(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.*

### *8.4.1 DEMAND REDUCTION*

**Voluntary Conservation Stage**

All persons are encouraged to voluntarily limit the amount of water used to the amount absolutely necessary for health and safety, business operations, and irrigation. Except as otherwise provided in this chapter where a declared water shortage stage or water shortage emergency requires mandatory or other more stringent requirements, the following elements of conservation apply at all times on a voluntary basis by all persons within the City:

1) Avoid hose washing of sidewalks, walkways, driveways, parking areas or other paved surfaces, except as required for sanitary purposes. If a person uses a hand-held hose to wash any paved surfaces, the hose shall be equipped with a positive shutoff nozzle.
2) Wash motor vehicles, trailers, boats, and other types of mobile equipment using a hand-held bucket, or a hose equipped with a positive shutoff nozzle for quick rinses, or at the immediate premises of a commercial car wash or with recycled wastewater for approved uses.
3) Avoid using water to clean, fill, or maintain levels in decorative fountains, ponds, lakes, or other similar aesthetic structures unless such water is part of a recycling system.

4) Encourage restaurants, hotels, cafes, cafeterias, or other public places where food is sold, served or offered for sale, to serve drinking water only to those customers expressly requesting water.
5) Promptly repair all leaks from indoor and outdoor plumbing fixtures.
6) Avoid watering lawn, landscape or other turf areas more often than every other day and during the hours between 6:00 a.m. and 6:00 p.m.
7) Avoid causing or allowing the water to run off landscape areas into adjoining streets, sidewalks, or other paved areas due to incorrectly directed or maintained sprinklers or excessive watering.

**Stage 1 Water Supply Shortage (Up to 10%)**

During a Stage 1, the following mandatory restrictions on the use of potable water shall be applicable when the City Council determines that the City's water conservation goals are not being met by voluntary water conservation measures, or that the City's water supplies are likely to be reduced by up to ten percent (10%) or it has otherwise been requested or directed by executive order or regulation of a State agency to reduce its potable water consumption or production by a specified amount.

1) Except as required for health and sanitary purposes, washing of sidewalks, driveways, parking areas or other paved surfaces is prohibited. Any hand-held hose used for such purposes shall be equipped with a positive shutoff nozzle.
2) Washing of motor vehicles, trailers, boats or other types of mobile equipment shall be done only with a hand-held bucket or a hose equipped with a positive shutoff nozzle for quick rinses, except that washing may be done at the immediate premises of a commercial car wash or with reclaimed wastewater.
3) No water shall be used to clean, fill or maintain levels in decorative fountains, ponds, lakes or other similar aesthetic structures unless such water is part of a recycling system.
4) No restaurant, hotel, café, cafeteria or other public place where food is sold, served or offered for sale, shall serve drinking water to any customer unless expressly requested.
5) All water customers of the City shall promptly repair all leaks from indoor and outdoor plumbing fixtures. Such leak shall be repaired in a timely manner after notification by the City, but in no case after notification in excess of 72 hours for the first violation and then every 72 hours thereafter for the second and third violations.
6) No person shall sprinkle, water, or irrigate any landscaped or vegetated areas between the hours of 9:00 a.m. and 4:00 p.m. In any event, such watering shall not be in excess of needs nor be of a manner that allows water flow onto streets or other paved areas. The above mentioned may be watered by a hand-held hose equipped with a positive shutoff nozzle at any time of the day. Commercial nurseries, golf courses, and other water-dependent industries are exempt.
7) No water customer of the City shall cause or allow the water to run off landscaped area into adjoining streets, sidewalks or other paved areas due to incorrectly directed or maintained sprinkler or excessive watering.

8) The use of water from fire hydrants shall be limited to fire fighting and related activities necessary to maintain the public health, safety, and welfare. An exception may be made for construction use through a proper City-Designated meter. The use of potable water for construction activities shall be restricted in areas where recycled water is available for such use.

**Stage 2 Water Supply Shortage (Up to 20%)**

During a Stage 2, the following mandatory restrictions on the use of potable water shall be applicable when the City Council determines that it is likely that the City will suffer a reduction of more than ten percent (10%) up to twenty percent (20%) in its water supplies or it has otherwise been requested or directed by executive order or regulation of a State Agency to reduce its potable water consumption or production by a specified amount.

1) All the prohibitions and restrictions in Stage 1 shall be in effect provided that the more restrictive measures noted in this Stage shall take precedence.
2) Filling or refilling of empty swimming pools shall not occur without the written permission of the City Manager or his/her designee.
3) All customers are prohibited from irrigating turf or ornamental landscapes during and within 48 hours following measurable rainfall.
4) Operators of hotels and motels must provide guests with the option of choosing not to have towels and linens laundered daily and prominently display notice of this option.
5) All persons, including the City, are prohibited from irrigating with potable water any ornamental turf on public street medians.
6) The use of potable water irrigation outside of newly constructed homes and buildings shall be consistent with the California Building Standards Commission and the Department of Housing & Community Development.

**Stage 3 Water Supply Shortage (Up to 30%)**

During a Stage 3, the following mandatory restrictions on the use of potable water shall be applicable when the City Council determines that it is likely that the City will suffer a reduction of more than twenty percent (20%) and up to thirty percent (30%) in its water supplies or it has otherwise been requested or directed by executive order or regulation of a State Agency to reduce its potable water consumption or production by a specified amount.

1) All the prohibitions and restrictions in the preceding Stages shall be in effect provided that the more restrictive measures noted in this Stage shall take precedence.
2) Residents and CII customers will be prohibited from irrigating any turf or landscape area more than four (4) days a week.
3) The use of water from fire hydrants shall be limited to fire fighting and related activities and other uses of water for municipal purposes shall be limited to activities necessary to maintain the public health, safety, and welfare. Unless written permission has been granted

by the City Manager or his/her designee, the use of potable water for construction activities and grading shall be prohibited.

**Stage 4 Water Supply Shortage (Up to 40%)**

During a Stage 4, the following mandatory restrictions on the use of potable water shall be applicable when the City Council determines that it is likely that the City will suffer a reduction of more than thirty percent (30%) and up to forty percent (40%) in its water supplies or it has otherwise been requested or directed by executive order or regulation of a State Agency to reduce its potable water consumption or production by a specified amount.

1) All the prohibitions and restrictions in the preceding Stages shall be in effect provided that the more restrictive measures noted in this Stage shall take precedence.
2) Residents and CII customers will be prohibited from irrigating turf or other landscaping more than two (2) days a week.
3) No person shall irrigate any turf or landscaped area more than fifteen minutes (15) on watering days.
4) No vehicles shall be washed unless it is taken to a carwash.

**Stage 5 Water Supply Shortage (Up to 50%)**

During a Stage 5, the following mandatory restrictions on the use of potable water shall be applicable when the City Council determines that it is likely that the City will suffer a reduction of more than forty percent (40%) and up to fifty percent (50%) in its water supplies or it has otherwise been requested or directed by executive order or regulation of a State Agency to reduce its potable water consumption or production by a specified amount.

1) All the prohibitions and restrictions in the preceding Stages shall be in effect provided that the more restrictive measures noted in this Stage shall take precedence.
2) Residents and CII customers will be prohibited from irrigating turf or other landscaping more than one (1) day a week.

**Stage 6 Water Supply Shortage Emergency (More than 50%)**

During Stage 6, the following mandatory restrictions on the use of potable water shall be applicable when the City Council determines that it is likely that the City will suffer a reduction of more than fifty percent (50%) in its water supplies or it has otherwise been requested or directed by executive order or regulation of a State agency to reduce its potable water consumption or production by a specified amount. A water shortage emergency may be declared whenever the City Council finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the City to the extent that there would be insufficient water for human consumption, sanitation, and fire protection. A water shortage emergency may include an immediate emergency. An immediate emergency may occur as a result of a breakage or failure

of a dam, pump, pipe line or conduit, a major earthquake, large-scale fire, or other so called "Act of God" which may have serious impacts on the City's available water supply.

The following restrictions on the use of potable water shall be applicable during a Stage 6 Water Supply Shortage Emergency:

1) All the prohibitions and restrictions in the preceding Stages shall be in effect provided that the more restrictive measures noted in this Stage shall take precedence.
2) Unless otherwise permitted by a resolution of the City Council, there shall be no use of potable water for irrigation of outdoor landscape or turf.
3) Commercial nurseries shall be prohibited from the use of potable water for irrigation of outdoor, landscape and turf except by use of a hand-held hose equipped with a positive shutoff nozzle.
4) The following nonessential use of water shall be prohibited: the filling, cycling, filtering, or refilling of swimming pools, spas, Jacuzzis, fountains or other like devices.

## Table 8-2 Demand Reduction Actions

| Submittal Table 8-2: Demand Reduction Actions | | | | |
|---|---|---|---|---|
| Shortage Level | Demand Reduction Actions<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>***For Retail Suppliers Only***<br>*Drop Down List* |
| *Add additional rows as needed* | | | | |
| 1 | Other - Prohibit use of potable water for washing hard surfaces | Collective reduction from all Shortage Level 1 actions is up to 4,712 AF | | Yes |
| 1 | Other - Require automatic shut of hoses | Collective reduction from all Shortage Level 1 actions is up to 4,712 AF | | Yes |
| 1 | Water Features - Restrict water use for decorative water features, such as fountains | Collective reduction from all Shortage Level 1 actions is up to 4,712 AF | | Yes |
| 1 | CII - Restaurants may only serve water upon request | Collective reduction from all Shortage Level 1 actions is up to 4,712 AF | | Yes |
| 1 | Other - Customers must repair leaks, breaks, and malfunctions in a timely manner | Collective reduction from all Shortage Level 1 actions is up to 4,712 AF | | Yes |
| 1 | Landscape - Limit landscape irrigation to specific times | Collective reduction from all Shortage Level 1 actions is up to 4,712 AF | | Yes |
| 1 | Landscape - Restrict or prohibit runoff from landscape irrigation | Collective reduction from all Shortage Level 1 actions is up to 4,712 AF | | Yes |
| 1 | Other | Collective reduction from all Shortage Level 1 actions is up to 4,712 AF | The use of water for fire hydrants shall be limited to fire fighting and related activities necessary to maintain the public health, safety, and welfare. An exception may be made for construction use through proper city-designated meter. The use of poable water for construction activities shall be restricted in areas where recycled water is available for such use. | Yes |
| 2 | Other | Collective reduction from all Shortage Level 2 actions is up to 9,424 AF | Includes all Stage 1 actions | Yes |
| 2 | Other water feature or swimming pool restriction | Collective reduction from all Shortage Level 2 actions is up to 9,424 AF | Filling or refilling of empty swimming pools shall not occur without the written permission of the City Manager or his/her designee. | Yes |
| 2 | Landscape - Other landscape restriction or prohibition | Collective reduction from all Shortage Level 2 actions is up to 9,424 AF | All customers are prohibited from irrigating turf or ornamental landscapes during and within 48 hours following measurable rainfall. | Yes |
| 2 | CII - Lodging establishment must offer opt out of linen service | Collective reduction from all Shortage Level 2 actions is up to 9,424 AF | | Yes |
| 2 | Landscape - Prohibit all landscape irrigation | Collective reduction from all Shortage Level 2 actions is up to 9,424 AF | All persons, including the City, are prohibited from irrigating with potable water any ornamental turf on public street medians. | Yes |
| 2 | Landscape - Other landscape restriction or prohibition | Collective reduction from all Shortage Level 2 actions is up to 9,424 AF | The use of potable water for irrigation outside of newly constructed homes and buildings shall be consistent with California Building Standards Commission and Department of Housing & Community Development. | Yes |
| 3 | Other | Collective reduction from all Shortage Level 3 actions is up to 14,137 AF | includes all Stage 2 actions | Yes |
| 3 | Landscape - Limit landscape irrigation to specific days | Collective reduction from all Shortage Level 3 actions is up to 14,137 AF | Residents and CII customers will be prohibited from irrigating any turf or landscape area more than four days a week. | Yes |
| 3 | Other - Prohibit use of potable water for construction and dust control | Collective reduction from all Shortage Level 3 actions is up to 14,137 AF | The use of water from fire hydrants shall be limited to fire fighting and related activities and other uses of water for municipal purposes shall be limited to activities necessary to maintain the public health, safety and welfare. Unless written permission has been granted by the CityManager or his/her designee, the use of potable water for construction activities and grading shall be prohibited. | Yes |

| | | | | |
|---|---|---|---|---|
| 4 | Other | Collective reduction from all Shortage Level 4 actions is up to 18,849 AF | Includes all Stage 3 actions | Yes |
| 4 | Landscape - Limit landscape irrigation to specific days | Collective reduction from all Shortage Level 4 actions is up to 18,849 AF | Residents and CII customers will be prohibited from irrigating any turf or landscape area more than two days a week. | Yes |
| 4 | Landscape - Other landscape restriction or prohibition | Collective reduction from all Shortage Level 4 actions is up to 18,849 AF | No person shall irrigate any turf or landscaped area more than fifteen minutes (15) on watering days. | Yes |
| 4 | Other - Prohibit vehicle washing except at facilities using recycled or recirculating water | Collective reduction from all Shortage Level 4 actions is up to 18,849 AF | | Yes |
| 5 | Other | Collective reduction from all Shortage Level 5 actions is up to 23,561 AF | Includes all Stage 4 actions | Yes |
| 5 | Landscape - Limit landscape irrigation to specific days | Collective reduction from all Shortage Level 5 actions is up to 23,561 AF | Residents and CII customers will be prohibited from irrigating any turf or landscape area more than one day a week. | Yes |
| 6 | Other | Collective reduction from all Shortage Level 6 actions is greater than 23,561 AF | Includes all Stage 5 actions | Yes |
| 6 | Landscape - Prohibit all landscape irrigation | Collective reduction from all Shortage Level 6 actions is greater than 23,561 AF | Commercial nurseries shall be prohibited from the use of potable water for irrigation of outdoor, landscape and turf except by use of a hand-held hose equipped with a positive shutoff nozzle. | Yes |
| 6 | Landscape - Other landscape restriction or prohibition | Collective reduction from all Shortage Level 6 actions is greater than 23,561 AF | | Yes |
| 6 | Other water feature or swimming pool restriction | Collective reduction from all Shortage Level 6 actions is greater than 23,561 AF | The following nonessential uses of water shall be prohibited: the filling, cycling, filtering, or refilling swimming pools, spas, Jacuzzis, fountains or other like devices. | Yes |
| NOTES: | | | | |

### 8.4.2 SUPPLY AUGMENTATION

The City does not plan to add a new source of water supply to address customer demands, but instead will consider increased supplies from existing sources. Table 8-3 reflects this approach and does not identify any new supplies. Instead, the City will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. As discussed in Chapter 6, the City's sources of water supply include: groundwater pumped from the Chino Basin; treated groundwater from the Chino Basin produced by the Chino Basin Desalter Authority; treated, imported surface water purchased from MWD through Water Facilities Authority; groundwater and/or surface water purchased from San Antonio Water Company; and recycled water purchased from Inland Empire Utilities Agency. The City's main source of water supply is groundwater pumped from the Chino Basin. As noted in Section 8.2, beginning July 1, 2022, the City will prepare and submit an Annual Assessment which will include a review of water supplies available to meet water demands for the current and upcoming years. In the event the City is currently in, or considers entering into, one of the standard water shortage levels identified in Section 8.3, the City will consider the water supply augmentation actions described below.

For each water shortage level discussed in Section 8.3, the City will consider supplementing its existing water supplies through increased groundwater production instead of the purchase of additional imported water supplies. Due to previous critically dry conditions, MWD developed the Water Supply Allocation Plan whereby available supplies are equitably allocated to its member agencies, including CDA, IEUA, and WFA. The WSAP establishes ten different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its Municipal and Industrial retail demand. The ratio of MWD water supply drought allocation to

local water supply will change based on the WSAP stage. The MWD drought allocation can be used to make Full-Service water deliveries at the Tier 1 rate up to a Tier 1 allocation. Any Full-Service water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water.

MWD's primary first response to any gap between core supplies (from the State Water Project and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million AF. Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and on-going water supply and storage programs and management practices, the City will use up to the treated imported water supply made available from MWD through WFA in association with each of the standard water shortage levels identified in Section 8.3. Water demands will be addressed through increased use of the local groundwater supplies and implementation of demand reduction measures through the various stages of action.

The City will consider augmenting its existing water supplies through production of additional groundwater from the Chino Basin. As noted in Section 6.2.2, the Chino Basin is managed under the Chino Basin adjudication. During the period of management under the Chino Basin Judgment, significant drought events have occurred. In each drought cycle the Chino Basin has been managed to maintain water levels. Parties to the Chino Basin Judgment, including the City, are authorized to produce groundwater in excess of their rights and pay assessments for such production to the Chino Basin Watermaster. The assessments are used to purchase untreated imported water to replenish the Chino Basin. The Chino Basin Watermaster purchases untreated imported water to replenish the Chino Basin from MWD through Inland Empire Utilities Agency. Groundwater quality is carefully monitored by the Chino Basin Watermaster. Treatment facilities and/or blend plans have been developed by water agencies to meet potable water standards and to prevent the spread of any groundwater contamination. Groundwater quality in the Chino Basin is not expected to impact potable supplies or constrain supply reliability. Based on historical and on-going management practices, the City will be able to continue relying on the Chino Basin for adequate supplies in response to each of the standard water shortage levels identified in Section 8.3.

**Table 8-3 Supply Augmentation and Other Actions**

| Submittal Table 8-3: Supply Augmentation and Other Actions | | | |
|---|---|---|---|
| Shortage Level | Supply Augmentation Methods and Other Actions by Water Supplier<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference *(optional)* |
| *Add additional rows as needed* | | | |
| 1 | Transfers | Not applicable (see Notes) | |
| 2 | Transfers | Not applicable (see Notes) | |
| 3 | Transfers | Not applicable (see Notes) | |
| 4 | Transfers | Not applicable (see Notes) | |
| 5 | Transfers | Not applicable (see Notes) | |
| 6 | Transfers | Not applicable (see Notes) | |
| | | | |
| | | | |
| | | | |
| NOTES: The City will consider increased production from the Chino Basin using existing facilities to address increased demands. As noted on Table 8-2, the City plans to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands. | | | |

### 8.4.3 OPERATIONAL CHANGES

During a water supply shortage situation, the City will manage its water supply resources to provide sufficient water supplies capable of meeting the demands of its customers. Section 8.4.1 describes the City's standard water shortage levels and associated demand reduction measures. Section 8.4.2 describes the City's water supply sources and water supply augmentation actions available. The supply augmentation actions and demand reduction measures, when implemented, may potentially result in short-term operational changes which are necessary to allow the City to utilize all available water supply sources in response to water shortage situations.

As noted in Section 8.2, beginning July 1, 2022, the City will prepare and submit an Annual Assessment which will include a review of the water supplies available to meet water demands for the current and upcoming years. Preparation of the Annual Assessment will assist the City in determining any potential operational changes. In addition, the City's standard water shortage levels and the associated demand reduction measures, in conjunction with the City's existing Demand Management Measures (discussed in Chapter 9), will be essential to the City in reducing water demands during any water shortage period. The operational changes the City will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, analysis, and tracking of customer water usage to enforce demand reduction measures
- Optimized production from existing available water supply sources
- Potential use of emergency supply sources, including emergency interconnections
- Potential blending of water supply resources
- Improved monitoring, maintenance, and repairs to reduce water distribution system losses

### 8.4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by the City to reduce customer demands are discussed in Section 8.4.2. There are no additional mandatory restrictions planned at this time.

### 8.4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in the City's standard water shortage levels (identified in Section 8.3) and the associated demand reduction measures (described in Section 8.4.2). In addition to the water supply augmentation actions (Section 8.4.1) and potential operational changes (Section 8.4.3) which the City may consider in order to continue providing sufficient water supplies, the City will review and implement any necessary steps included in its "Emergency Response Plan".

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including the City, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated "Emergency Response Plan" (ERP) every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States Environment Protection Agency (USEPA), from March 31, 2020 and December 30, 2021, confirming the current RRA and ERP have been reviewed and updated.

The City's RRA, prepared in May 2020, evaluates the vulnerabilities, threats, and consequences from potential hazards to the City's water system. The City prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and
- Operation and maintenance.

The District's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with the City's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

The City's ERP, prepared in September 2020, provides the management, procedures, and designated actions the City and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures and other unforeseen circumstances. The City's ERP (which is incorporated by reference) provides the guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies which directly affect the water system and the ability to maintain safe operations (such as a chlorine release, and earthquake or a threat of contamination). The ERP also incorporates the results of City's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity
- Plans and procedures for responding to a natural hazard or malevolent act
- Actions and equipment to lessen the impact of a natural hazard or malevolent act
- Strategies to detect natural hazards or malevolent act

The City will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. The City will also review applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

### *8.4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN*

**CWC 10632.5.**

*(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.*

*(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.*

*(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.*

The City prepared a local "Hazard Mitigation Plan" which was approved by the Federal Emergency Management Agency (FEMA) in 2018. The Hazard Mitigation Plan identifies effective ways to assess the significant natural hazards (including earthquakes) that may affect the City and its residents. The Hazard Mitigation Plan provides resources, information, and strategies to reduce the City's vulnerability to these hazards, while providing guidance for the coordination of mitigation activities throughout the City. The Hazard Mitigation Plan includes mitigation

projects necessary to reduce seismic risk to the City's water distribution system facilities (including its distribution system pipelines, groundwater wells, booster pumps, and storage reservoirs) and potential disruptions in providing water service. The City's Hazard Mitigation Plan is provided in Appendix O.

The County of San Bernardino prepared a "Multi-Jurisdictional Hazard Mitigation Plan" which was approved by the Federal Emergency Management Agency in June 2017. The County's Multi-Jurisdictional Hazard Mitigation Plan identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout San Bernardino County, and the mitigation strategies necessary to reduce risks, including seismic risk. The County's Multi-Jurisdictional Hazard Mitigation Plan is provided in Appendix P.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of the City's water service area are provided in the Figure 6 below. The faults that are located in close proximity to and could potentially cause significant shaking in the City's water service area include the San Andreas fault, the Walnut Creek fault, the San Jose fault, the Red Hill fault, the Cucamonga fault, the Chino fault, the Rialto-Colton fault and the Central Avenue fault. As discussed in Section 6.2.2, the faults which border the Chino Basin include the Rialto-Colton fault, the Chino fault, the San Jose fault, and the Cucamonga fault.

**Figure 6 - Location of Earthquake Faults**

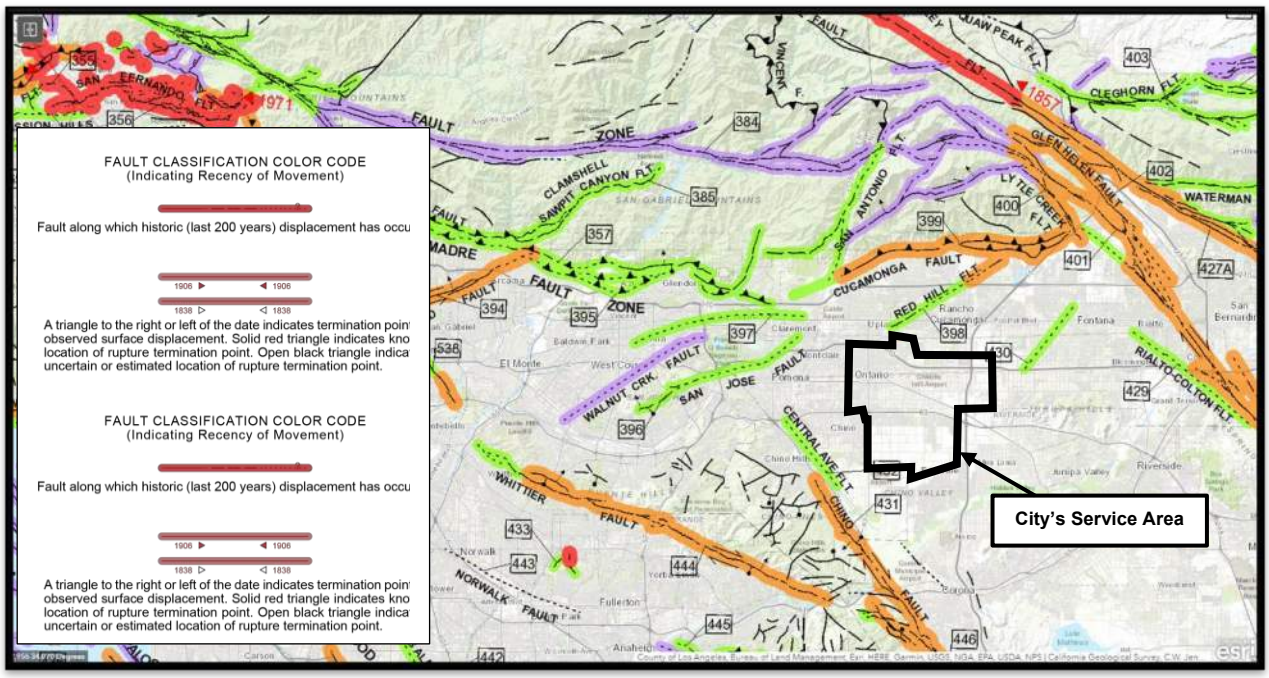


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following Figure 7 provides the relative intensity of ground shaking in the vicinity of the City's service area from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including the City's service area, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 8.4.5, the City has prepared an Emergency Response Plan which provides the management, procedures, and designated actions the City and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers receive a reliable and adequate supply of potable water. The City's ERP is incorporated by reference.

**Figure 7 - Earthquake Shaking Potential**

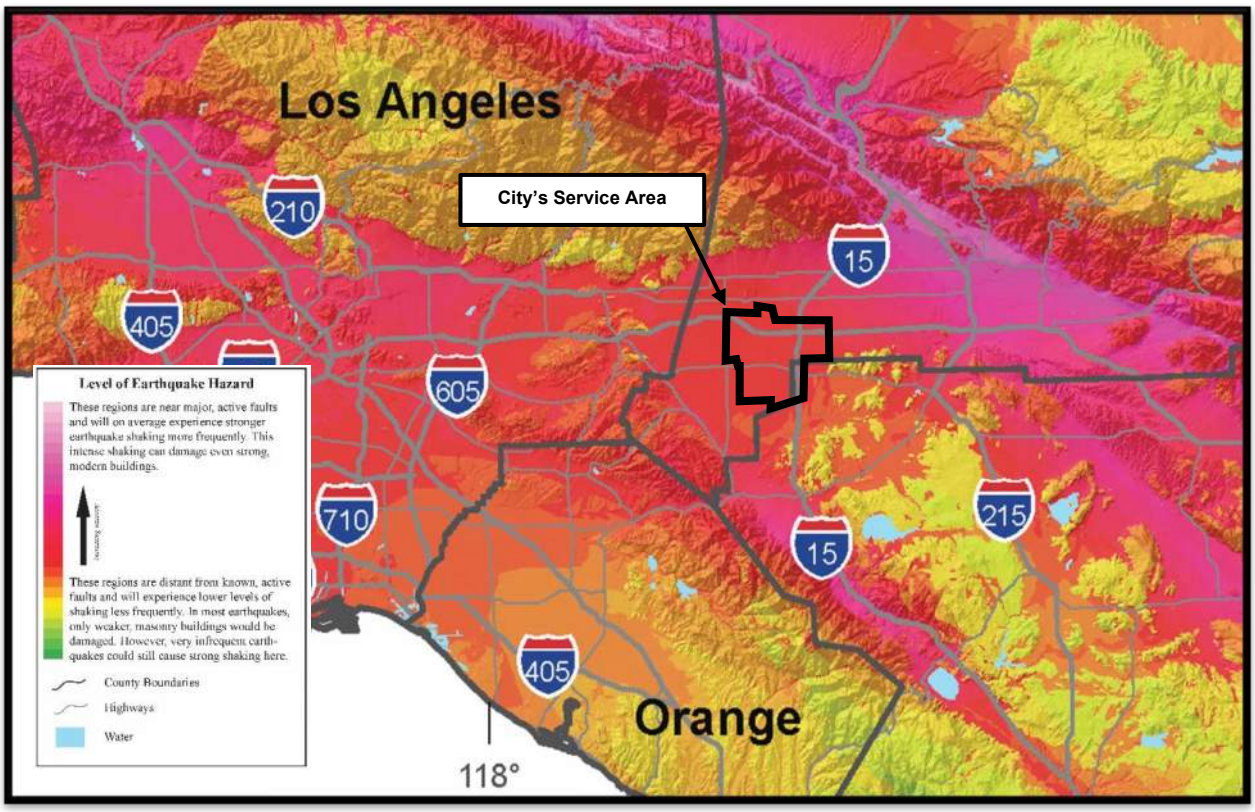


Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

### 8.4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 8.3, is evident in the City's historical ability to meet its customer's water demands in response to a water supply shortage. In addition, the City imposes water consumption regulations and restrictions, and supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of the City's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 8-2 and Table 8-3.

Section 6.1 provides a tabulation of the City's historical annual water demands for each water supply source. During the past 10 years, the City experienced a five-year consecutive drought within its service area from FY 2011-12 to FY 2015-16. Throughout this extended dry year period, the City's annual water production ranged from 36,036 AF to 45,196 AF, with an average of approximately 41,558 AF. In addition, historical records indicate the City previously produced a maximum of up to 45,196 AF during FY 2013-14. The City has been able to provide sufficient

water supplies to its customers, including during long-term droughts and years with historically high water demands. In addition, the City has been able to provide water service to meet maximum day water demands for these years, including during the summer months.

The City's water demands during the most recent five years (from FY 2015-16 to FY 2019-20) averaged approximately 39,374 AFY. Due to conservation efforts and demand management measures (discussed in Chapter 9), the City's recent water demands have been less than its historical water demands, including during long-term droughts. The City's projected water demands (during normal, single dry, and multiple dry years) are provided in Section 7.2.3 and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. Because the City's projected water rates are similar to its historical water use rates, it is anticipated the City will be able to continue providing sufficient water supplies to its customers to meet projected water demands, including during long-term droughts. In addition, as discussed in Section 8.4.1, based on historical and on-going management practices, the City will be able to continue relying on its water supply source from the Chino Basin for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 8.3.

Based on the City's demonstrated ability to meet water demands during past water supply shortages, the adopted water shortage levels, the adjusted operating safe yields, and water supplies during long-term droughts, it is anticipated that the City will be able to provide sufficient water supplies to its customers during each of its standard water shortage levels. Although adequate supplies are anticipated, the cost of those water supplies may become incrementally more expensive. The City will enact varying stages of its WSCP to encourage retail customers to reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of the City's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction section provided in Table 8-2 and Table 8-3. The effectiveness of the City's shortage response actions is based on the City's water demands prior to 2015 (unconstrained demands). The City reduced its water demands in 2015 in response to the Governor's April 1, 2015 Executive Order B-29-15 which mandated statewide reduction in water use of 25 percent. The City's actual water demand reduction during this period was used to estimate the extent of water use reductions for the City's Water Shortage Stages. The City's Water Shortage Stages 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

## 8.5 COMMUNICATION PROTOCOLS

**CWC 10632.**

*(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:*

*(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.*

*(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.*

*(C) Any other relevant communications.*

Upon finding that a need to implement a Stage 1 through Stage 6 Water Supply Shortage exists, the City Council will order implementation of the appropriate water shortage response action, or other measures which it deems appropriate to address the water shortage. This order shall be made by Resolution and will be published in a daily newspaper of general circulation and will become effective immediately following publication. The appropriate regulations that fall under the Stage Level declared will take effect with the first full billing period commencing on or after the effective date of the City Council's Resolution.

In the event of an immediate emergency that causes an unplanned interruption of water supply, the City Manager or his/her designee is authorized to restrict water use and apportion the available supply of water among its customers in the most equitable manner possible to continue service fairly and without discrimination, except that preference shall be given to such service as is essential to the public interest and to the preservation of life and health.

## 8.6 COMPLIANCE AND ENFORCEMENT

**CWC 10632.**

*(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

The City's WSCP includes fines and penalties that may be imposed on any customer who fails to comply with the prohibitions and restrictions of each water supply shortage stage. All fines and penalties may apply to each of the prohibitions and restrictions of each water supply shortage stage. If a customer if found to be in violation of any water supply shortage stage provision, fines begin with a written notice and subsequent violations include fines of $100, $200, and $500.

## 8.7 LEGAL AUTHORITIES

**CWC 10632.**

*(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.*

*(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.*

*(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.*

**CWC Division 1, Section 350**

*The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.*

The City has the legal authority to implement and enforce its water shortage contingency plan. California Constitution article X, section 2 and California Water Code section 100 provide that water must be put to beneficial use, the waste or unreasonable use or unreasonable method of use of water shall be prevented, and the conservation of water is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and the public welfare. In addition, CWC Section 375 provides the City with the statutory authority to adopt and enforce water conservation restrictions, and CWC Section 350 et seq. authorizes the City to declare a water shortage emergency and impose water conservation measures when it determines that the City may not be able to satisfy ordinary demands without depleting supplies to an insufficient level. If necessary, the City shall declare a water shortage emergency in according with CWC Chapter 3 (commencing with Section 350) of Division 1. Once having declared a water shortage, the City is provided with broad powers to implement and enforce regulations and restrictions for managing a water shortage. For example: CWC section 375(a) provides:

> Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity.

(CWC Section 375(a).) CWC Section 375(b) grants the City with the authority to set prices to encourage water conservation.

Pursuant to these authorities, the City adopted Ordinance No. 3027. Under the City's Ordinance No. 3027, a water shortage, including a water shortage emergency but excluding an immediate emergency, shall be declared by the adoption of a resolution of the City Council, in accordance with CWC section 350. The City Council may declare a water shortage based on a determination by the MWD and the IEUA of a water shortage, the declaration of an executive order of the Governor or the adoption of voluntary or mandatory water use restrictions by any State Agency governing the use of water or based upon any interruption in water supply or delivery that the City Council determines in its sole discretion necessitates water conservation pursuant to this chapter.

Under California law, including CWC Chapters 3.3 and 3.5 of Division 1, Parts 2.55 and 2.6 of Division 6, Division 13, and Article X, Section 2 of the California Constitution, the City is authorized to implement the water shortage actions outlined in this WSCP and in the City's Ordinance No. 3027. In water shortage cases, shortage response actions to be implemented will be at the discretion of the City and will be based on an assessment of the supply shortage, customer response, and need for demand reductions as outlined in this WSCP and the City's Ordinance No. 3027.

It is noted that upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the state will defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

The City will coordinate with the County and any other entities as necessary for possible proclamation of a local emergency as necessary under California Government Code, California Emergency Services Act (Article 2, Section 8558).

In the event of an immediate emergency that causes an unplanned interruption of water supply, the City Manager or his/her designee is authorized to restrict water use and apportion the available supply of water among its customers in the most equitable manner possible to continue service fairly and without discrimination, except that preference will be given to such service as is essential to the public interest and to the preservation of life and health.

At any time during Stage 1, 2, 3, 4, 5, or 6, if the City Council determines that additional reductions in the amount the potable water being used by water customers are necessary, it may adopt a resolution establishing water use limitations and enforce those water use limitations by the adoption and imposition of a volumetric penalty established therein.

## 8.8 FINANCIAL CONSEQUENCES OF WSCP

**CWC 10632.**

*(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:*

*(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).*

*(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).*

*(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.*

Potential revenue reductions and expense increases associated with activated shortage response actions are regulated and tracked by the City's financial department.

During periods of water supply shortages, state-mandated water use restrictions, or emergency conditions, the City may require its customers to reduce demands below levels projected under the current water rate structure. Under any of these circumstances, the City may experience a decrease in revenues. In order to offset any decline in revenues, the City Council may adopt resolutions to make additional adjustments to the water rates based on the City's increased costs to provide water to its customers.

Projected demands, water supply reductions, water rates and cost of water cannot be known with certainty. However, even under a hypothetical scenario whereby sales are gradually reduced by up to 50 percent, certain actions are known as noted below:

Water supplies:

- CDA supplies will not be impacted from a quantity or cost standpoint.
- As demands/sales are reduced, the City will rely on its least expensive sources of supply first and sequentially reduce the most expensive sources of water supply (i.e. imported water). This action will address much of the gap between reduced revenue from water sales and the cost of the water supplies.
- As sales are reduced, distribution system losses will also be reduced on a proportional basis resulting in savings by not having to provide as much water.

Revenue from water sales:

Revenue from the monthly standby charge to each retail customer will remain constant regardless of the volume of water sold.

The City will regularly track the impacts of potentially reduced water sales on revenue and compare it to the cost of operations. In the event that the City's revenues and expenditures are severely affected by a water shortage, the following measures could be taken by the City to alleviate the financial impacts before there has been a significant draw on financial reserves:

- Rate Adjustment
- Decrease in Capital Expenditure
- Decrease in O&M Expenditure

Rate increases are not viewed positively by the customers particularly when they reduce consumption. Negative consequences that could arise from the cost-cutting actions include dissatisfaction of the customers, reduced funding for Capital Improvement Projects and system maintenance, and reduced staff availability for emergency response. Nonetheless, these tools are available to the City in a worst-case scenario to ensure a constant balance between revenue and expenses.

## 8.9 MONITORING AND REPORTING

**CWC 10632.**

*(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

Customer compliance of the provisions adopted by declaration of a WSCP are monitored and reported through water loss audits performed by the City's Utilities Department. Staff prepares annual Distribution System Water Audits to monitor water losses. Staff reviews the audits to track real and apparent losses. Losses are monitored by comparing water production to sales. The City regularly monitors its system and repairs leaks in a timely manner. This includes regular checks on valves and meters, and pipeline maintenance. If leaks are encountered or suspected during routine inspection of the system, further evaluation is conducted. If leaks are found, they are repaired.

## 8.10 WSCP REFINEMENT PROCEDURES

**CWC 10632.**

*(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

The City's WSCP has been prepared as an adaptive management plan. As discussed in Section 8.9, the City will monitor and report on the implementation of the WSCP. The City will review the implementation results for any current or potential shortage gaps between water supplies and

demands. The City will evaluate the need for revising the WSCP in order to resolve any shortage gaps, as necessary. The City will consider the following potential revisions in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 9).
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 8.4.1).
- Implementation of stricter enforcement actions and penalties (discussed in Section 8.6).
- Improvements to the water supply augmentation responses (discussed in Section 8.4.2), as well as any associated operational changes (discussed in Section 8.4.3) which may be required.
- Incorporation of additional actions recommended by City staff or other interested parties.

The City will use the monitoring and reporting data to evaluate the ability for these potential revisions to resolve any shortage gaps which may occur within the standard water shortage levels.

The WSCP is adopted as part of the City's 2020 Urban Water Management Plan adoption process discussed in Section 10.3. It is anticipated the City will review, revise, and adopt an updated WSCP as part of preparing its 2025 Urban Water Management Plan as necessary. However, the City will continue to review the monitoring and reporting data, and if needed, update the WSCP more frequently. Any updates to the City's WSCP will include a public hearing and adoption process by the City Council (see Section 8.12).

## 8.11 SPECIAL WATER FEATURE DISTINCTION

**CWC 10632.**

*(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.*

The City's WSCP defines "decorative water features" as water features which are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, but excluding pools and spas. In general, there are additional health and safety considerations in the water supplied to pools and spas compared to decorative water features. As a result, the City's WSCP has reviewed the response actions, enforcement actions, and monitoring and reporting programs separately for decorative water features and for pools and spas, as applicable.

As described in Section 8.4.1, under a Stage 1 Water Supply Shortage Level, no water shall be used to clean, fill or maintain levels in decorative fountains, ponds, lakes or other similar aesthetic structures unless such water is part of a recycling system.

## 8.12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

**CWC 10632.**

*(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

The City's WSCP is adopted as part of the City's 2020 Urban Water Management Plan adoption process discussed in Chapter 10. The process for adopting the City's WSCP includes the following:

- The City will conduct a public hearing and make the WSCP available for public inspection.
- The City will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- The City will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- The City Council will adopt the 2020 Urban Water Management Plan and the WSCP.
- As part of submitting the 2020 Urban Water Management Plan to DWR, the City will also submit the WSCP (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2021. The City will submit a copy of the WSCP to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, the City will make the WSCP available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended WSCP includes the following:

- The City will conduct a public hearing and make the amended WSCP available for public inspection via public City Council agendas.
- The City Council will adopt the amended WSCP.
- The City will submit the amended WSCP to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.

Additional information regarding the adoption, submittal, and availability of the City's WSCP (and 2020 Urban Water Management Plan) is provided in Chapter 10.

Chapter 9

# DEMAND MANAGEMENT MEASURES

## LAY DESCRIPTION – CHAPTER 9

### DEMAND MANAGEMENT MEASURES

Chapter 9 (Demand Management Measures) of the City's 2020 Plan discusses and provides the following:

- The City has implemented "Demand Management Measures" to reduce its water demands and achieve its water use targets (discussed in Chapter 5)
- The City's Demand Management Measures include adoption of an ordinance to prevent water waste.
- The City's Demand Management Measures include metering of all customer connections, including separate metering for single-family residential, commercial, industrial, large landscape and institutional/governmental facilities.
- The City's Demand Management Measures include conservation pricing. The City's current water rate structure is tiered to promote water conservation by customers.
- The City's Demand Management Measures include public education and outreach programs regarding water conservation.
- The City's Demand Management Measures include various actions to assess and manage water distribution system losses.
- Additional Demand Management Measures including rebate, conservation, and educational programs are discussed.
- A summary of the Demand Management Measures the City has implemented over the past five (5) years is provided. The City met the 2020 Water Use Target (discussed in Chapter 5) through the implementation of these Demand Management Measures.

## 9.1 DEMAND MANAGEMENT MEASURES FOR WHOLESALE SUPPLIERS

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1)(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

*(ii) Metering.*

*(iv) Public education and outreach.*
*(vi) Water conservation program coordination and staffing support.*

*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

*(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.*

### *9.1.1 METERING*

The City is not a wholesale agency and is not required by DWR to complete Section 9.1.

## 9.2 EXISTING DEMAND MANAGEMENT MEASURES FOR RETAIL SUPPLIERS

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1)(A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

*(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

*(i) Water waste prevention ordinances.*

*(ii) Metering.*

*(iii) Conservation pricing.*

*(iv) Public education and outreach.*

*(v) Programs to assess and manage distribution system real loss.*

*(vi) Water conservation program coordination and staffing support.*

*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

### 9.2.1 WATER WASTE PREVENTION ORDINANCES

Waste is defined as any excessive, unnecessary or unwarranted use of water, including but not limited to any use which causes unnecessary runoff beyond the boundaries of any property as served by its meter and any failure to repair as soon as reasonably possible any leak or rupture in any water pipes, faucets, valves, plumbing fixtures or other water service appliances. The City adopted Ordinance No. 3027 in October 2015 to establish water conservation measures, staged water supply shortage demand management measures (DMMs), and prevent water waste. The adoption of Ordinance No. 3027 was part of a comprehensive water shortage planning effort to manage the City's response to any water supply challenges it may encounter. The City will review and update as necessary when DWR publishes urban water use targets for its service area in accordance with SB 606 and AB 1668 regulations.

### 9.2.2 METERING

**CWC 526.**

*(a) Notwithstanding any other provision of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract… shall do both of the following:*

*(1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings… located within its service area.*

**CWC 527.**

*(a) An urban water supplier that is not subject to Section 526 shall do both of the following:*

*(1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.*

The City meters all customer connections, including separate metering for single-family residential, commercial, industrial, large landscape and institutional/governmental facilities. Furthermore, if there is new development within the City, each facility is individually metered.

Service charges for the city are based on the customers' connection size. Further information regarding the City's service fees and conservation pricing is provided in Section 9.2.3.

### 9.2.3 CONSERVATION PRICING

The City has two commodity rates (Budgeted Use and Drought Surcharge) for water for customers within its service area. A Readiness-to-Serve Charge is added to the commodity rates to comprise the total water bill and is based on the size of the meter. Water bills are sent out monthly. A water rate sheet showing current rates is provided in Appendix Q.

The City's current water rate structure is tiered to promote water conservation by customers. The water rates have been developed to fund the cost of water and are related to the overall cost of water service. In the event the customer uses more than the amount of water allotted for the budgeted allocation, a Drought Surcharge rate would apply. The Drought Surcharge rate essentially penalizes the customers for over usage of water. This applies to all water-use sectors (e.g., single family residential, multifamily residential, industrial, institutional, etc.). Therefore, there is an economic benefit to conserving water.

### 9.2.4 PUBLIC EDUCATION AND OUTREACH

The City developed a public information program to educate the public to the benefits of water conservation. The program involves the dissemination of information through literature provided at City Hall and other City of Ontario facilities, and articles in the City of Ontario newsletter. The City includes informational flyers with the water bills periodically to address water conservation and other important matters. The City periodically holds public seminars and workshops with other local agencies to promote water conservation. The City also provides water conservation information and updates on its website. The City will continue these programs to promote water conservation.

As part of a public outreach program for water conservation, City representatives have visited schools to discuss water conservation. This discussion is usually included as part of an overall presentation on the water system and how it works. The City will continue the school education programs to promote water conservation to that sector of the community.

### 9.2.5 PROGRAMS TO ASSESS AND MANAGE DISTRIBUTION SYSTEM REAL LOSS

The City's system is comprised mainly of single and multi-family dwellings. The City estimates water system losses at approximately 2.9 percent, as discussed in Section 4.2. The City has water conservation literature that alerts customers to be on the lookout for water system leaks and to correct them promptly. The City is available to assist customers in answering questions regarding system leaks or higher than expected water usage.

As a part of normal operation and maintenance of the water system, City staff does preventive maintenance. This includes regular checks on valves and meters, and pipeline maintenance. If leaks are encountered or suspected during routine inspection of the system, further evaluation is conducted. If leaks are found, they are repaired.

The City monitors the water system for loss by comparing water production to water sales. The City will continue to monitor the water system for water loss, and if a trend develops to indicate that further analyses are required, the City will provide the necessary funds to institute another leak detection program.

The City will continue these programs to assess and manage distribution system real losses.

### *9.2.6 WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT*

Various City departments are involved in the water conservation program. These include maintenance and operations personnel, the Utilities General Manager, the Public Works Director, and administrative staff who answer billing and usage questions and serve at the front counter at City Hall. In addition, the City employs a full time Water Resources Coordinator to oversee all water conservation activities. The Water Resources Coordinator is responsible for all matters pertaining to the City's water conservation program including implementation of DMMs. The City plans to continue to provide water conservation program coordination and staffing support.

### *9.2.7 OTHER DEMAND MANAGEMENT MEASURES*

Large Landscape Conservation Programs

The City routinely hosts seminars and workshops in the community to promote landscape conservation. The City continues to offer a rebate program for the purchase of landscape related items to both residential and commercial customers to promote water conservation. During FY 2015-16 through FY 2019-20, the City provided rebates for this program.

Rebate Programs

The City continues to offer a rebate program for the purchase of high-efficiency washing machines, high-efficiency toilets, and weather-based irrigation controllers to customers to promote water conservation. The City currently offers rebates to qualifying customers for high-efficiency washing machines, high-efficiency toilets, and weather-based irrigation controllers. The rebate application, along with a list of qualifying appliances, are listed on the City's website. During FY 2015-16 through FY 2019-20, the City provided rebates for this program.

The City plans to continue implementation of the programs described above to promote water conservation.

## 9.3 REPORTING IMPLEMENTATION

### *9.3.1 IMPLEMENTATION OVER THE PAST FIVE YEARS*

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1) (A) ...a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.*

The City is committed to implementing water conservation programs. The highlights of DMM implementation over the past five years are described below.

As discussed in Section 9.2.1, in October 2015, the City adopted Ordinance No. 3027 to establish water conservation measures and staged water supply shortage demand management measures.

As discussed in Section 9.2.2, the City metered all customer connections, including separate metering for single-family residential, commercial, industrial, large landscape and institutional/governmental facilities during the past five years. Furthermore, if there was new development within the City, each facility was individually metered. Service charges for the City are based on the customers' connection size.

As discussed in Section 9.2.3, the City has two commodity rates (Budgeted Use and Drought Surcharge) for water for customers within its service area. Readiness-to-Serve Charges are added to the commodity rates to comprise the total water bill and are based on the size of the meter. Water bills are sent out monthly. A water rate sheet showing current rates is provided in Appendix Q.

As discussed in Section 9.2.4, the City developed a public information program to educate the public to the benefits of water conservation. The program involves the dissemination of information through literature provided at City Hall and other City of Ontario facilities, and articles in the City of Ontario newsletter. The City included informational flyers with the water bills periodically to address water conservation and other important matters. The City periodically held public seminars and workshops with other local agencies to promote water conservation. The City also provided water conservation information and updates on its website. As part of a public outreach program for water conservation, City representatives visited schools to discuss water conservation. The City coordinated and/or participated in public education/outreach events from FY 2015-16 through FY 2019-20.

As discussed in Section 9.2.5, the City distributed water conservation literature that alerted customers to be on the lookout for water system leaks and to correct them promptly.

As a part of normal operation and maintenance of the water system, City staff performed preventive maintenance. This included regular checks on valves and meters, and pipeline maintenance. The City monitored the water system for losses by comparing water production to water sales.

As described in Section 9.2.6, the City employed a full time Water Resources Coordinator to oversee all water conservation activities from FY 2015-16 through FY 2019-20. The Water Resources Coordinator is responsible for all matters pertaining to the City's water conservation program including implementation of DMMs. The City plans to continue to provide water conservation program coordination and staffing support.

Other DMMs employed by the City are discussed in Section 9.2.7. Highlights of other DMM implementation over the past five years are described below.

- Landscape Conservation Program – During FY 2015-16 through FY 2019-20, the City routinely hosted seminars and workshops in the community to promote landscape conservation. The City also offered a rebate program for the purchase of landscape related items to both residential and commercial customers to promote water conservation.
- High Efficiency Clothes Washing Machine Rebate Program – The City distributed high efficiency washing machine rebates from FY 2015-16 through FY 2019-20.
- High Efficiency Toilet Rebate Program – The City distributed high efficiency toilet rebates from FY 2015-16 through FY 2019-20.

### *9.3.2 IMPLEMENTATION TO ACHIEVE WATER USE TARGETS*

**CWC 10631.**

*(e)(1)(A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

The Demand Management Measures implemented by the City are discussed in Section 9.2. Descriptions regarding the nature and extent of these Demand Management Measures implemented by the City over the past five years are discussed in Section 9.3. The City will continue to implement these Demand Management Measures and other water conservation programs and work collaboratively with IEUA and MWD to provide water conservation programs for its residents.

As discussed in Section 5.5, the City's per-capita water use during FY 2019-20 was 161 GPCD. The City's confirmed 2020 Water Use Target is 196 GPCD. The City's per-capita water use during FY 2019-20 meets the 2020 Water Use Target and is in compliance. The City met the 2020 Water

Use Target through the implementation of the Demand Management Measures discussed in Section 9.2. Continued implementation of these Demand Management Measures will assist the City in meeting water use targets and objectives.

## 9.4 WATER USE OBJECTIVES (FUTURE REQUIREMENTS)

The City is currently working with DWR to develop Water Use Objectives pursuant to AB 1668 and SB 606. Beginning in 2024, water agencies, including the City, are required to begin reporting compliance of their Water Use Objectives consisting of indoor residential water use, outdoor residential water use, commercial, industrial and institutional, irrigation with dedicated meters, water loss, and other unique local uses. The City plans to meet its Water Use Objectives through continued implementation of the Demand Management Measures discussed in Section 9.2.

Chapter 10

# PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

## LAY DESCRIPTION – CHAPTER 10

### PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Chapter 10 (Plan Adoption, Submittal, and Implementation) of the City's 2020 Plan discusses and provides the following:

- The steps the City has performed to adopt and submit its 2020 Plan are detailed.
- The steps the City has performed to adopt and submit its Water Shortage Contingency Plan are detailed.
- The City coordinated the preparation of its 2020 Plan with the Chino Basin Watermaster, CDA, County of San Bernardino, Cucamonga Valley Water District, Fontana Water Company, IEUA, Jurupa Community Services District, Monte Vista Water District, MWD, Santa Ana Watershed Project Authority, SAWCo, WFA, and the Cities of Chino, Chino Hills, Fontana, Montclair, Pomona, Rancho Cucamonga, and Upland. The City notified these agencies at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited these agencies to participate in the development of the 2020 Plan.
- The City provided a notice of the public hearing to the same agencies regarding the time, date, and place of the public hearing.
- The City published a newspaper notification of the public hearing, once a week for two successive weeks.
- The City conducted a public hearing to discuss and adopt the City's 2020 Plan and City's Water Shortage Contingency Plan.
- Within 30 days of adoption, the City submitted the 2020 Plan and Water Shortage Contingency Plan to the California Department of Water Resources.
- Within 30 days of adoption, the City submitted all data tables associated with the 2020 Plan to the California Department of Water Resources.
- Within 30 days of adoption, the City submitted a copy of the 2020 Plan to the State of California Library.
- Within 30 days of adoption, the City submitted a copy of the 2020 Plan (and Water Shortage Contingency Plan) to the County of San Bernardino Assessor- Recorder/ Clerk's office and the City Clerk's Office.
- Within 30 days after submittal of the 2020 Plan to the California Department of Water Resources, the City made the 2020 Plan (including the Water Shortage Contingency Plan) available at the City Clerk's Office and on the City's website.

- The steps the City will perform to amend the 2020 Plan and/or the Water Shortage Contingency Plan, if necessary, are provided.

## 10.1 INCLUSION OF ALL 2020 DATA

The data provided in the City's 2020 Plan and the Water Shortage Contingency Plan is provided on a FY basis through June 30, 2020 (as discussed in Section 2.5).

## 10.2 NOTICE OF PUBLIC HEARING

The City's public hearing notification process for its 2020 Plan and the Water Shortage Contingency Plan is discussed below.

### *10.2.1 NOTICE TO CITIES AND COUNTIES*

**CWC 10621.**

*(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

**CWC 10642.**

*…The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area…*

#### *10.2.1.1 60 DAY NOTIFICATION*

As discussed in Section 2.6.1 and Section 2.6.2, the City coordinated the preparation of the 2020 Plan with the Chino Basin Watermaster, CDA, Cucamonga Valley Water District, Fontana Water Company, IEUA, Monte Vista Water District, MWD, Santa Ana Watershed Project Authority, SAWCo, and WFA. The City notified these agencies, as well as the city and county within which the City provides water supplies, at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited them to participate in the development of the Plan. A copy of the notification letters sent to these agencies is provided in Appendix D.

### 10.2.1.2 NOTICE OF PUBLIC HEARING

The City provided a notice of the public hearing to the Chino Basin Watermaster, CDA, Cucamonga Valley Water District, Fontana Water Company, IEUA, Monte Vista Water District, MWD, Santa Ana Watershed Project Authority, SAWCo, and WFA. The notice includes the time and place of the public hearing. In accordance with Government Code Section 7291, if the City's audience for the public hearing includes a substantial number that are not able to speak or understand English, the City will provide interpreters. To ensure that the draft 2020 Plan and the draft Water Shortage Contingency Plan were available for review, the City placed a copy at the City Clerk's Office located at City Hall and made a copy available for review on its website. Copies of the notice of the public hearing are provided in Appendix D.

### 10.2.1.3 SUBMITTAL TABLES

Table 10-1 summarizes the agencies which were provided notifications by the City.

**Table 10-1 Notification to Cities and Counties**

| Submittal Table 10-1 Retail: Notification to Cities and Counties | | |
|---|---|---|
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| Chino | Yes | Yes |
| Chino Hills | Yes | Yes |
| Fontana | Yes | Yes |
| Montclair | Yes | Yes |
| Pomona | Yes | Yes |
| Rancho Cucamonga | Yes | Yes |
| Upland | Yes | Yes |
| County Name *Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| San Bernardino County | Yes | Yes |
| | | |
| NOTES: | | |

### *10.2.2 NOTICE TO THE PUBLIC*

**CWC 10642.**

*...Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies.*

**Government Code 6066.**

*Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.*

Pursuant to Section 6066 of the Government Code, the City published an English and Spanish notice of public hearing in the newspaper during the weeks of June 1, 2021 and June 8, 2021. A notice of public hearing was also provided to the City Clerk's office and was posted throughout the City of Ontario and on the City's website. A copy of the published notice is provided in Appendix D. To ensure the draft 2020 Plan and the draft Water Shortage Contingency Plan were available for review, the City placed a copy of the Plan at the City Clerk's Office located at City Hall and made a copy available for review on its website.

## 10.3 PUBLIC HEARING AND ADOPTION

**CWC 10642.**

*...Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon.*

**CWC 10608.26.**

*(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:*

*(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.*

*(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.*

*(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.*

### 10.3.1 PUBLIC HEARING

Prior to adopting the draft 2020 Plan and the draft Water Shortage Contingency Plan, the City held a public hearing on June 15, 2021 which included input from the community regarding the City's draft 2020 Plan and the draft Water Shortage Contingency Plan. As part of the public hearing, the City adopted a method to determine of its water use targets through selection of Target Method 1 (see Section 5.2.1 and Appendix H). In addition, the City considered the economic impacts of meeting these water use targets; including measures described in Section 8.8.

### 10.3.2 ADOPTION

**CWC 10642.**

*… After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.*

Following the public hearing, the City adopted both the draft 2020 Plan and the draft Water Shortage Contingency Plan (included in Chapter 8). A copy of the resolutions adopting the 2020 Plan, the Water Shortage Contingency Plan, and the addendum to the 2015 Urban Water Management Plan are provided in Appendix R.

## 10.4 PLAN SUBMITTAL

**CWC 10621.**

*(e) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.*

**CWC 10644.**

*(a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption.*

**CWC 10635.**

*(c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*

The City's submittal process for its 2020 Plan and the Water Shortage Contingency Plan is discussed below.

### 10.4.1 SUBMITTING A UWMP AND WATER SHORTAGE CONTINGENCY PLAN TO DWR

The City Council adopted the 2020 Plan on June 15, 2021 and within 30 days of adoption and before July 1, 2021, the City submitted the adopted 2020 Plan (including the Water Shortage Contingency Plan) to DWR. The 2020 Plan and Water Shortage Contingency Plan were submitted through DWR's "Water Use Efficiency (WUE) Data Portal" website.

DWR developed a checklist which was used by the City to assist DWR with its determination that the City's 2020 Plan has addressed the requirements of the California Water Code. The City has completed the DWR checklist by indicating where the required CWC elements can be found within the City's 2020 Plan (See Appendix C).

### 10.4.2 ELECTRONIC DATA SUBMITTAL

**CWC 10644.**

> *(a)(2) The plan, or amendments to the plan, submitted to the department …shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.*

Within 30 days of adoption of the 2020 Plan and before July 1, 2021, the City submitted all data tables associated with the 2020 Plan through DWR's "Water Use Efficiency Data Portal" website.

### *10.4.3 SUBMITTING A UWMP, INCLUDING WSCP, TO THE CALIFORNIA STATE LIBRARY*

Within 30 days of adoption of the 2020 Plan by the City Council, a copy (CD or hardcopy) of the 2020 Plan was submitted to the State of California Library. A copy of the letter to the State Library will be maintained in the City's file. The 2020 Plan will be mailed to the following address if sent by regular mail:

California State Library
Government Publications Section
Attention: Coordinator, Urban Water Management Plans
P.O. Box 942837
Sacramento, CA 94237-0001

The 2020 Plan will be mailed to the following address if sent by courier or overnight carrier:

California State Library
Government Publications Section
Attention: Coordinator, Urban Water Management Plans
900 N Street
Sacramento, CA 95814

### *10.4.4 SUBMITTING A UWMP TO CITIES AND COUNTIES*

Within 30 days of adoption of the 2020 Plan (including the Water Shortage Contingency Plan) by the City Council, a copy of the 2020 Plan was submitted to the County of San Bernardino Assessor-Recorder/ Clerk's office and the City of Ontario's City Clerk's Office. A copy of the letter to the County of San Bernardino will be maintained in the City's file.

## 10.5 PUBLIC AVAILABILITY

**CWC 10645.**

*(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

*(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

Within 30 days after submittal of the 2020 Plan to DWR, the City made the 2020 Plan (including the Water Shortage Contingency Plan) available at the City Clerk's Office located at City Hall during normal business hours and on the City's website.

## 10.6 NOTIFICATION TO PUBLIC UTILITIES COMMISSION

**CWC 10621.**

*(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.*

The City is not regulated by the California Public Utilities Commission (CPUC).

## 10.7 AMENDING AN ADOPTED UWMP OR WATER SHORTAGE CONTINGENCY PLAN

**CWC 10621.**

*(d)The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).*

**CWC 10644.**

*(a)(1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.*

The City's amendment process for its 2020 Plan is discussed below.

### 10.7.1 AMENDING A UWMP

If the City amends the adopted 2020 Plan, the amended Plan will undergo adoption by the City's governing board. Within 30 days of adoption, the amended Plan will then be submitted to DWR, the State of California Library, the County of San Bernardino Assessor- Recorder/ Clerk's office, and the City of Ontario's City Clerk's Office.

### 10.7.2 AMENDING A WATER SHORTAGE CONTINGENCY PLAN

**CWC 10644.**

> *(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.*

If the City amends the adopted 2020 Plan (including the Water Shortage Contingency Plan), the amended Plan (and Water Shortage Contingency Plan) will undergo adoption by the City's governing board. Within 30 days of adoption, the amended Plan (and Water Shortage Contingency Plan) will then be submitted to DWR through the WUE portal, the State of California Library, the County of San Bernardino Assessor- Recorder/ Clerk's office, and the City of Ontario's City Clerk's Office.

# City of Ontario
# Water Master Plan Update

June 2020

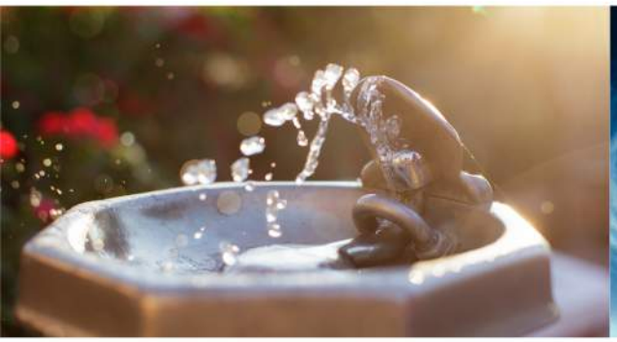

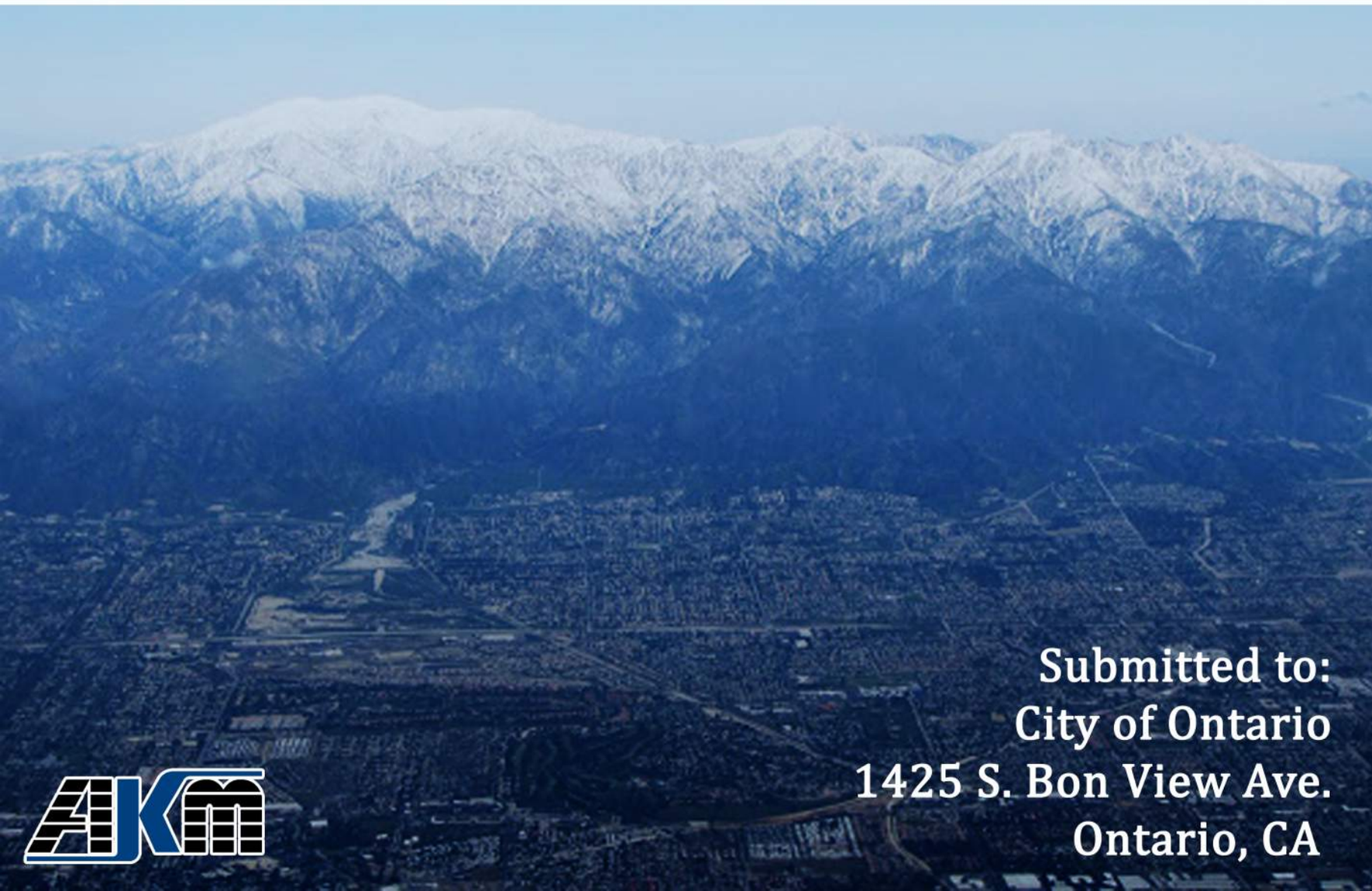

Submitted to:
City of Ontario
1425 S. Bon View Ave.
Ontario, CA

# CITY OF ONTARIO

# WATER MASTER PLAN UPDATE

*Date of Signing: 06/04/20*

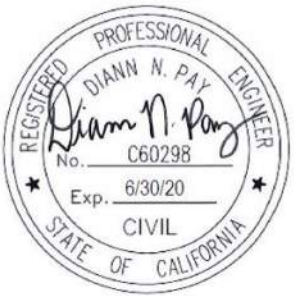


*Date of Signing: 06/04/20*

*Date of Signing: 06/04/20*

Submitted to:
City of Ontario
1425 S. Bon View Avenue
Ontario, California 91761

Submitted by:
AKM Consulting Engineers
553 Wald
Irvine, California 92618
(949) 753-7333

**June 2020**

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**Abbreviations**

| Abbreviation | Explanation |
|---|---|
| Ac, ac | Acre |
| AC, ACP | Asbestos Cement Pipe |
| AF | Acre-Foot or Acre Feet |
| AFY | Acre Feet per Year |
| AL | Action Level |
| amsl | Above Mean Sea Level |
| AWWA | American Water Works Association |
| BPS | Booster Pump Station |
| CBWM | Chino Basin Watermaster |
| ccf | Hundred Cubic Feet |
| CDA | Chino Basin Desalter Authority |
| CDA I | Chino Basin Desalter 1 |
| CDA II | Chino Basin Desalter 2 |
| CDPH | State of California Department of Public Health |
| cfs | Cubic Feet per Second |
| CII | Commercial, Institutional, Industrial |
| CIP, cip | Cast Iron Pipe |
| CIP | Capital Improvement Program |
| City | City of Ontario |
| CMLS | Concrete Mortar Lined Steel |
| CML & CMC | Concrete Mortar Lined & Concrete Mortar Coated |
| CML & CS | Concrete Mortar Lined & Coated Steel |
| CML & WS | Concrete Mortar Lined & Welded Steel |
| Conc | Concrete |
| CU | Copper |
| CVWD | Cucamonga Valley Water District |
| D/DBPR | Disinfectants/Disinfection By-Products Rule |
| DPH | State of California Department of Public Health |
| Dia | Diameter |
| DIP | Ductile Iron Pipe |
| DU, du | Dwelling Unit |
| DWR | State of California, Department of Water Resources |
| DW | Domestic Water |

| Abbreviation | Explanation |
|---|---|
| DYY | Dry Year Yield |
| EL, el | Elevation |
| ENR | Engineering News Record |
| EPA | United States Environmental Protection Agency |
| F | Fahrenheit |
| FCV | Flow Control Valve |
| fps | Feet per Second |
| ft | Feet |
| FY | Fiscal Year |
| GIS | Geographic Information System |
| gpcd | Gallons per Capita per Day |
| gpd | Gallons per Day |
| gpm | Gallons per Minute |
| GSTL | Galvanized Steel |
| HGE | Hydraulic Grade Elevation |
| HGL | Hydraulic Grade Line |
| HP, hp | Horsepower |
| HWL | High Water Level |
| IDSE | Initial Distribution System Evaluation |
| in | Inch |
| IEUA | Inland Empire Utilities Agency |
| JCSD | Jurupa Community Services District |
| LF | Lineal Feet |
| MCL | Maximum Contaminant Level |
| MCLG | Federal Maximum Contaminant Level Goal |
| MG, mg | Million Gallons |
| mgd | Million Gallons per Day |
| mg/l | Milligrams per Liter or Parts per Million |
| MWD | Metropolitan Water District of Southern California |
| NAVD | National American Vertical Datum |
| NL | Notification Levels |
| NOAA | National Oceanic and Atmospheric Administration |
| OBMP | Optimum Basin Management Program |
| OFD | Ontario Fire Department |

| Abbreviation | Explanation |
|---|---|
| O&M | Operation and Maintenance |
| OR | Ontario Ranch |
| OSHA | Occupational Safety & Health Administration |
| OSY | Operating Safe Yield |
| PCE | Tetrachloroethylene |
| PCCP | Pre-Cast Concrete Pipe |
| PHG | Public Health Goal |
| PRS | Pressure Regulating Station |
| PRV | Pressure Reducing Valve |
| psi | Pounds per Square Inch |
| PVC | Polyvinyl Chloride |
| RCCP | Reinforced Concrete Cylinder Pipe |
| RL | Response Levels |
| RPM | Rotations per Minute |
| RSTL | Riveted Steel |
| SAWC | San Antonio Water Company |
| SARWC | Santa Ana River Water Company |
| SCADA | Supervisory Control and Data Acquisition |
| SCE | Southern California Edison |
| SDWA | Safe Drinking Water Act |
| SF | Square Feet |
| SOI | Sphere of Influence |
| STL, stl | Steel |
| TCE | Trichloroethylene |
| TDH | Total Dynamic Head |
| TDS | Total Dissolved Solids |
| THAAS | Total Haloacetic Acids |
| TOC | Total Organic Carbon |
| TTHM | Total Trihalomethanes |
| µg/l | Micrograms per Liter or Parts per Billion |
| USEPA | United States Environmental Protection Agency |
| USGS | United States Geological Survey |
| UWMP | Urban Water Management Plan |
| VFD | Variable Frequency Drive |

| Abbreviation | Explanation |
|---|---|
| VOCs | Volatile Organic Compounds |
| WFA | Water Facilities Authority |
| WMP | Water Master Plan |
| WQPP | Water Quality Protection Plan |
| WS, WSTL | Welded Steel |
| WTP | Water Treatment Plant |

# SECTION ES

# EXECUTIVE SUMMARY

## ES-1 General

The City's latest Water Master Plan was completed in 2012. The intent of the 2020 Water Master Plan Update was to update the City's water model, perform hydraulic analyses, and develop capital improvement project recommendations based on the latest available information. The water model geometry was imported from the City's Water Geodatabase, from March 2019. The existing model demands and diurnal patterns were updated with the recent production, purchase, and water billing data. Future planning data was utilized to estimate future water demands. The hydraulic model was calibrated and used to conduct the existing and future system analyses. Average day demand (ADD), maximum day demand (MDD), peak hour and MDD plus fire flow scenarios were run. Existing and future system deficiencies were identified and improvement project were recommended.

## ES-2 Study Area

The water service area coincides with the City of Ontario boundary with the exception of two small areas. The City is divided into two distinct areas, the Original Model Colony (OMC) and Ontario Ranch (OR). The OMC consists of existing residential, commercial, and industrial developments, and the Ontario International Airport. It comprises approximately 37.2 square miles. Ontario Ranch is an agricultural area that was annexed to the City in 1999. It currently consists of approximately 12.8 square miles of primarily agricultural land.

The City's General Plan 2010 details future development of the agricultural lands in Ontario Ranch into a mix of residential, commercial, industrial, and public uses. Development of Ontario Ranch has begun with the development of Edenglen residential community located southeast of the intersection of Riverside Drive and Mill Creek Avenue. Residential communities currently in construction include Park Place development located east of Archibald Avenue and north and south of Merrill Avenue and the New Haven development located southwest of Haven Avenue and Schaefer Avenue.

For this Water Master Plan Update, the future residential population of Ontario Ranch was estimated to reach about 190,594. The total population of the City is estimated to expand to 371,979.

## ES-3 Water Supply

The City's existing imported water supply consists of water from the Water Facilities Authority (WFA) and Chino Basin Desalter Authority (CDA), with total entitlements of 25.0 MGD (17,260 AFY) and 8.6 MGD (8,533 AFY), respectively.

The City extracts groundwater from the Chino Groundwater Basin (Chino Basin or Basin), via seventeen (17) existing wells. Per the Chino Basin Judgement, the City of Ontario has appropriative rights to 16,337 AFY (14.6 MGD). The City has secured additional supply through early transfers for unused groundwater, groundwater recharge, and acquisition of groundwater rights.

## ES-4 Water Use

Historical water production and purchase data was reviewed between 2007 and 2019, which indicate that there has been a decrease in potable water production in recent years. This may be attributed to the expansion of the City's recycled water system, as well as a conscientious water conservation effort by the customers.

The existing potable water demand is important for evaluating the adequacy of the existing potable water facilities. Upon reviewing current production, purchase, and water billing data, the existing average day demand (ADD) is 19,280 gpm (31,153 AFY, 27.8 MGD) and the maximum day demand (MDD) is 29,790 gpm (48,951 AFY, 42.9 MGD).

To account for future development and redevelopment within the service area, future demands were estimated from specific plans, the General Plan, and the potable water demand factors. The potable water unit demand factors are generally based on the factors that were developed as a part of a study completed in May 2016 entitled "*Ultimate Citywide Water Demand Estimate*", and the revised potable water unit demand factors are shown in Table ES-1

**ES-1**

**Potable Water Unit Demand Factors**

| Landuse | | SAWCO (AFY) | Density (people/ du)[2] | Factors[3] | | | |
|---|---|---|---|---|---|---|---|
| | | | | gpd | unit | gpd/ac | gpd/du |
| **Residential** | | | | | | | |
| Rural Residential | RR | 2 | 3.997 | 172 | gpd/person | 1,375 | 687 |
| Low Density Residential (w/o RW) | LDR | 4 | 3.997 | 123 | gpd/person | 1,970 | 492 |
| Low Density Residential (w/ RW) | LDR | 5 | 3.997 | 95 | gpd/person | 1,900 | 380 |
| Low Medium Density Residential (w/o RW) | LMDR | 8.5 | 3.997 | 105 | gpd/person | 3,570 | 420 |
| Low Medium Density Residential (w/ RW) | LMDR | 11 | 3.997 | 90 | gpd/person | 3,960 | 360 |
| Medium Density Residential (w/o RW) | 5125.17 | 0 | 3.347 | 90 | gpd/person | 5,420 | 301 |
| Medium Density Residential (w/ RW) | 5498.09 | 0 | 3.347 | 80 | gpd/person | 6,690 | 268 |
| High Density Residential (w/o RW) | 5047.38 | 0 | 3.347 | 70 | gpd/person | 8,200 | 234 |
| High Density Residential (w/ RW) | 5326.91 | 0 | 3.347 | 60 | gpd/person | 8,030 | 201 |
| **Commercial** | 5162.38 | 0 | | | | | |
| Business Park (w/o RW) | 4911.28 | 0 | | 103 | gpd/job | 3,140 | |
| Business Park (w/ RW) | 4987.09 | 0 | - | 59 | gpd/job | 1,800 | - |
| General Commercial (w/o RW) | 5288.25 | 0 | | 258 | gpd/job | 3,140 | |
| General Commercial (w/ RW) | 3542.62 | 443.3 | - | 148 | gpd/job | 1,800 | - |
| Hospitality[4] (w/o RW) | 3029.19 | 106.5 | | 155 | gpd/room | 5,980 | |
| Hospitality[4] (w/ RW) | 3038.54 | 293.83 | - | 130 | gpd/room | 5,000 | - |
| Neighborhood Commercial (w/o RW) | 4413.48 | 358.75 | | 99 | gpd/job | 3,140 | |
| Neighborhood Commercial (w/ RW) | NC | - | - | 57 | gpd/job | 1,800 | - |
| Office Commercial (w/o RW) | OC | | | 53 | gpd/job | 3,840 | |
| Office Commercial (w/ RW) | OC | - | - | 35 | gpd/job | 2,500 | - |
| **Industrial** | | | | | | | |
| Industrial (w/o RW) | IND | - | - | 110 | gpd/job | 2,290 | - |
| Industrial (w/ RW) | IND | - | - | 67 | gpd/job | 1,400 | - |
| **Mixed Use[5]** | | | | | | | |
| High Density Residential (w/o RW) | MU-HDR | 35 | 2.000 | 70 | gpd/person | 4,900 | 140 |
| High Density Residential (w/ RW) | MU-HDR | 40 | 2.000 | 60 | gpd/person | 4,800 | 120 |
| Office (w/o RW) | MU-O | | | 53 | gpd/job | 3,840 | |
| Office (w/ RW) | MU-O | - | - | 35 | gpd/job | 2,500 | - |
| Non-Office (w/o RW) | MU-NO | | | 179 | gpd/job | 2,690 | |
| Non-Office (w/ RW) | MU-NO | - | - | 102 | gpd/job | 1,800 | - |

**ES-1 (Continued)**

**Potable Water Unit Demand Factors**

| Landuse | | Max Density (du/ac)[1] | Density (people/ du)[2] | Factors[3] | | | |
|---|---|---|---|---|---|---|---|
| | | | | gpd | unit | gpd/ac | gpd/du |
| **Open Space** | | | | | | | |
| Open Space Non-Recreational (w/o RW) | OS-NR | | | | | 2,340 | |
| Open Space Non-Recreational (w/ RW) | OS-NR | - | - | - | | 1,000 | - |
| Open Space Recreational (w/o RW) | OS-R | | | | | 2,340 | |
| Open Space Recreational (w/ RW) | OS-R | - | - | - | | 1,000 | - |
| **Public** | | | | | | | |
| Public Facility (w/o RW) | PF | | | | | 3,040 | |
| Public Facility (w/ RW) | PF | - | - | - | | 1,700 | - |
| Public Middle or High School (w/o RW) | PS | - | - | 50 | gpd/student | 3,500 | - |
| Public Middle or High School (w/RW) | PS | - | - | 10 | gpd/student | 1,800 | - |
| Public Elementary School (w/o RW) | PS | - | - | 30 | gpd/student | 3,500 | - |
| Public Elementary School (w/RW) | PS | - | - | 10 | gpd/student | 1,800 | - |

*[1] Max Density per the City's 2010 General Plan (The Ontario Plan) for OMC without recycled water. Density for LDR, LMDR, MDR, and HDR with recycled water (Ontario Ranch) were increased per the City Planning Department recommendation (March 2016).*

*[2] Density per the City's 2010 General Plan (The Ontario Plan)*

*[3] Unit Flow Factor Abbreviations:*

*ac = acre* *du = dwelling unit* *gpd = gallons per day*

*room = hotel/motel room* *stu = student* *tsf = thousand square feet*

*[4] If possible it is recommended to use 130 - 155 gpd/room on a case by case basis. It is difficult to estimate the number of rooms or square footage per acre.*

*[5] Mixed Use demands should be based on the types of landuse that make up the specific area and the unit demand factors provided above. The City's 2010 General Plan (The Ontario Plan) provides detailed information on the landuses that make up each mixed use area.*

The future average day demand (ADD) was 35,716 gpm (57,610 AFY, 51.4 MGD) and the maximum day demand (MDD) was 54,778 gpm (88,357 AFY, 78.9 MGD).

## ES-5 Diurnal Patterns

To evaluate the adequacy of the potable water sources of supply, pumping facilities, reservoirs, and the transmission / distribution facilities, it is important to have an understanding of how the potable water demand vary over a 24-hour period. A mass balance of the supply in, flow out, and change in reservoir level was conducted to develop the diurnal demand patterns in 15 minute increments. Diurnal demand patterns were developed by hydraulic zone, by meter type, and for high water users. Since system pressures, pipe velocities and fire flow capabilities can be affected by the usage patterns of customers with historically high water use, specific diurnal patterns were developed for the high water users.

## ES-6 Existing System

According to the City's Water Geodatabase from March 2019, the City's existing domestic water system consisted of the following:

- Five (5) primary pressure zones (925, 1010, 1074, 1212, and 1348 Zones)
- Over 3.1 million feet (584 miles) of transmission and distribution pipe, 2 inches through 42 inches in diameter
- 7,277 fire hydrants
- 35,906 water meters
- Seventeen (17) active wells
- Twelve (12) reservoirs with a total volume of 75 MG
- Six (6) active booster pump stations
- Fifteen (15) pressure reducing stations (PRS)
- Two (2) connections to Water Facilities Authority
- Two (2) connections to Chino Desalter Authority
- Five (5) inter-agency connections
- Two (2) Ion Exchange Treatment Facility
- Four (4) altitude valves

The existing potable water system is shown on Figure ES-1.

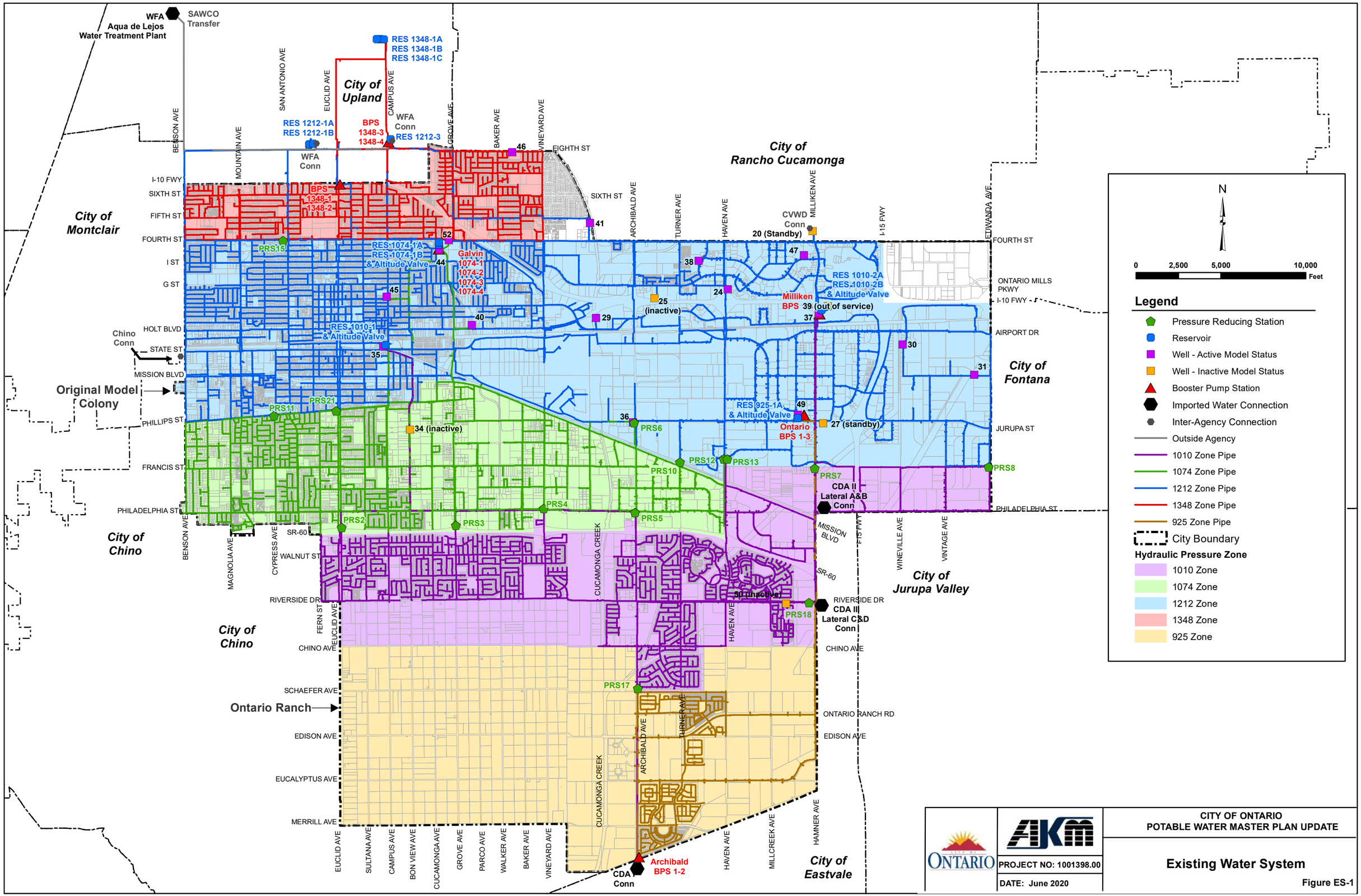
WFA
Aqua de Lejos
Water Treatment Plant
SAWCO
Transfer
RES 1348-1A
RES 1348-1B
RES 1348-1C
City of
Upland
RES 1212-1A
RES 1212-1B
BPS
1348-3
1348-4
WFA
Conn
RES 1212-3
WFA
Conn
BPS
1348-1
1348-2
City of
Rancho Cucamonga
City of
Montclair
RES 1074-1A
RES 1074-1B
& Altitude Valve
Galvin
1074-1
1074-2
1074-3
1074-4
RES 1010-1
& Altitude Valve
Chino
Conn
Original Model
Colony
CVWD
Conn
20 (Standby)
RES 1010-2A
RES 1010-2B
& Altitude Valve
Milliken
BPS 39 (out of service)
25
(inactive)
34 (inactive)
RES 925-1A
& Altitude Valve
Ontario
BPS 1-3
27 (standby)
City of
Fontana
CDA II
Lateral A&B
Conn
50 (inactive)
CDA III
Lateral C&D
Conn
City of
Jurupa Valley
City of
Chino
Ontario Ranch
Archibald
BPS 1-2
CDA I
Conn
City of
Eastvale
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ELDERANDA AVE
FOURTH ST
ONTARIO MILLS PKWY
I-10 FWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
I-10 FWY
SIXTH ST
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
PHILADELPHIA ST
SR-60
WALNUT ST
RIVERSIDE DR
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
MAGNOLIA AVE
CYPRESS AVE
FERN ST
CUCAMONGA CREEK
MISSION BLVD
WINEVILLE AVE
VINTAGE AVE
ONTARIO RANCH RD
SULTANA AVE
BON VIEW AVE
PARCO AVE
WALKER AVE
MILLCREEK AVE
HAMNER AVE
PRS2
PRS3
PRS4
PRS5
PRS6
PRS7
PRS8
PRS10
PRS11
PRS12
PRS13
PRS15
PRS17
PRS18
PRS21
N
0 2,500 5,000 10,000 Feet
Legend
Pressure Reducing Station
Reservoir
Well - Active Model Status
Well - Inactive Model Status
Booster Pump Station
Imported Water Connection
Inter-Agency Connection
Outside Agency
1010 Zone Pipe
1074 Zone Pipe
1212 Zone Pipe
1348 Zone Pipe
925 Zone Pipe
City Boundary
Hydraulic Pressure Zone
1010 Zone
1074 Zone
1212 Zone
1348 Zone
925 Zone
ONTARIO
AKM
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Existing Water System
Figure ES-1

## ES-7 Performance Evaluation Criteria

Establishing performance criteria is an important part of evaluating existing water systems, as it forms the basis for system analysis and system improvement recommendations. Some criteria are based upon experience and their application is at the discretion of the water purveyor. This includes service pressures, storage capacity, and sources of supply. Other criteria, such as water quality and fire protection, are based on federal, state and local jurisdictional requirements. A summary of the service criteria is listed in Table ES-2.

**ES-2**

**Service Criteria**

| Description | Criteria | Existing Requirement | Future Requirement |
|---|---|---|---|
| 1. Source of Supply | | | |
| a. Total | Maximum Day Demand ( except for closed zones which shall be Maximum Day Demand plus Fire Flow Demand or Peak Hour, whichever is greater) | 29,790 gpm | 54,780 gpm |
| b. Local Supply | Average Day Demand | 19,280 gpm | 35,700 gpm |
| 2. Reservoir Capacity | | | |
| a. Operational Storage | 30% of Maximum Day Demand for the OMC and 25% of Maximum Day Demand for Ontario Ranch | TBD | TBD |
| b. Emergency Storage | 100% of Average Day Demand | 27.8 mg | 39.7 mg |
| c. Fire Suppression | Highest Fire Flow Requirement | | |
| *Residential* | | | |
| Rural | 1,500 gpm for 2 hours | 0.18 mg | 0.18 mg |
| Low Density | 1,500 gpm for 2 hours | 0.18 mg | 0.18 mg |
| Low-Medium Density | 1,500 gpm for 2 hours | 0.18 mg | 0.18 mg |
| Medium Density | 2,000 gpm for 2 hours | 0.24 mg | 0.24 mg |
| High Density | 3,500 gpm for 4 hours | 0.84 mg | 0.84 mg |
| *Retail / Service* | | | |
| Neighborhood Commercial | 2,500 gpm for 3 hours | 0.45 mg | 0.45 mg |
| General Commercial | 3,000 gpm for 3 hours | 0.54 mg | 0.54 mg |
| Office Commercial | 3,000 gpm for 3 hours | 0.54 mg | 0.54 mg |
| Hospitality | 4,000 gpm for 4 hours | 0.96 mg | 0.96 mg |
| *Employment* | | | |
| Business Park | 3,000 gpm for 3 hours | 0.54 mg | 0.54 mg |
| Industrial | 4,000 gpm for 4 hours | 0.96 mg | 0.96 mg |

## ES-8 Hydraulic Model

The hydraulic model was developed to evaluate the adequacy of the existing facilities under the current and future supply and demand conditions.

Generally, the model development steps included the following:

1. Import water system GIS data to modeling software
2. Verify and complete pipe information (pressure zone, diameter, length, roughness)
3. Verify and complete junction information (pressure zone, elevations)
4. Add detailed facility data (wells, pump station, reservoir, imported water turnouts, and pressure reducing stations)

5. Add facility information (dimensions and water level for tank, pump curves for pumps, sizes and pressure settings for pressure reducing valves, and aquifer levels for well pump suction levels)
6. Determine and assign demands to model junctions
7. Develop and assign diurnal demand curves to model junctions
8. Assign controls to facilities (well, booster pump station, and altitude valve start and stop conditions)
9. Model Calibration

## ES-9 Model Calibration

The general calibration methodology was to gather as much system information as possible from available SCADA information and pressure measuring equipment temporarily installed in the field. This information was then used for input into the model as well as for comparison of model results. The calibration process was used to verify the accuracy of the model, system configuration, and the hydraulic parameters utilized.

April 18, 2019 was selected as the calibration day. SCADA data, specific to the calibration data, was reviewed to research the initial reservoir levels, well and pump station start and stop times, imported water turnout flowrates, and PRS status. A mass balance analysis was performed for each hydraulic zone to develop the calibration day demand and diurnal patterns. A calibration scenario was created in the hydraulic model, which includes this input data that is specific to April 18, 2019.

The model reservoir levels were compared to the SCADA data over the 24-hour period to verify that model calibration. To further calibrate the model, pressure data was collected by installing portable pressure data loggers throughout the system, during the calibration period. The model pressures were compared to the recorded field pressure at these locations to further verify that the model was well calibrated.

## ES-10 Existing System Analysis

The existing system analysis was conducted to identify all necessary potable water system improvements. Planned rehabilitation and replacement projects were identified for facilities with known condition, capacity, operation, and/or maintenance deficiencies. These projects were identified upon review of the city's existing CIP schedule and meetings with City staff. Recommendations include but are not limited to replacement of transmission mains, reservoir rehabilitation, well rehabilitation, reservoir rehabilitation, pump station rehabilitation and groundwater treatment projects. Other projects recommended included PRS improvements, back-up power sources, meter improvements, SCADA upgrades and security improvements.

In addition, the established system criteria and calibrated system computer model were used to analyze the existing system under average day, maximum day, and peak hour conditions. Source of supply, reservoir storage, system pressure, and pipeline velocities were evaluated with the hydraulic model.

The condition of the existing potable water facilities were also evaluated. All facilities have useful lives for which relatively trouble-free service can be expected. Once exceeded, these facilities become less reliable, expensive to maintain and are subject to failure. Therefore, facility age is considered in the assessment of all water systems and in formulating future replacement projects. Wells, pump stations, reservoirs, and pipelines that have reached the end of their useful lives were identified and replacement projects were recommended.

Pipes with small diameters that do not currently meet the City's minimum criteria (8-inches) were recommended for replacement. In addition, fire hydrant laterals that do not meet the City's diameter minimum criteria (6-inches) and older metal hydrant laterals were also recommended for replacement.

The recommendations from the existing system analysis were incorporated into the capital improvement program (CIP).

## ES-11 Future System

A future system model scenarios were updated to include the recommendations included from the existing system analysis as well as projects that have been identified for the future water system expansion.

Developer Impact Fee (DIF) projects were provided by the City and incorporated into the future system model and CIP. The DIF projects primarily include reservoirs, wells, pump stations, pipelines, water quality treatment

facilities, and pressure reducing stations that will serve the Ontario Ranch (OR) developments in the 925 Zone and the 1010 Zone. The future potable water system is shown on Figure ES-2.

The proposed DIF projects include one additional 6 MG reservoir and two 9 MG reservoirs in the 925 Zone. The proposed 6 MG reservoir will be located adjacent the existing 6 MG reservoir (Dupont Ave and Jurupa St). The two 9 MG reservoirs are planned to be located between Bon View Avenue and Cucamoga Avenue, north of Francis Street. Treatment facilities will be provided at both reservoir sites to treat groundwater before entering the distribution system. The DIF projects also include seven (7) new wells, which will provide an additional 17,000 gpm capacity for the future growth in this area.

The proposed DIF projects were incorporated into the CIP.

## ES-12 Future System Analysis

The established system criteria and future system model scenarios were used to analyze the future system under average day, maximum day, peak hour, and maximum day plus fire flow conditions. Source of supply, reservoir storage, system pressure, pipeline velocities, fire flow pressure, and fire flow availability were evaluated with the hydraulic model.

The recommendations from the future system analysis were incorporated into the CIP.

## ES-13 Capital Improvement Program

The primary goal of the Capacity Improvement Program (CIP) is to provide the City with a long-range planning tool for implementing its water system improvements in an orderly manner and a basis for financing of these improvements. The CIP consists of projects that will enhance the system to meet the established criteria, properly maintain the system's assets, and replace the facilities that have reached the end of their useful lives.

### ES-13.1 Project Categorization

Improvement projects are categorized as follows:

Existing System Improvement Projects include:

- Improvements identified from the hydraulic model analysis, such as velocity and fire flow deficiencies.
- Projects identified from the City's operations and engineering staff, to improve the condition of the main facilities such as reservoirs.
- Projects included on the City's existing DIF maps in the OMC area

Annual Improvement Projects are projects that need to be regularly updated and include:

- Reservoir recoating/repainting/ and repair improvements
- Meter replacement

Condition Projects – Mainline Replacement Program include:

- Small diameter pipes
- Pipes exceeding useful lives

Condition Projects – Facility Improvement Program include:

- Improvements to existing fire hydrant lateral size and/or material
- Wells exceeding useful lives
- Pump stations exceeding useful lives
- Reservoirs exceeding useful lives

Future System Development Projects include:

- DIF projects in the OR area

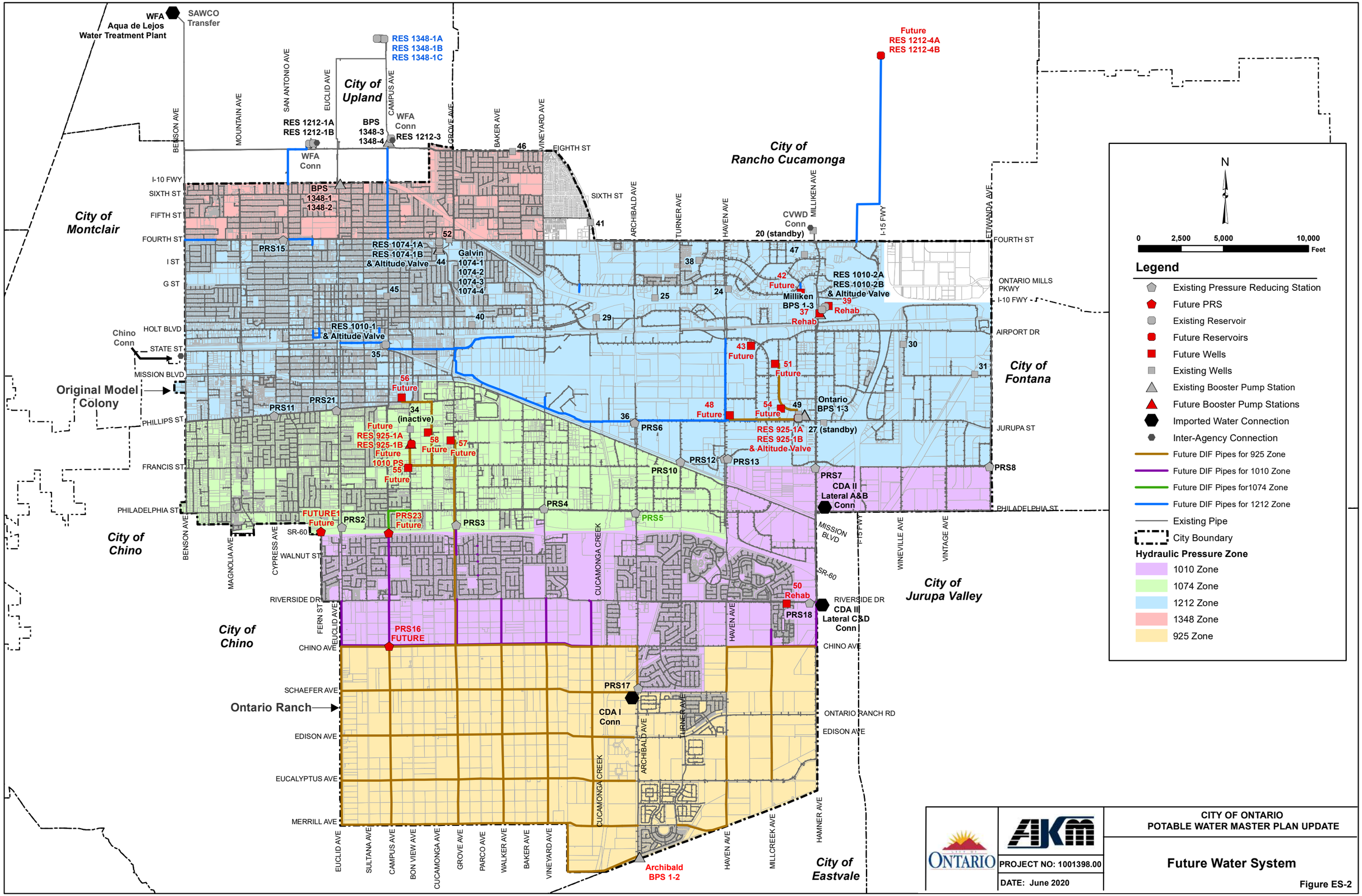


CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE

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DATE: June 2020

**Future Water System**

Figure ES-2

## ES-13.2 Project Cost Estimate

The cost estimates are based upon recent information for similar projects in the City of Ontario, and include contingencies for this planning level study. The cost estimates are based on the unit construction costs, detailed in Table ES-3. Pipeline costs take into consideration the size of the pipe as well as whether the construction will be within the OMC or OR areas. OMC is largely developed and there are many existing utilities to consider; therefore, the costs of replacing water pipes will be generally higher than the new construction costs in undeveloped areas such as OR.

Pipe improvements recommendations in the OMC are based on the replacement of the existing pipes. Replacement costs are generally more conservative and will therefore allow the City more flexibility for each project. Preliminary design studies should be conducted, utilizing detailed utility information to identify and evaluate project alternatives such as parallel pipes.

The estimated unit costs for wells include permanent back-up power.

**Table ES-3**
**Unit Cost Summary**

| Type | | Units | OMC | OR |
|---|---|---|---|---|
| Pipe | 6-inch [1] | $/LF | $108.36 | $72.00 |
| Pipe | 8-inch | $/LF | $144.48 | $96.00 |
| Pipe | 12-inch | $/LF | $216.72 | $144.00 |
| Pipe | 16-inch | $/LF | $288.96 | $192.00 |
| Pipe | 18-inch | $/LF | $325.08 | $260.06 |
| Pipe | 24-inch | $/LF | $433.44 | $331.56 |
| Pipe | 30-inch | $/LF | $541.80 | $403.05 |
| Pipe | 36-inch | $/LF | $650.16 | $486.31 |
| Pipe | 42-inch | $/LF | $758.52 | $557.81 |
| Well | | $/LS | $4,000,000.00 | |
| Reservoir | | $/MG | $1,444,800.00 | |
| Pump Station | | $/HP | $6,000.00 | |
| PRS | | $/LS | $680,260.00 | |
| Treatment Plant | | $/Well | $6,324,111.00 | |

[1] *6-inch recommendation for laterals only*

The total costs include construction, contingency, engineering, design, and construction management costs. The individual cost components are calculated as follows:

1. Base Cost = Unit Cost x Recommended Units (such as footage, number of wells, etc.)
2. Contingency Cost = 10% of the Base Cost
3. Construction Cost = Base Cost + Contingency Cost
4. Engineering and Design Cost = 10% of the Construction Cost
5. Construction Management Cost = 5% of the Construction Cost
6. Total Cost = Construction Cost + Engineering and Design Cost + Construction Management Cost

Construction costs can be expected to fluctuate as changes occur in the economy. These costs should therefore be reevaluated and updated annually based upon Engineering News Record (ENR) Index for the Los Angeles area (ENRLA), with the base ENRLA Index of 12,144.49 for January 2020.

The recommended CIP is detailed in Table ES-4. Project locations are shown on Plate 1.

A summary of the total costs are as follows:

| | |
|---|---|
| Existing System Improvement Projects: | $237,900,000 |
| Condition Projects – Mainline Replacement Program: | $226,200,000 |
| Condition Projects – Facility Improvement Program: | $89,600,000 |
| Future System Development Projects: | $225,600,000 |
| **Total CIP cost:** | **$779,300,000** |
| | |
| Annual Improvement Projects: | $3,600,000/Year |

**Table ES-4**
**Capital Improvement Program**

| Existing System Capital Improvement Projects | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project No.** | **OMC/ OR** | **Ex/ Fut** | **Facility Type** | **DIF#** | **Description** | **Replacement Pipe Size (in)** | **Number** | **Unit** | **Unit Cost ($)** | **Unit** | **Base Cost ($)** | **10% Contingency ($)** | **Construction Cost ($)** | **10% Engineering & Admin. ($)** | **5% Construction Mgmt. ($)** | **Total Cost ($)** |
| O01[1] | OMC | Ex | Other | WT-026 | 1348 Zone Reservoirs Structural Retrofits | N.A. | 1 | Reservoir | $5,800,000.00 | LS | $5,800,000 | $580,000 | $6,380,000 | $638,000 | $319,000 | $7,337,000 |
| O02 | OMC | Ex | Other | WT-026 | Reservoir 1010-1A Piping Seismic Retrofits | Completed | | | | | | | | | | |
| S01[1] | OMC | Ex | Supply | WT-002 | CIP Well #43 in the 1212 Zone Equipping of Well drilled in 2008 | N.A. | 1 | Well | $1,600,000.00 | $/Well | $1,600,000 | $160,000 | $1,760,000 | $176,000 | $88,000 | $2,024,000 |
| S02 | OMC | Ex | Supply | WT-002 | CIP Well #42 in the 1212 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S03 | OMC | Ex | Supply | WT-032 | Treatment for OMC Wells | N.A. | 12 | Well | $6,324,111 | $/Well | $75,889,328 | $7,588,933 | $83,478,261 | $8,347,826 | $4,173,913 | $96,000,000 |
| S04[2] | OMC | Ex | Supply | WT-002 | 18-inch Well #42 Collector Line (1212 Zone) | 18 | 600 | ft | $325.08 | $/ft | $195,048 | $19,505 | $214,553 | $21,455 | $10,728 | $246,736 |
| S05 | OMC | Ex | Supply | WT-009 | 18-Inch to PRS23 P-14 (1074 Zone) | 18 | 2,620 | ft | $325.08 | $/ft | $851,710 | $85,171 | $936,881 | $93,688 | $46,844 | $1,077,413 |
| Skipped | OMC | | Supply | WT-032 | Skipped | Skipped | | | | | | | | | | |
| S07 | OMC | Ex | Supply | WT-023 | Well #11 Abandon due to continuing sanding problem (1074 Zone) | Completed | | | | | | | | | | |
| R01 | OMC | Ex | Reliability | WT-017 | Backup Power for Well 39 (500 KW) - 1010 Zone | Completed | | | | | | | | | | |
| ST01[1] | OMC | Ex | Storage | WT-026 | Reservoir 1212-3, seismic rehabiliation (Improvements included in 2012 Tech Memo) | N.A. | 73,100 | sq ft | $10.00 | $/sq ft | $4,017,694 | $401,769 | $4,419,463 | $441,946 | $220,973 | $5,082,383 |
| ST02 | OMC | | Storage | WT-009 | Booster Pump Station from 1010 Zone to 1074 Zone - Location to be determined | Removed | | | | | | | | | | |
| O03 | OMC | | Other | WT-035 | Airport Metering and Backflow Prevention - Planning | Removed | | | | | | | | | | |
| O04 | OMC | | Other | WT-035 | Airport Metering and Backflow Prevention - Construction | Removed | | | | | | | | | | |
| R02[1] | OMC | Ex | Reliability | WT-017 | Portable Generator Connection and Manual Transfer Switchs at Well 31 and Well 39. | N.A. | 1 | Well | $300,000.00 | Lump Sum | $300,000 | $30,000 | $330,000 | $33,000 | $16,500 | $379,500 |
| R03[1] | OMC | Ex | Reliability | WT-017 | Portable Generators-850 KW | N.A. | 1 | EA | $670,000.00 | $/Genset | $670,000 | $67,000 | $737,000 | $73,700 | $36,850 | $847,550 |

**Table ES-4 (Continued)**
**Capital Improvement Program**

| Existing System Capital Improvement Projects | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
| S08 | OMC | Ex | Supply | WT-023 | Abandon Existing OMC Well #3 | Completed | | | | | | | | | | |
| S09 | OMC | Ex | Supply | WT-023 | Abandon Existing OMC Well #4 | Completed | | | | | | | | | | |
| S10 | OMC | Ex | Supply | WT-023 | Abandon Existing OMC Well #16 | Completed | | | | | | | | | | |
| S11 | OMC | | Supply | WT-023 | Skipped | Skipped | | | | | | | | | | |
| S12 | OMC | | Supply | WT-025 | Abandon John Galvin Facility | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| P01[2] | OMC | Ex | DIF 1212 Zone | WT-004 | 24-inch pipeline in Campus Ave from Eighth St to Fourth St (1212 Zone) | 24 | 5,400 | ft | $433.44 | $/ft | $2,340,576 | $234,058 | $2,574,634 | $257,463 | $128,732 | $2,960,829 |
| P02 | OMC | Ex | DIF 1212 Zone | WT-004 | 30-inch pipeline in Eighth St from Reservoir 1212-1A and 1212-1B to San Antonio Ave (1212 Zone) | 30 | 1,650 | ft | $541.80 | $/ft | $893,970 | $89,397 | $983,367 | $98,337 | $49,168 | $1,130,872 |
| P03 | OMC | Ex | DIF 1212 Zone | WT-004 | 30-inch pipeline in San Antonio Ave from Eighth St to Fourth St (1212 Zone) | 30 | 2,100 | ft | $541.80 | $/ft | $1,137,780 | $113,778 | $1,251,558 | $125,156 | $62,578 | $1,439,292 |
| P04 | OMC | Ex | DIF 1212 Zone | WT-004 | 18-inch pipeline in Fourth St from Elderberry Ave to Benson Ave (1212 Zone) | 18 | 1,800 | ft | $325.08 | $/ft | $585,144 | $58,514 | $643,658 | $64,366 | $32,183 | $740,207 |
| P05[2] | OMC | Ex | DIF 1212 Zone | WT-004 | 18-inch pipeline in Fourth St from San Antonio Ave to Vine Ave (1212 Zone) | 18 | 1,800 | ft | $325.08 | $/ft | $585,144 | $58,514 | $643,658 | $64,366 | $32,183 | $740,207 |
| P06[2] | OMC | Ex | DIF 1212 Zone | WT-004 | 18-inch pipeline in Vine Ave from Fouth St to J St (1212 Zone) | 18 | 700 | ft | $325.08 | $/ft | $227,556 | $22,756 | $250,312 | $25,031 | $12,516 | $287,858 |
| P07 | OMC | Ex | Pressure | WT-004 | 18-inch pipeline in J St from Vine Ave to Euclid Ave (1212 Zone) | Completed | | | | | | | | | | |
| P08 | OMC | Ex | Pressure | WT-004 | 24-inch pipeline in J St east side of Euclid Ave (1212 Zone) | Completed | | | | | | | | | | |
| P19[2] | OMC | Fut | DIF 1212 Zone | WT-004 | 16-inch Ontario International Airport Loop (1212 Zone) | 16 | 3,850 | ft | $288.96 | $/ft | $1,112,496 | $111,250 | $1,223,746 | $122,375 | $61,187 | $1,407,307 |
| P20[2] | OMC | Fut | DIF 1212 Zone | WT-004 | 18-inch Ontario International Airport Loop (1212 Zone) | 18 | 33,200 | ft | $325.08 | $/ft | $10,792,656 | $1,079,266 | $11,871,922 | $1,187,192 | $593,596 | $13,652,710 |

**Table ES-4 (Continued)**
**Capital Improvement Program**

| Existing System Capital Improvement Projects | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
| P09 | OMC | Fut | Pressure | WT-036 | PRS 21 at Euclid Ave and Phillips St (from 1212 Zone to 1074 Zone) | Completed | | | | | | | | | | |
| P10 | OMC | Fut | Pressure | WT-036 | PRS 22 at Vineyard Ave and Mission Blvd (from 1212 Zone to 1074 Zone) | Completed | | | | | | | | | | |
| P11 | OMC | Fut | Pressure | WT-036 | 12-inch & 18-inch pipeline in Grove Ave from Philips St to Francis St (1074 Zone) | Completed | | | | | | | | | | |
| P12 | OMC | Fut | Pressure | WT-009 | 12-inch pipeline in Euclid Ave from PRS 2 at SR-60 to Walnut St (1010 Zone) | Completed | | | | | | | | | | |
| P13[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 16-inch pipeline in Grove Ave from PRS 3 at SR-60 to Walnut St (1010 Zone) | 16 | 1,850 | ft | $288.96 | $/ft | $534,576 | $53,458 | $588,034 | $58,803 | $29,402 | $676,239 |
| P14 | OMC | Fut | DIF 1074 Zone | WT-009 | PRS 23 at SR-60 and Campus Ave (from 1074 Zone to 1010 Zone) | N.A. | 4 and 8 | inch | $680,260.00 | $/station | $680,260 | $68,026 | $748,286 | $74,829 | $37,414 | $860,529 |
| P15[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 8-inch pipeline in Banyan St, west of Parco Ave (1010 Zone) | 8 | 300 | ft | $144.48 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| P16[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 12-inch pipeline in Walnut St, west of Parco Ave (1010 Zone) | 12 | 200 | ft | $216.72 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| P17[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 8-inch pipeline in Maidstone St, west of Parco Ave (1010 Zone) | 8 | 300 | ft | $144.48 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| P18[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 8-inch pipeline in St. Andrews St, west of Parco Ave (1010 Zone) | 8 | 300 | ft | $144.48 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| P21 | OMC | Fut | DIF 1212 Zone | WT-022 | 8-inch Miscellaneous Up-Sized Projects (1212 Zone) | 8 | 2700 | ft | $144.48 | $/ft | $264,218 | $26,422 | $290,640 | $29,064 | $14,532 | $334,236 |
| P21 | OMC | Fut | DIF 1212 Zone | WT-022 | 12-inch Miscellaneous Up-Sized Projects (1212 Zone) | 12 | 2300 | ft | $216.72 | $/ft | $421,367 | $42,137 | $463,504 | $46,350 | $23,175 | $533,030 |
| ST03 | OMC | Fut | Storage | WT-006 | Reservoir 1212-4A | N.A. | 8 | MG | $1,444,800.00 | $/MG | $11,558,400 | $1,155,840 | $12,714,240 | $1,271,424 | $635,712 | $14,621,376 |
| ST04 | OMC | Fut | Storage | WT-006 | Reservoir 1212-4B | N.A. | 8 | MG | $1,444,800.00 | $/MG | $11,558,400 | $1,155,840 | $12,714,240 | $1,271,424 | $635,712 | $14,621,376 |
| ST05[2] | OMC | Fut | Storage | WT-004 | 30-inch transmission line from Reservoir 1212-4A and 1212-4B | 30 | 13,750 | ft | $541.80 | $/ft | $7,449,750 | $744,975 | $8,194,725 | $819,473 | $409,736 | $9,423,934 |

**Table ES-4 (Continued)**
**Capital Improvement Program**

| Existing System Capital Improvement Projects | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
| ST06[1] | OMC | Ex | Storage | WT-025 | Abandon Reservoir 1212-3 (condition/age) | N.A. | 10 | MG | $148,500.00 | $/CY | $1,485,000 | $148,500 | $1,633,500 | $163,350 | $81,675 | $1,878,525 |
| P22 | OMC | Fut | DIF 925 Zone | | Future 1010 to 925 PRS at Fern asn SR-60 | N.A. | 4 and 8 | inch | $680,260.00 | $/station | $680,260 | $68,026 | $748,286 | $74,829 | $37,414 | $860,529 |
| P23 | OMC | Fut | DIF 925 Zone | | Piping of Future 1010 to 925 PRS at Fern and SR-60 | 12 | 550 | ft | $216.72 | $/ft | $119,196 | $11,920 | $131,116 | $13,112 | $6,556 | $150,783 |
| S48[1] | OMC | Ex | Supply | | Well 37 Rehabilitation | N.A. | 1 | Well | | $/Well | $5,811,350 | $1,015,000 | $6,826,350 | | $341,318 | $7,167,668 |
| S49[1] | OMC | Ex | Supply | | Well 39 Rehabilitation | N.A. | 1 | Well | | $/Well | $5,811,350 | $1,015,000 | $6,826,350 | | $341,318 | $7,167,668 |
| R11 | OMC | | Reliability | WT-035 | Future Emergency Connection (MVWD-1) | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| R12 | OMC | | Reliability | WT-035 | Future Emergency Connection (Chino-2) | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| R13 | OMC | | Reliability | WT-035 | Future Emergency Connection (FWC-1) | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| R14 | OMC | | Reliability | WT-035 | Future Emergency Connection (Upland-2) | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| FF1 | OMC | Fut | Fire | | Fire Flow Improvement: New Looped 6-inch pipe | 6 | 400 | ft | $108.36 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| FF1 | OMC | Fut | Fire | | Fire Flow Improvement: New Looped 8-inch pipe | 8 | 2,350 | ft | $144.48 | $/ft | $339,528 | $33,953 | $373,481 | $37,348 | $18,674 | $429,503 |
| FF1 | OMC | Fut | Fire | | Fire Flow Improvement: New Looped 12-inch pipe | 12 | 1,300 | ft | $216.72 | $/ft | $281,736 | $28,174 | $309,910 | $30,991 | $15,495 | $356,396 |
| FF1 | OMC | Fut | Fire | | Fire Flow Improvement: New Looped 16-inch pipe | 16 | 1,000 | ft | $216.72 | $/ft | $216,720 | $21,672 | $238,392 | $23,839 | $11,920 | $274,151 |
| FF2 | OMC | Ex | Fire | | Fire Flow Improvement: Upsize to 12-inch pipe | 12 | 59,200 | ft | $216.72 | $/ft | $12,829,824 | $1,282,982 | $14,112,806 | $1,411,281 | $705,640 | $16,229,727 |
| V1 | OMC | Ex | Velocity | | Pipe Velocity Improvement: Replace with 12-inch | 12 | 350 | ft | $216.72 | $/ft | $75,852 | $7,585 | $83,437 | $8,344 | $4,172 | $95,953 |
| V2 | OMC | Ex | Velocity | | Pipe Velocity Improvement: Replace with 16-inch | 16 | 4,750 | ft | $288.96 | $/ft | $1,372,560 | $137,256 | $1,509,816 | $150,982 | $75,491 | $1,736,288 |
| V3 | OMC | Ex | Velocity | | Pipe Velocity Improvement: Replace with 24-inch | 24 | 400 | ft | $433.44 | $/ft | $173,376 | $17,338 | $190,714 | $19,071 | $9,536 | $219,321 |
| ST11[1] | OMC | Ex | Storage | | Seismic Upgrades of Reservoirs 1074-1A, 1074-1B, 1212-1A | | | | $9,200,000.00 | LS | $9,200,000 | $920,000 | $10,120,000 | $1,012,000 | $506,000 | $11,638,000 |
| O05[1] | OMC | Ex | Other | Rate | Facility Security Improvements | | | | $370,000.00 | LS | $370,000 | $37,000 | $407,000 | $40,700 | $20,350 | $468,050 |

**Table ES-4 (Continued)**
**Capital Improvement Program**

**Existing System Capital Improvement Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| O10[1] | OMC | Ex | Other | | Wellhouse Roof Upgrades | | | | $325,000.00 | LS | $325,000 | $32,500 | $357,500 | $35,750 | $17,875 | $411,125 |
| O07[1] | OMC | Ex | Other | | On-site Chlorine Generators | | | | $3,027,000.00 | LS | $3,027,000 | $302,700 | $3,329,700 | $332,970 | $166,485 | $3,829,155 |
| O08[1] | OMC | Ex | Other | | Upgrade of existing PRS (New valves, new vaults, and SCADA upgrades) | | | | $2,100,000.00 | LS | $2,100,000 | $210,000 | $2,310,000 | $231,000 | $115,500 | $2,656,500 |
| O09[1] | OMC | Ex | Other | | SCADA System Upgrade. Connection to new Ethernet System | | | | $450,000.00 | LS | $450,000 | $45,000 | $495,000 | $49,500 | $24,750 | $569,250 |
| | | | | | | | | | **Total** | | **$188,351,545** | | | | | **$237,897,324** |

**Annual Improvement Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ST07[1] | OMC | Ex | Storage | Rate | Reservoir recoating/repainting/repair | | | | $150,000.00 | $/year | $150,000 | $15,000 | $165,000 | $16,500 | $8,250 | $189,750 |
| O07[1] | OMC | Ex | Other | Rate | Water Meter Replacements | | | | $2,000,000.00 | $/year | $2,000,000 | $200,000 | $2,200,000 | $220,000 | $110,000 | $2,530,000 |
| O06[1] | OMC | Ex | Other | Rate | New Meter Installations | | | | $700,000.00 | $/year | $700,000 | $70,000 | $770,000 | $77,000 | $38,500 | $885,500 |
| | | | | | | | | | **Total** | | **$2,850,000** | | | | | **$3,605,250** |

**Table ES-4 (Continued)**
**Capital Improvement Program**

| Condition Improvement Projects - Mainline Replacement Program | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
| D01 | OMC | Ex | Size | WT-021 | 4" and Due to Pipe Age - Replace Small Diameter Pipes with 8-inch Pipe | 8 | 32,850 | ft | $144.48 | $/ft | $4,746,168 | $474,617 | $5,220,785 | $522,078 | $261,039 | $6,003,903 |
| D01 | OMC | Ex | Size | WT-021 | 6" and Due to Pipe Age - Replace Small Diameter Pipes with 8-inch Pipe | 8 | 317,550 | ft | $144.48 | $/ft | $45,879,624 | $4,587,962 | $50,467,586 | $5,046,759 | $2,523,379 | $58,037,724 |
| D01 | OMC | Ex | Size | WT-021 | 4" & Less. (Verify Pipe Age) Replace Small Diameter Pipes with 8-inch Pipe | 8 | 72,300 | ft | $144.48 | $/ft | $10,445,904 | $1,044,590 | $11,490,494 | $1,149,049 | $574,525 | $13,214,069 |
| D01 | OMC | Ex | Size | WT-021 | 6" (Verify Pipe Age)- Replace Small Diameter Pipes with 8-inch Pipe | 8 | 23,400 | ft | $144.48 | $/ft | $3,380,832 | $338,083 | $3,718,915 | $371,892 | $185,946 | $4,276,752 |
| D01 | OMC | Ex | Size | WT-021 | 4" & Less- Replace Small Diameter Pipes with 8-inch Pipe | 8 | 23,750 | ft | $144.48 | $/ft | $3,431,400 | $343,140 | $3,774,540 | $377,454 | $188,727 | $4,340,721 |
| D01 | OMC | Ex | Size | WT-021 | 6" -Replace Small Diameter pipes with 8-inch Pipe | 8 | 375,500 | ft | $144.48 | $/ft | $54,252,240 | $5,425,224 | $59,677,464 | $5,967,746 | $2,983,873 | $68,629,084 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 8" Improvements Due to Pipe Age (pipes constructed in or before 1970)- Replace with 8" | 8 | 65,900 | ft | $144.48 | $/ft | $9,521,232 | $952,123 | $10,473,355 | $1,047,336 | $523,668 | $12,044,358 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 10" to 12" Improvements Due to Pipe Age (pipes constructed in or before 1970)- Replace with 12" | 12 | 89,300 | ft | $216.72 | $/ft | $19,353,096 | $1,935,310 | $21,288,406 | $2,128,841 | $1,064,420 | $24,481,666 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 13" to 16"- Improvements Due to Pipe Age (pipes constructed in or before 1970) - Replace with 16" | 16 | 19,950 | ft | $288.96 | $/ft | $5,764,752 | $576,475 | $6,341,227 | $634,123 | $317,061 | $7,292,411 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 17" to 18"- Improvements Due to Pipe Age (pipes constructed in or before 1970) - Replace with 18" | 18 | 50,250 | ft | $325.08 | $/ft | $16,335,270 | $1,633,527 | $17,968,797 | $1,796,880 | $898,440 | $20,664,117 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 19" to 24"- Improvements Due to Pipe Age (pipes constructed in or before 1970) - Replace with 24" | 24 | 12,550 | ft | $433.44 | $/ft | $5,439,672 | $543,967 | $5,983,639 | $598,364 | $299,182 | $6,881,185 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 37" to 42"- Improvements Due to Pipe Age (pipes constructed in or before 1970) - Replace with 42" | 42 | 300 | ft | $758.52 | $/ft | $227,556 | $22,756 | $250,312 | $25,031 | $12,516 | $287,858 |
| | | | | | | | | | **Total** | | **$178,777,746** | | | | | **$226,153,849** |

**Table ES-4 (Continued)**
**Capital Improvement Program**

| Condition Improvement Projects - Facility Improvement Program | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
| L1 | OMC | Ex | Hydrant Lateral | | 4" & Less, Small Diameter Hydrant Lateral | 6 | 4,050 | ft | $108.36 | $/ft | $438,858 | $43,886 | $482,744 | $48,274 | $24,137 | $555,155 |
| L2 | OMC | Ex | Hydrant Lateral | | Hydrant Lateral material improvements | 6 | 11,400 | ft | $108.36 | $/ft | $1,235,304 | $123,530 | $1,358,834 | $135,883 | $67,942 | $1,562,660 |
| S50 | OMC | Ex | Supply | | 1212 Zone Well 24 Replacement due to age. | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S51 | OMC | Ex | Supply | | 1212 Zone Well 29 Replacement due to age. | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S52 | OMC | Ex | Supply | | 1212 Zone Well 30 Replacement due to age. | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S53 | OMC | Ex | Supply | | 1212 Zone Well 31 Replacement due to age. | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S54 | OMC | Ex | Supply | | Galvin Booster PS Replacement due to age. | N.A. | 1,050 | HP | $6,000.00 | $/HP | $6,300,000 | $630,000 | $6,930,000 | $693,000 | $346,500 | $7,969,500 |
| S55 | OMC | Ex | Supply | | 1348 Booster Pump 1 and 2 Replacement due to age. | N.A. | 400 | BPS | $6,000.00 | $/HP | $2,400,000 | $240,000 | $2,640,000 | $264,000 | $132,000 | $3,036,000 |
| S56 | OMC | Ex | Supply | | 1348 Booster Pump 3 and 4 Replacement due to age. | N.A. | 250 | BPS | $6,000.00 | $/HP | $1,500,000 | $150,000 | $1,650,000 | $165,000 | $82,500 | $1,897,500 |
| ST12 | OMC | Ex | Storage | | Reservoir past useful Life 1074-1B | N.A. | 2 | MG | $1,444,800.00 | $/MG | $2,889,600 | $288,960 | $3,178,560 | $317,856 | $158,928 | $3,655,344 |
| ST13 | OMC | Ex | Storage | | Reservoir past useful Life 1212-1A | N.A. | 20 | MG | $1,444,800.00 | $/MG | $28,896,000 | $2,889,600 | $31,785,600 | $3,178,560 | $1,589,280 | $36,553,440 |
| ST14 | OMC | Ex | Storage | | Reservoir past useful Life 1212-1B | N.A. | 2 | MG | $1,444,800.00 | $/MG | $2,889,600 | $288,960 | $3,178,560 | $317,856 | $158,928 | $3,655,344 |
| ST15 | OMC | Ex | Storage | | Reservoir past useful Life 1348-1B | N.A. | 2 | MG | $1,444,800.00 | $/MG | $2,889,600 | $288,960 | $3,178,560 | $317,856 | $158,928 | $3,655,344 |
| ST16 | OMC | Ex | Storage | | Reservoir past useful Life 1348-1C | N.A. | 3.75 | MG | $1,444,800.00 | $/MG | $5,418,000 | $541,800 | $5,959,800 | $595,980 | $297,990 | $6,853,770 |
| | | | | | | | | | **Total** | | **$70,856,962** | | | | | **$89,634,057** |

**Table ES-4 (Continued)**
**Capital Improvement Program**

| Future System Development Projects | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
| ST08 | OR | Fut | Storage | WT-014 | Reservoir 925-1A | N.A. | 9.0 | MG | $1,444,800.00 | $/gallon | $13,003,200 | $1,300,320 | $14,303,520 | $1,430,352 | $715,176 | $16,449,048 |
| ST09 | OR | Fut | Storage | WT-014 | Reservoir 925-1B | N.A. | 9.0 | MG | $1,444,800.00 | $/gallon | $13,003,200 | $1,300,320 | $14,303,520 | $1,430,352 | $715,176 | $16,449,048 |
| ST10 | OR | Fut | Storage | WT-014 | Reservoir 925-2B | N.A. | 6.0 | MG | $1,444,800.00 | $/gallon | $8,668,800 | $866,880 | $9,535,680 | $953,568 | $476,784 | $10,966,032 |
| S13 | OR | Fut | Supply | WT-012 | Altitude Valve from 1074 Zone to 925 Zone at Reservoir 925-1A and 925-1B | N.A. | 1 | Valve | $680,260.00 | $/LS | $680,260 | $68,026 | $748,286 | $74,829 | $37,414 | $860,529 |
| S14[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #48 in 925 Zone (Not in DIF) | N.A. | 1 | Well | | $/site | | | | | | |
| S15 | OR | Fut | Supply | WT-007 | NMC Well #48 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S16[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 48 and 54 to Reservoir 925-2A | 18 | 3,250 | ft | $325.08 | $/ft | $1,056,510 | $105,651 | $1,162,161 | $116,216 | $58,108 | $1,336,485 |
| S17[2] | OR | Fut | Supply | WT-012 | 24-inch well collecting line for Well 48 and 54 to Reservoir 925-2A | 24 | 1,000 | ft | $433.44 | $/ft | $433,440 | $43,344 | $476,784 | $47,678 | $23,839 | $548,302 |
| S18[2] | OR | Fut | Supply | WT-012 | 30-inch well collecting line for Well 48 to Reservoir 925-2A | 30 | 600 | ft | $541.80 | $/ft | $325,080 | $32,508 | $357,588 | $35,759 | $17,879 | $411,226 |
| S19[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #51 in 925 Zone (Not in DIF) | N.A. | 1 | Well | | $/site | | | | | | |
| S20 | OR | Fut | Supply | WT-007 | NMC Well #51 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S21[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 51 to Reservoir 925-2A | 18 | 4,300 | ft | $325.08 | $/ft | $1,397,844 | $139,784 | $1,537,628 | $153,763 | $76,881 | $1,768,273 |
| S22[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #54 in 925 Zone (Not in DIF) | N.A. | 1 | Well | | $/site | | | | | | |
| S23 | OR | Fut | Supply | WT-007 | NMC Well #54 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S24[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 54 to Reservoir 925-2A | 18 | 700 | ft | $325.08 | $/ft | $227,556 | $22,756 | $250,312 | $25,031 | $12,516 | $287,858 |
| S25[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #55 in 925 Zone | N.A. | 1 | Well | | $/site | | | | | | $300,000 |
| S26 | OR | Fut | Supply | WT-007 | NMC Well #55 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |

**Table ES-4 (Continued)**
**Capital Improvement Program**

| Future System Development Projects | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
| S27[2] | OR | Fut | Supply | WT-012 | 18-inch line from Well 55 to intersection of Bonview Ave and Francis St | 18 | 800 | ft | $325.08 | $/ft | $260,064 | $26,006 | $286,070 | $28,607 | $14,304 | $328,981 |
| S28[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #56 in 925 Zone | N.A. | 1 | Well | | $/site | | | | | | $300,000 |
| S29 | OR | Fut | Supply | WT-007 | NMC Well #56 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S30[2] | OR | Fut | Supply | WT-012 | 42-inch line from Well 56 to intersection of Bon View Ave and Francis St | 42 | 1,250 | ft | $758.52 | $/ft | $948,150 | $94,815 | $1,042,965 | $104,297 | $52,148 | $1,199,410 |
| S31[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 48 to Reservoir 925-2A | 18 | 400 | ft | $325.08 | $/ft | $130,032 | $13,003 | $143,035 | $14,304 | $7,152 | $164,490 |
| S32[2] | OR | Fut | Supply | WT-012 | 30-inch line in Francis St from Bon View Ave to Grove Ave | 30 | 1,200 | ft | $541.80 | $/ft | $650,160 | $65,016 | $715,176 | $71,518 | $35,759 | $822,452 |
| S33[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #57 in 925 Zone | N.A. | 1 | Well | | $/site | | | | | | $300,000 |
| S34 | OR | Fut | Supply | WT-007 | NMC Well #57 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S35[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 57 to Reservoir 925-1A | 18 | 1,400 | ft | $325.08 | $/ft | $455,112 | $45,511 | $500,623 | $50,062 | $25,031 | $575,717 |
| S36[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #58 in 925 Zone | N.A. | 1 | Well | | $/site | | | | | | $300,000 |
| S37 | OR | Fut | Supply | WT-007 | NMC Well #58 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S38[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line from Well 58 to intersection of Francis St and Cucamonga Ave | 24 | 1,950 | ft | $433.44 | $/ft | $845,208 | $84,521 | $929,729 | $92,973 | $46,486 | $1,069,188 |
| S39 | OR | Fut | Supply | WT-013 | PRS 16 at Campus Ave and Chino Ave (from 1010 Zone to 925 Zone) | N.A. | 8 and 12 | inch | $680,260.00 | $/station | $680,260 | $68,026 | $748,286 | $74,829 | $37,414 | $860,529 |
| S40 | OR | Fut | Supply | WT-032 | Water Quality Treatment Facility at the Jurupa 925-2 Reservoir Site | N.A. | 4 | Site | $6,324,111 | $/Well | $25,296,443 | $2,529,644 | $27,826,087 | $2,782,609 | $1,391,304 | $32,000,000 |
| S46 | OR | Fut | Supply | WT-032 | Water Quality Treatment Facility at the at the Bon View 925-1 Reservoir Site | N.A. | 4 | Site | $6,324,111 | $/Well | $25,296,443 | $2,529,644 | $27,826,087 | $2,782,609 | $1,391,304 | $32,000,000 |
| S47[1] | OR | Fut | Supply | WT-008 | Water Quality Treatment Facility for Well #50 | N.A. | 1 | Site | $3,100,000.00 | $/site | $3,100,000 | $310,000 | $3,410,000 | $341,000 | $170,500 | $3,921,500 |

**Table ES-4 (Continued)**
**Capital Improvement Program**

| Future System Development Projects | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Project No.** | **OMC/ OR** | **Ex/ Fut** | **Facility Type** | **DIF#** | **Description** | **Replacement Pipe Size (in)** | **Number** | **Unit** | **Unit Cost ($)** | **Unit** | **Base Cost ($)** | **10% Contingency ($)** | **Construction Cost ($)** | **10% Engineering & Admin. ($)** | **5% Construction Mgmt. ($)** | **Total Cost ($)** |
| S41 | OR | | Supply | WT-007 | Land Acquisition for Well #59 in 925 Zone | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| S42 | OR | | Supply | WT-007 | NMC Well #59 in the 925 Zone | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| S43[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line from Well 56 in Belmont St and Cucamonga Ave | N.A. | 1,950 | ft | $325.08 | $/ft | $633,906 | $63,391 | $697,297 | $69,730 | $34,865 | $801,891 |
| S44 | OR | | Supply | WT-012 | 18-inch well collecting line from Well 59 in Belmont St and Cucamonga Ave | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| S45[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line from Well 56 in Belmont St and Cucamonga Ave | 18 | 2,050 | ft | $325.08 | $/ft | $666,414 | $66,641 | $733,055 | $73,306 | $36,653 | $843,014 |
| S57 | OR | Fut | Supply | | New 925 to 1010 BPS | N.A. | 400 | BPS | $6,000.00 | $/HP | $2,400,000 | $240,000 | $2,640,000 | $264,000 | $132,000 | $3,036,000 |
| T1[2] | OR | Fut | Transmission | WT-011 | 12-inch distribution lines (925 Zone) Completed Projects removed. | 12 | 115,600 | ft | $144.00 | $/ft | $16,646,400 | $1,664,640 | $18,311,040 | $1,831,104 | $915,552 | $21,057,696 |
| T2[2] | OR | Fut | Transmission | WT-011 | 16-inch distribution lines (925 Zone) | 16 | 44,450 | ft | $192.00 | $/ft | $8,534,400 | $853,440 | $9,387,840 | $938,784 | $469,392 | $10,796,016 |
| T3[2] | OR | Fut | Transmission | WT-011 | 18-inch distribution lines (925 Zone), Chino Ave | 18 | 12,400 | ft | $260.06 | $/ft | $3,224,744 | $322,474 | $3,547,218 | $354,722 | $177,361 | $4,079,301 |
| T4[2] | OR | Fut | Transmission | WT-010 | 24-inch distribution lines (925 Zone), Milliken Ave, Eucalyptus Ave, Archibald Ave, Edison Ave | 24 | 10,850 | ft | $331.56 | $/ft | $3,597,372 | $359,737 | $3,957,109 | $395,711 | $197,855 | $4,550,675 |
| T05 | OR | Fut | Transmission | WT-010 | 42-inch distribution lines (925 Zone), Grove Ave btw Reservoir 925-1A and Edison Ave | 42 | 22,700 | ft | $557.81 | $/ft | $12,662,174 | $1,266,217 | $13,928,391 | $1,392,839 | $696,420 | $16,017,649 |
| T06[2] | OR | Fut | Transmission | WT-009 | 12-inch distribution lines (1010 Zone) | 12 | 19,200 | ft | $144.00 | $/ft | $2,764,800 | $276,480 | $3,041,280 | $304,128 | $152,064 | $3,497,472 |
| T07[2] | OR | Fut | Transmission | WT-009 | 18-inch distribution lines (1010 Zone) Campus Ave north of Riverside Ave | 18 | 6,950 | ft | $260.06 | $/ft | $1,807,417 | $180,742 | $1,988,159 | $198,816 | $99,408 | $2,286,383 |
| | | | | | | | | | **Total** | | **$177,395,388** | | | | | **$225,605,166** |

[1] *Project cost specifically estimated based on more detailed information. The unit costs from Table 13-1 were not used.*

[2] *Project lengths based on existing planning estimates.*

| | | | |
|---|---|---|---|
| | Existing System Capital Improvement Projects | $188,351,545 | $237,897,324 |
| 115550 | Condition Projects - Mainline Replacement Program | $178,777,746 | $226,153,849 |
| | Condition Projects - Facility Improvement Program | $70,856,962 | $89,634,057 |
| | Future System Development Projects | $177,395,388 | $225,605,166 |
| | **Total** | **$615,381,641** | **$779,290,395** |
| | Annual Capital Improvement Costs | | $3,605,250 |

# SECTION 1

# INTRODUCTION

## 1-1 Purpose

The City of Ontario provides potable water service to residential, commercial, industrial, public and agricultural lands and the Ontario International Airport within its service area. The City recognizes its responsibility to efficiently meet the customers' needs with long range planning efforts. By reviewing its existing water system and future needs, the City can continue to maintain a high service level and reliability in its water system in a cost effective and fiscally responsible manner. This report is intended to update the domestic water analysis of the *2012 Water Master Plan* and to provide a comprehensive planning guide for improving and upgrading the City's domestic water system.

## 1-2 Previous Studies

Previous studies completed and utilized in the development of this Water Master Plan include the following:

- *The Ontario Plan (General Plan), February 2010*
- *The Ontario Plan Draft Environmental Impact Report, April 2009*
- *City of Ontario Water and Recycled Water Master Plan Update*, *April 2006*
- *City of Ontario Water Master Plan, April 2012*
- *2015 City of Ontario Urban Water Management Plan, July 2016*
- *Ultimate Citywide Water Demand Estimate Technical Memorandum, May 2016*
- *Sanitary Sewer Survey, October 2016*

## 1-3 Scope of Work

The scope of work for this study consists of the following:

Task 1 – Obtain and Review all Related Information

Task 2 – Review and Update the City's Current Design Criteria

Task 3 - Update Potable Water Hydraulic Model

- Update the City's current model geometry to the most-recent GIS shapefiles
- Update all facilities (wells, pump stations, reservoirs, pressure reducing stations, turnouts and interconnections)
- Update facility operational controls
- Utilize City's existing potable water demand factors that were developed as part of the 2016 Ultimate Citywide Water Demand Estimate Technical Memorandum.
- Develop peaking relationships for demands based on the City's historical production and purchase data.
- Allocation of potable water demands, based on the most recent water billing meter records
- Develop diurnal patterns based on SCADA data, automatic meter read (AMR), and automatic meter infrastructure (AMI) data
- Model calibration consists of making adjustments to the model such that the field data and model results are similar for the chosen 24-hour calibration period.

Task 4 – System Analysis

- Existing and future system analyses are conducted for average day demand, maximum day demand, and maximum day plus fire flow demands.

- Review and update the following:
  - System-wide Supply Analysis
  - Storage Capacity Evaluation
  - Pipeline Replacement Plan

Task 5 – Develop an updated Capital Improvement Program (CIP)

## 1-4 Organization of Report

The Potable Water Master Plan Update presents the methodology for developing the hydraulic model. A brief outline of the report is as follows:

***Section ES: Executive Summary***

***Section 1: Introduction***

***Section 2: Study Area***

***Section 3: Water Supply***

***Section 4: Water Use***

***Section 5: Diurnal Patterns***

***Section 6: Existing System***

***Section 7: Criteria***

***Section 8: Hydraulic Model***

***Section 9: Model Calibration***

***Section 10: Existing System Analysis***

***Section 11: Future System***

***Section 12: Future System Analysis***

***Section 13: Capital Improvement Program***

## 1-5 Acknowledgements

AKM Consulting Engineers would like to express their sincere appreciation to the following individuals for their valuable assistance and support throughout the preparation of this study:

- Scott Burton, Assistant Utilities General Manager
- Dennis Mejia, Utilities Engineering Division Manager
- Christy Stevens, Senior Associate Civil Engineer
- Jeffrey Krizek, Associate Engineer
- Tom O'Neill, Water Production Manager
- Chris Bonadurer, Water Production Supervisor
- Ivan Sanchez, Engineering Assistant/GIS
- Joline Neal, Water Quality Specialist

# SECTION 2

# STUDY AREA

## 2-1 Purpose

This section describes the City of Ontario water service area, the land uses within the study area, and population estimates.

## 2-2 Location

The study area, shown on Figure 2-1, coincides with the City of Ontario boundary with the exception of two small areas in the north central and northeastern portion of the City that are served by Cucamonga Valley Water District (CVWD). It is located approximately 35 miles east of downtown Los Angeles and encompasses approximately 50 square miles (32,060 acres) of residential, commercial, industrial, public and agricultural lands and the Ontario International Airport. It is bordered by the Cities of Chino and Montclair on the west; the Cities of Upland and Rancho Cucamonga on the north; the Cities of Fontana, Eastvale, and Jurupa Valley on the east; and the Cities of Chino and Eastvale on the south. The major highways crossing through portions of the study area include the San Bernardino Freeway (I-10) on the north, the Pomona Freeway (SR-60) on the south, and the Ontario Freeway (I-15) on the east.

The City is divided into two distinct areas, the Original Model Colony (OMC) and Ontario Ranch (OR). The two areas are generally divided by Riverside Drive. The OMC consists of existing residential, commercial, and industrial developments, and the Ontario International Airport. It comprises approximately 37.2 square miles (23,776 acres). Ontario Ranch is an agricultural area that was annexed to the City in 1999. It currently consists of approximately 12.8 square miles (8,182 acres) of agricultural land. The City's 2010 General Plan details plans to develop the agricultural lands in Ontario Ranch into a mix of residential, commercial, industrial, and public uses. The future residential population of Ontario Ranch is expected to reach about 181,385. Development of Ontario Ranch has begun with the development of Edenglen residential community located southwest and south east of the intersection of Riverside Drive and Mill Creek Avenue. Residential communities currently in construction include the Park Place development located southeast of Archibald Avenue and Merrill Avenue and the New Haven development located southwest of Haven Avenue and Schaefer Avenue.

## 2-3 Topographic Description and Geology

### 2-3.1 General Area

The City's water service area is located in the San Bernardino Plain, which is an expanse of sand, gravel and boulders. Dominating the valley are Mt. San Antonio, Cucamonga Peak, and Ontario Peak. Cucamonga Peak is visibly flat on top which represents sections of the original valley floor. Loose dirt and gravel flows swiftly from the slopes of these young mountains with the sometimes torrential rains.

The valley and plain has taken more than 10 million years to form. Geologists place the beginning of the area's geologic history between 12 and 28 million years ago, the same time the San Andreas Fault is believed to have been formed. The San Gabriel Mountains are part of the east-west trending transverse ranges, which run across the north-south grain of California. The San Gabriel Mountains are intersected 25 miles east of Ontario at the Cajon Pass by the San Andreas Fault. These mountains were partially formed by geologic activity along this fault.

Visible to the south of Ontario is a portion of the peninsular range consisting of the Santa Ana Mountains, the base of which is carved by the Santa Ana River. Several blocks of the peninsular range are separated by faults generally attributed to the San Andreas Fault system. Small rolling hills make up the north and west portions of the valley (Chino Hills, Diamond Bar, and the Covina Hills).

The transverse and peninsular ranges meet in the San Gorgonio Pass area, 50 miles east of Ontario. Mount San Gorgonio is the tallest peak in Southern California and is frequently visible from Ontario.

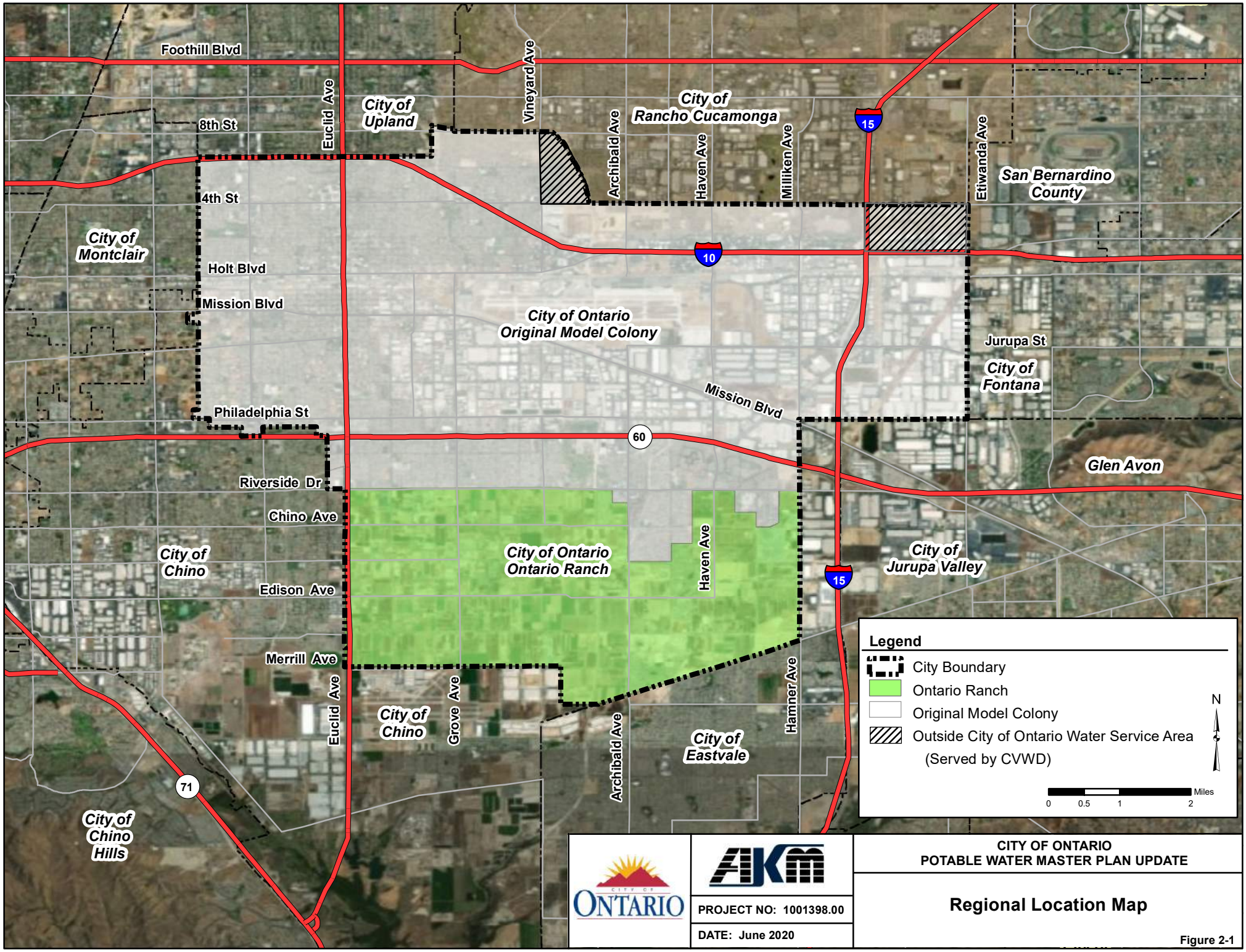
Foothill Blvd
8th St
4th St
Holt Blvd
Mission Blvd
Philadelphia St
Riverside Dr
Chino Ave
Edison Ave
Merrill Ave
Euclid Ave
Vineyard Ave
Archibald Ave
Haven Ave
Milliken Ave
Etiwanda Ave
Grove Ave
Hamner Ave
Jurupa St
City of Upland
City of Rancho Cucamonga
San Bernardino County
City of Montclair
City of Ontario Original Model Colony
City of Fontana
Glen Avon
City of Ontario Ontario Ranch
City of Jurupa Valley
City of Chino
City of Chino
City of Eastvale
City of Chino Hills
10
15
60
71
Legend
City Boundary
Ontario Ranch
Original Model Colony
Outside City of Ontario Water Service Area (Served by CVWD)
N
Miles
0
0.5
1
2
CITY OF ONTARIO
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Regional Location Map
Figure 2-1

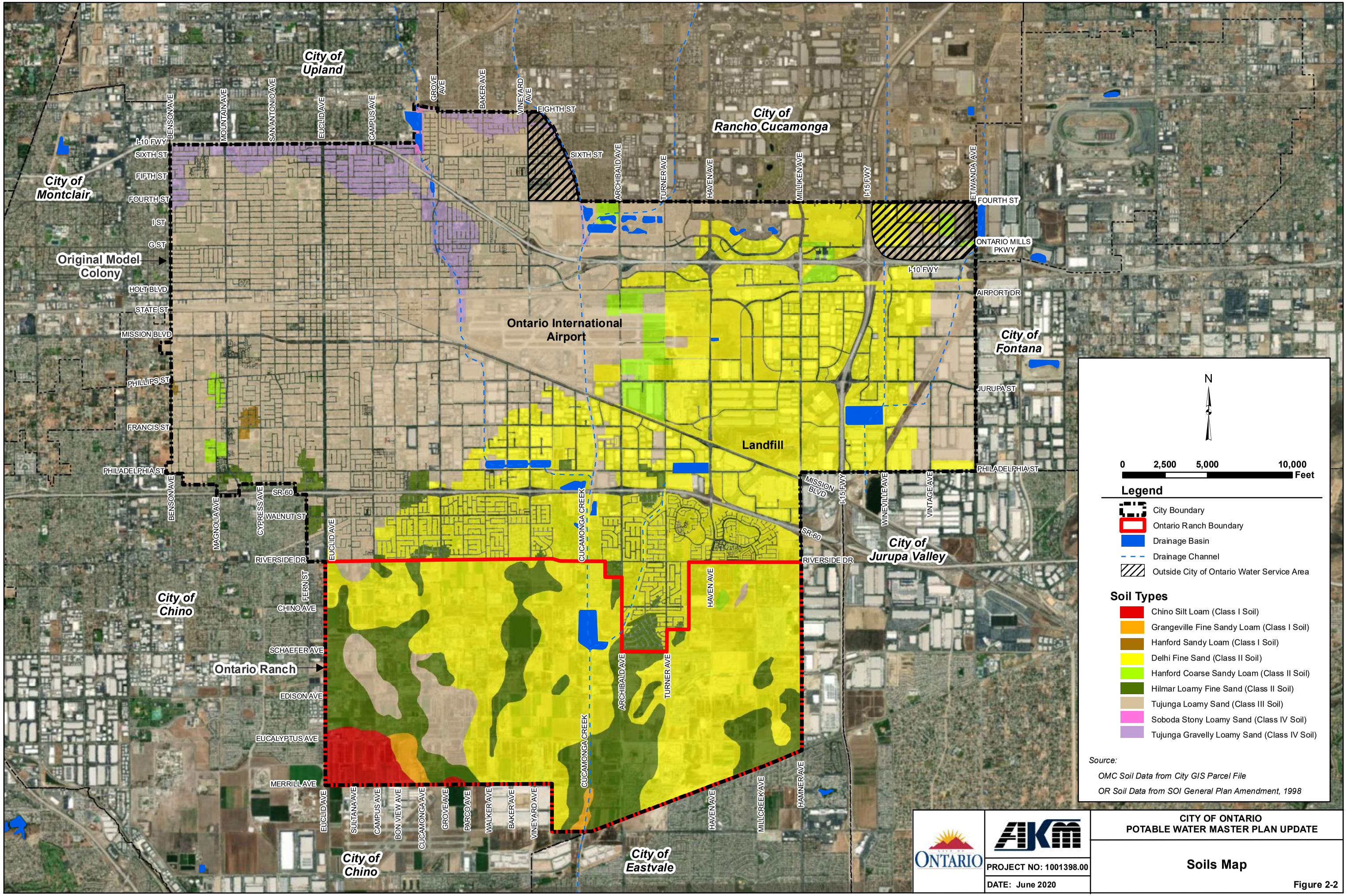
City of Upland
City of Rancho Cucamonga
City of Montclair
Original Model Colony
Ontario International Airport
City of Fontana
Landfill
City of Jurupa Valley
City of Chino
Ontario Ranch
City of Eastvale
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ETIWANDA AVE
FOURTH ST
ONTARIO MILLS PKWY
I-10 FWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
MISSION BLVD
WINEVILLE AVE
VINTAGE AVE
SR-60
RIVERSIDE DR
CUCAMONGA CREEK
HAMNER AVE
MILLCREEK AVE
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
PHILLIPS ST
FRANCIS ST
MAGNOLIA AVE
CYPRESS AVE
WALNUT ST
FERN ST
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
SULTANA AVE
BON VIEW AVE
CUCAMONGA AVE
PARCO AVE
WALKER AVE
N
0 2,500 5,000 10,000 Feet
Legend
City Boundary
Ontario Ranch Boundary
Drainage Basin
Drainage Channel
Outside City of Ontario Water Service Area
Soil Types
Chino Silt Loam (Class I Soil)
Grangeville Fine Sandy Loam (Class I Soil)
Hanford Sandy Loam (Class I Soil)
Delhi Fine Sand (Class II Soil)
Hanford Coarse Sandy Loam (Class II Soil)
Hilmar Loamy Fine Sand (Class II Soil)
Tujunga Loamy Sand (Class III Soil)
Soboda Stony Loamy Sand (Class IV Soil)
Tujunga Gravelly Loamy Sand (Class IV Soil)
Source:
OMC Soil Data from City GIS Parcel File
OR Soil Data from SOI General Plan Amendment, 1998
ONTARIO
AKM
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Soils Map
Figure 2-2

### 2-3.2 Elevations

The topography of the region generally slopes in a southwesterly direction. The highest point in the service area is west of Grove Avenue and north of 8th Street at 1180 feet above mean sea level (amsl), and the lowest point is at the intersection of Euclid Avenue and Merrill Avenue (633 feet amsl).

### 2-3.3 Soils

Native soils, shown on Figure 2-2, consist of the following:

| | |
|---|---|
| **Class I Soils** | • Chino Silt Loam<br>• Grangeville Fine Sandy Loam<br>• Hanford Sandy Loam |
| **Class II Soils** | • Delhi Fine Sand<br>• Hanford Coarse Sandy Loam<br>• Hilmar Loamy Fine Sand |
| **Class III Soils** | • Tujunga Loamy Sand |
| **Class IV Soils** | • Soboda Stony Loamy Sand<br>• Tujunga Gravelly Loamy Sand |

Due to the presence of predominantly dairy industries over a long period of time, prime agricultural soils, high in salts and nitrates, cover approximately 2,999 acres or 36 percent of the total area in the Ontario Ranch (SOI General Plan Amendment, 1998). Organic materials (manure and feed) are reportedly present in thickness of up to six feet.

Ontario Ranch is located within the Chino Groundwater Basin, which has been found to maintain a relatively shallow water table. The SOI General Plan Amendment reported findings of groundwater elevations ranging from 530 to 590 feet in 1991. Water depths observed in 1991 were about 100 feet (SOI General Plan Amendment).

## 2-4 Climate

According to the National Oceanic and Atmospheric Administration (NOAA), the climate in the study area is generally Mediterranean with hot summers and warm winters. The average median temperature is approximately 66º F.

The historical average annual rainfall is about 8.9 inches. Most of the rainfall typically occurs between October and April. Figure 2-3 shows the seasonal rainfall from 2008 to 2018 as measured by the San Bernardino County Rain Gauge Stations 2835, which is located at Ontario Fire Station #4 on Mountain Avenue, south of Fourth Street.

**Figure 2-3**
**Seasonal Rainfall 2008-2018**

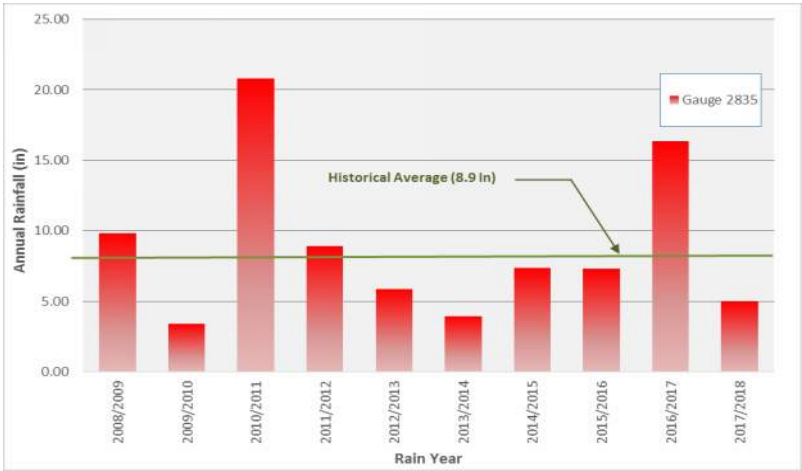


## 2-5 Land Use

The land use information utilized in the preparation of the Water Master Plan is primarily based upon the City's GIS parcel land use data and newly approved General Plan data. This information was supplemented by aerial photographs, field reviews, and information provided by City staff.

### 2-5.1 Existing Land Use

The City is a well planned urban community with a balance of residential, commercial, and industrial land uses. The City's land use GIS shapefile from May 2017 was considered current and has been used for reporting purposes. Within the service area, the residential land uses are 5,973 acres or 19 percent of the total. Industrial uses are 5,235 acres or 17 percent of the total. Approximately 6,741 acres or 22 percent of the total service area is Agricultural Multi-Use which primarily resides in the Ontario Ranch area. Table 2-1 provides a summary of the existing land uses. Figure 2-4 shows the locations of the land uses.

The total number of housing units in the City is estimated at 51,283. With a population of 182,871 and a 3.7 percent vacancy rate, the average number of persons per household is estimated at 3.69 (Ref: *California Department of Finance, Demographic Research Unit, Table E-5, 2020*).

**Table 2-1**

**Existing Study Area Land Uses**

| | Service Area | | | | Outside Service Area | | Total City | |
|---|---|---|---|---|---|---|---|---|
| **Landuse Description** | **OMC[1] (Ac)** | **OR[2] (Ac)** | **Total (Ac)** | **% of Total** | **Total (Ac)** | **% of Total** | **Total (Ac)** | **% of Total** |
| Low Density Residential | 4,300 | 54.6 | 4,355 | 14.0% | 114.2 | 14.7% | 4,469 | 14.1% |
| Low-Medium Density Residential | 180 | 0.0 | 180 | 0.6% | 0.0 | 0.0% | 180 | 0.6% |
| Medium Density Residential | 364 | 0.0 | 364 | 1.2% | 9.7 | 1.3% | 374 | 1.2% |
| High Density Residential | 446 | 0.0 | 446 | 1.4% | 0.0 | 0.0% | 446 | 1.4% |
| Rural Residential | 449 | 0.0 | 449 | 1.4% | 0.0 | 0.0% | 449 | 1.4% |
| Mobile Home | 174 | 0.0 | 174 | 0.6% | 27.3 | 3.5% | 202 | 0.6% |
| Group Quarters | 1 | 0.0 | 1 | 0.0% | 0.0 | 0.0% | 1 | 0.0% |
| Other Residential | 3 | 0.0 | 3 | 0.0% | 0.0 | 0.0% | 3 | 0.0% |
| **Total Residential** | **5,919** | **54.6** | **5,973** | **19.3%** | **151.2** | **19.5%** | **6,124** | **19.3%** |
| Commercial | 1,185 | 8.7 | 1,194 | 3.9% | 118.8 | 15.3% | 1,313 | 3.8% |
| Business Park | 33 | 0.0 | 33 | 0.1% | 4.5 | 0.6% | 38 | 0.1% |
| Office | 436 | 0.0 | 436 | 1.4% | 0.9 | 0.1% | 437 | 1.4% |
| Admin./Prof. | 140 | 0.0 | 140 | 0.5% | 2.5 | 0.3% | 143 | 0.4% |
| Misc. Service Org. | 71 | 8.8 | 80 | 0.3% | 0.0 | 0.0% | 80 | 0.3% |
| **Total Commercial** | **1,866** | **17.5** | **1,883** | **6.1%** | **126.7** | **16.3%** | **2,010** | **6.0%** |
| Industrial | 1,795 | 0.0 | 1,795 | 5.8% | 46.4 | 6.0% | 1,842 | 5.8% |
| Industrial_Meredith | 135 | 0.0 | 135 | 0.4% | 0.0 | 0.0% | 135 | 0.4% |
| Manufacturing | 1,646 | 0.0 | 1,646 | 5.3% | 67.2 | 8.7% | 1,714 | 5.4% |
| Warehousing | 1,658 | 0.0 | 1,658 | 5.3% | 149.4 | 19.3% | 1,807 | 5.7% |
| **Total Industrial** | **5,235** | **0.0** | **5,235** | **16.9%** | **263.0** | **33.9%** | **5,498** | **17.3%** |
| Mixed Use | 75 | 0.0 | 75 | 0.2% | 0.0 | 0.0% | 75 | 0.2% |
| School | 497 | 0.0 | 497 | 1.6% | 0.0 | 0.0% | 497 | 1.6% |
| Public Facilities | 165 | 0.0 | 165 | 0.5% | 0.0 | 0.0% | 165 | 0.5% |
| Transp/Utilities | 1,164 | 335.4 | 1,499 | 4.8% | 118.8 | 15.3% | 1,618 | 5.1% |
| Transp/Utilities/Airport | 1,483 | 0.0 | 1,483 | 4.8% | 0.0 | 0.0% | 1,483 | 4.7% |
| Parks/Rec/Cultural | 754 | 0.0 | 754 | 2.4% | 0.9 | 0.1% | 754 | 2.4% |
| Street/Parking | 241 | 0.0 | 241 | 0.8% | 23.5 | 3.0% | 264 | 0.8% |
| Ag. Multi-Use | 184 | 6,556.4 | 6,741 | 21.7% | 0.8 | 0.1% | 6,742 | 21.2% |
| Landfill | 137 | 0.0 | 137 | 0.4% | 0.0 | 0.0% | 137 | 0.4% |
| Vacant | 1,031 | 661.3 | 1,692 | 5.5% | 0.0 | 0.0% | 1,692 | 5.5% |
| Right-of-Way[3] | 4,310 | 324.2 | 4,634 | 14.9% | 90.0 | 11.6% | 4,724 | 15.0% |
| **Total Other** | **10,040** | **7,877** | **17,918** | **57.8%** | **234.0** | **30.2%** | **18,152** | **57.4%** |
| **Grand Total** | **23,059** | **7,949** | **31,009** | **100%** | **775** | **100%** | **31,784** | **100%** |

[1] *OMC refers to Original Model Colony*

[2] *OR refers to Ontario Ranch*

[3] *Right-of-Way acreage estimated by subtracting totalparcel areas from the City and Service Area Boundaries*

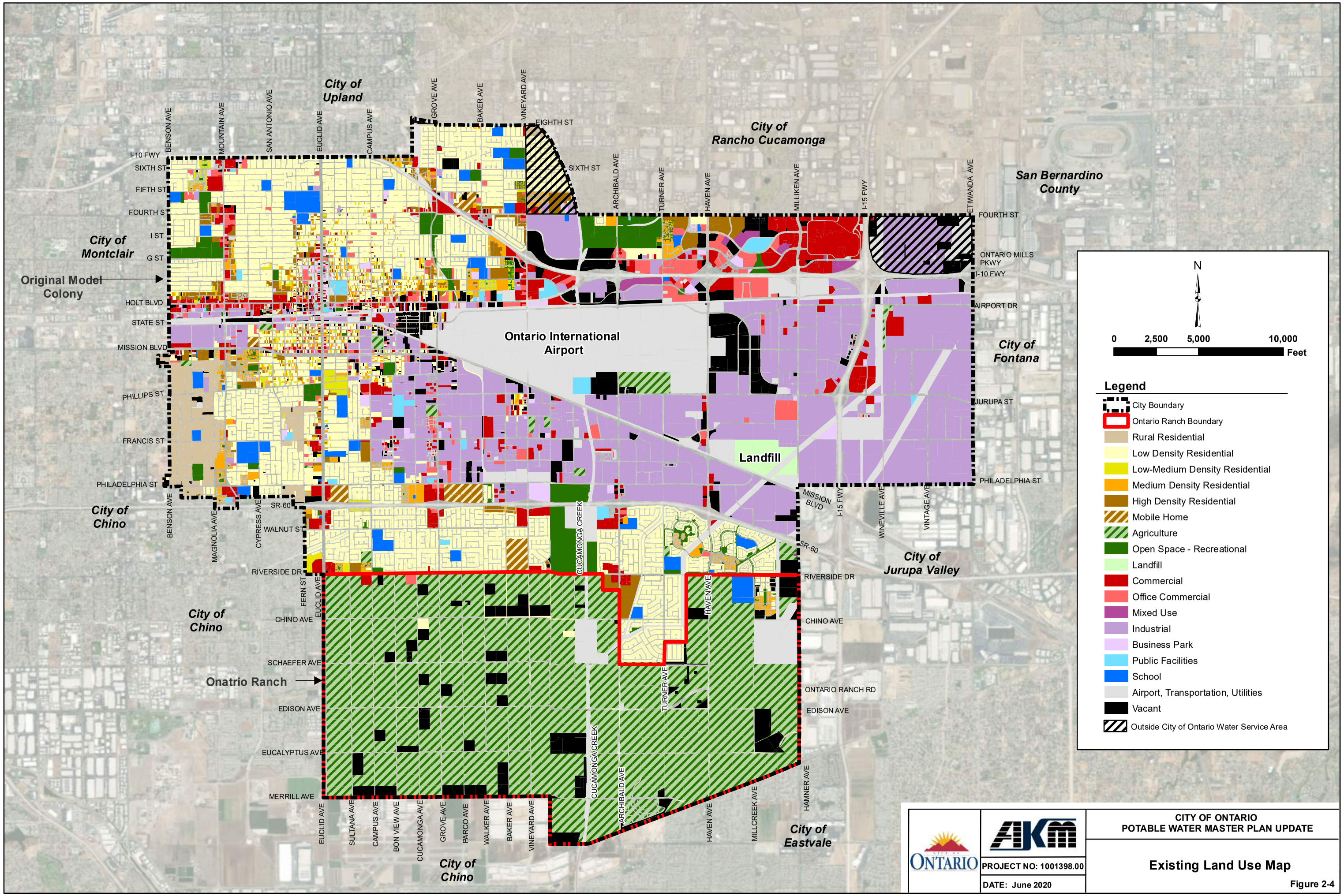
City of Upland
City of Rancho Cucamonga
San Bernardino County
City of Montclair
Original Model Colony
Ontario International Airport
City of Fontana
Landfill
City of Chino
City of Jurupa Valley
Onatrio Ranch
City of Eastvale
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ETIWANDA AVE
FOURTH ST
ONTARIO MILLS PKWY
I-10 FWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
I-10 FWY
SIXTH ST
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
PHILADELPHIA ST
SR-60
WALNUT ST
RIVERSIDE DR
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
MAGNOLIA AVE
CYPRESS AVE
FERN ST
CUCAMONGA CREEK
MISSION BLVD
WINEVILLE AVE
VINTAGE AVE
ONTARIO RANCH RD
HAMNER AVE
MILLCREEK AVE
SULTANA AVE
BON VIEW AVE
PARCO AVE
WALKER AVE
N
0
2,500
5,000
10,000
Feet
Legend
City Boundary
Ontario Ranch Boundary
Rural Residential
Low Density Residential
Low-Medium Density Residential
Medium Density Residential
High Density Residential
Mobile Home
Agriculture
Open Space - Recreational
Landfill
Commercial
Office Commercial
Mixed Use
Industrial
Business Park
Public Facilities
School
Airport, Transportation, Utilities
Vacant
Outside City of Ontario Water Service Area
ONTARIO
AKM
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Existing Land Use Map
Figure 2-4

### 2-5.2 Future Land Uses

The future land uses are generally based upon the City's latest general plan document entitled *The Ontario Plan (2010).* Revisions have been incorporated by the City's planning department, for specific developments that have been developed or planned that may differ from the 2010 document. Table 2-2 provides a summary of the future land uses. Figure 2-5 shows the locations of future land use according to the City's GIS land use shapefile from May 2017. The residential area will increase to 10,869 acres (34.2 percent of total). The employment area, including business parks and industrial uses, is expected to entail about 7,818 acres (24.6 percent of total).

- ***Residential Land Uses:*** The Ontario Plan defines five residential land use categories: Rural, Low Density, Low-Medium Density, Medium Density, and High Density. The plan provides densities for each of the residential land use categories, which are summarized in Table 2-2.
- ***Retail / Service:*** Four retail / service uses are defined: Neighborhood Commercial, General Commercial, Office Commercial, and Hospitality. The intensities for each commercial use are shown in Table 2-3.
- ***Employment:*** Two employment uses are defined: Business Park and Industrial. The intensities for each employment use are shown in Table 2-3.
- ***Open Space:*** Open Space land use designations include Non-Recreational Open Space, Recreational Open Space and Water Open Space (i.e. lakes, ponds, etc.).
- ***Public:*** Public land use designations include Public Facility and Public School.
- ***Other:*** Other land use designations include the Ontario International Airport, Landfill, Railroad and Roadways.

It should be noted that Table 2-2 is general in nature for the entire City. It has been found that many of the newer developments constructed and proposed in Ontario Ranch exceed the densities (dwelling unit per acre) anticipated when the 2012 Water Master Plan was completed. Therefore, the maximum densities for the Ontario Ranch area were increased in Table 2-2 (per the City Planning Department).

For the 2020 Potable Water Master Plan Update, the future land uses and associated sewer loads were estimated using more detailed information, such as specific plans and detailed development information, when available. This is especially important in the east portion of Ontario Ranch which is already being developed and the City has development proposals under review. Details of how future water loads were calculated and allocated in the hydraulic model are described in Section 4-7.3.

## 2-6 Population

Since its incorporation in 1890, the City of Ontario has grown from a population of 683 to approximately 182,871 in 2020 (*Ref: California Department of Finance, Table E-5, 2020*). The historical population increase from 1890 to 2020, as well as future projections are depicted on Figure 2-6.

It should be noted that the estimates shown on Figure 2-6 for the year 2000 through 2035 includes Ontario Ranch, which was annexed by the City in 1999. The population shown also includes the 628 acres of land (5,770 persons) within the Ontario Ranch, but served water by the Cucamonga Valley Water District (CVWD).

Projections for 2020 and 2035 are based on South California Association of Government future projections.

The future population in Ontario Ranch is expected to be approximately 181,385. The future population in the OMC is estimated at 190,594. The total future population is estimated at 371,979 which will nearly double the existing population.

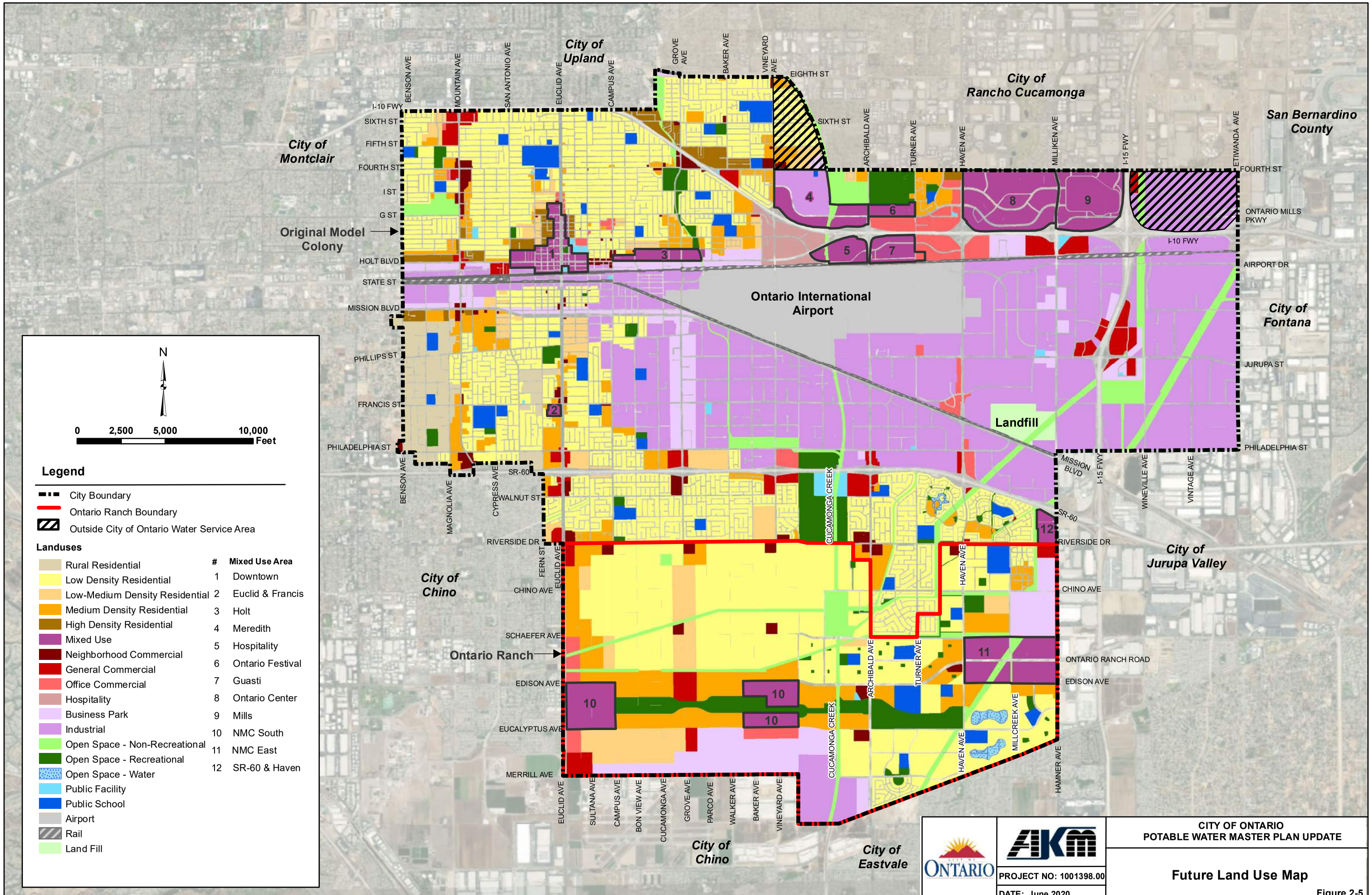
City of Upland
City of Rancho Cucamonga
San Bernardino County
City of Montclair
City of Fontana
City of Jurupa Valley
City of Chino
City of Eastvale
Original Model Colony
Ontario Ranch
Ontario International Airport
Landfill
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ETIWANDA AVE
I-10 FWY
FOURTH ST
ONTARIO MILLS PKWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
FIFTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
MAGNOLIA AVE
CYPRESS AVE
SR-60
WALNUT ST
RIVERSIDE DR
FERN ST
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
SULTANA AVE
BON VIEW AVE
PARCO AVE
WALKER AVE
CUCAMONGA CREEK
WINEVILLE AVE
VINTAGE AVE
ONTARIO RANCH ROAD
MILLCREEK AVE
HAMNER AVE
1
2
3
4
5
6
7
8
9
10
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12
N
0 2,500 5,000 10,000 Feet
Legend
City Boundary
Ontario Ranch Boundary
Outside City of Ontario Water Service Area
Landuses
Rural Residential
Low Density Residential
Low-Medium Density Residential
Medium Density Residential
High Density Residential
Mixed Use
Neighborhood Commercial
General Commercial
Office Commercial
Hospitality
Business Park
Industrial
Open Space - Non-Recreational
Open Space - Recreational
Open Space - Water
Public Facility
Public School
Airport
Rail
Land Fill
# Mixed Use Area
1 Downtown
2 Euclid & Francis
3 Holt
4 Meredith
5 Hospitality
6 Ontario Festival
7 Guasti
8 Ontario Center
9 Mills
10 NMC South
11 NMC East
12 SR-60 & Haven
ONTARIO
AKM
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
PROJECT NO: 1001398.00
DATE: June 2020
Future Land Use Map
Figure 2-5

**Table 2-2**

**Future Study Area Land Uses[1]**

| Land Use Category | Acres | % of Total Area | Density (du/ac) | Intensity (FAR) | Units | Population | Square Feet (Office) | Square Feet (Non-Office) | Total Square Feet | Jobs (Office) | Jobs (Non-Office) | Total Jobs |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Residential | | | | | | | | | | | | |
| Rural Res | 458.3 | 1.4 | 2.0 | | 917 | 3,663 | | | | | | |
| LDR (OMC)[2] | 4,243.3 | 13.4 | 4.0 | | 16,973 | 67,842 | | | | | | |
| LDR (OR)[3] | 3,126.6 | 9.8 | 5.0 | | 15,633 | 62,486 | | | | | | |
| LMDR (OMC)[2] | 336.7 | 1.1 | 8.5 | | 2,862 | 11,438 | | | | | | |
| LMDR (OR)[3] | 573.8 | 1.8 | 11.0 | | 6,311 | 25,227 | | | | | | |
| MDR (OMC)[2] | 882.3 | 2.8 | 18.0 | | 15,881 | 60,621 | | | | | | |
| MDR (OR)[3] | 1,014.0 | 3.2 | 25.0 | | 25,350 | 83,096 | | | | | | |
| HDR (OMC)[2] | 233.7 | 0.7 | 35.0 | | 8,178 | 27,373 | | | | | | |
| ***Subtotal*** | ***10,868.6*** | ***34.2*** | | | ***92,105*** | ***341,746*** | | | | | | |
| Mixed Use | | | | | | | | | | | | |
| Downtown | 112.0 | 0.4 | 35.0 | | 2,352 | 4,704 | 780,665 | 780,665 | 1,561,330 | 2,233 | 561 | 2,793 |
| East Holt | 57.1 | 0.2 | 30.0 | | 428 | 856 | 1,243,202 | 497,281 | 1,740,483 | 3,556 | 357 | 3,913 |
| Euclid & Francis | 10.4 | 0.0 | 30.0 | | 156 | 312 | 0 | 181,210 | 181,210 | 0 | 419 | 419 |
| Guasti | 77.4 | 0.2 | 30.0 | | 465 | 929 | 1,180,650 | 1,011,986 | 2,192,636 | 3,377 | 727 | 4,103 |
| Inland Empire | 36.8 | 0.1 | 20.0 | | 368 | 736 | 240,451 | 112,211 | 352,662 | 688 | 81 | 768 |
| Meredith | 93.0 | 0.3 | 37.4 | | 800 | 1,600 | 340,291 | 832,497 | 1,172,788 | 973 | 489 | 1,462 |
| Multi-Modal | 76.1 | 0.2 | 60.0 | | 457 | 913 | 1,491,712 | 1,491,712 | 2,983,424 | 4,266 | 1,071 | 5,337 |
| NMC east | 263.7 | 0.8 | 25.0 | | 1,978 | 3,956 | 1,206,111 | 1,378,413 | 2,584,524 | 3,449 | 990 | 4,439 |
| NMC west/south | 315.3 | 1.0 | 35.0 | | 3,311 | 6,621 | 5,768,477 | 961,413 | 6,729,889 | 16,498 | 690 | 17,188 |
| Ontario Center (E. of Haven) | 344.9 | 1.1 | 40.0 | | 4,139 | 8,278 | 7,511,922 | 1,502,384 | 9,014,306 | 21,484 | 1,079 | 22,563 |
| Ontario Mills | 239.5 | 0.8 | 40.0 | | 479 | 958 | 1,564,893 | 3,912,233 | 5,477,126 | 4,476 | 2,809 | 7,285 |
| SR60 & Hamner | 41.0 | 0.1 | 25.0 | | 185 | 369 | 669,735 | 254,499 | 924,234 | 1,915 | 183 | 2,098 |
| ***Subtotal*** | ***1,667.2*** | ***5.2*** | | | ***15,116*** | ***30,232*** | ***21,998,109*** | ***12,916,503*** | ***34,914,612*** | ***62,915*** | ***9,454*** | ***72,368*** |
| Retail/Service | | | | | | | | | | | | |
| Neighborhood Commercial | 244.5 | 0.8 | | 0.30 | | | 639,104 | 2,556,414 | 3,195,518 | 1,546 | 6,186 | 7,732 |
| General Commercial | 614.9 | 1.9 | | 0.30 | | | 803,564 | 7,232,080 | 8,035,644 | 747 | 6,719 | 7,465 |
| Office Commercial | 527.3 | 1.7 | | 0.75 | | | 12,059,052 | 5,168,166 | 17,227,218 | 26,743 | 11,461 | 38,204 |
| Hospitality | 144.9 | 0.5 | | 1.00 | | | 1,262,543 | 5,050,172 | 6,312,715 | 1,447 | 5,790 | 7,237 |
| ***Subtotal*** | ***1,531.7*** | ***4.8*** | | | | | ***14,764,263*** | ***20,006,832*** | ***34,771,095*** | ***30,483*** | ***30,155*** | ***60,638*** |
| Employment | | | | | | | | | | | | |
| Business Park | 1,594.9 | 5.0 | | 0.40 | | | 13,894,333 | 13,894,333 | 27,788,666 | 24,377 | 24,377 | 48,755 |
| Industrial | 6,223.4 | 19.6 | | 0.55 | | | 14,909,926 | 134,189,333 | 149,099,259 | 13,100 | 117,902 | 131,002 |
| ***Subtotal*** | ***7,818.2*** | ***24.6*** | | | | | ***28,804,259*** | ***148,083,666*** | ***176,887,925*** | ***37,477*** | ***142,279*** | ***179,756*** |
| Other | | | | | | | | | | | | |
| Open Space - Non Recreational | 1,221.0 | 3.8 | | | | | | | | | | |
| Open Space - Parkland | 950.1 | 3.0 | | | | | | | | | | |
| Open Space - Water | 59.2 | 0.2 | | | | | | | | | | |
| Public Facility | 96.6 | 0.3 | | | | | | | | | | |
| Public School | 631.9 | 2.0 | | | | | | | | | | |
| Airport | 1,671.9 | 5.3 | | | | | | | | | | |
| Landfill | 136.9 | 0.4 | | | | | | | | | | |
| Rail | 250.7 | 0.8 | | | | | | | | | | |
| Right-of-Way | 4,880.0 | 15.4 | | | | | | | | | | |
| ***Subtotal*** | ***9,898.2*** | ***31.1*** | | | | | | | | | | |
| ***Total*** | ***31,783.9*** | ***100.0*** | | | ***107,221*** | ***371,979*** | ***65,566,631*** | ***181,007,001*** | ***246,573,632*** | ***130,875*** | ***181,888*** | ***312,763*** |

*[1] Landuses from City Buildout Table (April 2015)*

*[2] OMC refers to Original Model Colony. Density (du/ac) per the City Buildout Table (April 2015)*

*[3] OR refers to Ontario Ranch. Density (du/ac) is considered maximum per City Planning Department (January 2016)*

**Figure 2-6**

**City of Ontario Population History and Projections**

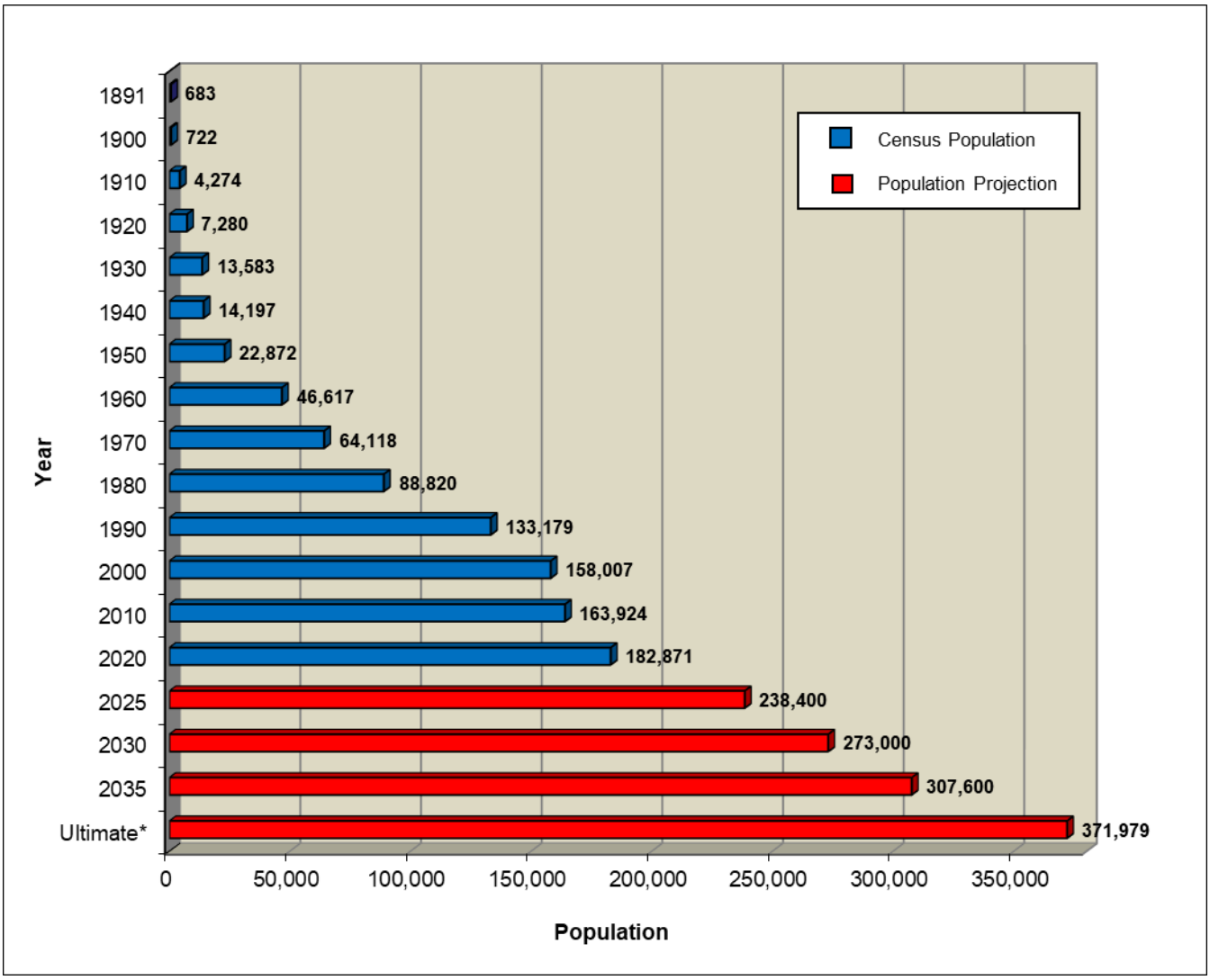


*References:*

*Historical population data from California State Department of Finance*

*2020 and 2035 Population projections from SCAG Adopted 2012 Regional Transportation Plan Growth Forecast*

*Ultimate population from Table 2-2*

# SECTION 3

# WATER SUPPLY

## 3-1 Source of Supply

The City's existing potable water supply consists of imported water from the Water Facilities Authority (WFA) and Chino Basin Desalter Authority (CDA) and the groundwater from Chino Basin, extracted via the City's wells. The City has seventeen (17) active wells. Over the last twelve years, the City has imported an average of 12,253 AFY and pumped 23,100 AFY from the groundwater basin. Therefore, about 35 percent of the City's water supply is imported.

## 3-2 Imported Water Supply

Water is imported into Southern California through two major water supply systems:

1. The Colorado River Aqueduct, constructed and operated by Metropolitan Water District of Southern California (MWD), transports water from the Colorado River to MWD's service area.
2. The State Water Project, owned and operated by the State of California Department of Water Resources (DWR), transports water from the Sacramento-San Joaquin Delta through the California Aqueduct.

The City's imported water supply over the last ten years is shown in Table 3-1.

**Table 3-1**

**Imported Water Supply**

| Year | CDA Supply | | WFA Supply | | SAWCO | | Total Imported Water Supply | |
|---|---|---|---|---|---|---|---|---|
| | (AFY) | (mgd) | (AFY) | (mgd) | (AFY) | (mgd) | (AFY) | (mgd) |
| 2007 | 5,125 | 4.6 | 12,734 | 11.4 | 0 | 0.0 | 17,859 | 15.9 |
| 2008 | 5,498 | 4.9 | 8,740 | 7.8 | 0 | 0.0 | 14,238 | 12.7 |
| 2009 | 5,047 | 4.5 | 3,494 | 3.1 | 0 | 0.0 | 8,541 | 7.6 |
| 2010 | 5,327 | 4.8 | 7,666 | 6.8 | 0 | 0.0 | 12,993 | 11.6 |
| 2011 | 5,162 | 4.6 | 8,883 | 7.9 | 0 | 0.0 | 14,046 | 12.5 |
| 2012 | 4,911 | 4.4 | 10,415 | 9.3 | 0 | 0.0 | 15,326 | 13.7 |
| 2013 | 4,987 | 4.5 | 10,967 | 9.8 | 0 | 0.0 | 15,954 | 14.2 |
| 2014 | 5,288 | 4.7 | 10,135 | 9.0 | 0 | 0.0 | 15,423 | 13.8 |
| 2015 | 3,543 | 3.2 | 6,413 | 5.7 | 443 | 0.4 | 10,399 | 9.3 |
| 2016 | 3,029 | 2.7 | 2,398 | 2.1 | 107 | 0.1 | 5,534 | 4.9 |
| 2017 | 3,039 | 2.7 | 3,035 | 2.7 | 294 | 0.3 | 6,367 | 5.7 |
| 2018 | 4,413 | 3.9 | 5,589 | 5.0 | 359 | 0.3 | 10,361 | 9.3 |
| **Average** | **4,614** | **4.1** | **7,539** | **6.7** | **100** | **0.1** | **12,253** | **10.9** |

### 3-2.1 Water Facilities Authority

The Water Facilities Authority (WFA) was formed in 1980 as a Joint Powers Authority by the Cities of Chino, Chino Hills, Ontario and Upland, and the Monte Vista Water District. It was formed to construct and operate water treatment facilities that provide a supplemental supply of potable water to its member agencies. The WFA currently owns and operates the Agua de Lejos Water Treatment Plant located at the Benson Avenue and 18th Street, in the City of Upland. It is a conventional surface water treatment facility that treats and disinfects imported water supplies, primarily State Water Project water that is purchased from MWD through WFA. The current rated capacity of the plant is 81 mgd. The City of Ontario owns 25 mgd, or 31.4 percent of the treatment plant capacity.

The water from Agua de Lejos Water Treatment Plant is conveyed to two locations that connect with the City's existing water system. The first turnout (Turnout 1) is located adjacent the 1212-1A and 1212-1B Reservoirs at the northwest corner of Eighth Street and Fern Avenue. The City has access to 16 mgd from the WFA Turnout 1, available to the 1212 Zone.

The second WFA connection (Turnout 2) is through the 1348 Zone and is located adjacent to the 1212-3 at the southeast corner of Campus Avenue and A Street. The City has an internal subconnection (Turnout 2A) that takes the water from Turnout 2 and feeds the 1212 Zone. The City has access to 9 mgd from the WFA Turnout 2. The maximum volume of water that the City can receive from their WFA connections is therefore 25 mgd. According to the City's operations staff, the WFA turnouts can currently be taken at a maximum flowrate of 17,260 AFY (15.4 mgd)

Based on historical records for 2007 through 2018, the average annual WFA supply has been 6,905 AFY (6.2 mgd), as shown in Table 3-1. The maximum annual supply was 10,967 AFY (9.8 mgd) in 2013. The minimum annual supply was 2,398 AFY (2.1 mgd) in 2016.

### 3-2.2 Chino Basin Desalter Authority

The City of Ontario is a member of the Chino Basin Desalter Authority (CDA), a joint powers agency created on September 25, 2001. Other members of the CDA include Jurupa Community Services District (JCSD), Santa Ana River Water Company (SARWC), IEUA, Western Municipal Water District (WMWD) and the Cities of Chino, Chino Hills, and Norco. The CDA purifies brackish groundwater extracted from the lower Chino Basin with the Chino 1 and Chino 2 Desalter facilities and distributes drinking water to member agencies. The treatment of the brackish groundwater, high in salts and nitrates, provide the members of the CDA a reliable source of water, as well as protects the downstream Santa Ana River of contamination. Each of the member agencies has "take or pay" contracts to purchase water produced by the CDA.

CDA owns and operates the two groundwater treatment desalination systems, Chino Desalter 1 (CDA I) and Chino Desalter 2 (CDA II). Both facilities include groundwater extraction wells, pumps and pipelines that provide water to advanced treatment facilities that include processes for pretreatment, filtration, air stripping of volatile organic compounds, ion exchange for removal of nitrates, and reverse osmosis for removal of salts. The treated water is then blended and disinfected to produce high quality drinking water that is delivered to member agencies through pipelines, pumps, and reservoirs.

CDA I is located in the City of Chino south of Kimball Avenue, west of Euclid Avenue. CDA I produces 14.2 mgd or 15,900 AFY of high-quality drinking water. In 2018, the City received 655AFY of water from the CDA I facility. The point of connection from CDA's facilities to the City's potable water system (1010 Zone) is located near the intersection of Archibald Avenue and the Remington Avenue. Water is pumped to the City from the JCSD system at the Archibald Pump Station. The water is a blend of CDA I water and JCSD system water.

CDA II is located at 11202 Harrel Street in Mira Loma, California. CDA has recently completed the Chino Desalter Phase 3 Expansion, which was planned to increase the existing capacity of CDA II by an additional 9.4 mgd or 10,500 AFY. Prior to the Phase 3 expansion, the City had a contract entitlement of 5,000 AFY (4.5 mgd). With the recent expansion the City's contract entitlement was increased to 8,533 AFY (8.6 mgd). Since the agreement is set up as "take or pay", the City tries to utilize the full entitlement.

The City has four points of connection to the CDA II system at the following locations:

- CDA II Lateral A – Philadelphia Street and Milliken Avenue (925 Zone)
- CDA II Lateral B – Philadelphia Street and Milliken Avenue (1010 Zone)

- CDA II Lateral C – Riverside Drive and Hamner Avenue (925 Zone)
- CDA II Lateral D – Riverside Drive and Hamner Avenue (1010 Zone)

The water at Laterals A and B consist of a blend of CDA II water and JCSD system water. The water at Laterals C and D consist water from CDA II alone.

### 3-2.3 Inter-Agency Connections

The City of Ontario has inter-agency connections with the following agencies:

- Cucamonga Valley Water District (CVWD) can provide water to the 1212 Zone, at the intersection of Milliken Avenue and Fourth Street. Water cannot be delivered to CVWD at this connection.
- City of Chino, can receive water from the City of Ontario's 1212 Zone, at reservoir near Benson Avenue and State Street. Water cannot be provided to the City at this connection.

## 3-3 Groundwater Supply

The City extracts groundwater from the Chino Groundwater Basin (Chino Basin or Basin), which is one of the largest groundwater basins in the Southern California area with storage capacity estimated at five to seven million acre-feet. It collects roughly 140,000 acre-feet of water each year. Chino Basin encompasses about 235 square miles of the upper Santa Ana River watershed and lies within portions of San Bernardino, Riverside, and Los Angeles counties. The location of the groundwater basin is illustrated in Figure 3-1.

### 3-3.1 Chino Basin Judgement

The Chino Basin Judgement (Judgement) was entered by the California State Superior Court for San Bernardino County on January 27, 1978. The Judgement adjudicates water rights in the Chino Basin and establishes the Chino Basin Watermaster (Watermaster) to account for and implement the management of the basin. The Judgement declared that the initial operation safe yield of the Chino Basin is 145,000 AFY. There are three pools of water users: agricultural, non-agricultural (industrial users), and appropriative (water municipalities and other government entities). The safe yield is allocated at 82,800 AFY to the agricultural pool, 7,366 AFY to the non-agricultural pool, and 54,834 AFY to the appropriative pool. The Judgement was expanded in 2000 and 2007 with the addition of Peace Agreements I and II, respectively, which further clarified the Watermaster's operations.

Per the Judgement, the City of Ontario has appropriative rights to 16,337 AFY and its share of the initial operating safe yield is 11,373 AFY or 21 percent of the 54,834 AFY appropriative pool rights. The City has secured additional supply through the following:

- Annual early transfers, which is expected water not used by agricultural pool
- Groundwater recharge from recycled water and storm water
- Purchased groundwater recharge rights from the City of Fontana
- Acquisition of San Antonio Water Company rights, available through the WFA connection

### 3-3.2 Watermaster

The Chino Basin Watermaster (Watermaster) is a governmental body responsible for managing water use and supplies within Chino Basin. The Watermaster's primary responsibilities include the following:

- Maintain and increase the water supply
- Sustain and improve water quality
- Ensure that water will be fairly shared
- Provide cooperative leadership
- Study and increase understanding of the basin

The Watermaster is comprised of three stakeholder groups based on how they use water obtained from the basin. The groups are called Pools and are represented by Pool Committees:

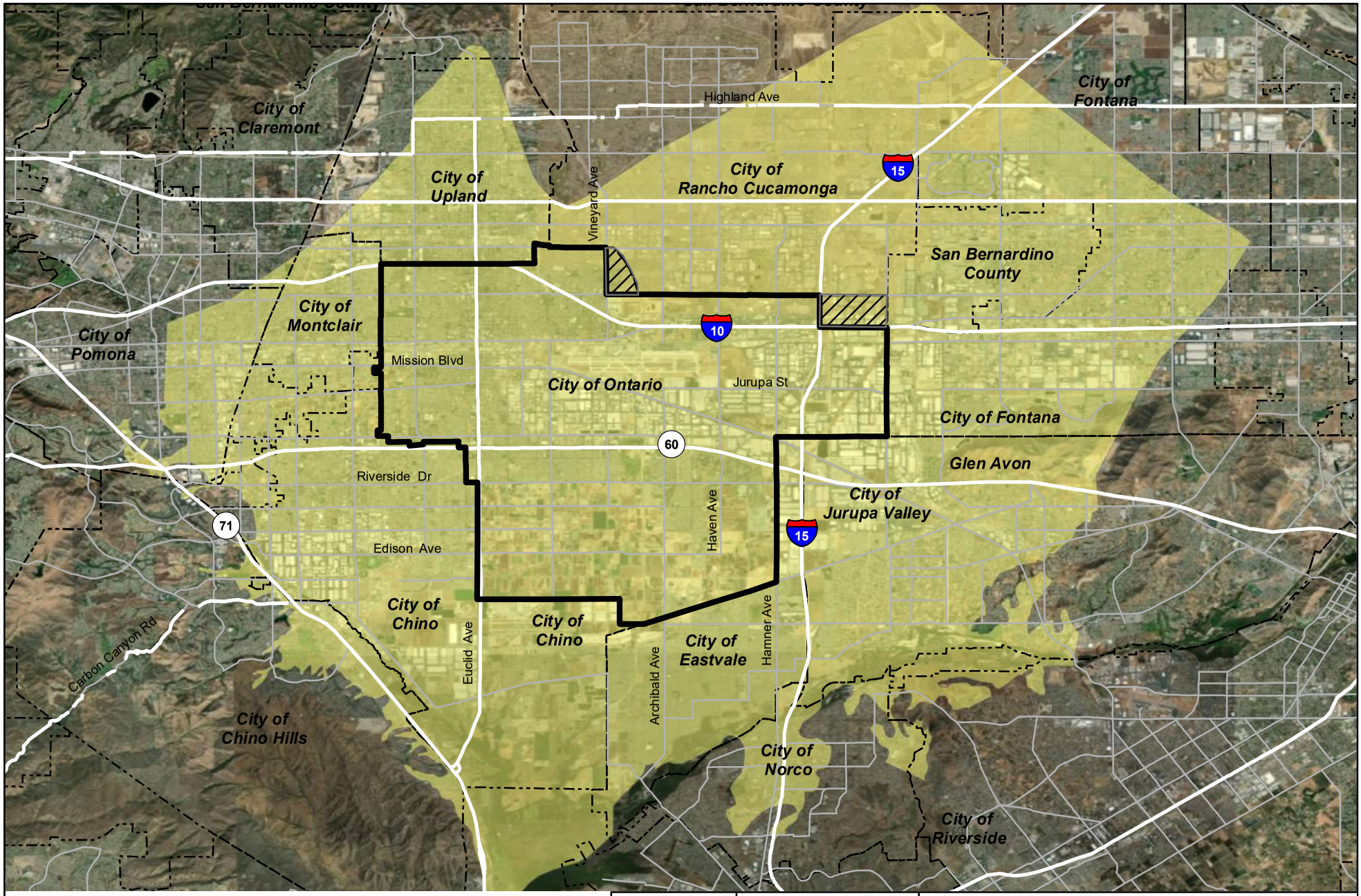


**Legend**

- Service Area Boundary
- Chino Groundwater Basin

N

0 7,500 15,000 Feet

ONTARIO

AKM

PROJECT NO: 1001398.00

DATE: June 2020

CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE

**Chino Groundwater Basin**

Figure 3-1

- Overlying Agricultural Pool Committee, representing dairymen, farmers, and the State of California;
- Overlying Non-Agricultural Pool Committee, representing area industries;
- Appropriative Pool Committee, representing local cities, public water districts, and private water companies.

Representatives from the three Pools form an Advisory Committee to oversee the regular activities of the Watermaster. The Pool Committees handle business affecting their own members and then make recommendations to the Advisory Committee. The Advisory Committee, in turn makes recommendations to the Watermaster Board of Directors, consisting of nine members appointed by the San Bernardino County Superior Court.

### 3-3.3 Optimum Basin Management Program

The Optimum Basin Management Program (OBMP) was adopted by the Watermaster after a 1998 court decree required the development of a detailed plan outlining issues facing Chino Basin and solutions to resolve them. The program was supposed to address water quality problems within the Chino groundwater basin and increase and improve the water supply available from this source. The OBMP identifies groundwater recovery in the southern portion of the basin as a way to improve basin water supplies.

The OBMP and the specific actions contained within it, has guided the Watermaster's activities ever since its adoption. The OBMP includes nine major tasks:

1. Comprehensive monitoring program for documenting changes in water level, quality, and flow by testing at wells within the Basin
2. Comprehensive recharge program
3. Water supply plan for the impaired areas of the Basin to improve water quality and supply
4. Regional supplemental water program
5. Comprehensive groundwater management plan for monitoring zone 1 to stop land subsidence
6. Cooperative programs with the Regional Board and other agencies to improve Basin management
7. Salt management program
8. Groundwater storage management program
9. Conjunctive use programs

### 3-3.4 Dry Year Yield Storage Program

The Dry Year Yield (DYY) Storage Program is a cooperative conjunctive use program involving MWD, IEUA, CBWM, Three Valleys Municipal Water District (TVMWD) and Chino Basin groundwater producers. Under the DYY Program, MWD is allowed to store up to 100,000 AFY of water in the Chino Basin when surplus water is available during wet years and to produce 33,000 AFY in dry, drought, or emergency periods.

The City of Ontario authorized execution of an agreement with IEUA to participate in the DYY program in 2003. Participation means that the City agrees to reduce its use of imported water compared to the previous year by a fixed amount, known as their "shift obligation". The City's shift obligation is 8,076 AFY. This means that during years when MWD calls for extraction, the City's WFA production would be reduced by 8,076 AFY compared to the previous year and it would extract this amount from the designated DYY wells.

DYY funds were used for the construction of three groundwater wells (Wells 45, 46, and 47) and an ion-exchange facility located at John Galvin Park to treat water extracted from Well 44 and Well 52. When MWD calls for stored water delivery, the City will operate these facilities, to meet its shift obligation. MWD would pay for the cost of operations and the City would pay MWD (through IEUA) the full service water rate. The City can use the DYY facilities to meet its normal water demands during other periods but is responsible for the O&M costs.

This program allows the City to be less reliant upon imported water supplies. The additional groundwater capacity allows the City to increase the percentage of groundwater supply used to meet peak demands.

## 3-4 Water Quality

Imported water quality and local groundwater quality per the City's 2018 Water Quality Report is shown in Table 3-2.

Imported water is generally of good quality with nitrate and total dissolved solid concentrations well below the established maximum contaminant levels.

The City's groundwater contains the following water quality issues for perchlorate, nitrates, 1,2,3 Trichloropropane (TCP), and bacterial constituents.

- Wells 3, 4, 9, 15, 31, 35, and 50 were removed from service due to high nitrate and/or perchlorate concentrations.
- Well 34 was removed from service due to (TCP) water quality issues.
- The operations of Wells 44 and 52 are limited due to the migration of the bacterial groundwater plume when these wells are used too frequently.
- Well 25 was taken out of service due to a PFOA detection, which was below the PFOA interim notification level.

Areas of high nitrate concentrations are shown on Figure 3-2.

The City is anticipating that all existing wells will require improvements to provide the necessary treatment capabilities for the various water quality issues with the groundwater source. Capital improvement projects are recommended for water quality treatment near Reservoir 925-2A, near future Reservoirs 925-1A and 925-1B, and for wells in the OMC.

## Table 3-2

## City of Ontario 2018 Water Quality Report

| Ontario Municipal Utilities Company - 2018 Distribution System | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Constituent** | **Units** | **MCL or (AL) or (MRDLG)** | **PHG or (MCLG) or (MRDLG)** | **CA DLR (MRL)** | **Range Average** | **Distribution** | **Major Sources in Drinking Water** |
| **Microbiological** | | | | | | | |
| Total Coliforms | % Positive per month | 5% Positive per month | [0] | NA | Highest Monthly % Positive | 0.65% | Erosion of natural deposits; residue from some surface water treatment processes |
| | | | | | # of months in Violation | 0 | |
| Heterotrophic Plate Count (HPC) | CFU/mL | TT | NA | [1] | # HPC>500 cfu/mL | 1 | Naturally present in the environment |
| | | | | | Lowest Monthly % | 99.30% | |
| **Physical Parameters** | | | | | | | |
| Odor | Units | 3 | NA | 1 | Range | ND TO 62 | Naturally-occurring organic materials |
| | | | | | Average | 0.19 | |
| pH | pH Unit | 6.5-6.8 | NA | [1] | Range | 6.88 to 8.71 | Measurement of hydrogen ion activity |
| | | | | | Average | 7.56 | |
| Turbidity | NTU | 5 | NA | 0.1 | Range | ND TO 0.76 | Soil runoff |
| | | | | | Average | 0.04 | |
| **Disinfetion By-Products and Disinfectant Residuals** | | | | | | | |
| Haloacetic Acids (HAA5) | ppb | LRAA = 60 | NA | 2.0* | Range | ND TO 13 | Byproduct of drinking water disinfection |
| | | | | | Highest LRAA | 9 | |
| Total Trihalomethanes | ppb | LRAA = 80 | NA | 1 | Range | ND TO 69 | Byproduct of drinking water disinfection |
| | | | | | Highest LRAA | 59 | |
| Chlorine Residual | ppm | (4) | (4) | NA | Range | 0.02 TO 1.78 | Drinking water disinfectant added for treatment |
| | | | | | Average | 0.73 | |
| **Metals at Consumers Plumbing** | | | | | | | |
| Copper | ppb | [1300] | 300 | 50 | NA | 90th percentile: 160 PPB (0 exceeded AL/57 samples) | Internal corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives |
| Lead | ppb | [15] | 0.2 | 5 | NA | 90th percentile: ND (0 exceeded AL/57 samples | Internal corrosion of household plumbing systems; discharges from industrial manufacturers; erosion of natural deposits |
| **Unregulated Contaiminant Monitoring Rule 4 (2018)** | | | | | | | |
| Anatoxin-a | ppb | NA | NA | [0.03] | Range | NR | |
| | | | | | Average | ND | |
| Cylindrospermopsin | ppb | NA | NA | [0.09] | Range | NR | |
| | | | | | Average | ND | |
| Total Microcystins | ppb | NA | NA | [0.3] | Range | NR | |
| | | | | | Average | ND | |

*DLR =1.0 ppb for each HAA5 analyte except for monochloroacetic acid which has a DLR = 2.0ppb.

Unregulated contaminant monitoring helps USEPA and the State Water Resources Control Board to determine where certin contaminants occur and whether the contaminants need to be regulated.

## Table 3-2

## City of Ontario 2018 Water Quality Report (Continued)

| | | | | | Local Ground | | Imported Water, | | |
|---|---|---|---|---|---|---|---|---|---|
| CONSTITUENT | UNITS | MCL [NL] | PHG or [MCLG] | CA DLR [MRL] | Ave. | Range | Average | Range | Major Sources in Drinking Water |
| **PRIMARY STANDARDS - Mandatory Health-Related Standards** | | | | | | | | | |
| **CLARITY** | | | | | | | | | |
| Combined Filter Effluent | NTU and % | TT = 1 NTU | NA | NA | NA | NA | 0.2 Highest | | Soil Runoff |
| | | TT | | | | | % ≤ 0.3 | 100% | |
| **MICROBIOLOGICAL** | | | | | | | | | |
| Total Coliform | % | 5 | [0] | NA | ND | ND to 1.1 | ND | NR | Erosion of natural deposits; residue from some surface water treatment process. |
| Heterotrophic Plate Count (HPC) | # HPCs>500 cfu/mL | TT | NA | [1] | 14 | ND to 90 | NA | NA | Erosion of natural deposites; runoff from orchards; glass and electronics production wastes. |
| **ORGANIC CHEMICALS** | | | | | | | | | |
| Dibromochloropropane | ppt | 200 | 1.7 | 10 | 17 | ND to 30 | NA | NA | Banned nematocide that may still be present in soils due to runoff/leaching from former use on soybeans, cotton, vineyards, tomatoes, and tree fruit. |
| Ethylene Dibromibe | ppt | 50 | 10 | 20 | 7 | ND to 21 | NA | NA | Discharge from pertoleum refineries; underground gas tank leaks; banned nematocide that may still be present in soils due to runoff and leaching from grain and fruit crops. |
| **INORGANIC CHEMICAL** | | | | | | | | | |
| Aluminum | ppb | 1000 | 600 | 50 | ND | NR | 38 | ND to 97 | Erosion of natural deposits; residue from some surface water treatment processes |
| Barium | ppm | 1 | 2 | 0.1 | 0.7 | 0.3 to 0.8 | NA | NA | Discharges of oil drilling wastes and from metal. |
| Cadmium | ppb | 5 | 0.04 | 1 | 0.4 | NR | NA | NA | Internal corrosion of galvanized pipes; erosions of natural deposits; discharge from electroplating and industrial chemical factories, and metal refineries; runoff from waste batteries and paints. |
| Chromium, Total | ppb | 50 | [100]* | 10 | 3.7 | 2.2 to 6.0 | NA | NA | Discharge from steel and pulp mills and chrome plating; erosion of natural deposits. |
| Hexavalent Chromium | ppb | ** | 0.02 | [1] | 3.6 | 2.1 to 6.0 | ND | NR | Discharge from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities; erosion of natural deposits. |
| Fluoride (naturally-occuring) | ppm | 2 | 1 | 0.1 | 0.2 | 0.1 to 0.3 | 0.15 | ND to 0.41 | Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories. |
| Nitrate (as Nitrogen) | ppm | 10 | 10 | 0.4 | 2.7 | 0.9 to 5.5 | 0.8 | ND to 2.1 | Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits. |
| Nitrate and Nitrite (as Nitrogen) | ppm | 10 | 10 | [0.2] | 2.6 | 1.2 to 4.1 | 0.8 | ND to 2.1 | Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits. |
| Perchlorate | ppb | 6 | 1 | 4 | 1.8 | ND to 4.1 | NA | NA | Perchlorate is an inorganic chemical used in solid rocket propellant, fireworks, explosives, flares, matches, and a variety of industries. It usually gets into drinking water as a result of environmental contamination from historic aerospace or other industrial operations that used or use, store, or dispose of perchlorate and its salts. |

## Table 3-2

## City of Ontario 2018 Water Quality Report (Continued)

| | | | | | Local Ground | | Imported Water, | | |
|---|---|---|---|---|---|---|---|---|---|
| CONSTITUENT | UNITS | MCL [NL] | PHG or [MCLG] | CA DLR [MRL] | Ave. | Range | Average | Range | Major Sources in Drinking Water |
| **DISINFECTION BY-PRODUCTS, DISINFECTANT RESIDUALS, AND DISINFECTION BY-PRODUCTS PRECURSORS** | | | | | | | | | |
| Haloacetic Acids (HAA5) | ppb | LRAA = 60 | NA | 2 | NA | NA | 11 | 7 to 13 | By-product of drinking water chlorination |
| Total Trihalomethanes (TTHMs) | ppb | LRAA = 80 | NA | 1 | NA | NA | 54 | 29 to 60 | By-product of drinking water chlorination |
| Chlorine Residual | ppm | MRDL = 4 | MRDLG = 4 | NA | NA | NA | 1.31 | 0.54 to 2.10 | Drinking water disinfectant added for treatment |
| **SECONDARY STANDARDS - Aesthetic Standards** | | | | | | | | | |
| Aluminum | ppb | 200 | 600 | 50 | ND | NR | 38 | ND to 97 | Erosion of natural deposits; residue from some surface water treatment processes |
| Chloride | ppm | 500 | NA | [1] | 7.6 | 3.7 to 15 | 49 | 3.3 to 89 | Runoff/leaching from natural deposits; seawater influence |
| Iron | ppb | 300 | NA | 100 | ND | NR | ND | NR | Leaching from naturla deposits; industrial wastes |
| Odor Threshold | TON | 3 | NA | 1 | ND | NR | 1.3 | ND to 2.0 | Naturally-occurring organic materials |
| Specific Conductance | µS/cm | 1600 | NA | [1] | 357 | 310 to 450 | 442 | 380 to 500 | Substances that form ions when in water; seawater influence |
| Sulfate | ppm | 500 | NA | 0.5 | 14 | 5.5 to 36 | 35 | 25 to 49 | Runoff/leaching from natural deposits; industrial wastes |
| Total Dissolved Solids | ppm | 1000 | NA | NA | 221 | 190 to 270 | 262 | 230 to 290 | Runoff/leaching from natural deposits |
| Turbidity | NTU | 5 | NA | [0.10] | 0.1 | 0.1 to 0.2 | 0.09 | 0.05 to 0.3 | Soil runoff |
| **OTHER PARAMETERS** | | | | | | | | | |
| Alkalinity (Total) | ppm | NA | NA | [3] | 143 | 130 to 160 | 103 | 58 to 180 | Naturally-occurring carbonate; measures the water's ability to neutralize acid. |
| Bicarbonate | ppm | NA | NA | [3] | 143 | 130 to 160 | 126 | 70 to 220 | |
| Boron | ppb | [1000] | NA | 100 | NA | NA | 68 | ND to 160 | Naturally-occurring element; Runoff/leaching from natural deposits and fertilizer use; industrial wastes. |
| Calcium | ppm | NA | NA | [1] | 43 | 35 to 55 | 32 | 18 to 60 | Naturally-occurring mineral |
| Corrosivity (Aggressiveness Index) | AI | NA | NA | NA | NA | NA | 12 | 12 to 12.1 | Elemental balance in water; affected by temperature, other factors |
| Corrosivity (Saturation Index) | SI | NA | NA | NA | NA | NA | 0.36 | 0.29 to 0.43 | Elemental balance in water; affected by temperature, other factors |
| Hardness | ppm | NA | NA | [3] | 138 | 120 to 180 | 124 | 86 to 190 | Naturally-occurring mineral; the sum of calcium and magnesium present in water |
| Magnesium | ppm | NA | NA | [1] | 7.5 | 6.0 to 10 | 10.2 | 7.8 to 12 | Naturally-occurring mineral |
| pH | pH units | NA | NA | [1] | 8.2 | 8.0 to 8.3 | 8.47 | 8.1 to 8.8 | Measurement of hydrogen ion activity |
| Potassium | ppm | NA | NA | [1] | 1.8 | 1.5 to 2.1 | 2.4 | 1.9 to 2.8 | Naturally-occurring mineral |
| Sodium | ppm | NA | NA | [1] | 19 | 14 to 27 | 39 | 11 to 58 | Naturally-occurring mineral; seawater influence |
| Total Organic Carbon (TOC) | ppm | TT | NA | 0.3 | NA | NA | 2.3 | 1.8 to 2.8 | Various natural and man-made sources |
| Vanadium | ppb | [50] | NA | 3 | NA | NA | 3.4 | ND to 4.9 | Naturally-occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst |

## Table 3-2

## City of Ontario 2018 Water Quality Report (Continued)

| | | | | | Imported Water, JCSD | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CDA 1 | | CDA 2 | | Ion Exchange | | |
| CONSTITUENT | UNITS | MCL [NL] | PHG or [MCLG] | CA DLR [MRL] | Ave | Range | Ave | Range | Ave | Range | Major Sources in Drinking Water |
| PRIMARY STANDARDS - Mandatory Health-Related Standards | | | | | | | | | | | |
| INORGANIC CHEMICALS | | | | | | | | | | | |
| Chromium (total) | ppb | 50 | [100]* | 10 | ND | ND | 0.9 | ND to 4.5 | 3.8 | 3.0 to 5.8 | Discharge from steel and pulp mills and chrome plating; erosion of natural deposits |
| Fluoride (Naturally -occurring) | ppm | 2 | 1 | 0.1 | ND | ND | ND | ND to 0.16 | ND | ND to 0.16 | Erosion of natural deposits; water additive that promotes strong teeth; discharge from fertilizer and aluminum factories |
| Nitrate (as Nitrogen) | ppm | 10 | 10 | 0.4 | 5 | 4.5 to 5.5 | 5.1 | 3.8 to 5.8 | 6 | 4.2 to7.4 | Runoff and leaching from fertilizer use; leaching from septic tanks and sewage; erosion of natural deposits |
| radiological | | | | | | | | | | | |
| Uranium | pCI/L | 20 | 0.43 | NA | ND | ND | ND | ND | 1.7** | 1.7** | Some people who drink water containing uranium in excess of the MCL over many years may have kidney problems or an increased risk of getting cancer. |
| DISINFECTION BY-PRODUCTS, DISINFECTNAT RESIDUALS, AND DISINFECTION BY-PRODUCTS PRECURSORS | | | | | | | | | | | |
| Haloacetic Acids (HAA5) | ppb | LRAA=60 | NA | 2 | ND | ND | ND | ND | 2.9 | 2.0 to 3.8 | By-product of drinking water chlorination |
| Total Trihalomethanes (TTHMs) | ppb | LRAA = 80 | NA | 1 | ND | ND | ND | ND | 8.9 | 8.9 | By-product of drinking water chlorination |
| Chlorine Residual | ppm | MRDL = 4 | MRDLG = 4 | NA | 0.84 | 0.61 to 1.54 | 1.4 | 0.65 to 1.85 | 1.35 | 0.62 to 1.70 | Drinking water disinfectant added for treatment |
| SECONDARY STANDARDS - Asethtic Standards | | | | | | | | | | | |
| Chloride | ppm | 500 | NA | [1] | 108 | 96 to 120 | 68 | 13 to 79 | 63 | 23 to 110 | Runoff/leaching from natural deposits; seawater influence |
| Color | Units | 15 | NA | 3 | 3 | 3 | ND | ND | ND | ND | Naturally occuring organic material |
| Specific Conductance | µS/cm | 1600 | NA | [1] | 601 | 570 to 631 | 5.1 | 3.8 to 5.8 | 553 | 470 to 650 | Substances that form ions when in water; seawater influence |
| Sulfate | ppm | 500 | NA | 0.5 | 4.7 | 4.4 to 5.0 | 10 | 7.4 to 14 | 23 | 18 to 27 | Runoff/leaching from natural deposits; industrial wastes |
| Total Dissolved Solids (TDS) | ppm | 1000 | NA | NA | 525 | 520 to 530 | 344 | 230 to 390 | 423 | 290 to 580 | Runoff/leaching from natural deposits |
| Turbidity | NTU | 5 | NA | [0.10] | ND | ND to 0.17 | ND | ND | ND | ND | Soil runoff |
| Surfactants | ppb | 500 | NA | NA | 45 | ND TO 90 | 50 | ND TO 0100 | ND | ND | |

## Table 3-2

## City of Ontario 2018 Water Quality Report (Continued)

| | | | | | Imported Water, JCSD | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CDA 1 | | CDA 2 | | Ion Exchange | | Major Sources in Drinking Water |
| CONSTITUENT | UNITS | MCL [NL] | PHG or [MCLG] | CA DLR [MRL] | Ave | Range | Ave | Range | Ave | Range | |
| OTHER PARAMETERS | | | | | | | | | | | |
| 1,4-dioxane (1) | ppb | NA | NA | [0.07] | ND | ND | 0.24 | 0.17 to 0.24 | 0.19 | 0.09 to 0.31 | Cyclic aliphatic ether; used as a solvent or solvent stabilizer in manufacture and processing of paper, cotton, textile products, automotive coolant, cosmetics and shampoos. |
| Alkalinity (Total) | ppm | NA | NA | [3] | 104 | 87 to 120 | 108 | 106 to 120 | 151 | 120 to 180 | Naturally-occurring carbonate; measures the water's ability to neutralize acid. |
| Calcium | ppm | NA | NA | [1] | 57 | 57 | 51 | 43 to 58 | 70 | 62 to 81 | Naturally-occurring mineral. |
| Chlorate (1) | ppb | [800] | NA | [20] | 23 | 21 to 25 | 42 | 27 to 57 | 71 | 31 to 170 | Byproduct of drinking water disinfection; industrial process. |
| Hardness | ppm | NA | NA | [3] | 190 | 190 | 158 | 130 to 180 | 206 | 108 to 240 | Naturally-occurring mineral; the sum of calcium and magnesium present in water. |
| Hexavalent Chromium | ppb | *** | 0.02 | [1] | ND | ND | ND | ND | 3.5 | 3.0 to 5.1 | Discharge from electroplating factories, leather tanneries, wood preservation, chemical synthesis, refractory production, and textile manufacturing facilities; erosion of natural deposits. |
| Magnesium | ppm | NA | NA | [1] | 12 | 12 | 7.9 | 5.6 to 9.4 | 7.6 | 5.8 to 9.5 | Naturally-occurring mineral. |
| Molybdenum (1) | ppb | NA | NA | [1] | ND | ND | 1.9 | ND to 3.9 | 0.9 | ND to 1.7 | Naturally-occurring element found in ores and present in plants, animals and bacteria; commonly used form molybdenum trioxide used as a chemical reagent. |
| N-Nitrosodimethylamine (NDMA) | ppt | [10] | NA | NA | 7.2 | 7.2 | ND | ND | ND | ND | |
| pH | pH units | NA | NA | [1] | 7.7 | 7.5 to 7.9 | 8 | 7.9 to 8.1 | 8.1 | 7.9 to 8.2 | Measurement of hydrogen ion activity. |
| Potassium | ppm | NA | NA | [1] | 1.3 | 1.2 to 1.3 | 1.6 | 1.1 to 2.0 | 1.9 | 1.7 to 2.2 | Naturally-occurring mineral. |
| Sodium | ppm | NA | NA | [1] | 28 | 27 to 28 | 25 | 23 to 28 | 24 | 21 to 28 | Naturally-occurring mineral; seawater influence. |
| Strontium (1) | ppb | NA | NA | [0.3] | 370 | 360 to 380 | 351 | 270 to 440 | 515 | 360 to 680 | Naturally-occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions. |
| Total Silica | ppm | NA | NA | NA | 11 | 11 | 20 | 14 to 25 | 20 | 20 | |
| Vandaium (1) | ppb | [50] | NA | [0.2] | 1.4 | 1.3 to 1.4 | 1.5 | 1.0 to 1.9 | 3.3 | 2.1 to 4.4 | Naturally-occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst. |

(1) Data was collected in 2014

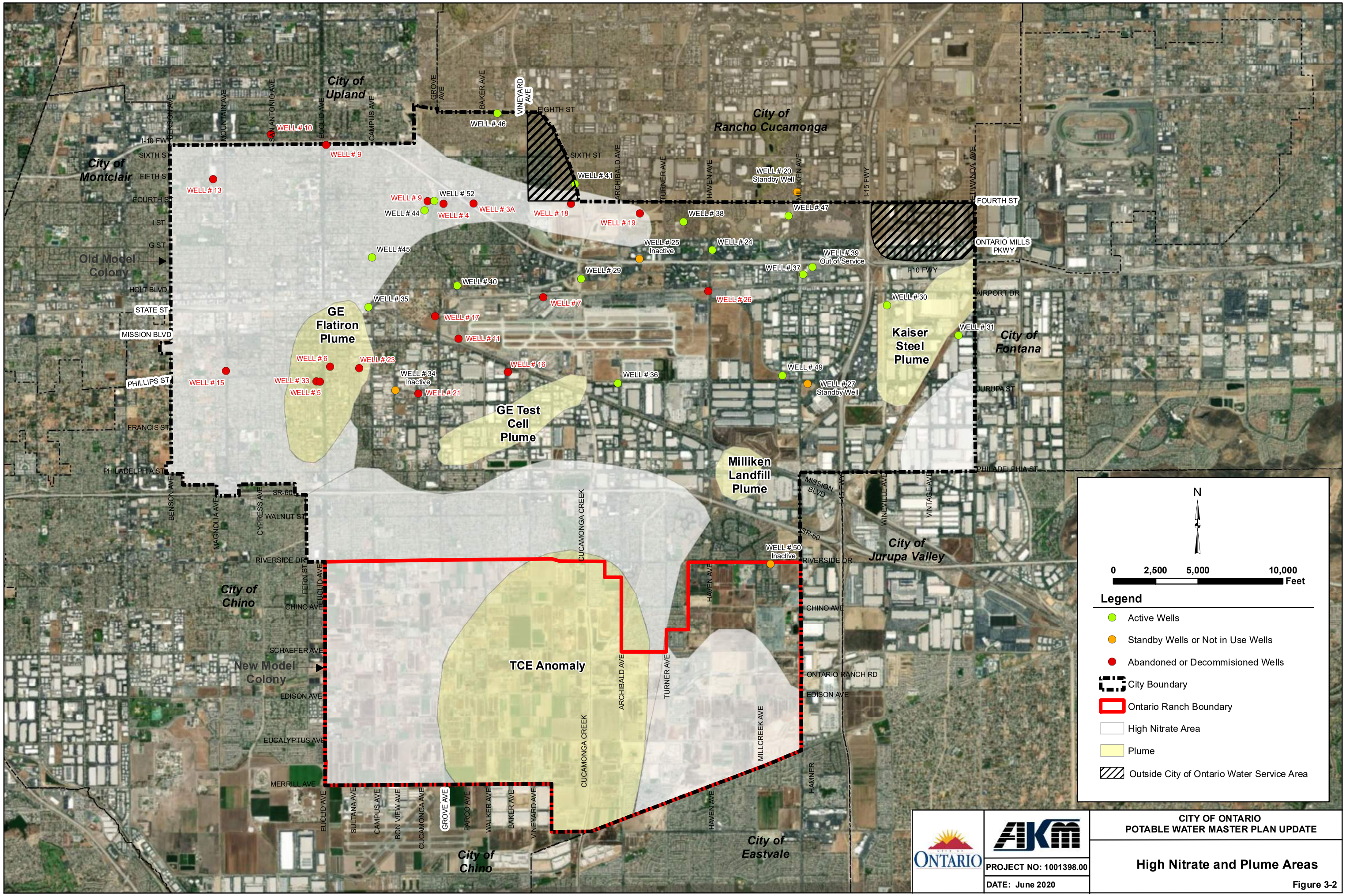


ONTARIO

AKM

PROJECT NO: 1001398.00

DATE: June 2020

CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE

**High Nitrate and Plume Areas**

Figure 3-2

## SECTION 4

## WATER USE

### 4-1 Historic Water Production and Purchase

The City obtains its potable water supply from groundwater wells in Chino Basin and imported water from the Water Facilities Authority (WFA) and the Chino Basin Desalter Authority (CDA). Currently, the City operates seventeen (17) active wells.

The total annual water production and purchase from January 2007 to December 2018 is shown in Table 4-1 and on Figure 4-1. Figure 4-2 illustrates the historic water production and purchase by month. Over the last twelve years, the annual supply has averaged a total of 35,774 AFY (31.9 mgd). The average groundwater production is 23,520 AFY (21.0 mgd). Per the Chino Basin Watermaster 41st Annual Report, the City of Ontario has appropriative rights to 16,337 AFY, and its share of the initial operating safe yield is 11,374 AFY or 21 percent of the appropriative pool rights. The City has secured additional supply through transfers, purchase, and groundwater recharge. The average amount of imported water purchased is 12,253 AFY (10.9 mgd).

There has been a decrease in production over the past twelve years. This may be attributed to the expansion of the City's recycled water system, as well as a conscientious water conservation effort by the customers. Water conservation is discussed further in Section 4-9.

**Table 4-1**

**Historic Water Production and Purchase (Annual)**

| | Imported Water Purchased | | | | | | Groundwater Well Production | | | | | Total Production and Purchase | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calendar Year | CDA (AFY) | WFA (AFY) | SAWCO (AFY) | Total (AFY) | Total (mgd) | % of Total | Local (AFY) | DYY Shift (AFY) | Total (AFY) | mgd | % of Total | AFY | mgd |
| 2007 | 5,125 | 12,734 | 0 | 17,859 | 15.9 | 40% | 26,946 | 0 | 26,946 | 24.1 | 60% | 44,806 | 40.0 |
| 2008 | 5,498 | 8,740 | 0 | 14,238 | 12.7 | 33% | 27,064 | 2,000 | 29,064 | 25.9 | 67% | 43,302 | 38.7 |
| 2009 | 5,047 | 3,494 | 0 | 8,541 | 7.6 | 22% | 28,996 | 2,000 | 30,996 | 27.7 | 78% | 39,537 | 35.3 |
| 2010 | 5,327 | 7,666 | 0 | 12,993 | 11.6 | 37% | 20,955 | 1,043 | 21,997 | 19.6 | 63% | 34,990 | 31.2 |
| 2011 | 5,162 | 8,883 | 0 | 14,046 | 12.5 | 41% | 20,442 | 0 | 20,442 | 18.3 | 59% | 34,488 | 30.8 |
| 2012 | 4,911 | 10,415 | 0 | 15,326 | 13.7 | 43% | 20,226 | 0 | 20,226 | 18.1 | 57% | 35,552 | 31.7 |
| 2013 | 4,987 | 10,967 | 0 | 15,954 | 14.2 | 44% | 19,967 | 0 | 19,967 | 17.8 | 56% | 35,921 | 32.1 |
| 2014 | 5,288 | 10,135 | 0 | 15,423 | 13.8 | 43% | 20,274 | 0 | 20,274 | 18.1 | 57% | 35,697 | 31.9 |
| 2015 | 3,543 | 6,413 | 443 | 10,399 | 9.3 | 35% | 19,544 | 0 | 19,544 | 17.5 | 65% | 29,943 | 26.7 |
| 2016 | 3,029 | 2,398 | 107 | 5,534 | 4.9 | 19% | 24,132 | 0 | 24,132 | 21.5 | 81% | 29,666 | 26.5 |
| 2017 | 3,039 | 3,035 | 294 | 6,367 | 5.7 | 20% | 25,797 | 0 | 25,797 | 23.0 | 80% | 32,164 | 28.7 |
| 2018 | 4,413 | 5,589 | 359 | 10,361 | 9.3 | 31% | 22,860 | 0 | 22,860 | 20.4 | 69% | 33,221 | 29.7 |
| **Average** | **4,614** | **7,539** | **100** | **12,253** | **10.9** | **34%** | **23,100** | **420** | **23,520** | **21.0** | **66%** | **35,774** | **31.9** |

**Figure 4-1**

**Historical Water Production and Purchase (Annual)**

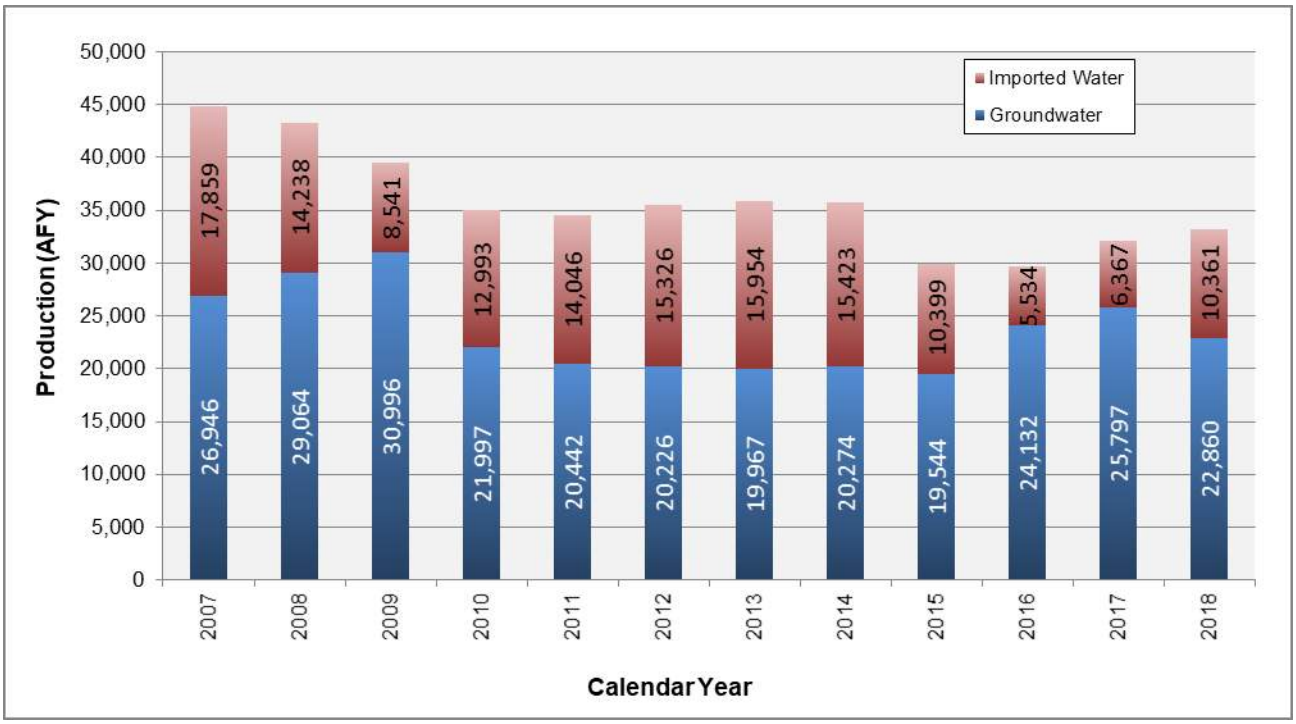


**Figure 4-2**

**Historical Water Production and Purchase (Monthly)**

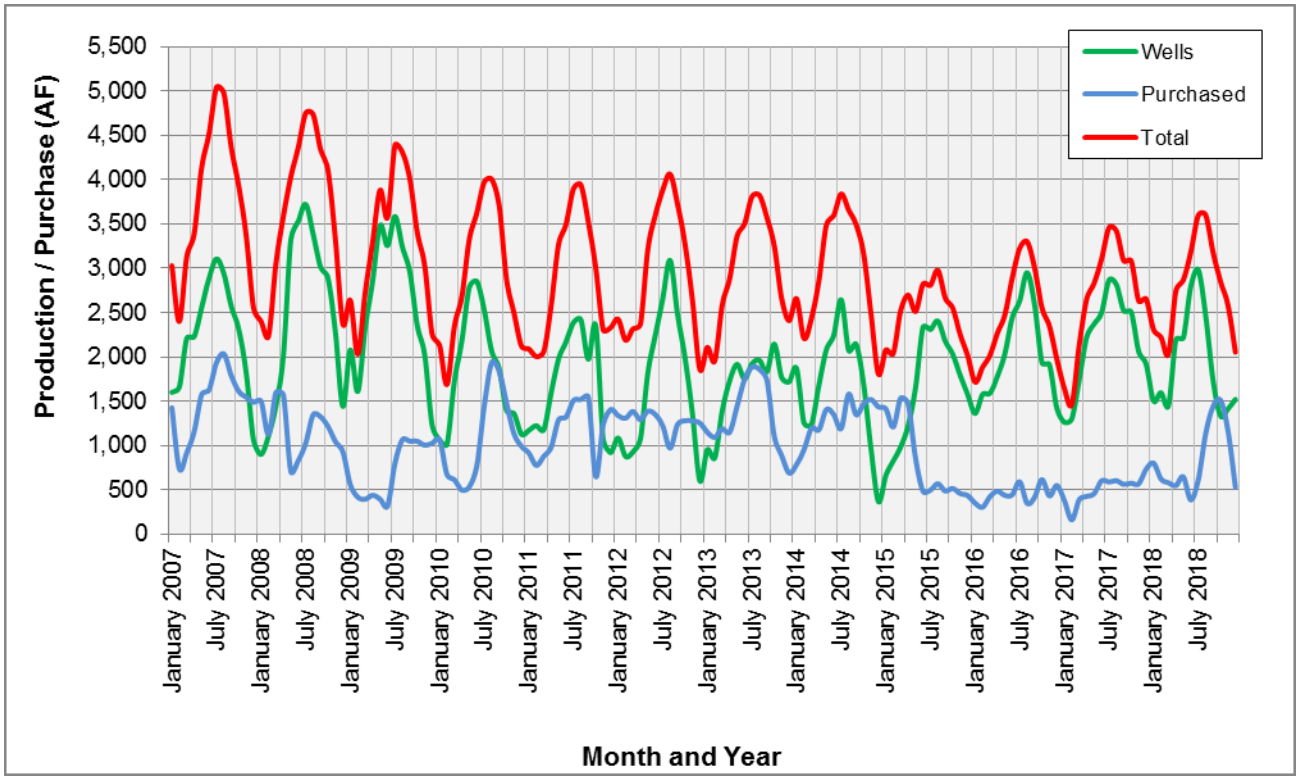

## 4-2 Water Consumption versus Water Production / Purchase

The City typically purchases/produces more water than the quantity measured by the customer meters. Table 4-2 summarizes the difference between the measured consumption and production from 2007 to 2018. Figure 4-3 graphically shows the City's water consumption versus production/purchase.

**Table 4-2**

**Water Consumption versus Water Production/Purchase**

| Calendar Year | Water Consumption[1] (AFY) | Water Production/ Purchase[2] (AFY) | Non-Revenue Water (%) | Population[3] | Per Capita Production/ Purchase (gpcd) | Per Capita Consumption (gpcd) |
|---|---|---|---|---|---|---|
| 2007 | 44,286 | 44,806 | 1.2% | 158,405 | 253 | 250 |
| 2008 | 42,072 | 43,302 | 2.8% | 158,181 | 244 | 237 |
| 2009 | 37,708 | 39,537 | 4.6% | 157,539 | 224 | 214 |
| 2010 | 35,403 | 34,990 | -1.2% | 158,154 | 198 | 200 |
| 2011 | 37,735 | 34,488 | -9.4% | 160,723 | 192 | 210 |
| 2012 | 37,652 | 35,552 | -5.9% | 160,827 | 197 | 209 |
| 2013 | 34,212 | 35,921 | 4.8% | 161,812 | 198 | 189 |
| 2014 | 35,160 | 35,697 | 1.5% | 162,778 | 196 | 193 |
| 2015[4] | 29,346 | 29,943 | 2.0% | 164,389 | 163 | 159 |
| 2016[4] | 29,056 | 29,666 | 2.1% | 165,966 | 160 | 156 |
| 2017[4] | 30,817 | 32,164 | 4.2% | 169,387 | 170 | 162 |
| 2018[4] | 33,026 | 33,221 | 0.6% | 171,819 | 173 | 172 |
| **Average** | **35,539** | **35,774** | **2.6%** | **162,498** | **197** | **196** |

*[1] Consumption from annual Department of Water Resources Public Water System Statistics Report.*

*[2.] Water Production/Purchase data extracted from City's Anuual System Operations Data*

*[3] Population data from California Department of Finance, E-5 Population and Housing Estimates for Cities 2000-2018, excluding estimate of population for areas in Ontario served by CVWD.*

*[4] Water consumption estimates are from monthly water billing data.*

Per the historical records, the consumption between 2010 and 2012 was more than the amount of water produced and/or purchased, which could not have actually happened. Possible explanations for the discrepancy in data include the following:

- During this time, the City was expanding its recycled water system. Some customers were converted from potable water use to recycled water use. Some of the consumption data might have actually been a combination of the potable and recycled water use.
- City staff has been updating and reclassifying meter types in its billing database. Some of the data provided in the historical DWR reports might have been misclassified at the time the report was created.
- Meters are not always perfectly calibrated. The margin of error in few large meters that measure production and purchase amounts or the thousands of small meters measuring consumption could contribute to the discrepancy in data.

The water consumption data before the 2015 Calendar Year is based on Department of Water Resources Public Water System Statistics Reports. After the 2015 Calendar Year, the consumption data is based on the monthly water billing data. Non-revenue water makes up between 0.6% and 4.8% of the total production and purchase supply, respectively. The City strives to keep the percentage as low as possible. The City's non-revenue water is 2.6%, on average.

Non-revenue water occurs in all water systems. There will be differences in the accuracies of the few large meters which measure purchases and production, and the thousands of small customer meters which measure sales. Non-revenue water can also be due to unmeasured uses such as water main flushing and other maintenance related tasks. The remainder may be due to leaks from the system. The City's average non-revenue water rate of 2.6%.

**Figure 4-3**

**Water Consumption versus Water Production/Purchase**

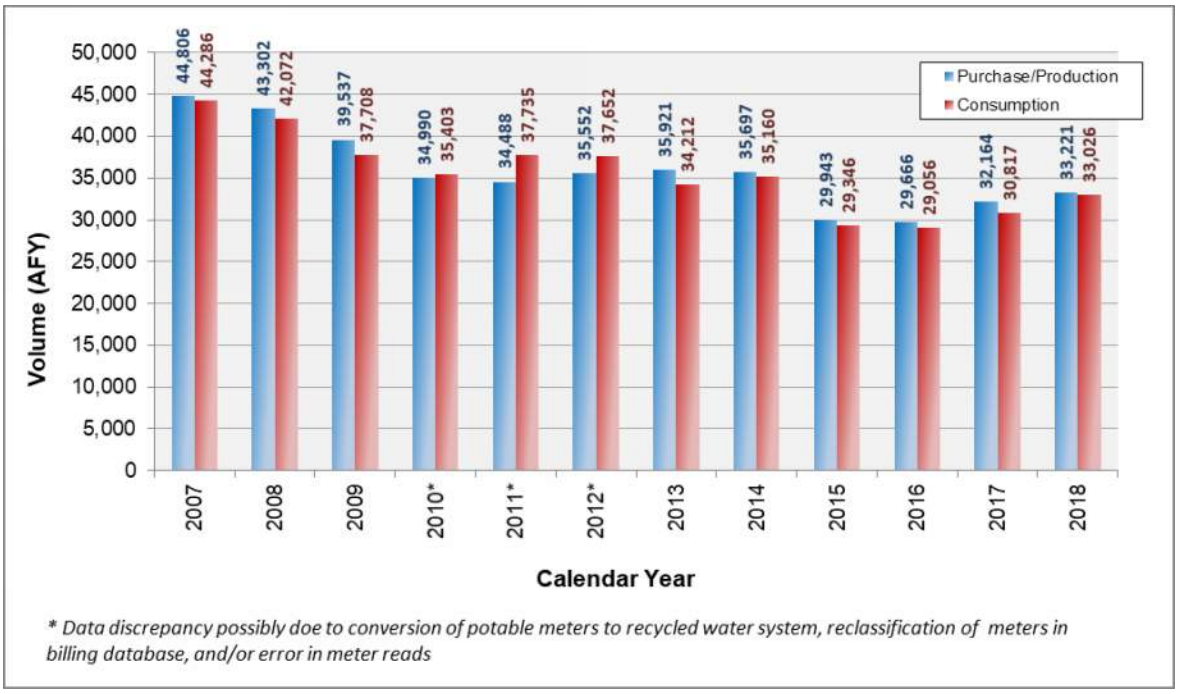


## 4-3 Water Demand Variations

Demand variations through a year are influenced by seasonal effects such as temperature, humidity, and precipitation. System demand variations throughout a day are influenced by the customer base and the daily lifestyles of the customers. In primarily residential areas, the peak demands within a day typically occur in the morning hours between 6:00 am and 9:00 am, when customers wake to begin their daily routine. In largely commercial and industrial areas, the peaks may occur mid-day or the demand may even remain relatively constant throughout the work day. For this study, the variations are expressed as a ratio to the average demand, with the average demand being equal to one.

For the purpose of this master plan, the average day demand was based on the most recent twelve consecutive months of production and purchase data that was available at the time the hydraulic model was created. The average day demand is summarized in Table 4-3.

**Table 4-3**
**Average Day Demand for the Hydraulic Water Model**

| | AF | MGD | gpm |
|---|---|---|---|
| September 2018 | 3,179 | 34.53 | 23,980 |
| October 2018 | 2,850 | 29.95 | 20,800 |
| November 2018 | 2,583 | 28.06 | 19,483 |
| December 2018 | 2,053 | 21.58 | 14,988 |
| January 2019 | 1,915 | 20.13 | 13,980 |
| February 2019 | 1,503 | 17.49 | 12,147 |
| March 2019 | 1,831 | 19.25 | 13,366 |
| April 2019 | 2,708 | 29.41 | 20,425 |
| May 2019 | 2,682 | 28.19 | 19,574 |
| June 2019 | 2,966 | 32.22 | 22,373 |
| July 2019 | 3,404 | 35.78 | 24,847 |
| August 2019 | 3,479 | 36.57 | 25,397 |
| **Total** | **31,153** | **27.76** | **19,280** |

## 4-4 Monthly Demand Variations

Typical of most Southern California communities, the City's water consumption exhibits a distinct seasonal pattern. Peak and low monthly consumption occur during the dry summer months and wet winter months, respectively. Monthly demand

totals and factors for 2007 to 2018 are shown in Table 4-4. Peak demands typically occur in July and August. Low demands typically occur in February. The highest and lowest monthly demand factor for the 2018 Calendar year is 1.46 and 0.82, respectively.

The maximum month factor is estimated to be 1.46 times the ADD, which is representative of the OMC demands, since there is very little existing usage in the OR area. The OR maximum day peaking factor was estimated to be 1.36, which was developed by excluding a portion of the water use that is expected to be served through the recycled water system.

**Table 4-4**

**Monthly Water Demand Totals and Factors**

| | 2007 | | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | 2013 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** |
| January | 3,031 | 0.81 | 2,402 | 0.67 | 2,639 | 0.80 | 2,134 | 0.73 | 2,090 | 0.73 | 2,427 | 0.82 | 2,108 | 0.70 |
| February | 2,402 | **0.64** | 2,238 | **0.62** | 2,033 | **0.62** | 1,690 | **0.58** | 2,004 | **0.70** | 2,190 | 0.74 | 1,958 | **0.65** |
| March | 3,127 | 0.84 | 3,055 | 0.85 | 2,726 | 0.83 | 2,345 | 0.80 | 2,060 | 0.72 | 2,317 | 0.78 | 2,583 | 0.86 |
| April | 3,387 | 0.91 | 3,588 | 0.99 | 3,297 | 1.00 | 2,683 | 0.92 | 2,574 | 0.90 | 2,369 | 0.80 | 2,883 | 0.96 |
| May | 4,132 | 1.11 | 4,032 | 1.12 | 3,880 | 1.18 | 3,325 | 1.14 | 3,267 | 1.14 | 3,212 | 1.08 | 3,362 | 1.12 |
| June | 4,511 | 1.21 | 4,363 | 1.21 | 3,574 | 1.08 | 3,621 | 1.24 | 3,493 | 1.22 | 3,597 | 1.21 | 3,500 | 1.17 |
| July | 5,039 | **1.35** | 4,750 | **1.32** | 4,385 | **1.33** | 3,970 | 1.36 | 3,895 | 1.36 | 3,881 | 1.31 | 3,808 | 1.27 |
| August | 4,974 | 1.33 | 4,733 | 1.31 | 4,307 | 1.31 | 4,005 | **1.37** | 3,939 | **1.37** | 4,061 | **1.37** | 3,824 | **1.28** |
| September | 4,359 | 1.17 | 4,338 | 1.20 | 4,008 | 1.22 | 3,714 | 1.27 | 3,524 | 1.23 | 3,722 | 1.26 | 3,574 | 1.19 |
| October | 3,925 | 1.05 | 4,105 | 1.14 | 3,403 | 1.03 | 2,878 | 0.99 | 3,004 | 1.05 | 3,276 | 1.11 | 3,251 | 1.09 |
| November | 3,369 | 0.90 | 3,323 | 0.92 | 3,028 | 0.92 | 2,500 | 0.86 | 2,307 | 0.80 | 2,641 | 0.89 | 2,657 | 0.89 |
| December | 2,549 | 0.68 | 2,374 | 0.66 | 2,257 | 0.69 | 2,125 | 0.73 | 2,331 | 0.81 | 1,860 | **0.63** | 2,411 | 0.81 |
| **Average** | **3,734** | | **3,609** | | **3,295** | | **2,916** | | **2,874** | | **2,963** | | **2,993** | |

| | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | Average | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** | **AF** | **Factor** |
| January | 2,657 | 0.89 | 2,080 | 0.83 | 1,717 | 0.69 | 1,647 | 0.66 | 2,309 | 0.93 | 2,270 | 0.77 |
| February | 2,210 | 0.74 | 2,039 | 0.82 | 1,884 | **0.76** | 1,465 | **0.59** | 2,223 | 0.90 | 2,028 | **0.69** |
| March | 2,434 | 0.82 | 2,523 | 1.01 | 2,020 | 0.82 | 2,133 | 0.85 | 2,034 | **0.82** | 2,446 | 0.83 |
| April | 2,859 | 0.96 | 2,698 | 1.08 | 2,271 | 0.92 | 2,650 | 1.06 | 2,744 | 1.11 | 2,834 | 0.94 |
| May | 3,487 | 1.17 | 2,513 | 1.01 | 2,476 | 1.00 | 2,830 | 1.13 | 2,867 | 1.16 | 3,282 | 1.11 |
| June | 3,596 | 1.21 | 2,822 | 1.13 | 2,890 | 1.17 | 3,104 | 1.24 | 3,181 | 1.29 | 3,521 | 1.19 |
| July | 3,838 | **1.29** | 2,809 | 1.13 | 3,226 | 1.30 | 3,458 | **1.39** | 3,596 | 1.45 | 3,888 | 1.30 |
| August | 3,657 | 1.23 | 2,977 | **1.19** | 3,301 | **1.34** | 3,421 | 1.37 | 3,601 | **1.46** | 3,900 | **1.31** |
| September | 3,494 | 1.17 | 2,664 | 1.07 | 3,008 | 1.22 | 3,085 | 1.24 | 3,179 | 1.29 | 3,556 | 1.20 |
| October | 3,168 | 1.07 | 2,550 | 1.02 | 2,554 | 1.03 | 3,083 | 1.24 | 2,850 | 1.15 | 3,171 | 1.06 |
| November | 2,488 | 0.84 | 2,252 | 0.90 | 2,347 | 0.95 | 2,634 | 1.06 | 2,583 | 1.04 | 2,677 | 0.89 |
| December | 1,809 | **0.61** | 2,016 | **0.81** | 1,973 | 0.80 | 2,654 | 1.06 | 2,053 | 0.83 | 2,201 | 0.72 |
| **Average** | **2,975** | | **2,495** | | **2,472** | | **2,680** | | **2,768** | | **2,981** | |

**Figure 4-4**

**Monthly Demand Factors**

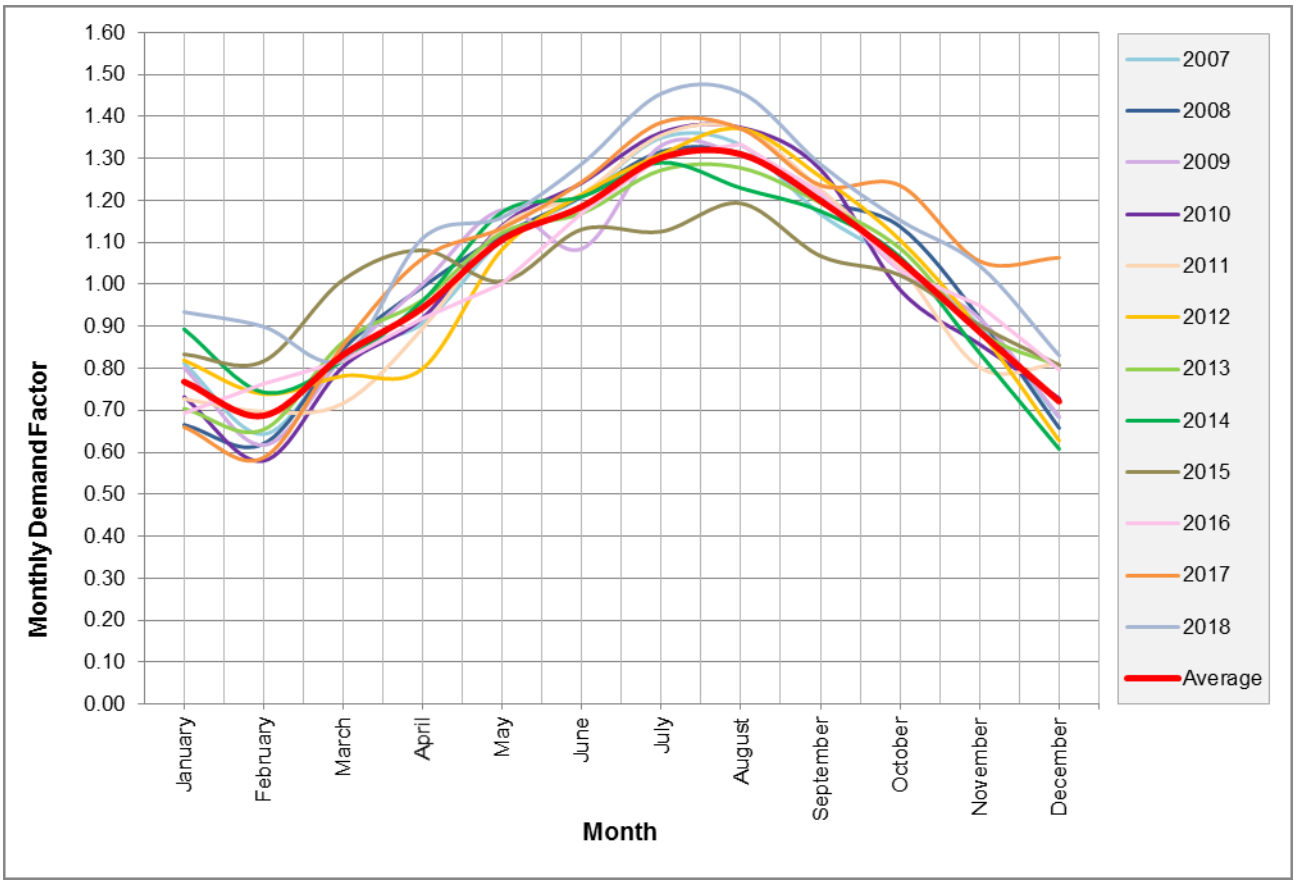


## 4-5 Daily Demand Variations

In the predominately developed OMC service area, the MDD is estimated to be 1.60 times the ADD. The OR maximum day peaking factor was estimated to be 1.50, which was developed by excluding a portion of the water use that is expected to be served through the recycled water system. The MDD estimate is summarized in Table 4-5.

In the hydraulic model, demands and patterns for high water users were allocated based on field data that was captured during the calibration period. For modeling purposes, the calibration diurnal pattern and demands were used for the ADD and MDD scenarios.

**Table 4-5**

**Maximum Day Demand Summary**

| | ADD (gpm) | | | MDD/ADD Peaking Factor | MDD (gpm) | | |
|---|---|---|---|---|---|---|---|
| | Non-HWU | HWU[1] | Total | | Non-HWU | HWU[1] | Total |
| Original Model Colony (OMC) | 17,196 | 1,691 | 18,887 | 1.6 | 27,512 | 1,691 | 29,202 |
| Ontario Ranch (OR) | 391 | 2 | 393 | 1.5 | 586 | 2 | 588 |
| Total | 17,587 | 1,693 | 19,280 | | 28,097 | 1,693 | 29,790 |

[1] *High water user demand and diurnal patterns are based on the calibration period*

## 4-6 Hourly Demand Variations

Knowledge of accurate demand variations over a 24-hour period is essential for proper analysis of water systems. For this study, diurnal use patterns were developed for each hydraulic zone. Customer specific diurnal patterns were developed for high water users. The development of diurnal use patterns are described in detail in Section 5 (Diurnal Patterns) of this report.

## 4-7 System Demands and Peaking Factors

It is important to evaluate a water system during various incremental peak demands. Typically, a water system is designed to meet the maximum demands placed on it. The system components must be designed to cope with these demands as they occur. Maximum month and maximum day demands are important factors in sizing a system's supply capability. Maximum day demands usually dictate the design criteria for both system transmission and storage needs. Peak hour criterion is a measure of the system's overall adequacy with respect to its transmission and distribution elements, as well as its operational storage capacity.

The peaking factors for Ontario Ranch (OR) was further refined to account for the fact that it is planned to be largely residential in nature and there were a dual recycled water system constructed in all major streets. The City anticipates a target of 12 percent of the total water use in low density residential areas to be provided by the recycled water system. It is expected that this percentage will increase as the residential density increases. With more recycled water and less irrigation use on the domestic water system, the peaking factors in OR are reduced as detailed in Table 4-6. These factors are utilized for future demand estimates in Ontario Ranch. The relationships between the peaking factors developed for this study with respect to the average day demand estimate are displayed graphically on Figure 4-5.

**Table 4-6**

**Existing Water System Demands and Peaking Factors**

| Demand Description | OMC Demand (gpm) | OR Demand (gpm) | HWU Demand[1] (gpm) | Total System Demand (gpm) | Total System Demand (mgd) | Total System Demand (AFY) | (OMC) Peaking Factor | (OR) Peaking Factor | Total System Peaking Factor |
|---|---|---|---|---|---|---|---|---|---|
| Average Day | 17,196 | 391 | 1,693 | 19,280 | 27.76 | 31,098 | 1.00 | 1.00 | 1.00 |
| Max Month | 25,107 | 531 | 1,693 | 27,331 | 39.36 | 44,085 | 1.46 | 1.36 | 1.42 |
| Max Day | 27,512 | 586 | 1,693 | 29,790 | 42.90 | 48,051 | 1.60 | 1.50 | 1.55 |
| Peak Hour[2] | N.A. | N.A. | N.A. | 36,934 | 53.19 | 59,575 | N.A. | N.A. | 1.98 |

[1] *High water user demand and diurnal patterns are based on the calibration period*

[2] *System Wide Peak Hour Factor was developed with multiple diurnal patterns that differ by zone, meter type, and for high water users.*

**Figure 4-5**

**Water Demand Peaking Factors**

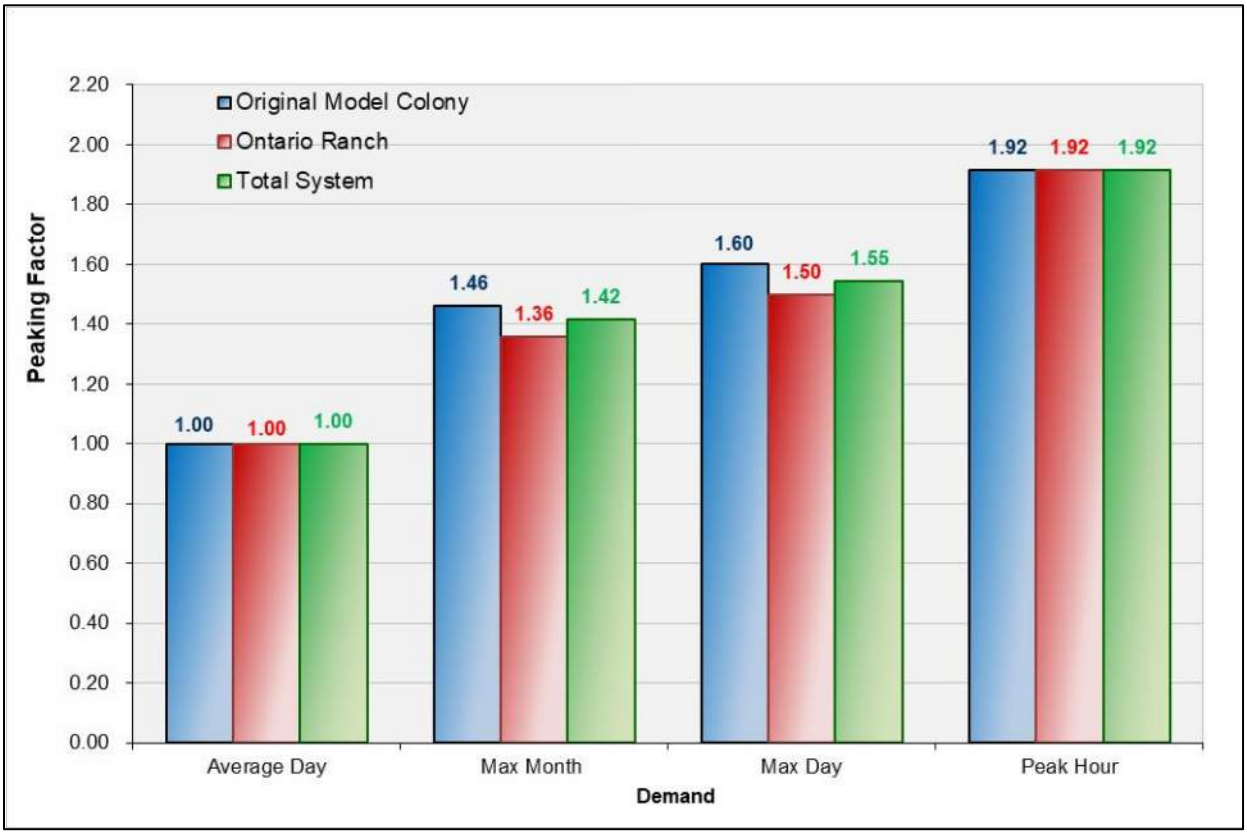


## 4-7.1 Existing Demands

- **Average Day -** As detailed in Table 4-2, the average day demand is based on the City of Ontario's average daily production and purchase data between September 2018 and August 2019. As shown in Table 4-5, the average day demand is 31,153 AFY (19,280 gpm).
- **Maximum Month -** As detailed in Table 4-6, the maximum month peaking factor for OMC and OR are 1.46 and 1.36, respectively. The maximum month demand is estimated as 45,341 AFY (28,109 gpm).
- **Maximum Day -** As detailed in Table 4-6, the maximum day peaking factor for OMC and OR are 1.6 and 1.5, respectively. The maximum day demand is estimated as 48,051 AFY (29,790 gpm).
- **Peak Hour Demands -** Modeled peak hour demands were based upon the diurnal patterns that were developed for the hydraulic model, as detailed in Section 5. The overall peak hour system demand is estimated to be 1.98 times the average day demand or 61,656 AFY (38,224 gpm). This factor varies by zone depending on the diurnal patterns developed by zone, meter type, and for high water users.
- **Existing Water Demands by Zone -** Existing water demands by zone are shown in Table 4-5. These estimates are based upon the demand distribution generated from water billing historical data linked to the City's meter geodatabase. The average day demands (ADD) were distributed in the model using the 12-month consumption data from the City's billing department, adjusted to the most-recent production and purchase data (31,094 AFY; 27.8 mgd; 19,280 gpm) which takes into consideration non-revenue water.

  Generally, the ADD were increased with the factors included in Table 4-6 to develop the Maximum Day Demands (MDD), which are summarized by zone in Table 4-7. It should be noted that the MDD model demands for the high water users are based on actual field data collected during the calibration period, and they are not estimated with the MDD peaking factor included in Table 4-6. The MDD total 48,051 AFY (42.9 mgd; 29,790 gpm).

**Table 4-7**

**Existing Water Demands by Zone**

| Zone | Average Day Demand | | | | Maximum Day Demand[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | gpm | mgd | AFY | % of Total | gpm | mgd | AFY | % of Total |
| 1348 | 2,059 | 2.96 | 3,321 | 10.7% | 3,273 | 4.71 | 5,280 | 11.0% |
| 1212 | 8,947 | 12.88 | 14,432 | 46.4% | 13,718 | 19.75 | 22,127 | 46.0% |
| 1074 | 3,839 | 5.53 | 6,192 | 19.9% | 5,939 | 8.55 | 9,579 | 19.9% |
| 1010 | 4,153 | 5.98 | 6,698 | 21.5% | 6,439 | 9.27 | 10,386 | 21.6% |
| 925 | 282 | 0.41 | 455 | 1.5% | 422 | 0.61 | 680 | 1.4% |
| **Total** | **19,280** | **27.76** | **31,098** | **100.0%** | **29,790** | **42.90** | **48,051** | **100.0%** |

[1] *MDD for high water users model demands are based on actual field data collected, not MDD peaking factors included in Table 4-6*

### 4-7.2 Water Unit Demand Factors

Existing consumption data was used in this study to represent the water use of existing customers. For future developments, water unit demand factors were used to estimate future water use. Potable water unit demand factors are generally based on the factors that were developed as a part of a study completed in May 2016 entitled "*Ultimate Citywide Water Demand Estimate*".

The revised potable water unit demand factors are shown in Table 4-8.

The residential unit demand factors were first developed in terms of gpd/person. Then the maximum densities (people/du and du/ac) were applied to determine the factors in other units. The resulting unit factors in terms of gpd/du and gpd/ac represent the maximum expected demand factors.

The 2016 study included maximum residential densities in the Ontario Ranch area, which were based on historical development projections that were provided by the City's planning department. Some of the recent actual projections are higher than those included in the Ontario Plan, which needed to be updated to appropriately develop the demand factors and the future demand estimate.

**Table 4-8**

**Potable Water Unit Demand Factors**

| Landuse | | Max Density (du/ac)[1] | Density (people/ du)[2] | Domestic Water Unit Demand Factors[3] | | | |
|---|---|---|---|---|---|---|---|
| | | | | gpd | unit | gpd/ac | gpd/du |
| **Residential** | | | | | | | |
| Rural Residential | RR | 2 | 3.997 | 172 | gpd/person | 1,375 | 687 |
| Low Density Residential (w/o RW) | LDR | 4 | 3.997 | 123 | gpd/person | 1,970 | 492 |
| Low Density Residential (w/ RW) | LDR | 5 | 3.997 | 95 | gpd/person | 1,900 | 380 |
| Low Medium Density Residential (w/o RW) | LMDR | 8.5 | 3.997 | 105 | gpd/person | 3,570 | 420 |
| Low Medium Density Residential (w/ RW) | LMDR | 11 | 3.997 | 90 | gpd/person | 3,960 | 360 |
| Medium Density Residential (w/o RW) | MDR | 18 | 3.347 | 90 | gpd/person | 5,420 | 301 |
| Medium Density Residential (w/ RW) | MDR | 25 | 3.347 | 80 | gpd/person | 6,690 | 268 |
| High Density Residential (w/o RW) | HDR | 35 | 3.347 | 70 | gpd/person | 8,200 | 234 |
| High Density Residential (w/ RW) | HDR | 40 | 3.347 | 60 | gpd/person | 8,030 | 201 |
| **Commercial** | | | | | | | |
| Business Park (w/o RW) | BP | | | 103 | gpd/job | 3,140 | |
| Business Park (w/ RW) | BP | - | - | 59 | gpd/job | 1,800 | - |
| General Commercial (w/o RW) | GC | | | 258 | gpd/job | 3,140 | |
| General Commercial (w/ RW) | GC | - | - | 148 | gpd/job | 1,800 | - |
| Hospitality[4] (w/o RW) | HOS | | | 155 | gpd/room | 5,980 | |
| Hospitality[4] (w/ RW) | HOS | - | - | 130 | gpd/room | 5,000 | - |
| Neighborhood Commercial (w/o RW) | NC | | | 99 | gpd/job | 3,140 | |
| Neighborhood Commercial (w/ RW) | NC | - | - | 57 | gpd/job | 1,800 | - |
| Office Commercial (w/o RW) | OC | | | 53 | gpd/job | 3,840 | |
| Office Commercial (w/ RW) | OC | - | - | 35 | gpd/job | 2,500 | - |
| **Industrial** | | | | | | | |
| Industrial (w/o RW) | IND | - | - | 110 | gpd/job | 2,290 | - |
| Industrial (w/ RW) | IND | - | - | 67 | gpd/job | 1,400 | - |
| **Mixed Use[5]** | | | | | | | |
| High Density Residential (w/o RW) | MU-HDR | 35 | 2.000 | 70 | gpd/person | 4,900 | 140 |
| High Density Residential (w/ RW) | MU-HDR | 40 | 2.000 | 60 | gpd/person | 4,800 | 120 |
| Office (w/o RW) | MU-O | | | 53 | gpd/job | 3,840 | |
| Office (w/ RW) | MU-O | - | - | 35 | gpd/job | 2,500 | - |
| Non-Office (w/o RW) | MU-NO | | | 179 | gpd/job | 2,690 | |
| Non-Office (w/ RW) | MU-NO | - | - | 102 | gpd/job | 1,800 | - |
| **Open Space** | | | | | | | |
| Open Space Non-Recreational (w/o RW) | OS-NR | | | | | 2,340 | |
| Open Space Non-Recreational (w/ RW) | OS-NR | - | - | - | | 1,000 | - |
| Open Space Recreational (w/o RW) | OS-R | | | | | 2,340 | |
| Open Space Recreational (w/ RW) | OS-R | - | - | - | | 1,000 | - |

**Table 4-8 (Continued)**

**Potable Water Unit Demand Factors**

| Landuse | | Max Density (du/ac)[1] | Density (people/ du)[2] | Domestic Water Unit Demand Factors[3] | | | |
|---|---|---|---|---|---|---|---|
| | | | | gpd | unit | gpd/ac | gpd/du |
| **Public** | | | | | | | |
| Public Facility (w/o RW) | PF | | | | | 3,040 | |
| Public Facility (w/ RW) | PF | - | - | - | | 1,700 | - |
| Public Middle or High School (w/o RW) | PS | - | - | 50 | gpd/student | 3,500 | - |
| Public Middle or High School (w/RW) | PS | - | - | 10 | gpd/student | 1,800 | - |
| Public Elementary School (w/o RW) | PS | - | - | 30 | gpd/student | 3,500 | - |
| Public Elementary School (w/RW) | PS | - | - | 10 | gpd/student | 1,800 | - |

*[1] Max Density per the City's 2010 General Plan (The Ontario Plan) for OMC without recycled water. Density for LDR, LMDR, MDR, and HDR with recycled water (Ontario Ranch) were increased per the City Planning Department recommendation (March 2016).*

*[2] Density per the City's 2010 General Plan (The Ontario Plan)*

*[3] Unit Flow Factor Abbreviations:*

*ac = acre* *du = dwelling unit* *gpd = gallons per day*

*room = hotel/motel room* *stu = student* *tsf = thousand square feet*

*[4] If possible it is recommended to use 130 - 155 gpd/room on a case by case basis. It is difficult to estimate the number of rooms or square footage per acre.*

*[5] Mixed Use demands should be based on the types of landuse that make up the specific area and the unit demand factors provided above. The City's 2010 General Plan (The Ontario Plan) provides detailed information on the landuses that make up each mixed use area.*

### 4-7.3 Future Demands

The City of Ontario's Future water system demands utilized in this study are detailed in Table 4-9 by zone. Generally, the ADD were increased with the factors included in Table 4-6 to develop the Maximum Day Demands (MDD), which are summarized by zone in Table 4-7. It should be noted that the MDD model demands for the high water users are based on actual field data collected during the calibration period, and they are not estimated with the MDD peaking factor included in Table 4-6. The MDD total 48,051 AFY (42.9 mgd; 29,790 gpm).

**Table 4-9**

**Future Water demands by Zone**

| Zone | Average Day Demand | | | | Maximum Day Demand[1] | | | |
|---|---|---|---|---|---|---|---|---|
| | gpm | mgd | AFY | % of Total | gpm | mgd | AFY | % of Total |
| 1348 | 2,137 | 3.08 | 3,446 | 6.0% | 3,398 | 4.89 | 5,481 | 6.2% |
| 1212 | 11,298 | 16.27 | 18,224 | 31.6% | 17,481 | 25.17 | 28,196 | 31.9% |
| 1074 | 4,103 | 5.91 | 6,618 | 11.5% | 6,361 | 9.16 | 10,261 | 11.6% |
| 1010 | 6,292 | 9.06 | 10,149 | 17.6% | 9,706 | 13.98 | 15,657 | 17.7% |
| 925 | 11,886 | 17.12 | 19,172 | 33.3% | 17,831 | 25.68 | 28,762 | 32.6% |
| **Total** | **35,716** | **51.43** | **57,610** | **100.0%** | **54,778** | **78.88** | **88,357** | **100.0%** |

*[1] MDD for high water users model demands are based on actual field data collected, not MDD peaking factors included in Table 4-6*

The increase in future water demand is due to development of Ontario Ranch, anticipated densification in land use and population per the City's 2010 General Plan, and the assumption that the area within the service area will be fully occupied (vacant land will be built upon and occupied).

The total water maximum day demand for the future system is estimated 54,778 gpm (78.88 mgd; 88,357 AFY). This Subsection describes the process of developing the future system demands for the areas that are going to be developed or redeveloped and distributing the demands in the hydraulic model. The existing demands remained the same unless an area was going to be redeveloped.

In summary, the following steps were used to estimate the future demands:

1. Existing meter data was used for existing uses.
2. Used Water Demand Factors included in Table 4-7 to estimate demand for the vacant and future densification areas. In areas of redevelopment the existing demands were updated with the estimated flows for the future development.
3. The "City Buildout Table" approved in April 2015 (*Appendix 4-1*) provided the population and job estimates for all future mixed use areas as defined by the Ontario Plan (General Plan). The unit flow factors provided in Table 4-7 were used to estimate the total average day water demand for mixed use areas. Any existing water demands were deducted from the total future average water demand estimate. If the existing demands were greater than the calculated future demands, the existing water demand was maintained in the hydraulic model. The difference was then applied to the hydraulic model in the specific mixed use area.
4. In the Original Model Colony, future average water demands were calculated for currently vacant parcels, assuming that they will be developed in the future per the land use designated in the General Plan. The parcel acreage and the water demand factors provided in Table 4-7 were utilized to estimate the total water demand.
5. All available specific plans and other more current planning information were utilized for Ontario Ranch. The specific plan areas are shown on Figure 4-6. The City compiled the information and provided table specifying the proposed land uses (*Appendix 4-1: Ontario Ranch Proposed Land Uses per Specific Plans*). The detailed land use information and the water demand factors provided in Table 4-7 were utilized for calculating the future water demands. Demands were applied to the nearest model junction. If less than 50 percent of a specific plan area was constructed at the time of this study, all existing water demand was removed and replaced with the projected future water demand. If a specific plan area was mostly constructed, the difference in existing and future water demand was added to the model in that particular area.
6. On the west side of Ontario Ranch, where no specific plans yet exist, the future water demands were calculated utilizing the General Plan land uses, parcel acreages, and the water demand factors provided in Table 4-7. Demands were applied to the nearest model junction.

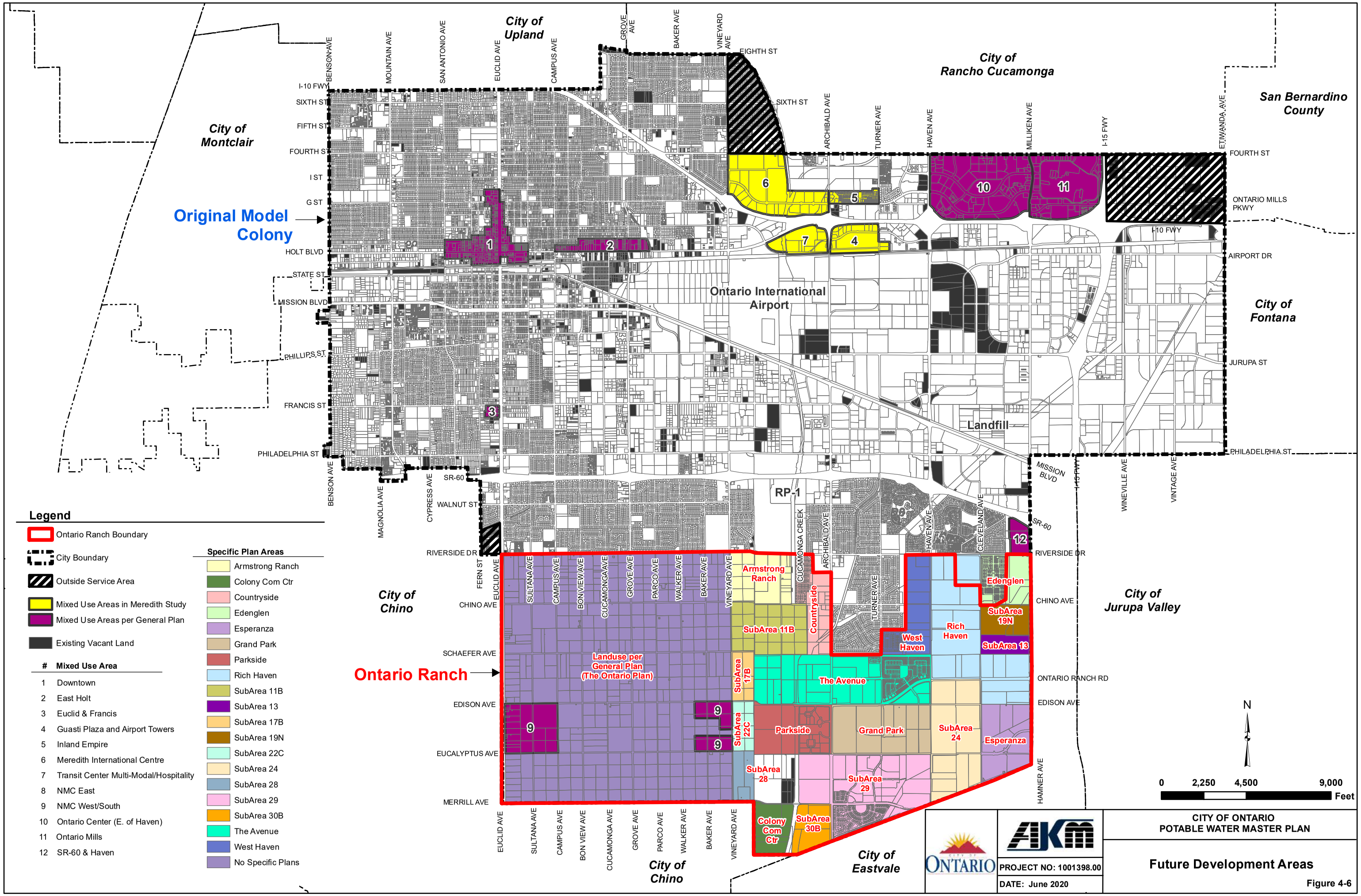
City of Upland
City of Rancho Cucamonga
San Bernardino County
City of Montclair
Original Model Colony
Ontario International Airport
City of Fontana
Landfill
RP-1
City of Jurupa Valley
City of Chino
Ontario Ranch
City of Eastvale
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ETIWANDA AVE
FOURTH ST
ONTARIO MILLS PKWY
I-10 FWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
I-10 FWY
SIXTH ST
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
PHILADELPHIA ST
MAGNOLIA AVE
CYPRESS AVE
SR-60
WALNUT ST
RIVERSIDE DR
FERN ST
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
SULTANA AVE
BON VIEW AVE
CUCAMONGA AVE
PARCO AVE
WALKER AVE
CUCAMONGA CREEK
MISSION BLVD
WINEVILLE AVE
VINTAGE AVE
ONTARIO RANCH RD
HAMNER AVE
1
2
3
4
5
6
7
9
10
11
12
Armstrong Ranch
Countryside
SubArea 11B
SubArea 17B
SubArea 22C
The Avenue
Parkside
Grand Park
SubArea 28
SubArea 29
Colony Com Ctr
SubArea 30B
West Haven
Rich Haven
SubArea 24
Edenglen
SubArea 19N
SubArea 13
Esperanza
Landuse per General Plan (The Ontario Plan)
Legend
Ontario Ranch Boundary
City Boundary
Outside Service Area
Mixed Use Areas in Meredith Study
Mixed Use Areas per General Plan
Existing Vacant Land
# Mixed Use Area
1 Downtown
2 East Holt
3 Euclid & Francis
4 Guasti Plaza and Airport Towers
5 Inland Empire
6 Meredith International Centre
7 Transit Center Multi-Modal/Hospitality
8 NMC East
9 NMC West/South
10 Ontario Center (E. of Haven)
11 Ontario Mills
12 SR-60 & Haven
Specific Plan Areas
Armstrong Ranch
Colony Com Ctr
Countryside
Edenglen
Esperanza
Grand Park
Parkside
Rich Haven
SubArea 11B
SubArea 13
SubArea 17B
SubArea 19N
SubArea 22C
SubArea 24
SubArea 28
SubArea 29
SubArea 30B
The Avenue
West Haven
No Specific Plans
N
0 2,250 4,500 9,000 Feet
ONTARIO
AKM
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN
Future Development Areas
Figure 4-6

## 4-8 Recycled Water

The City's recycled water use was 9,653 AFY (3,042 gpm) in Fiscal Year 2018. The recycled water is supplied by Inland Empire Utilities Agency (IEUA). Recycled water from IEUA's treatment plants are conveyed through IEUA's pipe conveyance system to the City's recycled distribution system. According to the City's billing data, there are approximately 370 recycled customer meters in the City.

The City's Recycled Water Master Plan was last updated in April 2006. It is being updated concurrent to this master plan. Potable water customers that are anticipated to be converted to the recycled water system in the future will be identified as part of the recycled water master plan update.

## 4-9 Water Conservation

Title 6, Chapter 8A, The Emergency Water Conservation Plan of the City's Municipal Code addresses water conservation issues. The reference for this Chapter is Ordinance 2907, which became effective June 16, 2009.

Voluntary conservation is encouraged to limit the amount of water used to the amount absolutely necessary for health, business, and irrigation. The following elements of conservation apply at all times on a voluntary basis:

- Avoid hose washing of sidewalks, walkways, driveways, parking areas or other paved surfaces, except as required for sanitary purposes.
- Wash motor vehicles, trailers, boats and other types of mobile equipment using a hand held bucket or a hose equipped with a positive shutoff nozzle for quick rinses, or at the immediate premises of a commercial car wash or with recycled wastewater for approved uses.
- Avoid using water to clean, fill or maintain levels in decorative fountains, ponds, lakes or other similar aesthetic structures unless such water is part of a recycling system.
- Encourage restaurants, hotels, cafés, cafeterias or other public places where food is sold, served or offered for sale, to serve drinking water only to those customers expressly requesting water.
- Promptly repair all leaks from indoor and outdoor plumbing fixtures.
- Avoid watering lawn, landscape or other turf area more often than every other day and during the hours between 6:00 a.m. and 6:00 p.m.
- Avoid causing or allowing the water to run off landscape areas into adjoining streets, sidewalks or other paved areas due to incorrectly directed or maintained sprinklers or excessive watering.

The City maintains water conservation information on their website for viewing by the public. Information includes water use efficiency and conservation tips, links to other websites pertaining to water conservation, and links to IEUA's website where indoor and outdoor rebates are offered for residents of the IEUA service area. Indoor and outdoor rebates are also offered to commercial businesses

### 4-9.1 California Water Conservation

A variety of executive orders have been issued since 2009 regarding water conservation in the state of California. The following is a brief summary:

1. **November 2009 – Senate Bill SBx7-7 (i.e. The Water Conservation Act of 2009) enacted**
   - Requires State of California Department of Water Resources (DWR) in consultation with other state agencies, to develop a single standardized water use reporting form that can be used by both urban and agricultural water agencies.
   - For urban water conservation, the legislation sets an overall goal of reducing per capita urban water use by 20 percent by December 31, 2020.
2. **April 2014 Proclamation**
   - Governor declares a drought State of Emergency to exist in California due to severe drought conditions.

- Calls on Californians to reduce their water usage by 20 percent.
- Suspends California Environmental Quality Act to allow the emergency regulation and other actions to take place as quickly as possible

**3. December 2014 - Executive Order B-28-14**

- Extends the California Environmental Quality Act suspension through May 2016

**4. April 2015 - Executive Order B-29-15**

- Imposes restrictions on urban water suppliers to achieve a statewide 25 percent reduction in potable urban usage through February 2016
- Requires commercial, industrial, and institutional users to implement water efficiency measures
- Prohibits irrigation with potable water of ornamental turf in public street medians
- Prohibits irrigation with potable water outside newly constructed homes and buildings that is not delivered by drip or microspray systems
- Directs urban suppliers to develop rate structures and other pricing mechanisms to promote water conservation
- Requires urban suppliers to increase enforcement against water waste

**5. November 2015 – Executive Order B-26-15**

- Directs State agencies to prioritize and accelerate approvals for projects that enhance the ability of a local or state agency to capture high precipitation events
- Extends drought restrictions through October 2016

**6. May 2016 - Executive Order B-37-16**

- Aims to bolster California's climate and drought resilience by instructing State agencies to help Californians adopt permanent changes to use water more wisely.
- Directs the State Water Resources Control Board to develop new mandatory water conservation regulations
- Directs the Department of Water Resources to update new water use targets for urban water agencies. These new targets will build upon the existing requirement to achieve 20% reduction in usage by 2020. The executive order states that new targets would be developed no later than 2020, with the goal of reaching full compliance by 2025.
- Directs the State Water Resources Control Board to eliminate water waste by
  - **i.** permanently prohibits practices that waste potable water
  - **ii.** directing actions to minimize water system leaks
  - **iii.** directing urban and agricultural water suppliers to accelerate data collection, improve water system management and prioritize capital projects to reduce water waste
- Directs the Department of Water Resources to strengthen local drought resilience by updating requirements for Water Shortage Contingency Plans
- Directs the Department of Water Resources to improve agricultural water use efficiency and drought planning

**7. April 2017 – Executive Order B-40-17 was issued**

- Terminates the January 17, 2014 Drought State of Emergency
- Rescinds Executive Orders B-26-14, B-28-14, B-29-15, and B-36-15

- Most of Executive Order B-37-16 (Making Water Conservation a California Way of Life) remains in full force. The Department of Water Resources and State Water Resources Control Board continues to:
  - **i.** develop permanent prohibitions on wasteful water use and requirements for reporting water use by urban water agencies. Permanent restrictions include:
    - ✓ Hosing off sidewalks, driveways and other hardscapes
    - ✓ Washing automobiles with hoses not equipped with shut-off nozzle
    - ✓ Using non-recirculated water in a fountain or other decorative water feature
    - ✓ Watering lawns in a manner that causes runoff, or within 48 hours after measurable precipitation
    - ✓ Irrigating ornamental turf on public street medians
  - **ii.** develop standards that urban water suppliers will use to set new urban water use efficiency targets
  - **iii.** direct actions to minimize water system leaks that waste large amounts of water.
  - **iv.** direct urban and agricultural water suppliers to accelerate their data collection, improve water system management, and prioritize capital projects to reduce water waste
  - **v.** work with agencies and suppliers to identify mechanisms that would encourage and facilitate the adoption of rate structures and other pricing mechanisms that promote water conservation

**8. Assembly Bill No. 606 – May 31, 2018**

- authorizes State Water Resources Control Board (SWRCB), along with the Department of Water Resources (DWR) to issue regulation requiring wholesale water suppliers, urban retail water suppliers, or distributors of public water supply to submit information relating to water production, water use, or water conservation.
- require urban water suppliers to submit a urban water usage objective report by November 1, 2023
- updates the requirements of the urban water management plans

**9. Assembly Bill No. 1668 – May 31, 2018**

- authorizes State Water Board, along with the Department of Water Resources (DWR) to issue regulation requiring wholesale water suppliers, urban retail water suppliers, or distributors of public water supply to submit information relating to water production, water use, or water conservation.
- establishes 55 gallons per capita daily as the standard for indoor residential water use beginning January 1, 2025 and 50 gallons per capita daily beginning January 1, 2030
- require DWR and SWRCB to adopt standards to monitor the performance of commercial, industrial, and institutional water use.
- Includes penalties of $1,000 to $10,000 per day to the water supplier for violations to this order

# SECTION 5

# DIURNAL PATTERNS

## 5-1 General

Knowledge of accurate demand variations over a 24-hour period is essential for proper analysis of water systems. For this study, 15-minute demand variations were represented by the development of diurnal demand patterns based on recorded field data. The diurnal demand patterns are used to develop an extended period hydraulic model simulation. The model analysis is used to determine the adequacy of the sources of supply, pumping facilities, reservoirs, and the transmission / distribution facilities. For this study, diurnal patterns were created for each hydraulic pressure zone for residential usage, non-residential usage, and high water users (HWUs).

## 5-2 Diurnal Patterns Areas

SCADA data was collected from April 8, 2019 to April 22, 2019. An electronic database with the following information for each facility was provided for use in developing the diurnal patterns.

1. Reservoirs – levels
2. Booster Pump Stations – total flow
3. Wells – flow
4. Turnouts - flow
5. Flow Control Facilities - flow

The SCADA information was utilized in calculating the demands for each diurnal pattern area in 15 minute increments over a typical 24-hour period (average weekday excluding days with odd usages and/or missing data). Diurnal patterns were based on data for April 18, 2019, for each of the following pressure zones:

1. 925 Zone
2. 1010 Zone
3. 1074 Zone
4. 1212 Zone
5. 1348 Zone

It should be noted that the diurnal patterns start at 12 am and end at 12 am of the following day. As the model runs, the first time step represents 12 am midnight.

The mass balance of the supply in, flow out, and change in reservoir level for each of the hydraulic pressure zones is summarized in Table 5-1. The diurnal patterns for each of the five pressure zones are shown on Figure 5-1.

Section 5-3 to Section 5-5 detail the processes used to develop use patterns for residential, non-residential, and high water users.

**Figure 5-1**
**Total Zone Diurnal Patterns**

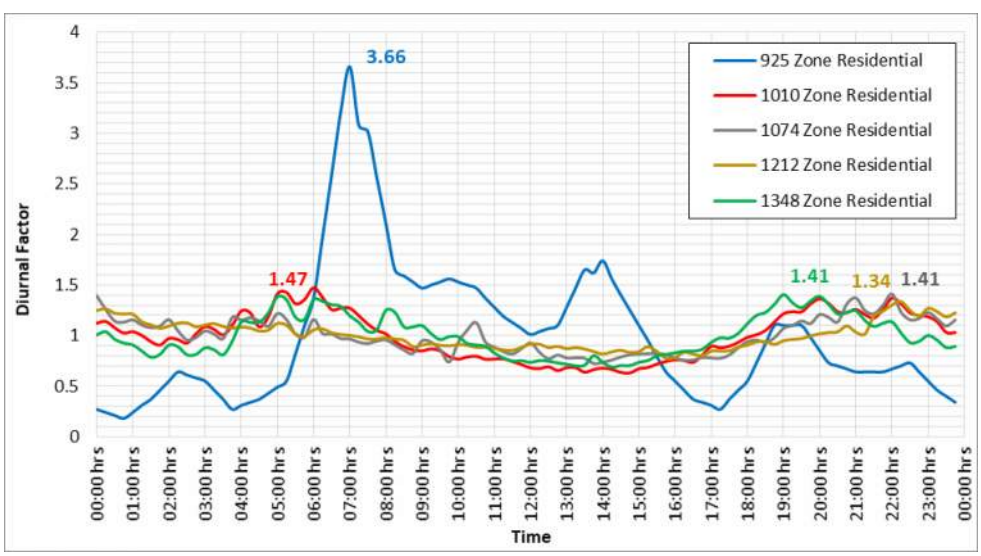

**Table 5-1**

**Diurnal Pattern Mass Balance Summary**

| Hydraulic Zones | Reservoirs (Supply In or Out) | Supply In | Supply Out |
|---|---|---|---|
| | Reservoir 925-2A | CDAII Lat A | CDA Ontario Booster 1, Booster 2, and Booster 3 |
| | | CDAII Lat C | |
| | | Well 49 | |
| | | AV-925-2 | |
| | | PRS17 | |
| 925 | | PRS18 | |

| Hydraulic Zones | Reservoirs (Supply In or Out) | Supply In | Supply Out |
|---|---|---|---|
| | Reservoir 1010-1 | Well 34[1] | CDA Milliken Booster 1, Booster 2, and Booster 3. |
| | Reservoir 1010-2A | Well 39[1] | PRS17 |
| | Reservoir 1010-2B | Well 50[3] | PRS18 |
| | | CDAII Lat B | |
| | | CDAII Lat D | |
| | | CDA1 (Archibald Ranch Booster Pump Station 1010-1 and 1010-2) | |
| | | AV-1010-1 | |
| | | AV-1010-2 | |
| | | PRS2 | |
| | | PRS3 | |
| | | PRS4 | |
| | | PRS5 | |
| | | PRS7 | |
| | | PRS8 | |
| 1010 | | PRS13 | |

**Table 5-1 (Continued)**

**Diurnal Pattern Mass Balance Summary**

| Hydraulic Zones | Reservoirs (Supply In or Out) | Supply In | Supply Out |
|---|---|---|---|
| | Reservoir 1074-1A | Well 35[3] | Galvin Booster 1074-1, 1074-2, 1074-3 |
| | Reservoir 1074-1B | Well 36 | Galvin Booster 1074-4 |
| | | Well 40[2] | AV-1010-1 |
| | | Well 44[4] | PRS2 |
| | | Well 45 | PRS3 |
| | | Well 52 | PRS4 |
| | | AV-1074-1 | PRS5 |
| | | PRS6 | |
| | | PRS10 | |
| | | PRS11 | |
| | | PRS12 | |
| 1074 | | PRS21 | |

| Hydraulic Zones | Reservoirs (Supply In or Out) | Supply In | Supply Out |
|---|---|---|---|
| | Reservoir 1212-1A | WFA 1 | Booster 1348-1 and 1348-2 |
| | Reservoir 1212-1B | WFA 2A | Booster 1348-3 and 1348-4 |
| | Reservoir 1212-3 | Well 20[1] | AV-1010-2 |
| | | Well 24 | AV-1074-1 |
| | | Well 25[1] | AV-925-2 |
| | | Well 27[1] | PRS6 |
| | | Well 29[2] | PRS7 |
| | | Well 30 | PRS8 |
| | | Well 31[3] | PRS10 |
| | | Well 37 | PRS11 |
| | | Well 38 | PRS12 |
| | | Well 41 | PRS13 |
| | | Well 47 | PRS21 |
| | | Galvin Booster 1074-1, 1074-2, 1074-3 | |
| | | CDA Milliken Booster 1, Booster 2, and Booster 3. | |
| | | CDA Ontario Booster 1, Booster 2, and Booster 3 | |
| 1212 | | PRS15 | |

**Table 5-1 (Continued)**

**Diurnal Pattern Mass Balance Summary**

| Hydraulic Zones | Reservoirs (Supply In or Out) | Supply In | Supply Out |
|---|---|---|---|
| | Reservoir 1348-1A | WFA 2 | WFA 2A |
| | Reservoir 1348-1B | 1348 Well 46 | PRS15 |
| | Reservoir 1348-1C | Booster 1348-1 and 1348-2 | |
| | | Booster 1348-3 and 1348-4 | |
| 1348 | | Galvin Booster 1074-4 | |

[1] *Well is currently inactive, but could be placed back in service*

[2] *Well use is restricted due to high operation and energy costs*

[3] *Well usage is restricted due to water quality*

[4] *Ion exchange treatment is necessary*

## 5-3 Residential Diurnal Patterns

The service area is predominately residential to the west and industrial to the east. To account for the variations in usage by type, diurnal patterns were developed for the residential customers.

Automatic meter infrastructure (AMI) data was gathered for approximately 4,000 meters, which were predominately single family residential meters located in the OMC area. Multi-family residential usage was not included with the residential diurnal pattern, since there was limited AMI data and its usage pattern was not consistent with the single family residential use patterns. Hourly data was gathered between April 8, 2019 and April 22, 2019. The residential diurnal pattern was developed for each pressure zone by summarizing the total residential water usage for each hour for the April 18, 2019 calibration day. The residential diurnal patterns for each pressure zone are detailed on Figure 5-2.

During the calibration period, the demands in the 925 Zone were only 282 gpm (455 AFY), as detailed in Table 4-7. The existing land use is predominately residential, with several large developments that were under construction at that time. It is understood that the diurnal pattern developed from the mass balance estimate is representative of residential land use, and it is used for model calibration and existing system analyses. As illustrated on Figure 5-1, the residential demand factor variation in the 925 Zone is greater than those developed for the other zones. This difference can be attributed to the overall low demand in this zone, which may be heavily influenced by several high water users. As the development in the 925 Zone is expanded, the intermittent peaks will lessen as the future customer's peak usage offset each other to develop a more appropriate diurnal pattern. For the future demand scenario, the 1010 Zone residential diurnal pattern was applied to the residential customers in the 925 Zone. As development expands and becomes occupied, it is recommended that the City reevaluate the residential diurnal patterns in the 925 Zone, and make model updates, as necessary.

## 5-4 Non-Residential Diurnal Patterns

To create the non-residential patterns for each pressure zone, the residential use were subtracted from the total use patterns for each zone over the 24-hour period. In addition, the demand for customers with high water use were also excluded when developing the non-residential diurnal pattern, since diurnal patterns were developed specifically for each of these high water use customers. Multi-family residential usage was included in the non-residential diurnal pattern, since there was limited AMI data and its usage pattern was not consistent with the residential use patterns. The non-residential diurnal patterns for each pressure zone are detailed on Figure 5-3.

During the time of calibration, there was insufficient non-residential usage within the 925 Zone. For the future demand scenario, the 1010 Zone non-residential diurnal pattern was applied to the residential customers in the 925 Zone. As development expands and becomes occupied, it is recommended that the City reevaluate the residential diurnal patterns in the 925 Zone, and make model updates, as necessary.

**Figure 5-2**

**Residential Diurnal Patterns**

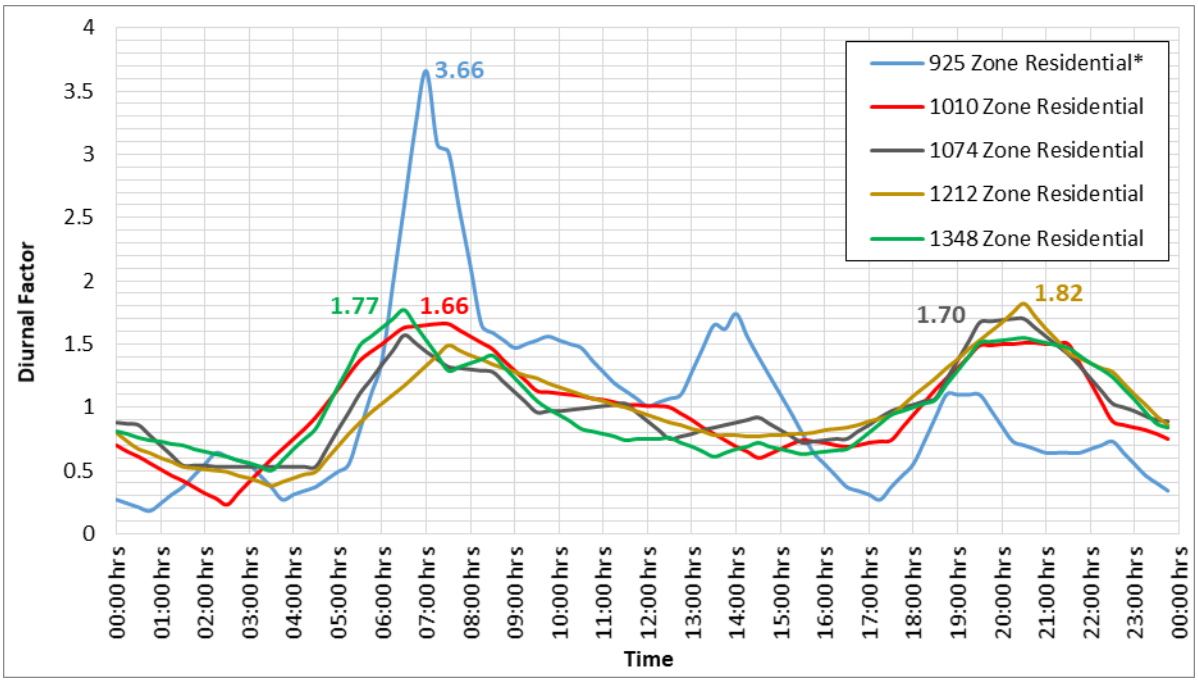


**Future 925 Zone demands are represented with the 1010 Zone diurnal pattern.*

**Figure 5-3**

**Non-Residential Diurnal Patterns**

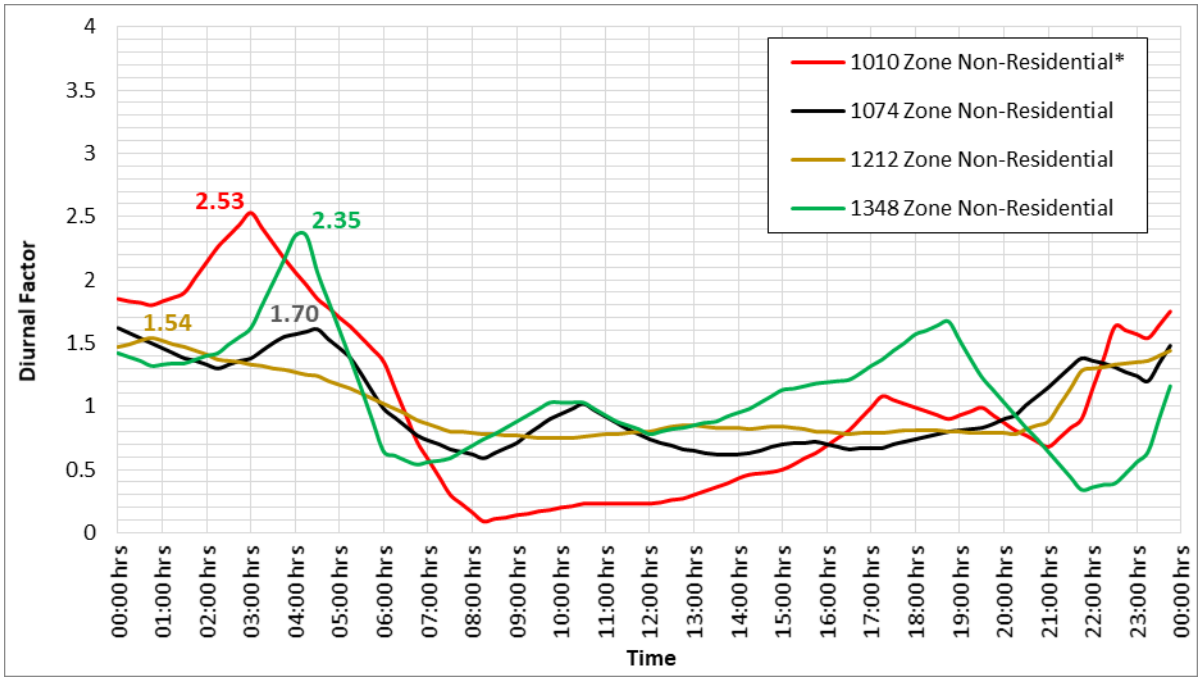


**Future 925 Zone demands are represented with the 1010 Zone diurnal pattern.*

## 5-5 High Water User Diurnal Patterns

To further refine the demand distribution, specific diurnal patterns were developed for the customers with the highest water use. Billing records from 2016 were reviewed to identify the high water use customers. To capture the total flow for some of these customers, multiple meters were needed. Automatic meter reading (AMR) data was gathered by the City's operations staff. Data was captured in hour increments between April 8, 2019 and April 22, 2019. The summary of high water user location is detailed on Figure 5-4, and summarized in Table 5-2. Specific use patterns for these high water users is detailed in Appendix 5-1.

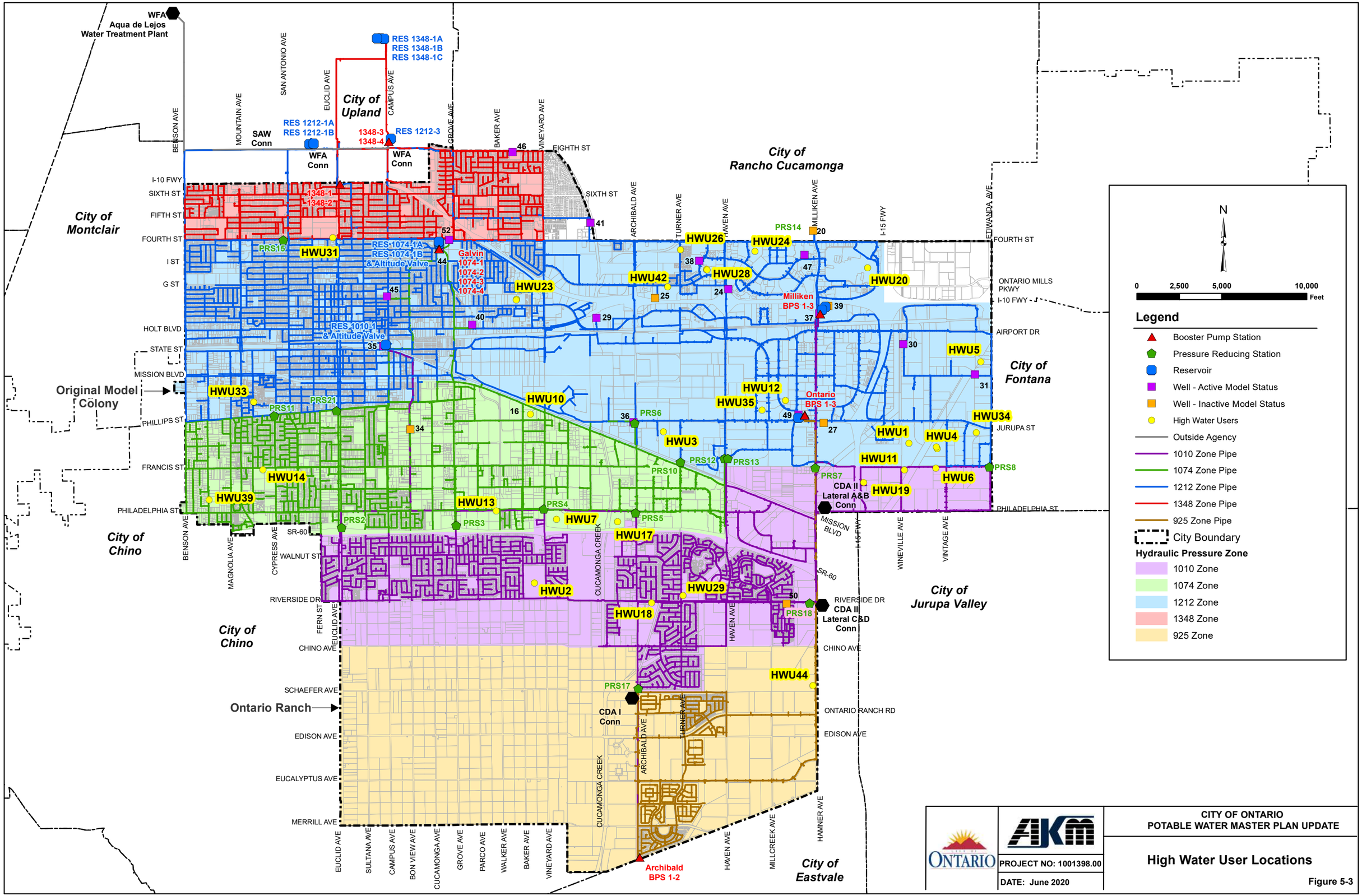


CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE

PROJECT NO: 1001398.00

DATE: June 2020

**High Water User Locations**

Figure 5-3

## Table 5-2

## High Water Use Locations

| ID | Model ID | Pattern | Model Demand (gpm) | Name | Address | SP_ID | Meter Type | Pressure Zone | 2016 Average Demand (gpm) |
|---|---|---|---|---|---|---|---|---|---|
| 1 | N24DB103 | CAL_Z1212_HWU_1 | 362.6 | New Indy Ontario | 5100 E Jurupa St | 6557400761 | WATERIND | 1212 Zone | 305.7 |
| 2 | R17FIT153 | CAL_Z1010_HWU_2 | 91.1 | Country Meadows | 1855 E Riverside Dr | 3836400013 | WATERMF | 1010 Zone | 110.1 |
| 3 | WMP2019_FIT00514 | CAL_Z1212_HWU_3 | 41.5 | Ventura Foods | 2900 E Jurupa St | 8194400106 | WINDNWW | 1212 Zone | 100.9 |
| | N25FIT124 | CAL_Z1212_HWU_4 | 147.2 | Coca Cola USA | 1650 S Vintage Av | 3435400799 | WATERIND | 1212 Zone | 88.3 |
| 4 | N25FIT123 | CAL_Z1212_HWU_4 | 90.7 | Coca Cola USA | 1650 S Vintage Av | 3435400843 | WATERIND | 1212 Zone | 75.3 |
| 5 | L25FIT114 | CAL_Z1212_HWU_5 | 69.1 | Unifirst Corp | 700 S Etiwanda Av | 7506400929 | WATERCOM | 1212 Zone | 80.6 |
| 6 | N25FIT136 | CAL_Z1010_HWU_6 | 106.5 | Crothall Healthcare Inc | 5410 E Francis St | 5227400881 | WATERCOM | 1010 Zone | 74.0 |
| 7 | WMP2019_FIT00257 | CAL_Z1074_HWU_7 | 101.3 | Kaiser Permanente | 2295 S Vineyard Av | 0000008490 | WATERCOM | 1074 Zone | 68.3 |
| 10 | M17FIT137 | CAL_Z1074_HWU_10 | 102.3 | Clement Pappas | 1755 E Acacia St | 0000014757 | WINDNWW | 1074 Zone | 47.6 |
| 11 | N24FIT148 | CAL_Z1010_HWU_11 | 56.1 | Cintas / US Energy Services | 1851 S Wineville Av | 5127400837 | WCOMNWW | 1010 Zone | 47.2 |
| 12 | M21SV132 | CAL_Z1212_HWU_12 | 65.4 | KTR Management Services | 3855 E Jurupa St | 6323200917 | WATERIND | 1212 Zone | 46.9 |
| 13 | P16FIT164 | CAL_Z1074_HWU_13 | 56.6 | Rancho Ontario Corp | 1456 E Philadelphia St | 2014400145 | WATERMF | 1074 Zone | 49.9 |
| 14 | N11FIT152 | CAL_Z1074_HWU_14 | 32.7 | Chaffey High School | 901 W Francis St (ontario HS) | 9907400664 | WATERCOM | 1074 Zone | 41.6 |
| 17 | P18RE102 | CAL_Z1074_HWU_17 | 39.7 | Niagara Bottling LLC | 2560 E Philadelphia St | 3125400330 | WATERIND | 1074 Zone | 42.1 |
| 18 | R19FIT138 | CAL_Z1010_HWU_18 | 65.5 | ROC III CA TERRACINA LLC | 2800 E Riverside Dr | 9816400796 | WATERMF | 1010 Zone | 35.5 |
| 19 | O23RE100 | CAL_Z1010_HWU_19 | 1.7 | Culligan Ontario | 1925 S Burgundy Pl | 1546400928 | WINDNWW | 1010 Zone | 37.5 |
| 20 | H23RE100 | CAL_Z1212_HWU_20 | 15.6 | Ontario Mills Limited Partnership | 1 E Mills Cr | 8774100869 | WATERCOM | 1212 Zone | 32.6 |
| | J16FIT170 | CAL_Z1212_HWU_23 | 23.4 | AMC LLC | 1701 E D St | 0255400823 | WATERMF | 1212 Zone | 34.6 |
| 23 | J16FIT169 | CAL_Z1212_HWU_23 | 12.0 | AMC LLC | 1701 E D St | 0255400841 | WATERMF | 1212 Zone | 21.1 |
| 24 | WMP2019_FIT02505 | CAL_Z1212_HWU_24 | 35.8 | Camden Development Inc | 950 N Duesenberg Dr | 3267900593 | WATERMF | 1212 Zone | 27.9 |
| 26 | H20FIT222 | CAL_Z1212_HWU_26 | 8.8 | Laing's First Edition HOA | 1032 N Turner Av | 9989300053 | WATERMF | 1212 Zone | 19.9 |
| 28 | I20FIT196 | CAL_Z1212_HWU_28 | 18.7 | Park Centre | 850 N Center Av | 8185400442 | WATERMF | 1212 Zone | 29.3 |
| 29 | R20FIT119 | CAL_Z1010_HWU_29 | 2.1 | Grace Yokley School | 2947 S Turner Av | 3344300682 | WATERCOM | 1010 Zone | 31.2 |
| 31 | H13SV190 | CAL_Z1348_HWU_31 | 34.3 | Chaffey High School | 150 W Fourth St (Chaffey) | 6742200100 | WATERCOM | 1348 Zone | 26.1 |
| 33 | M11FIT246 | CAL_Z1212_HWU_33 | 44.2 | Park Vista | 1031 S Palmetto Av | 2793400168 | WATERMF | 1212 Zone | 24.5 |
| 34 | M26FIT123 | CAL_Z1212_HWU_34 | 37.1 | GSWA | 5772 E Jurupa St | 4816400515 | WATERCOM | 1212 Zone | 25.3 |
| 35 | M22DE127 | CAL_Z1212_HWU_35 | 0.1 | Ecopet Plastics Inc | 1351 S Doubleday Av | 0457400950 | WATERCOM | 1212 Zone | 25.4 |
| 39 | O10FIT125 | CAL_Z1074_HWU_39 | 6.1 | Parks Dept | 2055 S Oaks Av | 0484400476 | IRRIGATN | 1074 Zone | 22.6 |
| 42 | I19FIT177 | CAL_Z1212_HWU_42 | 22.3 | Ap-Transpark LLC | 2990 E Inland Empire Bl | 2784400489 | WATERCOM | 1212 Zone | 21.6 |
| 44 | WMP2019_WNJ00137 | CAL_Z925_HWU_44 | 2.1 | SCE/Mira Loma Peaker Plant | 13568 S Hamner Av | 7778216217 | WATERCOM | 925 Zone | 0.0 |

# SECTION 6

# EXISTING SYSTEM

## 6-1 General

According to the City's Water Geodatabase from March 2019, the City's existing domestic water system consisted of the following:

- Five (5) primary pressure zones (925, 1010, 1074, 1212, and 1348 Zones)
- Over 3.1 million feet (584 miles) of transmission and distribution pipe, 2 inches through 42 inches in diameter
- 7,277 fire hydrants
- 35,906 water meters
- Seventeen (17) active wells
- Twelve (12) reservoirs with a total volume of 75 MG
- Six (6) active booster pump stations
- Fifteen (15) pressure reducing stations
- Two (2) connections to Water Facilities Authority
- Five (5) connections to Chino Desalter Authority
- Two (2) inter-agency connections
- Two (2) Ion Exchange Treatment Facility
- Four (4) altitude valves

A breakdown of the water meters by customer classes are shown in Table 6-1.

The existing domestic water system is shown on Figure 6-1. The hydraulic schematic of the existing water system is shown on Figure 6-2.

**Table 6-1**
**Potable Water Meter Type**

| Meter Type | Number of Meters |
|---|---|
| Residential | 28,906 |
| Multifamily Residential | 2,014 |
| Irrigation | 1,192 |
| Commercial | 2,999 |
| Industrial | 337 |
| Departmental/Government | 294 |
| Hydrant (Construction) | 164 |
| **Total** | **35,906** |

## 6-2 Pressure Zones

The existing system is divided into the five (5) pressure zones entitled: 925 Zone, 1010 Zone, 1074 Zone, 1212 Zone, 1348 Zone. It should be noted that the 925 Zone has very minimal existing demands. The 925 Zone will serve the future OR developments. The largest pressure zone in the system is the 1212 Zone, which covers about 38 percent of the existing water service area. A summary of all pressure zones are detailed in Table 6-2.

**Table 6-2**
**City of Ontario Pressure Zones**

| Pressure Zone Name[1] | Area (sq. mi.) | Area (Ac) | Pipe Length (ft) | Hydraulic Grade Line (ft) | Ground Elevation Range (ft) | Static Pressure Range[2] (psi) |
|---|---|---|---|---|---|---|
| 1348 | 3.0 | 1,913 | 365,426 | 1,348 | 1036 - 1177 | 74 - 135 |
| 1212 | 18.7 | 11,952 | 1,271,132 | 1,212 | 860 - 1096 | 50 - 152 |
| 1074 | 7.5 | 4,776 | 582,667 | 1,074 | 825 - 940 | 58 - 108 |
| 1010 | 9.1 | 5,793 | 676,705 | 1,010 | 735 - 880 | 56 - 119 |
| 925 | 10.6 | 6,801 | 193,221 | 925 | 650 - 776 | 65 - 119 |
| | **48.8** | **31,235** | **3,089,151** | | | |

[1] *Nomenclature used in this report.*

[2] *Calculated based on HGL and ground elevation range.*

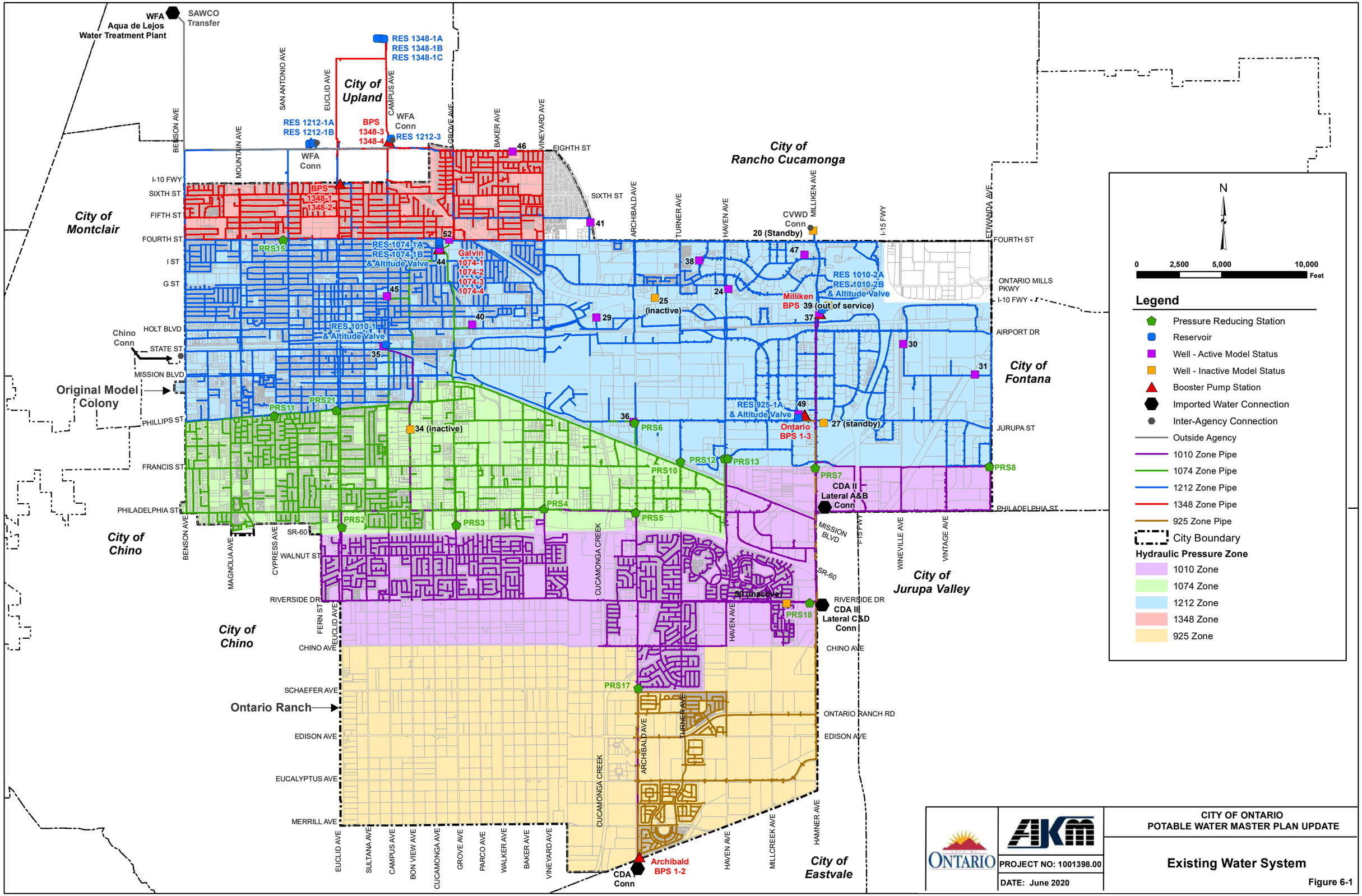


CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE

PROJECT NO: 1001398.00

DATE: June 2020

**Existing Water System**

Figure 6-1

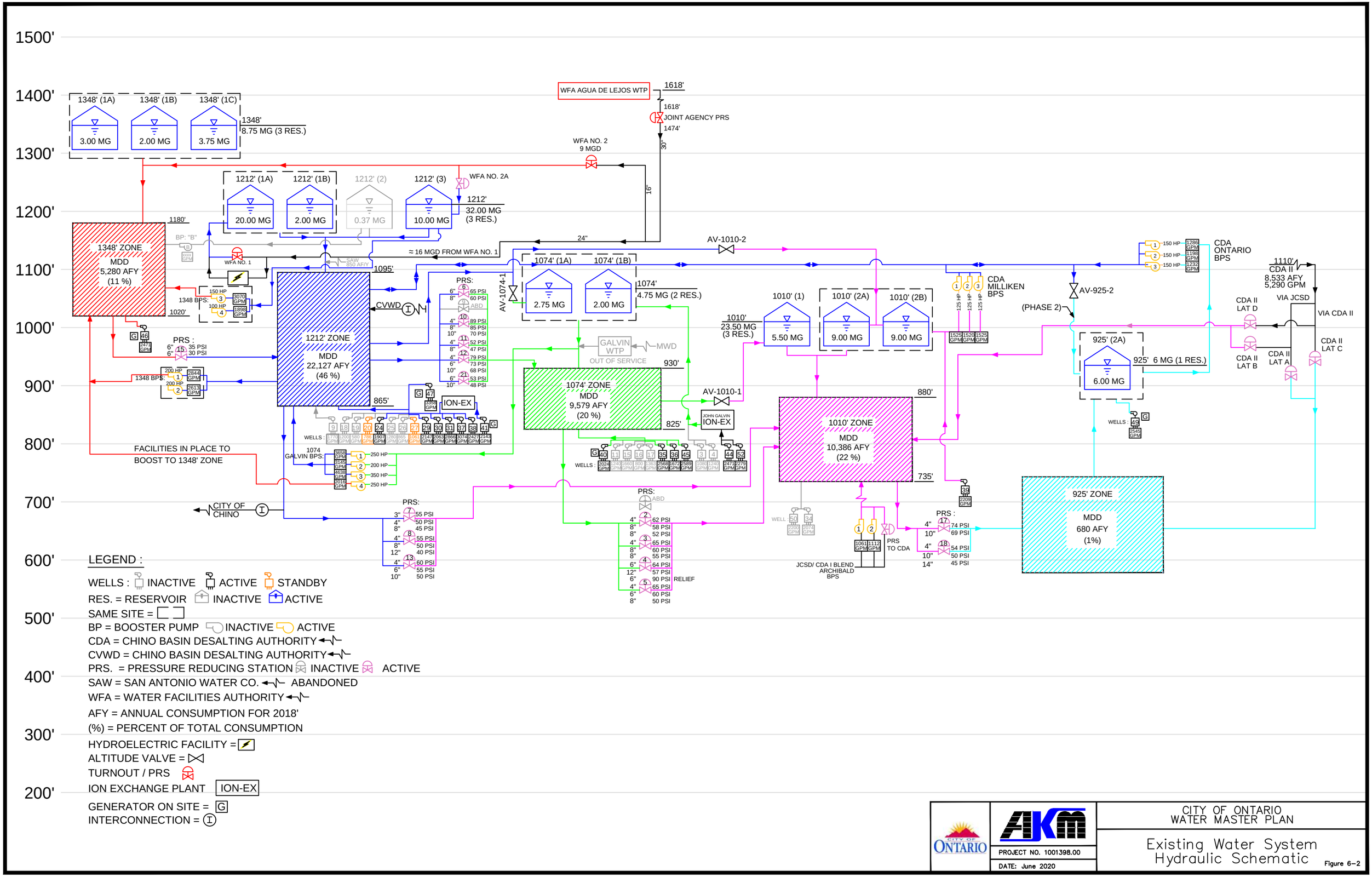
1500'
1400'
1300'
1200'
1100'
1000'
900'
800'
700'
600'
500'
400'
300'
200'
1348' (1A)
1348' (1B)
1348' (1C)
3.00 MG
2.00 MG
3.75 MG
1348'
8.75 MG (3 RES.)
WFA AGUA DE LEJOS WTP
1618'
JOINT AGENCY PRS
1474'
30"
WFA NO. 2
9 MGD
16"
1212' (1A)
1212' (1B)
1212' (2)
1212' (3)
WFA NO. 2A
1212'
32.00 MG
(3 RES.)
20.00 MG
2.00 MG
0.37 MG
10.00 MG
1348' ZONE
MDD
5,280 AFY
(11 %)
1180'
BP: "B"
WFA NO. 1
SAW
850 AFY
1095'
1348 BPS:
150 HP
100 HP
3070 GPM
1898 GPM
1020'
≈ 16 MGD FROM WFA NO. 1
24"
AV-1010-2
1074' (1A)
1074' (1B)
1074'
4.75 MG (2 RES.)
2.75 MG
2.00 MG
AV-1074-1
CVWD
1212' ZONE
MDD
22,127 AFY
(46 %)
PRS:
PRS :
6" 35 PSI
6" 30 PSI
1348 BPS:
200 HP
200 HP
2844 GPM
2613 GPM
865'
ION-EX
WELLS :
1774 GPM
1200 GPM
580 GPM
788 GPM
1907 GPM
1280 GPM
865 GPM
1061 GPM
2147 GPM
2063 GPM
2868 GPM
3074 GPM
2427 GPM
2143 GPM
1074
GALVIN BPS:
3658 GPM
3145 GPM
4638 GPM
2016 GPM
250 HP
200 HP
350 HP
250 HP
FACILITIES IN PLACE TO
BOOST TO 1348' ZONE
CITY OF
CHINO
GALVIN
WTP
OUT OF SERVICE
MWD
930'
1074' ZONE
MDD
9,579 AFY
(20 %)
825'
AV-1010-1
JOHN GALVIN
ION-EX
WELLS :
2024 GPM
1240 GPM
1660 GPM
800 GPM
1363 GPM
2568 GPM
1672 GPM
2589 GPM
1180 GPM
1240 GPM
2471 GPM
2279 GPM
PRS:
ABD
RELIEF
1010' (1)
1010' (2A)
1010' (2B)
1010'
23.50 MG
(3 RES.)
5.50 MG
9.00 MG
9.00 MG
1525 GPM
1520 GPM
1525 GPM
125 HP
125 HP
125 HP
CDA
MILLIKEN
BPS
880'
1010' ZONE
MDD
10,386 AFY
(22 %)
735'
WELL :
50 2200 GPM
34 2074 GPM
JCSD/ CDA I BLEND
ARCHIBALD
BPS
1061 GPM
1112 GPM
PRS
TO CDA
PRS :
925' (2A)
6.00 MG
925' 6 MG (1 RES.)
AV-925-2
(PHASE 2)
150 HP
150 HP
150 HP
1286 GPM
1198 GPM
1232 GPM
CDA
ONTARIO
BPS
1110'
CDA II
8,533 AFY
5,290 GPM
VIA JCSD
VIA CDA II
CDA II
LAT D
CDA II
LAT A
CDA II
LAT B
CDA II
LAT C
925' ZONE
MDD
680 AFY
(1%)
LEGEND :
WELLS : INACTIVE ACTIVE STANDBY
RES. = RESERVOIR INACTIVE ACTIVE
SAME SITE =
BP = BOOSTER PUMP INACTIVE ACTIVE
CDA = CHINO BASIN DESALTING AUTHORITY
CVWD = CHINO BASIN DESALTING AUTHORITY
PRS. = PRESSURE REDUCING STATION INACTIVE ACTIVE
SAW = SAN ANTONIO WATER CO. ABANDONED
WFA = WATER FACILITIES AUTHORITY
AFY = ANNUAL CONSUMPTION FOR 2018'
(%) = PERCENT OF TOTAL CONSUMPTION
HYDROELECTRIC FACILITY =
ALTITUDE VALVE =
TURNOUT / PRS
ION EXCHANGE PLANT ION-EX
GENERATOR ON SITE = G
INTERCONNECTION = I
CITY OF ONTARIO
AKM
PROJECT NO. 1001398.00
DATE: June 2020
CITY OF ONTARIO
WATER MASTER PLAN
Existing Water System
Hydraulic Schematic
Figure 6-2

## 6-3 Transmission and Distribution System

The potable water system includes approximately 584 miles of transmission and distribution pipe that is ranging in size from 2-inches through 42-inches. A summary of the system pipes by diameter, material, and date of construction is shown on Figure 6-3, Figure 6-4 and Figure 6-5, respectively.

**Figure 6-3**

**Length of Pipe by Size**

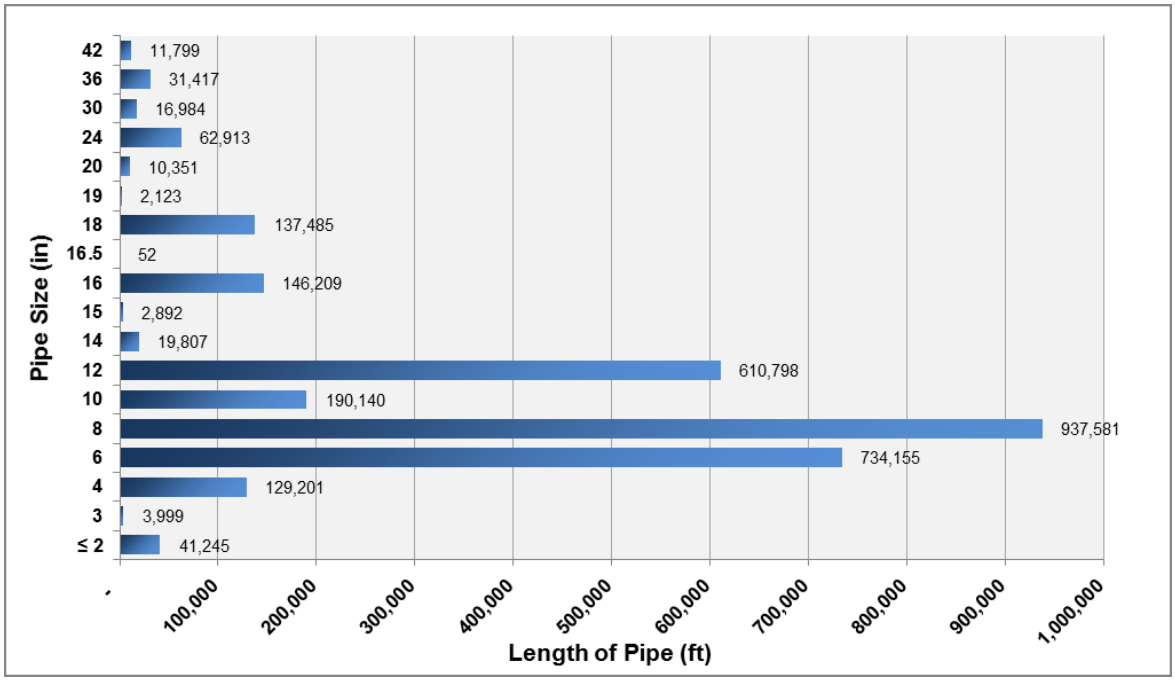


**Figure 6-4**

**Length of Pipe by Material**

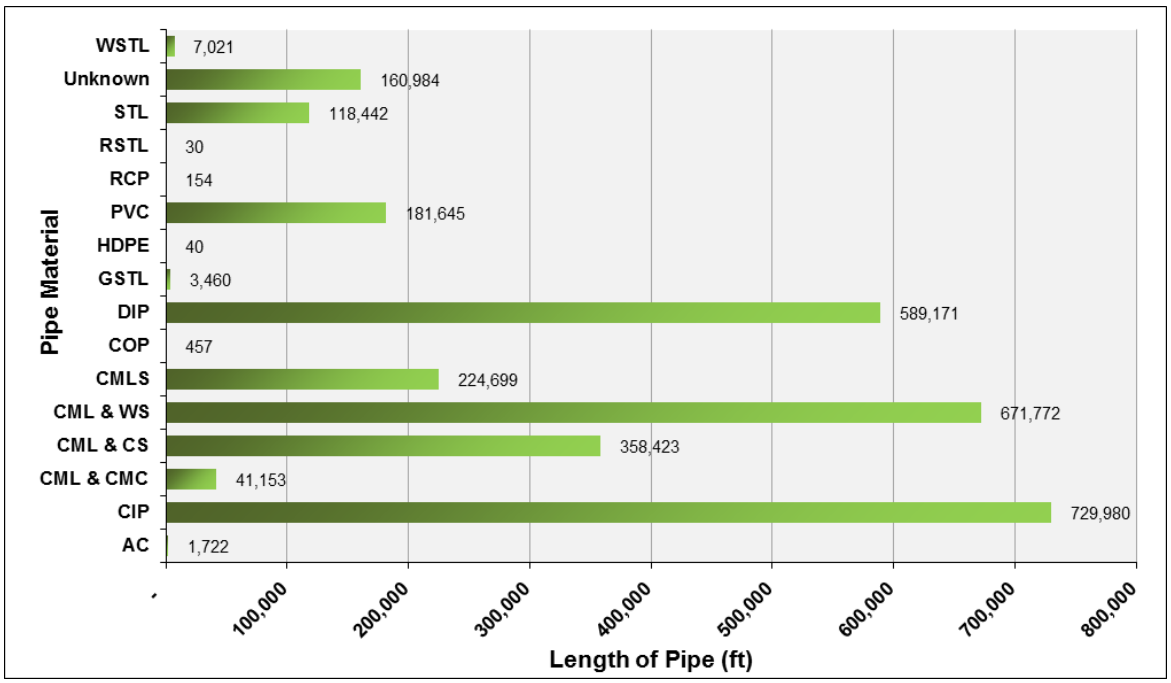

**Figure 6-5**

**Length of Pipe by Decade of Construction**

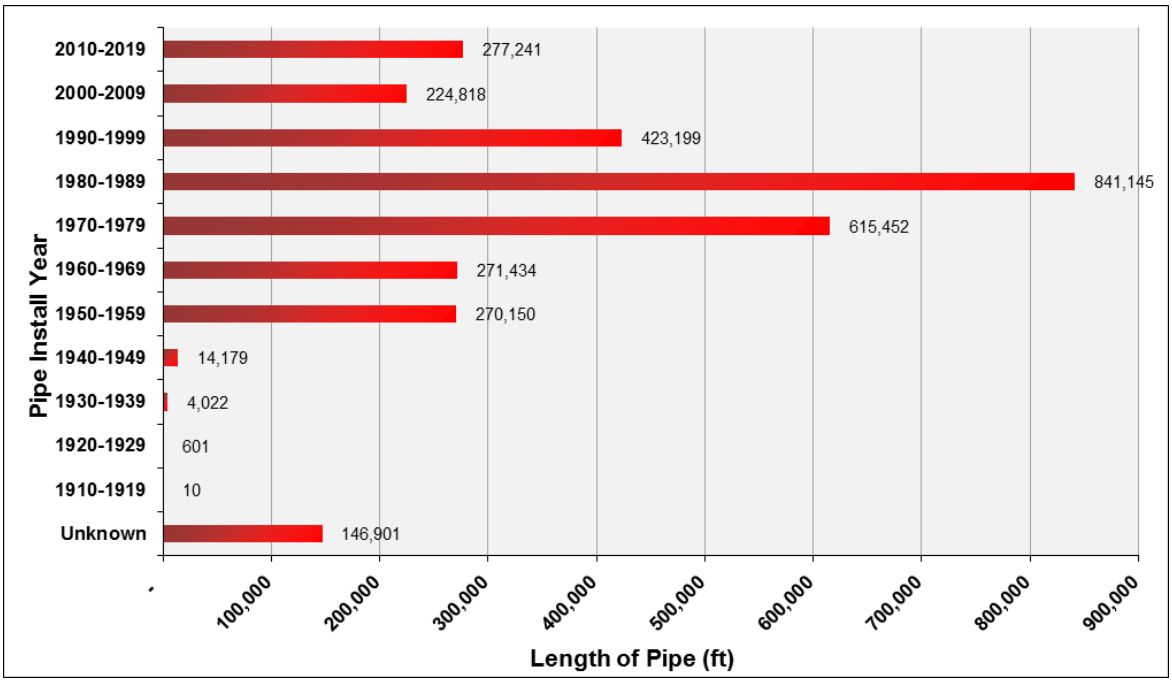


## 6-4 Wells

The total well capacity is about 38,600 gpm or 55.6 mgd. Well information and characteristics are provided in Table 6-3. There are currently seventeen (17) active wells.

The following wells are active but may either require treatment or are unreliable due to poor water quality.

- Wells 29 and 31 production need to be treated for nitrates, which requires higher costs for production. Currently, the City only uses these wells as needed during the warmer high demand periods.
- Well 35 is not reliable. In the past, this well did not meet the minimum water quality requirements and could not be used. As of September 2019, the samples passed all regulations and Well 35 was operating continuously.
- Well 40 needs to be treated for perchlorate, which requires higher costs for production. Currently the City only uses this well as needed during the warmer high demand periods.
- Recently treatment processes added to Well 41 have allowed the City to use this source consistently.
- Wells 44 and 52 are treated for nitrate and perchlorate removal by the Dry Year Yield Ion Exchange Plant.
- Wells 37 is currently not used due to water quality. It is scheduled to be placed back in service once additional treatment is provided. The discharge piping for Well 37 will connect to the 1010 Zone instead of the 1212 Zone.
- Well 39 is active, but placed out of service, due to poor water quality. It is scheduled to be placed back in service once additional treatment is provided.

The status of the inactive wells is summarized below:

- Well 20 and 27 are physically separated from the system, and are on the City's standby status. These wells were put on emergency use only due to their age and their low production. These wells could be rehabilitated and reconnected to the system if needed. These wells are not planned to be upgraded in the future.

- Wells 50 is currently inactive due to water quality. It is planned to be placed back in service once additional treatment is provided.
- Wells 34 is currently inactive due to 1,2,3 Trichloropropane (TCP). This well is not planned to be placed back in service.
- The pump at Well 25 has burned up, and the City does not plan to reactivate this well, at this time.

Additional information regarding the wells is as follows:

- Well 11 was constructed in 1958. It is located at the Ontario International Airport property. While the water quality meets the primary and secondary standards, it produces sand even after a new sand separator was installed in 2003. It is inactive and will be abandoned.
- Well 16, constructed in 1960, is inactive due to the production of sand and traces of oil from the oil-lubricated pump. There are no plans to reactivate this well.
- Wells 3, 4, 9, 15, 17, and 19, have been abandoned and Well 18 was destroyed due to high nitrates and perchlorates, and facility condition.
- Well 3 (1962) and Well 4 (1919) were abandoned due to high levels of nitrate and perchlorate. These wells had also exceeded their useful lives. The production of Wells 3 and 4 were replaced by Wells 44 and 52.
- Well 9 was abandoned due to high nitrates and perchlorates. The Well 9 property is large enough for the construction of a new well and a treatment facility.
- Well 15 was abandoned due to high nitrates and perchlorates.
- Wells 26 is currently inactive and will be abandoned.

## 6-5 Reservoirs

The City's water system includes twelve (12) reservoirs ranging in capacity from 2 million gallons to 20 million gallons. The City's total reservoir capacity is currently 75 MG, of which approximately 32 MG is within the 1212 Zone. The hydraulic gradient in each pressure zone is controlled by the high water elevation of the reservoirs that feed the zones by gravity. The characteristics of each existing storage reservoir are shown in Table 6-4.

All the existing reservoirs are less than 65 years old with the exception of Reservoir 1212-3, which was constructed in 1926. The average life expectancy of concrete reservoirs and steel tanks is about 100 years, provided that reservoirs are properly maintained and repainted or recoated every 15-20 years. Thus, most of the City reservoirs are expected to be in fairly good condition and no improvements based on age are recommended except for Reservoir 1212-3, due to its age and condition.

## 6-6 Booster Pump Stations

The City's system includes five (5) booster pump stations. Details of each booster station are summarized in Table 6-5.

The John Galvin Pump Station is adjacent to the 1074 Zone reservoirs, east of Cucamonga Avenue and south of Fourth Street. It was constructed in 1960. It takes suction from the 1074 Zone. Booster Pump Galvin 1074-1, Galvin 1074-2, and Galvin 1074-3 are vertical turbine pumps that pump into the 1212- Zone. Booster Pump Galvin 1074-4 is a vertical turbine pump that pumps into the 1348 Zone. Currently, these pumps are rarely used.

The booster pump station housing booster pumps 1348-3 and 1348-4 is located adjacent Reservoir 1212-3, on Campus Avenue, north of Eighth Street. It was constructed in 1959 and rehabilitated in 2004. It takes suction from Reservoir 1212-3. There are two horizontal split case pumps that pump into the 1348 Zone.

The booster pump station housing booster pumps 1348-1 and 1348-2 is located east of Euclid Avenue just south of the I-10 Freeway. It was constructed in 1960. It takes suction from the 1212 Zone. There are two horizontal split case pumps that pump into the 1348 Zone.

## Table 6-3

## Existing Wells Summary Table

| Well Data | | | | | | | | Efficiency Test | | | | | Motor Specifications | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Number | Location | Year Drilled | Pressure Zone | Pump Model | Pump Mfg | No of Stages | Pump RPM | Capacity (gpm) | TDH (ft) | Static GWL (ft) | Draw-down (ft) | Test Date | Motor Mfgr | HP | Motor RPM | Backup Power (Y/N) | WQ Issues | Model ID | Model Pump Curve ID | Existing Model Status | Future Model Status | Comments |
| 49 | 1495 S. Dupont Ave. | Unknown | 925 | 14MD | Peerless | 5 | 1780 | 2,545 | 341 | 292 | 23 | 9/9/16 | US | 350 | Unknown | Y | Yes | M22WE101_WELL_49 | WELL_49 | Active | Active | |
| | | | | | | | **Zone 925 Capacity** | **2,545** | | | | | | | | | | | | | | |
| 34 | 1425 S. Bon View Ave. | 1983 | 1010 | 15EHM | Ingersoll Dresser | 12 | 1175 | 2,074 | - | - | - | - | GE | 500 | 1180 | N | Yes | M14WE101_WELL_34 | | Inactive | Inactive | Well could be equipped and place back in service, but unlikely. |
| 50 | 3900 W. Riverside Dr. | - | 1010 | 14MD | Peerless | 6 | 1,780 | 2,274 | 475 | 218 | 38 | 6/30/09 | - | - | - | N | Yes | | | Inactive | Active | Perchlorate issues". Inactive during existing model, but will be placed back into service for the future model. |
| 39 | 4397 Guasti Ave. | 2002 | 1010 | 15EMM | Ingersoll Dresser | 4 | 1775 | 2,209 | 406 | 339 | 24 | 9/13/16 | US | 350 | Unknown | N | Yes | J23WE100_WELL_39 | | Active | Active | Needs treatment; directly connected to reservoir at 1010 reservoirs. Currently Active, but not in service. Place back into service for future model, as treatment will be provided. |
| | | | | | | | **Zone 1010 Capacity** | **0** | | | | | | | | | | | | | | |
| 35 | 652 E. Main St. | 1983 | 1074 | 17 MQH | Byron Jackson | 11 | 1170 | 2,568 | 548 | 351 | 65 | 3/18/18 | US | 500 | 1180 | N | Yes | K14WE100_WELL_35 | WELL_35 | Active | Active | The City indicated that there are water quality issues and the water, quality is not reliable. This well is currently in service. |
| 36 | 1400 S. Archibald Ave. | 1986 | 1074 | Unknown | | | | 1,672 | 532 | 268 | 62 | 3/18/18 | US | 350 | 1770 | N | | M19WE100_WELL_36 | WELL_36 | Active | Active | |
| 40 | 1335 East Holt Bl. | 2003 | 1074 | 14R | L&B Verti-line | 6 | 1785 | 2,024 | 503 | 360 | 39 | 3/18/18 | US | 600 | 1785 | Y | | J16WE100_WELL_40 | WELL_40 | Active | Active | Not sequenced to start and stop. Typically only used in summer months. High operation and energy costs. |
| 44 | 964 Cucamonga Ave. | 2003 | 1074 | 15ETMH | Flowserve | 7 | 1770 | 2,471 | 644 | 421 | 80 | 4/18/18 | USEM | 600 | 1800 | N | Yes | H15WE106_WELL_44 | WELL_44 | Active | Active | Ion Exchange Plant. at 1074 Reservoirs. Water quality makes this plant unreliable. Clearwell is planned for future. |
| 45 | 665 N .Campus Ave. | 2006 | 1074 | 17MQL | Flowserve | 5 | 1775 | 2,589 | 516 | 395 | 40 | 8/10/18 | Unknown | 500 | Unknown | N | | I14WE100_WELL_45 | WELL_45 | Active | Active | |
| 52 | 1230 E. 4th St, | Unknown | 1074 | 15ETMH | Flowserve | 7 | 1770 | 2,279 | 672 | 420 | 114 | 4/18/18 | USEM | 600 | 1800 | N | Yes | H15WE107_WELL_52 | WELL_52 | Active | Active | Ion Exchange Plant. at 1074 Reservoirs. Water quality makes this plant unreliable. Clearwell is planned for future. |
| | | | | | | | **Zone 1074 Capacity** | **13,603** | | | | | | | | | | | | | | |
| 20 | 9600 S. Milliken Ave. | 1977 | 1212 | - | - | - | - | - | - | - | - | - | - | - | - | N | | | | Inactive | Inactive | Not physically connected to system |
| 27 | 4300 E. Jurupa St. | 1971 | 1212 | - | - | - | - | - | - | - | - | - | - | - | - | N | | | | Inactive | Inactive | Not physically connected to system |
| 24 | 700 N. Haven Ave. | 1969 | 1212 | 14KHM | Aurora | 11 | 1770 | 1,907 | 599 | 351 | 21 | 2/18/18 | US | 450 | 1780 | N | | I21WE100_WELL_24 | WELL_24 | Active | Active | |
| 29 | 2400 E. Airport Dr. | 1979 | 1212 | Unknown | | | | 2,147 | 657 | 318 | 71 | 9/16/16 | GE | 500 | Unknown | N | | J18WE100_WELL_29 | WELL_29 | Active | Active | Not sequenced to start and stop. Typically only used in summer months. High operation and energy costs. |
| 30 | 220 S. Wineville Ave. | 1978 | 1212 | 14M160 | Ingersoll Dresser | 7 | 1775 | 2,063 | 597 | 314 | 31 | 4/18/18 | Westing-house | 600 | 1800 | N | | K24WE100_WELL_30 | WELL_30 | Active | Active | |
| 31 | 5719 E. Santa Ana St, | 1979 | 1212 | 16KHL | Verti-Line | 8 | 1770 | 2,866 | 606 | 283 | 36 | 4/18/18 | US | 600 | Unknown | N | Yes | L25WE100_WELL_31 | WELL_31 | Active | Active | There are water quality issues. It is used as an emergency backup well. |
| 37 | 4327 E. Guasti | 1994 | 1212 | 15EHM | Ingersoll Dresser | 6 | 1775 | 3,074 | 601 | 331 | 30 | 3/18/18 | USEM | 600 | 1780 | N | Yes | J22WE100_WELL_37 | WELL_37 | Active | Active | Currently connected to 1212' zone but will be moved to 1010' zone |
| 38 | 837 N. Center | 1997 | 1212 | 15MQH | Byron Jackson | 7 | 1770 | 2,427 | 663 | 369 | 44 | 3/18/18 | US | 500 | 1775 | N | | H20WE100_WELL_38 | WELL_38 | Active | Active | |
| 41 | 1252 North Hellman Ave. | 2003 | 1212 | Unknown | | | | 2,143 | 703 | 391 | 46 | 4/18/18 | US | 600 | Unknown | Y | | G18WE100_WELL_41 | WELL_41 | Active | Active | Treatment was added to well. |
| 47 | 4255 E. Concours St. | Unknown | 1212 | 17MQH | Flowserve | 5 | 1775 | 3,358 | 632 | 373 | 57 | 3/18/18 | Unknown | 800 | Unknown | Y | | H22WE100_WELL_47 | WELL_47 | Active | Active | |
| | | | | | | | **Zone 1212 Capacity** | **19,985** | | | | | | | | | | | | | | |
| 46 | 1670 W. 8th St. | 2006 | 1348 | 17MQL | Flowserve | 8 | 1775 | 2,471 | 847 | 486 | 82 | 3/18/18 | Unknown | 800 | Unknown | Y | | E16WE100_WELL_46 | WELL_46 | Active | Active | |
| | | | | | | | **Zone 1348 Capacity** | **2,471** | | | | | | | | | | | | | | |
| | | | | | | | **Total Capacity** | **38,604** | | | | | | | | | | | | | | |

## Table 6-4

## Existing Storage Reservoir Summary Table

| Pressure Zone | Reservoir ID | Reservoir Name | Old Reservoir Name | Location | Shape[1] | Volume (MG) | Bottom Elevation (ft) | High Water Elevation (ft) | Height (ft) | Width x Length[1] (ft) | Dia (ft) | Material | Year of Const. | Model ID | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 925 | 2A | Reservoir 925-2A | | Northeast corner of Dupont Ave and Jurupa St | Cylindrical | 6.00 | 893 | 925 | 32.0 | - | 188 | Concrete | 2003 | M22RS101_925_2A | |
| | | | | | **Total Zone 925 Volume** | **6.00** | | | | | | | | | |
| 1010 | 1 | Reservoir 1010-1 | Reservoir 10 | Southwest corner of Campus Ave and Main St | Cylindrical | 5.50 | 979.3 | 1,009.3 | 30.0 | - | 178 | Steel | 1982 | K14RS101_1010_1 | |
| 1010 | 2A | Reservoir 1010-2A | Reservoir 11 | Southeast corner of Miliken Ave and San Bernardino Freeway | Cylindrical | 9.00 | 980 | 1,010 | 30.0 | - | 226 | Concrete | 2001 | J23RS101_1010_2A | |
| 1010 | 2B | Reservoir 1010-2B | Reservoir 10 | | Cylindrical | 9.00 | 980 | 1,010 | 30.0 | - | 226 | Concrete | 2007 | J22RS101_1010_2B | |
| | | | | | **Total Zone 1010 Volume** | **23.50** | | | | | | | | | |
| 1074 | 1A | Reservoir 1074-1A | Reservoir 8 | Southeast corner of Cucamonga Ave and Fourth St | Rectangular | 2.75 | 1,054.4 | 1,074 | 19.6 | 140 x 140 | - | Concrete | 1978 | H15RS103_1074_ EQUIV_TANK | |
| 1074 | 1B | Reservoir 1074-1B | Reservoir 9 | Southeast corner of Cucamonga Ave and Fourth St | Rectangular | 2.00 | 1,058.8 | 1,074 | 15.2 | 118 x 158 | - | Concrete | 1957 | | |
| | | | | | **Total Zone 1074 Volume** | **4.75** | | | | | | | | | |
| 1212 | 1A | Reservoir 1212-1A | Reservoir 4 | Southwest corner of Fern Ave and Euclid Pl | Rectangular | 20.00 | 1,188 | 1,214 | 26.0 | 278 x 458 | - | Concrete | 1959 | E12RS102_1212_1A | Elevations were verified from surveying data. |
| 1212 | 1B | Reservoir 1212-1B | Reservoir 5 | Southwest corner of Fern Ave and Euclid Pl | Rectangular | 2.00 | 1,202 | 1,214 | 11.5 | 166 x 180 | - | Concrete | 1958 | E12RS101_1212_1B | Plans show depth 12' - 1.1.5'. |
| 1212 | 3 | Reservoir 1212-3 | Reservoir 7 | East side of Campus Ave, north of 8th Street | Irregular | 10.00 | 1,189 | 1,213 | 24.3 | 218 x 398 | - | Concrete | 1926 | E14RS101_1212_3 | Elevations were verified from surveying data. |
| | | | | | **Total Zone 1212 Volume** | **32.00** | | | | | | | | | |
| 1348 | 1A | Reservoir 1348-1A | Reservoir 1 | Southwest corner of Campus Ave and 13th St | Rectangular | 3.00 | 1,328.4 | 1,347.7 | 19.3 | 125.5 x 162.5 | - | Concrete | 1972 | B14RS104_EQUIV_ TANK_1348 | |
| 1348 | 1B | Reservoir 1348-1B | Reservoir 2 | | Rectangular | 2.00 | 1,327.6 | 1,348.0 | 20.5 | 107 x 125.5 | - | Concrete | 1955 | | |
| 1348 | 1C | Reservoir 1348-1C | Reservoir 3 | | Rectangular | 3.75 | 1,328.9 | 1,349.5 | 20.6 | 125.5 x 199.5 | - | Concrete | 1958 | | |
| | | | | | **Total Zone 1348 Volume** | **8.75** | | | | | | | | | |
| | | | | | **Total System Volume** | **75.00** | | | | | | | | | |

*[1] Reservoirs with hopper bottoms and sloped walls are considered regular shapes (rectangular/cylindrical) as these irregularities in the shape account for insignificant impact on volume.*

## Table 6-5

## Existing Booster Pump Station Summary Table

| Pump Data | | | | | | | | | | | Efficiency Test | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location of Booster Pump Station | Date of Construction | Name | Old Name | Suction Zone | Discharge Zone | Pump Model | Pump Mfg | Stages | Pump Type | RPM | Capacity (gpm) | TDH (ft) | Test Date | Horse Power | Model ID | Model Pump Curve ID | Comment |
| John Galvin Pump Station 960 N Cucamonga Ontario, CA 91764 | 1960 | Galvin 1074-1 | Galvin Booster 1A | 1074 | 1212 | 14FHC | Goulds | 3 | VT | 1800 | 3,658 | 152 | 4/18/18 | 250 | H15BP102_GALVIN_1212_1 | GALVIN_BPS_P1_1A | |
| | | Galvin 1074-2 | Galvin Booster 1B | 1074 | 1212 | 16ENL | Flowserve | 2 | VT | 1780 | 3,145 | 147 | 7/1/13 | 200 | H15BP103_GALVIN_1212_2 | GALVIN_BPS_P2_1B | |
| | | Galvin 1074-3 | Galvin Booster 1C | 1074 | 1212 | Unknown | | 2 | VT | 1770 | 4,638 | 164 | 4/18/18 | 350 | H15BP104_GALVIN_1212_3 | | Modeled pump with design point |
| | | Galvin 1074-4 | Booster 2 | 1074 | 1348 | 14HMC | Goulds | 4 | VT | 1800 | 2,016 | 334 | 4/18/18 | 250 | H15BP101_GALVIN_1348_4 | GALVIN_BPS_P4_2 | |
| 1212 Reservoir (10MG) 140 s. Campus, Upland, CA 91786 | 1959 | Booster 1348-3 | Booster 3 | 1212 | 1348 | 8A-16 | Peerless | - | HSC | 1770 | 3,070 | 157 | 4/18/18 | 150 | E14BP101_BOOSTER_1348_3 | | Modeled pump with design point |
| | | Booster 1348-4 | Booster 4 | 1212 | 1348 | 6AE16 | Peerless | - | HSC | 1760 | 1,898 | 161 | 4/18/18 | 100 | E14BP102_BOOSTER_1348_4 | BOOSTER_1348_4 | |
| 1559 N. Columbia Ave, Ontario, CA 91764 | 1960 | Booster 1348-1 | Booster 9A | 1212 | 1348 | 411-BF | Aurora | - | HSC | 1775 | 2,844 | 214 | 4/18/18 | 200 | F13BP101A_BOOSTER_1348_1 | | Modeled pump with design point |
| | | Booster 1348-2 | Booster 9B | 1212 | 1348 | 411-BF | Aurora | - | HSC | 1778 | 2,613 | 226 | 8/10/18 | 200 | F13BP101B_BOOSTER_1348_2 | | Modeled pump with design point |
| 4251 East Jurupa Ave, east of Dupont Ave | 2008 | CDA Ontario Booster Pump 1 | N.A. | 925 | 1212 | Unknown | | | | | 1,286 | 302 | 4/18/18 | 150 | M22BP100_ONTARIO_1212_1 | ONTARIO_BPS_P1 | |
| | | CDA Ontario Booster Pump 2 | N.A. | 925 | 1212 | Unknown | | | | | 1,198 | 295 | 4/18/18 | 150 | M22BP101_ONTARIO_1212_3 | ONTARIO_BPS_P2 | |
| | | CDA Ontario Booster Pump 3 | N.A. | 925 | 1212 | Unknown | | | | | 1,232 | 295 | 4/18/2018 | 150 | M22BP102_ONTARIO_1212_2 | ONTARIO_BPS_P3 | |
| 4301 E Guasti Rd, east of Milliken Ave | N.A. | CDA Milliken Booster 1 | N.A. | 1010 | 1212 | 12ENL | Flowserve | 5 | VT | 1770 | 1,525 | 203 | 12/18/2014 | 125 | WMP2019_BP00001_MILLIKAN_1212_1 | MILLIKEN_BPS_P1 | |
| | | CDA Milliken Booster 2 | N.A. | 1010 | 1212 | 12ENL | Flowserve | 5 | VT | 1770 | 1,520 | 202 | 12/18/2014 | 125 | WMP2019_BP00002_MILLIKAN_1212_2 | MILLIKEN_BPS_P2 | |
| | | CDA Milliken Booster 3 | N.A. | 1010 | 1212 | 12ENL | Flowserve | 5 | VT | 1770 | 1,525 | 204 | 12/18/2014 | 125 | WMP2019_BP00003_MILLIKAN_1212_3 | MILLIKEN_BPS_P3 | |
| Archibald Ave, north of Cloverfield Rd. (Owned by CDA) | N.A. | Archibald -1 | N.A. | CDA | 1010 | | Fairbanks Morse | | | | 1061 | 166 | 4/18/2018 | 75 | WMP2019_BP00004_ARCHIBALD_1010_1 | | Modeled pump with design point |
| | | Archibald -2 | N.A. | CDA | 1010 | | Fairbanks MOrse | | | | 1,112 | 164 | 4/18/2018 | 75 | WMP2019_BP00005_ARCHIBALD_1010_2 | | Modeled pump with design point |

The Ontario Booster Pump Station was constructed in 2008 and is located at 4251 East Jurupa Avenue, east of Dupont Avenue. It currently takes suction from Reservoir 925-2A, which was constructed to ultimately serve the 925 Zone (Ontario Ranch). Currently, there is little demand in New Model Colony. Per the "take or pay" agreement with CDA, the City tries to utilize 8,533 AFY from CDA, which is routed through the 925 Zone. Historically, the imported water supply has exceeded the 925 Zone demand, and the Ontario Booster Pump Station was constructed to move this water to the 1212 zone, which has an abundance of storage.

Milliken Booster Pump Station is located at 4301 E. Guasti Road, east of Milliken Avenue. It currently takes suction from Reservoir 1010-2A and Reservoir 1010-2B. Per the "take or pay" agreement with CDA, the City tries to utilize 8,533 AFY, which can be served to the 1010 Zone through CDA 2, Lateral D. As the imported water supply can exceed the total 1010 Zone demand, and the Milliken Booster Pump Station was constructed as a way to move the imported water to the 1212 Zone, which has an abundance of storage

## 6-7 Pressure Reducing Stations

The City's system includes fifteen (15) pressure reducing stations (PRS), The details of each PRS are shown in Table 6-6. Most of the stations have two or more pressure reducing valves (PRVs), a main valve and one or more bypass valves. The main valve, the smallest in diameter, typically has the highest pressure setting. Bypass valves are larger in diameter and have slightly lower pressure settings than the main valve. The bypass valve will open when the system pressure drops below the main valve's pressure setting and the main valve cannot supply enough water. If the downstream pressure continues to fall below the bypass valve pressure setting, the second bypass valve will open to provide additional water.

Pressure relief valves are present at PRS4, PRS12, and PRS13. These valves protect the water system from abnormally high pressures should the reducing valves fail to work properly.

**Table 6-6**

**Existing Pressure Reducing Stations Summary Table**

| Station No. | From Zone | To Zone | Location | Diameter (inch) | Pressure Setting (psi) | Ground Elevation (feet) | Model ID |
|---|---|---|---|---|---|---|---|
| 2 | 1074' | 1010' | Euclid Ave, south of Philadelphia St (east side of street) | 4 | 62 | 840 | P13PR102_PRV_2 |
| | | | | 8 | 58 | | |
| | | | | 8 | 52 | | |
| 3 | 1074' | 1010' | Grove Ave, south of Philadelphia St | 4 | 65 | 834 | P15PR101_PRV_3 |
| | | | | 8 | 60 | | |
| | | | | 8 | 55 | | |
| 4 | 1074' | 1010' | Philadelphia St at Vineyard Ave | 6 | 64 | 838 | P17PR103_PRV_4 |
| | | | | 12 | 57 | | |
| | | | Pressure Relief | 6 | 90 | | |
| 5 | 1074' | 1010' | Archibald Ave at Philadelphia St | 4 | 65 | 830 | P19PR101_PRV_5 |
| | | | | 6 | 60 | | |
| | | | | 8 | 50 | | |
| 6 | 1212' | 1074' | Archibald Ave at Jurupa St (adjacent Well 36) | 6 | 65 | 893 | M19PR101_PRV_6 |
| | | | | 8 | 60 | | |
| 7 | 1212' | 1010' | Milliken Ave south of Francis St | 3 | 55 | 876 | N22PR101_PRV_7 |
| | | | | 4 | 50 | | |
| | | | | 8 | 45 | | |
| 8 | 1212' | 1010' | Francis St at Etiwanda Ave | 4 | 55 | 878 | N26PR101_PRV_8 |
| | | | | 8 | 50 | | |
| | | | | 12 | 40 | | |

**Table 6-6 (Continued)**

**Pressure Reducing Stations**

| Station No. | From Zone | To Zone | Location | Diameter (inch) | Pressure Setting (psi) | Ground Elevation (feet) | Model ID |
|---|---|---|---|---|---|---|---|
| 10 | 1212' | 1074' | Mission Blvd at Turner Ave | 4 | 80 | 856 | N20PR101_PRV_10 |
| | | | | 8 | 75 | | |
| | | | | 10 | 70 | | |
| 11 | 1212' | 1074' | Phillips Street at Cypress Ave | 4 | 52 | 918 | M12PR101_PRV_11 |
| | | | | 8 | 47 | | |
| 12 | 1212' | 1074' | Haven Ave at Francis St (west side of street) | 4 | 79 | 866 | N21PR102_PRV_12 |
| | | | | 6 | 73 | | |
| | | | | 10 | 68 | | |
| | | | Pressure Relief | | - | | |
| 13 | 1212' | 1010' | Haven Ave at Francis St (east side of street) | 4 | 60 | 866 | N21PR101_PRV_13 |
| | | | | 6 | 55 | | |
| | | | | 10 | 50 | | |
| | | | Pressure Relief | | - | | |
| 15 | 1348' | 1212' | Fourth St at San Antonio Ave | 6 | 35 | 1,094 | H12PR100_PRV_15 |
| | | | | 6 | 30 | | |
| 17 | 1010' | 925' | Archibald Ave at Schaefer Ave | 4 | 74 | 728 | U19PR100_PRV_17 |
| | | | | 10 | 69 | | |
| 18 | 1010' | 925' | Riverside Dr, west of Milliken Ave | 4 | 54 | 788 | R22PR100_PRV_18 |
| | | | | 10 | 50 | | |
| | | | | 14 | 45 | | |
| 21 | 1212' | 1074' | Euclid St at Phillips St | 6 | 53 | 930 | M13PR100_PRV_21 |
| | | | | 10 | 48 | | |

## 6-8 Altitude Valves

The existing system has four (4) altitude valves that regulate reservoir operations. The altitude valves are operated based on levels in City reservoirs. Details are shown in Table 6-7.

**Table 6-7**

**Altitude Valves**

| ID | From Zone | To Zone | Location | Model ID | Diameter |
|---|---|---|---|---|---|
| AV-1010-2 | 1212 | 1010 | Reservoir 1010-2A & 1010-2B | WMP2019_VL00003_ALT_1212_1010 | 12 |
| AV-1010-1 | 1074 | 1010 | Reservoir 1010-1 | WMP2019_VL00004_ALT_1074_1010 | 12 |
| AV-1074-1 | 1212 | 1074 | Reservoir 1074-1A & 1074-1B | WMP2019_VL00002_ALT_1212_1074 | 12 |
| AV-925-2 | 1212 | 925 | Reservoir 925-2A | M22PR100_ALT_1212_925 | 10 |

## 6-9 Imported Water Connections

The City has two (2) Water Facilities Authority (WFA) turnouts and five (5) points of connection with the Chino Basin Desalter Authority (CDA). The locations and details are listed in Table 6-8.

**Table 6-8**

**Imported Water Connections**

| ID | To Zone | Location | Model ID | Connection Comment | Supply Agency Comment |
|---|---|---|---|---|---|
| WFA Turnout 1 | 1212 | Northwest corner of Eighth St and Fern Ave (adjacent Reservoir 1212-1A and 1212-1B) | E12PR101_WFA_1 | 16 mgd (16,800 AFY) Capacity | City plans for 15 mgd (17,900 AFY) maximum to be taken from turnout. |
| WFA Turnout 2 | 1348 | Southeast corner of Campus Ave and A St (adjacent Reservoir 1212-3) | WMP2019_VL00001_WFA_2 | 9 mgd (10,100 AFY) Capacity. This supply can be directed into the 1212-3A Reservoir through WFA 2A. This flow can be directed into the 1212-3A Reservoir through WFA 2A | |
| CDA I[1] | 1010 | Intersection of Archibald Ave and extension of Schaefer St | WMP2019_VL00009_CDA_1 | Blend of CDA II water and JCSD Water. Not used much due to additional pumping cost and water quality concerns. | CDA entitlement is 8.6 MGD (8,533 AFY) through CDA I and CDA II combined. |
| CDA II - Lat A[2] | 925 | Intersection of Philadelphia St and Milliken Ave | WMP2019_VL00006_CDA_2_LAT_A | Blend of CDA II water and JCSD Water. Currently not used much, since Laterals C and D are a direct connection to CDA II. | |
| CDA II - Lat B[2] | 1010 | Intersection of Philadelphia St and Milliken Ave | WMP2019_VL00005_CDA_2_LAT_B | | |
| CDA II - Lat C[2] | 925 | Intersection of Riverside Dr and Milliken Ave | WMP2019_VL00007_CDA_2_LAT_C | Newly constructed connection provides the majority of the CDA supply. | |
| CDA II - Lat D[2] | 1010 | Intersection of Riverside Dr and Milliken Ave | WMP2019_VL00008_CDA_2_LAT_D | | |

[1] *CDA I is the Chino Basin Desalter Facility No. 1*

[2] *CDA II is the Chino Basin Desalter Facility No. 2*

## 6-10 Inter-Agency Connections

The City's water system has two (2) inter-agency connections with neighboring cities or water utilities. These inter-agency connections allow the City to obtain water from or provide water to adjacent water systems. The inter-agency connections and their locations are listed in Table 6-9.

**Table 6-9**

**Inter-Agency Connections**

| No. | Location | From | To | Connection Size (in) | Comments |
|---|---|---|---|---|---|
| 1 | Milliken Ave & 4th St. | CVWD | City of Ontario 1212 Zone | 4" and 8" | PRS 14 |
| 2 | Benson Ave & State St | City of Ontario 1212 Zone | City of Chino | 10 | Connected to City of Chino Reservoir |

## 6-11 Water Treatment

Operated by the City for over thirty (30) years to treat raw Colorado River water from the MWD Upper Feeder, the John Galvin Water Treatment Plant was deactivated in 1993 because the treatment process did not meet the requirements of the Surface Water Treatment Rule.

As a part of participating in the DYY program, the John Galvin Water Treatment Plant site (southeast corner of Cucamonga Avenue and Fourth Street) was chosen for the location of a new ion-exchange facility. The John Galvin Ion Exchange Treatment Facility was commissioned on April 29, 2009. The treatment facility extracts raw groundwater with nitrate and perchlorate concentrations in excess of or near 80% of the MCL from either Well 44 and Well 52. The City's domestic water supply permit allows the operation of either Well 44 or Well 52 or both wells at once, depending on the water quality concentrations experienced when the facility is in operation. The facility's final chlorinated product is comprised of a small portion of raw water (either Well 44 or Well 52 or both wells, depending at the time of operation) that is bypassed and blended with treated water from the treatment facility before delivery into Reservoirs 1074-1A & 1074-1B. In addition, the facility includes a bypass blending system where the facility's final chlorinated product can be blended with Zone 1212 water prior to entering Reservoirs 1074-1A and 1074-1B. The maximum well water concentrations are 70 milligrams per liter (mg/L) nitrate and 8 micrograms/L (µg/L) perchlorate. The treatment facility's final chlorinated product has nitrate concentrations, on average of 25 mg/L and perchlorate concentrations of 2.8 (µg/L), on average.

# SECTION 7

# CRITERIA

## 7-1 General

Performance criteria are established to evaluate the adequacy of various water system components through a systematic analysis. Necessary improvements are identified and recommended for inclusion in a Capital Improvement Program (CIP). Some criteria are based upon experience and their application is at the discretion of the water purveyor. This includes service pressures, storage capacity, and sources of supply. Other criteria, such as water quality and fire protection, are based on federal, state and local jurisdictional requirements. This section details the criteria which will serve as the benchmark for evaluating the City's water system. A summary of the service criteria is listed in Table 7-1.

**Table 7-1**

**Service Criteria**

| Description | Criteria | Existing Requirement | Future Requirement |
|---|---|---|---|
| 1. Source of Supply | | | |
| a. Total | Maximum Day Demand ( except for closed zones which shall be Maximum Day Demand plus Fire Flow Demand or Peak Hour, whichever is greater) | 29,790 gpm | 54,780 gpm |
| b. Local Supply | Average Day Demand | 19,280 gpm | 35,700 gpm |
| 2. Reservoir Capacity | | | |
| a. Operational Storage | 30% of Maximum Day Demand for the OMC and 25% of Maximum Day Demand for Ontario Ranch | TBD | TBD |
| b. Emergency Storage | 100% of Average Day Demand | 27.8 mg | 39.7 mg |
| c. Fire Suppression | Highest Fire Flow Requirement | | |
| *Residential* | | | |
| Rural | 1,500 gpm for 2 hours | 0.18 mg | 0.18 mg |
| Low Density | 1,500 gpm for 2 hours | 0.18 mg | 0.18 mg |
| Low-Medium Density | 1,500 gpm for 2 hours | 0.18 mg | 0.18 mg |
| Medium Density | 2,000 gpm for 2 hours | 0.24 mg | 0.24 mg |
| High Density | 3,500 gpm for 4 hours | 0.84 mg | 0.84 mg |
| *Retail / Service* | | | |
| Neighborhood Commercial | 2,500 gpm for 3 hours | 0.45 mg | 0.45 mg |
| General Commercial | 3,000 gpm for 3 hours | 0.54 mg | 0.54 mg |
| Office Commercial | 3,000 gpm for 3 hours | 0.54 mg | 0.54 mg |
| Hospitality | 4,000 gpm for 4 hours | 0.96 mg | 0.96 mg |
| *Employment* | | | |
| Business Park | 3,000 gpm for 3 hours | 0.54 mg | 0.54 mg |
| Industrial | 4,000 gpm for 4 hours | 0.96 mg | 0.96 mg |

**Table 7-1**

**Service Criteria (continued)**

| Description | Criteria | Existing Requirement | Future Requirement |
|---|---|---|---|
| *Other* | | | |
| Airport | 4,000 gpm for 4 hours | 0.96 mg | 0.96 mg |
| Mixed Use | 3,500 gpm for 4 hours | 0.84 mg | 0.84 mg |
| Open Space | 1,500 gpm for 2 hours | 0.18 mg | 0.18 mg |
| Public Facility | 3,000 gpm for 3 hours | 0.54 mg | 0.54 mg |
| Public School | 2,500 gpm for 3 hours | 0.45 mg | 0.45 mg |
| 3. Booster Pump Stations | ➢ Capable of delivering Maximum Day Demand plus Fire Flow or Peak Hour Demand of service area, whichever is greater<br>➢ Stand-by pump equal in size to the largest duty pump<br>➢ Flow meters, suction and discharge pressure gauges, and telemetry equipment for alarm and status notification at each station<br>➢ Provisions for emergency power at all stations | | |
| 4. Minimum Pipe Size | 12-inch in commercial and industrial areas<br>8-inch in all other areas | | |
| 5. Maximum Velocities | ➢ 5 ft/s at Average Day Demand<br>➢ 7 ft/s at Maximum Day Peak Hour Demand (5 ft/s for PVC pipe)<br>➢ 10 ft/s at Maximum Day plus Fire Flow Demand | | |
| 6. Static Pressures | ➢ Minimum 40 psi<br>➢ Desired 60 - 80 psi<br>➢ With pressure regulation over 80 psi | | |
| 7. Dynamic Pressures | Minimum 40 psi during Peak Hour Demand | | |
| 8. Fire Flows and Pressures | | | |
| *Residential* | | | |
| Rural | 1,500 gpm for 2 hours with 20 psi residual pressure at fire hydrant | | |
| Low Density | 1,500 gpm for 2 hours with 20 psi residual pressure at fire hydrant | | |
| Low-Medium Density | 1,500 gpm for 2 hours with 20 psi residual pressure at fire hydrant | | |
| Medium Density | 2,000 gpm for 2 hours with 20 psi residual pressure at fire hydrant | | |
| High Density | 3,500 gpm for 4 hours with 20 psi residual pressure at fire hydrant | | |
| *Retail / Service* | | | |
| Neighborhood Commercial | 2,500 gpm for 3 hours with 20 psi residual pressure at fire hydrant | | |
| General Commercial | 3,000 gpm for 3 hours with 20 psi residual pressure at fire hydrant | | |
| Office Commercial | 3,000 gpm for 3 hours with 20 psi residual pressure at fire hydrant | | |
| Hospitality | 4,000 gpm for 4 hours with 20 psi residual pressure at fire hydrant | | |
| *Employment* | | | |
| Business Park | 3,000 gpm for 3 hours with 20 psi residual pressure at fire hydrant | | |
| Industrial | 4,000 gpm for 4 hours with 20 psi residual pressure at fire hydrant | | |
| *Other* | | | |
| Airport | 4,000 gpm for 4 hours with 20 psi residual pressure at fire hydrant | | |
| Mixed Use | 3,500 gpm for 4 hours with 20 psi residual pressure at fire hydrant | | |
| Open Space | 1,500 gpm for 2 hours with 20 psi residual pressure at fire hydrant | | |
| Public Facility | 3,000 gpm for 3 hours with 20 psi residual pressure at fire hydrant | | |
| Public School | 2,500 gpm for 3 hours with 20 psi residual pressure at fire hydrant | | |

## 7-2 Service and Operational Criteria

### 7-2.1 Source of Supply

Any water system must be capable of meeting all demands imposed upon the system. This can be achieved through multiple supply sources, storage, or a combination of both. Generally, the determination is based upon water availability, existing storage capacity, and economics. It is prudent to secure water supplies from multiple sources so that demands can be met at reasonable levels when one or more water sources are not available.

California Code of Regulations Related to Drinking Water require a minimum source of supply to meet the service area's maximum day demand. Also since the City serves more than 1,000 meters, the system must be capable of providing four hours of peak hourly demand through a combination of source capacity, storage capacity, and emergency source capacity. Under this criterion, reservoirs are typically needed to regulate hourly fluctuations in demand, provide fire flow and supplement supply during an outage of a source for an extended duration.

As much of the average day demand shall be supplied by local sources as feasible.

### 7-2.2 Storage

Typically for a water system, three categories of storage are of importance: operational, emergency, and fire suppression. The entire system as well as each individual pressure zone is evaluated to determine the system's ability to meet storage criteria.

The required storage requirements for each pressure zone are anticipated to be met with reservoir capacity and well water. For pressure zones with multiple reservoirs, there is the potential that the high water elevations will differ between the two reservoirs. There may be unusable space, which will be accounted for in the storage analysis.

**Operational Storage**

Operational storage serves to equalize variations in sources of supply and demand over short periods of time (daily or weekly). Utilizing the daily demand hydrograph, the component of operational storage needs to account for the difference in supply and demand, which can be determined with an extended period simulation of the system over a day or a week, etc.

The operational storage might typically be based on one maximum day demand if groundwater storage is not available. For the City of Ontario's system, operational storage criterion is based on 30 percent of the maximum day demand for Ontario Ranch (OR) and 25 percent of the maximum day demand for the Original Model Colony (OMC). Greater daily demand fluctuations are anticipated in OR due to its residential character compared to the mixed residential and industrial character of OMC.

**Emergency Storage**

Emergency storage is used in the event of an interruption in the primary water supply source. It is assumed that most outages can be mitigated within 7 days. Accordingly, many agencies that depend solely on imported water utilize 7 average days of storage as their emergency storage criterion. It is reasonable to expect that groundwater sources will be available during an outage of the imported water supply. Therefore, the required emergency storage volumes may typically be reduced by an agency's groundwater supply capacity. The City of Ontario's emergency storage volume can be reduced by the actual production capacity of its wells. The only requirement would be that the facilities be capable of pumping the water needed during an emergency from the wells to the higher zones. Since the City's well capacity of 38,604 gpm exceeds the existing average day demand (20,600 gpm), the emergency storage criteria is set to one average day demand.

Operational and fire storage shall be available for each individual zone while emergency storage shall be available system-wide. Again, the only the requirement be that the facilities are capable of moving the water needed during an emergency, from the location of the storage to all other zones.

**Fire Suppression Storage**

Fire suppression storage, shown in Table 7-1, is the volume required to supply the service area with the required fire flows, which range from 1,500 to 4,000 gpm for a duration of two (2) to four (4) hours.

### 7-2.3 Booster Pump Stations

Booster pump stations are typically sized to deliver the maximum day demand plus fire flow or the peak hour demand of the service areas, whichever is greater. The exception is closed service zones supplied by either a hydropneumatic pumping system or a variable speed pumping system. Under these circumstances, the booster pumps must meet maximum day demand plus fire flow requirements or there must be a separate fire pump installed to meet the fire flow requirements.

All booster pump stations shall incorporate a standby pump of the same size as the largest duty pump. This ensures that there is a replacement for the largest duty pump during maximum day demand conditions, while one of the pumps at the station is being repaired or replaced. It typically takes pump manufacturers 12 to 16 weeks for delivery of a new pump and motor unit once the order is placed and shop drawings are approved.

### 7-2.4 System Pressures

Most water utilities set 60 to 80 pounds per square inch (psi) as the average static pressure throughout the system. The water system shall also be capable of maintaining a minimum residual pressure of 40 psi during the peak hour demand. A residual pressure of 20 psi must be maintained at the fire hydrant outlet in developed areas during fire flow.

In areas where pressures exceed 80 psi, the Uniform Plumbing Code requires customers to install “an approved type pressure regulator preceded by an adequate strainer” on their service connections to protect domestic plumbing and water heaters.

### 7-2.5 Transmission and Distribution Pipelines

The distribution system shall be sized and designed to provide redundant service at adequate pressures for normal use as well as at fire flow conditions. In most cases, this can be accomplished by looping the system. Looping through easements or other areas which are not easily accessible shall be avoided. Provisions shall be made for supplying each service zone from at least two sources where feasible.

In order to maintain adequate system pressures and prolong the life of the pipe, flow velocities shall be limited. The system shall operate at velocities of 1 to 3 feet per second (fps) normally, with a maximum velocity of 7 fps at intermittent peak flows for all pipes other than VCP pipes. Velocity in PVC pipes shall not exceed 5 fps. The pipe velocity at fire flows shall not exceed 10 fps for all pipes.

The pressure in the system at any given point for a particular flow is dependent on a number of variables including pipe size, roughness and length. These components all contribute to the magnitude of pressure losses in the system. The system shall be designed and operated to maintain system losses to less than 10 feet for each 1000 feet of pipe length under any condition, subject to satisfying all other criteria.

All pipes shall be sized to provide adequate fire flows. To achieve this, when a single, unlooped pipe provides fire service to an area, a minimum diameter of 8-inch shall be maintained to the last hydrant. All mains shall be constructed with a minimum diameter of 8-inches. In commercial and industrial areas, the minimum diameter required is 12-inches. These pipe size recommendations shall be adhered to for all new design and construction projects, as well as any waterline replacement/upgrade projects.

### 7-2.6 Fire Suppression

The fire flow requirements used for this study are based upon the 2016 California Fire Code, which is adopted by the City’s municipal code (Section 4-4.01).

Fire flows shown in Table 7-1 are required to be delivered at a minimum residual pressure of 20 psi at the fire hydrant outlet. The requirements in the California Fire Code are specific to each building on a given parcel of land and based on several factors, including land use, building construction methods and materials, and whether or not automatic sprinklers are present. These specific requirements are shown in Appendix 7-1.

As this Potable Water Master Plan is a planning level document, an evaluation of whether California Fire Code requirements are met at each parcel was not performed. Instead, selected typical requirements as a function of land use are used to establish minimum fire flow availability at each system hydrant. The minimum required fire flow was generally established based on the adjacent land use having the highest fire flow requirement. Table 7-1 is a summary of the selected fire flow criteria for the various land uses within the City. These

requirements were established as performance evaluation criteria and used in developing system improvement recommendations.

For specific future development planning and design, the criteria should be adjusted on a case by case basis per the latest California Fire Code.

The 2016 California Fire Code requires the 20 psi minimum residual pressures at the fire hydrant outlet. Per the requirements of the City's fire department, the potable water system must be capable of maintaining this pressure, while providing the full fire flow requirement through a single fire hydrant. System pressures are estimated using the City's potable water hydraulic model, which has been updated and calibrated as part of this master plan effort.

### 7-2.7 Service Life of Facilities

All facilities have useful lives for which relatively trouble-free service can be expected. Once exceeded, these facilities become less reliable, expensive to maintain and are subject to failure. Therefore, facility age is considered in the assessment of all water systems and in formulating future replacement projects.

The determination of the useful life is dependent upon multiple considerations. Table 7-2 shows the useful lives that are generally accepted as prudent planning criteria. They shall be one of the considerations in determining the phasing of facility replacement.

### 7-2.8 Operational Flexibility

Operational Flexibility is achieved by providing multiple sources of supply, back-up or stand-by facilities, and looped distribution system piping. Criteria to be applied include:

- Provide multiple sources of supply
- Provide looped system whenever possible
- For wells, provide standby generators and automatic transfer switches to deliver at least the average day demand into the system. For other wells, provide portable generator connection and manual transfer switches.
- Provide standby generators and automatic transfer switches at all booster pump stations
- Provide emergency interconnections with neighboring agencies

### 7-2.9 Distribution System Maintenance Program

Regular maintenance of a distribution system is an essential part of a properly operated water distribution system. Maintenance shall include periodic flushing and cleaning of the system, servicing of valves and hydrants, conducting leak surveys, replacement and repairs, and disinfection of repaired sections. Each maintenance and repair activity shall be documented. This work shall be performed in accordance with the Title 22, Chapter 16 (California Waterworks Standards) and AWWA G200 Standards.

Flushing and Cleaning

Flushing shall be performed to remove any accumulated sediments or other impurities which have been deposited in the system pipes. It will also help to restore system capacity. It is important that system flushing be performed systematically to remove the debris. The minimum flushing velocity shall be 2.5 fps.

**Table 7-2**
**Planning Criteria for Facility Useful Life**

| Facility | Useful Life (Years) |
|---|---|
| Steel Reservoirs | 40 |
| Concrete Reservoirs | 50 |
| Lined and Coated Ductile Iron/Steel Pipe | 50 |
| PVC Pipe | 50 |
| Asbestos Cement Pipe | 50 |
| Cast Iron and Steel Pipe (Lining or coating of non-current practice) | 35 |
| Pump Stations/Wells/Treatment Facilities | |
| Structure | 50 |
| Piping | 40 |
| Valves | 20 |
| Mechanical | 15 |
| Electrical | 15 |
| Well Casing | 20 - 60 |

Cleaning, will require proper access to the pipelines, shall be conducted on the sections that require it based upon the information collected and documented during regular maintenance activities.

**Servicing of Valves and Hydrants**

Valves are often found inaccessible, inoperable, or closed and shall therefore be tested and exercised regularly. In the event of a line break, it is important that valves operate properly so that the break can be isolated for repair. Records of repair shall require a notation of the time at which valves are closed and reopened so that valves do not remain closed inadvertently. The City's valves are scheduled to be exercised every five years.

Hydrants shall be periodically inspected for leaks at the hose outlets. Leaking hydrants shall be removed and/or reconditioned and then replaced. Valve exercising and hydrant maintenance programs can be implemented in conjunction with the flushing program.

**Leak Surveys**

Comparison of pumping and purchase records, and customer meter readings and other uses such as system flushing can indicate if excessive leakage is occurring in the system. Leak surveys shall be conducted when excessive leakage is suspected.

**Water Main Replacement and Repair**

Water mains shall be repaired and/or replaced when pipes are found to be broken, corroded, or leaking. The method of repair shall consider if the line is scheduled for replacement, its location in the system, and the conditions which led to the failure. Following the repair or replacement of any pipe, the line shall be flushed and disinfected in accordance with the applicable requirements.

### 7-2.10 Storage Tank and Reservoir Maintenance

The storage tanks shall be inspected periodically by a qualified diver at no more than 5 year intervals. The reports from diving inspections shall be utilized in scheduling the subsequent inspection program, as well as the maintenance/repair projects.

## 7-3 Design Criteria

### 7-3.1 Wells

The wells shall be designed in accordance with the Water Well Standards: State of California Bulletin 74-81 and Bulletin 74-90 (supplement to Bulletin 74-81), the most recent AWWA Standard A-100, Department of Public Health requirements, and sound engineering judgment.

The pumps shall be placed low enough in the casing so that subsequent lowering shall not be necessary. All well screens shall be below the pump intake to preclude cascading of water into the well casing even with the lowest expected pumping water level. The casing diameter shall be at least 4 inches larger than the largest pump/column pipe dimension, and maximum velocity shall not exceed 5 fps. Total screen area shall be sized to maintain a velocity of less than 0.1 foot per second at the maximum anticipated flow. Additionally, the casings diameters shall be selected to allow lining the wells in the future without losing significant capacity. The use of higher grade materials, such as stainless steel shall be considered to increase the useful life of the wells.

The well design shall include a 4-inch diameter camera tube extending to below the pump intake elevation, and a sounding tube. A separate air line with a depth gauge and an air connection shall be provided at every well. Flow meters, pressure gauges, and telemetry equipment shall be included to continuously monitor the wells. Either permanent emergency generators with automatic transfer switches or portable generator connections with manual transfer switches shall be provided at each well site. Sufficient standby power generation capacity shall be provided to pump at least the average day demand into the system.

### 7-3.2 Booster Pump Station

The pump stations shall be equipped with modern pump controllers, flow meters, suction and discharge pressure gauges, proper isolation valves, and telemetry equipment. Facilities that will minimize pressure transients at start-up, shut-down, and power failure shall be provided. Flow meters and pressure gauges are essential tools for monitoring pump performance and demand conditions in the service area. Telemetry equipment is used to remotely monitor the status of the facility, and notify personnel in the event of a failure.

Pump stations shall be constructed of fireproof materials and be provided with peripheral sprinkler systems to prevent fire damage. Furthermore, power to the pump stations shall be provided through underground service to minimize possibility of damage during fires.

Standby generators and automatic transfer switches shall be provided to operate the pump stations during commercial power outages.

### 7-3.3 Pressure Reducing Stations

Pressure reducing stations supplying service zones shall be constructed with sufficient valves to deliver the entire range of demands and the fire flows within their proper operating range. Wherever possible, a minimum of two pressure reducing stations shall serve these zones. Pressure reducing stations shall be constructed with a pressure relief valve at the downstream end to preclude excessive pressures in the service area in case of malfunctioning of the pressure regulating valves. Each pressure reducing station shall be equipped with flow meters and telemetry equipment so that their operation can be remotely monitored through the SCADA system, and alarm conditions, such as open pressure relief valve can be addressed in a timely manner.

# SECTION 8

# HYDRAULIC MODEL

## 8-1 General

A computer model of the City's water system was developed in the Innovyze Infowater software platform. It was utilized to aid in the evaluation of the adequacy of the existing facilities under the current and future supply and demand conditions.

Generally, the model development steps included the following:

1. Import water system GIS data to modeling software
2. Verify and complete pipe information (pressure zone, diameter, length, roughness)
3. Verify and complete junction information (pressure zone, elevations)
4. Add detailed facility data (wells, pump station, reservoir, imported water turnouts, and pressure reducing stations)
5. Add facility information (dimensions and water level for tank, pump curves for pumps, sizes and pressure settings for pressure reducing valves, and aquifer levels for well pump suction levels)
6. Determine and assign demands to model junctions
7. Develop and assign diurnal demand curves to model junctions
8. Assign controls to facilities (pump start and stop conditions)

The City's Water GIS and atlas sheets were used as the basis of the geometry of the potable water model. Water system facilities (reservoir, pump station, wells, pressure reducing stations, and turnouts) were added to the model based on as-built construction plans and provided facility information, such as pump curves, efficiency tests, ground water levels, and operational controls. The City consistently updates its Water GIS as new developments are constructed and as improvement projects are completed. The potable water model was generated from the City's water geodatabase from March 2019.

The model includes the potable water pipelines that are owned by the City. Water service laterals are not included. Fire hydrant laterals are included. Modeling information associated with each pipe includes diameter, length, and roughness factor. Other pipe information included in the model database are year of installation, pressure zone, and pipe material. Modeling information associated with each junction includes ground elevation, water demand, and diurnal pattern of demand. Model junction elevations were obtained from the City's latest 5-foot contour data (GIS Shapefile).

## 8-2 Demand Distribution

**Existing Demands**

Customer water meter data was geocoded/linked to the City's GIS meter shapefile by Service Profile Identification (SPID) number. Next, service laterals were used to spatially join the the meters to the mainline junctions within the associated pressure zone. This enabled each water meter and its demand to be assigned to the closest model junction ID.

The existing average day demand (ADD) distribution was based upon water meter data provided for the period between September 2018 and August 2019. The existing maximum day demand (MDD) distribution was based upon peaking factors described in Section 4-5. In the OMC service area the MDD to ADD peaking factor is 1.6, while in the OR service area the peaking factor is 1.5.

After the ADD were loaded onto model junctions, they were adjusted so that the total demand matched the existing water production estimates (see Table 4-3). MDD were developed using the peaking factors. The method of distributing demands inherently accounted for any high water users within the existing service area as well as non-revenue water.

The water demands are assigned to the following database fields within the model:

- Demand Type 1: Existing residential demand
- Demand Type 2: Existing non-residential demand
- Demand Type 3: Existing high water user Demand
- Demand Type 4: Future residential demand
- Demand Type 5: Future non-residential demand

**Future Demands**

The increase in future water demand is due to the development of Ontario Ranch, anticipated densification in land use and population per the City's 2010 General Plan, and the assumption that the area within the service area will be fully occupied (vacant land will be built upon and occupied).

The existing loads remained the same unless an area was going to be redeveloped. Future demands were estimated using the water demand factors summarized in Table 4-7.

## 8-3 Diurnal Patterns

The developed diurnal demand patterns discussed in Section 5 were specified at each node.

## 8-4 Model Scenarios

The accuracy of the hydraulic model for the existing system was verified during the calibration process, as described in Section 10 of this report. Within the model software, new data sets and query sets were created to represent different operating conditions. The following five scenarios were created.

- Calibration Day Scenario (CALIBRATION_2019_04_18)
- Existing Average Day Demand Scenario (EXISTING_ADD)
- Existing Maximum Day Demand Scenario (EXISTING_MDD)
- Future Average Day Demand Scenario (FUTURE_ADD)
- Future Maximum Day Demand Scenario (FUTURE_MDD)

Data sets change as conditions in each scenario need to be changed. For example, separate demand sets were created to represent the various demand conditions. Separate control sets were created to define the initial status and controls of facilities (pumps and valves). The data sets associated with each scenario are shown in Table 8-1.

**Table 8-1**

**Existing Data Sets**

| Data Set | Calibration Day Scenario (CALIBRATION_2019_04_18) | Existing Scenarios | | Future Scenarios | |
|---|---|---|---|---|---|
| | | Average Day Demand Scenario (EXISTING_ADD) | Maximum Day Demand Scenario (EXISTING_MDD) | Average Day Demand Scenario (FUTURE_ADD) | Maximum Day Demand Scenario (FUTURE_MDD) |
| Demand Set | CALIBRATION_2019_04_18 | EXISTING_ADD | EXISTING_MDD | FUTURE_ADD | FUTURE_MDD |
| Tank Set | CALIBRATION_2019_04_18 | EXISTING_ADD | EXISTING_MDD | FUTURE_ADD | FUTURE_ADD |
| Reservoir Set | EXISTING | EXISTING | EXISTING | EXISTING | EXISTING |
| Pump Set | EXISTING | EXISTING | EXISTING | EXISTING | EXISTING |
| Pipe Set | EXISTING | EXISTING | EXISTING | FUTURE | FUTURE |
| Valve Set | CALIBRATION_2019_04_18 | EXISTING_ADD | EXISTING_MDD | FUTURE_ADD | FUTURE_MDD |
| Control Set | CALIBRATION_2019_04_18 | EXISTING_ADD | EXISTING_MDD | FUTURE_ADD | FUTURE_MDD |
| Logical Set | BASE | EXISTING_ADD | EXISTING_MDD | FUTURE_ADD | FUTURE_MDD |

## 8-5 System Operations

The hydraulic model was used to analyze the existing and future systems under average day demands (ADD) and maximum day demands (MDD).

For a potable water system as large as the City's, there are numerous ways that the system can be operated. There are multiple sources of water to each major zone. The day-to-day operations of the system take into consideration, but are not limited to the following issues: water quality, well production goals, imported water goals, and energy costs.

The operational settings and facility statuses for the ADD and MDD scenarios were developed per meetings with the City's Operations staff, review of SCADA data, historic water use and operations data.

It is important to note that the controls in the developed model are largely based on SCADA information. Controls will need to be reevaluated and updated for additional scenarios created and analyses conducted by the City in the future.

Some of the well and pump station facilities are enrolled in a time of use (TOU) rate through Southern California Edison. TOU rates are broken down into the following 4 categories: Super Off Peak, Off Peak, Mid Peak, and Peak. TOU rates vary the time of day energy is used, as well as between weekdays and weekends. TOU rates also vary seasonally with increased rates, during the warm summer months (June 1st to September 31st).

## 8-6 Wells

The City's water system currently has seventeen (17) active wells. Table 8-2 and Table 8-3 describe the existing and future operation control settings of the wells, respectively. The summary tables detail operations for the ADD and MDD scenarios.

Groundwater levels at the wells were represented in the model by constant level, unlimited capacity reservoirs. The groundwater levels for wells were based on the most-recent groundwater level readings.

## 8-7 Imported Water Connections

Imported water connections were simulated using flow control valves with the settings included in Table 8-4.

## Table 8-2
## Existing Well Operational Settings

| Well Number | Location | Pressure Zone | Model Reservoir ID | Groundwater Pumping Elevation (ft) | Model Pump ID | Model Pump Curve ID | Capacity (gpm) | TDH (ft) | ADD Operational Settings | | | | | | | MDD Operational Settings | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Reference Reservoir | Action | If Reference Reservoir is | [1]Level (Off Peak) | [2]Level (Mid Peak) | [3]Level (Peak) | [4]Level (Super Peak) | Reference Reservoir | Action | If Reference Reservoir is | [1]Level (Off Peak) | [2]Level (Mid Peak) | [3]Level (Peak) | [4]Level (Super Peak) |
| **Zone 925** | | | | | | | | | | | | | | | | | | | | | | |
| 49 | 1495 S. Dupont Ave. | 925 | WMP2019_RE00020_WELL49 | 586 | M22WE101_WELL_49 | WELL_49 | 2545 | 341.1 | 925-2A | closed | above | 25.0 | 25.0 | 18.0 | 18.0 | 925-2A | closed | above | 25.0 | 25.0 | 18.0 | 18.0 |
| | | | | | | | | | | open | below | 21.0 | 21.0 | 16.0 | 16.0 | | open | below | 21.0 | 21.0 | 16.0 | 16.0 |
| **Zone 1010** | | | | | | | | | | | | | | | | | | | | | | |
| 34 | 1425 S. Bon View Ave. | 1010 | WMP2019_RE00018_WELL34 | 522 | M14WE101_WELL_34 | WELL_34 | 2074 | - | 1010-1A | Inactive | | | | | | 1010-1A | Inactive | | | | | |
| 39 | 4397 Guasti Ave. | 1010 | WMP2019_RE00014_WELL39 | 621 | J23WE100_WELL_39 | WELL_39 | 2209 | 406.1 | 1010-2A | Out of Service | | | | | | 1010-2A | Out of Service | | | | | |
| 50 | 3900 W. Riverside Dr. | 1010 | N.A. | N.A. | N.A. | N.A. | 2274 | 475 | N.A. | Inactive | | | | | | N.A. | Inactive | | | | | |
| **Zone 1074** | | | | | | | | | | | | | | | | | | | | | | |
| 35 | 652 E. Main St. | 1074 | WMP2019_RE00015_WELL35 | 562 | K14WE100_WELL_35 | WELL_35 | 2568 | 548.1 | 1074-1A | Manually Off | | | | | | 1074-1A | Manually Off | | | | | |
| 36 | 1400 S. Archibald Ave. | 1074 | WMP2019_RE00019_WELL36 | 561 | M19WE100_WELL_36 | WELL_36 | 1672 | 532 | 1074-1A | closed | above | 11.0 | 11 | 11 | 11 | 1074-1A | closed | above | 11.0 | 11 | 11 | 11 |
| | | | | | | | | | | open | below | 9.5 | 9.5 | 9.5 | 9.5 | | open | below | 9.5 | 9.5 | 9.5 | 9.5 |
| 40 | 1335 East Holt Bl. | 1074 | WMP2019_RE00011_WELL40 | 582 | J16WE100_WELL_40 | WELL_40 | 2024 | 503.3 | 1074-1A | Manually On | | | | | | 1074-1A | Manually On | | | | | |
| 44 | 964 Cucamonga Ave. | 1074 | WMP2019_RE00004_WELL44 | 558 | H15WE106_WELL_44 | WELL_44 | 2471 | 644.2 | 1074-1A | Manually On | | | | | | 1074-1A | Manually On | | | | | |
| 45 | 665 N .Campus Ave. | 1074 | WMP2019_RE00008_WELL45 | 587 | I14WE100_WELL_45 | WELL_45 | 2589 | 515.6 | 1074-1A | closed | above | 11.5 | 11.5 | 11.5 | 11.5 | 1074-1A | closed | above | 11.5 | 11.5 | 11.5 | 11.5 |
| | | | | | | | | | | open | below | 10.0 | 10 | 10 | 10 | | open | below | 10.0 | 10 | 10 | 10 |
| 52 | 1230 E. 4th St, | 1074 | WMP2019_RE00005_WELL52 | 519 | H15WE107_WELL_52 | WELL_52 | 2279 | 672.1 | 1074-1A | MANUALLY OFF | | | | | | 1074-1A | MANUALLY OFF | | | | | |
| **Zone 1212** | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 9600 S. Milliken Ave. | 1212 | N.A. | N.A. | N.A. | N.A. | - | - | 1212-3 | Standy Wells | | | | | | 1212-3 | Standy Wells | | | | | |
| 27 | 4300 E. Jurupa St. | 1212 | N.A. | N.A. | N.A. | N.A. | - | - | 1212-3 | Standy Wells | | | | | | 1212-3 | Standy Wells | | | | | |
| 24 | 700 N. Haven Ave. | 1212 | WMP2019_RE00010_WELL24 | 618 | I21WE100_WELL_24 | WELL_24 | 1907 | 599.4 | 1212-3 | closed | above | 20.5 | 20.5 | 17.2 | 17.3 | 1212-3 | closed | above | 20.0 | 20.0 | 17.2 | 17.2 |
| | | | | | | | | | | open | below | 19.5 | 19.5 | 16.0 | 16.0 | | open | below | 19.0 | 19.0 | 16.0 | 16.0 |
| 29 | 2400 E. Airport Dr. | 1212 | WMP2019_RE00012_WELL29 | 572 | J18WE100_WELL_29 | WELL_29 | 2147 | 657.1 | 1212-3 | Manually Off | | | | | | 1212-3 | Manually On | | | | | |
| 30 | 220 S. Wineville Ave. | 1212 | WMP2019_RE00016_WELL30 | 622 | K24WE100_WELL_30 | WELL_30 | 2063 | 596.5 | 1212-1 | closed | above | 21.0 | 21.0 | 17.0 | 17.5 | 1212-3 | closed | above | 20.3 | 20.3 | 18.6 | 17.5 |
| | | | | | | | | | | open | below | 20.0 | 20.0 | 16.5 | 16.5 | | open | below | 19.3 | 19.3 | 17.6 | 16.5 |
| 31 | 5719 E. Santa Ana St, | 1212 | WMP2019_RE00017_WELL31 | 619 | L25WE100_WELL_31 | WELL_31 | 2866 | 605.7 | 1212-3 | Manually Off | | | | | | 1212-3 | Manually Off | | | | | |
| 37 | 4327 E. Guasti | 1212 | WMP2019_RE00013_WELL37 | 616 | J22WE100_WELL_37 | WELL_37 | 3074 | 600.7 | 1212-3 | closed | above | 21.5 | 21.5 | 18.0 | 18.0 | 1212-3 | closed | above | 20.8 | 20.8 | 19.5 | 19.5 |
| | | | | | | | | | | open | below | 20.5 | 20.5 | 17.0 | 17.0 | | open | below | 19.8 | 19.8 | 18.5 | 18.5 |
| 38 | 837 N. Center | 1212 | WMP2019_RE00006_WELL38 | 600 | H20WE100_WELL_38 | WELL_38 | 2427 | 662.8 | 1212-3 | closed | above | 21.2 | 21.2 | 17.8 | 17.8 | 1212-3 | closed | above | 20.6 | 20.6 | 18.8 | 17.8 |
| | | | | | | | | | | open | below | 20.2 | 20.2 | 16.8 | 16.8 | | open | below | 19.6 | 19.6 | 17.8 | 16.8 |
| 41 | 1252 North Hellman Ave. | 1212 | WMP2019_RE00003_WELL41 | 595 | G18WE100_WELL_41 | WELL_41 | 2143 | 703 | 1212-3 | Manually On | | | | | | 1212-3 | Manually On | | | | | |
| 47 | 4255 E. Concours St. | 1212 | WMP2019_RE00007_WELL47 | 586 | H22WE100_WELL_47 | WELL_47 | 3358 | 631.8 | 1212-3 | Manually On | | | | | | 1212-3 | closed | above | 21.0 | 21 | 21 | 21 |
| | | | | | | | | | | | | | | | | | open | below | 20.0 | 20 | 20 | 20 |
| **Zone 1348** | | | | | | | | | | | | | | | | | | | | | | |
| 46 | 1670 W. 8th St. | 1348 | WMP2019_RE00002_WELL46 | 567 | E16WE100_WELL_46 | WELL_46 | 2471 | 847.4 | 1348-1A | closed | above | 15.5 | 15.5 | 15.5 | 16 | 1348-1A | closed | above | 18 | 18 | 18 | 18 |
| | | | | | | | | | | open | below | 14.5 | 14.5 | 13.5 | 13.5 | | open | below | 17 | 17 | 17 | 17 |

*[1]ADD Off Peak time is from 8:15 am to 3:30 pm*
*[2]ADD Mid Peak time is from 9:15 pm to 8:15 am*
*[3]ADD Peak time is from 3:30 pm to 9:15 pm*
*[4]ADD Super Peak time is not used for low use periods.*
*[5]MDD Off Peak time is not used for high use periods*
*[6]MDD Mid Peak time is from 9:15 pm to 3:30 pm*
*[7]MDD Peak time is not used for high use periods*
*[8]MDD Super Peak time is from 3:30 pm to 9:15 pm*

## Table 8-3
## Future Well Operational Settings

| Well Number | Location | Pressure Zone | Model Reservoir ID | Groundwater Pumping Elevation (ft) | Model Pump ID | Model Pump Curve ID | Capacity (gpm) | TDH (ft) | ADD Operational Settings | | | | | | | MDD Operational Settings | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Reference Reservoir | Action | If Reference Reservoir is | [1]Level (Off Peak) | [2]Level (Mid Peak) | [3]Level (Peak) | [4]Level (Super Peak) | Reference Reservoir | Action | If Reference Reservoir is | [1]Level (Off Peak) | [2]Level (Mid Peak) | [3]Level (Peak) | [4]Level (Super Peak) |
| **Zone 925** | | | | | | | | | | | | | | | | | | | | | | |
| 49 | 1495 S. Dupont Ave. | 925 | WMP2019_RE00020_WELL49 | 586 | M22WE101_WELL_49 | WELL_49 | 2,545 | 341.1 | 925-2A | closed | above | 25.0 | 25.0 | 18.0 | 18.0 | 925-2A | closed | above | 27 | 27 | 18 | 18 |
| | | | | | | | | | | open | below | 21.0 | 21.0 | 16.0 | 16.0 | | open | below | 25.5 | 25.5 | 16 | 16 |
| 48 Future | 3595 W. Jurupa St. | 925 | WMP2019_FUTRE00002_WELL_48 | 635 | WMP2019_FUTWE00003_WELL_48 | Design Point | 2,500 | Future | 925-2A | closed | above | 25.2 | 25.2 | 18.2 | 18.2 | 925-2A | closed | above | 27.2 | 27.2 | 18.2 | 18.2 |
| | | | | | | | | | | open | below | 21.2 | 21.2 | 16.2 | 16.2 | | open | below | 25.7 | 25.7 | 16.2 | 16.2 |
| 51 Future | 600 N. Doubleday Ave. | 925 | WMP2019_FUTRE00005_WELL_51 | 579 | WMP2019_FUTWE00005_WELL_51 | Design Point | 2,500 | Future | 925-2A | closed | above | 25.4 | 25.4 | 18.4 | 18.4 | 925-2A | closed | above | 27.4 | 27.4 | 18.4 | 18.4 |
| | | | | | | | | | | open | below | 21.4 | 21.4 | 16.4 | 16.4 | | open | below | 25.9 | 25.9 | 16.4 | 16.4 |
| 54 Future | Jurupa and Dupont | 925 | WMP2019_FUTRE0004_WELL_54 | 625 | WMP2019_FUTWE00004_WELL_54 | Design Point | 2,000 | Future | 925-2A | closed | above | 25.6 | 25.6 | 18.6 | 18.6 | 925-2A | closed | above | 27.6 | 27.6 | 18.6 | 18.6 |
| | | | | | | | | | | open | below | 21.6 | 21.6 | 16.6 | 16.6 | | open | below | 26.1 | 26.1 | 16.6 | 16.6 |
| 55 Future | Francis and Bon View | 925 | WMP2019_FUTRE0009_WELL_55 | 625 | WMP2019_FUTWE00009_WELL_55 | Design Point | 2,500 | Future | 925-1A | closed | above | 17.0 | 17.0 | 15.0 | 15.0 | 925-1A | closed | above | 17.0 | 17.0 | 15.0 | 15.0 |
| | | | | | | | | | | open | below | 12.0 | 12.0 | 13.0 | 13.0 | | open | below | 12.0 | 12.0 | 13.0 | 13.0 |
| 56 Future | Belmont, east of Camput | 925 | WMP2019_FUTRE00007_WELL_56 | 625 | WMP2019_FUTWE00007_WELL_56 | Design Point | 2,500 | Future | 925-1A | closed | above | 17.2 | 17.2 | 15.2 | 15.2 | 925-1A | closed | above | 17.2 | 17.2 | 15.2 | 15.2 |
| | | | | | | | | | | open | below | 12.2 | 12.2 | 13.2 | 13.2 | | open | below | 12.2 | 12.2 | 13.2 | 13.2 |
| 57 Future | Grove and Locust | 925 | WMP2019_FUTRE00011_WELL_57 | 625 | WMP2019_FUTWE00011_WELL_57 | Design Point | 2,500 | Future | 925-1A | closed | above | 17.4 | 17.4 | 15.4 | 15.4 | 925-1A | closed | above | 17.4 | 17.4 | 15.4 | 15.4 |
| | | | | | | | | | | open | below | 12.4 | 12.4 | 13.4 | 13.4 | | open | below | 12.4 | 12.4 | 13.4 | 13.4 |
| 58 Future | Cucamonga, south of Acacia | 925 | WMP2019_FUTRE00010_WELL_58 | 625 | WMP2019_FUTWE00010_WELL_58 | Design Point | 2,500 | Future | 925-1A | closed | above | 17.6 | 17.6 | 15.6 | 15.6 | 925-1A | closed | above | 17.6 | 17.6 | 15.6 | 15.6 |
| | | | | | | | | | | open | below | 12.6 | 12.6 | 13.6 | 13.6 | | open | below | 12.6 | 12.6 | 13.6 | 13.6 |
| **Zone 1010** | | | | | | | | | | | | | | | | | | | | | | |
| 34 | 1425 S. Bon View Ave. | 1010 | WMP2019_RE00018_WELL34 | 522 | M14WE101_WELL_34 | WELL_34 | 2,074 | - | 1010-1A | Inactive | | | | | | 1010-1A | Inactive | | | | | |
| 37 | 4327 E. Guasti | 1010 | WMP2019_RE00013_WELL37 | 616 | J22WE100_WELL_37 | Design Point | 3,200 | 600.7 | 1010-2A | closed | above | 28.5 | 28.5 | 28.5 | 12.0 | 1010-2A | closed | above | 26.5 | 26.5 | 26.5 | 12.0 |
| | | | | | | | | | | open | below | 24.0 | 24.0 | 24.0 | 9.0 | | open | below | 24.0 | 24.0 | 24.0 | 9.0 |
| 39 | 4397 Guasti Ave. | 1010 | WMP2019_RE00014_WELL39 | 621 | J23WE100_WELL_39 | WELL_39 | 2,200 | 406.1 | 1010-2A | closed | above | 28.5 | 28.5 | 28.5 | 12.0 | 1010-2A | closed | above | 26.5 | 26.5 | 26.5 | 12.0 |
| | | | | | | | | | | open | below | 24.0 | 24.0 | 24.0 | 9.0 | | open | below | 24.0 | 24.0 | 24.0 | 9.0 |
| 50 | 3900 W. Riverside Dr. | 1010 | WMP2019_FUTRE00001_WELL_50 | 625 | R22WE100_WELL_50 | Design Point | 2,200 | 475 | 1010-1A | closed | above | 27.0 | 27 | 27 | 27 | 1010-1A | closed | above | 27.0 | 27 | 27 | 27 |
| | | | | | | | | | | open | below | 25.0 | 25 | 25 | 25 | | open | below | 25.0 | 25 | 25 | 25 |
| **Zone 1074** | | | | | | | | | | | | | | | | | | | | | | |
| 35 | 652 E. Main St. | 1074 | WMP2019_RE00015_WELL35 | 562 | K14WE100_WELL_35 | WELL_35 | 2,568 | 548.1 | 1074-1A | closed | above | 12.0 | 12 | 12 | 12 | 1074-1A | closed | above | 12.0 | 12 | 12 | 12 |
| | | | | | | | | | | open | below | 10.5 | 10.5 | 10.5 | 10.5 | | open | below | 10.5 | 10.5 | 10.5 | 10.5 |
| 36 | 1400 S. Archibald Ave. | 1074 | WMP2019_RE00019_WELL36 | 561 | M19WE100_WELL_36 | WELL_36 | 1,672 | 532 | 1074-1A | closed | above | 11.0 | 11 | 11 | 11 | 1074-1A | closed | above | 11.0 | 11 | 11 | 11 |
| | | | | | | | | | | open | below | 9.5 | 9.5 | 9.5 | 9.5 | | open | below | 9.5 | 9.5 | 9.5 | 9.5 |
| 40 | 1335 East Holt Bl. | 1074 | WMP2019_RE00011_WELL40 | 582 | J16WE100_WELL_40 | WELL_40 | 2,024 | 503.3 | 1074-1A | Manually Off | | | | | | 1074-1A | Manually On | | | | | |
| 44 | 964 Cucamonga Ave. | 1074 | WMP2019_RE00004_WELL44 | 558 | H15WE106_WELL_44 | WELL_44 | 2,471 | 644.2 | 1074-1A | Manually On | | | | | | 1074-1A | Manually On | | | | | |
| 45 | 665 N .Campus Ave. | 1074 | WMP2019_RE00008_WELL45 | 587 | I14WE100_WELL_45 | WELL_45 | 2,589 | 515.6 | 1074-1A | closed | above | 11.5 | 11.5 | 11.5 | 11.5 | 1074-1A | closed | above | 11.5 | 11.5 | 11.5 | 11.5 |
| | | | | | | | | | | open | below | 10.0 | 10 | 10 | 10 | | open | below | 10.0 | 10 | 10 | 10 |
| 52 | 1230 E. 4th St, | 1074 | WMP2019_RE00005_WELL52 | 519 | H15WE107_WELL_52 | WELL_52 | 2,279 | 672.1 | 1074-1A | Manually Off | | | | | | 1074-1A | Manually Off | | | | | |
| **Zone 1212** | | | | | | | | | | | | | | | | | | | | | | |
| 20 | 9600 S. Milliken Ave. | 1212 | N.A. | N.A. | N.A. | N.A. | - | - | 1212-3 | Standby | | | | | | 1212-3 | Standby | | | | | |
| 27 | 4300 E. Jurupa St. | 1212 | N.A. | N.A. | N.A. | N.A. | - | - | 1212-3 | Standby | | | | | | 1212-3 | Standby | | | | | |
| 24 | 700 N. Haven Ave. | 1212 | WMP2019_RE00010_WELL24 | 618 | I21WE100_WELL_24 | WELL_24 | 1,907 | 599.4 | 1212-3 | closed | above | 20.5 | 20.5 | 17.2 | 17.3 | 1212-3 | closed | above | 20.0 | 20.0 | 17.2 | 17.2 |
| | | | | | | | | | | open | below | 19.5 | 19.5 | 16.0 | 16.0 | | open | below | 19.0 | 19.0 | 16.0 | 16.0 |
| 29 | 2400 E. Airport Dr. | 1212 | WMP2019_RE00012_WELL29 | 572 | J18WE100_WELL_29 | WELL_29 | 2,147 | 657.1 | 1212-3 | Manually Off | | | | | | 1212-3 | Manually On | | | | | |
| 30 | 220 S. Wineville Ave. | 1212 | WMP2019_RE00016_WELL30 | 622 | K24WE100_WELL_30 | WELL_30 | 2,063 | 596.5 | 1212-3 | closed | above | 21.0 | 21.0 | 17.0 | 17.5 | 1212-3 | closed | above | 20.3 | 20.3 | 18.6 | 17.5 |
| | | | | | | | | | | open | below | 20.0 | 20.0 | 16.5 | 16.5 | | open | below | 19.3 | 19.3 | 17.6 | 16.5 |
| 31 | 5719 E. Santa Ana St, | 1212 | WMP2019_RE00017_WELL31 | 619 | L25WE100_WELL_31 | WELL_31 | 2,866 | 605.7 | 1212-3 | closed | above | 21.3 | 21.3 | 18.0 | 18.0 | 1212-3 | closed | above | 20.8 | 20.8 | 19.0 | 18.0 |
| | | | | | | | | | | open | below | 20.3 | 20.3 | 17.0 | 17.0 | | open | below | 19.8 | 19.8 | 18.0 | 17.0 |
| 38 | 837 N. Center | 1212 | WMP2019_RE00006_WELL38 | 600 | H20WE100_WELL_38 | WELL_38 | 2,427 | 662.8 | 1212-3 | closed | above | 21.2 | 21.2 | 17.8 | 17.8 | 1212-3 | closed | above | 20.6 | 20.6 | 18.8 | 17.8 |
| | | | | | | | | | | open | below | 20.2 | 20.2 | 16.8 | 16.8 | | open | below | 19.6 | 19.6 | 17.8 | 16.8 |
| 41 | 1252 North Hellman Ave. | 1212 | WMP2019_RE00003_WELL41 | 595 | G18WE100_WELL_41 | WELL_41 | 2,143 | 703 | 1212-3 | Manually On | | | | | | 1212-3 | Manually On | | | | | |
| 47 | 4255 E. Concours St. | 1212 | WMP2019_RE00007_WELL47 | 586 | H22WE100_WELL_47 | WELL_47 | 3,358 | 631.8 | 1212-3 | Manually On | | | | | | 1212-3 | Manually On | | | | | |
| 42 Future | 4100 E. Inland Empire Blvd. | 1212 | WMP2019_FUTRE00002_WELL_42 | 650 | WMP2019_FUTWE00001_WELL_42 | Design Point | 2,500 | Future | 1212-3 | closed | above | 20.7 | 20.7 | 17.5 | 17.5 | 1212-3 | closed | above | 20.2 | 20.2 | 17.4 | 17.4 |
| | | | | | | | | | | open | below | 19.7 | 19.7 | 16.2 | 16.2 | | open | below | 19.2 | 19.2 | 16.2 | 16.2 |
| 43 Future | 3650 E. Airport Drive | 1212 | WMP2019_FUTRE00002_WELL_43 | 579 | WMP2019_FUTWE00002_WELL_43 | Design Point | 2,700 | Future | 1212-3 | closed | above | 20.5 | 20.5 | 17.2 | 17.3 | 1212-3 | closed | above | 20.0 | 20.0 | 17.2 | 17.2 |
| | | | | | | | | | | open | below | 19.5 | 19.5 | 16.0 | 16.0 | | open | below | 19.0 | 19.0 | 16.0 | 16.0 |
| **Zone 1348** | | | | | | | | | | | | | | | | | | | | | | |
| 46 | 1670 W. 8th St. | 1348 | WMP2019_RE00002_WELL46 | 567 | E16WE100_WELL_46 | WELL_46 | 2,471 | 847.4 | 1348-1A | closed | above | 15.5 | 15.5 | 15.5 | 16 | 1348-1A | closed | above | 18 | 18 | 18 | 18 |
| | | | | | | | | | | open | below | 14.5 | 14.5 | 13.5 | 13.5 | | open | below | 17 | 17 | 17 | 17 |

*[1]ADD Off Peak time is from 8:15 am to 3:30 pm*
*[2]ADD Mid Peak time is from 9:15 pm to 8:15 am*
*[3]ADD Peak time is from 3:30 pm to 9:15 pm*
*[4]ADD Super Peak time is not used for low use periods.*
*[5]MDD Off Peak time is not used for high use periods*
*[6]MDD Mid Peak time is from 9:15 pm to 3:30 pm*
*[7]MDD Peak time is not used for high use periods*
*[8]MDD Super Peak time is from 3:30 pm to 9:15 pm*

**Table 8-4**
**Imported Water Connection Operational Settings**

| ID | To Zone | Location | Model ID | Existing | | Future | |
|---|---|---|---|---|---|---|---|
| | | | | ADD Scenario (gpm) | MDD Scenario (gpm) | ADD Scenario (gpm) | MDD Scenario (gpm) |
| CDA I[1] | 1010 | Intersection of Archibald Ave and extension of Schaefer St | WMP2019_VL00009_CDA_1 | 0 | 0 | 0 | 0 |
| CDA II - Lat A[2] | 925 | Intersection of Philadelphia St and Milliken Ave | WMP2019_VL00006_CDA_2_LAT_A | 0 | 0 | 0 | 0 |
| CDA II - Lat B[2] | 1010 | Intersection of Philadelphia St and Milliken Ave | WMP2019_VL00005_CDA_2_LAT_B | 0 | 0 | 0 | 0 |
| CDA II - Lat C[2] | 925 | Intersection of Riverside Dr and Milliken Ave | WMP2019_VL00007_CDA_2_LAT_C | 1,000 | 1,200 | 1,000 | 1,000 |
| CDA II - Lat D[2] | 1010 | Intersection of Riverside Dr and Milliken Ave | WMP2019_VL00008_CDA_2_LAT_D | 4,500 | 4,500 | 4,500 | 4,500 |
| WFA Turnout 1 | 1212 | Northwest corner of Eighth St and Fern Ave (adjacent Reservoir 1212-1A and 1212-1B) | E12PR101_WFA_1 | 0 | 2,000 | 0 | 4,500 |
| WFA Turnout 2[3] | 1348 | Southeast corner of Campus Ave and A St (adjacent Reservoir 1212-3) | WMP2019_VL00001_WFA_2 | 2,000 | 6,000 | 2,000 | 6,200 |
| WFA Turnout 2A[3] | 1212 | | E14PR101_WFA_2A | 0 | 5,000 | 0 | 2,800 |

[1] *CDA I is the Chino Basin Desalter Facility No. 1*

[2] *CDA II is the Chino Basin Desalter Facility No. 2*

[3] *WFA2 is upstream of WFA2*

## 8-8 Reservoirs

All active reservoirs are included in the hydraulic model. The reservoirs are designated as “tanks” because they have a known finite volume and water surface levels that change with time as water flows into or out of them. (Note the model software defines “reservoirs” as sources of water that remain at a constant water level irrespective of the flow. They have an unlimited volume and are generally used to represent a lake or other inexhaustible supply source.)

The initial reservoir levels for the ADD and MDD scenarios for the existing and future models are summarized in Tables 8-5 and 8-6, respectively.

## 8-9 Booster Pumps

Tables 8-7 and 8-8 describes the existing and future operation control settings of the booster pumps, respectively. The ADD and MDD operational settings were determined after meeting with the City’s Operations staff and review of existing SCADA data.

## Table 8-5

## Existing Model Tank Summary

| Pressure Zone | Reservoir Name | Existing Model Tank ID | Bottom Elevation (ft) | Model Tank Type | Model Tank Diameter (ft) | Model Volume to Depth Curve ID | Model Tank Min. Level (ft) | Model Tank Max. Level (ft) | Existing ADD Initial Tank Level (ft) | Existing MDD Initial Tank Level (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 925 | Reservoir 925-2A | M22RS101_925_2A | 893.0 | 0: Cylindrical | 188 | | 5.0 | 32.0 | 26.0 | 26.0 |
| 1010 | Reservoir 1010-1 | K14RS101_1010_1 | 979.3 | 0: Cylindrical | 178 | | 5.0 | 30.0 | 20.2 | 20.2 |
| 1010 | Reservoir 1010-2A | J23RS101_1010_2A | 980.0 | 0: Cylindrical | 226 | | 5.0 | 30.0 | 25.5 | 25.5 |
| 1010 | Reservoir 1010-2B | J22RS101_1010_2B | 980.0 | 0: Cylindrical | 226 | | 5.0 | 30.0 | 25.5 | 25.5 |
| 1074 | Reservoir 1074-1A | H15RS103_1074_EQ | | | | 1074_RES_E | | | | |
| 1074 | Reservoir 1074-1B | UIV_TANK | 1054.4 | 1: Variable Area | 0 | QUIV_TANKS | 5.0 | 20.4 | 11.5 | 11.5 |
| 1212 | Reservoir 1212-1A | E12RS102_1212_1A | 1188.0 | 1: Variable Area | 0 | 1212_RES_4 | 5.0 | 26.0 | 20.5 | 17.8 |
| 1212 | Reservoir 1212-1B | E12RS101_1212_1B | 1202.0 | 1: Variable Area | 0 | 1212_RES_5 | 2.0 | 11.5 | 7.0 | 3.8 |
| 1212 | Reservoir 1212-3 | E14RS101_1212_3 | 1189.0 | 1: Variable Area | 0 | 1212_RES_7 | 5.0 | 24.3 | 23.0 | 23.0 |
| 1348 | Reservoir 1348-1A | | | | | | | | | |
| 1348 | Reservoir 1348-1B | B14RS104_EQUIV_T | | | | 1348_RES_E | | | | |
| 1348 | Reservoir 1348-1C | ANK_1348 | 1328.3 | 1: Variable Area | 0 | QUIVALENT | 5.0 | 20.6 | 15.0 | 17.2 |

## Table 8-6

## Future Model Tank Summary

| Pressure Zone | Reservoir Name | Existing Model Tank ID | Bottom Elevation (ft) | Model Tank Type | Model Tank Diameter (ft) | Model Volume to Depth Curve ID | Model Tank Min. Level (ft) | Model Tank Max. Level (ft) | Future ADD Initial Tank Level (ft) | Future MDD Initial Tank Level (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 925 | Reservoir 925-1A | 004_RES_925_1A_1 | | | | | | | | |
| 925 | Reservoir 925-1B | B | 905.0 | 0: Cylindrical | 391.4 | | 5.0 | 20.0 | 6.3 | 6.3 |
| 925 | Reservoir 925-2A | 001_RES_925_2A_2 | | | | | | | | |
| 925 | Reservoir 925-2B | B | 893.0 | 0: Cylindrical | 252.7 | | 5.0 | 32.0 | 21.3 | 21.3 |
| 1010 | Reservoir 1010-1 | K14RS101_1010_1 | 979.3 | 0: Cylindrical | 178.0 | | 5.0 | 30.0 | 20.2 | 20.2 |
| 1010 | Reservoir 1010-2A | J23RS101_1010_2A | 980.0 | 0: Cylindrical | 226.0 | | 5.0 | 30.0 | 25.5 | 25.5 |
| 1010 | Reservoir 1010-2B | J22RS101_1010_2B | 980.0 | 0: Cylindrical | 226.0 | | 5.0 | 30.0 | 25.5 | 25.5 |
| 1074 | Reservoir 1074-1A | H15RS103_1074_EQ | | | | 1074_RES_E | | | | |
| 1074 | Reservoir 1074-1B | UIV_TANK | 1,054.4 | 1: Variable Area | 0.0 | QUIV_TANKS | 5.0 | 20.4 | 11.5 | 11.5 |
| 1212 | Reservoir 1212-1A | E12RS102_1212_1A | 1,188.0 | 1: Variable Area | 0.0 | 1212_RES_4 | 5.0 | 26.0 | 20.5 | 20.5 |
| 1212 | Reservoir 1212-1B | E12RS101_1212_1B | 1,202.0 | 1: Variable Area | 0.0 | 1212_RES_5 | 2.0 | 11.5 | 7.0 | 7.0 |
| 1212 | Reservoir 1212-3 | E14RS101_1212_3 | 1,189.0 | 1: Variable Area | 0.0 | 1212_RES_7 | 5.0 | 24.3 | 23.0 | 23.0 |
| 1212 | Reservoir 1212-4A | WMP2019_FUTTA00 | | | | | | | | |
| 1212 | Reservoir 1212-4B | 001_RES_1212_4A_ | 1,188.0 | 0: Cylindrical | 336.9 | | 0.0 | 24.0 | 16.8 | 16.8 |
| 1348 | Reservoir 1348-1A | | 1,328.3 | 1: Variable Area | 0.0 | 1348_RES_E QUIVALENT | 5.0 | | | |
| 1348 | Reservoir 1348-1B | B14RS104_EQUIV_T | | | | | | | | |
| 1348 | Reservoir 1348-1C | ANK_1348 | | | | | | 20.6 | 15.0 | 15.0 |

**Table 8-7**

**Pump Station Operational Settings Summary**

| Booster Pump | Model Pump ID | Model Pump Curve | ADD settings (Existing and Future) | | | | | | | MDD settings (Existing and Future) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reference Reservoir | Action | If Reference Reservoir is | [1]Level (Off Peak) | [2]Level (Mid Peak) | [3]Level (Peak) | [4]Level (Super Peak) | Reference Reservoir | Action | If Reference Reservoir is | [1]Level (Off Peak) | [2]Level (Mid Peak) | [3]Level (Peak) | [4]Level (Super Peak) |
| Galvin 1074-1 | H15BP102_GALVIN_1212_1 | GALVIN_BPS_P1_1A | 1074-1A | closed | below | 11.2 | 11.2 | 11.2 | 11.2 | 1074-1A | closed | below | 11.2 | 11.2 | 11.2 | 11.2 |
| | | | | open | above | 12.8 | 12.8 | 12.8 | 12.8 | | open | above | 12.8 | 12.8 | 12.8 | 12.8 |
| Galvin 1074-2 | H15BP103_GALVIN_1212_2 | GALVIN_BPS_P2_1B | 1074-1A | closed | below | 12.0 | 12.0 | 12.0 | 12.0 | 1074-1A | closed | below | 12.0 | 12.0 | 12.0 | 12.0 |
| | | | | open | above | 13.5 | 13.5 | 13.5 | 13.5 | | open | above | 13.5 | 13.5 | 13.5 | 13.5 |
| Galvin 1074-3 | H15BP104_GALVIN_1212_3 | Design Point | 1074-1A | closed | below | 11.5 | 11.5 | 11.5 | 11.5 | 1074-1A | closed | below | 11.5 | 11.5 | 11.5 | 11.5 |
| | | | | open | above | 13.0 | 13.0 | 13.0 | 13.0 | | open | above | 13.0 | 13.0 | 13.0 | 13.0 |
| Galvin 1348-4 | H15BP101_GALVIN_1348_4 | GALVIN_BPS_P4_2 | 1074-1A | closed | below | 11.8 | 11.8 | 11.8 | 11.8 | 1074-1A | closed | below | 11.8 | 11.8 | 11.8 | 11.8 |
| | | | | open | above | 13.2 | 13.2 | 13.2 | 13.2 | | open | above | 13.2 | 13.2 | 13.2 | 13.2 |
| Booster 1348-3 | E14BP101_BOOSTER_1348_3 | Design Point | 1348-1A | closed | above | 15.0 | 15.0 | 15.0 | 15.5 | 1348-1A | closed | above | 15.0 | 15.0 | 15.0 | 15.5 |
| | | | | open | below | 14.0 | 14.0 | 13.0 | 13.0 | | open | below | 14.0 | 14.0 | 13.0 | 13.0 |
| Booster 1348-4 | E14BP102_BOOSTER_1348_4 | BOOSTER_1348_4 | 1348-1A | closed | above | 12.5 | 12.5 | 12.5 | 12.5 | 1348-1A | closed | above | 12.5 | 12.5 | 12.5 | 12.5 |
| | | | | open | below | 10.5 | 10.5 | 10.5 | 10.5 | | open | below | 10.5 | 10.5 | 10.5 | 10.5 |
| Booster 1348-1 | F13BP101A_BOOSTER_1348_1 | Design Point | 1348-1A | closed | above | 15.5 | 15.5 | 15.5 | 16.0 | 1348-1A | closed | above | 15.5 | 15.5 | 15.5 | 16.0 |
| | | | | open | below | 14.5 | 14.5 | 13.5 | 12.5 | | open | below | 14.5 | 14.5 | 13.5 | 13.5 |
| Booster 1348-2 | F13BP101B_BOOSTER_1348_2 | Design Point | 1348-1A | closed | above | 14.5 | 14.5 | 14.5 | 14.5 | 1348-1A | closed | above | 14.5 | 14.5 | 14.5 | 14.5 |
| | | | | open | below | 13.5 | 13.5 | 12.5 | 12.5 | | open | below | 13.5 | 13.5 | 12.5 | 12.5 |
| Ontario Booster Pump 1 | M22BP100_ONTARIO_1212_1 | ONTARIO_BPS_P1 | 925-2A | closed | below | 25.5 | 25.5 | 25.5 | 25.5 | 925-2A | closed | below | 27.0 | 27.0 | 27.0 | 27.0 |
| | | | | open | above | 26.5 | 26.5 | 26.5 | 26.5 | | open | above | 28.0 | 28.0 | 28.0 | 28.0 |
| Ontario Booster Pump 2 | M22BP102_ONTARIO_1212_2 | ONTARIO_BPS_P2 | 925-2A | closed | below | 26.0 | 26.0 | 26.0 | 26.0 | 925-2A | closed | below | 26.5 | 26.5 | 26.5 | 26.5 |
| | | | | open | above | 27.0 | 27.0 | 27.0 | 27.0 | | open | above | 27.5 | 27.5 | 27.5 | 27.5 |
| Ontario Booster Pump 3 | M22BP101_ONTARIO_1212_3 | ONTARIO_BPS_P3 | 925-2A | closed | below | 26.5 | 26.5 | 26.5 | 26.5 | 925-2A | closed | below | 27.5 | 27.5 | 27.5 | 27.5 |
| | | | | open | above | 27.5 | 27.5 | 27.5 | 27.5 | | open | above | 28.5 | 28.5 | 28.5 | 28.5 |
| Miliken Booster Pump 1 | WMP2019_BP00001_MILLIKAN_1212_1 | MILLIKEN_BPS_P1 | 1010-2A | closed | below | 27.0 | 27.0 | 27.0 | 27.0 | 1010-22A | closed | below | 27.0 | 27.0 | 27.0 | 27.0 |
| | | | | open | above | 28.0 | 28.0 | 28.0 | 28.0 | | open | above | 28.0 | 28.0 | 28.0 | 28.0 |
| Miliken Booster Pump 2 | WMP2019_BP00002_MILLIKAN_1212_2 | MILLIKEN_BPS_P2 | 1010-2A | closed | below | 26.0 | 26.0 | 26.0 | 26.0 | 1010-22A | closed | below | 26.0 | 26.0 | 26.0 | 26.0 |
| | | | | open | above | 27.0 | 27.0 | 27.0 | 27.0 | | open | above | 27.0 | 27.0 | 27.0 | 27.0 |
| Miliken Booster Pump 3 | WMP2019_BP00003_MILLIKAN_1212_3 | MILLIKEN_BPS_P3 | 1010-2A | closed | below | 26.5 | 26.5 | 26.5 | 26.5 | 1010-22A | closed | below | 26.5 | 26.5 | 26.5 | 26.5 |
| | | | | open | above | 27.5 | 27.5 | 27.5 | 27.5 | | open | above | 27.5 | 27.5 | 27.5 | 27.5 |
| Future PS 1010 | WMP2019_PS1010 | Design Point | 925 | closed | below | Backup | | | | 925 | closed | below | Backup | | | |
| | | | | open | above | Backup | | | | | open | above | Backup | | | |

*[1]ADD Off Peak time is from 8:15 am to 3:30 pm*
*[2]ADD Mid Peak time is from 9:15 pm to 8:15 am*
*[3]ADD Peak time is from 3:30 pm to 9:15 pm*
*[4]ADD Super Peak time is not used for low use periods.*
*[5]MDD Off Peak time is not used for high use periods*
*[6]MDD Mid Peak time is from 9:15 pm to 3:30 pm*
*[7]MDD Peak time is not used for high use periods*
*[8]MDD Super Peak time is from 3:30 pm to 9:15 pm*

## 8-10 Pressure Reducing Stations

The pressure reducing stations (PRS) are needed to increase pressure during peak hour demands, as well as to provide additional flow during an emergency fire flow event. The PRS controls settings were provided by the City's Operations staff and are summarized in Table 8-8.

The Innovyze InfoWater hydraulic model software has known difficulties modeling valves in parallel. Upon speaking with Innovyze technical support, it was recommended that one valve be modeled at each location representing a pressure reducing station. Therefore, the larger valve at each pressure reducing station was modeled with the highest pressure setting of that station.

**Table 8-8**

**Pressure Reducing Stations Summary Table**

| PRS ID | Model Valve ID | Status | US Zone | DS Zone | Model Elevation (ft) | Model Pressure Reducing Setting (psi) |
|---|---|---|---|---|---|---|
| 2 | P13PR102_PRV_2 | Existing | 1074' | 1010' | 840.0 | 62.0 |
| 3 | P15PR101_PRV_3 | Existing | 1074' | 1010' | 834.0 | 65.0 |
| 4 | P17PR103_PRV_4 | Existing | 1074' | 1010' | 838.0 | 64.0 |
| 5 | P19PR101_PRV_5 | Existing | 1074' | 1010' | 830.0 | 65.0 |
| 6 | M19PR101_PRV_6 | Existing | 1212' | 1074' | 893.0 | 65.0 |
| 7 | N22PR101_PRV_7 | Existing | 1212' | 1010' | 876.0 | 55.0 |
| 8 | N26PR101_PRV_8 | Existing | 1212' | 1010' | 878.0 | 55.0 |
| 10 | N20PR101_PRV_10 | Existing | 1212' | 1074' | 856.0 | 80.0 |
| 11 | M12PR101_PRV_11 | Existing | 1212' | 1074' | 918.0 | 52.0 |
| 12 | N21PR102_PRV_12 | Existing | 1212' | 1074' | 866.0 | 79.0 |
| 13 | N21PR101_PRV_13 | Existing | 1212' | 1010' | 866.0 | 60.0 |
| 15 | H12PR100_PRV_15 | Existing | 1348' | 1212' | 1094.0 | 35.0 |
| 16 | WMP2019_FUTVL00002_PRS_16 | Future | 1010' | 925' | 761.1 | 55.0 |
| 17 | U19PR100_PRV_17 | Existing | 1010' | 925' | 728.0 | 74.0 |
| 18 | R22PR100_PRV_18 | Existing | 1010' | 925' | 788.0 | 54.0 |
| 21 | M13PR100_PRV_21 | Existing | 1212' | 1074' | 930.0 | 53.0 |
| 23 | WMP2019_FUTVL00001_PRS_23 | Future | 1074' | 1010' | 834.0 | 55.0 |
| Future 1010 | WMP2019_VL00001_FUTURE1 | Future | 1074' | 1010' | 845.0 | 50.0 |

## 8-11 Altitude Valves

For master planning purposes, altitude valves refer to valves with flow control capabilities. These valves are set to open when downstream reservoir levels lower passed the flow control operational set point, which will allow water to pass the upstream zones to downstream zones.

The altitude valve operational settings were provided by the City's Operations staff and are summarized in Table 8-8.

**Table 8-9**

**Altitude Valve Operational Settings Summary**

| ID | Model ID | Reference Reservoir | Level Setting (ft) | Existing and Future | |
|---|---|---|---|---|---|
| | | | | ADD Flow Setting (gpm) | MDD Flow Setting (gpm) |
| AV-1010-2 | WMP2019_VL00003_ALT_1212_1010 | Reservoir 1010-2A | Open < 22 ft | 3,000 | 3,000 |
| | | | Closed > 24 ft | | |
| AV-1010-1 | WMP2019_VL00004_ALT_1074_1010 | Reservoir 1010-1 | Open < 20 ft | 2,000 | 3,000 |
| | | | Closed > 22 ft | | |
| AV-1074-1 | WMP2019_VL00002_ALT_1212_1074 | Reservoir 1074-1A | Open < 7 ft | 2,500 | 3,500 |
| | | | Closed > 9 ft | | |
| AV-925-2 | M22PR100_ALT_1212_925 | Reservoir 925-2A | Open < 19 ft | 2000 | 2000 |
| | | | Close > 20.5 | | |

## 8-12 Pipes

The friction factors established in the 2012 Water Master Plan was utilized in the hydraulic model for this study as well. The friction factors used are shown in Table 8-10.

**Table 8-10**

**C-factors used in the Model**

| Diameter | AC Pipes | PVC Pipes | Mortar Lined Pipes | Steel/ Cast Iron Pipes (before 1950) | Steel/ Cast Iron Pipes (after 1950) |
|---|---|---|---|---|---|
| <= 4-inch | 125 | 135 | 110 | 80 | 110 |
| 6-inch | 125 | 135 | 110 | 80 | 110 |
| 8-10 inch | 125 | 135 | 110 | 80 | 110 |
| 12-16 inch | 130 | 140 | 115 | 90 | 115 |
| 16-20 inch | 130 | 140 | 115 | 90 | 115 |
| 20-24 inch | 130 | 140 | 115 | 90 | 115 |
| 24-30 inch | 140 | 150 | 120 | 100 | 120 |
| 30-36 inch | 140 | 150 | 120 | 100 | 120 |

# SECTION 9

# MODEL CALIBRATION

## 9-1 General

The general calibration methodology was to gather as much system information as possible from either available SCADA information and pressure measuring equipment temporarily installed in the field. This information was then used for input into the model as well as for comparison of model results. The calibration process was used to verify the accuracy of the model, system configuration, and the hydraulic parameters utilized. Typical indicators of an accurate model include the following:

- Pressure differences of 5 percent or less
- Pressure reducing station flow differences of 5 percent or less (if flow information is available)
- Booster pump station flow differences of 5 percent or less
- Well flow differences of 5 percent or less
- Reservoir level differences of about 1 foot or less

## 9-2 SCADA Data Collection

SCADA data was collected from April 8, 2019 to April 22, 2019 and used in calibrating the 24-hour extended period simulation. The data was recorded in 5-minute intervals. Based on the data gathered, a time period was selected where the information gathered indicated flow and pressures without noticeable anomalies and/or significant variation. The selected calibration day was Thursday, April 18, 2019.

Supervisory Control and Data Acquisition (SCADA) Data

SCADA data collected generally included the following:

a. Reservoirs - level

b. Booster Pump Stations - flow at pump station, suction pressure, discharge pressure

c. Wells - flow, discharge pressure

d. Turnouts - flow

e. Flow Control Facilities - flow, upstream pressure, downstream pressure

## 9-3 Calibration Scenario

The existing water system model was calibrated to verify the accuracy of the model, system configuration, and the hydraulic parameters utilized.

**Demands**

Demand allocation for the calibration scenario was based on the distribution represented by the water billing data during the period April 2018 to May 2018. The model demands were then, globally adjusted to match the total average daily supply for each hydraulic pressure zone, during the calibration period.

The high-water user demands were excluded from the global adjustment because those demands and diurnal patterns were individually assigned to the appropriate model nodes. Then the diurnal patterns were assigned to the remaining demands, based on hydraulic pressure zone and meter type (residential and non-residential).

The total demand during the calibration period was 20,574 gpm, which was the daily production and purchase total for the selected calibration day (April 18, 2019).

**Reservoirs**

Initial reservoir levels were set to match those of calibration day (April 18, 2019 at 12 am), as shown in Table 9-1. Reservoirs 1074-1A and 1074-1B are located close to each other at Cucamonga Avenue and Fourth Street. The hydraulic model has difficulty modeling multiple reservoirs that are in close proximity to each other. The reservoir levels sporadically increase and decrease between each time step as the model tries to move

water between the storage facilities that are in close proximity to each other. For this reason, the 1074 Zone reservoirs are modeled as one equivalent sized tank. Likewise, Reservoirs 1348-1A, 1348-1B, and 1348-1C are modeled as one equivalent sized tank.

The City's operations staff identified that some of the reservoir level sensors are inaccurate. Per the City's operational staff recommendations, the SCADA level data information was adjusted as follows:

1. Reservoir 1010-2A level data was disregarded and instead assumed to be similar to that of Reservoir 1010-2B.
2. Reservoir 1074-1A and Reservoir 1074-1B level data was increased by 5 feet.
3. Reservoir 1212-1B level data was reduced by 14 feet.

**Turnouts**

The turnouts were modeled by utilizing a flow control valve and a flow pattern to simulate the volume of water entering the system on the calibration day per SCADA information. A summary of the turnout flows is detailed in Table 9-2.

**Wells**

The wells were operated by time controls per the calibration day SCADA information, as detailed in Table 9-3. The groundwater elevation at each well was calculated by subtracting the static ground water depth and the drawdown depth from the ground surface elevation. The static ground water levels were recorded at the time of the calibration effort. The drawdown levels were determined from the most recent efficiency tests.

**Altitude Valves**

The altitude valves were modeled utilizing a flow control valve and a flow pattern to simulate the volume of water through the facility on calibration day per SCADA information. A summary of the altitude valves for the calibration day are shown in Table 9-4.

**Pump Stations**

The booster pumps were operated by time controls per the calibration day SCADA information, as detailed in Table 9-5.

**Pressure Reducing Stations**

As discussed in Section 6, the larger pressure reducing valve at each station feeding a reduced zone was modeled with the highest pressure setting of that station. A summary of the pressure reducing stations for the calibration day are shown in Table 9-6.

**Table 9-1**

**Calibration Initial Reservoir Levels**

| Pressure Zone | Facility Name | Location | Model ID | Model Calibration | | |
|---|---|---|---|---|---|---|
| | | | | Bottom of Tank Elevation[1] | Initial Level (ft) | Initial HGL (ft) |
| 925 | Reservoir 925-2A | Northeast corner of Dupont Ave and Jurupa St | M22RS101_925_2A | 893.0 | 26.0 | 919.0 |
| 1010 | Reservoir 1010-1 | Southwest corner of Campus Ave and Main St | K14RS101_1010_1 | 979.3 | 20.2 | 999.6 |
| | Reservoir 1010-2A | Southeast corner of Milliken Ave and San Bernardino | J23RS101_1010_2A | 980.0 | 25.5 | 1,005.5 |
| | Reservoir 1010-2B | | J22RS101_1010_2B | 980.0 | 25.5 | 1,005.5 |
| 1074 | Reservoir 1074-1A | Southeast corner of Cucamonga Ave and Fourth | H15RS103_1074_EQUIV_TANK | 1,054.4 | 15.7 | 1,070.1 |
| | Reservoir 1074-1B | | | | | |
| 1212 | Reservoir 1212-1A | Southwest corner of Fern Ave and Euclid Pl | E12RS102_1212_1A | 1,187.5 | 20.0 | 1,207.5 |
| | Reservoir 1212-1B | | E12RS101_1212_1B | 1,202.3 | 6.0 | 1,208.3 |
| | Reservoir 1212-3 | East side of Campus Ave, north of 8th Street | E14RS101_1212_3 | 1,189.0 | 20.2 | 1,209.2 |
| 1348 | Reservoir 1348-1A | Southwest corner of Campus Ave and 13th St | B14RS104_EQUIV_TANK_1348 | 1,327.6 | 18.1 | 1,345.6 |
| | Reservoir 1348-1B | | | | | |
| | Reservoir 1348-1C | | | | | |

[1]*Bottom elevation was combined for equivalent reservoirs using lowest bottom elevation of target reservoirs*

**Table 9-2**

**Calibration Turnout Summary**

| ID | Source | Location | Model ID | Imported Water Connection Capacity (gpm)[3] | Model Calibration | |
|---|---|---|---|---|---|---|
| | | | | | 24-Hr Average Flowrate (gpm) | Model Flow Control Pattern |
| WFA Turnout 1 | WFA | Northwest corner of Eighth St and Fern Ave (adjacent Reservoir 1212-1A and 1212-1B) | E12PR101_WFA_1 | 10,417 | N.A. | Closed |
| WFA Turnout 2 | WFA | Southeast corner of Campus Ave and A St (adjacent Reservoir 1212-3) | WMP2019_VL00001_WFA_2 | | 1,869 | Pattern: CAL_WFA_2 |
| CDA I | CDA I[1] | Intersection of Archibald Ave and extension of Schaefer St | WMP2019_VL00009_CDA_1 | 5,278 | N.A. | Closed |
| CDA II - Lat A | CDA II[2] | Intersection of Philadelphia St and Milliken Ave | WMP2019_VL00006_CDA_2_LAT_A | | N.A. | Closed |
| CDA II - Lat B | CDA II[2] | Intersection of Philadelphia St and Milliken Ave | WMP2019_VL00005_CDA_2_LAT_B | | N.A. | Closed |
| CDA II - Lat C | CDA II[2] | Intersection of Riverside Dr and Milliken Ave | WMP2019_VL00007_CDA_2_LAT_C | | 974 | Pattern: CAL_CDA_2_LAT_C |
| CDA II - Lat D | CDA II[2] | Intersection of Riverside Dr and Milliken Ave | WMP2019_VL00008_CDA_2_LAT_D | | 4,180 | Pattern: CAL_CDA_2_LAT_D |
| | | | **Total** | **15,694** | **7,024** | |

[1] *CDA I is the Chino Basin Desalter Facility No. 1*

[2] *CDA II is the Chino Basin Desalter Facility No. 2*

[3] *Based on annual average maximimum capacity*

**Table 9-3**

**Calibration Well Summary**

| Discharge Pressure Zone | Well Number | Location | Model ID | Ground Elevation (ft) | Ground-water Elevation (ft)[1] | Model Pump Type | Model Pump Curve ID | Capacity (gpm)[2] | TDH (ft)[2] | Model Calibration | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | 24-Hr Average Flowrate (gpm) | Model Time Based Control Pattern | Time Start | Time Stop |
| 925 | 49 | 1495 S. Dupont Ave. | M22WE101_WELL_49 | 901 | 586 | 3: Multiple Point Curve | WELL_49 | 2545 | 341.1 | N.A. | Closed | N.A. | N.A. |
| 1074 | 35 | 652 E. Main St. | K14WE100_WELL_35 | 978 | 562 | 3: Multiple Point Curve | WELL_35 | 2568 | 548.1 | N.A. | Closed | N.A. | N.A. |
| | 36 | 1400 S. Archibald Ave. | M19WE100_WELL_36 | 891 | 561 | 3: Multiple Point Curve | WELL_36 | 1672 | 532 | 54 | CAL_WELL_36 | 10:00 A.M. | 10:45 A.M. |
| | 40 | 1335 East Holt Bl. | J16WE100_WELL_40 | 981 | 582 | 3: Multiple Point Curve | WELL_40 | 2024 | 503.3 | 1,979 | CAL_WELL_40 | 12:00 A.M. | 12:15 P.M. |
| | 44 | 964 Cucamonga Ave. | H15WE106_WELL_44 | 1059 | 558 | 3: Multiple Point Curve | WELL_44 | 2471 | 644.2 | 2,521 | CAL_WELL_44 | 12:00 A.M. | 12:15 P.M. |
| | 45 | 665 N .Campus Ave. | I14WE100_WELL_45 | 1022 | 587 | 3: Multiple Point Curve | WELL_45 | 2589 | 515.6 | 1,156 | CAL_WELL_45 | 12:00 A.M.<br>9:00 A.M.<br>8:30 P.M. | 3:45 A.M.<br>12:15 P.M.<br>11:59 P.M. |
| | 52 | 1230 E. 4th St. | H15WE107_WELL_52 | 1053 | 519 | 3: Multiple Point Curve | WELL_52 | 2279 | 672.1 | N.A. | Closed | N.A. | N.A. |
| 1212 | 24 | 700 N. Haven Ave. | I21WE100_WELL_24 | 990 | 618 | 3: Multiple Point Curve | WELL_24 | 1907 | 599.4 | 305 | CAL_WELL_24 | 12:00 A.M.<br>9:15 P.M. | 1:15 A.M.<br>11:59 P.M. |
| | 29 | 2400 E. Airport Dr. | J18WE100_WELL_29 | 961 | 572 | 3: Multiple Point Curve | WELL_29 | 2147 | 657.1 | N.A. | Closed | N.A. | N.A. |
| | 30 | 220 S. Wineville Ave. | K24WE100_WELL_30 | 967 | 622 | 3: Multiple Point Curve | WELL_30 | 2063 | 596.5 | 464 | CAL_WELL_30 | 12:00 A.M.<br>9:15 P.M. | 2:30 A.M.<br>11:59 P.M. |
| | 31 | 5719 E. Santa Ana St. | L25WE100_WELL_31 | 938 | 619 | 3: Multiple Point Curve | WELL_31 | 2866 | 605.7 | N.A. | Closed | N.A. | N.A. |
| | 37 | 4327 E. Guasti | J22WE100_WELL_37 | 977 | 616 | 3: Multiple Point Curve | WELL_37 | 3074 | 600.7 | 2,300 | CAL_WELL_37 | 12:00 A.M.<br>9:30 P.M. | 3:15 P.M.<br>11:59 P.M. |
| | 38 | 837 N. Center | H20WE100_WELL_38 | 1013 | 600 | 3: Multiple Point Curve | WELL_38 | 2427 | 662.8 | 987 | CAL_WELL_38 | 12:00 A.M.<br>10:45 P.M. | 8:30 A.M.<br>11:59 P.M. |
| | 41 | 1252 North Hellman Ave. | G18WE100_WELL_41 | 1032 | 595 | 3: Multiple Point Curve | WELL_41 | 2143 | 703 | N.A. | Closed | N.A. | N.A. |
| | 47 | 4255 E. Concours St. | H22WE100_WELL_47 | 1016 | 586 | 3: Multiple Point Curve | WELL_47 | 3358 | 631.8 | 3,320 | CAL_WELL_47 | 12:00 A.M. | 12:15 P.M. |
| 1348 | 46 | 1670 W. 8th St. | E16WE100_WELL_46 | 1135 | 567 | 3: Multiple Point Curve | WELL_46 | 2471 | 847.4 | N.A. | Closed | N.A. | N.A. |
| | | | | | | | | | **Total** | **13,086** | | | |

**Table 9-4**

**Calibration Altitude Valve Summary**

| ID | U/S Zone | D/S Zone | Location | Model ID | Valve Elevation (ft) | Model Valve Type | Size (in) | Model Calibration | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | 24-Hr Average Flowrate (gpm) | Model Flow Control Pattern/ Time Based Control |
| AV-1010-2 | 1212 | 1010 | Reservoir 1010-2A & 1010-2B | WMP2019_VL00003_ALT_1212_1010 | 983 | 3: Flow Control Valve | 12 | N.A. | Closed |
| AV-1010-1 | 1074 | 1010 | Reservoir 1010-1 | WMP2019_VL00004_ALT_1074_1010 | 979 | 3: Flow Control Valve | 12 | 1,794 | Pattern: CAL_ALT_VLV_1074_1010 |
| AV-1074-1 | 1212 | 1074 | Reservoir 1074-1A & 1074-1B | WMP2019_VL00002_ALT_1212_1074 | 1,061 | 3: Flow Control Valve | 12 | N.A. | Closed |
| AV-925-2 | 1212 | 925 | Reservoir 925 1A | M22PR100_ALT_1212_925 | 907 | 3: Flow Control Valve | 12 | N.A. | Closed |

**Table 9-5**

**Calibration Pump Station Summary**

| Location | Facility Name | Pump Model ID | Suction Zone | Discharge Zone | Model Pump Type | Model Pump Curve ID | Capacity (gpm)[2] | TDH (ft)[2] | Model Calibration | | Time Start | Time Stop |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | 24-Hr Average Flowrate (gpm) | Model Flow Control Pattern/ Time Based Control | | |
| John Galvin Pump Station 960 N Cucamonga Ontario, CA 91764 | Galvin 1074-1 | H15BP102_GALVIN_1212_1 | 1074 | 1212 | 3: Multiple Point Curve | GALVIN_BPS_P1_1A | 3,658 | 151.8 | N.A. | Closed | | |
| | Galvin 1074-2 | H15BP103_GALVIN_1212_2 | 1074 | 1212 | 3: Multiple Point Curve | GALVIN_BPS_P2_1B | 3,145 | 146.7 | N.A. | Closed | | |
| | Galvin 1074-3 | H15BP104_GALVIN_1212_3 | 1074 | 1212 | 1: Design Point Curve | No pump curve | 4,638 | 164.0 | N.A. | Closed | | |
| | Galvin 1074-4 | H15BP101_GALVIN_1348_4 | 1074 | 1348 | 3: Multiple Point Curve | GALVIN_BPS_P4_2 | 2,016 | 334.0 | N.A. | Closed | | |
| 1212 Reservoir (10MG) 140 S. Campus, Upland, CA | Booster 1348-3 | E14BP101_BOOSTER_1348_3 | 1212 | 1348 | 1: Design Point Curve | No pump curve | 3,070 | 156.8 | N.A. | Closed | | |
| | Booster 1348-4 | E14BP102_BOOSTER_1348_4 | 1212 | 1348 | 3: Multiple Point Curve | BOOSTER_1348_4 | 1,898 | 160.8 | N.A. | Closed | | |
| 1559 N. Columbia Ave, Ontario, CA 91764 | Booster 1348-1 | F13BP101A_BOOSTER_1348_1 | 1212 | 1348 | 1: Design Point Curve | No pump curve | 2,844 | 213.9 | N.A. | Closed | | |
| | Booster 1348-2 | F13BP101B_BOOSTER_1348_2 | 1212 | 1348 | 1: Design Point Curve | No pump curve | 2,613 | 225.7 | N.A. | Closed | | |
| 4251 East Jurupa Ave, east of Dupont Ave | CDA Ontario Booster Pump 1 | M22BP100_ONTARIO_1212_1 | 925 | 1212 | 3: Multiple Point Curve | ONTARIO_BPS_P1 | 1,286 | 301.7 | N.A. | Closed | | |
| | CDA Ontario Booster Pump 2 | M22BP102_ONTARIO_1212_2 | 925 | 1212 | 3: Multiple Point Curve | ONTARIO_BPS_P2 | 1,198 | 294.8 | 616 | Pattern: CAL_ONT_BPS | 12:00 A.M. 12:30 P.M. 11:00 P.M. | 5:00 A.M. 6:00 P.M. 11:59 P.M. |
| | CDA Ontario Booster Pump 3 | M22BP101_ONTARIO_1212_3 | 925 | 1212 | 3: Multiple Point Curve | ONTARIO_BPS_P3 | 1,232 | 295.0 | N.A. | Closed | | |
| 4301 E Guasti Rd, east of Milliken Ave | CDA Milliken Booster 1 | WMP2019_BP00001_MILLIKAN_1212_1 | 1010 | 1212 | 3: Multiple Point Curve | MILLIKEN_BPS_P1 | 1,525 | 203.0 | N.A. | Closed | | |
| | CDA Milliken Booster 2 | WMP2019_BP00002_MILLIKAN_1212_2 | 1010 | 1212 | 3: Multiple Point Curve | MILLIKEN_BPS_P2 | 1,520 | 201.6 | 1,529 | Pattern: CAL_MILLIKEN_BPS | 12:00 A.M. | 11:59 P.M. |
| | CDA Milliken Booster 3 | WMP2019_BP00003_MILLIKAN_1212_3 | 1010 | 1212 | 3: Multiple Point Curve | MILLIKEN_BPS_P3 | 1,525 | 203.9 | N.A. | Closed | | |
| Archibald Ave, north of Cloverfield Rd. (Owned by CDA) | Archibald -1 | WMP2019_BP00004_ARCHIBALD_1010_1 | CDA | 1010 | 1: Design Point Curve | No pump curve | 1,061 | 165.6 | N.A. | Closed | | |
| | Archibald -2 | WMP2019_BP00005_ARCHIBALD_1010_2 | CDA | 1010 | 1: Design Point Curve | No pump curve | 1,112 | 164.0 | N.A. | Closed | | |

[2] *Based on current efficiency tests*

**Table 9-6**

**Calibration Pressure Reducing Valve Summary**

| Station No. | U/S Zone | D/S Zone | Location | Valve Elevation (ft) | Model ID | Model Valve Type | Model Size (in) | 24-Hr Average Flowrate (gpm) | Model Flow Control Pattern/ Time Based Control |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 1074 | 1010 | Euclid Ave, south of Philadelphia St (east side of street) | 840 | P13PR102_PRV_2 | 0: Pressure Reducing Valve | 8 | N.A. | Closed |
| 3 | 1074 | 1010 | Grove Ave, south of Philadelphia St | 834 | P15PR101_PRV_3 | 0: Pressure Reducing Valve | 8 | N.A. | Closed |
| 4 | 1074 | 1010 | Philadelphia St at Vineyard Ave | 838 | P17PR103_PRV_4 | 0: Pressure Reducing Valve | 12 | N.A. | Closed |
| 5 | 1074 | 1010 | Archibald Ave at Philadelphia St | 830 | P19PR101_PRV_5 | 0: Pressure Reducing Valve | 8 | N.A. | Closed |
| 6 | 1212 | 1074 | Archibald Ave at Jurupa St (adjacent Well 36) | 893 | M19PR101_PRV_6 | 0: Pressure Reducing Valve | 8 | N.A. | Closed |
| 7 | 1212 | 1010 | Milliken Ave south of Francis St | 876 | N22PR101_PRV_7 | 0: Pressure Reducing Valve | 8 | N.A. | Closed |
| 8 | 1212 | 1010 | Francis St at Etiwanda Ave | 878 | N26PR101_PRV_8 | 0: Pressure Reducing Valve | 12 | N.A. | Closed |
| 10 | 1212 | 1074 | Mission Blvd at Turner Ave | 856 | N20PR101_PRV_10 | 0: Pressure Reducing Valve | 10 | N.A. | Closed |
| 11 | 1212 | 1074 | Phillips Street at Cypress Ave | 918 | M12PR101_PRV_11 | 0: Pressure Reducing Valve | 8 | N.A. | Closed |
| 12 | 1212 | 1074 | Haven Ave at Francis St (west side of street) | 866 | N21PR102_PRV_12 | 0: Pressure Reducing Valve | 10 | N.A. | Closed |
| 13 | 1212 | 1010 | Haven Ave at Francis St (east side of street) | 866 | N21PR101_PRV_13 | 0: Pressure Reducing Valve | 10 | N.A. | Closed |
| 15 | 1348 | 1212 | Fourth St at San Antonio Ave | 1094 | H12PR100_PRV_15 | 0: Pressure Reducing Valve | 6 | N.A. | Closed |
| 17 | 1010 | 925 | Archibald Ave at Schaefer Ave | 728 | U19PR100_PRV_17 | 0: Pressure Reducing Valve | 10 | N.A. | Closed |
| 18 | 1010 | 925 | Riverside Dr, west of Milliken Ave | 788 | R22PR100_PRV_18 | 0: Pressure Reducing Valve | 14 | N.A. | Closed |
| 21 | 1212 | 1074 | Euclid St at Phillips St | 930 | M13PR100_PRV_21 | 0: Pressure Reducing Valve | 10 | 129 | Pattern: CAL_PRS_21 |

## 9-4 Reservoir Level Comparison

Upon running the calibration scenario, the first comparisons made were the levels at all reservoirs. Initially, not all reservoir levels matched well. Adjustments/corrections to the model were made to resolve these situations. Actions taken to adjust/correct the model included the following:

a. Verified system geometry, including pipe connections, pipe sizes, and closed valve locations. We identified locations where the existing GIS did not accurately reflect the pipe connections and pipe sizes. The model was adjusted to include changes in pipe sizes per City's GIS information and verification. AKM and City staff utilized atlas sheets, as-built plans, and field investigation to determine if system geometry was incorrect and how to fix it in the hydraulic model.

b. Verified the facility information, including reservoir dimensions, pump curves, elevations, and valve settings.

c. Verified allocation of zone demand

d. Verified reservoir level controls

In general, the reservoir levels recorded in the field matched the reservoir levels that were calculated by the hydraulic model. Factors that may have contributed to the difference in levels include, but are not limited to; closed or partially closed isolation valves; inaccurate PRV settings; differences in billing data and the calibration day demands. The comparison of reservoir levels for the calibration scenario is graphically shown on Figures 9-1 through 9-9. A discussion of any discrepancies between the model and the field data is discussed following the associated reservoir level comparison figure.

**Figure 9-1**

**Reservoir 925-2A Level Comparison**

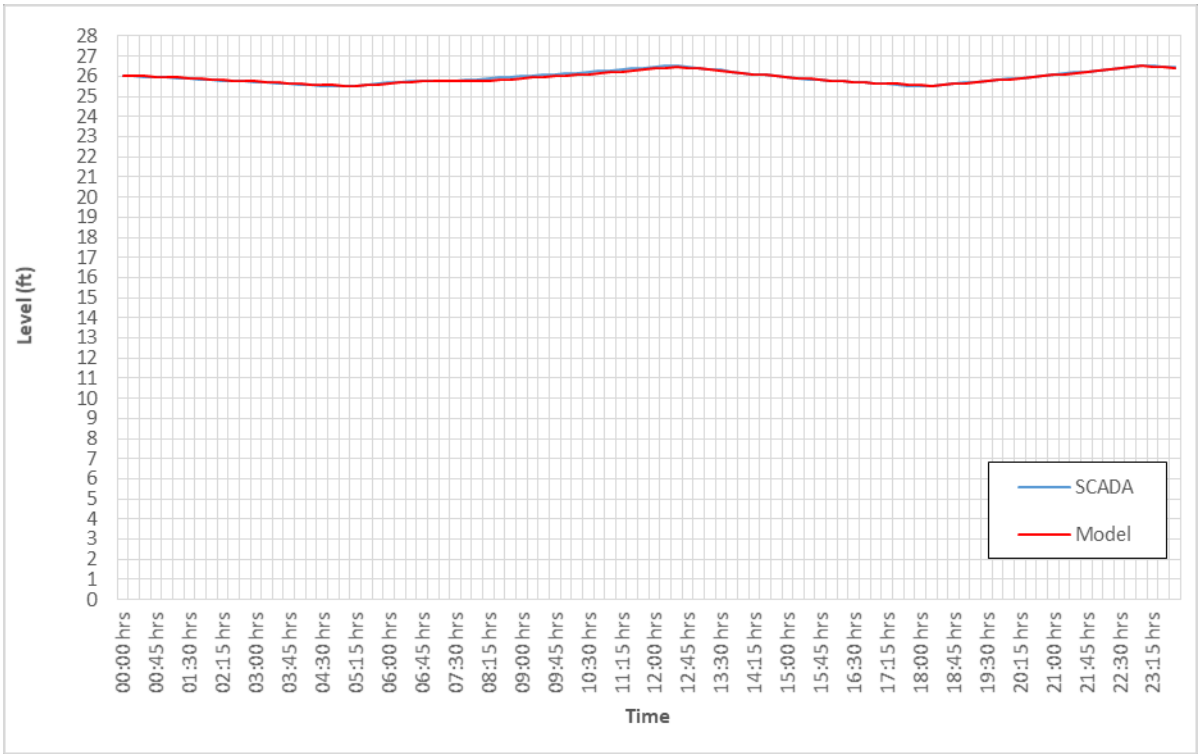

**Figure 9-2**

**Reservoir 1010-1 Level Comparison**

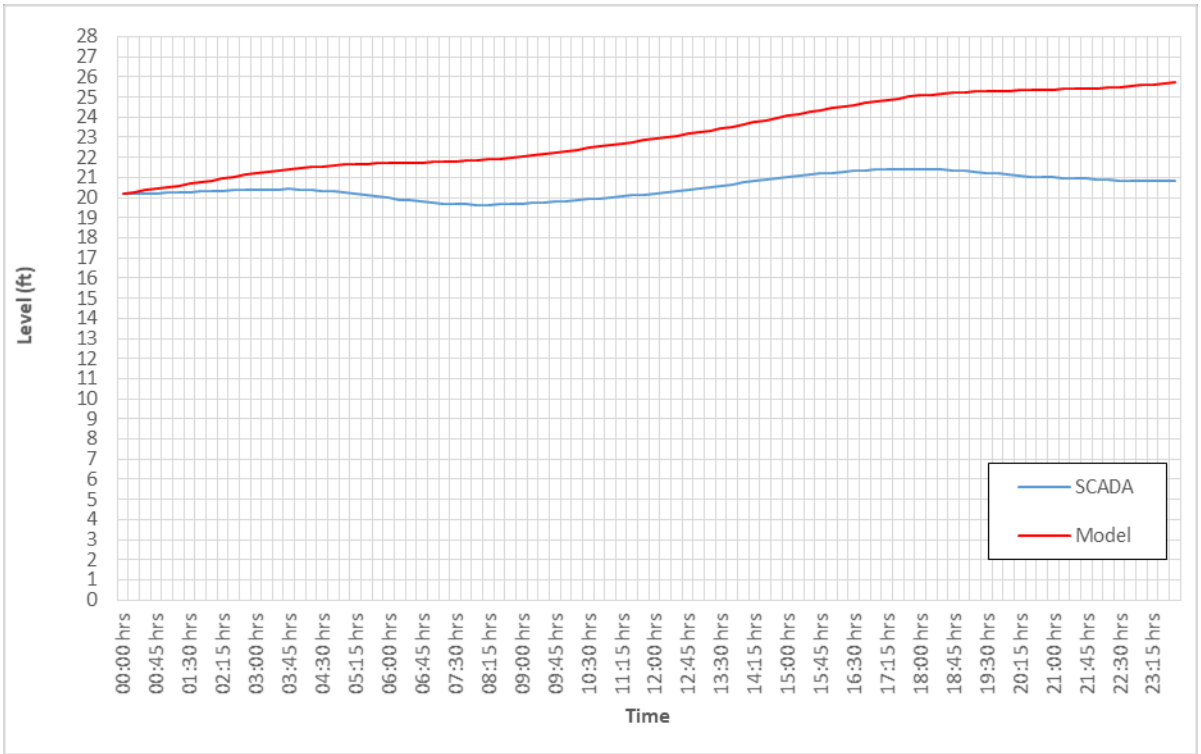


**Figure 9-3**

**Reservoir 1010-2A Level Comparison**

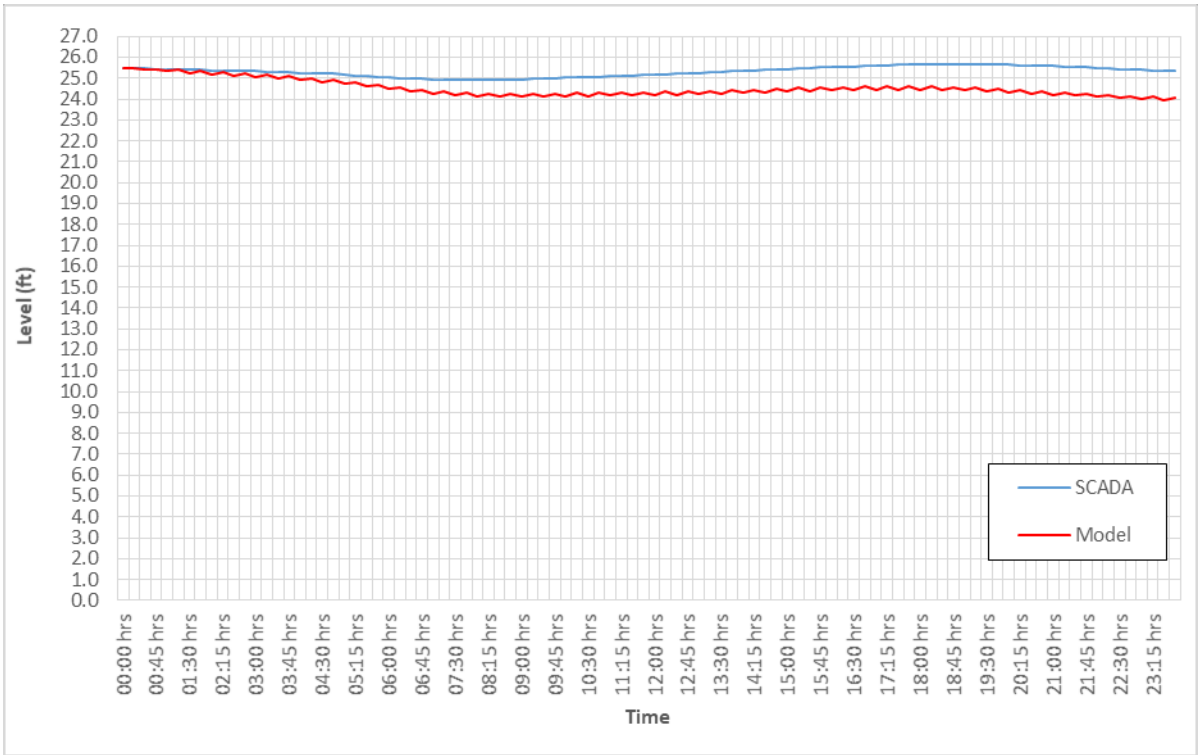

**Figure 9-4**

**Reservoir 1010-2B Level Comparison**

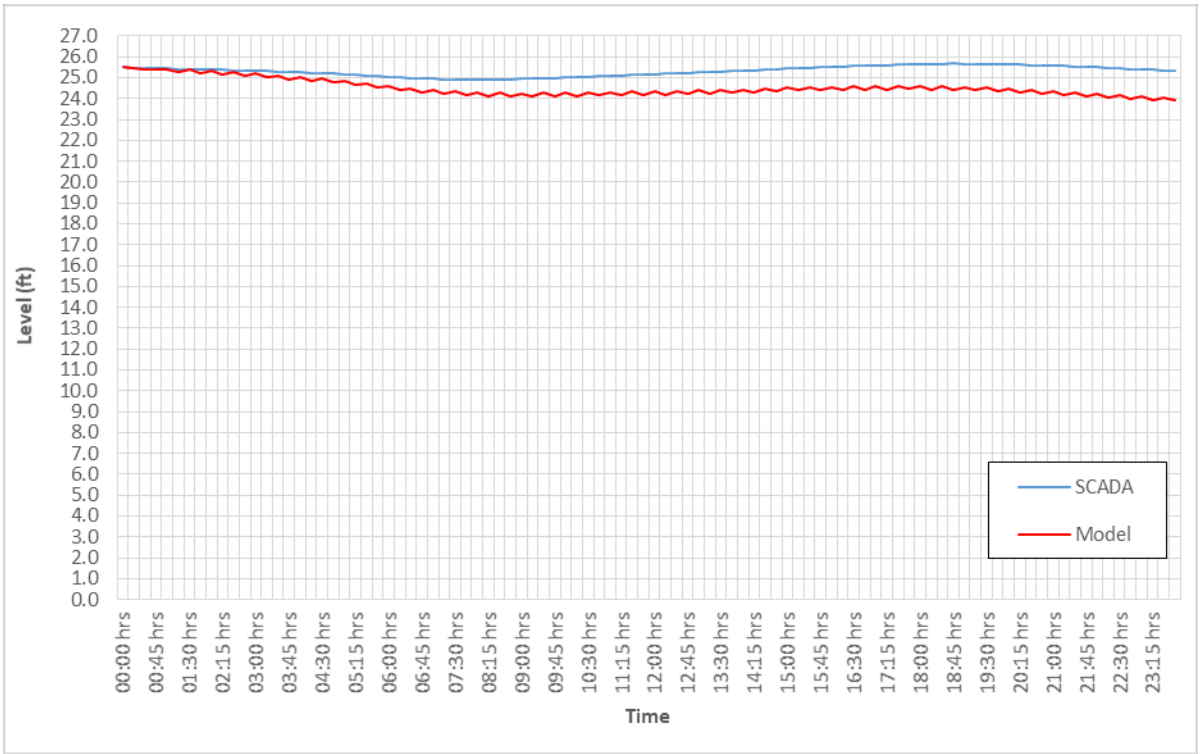


Reservoir levels from SCADA data did not match the model estimated levels in the 1010 Zone. The Reservoir 1010-1A is located on the west side of the service area, and the Reservoirs 1010-2A and 1010-2B are located at the same site on the east side of the service area. The City's operations staff stated that the east and the west side of the 1010 Zone are generally operated as two separate systems because the reservoir sites are located so far apart and connected by two pipelines that are not able to convey water back and forth efficiently between the two sides of the zone.

During the calibration period, Reservoir 1010-1A was supplied water via the AV-1010B altitude valve, while the Reservoir 1010-2A and 1010-2B were supplied water via the CDA II Lateral D. It is believed that there may be some closed and/or partially closed valves that are restricting flow between the 1010 Zone reservoirs on the east and the west side of the service area. It is recommended that the City verify that all valves in the 1010 Zone are fully opened and not restricting flow. For the purpose of this hydraulic analysis, the model valves in the 1010 Zone are fully open.

**Figure 9-5**

**Reservoirs 1074-1A and 1B Equivalent Tank Level Comparison**

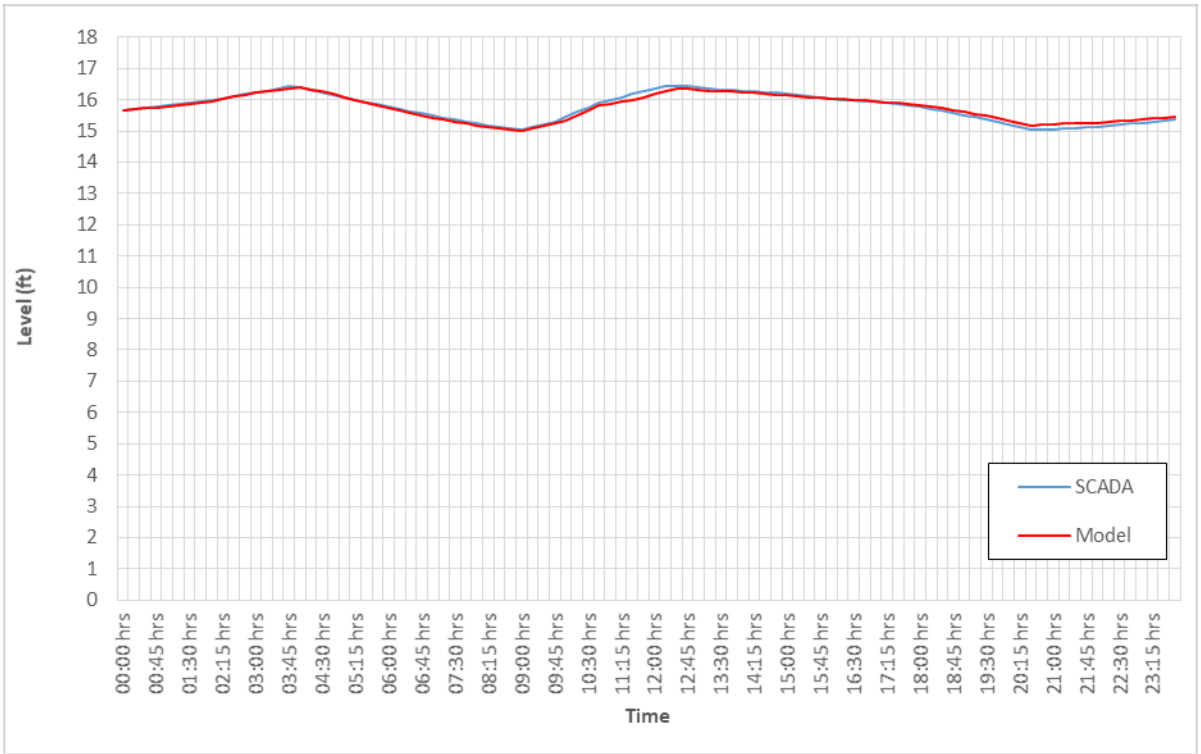


**Figure 9-6**

**Reservoir 1212-1A Level Comparison**

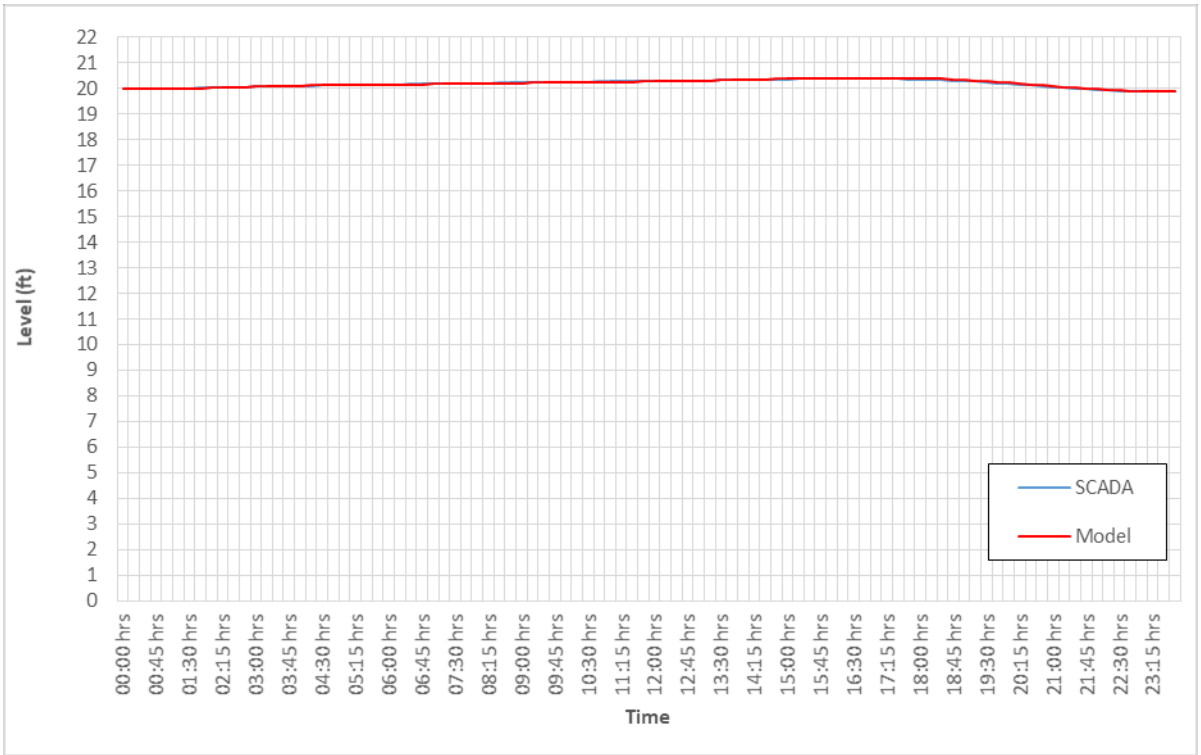

**Figure 9-7**

**Reservoir 1212-1B Level Comparison**

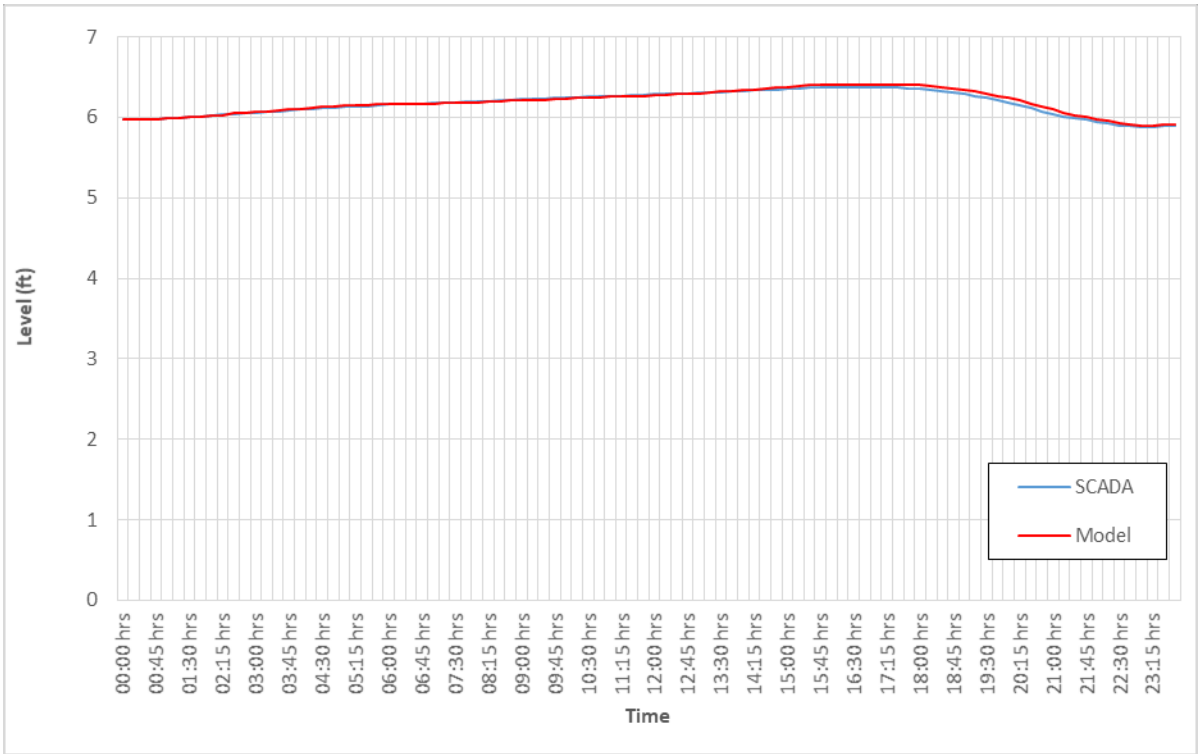


**Figure 9-8**

**Reservoir 1212-3 Level Comparison**

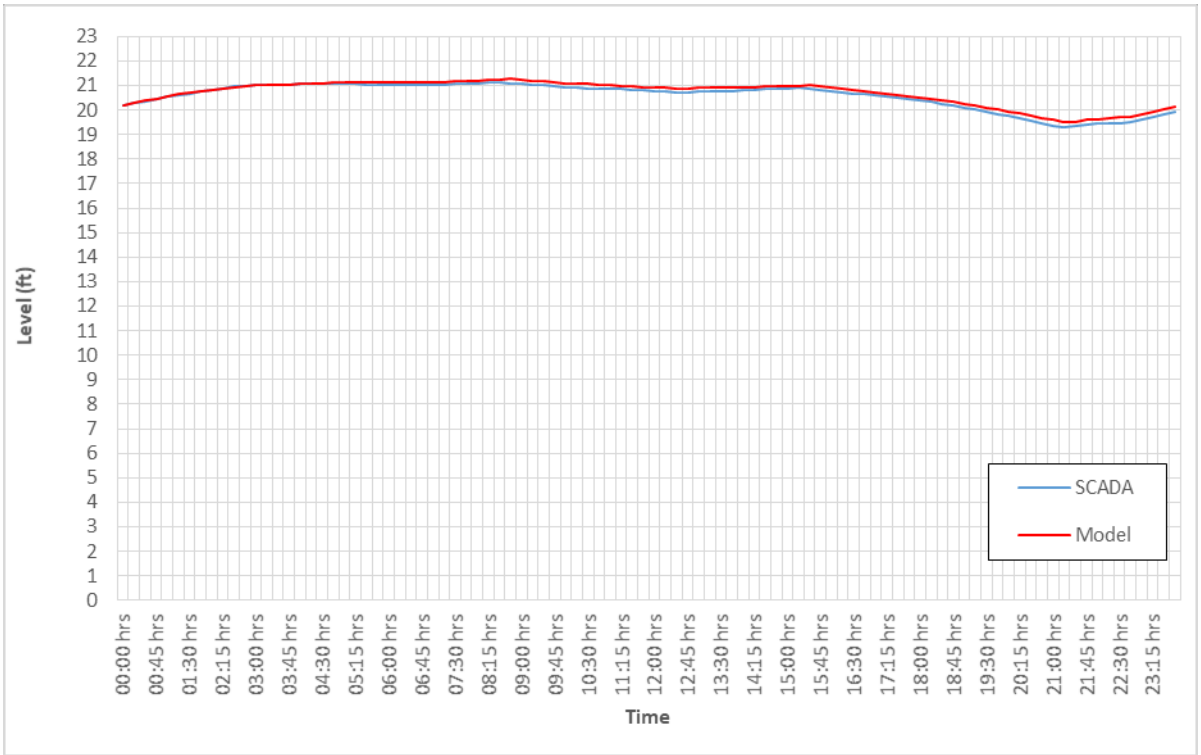

**Figure 9-9**

**Reservoirs 1348-1A, 1B, and 1C Equivalent Tank Level Comparison**

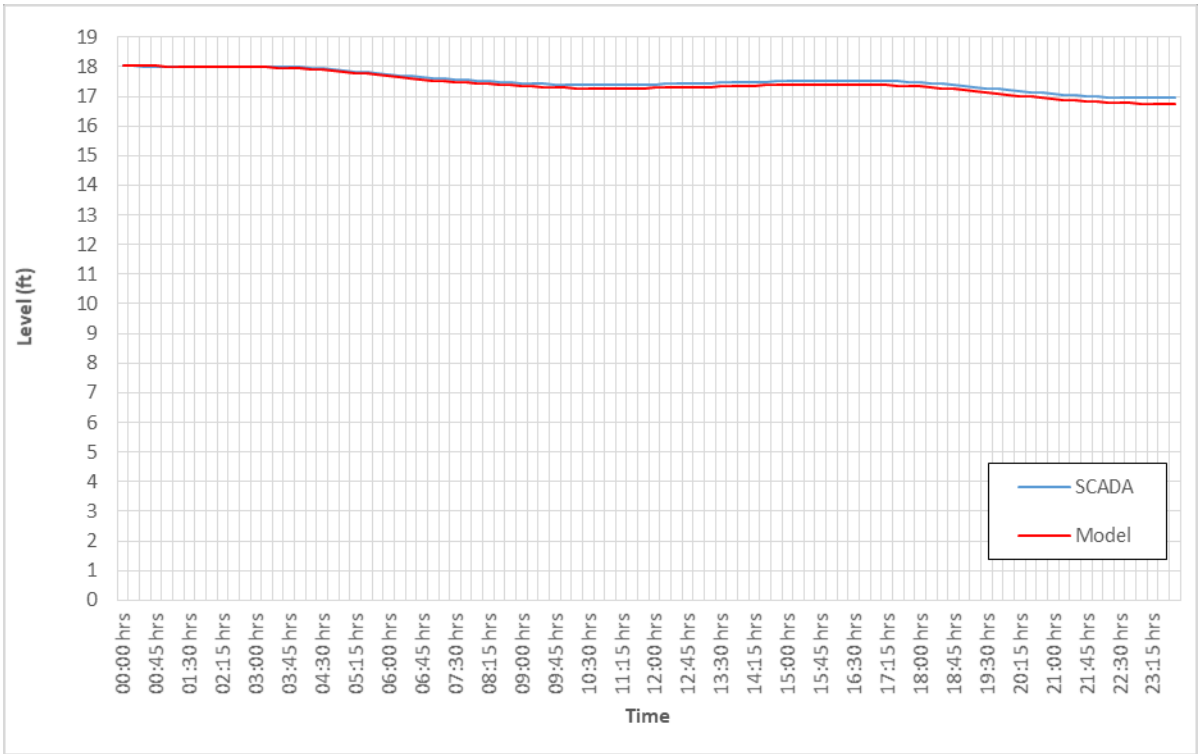


## 9-5 Pressure Data Comparison

In addition to the pressure data available on the SCADA system, pressure data was collected by installing portable pressure data loggers on twenty-eight (28) fire hydrants throughout the system. The locations selected were primarily in the large open zones of the system, scattered throughout in order to obtain representative pressure measurements in all areas of the system. The locations were specifically placed away from main facilities such as reservoirs, pump stations, and turnouts where pressures are not expected to vary as much and/or where pressure information is already available in the existing SCADA system. The pressure data logger locations are listed in Table 9-7 and shown on Figure 9-10.

The model calculated pressures at Cedar and Business (logger location ID 20 or model node O19FIT173) do not match the field recorded pressures on calibration day. The model calculated pressures that are about 8 psi less than the pressures recorded in the field. It is likely that the pressure difference is due to a discrepancies with actual hydrant elevation or with the pressure data logger equipment.

## Table 9-7

## Pressure Data Loggers Calibration Summary Table

| Proposed Data Logger Locations | | | | | | | Model Pressures | | | Field Pressures | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Logger Location ID | Model Junction ID | Hydrant ID | Location | Zone ID | Size (in) | Ground El. (ft) | Minimum (psi) | Average (psi) | Maximum (psi) | Minimum (psi) | Average (psi) | Maximum (psi) | Average Pressure Difference (psi) | Comments |
| 6 | F10FIT147 | F10FH101 | Gardenia Ct. and Deodar | 1348 | 6 | 1152 | 78.2 | 82.0 | 84.4 | 81.3 | 84.5 | 88.2 | -2.5 | |
| 7 | WMP2019_FIT00482 | G12FH180 | Princeton and San Antonio | 1348 | 6 | 1106 | 96.6 | 100.3 | 102.6 | 96.3 | 101.4 | 104.9 | -1.0 | |
| 8 | G15FIT233 | G15FH140 | Orchard and Fifth | 1348 | 6 | 1115 | 98.2 | 101.6 | 103.7 | 98.6 | 102.6 | 106.8 | -1.0 | |
| 9 | G17FIT109 | G17FH133 | Bonnie Brae and Corona | 1348 | 6 | 1070 | 112.3 | 116.2 | 118.7 | 111.2 | 116.3 | 121.4 | 0.0 | |
| 13 | H13FIT174 | H13FH160 | J e.o. Columbia | 1212 | 6 | 1078 | 54.1 | 55.4 | 55.9 | 51.8 | 54.0 | 55.5 | 1.4 | |
| 3 | H20FIT204 | H20FH147 | Center, north of Concours | 1212 | 10 | 1018 | 81.4 | 84.6 | 89.0 | 77.6 | 82.6 | 88.2 | 2.0 | |
| 10 | J11FIT217 | J11FH114 | E and Azalea | 1212 | 6 | 1023 | 77.0 | 78.7 | 79.4 | 72.9 | 77.7 | 81.8 | 1.0 | |
| 12 | WMP2019_FIT00749 | J13FH401 | n.o. Laurel and C | 1212 | 6 | 1018 | 78.8 | 80.4 | 81.1 | 73.9 | 78.6 | 83.3 | 1.8 | |
| 1 | J22FIT168 | J22FH111 | Guasti, east of Milliken | 1212 | 12 | 980 | 98.8 | 101.6 | 105.3 | 93.1 | 98.9 | 104.6 | 2.7 | |
| 15 | L21FIT178 | L21FH126 | Haven n.o. La Salle | 1212 | 6 | 943 | 120.0 | 122.6 | 126.1 | 116.2 | 121.6 | 126.0 | 1.0 | |
| 14 | L14FIT121 | L14FH157 | Maitland and Bon View | 1212 | 6 | 937 | 113.3 | 115.2 | 115.9 | 106.6 | 112.7 | 117.7 | 2.5 | |
| 11 | M10FIT165 | M10FH113 | Oaks and Clair | 1212 | 6 | 923 | 120.6 | 122.6 | 123.5 | 113.9 | 123.6 | 129.3 | -1.0 | |
| 19 | M16FIT118 | M16FH109 | Acacia and Walker | 1074 | 6 | 904 | 54.5 | 61.0 | 69.9 | 60.2 | 63.4 | 71.6 | -2.4 | |
| 5 | M19FIT159 | M19FH141 | Archibald, south of Jurupa (Near PRS #6) | 1074 | 12 | 893 | 55.8 | 63.3 | 87.0 | 60.3 | 65.4 | 82.2 | -2.2 | |
| 16 | N26FIT126 | N26FH113 | Clark and Chablis | 1212 | 6 | 893 | 136.0 | 138.7 | 142.8 | 120.0 | 134.6 | 149.9 | 4.1 | |
| 17 | O11FIT119 | O11FH105 | Magnolia s.o. Francis | 1074 | 6 | 867 | 65.4 | 72.9 | 81.2 | 70.2 | 76.8 | 84.1 | -3.9 | |
| 18 | O13FIT137 | O13FH130 | Manzanita and Sultana | 1074 | 6 | 870 | 64.3 | 71.2 | 79.6 | 69.2 | 73.3 | 81.1 | -2.1 | |
| 21 | O16FIT102 | O16FH155 | Cedar and Parco | 1074 | 6 | 852 | 74.1 | 81.0 | 90.3 | 78.5 | 82.3 | 89.2 | -1.3 | |
| 20 | O19FIT173 | O19FH149 | Cedar and Business | 1074 | 6 | 840 | 78.7 | 85.8 | 97.1 | 85.7 | 93.9 | 106.3 | -8.1 | Likely issue with actual hydrant elevation or with pressure logger equipment. |
| 27 | Q14FIT115 | Q14FH139 | s.o. Bon View and Oak Hill | 1010 | 6 | 826 | 67.9 | 73.4 | 77.3 | 62.0 | 70.3 | 76.1 | 3.1 | |
| 24 | Q19FIT176 | Q19FH125 | Seagull and Oakhill | 1010 | 6 | 805 | 78.2 | 82.2 | 85.3 | 69.0 | 79.2 | 83.9 | 2.9 | |
| 22 | R13FIT145 | R13FH142 | Plum, n.o. Merion | 1010 | 6 | 799 | 78.0 | 83.4 | 87.3 | 70.7 | 81.8 | 86.9 | 1.6 | |
| 23 | R16FIT116 | R16FH172 | Meadowbrook and Merion | 1010 | 6 | 784 | 85.5 | 90.9 | 94.8 | 76.7 | 88.2 | 93.3 | 2.7 | |
| 26 | WMP2019_FIT00332 | S22FH182 | Callaway and Edenglen | 1010 | 6 | 793 | 90.1 | 91.8 | 93.6 | 83.2 | 89.6 | 94.2 | 2.1 | |
| 25 | T20FIT210 | T20FH173 | Clover and Chaparral | 1010 | 6 | 766 | 100.4 | 104.5 | 107.7 | 91.6 | 100.0 | 104.8 | 4.5 | |
| 28 | WMP2019_FIT02667 | T22FH113 | Hamner and Chino | 925 | 6 | 776 | 62.2 | 62.4 | 62.6 | 57.2 | 60.2 | 62.0 | 2.2 | |
| 29 | WMP2019_FIT00697 | U20FH153 | Oakville and Trinitas | 925 | 6 | 737 | 78.0 | 78.6 | 78.9 | 67.5 | 77.0 | 81.5 | 1.6 | |
| 30 | WMP2019_FIT00966 | Y19FH131 | McCleve and Salisbury | 925 | 6 | 658 | 111.8 | 112.5 | 112.8 | 105.2 | 111.1 | 115.3 | 1.4 | |

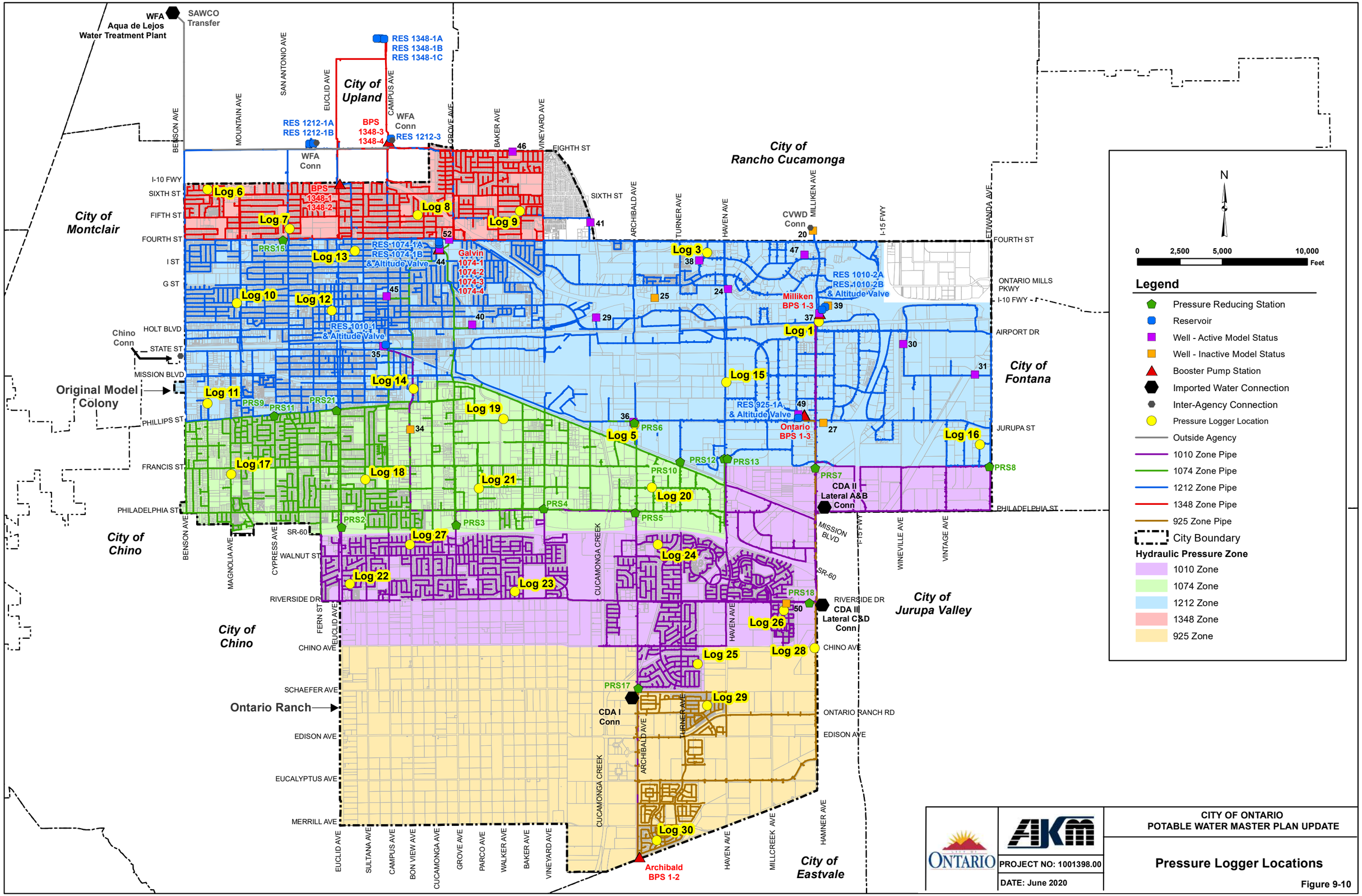
WFA
Aqua de Lejos
Water Treatment Plant
SAWCO
Transfer
RES 1348-1A
RES 1348-1B
RES 1348-1C
City of
Upland
RES 1212-1A
RES 1212-1B
BPS
1348-3
1348-4
WFA
Conn
RES 1212-3
WFA
Conn
BPS
1348-1
1348-2
City of
Rancho Cucamonga
City of
Montclair
RES 1074-1A
RES 1074-1B
& Altitude Valve
Galvin
1074-1
1074-2
1074-3
1074-4
RES 1010-1
& Altitude Valve
RES 1010-2A
RES 1010-2B
& Altitude Valve
Milliken
BPS 1-3
CVWD
Conn
Chino
Conn
Original Model
Colony
RES 925-1A
& Altitude Valve
Ontario
BPS 1-3
City of
Fontana
CDA II
Lateral A&B
Conn
City of
Chino
CDA II
Lateral C&D
Conn
City of
Jurupa Valley
Ontario Ranch
CDA I
Conn
Archibald
BPS 1-2
City of
Eastvale
Log 1
Log 3
Log 5
Log 6
Log 7
Log 8
Log 9
Log 10
Log 11
Log 12
Log 13
Log 14
Log 15
Log 16
Log 17
Log 18
Log 19
Log 20
Log 21
Log 22
Log 23
Log 24
Log 25
Log 26
Log 27
Log 28
Log 29
Log 30
PRS2
PRS3
PRS4
PRS5
PRS6
PRS7
PRS8
PRS9
PRS10
PRS11
PRS12
PRS13
PRS15
PRS17
PRS18
PRS21
N
0 2,500 5,000 10,000 Feet
Legend
Pressure Reducing Station
Reservoir
Well - Active Model Status
Well - Inactive Model Status
Booster Pump Station
Imported Water Connection
Inter-Agency Connection
Pressure Logger Location
Outside Agency
1010 Zone Pipe
1074 Zone Pipe
1212 Zone Pipe
1348 Zone Pipe
925 Zone Pipe
City Boundary
Hydraulic Pressure Zone
1010 Zone
1074 Zone
1212 Zone
1348 Zone
925 Zone
ONTARIO
AKM
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Pressure Logger Locations
Figure 9-10

# SECTION 10

# EXISTING SYSTEM ANALYSIS

## 10-1 Introduction

The established system criteria and calibrated system computer model were utilized in analyzing the existing system, and evaluating its adequacy. As discussed in Section 9, the system model was calibrated by simulating actual system conditions and making adjustments to the model. The model was then utilized to analyze the existing system under average day, maximum day, and peak hour conditions.

Existing system deficiencies were identified and mitigation projects were formulated based upon the results of the model runs and input from City staff. Proposed projects were added in the hydraulic model to test the operation of the system after their implementation.

A capital improvement program was developed as a result of these analyses. Recommended projects and cost estimates are discussed in Section 13 of this Master Plan Report.

## 10-2 Existing Source of Supply

Any water system must be capable of meeting all demands imposed upon the system. The City's existing water demands are summarized in Table 10-1.

This can be achieved through multiple supply sources, storage, or a combination of both. It is prudent to secure water supplies from multiple sources so that demands can be met at reasonable levels when one or more water sources are not available.

**Table 10-1**
**Existing System Demand**

| Demand Description | Total System Demand | | |
|---|---|---|---|
| | (gpm) | (mgd) | (AFY) |
| Average Day | 19,280 | 27.76 | 31,098 |
| Max Day | 29,790 | 42.90 | 48,051 |
| Peak Hour[1] | 36,934 | 53.19 | 59,575 |

[1] *Estimated from Existing System Model*

### 10-2.1 Existing Average Day Demand

The criterion established requires a source of supply equal to one average day demand (ADD) (19,280 gpm) from local sources.

The City's existing source of supply is detailed in Table 10-2. The City's local water source include direct access to groundwater from the Chino Basin, which is managed by the Chino Basin Watermaster. The City's existing seventeen (17) active wells have a capacity of 38,604 gpm, which is about double the existing ADD.

**Table 10-2**
**Existing Source of Supply**

| Source | Capacity | | |
|---|---|---|---|
| | gpm | mgd | AFY |
| Existing Wells | 38,604 | 55.6 | 62,269 |
| WFA | 10,700 | 15.4 | 17,259 |
| CDA | 5,290 | 7.6 | 8,533 |
| **Total** | **54,594** | **78.6** | **88,061** |

### 10-2.2 Existing Maximum Day Demand

California Code of Regulations Related to Drinking Water requires a minimum source of supply of one maximum day demand (MDD) of the service area. Under this criterion, reservoirs are typically needed to regulate hourly fluctuations in demand, provide fire flow and supplement supply during an outage of a source for an extended duration.

As detailed in Table 10-2, the total existing source of supply is equivalent to 54,594 gpm. This is about 183% of the City's existing MDD (29,790 gpm). With 38,604 gpm from groundwater sources alone, the City is capable of providing the full MDD.

The available existing imported water from the Chino Desalter Authority (CDA) and Water Facility Authority (WFA) total 15,990 gpm (54% of the existing MDD). If some wells are out of service, the City would need 13,800 gpm (29,790 gpm – 15,990 gpm) from groundwater sources to supply the remaining MDD. This is about 36% of the existing system well capacity.

### 10-2.3 Existing Peak Hour Demand

California Code of Regulations Related to Drinking Water, Chapter 16, Section 64554 requires that if a system has more than 1,000 service connections, it must be capable of providing four (4) hours of peak hourly demand (PHD) through a combination of source capacity, storage capacity, and/or emergency source connections.

As detailed in Table 4-5, the City's existing peak hour demand is 36,934 gpm. The City's existing total supply is 54,594 gpm with 38,604 gpm from groundwater sources, which is capable of providing the peak hour demand for four (4) hours. Storage capacity is not necessary to meet the peak hour demand supply criteria.

## 10-3 Storage

### 10-3.1 Storage Criteria Summary

**Operational Storage**

For the City of Ontario's system, operational storage criterion is based on 30 percent of the maximum day demand for OR, and 25 percent of maximum day demand for OMC due to the diversity of demands in OMC.

**Emergency Storage**

The City's emergency storage criterion is set at one average day demand. For a system that depends mostly on groundwater supplies, this amount of emergency storage is adequate and is primarily for response in operations due to a loss of a major source of supply.

**Fire Suppression Storage**

Fire suppression storage is the volume required to supply the service area with the required fire flows, which range from 1,500 to 4,000 gpm for a duration of two (2) to four (4) hours.

The fire flow suppression storage and operational storage is increased by 15 percent so that a portion of the reservoir volume is available for variations in elevation, and to provide submergence over the reservoir outlet pipes. In an emergency, the emergency storage volume, as well as the operational storage volume and the fire suppression storage volume would all be available for use.

### 10-3.2 Existing Storage Analysis

Table 10-3 shows the existing storage capacity in each zone, and the reservoir capacity needed.

**Table 10-3**

**Existing Storage Analysis**

| Zone | 1348 | 1212 | 1074 | 1010 | 925 | Total System |
|---|---|---|---|---|---|---|
| Average Day Demand (mgd) | 2.96 | 12.88 | 5.53 | 5.98 | 0.41 | 27.76 |
| Maximum Day Demand (mgd) | 4.71 | 19.75 | 8.55 | 9.27 | 0.61 | 42.90 |
| [1]Fire Flow Demand (gpm) | 3,500 | 4,000 | 4,000 | 4,000 | 4,000 | - |
| Fire Flow Duration (hrs) | 4 | 4 | 4 | 4 | 4 | - |
| [2]Fire Suppression Storage (MG) | 0.84 | 0.96 | 0.96 | 0.96 | 0.96 | - |
| [3]Operational Storage (MG) | 1.18 | 4.94 | 2.14 | 2.32 | 0.18 | 10.75 |
| [4]Emergency Storage (MG) | 2.96 | 12.88 | 5.53 | 5.98 | 0.41 | 27.76 |
| [5]Total Storage Required (MG) | 5.29 | 19.67 | 9.09 | 9.75 | 1.72 | 45.51 |
| [6]Existing Available Storage (MG) | 8.75 | 32.00 | 4.75 | 23.50 | 6.00 | 75.00 |
| Zone Surplus / Deficit (MG) | 3.46 | 12.33 | -4.34 | 13.75 | 4.28 | 29.49 |

*[1] Highest fire flow required in zone*

*[2] Fire flow multiplied by duration*

*[3] 30% of maximum day demand for NMC, 25% of maximum day demand for OMC*

*[4] One average day demand*

*[5] (1.15 x (fire suppression+operational storage))+emergency*

A deficit of 4.34 MG is calculated in the 1074 Zone. The storage surplus in the 1212 Zone could be transferred to the 1074 Zone through altitude valve 1074A at the Reservoir 1074-1 site, as well as through PRS 6, 10, 11, 12 and 21 to make up for this deficit.

## 10-4 Existing System Hydraulic Model Analysis

The existing system model was calibrated to simulate actual field conditions, as detailed in Section 9. Once calibrated, the hydraulic model was run to analyze the existing system. The pressures during the ADD scenario were above the City's dynamic pressure criteria (40 psi) throughout the service area. The existing system was also evaluated under the MDD scenario, which include the peak hour demand, and all pressures met the City's criteria. The 24-hour average pressure contours for the existing system are illustrated on Figure 10-1.

The maximum velocity criteria of 7 ft/s or less under maximum day and peak hour demands is generally met throughout the City's existing system. The maximum velocities are detailed on Figure 10-2.

## 10-5 Existing Facility Condition Assessment

All facilities have useful lives for which relatively trouble-free service can be expected. Once exceeded, these facilities become less reliable, expensive to maintain and are subject to failure. Therefore, facility age is considered in the assessment of all water systems and in formulating future replacement projects.

Planning criteria included in Table 7-2 were used to identify facilities that have reached or are nearing the end of their useful lives.

### 10-5.1 Wells

Operations staff is limited in its operating capabilities due to water quality issues which include but are not limited to perchlorate, 1,2,3 Trichloropropane (TCP), and a bacterial plume. In addition, the City is preparing for new state and federal regulations for perfuorooctane sulfonate (PFOS) and polyfluoroalkyl (PFOA). The City is anticipating that all existing wells will require improvements to provide the necessary treatment capabilities for the various water quality issues with the groundwater source. Capital improvement projects are recommended for water quality treatment near Reservoir 925-2A, near future Reservoirs 925-1A and 925-1B, and for wells in the OMC.

The City plans to rehabilitate and reactivate Well 37, 39, and 50 in the 1010 Zone. It should be noted that Well 37 currently supplies the 1212 Zone, but will be reconfigured to supply the 1010 Zone, when the well is upgraded.

The wells sites are being rehabilitated to improve the existing roofs to ensure all mechanical equipment is protected. The roof improvement projects are expected to be completed in the 2021 Fiscal Year. The wells are also being equipped with chlorine generators, which will be completed by the 2024 Fiscal Year.

The estimated useful life of well casings is 60 years. The oldest active well is Well 24, which was constructed in 1969. Well 30 was constructed in 1978, and Wells 29 and 31 were constructed in 1979. Depending upon the condition of the casings, these wells may need to be replaced in the next 10 to 20 years. Before designing treatment upgrades at Well 24, 29, 30, and 31, it is recommended that the City evaluate the condition of the casing to determine if additional improvements or replacement is necessary.

The future system hydraulic model analysis, includes use of all existing wells and rehabilitated Wells 37, 39, and 50.

### 10-5.2 Reservoirs

A "Reservoir Seismic Vulnerability Evaluation" was conducted in 2008 by Tetra Tech, which was summarized by the City's Utilities Engineering Division in the "Seismic Risk of City's Potable Water Reservoirs" technical memorandum, dated 2012. The memorandum recommended seismic upgrades at Reservoir 1074-1A, 1074-1B, 1212-1A, 1212-3, 1348-1A, 1348-1B, and 1348-1C.

Per the established criteria for concrete reservoirs, six of the City's existing reservoirs have outlived their useful life of 50 years: Reservoirs 1074-1B (1957), 1212-1A (1959), 1212-1B (1958), 1212-3 (1926), 1348-1B (1955) and 1348-1C (1958). These reservoirs should be re-inspected and their condition should be assessed every three (3) years, at minimum, to determine the need for rehabilitation/replacement projects.

The future system hydraulic model analysis, includes use of all these reservoirs.

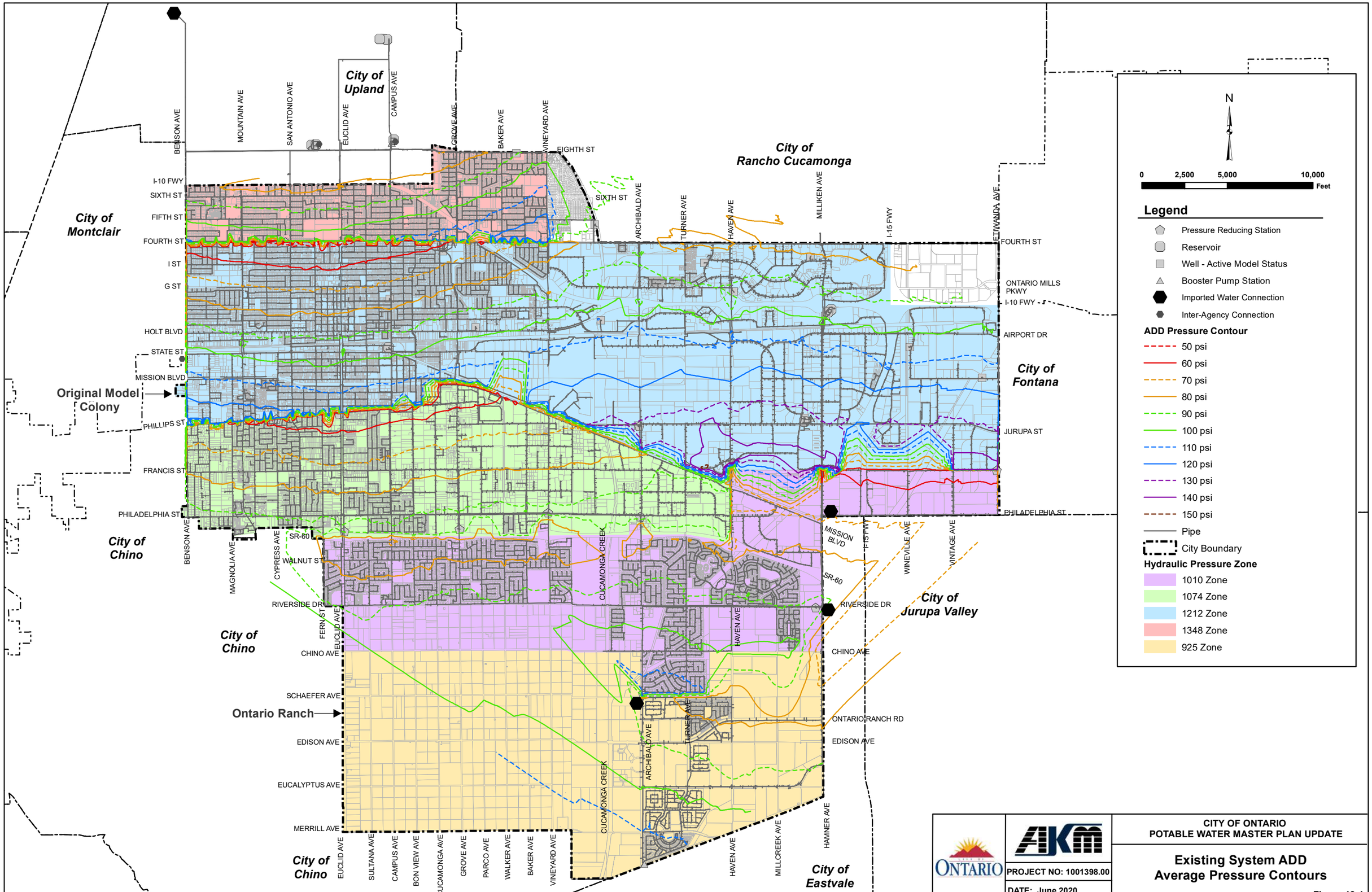


CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE

PROJECT NO: 1001398.00

DATE: June 2020

**Existing System ADD Average Pressure Contours**

Figure 10-1

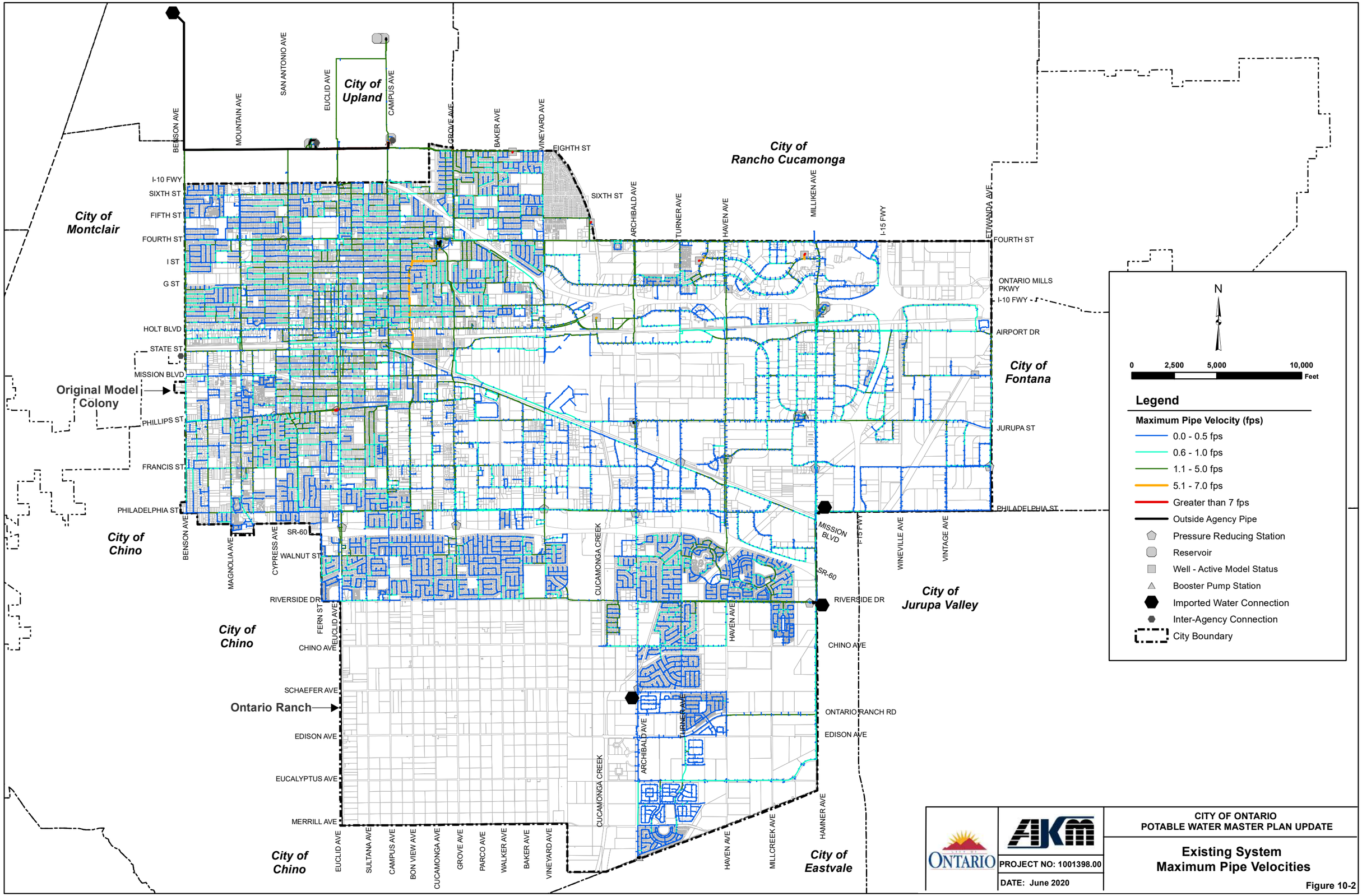
City of Upland
City of Rancho Cucamonga
City of Montclair
City of Fontana
City of Jurupa Valley
City of Chino
City of Eastvale
Original Model Colony
Ontario Ranch
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ELDERBERRY AVE
FOURTH ST
ONTARIO MILLS PKWY
I-10 FWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
I-10 FWY
SIXTH ST
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
PHILADELPHIA ST
BENSON AVE
MAGNOLIA AVE
CYPRESS AVE
SR-60
WALNUT ST
RIVERSIDE DR
FERN ST
EUCLID AVE
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
CUCAMONGA CREEK
MISSION BLVD
SR-60
RIVERSIDE DR
CHINO AVE
ONTARIO RANCH RD
EDISON AVE
I-15 FWY
WINEVILLE AVE
VINTAGE AVE
HAVEN AVE
ARCHIBALD AVE
TURNER AVE
HAMNER AVE
MILLCREEK AVE
EUCLID AVE
SULTANA AVE
CAMPUS AVE
BON VIEW AVE
CUCAMONGA AVE
GROVE AVE
PARCO AVE
WALKER AVE
BAKER AVE
VINEYARD AVE
N
0
2,500
5,000
10,000
Feet
Legend
Maximum Pipe Velocity (fps)
0.0 - 0.5 fps
0.6 - 1.0 fps
1.1 - 5.0 fps
5.1 - 7.0 fps
Greater than 7 fps
Outside Agency Pipe
Pressure Reducing Station
Reservoir
Well - Active Model Status
Booster Pump Station
Imported Water Connection
Inter-Agency Connection
City Boundary
ONTARIO
AKM
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Existing System
Maximum Pipe Velocities
Figure 10-2

***Reservoir 1212-3***

Based on review of the 2012 technical memorandum, the tank inspection (completed September 10, 2010), and discussions with City staff, there are plans for the Reservoir 1212-3 be repaired, which will extend its useful life possibly by 10 to 15 years. A thorough inspection and condition assessment is recommended every 3 years, at minimum. Due to its age (currently 84 years old), Reservoir 1212-3 is expected to eventually be taken out of service.

When Reservoir 1212-3 is taken out of service, two additional 8 MG reservoirs (Reservoirs 1212-4A and 1212-4B) are recommended for the 1212 Zone to replace Reservoir 1212-3. The City has acquired a site for these reservoirs near the intersection of Foothill Boulevard and Rochester Avenue in the City of Rancho Cucamonga. The reservoir site has an approximate ground elevation of 1,189 feet amsl. The City plans to tie into the 24-inch pipe (1212 Zone) on 4th Street at Buffalo Avenue. A 30-inch pipe will extend north on Buffalo Avenue east on San Marino Street, and north on Rochester Avenue to Reservoir 1212-4A and 1212-4B.

### 10-5.3 Booster Pump Stations

Per the established criteria for booster pump stations, three stations have outlived their useful life of 50 years. Booster pumps 1348-3 and 1348-4 are located at the pump station near Reservoir 1212-3. This pump station was constructed in 1959, and has reached the end of its useful life. Concurrent to this master planning effort, the City is conducting a condition assessment of this pump station, which will include recommendations to rehabilitate this facility.

The Galvin Pump Station includes three pumps (Galvin 1074-1, Galvin 1074-2, and Galvin 1074-3) that pump to the 1212 Zone and one pump (Galvin 1074-4) that pumps to the 1348 Zone. Built in 1960, this booster pump station has reached the end of its useful life. Likewise, the booster pump station that houses pumps 1348-1 and 1348-2 was constructed in 1960, and has reached the end of its useful life. It is recommended that a condition assessment of these pump stations be conducted to identify all necessary improvement projects.

### 10-5.4 Pipeline

The City has a pipeline replacement program that is intended to target the replacement of pipes that have exceeded their useful lives and/or have diameters that are less than the minimum 8-inch in diameter criteria. The City currently prioritizes the pipe replacement projects based on operational information such as historical pipe leaks, historical breaks, or maintenance issues.

***Small Diameter Pipe***

It is recommended that all small diameter pipe (less than 8-inches) be replaced with a minimum of 8-inch diameter pipe. Pipe improvements greater than the minimum 8-inch diameter criteria, may be required in areas where the system in unable to meet the minimum peak hour pressures and/or fire flow pressure criteria.

In addition, it is recommended that all small diameter fire hydrant laterals (less than 6-inches) be replaced with a minimum of 6-inch diameter pipe. The City Standard Drawing Number 4111 require the hydrant lateral to be 6-diameter PVC pipe. Older metal hydrant laterals were also recommended to be replaced with PVC pipe to reduce headless through the hydrant lateral in a fire flow event.

The geometry for the future system model scenario was adjusted such that the minimum pipe diameter is 8-inches, and the minimum fire hydrant lateral diameter is 6-inches.

***Pipes Exceeding Useful Lives***

The existing distribution system pipes were installed between 1916 and 2018. The system pipe length by decade of construction is shown in Figure 6-5. The majority of the distribution system was constructed after 1970. The year of installation is unknown for about 28 miles or 4.8 percent of the existing pipes.

As detailed in Table 7-2, the pipe useful life for DIP, ACP, and PVC pipe is 50 years, which means pipes constructed before 1970 have exceeded their useful lives. Pipe replacements due to age are planned for all pipes constructed on or before 1970. This excludes small diameter pipe improvements.

The total length of pipe replacements due to size and age, is estimated as 1,105,000 feet (209 miles). A summary of the recommended existing water system pipeline improvements is shown in Table 10-4. Locations of fire flow, small diameter, and age improvements are shown on Figure 10-3.

**Table 10-4**

**Summary of Existing Water System Improvements**

| Row Labels | Pipe Length (ft) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 925 Zone | 1010 Zone | 1074 Zone | 1212 Zone | 1348 Zone | Verify Pipe Age | Total |
| 4" and less small diameter deficiency and exceeding useful life. | | 86 | 4,061 | 14,621 | 14,037 | 72,271 | 105,077 |
| 6" diameter deficiency and exceeding useful life. | | 5,413 | 27,536 | 152,411 | 132,152 | 23,392 | 340,904 |
| 4" and less small diameter deficiency | 406 | 289 | 8,912 | 12,078 | 2,051 | | 23,736 |
| 6" diameter deficiency | 38 | 131,173 | 125,811 | 69,485 | 48,976 | | 375,483 |
| Exceeding Useful Life (8") | | | 7,548 | 35,553 | 11,486 | 11,268 | 65,855 |
| Exceeding Useful Life (10") | | 7,948 | 2,465 | 1,616 | 18,936 | 7,330 | 38,295 |
| Exceeding Useful Life (12") | | 53 | 866 | 28,753 | 12,251 | 9,062 | 50,985 |
| Exceeding Useful Life (14") | | | | 4,927 | 201 | 344 | 5,472 |
| Exceeding Useful Life (16") | | | | 7,217 | 5,235 | 2,009 | 14,460 |
| Exceeding Useful Life (16.5") | | | | | | 52 | 52 |
| Exceeding Useful Life (18") | | | 12,990 | 34,668 | 702 | 1,798 | 50,159 |
| Exceeding Useful Life (19") | | | | 2,073 | | 0 | 2,073 |
| Exceeding Useful Life (20") | | | | 2,159 | | 11 | 2,170 |
| Exceeding Useful Life (24") | | | | 6,493 | | 1,782 | 8,275 |
| Exceeding Useful Life (42") | | | | | | 289 | 289 |
| **Total** | **444** | **144,961** | **190,189** | **372,055** | **246,027** | **129,608** | **1,083,284** |

### 10-5.5 Pressure Reducing Stations

The City is in the process of rehabilitating all pressure reducing stations. New valves and vaults will be provided at all stations. The SCADA will also be updated to provide upstream pressure, downstream pressure, and flowrate.

### 10-5.6 Facility Back-up Power

The system has to be able to provide service during commercial power outages. Currently, the wells with standby power are Well 40 (1074 Zone), 41 (1212 Zone), 46 (1348 Zone), 47 (1212 Zone), and 49 (925 Zone).

All future pump stations and wells should be constructed with standby power so that at least one average day demand can be conveyed to each zone from the wells. If well capacity is not sufficient, water can be transferred via pressure reducing stations and/or booster pump stations with backup power.

Most wells are equipped with automatic transfer switches, which may be connected to a portable generator. The City plans to rehabilitate Well 31 and Well 39 with automatic transfer switches. The City currently has three (3) 850 KW and one (1) 530 KW portable generators. The City plans to purchase an additional 850 KW portable generator.

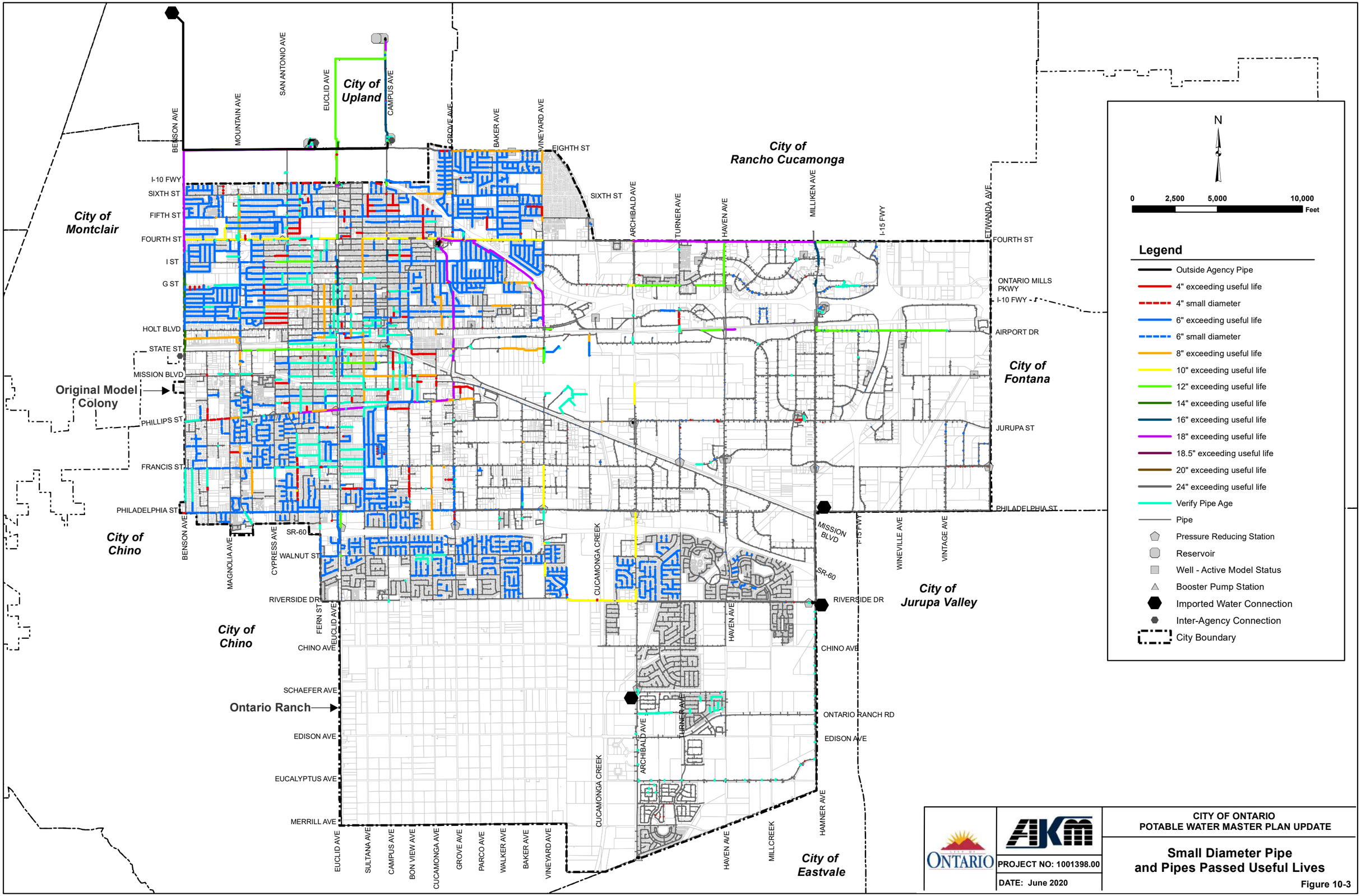
City of Upland
City of Rancho Cucamonga
City of Montclair
City of Fontana
City of Chino
City of Jurupa Valley
City of Eastvale
Original Model Colony
Ontario Ranch
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ELDWANDA AVE
FOURTH ST
ONTARIO MILLS PKWY
I-10 FWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
I-10 FWY
SIXTH ST
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
PHILADELPHIA ST
BENSON AVE
MAGNOLIA AVE
CYPRESS AVE
SR-60
WALNUT ST
RIVERSIDE DR
FERN ST
EUCLID AVE
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
CUCAMONGA CREEK
MISSION BLVD
SR-60
RIVERSIDE DR
CHINO AVE
ONTARIO RANCH RD
EDISON AVE
HAMNER AVE
MILLCREEK
WINEVILLE AVE
VINTAGE AVE
EUCLID AVE
SULTANA AVE
CAMPUS AVE
BON VIEW AVE
CUCAMONGA AVE
GROVE AVE
PARCO AVE
WALKER AVE
BAKER AVE
VINEYARD AVE
N
0
2,500
5,000
10,000
Feet
Legend
Outside Agency Pipe
4" exceeding useful life
4" small diameter
6" exceeding useful life
6" small diameter
8" exceeding useful life
10" exceeding useful life
12" exceeding useful life
14" exceeding useful life
16" exceeding useful life
18" exceeding useful life
18.5" exceeding useful life
20" exceeding useful life
24" exceeding useful life
Verify Pipe Age
Pipe
Pressure Reducing Station
Reservoir
Well - Active Model Status
Booster Pump Station
Imported Water Connection
Inter-Agency Connection
City Boundary
ONTARIO
AKM
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Small Diameter Pipe
and Pipes Passed Useful Lives
Figure 10-3

### 10-5.7 Water Service Meters

The existing system consists of approximately 36,750 water service meters. The City has an aggressive meter replacement program in place. In the 2021 Fiscal Year, approximately 4,000 meters are scheduled to be replaced. This equates to about a 12 year replacement schedule.

In addition to the meter replacements, approximately 1,600 meters are scheduled to be installed for new development areas in the 2021 Fiscal Year.

### 10-5.8 Communication Upgrades

The City is adding an additional wireless Ethernet radio system to their SCADA network. The older spread spectrum 900 mhz system will remain as a backbone. The new radio network will have much more bandwidth and provide more capabilities such as video from remote sites. Not all RTU are set up for Ethernet, and some hardware will need to be upgraded.

### 10-5.9 RTU/PLC Upgrades

SLC PLC systems make up approximately 95% of the City's system. Over the past 20 years, these have been the backbone of many water systems. Currently, the industry is moving toward faster PLC systems. Since the City's radio system is being upgraded, many of the PLC's will also need to be upgraded. The City is evaluate the necessary upgrades and schedule on a site-by-site basis. All new facilities will be installed with equipment that is compatible with the new Ethernet radio system.

### 10-5.10 Site Security

Once the SCADA upgrades are completed, the City will incorporated site security upgrades. The City will install security cameras and secure gate motors at all sites.

# SECTION 11

# FUTURE SYSTEM

## 11-1 Introduction

The future potable water system will consist of five pressure zones as shown on Figure 11-1. As Ontario Ranch is developed, the 1010 Zone will be expanded further south to Chino Avenue. The remaining Ontario Ranch area will be a part of the 925 Zone. A hydraulic schematic of the future potable water system is shown on Figure 11-2.

## 11-2 Developer Impact Fee Projects

The City has developed projects for the future system expansion. Developer Impact Fee (DIF) projects were provided by the City and incorporated into the future system model and capital improvement program. The DIF projects primarily include reservoirs, wells, pump stations, pipelines, water quality treatment facilities, and pressure reducing stations that will serve the Ontario Ranch (OR) developments in the 925 Zone and the 1010 Zone. It also includes transmission pipeline projects in the Original Model Colony (OMC) that will improve the overall system operations, including new development in OR and redevelopment in the OMC.

## 11-3 Future Facilities

As detailed in Section 8, the future system scenarios were developed in the hydraulic model to include all future facilities, which include all recommendations included from the existing system analysis.

### 11-3.1 Future Wells

The summary of all active wells that are included in the future model are detailed in Table 11-1.

### 11-3.2 Future Reservoirs

The summary of all active reservoirs that are included in the future model are detailed in Table 11-2.

### 11-3.3 Future Booster Pump Stations

The summary of all active booster pump stations that are included in the future model are detailed in Table 11-3.

### 11-3.3 Future Pressure Reducing Stations

The summary of all active pressure reducing stations that are included in the future model are detailed in Table 11-4.

## 11-4 Future 925 Zone Facilities

The future 925 Zone will provide water service to the majority of Ontario Ranch. This zone is generally bounded by Chino Avenue to the north, Euclid Avenue to the west, the City boundary to the south, and Milliken Avenue to the east. Table 11-5 summarizes the existing 925 Zone facilities and the recommended facilities that are yet to be constructed. The facility locations are shown on Figure 11-1.

One additional 6 MG reservoir and two 9 MG reservoirs are recommended for the 925 Zone which will ultimately provide service to most of the OR service area. The proposed 6 MG reservoir will be located adjacent the existing 6 MG reservoir (Dupont Ave and Jurupa St). The two 9 MG reservoirs are planned to be located between Bon View Avenue and Cucamoga Avenue, north of Francis Street. Treatment facilities will be provided at both reservoir sites to treat groundwater before entering the distribution system.

Seven new wells are planned in the 925 Zone to provide an additional 17,000 gpm capacity for the future growth in this area.

PRS 16 will reduce pressures from the 1010 Zone to the 925 Zone, near Chino Avenue and Campus Avenue.

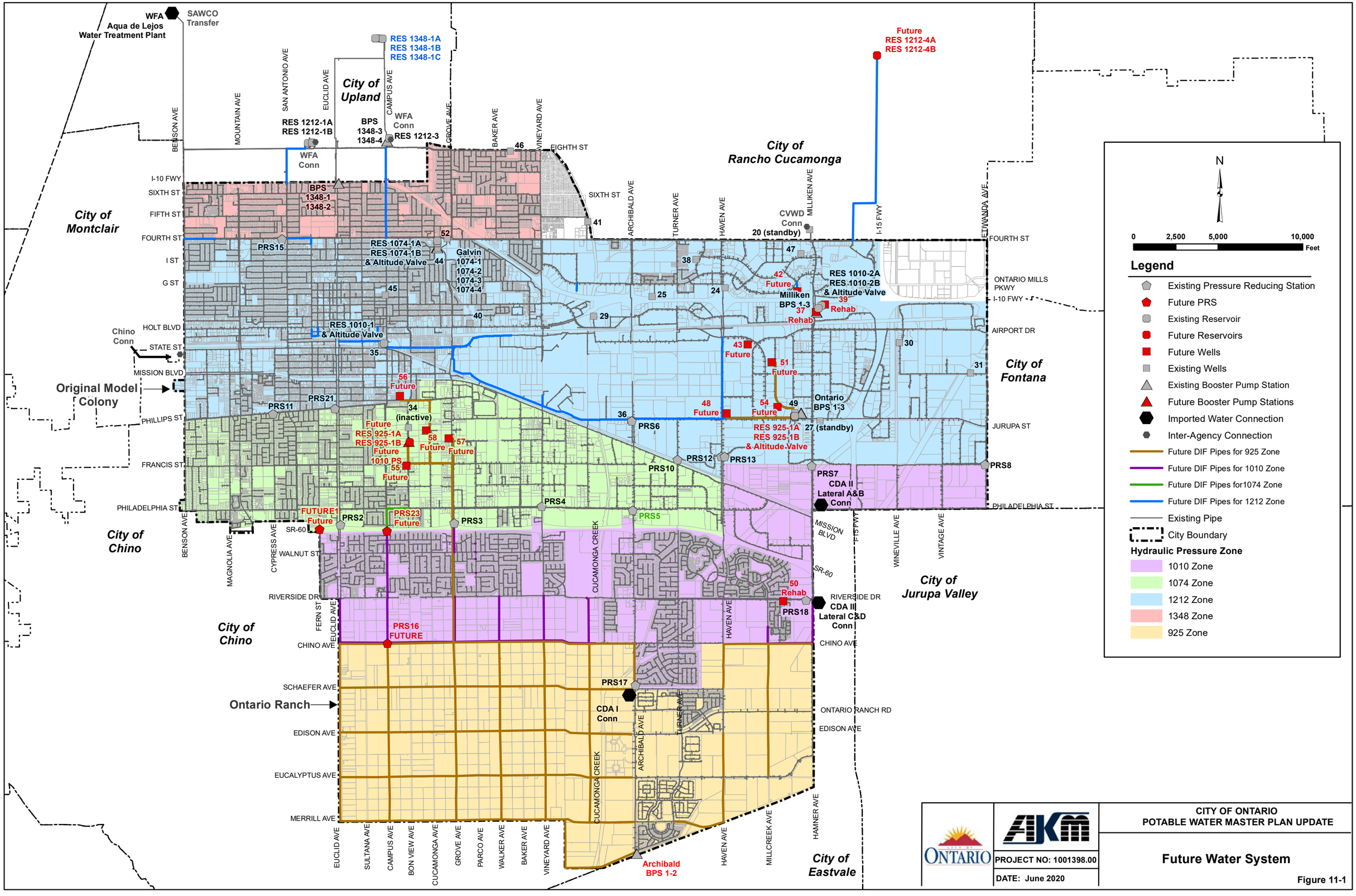
WFA
Aqua de Lejos
Water Treatment Plant
SAWCO
Transfer
RES 1348-1A
RES 1348-1B
RES 1348-1C
City of
Upland
RES 1212-1A
RES 1212-1B
WFA
Conn
BPS
1348-3
1348-4
WFA
Conn
RES 1212-3
BPS
1348-1
1348-2
RES 1074-1A
RES 1074-1B
& Altitude Valve
Galvin
1074-1
1074-2
1074-3
1074-4
RES 1010-1
& Altitude Valve
Chino
Conn
Original Model
Colony
City of
Montclair
City of
Chino
City of
Rancho Cucamonga
Future
RES 1212-4A
RES 1212-4B
CVWD
Conn
20 (standby)
RES 1010-2A
RES 1010-2B
& Altitude Valve
Milliken
BPS 1-3
Rehab
Ontario
BPS 1-3
27 (standby)
RES 925-1A
RES 925-1B
& Altitude Valve
CDA II
Lateral A&B
Conn
CDA III
Lateral C&D
Conn
CDA I
Conn
Archibald
BPS 1-2
City of
Fontana
City of
Jurupa Valley
City of
Eastvale
Future
RES 925-1A
RES 925-1B
Future
1010 PS
Future
RES 1010-1
& Altitude Valve
PRS15
PRS21
PRS11
PRS6
PRS12
PRS13
PRS10
PRS7
PRS8
PRS4
PRS5
PRS2
PRS3
PRS18
PRS17
FUTURE1
Future
PRS23
Future
PRS16
FUTURE
56
Future
34
(inactive)
58
Future
57
Future
55
Future
43
Future
51
Future
48
Future
54
Future
42
Future
39
Rehab
37
Rehab
50
Rehab
N
0
2,500
5,000
10,000
Feet
Legend
Existing Pressure Reducing Station
Future PRS
Existing Reservoir
Future Reservoirs
Future Wells
Existing Wells
Existing Booster Pump Station
Future Booster Pump Stations
Imported Water Connection
Inter-Agency Connection
Future DIF Pipes for 925 Zone
Future DIF Pipes for 1010 Zone
Future DIF Pipes for1074 Zone
Future DIF Pipes for 1212 Zone
Existing Pipe
City Boundary
Hydraulic Pressure Zone
1010 Zone
1074 Zone
1212 Zone
1348 Zone
925 Zone
ONTARIO
AKM
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DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Future Water System
Figure 11-1

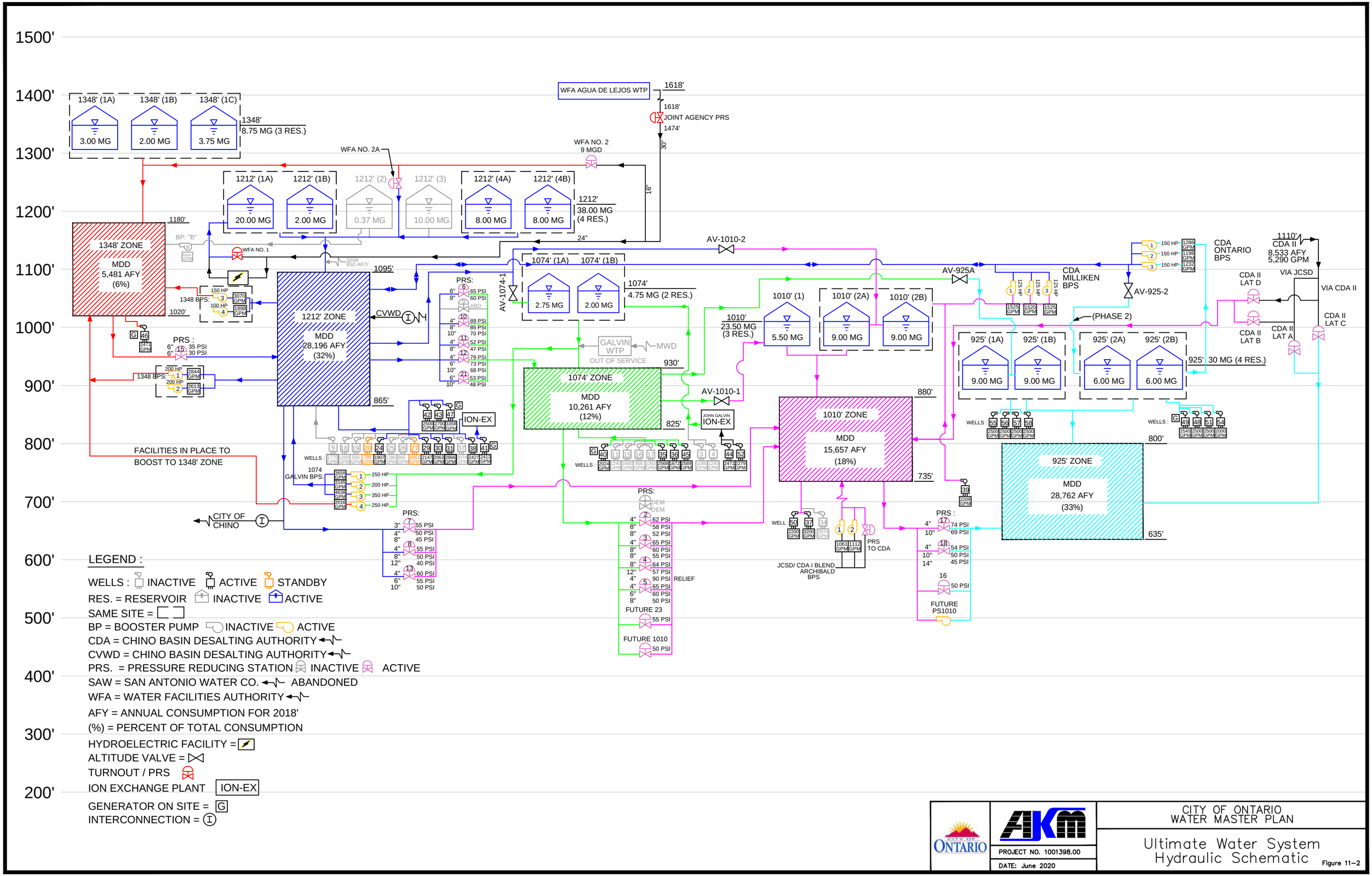


CITY OF ONTARIO

AKM

PROJECT NO. 1001398.00

DATE: June 2020

CITY OF ONTARIO
WATER MASTER PLAN

Ultimate Water System
Hydraulic Schematic

Figure 11–2

## Table 11-1

## Future System Wells Summary Table

| Well Data | | | | | | | | | | Efficiency Test | | | | | Motor Specifications | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Number | Location | Existing Model Status | Future Model Status | Year Drilled | Pressure Zone | Pump Model | Pump Mfg | No of Stages | Pump RPM | Capacity (gpm) | TDH (ft) | Static GWL (ft) | Draw-down (ft)[1] | Test Date | Motor Mfgr | HP | Motor RPM | Backup Power (Y/N) | WQ Issues | Remaining Useful Life[1] (Years) | Model ID | Comments |
| 49 | 1495 S. Dupont Ave. | Active | Active | Unknown | 925 | 14MD | Peerless | 5 | 1780 | 2,545 | 341 | 292 | 23 | 9/9/16 | US | 350 | Unknown | Y | Yes | N.A. | M22WE101_WELL_49 | |
| 48 | 3595 W. Jurupa St. | N.A. | Active | Future | 925 | N.A. | | | | 2,500 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00003_WELL_48 | Future Well |
| 51 | 600 N. Doubleday Ave. | N.A. | Active | Future | 925 | N.A. | | | | 2,500 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00005_WELL_51 | Future Well |
| 54 | Jurupa and Dupont | N.A. | Active | Future | 925 | N.A. | | | | 2,000 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00004_WELL_54 | Future Well |
| 55 | Francis and Bon View | N.A. | Active | Future | 925 | N.A. | | | | 2,500 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00009_WELL_55 | Future Well |
| 56 | Belmont, east of Campus | N.A. | Active | Future | 925 | N.A. | | | | 2,500 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00007_WELL_56 | Future Well |
| 57 | Grove and Locust | N.A. | Active | Future | 925 | N.A. | | | | 2,500 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00011_WELL_57 | Future Well |
| 58 | Cucamonga, between Belmont and Francis | N.A. | Active | Future | 925 | N.A. | | | | 2,500 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00010_WELL_58 | Future Well |
| | | | | **Zone 925 Capacity** | | | | | | **19,545** | | | | | | | | | | | | |
| 34 | 1425 S. Bon View Ave. | Inactive | Inactive | 1983 | 1010 | 15EHM | Ingersoll Dresser | 12 | 1175 | 2,074 | - | - | - | - | GE | 500 | 1180 | N | Yes | | M14WE101_WELL_34 | Well could be equipped and place back in service, but unlikely. |
| 37 | 4327 E. Guasti | Active | Active | Future | 1010 | N.A. | | | | 3,200 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | J22WE100_WELL_37 | Currently connected to 1212' zone but will be moved to 1010' zone |
| 39 | 4397 Guasti Ave. | Inactive | Active | Future | 1010 | N.A. | | | | 2,200 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | J23WE100_WELL_39 | Needs treatment; directly connected to reservoir at 1010 reservoirs. Place back into service for future model, as treatment will be provided. |
| 50 | 3900 W. Riverside Dr. | Inactive | Active | Future | 1010 | N.A. | | | | 2,200 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | R22WE100_WELL_50 | Perchlorate issues". Inactive during existing model, but will be placed back into service for the future model. |
| | | | | **Zone 1010 Capacity** | | | | | | **7,600** | | | | | | | | | | | | |
| 35 | 652 E. Main St. | Active | Active | 1983 | 1074 | 17 MQH | Byron Jackson | 11 | 1170 | 2,568 | 548 | 351 | 65 | 3/18/18 | US | 500 | 1180 | N | Yes | 23 | K14WE100_WELL_35 | The City indicated that there are water quality issues and the water, quality is not reliable. This well is currently in service. |
| 36 | 1400 S. Archibald Ave. | Active | Active | 1986 | 1074 | Unknown | | | | 1,672 | 532 | 268 | 62 | 3/18/18 | US | 350 | 1770 | N | | 26 | M19WE100_WELL_36 | |
| 40 | 1335 East Holt Bl. | Active | Active | 2003 | 1074 | 14R | L&B Verti-line | 6 | 1785 | 2,024 | 503 | 360 | 39 | 3/18/18 | US | 600 | 1785 | Y | | 43 | J16WE100_WELL_40 | Not sequenced to start and stop. Typically only used in summer months. High operation and energy costs. |
| 44 | 964 Cucamonga Ave. | Active | Active | 2003 | 1074 | 15ETMH | Flowserve | 7 | 1770 | 2,471 | 644 | 421 | 80 | 4/18/18 | USEM | 600 | 1800 | N | Yes | 43 | H15WE106_WELL_44 | Ion Exchange Plant. at 1074 Reservoirs. Water quality makes this plant unreliable. Clearwell is planned for future. |
| 45 | 665 N .Campus Ave. | Active | Active | 2006 | 1074 | 17MQL | Flowserve | 5 | 1775 | 2,589 | 516 | 395 | 40 | 8/10/18 | Unknown | 500 | Unknown | N | | 46 | I14WE100_WELL_45 | |
| 52 | 1230 E. 4th St, | Active | Active | Unknown | 1074 | 15ETMH | Flowserve | 7 | 1770 | 2,279 | 672 | 420 | 114 | 4/18/18 | USEM | 600 | 1800 | N | Yes | N.A. | H15WE107_WELL_52 | Ion Exchange Plant. at 1074 Reservoirs. Water quality makes this plant unreliable. Clearwell is planned for future. |
| | | | | **Zone 1074 Capacity** | | | | | | **13,603** | | | | | | | | | | | | |
| 20 | 9600 S. Milliken Ave. | Inactive | Inactive | 1977 | 1212 | - | - | - | - | - | - | - | - | - | - | - | - | N | | | | Not physically connected to system |
| 27 | 4300 E. Jurupa St. | Inactive | Inactive | 1971 | 1212 | - | - | - | - | - | - | - | - | - | - | - | - | N | | | | Not physically connected to system |
| 24 | 700 N. Haven Ave. | Active | Active | 1969 | 1212 | 14KHM | Aurora | 11 | 1770 | 1,907 | 599 | 351 | 21 | 2/18/18 | US | 450 | 1780 | N | | 9 | I21WE100_WELL_24 | |
| 29 | 2400 E. Airport Dr. | Active | Active | 1979 | 1212 | Unknown | | | | 2,147 | 657 | 318 | 71 | 9/16/16 | GE | 500 | Unknown | N | | 19 | J18WE100_WELL_29 | Not sequenced to start and stop. Typically only used in summer months. High operation and energy costs. |
| 30 | 220 S. Wineville Ave. | Active | Active | 1978 | 1212 | 14M160 | Ingersoll Dresser | 7 | 1775 | 2,063 | 597 | 314 | 31 | 4/18/18 | Westing-house | 600 | 1800 | N | | 18 | K24WE100_WELL_30 | |
| 31 | 5719 E. Santa Ana St, | Active | Active | 1979 | 1212 | 16KHL | Verti-Line | 8 | 1770 | 2,866 | 606 | 283 | 36 | 4/18/18 | US | 600 | Unknown | N | Yes | 19 | L25WE100_WELL_31 | There are water quality issues. It is used as an emergency backup well. |
| 38 | 837 N. Center | Active | Active | 1997 | 1212 | 15MQH | Byron Jackson | 7 | 1770 | 2,427 | 663 | 369 | 44 | 3/18/18 | US | 500 | 1775 | N | | 37 | H20WE100_WELL_38 | |
| 41 | 1252 North Hellman Ave. | Active | Active | 2003 | 1212 | Unknown | | | | 2,143 | 703 | 391 | 46 | 4/18/18 | US | 600 | Unknown | Y | | 43 | G18WE100_WELL_41 | Treatment was added to well. |
| 47 | 4255 E. Concours St. | Active | Active | Unknown | 1212 | 17MQH | | | | 3,358 | 632 | 373 | 57 | 3/18/18 | Unknown | 800 | Unknown | Y | | N.A. | H22WE100_WELL_47 | |
| 42 | 4100 E. Inland Empire Blvd. | N.A. | Active | Future | 1212 | N.A. | | | | 2,500 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00001_WELL_42 | Future Well |
| 43 | 3650 E. Airport Drive | N.A. | Active | Future | 1212 | N.A. | | | | 2,700 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | WMP2019_FUTWE00002_WELL_43 | Future Well |
| | | | | **Zone 1212 Capacity** | | | | | | **22,111** | | | | | | | | | | | | |
| 46 | 1670 W. 8th St. | Active | Active | 2006 | 1348 | 17MQL | Flowserve | 8 | 1775 | 2,471 | 847 | 486 | 82 | 3/18/18 | Unknown | 800 | Unknown | Y | | | E16WE100_WELL_46 | |
| | | | | | | | | | **Zone 1348 Capacity** | **2,471** | | | | | | | | | | | | |
| | | | | | | | | | **Total Capacity** | **65,330** | | | | | | | | | | | | |

[1] *Useful life of pump casing is 60 years*

## Table 11-2

## Future System Storage Reservoir Summary Table

| Pressure Zone | Reservoir ID | Status | Reservoir Name | Old Reservoir Name | Location | Shape[1] | Volume (MG) | Bottom Elevation (ft) | High Water Elevation (ft) | Height (ft) | Width x Length[1] (ft) | Dia (ft) | Material | Year of Const. | Passed Useful Life? | Model ID | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 925 | 1A | Future | Reservoir 925-1A | N.A. | Bon View between Belmont and Francis | Cylindrical | 9.00 | 905 | 925 | 20.0 | - | N.A. | N.A. | N.A. | | WMP2019_FUTTA00004_RES_925_1A_1B | Model Equivalent Diamter 391' |
| 925 | 1B | Future | Reservoir 925-1B | N.A. | | Cylindrical | 9.00 | 905 | 925 | 20.0 | - | N.A. | N.A. | N.A. | | | |
| 925 | 2A | Existing | Reservoir 925-2A | N.A. | Northeast corner of Dupont Ave and Jurupa St | Cylindrical | 6.00 | 893 | 925 | 32.0 | - | 188 | Concrete | 2003 | | WMP2019_FUTTA00001_RES_925_2A_2B | Model Equivalent Diamter 253' |
| 925 | 2B | Future | Reservoir 925-2B | N.A. | | Cylindrical | 6.00 | 893 | 925 | 32.0 | - | N.A. | N.A. | N.A. | | | |
| | | | | | | **Total Zone 925 Volume** | **30.00** | | | | | | | | | | |
| 1010 | 1 | Existing | Reservoir 1010-1 | Reservoir 10 | Southwest corner of Campus Ave and Main St | Cylindrical | 5.50 | 979.3 | 1,009.3 | 30.0 | - | 178 | Steel | 1982 | | K14RS101_1010_1 | |
| 1010 | 2A | Existing | Reservoir 1010-2A | Reservoir 11 | Southeast corner of Miliken Ave and San Bernardino Freeway | Cylindrical | 9.00 | 980 | 1,010 | 30.0 | - | 226 | Concrete | 2001 | | J23RS101_1010_2A | |
| 1010 | 2B | Existing | Reservoir 1010-2B | Reservoir 10 | | Cylindrical | 9.00 | 980 | 1,010 | 30.0 | - | 226 | Concrete | 2007 | | J22RS101_1010_2B | |
| | | | | | | **Total Zone 1010 Volume** | **23.50** | | | | | | | | | | |
| 1074 | 1A | Existing | Reservoir 1074-1A | Reservoir 8 | Southeast corner of Cucamonga Ave and Fourth St | Rectangular | 2.75 | 1,054.4 | 1,074 | 19.6 | 140 x 140 | - | Concrete | 1978 | | H15RS103_1074_EQUIV_TANK | Seismic upgrades planned |
| 1074 | 1B | Existing | Reservoir 1074-1B | Reservoir 9 | Southeast corner of Cucamonga Ave and Fourth St | Rectangular | 2.00 | 1,058.8 | 1,074 | 15.2 | 118 x 158 | - | Concrete | 1957 | Yes | | Seismic upgrades planned |
| | | | | | | **Total Zone 1074 Volume** | **4.75** | | | | | | | | | | |
| 1212 | 1A | Existing | Reservoir 1212-1A | Reservoir 4 | Southwest corner of Fern Ave and Euclid Pl | Rectangular | 20.00 | 1,188 | 1,214 | 26.0 | 278 x 458 | - | Concrete | 1959 | Yes | E12RS102_1212_1A | Elevations were verified from surveying data. Seismic upgrades planned. |
| 1212 | 1B | Existing | Reservoir 1212-1B | Reservoir 5 | Southwest corner of Fern Ave and Euclid Pl | Rectangular | 2.00 | 1,202 | 1,214 | 11.5 | 166 x 180 | - | Concrete | 1958 | Yes | E12RS101_1212_1B | Plans show depth 12' - 1.1.5'. |
| 1212 | 3 | To Be Abandoned | Reservoir 1212-3 | Reservoir 7 | East side of Campus Ave, north of 8th Street | Irregular | 10.00 | 1,189 | 1,213 | 24.3 | 218 x 398 | - | Concrete | 1926 | Yes | E14RS101_1212_3 | Elevations were verified from surveying data. Seismic upgrades planned. |
| 1212 | 4A | Future | Reservoir 1212-4A | N.A. | North of Rochester Ave and Foothill Blvd | Cylindrical | 8.00 | 1,188 | 1,212 | 24.0 | - | N.A. | N.A. | N.A. | | WMP2019_FUTTA00001_RES_1212_4A_B | Model Equivalent Diamter 337' |
| 1212 | 4B | Future | Reservoir 1212-4B | N.A. | | Cylindrical | 8.00 | 1,188 | 1,212 | 24.0 | - | N.A. | N.A. | N.A. | | | |
| | | | | | | **Total Zone 1212 Volume** | **38.00** | | | | | | | | | | |
| 1348 | 1A | Existing | Reservoir 1348-1A | Reservoir 1 | Southwest corner of Campus Ave and 13th St | Rectangular | 3.00 | 1,328.4 | 1,347.7 | 19.3 | 125.5 x 162.5 | - | Concrete | 1972 | | B14RS104_EQUIV_TANK_1348 | Seismic upgrades planned |
| 1348 | 1B | Existing | Reservoir 1348-1B | Reservoir 2 | | Rectangular | 2.00 | 1,327.6 | 1,348.0 | 20.5 | 107 x 125.5 | - | Concrete | 1955 | Yes | | Seismic upgrades |
| 1348 | 1C | Existing | Reservoir 1348-1C | Reservoir 3 | | Rectangular | 3.75 | 1,328.9 | 1,349.5 | 20.6 | 125.5 x 199.5 | - | Concrete | 1958 | Yes | | Seismic upgrades |
| | | | | | | **Total Zone 1348 Volume** | **8.75** | | | | | | | | | | |
| | | | | | **Total System Volume** | | **105.00** | | | | | | | | | | |

[1] *Reservoirs with hopper bottoms and sloped walls are considered regular shapes (rectangular/cylindrical) as these irregularities in the shape account for insignificant impact on volume.*

## Table 11-3

## Future System Booster Pump Station Summary Table

| | | | Pump Data | | | | | | | | | Efficiency Test | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location of Booster Pump Station | Status | Date of Construction | Name | Old Name | Suction Zone | Discharge Zone | Pump Model | Pump Mfg | Stages | Pump Type | RPM | Capacity (gpm) | TDH (ft) | Test Date | Horse Power | Model ID | Model Pump Curve ID | Comment |
| John Galvin Pump Station 960 N Cucamonga Ontario, CA 91764 | Existing | 1960 | Galvin 1074-1 | Galvin Booster 1A | 1074 | 1212 | 14FHC | Goulds | 3 | VT | 1800 | 3,658 | 152 | 4/18/18 | 250 | H15BP102_GALVIN_1212_1 | GALVIN_BPS_P1_1A | |
| | | | Galvin 1074-2 | Galvin Booster 1B | 1074 | 1212 | 16ENL | Flowserve | 2 | VT | 1780 | 3,145 | 147 | 7/1/13 | 200 | H15BP103_GALVIN_1212_2 | GALVIN_BPS_P2_1B | |
| | | | Galvin 1074-3 | Galvin Booster 1C | 1074 | 1212 | Unknown | | 2 | VT | 1770 | 4,638 | 164 | 4/18/18 | 350 | H15BP104_GALVIN_1212_3 | | Modeled pump with design point |
| | | | Galvin 1074-4 | Booster 2 | 1074 | 1348 | 14HMC | Goulds | 4 | VT | 1800 | 2,016 | 334 | 4/18/18 | 250 | H15BP101_GALVIN_1348_4 | GALVIN_BPS_P4_2 | |
| 1212 Reservoir (10MG) 140 s. Campus, Upland, CA 91786 | Existing | 1959 | Booster 1348-3 | Booster 3 | 1212 | 1348 | 8A-16 | Peerless | - | HSC | 1770 | 3,070 | 157 | 4/18/18 | 150 | E14BP101_BOOSTER_1348_3 | | Modeled pump with design point |
| | | | Booster 1348-4 | Booster 4 | 1212 | 1348 | 6AE16 | Peerless | - | HSC | 1760 | 1,898 | 161 | 4/18/18 | 100 | E14BP102_BOOSTER_1348_4 | BOOSTER_1348_4 | |
| 1559 N. Columbia Ave, Ontario, CA 91764 | Existing | 1960 | Booster 1348-1 | Booster 9A | 1212 | 1348 | 411-BF | Aurora | - | HSC | 1775 | 2,844 | 214 | 4/18/18 | 200 | F13BP101A_BOOSTER_1348_1 | | Modeled pump with design point |
| | | | Booster 1348-2 | Booster 9B | 1212 | 1348 | 411-BF | Aurora | - | HSC | 1778 | 2,613 | 226 | 8/10/18 | 200 | F13BP101B_BOOSTER_1348_2 | | Modeled pump with design point |
| 4251 East Jurupa Ave, east of Dupont Ave | Existing | 2008 | CDA Ontario Booster Pump 1 | N.A. | 925 | 1212 | Unknown | | | | | 1,286 | 302 | 4/18/18 | 150 | M22BP100_ONTARIO_1212_1 | ONTARIO_BPS_P1 | |
| | | | CDA Ontario Booster Pump 2 | N.A. | 925 | 1212 | Unknown | | | | | 1,198 | 295 | 4/18/18 | 150 | M22BP101_ONTARIO_1212_3 | ONTARIO_BPS_P2 | |
| | | | CDA Ontario Booster Pump 3 | N.A. | 925 | 1212 | Unknown | | | | | 1,232 | 295 | 4/18/2018 | 150 | M22BP102_ONTARIO_1212_2 | ONTARIO_BPS_P3 | |
| 4301 E Guasti Rd, east of Milliken Ave | Existing | N.A. | CDA Milliken Booster 1 | N.A. | 1010 | 1212 | 12ENL | Flowserve | 5 | VT | 1770 | 1,525 | 203 | 12/18/2014 | 125 | WMP2019_BP00001_MILLIKAN_1212_1 | MILLIKEN_BPS_P1 | |
| | | | CDA Milliken Booster 2 | N.A. | 1010 | 1212 | 12ENL | Flowserve | 5 | VT | 1770 | 1,520 | 202 | 12/18/2014 | 125 | WMP2019_BP00002_MILLIKAN_1212_2 | MILLIKEN_BPS_P2 | |
| | | | CDA Milliken Booster 3 | N.A. | 1010 | 1212 | 12ENL | Flowserve | 5 | VT | 1770 | 1,525 | 204 | 12/18/2014 | 125 | WMP2019_BP00003_MILLIKAN_1212_3 | MILLIKEN_BPS_P3 | |
| Archibald Ave, north of Cloverfield Rd. (Owned by CDA) | Existing | N.A. | Archibald -1 | N.A. | CDA | 1010 | | Fairbanks Morse | | | | 1061 | 166 | 4/18/2018 | 75 | WMP2019_BP00004_ARCHIBALD_1010_1 | | Modeled pump with design point |
| | | | Archibald -2 | N.A. | CDA | 1010 | | Fairbanks MOrse | | | | 1,112 | 164 | 4/18/2018 | 75 | WMP2019_BP00005_ARCHIBALD_1010_2 | | Modeled pump with design point |
| Bon View between Belmont and Francis | Future | FUTURE | Future 925-1010 Pump Station | N.A. | 925 | 1010 | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | 400 | WMP2019_PS1010 | | Modeled pump with design point |

## Table 11-4

## Future System Pressure Reducing Stations Summary Table

| Station No. | Status | From Zone | To Zone | Location | Diameter (inch) | Pressure Setting (psi) | Ground Elevation (feet) | Model ID |
|---|---|---|---|---|---|---|---|---|
| 2 | Existing | 1074' | 1010' | Euclid Ave, south of Philadelphia St (east side of street) | 4 | 62 | 840 | P13PR102_PRV_2 |
| | | | | | 8 | 58 | | |
| | | | | | 8 | 52 | | |
| 3 | Existing | 1074' | 1010' | Grove Ave, south of Philadelphia St | 4 | 65 | 834 | P15PR101_PRV_3 |
| | | | | | 8 | 60 | | |
| | | | | | 8 | 55 | | |
| 4 | Existing | 1074' | 1010' | Philadelphia St at Vineyard Ave | 6 | 64 | 838 | P17PR103_PRV_4 |
| | | | | | 12 | 57 | | |
| | | | | Pressure Relief | 6 | 90 | | |
| 5 | Existing | 1074' | 1010' | Archibald Ave at Philadelphia St | 4 | 65 | 830 | P19PR101_PRV_5 |
| | | | | | 6 | 60 | | |
| | | | | | 8 | 50 | | |
| 6 | Existing | 1212' | 1074' | Archibald Ave at Jurupa St (adjacent Well 36) | 6 | 65 | 893 | M19PR101_PRV_6 |
| | | | | | 8 | 60 | | |
| 7 | Existing | 1212' | 1010' | Milliken Ave south of Francis St | 3 | 55 | 876 | N22PR101_PRV_7 |
| | | | | | 4 | 50 | | |
| | | | | | 8 | 45 | | |
| 8 | Existing | 1212' | 1010' | Francis St at Etiwanda Ave | 4 | 55 | 878 | N26PR101_PRV_8 |
| | | | | | 8 | 50 | | |
| | | | | | 12 | 40 | | |
| 10 | Existing | 1212' | 1074' | Mission Blvd at Turner Ave | 4 | 80 | 856 | N20PR101_PRV_10 |
| | | | | | 8 | 75 | | |
| | | | | | 10 | 70 | | |
| 11 | Existing | 1212' | 1074' | Phillips Street at Cypress Ave | 4 | 52 | 918 | M12PR101_PRV_11 |
| | | | | | 8 | 47 | | |
| 12 | Existing | 1212' | 1074' | Haven Ave at Francis St (west side of street) | 4 | 79 | 866 | N21PR102_PRV_12 |
| | | | | | 6 | 73 | | |
| | | | | | 10 | 68 | | |
| | | | | Pressure Relief | | - | | |
| 13 | Existing | 1212' | 1010' | Haven Ave at Francis St (east side of street) | 4 | 60 | 866 | N21PR101_PRV_13 |
| | | | | | 6 | 55 | | |
| | | | | | 10 | 50 | | |
| | | | | Pressure Relief | | - | | |
| 15 | Existing | 1348' | 1212' | Fourth St at San Antonio Ave | 6 | 35 | 1,094 | H12PR100_PRV_15 |
| | | | | | 6 | 30 | | |
| 16 | Future | 1010 | 925 | Chino Ave and Campus Ave | N.A. | 55 | 761.1 | WMP2019_FUTVL00002_PRS_16 |
| 17 | Existing | 1010' | 925' | Archibald Ave at Schaefer Ave | 4 | 74 | 728 | U19PR100_PRV_17 |
| | | | | | 10 | 69 | | |
| 18 | Existing | 1010' | 925' | Riverside Dr, west of Milliken Ave | 4 | 54 | 788 | R22PR100_PRV_18 |
| | | | | | 10 | 50 | | |
| | | | | | 14 | 45 | | |
| 21 | Existing | 1212' | 1074' | Euclid St at Phillips St | 6 | 53 | 930 | M13PR100_PRV_21 |
| | | | | | 10 | 48 | | |
| 23 | Future | 1074 | 1010 | Campus Ave and SR-60 | N.A. | 55 | 834 | WMP2019_FUTVL00001_PRS_23 |
| Future 1010 | Future | 1074 | 1010 | Fern Ave and SR-60 | N.A. | 50 | 845 | WMP2019_VL00001_FUTURE1 |

**Table 11-5**
**Existing and Future 925 Zone Facilities**

| Facility Type | Existing Facility Description | | Ultimate Facility Description | |
|---|---|---|---|---|
| Reservoirs | Reservoir 925-2A | 6 MG | Reservoir 925-2B | 6 MG |
| | | | Reservoir 925-1A | 9 MG |
| | | | Reservoir 925-1B | 9 MG |
| Wells | Well 49 - 2,545 gpm | Pumps to Reservoir 925-2A | Well 48 - 2,500 gpm | Pumps to Reservoir 925-2A & 925-2B |
| | | | Well 51 - 2,500 gpm | |
| | | | Well 54 - 2,000 gpm | |
| | | | Well 55 - 2,500 gpm | Pumps to Reservoir 925-1A & 925-1B |
| | | | Well 56 - 2,500 gpm | |
| | | | Well 57 - 2,500 gpm | |
| | | | Well 58 - 2,500 gpm | |
| Treatment | N.A. | | Treatment at Reservoirs 925-1A and 1B | |
| | | | Treatment at Reservoirs 925-2A and 2B | |
| Pressure Reducing Stations | PRS17 - Capable of providing water from 1010 Zone to future 925 Zone at Archibald Ave and Schaeffer Ave | | PRS16 - Capable of providing water from 1010 Zone to future 925 Zone at Chino Ave and Campus Ave | |
| | PRS18 - Capable of providing water from 1010 Zone to future 925 Zone at Riverside Dr and Milliken Ave | | | |
| Altitude Valves | AV-925A at Reservoir 925-2A. | | AV-925B - Capable of providing water from 1074 Zone to future Reservoir 925-1A and 925-1B | |

## 11-5 Future 1010 Zone Facilities

The southerly boundary of the existing 1010 Zone will ultimately be expanded south to Chino Avenue from Euclid Avenue to Milliken Avenue. Currently, mainline pipes are planned in major streets as shown on Figure 11-3. The future pipes will tie into existing 1010 Zone pipes in Riverside Drive.

The following additional facilities are recommended to improve the redundancy of supply into the 1010 Zone:

- Well 39 and Well 50 upgrades will be made to provide water quality treatment, such that the pumps may be reactivated.
- Well 37 will be retrofitted to pump from the 1212 Zone to the 1010 Zone. Currently this well pumps to the 1212 Zone.
- New PRS 23 will reduce pressures from 1074 Zone to 1010 Zone, near Campus and the SR60 Freeway.
- New PRS FUTURE1. Will reduced pressures from the 1074 Zone to the 1010 Zone, near Euclid Avenue and the SR60 Freeway.
- A new booster pump station from 925 Zone to 1010 Zone is recommended to provide water to 1010 Zone in emergencies or when storage reserves are low. The location of this future pump station is near the future Reservoirs 925-1A and 925-1B.

## 11-6 Future 1074 Zone Facilities

The following improvements are necessary for facilities that have reached the end of their useful lives or require system upgrades.

- All existing wells in the 1010 Zone (Well 35, 36, 40, 44, 45, and 52) are currently operational; however, due to existing and upcoming water quality issues, treatment and/or other facility improvements maybe required.
- Improvements are necessary for Reservoirs 1074-1A and 1074-1B, based on the City's recommendations included in the 2012 Seismic Risk of City's Potable Water Reservoirs technical memorandum. While Reservoir 1074-1B (2 MG) was constructed in 1957 and has reached the end of its useful life, it is expected that the reservoir may continue operating once the recommended rehabilitation project has been implemented. This reservoir should be re-inspected and condition assessed every three (3) years, at minimum, to determine the additional rehabilitation/replacement project needs.
- The John Galvin Pump Station was constructed in 1960 and has reached the end of its useful life. It is recommended that a condition assessment of this pump station be conducted to identify all necessary improvement projects.

## 11-7 Future 1212 Zone Facilities

The following additional facilities are recommended to improve the redundancy of supply into the 1212 Zone:

- It is recommended that the future 1212 Zone include two additional 8 MG reservoirs (1212-4A and 1212-4B) to replace the existing Reservoir 1212-3 and to meet the storage criteria.
- Under future conditions, the City has access of up to 25 mgd capacity from the WFA connections in the 1212 Zone and 1348 Zone. Currently, the City's operations staff have experienced a maximum of 15.4 mgd from these turnouts.
- The City will construct Well 42 and Well 43 to provide an additional 5200 gpm capacity to the 1212 Zone. Well 43 has been drilled, but needs to be equipped before being placed into service.

The following improvements are necessary for facilities that have reached the end of their useful lives or require system upgrades.

- Well 38, 41, and 47 are currently operational; however, due to existing and upcoming water quality issues, treatment and/or other facility improvements may be required.
- Wells 24, 29, 30, and 31 will also require facility upgrades to meet water quality requirements. These wells are also expected to reach the end of their useful lives in the next 10 to 20 years. It is recommended that the City evaluate the condition of these wells to determine if additional improvements or replacement is necessary.
- Reservoir 1074-1A (20 MG) and Reservoir 1074-1B (2 MG) were constructed in 1959 and 1958, respectively. Per the criteria for concrete reservoirs, these facilities have reached the end of its useful life. These reservoirs should be re-inspected and condition assessed every three (3) years, at minimum, to determine the rehabilitation/replacement project needs.
- Booster pumps 1348-3 and 1348-4 are located at the pump station near Reservoir 1212-3. This pump station was constructed in 1959, and has reached the end of its useful life. Concurrent to this master planning effort, the City is conducting a condition assessment of this pump station, which will include recommendations to rehabilitate this facility.
- The booster pump station that house pumps 1348-1 and 1348-2 was constructed in 1960, and has reached the end of its useful life. It is recommended that a condition assessment of these pump stations be conducted to identify all necessary improvement projects.

## 11-8 Future 1348 Zone Facilities

The following improvements are necessary for facilities that have reached the end of their useful lives or require system upgrades.

- Well 46 is currently operational; however, due to existing and upcoming water quality issues, treatment and/or other facility improvements will be required.
- Reservoir 1348-1B (2 MG) and Reservoir 1074-1C (3.75 MG) were constructed in 1955 and 1958, respectively. Per the criteria for concrete reservoirs, these facilities have reached the end of its useful life. These reservoirs should be re-inspected and condition assessed every three (3) years, at minimum, to determine the rehabilitation/replacement project needs.

# SECTION 12

# FUTURE SYSTEM ANALYSIS

## 12-1 General

The established system criteria and calibrated system computer model were utilized in analyzing the system, and evaluating its adequacy. As discussed in Section 10, the model was utilized to perform the existing system analyses. The hydraulic model was updated to include the existing system improvement projects that were identified in Section 10 and the known future system facility expansion projects detailed in Section 11.

The hydraulic model was used to identify existing deficiencies and develop mitigation projects based on the future system analyses under average day, maximum day, and peak hour and maximum day plus fire flow conditions.

A capital improvement program was developed as a result of these analyses. Recommended projects and cost estimates are discussed in Section 13 of this Master Plan Report.

## 12-2 Future Source of Supply

It is prudent to secure water supplies from multiple sources so that demands can be met at reasonable levels when one or more water sources are not available. The City's future water demands are summarized in Table 12-1.

For planning purposes, the City's future sources of supply must be able to meet the minimum City and state supply requirements.

**Table 12-1**
**Future System Demand**

| Demand Description | Total System Demand | | |
|---|---|---|---|
| | (gpm) | (mgd) | (AFY) |
| Average Day | 35,716 | 51.43 | 57,610 |
| Max Day | 54,778 | 78.88 | 88,357 |
| Peak Hour[1] | 73,132 | 105.31 | 117,963 |

[1] *Estimated from Future System Model*

### 12-2.1 Future Average Day Demand

The criterion established requires a source of supply equal to one average day demand (ADD) (35,716 gpm) from local sources.

The City's future source of supply is detailed in Table 12-2. The City's local water source include direct access to groundwater from the Chino Basin, which is managed by the Chino Basin Watermaster. The City's existing and future wells have a capacity of 65,330 gpm, which is about 183% the future ADD.

**Table 12-2**
**Future Source of Supply**

| Source | Capacity | | |
|---|---|---|---|
| | gpm | mgd | AFY |
| Existing Wells[1] | 35,530 | 51.2 | 57,310 |
| Future Wells[1] | 29,800 | 42.9 | 48,068 |
| WFA | 10,700 | 15.4 | 17,259 |
| CDA | 5,290 | 7.6 | 8,533 |
| **Total** | **81,320** | **117.1** | **131,170** |

[1] *Well 37 will be retrofitted to pump to Zone 1010.*

### 12-2.2 Future Maximum Day Demand

California Code of Regulations Related to Drinking Water requires a minimum source of supply of one maximum day demand (MDD) of the service area. Under this criterion, reservoirs are typically needed to regulate hourly fluctuations in demand, provide fire flow and supplement supply during an outage of a source for an extended duration.

As detailed in Table 12-2, the total future source of supply is equivalent to 81,320 gpm. This is about 149% of the City's future MDD (54,778 gpm). With 65,330 gpm from existing and future groundwater sources alone, the City is capable of providing the full projected MDD.

The available future imported water from the Chino Desalter Authority (CDA) and Water Facility Authority (WFA) total 15,990 gpm (29% of the future MDD). If some wells are out of service, the City would need 38,788 gpm (54,778 gpm – 15,990 gpm) from groundwater sources to supply the remaining MDD. This is about 59% of the future system well capacity.

### 12-2.3 Future Peak Hour Demand

California Code of Regulations Related to Drinking Water, Chapter 16, Section 64554 requires that if a system has more than 1,000 service connections, it must be capable of providing four (4) hours of peak hourly demand (PHD) through a combination of source capacity, storage capacity, and/or emergency source connections.

The estimated future peak hour demand from the hydraulic model is 73,132 gpm. The City's future total supply (81,320 gpm) is greater than the peak hour demand. Storage capacity is not necessary to meet the future peak hour demand supply criteria.

## 12-3 Storage

### 12-3.1 Storage Criteria Summary

**Operational Storage**

For the City of Ontario's system, operational storage criterion is based on 30 percent of the maximum day demand for OR, and 25 percent of maximum day demand for OMC due to the diversity of demands in OMC.

**Emergency Storage**

The City's emergency storage criterion is set at one average day demand. For a system that depends mostly on groundwater supplies, this amount of emergency storage is adequate and is primarily for response in operations due to a loss of a major source of supply.

**Fire Suppression Storage**

Fire suppression storage is the volume required to supply the service area with the required fire flows, which range from 1,500 to 4,000 gpm for a duration of two (2) to four (4) hours.

The fire flow suppression storage and operational storage is increased by 15 percent so that a portion of the reservoir volume is available for variations in elevation, and to provide submergence over the reservoir outlet pipes. In an emergency, the emergency storage volume, as well as the operational storage volume and the fire suppression storage volume would all be available for use.

### 12-3.2 Future Storage Analysis

With anticipated development in the OR service area, the City is planning for additional storage in the 925 Zone 925 and the 1212 Zone. Table 12-3 shows the future storage capacity in each zone, and the reservoir capacity.

**Table 12-3**

**Future Storage Analysis**

| Zone | 1348 | 1212 | 1074 | 1010 | 925 | Total System |
|---|---|---|---|---|---|---|
| Average Day Demand (mgd) | 3.08 | 16.27 | 5.91 | 9.06 | 17.12 | 51.43 |
| Maximum Day Demand (mgd) | 4.89 | 25.17 | 9.16 | 13.98 | 25.68 | 78.88 |
| [1]Fire Flow Demand (gpm) | 3,500 | 4,000 | 4,000 | 4,000 | 4,000 | - |
| Fire Flow Duration (hrs) | 4 | 4 | 4 | 4 | 4 | - |
| [2]Fire Suppression Storage (MG) | 0.84 | 0.96 | 0.96 | 0.96 | 0.96 | - |
| [3]Operational Storage (MG) | 1.22 | 6.29 | 2.29 | 3.49 | 7.70 | 21.00 |
| [4]Emergency Storage (MG) | 3.08 | 16.27 | 5.91 | 9.06 | 17.12 | 51.43 |
| [5]Total Storage Required (MG) | 5.45 | 24.61 | 9.65 | 14.18 | 27.08 | 80.97 |
| [6]Existing Available Storage (MG) | 8.75 | 38.00 | 4.75 | 23.50 | 30.00 | 105.00 |
| Zone Surplus / Deficit (MG) | 3.30 | 13.39 | -4.90 | 9.32 | 2.92 | 24.03 |

*[1] Highest fire flow required in zone*

*[2] Fire flow multiplied by duration*

*[3] 30% of maximum day demand for NMC, 25% of maximum day demand for OMC*

*[4] One average day demand*

*[5] (1.15 x (fire suppression+operational storage))+emergency*

A deficit of 4.90 MG is calculated in the 1074 Zone. The construction of additional storage in the 1074 Zone is not recommended due to cost of construction and locating an appropriate site. There is 13.39 MG of surplus storage within the 1212 Zone that could be transferred to the 1074 Zone through altitude valve 1074A at the Reservoir 1074-1 site, as well as through PRS 6, 10, 11, 12 and 21 to make up for this deficit.

## 12-4 Pipeline Replacement Program

As detailed in Section 10-3.4, the City has a pipeline replacement program that is intended to target the replacement of pipes that have exceeded their useful lives and/or have diameters that are less than the minimum 8-inch in diameter criteria. The City currently prioritizes the pipe replacement projects based on operational information such as historical pipe leaks, historical breaks, or maintenance issues.

Approximately 1,105,000 feet of pipe will need to be replaced due to size and or age.

## 12-5 Future System Hydraulic Model Analysis

The future system model scenarios include the known future facilities, the future development demands, the future supplies, and planned future operations. As detailed in Section 10-5-4, pipe replacements are recommended for all pipes less than 8-inches in diameter and for all pipes that were constructed after 1970. Likewise, fire hydrant lateral replacements were recommended for hydrant laterals with diameters less than 6-inch, as well as older metal pipes that experience higher friction losses. The geometry for the future system model scenario was adjusted such that the minimum pipe diameter is 8-inches and minimum hydrant lateral diameter is 6-inch minimum.

### 12-5.1 Future Average Day Demand and Maximum Day Demand Scenarios

The pressures during the future ADD scenario were above the City's dynamic pressure criteria (40 psi) throughout the service area. The future system was also evaluated under the MDD scenario, which include the peak hour demand. All system pressures meet the City's minimum pressure requirements. The future system analysis resulted in the 24-hour average pressure contours shown on Figure 12-1.

For the future system model scenarios, the pipe diameters were increased to meet the City's maximum velocity criteria of 7 ft/s or less. The maximum velocities are detailed on Figure 12-2. The 12-inch pipe on Archibald Avenue south of Riverside Drive has a maximum velocity of 7.1 feet per second, which is due to water moving between the 1010 Zone and 925 Zone, through PRS17. If these velocities affect the pipe condition, the valve setting may be adjusted to restrict the flowrate from the upstream piping.

### 12-5.2 Future Maximum Day plus Fire Flow Scenario

The future fire flow system analysis was conducted with known future facilities and demands under maximum day plus fire flow conditions.

Fire flow demands, as listed in Table 7-1, were applied at all model fire hydrant locations. If a fire node was located near multiple land use types, the highest fire flow demand was utilized. The fire flow criterion requires a residual pressure of 20 psi at the fire hydrant outlet. The system evaluation is therefore based on providing 20 psi at the model hydrant.

When the fire flow analysis was initially run, there were areas within the system that could not meet the fire flow requirement. These areas were generally industrial and high density residential land use types, where the fire flow requirement is 4,000 gpm and 3,500 gpm, respectively. The fire flow deficiencies were due to small pipe sizes or dead end mainlines. The City currently requires a minimum pipe size of 12-inch diameter in commercial and industrial areas. The initial fire flow deficiencies were often remedied by increasing the existing pipe diameter to 12-inches. In some cases, pipe looping was also necessary. The available fire flow contours at 20 psi for the future system are illustrated on Figure 12-3.

Hydrants that are unable to meet the fire flow requirement are also detailed on Figure 12-3 and summarized in Appendix 12-1. These hydrants are located on private property and require improvements to the private system. No recommendations were made to private pipes and laterals, and no private system improvements are included in the capital improvement program.

The recommended fire flow improvements are illustrated on Figure 12-4 and detailed in Table 12-4.

**Table 12-4**
**Recommended Fire Flow Improvements**

| Zone | Fire Flow Deficiency Upsize | Fire Flow Deficiency Looping | | | | Total Footage |
|---|---|---|---|---|---|---|
| | Future Size 12" (ft) | Future Size 6" (ft) | Future Size 8" (ft) | Future Size 12" (ft) | Future Size 16" (ft) | |
| 925 | | | | | | 0 |
| 1010 | 3,657 | | 31 | | | 3,688 |
| 1074 | 51,115 | 127 | 79 | 1,130 | | 52,451 |
| 1212 | 2,735 | 235 | 2,196 | 156 | 955 | 6,277 |
| 1348 | 1,658 | | | | | 1,658 |
| **Total** | **59,165** | **362** | **2,305** | **1,287** | **955** | **64,074** |

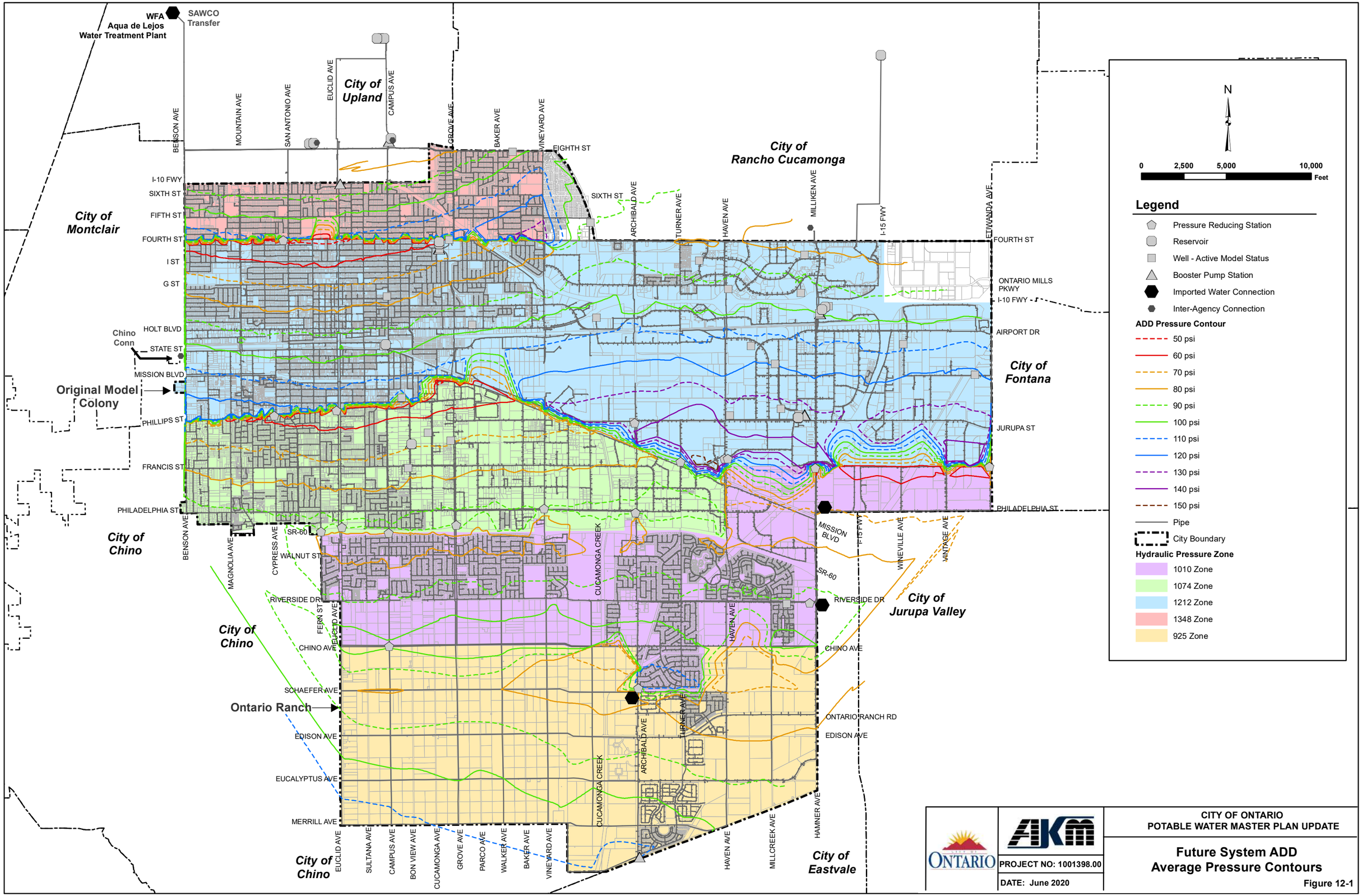
WFA
Aqua de Lejos
Water Treatment Plant
SAWCO
Transfer
City of Upland
City of Rancho Cucamonga
City of Montclair
City of Fontana
City of Chino
City of Jurupa Valley
City of Eastvale
Chino Conn
Original Model Colony
Ontario Ranch
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ELWANDA AVE
I-10 FWY
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
PHILADELPHIA ST
ONTARIO MILLS PKWY
AIRPORT DR
JURUPA ST
MAGNOLIA AVE
CYPRESS AVE
SR-60
WALNUT ST
RIVERSIDE DR
FERN ST
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
CUCAMONGA CREEK
WINEVILLE AVE
VINTAGE AVE
ONTARIO RANCH RD
SULTANA AVE
BON VIEW AVE
CUCAMONGA AVE
PARCO AVE
WALKER AVE
MILLCREEK AVE
HAMNER AVE
N
0
2,500
5,000
10,000
Feet
Legend
Pressure Reducing Station
Reservoir
Well - Active Model Status
Booster Pump Station
Imported Water Connection
Inter-Agency Connection
ADD Pressure Contour
50 psi
60 psi
70 psi
80 psi
90 psi
100 psi
110 psi
120 psi
130 psi
140 psi
150 psi
Pipe
City Boundary
Hydraulic Pressure Zone
1010 Zone
1074 Zone
1212 Zone
1348 Zone
925 Zone
ONTARIO
AKM
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Future System ADD
Average Pressure Contours
Figure 12-1

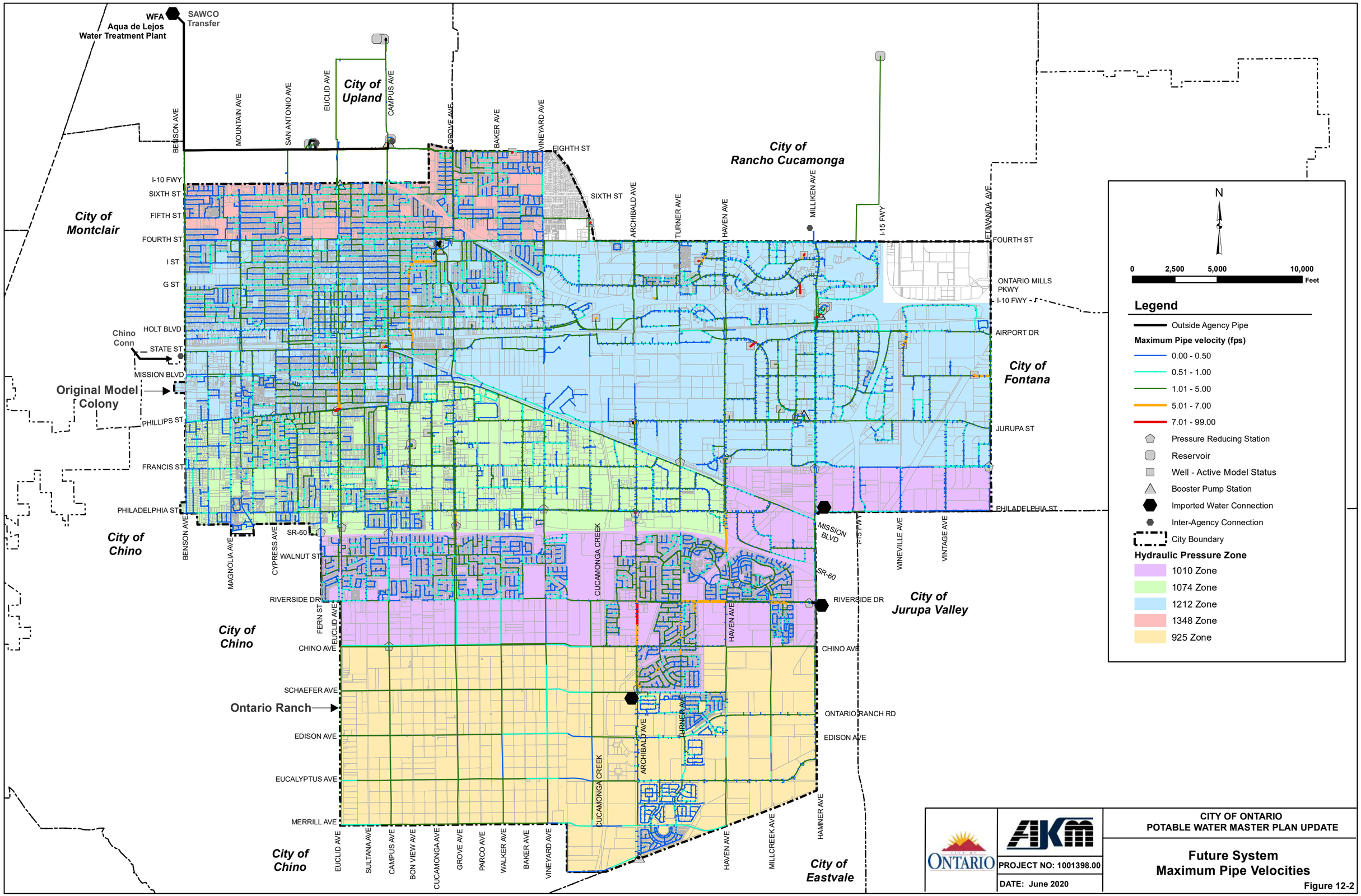


CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE

PROJECT NO: 1001398.00

DATE: June 2020

**Future System**
**Maximum Pipe Velocities**

Figure 12-2

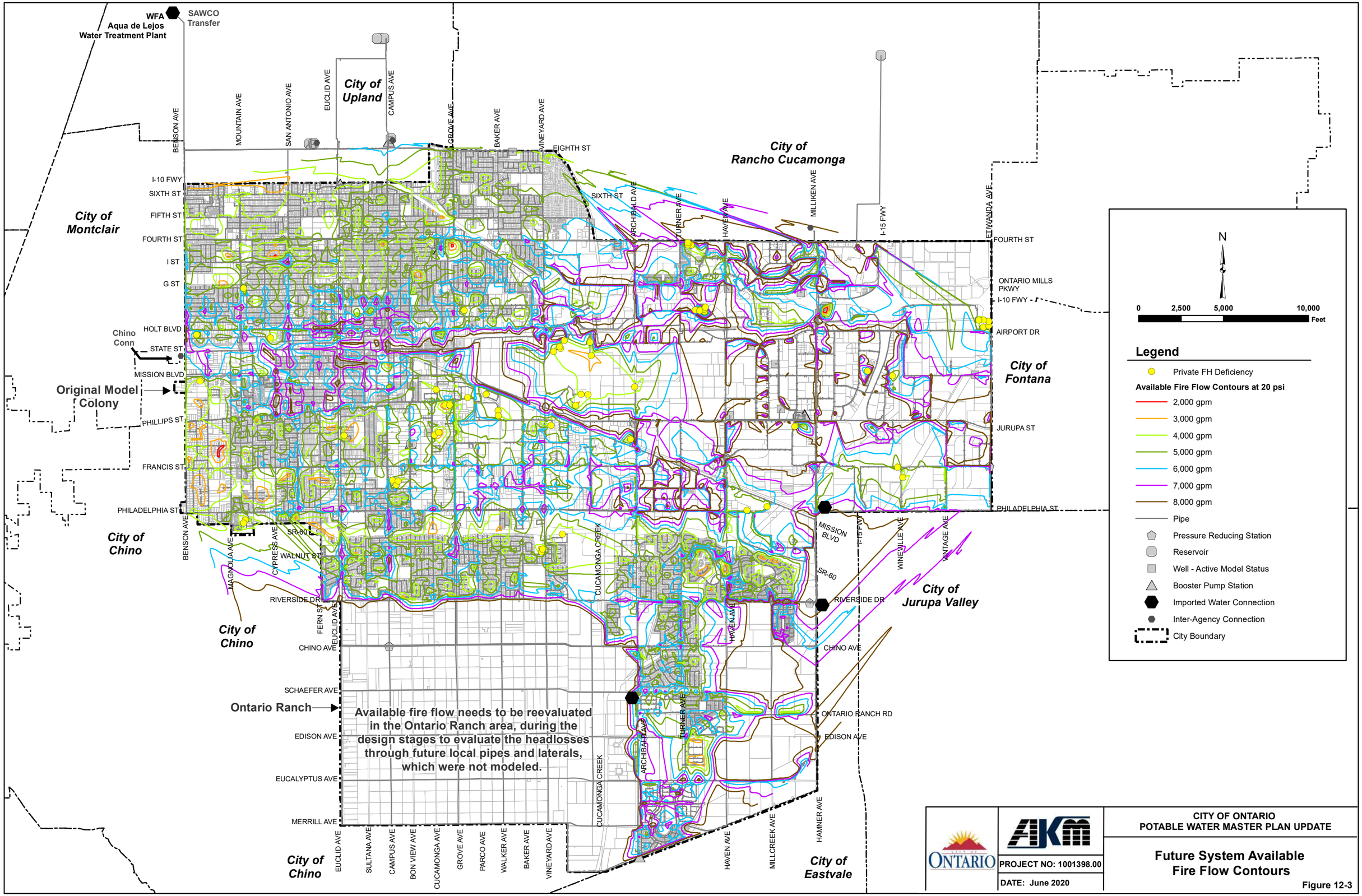
WFA
Aqua de Lejos
Water Treatment Plant
SAWCO
Transfer
City of Upland
City of Rancho Cucamonga
City of Montclair
City of Fontana
City of Jurupa Valley
City of Chino
City of Eastvale
Chino Conn
Original Model Colony
Ontario Ranch
Available fire flow needs to be reevaluated in the Ontario Ranch area, during the design stages to evaluate the headlosses through future local pipes and laterals, which were not modeled.
BENSON AVE
MOUNTAIN AVE
SAN ANTONIO AVE
EUCLID AVE
CAMPUS AVE
GROVE AVE
BAKER AVE
VINEYARD AVE
EIGHTH ST
SIXTH ST
ARCHIBALD AVE
TURNER AVE
HAVEN AVE
MILLIKEN AVE
I-15 FWY
ELWANDA AVE
FOURTH ST
ONTARIO MILLS PKWY
I-10 FWY
AIRPORT DR
JURUPA ST
PHILADELPHIA ST
I-10 FWY
SIXTH ST
FIFTH ST
FOURTH ST
I ST
G ST
HOLT BLVD
STATE ST
MISSION BLVD
PHILLIPS ST
FRANCIS ST
PHILADELPHIA ST
BENSON AVE
MAGNOLIA AVE
CYPRESS AVE
SR-60
WALNUT ST
RIVERSIDE DR
FERN ST
EUCLID AVE
CHINO AVE
SCHAEFER AVE
EDISON AVE
EUCALYPTUS AVE
MERRILL AVE
CUCAMONGA CREEK
MISSION BLVD
I-15 FWY
WINEVILLE AVE
VINTAGE AVE
SR-60
RIVERSIDE DR
CHINO AVE
ONTARIO RANCH RD
EDISON AVE
HAVEN AVE
TURNER AVE
ARCHIBALD AVE
CUCAMONGA CREEK
EUCLID AVE
SULTANA AVE
CAMPUS AVE
BON VIEW AVE
CUCAMONGA AVE
GROVE AVE
PARCO AVE
WALKER AVE
BAKER AVE
VINEYARD AVE
HAVEN AVE
MILLCREEK AVE
HAMNER AVE
N
0
2,500
5,000
10,000
Feet
Legend
Private FH Deficiency
Available Fire Flow Contours at 20 psi
2,000 gpm
3,000 gpm
4,000 gpm
5,000 gpm
6,000 gpm
7,000 gpm
8,000 gpm
Pipe
Pressure Reducing Station
Reservoir
Well - Active Model Status
Booster Pump Station
Imported Water Connection
Inter-Agency Connection
City Boundary
ONTARIO
AKM
PROJECT NO: 1001398.00
DATE: June 2020
CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE
Future System Available
Fire Flow Contours
Figure 12-3

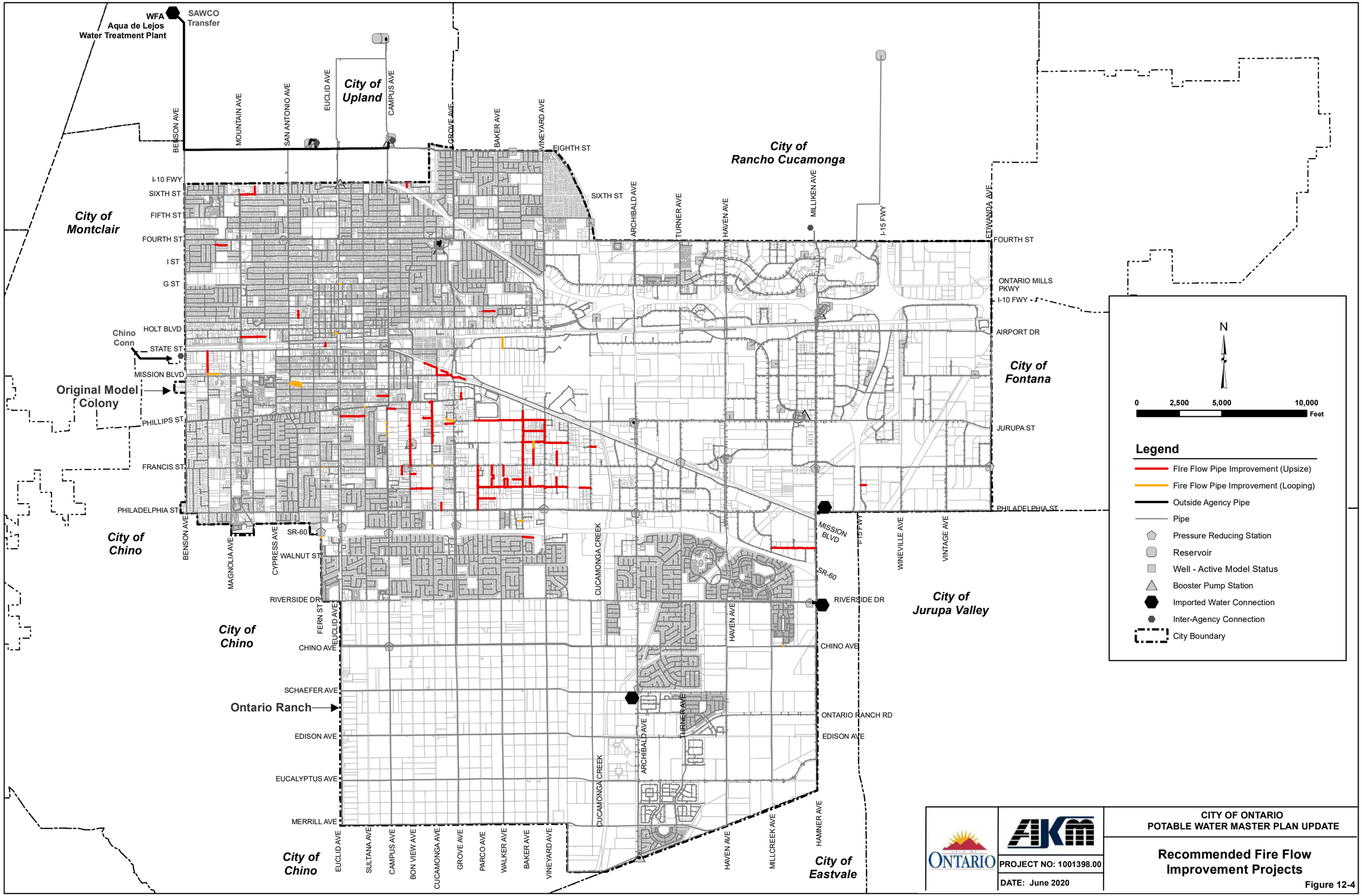


CITY OF ONTARIO
POTABLE WATER MASTER PLAN UPDATE

PROJECT NO: 1001398.00

DATE: June 2020

**Recommended Fire Flow Improvement Projects**

Figure 12-4

# SECTION 13

# CAPITAL IMPROVEMENT PROGRAM

## 13-1 Introduction

The primary goal of the Capacity Improvement Program (CIP) is to provide the City of Ontario with a long-range planning tool for implementing its water system improvements in an orderly manner and a basis for financing of these improvements. The CIP consists of projects that will enhance the system to meet the established criteria, properly maintain the system's assets, and replace the facilities that have reached the end of their useful lives.

## 13-2 Project Descriptions

Proposed facility improvement projects and costs are planning level estimates. Specific alignments and refined cost estimates should be developed as a part of the preliminary design phase for each recommended pipeline project.

It should be noted that some of the improvements recommended herein are conceptual in nature based on existing available planning information. Therefore, they should not be considered as absolute for final design. Further analysis and refinement will be necessary prior to commencing work on the final plans, specifications and estimates package for each project. Detailed preliminary design studies should be prepared to select the final design projects.

Improvement projects are categorized as Existing System Improvement Projects, Annual Improvement Projects, Condition Projects – Mainline Replacement Program, Condition Projects – Facility Improvement Program, or Future System Development Projects.

Existing System Improvement Projects include:

- Improvements identified from the hydraulic model analysis, such as velocity and fire flow deficiencies.
- Projects identified from the City's operations and engineering staff, to improve the condition of the main facilities such as reservoirs.
- Projects included on the City's existing DIF maps in the OMC area

Annual Improvement Projects are projects that need to be regularly updated and include:

- Reservoir recoating/repainting/ and repair improvements
- Meter replacement

Condition Projects – Mainline Replacement Program include:

- Small diameter pipes
- Pipes exceeding useful lives

Condition Projects – Facility Improvement Program include:

- Improvements to existing fire hydrant lateral size and/or material
- Wells exceeding useful lives
- Pump stations exceeding useful lives
- Reservoirs exceeding useful lives

Future System Development Projects include:

- DIF projects in the OR area

## 13-3 Project Cost Estimate

The capital improvement projects are developed based upon the results of the existing system analysis and future system analysis, which are described in detail in Section 10 and Section 12, respectively.

The cost estimates are based upon recent information for similar projects in the City of Ontario, and include contingencies for this planning level study. The cost estimates are based on the unit construction costs, detailed in Table 13-1. Pipeline costs take into consideration the size of the pipe as well as whether the construction will be within the OMC or OR areas. OMC is largely developed and there are many existing utilities to consider; therefore, the costs of replacing water pipes will be generally higher than the new construction costs in undeveloped areas such as OR.

Pipe improvements recommendations in the OMC are based on the replacement of the existing pipes. Replacement costs are generally more conservative and will therefore allow the City more flexibility for each project. Preliminary design studies should be conducted, utilizing detailed utility information to identify and evaluate project alternatives such as parallel pipes.

The estimated unit costs for wells include permanent back-up power.

**Table 13-1**
**Unit Cost Summary**

| Type | | Units | OMC | OR |
|---|---|---|---|---|
| Pipe | 6-inch [1] | $/LF | $108.36 | $72.00 |
| Pipe | 8-inch | $/LF | $144.48 | $96.00 |
| Pipe | 12-inch | $/LF | $216.72 | $144.00 |
| Pipe | 16-inch | $/LF | $288.96 | $192.00 |
| Pipe | 18-inch | $/LF | $325.08 | $260.06 |
| Pipe | 24-inch | $/LF | $433.44 | $331.56 |
| Pipe | 30-inch | $/LF | $541.80 | $403.05 |
| Pipe | 36-inch | $/LF | $650.16 | $486.31 |
| Pipe | 42-inch | $/LF | $758.52 | $557.81 |
| Well | | $/LS | $4,000,000.00 | |
| Reservoir | | $/MG | $1,444,800.00 | |
| Pump Station | | $/HP | $6,000.00 | |
| PRS | | $/LS | $680,260.00 | |
| Treatment Plant | | $/Well | $6,324,111.00 | |

[1] *6-inch recommendation for laterals only*

Cost estimates for currently planned improvement projects in the near future were provided by the City.

The total costs include construction, contingency, engineering, design, and construction management costs. The individual cost components are calculated as follows:

1. Base Cost = Unit Cost x Recommended Units
2. Contingency Cost for Original Model Colony Projects = 10% of the Base Cost
3. Construction Cost = Base Cost + Contingency Cost
4. Engineering and Design Cost = 10% of the Construction Cost
5. Construction Management Cost = 5% of the Construction Cost
6. Total Cost = Construction Cost + Engineering and Design Cost + Construction Management Cost

Construction costs can be expected to fluctuate as changes occur in the economy. These costs should therefore be reevaluated and updated annually based upon Engineering News Record (ENR) Index for the Los Angeles area (ENRLA), with the base ENRLA Index of 12,144.49 for January 2020.

The recommended CIP is detailed in Table 13-2. Project locations are shown on Plate-1. A summary of the total costs are as follows:

| | |
|---|---|
| Existing System Improvement Projects: | $237,900,000 |
| Condition Projects – Mainline Replacement Program: | $226,200,000 |
| Condition Projects – Facility Improvement Program: | $89,600,000 |
| Future System Development Projects: | $225,600,000 |
| **Total CIP cost:** | **$779,300,000** |
| | |
| Annual Improvement Projects: | $3,600,000/Year |

## 13-4 Project Priorities

The primary consideration in establishing project priorities for the capital improvement program list must always be given to the health, safety and welfare of the public and the customers. In general, the projects necessary to improve the existing system are scheduled earlier in the order of supply, pumping and storage.

With these guidelines, the projects recommended in this report and their estimated costs were examined and sorted. Each project is shown with its total estimated project cost. The City should review this schedule and adjust it annually to respond to changed conditions and to take advantage of concurrent construction such as street paving projects or adjacent infrastructure work.

Projects in Ontario Ranch or related to service to Ontario Ranch will be dependent upon the progression of development, which is continually changing. Therefore, the Ontario Ranch projects are not prioritized in Table 13-2.

**Table 13-2**

**Capital Improvement Program**

| Existing System Capital Improvement Projects | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
| O01[1] | OMC | Ex | Other | WT-026 | 1348 Zone Reservoirs Structural Retrofits | N.A. | 1 | Reservoir | $5,800,000.00 | LS | $5,800,000 | $580,000 | $6,380,000 | $638,000 | $319,000 | $7,337,000 |
| O02 | OMC | Ex | Other | WT-026 | Reservoir 1010-1A Piping Seismic Retrofits | Completed | | | | | | | | | | |
| S01[1] | OMC | Ex | Supply | WT-002 | CIP Well #43 in the 1212 Zone Equipping of Well drilled in 2008 | N.A. | 1 | Well | $1,600,000.00 | $/Well | $1,600,000 | $160,000 | $1,760,000 | $176,000 | $88,000 | $2,024,000 |
| S02 | OMC | Ex | Supply | WT-002 | CIP Well #42 in the 1212 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S03 | OMC | Ex | Supply | WT-032 | Treatment for OMC Wells | N.A. | 12 | Well | $6,324,111 | $/Well | $75,889,328 | $7,588,933 | $83,478,261 | $8,347,826 | $4,173,913 | $96,000,000 |
| S04[2] | OMC | Ex | Supply | WT-002 | 18-inch Well #42 Collector Line (1212 Zone) | 18 | 600 | ft | $325.08 | $/ft | $195,048 | $19,505 | $214,553 | $21,455 | $10,728 | $246,736 |
| S05 | OMC | Ex | Supply | WT-009 | 18-Inch to PRS23 P-14 (1074 Zone) | 18 | 2,620 | ft | $325.08 | $/ft | $851,710 | $85,171 | $936,881 | $93,688 | $46,844 | $1,077,413 |
| Skipped | OMC | | Supply | WT-032 | Skipped | Skipped | | | | | | | | | | |
| S07 | OMC | Ex | Supply | WT-023 | Well #11 Abandon due to continuing sanding problem (1074 Zone) | Completed | | | | | | | | | | |
| R01 | OMC | Ex | Reliability | WT-017 | Backup Power for Well 39 (500 KW) - 1010 Zone | Completed | | | | | | | | | | |
| ST01[1] | OMC | Ex | Storage | WT-026 | Reservoir 1212-3, seismic rehabiliation (Improvements included in 2012 Tech Memo) | N.A. | 73,100 | sq ft | $10.00 | $/sq ft | $4,017,694 | $401,769 | $4,419,463 | $441,946 | $220,973 | $5,082,383 |
| ST02 | OMC | | Storage | WT-009 | Booster Pump Station from 1010 Zone to 1074 Zone - Location to be determined | Removed | | | | | | | | | | |
| O03 | OMC | | Other | WT-035 | Airport Metering and Backflow Prevention - Planning | Removed | | | | | | | | | | |
| O04 | OMC | | Other | WT-035 | Airport Metering and Backflow Prevention - Construction | Removed | | | | | | | | | | |
| R02[1] | OMC | Ex | Reliability | WT-017 | Portable Generator Connection and Manual Transfer Switchs at Well 31 and Well 39. | N.A. | 1 | Well | $300,000.00 | Lump Sum | $300,000 | $30,000 | $330,000 | $33,000 | $16,500 | $379,500 |
| R03[1] | OMC | Ex | Reliability | WT-017 | Portable Generators-850 KW | N.A. | 1 | EA | $670,000.00 | $/Genset | $670,000 | $67,000 | $737,000 | $73,700 | $36,850 | $847,550 |

**Table 13-2 (Continued)**

**Capital Improvement Program**

**Existing System Capital Improvement Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S08 | OMC | Ex | Supply | WT-023 | Abandon Existing OMC Well #3 | Completed | | | | | | | | | | |
| S09 | OMC | Ex | Supply | WT-023 | Abandon Existing OMC Well #4 | Completed | | | | | | | | | | |
| S10 | OMC | Ex | Supply | WT-023 | Abandon Existing OMC Well #16 | Completed | | | | | | | | | | |
| S11 | OMC | | Supply | WT-023 | Skipped | Skipped | | | | | | | | | | |
| S12 | OMC | | Supply | WT-025 | Abandon John Galvin Facility | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| P01[2] | OMC | Ex | DIF 1212 Zone | WT-004 | 24-inch pipeline in Campus Ave from Eighth St to Fourth St (1212 Zone) | 24 | 5,400 | ft | $433.44 | $/ft | $2,340,576 | $234,058 | $2,574,634 | $257,463 | $128,732 | $2,960,829 |
| P02 | OMC | Ex | DIF 1212 Zone | WT-004 | 30-inch pipeline in Eighth St from Reservoir 1212-1A and 1212-1B to San Antonio Ave (1212 Zone) | 30 | 1,650 | ft | $541.80 | $/ft | $893,970 | $89,397 | $983,367 | $98,337 | $49,168 | $1,130,872 |
| P03 | OMC | Ex | DIF 1212 Zone | WT-004 | 30-inch pipeline in San Antonio Ave from Eighth St to Fourth St (1212 Zone) | 30 | 2,100 | ft | $541.80 | $/ft | $1,137,780 | $113,778 | $1,251,558 | $125,156 | $62,578 | $1,439,292 |
| P04 | OMC | Ex | DIF 1212 Zone | WT-004 | 18-inch pipeline in Fourth St from Elderberry Ave to Benson Ave (1212 Zone) | 18 | 1,800 | ft | $325.08 | $/ft | $585,144 | $58,514 | $643,658 | $64,366 | $32,183 | $740,207 |
| P05[2] | OMC | Ex | DIF 1212 Zone | WT-004 | 18-inch pipeline in Fourth St from San Antonio Ave to Vine Ave (1212 Zone) | 18 | 1,800 | ft | $325.08 | $/ft | $585,144 | $58,514 | $643,658 | $64,366 | $32,183 | $740,207 |
| P06[2] | OMC | Ex | DIF 1212 Zone | WT-004 | 18-inch pipeline in Vine Ave from Fouth St to J St (1212 Zone) | 18 | 700 | ft | $325.08 | $/ft | $227,556 | $22,756 | $250,312 | $25,031 | $12,516 | $287,858 |
| P07 | OMC | Ex | Pressure | WT-004 | 18-inch pipeline in J St from Vine Ave to Euclid Ave (1212 Zone) | Completed | | | | | | | | | | |
| P08 | OMC | Ex | Pressure | WT-004 | 24-inch pipeline in J St east side of Euclid Ave (1212 Zone) | Completed | | | | | | | | | | |
| P19[2] | OMC | Fut | DIF 1212 Zone | WT-004 | 16-inch Ontario International Airport Loop (1212 Zone) | 16 | 3,850 | ft | $288.96 | $/ft | $1,112,496 | $111,250 | $1,223,746 | $122,375 | $61,187 | $1,407,307 |
| P20[2] | OMC | Fut | DIF 1212 Zone | WT-004 | 18-inch Ontario International Airport Loop (1212 Zone) | 18 | 33,200 | ft | $325.08 | $/ft | $10,792,656 | $1,079,266 | $11,871,922 | $1,187,192 | $593,596 | $13,652,710 |

**Table 13-2 (Continued)**

**Capital Improvement Program**

**Existing System Capital Improvement Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P09 | OMC | Fut | Pressure | WT-036 | PRS 21 at Euclid Ave and Phillips St (from 1212 Zone to 1074 Zone) | Completed | | | | | | | | | | |
| P10 | OMC | Fut | Pressure | WT-036 | PRS 22 at Vineyard Ave and Mission Blvd (from 1212 Zone to 1074 Zone) | Completed | | | | | | | | | | |
| P11 | OMC | Fut | Pressure | WT-036 | 12-inch & 18-inch pipeline in Grove Ave from Philips St to Francis St (1074 Zone) | Completed | | | | | | | | | | |
| P12 | OMC | Fut | Pressure | WT-009 | 12-inch pipeline in Euclid Ave from PRS 2 at SR-60 to Walnut St (1010 Zone) | Completed | | | | | | | | | | |
| P13[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 16-inch pipeline in Grove Ave from PRS 3 at SR-60 to Walnut St (1010 Zone) | 16 | 1,850 | ft | $288.96 | $/ft | $534,576 | $53,458 | $588,034 | $58,803 | $29,402 | $676,239 |
| P14 | OMC | Fut | DIF 1074 Zone | WT-009 | PRS 23 at SR-60 and Campus Ave (from 1074 Zone to 1010 Zone) | N.A. | 4 and 8 | inch | $680,260.00 | $/station | $680,260 | $68,026 | $748,286 | $74,829 | $37,414 | $860,529 |
| P15[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 8-inch pipeline in Banyan St, west of Parco Ave (1010 Zone) | 8 | 300 | ft | $144.48 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| P16[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 12-inch pipeline in Walnut St, west of Parco Ave (1010 Zone) | 12 | 200 | ft | $216.72 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| P17[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 8-inch pipeline in Maidstone St, west of Parco Ave (1010 Zone) | 8 | 300 | ft | $144.48 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| P18[2] | OMC | Fut | DIF 1010 Zone | WT-009 | 8-inch pipeline in St. Andrews St, west of Parco Ave (1010 Zone) | 8 | 300 | ft | $144.48 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| P21 | OMC | Fut | DIF 1212 Zone | WT-022 | 8-inch Miscellaneous Up-Sized Projects (1212 Zone) | 8 | 2700 | ft | $144.48 | $/ft | $264,218 | $26,422 | $290,640 | $29,064 | $14,532 | $334,236 |
| P21 | OMC | Fut | DIF 1212 Zone | WT-022 | 12-inch Miscellaneous Up-Sized Projects (1212 Zone) | 12 | 2300 | ft | $216.72 | $/ft | $421,367 | $42,137 | $463,504 | $46,350 | $23,175 | $533,030 |
| ST03 | OMC | Fut | Storage | WT-006 | Reservoir 1212-4A | N.A. | 8 | MG | $1,444,800.00 | $/MG | $11,558,400 | $1,155,840 | $12,714,240 | $1,271,424 | $635,712 | $14,621,376 |
| ST04 | OMC | Fut | Storage | WT-006 | Reservoir 1212-4B | N.A. | 8 | MG | $1,444,800.00 | $/MG | $11,558,400 | $1,155,840 | $12,714,240 | $1,271,424 | $635,712 | $14,621,376 |
| ST05[2] | OMC | Fut | Storage | WT-004 | 30-inch transmission line from Reservoir 1212-4A and 1212-4B | 30 | 13,750 | ft | $541.80 | $/ft | $7,449,750 | $744,975 | $8,194,725 | $819,473 | $409,736 | $9,423,934 |

**Table 13-2 (Continued)**

**Capital Improvement Program**

**Existing System Capital Improvement Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ST06[1] | OMC | Ex | Storage | WT-025 | Abandon Reservoir 1212-3 (condition/age) | N.A. | 10 | MG | $148,500.00 | $/CY | $1,485,000 | $148,500 | $1,633,500 | $163,350 | $81,675 | $1,878,525 |
| P22 | OMC | Fut | DIF 925 Zone | | Future 1010 to 925 PRS at Fern asn SR-60 | N.A. | 4 and 8 | inch | $680,260.00 | $/station | $680,260 | $68,026 | $748,286 | $74,829 | $37,414 | $860,529 |
| P23 | OMC | Fut | DIF 925 Zone | | Piping of Future 1010 to 925 PRS at Fern and SR-60 | 12 | 550 | ft | $216.72 | $/ft | $119,196 | $11,920 | $131,116 | $13,112 | $6,556 | $150,783 |
| S48[1] | OMC | Ex | Supply | | Well 37 Rehabilitation | N.A. | 1 | Well | | $/Well | $5,811,350 | $1,015,000 | $6,826,350 | | $341,318 | $7,167,668 |
| S49[1] | OMC | Ex | Supply | | Well 39 Rehabilitation | N.A. | 1 | Well | | $/Well | $5,811,350 | $1,015,000 | $6,826,350 | | $341,318 | $7,167,668 |
| R11 | OMC | | Reliability | WT-035 | Future Emergency Connection (MVWD-1) | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| R12 | OMC | | Reliability | WT-035 | Future Emergency Connection (Chino-2) | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| R13 | OMC | | Reliability | WT-035 | Future Emergency Connection (FWC-1) | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| R14 | OMC | | Reliability | WT-035 | Future Emergency Connection (Upland-2) | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| FF1 | OMC | Fut | Fire | | Fire Flow Improvement: New Looped 6-inch pipe | 6 | 400 | ft | $108.36 | $/ft | $43,344 | $4,334 | $47,678 | $4,768 | $2,384 | $54,830 |
| FF1 | OMC | Fut | Fire | | Fire Flow Improvement: New Looped 8-inch pipe | 8 | 2,350 | ft | $144.48 | $/ft | $339,528 | $33,953 | $373,481 | $37,348 | $18,674 | $429,503 |
| FF1 | OMC | Fut | Fire | | Fire Flow Improvement: New Looped 12-inch pipe | 12 | 1,300 | ft | $216.72 | $/ft | $281,736 | $28,174 | $309,910 | $30,991 | $15,495 | $356,396 |
| FF1 | OMC | Fut | Fire | | Fire Flow Improvement: New Looped 16-inch pipe | 16 | 1,000 | ft | $216.72 | $/ft | $216,720 | $21,672 | $238,392 | $23,839 | $11,920 | $274,151 |
| FF2 | OMC | Ex | Fire | | Fire Flow Improvement: Upsize to 12-inch pipe | 12 | 59,200 | ft | $216.72 | $/ft | $12,829,824 | $1,282,982 | $14,112,806 | $1,411,281 | $705,640 | $16,229,727 |
| V1 | OMC | Ex | Velocity | | Pipe Velocity Improvement: Replace with 12-inch | 12 | 350 | ft | $216.72 | $/ft | $75,852 | $7,585 | $83,437 | $8,344 | $4,172 | $95,953 |
| V2 | OMC | Ex | Velocity | | Pipe Velocity Improvement: Replace with 16-inch | 16 | 4,750 | ft | $288.96 | $/ft | $1,372,560 | $137,256 | $1,509,816 | $150,982 | $75,491 | $1,736,288 |
| V3 | OMC | Ex | Velocity | | Pipe Velocity Improvement: Replace with 24-inch | 24 | 400 | ft | $433.44 | $/ft | $173,376 | $17,338 | $190,714 | $19,071 | $9,536 | $219,321 |
| ST11[1] | OMC | Ex | Storage | | Seismic Upgrades of Reservoirs 1074-1A, 1074-1B, 1212-1A | | | | $9,200,000.00 | LS | $9,200,000 | $920,000 | $10,120,000 | $1,012,000 | $506,000 | $11,638,000 |
| O05[1] | OMC | Ex | Other | Rate | Facility Security Improvements | | | | $370,000.00 | LS | $370,000 | $37,000 | $407,000 | $40,700 | $20,350 | $468,050 |

**Table 13-2 (Continued)**

**Capital Improvement Program**

**Existing System Capital Improvement Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| O10[1] | OMC | Ex | Other | | Wellhouse Roof Upgrades | | | | $325,000.00 | LS | $325,000 | $32,500 | $357,500 | $35,750 | $17,875 | $411,125 |
| O07[1] | OMC | Ex | Other | | On-site Chlorine Generators | | | | $3,027,000.00 | LS | $3,027,000 | $302,700 | $3,329,700 | $332,970 | $166,485 | $3,829,155 |
| O08[1] | OMC | Ex | Other | | Upgrade of existing PRS (New valves, new vaults, and SCADA upgrades) | | | | $2,100,000.00 | LS | $2,100,000 | $210,000 | $2,310,000 | $231,000 | $115,500 | $2,656,500 |
| O09[1] | OMC | Ex | Other | | SCADA System Upgrade. Connection to new Ethernet System | | | | $450,000.00 | LS | $450,000 | $45,000 | $495,000 | $49,500 | $24,750 | $569,250 |
| | | | | | | | | | **Total** | | **$188,351,545** | | | | | **$237,897,324** |

**Annual Improvement Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ST07[1] | OMC | Ex | Storage | Rate | Reservoir recoating/repainting/repair | | | | $150,000.00 | $/year | $150,000 | $15,000 | $165,000 | $16,500 | $8,250 | $189,750 |
| O07[1] | OMC | Ex | Other | Rate | Water Meter Replacements | | | | $2,000,000.00 | $/year | $2,000,000 | $200,000 | $2,200,000 | $220,000 | $110,000 | $2,530,000 |
| O06[1] | OMC | Ex | Other | Rate | New Meter Installations | | | | $700,000.00 | $/year | $700,000 | $70,000 | $770,000 | $77,000 | $38,500 | $885,500 |
| | | | | | | | | | **Total** | | **$2,850,000** | | | | | **$3,605,250** |

**Table 13-2 (Continued)**

**Capital Improvement Program**

**Condition Improvement Projects - Mainline Replacement Program**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D01 | OMC | Ex | Size | WT-021 | 4" and Due to Pipe Age - Replace Small Diameter Pipes with 8-inch Pipe | 8 | 32,850 | ft | $144.48 | $/ft | $4,746,168 | $474,617 | $5,220,785 | $522,078 | $261,039 | $6,003,903 |
| D01 | OMC | Ex | Size | WT-021 | 6" and Due to Pipe Age - Replace Small Diameter Pipes with 8-inch Pipe | 8 | 317,550 | ft | $144.48 | $/ft | $45,879,624 | $4,587,962 | $50,467,586 | $5,046,759 | $2,523,379 | $58,037,724 |
| D01 | OMC | Ex | Size | WT-021 | 4" & Less. (Verify Pipe Age) Replace Small Diameter Pipes with 8-inch Pipe | 8 | 72,300 | ft | $144.48 | $/ft | $10,445,904 | $1,044,590 | $11,490,494 | $1,149,049 | $574,525 | $13,214,069 |
| D01 | OMC | Ex | Size | WT-021 | 6" (Verify Pipe Age)- Replace Small Diameter Pipes with 8-inch Pipe | 8 | 23,400 | ft | $144.48 | $/ft | $3,380,832 | $338,083 | $3,718,915 | $371,892 | $185,946 | $4,276,752 |
| D01 | OMC | Ex | Size | WT-021 | 4" & Less- Replace Small Diameter Pipes with 8-inch Pipe | 8 | 23,750 | ft | $144.48 | $/ft | $3,431,400 | $343,140 | $3,774,540 | $377,454 | $188,727 | $4,340,721 |
| D01 | OMC | Ex | Size | WT-021 | 6" -Replace Small Diameter pipes with 8-inch Pipe | 8 | 375,500 | ft | $144.48 | $/ft | $54,252,240 | $5,425,224 | $59,677,464 | $5,967,746 | $2,983,873 | $68,629,084 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 8" Improvements Due to Pipe Age (pipes constructed in or before 1970)- Replace with 8" | 8 | 65,900 | ft | $144.48 | $/ft | $9,521,232 | $952,123 | $10,473,355 | $1,047,336 | $523,668 | $12,044,358 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 10" to 12" Improvements Due to Pipe Age (pipes constructed in or before 1970)- Replace with 12" | 12 | 89,300 | ft | $216.72 | $/ft | $19,353,096 | $1,935,310 | $21,288,406 | $2,128,841 | $1,064,420 | $24,481,666 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 13" to 16"- Improvements Due to Pipe Age (pipes constructed in or before 1970) - Replace with 16" | 16 | 19,950 | ft | $288.96 | $/ft | $5,764,752 | $576,475 | $6,341,227 | $634,123 | $317,061 | $7,292,411 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 17" to 18"- Improvements Due to Pipe Age (pipes constructed in or before 1970) - Replace with 18" | 18 | 50,250 | ft | $325.08 | $/ft | $16,335,270 | $1,633,527 | $17,968,797 | $1,796,880 | $898,440 | $20,664,117 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 19" to 24"- Improvements Due to Pipe Age (pipes constructed in or before 1970) - Replace with 24" | 24 | 12,550 | ft | $433.44 | $/ft | $5,439,672 | $543,967 | $5,983,639 | $598,364 | $299,182 | $6,881,185 |
| C01 | OMC | Ex | Condition/ Age | WT-021 | 37" to 42"- Improvements Due to Pipe Age (pipes constructed in or before 1970) - Replace with 42" | 42 | 300 | ft | $758.52 | $/ft | $227,556 | $22,756 | $250,312 | $25,031 | $12,516 | $287,858 |
| | | | | | | | | | **Total** | | **$178,777,746** | | | | | **$226,153,849** |

**Table 13-2 (Continued)**

**Capital Improvement Program**

**Condition Improvement Projects - Facility Improvement Program**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L1 | OMC | Ex | Hydrant Lateral | | 4" & Less, Small Diameter Hydrant Lateral | 6 | 4,050 | ft | $108.36 | $/ft | $438,858 | $43,886 | $482,744 | $48,274 | $24,137 | $555,155 |
| L2 | OMC | Ex | Hydrant Lateral | | Hydrant Lateral material improvements | 6 | 11,400 | ft | $108.36 | $/ft | $1,235,304 | $123,530 | $1,358,834 | $135,883 | $67,942 | $1,562,660 |
| S50 | OMC | Ex | Supply | | 1212 Zone Well 24 Replacement due to age. | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S51 | OMC | Ex | Supply | | 1212 Zone Well 29 Replacement due to age. | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S52 | OMC | Ex | Supply | | 1212 Zone Well 30 Replacement due to age. | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S53 | OMC | Ex | Supply | | 1212 Zone Well 31 Replacement due to age. | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S54 | OMC | Ex | Supply | | Galvin Booster PS Replacement due to age. | N.A. | 1,050 | HP | $6,000.00 | $/HP | $6,300,000 | $630,000 | $6,930,000 | $693,000 | $346,500 | $7,969,500 |
| S55 | OMC | Ex | Supply | | 1348 Booster Pump 1 and 2 Replacement due to age. | N.A. | 400 | BPS | $6,000.00 | $/HP | $2,400,000 | $240,000 | $2,640,000 | $264,000 | $132,000 | $3,036,000 |
| S56 | OMC | Ex | Supply | | 1348 Booster Pump 3 and 4 Replacement due to age. | N.A. | 250 | BPS | $6,000.00 | $/HP | $1,500,000 | $150,000 | $1,650,000 | $165,000 | $82,500 | $1,897,500 |
| ST12 | OMC | Ex | Storage | | Reservoir past useful Life 1074-1B | N.A. | 2 | MG | $1,444,800.00 | $/MG | $2,889,600 | $288,960 | $3,178,560 | $317,856 | $158,928 | $3,655,344 |
| ST13 | OMC | Ex | Storage | | Reservoir past useful Life 1212-1A | N.A. | 20 | MG | $1,444,800.00 | $/MG | $28,896,000 | $2,889,600 | $31,785,600 | $3,178,560 | $1,589,280 | $36,553,440 |
| ST14 | OMC | Ex | Storage | | Reservoir past useful Life 1212-1B | N.A. | 2 | MG | $1,444,800.00 | $/MG | $2,889,600 | $288,960 | $3,178,560 | $317,856 | $158,928 | $3,655,344 |
| ST15 | OMC | Ex | Storage | | Reservoir past useful Life 1348-1B | N.A. | 2 | MG | $1,444,800.00 | $/MG | $2,889,600 | $288,960 | $3,178,560 | $317,856 | $158,928 | $3,655,344 |
| ST16 | OMC | Ex | Storage | | Reservoir past useful Life 1348-1C | N.A. | 3.75 | MG | $1,444,800.00 | $/MG | $5,418,000 | $541,800 | $5,959,800 | $595,980 | $297,990 | $6,853,770 |
| | | | | | | | | | **Total** | | **$70,856,962** | | | | | **$89,634,057** |

**Table 13-2 (Continued)**

**Capital Improvement Program**

**Future System Development Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ST08 | OR | Fut | Storage | WT-014 | Reservoir 925-1A | N.A. | 9.0 | MG | $1,444,800.00 | $/gallon | $13,003,200 | $1,300,320 | $14,303,520 | $1,430,352 | $715,176 | $16,449,048 |
| ST09 | OR | Fut | Storage | WT-014 | Reservoir 925-1B | N.A. | 9.0 | MG | $1,444,800.00 | $/gallon | $13,003,200 | $1,300,320 | $14,303,520 | $1,430,352 | $715,176 | $16,449,048 |
| ST10 | OR | Fut | Storage | WT-014 | Reservoir 925-2B | N.A. | 6.0 | MG | $1,444,800.00 | $/gallon | $8,668,800 | $866,880 | $9,535,680 | $953,568 | $476,784 | $10,966,032 |
| S13 | OR | Fut | Supply | WT-012 | Altitude Valve from 1074 Zone to 925 Zone at Reservoir 925-1A and 925-1B | N.A. | 1 | Valve | $680,260.00 | $/LS | $680,260 | $68,026 | $748,286 | $74,829 | $37,414 | $860,529 |
| S14[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #48 in 925 Zone (Not in DIF) | N.A. | 1 | Well | | $/site | | | | | | |
| S15 | OR | Fut | Supply | WT-007 | NMC Well #48 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S16[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 48 and 54 to Reservoir 925-2A | 18 | 3,250 | ft | $325.08 | $/ft | $1,056,510 | $105,651 | $1,162,161 | $116,216 | $58,108 | $1,336,485 |
| S17[2] | OR | Fut | Supply | WT-012 | 24-inch well collecting line for Well 48 and 54 to Reservoir 925-2A | 24 | 1,000 | ft | $433.44 | $/ft | $433,440 | $43,344 | $476,784 | $47,678 | $23,839 | $548,302 |
| S18[2] | OR | Fut | Supply | WT-012 | 30-inch well collecting line for Well 48 to Reservoir 925-2A | 30 | 600 | ft | $541.80 | $/ft | $325,080 | $32,508 | $357,588 | $35,759 | $17,879 | $411,226 |
| S19[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #51 in 925 Zone (Not in DIF) | N.A. | 1 | Well | | $/site | | | | | | |
| S20 | OR | Fut | Supply | WT-007 | NMC Well #51 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S21[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 51 to Reservoir 925-2A | 18 | 4,300 | ft | $325.08 | $/ft | $1,397,844 | $139,784 | $1,537,628 | $153,763 | $76,881 | $1,768,273 |
| S22[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #54 in 925 Zone (Not in DIF) | N.A. | 1 | Well | | $/site | | | | | | |
| S23 | OR | Fut | Supply | WT-007 | NMC Well #54 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S24[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 54 to Reservoir 925-2A | 18 | 700 | ft | $325.08 | $/ft | $227,556 | $22,756 | $250,312 | $25,031 | $12,516 | $287,858 |
| S25[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #55 in 925 Zone | N.A. | 1 | Well | | $/site | | | | | | $300,000 |
| S26 | OR | Fut | Supply | WT-007 | NMC Well #55 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |

**Table 13-2 (Continued)**

**Capital Improvement Program**

**Future System Development Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S27[2] | OR | Fut | Supply | WT-012 | 18-inch line from Well 55 to intersection of Bonview Ave and Francis St | 18 | 800 | ft | $325.08 | $/ft | $260,064 | $26,006 | $286,070 | $28,607 | $14,304 | $328,981 |
| S28[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #56 in 925 Zone | N.A. | 1 | Well | | $/site | | | | | | $300,000 |
| S29 | OR | Fut | Supply | WT-007 | NMC Well #56 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S30[2] | OR | Fut | Supply | WT-012 | 42-inch line from Well 56 to intersection of Bon View Ave and Francis St | 42 | 1,250 | ft | $758.52 | $/ft | $948,150 | $94,815 | $1,042,965 | $104,297 | $52,148 | $1,199,410 |
| S31[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 48 to Reservoir 925-2A | 18 | 400 | ft | $325.08 | $/ft | $130,032 | $13,003 | $143,035 | $14,304 | $7,152 | $164,490 |
| S32[2] | OR | Fut | Supply | WT-012 | 30-inch line in Francis St from Bon View Ave to Grove Ave | 30 | 1,200 | ft | $541.80 | $/ft | $650,160 | $65,016 | $715,176 | $71,518 | $35,759 | $822,452 |
| S33[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #57 in 925 Zone | N.A. | 1 | Well | | $/site | | | | | | $300,000 |
| S34 | OR | Fut | Supply | WT-007 | NMC Well #57 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S35[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line for Well 57 to Reservoir 925-1A | 18 | 1,400 | ft | $325.08 | $/ft | $455,112 | $45,511 | $500,623 | $50,062 | $25,031 | $575,717 |
| S36[1] | OR | Fut | Supply | WT-007 | Land Acquisition for Well #58 in 925 Zone | N.A. | 1 | Well | | $/site | | | | | | $300,000 |
| S37 | OR | Fut | Supply | WT-007 | NMC Well #58 in the 925 Zone | N.A. | 1 | Well | $4,000,000.00 | $/Well | $4,000,000 | $400,000 | $4,400,000 | $440,000 | $220,000 | $5,060,000 |
| S38[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line from Well 58 to intersection of Francis St and Cucamonga Ave | 24 | 1,950 | ft | $433.44 | $/ft | $845,208 | $84,521 | $929,729 | $92,973 | $46,486 | $1,069,188 |
| S39 | OR | Fut | Supply | WT-013 | PRS 16 at Campus Ave and Chino Ave (from 1010 Zone to 925 Zone) | N.A. | 8 and 12 | inch | $680,260.00 | $/station | $680,260 | $68,026 | $748,286 | $74,829 | $37,414 | $860,529 |
| S40 | OR | Fut | Supply | WT-032 | Water Quality Treatment Facility at the Jurupa 925-2 Reservoir Site | N.A. | 4 | Site | $6,324,111 | $/Well | $25,296,443 | $2,529,644 | $27,826,087 | $2,782,609 | $1,391,304 | $32,000,000 |
| S46 | OR | Fut | Supply | WT-032 | Water Quality Treatment Facility at the at the Bon View 925-1 Reservoir Site | N.A. | 4 | Site | $6,324,111 | $/Well | $25,296,443 | $2,529,644 | $27,826,087 | $2,782,609 | $1,391,304 | $32,000,000 |
| S47[1] | OR | Fut | Supply | WT-008 | Water Quality Treatment Facility for Well #50 | N.A. | 1 | Site | $3,100,000.00 | $/site | $3,100,000 | $310,000 | $3,410,000 | $341,000 | $170,500 | $3,921,500 |

**Table 13-2 (Continued)**
**Capital Improvement Program**

**Future System Development Projects**

| Project No. | OMC/ OR | Ex/ Fut | Facility Type | DIF# | Description | Replacement Pipe Size (in) | Number | Unit | Unit Cost ($) | Unit | Base Cost ($) | 10% Contingency ($) | Construction Cost ($) | 10% Engineering & Admin. ($) | 5% Construction Mgmt. ($) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S41 | OR | | Supply | WT-007 | Land Acquisition for Well #59 in 925 Zone | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| S42 | OR | | Supply | WT-007 | NMC Well #59 in the 925 Zone | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| S43[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line from Well 56 in Belmont St and Cucamonga Ave | N.A. | 1,950 | ft | $325.08 | $/ft | $633,906 | $63,391 | $697,297 | $69,730 | $34,865 | $801,891 |
| S44 | OR | | Supply | WT-012 | 18-inch well collecting line from Well 59 in Belmont St and Cucamonga Ave | 2012 Water Master Plan project that is no longer required | | | | | | | | | | |
| S45[2] | OR | Fut | Supply | WT-012 | 18-inch well collecting line from Well 56 in Belmont St and Cucamonga Ave | 18 | 2,050 | ft | $325.08 | $/ft | $666,414 | $66,641 | $733,055 | $73,306 | $36,653 | $843,014 |
| S57 | OR | Fut | Supply | | New 925 to 1010 BPS | N.A. | 400 | BPS | $6,000.00 | $/HP | $2,400,000 | $240,000 | $2,640,000 | $264,000 | $132,000 | $3,036,000 |
| T1[2] | OR | Fut | Transmission | WT-011 | 12-inch distribution lines (925 Zone) Completed Projects removed. | 12 | 115,600 | ft | $144.00 | $/ft | $16,646,400 | $1,664,640 | $18,311,040 | $1,831,104 | $915,552 | $21,057,696 |
| T2[2] | OR | Fut | Transmission | WT-011 | 16-inch distribution lines (925 Zone) | 16 | 44,450 | ft | $192.00 | $/ft | $8,534,400 | $853,440 | $9,387,840 | $938,784 | $469,392 | $10,796,016 |
| T3[2] | OR | Fut | Transmission | WT-011 | 18-inch distribution lines (925 Zone), Chino Ave | 18 | 12,400 | ft | $260.06 | $/ft | $3,224,744 | $322,474 | $3,547,218 | $354,722 | $177,361 | $4,079,301 |
| T4[2] | OR | Fut | Transmission | WT-010 | 24-inch distribution lines (925 Zone), Milliken Ave, Eucalyptus Ave, Archibald Ave, Edison Ave | 24 | 10,850 | ft | $331.56 | $/ft | $3,597,372 | $359,737 | $3,957,109 | $395,711 | $197,855 | $4,550,675 |
| T05 | OR | Fut | Transmission | WT-010 | 42-inch distribution lines (925 Zone), Grove Ave btw Reservoir 925-1A and Edison Ave | 42 | 22,700 | ft | $557.81 | $/ft | $12,662,174 | $1,266,217 | $13,928,391 | $1,392,839 | $696,420 | $16,017,649 |
| T06[2] | OR | Fut | Transmission | WT-009 | 12-inch distribution lines (1010 Zone) | 12 | 19,200 | ft | $144.00 | $/ft | $2,764,800 | $276,480 | $3,041,280 | $304,128 | $152,064 | $3,497,472 |
| T07[2] | OR | Fut | Transmission | WT-009 | 18-inch distribution lines (1010 Zone) Campus Ave north of Riverside Ave | 18 | 6,950 | ft | $260.06 | $/ft | $1,807,417 | $180,742 | $1,988,159 | $198,816 | $99,408 | $2,286,383 |
| | | | | | | | | | **Total** | | **$177,395,388** | | | | | **$225,605,166** |

[1] *Project cost specifically estimated based on more detailed information. The unit costs from Table 13-1 were not used.*

[2] *Project lengths based on existing planning estimates.*

115550

| | | |
|---|---|---|
| Existing System Capital Improvement Projects | $188,351,545 | $237,897,324 |
| Condition Projects - Mainline Replacement Program | $178,777,746 | $226,153,849 |
| Condition Projects - Facility Improvement Program | $70,856,962 | $89,634,057 |
| Future System Development Projects | $177,395,388 | $225,605,166 |
| **Total** | **$615,381,641** | **$779,290,395** |
| Annual Capital Improvement Costs | | $3,605,250 |

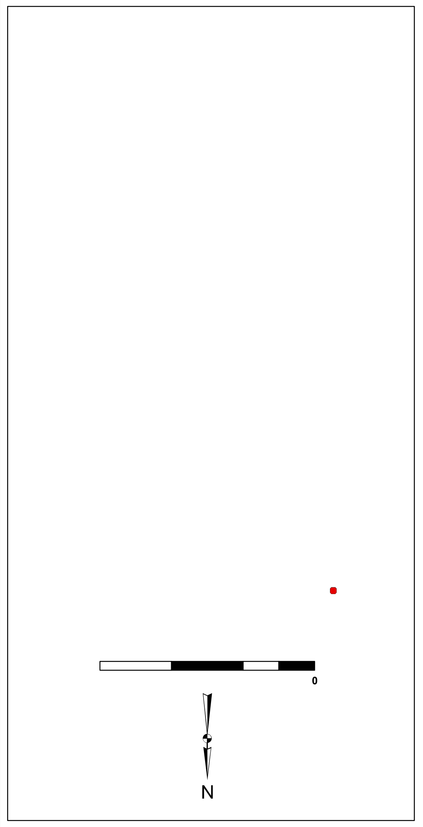
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City of Ontario - Water Master Plan Update

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# RECYCLED WATER MASTER PLAN UPDATE

City of Ontario Municipal Water Utilities Company

FINAL

June 22, 2020

Prepared for:

City of Ontario, Municipal Utilities Company
1425 S. Bon View Avenue
Ontario, CA 91761

Prepared by:

Stantec Consulting Services Inc.
38 Technology Drive
Irvine, CA 92618

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Prepared by _____
**Jeff Dunn, PE**

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# Abbreviations

| | |
|---|---|
| AF | Acre-Feet |
| AFM | Acre-Feet per Month |
| AFY | Acre-Feet per Year |
| AG | Agricultural |
| CCWRF | Carbon Canyon Waste Recycling Facility |
| CML&C | Cement Mortar Lined and Coated |
| CIP | Capital Improvement Plan |
| DIP | Ductile Iron Pipe |
| EPS | Extended Period Simulation |
| ft | feet |
| fps | feet per second |
| gpd | gallons per day |
| gpm | gallons per minute |
| GWR | Groundwater Recharge |
| HGL | Hydraulic Grade Line |
| Hp | Horsepower |
| HWL | High Water Level |
| IEUA | Inland Empire Utilities Agency |
| LF | Linear feet |
| LR | Local Runoff |
| MG | Million Gallons |
| MGD | Million Gallons per Day |
| NMC | New Model Colony (Now referred to as Ontario Ranch) |
| OMC | Original Model Colony |
| OR | Ontario Ranch |
| OMUC | Ontario Municipal Utilities Company |
| PRV | Pressure Reducing Valve |
| psi | pounds per square inch |
| PVC | Polyvinyl Chloride |
| RP | Regional Water Recycling Plant |
| RP-1 | Regional Water Recycling Plant No. 1 |
| RP-4 | Reginal Water Recycling Plant No.4 |
| RP-5 | Reginal Water Recycling Plant No.5 |
| RW | Recycled Water |
| RWC | Recycled Water Contribution |
| RWIP | Recycled Water Implementation Plan |
| RWMP | Recycled Water Master Plan |
| RWPS | Recycled Water Program Strategy |
| s.f. | square feet |

# Executive Summary

This Recycled Water Master Plan Update is to be used as a planning tool to guide future recycled water use and expansion of the existing recycled water system for the City of Ontario (City) over the course of the planning horizon. The planning horizon is identified to be the current General Plan.

The objective is to provide a cost-effective and fiscally responsible recycled water system CIP that will meet the needs of the future developments within the City, as well as the existing and future customers requirements for water delivery, system pressure, and reliability.

The future recycled water system has been developed for two major phases – Near-Term and Future. The Near-Term phase is assumed to be development in the Ontario Ranch and other recycled water conversion areas and connections to the recycled water system in the next 5-years, or approximately Year 2025. The Future phase is the remaining development of the Ontario Ranch to full build-out and other development areas and potential recycled water conversion areas as described herein in the Original Model Colony service areas.

Supply for the existing and future recycled water system demands is provided by Inland Empire Utilities Agency (IEUA). IEUA prepared a Recycled Water Program Strategy in 2015. This RWMP Update utilizes the hydraulic model used for that study. The IEUA Recycled Water Program Strategy developed a CIP with future improvements, including pumping and storage, to their 1158 and 1299 Zones to service the western portions of the 1158 and 1299 Zone service areas assuming all areas within the City are converted to recycled water. However, due to uncertainty in the timing of these facilities and reliance upon the recycled water improvements proposed by IEUA, this RWMP assumes the Future Phase as identified herein does not rely upon these improvements. Therefore, the Future Phase recycled water demands and potential conversion areas within the Original Model Colony are limited by IEUA's regional system's ability to provide the demands within the design criteria without these facilities.

## RECYCLED WATER DEMANDS

Recycled water demands are estimated for the existing conditions, Near-Term, and Future phases. The Near-Term phase considers the following for estimating the projected recycled water demands:

- Current Developments in the Ontario Ranch service area – These developments are currently in the planning phase or design phase that are expected to begin in approximately 5-years.
- Creekside conversion project areas – These areas have already been previously studied and proposed for conversion to recycled water, and preliminary design plans have been prepared for many of the facilities to serve these areas.

- Some large irrigation meters/users that can be converted to recycled water – These parcels are assumed to be converted in the near future since they are in the vicinity of existing facilities or could be connected to a pipeline that is already proposed to be constructed.
- Parks and Schools that can be converted – These parcels have a high priority for the City where it is practical. These parcels are assumed to be converted in the near term since they are in the vicinity of existing facilities or could be connected to a pipeline that is already proposed to be constructed.
- Some agriculture land that can be converted to recycled water before it is ultimately developed – The agricultural use parcels that are adjacent to an existing pipeline or a pipeline that is to be constructed within the Near-Term planning horizon are assumed to be converted to the recycled water system.

The Future phase consists of the full build-out of the Ontario Ranch developments and all potential conversion areas within the Original Model Colony as identified in this study. The Euclid Avenue conversion areas are also considered to be Future phase improvements

The table below provides a summary of the projected recycled water demands. A slight increase in demands for the Original Model Colony area for the next 5 years can be expected due to the reduction in agricultural uses as development areas are constructed. As shown in the table, overall, the Near-Term phase has only a moderate increase of approximately 20 percent while the future demands increase by nearly 70 percent.

**ES-1 Summary of Projected Recycled Water Demands**

| Service Area | Existing Recycled Water Demands (AFY) | Near Term Recycled Water Demands (AFY) | Future Recycled Water Demands (AFY) |
|---|---|---|---|
| Ontario Ranch | 4,465 | 6,740 | 8,158 |
| Original Model Colony | 5,190 | 5,428 | 7,901 |
| **Total** | **9,655** | **12,168** | **16,059** |

## RECYCLED WATER DISTRIBUTION SYSTEM

Hydraulic model analyses were conducted for a 24-hour EPS of the maximum day demands for existing, Near-Term, and Future phases of development of the recycled water system. No significant deficiencies to the distribution piping system were identified for existing conditions.

The Near-Term analysis sized the proposed pipelines so that the system meets design pressure and velocity criteria. In addition, to supplement the 930 Zone the two City PRV stations in Chino Avenue are assumed to be constructed. Each of these PRV stations reduces pressure from the 1050 Zone to the 930

Zone. These PRV stations will only open during peak demand periods. Approximately 12.2 miles of pipeline is proposed for the Near-Term, ranging from 8-inch to 30-inch diameter.

The Future system analysis shows that with the proposed piping system and booster pump station, the system meets all design criteria. In addition to approximately 51.9 miles of proposed pipelines ranging from 8-inch to 20-inch diameter, a 1050 to 1158 Zone Pump Station is proposed to supply the potential conversion areas in the western portion of the 1158 Zone. This pump station is anticipated to have a peak design capacity of 1,323 gpm, and be equipped with three pumps, each with 50-horsepower motors with variable frequency drives.

## CAPITAL IMPROVEMENT PLAN

The CIP is divided into the two major phases of development as described herein, the Near-Term and Future phases. The Near-Term phase consists of the recycled water demands and expansion needs for the next 5-years, to approximately Year 2025. The Future phase consists of the full build-out of Ontario Ranch and other development and conversion areas within the Original Model Colony based on the City's General Plan.

**ES-2 Summary of CIP Costs**

| Phase | Pressure Zone | Total Project CIP Costs |
|---|---|---|
| Near-Term | 930 | $5,843,879 |
| | 1050 | $3,180,019 |
| | 1158 | $399,848 |
| | 1299 | $838,901 |
| | PRV | $810,000 |
| | **Subtotal Near-Term** | **$11,072,647** |
| Future | 930 | $21,170,803 |
| | 1050 | $13,665,456 |
| | 1158 | $21,119,491 |
| | 1299 | $1,856,760 |
| | Pump Station | $2,025,000 |
| | **Subtotal Future** | **$59,837,510** |
| | **Total CIP** | **$70,910,157** |

This map is not intended to replace a survey by a Lic.California Surveyor. Stantec does not certify the accuracy of the data and is for reference only and should not be used for construction.

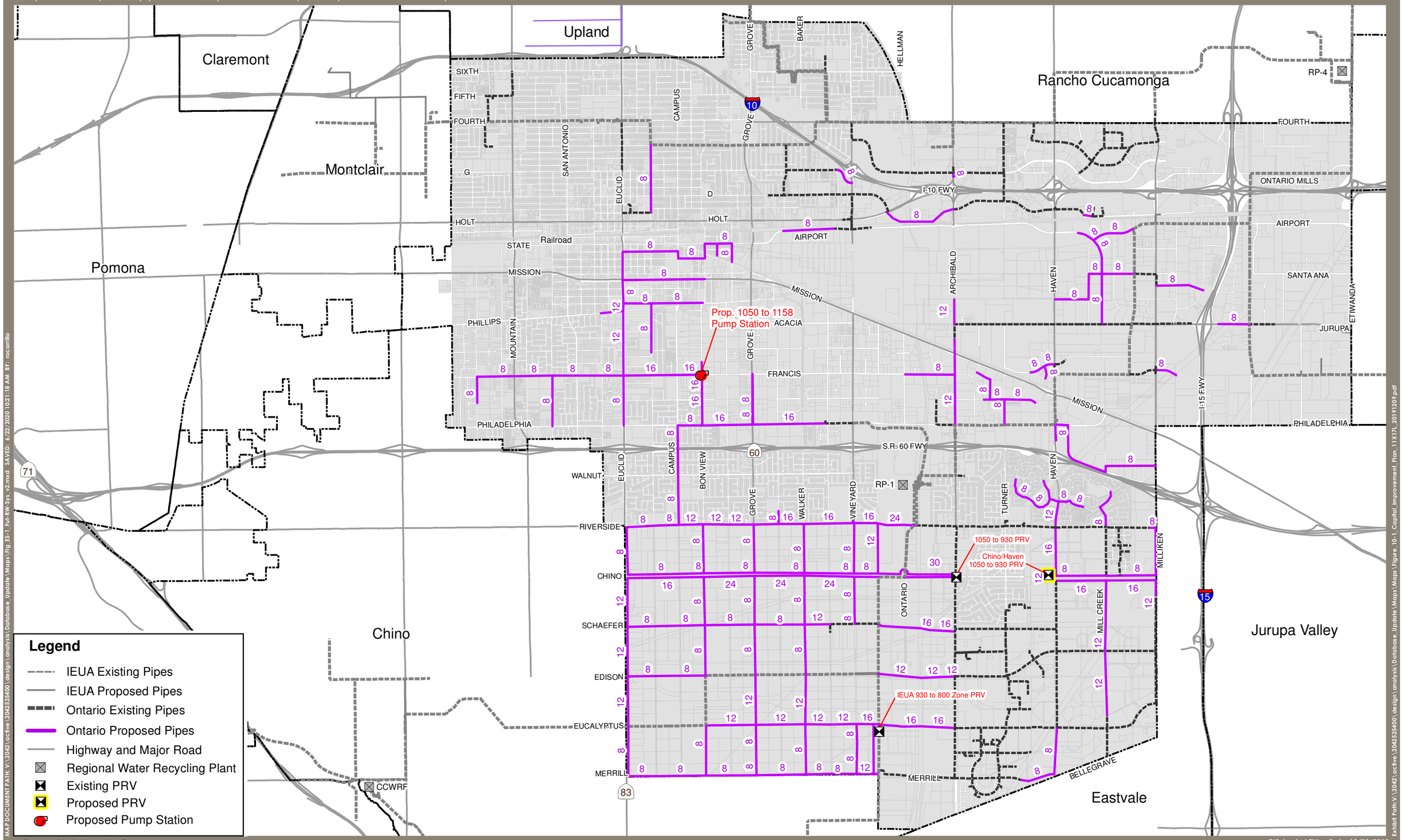


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GIS Analyst:TW Date: 12/09/2019

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Stantec
38 Technology Drive, Irvine, CA 92618
Phone 949.923.6000 www.stantec.com

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# Ontario Recycled Water Master Plan
## Figure ES-1 Future Recycled Water System

# 1.0 INTRODUCTION

## 1.1 PURPOSE AND SCOPE

The purpose of this document is to update the Recycled Water Master Plan (RWMP) prepared in 2012, with an updated Capital Improvement Plan (CIP). The 2012 RWMP was prepared by the Ontario Municipal Water Utilities Company (OMUC) staff and utilized the 2006 Water and Recycled Water Master Plan, Section 10 Recycled Water System as the basis for the update. OMUC recognizes the need to provide its customers with the most economically feasible source of water supply. With the decreasing supply and escalating costs of imported water, recycled water provides an alternate source of water supply for irrigation and some industrial processes.

The intent of this RWMP Update is to develop a document that can be used as a planning tool to guide future recycled water use and expansion of the existing recycled water system for the City of Ontario (City) over the course the planning horizon. The planning horizon is identified to be the current General Plan with anticipated buildout in year 2040.

The objective is to provide a cost-effective and fiscally responsible recycled water system CIP that will meet the needs of the future developments within the City, as well as the existing and future customers requirements for water delivery, system pressure, and reliability.

The scope for this RWMP Update includes achieving the following goals.

- Update the current Recycled Water Master Plan prepared in 2012;
- Create an updated hydraulic model in InfoWater modeling software that includes the IEUA supply facilities;
- Update existing, interim, and ultimate projected recycled water demands, based on the recent demand factor study prepared for the Urban Water Management Plan 2016 Update;
- Analyze and determine recommendations for recycled water system improvements and system expansion needs to meet ultimate recycled water demands; and,
- Develop a long-range Capital Improvement Plan.

## 1.2 STUDY AREA

The OMUC's service area comprises the City of Ontario and encompasses approximately 49.79 square miles. As shown in Figure 1-1, the service area is generally bordered by Cities of Rancho Cucamonga and Upland to the north, Cities of Fontana and Jurupa Valley to the east, City of Eastvale to the southeast

and south, City of Chino to the southwest and south, and City of Montclair to the west. OMUC's service area will be referred to as the Study Area from hereon.

The Study Area is divided into two main areas divided by Riverside Drive, the Original Model Colony (OMC) and the Ontario Ranch (OR), which was previously called the New Model Colony (NMC). OMC, located north of Riverside Drive, covers an area of approximately 37.00 square miles. OMC consists of existing residential, commercial, and industrial developments. Ontario Ranch (or NMC), located south of Riverside Drive, covers an area of approximately 12.79 square miles. Ontario Ranch mainly consists of agricultural land and vacant land; however, this area is a large growth area with many development projects planned for a mixture of residential, commercial, industrial, and public uses.

The City's recycled water (RW) system has several pipelines that are connected to the Inland Empire Utilities Agency (IEUA) recycled water mains. However, the City operates and maintains its own recycled water system that delivers recycled water to its customers.

This map is not intended to replace a survey by a Lic.California Surveyor. Stantec does not certify the accuracy of the data and is for reference only and should not be used for construction.

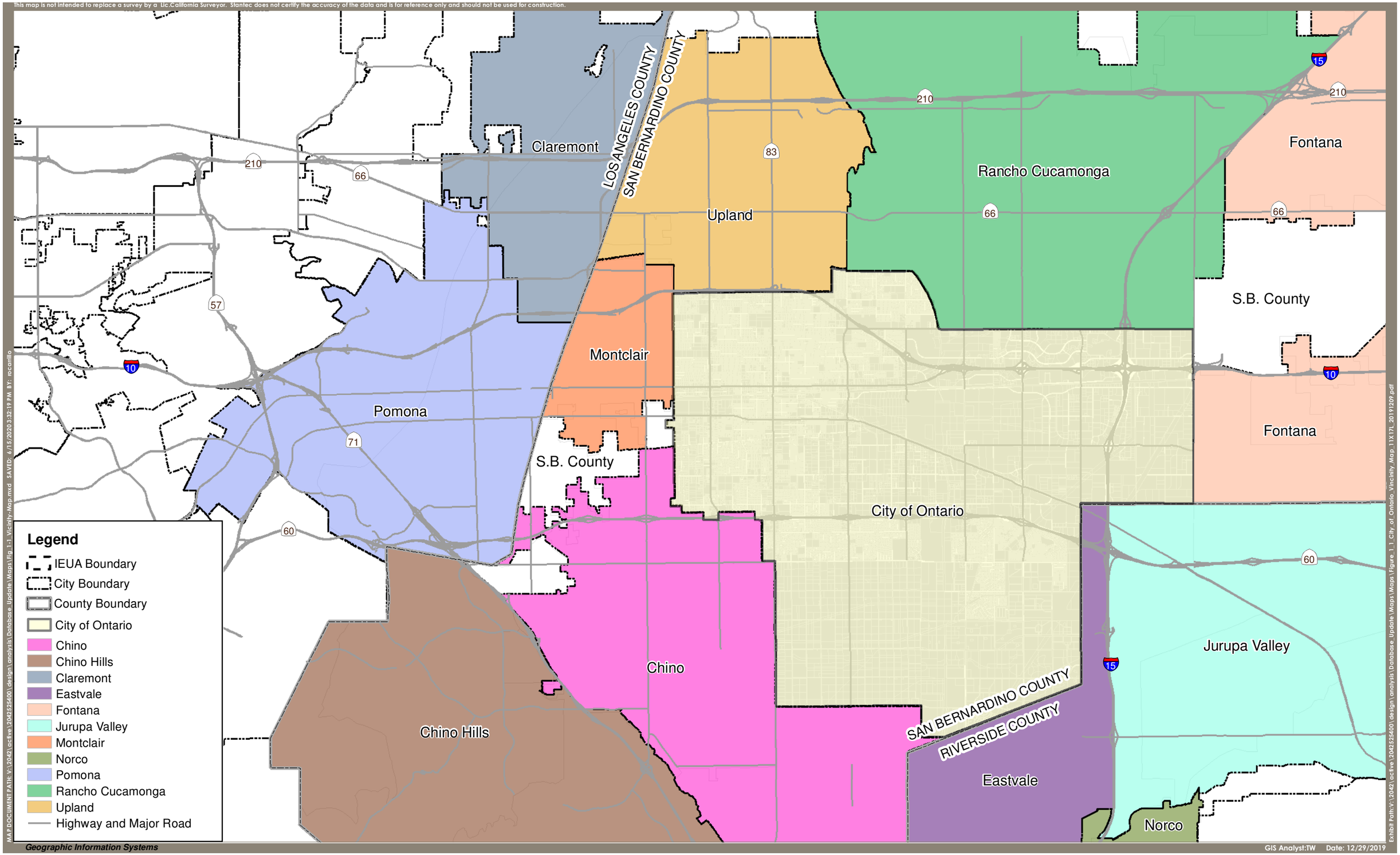


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# Ontario Recycled Water Master Plan
## Figure 1-1 City of Ontario Vicinity Map

## 1.3 DATA SOURCE AND MODEL

Previous studies for the recycled water system are:

- Ontario Recycled Water Pipeline Project: *Pipeline Sizing Memo* by Michael Baker, July 2016
- Ultimate City-Wide Water Demand Estimate Memo by AKM, May 2016
- Inland Empire Utilities Agency (IEUA) Recycled Water Program Strategy (RWPS), October 2015
- Study of Recycled Water Pressure Zone 930 (Elimination of pipe in Chino Ave) by AKM, April 2014
- City of Ontario Recycled Water Master Plan, April 2012

Reference documents for this report are as follows.

- The Ontario Plan (General Plan), February 2010
- California Code of Regulations Title 14 and Title 17

InfoWater 12.4 is used to conduct the analysis. Data sources are shown below.

- Existing Recycled Water Customer Billing Data from 2009 to 2018.
- Demand Factors and Demand Pattern from Ultimate City Wide Water Demand Estimate Memo (AKM, May 2016) and IEUA Recycled Water Program Strategy, October 2015.
- GIS data provided by the City of Ontario:
    - Land use data received on October 31, 2018.
    - Recycled water system data received on October 31st, 2018, which included recycled water mains, laterals, system valves, hydrants, meters, active recycled water meters with customer data, geocode points locations of active meters, parcel data, and street centerlines.
    - Recycled water meter locations, received on November 1, 2018.

# 2.0 EXISTING AND FUTURE LAND USES

## 2.1 EXISTING LAND USE

The existing land use and general land use categories are shown in Table 2-1 and illustrated on Figure 2-1. The existing land uses are identified using the City's GIS Existing Land Use database layer, aerial map overlay, and the land uses shown in the 2016 Ultimate Citywide Water Demand Estimate Technical Memorandum.

**Table 2-1 Existing Land Use**

| General Land Use Category | Existing Land Use Designation | Acres |
|---|---|---|
| Residential | LDR | 5,134 |
| | LMDR | 357 |
| | MDR | 328 |
| | HDR | 454 |
| Commercial | Admin./Prof. | 143 |
| | Commercial | 1,245 |
| | Office Commercial | 514 |
| | Misc. Service Org. | 116 |
| Industrial | Manufacturing | 1,716 |
| | Industrial | 2,116 |
| | Warehousing | 1,807 |
| Parks/Rec/Cultural | Parks/Rec/Cultural | 772 |
| Public Facilities | Public Facilities | 165 |
| School | School | 497 |
| Transportation/Utilities | Transp/Utilities | 3,242 |
| Agricultural | Ag. Multi-Use | 6,470 |
| Right of Way | Street/Parking | 264 |
| | ROW | 323 |
| Vacant | Vacant | 1,608 |
| | Vacant Bldg | 87 |
| | **Total** | **27,359** |

[1] Vacant, vacant building and agriculture land use that have been identified through aerial map as developed land are assigned land use based on general plan. Area of mix use land use is counted to commercial category.

[2] The table does not include area of ROW in OMC.

As shown in Figure 2-1, the OMC area (north of Riverside Drive) is mostly built-out. The OMC consists predominantly of Industrial, Commercial, and Single-Family Residential uses. The Ontario Ranch service area (south of Riverside Drive) is predominantly undeveloped or Agricultural land.

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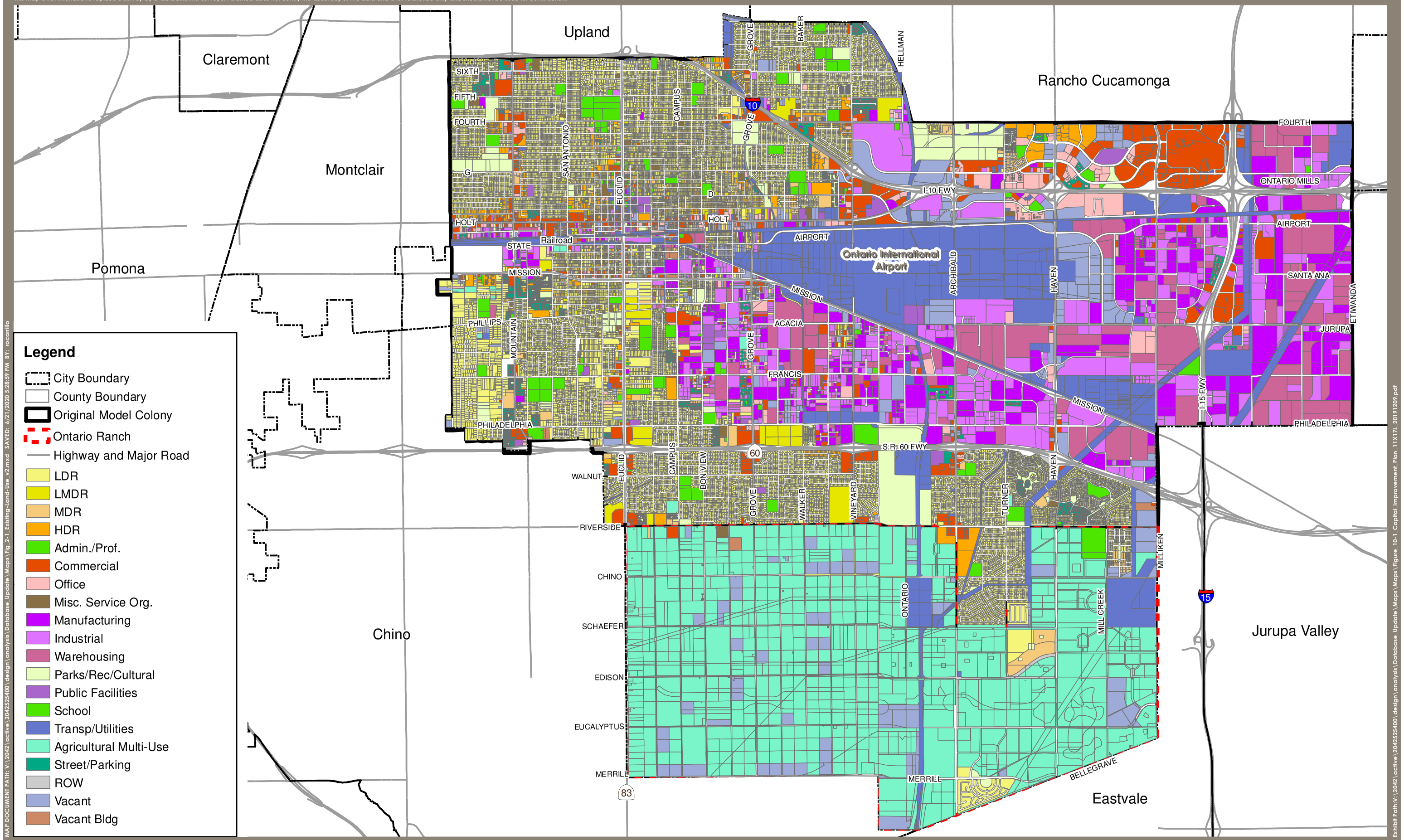


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# Ontario Recycled Water Master Plan
## Figure 2-1 Existing Land Use

## 2.2 FUTURE LAND USE DESIGNATIONS

The future land use categories and designations are shown in Table 2-2. These land uses are based on the City's current General Plan, as amended in March 2017.

**Table 2-2 General Plan Land Use Designations**

| General Category | Land Use Designations | Abbr. | Density/ Intensity | Intention |
|---|---|---|---|---|
| Residential | Rural Density Residential | RR | < 2 du/ac | Single-family detached, typically an estate setting. |
| | Low Density Residential | LDR | >2 -5 du/ac | Single-family detached residences |
| | Low Medium Density Residential | LMDR | 5 -11 du/ac | Includes small lot subdivisions, townhouses, mobile home parks. |
| | Medium Density Residential | MDR | 11-25 du/ac | Single/multi-family attached and detached residences including townhouses. |
| | High Density | HDR | 25-45 du/ac | Multi-Family residences |
| Commercial | Neighborhood Commercial | NC | 0.4 FAR | Local serving predominantly residential neighborhood. |
| | General Commercial | GC | 0.4 FAR | Local and regional serving retail, personal service, entertainment, dining, office, tourist-serving, and related commercial uses. |
| | Office Commercial | OC | 0.75 FAR | Includes professional offices in a neighborhood setting |
| | Business Park | BP | 0.6 FAR | Includes corporate offices, technology centers, research and development, "clean" industry, light manufacturing, and supporting retail. |
| | Hospitality | HOS | 1.0 FAR | Regional including convention centers, hotels/motels, and entertainment. |
| Industrial | Industrial | IND | 0.55 FAR | Variety of light industrial uses, including warehousing/distribution, assembly, and light manufacturing. |
| Open Space | Open Space- Non-Recreation | OS-OR | N/A | |
| | Open Space – Recreational | OS-R | N/A | |
| | Open Space – Water | OS-W | N/A | Accommodates recreational uses such as boating and fishing. |
| Public | Public Facilities | PF | N/A | Includes transportation facilities and museums. |
| | Public School | PS | N/A | Public schools (K-12) and universities. |
| | Airport | ARPT | N/A | Ontario Airport |
| | Right of Way | ROW | | |

[1] Designations listed above only included those shown and provided within the GIS Database. For additional designations, please refer to General Plan LU-02.

[2] FAR: Floor Area Ratio

## 2.3 FUTURE LAND USES

The future land uses are based on the current General Plan and the land use designations as shown in Table 2-2. For the OMC area, since most of the area has been built out, the land use types will largely remain the same, with the exception of the Mixed-Use areas. The Mixed-Use areas are predominantly high density residential and commercial uses. The eastern OMC consists mainly of industrial uses, whereas the western OMC is mostly residential uses. Table 2-3 provides a summary of the future land uses and acreages.

**Table 2-3 Future Land Use**

| Service Area | General Land Use Category | Land Use | Abbr. | Acres |
|---|---|---|---|---|
| Original Model Colony (OMC) | Residential | Rural Density Residential | RR | 529 |
| | | Low Density Residential | LDR | 4,321 |
| | | Low Medium Density Residential | LMDR | 448 |
| | | Medium Density Residential | MDR | 873 |
| | | High Density | HDR | 185 |
| | Commercial | Neighborhood Commercial | NC | 194 |
| | | General Commercial | GC | 380 |
| | | Office Commercial | OC | 349 |
| | | Business Park | BP | 665 |
| | | Hospitality | HOS | 141 |
| | Industrial | Industrial | IND | 6,456 |
| | Open Space | Open Space- Non-Recreation | OS-NR | 799 |
| | | Open Space – Recreational | OS-R | 533 |
| | | Open Space – Water | OS-W | 8 |
| | Public | Public Facilities | PF | 90 |
| | | Public School | PS | 429 |
| | | Airport | ARPT | 1,422 |
| | | Railroad | Rail | 247 |
| | | Right of Way | ROW | 8 |
| | | Landfill | LF | 137 |
| | Mixed Use | Mixed Use | MU | 1,107 |
| | | | **Subtotal OMC** | **19,322** |

**Table 2-3 Future Land Use**

| Service Area | General Land Use Category | Land Use | Abbr. | Acres |
|---|---|---|---|---|
| Ontario Ranch | Residential | Rural Density Residential | RR | - |
| | | Low Density Residential | LDR | 3,234 |
| | | Low Medium Density Residential | LMDR | 505 |
| | | Medium Density Residential | MDR | 1,069 |
| | | High Density | HDR | - |
| | Commercial | Neighborhood Commercial | NC | 88 |
| | | General Commercial | GC | 146 |
| | | Office Commercial | OC | 113 |
| | | Business Park | BP | 827 |
| | | Hospitality | HOS | - |
| | Industrial | Industrial | IND | 288 |
| | Open Space | Open Space- Non-Recreation | OS-NR | 434 |
| | | Open Space – Recreational | OS-R | 461 |
| | | Open Space – Water | OS-W | 51 |
| | Public | Public Facilities | PF | 2 |
| | | Public School | PS | 198 |
| | | Airport | ARPT | - |
| | | Railroad | Rail | - |
| | | Right of Way | ROW | 204 |
| | | Landfill | LF | - |
| | Mixed Use | Mixed Use | MU | 579 |
| | | | **Subtotal Ontario Ranch** | **8,199** |
| | | | **Total City of Ontario** | **27,521** |

[1] The table does not include street ROW that are shown in Figure 2-2 in OMC. However, OR does include areas to become become future street ROW.

## 2.3.1 Growth Areas

### 2.3.1.1 Mixed Use Areas

Based on the General Plan, the areas with anticipated growth are primarily identified within the Mixed-Use areas and within the Ontario Ranch area south of Riverside Drive. There are twelve Mixed-Use areas, with ten of these areas located in the OMC area. Each Mixed-Use area accommodates primarily commercial and residential uses. Densities and intensities vary by area and are designated by Area or Specific Plans.

**Table 2-4 Growth Areas – Mixed Use Areas**

| Mixed Use Area | | Residential Density & Non-residential Intensity | Acres |
|---|---|---|---|
| **Original Model Colony** | | | |
| 1 | Downtown | • >25.0 to 75.0 dwelling units per acre<br>• 2.0 FAR for retail and office uses | 178 |
| 2 | East Holt | • >14.0 to 40.0 dwelling units per acre<br>• 2.0 FAR for office uses<br>• 1.0 FAR for retail uses | 70 |
| 3 | Meredith | • >14.0 to 125.0 dwelling units per acre<br>• 3.0 FAR for office and retail uses | 275 |
| 4 | Multimodal | >20.0 to 80.0 dwelling units per acre<br>• 1.0 FAR for office and retail uses | 83 |
| 5 | Inland Empire Corridor | >14.0 to 30.0 dwelling units per acre<br>• 2.0 FAR for office uses<br>• 1.0 FAR for retail uses | 41 |
| 6 | Guasti | • >25.0 to 65.0 dwelling units per acre<br>• 1.0 FAR for office and retail uses | 94 |
| 7 | Ontario Center | • >20.0 to 125.0 dwelling units per acre<br>• 2.0 FAR for office uses<br>• 1.0 FAR for retail uses | 410 |
| 8 | Ontario Mills | >25.0 to 85.0 dwelling units per acre<br>• 1.5 FAR for office uses<br>• 1.0 FAR for retail uses | 278 |
| 9 | Euclid/Francis | • >14.0 to 25.0 dwelling units per acre<br>• 1.0 FAR for retail uses | 10 |
| 10 | 60/Hammer | 20.0 – 30.0 dwelling units per acre<br>• 1.0 FAR for retail and office uses | 42 |
| **Ontario Ranch** | | | |
| 11 | NMC East | • >14.0 to 50.0 dwelling units per acre<br>• 0.7 FAR for office and retail uses | 314 |
| 12 | NMC West | • >14.0 to 65.0 dwelling units per acre<br>• 1.5 FAR for office uses<br>• 1.0 FAR for retail uses | 315 |

[1] The acres include right of way within mix use areas.

Figure 2-2 illustrates the future land uses in accordance with the General Plan land uses. The Mixed-Use areas are also depicted to show the areas of anticipated growth and development.

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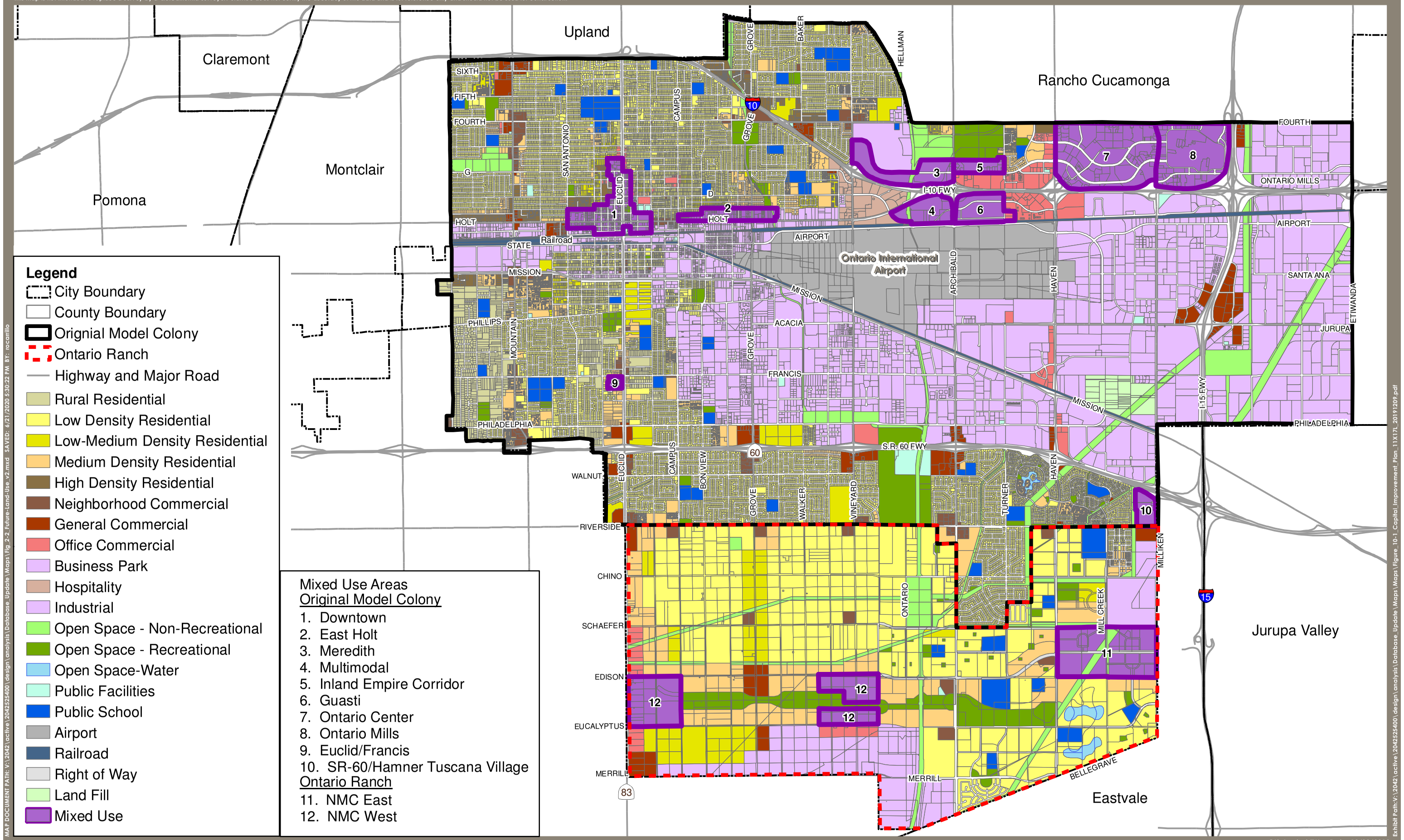


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# Ontario Recycled Water Master Plan
## Figure 2-2 Future Land Use

### 2.3.1.2 Ontario Ranch

Ontario Ranch will consist of the largest development area within the City. Most of the existing area is either vacant or used for Agricultural purposes. According to the General Plan, in addition to the Mixed-Use areas described in the previous section, the majority of the Ontario Ranch area will be developed for Low Density Residential and Industrial uses. There are several development projects within Ontario Ranch already being developed or in the planning stages. These projects area shown in Figure 2-3.

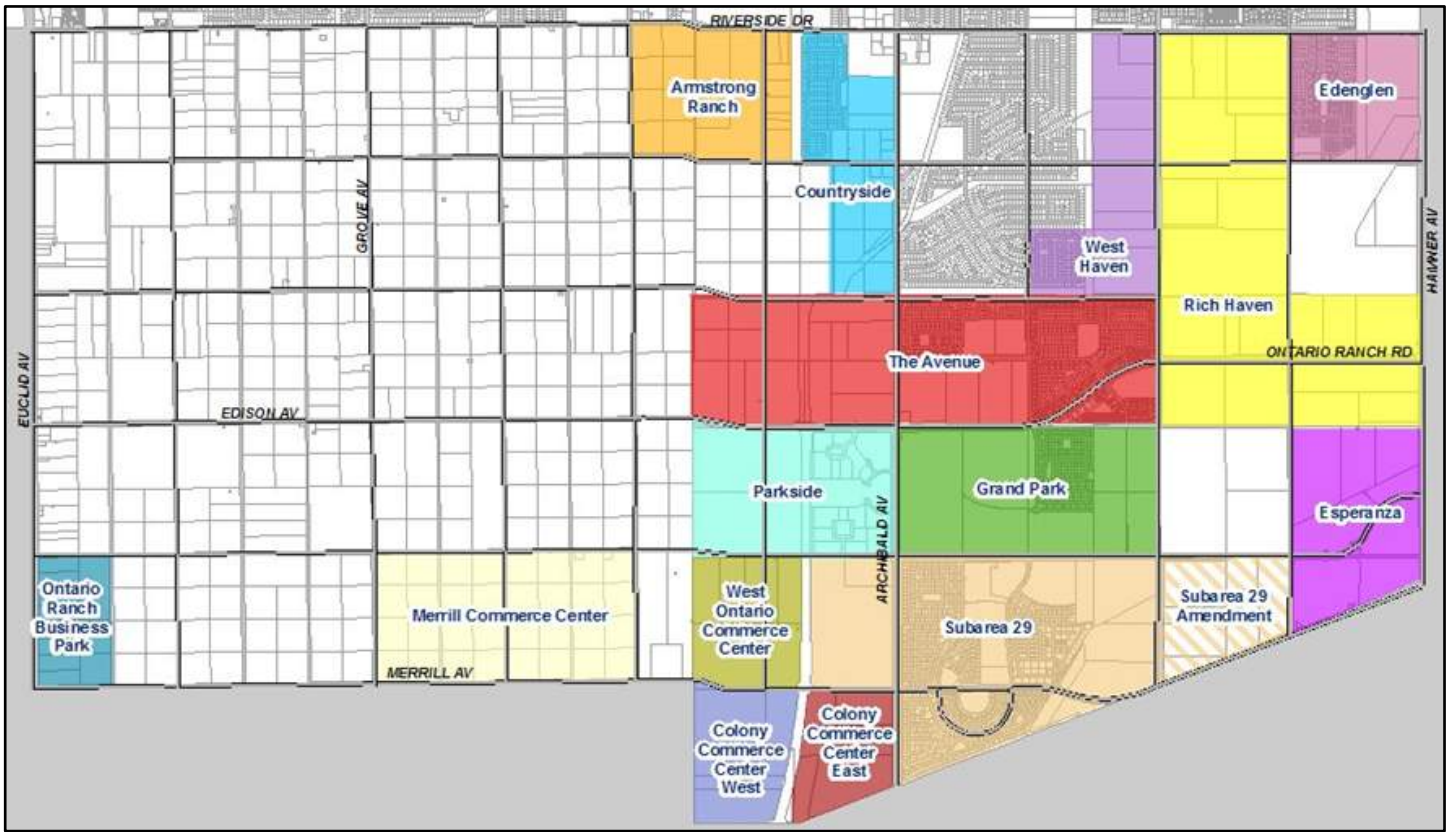


**Figure 2-3 Ontario Ranch Current Projects**

Table 2-5 provides a summary of the acreages and proposed land uses within each of the current projects shown in Figure 2-3.

**Table 2-5 Current Ontario Projects**

| Current Project | Total Area | Land Uses Proposed |
|---|---|---|
| Grand Park (Approved) | 320 acres | • 740 single family units<br>• 587 multi-family units |
| The Avenue (Approved) | 568 acres | • 2,313 single family units<br>• 562 multi-family units<br>• 130,000 s.f. commercial |
| Subarea 29 (Approved | 539 acres | • 2,392 single family units<br>• 87,000 s.f. commercial |
| Rich Haven | 584 acres | • 1,833 single family units<br>• 5361 multi-family units<br>• 1.13 million s.f. commercial |
| Parkside (Approved) | 250 acres | • 437 single family units<br>• 1,510 multi-family units<br>• 115,000 s.f. commercial |
| Esperanza (Approved) | 233 acres | • 914 single family units<br>• 496 multi-family units |
| West Haven (Approved) | 199 acres | • 753 single family units<br>• 87,000 s.f. commercial |
| Edenglen (Approved) | 160 acres | • 310 single family units<br>• 274 multi-family units<br>• 217,520 s.f. commercial<br>• 550,000 s.f. business park |
| Countryside (Approved) | 178 acres | • 819 single family units |
| Armstrong Ranch (Approved) | 199 acres | • 994 single family units |
| Colony Commerce Center West (Approved) | 123 acres | • 2.95 million s.f. industrial |
| West Ontario Commerce Center (Approved) | 125 acres | • 1.79 million s.f. industrial<br>• 555,000 s.f. business park |
| Colony Commerce Center East (Approved | 95 acres | • 2.2 million s.f. industrial |
| Subarea 29 Amendment | 125 acres | • 574 single family units |
| Merrill Commerce Center | 308 acres | • 5.8 million s.f. industrial<br>• 1.2 million s.f. business park |
| Ontario Ranch Business Park | 84 acres | • 410,000 s.f. business park<br>• 1.38 million s.f. industrial |

# 3.0 REGIONAL RECYCLED WATER SUPPLY

## 3.1 INLAND EMPIRE UTILITIES AGENCY (IEUA)

As one of the Member Agencies of IEUA, OMUC receives recycled water supply from IEUA. The recycled water supply is delivered via direct pipeline connections from the IEUA transmission system. The connections to IEUA are not separately metered or controlled.

The IEUA's recycled water supply is produced from wastewater collected and treated at tertiary wastewater treatment plants, mainly from Regional Water Recycling Plant No. 1 (RP-1), Regional Water Recycling Plant No. 4 (RP-4), Regional Water Recycling Plant No. 5 (RP-5), and Carbon Canyon Waste Recycling Facility (CCWRF). The treated wastewater effluent supplies IEUA member agencies through IEUA's distribution system via 35 miles of pipelines, three booster pump stations, three storage reservoirs, and four pressure regulating stations.

### 3.1.1 IEUA Recycling Plants

RP-1 is located in the City of Ontario near the intersection of State Highway 60 and Archibald Avenue. This facility was originally commissioned in 1948 and has undergone several expansions to increase the design wastewater treatment capacity to the current 44.0 MGD and biosolids treatment capacity equivalent to a wastewater flow rate of 60.0 MGD. The water pumped into the RW distribution system meets the requirement of California Title 22 bacteriological water quality regulations. As a source of supply to the RW system, RP-1 supplies three pressure zones, namely the 930, 1050, and 1158 Pressure Zones, through three (3) effluent pump stations.

RP-4 is located in the City of Rancho Cucamonga, which has been in operation and producing RW since 1997. RP-4 treats an average flow of 10 MGD. The RP-4 facility has been expanded to a capacity of 14 MGD. The plant provides recycled water that meets the State of California Title 22 Regulations. When the demand in the RW system is less than the amount of water being produced, the excess recycled water is discharged to the plant storage pond and the filter backwash water is sent to RP-1.

RP-5, located immediately east of the IEUA's Administrative Headquarters on Kimball Avenue in the City of Chino, began operation in March 2004. The first phase of RP-5 was designed to treat 15 MGD. Ultimately, RP-5 will treat 60 MGD and process 68 MGD of solids combined from RP-5 and CCWRF. The effluent waters meet the State of California Title 22 Regulations. The water produced from this plant is pumped to the 800 Pressure Zone.

CCWRF is located in the City of Chino and has been in operation since May 1992. This facility serves the cities of Chino, Chino Hills, Montclair, and Upland. Liquids are treated at CCWRF, while the solids removed from the waste flow are treated at RP-2, located on Prado Road in the City of Chino. CCWRF treats an annual average flow of 9.5 MGD. CCWRF includes several treatment processes that contribute to providing quality recycled water pursuant to the State of California Title 22 regulations. The water is pumped into the RW distribution system 930 Pressure Zone.

## 3.2 EXISTING SUPPLY CONNECTIONS

Table 3-1 provides a summary of OMUC's existing recycled water supply connections to the IEUA recycled water system. Each connection is a direct pipeline connection and is not metered or controlled separately.

**Table 3-1 OMUC Supply Points of Connections**

| No. | Location of POC | Pipe Connection Size | Pressure Zone |
|---|---|---|---|
| 1 | E 6th St / N Corona Ave | IEUA 30"/ Ontario 8" | 1630 |
| 2 | W 4th St / N Elderberry Ave | IEUA 30"/ Ontario 8" | 1299 |
| 3 | W 4th St / Anthony Munoz Hall of Fame Park | IEUA 30"/ Ontario 8" | 1299 |
| 4 | W 4th St / N Euclid Ave | IEUA 30"/ Ontario 8" | 1299 |
| 5 | E 1st St / N Imperial Ave | IEUA 24"/ Ontario12" | 1299 |
| 6 | E 4th St / N Turner Ave | IEUA 30"/ Ontario12" | 1299 |
| 7 | E 4th St / N Center Ave | IEUA 30"/ Ontario12" | 1299 |
| 8 | E 4th St / N Milliken Ave | IEUA 18"/ Ontario12" | 1299 |
| 9 | E Airport Dr / S Dupont Ave | IEUA 42"/ Ontario 8" | 1158 |
| 10 | E Airport Dr / S Rockefeller Ave | IEUA 42"/ Ontario 8" | 1158 |
| 11 | Day Creek Channel / S Wineville Ave | IEUA 24"/ Ontario 8" | 1158 |
| 12 | Day Creek Channel / Santa Ana St | IEUA 24"/ Ontario 8" | 1158 |
| 13 | Day Creek Channel / Jurupa St | IEUA 20"/ Ontario 20" | 1158 |
| 14 | Santa Ana St / Dupont Ave | IEUA 42"/ Ontario 8" | 1158 |
| 15 | Dupont Ave / Jurupa St | IEUA 42"/ Ontario 8" | 1158 |
| 16 | Dupont Ave / E Francis St | IEUA 36"/ Ontario 8" | 1158 |
| 17 | E Francis St / between S Haven Ave and Dupont Ave | IEUA 36"/ Ontario 8" | 1158 |
| 18 | S Metro Way / S Haven Ave | IEUA 36"/ Ontario 8" | 1158 |
| 19 | S Archibald Ave / E Philadelphia St | IEUA 36"/ Ontario 8" | 1158 |
| 20 | S Archibald Ave / E Walnut St | IEUA 42"/ Ontario 8" | 1050 |
| 21 | E Riverside Dr / Southeast corner of Westwind Park | IEUA 42"/ Ontario 12" | 1050 |
| 22 | S Whispering Lakes Ln / Schaefer Ave | IEUA 30"/ Ontario12" | 930 |

Figure 3-1 illustrates the IEUA regional recycled water supply facilities and OMUC supply points of connection listed in Table 3-1 above.

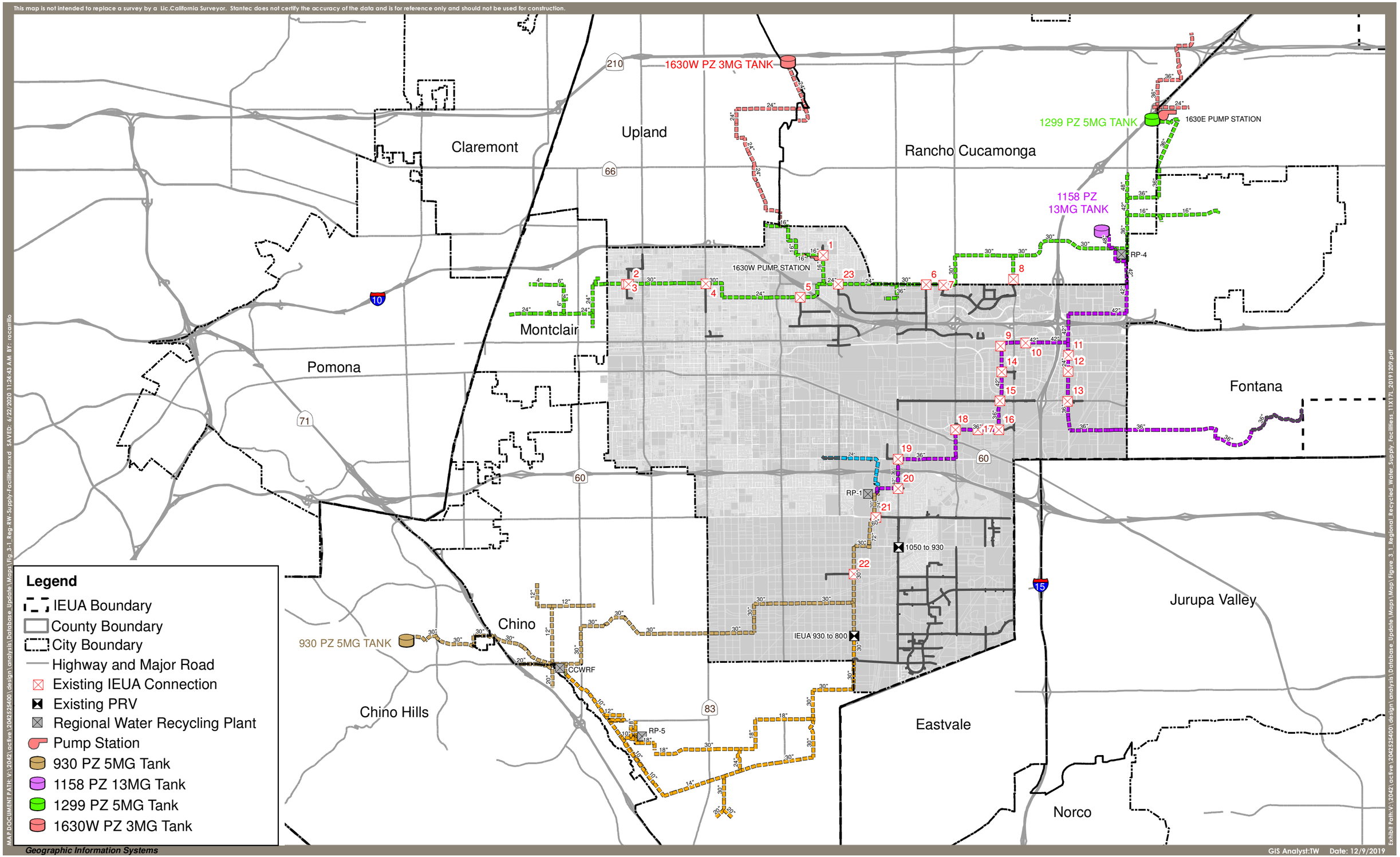


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0 0.75 1.5 3 Miles
1 inch = 1.5 miles

**Ontario Recycled Water Master Plan**
**Figure 3-1 Regional Recycled Water Supply Facilities**

# 4.0 EXISTING RECYCLED WATER SYSTEM INVENTORY

The existing recycled water system, including recycled water meters, in the Study Area are owned and maintained by OMUC. As of July 2018, there are 363 active recycled water meters, which consist of 343 meters for irrigation of landscaping and non-agricultural use, and 20 meters for agricultural or farmers' use.

## 4.1 PRESSURE ZONES

The preliminary pressure zone boundaries shown in Figure 4-1 are established based on surface elevation, pressure criteria, and IEUA's RWPS.

1630 Pressure Zone

IEUA's 1630 Zone is divided into separate service areas, the East and West 1630 Zones. As shown in Figure 4-1, the West 1630 Zone includes a small portion of OMUC's recycled water service area. This zone is supplied by the 1630 West Pump Station (which pumps recycled water from the 1299 Zone), and pumps to the 1630 West 3 MG storage tank. The 1630 pressure zone consists of a small portion of the City in the northern area and the whole area is north of the Freeway I-10 and East 6$^{th}$ Street and extends to the City's northern boundary.

1299 Pressure Zone

The 1299 Zone is supplied recycled water from the 1299 Zone Effluent Pump Station located at RP-4. This pump station can also pump recycled water from the lower 1158 Zone. The 1299 pressure zone is bounded on the north by the 1630 Zone and the northern City Boundary, and 1158 Zone to the south. It is bounded to the south by the 1158 Zone along the railroad, which is located to the north of Ontario International Airport, from the western city boundary to North Haven Ave, and then, to the north of Freeway I-10 to Freeway I-15; and then, along the city's northern boundary. The whole area above this boundary up to 1630 Pressure Zone is established as 1299 pressure zone.

1158 Pressure Zone

The 1158 Zone is supplied water from both the RP-1 and RP-4 facilities via 1158 Zone Effluent Pump Stations located at each. The 1158 pressure zone is bounded by the 1299 Zone to the north and 1050 pressure zone are divided along E. Francis St. from western city boundary to flood control channel next to Ontario Soccer Park, and then, along the channel southerly to California State Route 60 and then along the eastern city boundary to Route 60.

1050 Pressure Zone:

The 1050 pressure zone is bounded by the 1158 Zone to the north and the 930 Zone boundary to the south. The 1050/930 Zone boundary is along the Riverside Drive. The 1050 Zone is supplied directly from the 1050 Zone effluent pump station at RP-1. A 1158 to 1050 Zone PRV is also equipped at this facility to

maintain system pressure and demands. No storage tank exists in this pressure zone. Connections to the OMUC pipelines are from the 24-inch to 42-inch IEUA transmission mains as shown in Figure 4-1.

930 Pressure Zone

The 930 Zone is bounded by the 1050 Zone along Riverside Drive to the north, and the southern boundary is along the City's southern boundary. The 930 Zone is supplied directly from two IEUA recycled water effluent pump stations at the CCWRF and RP-1. Most of the supply is from the RP-1 facility, in particular during the winter months. The 930 Zone contains a 5 MG storage tank located in the City of Chino Hills to the west. Supply and meter connections to the OMUC pipelines are from the 30-inch transmission main as shown in Figure 4-1.

**Table 4-1 Pressure Zone Characteristics and Supply**

| Pressure Zone/HGL | Minimum Service Elevation in IEUA's RWPS | Maximum Service Elevation in IEUA's RWPS | IEUA Supply | Storage Tank |
|---|---|---|---|---|
| 930 | 600-ft | 778-ft | CCWRF, RP-1 | 5 MG |
| 1050 | 746-ft | 843-ft | RP-1 | - |
| 1158 | 813-ft | 1,042-ft | RP-1, RP-4 | 13 MG (RP-4) |
| 1299 | 971-ft | 1,183-ft | RP-4 | 5 MG |
| 1630 | 1,283-ft | 1,465-ft | RP-4 | 3 MG (1630 West) |

## 4.2 PRESSURE REDUCING STATIONS

The City owns and operates one existing pressure reducing station located at the intersection of Chino Avenue and Archibald Avenue. This PRV reduces pressure from the 1050 Zone to the 930 Zone. In addition, a second PRV station located at Chino Avenue and Haven Avenue is currently in the design phase and will also reduce pressure from the 1050 Zone to the 930 Zone.

## 4.3 PIPELINES

The pipelines operated and maintained by OMUC total approximately 172,684 LF. The pipelines range in size from 6-inch to 36-inch and consist primarily of PVC and CML&C materials. A summary of the length of pipe by diameter and material is shown in Table 4-2.

**Table 4-2 Recycled Water Pipeline Inventory**

| Pipe Size | Pipe Material | Total Length of Pipe (lf) |
|---|---|---|
| 6-inch | PVC | 339 |
| 8-inch | CML&C[1] | 531 |
| | PVC | 108,386 |
| 12-inch | CML&C | 199 |
| | DIP | 225 |
| | PVC | 40,409 |
| 16-inch | CML&C | 23 |
| | PVC | 9,120 |
| 20-inch | CML&C | 474 |
| 24-inch | CML&C | 12,619 |
| 30-inch | CML&C | 155 |
| 36-inch | CML&C | 204 |
| | **Total Length** | **172,684** |

[1] 8-inch CML&C also includes 327 LF of Cement Mortar Lined and Welded Steel pipe.

As illustrated in the chart below, approximately 63-percent of the OMUC pipelines are 8-inch PVC, and 23-percent are 12-inch PVC.

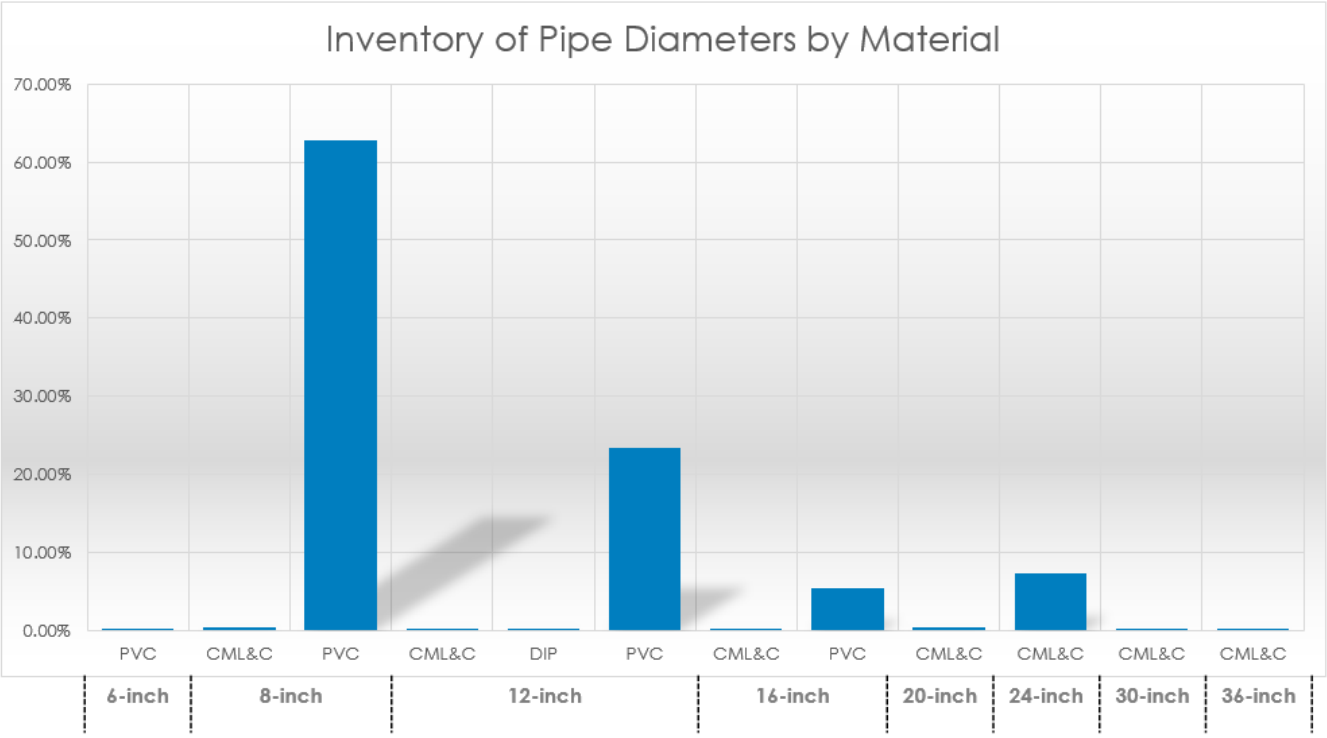

This map is not intended to replace a survey by a Lic.California Surveyor. Stantec does not certify the accuracy of the data and is for reference only and should not be used for construction.

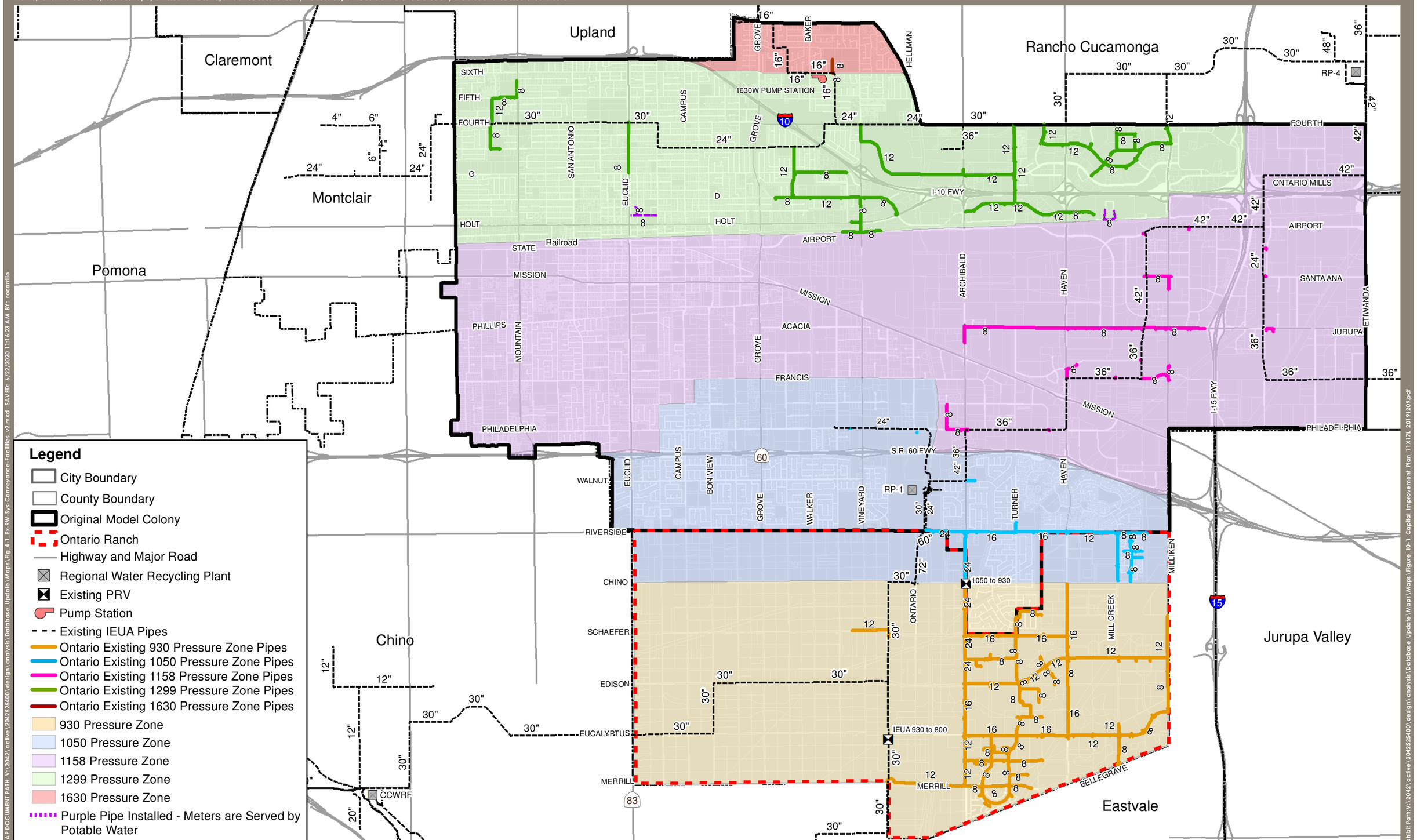


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Geographic Information Systems

GIS Analyst:TW Date: 12/09/2019

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Stantec
38 Technology Drive, Irvine, CA 92618
Phone 949.923.6000 www.stantec.com

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# Ontario Recycled Water Master Plan

## Figure 4-1 Existing Recycled Water System Conveyance Facilities

# 5.0 RECYCLED WATER DEMANDS

## 5.1 HISTORICAL RECYCLED WATER USE

The total amount of recycled water usage has been increasing since 2009 due to the increasing number of recycled water meters/users. In 2009, only 166 meters were active. As of 2018, there are 363 active recycled water meters. The chart below illustrates the growth in recycled water use and increase number of recycled water meters since 2009.

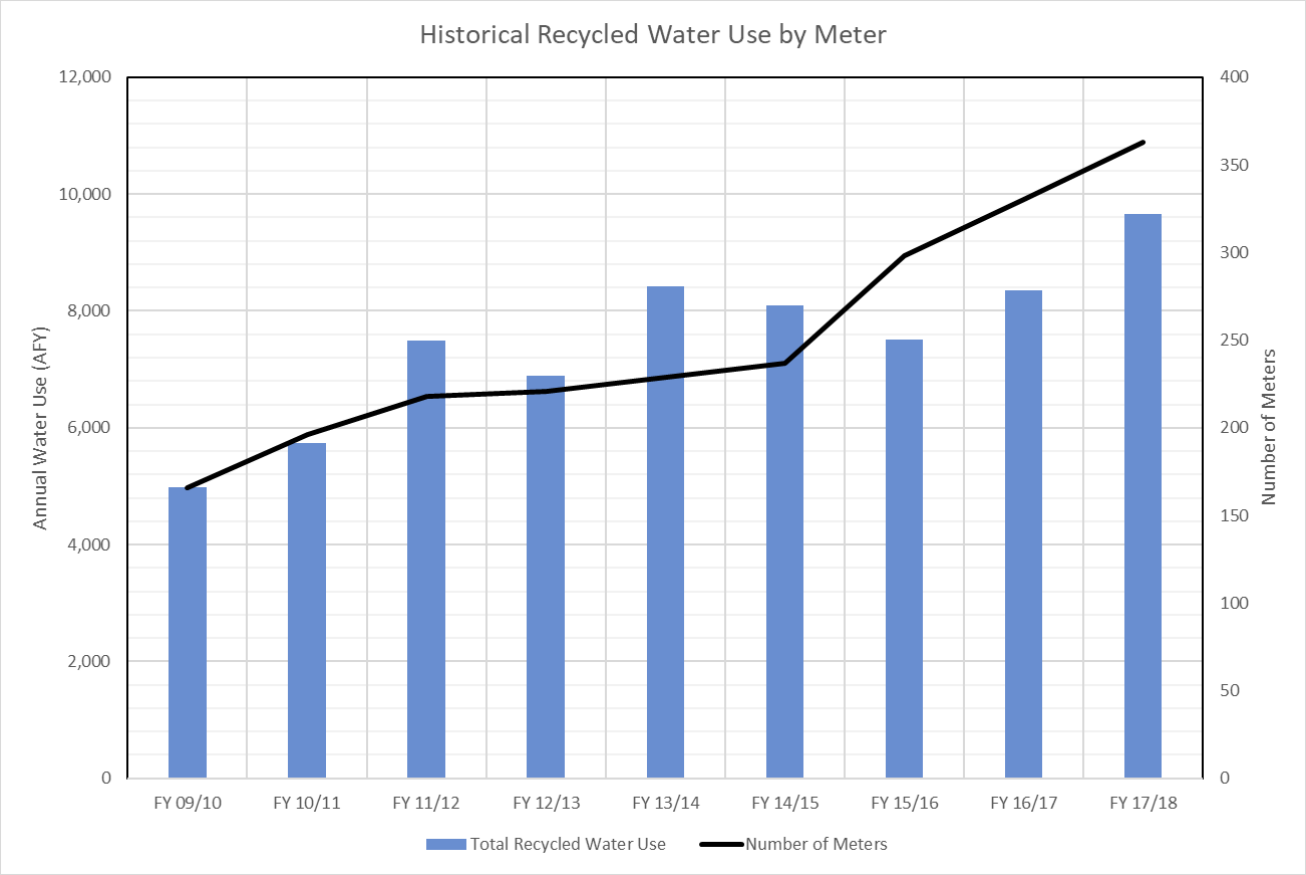


For this Master Plan and hydraulic analysis, the data from July 2017 through June 2018 will be utilized. The billing data from years 2009 through 2018 are summarized in Table 5-1.

**Table 5-1 Historical Recycled Water Usage (AF)**

| Month | FY 09/10 | FY 10/11 | FY 11/12 | FY 12/13 | FY 13/14 | FY 14/15 | FY 15/16 | FY 16/17 | FY 17/18 |
|---|---|---|---|---|---|---|---|---|---|
| July | - | 944 | 845 | 884 | 931 | 1056 | 1021 | 1124 | 1198 |
| August | 1120 | 813 | 1145 | 871 | 965 | 1306 | 935 | 1186 | 1166 |
| September | 878 | 895 | 1228 | 982 | 1016 | 1127 | 928 | 1222 | 1392 |
| October | 837 | 569 | 786 | 706 | 755 | 786 | 540 | 943 | 878 |
| November | 409 | 238 | 446 | 560 | 698 | 677 | 647 | 564 | 752 |
| December | 289 | 269 | 253 | 337 | 519 | 429 | 410 | 475 | 490 |
| January | 117 | 148 | 364 | 194 | 513 | 211 | 380 | 164 | 595 |
| February | 49 | 270 | 385 | 235 | 573 | 260 | 232 | 107 | 409 |
| March | 67 | 192 | 321 | 346 | 362 | 472 | 433 | 198 | 481 |
| April | 229 | 297 | 314 | 405 | 453 | 551 | 493 | 695 | 426 |
| May | 440 | 424 | 520 | 636 | 774 | 624 | 703 | 731 | 935 |
| June | 546 | 685 | 887 | 739 | 868 | 602 | 788 | 942 | 932 |
| **Total** | **4,981** | **5,744** | **7,493** | **6,894** | **8,427** | **8,099** | **7,511** | **8,351** | **9,653** |
| Number of Meters | 166 | 196 | 218 | 221 | 229 | 237 | 298 | 330 | 363 |
| AF/Meter | 30.0 | 29.3 | 34.4 | 31.2 | 36.8 | 34.2 | 25.2 | 25.3 | 26.6 |

Based on 363 active RW water meters' billing data provided by the City, the total recycled water usage from July 2017 to June 2018 was 9,653 ac-ft.

The recycled water usage subtotaled by existing land use is shown in Table 5-2.

**Table 5-2 Existing Recycled Water Usage by Existing Land Use**

| | General Land Use Category | Existing Land Use | FY 17/18 RW Usage (ac-ft) |
|---|---|---|---|
| Original Model Colony | Residential | LDR | 1 |
| | | MDR | 5 |
| | | HDR | 72 |
| | Commercial | Admin./Prof. | 42 |
| | | Commercial | 216 |
| | | Office Commercial | 678 |
| | Industrial | Manufacturing | 971 |
| | | Industrial | 411 |
| | | Warehousing | 181 |
| | Parks/Rec/Cultural | Parks/Rec/Cultural | 1,361 |
| | Public Facilities | Public Facilities | 99 |
| | School | School | 277 |
| | Transportation/Utilities | Transp/Utilities | 57 |
| | Agricultural | Ag. Multi-Use | 14 |
| | Right of Way | Street/Parking | 0 |
| | | ROW | 9 |
| | Vacant | Vacant Bldg | 1 |
| | Temporary | Construction Meters | 70 |
| | | **Subtotal Original Model Colony** | **4,465** |
| Ontario Ranch | Residential | LDR | 106 |
| | | MDR | 94 |
| | | HDR | 0 |
| | Commercial | Admin./Prof. | 0 |
| | | Commercial | 0 |
| | | Office Commercial | 0 |
| | Industrial | Manufacturing | 0 |
| | | Industrial | 0 |
| | | Warehousing | 0 |
| | Parks/Rec/Cultural | Parks/Rec/Cultural | 33 |
| | Public Facilities | Public Facilities | 0 |
| | School | School | 0 |
| | Transportation/Utilities | Transp/Utilities | 9 |
| | Agricultural | Ag. Multi-Use | 4,940 |
| | Right of Way | Street/Parking | 0 |
| | | ROW | 6 |
| | Vacant | Vacant Bldg | 0 |
| | Temporary | Construction Meters | 2 |
| | | **Subtotal Ontario Ranch** | **5,190** |
| | | **Total City of Ontario** | **9,655** |

Locations of the currently active recycled water meters are shown in Figure 5-1.

This map is not intended to replace a survey by a Lic.California Surveyor. Stantec does not certify the accuracy of the data and is for reference only and should not be used for construction.

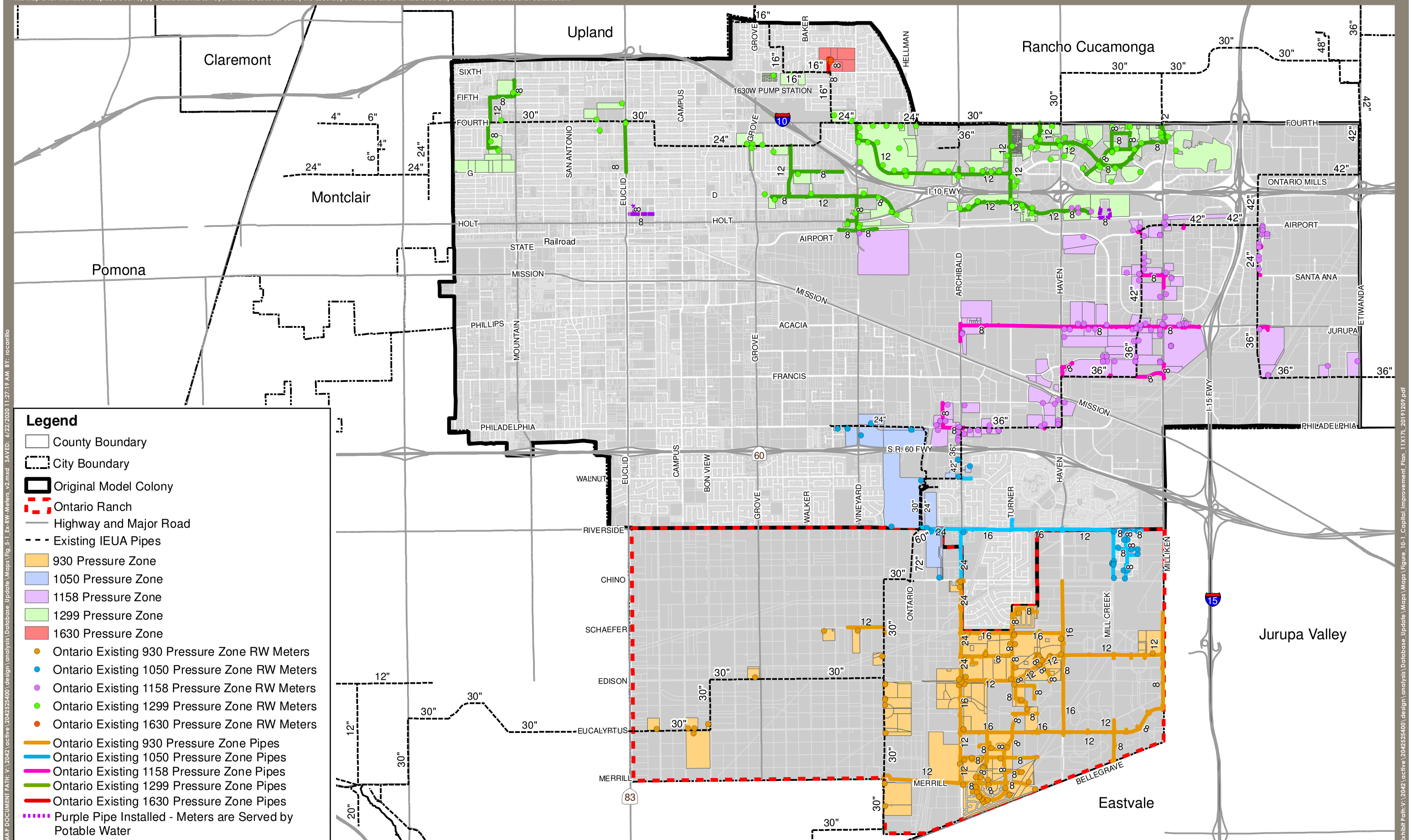


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Geographic Information Systems

GIS Analyst:TW Date: 12/09/2019

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# Ontario Recycled Water Master Plan
## Figure 5-1 Existing Recycled Water Meters

## 5.2 RECYCLED WATER DEMAND FACTORS

The recycled water demand factors are based on the recycled water meter billing data. In GIS the meters were assigned a parcel(s) based on the address and location information provided by the City. The meter data for each land use was then grouped and divided by the total area for each land use. This process also consisted of verifying that each land use and the service area of the meter (based on the land use from the GIS parcel base) is consistent with the actual land use (using aerial imagery).

The recycled water irrigation demand factors are shown in the following table.

**Table 5-3 Recycled Water Irrigation Unit Demand Factors**

| General Land Use Category | Land Use | Abbr. | Demand Factors (Gal/AC/Day) |
|---|---|---|---|
| Residential | Rural Density Residential | RR | - |
| | Low Density Residential | LDR | 600 |
| | Low Medium Density Residential | LMDR | 700 |
| | Medium Density Residential | MDR | 750 |
| | High Density | HDR | 800 |
| Commercial | Neighborhood Commercial | NC | 1,100 |
| | General Commercial | GC | 1,100 |
| | Office Commercial | OC | 1,500 |
| | Business Park | BP | 1,200 |
| | Hospitality | HOS | 1,000 |
| Industrial | Industrial | IND | 1,700 |
| Open Space | Open Space- Non-Recreation | OS-NR | - |
| | Open Space – Recreational | OS-R | 2,350 |
| | Open Space – Water | OS-W | 2,350 |
| Public | Public Facilities | PF | 2,100 |
| | Public School | PS | 2,250 |
| | Airport | ARPT | 100 |
| | Railroad | Rail | 250 |
| | Right of Way | ROW | 600 |
| | Landfill | LF | - |
| Mixed Use | Mixed Use | MU | 1,500 |

[1] Demand for LMDR is average of LDR and MDR.

## 5.3 RECYCLED WATER PEAKING FACTORS

In determining the peaking factors for this study, the monthly demands for FY 2017/2018 were used as shown below. Historically, the month of September represents the maximum monthly recycled water usage.

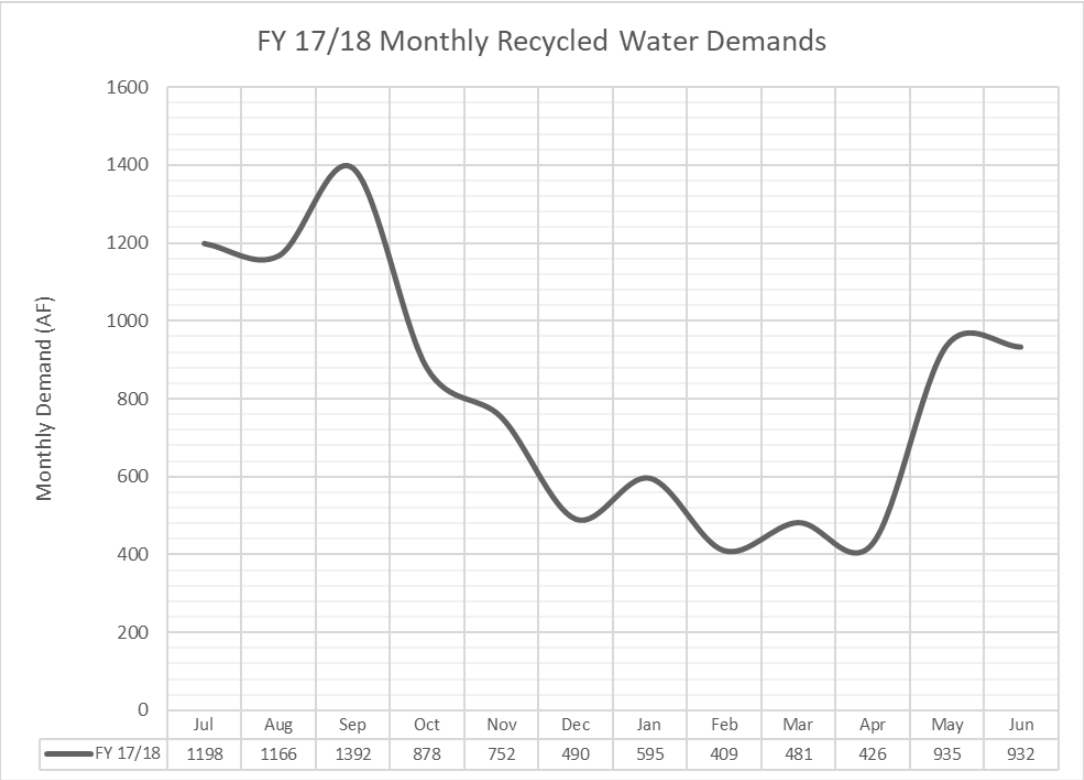


Table 5-4 has been prepared to summarize the water usage for FY 2017/2018.

**Table 5-4 Recycled Water Demand Factors**

| Demand Condition | Recycled Water Demand[1] | Demand Factor |
|---|---|---|
| Annual Average | 9,653 AFY | - |
| Average Day (ADD) | 8.46 mgd | - |
| Maximum Month | 14.63 mgd | 1.73 x ADD |
| Estimated Maximum Day (MDD) | 16.82 mgd / 11,684 gpm | 2.00 x ADD |
| Estimated Peak Hour (PH) | 20,358 gpm | 3.54 x ADD |

[1] Recycled Water Demand is based on the FY 17/18 data.

## 5.4 RECYCLED WATER DIURNAL DEMAND PATTERNS

The demand patterns previously developed for the City's ultimate water demand estimate are used for this Master Plan Update. There are four primary diurnals used for the OMUC service meters including landscape irrigation, industrial, industrial manufacturing, and agricultural uses. Each of these diurnals are shown below. A composite diurnal has also been prepared that combines these four land use diurnals based on a weighted average of demand contribution to show a systematic diurnal and system peak hour factor.

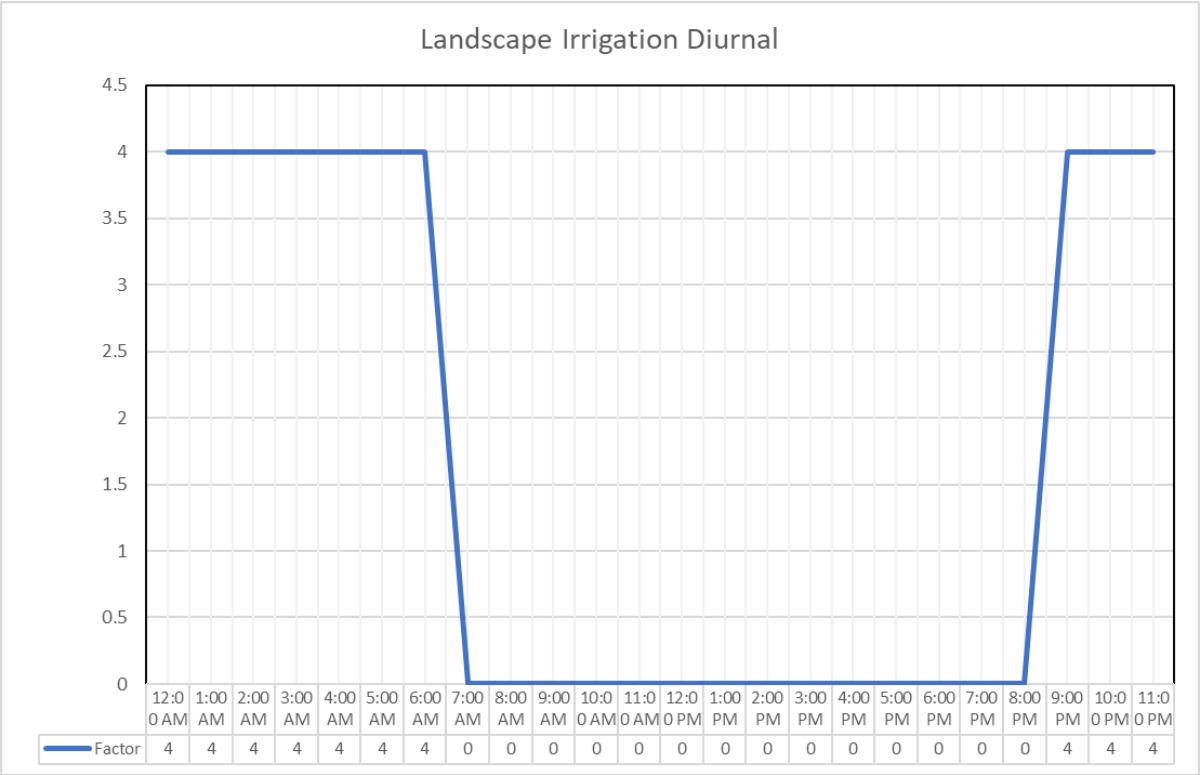


| | 12:00 AM | 1:00 AM | 2:00 AM | 3:00 AM | 4:00 AM | 5:00 AM | 6:00 AM | 7:00 AM | 8:00 AM | 9:00 AM | 10:00 AM | 11:00 AM | 12:00 PM | 1:00 PM | 2:00 PM | 3:00 PM | 4:00 PM | 5:00 PM | 6:00 PM | 7:00 PM | 8:00 PM | 9:00 PM | 10:00 PM | 11:00 PM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Factor | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 4 |

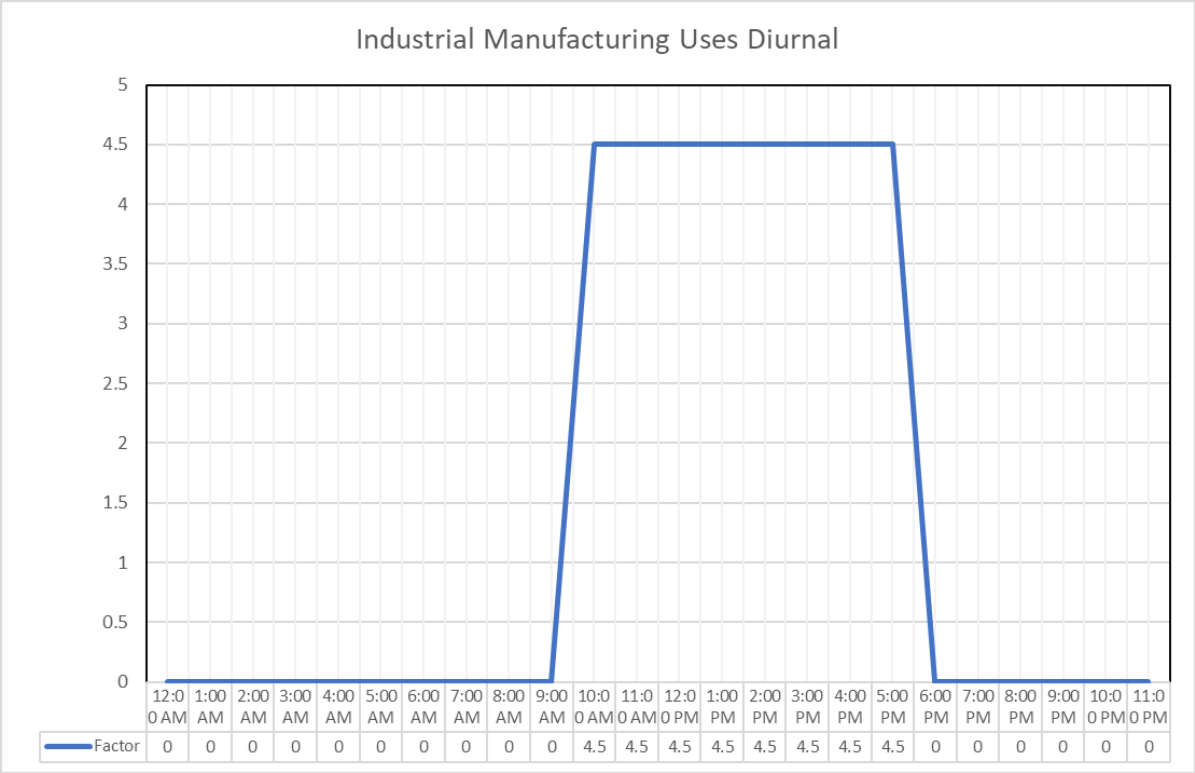
Industrial Manufacturing Uses Diurnal
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
12:00 AM 1:00 AM 2:00 AM 3:00 AM 4:00 AM 5:00 AM 6:00 AM 7:00 AM 8:00 AM 9:00 AM 10:00 AM 11:00 AM 12:00 PM 1:00 PM 2:00 PM 3:00 PM 4:00 PM 5:00 PM 6:00 PM 7:00 PM 8:00 PM 9:00 PM 10:00 PM 11:00 PM
Factor 0 0 0 0 0 0 0 0 0 0 4.5 4.5 4.5 4.5 4.5 4.5 4.5 4.5 0 0 0 0 0 0

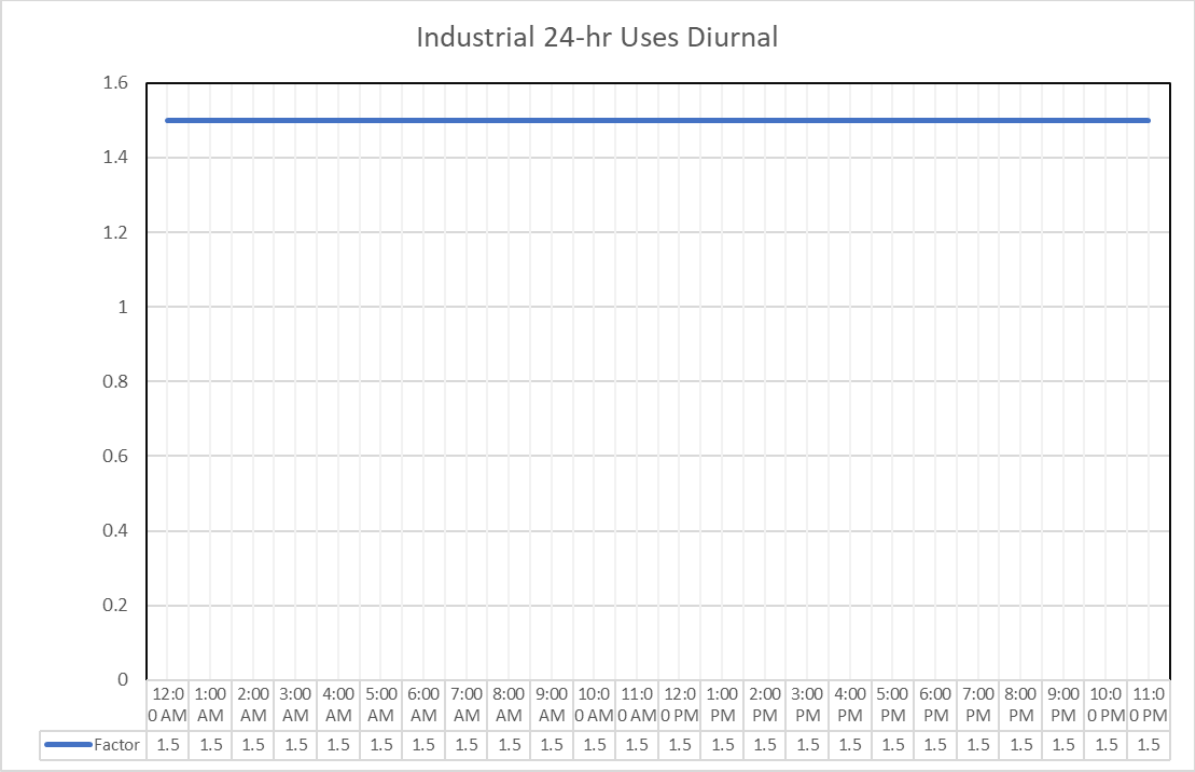
Industrial 24-hr Uses Diurnal
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
12:00 AM 1:00 AM 2:00 AM 3:00 AM 4:00 AM 5:00 AM 6:00 AM 7:00 AM 8:00 AM 9:00 AM 10:00 AM 11:00 AM 12:00 PM 1:00 PM 2:00 PM 3:00 PM 4:00 PM 5:00 PM 6:00 PM 7:00 PM 8:00 PM 9:00 PM 10:00 PM 11:00 PM
Factor 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5

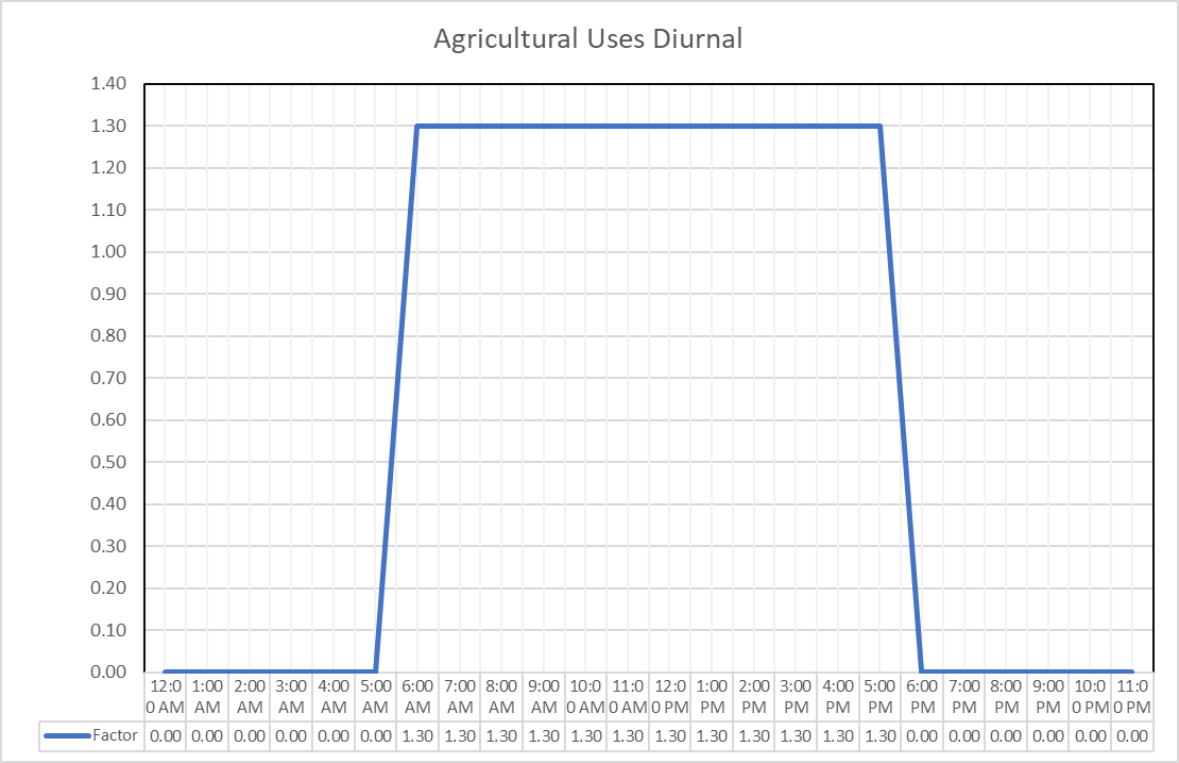
Agricultural Uses Diurnal
1.40
1.30
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
12:00 AM 1:00 AM 2:00 AM 3:00 AM 4:00 AM 5:00 AM 6:00 AM 7:00 AM 8:00 AM 9:00 AM 10:00 AM 11:00 AM 12:00 PM 1:00 PM 2:00 PM 3:00 PM 4:00 PM 5:00 PM 6:00 PM 7:00 PM 8:00 PM 9:00 PM 10:00 PM 11:00 PM
Factor 0.00 0.00 0.00 0.00 0.00 0.00 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 1.30 0.00 0.00 0.00 0.00 0.00 0.00

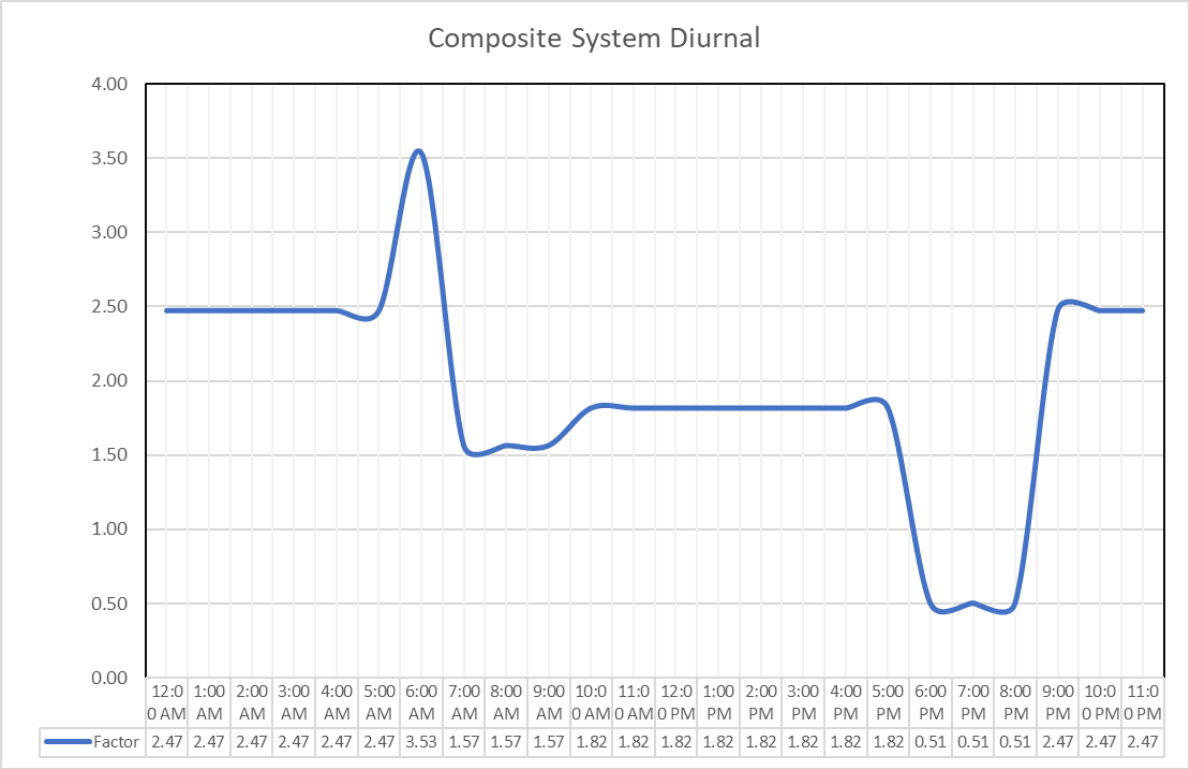
Composite System Diurnal
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
12:00 AM 1:00 AM 2:00 AM 3:00 AM 4:00 AM 5:00 AM 6:00 AM 7:00 AM 8:00 AM 9:00 AM 10:00 AM 11:00 AM 12:00 PM 1:00 PM 2:00 PM 3:00 PM 4:00 PM 5:00 PM 6:00 PM 7:00 PM 8:00 PM 9:00 PM 10:00 PM 11:00 PM
Factor 2.47 2.47 2.47 2.47 2.47 2.47 3.53 1.57 1.57 1.57 1.82 1.82 1.82 1.82 1.82 1.82 1.82 1.82 0.51 0.51 0.51 2.47 2.47 2.47

# 6.0 DESIGN CRITERIA

## 6.1 SYSTEM ANALYSIS CRITERIA

The model will be established based on the following set of design and planning criteria:

- Minimum regional service pressure = 50 psi
- Maximum regional system pressure = 150 psi
- Maximum flow rate < 8 ft/s
- Minimum flow rate > 1 ft/s

## 6.2 FACILITY DESIGN CRITERIA

The design and construction of any RW facilities should follow the *Water & Sewer Construction Specification*, and the *Water & Sewer Design Guidelines and Specification* provided by the City. The beneficial uses of recycled water include but are not limited to, landscape irrigation systems, agricultural irrigation systems, and industrial process uses. Systems used for industrial processes, construction purposes, or recreational impoundment shall be reviewed by the City. The determination of whether the City supplies recycled water or potable water will be in accordance with the standards of treatment and water quality requirements set forth in Title 22, Chapter 4 of the California Administrative Code.

### 6.2.1 Pipe Sizing and Configuration

The tertiary treated recycled water lines shall be constructed in accordance with the color-coding and labeling requirements. All pipeline material used in the recycled water system shall be purple in color or installed with a purple polyethylene sleeve at the time of installation. Separation between water, sewer, and recycled water line installations shall be in accordance with Department of Public Health regulations, or City requirements, whichever is greater.

The standard recycled water mainline sizes allowed in the City are 8-inch, 12-inch, 16-inch, 20-inch, 24-inch, 30-inch, and 36-inch in diameter. For recycled water, the minimum pipeline size in arterial streets of a new development area is 8-inch diameter. Smaller diameter pipelines will be considered in collector streets on a case-by-case basis by the City. Recycled water facilities shall typically be located 8-feet from the curb face on the opposite side of the street as the potable water. Each line shall be valved so that any segment does not exceed 2000 feet. Dead end mains shall be provided with means of flushing with a blow-off. Pipelines 8-inches and smaller shall be installed with a minimum of 54-inches of cover between the top of the pipe and the finished grade. Pipelines 12-inches or greater shall be installed with a minimum of 60-inches from the top of the pipe to the finished grade. Recycled water pipes shall be installed at a depth greater than the potable waterlines.

### 6.2.2 Pressure Reducing Station Requirements

Where required by the City, pressure reducing stations shall be individually designed specifically for each installation, subject to City review and approval of design and materials. All services shall be constructed in accordance with the applicable City Standard Drawings. Services shall not be connected to 18-inch or larger mains unless specifically permitted by the City.

# 7.0 EXISTING SYSTEM HYDRAULIC MODEL ANALYSIS

## 7.1 HYDRAULIC MODEL

The hydraulic model used for this Master Plan is the IEUA hydraulic model used for IEUA's Recycled Water Program Strategy. This hydraulic model contains the IEUA supplies for existing and future conditions, including the other Member Agencies connections and recycled water demands purchased from IEUA. This hydraulic model is therefore considered to accurately reflect regional supply and hydraulic conditions that impact the City of Ontario's recycled water system.

The hydraulic model is created in InfoWater, with the InfoWater Suite 12.4 utilized for this Master Plan analysis. Since the hydraulic model included all IEUA supply facilities, pump stations, regional pipelines, and recycled water demands, including the groundwater recharge basin flows, updating the model was required only for the existing Ontario pipelines and demands. The model was then updated to create the Near-Term and Future demand scenarios required for this study.

The recycled water model was updated to include the most recent City of Ontario recycled water demands, as described in Chapter 5 based on the 2017/2018 billing data. Pipelines and demand locations that represent existing meter locations were updated into the model based on the latest GIS database information that was provided by the City.

The hydraulic model includes data sets and diurnal demand patterns to analyze the system for a 24-hour extended period simulation (EPS).

## 7.2 MAXIMUM DAY DEMAND HYDRAULIC ANALYSIS

An analysis for the existing maximum day demands was conducted as a baseline scenario for this master plan. The maximum day demands were input at each demand location in the model. The hourly diurnal pattern was then applied to the demands. The total maximum day demand for the existing recycled water system within the City is 16.83 MGD. The maximum day demand by pressure zone is shown in Table 7-1 below.

**Table 7-1 Existing Maximum Day Demands by Pressure Zone**

| Pressure Zone | Maximum Daily Demand (MGD) | Maximum Day Flow Rate (gpm) |
|---|---|---|
| 930 | 8.82 | 6,124 |
| 1050 | 1.36 | 942 |
| 1158 | 2.75 | 1,910 |
| 1299 | 3.90 | 2,708 |
| Total | 16.83 | 11,684 |

The hydraulic modeling results show that the existing IEUA regional system meets the design criteria for both pressure and pipeline velocities throughout the IEUA regional system. There are a few known low pressure areas, such as at the 7th/8th Street Basins in 1299 Zone and in the 42-inch transmission main of the 1158 Zone near RP-4.

There are a few demand nodes with pressures below the criteria in the western portion of the 1299 Zone within the City of Ontario's distribution system. These pressures are predicted by the model to be as low as between 35-48 psi between 5th Street and 6th Street from Elderberry Avenue to Mountain Avenue. The low pressures in this area are due to high ground elevations for the 1299 Zone. The pipeline velocities and supply sources for the pressure are within design criteria. The nodes with low pressures are indicated in red in the graphic below. To mitigate the low service pressures in this area, an irrigation pump at the meter is recommended.

All other demand locations within the City have pressures above 50 psi and pipeline velocities less than maximum criteria. There are no deficiencies for existing demand conditions based on the hydraulic model.

# 8.0 RECYCLED WATER USE PROJECTIONS

## 8.1 OVERVIEW OF DEMAND CATEGORIES

The projected future demands are determined for five main types of demand categories:

1) existing users (as described in Chapter 5),

2) vacant land areas to developed,

3) existing agricultural land to be developed,

4) existing agricultural land that can be converted in the interim before being developed, and

5) existing developed land with potable water irrigation meters that may be converted to the recycled water system, or potential conversion areas.

The land uses are determined by acreage for each land use type or category. The areas that are currently vacant or agricultural uses that are proposed to be developed are determined according to the City of Ontario's General Plan, and in conjunction with other planning studies such as the Mixed-Use Area Plans and developments for the Ontario Ranch area. The following sections described in more detail the demand categories evaluated, with the exception of the existing users since they are already discussed in Chapter 5 of this report.

## 8.2 VACANT LAND TO BE DEVELOPED

The vacant land use parcels in the existing land use database were evaluated by overlaying the parcel database on Google Earth aerial photogrammetry. By inspection, the vacant parcels were verified if there was an actual use or occupancy or if the parcel was indeed vacant. The remaining existing vacant land use parcels that were then overlaid with the General Plan land uses to determine which currently vacant land use parcels will be developed, with the General Plan land use designation. The results of this analysis are shown in Table 8-1. These parcels are also graphically illustrated in Figure 8-1. As shown, there are a significant number of parcels in the Original Model Colony and Ontario Ranch service areas.

**Table 8-1 Vacant Parcels to Be Developed Recycled Water Use**

| Service Area | Future Land Use for the Existing Vacant Parcels | General Plan Land Use Designation | Total Gross Acreage (Acres) | Future Recycled Water Use (AFY) |
|---|---|---|---|---|
| Original Model Colony | Residential | RR | - | - |
| | | LDR | 0 | 0 |
| | | LMDR | - | - |
| | | MDR | 15 | 13 |
| | | HDR | - | - |
| | Commercial | NC | 3 | 4 |
| | | GC | 6 | 8 |
| | | OC | 45 | 76 |
| | | BP | 38 | 51 |
| | | HOS | 5 | 5 |
| | Industrial | IND | 321 | 611 |
| | Open Space | OS-NR | - | - |
| | | OS-R | - | - |
| | | OS-W | - | - |
| | Public | PF | - | - |
| | | PS | - | - |
| | | ARPT | 10 | 1 |
| | | Rail | - | - |
| | | ROW | 1 | 1 |
| | | LF | 1 | - |
| | Mixed Use | MU | 146 | 245 |
| | **Total Original Model Colony** | | 591 | 1,014 |
| Ontario Ranch | Residential | RR | - | - |
| | | LDR | 252 | 170 |
| | | LMDR | 27 | 21 |
| | | MDR | 78 | 66 |
| | | HDR | - | - |
| | Commercial | NC | - | - |
| | | GC | 18 | 23 |
| | | OC | - | - |
| | | BP | 120 | 162 |
| | | HOS | - | - |
| | Industrial | IND | 51 | 97 |
| | Open Space | OS-NR | 24 | - |
| | | OS-R | 21 | 56 |
| | | OS-W | - | - |
| | Public | PF | - | - |
| | | PS | 12 | 30 |
| | | ARPT | - | - |
| | | Rail | - | - |
| | | ROW | 4 | 3 |
| | | LF | - | - |
| | Mixed Use | MU | - | - |
| | **Total Ontario Ranch** | | 609 | 627 |
| **Total City of Ontario** | | | **1,199** | **1,641** |

Note: Vacant parcels located within Euclid Area are categorized to Euclid Ave conversion areas shown in Table 8-3.

## 8.3 EXISTING AGRICULTURE LAND TO BE DEVELOPED

The agriculture land uses in the City are entirely within the Ontario Ranch service area. Based on the General Plan these parcels currently are identified as agricultural uses that will be developed, and largely become either residential, industrial or business park type of land use. Some of the agricultural area has already been developed, with large portions that are now projects in the design or late planning stages.

Table 8-2 provides a summary list of the projected recycled water demand for these agricultural development parcels within the Ontario Ranch service area.

**Table 8-2 Agricultural Land to be Developed Recycled Water Use**

| Service Area | Future Land Use for the Existing Vacant Parcels | General Plan Land Use Designation | Total Gross Acreage (acres) | Future Recycled Water Use (AFY) |
|---|---|---|---|---|
| Ontario Ranch | Residential | RR | - | - |
| | | LDR | 2,301 | 1,546 |
| | | LMDR | 389 | 305 |
| | | MDR | 724 | 608 |
| | | HDR | - | - |
| | Commercial | NC | 57 | 71 |
| | | GC | 114 | 140 |
| | | OC | 109 | 182 |
| | | BP | 345 | 463 |
| | | HOS | - | - |
| | Industrial | IND | 171 | 325 |
| | Open Space | OS-NR | 226 | - |
| | | OS-R | 319 | 840 |
| | | OS-W | 51 | 134 |
| | Public | PF | - | - |
| | | PS | 101 | 254 |
| | | ARPT | - | - |
| | | Rail | - | - |
| | | ROW | 110 | 74 |
| | | LF | - | - |
| | Mixed Use | MU | 515 | 865 |
| | | **Total City of Ontario** | **5,531** | **5,807** |

It should be noted that the current demand for these parcels is approximately 4,940 AFY. Despite the large acreage of development, the overall future recycled water use is not expected to increase greatly, at approximately 5,807 AFY.

Agricultural land that has a potential to be converted to recycled water in the interim before the land is developed is considered separately in Section 8.5.1 and shown in Table 8-4.

## 8.4 CONVERSION AREAS

Conversion areas are defined as parcels that are currently serviced by the potable water system to supply a separate irrigation meter to the parcel and that has a potential to be converted to the recycled water system. An analysis was conducted on the historical billing data for these potable irrigation meters based on the largest water users. The results of this analysis identified approximately 3,422 acres with a total current potable water irrigation demand of 4,906 AFY. Parcels considered most viable for conversion to the recycled water system are parks, schools, and parcels adjacent to or within close proximity to an existing or proposed recycled water pipeline. Therefore, not all parcels with potable irrigation meters are included with the conversion areas as a result. The parcels with a priority and proposed for conversion to the recycled water system are listed and subtotaled by land use.

In addition, there are two conversion areas that have been previously identified and studied, and which are included in this analysis. These areas are known as the Euclid Avenue and Creekside conversion areas. Planning studies and design drawings have been prepared for some facilities within these areas. Therefore, these two conversion areas are identified and subtotaled separately from the potable irrigation meters.

**Table 8-3 Potential Conversion Areas for Recycled Water Use**

| Service Area | Future Land Use for the Existing Vacant Parcels | General Plan Land Use Designation | Total Gross Acreage (acres) | Future Recycled Water Use (AFY) |
|---|---|---|---|---|
| Original Model Colony (OMC) | Large Potable Irrigation Meters | | | |
| | Residential | RR | - | - |
| | | LDR | 156 | 105 |
| | | LMDR | 33 | 26 |
| | | MDR | 71 | 60 |
| | | HDR | - | - |
| | Commercial | NC | 13 | 16 |
| | | GC | 27 | 33 |
| | | OC | 19 | 32 |
| | | BP | 49 | 66 |
| | | HOS | 10 | 12 |
| | Industrial | IND | 304 | 580 |
| | Open Space | OS-NR | 246 | - |
| | | OS-R | 142 | 375 |
| | | OS-W | - | - |
| | Public | PF | 1 | 1 |
| | | PS | 153 | 385 |
| | | ARPT | 34 | 4 |
| | | Rail | - | - |
| | | ROW | 15 | 10 |
| | | LF | - | - |
| | Mixed Use | MU | 81 | 135 |
| | Subtotal Large Potable Irrig. Meters | | 1,354 | 1,840 |

**Table 8-3 Potential Conversion Areas for Recycled Water Use**

| Service Area | Future Land Use for the Existing Vacant Parcels | General Plan Land Use Designation | Total Gross Acreage (acres) | Future Recycled Water Use (AFY) |
|---|---|---|---|---|
| | Euclid Conversion Areas | | | |
| | Residential | RR | 11 | - |
| | | LDR | 46 | 31 |
| | | LMDR | 24 | 19 |
| | | MDR | 77 | 65 |
| | Commercial | NC | 4 | 4 |
| | | GC | 18 | 22 |
| | | OC | 6 | 10 |
| | | BP | 24 | 33 |
| | Industrial | IND | 72 | 138 |
| | Open Space | OS-R | 127 | 335 |
| | Public | PF | 13 | 31 |
| | | PS | 208 | 525 |
| | Mix Use | MU | 18 | 30 |
| | | Subtotal Euclid Area | 648 | 1,243 |
| | Creekside Conversion Areas | | | |
| | Residential | LDR | 236 | 159 |
| | | MDR | 41 | 34 |
| | Commercial | GC | 3 | 4 |
| | Open Space | OS-NR | 42 | 0 |
| | | OS-R | 22 | 59 |
| | | OS-W | 8 | 22 |
| | | PS | 31 | 78 |
| | | ROW | 5 | 3 |
| | | Subtotal Creekside Areas | 388 | 359 |
| | | **Subtotal OMC** | **2,390** | **3,442** |
| **Ontario Ranch** | SCE Facility Conversion Area | | | |
| | Commercial | BP | 150 | 202 |
| | | Subtotal SCE Facility Area | 150 | 202 |
| | | **Subtotal Ontario Ranch** | **150** | **202** |
| | | **Total City of Ontario** | **2,540** | **3,644** |

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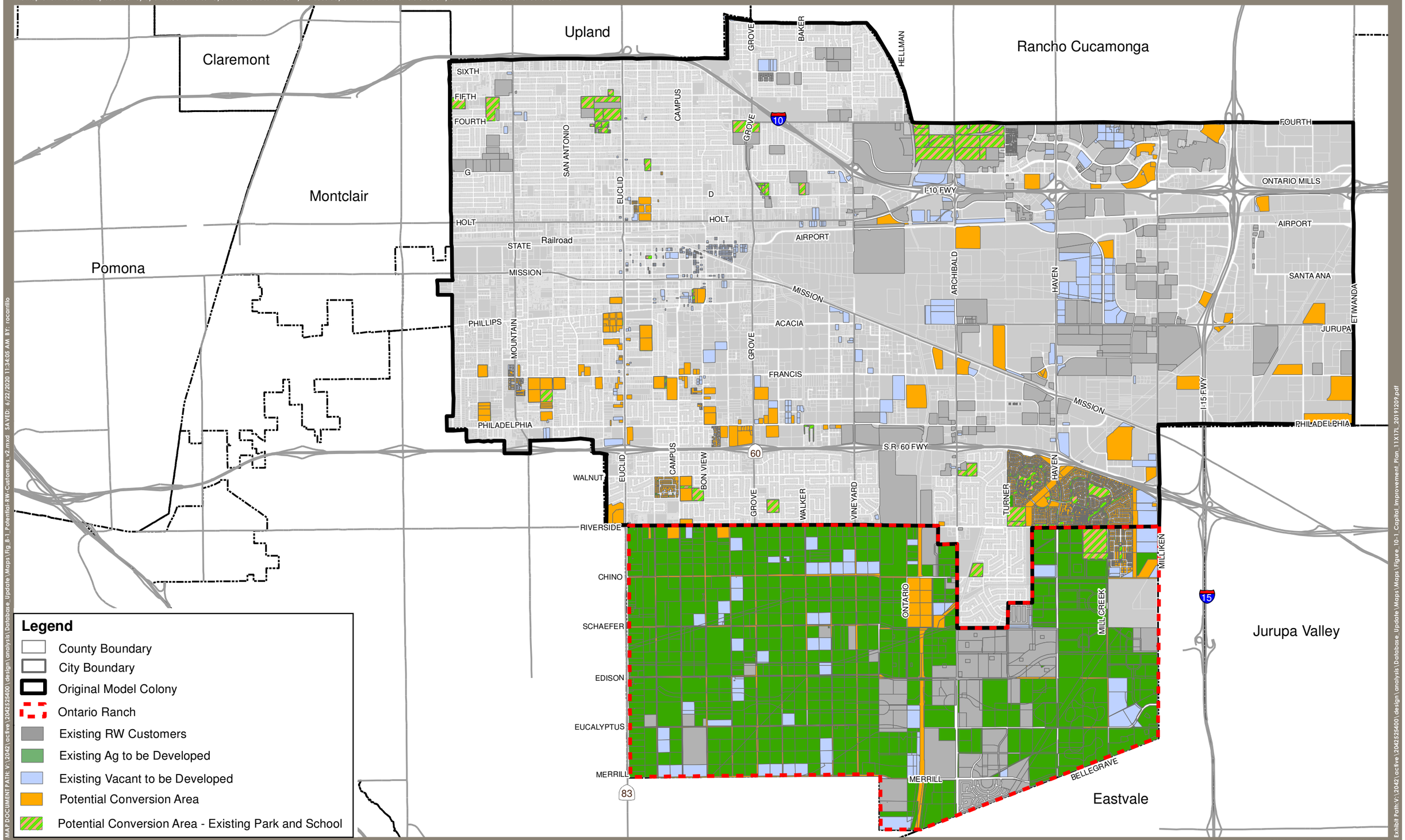


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# Ontario Recycled Water Master Plan
## Figure 8-1 Potential Recycled Water Customers

## 8.5 PHASING

For planning purposes for the recycled water system, there are two primary phases for the expansion of recycled water in the City of Ontario; a Near-Term phase, and the Future phase, as described in the following sections below.

### 8.5.1 Near-Term Phase

The Near-Term phase is assumed to include potential system requirements to support development for approximately the next 5-years. The Near-Term phase is assumed to consist of the following areas:

- Current Developments in the Ontario Ranch service area – These developments are currently in the planning phase or design phase that are expected to begin in approximately 5-years.
- Creekside conversion project areas – These areas have already been previously studied and proposed for conversion to recycled water, and design plans have been prepared many of the facilities to serve the areas.
- Some large irrigation meters/users that can be converted to recycled water – These parcels are assumed to be converted in the near future since they are in the vicinity of existing facilities or could be connected to a pipeline that is already proposed to be constructed.
- Parks and Schools that can be converted – These parcels have a high priority for the City where it is practical. These parcels are assumed to be converted in the near future since they are in the vicinity of existing facilities or could be connected to a pipeline that is already proposed to be constructed.
- Some agriculture land that can be converted to recycled water before it is ultimately developed – The temporary agricultural use parcels that are adjacent to an existing pipeline or a pipeline that is to be constructed within the Near-Term planning horizon are assumed to be converted to the recycled water system. For purposes of this study, the majority of these parcels are located along Haven Avenue and Eucalyptus Avenue in the East Ontario Ranch areas. Parcels are also assumed to be temporarily connected along the IEUA 30-inch pipeline in Edison Avenue.

Table 8-4 below provides the summary of the projected demands for this Near-Term Phase subtotaled by land use and service area. Table 8-4 summarizes the recycled water demands by type of area as listed above.

**Table 8-4 Near-Term Phase Recycled Water Demands**

| Service Area | Near-Term Land Use for the Existing Vacant Parcels | General Plan Land Use Designation | Total Gross Acreage (Acres) | Near-Term Recycled Water Use (AFY) |
|---|---|---|---|---|
| Original Model Colony | Residential | RR | - | - |
| | | LDR | 245 | 164 |
| | | LMDR | - | - |
| | | MDR | 89 | 75 |
| | | HDR | 11 | 10 |
| | Commercial | NC | 9 | 11 |
| | | GC | 34 | 41 |
| | | OC | 120 | 200 |
| | | BP | 85 | 114 |
| | | HOS | 36 | 40 |
| | Industrial | IND | 957 | 1,822 |
| | Open Space | OS-NR | 285 | - |
| | | OS-R | 551 | 1,450 |
| | | OS-W | 8 | 22 |
| | Public | PF | 8 | 19 |
| | | PS | 288 | 725 |
| | | ARPT | 141 | 16 |
| | | Rail | 25 | 7 |
| | | ROW | 5 | 3 |
| | | LF | - | - |
| | Mixed Use | MU | 417 | 709 |
| | **SubTotal Original Model Colony** | | **3,314** | **5,428** |
| Ontario Ranch | Residential | RR | - | |
| | | LDR | 1,655 | 1,112 |
| | | LMDR | 56 | 44 |
| | | MDR | 344 | 288 |
| | | HDR | - | - |
| | Commercial | NC | 32 | 39 |
| | | GC | 111 | 136 |
| | | OC | 48 | 82 |
| | | BP | 537 | 721 |
| | | HOS | - | - |
| | Industrial | IND | 469 | 894 |
| | Open Space | OS-NR | 52 | - |
| | | OS-R | 153 | 403 |
| | | OS-W | 29 | 76 |
| | Public | PF | 2 | 6 |
| | | PS | 315 | 794 |
| | | ARPT | - | - |
| | | Rail | - | - |
| | | ROW | 91 | 61 |
| | | LF | - | - |
| | Mixed Use | MU | 287 | 380 |
| | Temporary Agricultural | | 1,258 | 1,704 |
| | **SubTotal Ontario Ranch** | | **5,439** | **6,740** |
| **Total City of Ontario** | | | **8,753** | **12,168** |

### 8.5.2 Future

The Future phase consists of all remaining areas proposed to be converted or connected to the recycled water system after the Near-Term phase areas are completed. Land uses are based on the current General Plan. The Future phase areas consists of the following areas:

- All Developments in the Ontario Ranch service area – This includes the Mixed-Use areas as described in the General Plan
- Euclid Avenue conversion project areas – These areas have already been previously studied and proposed for conversion to recycled water, and design plans have been prepared many of the facilities to serve the areas.
- Parks and Schools that can be converted
- All Agricultural land to be developed
- All large potable irrigation meters/users that can converted to recycled water

Table 8-5 provides a summary of the projected recycled water demands for the Future phase.

Figure 8-2 illustrates the near term and future potential customers by phase. Figure 8-3 shows a summary of all the potential recycled water customers by phase with potential piping needs.

**Table 8-5 Future Phase Recycled Water Demands**

| Service Area | Future Land Use for the Existing Vacant Parcels | General Plan Land Use Designation | Total Gross Acreage (Acres) | Future Recycled Water Use (AFY) |
|---|---|---|---|---|
| Original Model Colony | Residential | RR | 11 | - |
| | | LDR | 290 | 195 |
| | | LMDR | 24 | 19 |
| | | MDR | 181 | 152 |
| | | HDR | 11 | 10 |
| | Commercial | NC | 17 | 21 |
| | | GC | 65 | 80 |
| | | OC | 175 | 295 |
| | | BP | 148 | 198 |
| | | HOS | 48 | 54 |
| | Industrial | IND | 1,645 | 3,132 |
| | Open Space | OS-NR | 213 | - |
| | | OS-R | 546 | 1,437 |
| | | OS-W | 8 | 22 |
| | Public | PF | 18 | 43 |
| | | PS | 469 | 1,181 |
| | | ARPT | 185 | 21 |
| | | Rail | 25 | 7 |
| | | ROW | 6 | 4 |
| | | LF | 1 | - |
| | Mixed Use | MU | 613 | 1,030 |
| | **Total Original Model Colony** | | **4,699** | **7,901** |
| Ontario Ranch | Residential | RR | - | - |
| | | LDR | 3,233 | 2,173 |
| | | LMDR | 505 | 396 |
| | | MDR | 1,064 | 894 |
| | | HDR | - | - |
| | Commercial | NC | 88 | 108 |
| | | GC | 146 | 180 |
| | | OC | 113 | 190 |
| | | BP | 525 | 706 |
| | | HOS | - | - |
| | Industrial | IND | 288 | 548 |
| | Open Space | OS-NR | 434 | - |
| | | OS-R | 461 | 1,214 |
| | | OS-W | 51 | 134 |
| | Public | PF | 2 | 6 |
| | | PS | 198 | 499 |
| | | ARPT | - | - |
| | | Rail | - | - |
| | | ROW | 202 | 136 |
| | | LF | - | - |
| | Mixed Use | MU | 579 | 974 |
| | **Total Ontario Ranch** | | **7,889** | **8,158** |
| **Total City of Ontario** | | | **12,590** | **16,059** |

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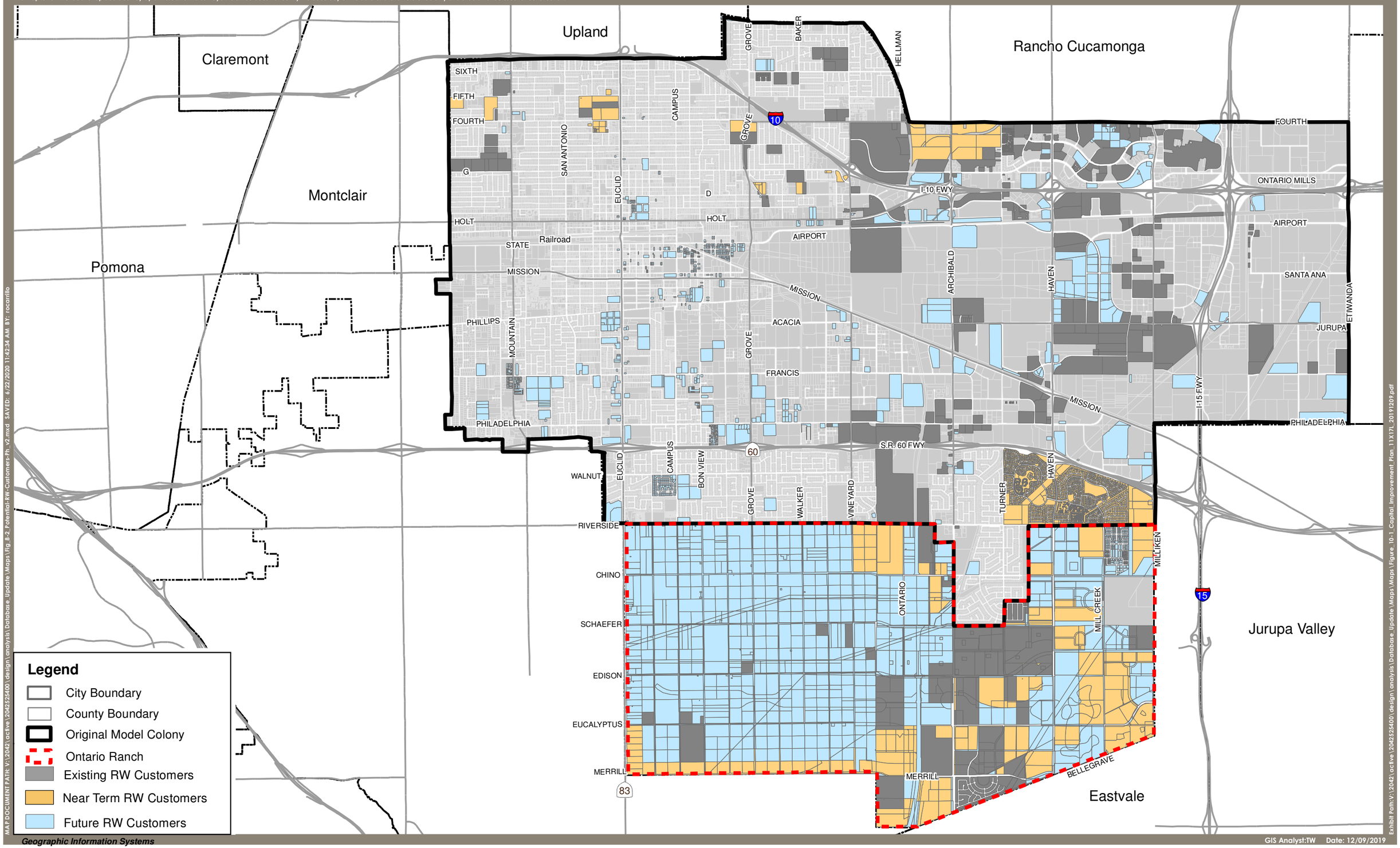


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# Ontario Recycled Water Master Plan

## Figure 8-2 Potential Recycled Water Customers by Phase

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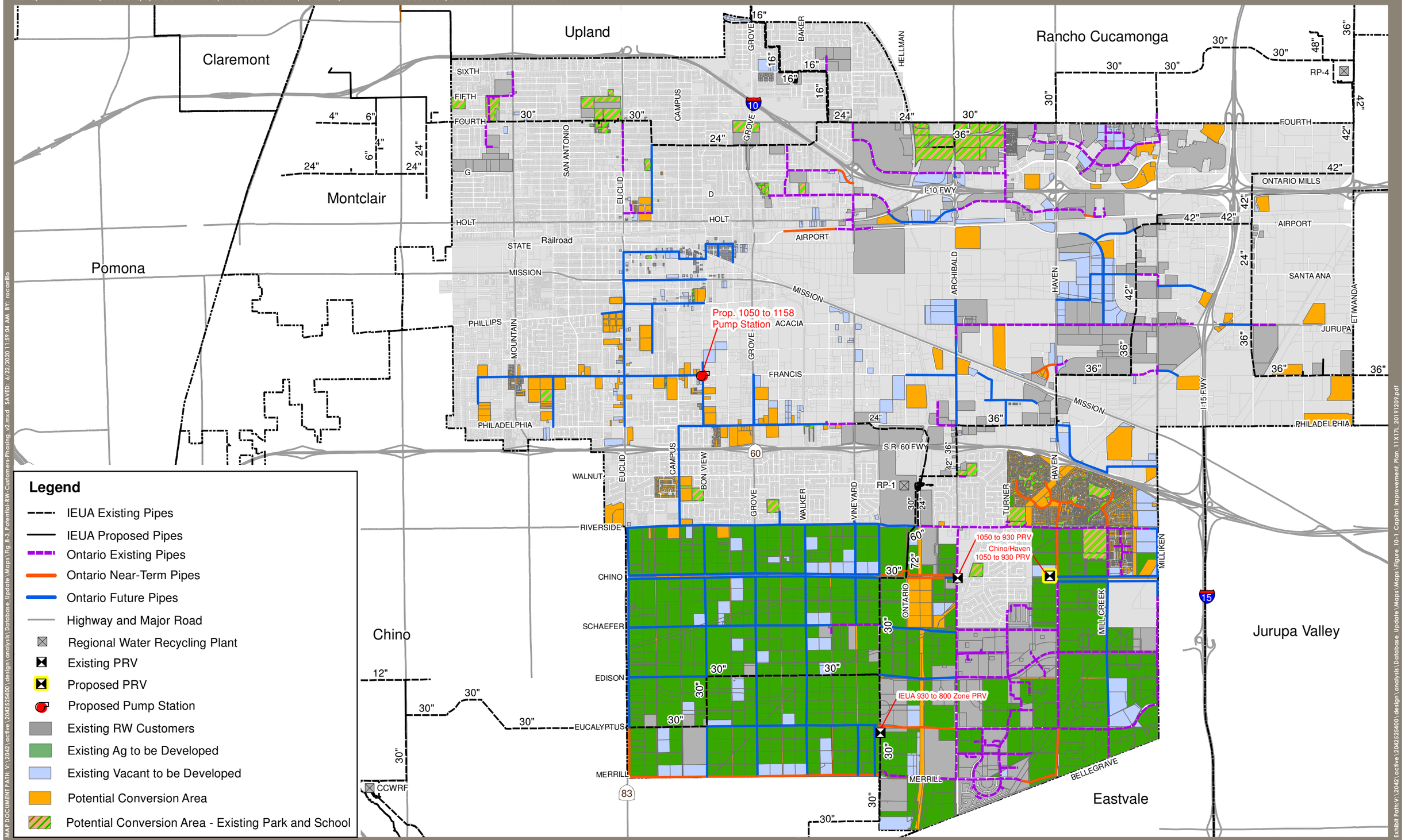


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# Ontario Recycled Water Master Plan
## Figure 8-3 Summary of Potential RW Customers & Phasing

# 9.0 FUTURE SYSTEM HYDRAULIC MODEL ANALYSIS

## 9.1 NEAR TERM HYDRAULIC MODEL ANALYSIS

The hydraulic model was updated to include the Near-Term Phase, which is assumed to occur within the next 5-years. This phase includes current developments in the Ontario Ranch service area, and portions of the previously planned Creekside conversion project areas. Some agriculture land adjacent to pipelines to be proposed that can be converted to recycled water before it is ultimately developed is also included in this phase for the Ontario Ranch area. Table 9-1 below provides a summary of the demands analyzed in the hydraulic model for each pressure zone.

**Table 9-1 Near Term Phase Maximum Day Demands by Pressure Zone**

| Pressure Zone | Maximum Daily Demand (MGD) | Maximum Day Flow Rate (gpm) |
|---|---|---|
| 930 | 9.67 | 6,715 |
| 1050 | 5.39 | 3,740 |
| 1158 | 2.64 | 1,910 |
| 1299 | 4.05 | 2,813 |
| Total | 21.75 | 15,178 |

The Near-Term phase is predominantly expansions within the 930 and 1050 Zones due to the Ontario Ranch developments and conversion of the existing Creekside area east of Turner Avenue. Additionally, there are some recycled water customers proposed to be converted to the 1299 Zone system that will require minimal piping construction. Most of the parcels to be converted in the 1299 Zone are near or adjacent to existing pipeline facilities.

930 Zone Pressure Reducing Stations

This zone is supplied primarily from the RP-1 and CCWRF treatment facilities and effluent pump stations from IEUA. To supplement the eastern portion of the 930 Zone, the City also has an existing pressure reducing station to feed the 930 Zone from the 1050 Zone located at Chino Avenue and Archibald Avenue. The City is also constructing a new pressure reducing station from the 1050 Zone to the 930 Zone at Chino Avenue and Haven Avenue. The following are the modeled pressure set points and resulting peak flow through the pressure reducing valve from the hydraulic model analysis.

**Table 9-2 930 Zone Pressure Reducing Stations – Near Term**

| Pressure Reducing Station | Location | Modeled Downstream Setpoint | Modeled Peak Flow Rate |
|---|---|---|---|
| PR-1 | Chino & Archibald | 70 | 2,830 gpm |
| PR-2 | Chino & Haven | 55 | 802 gpm |

The hydraulic modeling results show that the existing IEUA system meets the design criteria for both pressure and pipeline velocities throughout the IEUA regional system. There are a few known low pressure areas of the IEUA system, such as at the 7th/8th Street Basins in the 1299 Zone and in the northern area of the 42-inch transmission main of the 1158 Zone near RP-4.

The Near-Term model analysis shows that for the City's distribution system no additional locations with demands results pressures below the criteria than was seen for the Existing system analysis. The demand nodes with pressure below the criteria are located in the western portion of the 1299 Zone. These pressures are predicted by the model to be as low as between 35-48 psi between 5th Street and 6th Street from Elderberry Avenue to Mountain Avenue. The low pressures in this area are due to high ground elevations for the 1299 Zone. The pipeline velocities and supply sources for the pressure are within design criteria. The nodes with low pressures are indicated in red in the graphic below. Similar to the Existing system analysis, to mitigate the low service pressures an irrigation pump at the meter is recommended for this area.

All other demand locations within the City have pressures above 50 psi and pipeline velocities less than the maximum criteria.

Figure 9-1 and 9-2 illustrate the proposed Near-Term phase and proposed piping.

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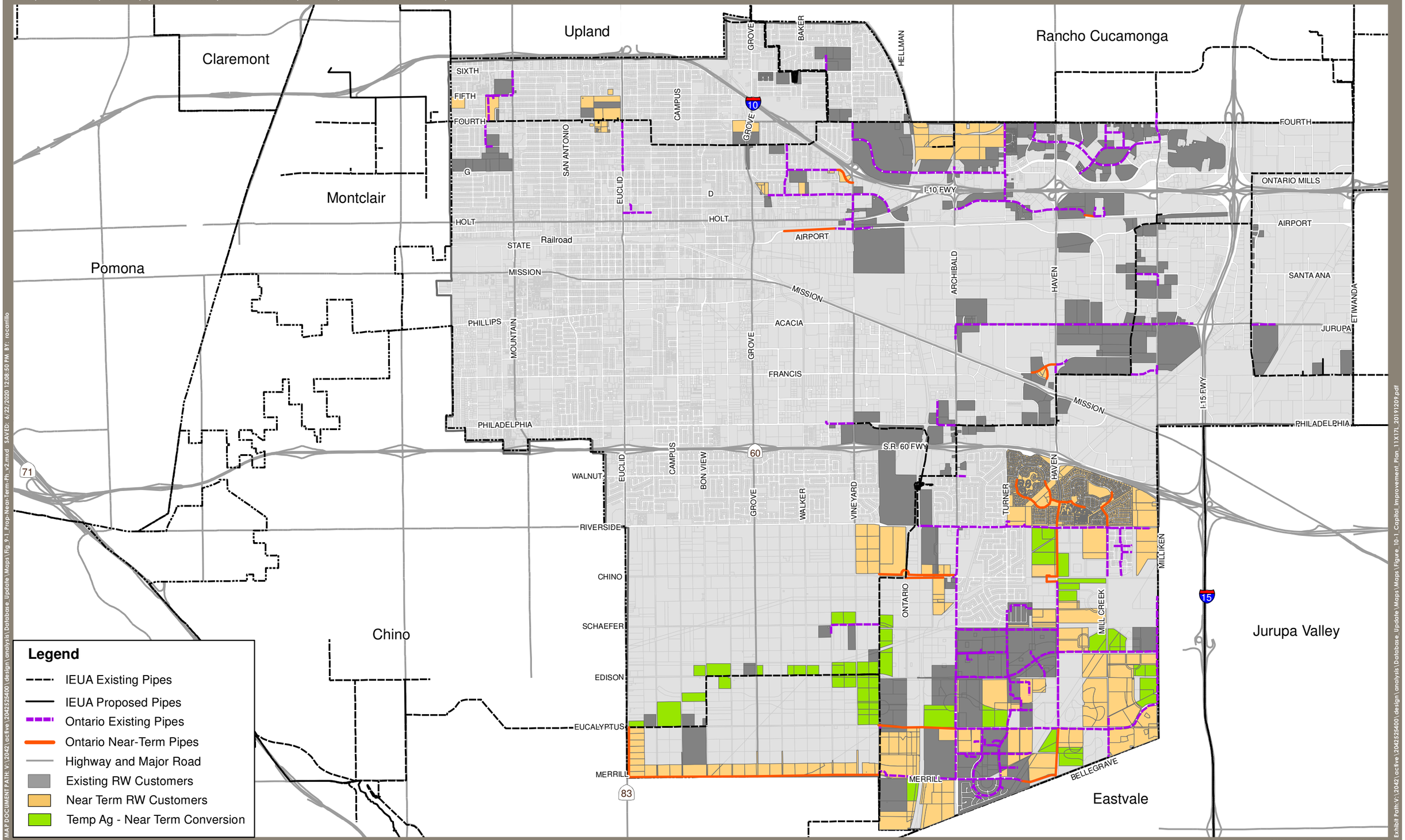


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# Ontario Recycled Water Master Plan
## Figure 9-1 Proposed Near Term Phase

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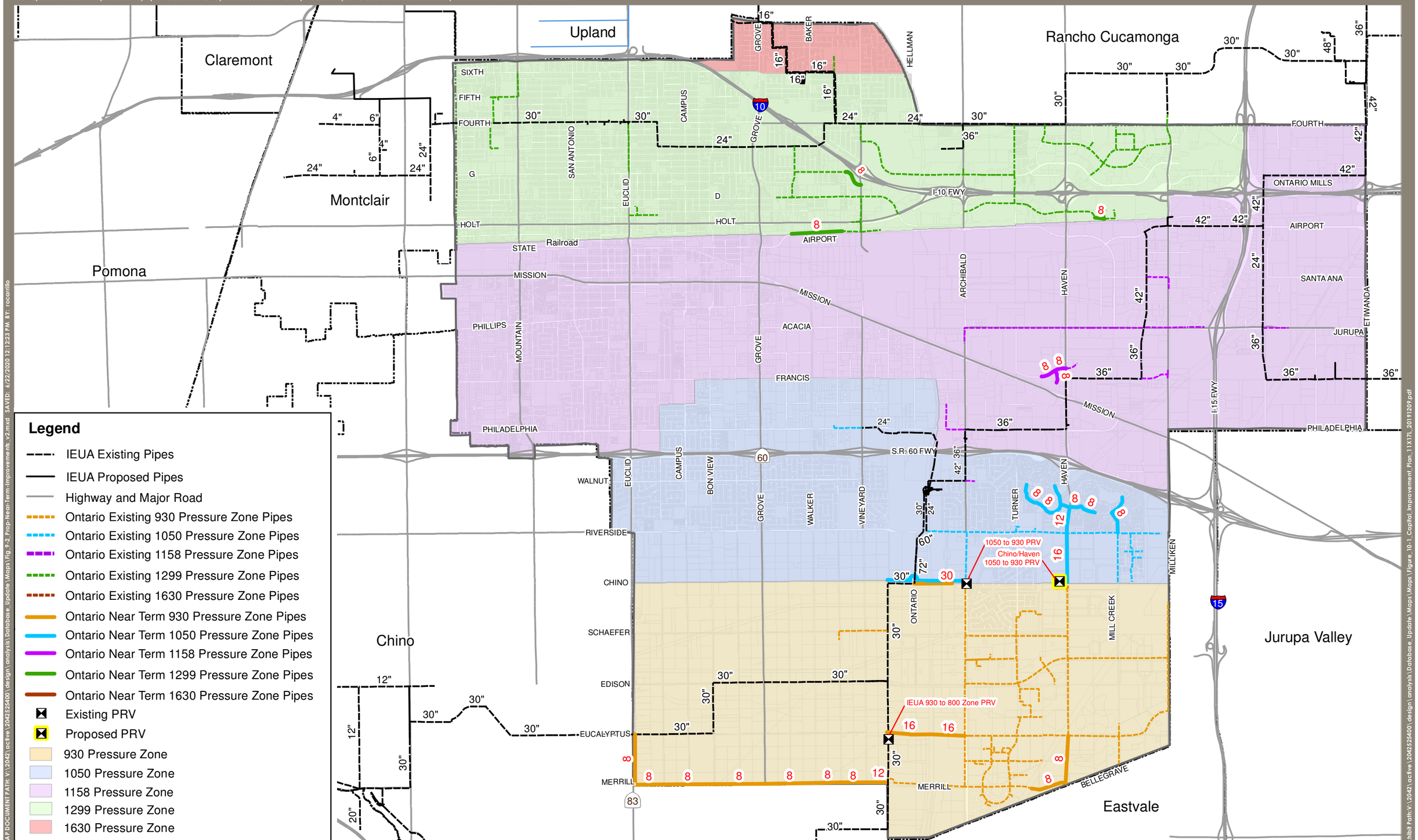


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# Ontario Recycled Water Master Plan
## Figure 9-2 Proposed Near Term Improvements

## 9.2 FUTURE HYDRAULIC MODEL ANALYSIS

The future phase areas consist of the following areas: all developments in the Ontario Ranch service area, parks and schools that can be converted, all agricultural land to be developed, and some large potable irrigation meters/users that can be converted to recycled water. Table 9-3 shows the maximum day demands for each pressure zone that were analyzed in the hydraulic model.

**Table 9-3 Future Phase Maximum Day Demands by Pressure Zone**

| Pressure Zone | Maximum Daily Demand (MGD) | Maximum Day Flow Rate (gpm) |
|---|---|---|
| 930 | 10.91 | 7,580 |
| 1050 | 3.02 | 2,202 |
| 1158 | 9.22 | 6,962 |
| 1299 | 4.55 | 3,156 |
| **Total** | **27.70** | **19,900** |

### 9.2.1 Future Regional 1158/1299 Zone IEUA Improvements

The Future phase for this study assumes that the proposed IEUA 1158/1299 Zone regional pipeline improvements, including the 1158 Zone storage tank and 1158 to 1299 Pump Station, as shown in the IEUA Recycled Water Program Strategy, are not constructed. The timing and reliance of these regional improvements are not certain, and therefore, the future planning horizon for this study assumes these IEUA regional facilities are not yet constructed.

### 9.2.2 Future 930 Zone Analysis

The 930 Zone Future phase assumes the Ontario Ranch development areas are built-out. The recycled water demands are primarily landscape irrigation with no agricultural uses. IEUA supply facilities from RP-1 and CCWRF are supplemented by the two City PRV stations located in Chino Avenue, as shown in Table 9-4 below.

**Table 9-4 930 Zone Pressure Reducing Stations – Future**

| Pressure Reducing Station | Location | Modeled Downstream Setpoint | Modeled Peak Flow Rate |
|---|---|---|---|
| PR-1 | Chino & Archibald | 70 | 8,725 gpm |
| PR-2 | Chino & Haven | 55 | 885 gpm |

### 9.2.3 Future 1050 Zone Analysis

The 1050 Zone Future expansion areas are west of South Vineyard Avenue, as shown in Figure 9-3. The demands for the 1050 Zone portion of the West Ontario Ranch will be met by new 8-inch, 12-inch, and

16-inch pipelines in Riverside Drive, and a new 8-inch pipeline in Chino Avenue. A new 16-inch diameter pipeline is proposed in Philadelphia and Bon View Avenue to support the proposed 1050 to 1158 Pump Station to serve the western portion of the 1158 Zone.

### 9.2.4 Future 1158 Zone Analysis

The Future 1158 Zone is proposed to be divided into two hydraulically separate pressure zones, the West 1158 Zone and the East 1158 Zone. The East 1158 Zone will be supplied by the IEUA RP-1 and RP-4 1158 Zone Effluent Pump Stations and 1158 Zone Storage Tank. The future pipeline expansion areas for the East 1158 Zone will be served by the existing IEUA 36-inch and 42-inch diameter pipelines, as shown in Figure 9-4.

The West 1158 Zone will be a closed-loop zone supplied by the proposed 1050 to 1158 Pump Station to be located at the southeast intersection of Bon View Avenue and Francis Street. A 16-inch diameter pipeline will then be routed from this pump station within Francis Street westerly to the intersection of Francis and Euclid Avenue. The proposed pump station is assumed to require VFD motors and equipped with three pumps: two-duty pumps and one-standby pump. The hydraulic parameters are described in Table 9-5 below.

**Table 9-5 Future 1050 to West 1158 Zone Pump Station**

| Description | Design Parameter |
|---|---|
| No. Pumps | 2-Duty<br>1-Standby |
| Suction Pressure | 70-75 psi |
| Discharge Pressure | 118-126 psi |
| Peak Flowrate | 1323 gpm |
| TDH (1) | 115-ft |
| Approx. Motor HP-each | 50 Hp |

(1) TDH does not include internal pump station minor losses.

### 9.2.5 Future 1299 Zone Analysis

Within the City's distribution system, there are a few additional low-pressure demand locations in the western portion of the 1299 Zone than resulted from the Existing and Near-Term conditions analyses. These additional locations of pressures below the criteria are predicted by the model to be as low as between 35-48 psi north of 5th Street. Pressures that are only slightly below 50 psi along 4th Street are located on the City's laterals and are approximately 48-50 psi. The low pressures in this area are due to high ground elevations for the 1299 Zone. The pipeline velocities and supply sources for the pressure are

within design criteria. The nodes with low pressures are indicated in red in the graphic below. To mitigate the low service pressures for these areas, an irrigation meter at the pump station is recommended.

Like the Existing and Near-Term analyses, demand nodes with pressure below the criteria are in the western portion of the 1299 Zone. These pressures are predicted by the model to be as low as between 35-48 psi between 5th Street and 6th Street from Elderberry Avenue to Mountain Avenue. The low pressures in this area are due to high ground elevations for the 1299 Zone. The pipeline velocities and supply sources for the pressure are within design criteria. The nodes with low pressures are indicated in red in the graphic below. Similar to the previous analyses, to mitigate the low service pressures an irrigation pump at the meter is recommended for this area.

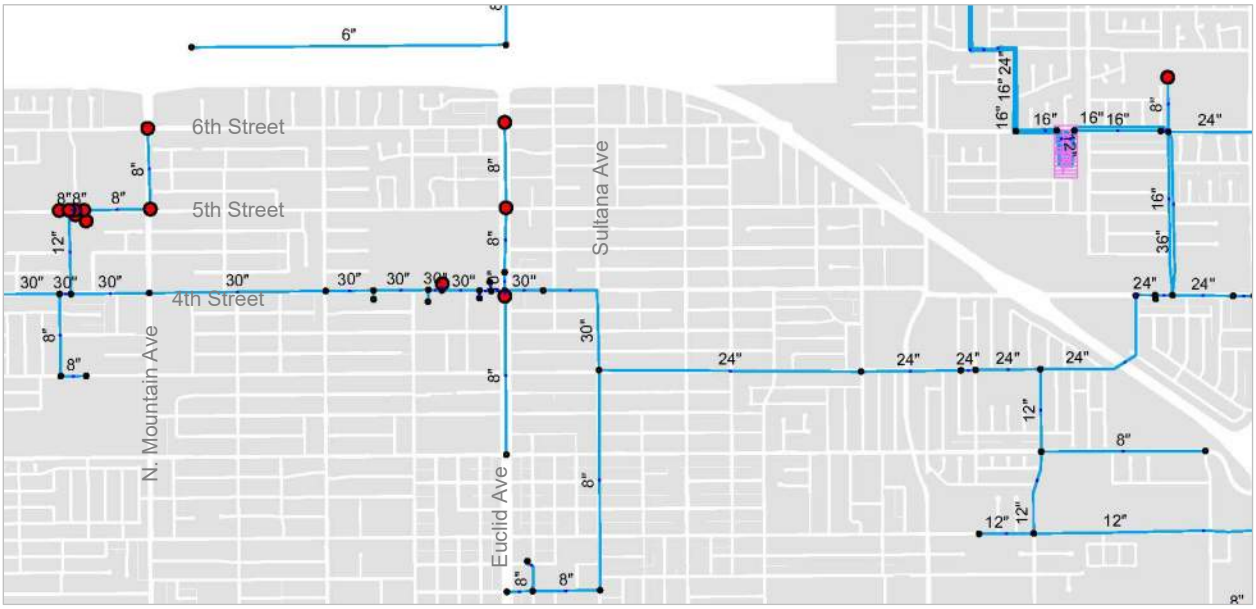

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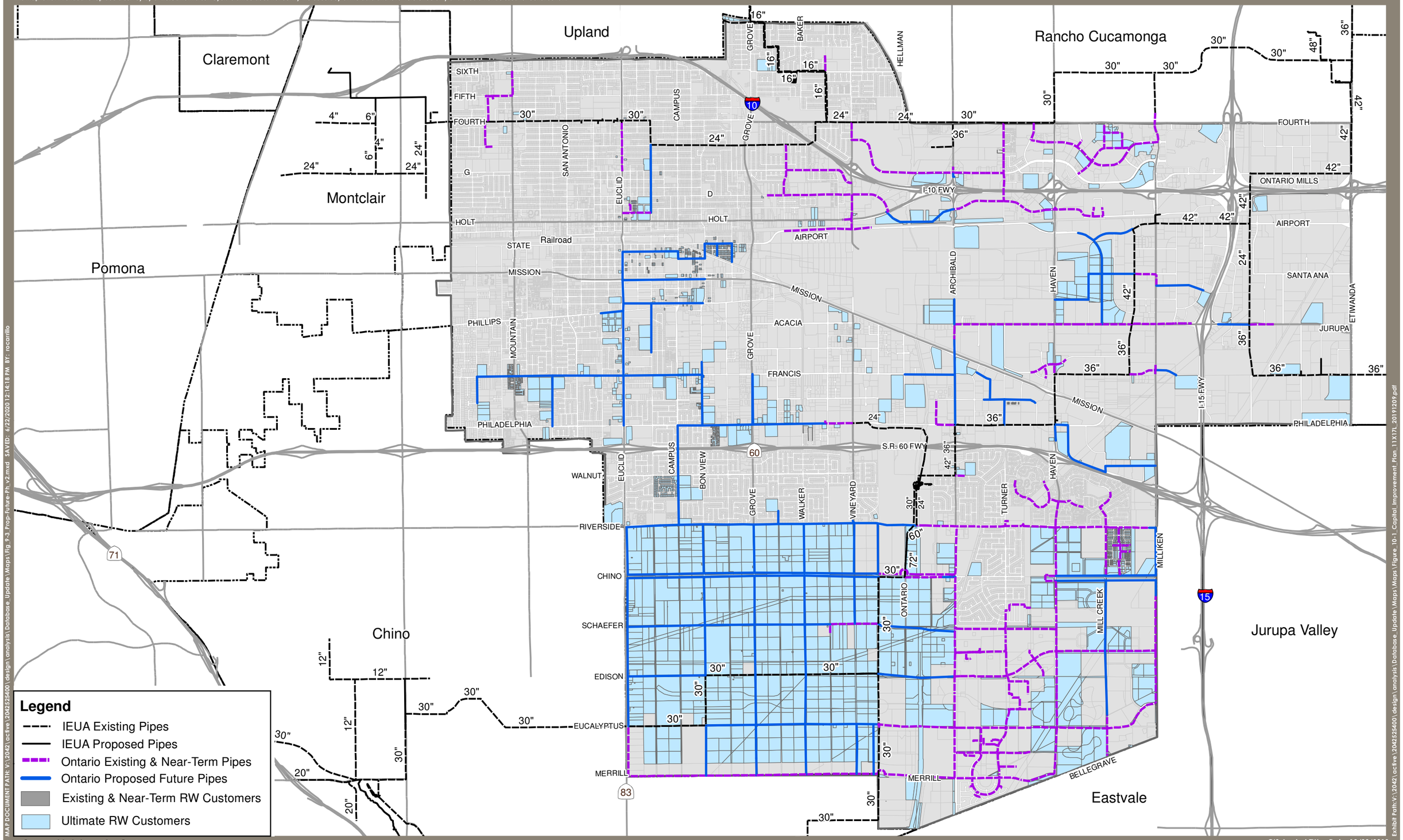


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# Ontario Recycled Water Master Plan
## Figure 9-3 Proposed Future Phase

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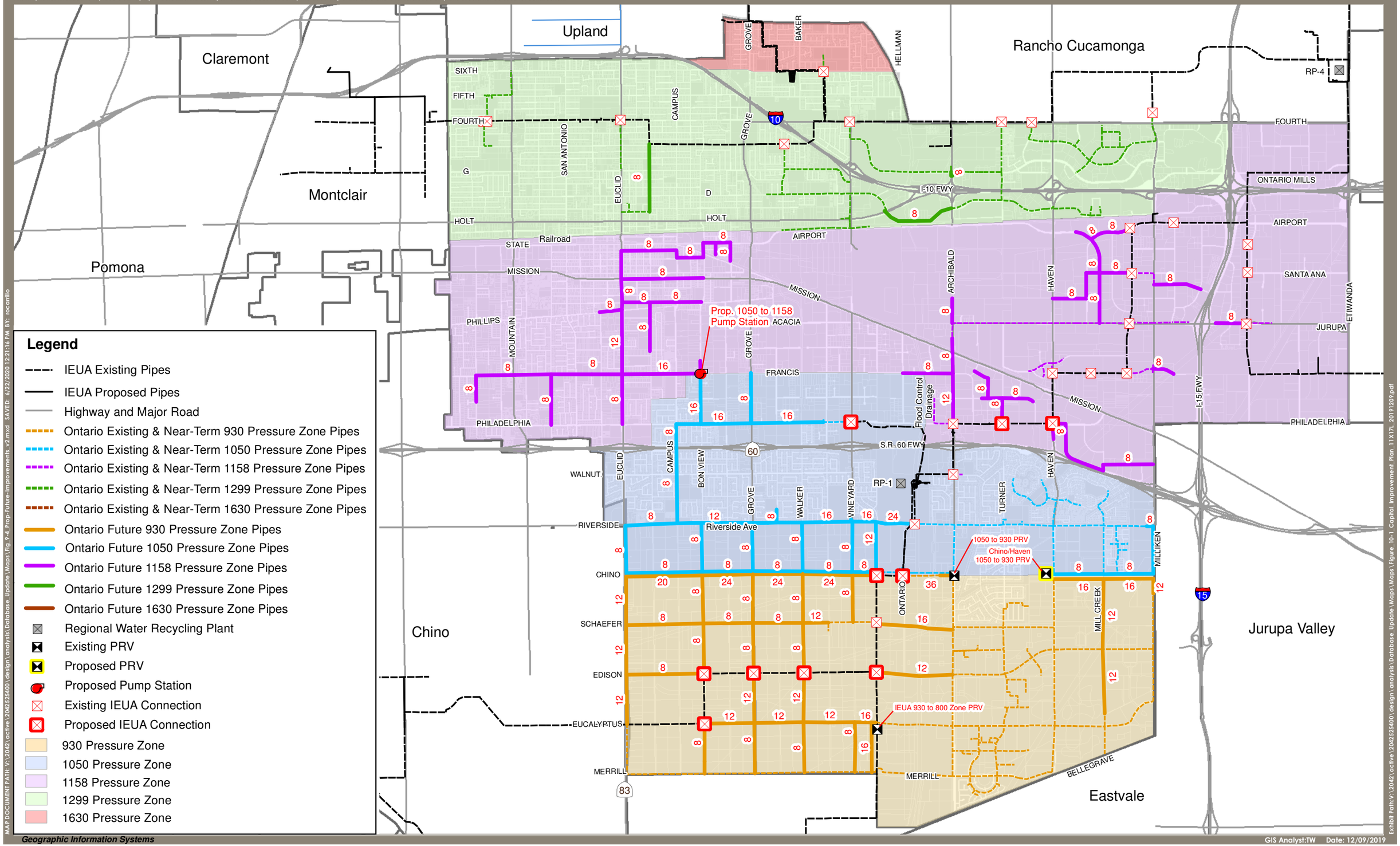


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GIS Analyst:TW Date: 12/09/2019

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# Ontario Recycled Water Master Plan
## Figure 9-4 Future Recycled System Improvements

This map is not intended to replace a survey by a Lic.California Surveyor. Stantec does not certify the accuracy of the data and is for reference only and should not be used for construction.

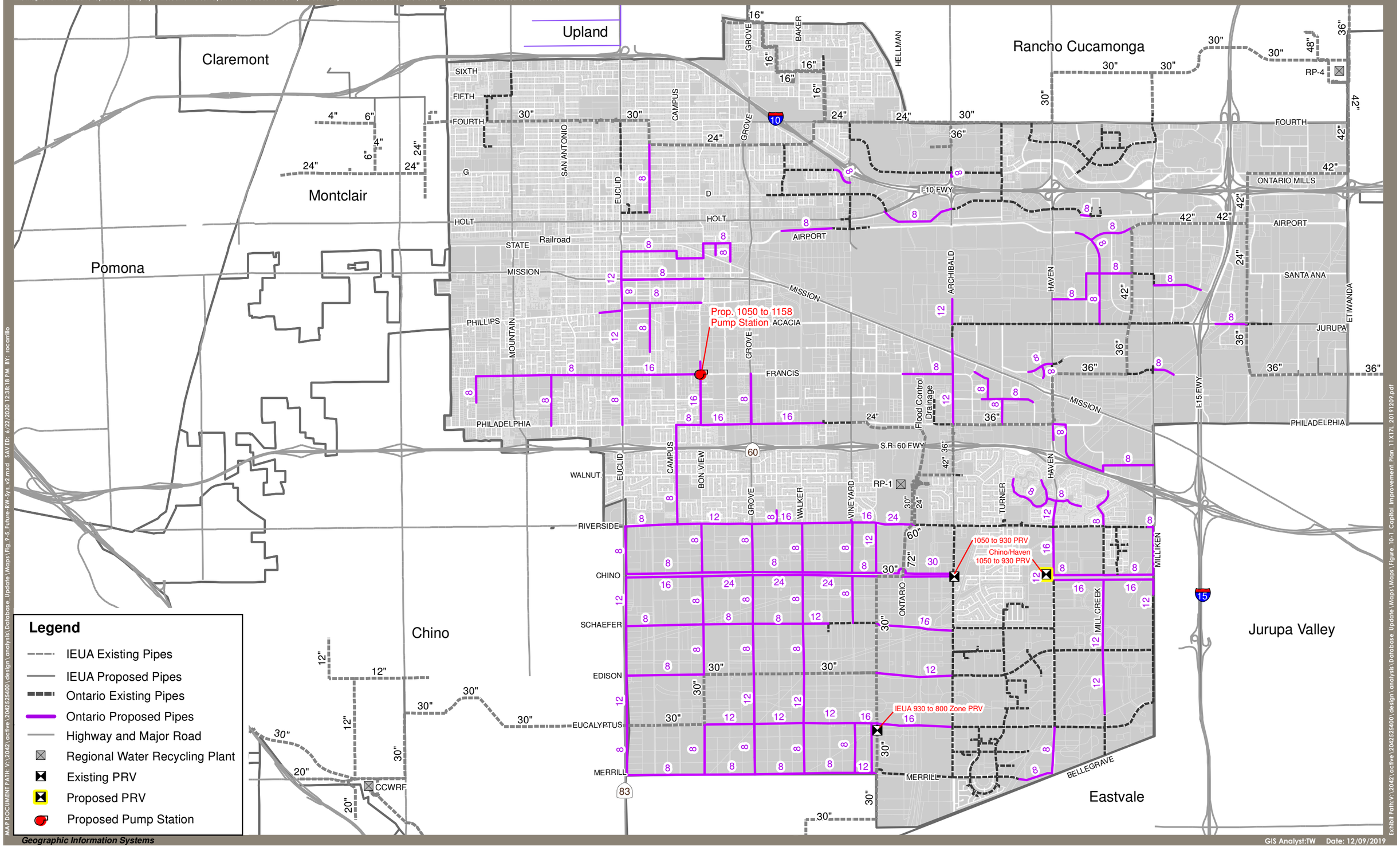


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# Ontario Recycled Water Master Plan
## Figure 9-5 Future Recycled Water System

## 9.3 STORAGE ANALYSIS

An investigation was performed to evaluate the potential need for future storage facilities to support the City's recycled water distribution system. Storage considerations were performed for only the Future system conditions and in addition to what is contained in the IEUA Recycled Water Program Strategy. Storage tanks are provided within IEUA's regional supply system that contain adequate storage for the direct recycled water use demands for each of the pressure zones. The hydraulic model analysis confirms that the future IEUA supply pumps and existing storage tanks have capacity for the projected maximum day demands proposed by this study.

The areas for any opportunity for storage would be the western portion of the 1299 and 1158 Zones. A storage tank in this area of the City may allow for increased demands in the system beyond what is projected by this Master Plan. A review of the potential for a storage tank to support the 1299 Zone shows that this would not be a feasible opportunity. The hydraulic model shows a storage tank located in the western portion of the 1299 Zone would not cycle appropriately and increase water quality concerns. In addition, a location would need to be located outside the City limits. Upon cursory review of the elevation contours required there is no suitable location for a new storage tank.

Storage tank locations for the 1158 and 1050 Zones would need to be far north from the existing and proposed pressure zone distribution systems requiring several miles of pipeline. Additionally, no suitable locations for storage tanks are available. The projected demands in these western areas have been planned so that the IEUA distribution system will be kept to a minimum of 50 psi without additional storage facilities.

## 9.4 COMPARISON TO 2012 RWMP

Some recommendations discussed in this report may differ from the 2012 RWMP. Table 9-6 compares the differences between the former and current RWMP and the reason for the updated recommendation.

**Table 9-6 Comparison to 2012 RWMP**

| Description | Reasoning |
|---|---|
| Chino Ave between Archibald Ave and Haven Ave main removed for both Zone 930 and 1050 | No RW demands along Chino Ave, Peak demand capacity to 930 Zone conveyed through PRV at Chino/Haven |
| Chino Ave between Haven Ave and Mill Creek Ave downsized to a 16-inch from a 20/24-inch main | Peak flow reduced due to less system demand and lower peaking factor |
| Chino Ave between Mill Creek Ave and Hamner Ave upsized to a 16-inch from a 12-inch main | To minimize headloss for system pressures above criteria |
| Merrill Ave between Baker Ave and Vineyard Ave downsized to an 8-inch from a 12-inch main | Peak flow reduced due to less system demand and lower peaking factor |
| Merrill Ave between Vineyard Ave and Carpenter Ave upsized to a 16-inch from a 12-inch main | Upsized to maintain pipe within velocity criteria due to peak flows in the area |
| Eucalyptus Ave between Baker Ave and Vineyard Ave upsized to a 12-inch from an 8-inch main | Upsized to maintain pipe within velocity criteria due to peak flows in the area |
| Euclid Ave OMC projects added | n/a |

# 10.0 CAPITAL IMPROVEMENT PLAN

The proposed Capital Improvement Plan (CIP) assumes that the proposed improvements as described in Chapter 9, and shown in Figure 9-5, will be constructed in two primary phases: Near-Term and Future. The Near-Term phase assumes recycled water distribution system expansion through the next 5-years, to approximately Year 2025. The Future phase will be expansion projects to occur after Year 2025 and include the build-out of the Ontario Ranch developments and all potential conversion areas as described in this Recycled Water Master Plan.

## 10.1 NEAR-TERM

The Near-Term improvements and costs by pressure zone are shown in Table 10-1 below. For the Near-Term improvements, a total of 51,960 LF (9.84 miles) of pipeline is proposed ranging from 8-inch to 30-inch diameter pipe, including the proposed PRV station at Chino Avenue and Haven Avenue. The total Project CIP Costs include administrative, engineering and contingency costs at 35-percent of the construction cost estimates.

**Table 10-1 Near-Term CIP Costs**

| CIP Project No. | Zone | Pipe Dia. (in) | Area | Ave Flow (gpm) | Peak Flow (gpm) | Length (LF) | Unit Cost ($/LF) | Project Const. Cost | Admin/ Eng/Conting Cost | Total CIP Costs |
|---|---|---|---|---|---|---|---|---|---|---|
| NT-100 | 930 | 8 | Ontario Ranch | 103 | 250 | 14,648 | 96.00 | $1,406,208 | $492,173 | $1,898,381 |
| NT-104 | 930 | 8 | Ontario Ranch | 70 | 201 | 4,274 | 96.00 | $410,322 | $143,613 | $553,935 |
| NT-105 | 930 | 12 | Ontario Ranch | 154 | 547 | 386 | 144.00 | $55,540 | $19,439 | $74,980 |
| NT-101 | 930 | 16 | Ontario Ranch | 335 | 936 | 3,979 | 192.00 | $763,968 | $267,389 | $1,031,357 |
| NT-103 | 930 | 16 | Ontario Ranch | 66 | 177 | 4,105 | 192.00 | $788,160 | $275,856 | $1,064,016 |
| NT-107 | 930 | 16 | Ontario Ranch | 154 | 547 | 564 | 192.00 | $108,291 | $37,902 | $146,193 |
| NT-114 | 930 | 30 | Ontario Ranch | 1859 | 4612 | 1,976 | 403.05 | $796,309 | $278,708 | $1,075,017 |
| | | | | | | | Subtotal 930 Zone | $4,328,799 | $1,515,080 | $5,843,879 |
| NT-110 | 1050 | 8 | General City | 83 | 246 | 2,967 | 144.48 | $428,672 | $150,035 | $578,707 |
| NT-111 | 1050 | 8 | General City | 83 | 246 | 1,033 | 144.48 | $149,248 | $52,237 | $201,485 |
| NT-112 | 1050 | 8 | General City | 65 | 192 | 1,408 | 144.48 | $203,428 | $71,200 | $274,628 |
| NT-113 | 1050 | 8 | General City | 82 | 241 | 2,194 | 144.48 | $316,989 | $110,946 | $427,935 |
| NT-116 | 1050 | 8 | Ontario Ranch | 98 | 291 | 4,280 | 96.00 | $410,845 | $143,796 | $554,641 |
| NT-108 | 1050 | 12 | Ontario Ranch | 154 | 547 | 527 | 144.00 | $75,955 | $26,584 | $102,539 |
| NT-109 | 1050 | 12 | Ontario Ranch | 312 | 901 | 2,572 | 144.00 | $370,368 | $129,629 | $499,997 |
| NT-109 | 1050 | 12 | General City | 312 | 901 | 1,846 | 216.72 | $400,065 | $140,023 | $540,088 |
| | | | | | | | Subtotal 1050 Zone | $2,355,570 | $824,449 | $3,180,019 |
| NT-119 | 1158 | 8 | General City | 19 | 55 | 1,379 | 144.48 | $199,238 | $69,733 | $268,971 |
| NT-120 | 1158 | 8 | General City | 12 | 37 | 671 | 144.48 | $96,946 | $33,931 | $130,877 |
| | | | | | | | Subtotal 1158 Zone | $296,184 | $103,664 | $399,848 |
| NT-121 | 1299 | 8 | General City | 5 | 16 | 2,654 | 144.48 | $383,450 | $134,207 | $517,657 |
| NT-124 | 1299 | 8 | General City | 23 | 67 | 497 | 144.48 | $71,807 | $25,132 | $96,939 |
| NT-125 | 1299 | 8 | General City | 9 | 27 | 1,150 | 144.48 | $166,152 | $58,153 | $224,305 |
| | | | | | | | Subtotal 1299 Zone | $621,408 | $217,493 | $838,901 |
| | | | | | | | 1050 to 930 Zone PRV at Chino & Haven | $600,000 | $210,000 | $810,000 |
| | | | | | | | **Total Near-Term CIP Costs** | **$8,201,961** | **$2,870,686** | **$11,072,648** |

## 10.2 FUTURE PHASE

The Future phase improvements and costs by pressure zone are shown in Table 10-2. For the Future improvements, a total of 275,564 LF (52.19 miles) of pipeline is proposed ranging from 8-inch to 24-inch diameter pipe. The improvements listed for this phase are in addition to the improvement projects identified for the near-term phase improvements. Also, the proposed 1050 to 1158 Pump Station is included in the cost table. The total Project CIP Costs include administrative, engineering and contingency costs at 35-percent of the construction costs estimates.

**Table 10-2 Future CIP Costs**

| CIP Project No. | Zone | Pipe Dia. (in) | Area | Ave Flow (gpm) | Peak Flow (gpm) | Length (LF) | Unit Cost ($/LF) | Project Const. Cost | Admin/ Eng/Conting Cost | Total CIP Costs |
|---|---|---|---|---|---|---|---|---|---|---|
| FUT-200 | 930 | 8 | Ontario Ranch | 34 | 100 | 2,617 | 96.00 | $251,232 | $87,931 | $339,163 |
| FUT-202 | 930 | 8 | Ontario Ranch | 37 | 111 | 2,634 | 96.00 | $252,864 | $88,502 | $341,366 |
| FUT-203 | 930 | 8 | Ontario Ranch | 59 | 174 | 2,647 | 96.00 | $254,112 | $88,939 | $343,051 |
| FUT-204 | 930 | 8 | Ontario Ranch | 69 | 204 | 2,638 | 96.00 | $253,248 | $88,637 | $341,885 |
| FUT-212 | 930 | 8 | Ontario Ranch | 20 | 57 | 4,105 | 96.00 | $394,080 | $137,928 | $532,008 |
| FUT-213 | 930 | 8 | Ontario Ranch | 46 | 138 | 5,217 | 96.00 | $500,792 | $175,277 | $676,070 |
| FUT-214 | 930 | 8 | Ontario Ranch | 53 | 156 | 5,215 | 96.00 | $500,607 | $175,212 | $675,819 |
| FUT-215 | 930 | 8 | Ontario Ranch | 53 | 156 | 5,189 | 96.00 | $498,169 | $174,359 | $672,528 |
| FUT-260 | 930 | 8 | Ontario Ranch | 52 | 155 | 2,485 | 96.00 | $238,541 | $83,489 | $322,030 |
| FUT-262 | 930 | 8 | Ontario Ranch | 29 | 87 | 9,358 | 96.00 | $898,368 | $314,429 | $1,212,797 |
| FUT-206 | 930 | 12 | Ontario Ranch | 187 | 549 | 7,944 | 144.00 | $1,143,936 | $400,378 | $1,544,314 |
| FUT-208 | 930 | 12 | Ontario Ranch | 247 | 734 | 2,617 | 144.00 | $376,848 | $131,897 | $508,745 |
| FUT-209 | 930 | 12 | Ontario Ranch | 162 | 478 | 2,632 | 144.00 | $379,008 | $132,653 | $511,661 |
| FUT-210 | 930 | 12 | Ontario Ranch | 47 | 157 | 2,641 | 144.00 | $380,304 | $133,106 | $513,410 |
| FUT-211 | 930 | 12 | Ontario Ranch | 181 | 543 | 4,044 | 144.00 | $582,336 | $203,818 | $786,154 |
| FUT-216 | 930 | 12 | Ontario Ranch | 111 | 303 | 5,172 | 144.00 | $744,840 | $260,694 | $1,005,533 |
| FUT-217 | 930 | 12 | Ontario Ranch | 70 | 230 | 3,704 | 144.00 | $533,324 | $186,663 | $719,987 |
| FUT-218 | 930 | 12 | Ontario Ranch | 53 | 175 | 1,483 | 144.00 | $213,552 | $74,743 | $288,295 |
| FUT-261 | 930 | 12 | Ontario Ranch | 73 | 217 | 1,339 | 144.00 | $192,816 | $67,486 | $260,302 |
| FUT-264 | 930 | 12 | Ontario Ranch | 31 | 115 | 3,403 | 144.00 | $490,032 | $171,511 | $661,543 |
| FUT-201 | 930 | 16 | Ontario Ranch | 143 | 425 | 2,628 | 192.00 | $504,576 | $176,602 | $681,178 |
| FUT-207 | 930 | 16 | Ontario Ranch | 15 | 119 | 1,087 | 192.00 | $208,792 | $73,077 | $281,869 |
| FUT-220 | 930 | 16 | Ontario Ranch | 161 | 453 | 4,043 | 192.00 | $776,256 | $271,690 | $1,047,946 |
| FUT-259 | 930 | 16 | Ontario Ranch | 293 | 883 | 4,089 | 192.00 | $785,088 | $274,781 | $1,059,869 |
| FUT-266 | 930 | 16 | Ontario Ranch | 175 | 557 | 2,641 | 192.00 | $507,147 | $177,501 | $684,648 |
| FUT-219 | 930 | 24 | Ontario Ranch | 474 | 1379 | 11,820 | 331.56 | $3,918,970 | $1,371,639 | $5,290,609 |
| | | | | | | | Subtotal 930 Zone | $15,779,837 | $5,522,943 | $21,302,780 |

| CIP Project No. | Zone | Pipe Dia. (in) | Area | Ave Flow (gpm) | Peak Flow (gpm) | Length (LF) | Unit Cost ($/LF) | Project Const. Cost | Admin/ Eng/Conting Cost | Total CIP Costs |
|---|---|---|---|---|---|---|---|---|---|---|
| FUT-223 | 1050 | 8 | Ontario Ranch | 13 | 70 | 2,796 | 96.00 | $268,450 | $93,958 | $362,408 |
| FUT-224 | 1050 | 8 | Ontario Ranch | 13 | 50 | 2,575 | 96.00 | $247,200 | $86,520 | $333,720 |
| FUT-225 | 1050 | 8 | Ontario Ranch | 18 | 50 | 2,529 | 96.00 | $242,784 | $84,974 | $327,758 |
| FUT-226 | 1050 | 8 | Ontario Ranch | 14 | 44 | 2,567 | 96.00 | $246,470 | $86,264 | $332,734 |
| FUT-227 | 1050 | 8 | Ontario Ranch | 4 | 16 | 2,495 | 96.00 | $239,543 | $83,840 | $323,383 |
| FUT-228 | 1050 | 8 | Ontario Ranch | 28 | 76 | 13,210 | 96.00 | $1,268,160 | $443,856 | $1,712,016 |
| FUT-232 | 1050 | 8 | Ontario Ranch | 23 | 72 | 2,741 | 96.00 | $263,136 | $92,098 | $355,234 |
| FUT-273 | 1050 | 8 | Ontario Ranch | 31 | 95 | 8,078 | 96.00 | $775,459 | $271,411 | $1,046,870 |
| FUT-233 | 1050 | 8 | General City | 6 | 17 | 684 | 144.48 | $98,824 | $34,589 | $133,413 |
| FUT-234 | 1050 | 8 | General City | 39 | 172 | 5,239 | 144.48 | $756,931 | $264,926 | $1,021,856 |
| FUT-235 | 1050 | 8 | General City | 39 | 172 | 1,313 | 144.48 | $189,702 | $66,396 | $256,098 |
| FUT-222 | 1050 | 12 | Ontario Ranch | 48 | 262 | 2,630 | 144.00 | $378,702 | $132,546 | $511,248 |
| FUT-230 | 1050 | 12 | Ontario Ranch | 91 | 237 | 2,660 | 144.00 | $382,990 | $134,047 | $517,037 |
| FUT-231 | 1050 | 12 | Ontario Ranch | 69 | 168 | 1,295 | 144.00 | $186,480 | $65,268 | $251,748 |
| FUT-229 | 1050 | 16 | Ontario Ranch | 189 | 520 | 6,550 | 192.00 | $1,257,623 | $440,168 | $1,697,791 |
| FUT-236 | 1050 | 16 | General City | 272 | 836 | 6,492 | 288.96 | $1,875,928 | $656,575 | $2,532,503 |
| FUT-237 | 1050 | 16 | General City | 226 | 669 | 2,633 | 288.96 | $760,832 | $266,291 | $1,027,123 |
| FUT-221 | 1050 | 24 | Ontario Ranch | 238 | 762 | 2,061 | 331.56 | $683,345 | $239,171 | $922,516 |
| | | | | | | | Subtotal 1050 Zone | $10,122,560 | $3,542,896 | $13,665,456 |
| FUT-239 | 1158 | 8 | General City | 30 | 283 | 9,103 | 144.48 | $1,315,201 | $460,321 | $1,775,522 |
| FUT-240 | 1158 | 8 | General City | 30 | 88 | 843 | 144.48 | $121,797 | $42,629 | $164,425 |
| FUT-241 | 1158 | 8 | General City | 4 | 13 | 2,638 | 144.48 | $381,138 | $133,398 | $514,537 |
| FUT-243 | 1158 | 8 | General City | 0 | 0 | 1,177 | 144.48 | $170,053 | $59,519 | $229,571 |
| FUT-244 | 1158 | 8 | General City | 24 | 71 | 10,636 | 144.48 | $1,536,689 | $537,841 | $2,074,531 |
| FUT-245 | 1158 | 8 | General City | 41 | 122 | 4,204 | 144.48 | $607,394 | $212,588 | $819,982 |
| FUT-246 | 1158 | 8 | General City | 23 | 68 | 2,593 | 144.48 | $374,637 | $131,123 | $505,759 |
| FUT-247 | 1158 | 8 | General City | 4 | 12 | 4,356 | 144.48 | $629,355 | $220,274 | $849,629 |
| FUT-249 | 1158 | 8 | General City | 93 | 276 | 2,635 | 144.48 | $380,705 | $133,247 | $513,951 |
| FUT-250 | 1158 | 8 | General City | 40 | 119 | 1,167 | 144.48 | $168,608 | $59,013 | $227,621 |
| FUT-252 | 1158 | 8 | General City | 0 | 0 | 1,641 | 144.48 | $237,092 | $82,982 | $320,074 |
| FUT-253 | 1158 | 8 | General City | 10 | 31 | 2,520 | 144.48 | $364,090 | $127,431 | $491,521 |
| FUT-254 | 1158 | 8 | General City | 347 | 618 | 5,533 | 144.48 | $799,408 | $279,793 | $1,079,201 |
| FUT-255 | 1158 | 8 | General City | 165 | 247 | 5,458 | 144.48 | $788,572 | $276,000 | $1,064,572 |
| FUT-256 | 1158 | 8 | General City | 132 | 477 | 2,221 | 144.48 | $320,876 | $112,306 | $433,182 |
| FUT-263 | 1158 | 8 | General City | 2 | 4 | 2,662 | 144.48 | $384,606 | $134,612 | $519,218 |
| FUT-267 | 1158 | 8 | General City | 33 | 96 | 2,426 | 144.48 | $350,508 | $122,678 | $473,186 |

| CIP Project No. | Zone | Pipe Dia. (in) | Area | Ave Flow (gpm) | Peak Flow (gpm) | Length (LF) | Unit Cost ($/LF) | Project Const. Cost | Admin/ Eng/Conting Cost | Total CIP Costs |
|---|---|---|---|---|---|---|---|---|---|---|
| FUT-268 | 1158 | 8 | General City | 31 | 92 | 1,866 | 144.48 | $269,600 | $94,360 | $363,960 |
| FUT-269 | 1158 | 8 | General City | 0 | 0 | 1,672 | 144.48 | $241,571 | $84,550 | $326,120 |
| FUT-272 | 1158 | 8 | General City | 0 | 0 | 625 | 144.48 | $90,300 | $31,605 | $121,905 |
| FUT-274 | 1158 | 8 | General City | 146 | 432 | 7,382 | 144.48 | $1,066,551 | $373,293 | $1,439,844 |
| FUT-242 | 1158 | 12 | General City | 90 | 268 | 3,788 | 216.72 | $820,935 | $287,327 | $1,108,263 |
| FUT-270 | 1158 | 12 | General City | 546 | 1328 | 2,641 | 216.72 | $572,358 | $200,325 | $772,683 |
| FUT-271 | 1158 | 12 | General City | 421 | 958 | 3,168 | 216.72 | $686,569 | $240,299 | $926,868 |
| FUT-238 | 1158 | 16 | General City | 211 | 623 | 4,152 | 288.96 | $1,199,762 | $419,917 | $1,619,679 |
| FUT-248 | 1158 | 16 | General City | 27 | 81 | 5,298 | 288.96 | $1,530,770 | $535,770 | $2,066,540 |
| FUT-275 | 1158 | 16 | General City | 223 | 661 | 813 | 288.96 | $234,924 | $82,224 | $317,148 |
| | | | | | | | Subtotal 1158 Zone | $15,644,068 | $5,475,424 | $21,119,491 |
| FUT-257 | 1299 | 8 | General City | 184 | 119 | 3,929 | 144.48 | $567,662 | $198,682 | $766,344 |
| FUT-276 | 1299 | 8 | General City | 11 | 34 | 5,063 | 144.48 | $731,502 | $256,026 | $987,528 |
| FUT-258 | 1299 | 16 | General City | 91 | 237 | 264 | 288.96 | $76,213 | $26,675 | $102,888 |
| | | | | | | | Subtotal 1299 Zone | $1,375,377 | $481,382 | $1,856,760 |
| | | | | | | | 1050 to West 1158 Pump Station | $1,500,000 | $525,000 | $2,025,000 |
| | | | | | | | **Total Near-Term CIP Costs** | **$44,324,082** | **$15,513,429** | **$59,837,510** |

**Table 10-3 Summary of CIP Costs**

| Phase | Pressure Zone | Total Project CIP Costs |
|---|---|---|
| Near-Term | 930 | $5,843,879 |
| | 1050 | $3,180,019 |
| | 1158 | $399,848 |
| | 1299 | $838,901 |
| | PRV | $810,000 |
| | **Subtotal Near-Term** | **$11,072,647** |
| Future | 930 | $21,170,803 |
| | 1050 | $13,665,456 |
| | 1158 | $21,119,491 |
| | 1299 | $1,856,760 |
| | Pump Station | $2,025,000 |
| | **Subtotal Future** | **$59,837,510** |
| | **Total CIP** | **$70,910,157** |

This map is not intended to replace a survey by a Lic.California Surveyor. Stantec does not certify the accuracy of the data and is for reference only and should not be used for construction.

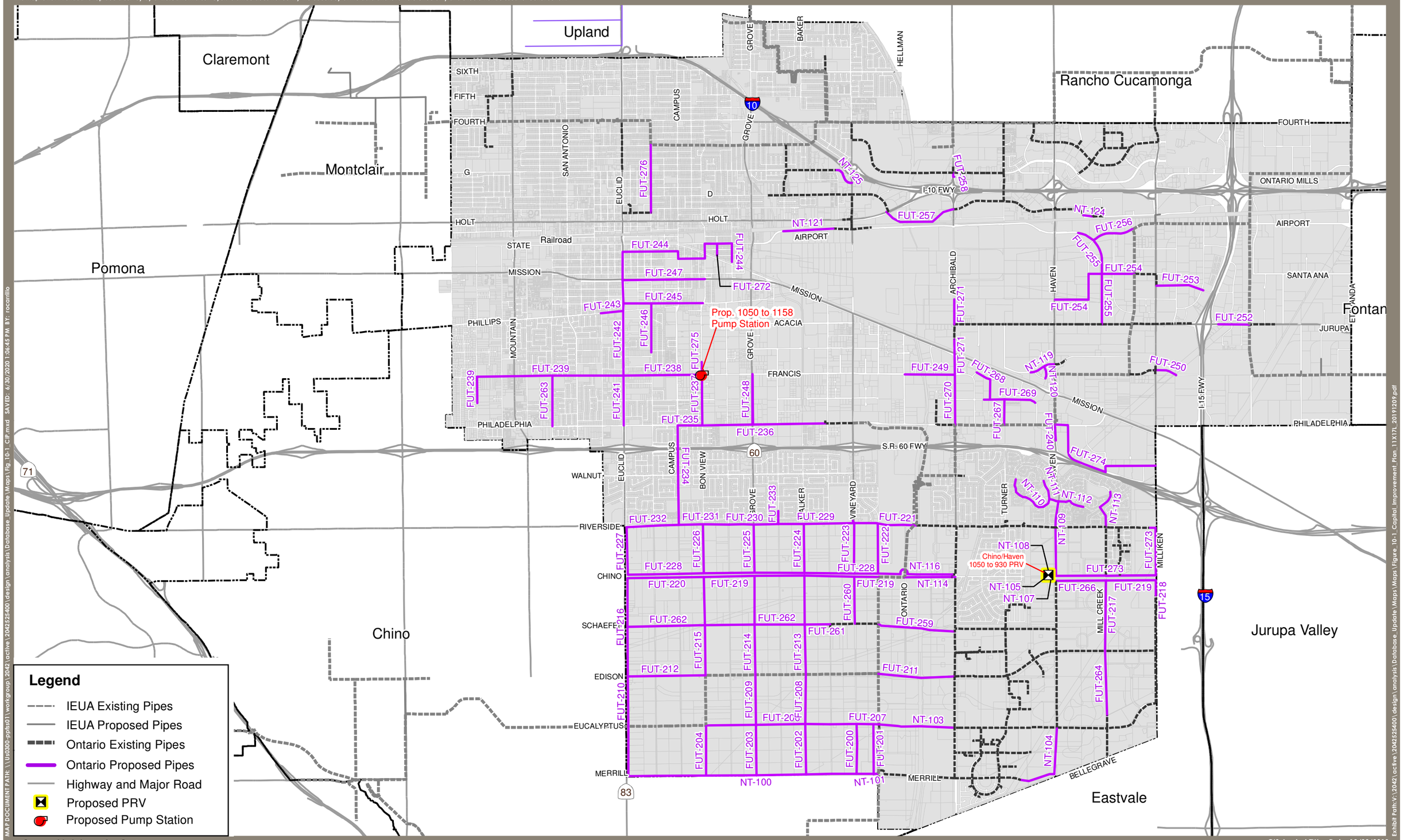


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Geographic Information Systems

GIS Analyst:TW Date: 12/09/2019

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Stantec
38 Technology Drive, Irvine, CA 92618
Phone 949.923.6000 www.stantec.com

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# Ontario Recycled Water Master Plan
## Figure 10-1 Capital Improvement Plan

# 11.0 REFERENCES

Previous studies for the recycled water system are:

- Ontario Recycled Water Pipeline Project: *Pipeline Sizing Memo* by Michael Baker, July 2016
- Ultimate City-Wide Water Demand Estimate Memo by AKM, May 2016
- Inland Empire Utilities Agency (IEUA) Recycled Water Program Strategy (RWPS), October 2015
- Study of Recycled Water Pressure Zone 930 (Elimination of pipe in Chino Ave) by AKM, April 2014
- City of Ontario Recycled Water Master Plan, April 2012

Reference documents for this report are as follows.

- The Ontario Plan (General Plan), February 2010
- California Code of Regulations Title 14 and Title 17

InfoWater 12.4 is used to conduct the analysis. Data sources are shown below.

- Existing Recycled Water Customer Billing Data from 2009 to 2018.
- Demand Factors and Demand Pattern from Ultimate City-Wide Water Demand Estimate Memo (AKM, May 2016) and IEUA Recycled Water Program Strategy, October 2015.
- GIS data provided by the City of Ontario:
    - Land use data received on October 31, 2018.
    - Recycled water system data received on October 31st, 2018, which included recycled water mains, laterals, system valves, hydrants, meters, active recycled water meters with customer data, geocode points locations of active meters, parcel data, and street centerlines.
    - Recycled water meter locations, received on November 1, 2018.

# APPENDIX A

# MODEL DATA

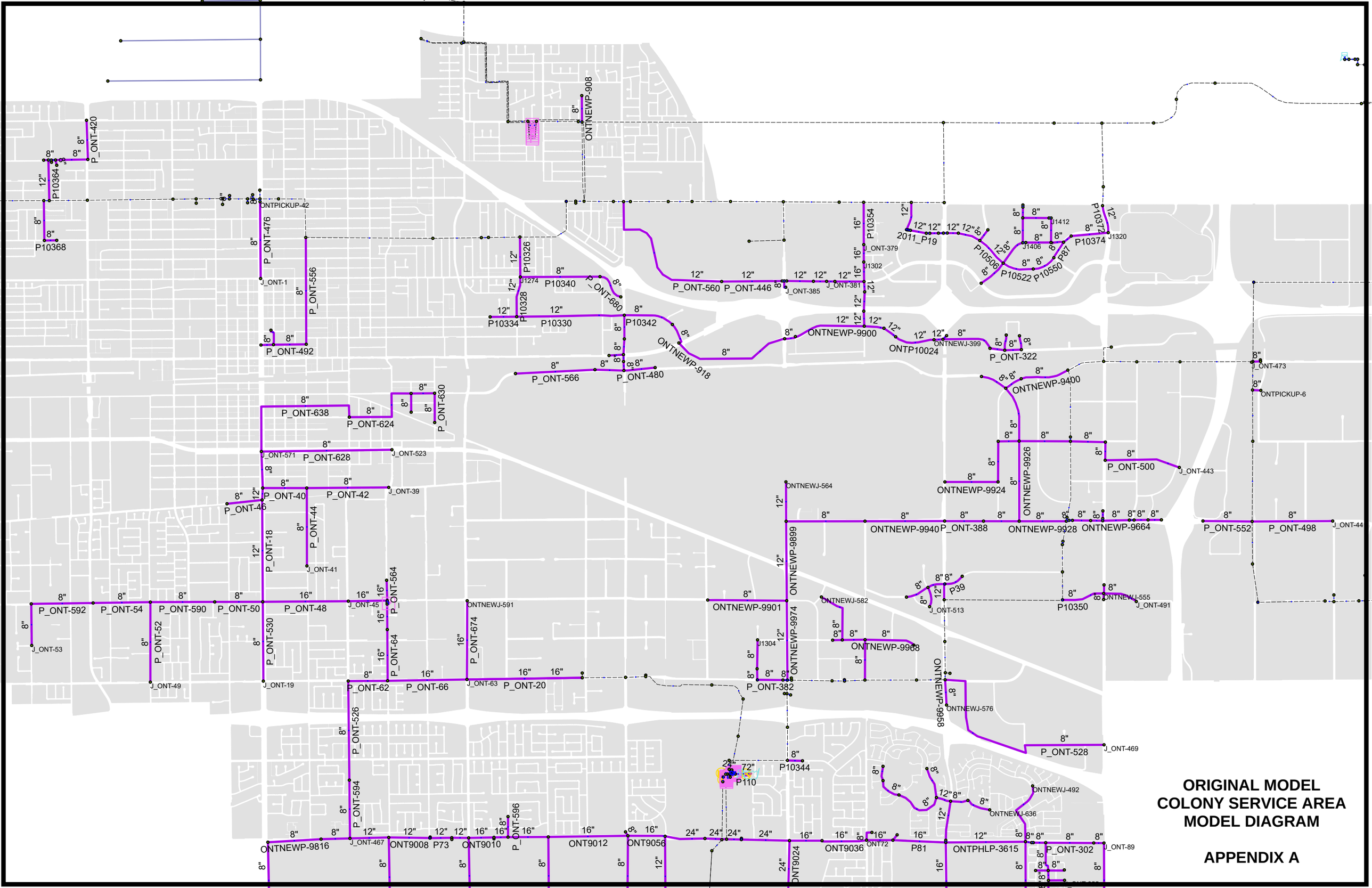


**ORIGINAL MODEL**
**COLONY SERVICE AREA**
**MODEL DIAGRAM**

**APPENDIX A**

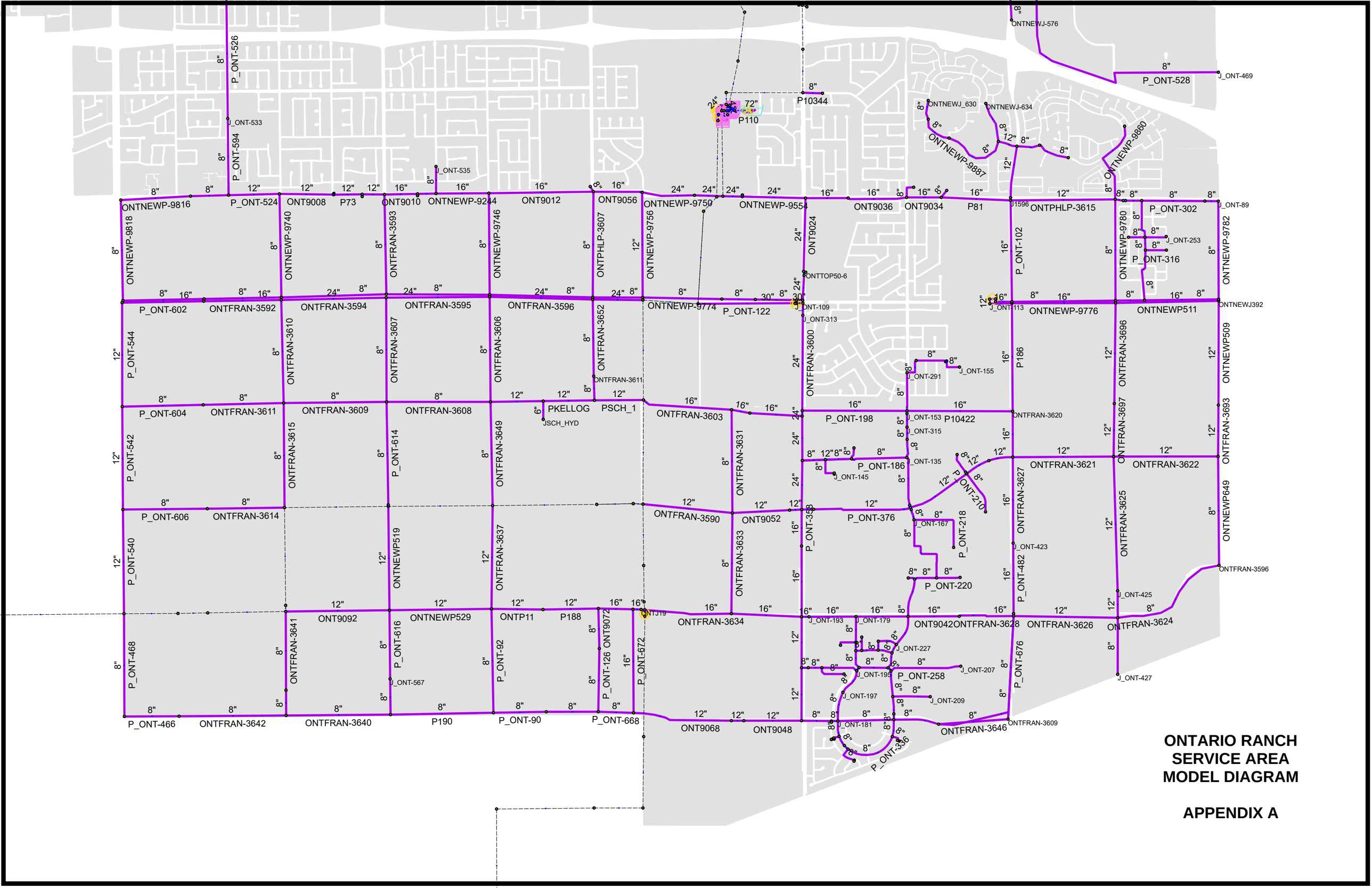


**ONTARIO RANCH SERVICE AREA MODEL DIAGRAM**

**APPENDIX A**

Existing Model Scenario

Existing Scenario - City of Ontario - Junction Elevations and Zone

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 1 | | J1272 | 1299 | 995.00 |
| 2 | | J1274 | 1299 | 1,015.00 |
| 3 | | J1276 | 1299 | 984.00 |
| 4 | | J1280 | 1299 | 997.00 |
| 5 | | J1288 | 1299 | 1,006.00 |
| 6 | | J1290 | 1299 | 967.00 |
| 7 | | J1292 | 1158 | 803.00 |
| 8 | | J1294 | 1158 | 873.00 |
| 9 | | J1296 | 1158 | 892.00 |
| 10 | | J1302 | 1299 | 1,005.00 |
| 11 | | J1304 | 1158 | 845.00 |
| 12 | | J1308 | 1299 | 1,010.00 |
| 13 | | J1314 | 1299 | 1,063.00 |
| 14 | | J1316 | 1299 | 1,063.00 |
| 15 | | J1320 | 1299 | 1,022.00 |
| 16 | | J1322 | 1299 | 998.50 |
| 17 | | J1324 | 1299 | 998.50 |
| 18 | | J1404 | 1299 | 1,005.00 |
| 19 | | J1406 | 1299 | 1,014.00 |
| 20 | | J1408 | 1299 | 1,029.00 |
| 21 | | J1410 | 1299 | 1,022.00 |
| 22 | | J1412 | 1299 | 1,022.00 |
| 23 | | J1414 | 1299 | 1,012.50 |
| 24 | | J1416 | 1299 | 994.50 |
| 25 | | J1586 | 1299 | 1,111.00 |
| 26 | | J1592 | 1299 | 970.00 |
| 27 | | J1596 | 1050 | 790.80 |
| 28 | | JKELLOG | 930 | 722.50 |
| 29 | | JSCH_HYD | 930 | 722.50 |
| 30 | | J_ONT-103 | 1050 | 752.33 |
| 31 | | J_ONT-105 | 930 | 752.33 |
| 32 | | J_ONT-107 | 1050 | 752.33 |
| 33 | | J_ONT-109 | 930 | 752.33 |
| 34 | | J_ONT-133 | 930 | 718.23 |
| 35 | | J_ONT-135 | 930 | 730.00 |
| 36 | | J_ONT-137 | 930 | 722.00 |
| 37 | | J_ONT-139 | 930 | 720.00 |
| 38 | | J_ONT-141 | 930 | 717.00 |
| 39 | | J_ONT-143 | 930 | 725.00 |
| 40 | | J_ONT-145 | 930 | 717.00 |
| 41 | | J_ONT-147 | 930 | 716.00 |
| 42 | | J_ONT-149 | 930 | 715.00 |
| 43 | | J_ONT-151 | 930 | 740.26 |
| 44 | | J_ONT-153 | 930 | 740.00 |
| 45 | | J_ONT-155 | 930 | 757.00 |
| 46 | | J_ONT-157 | 930 | 728.00 |
| 47 | | J_ONT-159 | 930 | 739.00 |
| 48 | | J_ONT-161 | 930 | 720.00 |
| 49 | | J_ONT-163 | 930 | 714.00 |
| 50 | | J_ONT-165 | 930 | 699.00 |
| 51 | | J_ONT-167 | 930 | 714.00 |

Existing Scenario - City of Ontario - Junction Elevations and Zone

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 52 | | J_ONT-169 | 930 | 710.00 |
| 53 | | J_ONT-171 | 930 | 700.00 |
| 54 | | J_ONT-173 | 930 | 696.00 |
| 55 | | J_ONT-175 | 930 | 695.00 |
| 56 | | J_ONT-177 | 930 | 690.26 |
| 57 | | J_ONT-179 | 930 | 686.77 |
| 58 | | J_ONT-181 | 930 | 662.11 |
| 59 | | J_ONT-185 | 930 | 667.75 |
| 60 | | J_ONT-187 | 930 | 662.97 |
| 61 | | J_ONT-189 | 930 | 652.00 |
| 62 | | J_ONT-191 | 930 | 652.00 |
| 63 | | J_ONT-193 | 930 | 683.62 |
| 64 | | J_ONT-195 | 930 | 670.00 |
| 65 | | J_ONT-197 | 930 | 665.00 |
| 66 | | J_ONT-199 | 930 | 668.00 |
| 67 | | J_ONT-201 | 930 | 673.00 |
| 68 | | J_ONT-203 | 930 | 676.00 |
| 69 | | J_ONT-205 | 930 | 677.00 |
| 70 | | J_ONT-207 | 930 | 683.00 |
| 71 | | J_ONT-209 | 930 | 676.00 |
| 72 | | J_ONT-211 | 930 | 671.02 |
| 73 | | J_ONT-213 | 930 | 667.00 |
| 74 | | J_ONT-215 | 930 | 669.00 |
| 75 | | J_ONT-217 | 930 | 669.00 |
| 76 | | J_ONT-219 | 930 | 670.00 |
| 77 | | J_ONT-221 | 930 | 675.00 |
| 78 | | J_ONT-223 | 930 | 679.00 |
| 79 | | J_ONT-225 | 930 | 680.00 |
| 80 | | J_ONT-227 | 930 | 685.00 |
| 81 | | J_ONT-229 | 930 | 677.00 |
| 82 | | J_ONT-231 | 930 | 677.00 |
| 83 | | J_ONT-233 | 930 | 675.00 |
| 84 | | J_ONT-235 | 930 | 678.00 |
| 85 | | J_ONT-237 | 930 | 673.00 |
| 86 | | J_ONT-239 | 1050 | 798.05 |
| 87 | | J_ONT-243 | 1050 | 775.00 |
| 88 | | J_ONT-247 | 1050 | 795.00 |
| 89 | | J_ONT-249 | 1050 | 785.00 |
| 90 | | J_ONT-251 | 1050 | 791.00 |
| 91 | | J_ONT-253 | 1050 | 800.00 |
| 92 | | J_ONT-255 | 1050 | 795.00 |
| 93 | | J_ONT-265 | 930 | 662.00 |
| 94 | | J_ONT-267 | 930 | 672.50 |
| 95 | | J_ONT-271 | 930 | 662.00 |
| 96 | | J_ONT-273 | 930 | 666.81 |
| 97 | | J_ONT-275 | 930 | 663.85 |
| 98 | | J_ONT-277 | 930 | 654.00 |
| 99 | | J_ONT-279 | 930 | 654.00 |
| 100 | | J_ONT-281 | 930 | 654.00 |
| 101 | | J_ONT-283 | 930 | 658.00 |
| 102 | | J_ONT-285 | 930 | 661.00 |

Existing Scenario - City of Ontario - Junction Elevations and Zone

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 103 | | J_ONT-287 | 930 | 661.00 |
| 104 | | J_ONT-289 | 930 | 730.83 |
| 105 | | J_ONT-291 | 930 | 748.00 |
| 106 | | J_ONT-295 | 930 | 754.00 |
| 107 | | J_ONT-297 | 930 | 755.00 |
| 108 | | J_ONT-299 | 930 | 755.00 |
| 109 | | J_ONT-301 | 930 | 698.61 |
| 110 | | J_ONT-313 | 930 | 750.65 |
| 111 | | J_ONT-315 | 930 | 737.00 |
| 112 | | J_ONT-317 | 930 | 735.00 |
| 113 | | J_ONT-321 | 930 | 630.05 |
| 114 | | J_ONT-325 | 930 | 663.56 |
| 115 | | J_ONT-333 | 1158 | 898.39 |
| 116 | | J_ONT-341 | 1158 | 897.00 |
| 117 | | J_ONT-343 | 1158 | 897.00 |
| 118 | | J_ONT-351 | 1158 | 905.98 |
| 119 | | J_ONT-357 | 1158 | 907.23 |
| 120 | | J_ONT-359 | 1299 | 1,125.73 |
| 121 | | J_ONT-361 | 1299 | 1,022.00 |
| 122 | | J_ONT-363 | 1299 | 1,027.86 |
| 123 | | J_ONT-365 | 1299 | 1,013.84 |
| 124 | | J_ONT-367 | 1299 | 1,015.12 |
| 125 | | J_ONT-369 | 1299 | 1,020.00 |
| 126 | | J_ONT-371 | 1299 | 1,020.00 |
| 127 | | J_ONT-373 | 1299 | 1,012.03 |
| 128 | | J_ONT-377 | 1299 | 975.08 |
| 129 | | J_ONT-379 | 1299 | 1,012.28 |
| 130 | | J_ONT-381 | 1299 | 990.66 |
| 131 | | J_ONT-383 | 1299 | 988.07 |
| 132 | | J_ONT-387 | 1299 | 979.36 |
| 133 | | J_ONT-399 | 1299 | 967.15 |
| 134 | | J_ONT-401 | 1299 | 975.71 |
| 135 | | J_ONT-403 | 1299 | 972.20 |
| 136 | | J_ONT-407 | 1299 | 970.00 |
| 137 | | J_ONT-421 | 1299 | 962.00 |
| 138 | | J_ONT-423 | 930 | 717.61 |
| 139 | | J_ONT-425 | 930 | 699.76 |
| 140 | | J_ONT-427 | 930 | 699.76 |
| 141 | | J_ONT-473 | 1158 | 973.90 |
| 142 | | J_ONT-477 | 1299 | 983.86 |
| 143 | | J_ONT-507 | 1299 | 1,020.00 |
| 144 | | J_ONT-509 | 1299 | 1,010.42 |
| 145 | | J_ONT-511 | 1299 | 1,010.97 |
| 146 | | J_ONT-537 | 930 | 706.89 |
| 147 | | J_ONT-569 | 930 | 653.59 |
| 148 | | J_ONT-609 | 930 | 665.39 |
| 149 | | ONT66 | 1050 | 780.00 |
| 150 | | ONT68 | 1050 | 787.87 |
| 151 | | ONT72 | 1050 | 786.40 |
| 152 | | ONT76 | 930 | 694.43 |
| 153 | | ONTFRAN-3581 | 930 | 728.00 |

Existing Scenario - City of Ontario - Junction Elevations and Zone

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 154 | | ONTFRAN-3583 | 930 | 723.56 |
| 155 | | ONTFRAN-3591 | 930 | 706.58 |
| 156 | | ONTFRAN-3592 | 930 | 725.00 |
| 157 | | ONTFRAN-3593 | 930 | 730.70 |
| 158 | | ONTFRAN-3594 | 930 | 731.73 |
| 159 | | ONTFRAN-3595 | 930 | 737.21 |
| 160 | | ONTFRAN-3596 | 930 | 706.61 |
| 161 | | ONTFRAN-3597 | 930 | 699.76 |
| 162 | | ONTFRAN-3598 | 930 | 706.52 |
| 163 | | ONTFRAN-3599 | 930 | 683.13 |
| 164 | | ONTFRAN-3608 | 930 | 658.46 |
| 165 | | ONTFRAN-3620 | 930 | 750.00 |
| 166 | | ONTFRAN-3622 | 930 | 750.00 |
| 167 | | ONTFRAN-3626 | 930 | 730.63 |
| 168 | | ONTJ114 | 1158 | 832.20 |
| 169 | | ONTNEWJ-198 | 1299 | 1,141.76 |
| 170 | | ONTNEWJ-212 | 1050 | 798.63 |
| 171 | | ONTNEWJ-214 | 1050 | 795.78 |
| 172 | | ONTNEWJ-224 | 1050 | 761.30 |
| 173 | | ONTNEWJ-262 | 1299 | 1,112.46 |
| 174 | | ONTNEWJ-278 | 1299 | 983.47 |
| 175 | | ONTNEWJ-322 | 1299 | 1,112.00 |
| 176 | | ONTNEWJ-340 | 1050 | 777.10 |
| 177 | | ONTNEWJ-354 | 1050 | 798.84 |
| 178 | | ONTNEWJ-356 | 1050 | 773.92 |
| 179 | | ONTNEWJ-378 | 1158 | 905.98 |
| 180 | | ONTNEWJ-398 | 1299 | 966.59 |
| 181 | | ONTNEWJ-399 | 1299 | 966.59 |
| 182 | | ONTNEWJ-432 | 1050 | 753.22 |
| 183 | | ONTNEWJ-438 | 1050 | 768.76 |
| 184 | | ONTNEWJ-470 | 1299 | 1,005.00 |
| 185 | | ONTNEWJ-478 | 1299 | 1,002.83 |
| 186 | | ONTNEWJ-482 | 1299 | 988.07 |
| 187 | | ONTNEWJ-500 | 1050 | 790.00 |
| 188 | | ONTNEWJ-510 | 1299 | 962.00 |
| 189 | | ONTNEWJ-516 | 1299 | 969.00 |
| 190 | | ONTNEWJ-520 | 1299 | 998.00 |
| 191 | | ONTNEWJ-522 | 1299 | 977.00 |
| 192 | | ONTNEWJ-526 | 1299 | 967.00 |
| 193 | | ONTNEWJ-528 | 1299 | 970.00 |
| 194 | | ONTNEWJ-550 | 1158 | 896.00 |
| 195 | | ONTNEWJ-554 | 1158 | 901.00 |
| 196 | | ONTNEWJ-555 | 1158 | 880.00 |
| 197 | | ONTNEWJ-556 | 1158 | 870.00 |
| 198 | | ONTNEWJ-560 | 1158 | 883.00 |
| 199 | | ONTNEWJ-562 | 1158 | 895.00 |
| 200 | | ONTNEWJ-568 | 1158 | 915.00 |
| 201 | | ONTNEWJ-598 | 1299 | 995.00 |
| 202 | | ONTNEWJ-622 | 1299 | 1,110.00 |
| 203 | | ONTNEWJ-640 | 1299 | 1,020.00 |
| 204 | | ONTNEWJ-646 | 1299 | 1,020.00 |

Existing Scenario - City of Ontario - Junction Elevations and Zone

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 205 | | ONTNEWJ-908 | 1299 | 1,099.00 |
| 206 | | ONTNEWJ-910 | 1299 | 967.00 |
| 207 | | ONTNEWJ-914 | 1299 | 992.50 |
| 208 | | ONTNEWJ-934 | 1158 | 936.00 |
| 209 | | ONTNEWJ-936 | 1158 | 934.00 |
| 210 | | ONTNEWJ-950 | 1299 | 1,020.00 |
| 211 | | ONTNEWJ402 | 930 | 652.53 |
| 212 | | ONTPHLP-3606 | 930 | 753.22 |
| 213 | | ONTPHLP-3610 | 1050 | 799.50 |
| 214 | | ONTPICKUP-12 | 1050 | 760.27 |
| 215 | | ONTPICKUP-14 | 1050 | 777.77 |
| 216 | | ONTPICKUP-17 | 1050 | 790.00 |
| 217 | | ONTPICKUP-30 | 1158 | 835.00 |
| 218 | | ONTPICKUP-32 | 1158 | 925.00 |
| 219 | | ONTPICKUP-51 | 1299 | 1,110.62 |
| 220 | | ONTPICKUP-68 | 1299 | 968.54 |
| 221 | | ONTPICKUP-71 | 1158 | 907.45 |
| 222 | | ONTPICKUP-72 | 1299 | 1,094.10 |
| 223 | | ONTTOP50-15 | 1299 | 979.36 |
| 224 | | ONTTOP50-18 | 1299 | 988.07 |
| 225 | | ONTTOP50-22 | 1299 | 973.68 |
| 226 | | ONTTOP50-40 | 1299 | 1,109.15 |
| 227 | | ONTTOP50-48 | 1158 | 877.76 |
| 228 | | ONTTOP50-6 | 1050 | 761.11 |

Existing Scenario - City of Ontario - Junction Input Data

| * EXISTING_MDD * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Demand 2 | Pattern 2 (Char) | Demand 3 (gpm) | Pattern 3 (Char) | Demand 4 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | J1272 | 23.58 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 2 | ☐ | J1274 | 52.34 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 3 | ☐ | J1276 | 3.10 | IND | | | | | |
| 4 | ☐ | J1280 | 4.26 | | 8.52 | LANDSCAPE_IRR | 24.92 | LANDSCAPE_IRR | 0.00 |
| 5 | ☐ | J1288 | 3.90 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 6 | ☐ | J1290 | 5.98 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 7 | ☐ | J1292 | 5.68 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 8 | ☐ | J1294 | 12.50 | LANDSCAPE_IRR | 9.40 | LANDSCAPE_IRR | 2.72 | LANDSCAPE_IRR | 3.38 |
| 9 | ☐ | J1296 | 8.96 | IND | 6.92 | IND | 11.98 | LANDSCAPE_IRR | 16.24 |
| 10 | ☐ | J1302 | 8.76 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 11 | ☐ | J1304 | 15.23 | IND | 10.94 | IND | 0.00 | | 0.00 |
| 12 | ☐ | J1308 | 5.92 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 13 | ☐ | J1314 | 20.44 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 14 | ☐ | J1316 | 231.50 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 15 | ☐ | J1320 | 9.32 | LANDSCAPE_IRR | 2.80 | LANDSCAPE_IRR | | | 0.00 |
| 16 | ☐ | J1322 | 10.48 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 17 | ☐ | J1324 | 58.95 | LANDSCAPE_IRR | 8.34 | LANDSCAPE_IRR | 3.30 | LANDSCAPE_IRR | 3.30 |
| 18 | ☐ | J1404 | 21.29 | LANDSCAPE_IRR | 11.02 | LANDSCAPE_IRR | 5.34 | LANDSCAPE_IRR | 0.00 |
| 19 | ☐ | J1406 | 41.69 | LANDSCAPE_IRR | 50.38 | LANDSCAPE_IRR | 23.54 | LANDSCAPE_IRR | |
| 20 | ☐ | J1408 | 9.28 | LANDSCAPE_IRR | 3.56 | LANDSCAPE_IRR | 0.42 | LANDSCAPE_IRR | 12.82 |
| 21 | ☐ | J1410 | | | | | | | |
| 22 | ☐ | J1412 | 9.22 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 23 | ☐ | J1414 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 24 | ☐ | J1416 | 61.65 | LANDSCAPE_IRR | 13.78 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 25 | ☐ | J1586 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 26 | ☐ | J1592 | 3.21 | LANDSCAPE_IRR | 0.22 | LANDSCAPE_IRR | | | |
| 27 | ☐ | J1596 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 28 | ☐ | JKELLOG | 0.02 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 29 | ☐ | JSCH_HYD | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 30 | ☐ | J_ONT-103 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 31 | ☐ | J_ONT-105 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 32 | ☐ | J_ONT-107 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 33 | ☐ | J_ONT-109 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 34 | ☐ | J_ONT-133 | 2.42 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 35 | ☐ | J_ONT-135 | 6.36 | LANDSCAPE_IRR | | | | | 0.00 |
| 36 | ☐ | J_ONT-137 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 37 | ☐ | J_ONT-139 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 38 | ☐ | J_ONT-141 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 39 | ☐ | J_ONT-143 | 43.42 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 40 | ☐ | J_ONT-145 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 41 | ☐ | J_ONT-147 | 11.40 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 42 | ☐ | J_ONT-149 | 4.95 | AGRICULTURAL | 7.22 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 43 | ☐ | J_ONT-151 | 3.41 | LANDSCAPE_IRR | 1.58 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 44 | ☐ | J_ONT-153 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 45 | ☐ | J_ONT-155 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 46 | ☐ | J_ONT-157 | 3.21 | LANDSCAPE_IRR | 5.18 | LANDSCAPE_IRR | 1.76 | LANDSCAPE_IRR | 1.64 |
| 47 | ☐ | J_ONT-159 | 7.62 | LANDSCAPE_IRR | 4.86 | LANDSCAPE_IRR | 0.53 | LANDSCAPE_IRR | 3.25 |
| 48 | ☐ | J_ONT-161 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 49 | ☐ | J_ONT-163 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 50 | ☐ | J_ONT-165 | 0.26 | AGRICULTURAL | | | 0.00 | | 0.00 |
| 51 | ☐ | J_ONT-167 | | | 0.00 | | 0.00 | | 0.00 |
| 52 | ☐ | J_ONT-169 | 0.20 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 53 | ☐ | J_ONT-171 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 54 | ☐ | J_ONT-173 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 55 | ☐ | J_ONT-175 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 56 | ☐ | J_ONT-177 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 57 | ☐ | J_ONT-179 | 0.00 | | 0.00 | | 0.00 | | 0.00 |

Existing Scenario - City of Ontario - Junction Input Data

| * EXISTING_MDD * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Demand 2 | Pattern 2 (Char) | Demand 3 (gpm) | Pattern 3 (Char) | Demand 4 |
|---|---|---|---|---|---|---|---|---|---|
| 58 | ☐ | J_ONT-181 | 7.73 | LANDSCAPE_IRR | 7.90 | LANDSCAPE_IRR | 32.92 | LANDSCAPE_IRR | 14.34 |
| 59 | ☐ | J_ONT-185 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 60 | ☐ | J_ONT-187 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 61 | ☐ | J_ONT-189 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 62 | ☐ | J_ONT-191 | 9.38 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 63 | ☐ | J_ONT-193 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 64 | ☐ | J_ONT-195 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 65 | ☐ | J_ONT-197 | 0.53 | AGRICULTURAL | 0.82 | AGRICULTURAL | 0.00 | | 0.00 |
| 66 | ☐ | J_ONT-199 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 67 | ☐ | J_ONT-201 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 68 | ☐ | J_ONT-203 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 69 | ☐ | J_ONT-205 | 1.84 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 70 | ☐ | J_ONT-207 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 71 | ☐ | J_ONT-209 | 0.24 | AGRICULTURAL | 0.48 | AGRICULTURAL | 0.76 | AGRICULTURAL | 0.00 |
| 72 | ☐ | J_ONT-211 | 391.86 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 73 | ☐ | J_ONT-213 | 10.17 | AGRICULTURAL | 8.54 | AGRICULTURAL | 0.00 | | 0.00 |
| 74 | ☐ | J_ONT-215 | 0.20 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 75 | ☐ | J_ONT-217 | 4.92 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 76 | ☐ | J_ONT-219 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 77 | ☐ | J_ONT-221 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 78 | ☐ | J_ONT-223 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 79 | ☐ | J_ONT-225 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 80 | ☐ | J_ONT-227 | 0.02 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 81 | ☐ | J_ONT-229 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 82 | ☐ | J_ONT-231 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 83 | ☐ | J_ONT-233 | 4.92 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 84 | ☐ | J_ONT-235 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 85 | ☐ | J_ONT-237 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 86 | ☐ | J_ONT-239 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 87 | ☐ | J_ONT-243 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 88 | ☐ | J_ONT-247 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 89 | ☐ | J_ONT-249 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 90 | ☐ | J_ONT-251 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 91 | ☐ | J_ONT-253 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 92 | ☐ | J_ONT-255 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 93 | ☐ | J_ONT-265 | 6.70 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 94 | ☐ | J_ONT-267 | 5.20 | AGRICULTURAL | 6.48 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 95 | ☐ | J_ONT-271 | | | | | | | |
| 96 | ☐ | J_ONT-273 | 3.68 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 97 | ☐ | J_ONT-275 | 13.52 | LANDSCAPE_IRR | 8.72 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 98 | ☐ | J_ONT-277 | | | | | | | |
| 99 | ☐ | J_ONT-279 | 5.16 | LANDSCAPE_IRR | 10.28 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 100 | ☐ | J_ONT-281 | 9.18 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 101 | ☐ | J_ONT-283 | | | | | | | |
| 102 | ☐ | J_ONT-285 | | | | | | | |
| 103 | ☐ | J_ONT-287 | 0.10 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 104 | ☐ | J_ONT-289 | 10.25 | LANDSCAPE_IRR | 4.66 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 105 | ☐ | J_ONT-291 | 3.32 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 106 | ☐ | J_ONT-295 | 8.44 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 107 | ☐ | J_ONT-297 | 9.58 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 108 | ☐ | J_ONT-299 | | | | | | | |
| 109 | ☐ | J_ONT-301 | 2.74 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 110 | ☐ | J_ONT-313 | 1.78 | AGRICULTURAL | | | | | |
| 111 | ☐ | J_ONT-315 | 6.64 | LANDSCAPE_IRR | | | | | 0.00 |
| 112 | ☐ | J_ONT-317 | 3.64 | LANDSCAPE_IRR | | | | | 0.00 |
| 113 | ☐ | J_ONT-321 | 9.52 | LANDSCAPE_IRR | 10.68 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 114 | ☐ | J_ONT-325 | 4.06 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |

Existing Scenario - City of Ontario - Junction Input Data

| * EXISTING_MDD * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Demand 2 | Pattern 2 (Char) | Demand 3 (gpm) | Pattern 3 (Char) | Demand 4 |
|---|---|---|---|---|---|---|---|---|---|
| 115 | ☐ | J_ONT-333 | 13.35 | IND | 3.22 | IND | 5.56 | IND | 2.36 |
| 116 | ☐ | J_ONT-341 | 17.47 | LANDSCAPE_IRR | 15.42 | LANDSCAPE_IRR | | | 0.00 |
| 117 | ☐ | J_ONT-343 | 13.32 | IND | | | | | 0.00 |
| 118 | ☐ | J_ONT-351 | 1.82 | IND | | | | | |
| 119 | ☐ | J_ONT-357 | 5.90 | IND | 0.00 | | 0.00 | | 0.00 |
| 120 | ☐ | J_ONT-359 | 1.06 | LANDSCAPE_IRR | | | | | 0.00 |
| 121 | ☐ | J_ONT-361 | 10.18 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 122 | ☐ | J_ONT-363 | 1.96 | LANDSCAPE_IRR | 1.36 | LANDSCAPE_IRR | 2.04 | LANDSCAPE_IRR | 0.00 |
| 123 | ☐ | J_ONT-365 | 3.86 | LANDSCAPE_IRR | | | | | |
| 124 | ☐ | J_ONT-367 | 13.52 | LANDSCAPE_IRR | 6.80 | LANDSCAPE_IRR | | | |
| 125 | ☐ | J_ONT-369 | 14.12 | LANDSCAPE_IRR | | | | | |
| 126 | ☐ | J_ONT-371 | 7.66 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 127 | ☐ | J_ONT-373 | 14.98 | LANDSCAPE_IRR | 5.92 | LANDSCAPE_IRR | | | 0.00 |
| 128 | ☐ | J_ONT-377 | 34.53 | LANDSCAPE_IRR | 44.50 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 129 | ☐ | J_ONT-379 | 5.56 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 130 | ☐ | J_ONT-381 | 16.56 | LANDSCAPE_IRR | | | | | |
| 131 | ☐ | J_ONT-383 | 12.12 | IND | | | | | |
| 132 | ☐ | J_ONT-387 | 9.58 | IND | 2.60 | IND | 15.96 | IND | 0.08 |
| 133 | ☐ | J_ONT-399 | 2.48 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 134 | ☐ | J_ONT-401 | 21.22 | LANDSCAPE_IRR | 10.52 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 135 | ☐ | J_ONT-403 | 10.11 | LANDSCAPE_IRR | 16.26 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 136 | ☐ | J_ONT-407 | | | 0.00 | | 0.00 | | 0.00 |
| 137 | ☐ | J_ONT-421 | | | | | 0.00 | | 0.00 |
| 138 | ☐ | J_ONT-423 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 139 | ☐ | J_ONT-425 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 140 | ☐ | J_ONT-427 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 141 | ☐ | J_ONT-473 | 1.89 | LANDSCAPE_IRR | 1.74 | LANDSCAPE_IRR | 0.48 | LANDSCAPE_IRR | 0.92 |
| 142 | ☐ | J_ONT-477 | 149.10 | LANDSCAPE_IRR | 280.04 | LANDSCAPE_IRR | 6.16 | LANDSCAPE_IRR | 0.00 |
| 143 | ☐ | J_ONT-507 | 16.36 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 144 | ☐ | J_ONT-509 | 14.18 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 145 | ☐ | J_ONT-511 | 23.26 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 146 | ☐ | J_ONT-537 | | | | | | | |
| 147 | ☐ | J_ONT-569 | | | | | | | |
| 148 | ☐ | J_ONT-609 | | | | | | | |
| 149 | ☐ | ONT66 | 33.20 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 150 | ☐ | ONT68 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 151 | ☐ | ONT72 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 152 | ☐ | ONT76 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 153 | ☐ | ONTFRAN-3581 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 154 | ☐ | ONTFRAN-3583 | 847.26 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 155 | ☐ | ONTFRAN-3591 | 7.40 | LANDSCAPE_IRR | 0.52 | LANDSCAPE_IRR | 1,411.68 | AGRICULTURAL | 0.00 |
| 156 | ☐ | ONTFRAN-3592 | 4.63 | LANDSCAPE_IRR | 0.14 | LANDSCAPE_IRR | 25.36 | LANDSCAPE_IRR | 0.00 |
| 157 | ☐ | ONTFRAN-3593 | 3.92 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 158 | ☐ | ONTFRAN-3594 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 159 | ☐ | ONTFRAN-3595 | 3.22 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 160 | ☐ | ONTFRAN-3596 | 1.88 | AGRICULTURAL | 0.00 | | 0.00 | | 0.00 |
| 161 | ☐ | ONTFRAN-3597 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 162 | ☐ | ONTFRAN-3598 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 163 | ☐ | ONTFRAN-3599 | 9.78 | AGRICULTURAL | 10.04 | AGRICULTURAL | 0.00 | | 0.00 |
| 164 | ☐ | ONTFRAN-3608 | 18.60 | LANDSCAPE_IRR | | | 0.00 | | 0.00 |
| 165 | ☐ | ONTFRAN-3620 | 7.10 | LANDSCAPE_IRR | 7.44 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 166 | ☐ | ONTFRAN-3622 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 167 | ☐ | ONTFRAN-3626 | 1.56 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 168 | ☐ | ONTJ114 | 11.35 | IND | 6.34 | IND | 0.32 | IND | |
| 169 | ☐ | ONTNEWJ-198 | 24.87 | LANDSCAPE_IRR | 1.10 | LANDSCAPE_IRR | 2.08 | LANDSCAPE_IRR | 0.00 |
| 170 | ☐ | ONTNEWJ-212 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 171 | ☐ | ONTNEWJ-214 | 0.00 | | 0.00 | | 0.00 | | 0.00 |

Existing Scenario - City of Ontario - Junction Input Data

| * EXISTING_MDD * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Demand 2 | Pattern 2 (Char) | Demand 3 (gpm) | Pattern 3 (Char) | Demand 4 |
|---|---|---|---|---|---|---|---|---|---|
| 172 | ☐ | ONTNEWJ-224 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 173 | ☐ | ONTNEWJ-262 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 174 | ☐ | ONTNEWJ-278 | 0.97 | LANDSCAPE_IRR | 0.62 | LANDSCAPE_IRR | 1.18 | LANDSCAPE_IRR | 1.18 |
| 175 | ☐ | ONTNEWJ-322 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 176 | ☐ | ONTNEWJ-340 | 1.61 | AGRICULTURAL | 3.22 | AGRICULTURAL | | | 0.00 |
| 177 | ☐ | ONTNEWJ-354 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 178 | ☐ | ONTNEWJ-356 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 179 | ☐ | ONTNEWJ-378 | 2.68 | IND | 0.76 | LANDSCAPE_IRR | 1.34 | LANDSCAPE_IRR | 3.34 |
| 180 | ☐ | ONTNEWJ-398 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 181 | ☐ | ONTNEWJ-399 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 182 | ☐ | ONTNEWJ-432 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 183 | ☐ | ONTNEWJ-438 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 184 | ☐ | ONTNEWJ-470 | 18.23 | LANDSCAPE_IRR | 13.06 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 185 | ☐ | ONTNEWJ-478 | 7.20 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 186 | ☐ | ONTNEWJ-482 | 16.00 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 187 | ☐ | ONTNEWJ-500 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 188 | ☐ | ONTNEWJ-510 | 17.02 | LANDSCAPE_IRR | 10.92 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 189 | ☐ | ONTNEWJ-516 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 190 | ☐ | ONTNEWJ-520 | 10.23 | LANDSCAPE_IRR | 9.74 | LANDSCAPE_IRR | | | 0.00 |
| 191 | ☐ | ONTNEWJ-522 | 4.16 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 192 | ☐ | ONTNEWJ-526 | 13.54 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 193 | ☐ | ONTNEWJ-528 | 16.66 | LANDSCAPE_IRR | 12.12 | IND | 0.00 | | 0.00 |
| 194 | ☐ | ONTNEWJ-550 | 9.30 | IND | | | | | |
| 195 | ☐ | ONTNEWJ-554 | 15.84 | IND | 6.64 | IND | 3.92 | IND | |
| 196 | ☐ | ONTNEWJ-555 | 8.96 | LANDSCAPE_IRR | 6.92 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 197 | ☐ | ONTNEWJ-556 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 198 | ☐ | ONTNEWJ-560 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 199 | ☐ | ONTNEWJ-562 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 200 | ☐ | ONTNEWJ-568 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 201 | ☐ | ONTNEWJ-598 | 14.21 | LANDSCAPE_IRR | 2.98 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 202 | ☐ | ONTNEWJ-622 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 203 | ☐ | ONTNEWJ-640 | 7.90 | LANDSCAPE_IRR | | | | | |
| 204 | ☐ | ONTNEWJ-646 | 9.52 | LANDSCAPE_IRR | 6.68 | LANDSCAPE_IRR | 15.78 | LANDSCAPE_IRR | |
| 205 | ☐ | ONTNEWJ-908 | 17.48 | LANDSCAPE_IRR | | | | | 0.00 |
| 206 | ☐ | ONTNEWJ-910 | 9.71 | LANDSCAPE_IRR | 11.10 | LANDSCAPE_IRR | 15.16 | LANDSCAPE_IRR | 13.68 |
| 207 | ☐ | ONTNEWJ-914 | 20.76 | LANDSCAPE_IRR | 10.36 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 208 | ☐ | ONTNEWJ-934 | 7.16 | IND | 6.80 | IND | 7.44 | IND | 0.00 |
| 209 | ☐ | ONTNEWJ-936 | 4.55 | IND | 4.42 | IND | 0.00 | | 0.00 |
| 210 | ☐ | ONTNEWJ-950 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 211 | ☐ | ONTNEWJ402 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 212 | ☐ | ONTPHLP-3606 | 0.42 | LANDSCAPE_IRR | | | | | |
| 213 | ☐ | ONTPHLP-3610 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 214 | ☐ | ONTPICKUP-12 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 215 | ☐ | ONTPICKUP-14 | 88.88 | LANDSCAPE_IRR | 0.00 | | 0.00 | | 0.00 |
| 216 | ☐ | ONTPICKUP-17 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 217 | ☐ | ONTPICKUP-30 | 133.18 | IND | 4.84 | IND | 5.72 | IND | 5.84 |
| 218 | ☐ | ONTPICKUP-32 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 219 | ☐ | ONTPICKUP-51 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 220 | ☐ | ONTPICKUP-68 | 7.30 | LANDSCAPE_IRR | 4.24 | LANDSCAPE_IRR | 0.02 | LANDSCAPE_IRR | 0.00 |
| 221 | ☐ | ONTPICKUP-71 | 3.28 | LANDSCAPE_IRR | 3.08 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 222 | ☐ | ONTPICKUP-72 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 223 | ☐ | ONTTOP50-15 | | | 0.00 | | 0.00 | | 0.00 |
| 224 | ☐ | ONTTOP50-18 | 20.27 | LANDSCAPE_IRR | 10.34 | LANDSCAPE_IRR | 0.00 | | 0.00 |
| 225 | ☐ | ONTTOP50-22 | 48.66 | LANDSCAPE_IRR | 12.36 | LANDSCAPE_IRR | | | |
| 226 | ☐ | ONTTOP50-40 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 227 | ☐ | ONTTOP50-48 | 0.00 | | 0.00 | | 0.00 | | 0.00 |
| 228 | ☐ | ONTTOP50-6 | 0.00 | | 0.00 | | 0.00 | | 0.00 |

Existing Scenario - City of Ontario - Junction Input Data

| * EXISTING_MDD * | | ID (Char) | Pattern 4 (Char) |
|---|---|---|---|
| 1 | ☐ | J1272 | |
| 2 | ☐ | J1274 | |
| 3 | ☐ | J1276 | |
| 4 | ☐ | J1280 | |
| 5 | ☐ | J1288 | |
| 6 | ☐ | J1290 | |
| 7 | ☐ | J1292 | |
| 8 | ☐ | J1294 | LANDSCAPE_IRR |
| 9 | ☐ | J1296 | LANDSCAPE_IRR |
| 10 | ☐ | J1302 | |
| 11 | ☐ | J1304 | |
| 12 | ☐ | J1308 | |
| 13 | ☐ | J1314 | |
| 14 | ☐ | J1316 | |
| 15 | ☐ | J1320 | |
| 16 | ☐ | J1322 | |
| 17 | ☐ | J1324 | LANDSCAPE_IRR |
| 18 | ☐ | J1404 | |
| 19 | ☐ | J1406 | |
| 20 | ☐ | J1408 | LANDSCAPE_IRR |
| 21 | ☐ | J1410 | |
| 22 | ☐ | J1412 | |
| 23 | ☐ | J1414 | |
| 24 | ☐ | J1416 | |
| 25 | ☐ | J1586 | |
| 26 | ☐ | J1592 | |
| 27 | ☐ | J1596 | |
| 28 | ☐ | JKELLOG | |
| 29 | ☐ | JSCH_HYD | |
| 30 | ☐ | J_ONT-103 | |
| 31 | ☐ | J_ONT-105 | |
| 32 | ☐ | J_ONT-107 | |
| 33 | ☐ | J_ONT-109 | |
| 34 | ☐ | J_ONT-133 | |
| 35 | ☐ | J_ONT-135 | |
| 36 | ☐ | J_ONT-137 | |
| 37 | ☐ | J_ONT-139 | |
| 38 | ☐ | J_ONT-141 | |
| 39 | ☐ | J_ONT-143 | |
| 40 | ☐ | J_ONT-145 | |
| 41 | ☐ | J_ONT-147 | |
| 42 | ☐ | J_ONT-149 | |
| 43 | ☐ | J_ONT-151 | |
| 44 | ☐ | J_ONT-153 | |
| 45 | ☐ | J_ONT-155 | |
| 46 | ☐ | J_ONT-157 | LANDSCAPE_IRR |
| 47 | ☐ | J_ONT-159 | LANDSCAPE_IRR |
| 48 | ☐ | J_ONT-161 | |
| 49 | ☐ | J_ONT-163 | |
| 50 | ☐ | J_ONT-165 | |
| 51 | ☐ | J_ONT-167 | |
| 52 | ☐ | J_ONT-169 | |
| 53 | ☐ | J_ONT-171 | |
| 54 | ☐ | J_ONT-173 | |
| 55 | ☐ | J_ONT-175 | |
| 56 | ☐ | J_ONT-177 | |
| 57 | ☐ | J_ONT-179 | |

Existing Scenario - City of Ontario - Junction Input Data

| * EXISTING_MDD * | | ID (Char) | Pattern 4 (Char) |
|---|---|---|---|
| 58 | ☐ | J_ONT-181 | LANDSCAPE_IRR |
| 59 | ☐ | J_ONT-185 | |
| 60 | ☐ | J_ONT-187 | |
| 61 | ☐ | J_ONT-189 | |
| 62 | ☐ | J_ONT-191 | |
| 63 | ☐ | J_ONT-193 | |
| 64 | ☐ | J_ONT-195 | |
| 65 | ☐ | J_ONT-197 | |
| 66 | ☐ | J_ONT-199 | |
| 67 | ☐ | J_ONT-201 | |
| 68 | ☐ | J_ONT-203 | |
| 69 | ☐ | J_ONT-205 | |
| 70 | ☐ | J_ONT-207 | |
| 71 | ☐ | J_ONT-209 | |
| 72 | ☐ | J_ONT-211 | |
| 73 | ☐ | J_ONT-213 | |
| 74 | ☐ | J_ONT-215 | |
| 75 | ☐ | J_ONT-217 | |
| 76 | ☐ | J_ONT-219 | |
| 77 | ☐ | J_ONT-221 | |
| 78 | ☐ | J_ONT-223 | |
| 79 | ☐ | J_ONT-225 | |
| 80 | ☐ | J_ONT-227 | |
| 81 | ☐ | J_ONT-229 | |
| 82 | ☐ | J_ONT-231 | |
| 83 | ☐ | J_ONT-233 | |
| 84 | ☐ | J_ONT-235 | |
| 85 | ☐ | J_ONT-237 | |
| 86 | ☐ | J_ONT-239 | |
| 87 | ☐ | J_ONT-243 | |
| 88 | ☐ | J_ONT-247 | |
| 89 | ☐ | J_ONT-249 | |
| 90 | ☐ | J_ONT-251 | |
| 91 | ☐ | J_ONT-253 | |
| 92 | ☐ | J_ONT-255 | |
| 93 | ☐ | J_ONT-265 | |
| 94 | ☐ | J_ONT-267 | |
| 95 | ☐ | J_ONT-271 | |
| 96 | ☐ | J_ONT-273 | |
| 97 | ☐ | J_ONT-275 | |
| 98 | ☐ | J_ONT-277 | |
| 99 | ☐ | J_ONT-279 | |
| 100 | ☐ | J_ONT-281 | |
| 101 | ☐ | J_ONT-283 | |
| 102 | ☐ | J_ONT-285 | |
| 103 | ☐ | J_ONT-287 | |
| 104 | ☐ | J_ONT-289 | |
| 105 | ☐ | J_ONT-291 | |
| 106 | ☐ | J_ONT-295 | |
| 107 | ☐ | J_ONT-297 | |
| 108 | ☐ | J_ONT-299 | |
| 109 | ☐ | J_ONT-301 | |
| 110 | ☐ | J_ONT-313 | |
| 111 | ☐ | J_ONT-315 | |
| 112 | ☐ | J_ONT-317 | |
| 113 | ☐ | J_ONT-321 | |
| 114 | ☐ | J_ONT-325 | |

Existing Scenario - City of Ontario - Junction Input Data

| * EXISTING_MDD * | | ID (Char) | Pattern 4 (Char) |
|---|---|---|---|
| 115 | ☐ | J_ONT-333 | IND |
| 116 | ☐ | J_ONT-341 | |
| 117 | ☐ | J_ONT-343 | |
| 118 | ☐ | J_ONT-351 | |
| 119 | ☐ | J_ONT-357 | |
| 120 | ☐ | J_ONT-359 | |
| 121 | ☐ | J_ONT-361 | |
| 122 | ☐ | J_ONT-363 | |
| 123 | ☐ | J_ONT-365 | |
| 124 | ☐ | J_ONT-367 | |
| 125 | ☐ | J_ONT-369 | |
| 126 | ☐ | J_ONT-371 | |
| 127 | ☐ | J_ONT-373 | |
| 128 | ☐ | J_ONT-377 | |
| 129 | ☐ | J_ONT-379 | |
| 130 | ☐ | J_ONT-381 | |
| 131 | ☐ | J_ONT-383 | |
| 132 | ☐ | J_ONT-387 | IND |
| 133 | ☐ | J_ONT-399 | |
| 134 | ☐ | J_ONT-401 | |
| 135 | ☐ | J_ONT-403 | |
| 136 | ☐ | J_ONT-407 | |
| 137 | ☐ | J_ONT-421 | |
| 138 | ☐ | J_ONT-423 | |
| 139 | ☐ | J_ONT-425 | |
| 140 | ☐ | J_ONT-427 | |
| 141 | ☐ | J_ONT-473 | LANDSCAPE_IRR |
| 142 | ☐ | J_ONT-477 | |
| 143 | ☐ | J_ONT-507 | |
| 144 | ☐ | J_ONT-509 | |
| 145 | ☐ | J_ONT-511 | |
| 146 | ☐ | J_ONT-537 | |
| 147 | ☐ | J_ONT-569 | |
| 148 | ☐ | J_ONT-609 | |
| 149 | ☐ | ONT66 | |
| 150 | ☐ | ONT68 | |
| 151 | ☐ | ONT72 | |
| 152 | ☐ | ONT76 | |
| 153 | ☐ | ONTFRAN-3581 | |
| 154 | ☐ | ONTFRAN-3583 | |
| 155 | ☐ | ONTFRAN-3591 | |
| 156 | ☐ | ONTFRAN-3592 | |
| 157 | ☐ | ONTFRAN-3593 | |
| 158 | ☐ | ONTFRAN-3594 | |
| 159 | ☐ | ONTFRAN-3595 | |
| 160 | ☐ | ONTFRAN-3596 | |
| 161 | ☐ | ONTFRAN-3597 | |
| 162 | ☐ | ONTFRAN-3598 | |
| 163 | ☐ | ONTFRAN-3599 | |
| 164 | ☐ | ONTFRAN-3608 | |
| 165 | ☐ | ONTFRAN-3620 | |
| 166 | ☐ | ONTFRAN-3622 | |
| 167 | ☐ | ONTFRAN-3626 | |
| 168 | ☐ | ONTJ114 | |
| 169 | ☐ | ONTNEWJ-198 | |
| 170 | ☐ | ONTNEWJ-212 | |
| 171 | ☐ | ONTNEWJ-214 | |

Existing Scenario - City of Ontario - Junction Input Data

| * EXISTING_MDD * | | ID (Char) | Pattern 4 (Char) |
|---|---|---|---|
| 172 | ☐ | ONTNEWJ-224 | |
| 173 | ☐ | ONTNEWJ-262 | |
| 174 | ☐ | ONTNEWJ-278 | LANDSCAPE_IRR |
| 175 | ☐ | ONTNEWJ-322 | |
| 176 | ☐ | ONTNEWJ-340 | |
| 177 | ☐ | ONTNEWJ-354 | |
| 178 | ☐ | ONTNEWJ-356 | |
| 179 | ☐ | ONTNEWJ-378 | LANDSCAPE_IRR |
| 180 | ☐ | ONTNEWJ-398 | |
| 181 | ☐ | ONTNEWJ-399 | |
| 182 | ☐ | ONTNEWJ-432 | |
| 183 | ☐ | ONTNEWJ-438 | |
| 184 | ☐ | ONTNEWJ-470 | |
| 185 | ☐ | ONTNEWJ-478 | |
| 186 | ☐ | ONTNEWJ-482 | |
| 187 | ☐ | ONTNEWJ-500 | |
| 188 | ☐ | ONTNEWJ-510 | |
| 189 | ☐ | ONTNEWJ-516 | |
| 190 | ☐ | ONTNEWJ-520 | |
| 191 | ☐ | ONTNEWJ-522 | |
| 192 | ☐ | ONTNEWJ-526 | |
| 193 | ☐ | ONTNEWJ-528 | |
| 194 | ☐ | ONTNEWJ-550 | |
| 195 | ☐ | ONTNEWJ-554 | |
| 196 | ☐ | ONTNEWJ-555 | |
| 197 | ☐ | ONTNEWJ-556 | |
| 198 | ☐ | ONTNEWJ-560 | |
| 199 | ☐ | ONTNEWJ-562 | |
| 200 | ☐ | ONTNEWJ-568 | |
| 201 | ☐ | ONTNEWJ-598 | |
| 202 | ☐ | ONTNEWJ-622 | |
| 203 | ☐ | ONTNEWJ-640 | |
| 204 | ☐ | ONTNEWJ-646 | |
| 205 | ☐ | ONTNEWJ-908 | |
| 206 | ☐ | ONTNEWJ-910 | LANDSCAPE_IRR |
| 207 | ☐ | ONTNEWJ-914 | |
| 208 | ☐ | ONTNEWJ-934 | |
| 209 | ☐ | ONTNEWJ-936 | |
| 210 | ☐ | ONTNEWJ-950 | |
| 211 | ☐ | ONTNEWJ402 | |
| 212 | ☐ | ONTPHLP-3606 | |
| 213 | ☐ | ONTPHLP-3610 | |
| 214 | ☐ | ONTPICKUP-12 | |
| 215 | ☐ | ONTPICKUP-14 | |
| 216 | ☐ | ONTPICKUP-17 | |
| 217 | ☐ | ONTPICKUP-30 | IND |
| 218 | ☐ | ONTPICKUP-32 | |
| 219 | ☐ | ONTPICKUP-51 | |
| 220 | ☐ | ONTPICKUP-68 | |
| 221 | ☐ | ONTPICKUP-71 | |
| 222 | ☐ | ONTPICKUP-72 | |
| 223 | ☐ | ONTTOP50-15 | |
| 224 | ☐ | ONTTOP50-18 | |
| 225 | ☐ | ONTTOP50-22 | |
| 226 | ☐ | ONTTOP50-40 | |
| 227 | ☐ | ONTTOP50-48 | |
| 228 | ☐ | ONTTOP50-6 | |

Existing Scenario - City of Ontario - Pipe Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 1 | ☐ | 2011_P14 | 373.88 | 8.00 | 130.00 | 0.00 |
| 2 | ☐ | 2011_P15 | 962.69 | 8.00 | 100.00 | 0.00 |
| 3 | ☐ | 2011_P17 | 325.69 | 8.00 | 130.00 | 0.00 |
| 4 | ☐ | 2011_P18 | 128.01 | 12.00 | 130.00 | 0.00 |
| 5 | ☐ | 2011_P19 | 536.66 | 12.00 | 130.00 | 0.00 |
| 6 | ☐ | 800ZONE_V1 | 98.84 | 16.00 | 150.00 | 0.00 |
| 7 | ☐ | 800ZONE_V2 | 61.66 | 16.00 | 150.00 | 0.00 |
| 8 | ☐ | ONT283 | 45.13 | 42.00 | 130.00 | 0.00 |
| 9 | ☐ | ONT9024 | 1,861.37 | 24.00 | 129.90 | 0.00 |
| 10 | ☐ | ONT9034 | 878.87 | 16.00 | 130.00 | 0.00 |
| 11 | ☐ | ONT9036 | 1,494.62 | 16.00 | 130.00 | 0.00 |
| 12 | ☐ | ONT9042 | 1,301.52 | 16.00 | 130.00 | 0.00 |
| 13 | ☐ | ONT9048 | 1,466.41 | 12.00 | 130.00 | 0.00 |
| 14 | ☐ | ONT9068 | 2,509.56 | 12.00 | 130.00 | 0.00 |
| 15 | ☐ | ONTFRAN-3600 | 2,415.15 | 24.00 | 130.00 | 0.00 |
| 16 | ☐ | ONTFRAN-3617 | 1,125.95 | 24.00 | 130.00 | 0.00 |
| 17 | ☐ | ONTFRAN-3618 | 302.48 | 12.00 | 130.00 | 0.00 |
| 18 | ☐ | ONTFRAN-3620 | 616.50 | 12.00 | 130.00 | 0.00 |
| 19 | ☐ | ONTFRAN-3621 | 2,561.70 | 12.00 | 130.00 | 0.00 |
| 20 | ☐ | ONTFRAN-3622 | 2,654.69 | 12.00 | 130.00 | 0.00 |
| 21 | ☐ | ONTFRAN-3624 | 3,119.97 | 8.00 | 130.00 | 0.00 |
| 22 | ☐ | ONTFRAN-3626 | 2,648.24 | 12.00 | 130.00 | 0.00 |
| 23 | ☐ | ONTFRAN-3627 | 2,180.56 | 16.00 | 130.00 | 0.00 |
| 24 | ☐ | ONTFRAN-3628 | 1,393.06 | 16.00 | 130.00 | 0.00 |
| 25 | ☐ | ONTFRAN-3629 | 1,795.09 | 16.00 | 130.00 | 0.00 |
| 26 | ☐ | ONTFRAN-3645 | 1,341.66 | 12.00 | 130.00 | 0.00 |
| 27 | ☐ | ONTFRAN-3693 | 1,301.23 | 12.00 | 130.00 | 0.00 |
| 28 | ☐ | ONTFRAN-3694 | 1,162.41 | 16.00 | 130.00 | 0.00 |
| 29 | ☐ | ONTFRAN-3706 | 139.34 | 24.00 | 130.00 | 0.00 |
| 30 | ☐ | ONTNEWP-10016 | 157.83 | 8.00 | 130.00 | 0.00 |
| 31 | ☐ | ONTNEWP-10017 | 96.03 | 8.00 | 130.00 | 0.00 |
| 32 | ☐ | ONTNEWP-10044 | 201.93 | 8.00 | 130.00 | 0.00 |
| 33 | ☐ | ONTNEWP-908 | 878.23 | 8.00 | 130.00 | 0.00 |
| 34 | ☐ | ONTNEWP-910 | 380.88 | 8.00 | 130.00 | 0.00 |
| 35 | ☐ | ONTNEWP-914 | 642.60 | 12.00 | 130.00 | 0.00 |
| 36 | ☐ | ONTNEWP-9170 | 207.39 | 8.00 | 130.00 | 0.00 |
| 37 | ☐ | ONTNEWP-9252 | 412.78 | 8.00 | 130.00 | 0.00 |
| 38 | ☐ | ONTNEWP-9276 | 100.39 | 24.00 | 129.90 | 0.00 |
| 39 | ☐ | ONTNEWP-9320 | 1,078.67 | 8.00 | 130.00 | 0.00 |
| 40 | ☐ | ONTNEWP-9322 | 178.65 | 8.00 | 130.00 | 0.00 |
| 41 | ☐ | ONTNEWP-934 | 606.33 | 8.00 | 130.00 | 0.00 |
| 42 | ☐ | ONTNEWP-9384 | 83.35 | 12.00 | 130.00 | 0.00 |
| 43 | ☐ | ONTNEWP-9434 | 58.47 | 8.00 | 130.00 | 0.00 |
| 44 | ☐ | ONTNEWP-9494 | 108.24 | 8.00 | 130.00 | 0.00 |
| 45 | ☐ | ONTNEWP-9512 | 142.43 | 8.00 | 130.00 | 0.00 |
| 46 | ☐ | ONTNEWP-9514 | 73.92 | 8.00 | 130.00 | 0.00 |
| 47 | ☐ | ONTNEWP-9554 | 1,604.77 | 24.00 | 130.00 | 0.00 |
| 48 | ☐ | ONTNEWP-9556 | 40.59 | 8.00 | 130.00 | 0.00 |
| 49 | ☐ | ONTNEWP-9590 | 55.67 | 8.00 | 130.00 | 0.00 |
| 50 | ☐ | ONTNEWP-9596 | 1,084.77 | 16.00 | 130.00 | 0.00 |
| 51 | ☐ | ONTNEWP-9600 | 425.19 | 8.00 | 130.00 | 0.00 |
| 52 | ☐ | ONTNEWP-9602 | 628.83 | 24.00 | 129.90 | 0.00 |
| 53 | ☐ | ONTNEWP-9664 | 888.03 | 8.00 | 130.00 | 0.00 |
| 54 | ☐ | ONTNEWP-9668 | 465.68 | 8.00 | 130.00 | 0.00 |
| 55 | ☐ | ONTNEWP-9712 | 297.60 | 12.00 | 130.00 | 0.00 |
| 56 | ☐ | ONTNEWP-9714 | 170.69 | 8.00 | 130.00 | 0.00 |
| 57 | ☐ | ONTNEWP-9780 | 2,567.84 | 8.00 | 130.00 | 0.00 |

Existing Scenario - City of Ontario - Pipe Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 58 | ☐ | ONTNEWP-9810 | 493.88 | 24.00 | 130.00 | 0.00 |
| 59 | ☐ | ONTNEWP-9846 | 649.71 | 16.00 | 130.00 | 0.00 |
| 60 | ☐ | ONTNEWP-9854 | 225.67 | 8.00 | 130.00 | 0.00 |
| 61 | ☐ | ONTNEWP-9861 | 444.03 | 8.00 | 130.00 | 0.00 |
| 62 | ☐ | ONTNEWP-9870 | 152.28 | 24.00 | 130.00 | 0.00 |
| 63 | ☐ | ONTNEWP-9884 | 483.65 | 8.00 | 130.00 | 0.00 |
| 64 | ☐ | ONTNEWP-9886 | 966.94 | 8.00 | 130.00 | 0.00 |
| 65 | ☐ | ONTNEWP-9890 | 343.61 | 12.00 | 130.00 | 0.00 |
| 66 | ☐ | ONTNEWP-9892 | 972.35 | 12.00 | 130.00 | 0.00 |
| 67 | ☐ | ONTNEWP-9894 | 500.54 | 12.00 | 130.00 | 0.00 |
| 68 | ☐ | ONTNEWP-9896 | 662.68 | 12.00 | 130.00 | 0.00 |
| 69 | ☐ | ONTNEWP-9900 | 2,385.20 | 12.00 | 130.00 | 0.00 |
| 70 | ☐ | ONTNEWP-9902 | 1,713.42 | 8.00 | 130.00 | 0.00 |
| 71 | ☐ | ONTNEWP-9912 | 1,165.49 | 8.00 | 130.00 | 0.00 |
| 72 | ☐ | ONTNEWP-9913 | 1,000.33 | 8.00 | 130.00 | 0.00 |
| 73 | ☐ | ONTNEWP-9928 | 1,570.82 | 8.00 | 130.00 | 0.00 |
| 74 | ☐ | ONTNEWP-9932 | 1,189.23 | 8.00 | 130.00 | 0.00 |
| 75 | ☐ | ONTNEWP-9940 | 2,657.09 | 8.00 | 130.00 | 0.00 |
| 76 | ☐ | ONTNEWP-9942 | 2,628.90 | 8.00 | 130.00 | 0.00 |
| 77 | ☐ | ONTNEWP-9946 | 444.01 | 8.00 | 130.00 | 0.00 |
| 78 | ☐ | ONTNEWP649 | 2,763.21 | 8.00 | 130.00 | 0.00 |
| 79 | ☐ | ONTP10024 | 1,339.83 | 12.00 | 130.00 | 0.00 |
| 80 | ☐ | ONTPHLP-3615 | 2,658.69 | 12.00 | 130.00 | 0.00 |
| 81 | ☐ | P10142 | 198.19 | 30.00 | 130.00 | 0.00 |
| 82 | ☐ | P10326 | 1,331.58 | 12.00 | 130.00 | 0.00 |
| 83 | ☐ | P10328 | 1,338.27 | 12.00 | 130.00 | 0.00 |
| 84 | ☐ | P10330 | 3,591.48 | 12.00 | 130.00 | 0.00 |
| 85 | ☐ | P10332 | 788.30 | 8.00 | 130.00 | 0.00 |
| 86 | ☐ | P10334 | 885.54 | 12.00 | 100.00 | 0.00 |
| 87 | ☐ | P10340 | 2,655.53 | 8.00 | 130.00 | 0.00 |
| 88 | ☐ | P10342 | 1,686.44 | 8.00 | 130.00 | 0.00 |
| 89 | ☐ | P10344 | 500.45 | 8.00 | 130.00 | 0.00 |
| 90 | ☐ | P10346 | 1,214.04 | 12.00 | 130.00 | 0.00 |
| 91 | ☐ | P10350 | 1,717.07 | 8.00 | 130.00 | 0.00 |
| 92 | ☐ | P10354 | 1,409.44 | 16.00 | 130.00 | 0.00 |
| 93 | ☐ | P10356 | 147.70 | 8.00 | 130.00 | 0.00 |
| 94 | ☐ | P10360 | 937.27 | 12.00 | 130.00 | 0.00 |
| 95 | ☐ | P10364 | 1,352.40 | 12.00 | 130.00 | 0.00 |
| 96 | ☐ | P10366 | 1,324.73 | 8.00 | 130.00 | 0.00 |
| 97 | ☐ | P10368 | 411.46 | 8.00 | 130.00 | 0.00 |
| 98 | ☐ | P10372 | 923.19 | 12.00 | 130.00 | 0.00 |
| 99 | ☐ | P10374 | 1,588.12 | 8.00 | 130.00 | 0.00 |
| 100 | ☐ | P10376 | 420.57 | 8.00 | 100.00 | 0.00 |
| 101 | ☐ | P10422 | 2,685.84 | 16.00 | 130.00 | 0.00 |
| 102 | ☐ | P10506 | 1,088.71 | 12.00 | 130.00 | 0.00 |
| 103 | ☐ | P10508 | 764.84 | 12.00 | 130.00 | 0.00 |
| 104 | ☐ | P10510 | 966.88 | 8.00 | 130.00 | 0.00 |
| 105 | ☐ | P10512 | 826.31 | 8.00 | 130.00 | 0.00 |
| 106 | ☐ | P10514 | 358.14 | 8.00 | 130.00 | 0.00 |
| 107 | ☐ | P10516 | 72.06 | 8.00 | 130.00 | 0.00 |
| 108 | ☐ | P10518 | 840.93 | 8.00 | 130.00 | 0.00 |
| 109 | ☐ | P10520 | 813.87 | 8.00 | 130.00 | 0.00 |
| 110 | ☐ | P10522 | 1,047.91 | 8.00 | 130.00 | 0.00 |
| 111 | ☐ | P10550 | 1,424.31 | 8.00 | 130.00 | 0.00 |
| 112 | ☐ | P39 | 666.18 | 8.00 | 130.00 | 0.00 |
| 113 | ☐ | P41 | 227.50 | 8.00 | 130.00 | 0.00 |
| 114 | ☐ | P63 | 300.71 | 8.00 | 130.00 | 0.00 |

Existing Scenario - City of Ontario - Pipe Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 115 | ☐ | P81 | 1,764.35 | 16.00 | 130.00 | 0.00 |
| 116 | ☐ | P87 | 621.53 | 8.00 | 130.00 | 0.00 |
| 117 | ☐ | PHYD_LAT | 464.40 | 6.00 | 130.00 | 0.00 |
| 118 | ☐ | PKELLOG | 1,300.25 | 12.00 | 130.00 | 0.00 |
| 119 | ☐ | PSCH_1 | 1,829.52 | 12.00 | 130.00 | 0.00 |
| 120 | ☐ | P_ONT-154 | 83.00 | 24.00 | 130.00 | 0.00 |
| 121 | ☐ | P_ONT-156 | 22.31 | 24.00 | 130.00 | 0.00 |
| 122 | ☐ | P_ONT-158 | 19.05 | 24.00 | 130.00 | 0.00 |
| 123 | ☐ | P_ONT-160 | 9.11 | 24.00 | 130.00 | 0.00 |
| 124 | ☐ | P_ONT-176 | 1,242.53 | 24.00 | 130.00 | 0.00 |
| 125 | ☐ | P_ONT-178 | 1,255.50 | 12.00 | 100.00 | 0.00 |
| 126 | ☐ | P_ONT-180 | 587.21 | 8.00 | 130.00 | 0.00 |
| 127 | ☐ | P_ONT-182 | 668.29 | 8.00 | 130.00 | 0.00 |
| 128 | ☐ | P_ONT-184 | 564.54 | 8.00 | 130.00 | 0.00 |
| 129 | ☐ | P_ONT-186 | 1,420.26 | 8.00 | 130.00 | 0.00 |
| 130 | ☐ | P_ONT-188 | 26.06 | 4.00 | 130.00 | 0.00 |
| 131 | ☐ | P_ONT-190 | 297.83 | 8.00 | 130.00 | 0.00 |
| 132 | ☐ | P_ONT-192 | 1,225.11 | 8.00 | 130.00 | 0.00 |
| 133 | ☐ | P_ONT-194 | 60.97 | 8.00 | 130.00 | 0.00 |
| 134 | ☐ | P_ONT-196 | 1,680.54 | 12.00 | 130.00 | 0.00 |
| 135 | ☐ | P_ONT-198 | 2,658.00 | 16.00 | 130.00 | 0.00 |
| 136 | ☐ | P_ONT-200 | 471.02 | 8.00 | 130.00 | 0.00 |
| 137 | ☐ | P_ONT-204 | 969.62 | 8.00 | 130.00 | 0.00 |
| 138 | ☐ | P_ONT-206 | 47.18 | 8.00 | 130.00 | 0.00 |
| 139 | ☐ | P_ONT-208 | 521.07 | 8.00 | 130.00 | 0.00 |
| 140 | ☐ | P_ONT-210 | 1,123.08 | 8.00 | 130.00 | 0.00 |
| 141 | ☐ | P_ONT-212 | 59.09 | 8.00 | 130.00 | 0.00 |
| 142 | ☐ | P_ONT-214 | 272.70 | 8.00 | 130.00 | 0.00 |
| 143 | ☐ | P_ONT-216 | 2,006.79 | 8.00 | 130.00 | 0.00 |
| 144 | ☐ | P_ONT-218 | 1,692.61 | 8.00 | 130.00 | 0.00 |
| 145 | ☐ | P_ONT-220 | 599.34 | 8.00 | 130.00 | 0.00 |
| 146 | ☐ | P_ONT-222 | 570.91 | 8.00 | 130.00 | 0.00 |
| 147 | ☐ | P_ONT-224 | 172.01 | 8.00 | 130.00 | 0.00 |
| 148 | ☐ | P_ONT-226 | 1,324.95 | 16.00 | 130.00 | 0.00 |
| 149 | ☐ | P_ONT-228 | 970.68 | 8.00 | 130.00 | 0.00 |
| 150 | ☐ | P_ONT-230 | 1,192.23 | 16.00 | 130.00 | 0.00 |
| 151 | ☐ | P_ONT-232 | 162.89 | 8.00 | 130.00 | 0.00 |
| 152 | ☐ | P_ONT-234 | 1,424.05 | 8.00 | 130.00 | 0.00 |
| 153 | ☐ | P_ONT-236 | 391.16 | 8.00 | 130.00 | 0.00 |
| 154 | ☐ | P_ONT-238 | 270.79 | 8.00 | 130.00 | 0.00 |
| 155 | ☐ | P_ONT-240 | 140.69 | 8.00 | 130.00 | 0.00 |
| 156 | ☐ | P_ONT-242 | 22.56 | 2.00 | 130.00 | 0.00 |
| 157 | ☐ | P_ONT-244 | 187.64 | 16.00 | 130.00 | 0.00 |
| 158 | ☐ | P_ONT-246 | 746.58 | 8.00 | 130.00 | 0.00 |
| 159 | ☐ | P_ONT-248 | 670.54 | 8.00 | 130.00 | 0.00 |
| 160 | ☐ | P_ONT-250 | 143.89 | 8.00 | 130.00 | 0.00 |
| 161 | ☐ | P_ONT-252 | 443.25 | 8.00 | 130.00 | 0.00 |
| 162 | ☐ | P_ONT-254 | 648.48 | 8.00 | 130.00 | 0.00 |
| 163 | ☐ | P_ONT-256 | 120.48 | 8.00 | 130.00 | 0.00 |
| 164 | ☐ | P_ONT-258 | 1,808.44 | 8.00 | 130.00 | 0.00 |
| 165 | ☐ | P_ONT-260 | 952.15 | 8.00 | 130.00 | 0.00 |
| 166 | ☐ | P_ONT-262 | 1,292.82 | 12.00 | 130.00 | 0.00 |
| 167 | ☐ | P_ONT-264 | 919.91 | 8.00 | 130.00 | 0.00 |
| 168 | ☐ | P_ONT-266 | 346.22 | 8.00 | 130.00 | 0.00 |
| 169 | ☐ | P_ONT-268 | 168.63 | 8.00 | 130.00 | 0.00 |
| 170 | ☐ | P_ONT-270 | 686.73 | 8.00 | 130.00 | 0.00 |
| 171 | ☐ | P_ONT-272 | 462.41 | 8.00 | 100.00 | 0.00 |

Existing Scenario - City of Ontario - Pipe Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 172 | ☐ | P_ONT-274 | 107.99 | 8.00 | 130.00 | 0.00 |
| 173 | ☐ | P_ONT-276 | 734.97 | 8.00 | 130.00 | 0.00 |
| 174 | ☐ | P_ONT-278 | 210.60 | 8.00 | 130.00 | 0.00 |
| 175 | ☐ | P_ONT-280 | 654.69 | 8.00 | 100.00 | 0.00 |
| 176 | ☐ | P_ONT-282 | 458.27 | 8.00 | 130.00 | 0.00 |
| 177 | ☐ | P_ONT-284 | 150.92 | 8.00 | 130.00 | 0.00 |
| 178 | ☐ | P_ONT-286 | 338.69 | 8.00 | 130.00 | 0.00 |
| 179 | ☐ | P_ONT-288 | 418.63 | 8.00 | 130.00 | 0.00 |
| 180 | ☐ | P_ONT-290 | 226.11 | 8.00 | 130.00 | 0.00 |
| 181 | ☐ | P_ONT-292 | 407.83 | 8.00 | 130.00 | 0.00 |
| 182 | ☐ | P_ONT-294 | 359.41 | 8.00 | 130.00 | 0.00 |
| 183 | ☐ | P_ONT-296 | 482.43 | 8.00 | 130.00 | 0.00 |
| 184 | ☐ | P_ONT-298 | 238.49 | 8.00 | 130.00 | 0.00 |
| 185 | ☐ | P_ONT-300 | 804.32 | 8.00 | 130.00 | 0.00 |
| 186 | ☐ | P_ONT-302 | 1,603.88 | 8.00 | 130.00 | 0.00 |
| 187 | ☐ | P_ONT-306 | 976.70 | 8.00 | 130.00 | 0.00 |
| 188 | ☐ | P_ONT-308 | 328.33 | 8.00 | 130.00 | 0.00 |
| 189 | ☐ | P_ONT-310 | 1,319.62 | 8.00 | 130.00 | 0.00 |
| 190 | ☐ | P_ONT-312 | 418.46 | 8.00 | 130.00 | 0.00 |
| 191 | ☐ | P_ONT-314 | 546.30 | 8.00 | 130.00 | 0.00 |
| 192 | ☐ | P_ONT-316 | 533.90 | 8.00 | 130.00 | 0.00 |
| 193 | ☐ | P_ONT-328 | 1,153.66 | 8.00 | 130.00 | 0.00 |
| 194 | ☐ | P_ONT-330 | 433.22 | 8.00 | 130.00 | 0.00 |
| 195 | ☐ | P_ONT-332 | 213.37 | 8.00 | 130.00 | 0.00 |
| 196 | ☐ | P_ONT-334 | 48.14 | 2.00 | 130.00 | 0.00 |
| 197 | ☐ | P_ONT-336 | 1,358.61 | 8.00 | 130.00 | 0.00 |
| 198 | ☐ | P_ONT-338 | 499.45 | 8.00 | 130.00 | 0.00 |
| 199 | ☐ | P_ONT-340 | 27.22 | 4.00 | 130.00 | 0.00 |
| 200 | ☐ | P_ONT-342 | 67.98 | 8.00 | 130.00 | 0.00 |
| 201 | ☐ | P_ONT-344 | 27.74 | 4.00 | 130.00 | 0.00 |
| 202 | ☐ | P_ONT-346 | 31.87 | 2.00 | 130.00 | 0.00 |
| 203 | ☐ | P_ONT-348 | 656.78 | 12.00 | 130.00 | 0.00 |
| 204 | ☐ | P_ONT-350 | 524.15 | 8.00 | 130.00 | 0.00 |
| 205 | ☐ | P_ONT-352 | 780.77 | 8.00 | 130.00 | 0.00 |
| 206 | ☐ | P_ONT-354 | 480.54 | 8.00 | 130.00 | 0.00 |
| 207 | ☐ | P_ONT-356 | 33.09 | 2.00 | 130.00 | 0.00 |
| 208 | ☐ | P_ONT-358 | 923.64 | 16.00 | 130.00 | 0.00 |
| 209 | ☐ | P_ONT-368 | 310.37 | 24.00 | 130.00 | 0.00 |
| 210 | ☐ | P_ONT-370 | 344.46 | 8.00 | 130.00 | 0.00 |
| 211 | ☐ | P_ONT-372 | 309.82 | 8.00 | 130.00 | 0.00 |
| 212 | ☐ | P_ONT-376 | 2,490.34 | 12.00 | 130.00 | 0.00 |
| 213 | ☐ | P_ONT-378 | 131.65 | 8.00 | 130.00 | 0.00 |
| 214 | ☐ | P_ONT-382 | 855.29 | 8.00 | 130.00 | 0.00 |
| 215 | ☐ | P_ONT-388 | 1,296.73 | 8.00 | 130.00 | 0.00 |
| 216 | ☐ | P_ONT-406 | 92.92 | 8.00 | 130.00 | 0.00 |
| 217 | ☐ | P_ONT-408 | 116.28 | 8.00 | 130.00 | 0.00 |
| 218 | ☐ | P_ONT-410 | 608.38 | 8.00 | 130.00 | 0.00 |
| 219 | ☐ | P_ONT-412 | 400.63 | 8.00 | 130.00 | 0.00 |
| 220 | ☐ | P_ONT-418 | 159.12 | 8.00 | 130.00 | 0.00 |
| 221 | ☐ | P_ONT-420 | 1,302.86 | 8.00 | 130.00 | 0.00 |
| 222 | ☐ | P_ONT-422 | 874.68 | 8.00 | 130.00 | 0.00 |
| 223 | ☐ | P_ONT-424 | 69.57 | 8.00 | 130.00 | 0.00 |
| 224 | ☐ | P_ONT-426 | 102.02 | 8.00 | 130.00 | 0.00 |
| 225 | ☐ | P_ONT-428 | 368.51 | 12.00 | 130.00 | 0.00 |
| 226 | ☐ | P_ONT-430 | 167.29 | 12.00 | 130.00 | 0.00 |
| 227 | ☐ | P_ONT-432 | 289.20 | 12.00 | 130.00 | 0.00 |
| 228 | ☐ | P_ONT-434 | 71.34 | 12.00 | 130.00 | 0.00 |

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 229 | ☐ | P_ONT-438 | 483.28 | 12.00 | 130.00 | 0.00 |
| 230 | ☐ | P_ONT-440 | 578.60 | 16.00 | 130.00 | 0.00 |
| 231 | ☐ | P_ONT-442 | 440.06 | 12.00 | 130.00 | 0.00 |
| 232 | ☐ | P_ONT-444 | 69.36 | 12.00 | 130.00 | 0.00 |
| 233 | ☐ | P_ONT-446 | 2,017.90 | 12.00 | 130.00 | 0.00 |
| 234 | ☐ | P_ONT-456 | 301.25 | 8.00 | 130.00 | 0.00 |
| 235 | ☐ | P_ONT-458 | 524.66 | 8.00 | 130.00 | 0.00 |
| 236 | ☐ | P_ONT-460 | 743.53 | 8.00 | 130.00 | 0.00 |
| 237 | ☐ | P_ONT-470 | 275.56 | 12.00 | 130.00 | 0.00 |
| 238 | ☐ | P_ONT-480 | 1,044.89 | 8.00 | 130.00 | 0.00 |
| 239 | ☐ | P_ONT-482 | 1,786.78 | 16.00 | 130.00 | 0.00 |
| 240 | ☐ | P_ONT-484 | 684.16 | 12.00 | 130.00 | 0.00 |
| 241 | ☐ | P_ONT-486 | 1,433.86 | 8.00 | 130.00 | 0.00 |
| 242 | ☐ | P_ONT-534 | 889.56 | 12.00 | 130.00 | 0.00 |
| 243 | ☐ | P_ONT-560 | 5,250.71 | 12.00 | 130.00 | 0.00 |
| 244 | ☐ | P_ONT-570 | 116.47 | 12.00 | 130.00 | 0.00 |
| 245 | ☐ | P_ONT-572 | 28.49 | 12.00 | 130.00 | 0.00 |
| 246 | ☐ | P_ONT-574 | 36.83 | 12.00 | 130.00 | 0.00 |
| 247 | ☐ | P_ONT-576 | 758.73 | 8.00 | 130.00 | 0.00 |
| 248 | ☐ | P_ONT-598 | 61.31 | 16.00 | 130.00 | 0.00 |
| 249 | ☐ | P_ONT-618 | 317.43 | 12.00 | 130.00 | 0.00 |
| 250 | ☐ | P_ONT-666 | 68.58 | 8.00 | 130.00 | 0.00 |

Existing Scenario - City of Ontario - Junction Output Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | JKELLOG | 100.23 | 18:00 | 84.08 | 06:10 | 92.51 | 16.14 |
| 2 | ☐ | JSCH_HYD | 100.23 | 18:00 | 84.08 | 06:10 | 92.51 | 16.14 |
| 3 | ☐ | J1272 | 141.88 | 20:00 | 98.60 | 00:30 | 117.20 | 43.28 |
| 4 | ☐ | J1274 | 133.21 | 20:00 | 90.10 | 00:30 | 108.59 | 43.11 |
| 5 | ☐ | J1276 | 146.64 | 20:00 | 103.17 | 00:30 | 121.90 | 43.47 |
| 6 | ☐ | J1280 | 141.01 | 20:00 | 97.72 | 00:30 | 116.33 | 43.29 |
| 7 | ☐ | J1288 | 137.11 | 20:00 | 94.00 | 00:30 | 112.49 | 43.11 |
| 8 | ☐ | J1290 | 154.01 | 20:00 | 110.45 | 00:30 | 129.24 | 43.56 |
| 9 | ☐ | J1292 | 176.67 | 11:40 | 142.80 | 01:50 | 159.37 | 33.87 |
| 10 | ☐ | J1294 | 134.25 | 14:30 | 112.94 | 01:50 | 123.94 | 21.31 |
| 11 | ☐ | J1296 | 122.75 | 14:30 | 104.60 | 01:50 | 114.22 | 18.15 |
| 12 | ☐ | J1302 | 137.61 | 19:40 | 98.37 | 00:30 | 115.62 | 39.24 |
| 13 | ☐ | J1304 | 151.60 | 19:50 | 123.39 | 09:40 | 137.51 | 28.20 |
| 14 | ☐ | J1308 | 135.55 | 19:40 | 97.51 | 00:30 | 114.33 | 38.04 |
| 15 | ☐ | J1314 | 112.41 | 20:00 | 65.43 | 00:30 | 85.57 | 46.99 |
| 16 | ☐ | J1316 | 112.41 | 20:00 | 64.64 | 00:30 | 85.32 | 47.77 |
| 17 | ☐ | J1320 | 130.81 | 19:40 | 97.52 | 00:30 | 112.77 | 33.29 |
| 18 | ☐ | J1322 | 140.71 | 19:40 | 102.61 | 00:30 | 120.12 | 38.10 |
| 19 | ☐ | J1324 | 140.61 | 19:40 | 101.85 | 00:30 | 119.42 | 38.76 |
| 20 | ☐ | J1404 | 137.77 | 19:40 | 99.10 | 00:30 | 116.52 | 38.67 |
| 21 | ☐ | J1406 | 133.94 | 19:40 | 95.10 | 00:30 | 112.91 | 38.84 |
| 22 | ☐ | J1408 | 127.44 | 19:40 | 88.59 | 00:30 | 106.44 | 38.85 |
| 23 | ☐ | J1410 | 130.48 | 19:40 | 91.64 | 00:30 | 109.48 | 38.83 |
| 24 | ☐ | J1412 | 130.49 | 19:40 | 91.73 | 00:30 | 109.54 | 38.75 |
| 25 | ☐ | J1414 | 134.61 | 19:40 | 96.00 | 00:30 | 113.73 | 38.61 |
| 26 | ☐ | J1416 | 142.37 | 19:40 | 103.59 | 00:30 | 121.32 | 38.79 |
| 27 | ☐ | ONT66 | 125.35 | 18:00 | 122.17 | 06:10 | 124.15 | 3.18 |
| 28 | ☐ | ONTFRAN-3608 | 93.16 | 18:00 | 79.38 | 06:00 | 86.99 | 13.78 |
| 29 | ☐ | ONTPHLP-3610 | 116.90 | 18:00 | 113.72 | 06:10 | 115.70 | 3.18 |
| 30 | ☐ | ONTNEWJ-470 | 137.87 | 19:40 | 99.46 | 00:30 | 117.11 | 38.41 |
| 31 | ☐ | ONTFRAN-3583 | 99.77 | 18:00 | 83.63 | 06:10 | 92.05 | 16.14 |
| 32 | ☐ | ONTTOP50-40 | 92.41 | 20:00 | 48.36 | 00:30 | 66.54 | 44.05 |
| 33 | ☐ | ONTNEWJ-262 | 90.98 | 20:00 | 46.93 | 00:30 | 65.10 | 44.05 |
| 34 | ☐ | ONTPICKUP-51 | 91.78 | 20:00 | 47.73 | 00:30 | 65.90 | 44.05 |
| 35 | ☐ | ONTNEWJ-322 | 91.18 | 20:00 | 47.13 | 00:30 | 65.30 | 44.05 |
| 36 | ☐ | ONTNEWJ-198 | 78.28 | 20:00 | 34.14 | 00:30 | 52.38 | 44.15 |
| 37 | ☐ | ONTNEWJ-516 | 153.14 | 20:00 | 109.48 | 00:30 | 128.34 | 43.67 |
| 38 | ☐ | ONTNEWJ-510 | 156.17 | 20:00 | 112.51 | 00:30 | 131.37 | 43.67 |
| 39 | ☐ | ONTNEWJ-908 | 96.81 | 20:00 | 54.56 | 00:30 | 72.70 | 42.26 |
| 40 | ☐ | ONTNEWJ-278 | 146.87 | 19:40 | 105.35 | 00:30 | 123.86 | 41.52 |
| 41 | ☐ | ONTTOP50-15 | 148.65 | 20:00 | 107.17 | 00:30 | 125.47 | 41.48 |
| 42 | ☐ | ONTTOP50-18 | 144.90 | 19:40 | 103.96 | 00:30 | 122.17 | 40.95 |
| 43 | ☐ | ONTNEWJ-520 | 140.64 | 19:40 | 101.04 | 00:30 | 118.51 | 39.60 |
| 44 | ☐ | ONTNEWJ-526 | 154.07 | 19:40 | 113.95 | 00:30 | 131.77 | 40.12 |
| 45 | ☐ | ONTNEWJ-910 | 154.07 | 19:40 | 113.95 | 00:30 | 131.77 | 40.12 |
| 46 | ☐ | ONTNEWJ-522 | 149.74 | 19:40 | 109.67 | 00:30 | 127.46 | 40.06 |
| 47 | ☐ | ONTNEWJ-914 | 143.02 | 19:40 | 103.29 | 00:30 | 120.85 | 39.73 |
| 48 | ☐ | ONTTOP50-22 | 151.18 | 19:40 | 110.99 | 00:30 | 128.86 | 40.18 |
| 49 | ☐ | ONTPICKUP-68 | 153.40 | 19:40 | 113.21 | 00:30 | 131.08 | 40.19 |
| 50 | ☐ | ONTNEWJ-398 | 154.25 | 19:40 | 114.06 | 00:30 | 131.92 | 40.19 |
| 51 | ☐ | ONTNEWJ-528 | 152.77 | 19:40 | 112.55 | 00:30 | 130.42 | 40.22 |
| 52 | ☐ | ONTNEWJ-598 | 142.12 | 19:40 | 103.35 | 00:30 | 120.93 | 38.77 |
| 53 | ☐ | ONTNEWJ-646 | 131.27 | 19:40 | 92.58 | 00:30 | 110.02 | 38.69 |
| 54 | ☐ | ONTNEWJ-934 | 101.02 | 06:40 | 86.02 | 01:50 | 93.93 | 15.00 |
| 55 | ☐ | ONTNEWJ-936 | 101.88 | 06:40 | 86.88 | 01:50 | 94.79 | 15.00 |
| 56 | ☐ | ONTNEWJ-550 | 119.06 | 06:40 | 103.29 | 01:50 | 111.39 | 15.77 |
| 57 | ☐ | ONTNEWJ-554 | 116.90 | 06:40 | 101.12 | 01:50 | 108.96 | 15.77 |

Existing Scenario - City of Ontario - Junction Output Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 58 | ☐ | ONTNEWJ-560 | 124.70 | 06:40 | 108.92 | 01:50 | 116.76 | 15.77 |
| 59 | ☐ | ONTNEWJ-562 | 119.50 | 06:40 | 103.72 | 01:50 | 111.56 | 15.77 |
| 60 | ☐ | ONTNEWJ-556 | 135.55 | 14:30 | 114.27 | 01:50 | 125.25 | 21.29 |
| 61 | ☐ | ONTNEWJ-378 | 114.74 | 14:30 | 98.91 | 01:50 | 107.39 | 15.83 |
| 62 | ☐ | ONTTOP50-48 | 128.94 | 14:30 | 110.80 | 01:50 | 120.40 | 18.14 |
| 63 | ☐ | ONTNEWJ-555 | 127.97 | 14:30 | 109.83 | 01:50 | 119.43 | 18.14 |
| 64 | ☐ | ONTFRAN-3596 | 72.30 | 18:00 | 68.51 | 06:00 | 70.78 | 3.79 |
| 65 | ☐ | ONTFRAN-3597 | 75.27 | 18:00 | 71.09 | 06:00 | 73.60 | 4.17 |
| 66 | ☐ | ONTFRAN-3598 | 72.34 | 18:00 | 68.12 | 06:00 | 70.65 | 4.22 |
| 67 | ☐ | ONTFRAN-3592 | 64.33 | 18:00 | 61.03 | 06:00 | 63.01 | 3.29 |
| 68 | ☐ | ONTNEWJ-432 | 136.96 | 18:00 | 131.97 | 06:10 | 135.09 | 4.99 |
| 69 | ☐ | ONTNEWJ-438 | 130.22 | 18:00 | 127.04 | 06:10 | 129.02 | 3.18 |
| 70 | ☐ | ONTFRAN-3622 | 53.50 | 18:00 | 50.05 | 06:00 | 52.12 | 3.44 |
| 71 | ☐ | ONTFRAN-3595 | 59.04 | 18:00 | 55.60 | 06:00 | 57.66 | 3.44 |
| 72 | ☐ | ONTFRAN-3594 | 61.41 | 18:00 | 58.02 | 06:00 | 60.06 | 3.39 |
| 73 | ☐ | ONTFRAN-3593 | 61.86 | 18:00 | 58.52 | 06:50 | 60.52 | 3.34 |
| 74 | ☐ | ONTNEWJ-622 | 92.05 | 20:00 | 48.00 | 00:30 | 66.17 | 44.04 |
| 75 | ☐ | ONTNEWJ-482 | 144.94 | 19:40 | 105.01 | 00:30 | 122.71 | 39.93 |
| 76 | ☐ | ONTPICKUP-32 | 106.50 | 06:40 | 90.67 | 01:50 | 99.14 | 15.83 |
| 77 | ☐ | ONTPICKUP-71 | 114.10 | 06:40 | 98.27 | 01:50 | 106.75 | 15.83 |
| 78 | ☐ | ONTNEWJ-568 | 110.83 | 06:40 | 95.00 | 01:50 | 103.47 | 15.83 |
| 79 | ☐ | ONTFRAN-3620 | 53.50 | 18:00 | 50.38 | 06:00 | 52.25 | 3.12 |
| 80 | ☐ | ONT76 | 77.58 | 18:00 | 72.99 | 06:00 | 75.74 | 4.59 |
| 81 | ☐ | ONTNEWJ402 | 95.73 | 18:00 | 72.42 | 06:00 | 84.87 | 23.31 |
| 82 | ☐ | ONTPHLP-3606 | 52.10 | 18:00 | 52.04 | 06:00 | 52.08 | 0.07 |
| 83 | ☐ | ONTFRAN-3591 | 72.31 | 18:00 | 69.21 | 06:00 | 71.21 | 3.10 |
| 84 | ☐ | ONTNEWJ-224 | 133.45 | 18:00 | 128.97 | 06:10 | 131.78 | 4.48 |
| 85 | ☐ | ONTTOP50-6 | 133.54 | 18:00 | 129.06 | 06:10 | 131.86 | 4.48 |
| 86 | ☐ | ONTPICKUP-12 | 133.90 | 18:00 | 129.35 | 06:10 | 132.20 | 4.55 |
| 87 | ☐ | ONTFRAN-3581 | 63.03 | 18:00 | 61.00 | 06:00 | 62.30 | 2.03 |
| 88 | ☐ | ONTFRAN-3626 | 61.89 | 18:00 | 59.93 | 06:00 | 61.18 | 1.96 |
| 89 | ☐ | ONTNEWJ-214 | 118.51 | 18:00 | 115.33 | 06:10 | 117.31 | 3.18 |
| 90 | ☐ | ONTNEWJ-212 | 117.28 | 18:00 | 114.10 | 06:10 | 116.07 | 3.18 |
| 91 | ☐ | ONTNEWJ-354 | 117.19 | 18:00 | 114.01 | 06:10 | 115.98 | 3.18 |
| 92 | ☐ | ONT68 | 121.94 | 18:00 | 118.76 | 06:10 | 120.74 | 3.18 |
| 93 | ☐ | ONT72 | 122.58 | 18:00 | 119.40 | 06:10 | 121.37 | 3.18 |
| 94 | ☐ | ONTPICKUP-17 | 121.02 | 18:00 | 117.84 | 06:10 | 119.81 | 3.18 |
| 95 | ☐ | ONTNEWJ-356 | 127.98 | 18:00 | 124.80 | 06:10 | 126.78 | 3.18 |
| 96 | ☐ | ONTNEWJ-500 | 121.02 | 18:00 | 117.84 | 06:10 | 119.81 | 3.18 |
| 97 | ☐ | ONTPICKUP-14 | 126.32 | 18:00 | 124.25 | 06:10 | 125.52 | 2.06 |
| 98 | ☐ | ONTNEWJ-340 | 126.61 | 18:00 | 124.55 | 06:10 | 125.81 | 2.06 |
| 99 | ☐ | ONTFRAN-3599 | 82.47 | 18:00 | 77.35 | 06:00 | 80.44 | 5.12 |
| 100 | ☐ | ONTJ114 | 157.14 | 19:50 | 129.96 | 09:40 | 143.74 | 27.19 |
| 101 | ☐ | ONTPICKUP-30 | 155.93 | 19:50 | 127.84 | 09:40 | 141.92 | 28.09 |
| 102 | ☐ | ONTNEWJ-478 | 138.88 | 19:40 | 101.57 | 00:30 | 118.71 | 37.31 |
| 103 | ☐ | ONTNEWJ-640 | 131.24 | 19:40 | 92.79 | 00:30 | 109.99 | 38.45 |
| 104 | ☐ | ONTNEWJ-950 | 131.23 | 19:40 | 92.97 | 00:30 | 109.99 | 38.26 |
| 105 | ☐ | ONTPICKUP-72 | 98.94 | 20:00 | 55.04 | 00:30 | 73.25 | 43.89 |
| 106 | ☐ | ONTNEWJ-399 | 154.25 | 19:40 | 114.06 | 00:30 | 131.93 | 40.19 |
| 107 | ☐ | J1586 | 91.61 | 20:00 | 47.57 | 00:30 | 65.74 | 44.04 |
| 108 | ☐ | J1592 | 152.71 | 20:00 | 109.06 | 00:30 | 127.91 | 43.64 |
| 109 | ☐ | J1596 | 120.67 | 18:00 | 117.49 | 06:10 | 119.47 | 3.18 |
| 110 | ☐ | J_ONT-103 | 137.34 | 18:00 | 132.25 | 06:10 | 135.44 | 5.10 |
| 111 | ☐ | J_ONT-105 | 52.49 | 18:00 | 52.47 | 06:00 | 52.48 | 0.02 |
| 112 | ☐ | J_ONT-107 | 137.34 | 18:00 | 132.19 | 06:10 | 135.42 | 5.15 |
| 113 | ☐ | J_ONT-109 | 52.49 | 18:00 | 52.47 | 06:00 | 52.48 | 0.01 |
| 114 | ☐ | J_ONT-133 | 67.26 | 18:00 | 64.70 | 06:00 | 66.35 | 2.56 |

Existing Scenario - City of Ontario - Junction Output Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 115 | ☐ | J_ONT-135 | 62.16 | 18:00 | 59.43 | 06:00 | 61.11 | 2.73 |
| 116 | ☐ | J_ONT-137 | 65.63 | 18:00 | 63.04 | 06:00 | 64.70 | 2.59 |
| 117 | ☐ | J_ONT-139 | 66.50 | 18:00 | 63.92 | 06:00 | 65.57 | 2.57 |
| 118 | ☐ | J_ONT-141 | 67.80 | 18:00 | 65.22 | 06:00 | 66.87 | 2.57 |
| 119 | ☐ | J_ONT-143 | 64.33 | 18:00 | 61.73 | 06:00 | 63.39 | 2.60 |
| 120 | ☐ | J_ONT-145 | 67.80 | 18:00 | 65.22 | 06:00 | 66.87 | 2.57 |
| 121 | ☐ | J_ONT-147 | 68.23 | 18:00 | 65.02 | 06:00 | 66.98 | 3.21 |
| 122 | ☐ | J_ONT-149 | 68.66 | 18:00 | 65.43 | 06:00 | 67.41 | 3.23 |
| 123 | ☐ | J_ONT-151 | 57.72 | 18:00 | 55.12 | 06:00 | 56.71 | 2.60 |
| 124 | ☐ | J_ONT-153 | 57.83 | 18:00 | 55.22 | 06:00 | 56.82 | 2.61 |
| 125 | ☐ | J_ONT-155 | 50.46 | 18:00 | 47.86 | 06:00 | 49.44 | 2.60 |
| 126 | ☐ | J_ONT-157 | 63.03 | 18:00 | 59.73 | 06:00 | 61.71 | 3.29 |
| 127 | ☐ | J_ONT-159 | 58.26 | 18:00 | 54.97 | 06:00 | 56.94 | 3.29 |
| 128 | ☐ | J_ONT-161 | 66.50 | 18:00 | 63.20 | 06:00 | 65.17 | 3.29 |
| 129 | ☐ | J_ONT-163 | 69.10 | 18:00 | 65.84 | 06:00 | 67.83 | 3.26 |
| 130 | ☐ | J_ONT-165 | 75.60 | 18:00 | 71.34 | 06:00 | 73.91 | 4.26 |
| 131 | ☐ | J_ONT-167 | 69.10 | 18:00 | 65.72 | 06:00 | 67.78 | 3.38 |
| 132 | ☐ | J_ONT-169 | 70.83 | 18:00 | 67.45 | 06:50 | 69.51 | 3.38 |
| 133 | ☐ | J_ONT-171 | 75.16 | 18:00 | 70.90 | 06:00 | 73.47 | 4.26 |
| 134 | ☐ | J_ONT-173 | 76.89 | 18:00 | 72.39 | 06:00 | 75.10 | 4.51 |
| 135 | ☐ | J_ONT-175 | 77.33 | 18:00 | 72.82 | 06:00 | 75.54 | 4.51 |
| 136 | ☐ | J_ONT-177 | 79.38 | 18:00 | 74.45 | 06:00 | 77.41 | 4.93 |
| 137 | ☐ | J_ONT-179 | 80.90 | 18:00 | 75.80 | 06:00 | 78.87 | 5.10 |
| 138 | ☐ | J_ONT-181 | 91.58 | 18:00 | 81.27 | 06:00 | 86.77 | 10.31 |
| 139 | ☐ | J_ONT-185 | 89.13 | 18:00 | 79.37 | 06:00 | 84.61 | 9.76 |
| 140 | ☐ | J_ONT-187 | 91.21 | 18:00 | 80.98 | 06:00 | 86.41 | 10.23 |
| 141 | ☐ | J_ONT-189 | 95.96 | 18:00 | 85.73 | 06:00 | 91.16 | 10.23 |
| 142 | ☐ | J_ONT-191 | 95.96 | 18:00 | 85.73 | 06:00 | 91.13 | 10.23 |
| 143 | ☐ | J_ONT-193 | 82.26 | 18:00 | 77.14 | 06:00 | 80.22 | 5.12 |
| 144 | ☐ | J_ONT-195 | 88.16 | 18:00 | 79.31 | 06:00 | 84.35 | 8.85 |
| 145 | ☐ | J_ONT-197 | 90.33 | 18:00 | 80.78 | 06:00 | 86.04 | 9.55 |
| 146 | ☐ | J_ONT-199 | 89.03 | 18:00 | 79.42 | 06:00 | 84.61 | 9.61 |
| 147 | ☐ | J_ONT-201 | 86.86 | 18:00 | 77.74 | 06:00 | 82.74 | 9.12 |
| 148 | ☐ | J_ONT-203 | 85.56 | 18:00 | 77.16 | 06:00 | 81.89 | 8.40 |
| 149 | ☐ | J_ONT-205 | 85.13 | 18:00 | 76.86 | 06:00 | 81.54 | 8.27 |
| 150 | ☐ | J_ONT-207 | 82.53 | 18:00 | 74.13 | 06:00 | 78.85 | 8.40 |
| 151 | ☐ | J_ONT-209 | 85.56 | 18:00 | 76.44 | 06:00 | 81.44 | 9.12 |
| 152 | ☐ | J_ONT-211 | 87.72 | 18:00 | 77.79 | 06:00 | 83.66 | 9.93 |
| 153 | ☐ | J_ONT-213 | 89.46 | 18:00 | 79.64 | 06:00 | 85.43 | 9.82 |
| 154 | ☐ | J_ONT-215 | 88.59 | 18:00 | 79.04 | 06:00 | 84.62 | 9.55 |
| 155 | ☐ | J_ONT-217 | 88.59 | 18:00 | 79.04 | 06:00 | 84.62 | 9.55 |
| 156 | ☐ | J_ONT-219 | 88.16 | 18:00 | 79.66 | 06:00 | 84.50 | 8.50 |
| 157 | ☐ | J_ONT-221 | 85.99 | 18:00 | 78.79 | 06:00 | 82.94 | 7.20 |
| 158 | ☐ | J_ONT-223 | 84.26 | 18:00 | 77.41 | 06:00 | 81.38 | 6.85 |
| 159 | ☐ | J_ONT-225 | 83.83 | 18:00 | 76.54 | 06:00 | 80.73 | 7.29 |
| 160 | ☐ | J_ONT-227 | 81.66 | 18:00 | 74.68 | 06:00 | 78.71 | 6.99 |
| 161 | ☐ | J_ONT-229 | 85.13 | 18:00 | 78.00 | 06:00 | 82.11 | 7.13 |
| 162 | ☐ | J_ONT-231 | 85.13 | 18:00 | 77.93 | 06:00 | 82.07 | 7.20 |
| 163 | ☐ | J_ONT-233 | 85.99 | 18:00 | 78.79 | 06:00 | 82.94 | 7.20 |
| 164 | ☐ | J_ONT-235 | 84.69 | 18:00 | 77.49 | 06:00 | 81.64 | 7.20 |
| 165 | ☐ | J_ONT-237 | 86.86 | 18:00 | 80.01 | 06:00 | 83.98 | 6.85 |
| 166 | ☐ | J_ONT-239 | 117.53 | 18:00 | 114.35 | 06:10 | 116.32 | 3.18 |
| 167 | ☐ | J_ONT-243 | 127.52 | 18:00 | 124.34 | 06:10 | 126.31 | 3.18 |
| 168 | ☐ | J_ONT-247 | 118.85 | 18:00 | 115.67 | 06:10 | 117.65 | 3.18 |
| 169 | ☐ | J_ONT-249 | 123.18 | 18:00 | 120.00 | 06:10 | 121.98 | 3.18 |
| 170 | ☐ | J_ONT-251 | 120.58 | 18:00 | 117.40 | 06:10 | 119.38 | 3.18 |
| 171 | ☐ | J_ONT-253 | 116.68 | 18:00 | 113.50 | 06:10 | 115.48 | 3.18 |

Existing Scenario - City of Ontario - Junction Output Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 172 | ☐ | J_ONT-255 | 118.85 | 18:00 | 115.67 | 06:10 | 117.65 | 3.18 |
| 173 | ☐ | J_ONT-265 | 91.63 | 18:00 | 81.77 | 06:00 | 87.00 | 9.86 |
| 174 | ☐ | J_ONT-267 | 87.08 | 18:00 | 77.31 | 06:00 | 82.55 | 9.76 |
| 175 | ☐ | J_ONT-271 | 91.63 | 18:00 | 81.77 | 06:00 | 87.04 | 9.86 |
| 176 | ☐ | J_ONT-273 | 89.54 | 18:00 | 79.69 | 06:00 | 84.95 | 9.86 |
| 177 | ☐ | J_ONT-275 | 90.83 | 18:00 | 80.68 | 06:00 | 86.06 | 10.14 |
| 178 | ☐ | J_ONT-277 | 95.09 | 18:00 | 84.95 | 06:00 | 90.32 | 10.14 |
| 179 | ☐ | J_ONT-279 | 95.09 | 18:00 | 84.95 | 06:00 | 90.32 | 10.14 |
| 180 | ☐ | J_ONT-281 | 95.09 | 18:00 | 84.86 | 06:00 | 90.30 | 10.23 |
| 181 | ☐ | J_ONT-283 | 93.36 | 18:00 | 83.13 | 06:00 | 88.56 | 10.23 |
| 182 | ☐ | J_ONT-285 | 92.06 | 18:00 | 81.14 | 06:00 | 87.01 | 10.93 |
| 183 | ☐ | J_ONT-287 | 92.06 | 18:00 | 81.14 | 06:00 | 87.01 | 10.93 |
| 184 | ☐ | J_ONT-289 | 61.80 | 18:00 | 58.48 | 06:00 | 60.47 | 3.32 |
| 185 | ☐ | J_ONT-291 | 54.36 | 18:00 | 51.76 | 06:00 | 53.35 | 2.60 |
| 186 | ☐ | J_ONT-295 | 51.76 | 18:00 | 49.16 | 06:00 | 50.75 | 2.60 |
| 187 | ☐ | J_ONT-297 | 51.33 | 18:00 | 48.73 | 06:00 | 50.26 | 2.60 |
| 188 | ☐ | J_ONT-299 | 51.33 | 18:00 | 48.73 | 06:00 | 50.31 | 2.60 |
| 189 | ☐ | J_ONT-301 | 75.76 | 18:00 | 71.98 | 06:00 | 74.35 | 3.79 |
| 190 | ☐ | J_ONT-313 | 53.22 | 18:00 | 52.93 | 06:00 | 53.11 | 0.28 |
| 191 | ☐ | J_ONT-315 | 59.13 | 18:00 | 56.48 | 06:00 | 58.11 | 2.65 |
| 192 | ☐ | J_ONT-317 | 60.00 | 18:00 | 57.32 | 06:00 | 58.96 | 2.68 |
| 193 | ☐ | J_ONT-321 | 105.47 | 18:00 | 102.36 | 06:00 | 104.35 | 3.11 |
| 194 | ☐ | J_ONT-325 | 90.95 | 18:00 | 80.78 | 06:00 | 86.17 | 10.17 |
| 195 | ☐ | J_ONT-333 | 118.03 | 06:40 | 102.25 | 01:50 | 110.15 | 15.77 |
| 196 | ☐ | J_ONT-341 | 118.66 | 14:30 | 102.83 | 01:50 | 111.29 | 15.83 |
| 197 | ☐ | J_ONT-343 | 118.66 | 14:30 | 102.84 | 01:50 | 111.30 | 15.82 |
| 198 | ☐ | J_ONT-351 | 114.75 | 14:30 | 98.92 | 01:50 | 107.39 | 15.83 |
| 199 | ☐ | J_ONT-357 | 114.20 | 06:40 | 98.37 | 01:50 | 106.84 | 15.83 |
| 200 | ☐ | J_ONT-359 | 85.23 | 20:00 | 41.13 | 00:30 | 59.34 | 44.10 |
| 201 | ☐ | J_ONT-361 | 130.48 | 19:40 | 91.72 | 00:30 | 109.53 | 38.76 |
| 202 | ☐ | J_ONT-363 | 127.94 | 19:40 | 89.09 | 00:30 | 106.93 | 38.85 |
| 203 | ☐ | J_ONT-365 | 134.01 | 19:40 | 95.20 | 00:30 | 113.00 | 38.81 |
| 204 | ☐ | J_ONT-367 | 133.36 | 19:40 | 94.84 | 00:30 | 112.11 | 38.53 |
| 205 | ☐ | J_ONT-369 | 131.24 | 19:40 | 92.82 | 00:30 | 109.99 | 38.42 |
| 206 | ☐ | J_ONT-371 | 131.24 | 19:40 | 92.86 | 00:30 | 109.99 | 38.38 |
| 207 | ☐ | J_ONT-373 | 134.67 | 19:40 | 96.58 | 00:30 | 113.45 | 38.10 |
| 208 | ☐ | J_ONT-377 | 150.57 | 19:40 | 110.41 | 00:30 | 128.26 | 40.16 |
| 209 | ☐ | J_ONT-379 | 134.46 | 19:40 | 95.54 | 00:30 | 112.59 | 38.92 |
| 210 | ☐ | J_ONT-381 | 143.79 | 19:40 | 103.18 | 00:30 | 121.21 | 40.61 |
| 211 | ☐ | J_ONT-383 | 144.92 | 19:40 | 104.53 | 00:30 | 122.43 | 40.39 |
| 212 | ☐ | J_ONT-387 | 148.65 | 19:40 | 107.13 | 00:30 | 125.63 | 41.52 |
| 213 | ☐ | J_ONT-399 | 153.94 | 20:00 | 110.29 | 00:30 | 129.14 | 43.65 |
| 214 | ☐ | J_ONT-401 | 150.23 | 20:00 | 106.62 | 00:30 | 125.44 | 43.62 |
| 215 | ☐ | J_ONT-403 | 151.75 | 20:00 | 108.20 | 00:30 | 126.98 | 43.55 |
| 216 | ☐ | J_ONT-407 | 152.71 | 20:00 | 109.06 | 00:30 | 127.91 | 43.64 |
| 217 | ☐ | J_ONT-421 | 156.17 | 20:00 | 112.51 | 00:30 | 131.37 | 43.67 |
| 218 | ☐ | J_ONT-423 | 67.53 | 18:00 | 63.71 | 06:00 | 66.00 | 3.82 |
| 219 | ☐ | J_ONT-425 | 75.27 | 18:00 | 71.09 | 06:00 | 73.60 | 4.17 |
| 220 | ☐ | J_ONT-427 | 75.27 | 18:00 | 71.09 | 06:00 | 73.60 | 4.17 |
| 221 | ☐ | J_ONT-473 | 78.12 | 06:40 | 69.92 | 03:10 | 74.05 | 8.21 |
| 222 | ☐ | J_ONT-477 | 146.70 | 19:40 | 105.18 | 00:30 | 123.70 | 41.53 |
| 223 | ☐ | J_ONT-507 | 131.23 | 19:40 | 92.93 | 00:30 | 109.99 | 38.30 |
| 224 | ☐ | J_ONT-509 | 135.37 | 19:40 | 97.31 | 00:30 | 114.15 | 38.05 |
| 225 | ☐ | J_ONT-511 | 135.13 | 19:40 | 97.06 | 00:30 | 113.91 | 38.07 |
| 226 | ☐ | J_ONT-537 | 72.18 | 18:00 | 67.97 | 06:00 | 70.50 | 4.20 |
| 227 | ☐ | J_ONT-569 | 95.27 | 18:00 | 73.66 | 06:00 | 85.25 | 21.61 |
| 228 | ☐ | J_ONT-609 | 90.16 | 18:00 | 66.85 | 06:00 | 79.30 | 23.31 |

Existing Scenario - City of Ontario - Pipe Output Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | 800ZONE_V1 | 10,918.05 | 15:00 | 0.00 | 17:50 | 6,942.94 | 10,918.05 |
| 2 | ☐ | 800ZONE_V2 | 10,918.05 | 15:00 | 0.00 | 17:50 | 6,944.07 | 10,918.05 |
| 3 | ☐ | PSCH_1 | 1,101.47 | 15:30 | 0.00 | 00:00 | 546.93 | 1,101.47 |
| 4 | ☐ | PKELLOG | 0.03 | 15:30 | 0.00 | 00:00 | 0.01 | 0.03 |
| 5 | ☐ | PHYD_LAT | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 6 | ☐ | P10142 | 4,842.93 | 06:50 | 0.11 | 18:20 | 2,655.48 | 4,842.82 |
| 7 | ☐ | P10326 | 426.66 | 00:00 | 4.26 | 06:30 | 151.62 | 422.40 |
| 8 | ☐ | P10328 | 314.18 | 00:00 | 4.26 | 06:30 | 113.61 | 309.92 |
| 9 | ☐ | P10330 | 195.88 | 00:00 | 0.00 | 05:00 | 70.81 | 195.88 |
| 10 | ☐ | P10332 | 131.18 | 00:00 | 0.00 | 05:00 | 44.33 | 131.18 |
| 11 | ☐ | P10334 | 71.14 | 00:00 | 4.26 | 05:00 | 26.86 | 66.88 |
| 12 | ☐ | P10340 | 7.80 | 00:00 | 0.00 | 05:00 | 2.64 | 7.80 |
| 13 | ☐ | P10342 | 64.70 | 00:00 | 0.00 | 05:00 | 21.86 | 64.70 |
| 14 | ☐ | P10344 | 11.36 | 00:00 | 0.00 | 05:00 | 3.84 | 11.36 |
| 15 | ☐ | P10346 | 56.00 | 00:00 | 0.00 | 05:00 | 18.92 | 56.00 |
| 16 | ☐ | P10350 | 122.32 | 22:30 | 0.00 | 05:00 | 64.99 | 122.32 |
| 17 | ☐ | P10354 | 1,509.49 | 04:00 | 0.42 | 20:00 | 776.93 | 1,509.07 |
| 18 | ☐ | P10356 | 871.92 | 10:00 | 0.00 | 05:00 | 294.14 | 871.92 |
| 19 | ☐ | P10360 | 742.97 | 21:00 | 0.25 | 20:00 | 431.10 | 742.72 |
| 20 | ☐ | P10364 | 58.22 | 22:50 | 0.00 | 05:00 | 19.67 | 58.22 |
| 21 | ☐ | P10366 | 503.88 | 00:00 | 0.00 | 05:00 | 170.28 | 503.88 |
| 22 | ☐ | P10368 | 463.00 | 00:00 | 0.00 | 05:00 | 156.46 | 463.00 |
| 23 | ☐ | P10372 | 586.87 | 04:00 | 0.25 | 20:00 | 395.42 | 586.63 |
| 24 | ☐ | P10374 | 562.63 | 04:00 | 0.25 | 20:00 | 387.22 | 562.39 |
| 25 | ☐ | P10376 | 292.23 | 04:00 | 0.14 | 20:00 | 208.89 | 292.10 |
| 26 | ☐ | P10422 | 834.42 | 06:50 | 0.03 | 19:00 | 499.53 | 834.39 |
| 27 | ☐ | P10506 | 481.72 | 09:30 | 0.25 | 20:00 | 297.52 | 481.48 |
| 28 | ☐ | P10508 | 481.73 | 21:00 | 0.25 | 20:00 | 343.61 | 481.48 |
| 29 | ☐ | P10510 | 267.36 | 09:30 | 0.14 | 20:00 | 142.59 | 267.23 |
| 30 | ☐ | P10512 | 98.13 | 09:30 | 0.05 | 20:00 | 50.05 | 98.08 |
| 31 | ☐ | P10514 | 62.88 | 00:00 | 0.00 | 05:00 | 21.25 | 62.88 |
| 32 | ☐ | P10516 | 112.46 | 04:00 | 0.05 | 20:00 | 78.18 | 112.41 |
| 33 | ☐ | P10518 | 169.23 | 09:30 | 0.09 | 20:00 | 124.48 | 169.14 |
| 34 | ☐ | P10520 | 130.90 | 04:00 | 0.05 | 20:00 | 84.41 | 130.85 |
| 35 | ☐ | P10522 | 214.36 | 09:30 | 0.11 | 20:00 | 104.06 | 214.25 |
| 36 | ☐ | P10550 | 214.36 | 09:30 | 0.11 | 20:00 | 145.24 | 214.25 |
| 37 | ☐ | ONT9036 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 38 | ☐ | ONTFRAN-3622 | 111.45 | 06:40 | 0.00 | 18:00 | 59.07 | 111.45 |
| 39 | ☐ | ONT9042 | 991.45 | 06:00 | 0.03 | 18:30 | 527.24 | 991.42 |
| 40 | ☐ | ONTNEWP-9322 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 41 | ☐ | ONTNEWP-9512 | 58.22 | 23:40 | 0.00 | 05:00 | 19.67 | 58.22 |
| 42 | ☐ | ONTNEWP-9514 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 43 | ☐ | ONTNEWP-934 | 40.36 | 10:00 | 0.00 | 00:00 | 13.36 | 40.36 |
| 44 | ☐ | ONTNEWP-10044 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 45 | ☐ | ONTNEWP-9320 | 58.22 | 00:00 | 0.00 | 05:00 | 19.67 | 58.22 |
| 46 | ☐ | ONTNEWP-10016 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 47 | ☐ | ONTNEWP-9884 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 48 | ☐ | ONTNEWP-9886 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 49 | ☐ | ONTNEWP-9384 | 609.18 | 09:30 | 0.42 | 20:00 | 325.82 | 608.76 |
| 50 | ☐ | ONTNEWP-9892 | 875.43 | 04:00 | 0.42 | 20:00 | 544.61 | 875.01 |
| 51 | ☐ | ONTNEWP-9900 | 126.38 | 00:00 | 0.00 | 05:00 | 42.71 | 126.38 |
| 52 | ☐ | ONTNEWP-910 | 27.08 | 00:00 | 0.00 | 05:00 | 9.15 | 27.08 |
| 53 | ☐ | ONTNEWP-9896 | 336.54 | 00:00 | 0.00 | 05:00 | 131.78 | 336.54 |
| 54 | ☐ | ONTNEWP-9712 | 56.44 | 00:00 | 0.00 | 05:00 | 37.13 | 56.44 |
| 55 | ☐ | ONTNEWP-9902 | 54.54 | 10:00 | 0.00 | 05:00 | 29.31 | 54.54 |
| 56 | ☐ | ONTNEWP-9890 | 565.48 | 00:00 | 0.00 | 05:00 | 209.15 | 565.48 |
| 57 | ☐ | ONTNEWP-914 | 503.24 | 00:00 | 0.00 | 05:00 | 188.12 | 503.24 |

Existing Scenario - City of Ontario - Pipe Output Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 58 | ☐ | ONTNEWP-9894 | 471.24 | 00:00 | 0.00 | 05:00 | 177.30 | 471.24 |
| 59 | ☐ | ONTNEWP-9913 | 34.38 | 00:00 | 0.00 | 05:00 | 11.62 | 34.38 |
| 60 | ☐ | ONTNEWP-9861 | 63.96 | 00:00 | 0.00 | 05:00 | 21.61 | 63.96 |
| 61 | ☐ | ONTNEWP-9912 | 136.67 | 10:00 | 0.00 | 00:00 | 45.24 | 136.67 |
| 62 | ☐ | ONTNEWP-9668 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 63 | ☐ | ONTNEWP-9664 | 26.55 | 11:10 | 0.00 | 05:00 | 13.09 | 26.55 |
| 64 | ☐ | ONTNEWP-9928 | 270.86 | 12:10 | 0.00 | 00:00 | 89.66 | 270.86 |
| 65 | ☐ | ONTNEWP-9932 | 229.01 | 12:10 | 0.00 | 00:00 | 75.81 | 229.01 |
| 66 | ☐ | ONTNEWP-9940 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 67 | ☐ | ONTNEWP-9942 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 68 | ☐ | ONTNEWP-908 | 34.96 | 00:00 | 0.00 | 05:00 | 11.81 | 34.96 |
| 69 | ☐ | ONTNEWP-9846 | 1,480.85 | 04:00 | 0.42 | 20:00 | 767.25 | 1,480.43 |
| 70 | ☐ | ONTFRAN-3693 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 71 | ☐ | ONTFRAN-3621 | 111.45 | 06:40 | 0.00 | 18:00 | 59.07 | 111.45 |
| 72 | ☐ | ONTNEWP649 | 107.26 | 06:50 | 0.00 | 18:00 | 56.99 | 107.26 |
| 73 | ☐ | ONTFRAN-3624 | 104.82 | 06:50 | 0.00 | 18:00 | 55.77 | 104.82 |
| 74 | ☐ | ONTFRAN-3626 | 104.81 | 07:00 | 0.00 | 18:00 | 55.77 | 104.81 |
| 75 | ☐ | ONTNEWP-9780 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 76 | ☐ | ONTFRAN-3694 | 834.42 | 06:50 | 0.03 | 19:00 | 489.71 | 834.39 |
| 77 | ☐ | ONTFRAN-3620 | 192.16 | 05:00 | 0.00 | 18:00 | 106.68 | 192.16 |
| 78 | ☐ | ONTFRAN-3628 | 991.45 | 06:00 | 0.03 | 18:30 | 527.24 | 991.42 |
| 79 | ☐ | ONT9048 | 2,349.48 | 00:40 | 0.00 | 08:00 | 1,182.84 | 2,349.48 |
| 80 | ☐ | ONT9068 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 81 | ☐ | ONTNEWP-9870 | 4,842.93 | 07:00 | 0.10 | 18:00 | 2,655.50 | 4,842.82 |
| 82 | ☐ | ONTFRAN-3645 | 1,830.77 | 00:40 | 0.04 | 18:30 | 928.84 | 1,830.72 |
| 83 | ☐ | ONTFRAN-3627 | 886.64 | 06:50 | 0.03 | 18:50 | 471.47 | 886.61 |
| 84 | ☐ | ONTFRAN-3618 | 392.19 | 21:30 | 0.00 | 18:00 | 211.37 | 392.19 |
| 85 | ☐ | ONTFRAN-3629 | 1,727.60 | 06:00 | 0.06 | 18:20 | 941.76 | 1,727.54 |
| 86 | ☐ | ONTFRAN-3617 | 3,905.44 | 06:50 | 0.08 | 18:20 | 2,080.59 | 3,905.36 |
| 87 | ☐ | ONTFRAN-3600 | 4,840.61 | 06:50 | 0.11 | 18:20 | 2,654.05 | 4,840.51 |
| 88 | ☐ | ONT9024 | 4,842.93 | 07:00 | 0.10 | 18:00 | 2,655.50 | 4,842.82 |
| 89 | ☐ | ONTNEWP-9276 | 4,842.93 | 07:00 | 0.10 | 18:00 | 2,655.50 | 4,842.82 |
| 90 | ☐ | ONTNEWP-9434 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 91 | ☐ | ONTNEWP-9602 | 4,842.93 | 07:00 | 0.10 | 18:00 | 2,655.50 | 4,842.82 |
| 92 | ☐ | ONTFRAN-3706 | 3,905.44 | 06:50 | 0.08 | 18:20 | 2,080.59 | 3,905.36 |
| 93 | ☐ | ONTNEWP-9252 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 94 | ☐ | ONTNEWP-9590 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 95 | ☐ | ONTNEWP-9170 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 96 | ☐ | ONTPHLP-3615 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 97 | ☐ | ONT9034 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 98 | ☐ | ONTNEWP-9600 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 99 | ☐ | ONTNEWP-9854 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 100 | ☐ | ONTNEWP-9556 | 177.76 | 00:00 | 0.00 | 05:00 | 60.07 | 177.76 |
| 101 | ☐ | ONTNEWP-9554 | 4,842.93 | 06:10 | 0.11 | 18:00 | 2,677.94 | 4,842.83 |
| 102 | ☐ | ONTNEWP-9810 | 4,849.21 | 06:10 | 0.11 | 18:00 | 2,741.13 | 4,849.11 |
| 103 | ☐ | ONTNEWP-9596 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 104 | ☐ | ONTNEWP-10017 | 58.22 | 22:40 | 0.00 | 05:00 | 19.67 | 58.22 |
| 105 | ☐ | ONTNEWP-9946 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 106 | ☐ | ONT283 | 10.06 | 00:20 | 0.00 | 05:00 | 3.40 | 10.06 |
| 107 | ☐ | ONTNEWP-9714 | 23.12 | 00:00 | 0.00 | 05:00 | 7.81 | 23.12 |
| 108 | ☐ | ONTNEWP-9494 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 109 | ☐ | ONTP10024 | 56.44 | 00:00 | 0.00 | 05:00 | 37.13 | 56.44 |
| 110 | ☐ | 2011_P14 | 790.87 | 10:00 | 0.00 | 00:00 | 261.81 | 790.87 |
| 111 | ☐ | 2011_P15 | 117.77 | 10:00 | 0.00 | 00:00 | 38.98 | 117.77 |
| 112 | ☐ | 2011_P17 | 548.23 | 04:00 | 0.25 | 20:00 | 382.36 | 547.99 |
| 113 | ☐ | 2011_P18 | 538.17 | 21:00 | 0.25 | 20:00 | 362.36 | 537.92 |
| 114 | ☐ | 2011_P19 | 614.45 | 21:00 | 0.25 | 20:00 | 387.96 | 614.20 |

Existing Scenario - City of Ontario - Pipe Output Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 115 | ☐ | P39 | 56.00 | 00:00 | 0.00 | 05:00 | 18.92 | 56.00 |
| 116 | ☐ | P41 | 60.84 | 02:00 | 0.00 | 05:00 | 20.56 | 60.84 |
| 117 | ☐ | P63 | 90.56 | 00:00 | 0.00 | 05:00 | 54.26 | 90.56 |
| 118 | ☐ | P81 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 119 | ☐ | P87 | 235.04 | 04:00 | 0.11 | 20:00 | 166.39 | 234.93 |
| 120 | ☐ | P_ONT-154 | 4,842.93 | 07:00 | 0.10 | 18:00 | 2,655.50 | 4,842.82 |
| 121 | ☐ | P_ONT-156 | 4,842.93 | 07:00 | 0.10 | 18:00 | 2,655.50 | 4,842.82 |
| 122 | ☐ | P_ONT-158 | 4,842.93 | 06:50 | 0.10 | 18:10 | 2,655.48 | 4,842.82 |
| 123 | ☐ | P_ONT-160 | 4,842.93 | 06:50 | 0.11 | 18:20 | 2,655.48 | 4,842.82 |
| 124 | ☐ | P_ONT-176 | 3,750.95 | 06:50 | 0.08 | 18:20 | 1,982.03 | 3,750.88 |
| 125 | ☐ | P_ONT-178 | 104.56 | 06:50 | 0.00 | 18:00 | 67.01 | 104.56 |
| 126 | ☐ | P_ONT-180 | 46.79 | 06:50 | 0.00 | 18:00 | 29.99 | 46.79 |
| 127 | ☐ | P_ONT-182 | 46.79 | 06:30 | 0.00 | 18:00 | 29.99 | 46.79 |
| 128 | ☐ | P_ONT-184 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 129 | ☐ | P_ONT-186 | 138.74 | 21:50 | 0.00 | 18:00 | 68.97 | 138.74 |
| 130 | ☐ | P_ONT-188 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 131 | ☐ | P_ONT-190 | 56.45 | 06:00 | 0.00 | 00:00 | 28.03 | 56.45 |
| 132 | ☐ | P_ONT-192 | 195.65 | 06:50 | 0.00 | 18:00 | 112.80 | 195.65 |
| 133 | ☐ | P_ONT-194 | 195.65 | 06:50 | 0.00 | 18:00 | 105.10 | 195.65 |
| 134 | ☐ | P_ONT-196 | 283.64 | 02:40 | 0.00 | 18:00 | 156.08 | 283.64 |
| 135 | ☐ | P_ONT-198 | 935.17 | 06:50 | 0.03 | 18:20 | 572.41 | 935.14 |
| 136 | ☐ | P_ONT-200 | 100.75 | 07:00 | 0.00 | 18:00 | 48.13 | 100.75 |
| 137 | ☐ | P_ONT-204 | 42.68 | 00:20 | 0.00 | 05:00 | 14.42 | 42.68 |
| 138 | ☐ | P_ONT-206 | 56.10 | 00:00 | 0.00 | 05:00 | 18.96 | 56.10 |
| 139 | ☐ | P_ONT-208 | 32.52 | 00:00 | 0.00 | 05:00 | 10.99 | 32.52 |
| 140 | ☐ | P_ONT-210 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 141 | ☐ | P_ONT-212 | 210.15 | 06:50 | 0.00 | 18:00 | 112.37 | 210.15 |
| 142 | ☐ | P_ONT-214 | 210.15 | 06:50 | 0.00 | 18:00 | 112.37 | 210.15 |
| 143 | ☐ | P_ONT-216 | 209.89 | 06:10 | 0.00 | 18:00 | 112.24 | 209.89 |
| 144 | ☐ | P_ONT-218 | 0.26 | 06:00 | 0.00 | 00:00 | 0.13 | 0.26 |
| 145 | ☐ | P_ONT-220 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 146 | ☐ | P_ONT-222 | 209.55 | 06:00 | 0.00 | 18:00 | 112.08 | 209.55 |
| 147 | ☐ | P_ONT-224 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 148 | ☐ | P_ONT-226 | 658.25 | 07:00 | 0.00 | 18:00 | 335.46 | 658.25 |
| 149 | ☐ | P_ONT-228 | 209.55 | 06:00 | 0.00 | 18:00 | 112.08 | 209.55 |
| 150 | ☐ | P_ONT-230 | 229.45 | 07:00 | 0.00 | 18:00 | 94.77 | 229.45 |
| 151 | ☐ | P_ONT-232 | 669.19 | 07:00 | 0.04 | 18:10 | 326.43 | 669.15 |
| 152 | ☐ | P_ONT-234 | 207.95 | 23:40 | 0.00 | 18:00 | 111.20 | 207.95 |
| 153 | ☐ | P_ONT-236 | 141.74 | 06:40 | 0.00 | 18:00 | 46.62 | 141.74 |
| 154 | ☐ | P_ONT-238 | 141.74 | 06:00 | 0.00 | 18:00 | 59.16 | 141.74 |
| 155 | ☐ | P_ONT-240 | 37.12 | 00:00 | 0.00 | 05:00 | 12.54 | 37.12 |
| 156 | ☐ | P_ONT-242 | 18.76 | 00:00 | 0.00 | 05:00 | 6.34 | 18.76 |
| 157 | ☐ | P_ONT-244 | 229.45 | 07:00 | 0.00 | 18:00 | 94.77 | 229.45 |
| 158 | ☐ | P_ONT-246 | 424.16 | 00:40 | 0.03 | 19:00 | 211.21 | 424.12 |
| 159 | ☐ | P_ONT-248 | 424.16 | 00:40 | 0.03 | 19:00 | 212.08 | 424.12 |
| 160 | ☐ | P_ONT-250 | 412.16 | 23:40 | 0.03 | 19:00 | 213.33 | 412.13 |
| 161 | ☐ | P_ONT-252 | 412.16 | 23:40 | 0.03 | 19:00 | 213.33 | 412.13 |
| 162 | ☐ | P_ONT-254 | 412.16 | 23:20 | 0.03 | 18:30 | 214.29 | 412.13 |
| 163 | ☐ | P_ONT-256 | 412.16 | 00:40 | 0.03 | 18:20 | 214.29 | 412.13 |
| 164 | ☐ | P_ONT-258 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 165 | ☐ | P_ONT-260 | 1.92 | 06:00 | 0.00 | 00:00 | 0.96 | 1.92 |
| 166 | ☐ | P_ONT-262 | 1,931.29 | 06:00 | 0.06 | 18:30 | 1,023.73 | 1,931.23 |
| 167 | ☐ | P_ONT-264 | 283.01 | 06:40 | 0.00 | 18:00 | 113.80 | 283.01 |
| 168 | ☐ | P_ONT-266 | 282.75 | 06:30 | 0.00 | 18:00 | 110.35 | 282.75 |
| 169 | ☐ | P_ONT-268 | 258.42 | 06:30 | 0.00 | 18:00 | 98.27 | 258.42 |
| 170 | ☐ | P_ONT-270 | 9.84 | 00:00 | 0.00 | 05:00 | 3.33 | 9.84 |
| 171 | ☐ | P_ONT-272 | 439.97 | 06:00 | 0.00 | 18:00 | 243.29 | 439.97 |

Existing Scenario - City of Ontario - Pipe Output Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 172 | ☐ | P_ONT-274 | 616.72 | 06:00 | 0.00 | 18:00 | 325.89 | 616.72 |
| 173 | ☐ | P_ONT-276 | 176.75 | 07:00 | 0.00 | 18:00 | 82.59 | 176.75 |
| 174 | ☐ | P_ONT-278 | 428.80 | 07:00 | 0.00 | 18:00 | 240.69 | 428.80 |
| 175 | ☐ | P_ONT-280 | 428.80 | 06:00 | 0.00 | 18:00 | 240.69 | 428.80 |
| 176 | ☐ | P_ONT-282 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 177 | ☐ | P_ONT-284 | 11.17 | 06:00 | 0.00 | 18:00 | 3.08 | 11.17 |
| 178 | ☐ | P_ONT-286 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 179 | ☐ | P_ONT-288 | 17.57 | 06:40 | 0.00 | 18:00 | 6.26 | 17.57 |
| 180 | ☐ | P_ONT-290 | 171.13 | 06:40 | 0.00 | 18:00 | 94.83 | 171.13 |
| 181 | ☐ | P_ONT-292 | 535.02 | 00:40 | 0.03 | 18:30 | 298.06 | 534.99 |
| 182 | ☐ | P_ONT-294 | 165.15 | 23:00 | 0.00 | 18:00 | 89.05 | 165.15 |
| 183 | ☐ | P_ONT-296 | 171.13 | 06:40 | 0.00 | 18:00 | 94.83 | 171.13 |
| 184 | ☐ | P_ONT-298 | 371.60 | 06:00 | 0.00 | 18:00 | 209.01 | 371.60 |
| 185 | ☐ | P_ONT-300 | 542.75 | 06:00 | 0.03 | 18:30 | 303.86 | 542.73 |
| 186 | ☐ | P_ONT-302 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 187 | ☐ | P_ONT-306 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 188 | ☐ | P_ONT-308 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 189 | ☐ | P_ONT-310 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 190 | ☐ | P_ONT-312 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 191 | ☐ | P_ONT-314 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 192 | ☐ | P_ONT-316 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 193 | ☐ | P_ONT-328 | 12.96 | 00:00 | 0.00 | 05:00 | 7.74 | 12.96 |
| 194 | ☐ | P_ONT-330 | 191.25 | 23:40 | 0.00 | 18:00 | 94.39 | 191.25 |
| 195 | ☐ | P_ONT-332 | 13.40 | 00:00 | 0.00 | 05:00 | 4.53 | 13.40 |
| 196 | ☐ | P_ONT-334 | 13.40 | 00:00 | 0.00 | 05:00 | 4.53 | 13.40 |
| 197 | ☐ | P_ONT-336 | 170.49 | 23:40 | 0.00 | 18:00 | 87.37 | 170.49 |
| 198 | ☐ | P_ONT-338 | 30.88 | 00:00 | 0.00 | 05:00 | 10.44 | 30.88 |
| 199 | ☐ | P_ONT-340 | 30.88 | 00:00 | 0.00 | 05:00 | 10.44 | 30.88 |
| 200 | ☐ | P_ONT-342 | 18.76 | 00:00 | 0.00 | 05:00 | 6.34 | 18.76 |
| 201 | ☐ | P_ONT-344 | 18.36 | 00:00 | 0.00 | 05:00 | 6.20 | 18.36 |
| 202 | ☐ | P_ONT-346 | 0.20 | 00:00 | 0.00 | 05:00 | 0.07 | 0.20 |
| 203 | ☐ | P_ONT-348 | 192.16 | 05:00 | 0.00 | 18:00 | 116.76 | 192.16 |
| 204 | ☐ | P_ONT-350 | 36.04 | 00:20 | 0.00 | 05:00 | 12.18 | 36.04 |
| 205 | ☐ | P_ONT-352 | 19.16 | 00:20 | 0.00 | 05:00 | 6.47 | 19.16 |
| 206 | ☐ | P_ONT-354 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 207 | ☐ | P_ONT-356 | 19.16 | 00:00 | 0.00 | 05:00 | 6.47 | 19.16 |
| 208 | ☐ | P_ONT-358 | 1,731.16 | 06:00 | 0.06 | 18:20 | 943.53 | 1,731.10 |
| 209 | ☐ | P_ONT-368 | 4,842.93 | 06:50 | 0.11 | 18:20 | 2,655.20 | 4,842.82 |
| 210 | ☐ | P_ONT-370 | 100.75 | 07:00 | 0.00 | 18:00 | 55.08 | 100.75 |
| 211 | ☐ | P_ONT-372 | 100.75 | 07:00 | 0.00 | 18:00 | 50.59 | 100.75 |
| 212 | ☐ | P_ONT-376 | 351.79 | 21:30 | 0.00 | 18:00 | 197.71 | 351.79 |
| 213 | ☐ | P_ONT-378 | 141.74 | 06:00 | 0.00 | 18:00 | 61.91 | 141.74 |
| 214 | ☐ | P_ONT-382 | 871.92 | 10:00 | 0.00 | 00:00 | 288.64 | 871.92 |
| 215 | ☐ | P_ONT-388 | 118.80 | 12:10 | 0.00 | 00:00 | 39.33 | 118.80 |
| 216 | ☐ | P_ONT-406 | 109.30 | 21:10 | 0.00 | 05:00 | 72.27 | 109.30 |
| 217 | ☐ | P_ONT-408 | 109.30 | 21:10 | 0.00 | 05:00 | 52.43 | 109.30 |
| 218 | ☐ | P_ONT-410 | 46.80 | 11:10 | 0.00 | 05:00 | 30.20 | 46.80 |
| 219 | ☐ | P_ONT-412 | 43.52 | 21:10 | 0.00 | 05:00 | 27.49 | 43.52 |
| 220 | ☐ | P_ONT-418 | 12.72 | 21:10 | 0.00 | 05:00 | 4.30 | 12.72 |
| 221 | ☐ | P_ONT-420 | 56.10 | 00:00 | 0.00 | 05:00 | 18.96 | 56.10 |
| 222 | ☐ | P_ONT-422 | 98.13 | 09:30 | 0.05 | 20:00 | 71.30 | 98.08 |
| 223 | ☐ | P_ONT-424 | 52.16 | 00:00 | 0.00 | 05:00 | 17.63 | 52.16 |
| 224 | ☐ | P_ONT-426 | 169.23 | 09:30 | 0.09 | 20:00 | 121.87 | 169.14 |
| 225 | ☐ | P_ONT-428 | 522.37 | 21:00 | 0.25 | 20:00 | 357.07 | 522.12 |
| 226 | ☐ | P_ONT-430 | 566.41 | 21:00 | 0.25 | 20:00 | 371.84 | 566.16 |
| 227 | ☐ | P_ONT-432 | 581.73 | 21:00 | 0.25 | 20:00 | 376.98 | 581.48 |
| 228 | ☐ | P_ONT-434 | 656.25 | 21:00 | 0.25 | 20:00 | 401.99 | 656.00 |

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 229 | ☐ | P_ONT-438 | 178.48 | 00:00 | 0.00 | 05:00 | 78.37 | 178.48 |
| 230 | ☐ | P_ONT-440 | 1,498.37 | 04:00 | 0.42 | 20:00 | 773.17 | 1,497.95 |
| 231 | ☐ | P_ONT-442 | 842.31 | 04:00 | 0.42 | 20:00 | 515.36 | 841.89 |
| 232 | ☐ | P_ONT-444 | 609.18 | 09:30 | 0.42 | 20:00 | 328.28 | 608.76 |
| 233 | ☐ | P_ONT-446 | 559.40 | 08:40 | 0.42 | 20:00 | 286.25 | 558.98 |
| 234 | ☐ | P_ONT-456 | 55.88 | 02:00 | 0.00 | 05:00 | 18.88 | 55.88 |
| 235 | ☐ | P_ONT-458 | 67.70 | 00:00 | 0.00 | 05:00 | 22.88 | 67.70 |
| 236 | ☐ | P_ONT-460 | 11.96 | 00:00 | 0.00 | 05:00 | 4.04 | 11.96 |
| 237 | ☐ | P_ONT-470 | 875.43 | 04:00 | 0.42 | 20:00 | 526.55 | 875.01 |
| 238 | ☐ | P_ONT-480 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 239 | ☐ | P_ONT-482 | 886.64 | 06:50 | 0.03 | 18:50 | 471.47 | 886.61 |
| 240 | ☐ | P_ONT-484 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 241 | ☐ | P_ONT-486 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 242 | ☐ | P_ONT-534 | 781.09 | 04:00 | 0.42 | 20:00 | 494.67 | 780.67 |
| 243 | ☐ | P_ONT-560 | 559.40 | 08:40 | 0.42 | 20:00 | 286.25 | 558.98 |
| 244 | ☐ | P_ONT-570 | 614.45 | 21:00 | 0.25 | 20:00 | 387.96 | 614.20 |
| 245 | ☐ | P_ONT-572 | 731.13 | 21:00 | 0.25 | 20:00 | 427.12 | 730.88 |
| 246 | ☐ | P_ONT-574 | 702.77 | 21:00 | 0.25 | 20:00 | 417.61 | 702.52 |
| 247 | ☐ | P_ONT-576 | 669.19 | 06:40 | 0.04 | 19:00 | 326.36 | 669.15 |
| 248 | ☐ | P_ONT-598 | 886.64 | 06:50 | 0.03 | 18:50 | 471.47 | 886.61 |
| 249 | ☐ | P_ONT-618 | 2,349.48 | 00:40 | 0.00 | 08:00 | 1,182.84 | 2,349.48 |
| 250 | ☐ | P_ONT-666 | 100.75 | 07:00 | 0.00 | 18:00 | 55.08 | 100.75 |

Near Term Model Scenario

Near Term Scenario - City of Ontario - Junction Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 1 | | J1272 | 1299 | 995.00 |
| 2 | | J1274 | 1299 | 1,015.00 |
| 3 | | J1276 | 1299 | 984.00 |
| 4 | | J1280 | 1299 | 997.00 |
| 5 | | J1288 | 1299 | 1,006.00 |
| 6 | | J1290 | 1299 | 967.00 |
| 7 | | J1292 | 1158 | 803.00 |
| 8 | | J1294 | 1158 | 873.00 |
| 9 | | J1296 | 1158 | 892.00 |
| 10 | | J1302 | 1299 | 1,005.00 |
| 11 | | J1304 | 1158 | 845.00 |
| 12 | | J1308 | 1299 | 1,010.00 |
| 13 | | J1314 | 1299 | 1,063.00 |
| 14 | | J1316 | 1299 | 1,063.00 |
| 15 | | J1320 | 1299 | 1,022.00 |
| 16 | | J1322 | 1299 | 998.50 |
| 17 | | J1324 | 1299 | 998.50 |
| 18 | | J1404 | 1299 | 1,005.00 |
| 19 | | J1406 | 1299 | 1,014.00 |
| 20 | | J1408 | 1299 | 1,029.00 |
| 21 | | J1410 | 1299 | 1,022.00 |
| 22 | | J1412 | 1299 | 1,022.00 |
| 23 | | J1414 | 1299 | 1,012.50 |
| 24 | | J1416 | 1299 | 994.50 |
| 25 | | J1586 | 1299 | 1,111.00 |
| 26 | | J1592 | 1299 | 970.00 |
| 27 | | J1596 | 1050 | 790.80 |
| 28 | | JKELLOG | 930 | 722.50 |
| 29 | | JSCH_HYD | 930 | 722.50 |
| 30 | | J_ONT-1 | 1299 | 1,020.00 |
| 31 | | J_ONT-103 | 1050 | 752.33 |
| 32 | | J_ONT-105 | 930 | 752.33 |
| 33 | | J_ONT-107 | 1050 | 752.33 |
| 34 | | J_ONT-109 | 930 | 752.33 |
| 35 | | J_ONT-113 | 930 | 766.97 |
| 36 | | J_ONT-115 | 1050 | 766.95 |
| 37 | | J_ONT-117 | 930 | 766.95 |
| 38 | | J_ONT-119 | 1050 | 766.95 |
| 39 | | J_ONT-133 | 930 | 718.23 |
| 40 | | J_ONT-135 | 930 | 730.00 |
| 41 | | J_ONT-137 | 930 | 722.00 |
| 42 | | J_ONT-139 | 930 | 720.00 |
| 43 | | J_ONT-141 | 930 | 717.00 |
| 44 | | J_ONT-143 | 930 | 725.00 |
| 45 | | J_ONT-145 | 930 | 717.00 |
| 46 | | J_ONT-147 | 930 | 716.00 |
| 47 | | J_ONT-149 | 930 | 715.00 |
| 48 | | J_ONT-151 | 930 | 740.26 |
| 49 | | J_ONT-153 | 930 | 740.00 |
| 50 | | J_ONT-155 | 930 | 757.00 |
| 51 | | J_ONT-157 | 930 | 728.00 |

Near Term Scenario - City of Ontario - Junction Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 52 | | J_ONT-159 | 930 | 739.00 |
| 53 | | J_ONT-161 | 930 | 720.00 |
| 54 | | J_ONT-163 | 930 | 714.00 |
| 55 | | J_ONT-165 | 930 | 699.00 |
| 56 | | J_ONT-167 | 930 | 714.00 |
| 57 | | J_ONT-169 | 930 | 710.00 |
| 58 | | J_ONT-171 | 930 | 700.00 |
| 59 | | J_ONT-173 | 930 | 696.00 |
| 60 | | J_ONT-175 | 930 | 695.00 |
| 61 | | J_ONT-177 | 930 | 690.26 |
| 62 | | J_ONT-179 | 930 | 686.77 |
| 63 | | J_ONT-181 | 930 | 662.11 |
| 64 | | J_ONT-185 | 930 | 667.75 |
| 65 | | J_ONT-187 | 930 | 662.97 |
| 66 | | J_ONT-189 | 930 | 652.00 |
| 67 | | J_ONT-191 | 930 | 652.00 |
| 68 | | J_ONT-193 | 930 | 683.62 |
| 69 | | J_ONT-195 | 930 | 670.00 |
| 70 | | J_ONT-197 | 930 | 665.00 |
| 71 | | J_ONT-199 | 930 | 668.00 |
| 72 | | J_ONT-201 | 930 | 673.00 |
| 73 | | J_ONT-203 | 930 | 676.00 |
| 74 | | J_ONT-205 | 930 | 677.00 |
| 75 | | J_ONT-207 | 930 | 683.00 |
| 76 | | J_ONT-209 | 930 | 676.00 |
| 77 | | J_ONT-211 | 930 | 671.02 |
| 78 | | J_ONT-213 | 930 | 667.00 |
| 79 | | J_ONT-215 | 930 | 669.00 |
| 80 | | J_ONT-217 | 930 | 669.00 |
| 81 | | J_ONT-219 | 930 | 670.00 |
| 82 | | J_ONT-221 | 930 | 675.00 |
| 83 | | J_ONT-223 | 930 | 679.00 |
| 84 | | J_ONT-225 | 930 | 680.00 |
| 85 | | J_ONT-227 | 930 | 685.00 |
| 86 | | J_ONT-229 | 930 | 677.00 |
| 87 | | J_ONT-231 | 930 | 677.00 |
| 88 | | J_ONT-233 | 930 | 675.00 |
| 89 | | J_ONT-235 | 930 | 678.00 |
| 90 | | J_ONT-237 | 930 | 673.00 |
| 91 | | J_ONT-239 | 1050 | 798.05 |
| 92 | | J_ONT-243 | 1050 | 775.00 |
| 93 | | J_ONT-247 | 1050 | 795.00 |
| 94 | | J_ONT-249 | 1050 | 785.00 |
| 95 | | J_ONT-251 | 1050 | 791.00 |
| 96 | | J_ONT-253 | 1050 | 800.00 |
| 97 | | J_ONT-255 | 1050 | 795.00 |
| 98 | | J_ONT-257 | 1299 | 0.00 |
| 99 | | J_ONT-259 | 1299 | 0.00 |
| 100 | | J_ONT-261 | 1299 | 0.00 |
| 101 | | J_ONT-263 | 1299 | 0.00 |
| 102 | | J_ONT-265 | 930 | 662.00 |

Near Term Scenario - City of Ontario - Junction Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 103 | | J_ONT-267 | 930 | 672.50 |
| 104 | | J_ONT-271 | 930 | 662.00 |
| 105 | | J_ONT-273 | 930 | 666.81 |
| 106 | | J_ONT-275 | 930 | 663.85 |
| 107 | | J_ONT-277 | 930 | 654.00 |
| 108 | | J_ONT-279 | 930 | 654.00 |
| 109 | | J_ONT-281 | 930 | 654.00 |
| 110 | | J_ONT-283 | 930 | 658.00 |
| 111 | | J_ONT-285 | 930 | 661.00 |
| 112 | | J_ONT-287 | 930 | 661.00 |
| 113 | | J_ONT-289 | 930 | 730.83 |
| 114 | | J_ONT-291 | 930 | 748.00 |
| 115 | | J_ONT-295 | 930 | 754.00 |
| 116 | | J_ONT-297 | 930 | 755.00 |
| 117 | | J_ONT-299 | 930 | 755.00 |
| 118 | | J_ONT-301 | 930 | 698.61 |
| 119 | | J_ONT-305 | 1050 | 752.15 |
| 120 | | J_ONT-313 | 930 | 750.65 |
| 121 | | J_ONT-315 | 930 | 737.00 |
| 122 | | J_ONT-317 | 930 | 735.00 |
| 123 | | J_ONT-319 | 930 | 705.67 |
| 124 | | J_ONT-321 | 930 | 630.05 |
| 125 | | J_ONT-325 | 930 | 663.56 |
| 126 | | J_ONT-333 | 1158 | 898.39 |
| 127 | | J_ONT-341 | 1158 | 897.00 |
| 128 | | J_ONT-343 | 1158 | 897.00 |
| 129 | | J_ONT-351 | 1158 | 905.98 |
| 130 | | J_ONT-357 | 1158 | 907.23 |
| 131 | | J_ONT-359 | 1299 | 1,125.73 |
| 132 | | J_ONT-361 | 1299 | 1,022.00 |
| 133 | | J_ONT-363 | 1299 | 1,027.86 |
| 134 | | J_ONT-365 | 1299 | 1,013.84 |
| 135 | | J_ONT-367 | 1299 | 1,015.12 |
| 136 | | J_ONT-369 | 1299 | 1,020.00 |
| 137 | | J_ONT-371 | 1299 | 1,020.00 |
| 138 | | J_ONT-373 | 1299 | 1,012.03 |
| 139 | | J_ONT-377 | 1299 | 975.08 |
| 140 | | J_ONT-379 | 1299 | 1,012.28 |
| 141 | | J_ONT-381 | 1299 | 990.66 |
| 142 | | J_ONT-383 | 1299 | 988.07 |
| 143 | | J_ONT-387 | 1299 | 979.36 |
| 144 | | J_ONT-399 | 1299 | 967.15 |
| 145 | | J_ONT-401 | 1299 | 975.71 |
| 146 | | J_ONT-403 | 1299 | 972.20 |
| 147 | | J_ONT-405 | 1158 | 906.93 |
| 148 | | J_ONT-407 | 1299 | 970.00 |
| 149 | | J_ONT-409 | 930 | 636.83 |
| 150 | | J_ONT-421 | 1299 | 962.00 |
| 151 | | J_ONT-423 | 930 | 717.61 |
| 152 | | J_ONT-425 | 930 | 699.76 |
| 153 | | J_ONT-427 | 930 | 699.76 |

Near Term Scenario - City of Ontario - Junction Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 154 | | J_ONT-473 | 1158 | 973.90 |
| 155 | | J_ONT-477 | 1299 | 983.86 |
| 156 | | J_ONT-489 | 1158 | 912.00 |
| 157 | | J_ONT-503 | 1299 | 870.00 |
| 158 | | J_ONT-507 | 1299 | 1,020.00 |
| 159 | | J_ONT-509 | 1299 | 1,010.42 |
| 160 | | J_ONT-511 | 1299 | 1,010.97 |
| 161 | | J_ONT-513 | 1158 | 863.00 |
| 162 | | J_ONT-515 | 1158 | 867.04 |
| 163 | | J_ONT-537 | 930 | 706.89 |
| 164 | | J_ONT-569 | 930 | 653.59 |
| 165 | | J_ONT-609 | 930 | 665.39 |
| 166 | | J_ONT-613 | 930 | 684.00 |
| 167 | | J_ONT-77 | 930 | 660.94 |
| 168 | | J_ONT-99 | 1050 | 791.41 |
| 169 | | ONT66 | 1050 | 780.00 |
| 170 | | ONT68 | 1050 | 787.87 |
| 171 | | ONT72 | 1050 | 786.40 |
| 172 | | ONT76 | 930 | 694.43 |
| 173 | | ONTFRAN-3581 | 930 | 728.00 |
| 174 | | ONTFRAN-3583 | 930 | 723.56 |
| 175 | | ONTFRAN-3591 | 930 | 706.58 |
| 176 | | ONTFRAN-3592 | 930 | 725.00 |
| 177 | | ONTFRAN-3593 | 930 | 730.70 |
| 178 | | ONTFRAN-3594 | 930 | 731.73 |
| 179 | | ONTFRAN-3595 | 930 | 737.21 |
| 180 | | ONTFRAN-3596 | 930 | 706.61 |
| 181 | | ONTFRAN-3597 | 930 | 699.76 |
| 182 | | ONTFRAN-3598 | 930 | 706.52 |
| 183 | | ONTFRAN-3599 | 930 | 683.13 |
| 184 | | ONTFRAN-3600 | 930 | 701.34 |
| 185 | | ONTFRAN-3601 | 930 | 674.45 |
| 186 | | ONTFRAN-3603 | 930 | 663.78 |
| 187 | | ONTFRAN-3605 | 930 | 655.40 |
| 188 | | ONTFRAN-3606 | 930 | 650.00 |
| 189 | | ONTFRAN-3607 | 930 | 636.83 |
| 190 | | ONTFRAN-3608 | 930 | 658.46 |
| 191 | | ONTFRAN-3618 | 930 | 768.59 |
| 192 | | ONTFRAN-3619 | 930 | 768.76 |
| 193 | | ONTFRAN-3620 | 930 | 750.00 |
| 194 | | ONTFRAN-3622 | 930 | 750.00 |
| 195 | | ONTFRAN-3626 | 930 | 730.63 |
| 196 | | ONTJ114 | 1158 | 832.20 |
| 197 | | ONTJ12 | 930 | 670.00 |
| 198 | | ONTJ19 | 930 | 660.59 |
| 199 | | ONTNEWJ-198 | 1299 | 1,141.76 |
| 200 | | ONTNEWJ-212 | 1050 | 798.63 |
| 201 | | ONTNEWJ-214 | 1050 | 795.78 |
| 202 | | ONTNEWJ-224 | 1050 | 761.30 |
| 203 | | ONTNEWJ-262 | 1299 | 1,112.46 |
| 204 | | ONTNEWJ-278 | 1299 | 983.47 |

Near Term Scenario - City of Ontario - Junction Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 205 | | ONTNEWJ-322 | 1299 | 1,112.00 |
| 206 | | ONTNEWJ-340 | 1050 | 777.10 |
| 207 | | ONTNEWJ-348 | 1158 | 973.90 |
| 208 | | ONTNEWJ-354 | 1050 | 798.84 |
| 209 | | ONTNEWJ-356 | 1050 | 773.92 |
| 210 | | ONTNEWJ-378 | 1158 | 905.98 |
| 211 | | ONTNEWJ-396 | 1158 | 950.07 |
| 212 | | ONTNEWJ-398 | 1299 | 966.59 |
| 213 | | ONTNEWJ-399 | 1299 | 966.59 |
| 214 | | ONTNEWJ-430 | 1050 | 750.81 |
| 215 | | ONTNEWJ-432 | 1050 | 753.22 |
| 216 | | ONTNEWJ-436 | 1050 | 768.59 |
| 217 | | ONTNEWJ-438 | 1050 | 768.76 |
| 218 | | ONTNEWJ-470 | 1299 | 1,005.00 |
| 219 | | ONTNEWJ-478 | 1299 | 1,002.83 |
| 220 | | ONTNEWJ-482 | 1299 | 988.07 |
| 221 | | ONTNEWJ-492 | 1050 | 815.00 |
| 222 | | ONTNEWJ-496 | 1050 | 803.00 |
| 223 | | ONTNEWJ-498 | 1050 | 803.00 |
| 224 | | ONTNEWJ-500 | 1050 | 790.00 |
| 225 | | ONTNEWJ-502 | 1050 | 752.00 |
| 226 | | ONTNEWJ-510 | 1299 | 962.00 |
| 227 | | ONTNEWJ-516 | 1299 | 969.00 |
| 228 | | ONTNEWJ-520 | 1299 | 998.00 |
| 229 | | ONTNEWJ-522 | 1299 | 977.00 |
| 230 | | ONTNEWJ-526 | 1299 | 967.00 |
| 231 | | ONTNEWJ-528 | 1299 | 970.00 |
| 232 | | ONTNEWJ-530 | 1158 | 947.00 |
| 233 | | ONTNEWJ-542 | 1158 | 923.00 |
| 234 | | ONTNEWJ-544 | 1158 | 924.00 |
| 235 | | ONTNEWJ-546 | 1158 | 909.00 |
| 236 | | ONTNEWJ-548 | 1158 | 917.00 |
| 237 | | ONTNEWJ-550 | 1158 | 896.00 |
| 238 | | ONTNEWJ-554 | 1158 | 901.00 |
| 239 | | ONTNEWJ-555 | 1158 | 880.00 |
| 240 | | ONTNEWJ-556 | 1158 | 870.00 |
| 241 | | ONTNEWJ-558 | 1158 | 863.00 |
| 242 | | ONTNEWJ-560 | 1158 | 883.00 |
| 243 | | ONTNEWJ-562 | 1158 | 895.00 |
| 244 | | ONTNEWJ-564 | 1158 | 905.00 |
| 245 | | ONTNEWJ-568 | 1158 | 915.00 |
| 246 | | ONTNEWJ-576 | 1158 | 815.00 |
| 247 | | ONTNEWJ-578 | 1158 | 841.00 |
| 248 | | ONTNEWJ-582 | 1158 | 854.00 |
| 249 | | ONTNEWJ-584 | 1158 | 842.00 |
| 250 | | ONTNEWJ-586 | 1158 | 842.00 |
| 251 | | ONTNEWJ-588 | 1158 | 845.00 |
| 252 | | ONTNEWJ-592 | 1158 | 864.00 |
| 253 | | ONTNEWJ-598 | 1299 | 995.00 |
| 254 | | ONTNEWJ-622 | 1299 | 1,110.00 |
| 255 | | ONTNEWJ-628 | 1158 | 956.00 |

Near Term Scenario - City of Ontario - Junction Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 256 | | ONTNEWJ-631 | 1050 | 805.00 |
| 257 | | ONTNEWJ-632 | 1050 | 800.00 |
| 258 | | ONTNEWJ-634 | 1050 | 812.00 |
| 259 | | ONTNEWJ-636 | 1050 | 800.00 |
| 260 | | ONTNEWJ-638 | 1050 | 803.00 |
| 261 | | ONTNEWJ-640 | 1299 | 1,020.00 |
| 262 | | ONTNEWJ-646 | 1299 | 1,020.00 |
| 263 | | ONTNEWJ-908 | 1299 | 1,099.00 |
| 264 | | ONTNEWJ-910 | 1299 | 967.00 |
| 265 | | ONTNEWJ-914 | 1299 | 992.50 |
| 266 | | ONTNEWJ-934 | 1158 | 936.00 |
| 267 | | ONTNEWJ-936 | 1158 | 934.00 |
| 268 | | ONTNEWJ-950 | 1299 | 1,020.00 |
| 269 | | ONTNEWJ402 | 930 | 652.53 |
| 270 | | ONTNEWJ_630 | 1050 | 805.00 |
| 271 | | ONTPHLP-3606 | 930 | 753.22 |
| 272 | | ONTPHLP-3610 | 1050 | 799.50 |
| 273 | | ONTPICKUP-12 | 1050 | 760.27 |
| 274 | | ONTPICKUP-14 | 1050 | 777.77 |
| 275 | | ONTPICKUP-17 | 1050 | 790.00 |
| 276 | | ONTPICKUP-30 | 1158 | 835.00 |
| 277 | | ONTPICKUP-32 | 1158 | 925.00 |
| 278 | | ONTPICKUP-42 | 1299 | 1,093.00 |
| 279 | | ONTPICKUP-48 | 1158 | 884.75 |
| 280 | | ONTPICKUP-51 | 1299 | 1,110.62 |
| 281 | | ONTPICKUP-6 | 1158 | 961.87 |
| 282 | | ONTPICKUP-65 | 1158 | 910.16 |
| 283 | | ONTPICKUP-68 | 1299 | 968.54 |
| 284 | | ONTPICKUP-71 | 1158 | 907.45 |
| 285 | | ONTPICKUP-72 | 1299 | 1,094.10 |
| 286 | | ONTTOP50-10 | 1158 | 974.34 |
| 287 | | ONTTOP50-15 | 1299 | 979.36 |
| 288 | | ONTTOP50-18 | 1299 | 988.07 |
| 289 | | ONTTOP50-22 | 1299 | 973.68 |
| 290 | | ONTTOP50-40 | 1299 | 1,109.15 |
| 291 | | ONTTOP50-48 | 1158 | 877.76 |
| 292 | | ONTTOP50-6 | 1050 | 761.11 |

Near Term Scenario - City of Ontario - Junctions Input Data

| * NEAR-TERM * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) |
|---|---|---|---|---|
| 1 | ☐ | J1272 | 37.97 | Landscape |
| 2 | ☐ | J1274 | 48.55 | Landscape |
| 3 | ☐ | J1276 | 5.26 | Landscape |
| 4 | ☐ | J1280 | 15.30 | Landscape |
| 5 | ☐ | J1288 | 15.59 | LANDSCAPE |
| 6 | ☐ | J1290 | 21.80 | Landscape |
| 7 | ☐ | J1292 | 0.00 | |
| 8 | ☐ | J1294 | 120.13 | Ontario_1158 |
| 9 | ☐ | J1296 | 0.00 | |
| 10 | ☐ | J1302 | 0.00 | |
| 11 | ☐ | J1304 | 0.00 | |
| 12 | ☐ | J1308 | 0.00 | |
| 13 | ☐ | J1314 | 0.00 | |
| 14 | ☐ | J1316 | 28.99 | Landscape |
| 15 | ☐ | J1320 | 206.67 | Landscape |
| 16 | ☐ | J1322 | 0.00 | |
| 17 | ☐ | J1324 | 0.00 | |
| 18 | ☐ | J1404 | 0.00 | |
| 19 | ☐ | J1406 | 64.76 | Landscape |
| 20 | ☐ | J1408 | 1.47 | Landscape |
| 21 | ☐ | J1410 | 0.00 | |
| 22 | ☐ | J1412 | 0.00 | |
| 23 | ☐ | J1414 | 0.00 | |
| 24 | ☐ | J1416 | 0.00 | |
| 25 | ☐ | J1586 | 0.00 | |
| 26 | ☐ | J1592 | 0.00 | |
| 27 | ☐ | J1596 | 0.00 | |
| 28 | ☐ | JKELLOG | 0.00 | |
| 29 | ☐ | JSCH_HYD | 8.77 | Ontario_Ranch |
| 30 | ☐ | J_ONT-1 | 50.66 | Landscape |
| 31 | ☐ | J_ONT-103 | 13.15 | Ontario_Ranch |
| 32 | ☐ | J_ONT-105 | 0.00 | |
| 33 | ☐ | J_ONT-107 | 0.00 | |
| 34 | ☐ | J_ONT-109 | 0.00 | |
| 35 | ☐ | J_ONT-113 | 0.00 | |
| 36 | ☐ | J_ONT-115 | 0.00 | |
| 37 | ☐ | J_ONT-117 | 0.00 | |
| 38 | ☐ | J_ONT-119 | 0.00 | |
| 39 | ☐ | J_ONT-133 | 0.00 | |
| 40 | ☐ | J_ONT-135 | 0.00 | |
| 41 | ☐ | J_ONT-137 | 242.69 | Ontario_Ranch |
| 42 | ☐ | J_ONT-139 | 0.00 | |
| 43 | ☐ | J_ONT-141 | 0.00 | |
| 44 | ☐ | J_ONT-143 | 0.00 | |
| 45 | ☐ | J_ONT-145 | 0.00 | |
| 46 | ☐ | J_ONT-147 | 0.00 | |
| 47 | ☐ | J_ONT-149 | 0.00 | |
| 48 | ☐ | J_ONT-151 | 0.00 | |
| 49 | ☐ | J_ONT-153 | 0.00 | |
| 50 | ☐ | J_ONT-155 | 0.00 | |
| 51 | ☐ | J_ONT-157 | 0.00 | |
| 52 | ☐ | J_ONT-159 | 0.00 | |
| 53 | ☐ | J_ONT-161 | 0.00 | |
| 54 | ☐ | J_ONT-163 | 242.09 | Ontario_Ranch |
| 55 | ☐ | J_ONT-165 | 0.00 | |
| 56 | ☐ | J_ONT-167 | 0.00 | |
| 57 | ☐ | J_ONT-169 | 0.00 | |

Near Term Scenario - City of Ontario - Junctions Input Data

| * NEAR-TERM * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) |
|---|---|---|---|---|
| 58 | ☐ | J_ONT-171 | 0.00 | |
| 59 | ☐ | J_ONT-173 | 93.35 | Ontario_Ranch |
| 60 | ☐ | J_ONT-175 | 0.00 | |
| 61 | ☐ | J_ONT-177 | 0.00 | |
| 62 | ☐ | J_ONT-179 | 125.68 | Ontario_Ranch |
| 63 | ☐ | J_ONT-181 | 0.00 | |
| 64 | ☐ | J_ONT-185 | 0.00 | |
| 65 | ☐ | J_ONT-187 | 0.00 | |
| 66 | ☐ | J_ONT-189 | 0.00 | |
| 67 | ☐ | J_ONT-191 | 0.00 | |
| 68 | ☐ | J_ONT-193 | 0.00 | |
| 69 | ☐ | J_ONT-195 | 0.00 | |
| 70 | ☐ | J_ONT-197 | 0.00 | |
| 71 | ☐ | J_ONT-199 | 0.00 | |
| 72 | ☐ | J_ONT-201 | 0.00 | |
| 73 | ☐ | J_ONT-203 | 0.00 | |
| 74 | ☐ | J_ONT-205 | 128.35 | Ontario_Ranch |
| 75 | ☐ | J_ONT-207 | 0.00 | |
| 76 | ☐ | J_ONT-209 | 16.88 | Ontario_Ranch |
| 77 | ☐ | J_ONT-211 | 0.00 | |
| 78 | ☐ | J_ONT-213 | 0.00 | |
| 79 | ☐ | J_ONT-215 | 0.00 | |
| 80 | ☐ | J_ONT-217 | 0.00 | |
| 81 | ☐ | J_ONT-219 | 0.00 | |
| 82 | ☐ | J_ONT-221 | 0.00 | |
| 83 | ☐ | J_ONT-223 | 0.00 | |
| 84 | ☐ | J_ONT-225 | 0.00 | |
| 85 | ☐ | J_ONT-227 | 0.00 | |
| 86 | ☐ | J_ONT-229 | 0.00 | |
| 87 | ☐ | J_ONT-231 | 0.00 | |
| 88 | ☐ | J_ONT-233 | 0.00 | |
| 89 | ☐ | J_ONT-235 | 0.00 | |
| 90 | ☐ | J_ONT-237 | 0.00 | |
| 91 | ☐ | J_ONT-239 | 0.00 | |
| 92 | ☐ | J_ONT-243 | 0.00 | |
| 93 | ☐ | J_ONT-247 | 100.00 | ONTARIO_RANCH |
| 94 | ☐ | J_ONT-249 | 0.00 | |
| 95 | ☐ | J_ONT-251 | 0.00 | |
| 96 | ☐ | J_ONT-253 | 0.00 | |
| 97 | ☐ | J_ONT-255 | 0.00 | |
| 98 | ☐ | J_ONT-257 | 50.00 | Landscape |
| 99 | ☐ | J_ONT-259 | 25.51 | Landscape |
| 100 | ☐ | J_ONT-261 | 0.00 | |
| 101 | ☐ | J_ONT-263 | 0.00 | Landscape |
| 102 | ☐ | J_ONT-265 | 0.00 | |
| 103 | ☐ | J_ONT-267 | 0.00 | |
| 104 | ☐ | J_ONT-271 | 0.00 | |
| 105 | ☐ | J_ONT-273 | 82.66 | Ontario_Ranch |
| 106 | ☐ | J_ONT-275 | 0.00 | |
| 107 | ☐ | J_ONT-277 | 0.00 | |
| 108 | ☐ | J_ONT-279 | 0.00 | |
| 109 | ☐ | J_ONT-281 | 0.00 | |
| 110 | ☐ | J_ONT-283 | 0.00 | |
| 111 | ☐ | J_ONT-285 | 0.00 | |
| 112 | ☐ | J_ONT-287 | 0.00 | |
| 113 | ☐ | J_ONT-289 | 0.00 | |
| 114 | ☐ | J_ONT-291 | 0.00 | |

Near Term Scenario - City of Ontario - Junctions Input Data

| * NEAR-TERM * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) |
|---|---|---|---|---|
| 115 | ☐ | J_ONT-295 | 0.00 | |
| 116 | ☐ | J_ONT-297 | 25.60 | Ontario_Ranch |
| 117 | ☐ | J_ONT-299 | 0.00 | |
| 118 | ☐ | J_ONT-301 | 9.16 | Ontario_Ranch |
| 119 | ☐ | J_ONT-305 | 49.47 | Ontario_Ranch |
| 120 | ☐ | J_ONT-313 | 6.98 | Ontario_Ranch |
| 121 | ☐ | J_ONT-315 | 0.00 | |
| 122 | ☐ | J_ONT-317 | 0.00 | |
| 123 | ☐ | J_ONT-319 | 0.00 | |
| 124 | ☐ | J_ONT-321 | 0.00 | |
| 125 | ☐ | J_ONT-325 | 0.00 | |
| 126 | ☐ | J_ONT-333 | 0.00 | |
| 127 | ☐ | J_ONT-341 | 0.00 | |
| 128 | ☐ | J_ONT-343 | 0.00 | |
| 129 | ☐ | J_ONT-351 | 0.00 | |
| 130 | ☐ | J_ONT-357 | 0.00 | |
| 131 | ☐ | J_ONT-359 | 26.15 | Landscape |
| 132 | ☐ | J_ONT-361 | 64.38 | Landscape |
| 133 | ☐ | J_ONT-363 | 0.00 | |
| 134 | ☐ | J_ONT-365 | 0.00 | |
| 135 | ☐ | J_ONT-367 | 0.00 | |
| 136 | ☐ | J_ONT-369 | 42.55 | Landscape |
| 137 | ☐ | J_ONT-371 | 0.00 | |
| 138 | ☐ | J_ONT-373 | 0.00 | |
| 139 | ☐ | J_ONT-377 | 40.87 | Landscape |
| 140 | ☐ | J_ONT-379 | 59.95 | Landscape |
| 141 | ☐ | J_ONT-381 | 0.00 | |
| 142 | ☐ | J_ONT-383 | 5.13 | Landscape |
| 143 | ☐ | J_ONT-387 | 0.00 | |
| 144 | ☐ | J_ONT-399 | 0.00 | |
| 145 | ☐ | J_ONT-401 | 28.43 | Landscape |
| 146 | ☐ | J_ONT-403 | 0.00 | |
| 147 | ☐ | J_ONT-405 | 0.00 | |
| 148 | ☐ | J_ONT-407 | 2.67 | Landscape |
| 149 | ☐ | J_ONT-409 | 105.04 | ONTARIO_RANCH |
| 150 | ☐ | J_ONT-421 | 0.00 | |
| 151 | ☐ | J_ONT-423 | 0.00 | |
| 152 | ☐ | J_ONT-425 | 0.00 | |
| 153 | ☐ | J_ONT-427 | | |
| 154 | ☐ | J_ONT-473 | | |
| 155 | ☐ | J_ONT-477 | 0.00 | |
| 156 | ☐ | J_ONT-489 | | |
| 157 | ☐ | J_ONT-503 | 18.18 | Landscape |
| 158 | ☐ | J_ONT-507 | 0.00 | |
| 159 | ☐ | J_ONT-509 | 0.00 | |
| 160 | ☐ | J_ONT-511 | 50.04 | Landscape |
| 161 | ☐ | J_ONT-513 | 24.54 | ONTARIO_1158 |
| 162 | ☐ | J_ONT-515 | | |
| 163 | ☐ | J_ONT-537 | | |
| 164 | ☐ | J_ONT-569 | | |
| 165 | ☐ | J_ONT-609 | | |
| 166 | ☐ | J_ONT-613 | 8.96 | LANDSCAPE |
| 167 | ☐ | J_ONT-77 | 84.42 | Ontario_Ranch |
| 168 | ☐ | J_ONT-99 | 0.00 | |
| 169 | ☐ | ONT66 | 1.42 | Ontario_Ranch |
| 170 | ☐ | ONT68 | 0.00 | |
| 171 | ☐ | ONT72 | 0.00 | |

Near Term Scenario - City of Ontario - Junctions Input Data

| * NEAR-TERM * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) |
|---|---|---|---|---|
| 172 | ☐ | ONT76 | 0.00 | |
| 173 | ☐ | ONTFRAN-3581 | 0.00 | |
| 174 | ☐ | ONTFRAN-3583 | 11.04 | ONTARIO_RANCH |
| 175 | ☐ | ONTFRAN-3591 | 313.31 | Ontario_Ranch |
| 176 | ☐ | ONTFRAN-3592 | 191.42 | Ontario_Ranch |
| 177 | ☐ | ONTFRAN-3593 | 0.00 | |
| 178 | ☐ | ONTFRAN-3594 | 300.90 | Ontario_Ranch |
| 179 | ☐ | ONTFRAN-3595 | 92.83 | Ontario_Ranch |
| 180 | ☐ | ONTFRAN-3596 | 0.00 | |
| 181 | ☐ | ONTFRAN-3597 | 237.79 | Ontario_Ranch |
| 182 | ☐ | ONTFRAN-3598 | 88.00 | Ontario_Ranch |
| 183 | ☐ | ONTFRAN-3599 | 0.00 | |
| 184 | ☐ | ONTFRAN-3600 | 0.00 | |
| 185 | ☐ | ONTFRAN-3601 | 0.00 | |
| 186 | ☐ | ONTFRAN-3603 | 0.00 | |
| 187 | ☐ | ONTFRAN-3605 | 71.22 | Ontario_Ranch |
| 188 | ☐ | ONTFRAN-3606 | 101.70 | Ontario_Ranch |
| 189 | ☐ | ONTFRAN-3607 | 59.64 | Ontario_Ranch |
| 190 | ☐ | ONTFRAN-3608 | 109.42 | Ontario_Ranch |
| 191 | ☐ | ONTFRAN-3618 | 0.00 | |
| 192 | ☐ | ONTFRAN-3619 | 0.00 | |
| 193 | ☐ | ONTFRAN-3620 | 220.30 | Ontario_Ranch |
| 194 | ☐ | ONTFRAN-3622 | 0.00 | |
| 195 | ☐ | ONTFRAN-3626 | 0.00 | |
| 196 | ☐ | ONTJ114 | 103.79 | Ontario_1158 |
| 197 | ☐ | ONTJ12 | 79.39 | Ontario_Ranch |
| 198 | ☐ | ONTJ19 | 0.00 | |
| 199 | ☐ | ONTNEWJ-198 | 1.10 | Landscape |
| 200 | ☐ | ONTNEWJ-212 | 0.00 | |
| 201 | ☐ | ONTNEWJ-214 | 207.68 | Ontario_Ranch |
| 202 | ☐ | ONTNEWJ-224 | 0.00 | |
| 203 | ☐ | ONTNEWJ-262 | 0.00 | |
| 204 | ☐ | ONTNEWJ-278 | 95.39 | Landscape |
| 205 | ☐ | ONTNEWJ-322 | 0.00 | |
| 206 | ☐ | ONTNEWJ-340 | 0.00 | |
| 207 | ☐ | ONTNEWJ-348 | 0.00 | |
| 208 | ☐ | ONTNEWJ-354 | 0.00 | |
| 209 | ☐ | ONTNEWJ-356 | 0.00 | |
| 210 | ☐ | ONTNEWJ-378 | 0.00 | |
| 211 | ☐ | ONTNEWJ-396 | 0.00 | |
| 212 | ☐ | ONTNEWJ-398 | 0.00 | |
| 213 | ☐ | ONTNEWJ-399 | 0.00 | |
| 214 | ☐ | ONTNEWJ-430 | 165.08 | Ontario_Ranch |
| 215 | ☐ | ONTNEWJ-432 | 0.00 | |
| 216 | ☐ | ONTNEWJ-436 | 0.00 | |
| 217 | ☐ | ONTNEWJ-438 | 0.00 | |
| 218 | ☐ | ONTNEWJ-470 | 35.41 | Landscape |
| 219 | ☐ | ONTNEWJ-478 | 0.00 | |
| 220 | ☐ | ONTNEWJ-482 | 0.00 | |
| 221 | ☐ | ONTNEWJ-492 | 136.65 | ONTARIO_RANCH |
| 222 | ☐ | ONTNEWJ-496 | 0.00 | |
| 223 | ☐ | ONTNEWJ-498 | 139.62 | ONTARIO_RANCH |
| 224 | ☐ | ONTNEWJ-500 | 0.00 | |
| 225 | ☐ | ONTNEWJ-502 | 0.00 | |
| 226 | ☐ | ONTNEWJ-510 | 130.36 | Landscape |
| 227 | ☐ | ONTNEWJ-516 | 0.00 | |
| 228 | ☐ | ONTNEWJ-520 | 6.53 | Landscape |

Near Term Scenario - City of Ontario - Junctions Input Data

| * NEAR-TERM * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) |
|---|---|---|---|---|
| 229 | ☐ | ONTNEWJ-522 | 0.00 | |
| 230 | ☐ | ONTNEWJ-526 | 56.39 | Landscape |
| 231 | ☐ | ONTNEWJ-528 | 0.00 | |
| 232 | ☐ | ONTNEWJ-530 | 0.00 | |
| 233 | ☐ | ONTNEWJ-542 | 0.00 | |
| 234 | ☐ | ONTNEWJ-544 | 0.00 | |
| 235 | ☐ | ONTNEWJ-546 | 0.00 | |
| 236 | ☐ | ONTNEWJ-548 | 0.00 | |
| 237 | ☐ | ONTNEWJ-550 | 0.00 | |
| 238 | ☐ | ONTNEWJ-554 | 255.60 | Ontario_1158 |
| 239 | ☐ | ONTNEWJ-555 | 0.00 | |
| 240 | ☐ | ONTNEWJ-556 | 0.00 | |
| 241 | ☐ | ONTNEWJ-558 | 24.54 | ONTARIO_1158 |
| 242 | ☐ | ONTNEWJ-560 | 0.00 | |
| 243 | ☐ | ONTNEWJ-562 | 0.00 | |
| 244 | ☐ | ONTNEWJ-564 | 0.00 | |
| 245 | ☐ | ONTNEWJ-568 | 0.00 | |
| 246 | ☐ | ONTNEWJ-576 | 0.00 | |
| 247 | ☐ | ONTNEWJ-578 | 0.00 | |
| 248 | ☐ | ONTNEWJ-582 | 0.00 | |
| 249 | ☐ | ONTNEWJ-584 | 0.00 | |
| 250 | ☐ | ONTNEWJ-586 | 0.00 | |
| 251 | ☐ | ONTNEWJ-588 | 0.00 | |
| 252 | ☐ | ONTNEWJ-592 | 0.00 | |
| 253 | ☐ | ONTNEWJ-598 | 46.98 | Landscape |
| 254 | ☐ | ONTNEWJ-622 | 0.00 | |
| 255 | ☐ | ONTNEWJ-628 | 89.99 | Ontario_1158 |
| 256 | ☐ | ONTNEWJ-631 | 0.00 | |
| 257 | ☐ | ONTNEWJ-632 | 0.00 | |
| 258 | ☐ | ONTNEWJ-634 | 139.62 | ONTARIO_RANCH |
| 259 | ☐ | ONTNEWJ-636 | 72.48 | ONTARIO_RANCH |
| 260 | ☐ | ONTNEWJ-638 | 72.48 | ONTARIO_RANCH |
| 261 | ☐ | ONTNEWJ-640 | 0.00 | |
| 262 | ☐ | ONTNEWJ-646 | 61.33 | Landscape |
| 263 | ☐ | ONTNEWJ-908 | 138.60 | Landscape |
| 264 | ☐ | ONTNEWJ-910 | 0.00 | |
| 265 | ☐ | ONTNEWJ-914 | 0.00 | |
| 266 | ☐ | ONTNEWJ-934 | 0.00 | |
| 267 | ☐ | ONTNEWJ-936 | 0.00 | |
| 268 | ☐ | ONTNEWJ-950 | 0.00 | |
| 269 | ☐ | ONTNEWJ402 | 702.34 | ONTARIO_RANCH |
| 270 | ☐ | ONTNEWJ_630 | 139.62 | ONTARIO_RANCH |
| 271 | ☐ | ONTPHLP-3606 | 0.00 | |
| 272 | ☐ | ONTPHLP-3610 | 372.78 | Ontario_Ranch |
| 273 | ☐ | ONTPICKUP-12 | 0.00 | |
| 274 | ☐ | ONTPICKUP-14 | 157.69 | Ontario_Ranch |
| 275 | ☐ | ONTPICKUP-17 | 0.00 | |
| 276 | ☐ | ONTPICKUP-30 | 0.00 | |
| 277 | ☐ | ONTPICKUP-32 | 254.39 | Ontario_1158 |
| 278 | ☐ | ONTPICKUP-42 | 0.00 | |
| 279 | ☐ | ONTPICKUP-48 | 0.00 | |
| 280 | ☐ | ONTPICKUP-51 | 0.00 | |
| 281 | ☐ | ONTPICKUP-6 | 0.00 | |
| 282 | ☐ | ONTPICKUP-65 | 0.00 | |
| 283 | ☐ | ONTPICKUP-68 | 82.87 | Landscape |
| 284 | ☐ | ONTPICKUP-71 | 0.00 | |
| 285 | ☐ | ONTPICKUP-72 | 25.00 | Landscape |

| * NEAR-TERM * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) |
|---|---|---|---|---|
| 286 | ☐ | ONTTOP50-10 | 0.00 | |
| 287 | ☐ | ONTTOP50-15 | 118.61 | Landscape |
| 288 | ☐ | ONTTOP50-18 | 0.00 | |
| 289 | ☐ | ONTTOP50-22 | 0.00 | |
| 290 | ☐ | ONTTOP50-40 | 0.00 | |
| 291 | ☐ | ONTTOP50-48 | 0.00 | |
| 292 | ☐ | ONTTOP50-6 | 0.00 | |

Near Term Scenario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 1 | ☐ | 2011_P14 | 373.88 | 8.00 | 130.00 | 0.00 |
| 2 | ☐ | 2011_P15 | 962.69 | 8.00 | 100.00 | 0.00 |
| 3 | ☐ | 2011_P17 | 325.69 | 8.00 | 130.00 | 0.00 |
| 4 | ☐ | 2011_P18 | 128.01 | 12.00 | 130.00 | 0.00 |
| 5 | ☐ | 2011_P19 | 536.66 | 12.00 | 130.00 | 0.00 |
| 6 | ☐ | 800ZONE_V1 | 98.84 | 16.00 | 150.00 | 0.00 |
| 7 | ☐ | 800ZONE_V2 | 61.66 | 16.00 | 150.00 | 0.00 |
| 8 | ☐ | ONT283 | 45.13 | 42.00 | 130.00 | 0.00 |
| 9 | ☐ | ONT9024 | 1,861.37 | 24.00 | 129.90 | 0.00 |
| 10 | ☐ | ONT9034 | 878.87 | 16.00 | 130.00 | 0.00 |
| 11 | ☐ | ONT9036 | 1,494.62 | 16.00 | 130.00 | 0.00 |
| 12 | ☐ | ONT9042 | 1,301.52 | 16.00 | 130.00 | 0.00 |
| 13 | ☐ | ONT9048 | 1,466.41 | 12.00 | 130.00 | 0.00 |
| 14 | ☐ | ONT9052 | 1,456.84 | 12.00 | 130.00 | 0.00 |
| 15 | ☐ | ONT9068 | 2,509.56 | 12.00 | 130.00 | 0.00 |
| 16 | ☐ | ONTFRAN-3590 | 2,281.59 | 12.00 | 130.00 | 0.00 |
| 17 | ☐ | ONTFRAN-3600 | 2,415.15 | 24.00 | 130.00 | 0.00 |
| 18 | ☐ | ONTFRAN-3617 | 1,125.95 | 24.00 | 130.00 | 0.00 |
| 19 | ☐ | ONTFRAN-3618 | 302.48 | 12.00 | 130.00 | 0.00 |
| 20 | ☐ | ONTFRAN-3620 | 616.50 | 12.00 | 130.00 | 0.00 |
| 21 | ☐ | ONTFRAN-3621 | 2,561.70 | 12.00 | 130.00 | 0.00 |
| 22 | ☐ | ONTFRAN-3622 | 2,654.69 | 12.00 | 130.00 | 0.00 |
| 23 | ☐ | ONTFRAN-3624 | 3,119.97 | 8.00 | 130.00 | 0.00 |
| 24 | ☐ | ONTFRAN-3625 | 3,403.01 | 12.00 | 130.00 | 0.00 |
| 25 | ☐ | ONTFRAN-3626 | 2,648.24 | 12.00 | 130.00 | 0.00 |
| 26 | ☐ | ONTFRAN-3627 | 2,180.56 | 16.00 | 130.00 | 0.00 |
| 27 | ☐ | ONTFRAN-3628 | 1,393.06 | 16.00 | 130.00 | 0.00 |
| 28 | ☐ | ONTFRAN-3629 | 1,795.09 | 16.00 | 130.00 | 0.00 |
| 29 | ☐ | ONTFRAN-3632 | 1,788.53 | 16.00 | 130.00 | 0.00 |
| 30 | ☐ | ONTFRAN-3633 | 2,552.79 | 8.00 | 130.00 | 0.00 |
| 31 | ☐ | ONTFRAN-3634 | 2,316.14 | 16.00 | 130.00 | 0.00 |
| 32 | ☐ | ONTFRAN-3635 | 1,319.73 | 8.00 | 130.00 | 0.00 |
| 33 | ☐ | ONTFRAN-3640 | 2,653.41 | 8.00 | 130.00 | 0.00 |
| 34 | ☐ | ONTFRAN-3642 | 2,718.37 | 8.00 | 130.00 | 0.00 |
| 35 | ☐ | ONTFRAN-3645 | 1,341.66 | 12.00 | 130.00 | 0.00 |
| 36 | ☐ | ONTFRAN-3693 | 1,301.23 | 12.00 | 130.00 | 0.00 |
| 37 | ☐ | ONTFRAN-3694 | 1,162.41 | 16.00 | 130.00 | 0.00 |
| 38 | ☐ | ONTFRAN-3706 | 139.34 | 24.00 | 130.00 | 0.00 |
| 39 | ☐ | ONTNEWP-10016 | 157.83 | 8.00 | 130.00 | 0.00 |
| 40 | ☐ | ONTNEWP-10017 | 96.03 | 8.00 | 130.00 | 0.00 |
| 41 | ☐ | ONTNEWP-10026 | 910.92 | 8.00 | 130.00 | 0.00 |
| 42 | ☐ | ONTNEWP-10044 | 201.93 | 8.00 | 130.00 | 0.00 |
| 43 | ☐ | ONTNEWP-908 | 878.23 | 8.00 | 130.00 | 0.00 |
| 44 | ☐ | ONTNEWP-910 | 380.88 | 8.00 | 130.00 | 0.00 |
| 45 | ☐ | ONTNEWP-914 | 642.60 | 12.00 | 130.00 | 0.00 |
| 46 | ☐ | ONTNEWP-9170 | 207.39 | 8.00 | 130.00 | 0.00 |
| 47 | ☐ | ONTNEWP-9252 | 412.78 | 8.00 | 130.00 | 0.00 |
| 48 | ☐ | ONTNEWP-9276 | 100.39 | 24.00 | 129.90 | 0.00 |
| 49 | ☐ | ONTNEWP-9320 | 1,078.67 | 8.00 | 130.00 | 0.00 |
| 50 | ☐ | ONTNEWP-9322 | 178.65 | 8.00 | 130.00 | 0.00 |
| 51 | ☐ | ONTNEWP-934 | 606.33 | 8.00 | 130.00 | 0.00 |
| 52 | ☐ | ONTNEWP-9384 | 83.35 | 12.00 | 130.00 | 0.00 |
| 53 | ☐ | ONTNEWP-9400 | 1,614.80 | 8.00 | 130.00 | 0.00 |
| 54 | ☐ | ONTNEWP-9434 | 58.47 | 8.00 | 130.00 | 0.00 |
| 55 | ☐ | ONTNEWP-9440 | 258.65 | 8.00 | 130.00 | 0.00 |
| 56 | ☐ | ONTNEWP-9494 | 108.24 | 8.00 | 130.00 | 0.00 |
| 57 | ☐ | ONTNEWP-9512 | 142.43 | 8.00 | 130.00 | 0.00 |

Near Term Scenario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 58 | ☐ | ONTNEWP-9514 | 73.92 | 8.00 | 130.00 | 0.00 |
| 59 | ☐ | ONTNEWP-9554 | 1,604.77 | 24.00 | 130.00 | 0.00 |
| 60 | ☐ | ONTNEWP-9556 | 40.59 | 8.00 | 130.00 | 0.00 |
| 61 | ☐ | ONTNEWP-9572 | 56.47 | 8.00 | 130.00 | 0.00 |
| 62 | ☐ | ONTNEWP-9578 | 275.26 | 8.00 | 130.00 | 0.00 |
| 63 | ☐ | ONTNEWP-9590 | 55.67 | 8.00 | 130.00 | 0.00 |
| 64 | ☐ | ONTNEWP-9596 | 1,084.77 | 16.00 | 130.00 | 0.00 |
| 65 | ☐ | ONTNEWP-9600 | 425.19 | 8.00 | 130.00 | 0.00 |
| 66 | ☐ | ONTNEWP-9602 | 628.83 | 24.00 | 129.90 | 0.00 |
| 67 | ☐ | ONTNEWP-9662 | 74.14 | 8.00 | 130.00 | 0.00 |
| 68 | ☐ | ONTNEWP-9664 | 888.03 | 8.00 | 130.00 | 0.00 |
| 69 | ☐ | ONTNEWP-9668 | 465.68 | 8.00 | 130.00 | 0.00 |
| 70 | ☐ | ONTNEWP-9704 | 606.10 | 8.00 | 130.00 | 0.00 |
| 71 | ☐ | ONTNEWP-9712 | 297.60 | 12.00 | 130.00 | 0.00 |
| 72 | ☐ | ONTNEWP-9714 | 170.69 | 8.00 | 130.00 | 0.00 |
| 73 | ☐ | ONTNEWP-9774 | 2,010.90 | 8.00 | 130.00 | 0.00 |
| 74 | ☐ | ONTNEWP-9776 | 2,636.37 | 16.00 | 130.00 | 0.00 |
| 75 | ☐ | ONTNEWP-9778 | 1,315.66 | 12.00 | 130.00 | 0.00 |
| 76 | ☐ | ONTNEWP-9780 | 2,567.84 | 8.00 | 130.00 | 0.00 |
| 77 | ☐ | ONTNEWP-9786 | 2,634.84 | 8.00 | 130.00 | 0.00 |
| 78 | ☐ | ONTNEWP-9798 | 413.06 | 12.00 | 130.00 | 0.00 |
| 79 | ☐ | ONTNEWP-9810 | 493.88 | 24.00 | 130.00 | 0.00 |
| 80 | ☐ | ONTNEWP-9846 | 649.71 | 16.00 | 130.00 | 0.00 |
| 81 | ☐ | ONTNEWP-9854 | 225.67 | 8.00 | 130.00 | 0.00 |
| 82 | ☐ | ONTNEWP-9860 | 2,193.91 | 8.00 | 130.00 | 0.00 |
| 83 | ☐ | ONTNEWP-9861 | 444.03 | 8.00 | 130.00 | 0.00 |
| 84 | ☐ | ONTNEWP-9864 | 490.66 | 12.00 | 130.00 | 0.00 |
| 85 | ☐ | ONTNEWP-9870 | 152.28 | 24.00 | 130.00 | 0.00 |
| 86 | ☐ | ONTNEWP-9884 | 483.65 | 8.00 | 130.00 | 0.00 |
| 87 | ☐ | ONTNEWP-9885 | 1,032.54 | 8.00 | 130.00 | 0.00 |
| 88 | ☐ | ONTNEWP-9886 | 966.94 | 8.00 | 130.00 | 0.00 |
| 89 | ☐ | ONTNEWP-9887 | 1,672.19 | 8.00 | 130.00 | 0.00 |
| 90 | ☐ | ONTNEWP-9889 | 804.75 | 8.00 | 130.00 | 0.00 |
| 91 | ☐ | ONTNEWP-9890 | 343.61 | 12.00 | 130.00 | 0.00 |
| 92 | ☐ | ONTNEWP-9891 | 490.48 | 8.00 | 130.00 | 0.00 |
| 93 | ☐ | ONTNEWP-9892 | 972.35 | 12.00 | 130.00 | 0.00 |
| 94 | ☐ | ONTNEWP-9893 | 586.37 | 8.00 | 130.00 | 0.00 |
| 95 | ☐ | ONTNEWP-9894 | 500.54 | 12.00 | 130.00 | 0.00 |
| 96 | ☐ | ONTNEWP-9895 | 821.31 | 8.00 | 130.00 | 0.00 |
| 97 | ☐ | ONTNEWP-9896 | 662.68 | 12.00 | 130.00 | 0.00 |
| 98 | ☐ | ONTNEWP-9899 | 2,644.11 | 12.00 | 130.00 | 0.00 |
| 99 | ☐ | ONTNEWP-9900 | 2,385.20 | 12.00 | 130.00 | 0.00 |
| 100 | ☐ | ONTNEWP-9902 | 1,713.42 | 8.00 | 130.00 | 0.00 |
| 101 | ☐ | ONTNEWP-9912 | 1,165.49 | 8.00 | 130.00 | 0.00 |
| 102 | ☐ | ONTNEWP-9913 | 1,000.33 | 8.00 | 130.00 | 0.00 |
| 103 | ☐ | ONTNEWP-9916 | 1,880.87 | 8.00 | 130.00 | 0.00 |
| 104 | ☐ | ONTNEWP-9918 | 1,712.19 | 8.00 | 130.00 | 0.00 |
| 105 | ☐ | ONTNEWP-9919 | 25.63 | 8.00 | 130.00 | 0.00 |
| 106 | ☐ | ONTNEWP-9920 | 697.71 | 8.00 | 130.00 | 0.00 |
| 107 | ☐ | ONTNEWP-9922 | 1,349.84 | 8.00 | 130.00 | 0.00 |
| 108 | ☐ | ONTNEWP-9924 | 1,772.79 | 8.00 | 130.00 | 0.00 |
| 109 | ☐ | ONTNEWP-9926 | 2,665.81 | 8.00 | 130.00 | 0.00 |
| 110 | ☐ | ONTNEWP-9928 | 1,570.82 | 8.00 | 130.00 | 0.00 |
| 111 | ☐ | ONTNEWP-9932 | 1,189.23 | 8.00 | 130.00 | 0.00 |
| 112 | ☐ | ONTNEWP-9936 | 583.37 | 8.00 | 130.00 | 0.00 |
| 113 | ☐ | ONTNEWP-9940 | 2,657.09 | 8.00 | 130.00 | 0.00 |
| 114 | ☐ | ONTNEWP-9942 | 2,628.90 | 8.00 | 130.00 | 0.00 |

Near Term Scenario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 115 | ☐ | ONTNEWP-9944 | 1,311.26 | 12.00 | 130.00 | 0.00 |
| 116 | ☐ | ONTNEWP-9946 | 444.01 | 8.00 | 130.00 | 0.00 |
| 117 | ☐ | ONTNEWP-9958 | 843.27 | 8.00 | 130.00 | 0.00 |
| 118 | ☐ | ONTNEWP-9960 | 760.67 | 8.00 | 130.00 | 0.00 |
| 119 | ☐ | ONTNEWP-9962 | 321.07 | 8.00 | 130.00 | 0.00 |
| 120 | ☐ | ONTNEWP-9964 | 1,865.93 | 8.00 | 130.00 | 0.00 |
| 121 | ☐ | ONTNEWP-9968 | 1,671.54 | 8.00 | 130.00 | 0.00 |
| 122 | ☐ | ONTNEWP-9972 | 1,343.85 | 8.00 | 130.00 | 0.00 |
| 123 | ☐ | ONTNEWP-9974 | 2,640.61 | 12.00 | 130.00 | 0.00 |
| 124 | ☐ | ONTNEWP649 | 2,763.21 | 8.00 | 130.00 | 0.00 |
| 125 | ☐ | ONTP10024 | 1,339.83 | 12.00 | 130.00 | 0.00 |
| 126 | ☐ | ONTPHLP-3615 | 2,658.69 | 12.00 | 130.00 | 0.00 |
| 127 | ☐ | P10142 | 198.19 | 30.00 | 130.00 | 0.00 |
| 128 | ☐ | P10326 | 1,331.58 | 12.00 | 130.00 | 0.00 |
| 129 | ☐ | P10328 | 1,338.27 | 12.00 | 130.00 | 0.00 |
| 130 | ☐ | P10330 | 3,591.48 | 12.00 | 130.00 | 0.00 |
| 131 | ☐ | P10332 | 788.30 | 8.00 | 130.00 | 0.00 |
| 132 | ☐ | P10334 | 885.54 | 12.00 | 100.00 | 0.00 |
| 133 | ☐ | P10340 | 2,655.53 | 8.00 | 130.00 | 0.00 |
| 134 | ☐ | P10342 | 1,686.44 | 8.00 | 130.00 | 0.00 |
| 135 | ☐ | P10344 | 500.45 | 8.00 | 130.00 | 0.00 |
| 136 | ☐ | P10346 | 1,214.04 | 12.00 | 130.00 | 0.00 |
| 137 | ☐ | P10350 | 1,717.07 | 8.00 | 130.00 | 0.00 |
| 138 | ☐ | P10354 | 1,409.44 | 16.00 | 130.00 | 0.00 |
| 139 | ☐ | P10356 | 147.70 | 8.00 | 130.00 | 0.00 |
| 140 | ☐ | P10360 | 937.27 | 12.00 | 130.00 | 0.00 |
| 141 | ☐ | P10364 | 1,352.40 | 12.00 | 130.00 | 0.00 |
| 142 | ☐ | P10366 | 1,324.73 | 8.00 | 130.00 | 0.00 |
| 143 | ☐ | P10368 | 411.46 | 8.00 | 130.00 | 0.00 |
| 144 | ☐ | P10372 | 923.19 | 12.00 | 130.00 | 0.00 |
| 145 | ☐ | P10374 | 1,588.12 | 8.00 | 130.00 | 0.00 |
| 146 | ☐ | P10376 | 420.57 | 8.00 | 100.00 | 0.00 |
| 147 | ☐ | P10422 | 2,685.84 | 16.00 | 130.00 | 0.00 |
| 148 | ☐ | P10506 | 1,088.71 | 12.00 | 130.00 | 0.00 |
| 149 | ☐ | P10508 | 764.84 | 12.00 | 130.00 | 0.00 |
| 150 | ☐ | P10510 | 966.88 | 8.00 | 130.00 | 0.00 |
| 151 | ☐ | P10512 | 826.31 | 8.00 | 130.00 | 0.00 |
| 152 | ☐ | P10514 | 358.14 | 8.00 | 130.00 | 0.00 |
| 153 | ☐ | P10516 | 72.06 | 8.00 | 130.00 | 0.00 |
| 154 | ☐ | P10518 | 840.93 | 8.00 | 130.00 | 0.00 |
| 155 | ☐ | P10520 | 813.87 | 8.00 | 130.00 | 0.00 |
| 156 | ☐ | P10522 | 1,047.91 | 8.00 | 130.00 | 0.00 |
| 157 | ☐ | P10550 | 1,424.31 | 8.00 | 130.00 | 0.00 |
| 158 | ☐ | P186 | 2,742.17 | 16.00 | 130.00 | 0.00 |
| 159 | ☐ | P190 | 2,615.63 | 8.00 | 130.00 | 0.00 |
| 160 | ☐ | P39 | 666.18 | 8.00 | 130.00 | 0.00 |
| 161 | ☐ | P41 | 227.50 | 8.00 | 130.00 | 0.00 |
| 162 | ☐ | P63 | 300.71 | 8.00 | 130.00 | 0.00 |
| 163 | ☐ | P81 | 1,764.35 | 16.00 | 130.00 | 0.00 |
| 164 | ☐ | P87 | 621.53 | 8.00 | 130.00 | 0.00 |
| 165 | ☐ | PHYD_LAT | 464.40 | 6.00 | 130.00 | 0.00 |
| 166 | ☐ | PKELLOG | 1,300.25 | 12.00 | 130.00 | 0.00 |
| 167 | ☐ | PSCH_1 | 1,829.52 | 12.00 | 130.00 | 0.00 |
| 168 | ☐ | P_ONT-102 | 2,572.48 | 16.00 | 130.00 | 0.00 |
| 169 | ☐ | P_ONT-120 | 1,052.44 | 8.00 | 130.00 | 0.00 |
| 170 | ☐ | P_ONT-122 | 2,468.11 | 30.00 | 130.00 | 0.00 |
| 171 | ☐ | P_ONT-128 | 560.40 | 16.00 | 130.00 | 0.00 |

Near Term Scenario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 172 | ☐ | P_ONT-146 | 67.80 | 12.00 | 130.00 | 0.00 |
| 173 | ☐ | P_ONT-148 | 77.35 | 12.00 | 130.00 | 0.00 |
| 174 | ☐ | P_ONT-150 | 74.86 | 12.00 | 130.00 | 0.00 |
| 175 | ☐ | P_ONT-152 | 117.20 | 12.00 | 130.00 | 0.00 |
| 176 | ☐ | P_ONT-154 | 83.00 | 24.00 | 130.00 | 0.00 |
| 177 | ☐ | P_ONT-156 | 22.31 | 24.00 | 130.00 | 0.00 |
| 178 | ☐ | P_ONT-158 | 19.05 | 24.00 | 130.00 | 0.00 |
| 179 | ☐ | P_ONT-160 | 9.11 | 24.00 | 130.00 | 0.00 |
| 180 | ☐ | P_ONT-174 | 69.50 | 12.00 | 130.00 | 0.00 |
| 181 | ☐ | P_ONT-176 | 1,242.53 | 24.00 | 130.00 | 0.00 |
| 182 | ☐ | P_ONT-178 | 1,255.50 | 12.00 | 100.00 | 0.00 |
| 183 | ☐ | P_ONT-180 | 587.21 | 8.00 | 130.00 | 0.00 |
| 184 | ☐ | P_ONT-182 | 668.29 | 8.00 | 130.00 | 0.00 |
| 185 | ☐ | P_ONT-184 | 564.54 | 8.00 | 130.00 | 0.00 |
| 186 | ☐ | P_ONT-186 | 1,420.26 | 8.00 | 130.00 | 0.00 |
| 187 | ☐ | P_ONT-188 | 26.06 | 4.00 | 130.00 | 0.00 |
| 188 | ☐ | P_ONT-190 | 297.83 | 8.00 | 130.00 | 0.00 |
| 189 | ☐ | P_ONT-192 | 1,225.11 | 8.00 | 130.00 | 0.00 |
| 190 | ☐ | P_ONT-194 | 60.97 | 8.00 | 130.00 | 0.00 |
| 191 | ☐ | P_ONT-196 | 1,680.54 | 12.00 | 130.00 | 0.00 |
| 192 | ☐ | P_ONT-198 | 2,658.00 | 16.00 | 130.00 | 0.00 |
| 193 | ☐ | P_ONT-2 | 94.46 | 8.00 | 130.00 | 0.00 |
| 194 | ☐ | P_ONT-200 | 471.02 | 8.00 | 130.00 | 0.00 |
| 195 | ☐ | P_ONT-204 | 969.62 | 8.00 | 130.00 | 0.00 |
| 196 | ☐ | P_ONT-206 | 47.18 | 8.00 | 130.00 | 0.00 |
| 197 | ☐ | P_ONT-208 | 521.07 | 8.00 | 130.00 | 0.00 |
| 198 | ☐ | P_ONT-210 | 1,123.08 | 8.00 | 130.00 | 0.00 |
| 199 | ☐ | P_ONT-212 | 59.09 | 8.00 | 130.00 | 0.00 |
| 200 | ☐ | P_ONT-214 | 272.70 | 8.00 | 130.00 | 0.00 |
| 201 | ☐ | P_ONT-216 | 2,006.79 | 8.00 | 130.00 | 0.00 |
| 202 | ☐ | P_ONT-218 | 1,692.61 | 8.00 | 130.00 | 0.00 |
| 203 | ☐ | P_ONT-220 | 599.34 | 8.00 | 130.00 | 0.00 |
| 204 | ☐ | P_ONT-222 | 570.91 | 8.00 | 130.00 | 0.00 |
| 205 | ☐ | P_ONT-224 | 172.01 | 8.00 | 130.00 | 0.00 |
| 206 | ☐ | P_ONT-226 | 1,324.95 | 16.00 | 130.00 | 0.00 |
| 207 | ☐ | P_ONT-228 | 970.68 | 8.00 | 130.00 | 0.00 |
| 208 | ☐ | P_ONT-230 | 1,192.23 | 16.00 | 130.00 | 0.00 |
| 209 | ☐ | P_ONT-232 | 162.89 | 8.00 | 130.00 | 0.00 |
| 210 | ☐ | P_ONT-234 | 1,424.05 | 8.00 | 130.00 | 0.00 |
| 211 | ☐ | P_ONT-236 | 391.16 | 8.00 | 130.00 | 0.00 |
| 212 | ☐ | P_ONT-238 | 270.79 | 8.00 | 130.00 | 0.00 |
| 213 | ☐ | P_ONT-240 | 140.69 | 8.00 | 130.00 | 0.00 |
| 214 | ☐ | P_ONT-242 | 22.56 | 2.00 | 130.00 | 0.00 |
| 215 | ☐ | P_ONT-244 | 187.64 | 16.00 | 130.00 | 0.00 |
| 216 | ☐ | P_ONT-246 | 746.58 | 8.00 | 130.00 | 0.00 |
| 217 | ☐ | P_ONT-248 | 670.54 | 8.00 | 130.00 | 0.00 |
| 218 | ☐ | P_ONT-250 | 143.89 | 8.00 | 130.00 | 0.00 |
| 219 | ☐ | P_ONT-252 | 443.25 | 8.00 | 130.00 | 0.00 |
| 220 | ☐ | P_ONT-254 | 648.48 | 8.00 | 130.00 | 0.00 |
| 221 | ☐ | P_ONT-256 | 120.48 | 8.00 | 130.00 | 0.00 |
| 222 | ☐ | P_ONT-258 | 1,808.44 | 8.00 | 130.00 | 0.00 |
| 223 | ☐ | P_ONT-260 | 952.15 | 8.00 | 130.00 | 0.00 |
| 224 | ☐ | P_ONT-262 | 1,292.82 | 12.00 | 130.00 | 0.00 |
| 225 | ☐ | P_ONT-264 | 919.91 | 8.00 | 130.00 | 0.00 |
| 226 | ☐ | P_ONT-266 | 346.22 | 8.00 | 130.00 | 0.00 |
| 227 | ☐ | P_ONT-268 | 168.63 | 8.00 | 130.00 | 0.00 |
| 228 | ☐ | P_ONT-270 | 686.73 | 8.00 | 130.00 | 0.00 |

Near Term Scenario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 229 | ☐ | P_ONT-272 | 462.41 | 8.00 | 100.00 | 0.00 |
| 230 | ☐ | P_ONT-274 | 107.99 | 8.00 | 130.00 | 0.00 |
| 231 | ☐ | P_ONT-276 | 734.97 | 8.00 | 130.00 | 0.00 |
| 232 | ☐ | P_ONT-278 | 210.60 | 8.00 | 130.00 | 0.00 |
| 233 | ☐ | P_ONT-280 | 654.69 | 8.00 | 100.00 | 0.00 |
| 234 | ☐ | P_ONT-282 | 458.27 | 8.00 | 130.00 | 0.00 |
| 235 | ☐ | P_ONT-284 | 150.92 | 8.00 | 130.00 | 0.00 |
| 236 | ☐ | P_ONT-286 | 338.69 | 8.00 | 130.00 | 0.00 |
| 237 | ☐ | P_ONT-288 | 418.63 | 8.00 | 130.00 | 0.00 |
| 238 | ☐ | P_ONT-290 | 226.11 | 8.00 | 130.00 | 0.00 |
| 239 | ☐ | P_ONT-292 | 407.83 | 8.00 | 130.00 | 0.00 |
| 240 | ☐ | P_ONT-294 | 359.41 | 8.00 | 130.00 | 0.00 |
| 241 | ☐ | P_ONT-296 | 482.43 | 8.00 | 130.00 | 0.00 |
| 242 | ☐ | P_ONT-298 | 238.49 | 8.00 | 130.00 | 0.00 |
| 243 | ☐ | P_ONT-300 | 804.32 | 8.00 | 130.00 | 0.00 |
| 244 | ☐ | P_ONT-302 | 1,603.88 | 8.00 | 130.00 | 0.00 |
| 245 | ☐ | P_ONT-304 | 735.32 | 8.00 | 130.00 | 0.00 |
| 246 | ☐ | P_ONT-306 | 976.70 | 8.00 | 130.00 | 0.00 |
| 247 | ☐ | P_ONT-308 | 328.33 | 8.00 | 130.00 | 0.00 |
| 248 | ☐ | P_ONT-310 | 1,319.62 | 8.00 | 130.00 | 0.00 |
| 249 | ☐ | P_ONT-312 | 418.46 | 8.00 | 130.00 | 0.00 |
| 250 | ☐ | P_ONT-314 | 546.30 | 8.00 | 130.00 | 0.00 |
| 251 | ☐ | P_ONT-316 | 533.90 | 8.00 | 130.00 | 0.00 |
| 252 | ☐ | P_ONT-318 | 497.34 | 8.00 | 130.00 | 0.00 |
| 253 | ☐ | P_ONT-322 | 555.31 | 8.00 | 130.00 | 0.00 |
| 254 | ☐ | P_ONT-324 | 468.49 | 8.00 | 130.00 | 0.00 |
| 255 | ☐ | P_ONT-326 | 512.82 | 8.00 | 130.00 | 0.00 |
| 256 | ☐ | P_ONT-328 | 1,153.66 | 8.00 | 130.00 | 0.00 |
| 257 | ☐ | P_ONT-330 | 433.22 | 8.00 | 130.00 | 0.00 |
| 258 | ☐ | P_ONT-332 | 213.37 | 8.00 | 130.00 | 0.00 |
| 259 | ☐ | P_ONT-334 | 48.14 | 2.00 | 130.00 | 0.00 |
| 260 | ☐ | P_ONT-336 | 1,358.61 | 8.00 | 130.00 | 0.00 |
| 261 | ☐ | P_ONT-338 | 499.45 | 8.00 | 130.00 | 0.00 |
| 262 | ☐ | P_ONT-340 | 27.22 | 4.00 | 130.00 | 0.00 |
| 263 | ☐ | P_ONT-342 | 67.98 | 8.00 | 130.00 | 0.00 |
| 264 | ☐ | P_ONT-344 | 27.74 | 4.00 | 130.00 | 0.00 |
| 265 | ☐ | P_ONT-346 | 31.87 | 2.00 | 130.00 | 0.00 |
| 266 | ☐ | P_ONT-348 | 656.78 | 12.00 | 130.00 | 0.00 |
| 267 | ☐ | P_ONT-350 | 524.15 | 8.00 | 130.00 | 0.00 |
| 268 | ☐ | P_ONT-352 | 780.77 | 8.00 | 130.00 | 0.00 |
| 269 | ☐ | P_ONT-354 | 480.54 | 8.00 | 130.00 | 0.00 |
| 270 | ☐ | P_ONT-356 | 33.09 | 2.00 | 130.00 | 0.00 |
| 271 | ☐ | P_ONT-358 | 923.64 | 16.00 | 130.00 | 0.00 |
| 272 | ☐ | P_ONT-362 | 850.40 | 8.00 | 130.00 | 0.00 |
| 273 | ☐ | P_ONT-368 | 310.37 | 24.00 | 130.00 | 0.00 |
| 274 | ☐ | P_ONT-370 | 344.46 | 8.00 | 130.00 | 0.00 |
| 275 | ☐ | P_ONT-372 | 309.82 | 8.00 | 130.00 | 0.00 |
| 276 | ☐ | P_ONT-374 | 305.99 | 12.00 | 130.00 | 0.00 |
| 277 | ☐ | P_ONT-376 | 2,490.34 | 12.00 | 130.00 | 0.00 |
| 278 | ☐ | P_ONT-378 | 131.65 | 8.00 | 130.00 | 0.00 |
| 279 | ☐ | P_ONT-382 | 855.29 | 8.00 | 130.00 | 0.00 |
| 280 | ☐ | P_ONT-388 | 1,296.73 | 8.00 | 130.00 | 0.00 |
| 281 | ☐ | P_ONT-406 | 92.92 | 8.00 | 130.00 | 0.00 |
| 282 | ☐ | P_ONT-408 | 116.28 | 8.00 | 130.00 | 0.00 |
| 283 | ☐ | P_ONT-410 | 608.38 | 8.00 | 130.00 | 0.00 |
| 284 | ☐ | P_ONT-412 | 400.63 | 8.00 | 130.00 | 0.00 |
| 285 | ☐ | P_ONT-418 | 159.12 | 8.00 | 130.00 | 0.00 |

Near Term Scenario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 286 | ☐ | P_ONT-420 | 1,302.86 | 8.00 | 130.00 | 0.00 |
| 287 | ☐ | P_ONT-422 | 874.68 | 8.00 | 130.00 | 0.00 |
| 288 | ☐ | P_ONT-424 | 69.57 | 8.00 | 130.00 | 0.00 |
| 289 | ☐ | P_ONT-426 | 102.02 | 8.00 | 130.00 | 0.00 |
| 290 | ☐ | P_ONT-428 | 368.51 | 12.00 | 130.00 | 0.00 |
| 291 | ☐ | P_ONT-430 | 167.29 | 12.00 | 130.00 | 0.00 |
| 292 | ☐ | P_ONT-432 | 289.20 | 12.00 | 130.00 | 0.00 |
| 293 | ☐ | P_ONT-434 | 71.34 | 12.00 | 130.00 | 0.00 |
| 294 | ☐ | P_ONT-438 | 483.28 | 12.00 | 130.00 | 0.00 |
| 295 | ☐ | P_ONT-440 | 578.60 | 16.00 | 130.00 | 0.00 |
| 296 | ☐ | P_ONT-442 | 440.06 | 12.00 | 130.00 | 0.00 |
| 297 | ☐ | P_ONT-444 | 69.36 | 12.00 | 130.00 | 0.00 |
| 298 | ☐ | P_ONT-446 | 2,017.90 | 12.00 | 130.00 | 0.00 |
| 299 | ☐ | P_ONT-456 | 301.25 | 8.00 | 130.00 | 0.00 |
| 300 | ☐ | P_ONT-458 | 524.66 | 8.00 | 130.00 | 0.00 |
| 301 | ☐ | P_ONT-460 | 743.53 | 8.00 | 130.00 | 0.00 |
| 302 | ☐ | P_ONT-462 | 251.49 | 8.00 | 130.00 | 0.00 |
| 303 | ☐ | P_ONT-466 | 1,390.97 | 8.00 | 130.00 | 0.00 |
| 304 | ☐ | P_ONT-468 | 2,607.09 | 8.00 | 130.00 | 0.00 |
| 305 | ☐ | P_ONT-470 | 275.56 | 12.00 | 130.00 | 0.00 |
| 306 | ☐ | P_ONT-476 | 2,555.59 | 8.00 | 130.00 | 0.00 |
| 307 | ☐ | P_ONT-480 | 1,044.89 | 8.00 | 130.00 | 0.00 |
| 308 | ☐ | P_ONT-482 | 1,786.78 | 16.00 | 130.00 | 0.00 |
| 309 | ☐ | P_ONT-484 | 684.16 | 12.00 | 130.00 | 0.00 |
| 310 | ☐ | P_ONT-486 | 1,433.86 | 8.00 | 130.00 | 0.00 |
| 311 | ☐ | P_ONT-534 | 889.56 | 12.00 | 130.00 | 0.00 |
| 312 | ☐ | P_ONT-552 | 1,641.00 | 8.00 | 130.00 | 0.00 |
| 313 | ☐ | P_ONT-560 | 5,250.71 | 12.00 | 130.00 | 0.00 |
| 314 | ☐ | P_ONT-566 | 2,653.80 | 8.00 | 130.00 | 0.00 |
| 315 | ☐ | P_ONT-570 | 116.47 | 12.00 | 130.00 | 0.00 |
| 316 | ☐ | P_ONT-572 | 28.49 | 12.00 | 130.00 | 0.00 |
| 317 | ☐ | P_ONT-574 | 36.83 | 12.00 | 130.00 | 0.00 |
| 318 | ☐ | P_ONT-576 | 758.73 | 8.00 | 130.00 | 0.00 |
| 319 | ☐ | P_ONT-578 | 795.55 | 8.00 | 130.00 | 0.00 |
| 320 | ☐ | P_ONT-580 | 670.59 | 8.00 | 130.00 | 0.00 |
| 321 | ☐ | P_ONT-598 | 61.31 | 16.00 | 130.00 | 0.00 |
| 322 | ☐ | P_ONT-618 | 317.43 | 12.00 | 130.00 | 0.00 |
| 323 | ☐ | P_ONT-666 | 68.58 | 8.00 | 130.00 | 0.00 |
| 324 | ☐ | P_ONT-668 | 900.10 | 8.00 | 130.00 | 0.00 |
| 325 | ☐ | P_ONT-676 | 4,250.25 | 8.00 | 130.00 | 0.00 |
| 326 | ☐ | P_ONT-680 | 1,044.59 | 8.00 | 130.00 | 0.00 |
| 327 | ☐ | P_ONT-90 | 1,342.35 | 8.00 | 130.00 | 0.00 |

Near Term - City of Ontario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | JKELLOG | 93.29 | 06:10 | 85.38 | 20:30 | 89.93 | 7.91 |
| 2 | ☐ | JSCH_HYD | 93.29 | 06:10 | 85.37 | 20:30 | 89.93 | 7.92 |
| 3 | ☐ | J1272 | 134.00 | 20:00 | 102.94 | 00:20 | 121.56 | 31.06 |
| 4 | ☐ | J1274 | 125.33 | 20:00 | 94.62 | 00:20 | 113.00 | 30.71 |
| 5 | ☐ | J1276 | 138.76 | 20:00 | 107.10 | 00:20 | 126.12 | 31.67 |
| 6 | ☐ | J1280 | 133.13 | 20:00 | 102.07 | 00:20 | 120.69 | 31.06 |
| 7 | ☐ | J1288 | 129.23 | 20:00 | 98.46 | 00:20 | 116.88 | 30.77 |
| 8 | ☐ | J1290 | 146.13 | 20:00 | 114.41 | 00:20 | 133.47 | 31.72 |
| 9 | ☐ | J1292 | 273.90 | 15:40 | 144.88 | 22:40 | 184.74 | 129.03 |
| 10 | ☐ | J1294 | 243.58 | 15:40 | 113.68 | 22:40 | 152.66 | 129.90 |
| 11 | ☐ | J1296 | 235.34 | 15:40 | 106.80 | 22:40 | 144.50 | 128.55 |
| 12 | ☐ | J1302 | 129.67 | 20:00 | 102.18 | 00:20 | 119.00 | 27.48 |
| 13 | ☐ | J1304 | 255.70 | 15:40 | 125.79 | 22:40 | 165.95 | 129.92 |
| 14 | ☐ | J1308 | 127.50 | 20:00 | 100.94 | 00:20 | 117.30 | 26.56 |
| 15 | ☐ | J1314 | 104.53 | 20:00 | 72.63 | 00:20 | 91.86 | 31.91 |
| 16 | ☐ | J1316 | 104.53 | 20:00 | 72.61 | 00:20 | 91.85 | 31.92 |
| 17 | ☐ | J1320 | 122.63 | 04:40 | 98.39 | 00:20 | 113.66 | 24.24 |
| 18 | ☐ | J1322 | 132.48 | 20:00 | 106.22 | 00:20 | 122.65 | 26.26 |
| 19 | ☐ | J1324 | 132.48 | 20:00 | 105.82 | 00:20 | 122.36 | 26.66 |
| 20 | ☐ | J1404 | 129.67 | 20:00 | 103.00 | 00:20 | 119.51 | 26.66 |
| 21 | ☐ | J1406 | 125.77 | 20:00 | 99.10 | 00:20 | 115.72 | 26.67 |
| 22 | ☐ | J1408 | 119.27 | 20:00 | 92.60 | 00:20 | 109.23 | 26.67 |
| 23 | ☐ | J1410 | 122.30 | 20:00 | 95.63 | 00:20 | 112.26 | 26.67 |
| 24 | ☐ | J1412 | 122.30 | 20:00 | 95.64 | 00:20 | 112.28 | 26.66 |
| 25 | ☐ | J1414 | 126.42 | 20:00 | 99.86 | 00:20 | 116.44 | 26.56 |
| 26 | ☐ | J1416 | 134.21 | 20:00 | 107.66 | 00:20 | 124.18 | 26.56 |
| 27 | ☐ | ONT66 | 125.35 | 05:00 | 115.79 | 20:30 | 122.93 | 9.56 |
| 28 | ☐ | ONTFRAN-3608 | 120.99 | 18:00 | 79.81 | 23:30 | 105.68 | 41.18 |
| 29 | ☐ | ONTPHLP-3610 | 116.90 | 05:00 | 50.60 | 23:30 | 96.09 | 66.30 |
| 30 | ☐ | ONTNEWJ-470 | 129.67 | 20:00 | 103.25 | 00:20 | 119.75 | 26.42 |
| 31 | ☐ | ONTFRAN-3583 | 92.83 | 06:10 | 84.92 | 20:30 | 89.48 | 7.91 |
| 32 | ☐ | ONTTOP50-40 | 84.54 | 20:00 | 52.67 | 00:20 | 71.87 | 31.87 |
| 33 | ☐ | ONTNEWJ-262 | 83.10 | 20:00 | 51.23 | 00:20 | 70.44 | 31.87 |
| 34 | ☐ | ONTPICKUP-51 | 83.90 | 20:00 | 52.03 | 00:20 | 71.24 | 31.87 |
| 35 | ☐ | ONTNEWJ-322 | 83.30 | 20:00 | 51.44 | 00:20 | 70.64 | 31.87 |
| 36 | ☐ | ONTNEWJ-198 | 70.41 | 20:00 | 38.51 | 00:20 | 57.73 | 31.90 |
| 37 | ☐ | ONTNEWJ-516 | 145.26 | 20:00 | 112.12 | 00:20 | 132.14 | 33.14 |
| 38 | ☐ | ONTNEWJ-510 | 148.30 | 20:00 | 115.17 | 00:20 | 135.18 | 33.13 |
| 39 | ☐ | ONTNEWJ-908 | 88.93 | 20:00 | 59.14 | 00:20 | 76.86 | 29.79 |
| 40 | ☐ | ONTNEWJ-278 | 138.99 | 20:00 | 110.54 | 00:20 | 127.89 | 28.45 |
| 41 | ☐ | ONTTOP50-15 | 140.78 | 20:00 | 112.03 | 00:20 | 129.47 | 28.74 |
| 42 | ☐ | ONTTOP50-18 | 137.00 | 20:00 | 108.84 | 00:20 | 126.03 | 28.16 |
| 43 | ☐ | ONTNEWJ-520 | 132.70 | 20:00 | 105.05 | 00:20 | 121.98 | 27.65 |
| 44 | ☐ | ONTNEWJ-526 | 146.13 | 20:00 | 118.03 | 00:20 | 135.26 | 28.10 |
| 45 | ☐ | ONTNEWJ-910 | 146.13 | 20:00 | 118.07 | 00:20 | 135.27 | 28.06 |
| 46 | ☐ | ONTNEWJ-522 | 141.80 | 20:00 | 113.77 | 00:20 | 130.95 | 28.02 |
| 47 | ☐ | ONTNEWJ-914 | 135.08 | 20:00 | 107.35 | 00:20 | 124.33 | 27.73 |
| 48 | ☐ | ONTTOP50-22 | 143.24 | 20:00 | 115.06 | 00:20 | 132.34 | 28.18 |
| 49 | ☐ | ONTPICKUP-68 | 145.46 | 20:00 | 117.07 | 00:20 | 134.50 | 28.39 |
| 50 | ☐ | ONTNEWJ-398 | 146.31 | 20:00 | 117.96 | 00:20 | 135.36 | 28.35 |
| 51 | ☐ | ONTNEWJ-528 | 144.83 | 20:00 | 116.15 | 00:20 | 133.77 | 28.68 |
| 52 | ☐ | ONTNEWJ-598 | 134.00 | 20:00 | 107.26 | 00:20 | 123.86 | 26.74 |
| 53 | ☐ | ONTNEWJ-646 | 123.17 | 20:00 | 96.45 | 00:20 | 112.99 | 26.72 |
| 54 | ☐ | ONTPICKUP-48 | 238.49 | 15:40 | 110.91 | 22:40 | 146.57 | 127.58 |
| 55 | ☐ | ONTNEWJ-396 | 210.18 | 15:40 | 81.32 | 22:40 | 118.84 | 128.87 |
| 56 | ☐ | ONTNEWJ-530 | 211.51 | 15:40 | 82.37 | 22:40 | 120.11 | 129.14 |
| 57 | ☐ | ONTNEWJ-628 | 207.62 | 15:40 | 77.83 | 22:40 | 116.00 | 129.78 |

Near Term - City of Ontario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 58 | ☐ | ONTNEWJ-542 | 221.91 | 15:40 | 92.84 | 22:40 | 130.58 | 129.07 |
| 59 | ☐ | ONTNEWJ-544 | 221.48 | 15:40 | 92.41 | 22:40 | 130.15 | 129.07 |
| 60 | ☐ | ONTNEWJ-546 | 227.98 | 15:40 | 98.91 | 22:40 | 136.65 | 129.07 |
| 61 | ☐ | ONTNEWJ-548 | 224.51 | 15:40 | 95.44 | 22:40 | 133.18 | 129.07 |
| 62 | ☐ | ONTNEWJ-934 | 216.28 | 15:40 | 87.99 | 22:40 | 125.16 | 128.29 |
| 63 | ☐ | ONTNEWJ-936 | 217.15 | 15:40 | 88.86 | 22:40 | 126.03 | 128.29 |
| 64 | ☐ | ONTNEWJ-550 | 233.61 | 15:40 | 103.85 | 22:40 | 142.19 | 129.77 |
| 65 | ☐ | ONTNEWJ-576 | 268.71 | 15:40 | 139.90 | 22:40 | 178.41 | 128.81 |
| 66 | ☐ | ONTNEWJ-554 | 231.44 | 15:40 | 97.04 | 22:40 | 139.02 | 134.40 |
| 67 | ☐ | ONTNEWJ-560 | 239.24 | 15:40 | 107.22 | 22:40 | 148.13 | 132.02 |
| 68 | ☐ | ONTNEWJ-562 | 234.04 | 15:40 | 104.38 | 22:40 | 144.22 | 129.66 |
| 69 | ☐ | ONTNEWJ-564 | 229.71 | 15:40 | 100.05 | 22:40 | 139.89 | 129.66 |
| 70 | ☐ | ONTNEWJ-556 | 244.88 | 15:40 | 115.77 | 22:40 | 154.22 | 129.10 |
| 71 | ☐ | ONTNEWJ-558 | 247.91 | 15:40 | 118.62 | 22:40 | 157.19 | 129.29 |
| 72 | ☐ | ONTNEWJ-378 | 229.29 | 15:40 | 95.01 | 22:40 | 136.32 | 134.28 |
| 73 | ☐ | ONTTOP50-48 | 241.51 | 15:40 | 112.97 | 22:40 | 150.67 | 128.55 |
| 74 | ☐ | ONTNEWJ-555 | 240.54 | 15:40 | 112.00 | 22:40 | 149.70 | 128.55 |
| 75 | ☐ | ONTNEWJ-498 | 115.38 | 05:00 | 55.71 | 23:30 | 96.70 | 59.68 |
| 76 | ☐ | ONTNEWJ-634 | 111.48 | 05:00 | 49.60 | 23:30 | 92.09 | 61.88 |
| 77 | ☐ | ONTNEWJ-632 | 116.68 | 05:00 | 53.44 | 23:30 | 96.84 | 63.24 |
| 78 | ☐ | ONTNEWJ-631 | 114.51 | 05:00 | 49.55 | 23:30 | 94.11 | 64.96 |
| 79 | ☐ | ONTNEWJ_630 | 114.51 | 05:00 | 48.50 | 23:30 | 93.77 | 66.01 |
| 80 | ☐ | ONTNEWJ-496 | 115.38 | 05:00 | 56.82 | 23:30 | 97.07 | 58.56 |
| 81 | ☐ | ONTNEWJ-638 | 115.38 | 05:00 | 55.48 | 23:30 | 96.63 | 59.91 |
| 82 | ☐ | ONTNEWJ-636 | 116.68 | 05:00 | 56.26 | 23:30 | 97.76 | 60.43 |
| 83 | ☐ | ONTNEWJ-492 | 110.18 | 05:00 | 39.38 | 23:30 | 87.91 | 70.80 |
| 84 | ☐ | ONTNEWJ-582 | 251.81 | 15:40 | 122.86 | 22:40 | 162.10 | 128.95 |
| 85 | ☐ | ONTNEWJ-584 | 257.01 | 15:40 | 128.06 | 22:40 | 167.30 | 128.95 |
| 86 | ☐ | ONTNEWJ-586 | 257.01 | 15:40 | 128.06 | 22:40 | 167.30 | 128.95 |
| 87 | ☐ | ONTNEWJ-578 | 257.44 | 15:40 | 128.49 | 22:40 | 167.73 | 128.95 |
| 88 | ☐ | ONTNEWJ-588 | 255.71 | 15:40 | 126.76 | 22:40 | 166.00 | 128.95 |
| 89 | ☐ | ONTFRAN-3596 | 100.14 | 18:00 | 63.63 | 23:30 | 86.48 | 36.52 |
| 90 | ☐ | ONTFRAN-3597 | 103.11 | 18:00 | 69.31 | 23:30 | 90.27 | 33.80 |
| 91 | ☐ | ONTFRAN-3598 | 100.18 | 18:00 | 72.58 | 23:30 | 89.26 | 27.61 |
| 92 | ☐ | ONTFRAN-3592 | 92.18 | 18:00 | 67.56 | 23:30 | 82.21 | 24.62 |
| 93 | ☐ | ONTJ12 | 115.87 | 18:00 | 57.17 | 23:30 | 94.95 | 58.70 |
| 94 | ☐ | ONTFRAN-3603 | 118.52 | 06:10 | 59.20 | 23:30 | 97.42 | 59.32 |
| 95 | ☐ | ONTFRAN-3605 | 122.22 | 06:10 | 62.32 | 23:30 | 100.86 | 59.90 |
| 96 | ☐ | ONTFRAN-3606 | 124.60 | 06:10 | 67.27 | 23:30 | 104.05 | 57.34 |
| 97 | ☐ | ONTFRAN-3607 | 130.36 | 06:10 | 83.58 | 22:40 | 113.24 | 46.78 |
| 98 | ☐ | ONTNEWJ-432 | 136.95 | 05:00 | 124.56 | 20:30 | 134.49 | 12.39 |
| 99 | ☐ | ONTNEWJ-502 | 137.48 | 05:00 | 122.46 | 23:30 | 132.59 | 15.01 |
| 100 | ☐ | ONTNEWJ-430 | 138.00 | 05:00 | 117.13 | 23:30 | 131.19 | 20.87 |
| 101 | ☐ | ONTFRAN-3619 | 73.22 | 18:00 | 53.29 | 23:30 | 64.45 | 19.92 |
| 102 | ☐ | ONTNEWJ-438 | 130.22 | 05:00 | 65.08 | 23:30 | 109.81 | 65.14 |
| 103 | ☐ | ONTFRAN-3622 | 81.34 | 18:00 | 40.33 | 23:30 | 66.33 | 41.02 |
| 104 | ☐ | ONTFRAN-3595 | 86.89 | 18:00 | 47.96 | 23:30 | 72.50 | 38.92 |
| 105 | ☐ | ONTFRAN-3594 | 89.26 | 18:00 | 54.77 | 23:30 | 76.21 | 34.49 |
| 106 | ☐ | ONTFRAN-3618 | 73.29 | 18:00 | 53.37 | 23:30 | 64.52 | 19.92 |
| 107 | ☐ | ONTNEWJ-436 | 130.29 | 05:00 | 73.96 | 23:30 | 112.82 | 56.33 |
| 108 | ☐ | ONTFRAN-3593 | 89.71 | 18:00 | 64.95 | 23:30 | 79.66 | 24.76 |
| 109 | ☐ | ONTTOP50-10 | 199.67 | 15:40 | 73.18 | 22:40 | 108.13 | 126.49 |
| 110 | ☐ | ONTNEWJ-348 | 199.86 | 15:40 | 73.37 | 22:40 | 108.32 | 126.49 |
| 111 | ☐ | ONTNEWJ-592 | 247.47 | 15:40 | 118.14 | 22:40 | 157.84 | 129.33 |
| 112 | ☐ | ONTNEWJ-622 | 84.17 | 20:00 | 52.30 | 00:20 | 71.50 | 31.86 |
| 113 | ☐ | ONTNEWJ-482 | 137.00 | 20:00 | 109.10 | 00:20 | 126.20 | 27.90 |
| 114 | ☐ | ONTPICKUP-32 | 221.05 | 15:40 | 77.38 | 22:40 | 125.02 | 143.66 |

Near Term - City of Ontario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 115 | ☐ | ONTPICKUP-71 | 228.65 | 15:40 | 89.35 | 22:40 | 134.05 | 139.30 |
| 116 | ☐ | ONTNEWJ-568 | 225.38 | 15:40 | 83.85 | 22:40 | 130.05 | 141.53 |
| 117 | ☐ | ONTPICKUP-65 | 227.48 | 15:40 | 93.20 | 22:40 | 134.51 | 134.28 |
| 118 | ☐ | ONTFRAN-3620 | 81.35 | 18:00 | 59.54 | 23:30 | 72.19 | 21.81 |
| 119 | ☐ | ONT76 | 105.42 | 18:00 | 77.92 | 23:30 | 94.54 | 27.50 |
| 120 | ☐ | ONTNEWJ402 | 123.54 | 18:00 | 67.53 | 23:30 | 103.43 | 56.01 |
| 121 | ☐ | ONTFRAN-3600 | 102.36 | 06:10 | 88.99 | 23:30 | 96.23 | 13.38 |
| 122 | ☐ | ONTFRAN-3601 | 114.07 | 18:00 | 89.03 | 23:30 | 104.01 | 25.04 |
| 123 | ☐ | ONTPHLP-3606 | 80.00 | 06:10 | 71.98 | 20:50 | 76.18 | 8.01 |
| 124 | ☐ | ONTFRAN-3591 | 100.16 | 18:00 | 84.29 | 23:30 | 93.17 | 15.87 |
| 125 | ☐ | ONTNEWJ-224 | 133.45 | 05:00 | 121.86 | 20:30 | 131.00 | 11.59 |
| 126 | ☐ | ONTTOP50-6 | 133.53 | 05:00 | 121.94 | 20:30 | 131.09 | 11.59 |
| 127 | ☐ | ONTPICKUP-12 | 133.90 | 05:00 | 122.20 | 20:30 | 131.45 | 11.70 |
| 128 | ☐ | ONTFRAN-3581 | 90.88 | 18:00 | 77.58 | 23:30 | 84.76 | 13.30 |
| 129 | ☐ | ONTFRAN-3626 | 89.75 | 18:00 | 76.63 | 23:30 | 83.68 | 13.12 |
| 130 | ☐ | ONTNEWJ-214 | 118.51 | 05:00 | 42.50 | 23:30 | 94.55 | 76.01 |
| 131 | ☐ | ONTNEWJ-212 | 117.27 | 05:00 | 49.98 | 23:30 | 96.15 | 67.30 |
| 132 | ☐ | ONTNEWJ-354 | 117.18 | 05:00 | 50.10 | 23:30 | 96.12 | 67.09 |
| 133 | ☐ | ONT68 | 121.94 | 05:00 | 84.23 | 23:30 | 110.17 | 37.71 |
| 134 | ☐ | ONT72 | 122.57 | 05:00 | 92.55 | 23:30 | 113.18 | 30.03 |
| 135 | ☐ | ONTPICKUP-17 | 121.01 | 05:00 | 90.99 | 23:30 | 111.62 | 30.03 |
| 136 | ☐ | ONTNEWJ-356 | 127.98 | 05:00 | 111.01 | 23:30 | 122.63 | 16.97 |
| 137 | ☐ | ONTNEWJ-500 | 121.01 | 05:00 | 83.31 | 23:30 | 109.25 | 37.71 |
| 138 | ☐ | ONTPICKUP-14 | 126.31 | 05:00 | 119.97 | 20:30 | 124.64 | 6.35 |
| 139 | ☐ | ONTNEWJ-340 | 126.60 | 05:00 | 120.29 | 20:30 | 124.97 | 6.32 |
| 140 | ☐ | ONTFRAN-3599 | 110.31 | 18:00 | 84.99 | 23:30 | 100.16 | 25.32 |
| 141 | ☐ | ONTJ19 | 120.08 | 18:00 | 95.04 | 23:30 | 110.02 | 25.04 |
| 142 | ☐ | ONTJ114 | 261.25 | 15:40 | 131.34 | 22:40 | 171.50 | 129.92 |
| 143 | ☐ | ONTPICKUP-30 | 260.04 | 15:40 | 130.12 | 22:40 | 170.28 | 129.92 |
| 144 | ☐ | ONTNEWJ-478 | 130.61 | 20:00 | 104.75 | 00:20 | 120.98 | 25.86 |
| 145 | ☐ | ONTNEWJ-640 | 123.17 | 20:00 | 96.53 | 00:20 | 112.99 | 26.64 |
| 146 | ☐ | ONTNEWJ-950 | 123.17 | 20:00 | 96.56 | 00:20 | 112.97 | 26.60 |
| 147 | ☐ | ONTPICKUP-6 | 205.07 | 15:40 | 78.06 | 22:40 | 113.35 | 127.01 |
| 148 | ☐ | ONTPICKUP-42 | 91.53 | 20:00 | 59.87 | 00:20 | 78.93 | 31.67 |
| 149 | ☐ | ONTPICKUP-72 | 91.06 | 20:00 | 59.37 | 00:20 | 78.45 | 31.69 |
| 150 | ☐ | ONTNEWJ-399 | 146.31 | 20:00 | 117.99 | 00:20 | 135.37 | 28.32 |
| 151 | ☐ | J1586 | 83.74 | 20:00 | 51.87 | 00:20 | 71.07 | 31.86 |
| 152 | ☐ | J1592 | 144.83 | 20:00 | 112.05 | 00:20 | 131.83 | 32.78 |
| 153 | ☐ | J1596 | 120.67 | 05:00 | 67.55 | 23:30 | 104.13 | 53.12 |
| 154 | ☐ | J_ONT-1 | 123.17 | 20:00 | 91.27 | 00:20 | 110.49 | 31.90 |
| 155 | ☐ | J_ONT-77 | 119.78 | 06:10 | 59.76 | 23:30 | 98.43 | 60.01 |
| 156 | ☐ | J_ONT-99 | 120.40 | 05:00 | 67.01 | 23:30 | 103.77 | 53.39 |
| 157 | ☐ | J_ONT-103 | 137.34 | 05:00 | 124.78 | 20:30 | 134.87 | 12.55 |
| 158 | ☐ | J_ONT-105 | 80.38 | 06:10 | 72.46 | 20:30 | 76.62 | 7.92 |
| 159 | ☐ | J_ONT-107 | 137.34 | 05:00 | 124.70 | 20:30 | 134.87 | 12.63 |
| 160 | ☐ | J_ONT-109 | 80.38 | 06:10 | 72.47 | 20:30 | 76.62 | 7.92 |
| 161 | ☐ | J_ONT-113 | 73.99 | 18:00 | 54.46 | 23:30 | 65.33 | 19.54 |
| 162 | ☐ | J_ONT-115 | 131.00 | 05:00 | 73.52 | 23:30 | 113.22 | 57.48 |
| 163 | ☐ | J_ONT-117 | 74.00 | 18:00 | 54.79 | 23:30 | 65.42 | 19.21 |
| 164 | ☐ | J_ONT-119 | 131.00 | 05:00 | 73.33 | 23:30 | 113.17 | 57.67 |
| 165 | ☐ | J_ONT-133 | 95.11 | 18:00 | 80.35 | 23:30 | 88.50 | 14.76 |
| 166 | ☐ | J_ONT-135 | 90.01 | 18:00 | 71.46 | 23:30 | 82.08 | 18.56 |
| 167 | ☐ | J_ONT-137 | 93.48 | 18:00 | 76.99 | 23:30 | 86.29 | 16.49 |
| 168 | ☐ | J_ONT-139 | 94.35 | 18:00 | 78.78 | 23:30 | 87.46 | 15.57 |
| 169 | ☐ | J_ONT-141 | 95.65 | 18:00 | 80.07 | 23:30 | 88.76 | 15.57 |
| 170 | ☐ | J_ONT-143 | 92.18 | 18:00 | 75.69 | 23:30 | 84.99 | 16.49 |
| 171 | ☐ | J_ONT-145 | 95.65 | 18:00 | 80.07 | 23:30 | 88.76 | 15.57 |

Near Term - City of Ontario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 172 | ☐ | J_ONT-147 | 96.08 | 18:00 | 73.38 | 23:30 | 86.78 | 22.70 |
| 173 | ☐ | J_ONT-149 | 96.51 | 18:00 | 73.61 | 23:30 | 87.15 | 22.90 |
| 174 | ☐ | J_ONT-151 | 85.57 | 18:00 | 67.64 | 23:30 | 77.81 | 17.93 |
| 175 | ☐ | J_ONT-153 | 85.68 | 18:00 | 67.71 | 23:30 | 77.92 | 17.97 |
| 176 | ☐ | J_ONT-155 | 78.32 | 18:00 | 60.17 | 23:30 | 70.49 | 18.14 |
| 177 | ☐ | J_ONT-157 | 90.88 | 18:00 | 66.26 | 23:30 | 80.91 | 24.62 |
| 178 | ☐ | J_ONT-159 | 86.11 | 18:00 | 61.49 | 23:30 | 76.14 | 24.62 |
| 179 | ☐ | J_ONT-161 | 94.34 | 18:00 | 69.72 | 23:30 | 84.37 | 24.62 |
| 180 | ☐ | J_ONT-163 | 96.94 | 18:00 | 73.35 | 23:30 | 87.36 | 23.59 |
| 181 | ☐ | J_ONT-165 | 103.44 | 18:00 | 76.83 | 23:30 | 92.87 | 26.61 |
| 182 | ☐ | J_ONT-167 | 96.94 | 18:00 | 72.99 | 23:30 | 87.24 | 23.95 |
| 183 | ☐ | J_ONT-169 | 98.68 | 18:00 | 74.72 | 23:30 | 88.97 | 23.95 |
| 184 | ☐ | J_ONT-171 | 103.01 | 18:00 | 76.40 | 23:30 | 92.43 | 26.61 |
| 185 | ☐ | J_ONT-173 | 104.74 | 18:00 | 77.38 | 23:30 | 93.92 | 27.36 |
| 186 | ☐ | J_ONT-175 | 105.17 | 18:00 | 77.81 | 23:30 | 94.35 | 27.36 |
| 187 | ☐ | J_ONT-177 | 107.22 | 18:00 | 79.83 | 23:30 | 96.38 | 27.39 |
| 188 | ☐ | J_ONT-179 | 108.74 | 18:00 | 81.81 | 23:30 | 98.05 | 26.93 |
| 189 | ☐ | J_ONT-181 | 119.41 | 18:00 | 83.76 | 23:30 | 105.90 | 35.66 |
| 190 | ☐ | J_ONT-185 | 116.97 | 18:00 | 82.39 | 23:30 | 103.80 | 34.59 |
| 191 | ☐ | J_ONT-187 | 119.04 | 18:00 | 83.45 | 23:30 | 105.55 | 35.59 |
| 192 | ☐ | J_ONT-189 | 123.80 | 18:00 | 88.21 | 23:30 | 110.30 | 35.59 |
| 193 | ☐ | J_ONT-191 | 123.80 | 18:00 | 88.21 | 23:30 | 110.30 | 35.59 |
| 194 | ☐ | J_ONT-193 | 110.10 | 18:00 | 84.56 | 23:30 | 99.87 | 25.54 |
| 195 | ☐ | J_ONT-195 | 116.00 | 18:00 | 82.91 | 23:30 | 103.31 | 33.09 |
| 196 | ☐ | J_ONT-197 | 118.16 | 18:00 | 83.86 | 23:30 | 105.08 | 34.30 |
| 197 | ☐ | J_ONT-199 | 116.86 | 18:00 | 82.42 | 23:30 | 103.74 | 34.44 |
| 198 | ☐ | J_ONT-201 | 114.70 | 18:00 | 80.69 | 23:30 | 101.71 | 34.00 |
| 199 | ☐ | J_ONT-203 | 113.40 | 18:00 | 80.27 | 23:30 | 100.70 | 33.13 |
| 200 | ☐ | J_ONT-205 | 112.97 | 18:00 | 80.00 | 23:30 | 100.32 | 32.97 |
| 201 | ☐ | J_ONT-207 | 110.37 | 18:00 | 77.24 | 23:30 | 97.67 | 33.13 |
| 202 | ☐ | J_ONT-209 | 113.40 | 18:00 | 79.35 | 23:30 | 100.40 | 34.05 |
| 203 | ☐ | J_ONT-211 | 115.55 | 18:00 | 82.47 | 23:30 | 102.87 | 33.09 |
| 204 | ☐ | J_ONT-213 | 117.30 | 18:00 | 84.21 | 23:30 | 104.62 | 33.09 |
| 205 | ☐ | J_ONT-215 | 116.43 | 18:00 | 83.34 | 23:30 | 103.75 | 33.09 |
| 206 | ☐ | J_ONT-217 | 116.43 | 18:00 | 83.34 | 23:30 | 103.75 | 33.09 |
| 207 | ☐ | J_ONT-219 | 116.00 | 18:00 | 83.11 | 23:30 | 103.38 | 32.89 |
| 208 | ☐ | J_ONT-221 | 113.83 | 18:00 | 82.95 | 23:30 | 101.86 | 30.88 |
| 209 | ☐ | J_ONT-223 | 112.10 | 18:00 | 81.87 | 23:30 | 100.34 | 30.23 |
| 210 | ☐ | J_ONT-225 | 111.67 | 18:00 | 80.55 | 23:30 | 99.62 | 31.12 |
| 211 | ☐ | J_ONT-227 | 109.50 | 18:00 | 78.89 | 23:30 | 97.62 | 30.61 |
| 212 | ☐ | J_ONT-229 | 112.97 | 18:00 | 82.16 | 23:30 | 101.02 | 30.81 |
| 213 | ☐ | J_ONT-231 | 112.97 | 18:00 | 82.07 | 23:30 | 100.99 | 30.90 |
| 214 | ☐ | J_ONT-233 | 113.83 | 18:00 | 82.94 | 23:30 | 101.86 | 30.89 |
| 215 | ☐ | J_ONT-235 | 112.53 | 18:00 | 81.64 | 23:30 | 100.56 | 30.89 |
| 216 | ☐ | J_ONT-237 | 114.70 | 18:00 | 84.47 | 23:30 | 102.94 | 30.23 |
| 217 | ☐ | J_ONT-239 | 117.53 | 05:00 | 48.66 | 23:30 | 95.89 | 68.86 |
| 218 | ☐ | J_ONT-243 | 127.51 | 05:00 | 61.24 | 23:30 | 106.73 | 66.27 |
| 219 | ☐ | J_ONT-247 | 118.85 | 05:00 | 50.03 | 23:30 | 97.23 | 68.82 |
| 220 | ☐ | J_ONT-249 | 123.18 | 05:00 | 54.87 | 23:30 | 101.73 | 68.31 |
| 221 | ☐ | J_ONT-251 | 120.58 | 05:00 | 51.76 | 23:30 | 98.96 | 68.82 |
| 222 | ☐ | J_ONT-253 | 116.68 | 05:00 | 47.86 | 23:30 | 95.06 | 68.82 |
| 223 | ☐ | J_ONT-255 | 118.85 | 05:00 | 50.53 | 23:30 | 97.39 | 68.31 |
| 224 | ☐ | J_ONT-257 | 565.13 | 20:00 | 536.31 | 00:20 | 554.03 | 28.82 |
| 225 | ☐ | J_ONT-259 | 565.13 | 20:00 | 536.33 | 00:20 | 554.03 | 28.80 |
| 226 | ☐ | J_ONT-261 | 565.13 | 20:00 | 536.35 | 00:20 | 554.04 | 28.79 |
| 227 | ☐ | J_ONT-263 | 565.13 | 20:00 | 536.36 | 00:20 | 554.04 | 28.77 |
| 228 | ☐ | J_ONT-265 | 119.46 | 18:00 | 84.19 | 23:30 | 106.07 | 35.28 |

Near Term - City of Ontario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 229 | ☐ | J_ONT-267 | 114.91 | 18:00 | 81.82 | 23:30 | 102.22 | 33.10 |
| 230 | ☐ | J_ONT-271 | 119.46 | 18:00 | 84.19 | 23:30 | 106.07 | 35.28 |
| 231 | ☐ | J_ONT-273 | 117.38 | 18:00 | 82.11 | 23:30 | 103.98 | 35.28 |
| 232 | ☐ | J_ONT-275 | 118.66 | 18:00 | 83.15 | 23:30 | 105.19 | 35.52 |
| 233 | ☐ | J_ONT-277 | 122.93 | 18:00 | 87.41 | 23:30 | 109.46 | 35.52 |
| 234 | ☐ | J_ONT-279 | 122.93 | 18:00 | 87.41 | 23:30 | 109.46 | 35.52 |
| 235 | ☐ | J_ONT-281 | 122.93 | 18:00 | 87.34 | 23:30 | 109.43 | 35.59 |
| 236 | ☐ | J_ONT-283 | 121.20 | 18:00 | 85.61 | 23:30 | 107.70 | 35.59 |
| 237 | ☐ | J_ONT-285 | 119.89 | 18:00 | 83.26 | 23:30 | 106.06 | 36.63 |
| 238 | ☐ | J_ONT-287 | 119.89 | 18:00 | 83.26 | 23:30 | 106.06 | 36.63 |
| 239 | ☐ | J_ONT-289 | 89.65 | 18:00 | 64.96 | 23:30 | 79.64 | 24.69 |
| 240 | ☐ | J_ONT-291 | 82.22 | 18:00 | 64.19 | 23:30 | 74.43 | 18.02 |
| 241 | ☐ | J_ONT-295 | 79.62 | 18:00 | 61.55 | 23:30 | 71.81 | 18.07 |
| 242 | ☐ | J_ONT-297 | 79.18 | 18:00 | 58.43 | 23:30 | 70.51 | 20.75 |
| 243 | ☐ | J_ONT-299 | 79.18 | 18:00 | 61.04 | 23:30 | 71.36 | 18.14 |
| 244 | ☐ | J_ONT-301 | 103.61 | 18:00 | 84.50 | 23:30 | 95.54 | 19.11 |
| 245 | ☐ | J_ONT-305 | 137.42 | 05:00 | 123.48 | 20:30 | 133.33 | 13.93 |
| 246 | ☐ | J_ONT-313 | 81.10 | 06:10 | 72.56 | 20:50 | 77.03 | 8.54 |
| 247 | ☐ | J_ONT-315 | 86.98 | 18:00 | 68.83 | 23:30 | 79.16 | 18.15 |
| 248 | ☐ | J_ONT-317 | 87.85 | 18:00 | 69.54 | 23:30 | 79.98 | 18.31 |
| 249 | ☐ | J_ONT-319 | 100.53 | 18:00 | 85.10 | 23:30 | 93.70 | 15.43 |
| 250 | ☐ | J_ONT-321 | 133.32 | 18:00 | 116.69 | 23:30 | 126.08 | 16.63 |
| 251 | ☐ | J_ONT-325 | 118.79 | 18:00 | 83.25 | 23:30 | 105.31 | 35.54 |
| 252 | ☐ | J_ONT-333 | 232.58 | 15:40 | 100.59 | 22:40 | 140.68 | 131.98 |
| 253 | ☐ | J_ONT-341 | 233.18 | 15:40 | 103.74 | 22:40 | 141.79 | 129.43 |
| 254 | ☐ | J_ONT-343 | 233.18 | 15:40 | 104.30 | 22:40 | 141.97 | 128.88 |
| 255 | ☐ | J_ONT-351 | 229.29 | 15:40 | 96.93 | 22:40 | 136.95 | 132.35 |
| 256 | ☐ | J_ONT-357 | 228.75 | 15:40 | 90.21 | 22:40 | 134.40 | 138.54 |
| 257 | ☐ | J_ONT-359 | 77.35 | 20:00 | 45.45 | 00:20 | 64.68 | 31.90 |
| 258 | ☐ | J_ONT-361 | 122.30 | 20:00 | 95.63 | 00:20 | 112.28 | 26.67 |
| 259 | ☐ | J_ONT-363 | 119.76 | 20:00 | 93.09 | 00:20 | 109.73 | 26.67 |
| 260 | ☐ | J_ONT-365 | 125.84 | 20:00 | 99.18 | 00:20 | 115.80 | 26.66 |
| 261 | ☐ | J_ONT-367 | 125.28 | 20:00 | 98.63 | 00:20 | 115.11 | 26.64 |
| 262 | ☐ | J_ONT-369 | 123.17 | 20:00 | 96.53 | 00:20 | 112.98 | 26.63 |
| 263 | ☐ | J_ONT-371 | 123.17 | 20:00 | 96.54 | 00:20 | 112.98 | 26.62 |
| 264 | ☐ | J_ONT-373 | 126.62 | 20:00 | 100.05 | 00:20 | 116.42 | 26.57 |
| 265 | ☐ | J_ONT-377 | 142.63 | 20:00 | 114.50 | 00:20 | 131.75 | 28.13 |
| 266 | ☐ | J_ONT-379 | 126.51 | 20:00 | 99.18 | 00:20 | 115.90 | 27.33 |
| 267 | ☐ | J_ONT-381 | 135.88 | 20:00 | 107.85 | 00:20 | 124.97 | 28.03 |
| 268 | ☐ | J_ONT-383 | 137.00 | 20:00 | 109.05 | 00:20 | 126.14 | 27.95 |
| 269 | ☐ | J_ONT-387 | 140.78 | 20:00 | 112.31 | 00:20 | 129.66 | 28.46 |
| 270 | ☐ | J_ONT-399 | 146.06 | 20:00 | 113.13 | 00:20 | 133.01 | 32.93 |
| 271 | ☐ | J_ONT-401 | 142.35 | 20:00 | 109.94 | 00:20 | 129.47 | 32.42 |
| 272 | ☐ | J_ONT-403 | 143.88 | 20:00 | 112.17 | 00:20 | 131.23 | 31.70 |
| 273 | ☐ | J_ONT-405 | 228.88 | 15:40 | 94.60 | 22:40 | 135.91 | 134.28 |
| 274 | ☐ | J_ONT-407 | 144.83 | 20:00 | 112.05 | 00:20 | 131.83 | 32.78 |
| 275 | ☐ | J_ONT-409 | 130.38 | 06:10 | 92.47 | 22:40 | 116.17 | 37.91 |
| 276 | ☐ | J_ONT-421 | 148.30 | 20:00 | 115.17 | 00:20 | 135.18 | 33.13 |
| 277 | ☐ | J_ONT-423 | 95.38 | 18:00 | 69.08 | 23:30 | 84.86 | 26.30 |
| 278 | ☐ | J_ONT-425 | 103.11 | 18:00 | 69.19 | 23:30 | 90.23 | 33.92 |
| 279 | ☐ | J_ONT-427 | 103.11 | 18:00 | 69.31 | 23:30 | 90.27 | 33.80 |
| 280 | ☐ | J_ONT-473 | 199.86 | 15:40 | 73.37 | 22:40 | 108.32 | 126.49 |
| 281 | ☐ | J_ONT-477 | 138.82 | 20:00 | 110.40 | 00:20 | 127.73 | 28.43 |
| 282 | ☐ | J_ONT-489 | 226.68 | 15:40 | 99.23 | 22:40 | 134.81 | 127.45 |
| 283 | ☐ | J_ONT-503 | 188.16 | 20:00 | 154.98 | 00:20 | 175.03 | 33.18 |
| 284 | ☐ | J_ONT-507 | 123.17 | 20:00 | 96.56 | 00:20 | 112.98 | 26.61 |
| 285 | ☐ | J_ONT-509 | 127.32 | 20:00 | 100.75 | 00:20 | 117.12 | 26.57 |

Near Term - City of Ontario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 286 | ☐ | J_ONT-511 | 127.08 | 20:00 | 100.51 | 00:20 | 116.88 | 26.57 |
| 287 | ☐ | J_ONT-513 | 247.91 | 15:40 | 118.63 | 22:40 | 157.20 | 129.28 |
| 288 | ☐ | J_ONT-515 | 246.16 | 15:40 | 116.92 | 22:40 | 155.46 | 129.24 |
| 289 | ☐ | J_ONT-537 | 100.02 | 18:00 | 72.46 | 23:30 | 89.12 | 27.56 |
| 290 | ☐ | J_ONT-569 | 123.08 | 18:00 | 69.72 | 23:30 | 103.83 | 53.37 |
| 291 | ☐ | J_ONT-609 | 117.94 | 18:00 | 61.18 | 23:30 | 97.60 | 56.76 |
| 292 | ☐ | J_ONT-613 | 268.75 | 20:00 | 237.98 | 00:20 | 256.41 | 30.77 |

Near Term Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | 800ZONE_V1 | 344.24 | 15:00 | 0.00 | 00:00 | 24.45 | 344.24 |
| 2 | ☐ | 800ZONE_V2 | 344.24 | 15:00 | 0.00 | 00:00 | 24.45 | 344.24 |
| 3 | ☐ | PSCH_1 | 69.94 | 00:00 | 0.00 | 05:00 | 23.63 | 69.94 |
| 4 | ☐ | PKELLOG | 30.97 | 00:00 | 0.00 | 05:00 | 10.46 | 30.97 |
| 5 | ☐ | PHYD_LAT | 30.97 | 00:00 | 0.00 | 05:00 | 10.46 | 30.97 |
| 6 | ☐ | P10142 | 9,638.79 | 04:00 | 0.00 | 18:10 | 3,900.03 | 9,638.79 |
| 7 | ☐ | P10326 | 589.54 | 02:10 | 0.00 | 05:00 | 199.22 | 589.54 |
| 8 | ☐ | P10328 | 460.15 | 02:10 | 0.00 | 05:00 | 155.50 | 460.15 |
| 9 | ☐ | P10330 | 365.86 | 02:10 | 0.00 | 05:00 | 123.64 | 365.86 |
| 10 | ☐ | P10332 | 317.96 | 02:10 | 0.00 | 05:00 | 107.45 | 317.96 |
| 11 | ☐ | P10334 | 27.08 | 00:00 | 0.00 | 05:00 | 9.15 | 27.08 |
| 12 | ☐ | P10340 | 43.45 | 00:00 | 0.00 | 05:00 | 14.68 | 43.45 |
| 13 | ☐ | P10342 | 38.59 | 00:00 | 0.00 | 05:00 | 13.04 | 38.59 |
| 14 | ☐ | P10344 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 15 | ☐ | P10346 | 507.63 | 00:00 | 0.00 | 05:00 | 171.54 | 507.63 |
| 16 | ☐ | P10350 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 17 | ☐ | P10354 | 1,074.44 | 01:20 | 0.00 | 20:00 | 500.28 | 1,074.44 |
| 18 | ☐ | P10356 | 311.37 | 03:50 | 0.00 | 05:00 | 105.22 | 311.37 |
| 19 | ☐ | P10360 | 359.84 | 21:00 | 0.00 | 20:00 | 213.41 | 359.84 |
| 20 | ☐ | P10364 | 48.24 | 01:20 | 0.00 | 05:00 | 16.30 | 48.24 |
| 21 | ☐ | P10366 | 51.31 | 00:00 | 0.00 | 05:00 | 17.34 | 51.31 |
| 22 | ☐ | P10368 | 51.31 | 00:00 | 0.00 | 05:00 | 17.34 | 51.31 |
| 23 | ☐ | P10372 | 731.56 | 01:20 | 0.00 | 20:00 | 358.80 | 731.56 |
| 24 | ☐ | P10374 | 365.76 | 02:10 | 0.00 | 20:00 | 235.18 | 365.76 |
| 25 | ☐ | P10376 | 209.37 | 02:10 | 0.00 | 20:00 | 132.67 | 209.37 |
| 26 | ☐ | P10422 | 2,562.60 | 04:10 | 0.00 | 18:10 | 1,079.04 | 2,562.60 |
| 27 | ☐ | P10506 | 261.90 | 08:00 | 0.00 | 20:00 | 123.50 | 261.90 |
| 28 | ☐ | P10508 | 261.90 | 08:00 | 0.00 | 20:00 | 158.62 | 261.90 |
| 29 | ☐ | P10510 | 145.36 | 08:00 | 0.00 | 20:00 | 73.57 | 145.36 |
| 30 | ☐ | P10512 | 53.35 | 08:00 | 0.00 | 20:00 | 27.70 | 53.35 |
| 31 | ☐ | P10514 | 2.60 | 00:00 | 0.00 | 05:00 | 0.88 | 2.60 |
| 32 | ☐ | P10516 | 106.94 | 02:10 | 0.00 | 20:00 | 58.81 | 106.94 |
| 33 | ☐ | P10518 | 102.43 | 02:10 | 0.00 | 20:00 | 73.86 | 102.43 |
| 34 | ☐ | P10520 | 106.94 | 02:10 | 0.00 | 20:00 | 58.81 | 106.94 |
| 35 | ☐ | P10522 | 116.54 | 08:00 | 0.00 | 20:00 | 81.34 | 116.54 |
| 36 | ☐ | P10550 | 116.54 | 08:00 | 0.00 | 20:00 | 81.34 | 116.54 |
| 37 | ☐ | ONT9036 | 6,530.15 | 23:30 | 0.00 | 05:00 | 2,258.66 | 6,530.15 |
| 38 | ☐ | ONTFRAN-3622 | 1,253.96 | 23:30 | 0.00 | 18:10 | 414.84 | 1,253.96 |
| 39 | ☐ | ONT9042 | 756.39 | 04:20 | 0.00 | 18:10 | 210.10 | 756.39 |
| 40 | ☐ | ONTNEWP-9322 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 41 | ☐ | ONTNEWP-9512 | 48.23 | 04:00 | 0.00 | 05:00 | 16.30 | 48.23 |
| 42 | ☐ | ONTNEWP-9514 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 43 | ☐ | ONTNEWP-9919 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 44 | ☐ | ONTNEWP-10026 | 269.97 | 00:00 | 0.00 | 05:00 | 91.23 | 269.97 |
| 45 | ☐ | ONTNEWP-934 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 46 | ☐ | ONTNEWP-10044 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 47 | ☐ | ONTNEWP-9885 | 492.86 | 00:00 | 0.00 | 05:00 | 166.55 | 492.86 |
| 48 | ☐ | ONTNEWP-9887 | 492.86 | 00:00 | 0.00 | 05:00 | 166.55 | 492.86 |
| 49 | ☐ | ONTNEWP-9889 | 492.86 | 00:00 | 0.00 | 05:00 | 166.55 | 492.86 |
| 50 | ☐ | ONTNEWP-9891 | 492.86 | 00:00 | 0.00 | 05:00 | 166.55 | 492.86 |
| 51 | ☐ | ONTNEWP-9893 | 511.71 | 00:00 | 0.00 | 05:00 | 172.92 | 511.71 |
| 52 | ☐ | ONTNEWP-9895 | 255.85 | 00:00 | 0.00 | 05:00 | 86.46 | 255.85 |
| 53 | ☐ | ONTNEWP-9962 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 54 | ☐ | ONTNEWP-9964 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 55 | ☐ | ONTNEWP-9968 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 56 | ☐ | ONTNEWP-9798 | 1,655.46 | 23:30 | 0.00 | 04:20 | 475.02 | 1,655.46 |
| 57 | ☐ | ONTNEWP-9572 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |

Near Term Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 58 | ☐ | ONTNEWP-9320 | 48.23 | 00:00 | 0.00 | 05:00 | 16.30 | 48.23 |
| 59 | ☐ | ONTNEWP-10016 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 60 | ☐ | ONTNEWP-9774 | 582.73 | 00:00 | 0.00 | 05:00 | 196.92 | 582.73 |
| 61 | ☐ | ONTNEWP-9884 | 4.73 | 00:00 | 0.00 | 05:00 | 1.60 | 4.73 |
| 62 | ☐ | ONTNEWP-9886 | 32.18 | 00:00 | 0.00 | 05:00 | 10.87 | 32.18 |
| 63 | ☐ | ONTNEWP-9384 | 495.21 | 01:20 | 0.00 | 20:00 | 304.54 | 495.21 |
| 64 | ☐ | ONTNEWP-9892 | 504.29 | 01:20 | 0.00 | 20:00 | 307.61 | 504.29 |
| 65 | ☐ | ONTNEWP-9900 | 99.81 | 00:00 | 0.00 | 05:00 | 33.73 | 99.81 |
| 66 | ☐ | ONTNEWP-910 | 99.81 | 00:00 | 0.00 | 05:00 | 33.73 | 99.81 |
| 67 | ☐ | ONTNEWP-9896 | 352.67 | 00:00 | 0.00 | 05:00 | 119.18 | 352.67 |
| 68 | ☐ | ONTNEWP-9712 | 280.33 | 00:00 | 0.00 | 05:00 | 94.73 | 280.33 |
| 69 | ☐ | ONTNEWP-9902 | 133.65 | 00:00 | 0.00 | 05:00 | 45.17 | 133.65 |
| 70 | ☐ | ONTNEWP-9890 | 452.48 | 00:00 | 0.00 | 05:00 | 152.91 | 452.48 |
| 71 | ☐ | ONTNEWP-914 | 452.48 | 00:00 | 0.00 | 05:00 | 152.91 | 452.48 |
| 72 | ☐ | ONTNEWP-9894 | 452.48 | 00:00 | 0.00 | 05:00 | 152.91 | 452.48 |
| 73 | ☐ | ONTNEWP-9913 | 83.15 | 00:00 | 0.00 | 05:00 | 28.10 | 83.15 |
| 74 | ☐ | ONTNEWP-9861 | 108.55 | 00:00 | 0.00 | 05:00 | 36.68 | 108.55 |
| 75 | ☐ | ONTNEWP-9912 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 76 | ☐ | ONTNEWP-9668 | 763.17 | 00:00 | 0.00 | 05:00 | 257.90 | 763.17 |
| 77 | ☐ | ONTNEWP-9664 | 763.17 | 00:00 | 0.00 | 05:00 | 257.90 | 763.17 |
| 78 | ☐ | ONTNEWP-9662 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 79 | ☐ | ONTNEWP-9400 | 214.16 | 22:40 | 0.00 | 20:00 | 68.08 | 214.16 |
| 80 | ☐ | ONTNEWP-9704 | 214.16 | 22:40 | 0.00 | 20:00 | 68.08 | 214.16 |
| 81 | ☐ | ONTNEWP-9916 | 125.56 | 04:40 | 0.00 | 20:00 | 36.84 | 125.56 |
| 82 | ☐ | ONTNEWP-9918 | 214.25 | 22:40 | 0.00 | 20:00 | 68.47 | 214.25 |
| 83 | ☐ | ONTNEWP-9928 | 299.82 | 22:40 | 0.00 | 20:00 | 100.04 | 299.82 |
| 84 | ☐ | ONTNEWP-9926 | 166.80 | 05:00 | 0.00 | 20:00 | 48.39 | 166.80 |
| 85 | ☐ | ONTNEWP-9920 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 86 | ☐ | ONTNEWP-9922 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 87 | ☐ | ONTNEWP-9924 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 88 | ☐ | ONTNEWP-9932 | 458.26 | 22:40 | 0.00 | 20:00 | 146.74 | 458.26 |
| 89 | ☐ | ONTNEWP-9936 | 147.24 | 00:00 | 0.00 | 05:00 | 49.76 | 147.24 |
| 90 | ☐ | ONTNEWP-9940 | 414.26 | 04:00 | 0.00 | 20:00 | 149.53 | 414.26 |
| 91 | ☐ | ONTNEWP-9942 | 414.26 | 04:00 | 0.00 | 20:00 | 149.53 | 414.26 |
| 92 | ☐ | ONTNEWP-9944 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 93 | ☐ | ONTNEWP-908 | 245.32 | 00:00 | 0.00 | 05:00 | 82.90 | 245.32 |
| 94 | ☐ | ONTNEWP-9846 | 968.33 | 01:20 | 0.00 | 20:00 | 464.42 | 968.33 |
| 95 | ☐ | ONTNEWP-9440 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 96 | ☐ | ONTNEWP-9958 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 97 | ☐ | ONTNEWP-9972 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 98 | ☐ | ONTNEWP-9960 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 99 | ☐ | ONTNEWP-9864 | 1,478.59 | 00:00 | 0.00 | 05:00 | 499.66 | 1,478.59 |
| 100 | ☐ | ONTNEWP-9860 | 482.37 | 00:00 | 0.00 | 05:00 | 163.01 | 482.37 |
| 101 | ☐ | ONTFRAN-3693 | 1,229.73 | 00:00 | 0.00 | 06:00 | 402.84 | 1,229.73 |
| 102 | ☐ | ONTFRAN-3621 | 1,954.40 | 23:30 | 0.00 | 18:10 | 658.94 | 1,954.40 |
| 103 | ☐ | ONTFRAN-3625 | 369.96 | 04:10 | 0.00 | 18:10 | 125.16 | 369.96 |
| 104 | ☐ | ONTNEWP649 | 303.81 | 04:00 | 0.00 | 18:10 | 101.57 | 303.81 |
| 105 | ☐ | ONTFRAN-3624 | 303.81 | 04:00 | 0.00 | 18:10 | 101.57 | 303.81 |
| 106 | ☐ | ONTFRAN-3626 | 1,508.56 | 04:00 | 0.00 | 18:10 | 510.39 | 1,508.56 |
| 107 | ☐ | ONTNEWP-9776 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 108 | ☐ | ONTNEWP-9899 | 414.26 | 04:00 | 0.00 | 20:00 | 149.53 | 414.26 |
| 109 | ☐ | ONTNEWP-9974 | 414.26 | 04:00 | 0.00 | 20:00 | 149.53 | 414.26 |
| 110 | ☐ | ONTNEWP-9780 | 231.77 | 21:00 | 0.00 | 05:00 | 83.68 | 231.77 |
| 111 | ☐ | ONTNEWP-9786 | 653.39 | 21:00 | 0.00 | 05:00 | 231.60 | 653.39 |
| 112 | ☐ | ONTNEWP-9778 | 1,990.30 | 00:00 | 0.00 | 05:00 | 672.58 | 1,990.30 |
| 113 | ☐ | ONTFRAN-3694 | 3,349.22 | 23:30 | 0.00 | 18:10 | 1,155.20 | 3,349.22 |
| 114 | ☐ | ONTFRAN-3620 | 463.43 | 04:20 | 0.00 | 18:10 | 185.33 | 463.43 |

Near Term Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 115 | ☐ | ONTFRAN-3628 | 756.39 | 04:20 | 0.00 | 18:10 | 210.10 | 756.39 |
| 116 | ☐ | ONTFRAN-3640 | 332.38 | 04:00 | 0.00 | 18:10 | 151.25 | 332.38 |
| 117 | ☐ | ONTFRAN-3635 | 235.69 | 21:20 | 0.00 | 18:10 | 113.05 | 235.69 |
| 118 | ☐ | ONT9048 | 2,995.21 | 21:20 | 0.00 | 18:10 | 1,045.57 | 2,995.21 |
| 119 | ☐ | ONT9068 | 515.95 | 21:20 | 0.00 | 18:10 | 207.75 | 515.95 |
| 120 | ☐ | ONTFRAN-3634 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 121 | ☐ | ONTFRAN-3632 | 750.10 | 04:00 | 0.00 | 18:10 | 277.93 | 750.10 |
| 122 | ☐ | ONTFRAN-3633 | 750.10 | 04:00 | 0.00 | 18:10 | 277.93 | 750.10 |
| 123 | ☐ | ONTNEWP-9870 | 6,166.06 | 20:30 | 0.00 | 05:00 | 335.76 | 6,166.06 |
| 124 | ☐ | ONTFRAN-3642 | 691.38 | 04:00 | 0.00 | 18:10 | 272.56 | 691.38 |
| 125 | ☐ | ONTFRAN-3645 | 2,514.87 | 21:20 | 0.00 | 18:10 | 874.44 | 2,514.87 |
| 126 | ☐ | ONTFRAN-3627 | 1,680.88 | 23:30 | 0.00 | 18:10 | 566.76 | 1,680.88 |
| 127 | ☐ | ONTFRAN-3618 | 1,581.08 | 04:00 | 0.00 | 18:10 | 614.85 | 1,581.08 |
| 128 | ☐ | ONT9052 | 1,179.58 | 04:00 | 0.00 | 18:10 | 503.25 | 1,179.58 |
| 129 | ☐ | ONTFRAN-3590 | 1,929.68 | 04:00 | 0.00 | 18:10 | 765.42 | 1,929.68 |
| 130 | ☐ | ONTFRAN-3629 | 3,974.29 | 04:00 | 0.00 | 18:10 | 1,585.09 | 3,974.29 |
| 131 | ☐ | ONTFRAN-3617 | 6,791.60 | 23:30 | 0.00 | 18:10 | 2,719.50 | 6,791.60 |
| 132 | ☐ | ONTFRAN-3600 | 9,614.14 | 04:00 | 0.00 | 18:10 | 3,891.70 | 9,614.14 |
| 133 | ☐ | ONT9024 | 6,166.06 | 20:30 | 0.00 | 05:00 | 335.76 | 6,166.06 |
| 134 | ☐ | ONTNEWP-9276 | 6,166.06 | 20:30 | 0.00 | 05:00 | 335.76 | 6,166.06 |
| 135 | ☐ | ONTNEWP-9434 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 136 | ☐ | ONTNEWP-9602 | 6,166.06 | 20:30 | 0.00 | 05:00 | 335.76 | 6,166.06 |
| 137 | ☐ | ONTFRAN-3706 | 6,791.60 | 23:30 | 0.00 | 18:10 | 2,719.50 | 6,791.60 |
| 138 | ☐ | ONTNEWP-9252 | 672.03 | 23:30 | 0.00 | 05:00 | 232.82 | 672.03 |
| 139 | ☐ | ONTNEWP-9590 | 672.03 | 23:30 | 0.00 | 05:00 | 232.82 | 672.03 |
| 140 | ☐ | ONTNEWP-9170 | 672.03 | 23:30 | 0.00 | 05:00 | 232.82 | 672.03 |
| 141 | ☐ | ONTPHLP-3615 | 2,256.60 | 23:30 | 0.00 | 05:00 | 774.34 | 2,256.60 |
| 142 | ☐ | ONT9034 | 6,530.15 | 23:30 | 0.00 | 05:00 | 2,258.66 | 6,530.15 |
| 143 | ☐ | ONTNEWP-9600 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 144 | ☐ | ONTNEWP-9854 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 145 | ☐ | ONTNEWP-9556 | 556.65 | 00:00 | 0.00 | 05:00 | 188.11 | 556.65 |
| 146 | ☐ | ONTNEWP-9554 | 8,605.91 | 20:30 | 0.00 | 05:00 | 2,596.11 | 8,605.91 |
| 147 | ☐ | ONTNEWP-9810 | 8,884.24 | 20:30 | 0.00 | 05:00 | 2,784.22 | 8,884.24 |
| 148 | ☐ | ONTNEWP-9596 | 6,530.15 | 23:30 | 0.00 | 05:00 | 2,258.66 | 6,530.15 |
| 149 | ☐ | ONTNEWP-10017 | 48.24 | 02:20 | 0.00 | 05:00 | 16.30 | 48.24 |
| 150 | ☐ | ONTNEWP-9946 | 763.17 | 00:00 | 0.00 | 05:00 | 257.90 | 763.17 |
| 151 | ☐ | ONT283 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 152 | ☐ | ONTNEWP-9714 | 146.68 | 00:00 | 0.00 | 05:00 | 49.57 | 146.68 |
| 153 | ☐ | ONTNEWP-9578 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 154 | ☐ | ONTNEWP-9494 | 44.25 | 00:00 | 0.00 | 05:00 | 14.95 | 44.25 |
| 155 | ☐ | ONTP10024 | 280.33 | 00:00 | 0.00 | 05:00 | 94.73 | 280.33 |
| 156 | ☐ | 2011_P14 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 157 | ☐ | 2011_P15 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 158 | ☐ | 2011_P17 | 365.76 | 02:10 | 0.00 | 20:00 | 235.18 | 365.76 |
| 159 | ☐ | 2011_P18 | 261.90 | 08:00 | 0.00 | 20:00 | 158.62 | 261.90 |
| 160 | ☐ | 2011_P19 | 271.27 | 21:00 | 0.00 | 20:00 | 183.69 | 271.27 |
| 161 | ☐ | P39 | 360.39 | 00:00 | 0.00 | 05:00 | 121.79 | 360.39 |
| 162 | ☐ | P41 | 262.92 | 02:10 | 0.00 | 05:00 | 88.85 | 262.92 |
| 163 | ☐ | P63 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 164 | ☐ | P81 | 6,530.14 | 23:30 | 0.00 | 05:00 | 2,258.66 | 6,530.14 |
| 165 | ☐ | P87 | 156.39 | 02:10 | 0.00 | 20:00 | 102.52 | 156.39 |
| 166 | ☐ | P186 | 1,655.46 | 23:30 | 0.00 | 04:20 | 747.70 | 1,655.46 |
| 167 | ☐ | P190 | 86.82 | 17:30 | 0.00 | 18:10 | 66.29 | 86.82 |
| 168 | ☐ | P_ONT-2 | 89.67 | 00:00 | 0.00 | 05:00 | 30.30 | 89.67 |
| 169 | ☐ | P_ONT-90 | 235.69 | 21:20 | 0.00 | 18:10 | 113.05 | 235.69 |
| 170 | ☐ | P_ONT-102 | 2,283.24 | 23:30 | 0.00 | 05:00 | 811.73 | 2,283.24 |
| 171 | ☐ | P_ONT-120 | 757.36 | 00:00 | 0.00 | 05:00 | 255.94 | 757.36 |

Near Term Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 172 | ☐ | P_ONT-122 | 9,638.79 | 04:00 | 0.00 | 18:10 | 3,844.42 | 9,638.79 |
| 173 | ☐ | P_ONT-128 | 1,655.46 | 23:30 | 0.00 | 04:20 | 475.04 | 1,655.46 |
| 174 | ☐ | P_ONT-146 | 1,655.46 | 23:30 | 0.00 | 04:20 | 475.02 | 1,655.46 |
| 175 | ☐ | P_ONT-148 | 1,655.46 | 23:30 | 0.00 | 04:20 | 475.02 | 1,655.46 |
| 176 | ☐ | P_ONT-150 | 1,655.46 | 23:30 | 0.00 | 04:20 | 475.04 | 1,655.46 |
| 177 | ☐ | P_ONT-152 | 1,655.46 | 23:30 | 0.00 | 04:20 | 475.04 | 1,655.46 |
| 178 | ☐ | P_ONT-154 | 5,764.17 | 20:30 | 0.00 | 00:00 | 64.13 | 5,764.17 |
| 179 | ☐ | P_ONT-156 | 5,764.17 | 20:30 | 0.00 | 00:00 | 64.13 | 5,764.17 |
| 180 | ☐ | P_ONT-158 | 5,764.17 | 20:30 | 0.00 | 00:00 | 64.13 | 5,764.17 |
| 181 | ☐ | P_ONT-160 | 5,764.17 | 20:30 | 0.00 | 00:00 | 64.13 | 5,764.17 |
| 182 | ☐ | P_ONT-174 | 1,990.30 | 00:00 | 0.00 | 05:00 | 672.58 | 1,990.30 |
| 183 | ☐ | P_ONT-176 | 5,534.20 | 23:30 | 0.00 | 18:10 | 2,254.45 | 5,534.20 |
| 184 | ☐ | P_ONT-178 | 874.55 | 04:00 | 0.00 | 18:10 | 321.28 | 874.55 |
| 185 | ☐ | P_ONT-180 | 391.37 | 04:00 | 0.00 | 18:10 | 143.78 | 391.37 |
| 186 | ☐ | P_ONT-182 | 391.37 | 04:00 | 0.00 | 18:10 | 143.78 | 391.37 |
| 187 | ☐ | P_ONT-184 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 188 | ☐ | P_ONT-186 | 420.58 | 04:10 | 0.00 | 18:10 | 175.55 | 420.58 |
| 189 | ☐ | P_ONT-188 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 190 | ☐ | P_ONT-190 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 191 | ☐ | P_ONT-192 | 633.35 | 04:00 | 0.00 | 18:10 | 238.17 | 633.35 |
| 192 | ☐ | P_ONT-194 | 633.35 | 04:00 | 0.00 | 18:10 | 238.17 | 633.35 |
| 193 | ☐ | P_ONT-196 | 994.56 | 04:10 | 0.00 | 18:10 | 413.68 | 994.56 |
| 194 | ☐ | P_ONT-198 | 2,834.14 | 04:00 | 0.00 | 18:10 | 1,172.19 | 2,834.14 |
| 195 | ☐ | P_ONT-200 | 231.05 | 23:30 | 0.00 | 18:10 | 83.19 | 231.05 |
| 196 | ☐ | P_ONT-204 | 90.35 | 21:40 | 0.00 | 05:00 | 30.53 | 90.35 |
| 197 | ☐ | P_ONT-206 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 198 | ☐ | P_ONT-208 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 199 | ☐ | P_ONT-210 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 200 | ☐ | P_ONT-212 | 1,235.32 | 23:30 | 0.00 | 18:10 | 439.28 | 1,235.32 |
| 201 | ☐ | P_ONT-214 | 380.75 | 23:30 | 0.00 | 18:10 | 150.50 | 380.75 |
| 202 | ☐ | P_ONT-216 | 380.75 | 23:30 | 0.00 | 18:10 | 150.50 | 380.75 |
| 203 | ☐ | P_ONT-218 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 204 | ☐ | P_ONT-220 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 205 | ☐ | P_ONT-222 | 380.75 | 23:30 | 0.00 | 18:10 | 150.50 | 380.75 |
| 206 | ☐ | P_ONT-224 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 207 | ☐ | P_ONT-226 | 1,208.37 | 04:10 | 0.00 | 18:10 | 429.54 | 1,208.37 |
| 208 | ☐ | P_ONT-228 | 51.23 | 23:30 | 0.00 | 18:10 | 39.14 | 51.23 |
| 209 | ☐ | P_ONT-230 | 2,221.74 | 04:00 | 0.00 | 18:10 | 787.25 | 2,221.74 |
| 210 | ☐ | P_ONT-232 | 866.74 | 21:00 | 0.00 | 18:10 | 303.13 | 866.74 |
| 211 | ☐ | P_ONT-234 | 285.33 | 21:00 | 0.00 | 18:10 | 99.44 | 285.33 |
| 212 | ☐ | P_ONT-236 | 132.58 | 21:00 | 0.00 | 18:10 | 46.77 | 132.58 |
| 213 | ☐ | P_ONT-238 | 132.58 | 21:00 | 0.00 | 18:10 | 46.77 | 132.58 |
| 214 | ☐ | P_ONT-240 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 215 | ☐ | P_ONT-242 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 216 | ☐ | P_ONT-244 | 2,221.74 | 04:00 | 0.00 | 18:10 | 998.24 | 2,221.74 |
| 217 | ☐ | P_ONT-246 | 451.44 | 23:30 | 0.00 | 18:10 | 157.01 | 451.44 |
| 218 | ☐ | P_ONT-248 | 451.44 | 23:30 | 0.00 | 18:10 | 157.01 | 451.44 |
| 219 | ☐ | P_ONT-250 | 325.50 | 23:30 | 0.00 | 18:10 | 113.24 | 325.50 |
| 220 | ☐ | P_ONT-252 | 325.50 | 23:30 | 0.00 | 18:10 | 113.24 | 325.50 |
| 221 | ☐ | P_ONT-254 | 385.10 | 23:30 | 0.00 | 18:10 | 133.38 | 385.10 |
| 222 | ☐ | P_ONT-256 | 385.10 | 23:30 | 0.00 | 18:10 | 133.38 | 385.10 |
| 223 | ☐ | P_ONT-258 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 224 | ☐ | P_ONT-260 | 59.60 | 00:00 | 0.00 | 05:00 | 20.14 | 59.60 |
| 225 | ☐ | P_ONT-262 | 2,503.80 | 23:30 | 0.00 | 18:10 | 872.57 | 2,503.80 |
| 226 | ☐ | P_ONT-264 | 50.98 | 04:20 | 0.00 | 18:10 | 9.72 | 50.98 |
| 227 | ☐ | P_ONT-266 | 50.98 | 04:20 | 0.00 | 18:10 | 9.72 | 50.98 |
| 228 | ☐ | P_ONT-268 | 50.98 | 04:20 | 0.00 | 18:10 | 9.72 | 50.98 |

Near Term Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 229 | ☐ | P_ONT-270 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 230 | ☐ | P_ONT-272 | 565.77 | 21:00 | 0.00 | 18:10 | 192.06 | 565.77 |
| 231 | ☐ | P_ONT-274 | 481.55 | 21:00 | 0.00 | 18:10 | 161.73 | 481.55 |
| 232 | ☐ | P_ONT-276 | 101.11 | 04:10 | 0.00 | 18:10 | 37.51 | 101.11 |
| 233 | ☐ | P_ONT-278 | 606.45 | 21:00 | 0.00 | 18:10 | 208.58 | 606.45 |
| 234 | ☐ | P_ONT-280 | 606.46 | 21:00 | 0.00 | 18:10 | 208.58 | 606.46 |
| 235 | ☐ | P_ONT-282 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 236 | ☐ | P_ONT-284 | 50.42 | 04:10 | 0.00 | 18:10 | 19.22 | 50.42 |
| 237 | ☐ | P_ONT-286 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 238 | ☐ | P_ONT-288 | 50.42 | 04:10 | 0.00 | 18:10 | 19.22 | 50.42 |
| 239 | ☐ | P_ONT-290 | 208.97 | 21:00 | 0.00 | 18:10 | 70.67 | 208.97 |
| 240 | ☐ | P_ONT-292 | 751.51 | 21:00 | 0.00 | 18:10 | 255.82 | 751.51 |
| 241 | ☐ | P_ONT-294 | 249.71 | 21:20 | 0.00 | 18:10 | 85.83 | 249.71 |
| 242 | ☐ | P_ONT-296 | 208.97 | 21:00 | 0.00 | 18:10 | 70.67 | 208.97 |
| 243 | ☐ | P_ONT-298 | 501.85 | 21:00 | 0.00 | 18:10 | 171.10 | 501.85 |
| 244 | ☐ | P_ONT-300 | 710.82 | 21:00 | 0.00 | 18:10 | 241.77 | 710.82 |
| 245 | ☐ | P_ONT-302 | 733.09 | 00:00 | 0.00 | 05:00 | 247.73 | 733.09 |
| 246 | ☐ | P_ONT-304 | 421.62 | 21:00 | 0.00 | 05:00 | 147.92 | 421.62 |
| 247 | ☐ | P_ONT-306 | 68.62 | 21:00 | 0.00 | 05:00 | 28.64 | 68.62 |
| 248 | ☐ | P_ONT-308 | 421.62 | 21:00 | 0.00 | 05:00 | 147.93 | 421.62 |
| 249 | ☐ | P_ONT-310 | 421.62 | 21:00 | 0.00 | 05:00 | 147.92 | 421.62 |
| 250 | ☐ | P_ONT-312 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 251 | ☐ | P_ONT-314 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 252 | ☐ | P_ONT-316 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 253 | ☐ | P_ONT-318 | 133.65 | 00:00 | 0.00 | 05:00 | 45.17 | 133.65 |
| 254 | ☐ | P_ONT-322 | 45.15 | 00:00 | 0.00 | 05:00 | 15.26 | 45.15 |
| 255 | ☐ | P_ONT-324 | 45.15 | 00:00 | 0.00 | 05:00 | 15.26 | 45.15 |
| 256 | ☐ | P_ONT-326 | 88.50 | 00:00 | 0.00 | 05:00 | 29.91 | 88.50 |
| 257 | ☐ | P_ONT-328 | 386.65 | 21:00 | 0.00 | 18:10 | 131.85 | 386.65 |
| 258 | ☐ | P_ONT-330 | 424.36 | 21:00 | 0.00 | 18:10 | 145.37 | 424.36 |
| 259 | ☐ | P_ONT-332 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 260 | ☐ | P_ONT-334 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 261 | ☐ | P_ONT-336 | 132.58 | 21:00 | 0.00 | 18:10 | 46.77 | 132.58 |
| 262 | ☐ | P_ONT-338 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 263 | ☐ | P_ONT-340 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 264 | ☐ | P_ONT-342 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 265 | ☐ | P_ONT-344 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 266 | ☐ | P_ONT-346 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 267 | ☐ | P_ONT-348 | 463.43 | 04:20 | 0.00 | 18:10 | 185.33 | 463.43 |
| 268 | ☐ | P_ONT-350 | 90.35 | 21:40 | 0.00 | 05:00 | 30.53 | 90.35 |
| 269 | ☐ | P_ONT-352 | 90.35 | 21:40 | 0.00 | 05:00 | 30.53 | 90.35 |
| 270 | ☐ | P_ONT-354 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 271 | ☐ | P_ONT-356 | 90.35 | 00:00 | 0.00 | 05:00 | 30.53 | 90.35 |
| 272 | ☐ | P_ONT-358 | 4,006.61 | 04:00 | 0.00 | 18:10 | 1,596.01 | 4,006.61 |
| 273 | ☐ | P_ONT-362 | 582.73 | 00:00 | 0.00 | 05:00 | 196.92 | 582.73 |
| 274 | ☐ | P_ONT-368 | 9,638.79 | 04:00 | 0.00 | 18:10 | 3,900.03 | 9,638.79 |
| 275 | ☐ | P_ONT-370 | 231.05 | 23:30 | 0.00 | 18:10 | 83.19 | 231.05 |
| 276 | ☐ | P_ONT-372 | 231.05 | 23:30 | 0.00 | 18:10 | 83.19 | 231.05 |
| 277 | ☐ | P_ONT-374 | 1,179.58 | 04:00 | 0.00 | 18:10 | 503.25 | 1,179.58 |
| 278 | ☐ | P_ONT-376 | 1,581.08 | 04:00 | 0.00 | 18:10 | 614.85 | 1,581.08 |
| 279 | ☐ | P_ONT-378 | 132.58 | 21:00 | 0.00 | 18:10 | 46.77 | 132.58 |
| 280 | ☐ | P_ONT-382 | 311.37 | 03:50 | 0.00 | 05:00 | 105.22 | 311.37 |
| 281 | ☐ | P_ONT-388 | 458.26 | 22:40 | 0.00 | 20:00 | 146.74 | 458.26 |
| 282 | ☐ | P_ONT-406 | 763.17 | 22:20 | 0.00 | 05:00 | 257.90 | 763.17 |
| 283 | ☐ | P_ONT-408 | 763.17 | 22:20 | 0.00 | 05:00 | 257.90 | 763.17 |
| 284 | ☐ | P_ONT-410 | 763.17 | 22:20 | 0.00 | 05:00 | 257.90 | 763.17 |
| 285 | ☐ | P_ONT-412 | 763.17 | 22:20 | 0.00 | 05:00 | 257.90 | 763.17 |

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 286 | ☐ | P_ONT-418 | 763.17 | 00:00 | 0.00 | 05:00 | 257.90 | 763.17 |
| 287 | ☐ | P_ONT-420 | 1.95 | 00:00 | 0.00 | 05:00 | 0.66 | 1.95 |
| 288 | ☐ | P_ONT-422 | 53.35 | 08:00 | 0.00 | 20:00 | 26.88 | 53.35 |
| 289 | ☐ | P_ONT-424 | 2.60 | 00:00 | 0.00 | 05:00 | 0.88 | 2.60 |
| 290 | ☐ | P_ONT-426 | 102.43 | 02:10 | 0.00 | 20:00 | 73.86 | 102.43 |
| 291 | ☐ | P_ONT-428 | 261.90 | 08:00 | 0.00 | 20:00 | 158.62 | 261.90 |
| 292 | ☐ | P_ONT-430 | 271.27 | 21:00 | 0.00 | 20:00 | 183.69 | 271.27 |
| 293 | ☐ | P_ONT-432 | 271.27 | 21:00 | 0.00 | 20:00 | 183.69 | 271.27 |
| 294 | ☐ | P_ONT-434 | 271.27 | 21:00 | 0.00 | 20:00 | 183.69 | 271.27 |
| 295 | ☐ | P_ONT-438 | 280.33 | 00:00 | 0.00 | 05:00 | 94.73 | 280.33 |
| 296 | ☐ | P_ONT-440 | 968.33 | 01:20 | 0.00 | 20:00 | 464.42 | 968.33 |
| 297 | ☐ | P_ONT-442 | 495.21 | 01:20 | 0.00 | 20:00 | 304.54 | 495.21 |
| 298 | ☐ | P_ONT-444 | 338.27 | 08:00 | 0.00 | 20:00 | 247.48 | 338.27 |
| 299 | ☐ | P_ONT-446 | 338.27 | 08:00 | 0.00 | 20:00 | 247.48 | 338.27 |
| 300 | ☐ | P_ONT-456 | 262.92 | 02:10 | 0.00 | 05:00 | 88.85 | 262.92 |
| 301 | ☐ | P_ONT-458 | 267.64 | 02:10 | 0.00 | 05:00 | 90.44 | 267.64 |
| 302 | ☐ | P_ONT-460 | 38.59 | 00:00 | 0.00 | 05:00 | 13.04 | 38.59 |
| 303 | ☐ | P_ONT-462 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 304 | ☐ | P_ONT-466 | 901.91 | 04:00 | 0.00 | 18:10 | 343.71 | 901.91 |
| 305 | ☐ | P_ONT-468 | 1,272.69 | 04:00 | 0.00 | 18:10 | 469.01 | 1,272.69 |
| 306 | ☐ | P_ONT-470 | 495.21 | 01:20 | 0.00 | 20:00 | 304.54 | 495.21 |
| 307 | ☐ | P_ONT-476 | 89.67 | 00:00 | 0.00 | 05:00 | 30.30 | 89.67 |
| 308 | ☐ | P_ONT-480 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 309 | ☐ | P_ONT-482 | 1,680.88 | 23:30 | 0.00 | 18:10 | 566.76 | 1,680.88 |
| 310 | ☐ | P_ONT-484 | 369.96 | 04:10 | 0.00 | 18:10 | 125.16 | 369.96 |
| 311 | ☐ | P_ONT-486 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 312 | ☐ | P_ONT-534 | 495.21 | 01:20 | 0.00 | 20:00 | 304.54 | 495.21 |
| 313 | ☐ | P_ONT-552 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 314 | ☐ | P_ONT-560 | 338.27 | 08:00 | 0.00 | 20:00 | 176.82 | 338.27 |
| 315 | ☐ | P_ONT-566 | 32.18 | 00:00 | 0.00 | 05:00 | 10.87 | 32.18 |
| 316 | ☐ | P_ONT-570 | 271.27 | 21:00 | 0.00 | 20:00 | 183.69 | 271.27 |
| 317 | ☐ | P_ONT-572 | 359.84 | 21:00 | 0.00 | 20:00 | 213.41 | 359.84 |
| 318 | ☐ | P_ONT-574 | 359.84 | 21:00 | 0.00 | 20:00 | 213.41 | 359.84 |
| 319 | ☐ | P_ONT-576 | 866.74 | 21:00 | 0.00 | 18:10 | 303.13 | 866.74 |
| 320 | ☐ | P_ONT-578 | 73.62 | 00:00 | 0.00 | 05:00 | 24.88 | 73.62 |
| 321 | ☐ | P_ONT-580 | 73.62 | 00:00 | 0.00 | 05:00 | 24.88 | 73.62 |
| 322 | ☐ | P_ONT-598 | 1,680.88 | 23:30 | 0.00 | 18:10 | 566.76 | 1,680.88 |
| 323 | ☐ | P_ONT-618 | 2,995.21 | 21:20 | 0.00 | 18:10 | 1,045.57 | 2,995.21 |
| 324 | ☐ | P_ONT-666 | 231.05 | 23:30 | 0.00 | 18:10 | 83.19 | 231.05 |
| 325 | ☐ | P_ONT-668 | 515.95 | 21:20 | 0.00 | 18:10 | 207.75 | 515.95 |
| 326 | ☐ | P_ONT-676 | 386.65 | 21:00 | 0.00 | 18:10 | 131.85 | 386.65 |
| 327 | ☐ | P_ONT-680 | 15.86 | 00:00 | 0.00 | 05:00 | 5.36 | 15.86 |

Future Model Scenario

Future Scenario - City of Ontario - Junctions Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 1 | | J1272 | 1299 | 995.00 |
| 2 | | J1274 | 1299 | 1,015.00 |
| 3 | | J1276 | 1299 | 984.00 |
| 4 | | J1280 | 1299 | 997.00 |
| 5 | | J1288 | 1299 | 1,006.00 |
| 6 | | J1290 | 1299 | 967.00 |
| 7 | | J1292 | 1158 | 803.00 |
| 8 | | J1294 | 1158 | 873.00 |
| 9 | | J1296 | 1158 | 892.00 |
| 10 | | J1302 | 1299 | 1,005.00 |
| 11 | | J1304 | 1158 | 845.00 |
| 12 | | J1308 | 1299 | 1,010.00 |
| 13 | | J1314 | 1299 | 1,063.00 |
| 14 | | J1316 | 1299 | 1,063.00 |
| 15 | | J1320 | 1299 | 1,022.00 |
| 16 | | J1322 | 1299 | 998.50 |
| 17 | | J1324 | 1299 | 998.50 |
| 18 | | J1404 | 1299 | 1,005.00 |
| 19 | | J1406 | 1299 | 1,014.00 |
| 20 | | J1408 | 1299 | 1,029.00 |
| 21 | | J1410 | 1299 | 1,022.00 |
| 22 | | J1412 | 1299 | 1,022.00 |
| 23 | | J1414 | 1299 | 1,012.50 |
| 24 | | J1416 | 1299 | 994.50 |
| 25 | | J1586 | 1299 | 1,111.00 |
| 26 | | J1592 | 1299 | 970.00 |
| 27 | | J1596 | 1050 | 790.80 |
| 28 | | JKELLOG | 930 | 722.50 |
| 29 | | JSCH_HYD | 930 | 722.50 |
| 30 | | J_ONT-1 | 1299 | 1,020.00 |
| 31 | | J_ONT-103 | 1050 | 752.33 |
| 32 | | J_ONT-105 | 930 | 752.33 |
| 33 | | J_ONT-107 | 1050 | 752.33 |
| 34 | | J_ONT-109 | 930 | 752.33 |
| 35 | | J_ONT-113 | 930 | 766.97 |
| 36 | | J_ONT-115 | 1050 | 766.95 |
| 37 | | J_ONT-117 | 930 | 766.95 |
| 38 | | J_ONT-119 | 1050 | 766.95 |
| 39 | | J_ONT-13 | 1158 | 935.00 |
| 40 | | J_ONT-133 | 930 | 718.23 |
| 41 | | J_ONT-135 | 930 | 730.00 |
| 42 | | J_ONT-137 | 930 | 722.00 |
| 43 | | J_ONT-139 | 930 | 720.00 |
| 44 | | J_ONT-141 | 930 | 717.00 |
| 45 | | J_ONT-143 | 930 | 725.00 |
| 46 | | J_ONT-145 | 930 | 717.00 |
| 47 | | J_ONT-147 | 930 | 716.00 |
| 48 | | J_ONT-149 | 930 | 715.00 |
| 49 | | J_ONT-15 | 1158 | 928.00 |
| 50 | | J_ONT-151 | 930 | 740.26 |
| 51 | | J_ONT-153 | 930 | 740.00 |

Future Scenario - City of Ontario - Junctions Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 52 | | J_ONT-155 | 930 | 757.00 |
| 53 | | J_ONT-157 | 930 | 728.00 |
| 54 | | J_ONT-159 | 930 | 739.00 |
| 55 | | J_ONT-161 | 930 | 720.00 |
| 56 | | J_ONT-163 | 930 | 714.00 |
| 57 | | J_ONT-165 | 930 | 699.00 |
| 58 | | J_ONT-167 | 930 | 714.00 |
| 59 | | J_ONT-169 | 930 | 710.00 |
| 60 | | J_ONT-17 | 1158 | 881.00 |
| 61 | | J_ONT-171 | 930 | 700.00 |
| 62 | | J_ONT-173 | 930 | 696.00 |
| 63 | | J_ONT-175 | 930 | 695.00 |
| 64 | | J_ONT-177 | 930 | 690.26 |
| 65 | | J_ONT-179 | 930 | 686.77 |
| 66 | | J_ONT-181 | 930 | 662.11 |
| 67 | | J_ONT-185 | 930 | 667.75 |
| 68 | | J_ONT-187 | 930 | 662.97 |
| 69 | | J_ONT-189 | 930 | 652.00 |
| 70 | | J_ONT-19 | 1158 | 848.00 |
| 71 | | J_ONT-191 | 930 | 652.00 |
| 72 | | J_ONT-193 | 930 | 683.62 |
| 73 | | J_ONT-195 | 930 | 670.00 |
| 74 | | J_ONT-197 | 930 | 665.00 |
| 75 | | J_ONT-199 | 930 | 668.00 |
| 76 | | J_ONT-201 | 930 | 673.00 |
| 77 | | J_ONT-203 | 930 | 676.00 |
| 78 | | J_ONT-205 | 930 | 677.00 |
| 79 | | J_ONT-207 | 930 | 683.00 |
| 80 | | J_ONT-209 | 930 | 676.00 |
| 81 | | J_ONT-211 | 930 | 671.02 |
| 82 | | J_ONT-213 | 930 | 667.00 |
| 83 | | J_ONT-215 | 930 | 669.00 |
| 84 | | J_ONT-217 | 930 | 669.00 |
| 85 | | J_ONT-219 | 930 | 670.00 |
| 86 | | J_ONT-221 | 930 | 675.00 |
| 87 | | J_ONT-223 | 930 | 679.00 |
| 88 | | J_ONT-225 | 930 | 680.00 |
| 89 | | J_ONT-227 | 930 | 685.00 |
| 90 | | J_ONT-229 | 930 | 677.00 |
| 91 | | J_ONT-231 | 930 | 677.00 |
| 92 | | J_ONT-233 | 930 | 675.00 |
| 93 | | J_ONT-235 | 930 | 678.00 |
| 94 | | J_ONT-237 | 930 | 673.00 |
| 95 | | J_ONT-239 | 1050 | 798.05 |
| 96 | | J_ONT-243 | 1050 | 775.00 |
| 97 | | J_ONT-247 | 1050 | 795.00 |
| 98 | | J_ONT-249 | 1050 | 785.00 |
| 99 | | J_ONT-251 | 1050 | 791.00 |
| 100 | | J_ONT-253 | 1050 | 800.00 |
| 101 | | J_ONT-255 | 1050 | 795.00 |
| 102 | | J_ONT-257 | 1299 | 0.00 |

Future Scenario - City of Ontario - Junctions Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 103 | | J_ONT-259 | 1299 | 0.00 |
| 104 | | J_ONT-261 | 1299 | 0.00 |
| 105 | | J_ONT-263 | 1299 | 0.00 |
| 106 | | J_ONT-265 | 930 | 662.00 |
| 107 | | J_ONT-267 | 930 | 672.50 |
| 108 | | J_ONT-271 | 930 | 662.00 |
| 109 | | J_ONT-273 | 930 | 666.81 |
| 110 | | J_ONT-275 | 930 | 663.85 |
| 111 | | J_ONT-277 | 930 | 654.00 |
| 112 | | J_ONT-279 | 930 | 654.00 |
| 113 | | J_ONT-281 | 930 | 654.00 |
| 114 | | J_ONT-283 | 930 | 658.00 |
| 115 | | J_ONT-285 | 930 | 661.00 |
| 116 | | J_ONT-287 | 930 | 661.00 |
| 117 | | J_ONT-289 | 930 | 730.83 |
| 118 | | J_ONT-291 | 930 | 748.00 |
| 119 | | J_ONT-295 | 930 | 754.00 |
| 120 | | J_ONT-297 | 930 | 755.00 |
| 121 | | J_ONT-299 | 930 | 755.00 |
| 122 | | J_ONT-3 | 1299 | 1,006.00 |
| 123 | | J_ONT-301 | 930 | 698.61 |
| 124 | | J_ONT-305 | 1050 | 752.15 |
| 125 | | J_ONT-313 | 930 | 750.65 |
| 126 | | J_ONT-315 | 930 | 737.00 |
| 127 | | J_ONT-317 | 930 | 735.00 |
| 128 | | J_ONT-319 | 930 | 705.67 |
| 129 | | J_ONT-321 | 930 | 630.05 |
| 130 | | J_ONT-325 | 930 | 663.56 |
| 131 | | J_ONT-333 | 1158 | 898.39 |
| 132 | | J_ONT-341 | 1158 | 897.00 |
| 133 | | J_ONT-343 | 1158 | 897.00 |
| 134 | | J_ONT-351 | 1158 | 905.98 |
| 135 | | J_ONT-357 | 1158 | 907.23 |
| 136 | | J_ONT-359 | 1299 | 1,125.73 |
| 137 | | J_ONT-361 | 1299 | 1,022.00 |
| 138 | | J_ONT-363 | 1299 | 1,027.86 |
| 139 | | J_ONT-365 | 1299 | 1,013.84 |
| 140 | | J_ONT-367 | 1299 | 1,015.12 |
| 141 | | J_ONT-369 | 1299 | 1,020.00 |
| 142 | | J_ONT-37 | 1158 | 930.00 |
| 143 | | J_ONT-371 | 1299 | 1,020.00 |
| 144 | | J_ONT-373 | 1299 | 1,012.03 |
| 145 | | J_ONT-377 | 1299 | 975.08 |
| 146 | | J_ONT-379 | 1299 | 1,012.28 |
| 147 | | J_ONT-381 | 1299 | 990.66 |
| 148 | | J_ONT-383 | 1299 | 988.07 |
| 149 | | J_ONT-385 | 1299 | 983.47 |
| 150 | | J_ONT-387 | 1299 | 979.36 |
| 151 | | J_ONT-39 | 1158 | 925.00 |
| 152 | | J_ONT-399 | 1299 | 967.15 |
| 153 | | J_ONT-401 | 1299 | 975.71 |

Future Scenario - City of Ontario - Junctions Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 154 | | J_ONT-403 | 1299 | 972.20 |
| 155 | | J_ONT-405 | 1158 | 906.93 |
| 156 | | J_ONT-407 | 1299 | 970.00 |
| 157 | | J_ONT-409 | 930 | 636.83 |
| 158 | | J_ONT-41 | 1158 | 900.00 |
| 159 | | J_ONT-421 | 1299 | 962.00 |
| 160 | | J_ONT-423 | 930 | 717.61 |
| 161 | | J_ONT-425 | 930 | 699.76 |
| 162 | | J_ONT-427 | 930 | 699.76 |
| 163 | | J_ONT-43 | 1158 | 926.00 |
| 164 | | J_ONT-433 | 1299 | 1,006.00 |
| 165 | | J_ONT-437 | 1299 | 1,006.00 |
| 166 | | J_ONT-441 | 1158 | 901.86 |
| 167 | | J_ONT-443 | 1158 | 927.00 |
| 168 | | J_ONT-45 | 1158 | 878.00 |
| 169 | | J_ONT-467 | 1050 | 784.72 |
| 170 | | J_ONT-469 | 1158 | 824.00 |
| 171 | | J_ONT-47 | 1158 | 870.00 |
| 172 | | J_ONT-473 | 1158 | 973.90 |
| 173 | | J_ONT-477 | 1299 | 983.86 |
| 174 | | J_ONT-489 | 1158 | 912.00 |
| 175 | | J_ONT-49 | 1158 | 838.00 |
| 176 | | J_ONT-491 | 1158 | 878.00 |
| 177 | | J_ONT-495 | 1299 | 96.70 |
| 178 | | J_ONT-499 | 1158 | 875.30 |
| 179 | | J_ONT-501 | 1158 | 870.00 |
| 180 | | J_ONT-503 | 1299 | 870.00 |
| 181 | | J_ONT-507 | 1299 | 1,020.00 |
| 182 | | J_ONT-509 | 1299 | 1,010.42 |
| 183 | | J_ONT-51 | 1158 | 868.00 |
| 184 | | J_ONT-511 | 1299 | 1,010.97 |
| 185 | | J_ONT-513 | 1158 | 863.00 |
| 186 | | J_ONT-515 | 1158 | 867.04 |
| 187 | | J_ONT-523 | 1158 | 928.55 |
| 188 | | J_ONT-525 | 1158 | 876.30 |
| 189 | | J_ONT-53 | 1158 | 851.00 |
| 190 | | J_ONT-531 | 1158 | 869.04 |
| 191 | | J_ONT-533 | 1050 | 805.94 |
| 192 | | J_ONT-535 | 1050 | 784.72 |
| 193 | | J_ONT-537 | 930 | 706.89 |
| 194 | | J_ONT-543 | 930 | 749.66 |
| 195 | | J_ONT-545 | 1050 | 748.04 |
| 196 | | J_ONT-547 | 1050 | 719.31 |
| 197 | | J_ONT-55 | 1050 | 842.00 |
| 198 | | J_ONT-567 | 930 | 661.07 |
| 199 | | J_ONT-569 | 930 | 653.59 |
| 200 | | J_ONT-571 | | 928.55 |
| 201 | | J_ONT-573 | 1158 | 928.55 |
| 202 | | J_ONT-575 | 1158 | 928.55 |
| 203 | | J_ONT-577 | 1158 | 928.55 |
| 204 | | J_ONT-579 | 1158 | 928.55 |

Future Scenario - City of Ontario - Junctions Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 205 | | J_ONT-583 | 1158 | 928.55 |
| 206 | | J_ONT-587 | 1050 | 875.30 |
| 207 | | J_ONT-589 | 1158 | 875.30 |
| 208 | | J_ONT-59 | 1050 | 840.00 |
| 209 | | J_ONT-609 | 930 | 665.39 |
| 210 | | J_ONT-61 | 1050 | 850.00 |
| 211 | | J_ONT-611 | 930 | 665.41 |
| 212 | | J_ONT-613 | 930 | 684.00 |
| 213 | | J_ONT-63 | 1050 | 841.00 |
| 214 | | J_ONT-77 | 930 | 660.94 |
| 215 | | J_ONT-89 | 1050 | 796.00 |
| 216 | | J_ONT-99 | 1050 | 791.41 |
| 217 | | ONT66 | 1050 | 780.00 |
| 218 | | ONT68 | 1050 | 787.87 |
| 219 | | ONT72 | 1050 | 786.40 |
| 220 | | ONT76 | 930 | 694.43 |
| 221 | | ONT84 | 930 | 730.00 |
| 222 | | ONTFRAN-3571 | 1050 | 776.17 |
| 223 | | ONTFRAN-3574 | 930 | 751.37 |
| 224 | | ONTFRAN-3575 | 930 | 748.04 |
| 225 | | ONTFRAN-3576 | 930 | 750.84 |
| 226 | | ONTFRAN-3577 | 930 | 750.28 |
| 227 | | ONTFRAN-3578 | 930 | 746.00 |
| 228 | | ONTFRAN-3581 | 930 | 728.00 |
| 229 | | ONTFRAN-3582 | 930 | 729.23 |
| 230 | | ONTFRAN-3583 | 930 | 723.56 |
| 231 | | ONTFRAN-3584 | 930 | 722.25 |
| 232 | | ONTFRAN-3585 | 930 | 718.48 |
| 233 | | ONTFRAN-3586 | 930 | 717.32 |
| 234 | | ONTFRAN-3587 | 930 | 721.32 |
| 235 | | ONTFRAN-3588 | 930 | 691.13 |
| 236 | | ONTFRAN-3591 | 930 | 706.58 |
| 237 | | ONTFRAN-3592 | 930 | 725.00 |
| 238 | | ONTFRAN-3593 | 930 | 730.70 |
| 239 | | ONTFRAN-3594 | 930 | 731.73 |
| 240 | | ONTFRAN-3595 | 930 | 737.21 |
| 241 | | ONTFRAN-3596 | 930 | 706.61 |
| 242 | | ONTFRAN-3597 | 930 | 699.76 |
| 243 | | ONTFRAN-3598 | 930 | 706.52 |
| 244 | | ONTFRAN-3599 | 930 | 683.13 |
| 245 | | ONTFRAN-3600 | 930 | 701.34 |
| 246 | | ONTFRAN-3601 | 930 | 674.45 |
| 247 | | ONTFRAN-3602 | 930 | 676.18 |
| 248 | | ONTFRAN-3603 | 930 | 663.78 |
| 249 | | ONTFRAN-3605 | 930 | 655.40 |
| 250 | | ONTFRAN-3606 | 930 | 650.00 |
| 251 | | ONTFRAN-3607 | 930 | 636.83 |
| 252 | | ONTFRAN-3608 | 930 | 658.46 |
| 253 | | ONTFRAN-3609 | 930 | 679.25 |
| 254 | | ONTFRAN-3611 | 930 | 735.93 |
| 255 | | ONTFRAN-3618 | 930 | 768.59 |

Future Scenario - City of Ontario - Junctions Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 256 | | ONTFRAN-3619 | 930 | 768.76 |
| 257 | | ONTFRAN-3620 | 930 | 750.00 |
| 258 | | ONTFRAN-3621 | 930 | 746.40 |
| 259 | | ONTFRAN-3622 | 930 | 750.00 |
| 260 | | ONTFRAN-3626 | 930 | 730.63 |
| 261 | | ONTJ10 | 930 | 684.00 |
| 262 | | ONTJ114 | 1158 | 832.20 |
| 263 | | ONTJ12 | 930 | 670.00 |
| 264 | | ONTJ145 | 1050 | 774.66 |
| 265 | | ONTJ18 | 930 | 686.00 |
| 266 | | ONTJ19 | 930 | 660.59 |
| 267 | | ONTJ76 | 1050 | 778.34 |
| 268 | | ONTNEWJ-198 | 1299 | 1,141.76 |
| 269 | | ONTNEWJ-212 | 1050 | 798.63 |
| 270 | | ONTNEWJ-214 | 1050 | 795.78 |
| 271 | | ONTNEWJ-222 | 1050 | 775.88 |
| 272 | | ONTNEWJ-224 | 1050 | 761.30 |
| 273 | | ONTNEWJ-262 | 1299 | 1,112.46 |
| 274 | | ONTNEWJ-278 | 1299 | 983.47 |
| 275 | | ONTNEWJ-322 | 1299 | 1,112.00 |
| 276 | | ONTNEWJ-334 | 1050 | 785.99 |
| 277 | | ONTNEWJ-336 | 1050 | 775.86 |
| 278 | | ONTNEWJ-338 | 1050 | 778.12 |
| 279 | | ONTNEWJ-340 | 1050 | 777.10 |
| 280 | | ONTNEWJ-348 | 1158 | 973.90 |
| 281 | | ONTNEWJ-354 | 1050 | 798.84 |
| 282 | | ONTNEWJ-356 | 1050 | 773.92 |
| 283 | | ONTNEWJ-378 | 1158 | 905.98 |
| 284 | | ONTNEWJ-396 | 1158 | 950.07 |
| 285 | | ONTNEWJ-398 | 1299 | 966.59 |
| 286 | | ONTNEWJ-399 | 1299 | 966.59 |
| 287 | | ONTNEWJ-418 | 1050 | 748.04 |
| 288 | | ONTNEWJ-420 | 1050 | 750.84 |
| 289 | | ONTNEWJ-424 | 1050 | 750.28 |
| 290 | | ONTNEWJ-426 | 1050 | 746.00 |
| 291 | | ONTNEWJ-428 | 1050 | 778.10 |
| 292 | | ONTNEWJ-430 | 1050 | 750.81 |
| 293 | | ONTNEWJ-432 | 1050 | 753.22 |
| 294 | | ONTNEWJ-436 | 1050 | 768.59 |
| 295 | | ONTNEWJ-438 | 1050 | 768.76 |
| 296 | | ONTNEWJ-440 | 1050 | 778.53 |
| 297 | | ONTNEWJ-456 | 1050 | 751.37 |
| 298 | | ONTNEWJ-458 | 1050 | 787.43 |
| 299 | | ONTNEWJ-470 | 1299 | 1,005.00 |
| 300 | | ONTNEWJ-478 | 1299 | 1,002.83 |
| 301 | | ONTNEWJ-482 | 1299 | 988.07 |
| 302 | | ONTNEWJ-492 | 1050 | 815.00 |
| 303 | | ONTNEWJ-496 | 1050 | 803.00 |
| 304 | | ONTNEWJ-498 | 1050 | 803.00 |
| 305 | | ONTNEWJ-500 | 1050 | 790.00 |
| 306 | | ONTNEWJ-502 | 1050 | 752.00 |

Future Scenario - City of Ontario - Junctions Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 307 | | ONTNEWJ-510 | 1299 | 962.00 |
| 308 | | ONTNEWJ-516 | 1299 | 969.00 |
| 309 | | ONTNEWJ-520 | 1299 | 998.00 |
| 310 | | ONTNEWJ-522 | 1299 | 977.00 |
| 311 | | ONTNEWJ-526 | 1299 | 967.00 |
| 312 | | ONTNEWJ-528 | 1299 | 970.00 |
| 313 | | ONTNEWJ-530 | 1158 | 947.00 |
| 314 | | ONTNEWJ-542 | 1158 | 923.00 |
| 315 | | ONTNEWJ-544 | 1158 | 924.00 |
| 316 | | ONTNEWJ-546 | 1158 | 909.00 |
| 317 | | ONTNEWJ-548 | 1158 | 917.00 |
| 318 | | ONTNEWJ-550 | 1158 | 896.00 |
| 319 | | ONTNEWJ-554 | 1158 | 901.00 |
| 320 | | ONTNEWJ-555 | 1158 | 880.00 |
| 321 | | ONTNEWJ-556 | 1158 | 870.00 |
| 322 | | ONTNEWJ-558 | 1158 | 863.00 |
| 323 | | ONTNEWJ-560 | 1158 | 883.00 |
| 324 | | ONTNEWJ-562 | 1158 | 895.00 |
| 325 | | ONTNEWJ-564 | 1158 | 905.00 |
| 326 | | ONTNEWJ-568 | 1158 | 915.00 |
| 327 | | ONTNEWJ-576 | 1158 | 815.00 |
| 328 | | ONTNEWJ-578 | 1158 | 841.00 |
| 329 | | ONTNEWJ-582 | 1158 | 854.00 |
| 330 | | ONTNEWJ-584 | 1158 | 842.00 |
| 331 | | ONTNEWJ-585 | 1158 | 867.00 |
| 332 | | ONTNEWJ-586 | 1158 | 842.00 |
| 333 | | ONTNEWJ-588 | 1158 | 845.00 |
| 334 | | ONTNEWJ-591 | 1158 | 872.50 |
| 335 | | ONTNEWJ-592 | 1158 | 864.00 |
| 336 | | ONTNEWJ-598 | 1299 | 995.00 |
| 337 | | ONTNEWJ-622 | 1299 | 1,110.00 |
| 338 | | ONTNEWJ-628 | 1158 | 956.00 |
| 339 | | ONTNEWJ-631 | 1050 | 805.00 |
| 340 | | ONTNEWJ-632 | 1050 | 800.00 |
| 341 | | ONTNEWJ-634 | 1050 | 812.00 |
| 342 | | ONTNEWJ-636 | 1050 | 800.00 |
| 343 | | ONTNEWJ-638 | 1050 | 803.00 |
| 344 | | ONTNEWJ-640 | 1299 | 1,020.00 |
| 345 | | ONTNEWJ-646 | 1299 | 1,020.00 |
| 346 | | ONTNEWJ-908 | 1299 | 1,099.00 |
| 347 | | ONTNEWJ-910 | 1299 | 967.00 |
| 348 | | ONTNEWJ-914 | 1299 | 992.50 |
| 349 | | ONTNEWJ-934 | 1158 | 936.00 |
| 350 | | ONTNEWJ-936 | 1158 | 934.00 |
| 351 | | ONTNEWJ-950 | 1299 | 1,020.00 |
| 352 | | ONTNEWJ392 | 930 | 778.53 |
| 353 | | ONTNEWJ398 | 930 | 672.00 |
| 354 | | ONTNEWJ400 | 930 | 672.80 |
| 355 | | ONTNEWJ402 | 930 | 652.53 |
| 356 | | ONTNEWJ_630 | 1050 | 805.00 |
| 357 | | ONTPHLP-2235 | 1050 | 769.70 |

Future Scenario - City of Ontario - Junctions Input Data Elevations and Zones

| | | ID (Char) | Zone (Char) | Elevation (ft) |
|---|---|---|---|---|
| 358 | | ONTPHLP-2241 | 1050 | 780.86 |
| 359 | | ONTPHLP-2263 | 1050 | 783.02 |
| 360 | | ONTPHLP-3507 | 1050 | 778.10 |
| 361 | | ONTPHLP-3606 | 930 | 753.22 |
| 362 | | ONTPHLP-3610 | 1050 | 799.50 |
| 363 | | ONTPICKUP-12 | 1050 | 760.27 |
| 364 | | ONTPICKUP-14 | 1050 | 777.77 |
| 365 | | ONTPICKUP-17 | 1050 | 790.00 |
| 366 | | ONTPICKUP-30 | 1158 | 835.00 |
| 367 | | ONTPICKUP-32 | 1158 | 925.00 |
| 368 | | ONTPICKUP-42 | 1299 | 1,093.00 |
| 369 | | ONTPICKUP-48 | 1158 | 884.75 |
| 370 | | ONTPICKUP-51 | 1299 | 1,110.62 |
| 371 | | ONTPICKUP-6 | 1158 | 961.87 |
| 372 | | ONTPICKUP-65 | 1158 | 910.16 |
| 373 | | ONTPICKUP-68 | 1299 | 968.54 |
| 374 | | ONTPICKUP-70 | 1050 | 777.55 |
| 375 | | ONTPICKUP-71 | 1158 | 907.45 |
| 376 | | ONTPICKUP-72 | 1299 | 1,094.10 |
| 377 | | ONTPICKUP-9 | 1050 | 775.82 |
| 378 | | ONTTOP50-10 | 1158 | 974.34 |
| 379 | | ONTTOP50-15 | 1299 | 979.36 |
| 380 | | ONTTOP50-18 | 1299 | 988.07 |
| 381 | | ONTTOP50-20 | 1050 | 776.21 |
| 382 | | ONTTOP50-22 | 1299 | 973.68 |
| 383 | | ONTTOP50-23 | 1050 | 773.61 |
| 384 | | ONTTOP50-25 | 1050 | 771.36 |
| 385 | | ONTTOP50-40 | 1299 | 1,109.15 |
| 386 | | ONTTOP50-48 | 1158 | 877.76 |
| 387 | | ONTTOP50-6 | 1050 | 761.11 |

Future Scenario - CIty of Ontario - Junctions Input Data

| * ULTIMATE * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Pattern 2 (Char) |
|---|---|---|---|---|---|
| 1 | ☐ | J1272 | 0.00 | LANDSCAPE | |
| 2 | ☐ | J1274 | 40.55 | LANDSCAPE | |
| 3 | ☐ | J1276 | 5.26 | LANDSCAPE | |
| 4 | ☐ | J1280 | 53.20 | LANDSCAPE | |
| 5 | ☐ | J1288 | 15.59 | LANDSCAPE | |
| 6 | ☐ | J1290 | 21.80 | LANDSCAPE | |
| 7 | ☐ | J1292 | 64.32 | Ontario_1158 | |
| 8 | ☐ | J1294 | 204.18 | Ontario_1158 | |
| 9 | ☐ | J1296 | 0.00 | | |
| 10 | ☐ | J1302 | 0.00 | | |
| 11 | ☐ | J1304 | 0.00 | | |
| 12 | ☐ | J1308 | 0.00 | | |
| 13 | ☐ | J1314 | 0.00 | | |
| 14 | ☐ | J1316 | 28.99 | LANDSCAPE | |
| 15 | ☐ | J1320 | 206.00 | LANDSCAPE | |
| 16 | ☐ | J1322 | 0.00 | | |
| 17 | ☐ | J1324 | 0.00 | | |
| 18 | ☐ | J1404 | 0.00 | | |
| 19 | ☐ | J1406 | 64.76 | LANDSCAPE | |
| 20 | ☐ | J1408 | 1.47 | LANDSCAPE | |
| 21 | ☐ | J1410 | 58.93 | LANDSCAPE | |
| 22 | ☐ | J1412 | 0.00 | | |
| 23 | ☐ | J1414 | 0.00 | | |
| 24 | ☐ | J1416 | 0.00 | | |
| 25 | ☐ | J1586 | 0.00 | | |
| 26 | ☐ | J1592 | 0.00 | | |
| 27 | ☐ | J1596 | 48.57 | LANDSCAPE | |
| 28 | ☐ | JKELLOG | 0.00 | Ontario_Ranch | |
| 29 | ☐ | JSCH_HYD | 5.92 | Ontario_Ranch | |
| 30 | ☐ | J_ONT-1 | 50.66 | LANDSCAPE | |
| 31 | ☐ | J_ONT-103 | 6.86 | LANDSCAPE | |
| 32 | ☐ | J_ONT-105 | 0.00 | Ontario_Ranch | |
| 33 | ☐ | J_ONT-107 | 0.00 | | |
| 34 | ☐ | J_ONT-109 | 0.00 | | |
| 35 | ☐ | J_ONT-113 | 50.12 | Ontario_Ranch | |
| 36 | ☐ | J_ONT-115 | 0.00 | | |
| 37 | ☐ | J_ONT-117 | 0.00 | Ontario_Ranch | |
| 38 | ☐ | J_ONT-119 | 0.00 | | |
| 39 | ☐ | J_ONT-13 | 15.60 | LANDSCAPE | |
| 40 | ☐ | J_ONT-133 | 0.00 | Ontario_Ranch | |
| 41 | ☐ | J_ONT-135 | 0.00 | Ontario_Ranch | |
| 42 | ☐ | J_ONT-137 | 163.89 | Ontario_Ranch | |
| 43 | ☐ | J_ONT-139 | 0.00 | Ontario_Ranch | |
| 44 | ☐ | J_ONT-141 | 0.00 | Ontario_Ranch | |
| 45 | ☐ | J_ONT-143 | 0.00 | Ontario_Ranch | |
| 46 | ☐ | J_ONT-145 | 0.00 | Ontario_Ranch | |
| 47 | ☐ | J_ONT-147 | 0.00 | Ontario_Ranch | |
| 48 | ☐ | J_ONT-149 | 0.00 | Ontario_Ranch | |
| 49 | ☐ | J_ONT-15 | 69.72 | LANDSCAPE | |
| 50 | ☐ | J_ONT-151 | 0.00 | Ontario_Ranch | |
| 51 | ☐ | J_ONT-153 | 0.00 | Ontario_Ranch | |
| 52 | ☐ | J_ONT-155 | 0.00 | Ontario_Ranch | |
| 53 | ☐ | J_ONT-157 | 0.00 | Ontario_Ranch | |
| 54 | ☐ | J_ONT-159 | 0.00 | Ontario_Ranch | |
| 55 | ☐ | J_ONT-161 | 0.00 | Ontario_Ranch | |
| 56 | ☐ | J_ONT-163 | 163.49 | Ontario_Ranch | |
| 57 | ☐ | J_ONT-165 | 0.00 | Ontario_Ranch | |

Future Scenario - CIty of Ontario - Junctions Input Data

| * ULTIMATE * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Pattern 2 (Char) |
|---|---|---|---|---|---|
| 58 | ☐ | J_ONT-167 | 0.00 | Ontario_Ranch | |
| 59 | ☐ | J_ONT-169 | 0.00 | Ontario_Ranch | |
| 60 | ☐ | J_ONT-17 | 32.73 | LANDSCAPE | |
| 61 | ☐ | J_ONT-171 | 0.00 | Ontario_Ranch | |
| 62 | ☐ | J_ONT-173 | 63.04 | Ontario_Ranch | |
| 63 | ☐ | J_ONT-175 | 0.00 | Ontario_Ranch | |
| 64 | ☐ | J_ONT-177 | 120.14 | Ontario_Ranch | |
| 65 | ☐ | J_ONT-179 | 84.87 | Ontario_Ranch | |
| 66 | ☐ | J_ONT-181 | 0.00 | Ontario_Ranch | |
| 67 | ☐ | J_ONT-185 | 0.00 | Ontario_Ranch | |
| 68 | ☐ | J_ONT-187 | 0.00 | Ontario_Ranch | |
| 69 | ☐ | J_ONT-189 | 0.00 | Ontario_Ranch | |
| 70 | ☐ | J_ONT-19 | 14.51 | LANDSCAPE | |
| 71 | ☐ | J_ONT-191 | 0.00 | Ontario_Ranch | |
| 72 | ☐ | J_ONT-193 | 0.00 | Ontario_Ranch | |
| 73 | ☐ | J_ONT-195 | 0.00 | Ontario_Ranch | |
| 74 | ☐ | J_ONT-197 | 0.00 | Ontario_Ranch | |
| 75 | ☐ | J_ONT-199 | 0.00 | Ontario_Ranch | |
| 76 | ☐ | J_ONT-201 | 0.00 | Ontario_Ranch | |
| 77 | ☐ | J_ONT-203 | 0.00 | Ontario_Ranch | |
| 78 | ☐ | J_ONT-205 | 86.68 | Ontario_Ranch | |
| 79 | ☐ | J_ONT-207 | 0.00 | Ontario_Ranch | |
| 80 | ☐ | J_ONT-209 | 11.40 | Ontario_Ranch | |
| 81 | ☐ | J_ONT-211 | 10.23 | Ontario_Ranch | |
| 82 | ☐ | J_ONT-213 | 0.00 | Ontario_Ranch | |
| 83 | ☐ | J_ONT-215 | 0.00 | Ontario_Ranch | |
| 84 | ☐ | J_ONT-217 | 0.00 | Ontario_Ranch | |
| 85 | ☐ | J_ONT-219 | 0.00 | Ontario_Ranch | |
| 86 | ☐ | J_ONT-221 | 0.00 | Ontario_Ranch | |
| 87 | ☐ | J_ONT-223 | 0.00 | Ontario_Ranch | |
| 88 | ☐ | J_ONT-225 | 0.00 | Ontario_Ranch | |
| 89 | ☐ | J_ONT-227 | 0.00 | Ontario_Ranch | |
| 90 | ☐ | J_ONT-229 | 0.00 | Ontario_Ranch | |
| 91 | ☐ | J_ONT-231 | 0.00 | Ontario_Ranch | |
| 92 | ☐ | J_ONT-233 | 0.00 | Ontario_Ranch | |
| 93 | ☐ | J_ONT-235 | 0.00 | Ontario_Ranch | |
| 94 | ☐ | J_ONT-237 | 0.00 | Ontario_Ranch | |
| 95 | ☐ | J_ONT-239 | | | |
| 96 | ☐ | J_ONT-243 | 0.00 | | |
| 97 | ☐ | J_ONT-247 | 10.82 | LANDSCAPE | |
| 98 | ☐ | J_ONT-249 | 20.70 | LANDSCAPE | |
| 99 | ☐ | J_ONT-251 | 0.00 | | |
| 100 | ☐ | J_ONT-253 | 0.00 | | |
| 101 | ☐ | J_ONT-255 | 0.00 | | |
| 102 | ☐ | J_ONT-257 | 50.00 | LANDSCAPE | |
| 103 | ☐ | J_ONT-259 | 25.51 | LANDSCAPE | |
| 104 | ☐ | J_ONT-261 | 0.00 | | |
| 105 | ☐ | J_ONT-263 | 0.00 | LANDSCAPE | |
| 106 | ☐ | J_ONT-265 | 0.00 | Ontario_Ranch | |
| 107 | ☐ | J_ONT-267 | 0.00 | Ontario_Ranch | |
| 108 | ☐ | J_ONT-271 | 0.00 | Ontario_Ranch | |
| 109 | ☐ | J_ONT-273 | 55.82 | Ontario_Ranch | |
| 110 | ☐ | J_ONT-275 | 0.00 | Ontario_Ranch | |
| 111 | ☐ | J_ONT-277 | 0.00 | Ontario_Ranch | |
| 112 | ☐ | J_ONT-279 | 0.00 | Ontario_Ranch | |
| 113 | ☐ | J_ONT-281 | 0.00 | Ontario_Ranch | |
| 114 | ☐ | J_ONT-283 | 0.00 | Ontario_Ranch | |

Future Scenario - CIty of Ontario - Junctions Input Data

| * ULTIMATE * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Pattern 2 (Char) |
|---|---|---|---|---|---|
| 115 | ☐ | J_ONT-285 | 0.00 | Ontario_Ranch | |
| 116 | ☐ | J_ONT-287 | 0.00 | Ontario_Ranch | |
| 117 | ☐ | J_ONT-289 | 0.00 | Ontario_Ranch | |
| 118 | ☐ | J_ONT-291 | 0.00 | Ontario_Ranch | |
| 119 | ☐ | J_ONT-295 | 0.00 | Ontario_Ranch | |
| 120 | ☐ | J_ONT-297 | 17.29 | Ontario_Ranch | |
| 121 | ☐ | J_ONT-299 | 0.00 | Ontario_Ranch | |
| 122 | ☐ | J_ONT-3 | 13.72 | LANDSCAPE | |
| 123 | ☐ | J_ONT-301 | 6.18 | Ontario_Ranch | |
| 124 | ☐ | J_ONT-305 | 25.80 | LANDSCAPE | |
| 125 | ☐ | J_ONT-313 | 4.72 | Ontario_Ranch | |
| 126 | ☐ | J_ONT-315 | 0.00 | Ontario_Ranch | |
| 127 | ☐ | J_ONT-317 | 0.00 | Ontario_Ranch | |
| 128 | ☐ | J_ONT-319 | 0.00 | Ontario_Ranch | |
| 129 | ☐ | J_ONT-321 | 0.00 | Ontario_Ranch | |
| 130 | ☐ | J_ONT-325 | 0.00 | Ontario_Ranch | |
| 131 | ☐ | J_ONT-333 | 0.00 | | |
| 132 | ☐ | J_ONT-341 | 0.00 | | |
| 133 | ☐ | J_ONT-343 | 0.00 | | |
| 134 | ☐ | J_ONT-351 | 0.00 | | |
| 135 | ☐ | J_ONT-357 | 0.00 | | |
| 136 | ☐ | J_ONT-359 | 26.15 | LANDSCAPE | |
| 137 | ☐ | J_ONT-361 | 64.38 | LANDSCAPE | |
| 138 | ☐ | J_ONT-363 | 0.00 | | |
| 139 | ☐ | J_ONT-365 | 0.00 | | |
| 140 | ☐ | J_ONT-367 | 0.00 | | |
| 141 | ☐ | J_ONT-369 | 42.55 | LANDSCAPE | |
| 142 | ☐ | J_ONT-37 | 6.80 | LANDSCAPE | |
| 143 | ☐ | J_ONT-371 | 0.00 | | |
| 144 | ☐ | J_ONT-373 | 0.00 | | |
| 145 | ☐ | J_ONT-377 | 40.87 | LANDSCAPE | |
| 146 | ☐ | J_ONT-379 | 59.95 | LANDSCAPE | |
| 147 | ☐ | J_ONT-381 | 0.00 | | |
| 148 | ☐ | J_ONT-383 | 5.13 | LANDSCAPE | |
| 149 | ☐ | J_ONT-385 | 59.03 | LANDSCAPE | |
| 150 | ☐ | J_ONT-387 | 0.00 | | |
| 151 | ☐ | J_ONT-39 | 53.87 | LANDSCAPE | |
| 152 | ☐ | J_ONT-399 | 0.00 | | |
| 153 | ☐ | J_ONT-401 | 28.43 | LANDSCAPE | |
| 154 | ☐ | J_ONT-403 | 0.00 | | |
| 155 | ☐ | J_ONT-405 | 0.00 | | |
| 156 | ☐ | J_ONT-407 | 2.67 | LANDSCAPE | |
| 157 | ☐ | J_ONT-409 | 70.93 | Ontario_Ranch | |
| 158 | ☐ | J_ONT-41 | 76.68 | LANDSCAPE | |
| 159 | ☐ | J_ONT-421 | 50.00 | LANDSCAPE | |
| 160 | ☐ | J_ONT-423 | 44.49 | Ontario_Ranch | |
| 161 | ☐ | J_ONT-425 | 0.00 | Ontario_Ranch | |
| 162 | ☐ | J_ONT-427 | 0.00 | Ontario_Ranch | |
| 163 | ☐ | J_ONT-43 | 0.00 | | |
| 164 | ☐ | J_ONT-433 | 13.72 | LANDSCAPE | |
| 165 | ☐ | J_ONT-437 | 0.00 | | |
| 166 | ☐ | J_ONT-441 | 89.64 | Ontario_1158 | |
| 167 | ☐ | J_ONT-443 | 20.53 | Ontario_1158 | |
| 168 | ☐ | J_ONT-45 | 33.94 | LANDSCAPE | |
| 169 | ☐ | J_ONT-467 | 49.45 | LANDSCAPE | |
| 170 | ☐ | J_ONT-469 | 288.07 | Ontario_1158 | |
| 171 | ☐ | J_ONT-47 | 184.19 | LANDSCAPE | |

Future Scenario - CIty of Ontario - Junctions Input Data

| * ULTIMATE * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Pattern 2 (Char) |
|---|---|---|---|---|---|
| 172 | ☐ | J_ONT-473 | 0.00 | | |
| 173 | ☐ | J_ONT-477 | 0.00 | | |
| 174 | ☐ | J_ONT-489 | | Ontario_1158 | |
| 175 | ☐ | J_ONT-49 | 5.07 | LANDSCAPE | |
| 176 | ☐ | J_ONT-491 | 79.39 | Ontario_1158 | |
| 177 | ☐ | J_ONT-495 | 46.28 | LANDSCAPE | |
| 178 | ☐ | J_ONT-499 | 6.85 | LANDSCAPE | |
| 179 | ☐ | J_ONT-501 | 36.40 | LANDSCAPE | |
| 180 | ☐ | J_ONT-503 | 18.18 | LANDSCAPE | |
| 181 | ☐ | J_ONT-507 | 0.00 | | |
| 182 | ☐ | J_ONT-509 | 0.00 | | |
| 183 | ☐ | J_ONT-51 | 22.28 | LANDSCAPE | |
| 184 | ☐ | J_ONT-511 | 50.04 | LANDSCAPE | |
| 185 | ☐ | J_ONT-513 | 0.00 | | |
| 186 | ☐ | J_ONT-515 | 0.00 | | |
| 187 | ☐ | J_ONT-523 | 13.36 | LANDSCAPE | |
| 188 | ☐ | J_ONT-525 | 6.53 | LANDSCAPE | |
| 189 | ☐ | J_ONT-53 | 80.58 | LANDSCAPE | |
| 190 | ☐ | J_ONT-531 | 21.59 | LANDSCAPE | |
| 191 | ☐ | J_ONT-533 | 134.45 | LANDSCAPE | |
| 192 | ☐ | J_ONT-535 | 19.75 | LANDSCAPE | |
| 193 | ☐ | J_ONT-537 | 272.64 | Ontario_Ranch | |
| 194 | ☐ | J_ONT-543 | 24.70 | Ontario_Ranch | |
| 195 | ☐ | J_ONT-545 | 37.57 | LANDSCAPE | |
| 196 | ☐ | J_ONT-547 | 51.48 | Ontario_Ranch | |
| 197 | ☐ | J_ONT-55 | 0.00 | | |
| 198 | ☐ | J_ONT-567 | 45.00 | Ontario_Ranch | |
| 199 | ☐ | J_ONT-569 | 48.43 | Ontario_Ranch | |
| 200 | ☐ | J_ONT-571 | 4.59 | LANDSCAPE | |
| 201 | ☐ | J_ONT-573 | 11.04 | LANDSCAPE | |
| 202 | ☐ | J_ONT-575 | | | |
| 203 | ☐ | J_ONT-577 | 22.93 | LANDSCAPE | |
| 204 | ☐ | J_ONT-579 | | | |
| 205 | ☐ | J_ONT-583 | 27.90 | LANDSCAPE | |
| 206 | ☐ | J_ONT-587 | | | |
| 207 | ☐ | J_ONT-589 | | | |
| 208 | ☐ | J_ONT-59 | 24.92 | LANDSCAPE | |
| 209 | ☐ | J_ONT-609 | 0.00 | ONTARIO_RANCH | |
| 210 | ☐ | J_ONT-61 | 9.05 | LANDSCAPE | |
| 211 | ☐ | J_ONT-611 | 0.00 | ONTARIO_RANCH | |
| 212 | ☐ | J_ONT-613 | 8.96 | ONTARIO_RANCH | |
| 213 | ☐ | J_ONT-63 | 31.61 | LANDSCAPE | |
| 214 | ☐ | J_ONT-77 | 57.01 | Ontario_Ranch | |
| 215 | ☐ | J_ONT-89 | 0.00 | | |
| 216 | ☐ | J_ONT-99 | 0.00 | | |
| 217 | ☐ | ONT66 | 0.74 | LANDSCAPE | |
| 218 | ☐ | ONT68 | 0.00 | | |
| 219 | ☐ | ONT72 | 0.00 | | |
| 220 | ☐ | ONT76 | 0.00 | Ontario_Ranch | |
| 221 | ☐ | ONT84 | 0.00 | Ontario_Ranch | |
| 222 | ☐ | ONTFRAN-3571 | 72.12 | LANDSCAPE | |
| 223 | ☐ | ONTFRAN-3574 | 75.41 | Ontario_Ranch | |
| 224 | ☐ | ONTFRAN-3575 | 64.61 | Ontario_Ranch | |
| 225 | ☐ | ONTFRAN-3576 | 62.80 | Ontario_Ranch | |
| 226 | ☐ | ONTFRAN-3577 | 43.95 | Ontario_Ranch | |
| 227 | ☐ | ONTFRAN-3578 | 42.95 | Ontario_Ranch | |
| 228 | ☐ | ONTFRAN-3581 | 0.00 | Ontario_Ranch | |

Future Scenario - CIty of Ontario - Junctions Input Data

| * ULTIMATE * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Pattern 2 (Char) |
|---|---|---|---|---|---|
| 229 | ☐ | ONTFRAN-3582 | 123.22 | Ontario_Ranch | |
| 230 | ☐ | ONTFRAN-3583 | 7.46 | Ontario_Ranch | |
| 231 | ☐ | ONTFRAN-3584 | 127.89 | Ontario_Ranch | |
| 232 | ☐ | ONTFRAN-3585 | 117.61 | Ontario_Ranch | |
| 233 | ☐ | ONTFRAN-3586 | 140.29 | Ontario_Ranch | |
| 234 | ☐ | ONTFRAN-3587 | 62.63 | Ontario_Ranch | |
| 235 | ☐ | ONTFRAN-3588 | 108.45 | Ontario_Ranch | |
| 236 | ☐ | ONTFRAN-3591 | 211.58 | Ontario_Ranch | |
| 237 | ☐ | ONTFRAN-3592 | 129.27 | Ontario_Ranch | |
| 238 | ☐ | ONTFRAN-3593 | 68.86 | Ontario_Ranch | |
| 239 | ☐ | ONTFRAN-3594 | 103.20 | ONTARIO_RANCH | |
| 240 | ☐ | ONTFRAN-3595 | 62.69 | Ontario_Ranch | |
| 241 | ☐ | ONTFRAN-3596 | 63.14 | Ontario_Ranch | |
| 242 | ☐ | ONTFRAN-3597 | 160.58 | Ontario_Ranch | |
| 243 | ☐ | ONTFRAN-3598 | 59.42 | Ontario_Ranch | |
| 244 | ☐ | ONTFRAN-3599 | 0.00 | Ontario_Ranch | |
| 245 | ☐ | ONTFRAN-3600 | 128.84 | Ontario_Ranch | |
| 246 | ☐ | ONTFRAN-3601 | 89.90 | Ontario_Ranch | |
| 247 | ☐ | ONTFRAN-3602 | 41.72 | Ontario_Ranch | |
| 248 | ☐ | ONTFRAN-3603 | 0.00 | Ontario_Ranch | |
| 249 | ☐ | ONTFRAN-3605 | 48.10 | Ontario_Ranch | |
| 250 | ☐ | ONTFRAN-3606 | 68.68 | Ontario_Ranch | |
| 251 | ☐ | ONTFRAN-3607 | 40.28 | Ontario_Ranch | |
| 252 | ☐ | ONTFRAN-3608 | 73.89 | Ontario_Ranch | |
| 253 | ☐ | ONTFRAN-3609 | 81.84 | Ontario_Ranch | |
| 254 | ☐ | ONTFRAN-3611 | 100.46 | Ontario_Ranch | |
| 255 | ☐ | ONTFRAN-3618 | | Ontario_Ranch | |
| 256 | ☐ | ONTFRAN-3619 | 100.88 | Ontario_Ranch | |
| 257 | ☐ | ONTFRAN-3620 | 148.77 | Ontario_Ranch | |
| 258 | ☐ | ONTFRAN-3621 | 93.23 | Ontario_Ranch | |
| 259 | ☐ | ONTFRAN-3622 | 103.00 | ONTARIO_RANCH | |
| 260 | ☐ | ONTFRAN-3626 | 0.00 | Ontario_Ranch | |
| 261 | ☐ | ONTJ10 | 0.00 | Ontario_Ranch | |
| 262 | ☐ | ONTJ114 | 176.41 | Ontario_1158 | |
| 263 | ☐ | ONTJ12 | 53.61 | Ontario_Ranch | |
| 264 | ☐ | ONTJ145 | 0.00 | | |
| 265 | ☐ | ONTJ18 | 295.14 | Ontario_Ranch | |
| 266 | ☐ | ONTJ19 | 0.00 | Ontario_Ranch | |
| 267 | ☐ | ONTJ76 | 0.00 | | |
| 268 | ☐ | ONTNEWJ-198 | 1.10 | LANDSCAPE | |
| 269 | ☐ | ONTNEWJ-212 | 0.00 | | |
| 270 | ☐ | ONTNEWJ-214 | 108.31 | LANDSCAPE | |
| 271 | ☐ | ONTNEWJ-222 | 0.00 | | |
| 272 | ☐ | ONTNEWJ-224 | 0.00 | | |
| 273 | ☐ | ONTNEWJ-262 | 0.00 | | |
| 274 | ☐ | ONTNEWJ-278 | 95.39 | LANDSCAPE | |
| 275 | ☐ | ONTNEWJ-322 | 0.00 | | |
| 276 | ☐ | ONTNEWJ-334 | 35.72 | LANDSCAPE | |
| 277 | ☐ | ONTNEWJ-336 | 0.00 | | |
| 278 | ☐ | ONTNEWJ-338 | 0.00 | | |
| 279 | ☐ | ONTNEWJ-340 | 0.00 | | |
| 280 | ☐ | ONTNEWJ-348 | 0.00 | | |
| 281 | ☐ | ONTNEWJ-354 | 0.00 | | |
| 282 | ☐ | ONTNEWJ-356 | 0.00 | | |
| 283 | ☐ | ONTNEWJ-378 | 0.00 | | |
| 284 | ☐ | ONTNEWJ-396 | 0.00 | | |
| 285 | ☐ | ONTNEWJ-398 | 0.00 | LANDSCAPE | |

Future Scenario - CIty of Ontario - Junctions Input Data

| * ULTIMATE * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Pattern 2 (Char) |
|---|---|---|---|---|---|
| 286 | ☐ | ONTNEWJ-399 | 0.00 | | |
| 287 | ☐ | ONTNEWJ-418 | 62.01 | LANDSCAPE | |
| 288 | ☐ | ONTNEWJ-420 | 47.01 | LANDSCAPE | |
| 289 | ☐ | ONTNEWJ-424 | 52.29 | LANDSCAPE | |
| 290 | ☐ | ONTNEWJ-426 | 36.34 | LANDSCAPE | |
| 291 | ☐ | ONTNEWJ-428 | 0.00 | | |
| 292 | ☐ | ONTNEWJ-430 | 86.09 | LANDSCAPE | |
| 293 | ☐ | ONTNEWJ-432 | 0.00 | | |
| 294 | ☐ | ONTNEWJ-436 | 55.56 | LANDSCAPE | |
| 295 | ☐ | ONTNEWJ-438 | 0.00 | | |
| 296 | ☐ | ONTNEWJ-440 | 22.21 | LANDSCAPE | |
| 297 | ☐ | ONTNEWJ-456 | 27.15 | LANDSCAPE | |
| 298 | ☐ | ONTNEWJ-458 | 30.56 | LANDSCAPE | |
| 299 | ☐ | ONTNEWJ-470 | 35.41 | LANDSCAPE | |
| 300 | ☐ | ONTNEWJ-478 | 37.08 | LANDSCAPE | |
| 301 | ☐ | ONTNEWJ-482 | 0.00 | | |
| 302 | ☐ | ONTNEWJ-492 | 123.42 | LANDSCAPE | |
| 303 | ☐ | ONTNEWJ-496 | 0.00 | | |
| 304 | ☐ | ONTNEWJ-498 | 72.81 | LANDSCAPE | |
| 305 | ☐ | ONTNEWJ-500 | 0.00 | | |
| 306 | ☐ | ONTNEWJ-502 | 8.39 | LANDSCAPE | |
| 307 | ☐ | ONTNEWJ-510 | 80.36 | LANDSCAPE | |
| 308 | ☐ | ONTNEWJ-516 | 0.00 | | |
| 309 | ☐ | ONTNEWJ-520 | 6.53 | LANDSCAPE | |
| 310 | ☐ | ONTNEWJ-522 | 0.00 | | |
| 311 | ☐ | ONTNEWJ-526 | 56.39 | LANDSCAPE | |
| 312 | ☐ | ONTNEWJ-528 | 0.00 | | |
| 313 | ☐ | ONTNEWJ-530 | | | |
| 314 | ☐ | ONTNEWJ-542 | 289.43 | Ontario_1158 | |
| 315 | ☐ | ONTNEWJ-544 | 0.00 | | |
| 316 | ☐ | ONTNEWJ-546 | 130.69 | Ontario_1158 | |
| 317 | ☐ | ONTNEWJ-548 | 47.08 | Ontario_1158 | |
| 318 | ☐ | ONTNEWJ-550 | 256.29 | Ontario_1158 | |
| 319 | ☐ | ONTNEWJ-554 | 434.43 | Ontario_1158 | |
| 320 | ☐ | ONTNEWJ-555 | 0.00 | | |
| 321 | ☐ | ONTNEWJ-556 | 57.48 | Ontario_1158 | |
| 322 | ☐ | ONTNEWJ-558 | 83.42 | Ontario_1158 | |
| 323 | ☐ | ONTNEWJ-560 | 140.07 | Ontario_1158 | |
| 324 | ☐ | ONTNEWJ-562 | 180.71 | Ontario_1158 | |
| 325 | ☐ | ONTNEWJ-564 | 180.00 | ONTARIO_1158 | |
| 326 | ☐ | ONTNEWJ-568 | 0.00 | | |
| 327 | ☐ | ONTNEWJ-576 | 58.91 | ONTARIO_1158 | |
| 328 | ☐ | ONTNEWJ-578 | 2.94 | Ontario_1158 | |
| 329 | ☐ | ONTNEWJ-582 | 61.19 | Ontario_1158 | |
| 330 | ☐ | ONTNEWJ-584 | 0.00 | | |
| 331 | ☐ | ONTNEWJ-585 | 184.14 | ONTARIO_1158 | |
| 332 | ☐ | ONTNEWJ-586 | 0.00 | | |
| 333 | ☐ | ONTNEWJ-588 | 0.00 | | |
| 334 | ☐ | ONTNEWJ-591 | 53.71 | Ontario_1158 | |
| 335 | ☐ | ONTNEWJ-592 | 62.45 | Ontario_1158 | |
| 336 | ☐ | ONTNEWJ-598 | 46.98 | LANDSCAPE | |
| 337 | ☐ | ONTNEWJ-622 | 0.00 | | |
| 338 | ☐ | ONTNEWJ-628 | 152.95 | Ontario_1158 | |
| 339 | ☐ | ONTNEWJ-631 | 0.00 | | |
| 340 | ☐ | ONTNEWJ-632 | 0.00 | | |
| 341 | ☐ | ONTNEWJ-634 | 72.81 | LANDSCAPE | |
| 342 | ☐ | ONTNEWJ-636 | 75.60 | LANDSCAPE | |

| * ULTIMATE * | | ID (Char) | Demand 1 (gpm) | Pattern 1 (Char) | Pattern 2 (Char) |
|---|---|---|---|---|---|
| 343 | ☐ | ONTNEWJ-638 | 0.00 | | |
| 344 | ☐ | ONTNEWJ-640 | 0.00 | | |
| 345 | ☐ | ONTNEWJ-646 | 61.33 | LANDSCAPE | |
| 346 | ☐ | ONTNEWJ-908 | 138.60 | LANDSCAPE | |
| 347 | ☐ | ONTNEWJ-910 | 50.00 | LANDSCAPE | |
| 348 | ☐ | ONTNEWJ-914 | 0.00 | | |
| 349 | ☐ | ONTNEWJ-934 | 0.00 | | |
| 350 | ☐ | ONTNEWJ-936 | 4.03 | Ontario_1158 | |
| 351 | ☐ | ONTNEWJ-950 | 0.00 | | |
| 352 | ☐ | ONTNEWJ392 | 0.00 | Ontario_Ranch | |
| 353 | ☐ | ONTNEWJ398 | 171.91 | Ontario_Ranch | |
| 354 | ☐ | ONTNEWJ400 | 398.54 | Ontario_Ranch | |
| 355 | ☐ | ONTNEWJ402 | 474.30 | Ontario_Ranch | |
| 356 | ☐ | ONTNEWJ_630 | 72.81 | LANDSCAPE | |
| 357 | ☐ | ONTPHLP-2235 | 25.59 | LANDSCAPE | |
| 358 | ☐ | ONTPHLP-2241 | 65.98 | LANDSCAPE | |
| 359 | ☐ | ONTPHLP-2263 | 39.32 | LANDSCAPE | |
| 360 | ☐ | ONTPHLP-3507 | 0.00 | | |
| 361 | ☐ | ONTPHLP-3606 | 9.97 | Ontario_Ranch | |
| 362 | ☐ | ONTPHLP-3610 | 194.41 | LANDSCAPE | |
| 363 | ☐ | ONTPICKUP-12 | 38.84 | LANDSCAPE | |
| 364 | ☐ | ONTPICKUP-14 | 82.24 | LANDSCAPE | |
| 365 | ☐ | ONTPICKUP-17 | 0.00 | | |
| 366 | ☐ | ONTPICKUP-30 | 0.00 | | |
| 367 | ☐ | ONTPICKUP-32 | 232.38 | ONTARIO_1158 | |
| 368 | ☐ | ONTPICKUP-42 | 0.00 | | |
| 369 | ☐ | ONTPICKUP-48 | 0.00 | | |
| 370 | ☐ | ONTPICKUP-51 | 0.00 | | |
| 371 | ☐ | ONTPICKUP-6 | 0.00 | | |
| 372 | ☐ | ONTPICKUP-65 | 20.00 | ONTARIO_1158 | |
| 373 | ☐ | ONTPICKUP-68 | 82.87 | LANDSCAPE | |
| 374 | ☐ | ONTPICKUP-70 | 0.00 | | |
| 375 | ☐ | ONTPICKUP-71 | 0.00 | | |
| 376 | ☐ | ONTPICKUP-72 | 25.00 | LANDSCAPE | |
| 377 | ☐ | ONTPICKUP-9 | 0.00 | | |
| 378 | ☐ | ONTTOP50-10 | 0.00 | | |
| 379 | ☐ | ONTTOP50-15 | 118.61 | LANDSCAPE | |
| 380 | ☐ | ONTTOP50-18 | 0.00 | | |
| 381 | ☐ | ONTTOP50-20 | 0.00 | | |
| 382 | ☐ | ONTTOP50-22 | 0.00 | | |
| 383 | ☐ | ONTTOP50-23 | 0.00 | | |
| 384 | ☐ | ONTTOP50-25 | 0.00 | | |
| 385 | ☐ | ONTTOP50-40 | 0.00 | | |
| 386 | ☐ | ONTTOP50-48 | 0.00 | | |
| 387 | ☐ | ONTTOP50-6 | 0.00 | | |

Future Scenario - City of Ontario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 1 | ☐ | 2011_P14 | 373.88 | 8.00 | 130.00 | 0.00 |
| 2 | ☐ | 2011_P15 | 962.69 | 8.00 | 100.00 | 0.00 |
| 3 | ☐ | 2011_P17 | 325.69 | 8.00 | 130.00 | 0.00 |
| 4 | ☐ | 2011_P18 | 128.01 | 12.00 | 130.00 | 0.00 |
| 5 | ☐ | 2011_P19 | 536.66 | 12.00 | 130.00 | 0.00 |
| 6 | ☐ | 800ZONE_V1 | 98.84 | 16.00 | 150.00 | 0.00 |
| 7 | ☐ | 800ZONE_V2 | 61.66 | 16.00 | 150.00 | 0.00 |
| 8 | ☐ | ONT283 | 45.13 | 42.00 | 130.00 | 0.00 |
| 9 | ☐ | ONT9008 | 1,370.98 | 12.00 | 130.00 | 0.00 |
| 10 | ☐ | ONT9010 | 842.75 | 16.00 | 130.00 | 0.00 |
| 11 | ☐ | ONT9012 | 2,656.26 | 16.00 | 130.00 | 0.00 |
| 12 | ☐ | ONT9024 | 1,861.37 | 24.00 | 129.90 | 0.00 |
| 13 | ☐ | ONT9034 | 878.87 | 16.00 | 130.00 | 0.00 |
| 14 | ☐ | ONT9036 | 1,494.62 | 16.00 | 130.00 | 0.00 |
| 15 | ☐ | ONT9042 | 1,301.52 | 16.00 | 130.00 | 0.00 |
| 16 | ☐ | ONT9048 | 1,466.41 | 12.00 | 130.00 | 0.00 |
| 17 | ☐ | ONT9050 | 473.48 | 16.00 | 130.00 | 0.00 |
| 18 | ☐ | ONT9052 | 1,456.84 | 12.00 | 130.00 | 0.00 |
| 19 | ☐ | ONT9056 | 1,239.77 | 16.00 | 130.00 | 0.00 |
| 20 | ☐ | ONT9068 | 2,509.56 | 12.00 | 130.00 | 0.00 |
| 21 | ☐ | ONT9072 | 1,016.82 | 8.00 | 130.00 | 0.00 |
| 22 | ☐ | ONT9092 | 2,634.74 | 12.00 | 130.00 | 0.00 |
| 23 | ☐ | ONTFRAN-3590 | 2,281.59 | 12.00 | 130.00 | 0.00 |
| 24 | ☐ | ONTFRAN-3592 | 1,970.13 | 16.00 | 130.00 | 0.00 |
| 25 | ☐ | ONTFRAN-3593 | 2,529.21 | 8.00 | 130.00 | 0.00 |
| 26 | ☐ | ONTFRAN-3594 | 2,666.85 | 24.00 | 130.00 | 0.00 |
| 27 | ☐ | ONTFRAN-3595 | 2,631.10 | 24.00 | 130.00 | 0.00 |
| 28 | ☐ | ONTFRAN-3596 | 2,618.91 | 24.00 | 130.00 | 0.00 |
| 29 | ☐ | ONTFRAN-3597 | 1,275.34 | 24.00 | 130.00 | 0.00 |
| 30 | ☐ | ONTFRAN-3600 | 2,415.15 | 24.00 | 130.00 | 0.00 |
| 31 | ☐ | ONTFRAN-3603 | 2,283.90 | 16.00 | 130.00 | 0.00 |
| 32 | ☐ | ONTFRAN-3604 | 613.34 | 8.00 | 130.00 | 0.00 |
| 33 | ☐ | ONTFRAN-3606 | 2,662.17 | 8.00 | 130.00 | 0.00 |
| 34 | ☐ | ONTFRAN-3607 | 2,641.39 | 8.00 | 130.00 | 0.00 |
| 35 | ☐ | ONTFRAN-3608 | 2,641.37 | 8.00 | 130.00 | 0.00 |
| 36 | ☐ | ONTFRAN-3608A | 1,339.15 | 12.00 | 130.00 | 0.00 |
| 37 | ☐ | ONTFRAN-3609 | 2,615.85 | 8.00 | 130.00 | 0.00 |
| 38 | ☐ | ONTFRAN-3610 | 2,614.80 | 8.00 | 130.00 | 0.00 |
| 39 | ☐ | ONTFRAN-3611 | 2,043.19 | 8.00 | 130.00 | 0.00 |
| 40 | ☐ | ONTFRAN-3614 | 1,959.04 | 8.00 | 130.00 | 0.00 |
| 41 | ☐ | ONTFRAN-3615 | 2,652.56 | 8.00 | 130.00 | 0.00 |
| 42 | ☐ | ONTFRAN-3617 | 1,125.95 | 24.00 | 130.00 | 0.00 |
| 43 | ☐ | ONTFRAN-3618 | 302.48 | 12.00 | 130.00 | 0.00 |
| 44 | ☐ | ONTFRAN-3620 | 616.50 | 12.00 | 130.00 | 0.00 |
| 45 | ☐ | ONTFRAN-3621 | 2,561.70 | 12.00 | 130.00 | 0.00 |
| 46 | ☐ | ONTFRAN-3622 | 2,654.69 | 12.00 | 130.00 | 0.00 |
| 47 | ☐ | ONTFRAN-3624 | 3,119.97 | 8.00 | 130.00 | 0.00 |
| 48 | ☐ | ONTFRAN-3625 | 3,403.01 | 12.00 | 130.00 | 0.00 |
| 49 | ☐ | ONTFRAN-3626 | 2,648.24 | 12.00 | 130.00 | 0.00 |
| 50 | ☐ | ONTFRAN-3627 | 2,180.56 | 16.00 | 130.00 | 0.00 |
| 51 | ☐ | ONTFRAN-3628 | 1,393.06 | 16.00 | 130.00 | 0.00 |
| 52 | ☐ | ONTFRAN-3629 | 1,795.09 | 16.00 | 130.00 | 0.00 |
| 53 | ☐ | ONTFRAN-3631 | 2,616.96 | 8.00 | 130.00 | 0.00 |
| 54 | ☐ | ONTFRAN-3632 | 1,788.53 | 16.00 | 130.00 | 0.00 |
| 55 | ☐ | ONTFRAN-3633 | 2,552.79 | 8.00 | 130.00 | 0.00 |
| 56 | ☐ | ONTFRAN-3634 | 2,316.14 | 16.00 | 130.00 | 0.00 |
| 57 | ☐ | ONTFRAN-3635 | 1,319.73 | 8.00 | 130.00 | 0.00 |

Future Scenario - City of Ontario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 58 | ☐ | ONTFRAN-3637 | 2,616.60 | 12.00 | 130.00 | 0.00 |
| 59 | ☐ | ONTFRAN-3639 | 904.14 | 8.00 | 130.00 | 0.00 |
| 60 | ☐ | ONTFRAN-3640 | 2,653.41 | 8.00 | 130.00 | 0.00 |
| 61 | ☐ | ONTFRAN-3641 | 1,997.13 | 8.00 | 130.00 | 0.00 |
| 62 | ☐ | ONTFRAN-3642 | 2,718.37 | 8.00 | 130.00 | 0.00 |
| 63 | ☐ | ONTFRAN-3645 | 1,341.66 | 12.00 | 130.00 | 0.00 |
| 64 | ☐ | ONTFRAN-3646 | 1,766.65 | 8.00 | 130.00 | 0.00 |
| 65 | ☐ | ONTFRAN-3647 | 2,617.97 | 8.00 | 130.00 | 0.00 |
| 66 | ☐ | ONTFRAN-3649 | 2,632.58 | 8.00 | 130.00 | 0.00 |
| 67 | ☐ | ONTFRAN-3651 | 38.70 | 8.00 | 130.00 | 0.00 |
| 68 | ☐ | ONTFRAN-3652 | 1,944.50 | 8.00 | 130.00 | 0.00 |
| 69 | ☐ | ONTFRAN-3693 | 1,301.23 | 12.00 | 130.00 | 0.00 |
| 70 | ☐ | ONTFRAN-3694 | 1,162.41 | 16.00 | 130.00 | 0.00 |
| 71 | ☐ | ONTFRAN-3696 | 2,551.39 | 12.00 | 130.00 | 0.00 |
| 72 | ☐ | ONTFRAN-3697 | 1,344.09 | 12.00 | 130.00 | 0.00 |
| 73 | ☐ | ONTFRAN-3706 | 139.34 | 24.00 | 130.00 | 0.00 |
| 74 | ☐ | ONTNEWP-10016 | 157.83 | 8.00 | 130.00 | 0.00 |
| 75 | ☐ | ONTNEWP-10017 | 96.03 | 8.00 | 130.00 | 0.00 |
| 76 | ☐ | ONTNEWP-10026 | 910.92 | 8.00 | 130.00 | 0.00 |
| 77 | ☐ | ONTNEWP-10044 | 201.93 | 8.00 | 130.00 | 0.00 |
| 78 | ☐ | ONTNEWP-908 | 878.23 | 8.00 | 130.00 | 0.00 |
| 79 | ☐ | ONTNEWP-910 | 380.88 | 8.00 | 130.00 | 0.00 |
| 80 | ☐ | ONTNEWP-914 | 642.60 | 12.00 | 130.00 | 0.00 |
| 81 | ☐ | ONTNEWP-9170 | 207.39 | 8.00 | 130.00 | 0.00 |
| 82 | ☐ | ONTNEWP-918 | 3,929.14 | 8.00 | 130.00 | 0.00 |
| 83 | ☐ | ONTNEWP-9240 | 565.90 | 12.00 | 130.00 | 0.00 |
| 84 | ☐ | ONTNEWP-9244 | 1,342.42 | 16.00 | 130.00 | 0.00 |
| 85 | ☐ | ONTNEWP-9252 | 412.78 | 8.00 | 130.00 | 0.00 |
| 86 | ☐ | ONTNEWP-9254 | 341.15 | 8.00 | 130.00 | 0.00 |
| 87 | ☐ | ONTNEWP-9276 | 100.39 | 24.00 | 129.90 | 0.00 |
| 88 | ☐ | ONTNEWP-9320 | 1,078.67 | 8.00 | 130.00 | 0.00 |
| 89 | ☐ | ONTNEWP-9322 | 178.65 | 8.00 | 130.00 | 0.00 |
| 90 | ☐ | ONTNEWP-934 | 606.33 | 8.00 | 130.00 | 0.00 |
| 91 | ☐ | ONTNEWP-9344 | 31.34 | 8.00 | 130.00 | 0.00 |
| 92 | ☐ | ONTNEWP-9346 | 57.84 | 8.00 | 130.00 | 0.00 |
| 93 | ☐ | ONTNEWP-9348 | 154.03 | 8.00 | 130.00 | 0.00 |
| 94 | ☐ | ONTNEWP-9384 | 83.35 | 12.00 | 130.00 | 0.00 |
| 95 | ☐ | ONTNEWP-9400 | 1,614.80 | 8.00 | 130.00 | 0.00 |
| 96 | ☐ | ONTNEWP-9434 | 58.47 | 8.00 | 130.00 | 0.00 |
| 97 | ☐ | ONTNEWP-9440 | 258.65 | 8.00 | 130.00 | 0.00 |
| 98 | ☐ | ONTNEWP-9494 | 108.24 | 8.00 | 130.00 | 0.00 |
| 99 | ☐ | ONTNEWP-9512 | 142.43 | 8.00 | 130.00 | 0.00 |
| 100 | ☐ | ONTNEWP-9514 | 73.92 | 8.00 | 130.00 | 0.00 |
| 101 | ☐ | ONTNEWP-9542 | 965.29 | 8.00 | 130.00 | 0.00 |
| 102 | ☐ | ONTNEWP-9546 | 6.59 | 16.00 | 130.00 | 0.00 |
| 103 | ☐ | ONTNEWP-9548 | 2.62 | 8.00 | 130.00 | 0.00 |
| 104 | ☐ | ONTNEWP-9550 | 468.93 | 16.00 | 130.00 | 0.00 |
| 105 | ☐ | ONTNEWP-9552 | 47.61 | 8.00 | 130.00 | 0.00 |
| 106 | ☐ | ONTNEWP-9554 | 1,604.77 | 24.00 | 130.00 | 0.00 |
| 107 | ☐ | ONTNEWP-9556 | 40.59 | 8.00 | 130.00 | 0.00 |
| 108 | ☐ | ONTNEWP-9566 | 263.75 | 8.00 | 130.00 | 0.00 |
| 109 | ☐ | ONTNEWP-9572 | 56.47 | 8.00 | 130.00 | 0.00 |
| 110 | ☐ | ONTNEWP-9578 | 275.26 | 8.00 | 130.00 | 0.00 |
| 111 | ☐ | ONTNEWP-9590 | 55.67 | 8.00 | 130.00 | 0.00 |
| 112 | ☐ | ONTNEWP-9596 | 1,084.77 | 16.00 | 130.00 | 0.00 |
| 113 | ☐ | ONTNEWP-9600 | 425.19 | 8.00 | 130.00 | 0.00 |
| 114 | ☐ | ONTNEWP-9602 | 628.83 | 24.00 | 129.90 | 0.00 |

Future Scenario - City of Ontario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 115 | ☐ | ONTNEWP-9662 | 74.14 | 8.00 | 130.00 | 0.00 |
| 116 | ☐ | ONTNEWP-9664 | 888.03 | 8.00 | 130.00 | 0.00 |
| 117 | ☐ | ONTNEWP-9668 | 465.68 | 8.00 | 130.00 | 0.00 |
| 118 | ☐ | ONTNEWP-9704 | 606.10 | 8.00 | 130.00 | 0.00 |
| 119 | ☐ | ONTNEWP-9712 | 297.60 | 12.00 | 130.00 | 0.00 |
| 120 | ☐ | ONTNEWP-9714 | 170.69 | 8.00 | 130.00 | 0.00 |
| 121 | ☐ | ONTNEWP-9740 | 2,623.36 | 8.00 | 130.00 | 0.00 |
| 122 | ☐ | ONTNEWP-9746 | 2,575.44 | 8.00 | 130.00 | 0.00 |
| 123 | ☐ | ONTNEWP-9750 | 1,338.53 | 24.00 | 130.00 | 0.00 |
| 124 | ☐ | ONTNEWP-9756 | 2,667.65 | 12.00 | 130.00 | 0.00 |
| 125 | ☐ | ONTNEWP-9760 | 1,269.50 | 8.00 | 130.00 | 0.00 |
| 126 | ☐ | ONTNEWP-9762 | 2,619.10 | 8.00 | 130.00 | 0.00 |
| 127 | ☐ | ONTNEWP-9764 | 2,625.40 | 8.00 | 130.00 | 0.00 |
| 128 | ☐ | ONTNEWP-9766 | 2,669.30 | 8.00 | 130.00 | 0.00 |
| 129 | ☐ | ONTNEWP-9768 | 1,964.17 | 8.00 | 130.00 | 0.00 |
| 130 | ☐ | ONTNEWP-9774 | 2,010.90 | 8.00 | 130.00 | 0.00 |
| 131 | ☐ | ONTNEWP-9776 | 2,636.37 | 16.00 | 130.00 | 0.00 |
| 132 | ☐ | ONTNEWP-9778 | 1,315.66 | 12.00 | 130.00 | 0.00 |
| 133 | ☐ | ONTNEWP-9780 | 2,567.84 | 8.00 | 130.00 | 0.00 |
| 134 | ☐ | ONTNEWP-9782 | 2,488.92 | 8.00 | 130.00 | 0.00 |
| 135 | ☐ | ONTNEWP-9784 | 1,882.18 | 8.00 | 130.00 | 0.00 |
| 136 | ☐ | ONTNEWP-9786 | 2,634.84 | 8.00 | 130.00 | 0.00 |
| 137 | ☐ | ONTNEWP-9790 | 722.03 | 24.00 | 130.00 | 0.00 |
| 138 | ☐ | ONTNEWP-9798 | 413.06 | 12.00 | 130.00 | 0.00 |
| 139 | ☐ | ONTNEWP-9810 | 493.88 | 24.00 | 130.00 | 0.00 |
| 140 | ☐ | ONTNEWP-9816 | 1,775.77 | 8.00 | 130.00 | 0.00 |
| 141 | ☐ | ONTNEWP-9818 | 2,550.88 | 8.00 | 130.00 | 0.00 |
| 142 | ☐ | ONTNEWP-9846 | 649.71 | 16.00 | 130.00 | 0.00 |
| 143 | ☐ | ONTNEWP-9854 | 225.67 | 8.00 | 130.00 | 0.00 |
| 144 | ☐ | ONTNEWP-9860 | 2,193.91 | 8.00 | 130.00 | 0.00 |
| 145 | ☐ | ONTNEWP-9861 | 444.03 | 8.00 | 130.00 | 0.00 |
| 146 | ☐ | ONTNEWP-9864 | 490.66 | 12.00 | 130.00 | 0.00 |
| 147 | ☐ | ONTNEWP-9870 | 152.28 | 24.00 | 130.00 | 0.00 |
| 148 | ☐ | ONTNEWP-9884 | 483.65 | 8.00 | 130.00 | 0.00 |
| 149 | ☐ | ONTNEWP-9885 | 1,032.54 | 8.00 | 130.00 | 0.00 |
| 150 | ☐ | ONTNEWP-9886 | 966.94 | 8.00 | 130.00 | 0.00 |
| 151 | ☐ | ONTNEWP-9887 | 1,672.19 | 8.00 | 130.00 | 0.00 |
| 152 | ☐ | ONTNEWP-9889 | 804.75 | 8.00 | 130.00 | 0.00 |
| 153 | ☐ | ONTNEWP-9890 | 343.61 | 12.00 | 130.00 | 0.00 |
| 154 | ☐ | ONTNEWP-9891 | 490.48 | 8.00 | 130.00 | 0.00 |
| 155 | ☐ | ONTNEWP-9892 | 972.35 | 12.00 | 130.00 | 0.00 |
| 156 | ☐ | ONTNEWP-9893 | 586.37 | 8.00 | 130.00 | 0.00 |
| 157 | ☐ | ONTNEWP-9894 | 500.54 | 12.00 | 130.00 | 0.00 |
| 158 | ☐ | ONTNEWP-9895 | 821.31 | 8.00 | 130.00 | 0.00 |
| 159 | ☐ | ONTNEWP-9896 | 662.68 | 12.00 | 130.00 | 0.00 |
| 160 | ☐ | ONTNEWP-9899 | 2,644.11 | 12.00 | 130.00 | 0.00 |
| 161 | ☐ | ONTNEWP-9900 | 2,385.20 | 12.00 | 130.00 | 0.00 |
| 162 | ☐ | ONTNEWP-9901 | 2,634.73 | 8.00 | 130.00 | 0.00 |
| 163 | ☐ | ONTNEWP-9902 | 1,713.42 | 8.00 | 130.00 | 0.00 |
| 164 | ☐ | ONTNEWP-9912 | 1,165.49 | 8.00 | 130.00 | 0.00 |
| 165 | ☐ | ONTNEWP-9913 | 1,000.33 | 8.00 | 130.00 | 0.00 |
| 166 | ☐ | ONTNEWP-9916 | 1,880.87 | 8.00 | 130.00 | 0.00 |
| 167 | ☐ | ONTNEWP-9918 | 1,712.19 | 8.00 | 130.00 | 0.00 |
| 168 | ☐ | ONTNEWP-9919 | 25.63 | 8.00 | 130.00 | 0.00 |
| 169 | ☐ | ONTNEWP-9920 | 697.71 | 8.00 | 130.00 | 0.00 |
| 170 | ☐ | ONTNEWP-9922 | 1,349.84 | 8.00 | 130.00 | 0.00 |
| 171 | ☐ | ONTNEWP-9924 | 1,772.79 | 8.00 | 130.00 | 0.00 |

Future Scenario - City of Ontario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 172 | ☐ | ONTNEWP-9926 | 2,665.81 | 8.00 | 130.00 | 0.00 |
| 173 | ☐ | ONTNEWP-9928 | 1,570.82 | 8.00 | 130.00 | 0.00 |
| 174 | ☐ | ONTNEWP-9932 | 1,189.23 | 8.00 | 130.00 | 0.00 |
| 175 | ☐ | ONTNEWP-9936 | 583.37 | 8.00 | 130.00 | 0.00 |
| 176 | ☐ | ONTNEWP-9940 | 2,657.09 | 8.00 | 130.00 | 0.00 |
| 177 | ☐ | ONTNEWP-9942 | 2,628.90 | 8.00 | 130.00 | 0.00 |
| 178 | ☐ | ONTNEWP-9944 | 1,311.26 | 12.00 | 130.00 | 0.00 |
| 179 | ☐ | ONTNEWP-9946 | 444.01 | 8.00 | 130.00 | 0.00 |
| 180 | ☐ | ONTNEWP-9958 | 843.27 | 8.00 | 130.00 | 0.00 |
| 181 | ☐ | ONTNEWP-9960 | 760.67 | 8.00 | 130.00 | 0.00 |
| 182 | ☐ | ONTNEWP-9962 | 321.07 | 8.00 | 130.00 | 0.00 |
| 183 | ☐ | ONTNEWP-9964 | 1,865.93 | 8.00 | 130.00 | 0.00 |
| 184 | ☐ | ONTNEWP-9968 | 1,671.54 | 8.00 | 130.00 | 0.00 |
| 185 | ☐ | ONTNEWP-9972 | 1,343.85 | 8.00 | 130.00 | 0.00 |
| 186 | ☐ | ONTNEWP-9974 | 2,640.61 | 12.00 | 130.00 | 0.00 |
| 187 | ☐ | ONTNEWP509 | 2,644.06 | 12.00 | 130.00 | 0.00 |
| 188 | ☐ | ONTNEWP511 | 2,616.39 | 16.00 | 130.00 | 0.00 |
| 189 | ☐ | ONTNEWP519 | 2,631.88 | 12.00 | 130.00 | 0.00 |
| 190 | ☐ | ONTNEWP529 | 2,593.21 | 12.00 | 130.00 | 0.00 |
| 191 | ☐ | ONTNEWP619 | 1,331.48 | 16.00 | 130.00 | 0.00 |
| 192 | ☐ | ONTNEWP649 | 2,763.21 | 8.00 | 130.00 | 0.00 |
| 193 | ☐ | ONTP10024 | 1,339.83 | 12.00 | 130.00 | 0.00 |
| 194 | ☐ | ONTP11 | 1,309.18 | 12.00 | 130.00 | 0.00 |
| 195 | ☐ | ONTP19 | 206.43 | 16.00 | 130.00 | 0.00 |
| 196 | ☐ | ONTPHLP-3607 | 2,680.07 | 8.00 | 130.00 | 0.00 |
| 197 | ☐ | ONTPHLP-3615 | 2,658.69 | 12.00 | 130.00 | 0.00 |
| 198 | ☐ | P10142 | 198.19 | 30.00 | 130.00 | 0.00 |
| 199 | ☐ | P10326 | 1,331.58 | 12.00 | 130.00 | 0.00 |
| 200 | ☐ | P10328 | 1,338.27 | 12.00 | 130.00 | 0.00 |
| 201 | ☐ | P10330 | 3,591.48 | 12.00 | 130.00 | 0.00 |
| 202 | ☐ | P10332 | 788.30 | 8.00 | 130.00 | 0.00 |
| 203 | ☐ | P10334 | 885.54 | 12.00 | 100.00 | 0.00 |
| 204 | ☐ | P10340 | 2,655.53 | 8.00 | 130.00 | 0.00 |
| 205 | ☐ | P10342 | 1,686.44 | 8.00 | 130.00 | 0.00 |
| 206 | ☐ | P10344 | 500.45 | 8.00 | 130.00 | 0.00 |
| 207 | ☐ | P10346 | 1,214.04 | 12.00 | 130.00 | 0.00 |
| 208 | ☐ | P10350 | 1,717.07 | 8.00 | 130.00 | 0.00 |
| 209 | ☐ | P10354 | 1,409.44 | 16.00 | 130.00 | 0.00 |
| 210 | ☐ | P10356 | 147.70 | 8.00 | 130.00 | 0.00 |
| 211 | ☐ | P10360 | 937.27 | 12.00 | 130.00 | 0.00 |
| 212 | ☐ | P10364 | 1,352.40 | 12.00 | 130.00 | 0.00 |
| 213 | ☐ | P10366 | 1,324.73 | 8.00 | 130.00 | 0.00 |
| 214 | ☐ | P10368 | 411.46 | 8.00 | 130.00 | 0.00 |
| 215 | ☐ | P10372 | 923.19 | 12.00 | 130.00 | 0.00 |
| 216 | ☐ | P10374 | 1,588.12 | 8.00 | 130.00 | 0.00 |
| 217 | ☐ | P10376 | 420.57 | 8.00 | 100.00 | 0.00 |
| 218 | ☐ | P10422 | 2,685.84 | 16.00 | 130.00 | 0.00 |
| 219 | ☐ | P10506 | 1,088.71 | 12.00 | 130.00 | 0.00 |
| 220 | ☐ | P10508 | 764.84 | 12.00 | 130.00 | 0.00 |
| 221 | ☐ | P10510 | 966.88 | 8.00 | 130.00 | 0.00 |
| 222 | ☐ | P10512 | 826.31 | 8.00 | 130.00 | 0.00 |
| 223 | ☐ | P10514 | 358.14 | 8.00 | 130.00 | 0.00 |
| 224 | ☐ | P10516 | 72.06 | 8.00 | 130.00 | 0.00 |
| 225 | ☐ | P10518 | 840.93 | 8.00 | 130.00 | 0.00 |
| 226 | ☐ | P10520 | 813.87 | 8.00 | 130.00 | 0.00 |
| 227 | ☐ | P10522 | 1,047.91 | 8.00 | 130.00 | 0.00 |
| 228 | ☐ | P10550 | 1,424.31 | 8.00 | 130.00 | 0.00 |

Future Scenario - City of Ontario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 229 | ☐ | P186 | 2,742.17 | 16.00 | 130.00 | 0.00 |
| 230 | ☐ | P188 | 1,406.38 | 12.00 | 130.00 | 0.00 |
| 231 | ☐ | P190 | 2,615.63 | 8.00 | 130.00 | 0.00 |
| 232 | ☐ | P39 | 666.18 | 8.00 | 130.00 | 0.00 |
| 233 | ☐ | P41 | 227.50 | 8.00 | 130.00 | 0.00 |
| 234 | ☐ | P63 | 300.71 | 8.00 | 130.00 | 0.00 |
| 235 | ☐ | P73 | 722.78 | 12.00 | 130.00 | 0.00 |
| 236 | ☐ | P81 | 1,764.35 | 16.00 | 130.00 | 0.00 |
| 237 | ☐ | P87 | 621.53 | 8.00 | 130.00 | 0.00 |
| 238 | ☐ | PHYD_LAT | 464.40 | 6.00 | 130.00 | 0.00 |
| 239 | ☐ | PKELLOG | 1,300.25 | 12.00 | 130.00 | 0.00 |
| 240 | ☐ | PSCH_1 | 1,829.52 | 12.00 | 130.00 | 0.00 |
| 241 | ☐ | P_ONT-102 | 2,572.48 | 16.00 | 130.00 | 0.00 |
| 242 | ☐ | P_ONT-120 | 1,052.44 | 8.00 | 130.00 | 0.00 |
| 243 | ☐ | P_ONT-122 | 2,468.11 | 30.00 | 130.00 | 0.00 |
| 244 | ☐ | P_ONT-126 | 1,600.17 | 8.00 | 130.00 | 0.00 |
| 245 | ☐ | P_ONT-128 | 560.40 | 16.00 | 130.00 | 0.00 |
| 246 | ☐ | P_ONT-146 | 67.80 | 12.00 | 130.00 | 0.00 |
| 247 | ☐ | P_ONT-148 | 77.35 | 12.00 | 130.00 | 0.00 |
| 248 | ☐ | P_ONT-150 | 74.86 | 12.00 | 130.00 | 0.00 |
| 249 | ☐ | P_ONT-152 | 117.20 | 12.00 | 130.00 | 0.00 |
| 250 | ☐ | P_ONT-154 | 83.00 | 24.00 | 130.00 | 0.00 |
| 251 | ☐ | P_ONT-156 | 22.31 | 24.00 | 130.00 | 0.00 |
| 252 | ☐ | P_ONT-158 | 19.05 | 24.00 | 130.00 | 0.00 |
| 253 | ☐ | P_ONT-16 | 397.11 | 12.00 | 130.00 | 0.00 |
| 254 | ☐ | P_ONT-160 | 9.11 | 24.00 | 130.00 | 0.00 |
| 255 | ☐ | P_ONT-174 | 69.50 | 12.00 | 130.00 | 0.00 |
| 256 | ☐ | P_ONT-176 | 1,242.53 | 24.00 | 130.00 | 0.00 |
| 257 | ☐ | P_ONT-178 | 1,255.50 | 12.00 | 100.00 | 0.00 |
| 258 | ☐ | P_ONT-18 | 3,391.08 | 12.00 | 130.00 | 0.00 |
| 259 | ☐ | P_ONT-180 | 587.21 | 8.00 | 130.00 | 0.00 |
| 260 | ☐ | P_ONT-182 | 668.29 | 8.00 | 130.00 | 0.00 |
| 261 | ☐ | P_ONT-184 | 564.54 | 8.00 | 130.00 | 0.00 |
| 262 | ☐ | P_ONT-186 | 1,420.26 | 8.00 | 130.00 | 0.00 |
| 263 | ☐ | P_ONT-188 | 26.06 | 4.00 | 130.00 | 0.00 |
| 264 | ☐ | P_ONT-190 | 297.83 | 8.00 | 130.00 | 0.00 |
| 265 | ☐ | P_ONT-192 | 1,225.11 | 8.00 | 130.00 | 0.00 |
| 266 | ☐ | P_ONT-194 | 60.97 | 8.00 | 130.00 | 0.00 |
| 267 | ☐ | P_ONT-196 | 1,680.54 | 12.00 | 130.00 | 0.00 |
| 268 | ☐ | P_ONT-198 | 2,658.00 | 16.00 | 130.00 | 0.00 |
| 269 | ☐ | P_ONT-2 | 94.46 | 8.00 | 130.00 | 0.00 |
| 270 | ☐ | P_ONT-20 | 3,844.58 | 16.00 | 130.00 | 0.00 |
| 271 | ☐ | P_ONT-200 | 471.02 | 8.00 | 130.00 | 0.00 |
| 272 | ☐ | P_ONT-204 | 969.62 | 8.00 | 130.00 | 0.00 |
| 273 | ☐ | P_ONT-206 | 47.18 | 8.00 | 130.00 | 0.00 |
| 274 | ☐ | P_ONT-208 | 521.07 | 8.00 | 130.00 | 0.00 |
| 275 | ☐ | P_ONT-210 | 1,123.08 | 8.00 | 130.00 | 0.00 |
| 276 | ☐ | P_ONT-212 | 59.09 | 8.00 | 130.00 | 0.00 |
| 277 | ☐ | P_ONT-214 | 272.70 | 8.00 | 130.00 | 0.00 |
| 278 | ☐ | P_ONT-216 | 2,006.79 | 8.00 | 130.00 | 0.00 |
| 279 | ☐ | P_ONT-218 | 1,692.61 | 8.00 | 130.00 | 0.00 |
| 280 | ☐ | P_ONT-220 | 599.34 | 8.00 | 130.00 | 0.00 |
| 281 | ☐ | P_ONT-222 | 570.91 | 8.00 | 130.00 | 0.00 |
| 282 | ☐ | P_ONT-224 | 172.01 | 8.00 | 130.00 | 0.00 |
| 283 | ☐ | P_ONT-226 | 1,324.95 | 16.00 | 130.00 | 0.00 |
| 284 | ☐ | P_ONT-228 | 970.68 | 8.00 | 130.00 | 0.00 |
| 285 | ☐ | P_ONT-230 | 1,192.23 | 16.00 | 130.00 | 0.00 |

Future Scenario - City of Ontario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 286 | ☐ | P_ONT-232 | 162.89 | 8.00 | 130.00 | 0.00 |
| 287 | ☐ | P_ONT-234 | 1,424.05 | 8.00 | 130.00 | 0.00 |
| 288 | ☐ | P_ONT-236 | 391.16 | 8.00 | 130.00 | 0.00 |
| 289 | ☐ | P_ONT-238 | 270.79 | 8.00 | 130.00 | 0.00 |
| 290 | ☐ | P_ONT-240 | 140.69 | 8.00 | 130.00 | 0.00 |
| 291 | ☐ | P_ONT-242 | 22.56 | 2.00 | 130.00 | 0.00 |
| 292 | ☐ | P_ONT-244 | 187.64 | 16.00 | 130.00 | 0.00 |
| 293 | ☐ | P_ONT-246 | 746.58 | 8.00 | 130.00 | 0.00 |
| 294 | ☐ | P_ONT-248 | 670.54 | 8.00 | 130.00 | 0.00 |
| 295 | ☐ | P_ONT-250 | 143.89 | 8.00 | 130.00 | 0.00 |
| 296 | ☐ | P_ONT-252 | 443.25 | 8.00 | 130.00 | 0.00 |
| 297 | ☐ | P_ONT-254 | 648.48 | 8.00 | 130.00 | 0.00 |
| 298 | ☐ | P_ONT-256 | 120.48 | 8.00 | 130.00 | 0.00 |
| 299 | ☐ | P_ONT-258 | 1,808.44 | 8.00 | 130.00 | 0.00 |
| 300 | ☐ | P_ONT-260 | 952.15 | 8.00 | 130.00 | 0.00 |
| 301 | ☐ | P_ONT-262 | 1,292.82 | 12.00 | 130.00 | 0.00 |
| 302 | ☐ | P_ONT-264 | 919.91 | 8.00 | 130.00 | 0.00 |
| 303 | ☐ | P_ONT-266 | 346.22 | 8.00 | 130.00 | 0.00 |
| 304 | ☐ | P_ONT-268 | 168.63 | 8.00 | 130.00 | 0.00 |
| 305 | ☐ | P_ONT-270 | 686.73 | 8.00 | 130.00 | 0.00 |
| 306 | ☐ | P_ONT-272 | 462.41 | 8.00 | 100.00 | 0.00 |
| 307 | ☐ | P_ONT-274 | 107.99 | 8.00 | 130.00 | 0.00 |
| 308 | ☐ | P_ONT-276 | 734.97 | 8.00 | 130.00 | 0.00 |
| 309 | ☐ | P_ONT-278 | 210.60 | 8.00 | 130.00 | 0.00 |
| 310 | ☐ | P_ONT-28 | 418.53 | 8.00 | 130.00 | 0.00 |
| 311 | ☐ | P_ONT-280 | 654.69 | 8.00 | 100.00 | 0.00 |
| 312 | ☐ | P_ONT-282 | 458.27 | 8.00 | 130.00 | 0.00 |
| 313 | ☐ | P_ONT-284 | 150.92 | 8.00 | 130.00 | 0.00 |
| 314 | ☐ | P_ONT-286 | 338.69 | 8.00 | 130.00 | 0.00 |
| 315 | ☐ | P_ONT-288 | 418.63 | 8.00 | 130.00 | 0.00 |
| 316 | ☐ | P_ONT-290 | 226.11 | 8.00 | 130.00 | 0.00 |
| 317 | ☐ | P_ONT-292 | 407.83 | 8.00 | 130.00 | 0.00 |
| 318 | ☐ | P_ONT-294 | 359.41 | 8.00 | 130.00 | 0.00 |
| 319 | ☐ | P_ONT-296 | 482.43 | 8.00 | 130.00 | 0.00 |
| 320 | ☐ | P_ONT-298 | 238.49 | 8.00 | 130.00 | 0.00 |
| 321 | ☐ | P_ONT-300 | 804.32 | 8.00 | 130.00 | 0.00 |
| 322 | ☐ | P_ONT-302 | 1,603.88 | 8.00 | 130.00 | 0.00 |
| 323 | ☐ | P_ONT-304 | 735.32 | 8.00 | 130.00 | 0.00 |
| 324 | ☐ | P_ONT-306 | 976.70 | 8.00 | 130.00 | 0.00 |
| 325 | ☐ | P_ONT-308 | 328.33 | 8.00 | 130.00 | 0.00 |
| 326 | ☐ | P_ONT-310 | 1,319.62 | 8.00 | 130.00 | 0.00 |
| 327 | ☐ | P_ONT-312 | 418.46 | 8.00 | 130.00 | 0.00 |
| 328 | ☐ | P_ONT-314 | 546.30 | 8.00 | 130.00 | 0.00 |
| 329 | ☐ | P_ONT-316 | 533.90 | 8.00 | 130.00 | 0.00 |
| 330 | ☐ | P_ONT-318 | 497.34 | 8.00 | 130.00 | 0.00 |
| 331 | ☐ | P_ONT-322 | 555.31 | 8.00 | 130.00 | 0.00 |
| 332 | ☐ | P_ONT-324 | 468.49 | 8.00 | 130.00 | 0.00 |
| 333 | ☐ | P_ONT-326 | 512.82 | 8.00 | 130.00 | 0.00 |
| 334 | ☐ | P_ONT-328 | 1,153.66 | 8.00 | 130.00 | 0.00 |
| 335 | ☐ | P_ONT-330 | 433.22 | 8.00 | 130.00 | 0.00 |
| 336 | ☐ | P_ONT-332 | 213.37 | 8.00 | 130.00 | 0.00 |
| 337 | ☐ | P_ONT-334 | 48.14 | 2.00 | 130.00 | 0.00 |
| 338 | ☐ | P_ONT-336 | 1,358.61 | 8.00 | 130.00 | 0.00 |
| 339 | ☐ | P_ONT-338 | 499.45 | 8.00 | 130.00 | 0.00 |
| 340 | ☐ | P_ONT-340 | 27.22 | 4.00 | 130.00 | 0.00 |
| 341 | ☐ | P_ONT-342 | 67.98 | 8.00 | 130.00 | 0.00 |
| 342 | ☐ | P_ONT-344 | 27.74 | 4.00 | 130.00 | 0.00 |

Future Scenario - City of Ontario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 343 | ☐ | P_ONT-346 | 31.87 | 2.00 | 130.00 | 0.00 |
| 344 | ☐ | P_ONT-348 | 656.78 | 12.00 | 130.00 | 0.00 |
| 345 | ☐ | P_ONT-350 | 524.15 | 8.00 | 130.00 | 0.00 |
| 346 | ☐ | P_ONT-352 | 780.77 | 8.00 | 130.00 | 0.00 |
| 347 | ☐ | P_ONT-354 | 480.54 | 8.00 | 130.00 | 0.00 |
| 348 | ☐ | P_ONT-356 | 33.09 | 2.00 | 130.00 | 0.00 |
| 349 | ☐ | P_ONT-358 | 923.64 | 16.00 | 130.00 | 0.00 |
| 350 | ☐ | P_ONT-362 | 850.40 | 8.00 | 130.00 | 0.00 |
| 351 | ☐ | P_ONT-368 | 310.37 | 24.00 | 130.00 | 0.00 |
| 352 | ☐ | P_ONT-370 | 344.46 | 8.00 | 130.00 | 0.00 |
| 353 | ☐ | P_ONT-372 | 309.82 | 8.00 | 130.00 | 0.00 |
| 354 | ☐ | P_ONT-374 | 305.99 | 12.00 | 130.00 | 0.00 |
| 355 | ☐ | P_ONT-376 | 2,490.34 | 12.00 | 130.00 | 0.00 |
| 356 | ☐ | P_ONT-378 | 131.65 | 8.00 | 130.00 | 0.00 |
| 357 | ☐ | P_ONT-382 | 855.29 | 8.00 | 130.00 | 0.00 |
| 358 | ☐ | P_ONT-388 | 1,296.73 | 8.00 | 130.00 | 0.00 |
| 359 | ☐ | P_ONT-40 | 1,467.46 | 8.00 | 130.00 | 0.00 |
| 360 | ☐ | P_ONT-406 | 92.92 | 8.00 | 130.00 | 0.00 |
| 361 | ☐ | P_ONT-408 | 116.28 | 8.00 | 130.00 | 0.00 |
| 362 | ☐ | P_ONT-410 | 608.38 | 8.00 | 130.00 | 0.00 |
| 363 | ☐ | P_ONT-412 | 400.63 | 8.00 | 130.00 | 0.00 |
| 364 | ☐ | P_ONT-418 | 159.12 | 8.00 | 130.00 | 0.00 |
| 365 | ☐ | P_ONT-42 | 2,736.68 | 8.00 | 130.00 | 0.00 |
| 366 | ☐ | P_ONT-420 | 1,302.86 | 8.00 | 130.00 | 0.00 |
| 367 | ☐ | P_ONT-422 | 874.68 | 8.00 | 130.00 | 0.00 |
| 368 | ☐ | P_ONT-424 | 69.57 | 8.00 | 130.00 | 0.00 |
| 369 | ☐ | P_ONT-426 | 102.02 | 8.00 | 130.00 | 0.00 |
| 370 | ☐ | P_ONT-428 | 368.51 | 12.00 | 130.00 | 0.00 |
| 371 | ☐ | P_ONT-430 | 167.29 | 12.00 | 130.00 | 0.00 |
| 372 | ☐ | P_ONT-432 | 289.20 | 12.00 | 130.00 | 0.00 |
| 373 | ☐ | P_ONT-434 | 71.34 | 12.00 | 130.00 | 0.00 |
| 374 | ☐ | P_ONT-438 | 483.28 | 12.00 | 130.00 | 0.00 |
| 375 | ☐ | P_ONT-44 | 2,592.84 | 8.00 | 130.00 | 0.00 |
| 376 | ☐ | P_ONT-440 | 578.60 | 16.00 | 130.00 | 0.00 |
| 377 | ☐ | P_ONT-442 | 440.06 | 12.00 | 130.00 | 0.00 |
| 378 | ☐ | P_ONT-444 | 69.36 | 12.00 | 130.00 | 0.00 |
| 379 | ☐ | P_ONT-446 | 2,017.90 | 12.00 | 130.00 | 0.00 |
| 380 | ☐ | P_ONT-456 | 301.25 | 8.00 | 130.00 | 0.00 |
| 381 | ☐ | P_ONT-458 | 524.66 | 8.00 | 130.00 | 0.00 |
| 382 | ☐ | P_ONT-46 | 1,177.08 | 8.00 | 130.00 | 0.00 |
| 383 | ☐ | P_ONT-460 | 743.53 | 8.00 | 130.00 | 0.00 |
| 384 | ☐ | P_ONT-462 | 251.49 | 8.00 | 130.00 | 0.00 |
| 385 | ☐ | P_ONT-466 | 1,390.97 | 8.00 | 130.00 | 0.00 |
| 386 | ☐ | P_ONT-468 | 2,607.09 | 8.00 | 130.00 | 0.00 |
| 387 | ☐ | P_ONT-470 | 275.56 | 12.00 | 130.00 | 0.00 |
| 388 | ☐ | P_ONT-476 | 2,555.59 | 8.00 | 130.00 | 0.00 |
| 389 | ☐ | P_ONT-48 | 2,855.66 | 16.00 | 130.00 | 0.00 |
| 390 | ☐ | P_ONT-480 | 1,044.89 | 8.00 | 130.00 | 0.00 |
| 391 | ☐ | P_ONT-482 | 1,786.78 | 16.00 | 130.00 | 0.00 |
| 392 | ☐ | P_ONT-484 | 684.16 | 12.00 | 130.00 | 0.00 |
| 393 | ☐ | P_ONT-486 | 1,433.86 | 8.00 | 130.00 | 0.00 |
| 394 | ☐ | P_ONT-492 | 1,090.79 | 8.00 | 130.00 | 0.00 |
| 395 | ☐ | P_ONT-494 | 554.75 | 8.00 | 130.00 | 0.00 |
| 396 | ☐ | P_ONT-498 | 2,685.60 | 8.00 | 130.00 | 0.00 |
| 397 | ☐ | P_ONT-50 | 1,601.31 | 8.00 | 130.00 | 0.00 |
| 398 | ☐ | P_ONT-500 | 2,519.57 | 8.00 | 130.00 | 0.00 |
| 399 | ☐ | P_ONT-52 | 2,662.25 | 8.00 | 130.00 | 0.00 |

Future Scenario - City of Ontario - Pipes Input Data

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 400 | ☐ | P_ONT-524 | 1,294.60 | 12.00 | 130.00 | 0.00 |
| 401 | ☐ | P_ONT-526 | 3,298.62 | 8.00 | 130.00 | 0.00 |
| 402 | ☐ | P_ONT-528 | 7,292.54 | 8.00 | 130.00 | 0.00 |
| 403 | ☐ | P_ONT-530 | 2,637.53 | 8.00 | 130.00 | 0.00 |
| 404 | ☐ | P_ONT-534 | 889.56 | 12.00 | 130.00 | 0.00 |
| 405 | ☐ | P_ONT-54 | 1,909.55 | 8.00 | 130.00 | 0.00 |
| 406 | ☐ | P_ONT-540 | 2,640.63 | 12.00 | 130.00 | 0.00 |
| 407 | ☐ | P_ONT-542 | 2,608.65 | 12.00 | 130.00 | 0.00 |
| 408 | ☐ | P_ONT-544 | 2,636.77 | 12.00 | 130.00 | 0.00 |
| 409 | ☐ | P_ONT-552 | 1,641.00 | 8.00 | 130.00 | 0.00 |
| 410 | ☐ | P_ONT-554 | 1,167.02 | 8.00 | 130.00 | 0.00 |
| 411 | ☐ | P_ONT-556 | 3,553.98 | 8.00 | 130.00 | 0.00 |
| 412 | ☐ | P_ONT-56 | 1,383.26 | 8.00 | 130.00 | 0.00 |
| 413 | ☐ | P_ONT-560 | 5,250.71 | 12.00 | 130.00 | 0.00 |
| 414 | ☐ | P_ONT-562 | 1,296.20 | 16.00 | 130.00 | 0.00 |
| 415 | ☐ | P_ONT-564 | 678.64 | 16.00 | 130.00 | 0.00 |
| 416 | ☐ | P_ONT-566 | 2,653.80 | 8.00 | 130.00 | 0.00 |
| 417 | ☐ | P_ONT-570 | 116.47 | 12.00 | 130.00 | 0.00 |
| 418 | ☐ | P_ONT-572 | 28.49 | 12.00 | 130.00 | 0.00 |
| 419 | ☐ | P_ONT-574 | 36.83 | 12.00 | 130.00 | 0.00 |
| 420 | ☐ | P_ONT-576 | 758.73 | 8.00 | 130.00 | 0.00 |
| 421 | ☐ | P_ONT-578 | 795.55 | 8.00 | 130.00 | 0.00 |
| 422 | ☐ | P_ONT-580 | 670.59 | 8.00 | 130.00 | 0.00 |
| 423 | ☐ | P_ONT-590 | 2,146.67 | 8.00 | 130.00 | 0.00 |
| 424 | ☐ | P_ONT-592 | 2,061.96 | 8.00 | 130.00 | 0.00 |
| 425 | ☐ | P_ONT-594 | 1,940.76 | 8.00 | 130.00 | 0.00 |
| 426 | ☐ | P_ONT-596 | 683.92 | 8.00 | 130.00 | 0.00 |
| 427 | ☐ | P_ONT-598 | 61.31 | 16.00 | 130.00 | 0.00 |
| 428 | ☐ | P_ONT-600 | 2,062.76 | 8.00 | 130.00 | 0.00 |
| 429 | ☐ | P_ONT-602 | 2,072.82 | 16.00 | 130.00 | 0.00 |
| 430 | ☐ | P_ONT-604 | 2,057.98 | 8.00 | 130.00 | 0.00 |
| 431 | ☐ | P_ONT-606 | 2,146.26 | 8.00 | 130.00 | 0.00 |
| 432 | ☐ | P_ONT-612 | 640.78 | 8.00 | 130.00 | 0.00 |
| 433 | ☐ | P_ONT-614 | 2,612.68 | 8.00 | 130.00 | 0.00 |
| 434 | ☐ | P_ONT-616 | 1,742.40 | 8.00 | 130.00 | 0.00 |
| 435 | ☐ | P_ONT-618 | 317.43 | 12.00 | 130.00 | 0.00 |
| 436 | ☐ | P_ONT-62 | 1,312.78 | 8.00 | 130.00 | 0.00 |
| 437 | ☐ | P_ONT-622 | 784.11 | 8.00 | 130.00 | 0.00 |
| 438 | ☐ | P_ONT-624 | 2,854.88 | 8.00 | 130.00 | 0.00 |
| 439 | ☐ | P_ONT-626 | 1,216.92 | 8.00 | 130.00 | 0.00 |
| 440 | ☐ | P_ONT-628 | 4,355.94 | 8.00 | 130.00 | 0.00 |
| 441 | ☐ | P_ONT-630 | 973.05 | 8.00 | 130.00 | 0.00 |
| 442 | ☐ | P_ONT-632 | 625.08 | 8.00 | 130.00 | 0.00 |
| 443 | ☐ | P_ONT-634 | 53.30 | 16.00 | 130.00 | 0.00 |
| 444 | ☐ | P_ONT-638 | 4,806.69 | 8.00 | 130.00 | 0.00 |
| 445 | ☐ | P_ONT-64 | 1,704.69 | 16.00 | 130.00 | 0.00 |
| 446 | ☐ | P_ONT-642 | 850.38 | 16.00 | 130.00 | 0.00 |
| 447 | ☐ | P_ONT-646 | 77.99 | 16.00 | 130.00 | 0.00 |
| 448 | ☐ | P_ONT-648 | 81.53 | 16.00 | 130.00 | 0.00 |
| 449 | ☐ | P_ONT-66 | 2,647.75 | 16.00 | 130.00 | 0.00 |
| 450 | ☐ | P_ONT-666 | 68.58 | 8.00 | 130.00 | 0.00 |
| 451 | ☐ | P_ONT-668 | 900.10 | 8.00 | 130.00 | 0.00 |
| 452 | ☐ | P_ONT-670 | 881.03 | 16.00 | 130.00 | 0.00 |
| 453 | ☐ | P_ONT-672 | 2,627.67 | 16.00 | 130.00 | 0.00 |
| 454 | ☐ | P_ONT-674 | 2,617.82 | 16.00 | 130.00 | 0.00 |
| 455 | ☐ | P_ONT-676 | 4,250.25 | 8.00 | 130.00 | 0.00 |
| 456 | ☐ | P_ONT-678 | 3,844.58 | 16.00 | 130.00 | 0.00 |

| * 2017_PIPES * | | ID (Char) | Length (ft) | Diameter (in) | Roughness (Double) | Minor Loss (Double) |
|---|---|---|---|---|---|---|
| 457 | ☐ | P_ONT-680 | 1,044.59 | 8.00 | 130.00 | 0.00 |
| 458 | ☐ | P_ONT-90 | 1,342.35 | 8.00 | 130.00 | 0.00 |
| 459 | ☐ | P_ONT-92 | 2,633.59 | 8.00 | 130.00 | 0.00 |

Future Scenario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | J_ONT-1 | 123.72 | 20:00 | 80.15 | 00:30 | 101.20 | 43.58 |
| 2 | ☐ | J_ONT-103 | 127.34 | 05:00 | 109.91 | 20:40 | 126.62 | 17.42 |
| 3 | ☐ | J_ONT-105 | 81.58 | 08:00 | 72.43 | 20:40 | 76.50 | 9.15 |
| 4 | ☐ | J_ONT-107 | 127.34 | 05:00 | 109.74 | 20:40 | 126.62 | 17.60 |
| 5 | ☐ | J_ONT-109 | 81.58 | 08:00 | 72.45 | 20:40 | 76.50 | 9.13 |
| 6 | ☐ | J_ONT-113 | 75.24 | 08:00 | 54.84 | 21:00 | 66.14 | 20.40 |
| 7 | ☐ | J_ONT-115 | 121.00 | 05:00 | 103.71 | 21:00 | 118.41 | 17.29 |
| 8 | ☐ | J_ONT-117 | 75.25 | 08:00 | 54.94 | 21:00 | 66.16 | 20.31 |
| 9 | ☐ | J_ONT-119 | 121.00 | 05:00 | 103.66 | 21:00 | 118.41 | 17.35 |
| 10 | ☐ | J_ONT-13 | 98.02 | 05:00 | 88.65 | 21:00 | 94.99 | 9.37 |
| 11 | ☐ | J_ONT-133 | 96.35 | 08:00 | 82.28 | 21:00 | 89.66 | 14.07 |
| 12 | ☐ | J_ONT-135 | 91.26 | 08:00 | 74.40 | 21:00 | 83.55 | 16.86 |
| 13 | ☐ | J_ONT-137 | 94.72 | 08:00 | 79.77 | 21:00 | 87.72 | 14.95 |
| 14 | ☐ | J_ONT-139 | 95.59 | 08:00 | 81.11 | 21:00 | 88.75 | 14.48 |
| 15 | ☐ | J_ONT-141 | 96.89 | 08:00 | 82.41 | 21:00 | 90.05 | 14.48 |
| 16 | ☐ | J_ONT-143 | 93.42 | 08:00 | 78.47 | 21:00 | 86.42 | 14.95 |
| 17 | ☐ | J_ONT-145 | 96.89 | 08:00 | 82.41 | 21:00 | 90.05 | 14.48 |
| 18 | ☐ | J_ONT-147 | 97.32 | 08:00 | 78.30 | 21:00 | 88.89 | 19.03 |
| 19 | ☐ | J_ONT-149 | 97.76 | 08:00 | 78.62 | 21:00 | 89.28 | 19.13 |
| 20 | ☐ | J_ONT-15 | 101.05 | 05:00 | 91.76 | 21:00 | 98.05 | 9.29 |
| 21 | ☐ | J_ONT-151 | 86.81 | 08:00 | 70.01 | 21:00 | 79.11 | 16.80 |
| 22 | ☐ | J_ONT-153 | 86.92 | 08:00 | 70.12 | 21:00 | 79.23 | 16.80 |
| 23 | ☐ | J_ONT-155 | 79.56 | 08:00 | 62.68 | 21:00 | 71.84 | 16.87 |
| 24 | ☐ | J_ONT-157 | 92.12 | 08:00 | 71.57 | 21:00 | 83.13 | 20.55 |
| 25 | ☐ | J_ONT-159 | 87.36 | 08:00 | 66.80 | 21:00 | 78.36 | 20.55 |
| 26 | ☐ | J_ONT-161 | 95.59 | 08:00 | 75.04 | 21:00 | 86.59 | 20.55 |
| 27 | ☐ | J_ONT-163 | 98.19 | 08:00 | 78.76 | 21:00 | 89.62 | 19.43 |
| 28 | ☐ | J_ONT-165 | 104.69 | 08:00 | 83.47 | 21:00 | 95.53 | 21.22 |
| 29 | ☐ | J_ONT-167 | 98.19 | 08:00 | 78.55 | 21:00 | 89.55 | 19.64 |
| 30 | ☐ | J_ONT-169 | 99.92 | 08:00 | 80.28 | 21:00 | 91.28 | 19.64 |
| 31 | ☐ | J_ONT-17 | 121.41 | 05:00 | 113.30 | 21:00 | 118.80 | 8.11 |
| 32 | ☐ | J_ONT-171 | 104.25 | 08:00 | 83.03 | 21:00 | 95.10 | 21.22 |
| 33 | ☐ | J_ONT-173 | 105.99 | 08:00 | 84.32 | 21:00 | 96.68 | 21.67 |
| 34 | ☐ | J_ONT-175 | 106.42 | 08:00 | 84.75 | 21:00 | 97.12 | 21.67 |
| 35 | ☐ | J_ONT-177 | 108.48 | 08:00 | 86.70 | 21:00 | 99.14 | 21.77 |
| 36 | ☐ | J_ONT-179 | 109.99 | 08:00 | 88.61 | 21:00 | 100.80 | 21.38 |
| 37 | ☐ | J_ONT-181 | 120.67 | 08:00 | 98.04 | 21:00 | 111.07 | 22.63 |
| 38 | ☐ | J_ONT-185 | 118.23 | 08:00 | 95.60 | 21:00 | 108.62 | 22.62 |
| 39 | ☐ | J_ONT-187 | 120.30 | 08:00 | 97.66 | 21:00 | 110.69 | 22.64 |
| 40 | ☐ | J_ONT-189 | 125.05 | 08:00 | 102.41 | 21:00 | 115.45 | 22.64 |
| 41 | ☐ | J_ONT-19 | 135.71 | 05:00 | 127.57 | 21:00 | 133.09 | 8.14 |
| 42 | ☐ | J_ONT-191 | 125.05 | 08:00 | 102.41 | 21:00 | 115.45 | 22.64 |
| 43 | ☐ | J_ONT-193 | 111.35 | 08:00 | 90.69 | 21:00 | 102.42 | 20.67 |
| 44 | ☐ | J_ONT-195 | 117.25 | 08:00 | 95.03 | 21:00 | 107.79 | 22.22 |
| 45 | ☐ | J_ONT-197 | 119.42 | 08:00 | 97.00 | 21:00 | 109.89 | 22.42 |
| 46 | ☐ | J_ONT-199 | 118.12 | 08:00 | 95.52 | 21:00 | 108.52 | 22.61 |
| 47 | ☐ | J_ONT-201 | 115.95 | 08:00 | 93.41 | 21:00 | 106.38 | 22.55 |
| 48 | ☐ | J_ONT-203 | 114.65 | 08:00 | 92.25 | 21:00 | 105.12 | 22.41 |
| 49 | ☐ | J_ONT-205 | 114.22 | 08:00 | 91.84 | 21:00 | 104.70 | 22.38 |
| 50 | ☐ | J_ONT-207 | 111.62 | 08:00 | 89.21 | 21:00 | 102.09 | 22.41 |
| 51 | ☐ | J_ONT-209 | 114.65 | 08:00 | 92.09 | 21:00 | 105.07 | 22.56 |
| 52 | ☐ | J_ONT-211 | 116.81 | 08:00 | 94.94 | 21:00 | 107.48 | 21.87 |
| 53 | ☐ | J_ONT-213 | 118.55 | 08:00 | 96.64 | 21:00 | 109.20 | 21.91 |
| 54 | ☐ | J_ONT-215 | 117.69 | 08:00 | 95.69 | 21:00 | 108.31 | 22.00 |
| 55 | ☐ | J_ONT-217 | 117.69 | 08:00 | 95.69 | 21:00 | 108.31 | 22.00 |
| 56 | ☐ | J_ONT-219 | 117.25 | 08:00 | 95.03 | 21:00 | 107.79 | 22.22 |
| 57 | ☐ | J_ONT-221 | 115.09 | 08:00 | 93.05 | 21:00 | 105.68 | 22.03 |

Future Scenario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 58 | ☐ | J_ONT-223 | 113.35 | 08:00 | 91.43 | 21:00 | 103.98 | 21.93 |
| 59 | ☐ | J_ONT-225 | 112.92 | 08:00 | 90.80 | 21:00 | 103.48 | 22.12 |
| 60 | ☐ | J_ONT-227 | 110.75 | 08:00 | 88.70 | 21:00 | 101.33 | 22.06 |
| 61 | ☐ | J_ONT-229 | 114.22 | 08:00 | 92.15 | 21:00 | 104.80 | 22.07 |
| 62 | ☐ | J_ONT-231 | 114.22 | 08:00 | 92.15 | 21:00 | 104.80 | 22.07 |
| 63 | ☐ | J_ONT-233 | 115.09 | 08:00 | 93.04 | 21:00 | 105.67 | 22.04 |
| 64 | ☐ | J_ONT-235 | 113.79 | 08:00 | 91.74 | 21:00 | 104.37 | 22.04 |
| 65 | ☐ | J_ONT-237 | 115.95 | 08:00 | 94.03 | 21:00 | 106.58 | 21.93 |
| 66 | ☐ | J_ONT-239 | 107.53 | 05:00 | 89.74 | 21:00 | 104.63 | 17.78 |
| 67 | ☐ | J_ONT-243 | 117.51 | 05:00 | 99.75 | 21:00 | 114.63 | 17.76 |
| 68 | ☐ | J_ONT-247 | 108.85 | 05:00 | 91.06 | 21:00 | 105.95 | 17.79 |
| 69 | ☐ | J_ONT-249 | 113.18 | 05:00 | 95.39 | 21:00 | 110.29 | 17.79 |
| 70 | ☐ | J_ONT-251 | 110.58 | 05:00 | 92.79 | 21:00 | 107.69 | 17.79 |
| 71 | ☐ | J_ONT-253 | 106.68 | 05:00 | 88.89 | 21:00 | 103.79 | 17.79 |
| 72 | ☐ | J_ONT-255 | 108.85 | 05:00 | 91.06 | 21:00 | 105.95 | 17.79 |
| 73 | ☐ | J_ONT-257 | 566.43 | 05:50 | 527.27 | 00:30 | 547.26 | 39.15 |
| 74 | ☐ | J_ONT-259 | 566.43 | 05:50 | 527.29 | 00:30 | 547.27 | 39.13 |
| 75 | ☐ | J_ONT-261 | 566.43 | 05:50 | 527.30 | 00:30 | 547.27 | 39.12 |
| 76 | ☐ | J_ONT-263 | 566.43 | 05:50 | 527.32 | 00:30 | 547.28 | 39.11 |
| 77 | ☐ | J_ONT-265 | 120.72 | 08:00 | 98.03 | 21:00 | 111.10 | 22.69 |
| 78 | ☐ | J_ONT-267 | 116.17 | 08:00 | 93.55 | 21:00 | 106.57 | 22.61 |
| 79 | ☐ | J_ONT-271 | 120.72 | 08:00 | 98.03 | 21:00 | 111.10 | 22.69 |
| 80 | ☐ | J_ONT-273 | 118.64 | 08:00 | 95.95 | 21:00 | 109.01 | 22.69 |
| 81 | ☐ | J_ONT-275 | 119.92 | 08:00 | 97.27 | 21:00 | 110.31 | 22.65 |
| 82 | ☐ | J_ONT-277 | 124.19 | 08:00 | 101.54 | 21:00 | 114.58 | 22.65 |
| 83 | ☐ | J_ONT-279 | 124.19 | 08:00 | 101.54 | 21:00 | 114.58 | 22.65 |
| 84 | ☐ | J_ONT-281 | 124.19 | 08:00 | 101.55 | 21:00 | 114.58 | 22.64 |
| 85 | ☐ | J_ONT-283 | 122.45 | 08:00 | 99.81 | 21:00 | 112.85 | 22.64 |
| 86 | ☐ | J_ONT-285 | 121.15 | 08:00 | 98.50 | 21:00 | 111.54 | 22.66 |
| 87 | ☐ | J_ONT-287 | 121.15 | 08:00 | 98.50 | 21:00 | 111.54 | 22.66 |
| 88 | ☐ | J_ONT-289 | 90.90 | 08:00 | 70.16 | 21:00 | 81.83 | 20.74 |
| 89 | ☐ | J_ONT-291 | 83.46 | 08:00 | 66.63 | 21:00 | 75.75 | 16.83 |
| 90 | ☐ | J_ONT-295 | 80.86 | 08:00 | 64.01 | 21:00 | 73.14 | 16.85 |
| 91 | ☐ | J_ONT-297 | 80.42 | 08:00 | 62.61 | 21:00 | 72.40 | 17.81 |
| 92 | ☐ | J_ONT-299 | 80.42 | 08:00 | 63.55 | 21:00 | 72.70 | 16.87 |
| 93 | ☐ | J_ONT-3 | 129.79 | 20:00 | 85.91 | 00:30 | 107.22 | 43.88 |
| 94 | ☐ | J_ONT-301 | 104.86 | 08:00 | 88.06 | 21:00 | 97.24 | 16.80 |
| 95 | ☐ | J_ONT-305 | 127.42 | 05:00 | 112.22 | 20:40 | 126.72 | 15.19 |
| 96 | ☐ | J_ONT-313 | 82.31 | 08:00 | 72.66 | 21:00 | 77.06 | 9.65 |
| 97 | ☐ | J_ONT-315 | 88.22 | 08:00 | 71.40 | 21:00 | 80.52 | 16.82 |
| 98 | ☐ | J_ONT-317 | 89.09 | 08:00 | 72.26 | 21:00 | 81.39 | 16.83 |
| 99 | ☐ | J_ONT-319 | 101.80 | 08:00 | 87.00 | 21:00 | 94.87 | 14.80 |
| 100 | ☐ | J_ONT-321 | 134.56 | 08:00 | 119.26 | 21:00 | 127.45 | 15.31 |
| 101 | ☐ | J_ONT-325 | 120.04 | 08:00 | 97.40 | 21:00 | 110.43 | 22.65 |
| 102 | ☐ | J_ONT-333 | 174.31 | 20:00 | 73.92 | 04:00 | 111.77 | 100.39 |
| 103 | ☐ | J_ONT-341 | 174.66 | 20:00 | 103.09 | 04:00 | 120.64 | 71.58 |
| 104 | ☐ | J_ONT-343 | 174.66 | 20:00 | 103.64 | 04:00 | 120.82 | 71.03 |
| 105 | ☐ | J_ONT-351 | 170.77 | 20:00 | 96.32 | 04:00 | 115.81 | 74.45 |
| 106 | ☐ | J_ONT-357 | 170.23 | 20:00 | 90.28 | 04:00 | 113.48 | 79.95 |
| 107 | ☐ | J_ONT-359 | 77.91 | 20:00 | 34.30 | 00:30 | 55.24 | 43.61 |
| 108 | ☐ | J_ONT-361 | 124.07 | 05:50 | 88.63 | 00:30 | 106.82 | 35.43 |
| 109 | ☐ | J_ONT-363 | 121.52 | 05:50 | 86.07 | 00:30 | 104.25 | 35.44 |
| 110 | ☐ | J_ONT-365 | 127.59 | 05:50 | 92.21 | 00:30 | 110.33 | 35.37 |
| 111 | ☐ | J_ONT-367 | 126.89 | 05:50 | 91.67 | 00:30 | 109.43 | 35.22 |
| 112 | ☐ | J_ONT-369 | 124.76 | 05:50 | 89.56 | 00:30 | 107.28 | 35.20 |
| 113 | ☐ | J_ONT-37 | 100.18 | 05:00 | 89.97 | 21:00 | 96.88 | 10.22 |
| 114 | ☐ | J_ONT-371 | 124.76 | 05:50 | 89.57 | 00:30 | 107.27 | 35.19 |

Future Scenario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 115 | ☐ | J_ONT-373 | 128.18 | 05:50 | 93.06 | 00:30 | 110.66 | 35.12 |
| 116 | ☐ | J_ONT-377 | 143.92 | 05:50 | 105.46 | 00:30 | 124.98 | 38.46 |
| 117 | ☐ | J_ONT-379 | 127.88 | 05:50 | 91.21 | 00:30 | 109.57 | 36.67 |
| 118 | ☐ | J_ONT-381 | 137.11 | 05:50 | 99.05 | 00:30 | 118.24 | 38.06 |
| 119 | ☐ | J_ONT-383 | 138.25 | 05:50 | 100.34 | 00:30 | 119.45 | 37.91 |
| 120 | ☐ | J_ONT-385 | 140.12 | 05:50 | 101.25 | 00:30 | 120.91 | 38.87 |
| 121 | ☐ | J_ONT-387 | 141.90 | 05:50 | 103.05 | 00:30 | 122.69 | 38.85 |
| 122 | ☐ | J_ONT-39 | 102.35 | 05:00 | 91.85 | 21:00 | 98.96 | 10.50 |
| 123 | ☐ | J_ONT-399 | 146.62 | 20:00 | 103.68 | 00:30 | 125.12 | 42.95 |
| 124 | ☐ | J_ONT-401 | 142.91 | 20:00 | 100.48 | 00:30 | 121.58 | 42.43 |
| 125 | ☐ | J_ONT-403 | 144.52 | 05:50 | 103.42 | 00:30 | 123.95 | 41.10 |
| 126 | ☐ | J_ONT-405 | 170.36 | 20:00 | 94.01 | 04:00 | 114.78 | 76.35 |
| 127 | ☐ | J_ONT-407 | 145.39 | 20:00 | 102.60 | 00:30 | 123.94 | 42.79 |
| 128 | ☐ | J_ONT-409 | 131.63 | 08:00 | 115.54 | 21:00 | 124.28 | 16.08 |
| 129 | ☐ | J_ONT-41 | 113.18 | 05:00 | 102.46 | 21:00 | 109.72 | 10.72 |
| 130 | ☐ | J_ONT-421 | 148.86 | 20:00 | 105.62 | 00:30 | 127.26 | 43.24 |
| 131 | ☐ | J_ONT-423 | 96.62 | 08:00 | 75.01 | 21:00 | 87.28 | 21.61 |
| 132 | ☐ | J_ONT-425 | 104.36 | 08:00 | 82.04 | 21:00 | 94.76 | 22.32 |
| 133 | ☐ | J_ONT-427 | 104.36 | 08:00 | 81.98 | 21:00 | 94.75 | 22.38 |
| 134 | ☐ | J_ONT-43 | 101.91 | 05:00 | 92.63 | 21:00 | 98.92 | 9.29 |
| 135 | ☐ | J_ONT-433 | 129.79 | 20:00 | 85.91 | 00:30 | 107.22 | 43.88 |
| 136 | ☐ | J_ONT-437 | 129.79 | 20:00 | 85.92 | 00:30 | 107.22 | 43.87 |
| 137 | ☐ | J_ONT-441 | 171.48 | 20:00 | 95.70 | 04:00 | 111.26 | 75.78 |
| 138 | ☐ | J_ONT-443 | 161.56 | 20:00 | 90.69 | 04:00 | 107.37 | 70.87 |
| 139 | ☐ | J_ONT-45 | 122.71 | 05:00 | 115.66 | 21:00 | 120.44 | 7.06 |
| 140 | ☐ | J_ONT-467 | 113.30 | 05:00 | 105.44 | 20:40 | 112.05 | 7.86 |
| 141 | ☐ | J_ONT-469 | 207.04 | 20:00 | 95.03 | 04:00 | 142.57 | 112.01 |
| 142 | ☐ | J_ONT-47 | 126.18 | 05:00 | 107.92 | 21:00 | 120.26 | 18.26 |
| 143 | ☐ | J_ONT-473 | 140.27 | 20:00 | 70.30 | 04:00 | 82.71 | 69.96 |
| 144 | ☐ | J_ONT-477 | 139.96 | 05:50 | 101.17 | 00:30 | 120.78 | 38.79 |
| 145 | ☐ | J_ONT-489 | 167.09 | 20:00 | 93.17 | 04:00 | 107.47 | 73.92 |
| 146 | ☐ | J_ONT-49 | 140.05 | 05:00 | 121.78 | 21:00 | 134.12 | 18.26 |
| 147 | ☐ | J_ONT-491 | 183.11 | 20:00 | 111.58 | 04:00 | 129.88 | 71.53 |
| 148 | ☐ | J_ONT-495 | 523.79 | 20:00 | 479.95 | 00:30 | 501.23 | 43.84 |
| 149 | ☐ | J_ONT-499 | 123.88 | 05:00 | 117.35 | 21:00 | 121.79 | 6.53 |
| 150 | ☐ | J_ONT-501 | 126.18 | 05:00 | 119.65 | 21:00 | 124.08 | 6.53 |
| 151 | ☐ | J_ONT-503 | 188.72 | 20:00 | 145.52 | 00:30 | 167.14 | 43.20 |
| 152 | ☐ | J_ONT-507 | 124.75 | 05:50 | 89.58 | 00:30 | 107.25 | 35.16 |
| 153 | ☐ | J_ONT-509 | 128.87 | 05:50 | 93.77 | 00:30 | 111.35 | 35.11 |
| 154 | ☐ | J_ONT-51 | 127.05 | 05:00 | 107.17 | 21:00 | 120.60 | 19.87 |
| 155 | ☐ | J_ONT-511 | 128.64 | 05:50 | 93.53 | 00:30 | 111.11 | 35.11 |
| 156 | ☐ | J_ONT-513 | 189.93 | 20:00 | 119.28 | 04:00 | 138.15 | 70.65 |
| 157 | ☐ | J_ONT-515 | 188.18 | 20:00 | 117.53 | 04:00 | 136.40 | 70.65 |
| 158 | ☐ | J_ONT-523 | 100.81 | 05:00 | 91.15 | 21:00 | 97.69 | 9.66 |
| 159 | ☐ | J_ONT-525 | 123.45 | 05:00 | 110.91 | 21:00 | 119.39 | 12.54 |
| 160 | ☐ | J_ONT-53 | 134.41 | 05:00 | 114.24 | 21:00 | 127.87 | 20.17 |
| 161 | ☐ | J_ONT-531 | 126.60 | 05:00 | 107.42 | 21:00 | 120.38 | 19.18 |
| 162 | ☐ | J_ONT-533 | 104.11 | 05:00 | 96.76 | 21:00 | 102.71 | 7.35 |
| 163 | ☐ | J_ONT-535 | 113.30 | 05:00 | 105.53 | 20:40 | 112.41 | 7.78 |
| 164 | ☐ | J_ONT-537 | 101.27 | 08:00 | 79.21 | 21:00 | 91.80 | 22.06 |
| 165 | ☐ | J_ONT-543 | 82.74 | 08:00 | 71.07 | 21:00 | 77.02 | 11.67 |
| 166 | ☐ | J_ONT-545 | 129.20 | 05:00 | 121.08 | 20:40 | 127.88 | 8.11 |
| 167 | ☐ | J_ONT-547 | 95.89 | 08:00 | 82.69 | 21:00 | 89.58 | 13.19 |
| 168 | ☐ | J_ONT-55 | 88.48 | 05:00 | 83.65 | 21:00 | 87.21 | 4.83 |
| 169 | ☐ | J_ONT-567 | 121.12 | 08:00 | 103.88 | 21:00 | 113.42 | 17.24 |
| 170 | ☐ | J_ONT-569 | 124.37 | 08:00 | 100.77 | 21:00 | 114.48 | 23.60 |
| 171 | ☐ | J_ONT-571 | 100.81 | 05:00 | 91.18 | 21:00 | 97.71 | 9.63 |

Future Scenario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 172 | ☐ | J_ONT-573 | 100.81 | 05:00 | 90.43 | 21:00 | 97.46 | 10.38 |
| 173 | ☐ | J_ONT-575 | 100.81 | 05:00 | 90.43 | 21:00 | 97.46 | 10.38 |
| 174 | ☐ | J_ONT-577 | 100.81 | 05:00 | 90.41 | 21:00 | 97.45 | 10.40 |
| 175 | ☐ | J_ONT-579 | 100.81 | 05:00 | 90.41 | 21:00 | 97.45 | 10.40 |
| 176 | ☐ | J_ONT-583 | 100.81 | 05:00 | 90.55 | 21:00 | 97.50 | 10.26 |
| 177 | ☐ | J_ONT-587 | 74.05 | 05:00 | 69.05 | 21:00 | 72.44 | 5.01 |
| 178 | ☐ | J_ONT-589 | 123.88 | 05:00 | 117.38 | 21:00 | 121.79 | 6.50 |
| 179 | ☐ | J_ONT-59 | 89.35 | 05:00 | 85.52 | 21:00 | 88.12 | 3.83 |
| 180 | ☐ | J_ONT-609 | 119.25 | 08:00 | 97.72 | 21:00 | 110.06 | 21.53 |
| 181 | ☐ | J_ONT-61 | 85.02 | 05:00 | 80.40 | 21:00 | 83.53 | 4.62 |
| 182 | ☐ | J_ONT-611 | 119.24 | 08:00 | 98.12 | 21:00 | 110.19 | 21.12 |
| 183 | ☐ | J_ONT-613 | 269.31 | 20:00 | 227.70 | 00:30 | 248.10 | 41.61 |
| 184 | ☐ | J_ONT-63 | 88.92 | 05:00 | 86.93 | 21:00 | 88.18 | 1.99 |
| 185 | ☐ | J_ONT-77 | 121.18 | 08:00 | 101.92 | 21:00 | 112.79 | 19.26 |
| 186 | ☐ | J_ONT-89 | 108.41 | 05:00 | 90.34 | 21:00 | 105.43 | 18.07 |
| 187 | ☐ | J_ONT-99 | 110.40 | 05:00 | 94.24 | 21:00 | 108.00 | 16.16 |
| 188 | ☐ | J1272 | 134.56 | 20:00 | 92.96 | 00:30 | 113.39 | 41.60 |
| 189 | ☐ | J1274 | 125.89 | 20:00 | 84.39 | 00:30 | 104.71 | 41.50 |
| 190 | ☐ | J1276 | 139.32 | 20:00 | 97.64 | 00:30 | 118.23 | 41.68 |
| 191 | ☐ | J1280 | 133.69 | 20:00 | 92.08 | 00:30 | 112.51 | 41.62 |
| 192 | ☐ | J1288 | 129.79 | 20:00 | 88.19 | 00:30 | 108.58 | 41.60 |
| 193 | ☐ | J1290 | 146.87 | 05:50 | 105.97 | 00:30 | 126.48 | 40.90 |
| 194 | ☐ | J1292 | 217.07 | 20:00 | 150.94 | 21:00 | 172.36 | 66.13 |
| 195 | ☐ | J1294 | 185.59 | 20:00 | 113.17 | 04:00 | 133.24 | 72.42 |
| 196 | ☐ | J1296 | 177.04 | 20:00 | 106.16 | 04:00 | 124.02 | 70.88 |
| 197 | ☐ | J1302 | 131.01 | 05:50 | 94.01 | 00:30 | 112.58 | 36.99 |
| 198 | ☐ | J1304 | 198.65 | 20:00 | 129.55 | 21:00 | 151.73 | 69.10 |
| 199 | ☐ | J1308 | 129.05 | 05:50 | 93.95 | 00:30 | 111.53 | 35.10 |
| 200 | ☐ | J1314 | 105.09 | 20:00 | 61.47 | 00:30 | 82.42 | 43.62 |
| 201 | ☐ | J1316 | 105.09 | 20:00 | 61.46 | 00:30 | 82.41 | 43.63 |
| 202 | ☐ | J1320 | 124.57 | 05:50 | 94.37 | 00:30 | 109.82 | 30.20 |
| 203 | ☐ | J1322 | 134.31 | 05:50 | 99.59 | 00:30 | 117.40 | 34.72 |
| 204 | ☐ | J1324 | 134.15 | 05:50 | 98.86 | 00:30 | 116.78 | 35.29 |
| 205 | ☐ | J1404 | 131.30 | 05:50 | 96.04 | 00:30 | 113.87 | 35.26 |
| 206 | ☐ | J1406 | 127.51 | 05:50 | 92.12 | 00:30 | 110.25 | 35.39 |
| 207 | ☐ | J1408 | 121.02 | 05:50 | 85.58 | 00:30 | 103.76 | 35.44 |
| 208 | ☐ | J1410 | 124.06 | 05:50 | 88.61 | 00:30 | 106.79 | 35.44 |
| 209 | ☐ | J1412 | 124.07 | 05:50 | 88.65 | 00:30 | 106.83 | 35.42 |
| 210 | ☐ | J1414 | 128.19 | 05:50 | 92.97 | 00:30 | 111.03 | 35.23 |
| 211 | ☐ | J1416 | 135.94 | 05:50 | 100.80 | 00:30 | 118.71 | 35.14 |
| 212 | ☐ | J1586 | 84.29 | 20:00 | 40.72 | 00:30 | 61.63 | 43.58 |
| 213 | ☐ | J1592 | 145.39 | 20:00 | 102.60 | 00:30 | 123.94 | 42.79 |
| 214 | ☐ | J1596 | 110.67 | 05:00 | 94.53 | 21:00 | 108.27 | 16.14 |
| 215 | ☐ | JKELLOG | 94.51 | 08:00 | 82.29 | 21:00 | 88.59 | 12.22 |
| 216 | ☐ | JSCH_HYD | 94.51 | 08:00 | 82.28 | 21:00 | 88.58 | 12.23 |
| 217 | ☐ | ONT66 | 115.35 | 05:00 | 103.10 | 20:40 | 114.71 | 12.25 |
| 218 | ☐ | ONT68 | 111.94 | 05:00 | 98.21 | 21:00 | 110.13 | 13.73 |
| 219 | ☐ | ONT72 | 112.57 | 05:00 | 99.58 | 20:40 | 111.07 | 12.99 |
| 220 | ☐ | ONT76 | 106.67 | 08:00 | 84.76 | 21:00 | 97.27 | 21.91 |
| 221 | ☐ | ONT84 | 91.26 | 08:00 | 78.41 | 21:00 | 85.01 | 12.85 |
| 222 | ☐ | ONTFRAN-3571 | 117.01 | 05:00 | 109.20 | 20:40 | 116.06 | 7.81 |
| 223 | ☐ | ONTFRAN-3574 | 82.00 | 08:00 | 70.02 | 21:00 | 76.16 | 11.98 |
| 224 | ☐ | ONTFRAN-3575 | 83.44 | 08:00 | 72.12 | 21:00 | 77.86 | 11.32 |
| 225 | ☐ | ONTFRAN-3576 | 82.23 | 08:00 | 71.06 | 21:00 | 76.71 | 11.16 |
| 226 | ☐ | ONTFRAN-3577 | 82.47 | 08:00 | 71.58 | 21:00 | 77.05 | 10.89 |
| 227 | ☐ | ONTFRAN-3578 | 84.32 | 08:00 | 73.82 | 21:00 | 79.05 | 10.50 |
| 228 | ☐ | ONTFRAN-3581 | 92.12 | 08:00 | 79.02 | 21:00 | 85.75 | 13.10 |

Future Scenario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 229 | ☐ | ONTFRAN-3582 | 91.59 | 08:00 | 78.83 | 21:00 | 85.39 | 12.76 |
| 230 | ☐ | ONTFRAN-3583 | 94.05 | 08:00 | 82.10 | 21:00 | 88.23 | 11.95 |
| 231 | ☐ | ONTFRAN-3584 | 94.61 | 08:00 | 82.14 | 21:00 | 88.60 | 12.47 |
| 232 | ☐ | ONTFRAN-3585 | 96.25 | 08:00 | 83.21 | 21:00 | 90.00 | 13.04 |
| 233 | ☐ | ONTFRAN-3586 | 96.75 | 08:00 | 83.56 | 21:00 | 90.44 | 13.19 |
| 234 | ☐ | ONTFRAN-3587 | 95.02 | 08:00 | 82.24 | 21:00 | 88.84 | 12.77 |
| 235 | ☐ | ONTFRAN-3588 | 108.10 | 08:00 | 95.22 | 21:00 | 101.84 | 12.88 |
| 236 | ☐ | ONTFRAN-3591 | 101.40 | 08:00 | 86.56 | 21:00 | 94.45 | 14.84 |
| 237 | ☐ | ONTFRAN-3592 | 93.42 | 08:00 | 72.87 | 21:00 | 84.43 | 20.55 |
| 238 | ☐ | ONTFRAN-3593 | 90.95 | 08:00 | 70.04 | 21:00 | 81.81 | 20.91 |
| 239 | ☐ | ONTFRAN-3594 | 90.51 | 08:00 | 68.48 | 21:00 | 80.98 | 22.02 |
| 240 | ☐ | ONTFRAN-3595 | 88.13 | 08:00 | 65.97 | 21:00 | 78.55 | 22.16 |
| 241 | ☐ | ONTFRAN-3596 | 101.39 | 08:00 | 78.82 | 21:00 | 91.70 | 22.57 |
| 242 | ☐ | ONTFRAN-3597 | 104.36 | 08:00 | 81.98 | 21:00 | 94.75 | 22.38 |
| 243 | ☐ | ONTFRAN-3598 | 101.43 | 08:00 | 79.37 | 21:00 | 91.96 | 22.06 |
| 244 | ☐ | ONTFRAN-3599 | 111.56 | 08:00 | 91.01 | 21:00 | 102.68 | 20.55 |
| 245 | ☐ | ONTFRAN-3600 | 103.67 | 08:00 | 89.07 | 21:00 | 96.83 | 14.60 |
| 246 | ☐ | ONTFRAN-3601 | 115.33 | 08:00 | 94.63 | 21:00 | 106.40 | 20.70 |
| 247 | ☐ | ONTFRAN-3602 | 114.58 | 08:00 | 93.24 | 21:00 | 105.45 | 21.34 |
| 248 | ☐ | ONTFRAN-3603 | 119.95 | 08:00 | 99.64 | 21:00 | 111.19 | 20.31 |
| 249 | ☐ | ONTFRAN-3605 | 123.58 | 08:00 | 105.97 | 21:00 | 115.75 | 17.61 |
| 250 | ☐ | ONTFRAN-3606 | 125.92 | 08:00 | 109.36 | 21:00 | 118.43 | 16.56 |
| 251 | ☐ | ONTFRAN-3607 | 131.63 | 08:00 | 115.14 | 21:00 | 124.16 | 16.49 |
| 252 | ☐ | ONTFRAN-3608 | 122.25 | 08:00 | 99.46 | 21:00 | 112.61 | 22.80 |
| 253 | ☐ | ONTFRAN-3609 | 113.25 | 08:00 | 90.49 | 21:00 | 103.58 | 22.76 |
| 254 | ☐ | ONTFRAN-3611 | 88.69 | 08:00 | 76.73 | 21:00 | 82.87 | 11.96 |
| 255 | ☐ | ONTFRAN-3618 | 74.53 | 08:00 | 54.06 | 21:00 | 65.43 | 20.48 |
| 256 | ☐ | ONTFRAN-3619 | 74.46 | 08:00 | 53.06 | 21:00 | 65.09 | 21.40 |
| 257 | ☐ | ONTFRAN-3620 | 82.59 | 08:00 | 62.29 | 21:00 | 73.62 | 20.30 |
| 258 | ☐ | ONTFRAN-3621 | 84.15 | 08:00 | 62.17 | 21:00 | 74.63 | 21.98 |
| 259 | ☐ | ONTFRAN-3622 | 82.59 | 08:00 | 60.46 | 21:00 | 73.01 | 22.13 |
| 260 | ☐ | ONTFRAN-3626 | 90.98 | 08:00 | 77.97 | 21:00 | 84.64 | 13.02 |
| 261 | ☐ | ONTJ10 | 111.19 | 08:00 | 91.59 | 21:00 | 102.67 | 19.60 |
| 262 | ☐ | ONTJ114 | 204.20 | 20:00 | 135.10 | 21:00 | 157.28 | 69.10 |
| 263 | ☐ | ONTJ12 | 117.25 | 08:00 | 95.91 | 21:00 | 108.13 | 21.34 |
| 264 | ☐ | ONTJ145 | 117.66 | 05:00 | 109.84 | 20:40 | 116.67 | 7.82 |
| 265 | ☐ | ONTJ18 | 110.32 | 08:00 | 89.20 | 21:00 | 101.27 | 21.12 |
| 266 | ☐ | ONTJ19 | 121.33 | 08:00 | 100.24 | 21:00 | 112.29 | 21.09 |
| 267 | ☐ | ONTJ76 | 116.07 | 05:00 | 108.30 | 20:40 | 115.18 | 7.77 |
| 268 | ☐ | ONTNEWJ_630 | 104.51 | 05:00 | 87.30 | 21:00 | 101.77 | 17.21 |
| 269 | ☐ | ONTNEWJ-198 | 70.97 | 20:00 | 27.35 | 00:30 | 48.29 | 43.61 |
| 270 | ☐ | ONTNEWJ-212 | 107.27 | 05:00 | 89.59 | 21:00 | 104.41 | 17.69 |
| 271 | ☐ | ONTNEWJ-214 | 108.51 | 05:00 | 90.42 | 21:00 | 105.52 | 18.09 |
| 272 | ☐ | ONTNEWJ-222 | 117.13 | 05:00 | 109.30 | 20:40 | 116.07 | 7.83 |
| 273 | ☐ | ONTNEWJ-224 | 123.45 | 05:00 | 107.68 | 20:40 | 122.76 | 15.77 |
| 274 | ☐ | ONTNEWJ-262 | 83.66 | 20:00 | 40.08 | 00:30 | 61.00 | 43.58 |
| 275 | ☐ | ONTNEWJ-278 | 140.12 | 05:50 | 101.29 | 00:30 | 120.92 | 38.84 |
| 276 | ☐ | ONTNEWJ-322 | 83.86 | 20:00 | 40.28 | 00:30 | 61.20 | 43.58 |
| 277 | ☐ | ONTNEWJ-334 | 112.75 | 05:00 | 104.77 | 20:40 | 111.45 | 7.98 |
| 278 | ☐ | ONTNEWJ-336 | 117.14 | 05:00 | 109.31 | 20:40 | 116.08 | 7.83 |
| 279 | ☐ | ONTNEWJ-338 | 116.16 | 05:00 | 108.38 | 20:40 | 115.26 | 7.78 |
| 280 | ☐ | ONTNEWJ-340 | 116.60 | 05:00 | 108.13 | 20:40 | 116.11 | 8.47 |
| 281 | ☐ | ONTNEWJ-348 | 140.27 | 20:00 | 70.30 | 04:00 | 82.71 | 69.96 |
| 282 | ☐ | ONTNEWJ-354 | 107.18 | 05:00 | 89.51 | 21:00 | 104.32 | 17.68 |
| 283 | ☐ | ONTNEWJ-356 | 117.98 | 05:00 | 105.42 | 20:40 | 116.98 | 12.56 |
| 284 | ☐ | ONTNEWJ-378 | 170.77 | 20:00 | 94.42 | 04:00 | 115.19 | 76.35 |
| 285 | ☐ | ONTNEWJ392 | 70.23 | 08:00 | 48.68 | 21:00 | 60.82 | 21.55 |

Future Scenario - Junction Output - Pressure Range Report

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 286 | ☐ | ONTNEWJ-396 | 151.51 | 20:00 | 69.47 | 04:00 | 93.48 | 82.04 |
| 287 | ☐ | ONTNEWJ398 | 116.39 | 08:00 | 100.99 | 21:00 | 109.30 | 15.40 |
| 288 | ☐ | ONTNEWJ-398 | 147.60 | 05:50 | 108.92 | 00:30 | 128.59 | 38.69 |
| 289 | ☐ | ONTNEWJ-399 | 147.60 | 05:50 | 108.95 | 00:30 | 128.60 | 38.65 |
| 290 | ☐ | ONTNEWJ400 | 116.04 | 08:00 | 97.86 | 21:00 | 108.02 | 18.18 |
| 291 | ☐ | ONTNEWJ402 | 124.82 | 08:00 | 101.11 | 21:00 | 114.90 | 23.71 |
| 292 | ☐ | ONTNEWJ-418 | 129.20 | 05:00 | 121.14 | 20:40 | 127.96 | 8.06 |
| 293 | ☐ | ONTNEWJ-420 | 127.98 | 05:00 | 119.97 | 20:40 | 126.95 | 8.01 |
| 294 | ☐ | ONTNEWJ-424 | 128.22 | 05:00 | 120.21 | 20:40 | 127.35 | 8.01 |
| 295 | ☐ | ONTNEWJ-426 | 130.08 | 05:00 | 122.04 | 20:40 | 129.40 | 8.04 |
| 296 | ☐ | ONTNEWJ-428 | 116.17 | 05:00 | 108.78 | 20:40 | 115.68 | 7.39 |
| 297 | ☐ | ONTNEWJ-430 | 128.00 | 05:00 | 119.75 | 20:40 | 127.39 | 8.24 |
| 298 | ☐ | ONTNEWJ-432 | 126.95 | 05:00 | 109.81 | 20:40 | 126.24 | 17.14 |
| 299 | ☐ | ONTNEWJ-436 | 120.29 | 05:00 | 103.33 | 21:00 | 117.75 | 16.96 |
| 300 | ☐ | ONTNEWJ-438 | 120.22 | 05:00 | 102.60 | 21:00 | 117.39 | 17.62 |
| 301 | ☐ | ONTNEWJ-440 | 115.98 | 05:00 | 98.02 | 21:00 | 113.03 | 17.97 |
| 302 | ☐ | ONTNEWJ-456 | 127.75 | 05:00 | 119.64 | 20:40 | 126.42 | 8.11 |
| 303 | ☐ | ONTNEWJ-458 | 112.13 | 05:00 | 104.05 | 20:40 | 110.80 | 8.08 |
| 304 | ☐ | ONTNEWJ-470 | 131.46 | 05:50 | 96.53 | 00:30 | 114.43 | 34.93 |
| 305 | ☐ | ONTNEWJ-478 | 132.51 | 05:50 | 98.41 | 00:30 | 115.92 | 34.10 |
| 306 | ☐ | ONTNEWJ-482 | 138.30 | 05:50 | 100.28 | 00:30 | 119.51 | 38.02 |
| 307 | ☐ | ONTNEWJ-492 | 100.18 | 05:00 | 81.52 | 21:00 | 97.00 | 18.66 |
| 308 | ☐ | ONTNEWJ-496 | 105.38 | 05:00 | 88.79 | 21:00 | 102.84 | 16.59 |
| 309 | ☐ | ONTNEWJ-498 | 105.38 | 05:00 | 88.70 | 21:00 | 102.81 | 16.68 |
| 310 | ☐ | ONTNEWJ-500 | 111.01 | 05:00 | 97.28 | 21:00 | 109.21 | 13.73 |
| 311 | ☐ | ONTNEWJ-502 | 127.48 | 05:00 | 114.30 | 20:40 | 126.81 | 13.18 |
| 312 | ☐ | ONTNEWJ-510 | 148.86 | 20:00 | 105.71 | 00:30 | 127.29 | 43.15 |
| 313 | ☐ | ONTNEWJ-516 | 145.82 | 20:00 | 102.66 | 00:30 | 124.25 | 43.16 |
| 314 | ☐ | ONTNEWJ-520 | 134.02 | 05:50 | 96.66 | 00:30 | 115.45 | 37.36 |
| 315 | ☐ | ONTNEWJ-522 | 143.09 | 05:50 | 104.73 | 00:30 | 124.19 | 38.36 |
| 316 | ☐ | ONTNEWJ-526 | 147.34 | 05:50 | 108.13 | 00:30 | 128.07 | 39.21 |
| 317 | ☐ | ONTNEWJ-528 | 146.12 | 05:50 | 107.11 | 00:30 | 127.01 | 39.01 |
| 318 | ☐ | ONTNEWJ-530 | 152.86 | 20:00 | 66.52 | 04:00 | 93.48 | 86.33 |
| 319 | ☐ | ONTNEWJ-542 | 163.30 | 20:00 | 73.09 | 04:00 | 102.84 | 90.22 |
| 320 | ☐ | ONTNEWJ-544 | 162.87 | 20:00 | 70.93 | 04:00 | 101.85 | 91.94 |
| 321 | ☐ | ONTNEWJ-546 | 169.37 | 20:00 | 74.09 | 04:00 | 107.26 | 95.28 |
| 322 | ☐ | ONTNEWJ-548 | 165.90 | 20:00 | 70.25 | 04:00 | 103.67 | 95.65 |
| 323 | ☐ | ONTNEWJ-550 | 175.15 | 20:00 | 82.54 | 04:00 | 114.45 | 92.62 |
| 324 | ☐ | ONTNEWJ-554 | 173.40 | 20:00 | 64.52 | 04:00 | 108.85 | 108.88 |
| 325 | ☐ | ONTNEWJ-555 | 182.24 | 20:00 | 111.36 | 04:00 | 129.22 | 70.88 |
| 326 | ☐ | ONTNEWJ-556 | 186.89 | 20:00 | 116.60 | 04:00 | 135.24 | 70.29 |
| 327 | ☐ | ONTNEWJ-558 | 189.93 | 20:00 | 118.79 | 04:00 | 138.00 | 71.13 |
| 328 | ☐ | ONTNEWJ-560 | 181.63 | 20:00 | 76.29 | 21:00 | 119.91 | 105.35 |
| 329 | ☐ | ONTNEWJ-562 | 176.87 | 20:00 | 84.15 | 21:00 | 121.43 | 92.72 |
| 330 | ☐ | ONTNEWJ-564 | 172.53 | 20:00 | 79.36 | 21:00 | 116.95 | 93.18 |
| 331 | ☐ | ONTNEWJ-568 | 166.86 | 20:00 | 84.38 | 04:00 | 109.28 | 82.48 |
| 332 | ☐ | ONTNEWJ-576 | 210.94 | 20:00 | 142.71 | 04:00 | 160.74 | 68.23 |
| 333 | ☐ | ONTNEWJ-578 | 200.18 | 20:00 | 132.78 | 21:00 | 152.70 | 67.40 |
| 334 | ☐ | ONTNEWJ-582 | 194.54 | 20:00 | 126.25 | 21:00 | 146.77 | 68.30 |
| 335 | ☐ | ONTNEWJ-584 | 199.74 | 20:00 | 132.09 | 21:00 | 152.18 | 67.66 |
| 336 | ☐ | ONTNEWJ-585 | 189.06 | 20:00 | 98.50 | 21:00 | 134.71 | 90.56 |
| 337 | ☐ | ONTNEWJ-586 | 199.74 | 20:00 | 132.09 | 21:00 | 152.18 | 67.66 |
| 338 | ☐ | ONTNEWJ-588 | 198.44 | 20:00 | 131.05 | 21:00 | 150.96 | 67.40 |
| 339 | ☐ | ONTNEWJ-591 | 75.27 | 05:00 | 73.26 | 21:00 | 74.53 | 2.01 |
| 340 | ☐ | ONTNEWJ-592 | 190.36 | 20:00 | 106.75 | 21:00 | 138.28 | 83.61 |
| 341 | ☐ | ONTNEWJ-598 | 135.67 | 05:50 | 100.30 | 00:30 | 118.27 | 35.37 |
| 342 | ☐ | ONTNEWJ-622 | 84.73 | 20:00 | 41.15 | 00:30 | 62.07 | 43.58 |

| | | ID | Max.Value (psi) | Max.Time (hrs.) | Min.Value (psi) | Min.Time (hrs.) | Average (psi) | Difference (psi) |
|---|---|---|---|---|---|---|---|---|
| 343 | ☐ | ONTNEWJ-628 | 148.96 | 20:00 | 60.92 | 04:00 | 89.03 | 88.03 |
| 344 | ☐ | ONTNEWJ-631 | 104.51 | 05:00 | 87.39 | 21:00 | 101.80 | 17.13 |
| 345 | ☐ | ONTNEWJ-632 | 106.68 | 05:00 | 89.70 | 21:00 | 104.01 | 16.98 |
| 346 | ☐ | ONTNEWJ-634 | 101.48 | 05:00 | 84.61 | 21:00 | 98.85 | 16.87 |
| 347 | ☐ | ONTNEWJ-636 | 106.68 | 05:00 | 89.82 | 21:00 | 104.05 | 16.86 |
| 348 | ☐ | ONTNEWJ-638 | 105.38 | 05:00 | 88.68 | 21:00 | 102.80 | 16.70 |
| 349 | ☐ | ONTNEWJ-640 | 124.77 | 05:50 | 89.56 | 00:30 | 107.29 | 35.20 |
| 350 | ☐ | ONTNEWJ-646 | 124.80 | 05:50 | 89.49 | 00:30 | 107.35 | 35.32 |
| 351 | ☐ | ONTNEWJ-908 | 89.49 | 20:00 | 48.59 | 00:30 | 68.58 | 40.90 |
| 352 | ☐ | ONTNEWJ-910 | 147.38 | 05:50 | 108.53 | 00:30 | 128.28 | 38.86 |
| 353 | ☐ | ONTNEWJ-914 | 136.39 | 05:50 | 98.80 | 00:30 | 117.75 | 37.59 |
| 354 | ☐ | ONTNEWJ-934 | 157.66 | 20:00 | 86.94 | 04:00 | 103.52 | 70.71 |
| 355 | ☐ | ONTNEWJ-936 | 158.53 | 20:00 | 87.77 | 04:00 | 104.38 | 70.75 |
| 356 | ☐ | ONTNEWJ-950 | 124.74 | 05:50 | 89.59 | 00:30 | 107.24 | 35.16 |
| 357 | ☐ | ONTPHLP-2235 | 119.81 | 05:00 | 112.27 | 20:40 | 119.20 | 7.54 |
| 358 | ☐ | ONTPHLP-2241 | 114.97 | 05:00 | 107.24 | 20:40 | 114.16 | 7.73 |
| 359 | ☐ | ONTPHLP-2263 | 114.04 | 05:00 | 106.18 | 20:40 | 112.85 | 7.86 |
| 360 | ☐ | ONTPHLP-3507 | 116.17 | 05:00 | 108.84 | 20:40 | 115.71 | 7.33 |
| 361 | ☐ | ONTPHLP-3606 | 81.19 | 08:00 | 71.98 | 21:00 | 76.09 | 9.21 |
| 362 | ☐ | ONTPHLP-3610 | 106.90 | 05:00 | 89.27 | 21:00 | 104.05 | 17.63 |
| 363 | ☐ | ONTPICKUP-12 | 123.90 | 05:00 | 107.94 | 20:40 | 123.20 | 15.96 |
| 364 | ☐ | ONTPICKUP-14 | 116.31 | 05:00 | 107.84 | 20:40 | 115.81 | 8.48 |
| 365 | ☐ | ONTPICKUP-17 | 111.01 | 05:00 | 98.02 | 20:40 | 109.51 | 12.99 |
| 366 | ☐ | ONTPICKUP-30 | 202.99 | 20:00 | 133.88 | 21:00 | 156.06 | 69.10 |
| 367 | ☐ | ONTPICKUP-32 | 162.53 | 20:00 | 78.24 | 04:00 | 104.36 | 84.29 |
| 368 | ☐ | ONTPICKUP-42 | 92.09 | 20:00 | 48.75 | 00:30 | 69.64 | 43.35 |
| 369 | ☐ | ONTPICKUP-48 | 178.90 | 20:00 | 104.48 | 04:00 | 118.94 | 74.41 |
| 370 | ☐ | ONTPICKUP-51 | 84.46 | 20:00 | 40.88 | 00:30 | 61.80 | 43.58 |
| 371 | ☐ | ONTPICKUP-6 | 145.48 | 20:00 | 73.36 | 04:00 | 86.80 | 72.11 |
| 372 | ☐ | ONTPICKUP-65 | 168.96 | 20:00 | 92.60 | 04:00 | 113.38 | 76.36 |
| 373 | ☐ | ONTPICKUP-68 | 146.76 | 05:50 | 108.03 | 00:30 | 127.73 | 38.72 |
| 374 | ☐ | ONTPICKUP-70 | 116.41 | 05:00 | 108.63 | 20:40 | 115.50 | 7.78 |
| 375 | ☐ | ONTPICKUP-71 | 170.13 | 20:00 | 89.54 | 04:00 | 113.17 | 80.59 |
| 376 | ☐ | ONTPICKUP-72 | 91.62 | 20:00 | 48.24 | 00:30 | 69.14 | 43.38 |
| 377 | ☐ | ONTPICKUP-9 | 117.16 | 05:00 | 109.33 | 20:40 | 116.10 | 7.83 |
| 378 | ☐ | ONTTOP50-10 | 140.08 | 20:00 | 70.11 | 04:00 | 82.51 | 69.96 |
| 379 | ☐ | ONTTOP50-15 | 141.75 | 05:50 | 102.52 | 00:30 | 122.26 | 39.23 |
| 380 | ☐ | ONTTOP50-18 | 138.20 | 05:50 | 99.90 | 00:30 | 119.23 | 38.30 |
| 381 | ☐ | ONTTOP50-20 | 116.99 | 05:00 | 109.16 | 20:40 | 115.93 | 7.83 |
| 382 | ☐ | ONTTOP50-22 | 144.53 | 05:50 | 106.01 | 00:30 | 125.58 | 38.52 |
| 383 | ☐ | ONTTOP50-23 | 118.12 | 05:00 | 110.30 | 20:40 | 117.12 | 7.82 |
| 384 | ☐ | ONTTOP50-25 | 119.09 | 05:00 | 111.55 | 20:40 | 118.48 | 7.54 |
| 385 | ☐ | ONTTOP50-40 | 85.10 | 20:00 | 41.51 | 00:30 | 62.43 | 43.58 |
| 386 | ☐ | ONTTOP50-48 | 183.21 | 20:00 | 112.33 | 04:00 | 130.19 | 70.88 |
| 387 | ☐ | ONTTOP50-6 | 123.53 | 05:00 | 107.76 | 20:40 | 122.84 | 15.77 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 1 | ☐ | 800ZONE_V1 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 2 | ☐ | 800ZONE_V2 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 3 | ☐ | PSCH_1 | 464.64 | 04:00 | 0.00 | 05:50 | 156.98 | 464.64 |
| 4 | ☐ | PKELLOG | 450.23 | 04:00 | 0.00 | 05:50 | 152.46 | 450.23 |
| 5 | ☐ | PHYD_LAT | 17.77 | 00:00 | 0.00 | 05:00 | 6.01 | 17.77 |
| 6 | ☐ | P10142 | 7,088.67 | 21:00 | 0.00 | 05:50 | 2,450.44 | 7,088.67 |
| 7 | ☐ | P10326 | 464.90 | 21:00 | 0.00 | 20:00 | 250.12 | 464.90 |
| 8 | ☐ | P10328 | 338.66 | 21:00 | 0.00 | 20:00 | 208.12 | 338.66 |
| 9 | ☐ | P10330 | 244.49 | 21:00 | 0.00 | 20:00 | 177.12 | 244.49 |
| 10 | ☐ | P10332 | 317.96 | 00:00 | 0.00 | 05:00 | 107.45 | 317.96 |
| 11 | ☐ | P10334 | 94.16 | 00:00 | 0.00 | 05:00 | 31.82 | 94.16 |
| 12 | ☐ | P10340 | 54.47 | 00:00 | 0.00 | 05:00 | 18.41 | 54.47 |
| 13 | ☐ | P10342 | 224.84 | 10:40 | 0.00 | 20:00 | 181.08 | 224.84 |
| 14 | ☐ | P10344 | 192.95 | 00:00 | 0.00 | 05:00 | 65.20 | 192.95 |
| 15 | ☐ | P10346 | 1,035.25 | 01:20 | 0.00 | 05:00 | 349.84 | 1,035.25 |
| 16 | ☐ | P10350 | 238.18 | 00:20 | 0.00 | 05:00 | 80.49 | 238.18 |
| 17 | ☐ | P10354 | 1,654.75 | 04:00 | 0.00 | 20:00 | 901.48 | 1,654.75 |
| 18 | ☐ | P10356 | 529.22 | 00:10 | 0.00 | 05:00 | 178.84 | 529.22 |
| 19 | ☐ | P10360 | 454.01 | 21:00 | 0.00 | 20:00 | 304.24 | 454.01 |
| 20 | ☐ | P10364 | 48.24 | 02:40 | 0.00 | 05:00 | 16.30 | 48.24 |
| 21 | ☐ | P10366 | 51.31 | 00:00 | 0.00 | 05:00 | 17.34 | 51.31 |
| 22 | ☐ | P10368 | 51.31 | 00:00 | 0.00 | 05:00 | 17.34 | 51.31 |
| 23 | ☐ | P10372 | 929.16 | 04:00 | 0.00 | 20:00 | 494.92 | 929.16 |
| 24 | ☐ | P10374 | 564.54 | 04:00 | 0.00 | 20:00 | 371.70 | 564.54 |
| 25 | ☐ | P10376 | 297.60 | 04:00 | 0.00 | 20:00 | 201.63 | 297.60 |
| 26 | ☐ | P10422 | 2,508.77 | 21:40 | 0.00 | 05:50 | 848.06 | 2,508.77 |
| 27 | ☐ | P10506 | 367.24 | 10:40 | 0.00 | 20:00 | 223.50 | 367.24 |
| 28 | ☐ | P10508 | 367.24 | 10:40 | 0.00 | 20:00 | 251.29 | 367.24 |
| 29 | ☐ | P10510 | 203.83 | 10:40 | 0.00 | 20:00 | 135.16 | 203.83 |
| 30 | ☐ | P10512 | 97.56 | 21:00 | 0.00 | 20:00 | 65.80 | 97.56 |
| 31 | ☐ | P10514 | 2.60 | 00:00 | 0.00 | 05:00 | 0.88 | 2.60 |
| 32 | ☐ | P10516 | 155.57 | 04:00 | 0.00 | 20:00 | 90.17 | 155.57 |
| 33 | ☐ | P10518 | 142.03 | 04:00 | 0.00 | 20:00 | 111.47 | 142.03 |
| 34 | ☐ | P10520 | 155.57 | 04:00 | 0.00 | 20:00 | 90.17 | 155.57 |
| 35 | ☐ | P10522 | 163.42 | 10:40 | 0.00 | 20:00 | 126.71 | 163.42 |
| 36 | ☐ | P10550 | 163.42 | 10:40 | 0.00 | 20:00 | 126.71 | 163.42 |
| 37 | ☐ | ONT9036 | 2,396.30 | 21:00 | 0.00 | 05:00 | 688.49 | 2,396.30 |
| 38 | ☐ | ONTFRAN-3622 | 216.79 | 21:40 | 0.00 | 05:50 | 71.87 | 216.79 |
| 39 | ☐ | ONT9042 | 751.97 | 21:40 | 0.00 | 05:50 | 248.54 | 751.97 |
| 40 | ☐ | ONTNEWP-9322 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 41 | ☐ | ONTNEWP-9512 | 48.23 | 01:20 | 0.00 | 05:00 | 16.30 | 48.23 |
| 42 | ☐ | ONTNEWP-9514 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 43 | ☐ | ONTNEWP-9919 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 44 | ☐ | ONTNEWP-10026 | 458.86 | 00:00 | 0.00 | 05:00 | 155.06 | 458.86 |
| 45 | ☐ | ONTNEWP-934 | 73.68 | 00:00 | 0.00 | 05:00 | 24.90 | 73.68 |
| 46 | ☐ | ONTNEWP-10044 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 47 | ☐ | ONTNEWP-9885 | 128.88 | 00:00 | 0.00 | 05:00 | 43.55 | 128.88 |
| 48 | ☐ | ONTNEWP-9887 | 128.88 | 00:00 | 0.00 | 05:00 | 43.55 | 128.88 |
| 49 | ☐ | ONTNEWP-9889 | 128.88 | 00:00 | 0.00 | 05:00 | 43.55 | 128.88 |
| 50 | ☐ | ONTNEWP-9891 | 128.88 | 00:00 | 0.00 | 05:00 | 43.55 | 128.88 |
| 51 | ☐ | ONTNEWP-9893 | 133.81 | 00:00 | 0.00 | 05:00 | 45.22 | 133.81 |
| 52 | ☐ | ONTNEWP-9895 | 133.81 | 00:00 | 0.00 | 05:00 | 45.22 | 133.81 |
| 53 | ☐ | ONTNEWP-9962 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 54 | ☐ | ONTNEWP-9964 | 183.56 | 00:00 | 0.00 | 05:00 | 62.03 | 183.56 |
| 55 | ☐ | ONTNEWP-9968 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 56 | ☐ | ONT9010 | 704.28 | 21:40 | 0.00 | 05:00 | 261.70 | 704.28 |
| 57 | ☐ | ONT9012 | 931.07 | 21:40 | 0.00 | 05:00 | 339.75 | 931.07 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 58 | ☐ | ONT9056 | 1,051.14 | 21:40 | 0.00 | 05:00 | 382.70 | 1,051.14 |
| 59 | ☐ | ONTNEWP-9240 | 478.26 | 21:40 | 0.00 | 05:00 | 182.82 | 478.26 |
| 60 | ☐ | ONTNEWP-9244 | 739.23 | 21:40 | 0.00 | 05:00 | 273.51 | 739.23 |
| 61 | ☐ | ONTNEWP-9344 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 62 | ☐ | ONTNEWP-9346 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 63 | ☐ | ONTNEWP-9348 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 64 | ☐ | ONTNEWP-9546 | 478.26 | 21:40 | 0.00 | 05:00 | 182.82 | 478.26 |
| 65 | ☐ | ONTNEWP-9548 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 66 | ☐ | ONTNEWP-9550 | 704.28 | 21:40 | 0.00 | 05:00 | 261.70 | 704.28 |
| 67 | ☐ | ONTNEWP-9552 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 68 | ☐ | ONTNEWP-9798 | 842.16 | 21:00 | 0.00 | 04:10 | 163.30 | 842.16 |
| 69 | ☐ | ONTNEWP-9572 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 70 | ☐ | ONTNEWP-9320 | 48.23 | 00:00 | 0.00 | 05:00 | 16.30 | 48.23 |
| 71 | ☐ | ONTNEWP-10016 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 72 | ☐ | ONTNEWP-9774 | 531.33 | 20:40 | 0.00 | 05:00 | 14.16 | 531.33 |
| 73 | ☐ | ONTNEWP-9884 | 4.73 | 00:00 | 0.00 | 05:00 | 1.60 | 4.73 |
| 74 | ☐ | ONTNEWP-9886 | 32.18 | 00:00 | 0.00 | 05:00 | 10.87 | 32.18 |
| 75 | ☐ | ONTNEWP-9384 | 746.26 | 04:00 | 0.00 | 20:00 | 481.72 | 746.26 |
| 76 | ☐ | ONTNEWP-9892 | 755.34 | 04:00 | 0.00 | 20:00 | 484.79 | 755.34 |
| 77 | ☐ | ONTNEWP-9566 | 104.48 | 00:00 | 0.00 | 05:00 | 35.31 | 104.48 |
| 78 | ☐ | ONTNEWP-9900 | 429.06 | 04:00 | 0.00 | 20:00 | 257.75 | 429.06 |
| 79 | ☐ | ONTNEWP-910 | 340.56 | 04:00 | 0.00 | 20:00 | 227.84 | 340.56 |
| 80 | ☐ | ONTNEWP-9896 | 352.67 | 00:00 | 0.00 | 05:00 | 119.18 | 352.67 |
| 81 | ☐ | ONTNEWP-9712 | 280.33 | 00:00 | 0.00 | 05:00 | 94.73 | 280.33 |
| 82 | ☐ | ONTNEWP-9902 | 133.65 | 00:00 | 0.00 | 05:00 | 45.17 | 133.65 |
| 83 | ☐ | ONTNEWP-9890 | 781.73 | 04:00 | 0.00 | 20:00 | 376.93 | 781.73 |
| 84 | ☐ | ONTNEWP-914 | 781.73 | 04:00 | 0.00 | 20:00 | 376.93 | 781.73 |
| 85 | ☐ | ONTNEWP-9894 | 781.73 | 04:00 | 0.00 | 20:00 | 376.93 | 781.73 |
| 86 | ☐ | ONTNEWP-9913 | 83.15 | 00:00 | 0.00 | 05:00 | 28.10 | 83.15 |
| 87 | ☐ | ONTNEWP-9861 | 108.55 | 00:00 | 0.00 | 05:00 | 36.68 | 108.55 |
| 88 | ☐ | ONTNEWP-918 | 240.75 | 04:00 | 0.00 | 20:00 | 194.11 | 240.75 |
| 89 | ☐ | ONTNEWP-9912 | 73.68 | 00:00 | 0.00 | 05:00 | 24.90 | 73.68 |
| 90 | ☐ | ONTNEWP-9668 | 697.14 | 00:00 | 0.00 | 05:00 | 235.59 | 697.14 |
| 91 | ☐ | ONTNEWP-9664 | 697.14 | 00:00 | 0.00 | 05:00 | 235.59 | 697.14 |
| 92 | ☐ | ONTNEWP-9662 | 60.00 | 00:00 | 0.00 | 05:00 | 20.28 | 60.00 |
| 93 | ☐ | ONTNEWP-9400 | 953.05 | 21:00 | 30.36 | 04:50 | 395.83 | 922.69 |
| 94 | ☐ | ONTNEWP-9704 | 953.05 | 21:00 | 30.36 | 04:50 | 395.83 | 922.69 |
| 95 | ☐ | ONTNEWP-9916 | 494.20 | 21:00 | 45.63 | 20:00 | 241.83 | 448.57 |
| 96 | ☐ | ONTNEWP-9918 | 1,236.17 | 21:00 | 23.28 | 20:00 | 452.20 | 1,212.90 |
| 97 | ☐ | ONTNEWP-9928 | 1,385.85 | 21:00 | 54.77 | 20:00 | 554.97 | 1,331.08 |
| 98 | ☐ | ONTNEWP-9926 | 328.76 | 21:00 | 12.08 | 20:10 | 222.44 | 316.68 |
| 99 | ☐ | ONTNEWP-9920 | 533.30 | 00:00 | 0.00 | 05:00 | 180.22 | 533.30 |
| 100 | ☐ | ONTNEWP-9922 | 533.30 | 00:00 | 0.00 | 05:00 | 180.22 | 533.30 |
| 101 | ☐ | ONTNEWP-9924 | 141.24 | 00:00 | 0.00 | 05:00 | 47.73 | 141.24 |
| 102 | ☐ | ONTNEWP-9932 | 945.74 | 21:00 | 71.77 | 04:40 | 516.62 | 873.96 |
| 103 | ☐ | ONTNEWP-9936 | 250.26 | 01:20 | 0.00 | 05:00 | 84.57 | 250.26 |
| 104 | ☐ | ONTNEWP-9940 | 413.52 | 04:00 | 123.67 | 20:00 | 357.43 | 289.85 |
| 105 | ☐ | ONTNEWP-9942 | 833.73 | 04:00 | 123.67 | 20:00 | 499.43 | 710.06 |
| 106 | ☐ | ONTNEWP-9944 | 540.00 | 00:00 | 0.00 | 05:00 | 182.48 | 540.00 |
| 107 | ☐ | ONTNEWP-9901 | 552.42 | 00:00 | 0.00 | 05:00 | 186.68 | 552.42 |
| 108 | ☐ | ONT9008 | 478.26 | 21:40 | 0.00 | 05:00 | 182.82 | 478.26 |
| 109 | ☐ | ONTNEWP-9542 | 142.85 | 21:00 | 0.00 | 05:00 | 46.64 | 142.85 |
| 110 | ☐ | ONTNEWP-9816 | 79.63 | 21:00 | 0.00 | 05:00 | 25.28 | 79.63 |
| 111 | ☐ | ONTNEWP-908 | 245.32 | 00:00 | 0.00 | 05:00 | 82.90 | 245.32 |
| 112 | ☐ | ONTNEWP-9846 | 1,548.63 | 04:00 | 0.00 | 20:00 | 865.63 | 1,548.63 |
| 113 | ☐ | ONTNEWP-9440 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 114 | ☐ | ONTNEWP-9958 | 176.73 | 00:00 | 0.00 | 05:00 | 59.72 | 176.73 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 115 | ☐ | ONTNEWP-9972 | 192.39 | 02:10 | 0.00 | 05:00 | 65.01 | 192.39 |
| 116 | ☐ | ONTNEWP-9960 | 183.56 | 23:10 | 0.00 | 05:00 | 62.03 | 183.56 |
| 117 | ☐ | ONTNEWP-9864 | 386.65 | 00:00 | 0.00 | 05:00 | 130.66 | 386.65 |
| 118 | ☐ | ONTNEWP-9860 | 218.45 | 00:00 | 0.00 | 05:00 | 73.82 | 218.45 |
| 119 | ☐ | ONTFRAN-3693 | 113.53 | 21:00 | 0.00 | 05:50 | 27.98 | 113.53 |
| 120 | ☐ | ONTNEWP509 | 422.53 | 21:00 | 0.00 | 05:50 | 132.40 | 422.53 |
| 121 | ☐ | ONTFRAN-3621 | 633.62 | 21:40 | 0.00 | 05:50 | 213.63 | 633.62 |
| 122 | ☐ | ONTFRAN-3696 | 426.92 | 21:00 | 0.00 | 05:50 | 127.79 | 426.92 |
| 123 | ☐ | ONTFRAN-3697 | 147.22 | 21:00 | 0.00 | 05:50 | 33.27 | 147.22 |
| 124 | ☐ | ONTFRAN-3625 | 253.01 | 21:00 | 0.00 | 05:50 | 70.92 | 253.01 |
| 125 | ☐ | ONTNEWP649 | 116.62 | 21:00 | 0.00 | 05:50 | 35.78 | 116.62 |
| 126 | ☐ | ONTFRAN-3624 | 88.36 | 21:40 | 0.00 | 05:50 | 29.23 | 88.36 |
| 127 | ☐ | ONTFRAN-3626 | 379.12 | 21:40 | 0.00 | 05:50 | 124.59 | 379.12 |
| 128 | ☐ | ONTNEWP511 | 422.53 | 21:00 | 0.00 | 05:50 | 132.40 | 422.53 |
| 129 | ☐ | ONTNEWP-9776 | 1,152.09 | 21:00 | 0.00 | 05:50 | 362.46 | 1,152.09 |
| 130 | ☐ | ONTNEWP-9899 | 1,915.85 | 04:00 | 123.67 | 20:00 | 865.11 | 1,792.18 |
| 131 | ☐ | ONTNEWP-9974 | 2,655.61 | 04:00 | 123.67 | 20:00 | 1,115.10 | 2,531.93 |
| 132 | ☐ | ONTNEWP-9780 | 45.10 | 20:50 | 0.00 | 05:00 | 12.80 | 45.10 |
| 133 | ☐ | ONTNEWP-9784 | 99.55 | 21:40 | 0.00 | 05:00 | 33.57 | 99.55 |
| 134 | ☐ | ONTNEWP-9786 | 188.11 | 21:40 | 0.00 | 05:00 | 61.56 | 188.11 |
| 135 | ☐ | ONTNEWP-9778 | 520.46 | 00:00 | 0.00 | 05:00 | 175.88 | 520.46 |
| 136 | ☐ | ONTFRAN-3694 | 1,430.63 | 21:00 | 0.00 | 05:50 | 447.26 | 1,430.63 |
| 137 | ☐ | ONTFRAN-3620 | 553.27 | 21:40 | 0.00 | 05:50 | 185.16 | 553.27 |
| 138 | ☐ | ONTFRAN-3628 | 751.97 | 21:40 | 0.00 | 05:50 | 248.54 | 751.97 |
| 139 | ☐ | ONTFRAN-3595 | 1,908.87 | 04:00 | 0.00 | 05:50 | 651.91 | 1,908.87 |
| 140 | ☐ | ONTNEWP-9764 | 133.29 | 21:40 | 0.00 | 05:00 | 48.72 | 133.29 |
| 141 | ☐ | ONTFRAN-3594 | 1,409.18 | 04:00 | 0.00 | 05:50 | 482.05 | 1,409.18 |
| 142 | ☐ | ONTNEWP-9766 | 148.46 | 21:40 | 0.00 | 05:00 | 56.35 | 148.46 |
| 143 | ☐ | ONTFRAN-3592 | 904.34 | 04:00 | 0.00 | 05:50 | 309.47 | 904.34 |
| 144 | ☐ | ONTNEWP-9768 | 107.20 | 21:40 | 0.00 | 05:00 | 39.60 | 107.20 |
| 145 | ☐ | ONTNEWP-9818 | 30.99 | 20:40 | 0.00 | 05:00 | 7.00 | 30.99 |
| 146 | ☐ | ONTFRAN-3640 | 210.70 | 21:40 | 0.00 | 05:50 | 74.44 | 210.70 |
| 147 | ☐ | ONTFRAN-3641 | 405.19 | 21:40 | 0.00 | 05:50 | 137.63 | 405.19 |
| 148 | ☐ | ONT9092 | 947.54 | 21:40 | 0.00 | 05:50 | 332.64 | 947.54 |
| 149 | ☐ | ONTNEWP529 | 1,034.73 | 21:40 | 0.00 | 05:50 | 354.87 | 1,034.73 |
| 150 | ☐ | ONTNEWP519 | 946.52 | 21:40 | 0.00 | 05:50 | 321.62 | 946.52 |
| 151 | ☐ | ONTP11 | 1,081.40 | 21:40 | 0.00 | 05:50 | 367.41 | 1,081.40 |
| 152 | ☐ | ONTFRAN-3637 | 1,452.65 | 21:40 | 0.00 | 05:50 | 487.70 | 1,452.65 |
| 153 | ☐ | ONTFRAN-3639 | 208.62 | 21:40 | 0.00 | 05:50 | 70.48 | 208.62 |
| 154 | ☐ | ONTFRAN-3635 | 314.35 | 21:40 | 0.00 | 05:50 | 106.97 | 314.35 |
| 155 | ☐ | ONTP19 | 774.52 | 21:00 | 0.00 | 05:50 | 264.83 | 774.52 |
| 156 | ☐ | ONT9072 | 140.52 | 21:00 | 0.00 | 05:50 | 47.43 | 140.52 |
| 157 | ☐ | ONT9048 | 686.70 | 21:00 | 0.00 | 05:50 | 233.07 | 686.70 |
| 158 | ☐ | ONT9068 | 910.16 | 21:40 | 0.00 | 05:50 | 310.01 | 910.16 |
| 159 | ☐ | ONTFRAN-3634 | 774.52 | 21:00 | 0.00 | 05:50 | 264.83 | 774.52 |
| 160 | ☐ | ONTFRAN-3632 | 520.74 | 21:00 | 0.00 | 05:50 | 173.64 | 520.74 |
| 161 | ☐ | ONTFRAN-3633 | 538.78 | 21:40 | 0.00 | 05:50 | 182.33 | 538.78 |
| 162 | ☐ | ONTFRAN-3631 | 280.17 | 04:00 | 0.00 | 05:50 | 97.21 | 280.17 |
| 163 | ☐ | ONTNEWP-9870 | 8,254.40 | 20:40 | 0.00 | 05:00 | 183.09 | 8,254.40 |
| 164 | ☐ | ONT9050 | 1,121.17 | 21:40 | 0.00 | 05:50 | 369.64 | 1,121.17 |
| 165 | ☐ | ONTNEWP619 | 1,121.17 | 21:40 | 0.00 | 05:50 | 369.64 | 1,121.17 |
| 166 | ☐ | ONTFRAN-3603 | 1,768.72 | 21:40 | 0.00 | 05:50 | 587.22 | 1,768.72 |
| 167 | ☐ | ONTNEWP-9750 | 1,538.93 | 21:00 | 0.00 | 05:00 | 488.52 | 1,538.93 |
| 168 | ☐ | ONTNEWP-9790 | 1,538.93 | 21:00 | 0.00 | 05:00 | 488.52 | 1,538.93 |
| 169 | ☐ | ONTNEWP-9756 | 529.97 | 21:00 | 0.00 | 05:00 | 105.81 | 529.97 |
| 170 | ☐ | ONTPHLP-3607 | 141.18 | 21:00 | 0.00 | 05:00 | 27.65 | 141.18 |
| 171 | ☐ | ONTNEWP-9746 | 100.13 | 21:00 | 0.00 | 05:00 | 26.76 | 100.13 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 172 | ☐ | ONTFRAN-3593 | 99.56 | 21:00 | 0.00 | 05:00 | 35.75 | 99.56 |
| 173 | ☐ | ONTNEWP-9740 | 88.37 | 21:00 | 0.00 | 05:00 | 27.33 | 88.37 |
| 174 | ☐ | ONTFRAN-3652 | 309.34 | 04:00 | 0.00 | 05:50 | 104.89 | 309.34 |
| 175 | ☐ | ONTFRAN-3597 | 2,753.55 | 04:00 | 0.00 | 05:50 | 938.28 | 2,753.55 |
| 176 | ☐ | ONTNEWP-9760 | 140.36 | 21:40 | 0.00 | 05:00 | 49.81 | 140.36 |
| 177 | ☐ | ONTFRAN-3596 | 2,315.36 | 04:00 | 0.00 | 05:50 | 789.85 | 2,315.36 |
| 178 | ☐ | ONTFRAN-3642 | 59.19 | 09:20 | 0.00 | 05:50 | 20.91 | 59.19 |
| 179 | ☐ | ONTNEWP-9762 | 150.81 | 21:40 | 0.00 | 05:00 | 53.65 | 150.81 |
| 180 | ☐ | ONTFRAN-3649 | 152.19 | 04:10 | 0.00 | 05:50 | 52.30 | 152.19 |
| 181 | ☐ | ONTFRAN-3606 | 274.65 | 04:00 | 0.00 | 05:50 | 93.38 | 274.65 |
| 182 | ☐ | ONTFRAN-3607 | 311.28 | 04:00 | 0.00 | 05:50 | 106.19 | 311.28 |
| 183 | ☐ | ONTFRAN-3610 | 311.00 | 04:00 | 0.00 | 05:50 | 107.26 | 311.00 |
| 184 | ☐ | ONTFRAN-3604 | 51.67 | 04:40 | 0.00 | 05:50 | 7.65 | 51.67 |
| 185 | ☐ | ONTFRAN-3609 | 84.36 | 04:20 | 0.00 | 05:50 | 27.49 | 84.36 |
| 186 | ☐ | ONTFRAN-3611 | 35.73 | 09:20 | 0.00 | 05:50 | 7.99 | 35.73 |
| 187 | ☐ | ONTFRAN-3608 | 172.88 | 04:00 | 0.00 | 05:50 | 58.92 | 172.88 |
| 188 | ☐ | ONTFRAN-3651 | 578.68 | 21:00 | 0.00 | 05:50 | 187.07 | 578.68 |
| 189 | ☐ | ONTFRAN-3615 | 102.75 | 04:40 | 0.00 | 05:50 | 34.46 | 102.75 |
| 190 | ☐ | ONTFRAN-3614 | 105.14 | 04:00 | 0.00 | 05:50 | 37.58 | 105.14 |
| 191 | ☐ | ONTNEWP-9782 | 60.23 | 21:40 | 0.00 | 05:00 | 20.28 | 60.23 |
| 192 | ☐ | ONTFRAN-3646 | 102.35 | 21:40 | 0.00 | 05:50 | 33.66 | 102.35 |
| 193 | ☐ | ONTFRAN-3645 | 784.68 | 21:40 | 0.00 | 05:50 | 269.86 | 784.68 |
| 194 | ☐ | ONTFRAN-3627 | 1,096.63 | 21:00 | 0.00 | 05:50 | 348.98 | 1,096.63 |
| 195 | ☐ | ONTFRAN-3647 | 160.53 | 21:00 | 0.00 | 05:50 | 50.77 | 160.53 |
| 196 | ☐ | ONTFRAN-3618 | 1,265.22 | 21:40 | 0.00 | 05:50 | 426.26 | 1,265.22 |
| 197 | ☐ | ONT9052 | 439.81 | 21:40 | 0.00 | 05:50 | 144.76 | 439.81 |
| 198 | ☐ | ONTFRAN-3590 | 1,087.21 | 21:40 | 0.00 | 05:50 | 362.47 | 1,087.21 |
| 199 | ☐ | ONTFRAN-3629 | 3,074.48 | 21:40 | 0.00 | 05:50 | 1,056.52 | 3,074.48 |
| 200 | ☐ | ONTFRAN-3617 | 5,483.86 | 04:00 | 0.00 | 05:50 | 1,889.20 | 5,483.86 |
| 201 | ☐ | ONTFRAN-3600 | 7,044.62 | 21:00 | 0.00 | 05:50 | 2,435.55 | 7,044.62 |
| 202 | ☐ | ONT9024 | 8,300.22 | 20:40 | 0.00 | 05:00 | 206.32 | 8,300.22 |
| 203 | ☐ | ONTNEWP-9276 | 8,300.22 | 20:40 | 0.00 | 05:00 | 206.32 | 8,300.22 |
| 204 | ☐ | ONTNEWP-9434 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 205 | ☐ | ONTNEWP-9602 | 8,254.40 | 20:40 | 0.00 | 05:00 | 183.09 | 8,254.40 |
| 206 | ☐ | ONTFRAN-3706 | 4,592.91 | 21:00 | 0.00 | 05:50 | 1,555.28 | 4,592.91 |
| 207 | ☐ | ONTNEWP-9252 | 149.44 | 21:00 | 0.00 | 05:00 | 48.16 | 149.44 |
| 208 | ☐ | ONTNEWP-9590 | 149.44 | 21:00 | 0.00 | 05:00 | 48.16 | 149.44 |
| 209 | ☐ | ONTNEWP-9170 | 149.44 | 21:00 | 0.00 | 05:00 | 48.16 | 149.44 |
| 210 | ☐ | ONTPHLP-3615 | 695.04 | 21:00 | 0.00 | 05:00 | 225.47 | 695.04 |
| 211 | ☐ | ONT9034 | 2,396.29 | 21:00 | 0.00 | 05:00 | 688.49 | 2,396.29 |
| 212 | ☐ | ONTNEWP-9600 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 213 | ☐ | ONTNEWP-9854 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 214 | ☐ | ONTNEWP-9254 | 60.23 | 21:40 | 0.00 | 05:00 | 20.28 | 60.23 |
| 215 | ☐ | ONTNEWP-9556 | 145.56 | 00:00 | 0.00 | 05:00 | 49.19 | 145.56 |
| 216 | ☐ | ONTNEWP-9554 | 9,337.19 | 20:40 | 0.00 | 05:00 | 895.26 | 9,337.19 |
| 217 | ☐ | ONTNEWP-9810 | 9,434.23 | 20:40 | 0.00 | 05:00 | 944.45 | 9,434.23 |
| 218 | ☐ | ONTNEWP-9596 | 2,396.30 | 21:00 | 0.00 | 05:00 | 688.49 | 2,396.30 |
| 219 | ☐ | ONTNEWP-10017 | 48.24 | 02:40 | 0.00 | 05:00 | 16.30 | 48.24 |
| 220 | ☐ | ONTNEWP-9946 | 697.14 | 00:00 | 0.00 | 05:00 | 235.59 | 697.14 |
| 221 | ☐ | ONT283 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 222 | ☐ | ONTNEWP-9714 | 146.68 | 00:00 | 0.00 | 05:00 | 49.57 | 146.68 |
| 223 | ☐ | ONTNEWP-9578 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 224 | ☐ | ONTNEWP-9494 | 44.25 | 00:00 | 0.00 | 05:00 | 14.95 | 44.25 |
| 225 | ☐ | ONTFRAN-3608A | 432.46 | 04:00 | 0.00 | 05:50 | 146.46 | 432.46 |
| 226 | ☐ | ONTP10024 | 280.33 | 00:00 | 0.00 | 05:00 | 94.73 | 280.33 |
| 227 | ☐ | 2011_P14 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 228 | ☐ | 2011_P15 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 229 | ☐ | 2011_P17 | 498.91 | 04:00 | 0.00 | 20:00 | 349.53 | 498.91 |
| 230 | ☐ | 2011_P18 | 367.24 | 10:40 | 0.00 | 20:00 | 251.29 | 367.24 |
| 231 | ☐ | 2011_P19 | 367.24 | 10:40 | 0.00 | 20:00 | 275.43 | 367.24 |
| 232 | ☐ | P39 | 612.54 | 00:00 | 0.00 | 05:00 | 207.00 | 612.54 |
| 233 | ☐ | P41 | 262.92 | 00:00 | 0.00 | 05:00 | 88.85 | 262.92 |
| 234 | ☐ | P63 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 235 | ☐ | P73 | 478.26 | 21:40 | 0.00 | 05:00 | 182.82 | 478.26 |
| 236 | ☐ | P81 | 2,396.29 | 21:00 | 0.00 | 05:00 | 688.49 | 2,396.29 |
| 237 | ☐ | P87 | 201.31 | 04:00 | 0.00 | 20:00 | 147.89 | 201.31 |
| 238 | ☐ | P186 | 907.13 | 04:10 | 0.00 | 05:50 | 249.98 | 907.13 |
| 239 | ☐ | P188 | 1,081.40 | 21:40 | 0.00 | 05:50 | 367.41 | 1,081.40 |
| 240 | ☐ | P190 | 275.03 | 21:40 | 0.00 | 05:50 | 94.32 | 275.03 |
| 241 | ☐ | P_ONT-2 | 89.67 | 00:00 | 0.00 | 05:00 | 30.30 | 89.67 |
| 242 | ☐ | P_ONT-16 | 412.01 | 23:10 | 0.00 | 05:00 | 139.23 | 412.01 |
| 243 | ☐ | P_ONT-18 | 535.41 | 00:50 | 0.00 | 05:00 | 180.93 | 535.41 |
| 244 | ☐ | P_ONT-20 | 941.31 | 21:00 | 0.00 | 05:00 | 308.10 | 941.31 |
| 245 | ☐ | P_ONT-28 | 24.28 | 00:00 | 0.00 | 05:00 | 8.21 | 24.28 |
| 246 | ☐ | P_ONT-40 | 243.11 | 00:00 | 0.00 | 05:00 | 82.15 | 243.11 |
| 247 | ☐ | P_ONT-42 | 95.35 | 00:00 | 0.00 | 05:00 | 32.22 | 95.35 |
| 248 | ☐ | P_ONT-44 | 135.72 | 00:00 | 0.00 | 05:00 | 45.87 | 135.72 |
| 249 | ☐ | P_ONT-46 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 250 | ☐ | P_ONT-48 | 1,185.85 | 00:50 | 0.00 | 05:00 | 400.74 | 1,185.85 |
| 251 | ☐ | P_ONT-50 | 566.82 | 00:00 | 0.00 | 05:00 | 191.55 | 566.82 |
| 252 | ☐ | P_ONT-52 | 8.97 | 00:00 | 0.00 | 05:00 | 3.03 | 8.97 |
| 253 | ☐ | P_ONT-54 | 220.28 | 00:00 | 0.00 | 05:00 | 74.44 | 220.28 |
| 254 | ☐ | P_ONT-56 | 142.63 | 00:00 | 0.00 | 05:00 | 48.20 | 142.63 |
| 255 | ☐ | P_ONT-62 | 339.99 | 20:40 | 0.00 | 05:00 | 75.62 | 339.99 |
| 256 | ☐ | P_ONT-64 | 1,338.50 | 00:50 | 0.00 | 05:00 | 452.32 | 1,338.50 |
| 257 | ☐ | P_ONT-66 | 1,665.54 | 21:00 | 0.00 | 05:00 | 542.84 | 1,665.54 |
| 258 | ☐ | P_ONT-90 | 314.35 | 21:40 | 0.00 | 05:50 | 106.97 | 314.35 |
| 259 | ☐ | P_ONT-92 | 210.35 | 21:40 | 0.00 | 05:50 | 70.58 | 210.35 |
| 260 | ☐ | P_ONT-102 | 1,094.83 | 21:00 | 0.00 | 05:00 | 258.10 | 1,094.83 |
| 261 | ☐ | P_ONT-120 | 490.99 | 20:40 | 0.00 | 05:00 | 31.65 | 490.99 |
| 262 | ☐ | P_ONT-122 | 7,061.17 | 04:00 | 0.00 | 05:50 | 2,358.62 | 7,061.17 |
| 263 | ☐ | P_ONT-126 | 20.14 | 09:20 | 0.00 | 05:50 | 5.38 | 20.14 |
| 264 | ☐ | P_ONT-128 | 691.79 | 21:00 | 0.00 | 05:00 | 122.86 | 691.79 |
| 265 | ☐ | P_ONT-146 | 842.16 | 21:00 | 0.00 | 04:10 | 163.30 | 842.16 |
| 266 | ☐ | P_ONT-148 | 842.16 | 21:00 | 0.00 | 04:10 | 163.30 | 842.16 |
| 267 | ☐ | P_ONT-150 | 842.15 | 21:00 | 0.00 | 04:10 | 163.30 | 842.15 |
| 268 | ☐ | P_ONT-152 | 842.15 | 21:00 | 0.00 | 04:10 | 163.30 | 842.15 |
| 269 | ☐ | P_ONT-154 | 8,737.29 | 20:40 | 0.00 | 00:00 | 165.53 | 8,737.29 |
| 270 | ☐ | P_ONT-156 | 8,737.29 | 20:40 | 0.00 | 00:00 | 165.53 | 8,737.29 |
| 271 | ☐ | P_ONT-158 | 8,737.29 | 20:40 | 0.00 | 00:00 | 165.53 | 8,737.29 |
| 272 | ☐ | P_ONT-160 | 8,737.29 | 20:40 | 0.00 | 00:00 | 165.53 | 8,737.29 |
| 273 | ☐ | P_ONT-174 | 520.46 | 00:00 | 0.00 | 05:00 | 175.88 | 520.46 |
| 274 | ☐ | P_ONT-176 | 4,591.31 | 04:00 | 0.00 | 05:50 | 1,582.96 | 4,591.31 |
| 275 | ☐ | P_ONT-178 | 627.61 | 21:40 | 0.00 | 05:50 | 211.56 | 627.61 |
| 276 | ☐ | P_ONT-180 | 280.86 | 21:40 | 0.00 | 05:50 | 94.68 | 280.86 |
| 277 | ☐ | P_ONT-182 | 280.86 | 21:40 | 0.00 | 05:50 | 94.68 | 280.86 |
| 278 | ☐ | P_ONT-184 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 279 | ☐ | P_ONT-186 | 416.79 | 21:40 | 0.00 | 05:50 | 140.09 | 416.79 |
| 280 | ☐ | P_ONT-188 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 281 | ☐ | P_ONT-190 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 282 | ☐ | P_ONT-192 | 452.69 | 21:40 | 0.00 | 05:50 | 154.78 | 452.69 |
| 283 | ☐ | P_ONT-194 | 452.69 | 21:40 | 0.00 | 05:50 | 154.78 | 452.69 |
| 284 | ☐ | P_ONT-196 | 941.09 | 21:40 | 0.00 | 05:50 | 316.21 | 941.09 |
| 285 | ☐ | P_ONT-198 | 2,596.53 | 21:40 | 0.00 | 05:50 | 880.28 | 2,596.53 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 286 | ☐ | P_ONT-200 | 62.60 | 21:00 | 0.00 | 05:50 | 14.69 | 62.60 |
| 287 | ☐ | P_ONT-204 | 51.86 | 02:50 | 0.00 | 05:00 | 17.52 | 51.86 |
| 288 | ☐ | P_ONT-206 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 289 | ☐ | P_ONT-208 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 290 | ☐ | P_ONT-210 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 291 | ☐ | P_ONT-212 | 779.57 | 04:00 | 0.00 | 05:50 | 264.82 | 779.57 |
| 292 | ☐ | P_ONT-214 | 289.11 | 04:00 | 0.00 | 05:50 | 99.08 | 289.11 |
| 293 | ☐ | P_ONT-216 | 289.11 | 04:00 | 0.00 | 05:50 | 99.08 | 289.11 |
| 294 | ☐ | P_ONT-218 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 295 | ☐ | P_ONT-220 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 296 | ☐ | P_ONT-222 | 289.11 | 04:00 | 0.00 | 05:50 | 99.08 | 289.11 |
| 297 | ☐ | P_ONT-224 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 298 | ☐ | P_ONT-226 | 1,183.01 | 21:40 | 0.00 | 05:50 | 395.22 | 1,183.01 |
| 299 | ☐ | P_ONT-228 | 100.00 | 04:00 | 0.00 | 05:50 | 35.18 | 100.00 |
| 300 | ☐ | P_ONT-230 | 1,670.87 | 21:40 | 0.00 | 05:50 | 559.39 | 1,670.87 |
| 301 | ☐ | P_ONT-232 | 130.98 | 21:00 | 0.00 | 05:50 | 38.12 | 130.98 |
| 302 | ☐ | P_ONT-234 | 36.53 | 20:50 | 0.00 | 05:50 | 5.26 | 36.53 |
| 303 | ☐ | P_ONT-236 | 52.14 | 21:40 | 0.00 | 05:50 | 17.87 | 52.14 |
| 304 | ☐ | P_ONT-238 | 52.14 | 21:40 | 0.00 | 05:50 | 17.87 | 52.14 |
| 305 | ☐ | P_ONT-240 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 306 | ☐ | P_ONT-242 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 307 | ☐ | P_ONT-244 | 1,670.87 | 21:40 | 0.00 | 05:50 | 559.39 | 1,670.87 |
| 308 | ☐ | P_ONT-246 | 168.29 | 21:40 | 0.00 | 05:50 | 57.46 | 168.29 |
| 309 | ☐ | P_ONT-248 | 168.29 | 21:40 | 0.00 | 05:50 | 57.46 | 168.29 |
| 310 | ☐ | P_ONT-250 | 110.10 | 21:40 | 0.00 | 05:50 | 37.36 | 110.10 |
| 311 | ☐ | P_ONT-252 | 110.10 | 21:40 | 0.00 | 05:50 | 37.36 | 110.10 |
| 312 | ☐ | P_ONT-254 | 144.30 | 21:40 | 0.00 | 05:50 | 48.92 | 144.30 |
| 313 | ☐ | P_ONT-256 | 144.30 | 21:40 | 0.00 | 05:50 | 48.92 | 144.30 |
| 314 | ☐ | P_ONT-258 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 315 | ☐ | P_ONT-260 | 34.21 | 00:00 | 0.00 | 05:00 | 11.56 | 34.21 |
| 316 | ☐ | P_ONT-262 | 986.87 | 21:40 | 0.00 | 05:50 | 335.43 | 986.87 |
| 317 | ☐ | P_ONT-264 | 171.51 | 21:40 | 0.00 | 05:50 | 57.38 | 171.51 |
| 318 | ☐ | P_ONT-266 | 171.51 | 21:40 | 0.00 | 05:50 | 57.38 | 171.51 |
| 319 | ☐ | P_ONT-268 | 171.51 | 21:40 | 0.00 | 05:50 | 57.38 | 171.51 |
| 320 | ☐ | P_ONT-270 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 321 | ☐ | P_ONT-272 | 155.52 | 21:00 | 0.00 | 05:50 | 51.76 | 155.52 |
| 322 | ☐ | P_ONT-274 | 22.98 | 09:20 | 0.00 | 05:50 | 3.33 | 22.98 |
| 323 | ☐ | P_ONT-276 | 151.04 | 21:40 | 0.00 | 05:50 | 51.04 | 151.04 |
| 324 | ☐ | P_ONT-278 | 233.24 | 21:40 | 0.00 | 05:50 | 79.05 | 233.24 |
| 325 | ☐ | P_ONT-280 | 233.25 | 21:40 | 0.00 | 05:50 | 79.05 | 233.25 |
| 326 | ☐ | P_ONT-282 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 327 | ☐ | P_ONT-284 | 85.43 | 21:40 | 0.00 | 05:50 | 28.21 | 85.43 |
| 328 | ☐ | P_ONT-286 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 329 | ☐ | P_ONT-288 | 85.43 | 21:40 | 0.00 | 05:50 | 28.21 | 85.43 |
| 330 | ☐ | P_ONT-290 | 35.09 | 21:00 | 0.00 | 05:50 | 9.55 | 35.09 |
| 331 | ☐ | P_ONT-292 | 259.92 | 21:00 | 0.00 | 05:50 | 87.28 | 259.92 |
| 332 | ☐ | P_ONT-294 | 109.00 | 21:40 | 0.00 | 05:50 | 36.84 | 109.00 |
| 333 | ☐ | P_ONT-296 | 35.09 | 21:00 | 0.00 | 05:50 | 9.55 | 35.09 |
| 334 | ☐ | P_ONT-298 | 151.84 | 21:00 | 0.00 | 05:50 | 50.44 | 151.84 |
| 335 | ☐ | P_ONT-300 | 186.94 | 21:00 | 0.00 | 05:50 | 59.99 | 186.94 |
| 336 | ☐ | P_ONT-302 | 132.57 | 21:00 | 0.00 | 05:00 | 44.50 | 132.57 |
| 337 | ☐ | P_ONT-304 | 145.98 | 21:40 | 0.00 | 05:00 | 48.77 | 145.98 |
| 338 | ☐ | P_ONT-306 | 16.87 | 21:00 | 0.00 | 05:00 | 3.66 | 16.87 |
| 339 | ☐ | P_ONT-308 | 12.61 | 20:50 | 0.00 | 05:00 | 2.82 | 12.61 |
| 340 | ☐ | P_ONT-310 | 46.43 | 21:40 | 0.00 | 05:00 | 15.20 | 46.43 |
| 341 | ☐ | P_ONT-312 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 342 | ☐ | P_ONT-314 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 343 | ☐ | P_ONT-316 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 344 | ☐ | P_ONT-318 | 133.65 | 00:00 | 0.00 | 05:00 | 45.17 | 133.65 |
| 345 | ☐ | P_ONT-322 | 45.15 | 00:00 | 0.00 | 05:00 | 15.26 | 45.15 |
| 346 | ☐ | P_ONT-324 | 45.15 | 00:00 | 0.00 | 05:00 | 15.26 | 45.15 |
| 347 | ☐ | P_ONT-326 | 88.50 | 00:00 | 0.00 | 05:00 | 29.91 | 88.50 |
| 348 | ☐ | P_ONT-328 | 40.99 | 20:50 | 0.00 | 05:50 | 5.11 | 40.99 |
| 349 | ☐ | P_ONT-330 | 118.98 | 21:00 | 0.00 | 05:50 | 40.10 | 118.98 |
| 350 | ☐ | P_ONT-332 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 351 | ☐ | P_ONT-334 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 352 | ☐ | P_ONT-336 | 52.14 | 21:40 | 0.00 | 05:50 | 17.87 | 52.14 |
| 353 | ☐ | P_ONT-338 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 354 | ☐ | P_ONT-340 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 355 | ☐ | P_ONT-342 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 356 | ☐ | P_ONT-344 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 357 | ☐ | P_ONT-346 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 358 | ☐ | P_ONT-348 | 553.27 | 21:40 | 0.00 | 05:50 | 185.16 | 553.27 |
| 359 | ☐ | P_ONT-350 | 51.86 | 02:50 | 0.00 | 05:00 | 17.52 | 51.86 |
| 360 | ☐ | P_ONT-352 | 51.86 | 02:50 | 0.00 | 05:00 | 17.52 | 51.86 |
| 361 | ☐ | P_ONT-354 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 362 | ☐ | P_ONT-356 | 51.86 | 00:00 | 0.00 | 05:00 | 17.52 | 51.86 |
| 363 | ☐ | P_ONT-358 | 3,093.03 | 21:40 | 0.00 | 05:50 | 1,062.78 | 3,093.03 |
| 364 | ☐ | P_ONT-362 | 521.43 | 20:40 | 0.00 | 05:00 | 18.32 | 521.43 |
| 365 | ☐ | P_ONT-368 | 7,058.76 | 21:00 | 0.00 | 05:50 | 2,440.33 | 7,058.76 |
| 366 | ☐ | P_ONT-370 | 62.60 | 21:00 | 0.00 | 05:50 | 14.69 | 62.60 |
| 367 | ☐ | P_ONT-372 | 62.60 | 21:00 | 0.00 | 05:50 | 14.69 | 62.60 |
| 368 | ☐ | P_ONT-374 | 439.81 | 21:40 | 0.00 | 05:50 | 144.76 | 439.81 |
| 369 | ☐ | P_ONT-376 | 1,265.22 | 21:40 | 0.00 | 05:50 | 426.26 | 1,265.22 |
| 370 | ☐ | P_ONT-378 | 52.14 | 21:40 | 0.00 | 05:50 | 17.87 | 52.14 |
| 371 | ☐ | P_ONT-382 | 529.22 | 00:10 | 0.00 | 05:00 | 178.84 | 529.22 |
| 372 | ☐ | P_ONT-388 | 945.74 | 21:00 | 71.77 | 04:40 | 516.62 | 873.96 |
| 373 | ☐ | P_ONT-406 | 757.14 | 00:00 | 0.00 | 05:00 | 255.86 | 757.14 |
| 374 | ☐ | P_ONT-408 | 757.14 | 00:00 | 0.00 | 05:00 | 255.86 | 757.14 |
| 375 | ☐ | P_ONT-410 | 757.14 | 00:00 | 0.00 | 05:00 | 255.86 | 757.14 |
| 376 | ☐ | P_ONT-412 | 757.14 | 00:00 | 0.00 | 05:00 | 255.86 | 757.14 |
| 377 | ☐ | P_ONT-418 | 697.14 | 00:00 | 0.00 | 05:00 | 235.59 | 697.14 |
| 378 | ☐ | P_ONT-420 | 1.95 | 00:00 | 0.00 | 05:00 | 0.66 | 1.95 |
| 379 | ☐ | P_ONT-422 | 74.81 | 10:40 | 0.00 | 20:00 | 51.66 | 74.81 |
| 380 | ☐ | P_ONT-424 | 2.60 | 00:00 | 0.00 | 05:00 | 0.88 | 2.60 |
| 381 | ☐ | P_ONT-426 | 142.03 | 04:00 | 0.00 | 20:00 | 111.47 | 142.03 |
| 382 | ☐ | P_ONT-428 | 367.24 | 10:40 | 0.00 | 20:00 | 251.29 | 367.24 |
| 383 | ☐ | P_ONT-430 | 367.24 | 10:40 | 0.00 | 20:00 | 275.43 | 367.24 |
| 384 | ☐ | P_ONT-432 | 367.24 | 10:40 | 0.00 | 20:00 | 275.43 | 367.24 |
| 385 | ☐ | P_ONT-434 | 367.24 | 10:40 | 0.00 | 20:00 | 275.43 | 367.24 |
| 386 | ☐ | P_ONT-438 | 280.33 | 00:00 | 0.00 | 05:00 | 94.73 | 280.33 |
| 387 | ☐ | P_ONT-440 | 1,548.63 | 04:00 | 0.00 | 20:00 | 865.63 | 1,548.63 |
| 388 | ☐ | P_ONT-442 | 746.26 | 04:00 | 0.00 | 20:00 | 481.72 | 746.26 |
| 389 | ☐ | P_ONT-444 | 479.93 | 10:40 | 0.00 | 20:00 | 389.36 | 479.93 |
| 390 | ☐ | P_ONT-446 | 479.93 | 10:40 | 0.00 | 20:00 | 389.36 | 479.93 |
| 391 | ☐ | P_ONT-456 | 262.92 | 00:00 | 0.00 | 05:00 | 88.85 | 262.92 |
| 392 | ☐ | P_ONT-458 | 267.64 | 00:00 | 0.00 | 05:00 | 90.44 | 267.64 |
| 393 | ☐ | P_ONT-460 | 224.84 | 10:40 | 0.00 | 20:00 | 181.08 | 224.84 |
| 394 | ☐ | P_ONT-462 | 60.00 | 00:00 | 0.00 | 05:00 | 20.28 | 60.00 |
| 395 | ☐ | P_ONT-466 | 174.09 | 21:40 | 0.00 | 05:50 | 61.13 | 174.09 |
| 396 | ☐ | P_ONT-468 | 386.89 | 21:40 | 0.00 | 05:50 | 132.55 | 386.89 |
| 397 | ☐ | P_ONT-470 | 746.26 | 04:00 | 0.00 | 20:00 | 481.72 | 746.26 |
| 398 | ☐ | P_ONT-476 | 89.67 | 00:00 | 0.00 | 05:00 | 30.30 | 89.67 |
| 399 | ☐ | P_ONT-480 | 88.50 | 00:00 | 0.00 | 05:00 | 29.91 | 88.50 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 400 | ☐ | P_ONT-482 | 963.16 | 21:00 | 0.00 | 05:50 | 303.87 | 963.16 |
| 401 | ☐ | P_ONT-484 | 253.01 | 21:00 | 0.00 | 05:50 | 70.92 | 253.01 |
| 402 | ☐ | P_ONT-486 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 403 | ☐ | P_ONT-492 | 48.57 | 00:00 | 0.00 | 05:00 | 16.41 | 48.57 |
| 404 | ☐ | P_ONT-494 | 24.28 | 00:00 | 0.00 | 05:00 | 8.21 | 24.28 |
| 405 | ☐ | P_ONT-498 | 268.92 | 00:00 | 0.00 | 05:00 | 90.88 | 268.92 |
| 406 | ☐ | P_ONT-500 | 61.60 | 00:00 | 0.00 | 05:00 | 20.82 | 61.60 |
| 407 | ☐ | P_ONT-524 | 340.16 | 21:40 | 0.00 | 05:00 | 139.15 | 340.16 |
| 408 | ☐ | P_ONT-526 | 339.99 | 20:40 | 0.00 | 05:00 | 75.62 | 339.99 |
| 409 | ☐ | P_ONT-528 | 864.22 | 00:00 | 0.00 | 05:00 | 292.05 | 864.22 |
| 410 | ☐ | P_ONT-530 | 25.68 | 00:00 | 0.00 | 05:00 | 8.68 | 25.68 |
| 411 | ☐ | P_ONT-534 | 746.26 | 04:00 | 0.00 | 20:00 | 481.72 | 746.26 |
| 412 | ☐ | P_ONT-540 | 313.58 | 09:20 | 0.00 | 05:50 | 100.32 | 313.58 |
| 413 | ☐ | P_ONT-542 | 349.30 | 04:30 | 0.00 | 05:50 | 104.29 | 349.30 |
| 414 | ☐ | P_ONT-544 | 604.02 | 04:00 | 0.00 | 05:50 | 209.01 | 604.02 |
| 415 | ☐ | P_ONT-552 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 416 | ☐ | P_ONT-554 | 238.17 | 00:00 | 0.00 | 05:00 | 80.49 | 238.17 |
| 417 | ☐ | P_ONT-556 | 130.48 | 00:00 | 0.00 | 05:00 | 44.09 | 130.48 |
| 418 | ☐ | P_ONT-560 | 479.93 | 10:40 | 0.00 | 20:00 | 326.59 | 479.93 |
| 419 | ☐ | P_ONT-562 | 1,245.92 | 00:50 | 0.00 | 05:00 | 421.04 | 1,245.92 |
| 420 | ☐ | P_ONT-564 | 64.43 | 00:00 | 0.00 | 05:00 | 21.77 | 64.43 |
| 421 | ☐ | P_ONT-566 | 32.18 | 00:00 | 0.00 | 05:00 | 10.87 | 32.18 |
| 422 | ☐ | P_ONT-570 | 367.24 | 10:40 | 0.00 | 20:00 | 275.43 | 367.24 |
| 423 | ☐ | P_ONT-572 | 454.01 | 21:00 | 0.00 | 20:00 | 304.24 | 454.01 |
| 424 | ☐ | P_ONT-574 | 454.01 | 21:00 | 0.00 | 20:00 | 304.24 | 454.01 |
| 425 | ☐ | P_ONT-576 | 130.98 | 21:00 | 0.00 | 05:50 | 38.12 | 130.98 |
| 426 | ☐ | P_ONT-578 | 250.26 | 00:00 | 0.00 | 05:00 | 84.57 | 250.26 |
| 427 | ☐ | P_ONT-580 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 428 | ☐ | P_ONT-590 | 555.27 | 00:00 | 0.00 | 05:00 | 187.64 | 555.27 |
| 429 | ☐ | P_ONT-592 | 182.06 | 00:00 | 0.00 | 05:00 | 61.52 | 182.06 |
| 430 | ☐ | P_ONT-594 | 181.34 | 20:40 | 0.00 | 05:00 | 75.10 | 181.34 |
| 431 | ☐ | P_ONT-596 | 34.95 | 00:00 | 0.00 | 05:00 | 11.81 | 34.95 |
| 432 | ☐ | P_ONT-598 | 145.23 | 21:00 | 0.00 | 05:50 | 29.89 | 145.23 |
| 433 | ☐ | P_ONT-600 | 40.70 | 21:40 | 0.00 | 05:00 | 17.12 | 40.70 |
| 434 | ☐ | P_ONT-602 | 830.24 | 04:00 | 0.00 | 05:50 | 284.60 | 830.24 |
| 435 | ☐ | P_ONT-604 | 142.73 | 21:40 | 0.00 | 05:50 | 49.84 | 142.73 |
| 436 | ☐ | P_ONT-606 | 113.56 | 21:40 | 0.00 | 05:50 | 39.31 | 113.56 |
| 437 | ☐ | P_ONT-612 | 363.47 | 21:40 | 0.00 | 05:50 | 123.53 | 363.47 |
| 438 | ☐ | P_ONT-614 | 106.09 | 04:40 | 0.00 | 05:50 | 21.08 | 106.09 |
| 439 | ☐ | P_ONT-616 | 343.62 | 21:40 | 0.00 | 05:50 | 116.11 | 343.62 |
| 440 | ☐ | P_ONT-618 | 541.42 | 21:00 | 0.00 | 05:50 | 183.97 | 541.42 |
| 441 | ☐ | P_ONT-622 | 40.59 | 24:00 | 0.00 | 05:00 | 13.72 | 40.59 |
| 442 | ☐ | P_ONT-624 | 60.13 | 23:10 | 0.00 | 05:00 | 20.32 | 60.13 |
| 443 | ☐ | P_ONT-626 | 141.28 | 23:10 | 0.00 | 05:00 | 47.74 | 141.28 |
| 444 | ☐ | P_ONT-628 | 23.65 | 00:00 | 0.00 | 05:00 | 7.99 | 23.65 |
| 445 | ☐ | P_ONT-630 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 446 | ☐ | P_ONT-632 | 0.00 | 00:00 | 0.00 | 00:00 | 0.00 | 0.00 |
| 447 | ☐ | P_ONT-634 | 1,322.48 | 00:50 | 0.00 | 05:00 | 446.91 | 1,322.48 |
| 448 | ☐ | P_ONT-638 | 109.51 | 23:10 | 0.00 | 05:00 | 37.01 | 109.51 |
| 449 | ☐ | P_ONT-642 | 1,322.48 | 00:50 | 0.00 | 05:00 | 446.91 | 1,322.48 |
| 450 | ☐ | P_ONT-646 | 1,322.48 | 00:50 | 0.00 | 05:00 | 446.91 | 1,322.48 |
| 451 | ☐ | P_ONT-648 | 1,322.48 | 00:50 | 0.00 | 05:00 | 446.91 | 1,322.48 |
| 452 | ☐ | P_ONT-666 | 62.60 | 21:00 | 0.00 | 05:50 | 14.69 | 62.60 |
| 453 | ☐ | P_ONT-668 | 158.55 | 21:40 | 0.00 | 05:50 | 54.96 | 158.55 |
| 454 | ☐ | P_ONT-670 | 256.79 | 04:50 | 0.00 | 05:50 | 32.58 | 256.79 |
| 455 | ☐ | P_ONT-672 | 751.61 | 21:40 | 0.00 | 05:50 | 255.73 | 751.61 |
| 456 | ☐ | P_ONT-674 | 161.13 | 00:00 | 0.00 | 05:00 | 54.45 | 161.13 |

Future Scenario - Pipe Output - Pipe Flow Range Report

| | | ID | Max.Value (gpm) | Max.Time (hrs.) | Min.Value (gpm) | Min.Time (hrs.) | Average (gpm) | Difference (gpm) |
|---|---|---|---|---|---|---|---|---|
| 457 | ☐ | P_ONT-676 | 108.96 | 21:00 | 0.00 | 05:50 | 32.09 | 108.96 |
| 458 | ☐ | P_ONT-678 | 941.31 | 21:00 | 0.00 | 05:00 | 308.10 | 941.31 |
| 459 | ☐ | P_ONT-680 | 26.88 | 00:00 | 0.00 | 05:00 | 9.08 | 26.88 |

# 2020 URBAN WATER MANAGEMENT PLAN

**JUNE 2021**

*THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA*

# 2020

# URBAN WATER MANAGEMENT PLAN

**JUNE 2021**

WATER TOMORROW

Planning for the Future

*THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA*

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## LIST OF ABBREVIATIONS

| Abbreviation | Terms |
|---|---|
| **Units of Measurement** | |
| AF | Acre-Feet |
| AFY | Acre-feet per Year |
| TAF | Thousand Acre-Feet |
| MAF | Million Acre-Feet |
| cfs | Cubic feet per second |
| GPCD | Gallons per Capita per Day |
| MGD | Million gallons per Day |
| mg/L | Milligrams per liter |
| MW | Megawatts |
| µg/L | Micrograms per liter |
| ng/L | Nanograms per liter |
| pCi/L | Picocuries per liter |
| kWh | Kilo-Watt Hour |
| **Acronyms** | |
| AGWA | Association of Ground Water Agencies |
| AMPAC | American Pacific Corporation |
| AVEK | Antelope Valley East Kern Water Agency |
| AWE | Alliance for Water Efficiency |
| AWWA | American Water Works Association |
| BDCP | Bay Delta Conservation Plan |
| BMPs | Best Management Practices |
| CAP | Climate Action Plan |
| CAWCD | Central Arizona Water Conservation District |
| CBM | Condition-based maintenance |
| CCL3 | Contaminant Candidate List 3 |
| CCP | Conservation Credits Program |
| CCWD | Contra Costa Water District |
| CDFW | California Department of Fish and Wildlife |
| CEC | California Energy Commission |
| CECs | Constituents of Emerging Concern |
| CEQA | California Environmental Quality Act |
| CII | Commercial, Industrial, and Institutional |
| CMMS | Computerized Maintenance Management System |
| $CO_2$ | Carbon Dioxide |
| CPE | Comprehensive Program Evaluation |
| CRA | Colorado River Aqueduct |
| CRSS | Colorado River Simulation System |
| CUWCC | California Urban Water Conservation Council |
| CVP | Central Valley Project |
| CVWD | Coachella Valley Water District |
| CWC | California Water Code |
| CWSRF | Clean Water State Revolving Fund |
| CY | Calendar Year |
| DAC | Disadvantaged Community |

## LIST OF ABBREVIATIONS

| Abbreviation | Terms |
|---|---|
| D/DBP | Disinfectants/Disinfection Byproduct |
| DBP | Disinfection Byproduct |
| DCP | Drought Contingency Plan |
| DDW | The SWRCB's Division of Drinking Water |
| DFW | Department of Fish and Wildlife |
| DLR | Detection Level for purposes of Reporting |
| DMM | Demand Management Measure |
| DOE | U.S. Department of Energy |
| DPC | Delta Protection Commission |
| DPR | Direct Potable Reuse |
| DRA | Drought Risk Assessment |
| DSOD | Division of Safety of Dams |
| DTSC | California Department of Toxic Substances Control |
| DVL | Diamond Valley Lake |
| DWA | Desert Water Agency |
| DWCV | Desert Water Agency/Coachella Valley Water District |
| DWR | California Department of Water Resources |
| ECLO | Existing Conveyance and Low Outflow |
| EDD | California Employment Development Department |
| EIR | Environmental Impact Report |
| EIS | Environmental Impact Statement |
| ELPH | Equivalent Level of Public Health Protection |
| ESA | Endangered Species Act |
| ESP | Energy Sustainability Plan |
| $ET_o$ | Evapotranspiration |
| FSA | Future Supply Actions |
| FWUA | Friant Water Users Authority |
| FY | Fiscal Year |
| GHG | Greenhouse Gas Emissions |
| GRP | Groundwater Recovery Program |
| GWRS | Groundwater Replenishment System |
| HECW | High Efficiency Clothes Washer |
| HET | High Efficiency Toilet |
| HTC | Hyatt/Thermalito Complex |
| ICP | Innovative Conservation Program |
| ICS | Intentionally Created Surplus |
| IEUA | Inland Empire Utilities Agency |
| IID | Imperial Irrigation District |
| IPR | Indirect Potable Reuse |
| IRP | Integrated Water Resources Plan |
| IRPSIM | Integrated Water Resources Plan Simulation Model |
| JWPCP | Joint Water Pollution Control Plant |
| LAA | Los Angeles Aqueduct |
| LADWP | Los Angeles Department of Water and Power |
| LRP | Local Resources Program |
| M&I | Municipal & Industrial |

## LIST OF ABBREVIATIONS

| Abbreviation | Terms |
|---|---|
| MCL | Maximum Contaminant Level |
| MFR | Multi-family Residential |
| MLPA | Marine Life Protected Area |
| MOU | Memorandum of Understanding |
| MWD | The Metropolitan Water District of Southern California |
| MWD-EDM | Metropolitan's Econometric Demand Model |
| MWDOC | Municipal Water District of Orange County |
| MWELO | Model Water Efficient Landscape Ordinance |
| MWQI | Municipal Water Quality Investigations |
| NASA | National Aeronautics and Space Administration |
| NDEP | Nevada Division of Environmental Protection |
| NDMA | N-nitrosodimethylamine |
| NEPA | National Environmental Policy Act |
| NERT | Nevada Environmental Response Trust |
| NMFS | National Marine Fisheries Services |
| OCWD | Orange County Water District |
| OEHHA | Office of Environmental Health Hazard Assessment |
| OMP&R | Operation, Maintenance, Power and Replacement |
| PFAS | Per- and polyfluoroalkyl substances |
| PFBS | Perfluorobutane sulfonic acid |
| PFOA | Perfluorooctanoic acid |
| PFOS | Perfluorooctanesulfonic acid |
| PG&E | Pacific Gas & Electric |
| PHG | Public Health Goal |
| polyDADMAC | polydiallyldimethylammonium chloride |
| PPCP | Pharmaceutical/Personal Care Product |
| PPRs | Present Perfected Rights |
| PVID | Palo Verde Irrigation District |
| QMCP | Quagga Mussel Control Program |
| QSA | Quantification Settlement Agreement |
| RDM | Robust Decision Making |
| RPAs | Reasonable and Prudent Alternatives |
| RRWP | Regional Recycled Water Program |
| RTP-12 | 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy |
| RTS | Readiness-to-Serve Charge |
| RWA | Raw Water Augmentation |
| SAF | San Andreas Fault |
| SANDAG | San Diego Association of Governments |
| SAR | System Access Rate |
| SARI Line | Santa Ana Regional Interceptor Line |
| SB X7-7 | Senate Bill X7-7, Water Conservation Act of 2009 |
| SCAG | Southern California Association of Governments |
| SCWC | Southern California Water Coalition |
| SDCWA | San Diego County Water Authority |
| SDP | Seawater Desalination Program |

## LIST OF ABBREVIATIONS

| Abbreviation | Terms |
|---|---|
| Series 13 | SANDAG Series 13: 2050 Regional Growth Forecast |
| SFR | Single-Family Residential Model |
| SNMP | Salt and Nutrient Management Plan |
| SNWA | Southern Nevada Water Authority |
| SPR | System Power Rate |
| SRCSD | Sacramento Regional County Sanitation District |
| SRWSTF | Seismic Resilience Water Supply Task Force |
| SWC | State Water Contractors |
| SWP | State Water Project |
| SWRCB | State Water Resources Control Board |
| TDS | Total Dissolved Solids |
| TOC | Total Organic Carbon |
| TVMWD | Three Valleys Municipal Water District |
| UCMR2 | Unregulated Contaminant Monitoring Regulation 2 |
| USBR | U.S. Department of the Interior, Bureau of Reclamation |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Services |
| UWMP | Urban Water Management Plan |
| VOC | Volatile Organic Compound |
| WIFIA | Water Infrastructure Finance and Innovation Act |
| WRD | Water Replenishment District of Southern California |
| WSAP | Water Supply Allocation Plan |
| WSCP | Water Shortage Contingency Plan |
| WSDM Plan | Water Surplus and Drought Management Plan |
| WSR | Water Stewardship Rate |
| WUCA | Water Utility Climate Alliance |
| WUE | Water Use Efficiency |
| YCWA | Yuba County Water Agency |

**Phrases**

| | |
|---|---|
| 2015 IRP Update | 2015 Integrated Water Resources Plan, Water Tomorrow |
| Act | Urban Water Management Planning Act |
| Annual Assessments | Annual Water Supply and Demand Assessment |
| Arvin-Edison | Arvin-Edison Water Storage District |
| Bank | Governor's Water Bank |
| Bay-Delta | San Francisco Bay/Sacramento-San Joaquin Delta |
| California Plan | California's Colorado River Water Use Plan |
| Conservancy | Sacramento-San Joaquin Delta Conservancy |
| Council | Delta Stewardship Council |
| Delta | Sacramento/San Joaquin River Delta |
| Forum | Colorado River Basin Salinity Control Forum |
| Kern Delta | Kern Delta Water District |
| Metropolitan | The Metropolitan Water District of Southern California |
| MWD Act | Metropolitan Water District Act |
| Plan | Urban Water Management Plan |
| Policy | State Recycled Water Policy |

## LIST OF ABBREVIATIONS

| Abbreviation | Terms |
|---|---|
| Regional Board | Regional Water Quality Control Board |
| Sanitation Districts | Los Angeles County Sanitation Districts |
| Science Board | Delta Independent Science Board |
| Semitropic | Semitropic Water Storage District |

# Summary of Compliance

| | |
|---|---|
| ***SB X7-7*** | |
| **Water Code § 10608.36 – Assessment of Measures, Programs, and Policies** | Assess present and proposed future measures, programs, and policies to help achieve water use reduction targets<br>• Metropolitan's actions to help achieve the urban per capita water use reduction pursuant to the goals set forth in SB X7-7 are discussed in Sections 3.4, 3.5, and 3.7. |
| ***Agency Coordination*** | |
| **Water Code § 10610.2(a)(4)** | Water suppliers should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning.<br>• See Sections 2 and 5 and Appendix 1. |
| **Water Code § 10620(d)(2) – Develop Water Shortage Contingency Plan** | Each urban water supplier shall develop its own water shortage contingency plan.<br>• See Section 2.5 and Appendix 4. |
| **Water Code § 10620(d)(3) – Coordination with Appropriate Agencies** | Describe the coordination of the plan preparation.<br>• See Section 5. |
| **Water Code § 10620(f) – Describe Resource Maximization/Import Minimization Plan** | Discuss how water management tools and options are used to maximize resources and minimize the need to import water.<br>• Metropolitan's planning strategy within the IRP and adaptive implementation approach are discussed in Section 2 and provide an overview of the water management tools and options. See pages 2-2 through 2-6.<br>• Further details are provided in Sections 1.4 (conservation and local resources, pages 1-25 through 1-27), 3.4 (demand management and conservation, pages 3-37 through 3-55), and 3.5 (recycling, groundwater recovery, and desalination, pages 3-56 through 3-78.) |
| **Water Code § 10621(b) – City and County Notification and Participation** | Notify any city or county within service area of Urban Water Management Plan (UWMP) review & revision at least 60 days before public hearing. May consult with and obtain comments from notified cities and counties.<br>• Notification and participation are discussed in Section 5, pages 5-1 through 5-10, and Appendix 12, DWR Submittal Table 10-1. |
| **Water Code § 10621(f) – Plan Submittal to Department of Water Resources (DWR)** | Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021<br>• Submission of the 2020 UWMP by the July 1, 2021 deadline is detailed in Section 5. |
| ***Contents of UWMP*** | |
| **Water Code § 10630.5 – Simple Lay Description** | Include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, the agency's strategy for meeting its water needs, the challenges the agency faces, and any other information necessary to provide a general understanding of the plan.<br>• The Simple Lay Description is contained in the Executive Summary. |

# Summary of Compliance

| | |
|---|---|
| **Water Code § 10631(a) – Service Area Information** | Describe service area of supplier<br>• Service area is discussed in Section 1.2, pages 1-6 through 1-10 and shown in Figure 1-1.<br>Include current and projected population<br>• Population is discussed in Section 1.3 and shown in Table 1-1, Figure 1-2, and Figure 1-3.<br>• Population analysis is discussed in Appendix 1, page A.1-5. Projections are on page A.1-10, Table A.1-2.<br>• Current and projected population are shown in Appendix 12, DWR Submittal Table 3-1.<br>Population projections must be based on data from state, regional or local service agency projections<br>• See footnote Table A.1-2, page A.1-10.<br>Describe climate characteristics that affect water management<br>• See Section 1.3, pages I-14 through I-16, Figure 1-5, and Table 1-4, and Section 2.6, pages 2-43 through 2-48.<br>Describe other social, economic, and demographic factors affecting water management<br>• See Section 1.3, pages 1-12 through 1-14 and Appendix 1.<br>Describe current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information.<br>• See methodologies and assumptions for developing projections of demand and water use in Section 2.2. |
| **Water Code § 10631(b)(1-3) – Water Sources** | Identify and quantify existing and planned water supply sources in 5-year increments to 20 years or as far as data is available<br>• Current supplies and quantities are described in Section 1.4, pages 1-21 through 1-30.<br>• Historic and current water supplies are described in Appendix 2.<br>• Planned water supplies and quantities are discussed in Section 2, and details are provided in Appendix 3, and particularly in Table A.3-7, pages A.3-58 through A.3-70.<br>• See Appendix 12, DWR Submittal Tables 6-8 and 6-9.<br>Detailed discussion of anticipated supply availability under normal water year, single dry year, and droughts lasting at least 5 years, as well as more frequent and severe drought periods (as described in the drought risk assessment). For each water supply source, consider any information pertinent to the Section 10635 reliability analysis, including climate change.<br>• See Section 2, Tables 2-4 through 2-7, pages 2-18 through 2-25.<br>• See Section 2.2 (estimating demand on Metropolitan) page 2-9,<br>• See Section 2.3 (water reliability assessment), pages 2-15 through 2-20, Section 2.4 (drought risk assessment), pages 2-21 through 2-25, Section 2.6 (other supply reliability risks), pages 2-43 through 2-48, and the discussions presented under the Colorado River and State Water Project (SWP), Sections 3.1 and 3.2.<br>• See Section 3 and Appendices 3 and 5<br>• See Appendix 12, DWR Submittal Tables 7-1, 7-2, 7-3, 7-4, and 7-5. |

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| | Describe the management of each supply source in correlation with the other supplies.<br>• See Section 3 and Appendix 3.<br>Describe the measures being taken to acquire and develop planned water supply sources.<br>• See Section 3 and Appendix 3. |
| **Water Code § 10631(b)(4) – If Groundwater Identified as Existing or Planned Source** | Metropolitan does not supply groundwater. However, Metropolitan partners with various entities for groundwater storage and exchange programs.<br>• See Sections 3.3, 3.5, and 3.6; Appendix 2 (pages A.2-4 through A.2-5, A.2-8 through A.2-9, A.2-15); and Appendix 3 (pages A.3-25 through A.3-28, A.3-31 through A.3-32, A.3-53 through A.3-55) for discussions of issues related to groundwater basins.<br>• See Section 4 for salinity issues related to groundwater basins. |
| **Water Code § 10631(c) – Transfer or Exchange Opportunities** | Describe short-term and long-term exchange or transfer opportunities<br>• Section 1.4 (augmenting water supplies), pages 1-27 through 1-28.<br>• Section 3.1 (pages 3-3 through 3-12) describes plans for banking, exchange and transfer opportunities along the Colorado River and Aqueduct.<br>• Section 3.2 (pages 3-13 through 3-30) describes plans for banking, exchange and transfer opportunities within the State Water Project.<br>• Section 3.3 (pages 3-31 through 3-36) describes plans for banking, exchange and transfer opportunities within the Central Valley/State Water Project.<br>• Section 3.6 (pages 3-79 through 3-82) describes plans for banking, exchange and transfer opportunities within the local region.<br>• Further details are provided in Appendix 3, particularly Table A.3-7 on pages A.3-58 through A.3-70. |
| **Water Code §§ 10631(d)(1) and (2) – Past, Current, and Projected Water Use** | Urban retail water suppliers are to quantify past, current, and projected water use by sector in five-year increments<br>• Not applicable to Metropolitan (which is a wholesaler) because this reporting requirement applies only to urban retail water suppliers. However, Metropolitan voluntarily provides this information in the following Sections:<br>• See Section 1.3, page 1-13 and Figure 1-4 for historical retail water demands.<br>• Past, current, and future water uses are shown in Appendix 1, Table A.1-13 on page A.1-14. Water uses by sector and county are shown in Tables A.1-6 through A.1-11 on pages A.1-13 through A.1-15. Water demands by sector are shown in Appendix 12 DWR Submittal Tables 4-1, 4-2, and 4-3.<br>Identify and quantify sales to other agencies<br>• See Section 1.3, page 1-13 and Figure 1-4 for historical retail water demands.<br>• Historic sales are presented in Table A.2-2 on page A.2-3.<br>• Metropolitan does not project sales by individual agency. However, total projected sales/demands to other agencies are shown in Section 2.2, pages 2-7 through 2-14. |

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| **Water Code §§ 10631(d)(1)(J), (d)(3)(A)-(C) – Distribution System Water Loss** | Urban retail water suppliers are to quantify distribution system water loss for each of the 5 years before the plan update<br>• Not applicable to Metropolitan (which is a wholesaler) because this reporting requirement applies only to urban retail water suppliers. However, Metropolitan voluntarily provides this information in the following Sections:<br>• Section 2.6, page 2-43, Appendix 7, Tables A.7-1 to A.7-5, and Appendix 12, DWR Submittal Table 4-4 (Optional for Wholesaler). |
| **Water Code § 10631(d)(4)(A) and (B) – Water Savings Estimate** | Water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans<br>Provide citations to the codes, standards, ordinances, or transportation and land use plans used to make projections<br>Indicate extent that water use projections consider savings from codes, standards, ordinances, or transportation and land use plans.<br>• See discussion on estimating demands and code-based conservation in Section 2, page 2-9 and Appendix 6. |
| **Water Code § 10631(e)(2) – Description of Supplier's Water Demand Management Measures, Distribution System Asset Management, Assistance Programs** | Provide narrative description of items in §10631(e)(1)(B)(ii), (iv), (vi), and (vii), distribution system asset management, and wholesale supplier assistance programs<br>• See discussion on metering, Section 3.4, page 3-47.<br>• See discussion on public education and outreach, Section 3.4, pages 3-38 through 3-43.<br>• See discussion on water conservation programs, Section 3.4, pages 3-44 through 3-46.<br>• See discussion on demand management and conservation, Section 3.4, pages 3-37 through 3-52.<br>• See discussion on distribution system asset management, Section 3.4, pages 3-53 through 3-55.<br>• See discussion on assistance programs to retail water agencies (rebate programs, public education and outreach, and other efforts to reduce water demand), Section 3.4, pages 3-37 through 3-52. |
| **Water Code § 10631(f) – Planned Water Supply Projects and Programs** | Detailed description of expected future supply projects & programs to meet projected water use<br>Timeline for each proposed project or program<br>Quantification of each project's normal water year yield (AFY)<br>Quantification of each project's single dry-year water year yield (AFY)<br>Quantification of each project's 5-year drought yield (AFY)<br>• Section 3.1 (pages 3-3 through 3-12) describes plans for banking, exchange and transfer opportunities along the Colorado River and Aqueduct.<br>• Section 3.2 (pages 3-13 through 3-30) describes plans for banking, exchange and transfer opportunities within the State Water Project.<br>• Section 3.3 (pages 3-31 through 3-36) describes plans for banking, exchange and transfer opportunities within the Central Valley/State Water Project.<br>• Section 3.6 (pages 3-79 through 3-82) describes plans for banking, exchange and transfer opportunities within the local region.<br>• Further details are provided in Appendix 3, particularly Table A.3-7 on pages A.3-58 through A.3-70.<br>• See Appendix 12, DWR Submittal Table 6-7. |

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| **Water Code § 10631(g) – Opportunities for Development of Desalinated Water** | Describe opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply<br>• See discussion on groundwater recovery and seawater desalination in Section 1.4, pages 1-24 through 1-26, and Section 3.5, pages 3-56 through 3-73.<br>• See Appendix 5, Table A.5-2 on pages A.5-9 through A.5-11 for a list of existing, under construction, CEQA, and conceptual groundwater recovery projects and their ultimate yield/capacity.<br>• See Appendix 5, Table A.5-3 on page A.5-12 for a list of existing, CEQA, and conceptual seawater desalination projects. |
| **Water Code § 10631(h) – If Supplier Relies on a Wholesale Supplier for Water** | Urban water suppliers that rely on wholesale agency for water source must provide wholesale agency with water use projections in 5-year increments to 20 years or as far as data is available. Wholesaler to provide urban water suppliers with existing and planned water supply availability projections, by source, and planned water supply quantities over same 5-year increments and during various water-year types.<br>• See discussions on Metropolitan and member agency coordination for the IRP Process in Sections 2 and 5.<br>• See Appendix 3, Table A.3-7, and Appendix 12, DWR Submittal Table 2-4. |
| **Water Code § 10631.1 – Projected Water Use for Low-Income Housing** | Water use projections for single-family and multi-family residential housing for lower income households.<br>• This is incorporated with the retail demand forecast, as reflected in Section 2 and Appendix 1. |
| **Water Code § 10631.2 – Calculation or Estimation of Energy Intensity of Urban Water Systems** | Must include any of the following that the supplier can readily obtain: estimated amount of energy for extraction or diversion (from sources), conveyance, treatment, distribution, treated water supplies compared to nontreated water supplies, and storage of water, and any other appropriate energy-related information.<br>• Estimate of the amount of energy used and energy intensity is presented in Appendix 10.<br>• See Section 3.8 for discussion of Metropolitan's Energy Management Initiative. |
| ***Water Shortage Contingency Plan*** | |
| **Water Code § 10632 – Water Shortage Contingency Plan**<br><br>**Water Code § 10632(a)(1) – Analysis of Water Supply Reliability** | Every supplier shall prepare and adopt a water shortage contingency plan as part of its Plan.<br>Water shortage contingency plan must include the analysis of water supply reliability conducted pursuant to Section 10635.<br>• See Section 2.5 and Appendix 4<br>For Water Supply Reliability assessments<br>• See Sections 2.2, 2.3, and 2.4 |

# Summary of Compliance

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| **Water Code § 10632(a)(2) – Procedures Used to Conduct Annual Water Supply and Demand Assessment** | Written decision-making process used each year to determine water supply reliability.<br>Key data inputs and assessment methodology to evaluate water supply reliability for current year and one dry year, including: (i) current year unconstrained demand, (ii) current year available supply, (iii) existing infrastructure capabilities and plausible constraints, (iv) locally applicable evaluation criteria used for each annual water supply and demand assessment, and (v) description and quantification of each water supply source.<br>• See Section 2.5 and Appendix 4 |
| **Water Code § 10632(a)(3)(A) – Six Standard Water Shortage Levels** | Six standard water shortage levels corresponding to ranges of up to 10, 20, 30, 40, and 50% shortages and greater than 50% shortage.<br>Shortage levels shall be defined based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other conditions indicative of available water supply.<br>Shortage levels also apply to catastrophic interruption of water supplies, including regional power outage, earthquake, Delta levee failure, and aqueduct failure.<br>• See discussion of Water Shortage Contingency Plan in Section 2.5 and Appendix 4, including description of Metropolitan's Water Surplus and Drought Management Plan and Water Supply Allocation Plan.<br>• See discussion of Metropolitan's Emergency Storage Objective developed under its catastrophic supply interruption plan in Section 2.5 and Appendix 8.<br>• See Appendix 12, DWR Submittal Tables 8-1, 8-2, and 8-3 |
| **Water Code § 10632(a)(4) – Shortage Response Actions** | Shortage response actions that align with the shortage levels and include: (i) supply augmentation actions, (ii) demand reduction actions, (iii) operational changes, (iv) mandatory prohibitions against specific water use practices, and (v) estimated extent to which the gap between supplies and demand will be reduced by each action.<br>• See discussion of Water Shortage Contingency Plan in Section 2.5 and Appendix 4, including description of Metropolitan's Water Surplus and Drought Management Plan and Water Supply Allocation Plan.<br>• See discussion of Metropolitan's Emergency Storage Objective developed under its catastrophic supply interruption plan in Section 2.5 and Appendix 8.<br>• See Appendix 12, DWR Submittal Tables 8-1, 8-2, and 8-3. |
| **Water Code § 10632(a)(5) – Communication Protocols and Procedures** | Communication protocols and procedures to inform customers, the public, interested parties, and governments regarding: (i) any current or predicted shortages, (ii) any shortage response actions triggered or expected to be triggered, and (iii) any other relevant communications.<br>• See Section 2.5 and Appendix 4. |
| **Water Code § 10632(a)(6) – Customer Compliance, Enforcement, Appeal, and Exemption Procedures** | For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions.<br>• Not applicable to Metropolitan as a wholesaler. |

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| **Water Code § 10632(a)(7) – Legal Authorities** | Describe legal authorities that empower supplier to implement shortage response actions.<br>Statement that supplier will declare a water shortage emergency in compliance with Chapter 3 (Water Code §§ 350-359 re Water Shortage Emergencies).<br>Statement that supplier will coordinate with any city or county within which it supplies water supply services for the possible proclamation of a local emergency.<br>• See Section 2.5 and Appendix 4. |
| **Water Code § 10632(a)(8) – Financial Consequences** | Describe financial consequences of and responses for drought conditions.<br>Describe potential revenue reductions and expense increases associated with shortage response actions, and mitigation actions to address such reductions and increases.<br>Describe cost of compliance with Chapter 3.3 (Water Code §§ 365-367 re Excessive Water Use During Drought).<br>• See Sections 2.5 and 2.7, page 2-27, and Appendix 4. |
| **Water Code § 10632(a)(9) – Monitoring and Reporting Requirements and Procedures for Customer Compliance and State Reporting** | For an urban retail water supplier, monitoring and reporting requirements and procedures for monitoring customer compliance and to meet state reporting requirements.<br>• Not applicable to Metropolitan as a wholesaler. |
| **Water Code § 10632(a)(10) – Reevaluation and Improvement Procedures** | Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan.<br>• See Section 2.5 and Appendix 4. |
| **Water Code § 10632(b) – Water Features** | Analyze and define water features artificially supplied with water separately from swimming pools and spas when developing water shortage contingency plan<br>• Not applicable to Metropolitan because prohibitions against specific water use practices are enforced on end users and are not within Metropolitan's authority as a wholesaler. |
| **Water Code § 10632(c) – Plan Availability** | Water shortage contingency plan shall be available to customers and any city or county within which the supplier provides water supplies no later than 30 days after adoption of the plan.<br>• Posting of water shortage contingency plan on Metropolitan's website and provision of water shortage contingency plan to cities and counties are described in Section 5. |
| **Water Code § 10632.5 – Seismic Risk Assessment and Mitigation Plan** | Include a seismic risk assessment and mitigation plan.<br>• See Section 2.5 and Appendix 9. |

# Summary of Compliance

| ***Recycled Water Plan*** | |
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| **Water Code § 10633 – Recycled Water as Potential Water Source; Agency Coordination** | Provide information, to the extent available, on recycled water and its potential as a water source in the supplier's service area.<br>Coordinate plan preparation with local water, wastewater, groundwater, and planning agencies within supplier's service area.<br>• See Section 1.4, pages 1-24 through 1-30, Section 3.5, pages 3-56 through 3-78, Tables 3-12 and 3-13 on pages 3-76 through 3-77, Appendix 2, pages A.2-8 through A.2-9, and Appendix 5, Table A.5-1.<br>• Coordination of the plan preparation is discussed in Section 5. |
| **Water Code § 10633(a) – Wastewater System Description** | Describe the wastewater collection and treatment systems in the supplier's service area<br>Quantify the volume of wastewater collected and treated<br>• Not applicable to Metropolitan because it does not collect or treat the wastewater generated within its service area. Instead, Metropolitan provides a general narrative description of the wastewater collection and treatment systems operated by others in its service area.<br>• See Section 3.5, pages 3-57 through 3-78, Table 3-8 on page 3-57, Tables 3-12 and 3-13 on pages 3-76 through 3-77, Appendix 2, pages A.2-8 through A.2-9, and Appendix 5, Table A.5-1. |
| **Water Code § 10633(a) through (d) – Wastewater Disposal and Recycled Water Uses** | Describes methods of wastewater disposal in the supplier's service area<br>• Not applicable to Metropolitan because it does not dispose of wastewater within its service area. Instead, Metropolitan provides a general narrative description of wastewater disposal by others in its service area.<br>• See Section 3.5, pages 3-57 through 3-78.<br>Describe quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.<br>• Not applicable to Metropolitan because it does not treat or discharge recycled water. Instead, Metropolitan provides a general narrative description of the treatment and discharge of recycled water by others in its service area.<br>• See Section 3.5, pages 3-57 through 3-78.<br>Describe the current type, place and quantity of use of recycled water in supplier's service area<br>Describe and quantify potential uses of recycled water<br>Determination of technical and economic feasibility of serving the potential uses<br>• Not applicable to Metropolitan because it does not use recycled water in its service area. Instead, Metropolitan provides a general narrative description of the use of recycled water by others in its service area, including potential uses and the technical and economic feasibility of serving the potential uses of recycled water<br>• See Section 3.5, pages 3-56 through 3-78, Section 4, pages 4-6 through 4-7, Appendix 2, pages A.2-8 through A.2-9, and Table A.5-1. |

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| **Water Code § 10633(e) – Projected Uses of Recycled Water** | Projected use of recycled water in service area at the end of 5, 10, 15, and 20 years<br>• See Section 2, Tables 2-1 through Table 2-3, pages 2-12 through 2-14 and Section 3.5.<br>Compare UWMP 2015 projections with UWMP 2020 actual use of recycled water<br>• The 2015 UWMP, Tables 2-1, 2-2, and 2-3 included the following projections for recycled water use in 2020 (without the Santa Ana River baseflow): 436 TAF for a single dry year; 427 TAF for a multiple dry year; and 436 TAF for an average year. In 2020, actual recycled water use is estimated at 441 TAF, as discussed in Table 3-14 on page 3-77 and Appendix 2, page A.2-8 of this 2020 UWMP.<br>• See Appendix 12, DWR Submittal Table 6-5. |
| **Water Code §§ 10633(f), (g) – Actions to Encourage Use of Recycled Water**<br>**Plan to Optimize Use of Recycled Water** | Describe actions, including financial incentives, that might be taken to encourage recycled water uses<br>Describe projected results of these actions in terms of acre-feet of recycled water used per year<br>Provide a plan to optimize the use of recycled water in the supplier's service area<br>• Metropolitan provides a general narrative description of the actions it takes to encourage recycled water uses in its service area<br>• See Section 1.4, pages 1-24 through 1-25, 1-27, Table 1-5, Section 3.5, pages 3-56 through 3-78, Tables 3-12 and 3-13 on pages 3-76 and 3-77, and Appendix 5, Table A.5-1. |
| ***Water Quality Impacts on Reliability*** | |
| **Water Code § 10634 – Water Quality Impacts on Availability and Reliability of Supply** | Discuss water quality of existing sources in 5-year increments to 20 years and how water quality affects water management strategies and supply reliability<br>• See Section 3.2, SWP Water Quality, pages 3-25 through 3-27, 3-29.<br>• See Section 4, Water Quality, pages 4-1 through 4-21. |
| ***Water Service Reliability*** | |
| **Water Code § 10635(a) – Supply and Demand Comparison: Normal Water Year** | Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments.<br>• For projected water use, see Section 2, Table 2-3, page 2-14.<br>• For projected water supply, see Table 2-6, page 2-19 and Table A.3-7 in Appendix 3, pages A.3-58 through A.3-70, and Appendix 12, DWR Submittal Table 7-2. |
| **Water Code § 10635(a) – Supply and Demand Comparison: Single-Dry Year Scenario** | Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments.<br>• For projected water use, see Section 2, Table 2-1, page 2-12.<br>• For projected water supply, see Table 2-4, page 2-17 and Table A.3-7 in Appendix 3, pages A.3-59 through A.3-70, and Appendix 12, DWR Submittal Table 7-3. |

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| **Water Code § 10635(a) – Supply and Demand Comparison: 5-Year Drought Scenario** | Project a 5-year drought period occurring between 2021-2025 and compare projected supply and demand during those years<br>Project a 5-year drought period occurring between 2026-2030 and compare projected supply and demand during those years<br>Project a 5-year drought period occurring between 2031-2035 and compare projected supply and demand during those years<br>Project a 5-year drought period occurring between 2036-2040 and compare projected supply and demand during those years<br>• Metropolitan has projected 5-year periods for the next 20 years.<br>• For projected water use, see Section 2, Table 2-2, page 2-13.<br>• For projected water supply, see Table 2-5, page 2-18 and Table A.3-7 in Appendix 3, pages A.3-58 through A.3-70.<br>• See Appendix 12, DWR Submittal Table 7-4. |
| **Water Code § 10635(b) – Drought Risk Assessment** | Include a drought risk assessment for water service to customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the Plan.<br>• See Section 2.4. |
| **Water Code § 10635(b)(1) – Data, Methodology, and Basis** | Describe the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a 5-year drought, starting from the year following when the assessment is conducted.<br>• See Sections 2.1 and 2.4, and Appendices 1 and 3, specifically Table A.3-8. |
| **Water Code § 10635(b)(2) – Reliability of Each Supply Source** | Determine the reliability of each supply source under a variety of water shortage conditions.<br>• See Section 2.3, specifically Tables 2-4, 2-5, and 2-6, and Appendix 3, specifically Tables A.3-7 and A.3-8. |
| **Water Code § 10635(b)(3) – Comparison of Total Water Supply Sources to Total Projected Water Use** | Compare the total water supply sources available with the total projected water use for the drought period.<br>• See Section 2.3, specifically Tables 2-4, 2-5, and 2-6. |
| **Water Code § 10635(b)(4) – Historical Drought Hydrology, Projected Supply and Demand Changes Due to Climate Change, Regulatory Changes, and Other Criteria** | Consider historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.<br>• See Sections 1.4, 2.6, 4, and Appendices 1, 2, 3, and 6. |
| **Water Code § 10635(c) – Plan Submittal to Cities and Counties** | Supplier to provide portion of Plan on water service reliability to cities and counties within its service area no later than 60 days after Plan submittal.<br>• Provision of Plan to cities and counties is described in Section 5. |
| **Water Code § 10640 – Water Shortage Contingency Plan** | Supplier to prepare a water shortage contingency plan pursuant to Section 10632, periodically review the water shortage contingency plan, and adopt any amendments or changes.<br>• See Section 2.5 and Appendix 4. |

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| **Water Code § 10641 – Consultations with public agency, state agency or experts** | Supplier may consult with and obtain comments from any public agency, state agency, or any person with special expertise as to water demand management methods and techniques<br>• Stakeholder, state agency, public agency, and expert participation, consultation, outreach, comments, and notification are described in Section 5. |
| **Water Code § 10642 – Public Hearing; Notice; Adoption** | Encourage involvement of diverse social, cultural & economic community groups prior to and during Plan and water shortage contingency plan preparation<br>• See Section 5, pages 5-1 through 5-12.<br>Prior to adoption, Plan and water shortage contingency plan available for public inspection and hold public hearing<br>• See Section 5, pages 5-5 and 5-12.<br>Provide proof of public hearing and notice<br>• See Section 5, page 5-11.<br>Provide meeting notice to any city or county in service area<br>• See Section 5, pages 5-8 and 5-11, and Appendix 12, DWR Submittal Table 10-1.<br>Provide notice pursuant to Chapter 17.5 of the Government Code<br>• See Section 5, page 5-12.<br>After hearing, Plan and water shortage contingency plan shall be adopted as prepared or as modified after hearing.<br>• See Section 5, pages 5-13 and 5-15. |
| **Water Code §§ 10615, 10643 – Plan Implementation** | Include in Plan strategy and time schedule for implementation<br>Implement Plan in accordance with the schedule set forth in the Plan<br>• Metropolitan has conducted a review of its planning progress through the 2020 IRP Update, discussed in Section 2. In addition, in each section, Metropolitan has included an "Achievement to Date" that discusses progress towards its planning goals, current issues, and potential problems with continued implementation of the Plan.<br>• Section 3 summarizes the implementation plan and continued progress in developing a diversified resource mix consistent with the IRP to meet the region's water supply needs<br>DMM Programs<br>• Metropolitan's conservation plan and approach are discussed in Section 3.4. Individual conservation programs are discussed on pages 3-44 through 3-48. |
| **Water Code § 10644(a)(1) –Plan Submittal** | Submit to DWR, the California State Library, and any city or county within service area copy of Plan no later than 30 days after adoption.<br>• Plan submission is described in Section 5. |
| **Water Code § 10644(a)(2) – Plan shall include any Standardized Forms, Tables, or Displays specified by DWR** | Submit Plan electronically<br>Include in Plan DWR's standardized forms, tables, or displays<br>• Plan submission is described in Section 5.<br>• DWR's standardized tables for wholesale urban water agencies are completed and presented in Appendix 12. |
| **Water Code § 10644(b) – Water Shortage Contingency Plan Revision** | Submit copy of revised water shortage contingency plan to DWR no later than 30 days after adoption.<br>• Plan submission is described in Section 5 and Appendix 4. |

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| **Water Code § 10645 – Plan and Water Shortage Contingency Plan Available for Public Review** | No later than 30 days after plan submittal, the supplier and DWR to make the Plan and water shortage contingency plan available for public review during normal business hours.<br>• Posting of Plan and water shortage contingency plan on Metropolitan's website for public review is described in Section 5. |

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# Executive Summary and Simple Lay Description of 2020 UWMP Findings

Metropolitan's 2020 Urban Water Management Plan (UWMP) has been prepared in compliance with the California Water Code (CWC)[1]. This Executive Summary satisfies the requirement of CWC Section 10630.5 to include a simple lay description of information necessary to provide a general understanding of the plan, including a description of Metropolitan's reliable water, as well as its needs, strategies, and potential challenges for the foreseeable future.

This plan provides an assessment of Metropolitan's water service reliability, describes and evaluates sources of water supply, efficient uses of water, demand management measures, implementation strategy and schedule, and other relevant information and programs. In addition to the water reliability assessments, the plan includes an evaluation of frequent and severe periods of droughts, as described in the Drought Risk Assessment, and the preparation and adoption of the Water Shortage Contingency Plan (WSCP).

Metropolitan's 2020 UWMP was developed as part of the 2020 Integrated Water Resources Plan (IRP) planning process and provides a representation of Metropolitan's planning elements reported under the conditions required by the Act. The IRP represents Metropolitan's comprehensive planning process and will serve as Metropolitan's blueprint for long-term water reliability, including key supply development and water use efficiency goals. Together, these plans serve as the reliability roadmap for the region. The planning process involved extensive coordination with Southern California's water agencies, municipal service providers, and public planning agencies. Metropolitan's Board of Directors provided oversight throughout the ongoing process for the development of the 2020 IRP that informed the preparation of the 2020 UWMP. Metropolitan's outreach efforts sought to engage the general public, businesses, environmental organizations, diverse communities, cities, counties, and other stakeholders with an interest in the future of Southern California's water supplies. The information included in the 2020 UWMP represents the most current and available planning projections of supply capability and demand forecasts developed through a collaborative process with the member agencies.

As with Metropolitan's previous plans, the 2020 UWMP does not explicitly discuss specific activities undertaken by its member agencies unless they relate to one of Metropolitan's water demand or supply management programs. Presumably, each member agency will discuss these activities in its UWMP.

### Factors Considered for Metropolitan's Water Reliability Assessments for the UWMP

The Act requires reporting agencies to describe their water service reliability under the conditions associated with a normal water year, single dry-year, and droughts lasting at least five consecutive water years, with projected information in five-year increments for 20 years. The factors used to evaluate Metropolitan's supply and demand balance for the 2020 UWMP are

[1] This UWMP complies with the Urban Water Management Planning Act (Act), which was added by Statute 1983, Chapter 1009, became effective on January 1, 1984, and currently includes CWC Sections 10610 through 10657; and with CWC Section 10608.36 which was added by SB X7-7 in 2009.

presented below. Some of the considerations and resulting projections may change as Metropolitan's planning progresses. These changes may be reflected in future updates of the UWMP. Metropolitan and its member agencies have engaged in a comprehensive regional planning process called the IRP since the 1990s. In its 2020 IRP process, Metropolitan and its member agencies are using a scenario planning approach to identify and account for the broad range of uncertainty that the region faces in its water supplies and demands. Instead of focusing on a target for future water supply needs based on a single projected outcome of supplies and demands, this approach encouraged broader thinking and discussion of possible future conditions for local and imported water supply and retail demand, and the policy implications for Metropolitan and its service area. Adaptive management during implementation will allow flexibility in how the region prepares for the supply and demand conditions as they evolve through the future. The scenario planning in the 2020 IRP started with identifying the major drivers of change that impact water supply and demand for the region, understanding how they interact, and then assessing the potential scale of impact in the future. Data sources and quantification methods were identified that could be used for quantitative and qualitative analysis of the drivers and their impact on water supplies and demands. The detailed analyses of future local and imported water supplies; economic growth, demographics and water demands; and changing hydrology were incorporated into the UWMP. The IRP planning effort and policy discussions continued into 2021.

### *Hydrologic Conditions and Reporting Period*

The 2020 UWMP presents Metropolitan's water reliability assessments from 2025 through 2045. As specified in the Act, there are three water-year types that must be included in the water service reliability assessment for the UWMP. To simulate hydrologic conditions for the required reliability assessments, Metropolitan assumed the following:

- Normal Year. The average of historic years 1922 to 2017 most closely represents the water supply conditions that Metropolitan considers available during a normal water year.
- Single Dry Year. The conditions for the year 1977 represent the lowest total water supply available to Metropolitan.
- Five-Consecutive-Year Drought. The five consecutive years of 1988 to 1992 represent the driest five-consecutive year historical sequence for Metropolitan's water supply. This five-year sequence is used to complete both Metropolitan's water service reliability and drought risk assessments.

Metropolitan developed and evaluated estimates of future demands and supplies from local sources and from Metropolitan sources based on a record of 96 years (1922-2017) of historic hydrology. Supply and demand analyses for the single dry year and droughts lasting at least five consecutive water years were based on conditions affecting the watershed and supplies from the SWP, as this supply availability fluctuates the most among Metropolitan's sources of supply. Using the same 96-year period of the SWP supply availability, 1977 is determined to be the single driest year and 1988-92 is the driest 5-year historical sequence that represents the lowest water supply available for SWP supplies to Metropolitan. In addition, staff analysis of the 8-river index, an indicator of river flow and runoff in the SWP watershed, indicated that 1977 is the single driest year and 1988-92 is the lowest 5 consecutive dry years from 1922 through 2017. The 8-river index is used by DWR and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

### *Demand Projections*

Within Metropolitan's service area, retail water demands can be met with local supplies or imported supplies. In the UWMP, Metropolitan's supply reliability assessments focus on the future demands for Metropolitan's imported and other supplies. The expected firm demand on Metropolitan is the difference between total demands, adjusted for conservation, and projected total local supplies. Thus, in order to project the regional need for water, Metropolitan starts with a projection of total demand including retail Municipal and Industrial (M&I), retail agricultural, seawater barrier, and replenishment demands, determines the adjustments from total conservation, and subtracts the total local supplies that are available to meet a portion of those demands.

#### *Total Demands*

Demographic growth is a major driver of the current and future retail M&I water demand. Metropolitan updates its retail M&I projection periodically based on the release of official regional demographic and economic projections, and in the 2020 IRP, alternative demographic projections are being evaluated. The projections of retail M&I water demands used in the 2020 UWMP are based on demographic data and projections taken from the following reports:

- Southern California Association of Governments (SCAG) Connect SoCal: The 2020-2045 Regional Transportation Plan/Sustainable Community Strategy (May 2020)
- San Diego Association of Governments (SANDAG) San Diego Forward: The 2019 Federal Regional Transportation Plan (October 2019)

The SCAG and SANDAG regional growth forecasts are the core assumptions for the retail M&I demand forecasts for the UWMP assessments. These forecasts drive the estimating equations of the retail demand forecasting in Metropolitan's Econometric Demand Model (MWD-EDM). Both SCAG and SANDAG prepare demographic forecasts based on land use data for their respective regions through extensive processes that emphasize input from local planners and are done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's and SANDAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Retail agricultural demands consist of retail level water use for irrigating crops. Metropolitan's member agencies estimate agricultural water use based on many factors, including farm acreage, crop types, historical water use, and land use conversion. Each member agency estimates its agricultural demands differently, depending on availability of information. Metropolitan relies on member agencies' estimates of agricultural demands for the 2020 UWMP.

Metropolitan also includes in its assessment of total demands the local groundwater requirements for seawater barrier and groundwater basin replenishment. Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Replenishment demands represent the amount of water that member agencies plan to use to replenish the groundwater basins and augment natural replenishment from precipitation. Metropolitan relies on member agencies' and groundwater management agencies' projections for these demands, as well as projections of local supplies that are also used to meet these demands.

#### *Total Conservation*

Projected regional water demand is adjusted to account for water conserved by best management practices from active, code-based, and price-effect conservation. Active

conservation levels are derived by calculating water savings from all active program device-based savings installed to date. Code-based conservation levels are derived by calculating water savings from devices covered by existing water conservation ordinances and plumbing codes, including the state Model Water Efficient Landscape Ordinance, with replacement and new construction rates driven by demographic growth consistent with SCAG and SANDAG land use and transportation plans used to derive retail demand. Price-effect conservation is derived by calculating water savings by retail customers attributable to the effect of changes in the real (inflation adjusted) price of water.

#### *Total Local Supplies*

Projections of local supplies are based on information gathered from Metropolitan's annual local production surveys and communications between Metropolitan and member agency staff. The projections include groundwater and surface water production, recycled water and recovery of contaminated or degraded groundwater (funded under the Metropolitan's Local Resources Program, as well as local agency funded programs), and seawater desalination. The local supply projections presented in demand tables for the 2020 UWMP are consistent with the local supply projections reported in member agencies' UWMPs, with one variation being the Colorado River water SDCWA exchanges with Metropolitan for deliveries of blended Metropolitan water.

The total local supplies presented in the 2020 UWMP also include projections of Los Angeles Aqueduct deliveries from the Los Angeles Department of Water and Power (LADWP).

### ***Water Use Reduction Achievement in 2020***

On November 10, 2009, the state Legislature passed Senate Bill 7 as part of the Seventh Extraordinary Session, referred to as SB X7-7 or the Water Conservation Act of 2009. This law is the water conservation component to the historic Delta legislative package, and seeks to achieve a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. According to CWC Section 10608.36, wholesale agencies are required to include in their UWMPs an assessment of present and proposed future measures, programs, and policies that would help achieve the water use reductions required under SB X7-7. Urban wholesale water suppliers are not required to comply with the target-setting and reporting requirements of SB X7-7.

As a wholesale water agency, Metropolitan is not required to establish or report on an urban water use reduction target. However, Metropolitan's regional conservation programs and local resource programs are designed to assist member agencies and retail water suppliers in the service area to comply with SB X7-7. Therefore, Metropolitan monitors the progress of its service area. Also, in compliance with SB X7-7, Metropolitan assesses its actions, programs, and policies to help achieve the water use reductions required by SB X7-7.

Based on an analysis of population, demand, and the methodologies for setting targets described in the legislation, Metropolitan's baseline per capita water use is 182 GPCD, and the 2020 reduction target is 146 GPCD. From 2011 to 2014, there was a slight increase in per capita water use explained in part by continued economic recovery and drier weather as compared to previous years. With mandatory restrictions from the state and implementation of Metropolitan's Water Supply Allocation Plan, Metropolitan's 2015 UWMP reported an interim water use reduction achievement of 131 gallons per capita per day (GPCD), which is a 28 percent reduction from the baseline. Over the last five years, Metropolitan continued to provide support for retail agency water use reduction efforts through technical assistance, legislation, code and standards updates, and financial incentives where needed to increase water use efficiency. Based on best available data as of January 2021, Metropolitan estimates

a 2019 per capita water use of 121 GCPD, well exceeding Metropolitan's 2020 water use target of 146 GPCD with a 34 percent reduction from the baseline.

### *Supply Capabilities*

The 2020 UWMP reports on Metropolitan's water reliability and identifies projected supplies to meet the long-term demand within its service area. For the 2020 UWMP reliability assessments, Metropolitan's supply capabilities are evaluated using the following assumptions for its imported supplies:

#### *Colorado River Supplies*

Colorado River supplies include Metropolitan's basic Colorado River apportionment, along with supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA) and related agreements, and the exchange agreement with SDCWA. The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's supplies. These include the PVID Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead. These stored supplies can be used to supply additional water to ensure that, when needed, Metropolitan can deliver up to Metropolitan's Colorado River Aqueduct (CRA) capacity of 1.25 MAF.

In light of declining reservoir levels, the Lower Basin Drought Contingency Plan (DCP) was signed in 2019. This agreement incentivizes storage in Lake Mead and requires certain volumes of water be stored in Lake Mead under certain Lake Mead elevation levels through 2026. Metropolitan is to store certain volumes of water in Lake Mead as DCP ICS once Lake Mead is below elevation 1,045 feet. This agreement also increases Metropolitan's flexibility to take delivery of water stored as ICS at Lake Mead elevations below 1,075 feet. The goal of this agreement is to keep Lake Mead above critical elevations, and overall, it increases Metropolitan's flexibility to store water in Lake Mead in greater volumes and to take delivery of stored water to fill the CRA as needed.

Projections for Colorado River supplies for the 2020 UWMP are based on the United States Bureau of Reclamation's (USBR) Colorado River Simulation System (CRSS) modeling developed in January 2021, which is the latest available at the time of production of this plan. USBR modeling is used to estimate Metropolitan's basic apportionment and the availability of QSA and other related programs.

#### *State Water Project Supplies*

State Water Project (SWP) supplies are estimated using the 2019 SWP Delivery Capability Report distributed by the California Department of Water Resources (DWR) in August 2020. The 2019 Delivery Capability Report presents the current DWR estimate of the amount of water deliveries for current (2020) conditions and conditions 20 years in the future under DWR's set of stated assumptions. These estimates incorporate restrictions on SWP and Central Valley Project (CVP) operations in accordance with water quality objectives established by the State Water Resources Control Board, the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued on October 21, 2019, and the Incidental Take Permit issued by the California Department of Fish and Wildlife on March 31, 2020. In addition, these estimates incorporate amendments to the Coordinated Operations Agreement between the Central

Valley Project and the State Water Project made in 2018. Under the 2019 Delivery Capability Report, the delivery estimates for the SWP for 2019 conditions as percentage of Table A amounts are 7 percent, equivalent to 134 TAF for Metropolitan, under a single dry-year (1977) condition and 58 percent, equivalent to 1.1 MAF for Metropolitan, under the long-term average condition.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. Over the years, under the pumping restrictions of the SWP, Metropolitan has collaborated with the other contractors to develop numerous voluntary Central Valley/SWP storage and transfer programs. The goal of these storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

#### *Storage*

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities. Storage is a major component of Metropolitan's dry-year and emergency resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing the Water Supply Allocation Plan (WSAP), depends on its storage resources. Metropolitan's WSCP also underscores the importance of storage as it is identified as one of potential shortage response actions at various water shortage levels.

In developing the supply capabilities for the 2020 UWMP, Metropolitan assumed the current (2020) storage levels at the start of simulation and used the median storage levels going into each of the five-year increments based on the balances of supplies and demands. Under the median storage condition, there is an estimated 50 percent probability that storage levels would be higher than the assumption used, and a 50 percent probability that storage levels would be lower than the assumption used. All storage capability figures shown in the 2020 UWMP reflect actual storage program conveyance constraints. It is important to note that under some conditions, Metropolitan may choose to implement the WSAP in order to preserve storage reserves for a future year, instead of using the full supply capability. This can result in impacts at the retail level even under conditions where there may be adequate supply capabilities to meet demands.

### ***Findings of the 2020 Urban Water Management Plan***

The 2020 UWMP provides an assessment and summary of Metropolitan's water service reliability outlook through 2045 under the assumptions and cited sources of information described above. As a reporting document, the UWMP will be updated every five years to reflect changes in water demand and supply projections.

The 2020 UWMP satisfies all the content and process requirements mandated by the Act, including the required collaboration for its planning initiatives and report preparation. It should be noted that Metropolitan's primary planning venue is its IRP and that the scenario planning approach within its 2020 IRP is intended to extend Metropolitan's planning beyond single scenario outcomes like that shown within this UWMP. The key findings of Metropolitan's 2020 UWMP are as follows:

#### *Water Service Reliability and Projected Water Supplies*

- Metropolitan has completed its water service reliability assessment, under the stated UWMP assumptions and conditions required by the Act, and determined that it has supply capabilities sufficient to meet expected demands from 2025 through 2045 under a single dry-

year condition and a period of drought lasting five consecutive water years, as presented in Figure ES-1, as well as in a normal water year hydrologic condition.

- Metropolitan has evaluated its water shortage risk, under the stated UWMP assumptions and conditions required by the Act, and determined that it has supply capabilities sufficient for a drought period that lasts five consecutive water years based on the driest five-year historic sequence for Metropolitan's water supply. This Drought Risk Assessment was completed starting from the year following when the assessment is conducted (2021 through 2025) and is presented in Figure ES-2.
- Metropolitan has plans for supply implementation and continued development of a diversified resource portfolio including programs in the Colorado River, SWP, Central Valley storage and transfers programs, local resource projects, and in-region storage that enables the region to meet its water supply needs.
- Metropolitan has developed comprehensive plans for stages of actions it would undertake to address frequent and severe periods of droughts; six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage; and a catastrophic interruption in water supplies through its Water Shortage Contingency Plan, Water Surplus and Drought Management Plan (WSDM Plan)[2], and Water Supply Allocation Plan (WSAP)[3].
- Metropolitan continues to invest in measures that will help improve the region's water use efficiency over time.
- Metropolitan continues to plan for emergency and catastrophic scenarios, recently revising an Emergency Storage Objective to manage against potential interruption in water supplies resulting from catastrophic occurrences within the Southern California region, including seismic events along the San Andreas fault, and Seismic Risk Assessment and Mitigation Plan to assess the vulnerability of Metropolitan's water system and mitigate those vulnerabilities. In addition, Metropolitan is working with the State on the Delta Risk Management Strategy to reduce the impacts of a seismic event in the Delta that would cause levee failure and disruption of SWP deliveries.
- Metropolitan has and will continue to regard water quality with paramount importance to water supply reliability. Metropolitan owns and operates five water treatment plants, three of which are among the 10 largest in the world. Metropolitan is a national leader in providing safe drinking water that meets increasingly stringent standards, testing for over 400 constituents and performing nearly 200,000 water quality tests annually on samples gathered throughout its distribution system. Metropolitan's Water Quality Laboratory analyzes these samples to ensure that Metropolitan's delivered water meets or surpasses all state and federal drinking water standards. Because treatment to remove specific contaminants can be more costly than measures to protect water at the source, Metropolitan also actively supports improved watershed protection programs for its source waters in the Colorado River and State Water Project.

[2] The WSDM plan is a coordinated plan used to direct Metropolitan's resource operations to help attain the region's reliability goal recognizing the interdependence of surplus and shortage actions. The WSCP is consistent with the WSDM Plan. See Attachment A in Appendix 4.

[3] The WSAP is intended as an equitable approach for encouraging water use efficiency and minimizing regional impacts in times of shortage consistent with the principles and considerations approved by the Board through the WSDM Plan. See Attachment B in Appendix 4.

### *Challenges Ahead and Strategies for Managing Reliability Risks*

- Metropolitan faces a number of challenges in providing adequate, reliable, and high-quality supplemental water supplies for southern California: The Colorado River Basin has historically experienced large swings in annual hydrologic conditions; however, these swings have largely been buffered through a large volume of storage.
- Dramatic swings in annual hydrologic conditions have impacted water supplies available from the State Water Project (SWP) over the last decade. Metropolitan's efforts in building dry-year storage reserves, water banking and transfers have helped manage the wide swings in SWP allocations.
- With approximately 30 percent of Southern California's water supply transported across the Bay-Delta, its declining ecosystem has led to reduction in water supply deliveries. Operational constraints will likely continue until a long-term solution to the problems in the Bay-Delta is identified and implemented.
- Approximately half of the region's water supplies come from resources controlled or operated by local water agencies. These resources include water extracted from local groundwater basins, catchment of local surface water, non-Metropolitan imported water supplied through the Los Angeles Aqueduct, and Colorado River water exchanged for Metropolitan supplies.
- Water quality challenges, such as algae toxins, per- and polyfluoroalkyl substances (PFAS), and the identification of constituents of emerging concern, have a significant impact on the region's water supply conditions and underscore the importance of flexible and adaptive regional planning strategies.

Metropolitan continues to address these water supply challenges through a variety of actions that will maintain water reliability within its service area. Metropolitan's proactive measures include:

- **Continuing water conservation** by expanding outreach, adding devices, and increasing incentives to residents,
- **Increasing local resources** by providing incentives for on-site recycled water hook-up and the Local Resources Program (LRP),
- **Augmenting water supplies** through water transfers and exchanges,
- **Improving return capability of storage programs** to effectively take delivery of water when needed,
- **Maintaining dry year and emergency storage for the region** to remain reliable during periods of low supply and emergencies,
- **Modifying Metropolitan's distribution system** to enhance operational flexibility and efficient delivery of Colorado River, State Water Project, and in-region supplies within Metropolitan's service area,
- **Implementing shortage response actions** under the Water Shortage Contingency Plan and elements of the Water Surplus and Drought Management Plan and Water Supply Allocation Plan to distribute the limited imported supplies and preserve storage reserves, and
- **Responding to water quality concerns** by protecting the quality of the source water, developing water management programs that maintain and enhance water quality, and changing water treatment protocols or blending.

Sections 1.4 and 2.6 offer detailed discussions and additional insight on Metropolitan's current challenges, current available resources, short-term supply outlook, other supply reliability risks, and recent and near-term actions to meet these challenges.

**Figure ES -1 Supply Capabilities under Single Dry-Year and Droughts Lasting Five Consecutive Years**

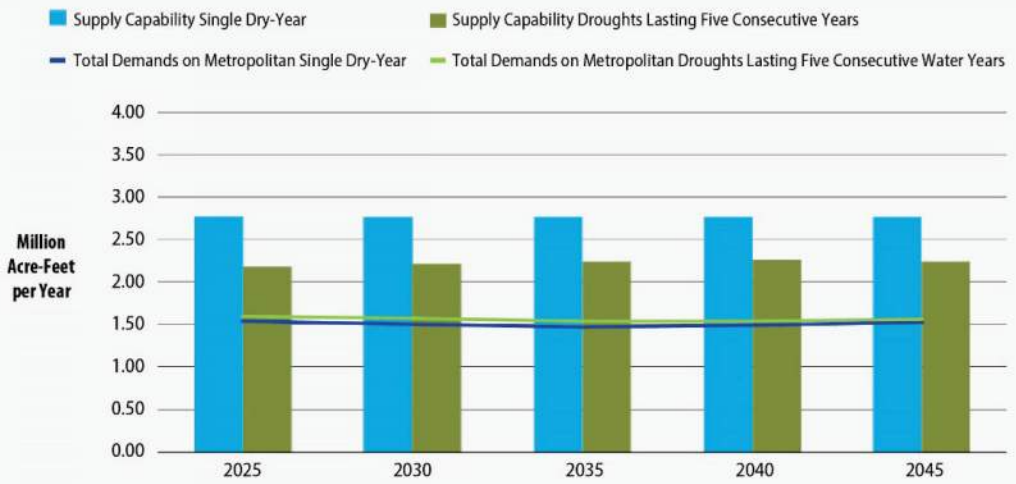


Notes:

1. Supply capabilities are derived using the simulated median storage level going into each of five-year increments based on the balances of supplies and demands. Under the median storage condition, there is an estimated 50 percent probability that storage levels would be higher than the assumption used, and a 50 percent probability that storage levels would be lower than the assumption used.
2. Under some conditions, Metropolitan may choose to implement the WSAP in order to preserve storage reserves for a future year, instead of using the full supply capability. This can result in impacts at the retail level even under conditions where there may be adequate supply capabilities to meet firm demands.
3. All storage capability figures shown in the 2020 UWMP reflect actual storage program conveyance constraints.
4. Total demands on Metropolitan illustrated in the figure includes delivery obligations associated with Exchange with SDCWA.

**Figure ES -2 Drought Risk Assessment for 2021-2025**

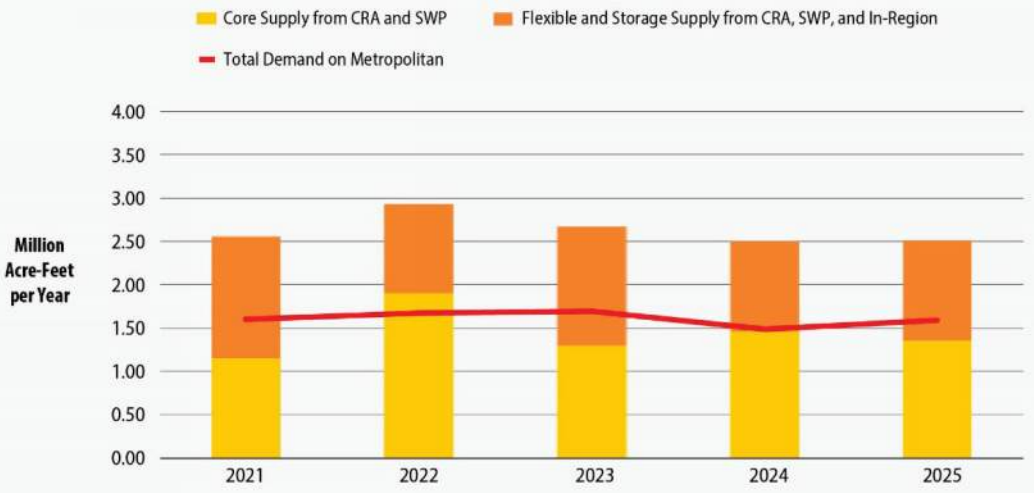


Notes:

1. Drought risk assessment for 2021-2025 is based on historic 1988 to 1992 conditions (driest five consecutive year historic sequence for Metropolitan's water supply) .
2. Shortfall from core supplies may be met through supply augmentation actions by exercising Metropolitan's flexible supplies and storage from CRA, SWP, and In-Region.
3. As of January 2021, Metropolitan has 3.2 MAF of dry-years supplies that may be utilized to meet sfortfall from core supplies.
4. Metropolitan may also implement demand reduction and operational flexibility as part of its shortage response actions, if needed.
5. Total Demand on Metropolitan illustrated in the figure includes delivery obligations associated with Exchange with SDCWA.

# Introduction 1

## 1.1 Introduction to this Document and the Agency

### *Organization of this Document*

Metropolitan's 2020 Urban Water Management Plan (UWMP) was prepared in compliance with California Water Code (CWC) Sections 10610 through 10657 of the Urban Water Management Planning Act (Act), which were added by Statute 1983, Chapter 1009 and became effective on January 1, 1984, and Section 10608.36 of SB X7-7, which was enacted in 2009. In addition to complying with the Act, this report details Metropolitan's current situation and how it will meet the challenges of the future.

This document contains five sections. The first section is the Introduction that defines Metropolitan in terms of governance, structure, and current water supply status. This section also briefly outlines how Metropolitan will meet current and future challenges. The second section describes Metropolitan's planning activities and explains how the agency will manage the region's water resources to ensure a reliable water supply for the region. The third section describes the actions Metropolitan has taken to implement the plans outlined in Section 2 and lists future programs and activities. The fourth section addresses the issue of water quality and steps taken to deliver high-quality water to Metropolitan's service area. The fifth section details the public outreach component integrated with Metropolitan's planning processes. In addition, this document includes Appendices that contain supporting documents on the required and voluntary reporting elements. The sections are further described in detail below:

#### *Section 1 - Introduction*

In addition to demonstrating how this report complies with the Act, the 2020 UWMP details Metropolitan's current situation and outlines its plan for meeting the challenges of the future. The Introduction section includes:

- Discussion of the Act and Metropolitan's reporting responsibilities under the Act;
- Introduction to Metropolitan and description of its formation, purpose, service area, current and projected land uses, member agencies, and governance;
- Historical, economic, and demographic information on Metropolitan's service area;
- Discussion of Metropolitan's current condition, challenges, and resource planning strategies; and
- Evaluation of Metropolitan's supply capabilities during a drought lasting five consecutive water years.

#### *Section 2 - Planning for the Future*

The Planning for the Future section discusses how Metropolitan plans to meet Southern California's water needs in the future. The section highlights the importance of Integrated Water Resources Planning (IRP) by summarizing Metropolitan's planning processes over the years and

emphasizes the need for Metropolitan to implement adaptive and multiple scenario planning strategies that will prepare the region to deal with uncertainties. This section also includes:

- Evaluation of regional water demand under a normal water year, single dry-year, and droughts lasting at least five years, for years 2025 through 2045;
- Evaluation of supply capabilities under a normal water year, single dry-year, and droughts lasting at least five consecutive water years, for years 2025 through 2045;
- Evaluation of frequent and severe periods of droughts, as described in the Drought Risk Assessment for years 2021 through 2025;
- Preparation and adoption of Water Shortage Contingency Plan (WSCP), including a discussion of Metropolitan's Emergency Storage Objective and Seismic Risk Assessment and Mitigation Plan;
- Discussion of other supply reliability risks including climate change; and
- Discussion of the different elements of Metropolitan's rate structure and revenue management.

### *Section 3 – Implementing the Plan*

The Implementing the Plan section summarizes Metropolitan's progress in developing a diversified resource mix that enables the region to meet its water supply needs. The investments that Metropolitan has made and its continuing efforts in many different areas coalesce toward its goal of long-term supply reliability for the region. This section includes:

- Discussion of resources and program development for the Colorado River, SWP, Central Valley/SWP storage and transfers programs, conservation, local resources program (groundwater recovery, recycling, desalination), and groundwater; and
- Discussion of Metropolitan's measures, programs, and policies to help achieve the SB X7-7 goal of 20 percent water use reduction by 2020 and the region's progress in meeting this target.

### *Section 4 - Water Quality*

The Water Quality section identifies key regional water quality issues and discusses the protection of the quality of source water and development of water management programs that maintain and enhance water quality. This section also includes:

- Discussion of water quality issues of concern, constituents of emerging concern, and water quality programs that Metropolitan has undertaken to protect its water supplies.

### *Section 5 – Coordination and Public Outreach*

The Coordination and Public Outreach section presents the processes undertaken in the development of the 2020 IRP, 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP with the public and other stakeholders. It provides a list of all meetings and workshops conducted to promote and achieve consensus and collaborative planning. Included in this section are the public notification letters and announcements distributed by Metropolitan as required by the Act and copies of the Metropolitan resolutions adopting and approving the 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP for submittal to DWR.

### *Appendices*

The appendices provide detailed background on the information presented in the 2020 UWMP.

Appendix 1 - Demand Forecast

Appendix 2 - Existing Regional Water Supplies

Appendix 3 - Justifications for Supply Projections

Appendix 4 - Water Shortage Contingency Plan

Appendix 5 - Local Projects

Appendix 6 - Conservation Estimates and Water Savings from Codes, Standards, and Ordinances

Appendix 7 - Distribution System Water Losses

Appendix 8 - Emergency Storage Objective

Appendix 9 - Seismic Risk Assessment and Mitigation Plan

Appendix 10 - Metropolitan's Energy Intensity Calculations, Including Conveyance and Distribution Generation

Appendix 11 - Quantifying Regional Self-Reliance and Reduced Reliance on Water Supplies from the Delta Watershed

Appendix 12 - DWR 2020 UWMP Submittal Tables

### *Urban Water Management Planning Act*

This report has been prepared in compliance with Water Code Sections 10610 through 10657 of the Urban Water Management Planning Act (Act). This Act requires that "*every urban water supplier shall prepare and adopt an urban water management plan*" (Water Code § 10620(a)). An "urban water supplier" is defined as a supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually (Water Code § 10617). These plans must be filed with the California Department of Water Resources (DWR) every five years. Recent amendments to the Act changed the Water Code to require each urban supplier to update and submit its 2020 UWMP by July 1, 2021 and changed the update and submittal dates for subsequent UWMPs to July 1 in years ending in 6 and 1.

### *Changes in the Act since 2015*

There have been numerous changes made and new requirements added to the Act since the 2015 UWMP. Set forth below is a general overview of the key current and new requirements for urban wholesale suppliers. Detailed descriptions of these existing and new requirements are provided in the various sections of this 2020 UWMP.

- Detailed evaluation of the supplies necessary to meet demands over at least a 20-year period, in five-year increments, under a normal water year, single dry-year, and droughts lasting at least five consecutive water years;
- Instead of a water shortage contingency analysis, suppliers must adopt a water shortage contingency plan which includes 10 prescribed elements, such as the procedures used to conduct an annual water supply and demand assessment; six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage; and shortage response actions that align with the defined shortage levels;
- Drought risk assessment which includes: (i) the data, methodology, and basis for one or more supply shortage conditions necessary to conduct a drought risk assessment for a 5-year

drought; (ii) a determination of the reliability of each supply source under a variety of water shortage conditions; (iii) a comparison of total available water supply sources to total projected water use for the drought period; and (iv) a consideration of historical drought hydrology, projected supplies and demands under climate change conditions, and anticipated regulatory changes;

- Water use projections, where available, must display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans;
- Simple lay description of information necessary to provide a general understanding of the UWMP;
- Description of supplier's service area must include current and projected land uses affecting supplier's water management planning;
- Seismic risk assessment and mitigation plan;
- Compliance with the Act is required in order for a supplier to be eligible for a water grant or loan;
- Energy information that a supplier can readily obtain; and
- Evaluation of reasonable and practical efficient water uses, recycling, and conservation activities.

### *Senate Bill 7 of the Seventh Extraordinary Session of 2009, Water Conservation in the Delta Legislative Package*

In addition to changes to the Act, the state Legislature passed Senate Bill 7 as part of the Seventh Extraordinary Session, referred to as SB X7-7, on November 10, 2009, which became effective February 3, 2010. This law was the water conservation component to the historic Delta legislative package and seeks to achieve a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. This implements the Governor's similar 2008 water use reduction goals. The law requires each urban retail water supplier to develop urban water use targets to help meet the 20 percent goal by 2020, and an interim urban water reduction target by 2015.

The bill states that the legislative intent is to require all water suppliers to increase the efficiency of use of water resources and to establish a framework to meet the state targets for urban water conservation called for by the Governor. The bill establishes methods for urban retail water suppliers to determine targets to help achieve increased water use efficiency by the year 2020. The law is intended to promote urban water conservation standards consistent with the California Urban Water Conservation Council's adopted best management practices.

Urban wholesale water suppliers are not required to perform all of the target-setting and reporting requirements of SB X7-7. However, wholesale agencies must include in their UWMPs an assessment of present and proposed future measures, programs, and policies that would help achieve the water use reductions required under this law (Water Code § 10608.36).

Sections 3.4, 3.5, and 3.7 of this plan address actions Metropolitan took to help urban retail water suppliers to achieve the urban per capita water use reduction pursuant to the goals set forth in SB X7-7.

### *Metropolitan's Compliance with the Urban Water Management Planning Act*

As with Metropolitan's previous plans, this Plan does not explicitly discuss specific activities undertaken by member agencies unless they relate to one of Metropolitan's water demand or supply management programs. Presumably, each member agency will discuss these activities in its Urban Water Management Plan, but elements of this Plan do not necessarily have to be adopted by the urban water suppliers or the public agencies directly providing retail water.

### *DWR Guidance*

In April 2021, DWR issued the final 2020 UWMP Guidebook for urban water suppliers (DWR Guidebook). The 2020 DWR Guidebook was updated from the 2015 version to reflect new legislation. As part of the Guidebook, DWR updated the Standardized Submittal Tables for the reporting and submittal of UWMP data to DWR. As mentioned above, water suppliers are required to use these Standardized Submittal Tables for electronic submittal of their UWMPs to DWR to satisfy the legislative requirement (Water Code § 10644(a)(2)). For the 2020 UWMP, Metropolitan electronically submitted the Standardized Submittal Tables to DWR through its Water Use Efficiency portal. In addition, Metropolitan included the Standardized Submittal Tables in this plan as Appendix 12.

The 2020 DWR Guidebook includes a voluntary checklist to show reporting of required elements to assist DWR with its review of the submitted UWMP. Included in the beginning of this 2020 UWMP is a compliance checklist, organized by Water Code section, which summarizes Metropolitan's response to the requirements of the Water Code and indicates where each required element can be found in the Plan.

## 1.2 The Metropolitan Water District of Southern California

### *Formation and Purpose*

The Metropolitan Water District of Southern California (Metropolitan) is a public agency organized in 1928 by a vote of the electorates of 13 Southern California cities. The agency was enabled by the adoption of the original Metropolitan Water District Act (MWD Act) by the California Legislature "for the purpose of developing, storing and distributing water for domestic purposes." The MWD Act also allows Metropolitan to sell "surplus water not needed or required for domestic or municipal uses within the district for beneficial purposes." In 1992, the Metropolitan Board of Directors adopted the following mission statement:

> *"To provide its service area with adequate and reliable supplies of high quality water to meet present and future needs in an environmentally and economically responsible way."*

The first function of Metropolitan was building the Colorado River Aqueduct (CRA) to convey water from the Colorado River. Deliveries through the aqueduct to member agencies began in 1941 and supplemented the local water supplies of the Southern California member cities. In 1960, to meet growing water demands in its service area, Metropolitan contracted for participation in the State Water Project (SWP), which is owned and operated by DWR and would deliver additional water supplies via the California Aqueduct. SWP deliveries began in 1972. Metropolitan currently receives imported water from both of these sources: (1) Colorado River water via the CRA, and (2) the SWP via the California Aqueduct.

### *Service Area*

Metropolitan's service area covers the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the city of Oxnard on the north to the international boundary with Mexico on the south, and it reaches as far as 70 miles inland from the coast (Figure 1-1). The total area served is approximately 5,200 square miles, and it includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Table 1-1 shows that although only 14 percent of the land area of the six Southern California counties is within Metropolitan's service area, approximately 86 percent of the populations of those counties reside within Metropolitan's boundaries.

### *Member Agencies*

Metropolitan is currently composed of 26 voluntary member agencies, including 14 cities, 11 municipal water districts, and one county water authority. Metropolitan is a water wholesaler with no retail customers. It provides treated and untreated water directly to its member agencies.

Metropolitan's 26 member agencies deliver to their customers a combination of local groundwater, local surface water, recycled water, and imported water purchased from or exchanged with Metropolitan. For some member agencies, Metropolitan supplies most of the water used within that agency's service area, while others obtain varying amounts of water from Metropolitan to supplement local supplies. Between 2011 and 2020, Metropolitan has provided between 40 and 50 percent of the municipal, industrial, and agricultural water used in its service area. The remaining water supply comes from local wells, local surface water, recycling, and the city of Los Angeles' aqueducts from the Owens Valley/Mono Basin east of the Sierra Nevada. Member agencies also implement conservation and other programs that can be considered part of their supplies.

Some member agencies provide retail water service, while others provide water to the local area as wholesalers. Table 1-2 shows Metropolitan's member agencies and the type of service that they provide. As shown in the table, 15 member agencies provide retail service to customers, 9 provide only wholesale service, and 2 provide a combination of both. Throughout Metropolitan's service area, approximately 250 retail water suppliers directly serve the population.

Metropolitan's member agencies serve residents in 152 cities and 89 unincorporated communities. Table 1-3 shows the member agencies of Metropolitan, as well as the cities and communities served by those member agencies. Figure 1-1 also shows the geographical area served by the member agencies.

Currently, member agencies receive water from Metropolitan at various delivery points, and pay for service through a rate structure made up of multiple components. The majority of these components consist of uniform volumetric rates, and the majority of the revenue is collected through these volumetric rates. Metropolitan's pricing and rate structure are described in detail in Section 2.7.

To aid in planning future water needs, member agencies advise Metropolitan in July of each year of how much water they anticipate they will need during the next five years. In addition, Metropolitan works with its member agencies to forecast future water demands.

**Table 1-1**
**July 1, 2020 Area and Population in the**
**Six Counties of Metropolitan's Service Area**

| County | Total County | In Metropolitan Service Area | Percent in Metropolitan |
|---|---|---|---|
| **Land Area (Square Miles)** | | | |
| Los Angeles County | 4,061 | 1,408 | 35% |
| Orange County | 789 | 699 | 89% |
| Riverside County | 7,208 | 1,057 | 15% |
| San Bernardino County | 20,052 | 242 | 1% |
| San Diego County | 4,200 | 1,420 | 34% |
| Ventura County | 1,845 | 365 | 20% |
| **Metropolitan's Service Area** | **38,155** | **5,191** | **14%** |
| ***Population (Persons)*** | | | |
| Los Angeles County | 10,172,000 | 9,275,000 | 91% |
| Orange County | 3,191,000 | 3,184,000 | 100% |
| Riverside County | 2,449,000 | 1,813,000 | 74% |
| San Bernardino County | 2,184,000 | 872,000 | 40% |
| San Diego County | 3,352,000 | 3,261,000 | 97% |
| Ventura County | 841,000 | 630,000 | 75% |
| **Metropolitan's Service Area** | **22,189,000** | **19,035,000** | **86%** |

Source: State of California, Department of Finance, E-2. California County Population Estimates and Components of Change by Year, July 1, 2010-2020. Sacramento, California, December 2020.

**Table 1-2**
**Metropolitan's Member Agencies and Type of Water Service Provided**

| Member Agency | Retail or Wholesale |
|---|---|
| **Los Angeles County** | |
| Beverly Hills, City of | Retail |
| Burbank, City of | Retail |
| Central Basin Municipal Water District | Wholesale |
| Compton, City of | Retail |
| Foothill Municipal Water District | Wholesale |
| Glendale, City of | Retail |
| Las Virgenes Municipal Water District | Retail |
| Long Beach, City of | Retail |
| Los Angeles, City of | Retail |
| Pasadena, City of | Retail |
| San Fernando, City of | Retail |
| San Marino, City of | Retail |
| Santa Monica, City of | Retail |
| Three Valleys Municipal Water District | Wholesale |
| Torrance, City of | Retail |
| Upper San Gabriel Valley Municipal Water District | Wholesale |
| West Basin Municipal Water District | Wholesale |
| **Orange County** | |
| Anaheim, City of | Retail |
| Fullerton, City of | Retail |
| Municipal Water District of Orange County | Wholesale |
| Santa Ana, City of | Retail |
| **Riverside County** | |
| Eastern Municipal Water District | Retail & Wholesale |
| Western Municipal Water District | Retail & Wholesale |
| **San Bernardino County** | |
| Inland Empire Utilities Agency | Wholesale |
| **San Diego County** | |
| San Diego County Water Authority | Wholesale |
| **Ventura County** | |
| Calleguas Municipal Water District | Wholesale |

## Table 1-3
## Member Agencies

***THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA***

| Municipal Water Districts (11) | | Member Cities (14) | | | County Water Authorities (1) |
|---|---|---|---|---|---|
| Calleguas | Las Virgenes | Anaheim | Glendale | San Marino | San Diego |
| Central Basin | Orange County | Beverly Hills | Long Beach | Santa Ana | |
| Foothill | Three Valleys | Burbank | Los Angeles | Santa Monica | |
| Inland Empire | Upper San Gabriel Valley | Compton | Pasadena | Torrance | |
| Eastern | West Basin | Fullerton | San Fernando | | |
| | Western | | | | |

***CALLEGUAS MWD***
*Camarillo*
*Camarillo Heights*
*Fairview*
*Lake Sherwood Valley*
*Las Posas*
*Moorpark*
*NAWS Point Mugu*
*NCBC Port Hueneme*
*Oak Park*
*Oxnard*
*Port Hueneme*
*Santa Rosa Valley*
*Simi Valley*
*Somis*
*Thousand Oaks*

**Central Basin MWD**
*Artesia*
*Bell*
*Bellflower*
*Bell Gardens*
*Cerritos*
*Commerce*
*Cudahy*
*Downey*
*East Los Angeles*
*Florence*
*Hawaiian Gardens*
*Huntington Park*
*La Habra Heights*
*Lakewood*
*La Mirada*
*Lynwood*
*Maywood*
*Montebello*
*Norwalk*
*Paramount*
*Pico Rivera*
*Santa Fe Springs*
*Signal Hill*
*South Gate*
*South Whittier*
*Vernon*
*Whittier*

**Foothill MWD**
*Altadena*
*La Cañada Flintridge*
*La Crescenta*
*Montrose*

***INLAND EMPIRE***
*Chino*
*Chino Hills*
*Fontana*
*Montclair*
*Ontario*
*Rancho Cucamonga*
*Upland*

***Eastern MWD***
*Good Hope*
*Hemet*
*Homeland*
*Juniper Flats*
*Lakeview*
*Mead Valley*
*Menifee*
*Moreno Valley*
*Murrieta*
*Murrieta Hot Springs*
*Nuevo*
*North Canyon Lake*
*Perris*
*Quail Valley*
*Romoland*
*San Jacinto*
*Sun City*
*Temecula*
*Valle Vista*
*Winchester*

**Las Virgenes MWD**
*Agoura*
*Agoura Hills*
*Calabasas*
*Chatsworth*
*Hidden Hills*
*Lake Manor*
*Malibu Lake*
*Monte Nido*
*Westlake Village*
*West Hills*

***MWD OF ORANGE COUNTY***
*Aliso Viejo*
*Brea*
*Buena Park*
*Capistrano Beach*
*Corona Del Mar*
*Costa Mesa*
*Coto De Caza*
*Cypress*
*Dana Point*
*Fountain Valley*
*Garden Grove*
*Huntington Beach*
*Irvine*
*Laguna Beach*
*Laguna Hills*
*Laguna Niguel*
*Laguna Woods*
*La Habra*
*Lake Forest*
*La Palma*
*Leisure World*
*Los Alamitos*
*Mission Viejo*
*Monarch Beach*
*Newport Beach*
*Orange*
*Placentia*
*Rancho Santa Margarita*
*San Clemente*
*South Laguna*

***MWD OF ORANGE COUNTY (cont.)***
*San Juan Capistrano*
*Seal Beach*
*Stanton*
*Tustin*
*Tustin Foothills*
*Villa Park*
*Westminster*
*Yorba Linda*

***Three Valleys MWD***
*Azusa*
*Charter Oak*
*Claremont*
*Covina*
*Covina Knolls*
*Diamond Bar*
*Glendora*
*Industry*
*La Verne*
*Pomona*
*Rowland Heights*
*San Dimas*
*So. San Jose Hills*
*Walnut*
*West Covina*

**Upper San Gabriel Valley MWD**
*Arcadia*
*Avocado Heights*
*Baldwin Park*
*Bradbury*
*Citrus*
*Covina*
*Duarte*
*El Monte*
*Glendora*
*Hacienda Heights*
*Industry*
*Irwindale*
*La Puente*
*Mayflower Village*
*Monrovia*
*Rosemead*
*San Gabriel*
*South El Monte*
*South Pasadena*
*South San Gabriel*
*Temple City*
*Valinda*
*West Covina*
*West Puente Valley*

***WEST BASIN MWD***
*Alondra Park*
*Carson*
*Culver City*
*El Segundo*
*Gardena*
*Hawthorne*
*Hermosa Beach*
*Inglewood*
*Ladera Heights*
*Lawndale*
*Lennox*

***WEST BASIN MWD (cont.)***
*Lomita*
*Malibu*
*Manhattan Beach*
*Marina Del Rey*
*Palos Verdes Estates*
*Rancho Palos Verdes*
*Redondo Beach*
*Rolling Hills*
*Rolling Hills Estates*
*Ross-Sexton*
*Topanga Canyon*
*West Athens*
*West Hollywood*

***WESTERN MWD OF*** **Riverside County**
*Bedford Heights*
*Canyon Lakes*
*Corona*
*Eagle Valley*
*El Sobrante*
*Jurupa*
*Lake Elsinore*
*Lake Mathews*
*March AFB*
*Murrieta*
*Norco*
*Riverside*
*Rubidoux*
*Temecula*
*Temescal Canyon*
*Woodcrest*

***SAN DIEGO CWA***
*Alpine*
*Bonita*
*Bonsall*
*Camp Pendleton*
*Carlsbad*
*Casa De Oro*
*Chula Vista*
*Del Mar*
*El Cajon*
*Encinitas*
*Escondido*
*Fallbrook*
*Lakeside*
*La Mesa*
*Lemon Grove*
*Mount Helix*
*National City*
*Oceanside*
*Pauma Valley*
*Poway*
*Rainbow*
*Ramona*
*Rancho Santa Fe*
*San Diego*
*San Marcos*
*Santee*
*Solana Beach*
*Spring Valley*
*Valley Center*
*Vista*

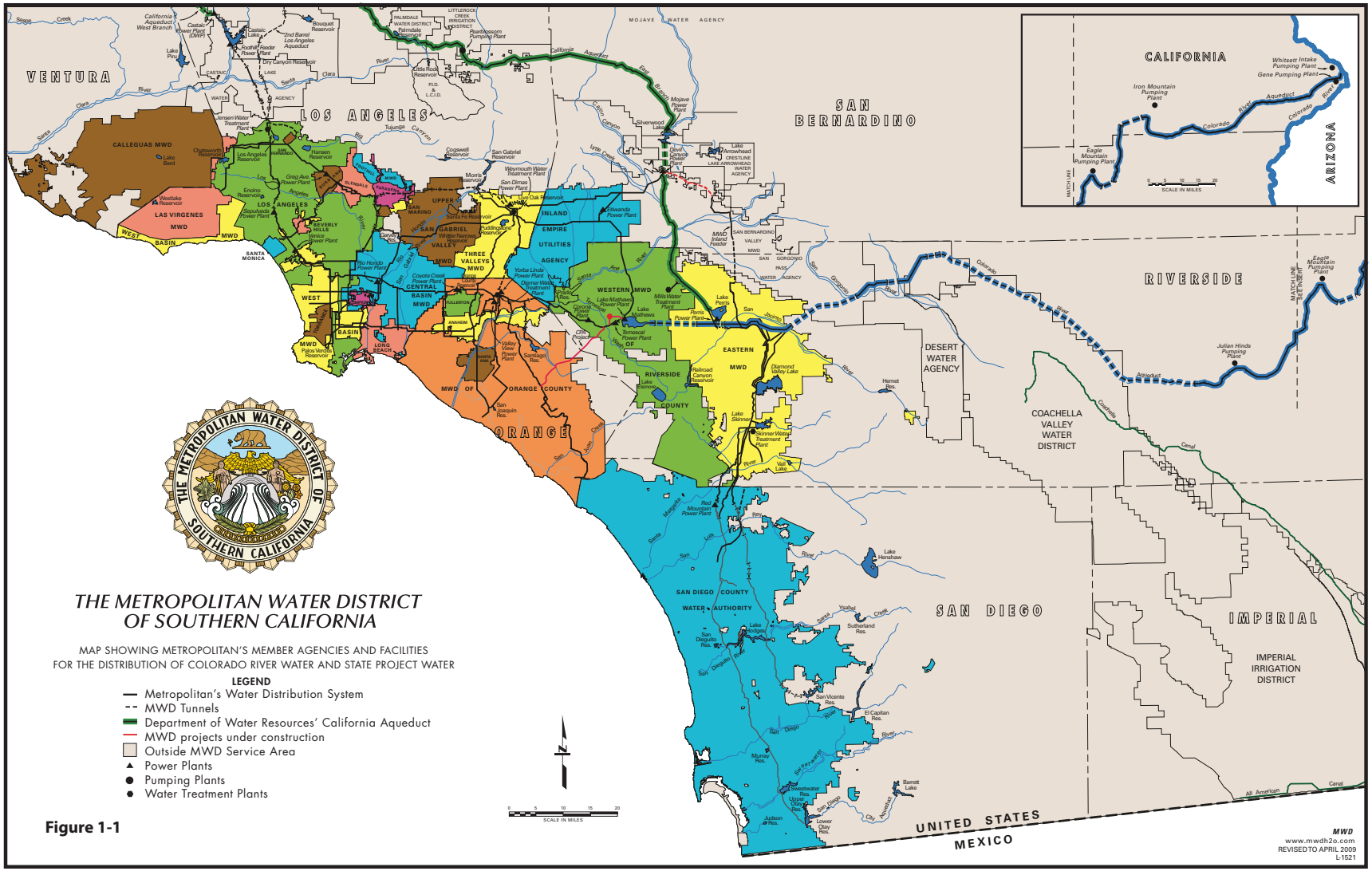
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
MAP SHOWING METROPOLITAN'S MEMBER AGENCIES AND FACILITIES
FOR THE DISTRIBUTION OF COLORADO RIVER WATER AND STATE PROJECT WATER
LEGEND
Metropolitan's Water Distribution System
MWD Tunnels
Department of Water Resources' California Aqueduct
MWD projects under construction
Outside MWD Service Area
Power Plants
Pumping Plants
Water Treatment Plants
VENTURA
LOS ANGELES
SAN BERNARDINO
RIVERSIDE
ORANGE
SAN DIEGO
IMPERIAL
ARIZONA
CALIFORNIA
UNITED STATES
MEXICO
DESERT WATER AGENCY
COACHELLA VALLEY WATER DISTRICT
IMPERIAL IRRIGATION DISTRICT
SAN DIEGO COUNTY WATER AUTHORITY
MWD
www.mwdh2o.com
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**Figure 1-1**

### *Board of Directors and Management Team*

Metropolitan's Board of Directors currently consists of 38 directors. The Board consists of at least one representative from each member agency, with each agency's assessed valuation determining its additional representation and voting rights. Directors can be appointed by the chief executive officer of the member agency or be elected by a majority vote of the governing body of the agency. Metropolitan does not compensate directors for their service. The Board includes business, professional, and civic leaders. Board meetings are generally held on the second Tuesday of each month and are open to the public.

Throughout its history, the Board has delegated certain tasks to Metropolitan staff, which are codified in Metropolitan's Administrative Code. In addition, Metropolitan has developed policy principles to help achieve its mission to provide adequate and reliable supplies of high-quality water in an environmentally and economically responsible way. These policies can be found in a variety of documents including: specific policy statements, the Administrative Code, Board-adopted policy principles, and letters submitted to the Board. Policy statements are also embedded in formal Board meeting discussions and recorded in meeting minutes. The policies established by the Board are subject to all applicable laws and regulations. The management of Metropolitan is under the direction of its General Manager, who serves at the discretion of the Board, as do Metropolitan's General Auditor, General Counsel, and Ethics Officer.

## 1.3 Metropolitan Service Area Historical Information

### *Population*

In 1990, the population of Metropolitan's service area was approximately 15.0 million people. By 2020, it had reached an estimated 19.0 million, representing almost half of the state's population. In the past, annual growth has varied from about 200,000 annually in the 1970s and early-to-mid-1980s to more than 300,000 annually in the late 1980s. Population growth slowed due to economic recession during the early 1990s to just over 50,000 in 1995, before again rising to more than 250,000 per year in the period 1999 through 2002. Growth has generally averaged 90,000 persons per year during the last 10 years from 2011-2020. Figure 1-2 shows the service area population growth from 1970 to 2020. From 2019 to 2020, the region experienced net decline in population due to the COVID-19 pandemic.

The most populated cities within Metropolitan's service area are Los Angeles (largest city in the state), San Diego (second largest in the state), Long Beach, Anaheim, Santa Ana, and Riverside. The Department of Finance State Population Report from May 2020 reports biggest numeric increases occurring in the cities of Los Angeles and San Diego, consistent with their larger population base. Figure 1-3 shows the 5-year growth rates for the six counties within Metropolitan's service area. As can be seen from this figure, there has been an overall decrease in population growth rate in the last 5 years. Appendix 1 presents a detailed discussion of the demographic trends in Southern California and their impacts on regional demand forecasts.

In preparing its demographic and growth forecast, Metropolitan relied on Southern California Association of Government's (SCAG's) 2020 Demographics and Growth Forecast Proposed Final Technical Report to the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). The report includes information on social factors affecting water management such as race, ethnicity, and cultures. As noted in SCAG's report, Southern California is one of the most diverse regions in the nation in race and ethnicity. Race and ethnicity are important for demographers to consider while forecasting since fertility and household formation have strong cultural underpinnings that vary based on these categories.

**Figure 1-2 Service Area Population Growth 1970-2020**

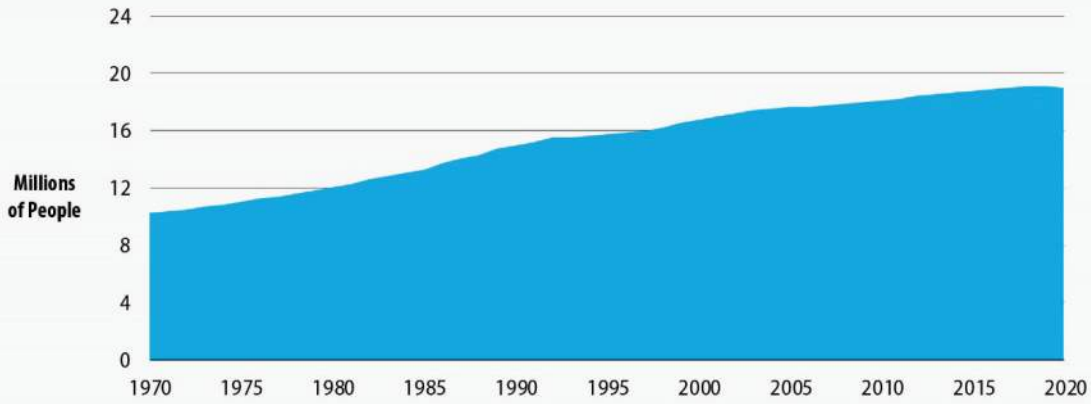


SOURCE: U.S. Census, California Department of Finance and Metropolitan

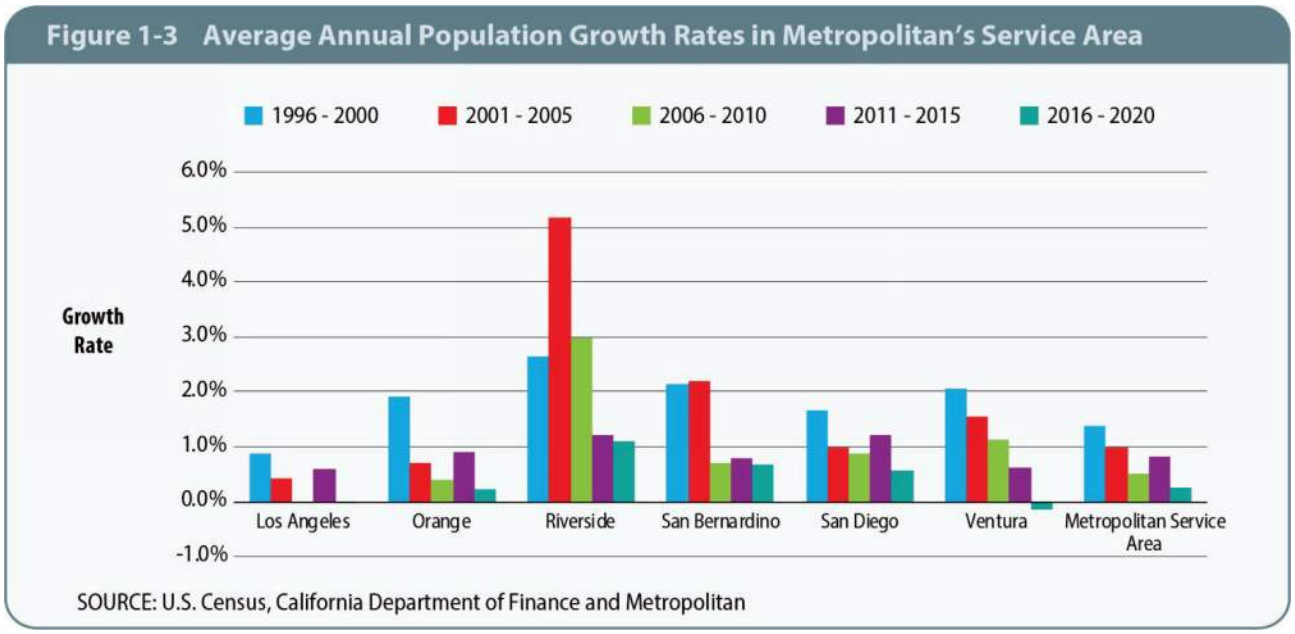


### *Historical Retail Water Demands*

Figure 1-4 presents historical retail water demands on a calendar year basis in Metropolitan's service area. Since 1980, retail water demands varied from 2.9 million acre-feet (MAF) in 1983 to nearly 4.2 MAF in 2007. Following record demand in 1990 of over 3.9 MAF, due to the economic recession, drought impacts, conservation, and mandatory water use restrictions, demands declined to 3.1 MAF in 1991. Demand remained below the historic peak level as a result of continuing effects from the recession and the drought, coupled with a number of wet years and ongoing conservation efforts. In 2000, retail demands once again reached 3.9 MAF, reaching the early peak level for the first time in a decade. Since 2000, retail demands reached a new peak level in 2007 with nearly 4.2 MAF. Calendar year 2007 was the driest year since 1989, with precipitation measured at 5.66 inches in Downtown Los Angeles. Since the peak retail demand in 2007, a decrease in demand was observed during the economic recession of 2008-2012. Starting in 2012, the severe drought in California led to a massive conservation campaign and water use restriction by the State, Metropolitan, and local water agencies resulting in a decrease in demand in 2015. Demands remain low even after the mandatory restriction was lifted in the spring of 2017.

In 2020, about 96 percent of retail demands were used for municipal and industrial purposes (M&I), and 4 percent for agricultural purposes. The relative share of agricultural water use has declined due to urbanization and market factors, including the price of water. Agricultural water use accounted for 19 percent of total regional water demand in 1970, 12 percent in 1980, 10 percent in 1990, and 4 percent in 2010.

**Figure 1-4 Retail Demand in Metropolitan's Service Area**

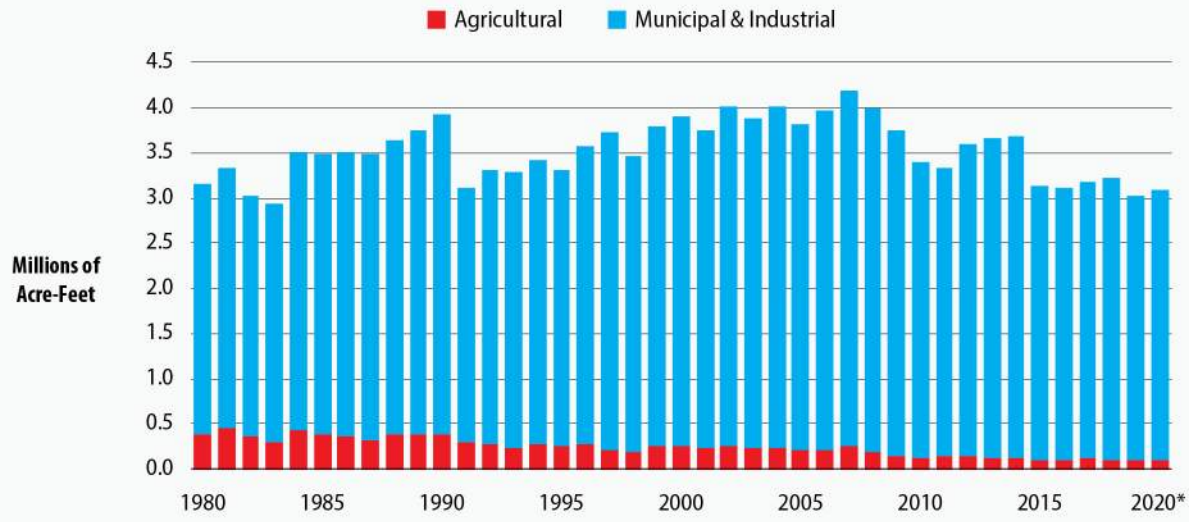


*Data not available. 2020 estimated based on historical data.

### *Climate and Rainfall*

As Figure 1-5 shows, Metropolitan's service area encompasses three major climate zones. Table 1-4 reports the average temperature and rainfall information for representative locations within those three zones for the 30-year period from 1990 to 2019. The evapotranspiration data (expressed as $Et_o$) are reported for the 30-year period of 1985 to 2014.

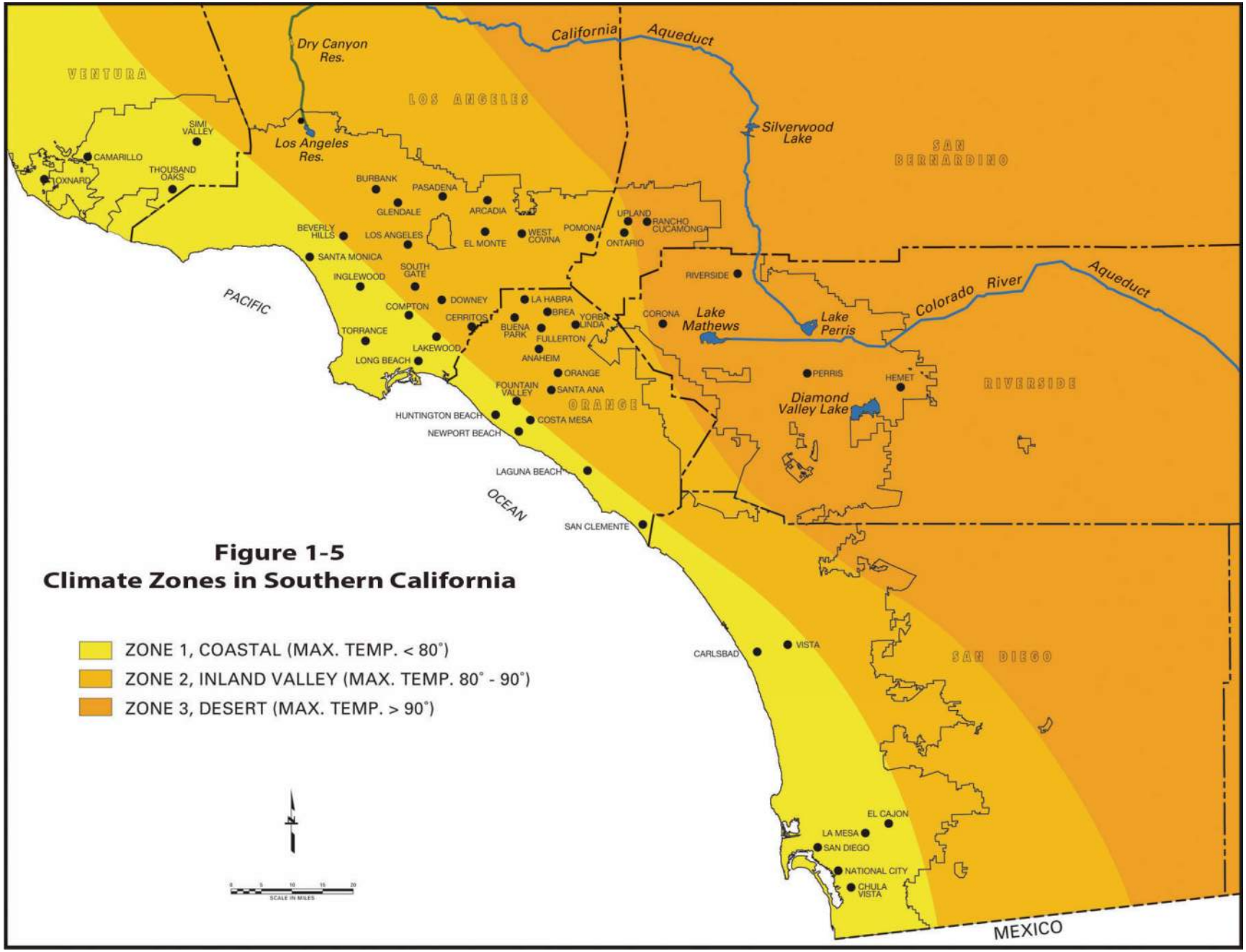


**Figure 1-5**
**Climate Zones in Southern California**

## Table 1-4 Weather Variables in Three Zones in Metropolitan's Service Area

30-year Average (1990-2019)

| Average Temperature | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angeles County[1] | 68.77 | 68.54 | 70.62 | 73.06 | 74.34 | 78.16 | 82.95 | 84.61 | 83.69 | 79.41 | 73.77 | 67.90 | 75.48 |
| Riverside County[2] | 65.89 | 65.55 | 66.45 | 68.22 | 68.98 | 71.18 | 74.87 | 76.85 | 76.64 | 74.04 | 70.15 | 65.42 | 70.35 |
| San Diego County[3] | 69.76 | 70.02 | 73.61 | 77.79 | 80.93 | 88.06 | 94.21 | 95.84 | 92.65 | 84.52 | 76.35 | 68.83 | 81.05 |

30-year Average (1990-2019)

| Average Precipitation | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angeles County[1] | 3.32 | 3.74 | 2.09 | 0.61 | 0.35 | 0.09 | 0.02 | 0.00 | 0.13 | 0.58 | 0.78 | 2.42 | 15.20 |
| San Diego[2] | 2.05 | 2.22 | 1.40 | 0.55 | 0.29 | 0.07 | 0.08 | 0.01 | 0.12 | 0.49 | 0.80 | 1.67 | 9.85 |
| Riverside[3] | 2.01 | 2.48 | 1.31 | 0.52 | 0.23 | 0.09 | 0.13 | 0.13 | 0.15 | 0.47 | 0.66 | 1.35 | 11.16 |

30-year Average (1985-2014)

| $Et_o$[4] | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Los Angeles County | 2.2 | 2.7 | 3.7 | 4.7 | 5.5 | 5.8 | 6.2 | 5.9 | 5.0 | 3.9 | 2.6 | 1.9 | 50.1 |
| San Diego | 2.5 | 2.9 | 4.2 | 5.3 | 5.9 | 6.6 | 7.2 | 6.9 | 5.4 | 4.1 | 2.9 | 2.6 | 56.4 |
| Riverside | 2.1 | 2.4 | 3.4 | 4.6 | 5.1 | 5.3 | 5.7 | 5.6 | 4.3 | 3.6 | 2.4 | 2.0 | 46.5 |

1. Temperature and precipitation data are from the National Oceanic and Atmospheric Administration, USC Station KCQT. Last updated February 18, 2020.
2. Temperature and precipitation data are from the National Oceanic and Atmospheric Administration, Riverside Station KNOC. February 18, 2020.
3. Temperature and precipitation data are from the National Oceanic and Atmospheric Administration, San Diego Airport Station KSAN. Last updated February 18, 2020.
4. Eto values are from Model Water Efficient Landscape Ordinance, September 10, 2009, Appendix A: Reference Evapotranspiration (Eto) Table.
Eto values were derived from: 1) California irrigation Management Information System (CIMIS); 2) Reference Evapotranspiration Zone Map, UC Department of Land, Air and Water Resources and California Department of Water Resources 1999; 3) Reference Evapotranspiration for California, UC Department of Resources, 1987, Bulletin 1922; and 4) Determining Daily Reference Evapotranspiration, UC Cooperative Extension, Division of Agriculture and Natural Resources, 1987, Publication Leaflet 21426.

## 1.4 Current Conditions

### *Current Challenges*

Metropolitan faces a number of challenges in providing adequate, reliable, and high-quality supplemental water supplies for southern California. One of those challenges is widely variable hydrologic conditions that can have a significant impact on Metropolitan's imported water supply sources. This section offers a brief discussion of Metropolitan's current challenges, current available resources, short-term supply outlook, and recent and near-term actions to meet these challenges.

Dramatic swings in annual hydrologic conditions have characterized the past decade on the State Water Project (SWP). 2014 saw the lowest allocation of contract supplies from the SWP up to that point, and 2015 saw the lowest ever Northern Sierra snowpack. Just two years later in 2017, the SWP watershed experienced the highest ever Sacramento River runoff, and the highest SWP allocation since 2006. Wet conditions returned in 2019, helping Metropolitan to build dry-year storage reserves to record high levels. Dry conditions have returned in 2020. The year began with a dry January and the driest February on record. In addition to below average precipitation, the snowpack peaked in April at only 66 percent of the April 1 average measurement. This dry hydrology produced only 52 percent of average runoff for the water year. As a result, Metropolitan only received 20 percent of its contract water supplies in 2020. For calendar year 2021, the SWP allocation decreased from an initial allocation of 10 percent to five percent based on on-going dry conditions. The five percent SWP allocation for Metropolitan in 2014 and 2021 represents the lowest in the history of the SWP.

The Colorado River Basin has also historically experienced large swings in annual hydrologic conditions; however, these swings have largely been buffered through a large volume of storage. In 2020, the Upper Colorado River Basin snowpack peaked in April at 107 percent of average. However, April through July runoff was observed at just 52 percent of average due to hot and dry conditions in the late spring and early summer. This is an example of a potential change in relationship between precipitation and expected runoff. The Colorado River Basin experienced 5 consecutive years of significantly below average runoff starting in 2000, followed by a period of alternating years of above average, near average, and significantly below average runoff through 2020. This 21-year period has been mitigated by actions taken by Metropolitan in cooperation with the Bureau of Reclamation and the other Basin States to maintain system storage, avoiding a shortage declaration. At the close of 2020, however, system storage is at or near its lowest since 2000, so there is less water available to buffer future dry conditions.

#### *Sacramento-San Joaquin River Delta Issues*

The Sacramento-San Joaquin River Delta (Bay-Delta) is the hub of California's water supply and is critically important to the entire state. About 30 percent of Southern California's water supply moves across the Bay-Delta. The Bay-Delta's declining ecosystem, caused by a number of factors that include agricultural runoff, predation of native fish species, urban and agricultural discharge, changing ecosystem food supplies, and overall system operation, has led to reduction in water supply deliveries. Operational constraints will likely continue until a long-term solution to the problems in the Bay-Delta is identified and implemented.

<u>Delta Conveyance</u>

In his State of the State address delivered February 12, 2019, Governor Newsom announced that he did not "support WaterFix as currently configured," but does "support a single tunnel." On April 29, 2019, Governor Newsom issued Executive Order N-10-19, directing several agencies to

(among other things), "inventory and assess… [c]urrent planning to modernize conveyance through the Bay Delta with a new single tunnel project." The Governor's announcement and Executive Order led to DWR's withdrawal of all approvals and environmental compliance documentation associated with California WaterFix. The CEQA process identified in this notice for the proposed Delta Conveyance Project will, as appropriate, utilize relevant information from the past environmental planning process for California WaterFix, but the proposed project will undergo a new stand-alone environmental analysis leading to issuance of a new EIR.

On January 15, 2020, DWR issued a Notice of Preparation of an Environmental Impact Report for the DCP. The proposed project would construct and operate new conveyance facilities in the Delta that would add to the existing SWP infrastructure. New intake facilities as points of diversion would be located in the north Delta along the Sacramento River between Freeport and the confluence with Sutter Slough. The new conveyance facilities would include a single main tunnel to convey water from the new intakes to the existing Banks Pumping Plant and potentially the federal Jones Pumping Plant in the south Delta. The new facilities would provide an alternate location for diversion of water from the Delta and would be operated in coordination with the existing south Delta pumping facilities. The new north Delta facilities would be sized to convey up to 6,000 cfs of water from the Sacramento River to the SWP facilities in the south Delta. DWR would operate the dual conveyance system in compliance with all state and federal regulatory requirements and would not reduce DWR's current ability to meet standards in the Delta to protect biological resources and water quality for beneficial uses.

2019 Biological Opinions

In August 2016, USBR and DWR reinitiated consultation with NMFS and USFWS on the Coordinated Long-term Operations of the CVP and SWP due to new information and science on declining listed fish species populations. On October 21, 2019, USFWS and NMFS released their Biological Opinions, and on February 18, 2020, USBR signed a Record of Decision, pursuant to the National Environmental Policy Act, completing its environmental review and adopting the 2019 Long-Term Operations Plan.

The 2019 Long-Term Operations Plan incorporates and updates many of the requirements contained in the previous 2008 and 2009 Biological Opinions. It also includes over $1 billion over a ten-year period in conservation, monitoring and new science, some of which is in the form of commitments carried forward from the previous 2008/2009 Biological Opinions. Those costs are shared by the SWP and CVP. The 2019 Long-Term Operations Plan and 2019 Biological Opinions are expected to increase SWP deliveries by an annual average of 200,000 acre-feet as compared to the previous Biological Opinions.

California ESA Incidental Take Permit

DWR described and analyzed its proposed SWP long-term operations plan for purposes of obtaining a new California ESA permit in its November 2019 Draft EIR. The 2019 Draft EIR proposed essentially the same operations plan as the federal 2019 Biological Opinions, with the addition of operations for the California ESA-listed Longfin smelt. The proposed project included an estimated $540 million in conservation, monitoring and science, much of which overlapped with DWR's share of the estimated $1 billion under the federal 2019 Biological Opinions. In December 2019, DWR submitted its application for an incidental take permit under the California ESA to the California Department of Fish and Wildlife (CDFW), with a modified State operations plan that added new outflow and environmental commitments. On March 27, 2020, DWR released its final EIR and Notice of Determination, describing and adopting a State operations plan with additional operational restrictions and additional conservation commitments. On March 31, 2020, CDFW issued a California ESA incidental take permit for the SWP that included further

operational restrictions and outflow. The final approved project and incidental take permit reduce long-term average SWP deliveries by more than 200 TAF, which more than erased any potential improvement in SWP water supplies that were anticipated to result from the 2019 Biological Opinions. In addition, the approved project and incidental take permit add another estimated $218 million over a ten-year period in environmental commitments for the SWP beyond the SWP's share of the $1 billion required to comply with the 2019 Biological Opinions.

Bay-Delta Water Quality Control Plan Update/Voluntary Agreements

The Bay-Delta Plan is reviewed periodically, and new standards and allocations of responsibility can be imposed on the SWP as a result. The last review was completed in 2006, and the current review has been ongoing since approximately 2010 in a phased approach.

Phase 1 focuses on the southern Delta salinity objectives for the protection of agriculture, San Joaquin River flow objectives for the protection of fish and wildlife, and a program of implementation for achieving those objectives. Phase 2 considers the comprehensive review of the other elements of the Bay-Delta Plan, including but not limited to Sacramento River and Delta outflow objectives.

The SWRCB has also encouraged all stakeholders to work together to reach one or more voluntary agreements for consideration by the SWRCB that could implement the proposed amendments to the Bay-Delta Plan through a variety of tools, while seeking to protect water supply reliability. Metropolitan is participating in the Phase 2 proceedings and voluntary agreement negotiations. In March of 2019, DWR and CDFW put forward a project description and planning agreement that would allow the SWRCB to analyze the environmental impacts and benefits of the voluntary agreement alternative to the percentage of unimpaired flow framework.

In December 2018, the SWRCB adopted the Phase 1 Bay-Delta Plan amendments and Final Substitute Environmental Document. Among other things, the Phase 1 updates established new Lower San Joaquin River (LSJR) flow objectives and revised southern Delta salinity objectives. In July of 2018, the SWRCB released a framework that describes the draft proposal for Phase 2, which will update the flow requirements for the Delta and its contributing watersheds, including the Sacramento River and its tributaries. The framework provides additional details about the flow requirements staff is likely to propose, how these new requirements could be implemented, and preliminary information on their potential environmental benefits and water supply effects. The framework also states that the SWRCB is interested in receiving potential Bay-Delta Plan amendment language developed through the voluntary agreement process that would authorize, with the affirmative concurrence from CDFW, a coordinated control of flows and other, non-flow factors that would achieve benefits comparable to the unimpaired flow requirements.

Other issues, such as the continued decline of some fish populations in the Bay-Delta and surrounding regions and certain operational actions in the Bay-Delta, may significantly reduce Metropolitan's water supply from the Bay-Delta. Future new or revised Biological Opinions or incidental take authorizations under the Federal ESA and California ESA might further adversely affect SWP and CVP operations. Additionally, new litigation, listings of additional species under the ESAs, or new regulatory requirements imposed by the SWRCB could further adversely affect SWP operations in the future by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations. Metropolitan cannot predict the ultimate outcome of any of the litigation or regulatory processes described above, but believes they could have an adverse impact on the operation of the SWP pumps, Metropolitan's SWP supplies, and Metropolitan's water reserves.

Operational constraints likely will continue until a long-term solution to the problems in the Bay-Delta is identified and implemented. The Delta Vision process, established by Governor Schwarzenegger, was aimed at identifying long-term solutions to the conflicts in the Bay-Delta, including natural resource, infrastructure, land use, and governance issues. In addition, State resource agencies and various water user entities are currently engaged in the development of the Delta Conveyance Project, which is aimed at making physical and operational improvements to the SWP system in the Delta necessary to restore and protect access south-of-Delta SWP water supplies and restore and protect water quality by addressing anticipated sea-level rise, seismic risks, and by providing operational flexibility to improve aquatic conditions in the Delta and better manage risks of further regulatory constraints on SWP operations.

### *Water Supply Conditions*

The water conditions that the region faced leading up to 2020 were characterized by alternating scarcity and abundance. Whereas the five years leading up to the prior UWMP were characterized by severe drought and depletion of Metropolitan's dry year storage reserves, conditions leading up to 2020 have included two very wet years and the rebuilding of Metropolitan's storage reserves to record high levels.

The five-year period began with 2016 reflecting average hydrologic conditions and a 60 percent SWP allocation. This level of supplies allowed for a modest recovery in storage reserves after the drought of 2014-2015. The wettest year on record followed in 2017, and with an 85 percent SWP allocation, Metropolitan was able to add over a million acre-feet to storage reserves by the end of 2017. As such, Metropolitan was well prepared to manage a future dry year, which arrived in 2018 with a 35 percent allocation. Wet conditions returned in 2019; with a 75 percent allocation, storage reserves increased by nearly 600 TAF, ending the year at a record high 3.1 MAF. With high volumes of water in storage, and healthy supplies on the Colorado River, Metropolitan was well prepared to meet the challenge of a dry 2020 and 20 percent SWP allocation.

Investments in storage and flexible operations have prepared Metropolitan to capitalize on available supplies in wet years and manage through drought years. During the wet years of 2017 and 2019, Metropolitan achieved the following milestones:

- In 2017, record deliveries of 395 TAF to exchange partners Desert Water Agency and Coachella Valley Water District from the Colorado River Aqueduct to accomplish the largest single year increase in the Advance Delivery Account;
- In 2017 and 2019, record creation of Intentionally Created Surplus storage in Lake Mead of 351 TAF and 410 TAF, respectively; and
- In 2019, a record low diversion of Colorado River water of approximately 540 TAF, a level not seen since the 1950s.

While recent wet conditions along with flexible adaptive management have brought great successes in building storage reserves, water supply challenges remain. These include:

- Analysis of historical records suggest a potential change in the relationship between precipitation and runoff in the Colorado River Basin and has contributed to a drying trend over the last 21 years. With Lake Mead and Lake Powell at 40 and 42 percent of capacity, respectively, there is practically no buffer to avoid a shortage from any future period of reduced precipitation and runoff.
- Groundwater basins and local reservoirs dropped to very low operating levels due to record-dry hydrology in Southern California in 2016. Due to wetter hydrology in 2017 and 2019, the groundwater basins started to recover. However, levels in groundwater basins throughout

the service area remained below healthy storage levels. In addition, groundwater production in the service area has remained at low levels even after the drought;

- Supply availability in the Los Angeles Aqueduct system continues to be affected by both drought and environmental mitigation efforts related to Owens Lake and the Lower Owens River.

In addition, water quality challenges such as algae toxins, PFAS, and the identification of constituents of emerging concern, have a significant impact on the region's water supply conditions and underscore the importance of flexible and adaptive regional planning strategies.

### *Current Available Resources*

Metropolitan's primary purpose is to provide a supplemental supply of water for domestic and municipal uses at wholesale rates to its member public agencies. Metropolitan's principal sources of water are the SWP and the Colorado River. Metropolitan's robust planning strategy continues to balance available local and imported water resources and member agencies' demands within Metropolitan's service area.

#### *A. Imported Supplies*

Metropolitan receives water from the Colorado River through the Colorado River Aqueduct (CRA) and from the SWP through the California Aqueduct. Figure 1-6 shows the historic annual deliveries from the SWP and the Colorado River.

Colorado River

The Colorado River was Metropolitan's original source of water after Metropolitan's establishment in 1928. Metropolitan has a legal entitlement to receive water from the Colorado River under a permanent service contract with the Secretary of the Interior. The CRA, which has a capacity of 1.25 MAF a year, is owned and operated by Metropolitan. It transports water from Lake Havasu, at the border of the state of California with Arizona, approximately 242 miles to its terminus at Lake Mathews in Riverside County.

Over the years, Metropolitan increased reliable supply through the CRA through programs that it helped fund and implement including: farm and irrigation district conservation programs, improved reservoir system operations, land management programs, and water transfers and exchanges through arrangements with agricultural water districts in southern California, entities in Arizona and Nevada that use Colorado River water, and the U.S. Department of the Interior, Bureau of Reclamation (USBR). A detailed discussion of availability of Colorado River water for delivery to Metropolitan is included in Section 3.1.

Metropolitan also receives approximately 277,700 AF per year of additional Colorado River supplies pursuant to an exchange agreement with its member agency, San Diego County Water Authority (SDCWA) (the Exchange Agreement). Pursuant to several agreements, SDCWA receives transfers of Colorado River water from Imperial Irrigation District (IID) and water resulting from the Coachella Canal Lining Project and All-American Canal Lining Project. Pursuant to the Exchange Agreement with Metropolitan, SDCWA makes that water available to Metropolitan at Lake Havasu, which Metropolitan then adds to its supplies. In exchange, Metropolitan delivers a like-amount of its own blended water to SDCWA at the Metropolitan-SDCWA connections.[1]

State Water Project

Metropolitan imports water from the SWP, owned by the state of California and operated by DWR. This project transports Feather River water stored in and released from Oroville Dam and conveyed through the Bay-Delta, as well as unregulated flows diverted directly from the Bay-Delta south via the California Aqueduct to four delivery points – one from the Aqueduct's West Branch at the northwestern and three from the East Branch at the northeastern portion of Metropolitan's service area.

In 1960, Metropolitan signed a water supply contract with DWR for participation in the SWP (State Water Contracts). Metropolitan is one of 29 agencies that have long-term contracts with DWR (State Water Contractors) that are participants in the SWP through State Water Contracts, and is the largest agency in terms of the number of people it serves (19.2 million), the share of SWP water that it is allocated pursuant to the State Water Contract (approximately 46 percent), and the percentage of total annual payments made to DWR by agencies with State Water Contracts (approximately 53 percent in 2020). A more detailed discussion of the SWP supplies is provided in Section 3.2.

[1] Prior UWMPs reported these exchanges as SDCWA's local supplies and not as Colorado River water made available to Metropolitan at Lake Havasu with Metropolitan's other Colorado River supplies. This was because Metropolitan reported information in the UWMP as reported by each member agency and SDCWA reported the exchanges as local supplies. Metropolitan has determined that it is most appropriate to report the exchanges here consistently with the transaction, pursuant to Water Code Section 10615. Section 10615 requires that Metropolitan describe and evaluate all sources of supply made available to the district. SDCWA has independently acquired the IID transfer water pursuant to its transfer agreement with IID, and Metropolitan assigned to SDCWA its rights to the canal lining water for 110 years. Under the Colorado River Water Delivery Agreement, the Secretary of the Interior has agreed to deliver this conserved Colorado River water to the Colorado River Aqueduct Intake at Lake Havasu for diversion by Metropolitan. Metropolitan and SDCWA executed the 2003 Exchange Agreement providing for Metropolitan to take possession of the water at Lake Havasu. Metropolitan owns and manages this water at its complete discretion for the benefit of its member agencies. In exchange for the volume made available to Metropolitan at Lake Havasu (at uneven intervals), Metropolitan delivers annually an equal volume to SDCWA (in even monthly deliveries) from whatever source or sources available to Metropolitan. Accordingly, other Metropolitan reports, including the Integrated Water Resources Plan (IRP) and the Annual Report, have accurately not categorized that water as "local supplies." To reflect the transfer of the Colorado River water to Metropolitan at Lake Havasu for its ownership and management, the exchange water is categorized here as water imported from the Colorado River pursuant to the Exchange Agreement and not as a local supply. This is consistent with Section 10615's requirement, and is also consistent with Metropolitan's prior report of the SDCWA exchange water at Section 3.1 of the UWMP and its exclusion from the local supplies at Figure 1-7 of prior UWMP reports.

**Figure 1-6 Imported Water Supplies in Metropolitan's Service Area**

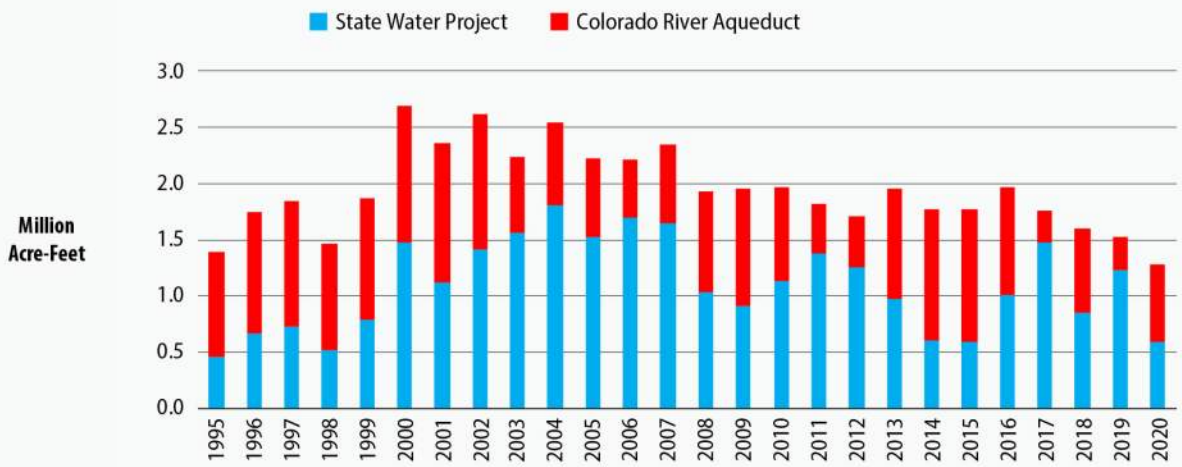


Notes:

1. State Water Project Supplies include Table A, Art. 21, Art. 14(b), Art. 12(d), Art. 12(e), Art. 55, draws from storage & carryover, DWCV & other exchanges, transfers, Drought Water Bank and Dry Year Pool Purchases, Pools A&B, Flood Water, wheeling, Port Hueneme lease, and SBVMWD Purchases.
2. Colorado River Aqueduct supplies are gross Havasu diversions less return flows, deliveries to USBR, Mexico, and storage.

## *B. Local Supplies*

Approximately 50 percent of the region's water supplies come from resources separately controlled or operated by local water agencies. These resources include water extracted from local groundwater basins, catchment of local surface water, and non-Metropolitan imported water supplied through the Los Angeles Aqueduct. Figure 1-7 shows the historic annual use of local and imported water supplies within Metropolitan's service area.

**Figure 1-7 Annual Regional Water Supplies in Metropolitan's Service Area**

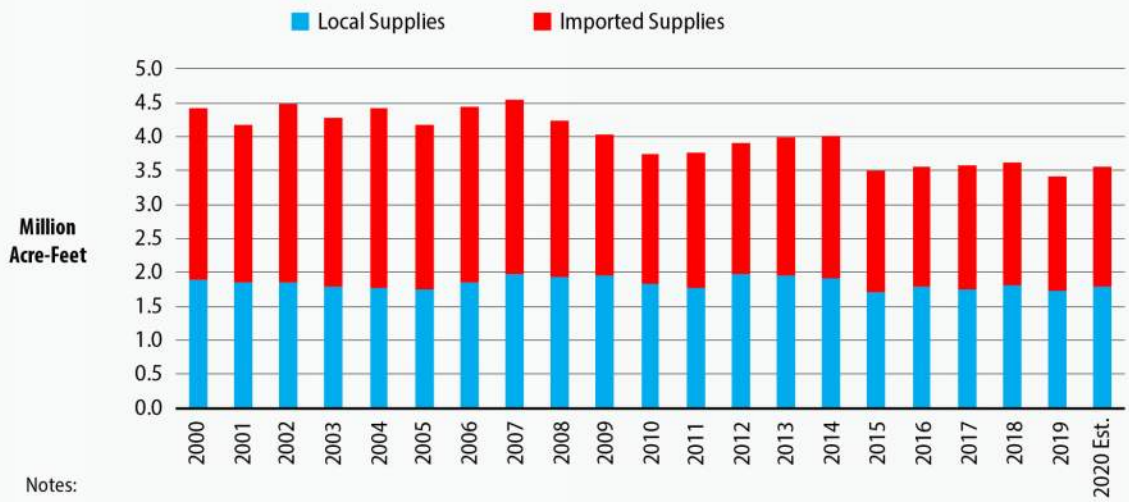


Notes:

1. Local supplies include: Groundwater, Groundwater Recovery, Recycled Water, and Surface water
2. Imported supplies include: Full-service, IAWP, Replenishment and LAA
3. Data not available for 2020. Estimate for 2020 is based on historical data.

Groundwater

The groundwater basins that underlie the region provide an annual average supply of approximately 1.2 MAF (2011-2020 average). Natural recharge of the groundwater basins is supplemented by active recharge of captured stormwater, recycled water, and imported water to support this level of annual production.

Estimates indicate that available storage space in the region's groundwater basins in mid-2020 is approximately 4.7 MAF. Successive dry years have resulted in groundwater depletions that will need to be replaced with natural recharge during wet years and active spreading of captured stormwater, recycled water, and imported water. Groundwater basin managers and water suppliers have taken steps to store water in advance of dry years to soften the potential impact on groundwater aquifers and to maintain reliable local water supplies during dry years.

Recycling, Groundwater Recovery, and Seawater Desalination

Recycling and groundwater recovery are local resources that add balance to Southern California's diverse water portfolio. In addition to replenishment of groundwater basins as described above, water recycling provides extensive treated wastewater for applicable municipal and industrial uses. Common uses of recycled water include landscape irrigation, agricultural irrigation, and commercial and industrial applications. Groundwater recovery employs additional treatment techniques to effectively use degraded groundwater supplies that were previously not considered viable due to high salinity or other contamination.

While water recycling and groundwater recovery projects in the Southern California region are primarily developed by local water agencies, many newer projects have been developed with financial incentives provided through Metropolitan's Local Resources Program (LRP). The LRP is a performance-based program that provides incentives to expand water recycling and support recovery of degraded groundwater, among other types of projects. In 2020, the regional water production from water recycling and groundwater recovery totaled approximately 552 TAF, of which 120 TAF was developed with Metropolitan funding assistance. A detailed discussion of recycling and groundwater recovery is presented in Section 3.5.

Seawater desalination represents a significant opportunity to diversify the region's water resource mix with a new, locally controlled, reliable potable supply. Metropolitan supports seawater desalination to its member agencies by providing technical assistance, regional facilitation of research and information exchanges, and financial incentives through the LRP.

In December 2015, pursuant to its Water Purchase Agreement with the San Diego County Water Authority (SDCWA), Poseidon Resources began operation of the 56 TAF Claude "Bud" Lewis Seawater Desalination Plant in the City of Carlsbad. During fiscal years 2017 through 2019, the facility produced an annual average of 42.1 TAF, meeting nearly 9 percent of SDCWA's service area demands. The Carlsbad facility does not receive funding through Metropolitan's LRP. Seawater desalination is discussed in more detail in Section 3.5

Surface Water

In addition to the groundwater basins, local agencies maintain surface reservoir capacity to capture local runoff. The average yield captured from local watersheds is estimated at approximately 90 TAF per year (2011-2020 average). The majority of this supply comes from reservoirs within the service area of the SDCWA.

Los Angeles Aqueduct

Although the Los Angeles Aqueduct (LAA) imports water from outside the region, Metropolitan classifies water provided by the LAA as a local resource because it is developed and imported by a local agency (the Los Angeles Department of Water and Power). This resource provided approximately 200 TAF per year on average over the last ten years from 2011 to 2020 but was reduced to approximately 33 TAF during a historic dry period of 2015.

Table 1-5 shows the projected local supplies estimated for a normal water year and under five consecutive years of drought for 2025, 2035, and 2045.

**Table 1-5**
**Local Supplies for Normal and Dry Years**
(Acre-Feet)

| | 2025 | | 2035 | | 2045 | |
|---|---|---|---|---|---|---|
| | Normal Year[1] | Dry Year[2] | Normal Year | Dry Year | Normal Year | Dry Year |
| **Local Groundwater** | | | | | | |
| *From Natural Recharge*[3] | 939,000 | 985,000 | 964,000 | 988,000 | 991,000 | 1,011,000 |
| *Replenishment* | 316,000 | 255,000 | 332,000 | 327,000 | 335,000 | 334,000 |
| **Local Projects** | | | | | | |
| *Groundwater Recovery* | 143,000 | 139,000 | 158,000 | 158,000 | 159,000 | 159,000 |
| *Recycling* | 550,000 | 491,000 | 687,000 | 658,000 | 706,000 | 703,000 |
| *Seawater Desalination* | 51,000 | 56,000 | 51,000 | 56,000 | 51,000 | 56,000 |
| Local Runoff Stored | 80,000 | 77,000 | 82,000 | 77,000 | 82,000 | 77,000 |
| Los Angeles Aqueduct | 257,000 | 118,000 | 258,000 | 118,000 | 258,000 | 118,000 |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 |
| **Total** | **2,613,000** | **2,400,000** | **2,809,000** | **2,660,000** | **2,860,000** | **2,736,000** |

[1] Normal Water Year is based on 1922 through 2017.

[2] Dry Year is based on five consecutive years of drought (1988-92).

[3] Estimate of natural recharge is based on basin balance considering projected local groundwater production and replenishment deliveries to the groundwater basins.

### *Metropolitan's Actions to Address Supply Challenges*

Metropolitan progressively addressed the challenges of water shortages caused by the dramatic swings in annual hydrologic conditions that have characterized the past decade on the SWP. Metropolitan took actions that include: (1) Increasing water conservation by expanding outreach, adding devices, and increasing incentives to residents, (2) Increasing local resources by providing incentives for on-site recycled water hook-up and increasing incentives for the LRP, (3) Augmenting water supplies through water transfers and exchanges, (4) Improving return capability of storage programs, (5) Modifying Metropolitan's distribution system to enhance the use of Colorado River water, and (6) Implementing the Water Supply Allocation Plan to distribute the limited imported supplies and preserve storage reserves.

### *Continuing Water Conservation*

By 2040, conservation and water recycling will account for one-third of Southern California's water supply portfolio in Metropolitan's service area. Metropolitan supports financial incentives, education, outreach programs and appliance/plumbing standards at both the regional and local level to ensure water conservation meets this goal.

On April 1, 2015, Governor Brown issued an Executive Order (Order) calling for a 25 percent reduction in consumer water use in response to the historically dry conditions throughout the State of California. The next month, Metropolitan increased funding for its conservation program to a record amount of $450 million over the next two fiscal years due to strong response to the incentive program and to assist retail agencies in the service area to meet their mandatory water reduction targets. Since the drought ended, Metropolitan has been working hard these past five years to ensure that water demand in its service area continues to remain low. Gallons per capita measurement is the major conservation indicator of residential water demand, and for the last five years, Metropolitan's service area has remained below the theoretical standard set to meet a 20 percent reduction goal by 2020. While Metropolitan is not subject to meeting the requirements of California's 20X2020 Water Conservation Plan, its conservation efforts are designed to help its member agencies and their retailers to meet their requirements.

Metropolitan's conservation program has seen numerous changes from the previous years of record high conservation activity during the last drought, as focus shifted from relying heavily on providing incentives to developing additional training and research programs to supplement conservation activity. This new focus was designed to reach a broader audience in order to maintain water demand levels achieved during the recent drought. The educational courses teach students the numerous benefits of water efficient landscaping and how to convert their traditional landscaped yards to something more appealing and sustainable, while greatly reducing their outdoor water usage. Ongoing educational efforts include turf removal, California Friendly native plants and landscaper training classes. Additionally, Metropolitan is searching for other water saving opportunities by researching the potential of water saving processes in cooling tower water use, the effects on household water pressure reduction on residential water use, and a household water demand pilot study to determine residential end use from water using fixtures.

Recent conservation highlights include the launching of a revised Turf Replacement Program, establishing additional water efficiency incentives with energy utilities, and a new program for increasing conservation in disadvantaged communities. The disadvantaged community program is comprised of three parts: (1) a regional pilot program; (2) increased flexibility for member agencies to use Metropolitan funds for member agency-administered programs; and, (3) grant funding support. The $3 million regional pilot program provides $250 for installation of premium high-efficiency toilets within multi-family housing constructed prior to 1994. Analyzing program data may better explain how regional approaches could increase conservation within disadvantaged communities. Under the second component, 100 percent of the Metropolitan funds given to member agencies for their locally administered conservation programs could be targeted toward supporting disadvantaged communities or income-qualified consumers. Metropolitan also works with member and local agencies to help identify opportunities and procure grant funding for such conservation programs

### *Increasing Local Resources*

Since 1982, Metropolitan has assisted local agencies in the development of water recycling and groundwater recovery under the Local Resources Program (LRP). The LRP has evolved over time in an effort to help support the development of local supply projects including the methodology

for providing the incentives to the Member Agencies. In October 2014, Metropolitan's Board approved additional LRP refinements to support further development of local resources, which included increasing the maximum incentive amount, offering three incentive payment structures, including on-site recycled water retrofit costs, including other water resources (such as seawater desalination and stormwater), and providing reimbursable services for Metropolitan's technical assistance.

On-site Retrofit Program

In February 2014, Metropolitan's Board approved the On-site Retrofit Pilot Program to offer incentives to modify existing water users' potable water or industrial water systems to utilize recycled water.

Stormwater Pilot Programs

In September 2019, Metropolitan's Board approved the Stormwater for Direct-use Pilot Program to offer incentives for development and monitoring of new and existing direct-use stormwater projects. The primary purpose of the Pilot Program is to collect data from several region-wide stormwater projects. The data collected will provide a better understanding of actual stormwater runoff capture volumes, costs, and project performance. The Pilot Program will help evaluate the potential water supply benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches.

In November 2019, Metropolitan's Board approved the Stormwater for Recharge Pilot Study. The purpose of this study is to evaluate the relationship between stormwater capture and yield to define the water supply benefits of stormwater. Yield for purposes of this study is defined as either increased groundwater production or decrease in imported water needs relative to baseline. The study also requires a minimum of 3 years of monitoring, both of the amount of stormwater captured and the impact to the groundwater basins via groundwater modeling and monitoring wells or sensors. This study will help evaluate the potential water supply benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches.

### *Augmenting Water Supplies*

Augmenting water supplies through water transfers and exchanges is an element of Metropolitan's IRP to mitigate water shortages during dry periods.

The Colorado River System has experienced a drying trend since 2000, leading to substantially decreased water levels in both Lakes Mead and Powell. In March 2014, Metropolitan's Board approved entering into an agreement with the Central Arizona Water Conservation District, Denver Water, Southern Nevada Water Authority (SNWA), and the United States to establish a two-year pilot program to compensate entitled users of the Colorado River water for voluntary reductions in water use, including fallowing of agricultural lands. The water savings from this program became system water and supported lake elevations.

Metropolitan also entered into several agreements to improve Metropolitan's operational flexibility on both a short-term and mid-term basis:

- In January 2015, Metropolitan's Board authorized an exchange of up to 50 TAF with Westside Mutual Water Company and Kern County Water Agency. This one-for-one exchange provides water at a time in the year when SWP supplies are expected to be low and provides flexibility on timing of returning water.
- In September 2015, Metropolitan's Board authorized an amendment to the operational storage agreement with SNWA and the Colorado River Commission of Nevada allowing

Metropolitan access to additional Colorado River water during 2015. Metropolitan paid SNWA $44.375 million for 150 TAF of water apportioned to but not used by SNWA during 2015. When SNWA requests return of water stored under this amendment, SNWA would reimburse Metropolitan for the costs paid for the initial delivery of water.

- In November 2015, Metropolitan's Board authorized entering into agreements with Antelope Valley-East Kern Water Agency (AVEK) to develop exchange and storage programs for SWP supplies. This would be an uneven exchange: for every two acre-feet provided to Metropolitan, AVEK would receive back one acre-foot in the future. Metropolitan may also store at least 30 TAF of its SWP supplies in wet years in the Antelope Valley groundwater basin.
- In September 2020, Metropolitan's Board authorized new price terms for the purchase of transfer supplies under the Yuba Accord. The price terms will be fixed for the next five years. Metropolitan has received around 200 TAF of new supplies before losses under the program.
- In March 2021, Metropolitan's Board authorized entering into an agreement with San Bernardino Valley Municipal Water District to obtain surplus SWP supplies. The program provides improved water supply reliability to Metropolitan and Metropolitan's member agencies within the Santa Ana River Watershed. The program is estimated to provide a long term average of around 13 TAFY to the region.

### *Improving Return Capabilities of Storage Programs*

Metropolitan has a number of storage programs with water agencies along the California Aqueduct that would allow it to store SWP supplies during surplus conditions and to have stored water returned when needed. In 2015, Metropolitan provided up-front capital costs to its water management program partners to build infrastructure to improve the return capabilities of several storage programs.

- In September 2014, Metropolitan's Board authorized providing capital funds to Semitropic Water Storage District to enhance the pumpback capacity of the Semitropic Groundwater Storage Program by 13,200 AFY. The capital costs would be reimbursed to Metropolitan should Semitropic market the added capacity to another party after Metropolitan has at least one year of recovery capability.
- In March 2015, Metropolitan's Board authorized entering into agreement with Arvin Edison Water Storage District to restore 2,500 AFY of return capability by replacing groundwater wells of the Arvin Edison/Metropolitan Water Management Program. The capital costs will be reimbursed as credits to future Program costs.
- Also, in March 2015, Metropolitan's Board authorized entering into agreement with Kern-Delta Water District to improve the return reliability of the Kern-Delta Water District Water Management Program. The improvement includes a pipeline that would reduce losses when Kern River supplies are delivered for exchange. Metropolitan's upfront costs will be more than offset through an elimination of put regulation fees on the next 20,000 AF delivered into the Program.
- In April 2019, Metropolitan's Board authorized entering into an agreement with AVEK for the High Desert Water Bank. Under the Water Bank, Metropolitan could store up to 280,000 acre-feet (AF) of its State Water Project (SWP) Table A or other supplies in the Antelope Valley groundwater basin. Metropolitan will have first priority to 70,000 AF per year of both put and take capacity. Metropolitan will pay AVEK for the capital costs for construction of monitoring and production wells, turnouts from the California Aqueduct, underground and aboveground pipelines, recharge basins, water storage, and booster pump facilities. In

addition, Metropolitan would subsequently pay actual operation and maintenance, energy, and recovery usage fees to recover the water in storage.

### *Modifying Metropolitan's Distribution System*

As a result of ongoing extraordinary dry conditions throughout the state of California, the SWP allocation for calendar year 2014 was five percent, which represents about 96,000 acre-feet of SWP Table A water allocation for Metropolitan. Although Metropolitan had been utilizing storage reserves to help bridge the gap between the low SWP supplies and its demand for SWP water, a number of extraordinary operational actions were taken in 2014 to use available Colorado River water and DVL storage supplies to deliver water service to areas where Metropolitan ordinarily uses SWP supplies to provide its service.

Metropolitan modified its normal operations in several areas of the system to use Colorado River water to provide service to areas as far west as the cities of Thousand Oaks and Calabasas, as well as other locations within Metropolitan's system, some of which had not received Metropolitan water from the Colorado River for extended periods since the completion of the SWP in the early 1970s. System modifications have also been implemented to increase system flexibility to use Colorado River water and DVL water for service to new areas of the system.

- In April 2014, Metropolitan's Board authorized a project that would allow Metropolitan to serve water from multiple sources, such as DVL, to the Mills Treatment Plant in Riverside. The initial phase, construction of an interconnect between the Inland Feeder and the Lakeview Pipeline, near San Jacinto, California, was completed in October 2014, which allowed for an initial flow of water. The second phase of the project, lining of the Bernasconi Tunnel No. 2 was completed in March of 2015 and allowed for increased flows from DVL. The final phase of the project, installation of 3 large valves to improve flow control was completed in 2018.
- In May 2014, Metropolitan's Board authorized the design of improvements to the Greg Avenue Pump Station to enhance water supply reliability in the West Valley area and construct flow control modifications to the outlet of the Jensen Water Treatment Plant. These projects currently allow the West Valley area and Ventura County, which is served normally with SWP water only, to receive blended supplies from the SWP and the Colorado River. Construction of the Greg Avenue Pump station improvements to enhance the long term reliability of the pumps was authorized in February 2019 and is scheduled to be completed in April 2021.

Additionally, several Metropolitan member agencies made modifications within their own local systems to maximize the use of more readily available Colorado River water and DVL supplies and to further reduce the use of scarce SWP supplies.

In the face of another five percent SWP Table A allocation in 2021, Metropolitan is applying the lessons learned in 2014 and able to reap the benefits of the distribution system modifications that help minimize the use of limited SWP supplies

### *Implementing the Shortage Response Actions, when needed*

Recent legislative changes to the California Water Code (CWC) introduced a new Section 10632, which requires that every urban water supplier prepare and adopt a Water Shortage Continency Plan (WSCP). The WSCP is a guide for a supplier's intended actions during water shortage conditions. It is meant to improve preparedness for droughts and other impacts on water supplies by describing the process used to address varying degrees of water shortages. While intended to be a stand-alone plan that may be revised outside of the UWMP process, the CWC requires suppliers to initially include the WSCP as part of their 2020 UWMP.

Metropolitan developed a WSCP to be consistent with its existing Water Surplus and Drought Management (WSDM) Plan and Water Supply Allocation Plan (WSAP). Metropolitan's WSDM Plan, approved in 1999, provides policy guidance for managing regional water supplies during surplus and shortage conditions. It provides an overall vision for operational supply management and characterizes a flexible sequence of actions to minimize the probability of severe shortages and reduce the likelihood of extreme shortages. Thus, the WSDM Plan principles guide the specific actions to be taken under WSCP shortage stages. Metropolitan's WSAP, developed in 2008, is integral to the WSCP's shortage response strategy. In the event that Metropolitan determines that shortage response actions through supply augmentation and demand reduction measures are insufficient to meet a projected shortage, the WSAP may be implemented to fairly distribute a limited amount of water supply using a detailed methodology that reflects the range of local conditions and needs of the region's retail water consumers.

Metropolitan's Board authorized the implementation of the WSAP for the period of July 2009 through April 2011 in response to the drought and low storage reserves. During the dry period of 2012 through 2016, Metropolitan managed its operations through significant use of regional storage reserves. It was anticipated that at end of year 2014, total dry year storage reserves would approach levels similar to those when the WSAP was first implemented in 2009. On December 9, 2014, Metropolitan's Board approved adjustments to the formula for calculating member agency supply allocations for future implementation of the WSAP. On April 14, 2015, Metropolitan's Board approved implementation of the WSAP at a Level 3 Regional Shortage Level, effective July 1, 2015 through June 30, 2016. The WSAP allows member agencies the flexibility to choose among various local supply and conservation strategies to help ensure that demands on Metropolitan stay in balance with limited supplies.

Over the last three years, favorable supply conditions notably in 2017 and 2019, allowed Metropolitan to rebuild its storage reserves. Metropolitan's regional dry year storage is estimated to be at approximately 3.2 MAF by the end of 2020. In addition, Metropolitan also has 750 TAF of stored supplies reserved to meet service area demands during emergency conditions. Metropolitan's comprehensive shortage response planning, combined with improved storage reserves, puts the region in a better position to withstand future dry conditions. Metropolitan's WSCP, WSDM Plan, and WSAP are described in detail in Section 2 and Appendix 4.

# Planning for the Future

# 2

The purpose of this section is to show the approach and extent to which Metropolitan plans to meet Southern California's water supply needs in the future. In its role as supplemental supplier to its 26 member agencies in the Southern California water community, Metropolitan faces ongoing challenges in meeting its member agencies' needs for water supply reliability and quality in the region. Increased environmental regulations and competition for water from outside the region have resulted in changes in delivery patterns and timing of imported water supply availability. At the same time, the Colorado River has experienced a drying trend over the past 21 years, resulting in reservoir levels that are reduced from historical levels.

As described in the previous chapter, the water used in Southern California comes from a number of sources. From 2010 through 2019, Metropolitan has provided 40 percent to 50 percent of the water needs in its service area from the Colorado River via the CRA, and from the Sacramento-San Joaquin River Watershed via the SWP. As Metropolitan continues to face various water supply challenges, development of adaptable resource management strategies to meet a range of possible future demands is ongoing.

Metropolitan's continued progress in developing a diverse resource mix enables the region to meet its water supply needs. The investments that Metropolitan has made and its ongoing efforts in many different areas coalesce toward its goal of long-term regional water supply reliability. Metropolitan's actions have been focused on the following:

- Continuing water conservation
- Developing water supply management programs outside of the region
- Developing storage programs related to the SWP and the Colorado River
- Developing storage and groundwater management programs within the Southern California region
- Increasing water recycling, groundwater recovery, stormwater, and seawater desalination
- Pursuing long-term solutions for the ecosystem, regulatory and water supply issues in the California Bay-Delta

Metropolitan has undertaken a number of planning initiatives over the years. This section summarizes past and current efforts, which include the 1996 Integrated Water Resources Plan (IRP) and its three updates in 2004, 2010, and 2015; the 2020 IRP; the Water Shortage Contingency Plan; the Water Surplus and Drought Management Plan; the Water Supply Allocation Plan; Metropolitan's Emergency Storage Objective; and Seismic Resiliency Studies. Collectively, they provide policy framework guidelines and resource targets for Metropolitan to achieve its goals towards regional water supply reliability.

While Metropolitan coordinates regional supply planning through its inclusive IRP process, Metropolitan's member agencies also conduct their own planning analyses – including their own urban water management plans – and may develop projects independently of Metropolitan.

Appendix 5 shows a list of potential local projects provided to Metropolitan by its member agencies.

## 2.1 Integrated Water Resource Planning

In 1993, Metropolitan commenced an Integrated Water Resources Planning process as the beginning of a new era of regional reliability planning for its Southern California service area. As this planning process began, Metropolitan held a series of three regional assemblies from 1993 through 1995 addressing strategic planning issues. Attendance at these regional assemblies included Metropolitan's Board, Metropolitan's senior management, member agency managers, local retail water providers, groundwater basin managers, and invited public representatives. The purpose of these regional assemblies was to gain consensus on resource policy issues, provide direction for future work, and to endorse regional objectives, principles, and strategies.

A key outcome of the regional assemblies was the establishment and adoption of water supply principles which provided critical policy guidance for the development and adoption of future Metropolitan IRPs. In summary, these principles state:

- No water supplier in Southern California is an isolated, independent entity unto itself, and all, to varying degrees, are dependent upon a regional system of water importation, storage, and distribution.
- Metropolitan plays a leading role in Southern California's regional water management, having the responsibility for importing water from outside the region and convening dialogues on regional water issues, encouraging local water development and conservation, advocating the region's interests to the state and federal governments, and leading the region's water community.
- Water suppliers at all levels have a responsibility to promote a strong water ethic both within the water community and among the public, developing plans through open processes, committing to achieving adopted regional goals and strategies, and committing to a policy of equity and fairness in development and implementation of water management programs.

These regional assemblies laid the foundation for Metropolitan's integrated regional planning path from 1996 to the present. This path has guided Metropolitan's water resources strategy from the initial adoption of the Metropolitan's IRP in 1996 to successive IRP updates in 2004, 2010, and 2015.

### *The 1996 IRP*

Metropolitan's inaugural IRP established a long-term, comprehensive water resources strategy to provide the region with a reliable and affordable water supply. One of the fundamental outcomes of the 1996 IRP was the identification and subsequent implementation of a diverse portfolio of resource investments in both imported and in--region supplies, and in water conservation measures. The 1996 IRP further emphasized the construction and creation of a network of water storage facilities, both below and above ground. It also set a regional water supply reliability goal of providing full capability to meet all retail-level water demands under all foreseeable hydrologic events.

The 1996 IRP process identified cost-effective solutions that offered long-term reliability to the region. Having identified the need for a portfolio of diversified supplies to meet its demands, the 1996 IRP analyzed numerous resource portfolios seeking to find a "Preferred Resource Mix" that would provide the region with reliable and affordable water supplies through 2020. The analysis determined the preferred mix of resources based on cost-effectiveness, diversification, and reliability. Establishing the "Preferred Resource Mix" was an integral part of the 1996 IRP, and subsequent updates have continued to focus on how best to diversify Metropolitan's water

portfolio and establish the broad resource targets for the region that helped to meet IRP objectives.

### *The 2004 IRP Update*

The 2004 IRP Update was the first major review and update in the IRP process. The 2004 IRP Update reviewed the goals and achievements of the 1996 IRP, identified the changed conditions for water resource development, and updated resource development targets through 2025. These targets included increased conservation savings and planned increases in local supplies. The 2004 IRP Update also explicitly recognized the need to handle uncertainties inherent in any planning process. Some of these uncertainties include:

- Fluctuations in population and economic growth
- Changes in water quality regulations
- Discovery of new chemical contaminants
- Regulation of endangered species affecting sources of supplies
- Changes in climate and hydrology

As a result, a key component of the 2004 IRP Update was the addition of a 10 percent "planning buffer." The planning buffer identified additional supplies, both imported and locally developed, that could be implemented to address uncertainty in future supplies and demands.

### *The 2010 IRP Update*

In keeping with the reliability goal established under the original 1996 IRP of meeting full-service demands at the retail level under all foreseeable hydrologic conditions, the 2010 IRP Update sought to stabilize Metropolitan's traditional imported water supplies and establish additional water resources to withstand California's inevitable dry cycles and growth in water demand. The 2010 IRP Update marked the first time that Metropolitan and its member agencies explicitly acknowledged the increasing impact that emerging challenges and uncertainties such as environmental regulations, threats to water quality, climate change, and economic unknowns would have on planning for a reliable, high quality, and affordable water supply. By 2010, the Colorado River had experienced below-average precipitation conditions for most of the previous decade, and the SWP was facing historic regulatory cutbacks that significantly reduced its supplies that pass through the Sacramento-San Joaquin Delta in Northern California. Recognizing that the conditions for developing and maintaining water supply reliability had changed, Metropolitan set out not only to update the IRP, but also to examine how best to adapt to the new water supply paradigm.

#### *Adaptive Management Strategy*

The 2010 IRP Update specifically planned for uncertainty with a range of adaptive management strategies that both meets demands under observed hydrologic conditions and responds to future uncertainty. The plan provided solutions by developing diverse and flexible resources that perform adequately under a wide range of future conditions. Specifically, the adaptive management strategy was a three-component plan that included the following:

- Core Resources Strategy – Designed to maintain reliable water supplies under known conditions. The Core Resources Strategy represented baseline efforts to manage water supply and demand conditions. This strategy was based on "what we know today," including detailed planning assumptions about future demographic scenarios, water supply yields, and a range of observed historical weather patterns. Under this strategy, Metropolitan and its

member agencies would advance water use efficiency through conservation and recycled water, along with further local supply development such as groundwater recovery and seawater desalination. Metropolitan would also stabilize traditional imported supplies from the Colorado River and Northern California.

- Uncertainty Buffer – A suite of actions which help to mitigate short-term changes. The 2010 IRP Update set goals for a range of potential buffer supplies to protect the region from possible shortages in a cost-effective manner, starting with a further expansion of water use efficiency on a region-wide basis. The buffer would enable the region to adapt to future circumstances and foreseeable challenges that were not assumed under the Core Resources Strategy, such as short-term loss of local supplies or regulatory restrictions.
- Foundational Actions – Strategies for additional water resources to augment the core or buffer supplies. Foundational Actions were designed to prepare the region by determining viable alternative supply options for long-range planning. These preparatory actions, including feasibility studies, technological research and regulatory review, were designed to lay the foundation for potential alternative resource development.

### *The 2015 IRP Update*

Following the 2010 IRP, drought in California and across the southwestern United States has put the IRP adaptive management strategy to the ultimate stress test. Dry conditions in California persisted into 2015, resulting in a fourth consecutive year of drought. The year 2015 began with the driest January on record, resulting in the earliest and lowest snowpack peak in recorded history at only 17 percent of the traditional snowpack peak on April 1st. In the ten years since 2006, there were only two wet years, with the other eight years having been below normal, dry, or critically dry. Within Southern California, continuing dry conditions impacted the region's local supplies, including its groundwater basins.

Throughout 2015, Metropolitan engaged in a comprehensive process with its Board of Directors and member agencies to review how conditions had changed since the 2010 IRP Update and to establish targets for achieving regional reliability, taking into account known opportunities and risks. Areas reviewed in the 2015 IRP Update include demographics, hydrologic scenarios, water supplies from existing and new projects, water supply reliability analyses, and potential resource and conservation targets. Metropolitan's Board of Directors adopted the 2015 IRP Update on January 12, 2016.[1]

The 2015 IRP Update approach explicitly recognizes that there are remaining policy discussions that will be essential to guiding the development and maintenance of local supplies and conservation. Since the adoption of the 2015 IRP Update and its targets for water supply reliability, Metropolitan has begun a process to address questions such as how to meet the targets for regional reliability, what are local and what are regional responsibilities, how to finance regional projects, etc. This discussion will involve extensive interaction with Metropolitan's Board of Directors and member agencies, with input from the public.

[1] http://www.mwdh2o.com/PDF_About_Your_Water/2015_IRP_Update_Report.pdf

*Findings and Conclusions*

The findings and conclusions of the 2015 IRP Update are:

- Action is needed – Without the investments in conservation, local supplies, and the California WaterFix targeted in the 2015 IRP Update, Metropolitan's service area would experience unacceptable level of shortage allocation frequency in the future.
- Maintain Colorado River supplies – The plan to stabilize deliveries at 900,000 AF in a typical year will require more than 900,000 AF of planned actions.
- Stabilize SWP supplies – A collaborative approach with state and federal agencies to pursue better science for resolving questions about SWP operations and advancing coequal goals of Delta restoration and statewide water supply reliability in the near term. Also work collaboratively with state and federal agencies in the California WaterFix and EcoRestore efforts.
- Develop and protect local supplies and water conservation – The 2015 IRP Update embraces and advances the regional self-sufficiency ethics by increasing the targets for additional local supplies and conservation. These targets are discussed in detail in Section 3 of this UWMP.
- Maximize the effectiveness of storage and transfers – Rebuilding Metropolitan's supply of water reserves is imperative when the drought is over. A comprehensive water transfer approach that takes advantage of water when it is available will help to stabilize and build storage reserves, increasing Metropolitan's ability to meet water demands in dry years.
- Continue with the adaptive management approach – The IRP is updated periodically to incorporate changed conditions, and an implementation report is prepared annually to monitor the progress in resources development. The 2015 IRP Update also includes Future Supply Actions (renaming the Foundational Actions component of the 2010 IRP Update to better reflect the attention on developing future supplies) that would advance a new generation of local supplies through public outreach; development of legislation and regulation; technical studies and support; and land and resource acquisitions.

### *The 2020 IRP*

The 2020 IRP provides a broader look and concept than the previous IRP updates. The 2020 IRP strengthens the adaptive management approaches employed in prior updates through the incorporation of an explicit scenario planning step. Coming on the completion of a full "planning cycle" with reaching the end of the planning horizon of the 1996 IRP, the 2020 IRP has the benefit of a fuller understanding of the lessons learned from the previous 25 years. The key lesson is that the future is not predictable and is a function of many diverse drivers that are out of the control of the water community. The purpose of scenario planning is to broaden the understanding of plausible, but uncertain, future conditions affecting both supplies and demands. On the demand side, uncertainties surrounding future economic conditions, the extent to which local supplies are developed, and water use behavior will guide member agency dependence on Metropolitan in meeting their retail demands. On the supply side, factors like climate change impacts and regulatory uncertainty are expected to affect future supply availability in unpredictable ways.

With these uncertainties in mind, scenario planning will allow for the evaluation of investments and actions needed to achieve desired reliability under a diverse range of future conditions. It will also reinforce the adaptive capabilities of the IRP by identifying and enabling the

development of future "sign-posts" indicating emerging conditions that may require the redirection of future investments and actions.

While prior IRP updates have addressed uncertainty, adaptation, and preparedness, the addition of a scenario planning element to the process further explores the plausible futures that Metropolitan may confront. Since retaining the ability to adapt through investments in preparedness can be expensive, the scenario planning element should support informed decisions regarding affordable levels of preparedness, as well as identify unacceptable consequences of inaction.

The process of developing scenarios is built on a comprehensive identification of those drivers of change that affect supply stability and demands on Metropolitan. Building on input received from the Board, member agencies, and the public, four scenarios were developed within a framework that examined the drivers of change over a range of future demands on Metropolitan and imported supply stability. This exercise provides four sets of logical, quantified assumptions resulting in unique supply demands gaps against which various investment options can be tested.

The UWMP, along with the original IRP and its subsequent updates, used a single set of assumptions for the uncertainties that drive supply and demands. In the 2020 IRP, Metropolitan explicitly acknowledges that the future is unpredictable and that a scenario planning approach can expand our thinking by examining multiple plausible futures. This approach will better prepare Metropolitan's service area for the uncertainties that lie ahead. Metropolitan believes this is an improvement over the single outcome approach taken in past IRPs and the UWMP requirements. It is important to emphasize that the scenario planning element of the 2020 IRP complements the IRP planning approach that has evolved since 1996. It is also important to note that the UWMP assumptions fall within the plausible futures contemplated in the IRP. This means that, while the reliability assessments in the UWMP comply with the Act, Metropolitan and its member agencies are contemplating and comparing future conditions that are beyond the requirements of the Act and thus will be prepared for a wider range of conditions than shown in the UWMP assessments. The following sections describe the methodology and IRP assumptions being applied for the purposes of the UWMP.

## 2.2 Estimating Demands on Metropolitan

The Urban Water Management Planning Act requires suppliers to conduct three key basic planning analyses to evaluate supply reliability. The first is a water service reliability assessment that compares the total water supply sources available to the water supplier with the long-term projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The second is a drought risk assessment (DRA) that evaluates a drought period that lasts five consecutive water years starting from the year following when the assessment is conducted. And third, a Water Shortage Contingency Plan (WSCP) that includes a detailed proposal for how the supplier intends to act during actual water shortage conditions. As one of the recent additions to the Act's requirements, suppliers need to present the WSCP as part of their UWMP. However, the WSCP is its own independent plan that shall be adopted and provided to customers, cities, and counties within the supplier's service area, and may be amended independent of a supplier's UWMP. These required assessments and planning are included in Sections 2.3, 2.4, and 2.5.

The 2020 UWMP presents Metropolitan's water reliability assessments from 2025 through 2045. As specified in the Act, there are three year types that must be included in the water service reliability assessment for the UWMP. To simulate hydrologic conditions for the required reliability assessments, Metropolitan assumed the following:

- Normal Year. The average of historic years 1922 to 2017 most closely represents the water supply conditions that Metropolitan considers available during normal water year.
- Single Dry Year. The conditions for the year 1977 represent the lowest water supply available to Metropolitan.
- Five-Consecutive-Year Drought. The five consecutive years of 1988 to 1992 represent the driest five-consecutive year historical sequence for Metropolitan's water supply. This five-year sequence is used to complete both Metropolitan's water service reliability and drought risk assessments.

Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan sources based on 96 years (1922-2017) of historic hydrologic conditions. The 96-year period starting in 1922 was chosen because the CalSim 2 model used in the 2019 SWP Delivery Capability Report began in 1922. Supply and demand analyses for the single-dry year and 5-year drought cases were based on conditions affecting the SWP as this supply availability fluctuates the most among Metropolitan's sources of supply. Using the same 96-year period of the SWP supply availability, 1977 is the single driest year, and 1988 through 1992 are the 5 consecutive driest years for SWP supplies to Metropolitan. In addition, staff analysis of the 8-river index indicated that 1977 is the single driest year and 1988 through 1992 are the lowest 5 consecutive dry years from 1922 through 2017. The 8-river index is used widely by DWR and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

### *Demand Projection for the UWMP*

Metropolitan developed its demand projections for the UWMP by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation.[2] Projections of local supplies were then derived using data from current and expected local supply programs. The resulting difference between total demands net of savings from conservation and local supplies is the expected regional demands on Metropolitan supplies.

[2] Information generated as part of this analysis is contained in Appendix 1.

These various estimates are shown in Tables 2-1 through 2-3. Major categories used in these tables are defined below.

### *Total Demands*

Total demands are the sum of retail demand for M&I and agricultural, seawater barrier demand, and replenishment demand. Total demands represent the total amount of water needed by the member agencies. Total demands include:

- Retail Municipal and Industrial (M&I) Demand – Retail M&I demands represent the full spectrum of urban water use within the region. These include residential, commercial, industrial, institutional, and un-metered water uses. Demographic and economic factors are the major drivers behind M&I water demands. The demographic and economic data used in developing these projections for the UWMP were taken from the Southern California Association of Governments' (SCAG) 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy from the Connect SoCal Complete Report (as adopted on May 7, 2020) and from the San Diego County Association of Governments' (SANDAG) San Diego Forward: The 2019 Federal Regional Transportation Plan (October 2019, Version 17). The SCAG and SANDAG regional growth forecasts are the core assumptions that drive the estimating equations in Metropolitan's Econometric Demand Model (MWD-EDM).

  SCAG's and SANDAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are backed by Environmental Impact Reports. Both SCAG and SANDAG prepare demographic forecasts based on land use data for their respective regions through extensive processes that emphasize input from local planners and are done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. These growth forecasts are used to guide development of regional plans and strategies mandated by federal and state governments. Metropolitan's use of SCAG and SANDAG projections is consistent with CWC Section 10631's requirement for suppliers to include current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning.

  Impacts of potential annexation are not included in the demand projections for the 2020 UWMP. However, Metropolitan's Review of Annexation Procedures concluded that the impacts of annexation within the service area beyond 2020 would not exceed two percent of overall demands.

- Retail Agricultural Demand – Retail agricultural demands consist of water use for irrigating crops. Member agencies estimate agricultural water use based on many factors, including farm acreage, crop types, historical water use, and land use conversion. Each member agency estimates its agricultural demand differently, depending on the availability of information. Metropolitan relies on member agencies' estimates of agricultural demands for the 2020 UWMP.

- Seawater Barrier Demand – Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Groundwater management agencies determine the barrier requirements based on groundwater levels, injection wells, and regulatory permits.

- Storage Replenishment Demand – Storage replenishment demands represent the amount of water member agencies plan to use to replenish their groundwater basins or surface reservoirs in order to maintain sustainable basin/reservoir heath and production. For the 2020 UWMP, replenishment deliveries are not included as part of consumptive demands.

Climate impacts to M&I and Agricultural demands are captured using climate adjustment factors. These factors were estimated using observed range of weather variables, precipitation and temperature, on historical consumptive demands. Metropolitan updated these factors to include the most recent weather and climate outcomes and recent changes in water use and irrigation demands. By incorporating these factors, Metropolitan's demand projections are calibrated to the more recent water use behaviors and better reflect current climate change impacts.

### *Conservation Adjustment*

Water savings from conservation reduces total retail demand. Conservation savings consists of the following:

- Code-Based Conservation – Water savings resulting from plumbing codes and other institutionalized water efficiency measures. Sometimes referred to as "passive conservation," this form of conservation would occur as a matter of course without any additional financial incentives from water agencies. In addition, water savings from Model Water Efficiency Ordinance (MWELO) is assumed for 50 percent of new home construction since the ordinance does not have a uniform effective enforcement mechanism for compliance. MWELO is also assumed not to affect water use projections for existing homes and businesses. Water savings from codes, standards, and ordinances are discussed in Appendix 6.
- Active Conservation – Water saved as a direct result of programs and practices directly funded by a water utility. Active conservation is unlikely to occur without agency action.
- Price Effect Conservation – Reductions in customer use attributable to changes in the real (inflation adjusted) cost of water. Because water has a positive price elasticity of demand, increases in water price will decrease the quantity of water demanded by the end use consumer.
- Pre-1990 Savings – Conservation savings are commonly estimated from a base-year water-use profile. Beginning with the 1996 IRP, Metropolitan identified 1980 as the base year for estimating conservation because it marked the effective date of a new plumbing code in California requiring toilets in new construction to be rated at 3.5 gallons per flush or less. Between 1980 and 1990, Metropolitan's service area saved an estimated 250 TAF per year as the result of this 1980 plumbing code and unrelated water rate increases. Within Metropolitan's planning framework, these savings are referred to as "pre-1990 savings."

Metropolitan's conservation savings projection includes savings from Metropolitan's Conservation Credits Program, code-based conservation, price effect conservation, and pre-1990 device retrofits. The projection does not include savings from the implementation of future active conservation programs.

### *Local Supplies*

Local supplies represent water produced or imported independently by the member agencies and other local water agencies within Metropolitan's service area. Local supplies are a key component in determining how much Metropolitan supply is needed. Projections of local supplies relied on information gathered from several sources including past urban water management plans, Metropolitan's annual local supply survey, and communications between Metropolitan and member agency staff. Local supplies include:

- Groundwater and Surface Water – Groundwater production consists of extractions from local groundwater basins. Groundwater production is supported by the active recharge of stormwater, recycled water, and imported water. Passive recharge (or native yield) also

supports groundwater production. Surface water comes from stream diversions and rainwater captured in reservoirs.

- The Los Angeles Aqueduct – A major source of imported water is conveyed from the Owens Valley via the Los Angeles Aqueduct (LAA) by the Los Angeles Department of Water and Power (LADWP). Although LADWP imports water from outside of Metropolitan's service area, Metropolitan classifies water provided by the LAA as a local resource because it is developed and controlled independently by a local agency.
- Seawater Desalination – Highly treated seawater suitable for municipal and industrial potable use.
- Groundwater Recovery and Recycled Water – Developed and operated by local water agencies, groundwater recovery projects treat degraded groundwater to meet potable use standards. Recycled water projects recycle wastewater for municipal, industrial, and agricultural consumptive uses as well as for groundwater replenishment and local seawater intrusion barriers.

The local supply projections presented in the demand tables are consistent with the local supply projections that the Metropolitan member agencies are including in their respective UWMPs.[3] [4] Information regarding the member agencies' local supply projections was compiled through the extensive coordination process between Metropolitan and its member agencies. Additionally, Metropolitan maintains an inventory of member agency local supply projects that have been identified within Metropolitan's service area. Appendix 5 contains the inventory of local supply projects by type of supply and includes a classification that shows the current stage of development for each supply in the inventory. The stages of development included in Appendix 5 are: Existing, Under Construction, CEQA, and Conceptual projects. The project inventory in Appendix 5 was updated and completed as part of the 2020 IRP Update survey completed by Metropolitan's member agencies in June 2019 and October 2020.

### *Determining Demands on Metropolitan*

Metropolitan serves imported water to its 26 member agencies. For most member agencies, they have other sources of water produced locally from groundwater basins, surface reservoirs, the LAA, recycled water projects, groundwater recovery projects, and seawater desalination projects. When local supplies are not enough to meet retail demands, member agencies purchase supplemental water from Metropolitan.

In determining demands for imported water, Metropolitan developed its Sales Model to calculate the difference between total forecasted retail demands and local supply projections

[3] One variation from the member agency local supply reporting is the Colorado River water SDCWA secured from Coachella Canal Lining Project and All-American Canal Lining Project that it exchanges with Metropolitan pursuant to the parties' Exchange Agreement, since that water is provided to Metropolitan at Lake Havasu where Metropolitan receives other Colorado River water, used by Metropolitan like other Colorado River supplies, and Metropolitan delivers a like-amount of Metropolitan blended water to SDCWA in exchange. (See Section 1 at p. 22.)

[4] Another variation from the member agency local supply reporting is the hydrology used for projecting future Los Angeles Aqueduct supply. LADWP in its UWMP uses a 30-year median hydrology from FY 1985/86 to 2014/15 while Metropolitan uses the 1922 to 2017 hydrology provided by LADWP, consistent with Metropolitan's modeling framework. The discrepancies between LADWP's 30-year median hydrology and Metropolitan's 96 hydrology resulted in Metropolitan's projection being approximately 70,000 acre-feet higher in average conditions. In a single dry-year, LADWP uses the FY 1989/1990 hydrology while Metropolitan uses 1977 hydrology, resulting in Metropolitan's projection being approximately 50,000 acre-feet higher. Both Metropolitan and LADWP use the 1988-1992 hydrology for five consecutive dry-year conditions.

on a per member agency basis. The balance is the demand on Metropolitan's imported water supply. The Sales Model calculates the difference between forecasted demands and projected local supplies after factoring in climate impacts to both demand and local supply. The Sales Model employs a modeling method using historical hydrologic conditions from 1922 to 2017 to simulate the expected demands on Metropolitan supplies based on hydrologic conditions. Each hydrologic condition results in one possible outcome for the forecast year in the planning horizon. For example, each forecast year, such as 2025, has 96 possible outcomes, one for each historical hydrology year during the period 1922 to 2017. This method of modeling produces a distribution of outcomes ranging from the driest to the wettest years within this historical period.

The Sales Model forecasts three types of demands on Metropolitan:

1. Consumptive Use – Metropolitan's supplies that are used to meet retail M&I demand.
2. Seawater Barrier – Imported water needed to hold back seawater intrusion into the coastal groundwater basins.
3. Replenishment – Water for groundwater or reservoir replenishment, when available, to meet replenishment demands.

Due to differences in data and modeling methodology, the results of Metropolitan's forecast are not directly comparable to member agencies' forecasts. Differences from the member agencies forecasts are not cumulative and can offset each other on the regional level. The overall impact is within the range of Metropolitan's supply capability under all year types.

For additional information on Metropolitan's demand forecast, see Appendix 1.

**Table 2-1**
**Metropolitan Regional Water Demands**
**Single Dry-Year**
(Acre-Feet)

| | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| **A.** | **Total Demands[1]** | **4,929,000** | **5,037,000** | **5,160,000** | **5,265,000** | **5,378,000** |
| | Retail Municipal and Industrial | 4,397,000 | 4,507,000 | 4,626,000 | 4,737,000 | 4,848,000 |
| | Retail Agricultural | 144,000 | 134,000 | 130,000 | 122,000 | 123,000 |
| | Seawater Barrier | 61,000 | 61,000 | 61,000 | 61,000 | 61,000 |
| | Storage Replenishment | 327,000 | 334,000 | 343,000 | 345,000 | 346,000 |
| **B.** | **Total Conservation** | **1,162,000** | **1,211,000** | **1,263,000** | **1,325,000** | **1,389,000** |
| | Existing Active (through 2020)[2] | 93,000 | 55,000 | 35,000 | 25,000 | 17,000 |
| | Code-based | 560,000 | 623,000 | 665,000 | 701,000 | 731,000 |
| | Price-Effect[3] | 259,000 | 283,000 | 313,000 | 349,000 | 391,000 |
| | Pre-1990 Conservation | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 |
| **C.** | **Total Local and Other Imported Supplies** | **2,501,000** | **2,604,000** | **2,702,000** | **2,722,000** | **2,743,000** |
| | Groundwater | 1,278,000 | 1,300,000 | 1,324,000 | 1,333,000 | 1,344,000 |
| | Surface Water | 78,000 | 80,000 | 80,000 | 80,000 | 80,000 |
| | Los Angeles Aqueduct[4] | 119,000 | 119,000 | 119,000 | 119,000 | 119,000 |
| | Seawater Desalination | 56,000 | 56,000 | 56,000 | 56,000 | 56,000 |
| | Groundwater Recovery | 143,000 | 157,000 | 158,000 | 158,000 | 159,000 |
| | Recycling[5] | 550,000 | 613,000 | 687,000 | 698,000 | 706,000 |
| | Other Imported Supplies[6] | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 |
| **D.** | **Total Metropolitan Demands** | **1,266,000** | **1,222,000** | **1,195,000** | **1,218,000** | **1,247,000** |
| | Consumptive Use | 1,125,000 | 1,081,000 | 1,055,000 | 1,078,000 | 1,107,000 |
| | Seawater Barrier | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| | Replenishment | 136,000 | 136,000 | 136,000 | 136,000 | 136,000 |

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand.
Totals may not sum due to rounding.
[1] Growth projections are based on SCAG 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy and SANDAG San Diego Forward: The 2019 Federal Regional Transportation Plan.
[2] Does not include future active conservation savings. 1990 is base year.
[3] Includes un-metered water use savings.
[4] Los Angeles Aqueduct Projection uses 1977 hydrology.
[5] Excludes Santa Ana River base flow, which is used for recharge of Orange County groundwater basin and reflected in the Groundwater production numbers.
[6] Exchange with SDCWA.

**Table 2-2**
**Metropolitan Regional Water Demands**
**Drought Lasting Five Consecutive Water Years**
(Acre-Feet)

| | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| **A.** | **Total Demands[1]** | **4,877,000** | **5,064,000** | **5,182,000** | **5,299,000** | **5,410,000** |
| | Retail Municipal and Industrial | 4,414,000 | 4,540,000 | 4,658,000 | 4,777,000 | 4,889,000 |
| | Retail Agricultural | 147,000 | 143,000 | 135,000 | 129,000 | 126,000 |
| | Seawater Barrier | 61,000 | 61,000 | 61,000 | 61,000 | 61,000 |
| | Storage Replenishment | 255,000 | 319,000 | 327,000 | 332,000 | 334,000 |
| **B.** | **Total Conservation** | **1,162,000** | **1,211,000** | **1,263,000** | **1,325,000** | **1,389,000** |
| | Existing Active (through 2020)[2] | 93,000 | 55,000 | 35,000 | 25,000 | 17,000 |
| | Code-based | 560,000 | 623,000 | 665,000 | 701,000 | 731,000 |
| | Price-Effect[3] | 259,000 | 283,000 | 313,000 | 349,000 | 391,000 |
| | Pre-1990 Conservation | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 |
| **C.** | **Total Local and Other Imported Supplies** | **2,400,000** | **2,561,000** | **2,660,000** | **2,713,000** | **2,736,000** |
| | Groundwater | 1,240,000 | 1,293,000 | 1,316,000 | 1,333,000 | 1,345,000 |
| | Surface Water | 77,000 | 76,000 | 77,000 | 77,000 | 77,000 |
| | Los Angeles Aqueduct[4] | 118,000 | 118,000 | 118,000 | 118,000 | 118,000 |
| | Seawater Desalination | 56,000 | 56,000 | 56,000 | 56,000 | 56,000 |
| | Groundwater Recovery | 139,000 | 152,000 | 158,000 | 158,000 | 159,000 |
| | Recycling[5] | 491,000 | 588,000 | 658,000 | 694,000 | 703,000 |
| | Other Imported Supplies[6] | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 |
| **D.** | **Total Metropolitan Demands** | **1,314,000** | **1,292,000** | **1,259,000** | **1,261,000** | **1,286,000** |
| | Consumptive Use | 1,221,000 | 1,164,000 | 1,130,000 | 1,132,000 | 1,158,000 |
| | Seawater Barrier | 8,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| | Replenishment | 85,000 | 124,000 | 124,000 | 124,000 | 124,000 |

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand.
Totals may not sum due to rounding.
[1] Growth projections are based on SCAG 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy and SANDAG San Diego Forward: The 2019 Federal Regional Transportation Plan.
[2] Does not include future active conservation savings. 1990 is base year.
[3] Includes un-metered water use savings.
[4] Los Angeles Aqueduct Projection uses 1988-1992 hydrology.
[5] Excludes Santa Ana River base flow, which is used for recharge of Orange County groundwater basin and reflected in the Groundwater production numbers.
[6] Exchange with SDCWA.

**Table 2-3**
**Metropolitan Regional Water Demands**
**Normal Water Year**
(Acre-Feet)

| | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| **A.** | **Total Demands[1]** | **4,925,000** | **5,032,000** | **5,156,000** | **5,261,000** | **5,374,000** |
| | Retail Municipal and Industrial | 4,403,000 | 4,514,000 | 4,632,000 | 4,743,000 | 4,854,000 |
| | Retail Agricultural | 144,000 | 134,000 | 130,000 | 123,000 | 123,000 |
| | Seawater Barrier | 61,000 | 61,000 | 61,000 | 61,000 | 61,000 |
| | Storage Replenishment | 316,000 | 323,000 | 332,000 | 334,000 | 335,000 |
| **B.** | **Total Conservation** | **1,162,000** | **1,211,000** | **1,263,000** | **1,325,000** | **1,389,000** |
| | Existing Active (through 2020)[2] | 93,000 | 55,000 | 35,000 | 25,000 | 17,000 |
| | Code-based | 560,000 | 623,000 | 665,000 | 701,000 | 731,000 |
| | Price-Effect[3] | 259,000 | 283,000 | 313,000 | 349,000 | 391,000 |
| | Pre-1990 Conservation | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 |
| **C.** | **Total Local and Other Imported Supplies** | **2,613,000** | **2,712,000** | **2,809,000** | **2,836,000** | **2,860,000** |
| | Groundwater | 1,255,000 | 1,273,000 | 1,296,000 | 1,311,000 | 1,326,000 |
| | Surface Water | 80,000 | 82,000 | 82,000 | 82,000 | 82,000 |
| | Los Angeles Aqueduct[4] | 257,000 | 257,000 | 258,000 | 258,000 | 258,000 |
| | Seawater Desalination | 51,000 | 51,000 | 51,000 | 51,000 | 51,000 |
| | Groundwater Recovery | 143,000 | 157,000 | 158,000 | 158,000 | 159,000 |
| | Recycling[5] | 550,000 | 613,000 | 687,000 | 698,000 | 706,000 |
| | Other Imported Supplies[6] | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 |
| **D.** | **Total Metropolitan Demands** | **1,149,000** | **1,110,000** | **1,084,000** | **1,100,000** | **1,125,000** |
| | Consumptive Use | 1,020,000 | 981,000 | 954,000 | 971,000 | 996,000 |
| | Seawater Barrier | 4,000 | 4,000 | 4,000 | 4,000 | 4,000 |
| | Replenishment | 125,000 | 125,000 | 125,000 | 125,000 | 125,000 |

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand.
Totals may not sum due to rounding.
[1] Growth projections are based on SCAG 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy and SANDAG San Diego Forward: The 2019 Federal Regional Transportation Plan.
[2] Does not include future active conservation savings. 1990 is base year.
[3] Includes un-metered water use savings.
[4] Los Angeles Aqueduct Projection uses 1922-2017 hydrology.
[5] Excludes Santa Ana River base flow, which is used for recharge of Orange County groundwater basin and reflected in the Groundwater production numbers.
[6] Exchange with SDCWA.

## 2.3 Water Reliability Assessment

After estimating demands for normal water year, single dry year, and droughts lasting at least five years, the water reliability assessment for the UWMP requires urban water suppliers to identify projected supplies to meet these demands. Table 2-4 summarizes the sources of supply for the single dry year (1977 hydrology), while Table 2-5 shows the region's ability to respond in future years under a repeat of the 1988-92 drought period lasting five consecutive water years. Table 2-5 provides results for the average of the five consecutive dry-year period rather than a year-by-year detail. Over the years, Metropolitan has developed numerous programs to increase its water supply capabilities, dry year supplies, and regional storage. These programs may be exercised in conjunction with effective demand management measures during drought years. Under this reliability planning, if a five consecutive year drought sequence was to repeat, Metropolitan could exercise similar supply augmentation and demand management options for each of the five drought years at the appropriate level to meet demands. This methodology best captures Metropolitan's complex demand and supply planning with appropriate flexibility. Table 2-6 reports assessment under a normal water year represented by the average of the 96 historic hydrologies from 1922 to 2017. Appendix 2 provides a detailed description of the existing regional water supplies and Appendix 3 contains detailed justifications for the sources of supply used for this analysis.

Metropolitan's supply capabilities are evaluated using the following assumptions:

### *Colorado River Supplies*

Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's supplies. These include the PVID Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead. These stored supplies can be used to supply additional water to ensure that, when needed, Metropolitan can deliver up to the CRA capacity of 1.25 MAF. A detailed discussion of the QSA is included in Section 3.1 and Appendix 3.1.

In light of declining reservoir levels, the Lower Basin Drought Contingency Plan (DCP) was signed in 2019. This agreement incentivizes storage in Lake Mead and requires certain volumes of water be stored in Lake Mead under certain Lake Mead elevation levels through 2026. Metropolitan is to store certain volumes of water in Lake Mead as DCP ICS once Lake Mead is below elevation 1,045 feet. This agreement also increases Metropolitan's flexibility to take delivery of water stored as ICS at Lake Mead elevations below 1,075 feet. The goal of this agreement is to keep Lake Mead above critical elevations, and overall, it increases Metropolitan's flexibility to store water in Lake Mead in greater volumes and to take delivery of stored water to fill the CRA as needed.

Projections for the Colorado River supplies for the 2020 UWMP are based on the United States Bureau of Reclamation's (USBR) Colorado River Simulation System (CRSS) modeling developed in January 2021, which is the latest available at the time of production of this plan. USBR modeling is used to estimate Metropolitan's basic apportionment and the availability of QSA and other related programs. While the official January 2021 CRSS run uses a full historical hydrology set, USBR also examines a stress test hydrology set as a proxy to show climate change impacts. The

stress test hydrology includes the latest 30 years which has lower inflows as compared to the full hydrology. The reliability assessments are inclusive of the sequence of hydrology found within the stress test hydrology set and is by proxy an estimate of lower inflows resulting from climate change. USBR is currently developing a climate change hydrology set that utilizes a suite of global climate models but it was unavailable at this time. For this reliability assessment, Metropolitan used the current methodologies USBR employs in its official CRSS run.

### *State Water Project Supplies*

SWP supplies are estimated using the 2019 SWP Delivery Capability Report distributed by DWR in August 2020 and the Early Long-Term (ELT) Alternative described in the 2015 SWP Delivery Capability Report. The 2019 SWP Delivery Capability Report presents current DWR estimates of the amount of water deliveries for current (2020) conditions and conditions 20 years in the future, assuming currently existing SWP facilities. Since this UWMP uses DWR's 2019 SWP Delivery Capability Report to estimate future SWP supplies, any changes in supply reliability that would result from new facilities proposed under the Delta Conveyance Project and Sites Reservoir are not included in the following tables. These estimates incorporate restrictions on SWP and Central Valley Project (CVP) operations in accordance with water quality objectives established by the State Water Resources Control Board, the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued on October 21, 2019, and the Incidental Take Permit issued by the California Department of Fish and Wildlife on March 31, 2020. In addition, these estimates incorporate amendments to the Coordinated Operations Agreement between the Central Valley Project and the State Water Project made in 2018. Under the 2019 SWP Delivery Capability Report - existing condition scenario, the delivery estimates for the SWP for 2020 conditions as a percentage of Table A amounts are 58 percent, equivalent to 1,109 TAF for Metropolitan, under a single dry-year (1977) condition and 7 percent, equivalent to 134 TAF for Metropolitan, under a long-term average condition. Detailed description of SWP supply programs are included in Section 3.2 and Appendix 3.2. To include consideration of climate change impacts, the ELT alternative as described in the 2015 Delivery Capability Report was also utilized in the analysis. DWR included climate change impacts to deliveries at a 2025 emission level and 15 cm of sea level rise in this alternative. DWR also considers the current impacts to State Water Project deliveries from existing subsidence in the Delivery Capability Report. In the 2019 Delivery Capability Report, they found that subsidence has reduced the flow capacity in the aqueduct at locations in San Luis and San Joaquin Field Divisions but has not yet resulted in a reduction in deliveries. DWR may address any potential future impacts of subsidence based on the efficacy of Sustainable Groundwater Management Act and Groundwater Management Plans in future analyses.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. Over the years, under the pumping restrictions of the SWP, Metropolitan has collaborated with the other contractors to develop numerous voluntary Central Valley/SWP storage and transfer programs. The goal of these storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the California Aqueduct during dry hydrologic conditions and regulatory restrictions. Descriptions of these storage and transfer programs are included in Section 3.3 and Appendix 3.2.

### *Storage*

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities. Over the past two decades, Metropolitan has developed a large regional storage portfolio that includes both dry-year and emergency storage capacity. Storage is a key component of water management. Storage enables the capture of surplus amounts of water in normal and wet climate and hydrologic conditions when it is plentiful for supply and environmental uses. Stored water can then be used in dry years and in conditions where augmented water supplies are needed to meet demands. Metropolitan's resource analysis model considers all the capacities and constraints of its storage facilities and programs and simulates the fill and withdrawal of these facilities through the 96 hydrologic conditions from 1922 to 2017. In-region storage and supply programs are discussed in detail in Section 3.6 and Appendix 3.3.

### *Interpreting Metropolitan's Reliability Assessment and Supply Capabilities in the UWMP*

Metropolitan's long-term water service reliability assessment performed for the UWMP shows that, under required and stated assumptions and the conditions required by the Act, there would be supply and storage capabilities, and projected surplus supplies, sufficient to meet projected demands from 2025 through 2045. This assessment applies under a normal water year, a single dry year, and five consecutive drought year conditions as specified by the Act. However, this assessment should be considered as addressing the specific conditions and assumptions stated in the UWMP and is not inclusive of a fuller range of assumptions and conditions that are considered in the 2020 IRP, which is Metropolitan's primary long-term water supply reliability planning process. To address the uncertainties and planning parameters in the IRP, additional supply and demand management measures may be identified and developed and implemented that are outside of the needs and capabilities indicated by the UWMP reliability assessments. A write up on the impact of alternative forecasts and projections of local supplies on Demand on Metropolitan is included in the 2020 Reference Materials page posted on Metropolitan's website (www.mwdh2o.com). This write up provides supplemental information on alternative forecasts and projections for estimating local supply development and production in the service area that may be appropriate for different planning applications and its impact on estimates of Demand on Metropolitan.

**Table 2-4**
**Single Dry-Year**
**Supply Capability[1] and Projected Demands**
**Repeat of 1977 Hydrology**
(Acre-feet per year)

| Forecast Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| **Current Programs** | | | | | |
| In-Region Supplies and Programs | 875,000 | 877,000 | 876,000 | 876,000 | 874,000 |
| California Aqueduct[2] | 647,000 | 634,000 | 634,000 | 634,000 | 633,000 |
| Colorado River Aqueduct | | | | | |
| Total Supply Available[3] | 1,424,000 | 1,403,500 | 1,352,500 | 1,352,500 | 1,380,750 |
| *Aqueduct Capacity Limit[4]* | *1,250,000* | *1,250,000* | *1,250,000* | *1,250,000* | *1,250,000* |
| Colorado River Aqueduct Capability | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 |
| **Capability of Current Programs** | **2,772,000** | **2,761,000** | **2,760,000** | **2,760,000** | **2,757,000** |
| | | | | | |
| **Demands** | | | | | |
| Total Demands on Metropolitan | 1,266,000 | 1,222,000 | 1,195,000 | 1,218,000 | 1,247,000 |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 |
| **Total Metropolitan Deliveries[5]** | **1,544,000** | **1,500,000** | **1,473,000** | **1,496,000** | **1,525,000** |
| | | | | | |
| **Surplus** | **1,228,000** | **1,261,000** | **1,287,000** | **1,264,000** | **1,232,000** |
| | | | | | |
| **Programs Under Development** | | | | | |
| In-Region Supplies and Programs | 0 | 0 | 0 | 0 | 0 |
| California Aqueduct | 0 | 0 | 0 | 0 | 0 |
| Colorado River Aqueduct | | | | | |
| Total Supply Available[3] | 0 | 0 | 0 | 0 | 0 |
| *Aqueduct Capacity Limit[4]* | *0* | *0* | *0* | *0* | *0* |
| Colorado River Aqueduct Capability | 0 | 0 | 0 | 0 | 0 |
| **Capability of Proposed Programs** | **0** | **0** | **0** | **0** | **0** |
| | | | | | |
| **Potential Surplus** | **1,228,000** | **1,261,000** | **1,287,000** | **1,264,000** | **1,232,000** |

[1] Represents Supply Capability for resource programs under listed year type.
[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
[3] Colorado River Aqueduct includes programs and Exchange with SDCWA conveyed by the aqueduct.
[4] Maximum CRA deliveries limited to 1.25 MAF including Exchange with SDCWA.
[5] Total demands are adjusted to include Exchange with SDCWA.

**Table 2-5**
**Drought Lasting Five Consecutive Water Years**
**Supply Capability[1] and Projected Demands**
**Repeat of 1988-1992 Hydrology**
(Acre-feet per year)

| Forecast Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| **Current Programs** | | | | | |
| In-Region Supplies and Programs | 194,000 | 197,000 | 197,000 | 197,000 | 197,000 |
| California Aqueduct[2] | 734,800 | 772,000 | 794,000 | 816,000 | 792,000 |
| Colorado River Aqueduct | | | | | |
| Total Supply Available[3] | 1,410,000 | 1,403,500 | 1,403,500 | 1,365,000 | 1,380,750 |
| *Aqueduct Capacity Limit[4]* | *1,250,000* | *1,250,000* | *1,250,000* | *1,250,000* | *1,250,000* |
| Colorado River Aqueduct Capability | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 |
| **Capability of Current Programs** | **2,178,800** | **2,219,000** | **2,241,000** | **2,263,000** | **2,239,000** |
| | | | | | |
| **Demands** | | | | | |
| Total Demands on Metropolitan | 1,314,000 | 1,292,000 | 1,259,000 | 1,261,000 | 1,286,000 |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 |
| **Total Metropolitan Deliveries[5]** | **1,592,000** | **1,570,000** | **1,537,000** | **1,539,000** | **1,564,000** |
| | | | | | |
| **Surplus** | **586,800** | **649,000** | **704,000** | **724,000** | **675,000** |
| | | | | | |
| **Programs Under Development** | | | | | |
| In-Region Supplies and Programs | 0 | 0 | 0 | 0 | 0 |
| California Aqueduct | 0 | 0 | 0 | 0 | 0 |
| Colorado River Aqueduct | | | | | |
| Total Supply Available[3] | 0 | 0 | 0 | 0 | 0 |
| *Aqueduct Capacity Limit[4]* | *0* | *0* | *0* | *0* | *0* |
| Colorado River Aqueduct Capability | *0* | *0* | *0* | *0* | *0* |
| **Capability of Proposed Programs** | **0** | **0** | **0** | **0** | **0** |
| | | | | | |
| **Potential Surplus** | **586,800** | **649,000** | **704,000** | **724,000** | **675,000** |

[1] Represents Supply Capability for resource programs under listed year type.
[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
[3] Colorado River Aqueduct includes programs and Exchange with SDCWA conveyed by the aqueduct.
[4] Maximum CRA deliveries limited to 1.25 MAF including Exchange with SDCWA.
[5] Total demands are adjusted to include Exchange with SDCWA.

**Table 2-6**
**Normal Water Year**
**Supply Capability[1] and Projected Demands**
**Average of 1922-2017 Hydrologies**
(Acre-feet per year)

| Forecast Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| **Current Programs** | | | | | |
| In-Region Supplies and Programs | 875,000 | 877,000 | 876,000 | 876,000 | 874,000 |
| California Aqueduct[2] | 1,774,000 | 1,766,000 | 1,764,000 | 1,762,000 | 1,761,000 |
| Colorado River Aqueduct | | | | | |
| Total Supply Available[3] | 1,453,000 | 1,390,500 | 1,390,500 | 1,339,500 | 1,367,750 |
| *Aqueduct Capacity Limit[4]* | *1,250,000* | *1,250,000* | *1,250,000* | *1,250,000* | *1,250,000* |
| Colorado River Aqueduct Capability | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 |
| **Capability of Current Programs** | **3,899,000** | **3,893,000** | **3,890,000** | **3,888,000** | **3,885,000** |
| | | | | | |
| **Demands** | | | | | |
| Total Demands on Metropolitan | 1,149,000 | 1,110,000 | 1,084,000 | 1,100,000 | 1,125,000 |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 |
| **Total Metropolitan Deliveries[5]** | **1,427,000** | **1,388,000** | **1,362,000** | **1,378,000** | **1,403,000** |
| | | | | | |
| **Surplus** | **2,472,000** | **2,505,000** | **2,528,000** | **2,510,000** | **2,482,000** |
| | | | | | |
| **Programs Under Development** | | | | | |
| In-Region Supplies and Programs | 0 | 0 | 0 | 0 | 0 |
| California Aqueduct | 13,000 | 13,000 | 13,000 | 13,000 | 13,000 |
| Colorado River Aqueduct | | | | | |
| Total Supply Available[3] | 0 | 0 | 0 | 0 | 0 |
| *Aqueduct Capacity Limit[4]* | *0* | *0* | *0* | *0* | *0* |
| Colorado River Aqueduct Capability | 0 | 0 | 0 | 0 | 0 |
| **Capability of Proposed Programs** | **13,000** | **13,000** | **13,000** | **13,000** | **13,000** |
| | | | | | |
| **Potential Surplus** | **2,485,000** | **2,518,000** | **2,541,000** | **2,523,000** | **2,495,000** |

[1] Represents Supply Capability for resource programs under listed year type.
[2] California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
[3] Colorado River Aqueduct includes programs and Exchange with SDCWA conveyed by the aqueduct.
[4] Maximum CRA deliveries limited to 1.25 MAF including Exchange with SDCWA.
[5] Total demands are adjusted to include Exchange with SDCWA.

## 2.4 Drought Risk Assessment

CWC Section 10635(b) requires every urban water supplier to include, as part of its urban water management plan, a drought risk assessment (DRA) for its water service as part of information considered in developing its demand management measures and water supply projects and programs. The DRA analysis allows suppliers to consider how to manage their water supplies during stressed hydrologic conditions in relation to variations in demand. The DRA helps a supplier to evaluate the functionality of its WSCP shortage response actions and understand the type and degree of response that is appropriate for managing water supplies. This evaluation can help the supplier to identify risks and take proactive steps before the next actual drought lasting at least five consecutive years.

CWC Section 10612 requires the DRA to be based on the driest five-year historic sequence for the agency's water supply. Furthermore, CWC Section 10635 also requires that the analysis consider plausible changes on projected supplies and demands due to climate change, anticipated regulatory changes, and other locally applicable criteria, and that the DRA start from the year following when the assessment is conducted. For the 2020 UWMP, DRA is developed for years 2021 through 2025. Accordingly, the 2020 UWMP Guidebook suggests that the historic five driest consecutive years on record may be considered a starting point in the analysis which is informed by other factors. Suppliers may then use these estimated supply conditions to prepare the DRA analysis, assuming they occur over the next five years.

For Metropolitan, the five-consecutive years of 1988 to 1992 represent the driest five-consecutive year historic sequence for Metropolitan's water supply. Thus, Metropolitan used this five-year historic sequence to complete its DRA. Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan sources based on 96 years (1922-2017) of historic hydrology. Supply and demand analyses for droughts lasting at least five consecutive water years were based on conditions affecting the SWP, as this supply availability fluctuates the most among Metropolitan's sources of supply. Using the same 96-year period of the SWP supply availability, 1988 to 1992 is the driest 5-year historical sequence that represents the lowest water supply available for SWP supplies to Metropolitan. In addition, staff analysis of the 8-river index indicates that the period 1988 to 1992 represents the lowest five consecutive dry years from 1922 through 2017. The 8-river index is used by DWR and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

### *Water Use Characterization*

Metropolitan developed its demand forecast by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation.[5] Projections of local supplies then were derived using data from current and expected local supply programs. The resulting difference between total demands net of savings from conservation and local supplies is the expected regional demands on Metropolitan supplies. As explained in detail in Section 2.2, Metropolitan used its Sales Model to calculate the difference between total forecasted retail demands and local supply projections. The balance is the demand on Metropolitan that will be met by supplies from Colorado River, SWP, and in-region storage.

Based on the 96 years of historic hydrologic condition (1922 to 2017), the five consecutive years of 1988 to 1992 represent the driest five-consecutive year historical sequence for Metropolitan's water supply and the five consecutive driest years for SWP supplies. Thus, Metropolitan used a repeat of the historic condition of 1988 to 1992 to assess the near-term drought risk for years 2021

[5] Information generated as part of this analysis is contained in Appendix 1.

to 2025. Under this assessment, the historic condition for 1988 is used to forecast the water use for the first year 2021, the historic condition for 1989 is used to forecast the water use for the second year 2022, and so on up to year 2025. Metropolitan's projected water use is presented annually for the next five years in Table 2-7, including the year-by-year change in projected use. In addition, estimated actual water use for 2020 and the historic water use for 2016 through 2019 are presented in Table 2-7.

Climate impacts to M&I and Agricultural demands are captured using climate adjustment factors. These factors were estimated using observed range of weather variables, precipitation and temperature, on historical consumptive demands. Metropolitan updated these factors to include the most recent weather and climate outcomes and recent changes in water use and irrigation demands. By incorporating these factors, Metropolitan's demand projections are calibrated to the more recent water use behaviors and better reflect current climate change impacts.

### *Supply Characterization*

Metropolitan's assumptions for its supply capabilities are discussed and presented in 5-year increments under its water reliability assessment in Section 2.3. For Metropolitan's DRA, these supply capabilities are further refined and presented annually for the years 2021 to 2025 by assuming a repeat of historic conditions from 1988 to1992. This historic five-year sequence represents the lowest water supply available for SWP supplies to Metropolitan.

For its DRA, Metropolitan assessed the reliability of each individual water supply source over the five consecutive year drought through a modeling method using the same historical hydrologic conditions from 1922 to 2017. Also, as part of this DRA, the expected quantity of each water supply source for each year of the five-year drought was evaluated and included within the tabulated capability of each supply category. Metropolitan's supply sources under the CR, SWP, and in-region supply categories are individually listed and discussed in detail in Section 3. Future supply capabilities for each of these supply sources are also individually tabulated in Appendix 3, with consideration for plausible changes on projected supplies under climate change conditions, anticipated regulatory changes, and other factors. as explained in Section 2.6.

Metropolitan used DWR's analyses of SWP delivery capability which includes climate change impacts to deliveries at a 2025 emission level and 15 cm of sea level rise. This resulted in adjusted delivery capability. The DWR analyses also incorporates restrictions on SWP and Central Valley Project (CVP) operations in accordance with water quality objectives established by the State Water Resources Control Board, the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued on October 21, 2019, and the Incidental Take Permit issued by the California Department of Fish and Wildlife on March 31, 2020. In addition, these estimates incorporate amendments to the Coordinated Operations Agreement between the Central Valley Project and the State Water Project made in 2018. In the 2019 Delivery Capability Report, they found that subsidence has reduced the flow capacity in the aqueduct at locations in San Luis and San Joaquin Field Divisions but has not yet resulted in a reduction in deliveries.

For the Colorado River, Metropolitan used the official January 2021 CRSS run which utilized a full hydrology set. USBR also examines a stress test hydrology set as a proxy to show climate change impacts. The stress test hydrology includes the latest 30 years and has lower inflows as compared to the full hydrology. The driest five-year period 1988-1992 falls within this stress test hydrology. USBR acknowledges that climate change impacts are demonstrated in the stress test hydrology. The five-year dry period used by Metropolitan in the DRA is within this stress test hydrology period, incorporating the decreased inflows associated with climate impacts.

The supply capabilities presented in Table 2-7 are based on Metropolitan's core supplies of programs within the Colorado River and SWP. Metropolitan's core water supplies are listed in Appendix 4 WSCP Table A.4-3. In addition, Metropolitan has numerous flexible supplies and storage programs within the Colorado River, SWP, and in-region that may be exercised as supply augmentation actions, if needed, consistent with the shortage response actions identified in Metropolitan's WSCP. The supply capabilities of Metropolitan's core, flexible, and storage programs for 2021 to 2025 are presented in detail in Appendix 3 Table A.3-8.

### *Total Water Supply and Use Comparison*

Metropolitan's DRA is presented in Table 2-7 and provides a comparison of Metropolitan's total water supply and use for the next five years. This table is based on and is an abridged version of DWR's optional Planning Tool. Table 2-7 also includes DWR Submittal Table 7-5, Five-Year Drought Risk Assessment Table to Address Water Code Section 10635(b). Metropolitan's DRA uses annual total comparisons of its water supply and use. Developing the DRA using annual totals versus monthly values is most practicable for large wholesale suppliers, like Metropolitan, with core supply sources that are annually assessed and depend on unpredictable hydrology, such as the SWP, Colorado River, and availability of water transfers, among others.

Metropolitan's near-term assessment reveals that there could be a potential shortfall of core supplies in four of the next five years. This shortfall is largely triggered by the assumed low supply conditions from the SWP under a repeat of the historical condition of 1988 to 1992, which is modeled at 12% for 2021, 15% for 2023, 23% for 2024, and 18% for 2025. Actual supply conditions for the next five years may prove different from these historic supply conditions. This DRA illustrates Metropolitan's potential shortage response actions, if such a shortfall were to happen.

As detailed in Section 2.5 and Appendix 4, Metropolitan has a robust Water Shortage Contingency Plan and comprehensive shortage response planning that include demand reduction measures and supply augmentation actions. For years 2021, 2023, 2024, and 2025, the estimated shortfalls from the Colorado River and SWP core supplies are 432 TAF (Level 3), 388 TAF (Level 3), 23 TAF (Level 1) and 223 TAF (Level 2), respectively, with the corresponding WSCP shortage levels indicated in parentheses. Appendix 4 Table A.4-5 presents Metropolitan's response actions for the different shortage levels, which include take from Storage, execute Flexible Supplies, implement Voluntary Demand Reduction, and implement Water Supply Allocation Plan. Appendix 4 Table A.4-6 further identifies Metropolitan's supply augmentation actions that may be exercised to mitigate any potential shortage, including withdrawal from available flexible supplies and storage programs.

As detailed in Section 3 and Appendix 3, Metropolitan has built its dry-year and emergency storage through partnerships with various entities and investments in infrastructure. As of January 1, 2021, Metropolitan has 3.2 MAF in storage that may be used for dry-year needs, with estimated supply capacity to withdraw and deliver over 1 MAF to 1.4 MAF per year for the next five years. Because dry-year storage is at a record high, Metropolitan may only need to implement supply augmentation actions to meet the potential core supply shortfall. Supply augmentation actions may include exercising Metropolitan's flexible supplies and storage from the Colorado River, SWP, and in-region. In addition to supply augmentation, Metropolitan may also implement demand reduction and operational flexibility as part of its shortage response actions, to preserve storage or under scenarios where dry-year storage levels are not high. The factual shortage response actions, combination of actions selected, and volume of take from supply programs exercised all depend on the shortage that needs to be met, storage balance of the supply programs, program constraints, and other supply management considerations. With a potential core

supply surplus estimated for year 2022, no water service reliability concern is anticipated, and no shortage response actions are expected to be exercised.

This DRA shows, under the assumptions described in this UWMP, that Metropolitan's total core, flexible, and storage supplies exceed the projected demand on Metropolitan for 2021 to 2025. This demonstrates Metropolitan's water service reliability for each year of the next five years under a repeat of the driest five-year historic sequence of Metropolitan's water supply. A graphical representation of the DRA is presented in Figure ES-2, as part of the Executive Summary. Metropolitan will periodically revisit its representation of both individual supply sources and of the gross water use estimated for each year and will revise its DRA if needed. A portion of Table 2-7 is also presented in Appendix 12 as new DWR Submittal Table 7-5.

## Table 2-7
## Metropolitan's Drought Risk Assessment
## Water Use, Supply, and Risk Assessment for 2021 – 2025
## (also included as Appendix 12 DWR Submittal Table 7-5)

**Based on DWR DRA Optional Planning Tool (Annual totals in AF)**

| Water Use Worksheet | |
|---|---|
| **Historicf and Actual** | |
| 2016 | 1,663,599 |
| 2017 | 1,449,015 |
| 2018 | 1,560,487 |
| 2019 | 1,327,928 |
| Customer Water Use Subtotal | 1,394,261 |
| Losses[1] | 48,520 |
| 2020 Total Gross Water Use | **1,442,781** |
| **Five Consecutive Water Years** | |
| Change from 2020 | 153,219 |
| 2021 Gross Water Use | **1,596,000** |
| Change from 2021 | 73,000 |
| 2022 Gross Water Use | **1,669,000** |
| Change from 2022 | 19,000 |
| 2023 Gross Water Use | **1,688,000** |
| Change from 2023 | (197,000) |
| 2024 Gross Water Use | **1,491,000** |
| Change from 2024 | 101,000 |
| 2025 Gross Water Use | **1,592,000** |

[1] Losses include treated syslem losses and surface reservoir evaporation.

| Supply Worksheet [1] | |
|---|---|
| 2021 (1st year) | **1,164,000** |
| 2022 (2nd year) | **1,903,000** |
| 2023 (3rd year) | **1,300,000** |
| 2024 (4th year) | **1,468,000** |
| 2025 (5th year) | **1,369,000** |
| Supply 1 - Colorado River Aqueduct supplies [2] | |
| 2021 (1st year) | 919,000 |
| 2022 (2nd year) | 866,000 |
| 2023 (3rd year) | 996,000 |
| 2024 (4th year) | 979,000 |
| 2025 (5th year) | 987,000 |
| Supply 2 - State Water Project supplies | |
| 2021 (1st year) | 245,000 |
| 2022 (2nd year) | 1,037,000 |
| 2023 (3rd year) | 304,000 |
| 2024 (4th year) | 489,000 |
| 2025 (5th year) | 382,000 |
| Supply 3 - In-Region supplies | |
| 2021 (1st year) | 0 |
| 2022 (2nd year) | 0 |
| 2023 (3rd year) | 0 |
| 2024 (4th year) | 0 |
| 2025 (5th year) | 0 |

**DRAFT Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)**

| 2021 | Total |
|---|---|
| Gross Water Use | **1,596,000** |
| Total Supplies | **1,164,000** |
| Surplus/Shortfall w/o WSCP Action | **(432,000)** |
| Planned WSCP Actions (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 432,000 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | **0%** |

| 2022 | Total |
|---|---|
| Gross Water Use [Use Worksheet] | **1,669,000** |
| Total Supplies [Supply Worksheet] | **1,903,000** |
| Surplus/Shortfall w/o WSCP Action | **234,000** |
| Planned WSCP Actions (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 234,000 |
| Resulting % Use Reduction from WSCP action | **0%** |

| 2023 | Total |
|---|---|
| Gross Water Use [Use Worksheet] | **1,688,000** |
| Total Supplies [Supply Worksheet] | **1,300,000** |
| Surplus/Shortfall w/o WSCP Action | **(388,000)** |
| Planned WSCP Actions (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 388,000 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | **0%** |

| 2024 | Total |
|---|---|
| Gross Water Use [Use Worksheet] | **1,491,000** |
| Total Supplies [Supply Worksheet] | **1,468,000** |
| Surplus/Shortfall w/o WSCP Action | **(23,000)** |
| Planned WSCP Actions (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 23,000 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | **0%** |

| 2025 | Total |
|---|---|
| Gross Water Use [Use Worksheet] | **1,592,000** |
| Total Supplies [Supply Worksheet] | **1,369,000** |
| Surplus/Shortfall w/o WSCP Action | **(223,000)** |
| Planned WSCP Actions (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 223,000 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | **0%** |

1. Includes Metropolitan's core supplies as defined in WSCP in Appendix 4. Detailed Supply Worksheets are included in Appendix 3 Table A.3-8. Metropolitan may exercise supply augmentation actions from flexible and storage programs as response to any potential core supply shortfall using the 3.2 MAF of dry-year supplies currently in storage. In addition, Metropolitan may also implement demand reduction actions, if needed.
2. Maximum CRA deliveries limited to 1.25 MAF, including Exchange with SDCWA and US.

## 2.5 Water Shortage Contingency Plan

In addition to the water supply reliability analysis addressing normal, dry, and multiple dry water years, CWC Section 10632 requires urban suppliers to prepare and adopt a water shortage contingency plan which includes the shortage response actions that they would take in response to six standard water shortage levels. The Water Shortage Contingency Plan (WSCP) is Metropolitan's plan in the case of an actual water shortage condition. As illustrated in the preceding section's service reliability assessment, Metropolitan has the supply capabilities to meet projected demands during various hydrologic conditions. With such service reliability, Metropolitan's WSCP is part of its resiliency strategy to improve preparedness for droughts and other impacts on water supplies. In fulfillment of the Act's requirements, described below are the WSCP reporting elements which show how Metropolitan will manage and mitigate a water shortage. A copy of Metropolitan's WSCP is provided in Appendix 4.

### *Water Supply Reliability Analysis*

CWC Section 10632(a)(1) directs the WSCP to include an "analysis of water supply reliability conducted pursuant to Section 10635." As shown in the water reliability assessment in Section 2.3, Metropolitan anticipates being able to meet water demands with adequate supplies across the single driest year and droughts lasting five consecutive water years scenarios through the year 2045. Metropolitan's DRA in Section 2.4. anticipates no water service reliability concerns or shortfall mitigation measures will be needed over the next five years, under a repeat of the historic driest five-year sequence of Metropolitan's water supply.

### *Annual Water Supply and Demand Assessment Procedures*

Pursuant to CWC Section 10632(a)(2), Metropolitan must include in its WSCP the procedures used for conducting an annual Water Supply and Demand Assessment (Annual Assessment). The Annual Assessment is a determination of Metropolitan's annual outlook for water supply reliability, and how a perceived shortage may relate to WSCP shortage stage response actions in the current calendar year. This determination will be based on information available to Metropolitan at the time of the analysis. Starting in 2022, the Annual Assessment will be due by July 1 of every year. CWC Section 10632.1 states: "An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later." The Annual Assessment and related reporting are to be conducted based on the procedures described in the WSCP.

The Annual Assessment determination will be based on considerations of available core water supplies, unconstrained water demand, planned water use, and infrastructure conditions. The difference between projected core water supplies and anticipated unconstrained demand will be used to determine what, if any, shortage stage is expected under the WSCP framework. CWC Section10632(a)(2)(B)(ii) requires the Annual Assessment to determine "current year available supply, considering hydrological and regulatory conditions in the current year and one dry year." The Annual Assessment will include two separate estimations of Metropolitan's annual water supply and unconstrained demand using: 1) current year conditions and 2) assumed dry year conditions. Accordingly, the Annual Assessment's shortage analysis will present separate sets of findings for the current year and dry year scenarios. The CWC does not specify the characteristics of a dry year, allowing discretion to the Supplier. Metropolitan will use this discretion to refine and update its assumptions for a dry year scenario in each Annual Assessment as information becomes available.

By the month of June, Metropolitan staff will present a completed Annual Assessment for approval by Metropolitan's Board of Directors or by the Board's authorized designee with

expressly delegated authority for approval of Annual Assessment determinations. This presentation to the decision-making body will include a request that the approval of the Annual Assessment determination also appropriately triggers any recommended specific shortage response actions resulting from the assessment. Upon approval, Metropolitan staff will then formally submit the Annual Assessment to the California Department of Water Resources by July 1.

### *Six Standard Water Shortage Levels*

As required by CWC 10632(a)(3)(A), the WSCP is framed around six standard shortage levels that correspond to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortages. Each of the six shortage levels represents an increasing gap between Metropolitan's estimated core supplies and unconstrained demand as determined in the Annual Assessment. Shortage levels also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other emergency events.

### *Shortage Response Actions*

CWC 10632(a)(4) directs the WSCP to contain shortage response actions that align with the defined shortage levels, and include:

- Supply Augmentation Actions
- Demand Reduction Actions
- Operational Changes
- Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions (Not applicable to Metropolitan as a wholesaler with no retail customers)
- An estimate of the extent to which the gap between supplies and demand will be reduced by implementation of each action.

Metropolitan has invested extensively in a diverse portfolio of supply sources and system resiliency to prepare for a wide range of possible challenging conditions. Metropolitan follows the principles of its Water Surplus and Demand Management (WSDM) Plan, which was adopted in 1999 and provides policy guidance for managing regional water supplies to achieve reliability.

Shortage responses will be customized to meet the circumstances for the particular shortage. Because circumstances can change at any time, Metropolitan's shortage responses actions will be adjusted accordingly throughout the year. To determine specific actions that would be taken at each standard shortage level, Metropolitan will evaluate conditions specific to cost, timing, distribution needs and capabilities, and other variables that include SWP allocation, Colorado River conditions, preexisting demand reduction measures, supply program take capacities, and storage balances.

Supply augmentation actions are comprised of Metropolitan's portfolio of water storage reserves and flexible supply sources that are available on an as-needed basis, such as water from its storage facilities and from transfer and exchange programs. Demand reduction actions are temporary measures that can constrain demand in the current year, such as public information campaigns and mandatory allocations. Operational flexibility actions are an acknowledgement that Metropolitan will adjust its operations as needed during shortages. These adjustments may include temporarily deferring or accelerating scheduled maintenance and planned shutdowns or adjusting the distribution system to compensate for limitations in Colorado River or State Water Project water.

Shortages are characterized not merely by shortfalls in annual core water supplies, but also by the water balances in Metropolitan's storage programs. Thus, a 10 percent or even a 50 percent shortfall in core supplies could be met entirely with stored water if storage levels are sufficient to meet demand. If storage levels are already depleted, the same shortfall in core supplies could potentially require a more complex mix of supply augmentation and demand reduction actions. During most years, Metropolitan anticipates that it can meet all or most shortages with supply augmentation actions. Depending on intensity, voluntary demand reduction measures are estimated to reduce retail water usage by up to 20 percent. In the most severe situations, allocating shortages to member agencies through the Water Supply Allocation Plan (WSAP) would address any remaining shortages not already mitigated by supply augmentation and lesser demand reduction actions.

### *Communication Protocols*

Metropolitan's WSCP Communication Plan details Metropolitan's action-oriented strategy for education, outreach, and coordination during each WSCP standard shortage stage and in response to a catastrophic loss of supply. The WSCP Communications Plan provides messaging strategies that would be implemented at each level, leading up to more focused crisis communication strategies. It emphasizes the need for plans to be adaptable and that Metropolitan management and/or Board of Directors could also call for specific messaging strategies that address unique shortage scenarios.

### *Compliance and Enforcement*

This WSCP reporting element is required for urban retail suppliers only.

### *Legal Authorities*

Metropolitan is a wholesale water provider organized as a cooperative of 26 voluntary members. Metropolitan was formed pursuant to the Metropolitan Water District Act, Statutes 1969, chapter 209, codified at California Water Code, Appendix Section 109 (the "MWD Act"). Pursuant to the MWD Act, Metropolitan has the express and implied statutory authority to "[p]rovide, sell, and deliver water at wholesale for municipal and domestic uses and purposes," among other powers. (MWD Act, §§ 120, 130.) To accomplish the provision of water, Metropolitan is also expressly authorized to promote and implement conservation programs, including during times of water shortage. (MWD Act, § 130.5.)

Metropolitan also has authority under the California Water Code to implement supply shortage programs. (Cal. Water Code, §§ 350-359, 375-378.) For example, Section 375(a) of the Water Code provides:

Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity.

Cal. Water Code, § 375(a). Water Code Section 375(b) also provides the authority for pricing to encourage water conservation.

Metropolitan's Board of Directors has approved many policies and rules, codified in Metropolitan's own Administrative Code, which further provide Metropolitan the authority to

ensure the availability of its water during times of shortages. For example, Administrative Code Section 3107 requires that any territory annexed to Metropolitan comply with Metropolitan's water use efficiency guidelines.

The Board has also ratified various policies and rules to implement a Water Supply Allocation Plan (WSAP) to address shortage conditions. Metropolitan's WSAP provides a standardized methodology for allocating supplies during times of shortage. The WSAP is authorized pursuant to the following Board actions:

- By Minute Item 43514, dated April 13, 1999, the Board adopted the Water Surplus and Drought Management Plan.
- By Minute Item 44005, dated June 17, 2000, the General Manager has the authority to reduce Interim Agriculture Water Program deliveries up to 30 percent prior to imposing any mandatory allocation under the Water Surplus and Drought Management Plan.
- By Minute Item 47393, dated February 12, 2008, the Board adopted the Water Supply Allocation Plan.
- By Minute Item 48376, dated August 17, 2010, the Board approved adjustments to the Water Supply Allocation Plan.
- By Minute Item 48803, dated September 12, 2011, the Board approved adjustments to the Water Supply Allocation Plan.
- By Minute Item 74526, dated February 11, 2014, the Board adopted the Water Supply Alert Resolution.
- By Minute Item 49979, dated December 9, 2014, the Board approved adjustments to the Water Supply Allocation Plan.

In addition to the statutes and other legal authorities set forth above, Metropolitan is empowered to implement and enforce its shortage response actions pursuant to various resolutions. For example, on April 11, 2016, Metropolitan's Board voted to adopt Metropolitan's 2015 UWMP and authorized its submittal to the State of California as stated in Resolution 9209. Metropolitan's 2015 UWMP contains Metropolitan's December 2014 Water Supply Allocation Plan in Appendix 4. Metropolitan's 2015 UWMP also describes in Section 2.4 Metropolitan's WSAP and Water Surplus and Drought Management (WSDM) Plan, which guide Metropolitan's planning and operations during both shortage and surplus conditions. Similarly, on May 11, 2021, Metropolitan's Board voted to adopt Metropolitan's UWMP and WSCP as stated in Resolutions 9279 and 9281, respectively. These two Resolutions authorize Metropolitan to implement and enforce its shortage response actions contained in the WSCP, which is attached as Appendix 4 to the UWMP.

Additionally, numerous agreements allow Metropolitan to take its shortage response actions. Supply augmentation actions are authorized by the agreements shown in Appendix 3 of the 2020 UWMP: Justifications for Supply Projections.

If necessary, Metropolitan shall declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1. In addition, Metropolitan shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Government Code Section 8558.

### *Financial Consequences of WSCP*

A water shortage may be created by either a reduction in water supply, or an increase in water demand, or a combination of both. Metropolitan's shortage response actions include supply augmentation, demand management, and operational flexibility, all of which could impact Metropolitan financially. From these financial effects, there is a potential for expenditures exceeding revenues more than budgeted, thereby requiring unanticipated draws from reserves.

Variation in the amount of revenues is already part of Metropolitan's financial planning. Revenues vary according to regional weather and the availability of statewide water supplies. In dry years, local demands increase, and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years, demands decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 2009 and 2015 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan maintains financial reserves, with a minimum and target balance, to stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales. Metropolitan's practice of using reserves to buffer unexpected increases or decreases in budgeted revenue also applies to unexpected expenditure increases or decreases resulting from shortage responses.

Metropolitan uses its financial reserves to mitigate the impacts of water shortages. This policy applies to each of the six shortage levels described in the WSCP. Financial reserves create a buffer to reduce the financial impact of the water shortage. Other mitigation actions such as reducing O&M expenses, deferring Capital Improvement Projects, and rates/charges increases are part of Metropolitan's biennial budget and rate design cycle and are not used routinely to mitigate financial impacts of water shortage response actions.

Metropolitan's reserve policy provides for a minimum reserve requirement and target amount of unrestricted reserves at June 30 of each year. Funds in excess of the target amount are to be utilized for capital expenditures in lieu of the issuance of additional debt, or for the redemption, defeasance or purchase of outstanding bonds or commercial paper as determined by the Board. However, if the fixed charge coverage ratio (the amount necessary to cover all fixed costs) is at or above 1.2, amounts over the minimum may be expended for any lawful purpose of Metropolitan, as determined by the Board. Therefore, unrestricted reserves are available to address Metropolitan's shortage response actions, as well as the consequences of those actions, so long as its fixed charge coverage ratio is at or above 1.2.

### *Monitoring and Reporting*

This WSCP reporting element is required for urban retail suppliers only.

### *WSCP Reevaluation and Improvement*

The WSCP will be periodically re-evaluated to ensure that its shortage response actions are effective and up to date based on lessons learned from implementing the WSCP. The WSCP will be revised and updated during the UWMP update cycle to incorporate updated and new information. For example, new supply augmentation actions will be added, and actions that are no longer applicable for reasons such as program expiration will be removed. However, if significant revisions are warranted, the WSCP will be updated outside of the UWMP update cycle. In the course of preparing the Annual Assessment each year, Metropolitan staff will routinely consider the functionality of the overall WSCP and will prepare recommendations for Metropolitan's Board of Directors if changes are found to be needed.

### *Relationship with other Metropolitan Shortage Planning*

The WSCP is designed to be consistent with the Water Shortage and Demand Management (WSDM) Plan, Water Supply Allocation Plan (WSAP), and other emergency planning efforts as described below. WSDM Plan principles guide the specific actions to be taken under WSCP shortage stages. Data collection, continual analysis, and monthly reporting processes of WSDM Plan implementation will form the basis for Metropolitan's Annual Water Supply Demand Assessment that will be provided annually to the state beginning in July 2022. The WSAP is integral to the WSCP's shortage response strategy in the event that Metropolitan determines that supply augmentation (including storage) and lesser demand reduction measures would not be sufficient to meet a projected shortage.

#### *Water Surplus and Drought Management Plan*

Metropolitan's Board adopted the WSDM Plan in April 1999, which provides policy guidance for managing regional water supplies to achieve the reliability goals of the IRP and identifies the expected sequence of resource management actions that Metropolitan will execute during surpluses and shortages to minimize the probability of severe shortages and reduce the possibility of extreme shortages and shortage allocations. Unlike Metropolitan's previous shortage management plans, the WSDM Plan recognizes the link between surpluses and shortages, and it integrates planned operational actions with respect to both conditions.

<u>WSDM Plan Development</u>

Metropolitan and its member agencies jointly developed the WSDM Plan during 1998 and 1999. This planning effort included more than a dozen half-day and full-day workshops and more than three dozen meetings between Metropolitan and member agency staff. The result of the planning effort is a consensus plan that addresses a broad range of regional water management actions and strategies.

<u>WSDM Plan Principles and Goals</u>

The guiding principle of the WSDM Plan is to manage Metropolitan's water resources and management programs to maximize management of wet year supplies and minimize adverse impacts of water shortages to retail customers. From this guiding principle came the following supporting principles:

- Encourage efficient water use and economical local resource programs
- Coordinate operations with member agencies to make available as much surplus water as possible for use in dry years
- Pursue innovative transfer and banking programs to secure more imported water for use in dry years
- Increase public awareness about water supply issues

The WSDM Plan also declared that if mandatory import water allocations become necessary, they would be calculated on the basis of need, as opposed to any type of historical purchases. The WSDM Plan contains the following considerations that would go into an allocation of imported water:

- Impact on retail consumers and regional economy
- Investments in local resources, including recycling and conservation
- Population growth

- Changes and/or losses in local supplies
- Participation in Metropolitan's non-firm (interruptible) programs
- Investment in Metropolitan's facilities

WSDM Plan Implementation

Each year, Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage. Each stage is associated with specific resource management actions designed to: (1) avoid an Extreme Shortage to the maximum extent possible; and (2) minimize adverse impacts to retail customers if an Extreme Shortage occurs. The current sequencing outlined in the WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan's existing and expected resource mix.

*Surplus Stages*

Metropolitan's supply situation is considered to be in surplus as long as net annual deliveries can be made to water storage programs. The WSDM Plan further defines four surplus management stages that guide the storage of surplus supplies in Metropolitan's storage portfolio. Deliveries for storage in DVL and in SWP terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from DVL for regulatory purposes or to meet seasonal demands may occur in any stage. Deliveries to other storage facilities may be interrupted, depending on the amount of the surplus.

*Shortage Stages*

The WSDM Plan distinguishes between Shortages, Severe Shortages, and Extreme Shortages. Within the WSDM Plan, these terms have specific meanings relating to Metropolitan's ability to deliver water to its member agency customers.

*Shortage*: Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfers as necessary.

*Severe Shortage*: Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation.

*Extreme Shortage*: Metropolitan allocates available supply to full-service customers.

The WSDM Plan also defines six shortage management stages to guide resource management activities. These stages are not defined merely by shortfalls in imported water supply, but also by the water balances in Metropolitan's storage programs. Thus, a 10 percent shortfall in imported supplies could be a stage one shortage if storage levels are high. If storage levels are already depleted, the same shortfall in imported supplies could potentially be defined as a more severe shortage.

When Metropolitan must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Under most of these stages, Metropolitan is still able to meet all end-use demands for water. For shortage stages 1 through 3, Metropolitan will meet demands by withdrawing water from storage. At shortage stages 4 and 5, Metropolitan may undertake additional shortage management steps, including issuing public calls for extraordinary conservation and exercising water transfer options, or purchasing water on the open market.

Figure 2-1 shows the actions under surplus and shortage stages and when an allocation plan would be necessary to enforce mandatory cutbacks. The overriding goal of the WSDM Plan is to avoid reaching Shortage Stage 6, an Extreme Shortage.

**Figure 2-1 Resource Stages, Anticipated Actions, And Supply Declarations**

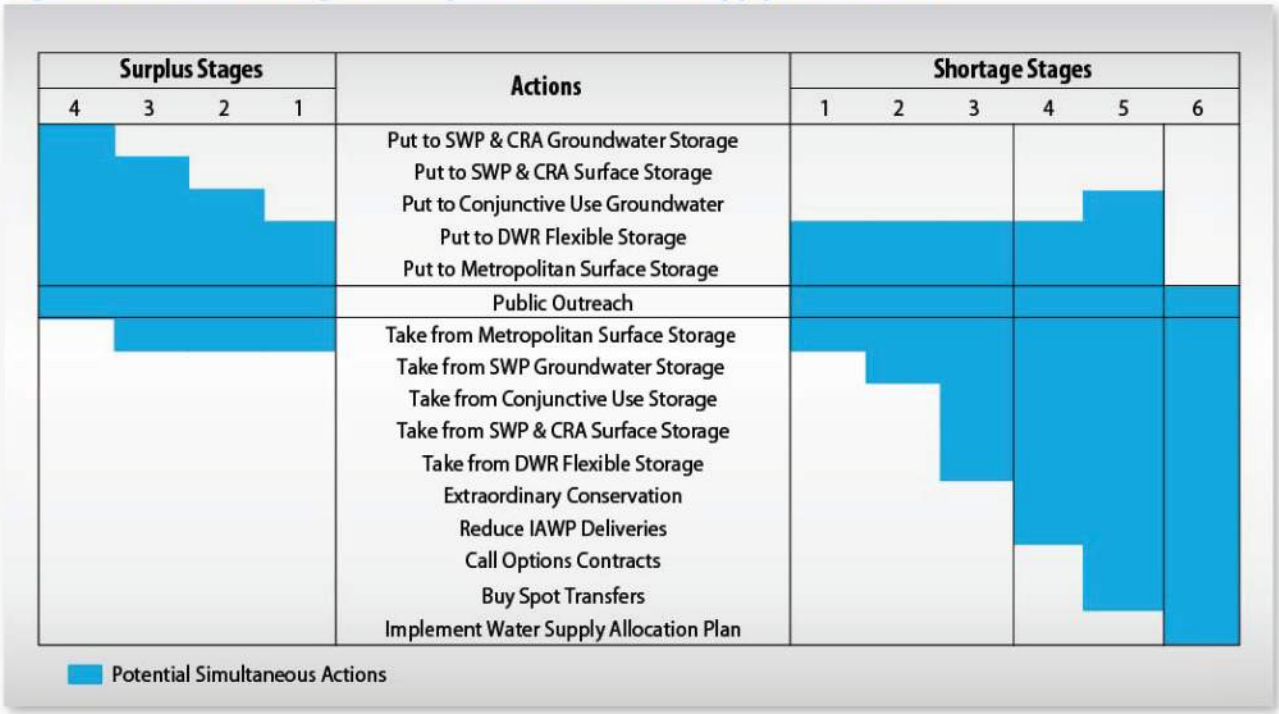


### *Water Supply Allocation Plan*

The WSAP provides a formula for allocating available water supplies to the member agencies in case of extreme water shortages within Metropolitan's service area. The WSAP was approved by Metropolitan's Board in February 2008 and has since been implemented three times, most recently in April 2015. The WSAP was developed in consideration of the principles and guidelines described in the WSDM Plan, with the objective of creating an equitable needs-based allocation. The WSAP formula seeks to balance the impacts of a shortage at the retail level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account growth, local investments, changes in supply conditions, and the demand hardening aspects of non-potable recycled water use and the implementation of conservation savings programs.

Water Supply Allocation Plan Development

Between July 2007 and February 2008, Metropolitan staff worked jointly with Metropolitan's member agencies to develop the WSAP. Throughout the development process, Metropolitan's Board was provided with regular progress reports on the status of the WSAP. The WSAP was adopted at the February 12, 2008 Board meeting. Since the WSAP's adoption in 2008, Metropolitan has worked extensively with the member agencies to periodically review the WSAP formula. Following Board-directed formal review of the WSAP at 12 months after initial implementation and at 3 years after initial adoption, the Board approved adjustments to the WSAP formula on August 17, 2010, and September 13, 2011. In light of drought conditions, Metropolitan staff convened a member agency working group between July and November 2014 to revisit the WSAP before possible implementation in 2015. On December 9, 2014, the Board approved additional adjustments to the formula.

*The WSAP Formula*

The WSAP formula is calculated in three steps: base period calculations, allocation year calculations, and supply allocation calculations. The first two steps involve standard computations, while the third step contains specific methodology developed for the WSAP.

*Step 1: Base Period Calculations*

The first step in calculating a water supply allocation is to estimate water supply and demand using a historical base period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from fiscal years (July through June) ending 2013 and 2014.

*Step 2: Allocation Year Calculations*

The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population growth and changes in local supplies.

*Step 3: Supply Allocation Calculations*

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. There are a number of adjustments that go into a member agency's water supply allocation. Each element and its application in the allocation formula are discussed in detail in Metropolitan's WSAP.

*Annual Reporting Schedule on Supply/Demand Conditions*

Managing Metropolitan's water supply resources to minimize the risk of shortages requires timely and accurate information on changing supply and demand conditions throughout the year. To facilitate effective resource management decisions, the WSDM Plan includes a monthly schedule for providing supply/demand information to Metropolitan's senior management and Board, and for making resource allocation decisions. Table 2-8 shows this schedule.

**Table 2-8**
**Schedule of Reporting and Water Supply Allocation Decision-Making**

| Month | Information Report/Management Decision |
|---|---|
| January | Initial supply/demand forecasts for year |
| February - March | Update supply/demand forecasts for year |
| April - May | Finalize supply/demand forecasts<br>Management decisions re: Contractual Groundwater and Option Transfer Programs<br>Board decision re: Need for Extraordinary Conservation |
| October - December | Report on Supply and Carryover Storage |

### *Catastrophic and Emergency Planning*

As part of the WSCP, the CWC requires urban suppliers to plan for catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events. In addition, CWC Section 10632.5 further requires urban water suppliers to develop a seismic risk assessment and mitigation plan to assess the vulnerability of

each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, these required planning elements are captured in the analyses that went into developing its Emergency Storage Objective, Seismic Resiliency Reports, and Emergency Response Plans. Elements of these Metropolitan analyses are summarized below.

### *Emergency Storage Objective*

Metropolitan established its original criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. These criteria were again discussed in the 1996 IRP. Metropolitan's Board approved both of these documents. Emergency storage requirements are based on the potential of a major earthquake that would damage all supply aqueducts isolating Southern California from its imported water sources.

In 2019, Metropolitan and its member agencies completed a collaborative process to update the regional planning estimate of Metropolitan's Emergency Storage Objective. This emergency storage represents the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct.

The emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service. The Emergency Storage Objective considers a six- and twelve-month outage period for the imported supply aqueducts incorporating latest seismic information and operational flexibility of Metropolitan's system, a retail water demand cutback ranging from 25 to 35 percent considering the level of conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions.

Under this update, Metropolitan's Emergency Storage Objective was set to 750 TAF, as this level of storage would prevent severe water shortages to the region given new information on expected recovery durations. The emergency storage volume represents a planning estimate for the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency. The detailed description of Metropolitan's Emergency Storage Objective is included in Appendix 8.

### *Emergency Freshwater Pathway (Sacramento-San Joaquin Delta)*

It has been estimated by the California Department of Water Resources (DWR) that in the event of a major earthquake in or near the Delta, water supplies could be interrupted for up to three years, posing a significant and unacceptable risk to the California business economy. A post-event strategy would provide necessary water supply protections to avert this catastrophe. Such a plan has been coordinated through DWR, Corps of Engineers (Corps), Bureau of Reclamation (Reclamation), California Office of Emergency Services (Cal OES), Metropolitan, and the State Water Contractors.

<u>DWR Delta Flood Emergency Management Plan</u>

The Delta Flood Emergency Management Plan (DWR, 2018) provides strategies for response to Delta levee failures, up to and including earthquake-induced multiple island failures during dry conditions when the volume of flooded islands and saltwater intrusion are large, resulting in

curtailment of export operations. Under these severe conditions, the plan includes a strategy to establish an emergency freshwater pathway from the central Delta along Middle River and Victoria Canal to the export pumps in the south Delta. The plan includes the prepositioning of emergency construction materials at existing and new stockpile and warehouse sites in the Delta, and development of tactical modeling tools (DWR Emergency Response Tool) to predict levee repair logistics, timelines of levee repair and suitable water quality to restore exports. The Delta Flood Emergency Management Plan has been extensively coordinated with state, federal and local emergency response agencies. DWR, in conjunction with local agencies, the Corps and Cal OES, conduct tabletop and field exercises to test and revise the plan under real time conditions.

DWR and the Corps provide vital Delta region response to flood and earthquake emergencies, complementary to Cal OES operations. These agencies perform under a unified command structure and response and recovery framework. The Northern California Catastrophic Flood Response Plan (Cal OES, 2018) incorporates the DWR Delta Flood Emergency Management Plan. The Delta Emergency Operations Integration Plan (DWR and USACE, 2019) integrates personnel and resources during emergency operations.

Pathway Implementation Timeline

The Delta Flood Emergency Management Plan has found that using pre-positioned stockpiles of rock, sheet pile and other materials, multiple earthquake-generated levee breaches and levee slumping along the freshwater pathway can be repaired in less than six months. A supplemental report (Levee Repair, Channel Barrier and Transfer Facility Concept Analyses to Support Emergency Preparedness Planning, M&N, August 2007) evaluated among other options, the placement of sheet pile to close levee breaches, as a redundant method if availability of rock is limited by possible competing uses. The stockpiling of sheet pile is vital should more extreme emergencies warrant parallel and multiple repair techniques for deep levee breaches. Stockpiles of sheet pile and rock to repair deep breaches and an array of levee slumping restoration materials are stored at DWR and Corps stockpile sites and warehouses in the Delta.

Emergency Stockpile Sites and Materials

DWR has acquired lands at Rio Vista and Stockton as major emergency stockpile sites, which are located and designed for rapid response to levee emergencies. The sites provide large loading facilities, open storage areas and new and existing warehousing for emergency flood fight materials, which augment existing warehousing facilities throughout the Delta. The Corps maintains large warehousing facilities in the Delta to store materials for levee freeboard restoration, which can be augmented upon request of other stockpiles in the United States. Pre-positioned rock and sheet pile are used for closure of deep levee breaches. Warehoused materials for rapid restoration of slumped levees include muscle (k-rail) walls, super sacks, caged rock containers, sandbags, stakes and plastic tarp. Stockpiles will be augmented as materials are used.

Emergency Response Drills

Earthquake-initiated multiple island failures will mobilize DWR and Corps resources to perform Delta region flood fight activities within an overall Cal OES framework. In these events, DWR and the Corps integrate personnel and resources to execute flood fight plans through the Delta Emergency Operations Integration Plan (DWR and USACE, 2019). DWR, the Corps and local agencies perform emergency exercises focusing on communication readiness and the testing of mobile apps for information collection and dissemination. The exercises train personnel and test the readiness of emergency preparedness and response capabilities under unified command, and provide information to help to revise and improve plans.

Levee Improvements and Prioritization

The DWR Delta Levees Subventions and Special Projects Programs have prioritized, funded and implemented levee improvements along the emergency freshwater pathway and other water supply corridors in the central and south Delta. These efforts are complementary to the Delta Flood Emergency Management Plan, which along with pre-positioned emergency flood fight materials, ensures reasonable seismic performance of levees and timely pathway restoration after a severe earthquake. These programs have been successful in implementing a coordinated strategy of emergency preparedness to the benefit of SWP and CVP export systems.

Significant improvements to the central and south Delta levees systems along Old and Middle Rivers began in 2010 and are continuing to the present time. This complements substantially improved levees at Mandeville and McDonald Islands and portions of Victoria and Union Islands. Levee improvements along the Middle River emergency freshwater pathway and Old River consist of crest raising, crest widening, landside slope fill and toe berms, which improve seismic stability, reduce levee slumping and create a more robust flood-fighting platform. Urban agencies, including Metropolitan, Contra Costa Water District, East Bay Municipal Utility District, and others have participated in levee improvement projects along or near the Old and Middle River corridors.

### *SWP Seismic Improvement*

DWR's recent SWP seismic resiliency efforts have focused heavily on SWP Dam Safety. The most prominent is the joint USBR/DWR corrective action study of Sisk Dam which will result in a massive seismic stability alteration project - to begin next year. Similarly, Perris Dam had a major foundation modification and stability berm added to the downstream face which has resulted in the removal of the DSOD imposed storage restriction. Several analyses have been conducted on SWP dam outlet towers/access bridges which has resulted in seismic upgrades (some completed/some on-going). Updated dam seismic safety evaluations are being performed on the Oroville Dam embankment and the radial gate control structure on the flood control spillway.

In addition to the dam safety elements, DWR has procured and stockpiled spare pipe sections for the SBA to increase recovery times following seismic induced damage (as part of the 2015 South Bay Aqueduct Reliability Improvement Project). Seismic retrofits have also been completed on 23 SWP bridges located in four Field Divisions with additional retrofits in various development stages. DWR has also updated the earthquake notification procedures and has replaced and expanded instrumentation for the SWP's seismic network.

### *Electrical Outages*

Metropolitan has also developed contingency plans that enable it to deal with both planned and unplanned electrical outages. These plans include the following key points:

- In event of power outages, water supply can be maintained by gravity feed from regional reservoirs such as DVL, Lake Mathews, Castaic Lake, and Silverwood Lake.
- Maintaining water treatment operations is a key concern. As a result, all Metropolitan treatment plants have at least two emergency generators capable of operating the treatment plant in the event of supply failure on the main electrical grid. These generators will automatically operate when power from the grid is interrupted, and annual testing is conducted to ensure they are operational and reliable. In addition, within the water treatment plants there are also dual electrical systems for all critical facilities (e.g., chemical feed systems) to provide redundancy and resiliency.

- Valves at Lake Skinner can be operated by the backup generation at the Lake Skinner treatment plant.
- Metropolitan owns mobile generators that can be transported quickly to key locations, such as reservoir Intake/outtake structures, if necessary.
- The CRA electric transmission system can supply power to the five CRA pumping plants from three independent power sources: Mead 230kV substation located near Hoover Dam; Parker Dam 230kV substation near Gene; and from interconnections with Southern California Edison. These multiple locations where Metropolitan's 230 kV transmission system interconnects to the regional transmission grid provide a redundant path to bring 230 kV power to Hinds, Eagle Mountain, Iron Mountain and Gene Pumping Plants. In addition to redundant paths of power to each CRA pumping plant, the CRA electric transmission system has dual lines from the 230 kV Mead substation and multiple disconnect switches and circuit breakers. This improves the flexibility of the CRA electric transmission system to isolate portions of the system for maintenance or repairs and re-route power from the three independent power sources to the pumping plants while repairs are executed.

### *Seismic Risk Assessment and Mitigation Plan*

Beginning January 2020, CWC Section 10632.5 mandates UWMPs to include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, the required assessment and plan are accomplished as part of developing its resilience strategy and are presented in detail in its seismic resiliency reports. This section provides a summary of the various components of Metropolitan's resilience strategy. These components are described in detail in Metropolitan's Seismic Resilience Report First Biennial Report (February 2018) and Seismic Resilience Report 2020 Update (February 2020) presented as part of Appendix 9.

Over its nearly 90-year history, Metropolitan has been proactive in mitigating seismic risks posed to its expansive infrastructure, as well as improving its ability to maintain (or quickly restore) water deliveries following a major earthquake. This ability to mitigate seismic risks and maintain (or quickly restore) water deliveries following a seismic event is referred to as "seismic resilience." Metropolitan's holistic strategy for seismic resilience follows a "defense in depth" multi-layered approach for managing risk. Metropolitan's Seismic Resilience Strategy has three primary objectives:

1. Provide a diversified water supply portfolio, system flexibility, and emergency storage
2. Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events
3. Minimize water delivery interruptions through a dedicated emergency response and recovery organization

Metropolitan's Seismic Resilience Strategy is implemented through four components that encompass the various internal functions that promote Metropolitan's seismic resilience objectives. These components are supplemented by Metropolitan's commitment to inter-agency coordination when preparing and responding to a seismic event and other emergencies. The strategy is shown below in Figure 2-2.

Figure 2-2 Seismic Resilience Strategy

A brief description of the components of Metropolitan's Seismic Resilience Strategy and examples of their implementation are provided below.

### *Planning*

The goals of the planning component are to develop and maintain a diversified water resource portfolio; provide a flexible system that allows for operational changes to handle variations in water supply, planned or unplanned system outages; and to maintain adequate emergency storage supplies. Metropolitan has developed a diverse water resource portfolio through the enactment of various exchange and water banking programs. These water supply programs are described in detail in Section 3 and Appendix 3. In addition to existing supply programs, development of the Regional Recycled Water Program would provide Metropolitan with an additional water resource and would be strategically located on the coastal side of the San Andreas Fault. Metropolitan also strives for regional seismic resilience by incentivizing local agencies to develop increased conservation, recycling, storage, and other water management programs.

As Metropolitan expanded its system over the years, it has continually improved the flexibility of the system to handle changes in water supply or pipeline or facility outages. One example of Metropolitan's system flexibility is the Common Pool service area, which can be supplied by the Jensen, Weymouth, or Diemer water treatment plants. Additionally, Metropolitan has constructed its system such that most of the service area can be supplied by either Colorado River or State Water Project supplies.

Metropolitan's imported water supplies from the CRA and SWP East and West Branches cross the San Andreas Fault (SAF) Zone prior to reaching Metropolitan's service area. A major earthquake on the SAF has the potential of damaging all three aqueducts and disrupting imported supplies for up to six months. Metropolitan constructed Diamond Valley Lake (DVL) on the coastal side of the fault to mitigate the potential impacts of a major SAF earthquake to its service area. Completion of DVL nearly doubled Metropolitan's available surface water storage in the region and, along with other local reservoirs, is used to maintain 6 to 12 months of emergency water storage supply. Water from DVL can supply 4 of Metropolitan's 5 regional water treatment plants.

### *Engineering*

The goal of the engineering component is to assess and mitigate seismic risk to individual facilities and the system. This is accomplished through Metropolitan's Seismic Resilience of Structures Program, the Seismic Resilience of Pipelines Program, the Dam Safety Program, and through special seismic assessments.

Seismic Resilience of Structures

Metropolitan's program to increase the seismic resilience of structures is an ongoing program with the goal of protecting life safety and critical infrastructure to minimize water delivery interruptions following a seismic event. The initial program focused on evaluating the seismic risk of above ground structures (e.g. water treatment plants) constructed prior to 1990 and upgrading structures to mitigate the risk when found to be seismically deficient. The program has recently expanded to include post-1990 structures due to the progress made on the initial list of structures. Examples of seismically upgraded facilities include the Colorado River Aqueduct pump plant buildings, the Weymouth East and West Wash Water Tanks, and the Diemer and Jensen Administration Buildings.

Seismic Resilience of Pipelines

Metropolitan's conveyance and distribution system has been built in conformance with standards and practice at the time of design. In keeping with the goals of the Seismic Resilience Strategy, Metropolitan is developing seismic design criteria for new pipelines based on current state of practice, geotechnical and seismicity criteria, operating conditions, and asset management strategies. The planned design approach for new pipelines will be to establish performance criteria, identify seismicity and ground conditions along the alignment, and design the pipeline to resist damage from ground shaking and deformation. Specialized pipe joints and sections can be designed to accommodate ground deformation from fault displacement or liquefaction. For existing pipelines, seismic resilience will be incorporated as a component of pipeline rehabilitation projects. Metropolitan will evaluate each upgrade individually to balance risk, performance, and cost. Metropolitan's Casa Loma Siphon Barrel No. 1 Seismic Upgrade Project is an example of Metropolitan incorporating seismic design in the rehabilitation of existing pipelines. The existing siphon, which crosses a segment of the San Jacinto Fault Zone and is subject to long-term subsidence, will be replaced with earthquake-resistant ductile iron pipe. The pipe joints are designed to accommodate ground displacement without failure to allow for continued service following an earthquake.

Dam Safety Program

Metropolitan has an ongoing Dam Safety Initiatives Program that has initiated several plans to improve Metropolitan's dam seismic safety and earthquake readiness. These initiatives are being coordinated with the California Division of Safety of Dams (DSOD) and Office of Emergency Services and include the following:

- Ongoing preparation of Emergency Action Plans, including inundation maps
- Performing training exercises at the dam site to test processes during a seismic event
- Providing training and guidance on overall dam safety
- Reviewing operation and maintenance methods for reservoir drawdown and operations after a seismic event
- Updating guidelines and procedures on protection against seismic risk
- Establishing a strong communications system on seismic information

- Performing structural strengthening of dams, including rehabilitation and improvement of spillways and inlet/outlet towers such as Lake Skinner Outlet Tower
- Improving dam safety instrumentation, monitoring, and reporting capabilities

Special Seismic Assessments

Metropolitan conducts special seismic assessments to increase understanding of the vulnerability of Metropolitan's assets and operations to various seismic hazards. The studies focus on hazards specific to individual facilities or the system as a whole and identify options to mitigate the risks posed by the hazards. In addition, the studies support emergency response training and planning for future earthquake events by estimating the magnitude of damage that may occur from various seismic events. The following is a list of some of the reports that Metropolitan has completed.

- Liquefaction Susceptibility Mapping for the Metropolitan Water District of Southern California's Feeder System (Report No. 1625), Carollo Engineers, Inc., 2019.
- Colorado River Aqueduct – San Gorgonio Pass Seismic Event Vulnerability Study (Report No. 1484), GeoPentech, July 2014.
- Potential Effects of Southern California Seismic Events on Metropolitan Water Deliveries (Report No. 1335), Metropolitan Facility Planning staff, January 2009.

### *Operations*

The goal of the operations component is to maintain effective emergency planning and response capabilities. This is accomplished through maintaining an effective Emergency Response Organization, conducting routine emergency response training exercises and maintaining emergency construction capabilities.

Metropolitan's Emergency Response Organization (ERO) is comprised of over 200 predesignated employees who work in the Emergency Operations Center (EOC), the Incident Command Posts, or in the field during emergencies. ERO staff has completed specialized training that meets state and federal requirements. Metropolitan's emergency response structure follows the National Incident Management System (NIMS) and the State of California's Standardized Emergency Management System (SEMS).

In addition to specialized NIMS training, Metropolitan staff routinely participate in emergency response training exercises that are often based on a postulated seismic event. In 2019, Metropolitan started a new five-year emergency exercise plan that will allow all member agencies to participate in at least one of Metropolitan's annual emergency exercises. The first of these exercises was a tabletop exercise for the Orange County member agencies on August 29, 2019, which focused on a hypothetical incident at the Diemer Water Treatment Plant.

Metropolitan has conducted over 100 exercises since February 2018. This included two large functional emergency exercises for the EOC and multiple tabletop exercises, workshops, and seminars for the 12 Incident Command Posts located at the water treatment plants, conveyance and distribution facilities, and other strategic locations in Metropolitan's service area.

Metropolitan maintains the necessary staffing, materials, and equipment to respond to two simultaneous pipeline breaks. The Machine Shop and Coating Shop at La Verne are available to fabricate pipe sizes up to 12 feet in diameter, and Metropolitan's construction forces have the necessary equipment and expertise to make the repairs in-house. In addition, Metropolitan has upgraded its satellite phones to ensure communication ability following a seismic event and is in

the process of installing high frequency radios at all Incident Command Posts and the Emergency Operations Center.

### *Reporting*

Metropolitan has committed to providing annual updates to its Board of Directors on its seismic resilience strategy and its progress toward identified short-term and long-term goals. Metropolitan has also committed to providing a formal report on a five-year interval summarizing accomplishments related to seismic resilience and changes in directives to the Seismic Resilience Strategy.

### *Inter-Agency Coordination*

Improving the region's seismic resilience requires that member agencies understand the seismic risks to the imported water supplies so that they may appropriately plan on the local level. Opportunities for inter-agency coordination are provided through the Local Resources Program, where Metropolitan incentivizes the development of local groundwater, recycling, and other supply resources to offset imported demands. As stated previously, Metropolitan provides member agencies the opportunity to participate in emergency response exercises. As part of a recent study, Metropolitan developed maps that define the relative liquefaction susceptibility of the region inclusive of the conveyance and distribution system and has made these maps available to member agencies. Recently, Metropolitan updated the emergency storage goals through several workshops in coordination with member agencies.

Metropolitan is also a member of the Seismic Resilience Water Supply Task Force, along with the California Department of Water Resources (DWR) and the Los Angeles Department of Water and Power (LADWP). As the owners of the three conveyance facilities that provide imported water to the region, Metropolitan, DWR, and LADWP recognize the importance of coordinating responses following a major seismic event that disrupts the imported water supplies. Each agency has provided an overview of the seismic risk to their respective systems and are in the process of developing a Water Mutual Assistance Agreement to formalize the coordination efforts following a major earthquake that disrupts service to the imported water supplies.

### *Emergency Response Plans*

Metropolitan also has two Emergency Response Plans: one dated March 2019 that has been in place long-term and is updated periodically; and a second dated September 2020, prepared pursuant to the requirements of the recently-enacted America's Water Infrastructure Act of 2018. The two plans work in conjunction. Together, Metropolitan's Emergency Response Plans present Metropolitan's organization and strategy for response to emergencies caused by natural hazards, malevolent acts, or other unavoidable circumstances. Metropolitan operates in accordance with the California Standardized Emergency Management System, the Incident Command System, and the National Incident Management System. The Emergency Response Plans provide guidelines for evaluating an emergency situation, responding to an emergency, and activating Incident Command Posts and the Emergency Operations Center. They also describe the Emergency Response Organization. Although the plans provide a framework for emergency response, they do not attempt to identify and discuss every potential situation or problem that may occur during an emergency. The plans will be exercised and updated regularly.

## 2.6 Other Supply Reliability Risks

Metropolitan provides water to a broad and heterogeneous service area with water supplies from a variety of sources and geographic regions. Each of these demand areas and supplies has its own unique set of benefits and challenges. Among the challenges Metropolitan's region faces are the following:

### *Supplies*

- The Colorado River Basin experienced a severe 5-year drought from 2000-2004 with both precipitation and runoff significantly below average. Since that time, precipitation has been, on average, near normal while runoff has been less than average in two out of every three years. Overall, a potential change in the precipitation to runoff relationship may be resulting in conditions in which less runoff is generated from a given level of precipitation, pushing the system toward a drying trend that is often characterized as a long-term drought.
- Endangered species protection and conveyance needs in the Sacramento-San Joaquin River Delta System have resulted in operational constraints that are particularly important because pumping restrictions impact many water resources programs – SWP supplies and additional voluntary transfers, Central Valley storage and transfers, in-region groundwater storage, and in-region surface water storage.
- Changing climate patterns are predicted to shift precipitation patterns and possibly affect water supply.
- Difficulty and implications of environmental review, documentation, and permitting for multi-year transfer agreements, recycled water projects, and seawater desalination plants.
- Public perception of recycled water use.
- Opposition to local seawater desalination projects from environmental groups and community organizations. New regulations and permitting uncertainty are also barriers to seawater desalination supplies.

### *Operations and Water Quality*

- The cost and use of energy and greenhouse gas emissions.
- Water quality regulations and issues, such as algae toxins, PFAS, and the identification of constituents of emerging concern, have a significant impact on the region's water supply conditions and underscore the importance of flexible and adaptive regional planning strategies.
- Salt and concentrate balance from a variety of sources.

### *Demand*

- Fluctuations in population and economic growth.
- Uncertain location of growth.
- Uncertain housing stock and density.
- Changes in outdoor water use patterns.
- Potential COVID-19 impacts

The challenges posed by continued population growth, environmental constraints on the reliability of imported supplies, and new uncertainties imposed by climate change demand that Metropolitan assert the same level of leadership and commitment to taking on large-scale

regional solutions to providing water supply reliability. New solutions are potentially available in the form of dramatically improved water-use efficiency, indirect and direct potable use of recycled water, and large-scale application of ocean desalinization.

### *Distribution System Water Losses*

California Water Code Section 10631(d)(3) requires that urban retail suppliers quantify distribution system water loss for each of the five years preceding the plan update based on water system balance methodology developed by the American Water Works Association (AWWA). For the 2020 UWMP, Metropolitan is voluntarily reporting its treated distribution water loss. Metropolitan followed the AWWA Water Audit methodology to track all sources of water and uses of water within its system. The AWWA Water Audit methodology quantifies real and apparent water system losses in an agency's distribution system.

For its voluntary distribution system water losses assessment, Metropolitan included its water balance audit for the treated water portion of its system for calendar years 2015 through 2019. The results of Metropolitan's audit showed that the average total amount of treated distribution system water losses over the last five years from 2015 to 2019 is approximately 7.8 TAF. A detailed discussion of Metropolitan's treated distribution system water losses is included in Appendix 7 and summarized in Tables A.7-1 through A.7-5. In addition to the treated distribution system losses described in the AWWA tables, Metropolitan estimates that 41.6 TAF was lost from reservoir evaporation occurring in Lake Mathews, Lake Skinner, and DVL during calendar year 2019.

### *Climate Change*

Climate change adds its own uncertainties to the challenges of planning. Metropolitan's water supply planning has been fortunate in having almost one hundred years of hydrological data regarding weather and water supply. This history of rainfall data has provided a sound foundation for forecasting both the frequency and the severity of future drought conditions, as well as the frequency and abundance of above-normal rainfall. But weather patterns can be expected to shift dramatically and unpredictably in a climate driven by increased concentrations of carbon dioxide in the atmosphere. These changes in weather significantly affect water supply planning, irrespective of the debate associated with the sources and cause of increasing concentrations of greenhouse gases. As a major steward of the region's water supply resources, Metropolitan is committed to performing its due diligence with respect to climate change.

#### *Potential Impacts*

While uncertainties remain regarding the exact timing, magnitude, and regional impacts of these temperature and precipitation changes, researchers have identified several areas of concern for California water planners. These include:

- Reduction in Sierra Nevada snowpack;
- Increased intensity and frequency of extreme weather events;
- Prolonged drought periods;
- Water quality issues associated with increase in wildfires;
- Changes in runoff pattern and amount; and
- Rising sea levels resulting in
    - Impacts to coastal groundwater basins due to seawater intrusion;
    - Increased risk of damage from storms, high-tide events, and the erosion of levees; and
    - Potential pumping cutbacks on the SWP and Central Valley Project (CVP)

Other important issues of concern due to global climate change include:

- Effects on local supplies such as groundwater;
- Changes in urban and agricultural demand levels and patterns;
- Increased evapotranspiration from higher temperatures;
- Impacts to human health from water-borne pathogens and water quality degradation;
- Declines in ecosystem health and function;
- Alterations to power generation and pumping regimes; and
- Increases in ocean algal blooms affected seawater desalination supplies.

### *Metropolitan's Activities Related to Climate Change Concerns*

Resource Planning

Under the 2020 IRP, Metropolitan recognizes additional risks and uncertainties from a variety of sources:

- Water quality
- Climate change
- Regulatory and operational changes
- Project construction and implementation issues
- Infrastructure reliability and maintenance
- Demographic and growth uncertainty

Any of these risks and uncertainties, should they occur individually or collectively, may result in a negative impact to water supply reliability. While it is impossible to know how much risk and uncertainty to guard against, the region's reliability will be more secure with a long-term plan that recognizes risk and provides resource development to offset that risk.

Metropolitan has established an intensive, comprehensive technical process to identify key vulnerabilities to regional reliability. This Robust Decision Making (RDM) approach was used with both the 2015 and 2010 IRP Updates. The 2015 RDM approach utilized the Delta Method to examine climate change impacts to Metropolitans water supplies across its three basins. The Delta Method is a technique that downscales data from a suite of global climate models and creates climate perturbation factors, in this case temperature and precipitation changes, and applies them to Metropolitan's baseline Integrated Water Resources Plan Simulation Model (IRPSIM) assumptions. This methodology can show how vulnerable the region's reliability is to longer-term risks such as climate change and can also establish "signposts" that can be monitored to see when critical changes may be happening. For example, if observed climate data shows we are trending toward more severe change and the results of the RDM analysis show an unacceptable level of reliability in this future, Metropolitan can use this as a signpost to take action. Signposts include monitoring the direction of ever-changing impacts from improved Global Climate Models, and housing and population growth patterns.

The RDM analysis was not only valuable in identifying vulnerabilities to Metropolitan's 2015 IRP approach to long-term reliability, it was also pivotal in understanding how climate change would best be incorporated into the 2020 IRP and IRPSIM modeling. On the Colorado River Aqueduct, the RDM analysis helped determine that the most appropriate way to look at climate change impacts would be to alter the inflow hydrologies within the CRSS model, which would then serve as inputs to Metropolitan's IRPSIM model. On the SWP side, climate change impacts were

included by altering SWP water deliveries provided in the 2019 Delivery Capability report and derived by CalSim 2. Metropolitan assembled a panel of climate change experts to translate how specific climate change impacts, such as changes to runoff timing, would be quantified and to what degree in the IRP scenario approach.

Knowledge Sharing and Research Support

Metropolitan is an active and founding member of the Water Utility Climate Alliance (WUCA). WUCA consists of twelve nationwide water providers collaborating on climate change adaptation. As a part of this effort, WUCA pursues a variety of activities on multiple fronts.

Member agencies of WUCA annually share individual agency actions on climate change adaptation and greenhouse gas mitigation strategies and collaborate on projects aimed at advancing adaptation in the water sector. WUCA also monitors development of climate change-related research, technology, programs, and federal legislation.

In addition to supporting federal and regional efforts, WUCA has released numerous white papers and reports. In 2019, WUCA co-produced with the Water Research Foundation the report "Mapping Climate Exposure and Climate Information Needs to Water Utility Business Functions." The purpose of this paper was to develop a comprehensive, enterprise-level framework for understanding the exposure and sensitivities of water utility business functions to a changing climate and for accelerating the mainstreaming of climate considerations into utility management.

In 2016, WUCA published "Co-producing Actionable Science for Water Utilities." The paper explores the efforts of four water utilities to co-produce actionable science by forging partnerships with scientific institutions to explore integrating climate considerations into their specific management context. The experiences of these four utilities and their scientific partners, as part of the Piloting Utility Modeling Applications project of the Water Utility Climate Alliance, provide a wealth of empirical evidence to illustrate some of the core concepts formulated to explain how to produce usable information and how to link research to decision making.

In recent years, WUCA has created a training that rotates around the country and aims to build a community of smart consumers of climate information proactively pursuing climate adaptation in the water sector. The training sessions include learning different methods for incorporating climate change information into water resource planning, guiding principles for resilience planning, communication strategies, tactics for decision making under conditions of uncertainty, and more.

WUCA continues to pursue opportunities and partnerships with water providers, climate scientists, federal agencies, research centers, academia and key stakeholders. Metropolitan also continues to pursue knowledge sharing and research support activities outside of WUCA. Metropolitan regularly provides input and direction on California legislation related to climate change issues. Metropolitan is active in collaborating with other state and federal agencies, as well as non-governmental organizations, on climate change related planning issues. The following list provides a sampling of entities that Metropolitan has recently worked with on a collaborative basis:

- RAND Corporation
- USBR
- U.S. Army Corps of Engineers
- AWWA Research Foundation

- National Center for Atmospheric Research
- California Energy Commission
- California Department of Water Resources

Quantification of Current Research

Metropolitan continues to incorporate current climate change science into its planning efforts. A major component of the current IRP effort is to explicitly reflect uncertainty in Metropolitan's future water management environment. This involves evaluating a wider range of water management strategies and seeking robust and adaptive plans that respond to uncertain conditions as they evolve over time, and that ultimately will perform adequately under a wide range of future conditions. The potential impacts and risks associated with climate change, as well as other major uncertainties and vulnerabilities, have been incorporated into the current IRP process. Overall, Metropolitan's planning activities strive to support the Board adopted policy principles on climate change by:

- Supporting reasonable, economically viable, and technologically feasible management strategies for reducing impacts on water supply,
- Supporting flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts, and
- Evaluating staff recommendations regarding climate change and water resources under the California Environmental Quality Act (CEQA) to avoid adverse effects on the environment.

Implementation of Programs and Policies

Metropolitan has made great efforts to implement greenhouse gas mitigation programs and policies for its facilities and operations. Similar to Metropolitan's approach to managing water resources, effectively reducing greenhouse gas emissions requires a portfolio approach that looks at all sources and implements strategies to reduce emissions over time. To date, these programs and policies have focused on:

- Developing Metropolitan's Climate Action Plan, which sets the target and guides future actions to reduce emission levels, pursuant to CEQA guidelines, and complements Metropolitan's IRP;
- Developing Metropolitan's Energy Sustainability Plan, which identifies ways to contain energy costs, move toward energy independence, and reduce price volatility through cost-effective alternative energy projects;
- Exploring water supply/energy relationships and opportunities to increase efficiencies;
- Participating in The Climate Registry, a nonprofit greenhouse gas emissions registry for North America that provides organizations with the tools and resources to help them calculate, verify, report, and manage their greenhouse gas emissions in a publicly transparent and credible way;
- Acquiring "green" fleet vehicles, and supporting an employee Rideshare program;
- Designing retail battery energy storage systems at the Weymouth, Skinner, and Jensen treatment plants, as well as the OC-88 (Orange County) pump station;
- Developing solar power at the Skinner water treatment plant, the Weymouth water treatment plant, the Jensen water treatment plant, and the Diamond Valley Lake Visitor Center; and

- Identifying and pursuing development of "green" renewable water and energy programs that support the efficient and sustainable use of water.

Metropolitan also continues to be a leader in efforts to increase regional water use efficiency. Metropolitan has worked to increase the availability of incentives for local conservation and recycling projects, as well as supporting conservation Best Management Practices for industry and commercial businesses. Many of Metropolitan's water use efficiency incentives also reduce customer electricity and natural gas use. In recognition of this fact, Metropolitan has MOUs with regional energy utilities to jointly implement water use efficiency programs that save energy and reduce greenhouse gas emissions.

## 2.7 Pricing and Rate Structures

### *Revenue Sources and Management*

A high proportion of Metropolitan's revenues come from volumetric water rates. Water sales revenues are approximately 80 percent of Metropolitan's total revenues. As a result, Metropolitan's revenues vary according to regional weather, the availability of statewide water supplies, the availability of local supplies to its member agencies, the economy, and other factors. For example, in dry years, local demands tend to increase, and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years, demands tend to decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 2009 and 2015 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan maintains financial reserves, with a minimum and target balance, to help stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales.

Another way in which Metropolitan helps to mitigate rate volatility is by generating a portion of revenues from fixed sources. Metropolitan currently has two fixed charges: the Readiness-to-Serve Charge (RTS) and the Capacity Charge. Metropolitan also collects tax revenue from taxable property within its boundaries. The revenues from fixed charges generate approximately 18 percent of all Metropolitan revenues. RTS revenues have been decreasing gradually, from $155.5 million in fiscal year 2015-16, to $135 million in fiscal year 2021-22.

Finally, Metropolitan generates revenue from interest income, hydroelectric power sales, and miscellaneous income such as rents and leases. For the last five fiscal years, these averaged approximately three percent of all Metropolitan revenues. These internally generated revenues are referred to as revenue offsets and reduce the amount of revenue that needs to be collected from rates and charges.

### *Elements of Rate Structure*

This section provides an overview of Metropolitan's rate structure. The different elements of the rate structure are discussed below and summarized in Table 2-9.

#### *System Access Rate (SAR)*

The SAR recovers the costs of Conveyance, Distribution, and Storage that is used on an average annual basis through a uniform, volumetric rate. All member agencies pay the SAR for access to conveyance and distribution capacity in the Metropolitan system.

#### *Water Stewardship Rate (WSR)*

The WSR provides a dedicated source of funding for Metropolitan's demand management function through a uniform, volumetric rate recovered through the end of calendar year 2020. Metropolitan's demand management operations functions include past and future conservation and local resources projects. Because of the uniform benefits conferred on all system users by investments in conservation and local resources, all users of Metropolitan's conveyance and distribution system paid the WSR except for exchange deliveries to SDCWA in calendar years 2018 through 2020.

Metropolitan's Board suspended the billing and collection of the WSR for calendar years 2018, 2019, and 2020 on exchange deliveries to SDCWA pending Metropolitan's completion of a cost allocation study of its demand management costs. Having completed the demand

management cost allocation process, in December 2019 Metropolitan's Board directed staff: (1) to incorporate the use of the 2019/20 fiscal-year-end balance of the Water Stewardship Fund to fund all demand management costs in the proposed FY 2020/21 and 2021/22 biennial budget; and (2) to not incorporate the WSR, or any other rates or charges to recover demand management costs, with the proposed rates and charges for CYs 2021 and 2022. As a result, the WSR is not collected from any member agency as of January 1, 2021. This decision provided the Board additional time to consider a rate design alternative for recovery of future demand management costs.

Therefore, as a result of this Board decision, the WSR is not incorporated in the rate structure during calendar years 2021 and 2022.

### *System Power Rate (SPR)*

The SPR recovers the costs of energy required to pump water to Southern California through the SWP and CRA. The cost of power is recovered through a uniform, volumetric rate.

### *Treatment Surcharge*

The Treatment Surcharge recovers all of the costs of providing treatment capacity and operations through a uniform, volumetric rate per acre-foot of treated water transactions.

### *Capacity Charge*

The Capacity Charge recovers the costs incurred to provide peak capacity within the Distribution System. The Capacity Charge also provides a price signal to encourage agencies to reduce peak demands on the Distribution System and to shift demands that occur during the May 1 through September 30 period into the October 1 through April 30 period, resulting in more efficient utilization of Metropolitan's existing infrastructure and deferring capacity expansion costs.

### *Readiness-To-Serve Charge (RTS)*

The RTS recovers the cost of the portion of system that is available to provide emergency service and available capacity during outages and hydrologic variability.

The RTS is a fixed charge that is allocated among the member agencies based on a ten-fiscal-year rolling average of firm demands. Water transfers and exchanges are included for purposes of calculating the ten-year rolling average. The Standby Charge is collected at the request of some member agencies that have elected to use the charge as a direct offset to the member agency's RTS obligation.

### *Tier 1 Supply Rate*

The Tier 1 Supply Rate is a volumetric rate charged on Metropolitan's water sales that are within a member agency's Tier 1 maximum. The Tier 1 Supply Rate supports a regional integrated approach through the uniform, postage stamp rate. The Tier 1 Supply Rate is calculated as the amount of the total revenue requirement functionalized as supply divided by the estimated amount of Tier 1 water sales.

### *Tier 2 Supply Rate*

The Tier 2 Supply Rate is a volumetric rate that reflects Metropolitan's cost of purchasing water transfers north of the Delta. The Tier 2 Supply Rate is charged on Metropolitan water sales that exceed a member agency's Tier 1 maximum. The Tier 2 Supply Rate encourages the member

agencies and their customers to maintain existing local supplies and develop cost-effective local supply resources and conservation.

**Table 2-9**
**Rate Structure Components**

| Rate Design Elements | Service Provided/ Costs Recovered | Type of Charge |
|---|---|---|
| System Access Rate | Conveyance/Distribution/Storage (Average Capacity) | Volumetric ($/AF) |
| System Power Rate | Power | Volumetric ($/AF) |
| Treatment Surcharge | Treatment | Volumetric ($/AF) |
| Capacity Charge | Peak Distribution System Capacity | Fixed ($/cfs) |
| Readiness-To-Serve Charge | Available capacity for Conveyance/Distribution and Emergency Storage | Fixed ($Million) |
| Tier 1 Supply Rate | Supply | Volumetric ($/AF) |
| Tier 2 Supply Rate | Reflects cost of water transfers from North of the Delta | Volumetric ($/AF) |

The following tables provide further information regarding Metropolitan's rates. Table 2-10 summarizes the rates and charges effective January 1, 2020, January 1, 2021, and January 1, 2022. Average costs of Metropolitan's service by member agency will vary depending upon an agency's RTS allocation, Capacity Charge, and relative proportions of treated and untreated Tier 1, and Tier 2 water purchases. Table 2-11 provides the details of the Capacity Charge, calculated for calendar year 2021.

Table 2-12 provides the details of the RTS calculation for calendar year 2021 by member agency. Table 2-13 provides the current Purchase Order commitment quantities that member agencies will purchase from Metropolitan over the 10-year period starting January 2015 through December 2024. Tier 1 annual average limits for each member agency are also shown in this table.

**Table 2-10**
**Metropolitan Water Rates and Charges**

| Effective | Jan 1, 2020 | Jan 1, 2021 | Jan 1, 2022 |
|---|---|---|---|
| Tier 1 Supply Rate ($/AF) | $208 | $243 | $243 |
| Tier 2 Supply Rate ($/AF) | $295 | $285 | $285 |
| System Access Rate ($/AF) | $346 | $373 | $389 |
| Water Stewardship Rate ($/AF) | $65 | - | - |
| System Power Rate ($/AF) | $136 | $161 | $167 |
| Full Service Untreated Volumetric Cost ($/AF) | | | |
| Tier 1 | $755 | $777 | $799 |
| Tier 2 | $842 | $819 | $841 |
| Treatment Surcharge ($/AF) | $323 | $327 | $344 |
| Full Service Treated Volumetric Cost ($/AF) | | | |
| Tier 1 | $1,078 | $1,104 | $1,143 |
| Tier 2 | $1,165 | $1,146 | $1,185 |
| Readiness-to-Serve Charge ($M) | $136 | $130 | $140 |
| Capacity Charge ($/cfs) | $8,800 | $10,700 | $12,200 |

**Table 2-11**
**Capacity Charge Detail Calendar Year 2021**

| | Peak Day Demand (cfs) (May 1 through September 30) Calendar Year | | | | |
|---|---|---|---|---|---|
| Agency | 2017 | 2018 | 2019 | 3-Year Peak | Calendar Year 2021 Capacity Charge ($10,7000/cfs) |
| Anaheim | 33.0 | 37.2 | 37.1 | 37.2 | $398,040 |
| Beverly Hills | 25.7 | 27.8 | 23.5 | 27.8 | $297,460 |
| Burbank | 14.0 | 17.1 | 17.3 | 17.3 | $185,110 |
| Calleguas | 186.5 | 184.7 | 168.9 | 186.5 | $1,995,550 |
| Central Basin | 36.7 | 39.2 | 48.6 | 48.6 | $520,020 |
| Compton | 0.1 | 6.9 | 2.9 | 6.9 | $73,830 |
| Eastern | 216.6 | 225.1 | 223.3 | 225.1 | $2,408,570 |
| Foothill | 18.6 | 19.9 | 16.0 | 19.9 | $212,930 |
| Fullerton | 13.0 | 13.3 | 13.1 | 13.3 | $142,310 |
| Glendale | 41.4 | 33.5 | 32.2 | 41.4 | $442,980 |
| Inland Empire | 140.5 | 147.8 | 118.7 | 147.8 | $1,581,460 |
| Las Virgenes | 44.6 | 45.9 | 39.4 | 45.9 | $491,130 |
| Long Beach | 55.2 | 80.4 | 51.8 | 80.4 | $860,280 |
| Los Angeles | 250.4 | 284.6 | 283.2 | 284.6 | $3,045,220 |
| MWDOC | 418.6 | 442.3 | 263.2 | 442.3 | $4,732,610 |
| Pasadena | 39.9 | 43.0 | 40.0 | 43.0 | $460,100 |
| San Diego | 749.7 | 855.5 | 672.0 | 855.5 | $9,153,850 |
| San Fernando | 0.0 | 0.0 | 0.0 | 0.0 | $0.0 |
| San Marino | 7.5 | 4.5 | 2.3 | 7.5 | $80, 250 |
| Santa Ana | 19.9 | 19.3 | 19.4 | 19.9 | $212,930 |
| Santa Monica | 16.6 | 16.7 | 20.7 | 20.7 | $221,930 |
| Three Valleys | 126.4 | 142.9 | 128.1 | 142.9 | $1,529,030 |
| Torrance | 34.0 | 32.6 | 27.8 | 34.0 | $363,800 |
| Upper San Gabriel | 12.1 | 23.3 | 29.1 | 29.1 | $311,370 |
| West Basin | 201.7 | 202.4 | 211.8 | 211.8 | $2,266,260 |
| Western | 175,2 | 194.7 | 170.5 | 194.7 | $2,083,290 |
| **Total** | **2,877.9** | **3,140.6** | **2,660.9** | **3,184.1** | **$34,069,870** |

Totals may not foot due to rounding

**Table 2-12**
**Readiness-to-Serve Charge (by Member Agency)**
**Calendar Year 2021**

| Member Agency | Rolling Ten-Year Average Firm Deliveries (Acre-Feet) FY2009-10 to FY2018-19 | RTS Share | 12 months @ $130 million per year (1/21-12/21) |
|---|---|---|---|
| Anaheim | 17,327 | 1.17% | 1,526,562 |
| Beverly Hills | 10,447 | 0.71% | 920,439 |
| Burbank | 12,324 | 0.84% | 1,085,747 |
| Calleguas MWD | 97,188 | 6.59% | 8,562,554 |
| Central Basin MWD | 42,103 | 2.85% | 3,709,422 |
| Compton | 779 | 0.05% | 68,659 |
| Eastern MWD | 94,363 | 6.40% | 8,313,628 |
| Foothill MWD | 8,395 | 0.57% | 739,661 |
| Fullerton | 8,126 | 0.55% | 715,882 |
| Glendale | 16,548 | 1.12% | 1,457,930 |
| Inland Empire Utilities Agency | 56,561 | 3.83% | 4,983,172 |
| Las Virgenes MWD | 20,449 | 1.39% | 1,801,585 |
| Long Beach | 30,374 | 2.06% | 2,676,061 |
| Los Angeles | 269,780 | 18.28% | 23,768,407 |
| Municipal Water District of Orange County | 207,818 | 14.04% | 18,309,363 |
| Pasadena | 18,840 | 1.28% | 1,659,827 |
| San Diego County Water Authority | 258,318 | 17.51% | 22,758,613 |
| San Fernando | 36 | 0.00% | 3,136 |
| San Marino | 838 | 0.06% | 73,804 |
| Santa Ana | 10,780 | 0.73% | 949,787 |
| Santa Monica | 5,511 | 0.37% | 485,554 |
| Three Valleys MWD | 62,229 | 4.22% | 5,482,576 |
| Torrance | 15,990 | 1.08% | 1,408,786 |
| Upper San Gabriel Valley MWD | 26,406 | 1.79% | 2,326,450 |
| West Basin MWD | 115,328 | 7.82% | 10,160,744 |
| Western MWD | 68,688 | 4.66% | 6,051,651 |
| **Metropolitan Total** | **1,475,544** | **100.00%** | **$130,000,000** |

Totals may not foot due to rounding

**Table 2-13**
**Purchase Order Commitments and Tier 1 Limits**
**(by Member Agency)**
**January 2015 through December 2024**

| Member Agency | Annual Average Tier 1 Maximum | Purchase Order Commitments (acre-feet) |
|---|---|---|
| Anaheim | 24,439 | 148,270 |
| Beverly Hills | 13,380 | 89,200 |
| Burbank | 16,776 | 108,910 |
| Calleguas MWD | 118,228 | 788,180 |
| Central Basin MWD[1] | 71,770 | - |
| Compton[1] | 3,372 | - |
| Eastern MWD | 117,585 | 783,900 |
| Foothill MWD | 11,773 | 73,310 |
| Fullerton | 11,299 | 75,320 |
| Glendale | 26,222 | 174,810 |
| Inland Empire Utilities Agency | 93,283 | 398,350 |
| Las Virgenes MWD | 24,358 | 162,390 |
| Long Beach | 51,804 | 263,140 |
| Los Angeles | 373,623 | 2,033,130 |
| Municipal Water District of Orange County | 321,635 | 2,144,230 |
| Pasadena | 22,965 | 153,100 |
| San Diego County Water Authority[1] | 393,542 | - |
| San Fernando[1] | 629 | - |
| San Marino | 1,442 | 9,610 |
| Santa Ana | 19,617 | 80,860 |
| Santa Monica[1] | 7,406 | - |
| Three Valleys MWD | 80,688 | 537,920 |
| Torrance | 19,204 | 128,030 |
| Upper San Gabriel Valley MWD | 67,228 | 110,080 |
| West Basin MWD | 135,418 | 902,780 |
| Western MWD | 105,783 | 705,220 |
| **Total** | **2,133,470** | **9,870,740** |

[1] No Purchase Order; Tier 1 maximum is annual, not cumulative.
Totals may not foot due to rounding.

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# Implementing the Plan 3

This section summarizes Metropolitan's implementation plans and continued progress in developing a diversified resource mix that enables the region to meet its water demands under a wide range of possible future conditions. The investments that Metropolitan has made and its ongoing efforts in many different areas coalesce toward its goal of long-term regional water supply reliability. Many of the resource programs discussed are already successfully implemented. Others will take more time to execute. Considerations are also in place for emerging integrated supplies, which could augment sources of regional water supply from non-traditional sources. In addition, water demand reductions brought about by legislative mandates could affect the landscape of future supply planning and implementation. The following sections discuss each of these programs, presenting both successes to date and the programs that are still underway.

Metropolitan's IRP implementation approach is consistent with the California Water Resilience Portfolio that was released in July 2020. The California Water Resilience Portfolio is discussed briefly below.

### *California Water Resilience Portfolio*

On April 29, 2019, Governor Newsom issued Executive Order N-10-19 that directed the California Natural Resources Agency, the California Environmental Protection Agency, and the California Department of Food and Agriculture to prepare a water resilience portfolio that meets the needs of California's communities, economy and environment through the 21st century.

The agencies were directed to first inventory and assess:

a. Existing demand for water on a statewide and regional basis and available water supply to address this demand.

b. Existing water quality of aquifers, rivers, lakes and beaches.

c. Projected water needs in the coming decades for communities, economy and environment.

d. Anticipated impacts of climate change to our water systems including growing drought and flood risks, and other challenges to water supply reliability.

e. Work underway to complete voluntary agreements for the Sacramento and San Joaquin river system regarding flows and habitat.

f. Current planning to modernize conveyance through the Bay Delta with a new single tunnel project.

g. Expansion of the state's drinking water program to ensure all communities have access to clean, safe and affordable drinking water.

h. Existing water policies, programs and investments within state government.

The California Water Resilience Portfolio outlines goals and actions to help address the state's water challenges through a broad and diversified approach. The goals and actions are meant

to be achieved region by region based on the unique challenges and opportunities in each area and are organized into four categories:

1. Maintain and diversify water supplies – the state will continue to help regions reduce reliance on any one source of water supply and diversify water supplies to enable flexibility in the face of changing conditions.
2. Protect and enhance natural ecosystems – the state will provide leadership in restoring the environmental health of our river systems through effective standard setting, continued investments and more adaptive and holistic environmental management.
3. Build connections – the state aims to improve infrastructure to store, move and share water more effectively, and to integrate water management through shared use of science, data and technology.
4. Be prepared – the state will provide guidance to support preparation, protective actions and adaptive management of regions in the face of new threats and stresses due to climate change.

## 3.1 Colorado River

Metropolitan's goal for the Colorado River is to maintain current supplies and programs, while also maintaining flexibility through dry-year programs and storage. This goal involves protecting existing supply and storage programs in the face of risks that could impact Colorado River supplies in the future.

### *Background*

Metropolitan was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the Colorado River Aqueduct (CRA). Under its contracts with the federal government, Metropolitan has a basic fourth priority entitlement of 550 TAF per year of Colorado River water. Metropolitan also holds a fifth priority for an additional 662 TAF per year that exceeds California's 4.4 MAF per year basic apportionment, and another 180 TAF per year when surplus flows are available. Metropolitan can obtain water under the fifth priority from:

- Water unused by the California holders of priorities 1 through 3
- Water saved by the Palo Verde land management, crop rotation, and water supply program, or
- When the U.S. Secretary of the Interior makes available either or both:
    - Surplus water, and
    - Water apportioned to, but unused by, Arizona and/or Nevada.

To satisfy a condition imposed by Congress in the Boulder Canyon Project Act, California's legislature enacted the Limitation Act in 1929, agreeing to limit consumptive use of Colorado River water to 4.4 MAF per year, plus not more than one-half of any excess or surplus waters unapportioned by the Colorado River Compact. The 1931 Seven Party Agreement provides the basis for the priorities among California contractors' use of Colorado River water available to California. Palo Verde Irrigation District (PVID), the Yuma Project (Reservation Division), Imperial Irrigation District (IID), and Coachella Valley Water District (CVWD), collectively the "agricultural entities," and Metropolitan are the entities that currently hold the priorities. These priorities are included in the contracts that the Department of the Interior executed with the California agencies in the 1930s for delivery of water from Lake Mead. The first four priorities total 4.4 MAF per year. As noted above, Metropolitan has the fourth priority of 550 TAF to California's basic apportionment and the fifth priority to 662 TAF per year. Under priorities 1 through 3, an amount not to exceed 3.85 MAF was apportioned to the agricultural entities for beneficial consumptive use. The Seven Party Agreement did not specify individual quantities for each of the first three priorities; rather, the amount of water available under the third priority was limited to the amount unused by the holders of priorities 1 and 2 on designated areas of land. This lack of quantification among the agricultural priorities posed an obstacle to the acquisition of water from the agricultural entities for use in Metropolitan's service area.

The Consolidated Decree issued in 2006 by the U.S. Supreme Court in *Arizona v. California*, consolidated into one decree the initial 1964 decree, the 1979 supplemental decree, the 1984 second supplemental decree, the 2000 third supplemental decree, and the 2006 approval settlements reached on the water rights claim of the Fort Yuma Indian Reservation. The Consolidated Decree confirmed the normal year allocation of 4.4 MAF per year to California. This limit effectively reduced Metropolitan's dependable supply of Colorado River water to its fourth priority amount of 550 TAF per year. The Consolidated Decree quantified present perfected rights (PPRs) to the use of Colorado River water by certain Indian reservations, federal wildlife refuges, and other users. Within California some, but not all, of these PPRs are

encompassed by the Seven Party Agreement. Consumptive use under these non-encompassed PPRs, known as "Miscellaneous and Indian PPRs," could reach as much as 61 TAF annually. Since 1985, these PPR holders have used less than 20 TAF annually. Because over 5.362 MAF of Colorado River water were already allocated by California's Seven Party Agreement, it was not clear which rights would be affected by the use of these non-encompassed PPRs.

For a period following the Court's 1964 decree, Metropolitan's fifth priority rights were satisfied with water unused under California's first three agricultural priorities and water allocated to, but unused by, Arizona and Nevada. With the commencement of Colorado River water deliveries to the Central Arizona Project in 1985, the availability of Colorado River water to meet Metropolitan's needs was determined on a year-by-year basis. Through 2002, Metropolitan's diversion requests were fully satisfied with unused supplies and surplus waters.

Figure 3-1 shows the major aqueducts within southern California including those from the Colorado River, and entities within the state having rights to use water from the Colorado River.

**Figure 3-1**

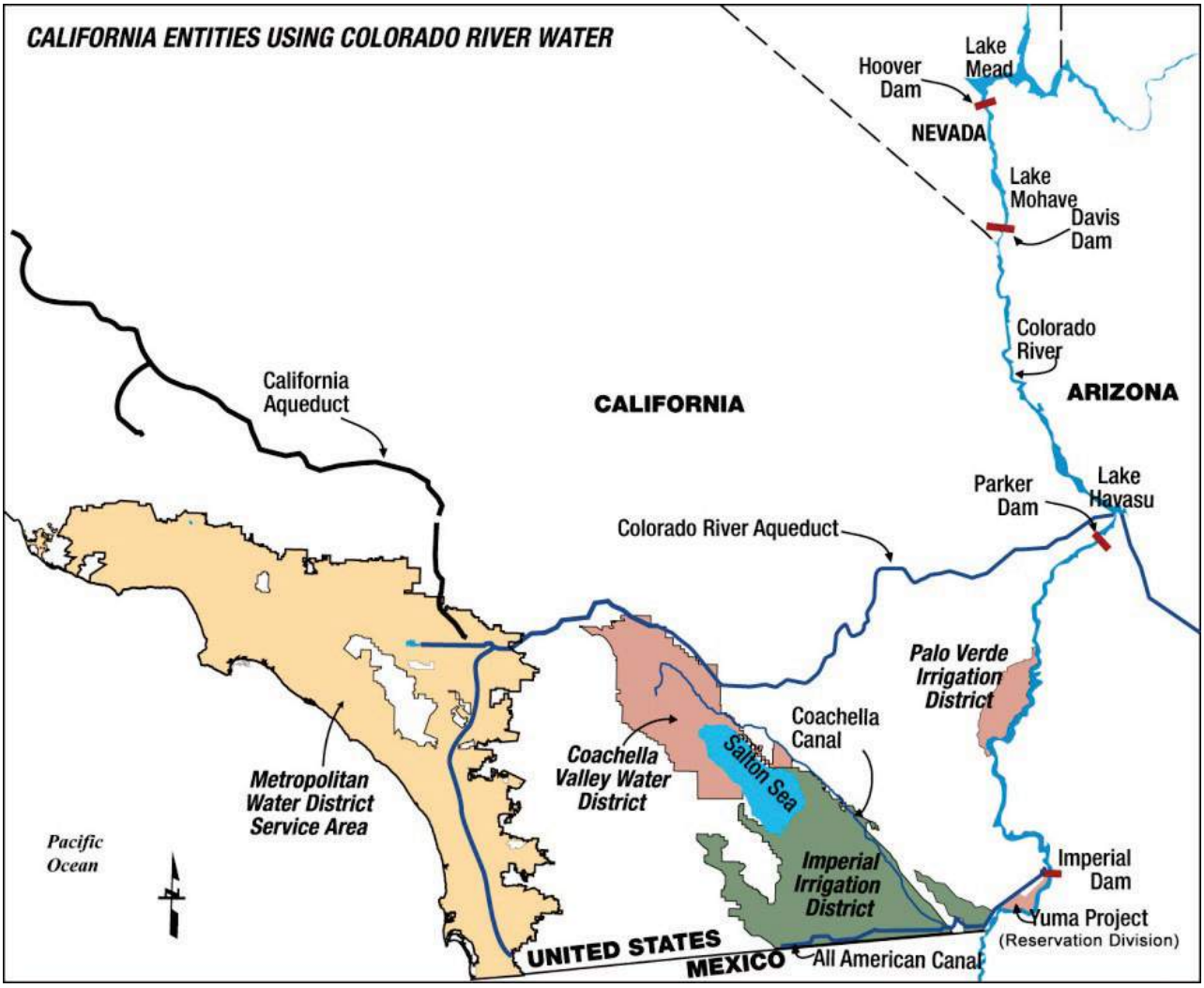

### *Changed Conditions*

#### *California's Colorado River Water Use Plan and the Quantification Settlement Agreement*

Metropolitan and the State of California acknowledged that Metropolitan would obtain less water from the Colorado River in the future than Metropolitan had in the past, but the lack of clearly quantified water rights hindered efforts to promote water management projects. The Secretary of the Interior asserted that California's users of Colorado River water had to limit their use to a total of 4.4 MAF per year, plus any available surplus water. Under the auspices of the state's Colorado River Board, these users developed a draft plan to resolve the problem, which was known as "California's Colorado River Water Use Plan" or the "California Plan." It characterized how California would develop a combination of programs to allow the state to limit its annual use of Colorado River water to 4.4 MAF per year plus any available surplus water. The 2003 Quantification Settlement Agreement (QSA) among IID, CVWD, and Metropolitan is a critical component of the California Plan. It establishes the baseline water use for each of the agencies, facilitates the transfer of water from agricultural agencies to urban uses, and specifies that IID, CVWD, and Metropolitan would forbear use of water to permit the Secretary of the Interior to satisfy the uses of the PPRs not covered by the Seven Party Agreement.

On November 5, 2003, IID filed a validation action in Imperial County Superior Court, seeking a judicial determination that thirteen agreements associated with the QSA are valid, legal, and binding. Other lawsuits also were filed challenging the execution, approval, and subsequent implementation of the QSA on various grounds. All of the QSA cases were coordinated in Sacramento County Superior Court. After more than a decade of litigation, the final challenges to the QSA were dismissed, and the agreements were upheld.

San Diego County Water Authority (SDCWA) is participating in three QSA-related projects that are providing additional water supplies that the agency exchanges with Metropolitan for receipt of Metropolitan deliveries.[1] First, the water conserved by these projects is made available to Metropolitan. In exchange, Metropolitan is delivering an amount of Metropolitan water equal to the amount of Colorado River water conserved by IID for SDCWA. Second, federal law allocates a portion of the water available as a result of the Coachella Canal Lining Project and the All-American Canal Lining Project for the benefit of parties, including five Indian Bands, and two non-Indian municipal water purveyors (San Luis Rey Settlement Parties) involved in litigation over water rights to the San Luis Rey River in San Diego County. Metropolitan has agreed to exchange that water and provide an equal amount of water to the United States for use by the San Luis Rey Settlement Parties, and SDCWA has agreed to convey the water when capacity is available for use within the Settlement Parties' service areas. The remainder of the water available as a result of the canal lining projects, up to the cap specified in the Metropolitan-SDCWA exchange agreement, is exchanged with SDCWA.

In 2005, Metropolitan entered into a settlement agreement in Arizona v. California with the Quechan Indian Tribe and other parties. The Tribe uses Colorado River water on the Fort Yuma Indian Reservation. Under the settlement agreement, the Tribe, in addition to the amounts of water decreed for the benefit of the Reservation in the 1964 decree in Arizona v. California, is entitled to (a) 20 TAF of diversions from the Colorado River, or (b) the amount necessary to supply the consumptive use required for irrigation of a specified number of acres, and for the satisfaction of related uses, whichever is less. Of the additional diversions, 13 TAF became available to the Tribe in 2006. An additional 7 TAF becomes available to the Tribe in 2035. Metropolitan agreed

[1] These projects, the SDCWA/IID transfer and the Coachella and All-American canal lining projects, will be discussed in SDCWA's Urban Water Management Plan.

to provide annual incentive payments to the Tribe if the Tribe forbore diversion of the additional water, thereby allowing Metropolitan to divert it.

### *Current Dry Condition*

The Colorado River Basin experienced a severe 5-year drought from 2000 to 2004 with both precipitation and runoff significantly below average. Since that time precipitation has been, on average, near normal, while runoff has been less than average in two out of every three years. Overall, a potential change in the precipitation to runoff relationship may be resulting in conditions in which less runoff is generated from a given level of precipitation, pushing the system toward a drying trend that is often characterized as a long-term drought. For example, in 2020, the Upper Colorado River Basin snowpack peaked in April at 107 percent of median. However, April through July runoff was observed at just 52 percent of average due to hot and dry conditions in the late spring and early summer. The overall 21-year drying trend has resulted in Lake Mead and Lake Powell storage at 40 and 42 percent of capacity, respectively, leaving less of a buffer for a future period of reduced precipitation.

### *Quagga Mussels*

Quagga mussels were discovered in January of 2007 in Lake Mead and rapidly spread downstream to the Lower Colorado River. The presence and spawning of quagga mussels in the Lower Colorado River and in reservoirs located in southern California pose an immediate threat to water and power systems serving more than 25 million people in the southwestern United States. Quagga mussels (*Dreissena bugensis*) are a related species to the better-known zebra mussels (*Dreissena polymorpha*) and are indigenous to Ukraine. They were introduced to the Great Lakes in the 1980s from fresh-water ballast of a transoceanic ship traveling from Eastern Europe. Although the introduction of these two species into drinking water supplies does not typically result in violation of drinking water standards, invasive mussel infestations can adversely impact aquatic environments and infrastructure. If unmanaged, invasive mussel infestations have been known to severely impact the aquatic ecology of lakes and rivers; clog intakes and raw water conveyance systems; reduce the recreational and aesthetic value of lakes and beaches; alter or destroy fish habitats; and render lakes more susceptible to deleterious algae blooms.

## ***Implementation Approach***

Metropolitan's planning strategy recognized explicitly that program development would play an important part in reaching the target level of deliveries from the Colorado River. The implementation approach explored a number of water conservation programs with water agencies that receive water from the Colorado River or are located in proximity to the CRA. Negotiating the QSA was a necessary first step for all of these programs. On October 10, 2003, after lengthy negotiations, representatives from Metropolitan, IID, and CVWD executed the QSA and other related agreements. Parties involved also included SDCWA, the California Department of Water Resources (DWR), the California DFW, the U.S. Department of the Interior, and the San Luis Rey Settlement Parties. One of those related agreements was the Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement, which specifies to which agencies water will be delivered under priorities 3a and 6a of the Seven Party Agreement during its term.

Metropolitan has identified several programs that could be used to achieve the regional long-term development targets for the Colorado River, as shown in Table 3-1. Metropolitan has entered into or is exploring agreements with agencies as described in this section. In addition,

Appendix 3 provides a detailed discussion of these programs and describes whether the programs are being implemented, are deferred, or are under investigation.

### *Colorado River Water Management Programs*

Imperial Irrigation District/Metropolitan Water District Conservation Program

Under agreements executed in 1988 and 1989, Metropolitan has funded water efficiency improvements within IID's service area in return for the right to divert the water conserved by those investments. Under this program, IID implemented a number of structural and non-structural measures, including the lining of existing earthen canals with concrete, constructing local reservoirs and spill-interceptor canals, installing non-leak gates, and automating the distribution system. Other implemented programs include the delivery of water to farmers on a 12-hour rather than a 24-hour basis and improvements in on-farm water management through irrigation management improvements. Through this program, IID has conserved an additional 105 TAF per year on average upon completion of program implementation. Execution of the QSA and amendments to the 1988 and 1989 agreements resulted in changes in the availability of water under the program, extending the term to 2078 if the term of the QSA extends through 2077, which guaranteed Metropolitan at least 85 TAF per year with the remainder of the conserved water available to CVWD when needed. In a 2019 agreement, Metropolitan and CVWD agreed to increase the amount of water guaranteed to Metropolitan to 90 TAF per year from 2020 to 2026, with the remainder of the conserved water available for Metropolitan's delivery to CVWD at Whitewater.

Palo Verde Land Management, Crop Rotation, and Water Supply Program

In May 2004, Metropolitan's Board authorized a 35-year land management, crop rotation, and water supply program with PVID. Under the program, participating farmers in PVID are paid to reduce their water use by not irrigating a portion of their land. A maximum of 29 percent of the lands within the Palo Verde Valley can be fallowed in any given year. Under the terms of the QSA, water savings within the PVID service area are made available to Metropolitan. This program provides up to 133 TAF of water to be available to Metropolitan in certain years. Over the life of the program, an average of 84.5 TAF per year has been saved and made available to Metropolitan. Additionally, in March 2009, Metropolitan and PVID entered into a one-year supplemental fallowing program within PVID that provided for the fallowing of additional acreage, with savings of 24.1 TAF in 2009 and 32.3 TAF in 2010.

Bard Seasonal Fallowing Program

In December 2019, Metropolitan's Board authorized a seven-year seasonal fallowing program with the Bard Water District. Under the program, participating farmers in Bard are paid to reduce their water use by not irrigating their land between the late spring and summer months. A maximum of 3,000 acres will be fallowed in the Bard Unit. Estimated water savings are between 1.5 and 2.0 AF per irrigable acre. Bard is part of the Yuma Project Reservation Division. Bard therefore holds a higher priority than Metropolitan, and any reductions in their water consumption increases supplies available to Metropolitan. Metropolitan has the option to make a fallowing call every year. The fallowing call notifies Bard and the farmers if Metropolitan needs fallowing the following year. This program provides up to 6 TAF of water to be available to Metropolitan in certain years.

Management of Metropolitan-Owned Land in Palo Verde

In 2001, Metropolitan acquired 8,946 acres of irrigable farmland within the Palo Verde Irrigation District (PVID). These lands were leased to growers and were eventually enrolled in the PVID Land

Management, Crop Rotation and Water Supply Program when it began in 2005. In 2015, Metropolitan acquired an additional 12,049 irrigable acres from Verbena LLC, bringing Metropolitan's ownership in the Palo Verde Valley to approximately 20,995 acres of irrigated farmland. The lands have historically been leased to growers who produced high water-using crops such as alfalfa.

In 2017 and 2018, Metropolitan entered into new leases on the lands with the goal of reducing consumptive water use while maintaining the lands as productive farmland. Strategies for reducing water use include incentivizing lessees to grow lower water-using crops, experimenting with different crop rotation cycles, and studying alternative irrigation practices. To assist in these studies, Metropolitan has deployed technologies for measuring crop water use via remote sensing imagery and ground-based sensors.

If long-term water savings from these farm leases is realized, Metropolitan may explore ways to have them formally accounted for in Metropolitan's Colorado River supplies in the future.

Southern Nevada Water Authority and Metropolitan Storage and Interstate Release Agreement

SNWA has undertaken extraordinary water conservation measures to maintain its consumptive use within Nevada's basic apportionment of 300 TAF. The success of the conservation program has resulted in unused basic apportionment for Nevada. As SNWA expressed interest in storing a portion of the water with Metropolitan, the agencies, along with the United States and the Colorado River Commission of Nevada, entered into a storage and interstate release agreement in October 2004. Under the agreement, additional Colorado River water supplies are made available to Metropolitan when there is space available in the CRA to receive the water. SNWA stored approximately 422 TAF with Metropolitan through 2019, 330 TAF of which is available for return to SNWA. In addition to providing capacity for SNWA to store unused water, the program has been beneficial to Metropolitan, providing additional water during dry years, especially during the recent California drought (2011 to 2016). SNWA is not expected to call upon Metropolitan to return water until after 2026.

Lower Colorado Water Supply Project

The Lower Colorado Water Supply Project was authorized by Congress in the 1980s to provide up to 10 TAF of water per year to the City of Needles and other entities adjacent to the river in California that do not have rights or have insufficient rights to use Colorado River water. In March 2007, Metropolitan, the City of Needles, and the United States Bureau of Reclamation (USBR) executed a Lower Colorado Water Supply Project contract. Under the contract, Metropolitan receives, on an annual basis, project water left unused by the project contractors along the River. The water supply for the project comes from groundwater wells located along the All-American Canal. A portion of the payments made by Metropolitan to the City of Needles is placed in a trust fund for potentially acquiring a new water supply for the project should the groundwater pumped from the project's wells become too saline for use. Metropolitan received 9.5 TAF from this project in 2019 and will receive an estimated 8.8 TAF in 2020 based on the amount of water pumped and used by other project water users.

Exchange with SDCWA

SDCWA has acquired conserved Colorado River water reaching an annual volume of 277.7 TAF by 2023. SDCWA makes this water available at Lake Havasu for Metropolitan diversion, where Metropolitan takes possession of the water and provides a matching volume from Metropolitan's blended supplies to SDCWA by exchange in equal monthly amounts. The conserved water is

acquired by SDCWA through its transfer agreement with the Imperial Irrigation District (IID) and from the lining of the All-American and Coachella canals.

Under the transfer agreement with IID, 192.5 TAF was transferred and exchanged with Metropolitan in 2020. In 2021, the transfer reaches 205 TAF, reduces to 202.5 TAF in 2022, then stabilizes at 200 TAF per year in 2023. The water is being conserved through on-farm efficiency conservation arrangements made by IID with its customers and other system efficiency measures.

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006 and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal. The project was completed in 2009 and conserves 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for Coachella Canal Lining Project mitigation. Any portion of the latter volume not used for mitigation is allocated to SDCWA; however, whether SDCWA can actually receive such water is subject to other laws, agreements, and factors.

The combined volume IID transferred water and canal lining water that Metropolitan will exchange with SDCWA is limited to 282.7 TAF in 2021, 280.2 TAF in 2022, and 277.7 TAF each year thereafter.

Exchange with the United States

Of the 16,000 AF allocated to the San Luis Rey Settlement Parties from the water conserved from the All-American Canal Lining Project and Coachella Canal Lining Project, the United States furnishes this water at Metropolitan's Colorado River Intake on Lake Havasu. Metropolitan takes possession of the water and by exchange delivers an equal volume of Metropolitan's blended supplies to SDCWA. By separate agreement, SDCWA conveys the water to the San Luis Rey Settlement Parties.

Lake Mead Storage Program

In May 2006, Metropolitan and the USBR executed an agreement for a demonstration program that allowed Metropolitan to leave conserved water in Lake Mead, for exclusive use by Metropolitan in later years, that Metropolitan would otherwise have used in 2006 and 2007. The program required that such water left in Lake Mead must be through reduced use resulting from implementation of extraordinary conservation measures and not simply be water that was not needed by Metropolitan in the year it was stored. This extraordinary conservation was accomplished through savings realized under the Palo Verde Land Management, Crop Rotation, and Water Supply Program. Through the two-year demonstration program, Metropolitan created 44.8 TAF of "Intentionally Created Surplus" (ICS) water.

In December 2007, Metropolitan entered into agreements to set forth the rules under which ICS water is developed, stored in, and delivered from Lake Mead. According to these rules, the amount of water stored in Lake Mead, created through extraordinary conservation, that is available for delivery in a subsequent year was reduced by a one-time deduction of five percent, resulting in additional system water in storage in the lake, and an annual evaporation loss of three percent, beginning in the year following the year the water is stored. The 2019 Lower Basin Drought Contingency Plan (Lower Basin DCP; see below) changed these rules such that, for ICS creators party to the DCP (including Metropolitan), a one-time10 percent deduction is assessed on ICS in the year it is created, without additional future evaporation losses. Metropolitan created ICS water in 2009, 2010, 2011, 2012, 2016, 2017, 2018, and 2019 and

withdrew ICS water in 2008, 2013, 2014, and 2015. As of January 1, 2020, Metropolitan had a total of 866 TAF of Extraordinary Conservation ICS water in Lake Mead.

Under these agreements, Metropolitan also agreed to store excess conservation by IID, up to 25 TAF per year with a cumulative cap of 50 TAF, with return upon the request of IID, subject to the conditions of the agreement. This was later amended in 2015 to temporarily increase the amount of excess conservation that Metropolitan would store, to account for the success of IID's conservation programs and the extreme drought conditions within the State of California. Metropolitan stored water for IID in 2014, 2015, 2016, and 2017. As of January 1, 2020, Metropolitan has stored approximately 168 TAF of IID's excess conservation either through application of the California ICS Agreement and its amendment, or through application of 3.B.8 of the 2007 Interim Guidelines (aka Lake Mead Storage Program)

The December 2007 federal guidelines concerning the operation of the Colorado River system reservoirs provided the ability for agencies to create "System Efficiency ICS" through the development and funding of system efficiency projects that save water that would otherwise be lost from the Colorado River. To that end, in 2008 the Central Arizona Water Conservation District (CAWCD), SNWA, and Metropolitan contributed funds for the construction of the Drop 2 (Brock) Reservoir by the USBR. The purpose of the Drop 2 (Brock) Reservoir is to increase the capacity to regulate deliveries of Colorado River water at Imperial Dam, reducing the amount of lost storage in Lake Mead due to excess flow downstream of Imperial Dam by approximately 70 TAF annually. In return for its $25 million net contribution toward construction, operation, and maintenance, 100 TAF of water that was stored in Lake Mead was assigned to Metropolitan as System Efficiency ICS. Through 2019, Metropolitan has diverted 35 TAF of this amount, with 65 TAF remaining in storage.

In 2009, Metropolitan entered into an agreement with the United States, SNWA, the Colorado River Commission of Nevada, and CAWCD to have USBR conduct a one-year pilot operation of the Yuma Desalting Plant at one-third capacity. The pilot project operated between May 2010 and March 2011 and provided data for future decision-making regarding long-term operation of the Plant and developing a near-term water supply. Metropolitan's contribution toward plant operating costs secured 24.4 TAF of System Efficiency ICS which is still stored in Lake Mead as of January 1, 2020.

Quagga Mussel Control Program

The presence and spawning of quagga mussels in the lower Colorado River from Lake Mead through Lake Havasu pose a threat to Metropolitan's Colorado River Aqueduct (CRA) system and other Colorado River water users due to the potential to continuously seed water conveyance systems with mussel larvae.

Metropolitan developed the Quagga Mussel Control Program (QMCP) in 2007 to address the long-term introduction of mussel larvae into the CRA from the lower Colorado River. The QMCP consists of surveillance activities and control measures. Inspections for adult mussel infestation of submerged infrastructure are conducted during annual CRA shutdowns (usually three to four weeks). Microscopic larvae are routinely monitored throughout the year in infested lakes and at non-infested locations.

Control activities consist of continuous chlorination of the CRA system (target residual = 0.1 – 0.5 mg/L) at the outlets of Copper Basin (5 miles downstream of the intake from the Colorado River), Lake Skinner, and Lake Mathews at the western terminus of the CRA. The outlet towers at Lakes Skinner and Mathews are also chlorinated for two weeks every quarter when operations allow (0.6 mg/L target residual). Attached mussels are removed during routine cleaning of the

trash racks at the Whitsett Intake Pumping Plant at the start of the CRA. The annual CRA shutdowns desiccate exposed quagga mussels, thus providing an additional control measure.

Recent shutdown inspections have demonstrated that the combined use of chlorine and regularly scheduled shutdowns effectively control mussel infestation along the length of the CRA since only few and small mussels are usually found during these inspections.

Lower Basin Drought Contingency Plan

In April 2019, the President signed legislation directing the Secretary of the Interior to sign and implement four DCP agreements related to the Upper and Lower Basin DCPs without delay. The agreements were executed, and the Upper and Lower Basin DCPs became effective on May 20, 2019 and will continue to be effective through 2026. The Lower Basin Drought Contingency Plan Agreement requires California, Arizona, and Nevada to store defined volumes of water ("DCP Contributions") in Lake Mead at specified lake levels. California would begin making contributions if Lake Mead's elevation is projected to be at or below 1,045 feet above sea level on January 1. Depending on the lake's elevation, California's contributions would range from 200 to 350 TAF a year. Pursuant to intrastate implementation agreements that terminate in 2026, Metropolitan is responsible for 93 percent of any California DCP Contribution that may be required under the Lower Basin DCP. CVWD is responsible for 7 percent of California's required DCP Contributions. In January 2020, the Lake Mead elevation was 1,090 feet; thus, no California DCP Contributions are necessary at this time. As noted above, under the Lower Basin DCP, the one-time deduction on new ICS was increased to 10 percent while the annual evaporation loss was removed.

Implementation of the Lower Basin DCP enhances Metropolitan's ability to store water in Lake Mead and to ensure that water in storage can be delivered at a later date. The Lower Basin DCP increases the total volume of water that California may store in Lake Mead by 200 TAF, which Metropolitan will have the right to use. Water stored as ICS will be available for delivery as long as Lake Mead's elevation remains above 1,025 feet. Previously, that water would likely have become inaccessible below a Lake Mead elevation of 1,075 feet. Rules are set for delivery of DCP ICS through 2026 and between 2027 and 2057.

### *Achievements to Date*

Metropolitan has developed a number of supply and conservation programs to increase the amount of supply available from the Colorado River. The Colorado River faces long-term challenges of water demands exceeding available supply with additional uncertainties due to climate change. Metropolitan's supply and conservation programs, as well as planned additional water management programs for 2035, are shown in Table 3-1.

**Table 3-1**
**Colorado River Program Capabilities**
**Year 2035**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Basic Apportionment – Priority 4 | 550,000 | 550,000 | 550,000 |
| DCP Contribution Reduction[1] | 0 | 0 | 0 |
| IID/MWD Conservation Program | 85,000 | 85,000 | 85,000 |
| Priority 5 Apportionment (Surplus) | 0 | 0 | 0 |
| PVID Land Management, Crop Rotation, and Water Supply Program | 130,000 | 130,000 | 117,000 |
| Bard Seasonal Fallowing Program | 6,000 | 6,000 | 6,000 |
| Lower Colorado Water Supply Project | 9,000 | 9,000 | 9,000 |
| Lake Mead ICS Storage Program | 337,500 | 337,500 | 337,500 |
| Binational ICS | 51,000 | 0 | 51,000 |
| Forbearance for Present Perfected Rights | (2,000) | (2,000) | (2,000) |
| CVWD SWP/QSA Transfer Obligation | (35,000) | (35,000) | (35,000) |
| DWCV SWP Table A Obligation | (51,000) | (12,000) | (113,000) |
| DWCV Advance Delivery Account | 51,000 | 12,000 | 113,000 |
| IID Payback | 0 | 0 | 0 |
| SNWA Agreement Payback | (22,000) | (22,000) | (22,000) |
| ***Subtotal of Current Programs*** | ***1,109,500*** | ***1,058,500*** | ***1,096,500*** |
| **Programs Under Development** | | | |
| Additional Transfer Programs | 0 | 0 | 0 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Additional Colorado River Exchange Supplies** | | | |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 |
| Exchange with United States | 16,000 | 16,000 | 16,000 |
| ***Subtotal of Additional Colorado River Supplies*** | ***294,000*** | ***294,000*** | ***294,000*** |
| **Maximum CR Supply Capability[2]** | **1,403,500** | **1,352,500** | **1,390,500** |
| *Less CRA Capacity Constraint (amount above 1.25 MAF)* | *(153,500)* | *(102,500)* | *(140,500)* |
| **Maximum Expected CRA Deliveries[3]** | **1,250,000** | **1,250,000** | **1,250,000** |

[1] DCP contribution beyond capacity of ICS accounts.
[2] Total amount of supplies available without taking into consideration CRA capacity constraint.
[3] The CRA delivery capacity is 1.25 MAF annually.

## 3.2 State Water Project

Much of the SWP water supply passes through the San Francisco-San Joaquin Bay-Delta (Bay-Delta). The SWP consists of a series of pump stations, reservoirs, aqueducts, tunnels, and power plants operated by DWR. Figure 3-2 shows SWP facilities. This statewide water infrastructure provides water to 29 urban and agricultural agencies throughout California. More than two-thirds of California's residents receive some of their drinking water from the Bay-Delta.

The original State Water Contract called for an ultimate delivery capacity of 4.2 MAF, with 1,911 TAF allocated to Metropolitan pursuant to its participation in the SWP. For decades, the Bay-Delta has experienced water quality and supply reliability challenges and conflicts due to variable hydrology and environmental standards that limit pumping operations. SWP deliveries in the most recent critically dry years lagged these projections and were 5 percent of contractual amounts in 2014 and 20 percent of contractual amounts in 2015. Dry conditions in 2020 also supported a supply allocation of only 20 percent. Consequently, Metropolitan's key concern is the continual deterioration of water supply reliability.

Another important concern for Metropolitan is sustained improvement in SWP water quality. Metropolitan must be able to meet the increasingly stringent drinking water regulations that are expected for disinfection by-products and pathogens in order to protect public health. Meeting these regulations will require improving the Bay-Delta water supply by cost effectively combining alternative source waters, source improvement, and treatment facilities. Additionally, Metropolitan requires water quality improvements of Bay-Delta water supplies to meet its 500 mg/L salinity blending objective in a cost-effective manner, while minimizing resource losses and helping to ensure the viability of regional recycling and groundwater management programs.

### *Background*

Endangered Species Act Permits - The listing of several fish species as threatened or endangered under the federal or California Endangered Species Acts (respectively, the "Federal ESA" and the "California ESA" and, collectively, the "ESAs") has adversely impacted operations and limited the flexibility of the SWP. Currently, five species (the winter-run and spring-run Chinook salmon, Delta smelt, North American green sturgeon, and Central Valley steelhead) are listed under the ESAs. In addition, on June 25, 2009, the California Fish and Game Commission declared the longfin smelt a threatened species under the California ESA. Because of the listing of the various species, the federal Central Valley Project (CVP) and SWP are prohibited from "taking" the fish in their operations and must consult with federal fisheries agencies to determine whether their operations will jeopardize the existence of the species. If so, CVP and SWP must establish "reasonable and prudent alternatives" (RPAs) to normal project operations to minimize their impacts on the smelt and salmon.

In 2004 and 2005, the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) issued biological opinions and incidental take statements that governed operations of the SWP and the CVP with respect to the Delta smelt, the winter-run and spring-run Chinook salmon, and the Central Valley steelhead. In July 2006, the USBR reinitiated consultation with the USFWS and NMFS with respect to the 2004 and 2005 biological opinions (with the addition of the North American green sturgeon, which was listed in April 2006) following the filing of legal challenges to those biological opinions and incidental take statements.

**Figure 3-2**
**Current and Projected Facilities of the State Water Project**

In 2008, USFWS issued a Biological Opinion with RPAs including criteria for operation of the CVP and SWP in a manner not likely to jeopardize the continued existence of the Delta smelt or adversely modify designated critical habitat. NMFS made a similar finding with respect to project operation effects on the listed salmon and steelhead in its revised Biological Opinion in 2009. Coordinated CVP/SWP operations were required to incorporate RPAs suggested by the agencies in the 2008 and 2009 Biological Opinions to ensure they are exempt from the otherwise applicable prohibition on "take" of Federal ESA-listed species.

To comply with the California ESA, DWR obtained consistency determinations for species listed under both ESAs and a separate Fish & Game Code Section 2081 Incidental Take Permit that authorized the incidental take of the state-listed Longfin smelt from SWP operations.

2019 Biological Opinions - In August 2016, USBR and DWR reinitiated consultation with NMFS and USFWS on the Coordinated Long-term Operations of the CVP and SWP due to new information and science on declining listed fish species populations. USBR submitted the initial biological assessment to USFWS and NMFS. The biological assessment contains a description of USBR's and DWR's proposed long-term coordinated operations plan (the "2019 Long-Term Operations Plan"). On October 21, 2019, USFWS and NMFS released their Biological Opinions. On February 18, 2020, USBR signed a Record of Decision, pursuant to the National Environmental Policy Act, completing its environmental review and adopting the 2019 Long-Term Operations Plan.

The 2019 Long-Term Operations Plan incorporates and updates many of the requirements contained in the previous 2008 and 2009 Biological Opinions. It also includes over $1 billion over a ten-year period in conservation, monitoring and new science, some of which is in the form of commitments carried forward from the previous 2008/2009 Biological Opinions. Those costs are shared by the SWP and CVP. The prior 2008 and 2009 Biological Opinions resulted in an estimated reduction in SWP deliveries of 0.3 million acre-feet during critically dry years to 1.3 million acre-feet in above normal water years as compared to the previous baseline. The 2019 Long-Term Operations Plan and 2019 Biological Opinions are expected to increase SWP deliveries by an annual average of 200,000 acre-feet as compared to the previous Biological Opinions. However, as explained further below, DWR committed to forego the anticipated improvement in the California ESA permitting process.

On December 2, 2019, a group of non-governmental organizations, including commercial fishing groups and the Natural Resources Defense Council (the "NGOs"), sued the Department of Interior, Department of Commerce, USFWS, NMFS, and USBR alleging the 2019 Biological Opinions are arbitrary and capricious, later amending the lawsuit to include claims alleged against USBR under the federal ESA and the National Environmental Policy Act. On February 20, 2020, the California Natural Resources Agency (Natural Resources), the California Environmental Protection Agency, and the Attorney General (collectively, the "State Plaintiffs") sued the federal agencies, making allegations similar to the NGOs, but also alleging that USBR must obtain a California ESA permit for CVP operations that cause incidental take of the state-listed Longfin smelt. The State Water Contractors intervened in both cases to defend the 2019 Biological Opinions. In May 2020, the court granted, in part, a preliminary injunction that affected CVP operations only for a short time in May. The federal defendants are nearing completion of the administrative records that will form the evidentiary basis for briefing the merits of the cases, and the court has issued a briefing schedule for any objections to the administrative records. Once the administrative records are finalized, the parties anticipate filing cross-motions for summary judgment. The outcome of those cross-motions may obviate the need for a trial.

California ESA Incidental Take Permit - DWR described and analyzed its proposed SWP long-term operations plan for purposes of obtaining a new California ESA permit in its November 2019 Draft EIR under CEQA. Its 2019 Draft EIR proposed essentially the same operations plan as for the

federal 2019 Biological Opinions, with the addition of operations for the California ESA-listed Longfin smelt. The proposed project included an estimated $540 million in conservation, monitoring and science, much of which overlapped with DWR's share of the estimated $1 billion under the federal 2019 Biological Opinions. In December 2019, DWR submitted its application for an incidental take permit under the California ESA to the California Department of Fish and Wildlife (CDFW), with a modified State operations plan that added new outflow and environmental commitments. On March 27, 2020, DWR released its final EIR and Notice of Determination, describing and adopting a State operations plan with additional operational restrictions and additional conservation commitments. On March 31, 2020, CDFW issued a California ESA incidental take permit for the SWP that included further operational restrictions and outflow. The final approved project and incidental take permit reduce long-term average SWP deliveries by more than 200 TAF, which more than erased any potential improvement in SWP water supplies that were anticipated to result from the 2019 Biological Opinions. In addition, the approved project and incidental take permit add another estimated $218 million over a ten-year period in environmental commitments for the SWP beyond the SWP's share of the $1 billion required to comply with the 2019 Biological Opinions.

On April 28, 2020, Metropolitan and Mojave Water Agency (Mojave) jointly sued CDFW, DWR and Natural Resources, alleging that the new California ESA permit and Final EIR violate CEQA and the California ESA. Metropolitan and Mojave also allege that DWR breached their respective State Water Contracts and the implied covenant of good faith and fair dealing by, among other things, accepting an incidental take permit containing mitigation or other measures in excess of that required by law. The State Water Contractors and the Kern County Water Agency also filed CEQA and CESA actions, and a CEQA challenge was filed by several federal contractors. In addition, San Bernardino Valley Municipal Water District sued CDFW and DWR, alleging CEQA and CESA violations, breach of its State Water Contract and the implied covenant, as well as unconstitutional takings and anticipatory repudiation of contract claims. Four other lawsuits also have been filed by certain commercial fishing groups and a tribe, several environmental groups, and two in-Delta water agencies challenging the Final EIR as inadequate under CEQA and, in some of the cases, alleging violations of the California ESA, Delta Reform Act, public trust doctrine and, in one of the cases, certain water right statutes. Since the initial filings, Coachella Valley Water District, San Gorgonio Pass Water Agency and the Municipal Water District of Orange County have joined Metropolitan's case; and nine individual State Water Contractors joined the SWC and Kern County Water Agency in their case, adding breach of contract and implied covenant claims. All eight cases have been ordered coordinated, and a stay has been imposed on any discovery until modified or lifted by the coordination trial judge. At this time, Metropolitan is unable to assess the likelihood of success of any litigation relating to the California ESA permit, including any future litigation or any future claims that may be filed, or any potential effect on Metropolitan's SWP water supplies.

Bay-Delta Water Quality Control Plan Update/Voluntary Agreements – The State Water Resources Control Board (SWRCB) is the agency responsible for setting water quality standards and administering water rights throughout California. The SWRCB exercises its regulatory authority over the Bay-Delta and its tributaries by means of public proceedings leading to regulations and decisions that can affect the availability of water to Metropolitan and other users of SWP water. These include the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (Bay-Delta Plan), which establishes the water quality objectives and proposed flow regime of the estuary, and water rights decisions, which assign responsibility for implementing the objectives of the Bay-Delta Plan to users throughout the system by adjusting their respective water rights permits.

Since 2000, SWRCB's Water Rights Decision 1641 (D-1641) has governed the SWP's ability to export water from the Bay-Delta for delivery to Metropolitan and other agencies receiving water from the SWP. D-1641 allocated responsibility for meeting flow requirements and salinity and other water quality objectives established earlier by the Bay-Delta Plan.

The Bay-Delta Plan gets reviewed periodically, and new standards and allocations of responsibility can be imposed on the SWP as a result. The last review was completed in 2006, and the current review has been ongoing since approximately 2010 in a phased approach.

Phase 1 focuses on the southern Delta salinity objectives for the protection of agriculture, San Joaquin River flow objectives for the protection of fish and wildlife, and a program of implementation for achieving those objectives. Phase 2 considers the comprehensive review of the other elements of the Bay-Delta Plan, including but not limited to Sacramento River and Delta outflow objectives.

The SWRCB has also encouraged all stakeholders to work together to reach one or more voluntary agreements for consideration by the SWRCB that could implement the proposed amendments to the Bay-Delta Plan through a variety of tools, while seeking to protect water supply reliability. Metropolitan is participating in the Phase 2 proceedings and voluntary agreement negotiations. In March of 2019, DWR and CDFW put forward a project description and planning agreement that would allow the SWRCB to analyze the environmental impacts and benefits of the voluntary agreement alternative to the percentage of unimpaired flow framework.

In December 2018, the SWRCB adopted the Phase 1 Bay-Delta Plan amendments and Final Substitute Environmental Document. Among other things, the Phase 1 updates established new Lower San Joaquin River (LSJR) flow objectives and revised southern Delta salinity objectives. The LSJR flow objectives for February through June require 40 percent of unimpaired flow, based on a minimum 7-day running average, from each of the Stanislaus, Tuolumne, and Merced Rivers, with the ability to adjust between 30 and 50 percent through adaptive management, and with certain minimum base flows. The SWRCB estimates that the new LSJR flow objectives will reduce water available for human consumptive use by between 7 and 23 percent, on average, and 38 percent in critically dry years.

On February 25, 2019, the Office of Administrative Law approved the Phase 1 amendments, which are now in effect. The SWRCB plans to fully implement the new LSJR flow objectives through adjudicatory (water rights) and regulatory (water quality) processes by 2022. The SWRCB has stated that it encourages voluntary agreements that will assist in implementing the LSJR flow objectives through a combination of flow and non-flow habitat restoration measures, and will consider such agreements as part of its proceedings to implement the Phase 1 Bay-Delta Plan update, consistent with its obligations under applicable law.

In July of 2018, the SWRCB released a framework that describes the draft proposal for Phase 2, which will update the flow requirements for the Delta and its contributing watersheds, including the Sacramento River and its tributaries. The framework provides additional details about the flow requirements staff is likely to propose, how these new requirements could be implemented, and preliminary information on their potential environmental benefits and water supply effects. Among other things, SWRCB staff anticipate proposing an inflow level of 45-65 percent of unimpaired flow, with a starting point of 55 percent. The proposed program of implementation would allow voluntary agreements with nonflow measures to be lower in the range – so long as the measures provide the same level of resource protection as 55 percent, and that the agreement is still within the range of 45-65 percent. The framework states that the SWRCB is interested in receiving potential Bay-Delta Plan amendment language developed through the

voluntary agreement process that would authorize, with the affirmative concurrence from CDFW, a coordinated control of flows and other, non-flow factors that would achieve benefits comparable to the unimpaired flow requirements.

Other issues, such as the recent decline of some fish populations in the Bay-Delta and surrounding regions and certain operational actions in the Bay-Delta, may significantly reduce Metropolitan's water supply from the Bay-Delta. Future new or revised Biological Opinions or incidental take authorizations under the Federal ESA and California ESA might further adversely affect SWP and CVP operations. Additionally, new litigation, listings of additional species under the ESAs, or new regulatory requirements imposed by the SWRCB could further adversely affect SWP operations in the future by requiring additional export reductions, releases of additional water from storage, or other operational changes impacting water supply operations. Metropolitan cannot predict the ultimate outcome of any of the litigation or regulatory processes described above, but believes they could have an adverse impact on the operation of the SWP pumps, Metropolitan's SWP supplies, and Metropolitan's water reserves.

Operational constraints likely will continue until a long-term solution to the problems in the Bay-Delta is identified and implemented. The Delta Vision process, established by Governor Schwarzenegger, was aimed at identifying long-term solutions to the conflicts in the Bay-Delta, including natural resource, infrastructure, land use, and governance issues. In addition, State resource agencies and various water user entities are currently engaged in the development of the Delta Conveyance Project, which is aimed at making physical and operational improvements to the SWP system in the Delta necessary to access south-of-Delta SWP water supplies and restore and protect water quality by addressing anticipated sea-level rise, seismic risks, and by providing operational flexibility to improve aquatic conditions in the Delta and better manage risks of further regulatory constraints on SWP operations.

### *Changed Conditions*

In August 2020, DWR released the 2019 State Water Project Delivery Capability Report. The 2019 Delivery Capability Report presents the current DWR estimate of the amount of water deliveries for current (2019) conditions and conditions 20 years in the future for each SWP contractor under a range of hydrologic conditions. These estimates incorporate regulatory requirements in accordance with the SWRCB Water Quality Control Plan, the USFWS and NMFS Biological Opinions and the CDFW Incidental Take Permit. In addition, these estimates incorporate 2018 amendments to the Coordinated Operations Agreement between the SWP and CVP. Future capability estimates also reflect the potential impacts of climate change and sea level rise. Under the 2019 Delivery Capability report, the delivery estimates for the SWP for 2019 conditions as a percentage of Table A amounts are 7 percent, equivalent to 134 TAF for Metropolitan, under a single dry year (1977) condition and 58 percent, equivalent to 1.1 MAF for Metropolitan, under long-term average conditions.

### *Implementation Approach*

Metropolitan's implementation approach for the SWP depends on the full use of the current State Water Contract provisions, including its basic contractual amounts and Article 21 interruptible supplies. In addition, it requires successful negotiation and implementation of a number of agreements. Each of these stakeholder processes or agreements involves substantial Metropolitan and member agency staff involvement to represent regional interests. Metropolitan is committed to working collaboratively with DWR, SWP contractors, and other stakeholders to ensure the success of these extended negotiations and programs.

### *SWP Reliability*

This discussion provides details of the major actions Metropolitan is undertaking to improve SWP reliability.

Delta Conveyance Project – Planning for a Delta conveyance project to address declining populations of sensitive fish species and the increasingly restrictive permit conditions began decades ago. In the mid-1990s, a consortium of federal, state, and local agencies including Metropolitan entered the Bay-Delta Accord, which included hundreds of millions of dollars for ecosystem restoration in the Delta and its salmon-bearing tributaries. In 2000, a similar consortium completed the CALFED analysis of a program of ecosystem restoration and improvements to Delta conveyance and issued a Record of Decision that included dual conveyance as an alternative. In April 2006, the CALFED Program issued a 10-year Action Plan to refocus the program based on new scientific and policy information. The scientific information indicated that the current physical configuration of the Delta did not lead to a sustainable condition due to increasing risk of seismic events and sea level rise; and that population levels for Delta pelagic (open water) organisms were at record low levels and were appearing to continue to decline.

The 10-year Action Plan also indicated that several water users were considering the development of a habitat conservation plan for the Delta. This effort was the initiation of the Bay Delta Conservation Plan (BDCP), which began with the support and participation of water suppliers, including Metropolitan. One of the conservation measures included new points of diversion on the Sacramento River in the north Delta connected by a canal or two tunnels to Clifton Court Forebay (part of the SWP) in the south Delta.

In September 2006, Governor Schwarzenegger signed Executive Order S-17-06, which launched the Delta Vision process by establishing a Blue-Ribbon Task Force, a cabinet-level Delta Vision Committee, Delta Science Advisors, and a Stakeholder Coordination Group. The executive order charged the Blue-Ribbon Task Force with developing both a long-term vision for a sustainable Delta and a plan to implement that vision. The Delta Vision Committee recommended, among other things, creation of a state plan for the Delta and Suisun Marsh aimed at landscape-scale ecosystem restoration and a new Delta conveyance infrastructure to create a dual system of conveyance. On February 28, 2008, Governor Schwarzenegger, in a letter to state Senators Perata, Machado, and Steinberg, stated his intention to direct DWR to proceed with preparation of environmental review and permitting activities for the BDCP.

In 2009, in light of the Delta Vision reports and recommendations, the Legislature enacted the Sacramento-San Joaquin Delta Reform Act of 2009, which established the coequal goals for the Delta of ecosystem restoration and restoration of reliable SWP and CVP supplies, created the Delta Stewardship Council, and charged the new agency with development of a Delta Plan to further the coequal goals in a manner that protects and enhances the Delta as an evolving place. The Delta Reform Act and the first Delta Plan, adopted in 2013, called for incorporation of the BDCP into the Delta Plan if it met state and federal requirements for a habitat conservation plan and natural communities' conservation plan.

The BDCP planning process continued under Governor Brown, but in light of comments on the BDCP, DWR began analyzing three new sub-alternatives to the BDCP that involved new conveyance independent of any landscape-scale habitat restoration called the California WaterFix. At the same time, Governor Brown initiated California EcoRestore, which was aimed at restoration of 30,000 acres of fish habitat in the Delta. In July 2017, DWR approved California WaterFix. Metropolitan's Board authorized participation in California WaterFix in October 2017, and again in April and July of 2018.

In his State of the State address delivered February 12, 2019, Governor Newsom announced that he did not "support WaterFix as currently configured," but does "support a single tunnel." On April 29, 2019, Governor Newsom issued Executive Order N-10-19, directing several agencies to (among other things) "inventory and assess… [c]urrent planning to modernize conveyance through the Bay Delta with a new single tunnel project." The Governor's announcement and Executive Order led to DWR's withdrawal of all approvals and environmental compliance documentation associated with California WaterFix. The CEQA process identified in this notice for the proposed Delta Conveyance Project will, as appropriate, utilize relevant information from the past environmental planning process for California WaterFix, but the proposed project will undergo a new stand-alone environmental analysis leading to issuance of a new EIR.

On January 15, 2020, DWR issued a Notice of Preparation of an Environmental Impact Report for the DCP, stating:

> *DWR's underlying, or fundamental, purpose in proposing the project is to develop new diversion and conveyance facilities in the Delta necessary to restore and protect the reliability of State Water Project (SWP) water deliveries and, potentially, Central Valley Project (CVP) water deliveries south of the Delta, consistent with the State's Water Resilience Portfolio.*
>
> *The above stated purpose, in turn, gives rise to several project objectives. In proposing to make physical improvements to the SWP Delta conveyance system, the project objectives are:*
>
> - *To address anticipated rising sea levels and other reasonably foreseeable consequences of climate change and extreme weather events.*
> - *To minimize the potential for public health and safety impacts from reduced quantity and quality of SWP water deliveries, and potentially CVP water deliveries, south of the Delta resulting from a major earthquake that causes breaching of Delta levees and the inundation of brackish water into the areas in which the existing SWP and CVP pumping plants operate in the southern Delta.*
> - *To protect the ability of the SWP, and potentially the CVP, to deliver water when hydrologic conditions result in the availability of sufficient amounts, consistent with the requirements of state and federal law, including the California and federal Endangered Species Acts and Delta Reform Act, as well as the terms and conditions of water delivery contracts and other existing applicable agreements.*
> - *To provide operational flexibility to improve aquatic conditions in the Delta and better manage risks of further regulatory constraints on project operations*

The proposed project would construct and operate new conveyance facilities in the Delta that would add to the existing SWP infrastructure. New intake facilities as points of diversion would be located in the north Delta along the Sacramento River between Freeport and the confluence with Sutter Slough. The new conveyance facilities would include a single main tunnel to convey water from the new intakes to the existing Banks Pumping Plant and potentially the federal Jones Pumping Plant in the south Delta. The new facilities would provide an alternate location for diversion of water from the Delta and would be operated in coordination with the existing south Delta pumping facilities. The new north Delta facilities would be sized to convey up to 6,000 cfs of water from the Sacramento River to the SWP facilities in the south Delta. DWR would operate the dual conveyance system in compliance with all state and federal regulatory requirements and would not reduce DWR's current ability to meet standards in the Delta to protect biological resources and water quality for beneficial uses.

Contract Amendments – Metropolitan and other State Water Contractors have undertaken negotiations with DWR to extend their State Water Contracts. In June 2014, DWR and the State Water Contractors reached an Agreement in Principle (the "Agreement in Principle") on an amendment to the State Water Contracts to extend the contracts and to make certain changes related to financial management of the SWP in the future. DWR and 25 of the State Water Contractors, including Metropolitan, have signed the Agreement in Principle. Under the Agreement in Principle, the term of the State Water Contract for each Contractor that signs an amendment would be extended until December 31, 2085. The Agreement in Principle served as the "proposed project" for purposes of environmental review under CEQA. DWR issued a Notice of Availability of the Draft Environmental Impact Report ("EIR") for the proposed project on August 17, 2016. DWR released the Final EIR on November 16, 2018 and certified the final EIR and issued a Notice of Determination on December 11, 2018. Concurrently, Metropolitan considered the certified final EIR and approved the water supply contract extension amendment at its December 11, 2018 Board meeting. That same day, DWR filed a lawsuit seeking to validate the contract extension. In January of 2019, two groups of plaintiffs filed lawsuits challenging DWR's Final EIR and approval of the Contract Extension under CEQA, the Delta Reform Act, and public trust doctrine. Those cases have been related to the validation action and are pending before the same judge. To date, 21 of the 29 State Water Contractors have executed the amendment, achieving the DWR established threshold needed for it to be fully executed. DWR is awaiting a decision from the trial court on the validation litigation described above before moving forward with execution of the amendments with individual State Water Contractors.

In a process separate from the State Water Contract extension amendment described above, Metropolitan and other State Water Contractors undertook public negotiations with DWR to amend their State Water Contracts to clarify how costs would be allocated for the California WaterFix, as well as to clarify the criteria applicable to certain water management tools including single and multi-year water transfers and exchanges between State Water Contractors. DWR and the State Water Contractors reached an Agreement in Principle in 2018 (the "2018 AIP"), and DWR issued a Draft EIR. On April 29, 2019, Governor Newsom issued the executive order directing State agencies to develop a comprehensive statewide strategy to build a climate-resilient water system that included consideration of a single-tunnel Delta conveyance facility instead of the approved California WaterFix project. DWR removed the WaterFix cost provisions from the 2018 AIP and, on February 28, 2020, recirculated the Draft EIR for only the 2018 AIP's water management provisions. DWR certified a Final EIR for the water management tools AIP in August 2020 and finalized contract language in October 2020. Since then, all but three of the SWP contractors have approved and signed the amendments, including Metropolitan, which approved the amendments on February 9, 2021. As a result, the amendments became effective on February 28, 2021. The water management provisions allow for greater flexibility for transfers and exchanges among those public agencies with State Water Contracts. Specifically, it would confirm existing practices for exchanges, allow more flexibility for non-permanent water transfers, and allow for the transfer and exchange of certain portions of Article 56 carry over water.

In light of the shift from California WaterFix to the Delta Conveyance Project, Metropolitan and other State Water Contractors embarked on a third public process to further negotiate proposed amendments related to cost allocation for a potential new Delta Conveyance Project. In March of 2020, DWR and the State Water Contractors reached an Agreement in Principle ("Delta Conveyance AIP") for the allocation of costs and benefits for a Delta Conveyance project based on an allocation of proportionate shares. The Delta Conveyance AIP provides a mechanism that would allow for the costs related to any Delta Conveyance project to be allocated for and collected by DWR. The Delta Conveyance AIP also provides for the allocation of benefits for any Delta Conveyance project. Additionally, the Delta Conveyance AIP includes a white paper that

describes how DWR would account for and administer any Delta Conveyance project benefits and costs if a project were implemented today. Contract language is under development, and any contract approval would follow DWR completing the Delta Conveyance Project environmental review.

COA Addendum – DWR operates the SWP in coordination with the federal CVP, which is operated by USBR. Since 1986, the coordinated operations have been undertaken pursuant to a Coordinated Operations Agreement for the Central Valley Project and State Water Project (the "COA"). The COA defines how the State and federal water projects share water quality and environmental flow obligations imposed by regulatory agencies. The agreement calls for periodic review to determine whether updates are needed in light of changed conditions. After completing a joint review process, DWR and USBR agreed to amend the COA to reflect water quality regulations, Biological Opinions, and hydrology updated since the 1986 agreement was signed. On December 13, 2018, DWR and USBR executed an Addendum to the COA (the "COA Addendum"). Through the COA Addendum, DWR will adjust current SWP operations to modify pumping operations, as well as project storage withdrawals to meet in-basin uses, pursuant to revised calculations based on water year types. The COA Addendum will shift responsibilities for meeting obligations between the CVP and the SWP, resulting in a shift of approximately 120 TAF in long-term average annual exports from the SWP to the CVP. In executing the COA Addendum, DWR found the agreement to be exempt from environmental review under the California Environmental Quality Act ("CEQA") as an ongoing project and that the adjustments in operations are within the original scope of the project. On January 16, 2019, commercial fishing groups and a tribe ("petitioners") filed a lawsuit against DWR alleging that entering into the COA Addendum violated CEQA, the Delta Reform Act, and the public trust doctrine. The parties are in the process of completing the administrative record, which will form the evidentiary basis at trial, which has not been set at this time.

Ecosystem Restoration – The main objective under the EcoRestore Program is the restoration of at least 30,000 acres of Delta habitat, with the near-term goal of making significant strides toward that objective by 2020. These restoration programs include projects and actions that comply with pre-existing regulatory requirements designed to improve the overall health of the Delta. Other priority restoration projects would also be identified by the Sacramento-San Joaquin Delta Conservancy and other agencies and local governments. Funding is provided through multiple sources, including various local and federal partners, state bonds, and other state-mandated funds. SWP/CVP contractors have provided funds as part of existing regulatory obligations imposed on the SWP and CVP.

Delta Science Initiatives – Metropolitan's Bay-Delta science program supports water supply reliability and ecosystem restoration by protecting the Bay-Delta environment, driving better management decisions, and fostering effective regulations. Metropolitan is conducting a science program to ensure that regulations effectively protect aquatic species while ensuring a reliable water supply. The key elements of the science program include: (1) staff with scientific expertise to design, manage and participate in scientific investigations addressing Metropolitan's priorities; (2) funding science studies through direct funding, collaborations, staff in-kind contributions, and by pursuing external grant funding sources to leverage Metropolitan's science investments; (3) collaborations with external organizations to conduct science studies, including the State Water Contractors, Collaborative Science and Adaptive Management Program (CSAMP), Interagency Ecological Program agencies, Delta Stewardship Council Delta Science Program, and university scientists; and (4) participation in the Bay-Delta science community through communication of science study findings, participation in science conferences and publishing results of scientific studies in peer reviewed journals.

Metropolitan's Bay-Delta science efforts focus on three priority areas of water operations to protect Delta fish, Delta stressors and habitat needs of listed fish species.

- Water Operations to Protect Delta Fish. A priority focus for the science program is to develop a better understanding of the effect of water project operations on the health, abundance, and distribution of listed fish species, including Delta smelt, longfin smelt and Chinook salmon. The science program includes investigation of the mechanisms behind flow-abundance relationships observed in analysis of fish survey data for Delta smelt and longfin smelt, factors that affect adult Delta smelt, salmon and steelhead entrainment risk at the CVP and SWP export facilities, potential bias in fish survey data, and development of effective methods to study Delta smelt without collecting or harming the fish.
- Delta Stressors. Multiple stressors in the Bay-Delta ecosystem affect the health, abundance, and distribution of listed fish species; however, we have limited understanding of the impacts of various stressors and their specific role in the decline of listed species. The science program includes investigation into key stressors to develop information that can support development of effective management actions. These studies include investigation into predation impacts on salmon, toxic contaminant effects on Delta smelt and juvenile salmon, and the effects of nutrients on the food web.
- Habitat Needs for Delta Fish. Compared to the historical Delta, the modern Delta is highly altered and has a small fraction of tidal marsh habitat remaining and greatly reduced levels of primary production. Food and habitat limitation have been identified as important stressors for listed species. The science program includes investigation of salmon habitat needs, pilot studies to enhance the food web, longfin smelt habitat studies, pilot projects to benefit Delta smelt, monitoring the effectiveness of habitat improvement actions, and evaluation of land use and habitat opportunities on Metropolitan's Delta Island properties.

SWP Terminal Storage

Metropolitan has contractual rights to 65 TAF of flexible storage at Lake Perris (East Branch terminal reservoir) and 154 TAF of flexible storage at Castaic Lake (West Branch terminal reservoir). This storage provides Metropolitan with additional options for managing SWP deliveries to maximize yield from the project. Over multiple dry years, it can provide Metropolitan with 44 TAF of additional supply. In a single dry year like 1977, it can provide up to 219 TAF of additional supply to Southern California.

Yuba Dry Year Water Purchase Program

In December 2007, Metropolitan entered into an agreement with DWR providing for Metropolitan's participation in the Yuba Dry Year Water Purchase Program between Yuba Water Agency and DWR. This program provides for transfers of water from the Yuba Water Agency during dry years through 2025.

Desert Water Agency/Coachella Valley WD SWP Table A Transfer

Under the transfer agreement, Metropolitan transferred 100 TAF of its SWP Table A contractual amount to Desert Water Agency/CVWD (DWCV). Under the terms of the agreement, DWCV pays all SWP charges for this water, including capital costs associated with capacity in the California Aqueduct to transport this water to Perris Reservoir, as well as the associated variable costs. The amount of water actually delivered in any given year depends on that year's SWP allocation. Water is delivered through the existing exchange agreements between Metropolitan and DWCV, under which Metropolitan delivers Colorado River supplies to DWVC equal to the SWP supplies delivered to Metropolitan. While Metropolitan transferred 100 TAF of its Table A amount, it retained other rights, including interruptible water service; its full carryover amounts in

San Luis Reservoir; its full use of flexible storage in Castaic and Perris Reservoirs; and any rate management credits associated with the 100 TAF.

Desert Water Agency/Coachella Valley WD Exchange and Advance Delivery Program

Under this program, Metropolitan delivers Colorado River water to the Desert Water Agency and CVWD in advance of the exchange for their SWP Contract Table A allocations. In addition to their Table A supplies, Desert Water Agency and CVWD may take delivery of other SWP supplies available to SWP Contractors. By delivering enough water in advance to cover Metropolitan's future exchange obligations, Metropolitan is able to receive Desert Water Agency and CVWD's available SWP supplies without having to deliver an equivalent amount of Colorado River water. This program allows Metropolitan to maximize delivery of SWP water in wet years by enabling delivery of Colorado River supplies to storage in the Advance Delivery Program instead of to the service area. These Table A deliveries are incorporated into the estimate of SWP Deliveries under Current Programs shown in Table 3-2.

Desert Water Agency/Coachella Valley WD Other SWP Deliveries

Since 2008, Metropolitan has provided Desert Water Agency and CVWD written consent to take delivery of non-SWP supplies separately acquired by each agency from the SWP facilities. These deliveries include water acquired from the Yuba Dry Year Water Purchase Program, the Multi-Year Water Pool, the 2009 Drought Water Bank, and long-term water supplies purchased by CVWD from Rosedale Rio-Bravo Water Storage District. Metropolitan has also consented to:

- 10 TAF of exchange deliveries to CVWD for non-SWP water acquired from the San Joaquin Valley from 2008 through 2010,
- 36 TAF of exchange deliveries to Desert Water Agency for non-SWP water acquired from the San Joaquin Valley from 2008 through 2015, and
- 16.5 TAF of exchange deliveries to CVWD from groundwater storage of Kern River flood flows or SWP water delivered from Kern County Water Agency provided by Rosedale Rio Bravo Water Storage District from 2012 through 2035.

Effective in 2020, Metropolitan, Desert Water Agency and CVWD executed an amendment to the Advance Delivery Program and exchange of water. Among its provisions is the termination of Metropolitan's right to an annual option to call-back the 100,000 acre-feet Table A transfer. It also provides that Metropolitan will deliver Article 21 and non-SWP water supplies for Desert and CVWD to the extent that Metropolitan has available capacity. This agreement also includes an additional exchange of 15 TAF per year from 2020 to 2026. However, as the source of the exchange is water CVWD can call from the ID/MWD Conservation Program, which is Colorado River water, this exchange is discussed in more detail in the IID/MWD Conservation Program section.

Table 3-2 summarizes Metropolitan's SWP supply range for 2035. Appendix 3 provides a detailed discussion of the current SWP programs and programs that are under development.

**Table 3-2**
**California Aqueduct**
**Program Capabilities**
**Year 2035**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| MWD Table A [1] | 499,000 | 122,000 | 1,108,000 |
| DWCV Table A | 51,000 | 12,000 | 113,000 |
| San Luis Carryover [2] | 57,000 | 283,000 | 283,000 |
| Article 21 Supplies | 0 | 0 | 20,000 |
| Yuba River Accord Purchase | 0 | 0 | 0 |
| ***Subtotal of Current Programs*** | ***607,000*** | ***417,000*** | ***1,524,000*** |
| **Programs Under Development** | | | |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Maximum Supply Capability** | **607,000** | **417,000** | **1,524,000** |

[1] Includes Port Hueneme lease.
[2] Includes DWCV carryover.

### *SWP Water Quality*

Metropolitan requires a safe drinking water supply from the Bay-Delta to meet current and future regulatory requirements for public health protection. Finding cost-effective ways to reduce total organic carbon (TOC), bromide concentrations, pathogenic microbes, and other unknown contaminants from the Bay-Delta water supply is one of Metropolitan's top priorities. Metropolitan also requires a SWP supply that is consistently low in salinity - Total Dissolved Solids (TDS) - so it can blend SWP water with higher-salinity Colorado River water to achieve salinity goals for its member agencies. In addition, Metropolitan needs consistently low-salinity SWP water to increase in-basin water recycling and groundwater management programs. These programs require that blended water supplied to the member agencies meets the TDS goal adopted by Metropolitan's Board, which specifies a salinity objective of 500 mg/L for blended imported water.

Metropolitan is actively involved in DWR's Municipal Water Quality Investigations (MWQI) Program. The highly variable quality of SWP water influences the operation of Metropolitan's system and its water treatment process. Increasingly restrictive State and Federal drinking water standards, concerns over emerging contaminants such as personal care products and pharmaceuticals, algal taste and odors, and Delta ecosystem fisheries issues are critical variables. DWR's MWQI Program strives to monitor, protect, and improve drinking water quality of Delta water deliveries to the urban State Water Contractors and other users of Delta water. The program focuses on issues related to drinking water quality through regular water quality monitoring, special field and laboratory studies, the use of forecasting tools such as computer models and data management systems, and reporting. While the program has developed extensive monitoring in the Delta including real-time monitoring, increased monitoring along the California Aqueduct is the next major step.

Levee modifications at Franks Tract and other source control actions may significantly reduce ocean salinity concentrations in Delta water, which would benefit Delta water users and export interests alike. Franks Tract is an island located in the central Delta that was actively farmed until levee breaches in 1936 and 1938. Since 1938, the tract has remained a flooded island, and its levees remain in disrepair. Tidal flows in the Delta entrap saline ocean water in the flooded tract, resulting in degraded water quality for both in-Delta and export users. Computer modeling analyses by Metropolitan, DWR, and the US Geological Survey indicate that reducing this salinity intrusion by partially closing existing levee breach openings and/or building radial gate flow control structures will significantly reduce TDS and bromide [2] concentrations in water from the Delta during the summer and fall months and in drought years.

In 2016, the California Department of Fish and Wildlife (CDFW), as part of the 2016 Delta Smelt Resiliency Strategy, began a process of working with the local community, local agencies, and interested stakeholders in developing a habitat enhancement plan for Franks Tract called the Franks Tract Restoration Feasibility Study. The objective was to assess the feasibility of restoring components of the historic tidal marsh form and function to create habitat suitable for Delta Smelt, reduce the extent of aquatic weeds, decrease predation on Delta Smelt and other native fishes by lowering habitat suitability for non-native species, modify hydrology to something more similar to historical conditions, improve food webs, and improve water quality in the interior Delta, which would benefit both in-Delta diverters and SWP and CVP supplies. In its current state of shallow open water, Franks Tract facilitates salinity intrusion into the mid-Delta as a result of tidal pumping through False River. Restoration designs focus on minimizing tidal pumping from False River. In 2018, CDFW determined that it is feasible to achieve the project objectives. In response to community concerns, in July 2019, CDFW, in cooperation with the Department of Parks and Recreation, launched a second round of planning that lasted from August 2019 through September 2020. Stakeholders, advisors, and the public chose the Central Landmass as the preferred design concept as documented in the Franks Tract Futures 2020 Reimagined report published in September 2020.

The state has adopted an "equivalent level of public health protection" (ELPH) program that targets water quality actions outside the Delta. The Bay-Delta Program is coordinating a feasibility study on water quality improvement in the California Aqueduct.

Metropolitan and the Friant Water Users Authority (FWUA) have entered into a partnership to investigate the potential of enhancing the quantity and affordability of the eastern San Joaquin Valley's water supply while improving Southern California's water quality. The FWUA and Metropolitan studied projects that benefited both regions. Using Proposition 13 funds, an existing canal belonging to the Arvin-Edison Water Storage District was enlarged, enabling greater volumes of water to be exchanged between their groundwater and the California Aqueduct.

### *SWP System Outage and Capacity Constraints*

The California Aqueduct is experiencing reduction in flow capacity in certain areas due to ongoing land subsidence. Subsidence has been observed in the San Joaquin Valley since the 1920s, and subsidence was included in the planning and design of the California Aqueduct. The DWR published a detailed study in 2017 describing the impacts of subsidence in the reduction of concrete liner freeboard and the ability to store water in certain pools, reducing operational flexibility and increasing power costs. Through 2016, no contracted deliveries had been curtailed due to subsidence, but DWR has a subsidence program aimed to proposed improvements to the California Aqueduct and restore capacity, as well as work with the Groundwater

[2] The importance of managing bromides is discussed in the Water Quality chapter.

Sustainability Agencies that cover the extension of the California Aqueduct to minimize future subsidence.

In 2015, Metropolitan, DWR, and the Los Angeles Department of Water and Power formed the Seismic Resilience Water Supply Task Force (SRWSTF). The goal of the SRWSTF is to collaborate on studies and mitigation measures aimed at improving the reliability of imported water supplies to Southern California. The SRWSTF aims to identify options to accelerate initial repairs acting as one agency and establish consensus on regional priorities for aqueduct repairs.

Because of the risk of a prolonged shutdown of the SWP caused by seismic or hydrologic events either within the Delta or along the California Aqueduct, Metropolitan has acted to ensure that Southern California has adequate emergency storage. Diamond Valley Lake (DVL) and SWP terminal reservoir storage, combined with member-agency emergency storage, are jointly capable of providing the region with a six-month supply of water if combined with a temporary 25 percent reduction in demand. Metropolitan engineering studies indicate this would provide sufficient time to repair the SWP and resume delivery.

Following the February 2017 Oroville spillways incident, DWR initiated a Comprehensive Needs Assessment (CNA). The CNA is led by DWR and technically reviewed by an Independent Review Board (IRB) composed of dam safety experts. The CNA is not investigating the causes of the February 2017 incident, but rather aims to identify actions to be taken by DWR to improve the resilience of the Oroville Dam complex. The report was released in November 2020 with a determination that Oroville is safe to operate, and no urgent repairs are needed. Several risk-reduction projects are currently being implemented and more projects are anticipated into the near future.

DWR is also investing to reduce seismic and hydrologic risk of aging SWP infrastructure critical in Southern California. A major retrofit to Perris Dam (Riverside County) was completed in April 2018, and other two major projects to improve seismic stability are currently under development with planned construction to start in a few years. Pyramid Dam and Castaic Dam (Los Angeles County) are also being studied with the planned assessment work estimated to be completed by 2022 and complete modernization work to take about 10 years to complete.

### *Achievements to Date*

#### *SWP Reliability*

Metropolitan's Long-Term Action Plan

Besides the short- and mid-term actions described earlier in Section 1.4, Metropolitan's adopted Delta action plan in June 2007 includes a long-term Delta Plan. The long-term action plan recognizes the need for a global, comprehensive approach to the fundamental issues and conflicts in the Delta to result in a truly sustainable Delta. A piecemeal approach cannot satisfy the many stakeholders that have an interest in the Delta and will fail; there must be a holistic approach that deals with all issues simultaneously. In dealing with the basic issues of the Delta, solutions must address the physical changes required, as well as the financing and governance. There are three basic elements that must be addressed: Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development. In addition, the state needs to establish governance structures and financing approaches to implement and manage the three identified elements.

Governor's Delta Vision Process

Through this enduring Delta crisis, the Legislature and the Governor initiated in 2006 a process to develop a new long-term vision for the Delta. SB 1574 (Kuehl/2006) required a cabinet

committee to present recommendations for a Delta strategic vision. The governor created a Delta Vision Blue-Ribbon Task Force to advise the Cabinet Committee. The Task Force produced an October 2008 Strategic Plan, which the Cabinet Committee largely adopted and submitted, with its recommendations, to the Legislature on January 3, 2009. Metropolitan, as a stakeholder in the process, provided input to the Task Force.

The 2009 Delta Legislation

After delivery of the Delta Vision recommendations, the Legislature held informational hearings from Delta experts, Task Force members, and the Schwarzenegger Administration, as well as the public at large, and engaged in vigorous water policy discussions. Following the informational hearings, several legislators began developing detailed legislation which culminated in pre-print proposals being issued in early August of 2009 for public review and discussion over the summer recess. The Assembly Water, Parks and Wildlife Committee and the Senate Natural Resources and Water Committee then held joint informational hearings on the pre-print proposals and received extensive public comment. Thereafter, legislative leadership appointed a conference committee, which convened and held additional public hearings, with further legislator discussions on key issues. That work continued into the 7th Extraordinary Session, which was called by the governor specifically to address the pending Delta and water issues, and culminated in the signing of a historic package of bills. One of the keystones of that package was SB X7-1, which reformed Delta policy and governance. Specifically, SB X7-1:

- Established a new legal framework for Delta management, emphasizing the coequal goals of "providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem" as foundation for state decisions as to Delta management.
- Reconstituted and redefined the role of the Delta Protection Commission (DPC) to narrow membership to focus on local representation and to expand the DPC's role in economic sustainability.
- Created a new Sacramento-San Joaquin Delta Conservancy (Conservancy) to support efforts that advance environmental protection and the economic well-being of Delta residents.
- Created the Delta Stewardship Council (Council) as an independent state agency to guide actions in the Delta which furthers the coequal goals of Delta restoration and water supply reliability.
- Repealed the CALFED Bay-Delta Authority Act and transfers existing staff, contracts, etc. to the Council.
- Created the Delta Independent Science Board (Science Board) and Delta Science Program.
- Required the State Water Resources Control Board (SWRCB) to develop by August 12, 2010, new flow criteria for the Delta ecosystem necessary to protect public trust resources.
- Required the Department of Fish and Game (DFG), now the Department of Fish and Wildlife (DFW), by December 31, 2010, to develop and recommend to the SWRCB flow criteria and quantifiable biological objectives for aquatic and terrestrial species.
- Created a Delta Watermaster as the enforcement officer for the SWRCB Division of Water Rights in the Delta.
- Required the Council to develop, adopt, and commence implementation of the "Delta Plan" by January 1, 2012, with a report to the Legislature by March 31, 2012.

- Required the DPC to develop a proposal to protect, enhance, and sustain the unique cultural, historical, recreational, agricultural, and economic values of the Delta as an evolving place.
- Required the Delta Plan to further the coequal goals of Delta ecosystem restoration and a reliable water supply.
- Required the Delta Plan to promote statewide water conservation, water use efficiency, and sustainable use of water, as well as improvements to water conveyance/storage and operation of both to achieve the coequal goals.
- Required the Delta Plan to attempt to reduce risks to people, property, and state interests in the Delta by promoting effective emergency preparedness, appropriate land uses, and strategic levee investments.
- Announced a statewide policy to reduce reliance on the Delta in meeting California's future water supply needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency. Each region that depends on water from the Delta watershed shall improve its regional self-reliance for water through investment in water use efficiency, water recycling, advanced water technologies, local and regional water supply projects, and improved regional coordination of local and regional water supply efforts.
- Required the Council to include the Bay Delta Conservation Plan (BDCP) in the Delta Plan and made the BDCP eligible for state funding if:
    - The BDCP complies with Natural Community Conservation Planning Act (NCCPA) and is approved as a Habitat Conservation Plan under the Federal ESA.
    - The BDCP complies with the California Environmental Quality Act and includes a full range of alternatives, including a reasonable range of flow criteria, rates of diversion, and other operational criteria.
    - DWR consults with the Council and Science Board during development of the BDCP.
    - DFW approves the BDCP as a Natural Community Conservation Plan and determines that it meets the requirements for incorporation into the Delta Plan.

### *SWP Water Quality*

The most significant achievement for SWP water quality has been continued definition and advancement of the Delta Improvement Package. Most notably, the Franks Tract studies identified cost-effective ways to achieve significant improvements in the quality of Delta export water.

### *SWP System Reliability*

The completion and filling of DVL marked the most important achievement with respect to protecting Southern California against an SWP system outage. Water deliveries to the reservoir commenced in November 1999, and the lake was filled by early 2003. The lake can hold up to 810 TAF which provides Southern California with emergency water supply, as well as carryover and regulatory storage. As of December 2020, the DVL storage is at 704 TAF.

#### Inland Feeder

The Inland Feeder is a 44-mile-long conveyance system that connects the SWP to DVL and the CRA. The Inland Feeder provides greater flexibility in managing Metropolitan's major water supplies and allows greater amounts of SWP water to be accepted during wet seasons for storage

in DVL. In addition, the Inland Feeder increases the conveyance capacity from the East Branch of the SWP by up to 1,000 cubic feet per second, allowing the East Branch to operate up to its full capacity. The project also improves the quality of the Southland's drinking water by allowing more uniform blending of lower salinity water from the SWP with Colorado River supplies, which have a higher mineral content. Construction of the Inland Feeder was completed in September 2009.

Inland Feeder-Lakeview Pipeline Intertie

The Inland Feeder-Lakeview Pipeline Intertie connects the two conveyance pipelines at the PC-1 control structure on the Inland Feeder. The project allows for delivery of water from Diamond Valley Lake to the Mills Water Treatment Plant. Completed in 2016, the project was a direct response to the extreme drought period in 2014, which saw a 5 percent allocation of Metropolitan's SWP supplies. The intertie enables the Mills Plant to withstand an extended interruption of supplies from the California Aqueduct East Branch. The intertie also provides delivery flexibility to handle any required repairs by DWR to the Santa Ana Valley Pipeline north segment.

## 3.3 Central Valley/State Water Project Storage and Transfer Programs

Metropolitan endeavors to increase the reliability of supplies received from the California Aqueduct by developing flexible SWP storage and transfer programs. Over the years, Metropolitan has developed numerous voluntary SWP storage and transfer programs to secure additional dry-year water supplies.

### *Background*

Metropolitan has a long history of managing the wide fluctuations of SWP supplies from year to year by forming partnerships with Central Valley agricultural districts along the California Aqueduct, as well as with other Southern California SWP Contractors. These partnerships allow Metropolitan to store its SWP supplies during wetter years for return in future drier years. Some programs also allow Metropolitan to purchase water in drier years for delivery via the California Aqueduct to Metropolitan's service area.

Because yields from individual programs can vary widely depending on hydrologic conditions and CVP/SWP operations, the dry-year yields for the various programs reported in this section are expected values only. In any given year, actual yields could depart from the expected values. Despite that uncertainty, Metropolitan's models of these programs indicate that in the aggregate, they can meet the resource target under a wide range of hydrologic conditions and CVP/SWP operations.

In addition, the SWP storage and transfer programs have served to demonstrate the value of partnering, and, increasingly, Central Valley agricultural interests see partnering with Metropolitan as a sensible business practice beneficial to their local district and regional economy.

### *Implementation Approach*

Metropolitan is currently operating several SWP storage programs that serve to increase the reliability of supplies delivered through the California Aqueduct. Metropolitan pursues SWP water transfers on an as-needed basis. Table 3-3 lists the expected yields from these storage and transfer programs. Figure 3-3 shows the location of Metropolitan's statewide groundwater banking programs.

#### *Storage and Transfer Programs*

<u>Semitropic Storage Program</u>

Metropolitan has a groundwater storage program with Semitropic Water Storage District located in the southern part of the San Joaquin Valley. The maximum storage capacity of the program is 350 TAF. The specific amount of water Metropolitan can store in and subsequently expect to receive from the program depends upon hydrologic conditions, any regulatory requirements restricting Metropolitan's ability to export water for storage, and the demands placed on the Semitropic Program by other program participants. In 2014, Metropolitan amended the program to increase the return yield by an additional 13.2 TAF per year. The minimum annual yield available to Metropolitan from the program is currently 34.7 TAF, and the maximum annual yield is 236.2 TAF, depending on the available unused capacity and the SWP allocation. During wet years, Metropolitan has the discretion to use the program to store portions of its SWP water that are in excess of the amounts needed to meet Metropolitan's service area demand. In Semitropic, the water is delivered to district farmers who use the water in lieu of pumping groundwater. During dry years, the district returns Metropolitan's previously stored water to Metropolitan by direct groundwater pump-in return and the exchange of SWP supplies.

Arvin-Edison Storage Program

Metropolitan amended the groundwater storage program with Arvin-Edison Water Storage District in 2008 to include the South Canal Improvement Project. The project increases the reliability of Arvin-Edison returning higher water quality to the California Aqueduct. In addition, Metropolitan and Arvin-Edison often enter into annual operational agreements to optimize program operations in any given year. The program storage capacity is 350 TAF. The specific amount of water Metropolitan can expect to store in and subsequently receive from the program depends upon hydrologic conditions and any regulatory requirements restricting Metropolitan's ability to export water for storage. The storage program is estimated to deliver 75 TAF. During wet years, Metropolitan has the discretion to use the program to store portions of its SWP supplies which are in excess of the amounts needed to meet Metropolitan's service area demand. The water can be either directly recharged into the groundwater basin or delivered to district farmers who use the water in lieu of pumping groundwater. During dry years, the district returns Metropolitan's previously stored water to Metropolitan by direct groundwater pump-in return or by exchange of surface water supplies. In 2015, Metropolitan funded the installation of three new wells at a cost of $3 million that will restore the return reliability by 2.5 TAF per year. The funding will ultimately be recovered through credits against future program costs. As a result of recent detection of 1,2,3-trichloropropane in Arvin-Edison wells, Metropolitan has temporarily suspended operation of the program until the water quality concerns can be further evaluated and managed.

Table 3-3 summarizes Metropolitan's Central Valley/SWP transfer programs supply range for 2035. The supply capabilities shown reflect actual storage program conveyance constraints. In addition, SWP supplies are estimated using DWR's 2019 SWP Delivery Capability Report released in August 2019. Appendix 3 provides a detailed discussion of the current Central Valley and SWP storage and transfers programs and programs that are under development.

**Table 3-3**
**Central Valley/State Water Project Storage and Transfer Programs**
**Supply Projection**
**Year 2035**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| San Gabriel Valley MWD Exchange and Purchase | 2,000 | 2,000 | 2,000 |
| Central Valley Storage and Transfers | | | |
| Semitropic Program | 50,000 | 45,000 | 68,000 |
| Arvin Edison Program[1] | 0 | 0 | 0 |
| Mojave Storage Program | 0 | 0 | 0 |
| Antelope Valley/East Kern Acquisition and Storage | 43,000 | 70,000 | 70,000 |
| Kern Delta Program | 42,000 | 50,000 | 50,000 |
| Transfers and Exchanges | 50,000 | 50,000 | 50,000 |
| ***Subtotal of Current Programs*** | ***187,000*** | ***217,000*** | ***240,000*** |
| **Programs Under Development** | | | |
| San Bernardino Valley Water District Program | 0 | 0 | 13,000 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***13,000*** |
| **Maximum Supply Capability** | **187,000** | **217,000** | **253,000** |

[1] Take and put amounts limited due to water quality considerations.

San Bernardino Valley MWD Transfer Program

The San Bernardino Valley MWD Transfer Program allows for the purchase of a portion of San Bernardino Valley MWD's SWP supply under surplus conditions. Each calendar year, a determination will be made on how much surplus supplies are available, and Metropolitan will then decide how much will be purchased. The agreement term is until December 31, 2035 and can be extended with a State Water Contract extension.

San Gabriel Valley MWD Exchange Program

The San Gabriel Valley MWD program allows for the exchange of up to 5 TAF each year. For each acre-foot Metropolitan delivers to the City of Sierra Madre, a San Gabriel Valley MWD member agency, San Gabriel Valley MWD provides two acre-feet to Metropolitan in the Main San Gabriel Basin, up to 5 TAF. The program provides increased reliability to Metropolitan by allowing additional water to be delivered to Metropolitan's member agencies Three Valleys MWD and Upper San Gabriel Valley MWD.

Antelope Valley-East Kern Water Agency Exchange and Storage Program

The Antelope Valley-East Kern Water Agency (AVEK) exchange and storage program provides Metropolitan with additional supplies and increased reliability. Under the exchange program, for every two acre-feet Metropolitan receives, Metropolitan returns one acre-foot to AVEK to improve its reliability. The exchange program is expected to deliver 30 TAF over ten years, with 10 TAF available in dry years. Under the program, Metropolitan will also be able to store up to 30 TAF in the AVEK's groundwater basin, with a dry year return capability of 10 TAF.

High Desert Water Bank Program

In December 2019, Metropolitan entered into an agreement with AVEK for the High Desert Water Bank Program to improve water supply reliability during dry years or emergencies and provide greater operational flexibility to balance supplies and demands. Under the Program, Metropolitan will have the ability to store up to 280 TAF of its SWP Table A or other supplies in the Antelope Valley groundwater basin. Metropolitan will provide up to $131 million for the construction of monitoring and production wells, turnouts from the California Aqueduct, underground and aboveground pipelines, recharge basins, water storage, and booster pump facilities. Metropolitan will have first priority to 70 TAF per year of both put and take capacity. The project is anticipated to be in operation by 2024.

Kern-Delta Water District Storage Program

This groundwater storage program has 250 TAF of storage capacity. The program is capable of providing up to 50 TAF of dry-year supply. In 2015, Metropolitan agreed to fund the cross-river pipeline that, when completed, will help improve Metropolitan's return reliability by reducing losses during exchanges. Metropolitan has not incurred any cost to date, as the pipeline has not been constructed. Environmental and regulatory issues have delayed implementation of the pipeline. Water for storage can be either directly recharged into the groundwater basin or delivered to district farmers who use the water in lieu of pumping groundwater. During dry years, the district returns Metropolitan's previously stored water to Metropolitan by direct groundwater pump-in return or by exchange of surface water supplies.

Mojave Storage Program

Metropolitan entered into a groundwater banking and exchange transfer agreement with Mojave Water Agency on October 29, 2003. This agreement was amended in 2011 to extend the term of the program through 2035 and to allow for the cumulative storage of up to 390 TAF. The agreement allows for Metropolitan to store water in an exchange account for later return. Through 2021, Metropolitan can annually withdraw the Mojave Water Agency's SWP contractual amounts in excess of 10%. After 2021, the withdraw rate lowers, reserving 20% of Mojave Water Agency's SWP contractual amounts. Under a 100% allocation, the State Water Contract provides Mojave Water Agency 82.8 TAF of water.

Presently, the Mojave Water Agency is not accepting additional water from Metropolitan. As of January 2021, Metropolitan has approximately 19 TAF remaining in storage. Without additional deliveries to the exchange account, the program may not be able to provide return supplies beyond 2025.

Central Valley Transfer Programs

Metropolitan secures Central Valley water transfer supplies via spot markets and option contracts to meet its service area demands when necessary. Hydrologic and market conditions, and regulatory measures governing Delta pumping plant operations, will determine the amount of water transfer activity occurring in any year. Transfer market activity, described below, provides examples of how Metropolitan has secured water transfer supplies as a resource to fill anticipated supply shortfalls needed to meet Metropolitan's service area demands.

In 2003, Metropolitan secured options to purchase approximately 145 TAF of water from willing sellers in the Sacramento Valley during the irrigation season. These options protected against potential shortages of up to 650 TAF within Metropolitan's service area that might have arisen from a decrease in Colorado River supply or as a result of drier-than-expected hydrologic conditions. Using these options, Metropolitan purchased approximately 125 TAF of water for delivery to the California Aqueduct.

In 2005, Metropolitan, in partnership with seven other State Water Contractors, secured options to purchase approximately 130 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was 113 TAF. Metropolitan also had the right to assume the options of the other State Water Contractors if they chose not to purchase the transfer water. Due to improved hydrologic conditions, Metropolitan and the other State Water Contractors did not exercise these options.

In 2008, Metropolitan, in partnership with seven other State Water Contractors, secured approximately 40 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 27 TAF.

In 2009, Metropolitan, in partnership with 8 other buyers and 21 sellers, participated in a statewide Drought Water Bank, which secured approximately 74 TAF, of which Metropolitan's share was approximately 37 TAF.

In 2010, Metropolitan, in partnership with three other State Water Contractors, secured approximately 100 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 88 TAF. Metropolitan also purchased approximately 18 TAF of water from Central Valley Project Contractors located in the San Joaquin Valley. In addition, Metropolitan entered into an unbalanced exchange agreement that resulted in Metropolitan receiving approximately 37 TAF.

In 2015, Metropolitan, in partnership with eight other State Water Contractors, secured approximately 20 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 13 TAF.

In addition, Metropolitan has secured water transfer supplies under the Yuba Accord, which is a long-term transfer agreement. To date, Metropolitan has purchased approximately 200 TAF.

Finally, Metropolitan has secured water transfer supplies under the Multi-Year Water Pool Demonstration Program. In 2013, 2015, and 2016 Metropolitan secured 30 TAF, 1.3 TAF, and 7 TAF respectively.

Metropolitan's recent water transfer activities demonstrate Metropolitan's ability to develop and negotiate water transfer agreements either working directly with the agricultural districts who are selling the water or through a statewide Drought Water Bank. Because of the complexity of cross-Delta transfers and the need to optimize the use of both CVP and SWP facilities, DWR and USBR are critical players in the water transfer process, especially when shortage conditions increase the general level of demand for transfers and amplify ecosystem and water quality issues associated with through-Delta conveyance of water. Therefore, Metropolitan views state and federal cooperation to facilitate voluntary, market-based exchanges and sales of water as a critical component of its overall water transfer strategy.

### *Achievements to Date*

Metropolitan has made rapid progress to date developing SWP storage and transfer programs. Most notably, Metropolitan has utilized approximately 122 TAF to supplement its SWP supplies during the recent 2016-2020 period. Of this total, approximately 90 TAF are from SWP storage program extractions in Semitropic, Arvin, Kern Delta, and Mojave; 13 TAF are from the San Gabriel Valley MWD program; and 19 TAF of SWP transfer supplies were purchased from the Yuba water purchase programs.

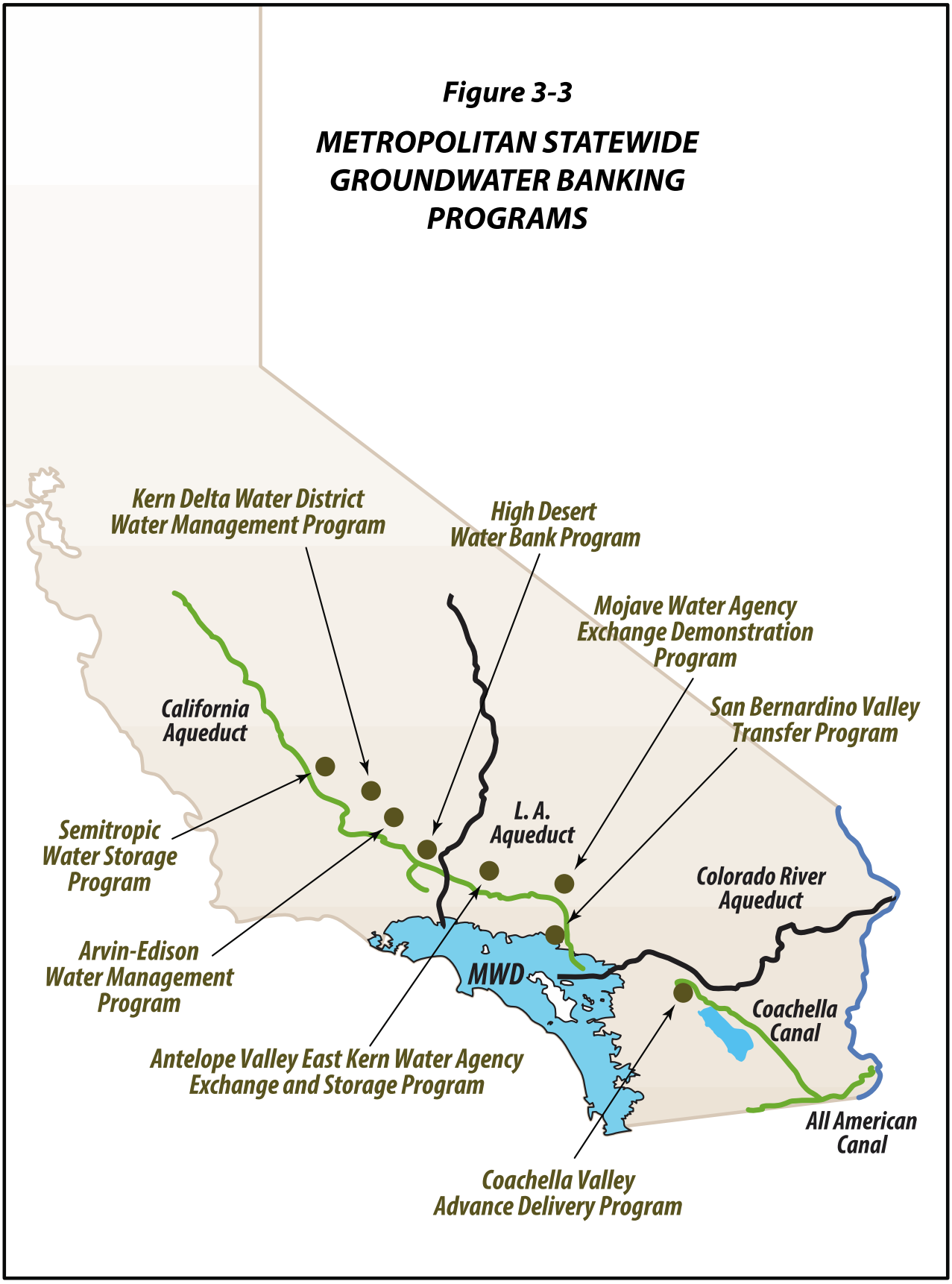
Figure 3-3
METROPOLITAN STATEWIDE GROUNDWATER BANKING PROGRAMS
Kern Delta Water District Water Management Program
High Desert Water Bank Program
Mojave Water Agency Exchange Demonstration Program
San Bernardino Valley Transfer Program
California Aqueduct
L. A. Aqueduct
Semitropic Water Storage Program
Colorado River Aqueduct
Arvin-Edison Water Management Program
MWD
Coachella Canal
Antelope Valley East Kern Water Agency Exchange and Storage Program
All American Canal
Coachella Valley Advance Delivery Program

## 3.4 Demand Management and Conservation

Demand management through conservation is a core element of Metropolitan's long-term water management strategy. Metropolitan continues to build on a 30-year investment in conservation of more than $823 million, reflecting a long-term commitment to water conservation. Among other measures, this investment has resulted in the replacement of more than 3.8 million toilets with more water efficient models, rebates of more than 620,000 high-efficiency clothes washers (HECWs), and removal of approximately 195 million square-feet of grass from both commercial and residential properties. Collectively, Metropolitan's conservation programs and other conservation in the region will reduce Southern California's reliance on delivery of imported water by almost 1.2 MAF per year by 2030.

Metropolitan's continued approach to conservation has put its service area on target to achieve California's 20x2020 Water Conservation Plan per capita goal of less than 145 gallons per capita per day (GPCD). Continuous conservation messaging, along with active conservation programs, have contributed to Metropolitan maintaining its water demand to sustainable levels, while also meeting its regional target.

### *Background*

Metropolitan's conservation policies and programs are designed to maintain a sustainable water demand level and meet the conservation savings target adopted in the IRP. These policies and programs directly relate to the demand management measures for wholesale water agencies in the Urban Water Management Planning Act.

Water conservation savings result from active, code-based, and price-effect conservation efforts. Active conservation consists of water-agency funded programs such as rebates and incentives for water efficient fixtures and equipment and turf removal. Code-based and price-based conservation consists of demand reductions attributable to conservation-oriented plumbing codes and usage reductions resulting from increases in the price of water. Metropolitan does not currently assign a savings value for public awareness campaigns and conservation education because any initial effect on demand reduction and the longevity of the effect are difficult to measure. It is generally accepted that these outreach programs prompt consumers to install water saving fixtures and change water-use behavior, thereby creating a residual benefit of increasing the effectiveness of complementary conservation programs.

Distinguishing between active, code-based, and price-effect conservation can be analytically complex when, for example, active programs for fixtures are concurrent with conservation-related plumbing codes. Metropolitan uses specially designed estimating models to quantify and project conservation savings. This plan combines active, code-based, and price-effect conservation savings using methods that avoid double counting.

Conservation savings are commonly estimated from a base-year water-use profile. Metropolitan uses 1980 as the base year because it marked the effective date of a new plumbing code in California requiring toilets in new construction to be rated at 3.5 gallons per flush or less. Between 1980 and 1990, the region saved an estimated 250 TAF per year as the result of this 1980 plumbing code and unrelated water rate increases. These savings are referred to as "pre-1990 savings." Metropolitan's resource planning target combines pre-1990 savings and estimates of more recently achieved savings.

Including regional pre-1990 conservation savings, Metropolitan anticipates savings of 1.19 MAF by 2030. A large share of the savings has already been achieved through existing Metropolitan and member agency programs, pre-1990 savings, price-effects, and continued savings that

accrue from plumbing codes. The remainder is expected to be achieved through additional agency-sponsored active conservation programs, code changes, and price-effects.

### *Implementation Approach*

Metropolitan's approach to achieving the conservation target depends on implementing a suite of demand management measures, including public education and outreach, a variety of conservation programs, metering, research and development, and asset management. These programs include cost-effective active conservation programs and new, innovative programs that address regional water uses. Metropolitan also provides support to member agencies for local programs that assist with implementing local conservation programs while reducing per capita water use. Metropolitan continues to seek state and federal grant funding for conservation in coordination with its member agencies.

As the California Urban Water Conservation Council (CUWCC) disbanded, Metropolitan worked with other California water agencies to form the California Water Efficiency Partnership (CALWEP). CALWEP's mission is to maximize urban water efficiency and conservation throughout California by supporting and integrating innovative technologies and practices; encouraging effective public policies; advancing research, training, and public education; and building collaborative approaches and partnerships. Metropolitan is an active participant on the CALWEP Board, the Program Committee, and Research Committee.

Metropolitan also participates in national water efficiency efforts. Metropolitan is a USEPA WaterSense partner, helping to promote water efficient products and practices in Southern California. Metropolitan is also a member of the Alliance for Water Efficiency, participating on its Board and in the committees on research, WaterSense and water efficient products, and education and outreach.

The following sections describe Metropolitan's demand management measures and conservation programs, including education and outreach.

### *Public Education and Outreach*

Since 1983, Metropolitan's Education Unit has provided award-winning water education programs, supplemental materials, teacher in-services and classroom presentations for K-12 teachers and students in Southern California. Since that time, materials and outreach programs have expanded to the pre-K and college education levels. In 2015, Metropolitan implemented an education strategic plan which sought to:

1. Expand working programs
2. Develop an "Educational Pipeline" to jobs in the water industry
3. Leverage collaborations
4. Invest in educational technology

These initiatives, as well as Metropolitan's curricula and materials, have impacted a generation of students, expanded their understanding of California's water supply and distribution systems, water sources, water use and conservation, the science of water, public policies, and the importance and responsibility of stewardship. All Metropolitan programs correlate to California Content Standards including Common Core and Next Generation Science Standards (NGSS). These programs are continually evaluated for effectiveness and improved upon. Metropolitan's most recent online education programs are summarized in Table 3-4.

### *Public Education Programs*

Metropolitan has continued to update and expand its comprehensive K-12 water education curriculum that meets all California education standards for each grade level in the areas of science, math, language arts and social studies classroom materials. Metropolitan worked with its member agencies to annually hold more than 700 outreach events which directly interact with more than 170,000 students, teachers, parents, and participants through its water education programs, curricular materials, and engagements. More than 12,000 public visitors and students annually tour the Diamond Valley Lake Visitor Center to learn more about Metropolitan's water systems and programs. These efforts led to Metropolitan's Education Unit being awarded the 2015 Governor's Environmental and Economic Leadership Award (GEELA), California's highest environmental honor.

In 2015, Metropolitan redesigned its museum-quality exhibit at the Vista del Lago visitor's center at Pyramid Lake, part of the State Water Project.

Throughout 2016, Metropolitan worked to develop virtual reality tours of the Colorado River Aqueduct and augmented reality watershed exhibits to encourage students to think critically about water issues in Southern California. This work led to a collaboration with the Department of Water Resources to create a virtual reality tour of the State Water Project which received first-place recognition from the National Association of Government Communicators.

In 2017, Solar Cup, the nation's largest high school solar boat race, celebrated its 15-year anniversary. This program engages 40 teams and more than 750 high school students annually in STEAM (science, technology, engineering, art and math) topics associated with water stewardship and renewable energy.

In 2018, Metropolitan's "Water is Life" Student Art Exhibit and Calendar celebrated its 30-year anniversary. This program annually compiles more than 12,000 pieces of art generated by K-12 students throughout Metropolitan's service area.

In 2019, Metropolitan's World Water College Grant Program increased solicited proposals from $10,000 to $20,000 grants to conduct research and development on improving water quality, environmental science of watersheds, and the implementation of water-use efficiency technologies. Since 2004, Metropolitan's World Water College Grant Program has disbursed approximately $800,000 in grants to 26 colleges, benefitting more than 800 students.

### *Outreach*

Since late 2013, the primary focus of Metropolitan's conservation and education outreach programs has been on the drought response and the need for additional conservation in order to maintain the region's water supply reserves. That message has evolved to emphasize conservation and stewardship as a sustainable way of life, rather than only a response to dry conditions.

Each year, Metropolitan implements a variety of conservation and education outreach programs. The "Let's All Take a Turn" campaign launched July 1, 2015 and continued in 2016, but added additional messaging around a new trademarked logo of H2Love, and the tagline, "Love Water. Save Water." This message emphasized the value of water conservation not only during the drought, but every day. Working with Metropolitan's 26 member agencies, the research-based advertising campaign includes several months of media coverage through radio live reads, 53 community newspapers, digital and online advertising, other customized materials and special outreach events throughout Southern California. The entire campaign was

produced in five languages: English, Spanish, Mandarin, Korean, and Vietnamese, and Print advertising included Tagalog language materials.

The campaign's design was informed by extensive research through focus groups, telephone interviews, and web surveys conducted in two languages throughout Metropolitan's service area. The media strategy was developed to effectively target the diverse communities, age groups, socioeconomic factors, and languages spoken in the region. The "Let's All Take A Turn" campaign supplements Metropolitan's strong program of outreach activities, social and traditional media, and business outreach efforts to spread the word to residents, businesses, community leaders and elected officials about the importance of water conservation.

A new component of the conservation campaign was an official sponsorship with Major League Soccer's LA Galaxy. This partnership provided digital signage at the StubHub Center in Carson, water-awareness exhibit booths at four home games, public service announcements and social media videos featuring LA Galaxy goalie Brian Rowe, cross-promotion of water-saving messages on Metropolitan and LA Galaxy social media platforms, Facebook Live events with actor Johnny Rey Diaz, and outreach activities with the LA Galaxy community foundation organization.

As part of the campaign, Metropolitan also conducted several television interviews and placed a series of advertorial news stories in the online editions of the Los Angeles Times and Nativo for added value news stories. Metropolitan placed advertorials on digital media focusing on the seriousness of the drought, what people can do to save water, and offering landscape and gardening advice including a Facebook Live broadcast by Sunset Magazine which was viewed by more than 7,000 people. In addition, Metropolitan used social and digital media to reach large audiences in cost effective and optimized strategies, including setting up playlists on Pandora and its Spanish-language equivalent, Uforia. The playlists promote shorter showers by listening to five-minute-long songs about water or rain. These elements promoted the ongoing need for conservation in Southern California, describing long-term benefits of investments in water storage and local water resources, and the availability of rebates and incentives for turf removal and water-saving devices and appliances.

The H2Love advertising campaign continued to support sustainable, lifelong water conservation. The campaign included digital ads, billboards, bus wraps and transit shelters, as well as a continued partnership with the Major League Soccer's LA Galaxy, its own Pandora song list, and a takeover of the Santa Monica Pier Ferris wheel.

Metropolitan's online conservation portal, bewaterwise.com®, was redesigned with a more user- and mobile-friendly navigation and translated into Chinese and Spanish. A Garden of the Month video series was launched on bewaterwise.com® and multiple social media platforms featuring California Friendly® inspiration gardens.

Metropolitan's multilingual H2Love campaign concluded in spring 2018 with a successful 12-week media strategy featuring outdoor billboards, radio ads, community newspapers and a sponsorship with Major League Soccer's LA Galaxy. With nearly two billion media impressions delivered and a toolkit of informational resources and files, the campaign successfully reached its target audiences as demonstrated in a post-campaign public survey. Outreach efforts increased traffic to the district's bewaterwise.com® conservation website by more than 300 percent, and social media growth in views increased more than one-hundred-fold.

While social media and search engine optimization maintained message consistency and visibility, Metropolitan initiated a request for proposal process for a new three-year water conservation outreach media campaign. Metropolitan's Board of Directors awarded a $14.7 million contract to the Los Angeles-based firm Quigley-Simpson & Heppelwhite, which produced Metropolitan's award-winning Take a Turn and H2Love campaigns. The new "Save

Water 365" campaign launched in July 2018. The campaign encouraged Southern Californians to save water every day. It also reminded residents to take advantage of rebate programs – including incentives for indoor and outdoor water-saving devices, as well as rebates for landscape transformation that requires more efficient irrigation systems, design and plants. The campaign also reached very diverse audiences in English, Spanish, Mandarin, Korean, Vietnamese, and Tagalog through traditional and grassroots marketing efforts. Creative messaging included signs on food trucks, local convenience and hardware stores, and a sponsorship with the LA Dodgers.

The "Save Water 365" campaign delivered more than 1 billion media impressions. Working with Metropolitan's 26 member agencies, the research-based advertising campaign included:

- Digital and online advertising
- Total of 1,475 billboards and television commercials
- Radio messages on more than 50 stations
- Animated digital ads with general rebate and landscape transformation program messaging
- Print ads in community newspapers
- English and Spanish language Pandora radio stations and other customized materials and special outreach events throughout Southern California

The campaign also included a grass-roots outreach effort in multiple languages through advertising at convenience and hardware stores and on food trucks, as well as a presence on a popular Chinese game show. The media strategy was designed to effectively target diverse communities, age groups, socioeconomic factors and languages spoken in the region.

In August 2018, Metropolitan began an official sponsorship with Major League Baseball's Los Angeles Dodgers. This sponsorship included a title night event before more than 40,000 fans featuring former Metropolitan Board Chairman Randy Record throwing the opening pitch. The evening highlighted a Dodger groundskeeper and the many ways in which the Dodger organization conserves water. Public service announcements were displayed on LED boards throughout the stadium, as well as cross promotions on conservation on Metropolitan's and the Dodgers' social media platforms.

Growth in social media activity was dramatic. In 2018, Metropolitan's Facebook page received more than 55 million impressions, with more than 27,000 followers. On Twitter, Metropolitan received strong engagement for its water efficiency posts, including short videos and animated gifs to reach a broader audience during its conservation campaign and for Delta Conveyance initiatives. Metropolitan used Facebook Live and Snapchat geo-filters to reach a broader audience throughout 2017-18.

The success of Metropolitan's outreach activities was recognized with several prestigious awards including the best in show for the National Association of Government Communicators in 2018. This organization is a national association of communication officials from local, state and federal public agencies. Metropolitan was a finalist in 13 of 40 award categories.

In April 2019, the general conservation message of the "Save Water 365" campaign became more targeted and focused on promoting the incentive under Metropolitan's revamped turf replacement program. The incentive provides Southern Californians $2 for every square-foot of grass replaced with more water efficient sustainable landscaping. The campaign continued to reach diverse audiences on multi-media platforms: digital billboards featured in shopping malls, grocery stores and movie theaters encouraged residents to "ditch their grass and claim their

rebate." Radio spots promoting the "ditch your grass" message in English and Spanish were featured on nearly 40 radio stations, and creative digital display ads generated nearly 120 million impressions on digital media and nearly 300,000 ad clicks.

Local community outreach also played an important role in this campaign through strengthened partnerships between Metropolitan and its member agencies. Turf Replacement Program advertisements in English, Spanish, and Chinese ran in 25 publications from May to June 2019, and together, these advertisements reached 1.7 million readers across the district's area.

Metropolitan also partnered with Los Angeles- and San Diego-based news shows to develop water conservation programming in English and Spanish. On-air talent spoke about the benefits of replacing your lawn with California Friendly® and native landscaping and promoted Metropolitan's turf rebate.

In fall 2019, Metropolitan launched a multilingual digital campaign that continued to promote the turf rebate incentive. Digital display banners on home improvement and lifestyle websites encouraged viewers to save money by converting their lawns to sustainable landscapes. Together with search advertising, these display ads generated 151 million impressions and thousands of turf rebate applications. The Hispanic market saw a significant increase in online engagement and drove the most landing page visits with 200k link clicks. Part of the fall campaign's communications strategy was to collaborate with Los Angeles- and San Diego-based news shows to develop water conservation programming in English and Spanish. On-air talent spoke about the benefits of replacing your lawn with California Friendly® and native landscaping and promoted Metropolitan's turf rebate.

To supplement digital outreach, Metropolitan partnered with Los Angeles Dodgers, Angels, Rams, Chargers, Lakers, Clippers and Kings sports organizations to promote advertisements with water use efficiency messaging. The ads appeared in game-day programs and annual yearbooks, reaching millions of fans across Southern California. These creative assets also received more than half a million impressions on Metropolitan's social media channels.

Additionally, Metropolitan initiated in-house design and advertising campaigns to reach new online demographics. Staff designed an award-winning social media campaign called Patch Match in the format of a dating app that 'matches' consumers with the perfect California Friendly® plants and promotes water conservation. The social media campaign was significantly more efficient than other digital and online advertising, reaching more than 200,000 people with nearly 400,000 impressions, resulting in nearly 3,000 page views to bewaterwise.com. The National Association of Government Communicators honored Patch Match with a first-place award in the social media category.

In late 2019, staff brought their creative concepts to fruition with the "Wasting Water Is…" campaign. This three-part digital commercial series was produced entirely in-house and featured scenarios where water wasters learn how scary, tragic and offensive wasting water really is. Production costs for all three commercials totaled less than $50,000 compared to typical advertising agency costs of $300,000 to $500,000 per video. Movie posters and animated GIFs promoted on Metropolitan social media channels resulted in more than 5.5 million impressions with more than 79,000 link clicks. Staff also advertised the videos on YouTube and connected TV devices such as Apple TV, Chromecast and Roku, targeting entertainment, lifestyle and sports themed content that outperformed targeted goals at an average 44 percent view through rate.

Throughout these years, Metropolitan officials conducted hundreds of interviews with news reporters from major TV and print media outlets, ethnic media and community publications to discuss a wide range of water-related issues. Topics included the effect of climate change and drought on Colorado River resources, water supply reliability and conservation, and raising

awareness about Metropolitan's new turf replacement program. As part of this public outreach, Metropolitan's General Manager Jeffrey Kightlinger blogged on Metropolitan's webpage mwdh2o.com and wrote guest blogs and op-eds encouraging conservation in 2019. Metropolitan continues to provide outreach to Southern California's businesses and industry.

Metropolitan is an active member in many chambers of commerce and other business organizations and provides regular updates to members on water policy issues and programs. Water use efficiency programs that help reduce demand for potable water are a key focus of these partnerships. In addition, Metropolitan hosts hundreds of community and business leaders on inspection trips of the State Water Project and Colorado River Aqueduct to help them better understand the challenges of providing reliable water to Southern California and how the Colorado River is managed to provide water for urban areas and agriculture.

### *Community Partnering Program*

Over the past five fiscal years, Metropolitan has engaged in approximately 270 sponsorship programs and projects through its Community Partnering Program. Investments totaling $540,000 were provided to non-profit organizations, member agencies, other public resource agencies and educational institutions for programs including California native plant gardens and outdoor classrooms, Earth day events, water quality laboratory test kits, and multi-lingual educational publications addressing conservation, water-use efficiency, recycling, watersheds and more regional issues.

### *California Friendly Landscape Education and Training Program*

Metropolitan provides education and training on ways to conserve water in homes and landscapes. Offerings include in-person and online classes, surveys, and audits.

#### Landscape Classes

Metropolitan offers in-person and online courses in irrigation efficiency and water-wise garden design through its California Friendly Landscape and Native Plant Training Program. Metropolitan also offers Turf Removal Classes. In FY 2019-20 Metropolitan conducted 45 classes for 1,200 students throughout Metropolitan's service area. After COVID-19 forced the temporary cancellation of in-person classes, Metropolitan created online Zoom courses with its vendors to continue offering Southern California residents valuable water saving landscape education.

#### Landscape Irrigation Surveys

Metropolitan provides irrigation surveys for large landscape customers. These surveys are performed by a certified Landscape Irrigation Auditor and provide the customer with specific recommendations on how to improve irrigation efficiency at the site. The survey report generated by the auditor also provides information on incentives to help the customer fund the needed improvements. In fiscal year 2019-20, 21 surveys were conducted.

#### Irrigation Evaluations and Residential Surveys

Metropolitan provides funding to its member agencies that choose to implement irrigation evaluations and indoor surveys for residents. Irrigation evaluations provide customers with a recommended irrigation schedule and suggested improvements for irrigation systems. Indoor residential surveys provide customers with information on identifying leaks and making changes to water-using devices in the home.

### *Water Conservation Programs*

Metropolitan's water conservation programs focus on two main areas: (1) residential water use, and (2) commercial, industrial, and institutional water use. Metropolitan directly manages regional programs and provides financial support for local programs that are implemented by the member agencies. Metropolitan's Water Use Efficiency team provides program development, implementation, administration, monitoring, evaluation, and research.

Metropolitan's Conservation Credits Program (CCP) provides the basis for financial incentives and funding for the conservation programs and other demand management related activities. Established in 1988, this funding mechanism supports Metropolitan's commitment to conservation as a long-term water management strategy.

The basis of Metropolitan's financial support to member agency conservation efforts is estimated at $195 per acre-foot of water saved up to the device cost. In general, CCP-funded water conservation project proposals must:

- Have demonstrable water savings;
- Reduce water demands on Metropolitan's system; and
- Be technically sound and require Metropolitan's participation to make the project financially and economically feasible.

Metropolitan introduced two new funding options for member agency conservation efforts. Member agencies may use a portion of their funding for projects that provide value to the region, but the water savings may be difficult to measure. In addition, member agencies can use funding to target disadvantaged communities.

Table 3-5 summarizes CCP savings and investments. Additional funding for conservation programs has been made available through federal and state government agencies. Metropolitan has worked to obtain a share of this funding to enhance the region's water conservation investments. Table 3-6 describes past sources and uses of these funds.

Table 3-7 summarizes the types and numbers of efficient devices that have been installed through Metropolitan's conservation programs since they began in fiscal year 1990-91.

#### *Regional Conservation Programs*

As mentioned above, Metropolitan's conservation programs focus on two main sectors: (1) residential water use, and (2) commercial, industrial and institutional water use.

<u>Residential Programs</u>

Metropolitan's residential conservation activities consist of two major programs:

- SoCal Water$mart – Metropolitan provides a region-wide residential rebate program named SoCal Water$mart. Since its inception in 2008, rebate activity has increased dramatically as many residential customers became increasingly aware of the financial incentives available to them to help offset the purchase of water-efficient devices. To date, this program helped to replace over 277,000 toilets, 319,000 washing machines, 50,000 smart irrigation controllers, 459,000 rotating nozzles, and hundreds of thousands of other devices and appliances.
- Metropolitan-Funded Residential Programs Administered by Member Agencies – Metropolitan's member and retail agencies also implement local residential water conservation programs within their respective service areas and receive Metropolitan incentives for qualified retrofits and other water-saving actions. Typical projects include

premium high-efficiency toilet (HET) distributions, locally administered clothes washer direct-installation programs, turf removal programs, and residential water audits.

*Residential Rebate Items*

Metropolitan provides incentives on a variety of water efficient devices for the residential sector. The following is a brief description of current and past devices that contribute to projected conservation savings:

- Turf Removal (Residential) – About 50 percent of residential household water demand is used for outside irrigation where opportunities to conserve water are substantial. Southern California residents have turned the turf removal program into Metropolitan's most popular conservation measure. To encourage market transformation, Metropolitan has paid over $198 million in the regional turf removal program for residential properties since program inception.
- High-Efficiency Clothes Washers – HECWs continue to be a major component of indoor water conservation. The water efficiency of clothes washers is represented by the "integrated water factor," which is a measure of the amount of water used to wash a standard load of laundry. Washers with a lower integrated water factor will save more water per wash cycle. Metropolitan has continued to move the water conservation rebate standards by requiring lower integrated water factors for eligible washers. The program eligibility requirement is currently set at an integrated water factor 3.2, which saves over 10,700 gallons per year per washer over a conventional top loading washer. Metropolitan has also partnered with Southern California Gas on a direct-installation program for high-efficiency clothes washers in low-income households.
- High-Efficiency Toilets – Metropolitan has provided incentives for water efficient toilets since 1988. Metropolitan changed its rebate program to provide funding for toilets that flush at 1.1 gallons or less. Metropolitan uses the Maximum Performance of Premium Toilet Models testing list to distinguish qualifying models.
- High Efficiency Sprinkler Nozzles – Pop-up, high efficiency spray heads provide significant outdoor water savings over conventional nozzles. Field tests and studies have demonstrated these nozzles apply water more evenly than traditional nozzles with fixed fan spray patterns, creating the potential for water savings. Low precipitation rates associated with these nozzles can also reduce run-off, thereby offering a significant value-added benefit when irrigating sloping landscapes.
- Irrigation Controllers – Smart irrigation controllers and soil moisture sensors adjust irrigation schedules based on water needs, temperature, sunlight, soil moisture, soil conditions, plant types, slope or some combination of indicators. Metropolitan uses the USEPA WaterSense list for eligible controllers.

*Commercial, Industrial and Institutional Programs*

Metropolitan's commercial industrial and institutional (CII) conservation consists of three major rebate and incentive programs:

- SoCal Water$mart Program – The majority of the commercial conservation activity comes from Metropolitan's regional SoCal Water$mart program, which also issues rebates to multi-family properties.
- Water Savings Incentive Program – The Water Savings Incentive Program provides financial incentives for customized landscape irrigation and industrial process improvements. This program allows large-scale water users to create their own conservation projects and receive

incentives for up to 10 years of water savings for measured water-use efficiency improvements.

- Metropolitan-Funded Commercial Programs Administered by Member Agencies – Member and retail agencies also implement local commercial water conservation programs using Metropolitan incentives. Projects target specific commercial sectors, with some programs also receiving assistance from state or federal grant programs. Metropolitan incentives are also used as the basis for meeting cost-share requirements for the grants.

*Commercial Rebate Items*

Metropolitan's CII programs provide rebates for water-saving plumbing fixtures, landscaping equipment, food-service equipment, cleaning equipment, HVAC (heating, ventilation, air conditioning) equipment, and medical equipment.

- Turf Removal (Commercial) – Similar to the residential sector, water demand for landscape irrigation on commercial, industrial, and institutional properties is significant. Opportunities to conserve water are substantial, particularly in areas with ornamental turf. With an increased incentive rate ($2 per square foot of turf removed), approximately 92 million square feet of grass has been removed from commercial, industrial, and institutional properties since program inception through the regional rebate program, and member agency turf programs. To encourage market transformation, Metropolitan has paid over $138 million for the regional turf removal program for commercial properties since inception.
- Commercial Devices – Following is a list of current and past devices that contribute to projected conservation savings:
  - Connectionless Food Steamers
  - Cooling Tower Conductivity Meters
  - Dry Vacuum Pumps
  - High-Efficiency Clothes Washers
  - High-Efficiency Toilets
  - High-Efficiency Urinals
  - Ice Machines
  - In-Stem Flow Regulators
  - Large Rotors - High Efficiency Nozzles
  - Laminar Flow Restrictors
  - High Efficiency Nozzles
  - pH Cooling Tower Controllers
  - Plumbing Flow Control Valves
  - Premium High Efficiency Toilets
  - Pre-rinse Spray Heads
  - Soil Moisture Sensors
  - Steam Sterilizers
  - Ultra-Low-Flush Toilets
  - Ultra-Low-Flush Urinals
  - Water Brooms
  - Weather-Based Irrigation Controllers
  - X-ray Processors
  - Zero/Ultra Low Water Urinals

### *Disadvantaged Communities Program Initiative*

Metropolitan initiated an effort to increase water efficiency within disadvantaged communities (DACs) in Metropolitan's service area through the Disadvantaged Communities Program. This program has been executed in three parts. First, a Regional Pilot Program for Multi Family/Apartments Pre-1994 offering an enhanced incentive for Premium High-Efficiency Toilets, targeting pre-1994 structures for retrofits combined with rigorous data collection and analysis. Part two is an effort to help Metropolitan's member agencies implement local DAC projects by providing intensive member agency local support and technical assistance with program design

and administration. And finally, Metropolitan looks for grant support to fund regional and local DAC projects.

### *Metering*

Metropolitan's water distribution system is metered. Metropolitan has over 400 service connections that meter water deliveries to our member agencies. Meters at these service connections are checked every six months or sooner to verify that they are measuring correctly. More extensive maintenance is done on a yearly basis to ensure the meter systems continue to operate reliably.

### *Research and Development Programs*

Metropolitan is committed to conservation research as a way to advance technology, improve program results, and help transform markets. Self-funded studies include determining water savings from municipal leak detection programs, effectiveness of single-family home pressure relief valves on lowering water demand, quantifying residential water use and water fixture inventory, and analyzing savings attributed from landscape irrigation system improvements.

Metropolitan's Innovative Conservation Program (ICP) is a competitive grant program that evaluates water savings and reliability of new water saving devices, technologies, and strategies. With funding provided by USBR, Southern Nevada Water Authority, Central Arizona Project, Southern California Gas, Western Resource Advocates, and Metropolitan, approximately $570,000 of funding was available for research for the 2018 ICP. After evaluating over 60 project proposals, twelve were selected. The projects focused on landscape, commercial, industrial, and residential water use applications. The next round of grants will be implemented in fiscal year 2021.

Metropolitan has partnered with the Alliance for Water Efficiency (AWE) for water conservation research. The current research project involves exploring the water efficiency potential of cooling towers through process improvements and operational management. Past projects have included: lessons learned through a drought management study of Australia, a water neutral development ordinance, a study on commercial kitchen efficiency, a study on outdoor impacts of the drought, and reasons and rationale for landscape choices.

### *Measurement and Evaluation*

Measurement and evaluation are important components of Metropolitan's conservation programs. These serve four primary functions:

- Providing a means to measure and evaluate the effectiveness of current and potential conservation programs
- Developing reliable estimates of various conservation programs and assessing the relative benefits and costs of these interventions
- Providing technical assistance and support to member agencies in the areas of research methods, statistics, and program evaluation
- Documenting the results and the effectiveness of Metropolitan-assisted conservation efforts

Metropolitan's staff has served as technical advisors for a number of state and national studies involving the quantification and valuation of water savings.

### *Recognition for Conservation Achievements*

Conservation is an integral part of water supply planning at Metropolitan. Metropolitan works to improve the understanding of the costs and benefits of conservation so investment decisions are both efficient and effective at meeting program goals. As a cooperative member of California's water conservation community, Metropolitan has made significant contributions to the development and coordination of conservation activities throughout the state. These contributions have been recognized in the form of "Gold Star" certification from the Association of California Water Agencies and awards from the USBR and California Municipal Utilities Association.

**Table 3-4**
**Online School Education Programs**

| Online Education Offerings | Grades | Notes |
|---|---|---|
| Water Journeys | Grades 4 – College | In partnership with Los Angeles County Sanitation Districts, Water Journeys begins with a presentation on water awareness, aqueducts, conservation and recycling followed by a walking tour of the Regional Recycled Water Purification Center. |
| DVL Online Fieldtrip | Grades 4-8 | Diamond Valley Lake, the largest reservoir in Southern California, located in Riverside County near Hemet. Students experience a variety of standards-based, water-related, hands-on science activities. |
| Girl Scout Programs | K - 12 Daisies, Brownies & Juniors, Cadettes, Seniors and Ambassadors | Metropolitan is offering a FREE online patch program about Southern California's water sources and conveyance systems. |
| Scout Programs | K - 12 | Metropolitan is offering a FREE online patch program about Southern California's water sources and conveyance systems aligned with Environmental Science Merit Badge Requirements |
| On-line class presentations | PreK - College | Metropolitan staff will create a customized water-education presentation or "H2O Show" for students from pre-K to college. |
| Online Story Time | PreK – 3rd | Bring story times to life with our engaging educators and colorful stories about water. |
| All About Water Curriculum | K - 2nd | New video experiments and interdisciplinary activities about water conservation, water quality and distribution, the water cycle, and fresh and saltwater. |
| VR Trip SWP | Grades 4 – College | Immerse your students in the State Water Project system and discover the 444-mile journey that water makes to Southern California. Students will virtually visit the Bay Delta, Banks Pumping Plant, the California Aqueduct, Chrisman Pumping Plant, and Lake Perris. |
| VR Trip CRA | Grades 4 – College | Follow the journey of water to Southern California via Metropolitan's Colorado River Aqueduct. The tour is available as a virtual reality app for Apple and Android mobile devices. |

**Table 3-5**
**Metropolitan's Conservation Credits Program**

| Fiscal Year | Annual Water Savings (AF) | Lifetime Water Savings (AF) | Investment |
|---|---|---|---|
| 2019 – 2020 | 212,000 | 55,719 | $25.7 million |
| 2018 – 2019 | 208,000 | 55,263 | $16.4 million |
| 2017 – 2018 | 213,000 | 82,435 | $12.6 million |
| 2016 - 2017 | 206,000 | 137,065 | $41.4 million |
| 2015 - 2016 | 203,000 | 731,093 | $229 million |

**Table 3-6**
**Grant Program Funding**

| Funding Source | Program/Project | Funding Amount ($1,000s) | Description | Status |
|---|---|---|---|---|
| **CALFED** | | | | |
| | Residential HECW | $925 | Increase rebate amount | Completed |
| | Protector del Agua | $100 | Course development | Completed |
| **Prop 13 Grants** | | | | |
| | HECW | $2,500 | Increase rebate amount | Completed |
| | ET Controllers | $1,800 | Initiate rebates | Completed |
| **CPUC (w/CUWCC)** | | | | |
| 2003 | Pre-Rinse Spray Valves: Phase 1 | $1,600[1] | 12,000 direct installations[1] | Completed |
| 2004 | Pre-Rinse Spray Valves: Phase 2 | $2,200[1] | 17,000 direct installations[1] | Completed |
| **USBR** | | | | |
| 2003 | CA-Friendly Landscapes | $182 | New home landscapes | Completed |
| 2003 | Data Loggers | $50 | Software error analysis | Deferred |
| 2004 | CA-Friendly Landscapes | $60 | New home landscapes | Completed |
| 2004 | Synthetic Turf pilot | $220 | Provide incentives | Completed |
| 2004 | World Forum | $50 | College/university grants | Completed |
| 2004 | CII Region wide | $250 | Additional dollars to rebate amounts and for administration | Completed |
| 2005 | Protector del Agua | $50 | Develop web classes | Completed |
| 2005 | Landscape Market Analysis | $50 | Analyze landscape conservation opportunities | Completed |
| 2005 | City Makeover | $50 | Public landscapes | Completed |
| 2006 | Innovative Conservation Program | $300 | Support research projects | Completed |
| 2008 | Innovative Conservation Program | $300 | Support research projects | Completed |
| 2012 | Sprinkler Nozzle Incentive Program | $1,501 | Provide incentives | Completed |
| 2013 | High Efficiency Clothes Washer Program | $500 | Provide incentives | Completed |
| | Innovative Conservation Program | $100 | Support research projects | Completed |
| 2014 | California Friendly Turf Replacement – Phase 2 Incentive Program | $300 | Provide incentives | Completed |
| 2015 | Innovative Conservation Program | $100 | Support research projects | Completed |
| 2017 | Innovative Conservation Program | $100 | Support research projects | Completed |
| **Water for the West** | | | | |
| | Protector del Agua | $25 | Develop web classes | Completed |
| **Prop 50** | | | | |
| | Residential HECW | $1,660 | Increase rebate amount | Completed |
| | CA-Friendly Landscapes | $423 | Common area landscapes | Completed |
| | High Efficiency Toilets | $1,000 | Increase rebate amount | Completed |
| | Protector del Agua | $78 | Develop on-line classes | Completed |
| 2008 | Residential HECW | $2,000 | Increase rebate amount | Completed |

[1] This is the funding amount and number of installations that represent Metropolitan's share of the project.

**Table 3-7**
**Conservation Achievements in Metropolitan's Service Area**

| | Quantity | Units |
|---|---|---|
| **Commercial Rebated Devices (FY 1990-91 to FY 2019-20)** | | |
| Audits/Surveys | 14,419 | ea |
| Connectionless Food Steamers | 219 | ea |
| Cooling Tower Conductivity Controllers | 1,232 | ea |
| Dry Vacuum Pump | 40 | ea |
| Toilets | 241,015 | ea |
| Urinals | 40,849 | ea |
| Ice Machines | 145 | ea |
| In-stem Flow Regulators | 35,265 | ea |
| High-Efficiency Washers | 36,545 | ea |
| pH Conductivity Controllers | 398 | ea |
| Plumbing Flow Control Valves | 56,148 | ea |
| Pre-Rinse Spray Heads | 17,192 | ea |
| Laminar Flow Restrictors | 27,627 | ea |
| High-Efficiency Nozzles | 1,730,313 | ea |
| Soil Moisture Sensors | 790 | ea |
| Steam Sterilizers | 28 | ea |
| Water Brooms | 6,931 | ea |
| Weather-Based Irrigation Controllers | 13,106 | acres |
| Weather-Based Irrigation Controllers | 573,226 | stations |
| X-Ray Processors | 185 | ea |
| Large Rotors - High-Efficiency Nozzles | 86,870 | ea |
| Synthetic Turf | 7,455,647 | sq. ft. |
| Turf Removal | 85,350,839 | sq. ft. |
| **Residential Rebated Devices (FY 1990-91 to FY 2019-20)** | | |
| Aerators | 158,817 | ea |
| Audits/Surveys | 152,544 | ea |
| Cisterns<br>High-Efficiency Clothes Washers | 2,010<br>585,607 | ea |
| Toilets | 3,596,694 | ea |
| High-Efficiency Rotating Nozzles | 1,274,686 | ea |
| Rain Barrels | 176,552 | ea |
| Soil Moisture Sensors | 15 | ea |
| Showerheads | 1,735,436 | ea |
| Turf Removal | 101,786,618 | sq. ft. |
| Weather-Based Irrigation Controllers | 69,493 | ea |
| Weather-Based Irrigation Controllers | 28,527 | stations |

### *Asset Management Program*

In compliance with California Water Code § 10631(e)(2), below is a description of Metropolitan's distribution system asset management program.

Metropolitan's approach to asset management is contained within its Infrastructure Reliability Strategy. The goal of Metropolitan's Infrastructure Reliability Strategy is to ensure long-term reliable performance of the system in an efficient and cost-effective manner. Infrastructure reliability is addressed through three programs: the Maintenance Management Program, the Infrastructure Protection Plan, and the Dam Safety Program. The activities performed under these programs allow for Metropolitan to extend the life span of its facilities and equipment and improve the overall reliability of the entire conveyance, treatment, and distribution system. Metropolitan is also completing a Strategic Asset Management Plan that will further expand the use of asset data for improved planning, maximizing the value of infrastructure assets and enhancing the longer-term visibility for its Capital Investment Plan.

#### *Maintenance Management Program*

Metropolitan manages the maintenance on approximately 135,000 pieces of equipment located at its five treatment plants, sixteen hydro-electric power plants, five desert pumping plants, 242 miles of canals, and over 5,000 structures on 830 miles of pipeline.

Computerized Maintenance Management System: A Computerized Maintenance Management System (CMMS) is used to track, plan, and schedule the required activities. The system currently has over 28,000 preventative maintenance cycles scheduled with approximately 96 percent of these performed at fixed intervals (Time Based). The remaining four percent are performed based on the condition or use of the equipment (Condition Based).

<u>Routine Maintenance, Inspection, and Monitoring</u>

Monitoring, inspection, and maintenance of equipment and facilities are a proactive effort to assess the overall condition of the assets. This effort encompasses identifying needed repairs and performing routine maintenance.

<u>Time-Based Maintenance</u>

Metropolitan currently uses time-based maintenance as the primary means of maintaining equipment reliability. Time-based maintenance for equipment is set at specific time intervals using manufacturer recommendations. These recommendations are used to develop Job Plans in the CMMS which detail the individual steps required for a particular maintenance operation.

<u>Condition-Based Maintenance</u>

Condition-based maintenance (CBM) relies on an understanding of how a piece of equipment degrades or fails to meet its intended function. It requires a greater depth of understanding of the manufacturer's recommended maintenance, industry standards, or practices. This knowledge is used in conjunction with field experience to develop a technique to gauge the equipment's condition. Through trending or analysis, a determination can then be made as to when the equipment may reach a point where corrective maintenance will be required including rehabilitation or replacement. A regular inspection cycle is set in the CMMS software to evaluate current equipment condition. High and low condition alarms are also set that trigger a corrective maintenance activity when equipment is starting to degrade or its use has reached a servicing checkpoint.

Predictive maintenance is a subcategory of CBM that uses diagnostic equipment or testing to determine the equipment condition. Predictive maintenance is also used to detect impending

problems before the equipment malfunctions. In some cases, Metropolitan has automated the inspections such as through online vibration monitoring systems that trend the performance of critical and large equipment. A fundamental characteristic of this type of maintenance is that it provides the capability to anticipate potential problems while the equipment is still operating. This provides several key benefits when compared to time-based maintenance or allowing equipment to reach a point where corrective maintenance is required. These benefits include: improved availability or uptime, enhanced reliability, and reduced cost.

Corrective Maintenance

Corrective maintenance is performed on equipment that either has already failed or has had a problem detected during routine (time or condition based) maintenance. Corrective maintenance needs to be scheduled, requires replacing equipment components, or involves a shutdown of the impacted system. Corrective maintenance is also tracked, planned, and scheduled in the CMMS.

Major Scheduled Outages/Shutdowns

In addition to the general maintenance described above, Metropolitan may take major systems out of service, such as water treatment plants, large pipelines, conveyance systems, or other large facilities, typically for periods of seven to twenty-one days. This is done to perform major maintenance or repairs on several components or systems, upgrade or add new processes, or perform other important work.

Reports and Metrics

Metropolitan produces internal reports that track maintenance management activities including overall backlog and past due work orders (including any missed regulatory preventive maintenance). In addition, other CMMS reports are available that provide managers, planners/schedulers, and maintenance staff with the data needed to evaluate and track work.

Metropolitan utilizes best management practices and performance metrics from the Society of Maintenance & Reliability Professionals to ensure a reliable and cost-effective maintenance management program.

### *Infrastructure Protection Plan*

Activities under the Infrastructure Protection Plan ensure long-term infrastructure reliability by conducting special condition assessments and vulnerability assessments of Metropolitan's facilities.

Special Condition Assessments

Special Condition Assessments are extensive inspections, investigations, and evaluations of Metropolitan facilities and equipment that go beyond routine maintenance and monitoring activities. The assessments are conducted to identify needed rehabilitation and replacement projects which can lead to long-term reliability programs. These assessments include: inspections of facilities during shutdowns when the facility may otherwise be non-accessible, investigations of systemic issues, and evaluations of Metropolitan's ability to maintain deliveries in the event of an unplanned facility outage or loss of water supply.

Special Condition Assessments may be initiated through requests from Water Systems Operations, in response to a specific event or concern within Metropolitan's system, or due to an issue identified within the water industry that could potentially affect Metropolitan. Through these activities, long-term infrastructure reliability programs are developed and executed to ensure

that the reliability of Metropolitan's distribution system is unimpeded, and the overall life-expectancy of its assets is maintained to the most cost-effective standard possible.

Vulnerability Assessments

Vulnerability Assessments involve simulating hazards such as vehicle impact, flooding, fire, equipment failure, third-party impacts, and earthquakes in order to identify their potential impacts to Metropolitan's ability to deliver water. Like the condition assessments, Vulnerability Assessments utilize operator experience and event reviews to identify potential vulnerabilities and impacts. The assessments evaluate both the reliability of individual facilities, as well as the reliability of Metropolitan's system as a whole, if it is exposed to a potential hazard. It is through these assessments that mitigation options are identified to improve reliability.

Potential mitigation includes facility and equipment upgrades, and procedural changes for designing, operating, or maintaining facilities. In addition, mitigation options may include recommendations for Metropolitan's emergency response planning to improve the capability to respond to an unplanned outage and restore service as quickly as possible. The types of hazards assessed include: seismic activity, hydraulic surge, vehicle impact, equipment malfunction, erosion or flooding, fire, corrosion, wind-blown projectiles, third party construction, and vandalism.

As a part of the Vulnerability Assessments, a specific set of reliability design criteria for water treatment plants have been developed to ensure optimal reliability, starting in the design phase. These reliability design criteria establish design practices that ensure that reliability is designed into new facilities, and that the staff uses this criterion when reviewing each capital project.

### *Dam Safety Program*

Metropolitan owns, operates, and maintains 20 facilities under the jurisdiction of the California Division of Safety of Dams (DSOD). In total, there are 24 individual dams/reservoir facilities, with some reservoirs having multiple dams. The Dam Safety Program is a robust and proactive comprehensive management program that includes daily or weekly observations and regularly scheduled detailed inspections in addition to mandatory annual inspections with DSOD personnel.

Metropolitan also ensures dam integrity by incorporating surveillance and monitoring instrumentation that measures specific parameters, including, but not limited to, seepage and structural movement. Staff also conducts cyclical facility assessment to identify potential vulnerabilities to dam embankments, dam structures, foundations, outlet structures and spillways. In addition, staff prepares Emergency Action Plans and regularly updates the associated inundation maps as required by the DSOD.

## 3.5 Recycling, Groundwater Recovery, and Desalination

Metropolitan continues to support local resources development through its Local Resources Program (LRP). The LRP provides financial incentives for local agencies to develop supplies including water recycling, groundwater recovery, and seawater desalination. In addition, for the first time, Metropolitan is planning for its own recycled water supply. The Regional Recycled Water Program would provide advanced treated water that could be used for both potable and non-potable reuse.

Metropolitan's involvement in local resources development started in 1982 as the Local Projects Program to provide financial incentives to its member agencies to develop recycled water projects. In 1991, Metropolitan established the Groundwater Recovery Program to provide financial assistance for the development of groundwater recovery projects. In 1995, these two programs combined into the LRP. Water recycling projects involve further treatment of treated wastewater that is currently discharged to the ocean, streams, or lands and use it instead for non-potable uses such as landscape and agricultural irrigation, commercial and industrial purposes, and for indirect potable uses such as groundwater replenishment, seawater intrusion barriers, and reservoir water augmentation. Currently, more than half of the water recycling in California occurs in Metropolitan's service area.

Groundwater recovery projects involve treatment of high salinity or contaminated groundwater for potable uses. Groundwater recovery projects use a variety of treatment technologies to remove undesirable constituents such as nitrates, volatile organic compounds (VOCs), perchlorate, color, and salt. Desalination of brackish groundwater and other local supplies enhances the continued supply reliability of the region by maximizing local groundwater resources.

Metropolitan's service area is also leading the development of seawater desalination in California. The 56 TAF Carlsbad Desalination Project in San Diego County started operations in 2015 and represents the largest seawater desalination project in the country. Several other local water agencies are considering seawater desalination projects. One of the largest of these is the Huntington Beach Seawater Desalination Project, currently being developed by Poseidon Resources LLC (a private company). These projects have the potential to help meet Metropolitan's current goals for new local supplies.

Metropolitan's Regional Recycled Water Program, a partnership with the Los Angeles County Sanitation Districts (Sanitation Districts), would purify treated wastewater from the Sanitation Districts' Joint Water Pollution Control Plant. The program could produce up to 168,000 acre-feet of purified water for groundwater replenishment, industrial use, and potentially raw water augmentation. The agencies have been working together for over 10 years on the program. They are currently operating a demonstration facility and seeking approval from their Boards of Directors to begin the environmental planning phase. At full-scale, the program could be one of the largest water reuse efforts of its kind in the world.

### *Background*

#### *Recycling*

This section provides a description of the wastewater sources that potentially could be recycled. This section also discusses the existing and potential uses of recycled water, as well as the technical and economic issues associated with those uses. In general, Metropolitan supports:

- Increasing water recycling in California and the Colorado River Basin

- Advocating funding assistance by parties that benefit both directly and indirectly from the use of recycled water
- Expanding recycled water uses
- Reviewing recycled water regulations to ensure streamlined administration, and public health and environmental protection
- Planning efforts and voluntary cooperative partnerships at the local and statewide levels
- Conducting research and studies to address public acceptance, new technologies, and health effects assessments
- Increasing cooperation between agencies to serve recycled water in other agency service areas

Wastewater Disposal in the Service Area

As part of regional planning that encourages use of recycled water, a database has been developed that includes the name of each wastewater treatment facility, operating agency, location and elevation of the facility, extent of wastewater treatment, capacity and anticipated production, method of effluent disposal, and influent and effluent water qualities. Table 3-8 shows the existing and projected total effluent capacities of the wastewater treatment plants from a database of 89 plants identified within Metropolitan's service area.

Wastewater treatment capacity provides an indication of the amount of wastewater being generated and disposed in Metropolitan's service area. Most wastewater plants in the service area provide secondary treatment, a level of treatment that complies with the Clean Water Act. Inland wastewater plants generally provide treatment to tertiary levels so the effluent may be disposed of in a stream or other water body or for beneficial reuse. A growing percentage of tertiary treated effluent undergoes reverse osmosis or electrodialysis reversal processes, producing high-quality recycled water for groundwater replenishment, industrial uses, or, in some instances, municipal uses.

Within Metropolitan's service area, many local agencies collect and treat municipal wastewater. Some of the largest agencies include:

- Los Angeles County Sanitation Districts
- Orange County Sanitation District
- City of Los Angeles Bureau of Sanitation
- San Diego Metropolitan Wastewater Department
- Eastern Municipal Water District
- Western Municipal Water District
- Inland Empire Utilities Agency

**Table 3-8**
**Existing and Projected Total Effluent Capacity**
**Wastewater Treatment Plants within Metropolitan's Service Area[1]**

| Treatment Level | Existing Capacity (MGD) | 2040 Capacity (MGD) |
|---|---|---|
| Primary | 1,770 | 3,139 |
| Secondary | 1,169 | 2,708 |
| Tertiary | 434 | 1,464 |
| Advanced | 104 | 229 |

[1] This data was compiled as part of the Southern California Comprehensive Water Reclamation and Reuse Study in 2002. As of the date of this UWMP, this reuse study has not been updated to reflect new information.

Many small special-purpose wastewater agencies, dual-purpose (water and wastewater) special districts, and municipal wastewater agencies also provide wastewater treatment and disposal services within Metropolitan's service area.

Wastewater is collected in a sewer collection system. From there, it flows to a wastewater treatment plant. Once treated, wastewater is disposed of through one of three mechanisms:

*Ocean Outfalls*

Treated wastewater is either disposed of directly through an ocean outfall or conveyed to the ocean outfall via a land outfall.

*Reuse*

Currently, about 441 TAF per year of recycled water is used for landscape irrigation, industrial processes, and groundwater replenishment applications in the region. A few inland treatment plants (in Riverside and San Bernardino counties) irrigate feed and fodder crops with recycled water. While this use is considered beneficial, it is not necessarily the highest and best use for recycled water. Higher value uses of recycled water include landscape or agricultural irrigation, commercial and industrial applications, groundwater replenishment, seawater intrusion barrier, and other uses such as street sweeping and dust control.

*Stream Discharge*

The majority of inland plants discharge treated effluent into local streams and rivers. That water is then used downstream for beneficial uses, eventually flowing to the ocean. Some of the affected rivers (or ephemeral streams) include:

- Los Angeles River
- Santa Ana River
- Calleguas Creek
- Rio Hondo & San Gabriel Rivers
- Santa Margarita River

Uses of Recycled Water

Water recycling is a reliable water supply, and it helps local agencies comply with environmental regulations. Uses of recycled water can generally be categorized as non-potable, indirect potable for groundwater replenishment or reservoir water augmentation, and direct potable.

*Non-Potable Reuse*

- *Industrial* – Industrial users represent a large potential market for recycled water, particularly in heavily industrialized areas, such as the cities of Vernon, Commerce, Industry, and the Wilmington area of Los Angeles. Additionally, refineries in West Basin MWD's service area and the city of Torrance use recycled water. Typical industrial uses include cooling tower makeup water, boiler feed water, paper manufacturing, carpet dying, and process water. Industrial users are high-demand, continuous-flow customers, which allows greater operational flexibility by allowing plants to base load operations rather than contend with seasonal and diurnal flow variations. Because of these operational benefits, industrial users reduce the need for storage and other peak demand facilities and management.
- *Irrigation* – Recycled water is used to irrigate golf courses, parks, schoolyards, cemeteries, greenbelts, roadway medians, and agricultural purposes throughout Southern California. Using recycled water for irrigation reduces the need for imported water during the critical summer months and in drought situations when water supplies are scarce. Unlike industrial uses, irrigation demands have large seasonal variations in reuse.

*Indirect Potable Reuse*

Indirect Potable Reuse (IPR) refers to the use of recycled water for groundwater replenishment, and reservoir water augmentation purposes. These types of uses require additional treatment levels beyond irrigation uses and use of an environmental buffer.

- Groundwater Replenishment – Metropolitan's service area overlies numerous groundwater basins, most of which rely on artificial recharge to sustain groundwater production, and some of which are threatened by seawater intrusion. Water agencies along the Los Angeles and Orange Counties coastline inject water into the underlying groundwater basins to create a barrier against this seawater intrusion and protect groundwater quality. The use of recycled water for seawater intrusion barrier projects is increasing and is replacing imported water used for this purpose. Increasing the proportion of recycled water can free imported water for direct consumption. For example, Metropolitan's Regional Recycled Water Program would provide purified recycled water instead of imported water to replenish multiple groundwater basins in the region, making imported water available for other purposes. Table 3-9 presents a summary of this recycled water use.
- Reservoir Water Augmentation – Reservoir Water Augmentation (previously identified as surface water augmentation) includes use of advanced treated recycled water to augment a surface water reservoir. The reservoir serves as an environmental buffer (similar to groundwater aquifer in the case of groundwater replenishment) prior to when recycled water is treated for potable uses. Blended water from the reservoir is then treated at a conventional water treatment plant for potable purposes. There is currently no reservoir water augmentation with recycled water in Metropolitan's service area. The State Water Resources Control Board (SWRCB) adopted the surface water augmentation regulations, required under SB 918, in 2018. The City of San Diego is currently operating a demonstration project to evaluate the feasibility and expected permitting requirements of a full-scale reservoir water augmentation project.

**Table 3-9**
**2020[1] Recycled Water Use for**
**Groundwater Replenishment and Seawater Barrier Injection**
(TAF per year)

| Groundwater Basin | Recycled Water Use |
|---|---|
| Central Basin | 56 |
| Chino Basin | 13 |
| Orange County Basin | 97 |
| West Coast Basin | 12 |
| Other Basins | 1 |
| **Total** | **179** |

[1] Data for 2020 not available at the time of publication, used average of 2017-2019.

*Direct Potable Reuse*

Direct Potable Reuse (DPR) refers to the use of advanced treated municipal recycled water as a direct supply before or after a conventional water treatment plant. DPR does not require an environmental buffer. There are two distinct forms of DPR: raw water augmentation, and treated drinking water augmentation. Currently, there are no permitted DPR projects in California. The report to the Legislature on DPR feasibility is complete (December 2016). In addition, SWRCB issued a framework for regulating DPR (1st edition April 2018, 2nd edition August 2019).

Raw Water Augmentation

Raw Water Augmentation (RWA) refers to the use of advanced treated wastewater as a direct supply before a conventional water treatment plant. Metropolitan is considering RWA as part of the Regional Recycled Water Program. This DPR option would involve delivery of advanced treated water upstream of the Weymouth and/or Diemer water treatment plants.

Treated Water Augmentation

Treated Water Augmentation means the planned placement of recycled water into the water distribution system of a public water system.

Technical and Economic Issues of Recycled Water

Recycled water use is growing rapidly in Metropolitan's service area. Further expansion depends on progress in research, regulatory change, public acceptance, water quality issues, cost, operational issues, and conflicting institutional objectives. Each of these challenges, as well as opportunities for recycled water use, lessons learned, and recommendations to enhance the development of recycled water, is discussed below.

Challenges

*Lengthy and Variable Permitting Process*

The SWRCB established the Recycled Water Policy (Policy). This Policy requires the SWRCB and the nine Regional Water Quality Control Boards (Regional Boards) to encourage the use of recycled water, consistent with state and federal water quality laws. The Policy provides additional direction to the Regional Boards on appropriate criteria to be used in regulating

recycled water projects. The Division of Drinking Water (DDW) and the nine Regional Boards are responsible for setting the rules and permitting for recycled water projects. The timeline and roadmap for getting a permit are challenging and inconsistently implemented in different regions of the state. Limited history and technical information (e.g., on DPR) to inform regulations and limited staffing at DDW and other agencies have challenged the ability to propose, revise, and adopt new regulations in a timely manner. Agencies planning and designing DPR and IPR projects face delays because of regulatory uncertainty. In addition, many project proponents seeking grant or loan funding have identified lengthy CEQA review as a challenge.

IPR projects face regulatory constraints such as treatment, blend water, retention time, and Basin Plan Objectives, which are the designated uses assigned by the SWRCB and which may limit how much recycled water can feasibly be recharged into the groundwater basins. For example, the Basin Plan Objective for TDS of a particular basin may be lower than the quality of the tertiary water effluent available, resulting in the need for more blended water or advanced levels of treatment. These treatment requirements impact the economic feasibility of a project.

*Public Perception/Conflicting Messaging*

Public acceptance of recycled water is critical in implementing water reuse projects, especially potable reuse projects. In the past, public opposition halted a number of recycled water projects, citing concerns about the source of the water and resulting water quality.

The public does not have a clear understanding of the difference between non-potable reuse, IPR, and DPR. The public is most familiar with non-potable reuse as they see recycled water in use at parks, golf courses, schools, and other large landscapes. Signage for non-potable reuse projects at parks, schools, and golf courses that read, "Using recycled water; do not drink" can adversely affect the public's acceptance of DPR and IPR even though IPR has been used in some areas for over 50 years.

With effective outreach, public understanding and acceptance of potable reuse have improved. Projects such as Orange County's Groundwater Replenishment System conduct tours and presentations to thousands of people, raising awareness of the project, addressing water quality concerns that may be associated with recycling wastewater, and gaining support. Metropolitan's Regional Recycled Water Program also involves extensive outreach to the communities impacted by the program.

Education and public outreach are still needed. Any water reuse effort must include public engagement to build awareness of the project and acceptance of recycled water as a new supply.

*Cost*

Cost, including up-front capital and ongoing operation and maintenance, remains a concern to recycled water development for some agencies. The cost for expanding recycled water distribution systems remains a significant consideration to full implementation of non-potable reuse projects, as these projects require pipelines connecting the treatment plants and the individual users. Some non-potable reuse and IPR projects and all DPR projects require advanced treatment facilities, which are comparatively expensive. Advanced treatment may also require additional concentrate disposal facilities (e.g., a brine line) and extensive infrastructure for injection wells/spreading facilities, or for delivery of the product water to a spreading ground, surface reservoir, or water treatment plant for potable uses. Ultimately, end users play a very important role for recycled water advancement. Site conversion costs (borne by the customer) and additional conveyance infrastructure for new customers can also be significant considerations in reaching full non-potable reuse project capacity. Some agencies

may be challenged with cash flow issues or inability to secure the funding needed to implement projects.

In addition, with the increasing prospect of statewide regulations, some agencies pursuing IPR may be hesitant to extend their existing distribution system for non-potable reuse projects for fear of stranded facilities. Similarly, some agencies pursuing DPR may delay their planned indirect potable reuse projects to prevent stranded distribution facilities.[3]

*Source Control and Effluent Water Quality Needs*

Source water quality and flow control is essential to help safeguard the water recycling treatment process and the end use of the water by placing controls on the type, timing, and amount of wastewater that comes into the plant. A good source control program limits wastewater treatment plant disruptions and ensures treatment processes are capable of handling spikes in volume, industrial influent, and high salinity influent. When it comes to the treatment process, recycled water policy requires that the effluent meets certain water quality standards. Salt and nutrient management plans protect groundwater beneficial uses and prevent excess degradation, which may limit expanded IPR applications if the agency does not have funds for advanced treatment to remove salts to meet the Basin Plan Objectives. In some cases, existing source control plans may need to be updated to deal with constituents of emerging concern and with more stringent needs of the users.

Source water quality for non-potable reuse can be affected by drought patterns in Southern California. Drought years with low State Water Project allocations will increase potable water salinity and, as a result, increases the salinity of source water for water reclamation plants. High salinity in wastewater decreases the viability of recycled water for irrigation uses and may also cause NPDES discharge violations for local agencies.

Water use efficiency helps conserve water, but also incidentally reduces wastewater volume resulting in an increase in the concentration of wastewater. As a result, additional treatment is needed, which increases operation and maintenance costs of the system. Source water quality is especially important for implementing IPR and DPR projects to protect potable water systems.

*Operational Issues*

While each agency is different, it is important to recognize the possible operational issues that may occur with the use of recycled water, including:

- Reduction in wastewater flows due to ongoing conservation and drought
- Lack of seasonal storage to address diurnal and seasonal demands; construction of storage facilities may be needed for flow equalization
- Concentrate disposal needs
- Environmental flow or stream discharge requirements may limit the ability to deliver recycled water during high demand periods
- Regulatory issues such as blend requirements and water quality objectives may impact the effectiveness of IPR
- Need for multiple barriers to ensure recycled water quality and for monitoring techniques that provide feedback in real-time to respond to plant disruptions, especially with DPR projects
- Need for additional operator training and certification

[3] Indirect potable reuse projects usually require injection wells or a distribution system to a surface reservoir or recharge basin, and may also require improvements to a surface reservoir, recharge basin, or treatment facility.

Opportunities

*Progress Towards New Regulatory Process*

The State of California has made progress in developing permit standards that provide opportunities to expand recycled water use.

In December 2018, the State Recycled Water Policy was amended to further encourage use of recycled water from municipal wastewater, promote standardized state-wide implementation, and provide directions for Regional Boards, proponents, and the public when issuing permits. The amended policy included standardized annual reporting requirements and updated recycled water categories for better tracking. The Policy also included baseline monitoring requirements for emerging contaminants.

Non-potable reuse: The SWRCB adopted a general permit (Order WQ 2016-0068) for most non-potable beneficial reuse of treated municipal wastewater in June 2016. The permit provides an opportunity for non-potable reuse projects to come online sooner with standardized conditions and conditionally delegated authority for an Administrator to manage a local water recycling program. Revisions to the Recycled Water Policy in 2018 further standardized statewide implementation requiring most regional non-potable reuse permits be moved to the statewide general permit.

On-site treated non-potable water systems legislation (SB 996, Chaptered September 2018), requires the SWRCB to adopt risk-based water quality regulations by December 1, 2022. The legislation also requires local jurisdictions to adopt ordinances and requires treatment systems to comply with adopted water quality standards.

IPR and DPR: The SWRCB adopted uniform water recycling criteria for IPR for groundwater recharge in June 2014 and reservoir (surface water) water augmentation in March 2018. The SWRCB is facing a December 31, 2023 deadline from AB 574 to develop regulations for DPR through raw water augmentation. AB 574 also requires the establishment and administration of a science advisory panel to provide DPR guidance and assurance of protection of public health. Per the State's August 2019 DPR framework, the State will be developing a regulatory package for both treated and raw water augmentations concurrently.

Metropolitan continues to work with the WateReuse Association and other agencies on legislative and regulatory issues to streamline permitting processes and to provide needed funding and support for increased use of recycled water.

*New Funding Opportunities*

Proposition 1 provided $625 million for water recycling projects. Grants and loans for planning and construction are administered through the SWRCB's Water Recycling Funding Program. An additional $100 million was available through DWR for desalination.

Proposition 13, approved by voters is 2000, is also used to fund grants and loans for planning and construction of recycled water projects. Repayment of low-interest loans from previous projects allows limited funding from this program to continue.

Proposition 68, approved by the voters in 2018, provided $72 million in grants and loans for recycled water planning and construction activities. The remaining funding has been committed by the SWRCB for disadvantaged community projects. The SWRCB has committed to spend the remaining available Prop 1 and Prop 68 funding on approved projects on the FY 2020-21 Intended Use Plan.

The Clean Water State Revolving Fund (CWSRF) provides low-interest loans to public agencies for planning, design, and construction of water recycling projects. There is currently a substantial backlog of CWSRF projects on the FY20-21 Intended Use Plan (~$7 billion) that could limit the number of new projects approved over the next several years.

The Water Infrastructure Finance and Innovation Act (WIFIA) program was authorized by the Water Resources Development Act of 2014. The program is similar to the State Revolving Fund programs like the CWSRF program but is intended to provide federally subsidized low-interest loans for up to 49 percent of large regional projects.

Title XVI Water Reclamation and Reuse Program was established in 1992 and provides grant funding up to 25 percent of project costs or $20 million for selected projects in the western U.S. Title XVI requires projects be either congressionally authorized or competitively selected after USBR approval of a feasibility study.

In 2014, Metropolitan increased the financial incentives under its LRP for agencies to develop recycled water. Metropolitan also established the On-site Retrofit Pilot Program to provide rebates to customers that convert their irrigation and industrial system from potable water to recycled water. In addition, Metropolitan established the Reimbursable Services Program to provide technical and construction assistance to its member agencies for local project development. Under this program, Metropolitan advances funds and is reimbursed by the agency.

*Improving Public Perception*

Recent droughts have heightened water awareness in the region and have provided momentum for water conservation and reuse. The public is more willing to accept alternative supplies such as recycled water. Extensive public outreach and education have also helped improve the public's perception of recycled water. Public sharing of information, open door stakeholder meetings, and focus groups have been very effective at distributing information and addressing public concerns. Case studies and demonstration projects are used to educate and improve public acceptance of recycled water.

Agencies are working together to share best practices for public outreach, create consistent messaging, simplify water reuse terminology, and ensure effective communications with the public. One such group is the WateReuse California Communications Collaborative Group, which provides a forum to discuss and collaborate on water reuse communications. The group offers resources for communications professionals, including a terminology document to provide consistent and simple water reuse terminology, for use with the public.

*New Technologies, Research, and Information Sharing*

New technologies, research, and information sharing greatly enhance the development of recycled water. Programs such as Metropolitan's Future Supply Actions (FSA) Funding Program focus on technical studies and pilot projects that reduce barriers to future local production. Projects under this program include optimizing new treatment techniques for recycled water, exploring new monitoring methodologies, and testing innovative brine concentration technology. In addition to the technical portions of this program, the FSA Funding Program supports collaboration between agencies and regional sharing of information.

Metropolitan is also conducting cutting-edge research at the Regional Recycled Water Advanced Purification Center. The demonstration facility is testing the effectiveness of membrane bioreactors followed by reverse osmosis and ultraviolet disinfection/advanced oxidation in the advanced water treatment process. During testing, Metropolitan and the Sanitation Districts are analyzing water quality for removal of various contaminants, especially

microorganisms. The agencies are also working closely with state regulators and an independent scientific advisory panel to oversee the work. Once regulators approve the process, it may be used throughout California. Additional research on membrane bioreactors and potential purification processes to address raw water augmentation are also planned at the demonstration facility. The studies will help further potable reuse in California and across the globe.

Research is especially critical in advancing new water supply options, such as DPR. WateReuse, in partnership with other agencies (including Metropolitan), is leading the California Direct Potable Reuse Initiative [4] to advance DPR as a water supply option in California and to address regulatory, utility, and community concerns. WateReuse's report *Direct Potable Reuse: A Path Forward* [5] provides an overview of DPR and identifies research needs.

Regional studies can also examine the needs of multi-jurisdictional areas and foster communication among agencies to promote the use of recycled water. For example, sharing regional information such as GIS data can identify areas of recycled water surpluses and needs.

*Partnerships*

Drinking water, wastewater, and groundwater management agencies share some common objectives, including access to source water, cost minimization, and protection of the environment. Many agencies are successfully cooperating and developing recycled water projects. These partnerships can allow sanitation districts to reduce the cost of disposing treated wastewater in the ocean, reduce impacts to the marine environment, and provide a source of reclaimed water to water agencies for recycling. At the same time, groundwater basin management agencies could be the recipients of final recycled water, helping maintain or increase groundwater levels.

*Lessons Learned*

There have been many success stories on recycled water development. Focusing on public outreach and education has improved public perception. Partnerships and joint efforts among water and wastewater agencies proved to be an effective way to remove barriers and make progress. Numerous studies and research funded by federal, state, and local agencies are benefitting local and regional efforts.

*Public Outreach is Important*

Public outreach and education have helped improve the public's perception of recycled water. Both experience and research have shown that when the public is informed and takes part in the decision-making process, they will likely accept and support recycled water as a new supply in their community.

Water shortages raise awareness for alternate ways to conserve. As a result, the public is more willing to accept alternative supplies such as recycled water, support the more expensive projects, and tolerate rate increases. Potable reuse projects throughout Southern California are advancing due to this increased public awareness and support. Non-potable reuse is also increasing. Some residential property owners are interested in using recycled water for watering plants to help with the drought. For example, residents have access to recycled water from "residential recycled water fill stations" in the Irvine Ranch Water District. Programs like these improve public acceptance of recycled water, increase recycled water use, and conserve potable supplies.

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[4] https://www.watereuse.org/foundation/research/direct potable reuse-Initiative
[5] https://www.watereuse.org/product/direct-potable-reuse-path-forward

Standard practice for water reuse projects now includes robust outreach. Many projects dedicate considerable resources towards public engagement. For example, Metropolitan's Regional Recycled Water Program features a learning center at its demonstration facility to provide a platform for public outreach. The facility and learning center are used to conduct tours, introducing the public to the program and potential new source of water.

*Additional Funding is Needed*

LRP incentives and onsite retrofit program funding have increased use of recycled water in the region by almost 200 percent. However, incentives alone may not be enough to spur project development - capital funding is also necessary because the LRP pays for project performance; in other words, it provides funding after a project begins operation. Metropolitan increased its LRP incentive rate in 2014, and also offers three options for an agency to receive funding. Agencies select the option that allows the project to receive incentives when they are needed, recognizing the higher costs borne by the agency and lower cost recovery at the start of operation. Although available construction funding for recycled water projects has increased under Proposition 1, projects generally still require a 50 percent local match. One source of funding is typically not enough to fund a recycled water project.

*Partnerships Can Be Successful*

History shows us that partnerships among agencies help advance use of recycled water and provide tangible benefits to each participating agency. A good example of partnerships working well is the agreement between Orange County Water District (OCWD) and the Orange County Sanitation District. This partnership began in the 1970s, when OCWD built the Water Factory 21 to produce recycled water to mitigate seawater intrusion in the Orange County Groundwater Basin. Twenty years later, the two agencies decided to jointly build the Groundwater Replenishment System (GWRS) recycled water project. The GWRS is the largest planned IPR facility in the world with a current capacity of 100 TAF per year and future expansion to 130 TAF per year.

Other examples of cooperation between agencies to further recycled water use include partnerships between the city of Los Angeles and West Basin Municipal Water District (West Basin Water Recycling Program), the City of Los Angeles and the City of Burbank (North Hollywood Water Recycling Project), City of Long Beach and the Water Replenishment District (Alamitos Barrier Water Recycling Project), and the Los Angeles County Sanitation Districts and Central Basin Municipal Water District (Century and Rio Hondo Water Recycling Project).

In addition, Metropolitan and the Sanitation Districts have been in partnership since 2009 to develop a regional recycled water project for groundwater replenishment and raw water augmentation. The Regional Recycled Water Program (RRWP) would produce up to 150 MGD of purified water from the Joint Water Pollution Control Plant in Carson. As a first step toward full implementation, Metropolitan and the Sanitation Districts cooperated to complete the Advanced Purification Center in 2019. The Advanced Purification Center is a 0.5 million gallon per day demonstration facility that will generate information needed for the potential future construction of a full-scale recycled water facility. It uses a unique application of membrane bioreactors designed to significantly increase efficiency in water recycling. Scientists and engineers will test the process, utilizing full-scale treatment modules, to ensure the resulting purified water meets the highest water quality standards. Once approved by regulators, this innovative process could be used throughout California and even applied around the globe. Metropolitan and the Sanitation Districts are continuing to move forward with the program, to enhance their partnership and begin the next phase of the program. Metropolitan's Board approved proceeding with the environmental planning phase of the project in November 2020.

Metropolitan is also in partnership with many other organizations to collaborate on this program. Potential recipients of the water, such as groundwater basin managers and member agencies, are partners. The Southern Nevada Water Authority, Central Arizona Project and Arizona Department of Water Resources are also partners, collaborating on how the project could support Colorado River water use. Metropolitan is also partnering with LADWP to work together to develop recycled water. LADWP's Operation Next Program to reuse wastewater from Hyperion is also a key project in development and could provide a potable supply for the region.

*Water Industry Organizations and Regional Collaboration Help Advance Recycled Water*

Recent advancements to recycled water development are due, in large part, to cooperation and collaboration among water and sanitation districts, as well as other water industry organizations. Historically, the WateReuse Association was one of the main advocates for recycled water development in the state. Their activities initially focused on permitting issues, public outreach/education, conferences for information sharing, and research related to recycled water. As recycled water became a core resource for water and wastewater agencies, they started to ramp up their activities to help advance recycled water and utilized partnerships with academia along with other trade organizations such as the Association of California Water Agencies, California Urban Water Agencies, WateReuse Association, and California Association of Sanitation Agencies. Professional organizations such as American Water Works Association are another vehicle to promote recycled water through research, technical seminars, and operator training and certification. These organizations have proven to be effective in promoting regional collaboration on research and leveraging resources. Recently, the Southern California Water Coalition (SCWC) has launched the Recycled Water Task Force with the goal of addressing barriers, gaining acceptance, and educating stakeholders on recycled water.

Recommendations

*Explore Opportunities to Improve Permitting Process*

- Streamline and simplify water recycling regulations with uniform administration consistent with operations, public health, and the environment
- Support legislation and regulation that expand the types of recycled water uses consistent with the protection of public health and help achieve the state's recycled water goal
- Convene a forum to discuss projects, permitting, and treatment technologies

*Improve Public Education and Awareness of Water Recycling*

- Continue to pursue unified, consistent messaging
- Consider updating signage for non-potable reuse, expanding residential fill stations, and other public outreach strategies to further advance public acceptance of recycled water
- Use demonstration facilities and learning centers like the Regional Recycled Water Advanced Purification Center to educate the public and key stakeholders about recycled water

*Explore Various Investment Strategies, Such as Incentives, Ownership, and Partnerships*

- Promote collaboration among stakeholders and agencies to facilitate implementation of recycled water projects in California

- Promote development of new financing to increase water recycling, advance research in science and technology, assess health effects, develop additional regional planning, and study innovative technologies
- Explore the development of recycled water partnerships or ownership
- Pursue the RRWP as a showcase of recycled water development
- Consider additional end user programs to replace potable water systems with recycled water
- Collaborate on pursuing grant funding

*Consider Joint Technical Studies and Projects*

- Explore integration approaches
- Investigate programs for the development of new technologies, such as comprehensive real-time monitoring devices and techniques that improve water quality and ensure public health, and maintain public confidence
- Study opportunities to protect or improve the quality of wastewater source supplies, as well as optimizing wastewater treatment for use in potable reuse applications
- Explore development of a regional study to help identify opportunities for seasonal storage
- Advance research that supports timely development of DPR regulations in California

### *Groundwater Recovery*

All Southern California groundwater basins experience varying degrees of water quality challenges as a result of urban and agricultural uses. The accumulation of high-salinity water and degradation from volatile organics are two common constraints to the economic use of groundwater for urban applications. In some cases, the threat of increased salt buildup can also complicate conjunctive use of groundwater basins and imported supplies.

Use of degraded groundwater normally requires high levels of treatment. Membrane processes used to recover the majority of severely degraded water have a high capital cost and incur a high operational cost for power. Once treated, however, recovered groundwater may be integrated into potable water systems. Metropolitan initiated its Groundwater Recovery Program (GRP) in 1991 to encourage local agencies to treat and use degraded groundwater for municipal purposes. The GRP was open to all technologies that recovered and used degraded groundwater. The GRP was retired in 1998 and folded into Metropolitan's LRP.

### *Seawater Desalination*

The constant availability of ocean water regardless of weather or climate is one of the key benefits of seawater desalination. Countries with arid or Mediterranean climates and/or growing populations with developing economies have embraced seawater desalination as a drought and climate resistant option for meeting water needs. In the past 20 years, water agencies in Australia, Spain, Singapore, Hong Kong, India, China, Israel, and other countries throughout the middle east have implemented large-scale seawater desalination plants in response to droughts and to meet growing demands. Within Southern California, San Diego County Water Authority, the City of Santa Barbara, and communities on Catalina Island have supplemented their water supplies with seawater desalination.

Seawater desalination projects provide unique benefits as part of a diversified water resource portfolio. In California, they also present unique development challenges compared to other alternative resources. Table 3-10 provides a summary of the primary benefits and challenges:

**Table 3-10**
**Summary of Benefits and Challenges of Seawater Desalination Projects**

| Benefits | Challenges |
|---|---|
| • Highly reliable potable supply resistant to weather variations and climate change<br>• Low salinity, high-quality resource improves supply blends and supports reuse<br>• Locally controlled<br>• Does not affect and is not affected by upstream or downstream water rights – truly a new supply<br>• Located near coastal population centers<br>• Supports Southern California's desalination industry cluster and innovation centers | • Expensive compared to many alternative existing supplies and some new alternative supplies<br>• Potential marine life impacts<br>• Local community and environmental opposition<br>• Permitting uncertainty and development risk<br>• Energy intensive and thus increased exposure to energy rate uncertainty<br>• Demand risk in wet years |

Metropolitan and its member agencies have been considering seawater desalination as a potential new supply source since the 1960s. Up until the 1990s, seawater desalination was considered expensive compared to other resource alternatives, especially imported water. Advances in membrane technology, energy recovery, and process design in the 1990s lowered desalination costs compared to other new supply alternatives.

By the early 2000s, several member agencies began pursuing local projects to diversify their resource portfolios. In 2001, Metropolitan created an incentive program, the Seawater Desalination Program (SDP), to support these projects. Soon after, the Board approved Metropolitan's role as a regional facilitator for seawater desalination with the purpose of assisting the member agencies with state and regional development issues. Metropolitan signed SDP agreements with Long Beach, MWDOC and West Basin in 2006. In 2014, Metropolitan merged seawater desalination projects into the LRP to promote development of additional local supplies in the region. Metropolitan's SDP agreements with the three member agencies expired in June 2020.

In order to protect California's coastal and marine resources, seawater desalination projects in the State must meet stringent environmental regulations. Relevant regulations include the California Ocean Plan and Marine Life Protected Area restrictions. Additionally, projects located near coastal generating stations are affected by the California's Once Through Cooling regulations. Each of these is discussed below:

<u>Ocean Plan Regulations</u>

In May 2015, the SWRCB updated California's Ocean Plan with regulations for new seawater desalination projects. The regulations include requirements for ocean water intakes, outfalls, brine discharges, mitigation, monitoring and permitting. Regional Water Quality Control Boards are responsible for implementing the regulations and have broad powers over project design elements.

Marine Life Protected Areas

In 2011, the California DFW adopted a system of 50 Marine Life Protected Areas (MLPAs) covering approximately 15 percent of Southern California's coastline[6]. MLPAs are defined zones along the coast where certain commercial and recreational activities are restricted. Most construction and operational activities associated with seawater desalination are prohibited in MLPAs with the exception of certain types of subsurface intakes. MLPAs are located along the Channel Islands, the mainland coast, and locations surrounding the Channel Islands. The MLPA network includes areas near planned seawater desalination projects. In October 2020, Governor Newsom announced a 30 percent by 2030 initiative. The initiative calls for preserving 30 percent of the California's lands and coastal waters by 2030. Implementation of the initiative may increase MLPAs within Southern California's coastal waters and could affect potential sites for seawater desalination projects. Additional MLPAs may also provide marine life mitigation opportunities for potential projects.

Once-Through Cooling Regulations

Prior to the revised Ocean Plan regulations, the SWRCB in 2010 adopted regulations requiring coastal power plants to phase out the use of once-through-cooling (the use of seawater to cool generators in a single-pass system) by 2030. As once-through-cooling is phased out, many of the environmental and operational benefits of co-locating seawater desalination projects with coastal power plants have been diminished. However, coastal power plants remain attractive sites for development due to the presence of coastal-dependent industrial zoned land, power infrastructure, and the potential to repurpose existing infrastructure.

### *Changed Conditions*

The status of locally planned projects changes from year to year. Metropolitan periodically surveys its member agencies for planned projects to coordinate local supply projections and plans. Recent changes in long-term strategies, regulations, and funding priorities could provide new opportunities to develop these resources.

#### *Recycled Water*

Several recent state policies and adopted codes help recycled water development as described below.

SWRCB adopted the State Recycled Water Policy (Policy) in February 2009 after several years of negotiation and amended it in 2013 to include the monitoring and analytical requirements for constituents of emerging concern (CEC). The Policy supports the SWRCB Strategic Plan to promote sustainable local water supplies and establishes a mandate to increase the use of recycled water in California by 1 MAF per year over 2002 levels (approximately 525 TAF) by 2020 and by an additional 3 MAF per year by 2030. The Policy is organized into recycled water goals, roles of agencies, salt and nutrient management plans, landscape irrigation, groundwater replenishment, anti-degradation, emerging constituents, and recycled water incentives.

SWRCB's General Permit for Recycled Water Use was adopted June 4, 2014, in response to the Governor's drought declaration and to facilitate the use of recycled water to offset potable water demands. Coverage is available to most treated municipal wastewater for non-potable uses, but specifically excludes groundwater replenishment. Monitoring for CECs is not required for non-potable uses. Application of recycled water for irrigation sites is limited to agronomic rates.

[6] http://www.wildlife.ca.gov/Conservation/Marine/MPAs/Network/Southern-California

On November 18, 2009, the Building Standards Commission unanimously voted to approve the California Dual Plumbing Code that establishes statewide standards for installing both potable and recycled water plumbing systems in new commercial, retail, and office buildings, theaters, auditoriums, condominiums, schools, hotels, apartments, barracks, dormitories, jails, prisons, and reformatories. The code was adopted January 15, 2010, with an effective date of January 1, 2011.

Assembly Bill 2071 (Levine 2014) directed the SWRCB, in consultation with other agencies, to determine if the voluntary use of disinfected treated recycled water for watering animals would pose a significant risk to the public and animal health. Use of recycled water would be prohibited for dairy animals that are producing items for human consumption. An expert panel provided recommendations in 2018 including source control, ultraviolet light disinfection, and animal health surveys. The SWRCB will require these conditions in proposed projects and update the Title 22 Water Recycling Criteria. Permit conditions for a use of recycled water not addressed by the uniform statewide water recycling criteria shall be considered on a case-by-case basis.

The SWRCB shall update the uniform statewide criteria for non-potable recycled water uses by January 1, 2023.

Assembly Bill 2282 (Gatto 2014) directed the California Building Standards Commission to adopt mandatory building standards for the installation of recycled water systems for newly constructed commercial and residential buildings in areas where there is access to a water recycling facility. These standards became effective in July 2018 but were invalidated in 2019 for not complying with the Administrative Procedure Act. The California Building Standards Commission is expected to hold new workshops to address requirements.

Assembly Bill 574 (Quirk 2017) specifies that "direct potable reuse" includes "raw water augmentation" and "treated drinking water augmentation." The bill also changed the term "surface water augmentation" to "reservoir water augmentation" and redefined that term to mean the planned placement of recycled water into a raw surface water reservoir used as a source of domestic drinking water supply for a public water system or into a constructed system conveying water to such a reservoir. This bill mandates the following: 1) requires the SWRCB, on or before December 31, 2023, to adopt uniform water recycling criteria for DPR through raw water augmentation, 2) requires the SWRCB to establish and administer an expert review panel, and would require the SWRCB, before adopting the uniform water recycling criteria, to submit the proposed criteria to the expert review panel; 3) prohibits the SWRCB from adopting the uniform water recycling criteria until the expert review panel adopts a finding that the proposed criteria would adequately protect public health; 4) allows the SWRCB to extend the date by which the uniform water recycling criteria are to be adopted if certain criteria are met; and 5) authorizes the SWRCB, after it has adopted the initial uniform water recycling criteria, to reconvene or reestablish the expert review panel.

### *Groundwater Recovery Brine Disposal*

The management of existing regional brine lines and the development of new brine line systems will be a critical factor in the continued growth in brackish groundwater desalination. Brine lines will also be applicable for disposing brine from advanced treatment of wastewater for recycled water use. All processes that recover degraded groundwater also produce concentrated waste flows for which disposal can be problematic. Most importantly, membrane processes such as reverse osmosis—the predominant desalting technology used in Southern California—produce significant volumes of brine that can account for about 15 percent of the treated water. In Southern California, brines generated from brackish water desalination are typically disposed through dedicated brine lines to ocean outfalls or sanitary sewers.

The region currently has two operating brine lines: the Santa Ana Regional Interceptor (SARI line) and the Calleguas Regional Salinity Management Pipeline. The SARI line collects brine from desalters in San Bernardino, Riverside, and Orange Counties and discharges to a treatment plant operated by the Orange County Sanitation Districts (OCSD), with final discharge through the OCSD ocean outfall. A key benefit of the SARI line is that it has allowed inland water agencies to recover impaired groundwater resources which would otherwise be unusable.

A lower portion of the Calleguas Regional Salinity Management Pipeline is in operation while the upper reach is still under construction. The Calleguas Regional Salinity Management Pipeline delivers brine from recycled water plants and groundwater desalination facilities in Ventura County to the ocean.

A third regional line is in the planning phase in San Diego County. The Southern California Salinity Coalition, a coalition of water and wastewater agencies, has advocated for state and federal financial assistance to build these regional brine lines.

### *Seawater Desalination*

Changed conditions for seawater desalination include sustained operations of the Carlsbad Seawater Desalination plant, state and federal funding opportunities, and increased permitting uncertainty.

#### Carlsbad Desalination Project Operations

In 2015, the San Diego County Water Authority (SDCWA) started taking delivery of supplies from the Carlsbad Desalination Project (Carlsbad Project). The Carlsbad Project is the largest seawater desalination in the United States with a capacity of 50 MGD, or 56 TAF per year. The SDCWA developed the Carlsbad Project under a Public-Private Partnership with Poseidon Resources Inc. Production from the project is guided by a Water Purchase Agreement which specifies minimum and maximum purchases and also determines the price SDCWA pays for the supplies from the project. The following Table shows production from the Carlsbad Project since 2015.

**Table 3-11**
**Claude Bud Lewis Carlsbad Seawater Desalination Program Production[1]**

| Fiscal Year Ending | Production (AF) |
|---|---|
| 2016 | 27,349 |
| 2017 | 40,421 |
| 2018 | 40,907 |
| 2019 | 46,036 |
| 2020 (est.) | 43,868 |

[1] Source: SDCWA

#### State and Federal Funding Opportunities

Several State and Federal funding opportunities exist to promote the development of seawater desalination projects. Within California, the Department of Water Resources (DWR) provides funding through the Water Desalination Grant Program. DWR taps limited funds for the Grant

Program from Proposition 1 and in the past from Proposition 50. As of January 2020, the Grant Program has funded over $100 million in grants for 70 projects. The program funds new construction, demonstration projects, and research studies. It also covers brackish water desalination projects. In 2018, DWR converted the program to a continuous application process.

Federal funding for desalination projects includes programs administered by the United States Bureau of Reclamation (USBR) and the Department of Energy (DOE).

USBR promotes desalination through its Desalination and Water Purification Research Program (DWPRP). Under DWPRP, USBR funds research, pilot tests and demonstration projects to improve technologies for desalination and brine management. Program goals include reducing desalination costs, energy use and environmental impacts. USBR operates the Brackish Groundwater National Desalination Research Facility and other desalination technology testing laboratories as part of the program. Several member agencies have received DWPRP grants for local desalination projects.

The DOE established a new Water-Energy desalination hub called the National Alliance for Water Innovation (NAWI). NAWI's focus is to accelerate the development of early-stage desalination technologies in order to lower desalination's costs and energy use. Led by Lawrence Berkeley National Laboratory, NAWI is a consortium of national laboratories, university researchers, private companies and water industry stakeholders. DOE is funding NAWI with $100 million over a five-year period starting in 2020. While the focus of NAWI is early-stage pre-commercial technologies, water agencies will have opportunities to participate in research projects and pilot tests. Water agencies will also help guide NAWI's research agenda. Metropolitan joined NAWI in 2020.

### *Implementation Approach*

#### *Local Resources Program*

The Local Resources Program (LRP) is the primary tool for Metropolitan to incentivize local resources development. The success of the LRP is due to its adaptability to changed conditions. Periodically, Metropolitan and its member agencies review and update the LRP in response to water supply conditions.

In October 2018, Metropolitan's Board authorized an interim program target of 170 TAF since the program target established in 2007 of 174 TAF was nearly subscribed. The executed agreements, in combination with submitted and proposed LRP applications, exceeded the remaining program capacity under the 2007 LRP target. By establishing an interim target, Metropolitan continues to encourage and support development of local supplies. The interim target may be revised upon completion of the 2020 IRP.

#### *On-Site Retrofit Program*

Metropolitan continues to explore ways to help increase recycled water use. In order for a site to receive recycled water, the potable water systems must be retrofitted for recycled water use. In July 2014, to catalyze an increase in recycled water use, Metropolitan established the On-site Retrofit Program to provide financial incentives directly to public or private property owners to convert potable water irrigation or industrial water systems to recycled water service. The goal of this program is to alleviate some of the costs borne by property owners to retrofit their sites. The program offers a rebate of up $195/AF for five years of estimated water savings, capped at actual retrofit costs. Eligible items include retrofit costs related to project design, permitting, construction, connection fees, and required recycled water signage. The program currently has an annual budget of $2 million and is accepting applications on a first-come, first-served basis until funding is exhausted.

### *Stormwater Pilot Programs*

Metropolitan's 2015 IRP Update called for the development of a diverse resource portfolio through local supply projects – including recycled water, groundwater recovery, seawater desalination, and stormwater capture. Metropolitan has played an active role in the development of those local supplies through different approaches and programs developed over the years. Since 1982, Metropolitan has provided incentives to its member agencies to develop local projects through the LRP. Local stormwater capture projects currently are not funded through the LRP in part due to the need to have a better understanding of the connection between captured stormwater and yield.

In 2018, the SCWC published a white paper that detailed benefits and challenges associated with stormwater development. Although stormwater projects deliver multiple benefits, such as supply yield, flood mitigation, habitat creation, and water quality improvements, some of the main challenges with developing stormwater projects are related to costs, metering, data collection, and water supply yield. The relationship between stormwater capture and yield has not been extensively analyzed. In addition, most projects do not demonstrate a direct link to increased groundwater production or yield. This limits the ability to fully characterize stormwater capture project costs or to quantify the water supply benefit.

To better understand the actual costs and potential benefits associated with stormwater capture, yield, and reuse, Metropolitan developed two Stormwater Pilot Programs. The Direct Use Pilot Program aims to develop costs and benefits associated with capture and direct reuse of stormwater. Under this pilot, projects are required to capture stormwater onsite or through storm drain diversion. In addition, projects must meter both captured and reused stormwater. The Recharge Pilot Program was initiated to further examine the relationship between stormwater capture and yield. The Recharge Pilot requires participants to measure both stormwater capture and how much of the captured water reaches the primary pumping and subsequently allows for increased groundwater production or yield. Proposed methods for measuring how stored water recharges the primary pumping aquifers must use at least one physical method and one modeling method. This pilot will help collect data to better understand how stormwater recharge affects usable groundwater. Both pilots provide funding for new construction and installation of monitoring equipment. Additionally, both pilots provide funding for collecting three years of monitoring data. The Direct Use Pilot launched in January of 2020 with a $5.0 million budget, while the Recharge Pilot launched shortly after in March 2020, with a budget of $7.5 million.

The data collected from the pilot programs will provide a better understanding of stormwater projects and their performance. Providing funding to offset construction and monitoring costs alleviates a key constraint in project development and the ability to quantify stormwater volumes. Furthermore, the data collected from the pilot programs will help evaluate the water supply benefits delivered by stormwater projects and provide a basis for potential future funding approaches.

### *Regional Recycled Water Program*

The Regional Recycled Water Program, a partnership with the Los Angeles County Sanitation Districts, will purify wastewater that currently flows to the ocean to produce high quality water that could be used again. On November 10, 2015, Metropolitan's Board authorized Metropolitan to enter into an agreement with the Sanitation Districts to implement a demonstration-scale recycled water treatment plant and to establish the framework of terms and conditions for development of a regional recycled water supply program. Under this agreement, Metropolitan has the opportunity to work collaboratively with the Sanitation Districts to develop a potential regional recycled water supply program that would purify and reuse water. Metropolitan and

the Sanitation Districts would jointly develop this program to purify effluent from the Sanitation Districts' Joint Water Pollution Control Plant (JWPCP) using advanced treatment technologies to produce water that is near-distilled in quality and that would be equal to or better than the quality of water currently used to replenish groundwater basins in the Southern California region. The purified water would be delivered to Metropolitan's member agencies to meet their groundwater replenishment and storage requirements. A collaboration between the two districts could advance the reuse of water at a scale, timing, and strategic location to serve the direct needs of multiple member agencies for recharge of groundwater basins in Southern California, and to augment regional supplies for Metropolitan's service area. In addition, with the development of regulations for raw water augmentation, purified water may eventually be blended with imported supplies at Metropolitan's treatment plants and delivered to additional member agencies.

In October 2019, the agencies began operating the Regional Recycled Water Advanced Purification Center, a 0.5 million gallon per day demonstration facility. The facility will generate information needed for the potential future construction of a full-scale advanced water plant. It uses a unique application of membrane bioreactors designed to significantly increase efficiency in water recycling. Scientists and engineers will test the process, utilizing full-scale treatment modules, to ensure the resulting purified water meets the highest water quality standards. Once approved by regulators, this innovative process could be used throughout California and even applied around the globe. Following approval, additional treatment trains will be tested to determine the needed purification processes for a full-scale program.

The full-scale regional RRWP would produce up to 150 million gallons daily, enough to serve more than 500,000 homes. Purified water from the advanced treatment facility would be delivered through 60 miles of new pipelines to the region's groundwater basins, industrial facilities, and potentially two of Metropolitan's treatment plants. Metropolitan prepared feasibility analyses for the RRWP (the Feasibility Study, Report No. 1530) in November 2016 and Conceptual Planning Studies Report (Report 1618, February 21, 2019) in preparation for environmental review and preliminary design. Letters of intent have also been executed with key partners.

In November 2020, Metropolitan's Board of Directors approved the next phase of the program, environmental planning. In addition, the Board also approved an updated agreement with the Sanitation Districts, which further expands the partnership and allows for additional shared responsibilities and resources.

### Future Supply Actions

Metropolitan supports the development of local supplies through the FSA Funding Program. FSA are low cost, low risk investments Metropolitan can take now to remove barriers to new supplies so that they can be accelerated in the future, if when needed. The FSA Funding Program is Metropolitan's primary vehicle for promoting innovative new approaches to local supply development. Under the FSA Funding Program, Metropolitan funds member agency studies addressing development challenges for groundwater, recycled water, stormwater and seawater desalination supplies. The goals of the FSA Funding Program include:

- Reduce barriers to future resource production
- Provide results that are unique, yet transferable to other areas in the region
- Advance the field of knowledge
- Represent a critical path to water resource implementation

Metropolitan implemented an initial round of FSA funding in 2013 and launched a second round of funding in 2019. Both rounds have funded a mix of white papers, pilot tests and demonstration studies. The program funds a maximum of $500,000 per study or per agency. In 2018, Metropolitan also co-funded six potable reuse projects and one agricultural reuse study under the FSA Funding Program with the Water Research Foundation. Metropolitan's nearly $1.0 million in co-funding supports WRF's $8.0 million Advancing Potable Reuse Initiative and helped match $4.5 million in State Water Resource Control Board grant funds. Table 3-12 provides a summary of the FSA funding.

**Table 3-12**
**Summary of FSA Funding**

| | 2013 FSA Member Agency Studies | | 2018 FSA Member Agency Studies | | 2018 WRF Potable Reuse Studies | |
|---|---|---|---|---|---|---|
| | **Studies** | **Funding** | **Studies** | **Funding** | **Studies** | **Funding** |
| Groundwater | 4 | $900,000 | 3 | $661,000 | | |
| Recycled Water | 5 | $810,000 | 5 | $1,265,000 | 7 | $975,000 |
| Stormwater | 2 | $814,000 | 4 | 865,000 | | |
| Seawater Desalination | 2 | $325,000 | 2 | $365,000 | | |
| **Total Funding** | **13** | **$2,939,000** | **14** | **$3,156,000** | **7** | **$975,000** |

Metropolitan also supports local supply development as a regional facilitator for seawater desalination and related resource issues. This includes assisting member agencies with technical issues, supporting member agency projects during permit hearings, coordinating responses to proposed regulations, and collaborating with the member agencies to address development challenges. Metropolitan helped launch and now participates in CalDesal, a consortium of water utility and private stakeholders promoting desalination as an element of California's future supply portfolio.

### *Achievements to Date*

Metropolitan has continued to develop and refine its programs to encourage the involvement of its member agencies in water recycling, groundwater recovery, and desalination. Developing and managing these programs requires considerable coordination and refinement. Changing conditions over the last five years have reduced the costs of these options and allow Metropolitan to rely on these sources for future water supply.

Table 3-13 provides a summary of the status of local agency seawater desalination projects that are under development within Metropolitan's service area. Local agencies are considering several projects with the potential to produce up to 131 TAF, if developed.

Metropolitan is committed to providing financial assistance to the development of water recycling projects throughout its service area. Since 1982, Metropolitan has executed LRP contracts for 85 recycled water projects, 75 of which produced about 138 TAF in 2019. Local projects not receiving funding from Metropolitan provide an additional 370 TAF of recycled water to the region.

Since 1991, Metropolitan has executed GRP and LRP contracts for 27 recovered groundwater projects, 24 of which produced about 50 TAF in 2019. In addition to the projects under

Metropolitan's programs, about 62 TAF of degraded groundwater is recovered by agencies in Metropolitan's service area without Metropolitan's financial assistance.

Table 3-14 provides a summary of recycled water use and groundwater recovery in FY 2019-20. To date, Metropolitan has invested $510 million in recycling programs and $173 million for groundwater recovery. Table 3-15 provides a summary of the groundwater and recycled water production and incentive payments under Metropolitan's programs to date.

**Table 3-13**
**Seawater Desalination Projects Under Development within Metropolitan's Service Area[1]**

| Project | Member Agency Service Area | Planned Capacity AF per Year | Status as of September 2020 |
|---|---|---|---|
| Huntington Beach Seawater Desalination Project | Orange County Water District / Municipal Water District of Southern California | 56,000 | Permitting |
| West Basin Ocean Desalination Project | West Basin Municipal Water District | 20,000 to 60,000 | Environmental Impact Report |
| Doheny Desalination Project | South Coast Water District / Municipal Water District of Orange County | 5,000 to 15,000 | Permitting |
| **Total: Potential Projects** | | **81,000 – 131,000** | |

[1] Does not include potential seawater desalination projects in Mexico which could supply Metropolitan's service area through direct deliveries or through exchanges.

**Table 3-14**
**FY 2019-20 Water Production from Recycling and Groundwater Recovery**
(TAF)

| Type of Project | With Metropolitan Funding | Without Metropolitan Funding | Total |
|---|---|---|---|
| Recycled Water[1] | 71 | 370 | 441 |
| Groundwater Recovery | 50 | 62 | 112 |
| **Total** | **121** | **432** | **553** |

[1] Excluding Santa Ana River baseflow.

**Table 3-15**
**Local Resources Program**

| | Recovered Groundwater | Recycled Water | Total |
|---|---|---|---|
| **Projects** | | | |
| Contracted | 27 | 85 | 112 |
| In Operation | 24 | 76 | 100 |
| Ultimate Yield (TAF) | 124 | 348 | 472 |
| **Deliveries (TAF)** | | | |
| FY 2019-2020 | 50 | 71 | 121 |
| Since Inception | 1,052 | 2,972 | 4,024 |
| **Payments ($ millions)** | | | |
| FY 2019-2020 | $4 | $13 | $17 |
| Since Inception | $173 | $510 | $683 |

## 3.6 Surface Storage and Groundwater Management Programs: Within the Region

Since the 1950s, local water management in Metropolitan's service area has included the surface water storage and conjunctive use of groundwater. Conjunctive use of water refers to the use and storage of imported surface water supplies in groundwater basins and reservoirs during periods of abundance. This stored water is available for use during periods of low surface water supplies as a way of augmenting seasonal and multiyear shortages.

### *Background*

Metropolitan established general long-term storage guidelines in its Water Surplus and Drought Management (WSDM) Plan. The WSDM Plan provides for flexibility during dry years, allowing Metropolitan to use storage for managing water quality, hydrology, SWP, and Colorado River issues. Dry-year surface storage yields have been characterized in several ways, including delivery capabilities over two- and three-year dry periods. The approach used in Metropolitan's resource planning assumes that dry-year surface storage can be used as needed and as available within the WSDM planning framework. In addition to surface reservoirs in the region, storage capacity in the region's groundwater basins allows for conjunctive use programs. In 2000, the Association of Ground Water Agencies (AGWA) published Groundwater and Surface Water in Southern California: A Guide to Conjunctive Use that estimated the potential for dry-year or long-term conjunctive use in Metropolitan's service area at approximately 4.0 MAF. In 2007, Metropolitan published the Groundwater Assessment Study that estimated 3.2 MAF of space in groundwater basins available for storage within Metropolitan's service area. Metropolitan's 1996 IRP calls for the development of conjunctive use programs with member agencies and groundwater basin managers to store surplus imported supplies in wet years to provide dry-year supplies.

To prepare for supply disruptions, Metropolitan and its member agencies have adopted goals for water storage within the region. Metropolitan has identified in-region storage that should be set aside for use in emergencies, such as a disruption to imported supplies due to a major seismic event at the San Andreas Fault.

### *Implementation Approach*

#### *Surface Storage*

Since the beginning of Metropolitan's planning process, two significant changes have occurred to regional surface storage: (1) the construction of DVL, and (2) Metropolitan receiving operational control of 218,940 AF in Castaic Lake and Lake Perris.

<u>Diamond Valley Lake</u>

Construction of Southern California's newest and largest reservoir nearly doubled the area's surface water storage capacity. Transport of imported water to the lake began in November 1999, and the lake reached capacity in early 2003. DVL holds up to 810 TAF, some of which is for dry-year or seasonal storage, and the remainder for emergency storage.

<u>SWP Terminal Reservoirs</u>

Under the 1994 Monterey Agreement and Amendment, Metropolitan is permitted to withdraw up to 218,940 AF in the reservoirs at the southern terminals of the California Aqueduct. Access to this storage capacity in Castaic Lake (153,940 AF) and Lake Perris (65,000 AF) gives Metropolitan greater flexibility in handling supply shortages. Any amount of water withdrawn in a year must be replaced with supplies available to Metropolitan within five years.

### *Groundwater Storage*

Many local groundwater storage programs have been implemented over the years to maximize the use of local water supplies. These programs have included the diversion of water flows into percolation ponds for recharging groundwater basins and the recovery of degraded groundwater.

- For many years, flood control agencies within Metropolitan's service area have captured and spread stormwater for groundwater replenishment. Local runoff and reclaimed water have been conserved via spreading grounds, injection wells, reservoirs, and unlined river channels. In addition, flood control agencies have operated seawater barrier projects in Los Angeles and Orange Counties to prevent seawater intrusion into the coastal groundwater basins.
- Water quality issues have raised serious concerns about the ability to sustain average annual production levels in some groundwater basins. For example, recently recognized threats to groundwater basins posed by emerging contaminants such as per- and polyfluoroalkyl substances (PFAS) have affected groundwater production in many areas. Groundwater levels have been augmented by groundwater water recovery projects discussed in Section 3.5.

Conjunctive use of the aquifers offers an important source of dry year supplies. Unused storage in Southern California groundwater basins can be used to optimize imported water supplies, and the development of groundwater storage projects allows effective management and regulation of the region's major imported supplies from the Colorado River and SWP. Over the years, Metropolitan has implemented conjunctive use through various programs. Typically, this storage takes place in one of two ways:

- Direct deliveries to storage – Metropolitan delivers recharge water directly to water storage facilities, including spreading sites and injection wells.
- In-lieu deliveries to storage – Metropolitan delivers water directly to a member agency's distribution system for use by the member agency rather than, or in-lieu of, pumping the groundwater it otherwise would have taken out of storage. The deferred local production results in water being left in local storage (surface or groundwater) for future use.

Metropolitan has developed a number of local programs to work with its member agencies to increase stored water in groundwater basins through conjunctive use. Conjunctive use agreements provide for storage of imported water that can be called for use by Metropolitan during dry, drought, or emergency conditions. During a dry period, Metropolitan has the option to call water stored in the groundwater basins pursuant to its contractual conjunctive use agreements. At the time of the call, the member agency pays Metropolitan the prevailing rate for that water. Metropolitan has drawn on dry-year supply from nine contractual conjunctive use storage programs to address shortages from the SWP and the Colorado River.

Metropolitan has also made use of the basins to manage its water supply resources through programs such as its cyclic agreements. Cyclic programs allow Metropolitan to deliver water into groundwater basin or surface water reservoir before the agency has a demand for water. Advanced deliveries allow Metropolitan to manage high-supply availability when its own storage capacity is limited. The member agency purchases the delivered water based on a long-term schedule agreed by the parties. Although cyclic programs do not hold stored water for Metropolitan, they provide water resource management flexibility, especially when storage capacity is restricted.

### *Achievements to Date*

In 2000, Metropolitan entered an agreement with DWR to administer $45 million of Proposition 13 state bond funds for Metropolitan's Southern California Water Supply Reliability Projects Program. Metropolitan paired the $45 million of state funds with $35 million of Metropolitan capital funds to develop nine groundwater storage programs in partnership with member and retail agencies and groundwater basin managers. These nine contractual storage programs have an initial 25-year term and provide for storage of up to 212 TAF and dry-year yield of up to 70 TAF. These programs are summarized in Table 3-16. Since inception, the conjunctive use program has been exercised to store water in groundwater basins during wet periods and relied upon to extract that water during dry periods. For example, during the recent drought period from 2012 to 2016, the conjunctive use program provided 64,000 AF of dry year supply to help Metropolitan meet regional demands. As of January 2020, the conjunctive use storage balance is 61,000 AF.

In 2007, Metropolitan prepared the Groundwater Assessment Study Report in collaboration with its member agencies and with groundwater basin managers. The report finds that while there is substantial storage space in service area groundwater basins that could be used for conjunctive use, there are significant challenges that must be overcome in order to implement additional storage programs. Use of additional storage opportunity requires:

- Capture, delivery, and recharge of additional local and imported surface supplies;
- Improved capability to store available surplus surface supplies with adequate conveyance and recharge capacity; and
- Resolution of constraints including: remediation of contamination, institutional and legal issues, funding for significant investment in capital infrastructure, and incongruity between aquifer capability with overlying demand for water supplies.

To follow up on the findings of the Groundwater Assessment Study Report, Metropolitan initiated a series of seven groundwater workshops beginning in July 2008 among Metropolitan, member agencies, groundwater basin managers, and stakeholders to discuss challenges for increasing conjunctive use and to develop recommendations for addressing the challenges. The workgroup's recommendations were submitted as a Board Report to Metropolitan's Board of Directors and provided as input to Metropolitan's current planning process. The recommendations are as follows:

1. Enhance groundwater replenishment with increased stormwater, recycled water, and imported water recharge.
2. Streamline requirements, remove policy constraints, clarify procedures, increase coordination and sharing of information to accomplish recharge goals.
3. Develop flexible regional policies and programs that can be tailored to meet specific local needs of each groundwater basin.
4. Increase integration of local groundwater and regional water supplies with a proposal for a comprehensive modeling study to initiate review of innovative opportunities.
5. Use appropriate price signals to encourage conjunctive use and investments for storage.
6. Increase coordination among Metropolitan, member agencies, basin managers, groundwater producers, and stakeholders inclusive of collaboration for legislative, regulatory, and educational efforts in support of specific initiatives and funding needed for sound groundwater management.

Metropolitan has given updates of the Groundwater Assessment Study to the Board in 2011, 2015, and 2018.

Since 2013, Metropolitan has also been working with the SCWC Stormwater Task Force to evaluate the feasibility of further supporting groundwater production with increases in stormwater capture for groundwater replenishment. Metropolitan remains actively involved in the SCWC Stormwater Task Force. In 2019, the Stormwater Task Force developed a white paper that discussed innovative project implementation and enhanced operation and maintenance strategies. Metropolitan staff gave a presentation on the stormwater pilot program at the annual workshop on September 27, 2019. The workshop brought together more than 200 participants, including local agencies, regional planners, and non-government agencies for a discussion on regional stormwater issues. In 2020, due to the global pandemic, the Stormwater Task Force hosted a series of short informational webinars related to water resources development and innovative stormwater projects.

**Table 3-16**
**Contractual Conjunctive Groundwater Projects**

| Project and Project Proponents | Storage Capacity (TAF) | Dry-Year Yield (TAF/Year) | Storage Account Balance as of 01/01/2020 (TAF) |
|---|---|---|---|
| **LOS ANGELES COUNTY** | | | |
| **Long Beach Conjunctive Use Project**<br>Long Beach | 13.0 | 4.3 | 3 |
| **Foothill Area GW Storage Project**<br>Foothill MWD | 9.0 | 3.0 | 0 |
| **Long Beach CUP: Expansion in Lakewood**<br>Long Beach | 3.6 | 1.2 | 0 |
| **City of Compton Conjunctive Use Program**<br>City of Compton | 2.3 | 0.8 | 0 |
| **Upper Claremont Heights Conjunctive Use**<br>Three Valleys MWD | 3.0 | 1.0 | 1 |
| **ORANGE COUNTY** | | | |
| **Orange County GW Conjunctive Use Program**<br>OCWD, MWDOC | 66.0 | 22.0 | 0 |
| **SAN BERNARDINO COUNTY** | | | |
| **Chino Basin Programs**<br>IEUA, TVMWD, Chino Basin Watermaster | 100.0 | 33.0 | 49 |
| **Live Oak Basin Conjunctive Use Project**<br>Three Valleys MWD | 3.0 | 1.0 | 0 |
| **RIVERSIDE COUNTY** | | | |
| **Elsinore Groundwater Storage Program**<br>Western MWD, Elsinore Valley MWD | 12.0 | 4.0 | 8 |
| **Total** | **211.9** | **70.3** | **61** |

## 3.7 Water Use Reduction

In November 2009, Governor Arnold Schwarzenegger signed the Water Conservation Act of 2009 (SB X7-7) into law as part of the historic comprehensive water package designed to address the State's growing water challenges. The Act represented the culmination of efforts by water industry leaders (including Metropolitan), the environmental community, and the Legislature to enact legislation that would answer the governor's call for the state to reduce per capita water use 20 percent by the year 2020 (referred to as "20x2020") as part of a larger effort to ensure reliable water supplies for future generations and restore the Bay-Delta.

The 20x2020 legislation requires urban retail water suppliers to develop urban water use targets to help meet the 20 percent reduction in water use by 2020, with interim targets for 2015. The legislation provides flexibility in how targets are established and achieved. Per capita reductions can be accomplished through any combination of increased water conservation, improved water use efficiency, and increased use of recycled water to offset potable demand. Potable demand offsets can occur through direct reuse of recycled water, such as for irrigation, or IPR through groundwater replenishment and reservoir water augmentation. Retail water suppliers receive partial credit for past efforts in conservation and recycled water; therefore, not all agencies need to reduce demand by 20 percent in order to comply with the law.

### *Achievement as of 2020*

As a wholesale water agency, Metropolitan is not required to establish or report an urban water use reduction target. However, Metropolitan's regional conservation programs and local resource programs are designed to assist member agencies and retail water suppliers in the service area to comply with SB X7-7. These programs are described in Sections 3.4 and 3.5. Therefore, Metropolitan monitors the progress of its service area.

Based on an analysis of population, demand, and the methodologies for setting targets described in the legislation, Metropolitan's baseline per capita water use is 182 GPCD and the 2020 reduction target is 146 GPCD. From 2011 to 2014, there was a slight increase in per capita water use explained in part by continued economic recovery and drier weather as compared to previous years. With mandatory restrictions from the state and water supply allocation from Metropolitan, Metropolitan's 2015 UWMP reported an interim water use reduction achievement of 131 gallons per capita per day (GPCD), which is a 28 percent reduction from the baseline.

Over the last five years, Metropolitan continued to provide support for retail agency water use reduction efforts through technical assistance, legislation, code and standards updates, and financial incentives where needed to increase water use efficiency. Based on best available data as of January 2021, Metropolitan estimates a 2019 per capita water use of 121 GCPD, well exceeding Metropolitan's 2020 water use target of 146 GPCD with a 34 percent reduction from the baseline of 182 GPCD.

**Figure 3-4 Potable Per Capita Water Use: 20% Reduction by 2020 Metropolitan's Service Area (Calendar Year)**

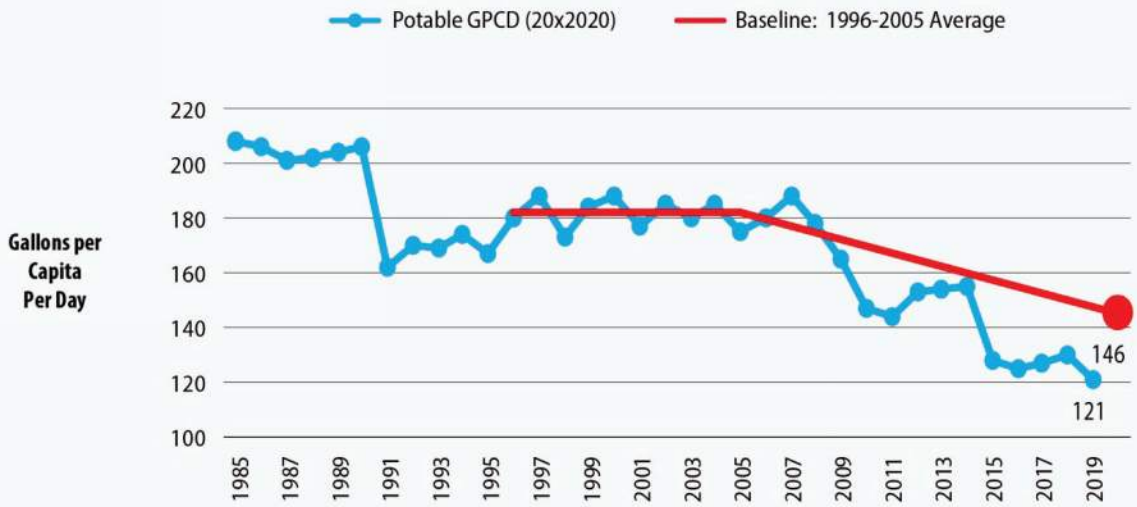


Notes:
1. Calendar year data.
2. 2019 GPCD based on best available data as of January 2021 and is subject to change.
3. Baseline per capita water use based on 1996-2005 average (182 GPCD).
4. Target GPCD for 2020 based on 20% reduction from baseline (146 GPCD).

## 3.8 Energy Management Initiative

Metropolitan's mission is to provide its service area with an adequate and reliable supply of high-quality water to meet present and future needs in an environmentally and economically responsible way. The conveyance, treatment, and distribution of water is an energy-intensive and energy-dependent process, and as such, Metropolitan has goals of controlling operational costs and conserving valuable natural resources.

Metropolitan's net energy use and costs are dominated by the pumping (transport) required to import water via the Colorado River Aqueduct (CRA) and State Water Project (SWP) systems (Figure 3-5). Given that Metropolitan does not have direct control over operations of the SWP, its energy strategy focuses exclusively on the energy use and cost for CRA operations (wholesale power) and for Metropolitan's distribution, treatment, and office facilities (retail power), which on average total $43.1 million per year.

**Figure 3-5**
**Metropolitan's overall electricity requirements and cost (average 2013-2018)**

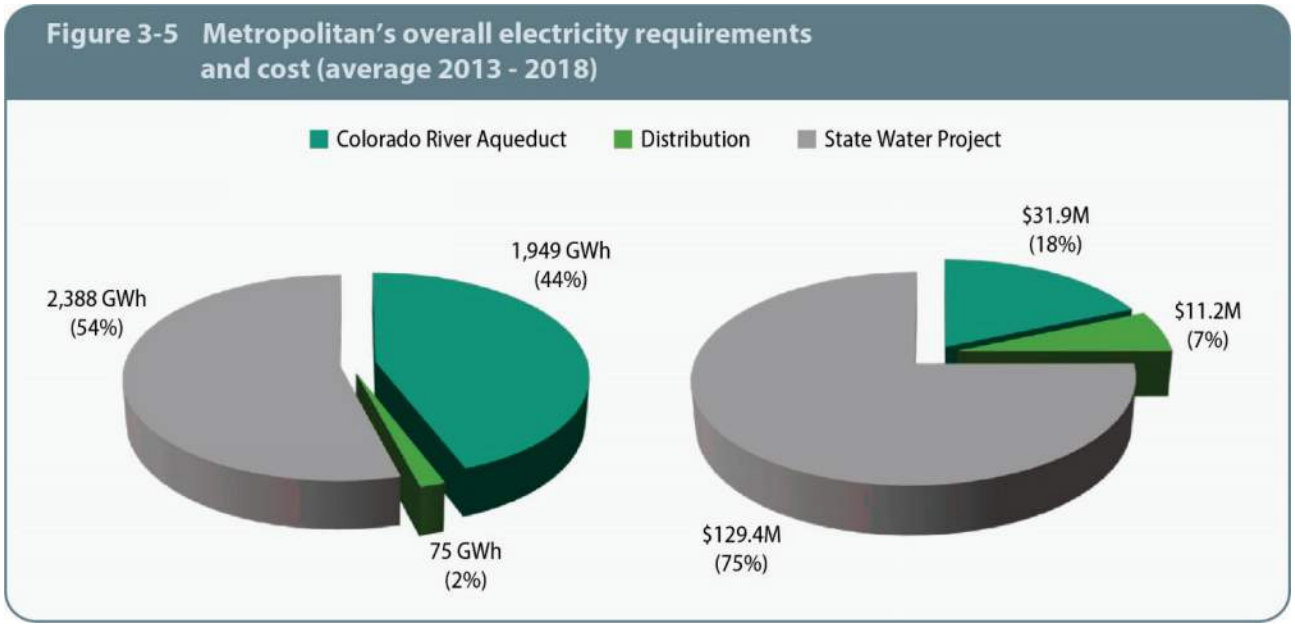


Over the past several decades, Metropolitan has implemented many energy initiatives that have reduced energy costs and use, while diversifying its energy portfolio. These have included 130 megawatts (MW) of small hydropower generating facilities, 5.5 MW of solar power generation installations[7], and a 50-year agreement executed in 2017 to receive low-cost carbon-free hydropower from Hoover Dam for CRA operations. Despite these efforts, external factors have resulted in increased energy costs. Five major drivers influence the future energy market and Metropolitan's corresponding energy sustainability strategy, including:

- *Progression of environmental regulations*. California is leading the nation with energy and environmental policy initiatives that are driving electrical grid changes. In particular, California's shift to renewables and carbon-free energy by 2045 (Senate Bill 100) is a primary

[7] This includes 5 MW of solar power capacity located at three of Metropolitan's treatment plants and 0.5 MW located at Diamond Valley Lake.

driver in future energy dynamics and will impact both the cost and volatility of energy markets.

- *Energy market pricing uncertainty*. Approximately 50 to 85 percent of Metropolitan's energy for CRA pumping is supplied from low-cost federal hydropower, and the balance is supplied from supplemental purchases of wholesale energy from the market. The adoption of recent policies and state goals in greenhouse gas (GHG) emission reductions and environmental protection are fundamentally changing the wholesale electric grid and its operation. The high penetration of renewable generation across the state resulted in the "duck curve" effect which has shifted peak prices from periods when demand is highest (typically midday) to periods in which solar generation declines (typically evening hours) (CAISO load minus solar generation is shown in Figure 3-6). In certain times of the year, a significant net load increase occurs when solar generation decreases at the end of the day. This increase must be mitigated by conventional fossil fired energy generators. This effect also creates over-generation during the middle of the day, which produces a "belly" appearance, and a steep ramp for fossil fuel generators during the late afternoon and evening, creating an "arch." The consequent changes in wholesale and retail energy price and structures are impacting hourly energy costs and operations at Metropolitan.

**Figure 3-6**
**CAISO's duck curve of average net electric load for a spring day in California**

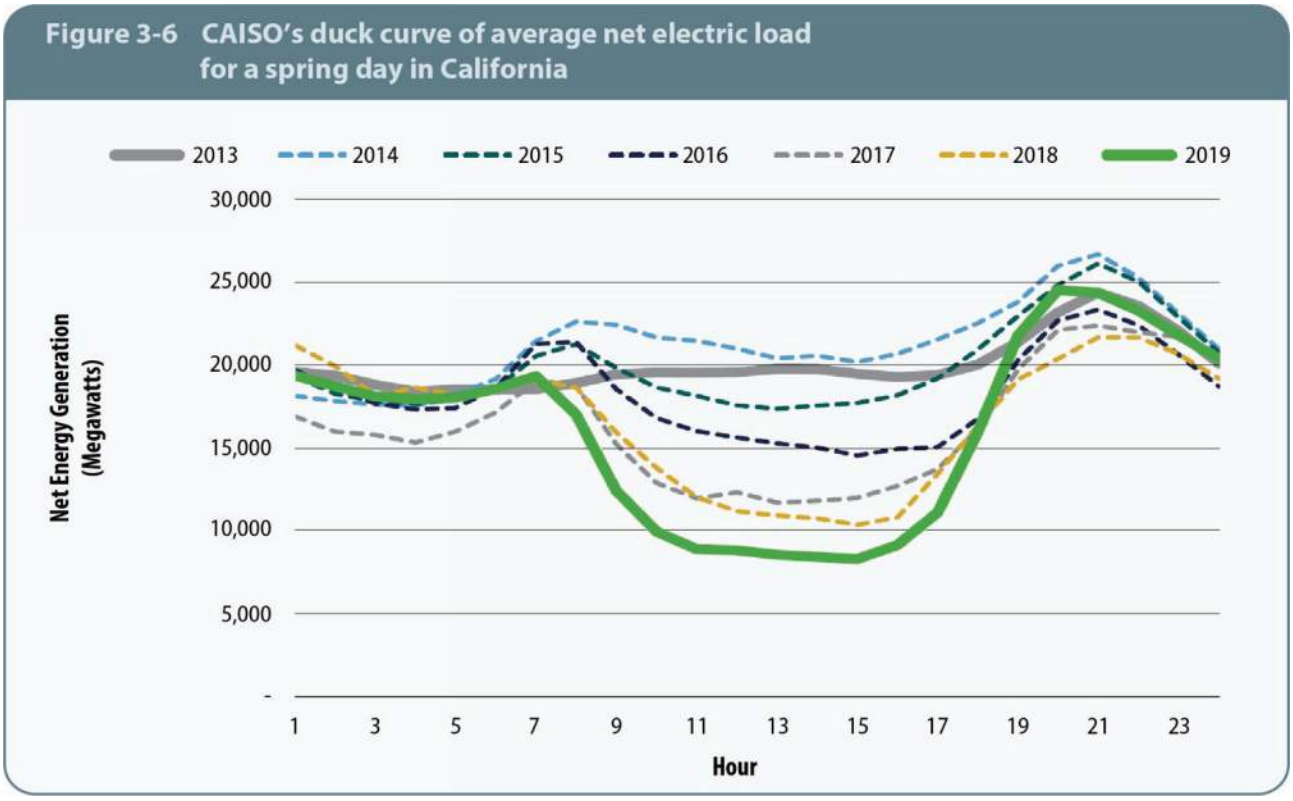


Source: IEA, 2019

- *Grid reliability*. California has historically depended on fossil-fired generation to provide for the bulk of its energy needs, as well as peaking capacity and operating reserves to balance the system and compensate for system contingencies. The state's environmental policies to reduce fossil generation emissions and cooling water impacts have and will continue to result in the retirement of fossil generation throughout the state and the region. The transition to renewable, non-emitting generation creates challenges for grid operators without the traditional sources of on-demand, fast-ramping capacity.
- *Climate change and natural disasters*. Natural disasters and a changing climate pose substantial risks to the availability and price of energy for Metropolitan. While the timing and extent of these events are unpredictable, their effects can be anticipated and estimated. The main challenge for Metropolitan and its energy providers will be to develop and nimbly execute energy management initiatives that preserve a high degree of long-term flexibility and stable costs.
- *Technological advances and incentives*. New technological advancements and improved practices in the renewable energy and energy storage sectors provide viable options for Metropolitan's long-term energy management goals. For example, energy storage systems are able to capture the energy generated by renewables and store it until the energy is needed. Energy storage can address the power intermittency challenges from renewables and effectively increase utility resiliency and reliability. Several incentive and credit programs are also available, such as the California Public Utilities Commission Self-Generation Incentive Program, to further improve the economic feasibility of battery energy storage projects.

The evolution in California's energy mix and resulting uncertainty in the reliability and cost of energy supplies affect the affordability and reliability of Metropolitan's water supply operations. Metropolitan's review of its energy strategies, practices and projects is an important step to help position itself as a leader in energy sustainability.

In 2020, Metropolitan developed a new Energy Sustainability Plan (ESP) and an updated implementation roadmap, to formulate actions and strategies that best position Metropolitan to adapt to future wholesale and retail energy market changes for its CRA operations and conveyance and distribution system. The ESP's purpose is to foster informed energy management decisions through a framework of sustainable actions focused on energy cost containment, reliability, affordability, conservation and adaptation – now and into the future.

The ESP incorporates an adaptive energy management strategy and project implementation roadmap resulting in projects and initiatives that:

- Contain costs and reduce Metropolitan's exposure to energy price volatility
- Increase operational reliability and flexibility
- Move Metropolitan towards energy independence and sustainability
- Support Metropolitan's Climate Action Plan (CAP) effort to meet proposed GHG emissions reduction targets

Metropolitan's adaptive energy management strategy addresses issues surrounding energy management and cost mitigation. The energy strategy roadmap addresses near- to long-term energy issues and achieves Metropolitan's overarching goals by including projects that address both retail and wholesale energy markets, and energy management best practices. The recommended actions are impacted by numerous factors, considered as indicators in this plan, that will signal the acceleration or change of course for certain actions. The magnitude, nature,

and timing of these signals will result in different responses and actions for Metropolitan in the long-term and will be continuously monitored over time.

Selected near-term actions (1-3 years) identified are:

- Implement reconfiguration of the Yorba Linda Power Plant feed to serve the Diemer water treatment plant (WTP) retail load behind the Southern California Edison meter.
- Implement battery storage projects at the Weymouth, Skinner, Jensen, and Mills WTPs and the OC-88 Pumping Plant.
- Evaluate implementation of islanded operations using battery storage for possible future microgrid operations.
- Monitor wholesale energy market developments for major changes to CRA energy costs and evaluate appropriate options, such as generation or energy storage.
- Assess pump modifications at Intake and Gene pumping plants to implement targeted application of variable-speed pump drives.
- Continue to monitor third-party developer projects for opportunities in retail and large-scale wholesale renewable energy and energy storage opportunities.

Metropolitan has made progress on two near-term actions. This includes initiating projects for battery storage at the Skinner, Jensen, and Weymouth treatment plants, as well as OC-88. To support implementation, Metropolitan has applied for $10.3 million in state incentives for these projects. The battery storage facilities will be configured as microgrids to optimize on-site solar generation and increase energy resilience.

Selected mid-term actions (4-7 years) include:

- Assess the performance of implemented Battery Energy Storage System projects and later implement the previously deferred project options based on first phase performance results.
- Implement renewable energy and/or energy storage projects with third-party developers, if determined feasible.
- Continue evaluating low/no carbon power for CRA pumping operations to hedge against rising carbon prices.
- Reevaluate small hydropower opportunities within the distribution system if project economics become favorable.

Metropolitan engages in several energy best practices to reduce Metropolitan's overall energy consumption. These practices focus on energy auditing, monitoring and benchmarking, cost optimization of process and pumping operations, energy efficient design and rehabilitation measures, and providing staff training and communication strategies for energy management. Energy efficiency opportunities that reduce energy usage are evaluated on a continuous basis for short- and long-term benefits to help reduce energy-related costs and GHG emissions.

Long-term planning over the next 10 years will adapt relevant actions and strategies to current conditions. The key goal for Metropolitan's long-term energy management plan is to continuously update the ESP, monitor implemented projects and initiatives, reassess the main market drivers to better understand potential project and energy management opportunities, and adjust the ESP and roadmap accordingly.

The framework is intended to be flexible by accommodating future projects, preferences, and localized needs, and to be adaptable as Metropolitan's goals and technology evolve. The

roadmap provides a plan for implementation of the recommended energy projects and initiatives, while accounting for changes in the future. Signals assigned to each action will be monitored over time by Metropolitan staff to indicate when these actions and their economic and operational benefits can serve Metropolitan's needs.

### *Climate Action Plan*

In 2016, California signed into law the country's most stringent GHG reduction target of 40 percent below 1990 levels by the year 2030, as well as a long-term goal of 80 percent below 1990 levels by 2050. In 2017, then Governor Brown signed EO B-55-18, which set an even more progressive long-term goal of carbon neutrality by 2045. While the state has not imposed specific GHG reduction requirements for public water agencies, its 2017 Climate Change Scoping Plan suggests that water agencies should move towards low carbon or net-zero carbon water management systems.

To help California achieve this ambitious goal, Metropolitan is in the process of developing its first ever Climate Action Plan (CAP), which will serve as a road map for reducing greenhouse gas (GHG) emissions from its operations and future construction projects. The CAP will meet the goals of the state by identifying and implementing a number of actions that will reduce Metropolitan's future GHG emissions. In addition, it will serve as a vehicle to streamline project evaluation of GHG impacts under the California Environmental Quality Act (CEQA Guidelines § 15183.5(b) Plans for Reduction of Greenhouse Gas Emissions). The CAP will include the following elements:

- A complete inventory of GHG emissions, both existing and projected
- A GHG reduction target aligned with state goals
- A strategy to reduce emissions to meet the GHG reduction target
- A plan to monitor and verify results
- Adoption of the plan in a public process

#### Emissions Inventory

Using standard accounting protocols from The Climate Registry (TCR)[8] and the International Council for Local Environmental Initiatives (ICLEI)[9], Metropolitan completed an emissions inventory of three source categories or scopes related to the operational control the organization has over the emission source.

- Scope 1 emissions consist of direct GHG emissions associated with fuel use, such as emissions from gasoline and diesel consumption by Metropolitan's vehicle fleet, propane and natural gas use at its facilities, and unintended fugitive emissions[10].
- Scope 2 emissions consist of indirect GHG emissions associated with the purchase and consumption of electricity used primarily for the transmission, treatment and distribution of water. Scope 2 also includes electricity transmission and distribution losses.

[8] The Climate Registry. https://www.theclimateregistry.org/tools-resources/reporting-protocols/general-reporting-protocol/. Metropolitan's reported GHG emissions to The Climate Registry are shown in Appendix 10.
[9] ICLEI. 2010. Local Government Operations Protocol. http://icleiusa.org/ghg-protocols/.
[10] Fugitive emissions are emissions of gases or vapors from industrial equipment due to leaks or other unintended releases.

- Scope 3 emissions consist of other indirect GHG emissions not captured in Scope 1 or 2, such as those associated with employee commutes, waste generation, water consumption occurring at Metropolitan facilities, and emissions associated with construction projects.

Figure 3-7 illustrates the Metropolitan emissions by scope for calendar years 2008 and 2017.

**Figure 3-7**
**Metropolitan Emissions by Scope 2008 and 2017.**

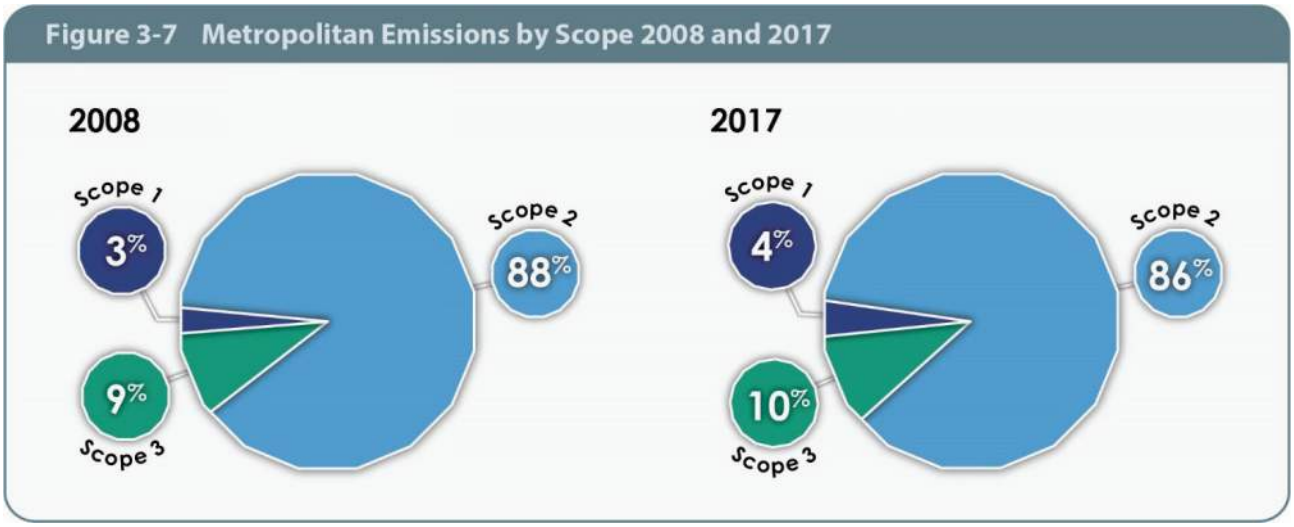


## Emissions Forecast

In order to estimate the level of GHG emissions reductions necessary for Metropolitan to achieve its selected GHG reduction target and be consistent with the requirements for a qualified GHG emissions reduction plan, an emissions forecast was prepared based on Metropolitan projected energy demand and energy sources, the anticipated impact of future Metropolitan projects, the anticipated impact of existing energy efficiency and GHG reduction programs, and regional population growth assumptions.

As noted above, Metropolitan does not have direct control over operations of the SWP. Thus, Metropolitan's strategy focuses exclusively on reducing the GHG emissions associated with operation of the CRA, and operation and maintenance of Metropolitan's distribution, treatment, and office facilities. Water deliveries from the CRA require substantial electricity usage, as the water must be pumped up a total lift of 1,614 feet from the Colorado River before flowing by gravity into Metropolitan's distribution system.

CRA water deliveries vary significantly year-to-year based on water needs, rainfall, and availability of water from the SWP. To account for this variability in electricity use and related GHG emissions, three forecast scenarios were modeled to estimate the range of GHG emissions that will need to be reduced to reach Metropolitan's adopted GHG reduction target. A high emissions scenario represents a worst case scenario with extended drought and maximum pumping capacity from the CRA, an average emissions scenario is modelled by averaging pumping data from 2008 through 2017, and a low emissions scenario represents Metropolitan's lowest single year CRA pumping from 2008 through 2017 and high deliveries from the SWP. The results of the potential range of emission that will need to be offset in future years is shown in Figure 3-8. Baseline emissions for 1990 were estimated using the best available data. It is important to note that in all projections, GHG emissions taper off as a result of new California

regulations that require all retail energy sold in California to be from 100 percent carbon-free energy by 2045.

**Figure 3-8**
**GHG Emissions Forecast and Potential Range of Emission**

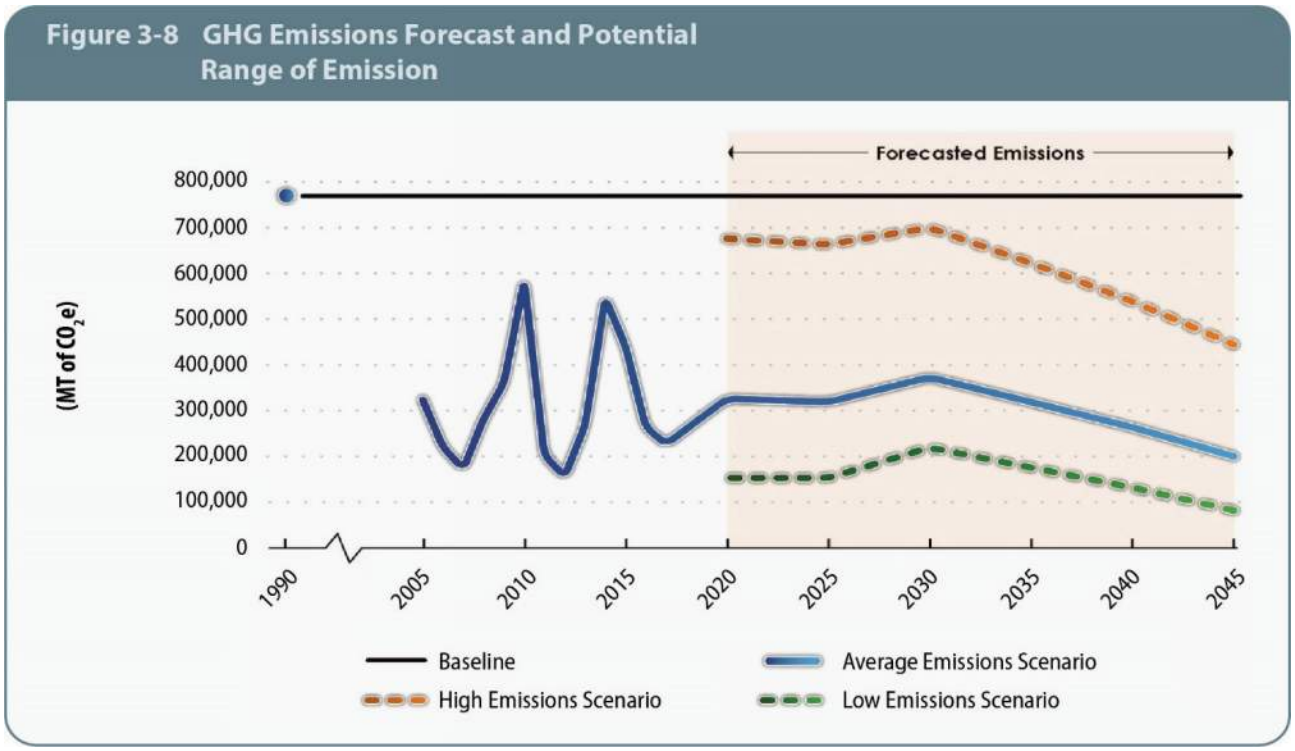


## GHG Reduction Target

Metropolitan is committed to achieving the state's GHG reduction goals. Therefore, Metropolitan has set its GHG reduction target to be consistent with the state target of 40 percent below 1990 levels by 2030. In addition, Metropolitan is committing to achieving net carbon neutrality by 2045. Metropolitan is well-situated to meet this goal.

## Strategy to Meet GHG Reduction Goals

In conjunction with Metropolitan's Energy Management Initiative described above, a number of projects have been identified that will not only ensure Metropolitan's energy reliability, but also further Metropolitan's efforts to reach carbon neutrality by 2045, including developing solar and battery storage facilities, negotiating wholesale carbon-free energy contracts, improving pump efficiency, purchasing zero emission fleet vehicles, and implementing waste recycling techniques. Metropolitan may also leverage extensive land holdings to implement potential carbon sequestration programs that could generate carbon credits. Additional actions will depend on many variables that are not yet quantified, such as the rate of energy storage deployed by the State of California and its utilities, the cost of renewable energy, and the costs associated with infrastructure. Not only do many of these projects ensure energy reliability and reduce GHG emissions, but they may also provide a substantial net cost savings to Metropolitan through reduced energy costs and reduced costs to offset GHG emissions.

### Monitoring and Reporting

Ensuring that Metropolitan is meeting its GHG reduction target is a cornerstone of an adopted GHG reduction plan. As such, Metropolitan will track its GHG emissions annually and update the CAP every five years to revise and refine the plan to capture any new measures and ensure Metropolitans is meeting its goals. Metropolitan currently reports verified GHG emissions to TCR's open and transparent GHG Registry. Appendix 10 of this plan contains additional information on Metropolitan's GHG emissions and overall energy intensity.

### CAP Adoption

The CAP will be released for public review in spring 2021, with an expected Board adoption of the completed CAP in summer 2021. Metropolitan's unique emissions profile and commitment to environmental and energy sustainability ensure that it is situated to meet not only the state's adopted target of 40 percent below 1990 levels by 2030, but also the state's goal of carbon neutrality by 2045, guaranteeing that Metropolitan remains an industry leader.

# Water Quality 4

Metropolitan's planning efforts recognize the importance of the quality of its water supplies. To the extent possible, Metropolitan responds to water quality concerns by protecting the quality of the source water and developing water management programs that maintain and enhance water quality. Contaminants that cannot be sufficiently controlled through protection of source waters must be handled through changed water treatment protocols or blending. These practices can increase costs and/or reduce operating flexibility. This section discusses source water quality and issues of concern affecting water management strategies and water supply reliability.

## *Background*

Metropolitan's planning efforts for groundwater storage, recycled water, and other water management strategies require meeting specific water quality targets for imported water. Metropolitan has two major sources of water: the Colorado River and the State Water Project (SWP). Groundwater inflows are also received into the SWP through groundwater banking programs in the Central Valley. Each source has specific water quality issues, which are summarized in this section. For example, the water industry has had to respond to constituents of emerging concern (CECs). To date, Metropolitan has not identified any water quality risks that cannot be mitigated. However, based on current knowledge, a water quality issue that could potentially affect water management strategies and supply reliability in the future might be increases in the salinity of water resources. Under California's current drought conditions, decreased flows have altered Delta flow patterns and, while the effects of the drought have not been fully studied, there have been some observable changes in water quality such as increased salinity due to increased seawater intrusion. However, even under drought conditions, SWP salinity is significantly lower than Colorado River water salinity, and Metropolitan relies on blending imported water sources to mitigate for the higher salinity Colorado River water. During recent periods of drought, Metropolitan's SWP allocation has been reduced, including to a historical low of five percent in 2014 and twenty percent in 2015 and 2020, which affected blending operations. Metropolitan increased its deliveries of Colorado River water in 2014, 2015, and 2020, and subsequently, salinity in treatment plant influent increased overall from the higher Colorado River salinity levels. Metropolitan anticipates no significant reductions in water supply availability from imported sources due to water quality concerns, such as salinity, over the next five years.

### *Colorado River*

High salinity levels remain a significant issue associated with Colorado River supplies. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium-6, which are discussed later in this section. Metropolitan has also been active in efforts to protect these supplies from potential increases in nutrient loading due to agriculture and urbanization, as well as tracking the occurrence of CECs. Metropolitan fully expects its source water protection efforts to be successful, so the only foreseeable water quality constraint to the use of Colorado River water will be the need to blend (mix) it with SWP supplies to meet Metropolitan's Board-adopted salinity standards.

### *State Water Project*

The key water quality issues for the SWP are disinfection byproduct precursors, in particular, total organic carbon, bromide, and low alkalinity. Metropolitan is working to protect the water quality of this source, but it has needed to upgrade its water treatment plants to deal adequately with disinfection byproducts. Disinfection byproducts result from total organic carbon and bromide in the source water reacting with disinfectants at the water treatment plant, and they may place some near-term restrictions on Metropolitan's ability to use SWP water. Low alkalinity water requires a higher percentage of total organic carbon removal in order to reduce disinfection byproduct formation. Metropolitan is overcoming these treatment restrictions through the use of ozone disinfection at its treatment plants, which has been implemented at all five of Metropolitan's treatment plants and blending SWP water with higher alkalinity Colorado River water. Arsenic is also of concern in some groundwater storage programs. Groundwater inflows into the California Aqueduct are managed to comply with regulations and protect downstream water quality while meeting supply targets. Additionally, nutrient levels are significantly higher in the SWP than within the Colorado River, leading to the potential for algal related concerns that can affect water management strategies. Metropolitan is engaged in efforts to protect the quality of SWP water from potential increases in nutrient loading from wastewater treatment plants.

### *Local Agency Supplies and Groundwater Storage*

Drinking water standards for contaminants, such as arsenic, chromium-6, 1,2,3-trichloropropane, and other emerging constituents, such as per- and polyfluoroalkyl substances (PFAS), may add costs to the use of groundwater storage and may affect the availability of local agency groundwater sources. Although Metropolitan has not analyzed the direct effect of these water quality issues on local agency supply, these contaminants are not expected to significantly impact the availability of Metropolitan supplies, but may affect the availability of local agency supplies. This could affect demands on Metropolitan supplies if local agencies abandon impacted supplies in lieu of treatment options or use Metropolitan water to blend with their sources.

In summary, the major regional water quality concerns include the following:

- Salinity
- Perchlorate
- Total organic carbon and bromide (disinfection byproduct precursors)
- Nutrients (as they relate to algal productivity)
- Arsenic
- Uranium
- Chromium-6
- 1,2,3-trichlorpropane
- Constituents of emerging concern (e.g., NDMA, microplastics, and PFAS)

Metropolitan has taken several actions and adopted programs to address these contaminants and to ensure a safe and reliable water supply. These actions, organized by contaminant, are discussed below, along with other water quality programs that Metropolitan has been engaged in to protect its water supplies.

### *Issues of Potential Concern*

#### *Salinity*

The State Water Resources Control Board's (SWRCB's) Division of Drinking Water (DDW), formerly the California Department of Public Health, established a secondary drinking water standard for salinity, commonly expressed as total dissolved solids (TDS), with a recommended maximum contaminant level (MCL) of 500 milligrams per liter (mg/L) and upper limit MCL of 1,000 mg/L. Imported water from the Colorado River has high salinity levels, so it must be blended (mixed) with lower-salinity water from the SWP to meet salinity management goals. Higher salinity levels in Colorado River water would increase the proportion of SWP supplies required to meet Metropolitan's Board-adopted imported water salinity objectives. High levels of salinity can impact various water uses such as limiting groundwater and recycled water uses, reducing the lifespan of household appliances, and reducing crop yields. These salinity impacts affect various sectors including residential, agricultural, commercial, industrial, utility, groundwater, and recycled water. Metropolitan adopted an imported water salinity goal because higher salinity could increase costs and reduce operating flexibility. For example,

1. If diminished water quality causes a need for membrane treatment to remove TDS, the process typically results in losses of up to 15 percent of the water processed. These losses would result in both an increased requirement for additional water supplies and environmental constraints related to brine disposal. In addition, the process is costly. However, only a portion of the imported water would need to be processed, so the possible loss in supplies is small.
2. High TDS in water supplies leads to high TDS in wastewater, which lowers the usefulness and increases the cost of recycled water.
3. Water quality degradation of imported water supply could limit the use of local groundwater basins for storage because of standards controlling the quality of water recharged to the basins.

In addition to the link between water supply and water quality, Metropolitan has identified economic benefits from reducing the TDS concentrations of water supplies. Estimates show that a reduction in salinity concentrations of 100 mg/L in both the Colorado River and SWP supplies will yield economic benefits of $95 million per year (1999 dollars) within Metropolitan's service area.[1] This economic benefit provides an additional incentive to reduce salinity concentrations within the region's water supplies.

<u>The Salinity Management Policy</u>

Considering all of these factors, Metropolitan's Board approved a Salinity Management Policy on April 13, 1999. The policy set a goal of achieving salinity concentrations in delivered water of less than 500 mg/L TDS when practical, understanding that hydrologic conditions will make this infeasible at times. It also identified the need for both local and imported water sources to be managed comprehensively to maintain the ability to use recycled water and groundwater. To achieve these targets, lower TDS SWP water supplies are blended with Colorado River supplies. Using this approach, the salinity target could be met an estimated seven out of ten years. In the other three years, hydrologic conditions would result in a reduced volume of SWP supplies and increased salinity. Due to drought conditions, the target goal was exceeded between 2008 and 2011 and again between 2013 and 2018. Metropolitan has alerted its local agencies that high

[1] Metropolitan Water District of Southern California and U.S. Bureau of Reclamation, Salinity Management Study: Final Report (June 1999)

salinity levels are inevitable under these drought conditions despite its best efforts. Metropolitan has also urged its member agencies to structure the operation of their local projects and groundwater supplies so they are prepared to mitigate the effect of higher salinity levels in imported waters.

The adoption of the Salinity Management Policy resulted from the completion of a Salinity Management Study in 1999. Metropolitan worked collaboratively with multiple stakeholders to complete the salinity study which assessed regional salinity problems and developed management strategies. Metropolitan is currently working with the USBR and Southern California Salinity Coalition to update the study. The current study objectives include updating the impact functions of the economic impact model and revising the salinity economic damage assessment for the Colorado River Salinity Control Forum Triennial Review; developing regional salinity indicators to increase awareness and facilitate salinity management in groundwater basins; and assessing Metropolitan's long-term capability of delivering low-salinity water supplies and determining whether new salinity operational goals should be established. In 2020, USBR completed a study updating the economic impact functions of the salinity model. The new model will be used to generate revised estimates for the Lower Colorado River Basin and can be used to update the estimates for Metropolitan's service area. The impacts estimated by the model are based on the change in economic costs from a 500 mg/L baseline condition and the projected elevated salinity concentrations from the Colorado River Simulation System (CRSS) long term planning model which incorporates current and future salinity control projects mainly in the Upper Colorado River Basin.

Within Metropolitan's service area, local water sources account for approximately half of the salt loading, and imported water accounts for the remainder. All of these sources must be managed appropriately to sustain water quality and supply reliability goals. The following sections discuss the salinity issues relevant to each of Metropolitan's major supply sources and other resources.

Colorado River

Colorado River water has the highest level of salinity of all of Metropolitan's sources of supply, averaging around 630 mg/L since 1976. Concern over salinity levels in the Colorado River has existed for many years.

To deal with the concern, the International Boundary and Water Commission approved Minute No. 242, Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River, in 1973, and the President approved the Colorado River Basin Salinity Control Act in 1974. High TDS in the Colorado River as it entered Mexico and the concerns of the seven basin states regarding the quality of Colorado River water in the United States drove these initial actions. To foster interstate cooperation on this issue, the seven basin states formed the Colorado River Basin Salinity Control Forum (Forum).

The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system. The Colorado River Basin Salinity Control Program is designed to prevent a portion of this abundant salt supply from moving into the river system. The program targets the interception and control of non-point sources, such as surface runoff, as well as wastewater and saline hot springs. Examples of salinity control measures include improved irrigation practices, rangeland management, and the operation of a deep well brine injection project.

The Forum proposed, the states adopted, and the USEPA approved water quality standards in 1975, including numeric criteria and a plan for controlling salinity increases. The standards require

that the plan ensure that the flow-weighted average annual salinity remain at or below the 1972 levels, while the Basin states continue to develop their 1922 Colorado River Compact-apportioned water supply. The Forum selected three points on the main stream of the lower Colorado River to measure the river's salinity. These points and numeric criteria are: (1) below Hoover Dam, 723 mg/L; (2) below Parker Dam, 747 mg/L; and (3) at Imperial Dam, 879 mg/L.

Per the Forum, concentrations of salts in the Colorado River cause approximately $454 million in quantified damages (2019 dollars) in the lower Basin each year.[2] The salinity control program has proven to be very successful and cost-effective. Salinity control projects remove over a million tons of salts from the Colorado River water annually, resulting in reduced salinity concentrations of over 100 mg/L as a long-term average.

During the high-water flows of 1983-1986, salinity levels in the Colorado River dropped to a historic low of 525 mg/L. However, during the 1987-1992 drought, higher salinity levels of 600 to 650 mg/L returned. TDS in Lake Havasu was measured at 662 mg/L in October 2015 and was 592 mg/L in October 2019. Salinity is projected to continue increasing as water development occurs throughout the Colorado River basin, particularly as the Upper Colorado River Basin States continue to develop their apportioned water reducing dilution in the Colorado River. Also, under drought conditions, Lake Powell has received higher salinity water, and as the system normalizes, salinity is expected to increase in the lower Colorado River as water from Lake Powell is released downstream.

State Water Project

Water supplies from the SWP have significantly lower TDS concentrations than the Colorado River, averaging approximately 250 mg/L in water supplied through the East Branch and 325 mg/L on the West Branch over the long-term, with short term variability as a result of hydrologic conditions.[3] Because of this lower salinity, Metropolitan blends SWP water with high salinity Colorado River water to reduce the salinity concentrations of delivered water. However, both the supply and the TDS concentrations of SWP water can vary significantly in response to hydrologic conditions in the Sacramento-San Joaquin watersheds.

As indicated above, the TDS concentrations of SWP water can vary widely over short periods of time. These variations reflect seasonal and tidal flow patterns, and they pose an additional problem for use of blending as a management tool to lower the higher TDS from the Colorado River supply. For example, during the 1977 drought, the salinity of SWP water reaching Metropolitan increased to 430 mg/L, and supplies became limited. During this same event, salinity at the SWP's Banks pumping plant exceeded 700 mg/L. Under similar circumstances in the future, Metropolitan's 500 mg/L TDS objective could only be achieved by reducing imported water from the Colorado River. Thus, it may be infeasible to maintain both the salinity objective and water supply reliability unless salinity concentrations of source supplies can be reduced.

A federal court ruling on a biological opinion issued in consultation with U.S. Fish and Wildlife Service addressing the effects of the water supply pumping operations on sensitive fish species in the Delta has limited SWP exports at specified times of the year since December 2007. These restrictions have increased reliance on higher salinity Colorado River water, impacting the ability at times to meet Metropolitan's goal of 500 mg/L TDS at its blending plants. Drought conditions leading to lower SWP water supply allocations in recent years also affect Metropolitan's ability to meet its salinity goal. The target goal was exceeded between 2008 and 2011 when water supply

[2] Colorado River Basin Salinity Control Program–Briefing Document (March 20, 2019)
[3] The higher salinity in the West Branch deliveries is due to salt loadings from local streams, operational conditions, and evaporation at Pyramid and Castaic Lakes.

allocations were reduced to 35-50 percent. Similarly, the target goal was exceeded between 2013 and 2015 when restricted annual water supply allocations were reduced to 5-35 percent and were briefly reduced to a historical zero percent allocation in January 2014.

The SWP Water Service Contract Article 19 TDS objectives specify a ten-year average of 220 mg/L and a maximum monthly average of 440 mg/L. These objectives have not been met, and Metropolitan is working with DWR and other agencies on programs aimed at reducing salinity in Delta supplies. These programs aim to reduce salinity on the San Joaquin River through modifying agricultural drainage and developing comprehensive basin plans. In addition, operable gates and channel barriers have been placed in strategic locations in the Delta to impede transport of seawater derived salt. For the first time since 1977, in response to California's drought emergency, DWR installed a temporary rock barrier across False River in May 2015 to help limit salt intrusion from the San Francisco Bay into the central Delta. DWR is also leading the development of the Delta Conveyance Project, which involves water delivery upgrades that could reduce SWP salinity levels by diverting a greater percentage of lower salinity Sacramento River flows to the South Delta export pumps.

Recycled Water

Wastewater flows always experience significantly higher salinity concentrations than the potable water supply. Typically, each cycle of urban water use adds 250 to 400 mg/L of TDS to the wastewater. Salinity increases tend to be higher where specific commercial or industrial processes add brines to the discharge stream or where brackish groundwater infiltrates into the sewer system.

Where wastewater flows have high salinity concentrations, the use of recycled water may be limited or require more expensive treatment (e.g., reverse osmosis). Landscape irrigation and industrial reuse become problematic at TDS concentrations over 1,000 mg/L. Some crops such as strawberries and avocados are particularly sensitive to high TDS concentrations, and the use of high-salinity recycled water may reduce crop yields. In addition, water quality objectives in basin plans may lead to restrictions on the use of recycled water on lands overlying those groundwater basins.

These issues are exacerbated during times of drought, when the salinity of imported water supplies may increase salinity in wastewater flows and recycled water. Basin management plans and recycled water customers may restrict the use of recycled water at a time when its use would be most valuable. Therefore, to maintain the cost-effectiveness of recycled water, the salinity level of the region's potable water sources and wastewater flows must be controlled.

In May 2009, the SWRCB adopted a Recycled Water Policy to help streamline the permitting process and to help establish uniform statewide criteria for recycled water projects. The policy was amended in January 2013 and again in December 2018[4] to include baseline monitoring requirements for CECs. The amended policy includes updated annual volumetric reporting requirements for influent, effluent, and recycled water uses. This policy promotes the development of watershed- or basin-wide salt management plans (to be adopted by the respective Regional Boards) to meet water quality objectives and protect beneficial uses, rather than imposing project-by-project restrictions. The Recycled Water Policy identifies several criteria to guide recycled water irrigation or groundwater recharge project proponents in developing a Salt (and Nutrient) Management Plan (SNMP).

[4] https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2018/121118_7_final_amendment_oal.pdf

Groundwater Basins

Increased TDS in groundwater basins occurs either when basins near the ocean are overdrafted, leading to seawater intrusion, or when agricultural and urban return flows add salts to the basins. Much of the water used for agricultural or urban irrigation infiltrates into the aquifer, so where irrigation water is high in TDS or where the water transports salts from overlying soil, the infiltrating water will increase the salinity of the aquifer. In addition, wastewater discharges in inland regions may lead to salt buildup from fertilizer and dairy waste. In the 1950s and 1960s, high-TDS Colorado River water was used to recharge severely overdrafted aquifers and prevent saltwater intrusion, resulting in significant salt loadings to the region's groundwater basins.

In the past, these high salt concentrations have caused some basins within Metropolitan's service area to be unsuitable for municipal uses if left untreated. The Arlington Basin in Riverside and the Mission Basin in San Diego required demineralization before they could be returned to municipal service. The capacity of the larger groundwater basins makes them better able to dilute the impact of increasing salinity. While most groundwater basins within the region still produce water of acceptable quality, this resource must be managed carefully to minimize further degradation. Even with today's more heightened concern regarding salinity, approximately 600,000 tons of salts per year accumulate within the region, leading to ever-increasing salinity concentrations in many groundwater basins.[5] Drought conditions have further impacted salinity levels in recycled water, reflective of increased salinity levels in source water. Increased recycled water salinity levels make it difficult for dischargers to comply with water quality objectives for groundwater basins.

To protect the quality of groundwater basins, Regional Boards often place restrictions on the salinity concentrations of water used for basin recharge or for irrigation of lands overlying the aquifers. Those situations may restrict water reuse and aquifer recharge, or they may require expensive mitigation measures. SNMPs offer an opportunity for stakeholders to work with Regional Boards to address salt and nutrient issues regionally. The SNMP development process is locally driven and focuses on addressing all sources of salts and nutrients, instead of only regulating individual recycled water projects which may not address all sources impacting groundwater. The SNMP objectives include: optimizing recycled water use, protecting groundwater supply and beneficial uses, protecting agricultural beneficial uses, and protecting human health. SNMPs were to be completed by May 2014 with a possible two-year extension. After completion, SNMPs may be adopted in a Basin Plan Amendment.

Several SNMPs were completed by the completion deadline, while other plans were granted an extension for completion in 2016. The Santa Ana Region Basin Plan updated its TDS and Nitrogen Management Plan with a subsequent SNMP amendment in 2014. This SNMP highlights efforts to implement extensive groundwater recharge projects using recycled water in the Chino Basin and expansion of the GWRS in Orange County. The Central Basin and West Coast Basin SNMP was approved as an amendment to the Los Angeles Region Basin Plan in February 2015. This SNMP highlights existing and planned implementation measures to ensure future compliance with water quality objectives including increased recharge at seawater intrusion barriers, increased groundwater pump and treat by the Goldsworthy and Brewer Desalters, and increased recycled water use for irrigation. Multiple SNMPs have been completed in the San Diego Region, and basin plan amendments are being considered. SNMPs have also been approved for the Main San Gabriel Basin and the Raymond Basin.

[5] Metropolitan Water District of Southern California and U.S. Bureau of Reclamation, Salinity Management Study: Final Report (June 1999)

### *Perchlorate*

Perchlorate compounds are used as a main component in solid rocket propellant and are also found in some types of munitions and fireworks. Perchlorate compounds quickly dissolve and become highly mobile in groundwater. Unlike many other groundwater contaminants, perchlorate neither readily interacts with the soil matrix nor degrades in the environment. Conventional drinking water treatment (as utilized at Metropolitan's water treatment plants) is not effective for perchlorate removal.

The primary human health concern related to perchlorate is its effect on the thyroid. Perchlorate can interfere with the thyroid's ability to produce hormones required for normal growth and development. Pregnant women who are iodine deficient and their fetuses, infants and small children with low dietary iodide intake, and individuals with hypothyroidism may be more sensitive to the effects of perchlorate.

DDW established a primary drinking water standard for perchlorate in 2007 with an MCL of 6 micrograms per liter (µg/L), and a detection limit for purposes of reporting (DLR) of 4 µg/L. In February 2015, the California Office of Environmental Health Hazard Assessment (OEHHA) lowered the public health goal (PHG)[6] for perchlorate from 6 µg/L to 1 µg/L. In response to the new PHG,[7] DDW reviewed the perchlorate MCL, but there was a lack of occurrence data below the DLR of 4 µg/L. In July 2020, due to improved analytical methods, and in order to evaluate a lower MCL, DDW proposed lowering the DLR for perchlorate initially to 2 µg/L, and subsequently to the PHG of 1 µg/L in a second phase effective January 1, 2024. On October 6, 2020, the SWRCB approved the proposal. There is currently no federal drinking water standard for perchlorate. On June 18, 2020, the USEPA withdrew its 2011 determination to regulate perchlorate under the SDWA and decided not to develop a federal MCL for perchlorate at the present time. Whether the USEPA should issue a national drinking water standard for perchlorate is the subject of ongoing litigation by the Natural Resources Defense Council. The case is currently on hold while EPA is reviewing its prior decision not to set a federal MCL for perchlorate for compliance with the President's Executive Order on "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis."

Perchlorate was first detected in Colorado River water in June 1997 and was traced back to Las Vegas Wash. The source of contamination was found to be emanating from two chemical manufacturing facilities in Henderson, Nevada: (1) the former Tronox, Inc. site, and (2) a facility owned by American Pacific Corporation (AMPAC).

Following the detection of perchlorate in the Colorado River, Metropolitan, along with USEPA and agencies in Nevada including the Nevada Division of Environmental Protection (NDEP), organized the forces necessary to successfully treat and decrease the sources of perchlorate loading. Under NDEP oversight, remediation efforts began in 1998, and treatment operations became fully operational in 2004. These efforts have reduced perchlorate loading into Las Vegas Wash from over 1,000 lbs/day (prior to treatment) to 50-90 lbs/day since early 2007. This has resulted in over 90 percent reduction of the perchlorate loading entering the Colorado River system. As of December 2020, remediation activities in Southern Nevada have resulted in the removal of more than 6,800 tons of perchlorate from the environment. In January 2009, Tronox filed for Chapter 11 bankruptcy protection citing significant environmental liabilities taken from the previous site owner. A settlement was reached in February 2011 which resulted in the

[6] A PHG is a concentration of a contaminant in drinking water that does not pose a significant risk to health.
[7] MCLs are required to be established at a level as close to a chemical's PHG as is technologically and economically feasible, placing primary emphasis on the protection of public health.

formation of the Nevada Environmental Response Trust (NERT). NERT initially received $81 million for cleanup efforts while pursuing additional funding sources.

In April 2014, Tronox reached a $5.15 billion settlement with its predecessors which awarded approximately $1.1 billion, directed to NERT, to clean up perchlorate and certain other contaminants at the former Tronox site in Henderson. The settlement, which represents one of the largest environmental recoveries in history, went into effect in January 2015 and helps to ensure adequate funds are available for site cleanup and protection of the downstream Colorado River. In December 2020, NERT's assets totaled approximately $1.28 billion. NERT is currently investigating remedial options for long-term soil and groundwater cleanup, as well as conducting a regional investigation of downgradient perchlorate-contaminated areas to further reduce loading into Las Vegas Wash. This would help ensure compliance with a potential reduction of California's perchlorate MCL of 6 µg/L, in light of the 1 µg/L PHG.

As a result of the aggressive clean-up efforts, perchlorate levels in Colorado River water at Lake Havasu have decreased significantly in recent years from a peak of 9 µg/L in May 1998. Levels have remained less than 6 µg/L since October 2002 and have been typically less than 2 µg/L since June 2006. Metropolitan routinely monitors perchlorate at over 30 locations within its system, and levels currently remain below 2 µg/L. Metropolitan has not detected perchlorate in the SWP since monitoring began in 1997.

Perchlorate has also been found in groundwater basins within Metropolitan's service area, largely from local sources. The vast majority of locations where perchlorate has been detected in the groundwater are associated with the manufacturing or testing of solid rocket fuels for the Department of Defense and the National Aeronautics and Space Administration (NASA), or with the manufacture, storage, handling, or disposal of perchlorate (such as Aerojet in Azusa in the Main San Gabriel Basin and the Jet Propulsion Laboratory/NASA in the Raymond Basin). Past agricultural practices using fertilizers laden with naturally occurring perchlorate have also been implicated in some areas. As of October 2020, per SWRCB's water quality database, reported monitoring results from 2011 to present indicate that 358 wells in the counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura have detected perchlorate in their service areas at levels greater than 4 µg/L, while 219 wells have detected levels greater than 6 µg/L.[8] Water systems may have installed treatment or removed wells from service due to perchlorate concentrations.

Metropolitan has investigated technologies to mitigate perchlorate contamination. Perchlorate cannot be removed using conventional water treatment. Nanofiltration and reverse osmosis do work effectively, but at a very high cost. Endeavour, LLC (which was formed in 2015 to continue operation of AMPAC's groundwater treatment system) and NERT utilize a biological fluidized bed reactor (FBR) process train for the cleanup of their Henderson sites. A number of sites in Southern California have successfully installed ion exchange systems to treat perchlorate impacted groundwater. In November 2009, a study of biological treatment for perchlorate removal in the City of Pasadena's groundwater was completed with funding provided through a Congressional mandate from USEPA to Metropolitan. The City of Pasadena decided to continue using ion exchange treatment for perchlorate removal and expanded treatment to two well sites.

Treatment options are available to recover groundwater supplies contaminated with perchlorate. However, it is very difficult to predict whether treatment will be pursued to recover all lost production because local agencies will make decisions based largely on cost

[8] DDW data reported from the SWRCB Groundwater Ambient Monitoring Assessment Program's web site: https://gamagroundwater.waterboards.ca.gov/. Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.

considerations, ability to identify potentially responsible parties for cleanup, and the availability of alternative supplies.

### *Total Organic Carbon and Bromide*

Disinfection byproducts (DBPs) form when source water containing high levels of total organic carbon (TOC) and bromide is treated with disinfectants such as chlorine or ozone. Studies have shown a link between certain cancers and DBP exposure. In addition, some studies have shown an association between reproductive and developmental effects and chlorinated water. While many DBPs have been identified and some are regulated under the Safe Drinking Water Act, there are others that are not yet known. Even for those that are known, the potential adverse health effects may not be fully characterized.

Water agencies began complying with new regulations to protect against the risk of DBP exposure in January 2002. This rule, known as the Stage 1 Disinfectants and Disinfection Byproducts (D/DBP) Rule, required water systems to comply with new MCLs and a treatment technique to improve control of DBPs. USEPA then promulgated the Stage 2 D/DBP Rule in January 2006 requiring systems to comply at terminus locations in the distribution system to be more representative of maximum residence time and to protect the public. Metropolitan has been in compliance with the Stage 2 D/DBP Rule since it became effective.

Existing levels of TOC and bromide in Delta water supplies present challenges for water utilities to maintain safe drinking water supplies and comply with regulations. Levels of these constituents in SWP water increase several-fold due to agricultural drainage and seawater intrusion as water moves through the Delta.

SWP water has also experienced lower alkalinity concentrations during years with increased snowmelt, particularly in 2017 and 2019. Low alkalinity requires higher TOC removal by treatment plants and potentially contributes to increased water corrosivity. As a corrosion control strategy, Metropolitan may blend low alkalinity SWP water with Colorado River Water, adjust effluent pH, and increase plant effluent alkalinity.

Source water quality improvements must be combined with cost-effective water treatment technologies to ensure safe drinking water at a reasonable cost. Metropolitan has five treatment plants: two that receive SWP water exclusively, and three that receive a blend of SWP and Colorado River water. In 2003 and 2005, Metropolitan completed upgrades to its SWP-exclusive water treatment plants, Mills and Jensen, respectively, to utilize ozone as its primary disinfectant. This ozonation process minimizes the production of certain regulated disinfection byproducts that would otherwise form in the chlorine treatment of SWP water. The non-ozone plants utilizing blended water met federal guidelines for these byproducts through managing the blend of SWP and Colorado River water. To maintain the byproducts at a level consistent with federal law, Metropolitan limited the percentage of water from the SWP for plants utilizing chlorine as the primary disinfectant. In 2010, 2015, and 2017, Metropolitan completed ozone upgrades at Skinner, Diemer, and Weymouth water treatment plants, respectively. The estimated ozone retrofit cost for all five treatment plants is over $1.1 billion.

### *Nutrients*

Elevated levels of nutrients (phosphorus and nitrogen compounds) can stimulate nuisance algal and aquatic weed growth that affects water system operations and consumer acceptability, including the production of noxious taste and odor compounds and algal toxins. In addition to taste and odor and toxin concerns, increases in algal and aquatic weed biomass can impede flow in conveyances, shorten filter run times, increase solids production at drinking water

treatment plants, and add to organic carbon loading. Further, nutrients can provide an increasing food source that may lead to the proliferation of quagga and zebra mussels, and other invasive biological species. Studies have shown phosphorus to be the limiting nutrient in both SWP and Colorado River supplies. Therefore, any increase in phosphorus loading has the potential to stimulate algal growth, leading to the concerns identified above.

SWP supplies have significantly higher nutrient levels than Colorado River supplies. Wastewater discharges, agricultural drainage, and nutrient-rich soils in the Delta are primary sources of nutrient loading to the SWP. Metropolitan and other drinking water agencies receiving Delta water have been engaged in efforts to minimize the effects of nutrient loading from Delta wastewater plants. The Sacramento Regional County Sanitation District (SRCSD), the primary discharger to the Sacramento River, is in the process of constructing wastewater treatment plant upgrades to comply with its 2010 discharge permit requirements for ammonia and nitrate removal. Excessive levels of ammonia are suspected to be altering the Delta's food web which, in turn, has implications for SWP supply reliability. SRCSD expects to complete its EchoWater Project by mid-2022, in compliance with the 2023 deadline, and has stated that the project will serve multiple benefits including improving water quality in the Sacramento River, protecting the fragile Delta ecosystem, and expanding recycled water use opportunities. The improvements include a biological nutrient removal process for ammonia and nitrate removal. The project also includes tertiary treatment processes for filtration and enhanced disinfection. In 2014, the City of Stockton Wastewater Treatment Plant, a discharger to the San Joaquin River, was issued a draft permit with a more stringent nitrate discharge limit consistent with the final discharge limits issued in SRCSD's permit. Due to the lower limit, the City of Stockton began to make plans to implement similar plant upgrades as SRCSD to comply with discharge permit requirements. Construction is planned to be completed in March 2023.

Metropolitan reservoirs receiving SWP water have experienced several taste and odor episodes in recent years. For example, between 2015 and June 2020, Metropolitan reservoirs experienced 13 taste and odor events requiring treatment. A taste and odor event can cause a reservoir to be bypassed and potentially have a short-term effect on the availability of that supply. Metropolitan has a comprehensive program to monitor and manage algae in its source water reservoirs. This program was developed to provide an early warning of algae related problems and taste and odor events to best manage water quality in the system.

The issue of cyanotoxins has become a growing concern as a result of increasing occurrences both nationally and internationally. For example, in August 2014, an algae bloom producing Microcystin in Lake Erie significantly affected the water supply for Toledo, Ohio, prompting the city to issue urgent notices to residents to not drink or boil the drinking water. This event stimulated state and federal legislation to develop health advisories and strategic plans for algal toxins. In June 2015, USEPA issued health advisories for two cyanobacterial toxins: Microcystins and Cylindrospermopsin. The health advisories serve as recommended precautionary levels and are not enforceable federal water quality standards. Cyanotoxins are included on the current Contaminant Candidate List (CCL4), which identifies contaminants considered for regulation under the Safe Drinking Water Act. USEPA has developed improved analytical methods for cyanotoxins to support nationwide monitoring for Microcystins, Anatoxin-a, and Cylindrospermopsin through the Unregulated Contaminant Monitoring Rule 4 program, which was published in 2016 and required monitoring to be conducted between 2018 and 2020. Metropolitan is complying with Unregulated Contaminant Monitoring Rule monitoring and reporting requirements. Although phosphorus levels are much lower in the Colorado River than in the SWP, this nutrient is still of concern. Despite relatively low concentrations (Colorado River has been considered an oligotrophic, or low-productivity, system), any additions of phosphorus

to Colorado River water can result in increased algal growth. In addition, low nutrient Colorado River water is relied upon by Metropolitan to blend down the high nutrient SWP water in Metropolitan's blend reservoirs. With population growth expected to continue in the Las Vegas area in the future, ensuring high levels of treatment at wastewater treatment plants to maintain existing phosphorus levels will be critical in minimizing the operational, financial, and public health impacts associated with excessive algal growth and protecting downstream drinking water uses. Metropolitan and other affected drinking water agencies collaborate with wastewater dischargers in the Las Vegas area to protect the phosphorus-limited Colorado River. Since 2001, wastewater dischargers have undertaken considerable efforts to improve treated effluent water quality by removing phosphorus on a year-round basis. In 2005, dischargers also began optimizing their treatment processes to remove greater amounts of phosphorus, maintaining levels well below current permit requirements.

Although current nutrient loading is of concern for Metropolitan and is anticipated to have cost implications, with its comprehensive monitoring program and response actions to manage algal related issues, there should be no impact on availability of water supplies. Metropolitan's source water protection program will continue to focus on preventing future increases in nutrient loading as a result of urban and agricultural sources.

### *Arsenic*

Arsenic is a naturally occurring element found in rocks, soil, water, and air. It is used in wood preservatives, alloying agents, certain agricultural applications, semi-conductors, paints, dyes, and soaps. Arsenic can get into water from the natural erosion of rocks, dissolution of ores and minerals, runoff from agricultural fields, and discharges from industrial processes. Long-term exposure to elevated levels of arsenic in drinking water has been linked to certain cancers, skin pigmentation changes, and hyperkeratosis (skin thickening).

In April 2004, OEHHA set a PHG for arsenic of 0.004 µg/L, based on lung and urinary bladder cancer risk. The MCL for arsenic in domestic water supplies was lowered to 10 µg/L, with an effective date of January 2006 in the federal regulations, and an effective date of November 2008 in the California regulations. Monitoring results submitted to California Department of Public Health (now DDW) since 2010 showed that arsenic is ubiquitous in drinking water sources, reflecting its natural occurrence. They also showed that many sources have arsenic detections above the 10 µg/L MCL. Southern California drinking water sources, by county, that contain concentrations of arsenic over 10 µg/L include San Bernardino (113 sources), Los Angeles (82 sources), Riverside (52 sources), San Diego (5 sources), Orange (10 sources), and Ventura (3 sources).[9]

The arsenic drinking water standard impacts both groundwater and surface water supplies. Historically, Metropolitan's water supplies have had low levels of this contaminant and did not require treatment changes or capital investment to comply with the standard. However, some of Metropolitan's water supplies from groundwater storage programs are at levels near the MCL. These groundwater storage projects are called upon to supplement flow only during low SWP allocation years. Under drought conditions, Metropolitan has further relied on groundwater storage programs and continues to participate in the California Aqueduct Pump-in Facilitation Group to ensure that water quality in the SWP is not adversely affected when considering water supply decisions. Metropolitan has had to restrict flow from one program to limit arsenic increases in the SWP. Implementation of an arsenic treatment facility, which is operated by a groundwater

[9] DDW data reported from the SWRCB Groundwater Ambient Monitoring Assessment Program's web site: https://gamagroundwater.waterboards.ca.gov/. Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.

banking partner, has increased groundwater supply costs. Moreover, Metropolitan has invested in solids handling facilities at its treatment plants and implemented operational changes to manage arsenic in the treatment process residual solids.

The DLR for arsenic is 2 μg/L. Between 2010 and June 2020, arsenic levels in Metropolitan's water treatment plant effluents ranged from non-detect (< 2 μg/L) to 3.3 μg/L. For Metropolitan's source waters, levels in Colorado River water have ranged from 2.2 to 2.8 μg/L, while levels in SWP water have ranged from non-detect to 4.8 μg/L. Increasing coagulant doses at water treatment plants can reduce arsenic levels for delivered water.

Some member agencies may face greater problems with arsenic compliance due to naturally occurring arsenic in groundwater. Per the Water Replenishment District's 2018-2019 Regional Groundwater Monitoring Report, arsenic concentrations greater than the 10 μg/L MCL were detected in 9 of 220 Central Basin production wells.[10] Water supplies imported by the Los Angeles Department of Water and Power may also contain arsenic above the MCL. The cost of arsenic removal from these supplies could vary significantly.

### *Uranium*

The U.S. Department of Energy (DOE) has completed about 66 percent of a project to move a 16-million-ton pile of uranium mill tailings near Moab, Utah, which lies approximately 750 feet from the Colorado River. Due to the proximity of the pile to the Colorado River, there is a potential for the tailings to enter the river as a result of a catastrophic flood event or other natural disaster. In addition, contaminated groundwater from the site is slowly seeping into the river. The DOE is responsible for remediating the site, which includes removal and offsite disposal of the tailings and onsite groundwater remediation.

Previous investigations have shown uranium concentrations contained within the pile at levels significantly above the California MCL of 20 picocuries per liter (pCi/L). Metropolitan has been monitoring for uranium in the CRA and at its treatment plants since 1986. Monitoring at Lake Powell began in 1998. Uranium levels measured at Metropolitan's intake have ranged from 1 to 6 pCi/L, well below the California MCL. Conventional drinking water treatment, as employed at Metropolitan's water treatment plants, can remove low levels of uranium; however, these processes would not be protective if a catastrophic event washed large volumes of tailings into the Colorado River. Public perception of drinking water safety is also of particular concern as to uranium.

Remedial actions at the site since 1999 have focused on removing contaminated water from the pile and groundwater. To date, over 5,300 pounds of uranium in contaminated groundwater have been removed. In July 2005, DOE issued its Final Environmental Impact Statement with the preferred alternative of permanent offsite disposal by rail to a disposal cell at Crescent Junction, Utah, located approximately 30 miles northwest of the Moab site.

Rail shipment and disposal of the uranium mill tailings pile from the Moab site began in April 2009 using American Recovery and Reinvestment Act 2009 funding which helped to accelerate initial cleanup efforts. Through September 2020, DOE has shipped over 10.9 million tons of mill tailings to the Crescent Junction disposal cell. DOE estimates completing movement of the tailings pile by 2034, depending on annual appropriations. Metropolitan continues to track progress of the remediation efforts and work with Congressional representatives to support increased annual appropriations and expedite cleanup.

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[10] *Regional Groundwater Monitoring Report Water Year 2018-2019, Los Angeles County, California*, prepared by Water Replenishment District, March 2020.

Another uranium-related issue began receiving attention in 2008 due to a renewed worldwide interest in nuclear energy and a resulting increase in uranium mining claims filed throughout the western United States. Of particular interest were thousands of mining claims filed near Grand Canyon National Park and the Colorado River. Metropolitan sent letters to the Secretary of the Interior to highlight source water protection and consumer confidence concerns related to uranium exploration and mining activities near the Colorado River, and advocate for close federal oversight over these activities. In 2009, Secretary of the Interior Ken Salazar announced a two-year hold on new mining claims on 1 million acres adjacent to the Grand Canyon to allow necessary scientific studies and environmental analyses to be conducted. In January 2012, Secretary Salazar formally signed a 20-year moratorium on new uranium and other hard rock mining claims. The moratorium has been challenged by a number of industry groups and was most recently upheld by a U.S. District Court in September 2014. Meanwhile, local conservation groups continue to defend the moratorium and are seeking additional protection of lands with mines that have been inactive for long periods of time but may resume operations. Although of no direct impact to Metropolitan due to its upstream location and resulting dilution, in August 2015, an accidental release of wastewater from an abandoned mine in southwest Colorado demonstrated the potential threat that mining activities can have on public health and the environment. In 2020, the DOE released a strategy to revive and expand nuclear fuel production which would be of interest to Metropolitan if projects are in proximity to the Colorado River.

### *Chromium-6*

Chromium is a naturally occurring element found in rocks, soil, plants, and animals. Chromium-3 is typically the form found in soils and is an essential nutrient that helps the body use sugar, protein, and fat. Chromium-6 is used in electroplating, stainless steel production, leather tanning, textile manufacturing, dyes and pigments, wood preservation, and as an anti-corrosion agent. Chromium occurs naturally in deep aquifers and can also enter drinking water through discharges of dye and paint pigments, wood preservatives, chrome plating liquid wastes, and leaching from hazardous waste sites. In drinking water, chromium-6 is very stable and soluble, whereas chromium-3 is not very soluble. Chromium-6 is the more toxic species and is known to cause lung cancer in humans when inhaled, but the health effects in humans from ingestion are still in question. There is evidence that when chromium-6 enters the stomach, gastric acids may reduce it to chromium-3. However, recent studies conducted by the National Toxicology Program have shown that chromium-6 can cause cancer in animals when administered orally.

Effective July 1, 2014, California's Office of Administrative Law approved a primary drinking water standard of 10 μg/L for chromium-6. In May 2017, the Superior Court of Sacramento County issued a judgment invalidating California's MCL of 10 μg/L for chromium-6 on the basis that CDPH (now DDW), had not properly considered the economic feasibility of complying with the MCL. DDW therefore rescinded the chromium-6 MCL. However, chromium-6 remains regulated as part of total chromium. California's MCL for total chromium is 50 μg/L. In February 2020, DDW released a white paper discussion on an updated economic feasibility analysis of chromium-6 treatment for the consideration of a new chromium-6 MCL. USEPA regulates chromium-6 as part of the total chromium drinking water standard of 100 μg/L and is currently evaluating whether a new federal drinking water standard for chromium-6 is warranted based on new health effects information.

Metropolitan utilizes an analytical method with a minimum reporting level of 0.03 μg/L, which is less than the State DLR of 1 μg/L. In the past 5 years, the results from all of Metropolitan's source and treated waters are less than the State DLR. The following summarizes chromium-6 levels found in Metropolitan's system:

In the past 5 years, results of source and treated water monitoring for chromium-6 indicate the following:

- Levels in Colorado River water are mostly not detected (<0.03 μg/L), but when detected, levels range from 0.03 to 0.085 μg/L. SWP levels range from 0.03 to 1.0 μg/L. Treated water levels range from 0.03 to 0.8 μg/L.
- There is a slight increase in chromium-6 in the treated water from the oxidation (chlorination and ozonation) of natural background chromium (total) to chromium-6.
- Colorado River monitoring results upstream and downstream of the site of a Pacific Gas and Electric (PG&E) gas compressor station located along the Colorado River near Topock, Arizona (discussed below) have ranged from not detected (<0.03 μg/L) to 0.06 μg/L.
- Chromium-6 in Metropolitan's groundwater pump-in storage programs in the Central Valley has ranged from not detected (< 1 μg/L) to 8.9 μg/L in 2014, with the average for the different programs ranging from < 1 μg/L to 3 μg/L.

PG&E used chromium-6 as an anti-corrosion agent in its cooling towers at the Topock site from 1951 to 1985. Wastewater from the cooling towers was discharged from 1951 to 1968 into a dry wash next to the station. Monitoring wells show the plume concentration has peaked as high as 16,000 μg/L in groundwater. Since 2004, PG&E has operated an interim groundwater extraction and treatment system that is protecting the Colorado River. This interim treatment system will be taken offline in September 2021 and replaced by the long-term groundwater remedy system. Quarterly monitoring of the river has shown levels of chromium-6 less than 1 μg/L, which are considered background levels. The California Department of Toxic Substances Control (DTSC) and the U. S. Department of the Interior are the lead state and federal agencies overseeing the cleanup efforts. Metropolitan participates through various stakeholder workgroups and partnerships that include state and federal regulators, Indian tribes, and other stakeholders (e.g., Colorado River Board) involved in the corrective action process. In January 2011, a final treatment remedy was selected, and an Environmental Impact Report was certified. In November 2015, PG&E completed the final remedy design based on the selected remedy which involves the installation of an in-situ bioremediation treatment system. In April 2015, DTSC required the preparation of a Subsequent Environmental Impact Report (EIR) to address new design details. The Subsequent EIR was certified in April 2018. Construction of Phase 1, consisting of an In-situ reduction zone, began in October 2018 and is expected to be completed in 2021. Phase 2, consisting of a freshwater injection system, is anticipated to begin construction in 2023 and last about one year. Operation of the treatment system will run for an estimated 30 years.

The federal- and state-approved technologies for removing total chromium from drinking water include coagulation/filtration, ion exchange, reverse osmosis, and lime softening. For several years, the cities of Glendale, Burbank, and Los Angeles have been voluntarily limiting chromium-6 levels in their drinking water to 5 μg/L, even after the MCL was rescinded in 2017.

### *1,2,3-Trichloropropane (1,2,3-TCP)*

1,2,3-TCP is a chlorinated hydrocarbon with high chemical stability. It is a manmade chemical found at industrial or hazardous waste sites. It has been used as a cleaning and degreasing solvent and also is associated with pesticide products.

At its July 18, 2017 public meeting, the SWRCB adopted an MCL of 5 parts per trillion (ppt) for 1,2,3-TCP, and related requirements, including establishing a DLR, identifying the best available technology for treatment, and setting public notification and consumer confidence report language. The regulations also included a method for public water systems to substitute existing

water quality data for initial monitoring requirements under certain circumstances. Under the new regulation, drinking water agencies are required to perform quarterly monitoring of 1,2,3-TCP. There have been no detections of this chemical in Metropolitan's system. However, 1,2,3-TCP has been detected above the new MCL in groundwater wells of three of Metropolitan's groundwater storage program partners through monitoring performed by these agencies. Levels detected in groundwater wells of the Arvin-Edison Water Storage District are the highest and impact the ability of Metropolitan to put water and take return water under that program. Metropolitan has temporarily suspended operation of this program until the water quality concerns can be further evaluated and managed. The levels of 1,2,3-TCP detected in Metropolitan's other groundwater storage programs are much lower and impact fewer groundwater wells. Metropolitan is evaluating the effects of TCP on the return capability of those programs. Southern California counties that have detected concentrations of 1,2,3-TCP in drinking water sources at or over 5 ppt since 2010 include San Bernardino (48 sources), Los Angeles (63 sources), Riverside (24 sources), San Diego (10 sources), and Ventura (3 sources).[11]

### *Constituents of Emerging Concern*

#### *N-Nitrosodimethylamine*

N-Nitrosodimethylamine (NDMA) is part of a family of organic chemicals called nitrosamines. NDMA is a chloramine disinfection by-product, and it is the most abundantly detected nitrosamine in drinking water systems. Metropolitan utilizes chloramines as a secondary disinfectant at its treatment plants. Wastewater treatment plant discharges can contribute organic matter into source waters, which react with chloramines to form NDMA at drinking water treatment plants. Certain coagulation aid polymers used in water treatment, e.g., polydiallyldimethylammonium chloride (polyDADMAC), can also contribute to NDMA formation. Some NDMA control measures are being used to avoid adverse impacts on Southern California drinking water supplies. Metropolitan is involved in several projects to understand the impact of different treatment processes on NDMA and its precursors at drinking water treatment plants and in distribution systems. Certain pre-oxidation processes, such as chlorine and ozone, have been shown to destroy NDMA precursors. Additional studies are being conducted to better understand how polyDADMAC contributes to NDMA formation and to identify measures to reduce polymer-derived NDMA formation.

USEPA considers NDMA to be a probable human carcinogen. USEPA placed NDMA on the Contaminant Candidate List 4 (CCL4). Although there is no federal regulation for nitrosamines in drinking water, DDW set a notification level of 0.01 µg/L each for NDMA and two other nitrosamines. Occurrences of NDMA in treated water supplies at concentrations greater than 0.01 µg/L are recommended to be included in a utility's annual Consumer Confidence Report. In December 2006, OEHHA set a PHG for NDMA of 0.003 µg/L. Since 1999, Metropolitan has conducted voluntary monitoring of the five treatment plant effluents and representative distribution system locations semi-annually. NDMA is the only detected nitrosamine in Metropolitan's treated water systems, and it is in the range of non-detect (<0.002 µg/L) to 0.006 µg/L. NDMA or a broader class of nitrosamines may likely be the next class of disinfection by-products to be regulated by USEPA.

[11] DDW data reported from SWRCB Groundwater Ambient Monitoring Assessment Program's web site: https://gamagroundwater.waterboards.ca.gov/. Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.

### *Pharmaceuticals and Personal Care Products*

Pharmaceuticals and personal care products (PPCPs) are a growing concern to the water industry. Numerous studies have reported the occurrence of these emerging contaminants in treated wastewater, surface water, and sometimes, in finished drinking water in the United States and around the world. The use of ozone in treatment processes may have a beneficial effect on PPCP removal in drinking water. The sources of PPCPs in the aquatic environment include (but may not be limited to) treated wastewater and industrial discharge, agricultural run-off, and leaching of municipal landfills. Currently, there is no evidence of human health risks from long-term exposure to the low concentrations (low ng/L; parts per trillion) of PPCPs found in some drinking water. Furthermore, there are no regulatory requirements for PPCPs in drinking water. USEPA included 14 PPCPs on the CCL3 and 10 PPCPs on the CCL4, nine of which are carried over from the CCL3; however, currently there are no standardized analytical methods for these compounds. USEPA's strategy for addressing PPCPs involves strengthening analytical methods, conducting source studies, improving public understanding of PPCPs in water, building partnerships and promoting stewardship opportunities, and taking regulatory action when appropriate.

In 2007, Metropolitan implemented a short-term monitoring program to determine the occurrence of PPCPs and other organic wastewater contaminants in Metropolitan's treatment plant effluents and selected source water locations within the Colorado River and SWP watersheds. Currently, PPCP monitoring is conducted on an annual basis for Metropolitan's source waters and treatment plants. Some PPCPs have been detected at very low ng/L levels, which is consistent with reports from other utilities. However, analytical methods are still being refined, and more work is required to fully understand occurrence issues. Metropolitan has been actively involved in studies related to PPCPs, including analytical methods improvements, and characterization of drinking water sources in California.

### *Microplastics*

In 2018, Senate Bill No. 1422 added Section 116376 to the Health and Safety Code, which required the SWRCB to adopt a definition of microplastics in drinking water on or before July 1, 2020. Section 116376 also requires the SWRCB on or before July 1, 2021, to: (1) adopt a standard methodology to be used in the testing of drinking water for microplastics; (2) adopt requirements for four years of testing and reporting of microplastics in drinking water, including public disclosure of those results; (3) if appropriate, consider issuing a notification level or other guidance to help consumer interpretations of the results of the testing required; and (4) accredit qualified laboratories in California to analyze microplastics. No other states have defined microplastics. Knowledge in the microplastics field has been primarily provided by the European Union. On June 16, 2020, the SWRCB adopted a definition, acknowledging the definition is a work in progress, and stated the SWRCB will re-visit the microplastic definition as knowledge in the field progresses. The definition reads: '*Microplastics in Drinking Water' are defined as solid polymeric materials to which chemical additives or other substances may have been added, which are particles which have at least three dimensions that are greater than 1nm and less than 5,000 micrometers (µm). Polymers that are derived in nature that have not been chemically modified (other than by hydrolysis) are excluded.* Metropolitan is participating in a study with the Southern California Coastal Water Research Project to develop analytical methods for microplastics.

### *Per- and Polyfluoroalkyl Substances (PFAS)*

Drinking water containing perfluorooctanoic acid (PFOA), perfluorooctanesulfonic acid (PFOS) – and the larger family of per- and polyfluoroalkyl substances (PFAS) – has become an increasing

concern due to the persistence of these chemicals in the environment and their tendency to accumulate in groundwater.

In August 2019, the SWRCB's Division of Drinking Water (DDW) updated its guidelines for local water agencies to follow in detecting and reporting the presence of these chemicals in drinking water. The guidelines lower the notification levels from 14 parts per trillion (ppt) to 5.1 ppt for PFOA and from 13 ppt to 6.5 ppt for PFOS. These levels are based on updated health recommendations from the Office of Environmental Health Hazard Assessment (OEHHA), which is part of the California Environmental Protection Agency. Notification levels are non-regulatory, precautionary health-based measures for concentrations of chemicals in drinking water that warrant notification and further monitoring and assessment. If a chemical concentration is greater than its notification level in drinking water that is provided to consumers, DDW recommends that the utility inform its customers and consumers about the presence of the chemical and about health concerns associated with exposure to it. The SWRCB also set new response levels (RLs) of 10 parts per trillion (ppt) for PFOA and 40 ppt for PFOS based on a running four quarter average. Previously, the RL was 70 ppt for the total concentration of the two contaminants combined. A response level is set higher than a notification level and represents a chemical concentration level at which DDW recommends a water system consider taking a water source out of service or providing treatment if that option is available to them. In March 2021, DDW issued an NL of 0.5 parts per billion (ppb) and an RL of 5 ppb for perfluorobutane sulfonic acid (PFBS), another PFAS chemical. The NL for PFBS is 100 times higher than the NLs for PFOA and PFOS. Metropolitan sources have not been affected by PFBS, but Metropolitan has not yet evaluated potential PFBS impacts on its member agencies' sources. DDW has also asked OEHHA to recommend NLs for six other PFAS compounds consistently detected in California drinking water sources: perfluorohexane sulfonic acid (PFHxS), perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), perfluorononanoic acid (PFNA), perfluorodecanoic acid (PFDA), and 4,8-dioxia-3H-perflourononanoic acid (ADONA). Legislation which took effect on January 1, 2020 (California Assembly Bill 756), requires that water systems that receive a monitoring order from the SWRCB and detect levels of PFAS that exceed their respective RLs must either take the drinking water source out of use or provide specified public notification if they continue to supply water above the RL.

In addition to the updated notification levels, DDW has requested that OEHHA develop PHGs for both PFOA and PFOS, the next step in the process of establishing MCLs in drinking water. As of the writing of this UWMP, draft PHGs have not been released. Other chemicals in the broader group of PFAS may be considered later, either individually or grouped, as data permits. On March 19, 2021, OEHHA announced its intent to list PFOA as a carcinogen under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). On March 26, 2021, OEHHA announced its review of the carcinogenic hazard of PFOS for possible listing under Proposition 65. That same day, OEHHA also announced its assessment of the reproductive toxicity of PFDA, PFHxS, PFNA, and perfluoroundecanoic acid (PFUnDA) for possible listing under Proposition 65. Comments regarding whether PFOA meets the criteria to be listed as a carcinogen under Proposition 65 were due by May 3, 2021. The public had until May 10, 2021, to submit information relevant to the assessment of the carcinogenicity of PFOS and the reproductive toxicity of PFDA, PFHxS, PFNA, and PFUnDA. In November 2017, OEHHA listed PFOA and PFOS as chemicals known to cause reproductive toxicity under Proposition 65. Proposition 65 requires businesses to provide warnings to Californians about significant exposures to chemicals that cause cancer, birth defects or other reproductive harm. Proposition 65 also prohibits California businesses from knowingly discharging significant amounts of listed chemicals into sources of drinking water.

On the federal level, U.S. EPA announced on January 19, 2021 that it is considering whether to designate PFOA and PFOS as hazardous substances under the Comprehensive Environmental Responsibility and Liability Act (CERCLA) and/or hazardous waste under the Resource Conservation and Recovery Act (RCRA). On February 22, 2021, U.S. EPA announced its proposed revisions to the Unregulated Contaminant Monitoring Rule (UCMR 5) for public water systems which includes monitoring for 29 PFAS in drinking water. The proposal would require pre-sampling preparations in 2022, sample collection from 2023-2025, and reporting of final results through 2026. Comments on U.S. EPA's proposal will be due within 60 days after it is published in the Federal Register. On March 3, 2021, U.S. EPA published its final regulatory determination to regulate PFOA and PFOS in drinking water. EPA has 24 months to propose maximum contaminant level goals (MCLG) and MCLs for PFOA and PFOS. Following that deadline, EPA has 18 months to publish final MCLGs and MCLs for PFOA and PFOS.

PFOA and PFOS were introduced in the 1940s and widely used in firefighting foams and in grease and stain-resistant, non-stick coatings in a variety of consumer products such as food paper packaging, carpets, furniture and cookware. The main route of exposure to PFOA and PFOS is through ingestion. While consumer products have been a large source of exposure to these chemicals for most people, drinking water has become an increasing concern due to the persistence of PFAS chemicals in the environment and their tendency to accumulate in groundwater. Groundwater contamination typically has been associated with an industrial facility where these chemicals were manufactured or used in other products, such as airfields and military bases where the chemicals have been used for firefighting or in areas near landfills that accept items containing PFAS.

Metropolitan has not detected PFOA or PFOS in its raw water. In 2019, Metropolitan detected in its supplies low levels of PFHxA, which is not acutely toxic or carcinogenic and is not currently regulated in California or at the federal level. No other PFAS have been detected in Metropolitan's imported or treated supplies. However, some of its member agencies have experienced detections in their groundwater wells. As DDW moves to establish MCLs for PFOA and PFOS, Metropolitan's member agencies may be confronted with the choice of implementing treatment or inactivating their affected sources to remain in compliance with DDW regulations. This may cause those systems to supplement their water needs with increased purchases of Metropolitan water.

### *1,4-Dioxane*

1,4-dioxane has been used as a stabilizer for solvents, in particular 1,1,1- trichloroethane (TCA), and a solvent in its own right, as well as in a number of industrial and commercial applications. 1,4-dioxane is an emerging contaminant. In response to the occurrence data and potential adverse health effects, a notification level for 1,4-dioxane of 1 µg/L was established. The response level for 1,4-dioxane is 35 µg/L.

The SWRCB set a notification level of 1 µg/L for 1,4-dioxane in drinking water in November 2010, revising an earlier notification level of 3 µg/L set in March 1998 that was based on a risk determination by the U.S. EPA and concurrence from OEHHA. In August 2010, U.S. EPA revised its 1,4-dioxane risk evaluation, lowering the recommended levels in drinking water by nearly 10-fold to 0.35 µg/L. Following U.S. EPA's reevaluation of risk, the SWRCB revised the notification level to 1 µg/L in November 2010, considering analytical limitations at the time. On January 22, 2019, the SWRCB asked OEHHA to establish a PHG for 1,4-dioxane. OEHHA's PHG will be used by the SWRCB to set an MCL for 1,4-dioxane in drinking water.

Advanced oxidation treatment is currently the water industry's preferred treatment technology for 1,4-dioxane. However, DDW has not yet adopted a Best Available Technology for 1,4-dioxane treatment.

There are currently 90 wells in Los Angeles County and 21 wells in Orange County that have detected 1,4-dioxane over the NL in the last three years.[12]

### *Other Water Quality Programs*

In addition to monitoring for and controlling specific identified chemicals in the water supply, Metropolitan has undertaken several programs to protect the quality of its water supplies. These programs are summarized below.

#### *Source Water Protection*

Source water protection is the first step in a multi-barrier approach to provide safe and reliable drinking water. In accordance with California's Surface Water Treatment Rule, Title 22 of the California Code of Regulations, DDW requires large utilities delivering surface water to complete a Watershed Sanitary Survey every five years to identify possible sources of drinking water contamination, evaluate source and treated water quality, and recommend watershed management activities that will protect and improve source water quality. The most recent sanitary surveys for Metropolitan's water sources are the Colorado River Watershed Sanitary Survey – 2015 Update and the State Water Project Watershed Sanitary Survey – 2016 Update.[13] The next Sanitary Surveys for the watersheds of the Colorado River and the SWP will report on watershed and water quality issues through 2020.

Metropolitan has an active source water protection program and continues to advocate on numerous issues to protect and enhance SWP and Colorado River water quality. As part of its source water protection program, Metropolitan monitors and forecasts source water quality, including closely monitoring the biology and limnology of lakes and aqueducts. Monitoring is conducted to comply with regulatory requirements, respond to water quality events, assess temporal variability, advise operations, and investigate emerging constituents and invasive species.

#### *Colorado River Water Quality Partnerships*

Metropolitan collaborates with external partners to asses and manage watershed threats to Colorado River water quality. Metropolitan is a member of the Clean Colorado River Sustainability Coalition, which was formed in 1997 and focuses on protecting and enhancing the Colorado River through monitoring and analysis of water quality to assure and sustain high quality water for all users of the Colorado River. In 2011, Metropolitan formed the Lower Colorado River Water Quality Partnership with SNWA and Central Arizona Project to identify and implement collaborative solutions to address water quality issues facing the Colorado River. Metropolitan also participated in the Lake Mead Water Quality Forum, which was formed in 2012, and its Lake Mead Ecosystem Monitoring Workgroup subcommittee. The Lake Mead Water Quality Forum's goals were to support the protection of human health and the environment and to preserve and improve the water quality of the Las Vegas Wash, Las Vegas Bay, and Lake Mead (and as a

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[12] DDW data reported from SWRCB Groundwater Ambient Monitoring Assessment Program's web site: https://gamagroundwater.waterboards.ca.gov/. Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.

[13] Metropolitan Water District of Southern California, *Colorado River Watershed Sanitary Survey, 2015 Update*. For the State Water Project, the sanitary survey report was prepared on behalf of the State Water Project Contractors Authority, in 2016, and was titled *California State Water Project 2016 Watershed Sanitary Survey Update*.

result, the Colorado River). In addition, as discussed earlier, Metropolitan is a member of the Colorado River Basin Salinity Control Forum which facilitates coordination between Basin states and federal agencies on salinity matters and the implementation of the Colorado River Basin Salinity Control Program.

### *SWP Water Quality Programs*

Metropolitan supports DWR policies and programs aimed at maintaining or improving the quality of SWP water delivered to Metropolitan. In particular, Metropolitan supported the DWR policy to govern the quality of non-project water conveyed by the California Aqueduct. In addition, Metropolitan has supported the expansion of DWR's Municipal Water Quality Investigations Program beyond its Bay-Delta core water quality monitoring and studies to include enhanced water quality monitoring and forecasting of the Delta and SWP. These programs are designed to provide early warning of water quality changes that will affect treatment plant operations both in the short-term (hours to weeks) and up to seasonally. The forecasting model is currently suitable for use in a planning mode. It is expected that with experience and model refinement, it will be suitable to use as a tool in operational decision making.

Metropolitan has implemented selective withdrawals from storage programs and exchanges to improve water quality. Although these programs were initially designed to provide dry-year supply reliability, they can also be used to store SWP water at periods of better water quality so the stored water may be withdrawn at times of lower water quality, thus diluting SWP water deliveries. Although elevated arsenic levels have been a concern in one groundwater banking program, there are also short-term water quality benefits that can be realized through storage programs, such as groundwater pump-ins into the California Aqueduct with lower TOC levels (as well as lower bromide and TDS, in some programs).

### *Regulatory and Legislative Actions*

Metropolitan conducts technical reviews of regulatory and legislative actions that may have an effect on the quality of Metropolitan's source waters. These may include changes in federal and state water quality standards; California Environmental Quality Act (CEQA) documents for projects or programs within Metropolitan's source watersheds; National Pollutant Discharge Elimination System permits for wastewater discharges into the Delta or Colorado River systems; and regulations or statewide policies and permits affecting source water quality or reservoir management issues.

In addition, Metropolitan advocates and provides funding requests for key source water protection priorities, including the Moab uranium tailings cleanup and Colorado River salinity control. In 2020, Metropolitan also co-sponsored SB 996 with the California Municipal Utilities Association to establish a statewide CEC program, which has been re-introduced as SB 230 in 2021's legislative session.

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# Coordination and Public Outreach

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### *Collaborative Regional Planning*

Southern California meets its water challenges through collaborative long-range planning, bringing local perspectives and data together with expert knowledge of hydrology, climate change, demographics, and economics. Metropolitan's 2020 Urban Water Management Plan (UWMP) was developed as part of the ongoing 2020 Integrated Water Resources Plan (IRP) planning process and provides a representation of Metropolitan's planning elements reported under the conditions required by the Act. Together, these plans serve as the reliability road map for the region. The planning process involved extensive coordination with Southern California's wholesale and retail water agencies, as well as municipal service providers and public planning agencies. Outreach efforts sought to engage the general public, businesses, environmental organizations, diverse communities, cities, counties, and other stakeholders with an interest in the future of Southern California's water supplies.

This chapter describes how Metropolitan's process to develop the 2020 UWMP, Appendix 11 to the 2015 UWMP, and Water Shortage Contingency Plan (WSCP) complies with the provisions for coordination and public outreach in the Urban Water Management Planning Act included as part of the California Water Code (CWC) §10610, et seq.

### *Concurrent Planning with the 2020 Integrated Water Resources Plan*

Metropolitan and its member agencies used a scenario planning approach for the 2020 IRP. Instead of focusing on a target for future water supply needs, this approach encouraged broader thinking and discussion on possible future conditions for local and imported water supply and retail demand, and the policy implications for Metropolitan. Adaptive management during implementation will allow flexibility in how the region prepares for the supply and demand conditions that are becoming more likely. The planning started with identifying drivers of change for water supply and demand, understanding how they interact, and then assessing the potential scale of impact in the future. Data sources were identified that could be used for quantitative and qualitative analysis. The detailed analyses of future local and imported water supplies; economic growth, demographics and water demands; and changing hydrology were incorporated into the 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP. The IRP planning effort and policy discussions continued into 2021.

#### *Board of Directors Oversight*

Metropolitan's Board of Directors provided oversight throughout the ongoing process for the development of the 2020 IRP that informed the preparation of the 2020 UWMP. The Board established the Integrated Resources Plan Special Committee (IRP Committee) to provide focused involvement of the Metropolitan Board for the preparation of these plans. The IRP Committee has 14 members, and all Board members are invited to attend and participate in discussions. The meetings are held online due to COVID-19 concerns. They are open to the public, and the public is invited to provide comments at each meeting. The IRP Committee held 12 meetings between February 2020 and March 2021, as summarized in Table 5-1.

**Table 5-1**
**Summary of Metropolitan Board of Directors IRP Committee Meetings**

| Date | Committee | Topic |
|---|---|---|
| February 25, 2020 | IRP Committee | Overview of the planning process, introduction to scenario planning, identify major policy areas |
| April 28, 2020 | IRP Committee | Review process and scenario planning, identify relevant policy questions |
| May 26, 2020 | IRP Committee | Review schedule, overview of stakeholder outreach |
| June 23, 2020 | IRP Committee | Discuss drivers of change and method for constructing scenarios |
| July 28, 2020 | IRP Committee | Qualitative and quantitative assessment for scenarios, collaboration with member agencies |
| August 17, 2020 | IRP Committee | IRP purpose and benefit; development of an example scenario |
| September 22, 2020 | IRP Committee | Draft scenarios and analysis |
| October 27, 2020 | IRP Committee | Scenario assumptions and preliminary analysis of drivers |
| December 15, 2020 | IRP Committee | Draft retrospective of the 2015 IRP, preliminary gap analysis and policy implications of the 2020 IRP |
| January 26, 2021 | IRP Committee | Comments and feedback on 2015 IRP retrospective report, 2020 IRP policy discussion |
| February 23, 2021 | IRP Committee | Policy discussion on portfolio development, preparation for workshops with demand and climate experts |
| March 23, 2021 | IRP Committee | Workshop with water demand experts |

### *Coordination with Member Agencies and Other Organizations*

Metropolitan coordinated the preparation of the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP with its 26 member agencies, wastewater management agencies, municipal service providers, groundwater management agencies, cities and counties within which Metropolitan provides water supplies, and regional planning agencies. The extensive regional coordination is consistent with the requirements of CWC Sections 10610.2(a)(4), 10620(d)(3), 10621(b), 10641, and 10642. With the WSCP initially included as part of the 2020 UWMP and the content of Appendix 11 to the 2015 UWMP the same as the content of Appendix 11 to the 2020 UWMP, the required coordination, notification, hearing, and adoption of the WSCP and Appendix 11 to the 2015 UWMP were accomplished side by side and concurrently with the 2020 UWMP process. Additionally, the WSDM Plan and WSAP, which are planning components included as part of the WSCP, were previously developed through extensive coordination with member agencies and various stakeholders and adopted by Metropolitan's Board in 1999 and 2008, respectively, and subsequent revisions to the WSAP were adopted in 2009, 2010, 2011, and 2014.

Metropolitan collaborated with its member agencies through the Member Agency Managers meetings and an IRP Member Agency Technical Workgroup, as well as the UWMP Coordination Meetings with member agencies and other appropriate agencies. These meetings provided an opportunity to share information, discuss scenario development and data analysis, and review draft analyses of future supply and demand. A summary of the meetings is provided in Table 5-2. In addition, Metropolitan staff met with member agency staff individually and provided presentations to member agency boards upon request.

Work with the member agencies was structured to complement presentations and discussions with the IRP Committee. Presentations and discussions with the Member Agency Technical Workgroup were incorporated into the following Member Agency Managers meetings. The feedback from the Member Agency Managers was then used to develop the presentations for the upcoming IRP Committee meetings. The Committee discussion and direction provided to staff informed the preparation of analysis and materials for the next Member Agency Technical Workgroup. This iterative process allowed for regular input and discussion, an essential element of scenario planning.

The first step in the planning process was to identify the drivers of change, those external factors that could impact future water supply and demand for the region. Over several months, Metropolitan worked with the Board, member agencies, stakeholders and the public to identify a broad range of drivers, understand how the drivers interact, and assess the potential scale of impact on water supply and demand. An important part of the discussion focused on how the impact of drivers could be evaluated qualitatively and quantitatively. The member agencies made recommendations on data and methodologies that could be used, and the draft analyses led to refinements.

Using the requirements for the UWMP, Metropolitan analyzed the data provided by the member agencies, other regional planning organizations such as SCAG and SANDAG, the California Department of Water Resources, and the U.S. Bureau of Reclamation. Local and imported water supplies were included, as well as demand management programs, regulations, and public acceptance of conservation as a way of life. Metropolitan prepared the data in five-year increments for conditions under normal water year, single dry year, and for droughts lasting at least five years as required in CWC Section 10631. The analyses were shared with the member agencies for their feedback, and to assist with their preparation and adoption of their plans. When requested, Metropolitan staff met individually with the member agencies to review the data sets and discuss any agency-specific questions or issues. Regional issues and analysis methodologies were discussed during the technical workgroup meetings and the Member Agency Managers meetings. Preliminary estimates of demand and supply were included in the Final Draft 2020 UWMP and draft Appendix 11 to the 2015 UWMP distributed to the member agencies in December 2020. Further refinements of demand and supply estimates were included in the Public Review drafts of the 2020 UWMP and draft Appendix 11 to the 2015 UWMP that were prominently posted on Metropolitan's website in February 2021, March 2021, and April 2021.

### *Public Outreach during IRP/UWMP/Appendix 11/WSCP Preparation*

Metropolitan involved environmental and non-governmental organizations, businesses, academia, diverse communities, and the public in the preparation of the IRP, 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP. Public outreach provides an invitation and a means for the public to provide input on the region's future water supply reliability. Metropolitan's three key objectives for public involvement in the preparation of the 2020 IRP, 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP are as follows:

- Ensure that the planning process is understandable and accessible to anyone who has an interest in Southern California's water resources and water supply reliability
- Provide opportunities for learning, dialogue, and input
- Create a pathway to encourage continued engagement in future policy discussions

"Water Tomorrow" is Metropolitan's brand to build awareness of long-range planning efforts and programs for water reliability. The website MWDWaterTomorrow.com links the IRP, 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP. It provides key information on the IRP and IRP Committee presentations, as well as notice of stakeholder workshops. Metropolitan shares news and updates about the IRP and UWMP through Metropolitan's e-newsletter and social media on several platforms. Metropolitan also provides speakers for community, governmental and business organizations throughout its service area.

To encourage public involvement during the planning process, Metropolitan held two public workshops in May 2020 using an online platform due to COVID-19 concerns. The workshops introduced the scenario planning approach and focused on drivers of change, opening up dialogue and discussion among stakeholders across the region. Over 500 stakeholders participated, sharing their ideas on what could drive future water supply and demand conditions. Throughout the planning process the public was invited to provide comments at each IRP Committee meeting and to view the presentations and listen to the board discussions.

The third outreach objective looks to the future. One of Metropolitan's overarching communication goals is to develop the general public's knowledge of water resource issues and the range of solutions available to Southern California. An informed public is better able to contribute to the discussions and understand the implications and opportunities afforded by decisions. Metropolitan is building on the momentum for the IRP, 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP planning efforts to encourage continued public involvement in water issues. Stakeholders will continue to receive updates through MWDWaterTomorrow.com, social media, and e-news.

### *2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP Public Notice and Adoption*

CWC Section 10632 requires urban water suppliers to prepare a detailed WSCP. While the WSCP is its own independent plan that may be revised at any point in time, it is initially included as part of the 2020 UWMP.

Metropolitan provided notice of the availability of the draft 2020 UWMP (including Appendix 11 which will also be a new Appendix 11 to its 2015 UWMP) and the WSCP, and notice of the public hearing to consider adoption of both plans and Appendix 11 as an addendum to its 2015 UWMP, in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP were posted prominently on Metropolitan's website, mwdh2o.com, on February 1, 2021, more than 60 days in advance of the public hearing on April 12, 2021. The notice of availability of the documents was sent to Metropolitan's member agencies, as well as to cities and counties in Metropolitan's service area. In addition, a public notice advertising the public hearing in English and Spanish was published in 12 Southern California newspapers. The notification in English language newspapers was published on February 1 and 8, 2021. The notification was also published on January 28-30, 2021 and February 1, 4-6, and 8, 2021 in Spanish language newspapers, satisfying the requirement for non-English language notification. Copies of: (1) the notification letter sent to the member agencies, cities and counties in Metropolitan's service area, and (2) the notice published in the newspapers are included in this section. Table 5-3

provides a list of participating member agencies and other appropriate agencies that Metropolitan coordinated with in its regional planning, as well as the cities and counties that were notified about the preparation of its 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP. In addition, the list of newspaper publications is included in Table 5-4.

Metropolitan held the public hearing for the draft 2020 UWMP, draft Appendix 11 to the 2015 UWMP, and draft WSCP on April 12, 2021, at the Board's Water Planning and Stewardship Committee meeting, held online due to COVID-19 concerns. On May 11, 2021, Metropolitan's Board determined that the 2020 UWMP and the WSCP are consistent with the Act and accurately represent the water resources plan for Metropolitan's service area. In addition, Metropolitan's Board determined that Appendix 11 to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003) which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions 9279, 9280, and 9281, the Board adopted the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP, and authorized their submittal to the State of California. Copies of Resolutions 9279, 9280, and 9281 are included in this section.

### *Submission and Availability of Final 2020 UWMP, Appendix 11 to 2015 UWMP, and WSCP*

In fulfillment of CWC Sections 10632(c) and 10645(a) and (b), Metropolitan's final 2020 UWMP, Appendix 11 to its 2015 UWMP, and its WSCP were posted on the mwdh2o.com website in May 2021, following their adoption by the Metropolitan Board. This satisfies the requirement to make the plans available for public review and to make the WSCP available to Metropolitan's customers (which are its member agencies).

In fulfillment of CWC Sections 10632(c), 10635(c), and 10644(a)(1), Metropolitan also mailed copies of the final 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP (in electronic pdf format) to the California State Library and all cities and counties within Metropolitan's service area within 30 days of Board adoption.

In fulfillment of CWC Section 10621(f) and Sections 10644(a)(1), (2), and (b), Metropolitan's final 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP were electronically submitted to the State of California through DWR's WUE data website https://wuedata.water.ca.gov/secure/ in June 2021.

**Table 5-2**
**2020-2021 Member Agency Participation**

| Date | Group | Topic |
|---|---|---|
| May 5, 2020 | Member Agency UWMP Coordinators and Consultants | UWMP Member Agency Coordination Meeting #1 – Kickoff of UWMP Process |
| May 13, 2020 | Member Agency Technical Workgroup | IRP schedule and process, drivers of change brainstorm |
| May 15, 2020 | Member Agency Managers Meeting | IRP schedule and process, drivers of change brainstorm |
| June 10, 2020 | Member Agency Technical Workgroup | Drivers of change survey, process for constructing scenarios |
| June 12, 2020 | Member Agency Managers Meeting | Drivers of change survey, process for constructing scenarios |
| June 30, 2020 | Member Agency UWMP Coordinators and Consultants | UWMP Member Agency Coordination Meeting #2 – Coordination with DWR on Guidebook Development and Reduced Delta Reliance Reporting |
| July 15, 2020 | Member Agency Technical Workgroup | Drivers of change, qualitative and quantitative assessment |
| July 17, 2020 | Member Agency Managers Meeting | Drivers of change, qualitative and quantitative assessment |
| August 5, 2020 | Member Agency Technical Workgroup | Qualitative and quantitative assessment |
| August 6, 2020 | Member Agency Managers Meeting | Qualitative and quantitative assessment |
| August 12, 2020 | Member Agency Technical Workgroup | Qualitative and quantitative assessment |
| August 21, 2020 | Member Agency Managers Meeting | IRP progress, draft scenario framework |
| August 24, 2020 | Member Agency Meeting: IEUA | Coordination meeting on IEUA UWMP preparation |
| September 10, 2020 | Member Agency Meeting: MWDOC | Kickoff meeting on UWMP preparation with MWDOC Retail Agencies |
| September 16, 2020 | Member Agency Technical Workgroup | Draft scenario framework, narrative summaries |
| September 18, 2020 | Member Agency Managers Meeting | Draft scenario framework, assumptions |
| September 28, 2020 | Member Agency Meeting: SDCWA | Coordination meeting on UWMP preparation (Reduced Delta Reliance) |
| October 8, 2020 | Member Agency UWMP and IRP Coordinators and Consultants | Technical Meeting on IRP Analysis, Local Supply Information Exchange, Reduced Delta Reliance Reporting |
| October 14, 2020 | Member Agency Technical Workgroup | Draft scenario assumptions, preliminary analysis |

**Table 5-2** (continued)
**2020-2021 Member Agency Participation**

| Date | Group | Topic |
|---|---|---|
| October 16, 2020 | Member Agency Managers Meeting | Draft scenario assumptions, preliminary analysis |
| November 13, 2020 | Member Agency Managers Meeting | Imported water supply analysis; preliminary results for UWMP and IRP scenarios |
| November 24, 2020 | Member Agency Technical Workgroup | Preliminary assumptions and gap analysis for IRP scenarios |
| November 30, 2020 | Member Agency UWMP Coordinators, Sanitation Districts, Groundwater Managers, and Stakeholders | UWMP Member Agency Coordination Meeting #3 – Discussion of Final Draft UWMP |
| December 11, 2020 | Member Agency Managers Meeting | IRP update and preliminary results for UWMP |
| January 15, 2021 | Member Agency Managers Meeting | UWMP update and discussion of reliability for IRP |
| February 12, 2021 | Member Agency Managers Meeting | Scenario refinements, engaging local agencies for groundwater, surface water and local projects |
| February 22, 2021 | Member Agency Technical Workgroup | Scenario and gap analysis refinements, engaging local agencies for groundwater, surface water and local projects; preparation for workshops with demand and climate experts |
| March 12, 2021 | Member Agency Managers Meeting | Discussion on workshops with water demand and climate change experts |
| March 18, 2021 | Member Agency UWMP Coordinators and Consultants | UWMP status update, Reduced Delta Reliance reporting, Understanding Alternative Forecasts and Projections for Demand on Metropolitan |

**Table 5-3**
**Water Supplier Information Exchange**

| **6 Counties** | | | |
|---|---|---|---|
| Los Angeles | Orange | Riverside | San Bernardino |
| San Diego | Ventura | | |
| **136 Cities** | | | |
| Agoura Hills | Fillmore | Long Beach | Rosemead |
| Aliso Viejo | Fontana | Los Alamitos | San Clemente |
| Arcadia | Fountain Valley | Lynwood | San Dimas |
| Artesia | Fullerton | Malibu | San Fernando |
| Azusa | Garden Grove | Manhattan Beach | San Gabriel |
| Bell Gardens | Gardena | Maywood | San Jacinto |
| Bellflower | Glendale | Menifee | San Marcos |
| Bradbury | Glendora | Mission Viejo | San Marino |
| Buena Park | Hawaiian Gardens | Monrovia | Santa Ana |
| Burbank | Hermosa Beach | Monterey Park | Santa Fe Springs |
| Calabasas | Hidden Hills | Moorpark | Santa Monica |
| Camarillo | Huntington Beach | Murrieta | Seal Beach |
| Carson | Imperial Beach | National City | Sierra Madre |
| Chino | Industry | Newport Beach | Signal Hill |
| Chino Hills | Inglewood | Norco | Simi Valley |
| Chula Vista | Irvine | Norwalk | Solana Beach |
| Claremont | Irwindale | Ontario | South El Monte |
| Compton | La Canada Flintridge | Oxnard | South Gate |
| Corona | La Habra | Palos Verdes Estates | South Pasadena |
| Covina | La Habra Heights | Paramount | Stanton |
| Cudahy | La Mesa | Pasadena | Temecula |
| Culver City | La Mesa | Perris | Temple City |
| Cypress | La Mirada | Pico Rivera | Thousand Oaks |
| Dana Point | La Palma | Placentia | Torrance |
| Del Mar | La Puente | Pomona | Upland |
| Diamond Bar | La Verne | Port Hueneme | Ventura |
| Downey | Laguna Beach | Poway | Villa Park |
| Duarte | Laguna Hills | Rancho Cucamonga | Vista |
| Eastvale | Laguna Niguel | Rancho Palos Verdes | Walnut |
| El Cajon | Laguna Woods | Rancho Santa Margarita | West Hollywood |
| El Monte | Lake Elsinore | Redondo Beach | Westlake Village |
| El Segundo | Lake Forest | Riverside | Westminster |
| Encinitas | Lakewood | Rolling Hills | Whittier |
| Escondido | Lawndale | Rolling Hills Estates | Wildomar |

**Table 5-3**
**Water Supplier Information Exchange** (continued)

| **26 Member Agencies** | | | |
|---|---|---|---|
| Anaheim | Foothill MWD | Municipal Water District of Orange County | Three Valleys MWD |
| Beverly Hills | Fullerton | Pasadena | Torrance |
| Burbank | Glendale | San Diego County Water Authority | Upper San Gabriel Valley MWD |
| Calleguas MWD | Inland Empire Utilities Agency | San Fernando | West Basin MWD |
| Central Basin MWD | Las Virgenes MWD | San Marino | Western MWD |
| Compton | Long Beach | Santa Ana | |
| Eastern MWD | Los Angeles | Santa Monica | |
| **9 Groundwater Basin Management Organizations** | | | |
| Santa Margarita River Watermaster | Ventura County Watershed Protection District | Water Replenishment District | Upper Los Angeles River Area Watermaster |
| San Bernardino County Flood Control District | Chino Basin Watermaster | Main San Gabriel Basin Watermaster/ | Orange County Water District |
| Raymond Basin Management Board | | | |
| **Other Agencies / Planning Organizations** | | | |
| Los Angeles County Sanitation Districts | City of Los Angeles Bureau of Sanitation | Southern California Association of Governments | Western Riverside Council of Governments |
| Orange County Sanitation District | City of San Diego Metropolitan Wastewater Department | City of San Diego Recycled Water Section Public Utilities Department | San Diego Association of Governments |
| California State Water Contractors | | | |

**Table 5-4**
**Newspaper Publication of Public Hearing Notification**

| English Language Newspapers | | |
|---|---|---|
| Los Angeles County | Los Angeles Times | February 1 and 8, 2021 |
| Orange County | Orange County Register | February 1 and 8, 2021 |
| San Bernardino | Inland Valley Daily Bulletin | February 1 and 8, 2021 |
| Ventura County | Ventura County Star | February 1 and 8, 2021 |
| Riverside County | Press Enterprise | February 1 and 8, 2021 |
| San Diego County | San Diego Union Tribune | February 1 and 8, 2021 |
| **Spanish Language Newspapers** | | |
| Los Angeles County | La Opinion | February 1 and 8, 2021 |
| Orange County | Excelsior | January 29, 2021 and February 5, 2021 |
| San Bernardino | El Chicano | January 28, 2021 and February 4, 2021 |
| Ventura County | VIDA Ventura County | January 28, 2021 and February 4, 2021 |
| Riverside County | La Prensa Hispana | January 29, 2021 and February 5, 2021 |
| San Diego County | Fronteras | January 30, 2021 and February 6, 2021 |

**(Notification per California Water Code § 10621(b) and § 10642)**
**Letter Notifying Cities and Counties**

February 1, 2021 [Sent via US Mail to Member Agencies, City Managers, and County Administrators]

Notice of Public Hearing on The Metropolitan Water District of Southern California's Draft 2020 Urban Water Management Plan (UWMP), Draft Appendix 11 to the 2015 UWMP, and Draft Water Shortage Contingency Plan

The Metropolitan Water District of Southern California (Metropolitan) cordially invites you to participate and provide comments at a public hearing on the draft 2020 Urban Water Management Plan (UWMP), draft Appendix 11 as an addendum to the 2015 UWMP, and draft Water Shortage Contingency Plan (WSCP). The UWMP presents Metropolitan's long-term plan for ensuring water supply reliability and water quality for the region. The draft 2020 UWMP complies with California state law requiring urban water suppliers to prepare and update urban water management plans every five years. The draft WSCP includes Metropolitan's efficient management and planned actions to respond to actual water shortage conditions. Metropolitan's WSCP satisfies the requirements of the California Water Code. The draft Appendix 11 to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003) which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. The hearing will be held as part of the meeting of the Water Planning and Stewardship Committee whose board members are helping to shape a public dialogue on the future of water management and conservation in the region. The meeting details are as follows:

> **Water Planning and Stewardship Committee Meeting**
> **Monday, April 12, 2021 at 10:00 AM**
> **(expected time; please confirm time 7 days prior to meeting)**
> **Teleconference Participation Only**
> **No Physical Meeting Location**
>
> As a result of the COVID-19 emergency and the Governor's Executive Orders to protect public health by limiting public gatherings and requiring social distancing, at this time, this meeting is scheduled to occur via remote presence.
>
> The Water Planning and Stewardship Committee meeting will be live streamed and recorded and may be accessed using the following link:
> http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Pages/default.aspx.
> (Please check this website for final time of the Public Hearing.)

The draft 2020 UWMP, draft Appendix 11 to the 2015 UWMP, and draft WSCP are posted on Metropolitan's website, mwdh2o.com, for your review. Public input is encouraged and will be considered during finalization of the 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP. Written comments are due by **April 12, 2021**.

If you would like to get more information or send comments, please contact Edgar Fandialan at efandialan@mwdh2o.com.

Very Truly Yours,
Brad Coffey
Manager, Water Resource Management Group

**(Published on February 1 and 8, 2021 for English language newspapers and January 28-30, 2021 and February 1, 4-6, and 8, 2021 for Spanish language newspapers per California Water Code § 10642, Government Code § 6066, and Chapter 17.5 of the Government Code)**

**PUBLIC HEARING SCHEDULED ON**

**DRAFT 2020 URBAN WATER MANAGEMENT PLAN, DRAFT APPENDIX 11 TO 2015 URBAN WATER MANAGEMENT PLAN, AND DRAFT WATER SHORTAGE CONTINGENCY PLAN**

The Metropolitan Water District of Southern California (Metropolitan) will hold a public hearing on **Monday, April 12, 2021** to receive comments on its draft 2020 Urban Water Management Plan (UWMP), draft Appendix 11 as an addendum to its 2015 UWMP, and its draft Water Shortage Contingency Plan (WSCP).

The hearing will be held as part of the meeting of the Water Planning and Stewardship Committee whose board members are helping to shape a public dialogue on the future of water management and conservation in the region. The meeting is at:

> **Water Planning and Stewardship Committee Meeting**
> **Monday, April 12, 2021 at 10:00 AM**
> **Teleconference Participation Only**
> **No Physical Meeting Location**
>
> As a result of the COVID-19 emergency and the Governor's Executive Orders to protect public health by limiting public gatherings and requiring social distancing, at this time, this meeting is scheduled to occur via remote presence.
>
> The Water Planning and Stewardship Committee meeting will be live streamed and recorded and may be accessed using the following link:
> http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Pages/default.aspx.
> (Please check this website for final time of the Public Hearing.)

The UWMP presents Metropolitan's long-term plan for ensuring water supply reliability and water quality for the region. The draft 2020 UWMP complies with California state law requiring urban water suppliers to prepare and update urban water management plans every five years. The draft Appendix 11 to both the 2020 UWMP and the 2015 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003) which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. The draft WSCP includes Metropolitan's efficient management and planned actions to respond to actual water shortage conditions. Metropolitan's draft WSCP satisfies the requirements of the California Water Code.

The draft 2020 UWMP, draft Appendix 11, and the draft WSCP are available on Metropolitan's website, mwdh2o.com. Public input is encouraged and will be considered during finalization of the 2020 UWMP, Appendix 11, and the WSCP. Metropolitan will accept written comments on the draft plans and draft Appendix 11. All written comments must be received by **April 12, 2021**.

To send comments or for more information on the draft 2020 UWMP, draft Appendix 11, and draft WSCP, please contact Edgar Fandialan of Metropolitan's Water Resource Management Group at efandialan@mwdh2o.com.

## Resolution Adopting the 2020 Urban Water Management Plan

**Resolution 9279**

**RESOLUTION**
**OF THE BOARD OF DIRECTORS**
**OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**
**ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN**

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, an urban water management plan every five years; and

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such urban water management plans; and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered the 2020 Urban Water Management Plan and has determined the 2020 Urban Water Management Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of the water resources plan for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May 11, 2021, this District hereby adopts this 2020 Urban Water Management Plan for submittal to the State of California.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May 11, 2021.

Judy Abdo

Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California

## Resolution Adopting the Appendix 11 Addendum to the 2015 Urban Water Management Plan

**Resolution 9280**

**RESOLUTION**
**OF THE BOARD OF DIRECTORS**
**OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**
**ADOPTING APPENDIX 11 AS AN ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN**

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, an urban water management plan every five years; and

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for amending and adopting such urban water management plans; and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered Appendix 11 as an addendum to Metropolitan's 2015 Urban Water Management Plan and has determined Appendix 11 to be consistent with the Urban Water Management Planning Act and includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs., tit. 23, § 5003, subd. (c)(1)) which need to be included in a water supplier's urban water management plan to support a certification of consistency for one or more future water supply covered actions in the Sacramento-San Joaquin Delta.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May 11, 2021, this District hereby adopts this Appendix 11 to the 2015 Urban Water Management Plan for submittal to the State of California.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May 11, 2021.

Judy Abdo

Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California

## Resolution Adopting the Water Shortage Contingency Plan

**Resolution 9281**

**RESOLUTION**
**OF THE BOARD OF DIRECTORS**
**OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**
**ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN**

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, a water shortage contingency plan;

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such Water Shortage Contingency Plans;

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers to conduct an annual water supply and demand assessment (Annual Assessment) each year and to include in their water shortage contingency plans the procedures they use to conduct the Annual Assessment;

WHEREAS, the procedures used to conduct an Annual Assessment include, but are not limited to, the written decision-making process that an urban water supplier will use each year to determine its water supply reliability;

WHEREAS, The Metropolitan Water District of Southern California's (Metropolitan's) water shortage contingency plan provides that by June of each year, Metropolitan staff will present a completed Annual Assessment for approval by Metropolitan's Board of Directors or by the Board's authorized designee with expressly delegated authority for approval of Annual Assessment determinations;

and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered such Water Shortage Contingency Plan and has determined the Water Shortage Contingency Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of the planned actions during shortage conditions for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May 11, 2021, this District hereby adopts this Water Shortage Contingency Plan for submittal to the State of California and expressly authorizes the General Manager of The Metropolitan Water District of Southern California to approve the Annual Assessment each year.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May 11, 2021.

Judy Abdo

Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California

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# Appendix 1

# DEMAND FORECAST

# Appendix 1
# DEMAND FORECAST

## Forecast Overview

Retail water demand forecasting is essential for planning total water requirements in Metropolitan's service area. Retail water demand can be met with conservation, local supplies, or imported supplies. As a wholesale imported water supplier, Metropolitan's long-term plans focus on the future demands for Metropolitan's supplies. In order to project the need for resources and system capacity, Metropolitan begins with a long-term projection of retail water demands.

Total retail demands include:

- Retail Municipal and Industrial (M&I) — Retail M&I demands represent urban water use within the region including residential, commercial, industrial, and institutional water uses. To forecast retail M&I demands, Metropolitan uses econometric models that have been adapted for conditions in Southern California. The econometric models are statistical models that can capture and explain the impacts of long-term socioeconomic trends on retail M&I demands. The econometric models incorporate projections of demographic and economic variables from regional transportation planning agencies to produce forecasts of water demand.
- Retail Agricultural Demand — Retail agricultural demands consist of water use for irrigating crops. Metropolitan's member agencies provide projections of agricultural water use based on many factors, including farm acreage, crop types, historical water use, and land use conversion. Metropolitan relies on member agencies' projections of agricultural demands.
- Seawater Barrier Demand — Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Groundwater management agencies determine the barrier requirements based on groundwater levels, injection wells, and regulatory permits.
- Replenishment Demand — Replenishment demands represent the amount of water member agencies plan to use to replenish their groundwater basins in order to maintain sustainable basin health and production.

### *Retail M&I Demand Forecast*

In forecasting retail M&I water demand, Metropolitan utilizes an econometric model (the Metropolitan Water District – Econometric Demand Model or MWD-EDM) developed by The Brattle Group (January 2015). MWD-EDM utilizes multiple regression, which is generally favored by academics and practitioners for long-term water demand analysis. It uses demand relationships based on actual observed behavior to consider the effect of anticipated changes in demand factors on long-term demand.

MWD-EDM is comprised of three separate regression models described below. Each model is developed using historical water consumption, socio-demographic, and economic data specific to the sector:

- Single-Family Residential (SFR) Model — SFR water demand is modeled as a function of price, weather, retailer level housing, socio-demographic characteristics, and member agency

level fixed effects. The model used water consumption data from 153 retailers with 3,000 accounts or more in Metropolitan's service area. The dataset, ranging from 1994 to 2011, consisted of 1,225 observations and represented 80 percent of all SFR accounts from all 26 Metropolitan member agencies.

- Multi-family Residential (MFR) Model — MFR demand is modeled as a function of price, retailer level housing, socio-demographic characteristics, and member agency level fixed effects. Water consumption data, ranging from 1994 to 2011, was collected from 53 water retailers consisting of 469 observations and representing 23 out of 26 Metropolitan member agencies.
- Commercial, Industrial, and Institutional (CII) Model — CII demand is modeled as a function of price, weather, employment, the share of employment in the manufacturing sector, and member agency level fixed effects. Water consumption data, ranging from 1994 to 2011, was collected from 75 water retailers consisting of 709 observations and representing 25 out of 26 Metropolitan member agencies.

The SFR and MFR models forecast average monthly household consumption before conservation, while the CII model forecasts average monthly consumption per employee. Table A.1-1 shows the dependent and the covariates uses in the econometric models for each sector.

**Table A.1-1**
**MWD-EDM Variables**

| Sector | Dependent Variable | Independent Variable (Covariate) |
|---|---|---|
| SFR | Water-Use Per Household | Total Average Cost<br>Total Average Cost x Median Lot Size<br>Annual precipitation<br>Average Max Temperature<br>Median Income<br>Average Household Size<br>Median Lot Size |
| MFR | Water-Use Per Household | Median Tier Price<br>Median Income<br>Median Lot Size<br>Average Household Size |
| CII | Water-Use Per Employee | Median Tier Price<br>Cooling Degree Days<br>Average Max Temperature<br>Share of Employment In Manufacturing<br>Median Tier Price x Share of Manufacturing |

Total retail M&I demand is the product of projected household/employee and the average monthly consumption.

Price Elasticity

Price elasticity of demand is a measure used in economics to show the responsiveness of the quantity of water demanded to a change in its price. The assumed price increase reduces the

water use. This reduction can be assessed in MWD-EDM and is considered a conservation savings due to price or "price-effect." Consumers can respond to price increases by installing water-conserving fixtures and appliances such as high-efficiency toilets. However, many of the fixture-based conservation savings options are already factored into Metropolitan's Conservation Savings Model. As more water efficient fixtures are installed, the impact of changing water using behavior through price or rates is reduced. Consider consumers who respond to rate increases by taking shorter showers. Their behavior adjustment will save less water if they use a water-efficient low-flow showerhead compared to a regular showerhead. This effect is known as demand hardening. In order to avoid double-counting conservation savings and account for demand hardening, the impact of price elasticity is reduced. In MWD-EDM, price elasticity is adjusted by 33 percent in 2019 and 66 percent by 2045. Price-effect savings are reduced (and demands increased) as a result of this adjustment. The elasticity is reduced in proportion to increases in conservation savings from the conservation model. Reducing price elasticity to 1/3 of its originally estimated levels is based on professional judgment, assuming that much of the easily obtained water use efficiencies will be achieved by 2020 but allowing for new conservation technologies.

Fixed Effects

MWD-EDM forecasts retail M&I demand for each of the 26 member agencies. To account for the differences observed between each agency, MWD-EDM uses the fixed effects or the constant term that represents the member agency specific intercepts that account for all time-invariant unobserved factors common to an agency.

Demographics

Demographics are recognized by the water industry as drivers of water demand. Metropolitan's retail demand modelling is driven by key demographics such as projected population, households, employment, and median household income.

Metropolitan uses demographic growth projections produced by two regional transportation planning agencies: Southern California Association of Governments (SCAG) and San Diego Association of Governments (SANDAG). Together they represent more than 200 cities in Southern California and produce long-term transportation plans for sustainable communities. Among other responsibilities, SCAG and SANDAG also prepare projections of population, households, income, and employment for their regions. Both planning agencies update their regional growth forecasts approximately every four years, at different times. SCAG is the regional planning agency for six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. SANDAG is the regional planning agency for San Diego County. Significantly, SCAG's and SANDAG's official growth projections are backed by environmental reports. These regional growth forecasts provide the core assumptions underlying Metropolitan's retail demand forecasting model.

In May 2020, SCAG approved the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) for federal transportation conformity purposes, certified the Connect SoCal program environmental impact report (PEIR), and delayed for up to 120 days approval of the plan for other purposes primarily due to the COVID-19 pandemic. This enabled SCAG to submit the plan to the Federal Highway Administration and Federal Transit Administration for review prior to the June 1, 2020, deadline, as required by the federal Clean Air Act. SCAG subsequently approved Connect SoCal in its entirety in September 2020. SCAG's related growth forecast (RTP-20) projects growth in employment, population, and households at the regional, county, jurisdictional, and sub-jurisdictional levels. The regional and county growth forecasts reflect recent and past trends and expert-derived demographic and economic

assumptions for Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties. Metropolitan uses the forecast for every county except Imperial, which is outside of Metropolitan's service area. In preparing its demographic and growth forecast, Metropolitan relied on SCAG's 2020 Demographics and Growth Forecast Proposed Final Technical Report to the RTP/SCS. The report includes information on social factors affecting water management such as race, ethnicity, and cultures. As noted in SCAG's report, Southern California is one of the most diverse regions in the nation in race and ethnicity. Race and ethnicity are important for demographers to consider while forecasting since fertility and household formation have strong cultural underpinnings that vary based on these categories.

In October 2019, SANDAG adopted the San Diego Forward: The 2019 Federal Regional Transportation Plan that utilized Version 17 of the SANDAG Series 14 Regional Growth Forecast (SANDAG Series 14). The forecast is a comprehensive projection of the regional demographic, economic, and housing trends for the San Diego region that was developed through a collaborative effort with experts in demography, housing, the economy and other disciplines, and the close cooperation of the local planning directors and their staff. Metropolitan uses the forecast for the San Diego County Water Authority's service area in the retail demand forecast.

### *Effects of the COVID-19 Pandemic on SCAG's and SANDAG's Forecasts*

Both SCAG and SANDAG's forecasts were developed prior to the advent of the COVID-19 global pandemic. For this reason, assumptions about the pandemic's effects on future growth are not reflected in the demographic forecast data used in this UWMP. Although long-term impacts are extremely uncertain, the region is currently experiencing acute and potentially lasting disruptions across a wide range of economic and lifestyle activities that in turn may unsettle pre-pandemic expectations for future household formation, migration, fertility, and life expectancy.

After approving Connect SoCal in May 2020 for the limited purpose of federal air quality conformity, SCAG engaged in a stakeholder outreach process to learn more from stakeholders about how they have been impacted by COVID-19 and learn how Connect SoCal could be better positioned as a tool for recovery and regional resilience. Activities included engagement with regional planning working groups, direct outreach to stakeholders, focus groups with community-based organizations, a public survey, and a public virtual townhall. Given the living nature of Connect SoCal and its existing focus on the need to develop regional resilience strategies targeting vulnerable communities, SCAG staff did not recommend specific modifications or clarifications to Connect SoCal in response to the pandemic at the time. Rather, staff recommended that policy changes and plan updates be considered through future board action informed by its implementation planning and regular processes for updating the Regional Transportation Plan/Sustainable Communities Strategy. With its September 2020 final adoption, SCAG accepted the Connect SoCal in its entirety without substantive changes to the growth forecast.

### *Forecasts Used by Metropolitan*

Metropolitan uses the forecast approved by SCAG in May 2020. During the period between May and September 2020, the cities of Anaheim, Chino, Duarte, Malibu, and some unincorporated areas of Los Angeles and San Bernardino counties made adjustments to the forecast to reflect changes in their general plan capacities and entitlements. The total household change resulted in 0.29% of the region's Transportation Analysis Zones (TAZ) and jobs were shifted in 0.77% of TAZs. Given the timing and the small scale change in the forecast, Metropolitan continues to use the May 2020 release for its planning activities. For the San Diego region, Metropolitan uses a version of SANDAG Series 14 provided by the San Diego County Water Authority.

## Trends in Southern California

### *Population*

According to the California Department of Finance, the population in Metropolitan's service area was approximately 19.0 million in 2020. SCAG and SANDAG estimate the population in Metropolitan's service area will reach 20.1 million in 2025 and 22.0 million by 2045. The historical and projected population for the service area, by county, is shown in Figure A.1-1. While Los Angeles County leads in total population, the inland areas of Riverside and San Bernardino counties are projected to grow at the fastest rates over the next ten years. Generally speaking, however, annual growth rates will slow for all counties between 2010 and 2045. In part, this is due to changing patterns of migration, as well as aging of the overall population. It also reflects the effects of the recession of the late 2000s and the ongoing restructuring of the Southern California economy.

### *Employment*

Within Metropolitan's service area, employment growth is likely to occur unevenly across the six counties. Over the 25-year period between 2020 and 2045, the greatest employment increases are expected to occur in Riverside, Los Angeles, and San Diego Counties with estimated increases of 208, 375, and 237 thousand jobs respectively. Relative to existing employment, Riverside and San Bernardino counties are expected to have the highest rates of employment growth.

Figure A.1-2 and Table A.1-3 summarize the projected growth of commercial, industrial, and institutional employment in Metropolitan's service area. The 2020 urban employment number includes the effects of the COVID-19 pandemic based on analysis by the California Employment Development Department (EDD). The EDD estimated a 7 percent decrease in employment in Metropolitan's service area from 2019 to 2020. Employment projections for 2021 through 2023 are based on recovery rates from the UCLA Anderson Forecast. Long-term employment is based on SCAG and SANDAG's forecasts. Total urban employment is expected to increase from 8.6 million in 2020 to about 10.3 million in 2045. This increase of about 12 percent is less than the projected population increase of 14 percent, suggesting a slight decrease in the employed population over time due to aging population.

**Figure A.1-1 Actual and Projected Population**

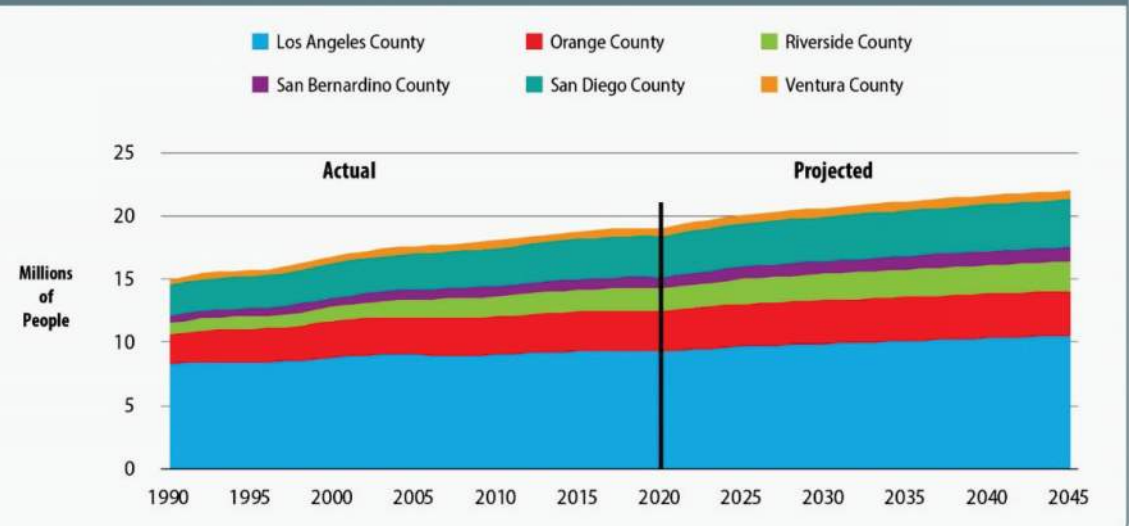

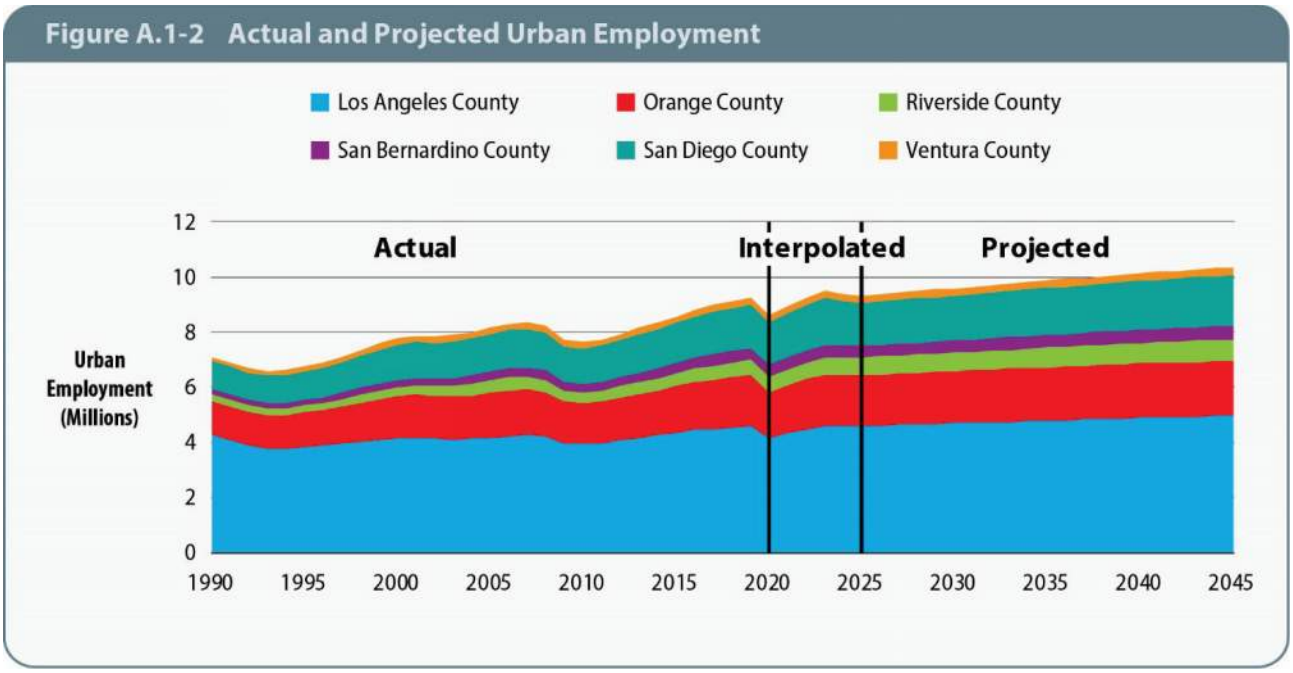


### *Residential Consumers*

Southern California's regional planning agencies have forecast residential housing growth in all parts of the Metropolitan service area. These forecasts are shown in Figure A.1-3 and Table A.1-4. The total occupied housing stock is expected to increase more than 20 percent between 2020 and 2045, growing from 6.3 to around 7.6 million households. Much of this growth will likely occur in hotter inland areas of Southern California. Within the service territory, the household occupancy size (household population divided by total occupied dwelling units) is projected to decline slightly from about 3.0 persons per unit currently to 2.9 persons per unit by 2045.

Permits for new residential housing construction are another indicator of the future growth in water demand. Figure A.1-4 shows the pattern of historical growth in residential housing permits between 1970 and 2019. The effect of economic cycles can clearly be seen over time with the precipitous fall in housing construction during the 2007 to 2010 recession being most notable. Overall housing construction has made a modest recovery since 2011. However, in a departure from the previous trend since the late 1980s that favored single-family homes, new dwellings built since 2011 have been mostly multifamily units.

**Figure A.1-3 Actual and Projected Households**

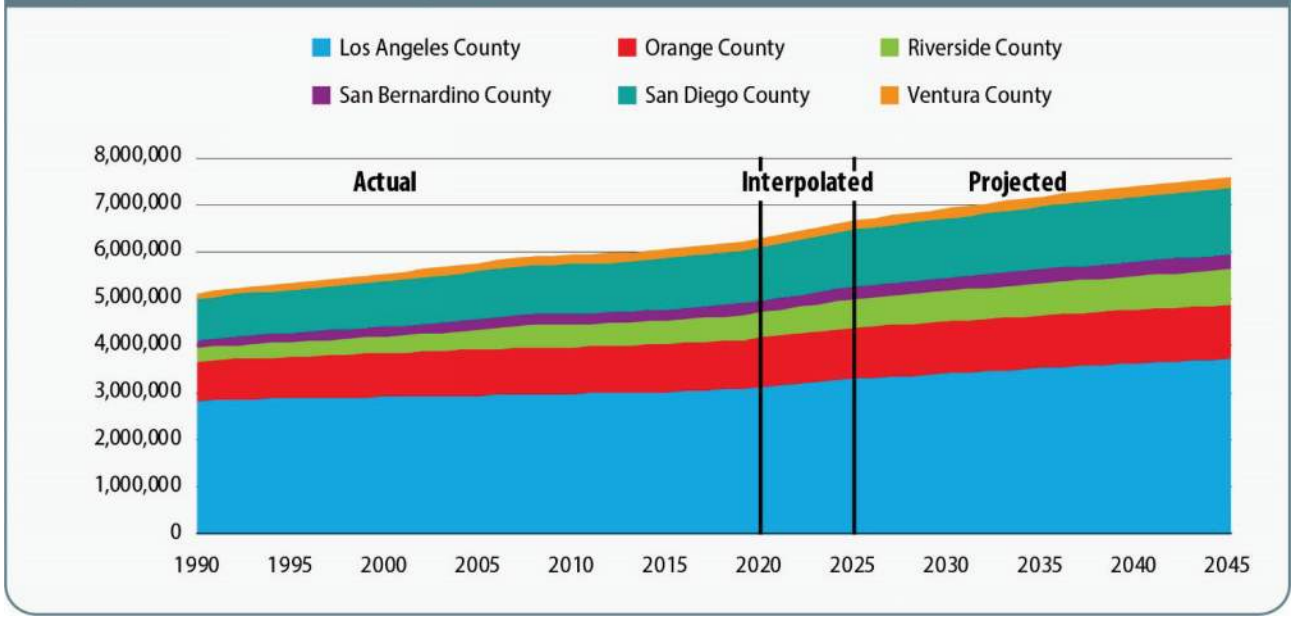


**Figure A.1-4 Residential Housing Permits in Six-County Region**

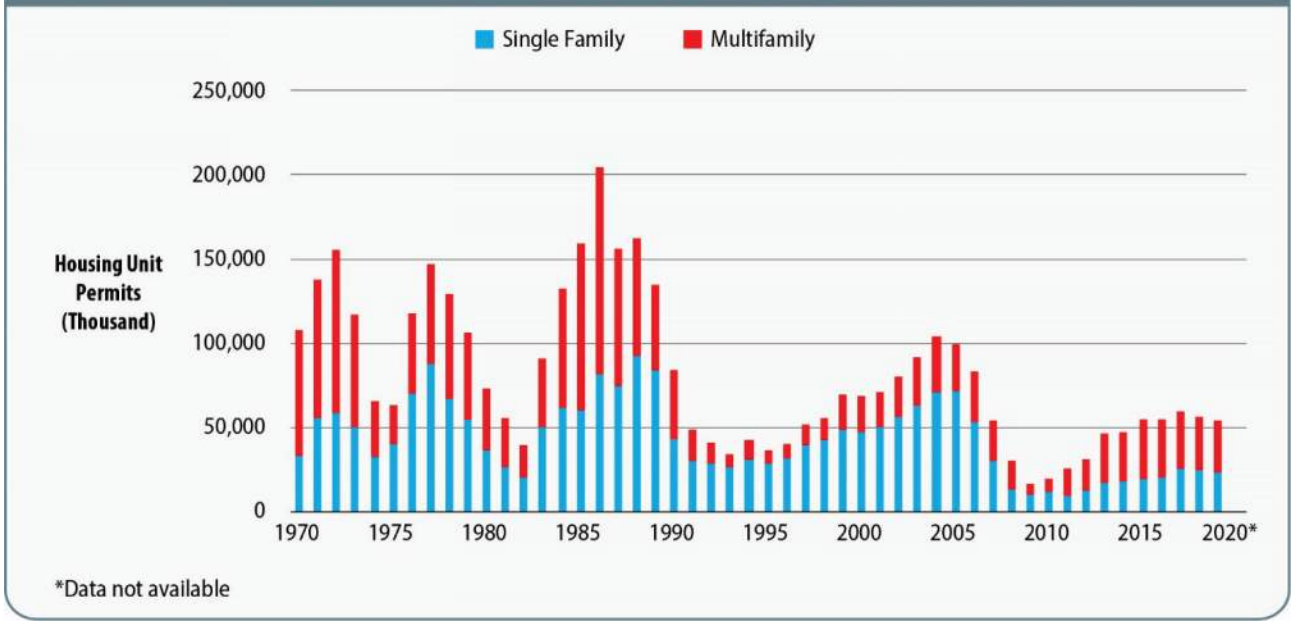


## Water Demands

As shown in Figure A.1-5, actual retail municipal and industrial (M&I) water demands in 2019 were 2.92 million acre-feet (MAF), which is approximately the same as in 1983. This is due to a number of factors including a higher than normal precipitation, an aggressive outreach campaign and mandatory water use restriction in 2015. Water demand in 2020 is estimated to be 3.1 MAF. In addition, agricultural water use is estimated to be 144 TAF. Similar to M&I demand, agricultural

demand was also impacted ty the 2015 drought restriction. By 2045, under average conditions, retail agricultural demand is expected to be about 123 TAF.

### *Retail Demand*

It is estimated that total M&I water use will grow from 3.1 MAF in 2020 to 3.5 MAF in 2045. All water demand projections assume normal weather conditions. Future changes in estimated water demand assume continued water savings due to conservation measures such as water savings resulting from plumbing codes, price effects, and the continuing implementation of utility-funded conservation BMPs. Retail demand was greatly reduced in 2015 due to extraordinary response to statewide calls for a 25 percent reduction in water use in light of historic drought conditions. Between 2020 and 2045, regional water use will grow slowly as driven by population and economic growth while water use efficiency increases.

#### By County

M&I water demand is not expected to grow uniformly across counties. Consistent with the general pattern of future demographic distributions, the largest absolute increases in urban water demands are expected to occur in Los Angeles and Riverside Counties, with respective estimated increases of about 109 TAF and 108 TAF between 2020 and 2045.

#### By Sector

Water use can also be broken down by sector. Between 2020 and 2045, single-family residential water use is expected to increase by 9 percent (Table A.1-8), while multifamily water use is estimated to increase by 28 percent (Table A.1-9). Table A.1-10 shows estimated nonresidential water use decreasing by 5 percent between 2020 and 2045.

### *Residential Water Use*

While single-family homes are estimated to account for about 60 percent of the total occupied household in 2020, they are responsible for about 75 percent of total residential water demands (Tables A.1-8 and A.1-9). This is consistent with the fact that single-family households are known to use more water than multifamily households (e.g., those residing in duplexes, triplexes, apartment buildings and condo developments) on a per housing-unit basis. This is because single-family households tend to have more persons living in the household; they are likely to have more water-using appliances and fixtures; and they tend to have more landscaping.

### *Nonresidential Water Use*

Nonresidential water use represented approximately 18 percent of the total M&I demands in Metropolitan's service area in 2020 (Table A.1-10). This includes water that is used by businesses, services, government, institutions (such as hospitals and schools), and industrial (or manufacturing) establishments. Within the commercial/institutional category, the top water users include schools, hospitals, hotels, amusement parks, colleges, laundries, and restaurants. In Southern California, major industrial users include electronics, aircraft, petroleum refining, beverages, food processing, and other industries that use water as a major component of the manufacturing process.

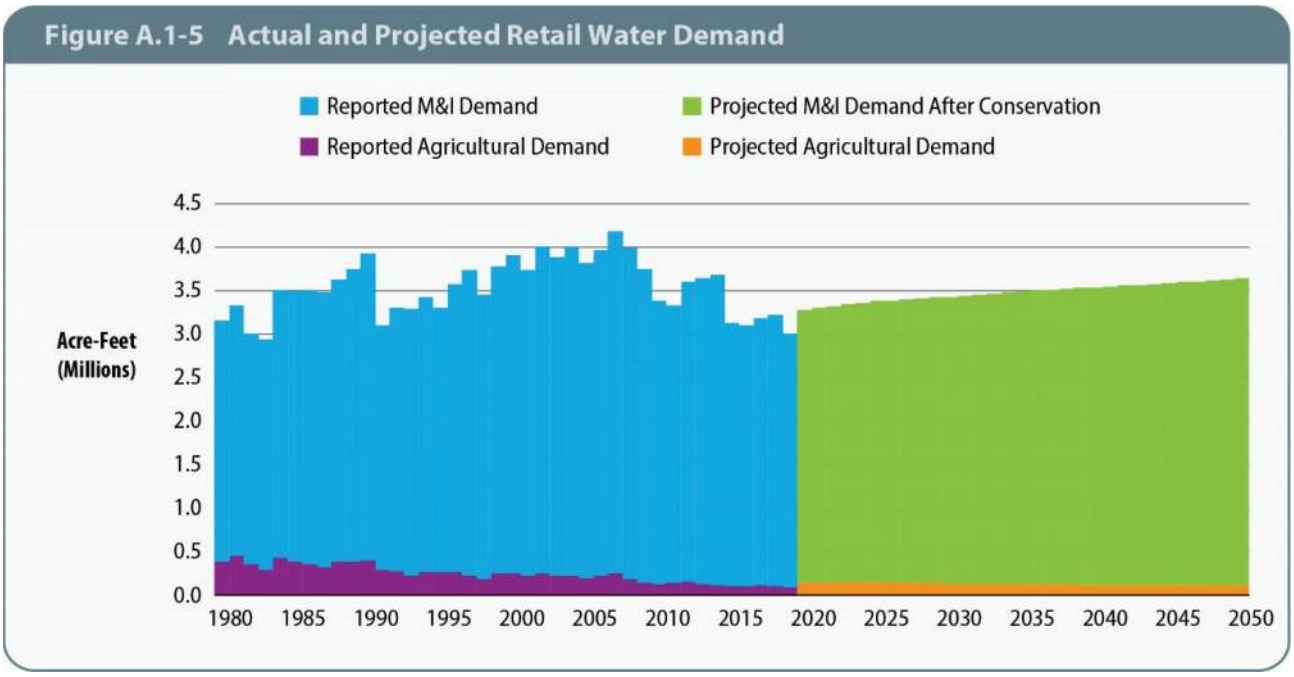


### *Conservation Savings*

Table A.1-12 shows estimated conservation savings resulting from active conservation programs ("Active"), ongoing conservation from natural replacement of plumbing fixtures ("Code-Based"), and conservation induced by projected increases in the real price of water ("Price"). Code-Based savings account for the largest share of total conservation. However, aggressive utility-funded conservation programs have made a significant contribution in this area. For example, Metropolitan-assisted programs were responsible for an estimated 213 TAF in savings during FY 2019-20 and nearly 3.27 MAF in cumulative conservation savings since FY 1990/91.

### *Projected M&I Demand by Sector*

Table A.1-13 provides a summary of municipal and industrial demands, broken down by sector, along with each sector's share of total retail demand. In 2020, residential use accounted for about 82 percent of total projected M&I demand, while non-residential use constituted nearly 18 percent of projected M&I demand. These shares are projected to have a slight increase on residential and a slight decrease on CII by about 2 percent in 2045. System losses and unmetered use are expected to remain relatively constant over this period at about 5 percent.

## Table A.1-2 Population Growth in Metropolitan's Service Area (July)

(Acre-feet)

| | Actual | | | Estimated | | Projected | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **County** | **2000** | **2005** | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Los Angeles County | 8,833,000 | 9,025,000 | 9,010,000 | 9,277,000 | 9,275,000 | 9,692,000 | 9,894,000 | 10,118,000 | 10,332,000 | 10,538,000 |
| Orange County | 2,854,000 | 2,954,000 | 3,012,000 | 3,148,000 | 3,184,000 | 3,353,000 | 3,433,000 | 3,491,000 | 3,524,000 | 3,527,000 |
| Riverside County | 1,120,000 | 1,409,000 | 1,620,000 | 1,719,000 | 1,813,000 | 1,987,000 | 2,105,000 | 2,191,000 | 2,271,000 | 2,344,000 |
| San Bernardino County | 706,000 | 783,000 | 810,000 | 843,000 | 872,000 | 946,000 | 987,000 | 1,031,000 | 1,075,000 | 1,119,000 |
| San Diego County | 2,730,000 | 2,863,000 | 2,989,000 | 3,169,000 | 3,261,000 | 3,442,000 | 3,536,000 | 3,624,000 | 3,709,000 | 3,789,000 |
| Ventura County | 541,000 | 583,000 | 616,000 | 635,000 | 630,000 | 669,000 | 679,000 | 690,000 | 699,000 | 709,000 |
| **Metropolitan's Service Area** | **16,784,000** | **17,617,000** | **18,057,000** | **18,791,000** | **19,035,000** | **20,089,000** | **20,634,000** | **21,145,000** | **21,610,000** | **22,026,000** |

Source: US Census, CA Department of Finance, SCAG's 2020 Regional Transportation Plan (RTP-20) and SANDAG's Series 14 Growth Forecast (version 17).
Growth forecasts do not include COVID-19 impacts.
Note: Totals may not foot due to rounding differences

## Table A.1-3 Urban Employment Growth in Metropolitan's Service Area (July)

(Acre-feet)

| | Actual | | | Estimated | | Projected | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **County** | **2000** | **2005** | **2025** | **2025** | **2025** | **2025** | **2025** | **2035** | **2040** | **2045** |
| Los Angeles County | 4,180,000 | 4,163,000 | 3,945,000 | 4,351,000 | 4,164,000 | 4,602,000 | 4,696,000 | 4,795,000 | 4,900,000 | 4,977,000 |
| Orange County | 1,498,000 | 1,618,000 | 1,482,000 | 1,677,000 | 1,656,000 | 1,833,000 | 1,884,000 | 1,926,000 | 1,958,000 | 1,979,000 |
| Riverside County | 346,000 | 451,000 | 401,000 | 488,000 | 582,000 | 641,000 | 675,000 | 711,000 | 752,000 | 787,000 |
| San Bernardino County | 255,000 | 322,000 | 302,000 | 366,000 | 402,000 | 422,000 | 441,000 | 459,000 | 478,000 | 497,000 |
| San Diego County | 1,258,000 | 1,358,000 | 1,296,000 | 1,450,000 | 1,531,000 | 1,558,000 | 1,626,000 | 1,700,000 | 1,766,000 | 1,822,000 |
| Ventura County | 218,000 | 235,000 | 221,000 | 238,000 | 239,000 | 251,000 | 257,000 | 263,000 | 268,000 | 272,000 |
| **Metropolitan's Service Area** | **7,755,000** | **8,147,000** | **7,647,000** | **8,570,000** | **8,574,000** | **9,307,000** | **9,579,000** | **9,854,000** | **10,122,000** | **10,334,000** |

Source: US Census, CA Department of Finance, SCAG's 2020 Regional Transportation Plan (RTP-20) and SANDAG's Series 14 Growth Forecast (version 17).
Growth forecasts do not include COVID-19 impacts.
Note: Totals may not foot due to rounding differences

## Table A.1-4 Occupied Housing Growth in Metropolitan's Service Area

(Acre-feet)

| | Actual | | | Estimated | | Projected | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **County** | **2000** | **2005** | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Los Angeles County | 2,909,000 | 2,944,000 | 2,981,000 | 3,017,000 | 3,113,000 | 3,300,000 | 3,408,000 | 3,520,000 | 3,622,000 | 3,720,000 |
| Orange County | 937,000 | 974,000 | 993,000 | 1,017,000 | 1,057,000 | 1,089,000 | 1,103,000 | 1,124,000 | 1,143,000 | 1,154,000 |
| Riverside County | 357,000 | 432,000 | 484,000 | 504,000 | 539,000 | 609,000 | 655,000 | 688,000 | 719,000 | 746,000 |
| San Bernardino County | 204,000 | 220,000 | 232,000 | 238,000 | 249,000 | 269,000 | 282,000 | 295,000 | 309,000 | 323,000 |
| San Diego County | 963,000 | 1,016,000 | 1,045,000 | 1,081,000 | 1,131,000 | 1,195,000 | 1,265,000 | 1,335,000 | 1,389,000 | 1,427,000 |
| Ventura County | 170,000 | 185,000 | 195,000 | 199,000 | 203,000 | 209,000 | 213,000 | 218,000 | 221,000 | 224,000 |
| **Metropolitan's Service Area** | **5,540,000** | **5,771,000** | **5,930,000** | **6,056,000** | **6,292,000** | **6,671,000** | **6,926,000** | **7,180,000** | **7,403,000** | **7,594,000** |

Source: US Census, CA Department of Finance, SCAG's 2020 Regional Transportation Plan (RTP-20) and SANDAG's Series 14 Growth Forecast (version 17).
Growth forecasts do not include COVID-19 impacts.
Note: Totals may not foot due to rounding differences

## Table A.1-5 Total Retail Demand in Metropolitan's Service Area with Conservation

(Acre-feet)

| | Actual | | | | | Projected | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **County** | **2000** | **2005** | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Los Angeles County | 1,740,000 | 1,655,000 | 1,432,000 | 1,314,000 | 1,347,000 | 1,391,000 | 1,404,000 | 1,427,000 | 1,441,000 | 1,457,000 |
| Orange County | 660,000 | 631,000 | 553,000 | 510,000 | 541,000 | 543,000 | 545,000 | 547,000 | 548,000 | 547,000 |
| Riverside County | 474,000 | 492,000 | 472,000 | 423,000 | 474,000 | 506,000 | 531,000 | 550,000 | 563,000 | 579,000 |
| San Bernardino County | 250,000 | 261,000 | 253,000 | 203,000 | 225,000 | 227,000 | 225,000 | 228,000 | 230,000 | 237,000 |
| San Diego County | 659,000 | 621,000 | 533,000 | 558,000 | 559,000 | 578,000 | 591,000 | 604,000 | 616,000 | 626,000 |
| Ventura County | 132,000 | 156,000 | 152,000 | 125,000 | 140,000 | 141,000 | 141,000 | 142,000 | 142,000 | 143,000 |
| **Metropolitan's Service Area** | **3,915,000** | **3,816,000** | **3,395,000** | **3,133,000** | **3,286,000** | **3,386,000** | **3,437,000** | **3,498,000** | **3,540,000** | **3,589,000** |

## Table A.1-6 Total Retail M&I Demand in Metropolitan's Service Area with Conservation

(Acre-feet)

| | Actual | | | | Projected | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **County** | **2000** | **2005** | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Los Angeles County | 1,738,000 | 1,653,000 | 1,431,000 | 1,313,000 | 1,346,000 | 1,389,000 | 1,403,000 | 1,426,000 | 1,440,000 | 1,455,000 |
| Orange County | 643,000 | 621,000 | 551,000 | 506,000 | 537,000 | 540,000 | 543,000 | 545,000 | 546,000 | 545,000 |
| Riverside County | 360,000 | 417,000 | 409,000 | 380,000 | 416,000 | 450,000 | 475,000 | 493,000 | 508,000 | 524,000 |
| San Bernardino County | 247,000 | 250,000 | 224,000 | 176,000 | 201,000 | 209,000 | 215,000 | 222,000 | 229,000 | 236,000 |
| San Diego County | 554,000 | 530,000 | 506,000 | 542,000 | 521,000 | 531,000 | 545,000 | 559,000 | 570,000 | 581,000 |
| Ventura County | 124,000 | 144,000 | 140,000 | 109,000 | 122,000 | 123,000 | 123,000 | 124,000 | 124,000 | 125,000 |
| **Metropolitan's Service Area** | **3,666,000** | **3,615,000** | **3,261,000** | **3,026,000** | **3,143,000** | **3,242,000** | **3,304,000** | **3,369,000** | **3,417,000** | **3,466,000** |

## Table A.1-7 Total Retail Agricultural Demand in Metropolitan's Service Area

(Acre-feet)

| | Actual | | | | Projected | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **County** | **2000** | **2005** | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** | **2045** |
| Los Angeles County | 1,800 | 1,700 | 1,000 | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 | 1,300 |
| Orange County | 17,000 | 9,600 | 1,800 | 3,900 | 4,500 | 3,300 | 2,000 | 2,000 | 2,000 | 2,000 |
| Riverside County | 113,500 | 75,200 | 63,200 | 43,000 | 57,500 | 56,100 | 56,600 | 57,100 | 54,600 | 55,000 |
| San Bernardino County | 2,100 | 11,300 | 28,900 | 26,500 | 23,800 | 18,200 | 9,800 | 5,800 | 1,100 | 1,100 |
| San Diego County | 105,600 | 91,300 | 27,100 | 16,800 | 38,400 | 47,100 | 46,400 | 45,700 | 45,600 | 45,600 |
| Ventura County | 7,500 | 12,600 | 11,800 | 15,600 | 18,400 | 18,300 | 18,400 | 18,700 | 18,400 | 18,400 |
| **Metropolitan's Service Area** | **247,500** | **201,700** | **133,800** | **107,100** | **143,900** | **144,300** | **134,500** | **130,600** | **123,000** | **123,400** |

**Table A.1-8 Single Family Retail Demand in Metropolitan's Service Area**

Average Year (Acre-feet)

| County | 2020 | 2025 | 2030 | Projected 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Los Angeles County | 740,000 | 766,000 | 765,000 | 767,000 | 771,000 | 776,000 |
| Orange County | 294,000 | 295,000 | 296,000 | 297,000 | 299,000 | 300,000 |
| Riverside County | 297,000 | 320,000 | 339,000 | 352,000 | 362,000 | 373,000 |
| San Bernardino County | 113,000 | 117,000 | 122,000 | 126,000 | 131,000 | 137,000 |
| San Diego County | 320,000 | 327,000 | 327,000 | 329,000 | 332,000 | 337,000 |
| Ventura County | 85,000 | 87,000 | 87,000 | 88,000 | 88,000 | 89,000 |
| **Metropolitan's Service Area** | 1,849,000 | 1,912,000 | 1,936,000 | 1,959,000 | 1,983,000 | 2,012,000 |

**Table A.1-9 Multi-family Retail Demand in Metropolitan's Service Area**

Average Year (Acre-feet)

| County | 2020 | 2025 | 2030 | Projected 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Los Angeles County | 317,000 | 338,000 | 353,000 | 377,000 | 392,000 | 409,000 |
| Orange County | 93,000 | 95,000 | 96,000 | 99,000 | 101,000 | 102,000 |
| Riverside County | 47,000 | 51,000 | 53,000 | 57,000 | 60,000 | 63,000 |
| San Bernardino County | 27,000 | 29,000 | 30,000 | 31,000 | 33,000 | 34,000 |
| San Diego County | 110,000 | 117,000 | 128,000 | 140,000 | 149,000 | 156,000 |
| Ventura County | 11,000 | 11,000 | 11,000 | 12,000 | 12,000 | 12,000 |
| **Metropolitan's Service Area** | 605,000 | 641,000 | 671,000 | 716,000 | 747,000 | 776,000 |

**Table A.1-10 Commercial, Industrial and Institutional Retail Demand in Metropolitan's Service Area**

Average Year (Acre-feet)

| County | 2020 | 2025 | 2030 | Projected 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Los Angeles County | 219,000 | 213,000 | 211,000 | 208,000 | 201,000 | 195,000 |
| Orange County | 122,000 | 122,000 | 123,000 | 121,000 | 118,000 | 115,000 |
| Riverside County | 47,000 | 51,000 | 53,000 | 54,000 | 55,000 | 56,000 |
| San Bernardino County | 47,000 | 48,000 | 49,000 | 49,000 | 49,000 | 49,000 |
| San Diego County | 73,000 | 70,000 | 71,000 | 71,000 | 70,000 | 68,000 |
| Ventura County | 18,000 | 18,000 | 18,000 | 17,000 | 17,000 | 16,000 |
| **Metropolitan's Service Area** | 526,000 | 522,000 | 525,000 | 520,000 | 510,000 | 499,000 |

## Table A.1-11 Unmetered Use in Metropolitan's Service Area

Average Year (Acre-feet)

| County | Projected | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
| Los Angeles County | 70,000 | 72,000 | 73,000 | 74,000 | 75,000 | 76,000 |
| Orange County | 27,000 | 27,000 | 28,000 | 28,000 | 28,000 | 28,000 |
| Riverside County | 25,000 | 27,000 | 29,000 | 30,000 | 31,000 | 32,000 |
| San Bernardino County | 14,000 | 15,000 | 15,000 | 16,000 | 16,000 | 17,000 |
| San Diego County | 17,000 | 18,000 | 18,000 | 18,000 | 19,000 | 19,000 |
| Ventura County | 7,000 | 7,000 | 7,000 | 7,000 | 7,000 | 7,000 |
| **Metropolitan's Service Area** | 160,000 | 166,000 | 170,000 | 173,000 | 176,000 | 179,000 |

## Table A.1-12 Conservation Savings in Metropolitan's Service Area – 1980 Base Year

(Acre-feet)

| County | Estimated | | | | Projected | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
| Los Angeles | 166,000 | 235,000 | 297,000 | 368,000 | 440,000 | 467,000 | 485,000 | 499,000 | 521,000 | 546,000 |
| Orange County | 55,000 | 81,000 | 107,000 | 132,000 | 151,000 | 155,000 | 157,000 | 162,000 | 168,000 | 173,000 |
| Riverside | 22,000 | 37,000 | 52,000 | 66,000 | 78,000 | 89,000 | 97,000 | 106,000 | 116,000 | 126,000 |
| San Bernardino | 10,000 | 16,000 | 22,000 | 28,000 | 32,000 | 35,000 | 38,000 | 40,000 | 44,000 | 48,000 |
| San Diego | 56,000 | 78,000 | 96,000 | 116,000 | 137,000 | 149,000 | 165,000 | 183,000 | 202,000 | 220,000 |
| Ventura | 9,000 | 13,000 | 16,000 | 20,000 | 24,000 | 25,000 | 27,000 | 29,000 | 31,000 | 32,000 |
| Active, Code, Price | **317,000** | **460,000** | **590,000** | **729,000** | **862,000** | **920,000** | **968,000** | **1,020,000** | **1,081,000** | **1,145,000** |
| Pre-1990 Conservation | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 |
| **Total Conservation** | **567,000** | **710,000** | **840,000** | **979,000** | **1,112,000** | **1,170,000** | **1,218,000** | **1,270,000** | **1,331,000** | **1,395,000** |

## Table A.1-13 Projected Municipal and Industrial Demands by Sector

(Acre-feet)

| Sector | Historical | | | | Projected | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
| Single-Family | 2,269,000 | 2,237,000 | 2,018,000 | 1,872,000 | 1,849,000 | 1,911,000 | 1,935,000 | 1,959,000 | 1,984,000 | 2,011,000 |
| Multi-Family | 743,000 | 732,000 | 660,000 | 613,000 | 605,000 | 641,000 | 672,000 | 715,000 | 747,000 | 775,000 |
| Non-Residential | 655,000 | 646,000 | 583,000 | 541,000 | 527,000 | 520,000 | 524,000 | 520,000 | 510,000 | 499,000 |
| System Losses/Unmetered | 198,000 | 195,000 | 176,000 | 163,000 | 161,000 | 166,000 | 169,000 | 173,000 | 176,000 | 178,000 |
| **Metropolitan Total** | 3,865,000 | 3,810,000 | 3,437,000 | 3,189,000 | 3,142,000 | 3,239,000 | 3,301,000 | 3,367,000 | 3,416,000 | 3,464,000 |

# Appendix 2

# EXISTING REGIONAL WATER SUPPLIES

# Appendix 2
# EXISTING REGIONAL WATER SUPPLIES

Water used in Metropolitan's service area comes from both local and imported sources. Local sources include groundwater, surface water, and recycled water. Sources of imported water include the Colorado River, the State Water Project (SWP), and the Owens Valley/Mono Basin. On average over the last 10 years (from 2011 to 2020), local sources met about 49 percent of the water needs, while imported sources supplied the remaining 51 percent.

The City of Los Angeles imports water from the Owens Valley/Mono Basin east of the Sierra Nevada through the Los Angeles Aqueduct (LAA). This water currently meets about 5 percent of the region's water needs based on a ten-year average from 2011 to 2020 but is dedicated for use by the City of Los Angeles. Metropolitan provides imported water supplies to meet the remaining 46 percent of the region's water needs based on the same ten-year period. These imported supplies are received through Metropolitan's Colorado River Aqueduct (CRA) and the SWP's California Aqueduct. Table A.2-1 and Figure A.2-1 show the historical sources of local and imported supplies within Metropolitan's service area.

Table A.2-2 shows the quantities of Metropolitan water used by member agencies during the last ten years (2011 to 2020). Metropolitan's largest water customers are the San Diego County Water Authority (25 percent), City of Los Angeles (16 percent), and Municipal Water District of Orange County (12 percent).

The following sections describe the current supply sources in more detail. The main body of the Urban Water Management Plan contains descriptions of planned future supplies.

## Local Water Supplies

Local sources of water available to the region include surface water, groundwater, recycled water, and seawater desalination. Some of the major river systems in Southern California have been developed into systems of dams, flood control channels, and percolation ponds for supplying local water and recharging groundwater basins. For example, the San Gabriel and Santa Ana Rivers capture over 90 percent of the runoff in their watersheds. The Los Angeles River system, however, is not as efficient in capturing runoff. In its upper reaches, which make up 25 percent of the watershed, most runoff is captured with recharge facilities. In its lower reaches, which comprise the remaining 75 percent of the watershed, the river and its tributaries are lined with concrete, so there are no recharge facilities. The Santa Clara River in Ventura County is outside of Metropolitan's service area, but it replenishes groundwater basins used by water agencies within Metropolitan's service area. Other rivers in Metropolitan's service area, such as the Santa Margarita and San Luis Rey, are essentially natural replenishment systems.

## Table A.2-1
## Sources of Water Supply to the Metropolitan Service Area
(Acre-Feet)[1]

| Calendar Year | Local Supplies[4] | L.A. Aqueduct | Colorado River Aqueduct[2] | State Water Project[3] | Total |
|---|---|---|---|---|---|
| 1976 | 1,424,000 | 430,000 | 778,000 | 638,000 | 3,270,000 |
| 1977 | 1,432,000 | 275,000 | 1,277,000 | 209,000 | 3,193,000 |
| 1978 | 1,339,000 | 472,000 | 710,000 | 576,000 | 3,096,000 |
| 1979 | 1,512,000 | 493,000 | 784,000 | 532,000 | 3,321,000 |
| 1980 | 1,551,000 | 515,000 | 791,000 | 560,000 | 3,416,000 |
| 1981 | 1,593,000 | 465,000 | 791,000 | 827,000 | 3,676,000 |
| 1982 | 1,504,000 | 483,000 | 686,000 | 737,000 | 3,410,000 |
| 1983 | 1,551,000 | 519,000 | 850,000 | 410,000 | 3,329,000 |
| 1984 | 1,762,000 | 516,000 | 1,150,000 | 498,000 | 3,926,000 |
| 1985 | 1,698,000 | 496,000 | 1,018,000 | 728,000 | 3,939,000 |
| 1986 | 1,679,000 | 515,000 | 1,001,000 | 756,000 | 3,952,000 |
| 1987 | 1,608,000 | 428,000 | 1,175,000 | 763,000 | 3,974,000 |
| 1988 | 1,659,000 | 360,000 | 1,199,000 | 957,000 | 4,175,000 |
| 1989 | 1,676,000 | 274,000 | 1,189,000 | 1,215,000 | 4,355,000 |
| 1990 | 1,595,000 | 107,000 | 1,183,000 | 1,458,000 | 4,343,000 |
| 1991 | 1,547,000 | 181,000 | 1,252,000 | 625,000 | 3,605,000 |
| 1992 | 1,631,000 | 177,000 | 1,153,000 | 744,000 | 3,704,000 |
| 1993 | 1,546,000 | 289,000 | 1,144,000 | 663,000 | 3,642,000 |
| 1994 | 1,649,000 | 133,000 | 1,263,000 | 845,000 | 3,890,000 |
| 1995 | 1,719,000 | 444,000 | 933,000 | 451,000 | 3,546,000 |
| 1996 | 1,842,000 | 422,000 | 1,089,000 | 663,000 | 4,016,000 |
| 1997 | 1,902,000 | 436,000 | 1,125,000 | 724,000 | 4,187,000 |
| 1998 | 1,902,000 | 467,000 | 941,000 | 521,000 | 3,830,000 |
| 1999 | 2,034,000 | 309,000 | 1,072,000 | 792,000 | 4,206,000 |
| 2000 | 1,899,000 | 255,000 | 1,217,000 | 1,473,000 | 4,845,000 |
| 2001 | 1,846,000 | 267,000 | 1,245,000 | 1,119,000 | 4,477,000 |
| 2002 | 1,844,000 | 179,000 | 1,198,000 | 1,415,000 | 4,636,000 |
| 2003 | 1,790,000 | 252,000 | 676,000 | 1,561,000 | 4,278,000 |
| 2004 | 1,760,000 | 203,000 | 741,000 | 1,802,000 | 4,506,000 |
| 2005 | 1,758,000 | 369,000 | 707,000 | 1,525,000 | 4,358,000 |
| 2006 | 1,861,000 | 379,000 | 514,000 | 1,695,000 | 4,448,000 |
| 2007 | 1,984,000 | 129,000 | 696,000 | 1,648,000 | 4,457,000 |
| 2008 | 1,942,000 | 147,000 | 896,000 | 1,037,000 | 4,023,000 |
| 2009 | 1,959,000 | 137,000 | 1,044,000 | 908,000 | 4,048,000 |
| 2010 | 1,839,000 | 251,000 | 837,000 | 1,129,000 | 4,071,000 |
| 2011 | 1,779,000 | 355,000 | 445,000 | 1,379,000 | 3,991,000 |
| 2012 | 1,979,000 | 167,000 | 455,000 | 1,252,000 | 3,794,000 |
| 2013 | 1,963,000 | 65,000 | 986,000 | 974,000 | 4,019,000 |
| 2014 | 1,923,000 | 64,000 | 1,168,000 | 607,000 | 3,729,000 |
| 2015 | 1,714,000 | 33,000 | 1,178,000 | 593,000 | 3,480,000 |
| 2016 | 1,795,000 | 96,000 | 961,000 | 1,009,000 | 3,812,000 |
| 2017 | 1,751,000 | 380,000 | 282,000 | 1,473,000 | 3,833,000 |
| 2018 | 1,816,000 | 246,000 | 757,000 | 845,000 | 3,633,000 |
| 2019 | 1,735,000 | 345,000 | 298,000 | 1,232,000 | 3,611,000 |
| 2020 | 1,787,000 | 183,000 | 687,000 | 588,000 | 3,245,000 |

1. Not including system losses.
2. Colorado River Aqueduct supplies are gross Havasu diversions less return flows, deliveries to USBR, Mexico, and storage.
3. State Water Project Supplies include Table A, Art. 21, Art. 14(b), Art. 12(d), Art. 12(e), Art. 55, draws from storage & carryover, DWCV & other exchanges, transfers, Drought Water Bank and Dry Year Pool Purchases, Pools A&B, Flood Water, wheeling, Port Hueneme lease, and SBVMWD Purchases.
4. Local Supplies includes local groundwater, surface water, recycled water, groundwater recovery, and seawater desalination used for MI, AG, SW or GW recharge in MWD service area. Include Santa Ana River Baseflow at Prado Dam for groundwater recharge. Based on best available data at the time of publication, subject to updates without notice. Data for 2020 not available and is estimated based on historical data.

## Table A.2-2 Historical Metropolitan Water Deliveries to Member Agencies

(Acre-feet) Calendar Year

| Member Agency | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| City of Anaheim | 29,000 | 20,000 | 20,000 | 18,000 | 14,000 | 13,000 | 26,000 | 15,000 | 13,000 | 39,000 |
| City of Beverly Hills | 10,000 | 11,000 | 11,000 | 12,000 | 10,000 | 9,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| City of Burbank | 18,000 | 15,000 | 15,000 | 16,000 | 12,000 | 12,000 | 19,000 | 12,000 | 18,000 | 6,000 |
| Calleguas Municipal Water District | 97,000 | 106,000 | 112,000 | 96,000 | 77,000 | 86,000 | 92,000 | 93,000 | 90,000 | 90,000 |
| Central Basin Municipal Water District | 67,000 | 38,000 | 36,000 | 30,000 | 58,000 | 61,000 | 24,000 | 24,000 | 17,000 | 21,000 |
| City of Compton | 2,000 | 2,000 | 1,000 | 0 | 0 | 0 | 0 | 20 | 40 | 0 |
| Eastern Municipal Water District | 90,000 | 99,000 | 98,000 | 102,000 | 76,000 | 84,000 | 89,000 | 93,000 | 94,000 | 93,000 |
| Foothill Municipal Water District | 8,000 | 8,000 | 9,000 | 10,000 | 7,000 | 7,000 | 9,000 | 8,000 | 7,000 | 9,000 |
| City of Fullerton | 10,000 | 10,000 | 9,000 | 9,000 | 7,000 | 5,000 | 9,000 | 7,000 | 5,000 | 6,000 |
| City of Glendale | 18,000 | 18,000 | 19,000 | 19,000 | 15,000 | 15,000 | 15,000 | 16,000 | 14,000 | 16,000 |
| Inland Empire Utilities Agency | 76,000 | 57,000 | 64,000 | 68,000 | 38,000 | 44,000 | 62,000 | 67,000 | 66,000 | 44,000 |
| Las Virgenes Municipal Water District | 20,000 | 21,000 | 24,000 | 20,000 | 17,000 | 18,000 | 18,000 | 20,000 | 17,000 | 20,000 |
| City of Long Beach | 43,000 | 30,000 | 35,000 | 37,000 | 35,000 | 28,000 | 24,000 | 26,000 | 25,000 | 30,000 |
| City of Los Angeles | 120,000 | 328,000 | 439,000 | 403,000 | 384,000 | 318,000 | 115,000 | 218,000 | 103,000 | 244,000 |
| Municipal Water District of Orange County | 262,000 | 207,000 | 216,000 | 263,000 | 178,000 | 196,000 | 237,000 | 213,000 | 143,000 | 134,000 |
| City of Pasadena | 18,000 | 18,000 | 21,000 | 21,000 | 17,000 | 17,000 | 18,000 | 20,000 | 20,000 | 18,000 |
| San Diego County Water Authority | 407,000 | 455,000 | 492,000 | 571,000 | 501,000 | 436,000 | 358,000 | 374,000 | 319,000 | 308,000 |
| City of San Fernando | 20 | 110 | 70 | 110 | 0 | 0 | 0 | 0 | 0 | 0 |
| City of San Marino | 310 | 840 | 1,050 | 1,110 | 970 | 970 | 960 | 950 | 960 | 1,600 |
| City of Santa Ana | 16,000 | 12,000 | 15,000 | 11,000 | 10,000 | 4,000 | 14,000 | 9,000 | 7,000 | 8,000 |
| City of Santa Monica | 6,000 | 7,000 | 6,000 | 5,000 | 3,000 | 3,000 | 4,000 | 4,000 | 3,000 | 5,000 |
| Three Valleys Municipal Water District | 65,000 | 64,000 | 69,000 | 67,000 | 53,000 | 67,000 | 60,000 | 67,000 | 71,000 | 62,000 |
| City of Torrance | 17,000 | 17,000 | 17,000 | 17,000 | 14,000 | 16,000 | 16,000 | 15,000 | 14,000 | 15,000 |
| Upper San Gabriel Valley Municipal Water District | 35,000 | 16,000 | 30,000 | 22,000 | 50,000 | 46,000 | 46,000 | 56,000 | 103,000 | 15,000 |
| West Basin Municipal Water District | 112,000 | 117,000 | 121,000 | 118,000 | 109,000 | 109,000 | 113,000 | 117,000 | 113,000 | 111,000 |
| Western Municipal Water District of Riverside County | 72,000 | 79,000 | 76,000 | 82,000 | 58,000 | 65,000 | 71,000 | 73,000 | 54,000 | 68,000 |
| Total of All Agencies | 1,618,000 | 1,756,000 | 1,956,000 | 2,018,000 | 1,744,000 | 1,660,000 | 1,450,000 | 1,558,000 | 1,327,000 | 1,374,000 |

**Figure A.2-1 Sources of Supply to Metropolitan's Service Area**

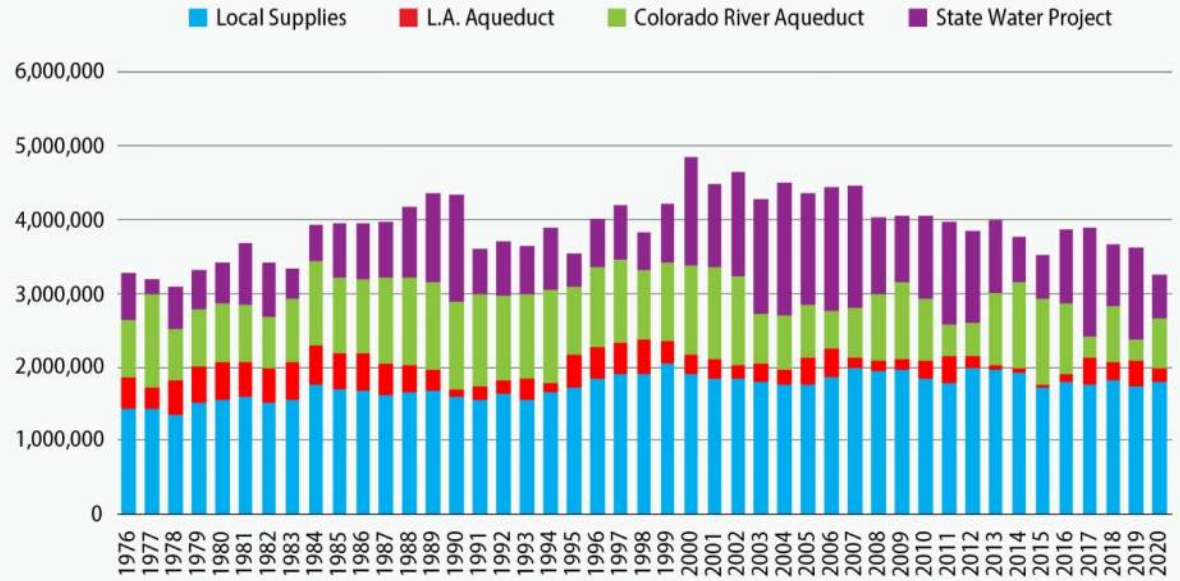


Notes:

1. Not including system losses.
2. Colorado River Aqueduct supplies are gross Havasu diversions less return flows, deliveries to USBR, Mexico, and storage.
3. State Water Project Supplies include Table A, Art. 21, Art. 14(b), Art. 12(d), Art. 12(e), Art. 55, draws from storage & carryover, DWCV & other exchanges, transfers, Drought Water Bank and Dry Year Pool Purchases, Pools A&B, Flood Water, wheeling, Port Hueneme lease, and SBVMWD Purchases.
4. Local Supplies includes local groundwater, surface water, recycled water, groundwater recovery, and seawater desalination used for MI, AG, SW or GW recharge in MWD service area. Include Santa Ana River Baseflow at Prado Dam for groundwater recharge. Based on best available data at the time of publication, subject to updates without notice. Data for 2020 not available and is estimated based on historical data.

Local supplies fluctuate in response to variations in rainfall. During prolonged periods of below-normal rainfall, local water supplies decrease. Conversely, prolonged periods of above-normal rainfall increase local supplies. Sources of groundwater basin replenishment include local precipitation, runoff from the coastal ranges, and artificial recharge with imported water supplies. In addition to runoff, recycled water provides an increasingly important source of replenishment water for the region.

## Major Groundwater Basins

From 2011-2020, groundwater sources accounted for an average of about 92 percent of the local water supplies, which are found in many basins throughout the Southern California region and provide an annual average total production of about 1.27 MAF per year. Figure A.2-2 shows the locations of the groundwater basins within Metropolitan's service area. Groundwater yield comes from passive recharge from the percolation of rainfall and stream runoff and active recharge from spreading and injection of captured stormwater, recycled water, and imported water. In certain major drainage areas, runoff is retained in flood control reservoirs and released into spreading basins for percolation into the ground. In Los Angeles County, many groundwater recharge facilities located along the upper reaches of the Los Angeles River and San Gabriel River systems provide recharge to San Fernando, Raymond, Main San Gabriel, Central, and West Coast groundwater basins. The Orange County Water District operates a system of diversion structures and recharge basins along the Santa Ana River that captures much of the storm runoff, as well as water from reclamation facilities in Riverside and San Bernardino counties. Storm runoff

is also diverted to recharge basins in the Chino Basin. This water, which would otherwise flow into the Pacific Ocean, is allowed to percolate into the underlying aquifers so it may be pumped for local use when needed. Recycled water use for groundwater recharge has increased steadily. The Water Replenishment District of Southern California (WRD) has spread recycled water at the Montebello Forebay to recharge Central and West Coast basins for many years and has expanded this practice with the completion of the WRD Albert Robles Center for Water Recycling and Environmental Learning in 2019. The Inland Empire Utilities Agency (IEUA) provides recycled water for recharge of the Chino Basin. Orange County Water District has implemented the Groundwater Replenishment System (GWRS) to recharge over 100 TAF per year of highly-treated recycled water to the Orange County Basin. Highly treated recycled water is also used at seawater barriers in the West Coast, Central, and Orange County basins and has largely replaced use of imported water for this purpose.

Almost all major groundwater basins in Southern California are either adjudicated or managed by special districts or agencies. Over 95 percent of the groundwater used in Metropolitan's service area is produced from adjudicated or managed groundwater basins. Adjudicated basins in the region include: Raymond Basin, Upper Los Angeles River Area basins (which include San Fernando, Sylmar, Verdugo, and Eagle Rock Basins), Main San Gabriel Basin, Puente Basin, Central Basin, West Coast Basin, Six Basins, Hemet-San Jacinto Basin, Chino Basin, and Cucamonga Basin. The Orange County Groundwater Basin is managed by Orange County Water District; portions of the Ventura County Basins are managed by the Fox Canyon Groundwater Management Agency; and the West San Jacinto Basins are managed by Eastern Municipal Water District. In general, these basins have management plans that include protection from seawater intrusion in the coastal region, water quality deterioration, and excessive lowering of water levels. Groundwater basin managers address treatment of contamination, manage recharge and storage programs, and monitor extraction, water levels, and water quality.

### Major River Systems and Reservoirs

Local surface water resources consist of runoff captured in storage reservoirs and diversions from streams. Reservoirs hold the runoff for later direct use, and diversions from streams are delivered directly to local water systems. As Table A.2-3 shows, local water agencies currently own and operate 33 reservoirs. These reservoirs provide a storage capacity of approximately 862 TAF. The historic average yield of these local surface supplies, which come from reservoir releases and stream diversions, is about 87 TAF per year from 2011-2020. The annual yield varies widely between wet and dry years, and most reservoirs that capture local surface runoff are operated with minimal carry-over storage. San Diego County has the greatest storage capacity for these types of reservoirs, with approximately 84 percent of the total local agency storage capacity in Metropolitan's service area.

In addition to the storage that is owned and operated by local agencies, Metropolitan operates DVL, Lake Skinner, and Lake Mathews. DVL stores water imported during years of ample supply. DVL's 810 TAF capacity is used to augment supplies to meet dry year and seasonal needs, and also provides supply for the region during an emergency period. While Lake Skinner and Lake Mathews are largely used for system operations, they may also be used to augment supplies during dry years and emergencies, if necessary and available. Table A.2-4 lists the Metropolitan-owned reservoirs with significant storage capacity.

**Figure A.2-2**
**Major Groundwater Basins in Metropolitan's Service Area**

**Table A.2-3**
**Local Storage Reservoirs in Metropolitan's Service Area**
(Acre-feet)

| Member Agency/Sub-agency | Reservoir | Storage Capacity |
|---|---|---|
| **Eastern MWD** | | |
| Rancho California WD | Vail Lake | 45,207 |
| Lake Hemet MWD | Lake Hemet | 12,750 |
| **Las Virgenes MWD** | Westlake Reservoir | 9,500 |
| **City of Los Angeles** | Los Angeles | 10,170 |
| | Encino | 9,800 |
| | Stone Canyon | 10,800 |
| | Hollywood | 4,200 |
| **MWD of Orange County** | | |
| Irvine Ranch WD & Serrano ID | Santiago | 25,000 |
| **San Diego County Water Authority** | | |
| Carlsbad MWD | Maerkle | 600 |
| Escondido, City of | Dixon | 2,606 |
| | Wohlford | 2,783 |
| Fallbrook PUD | Red Mountain | 1,335 |
| Helix WD | Cuyamaca | 8,195 |
| | Jennings | 9,790 |
| Poway, City of | Poway | 3,432 |
| | Morro Hill | 465 |
| Ramona MWD | Ramona | 12,000 |
| San Diego County Water Authority | Olivenhain – CWA | 24,774 |
| San Diego, City of | Barrett | 34,806 |
| | El Capitan | 112,807 |
| | Hodges | 13,401 |
| | Lower Otay | 47,067 |
| | Miramar | 6,682 |
| | Morena | 50,694 |
| | Murray | 4,684 |
| | San Vicente | 249,358 |
| | Sutherland | 29,508 |
| San Dieguito WD | San Dieguito | 883 |
| Sweetwater Authority | Loveland | 25,400 |
| | Sweetwater | 28,079 |
| Valley Center MWD | Turner | 1,612 |
| Vista Irrigation District | Henshaw | 51,774 |
| **Western MWD of Riverside** | | |
| Temescal Water Company | Railroad Canyon | 12,000 |
| **Total** | | **862,162** |

**Table A.2-4**
**Total Storage Capacity of Metropolitan's Reservoirs**
(Thousands Acre-feet)

| Reservoir | Capacity |
|---|---|
| Diamond Valley Lake | 810 |
| Lake Skinner[1] | 44 |
| Lake Mathews[1] | 182 |

[1] These are used for operations and not primarily for dry year storage.

Lastly, Castaic and Perris are the terminal reservoirs to the West Branch and East Branch of the California Aqueduct operated by DWR. Through the Monterey Amendment to its SWP water service contract, Metropolitan has access to 219 TAF of flexible storage capacity in these SWP terminal reservoirs.

## Water Recycling and Groundwater Recovery

Water recycling projects involve treating wastewater to a level that is acceptable and safe for many non-potable applications. This resource is providing an increasing level of local water. In 1982, Metropolitan began helping to fund its member agencies' recycled water projects. Since that time, Metropolitan has invested approximately $510 million. In fiscal year 2019-20, water recycling projects in which Metropolitan has invested produced over 71 TAF. Local agency projects that did not receive financial assistance from Metropolitan produced an additional 320 TAF, and approximately 50 TAF of Santa Ana River base flow were used to recharge the Orange County basin. This brings the regional total to 441 TAF of recycled water use. Figure A.2-3 demonstrates the increase in this regional supply for direct use.

**Figure A.2-3 Recycled Water**

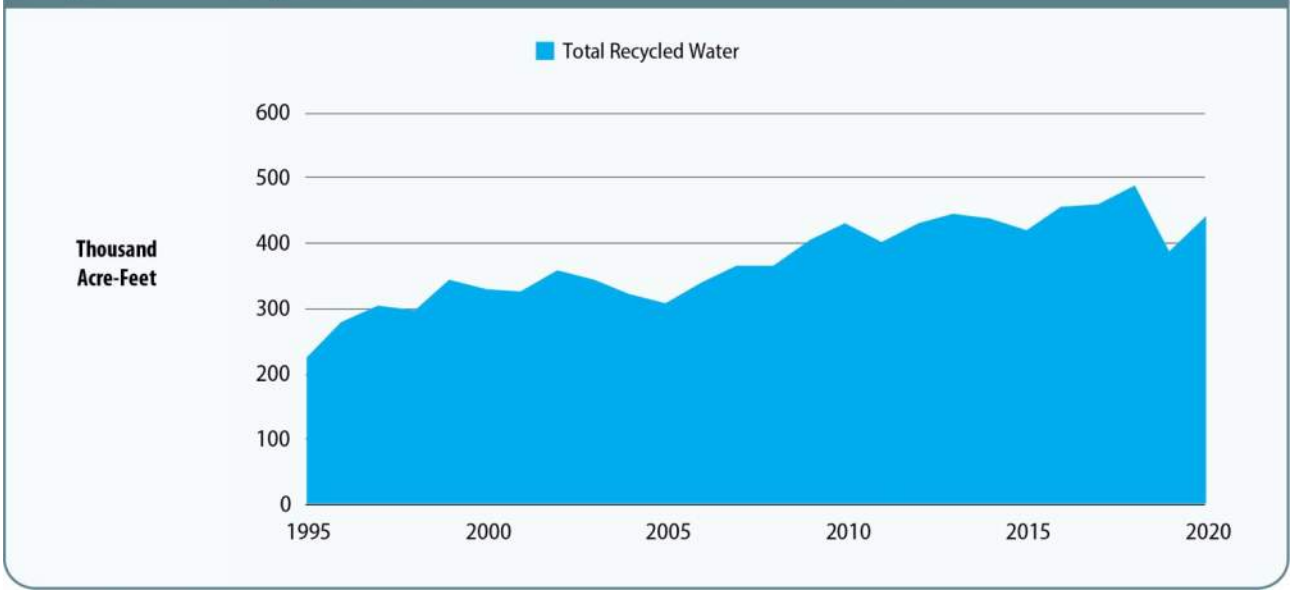

In addition, local agencies have implemented several projects to recover contaminated or degraded groundwater for potable uses. The groundwater recovery projects use a variety of treatment technologies to remove nitrates, volatile organic compounds, perchlorate, color, and salt. In 1991, Metropolitan began helping fund its member agencies' groundwater recovery projects. Since that time, Metropolitan has invested approximately $173 million. In FY 2019-20, these groundwater recovery projects produced 50 TAF. Other member agency projects that did not receive funding from Metropolitan produced another 62 TAF, for a regional total of 112 TAF. Figure A.2-4 shows this increase in supply.

**Figure A.2-4 Groundwater Recovery**

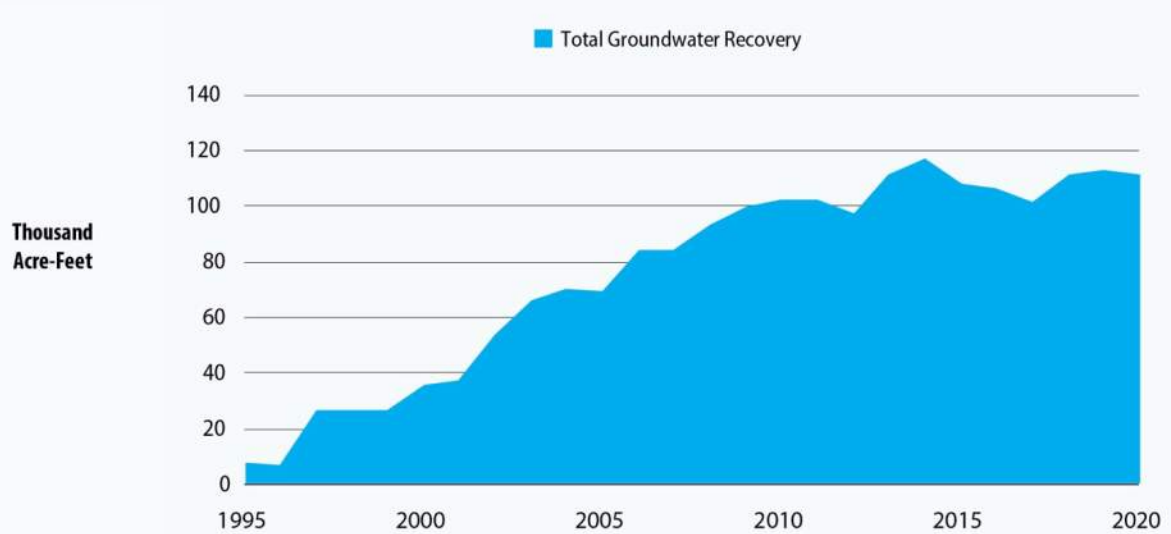


## Imported Water

Most member agencies and retail water suppliers depend on imported water for a portion of their water supply. For some member agencies, Metropolitan supplies most of the water used within that agency's service area, while others obtain varying amounts of water from Metropolitan to supplement local supplies. For example, Los Angeles and San Diego (the largest and second largest cities in the state) have historically obtained up to 85 percent of their water from imported sources. These imported water requirements are similar to those of other metropolitan areas within the state, such as San Francisco and other cities around the San Francisco Bay.

Figure A.2-5 shows the conveyance facilities for the state's imported water supplies. Descriptions of each of the imported sources of water available to Metropolitan's service area follow. Justification for projected water supplies from these sources is provided in Appendix 3.

### *Colorado River*

A number of water agencies within California have rights to divert water from the Colorado River. Through the Seven Party Agreement (1931), seven agencies recommended apportionments of California's share of Colorado River water within the state. Table A.2-5 shows the historic apportionment of each agency, and the priority accorded that apportionment.

**Table A.2-5**
**Priorities in Seven Party Agreement and Water Delivery Contracts**

| Priority | Description | TAF Annually |
|---|---|---|
| 1 | Palo Verde Irrigation District – gross area of 104,500 acres of land in the Palo Verde Valley | |
| 2 | Yuma Project (Reservation Division) – not exceeding a gross area of 25,000 acres in California | |
| 3(a) | Imperial Irrigation District and land in Imperial and Coachella Valleys[1] to be served by All American Canal | 3,850 |
| 3(b) | Palo Verde Irrigation District –16,000 acres of land on the Lower Palo Verde Mesa | |
| 4 | Metropolitan Water District of Southern California for use on the coastal plain of Southern California | 550 |
| Subtotal | | 4,400 |
| 5(a) | Metropolitan Water District of Southern California for use on the coastal plain of Southern California | 550 |
| 5(b) | Metropolitan Water District of Southern California for use on the coastal plain of Southern California[2] | 112 |
| 6(a) | Imperial Irrigation District and land in Imperial and Coachella Valleys[1] to be served by the All American Canal | |
| 6(b) | Palo Verde Irrigation District –16,000 acres of land on the Lower Palo Verde Mesa | 300 |
| 7 | Agricultural Use in the Colorado River Basin in California | |
| | **Total Prioritized Apportionment** | **5,362** |

[1] The Coachella Valley Water District now serves Coachella Valley.

[2] In 1946, the City of San Diego, the San Diego County Water Authority, Metropolitan, and the Secretary of the Interior entered into a contract that merged and added the City of San Diego's rights to store and deliver Colorado River water to the rights of Metropolitan. The conditions of that agreement have long since been satisfied.

**Figure A.2-5**
**MAJOR WATER CONVEYANCE FACILITIES IN CALIFORNIA**

The water is delivered to Metropolitan's service area by way of the CRA, which has a rated capacity of approximately 1,700 cfs. The CRA conveys water 242 miles from its Lake Havasu intake to its terminal reservoir, Lake Mathews, near the City of Riverside. Conveyance losses along the CRA of 10 TAF per year reduce the amount of Colorado River water received in the coastal plain.

Since the date of the original contract, several events have occurred that changed the dependable supply that Metropolitan expects from the Colorado River. The most significant event was the 1964 U.S. Supreme Court decree in *Arizona v. California* that reduced Metropolitan's dependable supply of Colorado River water to 550 TAF per year. The reduction in dependable supply occurred with the commencement of Colorado River water deliveries to the Central Arizona Project. In 1987, Metropolitan entered into a contract with the U.S. Bureau of Reclamation (USBR) for an additional 180 TAF per year of surplus water when surplus water is available. In addition, Metropolitan has obtained a minimum of approximately 85 TAF per year of Colorado River water since 1996 through a conservation program with the Imperial Irrigation District.

In 1979, the Present Perfected Rights (PPRs) of certain Indian reservations, cities, and individuals along the Colorado River were quantified. These PPRs predate the Seven Party Agreement, but the rights holders were not included in the Seven Party Agreement prioritizing California's use and storage of Colorado River water.

In 1999, under the auspices of the Colorado River Board of California, a draft plan, "California's Colorado River Water Use Plan," was developed. The Colorado River Board of California protects California's rights and interests in the resources provided by the Colorado River and represents California in discussions and negotiations regarding the Colorado River and its management. The overall purpose of California's Colorado River Water Use Plan is to provide Colorado River water users with a framework by which programs, projects, and other activities may be coordinated and cooperatively implemented. This framework specified how California would make the transition from relying on surplus water supplies from the Colorado River to living within its normal (basic) water supply apportionment.

To implement these plans, a number of agreements have been executed. In October 2003, representatives from Metropolitan, IID, and Coachella Valley Water District (CVWD) executed the Quantification Settlement Agreement (QSA) and several other related agreements. Parties involved include the San Diego County Water Authority (SDCWA), the California Department of Water Resources (DWR), the California Department of Fish and Wildlife, the U.S. Department of the Interior, and the San Luis Rey Indian Water Rights Settlement Parties. The QSA quantifies the use of water under the third priority of the Seven Party Agreement and allows for implementation of agricultural conservation, land management, and other programs identified in Metropolitan's 1996 IRP. Quantification of the third priority provides the needed numeric baseline from which conservation and transfer programs may be measured. The QSA has helped California reduce its reliance on Colorado River down to its normal apportionment (4,400 TAF).

The quantification of the agricultural priorities under the QSA provided for the water saved under the Palo Verde Land Management and Crop Rotation Program to be made available to Metropolitan. This program provides up to 133 TAF of water to be available to Metropolitan in certain years and will supply a minimum of 33 TAF per year.

SDCWA is participating in QSA-related projects that are providing additional water supplies that the agency exchanges with Metropolitan for receipt of Metropolitan deliveries. First, the water conserved by these projects is made available to Metropolitan. In exchange, Metropolitan is delivering an amount of Metropolitan water equal to the amount of Colorado River water

conserved by IID for SDCWA. Second, federal law allocates a portion of the water available as a result of the Coachella Canal Lining Project and the All-American Canal Lining Project for the benefit of parties, including five Indian Bands, and two non-Indian municipal water purveyors (San Luis Rey Settlement Parties) involved in litigation over water rights to the San Luis Rey River in San Diego County. Metropolitan has agreed to exchange that water and provide an equal amount of water to the United States for use by the San Luis Rey Settlement Parties, and SDCWA has agreed to convey the water when capacity is available for use within the Settlement Parties' service areas. The remainder of the water available as a result of the canal lining projects, up to the cap specified in the Metropolitan-SDCWA exchange agreement, is exchanged with SDCWA.

In October 2004, Southern Nevada Water Authority (SNWA) and Metropolitan entered into a storage and interstate release agreement. Under this program, SNWA can request that Metropolitan store unused Nevada apportionment. The amount of water which Metropolitan diverted through 2015 under this agreement was over 422 TAF. In subsequent years, SNWA may request return of approximately 330 TAF. It is expected that SNWA will not request return of stored water until after 2026.

In December 2007, the Secretary of the Interior approved the adoption of specific interim guidelines for reductions in Colorado River water deliveries during declared shortages and coordinated operations of Lake Powell and Lake Mead. These guidelines provide water release criteria from Lake Powell and water storage and water release criteria from Lake Mead during shortage, normal, and surplus conditions in the Lower Basin; provide a mechanism for the storage and delivery of conserved system and non-system water in Lake Mead; and modify and extend interim surplus guidelines through 2026. The Record of Decision and accompanying agreement among the Colorado River Basin States protect reservoir levels by reducing deliveries during drought periods, encourage agencies to develop conservation programs, and allow the states to develop and store new water supplies. The Colorado River Basin Project Act of 1968 insulates California from shortages in all but the most extreme hydrologic conditions.

In May 2006, Metropolitan and the USBR executed an agreement for a demonstration program that allowed Metropolitan to leave conserved water in Lake Mead that Metropolitan would otherwise have used in 2006 and 2007. The water left in Lake Mead must have been made available through extraordinary conservation measures, which was accomplished in 2006 and 2007 through savings realized under the Palo Verde Land Management, Crop Rotation, and Water Supply Program. This demonstration program was an activity eligible for creation of Extraordinary Conservation Intentionally Created Surplus (ICS) under the provisions of the December 2007 federal guidelines for the operation of Lake Powell and Lake Mead. Metropolitan continued to store water in Lake Mead through extraordinary conservation measures as provided in the December 2007 federal guidelines in 2009, 2010, 2011, 2012, 2016, 2017, 2018, and 2019. Metropolitan took delivery of a portion of its extraordinary conservation ICS in 2013, 2014, and 2015. As of January 1, 2020, Metropolitan had approximately 866 TAF of extraordinary conservation ICS water in Lake Mead.

The December 2007 federal guidelines provided Colorado River contractors the ability to create System Efficiency ICS through development and funding of system efficiency projects. To that end, in 2008 the Central Arizona Water Conservation District, SNWA, and Metropolitan contributed funds for the construction of the Drop 2 (Brock) Reservoir by the USBR. The purpose of the Drop 2 reservoir is to increase the capacity to regulate deliveries of Colorado River water at Imperial Dam, reducing the amount of water released downstream, and therefore lost from storage in Lake Mead, by approximately 70 TAF annually. In return for funding one-sixth of the project cost, 100 TAF of water stored in Lake Mead was assigned to Metropolitan as System

Efficiency ICS in 2008. Metropolitan also created approximately 24 TAF of System Efficiency ICS by contributing to a one-year pilot operation of the Yuma Desalting Plant. Overall, from 2008-2011, Metropolitan created over 124 TAF of System Efficiency ICS As of January 1, 2020, Metropolitan had approximately 89 TAF of System Efficiency ICS water in Lake Mead.

In November 2012, as part of the implementation of Minute 319 to the 1944 water treaty between the U.S. and Mexico, Metropolitan executed an agreement with the USBR and other Lower Colorado River Basin stakeholders to fund a pilot water conservation program in the Mexicali Valley region of Mexico in exchange for a portion of the conserved water received as Binational ICS (BICS) stored in Lake Mead, converted from Intentionally Created Mexican Allocation (ICMA). The Minute 319 pilot program was completed in 2017, and Metropolitan received 23,750 AF of BICS, which remained stored in Lake Mead as of January 1, 2020. In September 2017, Metropolitan executed a similar agreement as part of the implementation of Minute 323, through which Metropolitan expects to receive up to 27,275 AF of BICS between 2020 and 2026.

In May 2019, in response to ongoing conditions in the Colorado River Basin and concern over water levels in Lake Mead, Metropolitan, the Secretary of the Interior, and representatives of state governments and water agencies throughout the Colorado River Basin executed the *Agreement Concerning Colorado River Drought Contingency Management and Operations* (DCP). Exhibit 1 of Attachment B to the DCP—*Lower Basin Drought Contingency Operations* (LBOps)—specifies certain changes to the management of Lake Mead. Key provisions include increases in the cumulative allowable ICS storage in Lake Mead for each state, greater flexibility in annual ICS storage limits, and the requirement for Lower Basin states to make contributions to Lake Mead storage ("DCP contributions") when water levels drop below elevation 1075 feet. California DCP contributions are required when Lake Mead levels drop below elevation 1045 feet.

Metropolitan is undertaking ongoing efforts to maintain and improve the flexibility and quality of its water supply from the Colorado River. Section 3.1 of this Plan describes current programs and plans related to flexibility, and Section 4 describes water quality programs.

### *State Water Project*

The State Water Project, which is owned by the state and operated by DWR, is the second source of Metropolitan's imported water supplies. The SWP comprises 32 storage facilities (reservoirs and lakes), 662 miles of aqueduct, and 25 power and pumping plants.

The SWP conveys water from Northern California to the north and south of the San Francisco Bay Area and areas south of the Bay Delta region. Water from the SWP originates at Lake Oroville, which is located on the Feather River in Northern California. That water, along with all additional unused water from the watershed, flows into the Sacramento/San Joaquin Delta. Water from the Delta is then either pumped to water users in the San Francisco Bay area or transported through the California Aqueduct to water users in Central and Southern California.

DWR contracted to deliver water in stages to 32 SWP contractors, with an ultimate delivery of 4,172 TAF per year. Three contractors have had their contract amounts taken on by other contractors; currently, DWR is delivering water to 29 SWP contractors. Metropolitan is the largest, with a contractual amount of 1,911 TAF per year, or approximately 46 percent of the total contracted amount. Metropolitan receives deliveries of SWP supplies via the California Aqueduct at Castaic Lake in Los Angeles County, Devil Canyon Afterbay in San Bernardino County, and Box Springs Turnout and Lake Perris in Riverside County. The first delivery of SWP water to Metropolitan occurred in 1972.

The initial facilities of the SWP, completed in the early 1970s, were designed to meet the original needs of the SWP contractors. It was intended that additional SWP facilities would be built over

time to meet projected increases in contractors' delivery needs. Each contractor's SWP contract provided for a buildup in contractual amount over time, with most contractors reaching their maximum annual contractual amount by the year 1990. Since the completion of the initial SWP facilities in the early 1970s, major improvements to the system have included: four new pumps added to the Banks Pumping Plant at the Delta, the completion of the Coastal Branch, and the East Branch enlargement. Even with these improvements, however, there are still significant capacity constraints within the SWP that limit the delivery capability of the full contracted amount. During the same time, the contractors' needs for water from the SWP have increased. As a result, the contractors' demands for SWP water currently exceed the dependable yield.[1] Metropolitan has developed groundwater storage programs with Semitropic Water Storage District, Arvin-Edison Water Storage District, Kern Delta Water District, and Antelope Valley-East Kern Water Agency to supplement the available water supply.

The amount of contractual supplies DWR approves for delivery varies annually with contractor demands and projected water supplies from tributary sources to the Delta, based on snowpack in the Sierra Nevada, reservoir storage, operational constraints, and demands of other water users. Deliveries to Metropolitan reached a high of 1,802 TAF in calendar year 2004. Metropolitan experienced shortages in SWP supplies in fiscal years 1991 and 1992, with reduced deliveries of 391 TAF and 710 TAF, respectively.[2] SWP deliveries were limited to a record low 5 percent of contractual amount in 2014 and 20 percent of contractual amount in 2015. For calendar year 2021, the SWP allocation decreased from an initial allocation of 10 percent to 5 percent based on on-going dry conditions. The five percent SWP allocation for Metropolitan in 2014 and 2021 represents the lowest in the history of the SWP.

In recent years, the listing of several fish species in the Sacramento/San Joaquin River Delta (Delta) under both state and federal Endangered Species Acts has constrained SWP operations and created more uncertainty in SWP supply reliability. These listed species include Delta smelt, winter-run Chinook salmon, spring-run Chinook salmon, Central Valley steelhead, green sturgeon, and Longfin smelt (state-listed only). In August 2020, DWR released the SWP Delivery Capability Report. The report shows that current SWP delivery capability has been negatively impacted by two significant factors. The first is the 2018 Addendum to the Coordinated Operation Agreement (COA), which increased State Water Project obligations to meet in-basin uses and decreased the ability of the State Water Project to export water relative to the Central Valley Project. The second major factor is operational changes by DWR to maintain higher levels of storage in Lake Oroville, made in part to ensure sufficient supplies to meet increased COA obligations. Additionally, the report shows a reduction in future delivery capability because of climate change, which is altering the hydrologic conditions in the State.

Metropolitan is undertaking ongoing efforts to maintain and improve the reliability and quality of its water supply from the State Water Project. Sections 3.2 and 3.3 in this Plan describe current programs and plans for reliability, and Chapter 4 addresses water quality issues.

### *Los Angeles Aqueduct*

The City of Los Angeles imports water from the eastern Sierra Nevada through the Los Angeles Aqueduct (LAA). The original LAA, completed in 1913, imported water from the Owens Valley. In 1940, the aqueduct was extended to the Mono Basin. A second aqueduct, which parallels the original, was completed in 1970.

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[1] The dependable yield of the existing SWP facilities is considered to be the delivery capability during a critically dry seven-year period.

[2] These numbers are Metropolitan's allocated contractual amount. Total water deliveries to Metropolitan's service area are shown in Table A.2-1.

Prior to the 1990-1991 drought, the City of Los Angeles had imported an average of 440 TAF of water annually from the combined Owens Valley/Mono Basin system, of which about 90 TAF came from the Mono Basin. In 1986, the aqueduct delivered a record 520 TAF of water.

In the late 1980s, a series of court injunctions limited the amount of water that Los Angeles could receive from its aqueduct system. In 1990, these limitations, along with a persistent drought, limited the delivery from the aqueduct to only 106 TAF. The Mono Lake Water Rights Decision (Decision) in September of 1994 ended the litigation in the Mono Basin, while negotiations continued with Inyo County on the fate of the Owens Valley water supply. In the Decision, the state ruled that Mono Lake should rise 17 feet over the next 25 years. During this time, Los Angeles would only be permitted to divert a fraction of its historical amounts. After the lake had risen, the City of Los Angeles would still be allowed only significantly reduced diversions. However, the high precipitation during the 1990s allowed increased diversions of water to the LAA to occur at a much earlier time frame than had been foreseen at the time of the Decision.

More recently, the LAA diversions of water from the Owens Valley came under additional pressure. Diversion of water from the Owens River had led to the drying up of Owens Lake by the end of the 1920s. This dry lakebed became a major source of windblown dust, resulting in EPA pressure to develop a State Implementation Plan to bring the region into compliance with federal air quality standards. In 1998, the Los Angeles Department of Water and Power entered into a Memorandum of Agreement with the Great Basin Air Pollution Control District that specified actions needed to control the problem. These actions included shallow flooding and managed vegetation at various lakebed locations. An estimated 54 TAF per year will be required to maintain the dust control measures, further restricting the water available for diversion through the LAA. More recently, the city has been required to restore portions of the Owens River, which could further restrict the water that can be provided from this source. During the last 5 years (2015 to 2019), LAA supplies ranged from a high of 380 TAF in 2017 to a low of 33 TAF in 2015.

### Historic Total Regional Water Supplies

The previous sections have presented the various sources of Metropolitan and the region's water supply. The amount of water supplied by each local and imported source from 1976 through 2020 appears in Table A.2-1. The imported supplies represent the amount of water imported into Metropolitan's service area, not the amount delivered to member agencies, which is shown in Table A.2-2. The difference between Metropolitan's imports and deliveries is water placed into or withdrawn from storage.

# Appendix 3

# JUSTIFICATIONS FOR SUPPLY PROJECTIONS

# Appendix 3
# JUSTIFICATIONS FOR SUPPLY PROJECTIONS

The California Water Code (CWC) Section 10631 requires that urban water suppliers identify and quantify, to the extent practicable, the existing and planned sources of water available to them over five-year increments to 20 years or as far as data is available. This CWC section further requires urban suppliers to include a detailed description of all water supply projects and water supply programs that may be undertaken to meet the total projected water use. This Appendix provides the basis for the water supply available to Metropolitan as contained in this plan, by each major source of supply. Such bases and proofs are required for supply verification under the legislation.

Throughout this Appendix, references are made to Metropolitan's operating budget and its long-term capital investment plan. The most recent operating budget (for fiscal years 2020-21 and 2021-22) was adopted at the April 14, 2020 meeting of Metropolitan's Board of Directors. A copy of the budget summary and the Capital Investment Plan for fiscal years 2020-21 and 2021-22 can be found at: http://mwdh2o.com/PDF_Who_We_Are/Biennial%20Budget%20–%20Fiscal%20Years%202020-21%20and%202021-22.pdf.

Another document of interest related to Metropolitan's water supply planning is its annual report to the state Legislature in compliance with Senate Bill 60 of 1999 (Hayden).[1] Senate Bill 60 requires that Metropolitan report on its progress in increasing its emphasis on cost-effective conservation, recycling, and groundwater recharge.

## A.3.1. Colorado River Aqueduct Deliveries

### *A. Colorado River Supplies*

Metropolitan obtains water from the Colorado River under its Boulder Canyon Project Section 5 water delivery contract with the Secretary of the Interior providing for permanent service. A number of programs have been developed over the years to enhance and manage Colorado River supplies available under its water delivery contract. Appendix 2 describes the history of water supplies and the expected availability from this source, and Section 3.1 of the 2020 UWMP describes the agreements for water supplies.

*Rationale for the Expected Supply*

Historical Record

Water supply under Metropolitan's Boulder Canyon Project Section 5 water delivery contract has been delivered since 1939. By existing contract, it is expected to be available in perpetuity because of California's senior water rights to use of Colorado River water.

[1] Metropolitan Water District of Southern California, *Annual Progress Report to the California State Legislature: Achievements in Conservation, Recycling and Groundwater Recharge (February 2021)*, which can be found at http://www.mwdh2o.com/PDF_About_Your_Water/Annual_Achievement_Report.pdf. The legislation requiring this information can be found at http://www.leginfo.ca.gov/pub/99-00/bill/sen/sb_0051-0100/sb_60_bill_19990916_chaptered.pdf. Similar reports have been filed with the Legislature since 2000.

The historical record for available Colorado River water indicates that Metropolitan's contracted Colorado River supply has been available in every year and can reasonably be expected to be available over the next 20 years. Through 2002 the volume of water available and diverted from the Colorado River has been up to the annual capacity of the Colorado River Aqueduct of approximately 1.25 MAF. Since 2003, increased use by the other Colorado River basin states and persistent dry conditions in the Colorado River Basin has reduced the firm available supply to its 550 TAF Priority 4 entitlement.

Written Contracts or Other Proof

Metropolitan's entitlement to Colorado River water is based on a series of interstate compacts, federal laws, agreements, court decrees, and guidelines collectively known as "The Law of the River,"[2] which govern the distribution and management of Colorado River water. The following documents specifically determine Metropolitan's dependable supplies:

1931 Seven Party Agreement.[3] The 1931 Agreement recommended California's Colorado River use priorities and has no termination date. The priorities to water available for use in California held by Palo Verde Irrigation District (PVID), Yuma Project (Reservation Division), Imperial Irrigation District (IID), Coachella Valley Water District (CVWD), and Metropolitan are shown in Table A.2-5. These priorities are incorporated into the water delivery contracts that the Secretary of the Interior executed with the California agencies in the 1930s for water from Lake Mead. Metropolitan holds Priority 4 to California's basic apportionment of Colorado River water and utilizes this water – 550 TAF per year. Metropolitan also holds Priority 5 to 662 TAF per year. Appendix 2 describes the current status of water available under these priorities.

Metropolitan's Basic Contracts.[4] Metropolitan's 1930, 1931, and 1946 basic contracts with the Secretary of the Interior permit the delivery of 1.212 MAF per year when sufficient water is available. Metropolitan's 1987 surplus flow contract for up to 180 TAF with USBR permits the delivery of water to fill the remainder of the Colorado River Aqueduct when water is available.

Consolidated Court Decree.[5] The 1964 U.S. Supreme Court Decree confirmed the Arizona, California, and Nevada basic apportionments of 2.8 MAF per year, 4.4 MAF per year, and 300 TAF per year, respectively. The 1964 Decree also permits the Secretary of the Interior to make water available that is unused by one of the states for use in the other two states. In addition, it permits the Secretary of the Interior to make surplus water available. The Consolidated Decree issued on March 27, 2006, by the U.S. Supreme Court in Arizona v. California consolidated into one decree the initial 1964 decree, the 1979 supplemental decree, the 1984 second supplemental decree, the 2000 third supplemental decree, and the 2006 approval of settlements reached on the water rights claim of the Fort Yuma Indian Reservation. The Consolidated Decree quantified present perfected rights (PPRs) to the use of Colorado River water by certain Indian reservations, federal wildlife refuges, and other users.

2003 Quantification Settlement Agreement (QSA). The QSA and several other related agreements were executed in October 2003.[6] The QSA quantifies the use of water under the third priority of the Seven Party Agreement, and further allocates 38 TAF of the sixth priority to

[2] A description of many of these documents can be found at http://www.usbr.gov/lc/region/pao/lawofrvr.html.

[3] This agreement among the seven California agencies was dated August 18, 1931, and was codified in federal regulations promulgated by the Secretary of the Interior on September 28, 1931.

[4] Including contract number Ilr-645 dated April 9, 1930, supplemented September 28, 1931.

[5] The Consolidated Decree entered by the U.S. Supreme Court on March 27, 2006, in *Arizona v. California, et al.,* can be found at http://www.usbr.gov/lc/region/pao/pdfiles/scconsolidateddecree2006.pdf.

[6] These agreements can be found at http://www.iid.com/water/library/qsa-water-transfer.

Metropolitan. The QSA provides the numeric baseline needed to measure conservation and transfer programs, and it allows for implementation of agricultural conservation, land fallowing, and other programs identified in Metropolitan's IRP. Although this agreement does not directly impact Metropolitan's entitlements, Metropolitan agreed to forbear consumptive use when necessary so that the Secretary of the Interior can satisfy the uses of holders of miscellaneous and Indian present perfected rights in excess of 14.5 TAF.

2005 Settlement Agreement with Quechan Indian Tribe. In 2005, Metropolitan entered into a settlement agreement in Arizona v. California with the Quechan Indian Tribe and other parties. The Tribe uses Colorado River water on the Fort Yuma Indian Reservation. Under the settlement agreement, the Tribe, in addition to the amounts of water decreed for the benefit of the Reservation in the 1964 decree in Arizona v. California, is entitled to (a) 20 TAF of diversions from the Colorado River, or (b) the amount necessary to supply the consumptive use required for irrigation of a specified number of acres, and for the satisfaction of related uses, whichever is less. Of the additional diversions, 13 TAF became available to the Tribe in 2006. An additional 7 TAF becomes available to the Tribe in 2035. Metropolitan agreed to provide annual incentive payments to the Tribe if the Tribe forbore diversion of the additional water, thereby allowing Metropolitan to divert it.

Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead. In December 2007, the Secretary of the Interior approved a Record of Decision establishing specific interim guidelines for reductions in Colorado River water deliveries in the Lower Basin during declared shortages and coordinated operations of Lake Powell and Lake Mead. These guidelines provide water release criteria from Lake Powell and water storage and water release criteria from Lake Mead during shortage, normal, and surplus conditions in the Lower Basin, and provide a mechanism for Metropolitan to store and take delivery of conserved system and non-system water in Lake Mead. In December 2020, the seven Colorado River Basin States sent a letter to the Secretary of Interior giving notice that the Basin States have begun the process of reconsultation regarding the 2007 interim guidelines. The Basin States and major water contractors, including Metropolitan, will be involved in reconsultation and development of new guidelines for the management and operation of Lake Powell and Lake Mead after the term of the 2007 interim guidelines ends in 2026.

Lower Basin Drought Contingency Plan. In April 2019, the President signed legislation directing the Secretary of the Interior to sign and implement four DCP agreements related to the Upper and Lower Basin DCPs without delay. The agreements were executed and became effective on May 20, 2019 and will continue to be effective through 2026. The Lower Basin Drought Contingency Plan Agreement requires California, Arizona and Nevada to contribute defined volumes of water to Lake Mead ("DCP Contributions") when lake elevations drop below certain levels. California would begin making these contributions if USBR modeling projects Lake Mead's elevation to be at or below 1,045 feet (relative to mean sea level) on January 1. Lake Mead elevation in January 2020 was 1,090 feet. Depending on the lake's elevation, California's annual contributions would range from 200 to 350 TAF. Pursuant to intrastate implementation agreements that terminate in 2026, Metropolitan is responsible for 93 percent of any California DCP Contribution that may be required under the Lower Basin DCP. CVWD is responsible for 7 percent of California's required DCP Contributions.

Implementation of the Lower Basin DCP enhances Metropolitan's ability to store water in Lake Mead and to ensure that water in storage can be delivered at a later date. The Lower Basin DCP increases the total volume of water that California may store in Lake Mead as ICS by 200 TAF. Water stored as ICS will be available for delivery as long as Lake Mead's elevation remains above 1,025 feet. Previously, that water would likely have become inaccessible below

a Lake Mead elevation of 1,075 feet. DCP Contributions may be made through conversion of existing ICS. These types of DCP Contributions become DCP ICS. DCP Contributions may also be made by leaving water in Lake Mead to which there was a legal right of delivery. This type of DCP Contribution becomes system water and may not be recovered. Rules are set for delivery of DCP ICS through 2026 and between 2027 to 2057.

#### *Financing*

Metropolitan's operating budget (referenced at the beginning of this appendix) includes the cost of delivering Colorado River water and the payment to the Quechan Indian Tribe, which is paid from water sales revenue.

#### *Federal, State, and Local Permits/Approvals*

Metropolitan's fourth priority Colorado River water is currently available, and this priority assures delivery of the basic apportionment.

### ***B. IID - Metropolitan Conservation Program***

#### *Source of Supply*

The IID-Metropolitan Conservation Program provides an annual supply that is delivered to Metropolitan's service area via its Colorado River Aqueduct (CRA). In 1988, Metropolitan executed a Conservation Agreement to fund water efficiency improvements within IID's service area in return for the right to divert the water conserved by those improvements. The program consists of structural and non-structural measures, including the concrete lining of existing canals, the construction of local reservoirs and spill-interceptor canals, installation of non-leak gates, and automation of the distribution system. Other implemented projects include the delivery of water to farmers on a 12-hour basis rather than a 24-hour basis and improvements in on-farm water management.

#### *Expected Supply Capability*

The IID-Metropolitan Conservation Program activity began in 1990, has been fully operational since 1998, and makes available 105 TAF of conserved water annually from 2016 onward. The initial program agreement provided CVWD the option to call up to about 45 TAF per year if needed to meet its demands. Execution of the QSA reduced CVWD's option to a maximum of 20 TAF. This water is available to Metropolitan if not required by CVWD, but the minimum supply to Metropolitan has been increased to 85 TAF from 2016 onward through a second amendment to the agreement, and the clarification on the number of 12-hour deliveries that would be included in the program through a letter agreement. This amount was further increased to 90 TAF from 2020-2026 under the 2019 Second Amendment to the Delivery and Exchange Agreement with CVWD, with the remainder of CVWD's option (15 TAF) available for Metropolitan's delivery to CVWD at Whitewater.

#### *Rationale for the Expected Supply*

<u>Historical Record</u>

The IID-Metropolitan Conservation Program has been fully operational since 1998. Existing agreements have extended the initial term to at least 2041 or 270 days after the termination of the QSA, whichever is later, and they guarantee Metropolitan a minimum of 85 TAF per year from 2016 onward. A 2019 amendment increases the minimum to 90 TAF from 2020 to 2026.

With operations beginning in 1990, the program has conserved as much as 109.46 TAF per year to date. By an amendment to the program agreement beginning in 2007 and a 2014 letter agreement, the annual conserved water yield will be 105 TAF. The historical record indicates that

Metropolitan's expected minimum supply of 85 TAF per year (and 90 TAF from 2020 to 2026) would be available over at least the next 26 years.

Written Contracts or Other Proof

Metropolitan's annual supply from the IID-Metropolitan Conservation Program is based on three agreements and amendments to those agreements.

1988 IID-Metropolitan Conservation and Use of Conserved Water Agreement. This Agreement was executed in December 1988 by IID and Metropolitan for a 35-year term following completion of program implementation (1998–2033).

1989 Approval Agreement. This Agreement secured the approval of PVID and CVWD to not divert an amount of water equal to the amount conserved except under limited circumstances. The Agreement was executed in December 1989.

1989 Supplemental Approval Agreement. This Agreement was executed in December 1989 between Metropolitan and CVWD to coordinate Colorado River diversions and the use of the conserved water provided by the Program.

2003 Amendments to 1988 Agreement and 1989 Approval Agreement. These amendments revise Metropolitan's potential obligation to reduce its use of the conserved water yield in favor of its use by CVWD down to 20 TAF annually. Any of this water not used by CVWD would be available to Metropolitan. The amendments also extended the term of the IID-Metropolitan conservation program through December 31, 2041, or 270 days beyond the termination of the QSA.

2007 Amendments to 1988 Agreement and 1989 Approval Agreement. These amendments specify that beginning in 2007, the annual conserved water yield has and will be 105 TAF with continued operation of 24 tailwater pump back systems, of which up to 20 TAF would be made available to CVWD upon its request.

2014 Letter Agreement Related to the 1988 Agreement. This letter agreement specifies that beginning in 2016, the annual conserved water yield has and will be 105 TAF, of which up to 20 TAF would be made available to CVWD upon its request. This amendment also removes tailwater recovery systems from the conservation actions and quantifies the yield and number of 12-hour deliveries that are included in the program.

2019 Second Amendment to Delivery and Exchange Agreement Between Metropolitan and Coachella for 35 TAF. The second amendment was executed in December 2019 between Metropolitan and CVWD for the exchange of additional water during the period from 2020 through 2026. Metropolitan will be guaranteed 90 TAF per year from 2020 to 2026, with the remaining amount that CVWD could call (15 TAF) available for Metropolitan's delivery to CVWD at whitewater.

### *Financing*

Construction of the water efficiency improvements under this Program have been funded and put into operation. Metropolitan's five-year financial forecast in the budget includes the cost of operating, maintaining, and delivering the conserved water under the IID--Metropolitan Conservation Program.

### *Federal, State, and Local Permits/Approvals*

A comprehensive environmental review process supported implementation.

EIR for Program. The IID Board certified the final EIR for the Program in December 1986.[7]

Supplemental EIR for Program. The IID Board certified the final EIR for the Completion Program in June 1994.[8]

Program EIR for Quantification Settlement Agreement. Metropolitan's Board certified the final Program EIR for the QSA in June 2002.[9]

Addendums to the QSA Final Program EIR. Metropolitan's Board adopted the Addendum to the QSA Final Program EIR in December 2002 and a second addendum in September 2003. Metropolitan's Board also adopted the Findings of Fact and Statement of Overriding Considerations, and Mitigation and Monitoring and Reporting Program at that time.

## *C. Palo Verde Irrigation District Land Management, Crop Rotation and Water Supply Program*

### *Source of Supply*

At its May 11, 2004 meeting, Metropolitan's Board authorized a 35-year land management, crop rotation, and water supply program with the PVID. Under the program, participating landowners in PVID are being paid to reduce their water use by not irrigating a portion of their land. A maximum of 29 percent of lands within PVID can be fallowed in any given year. Under the terms of the QSA, water savings within the PVID service area are made available to Metropolitan. PVID has the first priority for Colorado River water under the water delivery contracts with the USBR. Implementation of the program began in January 2005. The agreement also specifies that the participating landowners will fallow land in an amount equal to 25% of the landowner's total maximum fallowing commitment during each year.

### *Expected Supply Capability*

It is estimated that the PVID/Metropolitan Program would provide up to 133 TAF per year of additional Colorado River water. This water would be available in any year as needed and in accordance with the provisions described in the agreements with Palo Verde Valley landowners and PVID.

### *Rationale for the Expected Supply*

Historical Record

Metropolitan and PVID tested the concept of developing a water supply for Metropolitan by entering into an agreement in 1992.[10] Agreements were signed with landowners and lessees in the Palo Verde Valley to forego irrigation for a two-year period from August 1992 to July 1994. Water unused by PVID, in the amount of 186 TAF, was stored in Lake Mead for Metropolitan. Both PVID and Metropolitan signed approved Principles of Agreement in 2001. PVID issued the Final

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[7] Imperial Irrigation District, *Final EIR, Proposed Water Conservation Program and Initial Water Transfer, Imperial Irrigation District,* October, 1986. SCH Number: 1986012903.

[8] Imperial Irrigation District, *Final EIR for Modified East Lowline and Trifolium Interceptors, and Completion Projects*, May 1994. SCH Number: 1992071061.

[9] Coachella Valley Water District, Imperial Irrigation District, Metropolitan, San Diego County Water Authority, *Final Program EIR, Implementation of the Colorado River Quantification Settlement Agreement*, June 2002, SCH Number 2000061034.

[10] Presented to Metropolitan's Board at its regular meeting on January 14, 1992.

EIR for the Proposed Palo Verde Irrigation District Land Management, Crop Rotation and Water Supply Program in September 2002.[11]

Implementation of the program began in January 2005. In March 2009, Metropolitan and PVID entered into a one-year supplemental fallowing program within PVID that provided for the fallowing of additional acreage, with savings of 24.1 TAF in 2009 and 32.3 TAF in 2010.

| **Calendar Year** | **Volume of Water Saved** (TAF) |
|---|---|
| 2005 | 108.7 |
| 2006 | 105.0 |
| 2007 | 72.3 |
| 2008 | 94.3 |
| 2009 | 120.2 |
| 2010 | 116.3 |
| 2011 | 122.2 |
| 2012 | 73.7 |
| 2013 | 32.8 |
| 2014 | 43.0 |
| 2015 | 94.5 |
| 2016 | 125.4 |
| 2017 | 119.4 |
| 2018 | 95.7 |
| 2019 | 44.5 |
| 2020 | 50.0 (estimated) |

Written Contracts or Other Proof

Contracts for this program are listed below.

August 2004 Forbearance and Fallowing Program Agreement. This agreement establishes the PVID/Metropolitan Program, which provides for a solicitation of and provisional approval of landowner participation offers, specifies the process for incorporating offers into agreements with landowners, and states the terms and conditions for fallowing, including payments made by Metropolitan.

Landowner Agreements for Fallowing in PVID. These agreements specify an escrow process to consummate the transaction, an easement deed to encumber land for fallowing, a tenant agreement to subordinate a tenant's lease to the agreement and easement, and an encumbrance agreement to subordinate any encumbrance (e.g., a mortgage) to the easement. These agreements also state the landowner's fallowing obligation, payments to be made by Metropolitan, and land management measures to be implemented.

[11] SCH Number 2001101149.

### *Financing*

Metropolitan's annual O&M budget (referenced above) includes the cost of the PVID/Metropolitan Program.

### *Federal, State and Local Permits*

EIR for Program. A Notice of Preparation for the PVID/Metropolitan Program was published on October 29, 2001. PVID issued the Final EIR for the Proposed Palo Verde Irrigation District Land Management, Crop Rotation, and Water Supply Program in September 2002 (see reference above).

## ***D. Land Management of Metropolitan Owned Lands in Palo Verde Valley***

### *Source of Supply*

In 2017 and 2018, Metropolitan executed new farm leases on 20,478 irrigable acres that it owns in the Palo Verde valley. These leases provide economic incentives for farmers leasing the land to grow less water-intensive crops, generating additional water savings beyond what is achieved by the Land Management, Crop Rotation, and Water Supply Program. The leases also allow Metropolitan and its lessees to collaborate on other types of conservation, such as high-efficiency irrigation and precision irrigation practices. Under the terms of the QSA, water savings within the PVID service area are made available to Metropolitan.

### *Expected Supply Capability*

Metropolitan's lands in PVID generate water savings through the existing PVID Land Management, Crop Rotation and Water Supply Program. Changes in land management through cropping and irrigation practices generate an additional 14 - 25 TAF annually, compared to a baseline of 2015-16 water use. Because all Metropolitan-owned lands are enrolled in the fallowing program, the savings from agricultural practices depend on the fallowing call for each year, with a high call resulting in lower savings due to lower baseline usage.

### *Rationale for the Expected Supply*

Field water use in PVID is currently measured as applied water rather than consumptive use. The baseline applied water use on Metropolitan's lands was 10.6 AF per acre in 2015-16. In 2017, 2018, and 2019, the applied water use was 8.0 to 8.5 AF per acre, representing a 20% to 25% decrease below baseline. If the consumptive water use is assumed to be half of the applied water use, then the consumptive savings on Metropolitan lands are 1.1 – 1.3 AF per acre.

Metropolitan leases 20,478 irrigable acres in the valley, but depending on the fallowing call, only 13,152 to 19,001 acres are in production in any given year. A 1.1 – 1.3 AF per acre decrease results in 14 to 25 TAF of additional supply per year, depending on the call.

### *Financing*

Metropolitan's annual O&M budget includes the cost of the PVID land management program.

### *Federal, State and Local Permits*

This program is not subject to any permits or environmental impact reviews under federal, state, or local laws.

### *E. Metropolitan-CVWD Delivery and Exchange Agreement for 35,000 Acre-Feet*

#### *Source of Supply*

Metropolitan delivers to CVWD up to 35 TAF from Metropolitan's available State Water Project (SWP) Table A supply without condition on the actual Department of Water Resources (DWR) allocation for that year. As CVWD does not have a connection to the SWP, the water is delivered to CVWD by an exchange with Colorado River water. Metropolitan takes delivery of the Table A supply in conjunction with forgoing diversion of an equal volume of its Colorado River supply, effectively leaving this water in the River for diversion by CVWD at Imperial Dam. Exchange deliveries may also be made at the CRA Whitewater service connection or through the Metropolitan-CVWD-Desert Water Agency Advance Delivery Agreement. This program represents a net debit to Metropolitan's supplies.

A second source of supply governs an additional 15 TAF a year obligation from 2020-2026 under the 2019 Second Amendment to the Delivery and Exchange Agreement. However, the source of the increase is water CVWD can call from the IID/MWD Conservation Program, which is Colorado River water. Therefore, this portion of the exchange is described in greater detail in the IID/MWD Conservation Program section. This water is a one-for-one exchange and does not represent a net change to Metropolitan's supplies.

#### *Expected Capability*

Up to 35 TAF of Metropolitan's SWP Table A supply will be delivered annually to CVWD by exchange.

#### *Rationale for the Expected Supply*

This program is undertaken pursuant to the Delivery and Exchange Agreement between Metropolitan and Coachella for 35 TAF dated October 10, 2003 and is a QSA-related agreement.

Program Facilities

Metropolitan takes delivery of the Table A supply from the East Branch of the California Aqueduct at Devil Canyon Afterbay. At Metropolitan's request, the USBR releases a portion of Metropolitan's available Colorado River supply from Lake Mead for diversion by CVWD at Imperial Dam and conveyance through the All-American Canal System.

Historical Record

Since the 2003 execution of the QSA and the Delivery and Exchange Agreement, the following volumes of exchange water were delivered to CVWD at Imperial Dam:

| **Calendar Year** | **Volume of Exchange Water** (AF) |
|---|---|
| 2003 | 0 |
| 2004 | 0 |
| 2005 | 0 |
| 2006 | 34,958 |
| 2007 | 0 |
| 2008 | 0 |
| 2009 | 0 |
| 2010 | 10,000 |
| 2011 | 0 |

| Calendar Year | Volume of Exchange Water (AF) |
|---|---|
| 2012 | 0 |
| 2013 | 0 |
| 2014 | 0 |
| 2015 | 313 |
| 2016 | 0 |
| 2017 | 0 |
| 2018 | 0 |
| 2019 | 0 |
| 2020 | 0 |

Written Contracts or Other Proof

2003 Delivery and Exchange Agreement. This agreement between Metropolitan and CVWD provides for the delivery of up to 35 TAF of Metropolitan SWP Table A supply by exchange with Colorado River water.

2019 Second Amendment to Delivery and Exchange Agreement Between Metropolitan and Coachella. The second amendment was executed in December 2019 between Metropolitan and CVWD for the exchange of additional water during the period from 2020 through 2026. Metropolitan will exchange an average of 15 TAF per year with CVWD between 2020 and 2026. The source of this water is the portion of the IID/MWD Conservation Program that is subject to call by CVWD.

*Federal, State, and Local Permits/Approvals*

Program EIR for Quantification Settlement Agreement. Metropolitan's Board certified the final Program EIR for the QSA in June 2002.[12]

Addendums to the QSA Final Program EIR. Metropolitan's Board adopted the Addendum to the QSA Final Program EIR in December 2002 and a second addendum in September 2003. Metropolitan's Board also adopted the Findings of Fact and Statement of Overriding Considerations, and Mitigation and Monitoring and Reporting Program at that time.

September 2002 Final Program EIR for Coachella Valley Water Management Plan and State Water Project Entitlement Transfer. The final Program EIR for the Coachella Valley Water Management Plan and SWP Entitlement Transfer was certified by the CVWD on October 8, 2002.

### *F. SNWA and Metropolitan Storage and Interstate Release Agreement*

*Source of Supply*

The source of supply is SNWA's unused Nevada apportionment of Colorado River water made available to Metropolitan for diversion and storage. In later years, Metropolitan would return water through reduced diversions of Colorado River water made at the request of SNWA.

[12] Coachella Valley Water District, Imperial Irrigation District, Metropolitan, San Diego County Water Authority, Final Program EIR, Implementation of the Colorado River Quantification Settlement Agreement, June 2002, SCH Number 2000061034.

### *Expected Supply Capability*

As of January 1, 2020, over 422 TAF had been diverted by Metropolitan since 2004. Of the amount that has been stored, 330 TAF is available for return to SNWA.

Returns to SNWA are limited to no more than 30 TAF annually unless Metropolitan agrees to a larger amount. In 2020 and 2021, SNWA may request return of an amount equal to the shortage allocated by the Secretary of the Interior to Nevada, though they are not expected to do so. If the Secretary of the Interior apportions less than 280 TAF of basic apportionment for use in Nevada, SNWA may request the return of up to 50 TAF, 1 acre-foot for each acre-foot less than Nevada's 280 TAF basic apportionment.

If less than 75 TAF has been returned, then during each year prior to 2027 for which Lake Mead begins the year at or below elevation 1,045 feet, Metropolitan will create 50 TAF of Intentionally Created Surplus (ICS) in Lake Mead, until the combined sum of ICS and the amount of water returned to SNWA equals 75 TAF. Prior to 2027, Metropolitan would be able to request delivery of this ICS during a year in which Lake Mead begins the year at or above elevation 1,080 feet.

### *Rationale for the Expected Supply*

Program Facilities

Water is diverted through the CRA by Metropolitan. To return the water to SNWA, Metropolitan would reduce its CRA diversions, and the Secretary of the Interior would make water available to SNWA at Lake Mead.

Historical Record

The annual volumes of water diverted into the CRA, and the volume of water stored for SNWA by Metropolitan are as follows:

| Calendar Year | Volume of Water Diverted (AF) | Volume of Water Stored for SNWA (AF) |
|---|---|---|
| 2004 | 10,000 | 10,000 |
| 2005 | 10,000 | 10,000 |
| 2006 | 5,000 | 5,000 |
| 2007 | 0 | 0 |
| 2008 | 45,000 | 45,000 |
| 2009 | 0 | 0 |
| 2010 | 0 | 0 |
| 2011 | 0 | 0 |
| 2012 | 62,839 | 41,892 |
| 2013 | 75,000 | 50,000 |
| 2014 | 65,000 | 43,333 |
| 2015 | 150,000 | 125,000 |
| 2016 | 0 | 0 |
| 2017 | 0 | 0 |
| 2018 | 0 | 0 |
| 2019 | 0 | 0 |
| 2020 | 0 | 0 |

No water has been returned to SNWA.

Written Contracts or Other Proof

2004 Storage and Interstate Release Agreement. This agreement among Metropolitan, the Colorado River Commission of Nevada, SNWA, and the United States provides for the Secretary of the Interior to make available to Metropolitan for diversion and storage unused Nevada apportionment. In subsequent years, the agreement provides for Metropolitan to make water available to SNWA by forgoing diversion of a portion of its available Colorado River supply.

Operational Agreement. As amended on August 11, 2009, on October 24, 2012, and on October 19, 2015, the Operational Agreement specifies the conditions under which Metropolitan would divert and store unused Nevada apportionment through 2026 and the return of water to SNWA.

## *G. Lower Colorado Water Supply Project*

### *Source of Supply*

Groundwater is pumped by the Lower Colorado Water Supply Project wells near the All-American Canal and is discharged to the Canal. IID reduces its net diversions of Colorado River water by an amount equal to the amount of Project water discharged into the Canal, permitting entities along the Colorado River that do not have rights or have insufficient rights to divert Colorado River water to obtain a supply of water. In 2007, Metropolitan entered into a contract with the USBR and the City of Needles to utilize the unused Project capacity.

### *Expected Capability*

Metropolitan estimates that it received 8.8 TAF of Lower Colorado Water Supply Project water in 2020.

### *Rationale for the Expected Supply*

Program Facilities

Two Lower Colorado Water Supply Project wells pump water into the All-American Canal. The groundwater level in one of the wells declined to the point that it could not operate at capacity with existing equipment. Replacement equipment to restore pumping capacity was installed. Two new Project wells became operational in 2016 and brought the pumping capacity to the full 10,000 AFY project capacity.

Historical Record

Metropolitan has received the following amounts of Lower Colorado Water Supply Project water:

| **Calendar Year** | **Volume of Water** (AF) |
|---|---|
| 2007 | 5,011 |
| 2008 | 6,300 |
| 2009 | 2,349 |
| 2010 | 3,872 |
| 2011 | 3,611 |
| 2012 | 3,253 |
| 2013 | 4,208 |
| 2014 | 6,109 |
| 2015 | 6,722 |
| 2016 | 6,647 |
| 2017 | 6,851 |

| Calendar Year | Volume of Water (AF) |
|---|---|
| 2018 | 9,469 |
| 2019 | 9,554 |
| 2020 | 8,800 (estimated) |

Written Contracts or Other Proof

2007 Lower Colorado Water Supply Project Contract among the United States, the City of Needles, and Metropolitan. This contract, as amended in 2010 and 2020, provides for the United States to deliver Colorado River water to Metropolitan, the availability of which results from the pumping of Lower Colorado Water Supply Project groundwater and the exchange of such water.

*Financing*

Metropolitan's O&M budget includes the cost associated with receipt of Lower Colorado Water Supply Project water.

### *H. Lake Mead Storage Program, Drop 2 (Brock) Reservoir Funding, Yuma Desalting Plant Pilot Project, Binational Intentionally Created Surplus, and the Lower Basin Drought Contingency Plan*

*Source of Supply*

Water has been and will be stored in Lake Mead as Intentionally Created Surplus (ICS) through extraordinary conservation measures, such as water saved through the Palo Verde Irrigation District Land Management, Crop Rotation, and Water Supply Program.

Water has been and will be stored in Lake Mead as ICS through system efficiency measures, such as Metropolitan's funding contributions toward construction of the Drop 2 (Brock) Reservoir near the All-American Canal and pilot operation of the Yuma Desalting Plant.

Water will be stored in Lake Mead as Binational ICS through implementation of pilot conservation projects in Mexico.

Water has been stored in Metropolitan's service area for IID as excess conservation.

*Expected Capability*

Metropolitan may create as much as 400 TAF of Extraordinary Conservation ICS water in a single year less the amount that may be created by IID, which could be as much as 25 TAF. In any given year, if Arizona and Nevada create less than their respective maximums, according to provisions in the Lower Basin Drought Contingency Plan (DCP) Metropolitan may create above 400 TAF, provided that all entities in the Lower Basin create no more than 625 TAF combined.

As stipulated in the DCP, upon creation, 10 percent of the Extraordinary Conservation ICS is deducted, resulting in additional system water stored in Lake Mead and leaving 90 percent of the water available for release to Metropolitan, without additional annual evaporation losses.

Under the DCP, the amount of Extraordinary Conservation ICS accumulated in Lake Mead for Metropolitan is limited to 1.7 MAF less the amount accumulated by IID which could be as much as 50 TAF and less the amount of Binational ICS stored by both IID and Metropolitan. Per the DCP, Arizona is also allowed to request 50 TAF of California Extraordinary Conservation ICS accumulation space. It is expected that Arizona will do so by the end of 2021.

Metropolitan may take delivery of as much as 400 TAF of Extraordinary Conservation ICS from Lake Mead in a year less the amount delivered to IID, which could be as much as 50 TAF, as long as Lake Mead's elevation remains above 1,025 feet.

Under the DCP, Metropolitan must also store defined volumes of water in Lake Mead at specified lake levels. California would begin making contributions if Lake Mead's elevation is projected to be at or below 1,045 feet (relative to mean sea level) on January 1. Depending on the lake's elevation, California's contributions would range from 200 to 350 TAF a year ("DCP Contributions"). Pursuant to intrastate implementation agreements that terminate in 2026, Metropolitan is responsible for 93 percent of any California DCP Contribution that may be required under the Lower Basin DCP. CVWD is responsible for 7 percent of California's required DCP Contributions.

As of January 1, 2020, Metropolitan has 89 TAF of System Efficiency ICS stored in Lake Mead. There are no evaporation losses charged to stored System Efficiency ICS. Metropolitan may take delivery of as much as 24 TAF of this System Efficiency ICS resulting from pilot operation of the Yuma Desalting Plant and 25 TAF of this System Efficiency ICS resulting from construction of the Drop 2 (Brock) Reservoir annually. The USBR may reduce this delivery if it determines a reduction is necessary to avoid a shortage.

Binational ICS is provided for through domestic agreements related to Minutes to the 1944 Treaty between the United States and Mexico. Metropolitan received 23.75 TAF of Binational ICS in Lake Mead in 2017 under Minute 319. Under Minute 323 Metropolitan will receive 27,275 AF of Binational ICS in Lake Mead between 2020 and 2026.

Additionally, under the California ICS Agreement, rather than storing conserved water in Lake Mead, IID may, with the written consent of Metropolitan, have up to 25 TAF of this water delivered to Metropolitan for storage in any one calendar year. Upon request by IID, Metropolitan would return 90 percent of the stored water to IID with the remaining 10 percent left for Metropolitan's use. A 2015 Amendment allowed IID to increase the amount of water it could deliver to Metropolitan for storage from 2015 to 2017. Metropolitan would return 95 percent of the stored water to IID, with additional 3 percent reductions in return obligation each year starting in 2020. Also, Metropolitan may make temporary use of IID's Extraordinary Conservation ICS accumulated in Lake Mead. As of January 1, 2020, Metropolitan has stored approximately 168 AF of IID's conserved water.

### *Rationale for the Expected Supply*

Program Facilities

This program makes use of Lake Mead and the CRA.

Historical Record

From 2006 to 2010, Metropolitan created approximately 201.5 TAF of Extraordinary Conservation ICS.

In 2008, the USBR assigned to Metropolitan 100 TAF of water stored in Lake Mead as System Efficiency ICS due to Metropolitan's contributions to the Drop 2 Reservoir project, and Metropolitan diverted 34 TAF of that water.

In 2010 and 2011, the USBR assigned to Metropolitan 16.75 TAF and 7.647 TAF of water stored in Lake Mead as System Efficiency ICS, respectively, due to Metropolitan's contributions to the Yuma Desalting Plant pilot project.

From 2011 to 2012, Metropolitan created approximately 348.7 TAF of Extraordinary Conservation ICS.

From 2013 through 2015, Metropolitan took delivery of approximately 475.6 TAF of Extraordinary Conservation ICS.

From 2016 to 2019, Metropolitan created approximately 896.7 TAF of Extraordinary Conservation ICS.

In 2017, Metropolitan received 23.75 TAF of Binational ICS.

As of January 1, 2020, Metropolitan's Extraordinary Conservation ICS, System Efficiency ICS, and Binational ICS volumes in Lake Mead were approximately 866 TAF, 89.4 TAF, and 23.8 TAF respectively, and no DCP Contributions to Lake Mead have been required.

Written Contracts or Other Proof

2007 Lower Colorado River Basin Intentionally Created Surplus Forbearance Agreement among the Arizona Department of Water Resources, PVID, IID, the City of Needles, CVWD, Metropolitan, SNWA, and the Colorado River Commission of Nevada. This agreement sets forth the rules under which ICS water is developed, stored in, and delivered from Lake Mead. It also provides for IID storing conserved water with Metropolitan under certain conditions.

2007 California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus among Metropolitan, PVID, IID, CVWD, and the City of Needles. This agreement determines the conditions under which California contractors receiving Colorado River water may store and deliver water from Lake Mead.

2007 Agreement among the United States, the Colorado River Commission of Nevada, and the SNWA for the Funding and Construction of the Lower Colorado River Drop 2 Storage Reservoir Project. This agreement provides for: the United States to design and construct the Drop 2 Storage Reservoir Project; SNWA to fund the capital cost of the Project; the United States to credit SNWA's ICS account with 600 TAF of System Efficiency ICS; and allows Metropolitan to become a party to the agreement, requiring that Metropolitan provide funding for a portion of the capital cost.

2007 Delivery Agreement between the United States and Metropolitan. This agreement provides the procedures for creating ICS water and guarantees delivery of the water to Metropolitan.

2008 Metropolitan Notice of Election to Participate as a Party to the Drop 2 Funding Agreement. This notice requires Metropolitan to provide funding for a portion of the capital cost of the Drop 2 Storage Reservoir Project, and the United States to credit Metropolitan's ICS account with 100 TAF of System Efficiency ICS, reducing the amount of System Efficiency ICS in SNWA's account by an equal amount.

2009 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Project for Operation of the Yuma Desalting Plant. This agreement provides for the allocation of the costs for the preparation and pilot operation of the Yuma Desalting Plant.

2010 Yuma Desalting Plant Pilot Project Delivery Agreement between the United States and Metropolitan. This agreement secures delivery of the ICS water created and specifies the manner in which this water will be accounted.

2012 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Intentionally Created Mexican Allocation to Intentionally Created Surplus. This

agreement provides for the allocation of the costs among the agencies for the implementation of pilot conservation projects within Mexico and the allocation of 95 TAF of conserved water among the non-federal agencies as Binational ICS in Lake Mead.

2012 Interim Operating Agreement for Implementation of Minute No. 319 of the International Boundary and Water Commission. This agreement among the United States, the Upper Basin states, and Lower Basin states' agencies, including Metropolitan, sets forth the rules under which Intentionally Created Mexican Allocation is to be converted to Binational ICS for storage in and delivery from Lake Mead.

2012 Lower Colorado River Basin Forbearance Agreement for Binational Intentionally Created Surplus. This agreement among the state of Arizona, the Colorado River Commission of Nevada and SNWA, and California Colorado River water contractors, including Metropolitan, ensures that the Binational ICS made available to a contractor that invests in a project in Mexico cannot be claimed by another contractor in another state.

2012 Binational ICS Delivery Agreement. This agreement between Metropolitan and the United States secures delivery of the Binational ICS water made available by exchange and specifies the manner in which this water would be accounted.

2013 Agreement between Metropolitan and IID Regarding Binational Intentionally Created Surplus. This agreement allows IID to provide a payment to Metropolitan of up to 50 percent of the financial contribution to be made to the United States by Metropolitan for the implementation of pilot conservation projects within Mexico. As a result of IID's payment, Metropolitan received 23.75 TAF and IID received 23.75 TAF of Binational ICS in 2017.

2015 Amendment 2 to the California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus. This agreement between Metropolitan, PVID, IID, CVWD, and the City of Needles increased both IID's put capacity and cumulative capacity limits on storing conserved water with Metropolitan during the three-year period from 2015-2017.

2017 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, IID, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Mexico's Water Reserve to Binational ICS. This agreement provides for the allocation of the costs among the agencies for the implementation of pilot conservation projects in Mexico and the allocation of 109.1 AF of conserved water to the non-federal agencies as Binational ICS in Lake Mead.

2017 Interim Operating Agreement for Implementation of Minute No. 323. This agreement between the United States, the Upper Basin states, and Lower Basin states' agencies, including Metropolitan, sets forth the rules under which Intentionally Created Mexican allocation is to be converted to Binational ICS for storage in and delivery from Lake Mead.

2017 Binational ICS Agreement. This agreement between the state of Arizona, the Colorado River Commission of Nevada and SNWA, and California Colorado River water contractors, including Metropolitan, ensures that the Binational ICS made available to a contractor that invests in a project in Mexico cannot be claimed by another contractor in another state.

2017 Binational ICS Delivery Agreement. This agreement between Metropolitan and the United States secures delivery of the Binational ICS water made available by exchange and specifies the way this water would be accounted for.

2019 Lower Basin Drought Contingency Plan. This agreement creates additional guidelines under which ICS water is developed, stored in, and delivered from Lake Mead.

## *I. Metropolitan/Bard Seasonal Fallowing Program*

### *Source of Supply*

At its December 2019 meeting, Metropolitan's Board authorized a 7-year seasonal fallowing program with the Bard Water District (Bard). Under the program, participating farmers in Bard are being paid to reduce their water use by not irrigating a portion of their land. A maximum of 3,000 acres can be fallowed in any given year. Under the terms of the QSA, water savings within the Bard service area are made available to Metropolitan. Bard Unit, as part of the Yuma Project, has the first priority for Colorado River water under the water delivery contracts with the USBR. Implementation of the program began in March 2020.

### *Expected Supply Capability*

It is estimated that the Seasonal Fallowing Program would provide up to 6 TAF per year of additional Colorado River water. This water would be available in any year as needed and in accordance with the provisions described in the agreements with Bard Unit farmers and Bard.

### *Rationale for the Expected Supply*

Historical Record

Metropolitan and Bard tested the concept of developing a water supply for Metropolitan by entering into agreements for a two-year Metropolitan/Bard Water District Land Management and Seasonal Fallowing Pilot Program. Agreements were signed with farmers, with written consent from landowners if leasing land, in the Bard Unit to forego irrigation for two summers between March and July in 2016 and 2017. Water unused by Bard was about 2.3 TAF and was stored in Lake Mead for Metropolitan. Bard was issued a categorical exemption for the Proposed Metropolitan/Bard Seasonal Fallowing Pilot Program in January 2016.[13] Implementation of the program began in March 2016.

Written Contracts or Other Proof

December 2019 Agreement for the Implementation of a Seasonal Land Fallowing Program. This agreement establishes the Bard/Metropolitan Program, which provides for a solicitation of farmer interest in participation in the program, specifies the process for incorporating eligible lands into agreements with farmers, and states the terms and conditions for fallowing, including payments made by Metropolitan.

Agreement for Seasonal Fallowing in Bard Unit (Farmer Fallowing Agreements). These agreements specify the process for farmers in the Bard Unit to participate in the Program. These agreements establish the fallowing period, the eligibility criteria for the fallowed land, the farmers' fallowing obligations, payments to be made by Metropolitan, and the land management measures to be implemented.

May 2020 First Amendment Agreement for the Implementation of a Seasonal Land Fallowing Program. This amendment clarifies Metropolitan's method of calculating fallowed acreage for the Program. To ensure Metropolitan only provides funding to lands that could have been otherwise irrigated, the amendments defines which acres within the Bard Unit are "fallowable" and therefore eligible for participation in the Program. The parties did not make changes to the Metropolitan Board-approved terms of the original December 2019 agreement.

[13] SCH Number 2001101149.

### *Financing*

Metropolitan's annual O&M budget (referenced above) includes the cost of the Metropolitan/Bard Program. Metropolitan will provide an annual incentive per acre of irrigable land fallowed. The agreement provides for escalating the incentive every year using the Consumer Price Index. Metropolitan will pay for 75 percent of the incentive to the participating farmer and 25 percent to Bard.

## ***J. Exchange with SDCWA***

### *Source of Supply*

SDCWA has acquired conserved Colorado River water reaching an annual volume of 277.7 TAF by 2023. SDCWA makes this water available at Lake Havasu for Metropolitan diversion, where Metropolitan takes possession of the water and provides a matching volume from Metropolitan's blended supplies to SDCWA by exchange in equal monthly amounts. The conserved water is acquired by SDCWA through its transfer agreement with the Imperial Irrigation District (IID) and from the lining of the All-American and Coachella canals.

Under the transfer agreement with IID, the stabilized annual transfer volume of 200 TAF is generated from conservation of water through on-farm efficiency conservation arrangements made by IID with its customers and other system efficiency measures.

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006 and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal, was completed in 2009 conserving 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for Coachella Canal Lining Project mitigation, with the amount not needed for mitigation becoming available to SDCWA.

### *Expected Supply Capability*

In 2021, the IID transfer to SDCWA reaches 205 TAF, reduces to 202.5 TAF in 2022, then stabilizes at 200 TAF per year in 2023, which will be made available to Metropolitan for exchange each year through 2047. At least 77.7 TAF of canal lining water will be made available to Metropolitan for exchange each year through 2112. After 2022, the annual volume SDCWA will make available to Metropolitan is limited to 277.7 TAF.

### *Rationale for the Expected Supply*

<u>Historical Record</u>

The IID transfers to SDCWA began in 2003 for a volume of 10,000 AF and have ramped up each year thereafter according to a defined schedule, reaching 192.5 TAF in 2020.

Conserved water from the All-American Canal Lining Project first became available in 2008 when 7,385 AF was allocated to SDCWA, increased to 54,429 AF in 2009, reached 56,200 AF in 2010, and has continued at that volume through 2020.

Conserved water from the Coachella Canal Lining Project first became available in 2006 when 687 AF was allocated to SDCWA and ranged from 21,511 AF to 25,759 AF from 2007 through 2019.

SDCWA has made available to Metropolitan all of this conserved water at Lake Havasu, where Metropolitan took possession and managed the water at its complete discretion for the benefit

of all member agencies. Of the volume received at Lake Havasu Metropolitan delivered an equal volume to SDCWA by exchange from a blend of sources that were available to Metropolitan at a price that is less than its full service rate.

Written Contracts or Other Proof

Amended and Restated Agreement between The Metropolitan Water District of Southern California and the San Diego County Water Authority for the Exchange of Water. This October 10, 2003, agreement provides for Metropolitan delivery of Exchange Water to SDCWA in exchange for conserved Colorado River water SDCWA makes available to Metropolitan at Lake Havasu.

Agreement Between Imperial Irrigation District And San Diego County Water Authority For Transfer Of Conserved Water. This April 9, 1998, agreement, as amended, provides for IID to conserve water for transfer to SDCWA and establishes the price SDCWA pays to IID for the conserved water.

Allocation Agreement. This October 10, 2003, agreement among the United States, CVWD, IID, SDCWA, Metropolitan, and the San Luis Rey Settlement Parties provides for the allocation of water conserved from the All-American Canal Lining Project and the Coachella Canal Lining Project, and Metropolitan's assignment to SDCWA of it rights to both canal lining projects.

Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement. By this October 10, 2003, agreement, among the Secretary of the Interior. CVWD, IID, SDCWA, and Metropolitan, the Secretary agreed to deliver IID-SDCWA transfer water and canal lining water allocated to SDCWA to Metropolitan's Colorado River Aqueduct Intake at Lake Havasu for diversion by Metropolitan.

### *Financing*

Metropolitan's annual O&M budget (referenced above) incorporates the price that SDCWA pays for Metropolitan delivery of Exchange Water, which is less than Metropolitan full service rate.

## ***K. Exchange with the United States***

### *Source of Supply*

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006 and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal, was completed in 2009 conserving 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for Coachella Canal Lining Project mitigation, with the amount not needed for mitigation becoming available to SDCWA.

The United States furnishes the 16 TAF allocated to the San Luis Rey Settlement Parties at Metropolitan's Colorado River Intake on Lake Havasu. Metropolitan takes possession of the water and by exchange delivers an equal volume of Metropolitan's blended supplies to SDCWA. By separate agreement SDCWA conveys the water to the San Luis Rey Settlement Parties.

### *Expected Supply Capability*

So long as water conserved by the All-American Canal Lining Project and Coachella Canal Lining Project is allocated to and available for use by the San Luis Rey Settlement Parties, the United States will make 16 TAF available for diversion by Metropolitan in perpetuity.

### *Rationale for the Expected Supply*

Historical Record

The allocation of canal lining water to the San Luis Rey Settlement Parties was 172 AF in 2006, 4,500 AF in 2007, 6,013 AF in 2008, 15,648 AF in 2009, and 16,000 AF each year thereafter. The United States has made this water to available for diversion by Metropolitan. Through May 31, 2017, all water furnished by the United States at Lake Havasu was available for use by Metropolitan for the benefit of all member agencies. Beginning June 1, 2017, Metropolitan took possession of the water furnished by the United States and managed that water at its complete discretion for the benefit of all member agencies and delivered an equal volume to SDCWA by exchange from a blend of sources that were available to Metropolitan at a discounted price paid by the United States.

Written Contracts or Other Proof

Allocation Agreement. This October 10, 2003, agreement among the United States, CVWD, IID, SDCWA, Metropolitan, and the San Luis Rey Settlement Parties provides for the allocation of water conserved from the All-American Canal Lining Project and the Coachella Canal Lining Project, and Metropolitan's assignment to SDCWA of it rights to both canal lining projects.

Agreement Relating to Supplemental Water Among The Metropolitan Water District of Southern California, The San Luis Rey Settlement Parties, and The United States. This October 10, 2003, agreement provides that the United States will furnish to Metropolitan up to 16 TAF per year of water conserved by the canal lining projects for the benefit of the San Luis Rey Settlement Parties.

### *Financing*

Metropolitan's annual O&M budget (referenced above) incorporates the price that United States pays for Metropolitan delivery of Exchange Water, which is less than Metropolitan full service rate, and the delivery of an equal volume by exchange to SDCWA.

## *L. Programs Under Development*

Expansion of the Palo Verde Irrigation District (PVID) Land Management Program: Additional fallowing agreements may be developed in subsequent years as needed.

Quechan Seasonal Fallowing Program: The Quechan Indian tribe has expressed interest in participating in a fallowing program similar to the Bard Water District Seasonal Fallowing Program. Such a program is under consideration.

### A.3.2 California Aqueduct Deliveries

#### *A. State Water Project Deliveries*

*Source of Supply*

The State Water Project (SWP) provides imported water to the Metropolitan service area and has provided from 25 to 50 percent of Metropolitan's supplies. In accordance with its contract with the Department of Water Resources (DWR), Metropolitan has a Table A allocation of 1,911,500 AF per year under contract from the SWP. Actual deliveries have never reached this amount. The availability of SWP supplies for delivery through the California Aqueduct over the next 18 years is estimated according to the historical record of hydrologic conditions, existing system capabilities as may be influenced by environmental permits, requests of the SWC, and the SWP contract provisions for allocating Table A, Article 21 supplies, and other SWP deliveries including San Luis carryover to each contractor. As shown in this 2020 UWMP, the estimates of SWP deliveries to Metropolitan are based on DWR's 2019 SWP Delivery Capability Report.

As part of its contract with DWR, Metropolitan pays both the fixed costs of financing SWP facilities construction and the variable costs of operations, maintenance, power, and replacement costs for water delivered each year. SWP water is delivered to Metropolitan through the East Branch at Devil Canyon Power Plant afterbay, along the Santa Ana Valley Pipeline, and at Lake Perris. Metropolitan takes delivery from the West Branch at Castaic Lake.

*Expected Supply Capability*

The Edmund G. Brown California Aqueduct transports Metropolitan's supplies from the SWP. The quantity of water available for export through the California Aqueduct can vary significantly year to year. The amount of precipitation and runoff in the Sacramento and San Joaquin watersheds, system reservoir storage, regulatory requirements, and contractor demands for SWP supplies impact the quantity of water available to Metropolitan.

*Rationale for the Expected Supply*

Metropolitan and 28 other public entities have contracts with the State of California for SWP water. These contracts require the state, through DWR, to use reasonable efforts to develop and maintain the SWP supply. SWP contractors have the right to participate in the system, with an entitlement to water service from the SWP and the right to use the portion of the SWP conveyance system necessary to deliver water to them. The state has made significant investment in infrastructure. It has constructed 28 dams and reservoirs, 26 pumping and generation plants, and about 660 miles of aqueducts. More than 25 million California residents benefit from SWP water. DWR estimates that with current facilities and regulatory requirements, the project will deliver approximately 2.4 MAF under average hydrology considering regulatory requirements from the SWRCB Water Quality Control Plan, the USFWS and NMFS biological opinions and the CDFW Incidental Take Permit. In addition, these estimates incorporate 2018 amendments to the Coordinated Operations Agreement between the SWP and CVP.

On a yearly basis, DWR estimates the amount of supplies that are available for that year. Metropolitan uses a forecasting method for SWP deliveries based on historical patterns of precipitation, runoff, and actual deliveries of water.

Further, under the water supply contract, DWR is required to use reasonable efforts to maintain and increase the reliability of service to Metropolitan. As discussed in a subsequent section, DWR is participating in the Bay-Delta process to achieve these requirements.

Historical Record

The historical record shows significant accomplishments by DWR in providing its contractors with SWP water supplies. Through 2018, the SWP has delivered over 103 MAF to its contractors. The maximum annual water supply was delivered in 2017, and totaled 3.77 MAF, exceeding the previous record delivery of 3.75 MAF in 2005. In 2006 and 2011 the project delivered 3.7 MAF. DWR has continued to invest in SWP facilities to deliver water to its contractors.

Written Contracts or Other Proof

1960 Contract between the State of California and The Metropolitan Water District of Southern California for a Water Supply. This contract, initially executed in 1960 and amended numerous times since, is the basis for SWP deliveries to Metropolitan. It requires DWR to make reasonable efforts to secure water supplies for Metropolitan and its other contractors. The contract expires in 2035. In December 2018, Metropolitan signed a Contract Extension Amendment that would extend the contract term to 2085. The amendment is not effective until approval of the December 2018 validation action filed by DWR in Sacramento County Superior Court, which is still pending.

### *Financing*

Metropolitan's payments for its State Water contract obligation are approved each year by its Board of Directors and currently constitute approximately a third of the annual budget.

### *Federal, State and Local Permit/Approvals*

Operation of the SWP. The DWR is responsible for acquiring, maintaining, and complying with numerous federal and state permits for operation of the SWP. Metropolitan has been active in monitoring the issues affecting its contract with DWR.

EIR for the East Branch Enlargement. In April 1984, DWR prepared and finalized an EIR for the Enlargement of the East Branch of the Governor Edmund G. Brown California Aqueduct.

EIR for the Harvey O. Banks Pumping Plant. In January 1986, DWR prepared and finalized an EIR for the additional pumping units at Harvey O. Banks Delta Pumping Plant.

EIR for the Mission Hills Extension. In 1990, DWR prepared and finalized an EIR for the SWP Coastal Branch, Phase II and Mission Hills Extension.

East Branch Extension Project Phase 1. In 1998, DWR completed an EIR to extend the East Branch of the California Aqueduct to provide service to San Gorgonio Pass Water Agency. Phase 1 was completed in 2002.

State Water Resources Control Board Water Quality Control Plan for the San Francisco/ Sacramento-San Joaquin Delta Estuary (Bay-Delta WQCP), Sacramento-San Joaquin Bay-Delta Estuary Revised Water Right Decision 1641 (D-1641), March 2000.

National Marine Fisheries Service Biological Opinion on Long Term Operation of the Central Valley Project and the State Water Project, October 2019.

U.S. Fish and Wildlife Service Biological Opinion for the Reinitiation of Consultation on the Coordinated Operations of the Central Valley Project and State Water Project, October 2019.

California Department of Fish and Wildlife Incidental Take Permit for Long-Term Operation of the State Water Project in the Sacramento-San Joaquin Delta, March 2020.

### B. Port Hueneme Lease of Ventura Table A

#### *Source of Supply*

Metropolitan has a right to delivery of up to 1,850 AF of Table A from the Ventura County Watershed Protection District (Ventura), one of 29 SWP contractors, via a sublease agreement with the Port Hueneme Water Agency (Port Hueneme). United Water Conservation District, one of three agencies holding a contract right to Ventura Table A supply, leases this portion of their total 5,000 AF of Table A to Port Hueneme, who in turn subleases the Table A to Metropolitan. The long-term lease is a condition of the 1996 annexation of the Port Hueneme service area to Calleguas Municipal Water District and Metropolitan.

#### *Expected Supply Capability*

The amount of supply available to Metropolitan under the long-term lease is up to 1,850 AF of Ventura Table A. This water supply is in addition to Metropolitan's Table A, and the amount available each year is determined by the SWP allocation, with 1,850 AF available at a 100 percent allocation.

#### *Rationale for the Expected Supply*

The DWR estimates the amount of supplies that are available each year. Metropolitan uses a forecasting method for SWP deliveries based on historical patterns of precipitation, runoff and actual deliveries of water.

Historical Record

Metropolitan has taken delivery of Port Hueneme Lease water since 1997. These supplies are delivered to Metropolitan from the West Branch of the California Aqueduct and have ranged from 93 AF under a 5 percent allocation to 1,850 AF under a 100 percent allocation.

Written Contracts or Other Proof

Port Hueneme Water Agency Annexation. By Minute Item 41728, dated January 9, 1996, Metropolitan's Board adopted Resolution 8487 granting the concurrent annexation of Annexation No. 32 to Calleguas Municipal Water District and The Metropolitan Water District of Southern California, and fixing Metropolitan's terms and conditions for the annexation.

1996 Sublease Agreement. The Port Hueneme and Metropolitan executed a sublease agreement to facilitate annual delivery to Metropolitan of up to 1,850 AF of Ventura Table A that is leased to Port Hueneme by United Water Conservation District.

#### *Financing*

Financial obligations to DWR related to the 1,850 AF Port Hueneme Lease supply, including variable transportation charges for delivery, remain the responsibility of the Ventura County Watershed Protection District.

#### *Federal, State, and Local Permits/Approvals*

DWR is responsible for acquiring, maintaining, and complying with numerous Federal and State permits for operation of the SWP.

### *C. Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs*

#### *Source of Supply*

The Desert Water Agency (DWA) and CVWD, both in Riverside County, have rights to SWP deliveries, but do not have any physical connections to the SWP facilities. Both agencies are adjacent to the CRA. For DWA and CVWD to obtain water equal to their SWP allocations, Metropolitan has agreed to exchange an equal quantity of its Colorado River water for DWA and CVWD's SWP water. DWA has a SWP Table A contract right of 55.75 TAF per year, and CVWD has a SWP Table A contract right of 138.35 TAF per year, for a total of 194.1 TAF per year. Additionally, CVWD has a long-term water supply agreement for 9.5 to 16.5 TAF annually from Rosedale Rio-Bravo Water Storage District.

#### *Expected Supply Capability*

Under the existing agreements, Metropolitan provides water from its CRA to DWA and CVWD in exchange for SWP deliveries. Metropolitan can deliver additional water to its DWA/CVWD service connections, permitting these agencies to store water. When supplies are needed, Metropolitan can then receive its full Colorado River supply, as well as the SWP allocation from the two agencies, while the two agencies can rely on the stored water for meeting their water supply needs. The amount of DWA and CVWD SWP Table A water available to Metropolitan depends on total SWP deliveries and varies from year to year.

In addition to their Table A and long-term water supplies, DWA and CVWD, subject to available capacity, may take delivery of SWP supplies available under Article 21, the Turn-back Pool Program, and non-SWP water supplies they may acquire and convey through the SWP facilities. These other supplies are delivered to DWA and CVWD by exchange with Metropolitan in the same manner as Table A deliveries. DWA and CVWD are participants in the Yuba Dry Year Water Purchase Program. Additionally, DWA participated in the 2009 Drought Water Bank and the 2015-2016 Multi-Year Water Pool Demonstration Program.

#### *Rationale for the Expected Supply*

The DWR estimates the amount of supplies that are available each year. Metropolitan uses a forecasting method for SWP deliveries based on historical patterns of precipitation, runoff and actual deliveries of water.

Historical Record

DWA and CVWD Exchange Program is currently in operation. The Advance Delivery Agreement has been in place since 1984. Since 1973, Metropolitan has been taking delivery of these agencies' SWP Table A water and has provided equivalent water to those agencies from Metropolitan's Colorado River supplies. Metropolitan has also been delivering water in advance of the amount needed under the exchange agreements. With water having been delivered in advance, Metropolitan can reduce deliveries to DWA and CVWD as needed. The Advance Delivery Account is a key tool for managing abundant SWP supplies. In 2017, Metropolitan managed an 85 percent SWP allocation in part by making 245 TAF of advance deliveries, bringing the account balance up to 325 TAF by the end of the year.

Written Contracts or Other Proof

1967 and 1983 Water Exchange Contract and Agreements. The DWA and CVWD Program is currently in operation. The DWA and CVWD water exchange contract has been in place since 1967, was amended in 1972, and was modified with execution of additional agreements in 1983.

1984 Advance Delivery Agreement. The Advance Delivery Agreement allows Metropolitan to supply DWA and CVWD with Colorado River water in advance of the time these agencies are entitled to receive water under the exchange agreements. In future years, Metropolitan can recover this water by reducing its deliveries under the exchange agreements.

The 2003 Exchange Agreement. DWA, CVWD, and Metropolitan executed the 2003 Exchange Agreement under which Metropolitan transferred 88.1 TAF and 11.9 TAF of its SWP Table A water to DWA and CVWD, respectively, reducing Metropolitan's Table A volume from 2,011.5 TAF to 1,911.5 TAF. The 2003 Exchange Agreement became operational in calendar year 2005 with the execution of letter agreements among DWA, CVWD, and Metropolitan governing its implementation. The exhibits to the November 9, 2004, and November 19, 2007, letter agreements also modify certain provisions of the Water Exchange Contract and Agreements and the Advance Delivery Agreement.

November 2012 Letter Agreement. CVWD and Metropolitan executed the letter agreement to deliver non-SWP water in exchange for Colorado River water under which CVWD arranged for the delivery of up to 16.5 TAF per year of water to Metropolitan provided by Rosedale-Rio Bravo Water Storage District to CVWD. Metropolitan delivers to CVWD an equal amount of Colorado River water.

2019 Amended and Restated Agreement for Exchange and Advance Delivery. In December 2019, CVWD, DWA, and Metropolitan executed an amendment to the exchange and delivery agreements in order to provide greater certainty for water supply and financial planning, simplify implementation of the exchange, provide Metropolitan with additional revenue, and improve dry-year water supply reliability.

#### *Financing*

The funds for deliveries under this Program are included in Metropolitan's O&M budget and Long-Range Finance Plan (referenced above).

#### *Federal, State, and Local Permits/Approvals*

DWR is responsible for acquiring, maintaining, and complying with numerous Federal and State permits for operation of the SWP.

July 26, 1983, CVWD Negative Declaration, Whitewater River Spreading Area expansion Phase 1.

February 1983, DWA Final EIR for the proposed extension of time for utilizing Colorado River water to recharge the upper Coachella Valley groundwater basins to the year 2035, Volume I and II, April 1983, Volume III.

September 2002, Final Program EIR for Coachella Valley Water Management Plan and SWP Entitlement Transfer was certified by CVWD on October 8, 2002.

In 2020, an application was filed with the Bureau of Land Management to renew and amend the existing Right-of-way grant for groundwater replenishment purposes on the Whitewater River Groundwater Replenishment Facility.

### *D. Semitropic Water Banking and Exchange Program*

#### *Source of Supply*

The agreement between Semitropic Water Storage District (Semitropic) and Metropolitan was executed in February 1994. Semitropic obtains water from the SWP through its contracts with the Kern County Water Agency. SWP supplies irrigate an area of 161,200 acres within Semitropic's service area. When this surface water is not available, these growers withdraw water from the

underlying aquifer. The agreement between Semitropic and Metropolitan allows Metropolitan to make use of 350 TAF of storage in Semitropic's groundwater basin. In years of plentiful supply, Metropolitan can deliver available SWP supplies to Semitropic through the California Aqueduct. During dry years, Metropolitan can withdraw this stored water. Five other banking partners participate in this Program and use 650 TAF of storage in Semitropic's groundwater basin.

### *Expected Supply Capability*

The Semitropic-Metropolitan Program provides Metropolitan with the capacity to store up to 350 TAF of water under the current agreement. During dry years, Metropolitan can recover its stored water through a combination of direct pumping of the groundwater and delivery of Semitropic's SWP Table A water in the California Aqueduct. In 2014, Metropolitan amended the program to increase the return yield by an additional 13.2 TAF per year that has since been reduced to 6.7 TAF. The minimum annual yield available to Metropolitan from the program is currently 38.2 TAF, and the maximum annual yield is 229.77 TAF depending on the available unused capacity and the SWP allocation. The average annual supply capability for a single dry year similar to 1977 is 45 TAF. For a five-year consecutive drought condition similar to the period of 1988-1992, the expected supply capability is 50 TAF.

### *Rationale for the Expected Supply*

Historical Record

The Semitropic-Metropolitan Water Banking and Exchange Program has been operational since 1994. With existing agreements, it will continue to operate over the term of 41 years (1994 to 2035). By the end of 2020, the program had 261 TAF in its storage account.

Written Contracts or Other Proof

1992 Turn-in/out Construction, Operation and Maintenance Agreement. This Agreement was executed in 1992 by DWR and Semitropic to allow construction, operation, and maintenance of the Semitropic California Aqueduct Turn in/out.

1993 Temporary Semitropic-Metropolitan Water Banking Agreement. This Agreement was executed in February 1993 by Semitropic and Metropolitan to allow the storage of available Metropolitan supplies in advance of execution of the long-term agreement.

1994 Semitropic/Metropolitan Water Banking and Exchange Agreement. This Agreement was executed in December 1994 by Semitropic and Metropolitan to implement the program for a 41-year term (1994-2035).

1995 Point of Delivery Agreement. This agreement, with DWR, Kern County Water Agency, and Metropolitan, allows Metropolitan to divert water from the California Aqueduct into Semitropic's service area.

1995 Introduction of Local Water into the California Aqueduct. This agreement, with DWR, Kern County Water Agency, and Semitropic, allows Metropolitan to receive water from the program into the California Aqueduct.

2014 Amendment to Increase Program Yield. The amendment increased Metropolitan's minimum return yield by 13,200 acre-feet per year.

### *Financing*

Metropolitan's O&M budget (referenced above) includes payments for the Semitropic Program.

### *Federal, State, and Local Permits/Approvals*

Final EIR. Semitropic acting as the lead agency under CEQA and Metropolitan acting as a responsible agency jointly completed the EIR for the Program. The EIR was certified by Semitropic in July 1994 and adopted by Metropolitan in August 1994.

Regulatory Approvals. All regulatory approvals are in place, and the program is operational.

## *E. Arvin-Edison Water Management Program*

### *Source of Supply*

The Arvin-Edison Water Storage District (Arvin-Edison) manages the delivery of local groundwater and water imported into its service area from the Central Valley Project's (CVP) Millerton Reservoir via the Friant-Kern Canal. The surface water service area consists of 132,000 acres of predominantly agricultural land, and to a minor degree, municipal and industrial uses. It is situated in Kern County. Arvin-Edison operates its supplies conjunctively, storing water in the underlying aquifer when imported supplies are available and withdrawing that water when the availability of imported supplies is reduced. In 1997, Metropolitan entered into an agreement with the Arvin-Edison Water Storage District. The agreement allows Metropolitan to store available water in Arvin-Edison's groundwater basin, either through direct spreading operations, or through deliveries to growers in Arvin-Edison's service area. Similar to Arvin-Edison's own usage, this previously stored water could be withdrawn when the availability of imported supplies to Metropolitan is reduced.

### *Expected Supply Capability*

The Arvin-Edison/Metropolitan Program provides Metropolitan with the capacity to store up to 350 TAF of water under the current agreement. During dry years, Metropolitan can recover its stored water either through direct pumping of the groundwater or through exchange. Based on the terms and conditions of the program agreement, the return of water to Metropolitan ranges from a minimum of 40 TAF per year (peak 4-month summer period) up to 110 TAF (over a 12-month period). Metropolitan staff are currently working to overcome a new challenge of detections of 1,2,3-trichloropropane (TCP) above the Maximum Contaminant Level (MCL) of five parts per trillion (ppt) in wells that are part of the Arvin-Edison/Metropolitan Program. These levels of TCP impact Metropolitan's ability to put water and take return water under that program. As a result, Metropolitan has temporarily suspended operation of the program until the water quality concerns can be further evaluated and managed.

### *Rationale for the Expected Supply*

Historical Record

The Arvin-Edison/Metropolitan Water Management Program has been operational since 1997. With existing agreements, it will continue to operate over the term of 38 years (1997 to 2035). By the end of 2020, the program had 142 TAF in its storage account.

Written Contracts or Other Proof

1997 Arvin-Edison/Metropolitan Water Management Agreement. This Agreement was executed in December 1997 by Arvin-Edison and Metropolitan to implement the program for a 30-year term (1997-2027).

1998 Turn-in/out Construction and Maintenance Agreement. This Agreement was executed in 1998 by DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan to allow construction, operation and maintenance of the Arvin-Edison California Aqueduct Turn in/out.

1998-2002 Water Delivery and Return Agreements. These agreements, with DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan, allow Metropolitan to divert water from, and introduce water to, the California Aqueduct.

2004 Point of Delivery Agreement. This agreement, with DWR, Kern County Water Agency, and Metropolitan, allows Metropolitan to divert water from the California Aqueduct into Arvin-Edison's service area.

2004 Introduction of Water into the California Aqueduct. This agreement, with DWR, Kern County Water Agency, and Arvin-Edison, allows Metropolitan to receive water from the program into the California Aqueduct.

2007 First Amended and Restated Agreement Between Arvin-Edison Water Storage District and The Metropolitan Water District of Southern California for a Water Management Program. This amendment increased the maximum storage level to 350 TAF, extended the agreement term to 2035, and provided for the construction of the South Canal Improvement Project. The project increases the reliability of Arvin-Edison returning higher water quality to the California Aqueduct.

#### *Financing*

Metropolitan's O&M budget (referenced above) includes payments for the Arvin-Edison Program.

#### *Federal, State, and Local Permits/Approvals*

Environmental Status: A Negative Declaration was completed in 1996.

An Addendum to the 1996 Negative Declaration was completed in 2003.

A Negative Declaration for the Arvin-Edison South Canal Improvement Project was completed in 2007.

Regulatory Approvals: All regulatory approvals are in place, and the program is operational.

### *F. San Bernardino Valley Municipal Water District Program*

#### *Source of Supply*

The San Bernardino Valley Municipal Water District Program allows Metropolitan to purchase a dependable annual supply, as well as an additional supply for dry year needs. Under this program, Metropolitan purchases water provided to San Bernardino Valley Municipal Water District (Valley District) from its annual SWP water allocation. Valley District delivers the purchased supplies to Metropolitan's service area through the coordinated use of facilities and interconnections within the water conveyance system of the two districts.

The purchased SWP supply is provided to Metropolitan as direct deliveries of annual SWP water through the California Aqueduct to Metropolitan's service area, as well as deliveries of SWP water to the San Bernardino groundwater basin that will subsequently be delivered to Metropolitan's service area. Under this program, Metropolitan purchases surplus Valley District supplies on a fixed price schedule based on the final SWP allocation each calendar year.

To facilitate the transfer, the program also provides the coordinated use of existing facilities, including the Valley District's Foothill Pipeline and the Inland Feeder, to improve the conveyance capabilities of the delivery of SWP water to the service areas of both districts. The intertie

between the Foothill Pipeline and the Inland Feeder has been constructed and was operational as of December 2002. This intertie allows Metropolitan to move SWP water from the East Branch of the California Aqueduct through the Foothill Pipeline and Inland Feeder, into DVL and the CRA. As a result of this intertie, Metropolitan has an alternative conveyance capacity of 260 cfs into Metropolitan's system should an outage occur on the upper section of the Inland Feeder.

### *Expected Supply Capability*

The program changed from the minimum purchase program to a surplus program. Valley District will provide Metropolitan surplus SWP supplies likely in higher than normal SWP allocations. The historical average for the program is expected to be around 13 TAF per year.

### *Rationale for the Expected Supply*

Historical Record

The San Bernardino Valley Municipal Water District Program began operations in 2001 and ended in 2016. Since its inception in 2001, this program has delivered 200 TAF to Metropolitan. Metropolitan and Valley District approved a new Coordinated Operating Agreement in 2021 that will provide Metropolitan surplus Valley District supplies and emergency mutual aid.

Written Contracts or Other Proof

Metropolitan's annual and dry-year supplies from the San Bernardino Valley Municipal Water District Program are based on Metropolitan Board actions and agreements.

2000 Board Approval of Coordinated Operating Agreement. In June 2000, Metropolitan's Board authorized entering into a Coordinated Operating Agreement between Metropolitan and Valley District to develop projects that could provide benefits to both districts through the coordinated use of facilities and SWP supplies.

2000 Coordinated Operating Agreement. The Coordinated Operating Agreement between Metropolitan and Valley District was executed in July 2000.

2001 Board Approval of the Coordinated Use Agreement. In April 2001, Metropolitan's Board authorized entering into the Coordinated Use Agreement for Conveyance Facilities and SWP Water Supplies between Metropolitan and Valley District for the purchase of dependable annual and dry year supplies by Metropolitan.

2001 Coordinated Use Agreement. The Coordinated Use Agreement for Conveyance Facilities and SWP Water Supplies between Metropolitan and Valley District for the purchase of dependable annual and dry year supplies by Metropolitan was executed May 2001. The Agreement is effective as of July 1, 2001, for an "evergreen" term (10-years with automatic annual extensions unless otherwise notified).

2021 Coordinated Operating Agreement. The Coordinated Operating Agreement between Metropolitan and Valley District was approved by Metropolitan's Board in March 2021. The agreement will terminate on December 31, 2035 unless there is an extension of the SWP Contract.

### *Financing*

Metropolitan's O&M budget (referenced above) includes the funds to purchase Program water.

### *Federal, State, and Local Permits/Approvals*

The Program became effective July 1, 2001. An environmental review process and regulatory approval supported implementation.

Final EIR. Final Regional Water Facilities Master Plan EIR dated February 1, 2001, was certified by Valley District, as lead agency, and by Metropolitan, as responsible agency. Notices of determinations were filed by Valley District and Metropolitan on May 29, 2001, and April 18, 2001, respectively.

State Water Contractors' Review. In May 2001, the SWC reviewed and issued a letter supporting the program.

DWR Review. DWR agreed to the program in December 2001.

### *G. San Gabriel Valley Municipal Water District Program*

#### *Source of Supply*

The San Gabriel Valley Municipal Water District Program allows Metropolitan to exchange supplies to provide additional water for normal and dry year needs. Under this program, Metropolitan delivers supplies to the City of Sierra Madre, a San Gabriel Valley MWD member agency. In exchange for Metropolitan delivering one acre-foot, San Gabriel Valley MWD returns two acre-feet to Metropolitan in the Main San Gabriel Basin, up to 5 TAF. For any exchange amount less than 5 TAF, Metropolitan purchases the balance of the 5 TAF. The program provides increased reliability to Metropolitan by allowing additional water to be delivered to Metropolitan's member agencies Three Valleys MWD and Upper San Gabriel Valley MWD that rely upon the Main San Gabriel Basin for their supplies.

#### *Expected Supply Capability*

The average annual supply capability for a single dry year similar to 1977 is a net 2 TAF. For a five-year consecutive drought condition similar to the period of 1988-1992, the expected supply capability is 2 TAF.

#### *Rationale for the Expected Supply*

Historical Record

The San Gabriel Valley Municipal Water District Program began operations in 2013 and is expected to be renewed continually in the future. Since its inception in 2013, the program has completed the exchange and purchase of 30.66 TAF, with a net increase to Metropolitan's supply by an additional 19.5 TAF.

Written Contracts or Other Proof

Metropolitan's dependable annual and dry-year supplies from the San Gabriel Valley Municipal Water District Program are based on Metropolitan Board action and agreement.

2013 San Gabriel Valley MWD Exchange and Purchase Agreement. The agreement between Metropolitan and San Gabriel Valley MWD was executed in September 2013.

2013 Board Approval of the San Gabriel Valley MWD Exchange and Purchase Agreement. In August 2013, Metropolitan's Board authorized entering into the agreement with San Gabriel Valley MWD.

#### *Financing*

Metropolitan's O&M budget (referenced above) includes the funds to purchase water.

#### *Federal, State, and Local Permits/Approvals*

The Program became effective as of September 2013. An environmental review process supported implementation.

CEQA Compliance. The proposed action involved an exchange and purchase agreement associated with the leasing, licensing, and operating of existing public water conveyance facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment.

### *H. Antelope Valley East Kern Water Agency Exchange and Storage Program*

#### *Source of Supply*

The Antelope Valley East Kern Water Agency (AVEK) Program allows Metropolitan to both exchange and store SWP supplies to provide additional water for normal and dry year needs. Under this program, AVEK provides Metropolitan its unused SWP supplies. For every two acre-feet provided by AVEK, Metropolitan will return one acre-foot. The exchange program when implemented is expected to deliver 30 TAF over ten years, with 10 TAF available in dry years. At this time, the Department of Water Resources has not approved the exchange program element. Metropolitan has storage capability in the groundwater basin, with a capacity of 30 TAF, and a dry year return capability of 10 TAF.

#### *Expected Supply Capability*

The average annual supply capability for a single dry year similar to 1977 is 3 TAF for each program. For a five-year consecutive drought condition similar to the period of 1988-1992, the expected supply capability is 4 TAF for each program.

#### *Rationale for the Expected Supply*

Historical Record

The AVEK Program started providing benefits in 2017. By the end of 2020, the program had 27 TAF in its storage account.

Written Contracts or Other Proof

Metropolitan's dependable annual and dry-year supplies from the AVEK Exchange and Storage Program are based on Metropolitan Board action and proposed agreement.

2015 Board Approval of the AVEK Exchange and Storage Agreement. In November 2015, Metropolitan's Board authorized entering into the agreement with AVEK.

#### *Financing*

Metropolitan's Board authorized up $16.6 million for the program with additional funds, if needed, from Metropolitan's O&M budget (referenced above).

#### *Federal, State, and Local Permits/Approvals*

The storage element of the Program became effective after the agreement was executed in 2016. The Department of Water Resources has not approved the exchange program element at this time.

CEQA Compliance. The proposed action involved an exchange and purchase agreement associated with the leasing, licensing, and operating of existing public water conveyance facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment.

### *I. High Desert Water Bank*

#### *Source of Supply*

The High Desert Water Bank with Antelope Valley East Kern Water Agency (AVEK) allows Metropolitan to store supplies to provide additional water for normal and dry year needs. Metropolitan has a storage capability in the groundwater basin, with a capacity of 280 TAF, and a dry year return capability of 70 TAF. The program is planned to be fully operational in 2024.

#### *Expected Supply Capability*

The High Desert Water Bank is currently under design and construction. When the High Desert Water Bank is completed, the program would provide 70 TAF of additional water supply capability in a dry year.

#### *Rationale for the Expected Supply*

Historical Record

The High Desert Water Bank is expected to be fully operational in 2024. The program may be providing recharge capability earlier. By the end of 2020, the program has yet to store water in its storage account.

Written Contracts or Other Proof

2019 Board Approval of the High Desert Water Bank Agreement. In April 2019, Metropolitan's Board authorized entering into the agreement with AVEK.

#### *Financing*

Metropolitan's Board authorized up $131 million for construction of the program with additional funds for program operation.

#### *Federal, State, and Local Permits/Approvals*

CEQA Compliance. The Metropolitan Board reviewed and considered AVEK's adopted Mitigated Negative Declaration and took related CEQA action.

### *J. Bay-Delta Improvements*

#### *Source of Supply*

Improving the water supply reliability of the State Water Project (SWP) is a primary focus of Metropolitan's long-term planning efforts. Metropolitan's strategy is to reduce its dependence on SWP supplies during dry years, when risks to the Bay-Delta ecosystem are greatest, and to maximize its deliveries of available SWP water during wetter years to store in surface reservoirs and groundwater basins for later use during droughts and emergencies.

State resource agencies and various water user entities are currently engaged in the development of the Delta Conveyance Project (DCP), which would include new diversion and conveyance facilities in the Delta necessary to restore and protect the reliability of SWP water deliveries and, potentially, Central Valley Project (CVP) water deliveries south of the Delta, consistent with the State's Water Resilience Portfolio. The DCP objectives are to address sea level rise, climate change and extreme weather events; minimize the potential for public health and safety impacts from reduced quantity and quality of SWP water deliveries, and potentially CVP water deliveries, south of the Delta resulting from a major earthquake that causes breaching of Delta levees; protect the ability of the SWP, and potentially the CVP, to deliver water when hydrologic conditions result in the availability of sufficient amounts, consistent with the

requirements of state and federal law and contractual commitments; and to provide operational flexibility to improve aquatic conditions in the Delta and better manage risks of further regulatory constraints on project operations.

The SWP conveys water from the western slope of the Sierra Nevada to water users both north and south of the Bay-Delta. Specifically, SWP water is delivered to Metropolitan's service area through a system of reservoirs, the Bay-Delta, pumping plants, and the California Aqueduct. Owned and operated by the California Department of Water Resources (DWR), the SWP provides municipal and agricultural water to 29 State Water Contractors. Annual deliveries for the SWP average about 1.96 MAF. Municipal uses account for about 60 percent of annual deliveries, with the remaining 40 percent going to agriculture.

SWP supplies are estimated using the 2019 SWP Delivery Capability Report distributed by DWR in August 2020. The 2019 Delivery Capability Report presents the current DWR estimate of the amount of water deliveries for current (2019) conditions and conditions 20 years in the future. These estimates incorporate regulatory requirements in accordance with the SWRCB Water Quality Control Plan, the USFWS and NMFS biological opinions and the CDFW Incidental Take Permit. In addition, these estimates incorporate 2018 amendments to the Coordinated Operations Agreement between the SWP and CVP. Future capability estimates also reflect the potential impacts of climate change and sea level rise. Under the 2019 Delivery Capability Report, the delivery estimates for the SWP for 2019 conditions as percentage of Table A amounts are seven percent, equivalent to 134 TAF for Metropolitan, under a single dry-year (1977) condition and 58 percent, equivalent to 1.1 MAF for Metropolitan, under long-term average conditions.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. The goal of these storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Banks pumping capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

### *Delta Conveyance Project*

In 2000, several State and federal agencies released the CALFED Bay Delta Programmatic Record of Decision ("ROD") and Environmental Impact Report/Environmental Impact Statement ("EIR/EIS") that outlined and disclosed the environmental impacts of a 30-year plan to improve the Bay-Delta's ecosystem, water supply reliability, water quality, and levee stability. The CALFED ROD remains in effect and many of the State, federal, and local projects begun under CALFED continue.

Building on CALFED and other Bay-Delta planning activities, in 2006 multiple state and federal resource agencies, water agencies, and other stakeholder groups entered into a planning agreement for the Bay-Delta Conservation Plan ("BDCP"). The BDCP was originally conceived as a comprehensive conservation strategy for the Bay-Delta designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework to be implemented over a 50-year time frame with corresponding long-term permit authorizations from fish and wildlife regulatory agencies. The BDCP included both alternatives for new water conveyance infrastructure and extensive habitat restoration in the Bay-Delta.

In 2015, the State and federal lead agencies proposed an alternative implementation strategy and new alternatives to the BDCP to provide for the protection of water supplies conveyed through the Bay-Delta and the restoration of the ecosystem of the Bay-Delta, termed "California WaterFix" and "California EcoRestore," respectively. In this alternative approach, DWR and the

Bureau of Reclamation would implement planned water conveyance improvements as a stand-alone project. Ecosystem improvements and habitat restoration more generally (California EcoRestore) would be undertaken under a more phased approach than previously contemplated by the BDCP and would not be linked with the California WaterFix project or permits. Accelerated restoration actions totaling 30,000 acres of tidal marsh habitat were proposed to be undertaken in the coming decade to provide public benefits for listed fish in the Bay-Delta.

In his State of the State address delivered February 12, 2019, Governor Newsom announced that he did not "support WaterFix as currently configured" but does "support a single tunnel." On April 29, 2019, Governor Newsom issued Executive Order N-10-19, directing several agencies to (among other things), "inventory and assess… [c]urrent planning to modernize conveyance through the Bay Delta with a new single tunnel project." In light of the Governor's announcement and Executive Order, DWR withdrew all approvals and environmental compliance documentation associated with California WaterFix.

On January 15, 2020, DWR issued a Notice of Preparation of Environmental Impact Report for the Delta Conveyance Project. Planning, environmental review and conceptual design work by DWR for a proposed single tunnel project is expected to take approximately 18 to 36 months.

### *California EcoRestore*

The main objective under the EcoRestore Program is to pursue at least 30,000 acres of Delta habitats. These restoration programs would include projects and actions that are in compliance with pre-existing regulatory requirements designed to improve the overall health of the Delta. Other priority restoration projects would also be identified by the Delta Conservancy and other local governments. Funding would be provided through multiple sources including state bonds and other state-mandated funds, SWP/CVP contractors funds as part of existing regulatory obligations, and from various local and federal partners.

As of May 2020, 32 projects have been identified that restore more than the targeted 30,000 acres of habitat, including a projected 18,580 acres of floodplain, 14,000 acres of tidal habitat, 3,500 acres of non-tidal wetlands and 1,650 acres of riparian and upland habitat. To date, 12 projects have been completed, four more are under construction, and the remaining 16 projects are planned to begin construction by 2021.

### *Sites Reservoir*

Sites Reservoir first emerged as part of a second stage of the SWP proposed in the 1980s, which included a peripheral canal and other northern California water-related projects. In 1996, the project was further analyzed by DWR and USBR as part of the CALFED Bay-Delta process. The CALFED process resulted in a Programmatic Record of Decision that recommended implementation of the project as a component of the Preferred Program Alternative. In 2010, the Sites Project Authority was formed as a joint powers authority to continue moving forward with development of the Sites Reservoir project.

Sites Reservoir would be located north of Sacramento, about 10 miles west of the town of Maxwell. The project includes water storage reservoir of 1.3 to 1.5 MAF and would require the construction of two large dams up to 310 feet high and nine smaller saddle dams. The water stored in the reservoir would be diverted from the Sacramento River during high flow events and returned to the Sacramento River during dry and critical years, thereby providing additional dry-year water for environmental flows and project partners including CVP and SWP agencies south of the Delta.

The current operations model estimates the annual water yield of Sites Reservoir at approximately 240 TAF per year. This model utilizes upstream Sacramento River flow and fishery criteria, assumed in earlier phases of the Project. Additional modeling analyses will continue to be conducted as further refinements are made to Project operations and projected regulatory requirements, including proposed Delta Conveyance operations. Implementation of the proposed Delta Conveyance Project would allow for greater yields south of the Delta. DWR estimates that if the Project were operational in 2016 (categorized as a 'below-normal' water year for the Sacramento River), the reservoir could have captured 448 TAF of water supplies. Final Project formulation and annual operations will determine how the firm yield will be divided between meeting water supply and environmental improvements funded by state Proposition 1 grant and federal Water Infrastructure Investment for the Nation (WIIN) Act appropriations.

In 2020, the Sites Project Authority and its participating agencies conducted an internal value-planning effort to minimize potential project costs and impacts. That effort resulted in a project cost reduction of over $2 billion (i.e., $5.2B to $2.9B). The Sites Project Authority is recommending a new workplan and schedule that will move the project forward through the end of 2021. This 16-month workplan (Phase 2) will focus on the continued development and possible revision of project permits and environmental planning documents, and the development of a final feasibility report, and a draft operations plan.

An initial feasibility study and Administrative Draft Environmental Impact Report (EIR) were completed in 2013 by DWR. A Public Draft EIR/Environmental Impact Statement (EIS) for the Project was released by the Sites Project Authority (state lead agency) and the USBR (federal lead agency) in August 2017. However, with the completion of the recent value-planning process, a Revised Draft EIR and Supplemental EIS will need to be released due to the smaller Project footprint and operational changes. The Revised Draft EIR and Supplemental EIS are scheduled to be released in July 2021, with a Final EIR/EIS completed in mid-2022.

### *Water Quality Control Plan for the Bay-Delta/Voluntary Agreements*

The State Water Resources Control Board (SWRCB) is continuing its phased review and update of the 2006 Water Quality Control Plan for the Bay-Delta (Bay-Delta WQCP). Phase 1 focuses on the southern Delta salinity objectives for the protection of agriculture, San Joaquin River flow objectives for the protection of fish and wildlife, and a program of implementation for achieving those objectives. Phase 2 considers the comprehensive review of the other elements of the Bay-Delta WQCP, including but not limited to Sacramento River and Delta outflow objectives.

The SWRCB has also encouraged all stakeholders to work together to reach one or more voluntary agreements for consideration by the SWRCB that could implement the proposed amendments to the Bay-Delta WQCP through a variety of tools, while seeking to protect water supply reliability. Metropolitan is participating in the Phase 2 proceedings and voluntary agreement negotiations.

In December 2018, the SWRCB adopted the Plan amendments and Final Substitute Environmental Document for Phase 1, which establishes the Lower San Joaquin River flow objectives and revised southern Delta salinity objectives. On February 25, 2019, the Office of Administrative Law approved the Plan amendments, which are now in effect, although enforceable obligations to implement the water quality objectives will be imposed in future proceedings involving the specific exercise of the SWRCB's water right or water quality authority. Various stakeholders filed suit against the SWRCB challenging the Phase 1 amendments.

The Phase 1 amendments are highly controversial because they include new requirements for the San Joaquin River tributaries (Stanislaus, Tuolumne, and Merced Rivers) of 40-percent of unimpaired outflow, with an adaptive range between 30-percent and 50-percent for the

protection of fish and wildlife beneficial uses. Unimpaired flow is the flow that would accumulate in surface waters in response to rainfall and snowmelt and flow downstream if there were no reservoirs or diversions to change the quantity, timing, and magnitude of flows. Modeling of this objective shows significant reductions in water supplies available for human consumptive use during most water year types. While the southern Delta salinity objective for the protection of agricultural beneficial uses has been amended to 1.0 dS/m EC (a measure of salinity), the Phase 1 amendments continue the United States Bureau of Reclamation's existing obligation to meet 0.7 dS/m EC on the Lower San Joaquin River at Vernalis.

As part of Phase 2 proceedings, the SWRCB released a framework document in July 2018 focused on the Sacramento River and its tributaries, Delta eastside tributaries, Delta interior Delta flows and Delta outflows. The framework describes changes that will likely be proposed by SWRCB staff through formal proposed amendments and supporting environmental documents. The proposed changes include certain unimpaired flow requirements for the Sacramento River and its salmon-bearing tributaries. an inflow level of 45-percent to 65-percent of unimpaired flow, with a starting point of 55-percent.

The SWRCB has also encouraged all stakeholders to work together to reach one or more voluntary agreements for consideration by the SWRCB that could implement the proposed amendments to the Bay-Delta WQCP through a variety of tools, while seeking to protect water supply reliability. In July of 2019, the State submitted to the SWRCB an update on the voluntary agreement processes. On February 4, 2020, the State agencies released a framework for voluntary agreements that outlined a 15-year program to improve environmental conditions, in an adaptive way, through new flows dedicated to the environment and providing additional habitat. The California Natural Resources Agency and the California Environmental Protection Agency are leading an effort to negotiate voluntary agreements to improve conditions for native fish through an unprecedented commitment to increased flows for the environment, creation of 60,000 acres of new and restored habitat, and $5 billion in new funding for environmental improvements and science. If successful, these agreements will implement the SWRCB's legally required update to the Bay-Delta WQCP and improve conditions for native fish through a broad set of tools. The agreements hold the potential to achieve meaningful landscape-scale solutions to meet the needs of the Delta and its major rivers, reconnect our floodplains and wetlands to the rivers and estuary, and comprehensively manage these vital watersheds. Metropolitan is participating in the Phase 2 proceedings and voluntary agreement discussions.

*Rationale for the Expected Supply*

Implementation Status

Expected supplies are projected in accordance with the approved implementation.

Written Contracts or Other Proof

*Metropolitan Board Actions and Policies:*

Policy Principles Regarding Long-term Actions for the Sacramento-San Joaquin River Delta approved in April 2006.

Delta Action Plan Framework approved in June 2007.

Delta Conveyance Criteria approved in September 2007.

Execution of Initial Funding Agreement approved in December 2008.

Execution of Amendments to Planning Agreement approved in December 2009.

Execution of Planning Agreement Amendment (additional funds) approved in July 2010.

Execution of Amendment to Memorandum of Agreement approved in August 2011.

Authorized Funding and Entered into Project Agreement with Sites Project Authority for Phase 1, April 2017.

Authorized Funding and Entered into Project Agreement with Sites Project Authority for 2019 Workplan, February 2019.

Appropriated Funding and Authorized Amendment to 2019 Reservoir Project Agreement with Sites Project Authority to Allow Participation in Phase 2 Workplan, November 2020.

Board action on "Water Management Tools" approved February 2021.

Board vote on California WaterFix, October 2017.

Board vote on California WaterFix, July 2018.

Board vote on Funding Agreement with DWR for Metropolitan's share of the Delta Conveyance Project planning and pre-construction costs, and execution of an amendment to the Joint Powers Agreement for Delta Conveyance Design and Construction Authority, December 2020.

*Supporting Agreements and Contracts:*

Bay-Delta Accord approved in December 1994.

CALFED Framework, June 2000.

Lower Yuba River Accord, May 2008.

Delta Reform Act Legislation enacted in 2009.

*State and Federal Funding:*

Proposition 204 funds approved by voters in November 1996.

Proposition 13 funds approved by voters in March 2000.

Proposition 50 funds approved by voters in November 2002.

Proposition 1, approved by the voters in 2014, authorized $7.545 billion in general obligation bonds for state water supply infrastructure projects, including surface and groundwater storage, ecosystem and watershed protection and restoration, and drinking water protection.

Annual federal appropriations from 1998 to present, authorized in annual Energy and Water Development Appropriations balls and the CALFED Bay-Delta Authorization Act.

California Water Commission approved $816 million of Proposition 1 funding for Sites Reservoir, July 2018

### *Financing*

The Delta Conveyance Project would be paid for by public water agencies that would receive the water supply reliability benefits.

California EcoRestore is a program separate from the Delta Conveyance Project and the prior California WaterFix planning efforts. The state would pursue at least 30,000 acres of Delta habitat restoration over the next few years, pursuant to pre-existing regulatory requirements such as the 2008 and 2009 Biological Opinions and various enhancements to improve the overall health of the Delta ecosystem and its native fish and wildlife species. Proposition 1 funds and other state public dollars will be directed exclusively for public benefits unassociated with any regulatory compliance responsibilities.

### *Federal, State, and Local Permits/Approvals*

CALFED's Bay-Delta Program.

CALFED Programmatic EIR/EIS finalized in July 2000.

Record of Decision issued in August 2000 for the final Programmatic EIR/EIS regarding the CALFED Bay-Delta Program.

## *K. Kern Delta Water Management Program*

### *Source of Supply*

In December 1999, Metropolitan advertised a request for proposals for participation in "The California Aqueduct Dry-year Transfer Program." As a result of this request for proposals, four programs, including one from the Kern Delta Water District (Kern Delta), were selected for further consideration. In 2001, Metropolitan entered into Principles of Agreement with Kern Delta for the development of a dry-year supply program. Kern Delta serves 125,000 acres of actively farmed highly productive farmland located in the San Joaquin Valley portion of southern Kern County. Kern Delta has under contract 180 TAF per year of good quality, highly reliable pre-1914 Kern River water and 25.5 TAF per year of SWP Table A contract right (under contract with Kern County Water Agency).

The dry-year supply program between Kern Delta and Metropolitan involves the storage of water with Kern Delta. In years of plentiful supply, the agreement allows Metropolitan to store water in Kern Delta's groundwater basin, either through direct spreading operations or through deliveries to growers in Kern Delta's service area. Metropolitan has the ability to store up to 250 TAF of water. Agreement provisions may allow for storage beyond this amount. When needed, Metropolitan can recover its stored water either through direct pumping of the groundwater or exchange at a rate of 50 TAF per year. The program duration will be from 2002 to 2027 with provisions that allow the water to be withdrawn until 2033.

### *Expected Supply Capability*

The Kern Delta/Metropolitan Program provides Metropolitan with the capacity to store up to 250 TAF of water at any one time. When needed, Metropolitan can recover its stored water either through direct pumping of the groundwater or exchange at a rate of 50 TAF per year.

### *Rationale for the Expected Supply*

<u>Implementation Status</u>

Expected supplies are projected in accordance with accepted detailed groundwater modeling that has been accomplished for the program. In addition, the Kern Delta/Metropolitan Water Management Program was operational and accepting water for storage by fall of 2003. By the end of 2020, the program had 181 TAF in its storage account.

<u>Written Contracts or Other Proof</u>

<u>2001 Kern Delta/Metropolitan Principles of Agreement.</u> Principles of agreement were entered into between Kern Delta and Metropolitan in June 2001, covering program costs, operational aspects, and risks/responsibilities.

<u>2002 Kern Delta and Metropolitan Boards of Directors Approval.</u> These actions approved execution of the long-term agreement, which delineates program operations, costs, and risks/responsibilities

### *Financing*

Metropolitan's O&M budget (referenced above) includes payments for the Kern Delta/ Metropolitan Program.

### *Federal, State, and Local Permits/Approvals*

Kern Delta, acting as lead agency under CEQA, has prepared a full EIR. As part of this EIR, Kern Delta published a Notice of Preparation and held meetings with the general public, interested agencies, and resource agencies. In November 2002, the Final EIR was certified by Kern Delta and adopted by Metropolitan.

## *L. Central Valley / State Water Project Storage and Water Transfers*

### *Source of Supply*

Around 34 MAF of water (80 percent of California's developed water) is delivered for agricultural use every year. Over half of this water is used in the Central Valley; and much of it is delivered by, or adjacent to, SWP and Central Valley Project (CVP) conveyance facilities. This allows for the voluntary transfer of water to many urban areas, including Metropolitan's service area, via the California Aqueduct.

In recent years, a portion of this agricultural water supply has been secured by Metropolitan through mutually beneficial transfer agreements:

The Governor's Water Bank (Bank) in 1991, 1992, 1994, and 2009 secured 75 to 820 TAF per year of water supply. Further, the DWR's Dry Year Water Purchase Program (Purchase Program) in 2001, 2002, and 2003 secured a total of 162 TAF. DWR established and administered the Bank and the Purchase Program by facilitating purchasing water from willing sellers and transferring the water to those with critical needs using the SWP facilities. Sellers, such as farmers and water districts, made water available for the Bank and Purchase Program by fallowing crops, shifting crops, releasing surplus reservoir storage, and by substituting groundwater for surface supplies.

In 2003, Metropolitan secured options to purchase approximately 145 TAF of water from willing sellers in the Sacramento Valley during the irrigation season. Using these options, Metropolitan purchased approximately 125 TAF of water for delivery to the California Aqueduct.

In 2005, Metropolitan, in partnership with three other SWC, secured options to purchase approximately 130 TAF of water from willing sellers in the Sacramento Valley during the irrigation season, of which Metropolitan's share was 113 TAF. Metropolitan also had the right to assume the other SWC options if they chose not to exercise their options. Due to improved hydrologic conditions, Metropolitan and the other SWC did not exercise these options.

In December 2007, Metropolitan entered into a long-term agreement with DWR providing for Metropolitan's participation in the Yuba Dry Year Water Purchase Program between Yuba County Water Agency and DWR that was approved by the SWRCB as part of the Yuba River Accord. This program provides for transfers of water from the Yuba County Water Agency during dry years through the year 2025, and Metropolitan has purchased approximately 200 TAF to date.

In 2008, Metropolitan, in partnership with eight other SWC, purchased approximately 40 TAF of water from willing sellers in the Sacramento Valley during the irrigation season, of which Metropolitan's share was approximately 27 TAF.

In 2009, Metropolitan participated in the Governor's Water Bank, which purchased approximately 74 TAF, of which Metropolitan's share was approximately 36.9 TAF.

In 2010, Metropolitan in partnership with three other SWC, secured approximately 100 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 88 TAF.

In 2010, Metropolitan purchased approximately 18 TAF of water from CVP Contractors located in the San Joaquin Valley. In addition, Metropolitan entered into an unbalanced exchange agreement that resulted in Metropolitan receiving approximately 37 TAF.

In 2015, Metropolitan, in partnership with eight other SWC, secured approximately 20 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 12 TAF.

In addition, Metropolitan has secured water transfer supplies under the Multi-Year Water Pool Demonstration Program. In 2013, 2015, and 2016, Metropolitan secured 30 TAF, 1.3 TAF, and 7 TAF, respectively. Unlike the other transfer programs discussed herein, which were derived from agricultural sellers, a portion of these transfer supplies came from urban sellers.

### *Expected Supply Capability*

The combined effect of the 2019 National Marine Fisheries Service's and United States Fish and Wildlife Service's biological opinions and the 2020 California Department of Fish and Wildlife's Incidental Take Permit have resulted in uncertainty in how the CVP and SWP will be operated to facilitate water transfers. The new state and federal permits result in the SWP being required to dedicate approximately 200 TAF on average to additional outflow, in addition to the SWP being required to reduce water diversions under a larger number of environmental conditions. The CVP is not subject to the same state permit requirements and will be diverting more frequently, particularly in April and May. There are also new limits on the CVP's ability to use the SWP's facilities for water transfers, particularly when the SWP is under heightened export limits, which could impact how water transfer deals are structured. While the new state and federal permits allow the water transfer window to be extended through November, the 2020 state Incidental Take Permit includes new November export limits on the SWP; and when these limits are triggered, the CVP would also be precluded from using SWP facilities. Under the new permit, the SWP is further obligated to implement a new water transfer monitoring program, which will increase costs to the SWP water contractors.

### *Rationale for the Expected Supply*

#### Historical Record

Metropolitan has made rapid progress in developing SWP transfer programs. This progress may be attributed to several factors, including Metropolitan dedicating additional staff to identify, develop, and implement SWP transfer programs; increased willingness of Central Valley agricultural interests to enter into transfer programs with Metropolitan; and Metropolitan staff's ability to work with DWR and USBR staff to facilitate SWP storage and transfer programs. The availability of dry year supplies has been demonstrated by the annual water purchase programs described above. In addition, Metropolitan participates in longer-term programs to secure water like the Yuba Accord and the Multi-Year Water Pool Demonstration Program.

The historical record for purchases from the Bank, Purchase Program, Metropolitan-initiated Central Valley programs, Yuba Accord, and Multi-Year Demonstration Program, as well as the number of sellers and buyers participating in these Programs, are strong indicators that there are significant amounts of water that can be purchased through spot market or long-term water transfers during dry years. This historical record from 1991 through 2016 is summarized in Table A.3-1 below. Metropolitan did not purchase supplies from nor participated in any dry year transfer programs from 2017 through 2020.

Approximately 20-35 percent of these north of the Delta water transfers are dedicated to improving Delta water quality to comply with regulations governing Delta pumping.

Written Contracts or Other Proof

With near record-low precipitation in California in recent years, Governor Edmund G. Brown Jr. issued several executive orders to expedite processing of water transfers within the state:

Executive Order B-21-13 (May 20, 2013): The Department of Water Resources and the State Water Resources Control Board are to "take immediate action to address the dry conditions and water delivery limitations by doing the following: … (1) Expedite processing of one-year water transfers for 2013 and assist water transfer proponents and suppliers as necessary, provided that the transfers will not harm other legal users of water and will not unreasonably affect fish, wildlife, or other in-stream beneficial uses; (2) The SWRCB shall expedite review and processing of water transfer petitions in accordance with the applicable provisions of the Water Code; (3) The DWR shall expedite and facilitate water transfer proposals in accordance with applicable provisions of the Water Code..."

January 1, 2014 Drought Proclamation: "The Department of Water Resources and the State Water Resources Control Board will expedite the processing of water transfers, as called for in Executive Order B-21-13. Voluntary water transfers from one water right holder to another enables water to flow where it is needed most."

April 25, 2014 Drought Proclamation: "The Department of Water Resources and the State Water Resources Control Board will immediately and expeditiously process requests to move water to areas of need, including requests involving voluntary water transfers, forbearance agreements, water exchanges, or other means. If necessary, the Department will request that the Water Board consider changes to water right permits to enable such voluntary movements of water."

Executive Order B-29-15 (April 1, 2015): "The Department shall immediately consider voluntary crop idling water transfer and water exchange proposals of one year or less in duration that are initiated by local public agencies and approved in 2015 by the Department subject to the criteria set forth in Water Code section 1810." [This executive order incorporated by reference the previous drought proclamations.]

In February 2021, Metropolitan's Board approved a water management amendment to the State Water Contract that provides greater water management flexibility with transfers and exchanges of SWP water within the SWP service area. The amendment will provide increased opportunities among the State Water Project Contractors to work together on programs that will improve the management of existing SWP water.

**Table A.3-1**
**Historical Record of MWD Central Valley Water Transfers**

| Program | Purchases (AF per year) Total | Purchases (AF per year) Metropolitan | Participants Sellers | Participants Buyers |
|---|---|---|---|---|
| 1991 Governor's Water Bank | 820,000 | 215,000 | 351 | 13 |
| 1992 Governor's Water Bank | 193,246 | 10,000 | 18 | 16 |
| 1994 Governor's Water Bank | 220,000 | 100 | 6 | 15 |
| 2001 Dry-Year Purchase Program | 138,806 | 80,000 | 9 | 8 |
| 2003 MWD Water Transfer Program | 146,230[1] | 126,230 | 11 | 1 |
| 2005 SWC Water Transfer Program | 127,275[2] | 0 | 3 | 4 |
| 2008 SWC Water Transfer Program | 39,152 | 26,621 | 4 | 8 |
| 2009 Governor's Water Bank | 47,505 | 36,900 | 10 | 9 |
| 2010 SWC Water Transfer Program | 98,959 | 88,159 | 11 | 4 |
| 2013 Multi-Year Water Pool Demo | 92,232 | 30,000 | 4 | 9 |
| 2015 Multi-Year Water Pool Demo | 3,000 | 1,374 | 1 | 14 |
| 2015 SWC Water Transfer Program | 19,686 | 12,358 | 5 | 9 |
| 2016 Multi-Year Water Program | 15,000 | 6,871 | 2 | 9 |

[1] Quantities denote options Metropolitan secured, of which 20,000 AF were not exercised due to improved hydrologic conditions.

[2] Quantities denote options Metropolitan secured, but were not exercised due to improved hydrologic conditions.

Agreements Between Sellers and Buyers. Since 1991, Metropolitan has entered into Central Valley water transfer agreements in eleven years with sellers, or DWR acting in an intermediary capacity for the Drought Water Bank. The essential terms and conditions for negotiating purchases, including maximum offering price, quantity of water needed, and the timing of delivery, were established in these agreements.

1999 Board Directive. Metropolitan's Board has authorized water transfers in accordance with the Water Surplus and Drought Management Plan (WSDM Plan) adopted in April 1999. The WSDM Plan is a comprehensive policy guideline for managing Metropolitan's water supply during periodic surplus and shortage conditions. During shortage conditions, the plan specifies the type, priority, and timing of drought actions, including the purchase of transfers on the spot market that could be taken in order to prevent or mitigate negative impacts on retail demands.

### *Financing*

Funds for Central Valley water transfers are included in Metropolitan's O&M budget (referenced above).

### *Federal, State, and Local Permits/Approvals*

Environmental documentation for the Drought Water Bank. In November 1993, DWR prepared and finalized a programmatic EIR for the operation of the Drought Water Bank during future

drought events. In 2009, an emergency CEQA exemption was issued to support the Drought Water Bank.

Individual CEQA and NEPA documents for Metropolitan's 2003, 2005, and 2008 Central Valley water transfer programs. Individual sellers prepared CEQA documentation to support their transfers. In addition, the USBR prepared NEPA documentation for those transfers requiring federal approval.

### *M. Mojave Storage Program*

#### *Source of Supply*

Water from Metropolitan's SWP supply is delivered to Mojave Water Agency through SWP facilities for deposit into an exchange account managed by Mojave. Returns to Metropolitan are made on an acre-foot-for-acre-foot basis (i.e., no losses) at Metropolitan's request by exchange with Mojave's SWP supplies delivered through SWP facilities, subject to rules reserving a minimum annual SWP supply for use by Mojave.

#### *Expected Supply Capability*

Through 2021, Metropolitan can annually withdraw the Mojave Water Agency's SWP contractual amounts in excess of 10%. After 2021, the withdrawal rate lowers, reserving 20% of Mojave Water Agency's SWP contractual amounts. Under a 100% allocation, the State Water Contract provides Mojave Water Agency 82.8 TAF of water.

#### *Rationale for the Expected Supply*

Implementation Status

Presently, the Mojave Water Agency is not accepting additional water from Metropolitan. As of January 2021, Metropolitan has approximately 19 TAF remaining in storage. Without additional deliveries to the exchange account, the program may not be able to provide return supplies beyond 2025.

Written Contracts or Other Proof

2003 Mojave Water Agency and Metropolitan Boards of Directors Approval. These actions approved the Mojave Water Agency Groundwater Recharge and Exchange Demonstration Project.

2003 Agreement for a Demonstration Water Exchange Program. Provided for a demonstration water exchange between Metropolitan and the Mojave Water Agency for the immediate benefit of both agencies and for the purpose of determining what mutual benefits can result from increased coordinated management of water and facilities. Provides for Metropolitan to deliver up to 75,000 AF for an exchange through December 2004 and the return of water to Metropolitan by December 2014.

2005 Mojave Water Agency and Metropolitan Boards of Directors Approval. These actions approved a one-year extension of the period for Metropolitan to deliver up to the maximum amount of 75,000 AF for an exchange and a one-year extension of the return of water supply to Metropolitan.

2005 First Amendment to the Agreement for a Demonstration Water Exchange Program. Provides for a one-year extension of the period for Metropolitan to deliver up to the maximum amount of 75,000 AF for an exchange and a one-year extension of the return of water supply to Metropolitan.

2011 Mojave Water Agency and Metropolitan Boards of Directors Approval. These actions approved an amendment to the Agreement for a Demonstration Water Exchange Program to provide for a longer term Water Storage Program for Metropolitan to store up to an additional 390,000 acre-feet of SWP supplies through 2035.

2011 Amended Agreement for a Water Storage Program. Establishes the Water Storage Program under which Metropolitan to store up to an additional 390,000 acre-feet of SWP supplies through 2035 for subsequent return by Mojave Water Agency.

### *Financing*

Metropolitan O&M budget includes payments to deliver Metropolitan's SWP supplies to Mojave Water Agency and the recovery on that water by exchange with Mojave Water Agency's SWP supplies.

### *Federal, State, and Local Permits/Approvals*

The Mojave Water Agency, as the Lead Agency, adopted a Final Environmental Impact Report on January 26, 2006, for the Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program (SCH#2005041103), adopted a mitigation monitoring and reporting program, and filed a Notice of Determination with the State Clearinghouse on January 31, 2006. Metropolitan's Board certified the CEQA documents as a Responsible Agency on July 12, 2011.

On September 8, 2011, Metropolitan and Mojave Water Agency entered into a Point of Delivery Agreement with DWR providing for the delivery of Metropolitan's SWP supplies to Mojave Water Agency and the return to Metropolitan through an exchange of Mojave's SWP supplies.

## *N. Yuba Accord Dry Year Purchase Program*

### *Source of Supply*

As part of a comprehensive settlement of a State Water Resources Control Board (SWRCB) proceeding in which the Yuba County Water Agency (YCWA) is required to increase Yuba River fishery flows, referred to as the "Yuba River Accord" (Accord), YCWA reached agreement with DWR and USBR to sell a portion of the water it would be required to release, plus additional water made available by reoperation of YCWA's storage reservoirs and groundwater substitution. DWR entered into a purchase agreement with YCWA under which one-half of the water available for purchase would be available to SWP contractors that elected to participate in the purchase program.

Under this 25-year program, the price for water is set by the agreement between DWR and the YCWA. There are four categories of water sold, and the price for each type of water depends on hydrology.

### *Expected Supply Capability*

Metropolitan's share of the water made available under the Yuba Accord Dry Year Purchase Program is approximately 25 percent. Should other participating contractors decline to purchase their respective shares, that water is allocated to the remaining interested participating contractors. Metropolitan's likely share of assured YCWA transfer water would be at least 13,750 AF in dry years and up to 35,000 AF or more in other years. These volumes are as provided by YCWA north-of-the-Delta and are subject to conveyance losses through the Delta to the Banks Pumping Plant (approximately 20 to 35 percent).

### *Rationale for the Expected Supply*

Historical Record

Actual volumes purchased by Metropolitan since program inception were as follows:

| Year | Purchased Volume (AF) |
|---|---|
| 2008 | 26,430 |
| 2009 | 42,915 |
| 2010 | 67,068 |
| 2011 | 0 |
| 2012 | 0 |
| 2013 | 14,548 |
| 2014 | 10,962 |
| 2015 | 8,192 |
| 2016 | 0 |
| 2017 | 0 |
| 2018 | 21,131 |
| 2019 | 0 |
| 2020 | 8,950 Estimate |

Written Contracts or Other Proof

DWR-YCWA Purchase Agreement. This December 4, 2007, agreement provides the annual determination of the amount of water to be made available by YCWA and purchased by DWR. The agreement also specifies the costs of various categories of water to be made available under a variety of hydrologic conditions.

DWR-Metropolitan Participation Agreement. This December 21, 2007, agreement provides Metropolitan's election to purchase water made available by YCWA to DWR and the scheduling delivery of the purchased water. The agreement provides for mechanisms for Metropolitan payments to DWR that are due to YCWA under the DWR-YCWA Purchase Agreement.

Amended DWR-Metropolitan Participation Agreement. This December 5, 2014, amendment established prices for surface water transfer supplies between 2016 and 2020 and clarifies YCWA's rights to sell to third parties.

Amended DWR-Metropolitan Participation Agreement. The amendment, executed in September 2020, established new prices for surface water transfer supplies between 2020 and 2025.

### *Financing*

Funds for purchases of water from the Yuba Accord Dry Year Purchase Program are included in Metropolitan's O&M budget (referenced above).

### *Federal, State, and Local Permits/Approvals*

SWRCB Order WR 2008-0014. Approval of YCWA's petition to modify revised Water Right Decision 1644 related to Water Right Permits 15026, 15027, and 15030 (Applications 5632, 15204, and 15574), and petition for long-term transfer of up to 200,000 AF of water per year from YCWA to the DWR and the USBR under Permit 15026 (Application 5632) - Lower Yuba River in Yuba County.

## *O. 2011 Coordinated Operating, Water Storage, Exchange and Delivery Agreement among Metropolitan, Municipal Water District of Orange County, and Irvine Ranch Water District*

### *Source of Supply*

In July 2010, Metropolitan's Board authorized the Coordinated Operating, Water Storage, Exchange and Delivery Agreement among Metropolitan, Municipal Water District of Orange County (MWDOC), and Irvine Ranch Water District (IRWD). The agreement allows Metropolitan to manage additional SWP supplies obtained from other State Water Contractors. The SWP supplies are obtained through unbalanced exchanges with other State Water Contractors and stored in IRWD storage facilities along the California Aqueduct. Metropolitan maintains ownership and control over the SWP supplies that would be later delivered into the region. MWDOC and IRWD receive a benefit that when the storage programs operate consistent with Metropolitan's Water Supply Allocation Plan, MWDOC and IRWD would receive an extraordinary supply benefit. MWDOC continues to pay the full-service rate for the water generated and delivered under the program.

### *Expected Supply Capability*

The average annual supply benefit is estimated at around 2,000 AFY which can vary drastically based on hydrologic conditions. The maximum supply benefit during a water supply allocation may be as high as 28,750 AF if IRWD has sufficiently developed supplies in storage.

### *Rationale for the Expected Supply*

The expected supply is estimated on the SWP Supplies that the program typically develops through 2020.

Historical Record

The program has allowed Metropolitan to acquire additional supplies through unbalanced exchanges with Antelope Valley-East Kern Water Agency, Dudley Ridge Water District, and Santa Barbara County Flood Control and Water Conservation District.

Written Contracts or Other Proof

2011 Coordinated Operating, Water Storage, Exchange and Delivery Agreement among Metropolitan, Municipal Water District of Orange County, and Irvine Ranch Water District.

### *Financing*

Metropolitan does not fund the exchanges or storage program. IRWD is responsible for the normal program costs. There are provisions where Metropolitan can utilize the program facilities on a limited basis and would reimburse actual operating costs.

### A.3.3 In-Region Storage and Supplies

#### *A. Surface Storage*

*Source of Supply*

Surface storage is a critical element of Southern California's water resources strategy. Because California experiences dramatic swings in weather and hydrology, surface storage is important to regulate those swings and mitigate possible supply shortages. Surface storage provides a means of storing water during normal and wet years for later use during dry years, when imported supplies are limited. Since the early twentieth century, DWR and Metropolitan have constructed surface water reservoirs to meet emergency, drought/seasonal, and regulatory water needs for Southern California. These reservoirs include Pyramid Lake, Castaic Lake, Elderberry Forebay, Silverwood Lake, Lake Perris, Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, Orange County Reservoir, and Metropolitan's DVL. Some reservoirs such as Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, and Orange County Reservoir, which have a total combined capacity of about 3,500 AF, are used solely for regulating purposes. The remaining surface reservoirs are primarily used to meet emergency, drought, and seasonal requirements. The total gross storage capacity for these larger remaining reservoirs is 1,757,600 AF. However, not all of the gross storage capacity is available to Metropolitan; dead storage and storage allocated to others reduce the amount of storage that is available to Metropolitan to 1,665,200 AF.

*Expected Supply Capability*

Surface storage reservoirs are an important tool that allows Metropolitan to meet the water needs of its service area. As discussed in the EIR for the Eastside Reservoir (DVL) Project dated October 1991 and Metropolitan's IRP, the allocation of available surface storage can be divided into two primary components: emergency and drought/seasonal. As specified by Metropolitan's Board of Directors in the Final EIR for DVL, "Metropolitan shall maintain sufficient water reserves within its service area to supplement local production during an emergency or severe water shortage." With DVL in operation, Metropolitan can now re-operate the surface reservoirs and meet the Board's stated objectives.

<u>Updated Emergency Storage Objective</u>

Metropolitan established its original criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. These criteria were again discussed in the 1996 IRP. Metropolitan's Board approved both of these documents. Emergency storage requirements are based on the potential of a major earthquake that would damage all supply aqueducts isolating Southern California from its imported water sources. In 2019, Metropolitan and its member agencies completed a process to update the regional planning estimate of Metropolitan's Emergency Storage Objective. This emergency storage represents the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. The emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service. The Emergency Storage Objective considers a six- and twelve-month outage period for the imported supply aqueducts incorporating latest seismic information and operational flexibility of Metropolitan's system, a retail water demand cutback ranging from 25 to 35 percent considering the level of

conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors could affect local production during emergency conditions. Under this update, Metropolitan's Emergency Storage Objective was set to 750 TAF, as this level of storage would prevent severe water shortages to the region given new information on expected recovery durations. The emergency storage volume represents a planning estimate for the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency. A detailed description of Metropolitan's Emergency Storage Objective is included in Appendix 8.

The storage reserved in system reservoirs for emergency purposes is shown in Table A.3-2.

Updated Storage Requirements for Dry-Year Supply and Seasonal Needs

Storage capacity in system reservoirs, including DVL, is also earmarked for dry-year supply and system regulation purposes. Dry-year supply storage within Metropolitan's service area is required to meet the additional water demands that occur during single-year and extended droughts. As specified in the Final EIR for DVL and further discussed in the IRP, this storage requirement is defined as the difference between average-year demand and above average demand during dry years. In addition to dry-year storage, seasonal storage is required to meet seasonal peak demands, which are defined as the difference between average winter demands and average summer demands. The dry-year supply and seasonal storage also provide sufficient reserves to permit approximately five percent downtime for rehabilitation, repair, and maintenance of raw water transmission facilities.

**Table A.3-2**
**Surface Storage Utilization**
(acre-feet per year)

| Forecast Year | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| **MWD Dry-Year/Seasonal Surface Storage** | | | | | |
| DVL, Mathews, Skinner | 596,000 | 596,000 | 596,000 | 596,000 | 596,000 |
| Flexible Storage in Castaic & Perris | 217,000 | 217,000 | 217,000 | 217,000 | 216,000 |
| ***Subtotal of Dry-Year/Seasonal Storage*** | **813,000** | **813,000** | **813,000** | **813,000** | **812,000** |
| **MWD Emergency Storage** | | | | | |
| DVL, Mathews, Skinner | 436,000 | 436,000 | 436,000 | 436,000 | 436,000 |
| Emergency Storage in DWR Reservoirs | 381,000 | 381,000 | 381,000 | 381,000 | 381,000 |
| ***Subtotal of Emergency Storage*** | **817,000** | **817,000** | **817,000** | **817,000** | **817,000** |
| **Total MWD Surface Storage** | **1,630,000** | **1,630,000** | **1,630,000** | **1,630,000** | **1,629,000** |

Historical Record

Metropolitan has a contract with the DWR that allows use of its terminal reservoirs, such as Castaic Lake on the West Branch and Lake Perris on the East Branch of the California Aqueduct (see Section A.3.3.B for a discussion of Metropolitan's contractual rights to storage in these DWR reservoirs). In addition, Metropolitan owns and operates surface reservoirs such as Lake Skinner, Lake Mathews, and DVL to enhance water supply reliability for its member agencies.

Written Contracts or Other Proof of Usage

The surface reservoirs used by Metropolitan are available either by contract (in the case of the DWR terminal reservoirs) or by construction of its own facilities. The following historical record is provided:

November 1960 Contract between the State of California Department of Water Resources and the Metropolitan Water District of Southern California for a Water Supply. This Contract and its numerous amendments describe Metropolitan's legal access to and obligations for the operation of the SWP for the benefit of its Contractors. Metropolitan has an entitlement to 1,911,500 AF of water each year subject to availability. The terms of this Contract describe Metropolitan's rights to and obligations for the terminal surface reservoirs for water supply purposes.

November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner. This MOU and the January 2005 Amendment, signed by Metropolitan and other affected parties, govern Metropolitan's operations of Lake Skinner in Riverside County. The DWR Division of Safety and Dams also reviews monitoring data on the safety of the dam annually.

November 1994 Memorandum of Understanding on Operation of Domenigoni Valley Reservoir (now known as Diamond Valley Lake). This MOU, signed by Metropolitan and other affected parties, governs Metropolitan's operations of DVL in Riverside County. The DWR Division of Safety and Dams also reviews monitoring data on the safety of the dam annually.

Elderberry Forebay Contract for Conditions for Use. Conditions for use of storage are described in the contract between the DWR, State of California, and the Department of Water and Power, City of Los Angeles, for Cooperative Development, West Branch, California Aqueduct; Amendment No. 1, July 3, 1969; and Amendment No. 4, June 27, 1985.

June 2002 Division of Safety of Dams Certificate of Approval. The DWR, Division of Safety of Dams issued the Certificate of Approval for operation of DVL in early 2000, with three conditions. These conditions were: (1) Satisfactory operation of the butterfly valves and emergency gate in the inlet/outlet tower, (2) completion of the Tank Saddle Cutoff remediation, and (3) completion of the Signal Spillway. Metropolitan completed these conditions in 2001, and DVL is currently operational in accordance with the Certificate of Approval.

October 1991 Final EIR for the Eastside Reservoir Project (DVL). The EIR established criteria for integrating the operations of Metropolitan's reservoirs and DWR's southern reservoirs for emergency purposes. These criteria also provided that Metropolitan reservoirs could be expected to withdraw all drought storage water within a two-year period.

### *B. Flexible Storage Use of Castaic Lake and Lake Perris*

#### *Source of Storage*

Metropolitan's flexible storage accounts in Castaic Lake and Lake Perris, which are SWP reservoirs, are 153,940 AF and 65,000 AF, respectively. These accounts provide Metropolitan with dry-year supply that is independent of the Table A allocation. Metropolitan can withdraw water from these reservoirs in addition to its allocated supply in any year on an as-needed basis. Withdrawn water must be replaced from supplies available to Metropolitan within five years of each withdrawal. This "flexible storage" is available in Castaic Lake to Metropolitan, Ventura County Flood Control and Water Conservation District, and to Santa Clarita Valley Water Agency. It is available in Lake Perris to Metropolitan only.

### *Expected Supply Capability*

The dry-year supply available to Metropolitan from the flexible storage use of Castaic Lake and Lake Perris totals 218,940 AF, made up of 153,940 AF in Castaic Lake and 65,000 AF in Lake Perris. Table A.3-3 shows the use of this available supply in accordance with Metropolitan's operating criteria.

**Table A.3-3**
**Estimated Water Supplies Available for Metropolitan's Use**
**Under the Flexible Storage Use of Castaic Lake and Lake Perris**[1]
(TAF per year)

| Year | Five Year Drought (1988-1992) | Single Dry Year (1997) |
|---|---|---|
| 2025 | 43 | 217 |
| 2030 | 43 | 217 |
| 2035 | 43 | 217 |
| 2040 | 43 | 217 |
| 2045 | 43 | 217 |

[1]Source: Metropolitan's operating criteria.

### *Rationale for the Expected Supply*

Implementation Status

Express provisions related to flexible storage have been incorporated in Metropolitan's SWP contract since 1995. The operating options have been available for use since that time and will continue to be in effect as a part of the SWP contracts.

Historical Record

Metropolitan has exercised the flexible storage provision on numerous occasions and withdrew the full contract amount during calendar year 2014. The full amount was replaced by the beginning of 2017. Its use is based on existing contract provisions.

DWR Bulletin 132-94. The use of Castaic Lake and Lake Perris is determined in accordance with the proportionate use factors from Bulletin 132-94, Table B, upon which capital cost repayment obligations are based. Based on its capital repayment obligations, Metropolitan's proportionate use of Castaic Lake is 96.2 percent and of Lake Perris is 100 percent. Per its SWP contract, Metropolitan has express rights to use certain portions of the SWP's southern reservoirs independently of DWR to supply water in amounts in addition to approved SWP deliveries.

Metropolitan's SWP Contract. Metropolitan's SWP contract was amended in 1995 to include Article 54, "Usage of Lakes Castaic and Perris." This article provides flexible storage to contractors participating in repayment of the capital costs of Castaic Lake and Lake Perris. Each contractor shall be permitted to withdraw up to a Maximum Allocation from Castaic Lake and Lake Perris. These contractors may withdraw a collective Maximum Allocation up to 160 TAF in Castaic Lake and 65 TAF in Lake Perris, which shall be apportioned among them pursuant to the respective proportionate use factors, as shown in Table A.3-4 below.

### *Financing*

The cost associated with the withdrawal and replacement of water in the flexible storage is included in Metropolitan's annual payments under the State Water Contract.

### *Federal, State, and Local Permits/Approvals*

The flexible storage provision became effective in 1995. DWR has the approval authority to affect changes in the operations and usage of existing SWP facilities, including Castaic Lake and Lake Perris.

**Table A.3-4**
**Flexible Storage Allocations**

| Participating Contractor | Proportionate Use Factor | Maximum Flexible Storage Allocation (AF) |
|---|---|---|
| Castaic Lake | | |
| Metropolitan | .96212388 | 153,940 |
| Ventura County Flood Control and Water Conservation District | .00860328 | 1,376 |
| Santa Clarita Valley Water Agency | .02927284 | 4,684 |
| Total Castaic Lake | 1.00000000 | 160,000 |
| Lake Perris[1] | 1.00000000 | 65,000 |
| Metropolitan | | |

[1] The 2003 Exchange Agreement among Metropolitan, CVWD, and DWA, among other things, transferred to CVWD and DWA a portion of Metropolitan's capacity in the California Aqueduct and the East Branch including Lake Perris. However, Metropolitan's rights to the full 65,000 AF of Lake Perris flexible storage account was retained by Metropolitan.

## C. *Metropolitan Surface Reservoirs*

### *Source of Supply*

Storage capacity in Metropolitan reservoirs, including Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, Orange County Reservoir, and DVL, is earmarked to meet emergency, dry-year/seasonal, and system regulation needs, as these have been defined above.

### *Expected Supply Capability*

The total available storage capacity for all Metropolitan-controlled surface reservoirs (Metropolitan-owned and DWR terminal reservoirs) is 1,632,000 AF. As discussed earlier, approximately 750,000 AF has been set aside to meet the emergency storage objective of the service area. After accounting for emergency storage, the surface storage available in Metropolitan-owned reservoirs to meet dry-year/seasonal requirements is presented in Table A.3-5.

### *Rationale for the Expected Supply*

Program Facilities

Major facilities for Lake Mathews include an earthen dam to impound water and a recently completed new outlet tower. Major facilities for Lake Skinner include an earthen dam to impound water, an outlet tower, an inlet from the San Diego Canal to deliver water into the

reservoir, a water treatment filtration facility, and recreational facilities consisting of a marina, parks, swimming areas, golf course, and hiking trails. Major facilities at DVL include three earthen dams to impound water, an inlet/outlet tower, a secondary inlet from the Inland Feeder, a large pumping station to deliver water into the reservoir, and power generating facilities. Recreational facilities consisting of a marina, parks, swimming areas, golf course, hiking trails, equestrian trails, and lodging are planned.

Historical Record

DVL has been operational for over 20 years. Lake Mathews and Lake Skinner have been in service since the 1940s and 1970s, respectively.

November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner. This MOU and the January 2005 Amendment, signed by Metropolitan and other affected parties, govern Metropolitan's operations of Lake Skinner in Riverside County. The DWR Division of Safety and Dams also reviews monitoring data on the safety of the dam annually.

October 1991 Final EIR for the Eastside Reservoir Project (DVL). The EIR established criteria for integrating the operations of Metropolitan's reservoirs and DWR's southern reservoirs for emergency purposes. These criteria also provided that Metropolitan reservoirs could be expected to withdraw all drought storage water within a two-year period.

November 1994 Memorandum of Understanding on Operation of Domenigoni Valley Reservoir (now known as Diamond Valley Lake). This MOU, signed by Metropolitan and other affected parties, governs Metropolitan's operations of DVL in Riverside County. The DWR Division of Safety and Dams also reviews monitoring data on the safety of the dam annually.

June 2002 Division of Safety of Dams Certificate of Approval. The DWR Division of Safety of Dams issued the Certificate of Approval for operation of DVL in early 2000, with three conditions. These conditions were: (1) satisfactory operation of the butterfly valves and emergency gate in the inlet/outlet tower, (2) completion of the Tank Saddle Cutoff remediation, and (3) completion of the Signal Spillway. Metropolitan completed these conditions in 2001, and DVL is currently operational in accordance with the Certificate of Approval.

**Table A.3-5**
**Estimated Supplies Available from Metropolitan's Surface Storage Program Capabilities**
(acre-feet per year)

| Forecast Year | Five Year Drought (1988-92) | Single Dry Year (1977) |
|---|---|---|
| 2025 | 161,000 | 807,000 |
| 2030 | 161,000 | 809,000 |
| 2035 | 161,000 | 808,000 |
| 2040 | 161,000 | 808,000 |
| 2045 | 161,000 | 806,000 |

Source: Metropolitan analysis

### *Financing*

The capital cost of DVL, Lake Mathews, and Lake Skinner was financed by a combination of revenue bonds and operating revenues. Annual operating costs, including maintenance and pumping, are included in Metropolitan's annual O&M budget (referenced above).

### *Federal, State, and Local Permits/Approvals*

All necessary permits have been obtained. A permit to generate and sell power has been acquired from the Federal Energy Regulatory Commission. No further regulatory permits are required.

## ***D. Groundwater Conjunctive Use Programs***

### *Source of Supply*

Metropolitan's IRP established the strategy to store imported water that is most available during wet years in surface reservoirs or groundwater aquifers for later use during droughts and emergencies. In this way, Metropolitan can reduce its reliance on direct deliveries from the SWP and the Colorado River during dry years when competing demands by other users and risks to the watershed ecosystems are greatest. Metropolitan has implemented a conjunctive use program for imported water storage in groundwater basins within the service area based upon policy principles adopted in 2000.

In 2007, Metropolitan published the Groundwater Assessment Study which estimated 3.2 MAF of available storage space in groundwater basins. Due to drought and the subsequent decline in water levels, it is estimated that storage in the groundwater basins has declined about 700 TAF from 2000 to 2019. Additionally, the 2020 IRP may lead to policies and strategies for ensuring sustainable groundwater production in light of a potential for extended multiple-year dry conditions.

### *Rationale for the Expected Supply*

<u>Implementation Status</u>

The status of implementation for the groundwater conjunctive use programs has been described above.

<u>Historical Record</u>

In 2000, Metropolitan entered an agreement with DWR to administer $45 million of Proposition 13 state bond funds for Metropolitan's Southern California Water Supply Reliability Projects Program. Metropolitan paired the $45 million of state funds with $35 million of Metropolitan capital funds to develop nine groundwater storage programs in partnership with member and retail agencies and groundwater basin managers. These nine contractual storage programs have an initial 25-year term and provide for storage of up to 212 TAF and dry-year yield of up to 70 TAF. These programs are summarized in Table 3-16. Since inception, the conjunctive use program has been exercised to store water in groundwater basins during wet periods and relied upon to extract that water during dry periods. For example, during the recent drought period from 2012 to 2016, the conjunctive use program provided 64,000 AF of dry year supply to help Metropolitan meet regional demands. As of January 2020, the conjunctive use storage balance is 61,000 AF.

Metropolitan has also implemented a Cyclic Program to help capture additional imported supplies that would otherwise be lost to the region, when available storage capacity is limited. Under the Cyclic Program, Metropolitan delivers imported water supplies to the member agencies for storage in their local groundwater basin or surface water reservoir in advance of the demand for the water for a future use. The member agency purchases the water based on

a mutually agreed upon schedule but has full discretion on the use of the stored water. The Cyclic Program creates additional flexibility for managing Metropolitan's water supplies.

Metropolitan has ten-year cyclic agreements with the City of Burbank, City of Pasadena, Calleguas Municipal Water District, Eastern Municipal Water District, Municipal Water District of Orange County, San Diego County Water Authority, and Western Municipal Water District. These agreements commenced between 2017 and 2019. In addition to these agreements, Metropolitan has existing agreements with two other member agencies. The Cyclic Storage Agreement with Upper San Gabriel Valley MWD allows pre-delivery and storage of up to 100 TAF of imported water. The agreement was originally signed in 1975 for a term of five years and has been extended in five-year increments. The agreement currently expires in November 2023. Metropolitan amended this agreement in August 2019 to increase the storage amount to up to 200 TAF. Metropolitan is working with Upper San Gabriel Valley MWD to enter into a new ten-year agreement. The Cyclic Storage Agreement with Three Valleys MWD allows for pre-delivery and storage of up to 40 TAF. This agreement was originally signed in 1991 for a term of five years and has been extended in five-year increments. Metropolitan entered into a new agreement that increased the storage amount to 50 TAF and expires in June 2030. Both agreements are expected to be renewed repeatedly in the future.

Written Contracts or Other Proof

Metropolitan's dry-year supply from the groundwater conjunctive use programs is based on Metropolitan's Board actions and agreements.

Proposition 13 Groundwater Conjunctive Use Programs.

Metropolitan Water District published the Groundwater Assessment Study Report in 2007 in collaboration with its member agencies and groundwater basin managers documenting existing use and development of groundwater resources in Metropolitan's service area and estimating additional groundwater basin storage potential.

Principles for groundwater storage adopted by the Metropolitan Board in January 2000.

Resolution for Proposition 13 Funds adopted by the Metropolitan Board in October 2000.

Agreement executed with the DWR for Interim Water Supply Construction Grant Commitment Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection (Proposition 13, Chapter 9, Article 4) providing for Metropolitan to administer $45 million in state Proposition 13 grant funds for groundwater reliability programs; October 2000.

Agreement executed for Long Beach Conjunctive Use Project, July 2002, amended in July 2003, October 2005, and November 2008.

Agreement executed for Live Oak Conjunctive Use Project, October 2002.

Agreement executed for Foothill Area Groundwater Storage Project, February 2003, amended in August 2006, April 2008, and February 2009.

Agreement executed for Chino Basin Programs, June 2003, amended in May 2004, August 2004, August 2005, May 2008, March 2009, September 2009, July 2010, and January 2015.

Agreement executed for Orange County Groundwater Storage Program, June 2003, amended in July 2004, December 2005, and July 2008.

Agreement executed for Compton Conjunctive Use Program, February 2005.

Agreement executed for Long Beach Conjunctive Use Project — Expansion in Lakewood, July 2005, amended in April 2006, August 2007, November 2008, and February 2010.

Agreement executed for Upper Claremont Basin Groundwater Storage Program, September 2005, amended in April 2008.

Agreement executed for Elsinore Basin Conjunctive Use Program, December 2006, amended in May 2008.

All of these programs have an initial 25-year term, with provision for renewal or extension after that period.

### *Financing*

Financing has been supplied from multiple sources as discussed below:

Financing from Proposition 13 and Additional Groundwater Storage Programs.

Proposition 13 funds ($45 million) were allocated to Metropolitan by the state in May 2000 for the development of local groundwater storage projects.

Metropolitan has executed groundwater storage funding agreements for nine storage programs, expended $45 million of the Proposition 13 funds, and appropriated over $35 million of Metropolitan capital funds for the storage programs in the Orange County and Chino groundwater basins. All nine storage programs have completed facilities and are currently active. Metropolitan began calling for production of stored water beginning in 2007.

Table A.3-6 provides details on groundwater storage programs.

### *Federal, State, and Local Permits/Approvals*

Long Beach Conjunctive-use Storage Project. Environmental documentation for the Long Beach Conjunctive-use Storage Project was certified by the City of Long Beach in August 2001.

Live Oak Basin Conjunctive-use Storage Project. Environmental documentation for the Live Oak Basin Conjunctive-use Storage Project was certified by Three Valleys MWD in January 2002.

Foothill Area Groundwater Storage Project. Environmental documentation for the Foothill Area Groundwater Storage Project was certified by Foothill Municipal Water District in January 2003.

Chino Basin Programs Groundwater Storage Project. Environmental documentation for the Chino Basin Programs Groundwater Storage Project was certified by Inland Empire Utility Agency in December 2002.

Long Beach Conjunctive Use Storage Project — Expansion in Lakewood. Environmental documentation for the project was certified by the City of Lakewood in May 2005.

City of Compton Conjunctive Use Program. Environmental documentation for the project was certified by the City of Compton in December 2004.

Orange County Groundwater Conjunctive Use Program. Environmental documentation for the project was certified by Orange County Water District in March 1999 and in July 2002.

Upper Claremont Basin Groundwater Storage Program. Environmental documentation for the project was certified by Three Valleys MWD in July 2005.

Elsinore Basin Conjunctive Use Program. Environmental documentation for the project was certified by Elsinore Valley MWD in February 2004.

## *E. Program under Development*

### *Regional Recycled Water Program*

The Regional Recycled Water Program (RRWP), a partnership with the Los Angeles County Sanitation Districts, will purify wastewater to produce high quality water that could be used again. The RRWP would produce up to 150 MGD of purified water from the Joint Water Pollution Control Plant in Carson for groundwater replenishment, industrial use, and potentially raw water augmentation. The agencies have been working together for over 10 years on the program. As a first step toward full implementation, Metropolitan and the Sanitation Districts cooperated to complete the Advanced Purification Center in 2019. The Advanced Purification Center is a 0.5 million gallon per day demonstration facility that will generate information needed for the potential future construction of a full-scale recycled water facility. It uses a unique application of membrane bioreactors designed to significantly increase efficiency in water recycling. Scientists and engineers will test the process, utilizing full-scale treatment modules, to ensure the resulting purified water meets the highest water quality standards. Once approved by regulators, this innovative process could be used throughout California and even applied around the globe.

Metropolitan and the Sanitation Districts are continuing to move forward with the program, to enhance their partnership and begin the next phase of the program. Metropolitan's Board approved proceeding with the environmental planning phase of the project in November 2020.

**Table A.3-6**
**Metropolitan's In-Region Groundwater Storage Programs**

| Program | Metropolitan Agreement Partners | Program Term | Max Storage AF | Dry-Year Yield AF/Yr |
|---|---|---|---|---|
| Long Beach Conjunctive Use Storage Project (Central Basin) | Long Beach | June 2002-2027 | 13,000 | 4,300 |
| Foothill Area Groundwater Storage Program (Monkhill/ Raymond Basin) | Foothill MWD | February 2003-2028 | 9,000 | 3,000 |
| Orange County Groundwater Conjunctive Use Program | MWDOC<br>OCWD | June 2003-2028 | 66,000+ | 22,000 |
| Chino Basin Conjunctive Use Programs | IEUA<br>TVMWD<br>Watermaster | June 2003-2028 | 100,000 | 33,000 |
| Live Oak Basin Conjunctive Use Project (Six Basins) | TVMWD<br>City of La Verne | October 2002-2027 | 3,000 | 1,000 |
| City of Compton Conjunctive Use Project (Central Basin) | Compton | February 2005-2030 | 2,289 | 763 |
| Long Beach Conjunctive Use Program Expansion in Lakewood (Central Basin) | Long Beach | July 2005-2030 | 3,600 | 1,200 |
| Upper Claremont Basin Groundwater Storage Program (Six Basins) | TVMWD | Sept. 2005- 2030 | 3,000 | 1,000 |
| Elsinore Basin Conjunctive Use Storage Program | Western MWD<br>Elsinore Valley MWD | May 2008- 2033 | 12,000 | 4,000 |
| **Total** | | | **211,889** | **70,263** |

**Table A.3-7**
**Colorado River**
**Program Capabilities**
**Year 2025**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Basic Apportionment – Priority 4 | 550,000 | 550,000 | 550,000 |
| DCP Contribution Reduction[1] | 0 | 0 | 0 |
| IID/MWD Conservation Program | 105,000 | 105,000 | 105,000 |
| Priority 5 Apportionment (Surplus) | 0 | 0 | 0 |
| PVID Land Management, Crop Rotation, and Water Supply Program | 99,000 | 130,000 | 117,000 |
| Bard Seasonal Fallowing Program | 6,000 | 6,000 | 6,000 |
| Lower Colorado Water Supply Project | 9,000 | 9,000 | 9,000 |
| Lake Mead ICS Storage Program | 400,000 | 400,000 | 400,000 |
| Binational ICS | 17,000 | 0 | 42,000 |
| Forbearance for Present Perfected Rights | 0 | 0 | 0 |
| CVWD SWP/QSA Transfer Obligation | (50,000) | (50,000) | (50,000) |
| DWCV SWP Table A Obligation | (47,000) | (12,000) | (113,000) |
| DWCV Advance Delivery Account | 47,000 | 12,000 | 113,000 |
| IID Payback | (20,000) | (20,000) | (20,000) |
| SNWA Agreement Payback | 0 | 0 | 0 |
| ***Subtotal of Current Programs*** | ***1,116,000*** | ***1,130,000*** | ***1,159,000*** |
| **Programs Under Development** | | | |
| Additional Transfer Programs | 0 | 0 | 0 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Additional Colorado River Exchange Supplies** | | | |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 |
| Exchange with United States | 16,000 | 16,000 | 16,000 |
| ***Subtotal of Additional Colorado River Supplies*** | ***294,000*** | ***294,000*** | ***294,000*** |
| **Maximum CR Supply Capability2** | **1,410,000** | **1,424,000** | **1,453,000** |
| *Less CRA Capacity Constraint (amount above 1.25 MAF)* | *(160,000)* | *(174,000)* | *(203,000)* |
| **Maximum Expected CRA Deliveries[3]** | **1,250,000** | **1,250,000** | **1,250,000** |

[1] DCP contribution beyond capacity of ICS accounts.
[2] Total amount of supplies available without taking into consideration CRA capacity constraint.
[3] The CRA delivery capacity is 1.25 MAF annually.

**Table A.3-7**
**Colorado River**
**Program Capabilities**
**Year 2030**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Basic Apportionment – Priority 4 | 550,000 | 550,000 | 550,000 |
| DCP Contribution Reduction[1] | 0 | 0 | 0 |
| IID/MWD Conservation Program | 85,000 | 85,000 | 85,000 |
| Priority 5 Apportionment (Surplus) | 0 | 0 | 0 |
| PVID Land Management, Crop Rotation, and Water Supply Program | 130,000 | 130,000 | 117,000 |
| Bard Seasonal Fallowing Program | 6,000 | 6,000 | 6,000 |
| Lower Colorado Water Supply Project | 9,000 | 9,000 | 9,000 |
| Lake Mead ICS Storage Program | 337,500 | 337,500 | 337,500 |
| Binational ICS | 51,000 | 51,000 | 51,000 |
| Forbearance for Present Perfected Rights | (2,000) | (2,000) | (2,000) |
| CVWD SWP/QSA Transfer Obligation | (35,000) | (35,000) | (35,000) |
| DWCV SWP Table A Obligation | (49,000) | (12,000) | (113,000) |
| DWCV Advance Delivery Account | 49,000 | 12,000 | 113,000 |
| IID Payback | 0 | 0 | 0 |
| SNWA Agreement Payback | (22,000) | (22,000) | (22,000) |
| ***Subtotal of Current Programs*** | ***1,109,500*** | ***1,109,500*** | ***1,096,500*** |
| **Programs Under Development** | | | |
| Additional Transfer Programs | 0 | 0 | 0 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Additional Colorado River Exchange Supplies** | | | |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 |
| Exchange with United States | 16,000 | 16,000 | 16,000 |
| ***Subtotal of Additional Colorado River Supplies*** | ***294,000*** | ***294,000*** | ***294,000*** |
| **Maximum CR Supply Capability[2]** | **1,403,500** | **,403,500** | **1,390,500** |
| *Less CRA Capacity Constraint (amount above 1.25 MAF)* | *(153,500)* | *(153,500)* | *(140,500)* |
| **Maximum Expected CRA Deliveries[3]** | **1,250,000** | **1,250,000** | **1,250,000** |

[1] DCP contribution beyond capacity of ICS accounts.
[2] Total amount of supplies available without taking into consideration CRA capacity constraint.
[3] The CRA delivery capacity is 1.25 MAF annually.

**Table A.3-7**
**Colorado River**
**Program Capabilities**
**Year 2035**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Basic Apportionment – Priority 4 | 550,000 | 550,000 | 550,000 |
| DCP Contribution Reduction[1] | 0 | 0 | 0 |
| IID/MWD Conservation Program | 85,000 | 85,000 | 85,000 |
| Priority 5 Apportionment (Surplus) | 0 | 0 | 0 |
| PVID Land Management, Crop Rotation, and Water Supply Program | 130,000 | 130,000 | 117,000 |
| Bard Seasonal Fallowing Program | 6,000 | 6,000 | 6,000 |
| Lower Colorado Water Supply Project | 9,000 | 9,000 | 9,000 |
| Lake Mead ICS Storage Program | 337,500 | 337,500 | 337,500 |
| Binational ICS | 51,000 | 0 | 51,000 |
| Forbearance for Present Perfected Rights | (2,000) | (2,000) | (2,000) |
| CVWD SWP/QSA Transfer Obligation | (35,000) | (35,000) | (35,000) |
| DWCV SWP Table A Obligation | (51,000) | (12,000) | (113,000) |
| DWCV Advance Delivery Account | 51,000 | 12,000 | 113,000 |
| IID Payback | 0 | 0 | 0 |
| SNWA Agreement Payback | (22,000) | (22,000) | (22,000) |
| ***Subtotal of Current Programs*** | ***1,109,500*** | ***1,058,500*** | ***1,096,500*** |
| **Programs Under Development** | | | |
| Additional Transfer Programs | 0 | 0 | 0 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Additional Colorado River Exchange Supplies** | | | |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 |
| Exchange with United States | 16,000 | 16,000 | 16,000 |
| ***Subtotal of Additional Colorado River Supplies*** | ***294,000*** | ***294,000*** | ***294,000*** |
| **Maximum CR Supply Capability[2]** | **1,403,500** | **1,352,500** | **1,390,500** |
| *Less CRA Capacity Constraint (amount above 1.25 MAF)* | *(153,500)* | *(102,500)* | *(140,500)* |
| **Maximum Expected CRA Deliveries[3]** | **1,250,000** | **1,250,000** | **1,250,000** |

[1] DCP contribution beyond capacity of ICS accounts.
[2] Total amount of supplies available without taking into consideration CRA capacity constraint.
[3] The CRA delivery capacity is 1.25 MAF annually.

**Table A.3-7**
**Colorado River**
**Program Capabilities**
**Year 2040**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Basic Apportionment – Priority 4 | 550,000 | 550,000 | 550,000 |
| DCP Contribution Reduction[1] | 0 | 0 | 0 |
| IID/MWD Conservation Program | 85,000 | 85,000 | 85,000 |
| Priority 5 Apportionment (Surplus) | 0 | 0 | 0 |
| PVID Land Management, Crop Rotation, and Water Supply Program | 130,000 | 130,000 | 117,000 |
| Bard Seasonal Fallowing Program | 6,000 | 6,000 | 6,000 |
| Lower Colorado Water Supply Project | 9,000 | 9,000 | 9,000 |
| Lake Mead ICS Storage Program | 350,000 | 337,500 | 337,500 |
| Binational ICS | 0 | 0 | 0 |
| Forbearance for Present Perfected Rights | (2,000) | (2,000) | (2,000) |
| CVWD SWP/QSA Transfer Obligation | (35,000) | (35,000) | (35,000) |
| DWCV SWP Table A Obligation | (53,000) | (12,000) | (113,000) |
| DWCV Advance Delivery Account | 53,000 | 12,000 | 113,000 |
| IID Payback | 0 | 0 | 0 |
| SNWA Agreement Payback | (22,000) | (22,000) | (22,000) |
| ***Subtotal of Current Programs*** | ***1,071,000*** | ***1,058,500*** | ***1,045,500*** |
| **Programs Under Development** | | | |
| Additional Transfer Programs | 0 | 0 | 0 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Additional Colorado River Exchange Supplies** | | | |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 |
| Exchange with United States | 16,000 | 16,000 | 16,000 |
| ***Subtotal of Additional Colorado River Supplies*** | ***294,000*** | ***294,000*** | ***294,000*** |
| **Maximum CR Supply Capability[2]** | **1,365,000** | **1,352,500** | **1,339,500** |
| *Less CRA Capacity Constraint (amount above 1.25 MAF)* | *(115,000)* | *(102,500)* | *(89,500)* |
| **Maximum Expected CRA Deliveries[3]** | **1,250,000** | **1,250,000** | **1,250,000** |

[1] DCP contribution beyond capacity of ICS accounts.
[2] Total amount of supplies available without taking into consideration CRA capacity constraint.
[3] The CRA delivery capacity is 1.25 MAF annually.

**Table A.3-7**
**Colorado River**
**Program Capabilities**
**Year 2045**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Basic Apportionment – Priority 4 | 550,000 | 550,000 | 550,000 |
| DCP Contribution Reduction[1] | 0 | 0 | 0 |
| IID/MWD Conservation Program | 85,000 | 85,000 | 85,000 |
| Priority 5 Apportionment (Surplus) | 0 | 0 | 0 |
| PVID Land Management, Crop Rotation, and Water Supply Program | 130,000 | 130,000 | 117,000 |
| Bard Seasonal Fallowing Program | 6,000 | 6,000 | 6,000 |
| Lower Colorado Water Supply Project | 9,000 | 9,000 | 9,000 |
| Lake Mead ICS Storage Program | 343,750 | 343,750 | 343,750 |
| Binational ICS | 0 | 0 | 0 |
| Forbearance for Present Perfected Rights | (2,000) | (2,000) | (2,000) |
| CVWD SWP/QSA Transfer Obligation | (35,000) | (35,000) | (35,000) |
| DWCV SWP Table A Obligation | (53,000) | (12,000) | (113,000) |
| DWCV Advance Delivery Account | 53,000 | 12,000 | 113,000 |
| IID Payback | 0 | 0 | 0 |
| SNWA Agreement Payback | 0 | 0 | 0 |
| ***Subtotal of Current Programs*** | ***1,086,750*** | ***1,086,750*** | ***1,073,750*** |
| **Programs Under Development** | | | |
| Additional Transfer Programs | 0 | 0 | 0 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Additional Colorado River Exchange Supplies** | | | |
| Exchange with SDCWA | 278,000 | 278,000 | 278,000 |
| Exchange with United States | 16,000 | 16,000 | 16,000 |
| ***Subtotal of Additional Colorado River Supplies*** | ***294,000*** | ***294,000*** | ***294,000*** |
| **Maximum CR Supply Capability[2]** | **1,380,750** | **1,380,750** | **1,367,750** |
| *Less CRA Capacity Constraint (amount above 1.25 MAF)* | *(130,750)* | *(130,750)* | *(117,750)* |
| **Maximum Expected CRA Deliveries[3]** | **1,250,000** | **1,250,000** | **1,250,000** |

[1] DCP contribution beyond capacity of ICS accounts.
[2] Total amount of supplies available without taking into consideration CRA capacity constraint.
[3] The CRA delivery capacity is 1.25 MAF annually.

**Table A.3-7**
**California Aqueduct**
**Program Capabilities**
**Year 2025**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| MWD Table A [1] | 459,000 | 122,000 | 1,108,000 |
| DWCV Table A | 47,000 | 12,000 | 113,000 |
| San Luis Carryover [2] | 56,000 | 282,000 | 282,000 |
| Article 21 Supplies | 0 | 0 | 25,000 |
| San Gabriel Valley MWD Exchange and Purchase | 2,000 | 2,000 | 2,000 |
| Yuba River Accord Purchase | 12,800 | 14,000 | 6,000 |
| Central Valley Storage and Transfers | | | |
| Semitropic Program | 50,000 | 45,000 | 68,000 |
| Arvin Edison Program[3] | 0 | 0 | 0 |
| Mojave Storage Program | 0 | 0 | 0 |
| Antelope Valley/East Kern Acquisition and Storage | 20,000 | 70,000 | 70,000 |
| Kern Delta Program | 38,000 | 50,000 | 50,000 |
| Transfers and Exchanges | 50,000 | 50,000 | 50,000 |
| ***Subtotal of Current Programs*** | ***734,800*** | ***647,000*** | ***1,774,000*** |
| **Programs Under Development** | | | |
| San Bernardino Valley Water District Program | 0 | 0 | 13,000 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***13,000*** |
| **Maximum Supply Capability** | **734,800** | **647,000** | **1,787,000** |

[1] Includes Port Hueneme Lease.
[2] Includes DWCV carryover.
[3] Take and put amounts limited due to water quality considerations.

**Table A.3-7**
**California Aqueduct**
**Program Capabilities**
**Year 2030**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| MWD Table A [1] | 479,000 | 122,000 | 1,108,000 |
| DWCV Table A | 49,000 | 12,000 | 113,000 |
| San Luis Carryover [2] | 57,000 | 283,000 | 283,000 |
| Article 21 Supplies | 0 | 0 | 22,000 |
| San Gabriel Valley MWD Exchange and Purchase | 2,000 | 2,000 | 2,000 |
| Yuba River Accord Purchase | 0 | 0 | 0 |
| Central Valley Storage and Transfers | | | |
| Semitropic Program | 50,000 | 45,000 | 68,000 |
| Arvin Edison Program[3] | 0 | 0 | 0 |
| Mojave Storage Program | 0 | 0 | 0 |
| Antelope Valley/East Kern Acquisition and Storage | 43,000 | 70,000 | 70,000 |
| Kern Delta Program | 42,000 | 50,000 | 50,000 |
| Transfers and Exchanges | 50,000 | 50,000 | 50,000 |
| ***Subtotal of Current Programs*** | ***772,000*** | ***634,000*** | ***1,766,000*** |
| **Programs Under Development** | | | |
| San Bernardino Valley Water District Program | 0 | 0 | 13,000 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***13,000*** |
| **Maximum Supply Capability** | **772,000** | **634,000** | **1,779,000** |

[1] Includes Port Hueneme Lease.
[2] Includes DWCV carryover.
[3] Take and put amounts limited due to water quality considerations.

**Table A.3-7**
**California Aqueduct**
**Program Capabilities**
**Year 2035**

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| MWD Table A [1] | 499,000 | 122,000 | 1,108,000 |
| DWCV Table A | 51,000 | 12,000 | 113,000 |
| San Luis Carryover [2] | 57,000 | 283,000 | 283,000 |
| Article 21 Supplies | 0 | 0 | 20,000 |
| San Gabriel Valley MWD Exchange and Purchase | 2,000 | 2,000 | 2,000 |
| Yuba River Accord Purchase | 0 | 0 | 0 |
| Central Valley Storage and Transfers | | | |
| Semitropic Program | 50,000 | 45,000 | 68,000 |
| Arvin Edison Program[3] | 0 | 0 | 0 |
| Mojave Storage Program | 0 | 0 | 0 |
| Antelope Valley/East Kern Acquisition and Storage | 43,000 | 70,000 | 70,000 |
| Kern Delta Program | 42,000 | 50,000 | 50,000 |
| Transfers and Exchanges | 50,000 | 50,000 | 50,000 |
| ***Subtotal of Current Programs*** | ***794,000*** | ***634,000*** | ***1,764,000*** |
| **Programs Under Development** | | | |
| San Bernardino Valley Water District Program | 0 | 0 | 13,000 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***13,000*** |
| **Maximum Supply Capability** | **794,000** | **634,000** | **1,777,000** |

(acre-feet per year)

[1] Includes Port Hueneme Lease.
[2] Includes DWCV carryover.
[3] Take and put amounts limited due to water quality considerations

**Table A.3-7**
**California Aqueduct**
**Program Capabilities**
**Year 2040**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| MWD Table A [1] | 519,000 | 122,000 | 1,108,000 |
| DWCV Table A | 53,000 | 12,000 | 113,000 |
| San Luis Carryover [2] | 57,000 | 283,000 | 283,000 |
| Article 21 Supplies | 0 | 0 | 18,000 |
| San Gabriel Valley MWD Exchange and Purchase | 2,000 | 2,000 | 2,000 |
| Yuba River Accord Purchase | 0 | 0 | 0 |
| Central Valley Storage and Transfers | | | |
| Semitropic Program | 50,000 | 45,000 | 68,000 |
| Arvin Edison Program[3] | 0 | 0 | 0 |
| Mojave Storage Program | 0 | 0 | 0 |
| Antelope Valley/East Kern Acquisition and Storage | 43,000 | 70,000 | 70,000 |
| Kern Delta Program | 42,000 | 50,000 | 50,000 |
| Transfers and Exchanges | 50,000 | 50,000 | 50,000 |
| ***Subtotal of Current Programs*** | ***816,000*** | ***634,000*** | ***1,762,000*** |
| **Programs Under Development** | | | |
| San Bernardino Valley Water District Program | 0 | 0 | 13,000 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***13,000*** |
| **Maximum Supply Capability** | **816,000** | **634,000** | **1,775,000** |

[1] Includes Port Hueneme Lease.
[2] Includes DWCV carryover.
[3] Take and put amounts limited due to water quality considerations.

**Table A.3-7**
**California Aqueduct**
**Program Capabilities**
**Year 2045**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| MWD Table A [1] | 519,000 | 122,000 | 1,108,000 |
| DWCV Table A | 53,000 | 12,000 | 113,000 |
| San Luis Carryover [2] | 56,000 | 282,000 | 282,000 |
| Article 21 Supplies | 0 | 0 | 18,000 |
| San Gabriel Valley MWD Exchange and Purchase | 2,000 | 2,000 | 2,000 |
| Yuba River Accord Purchase | 0 | 0 | 0 |
| Central Valley Storage and Transfers | | | |
| Semitropic Program | 50,000 | 45,000 | 68,000 |
| Arvin Edison Program[3] | 0 | 0 | 0 |
| Mojave Storage Program | 0 | 0 | 0 |
| Antelope Valley/East Kern Acquisition and Storage | 20,000 | 70,000 | 70,000 |
| Kern Delta Program | 42,000 | 50,000 | 50,000 |
| Transfers and Exchanges | 50,000 | 50,000 | 50,000 |
| ***Subtotal of Current Programs*** | ***792,000*** | ***633,000*** | ***1,761,000*** |
| **Programs Under Development** | | | |
| San Bernardino Valley Water District Program | 0 | 0 | 13,000 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***13,000*** |
| **Maximum Supply Capability** | **792,000** | **633,000** | **1,774,000** |

[1] Includes Port Hueneme Lease.
[2] Includes DWCV carryover.
[3] Take and put amounts limited due to water quality considerations.

**Table A.3-7**
**In-Region Supplies and Programs**
**Program Capabilities**
**Year 2025**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Metropolitan Surface Storage (DVL, Mathews, Skinner) | 118,000 | 590,000 | 590,000 |
| Flexible Storage in Castaic & Perris | 43,000 | 217,000 | 217,000 |
| Groundwater Storage | | | |
| Conjunctive Use | 33,000 | 68,000 | 68,000 |
| ***Subtotal of Current Programs*** | ***194,000*** | ***875,000*** | ***875,000*** |
| **Programs Under Development** | | | |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Maximum Supply Capability** | **194,000** | **875,000** | **875,000** |

**Table A.3-7**
**In-Region Supplies and Programs**
**Program Capabilities**
**Year 2030**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Metropolitan Surface Storage (DVL, Mathews, Skinner) | 118,000 | 592,000 | 592,000 |
| Flexible Storage in Castaic & Perris | 43,000 | 217,000 | 217,000 |
| Groundwater Storage | | | |
| Conjunctive Use | 36,000 | 68,000 | 68,000 |
| ***Subtotal of Current Programs*** | ***197,000*** | ***877,000*** | ***877,000*** |
| **Programs Under Development** | | | |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Maximum Supply Capability** | **197,000** | **877,000** | **877,000** |

**Table A.3-7**
**In-Region Supplies and Programs**
**Program Capabilities**
**Year 2035**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Metropolitan Surface Storage (DVL, Mathews, Skinner) | 118,000 | 591,000 | 591,000 |
| Flexible Storage in Castaic & Perris | 43,000 | 217,000 | 217,000 |
| Groundwater Storage Conjunctive Use | 36,000 | 68,000 | 68,000 |
| ***Subtotal of Current Programs*** | ***197,000*** | ***876,000*** | ***876,000*** |
| **Programs Under Development** | | | |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Maximum Supply Capability** | **197,000** | **876,000** | **876,000** |

**Table A.3-7**
**In-Region Supplies and Programs**
**Program Capabilities**
**Year 2040**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Metropolitan Surface Storage (DVL, Mathews, Skinner) | 118,000 | 591,000 | 591,000 |
| Flexible Storage in Castaic & Perris | 43,000 | 217,000 | 217,000 |
| Groundwater Storage Conjunctive Use | 36,000 | 68,000 | 68,000 |
| ***Subtotal of Current Programs*** | ***197,000*** | ***876,000*** | ***876,000*** |
| **Programs Under Development** | | | |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Maximum Supply Capability** | **197,000** | **876,000** | **876,000** |

**Table A.3-7**
**In-Region Supplies and Programs**
**Program Capabilities**
**Year 2045**
(acre-feet per year)

| Hydrology | Five Year Drought (1988-1992) | Single Dry Year (1977) | Normal Year (1922-2017) |
|---|---|---|---|
| **Current Programs** | | | |
| Metropolitan Surface Storage (DVL, Mathews, Skinner) | 118,000 | 589,000 | 589,000 |
| Flexible Storage in Castaic & Perris | 43,000 | 217,000 | 217,000 |
| Groundwater Storage | | | |
| Conjunctive Use | 36,000 | 68,000 | 68,000 |
| ***Subtotal of Current Programs*** | ***197,000*** | ***874,000*** | ***874,000*** |
| **Programs Under Development** | | | |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** |
| **Maximum Supply Capability** | **197,000** | **874,000** | **874,000** |

**Table A.3-8**
**Colorado River**
**Supply Characterization[1] Year 2021-2025**
**Repeat of 1988-1992 Hydrologies**
(acre-feet per year)

| Hydrology | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|
| **Current Programs** | | | | | |
| Basic Apportionment – Priority 4 | 550,000 | 550,000 | 550,000 | 550,000 | 550,000 |
| DCP Contribution Reduction[2] | 0 | 0 | 0 | 0 | 0 |
| IID/MWD Conservation Program | 105,000 | 105,000 | 105,000 | 105,000 | 105,000 |
| Priority 5 Apportionment (Surplus) | 0 | 0 | 0 | 0 | 0 |
| PVID Land Management, Crop Rotation, and Water Supply Program | 42,000 | 64,000 | 130,000 | 130,000 | 130,000 |
| Lower Colorado Water Supply Project | 9,000 | 9,000 | 9,000 | 9,000 | 9,000 |
| Bard Seasonal Fallowing Program | 6,000 | 6,000 | 6,000 | 6,000 | 6,000 |
| Lake Mead ICS Storage Program | 400,000 | 400,000 | 400,000 | 100,000 | 100,000 |
| Binational ICS | 33,000 | 33,000 | 0 | 0 | 0 |
| Forbearance for Present Perfected Rights | 0 | 0 | 0 | 0 | (2,000) |
| CVWD SWP/QSA Transfer Obligation | (50,000) | (50,000) | (50,000) | (50,000) | (50,000) |
| DWCV SWP Table A Obligation | (22,000) | (95,000) | (28,000) | (45,000) | (35,000) |
| DWCV Advance Delivery Account | 22,000 | 95,000 | 28,000 | 45,000 | 35,000 |
| SNWA Agreement Payback | 0 | 0 | 0 | 0 | 0 |
| IID Payback | (20,000) | (20,000) | (20,000) | (20,000) | (20,000) |
| ***Subtotal of Current Programs*** | ***1,075,000*** | ***1,097,000*** | ***1,130,000*** | ***830,000*** | ***828,000*** |
| **Additional Colorado River Exchange Supplies** | | | | | |
| Exchange with SDCWD | 283,000 | 281,000 | 278,000 | 278,000 | 278,000 |
| Exchange with United States | 16,000 | 16,000 | 16,000 | 16,000 | 16,000 |
| ***Subtotal of Additional Colorado River Supplies*** | ***299,000*** | ***297,000*** | ***294,000*** | ***294,000*** | ***294,000*** |
| **Maximum CR Supply Capability[3]** | **1,374,000** | **1,394,000** | **1,424,000** | **1,124,000** | **1,122,000** |
| *Less CRA Capacity Constraint (amount above 1.25 MAF)* | *(124,000)* | *(144,000)* | *(174,000)* | *0* | *0* |
| ***Subtotal of CR Core Supplies*** | **919,000** | **866,000** | **996,000** | **979,000** | **987,000** |
| ***Subtotal of CR Storage*** | **331,000** | **384,000** | **254,000** | **145,000** | **135,000** |
| **Maximum Expected CRA Deliveries[4]** | **1,250,000** | **1,250,000** | **1,250,000** | **1,124,000** | **1,122,000** |

[1] Supply characterization for the Drought Risk Assessment is based on core supplies as defined in WSCP Appendix 4. Flexible and storage supplies from CR, SWP, and In-Region may be exercised as supply augmentation action to any potential core supply shortfall.
[2] DCP contribution beyond capacity of ICS accounts.
[3] Total amount of supplies available without taking into consideration CRA capacity constraint.
[4] The CRA delivery capacity is 1.25 MAF annually.

**Table A.3-8**
**California Aqueduct**
**Supply Characterization[1] Year 2021-2025**
**Repeat of 1988-1992 Hydrologies**
(acre-feet per year)

| Hydrology | 2021 | 2022 | 2023 | 2024 | 2025 |
|---|---|---|---|---|---|
| **Current Programs** | | | | | |
| MWD Table A[2] | 221,000 | 940,000 | 274,000 | 442,000 | 345,000 |
| DWCV Table A | 22,000 | 95,000 | 28,000 | 45,000 | 35,000 |
| Article 21 Supplies | 0 | 0 | 0 | 0 | 0 |
| San Gabriel Valley MWD Exchange and Purchase | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| ***Subtotal of SWP Core Supplies*** | ***245,000*** | ***1,037,000*** | ***304,000*** | ***489,000*** | ***382,000*** |
| San Luis Carryover[3] | 200,000 | 0 | 69,000 | 0 | 0 |
| Yuba River Accord Purchase | 14,000 | 11,000 | 14,000 | 11,000 | 14,000 |
| Central Valley Storage and Transfers | | | | | |
| Semitropic Program | 40,000 | 0 | 40,000 | 44,000 | 41,000 |
| Arvin Edison Program[4] | 0 | 0 | 0 | 0 | 0 |
| Mojave Storage Program | 0 | 0 | 0 | 0 | 0 |
| Antelope Valley/East Kern Acquisition and Storage | 27,000 | 0 | 27,000 | 0 | 11,000 |
| Kern Delta Program | 50,000 | 0 | 50,000 | 50,000 | 40,000 |
| Transfers and Exchanges | 50,000 | 50,000 | 50,000 | 50,000 | 50,000 |
| ***Subtotal of SWP Flexible and Storage Programs*** | ***381,000*** | ***61,000*** | ***250,000*** | ***155,000*** | ***156,000*** |
| **Programs Under Development** | | | | | |
| San Bernardino Valley Water District Program | 0 | 0 | 0 | 0 | 0 |
| ***Subtotal of Proposed Programs*** | ***0*** | ***0*** | ***0*** | ***0*** | ***0*** |
| **Maximum Supply Capability** | **626,000** | **1,098,000** | **554,000** | **644,000** | **538,000** |

[1] Supply characterization for the Drought Risk Assessment is based on core supplies as defined in WSCP Appendix 4. Flexible and storage supplies from CR, SWP, and In-Region may be exercised as supply augmentation action to any potential core supply shortfall.
[2] Includes Port Hueneme lease.
[3] Includes DWCV carryover.
[4] Take and put amounts limited due to water quality considerations.

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# Appendix 4

# WATER SHORTAGE CONTINGENCY PLAN

# Appendix 4
# WATER SHORTAGE CONTINGENCY PLAN

This Water Shortage Contingency Plan (WSCP) complies with California Water Code (CWC) Section 10632, which requires that every urban water supplier shall prepare and adopt a WSCP as part of its urban water management plan (UWMP). Section 10632.2 provides, "An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan...or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1." Notwithstanding, the CWC does not prohibit an urban water supplier from taking actions not specified in its WSCP, if needed, without having to formally amend its UWMP or WSCP.

The WSCP is a guide for the Metropolitan Water District of Southern California's (Metropolitan's) intended actions during water shortage conditions. It is meant to improve preparedness for droughts and other impacts on water supplies by describing the process used to address varying degrees of water shortages. Certain elements of the WSCP are required by the CWC, including response actions that align with six standard water shortage levels based on water supply conditions, as well as shortages resulting from catastrophic supply interruptions. The WSCP also describes Metropolitan's procedures for conducting an Annual Water Supply and Demand Assessment (Annual Assessment) that is required by CWC Section 10632.1 and is to be submitted to the California Department of Water Resources (DWR) on or before July 1 of each year, or within 14 days of receiving final allocations from the State Water Project (SWP), whichever is later.

Metropolitan's WSCP is included as Appendix 4 to its 2020 UWMP which will be submitted to DWR by July 1, 2021. However, this WSCP is created separately from Metropolitan's 2020 UWMP and can be amended, as needed, without amending the UWMP.

### *Organization of this Document*

The WSCP covers the required elements as set forth by CWC Section 10632. Because Metropolitan is a wholesale urban water supplier, elements that pertain only to retail water suppliers are not addressed in this WSCP.[1] The document contains eight sections. Section A.4.1 is an introduction that explains the purpose of the WSCP and provides background on Metropolitan's service area and system. Section A.4.2 is a summary of the water supply analysis and water reliability findings from the 2020 UWMP, pursuant to CWC Section 10635. Section A.4.3 is a description of procedures to conduct and approve the Annual Assessment. Section A.4.4 explains the WSCP's six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, 50, and more than 50 percent shortages and describes the WSCP's shortage response actions that align with the defined shortage levels. Section A.4.5 addresses communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments regarding any current

[1] WSCP elements that apply specifically to retailer water suppliers are: (1) a description of customer compliance, enforcement, appeal, and exemption procedures for triggered response actions (CWC Section 10632(a)(6)); (2) a description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1 (CWC Section 10632(a)(8)(c)); and (3) monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements (CWC Section 10632(a)(9)).

or predicted shortages and any resulting shortage response actions. Section A.4.6 is a description of the legal authorities that enable Metropolitan to implement and enforce its shortage response actions. Section A.4.7 is a description of the financial consequences of and responses for drought conditions. Section A.4.8 addresses reevaluation and improvement procedures for monitoring and evaluating the functionality of the WSCP and describes the process to adopt, submit, and amend the WSCP.

### A.4.1 Background Information on Metropolitan

#### *Background*

Metropolitan is a public agency organized in 1928 by a vote of the electorate of 13 Southern California cities. The agency was enabled by the adoption of the original Metropolitan Water District Act (MWD Act) by the California Legislature "for the purpose of developing, storing, and distributing water for domestic purposes." The MWD Act also allows Metropolitan to sell "surplus water not needed or required for domestic or municipal uses within the district for beneficial purposes." In 1992, the Metropolitan Board of Directors adopted the following mission statement:

> *"To provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way."*

Water used in Southern California comes from several sources. The investments that Metropolitan has made and its ongoing efforts in many different areas coalesce toward its goal of long-term regional water supply reliability. The first function of Metropolitan was building the Colorado River Aqueduct (CRA) to convey water from the Colorado River. Deliveries through the CRA to member agencies began in 1941 and supplemented the local water supplies of the Southern California member cities. In 1960, to meet growing water demands in its service area, Metropolitan contracted with DWR for participation in the SWP, which delivers water to Metropolitan's service area via the California Aqueduct. SWP deliveries began in 1972. Metropolitan currently receives imported water from both of these sources: (1) Colorado River via the CRA, and (2) the SWP via the California Aqueduct. Beyond its core imported supplies from the Colorado River and SWP, Metropolitan actively supports efforts to develop storage and groundwater management programs, and to increase conservation, water recycling, groundwater recovery, and seawater desalination projects.

#### *Service Area*

Metropolitan's service area covers the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the city of Oxnard to the north to the international boundary with Mexico to the south, and it reaches as far as 70 miles inland from the coast. The total area served is approximately 5,200 square miles, and it includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Table A.4-1 shows that although only 14 percent of the land area of the six Southern California counties is within Metropolitan's service area, approximately 86 percent of the population of those counties resides within Metropolitan's boundaries.

**Table A.4-1**
**July 1, 2020 Area and Population in the**
**Six Counties of Metropolitan's Service Area**

| County | Total County | In Metropolitan Service Area | Percent in Metropolitan |
|---|---|---|---|
| Land Area (Square Miles) | | | |
| Los Angeles County | 4,061 | 1,408 | 35% |
| Orange County | 789 | 699 | 89% |
| Riverside County | 7,208 | 1,057 | 15% |
| San Bernardino County | 20,052 | 242 | 1% |
| San Diego County | 4,200 | 1,420 | 34% |
| Ventura County | 1,845 | 365 | 20% |
| **Metropolitan's Service Area** | **38,155** | **5,191** | **14%** |
| Population (Persons) | | | |
| Los Angeles County | 10,172,000 | 9,275,000 | 91% |
| Orange County | 3,191,000 | 3,184,000 | 100% |
| Riverside County | 2,449,000 | 1,813,000 | 74% |
| San Bernardino County | 2,184,000 | 872,000 | 40% |
| San Diego County | 3,352,000 | 3,261,000 | 97% |
| Ventura County | 841,000 | 630,000 | 75% |
| **Metropolitan's Service Area** | **22,189,000** | **19,035,000** | **86%** |

Metropolitan is currently composed of 26 member agencies, including 14 cities, 11 municipal water districts, and one county water authority. Metropolitan is a water wholesaler with no retail customers. It provides treated and untreated water to its member agencies.

Metropolitan's 26 member agencies deliver to their customers a combination of local groundwater, local surface water, recycled water, desalinated seawater, and imported water received from Metropolitan. For some member agencies, Metropolitan supplies all the water used within that agency's service area, while others obtain varying amounts of water from Metropolitan to supplement local supplies. Between 2011 and 2020, Metropolitan has provided between 40 and 50 percent of the municipal, industrial, and agricultural water used in its service area. The remaining water supply comes from local wells, local surface water, recycling, and the city of Los Angeles' aqueducts from the Owens Valley/Mono Basin east of the Sierra Nevada. Member agencies also implement conservation programs that can be considered part of their supplies.

Some member agencies provide retail water service, while others provide water to their local area as wholesalers. Table A.4-2 shows Metropolitan's member agencies and the type of service that they provide. As shown in the table, 15 member agencies provide retail service to customers, nine provide only wholesale service, and two provide a combination of both. Metropolitan's member agencies serve residents in 152 cities and 89 unincorporated communities. Throughout Metropolitan's service area, approximately 250 retail water suppliers directly serve the population.

**Table A.4-2**
**Metropolitan's Member Agencies and Type of Water Service Provided**

| Member Agency | Retail or Wholesale |
|---|---|
| **Los Angeles County** | |
| Beverly Hills, City of | Retail |
| Burbank, City of | Retail |
| Central Basin Municipal Water District | Wholesale |
| Compton, City of | Retail |
| Foothill Municipal Water District | Wholesale |
| Glendale, City of | Retail |
| Las Virgenes Municipal Water District | Retail |
| Long Beach, City of | Retail |
| Los Angeles, City of | Retail |
| Pasadena, City of | Retail |
| San Fernando, City of | Retail |
| San Marino, City of | Retail |
| Santa Monica, City of | Retail |
| Three Valleys Municipal Water District | Wholesale |
| Torrance, City of | Retail |
| Upper San Gabriel Valley Municipal Water District | Wholesale |
| West Basin Municipal Water District | Wholesale |
| **Orange County** | |
| Anaheim, City of | Retail |
| Fullerton, City of | Retail |
| Municipal Water District of Orange County | Wholesale |
| Santa Ana, City of | Retail |
| **Riverside County** | |
| Eastern Municipal Water District | Retail & Wholesale |
| Western Municipal Water District | Retail & Wholesale |
| **San Bernardino County** | |
| Inland Empire Utilities Agency | Wholesale |
| **San Diego County** | |
| San Diego County Water Authority | Wholesale |
| **Ventura County** | |
| Calleguas Municipal Water District | Wholesale |

### *Reliability Planning*

Metropolitan continuously engages in planning for various aspects of its water management, including operations, long-term reliability, and emergency response. These planning efforts include the 1996 Integrated Water Resources Plan (IRP) and its three updates in 2004, 2010, and 2015; the 2020 IRP (currently in development); the WSCP; the Water Surplus and Drought Management (WSDM) Plan; the Water Supply Allocation Plan (WSAP); the Emergency Storage Objective; and the Seismic Risk Assessment and Mitigation Plan. Collectively, they provide a policy framework, operating guidelines, and resource targets for Metropolitan to ensure regional water supply reliability.

The IRP is Metropolitan's evolving long-term plan to assure adequate water supplies for Southern California. The first IRP was adopted in 1996 to address the complexity of developing, maintaining and delivering water to meet changing demands in the face of growing challenge. The IRP has been updated several times over the past 25 years. In 2020, Metropolitan started development of a new IRP that incorporates planning for multiple future scenarios to address an extended range of uncertainty. While Metropolitan coordinates regional supply planning through its inclusive IRP process, Metropolitan's member agencies also conduct their own planning analyses, including their own urban water management plans, and may develop projects independently of Metropolitan.

The WSCP is designed to be consistent with the WSDM Plan and the WSAP described below. Throughout the year, Metropolitan evaluates member agency demands, available water supplies, and existing water storage levels on a monthly basis to determine the appropriate actions identified in the WSDM Plan.

The 1999 WSDM Plan provides policy guidance for managing regional water supplies during surplus and shortage conditions. Similar in concept to the WSCP, the WSDM Plan provides an overall vision for operational supply management and characterizes a flexible sequence of actions to minimize the probability of severe shortages and reduce the likelihood of extreme shortages. WSDM Plan principles guide the specific actions to be taken under WSCP shortage stages (see section A.4.4). Data collection, continual analysis, and monthly reporting processes of WSDM Plan implementation will form the basis for Metropolitan's Annual Water Supply Demand Assessment that will be provided annually to the state beginning in July 2022. The WSDM Plan is included as Attachment A to this WSCP.

The WSAP is Metropolitan's policy and formula for equitably allocating available water supplies to the member agencies during extreme water shortages when Metropolitan determines it is unable to meet all of its demands. The WSAP is included as Attachment B to this WSCP.

The Emergency Storage Objective is the regional planning estimate for emergency storage, which represents the amount of water that Metropolitan would hold in storage for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California: the CRA, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. In 2019, Metropolitan and its member agencies completed a process to update the planning estimate of Metropolitan's Emergency Storage Objective. The emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

Beginning January 2020, CWC Section 10632.5 mandates urban water suppliers to include in their UWMP a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, this requirement was addressed as part of developing its resilience strategy and is presented in detail in Metropolitan's seismic resiliency reports in Appendix 9 to the 2020 UWMP, which are incorporated herein by reference.

### A.4.2. Analysis of Water Supply Reliability

Besides the WSCP, the Urban Water Management Planning Act requires suppliers to conduct two other planning analyses to evaluate supply reliability. The first is a Water Reliability Assessment that compares the total water supply sources available to the water supplier with long-term projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The second is a Drought Risk Assessment that evaluates a drought period that lasts five consecutive water years starting from the year following when the assessment is conducted.

Metropolitan completed its Water Reliability Assessment and Drought Risk Assessment as part of the 2020 UWMP. Through the Water Reliability Assessment, Metropolitan determined that, under the conditions required by the Urban Water Management Planning Act, it has supply capabilities sufficient to meet expected demands from 2025 through 2045 under a single dry-year condition and a period of drought lasting five consecutive water years, as well as in a normal water year hydrologic condition. Metropolitan's near-term Drought Risk Assessment revealed that its supply capabilities are expected to exceed its projected water use for the year 2022. However, estimates of projected water supply and use reveal that there could be a possible shortfall of core supplies in 2021, 2023, 2024, and 2025. This shortfall is largely triggered by the assumed low supply conditions from the SWP under a repeat of the historical condition of 1988 to 1992, which is modeled at 12% for 2021, 15% for 2023, 23% for 2024, and 18% for 2025. Actual supply conditions for the next five years may prove different from historic supply conditions. The WSCP shows Metropolitan's potential shortage response actions if such shortfalls were to happen. The Drought Risk Assessment projected supplies and demands for the years 2021 through 2025 using the driest five-year sequence.

Metropolitan's principal sources of water supplies are the SWP and the Colorado River. Metropolitan receives water delivered from the SWP under State Water Contract provisions, including contracted supplies, use of carryover storage in San Luis Reservoir, and surplus supplies. Metropolitan holds rights to Colorado River water for CRA diversion at Lake Havasu. Water management programs supplement these Colorado River supplies. To secure additional supplies, Metropolitan has groundwater banking partnerships and water transfer and storage arrangements within and outside its service area.

Hydrologic conditions and environmental regulations can have a significant impact on Metropolitan's imported water supply sources. For Metropolitan's SWP supplies, precipitation in California's northern Sierra Nevada during the fall and winter helps replenish storage levels in Lake Oroville, a key SWP facility. The source of Metropolitan's Colorado River supplies is primarily the watersheds of the Upper Colorado River Basin in the states of Colorado, Utah, and Wyoming. Although precipitation is primarily observed in the winter and spring, summer storms are common and can affect water supply conditions. Hydrologic variability, potential climate change, and regulatory risk are embedded in Metropolitan's modeling efforts. Metropolitan's modeling utilizes historical hydrologic conditions from 1992 to 2017 to simulate expected demands on Metropolitan supplies, as well as capacities and constraints of its storage facilities and supply programs. While potential impacts from climate change remain subject to study and debate, climate change is among the uncertainties that Metropolitan seeks to address through its various planning processes. Metropolitan's 2020 IRP is further addressing ways to account for and mitigate these uncertainties.

As demonstrated by the findings of both the Water Reliability Assessment and the Drought Risk Assessment, Metropolitan is able to mitigate the challenges posed by hydrologic variability, potential climate change, and regulatory risk on its imported supply sources through the significant storage capabilities it has developed over the last two decades, both dry-year and emergency storage.

### A.4.3. Annual Water Supply and Demand Assessment Procedures

As an urban water supplier, Metropolitan is required under CWC Section 10632(a)(2) to prepare and submit an "annual water supply and demand assessment" (Annual Assessment). The Annual Assessment is a determination of Metropolitan's near-term outlook for supplies and demands and how a perceived shortage may relate to WSCP shortage stage response actions in the current calendar year. This determination will be based on known circumstances and information available to Metropolitan at the time of analysis. Starting in 2022, the Annual Assessment will be due by July 1 of every year, as indicated by CWC Section 10632.1. CWC Section 10632.1 also states that "*[a]n urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later*." The Annual Assessment and related reporting are to be conducted based on the procedures described in this WSCP. This section describes Metropolitan's procedures for conducting the Annual Assessment, which include: (1) the written decision-making process to determine water supply reliability; and (2) the key data inputs and assessment methodology to evaluate water supply reliability for the current year and one dry year.

#### *Steps to Approve the Annual Assessment Determination*

The Annual Assessment will be primarily based on Metropolitan's ongoing WSDM supply-demand tracking process which is exhibited in monthly reporting to the Board of Directors throughout the year. WSDM planning activities involve examination of developing demand and supply conditions for the calendar year, as well as considerations of potential actions consistent with the WSDM Plan. These monthly analyses provide key information for Metropolitan to manage resources to meet a range of estimated demands and adjust to changing conditions throughout the year.

As a water supply wholesaler, Metropolitan's water demands are a function of retail-level demands and local water production. Water from Metropolitan serves as a supplemental source of supply for its 26 member agencies. For many member agencies, their primary source of water is produced locally from groundwater basins, surface reservoirs, recycled water projects, groundwater recovery projects, and seawater desalination. When local supplies are not enough to meet retail demands, member agencies purchase supplemental water from Metropolitan. Some member agencies rely heavily on Metropolitan due to limited local supplies. As described below, Metropolitan collects estimates of projected consumptive and replenishment water demands from its member agencies. This information is adjusted to determine unconstrained demands for the purpose of the Annual Assessment shortage percentage evaluation.

By June, Metropolitan staff will present a completed Annual Assessment for approval by the Board of Directors or by the Board's authorized designee with expressly delegated authority for approval of Annual Assessment determinations. This presentation will include a request that the approval of the Annual Assessment determination also appropriately triggers any recommended specific shortage response actions resulting from the assessment. Upon approval, Metropolitan staff will then formally submit the Annual Assessment to DWR by July 1. Figure A.4-1 provides a graphic representation of the decision-making process.

**Figure A.4-1**
**Sample Annual Assessment Decision-Making Timeline**

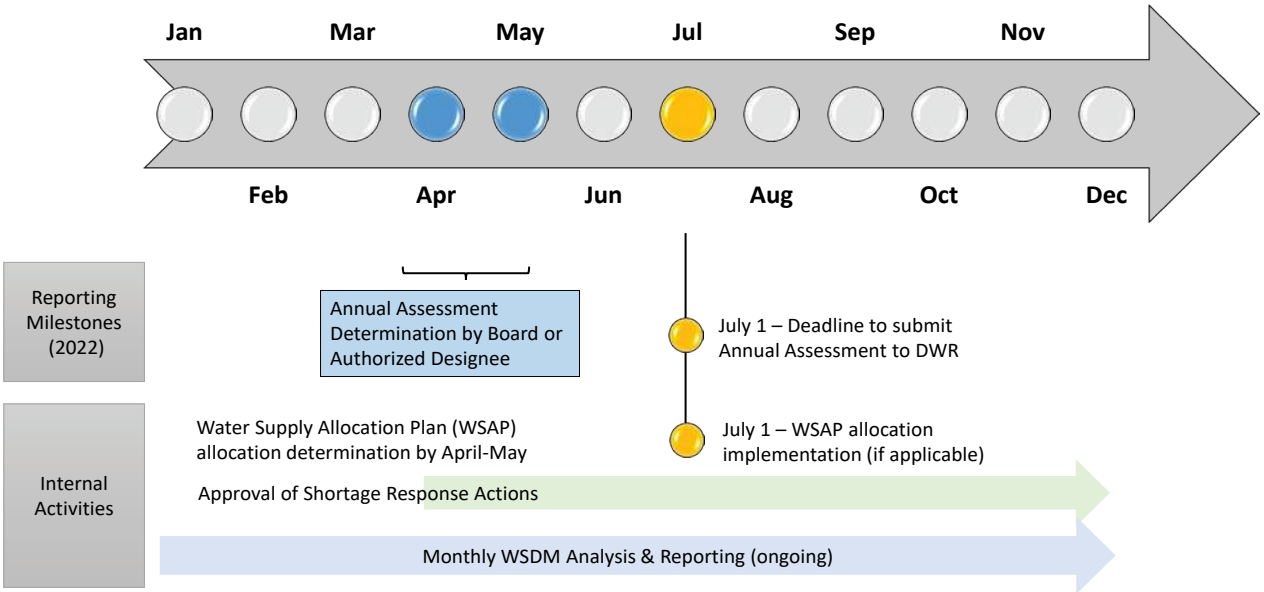


## *Data Inputs and Assessment Methodology*

This section describes how Metropolitan will evaluate water supply reliability for the current year and one dry year for the purpose of the Annual Assessment. The Annual Assessment determination will be based on considerations of available core water supplies, unconstrained water demand, and infrastructure considerations. The difference between core water supplies and unconstrained demand will be used to determine what, if any, shortage stage is expected under the WSCP framework. The standard shortage stage percentage will be calculated by dividing the difference between core supplies and unconstrained demand by unconstrained demand. This calculation will be performed separately for anticipated current year conditions and for an assumed dry year condition.

### *Locally Applicable Evaluation Criteria*

Because shortages are based on the difference between expected core supplies and unconstrained demand under current year and dry year conditions, the locally-applicable evaluation criteria to be used in the Annual Assessment for determining a shortage include the following:

- Characterization of current year and dry year scenarios based on best-available data, including anticipated hydrologic conditions for Metropolitan's supply source watersheds in the Colorado River basin and Northern California, as well as for local conditions in Metropolitan's service area in Southern California.
- Estimation of available core supplies (see below) for current year and dry year scenarios
- Estimation of unconstrained demands (see below) for current year and dry year scenarios

Together, these three criteria provide the necessary information to calculate shortage percentages by dividing the difference between core supplies and unconstrained demand by unconstrained demand, under current year and dry year scenarios. These criteria findings will also be given additional context and influenced by infrastructure considerations discussed below which will differ from year to year.

The information and analyses that comprise the Annual Assessment will be based on ongoing planning processes that include the monthly WSDM supply-demand reporting. The Annual Assessment represents a mid-year evaluation at a given point in time; even after formal approval and submittal of the Annual Assessment determination by July 1, Metropolitan will continue to monitor emerging supply and demand conditions and take appropriate actions consistent with the flexibility and adaptiveness inherent to this WSCP. Some locally-applicable conditions that affect Metropolitan's wholesale supply and demand, such as the Higher Priority Water Use Adjustment for Colorado River use (see below), local supply production, annual SWP allocations, the status of Metropolitan storage accounts, the status of the local groundwater basins, changed water use practices, and local economic activity entail a high degree of uncertainty and can differ significantly from earlier projections throughout the year.

### *Description and Quantification of Each Source of Water Supply (Core Supplies)*

Metropolitan's core water supplies are counted as the supply component of the Annual Assessment. Core supplies include estimated water supplies from the Colorado River and the SWP for the current year. Imported core supplies vary from year to year and are influenced by annual weather and hydrology, as well as demand by other higher priority users and operational and regulatory factors.

Because core supplies are used every year, they are differentiated from the WSCP's shortage response actions for supply augmentation; supply augmentation actions are comprised of Metropolitan's portfolio of water storage reserves and flexible supply sources that are available on an as-needed basis.

Metropolitan's core supplies come from several programs, which are shown in Table A.4-3 and described below.

**Table A.4-3**
**Core Water Supplies**

| Source | Core Supply |
|---|---|
| **Colorado River** | Colorado River Basic Apportionment<br>Higher Priority Water Use Adjustment to Colorado River Basic Apportionment<br>IID/MWD Conservation Program<br>PVID Fallowing Program<br>Bard Water District Seasonal Fallowing Program<br>Lower Colorado Water Supply Project<br>Exchange with SDCWA<br>Exchange with the United States |
| **State Water Project** | MWD SWP Table A<br>SWP Article 21 Interruptible Supplies<br>SWP Port Hueneme Lease of Ventura Table A<br>Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs<br>San Gabriel Valley Municipal Water District Program |

## Colorado River

### *Colorado River Basic Apportionment*

Metropolitan built, owns, and operates the 242-mile CRA. The CRA originates at Lake Havasu on the Colorado River and winds through a series of pump stations and reservoirs through the California desert to its terminal reservoir at Lake Mathews in Riverside County. The CRA has a full delivery capacity of about 1.25 MAF.

The state of California holds a 4.4 MAF per year normal apportionment to Colorado River water. Metropolitan has the Fourth Priority right to normal apportionment of 550,000 AF per year of the State's normal apportionment. Metropolitan also holds the Fifth Priority right for an additional 662,000 AF per year which is utilized during surplus conditions or when supplies from other Colorado River users are available.

### *Higher Priority Water Use Adjustment to Metropolitan's Colorado River Basic Apportionment*

Entitlements to use Colorado River water in California under priorities 1, 2, and 3 are limited to 3.85 MAF per year. Priority 3(a) is held by the Imperial Irrigation District and the Coachella Valley Water District (CVWD) totaling 3.43 MAF. After accounting for contractual conservation and transfers, any unused volume available to Priority 3(a) becomes available for use by Metropolitan. Of the 3.85 MAF, the remaining 420,000 AF is available for use under priorities 1, 2, and 3(b) held by the Palo Verde Irrigation District and the Yuma Project lands

within California. Any unused amount from this volume is available for use by Metropolitan, however, Metropolitan must forego its otherwise available Colorado River supplies to meet annual uses under priorities 1, 2, and 3(b) that are in excess of 420,000 AF. Lastly, there are additional high-priority "present perfected rights" within California not incorporated into the priorities, for which Metropolitan must forego its otherwise available Colorado River supplies to meet uses of present perfected rights that exceed 14,500 AF. The net sum of these volumes is the "higher priority water use adjustment" to Metropolitan's base supply.

### *Imperial Irrigation District-Metropolitan Conservation Program*

Since 1988, Metropolitan has funded water conservation programs within Imperial Irrigation District's (IID) service area. The amount of water conserved from these programs is then transferred to Metropolitan. Conservation approaches range from distribution system improvements (such as canal lining, spill capture and the installation of non-leak irrigation gates) to efficient on-farm water management practices (such as delivering water to farmers on a 12-hour rather than a 24-hour basis). Through this program, a total of 105,000 AF per year of water is conserved and made available to Metropolitan.

### *Palo Verde Irrigation District Land Management, Crop Rotation and Water Supply Program*

In 2005, Metropolitan entered a 35-year program with the Palo Verde Irrigation District (PVID). Under the program, participating farmers in PVID are paid to reduce their water use by leaving acreage unirrigated. A base amount of 25 percent of the program acreage must be fallowed every year. Metropolitan may elect to call for additional acreage to be fallowed up to 90.3%. Fallowing calls must be made at least one year in advance by July 31 of each year and would take effect on August 1 of the following year. The reduced consumptive use due to fallowed lands reduces uses under priorities 1, 2, and 3(b), thereby increasing the Colorado River water supply available to Metropolitan. The fallowing program saves a minimum of 33,000 AF per year and up to 133,000 AF in certain years.

### *Metropolitan/Bard Seasonal Fallowing Program*

At its December 2019 meeting, Metropolitan's Board authorized a 7-year seasonal fallowing program with the Bard Water District (Bard). Under the program, participating farmers in Bard are being paid to reduce their water use by not irrigating a portion of their land. A maximum of 3,000 acres can be fallowed in any given year. Under the terms of the QSA, water savings within the Bard service area are made available to Metropolitan. Bard Unit, as part of the Yuma Project, has the first priority for Colorado River water under the water delivery contracts with the USBR. Implementation of the program began in March 2020. It is estimated that the Seasonal Fallowing Program would provide up to 6,000 AF per year of additional Colorado River water. This water would be available in any year as needed and in accordance with the provisions described in the agreements with Bard Unit farmers and Bard.

### *Lower Colorado Water Supply Project*

Groundwater is pumped by the Lower Colorado Water Supply Project near the All-American Canal and is discharged to the Canal. IID reduces its net diversions of Colorado River water by an amount equal to the amount of Project water discharged into the Canal, permitting entities along the Colorado River that do not have rights or have insufficient rights to divert Colorado River water to obtain a supply of water. In 2007, Metropolitan entered into a contract with the USBR and the City of Needles to utilize the unused Project capacity.

### *Exchange with the San Diego County Water Authority (SDCWA)*

SDCWA has acquired conserved Colorado River water reaching an annual volume of 277.7 TAF by 2023. SDCWA makes this water available at Lake Havasu for Metropolitan diversion, where Metropolitan takes possession of the water and provides a matching volume from Metropolitan's blended supplies to SDCWA by exchange in equal monthly amounts. The conserved water is acquired by SDCWA through its transfer agreement with IID and from the lining of the All-American and Coachella canals.

Under the transfer agreement with IID, the stabilized annual transfer volume of 200 TAF is generated from conservation of water through on-farm efficiency conservation arrangements made by IID with its customers and other system efficiency measures.

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006 and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal and was completed in 2009, conserving 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for Coachella Canal Lining Project mitigation.

### *Exchange with the United States*

Of the 16 TAF allocated to the San Luis Rey Settlement Parties from the All-American and Coachella canal lining projects, the United States furnishes this water at Metropolitan's Colorado River Intake on Lake Havasu. Metropolitan takes possession of the water and by exchange delivers an equal volume of Metropolitan's blended supplies to SDCWA. By separate agreement, SDCWA conveys the water to the San Luis Rey Settlement Parties. So long as water conserved by the All-American Canal Lining Project and Coachella Canal Lining Project is allocated to and available for use by the San Luis Rey Settlement Parties, the United States will make 16 TAF available for diversion by Metropolitan in perpetuity.

## ***State Water Project***

### *Table A Contract Amount*

In accordance with its participation contract with DWR, Metropolitan's basic contract amount is for 1,911,500 AF per year. This represents the amount of water supply that would be available to Metropolitan in years where there is sufficient water supply for the SWP to deliver 100 percent of its total contract amounts. The amount of supply actually available on an annual basis is allocated to the State Water Contractors based on their proportionate Table A amounts.

DWR estimates the amount of supplies that are available each year. Metropolitan uses a forecasting method for SWP deliveries based on historical patterns of precipitation, runoff and actual deliveries of water. Annual SWP allocations have ranged from 5 percent to 100 percent of the Table A contract amounts.

### *Article 21 Interruptible Supplies*

Metropolitan has a contract to water supplies that are made available on an intermittent basis. Storm flows can occasionally make water supplies available that are in excess to the Table A allocation. State Water Contractors can take delivery of these supplies, with their

rights being based on their proportional Table A contract amounts. Historically, Article 21 interruptible supplies have ranged from 0 to 240,000 AF annually.

### *SWP Port Hueneme Lease of Ventura Table A*

Metropolitan has a right to delivery of up to 1,850 AF of Table A supply from the Ventura County Watershed Protection District (Ventura), one of 29 SWP contractors, via a sublease agreement with the Port Hueneme Water Agency (Port Hueneme). United Water Conservation District, one of three agencies holding a contract right to Ventura Table A supply, leases this portion of their total 5,000 AF of Table A supply to Port Hueneme, which in turn subleases the Table A supply to Metropolitan. The long-term lease is a condition of the 1996 annexation of the Port Hueneme service area to Calleguas Municipal Water District and Metropolitan. This water supply is in addition to Metropolitan's Table A, and the amount available each year is determined by the SWP allocation, with 1,850 AF available at a 100 percent allocation.

### *Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs*

The Desert Water Agency (DWA) and CVWD, both in Riverside County, have rights to SWP deliveries, but do not have any physical connections to the SWP facilities. Both agencies are adjacent to the CRA. For DWA and CVWD to obtain water equal to their SWP allocations, Metropolitan has agreed to exchange an equal quantity of its Colorado River water for DWA and CVWD's SWP water. DWA has a SWP Table A contract right of 55.75 TAF per year, and CVWD has a SWP Table A contract right of 138.35 TAF per year, for a total of 194.1 TAF per year. Additionally, CVWD has a long-term water supply agreement for 9.5 to 16.5 TAF annually from Rosedale Rio-Bravo Water Storage District.

Under the existing agreements, Metropolitan provides water from its CRA to DWA and CVWD in exchange for SWP deliveries. Metropolitan can deliver additional water to its DWA/CVWD service connections, permitting these agencies to store water. When supplies are needed, Metropolitan can then receive its full Colorado River supply, as well as the SWP allocation from the two agencies, while the two agencies can rely on the stored water for meeting their water supply needs. The amount of DWA and CVWD SWP Table A water available to Metropolitan depends on total SWP deliveries and varies from year to year.

In addition to their Table A and long-term water supplies, DWA and CVWD, subject to available capacity, may take delivery of SWP supplies available under Article 21, the Turn-back Pool Program, and non-SWP water supplies they may acquire and convey through the SWP facilities. These other supplies are delivered to DWA and CVWD by exchange with Metropolitan in the same manner as Table A deliveries. DWA and CVWD are participants in the Yuba Dry Year Water Purchase Program. Additionally, DWA participated in the 2009 Drought Water Bank and the 2015-2016 Multi-Year Water Pool Demonstration Program.

### *San Gabriel Valley Municipal Water District Program*

The San Gabriel Valley Municipal Water District Program allows Metropolitan to exchange supplies to provide additional water for normal and dry year needs. Under this program, Metropolitan delivers supplies to the City of Sierra Madre, a San Gabriel Valley Municipal Water District member agency. In exchange for Metropolitan delivering one AF, San Gabriel Valley Municipal Water District returns two AF to Metropolitan in the Main San Gabriel Basin, up to 5 TAF. For any exchange amount less than 5 TAF, Metropolitan purchases the balance of the 5 TAF. The program provides increased reliability to Metropolitan by allowing additional water to be delivered to Metropolitan member agencies that rely upon the Main San Gabriel

Basin for their supplies – Three Valleys Municipal Water District and Upper San Gabriel Valley Municipal Water District.

### *Unconstrained Demands*

For the purpose of the Annual Assessment and WSCP, CWC Section 10632(a)(2)(B)(i) directs Metropolitan to use current year "unconstrained demand" when assessing water supply reliability. The WSCP and Annual Assessment define unconstrained demand as expected water use in the current assessment year, based on recent water use, and before any projected shortage response actions that may be taken under the WSCP. Unconstrained demand is distinguished from observed demand, which may be constrained by preceding, ongoing, or future actions, such as emergency supply allocations during a multi-year drought. WSCP shortage response actions, if any are in place, that result in extraordinary demand reductions in the current year to constrain demand are inherently extraordinary; routine activities such as ongoing conservation programs and regular operational adjustments are not considered as constraints on demands.

To forecast near-term demands, Metropolitan begins by gathering data from its member agencies. In July of each year, member agencies submit their five-year demand forecasts to Metropolitan. Metropolitan uses this information as the foundation for forecasting demands. As the year progresses, the member agency forecasts are compared to the current demand trend. This comparison allows Metropolitan to adjust member agency forecasts to current conditions, while collaborating with member agencies as needed.

Metropolitan builds upon member agency demand projections to develop its own near-term forecast for its monthly WSDM supply-demand reporting. This forecast considers additional factors such as historical demand trends, changes in local supply production, weather trends, water-use efficiency trends, retail demand estimates, and updated estimates from member agencies.

Because these forecasted demands would be "constrained" observed demands rather than unconstrained demands, Metropolitan will adjust its near-term demand forecast for the Annual Assessment to account for extraordinary demand management measures that Metropolitan may intend or have already put into effect for the current year. Extraordinary demand management measures may include intensified communication and public outreach, and shortage allocations to its member agency customers through implementation of Metropolitan's WSAP. Non-extraordinary water savings from regular conservation and community outreach activities are considered part of Metropolitan's baseline demands and are not counted again for assessments of unconstrained demand.

### *Water Conditions for Current Year Available Supply Considering Current Year Conditions and One Dry Year*

CWC Section 10632(a)(2)(B)(ii) requires the Annual Assessment to determine "*current year available supply, considering hydrological and regulatory conditions in the current year and one dry year.*" The Annual Assessment will include two separate estimates of Metropolitan's annual water supply and unconstrained demand using: 1) current year conditions, and 2) assumed dry year conditions. Accordingly, the Annual Assessment's shortage analysis will present separate sets of findings for the current year and dry year scenarios. The CWC does not specify the characteristics of a dry year, allowing discretion to the Supplier. Metropolitan will use this discretion to refine and update its assumptions for a dry year scenario in each Annual Assessment as information becomes available.

In the 2020 UWMP, the "single dry year" is characterized to resemble conditions as a year in which conditions reflect the lowest water supply available to the Supplier. Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan sources based on 96 years (1922-2017) of historic hydrologic conditions. Supply and demand analyses for the single-dry year case was based on conditions affecting the SWP as this supply availability fluctuates the most among Metropolitan's sources of supply. Based on the 96-year period, 1977 was the single driest year for SWP supplies to Metropolitan. In addition, staff analysis of the 8-river index indicated that 1977 was the single driest year from 1922 through 2017. The 8-river index is used by DWR and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

*Infrastructure Considerations*

The Annual Assessment will consider any infrastructure issues that may pertain to near-term water supply reliability, including repairs, construction, and environmental mitigation measures that may temporarily constrain capabilities, as well as any new projects that may add to system capacity.

Metropolitan operates a distribution system that is flexible and adaptable allowing delivery of supplies from a combination of SWP, Colorado River, and regional storage sources to meet demands throughout its service area, as shown in Figure A.4-2. System distribution capabilities and limitations can add complexity to near-term reliability. For example, a portion of Metropolitan's service area currently cannot be served by Colorado River supplies. In the event of very low SWP supplies and available storage along the SWP system, Metropolitan's operations may be acutely challenged to meet SWP-only demands even though in that same year total supplies including Colorado River supplies may exceed total demands.

Metropolitan also has five regional water treatment plants, with capacities presented in Table A.4-4. Portions of Metropolitan's service area may receive water treated by one or a combination of several of these water treatment plants. Over the last 40 years, Metropolitan effectively delivered to its member agencies water supplies to meet demands ranging from 1.2 MAF per year to over 2.5 MAF per year.

**Table A.4-4**
**Metropolitan's Water Treatment Plants**

| Water Treatment Plant | Capacity (in MGD) |
|---|---|
| Jensen | 750 |
| Weymouth | 520 |
| Diemer | 520 |
| Mills | 220 |
| Skinner | 350 |

Note: Rated capacity. Effluent capacities may be less to account for backwash.

Metropolitan and its member agencies continue to implement system improvements and modifications to effectively increase system flexibility during both normal operations when imported supplies are available and during extraordinary times when SWP supplies are reduced to maximize the use of more readily available Colorado River water and Diamond Valley Lake supplies.

# Figure A.4-2
# Metropolitan's Service Area

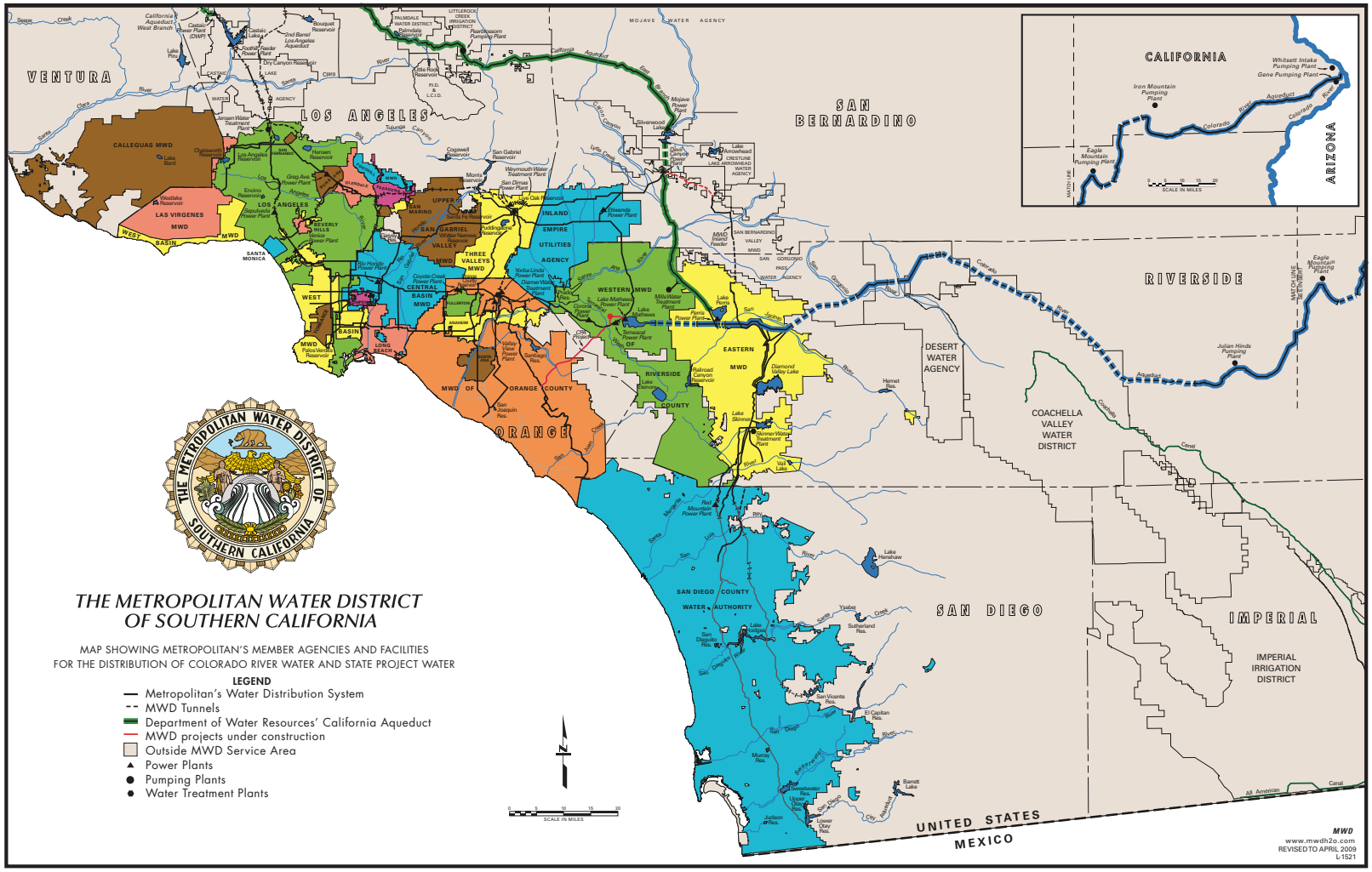

Throughout each year, Metropolitan regularly carries out preventive and corrective maintenance of its facilities. Metropolitan plans and performs shutdowns to inspect and repair pipelines and facilities and support capital improvement projects. These shutdowns involve a high level of planning and coordination within Metropolitan, as well as with member agencies, other affected organizations, contractors, and the community. These shutdowns are scheduled to ensure that major portions of the distribution system are not out of service at the same time. Operational flexibility within Metropolitan's system and the cooperation of member agencies allow shutdowns to be successfully completed while continuing to meet all system demands.

Metropolitan's Infrastructure Reliability Strategy helps to ensure long-term reliable performance of the system in an efficient and cost-effective manner. Infrastructure reliability is addressed through three programs: the Maintenance Management Program, the Infrastructure Protection Plan, and the Dam Safety Program. The activities performed under these programs allow for Metropolitan to extend the life span of its facilities and equipment and improve the overall reliability of the entire conveyance, treatment, and distribution system. In addition, seismic resiliency issues are addressed in the Seismic Risk Assessment and Mitigation Plan, which is included in Appendix 8 to the 2020 UWMP and incorporated herein by reference.

In the event that Metropolitan anticipates that an infrastructure issue is likely to impede or expand Metropolitan's capability to convey, treat, or distribute water during the current year, then the issue would be documented, and the determination of water reliability in the Annual Assessment would be adjusted accordingly.

### *Other Factors*

Water quality is of paramount importance to water supply reliability. Metropolitan owns and operates five water treatment plants. Metropolitan is a national leader in providing safe drinking water that meets increasingly stringent standards, testing for over 400 constituents and performing nearly 200,000 water quality tests annually on samples gathered throughout its distribution system. Metropolitan's Water Quality Laboratory analyzes these samples to ensure that Metropolitan's delivered water meets or surpasses all state and federal drinking water standards. Because treatment to remove specific contaminants can be more costly than measures to protect water at the source, Metropolitan also actively supports improved watershed protection programs for its source waters in the Colorado River and SWP. For the Annual Assessment, any known issues related to water quality will be considered for their potential effects on water supply reliability.

## A.4.4. Shortage Levels and Shortage Response Actions

### *Six Standard Water Shortage Levels*

As required by California Water Code Section 10632(a)(3)(A), the WSCP is framed around six standard water shortage levels that correspond to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortages. As shown in Table A.4-5, each of the six shortage levels represents an increasing gap between Metropolitan's estimated core supplies and unconstrained demand as determined in the Annual Assessment. As explained above, shortage percentages will be calculated by dividing the difference between core supplies and unconstrained demand by unconstrained demand. This calculation will be performed separately for anticipated current year conditions and for assumed dry year conditions. Shortage levels also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other emergency events. The shortage levels are defined in terms of the percent shortfall of supplies against demands.

### *Shortage Response Actions*

California Water Code Section 10632(a)(4) requires the WSCP to specify shortage response actions that align with the defined shortage levels, and include, at a minimum, all of the following:

- Locally appropriate supply augmentation actions
- Locally appropriate demand reduction actions to adequately respond to shortages
- Locally appropriate operational changes
- Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions (Not applicable to Metropolitan)
- An estimate of the extent to which the gap between supplies and demand will be reduced by implementation of each action.

As indicated in Table A.4-5, shortage responses will be customized to meet the circumstances for the particular shortage. Because circumstances can change at any time, Metropolitan's shortage responses actions will be adjusted accordingly throughout the year. To determine specific actions that would be taken at each standard shortage level, Metropolitan will evaluate conditions specific to cost, timing, distribution needs and capabilities, and other variables that include SWP allocation, Colorado River conditions, demand reduction measures, supply program take capacities, and storage balances.

Shortages are characterized not merely by shortfalls in annual core water supplies, but also by the water balances in Metropolitan's storage programs. Thus, a 10 percent shortfall in core supplies could be met entirely with stored water if storage levels are high. If storage levels are already depleted, the same shortfall in core supplies could potentially require a more complex mix of supply augmentation and demand reduction actions. In the most severe situations, allocating shortages to member agencies through the WSAP would address any remaining shortages not already mitigated by supply augmentation and lesser demand reduction actions.

Metropolitan has invested extensively in a diverse portfolio of supply sources and system resiliency to prepare for a wide range of possible challenging conditions. Metropolitan follows the principles of its WSDM Plan, which was adopted in 1999 and provides policy guidance for managing regional water supplies to achieve reliability. It identifies a broad sequence of actions during surpluses and shortages to minimize probability of severe shortages, based on detailed modeling of Metropolitan's existing and expected resource mix. The WSDM Plan recognizes the link between surplus and shortages and integrates planned operational actions with respect to both conditions. The WSDM Plan is included as Attachment A to this document.

**Table A.4-5**
**Shortage Stages and Response Actions**

| Shortage Stage | Shortage Percentage | Shortage Response | |
|---|---|---|---|
| **1** | Up to 10% | Take from Storage<br>Execute Flexible Supplies<br>Implement Voluntary Demand Reduction<br>Implement Water Supply Allocation Plan | • 0 to 100% met by Storage<br>• 0 to 100% met by Flexible Supplies<br>• 0 to 20% of total retail water use met by implementing Communication Plan<br>• 0 to 50% of total base demand met by WSAP supply allocation |
| **2** | 10% to 20% | Take from Storage<br>Execute Flexible Supplies<br>Implement Voluntary Demand Reduction<br>Implement Water Supply Allocation Plan | • 0 to 100% met by Storage<br>• 0 to 100% met by Flexible Supplies<br>• 0 to 20% of total retail water use met by implementing Communication Plan<br>• 0 to 50% of total base demand met by WSAP supply allocation |
| **3** | 20% to 30% | Take from Storage<br>Execute Flexible Supplies<br>Implement Voluntary Demand Reduction<br>Implement Water Supply Allocation Plan | • 0 to 100% met by Storage<br>• 0 to 100% met by Flexible Supplies<br>• 0 to 20% of total retail water use met by implementing Communication Plan<br>• 0 to 50% of total base demand met by WSAP supply allocation |
| **4** | 30% to 40% | Take from Storage<br>Execute Flexible Supplies<br>Implement Voluntary Demand Reduction<br>Implement Water Supply Allocation Plan | • 0 to 100% met by Storage<br>• 0 to 100% met by Flexible Supplies<br>• 0 to 20% of total retail water use met by implementing Communication Plan<br>• 0 to 50% of total base demand met by WSAP supply allocation |
| **5** | 40% to 50% | Take from Storage<br>Execute Flexible Supplies<br>Implement Voluntary Demand Reduction<br>Implement Water Supply Allocation Plan | • 0 to 100% met by Storage<br>• 0 to 100% met by Flexible Supplies<br>• 0 to 20% of total retail water use met by implementing Communication Plan<br>• 0 to 50% of total base demand met by WSAP supply allocation |
| **6** | More than 50% | Take from Storage<br>Execute Flexible Supplies<br>Implement Voluntary Demand Reduction<br>Implement Water Supply Allocation Plan<br>Take from Emergency Storage, if needed | • 0 to 100% met by Storage<br>• 0 to 100% met by Flexible Supplies<br>• 0 to 20% of total retail water use met by implementing Communication Plan<br>• 0 to 50% of total base demand met by WSAP supply allocation<br>• Take from emergency storage during a catastrophic event |

### *Supply Augmentation Actions*

Generally, Metropolitan's first response to any gap between core supplies and demand is to make optimal use of its supply augmentation options consisting of draws from flexible supply programs and storage reserves listed in Table A.4-6. To supplement its core water supplies from the SWP and Colorado River, Metropolitan has developed and actively manages a portfolio of water supply programs, including water transfer, storage and exchange agreements, the supplies created by which are conveyed through available CRA capacity or the California Aqueduct. Metropolitan pursues voluntary water transfer and exchange programs with other entities to help mitigate supply/demand imbalances and provide additional dry-year supply sources. Metropolitan has also developed significant storage capacity in reservoirs and groundwater banking programs both within and outside of the Southern California region. In a hypothetical single dry year assessment within the 2020 Urban Water Management Plan, Metropolitan could take up to approximately 1.8 MAF in a single year to meet dry year demands. Actual take capabilities would depend on various factors including water balances, location, and operational constraints.

#### Flexible Supplies

Metropolitan can augment its core Colorado River supplies through agreements with other agencies that have rights to use such water. Metropolitan determines the delivery schedule of these supplies throughout the year based on changes in the availability of SWP and to a smaller extent the higher priority water use adjustment for Colorado River water.

In addition to the basic SWP contract provisions, Metropolitan has other contract rights that facilitate augmentation of its SWP supply. Each SWP contractor has the right to use the facilities to move water supplies associated with agreements, water transfers, and water exchanges at the incremental cost. Metropolitan utilizes this ability in conveying water obtained through a number of agreements and exchanges with agencies in California's Central Valley north of the Bay-Delta and southward to Southern California.

### *Storage*

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities and programs in which surplus amounts of water in normal and wet years are captured until needed to augment core supplies. Metropolitan has developed an extensive storage portfolio made up of units within and outside Metropolitan's service area that includes both dry-year and emergency storage capacity. Such units, totaling approximately 6.0 MAF, include reservoirs, conjunctive use and other groundwater storage programs within the service area, and groundwater and surface storage accounts outside the service area delivered through the CRA or SWP. Consistent with the Emergency Storage Objective that was revised in 2019, approximately 750,000 AF of total stored water is emergency storage reserved for use in the event of supply interruptions from earthquakes or similar emergencies.

**Table A.4-6**
**Supply Augmentation Actions: Flexible Supplies and Storage**

| Source | Flexible Supplies | Storage |
|---|---|---|
| **Colorado River** | | Lake Mead Intentionally Created Surplus (ICS) Storage Program<br>Southern Nevada Water Agency Storage and Interstate Release Agreement<br>Desert Water Agency/Coachella Valley Water District Advanced Delivery Account<br>Imperial Irrigation District Storage |
| **State Water Project** | SWP Transfers: State Water Contractors Buyers Group<br>SWP Transfers: Yuba Accord Dry-Year Purchase<br>San Bernardino Valley Municipal Water District Program | SWP Carryover<br>DWR Flexible Storage (Castaic Lake and Lake Perris)<br>SWP Banking Programs |
| **In-Region** | | Diamond Valley Lake<br>Lake Mathews<br>Lake Skinner<br>Conjunctive Use Programs (CUP) |

### *Demand Reduction Actions*

Demand reduction actions are extraordinary measures taken to temporarily constrain water demand during a shortage. For the purpose of the WSCP and the Annual Assessment, it is important to separate temporary reductions in demand from baseline conservation as they relate to constrained and unconstrained demands. WSCP demand reduction actions result in constrained demands. Water savings from WSCP demand reduction actions must be factored into estimates of unconstrained demands for Annual Assessment shortage determinations. Intensity of demand reduction measures will vary by the severity of shortage and availability of other cost-effective supply augmentation measures. Early demand reduction actions tend to be voluntary measures that are comprised of outreach and education actions from Metropolitan's WSCP Communication Plan (see following section A.4.5). More severe conditions may necessitate supply allocations to wholesale customers through implementation of the WSAP. Table A.4-7 shows the demand reduction measures available to Metropolitan.

**Table A.4-7**
**Demand Reduction Actions**

| | Demand Reduction Actions |
|---|---|
| **Voluntary Measures** | Implement Communication Plan (May apply to Shortage Levels 1-6, Crisis)<br>• Public information campaigns<br>• Community outreach and media relations<br>• Public opinion research<br>• Interagency and intergovernmental coordination |
| **Mandatory Measures** | Implement Water Supply Allocation Plan (May apply to Shortage Levels 1-6, Crisis) |

Benefits of public information campaigns include rapid implementation and raising public awareness of the severity of the water shortage. For this reason, public information campaigns are included as a Demand Reduction Action in the WSCP. According to the American Water Works Association, water savings from this measure alone range from 5 to 20 percent, depending on the time, money, and effort spent.[2] If public outreach targets between 5 and 10 percent of population, then demand would be assumed to be reduced by 5 to 20 percent of the 5 to 10 percent. The size of media campaign is correlated with the number of people being reached.

Implement Communications Plan

Metropolitan's WSCP Communication Plan details Metropolitan's action-oriented strategy for education, outreach, and coordination during each WSCP standard shortage stage and in response to a catastrophic loss of supply. See the following section A.4.5 for the WSCP Communications Plan.

Enhanced Conservation Program

Although not considered as a WSCP demand reduction action because of their limited effect in the immediate term, Metropolitan administers regional conservation programs and co-funds member agency conservation programs designed to achieve greater water use efficiency in residential, commercial, industrial, institutional, and landscape uses. Metropolitan may implement extraordinary measures to temporarily enhance conservation during a shortage which include, but are not limited to, increasing rebates, reducing program eligibility requirements, working with rebate vendors to create in-store marketing and direct outreach to businesses, increasing direct install efforts with member agencies and partners, and working with water retailers and retail customers to develop onsite leak prevention programs. While the savings from conservation programs may not be realized quickly enough to mitigate the need for other shortage response actions, water-efficient device retrofit rebates, landscape conversions, and leak prevention all contribute to ongoing structural water savings. Conservation device retrofits help to recover storage in future years by lowering demands in all years, not only shortage years.

[2] American Water Works Association. 2019. Manual of Water Supply Practices – M60, Second Edition: Drought Preparedness and Response. p. 35

### Water Supply Allocation Plan

Under most conditions, Metropolitan can meet all of its service area's wholesale water needs. However, during severe water shortage situations when pubic information campaigns and enhanced conservation programs are insufficient to generate the needed demand reduction, Metropolitan may find it necessary to temporarily limit and allocate supplies to its member agencies. Metropolitan's WSAP allocates Metropolitan's water supplies among its member agencies, based on the principles contained in the WSDM Plan, to mitigate drawdowns from water storage reserves. The WSAP was originally approved by Metropolitan's Board in February 2008 and has been implemented three times since its adoption, most recently in April 2015. The WSAP provides a formula for equitable distribution of limited water supplies. If needed, a WSAP action is typically approved in the month of April with implementation beginning in the following July. This allows Metropolitan's member agencies time to prepare and to adjust their estimates for Metropolitan current year supply for their own WSCP Annual Assessments.

The WSAP allocation is a costly shortage response action that places acute burdens upon member agencies and the public. Other shortage response actions are generally preferred to the extent practicable. Metropolitan's overall strategy considers WSAP allocations to be a fallback option to address any remaining shortages when supply augmentation actions and other demand management measures are insufficient to meet demand reduction objectives. For reference, the WSAP is included as Attachment B to this document.

#### *Operational Changes*

During shortage conditions, operations may be affected by supply augmentation or demand reduction responses. For example, Metropolitan may temporarily alter maintenance cycles, defer planned system outages, and adjust the flow and routing of water through its system to more effectively distribute available supply across the service area, including areas that are currently only able to be served by SWP water supplies.

Because of the extensive and complex nature of Metropolitan's conveyance and distribution system, and the varying levels of local supplies available among each of the member agencies, by necessity, any supply-related shortage response actions triggered under the WSCP would be carefully chosen to optimally match available resources with specific localized demands by the member agencies.

Metropolitan's diversified portfolio of water supplies presents operational opportunities and challenges during droughts. Because water resources available to the Metropolitan service area come from three geographically distinct regions—Northern California, the Colorado River, and local resources—a relatively dry year affecting one of these three regions can be offset by relatively abundant supplies from the other two regions. For example, a year of ample precipitation within Metropolitan's service area tends to depress demand and enhances local water resources, further reducing demands on imported supplies. A wet year in the Sacramento-San Joaquin watersheds increases the SWP allocation, facilitating reduced diversions from the Colorado River in favor of storing supplies in Lake Mead or in the Desert Water Agency/Coachella Valley Water District Advanced Delivery Account. Conversely, a shortfall on the SWP may require system operational modifications to maximize Colorado River diversions and the delivery of Colorado River supplies to areas normally served with SWP supplies. Metropolitan's Colorado River core supplies are relatively stable from year to year and are less subject to severe supply reductions.

### *Additional Mandatory Prohibitions (not applicable)*

California Water Code Section 10632(a)(4)(D) calls for "additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions" to be included among the WSCP's shortage response actions. However, this item is not applicable to Metropolitan. As a regional wholesaler, Metropolitan does not dictate or control the end uses of water by retail consumers.

### *Shortage Response Action Effectiveness*

As shown in Table A.4-5, WSCP shortage response actions will be implemented to reflect the overall conditions facing Metropolitan and the resources available in that given year. Supply augmentation actions consisting of stored water and as-needed flexible supplies are expected to address between 0 to 100 percent of anticipated shortages for any shortage stage, depending on availability of those supplies; in lesser WSCP shortage stages, it is likely that shortages can be completely addressed through supply augmentation.

Efficacy of demand reduction efforts is difficult to estimate or predict, but water savings are a function of the extent to which public information campaigns reach water users and the degree of consumer response to those messages. Given the estimate of between 5 to 20 percent effectiveness described above, in concept, up to 20 percent of retail demands could be reduced if a successful media campaign reached and influenced the entire service area population. Consistent with the WSCP Communications Plan in the following section A.4.5, anticipated shortages will involve an appropriately-sized outreach campaign to address the targeted demand reduction, which depends on the combined effectiveness of other shortage response actions.

As shown in Table A.4-8 below, the WSAP is designed to reduce demands by up to approximately 50 percent of the WSAP's calculated base demand. The WSAP contains 10 levels of allocation, and each level is approximated to generate an additional 5 percent reduction from base demands. Table A.4-8 gives examples of estimated savings by each WSAP level using a hypothetical base demand of 1.8 MAF. Actual reductions and base demands are based on a formula that includes various factors such as actual local supply production, population growth, and conservation. The WSAP is expected to address any remaining shortage not met by other shortage response actions.

**Table A.4-8**
**Water Supply Allocation Plan Levels**

| WSAP Level | Approximate Percent Reduction | Example Base Demand | Estimated Demand Reduction |
|---|---|---|---|
| 1 | 5% | 1.8 MAF | 90,000 AF |
| 2 | 10% | | 180,000 AF |
| 3 | 15% | | 270,000 AF |
| 4 | 20% | | 360,000 AF |
| 5 | 25% | | 450,000 AF |
| 6 | 30% | | 540,000 AF |
| 7 | 35% | | 630,000 AF |
| 8 | 40% | | 720,000 AF |
| 9 | 45% | | 810,000 AF |
| 10 | 50% | | 900,000 AF |

### *Catastrophic Interruption of Water Supplies*

Metropolitan's Emergency Storage Objective is a planning estimate that represents the amount of water that Metropolitan would hold in storage for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. Emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

The Emergency Storage Objective considers a six- and twelve-month outage period for the imported supply aqueducts incorporating latest seismic information and operational flexibility of Metropolitan's system, a retail water demand cutback ranging from 25 to 35 percent considering the level of conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions.

In 2019, Metropolitan and its member agencies completed a process to update the Emergency Storage Objective, which was set at 750,000 AF. This level of storage would prevent severe water shortages to the region given new information on expected recovery durations. The emergency storage volume represents a planning estimate for how much water Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency.

As an additional tool, in July 2019, the Board adopted amendments to Metropolitan's Administrative Code enabling deliveries of member agency water supplies in Metropolitan's system in an emergency. These deliveries are intended to provide Metropolitan's member agencies the ability to deliver member agency water through Metropolitan's system under specific emergency conditions. Emergency deliveries can only be made if Metropolitan is unable to make deliveries to a member agency due to physical damage to Metropolitan's system resulting from a natural disaster or other emergency, and there are no alternate

means for Metropolitan or the member agency to provide service to an area without the use of a portion of Metropolitan's system.

Metropolitan's strategy for catastrophic water shortage conditions is further discussed in Appendix 8 to the 2020 UWMP and incorporated herein by reference.

### *Emergency Freshwater Pathway (Sacramento-San Joaquin Delta)*

DWR has estimated that in the event of a major earthquake in or near the Delta, water supplies could be interrupted for up to three years, posing a significant and unacceptable risk to the California business economy. A post-event strategy would provide necessary water supply protections to avert this catastrophe. Such a plan has been coordinated through DWR, the Army Corps of Engineers, USBR, California Office of Emergency Services, Metropolitan, and the State Water Contractors. Additional information on the creation of an emergency freshwater pathway and other actions in the Delta is included in Section 2.5 of the 2020 UWMP and incorporated herein by reference.

### *Emergency Response Plans*

Metropolitan also has two Emergency Response Plans: one dated March 2019 that has been in place long-term and is updated periodically; and a second dated September 2020, prepared pursuant to the requirements of the recently-enacted America's Water Infrastructure Act of 2018. The two plans work in conjunction. Together, Metropolitan's Emergency Response Plans present Metropolitan's organization and strategy for response to emergencies caused by natural hazards, malevolent acts, or other unavoidable circumstances. Metropolitan operates in accordance with the California Standardized Emergency Management System, the Incident Command System, and the National Incident Management System. The Emergency Response Plans provide guidelines for evaluating an emergency situation, responding to an emergency, and activating Incident Command Posts and the Emergency Operations Center. They also describe the Emergency Response Organization. Although the plans provide a framework for emergency response, they do not attempt to identify and discuss every potential situation or problem that may occur during an emergency. The plans will be exercised and updated regularly.

### *Seismic Risk Assessment and Mitigation Plan*

Although the magnitude of damages resulting from a significant seismic event are impossible to predict, Metropolitan's water conveyance and distribution facilities are designed either to withstand a maximum probable seismic event or to minimize the potential repair time in the event of damage. Metropolitan's holistic strategy for seismic resilience follows a "defense in depth" multi-layered approach for managing risk. Metropolitan's Seismic Resilience Strategy has three primary objectives:

1. Provide a diversified water supply portfolio, system flexibility, and emergency storage
2. Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events
3. Minimize water delivery interruptions through a dedicated emergency response and recovery organization

Beginning January 2020, CWC Section 10632.5 mandates urban water suppliers to include in their UWMPs a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, the required seismic risk assessment and mitigation plan is part of its resilience strategy and is included in Metropolitan's 2020 UWMP Appendix 9: Seismic Risk Assessment and Mitigation Plan and incorporated herein by reference.

## A.4.5. WSCP Communications Plan

### *Introduction*

Following the record-breaking drought of 2012-2016, Metropolitan concentrated on building on its conservation and education outreach programs to emphasize water efficiency as a sustainable way of life, rather than solely a response to dry conditions or drought. Messaging has encouraged behavioral changes that can be sustained regardless of weather and uses tools and technology that can be implemented to permanently save water in homes and businesses, particularly outdoors where up to 70% of total water use occurs. These efforts have helped solidify a conservation ethic across Southern California, supporting a $1.5 billion investment in conservation, recycling and groundwater recovery since 1990. When combined with additional investments in storage, local supply development and programs to increase water storage reserves in wet years, the region is well positioned to withstand future droughts. Still, in response to the challenges of climate change and other abnormal supply conditions, increased water efficiency will still be necessary. And as those conditions become more prevalent, effective communication strategies and a common understanding of necessary actions between water agencies, the public, elected officials and other key stakeholders become even more important should the district need to activate the WSCP. These relationships and communication tools must be well-established to be successful. To that end, water providers should aim to communicate to customers in the following areas:[3]

1. Steps customers should take to plan for and protect themselves in emergency situations, ranging from abnormal to catastrophic water supply conditions
2. Actions water providers are taking to plan for and respond to these emergency situations
3. Efforts to invest and maintain critical water infrastructure
4. Steps water providers are taking to prepare for and respond to emergency situations that could impact water supplies – from drought to natural disasters

Several factors influence the communication strategies needed to address the diverse characteristics of Metropolitan's 5,200 square-mile service area, particularly when there is an urgent need for conservation. As a wholesaler serving 26 member agencies and a diverse region that is home to 19 million people, no single communication message or strategy connects with everyone in the region. Furthermore, state and local water regulations during periods of drought or supply shortages can result in a broad range of water-saving requirements and goals across the region. Qualitative research from previous droughts has also provided valuable insight on attitudes and behaviors toward water conservation, including drought fatigue, water quality concerns, increasing water rates and equity issues. These factors, though inherently complex, are conducive to collaboration that elevates the importance of drought resiliency. This section of the WSCP describes the basic communications strategies needed to help Metropolitan effectively communicate vital information for each of the six standard water shortage levels that represent changes from normal reliability. The six standard water shortage levels depicted in this communications plan correspond to:

- Progressively increasing estimated shortage conditions: up to 10, 20, 30, 40, 50, and greater than 50% shortage compared to the normal reliability conditions

[3] Source: 2019 Statewide Survey of Residential Customers Covering Water

### *Collaboration*

Collaboration with its member agencies is central to Metropolitan's outreach plans during drought, water shortages or other demand management periods. Developing and delivering a concise regional message in multiple languages is made possible through consistent coordination with member agencies and their constituents. Metropolitan's External Affairs group regularly engages and interacts with member agency staff in several capacities, including but not limited to the following groups:

- Member agency managers
- Legislative and government affairs representatives
- Water use efficiency/conservation coordinators
- Public information officers
- Education coordinators

In addition to member agency coordination, Metropolitan interacts with agencies and organizations outside of the region, including:

- Department of Water Resources
- State Water Resources Control Board
- Association of California Water Agencies
- California Municipal Utilities Association
- Colorado River Water Users Association
- California Water Efficiency Partnership
- Alliance for Water Efficiency
- Other state and federal agencies

As seen in past droughts, the methods of communication within these groups and the frequency of meetings fluctuate based on the changing needs of our member agencies and their key audiences. Water shortage conditions are ever-evolving, therefore remaining flexible yet focused not only reduces the risk of discordance, it also ensures key audiences throughout Southern California receive timely, valuable and cohesive information.

As mentioned, Metropolitan's WSCP includes six levels of potential shortage. The water-savings actions associated with each level of shortage will vary greatly, and Metropolitan recognizes the many different approaches to properly respond to each WSCP level. This section provides a general description of messaging strategies that would be implemented at each level, leading up to more focused crisis communication strategies. The plans need to be adaptable and cannot offer one-size-fits-all approaches. Metropolitan management and/or Board of Directors could also call for specific messaging strategies that address unique shortage scenarios.

### *Key Audiences*

Communicating to various stakeholders is essential during normal supply periods and becomes increasingly more involved during water shortages. Below is a list of key audiences:

- Member agencies and their customers
- General public

- State, federal and local elected officials and their district office staff
- Homeowners and renters
- Multi-family property owners/managers/landlords
- Business associations/chambers of commerce
- Commercial-industrial property owners/managers
- Landscape contractors/suppliers
- Restaurant/hotel industries
- School districts/educators/students
- Building and construction trade associations
- Community/civic leaders
- Land-use agencies
- Environmental groups
- Community-based and non-profit organizations
- Non-English-speaking populations
- Disadvantaged/under-invested communities

Communicating to these audiences requires varying levels of involvement depending on the status of supply conditions. Feedback, research, and leveraging existing relationships are central to an effective communications plan; therefore, External Affairs and Water Resource Management staff will continue to coordinate closely with member agencies, stakeholders, and governing agencies on an ongoing basis to ensure appropriate messaging is culturally competent and provided in multiple languages to reflect the region's demographics.

### *Goals and Objectives*

Metropolitan's communications goals are rooted in the following guiding principles:

- Motivate key audiences to:
  - Increase conservation
  - Follow voluntary or mandatory water use guidelines
  - Participate in water-saving incentive programs
  - Encourage family, friends, neighbors and colleagues to do all the above
- Raise awareness about:
  - Water shortage and/or drought conditions
  - Water sources, supplies and reserves
  - Local, regional and state regulations
- Educate key audiences about:
  - Water supply reliability
  - Water infrastructure and delivery
  - Water quality

- Prepare the region for:
  - Varying water supply conditions
  - Escalating supply shortage levels

### *Standard Communication*

Conservation as a way of life remains central to messaging during normal supply conditions. Regional rebate programs, indoor and outdoor water use efficiency, investments to maintain infrastructure, emergency preparedness, local supply programs, water quality, and regional supply reliability are among some of the themes that make up a normal supply period's communications mix to encourage ongoing conservation actions. Below is a snapshot of the various strategies involved:

- Media relations (news releases and advisories, interviews, op-eds)
- Social media (Twitter, Instagram, Facebook, YouTube, LinkedIn)
- Websites and Blogs
  - mwdh2o.com
  - bewaterwise.com
  - socalwatersmart.com
- Digital, print and other paid media marketing
- Search engine optimization
- E-newsletters
- Community events
- Education outreach
- Business outreach

### *Level 1 Communications – up to 10% Shortage*

This section addresses communications strategies Metropolitan uses during periods of 10% water shortage conditions. In addition to the district's ongoing communications efforts, a 10% shortage would require the following elements:

- Media relations and communications
  - Maintain media relations activities with enhanced communication about the specific need to conserve; provide media with regional water supply conditions and Metropolitan's shortage response action updates
    - Press releases, advisories, op-eds, direct outreach to media to drive earned media opportunities
    - Ethnic media outreach in multiple languages
  - Produce and distribute fact-based informational materials such as fact sheets, podcasts, and B-roll video
- Social media
  - Emphasize ways to conserve immediately (shorter showers, less watering, links to tools on bewaterwise.com, etc.), as well as continued promotion of conservation as a way

of life initiatives such as regional water use efficiency incentives and other rebate programs including the district's Turf Replacement Program

    - Paid social media boosting to target the district's entire service area
  - Encourage member agency co-branding and messaging continuity
    - Share social media creative with the public information officer working group and conservation coordinators
- Web
  - Establish a SharePoint site for member agency and public to download all water supply and conservation materials
  - Update all Metropolitan websites with pertinent conservation and water supply information and highlight such information
  - Provide links to local watering restrictions and conservation efforts
- Member agency coordination
  - Enhance collaboration and communication with member agencies to streamline messaging
  - Involve member agencies in development of a communications plan
  - Provide regular campaign updates to member agency managers, staff and board members.
  - Provide member agencies with campaign outreach materials (newsletter articles, creative design, bill inserts, etc.) for customization and distribution
- Community outreach
  - Make water supply conditions and conservation messaging a key component of all regular community outreach
  - Make additional, specialized outreach to inform non-profit organizations and civic/community leaders about water supply conditions and conservation efforts
    - Community events/webinars
    - Non-profit organization e-newsletters
- Education outreach
  - Update district curriculum to reflect the enhanced need to conserve and make water supply conditions and conservation messaging a key component of all regular education outreach
  - Communicate to K-12 school districts and colleges/universities about the need for increased conservation
  - Provide regional water and environmental education programs with materials addressing the need for increased conservation
- Legislative and government affairs
  - Coordinate with local, state and other elected officials in the region about the need to conserve
  - Encourage officials to promote these efforts to constituents

In addition:

- Work with member agencies to target key industries or groups to raise awareness about water-use efficiency programs and regional water supply conditions
    - Restaurants
    - Hotels/motels
    - Public agencies
- Research and public opinion
    - Conduct research to gain insights on public opinion, attitudes and beliefs toward conservation and water shortage levels
    - Message testing with key audiences

*Level 2 Communications – up to 20% Shortage*

In a more severe supply shortage or demand management period, Metropolitan will continue actions outlined in Level 1 communications strategies, and add the following efforts, which are designed to address a 20% percent mandatory conservation under the WSCP:

- Media relations and communications
    - Paid advertising – Execute a multimedia, multilingual regional advertising campaign to reflect a more urgent message emphasizing the need for compliance with mandatory water-use restrictions. Place paid advertisements in the following platforms:
        - Out of Home (billboards, bulletins, bus shelter ads)
        - Radio
        - Television
        - Digital
        - Grassroots
    - Host press conference to discuss current water shortage conditions, shortage response actions, and outlook
    - Coordinate with other regional or state agencies for greater impact and reach
- Social media
    - Emphasize a clear and practical message conveying mandatory water-use restrictions, drought conditions and ways to save water
    - Establish more targeted and focused social media advertising strategies – targeted boosting and messaging
- Member agency coordination
    - Meet with member agencies to streamline a more urgent and serious campaign tone
    - Coordinate paid media flights with member agencies to leverage regional exposure and distribution
    - Provide multimedia and multilingual campaign materials for member agency customization

- Community outreach
  - Coordinate with community-based organizations and leaders with higher impact, reach and credibility
  - Inform, debrief and prepare community/civic leaders to become water conservation ambassadors in their respective communities
- Legislative and government affairs
  - Increase briefing activity with state and local officials on water supply conditions, shortage response actions, and water conservation advertising campaign

In addition:

- Help prepare and distribute materials about restrictions, ordinances and guidelines through stakeholder communication channels, including but not limited to:
  - Business organizations
  - Civic organizations
  - Elected officials
  - Building/plumbing/construction associations
  - Building managers
  - Landscape contractors
- Increase outreach efforts to key associations and interest groups throughout the region, emphasizing immediate conservation goals

*Level 3 and 4 Communications – up to 30% or 40% Shortage*

In addition to Level 2 communications strategies, the following efforts will address an even more severe shortage of 30%-40% mandatory conservation under the WSCP:

- Media relations and communications
  - Increase media relations activities, with an added emphasis on the severe regional water supply conditions, the shortage response actions triggered or expected to be triggered, and the mandatory need to conserve
  - Host news conference in multiple languages alongside high-level public officials to highlight severity and extreme measures needed
  - Continue the following with greater frequency and stronger, more critical messaging:
    - Paid advertising campaign
    - Press releases, advisories, op-eds, etc.
    - Direct media outreach offering pre-recorded radio and TV interviews
    - Ethnic media outreach in multiple languages
- Social media
  - Messaging shift to reflect severity of supply conditions and shortage response actions triggered or expected to be triggered– conservation is mandatory to maintain day-to-day activity and future supplies, quality of life now being impacted

- Web
  - Make conservation messaging front and center on all websites
- Community Outreach
  - Host a community leader briefing, bringing together representatives from community-based organizations from across the region to learn about the severity of water supply conditions
- Member agency coordination
  - Continue to streamline messaging about WSCP level escalation to ensure message continuity throughout the region
  - Help member agencies address local and mandatory conservation needs
  - Coordinate with member agencies on any updated messages and campaign activities emphasizing extreme actions that must be taken
- Legislative and government affairs
  - Outreach to legislative leadership at state and federal level to raise awareness at high levels

In addition:

- Specialized targeted outreach to:
  - Special interest groups
  - Public agencies
  - County and city departments
- Assess the goals and objectives of regional rebate programs, begin a shift toward immediate water-saving actions
- Research and public opinion
  - Conduct public opinion research studies including focus groups to determine attitudes and beliefs toward extreme conservation levels in order to effectively communicate severity of supply conditions and the mandatory need to conserve

*Level 5-6 Communications – 50% Shortage or more*

The severity of this level of the WSCP calls for immediate, extreme conservation measures and a focus on water use for health and safety only. As with previous levels, communications strategies at this level of the WSCP incorporate and build upon ongoing efforts.

*Key Communications Strategies*

- Consider establishing a Joint Information Center (JIC) to pool crisis communications among emergency responders and affected local, state and federal agencies
- Produce and distribute fact-based informational materials such as fact sheets, podcasts, and B-roll video
- Host a press conference to announce the severity of water shortage level and shortage response actions triggered or anticipated to be triggered, to be held in conjunction with regional and/or state emergency response and public health authorities

- Emphasize work being done by Metropolitan and its member agencies to alleviate the impacts of such a severe shortage
- Focus on the need for residential and commercial customers across the region to do their part to get through the crisis situation
- Offer vulnerable populations increased assistance, in coordination with regional emergency response teams
- Keep the media and key stakeholders informed with frequent supply condition reports
- Shift from traditional advertising campaign efforts to emergency and crisis communication approach
- Messaging is no longer conservation-focused, begin shift to crisis response communications protocols

*Crisis Communications – Catastrophic Shortage*

In the event of a catastrophic shortage due to an infrastructure failure and/or natural disaster, Metropolitan will enact its crisis communications plan in accordance with local, regional, state and federal emergency response guidelines that ensure a coordinated effort and effective response. This plan utilizes the Standard Emergency Management System, the Incident Command System and the National Incident Management System.

*Strategic Message Development*

- In an emergency, communications messages will be created in a complex environment in which the tensions of multidirectional information flows must be balanced with the need for strategic message development

*Message Dissemination*

Communication efforts will center on the core identified tasks: providing information to the public and external audiences. Information dissemination tools:

- Website (mwdh2o.com, bewaterwise.com)
- Social Media (Twitter, Facebook, Instagram, YouTube)
- MetAlert Emergency Notification System + RSS Feeds
- Press Releases and statements
- Participation in joint information centers

*Information Dissemination*

- Public Information
    - Activate and manage the mechanisms for responding to public requests for information via social media, telephone, in writing, or by e-mail
    - Prepare Metropolitan's telephone operators for responding to and monitoring calls related to emergency incidents; brief them and provide scripts on how to respond to questions and where to direct calls for other requests
    - Work with subject matter experts to create situation-specific fact sheets, Q&A documents and updates
    - Respond to requests and inquiries from special interest groups

- Oversee and manage Metropolitan's emergency response website if needed, in addition to mwdh2o.com, social media, telephone, and public email correspondence response systems; establish and maintain links to other emergency response websites
- Manage the development and testing of messages and materials for cultural and language requirements of special populations
- Post updates on social media channels. Monitor and respond to comments as needed/appropriate

- Member agencies, partnering agencies and elected/legislative officials:
  - The Public Information Officer (PIO) or Crisis Communications Team will communicate, as needed, with the PIOs for member agencies and other partnering agencies
  - Help organize and facilitate official meetings and briefings to provide information and receive input from member agencies, other partners or stakeholders
  - Notify legislative/elected officials as needed

### A.4.6. Legal Authorities

This section describes the legal authorities that empower Metropolitan to implement and enforce its shortage response actions. Metropolitan is a wholesale water provider organized as a cooperative of 26 voluntary members. Metropolitan was formed pursuant to the Metropolitan Water District Act, Statutes 1969, chapter 209, codified at California Water Code, Appendix Section 109 (the "MWD Act"). Pursuant to the MWD Act, Metropolitan has the express and implied statutory authority to "[p]rovide, sell, and deliver water at wholesale for municipal and domestic uses and purposes," among other powers. (MWD Act, §§ 120, 130.) To accomplish the provision of water, Metropolitan is also expressly authorized to promote and implement conservation programs, including during times of water shortage. (MWD Act, § 130.5.)

Metropolitan also has authority under the California Water Code to implement supply shortage programs. (Cal. Water Code, §§ 350-359, 375-378.) For example, Section 375(a) of the Water Code provides:

> *Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity.*

Cal. Water Code, § 375(a). Water Code Section 375(b) also provides the authority for pricing to encourage water conservation.

> *With regard to water delivered for other than agricultural uses, the ordinance or resolution may specifically require the installation of water-saving devices that are designed to reduce water consumption. The ordinance or resolution may also encourage water conservation through rate structure design.*

Metropolitan's Board of Directors has approved many policies and rules, codified in Metropolitan's own Administrative Code, which further provide Metropolitan the authority to ensure the availability of its water during times of shortages. For example, Administrative Code Section 3107 requires that any territory annexed to Metropolitan comply with Metropolitan's water use efficiency guidelines.

The Board has also ratified various policies and rules to implement a Water Supply Allocation Plan (WSAP) to address shortage conditions. Metropolitan's WSAP provides a standardized methodology for allocating supplies during times of shortage. The WSAP is authorized pursuant to the following Board actions:

- By Minute Item 43514, dated April 13, 1999, the Board adopted the WSDM Plan.
- By Minute Item 44005, dated June 17, 2000, the General Manager has the authority to reduce Interim Agriculture Water Program deliveries up to 30 percent prior to imposing any mandatory allocation under the WSDM Plan.
- By Minute Item 47393, dated February 12, 2008, the Board adopted the WSAP.
- By Minute Item 48376, dated August 17, 2010, the Board approved adjustments to the WSAP.

- By Minute Item 48803, dated September 12, 2011, the Board approved adjustments to the WSAP.
- By Minute Item 74526, dated February 11, 2014, the Board adopted the Water Supply Alert Resolution.
- By Minute Item 49979, dated December 9, 2014, the Board approved adjustments to the WSAP.

In addition to the statutes and other legal authorities set forth above, Metropolitan is empowered to implement and enforce its shortage response actions pursuant to various resolutions. For example, on April 11, 2016, Metropolitan's Board voted to adopt Metropolitan's 2015 UWMP and authorized its submittal to the State of California as stated in Resolution 9209. Metropolitan's 2015 UWMP contains Metropolitan's December 2014 WSAP in Appendix 4. Metropolitan's 2015 UWMP also describes in Section 2.4 Metropolitan's WSAP and WSDM Plan, which guides Metropolitan's planning and operations during both shortage and surplus conditions. Similarly, on May 11, 2021, Metropolitan's Board voted to adopt Metropolitan's UWMP and WSCP as stated in Resolutions 9279 and 9281, respectively. These two Resolutions authorize Metropolitan to implement and enforce its shortage response actions contained in the WSCP, which is attached as Appendix 4 to the 2020 UWMP.

Additionally, numerous agreements allow Metropolitan to take its core supplies and shortage response actions. Core supplies and supply augmentation actions are authorized by the agreements shown in 2020 UWMP Appendix 3: Justifications for Supply Projections, which include:

*Colorado River Supplies*

- 1931 Seven Party Agreement dated August 18, 1931
- Metropolitan's 1930, 1931, and 1946 water delivery contracts with the Secretary of the Interior
- Consolidated Decree of the Supreme Court of the United States in *Arizona v. California*
- 2003 Quantification Settlement Agreement (QSA) and related agreements
- 2005 Settlement Agreement with Quechan Indian Tribe
- Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead
- 1988 IID-Metropolitan Conservation and Use of Conserved Water Agreement
- 1989 Approval Agreement
- 1989 Supplemental Approval Agreement
- August 2004 Forbearance and Fallowing Program Agreement with PVID
- Landowner Agreements for Fallowing in PVID
- 2003 Delivery and Exchange Agreement between Metropolitan and Coachella Valley Water District
- 2004 Storage and Interstate Release Agreement among Metropolitan, the Colorado River Commission of Nevada, Southern Nevada Water Authority, and the United States
- 2007 Lower Colorado Water Supply Project Contract among the United States, the City of Needles, and Metropolitan

- 2007 Lower Colorado River Basin Intentionally Created Surplus Forbearance Agreement among the Arizona Department of Water Resources, PVID, IID, the City of Needles, CVWD, Metropolitan, SNWA, and the Colorado River Commission of Nevada
- 2007 California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus among Metropolitan, PVID, IID, CVWD, and the City of Needles
- 2007 Agreement among the United States, the Colorado River Commission of Nevada, and the SNWA for the Funding and Construction of the Lower Colorado River Drop 2 Storage Reservoir Project
- 2007 Delivery Agreement between the United States and Metropolitan
- 2008 Metropolitan Notice of Election to Participate as a Party to the Drop 2 Funding Agreement
- 2009 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Project for Operation of the Yuma Desalting Plant
- 2010 Yuma Desalting Plant Pilot Project Delivery Agreement between the United States and Metropolitan
- 2012 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Intentionally Created Mexican Allocation to Intentionally Created Surplus
- 2012 Interim Operating Agreement for Implementation of Minute No. 319 of the International Boundary and Water Commission
- 2012 Lower Colorado River Basin Forbearance Agreement for Binational Intentionally Created Surplus
- 2012 Binational ICS Delivery Agreement
- 2013 Agreement between Metropolitan and IID Regarding Binational Intentionally Created Surplus
- 2015 Amendment 1 to the California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus
- 2017 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, IID, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Mexico's Water Reserve to Binational ICS
- 2017 Interim Operating Agreement for Implementation of Minute No. 323
- 2017 Binational ICS Agreement
- 2017 Binational ICS Delivery Agreement
- 2019 Lower Basin Drought Contingency Plan
- December 2019 Agreement for the Implementation of a Seasonal Land Fallowing Program
- Agreement for Seasonal Fallowing in Bard Unit (Farmer Fallowing Agreements

- May 2020 First Amended Agreement for the Implementation of a Seasonal Land Fallowing Program
- Agreement Relating to Supplemental Water among The Metropolitan Water District of Southern California, the San Luis Rey Settlement Parties, and the United States
- Amended and Restated Agreement between The Metropolitan Water District of Southern California and the San Diego County Water Authority for the Exchange of Water. This October 10, 2003 agreement provides for Metropolitan delivery of Exchange Water to SDCWA in exchange for conserved Colorado River water SDCWA makes available to Metropolitan at Lake Havasu.
- Agreement Between Imperial Irrigation District And San Diego County Water Authority For Transfer Of Conserved Water. This April 9, 1998 agreement, as amended, provides for IID to conserve water for transfer to SDCWA and establishes the price SDCWA pays to IID for the conserved water.
- Allocation Agreement. This October 10, 2003 agreement among the United States, CVWD, IID, SDCWA, Metropolitan, and the San Luis Rey Settlement Parties provides for the allocation of water conserved from the All-American Canal Lining Project and the Coachella Canal Lining Project, and Metropolitan's assignment to SDCWA of it rights to both canal lining projects.
- Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement. By this October 10, 2003 agreement, among the Secretary of the Interior. CVWD, IID, SDCWA, and Metropolitan, the Secretary agreed to deliver IID-SDCWA transfer water and canal lining water allocated to SDCWA to Metropolitan's Colorado River Aqueduct Intake at Lake Havasu for diversion by Metropolitan.

*State Water Project Supplies*

- 1960 Contract between the State of California and The Metropolitan Water District of Southern California for a Water Supply
- Port Hueneme Water Agency Annexation: By Minute Item 41728, dated January 9, 1996, Metropolitan's Board adopted Resolution 8487 granting the concurrent annexation of Annexation No. 32 to Calleguas Municipal Water District and The Metropolitan Water District of Southern California, and fixing Metropolitan's terms and conditions for the annexation
- 1996 Sublease Agreement between the Port Hueneme Water Agency and Metropolitan
- 1967 and 1983 Water Exchange Contract and Agreements with Desert Water Agency and Coachella Valley Water District
- 1984 Advance Delivery Agreement with Desert Water Agency and Coachella Valley Water District
- The 2003 Exchange Agreement with Desert Water Agency and Coachella Valley Water District
- November 2012 Letter Agreement with Coachella Valley Water District
- 2019 Amended and Restated Agreement for Exchange and Advance Delivery with Desert Water Agency and Coachella Valley Water District
- 1997 Arvin-Edison/Metropolitan Water Management Agreement

- 1998 Turn-in/out Construction and Maintenance Agreement between DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan
- 1998-2002 Water Delivery and Return Agreements with DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan
- 2004 Point of Delivery Agreement with DWR, Kern County Water Agency, and Metropolitan
- 2004 Introduction of Water into the California Aqueduct with DWR, Kern County Water Agency, and Arvin-Edison
- 2007 First Amended and Restated Agreement Between Arvin-Edison Water Storage District and The Metropolitan Water District of Southern California for a Water Management Program
- 2000 Coordinated Operating Agreement between Metropolitan and San Bernardino Valley Municipal Water District
- 2001 Coordinated Operating Agreement between Metropolitan and San Bernardino Valley Municipal Water District
- 2011 Coordinated Operating, Water Storage, Exchange and Delivery Agreement among Metropolitan, Municipal Water District of Orange County, and Irvine Ranch Water District
- 2013 San Gabriel Valley MWD Exchange and Purchase Agreement
- 2019 Board Approval of the High Desert Water Bank Agreement with Antelope Valley East Kern Water Agency
- 2001 Kern Delta/Metropolitan Principles of Agreement
- 2002 Kern Delta and Metropolitan Boards of Directors Approval
- 2007 DWR-Yuba County Water Agency Purchase Agreement
- 2007 DWR-Metropolitan Yuba Dry Year Program Participation Agreement
- 2014 Amended DWR-Metropolitan Yuba Dry Year Program Participation Agreement
- 2019 Amended and Restated Agreement Among The Metropolitan Water District of Southern California, Coachella Valley Water District, and Desert Water Agency for the Exchange and Advance Delivery of Water
- 2020 Amended DWR-Metropolitan Yuba Dry Year Program Participation Agreement
- 2021 Coordinated Operating Agreement. The Coordinated Operating Agreement between Metropolitan and San Bernardino Valley District was approved by Metropolitan's Board in March 2021. The agreement will terminate on December 31, 2035 unless there is an extension of the SWP Contract.
- <u>2013 San Gabriel Valley MWD Exchange and Purchase Agreement.</u> The agreement between Metropolitan and San Gabriel Valley MWD was executed in September 2013.
- <u>2013 Board Approval of the San Gabriel Valley MWD Exchange and Purchase Agreement.</u> In August 2013, Metropolitan's Board authorized entering into the agreement with San Gabriel Valley MWD.

*In-Region Storage and Supplies*

- November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner
- November 1994 Memorandum of Understanding on Operation of Domenigoni Valley Reservoir (now known as Diamond Valley Lake)
- Elderberry Forebay Contract for Conditions for Use
- June 2002 Division of Safety of Dams Certificate of Approval
- October 1991 Final EIR for the Eastside Reservoir Project (Diamond Valley Lake)
- 1995 amendment to Metropolitan's SWP contract to include Article 54, "Usage of Lakes Castaic and Perris"
- November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner
- June 2002 Division of Safety of Dams Certificate of Approval
- Principles for groundwater storage adopted by the Metropolitan Board in January 2000
- Resolution for Proposition 13 Funds adopted by the Metropolitan Board in October 2000
- Agreement executed with the DWR for Interim Water Supply Construction Grant Commitment Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection (Proposition 13, Chapter 9, Article 4) providing for Metropolitan to administer $45 million in state Proposition 13 grant funds for groundwater reliability programs; October 2000
- Agreement executed for Long Beach Conjunctive Use Project, July 2002, amended in July 2003, October 2005, and November 2008
- Agreement executed for Live Oak Conjunctive Use Project, October 2002
- Agreement executed for Foothill Area Groundwater Storage Project, February 2003, amended in August 2006, April 2008, and February 2009
- Agreement executed for Chino Basin Programs, June 2003, amended in May 2004, August 2004, August 2005, May 2008, March 2009, September 2009, July 2010, and January 2015
- Agreement executed for Orange County Groundwater Storage Program, June 2003, amended in July 2004, December 2005, and July 2008
- Agreement executed for Compton Conjunctive Use Program, February 2005
- Agreement executed for Long Beach Conjunctive Use Project — Expansion in Lakewood, July 2005, amended in April 2006, August 2007, November 2008, and February 2010
- Agreement executed for Upper Claremont Basin Groundwater Storage Program, September 2005, amended in April 2008
- Agreement executed for Elsinore Basin Conjunctive Use Program, December 2006, amended in May 2008

These agreements are described in more detail in Appendix 3 to Metropolitan's 2020 UWMP.

If necessary, Metropolitan shall declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1. In addition, Metropolitan shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

### A.4.7. Financial Consequences of and Responses for Drought Conditions

A water shortage may be created by a reduction in water supply, an increase in water demand, or a combination of both. Metropolitan's shortage response actions include supply augmentation, demand management, and operational flexibility, all of which could impact Metropolitan financially. For example, exercising the options to take water from supply augmentation programs may increase costs. Similarly, operational changes could result in higher system costs and lower revenues from on-system hydropower generation, and an increase in conservation and outreach efforts would also increase costs. On the other hand, if core supplies from the SWP or the Colorado River were reduced, variable power costs to move water into the service area would likely decrease. Additionally, effective demand management during shortages tends to decrease Metropolitan's water sales when effective, thereby potentially reducing revenue for Metropolitan. From these various financial effects, there is a potential for expenditures exceeding revenues more than budgeted, thereby requiring unanticipated draws from reserves.

Variation in the amount of revenues is already part of Metropolitan's financial planning. Revenues vary according to regional weather and the availability of statewide water supplies. In dry years, local demands increase, and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years, demands decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 2009 and 2015 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan maintains financial reserves, with a minimum and target balance, to stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales. Metropolitan's practice of using reserves to buffer unexpected increases or decreases in budgeted revenue also applies to unexpected expenditure increases or decreases resulting from shortage responses.

Metropolitan uses its financial reserves to mitigate the impacts of water shortages. This policy applies to each of the six shortage levels described in this WSCP. Financial reserves create a buffer to reduce the financial impact of the water shortage. Other mitigation actions such as reducing operations and maintenance expenses, deferring capital projects, and rates/charges increases are part of Metropolitan's biennial budget and rate design cycle, are not used routinely to mitigate financial impacts of water shortage response actions.

Metropolitan's reserve policy provides for a minimum reserve requirement and target amount of unrestricted reserves at June 30 of each year. Funds in excess of the target amount are to be utilized for capital expenditures in lieu of the issuance of additional debt, or for the redemption, defeasance or purchase of outstanding bonds or commercial paper as determined by the Board. However, if the fixed charge coverage ratio (the amount necessary to cover all fixed costs) is at or above 1.2, amounts over the minimum may be expended for any lawful purpose of Metropolitan, as determined by the Board. Therefore, unrestricted reserves are intended to be available to address Metropolitan's shortage response actions, as well as the consequences of those actions, so long as its fixed charge coverage ratio is at or above 1.2.

## A.4.8. WSCP Adoption and Refinement Procedures

### *WSCP Public Notice and Adoption*

Metropolitan provided notice of the availability of the draft 2020 UWMP (including Appendix 11 which will also be a new Appendix 11 to its 2015 UWMP) and WSCP, and notice of the public hearing to consider adoption of both plans and Appendix 11 to the 2015 UWMP in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP were posted prominently on Metropolitan's website, mwdh2o.com, on February 1, 2021, more than 60 days in advance of the public hearing on April 12, 2021. The notice of availability of the documents was sent to Metropolitan's member agencies, as well as to cities and counties in Metropolitan's service area. In addition, a public notice advertising the public hearing in English and Spanish was published in 12 Southern California newspapers. The notification in English language newspapers was published on February 1 and 8, 2021. The notification was published on January 28-30, 2021 and February 1, 4-6, and 8, 2021 in Spanish language newspapers, satisfying the requirement for non-English language notification. Copies of: (1) the notification letter sent to the member agencies, cities and counties in Metropolitan's service area, and (2) the notice published in the newspapers are included in the 2020 UWMP Section 5. Table 5-3 in the 2020 UWMP provides a list of participating member agencies and other appropriate agencies that Metropolitan coordinated with in its regional planning, as well as the cities and counties that were notified about the preparation of its 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP. In addition, the list of newspaper publications is included in Table 5-4.

Metropolitan held the public hearing for the draft 2020 UWMP, draft Appendix 11 to the 2015 UWMP, and draft WSCP on April 12, 2021, at the Board's Water Planning and Stewardship Committee meeting, held online due to COVID-19 concerns. On May 11, 2021, Metropolitan's Board determined that the 2020 UWMP and the WSCP are consistent with the MWD Act and accurately represent the water resources plan for Metropolitan's service area. In addition, Metropolitan's Board determined that Appendix 11 to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003) which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions 9279, 9280, 9281, the Board adopted the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP and authorized their submittal to the State of California. Copies of Resolutions 9279, 9280, 9281 are included in the 2020 UWMP Section 5, and Resolution 9281 for the WSCP is attached to this WSCP as Attachment C.

### *Submission and Availability of Final 2020 UWMP, Appendix 11 to 2015 UWMP, and WSCP*

In fulfillment of CWC Sections 10632(c) and 10645(a) and (b), Metropolitan's final 2020 UWMP, Appendix 11 to its 2015 UWMP, and its WSCP were posted on the mwdh2o.com website in May 2021, following their adoption by the Metropolitan board. This satisfies the requirement to make the plans available for public review and to make the WSCP available to Metropolitan's customers (which are its member agencies).

In fulfillment of CWC Sections 10632(c), 10635(c) and 10644(a)(1), Metropolitan also mailed copies of the final 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP (in electronic pdf format) to the California State Library and all cities and counties within Metropolitan's service area within 30 days of Board adoption.

In June 2021, in fulfillment of CWC Section 10621(f) and Sections 10644(a)(1), (2), and (b), Metropolitan's final 2020 UWMP, Appendix 11 to the 2015 UWMP, and WSCP were electronically submitted to the State of California through DWR's WUE data website https://wuedata.water.ca.gov/secure/.

### *WSCP Reevaluation and Improvement Procedures*

The WSCP will be periodically re-evaluated to ensure that its shortage risk tolerance is adequate and the shortage response actions are effective and up to date based on lessons learned from implementing the WSCP. The WSCP will be revised and updated during the UWMP update cycle to incorporate updated and new information. For example, new supply augmentation actions will be added, and actions that are no longer applicable for reasons such as program expiration will be removed. However, if revisions to the WSCP are warranted before the UWMP is updated, the WSCP will be updated outside of the UWMP update cycle. In the course of preparing the Annual Assessment each year, Metropolitan staff will routinely consider the functionality the overall WSCP and will prepare recommendations for Metropolitan's Board of Directors if changes are found to be needed.

## ATTACHMENTS

***Attachment A – Water Surplus and Drought Management Plan***

***Attachment B – Water Supply Allocation Plan***

***Attachment C – WSCP Resolution 9281***

## List of Acronyms and Abbreviations

| | |
|---|---|
| AF | Acre-feet |
| CRA | Colorado River Aqueduct |
| CUP | Conjunctive Use Programs |
| CVWD | Coachella Valley Water District |
| CWC | California Water Code |
| DWA | Desert Water Agency |
| DWR | California Department of Water Resources |
| IID | Imperial Irrigation District |
| IRP | Integrated Water Resources Plan |
| ICS | Lake Mead Intentionally Created Surplus |
| MAF | Million Acre-feet |
| MWD | The Metropolitan Water District of Southern California |
| MWD Act | Metropolitan Water District Act |
| PVID | Palo Verde Irrigation District |
| QSA | Quantification Settlement Agreement |
| SNWA | Southern Nevada Water Authority |
| SWP | State Water Project |
| TAF | Thousand Acre-Feet |
| USBR | United States Bureau of Reclamation |
| UWMP | Urban Water Management Plan |
| WSAP | Water Supply Allocation Plan |
| WSCP | Water Shortage Contingency Plan |
| WSDM | Water Surplus and Drought Management |

**Attachment A**

# THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

# WATER SURPLUS AND DROUGHT MANAGEMENT PLAN

**REPORT NO. 1150**

**AUGUST 1999**

## ACKNOWLEDGMENTS

The consensus reached in the Water Surplus and Drought Management Plan would not have been possible without the dedication and participation of the Rate Refinement Process Workgroup, comprises made by the General Manager, staff from Metropolitan's member agencies, Metropolitan staff, and the dedication and work of the consultants.

**Metropolitan's Pro,]ect Management:**

Program Manager: Brian G. Thomas, Assistant Chief, Planning and Resources Division
Project Managers: Timothy A. Blair, Senior Resource Specialist
Eddie A. Rigdon, Principal Resource Specialist

**Metropolitan Support Staff:**

Sydney B. Bennion
James V. Daber
Rafael G. Fernando
Brandon J. Goshi
Michael E. Hollis
Kenneth M. Kules
Dirk S. Marks
Ray Mokhtari
Christine M. Morioka
Dan Rodrigo
Nancy E. Clemm
B. Anatole Falagan
Amy Gallaher
Lee Gottlieb
Nina Jazmadarian
Anthony J. Liudzius
Cynthia J. Miller
Michael Morel
Keith E. Nobriga
Devendra N. Upadhyay

**Project Consultants:**

Jim Waldo, Gordon, Thomas, Honeywell, Malanca, Peterson & Daheim
B. J. Mirk, Gordon, Thomas, Honeywell, Malanca, Peterson & Daheim
Richard W. Atwater, Bookman-Edmonston Engineering, Inc.
Sanjay Gaur, DCSE
Virginia Grebbien, Bookman-Edmonston Engineering, Inc.
Wendy L. Illingworth, Foster Associates
Daniel Jones, Dan Jones Consulting
Dennis Underwood, MWD Agriculture Water Users

**Member Agency, Sub-Agency, and Groundwater Basin Management Agency Participants:**

Gary Arant, Valley Center Municipal Water District
Don Calkins, City of Anaheim
Robert Campbell, San Diego County Water Authority
Amy Chen, San Diego County Water Authority
Charles Darensbourg, Central and West Basin Municipal Water Districts
Tom Erb, Los Angeles Department of Water and Power
Jerry Gewe, Los Angeles Department of Water and Power
Donald L. Harriger, Western Municipal Water District of Riverside County
Gordon Hess, San Diego County Water Authority
Paul Jones, Central and West Basin Municipal Water Districts
Donald R. Kendall, Calleguas Municipal Water District

Keith Lyon, Municipal Water District of Orange County
Mathew Lyons, City of Long Beach
George P. Martin, City of Anaheim
William R. Mills, Jr., Orange County Water District
Ronald C. Palmer, Foothill Municipal Water District
Karl Seckel, Municipal Water District of Orange County
Stanley E. Sprague, Municipal Water District of Orange County
Matthew Stone, Municipal Water District of Orange County
Roger W. Turner, Eastern Municipal Water District
Diem Vuong, City of Long Beach
Kenneth Weinberg, San Diego County Water Authority
Lee Willer, San Diego County Water Authority
Wyatt H. Won, Central and West Basin Municipal Water Districts

**WATER SURPLUS AND DROUGHT MANAGEMENT PLAN**

**METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**

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# EXECUTIVE SUMMARY

## INTRODUCTION

The Water Surplus and Drought Management (WSDM) Plan for the Metropolitan Water District of Southern California (Metropolitan) is a ten-year plan that will be used to direct Metropolitan's resource operations to help attain the region's 100% reliability goal. The WSDM Plan recognizes the interdependence of surplus and shortage actions and is a coordinated plan that utilizes all available resources to maximize supply reliability. The overall objective of the WSDM Plan is to ensure that shortage allocation of Metropolitan's imported water supplies is not required.

The central effort in developing the WSDM Plan was a participatory process involving Metropolitan and its member agencies. Metropolitan staff and member agency representatives coordinated the Plan's development during a series of meetings of the Rate Refinement Team.

To lay a foundation for the WSDM Plan, participants in the Rate Refinement Process developed a set of proposed WSDM Principles and Implementation Goals which were subsequently adopted by the Metropolitan Board of Directors in September 1998. These Principles and Implementation Goals outline fundamental policies for guiding surplus and shortage management and establish a basis for dealing with shortages in an equitable and efficient manner.

## WSDM PRINCIPLES AND IMPLEMENTATION GOALS

### Guiding Principle

- Metropolitan will encourage storage of water during periods of surplus and work jointly with its Member Agencies to minimize the impacts of water shortages on the region's retail consumers and economy during periods of shortage.

### Supporting Principles

- Maintain an ongoing coordinated effort among Metropolitan and its Member Agencies to encourage efficient water use, develop cost-effective local resource programs, and inform the public on water supply and reliability issues

- Encourage local and regional storage during periods of surplus and use of storage during periods of shortage

- Manage and operate Metropolitan's regional storage and delivery system in coordination with local facilities to capture and store surplus water in local groundwater and surface reservoirs

- Arrange for secure sources of additional water from outside the region for use during periods of shortage

- Call upon sources of additional water from outside the region and water stored locally to meet the needs of consumers and protect the economy during periods of shortage

**WSDM Plan Implementation Goals**

- Avoid mandatory import water allocations to the extent practicable

- Equitably allocate imported water on the basis of agencies' needs

  Considerations to create an equitable allocation of imported water may include:

  - Impact on retail consumers and economy
  - Reclamation/Recycling
  - Conservation
  - Population and economic growth
  - Investment in local resources
  - Change and/or loss of local supply
  - Participation in Metropolitan's Non-firm (interruptible) programs
  - Investment in Metropolitan's facilities

- Encourage storage of surplus supplies to mitigate shortages and improve water quality

**SURPLUS AND SHORTAGE ACTIONS**

The region's ability to implement a long-term WSDM Plan results from the significant investments Metropolitan and its member agencies have made in a variety of resources since 1991. These additional resources include increased local conservation and water recycling, improvements in the reliability of imported supplies, increased regional storage, and increased conjunctive use groundwater programs. Together these improvements allow a comprehensive approach to water management.

The growing variety of resources available to the region is transforming Metropolitan from an agency with relatively modest storage capacity to one that will have storage sufficient to manage many shortages without impacts to its member agencies or retail customers. To attain this level of reliability, all storage programs and facilities, along with conservation, recycling, and other programs, must be managed as an integrated set of regional resources. To accomplish this, the WSDM Plan establishes the linkage between surplus and shortage resource management actions.

When imported supplies exceed projected demands for imported water within Metropolitan's service area, Metropolitan can operate available storage facilities to maximize the benefits of stored water to its member agencies. A number of factors affect Metropolitan's ability to divert surplus water into storage. Some of these factors include facility outages, system capacity, water quality (including requirements for managing total dissolved solids), and varying supply and demand patterns. The WSDM Plan provides a description of storage options available to Metropolitan and a framework for storing water in these programs and facilities when surplus supplies are available.

Except in severe or extreme shortages (defined in the Introduction) or emergencies, Metropolitan's resource management will allow shortages to be mitigated without impacting retail Municipal and Industrial (M&I) customers. A list of resource management actions and their descriptions are provided

below. This list emphasizes critical storage programs and facilities, and conservation programs that make up part of Metropolitan's response to shortages. The order in which these actions are presented does not imply the exact operational management of resources that would occur during a shortage, rather it represents a general framework and guide. In fact, several actions are likely to be taken concurrently. Many factors will dictate the exact order in which these actions will be taken during shortages. One action, however, will have an assigned prioritization: the curtailment of Full Service (firm) deliveries will be last. The following summarizes the drought actions:

- Draw on storage in the Eastside Reservoir Project
- Draw on out-of-region storage in Semitropic and Arvin-Edison
- Reduce/suspend long-term seasonal and groundwater replenishment deliveries
- Draw on contractual groundwater storage programs in the region
- Draw on State Water Project (SWP) terminal reservoir storage (per Monterey Agreement)
- Call for extraordinary drought conservation and public education
- Reduce Interim Agricultural Water Program (IAWP) deliveries
- Call on water transfer options contracts
- Purchase transfers on the spot market
- Implement the allocation of Metropolitan's imported supplies to its member agencies

For the ten-year period addressed by the WSDM Plan, 1999-2008, the majority of shortage contingencies will be managed by withdrawals from storage, groundwater management and options transfers. Shortages managed using these actions would not impact the quantity of water delivered to member agencies for consumptive uses. In fact, when coupled with other drought actions such as extraordinary conservation and reduction of agricultural deliveries, it is fully expected that an allocation of firm imported water supplies will not be necessary during the next ten years. Under this worse-case scenario, an approach to allocate Metropolitan's firm imported water supplies in a fair and equitable manner will be developed.

The overall policy objective of the allocation method will be to minimize the impacts to any one agency and the region as a whole. To meet that objective, the method of allocating firm imported supply will account for:

- Each agency's demands on Metropolitan,
- Each agency's local resources
- Each agency's total retail demands.

The WSDM Plan allocation method would address each of these supply and demand components and account for each agency's conservation and recycled water programs. A pricing structure will be coupled with the WSDM allocation method to accomplish two goals:

- Encourage conservation and water recycling
- Ensure that the regional impact of the shortage is as small as possible

To provide as much water as possible without changing wholesale prices, the allocation of all available supplies will be made at the prevailing rates for firm deliveries. In order to encourage conservation to the level of allocation, the rate for agency usage from 100-102% of its allocation will be the Full Service rate plus $175. Usage above 102% of allocated supply will be charged at three times the Full Service rate. Any substantial change in Metropolitan's water rate structure may require these rates to be revised.

During severe or extreme shortage conditions, public outreach will play a critical role in shaping consumer response. Public information campaigns will send clear signals if extraordinary drought conservation is required. An effective public information campaign requires a joint effort among Metropolitan and its member agencies. Under this Plan, the administration of the Public Information and Government Affairs program will be the responsibility of a Drought Program Officer (DPO). The DPO will be responsible for integrating the various activities in these areas, coordinating efforts with Metropolitan's Board of Directors and member agencies, and designing the region-wide messages for the general public and various target audiences. Important constituencies are residential users, industrial and institutional users, business interests, agricultural users, elected officials, officials of various agencies such as the Department of Water Resources, and the media.

## INTEGRATED RESOURCES MANAGEMENT

Throughout the Integrated Resources Planning process and the development of the WSDM Plan, extensive analysis of resource management strategies focused on maximizing supply reliability while minimizing overall resource costs. Various management strategies were analyzed trader shortage scenarios based on historical hydrologic data. The WSDM Plan presents a resource management framework to guide Metropolitan's integrated approach to supply management.

The resource management framework does not dictate a scripted response to shortage or surplus. The framework recognizes the complexity and variety of conditions that require action. Supporting this framework are general rules that describe the actions to be taken in each stage of surplus or shortage. These rules depend on shortage stage, account for monthly delivery requirements, and depend on when various supplies would be available.

One of the fundamental trade-offs in dealing with supply shortages is the need to maintain flexibility while providing supply certainty to member agencies and consumers. A central focus of the WSDM Plan is the analysis of information about supplies and demands. When do various pieces of information about the supply/demand balance become more certain? When should this information impact policy-making and trigger various resource actions? The WSDM Plan addresses these questions and the actual implementation of the Plan during a shortage.

Appendix A of this report provides a ten-year simulation of projected demands and supplies showing an example of how the region can maintain 100% reliability.

# INTRODUCTION

The Metropolitan Water District of Southern California (Metropolitan) provides water to a service area covering approximately 5,200 square miles. Over 16.5 million people live within the service area, which supports a $500 billion economy. Metropolitan provides supplemental supplies to twenty-seven member agencies, both retail and wholesale agencies, who in turn provide water to over three hundred cities and local agencies providing supplies at the retail level. In recent years Metropolitan supplemental deliveries have accounted for about one-half to two-thirds of the region's total water demands. With supplies from its Colorado River Aqueduct (CRA) and the State Water Project (SWP), Metropolitan delivers water for municipal and industrial (M&I) uses, agricultural uses, and augmentation of local storage.

As part of the implementation of the regional Integrated Resources Plan (IRP), Metropolitan and its member agencies have developed the Water Surplus and Drought Management (WSDM) Plan for Southern California. This ten-year plan will direct Metropolitan's resource operations to help attain the region's 100% reliability goal. Over this ten-year period, the WSDM Plan will be updated to account for changes impacting supplies from the Colorado River and California's Bay-Delta. In the past, Metropolitan has developed drought management plans that simply addressed shortage actions and primarily focused on issues of short-term conservation and allocation of imported water. The WSDM Plan recognizes the interdependence of surplus and shortage actions and is a coordinated plan that utilizes all available resources to maximize supply reliability. The overall goal of the WSDM Plan is to ensure that shortage allocation of Metropolitan's imported water supplies is no---At required.

Because it addresses both surplus and shortage contingencies, the WSDM Plans draws clear distinctions among the terms *surplus, shortage, severe shortage,* and *extreme shortage.*

> ***Surplus****: Supplies are sufficient to allow Metropolitan to meet Full Service demands, make deliveries to all interruptible programs (replenishment, long-term seasonal storage, and agricultural deliveries), and deliver water to regional and local facilities for storage.*
>
> ***Shortage****: Supplies are sufficient to allow Metropolitan to meet Full Service demands and make partial or full deliveries to interruptible programs, sometimes using stored water and voluntary water transfers.*
>
> ***Severe Shortage****: Supplies are insufficient and Metropolitan is required to make withdrawals from storage, call on its water transfers, and possibly call for extraordinary drought conservation and reduce deliveries under the IAWP.*
>
> ***Extreme Shortage****: Supplies are insufficient and Metropolitan is required to allocate available imported supplies.*

## WSDM PRINCIPLES AND IMPLEMENTATION GOALS

The central effort in developing the WSDM Plan was a participatory process involving Metropolitan and its member agencies. Metropolitan staff and member agency representatives coordinated the Plan's development during a series of meetings of the Rate Refinement Team and the Integrated Resources Planning Workgroup. To lay a foundation for the WSDM Plan, participants in the Rate Refinement Process developed a set of "WSDM Principles and Implementation Goals."

### Guiding Principle

- Metropolitan will encourage storage of water during periods of surplus and work jointly with its Member Agencies to minimize the impacts of water shortages on the region's retail consumers and economy during periods of shortage.

### Supporting Principles

- Maintain an ongoing coordinated effort among Metropolitan and its Member Agencies to encourage efficient water use and cost-effective local resource programs and to inform the public on water supply and reliability issues

- Encourage local and regional storage during periods of surplus and use of storage during periods of shortage

- Manage and operate Metropolitan's regional storage and delivery system in coordination with local facilities to capture and store surplus water in local groundwater and surface reservoirs

- Arrange for secure sources of additional water from outside the region for use during periods of shortage

- Call upon sources of additional water from outside the region and water stored locally to meet the needs of consumers and protect the economy during periods of shortage

### WSDM Plan Implementation Goals

- Avoid mandatory import water allocations to the extent practicable

- Equitably allocate imported water on the basis of agencies' needs

  Considerations to create an equitable allocation of imported water may include:
  - Impact on retail consumers and economy
  - Reclamation/Recycling
  - Conservation
  - Population and economic growth
  - Investment in local resources
  - Change and/or loss of local supply
  - Participation in Metropolitan's Non-firm (interruptible) programs
  - Investment in Metropolitan's facilities.

- Encourage storage of surplus supplies to mitigate shortages and improve water quality

## REGIONAL RESOURCES AND DEMANDS

Southern California receives its water supplies from a variety of different sources, both local to the region and imported from outside the region. These sources are summarized below.

### Local Supplies

Local supplies include groundwater pumping of local aquifers, surface reservoir production, recycled water, and supplies imported through wheeling arrangements or through the Los Angeles Aqueduct, which is owned and operated by the City of Los Angeles. Local supplies have, in the past, provided as much as 2.1 million acre-feet (maf) of water to meet the region's water demands. By far the largest component of local supplies is groundwater pumping, providing over 75% of historical local supplies.

### Colorado River Supplies

The distribution and management of Colorado River water is governed by a complex body of laws, court decrees, compacts, agreements, regulations, and an international treaty collectively known as the "Law of the River." Metropolitan's entitlement is established by the fourth and fifth priorities of California's Seven Party Agreement, included in Metropolitan's 1931 and 1946 contracts with the Secretary of the Interior. These priorities provide 550,000 acre-feet (af) per year and 662,000 af per year, respectively. In addition, Metropolitan holds a surplus water contract for delivery of 180,000 af. The physical capacity of the CRA is slightly in excess of 1.3 maf per year, based on a pumping capacity of 1,800 cubic feet per second (cfs). Metropolitan's long-held objective is to maximize the availability of Colorado River water, up to the maximum capacity of the CRA, subject to environmental, contractual, legal, political, financial, and institutional constraints. A California 4.4 Plan is being developed among California parties that will help ensure that full CRA deliveries are maintained, while addressing the concerns of the other Colorado River basin states that rely on the river. The California 4.4 Plan includes core transfers (such as the IID/MWD conservation agreement and the proposed IID/SDCWA transfer), system conservation (such as the lining of the All American Canal), offstream storage (such as the Arizona groundwater storage program), dry year option transfers (such as PVID land fallowing), and river re-operations.

### State Water Project

Metropolitan is one of 29 water agencies that have contracted with the State of California, through the Department of Water Resources (DWR), for water deliveries from the SWP system. Metropolitan's contracted entitlement is for 2.01 maf per year, or about 48 percent of the total contracted entitlement of 4.2 maf per year. SWP deliveries to Metropolitan are made via the SWP's California Aqueduct.

Initial SWP facilities, completed in the early 1970's, have produced average supply yields adequate to meet just over half of the total contracted entitlement. While it was intended that additional SWP facilities would be constructed as SWP contractor demands increased up to their contracted entitlements, few facilities have been constructed since that time.

The SWP obtains its supplies primarily from the Sacramento River Basin. About half of the total supply diverted from the Delta for the SWP is regulated flow from the Feather River (a tributary to the Sacramento River), while the other half is unregulated flow from runoff downstream of Sacramento River reservoirs and from other rivers that flow into the Delta. The Sacramento River watershed is subject to wide annual variations in total runoff. The Sacramento River Index (SRI), which measures runoff in the watershed, has averaged about 18 maf per year over the last 90 years. However, runoff varies widely from year to year. For example, the SRI measured 7.8 mafin 1994 and 32.5 mafin 1995.

Figure 1 shows the historical total regional supply production by type. As shown in Figure 1, water supplies were as high as 4.25 mafin 1990 and within two years dropped to 3.4 mar, a 20% decrease.

**Figure 1. Historical Supply Production by Type of Supply**

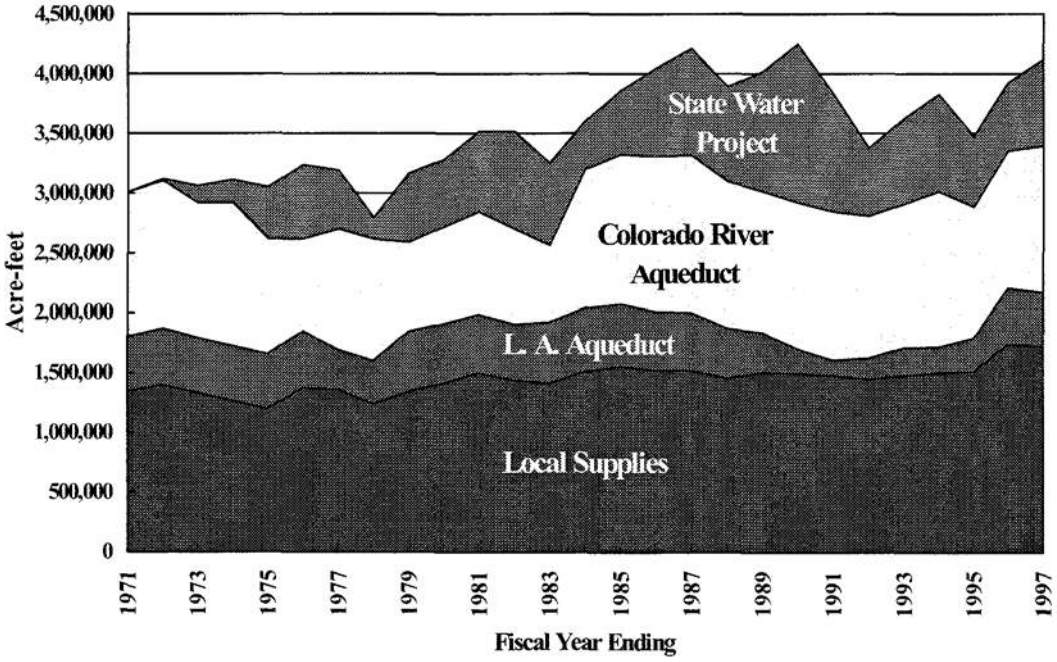

## RETAIL DEMANDS

From 1982 through 1995, the region experienced retail water demands averaging 3.5 mar. In dry years retail demands are approximately 5 to 7% greater than normal years, while demands in wet years are about 6 to 8% below normal demands. Under normal weather conditions, assuming full implementation of conservation best management practices, total regional retail demands are projected to increase from about 3.7 mar in 1997 to almost 4.3 mar in 2010. Without conservation, demands in 2010 would be about 10 to 12% greater than projected. Increases in retail demand are driven by demographics and economics, including changes in population, housing, employment, and income. Figure 2 shows the historical and projected retail demands in Metropolitan's service area.

**Figure 2. Regional Retail Water Demands**

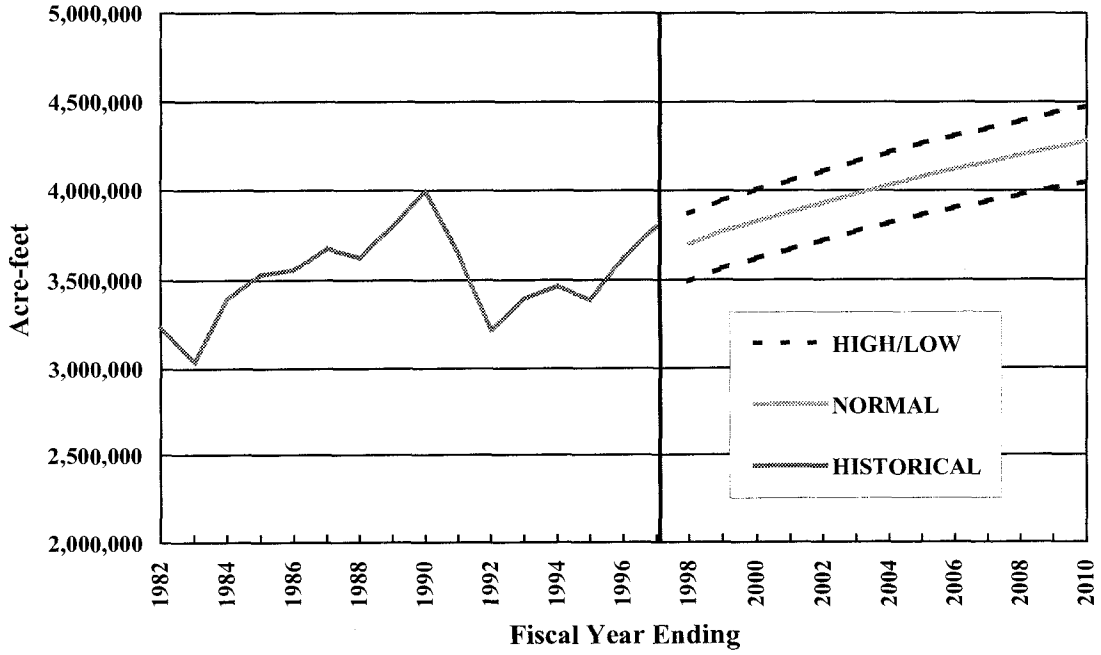

The historical variability in demands from 1982 to 1997 is mainly due to weather and the economy. In 1983, extreme wet weather caused a significant drop in retail demands. During the period from 1985 to 1990, hot and dry weather coupled with a strong economy resulted in increased demand from 3.5 maf to 4.0 maf, a 14% increase. In 1991, the 5th year of a prolonged drought, conditions forced many communities to implement mandatory supply reductions. These mandatory reductions coupled with extraordinary drought conservation caused a 10 to 15% decrease in retail demands for the region. In addition, the period between 1992 and 1995 was very wet (with the exception of 1994, which was dry), and was a period of severe economic recession. Southern California alone lost some 700,000 jobs from 1990 through 1995. The combination of wet weather, economic recession, and conservation resulted in demands decreasing by over 17%.

**DEMANDS ON METROPOLITAN**

For many member agencies, Metropolitan's water deliveries represent a supplemental supply. Most member agencies have local water supplies, but agencies differ in how much their supplies alone can meet their respective retail demands. Local supplies are often base-loaded (maximized subject to various constraints) and purchases from Metropolitan are used to meet remaining demands. In addition, to meeting consumptive demands, Metropolitan's deliveries are used to replenish local groundwater and surface reservoirs. To project demands on Metropolitan, projections of member agency's retail water demands and local water supplies are made. Local supplies are then subtracted from retail demands to get consumptive demands on Metropolitan. A projection of Metropolitan's long-term seasonal and replenishment deliveries are made based on safe groundwater yield and weather/hydrology.

Metropolitan forecasts its demands for three different broad categories: Full Service, Seasonal (reservoir storage and groundwater replenishment delivered for shift or long-term storage purposes and sold at a discount), and Agricultural (deliveries of water sold at a discount for agricultural use). Overall, demands on Metropolitan can vary -+ 11 to 18% from normal conditions due to weather and hydrology.

The following four figures show historical and projected demands on Metropolitan by category. Figure 3 shows Basic Water Deliveries, Figure 4 shows Seasonal Water Deliveries, Figure 5 shows Interim Agricultural Water Program (IAWP) Deliveries, and Figure 6 shows Total Water Deliveries for Metropolitan.

Figure 3. MWD Basic Water Deliveries

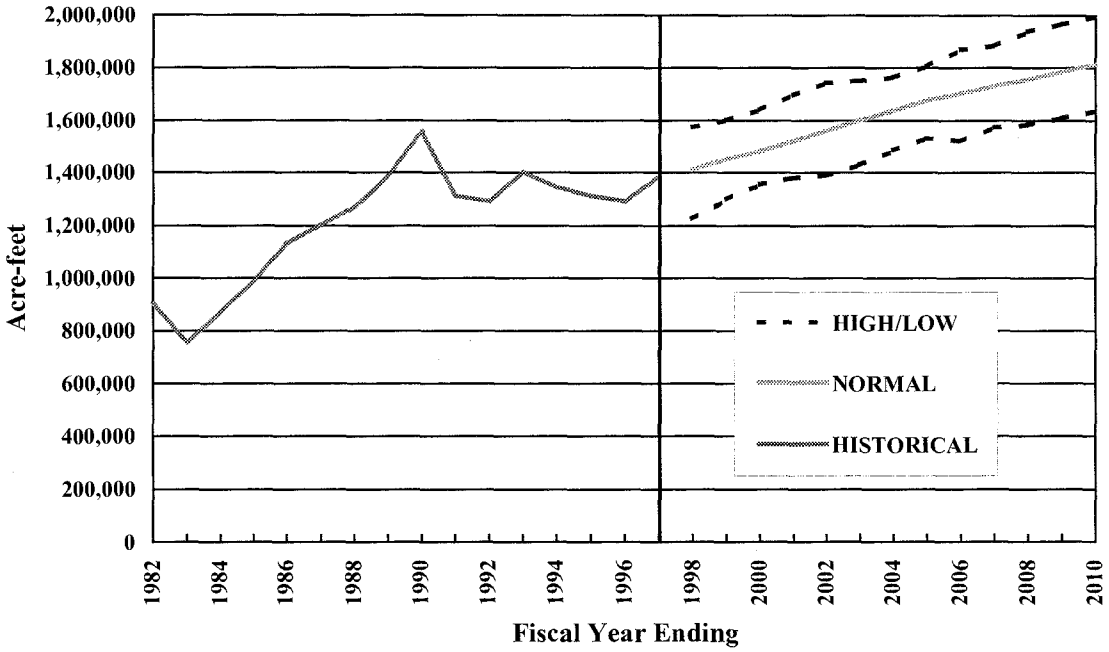


Figure 4. MWD Seasonal Water Deliveries

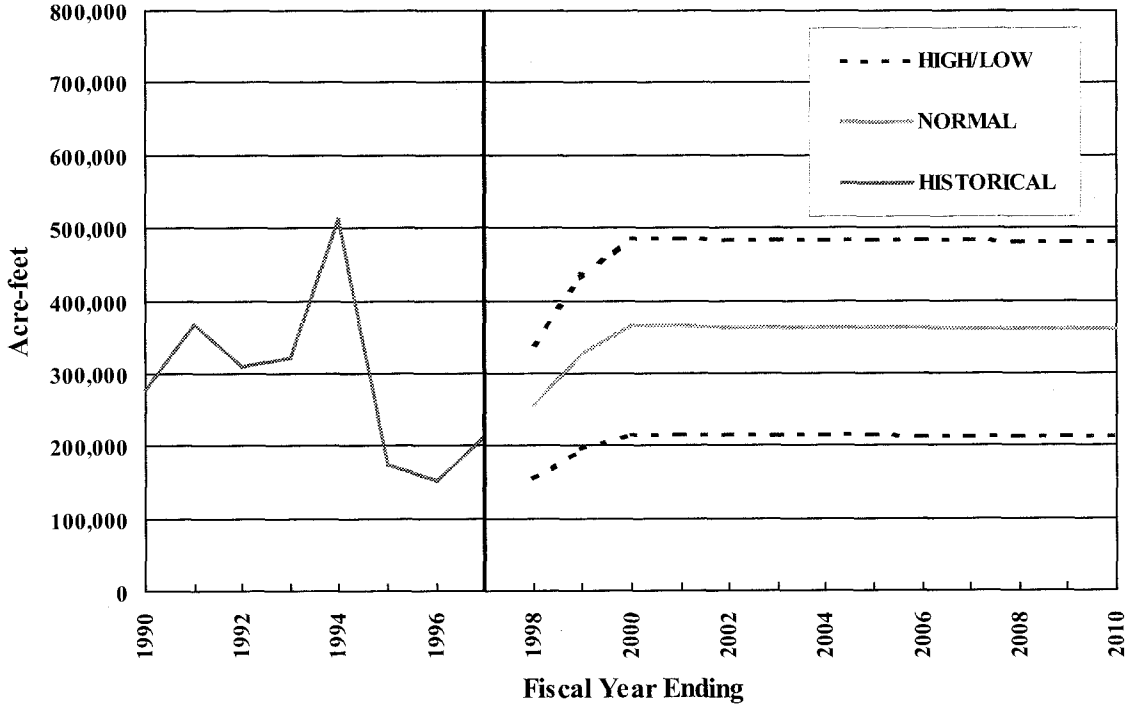

Figure 5. MWD Interim Agricultural Water Program (IAWP) Deliveries

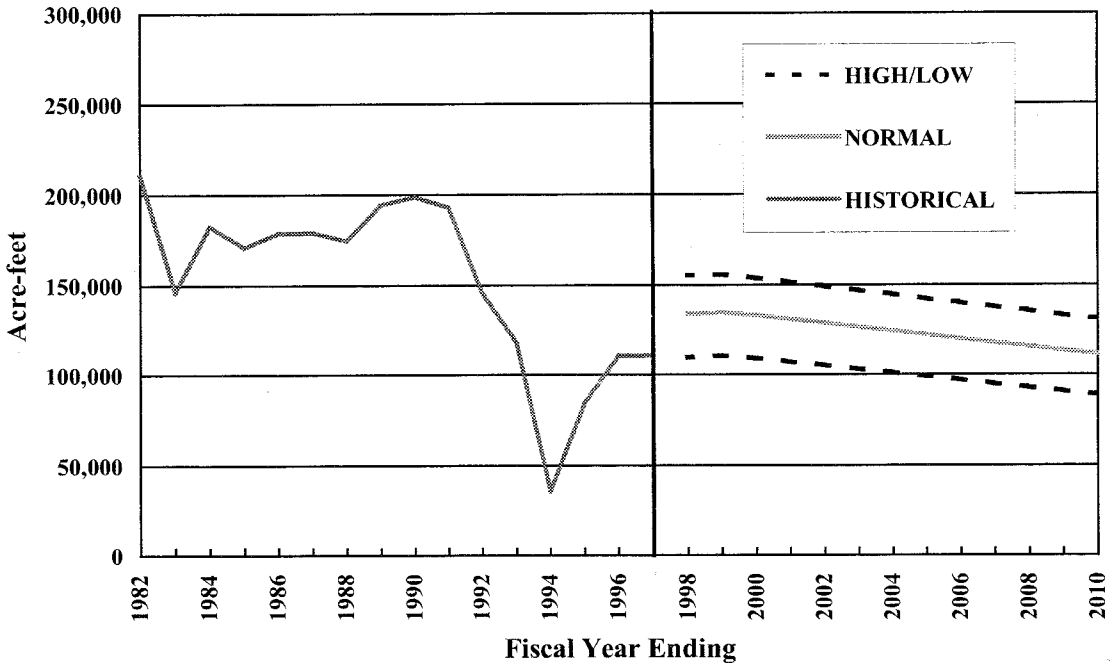


Figure 6. MWD Total Water Deliveries

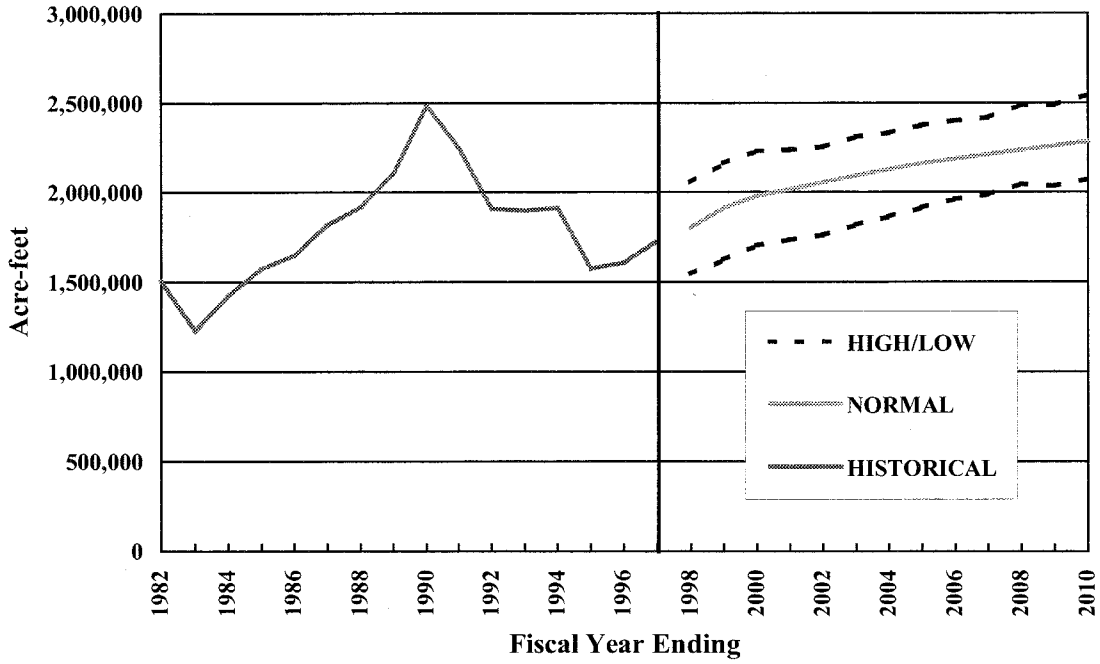

## INTEGRATED RESOURCES PLANNING

To ensure supply reliability under various drought conditions, Metropolitan and its member agencies developed an Integrated Resources Plan (IRP). The IRP, adopted by Metropolitan's Board of Directors in January 1996 and periodically updated, guides Metropolitan's resource and capital improvements investments. The region's ability to develop a long-term WSDM Plan results from the significant investments Metropolitan and its member agencies have made in resources since 1991. To date, these investments include:

- Local supplies: Metropolitan co-funded over 23 local projects and 200 conservation programs that will yield a total of 160,000 af per year.

- **Colorado River Aqueduct:** Metropolitan developed transfers and storage programs to help ensure a full aqueduct. The landmark Metropolitan/Imperial Irrigation District Conservation Program (IID), will result in a savings of 107,000 af per year. Storage programs in Arizona and California, combined with the IID savings, yield a total of 280,000 af of annual core, dry year options, and storage supply.

- **State Water Project:** Metropolitan and other parties negotiated the Bay-Delta Accord and the Monterey Amendment. The Bay-Delta Accord and subsequent efforts will increase the reliability of Metropolitan's entitlement deliveries. The Monterey Amendment provides access to 220,000 af of SWP storage.

- **In-Basin Storage:** Metropolitan is constructing the Eastside Reservoir Project, with 800,000 af of storage (400,000 af of which is emergency storage for use in case of facility failure as a result of earthquake or other event).

- **Groundwater Conjunctive Use Storage:** Metropolitan developed a conjunctive use storage program in the North Las Posas Basin in Ventura County with an anticipated capacity of 210,000 af and a dry-year withdrawal rate of up to 70,000 af.

- **Transfers and Storage:** Metropolitan developed the Semitropic Storage Program, with 350,000 af of storage and dry-year withdrawals averaging about 60,000 af. Metropolitan also approved the Arvin-Edison Storage and Transfer Program, with 250,000 af of storage and dry-year withdrawals averaging about 70,000 af. Metropolitan is also exploring storage and transfer programs with the Coachella Valley Water District and the Cadiz Land Company.

As a result of these investments, it is anticipated that Metropolitan and its member agencies will be 100% reliable over the next 10 years even under a repeat of the 1991 drought condition. Figure 7 compares actual Metropolitan demands and supplies during 1991 (the last year in a multiyear severe drought) and projected demands and supplies in year 2005 (assuming a repeat of 1991 conditions). In 1991, the region faced shortages that required Metropolitan to allocate water under the Incremental Interruption and Conservation Plan (IICP). The reduction in deliveries came after demands had already been reduced as a result of local conservation. In addition, water had to be purchased from the Governor's drought emergency water bank. By the year 2005 with the investments made to date,

Metropolitan's additional water supplies will be more than adequate to meet demands under a repeat of the 1991 drought event--even with increased demands due to growth.

**Figure 7. Historical and Projected Metropolitan Supplies and Demands Under Drought Conditions**

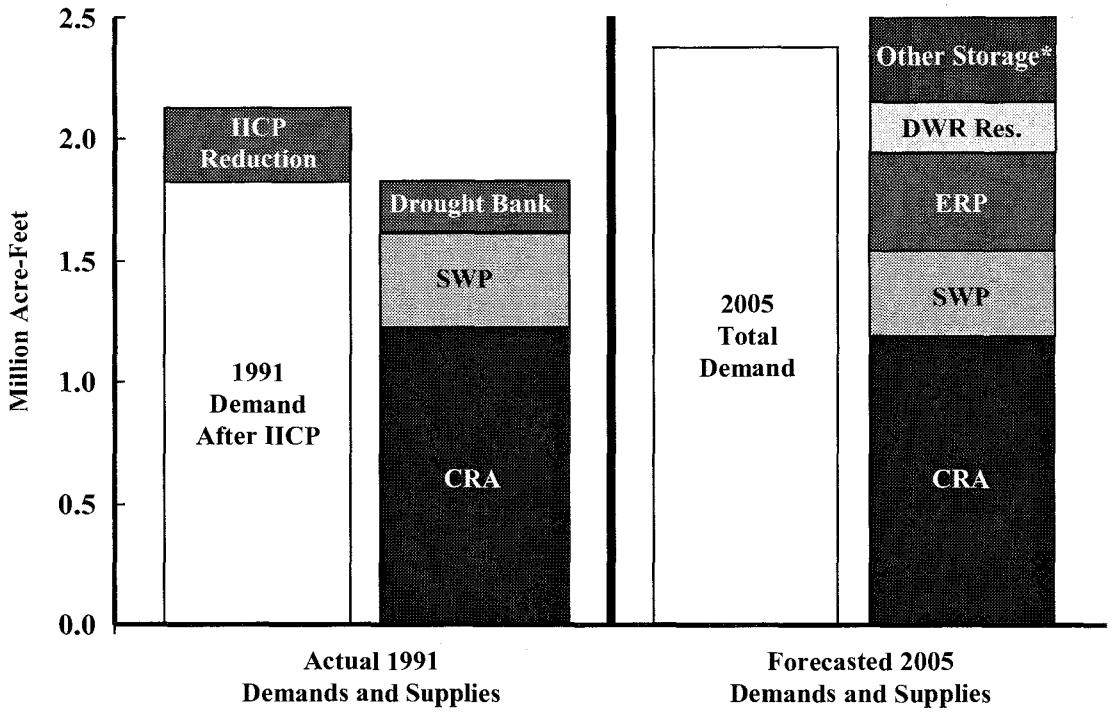


*** Groundwater management, Semitropic Storage Program, and Arvin-Edison Storage Program**

# SURPLUS AND SHORTAGE RESOURCE ACTIONS

Metropolitan's investments in water resources, facilities, and programs has transformed it from an agency with relatively modest storage capacity to one that will have storage sufficient to manage many shortages without negative impacts to its member agencies or retail customers. To attain this level of reliability, storage programs and facilities, along with conservation, recycling, and other programs, must be managed as an integrated set of regional resources. To accomplish this, the WSDM Plan recognizes the linkage between surplus and shortage resource management actions.

## SURPLUS ACTIONS

The combination of Metropolitan's regional storage facilities, such as Lake Mathews, Lake Skinner, the future Eastside Reservoir Project, and the storage capacity available to Metropolitan in Castaic Lake and Lake Perris as a result of the Monterey Amendment, allows Metropolitan great flexibility in managing its water resources. The development of storage programs both outside and within the service area provides even greater flexibility in storing surplus water. Each of the storage facilities and programs plays an important role in achieving Metropolitan's reliability goal.

When imported supplies exceed projected demands for imported water within Metropolitan's service area, Metropolitan can operate storage facilities to maximize stored water to benefit its member agencies. A number of factors affect Metropolitan's ability to divert surplus water into storage. Some of these factors include facility outages, system capacity, water quality (including requirements for managing total dissolved solids), and varying supply and demand patterns. This section provides a description of storage options available to Metropolitan and a framework for storing water in these programs and facilities when surplus supplies are available.

### Storage of Colorado River Supplies

Metropolitan has participated in a number of programs to maximize the reliability of supplies from the Colorado River. The landmark Metropolitan/Imperial Irrigation District Conservation Program will result in a savings of 107,000 af per year. These supplies will increase the reliability of Metropolitan's entitlement of Colorado River water. Other programs yield shortage benefits by increasing amounts of water stored for use during shortages. Between August 1992 and July 1994, Metropolitan and the Palo Verde Irrigation District conducted a Test Land Fallowing Program. Approximately 20,000 acres of farmland in the Palo Verde Valley were not irrigated, saving 186,000 af of water which was stored in Lake Mead for later use by Metropolitan. With Arizona and Nevada water agencies, Metropolitan is participating in a Central Arizona Groundwater Storage Demonstration Program that has encouraged the storage of water. To date, 139,000 af of supplies have been stored in groundwater basins in Central Arizona. The Desert Coachella program is an exchange and storage program with agencies situated along the Colorado River Aqueduct. Metropolitan releases Colorado River water for storage in the Coachella Groundwater Basin. Metropolitan then exchanges these supplies for the

participating agencies' SWP supplies. These programs serve as models for future programs that could increase the reliability of Colorado River supplies. Metropolitan continues to explore other possible options that would increase the reliability of supplies. The California 4.4 Plan is being developed among California parties to increase storage programs for Colorado River supplies. In addition to core transfers and conservation programs, the California 4.4 Plan includes offstream storage (such as the Arizona groundwater storage program), dry year option transfers (such as PVID land fallowing), and river re-operations. These programs, in conjunction with favorable supply determinations by the Secretary of Interior, will ensure the highest possible reliability of Colorado River supplies.

In addition to the programs mentioned above, the Colorado River system itself contributes to the high reliability of Metropolitan's Colorado River supplies. Currently, the average Colorado River runoff exceeds basin-wide demands by over 1.0 maf per year. The Colorado River system also contains a great deal of reservoir storage capacity. The total storage capacity in the Colorado River Basin is approximately 60 maf, almost four times the Colorado River's average annual flow. For much of 1997, system storage levels were at 80% or more of total capacity. These factors allow the Bureau of Reclamation, operators of the Colorado River system, to store significant supplies for use during shortages.

**Storage of State Water Project Supplies**

Total storage capacity is a critical factor in comparing the operations of the Colorado River system with the SWP. On average, both systems have similar amounts of water available on an annual basis. The SWP's watersheds in the Sacramento River Basin have produced about 18 maf per year over the long term, as represented by the Sacramento River Index (SRI.) Long-term runoff on the Colorado River has averaged more than 16 maf annually since 1906. However, the ability to carry over unused water from a wet year for use in a dry year differs substantially between the two systems. State Water Project storage facilities have storage capacity of about 4.5 maf, while system storage in the Colorado River Basin totals nearly 60 maf. This gives the operators of the Colorado River reservoirs much more flexibility in storing unused water from a wet year for use in a subsequent dry year.

When water from the SWP cannot be put to immediate use in Metropolitan's service area, the water may be stored for future use. Provided storage capacity is available, the water may remain in either Oroville Reservoir (as SWP storage for delivery to all contractors the following year) or San Luis Reservoir (as carryover storage assigned to Metropolitan). Through the carryover storage program, as amended by the Monterey Amendment, Metropolitan can place a maximum of 200,000 af per year of allocated supplies in SWP surface reservoirs. The program also allows for carryover storage in non-project facilities, including surface reservoirs and groundwater basins. In the case of carryover storage in San Luis Reservoir, SWP supplies allocated to but unused by a contractor may, under certain conditions, be assigned as carryover if storage capacity is available at the end of the calendar year. However, carryover water stored for a contractor has lower priority than storage of SWP water and consequently "spills" first as San Luis Reservoir fills.

Also, in a wet year such as 1995, low demands may allow DWR to operate San Luis Reservoir nearly full, eliminating any possibility of contractor carryover storage into the following year. As a result, carryover storage on the SWP may not be possible, and even when possible, is subject to spilling.

Due to these carryover storage limitations, Metropolitan has invested a great deal to expand its ability to store surplus SWP supplies. Metropolitan has entered into a number of water transfer and storage agreements. The Semitropic Water Banking and Exchange program allows Metropolitan to store up to 350,000 afin the groundwater basin underlying the Semitropic Water Storage District. The storage and withdrawal capacities of the program are shared with other participants in the storage program, with Metropolitan's share equaling 35%. Dry-year withdrawals will average about 60,000 af.

Metropolitan and the Arvin-Edison Water Storage District have developed a program that allows Metropolitan to store water in the groundwater basin in the Arvin-Edison service area. The program would allow the storage and withdrawal of 250,000 af of supplies over the next 25430 years. Dry-year withdrawals will average about 70,000 af.

**Storage in Regional Facilities**

In addition to the storage of Colorado River and SWP supplies outside the region, Metropolitan has established a number of programs for storing supplies within the region. Metropolitan owns and operates two main surface reservoirs, Lake Mathews and Lake Skinner, which have a combined storage of about 226,000 af. Only a small portion of this capacity is available for shortages, with the balance being used to regulate flows in Metr0Politan's delivery system. The Eastside Reservoir Project, currently under construction, will have a total capacity of 800,000 af, with approximately 400,000 af of operational drought and seasonal storage and 400,000 af of emergency storage. Through the Monterey Amendment, Metropolitan obtained the fight to use up to 220,000 af of water stored in the SWP terminal reservoirs. However, withdrawals from these terminal reservoirs must be replaced within five years.

Metropolitan and its member agencies have established the cyclic storage program to increase storage in groundwater basins within the service area. Regional groundwater basins offer an economical way for Metropolitan to improve supply reliability by storing water within the service area. This makes water readily accessible in times of need, either in emergency situations or during shortages. Some limitations are imposed by the fact that such water can generally only be used through pumping from the groundwater basin by an overlying member agency or local agency. Storage in groundwater basins takes place either by direct replenishment (spreading or injection), or through in-lieu means. Spreading (or injection) is desirable because direct measurement of the amount of stored water is a relatively simple, verifiable transaction. The main disadvantage to direct spreading is that spreading can occur only under certain conditions. For example, spreading cannot occur when spreading facilities are being used to capture local storm runoff for flood control purposes, or when the amount of local runoff precludes the need

for imported water to replenish the basins. Also, spreading basins require frequent maintenance to assure maximum efficiency. These and other conditions can limit the ability to deliver water for spreading at a time when surplus supplies are available.

In-lieu replenishment allows most member agencies to participate in groundwater replenishment without needing direct access to replenishment facilities. Their wells, in effect, become their replenishment facilities. Both direct and in-lieu replenishment from 1986 through 1990 served the region well during the critical drought years from 1991 through 1993.

The overall objective of the various storage programs is to maximize the availability of imported water during times of need by storing surplus water in a strategic manner and utilizing the storage available within the region. Many factors affect the availability of storage capacity and Metropolitan's ability to move water to and from various facilities. After reviewing the full range of shortage actions available to Metropolitan, a framework for prioritizing the full range of surplus and shortage actions will be presented.

In addition to pricing incentives used to encourage local agencies to store water in groundwater basins, Metropolitan has developed a conjunctive use contractual storage program with the Calleguas MWD in the North Las Posas Basin. Metropolitan will fund the construction of wells which will be called upon to meet demands during dry years. This program will yield a dry year supply of about 70,000 af.

**SHORTAGE ACTIONS**

Except in severe or extreme shortages or emergencies, Metropolitan's management of available resources will allow shortages to be mitigated without negatively impacting retail M&I demands. Below is a list of drought actions that will be taken during periods of shortage. The goal of these actions is to avoid, to the extent practicable, the allocation of Metropolitan's firm supplies. The order in which these actions are presented does not imply the exact operational management of resources that would occur. In fact, several actions are likely to be taken concurrently. Many factors dictate the particular order in which actions will be taken during an actual shortage, although it is clear that the last action will be the curtailment of firm deliveries to the member agencies.

- Draw on storage in the Eastside Reservoir Project
- Draw on out-of-region storage in Semitropic and Arvin-Edison
- Reduce/suspend long-term seasonal and groundwater replenishment deliveries
- Draw on contractual groundwater storage programs in the region
- Draw on SWP terminal reservoir storage (per Monterey Agreement)
- Call for extraordinary drought conservation and public education
- Reduce IAWP deliveries
- Call on water transfer options contracts
- Purchase transfers on the spot market
- Implement an allocation of Metropolitan's imported supplies to its member agencies

Even with dedicated programs to meet the reliability goal for the region, proper management and operations of these resources is critical to ensure reliability. The prioritization of both surplus and shortage actions need to account for several important criteria. It is also important to recognize that these criteria will need to be balanced. The criteria include:

**Location:** Out-of-region storage is more vulnerable than in-basin-storage due to the risks of seismic events. To only maximize out-of-region storage will put reliability at risk.

**Take capacity:** Surface reservoirs generally have the ability to be filled and drawn down very quickly. Certain groundwater storage programs have limited take capacities--requiring several years at full take capacity to withdraw **all** available storage. Stored water will be balanced so that dry year supplies are maximized.

**Cost:** Programs vary with respect to their marginal operating costs. Program actions will be taken to maximize supply reliability while minimizing cost.

**Flexibility:** Not all storage programs and transfers offer the same flexibility to Metropolitan. Some programs can only meet specific overlying demands, while others can meet demands anywhere in the system.

**DESCRIPTIONS OF RESOURCE ACTIONS**

**Draw on storage in the Eastside Reservoir Project:** Withdrawals from the Eastside Reservoir Project would provide a flexible supply for meeting a shortage. Eastside Reservoir Project supplies can be drawn upon quickly. The amount of water drawn from the Eastside Reservoir Project before exercising other shortage actions will depend on the severity of the shortage and the overall condition of other resources available to Metropolitan.

**Draw on out-of-region storage in Semitropic and Arvin-Edison programs:** Out-of-region programs such as Semitropic and Arvin-Edison provide cost-effective shortage supplies. These supplies also provide flexibility, as they can be distributed as effectively as any SWP supplies coming into Metropolitan's service area. Exercising these programs relatively early in the order of actions reduces the risk of leaving supplies out-of-region. Based upon the ratio of storage capacity to take capacity, these programs will generally provide supplies over several years. This provides the rationale for calling on these programs relatively early in a shortage.

**Reduce Long-Term Seasonal and Replenishment Deliveries, and call on cyclic storage accounts:** Certain interruptible supply programs provide benefits during shortage. Reducing deliveries to interruptible programs established for storage purposes, while continuing expected levels of groundwater production, allows limited supplies to go toward meeting direct consumptive uses. In addition, calling on cyclic storage accounts can extend the replenishment needs for several years. Most replenishment supplies would be expected to be interruptible for a minimum of two years before agencies would be allowed to claim a local supply adjustment on such supplies. Some programs have longer interruption requirements. For example, most Groundwater Recovery Programs are governed by contracts that require supply production through a three-year interruption in service.

**Draw on contractual groundwater storage programs:** In-region contractual groundwater programs provide cost-effective supplies that would be drawn upon during shortages. These programs are also

limited by their take capacities and generally have several years of withdrawals in storage. For this reason, these programs might be called upon before withdrawing heavily from surface reservoir storage.

**Draw on SWP terminal reservoir storage:** The storage available in the SWP terminal reservoirs provides a flexible and cost-effective shortage supply. Supplies withdrawn from this program must be replaced within five years of withdrawal. For this reason, the storage in these reservoirs would be reserved for more serious shortage conditions and would be utilized after the programs and facilities listed above were used to meet the shortage.

**Call for extraordinary drought conservation:** Voluntary conservation programs have historically been effective in reducing water demand during drought. However, voluntary conservation programs are not without impact to the retail customer and can be perceived as a failure of water agencies to properly plan for shortages. Therefore, the call for extraordinary drought conservation will only be taken with the consent of Metropolitan's Board of Directors.

**Reduce agricultural deliveries:** The Interim Agricultural Water Program (IAWP) offers interruptible water to southern California's agricultural industry at discounted rates. These supplies will be interrupted as part of Metropolitan's shortage actions. Metropolitan will work with IAWP participants to provide as much advance warning of interruption as possible. The IAWP reflects current policies toward agricultural water users. The policies underlying this program are due to be reviewed during the ten-year period of the WSDM Plan. The WSDM Plan will be changed accordingly.

**Call on water transfer option contracts:** Transfer options programs provide cost-effective supplies when the region is faced with reducing deliveries to meet consumptive demands. These programs might also be used to increase storage levels in Metropolitan storage facilities. Replenishment of these facilities reduces the risk of leaving available supplies outside the region and helps to protect the region during extended shortages.

**Purchase transfers on the spot market:** During the 1987-92 drought, the Drought Water Bank proved to be one mechanism for California to reduce the overall impacts of the shortage. However, the cost of spot market supplies may cause Metropolitan to use them as a last increment of supply before the region implements reductions in M&I deliveries. It is likewise possible that availability and cost will make spot market options more favorable under certain conditions. If this occurs then spot market supplies will be sought prior to calls on option transfers. However, participation in the spot market may be restricted to those agencies that have already taken significant actions in response to the shortage.

**Implement allocation plan:** As the final stage in responding to shortages, Metropolitan will implement an allocation plan to deliver reduced supplies to its member agencies. The issues of allocation and the methods of allocation are outlined in the following section.

## ALLOCATION OF SUPPLY FOR M&I DEMANDS

The equitable allocation of supplies is addressed by the Implementation Goals established for the WSDM Plan, with the first goal being to "avoid mandatory import water allocations to the extent practicable." The second fundamental goal is to "equitably allocate imported water on the basis of agencies' needs." Factors for consideration in establishing the equitable allocation include retail and economic impacts, recycled water production, conservation levels, growth, local supply production, and participation and investment in Metropolitan's system and programs. In the event of an extreme shortage an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

## INTEGRATED RESOURCE MANAGEMENT STRATEGY

Throughout the Integrated Resources Planning process and the development of the WSDM Plan, extensive analysis of resource management strategies focused on maximizing supply reliability while minimizing overall resource costs. Various management strategies were analyzed under shortage scenarios based on historical hydrologic data. Certain strategies yield high reliability but incur very high costs. This is the case for strategies that utilize relatively costly transfer programs early in a shortage while maintaining high storage levels. If a shortage is short, this results in high transfer costs and shortage storage programs that are not fully utilized. Other strategies draw more heavily on storage early in a shortage and do not use options transfer programs. Later in a shortage, the yields from these transfer programs, combined with low yields from depleted storage facilities, might not make up for continuing or deepening shortages. Overall, such approaches may be inexpensive to pursue at the wholesale level but have high costs associated with retail level impacts. The resource management framework presented results from extensive analysis of various strategies for managing available resources under a variety of surplus and shortage conditions. Although the extent to which various actions are exercised may still vary depending on specific shortage conditions, the ordering presented does reflect Metropolitan's anticipated order of actions during shortages.

### RESOURCE MANAGEMENT FRAMEWORK

The analysis of surplus and shortage actions yields a water management framework that accounts for the degree or "stage" of surplus and shortage. These stages are defined by parameters such as storage levels and expected SWP supplies. Each stage has associated actions that could be taken as part of the response to prevailing shortage conditions. For example, Surplus Stage 1 might have as associated actions to place water in the highest-priority storage resources. Figure 8 shows the mapping between actions and stages. The darkly shaded diagonal area identifies actions that can be undertaken concurrently, while the lightly shaded areas show actions that will not be taken. For example, Metropolitan will not withdraw water from most storage resources during a surplus.

Figure 8 highlights several aspects of the WSDM Plan's approach to supply management. First and most importantly, it does not dictate a response to shortage or surplus. The framework recognizes the complexity and variety of conditions that could require various responses. Supporting this framework are general "rule curves" that dictate the extent to which particular actions are taken in various stages of surplus or shortage. For example, the rule curves indicate approximately how much water should be taken from the Eastside Reservoir Project before calling on supplies from the Semitropic or Arvin-Edison storage programs. If a shortage were greater than the desired initial withdrawal from the Eastside Reservoir Project, then Stage 2 actions would be taken. The rule curves for a particular resource would take into account shortage stage, monthly delivery requirements, and when various supplies are available.

Surplus and Shortage Stages are determined by the total amount of water that would be stored or produced by exercising the actions in that Stage. Overall storage levels in each stage are determined by the extent to which storage is increased or reduced by earlier actions. Therefore, each Stage is defined by supplies (stored or produced) and an approximate overall level of storage remaining in all resources. Up through Shortage Stage 4, the actions taken will not result in negative impacts to any consumptive uses. Shortage Stages 1 through 4 constitute shortage management without retail level impacts. The conservation efforts and reductions in IAWP deliveries in Shortage Stage 5 will result in retail impacts.

Action by the Metropolitan Board of Directors would be required before actions corresponding to Stages 5, 6, and 7.

**Figure 8. Resource Stages and Actions Matrix**

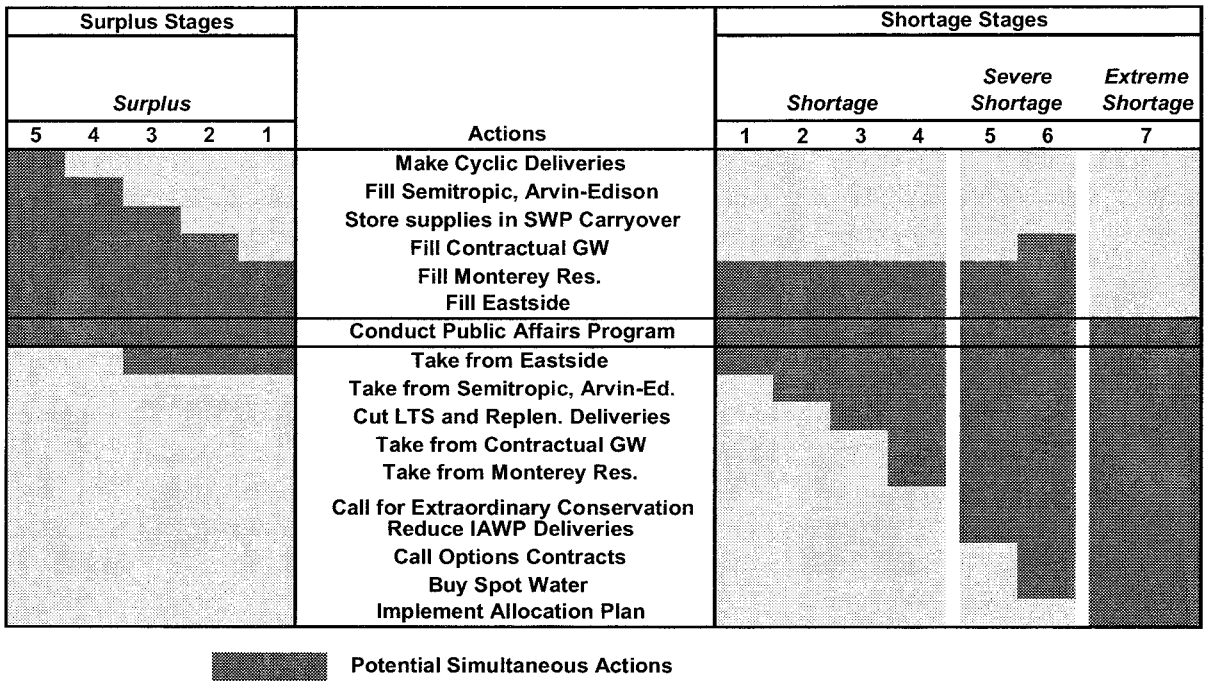


The Stages and Actions Matrix (Figure 8) is read from the center moving outward. Moving from the center to the left, are actions that Metropolitan will take during surplus conditions. For instance, in a Stage 3 Surplus, Metropolitan will be adding water to the Eastside Reservoir Project, the Monterey Reservoirs (if any water is due for repayment), Contractual Groundwater Programs, and carryover storage on the State Water Project. Moving from the center to the right are actions that Metropolitan will take during periods of shortage. For instance, in a Stage 3 Shortage, Metropolitan will be pulling water from the Eastside Reservoir Project, the Semitropic and Arvin Edison programs, and interrupting deliveries of Long-Term Seasonal and Replenishment program water. In addition, the Stages and Actions Matrix allows for surplus actions to be taken during shortages and vice versa, but these actions are strictly a result of prudent water management. For example, in a Stage 6 Shortage, Figure 8 shows Metropolitan potentially filling the Eastside Reservoir Project, the Monterey Reservoirs, and contractual groundwater programs while calling on spot transfers and buying spot water. Through these actions Metropolitan will be ensuring that water supply opportunities during a drought are realized--ultimately adding to the drought reserves of southern California.

Figure 8 also highlights the on-going efforts by Metropolitan and its member agencies in the conduct of public outreach and active conservation programs. Through all conditions, effective pubilc outreach and conservation programs are an integral part of Metropolitan's management of resources. In addition to ongoing conservation and water efficiency programs, Stage 5 of the Stages and Actions Matrix calls for participation of the citizens of southern California to take extraordinary conservation measures to cut water demand during droughts.

As with the listing of shortage actions earlier in the report, the Stages/Actions matrix in Figure 8 only highlights certain programs and response actions. However, unlike the discussion of actions earlier, Figure 8 is intended to convey Metropolitan's currently anticipated ordering for those actions listed. As the supply and demand outlooks, programs, and other factors continue to change, the analysis of the ordering of actions will continue during the ten-year period of the WSDM Plan.

## SUPPLY CERTAINTY AND THE TIMING OF RESOURCE ACTIONS

One of the fundamental trade-offs in dealing with supply shortages is the need to maintain flexibility while providing supply certainty to member agencies and consumers. A central focus of the WSDM Plan is the analysis of information about supplies and demands. When do various pieces of information about the supply/demand balance become more certain? When should this information impact policy-making and trigger various resource actions? The WSDM Plan addresses these questions and the actual implementation of the Plan during a shortage.

Figure 9 shows a hypothetical shortage year. With respect to the supply and demand outlook, a typical shortage year will have periods of certainty and stability, and other periods of relative uncertainty and transition. Important supply components--such as the SWP, CRA, Los Angeles Aqueduct (LAA), and local supplies--are closely monitored through the early part of the year. These supplies and demands are fairly well-known through the April-September period. Storage is assessed in the post-summer period and decisions about certain programs, such as long-term (LT) seasonal deliveries could be made at this time.

**Figure 9. Water Supply Outlook Throughout the Year**

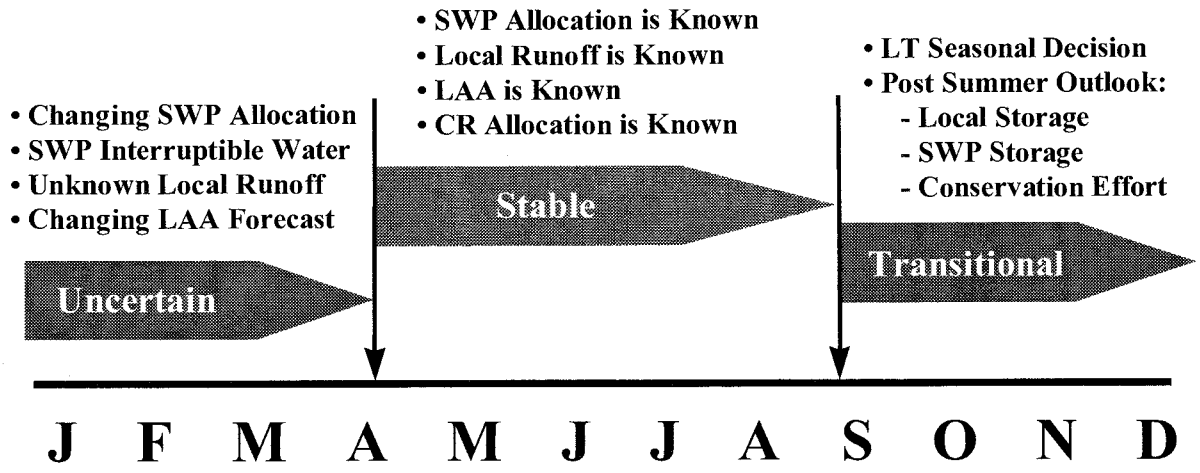


Figure 10 presents the annual schedule for actions taken in response to shortage conditions. Starting in January, an initial supply/demand report will be presented to the Metropolitan Board of Directors. SWP allocations are still only estimates in January and become more certain towards April and May. Demands for Metropolitan deliveries depend in part on how the winter hydrology develops and the condition of local supplies. These factors start to become known during the February-March period and will be reported to the Board in the Supply Report Update. By April-May, the outlook for imported supplies is known to a fairly high degree of certainty and a Final Supply Report will be produced. The May-September period will be one in which the import supply situation does not change drastically and drought policies can be implemented. Demands can be more or less than anticipated as a result of unusually hot or cool weather. At the end of summer, carryover SWP storage will be determined. October through December is a transitional period during which early assessments of available supplies for the following year will be made. During this period, Board actions would determine the management of various Metropolitan programs such as long-term seasonal (LTS) and IAWP deliveries. The following list presents major information and decision points during the year.

| Month | Information/Action |
|---|---|
| January | Initial Supply/Demand Reports |
| February, March | Updated Supply/Demand Reports |
| April, May | Final Supply/Demand Report |
| | Notification on Contractual GW and Options Transfer Programs |
| | Recommended Drought Actions |
| May-September | Stable Policy Period |
| October | Supply and Carryover Storage Report |
| November | MWD Program Decisions - LT Seasonal, Replenishment, IAWP |

**Figure 10. One Year of a Hypothetical Shortage - Supply and Demand Reports and Response Actions**

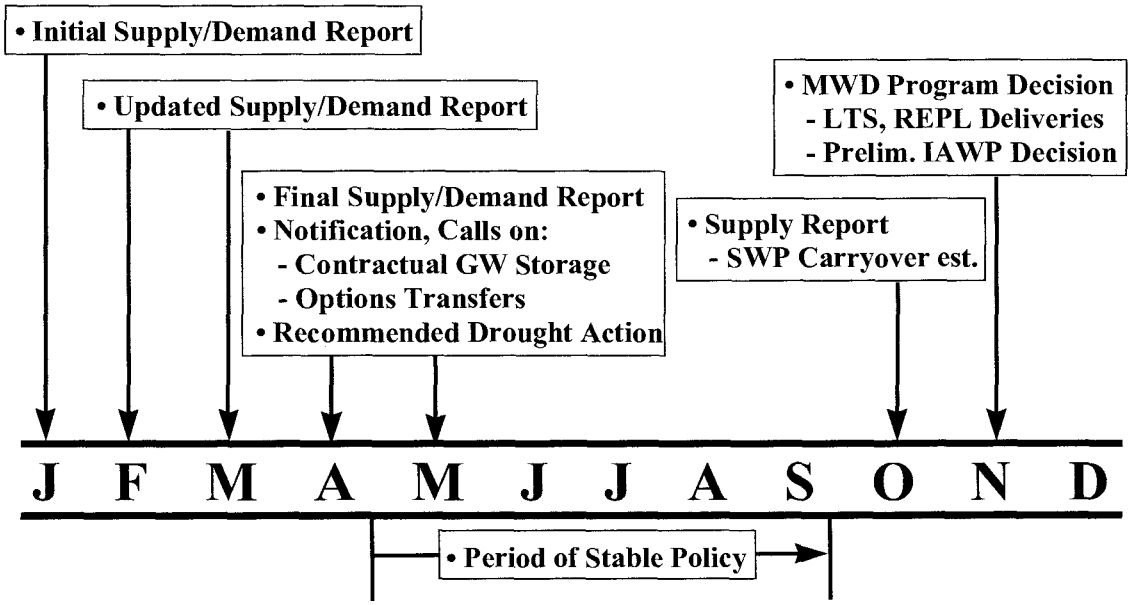


## PUBLIC OUTREACH AND CONSERVATION

Mechanisms are already in place to implement most of the water management actions and programs that are addressed in the WSDM Plan. Under the majority of supply and demand conditions, the actions of Metropolitan's Board of Directors, the General Manager, the operational activities of Metropolitan, and its member agencies would constitute all actions necessary to mitigate the shortage. Several aspects of the WSDM Plan, however, require additional attention to the administration of programs and actions. In particular, a shortage contingency requires special programs in the areas of public and governmental affairs and conservation. Metropolitan maintains an on-going public information program to encourage efficient water use. Public outreach programs are conducted at all times under both surplus and shortage conditions (see Figure 8). The actions discussed in this section constitute special actions in times of shortage.

During shortage conditions, public outreach will play a critical role in shaping consumer response. Public information campaigns need to send clear signals if extraordinary drought conservation is to achieve needed reductions in demands. Given Metropolitan's diverse set of customers and the varying impacts that shortages can have on different consumer groups, an effective public information campaign will require a joint effort among Metropolitan and its member agencies. Under this Plan, the administration of the Public Information and Government Affairs programs will be the responsibility of a Drought Program Officer (DPO). The DPO will be responsible for integrating the various activities in these areas, coordinating efforts with Metropolitan's Board of Directors and member agencies, and designing the region-wide messages for the general public and various target audiences. Important constituencies that have been identified in the process are residential users, business interests, agricultural users, elected officials, officials of various agencies (such as the Department of Water Resources), and the media.

Many conservation programs, such as Metropolitan's ultra-low flush toilet rebate program, are driven by member agency requests. Based on history, Metropolitan expects member agency requests to increase during droughts. Metropolitan is committed to increasing overall conservation program funding to meet member agency requests during droughts and attain higher levels of savings. These programs will be implemented by Metropolitan and member and local agency conservation staff. As many of the short-term conservation objectives during a shortage would be dependent upon an effective public information program, the Drought Program Officer will also be responsible for monitoring the effectiveness of the augmented conservation programs. A monthly conservation reporting process will be implemented. Quarterly estimates of regional conservation will be developed to track the progress of various actions in mitigating the shortage.

## APPENDIX A: RESOURCE AND STORAGE SIMULATION

The Water Surplus and Drought Management Plan (WSDM Plan) uses the Stages and Actions Matrix (Figure 8) as a guide for the operation of storage and transfers for the next ten years, 1999-2008**.** Metropolitan asserts that the investments that Metropolitan and its member agencies have made in water supply and storage, managed in a coordinated manner as presented in the WSDM Plan, will be sufficient to assure that retail firm water demands will be met 100% of the time through the year 2008. Metropolitan performed an extensive analysis of projected water demands, current and expected water supplies, along with hydrologic variations to support this assertion. Appendix A presents a summary of this analysis which includes statistical probabilities of actions under the WSDM Plan and two illustrative examples of how supply resources may be used in the future under worst-case drought events. Although the WSDM Plan is intended to be in effect through 2008, for the purposes of analysis the planning horizon was extended through 2010.

The WSDM Plan seeks to define the operational envelope for the Metropolitan system into the near future. Although the WSDM Plan only looks out ten years, it nonetheless involves the operation of some storage and water transfer projects that have not yet become fully operational. This makes the estimation of storage and transfers operations difficult. Compounding this problem is the lack of certainty around future demands, economic conditions, or even the weather over the next ten years. To manage these uncertainties, Metropolitan has developed a computer based simulation model called the Integrated Resources Planning Simulation Model or IRPSIM.

IRPSIM uses a modeling method known as sequentially indexed monte-carlo simulation. Simply put, the model looks at projected regional retail demand and supplies of water over the next twelve years and adjusts each, up or down, based on an assumed pattern of future weather. For instance, if Metropolitan expected the weather over the next twelve years (1999-2010) to be the same as the last twelve years (1987-1998), then IRPSIM would adjust the projected 1999 demands and supplies based on the historical 1987 hydrology, and adjust the projected 2000 demands and supplies using the historical 1988 hydrology, and so on. One obvious drawback to this approach is that Metropolitan does not know what future weather will be. Therefore, Metropolitan runs the models over and over again until all recorded hydrologies, 70 in all, have been tried. In this way, Metropolitan can look at probabilistic results of being in shortage year by year through 2010.

Although the projections of water supplies used in this analysis required certain assumptions to be made, they were based on most likely or probable outcomes. In most cases, projected water supplies represented projects that are currently operational, under construction, or in the final stages of negotiations. The following represents a summary of these assumptions:

- Local recycling and groundwater recovery: assumes currently operational projects with expected increases in supply yield as demand increases

- Conjunctive use groundwater storage: assumes Las Posas (under final stages of construction) and implementation of similar programs which are under negotiation (such as Raymond, Orange, and Chino Basins)

- Semitropic and Arvin-Edison storage: assumes use of both programs which are operational with water already stored

- Eastside Reservoir Project: assumes use of non-emergency storage from the reservoir currently under construction and an initial fill projected to start in approximately one year

- The Monterey Reservoirs: assumes use of State Water Project terminal reservoir supplies, Castaic and Perris Reservoirs, per the Monterey Amendment

- Colorado River Aqueduct: assumes a full aqueduct through the implementation of the California Plan (including lining of All American and Coachella canals, SD/IID water transfer/exchange, conjunctive use off-aqueduct storage, and river re-operations)

- State Water Project: assumes continuance of Bay-Delta Accord (with only current facilities)

One way of viewing the result of Metropolitan's WSDM Plan analyses is by summary statistics. Table A- 1 gives the probabilities of shortage actions over the next twelve years.

**Table A-1. Probability of Shortage Stage[1] by Forecast Year**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **1999** | 13% | 13% | 11% | 7% | 3% | 0% | O% |
| 2000 | 13% | 13% | 11% | 9% | 3% | O% | 0% |
| 2001 | 19% | 17% | 13% | 10% | 6% | O% | 0% |
| 2002 | 19% | 17% | 13% | 10% | 4% | 1% | 0% |
| 2003 | 19% | 19% | 14% | 11% | 4% | 0% | 0% |
| 2004 | 20% | 19% | 16% | 13% | 4% | 0% | 0% |
| 2005 | 21% | 19% | 17% | 13% | 6% | O% | O% |
| 2006 | 21% | 19% | 19% | 13% | 6% | 0% | 0% |
| 2007 | 23% | 20% | 19% | 13% | 4% | 0% | 0% |
| 2008 | 26% | 21% | 19% | 16% | 6% | 1% | 0% |
| 2009 | 26% | 24% | 19% | 17% | 6% | 1% | 0% |
| 2010 | 26% | 26% | 19% | 19% | 6% | 1% | O% |

Table A-1 can be read in one of two ways, by column or row. The Stage 7 column indicates that there are no historical weather conditions that require allocation over the next twelve years. This is the single most important conclusion of the WSDM Plan analysis. The Stage 6 column indicates that only in a few years--2002, and 2008 through 2010--would Metropolitan need have a need for option or spot transfer water. Read by row, Table A-1 indicates that in the year 2008 there is a 21% likelihood of taking some water from the Eastside Reservoir Project, a 19% likelihood of taking water from Semitropic or Arvin-Edison storage programs, a 17% likelihood of interrupting long-term seasonal and replenishment deliveries for two years, and so on. It should be noted that these probabilities represent the best current estimates by Metropolitan, but are based entirely on historical weather conditions. Conditions that fall outside of historical ranges, either in duration or severity, are not represented by this data.

Another way to view the WSDM Plan analysis is by observing the operation of a single hydrology. Table A-2 provides an example of resource operations for the period 1999 through 2010 assuming a repeat of the 1923 through 1934 hydrology. The table provides descriptions of hydrologic conditions to aid in understanding the example.

[1] Stage 1 consists of withdrawal from the Eastside Reservoir Project. Stage 2 consists of the above plus withdrawals from the Semitropic and Arvin-Edison water storage and transfer projects. Stage 3 consists of the above plus an interruption of Long-Term Seasonal and Replenishment discount water. Stage 4 consists of the above plus withdrawal from contractual groundwater programs and the Monterey Reservoirs. Stage 5 consists of the above plus a call for extraordinary drought conservation and interruption in agricultural discount water. Stage 6 consists of the above plus calls on option contract water and purchases of water on the open market. Stage 7 consists of the above plus allocation of remaining shortages. For a full description of stages and action, see Surplus and Shortage Resource Actions section and Figure 8 above.

For instance, 1923 was considered to be a dry year in southern California (defined as less than 9 inches of rain at the Los Angeles Civic Center) and is categorized by the California Department of Water Resources (DWR) as a below normal year for State Water Project deliveries. In this example, 1923 weather increases southern California's demand for water and decreases imported State Water Project supplies. The Colorado River Aqueduct supplies are influenced by yet another hydrologic indicator, but for the next ten year Metropolitan expects the Aqueduct to be full.

Table A-2 indicates that retail water demands in 1999, assuming a 1923 hydrology, will be 3.979 million acre-feet (maf). Adding expected long-term seasonal and replenishment demands of 0.165 maf gives a regional total water demand of 4.144 maf. After subtracting local supplies of 2.192 maf, which are also adjusted for 1923 weather, Metropolitan expects to see a demand of 1.952 maf. In 1999, under a 1923 hydrology, Metropolitan expects to see 2.954 maf of supply. This is enough to meet all expected demands and put over 1.0 maf into storage.

The 1923 through 1934 hydrology is significant because it starts and ends dry with little recovery in the middle. However, even in these most adverse conditions the actions proposed by the WSDM Plan provides the region with enough water to avoid shortage allocation. Again the most important result of this example is read from the last line, which indicates that there are no remaining shortages through 2008

Table A-3 provides a second example of using the 1980 through 1991 hydrology. This hydrology contains the most significant drought in recent record, ending with a critically dry year on the State Water Project that is expected to yield a mere 0.389 maf. However, even under these conditions the WSDM Plan provides a method to avoid firm water allocation.

The analyses performed using the prioritized action of the Stages and Actions Matrix support Metropolitan's assertion that water supply reliability can be attained through the use of regional storage, interruption of discounted water supplies, and transfers. And, through the implementation of the WSDM Plan, Metropolitan does not expect to allocate firm water deliveries for at least the next ten years.

## Table A-2. A Simulation of Water Supplies and Demands 1923-1934 Hydrology

| **Forecast Year** | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hydrology Year** | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 |
| **Hydrologic Conditions** | | | | | | | | | | | | |
| **Southern California Year Type** | Dry | Dry | Dry | Wet | Wet | Dry | Dry | Normal | Wet | Normal | Wet | Normal |
| **Sacramento River Index D1630 Year Type** | Below Normal | Critically Dry | Dry | Dry | Wet | Above Normal | Critically Dry | Dry | Critically Dry | Dry | Critically Dry | Critically Dry |
| **Demands** | | | | | | | | | | | | |
| **Retail Demand** | 3.979 | 4.152 | 4.149 | 4,018 | 4.005 | **4.249** | 4.237 | 4.223 | 4.280 | 4.280 | 4.407 | 4.500 |
| **Long-term/Replenishment Demand** | 0.165 | 0.182 | 0.226 | 0.188 | 0.149 | 0.176 | 0,213 | 0.203 | 0.164 | 0.175 | 0.141 | 0.163 |
| **Total Demand** | 4.144 | 4.334 | 4.375 | 4.205 | 4.154 | 4.425 | 4.450 | 4.426 | 4,443 | 4.455 | 4.548 | 4,663 |
| **Local Supplies** | | | | | | | | | | | | |
| **Groundwater Production** | 1.529 | 1.545 | 1.537 | 1.288 | 1.299 | 1.575 | **1.568** | 1.434 | 1.307 | 1.439 | 1.318 | 1.454 |
| **L. A. Aqueduct Production** | 0.383 | 0,287 | 0.304 | 0.316 | 0.392 | 0.302 | 0,245 | 0.235 | 0.174 | 0,324 | 0.251 | 0.220 |
| **Recycling Production** | 0.152 | 0.162 | 0.174 | 0.186 | 0,197 | 0.207 | 0.217 | 0.230 | 0,242 | 0.254 | 0.266 | 0.277 |
| **Surface Production** | 0,128 | 0,089 | 0,076 | 0.116 | 0.154 | 0.147 | 0.108 | 0.094 | 0,133 | 0,136 | 0.151 | 0.145 |
| **Total Local Supply** | 2,192 | 2.084 | 2.091 | 1.905 | 2,043 | 2.231 | 2,139 | 1.993 | 1.856 | 2.153 | 1.986 | 2,097 |
| **Total MWD Demand** | 1.952 | 2.250 | 2,284 | 2,300 | 2.112 | 2.194 | 2.311 | 2.433 | 2.587 | 2.302 | 2.562 | 2.566 |
| **MWD Supply Sources** | | | | | | | | | | | | |
| **Colorado River Aqueduct Supply** | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 | **1.200** | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 | 1.200 |
| **State Water Project Supply** | 1.754 | 0.812 | 0.783 | 1.280 | 1.678 | 1.438 | 0,764 | 1.163 | 0,589 | 0.843 | 0.559 | 0.620 |
| **MWD Cyclic Groundwater Deliveries** | 0.000 | 0.060 | 0.060 | 0.000 | 0.000 | 0,000 | 0.060 | 0,060 | 0.060 | 0.059 | 0.000 | 0.000 |
| **Eastside Reservoir** | 0.000 | 0.066 | 0.058 | 0.000 | 0.000 | 0.000 | 0,060 | 0.010 | 0.425 | 0.023 | 0.219 | 0.041 |
| **Arvin/Semitropic Groundwater Storage** | 0.000 | 0.111 | 0.115 | 0,000 | 0.000 | 0,000 | 0,119 | 0,000 | 0.115 | 0.117 | 0.059 | 0.041 |
| **Longterm Seasonal Demand Cuts** | 0.000 | 0,000 | 0,166 | 0.000 | 0.000 | 0.000 | 0.153 | 0.000 | 0.104 | 0,116 | 0.000 | 0.000 |
| **Cyclic Benefits** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0,000 | 0,000 | 0,000 | 0,000 | 0.060 | 0.060 |
| **Contractual Groundwater Storage** | 0.000 | 0.000 | 0.000 | 0,000 | 0.000 | 0.000 | 0.000 | 0,000 | 0.095 | 0.000 | 0.095 | 0.084 |
| **DWR Reservoirs (Monterey Agreement)** | 0.000 | 0.000 | 0,000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0,000 | 0,000 | 0.131 | 0.088 |
| **Voluntary Conservation** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0,000 | 0.000 | 0.206 | 0.210 |
| **MWD Ag Cuts** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0,000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.033 | 0.031 |
| **Central Valley Transfers** | 0.000 | 0.000 | 0,000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.193 |
| **Storage Puts** | 1.003 | 0.000 | 0.097 | 0.180 | 0.549 | 0.438 | 0.045 | 0.000 | 0,000 | 0.056 | 0.000 | 0.000 |
| **Remaining Shortage** | 0,000 | 0,000 | 0.000 | 0,000 | 0.000 | 0.000 | 0.000 | 0,000 | 0.000 | 0.000 | 0.000 | 0.000 |

## Table A-3. A Simulation of Water Supplies and Demands 1980-1991 Hydrology

| **Forecast Year** | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Hydrology Year** | 1923 | 1924 | 1925 | 1926 | 1927 | 1928 | 1929 | 1930 | 1931 | 1932 | 1933 | 1934 |
| **Hydrologic Conditions** | | | | | | | | | | | | |
| **Southern California Year Type** | Wet | Normal | Normal | Wet | Dry | Dry | Wet | Normal | Normal | Dry | Dry | Normal |
| **Sacramento River Index D1630 Year Type** | Above Normal | Dry | Wet | Wet | Wet | Dry | Wet | Dry | Critically Dry | Dry | Critically Dry | Critically Dry |
| **Demands** | | | | | | | | | | | | |
| **Retail Demand** | 3.781 | 4.170 | 3.930 | 3.647 | 4.308 | 4.250 | 4.151 | 4.281 | 4.380 | 4.550 | 4.663 | 4.497 |
| **Lon£1-term/Replenishment Demand** | 0.105 | 0.141 | 0.171 | 0.101 | 0.136 | 0.187 | 0.183 | 0.201 | 0.191 | 0.219 | 0.224 | 0.214 |
| **Total Demand** | 3.886 | 4.311 | 4.101 | 3.748 | 4.444 | 4.437 | 4.334 | 4.483 | 4.572 | 4.769 | 4.887 | 4.712 |
| **Local Supplies** | | | | | | | | | | | | |
| **Groundwater Production** | 1.292 | **1.440** | **1.381** | 1.248 | 1.546 | 1.565 | 1.275 | 1.413 | 1.438 | 1.588 | 1.600 | 1.446 |
| **L. A. Aqueduct Production** | 0.462 | 0.372 | 0.499 | 0.529 | 0.516 | O.367 | 0.472 | 0.400 | 0.326 | 0.278 | 0.213 | 0.223 |
| **Recycling Production** | 0.152 | 0.162 | 0.174 | 0.186 | 0.197 | 0.207 | 0.217 | 0.230 | 0.242 | 0.254 | 0.266 | 0.277 |
| **Surface Production** | 0.225 | 0.175 | 0.154 | 0.194 | 0.195 | 0.151 | 0.115 | 0.116 | 0.115 | 0.081 | 0.068 | 0.081 |
| **Total Local Supply** | 2.131 | 2.149 | 2.208 | 2.156 | 2.455 | 2.290 | 2.081 | 2.159 | 2.122 | 2.200 | 2,146 | 2.027 |
| **Total MWD Demand** | 1.755 | 2.162 | 1.894 | 1.591 | 1.989 | 2.147 | 2.253 | 2.324 | 2.450 | 2.569 | 2.741 | 2.684 |
| **MWD Supply Sources** | | | | | | | | | | | | |
| **Colorado River Aqueduct Supply** | 1.200 | 1.200 | 1.200 | 1,200 | 1.200 | 1.200 | 1.200 | 1.200 | **1.200** | 1.200 | 1.200 | 1.200 |
| **State Water Project Supply** | 1.561 | 1.441 | 1.725 | 1.886 | 1.643 | 1.590 | 1.441 | 1.292 | 0.611 | 1.285 | 0.877 | 0.389 |
| **MWD Cyclic Groundwater Deliveries** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.060 | 0.060 | 0.060 | 0.060 |
| **Eastside Reservoir** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.199 | 0.024 | 0.222 | 0.209 |
| **Arvin/Semitropic Groundwater Storage** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.115 | 0.000 | 0.122 | 0.104 |
| **Long-term Seasonal Demand Cuts** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.131 | 0.000 | 0.164 | 0.154 |
| **Cyclic Benefits** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Contractual Groundwater Storage** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.133 | 0.000 | 0.095 | 0.085 |
| **DWR Reservoirs (Monterey Agreement)** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.216 |
| **Voluntary Conservation** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.235 |
| **MWD Ag Cuts** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.032 |
| **Central Valley Transfers** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Storage Puts** | 1.006 | 0.260 | 0.344 | 0.240 | 0.200 | 0.200 | 0.388 | 0.168 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Remaining Shortage** | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

**Attachment B**

# Water Supply Allocation Plan

## December 2014 Revision

Metropolitan Water District of Southern California

Inside cover: Photo courtesy of Cora Edmonds/ArtXchange for the Healing Planet

# Water Supply Allocation Plan

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## List of Acronyms

AF – Acre-feet
CUP – Groundwater Conjunctive Use Program
CWD – County Water District
DWP – Drought Management Plan
IAWP – Interim Agricultural Water Program Reductions and Rates
IICP – Incremental Interruption and Conservation Plan
IRP – Integrated Resources Plan
GPCD – Gallons per Capita per Day
M&I – Municipal and Industrial
MWD – Municipal Water District
RUWMP – Regional Urban Water Management Plan
SWP – State Water Project
WSAP – Water Supply Allocation Plan
WSDM – Water Surplus and Drought Management

## Definitions

**Extraordinary Supplies**- Deliberate actions taken by member agencies to augment the total regional water supply only when Metropolitan is allocating supplies through the WSAP.

**Groundwater Recovery**- The extraction and treatment of groundwater making it usable for a variety of applications by removing high levels of chemicals and/or salts.

**In-lieu deliveries**- Metropolitan-supplied water bought to replace water that would otherwise be pumped from the groundwater basins.

**Seawater Barrier**- The injection of fresh water into wells along the coast to protect coastal groundwater basins from seawater intrusion. The injected fresh water acts like a wall, blocking seawater that would otherwise seep into groundwater basins as a result of pumping.

## Section 1: Introduction

Calendar Year 2007 introduced a number of water supply challenges for the Metropolitan Water District of Southern California (Metropolitan) and its service area. Critically dry conditions affected all of Metropolitan's main supply sources. In addition, a ruling in the Federal Courts in August 2007 provided protective measures for the Delta Smelt in the Sacramento-San Joaquin River Delta which brought uncertainty about future pumping operations from the State Water Project. This uncertainty, along with the impacts of dry conditions, raised the possibility that Metropolitan would not have access to the supplies necessary to meet total firm demands[1] and would have to allocate shortages in supplies to the member agencies.[2]

In preparing for this possibility, Metropolitan staff worked jointly with the member agency managers and staff to develop a Water Supply Allocation Plan (WSAP). The WSAP includes the specific formulas for calculating member agency supply allocations and the key implementation elements needed for administering an allocation should a shortage be declared. The WSAP became the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and was incorporated into Metropolitan's 2010 Regional Urban Water Management Plan (RUWMP).

## Section 2: Development Process

### Member Agency Input

Between July 2007 and February 2008, Metropolitan staff worked cooperatively with the member agencies through a series of member agency manager meetings and workgroups to develop a formula and implementation plan to allocate supplies in case of shortage. These workgroups provided an arena for in-depth discussion of the objectives, mechanics, and policy aspects of the different parts of the WSAP. Metropolitan staff also met individually with fifteen member agencies for detailed discussions of the elements of the recommended proposal. Metropolitan introduced the elements of the proposal to many nonmember retail agencies in its service area by providing presentations and feedback to a number of member agency caucuses, working groups, and governing boards. The discussions, suggestions, and comments expressed by the member agencies during this process contributed significantly to the development of this WSAP.

### Board of Directors Input

Throughout the development process Metropolitan's Board of Directors was provided with regular progress reports on the status of this WSAP, with oral reports in September, October, and December 2007, an Information Board of Directors Letter with a draft of the WSAP in November 2007, and a Board of Directors Report with staff recommendations in January 2008. Based on Water Planning and Stewardship Committee discussion of the staff recommendations and further review of the report by

[1] Firm demands are also referred to as uninterruptable demands; likewise non-firm demands are also called interruptible demands.
[2] See Appendix A: Metropolitan Member Agencies.

the member agencies, refinements were incorporated into the WSAP for final consideration and action in February 2008. The WSAP was adopted at the February 12, 2008 Board of Directors meeting.[3]

## The 12-Month Review Process

When the Board adopted the WSAP in February 2008, the decision specified a formal revisit of the WSAP commencing in February 2010. The scheduled revisit was meant to ensure the opportunity for Metropolitan staff and the member agencies to re-evaluate the WSAP and recommend appropriate changes to the Board of Directors.

In April 2009, the Board voted to implement the WSAP for the first time. The WSAP was implemented at a Level 2 allocation level, and was in effect for the period of July 1, 2009, through June 30, 2010. Since implementation of the 2009/10 WSAP began in July 2009, a number of practical issues relating to the WSAP were identified by staff and the member agencies for further consideration during the 12-Month Review Process. Metropolitan staff engaged with the member agencies in a formal review of the WSAP from January through May 2010. During the review process the member agency managers participated in a series of six workshops. The focus of these workshops was to facilitate in-depth discussion on WSAP-related issues and lessons learned since the WSAP was implemented in July 2009. The proposed adjustments to the WSAP developed during the review process were adopted at the August 17, 2010 Board of Directors meeting[4].

## The Three-Year Review Process

The Board action to adopt of the WSAP in February 2008 also directed staff to review the WSAP formula three years after the February 2008 adoption. February 2011 marked the three-year anniversary since the adoption of the WSAP. Similar to the 12-Month Review Process, the purpose of the Three-Year Review Process was to provide an opportunity for Metropolitan staff and the member agencies to re-evaluate the plan and recommend appropriate changes for board consideration.

Metropolitan staff met with the member agencies in a formal review of the WSAP from February through August 2011. Staff and member agency managers participated in a series of eleven workshops. Proposed adjustments to the WSAP developed during the process were adopted at the September 13, 2011 Board of Directors meeting.[5]

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[3] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix B: Water Supply Allocation Plan Process Timeline.

[4] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix C: 12-Month Review Process and Results.

[5] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix D: Three-Year Review Process and Results.

## 2014 Review Process

In 2014, California was challenged with a third year of severe drought.[6] Metropolitan managed its operations through significant use of regional storage reserves. It was anticipated that end of year total dry storage reserves would approach levels similar to those when the WSAP was last implemented in 2009.

Following discussion at the June 2014 Water Planning and Stewardship Committee, Metropolitan staff convened a member agency working group to revisit the WSAP. The purpose of the working group was to collaborate with member agencies to identify potential revisions to the WSAP in preparation for mandatory supply allocations in 2015. There were eight working group meetings and three discussions at the monthly Member Agency Managers' Meetings.

The process focused on three areas of the WSAP: the Base Period, the Allocation Formula, and the Allocation enforcement mechanism. Proposed adjustments to the WSAP developed during the process were adopted at the December 9, 2014 Board of Directors meeting. [7]

[6] The Governor of California proclaimed a State of Emergency due to drought conditions on January 17, 2014 and, on April 24, 2014 issued an Executive Order proclaiming a continued State of Emergency noting drought conditions have persisted for the last three years and authorizing adoption and implementation of emergency regulations.

[7] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix E: 2014 Review Process and Results.

## Section 3: Review of Historical Shortage Plans[8]

The WSAP incorporates key features and principles from the following historical shortage allocation plans but will supersede them as the primary and overarching decision tool for water shortage allocation.

### Interruptible Water Service Program

As part of the new rate structure implemented in 1981, Metropolitan's Board of Directors adopted the Interruptible Water Service Program (Interruptible Program) which was designed to address short-term shortages of imported supplies. Under the Interruptible Program, Metropolitan delivered water for particular types of use to its member agencies at a discounted rate. In return for this discounted rate, Metropolitan reserved the right to interrupt delivery of this Interruptible Program water so that available supplies could be used to meet municipal and industrial demands.

### Incremental Interruption and Conservation Plan

The ability to interrupt specific deliveries was an important element of Metropolitan's strategy for addressing shortage conditions when it adopted the Incremental Interruption and Conservation Plan (IICP) in December 1990. Reductions in IICP deliveries were used in concert with specific objectives for conservation savings to meet needs during shortages. The IICP reduced Interruptible Service deliveries in stages and provided a pricing incentive program to insure that reasonable conservation measures were implemented.

### 1995 Drought Management Plan

The 1995 Drought Management Plan (DMP) was a water management and allocation strategy designed to match supply and demand in the event that available imported water supplies were less than projected demands. Adopted by the Metropolitan Board of Directors in November 1994, the 1995 DMP was a short-term plan designed to provide for the 1995 calendar year only. The primary objective of the 1995 DMP was to identify methods to avoid implementation of mandatory reductions. The 1995 DMP included various phases and a step-by-step strategy for evaluating supply and demand conditions and utilizing Metropolitan's available options, with the final phase being implementation of the revised IICP.

### 1999 Water Surplus and Drought Management Plan

Metropolitan staff began work on the Water Surplus and Drought Management (WSDM) Plan in March 1997 as part of the Integrated Water Resources Plan (IRP), which was adopted by Metropolitan's Board of Directors in January 1996. The IRP established regional water resource targets, identifying the need for developing resource management policy to guide annual operations. The WSDM Plan defined Metropolitan's resource management policy by establishing priorities for the use of regional resources to achieve the region's reliability goal identified in the IRP. In April 1999, Metropolitan's Board of Directors adopted the WSDM Plan.

[8] A summary of the key elements in the following allocation plan is found in Appendix F: Summary of Historical Shortage Plans.

The WSDM Plan also included a set of principles and considerations for staff to address when developing specific allocation methods. The WSDM Plan stated the following guiding principle to be followed in developing any future allocation scheme:

> *"Metropolitan will encourage storage of water during periods of surplus and work jointly with its member agencies to minimize the impacts of water shortages on the region's retail consumers and economy during periods of shortage."*[9]

This principle reflects a central desire for allocation methods that are both equitable and minimize regional hardship to retail water consumers. The specific considerations postulated by the WSDM Plan to accomplish this principle include the following:[10]

- The impact on retail customers and the economy
- Allowance for population and growth
- Change and/or loss of local supply
- Reclamation/Recycling
- Conservation
- Investment in local resources
- Participation in Metropolitan's interruptible programs
- Investment in Metropolitan's facilities.

## Section 4: Water Supply Allocation Formula

Based on the guiding principle and considerations described in the WSDM Plan, Metropolitan staff and the member agencies developed a specific formula for allocating water supplies in times of shortage. The formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level, and takes into account growth, local investments, changes in supply conditions and the demand hardening[11] aspects of non-potable recycled water use and the implementation of conservation savings programs. The formula, described below, is calculated in three steps: base period calculations, allocation year calculations, and supply allocation calculations.[12] The first two steps involve standard computations, while the third section contains specific methodology developed for this WSAP.

### Base Period Calculations

The first step in calculating a water supply allocation is to estimate water supply and demand using a historical base period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the fiscal years (July through June) ending 2013 and 2014.[13]

---

[9] WSDM Plan, p. 1. Emphasis added.

[10] WSDM Plan, p. 2.

[11] Demand hardening is the effect that occurs when all low-cost methods of decreasing overall water demand have been applied (e.g., low-flow toilets, water recycling) and the remaining options to further decrease demand become increasingly expensive and difficult to implement.

[12] Detailed operational elements of these objectives and a numerical example are discussed in Appendix G: Water Supply Allocation Formula Example.

[13] Exceptions to this methodology are noted in the descriptions of base period calculations.

**Base Period Local Supplies:** Local supplies for the base period are calculated using a two-year average of groundwater production, groundwater recovery, Los Angeles Aqueduct supply, surface water production, and other imported supplies. Non-potable recycling production is not included in this calculation due to its demand hardening effect.

**Base Period Wholesale Demands:** Demands on Metropolitan for the base period are calculated using a two-year average of firm purchases and in-lieu deliveries to long-term groundwater replenishment, conjunctive use, cyclic, and supplemental storage programs.

**Base Period Retail Demands:** Total retail-level municipal and industrial (M&I) demands for the base period are calculated by adding the Base Period Wholesale Demands and the Base Period Local Supplies. This estimates an average total demand for water from each agency.

**Base Period Mandatory Conservation Credit:** Metropolitan allows a consultation process that enables member agencies to describe mandatory water use restrictions and/or rationing restrictions that were in place within their service areas during the Base Period. Restrictions may vary among agencies but include restricted water uses, fines, and water budget or penalty based rate structures that are enacted by the governing body of the member agency or retail agency. Following the consultation process, Metropolitan staff will recommend adjustments based on evidence of reduced GPCD. To qualify for an adjustment, GPCD reductions would have to be observed that are beyond those expected from the agency's ongoing conservation efforts and trends.

## Allocation Year Calculations

The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies.

**Allocation Year Retail Demands:** Total retail M&I demands for the allocation year are calculated by adjusting the Base Period Retail Demands for baseline inflation and growth.

***Baseline Inflation Adjustment:*** Baseline inflation occurs when non-potable recycling or conservation is developed after the Base Period. The development of these supplies reduces actual demands for water in the Allocation Year. Because non-potable-recycling and conservation are excluded from the WSAP formula, the actual need for water in the Allocation year is overestimated. The Baseline Inflation Adjustment removes increases in non-potable recycling and conservation annually from the Base Period forward to better reflect the true need for water in the Allocation Year.

***Growth Adjustment:*** The growth adjustment is calculated using the estimated actual annual rate of population growth at the county level, as generated by the California Department of Finance, whenever possible. For years without complete data, the growth rate is calculated using an average of the three most recent years available. Growth will be allocated based on historical per capita water use during the Base Period, with a cap equal to Metropolitan's IRP Target for Water Use Efficiency. For

allocation years up to and including 2014, the cap will be 163 GPCD, and for allocation years 2015-2020 the cap will reduce linearly from 163 to 145 GPCD. On an appeals basis, member agencies may request that their adjustment be calculated using member agency level population growth. A weighted combination of actual population and actual employment growth rates may also be requested.

**Allocation Year Local Supplies:** Allocation Year Local Supplies include groundwater production, groundwater recovery, Los Angeles Aqueduct supply, surface water production, seawater desalination, and other imported supplies. Estimates of Allocation Year Local Supplies are provided by the member agencies upon implementation of a WSAP. If estimates are not provided, Metropolitan will use the sum of the Base Period Local Supplies and Base Period In-Lieu Deliveries as a default. Agencies may provide updated estimates at any time during the Allocation Year to more accurately reflect their demand for Metropolitan supplies.

**Extraordinary Supplies:** Under the WSAP formula, local supply production in the Allocation Year can either be designated as a "planned" supply, or as an "extraordinary" supply.[14] This is an important designation for a member agency because the two types of supplies are accounted for differently in the WSAP formula. Local supplies classified at Extraordinary Supply are only partially included (scaled depending on the WSAP Level) as local supplies. This has the effect of providing significantly more benefit to the member agency in terms of total water supply that is available to the retail customer.[15]

**Allocation Year Wholesale Demands:** Demands on Metropolitan for the allocation year are calculated by subtracting the Allocation Year Local Supplies from the Allocation Year Retail Demands.

## Water Supply Allocation Calculations

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. The following table displays the elements that form the basis for calculating the supply allocation. Each element and its application in the allocation formula are discussed below.

Table 1: Shortage Allocation Index

| (a) Regional Shortage Level | (b) Wholesale Minimum Percentage | (c) Maximum Retail Impact Adjustment Percentage |
|---|---|---|
| 1 | 92.5% | 2.5% |
| 2 | 85.0% | 5.0% |
| 3 | 77.5% | 7.5% |
| 4 | 70.0% | 10.0% |

[14] Appendix H: Board Policy Principles on Determining the Status of Extraordinary Supply lists the key Board principles used in determining if a supply qualifies as an Extraordinary Supply.
[15] See Appendix G: Water Supply Allocation Formula Example for specific allocation formulae.

| | | |
|---|---|---|
| 5 | 62.5% | 12.5% |
| 6 | 55.0% | 15.0% |
| 7 | 47.5% | 17.5% |
| 8 | 40.0% | 20.0% |
| 9 | 32.5% | 22.5% |
| 10 | 25.0% | 25.0% |

**Regional Shortage Level:** The WSAP formula allocates shortages of Metropolitan supplies over ten levels.

**Wholesale Minimum Allocation:** The Wholesale Minimum Allocation ensures a minimum level of Metropolitan supplied wholesale water service to each member agency.

**Maximum Retail Impact Adjustment:** The purpose of this adjustment is to ensure that agencies with a high level of dependence on Metropolitan do not experience disparate shortages at the retail level compared to other agencies when faced with a reduction in wholesale water supplies. The Maximum Retail Impact Percentage is prorated on a linear scale based on each member agency's dependence on Metropolitan at the retail level. This percentage is then multiplied by the agency's Allocation Year Wholesale Demand to determine an additional allocation.

**Conservation Demand Hardening Credit:** The Conservation Demand Hardening Credit addresses the increased difficulty in achieving additional water savings at the retail level that comes as a result of successful implementation of water conserving devices and conservation savings programs. To estimate conservation savings, each member agency will establish a historical baseline Gallons Per Person Per Day (GPCD) calculated in a manner consistent with California Senate Bill SBx7-7.[16] Reductions from the baseline GPCD to the Allocation Year are used to calculate the equivalent conservation savings in acre-feet. The Conservation Demand Hardening Credit is based on an initial 10 percent of the GPCD-based Conservation savings plus an additional 5 percent for each level of Regional Shortage set by the Board during implementation of the WSAP. The credit will also be adjusted for:

- The overall percentage reduction in retail water demand
- The member agency's dependence on Metropolitan

The credit is calculated using the following formula:

*Conservation Demand Harding Credit = Conservation Savings x (10% + Regional Shortage Level Percentage) x (1 +((Baseline GPCD – Allocation Year GPCD)/Baseline GCPD)) x Dependence on MWD Percentage*

[16] California Department of Water Resources, February 2011, "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use. Available at: http://www.water.ca.gov/wateruseefficiency/sb7/docs/MethodologiesCalculatingBaseline_Final_03_01_2011.pdf

This provides a base demand hardening credit equal to 10 percent of conservation savings and increases the credit as deeper shortages occur, which is when conservation demand hardening has a bigger impact on the retail consumer. The credit also increases based on the percentage of an agency's demand that was reduced through conservation. This accounts for increased hardening that occurs as increasing amounts of conservation are implemented. Lastly, the credit is scaled to the member agency's dependence on Metropolitan to ensure that credits are being applied to the proportion of water demand that is being affected by reductions in Metropolitan supply.

**Minimum Per-Capita Water Use Credit:** This adjustment creates a minimum per capita water use threshold. Member agencies' retail-level water use is compared to two different thresholds. The proposed minimum thresholds are based upon compliance guidelines established under Senate Bill X7-7.

- 100 GPCD total water use
- 55 GPCD residential water use

Agencies that fall below either threshold under the WSAP will receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. If an agency qualifies under both thresholds, the one resulting in the maximum allocation adjustment will be given.[17] To qualify for this credit, member agencies must provide documentation of the total agency level population and the percent of retail level demands that are residential; no appeal is necessary.

**Total WSAP Allocation:** The allocation to an agency for its M&I retail demand is the sum of the Wholesale Minimum Allocation, the Retail Impact Adjustment, the Conservation Demand Hardening Credit, and the Minimum Per-Capita Water Use Credit.[18]

**Total Metropolitan Supply Allocations:** In addition to the WSAP Allocation described above, agencies may also receive separate allocations of supplies for and seawater barrier and groundwater replenishment demands. Allocations of supplies to meet seawater barrier demands are to be determined by the Board of Directors independently but in conjunction with the WSAP. Separating the seawater barrier allocation from the WSAP allocation allows the Board to consider actual barrier requirements in the Allocation Year and address the demand hardening issues associated with cutting seawater barrier deliveries. According to the principles outlined for allocating seawater barrier demands, allocations should be no deeper than the WSAP Wholesale Minimum Percentage implemented at that time.

The WSAP also provides a limited allocation for drought-impacted groundwater basins based on the following framework:[19]

[17] See Appendix J: Per Capita Water Use Minimum Example for specific minimum per-capita water use credit formulae and example.
[18] See Appendix G: Water Supply Allocation Formula Example for specific allocation formulae.
[19] See Appendix L: Groundwater Replenishment Allocation for more information.

1. Metropolitan staff will hold a consultation with the requesting member agency and the appropriate groundwater basin manager to document whether the basin is in one of the following conditions:
    a. Groundwater basin overdraft conditions that will result in water levels being outside normal operating ranges during the WSAP allocation period; or
    b. Violations of groundwater basin water quality and/or regulatory parameters that would occur without imported deliveries
2. An allocation is provided based on the verified need for groundwater replenishment. The allocation would start with a member agency's ten-year average purchases of imported groundwater replenishment supplies (excluding years in which deliveries were curtailed). The amount would then be reduced by the declared WSAP Regional Shortage Level.

# Section 5: WSAP Implementation

The WSAP will take effect if a regional shortage is declared by the Board of Directors. The following implementation elements are necessary for administering the WSAP during a time of shortage. These elements cover the processes needed to declare a regional shortage level as well as provide information pertaining to the allocation surcharge.

## Allocation Period

The allocation period covers twelve consecutive months, from July of a given year through the following June. This period was selected to minimize the impacts of varying State Water Project (SWP) allocations and to provide member agencies with sufficient time to implement their outreach strategies and rate modifications.

## Setting the Regional Shortage Level

Metropolitan staff is responsible for recommending a Regional Shortage Level for the Board of Directors' consideration. The recommendation shall be based on water supply availability, and the implementation of Metropolitan's water management actions as outlined in the WSDM Plan. Metropolitan staff will keep the Board of Directors apprised to the status of water supply conditions and management actions through monthly reports to the Water Planning and Stewardship Committee. To further facilitate staff in the development of a recommended regional shortage level, member agency requests for local supply adjustments shall be submitted by April 1$^{st}$.

Metropolitan's Board of Directors, through the Water Planning and Stewardship Committee, is responsible for approving the final Regional Shortage Level at its April meeting. By the April meeting, the majority of the winter snowfall accumulation period will have passed and will allow staff to make an allocation based on more stable water supply estimates. Barring unforeseen large-scale circumstances, the Regional Shortage Level will be set for the entire allocation period, which will provide the member agencies an established water supply level for their planning.

## Exit Strategy

While the Board ultimately has discretion to implement or lift and allocation at any point of time during the year; the WSAP includes a two-part exit strategy that is meant to streamline the WSAP implementation decision making process.

- If the Board decides to implement the WSAP, then any current WSAP allocation would remain in place until the end of the Allocation Year.
- If the Board decides not to implement the WSAP, then any current WSAP allocation would be terminated concurrent with the Board decision.

## Allocation Appeals Process

An appeals process is necessary for the administration of any changes or corrections to an agency's allocation. Metropolitan's General Manager will designate, subsequent to a declaration of an allocation by the Board of Directors, an Appeals Liaison as the official point of contact for all information and inquiries regarding appeals. All member agency General Managers will be notified in writing of the name and contact information of the Appeals Liaison. Only appeals that are made through the Appeals Liaison and in accordance with the provisions outlined in Appendix N: Allocation Appeals Process will be evaluated. Basis for appeals claims can include but are not limited to:

- Adjusting erroneous historical data used in base period calculations
- Adjusting for population growth rates
- Determining if a local supply qualifies as Extraordinary Supply

Additional details and a checklist for the appeals process are available in Appendix N: Allocation Appeals Process and Appendix O: Appeals Submittal Checklist.

## Allocation Surcharge

Member agency allocations are supported by an Allocation Surcharge. The Allocation Surcharge is charged to water use above the Member Agency allocation and is charged in addition to Metropolitan's standard rates for water service. Allocation Surcharges will only be assessed to the extent that an agency's total annual usage exceeds its total annual allocation. Any revenues collected through the Allocation Surcharge will be applied towards Metropolitan's Water Management Fund, which is used to in part to fund expenditures in dry-year conservation. No billing or assessment of allocation surcharges rates will take place until the end of the twelve-month allocation period.

**Allocation Surcharge:** The application of the Allocation Surcharge structure is a two tier structure that provides a lower level of Allocation Surcharge for minor overuse of allocations and a higher level of Allocation Surcharge for major overuse of allocations. The structure and applicable Allocation Surcharges are listed in Table 2.

| Table 2: Allocation Surcharge | | | |
|---|---|---|---|
| **Water Use** | **Base Water Rate**[20] | **Allocation Surcharge**[21] | **Total Rate** |
| 100% of Allocation | Tier 1 | 0 | Tier 1 |
| Between 100% and 115% | Tier 1 | $1,480 | Tier 1 + ($1,480) |
| Greater than 115% | Tier 1 | $2,960 | Tier 1 + ($2,960) |

**Qualifying Income-Based Rate Allocation Surcharge Adjustment:**[22] Any Allocation Surcharges incurred by a member agency under the WSAP will be adjusted to reflect the extent to which retail customers within a member agency's service area are served under a "lifeline" or similar qualified discounted rate program based on income or ability to pay ("Income-Based Rate").

Any member agency who is assessed Allocation Surcharges under the WSAP may submit an acre-foot equivalent of water used by retail customers served under a qualifying Income-Based Rate.[23] This amount of water use would be multiplied by the percentage of retail-level reduction in allocation year demand necessary for that member agency to avoid exceeding its WSAP allocation. The monetary amounts resulting from these acre feet are subtracted from the total monetary amounts incurred by an agency for exceeding its allocation. In the case that the monetary amounts associated with the Income-Based Rate are greater than the total Allocation Surcharges an agency incurs, no Allocation Surcharges will be incurred. The end result of this adjustment is that the member agency will not be subject to Allocation Surcharges for the use of water by their retail customers served under a qualifying Income-Based Rate.

**Growth Rate Allocation Surcharge Adjustment":** In recognition of member agency differences in geography and climate, a Growth Rate Allocation Surcharge Adjustment will be given to any agency that exceeds its WSAP Allocation. The Allocation Surcharge reduction will be based on the difference in acre-feet between the Growth Adjustment applied at Metropolitan's IRP planning goal rate, and the greater of the following:

- The IRP planning goal rate adjusted for the member agency's ETo, or
- The member agency's certified and documented 20x2020 targeted GPCD

If both of these alternatives result in a lower growth adjustment than the IRP planning goal, no Allocation Surcharge reduction will be made.

[20] The base water rate shall be the applicable water rate for the water being purchased. In most cases, it will be the Tier 1 rate (plus Treatment Surcharge for treated water deliveries). However, it is possible that the water being purchased would be in the amount that would put an agency beyond its Tier 1 limit. In that case, the base water rate will be the Tier 2 rate (plus Treatment Surcharge for treated water deliveries).

[21] Allocation Surcharge is applied to water use in excess of an agency's WSAP allocation.

[22] See Appendix K: Qualifying Income-Based Rate Allocation Surcharge Adjustment Example for specific penalty adjustment formulae and example.

[23] Appropriate documentation and certification will be required.

## Tracking and Reporting

Subsequent to a declared regional shortage by the Board of Directors, Metropolitan staff will produce monthly reports of each member agency's water use compared to its allocations based on monthly delivery patterns to be submitted by the member agency. In order to produce these reports, member agencies are requested to submit their local supply use on a monthly basis and certify end of allocation year local supply use. These reports and comparisons are to be used for the purposes of tracking and communicating potential underage/overage of an agency's annual allocations.

## Key Dates for Water Supply Allocation Implementation

The timeline for implementation of an allocation is shown in Table 3. A brief description of this timeline follows:

**January to March**: Water Surplus and Drought Management reporting occurs at Metropolitan's Water Planning and Stewardship Committee meetings. These reports will provide updated information on storage reserve levels and projected supply and demand conditions.

**April**: Member agencies report their projected local supplies for the coming allocation year. This information is incorporated in staff analysis of storage reserves and projected supply and demand conditions in order to provide an allocation recommendation to the Board. Metropolitan's Board will consider whether an allocation is needed. A declaration of an allocation will include the level of allocation to be in effect for the allocation year. Likewise, member agencies will report their projected demands and local supplies needed to meet seawater barrier and groundwater replenishment requirements for the allocation year. Metropolitan's Board will consider whether allocations for seawater barrier demands and groundwater replenishment demands are needed independently from the WSAP allocation decision.**July 1st**: If the Board declared an allocation in April, then it will be effective starting July 1st. The allocation level will be held through June 30th, barring unforeseen circumstances. Member agencies will now be requested to submit their local supply use on a monthly basis and certify end of allocation year local supply use. Local production data must be reported to Metropolitan by the end of the month following the month of use (use in July must be reported by the end of August). This information will be combined with Metropolitan sales information in order to track retail water use throughout Metropolitan's service area. Each month Metropolitan will report on member agency water sales compared to their allocation amounts.

**June 30th**: The allocation year is complete.

**July**: Member agency local supplies must be certified for the month of June, the last month of the previous allocation year.

**August**: Metropolitan will calculate each member agency's total potable water use based on local supply certifications and actual sales data for the allocation year of July through June. Allocation surcharges will be assessed for usage above a given member agency's final adjusted allocation (reflecting the actual local supply and imported water use that occurred in the allocation year).

| Table 3: Board Adopted Allocation Timeline | | | | | |
|---|---|---|---|---|---|
| **Year** | **Month** | **Year 1 Board Decision** | **Year 1 Allocation Year** | **Year 2 Board Decision** | **Year 2 Allocation Year** |
| Year 1 | January | | | | |
| | February | | | | |
| | March | | | | |
| | April | Declaration * | | | |
| | May | | | | |
| | June | | | | |
| | July | | **Effective Period** Continuous Tracking of Member Agency Local Supply and Imported Water Use | | |
| | August | | | | |
| | September | | | | |
| | October | | | | |
| | November | | | | |
| | December | | | | |
| Year 2 | January | | | | |
| | February | | | | |
| | March | | | | |
| | April | | | Declaration * | |
| | May | | | | |
| | June | | | | |
| | July | | | | |
| | August | | Assess | | |
| | September | | | | |
| | October | | | | |
| | November | | | | |
| | December | | | | |
| Year 3 | January | | | | **Effective Period** Continuous Tracking of Member Agency Local Supply and Imported Water Use |
| | February | | | | |
| | March | | | | |
| | April | | | | |
| | May | | | | |
| | June | | | | |

*Member agency projections of local supplies are due on April 1st to assist Metropolitan staff in determining the need for an allocation in the coming allocation year.

## Appendix A: Metropolitan Member Agencies

| Table 4: Member Agencies | | |
|---|---|---|
| City of Anaheim | City of Glendale | City of San Marino |
| City of Beverly Hills | Inland Empire Utilities Agency | City of Santa Ana |
| City of Burbank | Las Virgenes MWD | City of Santa Monica |
| Calleguas MWD | City of Long Beach | Three Valleys MWD |
| Central Basin MWD | City of Los Angeles | City of Torrance |
| City of Compton | MWD of Orange County | Upper San Gabriel MWD |
| Eastern MWD | City of Pasadena | West Basin MWD |
| Foothill MWD | San Diego CWA | Western MWD |
| City of Fullerton | City of San Fernando | |

Source: http://mwdh2o.com/WhoWeAre/Member-Agencies/

# Appendix B: Water Supply Allocation Plan Process Timeline

### July 2007

- City of Long Beach Water Department staff briefing
- Member Agency Managers/Member Agency Workgroup meeting
- Northern Managers Group meeting
    - Foothill MWD, City of Pasadena, City of Long Beach, Calleguas MWD, City of Los Angeles, West Basin MWD, City of Burbank, Three Valleys MWD, City of Glendale, Upper San Gabriel MWD

### August 2007

- Central Basin MWD staff briefing
- Eastern MWD staff briefing
- San Diego CWA staff briefing
- Member Agency Managers/Member Agency Workgroup meeting
- Western MWD staff briefing
- City of Beverly Hills staff briefing

### September 2007

- Member Agency Subgroup meetings
    - MWD of Orange County, San Diego CWA, West Basin MWD, Central Basin MWD
- MWD of Orange County staff briefing
- Member Agency Workgroup meeting
- Member Agency Workgroup meeting
- MWD Board of Directors Oral Report

### October 2007

- Inland Empire Utilities Agency staff briefing
- Central Basin MWD Caucus Meeting (included sub-agencies)
- Three Valleys MWD staff briefing
- MWD of Orange County staff briefing
- West Basin MWD staff briefing
- MWD Board of Directors Oral Report

### November 2007

- West Basin MWD Caucus Meeting (included sub-agencies)
- West Basin Water Users Association presentation
- Walnut Valley MWD staff briefing (sub-agency of Three Valleys MWD)
- Foothill MWD Managers Meeting (included sub-agencies)
- Central Basin MWD staff briefing
- City of Claremont City Council (sub-agency of Three Valleys MWD)
- MWD Board of Directors Information Letter with Draft Proposal

### December 2007

- Northern Managers Group Meeting
- California Department of Public Health staff briefing
- City of Long Beach Water Department staff briefing
- Santa Ana River Watershed Project Authority presentation
- Foothill MWD Managers Meeting (included sub-agencies)
- MWD Board of Directors Oral Report

### January 2008

- Northern Managers Group Meeting
- Water Replenishment District Board of Directors presentation
- Three Valleys MWD staff briefing
- Member Agency Conservation Coordinator's Group presentation
- Member Agency Managers/Member Agency Workgroup meeting
- City of Chino Hills presentation (sub-agency of IEUA)
- Member Agency Workgroup meeting
- Hemet/San Jacinto Exchange Club presentation
- MWD Board of Directors Report with Staff Recommended Water Supply Allocation Plan

### February 2008

- MWD of Orange County and Irvine Ranch WD staff briefing
- MWD Board of Directors Action Item
- San Gabriel Valley Water Association Meeting
- Orange County Water Policy Meeting
- SCAG Water Policy Task Force Meeting

# Appendix C: 12-Month Review Process and Results

### January 2010

- WSAP 12-Month Review Process workshop #1
    - Focused discussion of WSAP issues identified by Metropolitan staff and by member agencies since the July 2009 implementation began.

### February 2010

- WSAP 12-Month Review Process workshop #2
    - Continuation of focused discussion
- WSAP 12-Month Review Process workshop #3
    - Continuation of focused discussion

### March 2010

- WSAP 12-Month Review Process workshop #4
    - Continuation of focused discussion
- MWD Board of Directors information item
    - Review of potential modifications to the WSAP definition of Extraordinary Supply

### April 2010

- WSAP 12-Month Review Process workshop #5
    - Recap of identified issues and discussion of Metropolitan staff proposals for adjustments to the WSAP
- Member Agency Managers Meeting
    - Update on the 12-Month Review Process
- WSAP 12-Month Review Process workshop #6
    - Discussion of WSAP issues related to groundwater replenishment
- Member Agency Managers conference call
    - Clarification of WSAP definition for Extraordinary Supply

### May 2010

- Member Agency Managers Meeting
    - Discussion of proposed Extraordinary Supply policy principles and WSAP Local Supply certification process.
- Member Agency Managers conference call
    - Discussion of proposed Extraordinary Supply policy principles

### June 2010

- MWD Board of Directors action item

### July 2010

- MWD Board of Directors information item
    - Review of proposed adjustments to the WSAP developed in the 12-Month Review Process

### August 2010

- MWD Board of Directors action item

## Resulting Changes

- Removed references to Gains and Losses of Local Supply
    - Removed references in the WSAP to "gains and losses of local supplies" in order to better facilitate the accounting of historical base year and allocation year local supplies. This change did not affect the WSAP formula or allocations.
- Removed references to the Regional Shortage Percentage
    - Removed references to the "Regional Shortage Percentage" in the WSAP to reduce unintended confusion between calculation factors and shortage amounts. This change did not affect the WSAP formula or allocations.
- Included the Retail Impact Adjustment in all shortage levels
    - Included the Retail Impact Adjustment for Regional Shortage Levels 1 and 2. This change results in additional allocations to Metropolitan-dependent agencies under Level 1 and Level 2 regional shortages.
- Revised the accounting of Extraordinary Supplies
    - Revised the methodology for accounting of Extraordinary Supply in the WSAP formula by:
        - Removing the Base Period Local Supply threshold provision,
        - Removing the sliding-scale sharing mechanism from the formula, and
        - Including the full amount of the Extraordinary Supply in the calculation of the Retail Impact Adjustment.
- Included a Minimum Per Capita Water Use Threshold
    - Developed a minimum water use credit based on two GPCD water use thresholds. Member agencies would receive additional Metropolitan allocation for an acre-foot equivalent of GPCD below the minimum threshold. Member agency water use, on a gallon per capita per day (GPCD) basis, is compared to the following minimum thresholds established under Senate Bill X7-7 (Water Conservation Act of 2009)
        - 100 GPCD total use or
        - 55 GPCD residential indoor use
- Excluded Seawater Barrier from the WSAP Formula
    - Excluded seawater barrier supplies from the WSAP Base Period and Allocation Year local supply calculations. This allows the Board to determine allocations for seawater barrier demands separately from the WSAP.

# Appendix D: Three-Year Review Process and Results

### February 2011

- WSAP 3-Year Review Process workshop #1
  - Review of the existing WSAP policy formula; review of the process timeline; and focused discussion of WSAP issues identified by Metropolitan staff and by member agencies since the WSAP's adoption in February 2008

### March 2011

- WSAP 3-Year Review Process workshop #2
  - Discussion of issues related to local supplies and baseline inflation due to adjustments for recycling in the WSAP formula
- WSAP 3-Year Review Process workshop #3
  - Continuation of prior workshop

### April 2011

- WSAP 3-Year Review Process workshop #4
  - Discussion of issues and alternatives related to base period selection and baseline inflation in the WSAP formula
- WSAP 3-Year Review Process workshop #5
  - Discussion of recommendations to address baseline inflation in the WSAP formula

### May 2011

- WSAP 3-Year Review Process workshop #6
  - Discussion of issues and alternatives for the growth adjustment methodology in the WSAP formula
- WSAP 3-Year Review Process workshop #7
  - Continuation of prior workshop

### June 2011

- WSAP 3-Year Review Process workshop #8
  - Continuation of prior workshop, discussion of WSAP implementation exit strategy
- WSAP 3-Year Review Process workshop #9
  - Continuation of exit strategy discussion, discussion of baseline inflation due to conservation and related conservation demand hardening issues

### July 2011

- WSAP 3-Year Review Process workshop #9
  - Continued discussion of baseline inflation and conservation issues, and discussion of sharing allocations between agencies with common local resources

### August 2011

- WSAP 3-Year Review Process workshop #10
  - Discussion of WSAP Allocation Year timing vs. Tier 1-Tier 2 rate cycle timing, discussion of approaches for encouraging completion of WSAP local supply certifications
- Review WSAP at Member Agency Managers Meeting
  - Discussion of proposed WSAP adjustments to address baseline inflation issues, revise the growth adjustment methodology, and establish a WSAP exit strategy

### September 2011

- MWD Board of Directors action item

### Resulting Changes

- Baseline Inflation Adjustment
    - Removed non-potable recycling and conservation from the WSAP baseline
        - Increases in recycling and conservation will be subtracted annually from the Base Period forward
        - The annual population growth rate will be applied after deducting the annual increases in recycling and conservation
        - If an agency ends up in allocation penalty, a penalty reduction will be applied in an amount equal to the Code-Based and rate Structure conservation savings that were removed from the WSAP baseline
- Changed the Growth Adjustment methodology
    - Growth will be allocated at historical per capita rate capped at the 2010 Integrated Water Resource Plan (IRP) Target for Water Use Efficiency
        - For years up to and including 2014, the cap will be 163 GPCD
        - For years 2015-2020, the cap will reduce linearly from 163 to 145 GPCD
    - If an agency exceeds its allocation, a penalty reduction will be applied based on either:
        - The differential Evapotranspiration (ETo) of its service area compared to the MWD average, or
        - Certified and documented 20 x 2020 targeted GPCD
- Exit Strategy
    - Clarified the course of action for an existing WSAP allocation when Metropolitan's Board makes a declaration decision for the following WSAP year
        - If there is an allocation for the next year, then the current allocation stays in place
        - If there is no allocation for the next year, then the current allocation is lifted concurrent with the April decision

# Appendix E: 2014 Review Process and Results

## July 2014

- WSAP Workgroup Meeting #1
  - First meeting of the 2014 WSAP Review process; review of the existing WSAP policy and formula; review of the process timeline; began discussion of issues related to base period selection
- WSAP Workgroup Meeting #2
  - Discussion of base period selection

## August 2014

- WSAP Workgroup Meeting #3
  - Continuation of prior workshop discussion; comparison of base period alternatives

## September 2014

- WSAP Workgroup Meeting #4
  - Discussion of a base period proposal; discussion of replenishment issues in the WSAP; discussion of 2015 water supply scenarios
- Review WSAP at Member Agency Managers Meeting
  - Review of WSAP workgroup process; discussion on issues related to base period, demand hardening, and local resources development
- WSAP Workgroup Meeting #5
  - Review of base period recommendation; discussion of issues regarding agencies in mandatory conservation during a base period; discussion on replenishment in the WSAP

## October 2014

- WSAP Workgroup Meeting #6
  - Continuation of prior workshop discussion; discussion of alternative methods for conservation demand hardening credit; discussion of new and existing local supplies
- Review WSAP at Member Agency Managers Meeting
  - Review of WSAP workgroup process; discussion of issues related to base period and demand hardening

## November 2014

- WSAP Workgroup Meeting #7
  - Review and discussion of issues and potential methods for base period selection and adjustment, replenishment allocation, and conservation demand hardening credit; review of estimated effects of potential WSAP changes at the regional level
- WSAP Workgroup Meeting #8
  - Review of proposed recommendations for the WSAP based on workgroup discussion
- Review WSAP at Member Agency Managers Meeting
  - Review of proposed recommendations for the WSAP based on workgroup discussion

## Resulting Changes

- Base Period Update to FY2013 and FY2014
  - Changed the WSAP Base Period from calendar years 2004-2006 to fiscal years ending July 2013 and 2014
  - Mandatory Conservation Adjustment
    - Agencies with mandatory conservation in effect during the base period (FY 2013 and/or FY 2014) may qualify for a demand hardening adjustment, adjustment is subject to a consultation process that includes consideration historical demand and GPCD information

- Modify Conservation Demand Hardening Credit
  - Replaced device calculation-based estimates of conservation savings with a GPCD-based method
    - Conservation savings are calculated by comparing GPCD from a historical baseline to the Allocation Year; the difference is converted to acre-feet using the Allocation Year population.
      - Baseline GCPD is 10-year average ending between 2004 and 2010, with gross water, using gross water use minus non-potable recycled water production and documented historical population
  - Replaced formula for calculating the credit for each Regional Shortage Level
  - Conservation Demand hardening credit will be based on an initial 10 percent of GPCD-based conservation savings plus an additional 5 percent for each level of Regional Shortage; the credit will also be adjusted for the overall percentage reduction in retail water demand and the member agency's dependence on Metropolitan.
- Allocation Surcharge
  - Replaced the WSAP Penalty Rate with an Allocation Surcharge based on the estimated cost of Turf Replacement conservation programs

## Appendix F: Summary of Historical Shortage Plans

These five elements incorporated into the WSAP have, in four out of five instances, been used in previous shortage plans. Both the IICP and the 1995 DMP used a historical base period calculation, adjusted for growth, made local supply adjustments, and used conservation hardening credits in their formulations. The retail impact adjustment is the only feature of the WSAP that has not been used historically.

Table 5: Historical Shortage Plan Overview

| Plan Element | 1991 IICP | 1995 DMP | WSAP |
|---|---|---|---|
| Historical Base Period | √ | √ | √ |
| Growth Adjustment | √ | √ | √ |
| Local Supply Adjustment | √ | √ | √ |
| Conservation Hardening Credit | √ | √ | √ |
| Retail Impact Adjustment | | | √ |

# Appendix G: Water Supply Allocation Formula Example

The following example gives a step-by-step description of how the formula would be used to calculate an allocation of Metropolitan supplies for a hypothetical member agency. All numbers are hypothetical for the purpose of the example and do not reflect any specific member agency.

## Step 1: Calculate Base Period Retail Demand

**Base Period Local Supplies:** Calculated using a two-year average of groundwater (gw), groundwater recovery (gwr), Los Angeles Aqueduct supply (laa), surface water (sw), seawater desalination (sd), and other non-Metropolitan imported supplies (os). For the purpose of this example, assume that the two year average is 59,000 af.

$$[(gw1+gwr1+laa1+sw1+sd1+os1) + (gw2+gwr2+laa2+sw2+sd2+os2)] \div 2 = 59{,}000 \text{ af}$$

**Base Period Wholesale Demands:** Calculated using the same two-year time period as the Base Period Local Supplies. The Base Period Wholesale Demands include firm purchases (fp) and in-lieu deliveries to long-term groundwater replenishment (il), conjunctive use (cup), cyclic (cyc), and supplemental storage programs (ss). For the purpose of this example, assume that the two year average is 69,000 af.

$$[(fp^1{+}{+}il^1+cup^1+cyc^1+ss^1) + (fp^2+il^2+cup^2+cyc^2+ss^2)] \div 2 = 69{,}000 \text{ af}$$

**Base Period Retail Demands:** Calculated as the sum of the Base Period Local Supplies and Base Period Wholesale Demand.

$$59{,}000 + 69{,}000 = 128{,}000 \text{ af}$$

**Figure 1: Base Period Retail Demand Calculation**

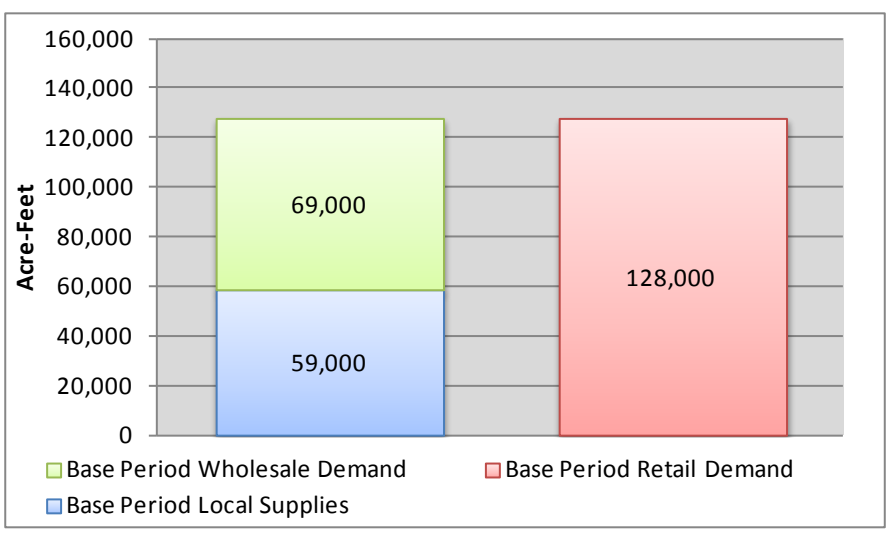

**Calculate Adjustment for Base Period Mandatory Rationing (if applicable):** The hypothetical agency used in this example is assumed not to qualify for the Base Period Mandatory Rationing Adjustment. A detailed discussion of the adjustment methodology can be found in Appendix I: Base Period Rationing Adjustment Example.

## Step 2: Calculate Allocation Year Retail Demand

**Allocation Year Retail Demand:** Calculated by adjusting the Base Period Retail Demand for any baseline inflation and growth that occurred since the Base Period.

128,000 af + 5,000 af (net adjustment to retail demand) = 133,000 af

**Figure 2: Allocation Year Retail Demand Calculation**

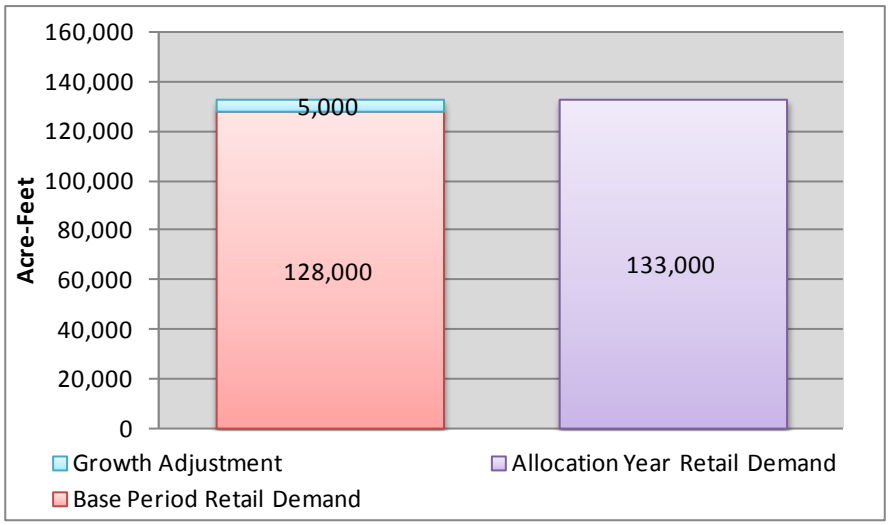


## Step 3: Calculate Allocation Year Wholesale Demand

**Allocation Year Local Supplies:** Estimates of Allocation Year Local Supplies are provided by the member agencies upon implementation of a WSAP. If estimates are not provided, Metropolitan will use the sum of the Base Period Local Supplies and Base Period In-Lieu Deliveries as a default. Agencies may provide updated estimates at any time during the Allocation Year to more accurately reflect their demand for Metropolitan supplies. For this example assume that the Allocation Year Local Supplies total 65,000 acre-feet.

Allocation Year Local Supplies = 65,000 af

For this example assume also that this agency has an additional 5,000 acre-feet of supplies that meet the determinations for Extraordinary Supply. These supplies are withheld from the allocation formula except for in calculating the Retail Impact Adjustment Allocation.

Extraordinary Local Supplies = 5,000 af

**Allocation Year Wholesale Demands:** Calculated by subtracting the Allocation Year Local Supplies (65,000 af) from the Allocation Year Retail Demands (133,000 af).

133,000 af - 65,000 af = 68,000 af

**Figure 3: Allocation Year Wholesale Demand Calculation**

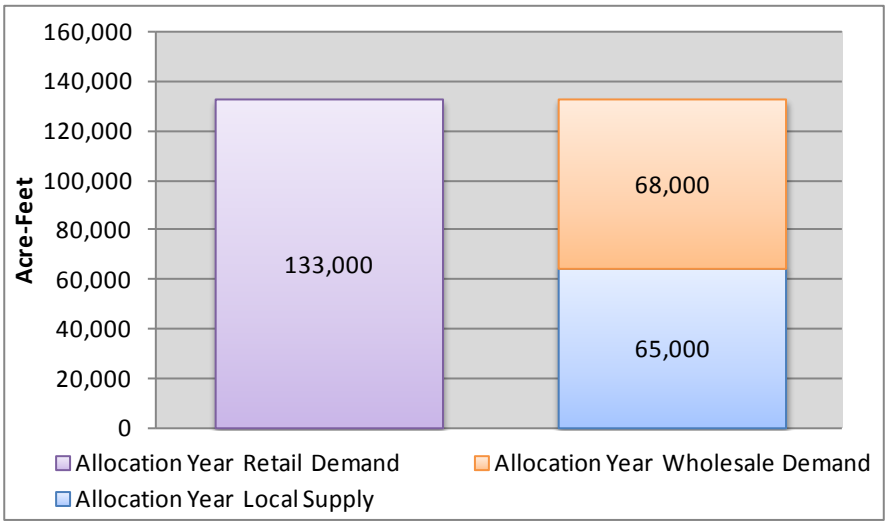


## Step 4: Calculate the Wholesale Minimum Allocation

**Wholesale Minimum Percentage:** Calculate from Table 1 for Regional Shortage Level 4.

| Table 1: Shortage Allocation Index | | |
|---|---|---|
| (a) Regional Shortage Level | (b) Wholesale Minimum Percentage | (c) Maximum Retail Impact Adjustment Percentage |
| 4 | 70.0% | 10.0% |

**Wholesale Minimum Allocation:** Calculated by multiplying the agency's Allocation Year Wholesale Demand (68,000 af) by the Wholesale Minimum Percentage (70%) from the Table 1 for Regional Shortage Level 4.

68,000 af * 70% = 47,600 af

## Step 5: Calculate the Retail Impact Adjustment Allocation

**Maximum Retail Impact Adjustment Percentage:** Calculate from Table 1 for Regional Shortage Level 4.

**Retail Impact Adjustment Allocation:** Calculated first by determining the agency's dependence on Metropolitan by dividing the Allocation Year Wholesale Demand (68,000 af) minus the Extraordinary Supply (5,000 af) by the Allocation Year Retail Demand (133,000 af) and multiplying by 100.

[(68,000 af - 5,000 af)/ 133,000 af] * 100 = 47%

Next, this percentage dependence on Metropolitan (47%) is multiplied by the Maximum Retail Impact Percentage for Shortage Level 4 (10%).

47% * 10% = 4.7%

This percentage is now multiplied by the Allocation Year Wholesale Demand (68,000 af) for the Retail Impact Adjustment Allocation.

68,000 af * 4.7% = 3,221 af

### Step 7: Calculate the Conservation Demand Hardening Adjustment

**Calculate Baseline GPCD:** To estimate conservation savings, each member agency will establish a historical baseline GPCD calculated in a manner consistent with California Senate Bill SBx7-7, using a 10 or 15-year average ending between 2004 and 2010, using gross water use minus non-potable recycle water production and documented historical population. For this example assume that the Baseline GPCD is 154 GPCD

Baseline GPCD = 154 GPCD

**Calculate Allocation Year GPCD:** Next, calculate the allocation year GPCD by converting the Allocation Year Retail Demand to GPCD and dividing by the Allocation Year Population from the WSAP. For this example the Allocation Year Retail Demand is 133,000 AF (see Step 2 above) and assume the Allocation Year Population is 905,000 persons. The resulting GPCD is 131 GPCD.

Allocation Year GPCD = 133,000 af/year * 325,851 gallons/af ÷ 365 days/year ÷ 905,000 persons = 131 GPCD

**Calculate Reduction in GPCD:** Subtract Allocation Year GPCD from Baseline GPCD to determine the GPCD Reduction.

GPCD Reduction = 154 GPCD – 131 GPCD = 23 GPCD

**Calculate Conservation Savings:** Convert the GPCD Reduction to the equivalent annual conservation savings in acre-feet, using the Allocation Year Population.

$$\text{Conservation Savings} = \frac{(\text{GPCD Reduction}) \times 365 \text{ days/yr} \times \text{Population}}{325{,}851 \text{ gallons/af}}$$

Conservation Savings = 23 x 365 x 905,000 ÷ 325,851 = 23,316 af

**Multiply by Regional Shortage Level Percentage:** Multiply the Conservation Savings by 10 percent plus an additional 5 percent for each level of Regional Shortage (see Step 4 above). This example assumes a Regional Shortage Level of 4. This scales the hardening credit by the level of regional shortage, thereby increasing the credit as deeper shortages occur when demand hardening has a larger impact on the retail consumer.

23,316 af x (10% + (4 x 5%) = 6,995 af

**Multiply by Conservation Savings Percentage:** Next, multiply by the percentage of an agency's demand that was reduced through conservation. This scales the hardening by the total percentage reduction to recognize that increased hardening occurs as increasing amounts of conservation are implemented.

Conservation Savings Percentage = 1 + ((Baseline GPCD – Allocation Year GPCD)/Baseline GPCD)

Conservation Savings Percentage = 1+ ((154 GPCD – 131 GPCD)/154 GPCD) = 115%

6,995 af x 115% = 8,044 af

**Multiply by Dependence on MWD:** Next, multiply by the agency's percentage dependence on MWD as shown in Step 5 above. This scales the credit to the member agency's dependence on MWD to ensure that credits are being applied to the proportion of water demand that is being affected by reductions in MWD's supply. For this example, dependence on MWD is 47%.

8.044 af x 47% = 3,781 af

**Summary:** The Conservation Demand Hardening Adjustment calculation is summarized by the following formula:

Conservation Demand Hardening Adjustment = Conservation Savings x (10% + Regional Shortage Level %) x (1+Conservation%) x Dependence on MWD %

Conservation Demand Hardening Adjustment = 23,316 af x (10% + (4 x 5%)) x (115%) x (47%) = 3,781 af

**Step 8: Calculate the Low Per-Capita Adjustment Allocation:** The hypothetical agency used in this example is assumed not to qualify for the Low Per-Capita Adjustment. A detailed discussion and example of the Low Per-Capita Adjustment calculation can be found in Appendix J: Per Capita Water Use Minimum Example.

**Step 9: Calculate the total WSAP Allocation**

**WSAP Allocation:** Calculated by adding the Wholesale Minimum Allocation (47,600 af), the Maximum Retail Impact Adjustment (3,221 af), the Demand Hardening Adjustment (3,781 af), and the Low Per-Capita Adjustment (0 af).

47,600 af + 3,221 af + 3,781 af + 0 af = 54,602 af

**Figure 4: WSAP Allocation Regional Shortage Level 4**

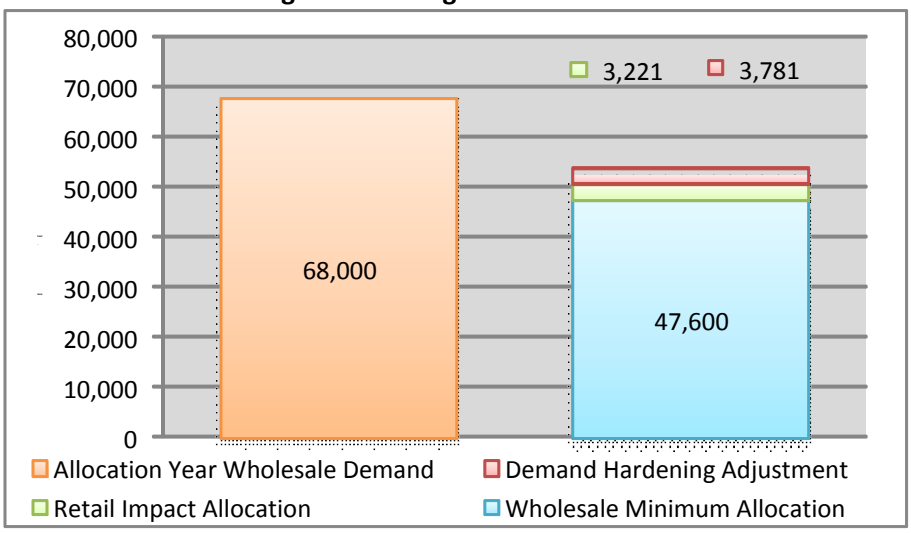


## Step 10: Calculate total retail level reliability

**Retail level reliability:** Calculated by adding the WSAP Allocation (54,602 af), the Allocation Year Local Supply (65,000 af) and the Extraordinary Local Supply (5,000 af) and dividing by the Allocation Year Retail Demand (133,000 af).

(54,602 af + 65,000 af + 5,000 af) ÷ 133,000 af = 93.7%

**Total Metropolitan Supply Allocations:** In addition to the WSAP Allocation described above, agencies may also receive separate allocations of supplies for groundwater replenishment and seawater barrier demands. More information on the groundwater replenishment allocation is located in Appendix L: Groundwater Replenishment Allocation.

# Appendix H: Board Policy Principles on Determining the Status of Extraordinary Supply

At the June 8, 2010 Water Planning and Stewardship Committee meeting Metropolitan's Board of Directors adopted the following policy principles to guide staff in determining the Extraordinary Supply status of future member agency supply programs.

### No Negative Impacts to Other Member Agencies

A potential Extraordinary Supply for a member agency should not decrease the amount of Metropolitan water supply that would be available to the other member agencies in a WSAP. Programs that utilize Metropolitan supplies as a primary or in-lieu source or as a means of payback or future replenishment may have the effect of decreasing supplies, available to other agencies, if designated as Extraordinary Supply.

### Provides Supply in Addition to Existing Regional Supplies

A potential Extraordinary Supply should provide a water supply that increases the overall water supplies that are available to the region in a WSAP. A program that is designed to move existing regional supplies from year to year would not qualify.

### Specifically Designed Program or Supply Action

A potential Extraordinary Supply must be intentionally created and operated to provide additional supply yield. Normal variations in existing and planned local supply programs would not qualify.

### Intended for Consumptive Use in a WSAP

A potential Extraordinary Supply should be designed with the primary intention to deliver water supply to a member agency only at a time when Metropolitan is allocating supplies. Programs designed to deliver water on a regular basis would not qualify. Exceptions for reasonable use of a supply program for emergency or other extenuating local circumstances should be considered.

### Fully Documented Resource Management Actions

A potential Extraordinary Supply should have a full description as to the source, transmission, distribution, storage, and delivery of the water supply.

These principles are intended to identify deliberate actions taken by member agencies to augment supplies only when Metropolitan is allocating supplies through the WSAP. Production from existing local supplies, programs that are operated on an ongoing basis, and incidental increases in water supply would not qualify as Extraordinary Supply. The intent of the Extraordinary Supply designation is to recognize programs and actions that are additive to the total regional water supply as the region continues to confront the water supply challenges from drought and regulatory conditions. To that end, any supply actions taken after the initial implementation of the WSAP in July 2009 that utilize Metropolitan supplies either as a primary source, or to refill or replenish an incurred obligation or deficit at a future date would not qualify as Extraordinary Supply.

## Appendix I: Base Period Mandatory Rationing Adjustment

Agencies that were under mandatory water use restrictions during the Base Period may have water use that is lower due to the mandatory actions already taken. Without adjusting for this, those agencies could be required to enforce even higher levels of restrictions under an allocation than those agencies that had not started mandatory restrictions.

To qualify for a Base Period Mandatory Rationing Adjustment, the member agency must provide Metropolitan staff with the following information:

- Time period when the mandatory conservation was in effect; it must be in effect during the Base Period
- A statement, with documentation, of how drought restrictions comply with the following Mandatory Conservation qualifications:
    - Governing Body-authorized or enacted
    - Includes mandatory demand reduction actions, restrictions or usage limitations including penalty-backed water budgets
    - Enforced by assessing penalties, fines, or rates based upon violating restrictions or exceeding usage limitations
- If the agency in question is a retail subagency, then the retailer's base period water demands during the Base Period in order to determine proportion to the member agency's total demand
- Historical data to construct GPCD base and trend for the consultation

Calculating the Base Period Rationing Adjustment involves following steps:

- Use the Baseline GPCD 10 or 15-year period selected by member agency for the Conservation Demand Hardening Adjustment calculation.
- Interpolate from the GPCD value of the midpoint of the Baseline GPCD period to the average GPCD of the two years preceding the agency's mandatory conservation
- Extrapolate to the WSAP Base Period (FY2013 and FY2014)
- Calculate the difference between estimated and observed GPCD for FY2013 and FY2014
- Convert to Acre-Feet and add to the member agency's Base Period Retail Demands

# Appendix J: Per-Capita Water Use Minimum Example

This adjustment creates a minimum per capita water use threshold. Member agencies' retail-level water use under the WSAP is compared to two different thresholds. The minimum water use levels are based on compliance guidelines for total and residential water use established under Senate Bill X7-7.

**Total Retail Level Use:** 100 GPCD
**Residential Retail Level Use:** 55 GPCD

Agencies that fall below either threshold under the WSAP would receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. To qualify for this credit, member agencies must provide documentation of the total agency level population and the percent of retail level demands that are residential; no appeal is necessary.

The following example gives a step-by-step description of how the Low Per-Capita Water Use Adjustment would be calculated for a hypothetical member agency. All numbers are hypothetical for the purpose of the example and do not reflect any specific member agency. This example was calculated using the following assumptions:

**Allocation Year Retail Demand:** 50,000 acre-feet
**Allocation Year Local Supplies:** 25,000 acre-feet;
**Allocation Year Wholesale Demand:** 25,000 acre-feet
**Base Period Conservation:** 5,000 acre-feet
**Agency Population:** 375,000
**Percent of Retail Demands that are Residential:** 60%

### Step 1: Calculate Total Retail-Level Allocation Year Supplies

Table 6 shows the Allocation Year Local Supply, WSAP Allocation, and the total Allocation Year Supplies for the example agency at each Regional Shortage Level. The WSAP Allocation was calculated using the methodology detailed in Appendix G: Water Supply Allocation Formula Example and the assumptions listed above.

| Table 6: Total Retail Level Allocation Year Supplies | | | |
|---|---|---|---|
| **Regional Shortage Level** | **Allocation Year Local Supply** | **WSAP Allocation** | **Total Allocation Year Supply** |
| 1 | 25,000 | 23,594 | 48,594 |
| 2 | 25,000 | 22,188 | 47,188 |
| 3 | 25,000 | 20,781 | 45,781 |
| 4 | 25,000 | 19,375 | 44,375 |
| 5 | 25,000 | 17,969 | 42,969 |
| 6 | 25,000 | 16,563 | 41,563 |
| 7 | 25,000 | 15,156 | 40,156 |
| 8 | 25,000 | 13,750 | 38,750 |
| 9 | 25,000 | 12,344 | 37,344 |
| 10 | 25,000 | 10,938 | 35,938 |

### Step 2: Calculate the Equivalent Total and Residential GPCD

The next step is to calculate the equivalent water use in gallons per capita per day (GPCD) for the Total Allocation Year Supply. The following equation shows the GPCD calculation under Regional Shortage Level 10.

35,938 af * 325,851 gallons ÷ 375,000 people ÷ 365 days = 85.6 GPCD

The residential per-capita water use is calculated in the same manner. Based on the assumption that 60% of the agency demands are residential, the following equation shows the residential GPCD calculation under Regional Shortage Level 10.

35,938 af * 60% * 325,851 gallons ÷ 375,000 people ÷ 365 days = 51.3 GPCD

### Step 3: Compare the Total and Residential GPCD to the Minimum Water Use Thresholds

The next step is to compare the total GPCD water use to the 100 GPCD total water use threshold. In a Regional Shortage Level 10, the WSAP results in an allocation that is 14.4 GPCD below the minimum threshold.

100 GPCD – 85.6 GPCD = 14.4 GPCD

Likewise the residential GPCD water use is compared to the 55 GPCD residential water use threshold.

55 GPCD – 51.3 GPCD = 3.7 GPCD

### Step 4: Determine the Allocation Adjustment in Acre-Feet

The final step is to calculate the acre-foot equivalent of the GPCD that fell below the minimum threshold. In a Regional Shortage Level 10, the adjustment provides 6,068 acre-feet of additional allocation to the agency; the results for Shortage Levels 1-10 are shown in Table 7.

14.4 GPCD ÷ 325,851 gallons * 375,000 people * 365 days = 6,068 acre-feet

| Table 7: Total Per-Capita Water Use Adjustment | | | | |
|---|---|---|---|---|
| **Regional Shortage Level** | **Allocation Year Supply** | **Equivalent GPCD** | **GPCD Below Threshold** | **Allocation Adjustment** |
| 1 | 48,594 | 115.7 | 0 | 0 |
| 2 | 47,188 | 112.3 | 0 | 0 |
| 3 | 45,781 | 109.0 | 0 | 0 |
| 4 | 44,375 | 105.6 | 0 | 0 |
| 5 | 42,969 | 102.3 | 0 | 0 |
| 6 | 41,563 | 98.9 | 1.1 | 443 |
| 7 | 40,156 | 95.6 | 4.4 | 1,849 |
| 8 | 38,750 | 92.3 | 7.7 | 3,255 |
| 9 | 37,344 | 88.9 | 11.1 | 4,662 |
| 10 | 35,938 | 85.6 | 14.4 | 6,068 |

Again, this step is repeated for the residential water use. In a Regional Shortage Level 10, the adjustment provides 1,540 acre-feet of additional allocation to the agency; the residential water use results for Regional Shortage Levels 1-10 are shown in Table 8.

3.7 GPCD ÷ 325,851 gallons * 375,000 people * 365 days = 1,540 acre-feet

| Table 8: Residential Per-Capita Water Use Adjustment | | | | |
|---|---|---|---|---|
| **Regional Shortage Level** | **Allocation Year Supply** | **Equivalent GPCD** | **GPCD Below Threshold** | **Allocation Adjustment** |
| 1 | 29,156 | 69.4 | 0 | 0 |
| 2 | 28,313 | 67.4 | 0 | 0 |
| 3 | 27,469 | 65.4 | 0 | 0 |
| 4 | 26,625 | 63.4 | 0 | 0 |
| 5 | 25,781 | 61.4 | 0 | 0 |
| 6 | 24,938 | 59.4 | 0 | 0 |
| 7 | 24,094 | 57.4 | 0 | 0 |
| 8 | 23,250 | 55.4 | 0 | 0 |
| 9 | 22,406 | 53.3 | 1.7 | 697 |
| 10 | 21,563 | 51.3 | 3.7 | 1,540 |

Agencies that fall below either threshold under the WSAP would receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. If an agency qualifies under both thresholds, the one resulting in the maximum allocation adjustment would be given. Under this example the agency would receive 6,068 acre-feet of additional allocation in a Regional Shortage Level 10.

# Appendix K: Qualifying Income-Based Rate Allocation Surcharge Adjustment Example

The following example provides a step by step description of how the qualifying income-based rate allocation surcharge adjustment is calculated. To qualify for this adjustment, member agencies must provide documentation showing the amount of retail demands that are covered by a qualifying income-based rate; no appeal is necessary.

The following list summarizes the allocation year demands, local supplies, and allocation as calculated in Appendix G: Water Supply Allocation Formula Example for a hypothetical agency under a Level 4 Regional Shortage. For detailed instructions on how to calculate these figures, reference Appendix G: Water Supply Allocation Formula Example.

**Allocation Year Retail Demand:** 133,000 acre-feet
**Allocation Year Local Supplies:** 68,000 acre-feet;
**Level 4 WSAP Allocation:** 52,735 acre-feet

### Step 1: Allocation Surcharge Calculation

(a) **Water Use above Allocation:** The first step in calculating the income-based rate Allocation Surcharge adjustment is to calculate the agency's total Allocation Surcharge under the WSAP. If the agency did not incur any Allocation Surcharge from the allocation year, the income-based rate allocation surcharge adjustment would not apply. For the purpose of this example, the agency used 61,000 acre-feet of MWD supplies in the allocation year. This represents 8,265 acre-feet of use above the water supply allocation.

| | |
|---|---|
| WSAP Allocation | 52,735 af |
| Actual MWD Water Use | 61,000 af |
| **Use Above WSAP Allocation** | 8,265 af |

(b) **Total Allocation Surcharge:** In this example the agency used 115.7% of its water supply allocation. 7,910 of the 8,265 acre-feet of use above the allocation would be assessed the Allocation Surcharge at an amount of $1,480 per acre-foot and 354 of the 8,265 acre-feet of use above the allocation would be assessed the Allocation Surcharge at an amount of $2,960.

| | | | |
|---|---|---|---|
| Between 100% and 115% of Allocation | 7,910 af | $1,480/af | $11,706,800 |
| Greater than 115% of Allocation | 354 af | $2,960/af | $1,047,840 |
| **Total** | 8,265 af | | $12,754,640 |

### Step 2: Effective Income-Based Rate Cutback

(a) **Calculate Retail Cutback:** The second step in calculating the income-based rate allocation surcharge adjustment is to calculate the amount of supply cutback that would have been expected from qualifying income-based rate customers under the WSAP. Using the water supply allocation that was calculated above, the total retail level impact on the agency can be

determined. In this example the agency receives a retail level cutback of 15,265 acre-feet, or 11.5% of their retail level demand.

| | |
|---|---|
| WSAP Allocation + Allocation Year Local Supplies | 117,735 af |
| Allocation Year Retail Demand | 133,000 af |
| **Effective Cutback** | **15,265 af (11.5%)** |

**(b) Income-based Rate Customer Retail Cutback:** To calculate the effective income-based rate cutback, the amount of demand covered by a qualifying income-based rate is multiplied by the effective retail level cutback. For this example assume that the agency has 10,000 acre-feet of qualifying demands.

| | |
|---|---|
| Qualifying Income-Based Rate Demand | 10,000 af |
| Effective Cutback Percentage | 11.5% |
| **Effective Income-Based Rate Cutback** | **1,148 af** |

**(c) Income-based Rate Cutback Allocation Surcharge:** Once the effective cutback has been calculated, the amount of Allocation Surcharge that is associated with qualifying income-based rate customers can be determined.

| | | | |
|---|---|---|---|
| Between 100% and 115% of Allocation | 794 af | $1,480/af | $1,175,120 |
| Greater than 115% of Allocation | 354 af | $2,960/af | $1,047,840 |
| **Total** | **1,148 af** | | **$2,222,960** |

**(d) Adjusted Allocation Surcharge Calculation:** Finally, the Allocation Surcharge attributable to qualifying income-based rate customers is subtracted from the total Allocation Surcharge that was calculated above to determine the qualifying income-based rate adjusted allocation surcharge. In the case that the monetary amounts associated with the Income-Based Rate are greater than the total amounts an agency incurs, no Allocation Surcharge will be incurred.

| | |
|---|---|
| Total Allocation Surcharge | $12,754,640 |
| Qualifying Income-Based Rate Allocation Surcharge | $2,222,960 |
| **Qualifying Income-Based Rate Adjusted Allocation** | **$10,531,680** |

## Appendix L: Groundwater Replenishment Allocation

Groundwater basins help provide vital local supplies that can buffer the region from short-term drought impacts. Longer droughts can result in reductions to the many sources of water that replenish groundwater basins, resulting in lower basin levels and potential impacts to the overlying consumptive demands. Limited imported deliveries under these conditions may help avoid impacts to the basins that may be drawn out of their normal operating range or subject to water quality or regulatory impacts. To this end, Metropolitan provides a limited allocation for drought impacted groundwater basins based on the following framework:

a) Staff hold a consultation with qualifying member agencies who have taken groundwater replenishment deliveries since 2010 and the appropriate groundwater basin managers to document whether their basins are in one of the following conditions:
    i. Groundwater basin overdraft conditions that will result in water levels being outside normal operating ranges during the WSAP allocation period; or
    ii. Violations of groundwater basin water quality and/or regulatory parameters that would occur without imported deliveries.
b) Provide an allocation based on the verified need for groundwater replenishment. The allocation would start with a member agency's ten-year average purchases of imported groundwater replenishment supplies (excluding years in which deliveries were curtailed). The amount would then be reduced by the declared WSAP Regional Shortage Level (5 percent for each Regional Shortage Level).
c) Any allocation provided under this provision for drought impacted groundwater basins is intended to help support and maintain groundwater production for consumptive use. As such, a member agency receiving an allocation under this provision will be expected to maintain groundwater production levels equivalent to the average pumping in the Base Period. Any adjustments to a member agency's M&I allocation due to lower groundwater production would be reduced by deliveries made under this provision.
d) Agencies for which this allocation does not provide sufficient supplies for the needs of the groundwater basin may use the WSAP Appeals Process to request additional supply (subject to Board approval). The appeal should include a Groundwater Management Plan that documents the need for additional supplies according to the following tenets:
    i. Maintenance of groundwater production levels;
    ii. Maintenance of, or reducing the further decline of, groundwater levels;
    iii. Maintenance of key water quality factors/indicators;
    iv. Avoidance of permanent impacts to groundwater infrastructure or geologic features; and
    v. Consideration of severe and/or inequitable financial impacts.

Final amounts and allocations will be determined following the consultations with groundwater basin managers and member agencies.

# Appendix M: Water Rates, Charges, and Definitions

| Table 9: Water Rates and Charges<br>Dollars per acre-foot (except where noted) | | | |
|---|---|---|---|
| **Rate** | **Effective 1/1/2014** | **Effective 1/1/2015** | **Effective 1/1/2016** |
| Tier 1 Supply Rate | $148 | $158 | $156 |
| Tier 2 Supply Rate | $290 | $290 | $290 |
| System Access Rate | $243 | $257 | $259 |
| Water Stewardship Rate | $41 | $41 | $41 |
| System Power Rate | 161 | $126 | $138 |
| Tier 1 | $593 | $582 | $594 |
| Tier 2 | $735 | $714 | $728 |
| Treatment Surcharge | $297 | $341 | $348 |
| Full Service Treated Volumetric Cost | | | |
| Tier 1 | $890 | $923 | $942 |
| Tier 2 | $1,032 | $1,055 | $1,076 |
| Readiness-to-Serve Charge (millions of dollars) | $166 | $158 | $153 |
| Capacity Charge (dollars per cubic foot second) | $8,600 | $11,100 | $10,900 |

## Definitions:

(1) **Tier 1 Supply Rate -** recovers the cost of maintaining a reliable amount of supply.
(2) **Tier 2 Supply Rate** - set at Metropolitan's cost of developing additional supply to encourage efficient use of local resources.
(3) **System Access Rate** – recovers a portion of the costs associated with the delivery of supplies.
(4) **System Power Rate** – recovers Metropolitan's power costs for pumping supplies to Southern California.
(5) **Water Stewardship Rate** – recovers the cost of Metropolitan's financial commitment to conservation, water recycling, groundwater clean-up and other local resource management programs.
(6) **Treatment Surcharge** – recovers the costs of treating imported water.
(7) **Readiness-to-Serve Charge -** a fixed charge that recovers the cost of the portion of system capacity that is on standby to provide emergency service and operational flexibility.
(8) **Capacity Charge** – the capacity charge recovers the cost of providing peak capacity within the distribution system.

Source: http://www.mwdh2o.com/WhoWeAre/Management/Financial-Information

# Appendix N: Allocation Appeals Process

## Step 1: Appeals Submittal

All appeals shall be submitted to the Appeals Liaison in the form of a written letter signed by the member agency General Manager. Each appeal must be submitted as a separate request, submittals with more than one appeal will not be considered. The appeal request is to include:

- A designated member agency staff person to serve as point of contact.
- The type of appeal (erroneous baseline data, loss of local supply, etc.).
- The quantity (in acre-feet) of the appeal.
- A justification for the appeal which includes supporting documentation.

A minimum of 60 days are required to coordinate the appeals process with Metropolitan's Board process.

## Step 2: Notification of Response and Start of Appeals Process

The Appeals Liaison will phone the designated member agency staff contact within 3 business days of receiving the appeal to provide an initial receipt notification, and schedule an appeals conference. Subsequent to the phone call, the Liaison will send an e-mail to the Agency General Manager and designated staff contact documenting the conversation. An official notification letter confirming both receipt of the appeal submittal, and the date of the appeals conference, will be mailed within 2 business days following the phone contact

## Step 3: Appeals Conference

All practical efforts will be made to hold an appeals conference between Metropolitan staff and member agency staff at Metropolitan's Union Station Headquarters within 15 business days of receiving the appeal submittal. The appeals conference will serve as a forum to review the submittal materials and ensure that there is consensus understanding as to the spirit of the appeal. Metropolitan staff will provide an initial determination of the size of the appeal (small or large) and review the corresponding steps and timeline for completing the appeals process.

### *Steps 4-7 of the appeals process differ depending upon the size of the appeal*

### *Small Appeals*

Small appeals are defined as those that would change an agency's allocation by less than 10 percent, or are less than 5,000 acre-feet in quantity. Small appeals are evaluated and approved or denied by Metropolitan staff.

## Step 4: Preliminary Decision

Metropolitan staff will provide a preliminary notice of decision to the member agency within 10 business days of the appeals conference. The preliminary decision timeline may be extended to accommodate requests for additional information, data, and documentation. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the preliminary decision and the rationale for approving or denying the appeal.

### Step 5: Clarification Conference

Following the preliminary decision the Appeals Liaison will schedule a clarification conference. The member agency may choose to decline the clarification conference if they are satisfied with the preliminary decision. Declining the clarification conference serves as acceptance of the preliminary decision, and the decision becomes final upon approval by Metropolitan's executive staff.

### Step 6: Final Decision

Metropolitan staff will provide a final notice of decision to the member agency within 10 business days of the clarification conference, pending review by Metropolitan's executive staff. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the final decision and the rationale for the decision. A copy of the letter will also be provided to Metropolitan executive staff.

#### Step 6a: Board Resolution of Small Appeal Claims

Member agencies may request to forward appeals that are denied by Metropolitan staff to the Board of Directors through the Water Planning and Stewardship Committee for final resolution. The request for Board resolution shall be submitted to the Appeals Liaison in the form of a written letter signed by the member agency General Manager. This request will be administered according to Steps 6 and 7 of the large appeals process.

### Step 7: Board Notification

Metropolitan staff will provide a report to the Board of Directors, through the Water Planning and Stewardship Committee, on all submitted appeals including the basis for determination of the outcome of the appeal.

### *Large Appeals*

Large appeals are defined as those that would change an agency's allocation by more than 10 percent, and are larger than 5,000 acre-feet. Large appeals are evaluated and approved or denied by the Board of Directors.

### Step 4: Preliminary Recommendation

Metropolitan staff will provide a preliminary notice of recommendation to the member agency within 10 business days of the appeals conference. The preliminary decision timeline may be extended to accommodate requests for additional information, data, and documentation. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the preliminary recommendation and the rationale for the recommendation. A copy of the draft recommendation will also be provided to Metropolitan executive staff.

### Step 5: Clarification Conference

Following the preliminary recommendation the Appeals Liaison will schedule a clarification conference. The member agency may choose to decline the clarification conference if the satisfied with preliminary recommendation. Declining the clarification conference signifies acceptance of the preliminary recommendation, and the recommendation becomes final upon approval by Metropolitan's executive staff.

### Step 6: Final recommendation

Metropolitan staff will provide a final notice of recommendation to the member agency within 10 business days of the clarification conference, pending review by Metropolitan executive staff. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the final recommendation and the rationale for the recommendation. A copy of the final recommendation will also be provided for Metropolitan executive review.

### Step 7: Board Action

Metropolitan staff shall refer the appeal to the Board of Directors through the Water Planning and Stewardship Committee for approval.

# Appendix O: Appeals Submittal Checklist

## Appeal Submittal

- ☐ Written letter (E-mail or other electronic formats will not be accepted)
- ☐ Signed by the Agency General Manager

### Mailed to the appointed Metropolitan Appeals Liaison

## Contact Information

- ☐ Designated staff contact
  - Name
  - Address
  - Phone Number
  - E-mail Address
- ☐ General Manager
  - Name
  - Address
  - Phone Number
  - E-mail Address

## Type of Appeal

- ☐ State the type of appeal
  - Erroneous historical data used in base period calculations
    - Metropolitan Deliveries
    - Local Production
    - Growth adjustment
    - Conservation savings
  - Exclusion of physically isolated areas
  - Extraordinary supply designation
  - Groundwater Replenishment Allocation
  - Base Period Mandatory Rationing Adjustment
  - Other

## Quantity of Appeal

- ☐ State the quantity in acre-feet of the appeal

## Justification and Supporting Documentation

- ☐ State the rationale for the appeal
- ☐ Provide verifiable documentation to support the stated rationale
  - Examples of verifiable documentation Include, but are not limited to:
    - Billing Statements
    - Invoices for conservation device installations
    - Basin Groundwater/Watermaster Reports
    - California Department of Finance economic or population data
    - California Department of Public Health reports

# Attachment C

## Resolution Adopting the Water Shortage Contingency Plan

**Resolution 9281**

**RESOLUTION**
**OF THE BOARD OF DIRECTORS**
**OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA**
**ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN**

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, a water shortage contingency plan;

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such Water Shortage Contingency Plans;

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers to conduct an annual water supply and demand assessment (Annual Assessment) each year and to include in their water shortage contingency plans the procedures they use to conduct the Annual Assessment;

WHEREAS, the procedures used to conduct an Annual Assessment include, but are not limited to, the written decision-making process that an urban water supplier will use each year to determine its water supply reliability;

WHEREAS, The Metropolitan Water District of Southern California's (Metropolitan's) water shortage contingency plan provides that by June of each year, Metropolitan staff will present a completed Annual Assessment for approval by Metropolitan's Board of Directors or by the Board's authorized designee with expressly delegated authority for approval of Annual Assessment determinations;

and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered such Water Shortage Contingency Plan and has determined the Water Shortage Contingency Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of the planned actions during shortage conditions for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May 11, 2021, this District hereby adopts this Water Shortage Contingency Plan for submittal to the State of California and expressly authorizes the General Manager of The Metropolitan Water District of Southern California to approve the Annual Assessment each year.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May 11, 2021.

Judy Abdo

Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California

# Appendix 5

# LOCAL PROJECTS

**(From 2020 IRP local supply survey and Member Agency Coordination)**

## Table A.5-1
## Recycled Water Projects

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| City of Anaheim | | |
| Anaheim GWRS Purchases | 120 | 2011 |
| Anaheim Water Recycling Demonstration Project | 110 | 2014 |
| City of Burbank | | |
| Burbank Recycled Water System Project | 1,300 | 1967 |
| Burbank Recycled Water System Expansion Project - Phase I | 850 | 1995 |
| Burbank Recycled Water System Expansion Project - Phase II | 960 | 2009 |
| Calleguas Municipal Water District | | |
| Camrosa Water Reclamation Facility Project | 1,600 | 1997 |
| City of Camarillo Recycled Distribution System | 1,502 | 1955 |
| Conejo Creek Diversion Project | 9,000 | 2003 |
| Lake Sherwood Reclaimed Water System | 420 | 1997 |
| Oak Park/North Ranch Recycled Water Distribution System | 1,300 | 1994 |
| Oxnard Advanced Water Purification Facility Project Phase I | 5,000 | 2015 |
| Simi Valley Recycled Water Project | 90 | 2001 |
| VCWWD No. 1 WWTP Recycled Water Distribution System | 1,100 | 2003 |
| Central Basin Municipal Water District | | |
| Albert Robles Center for Water Recycling & Environmental Learning | 10,000 | 2020 |
| Century/Rio Hondo Reclamation Program | 5,000 | 1992 |
| Cerritos Reclaimed Water System | 1,750 | 1978 |
| Cerritos Reclamation Extension Project | 260 | 1993 |
| Lakewood Water Reclamation Project | 500 | 1989 |
| Montebello Forebay Groundwater Recharge Project | 54,500 | 1962 |
| Eastern Municipal Water District | | |
| Eastern Recycled Water System Expansion Project | 5,000 | 2012 |
| Original Customers, Reach 1 Phase I & Reach 2 | 28,950 | 1966 |
| Rancho California Reclamation Expansion Project - Rancho Division | 5,250 | 1993 |
| Rancho California Reclamation Project - Rancho Division | 225 | 1989 |
| Reach 1 Phase II | 1,700 | 2000 |
| Reach 16 Phase I | 707 | 2006 |
| Reach 16 Phase II | Not Provided | Not Provided |
| Reach 3 & Reach 7 | 4,830 | 2012 |
| Foothill Municipal Water District | | |
| La Cañada Flintridge Country Club Controlled Access Irrigation | 90 | 1962 |
| City of Glendale | | |
| Glendale Water Reclamation Project | 400 | 1986 |
| Glendale Water Reclamation Expansion Project | 500 | 1992 |
| Glendale Verdugo-Scholl and Brand Park Project | 1,760 | 1995 |

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Inland Empire Utilities Agency | | |
| Ely Basin Groundwater Recharge | 14,000 | 1999 |
| IEUA Regional Recycled Water Distribution System | 13,500 | 1998 |
| Regional Sewage Service Contract | 3,500 | 1972 |
| Las Virgenes Municipal Water District | | |
| Calabasas Project | 900 | Not Provided |
| Calabasas Reclaimed Water System Extension Project | 700 | 1989 |
| Las Virgenes Reclamation Project | 2,700 | 1984 |
| Las Virgenes Valley Project | 500 | Not Provided |
| City of Long Beach | | |
| Alamitos Barrier Reclaimed Water Project | 3,025 | 2005 |
| Leo J. Vander Lans Water Treatment Facility Expansion Project | 3,475 | 2018 |
| Long Beach Reclamation Project | 1,700 | 1986 |
| Long Beach Recycled Water System Expansion Phase I | 2,750 | 2004 |
| Original Customers | 400 | 1980 |
| THUMS | 1,429 | 1981 |
| City of Los Angeles | | |
| Burbank Deliveries to Los Angeles | 9 | 2018 |
| Central City/Elysian Park Project Phase I - Taylor Yard Park | 150 | 2009 |
| Downtown Water Recycling Project | 2,116 | 2018 |
| Griffith Park South Water Recycling Project | 450 | 2019 |
| Hansen Area Water Recycling - Hansen Dam Golf Course | 500 | 2015 |
| Hansen Area Water Recycling Phase I Project | 2,115 | 2008 |
| Harbor Water Recycling Project | 5,000 | 2005 |
| Los Angeles Greenbelt Project | 1,766 | 1993 |
| North Atwater Area Water Recycling Project | 50 | 2015 |
| Original Deliveries from West Basin Reclamation Program | 740 | 1996 |
| Sepulveda Basin Water Reclamation Project Phase IV | 445 | 2010 |
| Sepulveda Basin Water Reclamation Project Phases I - III | 1,500 | 2007 |
| South Gardena Lateral | 95 | 2019 |
| Van Nuys Area Water Recycling Project | 150 | 2011 |
| Municipal Water District of Orange County | | |
| Capistrano Valley Non-Domestic Water System | 565 | 1989 |
| Capistrano Valley Non-Domestic Water System Expansion Project | 1,011 | 2006 |
| El Toro Recycled Water System | 260 | 1998 |
| El Toro Recycled Water System Expansion Project - Phase I | 1,050 | 2015 |
| El Toro Recycled Water System Expansion Project - Phase II | 350 | 2019 |
| Green Acres Reclamation Project - Coastal MWD & Orange County | 2,480 | 1991 |
| GWRS Initial Expansion | 30,000 | 2015 |
| GWRS Phase I | 74,880 | 2008 |

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Irvine Reclamation Expansion Project - Post 2003 Michelson & Los Alisos Dual Distribution System | 8,500 | 2008 |
| Irvine Reclamation Expansion Project - Pre 2003 Michelson & Los Alisos Dual Distribution System | 1,500 | Not Provided |
| Irvine Reclamation Project - Post 1983 Michelson System | 10,000 | 1986 |
| Irvine Reclamation Project - Pre 1983 Michelson System | 6,000 | 1967 |
| Moulton Niguel Reclamation Project - Phases I & II | 470 | 1968 |
| Moulton Niguel Reclamation Project - Phases III & IV | 9,276 | 1993 |
| San Clemente Recycled Water System Expansion Project | 1,000 | 2015 |
| San Clemente Water Reclamation Project | 500 | 1990 |
| San Clemente Water Reclamation Project - Municipal Golf Course | 200 | 1957 |
| Santa Margarita - Irvine Ranch Recycled Water Purchase Agreement | 321 | 2001 |
| Santa Margarita Advanced Purified Water Project | 300 | 2018 |
| Santa Margarita Chiquita Water Reclamation Project | 2,772 | 2005 |
| Santa Margarita Oso Water Reclamation Expansion Project | 3,600 | 1988 |
| Santa Margarita Oso Water Reclamation Project | 1,200 | 1978 |
| South Laguna Reclamation Expansion Project | 0 | 1991 |
| South Laguna Reclamation Project | 860 | 1985 |
| Trabuco Canyon Reclamation Expansion Project | 800 | 1992 |
| Trabuco Canyon Reclamation Project | 280 | 1987 |
| City of Santa Ana | | |
| Green Acres Reclamation Project - Santa Ana | 320 | 2008 |
| City of Santa Monica | | |
| Santa Monica Urban Runoff Recycling Facility | 210 | 2005 |
| San Diego County Water Authority | | |
| 4S Ranch WRF/ Olivenhain MWD | 1,145 | 2003 |
| Camp Pendleton Marine Corps Base Recycled Water System | 1,950 | 1997 |
| Connection #1 - North City Water Reclamation Plant/City of San Diego | 465 | 2003 |
| Connection #2 - North City Water Reclamation Plant/City of San Diego | 25 | 2003 |
| Del Mar San Elijo WRF/ San Elijo JPA | 130 | 2000 |
| Del Mar San Elijo WRF/ San Elijo JPA additional verifiable expansions | 20 | 2000 |
| Encina Basin Phases I & II - Carlsbad WRF/ Carlsbad MWD | 2,315 | 1993 |
| Encina Basin Phases I & II - Carlsbad WRF/ Carlsbad MWD additional verifiable expansions | 135 | 1993 |
| Encina Basin Phases I & II - Gafner WRF/ Leucadia CWD | 260 | 1993 |
| Encina Basin Phases I & II - Gafner WRF/ Leucadia CWD additional verifiable expansions | 15 | 1993 |
| Encina Basin Phases I & II - Meadowlark WRF (via Mahr Reservoir)/Vallecitos WD | 2,425 | 1993 |
| Encina Basin Phases I & II - Meadowlark WRF (via Mahr Reservoir)/Vallecitos WD additional verifiable expansions | 140 | 1993 |

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Fallbrook Public Utility District Water Reclamation Project | 1,200 | 1990 |
| Fallbrook Public Utility District Water Reclamation Project Verifiable Expansions | 500 | Not Provided |
| Hale Avenue Resources Recovery Facility (HARRF)/City of Escondido | 993 | 2004 |
| Hale Avenue Resources Recovery Facility (HARRF)/City of Escondido additional verifiable expansions | 127 | 2004 |
| Hale Avenue RRF/City of Escondido HGWRP/Rincon MWD | 648 | 2004 |
| Hale Avenue RRF/City of Escondido HGWRP/Rincon MWD Verifiable Expansions | 1,352 | 2004 |
| Northwest Quadrant/Meadowlark WRF/Vallecitos WD | 728 | 2009 |
| Oceanside Water Reclamation Project | 200 | 1992 |
| Oceanside Water Reclamation Project Additional Verifiable Expansion | 4,840 | 1992 |
| Olivenhain SEJPA1-Quail Gardens | 110 | 2000 |
| Olivenhain SEJPA1-Quail Gardens additional verifiable expansions | 13 | 2000 |
| Olivenhain SEJPA2-Village Park, Manchester/Phase I | 210 | 2000 |
| Olivenhain SEJPA2-Village Park, Manchester/Phase I additional verifiable expansions | 26 | 2000 |
| Otay Recycled Water System Phases I & II | 7,062 | 1991 |
| Padre Dam Reclaimed Water System Phase I | 850 | 1998 |
| San Diego Northern Recycled Water Distribution System | 12,619 | 1998 |
| San Diego Northern Recycled Water Distribution System - deliveries to Poway | 645 | 2009 |
| San Diego Southern Recycled Water Distribution System | 1,154 | 2006 |
| San Dieguito San Elijo WRF/ San Elijo JPA | 620 | 2000 |
| San Dieguito San Elijo WRF/ San Elijo JPA additional verifiable expansions | 80 | 2000 |
| San Vicente Recycled Water System | 230 | 1996 |
| San Vicente Recycled Water Treatment Upgrades | 340 | 2010 |
| Santa Fe ID San Elijo WRF/ San Elijo JPA | 530 | 2000 |
| Santa Fe ID San Elijo WRF/ San Elijo JPA additional verifiable expansions | 70 | 2000 |
| Santa Maria Recycled Water System | 400 | 1999 |
| Santee Lakes Existing Project | 65 | 1959 |
| Santa Fe Valley WRF/Rancho Santa Fe CSD | 153 | 2003 |
| Woods Valley Ranch Water Reclamation Facility Phase I | 47 | 2005 |
| Three Valleys Municipal Water District | | |
| City Industry Regional Recycled Water Project - Rowland Portion | 1,017 | 2008 |
| City Industry Regional Recycled Water Project - Walnut Valley Portion | 2,135 | 2008 |
| Pomona Recycled Water Distribution System | 1,500 | 1973 |
| Rowland Non-Potable Water System | 340 | 1985 |
| Walnut Valley Recycled Water System | 1,100 | 1986 |
| Walnut Valley Recycled Water System Expansion Project | 500 | 1993 |

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| City of Torrance | | |
| Torrance Recycled Water Purchases | 7,800 | 1995 |
| Upper San Gabriel Valley Municipal Water District | | |
| City of Industry Recycled Water Distribution System | 8,500 | 1983 |
| County Sanitation Districts of Los Angeles County Deliveries | 4,475 | 1978 |
| Direct Reuse Project - Phase I | 1,600 | 2003 |
| Direct Reuse Project - Phase IIA Rosemead Extension | 720 | 2011 |
| Direct Reuse Project - Phase IIA Whittier Narrows Project | 2,258 | 2006 |
| Direct Reuse Project - Phase IIB Industry (Packages 1 - 4) | 1,963 | 2011 |
| Rose Hills Expansion | 530 | 2015 |
| South El Monte Recycled Water Expansion Project (Packages 1 - 5) | 72 | 2019 |
| West Basin Municipal Water District | | |
| West Basin Water Recycling Program Phase I - IV | 29,460 | 1995 |
| West Basin Water Recycling Program Phase V | 8,000 | 2013 |
| Western Municipal Water District of Riverside County | | |
| Corona Reclaimed Water Distribution System | 4,750 | 2007 |
| Elsinore Valley Horsethief Canyon Recycled Water System | 400 | 1985 |
| Elsinore Valley Railroad Canyon Recycled Water System | 1,000 | 1984 |
| Elsinore Valley Wildomar Recycled Water Project | 300 | 2014 |
| Jackson Street Recycled Water Pipeline Project - Phase 1 | 820 | 2018 |
| Rancho California Reclamation Expansion Project - Rancho Division | 750 | 1993 |
| Rancho California Reclamation Project - Santa Rosa Division | 225 | 1989 |
| Riverside Recycled Water Program Phase | 260 | 1997 |
| Western Water Recycling Facility | 900 | 1940 |
| Western Water Recycling Facility Upgrade Project | 1,300 | 2014 |

| Under Construction Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Central Basin Municipal Water District | | |
| CBMWD Recycled Water System Expansion Phase 1 (Gateway Cities) | 500 | 2022 |
| City of Los Angeles | | |
| Los Angeles Groundwater Replenishment Project Initial Phase | 7,000 | 2024 |
| Los Angeles Groundwater Replenishment Project Second Phase | 4,000 | 2026 |
| North Hollywood Area Water Recycling Project | 300 | 2025 |
| Pershing Drive Recycled Water Pipeline Project | 750 | 2022 |
| Sepulveda Basin Sports Complex Water Recycling Project Phases I & II | 350 | 2021 |
| Terminal Island Recycled Water Expansion Project | 8,000 | 2025 |
| Westside Area Water Recycling Project | 150 | 2021 |

| Under Construction Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Municipal Water District of Orange County | | |
| GWRS Final Expansion | 29,150 | 2023 |
| Santa Margarita Water District Trampas Canyon RW Reservoir | 5,000 | 2020 |
| San Diego County Water Authority | | |
| East County Advanced Water Purification Program | 12,882 | 2025 |
| Escondido Membrane Filtration Reverse Osmosis Facility (Hale Avenue Resources Recovery Facility (HARRF)/City of Escondido) | 3,280 | 2025 |
| Oceanside Pure Water and Recycled Water Expansion Phase I Project | 6,000 | 2025 |
| Oceanside Pure Water and Recycled Water Expansion Phase I Project Additional Verifiable Yield | 720 | 2025 |
| San Diego Pure Water North City Phase I | 33,600 | 2025 |
| City of Santa Monica | | |
| Advanced Water Treatment | 1,100 | 2021 |
| Santa Monica Urban Runoff Recycling Facility Upgrades | 350 | 2021 |
| Upper San Gabriel Valley Municipal Water District | | |
| La Puente Valley County Water District Recycled Water Project | 60 | 2024 |

| CEQA Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| City of Anaheim | | |
| Anaheim South Recycled Water Project | 850 | 2027 |
| Central Basin Municipal Water District | | |
| West San Gabriel Recycled Water Expansion Project (Montebello Hills) | 240 | 2020 |

| Conceptual Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Calleguas Municipal Water District | | |
| Camarillo Water Reclamation Plant Effluent Transfer Pipeline | 1,120 | 2025 |
| City of Camarillo Recycled Distribution System Expansion | 2,583 | 2025 |
| Oxnard Advanced Water Purification Facility Project - Phase II | 5,000 | 2025 |
| Oxnard Aquifer Storage and Recovery Completion | Not Provided | 2024 |
| Oxnard Aquifer Storage and Recovery Wells #2 and #3 | Not Provided | 2024 |
| VCWWD No. 1 WWTP Recycled Water Distribution System Expansion Phase I | 500 | 2025 |
| Central Basin Municipal Water District | | |
| City of Monterey Park Recycled Water Expansion Project | 750 | Not Provided |
| East Los Angeles Recycled Water Expansion Project | 500 | Not Provided |
| La Mirada Recycled Water Expansion Project | 900 | Not Provided |

| Conceptual Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| City of Compton | | |
| Recycled Water Feasibility Study | 262 | 2025 |
| Eastern Municipal Water District | | |
| Purified Water Replenishment, Phase I | 4,000 | 2023 |
| Purified Water Replenishment, Phase II | 8,000 | 2035 |
| Rancho Indirect Potable Reuse Project | 4,000 | 2025 |
| Foothill Municipal Water District | | |
| Descanso Gardens MBR Plant | Not Provided | Not Provided |
| City of Glendale | | |
| Public Works Yard Recycled Water Main Extension Project | 80 | Not Provided |
| Inland Empire Utilities Agency | | |
| IEUA Regional Recycled Water Distribution System Expansion Ph I & II | 33,000 | Not Provided |
| Las Virgenes Municipal Water District | | |
| Pure Water Project | 3,100 | 2030 |
| City of Los Angeles | | |
| Airport Police Facility Water Recycling Project | 39 | 2024 |
| Extension to ConRAC Water Recycling Project | 10 | 2024 |
| Forest Lawn Tank | 450 | 2024 |
| Harbor Connection to Joint Pollution Control Plant | 3,500 | 2023 |
| Harbor Extension On Gaffey | 4,500 | 2023 |
| Harbor Extension on Port of LA Right-of-Way | 1,000 | 2022 |
| Second Dominguez Gap Connection and Harbor Potable Backup | 6,661 | 2021 |
| Terminal Island Recycled Water Expansion Project | 1,000 | 2021 |
| Municipal Water District of Orange County | | |
| Moulton Niguel Reclamation Project - Phase V | 2,000 | 2025 |
| Santa Margarita Chiquita Water Reclamation Expansion Project | 3,000 | Not Provided |
| Santa Margarita Recycled Water Conversion Projects | 2,420 | Not Provided |
| City of Pasadena | | |
| Pasadena Non-Potable Water Project - Ph I | 700 | Not Provided |
| Pasadena Non-Potable Water Project - Ph II: Southern Extension I | 400 | 2023 |
| Pasadena Non-Potable Water Project - Ph III: Southern Extension II | 900 | 2027 |
| Pasadena Non-Potable Water Project - Ph IV: Annandale Extension | 280 | 2030 |
| Pasadena Non-Potable Water Project - Ph V: Northwestern Extension | 390 | 2033 |
| Pasadena Non-Potable Water Project - Ph VI: Northeastern Extension | 390 | 2036 |
| San Diego County Water Authority | | |
| Additional Planned - Carlsbad WRF/ Carlsbad MWD | 495 | 2025 |
| Connection #1 - North City Water Reclamation Plant/City of San Diego (Extension 153) | 489 | 2030 |
| East County Advanced Water Purification Program Expansion | 2,803 | 2045 |
| Escondido Potable Reuse Project | 5,000 | 2035 |

| Conceptual Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Hale Avenue Resources Recovery Facility (HARRF)/City of Escondido Additional Planned Expansions | 6,800 | 2025 |
| Indirect Potable Recharge | 900 | 2020 |
| Joint RW Transmission Project with SFID and OMWD/TBD (Bridges) | 400 | 2030 |
| Lilac Hills Ranch WRF/VCMWD | 294 | 2035 |
| Los Flores and Santa Margarita Basin Injection Project | 1,320 | 2020 |
| Lower Moosa Canyon Water Reclamation Facility Treatment Process Upgrade and Reclamation System | 700 | 2020 |
| Meadowlark Water Reclamation Facility Direct Potable Reuse | 2,200 | 2030 |
| Meadowood Water Reclamation Facility | 143 | 2025 |
| North County One Water Program - Carlsbad MWD | 3,500 | 2035 |
| North County One Water Program - Olivenhain MWD | 2,500 | 2035 |
| North County One Water Program - Poway | 2,000 | 2035 |
| North County One Water Program - San Dieguito WD | 2,000 | 2035 |
| North County One Water Program - Santa Fe ID | 3,000 | 2035 |
| North County One Water Program - Vallecitos WD | 5,500 | 2030 |
| North District Recycled Water Project Phase I | 4,400 | 2030 |
| North Village Water Reclamation Facility | 105 | 2040 |
| Olivenhain - SEJPA 1 (Gardenview Rd) | 44 | 2030 |
| Olivenhain SEJPA 3 (Manchester Avenue Phases I and II) | 40 | 2025 |
| Rancho Cielo Project | 100 | 2030 |
| Ray Stoyer Expansion | 317 | 2025 |
| San Diego Pure Water Phases II | 59,360 | 2035 |
| Welk Water Reclamation Facility | 140 | 2025 |
| Woods Valley Ranch Water Reclamation Facility Phase II | 184 | 2020 |
| Woods Valley Ranch Water Reclamation Facility Phase III | 168 | 2030 |
| City of Santa Monica | | |
| Santa Monica Connection | 100 | Not Provided |
| Three Valleys Municipal Water District | | |
| Los Angeles County Fairplex Recharge | 1,000 | 2020 |
| Pomona Recycled Water Distribution System Expansion | 1,000 | 2020 |
| Recharge in Chino Basin | 2,405 | 2025 |
| Western Municipal Water District of Riverside County | | |
| Corona Reclaimed Water Distribution System Expansion | 1,760 | 2020 |
| Demineralization of Recycled Water | 550 | 2026 |
| Elsinore Valley Horsethief Canyon Recycled Water System Expansion | 500 | 2022 |
| Indirect Potable Reuse Project | 5,700 | 2035 |
| Jackson Street Recycled Water Pipeline Project - Phase 2 | 2,550 | Not Provided |
| Riverside Habitat, Parks & Water Project (RHPWP) | 10,000 | 2025 |

## Table A.5-2
## Groundwater Recovery Projects

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| City of Beverly Hills | | |
| Beverly Hills Desalter Project | 2,600 | 2003 |
| Maple Wells (Shallow Wells) | 350 | 2020 |
| City of Burbank | | |
| Burbank Operable Unit/Lockheed Valley Plant | 11,000 | 1996 |
| Calleguas Municipal Water District | | |
| Round Mountain Water Treatment Plant | 1,000 | 2014 |
| Tapo Canyon Groundwater Treatment Plant | 1,000 | 2010 |
| Central Basin Municipal Water District | | |
| Juan Well Filter Facility | 900 | 2001 |
| Water Quality Protection Plan | 5,807 | 2007 |
| Eastern Municipal Water District | | |
| Menifee Basin Desalter Project | 3,360 | 2002 |
| Perris I Desalter | 4,500 | 2006 |
| Foothill Municipal Water District | | |
| Glenwood Nitrate Water Reclamation Project | 1,600 | 1993 |
| Olive Avenue IX GAC Groundwater Treatment Plant | 2,000 | 2004 |
| City of Glendale | | |
| Glendale Operable Unit | 7,700 | 2001 |
| Verdugo Park Water Treatment Plant | 1,000 | 1997 |
| Inland Empire Utilities Agency | | |
| Chino Basin Desalination Program Phase I | 9,600 | 2000 |
| Chino Basin Desalination Program Phase II & III | 12,800 | 2006 |
| Las Virgenes Municipal Water District | | |
| Westlake Wells-Tapia WRF Intertie Project | 150 | 2000 |
| Municipal Water District of Orange County | | |
| Capistrano Beach Desalter Project | 1,300 | 2007 |
| Deep Aquifer Treatment System | 8,000 | 2002 |
| El Toro Groundwater Remediation Project | 4,000 | 2007 |
| Garden Grove Nitrate Blending Project | 4,000 | 1990 |
| Irvine Desalter Project | 6,700 | 2007 |
| IRWD Wells 21 & 22 Desalter | 6,400 | 2013 |
| Mesa Water Reliability Facility | 8,941 | 2001 |
| San Juan Basin Desalter Project Phase I | 4,800 | 2004 |
| Tustin 17th Street Desalter | 3,200 | 1996 |
| Tustin Main St Treatment Plant | 2,000 | 1989 |
| San Diego County Water Authority | | |
| Mission Basin Desalter Facility Phases I & II | 2,800 | 1994 |

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Richard A. Reynolds Groundwater Desalination Facility | 3,600 | 2000 |
| Richard A. Reynolds Groundwater Desalination Facility Expansion | 2,600 | 2017 |
| Three Valleys Municipal Water District | | |
| Cal Poly Pomona Water Treatment Plant | 250 | 2016 |
| Harrison Groundwater Treatment Facility | 981 | 2008 |
| Towne Groundwater Treatment Plant & Well 3 Treatment Facility | 4,678 | 1997 |
| City of Torrance | | |
| Robert W. Goldsworthy Desalter | 2,400 | 2002 |
| Robert W. Goldsworthy Desalter Expansion | 2,600 | 2019 |
| West Basin Municipal Water District | | |
| C. Marvin Brewer Desalter | 1,524 | 1993 |
| Western Municipal Water District of Riverside County | | |
| Arlington Basin Groundwater Desalter Project | 6,100 | 1990 |
| Chino Basin Desalination Program Phases II & III | 12,800 | 2006 |
| Existing Groundwater Threshold | 9,500 | 2001 |
| Temescal Basin Desalting Facility Project | 10,000 | 2001 |

| Under Construction Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Calleguas Municipal Water District | | |
| North Pleasant Valley Regional Desalter | 3,800 | 2020 |
| Eastern Municipal Water District | | |
| Perris II Desalter | 5,400 | 2021 |
| San Diego County Water Authority | | |
| Fallbrook Groundwater Desalter Project | 3,100 | 2025 |

| CEQA Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Calleguas Municipal Water District | | |
| Los Robles Golf Course Groundwater Utilization Project | 930 | Not Provided |

| Conceptual Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| City of Beverly Hills | | |
| La Brea Subbasin Groundwater Development | 1,700 | 2023 |
| City of Burbank | | |
| Deliveries from North Hollywood Operable Unit's offline wells | Not Provided | 2022 |

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Calleguas Municipal Water District | | |
| Moorpark Desalter Project | 5,000 | 2030 |
| Santa Rosa Basin Desalter | 1,000 | 2025 |
| Simi Groundwater Basin Reverse Osmosis Desalter | 830 | 2025 |
| Simi Valley Desalter Project | 5,500 | 2025 |
| Eastern Municipal Water District | | |
| Perris North Basin Groundwater Contamination Prevention and Remediation Program | 6,750 | 2023 |
| City of Los Angeles | | |
| West Coast Basin Brackish Water Reclamation | 8,000 | 2024 |
| San Diego County Water Authority | | |
| Middle Sweetwater River Basin Groundwater Well System | 1,000 | 2035 |
| Otay Mesa Lot 7 Groundwater Well System | 400 | 2035 |
| Rancho del Rey Brackish Groundwater Development | 500 | 2035 |
| San Dieguito River Basin Groundwater Recovery and Treatment Project | 1,120 | 2025 |
| San Marcos Groundwater Basin Supply Options | 2,000 | 2030 |

## Table A.5-3
## Seawater Desalination Projects

| Existing Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| San Diego County Water Authority | | |
| Claude "Bud" Lewis Carlsbad Desalination Plant - Carlsbad MWD | 2,500 | 2015 |
| Claude "Bud" Lewis Carlsbad Desalination Plant - SDCWA | 50,000 | 2015 |
| Claude "Bud" Lewis Carlsbad Desalination Plant - Vallecitos WD | 3,500 | 2015 |

| CEQA Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| Municipal Water District of Orange County | | |
| Doheny Ocean Desalination Project | 16,800 | 2025 |
| Huntington Beach Seawater Desalination Project | 56,000 | 2027 |
| West Basin Municipal Water District | | |
| West Basin Seawater Desalination Project | 21,500 | 2030 |

| Conceptual Projects | Ultimate Yield/Capacity (Acre-Feet) | Online Date |
|---|---|---|
| San Diego County Water Authority | | |
| Otay Mesa Conveyance and Disinfection System Project (Purchase) | 6,700 | 2030 |

# Appendix 6

# CONSERVATION ESTIMATES AND WATER SAVINGS FROM CODES, STANDARDS, AND ORDINANCES

# Appendix 6
# CONSERVATION ESTIMATES AND WATER SAVINGS FROM CODES, STANDARDS, AND ORDINANCES

## Background

Unlike traditional water supplies, which can be directly measured, conservation reduces water demand in ways that may only be indirectly quantified. Demand is reduced through changes in consumer behavior and savings from water-efficient fixtures. There are numerous approaches for estimating and projecting conservation savings, and many of them are utility-specific to meet the unique needs of different water agencies. Metropolitan estimates savings from the extensive existing conservation programs that it funds directly, as well as savings produced by plumbing codes. Metropolitan also incorporates the savings due to the impacts of price on consumers in its demand forecasts. These conservation savings estimates are incorporated into Metropolitan's long-term planning documents such as the Integrated Water Resources Plan (IRP) and its Urban Water Management Plan (UWMP).

Conservation savings are commonly estimated from a base-year water-use profile. Beginning with the 1996 IRP, Metropolitan identified 1980 as the base year for estimating conservation because it marked the effective date of a new plumbing code in California. Among other changes, the new code required toilets in new construction to be rated at 3.5 gallons per flush or less. Between 1980 and 1990, Metropolitan's service area saved an estimated 250 TAF per year as the result of this 1980 plumbing code and unrelated water rate increases. Within Metropolitan's planning framework, these savings are referred to as "pre-1990 savings." Metropolitan's conservation accounting combines pre-1990 savings and estimates of more recently achieved savings from the following sources of conservation:

- Active Conservation – Water saved directly as a result of conservation programs by water agencies. Active conservation is unlikely to occur without agency action.
- Code-Based Conservation – Water saved as a result of changes in water efficiency requirements for plumbing fixtures in plumbing codes. Sometimes referred to as "passive conservation," this form of conservation would occur as a matter of course without any additional action from water agencies.
- Price-Effect Conservation – Water saved by retail customers attributable to the effect of changes in the real (inflation-adjusted) price of water. Because water has a positive price elasticity of demand, increases in water price will decrease the quantity of water demanded.

## Metropolitan's Conservation Estimate

In September 19, 2014, Governor Brown signed SB 1420 (Wolk, D-Davis), which added Section 10631(e)(4) to the Water Code. This Section provided that "water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans" if that information is available and applicable to an urban water supplier. SB 606 (Hertzberg) amended Water Code Section 10631(e)(4), which is now Section 10631(d)(4) and applies only to retailers. This Section now requires that water use

projections, where available, must "display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area."

Metropolitan's conservation estimate is a comprehensive representation of Metropolitan's active conservation activities. It includes a combination of: (1) fixture/program-related savings, and (2) an estimate of code-based plumbing code conservation savings from a 1990 base year. In addition, price-effect savings are calculated using Metropolitan's MWD-EDM, a statistical model used to forecast retail water demands. Potential savings from public outreach and education programs are not included in Metropolitan's conservation estimate.

Distinguishing between active, code-based, and price-effect conservation can be complex when, for example, active programs for fixtures are implemented concurrently with conservation-related plumbing codes. Metropolitan's conservation estimate combines active, code-based, and price-effect conservation savings using methods that avoid double counting. Currently, 96 devices and programs are accounted for in estimating active conservation. These devices are spread across residential, landscape, commercial, industrial, and institutional sectors. There are eight fixtures tied to Code-based conservation estimate.

Metropolitan's conservation estimate is developed in cooperation with its 26 member agencies and falls into three general categories:

- Single-family residential (SFR),
- Multi-family residential (MFR), and
- Commercial, industrial, and institutional (CII).

### *Active Conservation*

Estimated savings for active conservation account for programs administered by Metropolitan and its member agencies since 1990. These savings are calculated by combining counts of active program activity – numbers of devices and/or program implementations – with device-related water savings factors. These factors include:

- Savings per device/implementation
- Device life expressed in years
- Decay rate expressed as percent decay per year

Device savings estimates reflect the key assumptions outlined above. Devices may be represented more than once due to different implementation methods or savings factors. Assumptions are periodically reviewed to ensure they represent the best available savings estimates. Device-specific savings are adjusted to account for performance decay rates, or device life, but not both. For example, a residential premium high-efficiency toilet (PHET) saves about 9.4 gallons per day when replacing a 1.6 gallons per flush toilet. Lifetime savings would assume a physical life of 20 years and no performance decay.

### *Code-Based Conservation*

Code-Based conservation accounts for water saved as a result of changes in water efficiency requirements for plumbing fixtures in plumbing codes. Plumbing code conservation is the impact of plumbing codes and other ordinances on water demand. Metropolitan's Code-Based conservation estimate represents plumbing code conservation with demographically-driven stock models. The stock models are device- or fixture- specific and are based on the same demographic data used in Metropolitan's retail demand projection. Each stock model considers

the stocks and flows of conserving and non-conserving water devices, providing estimates of the impacts of plumbing codes on device saturation and overall savings.

Metropolitan's Code-based conservation estimate accounts for the following:

- New Construction: Water fixtures installed due to new construction are assumed to be in compliance with the plumbing codes in effect when the new construction occurs. For instance, a house built in 1997 would meet the efficiency standards set by California's 1992 plumbing code. Therefore, new construction is assumed to result in measurable savings from 1990, which is the baseline for conservation savings calculations. Estimates and projections of the number of fixtures added through new housing units and offices are based on growth in housing units or employment.
- Natural Replacement: Natural replacement accounts for the savings that accrue when fixtures are replaced with more efficient models due to remodeling, failure, or for other reasons. Metropolitan's savings estimate represents this effect with a "natural replacement rate" that is expressed as a percentage of existing fixtures that are replaced in a given year. Natural replacement rates vary by device and are linked to the expected life of the device. Devices with short lifespans will be replaced more frequently and thus have higher natural replacement rates. A simple percentage is used to account for this natural turn-over in non-conserving fixtures because it is difficult to back-calculate the age of the fixtures in pre-1990 construction.
- Fixtures Up for Renewal: As water-conserving fixtures reach their useful lives and become defective or inefficient, they may be replaced with water conserving fixtures due to plumbing codes. The water savings from the device is then considered "renewed" savings, which is tracked in Metropolitan's savings estimate. For example, a fixture that was installed through an active conservation program provides water savings that otherwise would not have been realized without plumbing codes. However, subsequent adoption of efficient plumbing codes means that when the fixture reaches the end of its life, it will be replaced by the same or more water-efficient model.

### *Stock Models*

The number of efficient fixtures for each stock model is the sum of fixtures from active programs, new construction, natural replacement, and fixtures up for renewal. Table A.6-1 below shows the fixtures and devices that are assigned stock models based on existing plumbing codes.

**Table A.6-1**
**Stock Models**

| Residential | CII |
|---|---|
| Toilets | Toilets |
| Showerheads | Urinals |
| Faucet Aerators | Pre-Rinse Spray Heads |
| Washing Machines | Washing Machines |

The Stock Models generate separate annual estimates of devices and fixtures for tracking active conservation savings, while also accounting for the impacts of active programs on the overall device saturation rate. As a result, increased levels of active conservation lead to lower levels of

plumbing code conservation. This helps avoid double counting in Metropolitan's conservation savings estimate.

### *Plumbing Code Assumptions*

Plumbing code savings are determined by the device-specific assumptions used in the stock models, presented in Table A.6-2. The stock models are driven by projections of housing and employment consistent with the demand projections. Initial device counts and growth in the number of devices are determined by the combination of demographic information and the following assumptions:

- Devices per Household or Per Employee: This factor represents the average number of devices per household or per employee and is multiplied by the demographic projections to develop estimates of total number of devices or "stock." Devices per household and employee can vary by agency and change over time.
- Plumbing Code Compliance Rate: The plumbing code compliance rate is expressed as a percent and serves two purposes: (1) it indicates the presence of a plumbing code in a specific year, and (2) it determines the overall compliance rate with the plumbing code. This allows plumbing code effects to be phased in over several years.
- Natural Replacement Rate: This represents the rate at which existing non-conserving devices are converted to conserving devices due to remodeling or device failure. It has a strong impact on the saturation rate of devices that existed prior to plumbing codes, such as pre-1992 toilets.
- Device Life: The stock models also account for device life for water-efficient devices installed after 1990. This allows the stock model to track devices installed through active conservation as they reach the end of their life and are replaced due to plumbing codes. The stock models use the same device life specified in the savings assumptions.

**Table A.6-2**
**Plumbing Code Assumptions**

| Stock Model | Device per Household/ Employee | Compliance Rate | Natural Replacement Rate | Plumbing Code Year |
|---|---|---|---|---|
| Res. Toilets | 2 | 99% | 2% | 1994/2014 |
| Res. Shower Heads | 1.8 | 95% | 10% | 1994 |
| Res. Aerators | 3.5 | 90% | 33% | 1994 |
| Res. Washing Machine | 0.74 | 100% | 6.7% | 2018 |
| CII Toilets | 0.27* | 100% | 2% | 1994/2014 |
| CII Urinals | 0.06 | 100% | 4% | 1994 |
| CII Pre-Rinse Spray Heads | 0.0055* | 95% | 16.7% | 2006 |
| CII Washing Machine | 0.0073* | 100% | 5% | 2007 |

* Varies over time and by agency (based on CUWCC BMPs savings factors)

These assumptions are derived from California Urban Water Conservation Council (CUWCC) conservation reports, American Water Works Association Research Foundation's 1999 end use study, Metropolitan's Orange County Saturation Study, and other sources. In the residential sector, devices per household combine single family and multifamily trends.

### *Model Water Efficient Landscape Ordinance*

The California Water Commission adopted an updated Model Water Efficient Landscape Ordinance (MWELO) on July 15, 2015. The MWELO promotes efficient landscapes in new developments and retrofitted landscapes. The MWELO increases water efficiency standards for new and retrofitted landscapes through more efficient irrigation systems, greywater usage, onsite storm water capture, and by limiting the portion of landscapes that can be covered in turf. Local agencies had until December 1, 2015 to adopt the MWELO or to adopt a Local Ordinance which must be at least as effective in conserving water as MWELO. Local agencies working together to develop a Regional Ordinance had until February 1, 2016 to adopt, but they are still subject to the December 2015 reporting requirements. Local agencies were required to report on the implementation and enforcement of local ordinances by December 31, 2015.

Metropolitan's modeling of Code-based conservation includes a calculation of savings that would result from 50 percent of new households having efficient outdoor water use consistent with MWELO. The 50 percent compliance rate for new households is a conservative estimate based on an assessment of the efficacy of the current MWELO ordinance.

### *Price Savings Assumptions*

Price-effect savings are calculated by comparing MWD-EDM demand projections with price increases to demand projections with constant 1990 water rates. The difference is the price-effect savings measured from a 1990 base. Price-effect savings increase as prices rise over time; they also increase as the household and employment base grow. A price increase applied to 1,000 households will generate more water savings than the same price increase applied to 500 households.

### *Un-metered Water Use Savings*

A final category of savings tracked by Metropolitan is a product of other conservation efforts. MWD-EDM projects un-metered water use as a fixed percentage of total retail M&I demand. As conservation savings lowers residential and CII demands, it lowers un-metered use by the same percent. For instance, if conservation reduces M&I demands by 10 percent in 2020 (compared to demands before conservation), un-metered water use is also reduced 10 percent. This reduction is based on the assumption that un-metered use varies according to overall demand and that reducing overall use also reduces un-metered use. The reduction in un-metered water use is captured in the MWD-EDM model and included as a conservation source.

The total conservation savings are shown in Table A.6-3.

## Table A. 6-3 Conservation Savings (acre-feet)

| | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Active Savings | 0 | 26,000 | 59,000 | 94,000 | 133,000 | 152,000 | 144,000 | 93,000 | 55,000 | 35,000 | 25,000 | 17,000 | 0 |
| Code-Based Savings | 0 | 83,000 | 177,000 | 244,000 | 291,000 | 370,000 | 472,000 | 560,000 | 623,000 | 665,000 | 701,000 | 731,000 | 757,000 |
| Price Savings | 0 | 31,000 | 62,000 | 94,000 | 125,000 | 156,000 | 187,000 | 205,000 | 229,000 | 258,000 | 293,000 | 333,000 | 379,000 |
| Un-metered Water Savings | 0 | 9,000 | 18,000 | 26,000 | 35,000 | 44,000 | 52,000 | 53,000 | 54,000 | 55,000 | 56,000 | 57,000 | 58,000 |
| Pre-1990 Savings | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 |
| **Total** | **250,000** | **399,000** | **566,000** | **708,000** | **834,000** | **972,000** | **1,105,000** | **1,161,000** | **1,211,000** | **1,263,000** | **1,325,000** | **1,388,000** | **1,444,000** |

Note: Metropolitan's conservation savings projection includes savings from Metropolitan's Conservation Credits Program, code-based conservation, price effect conservation, and pre-1990 device retrofits. The projection does not include savings from the implementation of future active conservation programs.

# Appendix 7

# DISTRIBUTION SYSTEM WATER LOSSES

# Appendix 7
# DISTRIBUTION SYSTEM WATER LOSSES

California Water Code Section 10631(d)(3) requires urban retail suppliers to quantify distribution system water loss for each of the five years preceding the plan update, based on water system balance methodology developed by the American Water Works Association (AWWA). For the 2020 UWMP, Metropolitan is voluntarily reporting its distribution system water loss. Metropolitan followed the AWWA Water Audit methodology to track all sources of treated water and uses of treated water within its system. The AWWA Water Audit methodology quantifies real and apparent water system losses in an agency's distribution system.

For its voluntary reporting of distribution system water losses, Metropolitan included its water balance audit for calendar years 2015 through 2019. The results of Metropolitan's audit showed that the average water losses for its treated distribution system over the last five years from 2015 to 2019 is approximately 7.8 TAF. The water loss estimates are presented in Tables A.7-1 through A.7-5.

In addition to the distribution system losses described in the AWWA tables, Metropolitan estimates that 41.6 TAF was lost from reservoir evaporation occurring in Lake Mathews, Lake Skinner, and Diamond Valley Lake during calendar year 2019.

**Table A.7-1**
**Metropolitan's Distribution System Water Loss (AF)**
**Calendar Year 2015**

**AWWA Free Water Audit Software: Water Balance**

WAS v5.0

American Water Works Association.
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| | |
|---|---|
| Water Audit Report for: | Metropolitan Water District of Southern California |
| Reporting Year: | 2015 — 1/2015 - 12/2015 |
| Data Validity Score: | 95 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Own Sources (Adjusted for known errors) 791,352.381 | System Input 791,352.381 | Water Exported 0.000 | | | Billed Water Exported | Revenue Water 0.000 |
| | | Water Supplied 791,352.381 | Authorized Consumption 781,504.700 | Billed Authorized Consumption 780,724.000 | Billed Metered Consumption (water exported is removed) 780,724.000 | Revenue Water 780,724.000 |
| | | | | | Billed Unmetered Consumption 0.000 | |
| | | | | Unbilled Authorized Consumption 780.700 | Unbilled Metered Consumption 0.000 | Non-Revenue Water (NRW) 10,628.381 |
| | | | | | Unbilled Unmetered Consumption 780.700 | |
| | | | Water Losses 9,847.681 | Apparent Losses 2,001.800 | Unauthorized Consumption 0.000 | |
| | | | | | Customer Metering Inaccuracies 1,951.800 | |
| | | | | | Systematic Data Handling Errors 50.000 | |
| Water Imported 0.000 | | | | Real Losses 7,845.881 | Leakage on Transmission and/or Distribution Mains Not broken down | |
| | | | | | Leakage and Overflows at Utility's Storage Tanks Not broken down | |
| | | | | | Leakage on Service Connections Not broken down | |

**Table A.7-2**
**Metropolitan's Distribution System Water Loss (AF)**
**Calendar Year 2016**

## AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.
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| | |
|---|---|
| Water Audit Report for: | Metropolitan Water District of Southern California |
| Reporting Year: | 2016 — 1/2016 - 12/2016 |
| Data Validity Score: | 95 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Own Sources (Adjusted for known errors) 754,436.090 | System Input 754,436.090 | Water Exported 0.000 | | | Billed Water Exported | Revenue Water 0.000 |
| | | Water Supplied 754,436.090 | Authorized Consumption 746,636.500 | Billed Authorized Consumption 745,890.600 | Billed Metered Consumption (water exported is removed) 745,890.600 | Revenue Water 745,890.600 |
| | | | | | Billed Unmetered Consumption 0.000 | |
| | | | | Unbilled Authorized Consumption 745.900 | Unbilled Metered Consumption 0.000 | Non-Revenue Water (NRW) 8,545.490 |
| | | | | | Unbilled Unmetered Consumption 745.900 | |
| | | | Water Losses 7,799.590 | Apparent Losses 1,914.700 | Unauthorized Consumption 0.000 | |
| | | | | | Customer Metering Inaccuracies 1,864.700 | |
| | | | | | Systematic Data Handling Errors 50.000 | |
| Water Imported 0.000 | | | | Real Losses 5,884.890 | Leakage on Transmission and/or Distribution Mains Not broken down | |
| | | | | | Leakage and Overflows at Utility's Storage Tanks Not broken down | |
| | | | | | Leakage on Service Connections Not broken down | |

**Table A.7-3**
**Metropolitan's Distribution System Water Loss (AF)**
**Calendar Year 2017**

## AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.
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| | |
|---|---|
| Water Audit Report for: | Metropolitan Water District of Southern California |
| Reporting Year: | 2017 — 1/2017 - 12/2017 |
| Data Validity Score: | 95 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Own Sources (Adjusted for known errors) 850,417.043 | System Input 850,417.043 | Water Exported 0.000 | | | Billed Water Exported | Revenue Water 0.000 |
| | | Water Supplied 850,417.043 | Authorized Consumption 843,331.300 | Billed Authorized Consumption 842,488.800 | Billed Metered Consumption (water exported is removed) 842,488.800 | Revenue Water 842,488.800 |
| | | | | | Billed Unmetered Consumption 0.000 | |
| | | | | Unbilled Authorized Consumption 842.500 | Unbilled Metered Consumption 0.000 | Non-Revenue Water (NRW) 7,928.243 |
| | | | | | Unbilled Unmetered Consumption 842.500 | |
| | | | Water Losses 7,085.743 | Apparent Losses 2,156.200 | Unauthorized Consumption 0.000 | |
| | | | | | Customer Metering Inaccuracies 2,106.200 | |
| | | | | | Systematic Data Handling Errors 50.000 | |
| Water Imported 0.000 | | | | Real Losses 4,929.543 | Leakage on Transmission and/or Distribution Mains Not broken down | |
| | | | | | Leakage and Overflows at Utility's Storage Tanks Not broken down | |
| | | | | | Leakage on Service Connections Not broken down | |

**Table A.7-4**
**Metropolitan's Distribution System Water Loss (AF)**
**Calendar Year 2018**

## AWWA Free Water Audit Software: Water Balance

WAS v5.0

American Water Works Association.
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| | |
|---|---|
| Water Audit Report for: | Metropolitan Water District of Southern California |
| Reporting Year: | 2018 — 1/2018 - 12/2018 |
| Data Validity Score: | 95 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | Water Exported 0.000 | Billed Water Exported | | | Revenue Water 0.000 |
| Own Sources (Adjusted for known errors) 770,999.499 | System Input 770,999.499 | Water Supplied 770,999.499 | Authorized Consumption 766,774.500 | Billed Authorized Consumption 766,008.500 | Billed Metered Consumption (water exported is removed) 766,008.500 | Revenue Water 766,008.500 |
| | | | | | Billed Unmetered Consumption 0.000 | |
| | | | | Unbilled Authorized Consumption 766.000 | Unbilled Metered Consumption 0.000 | Non-Revenue Water (NRW) 4,990.999 |
| | | | | | Unbilled Unmetered Consumption 766.000 | |
| | | | Water Losses 4,224.999 | Apparent Losses 1,965.000 | Unauthorized Consumption 0.000 | |
| | | | | | Customer Metering Inaccuracies 1,915.000 | |
| | | | | | Systematic Data Handling Errors 50.000 | |
| Water Imported 0.000 | | | | Real Losses 2,259.999 | Leakage on Transmission and/or Distribution Mains Not broken down | |
| | | | | | Leakage and Overflows at Utility's Storage Tanks Not broken down | |
| | | | | | Leakage on Service Connections Not broken down | |

**Table A.7-5**
**Metropolitan's Distribution System Water Loss (AF)**
**Calendar Year 2019**

**AWWA Free Water Audit Software: Water Balance**

WAS v5.0

American Water Works Association.
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| | |
|---|---|
| Water Audit Report for: | Metropolitan Water District of Southern California |
| Reporting Year: | 2019 — 1/2019 - 12/2019 |
| Data Validity Score: | 95 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Own Sources (Adjusted for known errors) 706,766.917 | System Input 706,766.917 | Water Exported 0.000 | | | Billed Water Exported | Revenue Water 0.000 |
| | | Water Supplied 706,766.917 | Authorized Consumption 700,559.700 | Billed Authorized Consumption 699,859.800 | Billed Metered Consumption (water exported is removed) 699,859.800 | Revenue Water 699,859.800 |
| | | | | | Billed Unmetered Consumption 0.000 | |
| | | | | Unbilled Authorized Consumption 699.900 | Unbilled Metered Consumption 0.000 | Non-Revenue Water (NRW) 6,907.117 |
| | | | | | Unbilled Unmetered Consumption 699.900 | |
| | | | Water Losses 6,207.217 | Apparent Losses 1,799.600 | Unauthorized Consumption 0.000 | |
| | | | | | Customer Metering Inaccuracies 1,749.600 | |
| | | | | | Systematic Data Handling Errors 50.000 | |
| Water Imported 0.000 | | | | Real Losses 4,407.617 | Leakage on Transmission and/or Distribution Mains Not broken down | |
| | | | | | Leakage and Overflows at Utility's Storage Tanks Not broken down | |
| | | | | | Leakage on Service Connections Not broken down | |

# Appendix 8

# METROPOLITAN's EMERGENCY STORAGE OBJECTIVE

# Appendix 8
# METROPOLITAN'S EMERGENCY STORAGE OBJECTIVE

Metropolitan established its original criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. Emergency storage requirements are based on the potential of a major earthquake that would damage all supply aqueducts isolating Southern California from its imported water sources. The emergency storage criteria developed within the Eastside Reservoir EIR were again discussed in the 1996 Integrated Water Resources Plan. Metropolitan's Board approved both of these documents.

In 2019, Metropolitan and its member agencies completed a process to update the emergency criteria and methodology for determining the regional planning estimate of emergency storage under Metropolitan's Emergency Storage Objective. This planning estimate of emergency storage represents the amount of water that Metropolitan would store for the region to prepare for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. These emergency supplies, stored in Metropolitan and DWR existing surface reservoirs within the region, will allow Metropolitan to deliver reserve supplies to the member agencies to supplement their local production during a catastrophic earthquake or other disaster. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

The Emergency Storage Objective considers a six- and twelve-month outage period for the imported supply aqueducts, based on latest seismic information and estimates of repair duration for the different aqueducts. It also accounts for the operational flexibility of Metropolitan's distribution system, a retail water demand cutback ranging from 25 to 35 percent considering the level of conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions.

Under this update, Metropolitan's Emergency Storage Objective was set to 750,000 acre-feet, as this level of storage would prevent severe water shortages to the region given new information on expected recovery durations. While the emergency storage would allow Metropolitan to deliver reserve supplies to the member agencies to meet their water needs during a catastrophic event, it is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency.

Included in this appendix is a copy of the Board Information Letter to Metropolitan's Water Planning and Stewardship Committee dated May 14, 2019. This Board Information Letter and the attached draft white paper review the history, policy, and criteria for evaluating a regional planning estimate for emergency storage and describe the more than year-long coordination process between Metropolitan and its member agencies in developing the region's estimate for Emergency Storage Objective.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

INFORMATION

- **Board of Directors**
  ***Water Planning and Stewardship Committee***

5/14/2019 Board Meeting

**9-3**

## Subject

Update of Metropolitan's Emergency Storage Objective

## Executive Summary

In February 2018, The Metropolitan Water District of Southern California (Metropolitan) and its member agencies embarked on a process to evaluate regional storage including how the storage programs performed during this post decade of drought and revisiting the size and management of Metropolitan's emergency storage reserve. This process aims to maximize the potential for optimizing performance and operations of Metropolitan's storage programs. As part of the process, a Workgroup comprised of Metropolitan staff and representatives from member agencies evaluated Metropolitan's emergency storage objective.

Metropolitan, in coordination with the Workgroup, completed the attached draft White Paper on emergency storage, which summarizes the progress to date in estimating a planning objective for the region's emergency storage.

## Details

The White Paper reviews the history, policy, and criteria for evaluating a regional planning estimate for emergency storage. This evaluation prepares for major earthquake or other damage to the aqueducts that import water to Southern California. The emergency storage would allow Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This would help avoid severe water shortages while one or more of the imported water aqueducts may be out of service.

The White Paper also describes the mechanisms the Workgroup employed, including: (1) updated emergency criteria, and (2) a revised methodology to evaluate emergency storage.

Updating emergency criteria involved revising the outage durations based on the latest seismic information, and revisiting retail water demands and locally available supplies within the service area. It also accounted for the member agencies' unique situations in identifying practicable ranges of reduction of retail water demands through conservation and production levels of local water supplies during an imported supply emergency outage.

The proposed emergency storage volume considers various combinations of criteria to determine an envelope of acceptable scenarios designed to prevent severe shortages during the outage. Under this approach, the Workgroup focused on a range of values from 520,000 to 830,000 acre-feet (AF). With input from the Workgroup, staff recommends increasing the emergency storage objective to 750,000 AF. This recommended volume would be distributed amongst the available capacities of in-region Department of Water Resources and Metropolitan surface reservoirs.

The recommended emergency storage volume of 750,000 AF is an increase from the current planning target of 630,000 AF. A longer outage period based on damage restoration analysis and a consideration of lower local supply production attributed to this recommended increase in emergency storage.

The emergency storage volume presented in the White Paper represents a planning estimate for the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It

is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency. Staff will review and incorporate additional Board and Workgroup feedback in finalizing the White Paper. Staff will transmit the final White Paper to the Board and the member agencies.

Staff proposes to revisit the emergency storage periodically, and incorporate the analysis into the Integrated Water Resources Plan update process. In addition, a detailed review of the spatial distribution of storage and operation of the distribution system will be part of Metropolitan's continued efforts to evaluate the storage portfolio. This next phase of evaluating Metropolitan's regional storage portfolio is expected to be completed by spring of 2020.

## Policy

By Minute Item 50358, dated January 12, 2016, the Board adopted the 2015 Integrated Water Resources Plan Update, as set forth in Agenda Item 8-3 board letter.

By Minute Item 50473, dated May 10, 2016, the Board adopted the 2015 Urban Water Management Plan, as set forth in Agenda Item 8-6 board letter.

## Fiscal Impact

None

Bradley M. Coffey 5/1/2019
*Brad Coffey* *Date*
*Manager, Water Resource Management*

5/1/2019
*Jeffrey Kightlinger* *Date*
*General Manager*

**Attachment 1 – Draft White Paper on Metropolitan's Emergency Storage Objective (May 2019)**

Ref# wrm12661707

# 2018 Evaluation of Regional Storage Portfolio
# DRAFT Evaluation of Metropolitan's Emergency Storage Objective

## SUMMARY

In February 2018, the Metropolitan Water District of Southern California (Metropolitan) and its member agencies embarked on a process for the Evaluation of Regional Storage Portfolio (ERSP) to maximize potential for performance and operations of Metropolitan's storage programs. As part of the ERSP process, a Workgroup comprised of Metropolitan staff and representatives from member agencies evaluated Metropolitan's Emergency Storage Objective (Emergency Storage).

This White Paper provides a summary of the history, policy, and criteria for evaluating a regional planning estimate for the Emergency Storage. This evaluation assumes major earthquake damage to the aqueducts that transport imported water supplies to Southern California. The Emergency Storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

This White Paper describes: (1) updating the emergency criteria, and (2) revising the methodology for calculating the Emergency Storage.

In the review and update of emergency criteria, the Workgroup considered the 2015 Integrated Water Resources Plan (IRP) and centered on the following:

- A retail water demand cutback of 25 to 35 percent appears reasonable, based on the level of conservation that the region achieved during the recent drought; and
- A six-and 12-month aggregated loss of 10 to 20 percent of local production reported in the IRP seems reasonable. This allows a contingency for some damage to local facilities and accommodates variable durations of local repairs.

The Workgroup discussion also led to a new concept of an "envelope of solutions" to estimate an appropriate Emergency Storage for the region. The envelope concept shifts from a single equation and volume for determining emergency storage. Instead, it considers various combinations of criteria to determine a range of acceptable scenarios for Emergency Storage. The prior methodology assumed a single region-wide scenario of conservation and local production loss. This envelope concept underscores member agencies' unique situations while taking into account their inputs in identifying practicable ranges of decreases in retail water demands and local production. The Workgroup focused on an acceptable range of Emergency Storage values from 520,000 to 830,000 acre-feet (AF).

Based on input from the process, staff recommends the following:

- The Emergency Storage Objective should increase from 630,000 AF to 750,000 AF. This level of storage would prevent severe water shortages to the region given new information on expected recovery durations.
- Metropolitan should revisit the Emergency Storage Objective periodically, possibly following the completion of any new IRP with the latest information on damage scenarios, local supplies, imported water demand, and attainable conservation.

## DETAILED REPORT

### Background

Metropolitan's need for Emergency Storage is based on the potential for major earthquake damage to the Colorado River Aqueduct, California Aqueduct, and Los Angeles Aqueduct. Metropolitan coordinates with the member agencies in setting the emergency criteria, which forms the basis for establishing the Emergency Storage. These criteria assume that damage from such a catastrophic event could render the aqueducts that transport imported water supplies to Southern California out of service, isolating the region from its imported water supplies. Metropolitan's objective is to provide regional emergency storage that could allow Metropolitan to deliver supplies to all its member agencies during this period of outage. The Emergency Storage allows Metropolitan to continue deliveries to its member agencies to supplement local water production and release from local storage. This helps avoid severe water shortages during periods when aqueducts are out of service. In addition to Emergency Storage, Metropolitan may draw from dry-year storage during an emergency, if necessary and available.

Metropolitan's emergency planning criteria were previously established and reported in the following documents:

1. Final Environmental Impact Report for the Eastside Reservoir (now named the Diamond Valley Lake) dated October 1991, which was adopted by the Board on September 24, 1991;
2. Southern California's 1996 Integrated Water Resources Plan, which was adopted by the Board on January 9, 1996;
3. Reports on Metropolitan Water Supplies dated February 2002 and March 2003;
4. 2006 IRP Implementation Report, which was presented to the Board on September 11, 2006 and transmitted on October 9, 2006;
5. Metropolitan's Emergency Storage Requirement, a written report presented to the Board on May 11, 2010; and
6. The 2015 Urban Water Management Plan dated June 2016, which was adopted by the Board on May 10, 2016.

**Metropolitan's Current Emergency Criteria**

Metropolitan's current emergency criteria provide for a six-month water supply at 75 percent of member agencies' retail demand under normal hydrologic conditions. Metropolitan's emergency plan outlines that under catastrophic loss of water supply the following actions will be implemented, which serve as the criteria for determining Metropolitan's Emergency Storage:

1. any existing interruptible water deliveries would be suspended;
2. firm supplies to member agencies would be restricted by a mandatory cutback of 25 percent from normal year retail demand levels;
3. water stored in the surface reservoirs and groundwater basins under Metropolitan's interruptible program would be made available;
4. full local groundwater production, recycled water, and local surface emergency storage reserve production would be sustained; and
5. Metropolitan would draw on its emergency storage as well as other available storage.

These emergency planning criteria were the basis for the current Metropolitan's Emergency Storage planning level of 630, 000 AF.

## Review and Update of Metropolitan's Emergency Criteria

The following sections detail the updated assumptions and changed conditions since the last evaluation of Emergency Storage in 2010. These include demand and supply forecasts developed for the 2015 IRP, updated studies on the potential for seismic damage and outage periods for the imported supply aqueducts, and flexibility improvements within Metropolitan's distribution system implemented as a result of recent drought and supply challenges. This new information is critical to the review and update of the emergency criteria, which forms the basis for revising the Emergency Storage.

### Outage Period Criteria

The outage period pertains to the amount of time the regional aqueducts that deliver imported water to Southern California may be out of service. This outage period is derived from the estimated restoration timelines based on the nature of potential damage to the aqueduct coupled with the operational ability to deliver supplies to the area served by that specific aqueduct. During an emergency outage period, Metropolitan's member agencies will depend on previously stored imported and local supplies to supplement continued local production in meeting reduced levels of retail demands. It is acknowledged that some areas could be more impacted because they are primarily or exclusively fed by an imported aqueduct which is assumed to sustain damage. However, Metropolitan's objective is to continue building and operating its system with flexibility to respond to various potential damage scenarios.

*Recent Seismic Studies*

In August 2015, Metropolitan, Los Angeles Department of Water and Power (LADWP), and California Department of Water Resources (DWR) formed the Seismic Resilience Water Supply Task Force (Task Force) for the purpose of collaborating on studies and mitigation measures to improve the reliability of imported water supplies to Southern California. The specific goals of the Task Force included:

- Revisiting historical assumptions regarding potential aqueduct outages;
- Establishing a common understanding about individual agency aqueduct vulnerability assessments, projected damage scenarios, and planning assumptions; and
- Discussing ideas for improving the resilience of Southern California's imported water supplies through multi-agency cooperation.

Through exchange of information and ideas between the three agencies and experts from the industry and academia, the Task Force assessed potential aqueduct damage and restoration timeline for a M 7.8 earthquake on the San Andreas Fault. This scenario assumes severe damage to the Colorado River Aqueduct (CRA), the California Aqueduct, and the Los Angeles Aqueduct (LAA). A complete description of probable seismic damages and repair durations is presented in Metropolitan's *"Seismic Resilience Water Supply Task Force Report No. 1536"* dated June 2017 (http://www.mwdh2o.com/PDF_About_Your_Water/Report1536_Final.pdf).

Table 1 presents a summary of the estimated outage duration under the earthquake scenario based on the nature of damage for each of the aqueducts.

**Table 1**
**Estimated Outage Duration for Imported Supply Aqueducts (M 7.8 earthquake)**

| Aqueduct | Estimated Outage Duration |
|---|---|
| Colorado River Aqueduct | 2 to 6 months (recovery of 80% CRA capacity)<br>3 to 5 years (recovery of 100% CRA capacity) |
| California Aqueduct: East Branch | 12 to 24 months |
| California Aqueduct: West Branch | 6 to 12 months |
| Los Angeles Aqueduct | 18 months |

*Operational Flexibility*

Metropolitan's integrated system provides operational flexibility. The flexibility in Metropolitan's distribution system was demonstrated during the unprecedented drought of 2014-2016. Facing consecutive years of low SWP supplies, Metropolitan pushed CRA and Diamond Valley Lake (DVL) supplies to areas that Metropolitan normally serves only with SWP supplies or at higher blend of SWP. Figure 1 illustrates Metropolitan's operations during that period of extraordinary drought when SWP supplies were at a historic low. Metropolitan can utilize much of the same operational flexibility in its distribution system to facilitate movement of stored supplies during a prolonged outage. This flexibility combined with retail demand reduction through additional conservation and local production at appropriate levels will allow the region to meet its demands in most areas during emergency outages. Although it is not possible for Metropolitan to predict the specific damage to the system in an event of a catastrophic emergency, it seeks to ensure the most flexibility possible throughout the system to respond to different damage scenarios.

**Figure 1**
**Metropolitan Operations during Extraordinary Drought Actions (2014-16)**

During an emergency outage, previously stored imported supplies will be withdrawn to meet the region's supplemental water needs. Emergency Storage is used first and dry-year storage is then used, if necessary and available. Figure 2 shows the locations of existing DWR and Metropolitan surface reservoirs in various parts of the region.

**Figure 2**
**Existing DWR and Metropolitan Surface Reservoirs**
**South of the San Andreas Fault**

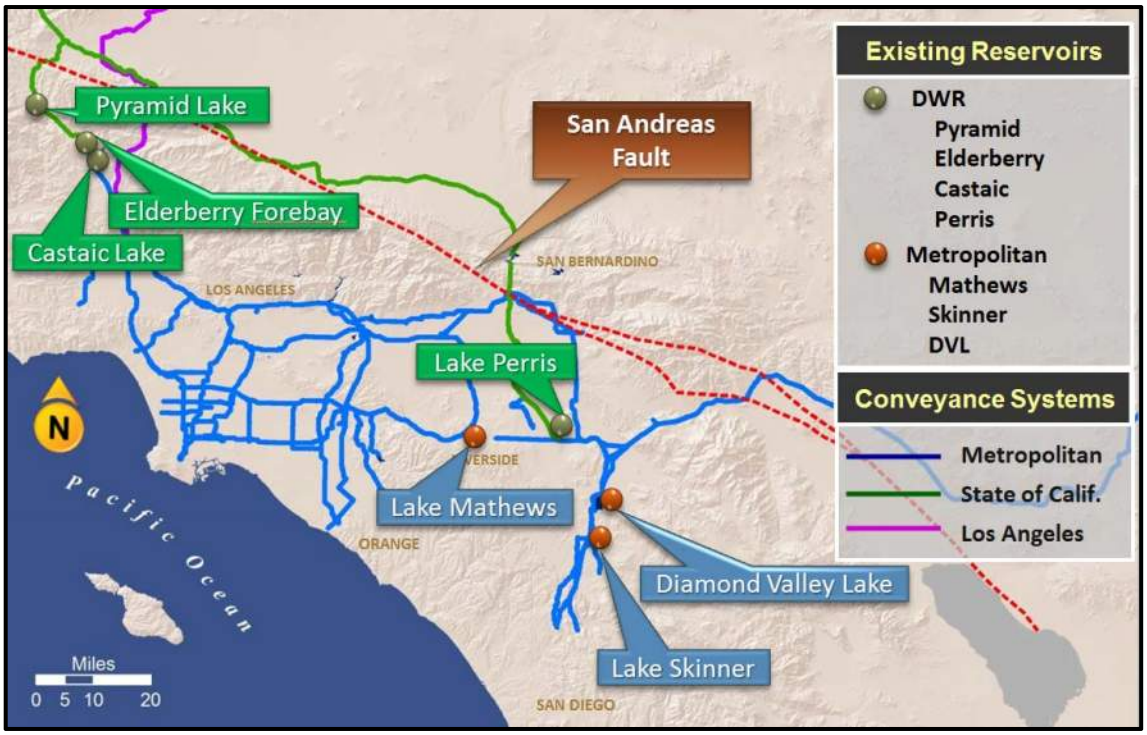


Metropolitan can draw from emergency supplies stored in Castaic Lake, Elderberry Forebay, and Pyramid Lake during an outage to serve the western areas that previously received SWP water. A limited quantity of CRA supplies could also be available to these areas when 80 percent of the CRA capacity is restored within six months to supplement emergency water needs in this area. Metropolitan can also supply up to 50 cfs of water from Greg Avenue Pump Station to the far western portion of its service area while repairs to the three aqueducts are being completed. This operational flexibility is also useful in the event that stored water was not adequate within the Castaic/Pyramid system.

Metropolitan can draw from emergency supplies stored in DVL, Lake Skinner, Lake Mathews, and Perris Lake during an outage to serve the eastern areas that previously received CRA and SWP water. When the CRA is restored to 80 percent of capacity within six months, it could provide up to 960,000 acre-feet per year (AFY) of imported water to the region. This volume is more than the 15-year historic average (2003 to 2017) CRA delivery of approximately 885,000 AFY and more than the 2015 IRP CRA delivery target of 900,000 AFY for a normal year. During outages, portions of the eastern area are expected to continue to receive treated CRA and/or stored emergency supplies through Weymouth. Some areas that normally receive SWP water from the East Branch may be served by delivering DVL water to Mills through the Inland Feeder/Lakeview Pipeline intertie. Metropolitan recognizes that there are currently no options to supply

the Rialto Pipeline from emergency storage reservoirs during an outage of the East Branch of the California Aqueduct. However, water stored in Silverwood Lake (which is not included in Metropolitan's Emergency Storage portfolio) could be available to supply the Rialto Area as soon as repairs to damaged penstocks and pipelines downstream of Silverwood Lake are completed. This could likely require less time than repairs to the East Branch north of Silverwood Lake. In addition, other potential options to supply the Rialto region include several conceptual pump back operations and increased groundwater storage and extraction capacity for emergencies.

Metropolitan will continue to deliver treated water from stored emergency supplies during an outage and from imported supplies upon service restoration. Four of Metropolitan's five water treatment plants have redundant power feeds from the power provider. A project is currently underway to also equip the fifth plant with a redundant power feed. All five water treatment plants have backup emergency generators that support all treatment processes with the exception of ozone. Disinfection using chlorine would occur when the plants are reliant on generator power for treatment operations during a loss of utility power. Metropolitan maintains a minimum 30 day supply of chlorine in the region.

*Updated Outage Criteria*

In updating the emergency outage criteria, the Workgroup considered both the duration of aqueduct repair based on the nature of potential seismic damage and recently demonstrated operational flexibilities of Metropolitan's distribution system.

Figure 3 shows the range of outage durations for the CRA, California Aqueduct East and West Branches, and the LAA. The effective outage period is then derived by accounting for the estimated durations of repair for each regional aqueduct coupled with the operational ability to deliver supplies to the area served by that specific aqueduct. In updating the outage period, the Workgroup considered the following operational assumptions:

- The estimated outage duration and repair of LAA under the earthquake scenario is 18 months. However, when the West Branch comes back in service within 12 months, it can supply water to LADWP through LA-35 while the LAA repairs continue.
  - ***Assumed outage period: 12 months for member agencies receiving supplies from West Branch and LAA.***
- The estimated outage duration and repair time of East Branch is 12 to 24 months. However, when 80 percent of the CRA capacity comes back in service within 6 months, CRA supplies would be available to many Metropolitan member agencies that normally receive SWP supplies. Thus, some areas that are normally served with water imported through the East Branch may be served with water imported through the CRA, using delivery of DVL water to Mills and several other options that should be evaluated in the Rialto area discussed above.
  - ***Assumed outage period: 6 months for member agencies receiving supplies from CRA and East Branch (with the exception of Rialto agencies).***

Using these assumptions, the effective new outage criteria presented in Figure 3 calls for storing supplemental supplies for 12 months in the West Branch and LAA areas (supplied by emergency storage in Castaic, Pyramid, and Elderberry) and 6 months in the CRA and East Branch areas (supplied by emergency storage in Perris, Skinner, Mathews, and DVL). In addition to the 12-month stored emergency supplies, West Branch areas could also be served with limited amounts of CRA supplies within 6 months to help meet demands in areas normally served with SWP supplies and higher blend areas. It is not possible to predict the specific damage to the system as a result of a catastrophic event. Therefore, system flexibility is important to ensure all supplies may be moved, if necessary and possible.

**Figure 3**
**Updated Emergency Outage Criteria**

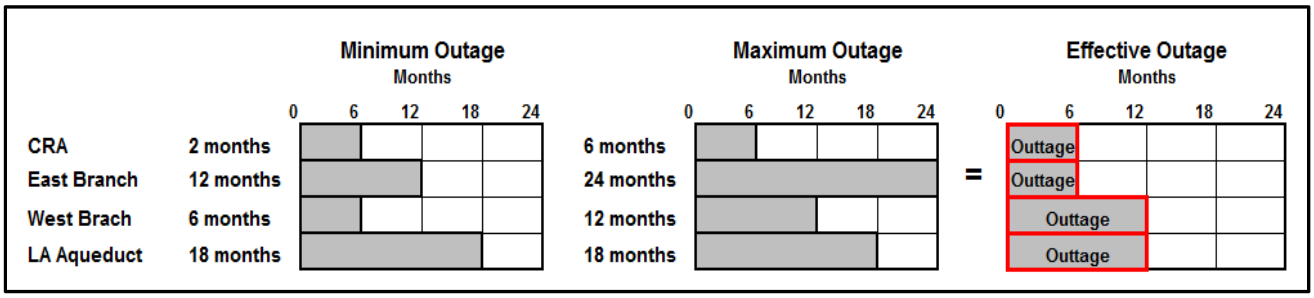


**Retail Demand Cut Back Criteria**

*Demand Projection*

The first step in calculating the Emergency Storage is to determine the total amount of emergency retail water demand at the member agency level. The Emergency Storage is intended to reflect estimated supplemental water demands on Metropolitan during an emergency outage now updated to a period of 6 or 12 months. Thus, the aggregate of emergency retail demand is used to determine the aggregate supplemental demands on Metropolitan during such emergency, which excludes non-firm deliveries. Those deliveries are assumed to be suspended during an outage, as shown in Table 2.

Calculations of the emergency retail demand are provided for the year 2018 based on forecasts reported in the 2015 IRP. The retail demands in Table 2 were calculated at the member agency level. The numbers shown in this table represent the aggregate total retail demand (M&I and agricultural), replenishment, and seawater barrier demands over the emergency outage period considered. The total retail demands are based on forecasts from the Southern California Association of Government's (SCAG) 2012 Regional Transportation Plan/Sustainable Community Strategy and from the San Diego County Association of Government's (SANDAG) Series 13: 2050 Regional Growth Forecast (October 2013) forecast. The SCAG and SANDAG regional growth forecasts are the core assumptions in the econometric demand modeling for Metropolitan's 2015 IRP.

**Table 2**
**Firm Retail Demands (Average Year)**
(Acre-Feet)

| | **2018 Demands for 6-months and 12-months[1]** |
|---|---|
| Total Retail Demand | 2,735,617 |
| Replenishment | (197,103) |
| Seawater Barrier | (52,000) |
| **Firm Retail Demand** | **2,486,514** |

Note: (1) Retail demands are assessed for the 6-month outage period for member agencies receiving supplies from CRA and East Branch, and 12-months for member agencies receiving supplies from West Branch and LAA (see Attachment A).

*Reduced Retail Demands during Emergency Outage*

The next step in calculating the emergency storage demand on Metropolitan is to subtract a percentage reduction, or cutback, in water use from the retail demands. For illustrative purposes, Table 3 below shows the resulting reduction in retail demands during emergency outage after a cutback of 25 percent is imposed on the 2018 average condition retail demands. The retail demands in Table 3 are calculated at the member agency level. The numbers represent the aggregated total over the emergency outage period considered.

The assumption of a 25 percent retail demand cutback is a planning criterion that is consistent with previous Metropolitan studies that showed overall outdoor water use at approximately 30 percent. That cutback criterion is also consistent with the Public Policy Institute of California (PPIC) report *(Building Drought Resilience in California's Cities and Suburbs, June 2017)* based on lessons learned during drought. A higher level of austerity, public awareness, and a likely emergency declaration during an outage may support a higher cut back through additional conservation actions.

**Table 3**
**Retail Level Emergency Demands (Average Year)**
(Acre-Feet)

| | **2018 Demands for 6-months and 12-months[(1)]** |
|---|---|
| Firm Retail Demand | 2,486,514 |
| 25% Reduction (Cutback) | (621,629) |
| 100% IAWP Reduction | N/A |
| **Retail Demand during Emergency** | **1,864,885** |

Note: (1) Retail demands are assessed for the 6-month outage period for member agencies receiving supplies from CRA and East Branch, and 12-months for member agencies receiving supplies from West Branch and LAA (see Attachment A).

**Local Production Level Criteria**

The next step in calculating the Emergency Storage is to determine the amount of local supplies (local production of in-region supplies and release from local storage) available to meet retail demands at the member agency level. The local production represents the member agencies' highest potential production from the various types of supplies available within their service areas with consideration to each member agency's supply, capacity, and demand limitations. For this evaluation, the year 2018 forecast from the 2015 IRP is initially used to estimate the local production for the 6-month and 12-month emergency outage periods. In addition, Metropolitan also considered the factors that could limit each member agency's local supplies production. These include:

- Supply limitation – Considers all supplies available during an emergency outage (including additional groundwater rights, allowable over pumping in the basin, or similar mechanism if available and needed)
- Capacity limitation – Considers all available local production capacity (including extra well capacities to produce the any additional groundwater supplies if available and needed)
- Demand limitation – Considers the projected demand during the outage period (to determine the needed supplies from local and supplemental sources)

The Unused Local Production represents the aggregated production of individual member agencies above what is needed to meet their demands. In contrast, the Effective Local Production is the aggregated amount of locally available supplies that are produced to meet the reduced retail demands during an emergency outage. The Effective Local Production is derived by subtracting Unused Local Production from the aggregate total local production. For planning purposes in determining the Emergency Storage for the region, the Effective Local Production is calculated with the assumption that locally available supplies will be used only within the producing member agency's service areas and not be used or exported to meet the demands of other agencies. However, in real emergency outages, it is likely that member agencies would implement region-wide and inter-agency coordination for the most efficient operation and use of available supplies.

As part of evaluating the Effective Local Production, Metropolitan also assessed the additional local groundwater that could be theoretically produced and local surface storage that could be reasonably available during an emergency outage. This evaluation revealed that additional groundwater supplies, while theoretically available, could not be produced due to one or a combination of limiting factors. The local surface storage, on the other hand, includes all reasonably available surface water storage that the member agency could produce and use within its service area during extended shortages. The Local Surface Storage in Table 4 includes SDCWA's calculated Emergency Storage Requirement of 20,000 AF (as reported to their Water Planning Committee in July 18, 2018) and a portion of its carryover storage. Under the Carryover Storage Policy Guidelines, included in SDCWA's Water Shortage Contingency Plan Appendix A dated August 2017, SDCWA will maintain a carryover target volume of 70,000 AF and a maximum of 100,000 AF to be utilized over five consecutive dry-years. During an emergency outage, the region will most likely draw supplies from all reasonably available storage to meet demands. This evaluation reasonably assumes that in addition to its emergency storage, one-fifth of SDCWA's 70,000 AF target carryover storage, amounting to 14,000 AF, would be available for a catastrophic emergency outage based on the low likelihood that that all carryover supplies would have been withdrawn over multiple dry-years.

Table 4 shows the aggregate total for each type of locally available supplies over the emergency outage period considered. For illustrative purposes for 2018, Table 4 also presents the local production at 100 percent, 90 percent, and 80 percent. The LAA production is excluded from this calculation because the Emergency Storage assumes the loss of all imported water supplies. The member agency local production data is included as Attachment A.

**Table 4**
**Effective Local Production**
(Acre-Feet)

| | **2018 Local Production for 6-months and 12-months[1]** | | |
|---|---|---|---|
| | At 100% | At 90% | At 80% |
| Groundwater | 832,000 | 748,800 | 665,600 |
| Surface Water | 54,935 | 49,442 | 43,948 |
| Local Surface Storage[2] | 34,000 | 30,600 | 27,200 |
| Recycling and GW Recovery | 353,797 | 318,417 | 283,038 |
| Seawater Desalination | 25,319 | 22,787 | 20,255 |
| Los Angeles Aqueduct | 0 | 0 | 0 |
| Other | 13,100 | 11,790 | 10,480 |
| *IRP Targets*[3] | 18,087 | 18,087 | 18,087 |
| *Subtotal Local Production* | 1,331,238 | 1,199,923 | 1,068,608 |
| Unused Local Production | (152,021) | (86,449) | (31,056) |
| **Effective Local Production** | **1,179,216** | **1,113,474** | **1,037,551** |

Note: (1) Local production are assessed for the 6-month outage period for member agencies receiving supplies from CRA and East Branch, and 12-months for member agencies receiving supplies from West Branch and LAA 9 (see Attachment A).
(2) Local Surface Storage is comprised of emergency storage plus reasonably available storage above emergency.
(3) Conservation and locally available supply targets from the 2015 IRP for Year 2018.

**Emergency Demands on Metropolitan**

The final step in calculating the Emergency Storage is to subtract the Effective Local Production from the retail demands during an emergency outage for each member agency. The resulting difference represents the supplemental water demands on Metropolitan during an outage period This is the Emergency Storage planning level for the region. Table 5 shows the aggregated totals at varying local production levels for 2018. The table below illustrates that the emergency demand on Metropolitan, and in effect the Emergency Storage, increases as Effective Local Production decreases under the 90 percent and 80 percent scenarios.

**Table 5**
**Emergency Demands on Metropolitan**
(Acre-Feet)

| | **Local Production** | | |
|---|---|---|---|
| | **At 100%** | **At 90%** | **At 80%** |
| Retail Demand during Emergency | 1,864,885 | 1,864,885 | 1,864,885 |
| Effective Local Production | (**1,179,216**) | (**1,113,474**) | (**1,037,551**) |
| **Metropolitan Emergency Demand** | **685,666** | **751,411** | **827,334** |

## Sensitivity Analysis

A sensitivity analysis of retail cutback and loss of local supplies were conducted. To explore the sensitivities of the Emergency Storage from these two criteria, Metropolitan evaluated various percentages of demand cut backs and levels of local production. Table 6 shows the resulting Emergency Storage at various combinations of retail demand cutback and local production levels. This matrix of emergency storage values presents retail demand cut backs of 0 percent, 25 percent, 35 percent, and 50 percent and local production levels of 100 percent, 90 percent, and 80 percent.

**Table 6**
**Range of Potential Emergency Storage Objectives for Year 2018**
(Acre-Feet)

| Local Production Level | Retail Demand Cutback | | | |
|---|---|---|---|---|
| | 0% | 25% | 35% | 50% |
| 100% | 1,176,600 | 685,700 | 513,300 | 294,000 |
| 90% | 1,286,600 | 751,400 | 570,700 | 332,300 |
| 80% | 1,417,900 | 827,300 | 636,300 | 377,300 |

**Envelope Concept for Metropolitan's Emergency Storage Objective**

Rather than considering a specific region-wide scenario of conservation and local production loss, the Workgroup discussion led to the development of a range of emergency storage values that could provide reliability during the outage period. The concept of an envelope of solutions emerged, with the idea that an envelope of solutions will yield an appropriate Emergency Storage for the region. The Emergency Storage, in turn, could be achieved through various combinations of (1) retail demand cutback from achievable conservation and (2) local production level taking into account potential damages to local facilities. This envelope concept underscores member agencies' individual and unique situations while taking into account their inputs in identifying practicable ranges of decreases in retail demand and local production.

For the retail demand cut back, most member agencies considered the 25 to 35 percent range to be reasonable. This range is based on the level of conservation that the region was able to achieve during the recent drought. For the local production, several member agencies expected some damage to local facilities during the earthquake. In addition, Metropolitan acknowledges that retail demand cutback may also lead to reduction of non-potable recycled water use. Thus, for local production, the Workgroup focused on a range from 80 percent to 100 percent of the member agencies' reported local production in the 2015 IRP. This would allow contingency planning for uncertainties in damage to local facilities and accommodate different durations of local repairs. This is a modification from the previous assumption of full local production at the IRP level during an outage period.

As indicated in Table 6, a scenario using the criteria of 25 percent retail demand cut back and 100 percent local production level yield an estimated Emergency Storage of 686,000 AF for year 2018. However, the Workgroup focused on an envelope of alternatives for Emergency Storage that could provide reliability during the outage period. The same table matrix of values above highlights the range from 520,000 to 830,000 AF. Within this range, an Emergency Storage of 750,000 AF is recommended. This level of storage would prevent severe water shortages in the region with practicable ranges of reduced demands through conservation and plausible levels of local production during an emergency outage. Figure 4 shows that the

Emergency Storage would be sufficient to cover various combinations of practicable ranges of decreases in retail demand and local production.

**Figure 4**
**Emergency Storage Objective derived from the Envelope Concept**

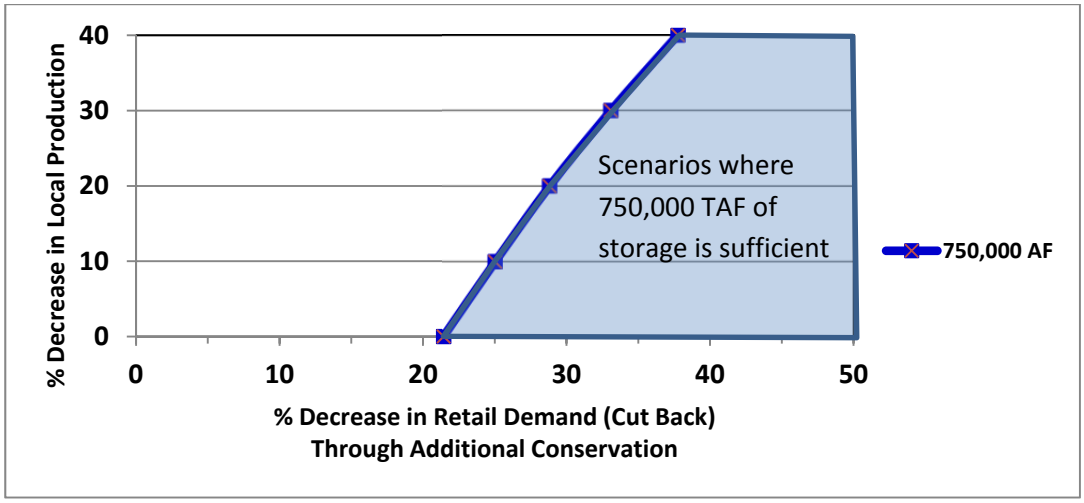


## Allocation of Emergency Storage in Regional Reservoirs

Once the Emergency Storage is determined, it can then be allocated to the various surface reservoirs within the region, previously illustrated in Figure 2, south of the San Andreas Fault. The total storage capacity of existing DWR and Metropolitan surface reservoirs and the allocation to emergency storage, seasonal, regulatory, and drought carryover needs are shown in Table 7 through 11. For the DWR reservoirs, the values in the tables reflect the normal maximum operating and dead pool storages indicated in the DWR report *"California State Water Project, Volume III, Storage Facilities, Bulletin 200"* dated November 1974. For this evaluation, recreational waters in DWR reservoirs are assumed to be available for emergency use during outage periods. On a short-term basis for operational purposes, storage at any specific reservoir may be below these planning levels. When this happens, the emergency storage is shifted temporarily to any of the other existing reservoirs.

### Department of Water Resources Surface Reservoirs

Table 7 below shows the five major reservoirs owned and operated by DWR in or near Metropolitan's service area. Castaic Lake, Elderberry Forebay, and Pyramid Lake are located on the West Branch of the California Aqueduct. Silverwood Lake and Lake Perris are on the East Branch of the California Aqueduct. The total storage capacity of these five reservoirs is approximately 721,600 AF. When cost allocation factors from DWR Bulletin 132 Appendix B, Table B-2 are applied to the operational storage capacities, Metropolitan's share of storage in the reservoirs is equivalent to 644,400 AF.

**Table 7**
**Allocation of Storage Capacities in DWR Reservoirs**
(Acre-Feet)

| Reservoir | Total Storage Capacity | Dead Storage | Storage Paid by Others | Storage Paid by Metropolitan |
|---|---|---|---|---|
| Pyramid Lake | 169,900 | 4,800 | 7,000 | 158,100 |
| Castaic Lake | 323,700 | 18,600 | 12,500 | 292,600 |
| Elderberry Forebay | 28,200 | 800 | 1,100 | 26,300 |
| Silverwood Lake | 73,000 | 4,000 | 24,300 | 44,700 |
| Lake Perris | 126,800 | 4,100 | 0 | 122,700 |
| **Total** | **721,600** | **32,300** | **44,900** | **644,400** |

Source: California Department of Water Resources (1974). California State Water Project, Volume III, Storage Facilities, Bulletin 200, pages 294, 340, 367, 407, and 408.

From 2005 to 2017, DWR temporarily lowered the maximum storage elevation in Lake Perris because of seismic safety issues. This elevation change resulted in reduction of storage available to Metropolitan in Lake Perris, which was taken into account in past emergency storage evaluations. In 2018, the seismic retrofit of Lake Perris was completed, which restored storage to its full capacity. For purposes of the emergency storage analysis provided herein, it is assumed that 122,700 AF could be available to Metropolitan from Lake Perris. Furthermore, the Monterey Amendment, executed by the DWR and most of the State Water Contractors in 1995 and 1996, addresses the allocation of SWP water in times of shortage and deals with a number of other issues that facilitate more water management flexibility for Contractors.

Table 8 shows the distribution of Metropolitan's emergency storage in DWR reservoirs. Of the total 644,400 AF of storage in DWR Reservoirs that is for Metropolitan use, almost 381,000 AF of this amount is allocated to emergency storage and the remaining 263,600 AF is for seasonal, regulatory, and dry-year storage.

Silverwood Lake capacity does not add to the total Emergency Storage Capacity because of its location outside of major earthquake faults assumed for the emergency storage calculation methodology. However, Silverwood Lake could be available after a seismic event upon restoration of any damaged distribution system components downstream of the lake. It is expected that the portion of the distribution system downstream of the lake could be restored more expeditiously after an event due to its relatively short length, accessibility of the pipelines, and redundancies in the system.

**Table 8**
**Allocation of Emergency Storage in DWR Reservoirs**
(Acre-Feet)

| Reservoir | Metropolitan Storage Capacity | Seasonal, Regulatory and Dry-Year Storage | Emergency Storage Capacity |
|---|---|---|---|
| Pyramid Lake | 158,100 | 0 | 158,100 |
| Castaic Lake | 292,600 | 153,900 | 138,700 |
| Elderberry Forebay | 26,300 | 0 | 26,300 |
| Silverwood Lake | 44,700 | 44,700 | 0 |
| Lake Perris | 122,700 | 65,000 | 57,700 |
| **Total** | **644,400** | **263,600** | **380,800** |

**Metropolitan Surface Reservoirs**

Table 9 shows the allocation of storage resources in Metropolitan's three major surface reservoirs, Lake Mathews, Lake Skinner, and DVL. These three reservoirs provide approximately 1,036,000 AF of total storage capacity to Metropolitan's service area.

Lake Mathews has available storage of approximately 178,500 AF and distributes CRA water to Riverside, Orange, Los Angeles, and San Bernardino counties. Lake Skinner has approximately 43,800 AF of available storage and receives CRA and SWP water for distribution to Riverside and San Diego counties. DVL is Southern California's largest reservoir with approximately 810,000 AF of total capacity, with 798,500 AF of available capacity to meet demands and provide emergency water supplies.

**Table 9**
**Allocation of Storage Capacities in Metropolitan Reservoirs**
(Acre-Feet)

| Reservoir | Total Storage Capacity | Dead Storage | Available Capacity |
|---|---|---|---|
| Lake Mathews | 182,000 | 3,500 | 178,500 |
| Lake Skinner | 44,000 | 200 | 43,800 |
| Diamond Valley Lake | 810,000 | 11,500 | 798,500 |
| **Total** | **1,036,000** | **15,200** | **1,020,800** |

Table 10 shows the components of storage, including emergency, seasonal, regulatory, and dry-year storages, for all of Metropolitan's reservoirs. Under the recommended Emergency Storage of 750,000 AF, out of the roughly 1,021,000 AF of available Metropolitan storage capacity, approximately 369,200 AF are reserved for emergency storage, with the remaining storage capacity available for seasonal, regulatory, and dry-year storage.

**Table 10**
**Allocation of Emergency Storage in Metropolitan Reservoirs**
(Acre-Feet)

| Reservoir | Available Capacity | Emergency Storage Objective at 750 TAF | |
|---|---|---|---|
| | | Seasonal, Regulatory and Drought Storage | Emergency Storage |
| Lake Mathews | 178,500 | 100,000 | 78,500 |
| Lake Skinner | 43,800 | 10,000 | 33,800 |
| Diamond Valley Lake | 798,500 | 541,600 | 256,900 |
| **Total** | **1,020,800** | **651,600** | **369,200** |

**Emergency Storage Capacities in DWR and Metropolitan Reservoirs**

The Emergency Storage presented in this white paper is evaluated based on regional aggregation of retail demands and locally available supplies within the service area. The resulting Emergency Storage is assumed to be distributed amongst the available capacities within the existing DWR and Metropolitan surface reservoirs. During an outage, Metropolitan delivers supplement water to member agencies from previously stored emergency supplies, and dry-year supplies if necessary and available, based on the most effective operation of the distribution system under emergency conditions.

Table 11 presents the storage of emergency supplies in DWR Reservoirs, Lake Mathews, and Lake Skinner to be fixed quantities, with any remaining need reflected as changes in DVL's emergency storage allocation under the recommended 750,000 AF of Emergency Storage.

**Table 11**
**Allocation of Emergency Storage in Existing Reservoirs(1)**
(Acre-Feet)

| Reservoir | Emergency Storage Objective at 750 TAF |
|---|---|
| Pyramid Lake | 158,100 |
| Castaic Lake | 138,700 |
| Elderberry Forebay | 26,300 |
| Lake Perris | 57,700 |
| Lake Mathews | 78,500 |
| Lake Skinner | 33,800 |
| Diamond Valley Lake | 256,900 |
| **Total** | **750,000** |

Note: (1) This allocation provides operational guidance but does not create a minimum emergency storage volume in any single reservoir.

## Conclusion

This white paper summarizes the progress to date of the Workgroup coordination process to estimate a planning objective for the region's emergency storage, as part of Metropolitan's ERSP. Evaluating the Emergency Storage involves the regional aggregation of retail water demands and locally available supplies within the service area. It also accounts for the member agencies' unique situations in identifying practicable ranges of additional conservation actions that could yield decreases in retail demand and levels of local production that could be accomplished during emergency outage.

Under the new envelope concept, the Workgroup focused on an acceptable range of regional emergency storage values from 520,000 to 830,000 AF. **Based on feedback to date, staff recommends an Emergency Storage of 750,000 AF.** This level of storage would prevent severe water shortages for the region with practicable ranges of water demand reduction achievable conservation actions and plausible levels of local production. This recommended regional emergency storage is assumed to be distributed amongst the available capacities within the existing DWR and Metropolitan surface reservoirs, as shown in Table 11.

The Emergency Storage presented in this white paper is a regional planning objective. It is an estimate for the amount of Metropolitan water that the region targets to store in preparation for a catastrophic earthquake event. This evaluation of Emergency Storage is not intended to set a basis or a policy for allocating or apportioning storage for each individual member agency.

The Workgroup proposes that this storage objective be revisited periodically, possibly following the completion of a new IRP. Metropolitan also considers spatial distribution for the purpose of determining generally where to store its emergency water. However, specific operations during an emergency will depend on the actual conditions at that time. Since member agency demands for supplemental water will be met through deliveries of supplies from storage, evaluation of spatial distribution of storage and most effective operation of the distribution system will be accomplished as part of Metropolitan's continued efforts and coordination within the ERSP's storage portfolio evaluation or other regional planning processes.

## Attachment A

**2018 Member Agency Total Retail Demand and Local Production**
**(Source data for Tables 2, 3, and 4)**

| | Total Retail Demand | Groundwater | Surface Production | Recycling + GW Recovery Reclamation | Other Imports | Seawater Desal | Local Surface Storage | IRP Target | |
|---|---|---|---|---|---|---|---|---|---|
| **Agencies at 6 month Outage** | | | | | | | | | |
| Foothill MWD | 9,204 | 3,970 | 200 | 120 | 0 | 0 | 0 | 67 | |
| Pasadena | 16,217 | 6,000 | 0 | 0 | 0 | 0 | 0 | 118 | |
| San Marino | 2,700 | 2,250 | 0 | 0 | 0 | 0 | 0 | 20 | |
| Three Valleys MWD | 63,226 | 21,650 | 3,100 | 4,384 | 0 | 0 | 0 | 447 | |
| Upper San Gabriel MWD | 106,945 | 74,163 | 4,500 | 4,354 | 0 | 0 | 0 | 625 | |
| Anaheim | 34,253 | 23,932 | 0 | 39 | 0 | 0 | 0 | 249 | |
| Fullerton | 14,315 | 10,376 | 0 | 0 | 0 | 0 | 0 | 104 | |
| MWDOC | 310,510 | 107,945 | 2,000 | 93,163 | 0 | 0 | 0 | 1,651 | |
| Santa Ana | 19,074 | 13,478 | 0 | 160 | 0 | 0 | 0 | 139 | |
| Eastern MWD | 126,051 | 40,400 | 1,550 | 25,112 | 0 | 0 | 0 | 890 | |
| Western MWD | 147,318 | 73,700 | 2,750 | 21,295 | 0 | 0 | 0 | 1,064 | |
| IEUA | 143,302 | 74,800 | 16,240 | 28,573 | 0 | 0 | 0 | 969 | |
| San Diego County Water Authority | 315,373 | 5,900 | 24,595 | 19,956 | 0 | 25,319 | 34,000 | 2,204 | |
| **Agencies at 12 month Outage** | | | | | | | | | |
| Central Basin MWD | 296,066 | 182,300 | 0 | 55,972 | 0 | 0 | 0 | 1,590 | |
| Compton | 7,766 | 6,400 | 0 | 0 | 0 | 0 | 0 | 56 | |
| Long Beach | 68,633 | 28,700 | 0 | 10,118 | 0 | 0 | 0 | 452 | |
| Torrance | 28,420 | 2,700 | 0 | 9,150 | 0 | 0 | 0 | 207 | |
| West Basin MWD | 179,750 | 34,600 | 0 | 33,621 | 0 | 0 | 0 | 1,173 | |
| Santa Monica | 13,732 | 8,200 | 0 | 145 | 0 | 0 | 0 | 100 | |
| Burbank | 27,819 | 300 | 0 | 13,985 | 0 | 0 | 0 | 159 | |
| Glendale | 30,319 | 1,500 | 0 | 8,984 | 0 | 0 | 0 | 221 | |
| Los Angeles | 566,486 | 77,794 | 0 | 11,681 | 0 | 0 | 0 | 4,070 | |
| San Fernando | 3,150 | 3,143 | 0 | 0 | 0 | 0 | 0 | 23 | |
| Calleguas MWD | 164,638 | 27,700 | 0 | 7,483 | 13,100 | 0 | 0 | 1,198 | |
| Beverly Hills | 11,938 | 0 | 0 | 700 | 0 | 0 | 0 | 87 | |
| Las Virgenes MWD | 28,413 | 100 | 0 | 4,804 | 0 | 0 | 0 | 207 | |
| **MWD TOTAL** | **2,735,617** | **832,000** | **54,935** | **353,797** | **13,100** | **25,319** | **34,000** | **18,087** | **1,331,238** |

Note: Member agency local production are approximation for year 2018 based on 2015 IRP and are estimated for the outage periods indicated.
This table shows individual member agency estimates used to develop Metropolitan's Emergency Storage Objective for the region.
For agencies along the Rialto Pipeline, see discussion on pages 5-6 related to system limitations for receiving CRA supplies.
Local surface storage includes all reasonably available surafce storage that the member agency could produce and use within its service area. Includes SDCWA's calculated ESP storage requirement reported to their Water Planning Committee in July 2018 and a portion of their target carryover storage as discussed in page 9.

# Appendix 9

# SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

# Appendix 9
# SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

Beginning January 2020, CWC Section 10632.5 mandates UWMPs to include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, this required assessment and plan are accomplished as part of developing its resilience strategy and are presented in detail in Metropolitan's seismic resiliency reports attached to this appendix.

Over its nearly 90-year history, Metropolitan has been proactive in mitigating seismic risks posed to its expansive infrastructure, as well as improving its ability to maintain (or quickly restore) water deliveries following a major earthquake. This ability to mitigate seismic risks and maintain (or quickly restore) water deliveries following a seismic event is referred to as "seismic resilience." Metropolitan's holistic strategy for seismic resilience follows a "defense in depth" multi-layered approach for managing risk. Metropolitan's Seismic Resilience Strategy has three primary objectives:

1. Provide a diversified water supply portfolio, system flexibility, and emergency storage
2. Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events
3. Minimize water delivery interruptions through a dedicated emergency response and recovery organization

Metropolitan's Seismic Resilience Strategy is implemented through four components that encompass the various internal functions that promote the organization's seismic resilience objectives. These components are supplemented by Metropolitan's commitment to inter-agency coordination when preparing and responding to a seismic event and other emergencies. The strategy is shown below in Figure A.9-1.

**Figure A.9-1**
**Seismic Resiliency Strategy**

A brief description of the components of Metropolitan's Seismic Resilience Strategy and examples of their implementation are provided below.

## Planning

The goals of the planning component are to develop and maintain a diversified water resource portfolio; provide a flexible system that allows for operational changes to handle variations in water supply, planned or unplanned system outages; and to maintain adequate emergency storage supplies. Metropolitan has developed a diverse water resource portfolio through the enactment of various exchange and water banking programs. These water supply programs are described in detail in Section 3 and Appendix 3. In addition to existing supply programs, development of the Regional Recycled Water Program would provide Metropolitan with an additional water resource and would be strategically located on the coastal side of the San Andreas Fault. Metropolitan also strives for regional seismic resilience by incentivizing local agencies to develop increased conservation, recycling, storage, and other water management programs.

As Metropolitan expanded its system over the years, it has continually improved the flexibility of the system to handle changes in water supply or pipeline or facility outages. One example of Metropolitan's system flexibility is the Common Pool service area, which can be supplied by the Jensen, Weymouth, or Diemer water treatment plants. Additionally, Metropolitan has constructed its system such that most of the service area can be supplied by either Colorado River or State Water Project supplies.

Metropolitan's imported water supplies from the CRA and SWP East and West Branches cross the San Andreas Fault (SAF) Zone prior to reaching Metropolitan's service area. A major earthquake on the SAF has the potential of damaging all three aqueducts and disrupting imported supplies for up to six months. Metropolitan constructed Diamond Valley Lake (DVL) on the coastal side of the fault to mitigate the potential impacts of a major SAF earthquake to its service area. Completion of DVL nearly doubled Metropolitan's available surface water storage in the region and, along with other local reservoirs, is used to maintain 6 to 12 months of emergency water storage supply. Water from DVL can supply four of Metropolitan's five regional water treatment plants.

## Engineering

The goal of the engineering component is to assess and mitigate seismic risk to individual facilities, and the system. This is accomplished through Metropolitan's Seismic Resilience of Structures Program, the Seismic Resilience of Pipelines Program, the Dam Safety Program, and special seismic assessments.

### *Seismic Resilience of Structures*

Metropolitan's program to increase the seismic resilience of structures is an ongoing program with the goal of protecting life safety and critical infrastructure to minimize water delivery interruptions following a seismic event. The initial program focused on evaluating the seismic risk of above ground structures (e.g., water treatment plants) constructed prior to 1990 and upgrading structures to mitigate the risk when found to be seismically deficient. The program has recently expanded to include post-1990 structures due to the progress made on the initial list of structures. Examples of seismically upgraded facilities include the Colorado River Aqueduct pump plant buildings, the Weymouth East and West Wash Water Tanks, and the Diemer and Jensen Administration Buildings.

### *Seismic Resilience of Pipelines*

Metropolitan's conveyance and distribution system has been built in conformance with standards and practice at the time of design. In keeping with the goals of the Seismic Resilience Strategy, Metropolitan is developing seismic design criteria for new pipelines based on current state of practice, geotechnical and seismicity criteria, operating conditions, and asset management strategies. The planned design approach for new pipelines will be to establish performance criteria, identify seismicity and ground conditions along the alignment, and design the pipeline to resist damage from ground shaking and deformation. Specialized pipe joints and sections can be designed to accommodate ground deformation from fault displacement or liquefaction. For existing pipelines, seismic resilience will be incorporated as a component of pipeline rehabilitation projects. Metropolitan will evaluate each upgrade individually to balance risk, performance, and cost. Metropolitan's Casa Loma Siphon Barrel No. 1 Seismic Upgrade Project is an example of the organization incorporating seismic design in the rehabilitation of existing pipelines. The existing siphon, which crosses a segment of the San Jacinto Fault Zone and is subject to long-term subsidence, will be replaced with earthquake-resistant ductile iron pipe. The pipe joints are designed to accommodate ground displacement without failure to allow for continued service following an earthquake.

### *Dam Safety Program*

Metropolitan has an ongoing Dam Safety Initiatives Program that has initiated several plans to improve Metropolitan's dam seismic safety and earthquake readiness. These initiatives are being coordinated with the California Division of Safety of Dams (DSOD) and Office of Emergency Services and include the following:

- Ongoing preparation of Emergency Action Plans, including inundation maps
- Performing training exercises at the dam site to test processes during a seismic event
- Providing training and guidance on overall dam safety
- Reviewing operation and maintenance methods for reservoir drawdown and operations after a seismic event
- Updating guidelines and procedures on protection against seismic risk
- Establishing a strong communications system on seismic information
- Performing structural strengthening of dams, including rehabilitation and improvement of spillways and inlet/outlet towers such as Lake Skinner Outlet Tower
- Improving dam safety instrumentation, monitoring, and reporting capabilities

### *Special Seismic Assessments*

Metropolitan conducts special seismic assessments to increase understanding of the vulnerability of the organization's assets and operations to various seismic hazards. The studies focus on hazards specific to individual facilities or the system as a whole and identify options to mitigate the risks posed by the hazards. In addition, the studies support emergency response training and planning for future earthquake events by estimating the magnitude of damage that may occur from various seismic events. The following is a list of some of the reports that Metropolitan has completed:

- Liquefaction Susceptibility Mapping for the Metropolitan Water District of Southern California's Feeder System (Report No. 1625), Carollo Engineers, Inc., 2019.

- Colorado River Aqueduct – San Gorgonio Pass Seismic Event Vulnerability Study (Report No. 1484), GeoPentech, July 2014.
- Potential Effects of Southern California Seismic Events on Metropolitan Water Deliveries (Report No. 1335), Metropolitan Facility Planning staff, January 2009.

### Operations

The goal of the operations component is to maintain effective emergency planning and response capabilities. This is accomplished through maintaining an effective Emergency Response Organization, conducting routine emergency response training exercises, and maintaining emergency construction capabilities.

Metropolitan's Emergency Response Organization (ERO) is comprised of over 200 predesignated employees who work in the Emergency Operations Center (EOC), the Incident Command Posts, or the field during emergencies. ERO staff has completed specialized training that meets State and Federal requirements. Metropolitan's emergency response structure follows the National Incident Management System (NIMS) and the State of California's Standardized Emergency Management System (SEMS).

In addition to specialized NIMS training, Metropolitan staff routinely participate in emergency response training exercises that are often based on a postulated seismic event. In 2019, Metropolitan started a new five-year emergency exercise plan that will allow all member agencies to participate in at least one of Metropolitan's annual emergency exercises. The first of these exercises was a tabletop exercise for the Orange County member agencies on August 29, 2019, which focused on a hypothetical incident at the Diemer Water Treatment Plant.

Metropolitan has conducted over 100 exercises since February 2018. This included two large functional emergency exercises for the EOC and multiple tabletop exercises, workshops, and seminars for the 12 Incident Command Posts located at the water treatment plants, conveyance and distribution facilities, and other strategic locations in Metropolitan's service area.

Metropolitan maintains the necessary staffing, materials, and equipment to respond to two simultaneous pipeline breaks. The Machine Shop and Coating Shop at La Verne are available to fabricate pipe sizes up to 12 feet in diameter, and Metropolitan's construction forces have the necessary equipment and expertise to make the repairs in-house. In addition, Metropolitan has upgraded its satellite phones to ensure communication ability following a seismic event and is in the process of installing high frequency radios at all Incident Command Posts and the Emergency Operations Center.

### Reporting

Metropolitan has committed to providing annual updates to its Board of Directors on the organization's Seismic Resilience Strategy and its progress toward identified short-term and long-term goals. The organization has also committed to providing a formal report on a five-year interval summarizing accomplishments related to seismic resilience and changes in directives to the Seismic Resilience Strategy.

### Inter-Agency Coordination

Improving the region's seismic resilience requires that member agencies understand the seismic risks to the imported water supplies so that they may appropriately plan on the local level. Opportunities for inter-agency coordination are provided through the Local Resources Program where Metropolitan incentivizes the development of local groundwater, recycling, and other supply resources to offset imported demands. As stated previously, Metropolitan provides

member agencies the opportunity to participate in emergency response exercises. As part of a recent study, Metropolitan developed maps that define the relative liquefaction susceptibility of the region inclusive of the conveyance and distribution system and has made these maps available to member agencies. Recently, the organization updated the emergency storage goals through several workshops in coordination with member agencies.

Metropolitan is also a member of the Seismic Resilience Water Supply Task Force, along with the California Department of Water Resources (DWR) and the Los Angeles Department of Water and Power (LADWP). As the owners of the three conveyance facilities that provide imported water to the region, Metropolitan, DWR, and LADWP have recognized the importance of coordinating responses following a major seismic event that disrupts the imported water supplies. Each agency has provided an overview of the seismic risk to their respective systems and are in the process of developing a Water Mutual Assistance Agreement to formalize the coordination efforts following a major earthquake that disrupts service to the imported water supplies.

### Metropolitan's Seismic Resilience Reports

The various components of Metropolitan's resilience strategy summarized above are described in detail in Metropolitan's Seismic Resilience Report First Biennial Report (February 2018) and Seismic Resilience Report 2020 Update (February 2020) presented as part of this appendix. These reports are also available on Metropolitan's website:
http://mwdh2o.com/AboutYourWater/Planning/Seismic-Resilience-Report/

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REPORT

# SEISMIC RESILIENCE

## FIRST BIENNIAL REPORT

The Metropolitan Water District of Southern California
700 N. Alameda Street, Los Angeles, California 90012

Report No. 1551
February 2018

# SEISMIC RESILIENCE
# FIRST BIENNIAL REPORT

**Prepared By:**

The Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, California 90012

Report Number 1551
February 2018

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**Prepared under the direction of:**

| | |
|---|---|
| Gordon Johnson | Chief Engineer |

**Prepared by:**

| | |
|---|---|
| Robb Bell | Engineering Services |
| Don Bentley | Water Resource Management |
| Winston Chai | Engineering Services |
| David Clark | Engineering Services |
| Greg de Lamare | Engineering Services |
| Ray DeWinter | Administrative Services |
| Edgar Fandialan | Water Resource Management |
| Ricardo Hernandez | Engineering Services |
| Rosa Lau | Engineering Services |
| Silvia Perez | Water System Operations |
| Ian Whyte | Water System Operations |

**Reviewed by:**

| | |
|---|---|
| Grace Chan | Water Resource Management |
| Heather Collins | Water System Operations |
| Kevin Donhoff | Water Resource Management |
| Jim Green | Water System Operations |
| Bob Harding | Water Resource Management |
| Mike Rojas | Engineering Services |
| Jack Safely | Water Resource Management |
| Deven Upadhyay | Assistant General Manager/Chief Operating Officer |
| Brent Yamasaki | Water System Operations |

**Additional copies**: The Seismic Resilience Report is located on the Seismic Resilience SharePoint site. To obtain a copy of this document, please contact the Engineering Services Group.

***Disclaimer***

*Extensive efforts have been made to ensure that the material contained in this document is accurate as of the date of publication. There are many factors, however, related to the content and applicability of this document which are beyond the control of MWD. In addition, the contents of this publication will be periodically updated, so the reader should inquire about any such changes in addition to reading this document. Finally, the reader is encouraged to seek appropriate technical and/or legal advice when specific facts or circumstances arise that raise questions concerning the applicability or interpretation of the policies and procedures discussed herein.*

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# EXECUTIVE SUMMARY

***The ability to maintain, or quickly restore, water deliveries after a seismic event.***

--Definition of "Seismic Resilience" for a water agency

An interruption in a key lifeline service such as water delivery can be devastating to a community's recovery after an earthquake. As the agency responsible for delivering imported water to over 19 million people in one of the world's most seismically active regions, The Metropolitan Water District of Southern California (Metropolitan) has made substantial efforts to minimize the impact of a major earthquake on the people and businesses within its service area. In 2017, Metropolitan refined and formalized its approach for addressing seismic resilience by fully integrating its planning, engineering, operations, and reporting functions.

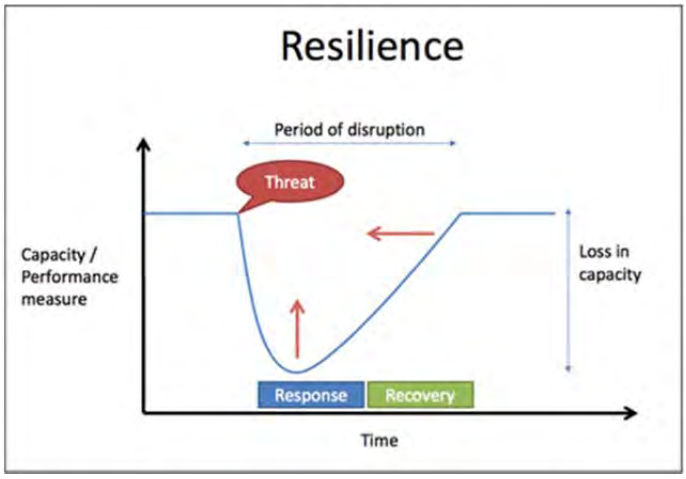


This report documents Metropolitan's integrated Seismic Resilience Strategy, reports on key historic achievements, and communicates near-term goals aimed at further enhancing the seismic resilience of Metropolitan's infrastructure and water deliveries.

### Seismic Resilience

"Resilience" is broadly defined as the ability of a system to absorb and rebound from shocks. The more resilient a system is, the smaller the impact will be that any given shock will have on the system, and the shorter the duration of recovery will be. Using the broad definition of resilience as a baseline, Metropolitan defines "seismic resilience" as the ability to maintain (or quickly restore) water deliveries following a seismic event. The more prepared a water agency is for earthquakes, and the more effective its emergency response capabilities are, the less impact the event will have on water deliveries to its customers.

### Metropolitan's Seismic Resilience Strategy

Metropolitan's Seismic Resilience Strategy is a multi-faceted approach to prepare for and respond to seismic events. It involves close, formal coordination within the Metropolitan organization and with other owners of imported water conveyance systems that cross the Southern San Andreas Fault.

Coordination within Metropolitan and its member agencies focuses on diversifying water resources; enhancing operational flexibility; providing adequate emergency water supplies; and identifying and addressing infrastructure and system vulnerabilities. This coordination also involves development of effective emergency response capabilities.

The coordination with other owners of imported water conveyance systems is through a multi-agency task force. The members of this task force, which includes the California Department of Water Resources

(DWR) and the Los Angeles Department of Water and Power (LADWP) as well as other State and water industry organizations, work together to evaluate the unique seismic vulnerabilities of Southern California's imported water systems.

In addition to the coordination elements, Metropolitan's Seismic Resilience Strategy includes a reporting component to increase transparency and accountability. Each year, Metropolitan staff will update its Board of Directors on recent achievements and near-term goals. Every two years, a written report will be prepared to document these items.

**Water is recognized as a critical resource, but having sufficient water available following an earthquake is essential. Seismic resilience has a goal that in most scenarios, water will be available for the vast majority of people and business affected by the event and for essential post-earthquake activities such as fire suppression.**

## Conclusion

Metropolitan's strategy for seismic resilience has evolved over time and has benefited from the lessons learned from major seismic events around the world. Because of this strategy, significant improvements in the overall seismic resilience of Metropolitan's water system have been made in each of the following key areas: water resource diversity, operational flexibility, emergency water storage capacity, resilience of existing infrastructure, and emergency response capabilities.

Metropolitan has also established a number of near-term goals within each of the planning, engineering, and operations components of seismic resilience that will further enhance this multi-layered approach.

Metropolitan's refined Seismic Resilience Strategy approach will maintain a clear and effective focus on long-term efforts, clearly communicate program achievements and goals to the Board, and provide member agencies with more clarity regarding projected seismic performance of Metropolitan's infrastructure.

# SECTION 1 INTRODUCTION

## Purpose

The Metropolitan Water District of Southern California (Metropolitan) owns and operates a complex conveyance, treatment, and distribution system that serves a 5,200-square-mile service area within an active seismic region. Over its nearly 90-year history, Metropolitan has been proactive in mitigating seismic risks posed to this expansive infrastructure, as well as improving its ability to maintain (or quickly restore) water deliveries following a major earthquake. This ability to mitigate seismic risks and maintain (or quickly restore) water deliveries following a seismic event is referred to as "seismic resilience." Metropolitan's strategy for seismic resilience follows a "defense in depth" multi-layered approach for managing risk: providing a diversified water resource portfolio, system flexibility, emergency water storage, robust emergency response capabilities and performing cyclical assessments of facilities and addressing identified vulnerabilities.

Over the last 20 years, Metropolitan has made significant progress in a number of key areas related to seismic resilience (see Appendix 1):

1. Increasing water supply resilience, flexibility, and emergency storage
2. Addressing the susceptibility of above-ground structures to damage from seismic events
3. Developing effective and robust emergency response capabilities

Recognizing the need for continuous improvement, Metropolitan recently re-assessed the various activities that enhance seismic resilience to refine, expand, and formalize its overall approach. The resulting Seismic Resilience Strategy is a fully integrated approach toward minimizing regional water delivery interruptions and restoring interrupted regional deliveries quickly after an earthquake.

The specific goals of the refined Seismic Resilience Strategy are to:

- Improve the integration of planning, engineering and operations activities focused on seismic resilience through regular collaborative meetings and integrated reporting
- Expand current programs to identify and address any additional seismic vulnerabilities
- Re-visit existing seismic performance objectives in light of advancements in the knowledge of earthquake hazards, earthquake engineering, and mitigation capabilities
- Document Metropolitan's seismic resilience activities to facilitate knowledge transfer and coordination
- Improve accountability by communicating seismic resilience goals and accomplishments to Metropolitan's Board of Directors and member agencies on an annual basis
- Enhance member agency planning efforts for emergency response and facility improvements by providing more clarity regarding the projected seismic performance of Metropolitan's infrastructure

This document describes Metropolitan's Seismic Resilience Strategy, summarizes key historical achievements, and communicates near-term goals that will further increase the seismic resilience of Metropolitan's system.

## Seismic Resilience Strategy Structure

Metropolitan's Seismic Resilience Strategy (see **Figure 1-1**) is a multi-faceted approach that involves coordination among key functions within Metropolitan as well as formal coordination with other owners of imported water conveyance systems that cross the Southern San Andreas Fault.

**Figure 1-1: Seismic Resilience Strategy Structure and High Level Goals**

As shown in the figure, the coordination within Metropolitan and its member agencies focuses on the activities of planning, engineering/design, operations/emergency response, and reporting. These efforts are complemented by the efforts of the multi-agency Seismic Resilience Water Supply Task Force (Task Force). This Task Force includes the California Department of Water Resources (DWR) and the Los Angeles Department of Water and Power (LADWP) as well as other State and water industry organizations and focuses on the unique seismic vulnerabilities of Southern California's imported water supplies.

The purpose of Metropolitan's Seismic Resilience Strategy is to enable Metropolitan to restore water deliveries to its member agencies promptly after seismic events by maintaining a diversified supply portfolio, system flexibility, and emergency storage; minimizing damage to infrastructure; and supporting a robust emergency response and recovery capability. This integrated, comprehensive approach will maintain focus on effective long-term efforts, clearly communicate program achievements and goals to the Board, and provide more clarity to member agencies regarding projected regional seismic performance to enhance local facility and emergency response planning efforts.

## Report Organization

This report is organized as follows:

- *Section 2 – Background.* Provides context regarding inherent seismic risks within Southern California, a definition of seismic resilience, and a summary of how Metropolitan's seismic resilience strategy developed over time.
- *Section 3 – Planning Component.* Describes planning activities that address seismic resilience through Metropolitan's diverse water supply portfolio and adaptive management approach to managing resources, including establishing emergency storage.
- *Section 4 – Engineering Component.* Describes technical programs that identify and mitigate the seismic vulnerability of Metropolitan's infrastructure and systems.
- *Section 5 – Operations Component.* Describes the emergency response organization, training exercises, and post-event capabilities that serve to minimize the disruption of water deliveries following earthquakes.
- *Section 6 – Reporting Component.* Explains the purpose and timing of the integrated reporting component.
- *Section 7 – Seismic Resilience Water Supply Task Force Component.* Describes the purpose of the collaborative task force, recent progress, and planned activities.
- *Section 8 – Seismic Resilience Performance Objectives and Near-Term Goals.* Summarizes existing objectives of the various components of seismic resilience, describes areas where new objectives are being considered, and provides high-level goals planned to be achieved by December 2019.

## List of Abbreviations and Acronyms

| | |
|---|---|
| BCP | Business Continuity Plan |
| CIP | Capital Investment Plan |
| CRA | Colorado River Aqueduct |
| DATs | Damage Assessment Teams |
| DSOD | Division of Safety of Dams |
| DVL | Diamond Valley Lake |
| DWR | California Department of Water Resources |
| EAP | Emergency Action Plan |
| EOC | Emergency Operations Center |
| ERO | Emergency Response Organization |
| FEMA | Federal Emergency Management Agency |
| ICCs | Incident Command Centers |
| IRP | Integrated Water Resources Plan |

| | |
|---|---|
| IT | Information Technology |
| ITP | IT Continuity Plan |
| LAA | Los Angeles Aqueduct |
| LADWP | Los Angeles Department of Water and Power |
| LRP | Local Resources Program |
| M | Magnitude |
| MARS | Member Agency Response System |
| MCE | Maximum Considered Earthquake |
| Metropolitan | The Metropolitan Water District of Southern California |
| MOU | Memorandum of Understanding |
| $M_W$ | Moment Magnitude |
| MWD | The Metropolitan Water District of Southern California |
| NIAC | National Infrastructure Advisory Council |
| NIMs | National Incident Management System |
| O&M | Operation and Maintenance |
| OCC | Operations Control Center |
| PCCP | Prestressed Concrete Cylinder Pipe |
| PGA | Peak Ground Acceleration |
| SCE | Southern California Edison |
| SEMS | Standardized Emergency Management System |
| ShakeOut | Great Southern California ShakeOut Scenario |
| SWC | Security Water Center |
| SWP | State Water Project |
| Task Force | Seismic Resilience Water Supply Task Force |
| UBC | Uniform Building Code |
| UCERF3 | Uniform California Rupture Forecast Version 3 |
| USGS | United States Geological Survey |
| WSAP | Water Supply Allocation Plan |
| WSDM | Water Surplus Drought Management |

# SECTION 2 BACKGROUND

## Seismic Risk

Within Southern California, there are a number of known active faults with varying levels of activity that are capable of generating significant earthquakes and causing widespread damage to infrastructure. Modern era earthquakes that occurred within or close to Metropolitan's primary service area with a magnitude above 6.3 (M6.3) are listed in Appendix 2. In 2015, the United States Geologic Survey (USGS) released the Uniform California Earthquake Rupture Forecast Version 3 (UCERF3), which provides a forecast for the likelihood of rupture for particular earthquake faults within California. UCERF3's forecast of the likelihood of a M6.7 earthquake or greater in the next 30 years on each active fault in Southern California is shown in **Figure 2-1**. As indicated in the figure, the Southern San Andreas Fault was identified as having the highest likelihood (19%) of a M6.7 earthquake or greater in the next 30 years. UCERF3 further states that the there is a 93% chance of a M6.7 or greater earthquake occurring on one of the faults within Southern California within the next 30 years, and a 36% chance of a M7.5 or greater earthquake occurring within the next 30 years.

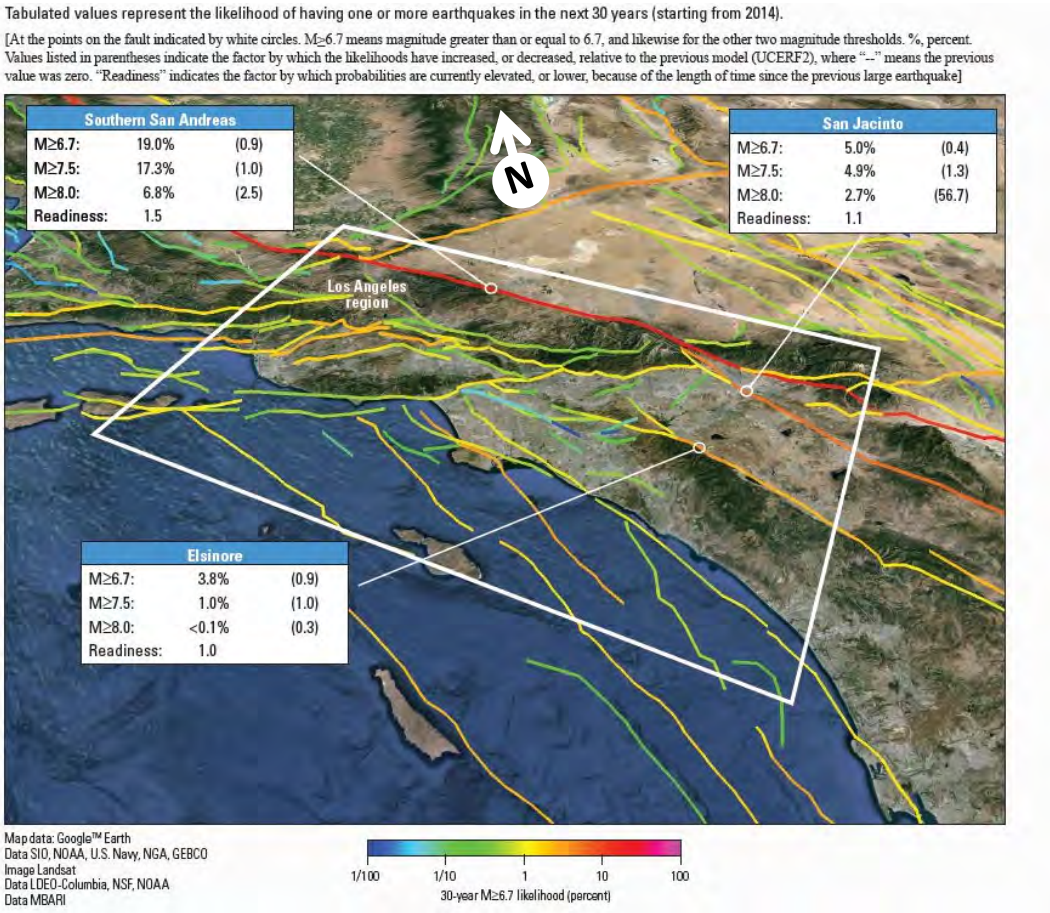


**Figure 2-1: Likelihood of M6.7 or greater earthquake in the next 30 years (Source: UCERF3)**

As shown in **Figure 2-2**, a significant portion of Metropolitan's infrastructure, including the Colorado River Aqueduct (CRA) and several treated water pipelines, is located near or crosses active faults.

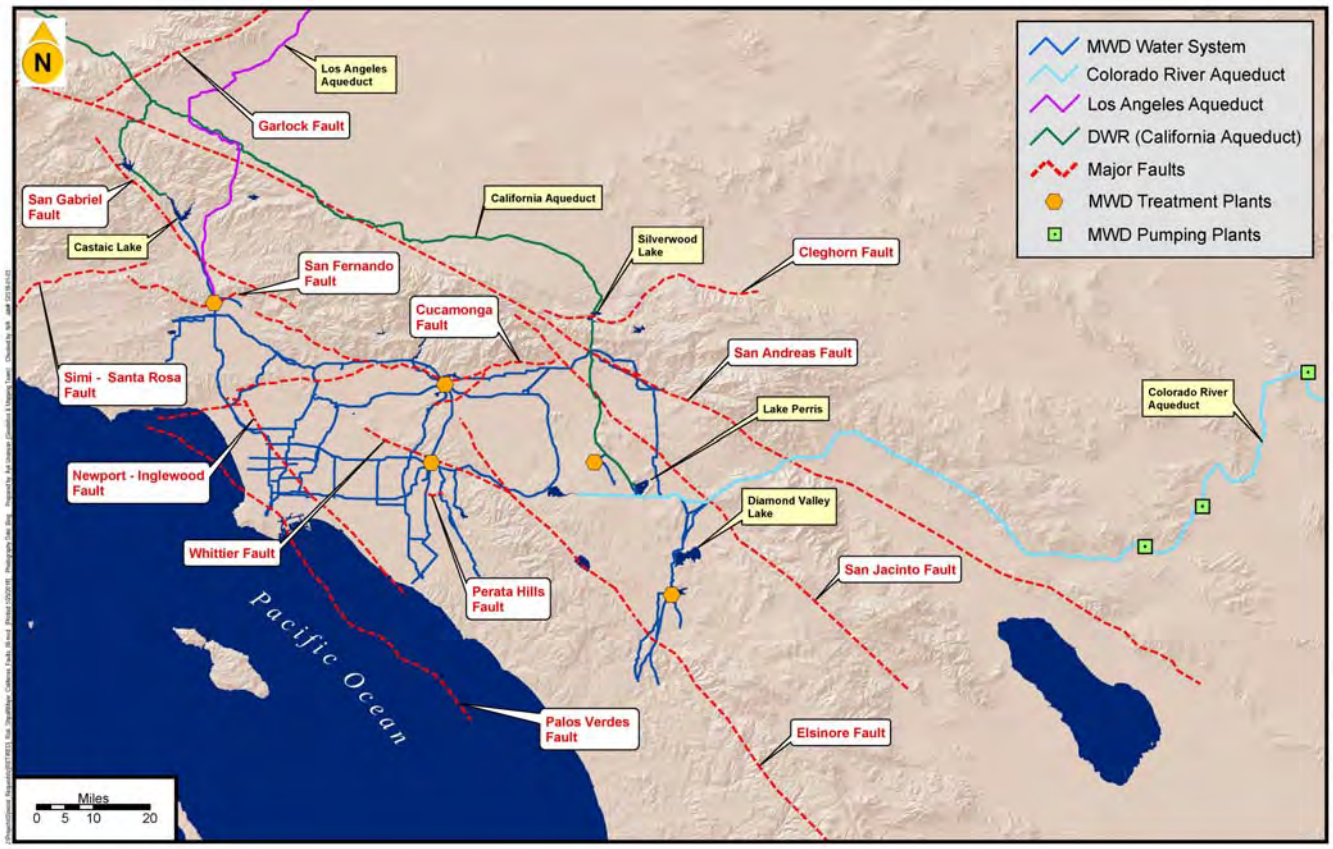


**Figure 2-2: Major Earthquake Faults in Southern California**

The risk of earthquake damage to Metropolitan's infrastructure from these active faults is manifested through different seismic hazards, including seismically induced ground shaking, seismically induced ground failure, and surface fault displacement.

- <u>Seismically induced ground shaking</u> can damage buildings, structures, aqueducts, pipelines, and tunnels. The intensity and duration of shaking at a particular location is dependent on a number of factors, including the earthquake magnitude, the distance from the earthquake epicenter, and local soil conditions.

**Examples of typical effects of seismically induced ground shaking. The photograph on the left shows a damaged building from the 1994 M6.7 Northridge Earthquake. The building has essentially fallen backwards, and what was once a straight wall now appears curved. The photograph on the right shows the collapsed portion of a freeway overpass from the same earthquake.**

- Seismically induced ground failure includes liquefaction, landslide, and seismic settlement. Liquefaction occurs when prolonged shaking causes saturated (water-bearing) soils to consolidate and lose their bearing capacity. This can compromise the support of structures that are constructed in these zones, including buildings and pipelines. Prolonged shaking can also lead to displacement of large areas of soil or rock, resulting in hazardous landslides and rock falls. The integrity of buildings and pipelines constructed in landslide zones can be compromised if the supporting ground experiences seismically induced failure; rockfalls can also result in structural damage due to the impacts of large boulders on structures. Seismic settlement is similar to liquefaction, except that the soil is not saturated.

**Examples of seismically induced ground failures include liquefaction (left photo) and landslides (right photo) from the 2011 M6.3 Christchurch, New Zealand Earthquake and the 2016 M7.8 Kaikoura, New Zealand Earthquake, respectively.**

- Surface fault displacement is usually only observed in large magnitude earthquakes but can result in devastating structural damage. The 1972 Alquist-Priolo Earthquake Fault Zoning Act prohibits construction of buildings in California within 50 feet of a known active fault trace. Therefore, surface fault displacement is generally not an issue for Metropolitan's buildings constructed after the early 1970s. However, several components of Metropolitan's conveyance and distribution infrastructure cross known active faults, including the CRA, various pipelines, and power transmission lines. These facilities are subject to damage from surface fault displacement.

**Examples of surface fault displacement. The photograph on the left shows railroad tracks displaced as a result of the 1952 M7.5 Kern County Earthquake. The photograph on the right shows a field that shifted as a result of the 2010 M7.1 earthquake in Canterbury, New Zealand.**

# Seismic Resilience

## General

According to the National Infrastructure Advisory Council (NIAC), infrastructure resilience is "the ability to reduce the magnitude and/or duration of disruptive events." The effectiveness of a resilient infrastructure or enterprise depends upon its ability to "anticipate, absorb, adapt to, and rapidly recover from a potentially disruptive event." [ref. "*Critical Infrastructure Resilience Final Report and Recommendations*," September 8, 2009]**.** This event may be man-made, such as a cyber-attack, or a natural disaster, such as a drought, flood, or earthquake.

"Seismic resilience" (see **Figure 2-3**) narrows the focus of infrastructure resilience to only earthquakes. Using the definition of "infrastructure resilience" presented above, Metropolitan has defined seismic resilience for water agencies as the ability to reduce the magnitude and/or duration of water delivery interruptions resulting from seismic events. Rather than striving to make an entire water system "earthquake-proof," seismic resilience involves setting reasonable performance goals that provide sufficient benefits that justify the corresponding investments required by both an agency and its ratepayers. Metropolitan's seismic resilience performance objectives are summarized in Section 8 of this report.

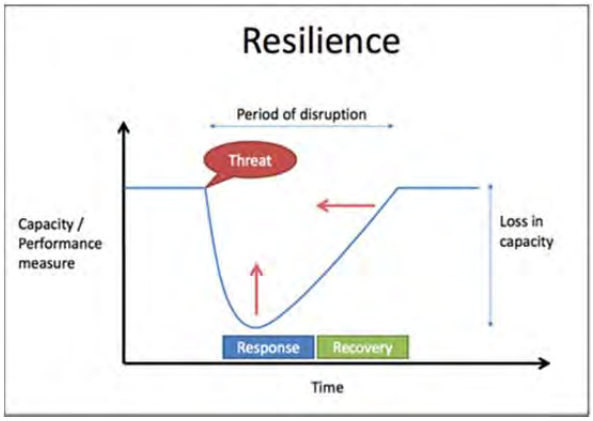


Source: http://www.iparametrics.com/solutions/infrastructure-resilience.html

**Figure 2-3: Resilience -- the ability to reduce the magnitude and/or duration of disruptive events**

## Applicability to Metropolitan

For over a decade, Metropolitan has had a well-defined approach to system reliability that addressed overall system resilience in five key areas: Water Supply Reliability, System Capacity, Infrastructure Reliability, System Flexibility and Emergency Response.

Seismic resilience is an essential aspect of Metropolitan's overall reliability strategy. Water deliveries are extremely crucial following earthquakes for fire suppression, for the general welfare of local residents, and for the regional economy that relies on imported water. Metropolitan's approach to seismic resilience has evolved over time to become one that is highly effective and recognized within the water industry [ref. "*Water Supply in Regard to Fire Following Earthquake*," Charles Scawthorn, Pacific Earthquake Engineering Research Center, November 2011]**.**

# Metropolitan's Historical Approach to Seismic Resilience

***"The aqueduct is being built for the future as well as the present, and must stand and give adequate service for an indefinitely long time."***

From the "Design" Chapter of "The Great Aqueduct" book by Julian Hinds, 1938.

***"It was desirable that faults be crossed at right angles, to minimize damage in the event of movement, and that some flexible type of conduit on or near the surface be used so that if repairs become necessary they will be as simple as may be…"***

From "Major Problems of Aqueduct Location" by Julian Hinds, Nov. 24, 1938 Engineering News-Record.

Since its inception, and particularly during the design and construction of the CRA, Metropolitan has recognized the potential vulnerability of water infrastructure to disruptions by earthquakes. This section provides a brief overview of Metropolitan's historical approach to seismic resilience, focusing on major earthquake events in the past and lessons learned from these events.

**The 1906 M7.8 San Francisco earthquake struck the coast of Northern California at 5:12 a.m. on April 18. Severe shaking was felt from Eureka on the North Coast to the Salinas Valley. Broken gas lines resulted in fires that lasted for several days due to a lack of fire supply. As a result, about 3,000 people died and over 80% of the city of San Francisco was destroyed.**

**The 1933 M6.7 Long Beach earthquake took place on March 10 at 5:54 P.M. Damage to buildings was widespread and between 115 and 120 people died. The earthquake highlighted the need for earthquake-resistant design for structures in California.**

### Post-1906 San Francisco and 1933 Long Beach Earthquakes (1930-1970)

Conveyance and Distribution System: The majority of Metropolitan's conveyance and distribution system was constructed between the 1930s and the 1970s. Historical documents regarding the planning and design of this infrastructure describe a philosophy of "permanence," which may be considered as a forerunner to "resilience." This philosophy not only took into account decades of wear and tear, routine hazards, and large storms, but also provided for seismic resilience.

Despite having no provisions within design codes, Metropolitan took proactive measures to address seismic resilience while designing the CRA. Metropolitan geologists and engineers took into account the ground shaking and deformation that had occurred along the San Andreas Fault system during the 1857 Fort Tejon earthquake and lessons learned from 1906 San Francisco earthquakes, and supplemented their understanding of regional active faults through geologic mapping and analysis of stereo aerial photographs. This led to the aqueduct being designed to cross active faults near the ground

surface in inverted siphons and cross fault traces at right angles. The designers also opted for a more flexible siphon design in fault regions than the rigid monolithic concrete construction used elsewhere on the CRA, and provided extra hydraulic grade at three siphons crossing active faults (Appendix 3). These provisions were intended to minimize the adverse effects of seismically induced ground movement and to simplify access for repairs.

**Metropolitan's dams are inspected on a regular basis.**

**Photo of the 120-inch Froriep Vertical Turning Lathe (above) and the 5-inch G&L Horizontal Boring Mill (below) in the La Verne Machine shop.**

Water Treatment Plants: Metropolitan's water treatment plants were also designed with features that enhance seismic resilience, beginning with the F. E. Weymouth Water Treatment Plant in 1940, and followed by the Robert B. Diemer Water Treatment Plant in 1963. The plants are modular in design and incorporate redundancy of key components. They are also situated strategically to maximize gravity flow to a majority of the distribution system.

Dams and Reservoirs: Metropolitan began a Safety of Dams program many years before formal reporting was required by the California Division of Safety of Dams (DSOD). Staff regularly inspects Metropolitan's dams for vulnerabilities, documents their findings, and reports these findings to DSOD.

La Verne Shops and Construction Equipment: The La Verne Shops were built in the 1940s to support the construction and maintenance of Metropolitan's initial infrastructure. The shops were expanded in the 1960s as Metropolitan's system grew along with its service area. These specialized shops provide support for routine maintenance activities and are also vital for responding to emergency events impacting Metropolitan and member agency facilities. The stockpiling of key materials and the ability to roll pipe and fabricate or repair specialty equipment greatly enhances seismic resilience. Many of Metropolitan's pumps, piping, valves, and related equipment are too large to be routinely stocked by vendors.

### *Post-1971 San Fernando Earthquake (1971-1990)*

**The San Fernando earthquake struck the greater Los Angeles region in the early morning of February 9, 1971. The M6.5 earthquake caused severe property damage over $500 million and the loss of life directly attributable to the earthquake reached 58.**

**There were over 145 post-earthquake ignitions, typically caused by severed gas lines. Metropolitan experienced widespread damage at the Jensen plant, including a severe break to a 72" influent conduit and damage to the new finished water reservoir (shown below).**

Earthquake Committee: Following the San Fernando Earthquake in 1971, Metropolitan formed an Earthquake Committee to investigate damaged structures at the Joseph Jensen Water Treatment Plant and to recommend enhanced seismic design criteria and site improvements to mitigate the seismic risk from potential future events.

The recommended modifications, such as the addition of stone columns to prevent liquefaction, are believed to have contributed to improved seismic performance of the Jensen plant in the 1994 Northridge Earthquake (see Section 4 of this report).

The Earthquake Committee also evaluated other facilities and recommended additional improvements that resulted in the upgrade of several key structures throughout Metropolitan's system. The Committee's efforts evolved over time into the current formal approach, with its emphasis on improving the seismic resilience of structures.

Emergency Response Plan: This period also saw Metropolitan adopt its Emergency Response Plan and establish a formal Emergency Response Organization (ERO). These steps led to regular emergency response training for staff, and eventually to staging formal emergency response exercises. As part of this effort, Metropolitan coordinated with its member agencies to establish the Member Agency Response System (MARS). Engineering Damage Assessment Teams (DATs) were also created to rapidly assess damage and help prioritize and initiate repair efforts.

La Verne Shops and Construction Equipment: The La Verne Shops were further expanded in the 1980s to support a major rehabilitation of the main pumps on the Colorado River Aqueduct. The additional fabrication capacity increased Metropolitan's ability to respond to emergency events.

Local Projects Program: To decrease reliance upon imported water, Metropolitan established the Local Projects Program in 1982 to provide financial incentives to member agencies for the development of recycled water projects throughout the region. A more diversified water portfolio helps the region's overall water supply reliability, which improves seismic resilience for the entire service area.

### *Post-1989 Loma Prieta and 1994 Northridge Earthquake (1990-2010)*

During this period, Metropolitan greatly enhanced seismic resilience by performing seismic risk assessments, updating seismic design criteria, strengthening dozens of at-risk structures, encouraging development of local water resources, increasing emergency storage supplies, and enhancing emergency response capabilities.

**The M6.9 Loma Prieta earthquake occurred in Northern California on October 17, 1989, at 5:04 p.m. . The shock was centered approximately 10 miles (16 km) northeast of Santa Cruz on a section of the San Andreas Fault System.**

**The earthquake was responsible for 63 deaths and over 3,750 injuries. The Loma Prieta segment of the San Andreas Fault System had been relatively inactive since the 1906 San Francisco earthquake until two moderate foreshocks occurred in June 1988 and again in August 1989.**

**As a result of this event, there were more 916 documented water system pipe breaks. This resulted in the loss of water pressure in the Marina District of San Francisco and difficulty in fighting fires.**

Seismic Design Criteria: During the Inland Feeder Project, criteria were developed for new pipelines that cross seismic faults. The refined fault-crossing strategy includes using steel pipelines with welded joints; crossing fault-zones at right angles, and burying the pipes at relatively shallow depth to enable easy access for repair; and locating the pipelines where they can drain into channels or streams if damaged at fault crossings. Metropolitan also began considering the benefits of exceeding minimum code requirements for essential structures.

Seismic Upgrade Program: Dozens of pre-1990 structures were upgraded during this period. The benefit of upgrading seismically vulnerable facilities was demonstrated during the Northridge Earthquake in 1994. Structures that were upgraded at the Jensen plant, which was near the earthquake's epicenter, experienced only minor damage. The only significant damage consisted of rupture of an inlet 84-inch steel pipeline. The Jensen plant was off-line for less than 72 hours while the broken pipeline was repaired, and limited water deliveries were maintained during the repairs. Appendix 4 summarizes damage to Metropolitan infrastructure from the 1971 San Fernando and 1994 Northridge earthquakes.

Local Resources Program: In 1995, Metropolitan established the Local Resources Program (LRP). The LRP combined the Local Projects Program, which provided financial incentives for recycled water projects, with the Groundwater Recovery Program, which provided financial incentives to encourage the development of local groundwater recovery projects. The present LRP has been highly successful in reducing the region's dependence upon imported water.

Diamond Valley Lake (DVL): DVL was completed in 1999 to increase operational flexibility and reliability by providing seasonal storage, drought protection, and dedicated emergency supplies. Seismic resilience was a major factor in both the siting and design of the reservoir. DVL was specifically constructed south and west of the San Andreas Fault, and it was designed to withstand a major event on that fault in order to mitigate for the potential interruption of Southern California's imported water supplies. This 810,000 acre-

foot reservoir, combined with other storage programs, provides a 6-month emergency water supply for Metropolitan's service area.

**The M6.7 Northridge earthquake occurred on January 17, 1994, at 4:31 a.m. and had a duration of approximately 10-20 seconds.**

**The death toll was 57, with more than 8,700 injured. Property damage was estimated to be between $13 and $50 billion. LADWP reported a total of 1,405 pipe repairs and that water pressure had dropped to zero in some areas.**

**Metropolitan experienced damage at the Jensen Plant including a rupture of an 84" diameter pipeline. Crews worked around the clock and restored service within 72 hours. The ability to roll pipe in the La Verne shops expedited these emergency repairs.**

**Although Metropolitan's response was very good, a task force was formed to develop recommendations for further improvement (Ref. Report 1087, "Northridge Earthquake Assessment Report").**

Special Seismic Risk Assessments: During this period, Metropolitan broadened the scope of seismic risk assessments, from focusing on isolated structures to assessing entire facilities, such as the Diemer plant, and overall systems, such as the CRA. These efforts included seismic vulnerability assessments, facility reliability assessments, and system flexibility studies. These special seismic risk assessments led to several capital projects to structurally upgrade facilities, provided input into Metropolitan's emergency response planning to reduce the time to restore service, and identified options to improve system flexibility to help maintain water deliveries during planned and unplanned outages.

Emergency Response Planning: Following the Northridge Earthquake, Metropolitan revised its Emergency Response Plan and associated programs and established a Member Agency Coordinator function. Metropolitan also began conducting training exercises in coordination with member agencies and other external agencies and three functional exercises based on postulated seismic events were conducted during this period. In addition, the EOC was relocated from the Sunset Headquarters Building to Eagle Rock, and Incident Command Centers (ICCs) were established at each of the water treatment plants. Recognizing that seismic events can impact business functions as well as infrastructure, staff developed a formal Business Resumption Plan. Over time, this evolved into the present Business Continuity Plan (BCP) and IT Continuity Plan (ITP).

Emergency Response Construction Capabilities: In 2008**,** Metropolitan enhanced its ability to respond to emergency events by initiating a long-term project to refurbish and upgrade the La Verne Shops. Metropolitan can roll pipe and conduct simultaneous repairs on two large-diameter pipelines. Retaining in-house fabrication functions is important, as there are few firms in the western U.S. with similar capabilities. In recent years, private firms with machine shop and fabrication capabilities have tended to increase the amount of work outsourced to offshore facilities, instead of retaining it locally. These firms have little ability to respond expeditiously to emergency needs.

### *Post-2010 Chile, 2011 Christchurch and 2011 Great East Japan Earthquakes (2010-Present)*

Seismic Resilience Strategy Defined: The recent earthquakes in Chile, New Zealand, and Japan demonstrated the importance of seismic resilience, and have resulted in extensive discussions among industry experts and public agencies on strategies to achieve greater levels of seismic resilience beyond the conventional measures of prevention and protection. This was particularly true for the 2011 Christchurch, New Zealand Earthquake, although it was the smallest of the three. The reason was the widespread damage that occurred in the downtown section of Christchurch, despite the fact that the infrastructure was designed and constructed in accordance with modern building codes. While the majority of buildings did not fall, and most people were able to exit safely, many of the downtown structures were unsuitable for occupation and had to be demolished. In addition, many of the buried utilities were damaged and had to be abandoned in place. The combined loss of structures and utilities resulted in a long-term reduction to the population within the city.

**A M6.3 earthquake occurred in Christchurch, New Zealand on 22 February 2011 at 12:51 p.m. The earthquake was centered 6 miles south-east of the center of Christchurch, which at the time was New Zealand's second-most populous city. The earthquake caused widespread damage across Christchurch, killing 185 people in the nation's fifth-deadliest disaster.**

**In December 2014, Los Angeles Mayor Eric Garcetti released Resilience by Design which provided recommendations to addresses Los Angeles' greatest earthquake vulnerabilities, including taking steps to secure imported water supplies.**

Concurrent with the infrastructure industry's focus on resilience, Metropolitan re-assessed its existing programs and developed a more integrated, comprehensive approach to seismic resilience. One improvement was to incorporate the concept of performance-based design during seismic evaluations. In addition to the evaluation of structures based on design-level earthquakes to prevent damage, performance-based design evaluates the effects of more extreme events to anticipate structural damage. Another improvement was to embrace the significant technological advancements that can improve seismic resilience, including computer modeling techniques, seismic resistant products, and recent industry research. These improvements have allowed Metropolitan to develop an enhanced strategy for seismic resilience moving forward.

During this period, Metropolitan also formed a collaborative Task Force to address the unique vulnerabilities of the major aqueducts that cross the San Andreas Fault. In 2017, Metropolitan fully integrated the various seismic resilience efforts currently underway throughout the organization. The resulting Seismic Resilience Strategy is described in detail in Sections 3 through 7 of this report.

## Metropolitan's Comprehensive, Integrated Seismic Resilience Strategy

The enhanced Seismic Resilience Strategy has the following objectives for Metropolitan and for the entire southern California region:

- Provide a diversified water supply portfolio, system flexibility, and emergency storage
- Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events
- Minimize water delivery interruptions through a dedicated emergency response and recovery organization

This strategy is built upon improved collaboration within Metropolitan and formal collaboration with LADWP and DWR, which also import water to Southern California.

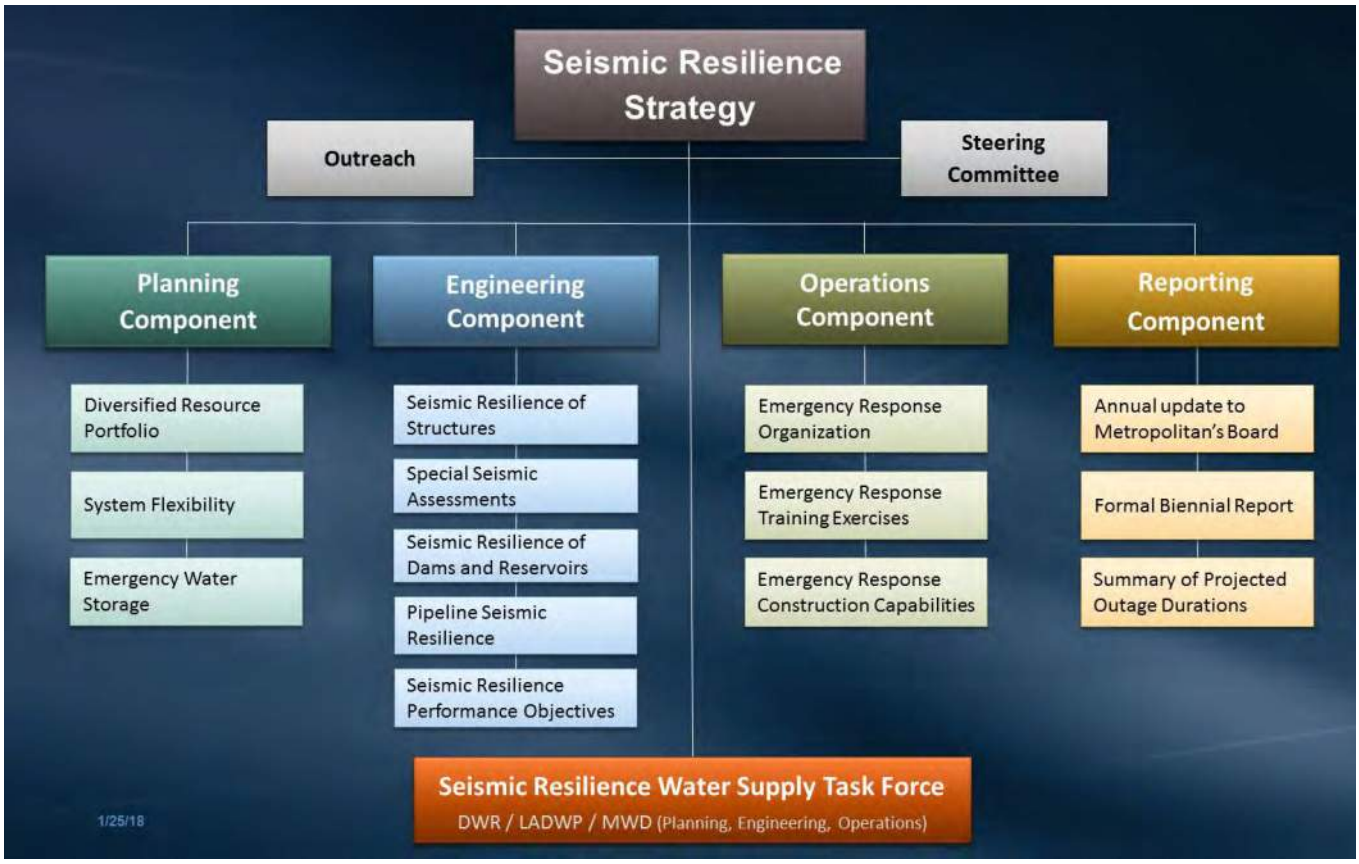


**Figure 2-4: Detailed Breakdown of Metropolitan's Seismic Resilience Strategy**

As shown in **Figure 2-4**, Metropolitan's enhanced Seismic Resilience Strategy includes four components within Metropolitan and a fifth component that involves formal coordination between Metropolitan, LADWP, and DWR.

1. The **Planning component** develops diversified water resources, system flexibility, and emergency water storage through Metropolitan's Integrated Water Resources Plan (IRP) and System Overview Studies. The goal of Metropolitan's IRP is to develop a diverse water supply portfolio that will be able to maintain a reliable water supply under any conditions, including a major seismic event.
2. The **Engineering component** addresses design concepts, vulnerability studies, and seismic resilience projects executed under Metropolitan's Capital Investment Plan (CIP). The Engineering component includes evaluating the seismic resilience of structures, monitoring dams, special seismic assessments, and enhancing pipeline seismic resilience. These efforts are all aimed at improving the seismic resilience of the treatment plants and distribution system through facility upgrades and operational flexibility improvements.
3. The **Operations component** involves Metropolitan's emergency response organization, training exercises, and construction capabilities. Their objectives are to effectively prepare for and respond to emergency events so that impacts to water deliveries are minimized and interrupted deliveries are restored quickly.
4. The **Reporting component** involves documenting the Seismic Resilience Strategy, tracking progress of seismic resilience activities, and annual reporting of near-term goals and recent accomplishments to Metropolitan's Board. This component is aimed at facilitating knowledge transfer, increasing accountability, and improving the transparency of seismic resilience goals and achievements to the Board and member agencies. The reporting component also supports the planning efforts of member agencies by communicating potential outage durations of Metropolitan facilities during emergency events.
5. The **Seismic Resilience Water Supply Task Force component** involves Metropolitan's formal collaboration with DWR, LADWP, the State of California, and other water industry organizations to address the unique seismic vulnerabilities of Southern California's imported water supplies. The two primary objectives of this task force are to 1) enable the agencies to coordinate emergency response efforts, and 2) identify practical mitigation options for reducing the magnitude and duration of disruptions to the region's imported water supplies following a large earthquake on the San Andreas Fault.

# SECTION 3 PLANNING COMPONENT

As a supplemental supplier to the Southern California water community, Metropolitan faces many challenges in meeting the region's needs for water supply reliability and quality. One of the challenges is the ability to maintain water deliveries within the region following a major seismic event. In general, Metropolitan's planning efforts focus on meeting demands during dry and critical periods. However, during the original planning for Diamond Valley Lake (DVL), Metropolitan considered a scenario and a plan to meet demands if imported supplies were interrupted due to a seismic event, including development of a significant increase in storage dedicated to meeting emergencies.

Historically, Metropolitan has provided 50 to 60 percent of the water used in its service area from the Colorado River (via the Colorado River Aqueduct) and from the Sacramento-San Joaquin River Watershed (via the State Water Project). In addition to relying on imported supplies, Metropolitan and its member agencies have developed other sources, including groundwater, surface water, recycled water, desalination of seawater, and an aggressive water conservation and water use efficiency program. These investments, and Metropolitan's ongoing efforts in several different areas, coalesce toward the goal of long-term regional water supply reliability.

Metropolitan's Integrated Water Resources Plan (IRP) is the foundation for planning and developing a diverse water supply and emergency storage. The fundamental goal of the IRP is for Southern California to develop a water supply portfolio that will be able to maintain a reliable water supply. Maintaining this reliability includes investments prior to major seismic events, when there could be extended outages of imported water conveyance systems. To meet this fundamental IRP goal of a diversified water portfolio, Metropolitan believes in investing in the reliability of imported supplies, incentivizing its member agencies to develop increased water conservation, recycling, storage, and other resource-management programs. A significant part of imported water supply reliability is preparing for recovery periods following seismic events. With the commencement of the IRP process in 1993, Metropolitan formalized this process as a long-term strategy and official policy.

Metropolitan's success in improving water supply reliability by diversifying its water resource portfolio, and by the application of adaptive resource management approaches has also increased seismic resilience. At a system level, the Planning component of seismic resilience has several facets:

- Diversified water supply portfolio
- System flexibility
- Emergency storage

## Diversified Water Supply Portfolio

Metropolitan has undertaken a number of planning initiatives over the years in order to maintain a diversified water portfolio. These initiatives include the IRP, periodic IRP updates, the Water Surplus and Drought Management (WSDM) Plan, and the Water Supply Allocation Plan (WSAP). Collectively, these initiatives provide policy framework guidelines and resource targets for Metropolitan to ensure regional water supply reliability, along with additional resilience for seismic events. In addition to Metropolitan's efforts to coordinate regional supply planning through its inclusive IRP process, Metropolitan's member

agencies also conduct their own planning analyses and may develop projects independently of Metropolitan.

### 2015 IRP Update

The 2015 IRP Update was a refinement of Southern California's water management strategy, with seismic resilience continuing to be a key component. The 2015 IRP Update called for increasing the targets for conservation and local supply development and an emphasis on the importance of protecting and maintaining existing local supplies. The more that conservation and local supplies can contribute to the baseline each year, the more imported water Metropolitan can divert into storage to prepare for droughts of unknown duration or potential seismic events. Further developing a diverse water supply portfolio also contributes to increased seismic resilience.

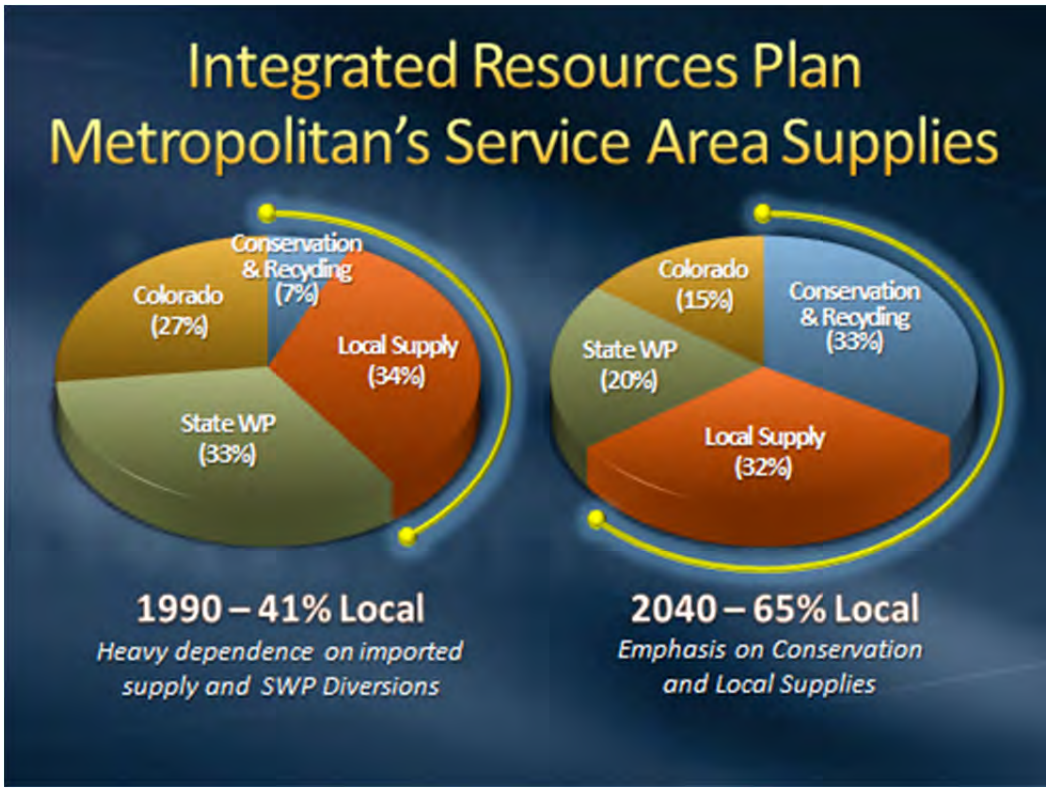


**Figure 3-1: Integrated Resource Plan, Metropolitan's Service Area Supplies**

### Metropolitan's Service Area Supplies under the IRP

In 1990, about 41 percent of regional water demands were met with local resources and conservation. By 2040, about two-thirds will be met by local resources and increased conservation and recycling, as shown in **Figure 3-1**. Metropolitan's strategy is to maintain rather than increase traditional levels of imported supplies. The long-term portfolio approach looks to local solutions to sustain the region's continued growth. Increased flexibility to draw upon a wide range of sources from an ever more diverse water supply portfolio results in greater resilience to the potential impacts of seismic events on Southern California's water supply infrastructure.

### Water Surplus and Drought Management (WSDM) Plan

Diversifying the region's water supplies and developing adequate and healthy water storage reserves have proven to be the backstop for water supply reliability. These actions have also contributed to improved seismic resilience for the region. Stored water reserves provide certainty for meeting the needs of the region's vast service area when traditional sources of supply are challenged by drought, climate change, seismic events, and other risks. It is critical that these storage resources be developed, managed and enhanced.

Metropolitan's WSDM Plan, which defines a regional water management strategy for Metropolitan and its member agencies, has focused on using storage to manage water supplies and enhance reliability since 1999. The WSDM Plan includes the following guiding principle: Metropolitan will encourage storage of water during periods of surplus and work jointly with its member agencies to minimize the impacts of water shortages on the region's retail consumers and economy during periods of shortage.

### Water Supply Allocation Plan

When continued drought, earthquakes, or other natural disasters lead to shortages of supplies, Metropolitan distributes a limited amount of water through its Water Supply Allocation Plan (WSAP). First developed in 2008, Metropolitan's WSAP takes a basic premise --to fairly distribute a limited amount of water supply-- and applies it through a detailed methodology to reflect a range of local conditions and needs of the region's retail water consumers. In particular, under severe drought conditions or a potential seismic event that impacts imported conveyance systems, it may be necessary and prudent to call for greater reductions in the use of limited water supplies and to reduce reliance on storage reserves. The WSAP has 10 levels of water supply allocations, each corresponding to a five percent reduction of supply. A Level 2 allocation, for example, represents a reduction of approximately 10 percent in overall water supply available to each member agency. The level of WSAP reduction implemented would correlate to the severity of the seismic event.

## System Flexibility

Metropolitan develops its facilities to meet demands; however, in the course of developing a reliable system to meet demands, some flexibility has been incorporated into the system. This flexibility helps Metropolitan accommodate changes in water supply, demands, and water quality. System flexibility also helps mitigate the impacts of planned and unplanned outages. Metropolitan's system flexibility has two key components:

- Operational flexibility: the ability to respond to changes in regional supply, water quality, or member agency demands
- Delivery flexibility: the ability to maintain partial to full deliveries during planned and unplanned single-facility outages

Metropolitan has found that for planned and unplanned outages of Metropolitan facilities, system flexibility at the regional and local levels is key to minimizing the effects of these outages. Water supply reliability and water demand-driven projects increase Metropolitan's system flexibility, which in turn can

also increase seismic resilience. For example, the construction of DVL and the Inland Feeder provided significantly increased water supply reliability through the potential for dramatically increased storage of imported supplies within the service area. These projects increased water supply reliability and system flexibility, and also greatly improved seismic resilience as the storage was purposely located on the coastal side of major faults that are crossed by the SWP, CRA, and Los Angeles Aqueduct (LAA). A significant amount of storage in DVL is dedicated to emergency storage. This water is not used except in emergency conditions such as following a major seismic event. Additionally, the Diemer and Jensen plants (and associated feeders) were constructed as water demand-driven projects that also significantly improved delivery flexibility and seismic resilience within Metropolitan's distribution system.

## Emergency Storage

Over the past two decades, Metropolitan has developed a large regional storage portfolio that includes both dry year and emergency storage capacity (summarized in Appendix 5). Storage generally takes two forms: surface reservoirs and groundwater basin storage. In late 2011, heading into the most recent drought cycle, Metropolitan had developed over 5.5 million acre-feet of storage capacity and had successfully stored over 2.7 million acre-feet.

Additionally, Metropolitan has long discussed and executed plans to maintain a reliable supply of water in the face of any type of water supply condition, including following major seismic events that could impact imported water conveyance systems. The development of its diverse resource mix has enhanced the flexibility of Metropolitan's conveyance and distribution system. Metropolitan established criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now DVL. These criteria were again discussed in the 1996 IRP. Both of these documents were approved by Metropolitan's Board. Additionally, Metropolitan's emergency storage requirements were summarized in a 2008 Board Report entitled "Water Surplus and Drought Management Plan on water supply and demand as of October 30, 2008."

Emergency storage requirements are based on the potential of a major earthquake causing damage to one or more of the aqueducts that convey Southern California's imported supplies (SWP, CRA, and LAA) into the region. The adopted criteria assume that damage from such an event could render the aqueducts out of service for six months. As a result, Metropolitan has based its planning on a 100 percent reduction in these imported supplies for a period of six months.

Metropolitan's WSDM Plan shortage stages guide Metropolitan's management of available supplies and resources during an emergency to minimize impacts of the catastrophe. This emergency plan outlines that under catastrophic loss of water supply the following actions will be taken:

1. Interruptible water deliveries would be suspended
2. Firm supplies to member agencies would be restricted by a mandatory cutback of 25 percent from normal year retail demand levels
3. Water stored in surface reservoirs and groundwater basins under Metropolitan's program would be made available

4. Full local groundwater production, recycled water, and local surface emergency storage reserve production would be sustained
5. Metropolitan would draw on its emergency storage as well as other available storage

Under the emergency criteria, retail demands would be met through existing surface storage, local production, and storage in surface reservoirs owned and operated by Metropolitan and by DWR. The total amount of storage available for emergency needs in Metropolitan's storage facilities, including DVL, Lake Mathews, and Lake Skinner, is currently 292,100 acre-feet (February 2018). The amount of emergency storage available to Metropolitan in DWR's reservoirs, including Lake Perris, Castaic Lake, Silverwood Lake, and Pyramid Lake, is an additional 334,300 acre-feet (February 2018).

**SUMMARY**

Through its IRP, Metropolitan has established a fundamental goal that Southern California will have a reliable water supply system for present and future generations, even if imported water supplies are disrupted due to a major seismic event. This reliability is achieved through Metropolitan's development of local water supplies, emphasis on water conservation, and establishment of emergency storage on the coastal side of major earthquake faults that are crossed by the SWP, CRA, and LAA. These reliability actions enable Southern California to continue water deliveries during the period when imported supply aqueducts are out of service due to damage from a major seismic event. In addition, Metropolitan's planning efforts to diversify the water supply and increase overall system flexibility over time have also contributed to providing resilience against potential in-basin earthquakes.

Metropolitan will continue to evaluate its water resource planning programs in terms of how they may further enhance seismic resilience and coordinate these efforts with the Engineering and Operations functions that are described in Sections 4 and 5 of this report.

# SECTION 4 ENGINEERING COMPONENT

Metropolitan manages a number of strategies and component studies that evaluate facilities and systems against earthquake hazards. Mitigation options are then developed and executed when practical. These strategies include evaluating the seismic resilience of structures; special seismic assessments that address multiple facilities and systems; and other specialized efforts that address the seismic resilience of dams and reservoirs and the mitigation of geotechnical hazards.

## Seismic Resilience of Structures

The purpose of evaluating the seismic resilience of structures is to prevent seismic damage to water delivery infrastructure from probable events and to limit damage due to extreme events in order to minimize water delivery interruptions. For occupied structures, the goal is to protect life safety and critical functions. Metropolitan applies a systematic approach to evaluate older structures that were constructed in accordance with earlier codes, and where necessary, to upgrade structures with seismic deficiencies. The criteria applied to the seismic evaluations incorporate current code provisions and up-to-date industry standards. In general, structures are upgraded to maintain seismic performance levels that are comparable to the levels of a new facility. Additional details are provided in Appendix 6, "Seismic Design Frequently Asked Questions."

Over the past two decades, this effort was primarily aimed at improving the seismic resilience of above-ground facilities and structures constructed prior to 1990. For example, the original pump houses at the five CRA pumping plants were determined to be vulnerable to significant damage in a design-level earthquake. A design-level earthquake is a probable event that is defined by the Building Code as the basis for seismic design of structures. To address this vulnerability, which could have impacted deliveries from the CRA over an extended period, new buttress walls were constructed in 1996.

**Construction of new buttress walls at Hinds Pumping Plant**

### Procedure for Seismic Evaluation of Structures

A seismic risk-reduction program identifies seismic deficiencies of structures and quantifies the associated risks through an effective evaluation process, enabling limited resources to be allocated strategically to projects that address key vulnerabilities and to maximize improvements in seismic resilience of the water delivery system.

Metropolitan's procedure for the seismic evaluation of structures includes the following steps:

1. **Preliminary evaluation of all high-risk structures**

   The preliminary evaluation of existing structures is a high-level assessment to quickly determine if a structure is seismically deficient. Typically, this evaluation involves drawing review, visual inspection, and simplified calculations. If a potential seismic deficiency is identified, the structure is categorized as seismically deficient and the preliminary evaluation is complete.

2. **Prioritization of structures with seismic deficiencies**

   Structures identified as seismically deficient are then prioritized in preparation for a detailed evaluation. Structures built after 1990 were designed and constructed in accordance with the 1988 or later versions of the Uniform Building Code (UBC), which provides reasonable assurance of withstanding a design-level earthquake without catastrophic structural failure. Therefore, structures built before the early 1990's are given priority for the detailed evaluations, with consideration of life safety and the importance of the facility in water deliveries.

3. **Detailed evaluation to develop retrofit options**

   Structures identified with at least one potential seismic deficiency via the preliminary evaluation are thoroughly assessed to confirm any deficiencies. Feasible retrofit options are developed during this step to mitigate the identified deficiencies, and more advanced procedures such as finite element modeling and comprehensive structural calculations may also be applied. The analysis methodology, its results, findings, and recommendations are then summarized in a report that includes rough order-of-magnitude construction costs.

4. **Final retrofit design to strengthen deficient structures**

   The recommendations from the detailed evaluation form the basis for requesting approval from the Board of Directors to proceed with a seismic upgrade project. A project team consisting of design engineers and a project manager considers all feasible retrofit options developed during the detailed evaluation and recommends one option for the final retrofit design. In this process, the project team considers adequacy for seismic resistance, cost, constructability, operational impacts, and environmental impacts to select the preferred option. The selected option is then developed into bidding documents that include detailed design drawings and specifications for the retrofit work.

5. **Periodic reevaluation of strengthened structures**

   The seismic design provisions in building codes are constantly evolving, which reflects lessons learned from recent earthquakes and new findings in regional seismicity. Metropolitan periodically re-evaluates its facilities to ensure that system reliability is not compromised due to newly discovered vulnerabilities. Factors that may trigger a re-evaluation of a previously upgraded structure include:

   - Substantial increase of seismic hazard level at the site
   - New discovery of site seismicity
   - New discovery of potential seismic deficiencies in the structure
   - Significant deterioration of existing materials in the structure

### Progress to date

A comprehensive inventory list of Metropolitan's above-ground structures is used to track the progress of the evaluation and seismic upgrades of structures. To date, Metropolitan has completed preliminary evaluations of all 311 pre-1990 above-ground structures (see **Figure 4-1**). Upgrades of many critical structures have also been completed, including the five pumping plants along the Colorado River Aqueduct, the Jensen Administration Building, and the Lake Mathews Outlet Tower.

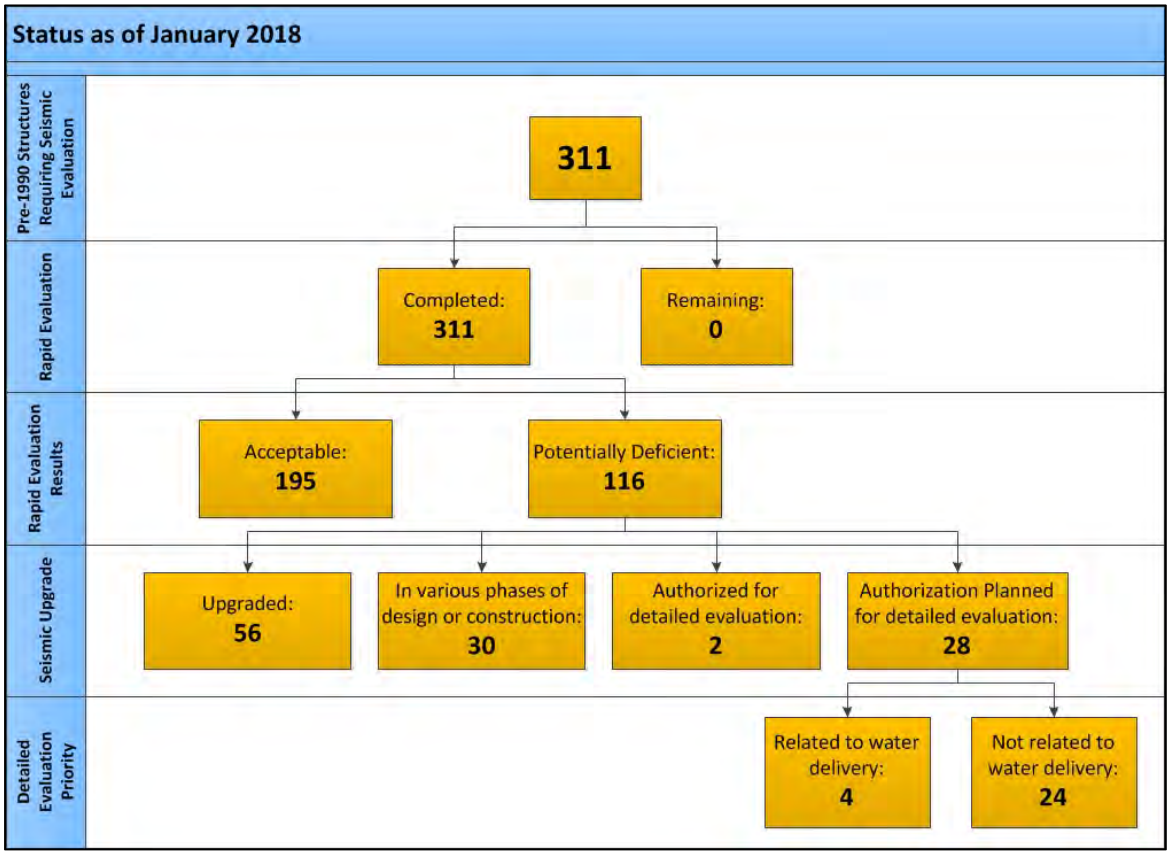


**Figure 4-1: Status of Seismic Assessments and Upgrades of Pre-1990 Structures**

As shown in the figure, of the 116 structures identified as potentially deficient, 56 have been upgraded and 32 are authorized for study, design or construction. The remaining 28 structures will proceed through Metropolitan's CIP evaluation process to obtain authorization for the detailed evaluations. Since 1998, Metropolitan has invested over $200M in seismic upgrades of its key structures.

### Expanded Approach for Achieving Seismic Resilience of Structures

In 2017, the strategy for achieving the seismic resilience of structures was modified to further enhance the seismic resilience of the delivery system. The refined strategy moved beyond assessing only Pre-1990 above-ground structures to include the following:

- Fully and partially buried structures
- Seismic anchorage and bracing of non-structural components such as equipment, pipes, and ducts.
- Structures constructed between 1990 and 2000 (prior to the adoption of UBC1997)

For the first two items, it was recognized that fully and partially buried structures, while less vulnerable to seismic hazards than above-ground structures, are nevertheless important to maintaining system reliability. Similarly, the seismic resilience of non-structural components, such as equipment and piping, is also important for minimizing operational downtime after an earthquake.

The third item, relating to UBC1997, is included in the expanded effort since seismic design codes have been modified such that some structures designed and constructed after 1990 also warrant an assessment. Recorded ground motions in the 1994 Northridge Earthquake, for example, revealed that the design seismic force specified in building codes at the time were underestimated for sites located close to faults. This near-fault effect was incorporated into the subsequent code (UBC 1997). As a result, certain structures designed between 1990-2000 prior to the adoption of UBC 1997 may be vulnerable to a major earthquake.

Moving forward, the near-term focus is to complete the detailed evaluations and seismic retrofit projects that have been authorized to date. Long-term goals include:

- Continue assessment of seismic design criteria to incorporate updated seismic resilience strategy
- Document a systematic approach to improve seismic resilience of non-structural components
- Conduct preliminary evaluations for critical fully or partially buried structures
- Conduct preliminary evaluation of post-1990 structures.

## Special Seismic Assessments

Special seismic assessments are performed to complement the original seismic resilience of structures evaluations. These special assessments include seismic vulnerability evaluations, general reliability assessments, and system flexibility studies.

**Seismic Vulnerability Evaluations**. Seismic vulnerability evaluations identify potential impacts of credible earthquake scenarios on individual facilities and the system as a whole. For these studies, staff review current and readily available seismic hazard data from public, academic, state, and federal sources, as well as input from geotechnical consultants, to screen each facility or system (e.g., the CRA) for its level of exposure to seismic hazards (i.e., surface displacement, ground shaking, liquefaction, and landslides)

during a major seismic event. Based on the potential level of exposure and the resulting damage to Metropolitan facilities, the time to restore service are estimated. These studies then evaluate the impact of the damage on Metropolitan's water delivery capability and identify areas with limited backup capability to provide water while the facility is out of service. Improvements that could reduce the loss of service, and/or reduce the time to restore service, are then identified and prioritized.

Findings from these evaluations can lead to capital improvements to strengthen facilities, improve system flexibility, and/or provide input into Metropolitan's emergency response planning to improve the seismic resilience of the distribution system.

To date, Metropolitan has completed over ten seismic vulnerability studies. A few examples are listed below, while a complete list with a brief summary of each study is included in Appendix 7.

**The 2014 Potential Impact of a Seismic Event on the CRA Tunnels validated historic assumptions regarding potential outage durations for the CRA tunnels.**

- *Seismic Risk Assessment of Local Water Production Facilities in the Service Area of Metropolitan Water District of Southern California,* January 14, 1991, Dames & Moore
- *Probable Maximum Loss Analysis for Metropolitan Water District of Southern California*, September 1998, EQE International
- 2009 Report No. 1335: *Effects of Southern California Seismic Events on Metropolitan Water District Deliveries*
- 2014 Report No. 1490: *Colorado River Aqueduct Seismic Vulnerability Investigations – Summary Report*
- 2017 Report No. 1533: *Seismic Risk Assessment – Conveyance and Distribution System Tunnels*

**General Reliability Assessments.** The vulnerability of Metropolitan's facilities to damage from major seismic events is also evaluated through general reliability assessments. The objective of these assessments is to examine the vulnerability of facilities to unplanned service interruptions from the following hazards and events:

| | |
|---|---|
| Seismic activity | Fire |
| Hydraulic surge | Corrosion |
| Vehicle impact | Wind-blown projectiles |
| Equipment malfunction | Third-party construction |
| Erosion/Scour/Flooding | Vandalism |

The assessments are based on compiling data collected from several sources and evaluating the information to identify vulnerabilities that may damage a facility and impact water deliveries. The sources of information include prior reliability studies conducted for the facility; the facility's piping and

instrumentation diagrams, electrical single-line drawings and plant layout drawings; interviews with Water System Operations and Engineering Services staff; reviews of corrective maintenance reports, reviews of CIP projects; and field inspections of the facilities.

The general reliability assessments focus on the following when relating to seismic activities:

- Assessing the ability of individual equipment and piping within the facilities to withstand an earthquake
- Reviewing potential soil stability issues that might affect earthquake vulnerability with Metropolitan's geotechnical staff
- Reviewing the ability of existing critical structures (i.e., tanks, treatment basins and pump house buildings) to withstand a seismic event

After identifying potential vulnerabilities to specific hazards and events, staff categorize the vulnerabilities based on the potential service impacts and identify options to mitigate the vulnerability and improve reliability. Mitigation steps include conducting capital projects to rehabilitate, replace, or upgrade equipment and facilities; performing operation and maintenance (O&M) activities for minor equipment modifications; creating procedures for designing, operating or maintaining the facility; and refining Metropolitan's emergency response plan. These options are prioritized based on their potential impact on the operation of the facility and are considered for evaluation and action. The cost and benefit of options that involve capital projects are evaluated through the normal CIP evaluation process.

Metropolitan has completed a total of eight general reliability assessments to date, including assessments of the CRA, all five water treatment plants, the conveyance system, and portions of the distribution system. A few examples are listed below, while a complete list with a brief summary of each study is presented in Appendix 7. As the understanding of earthquake probability and seismic forces continues to increase, these studies will be periodically updated.

- 2006 Report No. 1227: *Distribution System Reliability Assessment*
- 2006 Report No. 1255: *Weymouth Water Treatment Plant Reliability Assessment*
- 2006 Report No. 1297: *Colorado River Aqueduct Reliability Assessment*

**System Flexibility Studies**. System flexibility studies identify:

1. The impacts of regional facility outages on water deliveries to member agencies
2. Areas with limited flexibility to serve water, which may impact deliveries during an outage
3. Options to improve system flexibility (e.g., interconnections with other agencies, local resource development, or isolation valves).

These studies postulate outages to Metropolitan and DWR facilities, assign a reasonable duration to the outage based on past experience, and then evaluate the impact of the assumed outage on water deliveries through the following steps:

1. Identify service connections affected by an outage
2. Evaluate Metropolitan options to deliver water to the affected service connections

3. Evaluate member agency backup options (e.g., wells, treatment plants, surface storage, interconnections with other agencies) to deliver water to affected service connections
4. Quantify the impact of each outage in terms of loss of retail service to affected service connections, and identify service connections and/or regions with limited or no backup capability
5. Identify options to mitigate the impact of the outage and improve system flexibility to respond to planned and unplanned outages

The results of these studies support member agencies' efforts to improve local system reliability in the event of a planned or unplanned outage of a Metropolitan facility; support joint efforts of Metropolitan and its member agencies in evaluating the reliability benefits of potential projects; and support Metropolitan's efforts to identify options to improve operational flexibility.

Two significant system flexibility studies have been completed to date:

- **System Reliability Study (2006).** This study evaluated the flexibility of Metropolitan's overall distribution system. The study examined the impact of single failures in the system to the ability to deliver water to member agencies and identified existing backup options to deliver water during the outage. Specific types of failures considered in the study included individual facility failures (e.g., the CRA, a treatment plant, a reservoir) and failures in each isolatable segment of the distribution system (e.g., pipelines). Over 250 different postulated events were considered, and the impact on delivery to each service connection was evaluated for each event. The study considered the capabilities both within Metropolitan's system as well as the member agencies' to mitigate impacts of an outage. The study did not, however, consider multiple failures that might be associated with an earthquake, due to the almost unlimited number of combinations of failures that would have to be considered. Metropolitan and member agency discussions regarding this study and local and regional obligations led to a clarification about Administrative Code 4503 "Suspension of Deliveries" that is included in Appendix 8.
- **Mills Water Supply Reliability Study (Report No. 1337).** One of the findings of the 2007 Integrated Area Study was that the supply of raw water to the Mills plant had a lesser degree of redundancy than Metropolitan's other water treatment plants. The Mills Water Supply Reliability Study was undertaken to evaluate conditions that could interrupt the normal raw water supply to the Mills plant, such as earthquakes, and develop options to improve the redundancy and flexibility of supply to the plant.

## Seismic Resilience of Dams and Reservoirs

The seismic stability of Metropolitan's dams is safeguarded by a robust and proactive comprehensive dam safety strategy managed by the Safety of Dams Team. The core responsibilities of the Safety of Dams Team are to perform inspections, interpret and analyze collected surveillance and monitoring data, evaluate dam structures and appurtenant works, report the findings, and serve as Metropolitan's liaison with the California Department of Water Resources, Division of Safety of Dams (DSOD).

Metropolitan owns and operates 20 facilities that are under the jurisdiction of DSOD, as listed in Table 4-1. There are a total of 24 individual dams/reservoirs, as some of these facilities have multiple dams.

**Table 4-1: Current Metropolitan Jurisdictional Dam and Reservoir Facilities**

| Dam/Reservoir Name | Dam Type |
|---|---|
| Cajalco Creek Detention Basin | Flood Control |
| Copper Basin Reservoir | Surface Water Reservoir |
| Diamond Valley Forebay | Hydraulic Structure |
| Diamond Valley Lake | Surface Water Reservoir |
| Diemer Mixing & Settling Basin No. 8 | Hydraulic Structure |
| Diemer Ozone Contactor Basins | Hydraulic Structure |
| Diemer Treated Water Reservoir | Hydraulic Structure |
| Garvey Reservoir | Surface Water Reservoir |
| Gene Wash Reservoir | Surface Water Reservoir |
| Goodhart Canyon Detention Basin | Flood Control |
| Lake Mathews | Surface Water Reservoir |
| Lake Skinner | Surface Water Reservoir |
| Live Oak Reservoir | Surface Water Reservoir |
| Mills Reclamation Basin No. 14 | Hydraulic Structure |
| Mills Treated Water Reservoir No. 1 | Hydraulic Structure |
| Mills Treated Water Reservoir No. 2 | Hydraulic Structure |
| Orange County Reservoir | Surface Water Reservoir |
| Palos Verdes Reservoir | Surface Water Reservoir |
| Skinner Treated Water Reservoir | Hydraulic Structure |
| Weymouth Treated Water Reservoir | Hydraulic Structure |

### Metropolitan's Comprehensive Dam Safety Management Program

Metropolitan's comprehensive dam safety strategy is comprised of six key elements:

1. Regular detailed inspections
2. Surveillance monitoring and performance reporting
3. Cyclical facility assessments
4. Emergency preparedness
5. Inundation map preparation
6. Execution of capital projects

#### *Regular Detailed Inspections*

Regular detailed inspections are essential to preserve the integrity of a dam and are necessary for early problem detection and remediation. All Metropolitan dams are regularly inspected by Metropolitan staff at specific intervals using a formal, multilayered process:

- Daily or weekly observations
- Monthly inspections of dam and reservoir facilities with the highest DSOD designated hazard classification, with at least semi-annual inspections of all other facilities
- Detailed mandatory annual inspections conducted in the presence of DSOD staff

Upon completion of the annual DSOD inspections, DSOD prepares and provides a summary inspection report that summarizes their findings and may identify recommended remedial work, which is cataloged as action items that are corrected promptly.

### *Surveillance Monitoring and Performance Reporting*

All Metropolitan dams and reservoirs incorporate instrumentation that measures specific performance parameters such as dam or structural movement, water levels, and seepage, as well as other parameters such as shaking due to earthquakes. Collected data are retained as part of the required annual DSOD inspection report.

In terms of seismic resilience, data from surveillance monitoring and performance reporting contribute to the Cyclic Facility Assessments described below by identifying changes in specific parameters, such as dam or reservoir movement or increased seepage, that may indicate a condition that could affect the ability of the dam or reservoir to withstand an earthquake.

### *Cyclical Facility Assessments*

Cyclic facility assessments were initiated at Metropolitan in 2004 and are generally repeated about every 10 years. These assessments use the most up-to-date data and evaluation criteria to identify potential vulnerabilities in dam embankments, dam structures, foundations, outlet facilities and spillways and develop mitigation options, if necessary. If a potential vulnerability or deficiency is identified, a rehabilitation or remediation project may be included in Metropolitan's CIP.

An example of a facility assessment that evolved into a project under Metropolitan's CIP is the Lake Mathews Outlet Tower. The outlet tower, which is critical for water deliveries to a large portion of Metropolitan's service area, was constructed in 1938 and modified in 1961 to increase its height by 30 feet. A facility assessment conducted in 1994 determined that the modified tower was vulnerable to significant damage from ground shaking. A project was authorized to evaluate and address this vulnerability, resulting in a new seismically resilient Outlet Tower being constructed in 2005.

**New and Old Outlet Towers at Lake Mathews (2008)**

### *Emergency Preparedness*

Metropolitan has a comprehensive Emergency Action Plan (EAP) for each of its dam and reservoir facilities. The EAP identifies potential emergency conditions that could occur at a dam or reservoir facility and describes procedures to be implemented to minimize loss of life and property damage. EAPs serve to provide guidance to responders, local agencies, and stakeholders in evaluating potential hazards, determining the severity of the emergency, and establishing communication protocols. Required content of dam EAPs are provided in the Federal Emergency Management Agency's (FEMA) Federal Guidelines for Dam Safety, Emergency Action Planning for Dams (FEMA 64, July 2013).

### *Inundation Map Preparation*

Inundation maps illustrate worst-case flooding that would result in the complete draining of a full reservoir. Inundation maps show lateral and longitudinal extent of flooding, flood wave arrival times, maximum flood wave depths, total flooding duration, and peak flood flow rates. Inundation maps are a required component of dam and reservoir EAPs and are used by local emergency response agencies for emergency planning purposes.

Metropolitan's current cycle of inundation mapping updates is planned to be completed by 2018 for all dam and reservoir facilities.

### *Execution of Capital Projects*

Dam and reservoir facility vulnerabilities or deficiencies that are identified during detailed inspections or from cyclical assessments are proposed for rehabilitation or remediation through Metropolitan's CIP. Past examples of facility rehabilitation or remediation projects include the Lake Mathews Outlet Facilities, described earlier, and the Seismic Upgrade of the Diemer Finished Water Reservoir.

Currently, several dam and reservoir related capital projects are in progress, including the final design of the outlet valve replacements at Copper Basin and Gene Wash Reservoirs and the construction of the Palos Verdes Reservoir floating cover replacement and tower seismic upgrades. Planned future projects include floating cover replacements and facility upgrades for the Mills Finished Water Reservoir Nos. 1 and 2 and Garvey Reservoir.

## Pipeline Seismic Resilience

Metropolitan's pipelines are exposed to a number of geohazards of varying risk, including fault zone crossings, permanent ground deformation from causes such as liquefaction or landslides, and ground shaking during seismic events. While Metropolitan's pipelines have always been constructed in conformance with standards of practice at the time of design, there haven't been code requirements to address seismic risk. In addition, until recently, there have not been mitigation options for large diameter pipelines.

**The photograph on the left shows a pipe joint pullout due to liquefaction from 1995 in Kobe, Japan. (photo courtesy of D. Ballantyne, *Understanding the Seismic Vulnerability of Water Systems*, Regional Water Providers Consortium Board, October 2013)**

**The photograph on the right shows pipe damage at a fault crossing (photo courtesy of D. Ballantyne, *Understanding the Seismic Vulnerability of Water Systems*, Regional Water Providers Consortium Board, October 2013)**

There are currently several seismic resistant pipeline options, such as earthquake resistant ductile iron pipelines with special seismic resistant joints (see **Figure 4-2**), that are becoming available in diameters suitable for use by Metropolitan.

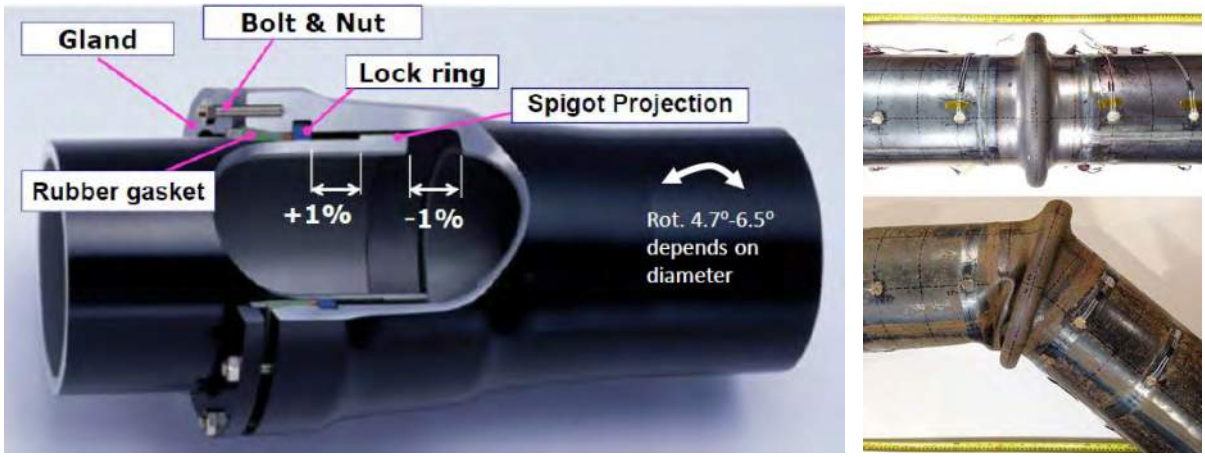


**Figure 4-2: Example of Seismic Resistant Pipe (courtesy of Kubota Corp. and JFE)**

As mentioned previously, Metropolitan is now formalizing a strategy to achieve significant improvements in seismic resistance of the distribution system over time. This approach takes advantage of up-to-date seismicity data, modern computer modeling techniques, recently developed seismic resistant products, extensive industry research, and updated codes.

The seismic resilience strategy for pipelines has three components:

1. Part 1 – Conducting vulnerability assessments of the existing distribution system
2. Part 2 – Identifying potential mitigation measures for existing pipelines
3. Part 3 – Establishing design and performance criteria for new pipelines and rehabilitation projects

Parts 1 and 2 are described below in more detail. Part 3 for new pipelines will be developed in conjunction with several new large-diameter pipeline projects that are planned over the next 5 to 10 years.

*Part 1 –Vulnerability Assessment of Existing Pipelines:* Due to the relatively good performance of large-diameter pipelines within Metropolitan's distribution system during previous earthquakes, Metropolitan is focusing on the most vulnerable existing pipelines to establish the need and priority of future mitigation work as well as integrating seismic mitigation into planned rehabilitation programs for aging pipelines. This approach is currently being followed for the PCCP Rehabilitation Program. It is anticipated that there will be relatively few cases where it would be considered cost-effective to upgrade a pipeline solely to enhance seismic resilience.

Vulnerability assessments of pipelines within the distribution system follow the same multi-step approach used for traditional risk assessments. The initial steps entail gathering available geologic, seismologic, and geodetic data, and then identifying seismic hazards along a pipeline route, such as fault zone crossings, liquefaction zones, and landslide hazards. Three simulated earthquake scenarios are considered in the evaluation: a frequent seismic event, moderate event, and a severe event. The hazard assessment provides a bounded solution that includes the expected probable and maximum probable damage for each earthquake scenario.

The resulting damage to the pipeline due to the three design seismic scenarios provides an insight into the corresponding consequences of disruption. These consequences include life-safety impacts, delivery impacts, and societal/environmental impacts.

Preliminary screening is then performed to identify the most vulnerable pipelines that warrant further analysis. Depending on the nature of the seismic hazard, Metropolitan may perform a preliminary assessment using a simplified analysis based on probable ground strain and pipeline material properties. However, in some cases, a more detailed finite element model is required to fully determine the behavior of the pipe and the surrounding support strata under seismic shaking. This comprehensive analysis includes soil-structure interaction, rupture modeling, and permanent pipeline deformation.

For any pipelines that do not meet the performance objectives, mitigation measures are considered. The order and timing of projects to mitigate risks as part of the overall rehabilitation strategy are evaluated and prioritized for inclusion in Metropolitan's CIP.

*Part 2 – Mitigation Measures for Existing Pipelines:* Where mitigation is recommended to minimize the consequences of service disruption, the general design goals are to design pipe segments and joints that can withstand projected vertical and horizontal movement. In most cases, a simplified analysis will provide sufficient insight into seismic performance; however, in some cases, it may be necessary to analyze the pipeline and connecting structures using a more comprehensive computer model.

Existing continuous welded steel pipe with adequate wall thickness and joint welds typically perform well under significant ground shaking. Where mitigation of existing pipelines is required to achieve acceptable seismic performance, Metropolitan may use specialized earthquake resistant joints as an option. Where these joints cannot achieve acceptable seismic performance, other options may include stiffening of the joints and pipe section; and enlarged vault sections to isolate the pipe from maximum ground deformation. Metropolitan may also evaluate alternate alignment options to relocate existing pipes, if feasible, to avoid areas of known fault crossings or expected permanent ground deformation that may result in significant disruption. Where these options are not feasible and seismic risk is not within acceptable limits, Metropolitan may consider installation of isolation valves or addition of a vault with a removable pipe spool to allow quick insertion of a bulkhead to facilitate shutdown and repair of the damaged section of pipe

*Part 3 – Design Guidelines for New Pipelines:* The guidelines for new pipelines will be similar in concept to existing pipelines and will be developed in conjunction with several new large-diameter pipeline projects that are planned over the next 5 to 10 years.

# SECTION 5 OPERATIONS COMPONENT

Metropolitan is prepared to respond to all types of emergencies through its Emergency Management and Business Continuity Operating Policy A-06. Key elements of this policy include IT Disaster Recovery, Business Continuity and Emergency Response functions. This section focuses on the Emergency Response functions due to specific steps in this area that pertain to seismic resilience.

## Emergency Response Organization

Metropolitan maintains a dedicated Emergency Operations Center (EOC) that can be activated at any time to manage Metropolitan's response to a large disaster, including seismic events. The EOC is equipped with multiple modes of communication and coordinates directly with Metropolitan's Operations Control Center (OCC) and Security Watch Center (SWC), as well as with numerous external agencies. For example, the EOC would coordinate with DWR and LADWP, as well as other related agencies, in the event of one or more aqueducts being damaged by an earthquake on the San Andreas Fault, as further explained in the next section.

Metropolitan also has Incident Command Centers (ICCs) located at various facilities. These ICCs can also be activated at any time to manage localized emergencies, and will coordinate directly with the EOC during a major disaster. Metropolitan also has Damage Assessment Teams (DATs) that that can be called upon by the ICCs to conduct investigations at incident sites. The DATs consist of engineers who can assess damage and initiate engineering responses, including recommendations for short-term repairs or work-arounds and potential designs for permanent, long-term repairs.

The Emergency Response Organization (ERO), illustrated in **Figure 5-1**, is comprised of over 200 pre-designated employees who work in the EOC, the ICCs, or in the field during emergencies. ERO staff has completed specialized training that meets State and Federal requirements.

Metropolitan's emergency response structure follows the National Incident Management System (NIMS) and the State of California's Standardized Emergency Management System (SEMS).

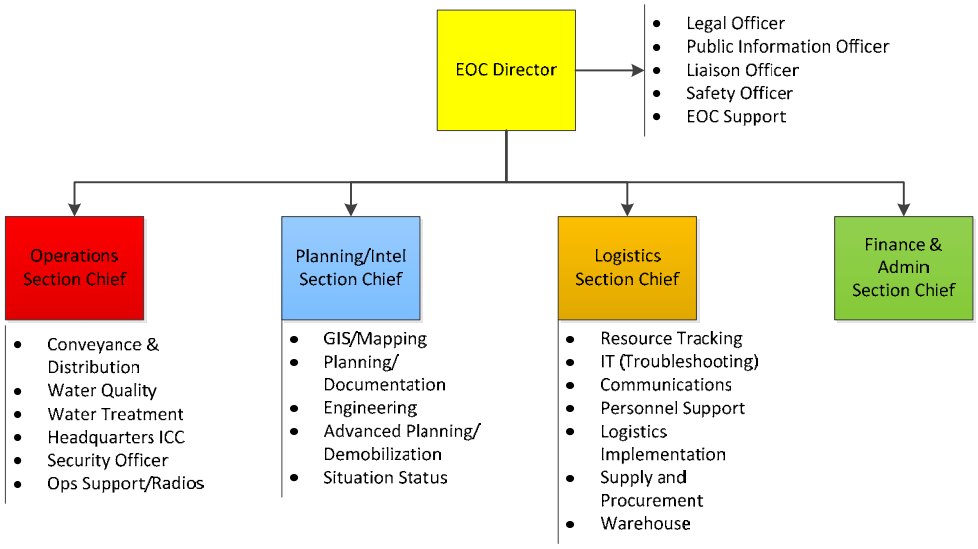


**Figure 5-1: Metropolitan's Emergency Response Organization**

**Photographs from recent emergency exercises at the EOC**

## Emergency Response Training Exercises

In addition to training emergency response staff on NIMS procedures, Metropolitan regularly conducts emergency response training exercises which have often been based upon a postulated seismic event. Examples include:

- "Resilient Grid" Functional Exercise, 19 Oct 2017
- "Can you hear me now?" Full Scale Communications Exercise, 08 Apr 2017
- "Desert Shake" Functional Exercise – 04 Nov 2015 (Metropolitan and seven other agencies)
- "Oh Susana!" Functional Exercise – 05 Nov, 2013 (Metropolitan and four other agencies)
- "Golden Guardian" Functional Exercise – 20 Jun 2012
- "California Rolling" Mini Functional Exercise – 08 Oct 2008
- "Hollywood Havoc" Functional Exercise – 04 April 2007
- "Mayhem at Mathews" Tabletop Exercise – 15 Mar 2006 (Metropolitan and four other agencies)

In 2017, Metropolitan completed a five-year exercise plan that allowed all of its member agencies to participate in at least one of Metropolitan's annual emergency exercises during that period. Metropolitan also conducts approximately 50 tabletop and functional exercises each year. This includes three large-scale emergency exercises per year for the EOC and for each of the 12 ICCs. There are also monthly communication drills (includes Member Agency Response System (MARS) two-way radio, internal Metropolitan radio system, WebEOC updates, mass notification system, and satellite phones) with member agencies, ICCs, Treatment Plant Control Centers, and DWR facilities. These regular exercises, as well as monthly radio and communications tests with member agencies and other outside agencies, help Metropolitan to continually improve its readiness.

## Emergency Response Construction Capabilities

Metropolitan maintains the capability to perform rapid repair of damaged facilities such as large pipelines for up to two simultaneous repairs. The machine, fabrication, coating, and valve shops at the La Verne

Shops are used extensively to support system-wide maintenance; to provide emergency services within Metropolitan, for member agencies, and for DWR; and to perform fee-for-service work that supports member agencies and the State Water Project. The fabrication shop can roll pipe on a 24-hour-per-day basis. In 2015, Metropolitan expanded the La Verne Shops to enable the fabrication of two pipe sections up to 12 feet (3.7 meters) in diameter simultaneously, and has been developing standardized pipeline repair drawings and shoring drawings to expedite repair operations.

Metropolitan also maintains stockpiles and materials on hand, and has its own construction equipment and crews ready to mobilize if necessary. Pre-selected urgent repair contractors can also provide additional construction support in case of an emergency. Maintaining these manufacturing and construction capabilities supports Metropolitan's efforts to efficiently operate and maintain its infrastructure and to quickly repair components or systems that may be damaged.

**Pipe being rolled at Metropolitan's La Verne Shops**

**Metropolitan construction crews**

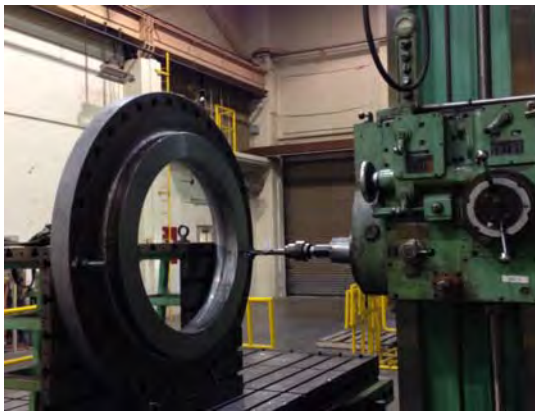

**42" x 30" adapter flange being drilled at Metropolitan's La Verne Shops**

**Stocks of steel plate allow Metropolitan to roll pipe of various diameters and wall thicknesses**

# SECTION 6 REPORTING COMPONENT

The reporting component of Metropolitan's seismic resilience strategy focuses on the following areas:

1. Record Keeping: Tracking progress and maintaining a record of expenditures
2. Annual Updates: Providing annual updates to Metropolitan's Board of Directors
3. Formal Reporting: Preparing a formal Seismic Resilience Biennial Report

## Record Keeping

The Record Keeping component involves tracking progress on key seismic activities and maintaining a detailed record of all investments and expenditures related to seismic upgrade projects.

Key seismic resilience activities include the planning, engineering, operations, and Task Force component near-term goals identified in Section 8. Specific activities include:

- Special planning studies related to seismic resilience
- Seismic evaluations of structures, facilities, and regions
- Designs for seismically upgrading structures/systems and related construction activities
- Emergency response training exercises
- Development of new seismic performance objectives
- Joint efforts with external agencies through the Task Force

For each of these activities, progress will be tracked and reported on at regular intervals. In addition, the cumulative cost of capital investments in seismic upgrade projects will be tracked and reported on annually.

## Annual Updates

Staff will update Metropolitan's Board of Directors on an annual basis. The annual update will focus on current seismic resilience issues, recent Metropolitan and Task Force accomplishments, and near-term goals.

## Formal Reporting

The biennial report will summarize seismic resilience objectives, goals, and accomplishments; consolidate key reference material; and provide a high-level summary of the various activities related to seismic resilience throughout Metropolitan. Specific areas of emphasis will include:

- Knowledge Transfer: The biennial report will provide a convenient, comprehensive source for seismic resilience information. The report will contain key information for all seismic resilience efforts throughout Metropolitan, and will include a list of all formal Metropolitan reports on seismic issues. Individuals can use this information to familiarize themselves with Metropolitan's seismic resilience history, issues, and goals, which will make them more effective in supporting seismic resilience efforts.

- Accountability: Through annual reporting to the Board, seismic resilience programs will maintain a higher degree of visibility, focus and momentum on projects and studies that will help Metropolitan meet target goals.
- Transparency: The sharing of seismic resilience studies, projects, and performance objectives will benefit the facility planning efforts of member agencies. Seismic risk, mitigation, and projected duration of outages are complex issues that deserve adequate discussions between Metropolitan and member agencies to facilitate decisions and investments that best serve the public.

This summary report will be updated every two years.

# SECTION 7 SEISMIC RESILIENCE WATER SUPPLY TASK FORCE

The City of Los Angeles has recently increased its focus on seismic risks and public safety. In December 2014, the city released the report, "Resilience by Design," which highlighted Los Angeles' earthquake vulnerabilities and laid out strategies to protect lives; improve the capacity of the city to respond to earthquakes; prepare the city to recover quickly from earthquakes; and protect the economy of Los Angeles and all of Southern California.

A concern noted in "Resilience by Design" is the importance of water infrastructure and the unique dependence of the region upon imported water supplies, all of which cross the San Andreas Fault. The report included a recommendation to fortify the imported water aqueducts by creating a Seismic Resilience Water Supply Task Force (Task Force) with the LADWP, Metropolitan, and DWR.

In August 2015, the three agencies formed the Task Force for the purpose of collaborating on studies and mitigation measures to improve the seismic resilience of imported water supplies to Southern California. The Task Force is comprised of managers and staff from the planning, engineering, and operations functional groups of each agency, and includes executive management on a steering committee. The Task Force also coordinates with other agencies and utilities.

The Task Force created a structure (**Figure 7-1**) that includes functional sub-teams that will focus on aqueduct assessments and mitigation, emergency response, and public relations in the near-term. The Task Force also recognized the benefit of long-term collaboration regarding 'non-aqueduct' assessments and mitigation, and agreed to discuss such issues as they arise.

The initial Task Force goals include:

- Establishing a common understanding about individual agency aqueduct seismic vulnerability assessments, projected damage scenarios, and planning assumptions
- Revisiting historical assumptions regarding potential aqueduct outages due to seismic events
- Discussing opportunities for improving the seismic resiliency of Southern California's imported water supplies through multi-agency cooperation

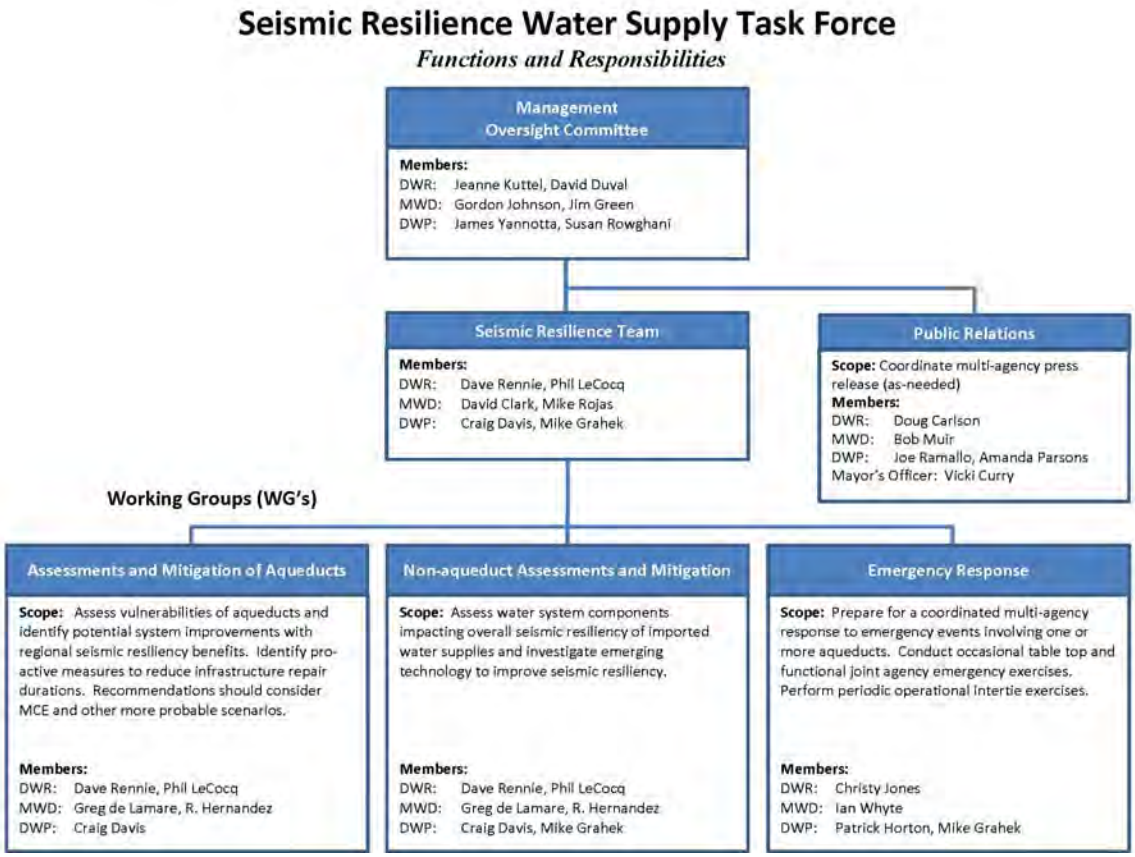


**Figure 7-1: Seismic Resilience Water Supply Task Force**

One of the initial activities for the Task Force was to conduct a workshop that would allow the three agencies to establish a common understanding about each agency's seismic vulnerabilities; revisit historical planning assumptions; and identify action items that would lead to increased seismic resilience moving forward. The workshop is summarized below.

## 2016 Aqueduct Workshop

On March 30, 2016, the Task Force held an Aqueduct Workshop at Metropolitan's Headquarters Building in Los Angeles. The purpose of this workshop was to discuss potential damage to Southern California's imported water aqueducts from a major seismic event on the San Andreas Fault. The discussion focused specifically on the Great Southern California ShakeOut Scenario (ShakeOut) of a M7.8 earthquake, developed by the U.S. Geological Survey (USGS) and many partners. The workshop format allowed for a candid exchange of information and ideas between staff from the three agencies, along with LADWP's Seismic Resilience and Sustainability Program's Expert Panel that included experts from industry and academia.

Participants were asked to consider preparations for, and response to, the ShakeOut Scenario from a regional perspective. Specifically, participants were asked, "If all aqueducts were owned and operated by a single agency, then what steps should be taken now to mitigate potential damage, and what would the priority of repairs be following a major seismic event to most rapidly restore imported water deliveries to the region?" This focus on actions that would best serve the region led to productive discussions and practical recommendations for the three agencies to improve the resilience of imported water supplies.

The assembled team concluded that for a M7.8 ShakeOut Scenario event on the southern portion of the San Andreas Fault, the recovery times would exceed historic planning assumptions:

- Restoration of full aqueduct capacities could take more than six months
- Restoration of partial aqueduct flows could take at least two months

**The March 30, 2016 Task Force Workshop at Metropolitan's Headquarters Building**

When considering this specific scenario from a regional perspective, the participants concluded that residents within Metropolitan's service area would be best served if the three agencies:

- Implement recently identified mitigation projects on the Colorado River Aqueduct and Los Angeles Aqueduct
- Prioritize known vulnerabilities on the Colorado River Aqueduct, Los Angeles Aqueduct, and the State Water Project
- Execute an agreement to allow for a coordinated response to emergency events
- Share resources when responding to emergency events
- Focus initial repair efforts on the State Water Project's West Branch and the Colorado River Aqueduct*

(*This is based on a ShakeOut-type event; it is recognized DWR will also have a priority to serve other customers on the East Branch)

LADWP's Seismic Resilience and Sustainability Program's Expert Panel noted the significance of the nation's largest municipal utility, largest water wholesaler, and largest state-owned water agency joining together to address a major hazard for the first time, and encouraged the Task Force to continue working together long into the future. The assembled team agreed that Southern California could become better prepared for seismic events and that the Task Force should continue to facilitate coordinated vulnerability

assessments, evaluate mitigation options, and develop agreements that allow coordinated emergency responses to major seismic events. It was clear that common issues could be studied more efficiently together and there was a consensus for the Task Force to continue to maintain the momentum achieved through this workshop. Although the regional challenge of achieving a greater level of seismic resiliency is significant, the consensus was that it would be achievable through the continued, dedicated efforts of the Task Force.

## Future Task Force Activities

To continue the momentum built during the collaborative workshop, the Task Force agreed to conduct conference calls every two months and to initiate a repeating 5-year cycle of planning, executing, and reporting on collaborative goals, activities and accomplishments. This approach is aimed at providing effective management of long-range actions and ensuring task force stability.

The first cycle has included preparation of a detailed report that summarized the 2016 Workshop and identified goals for the period between April 2017 and March 2022. The second cycle will report on progress achieved between 2017 and 2022, and will identify goals for the period between 2022 to 2027.

The high-level goals for 2018 to 2019 are included in Section 8 of this report.

# SECTION 8 SEISMIC RESILIENCE PERFORMANCE OBJECTIVES AND NEAR-TERM GOALS

This section summarizes Metropolitan's established performance objectives for the various components of seismic resilience, along with corresponding near-term goals. The goals listed are those that are anticipated to be completed in calendar years 2018 and 2019.

Established Performance Objectives and Near-Term Goals:

- System Level
- Facility Level
- Emergency Response
- Task Force

Other Near-term Goals:

- Establish Additional Performance Objectives
- Develop a Standard Approach for Evaluating Non-Structural Elements
- Enhance Member Agency Planning Efforts
- Seek Funding for Identified Projects
- Support California WaterFix

## Established Performance Objectives and Near-Term Goals

Seismic resilience performance objectives are summarized in this section along with the corresponding near-term goals.

### System Level

System-level seismic resilience performance objectives and near-term goals focus on two areas: System Flexibility and Regional Supply Interruption/Emergency Storage.

#### *System Flexibility*

There are two primary components of system flexibility that contribute to seismic resilience:

1. Operational flexibility - the ability to accommodate short-term changes in regional supply, water quality, or member agency demands, and
2. Delivery flexibility - the ability to maintain deliveries to member agencies during single regional facility planned or unplanned outages.

Metropolitan will continue to develop a demand-driven, flexible regional system aimed at meeting demands, while reducing the impacts of regional infrastructure outages. Regional delivery flexibility improvements will be achieved through demand-driven projects.

| System Flexibility Goal | |
|---|---|
| 2019 Goal: | Conduct Rialto Pipeline Alternative Supply Needs study |
| This study will identify potential near-term and long-term options to meet municipal and industrial (M&I) demands supplied exclusively from the Rialto Pipeline system in the event of a disruption of supplies from the California Aqueduct, East Branch. | |

*Emergency Storage*

**Performance Objectives**: Metropolitan's objectives for emergency storage include maintaining a six-month supply of water to account for interruption of imported water supplies (assuming a 25% reduction at the retail level).

| Emergency Storage Goals | |
|---|---|
| 2019 Goal: | Complete a re-evaluation of Metropolitan's emergency storage needs |
| This study will re-evaluate Metropolitan's emergency storage requirement based on updated assumptions on potential outage durations for the State Water Project and the Los Angeles Aqueduct. The latest projections for the worst case scenario are that Metropolitan's Colorado River Aqueduct can be repaired within 6 months, LADWP's Los Angeles Aqueduct within about 18 months, the West Branch of the SWP within 6-12 months and the East Branch of the SWP within 12-24 months. | |
| 2019 Goal: | Complete a comprehensive evaluation of Metropolitan's storage programs |
| This comprehensive evaluation will review all existing storage programs within Metropolitan | |

### Facility Level

Facility-level seismic resilience performance objectives and near-term goals are categorized based on functionality of facilities: essential facilities related to water delivery; supporting facilities with permanent staff, such as administration buildings; and supporting facilities without permanent staff, such as warehouse facilities.

*Essential Facilities (related to water delivery)*

**Performance Objectives:** Performance objectives for essential facilities include maintaining operation with minimum interruption after design-level events and controlling structural damage to facilitate recovery after extreme events.

| **Essential Facility Goals** | |
|---|---|
| Goal 1: | Complete construction of approved seismic upgrade projects |
| • Carbon Creek Pressure Control Structure (2018)<br>• Ten Control Structures along the Allen McColloch Pipeline (2018)<br>• Diemer Administration (Control) Building (2019)<br>• Five CRA Pumping Plant Switch Houses (2019) | |
| Goal 2: | Conduct studies, and complete design of approved upgrade projects |
| • Define the scope and approach for assessing potential seismic-induced damage to Metropolitan's water conveyance and distribution pipelines (2018)<br>- The purpose of the damage assessment is to estimate the number and severity of pipeline breaks and leaks during major earthquakes, and identify pipelines with the greatest risk for seismic damage. The results of the study will provide input into Metropolitan's emergency response planning activities, and will help prioritize future pipeline seismic resilience enhancements.<br>• Design of seismic upgrade for Weymouth West Wash Water Tank (2018)<br>• Design of seismic upgrade for Diemer West Filter Building (2018)<br>• Complete evaluation of options, design, and award of construction contract to strengthen the CRA Whitewater Tunnel No. 2 (2019)<br>- This work will include strengthening shallow tunnel sections near the portals, improving tunnel access at the west portal, prequalifying tunnel repair contractors, stockpiling steel sets, and pre-designing tunnel repair elements.<br>• Investigate options to improve emergency raw water bypass capabilities at Skinner, Weymouth, Jensen and Mills Water Treatment plants (2019)<br>• Vulnerability study of CRA electric transmission and distribution systems (2019)<br>• Design of seismic upgrade for the original portion of the Water Quality Lab in La Verne and the Weymouth Administration Building (2019) | |

### *Supporting Facilities with Permanent Staff*

**Performance Objectives:** Performance objectives for support facilities with permanently assigned staff include controlling structural damage to prevent casualties and severe injuries under design-level events and maintaining structural stability to prevent catastrophic collapse under extreme events.

| **Supporting Facilities (with permanent staff) Goals** | |
|---|---|
| Goal 1: | Expedite construction of approved seismic upgrade projects |
| • Headquarters Building seismic upgrades (award construction contract in 2018) | |
| Goal 2: | Complete approved studies and seismic upgrade designs |
| • Seismic upgrade to Field Engineering Building at La Verne (2019) | |

### *Supporting Facilities without Permanent Staff*

**Objectives:** Performance objectives for support facilities without permanently assigned staff include controlling structural damage to facilitate recovery after design-level events and maintaining structural stability to prevent catastrophic collapse under extreme events.

**Goals**: Metropolitan's near-term goal for improving the seismic resilience of support facilities without permanently assigned staff is to continue exploring opportunities of integrating seismic upgrade work of these relatively minor structures with future capital projects at the facility. At this time, no specific goals have been identified in this area.

### Emergency Response

**Objectives:** Metropolitan's objective is to maintain an effective emergency response organization and support facilities to ensure Metropolitan is prepared to respond to significant earthquakes. Regular training is conducted to ensure staff is prepared for actual events. Metropolitan maintains shop and construction crew capabilities to complete the repair of two simultaneous large diameter pipeline breaks within seven days. This capability is augmented by Metropolitan's ability to re-deploy its contractors and to call upon other agreements to repair four additional large diameter pipe breaks simultaneously within seven days (as well as repair other facility damages). These capabilities ensure Metropolitan is prepared to respond to significant earthquakes.

| **Emergency Response Goals** | |
|---|---|
| Goal 1: | Prepare and conduct emergency exercises |
| • Conduct a joint agency workshop to prepare a draft Joint Agency Response Plan (2018)<br>• Conduct high-level training for DWR, LADWP, and MWD staff on the Joint Agency Response Plan (2019)<br>• Run a functional exercise on the Joint Agency Response Plan (2019) | |
| Goal 2: | Execute a MOU to allow for a coordinated emergency response |
| • Prepare draft MOU and submit for review (2018)<br>• Secure LADWP, Metropolitan, and DWR approval for the MOU (2019) | |

### Task Force

| **Task Force Goals** | |
|---|---|
| 2018 Goals: | Collaborative LADWP, Metropolitan, and DWR Goals |
| • Discuss the applicability of lessons learned from seismic events in Japan, Chile, New Zealand, and Mexico<br>• Compare each agency's approach to conducting seismic assessments<br>• Meet with Southern California Edison (SCE) and Southern California Gas Co. to discuss the potential vulnerabilities of aqueduct power systems<br>• Conduct workshop to explore potential aqueduct interties | |
| 2019 Goals: | Collaborative LADWP, Metropolitan, and DWR Goals |
| • Establish a leadership structure for a coordinated response to major events<br>• Finalize a three-agency database of available emergency response resources<br>• Conduct a three-agency table top emergency exercise<br>• Develop a ShakeOut Scenario Response and Restoration Plan<br>• Conduct a second three-agency functional emergency exercise that includes energy utilities | |

## Other Near-Term Goals

Additional seismic resilience goals Metropolitan plans on achieving during 2018 and 2019 include:

1. **Develop a Standard Approach for Evaluating Non-Structural Elements (2019)**

   The Seismic Upgrade Program was expanded from its focus on pre-1990 above-ground structures to include post-1990 structures, partially buried structures, and non-structural components in essential facilities. The existing approach to evaluating pre-1990 structures is also applicable to the post-1990 and partially buried structures. However, a standard approach needs to be developed for evaluating the non-structural components within existing facilities, which involves equipment anchorages and bracing for piping, ducts, and cable trays.

2. **Establish Additional Performance Objectives (2019)**

   Metropolitan intends to establish seismic resilience performance objectives in the following areas:

   a) New pipelines

   b) Retrofit of existing Metropolitan pipelines, typically concurrent with rehabilitation projects

   c) New and existing tunnels

   Metropolitan is now in the process of developing a more comprehensive strategy for incorporating seismic mitigation into the design of its pipelines and tunnels. Although it is possible to clearly define performance objectives for above-ground structures, this process is more complicated for pipelines and tunnels for two reasons: 1) The performance of a pipeline or tunnel subjected to seismic forces is less well-defined than with structures, and 2) The performance needs of specific pipelines, pipeline segments, or tunnels vary widely due to Metropolitan's supply flexibility and the varied reliance on imported water by member agencies. Metropolitan will explore these issues in greater detail as it moves ahead with major capital programs, including the PCCP Rehabilitation Program. It is expected that by December 2019, Metropolitan will have established an approach for addressing seismic vulnerabilities during pipeline and tunnel rehabilitation projects, and for new pipeline and tunnel design efforts.

3. **Investigate the Potential for Developing a Model to Prioritize Pipeline Rehabilitation (2019)**

   The prioritization model will seek to optimize the sequence of pipeline repairs to achieve the greatest risk reduction for every dollar invested. The prioritization model would take into account multiple risk factors including seismic risk exposure, pipeline condition, consequence of failure in terms of damage to key facilities (e.g., hospital), difficulty of repairs, system flexibility, and cost of repairs.

**4. Enhance Member Agency Planning Efforts (2019)**

Development of the following documents will support member agency planning efforts regarding new facilities and emergency response programs:

a) Summary of seismic performance objectives by facility class; examples of recent seismic upgrade projects; and identification of open items

b) Summary of projected outage durations for Metropolitan facilities under "Operational", "Design", and "MCE" earthquake scenarios

**5. Seek Approval for Detailed Seismic Studies (Ongoing)**

Under the ongoing Seismic Upgrade Program, Metropolitan will assess the options for seismic upgrades to 28 structures identified as seismically deficient. These projects will be considered for inclusion in Metropolitan's Capital Investment Plan.

**6. Support California Water Fix (Ongoing)**

Metropolitan will continue supporting the California WaterFix to increase seismic resilience of the Bay-Delta portion of the State Water Project.

# Appendix 1

# Key Seismic Resilience Achievements

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Metropolitan has made significant improvements in the overall seismic resilience of its water system over the past few decades. These achievements include:

| | |
|---|---|
| 1971 | Earthquake Committee formed to assess damage and recommend improvements |
| 1976 | Metropolitan's Emergency Response Plan formally adopted |
| 1983 | Member Agency Response System (MARS) established |
| 1993 | Incident Command Centers (ICCs) established at each treatment plant and a formal engineering response chart adopted for the Damage Assessment Teams (DATs) |
| 1995 | Formal Business Resumption Plan developed |
| 1996 | Seismic upgrade of CRA Pump Houses completed |
| 1999 | Construction of Diamond Valley Lake completed |
| 2004 | South slope stability improvements completed at Diemer |
| 2005 | Construction of new Lake Mathews Tower completed |
| 2010 | Jensen Administration Building seismic upgrade completed |
| 2010 | Construction of the Inland Feeder completed |
| 2011 | Seismic upgrade of Mills Electrical Buildings 1 & 2 completed |
| 2013 | Seismic upgrade of Diemer Finish Water Reservoir completed |
| 2013 | Diemer East Wash Water Tank seismic upgrade completed |
| 2014 | Seismic upgrade of Weymouth Filter Buildings 1 and 2 completed |
| 2014 | CRA seismic assessment confirmed historical assumptions for duration of worst-case outage of the CRA |
| 2015 | Seismic upgrade of Jensen Washwater Tanks 1 & 2 completed |
| 2015 | Seismic upgrade of Weymouth East Wash Water Tank completed |
| 2015 | Task Force formed to enhance seismic resilience of imported water supplies |
| 2017 | Seismic upgrade of Diemer East Filter Building completed |

***Note: Metropolitan has invested over $250M in seismic upgrade projects since 1998.***

The California Department of Water Resources has also taken steps to improve the seismic resilience of Southern California's imported water systems, including:

| | |
|---|---|
| 1997 | Construction of new Outlet Tower at Silverwood Lake completed |
| 2018 | Lake Perris Dam improvements completed |

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# Appendix 2

# Modern Era Earthquakes over M6.3 Within or Near Metropolitan's Primary Service Area

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Southern California has experienced at least six earthquakes within or near Metropolitan's service area and with magnitudes greater than M6.3 during the past hundred years.

| Date | Event Location | Fault | Magnitude |
|---|---|---|---|
| April 21, 1918 | San Jacinto | San Jacinto | 6.7 |
| Mar. 10, 1933 | Long Beach | Newport-Inglewood | 6.4 |
| Feb. 9, 1971 | San Fernando | Sierra Madre | 6.5 |
| June 28, 1992 | Landers | San Andreas | 7.3 |
| Jan. 17, 1994 | Northridge | Northridge Thrust | 6.7 |
| Oct, 16, 1999 | Hector Mine | Lavic Lake Fault | 7.1 |

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# Appendix 3

# Provision for CRA Uplift

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MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

# COLORADO RIVER AQUEDUCT

# TECTONIC ALLOWANCE ORIGINAL INTENTION INVESTIGATION

**1 March 2016**

**Purpose and Objective**

Historic documents have mentioned that the designers of the Colorado River Aqueduct (CRA) incorporated "measures in their engineering designs to minimize the impacts on the flow through the CRA due to future vertical displacements across the key fault traces mapped at that time. **The measures included an additional 0.8 m (2.5 ft) of drop beyond that required by siphon losses at… three fault crossings**" (Report 1484). "In each siphon [Big Morongo and San Andreas] approximately 2.5 feet of additional grade was allowed to provide for adjustment in slope if future movement should occur" (Contract Number 149).

Figure 1 shows the location of each of the siphons in question.

**Figure 1**
**Overview Map**

The question was raised regarding the specifics of how this was accomplished. This document will describe investigation into whether this allowance was incorporated, the mechanism by which this allowance was included, summarize historical records suggesting such an allowance, and recommend field investigations which can confirm this analysis.

**Observances of Tectonic Allowance**

Record drawings for the Colorado River Aqueduct were explored to identify any occurrences or explanation for design Hydraulic Grade Line (HGL) at the Big Morongo Siphon, San Andreas Siphon and Casa Loma Siphon. The first observance of the allowance is found in the hydraulic profiles prepared as a part of the original record drawings of the Colorado River Aqueduct in 1935. Selected copies are included at the end of this document.

A discontinuity is observed in the HGL, dropping by a notated 2.5 feet at the beginning of the Big Morongo Siphon, San Andreas Siphon, and Casa Loma Siphon. The HGL is highlighted in red on Figure 1, with the 2.5-foot drop circled.

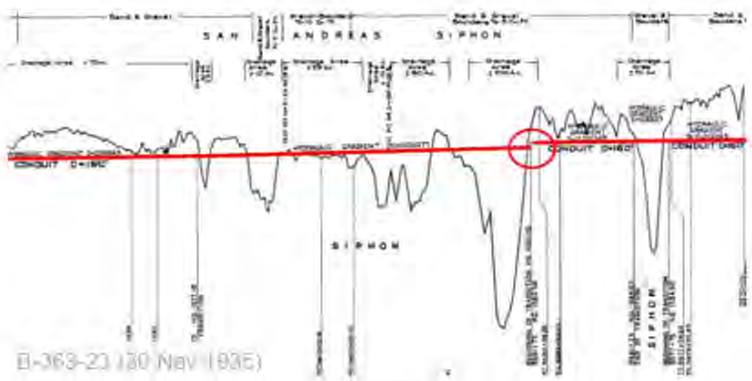


**Figure 1**
**Original 1935 San Andreas Siphon Plan and Profile**

A second observance of the allowance is found in the record drawings associated with the late 1950's construction of the second barrel for the CRA siphons (Specification Numbers 504 and 509). As before, selected copies are included at the end of this document. The plan and profiles found in the second barrel siphon record drawings show two parameters corresponding to hydraulic grade at the downstream transition structures, as follows:

- "HG. El.", assumed to be an acronym for Hydraulic Grade Elevation, and assumed to refer to the pressure head at design flow
- "WS El.", assumed to be an acronym for Water Surface Elevation, and assumed to refer to the water surface under free-surface flow conditions at design flow

In the siphon, the HGL is observed to be above the soffit of the pipeline, indicating the pipeline is designed to be under pressurized flow. Upon entering the transition structure, the HGL is below the top of the transition structure walls as free surface flow is designed for.

As shown on Figure 2, the Water Surface Elevation line in the outlet transition structure is depicted 2.5 feet below the Hydraulic Grade Elevation line, as circled in red. For other transition structures, the Hydraulic Grade Elevation line meets the Water Surface Elevation line, as shown on Figure 3 for Thousand Palms Siphon.

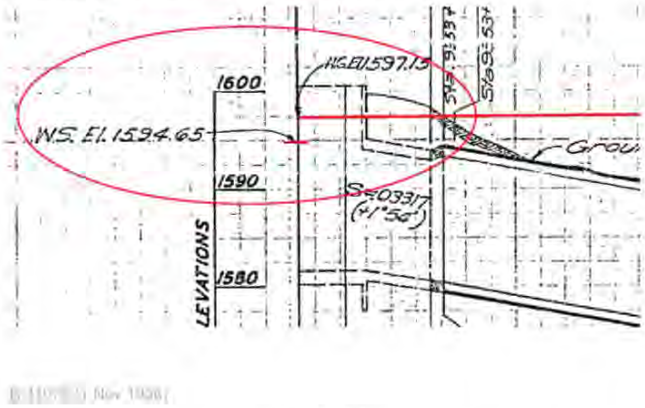


**Figure 2**
**Big Morongo Siphon Second Barrel Plan and Profile**

A second barrel was not constructed at Casa Loma Siphon according to the original plans, so no corresponding record drawing was identified.

Staff from the Hydraulics team confirmed via calculation that the headloss depicted by the HGL is consistent with the major and minor losses shown in the record drawings for the design flows.

A third observation of the allowance is found in the hydraulic profiles. While not called out numerically as on the previous two sources, the hydraulic profiles depict a slope offset at the Big Morongo and San Andreas Siphons of a much greater magnitude than those observed for other siphons. This is depicted in two figures on the following page.

It is understood that the design philosophy for each siphon was to size the losses across each siphon to maintain the free surface flow HGL across the siphon. This can be graphically observed in Figure 4 as shown by the red dashed line highlighting the HGL matching the canal or conduit slope upstream and downstream of the siphon.

At Big Morongo and San Andreas siphons, an offset of 2.5 feet is observed between the slope upstream of the siphon and the slope downstream of the siphon. Figure 5 highlights this in blue for Big Morongo Siphon.

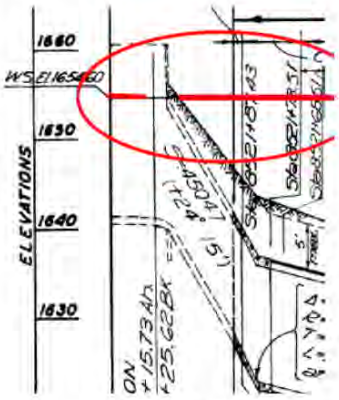


**Figure 3**
**Thousand Palms Siphon Second Barrel Plan and Profile**

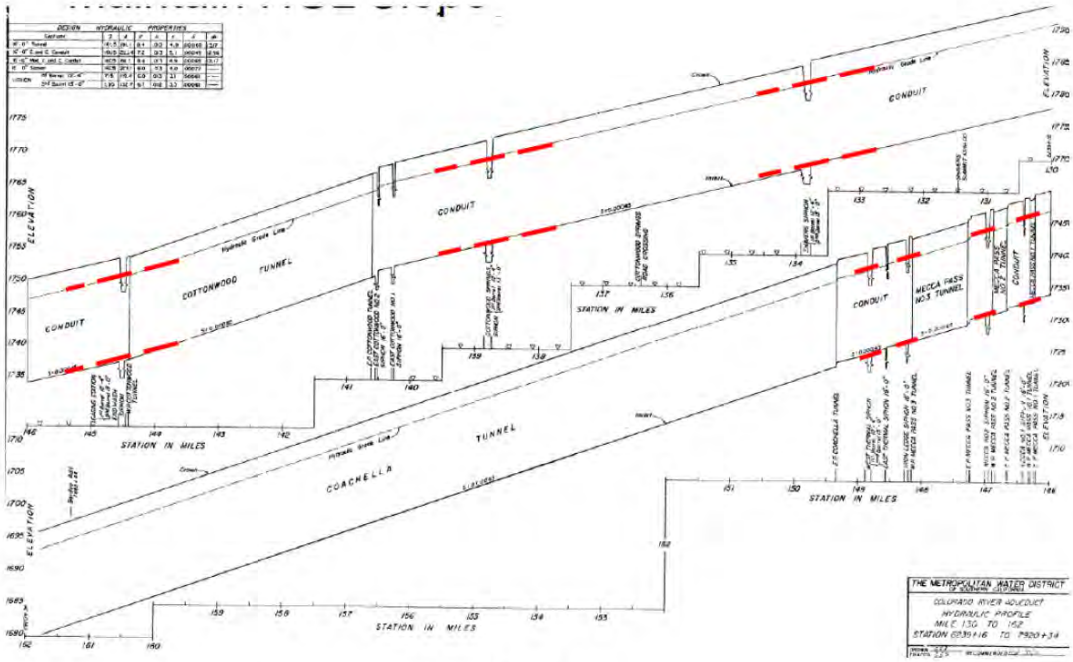


**Figure 4**
**Siphon HGL Slope Consistent with Aqueduct Slope**

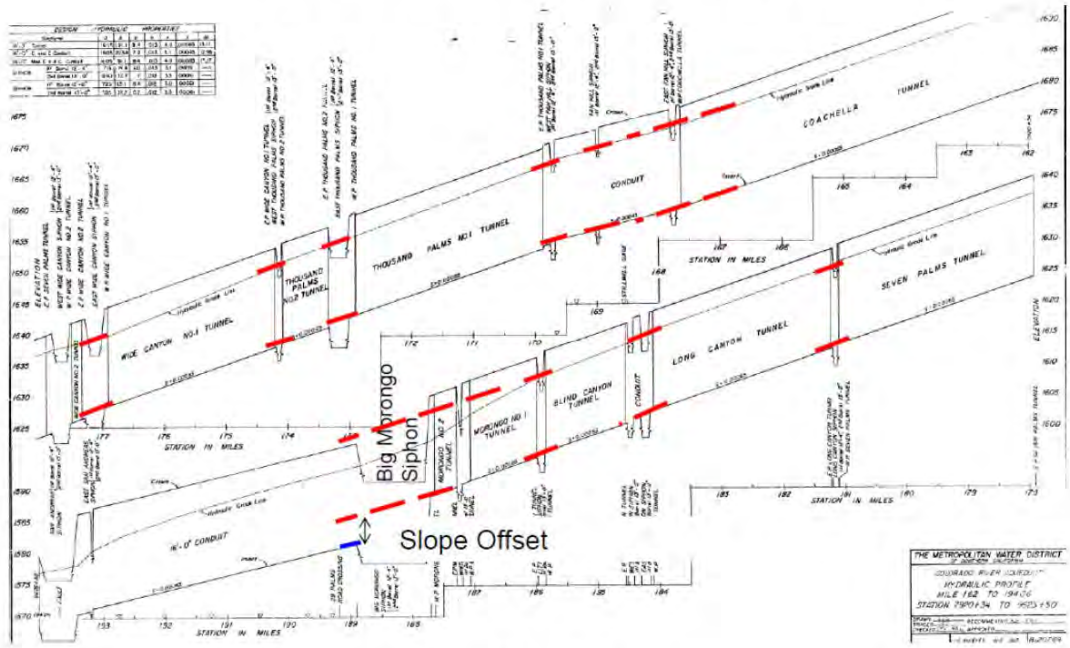


**Figure 5**
**Siphon HGL Slope at Big Morongo Siphon**

This last set of observances of the 2.5-foot allowance may provide a suggestion of the designer's thoughts on the effect of the allowance. The Hydraulic Grade Line observed on the profiles gradually drops relative to the invert elevation though the Morongo Number 1 Tunnel and the Morongo Number 2 Tunnel, and in the conduit immediately upstream of the San Andreas Siphon. While dimensions nor elevations are called out on this profile, the depth at the outlet to the Morongo Number 2 Tunnel can be measured on the drawing as 8.9 feet, and the depth at the entrance to the San Andreas Siphon can be measured on the drawing as 7.8 feet.

**Previous Surveys**

Based on the contract document, construction on Big Morongo Siphon and San Andreas Siphon was started on 5 Feb 1935 and concluded on 16 Sep 1936, with work activities completed by May 1936.

In February and March 1935, a construction staking survey was conducted. Included in the survey notes are an adjustment to the slopes consistent with the markups included in the contract documents (Contract 149). This timing is consistent with the start of construction.

In August 1937, after construction of the CRA, the as-built survey was conducted to set brass caps on the transition structure as permanent benchmarks. Benchmarks established include:

- a manhole at Station 9316+46
- the outlet transition structure for Big Morongo Siphon at Station 9353+15
- the outlet transition structure for East San Andreas Siphon at Station 9581+25 (referred to as "Outlet Siphon" in survey notes)
- the inlet transition structure for San Andreas Siphon at Station 9591+75
- a manhole at Station 9595+00
- the outlet transition structure for San Andreas Siphon at Station 9625+75
- the outlet transition structure for West San Andreas Siphon at Station 9651+75 (referred to as "small siphon" in survey notes)

These are recorded in Field Book 2740. No mention is made within the survey notes of any measurement of invert elevations of the pipeline or transition structure, so any inferences made to the invert elevation require the assumption that the transition structure dimensions are consistent with the planned dimensions appearing on the construction plans (19.17 feet for the Big Morongo Siphon outlet transition structure 18.96 feet for the Big Morongo Siphon inlet transition structure and both San Andreas Siphon transition structures).

In 1998, the Casa Loma Siphon first barrel was surveyed as a part of an as-built survey prepared for construction of concrete encasement between Stations 11073+45 and 11073+93 related to work on the Inland Feeder. The survey notes mention replacement of the pipeline, but do not appear to include any survey of invert elevations.

In 2008, the San Jacinto Diversion Structure, which originated as the inlet transition structure to the Casa Loma Siphon first barrel, was surveyed as a part of establishing NAVD 1988 elevations in the area. While the survey notes do not include invert elevations, they do include the weir elevation, which can be used to estimate the invert elevation based on the record drawings.

In 2014, a settlement study was conducted by Survey at San Andreas Siphon and Big Morongo Siphon to determine the difference in elevation between the inlet and outlet transition structures. The survey only

measured the relative difference between the benchmarks set on the inlet and outlet transition structures of each siphon in the August 1937 survey. The difference in elevation between the inlet and outlet structure benchmarks is presented in the table below, suggesting no changes in relative ground movement in the intervening eight decades.

**Table 1 1934 and 2014 Survey Comparison**

| Siphon | May 2014 Survey (feet) | August 1935 Survey (feet) | Difference (feet) |
|---|---|---|---|
| Big Morongo | 7.90 | 7.90 | 0.00 |
| San Andreas | 6.64 | 6.68 | -0.04 |

Source: Survey Field Book 2740 and Survey Note 100) 29 042

As with the previous surveys, no measurement was made of the invert elevations, so it is not possible to verify that the slope of the canal includes the 2.5-foot slope offset upstream of the siphon directly from survey measurements.

However, using the derived measurements developed as a part of IMDC (ultimately from the design drawings), the slope offset can be calculated. If the difference in elevation between the invert elevations at the inlet and outlet transition structures is 2.5 feet greater than that calculated based on the design slope for the siphon, then the survey data would confirm the tectonic allowance is included in the slope offset. Based on the notes included in the contract document and the slopes appearing on the hydraulic profiles, a slope of 0.00077 was used for design of the lengths of the CRA siphons. The table below presents the calculation, including several other siphons for comparison.

**Table 2 Slope Offset Calculation**

| Siphon Name | Transition Structure Invert Elevation Upstream (ft-msl '88) | Downstream (ft-msl '88) | Drop per Survey (feet) | Drop per Slope (feet) | Slope Offset (feet) |
|---|---|---|---|---|---|
| Cottonwood Spring Siphon | 1,759.21 | 1,758.60 | 0.61 | 0.46 | 0.15 |
| End Wash Siphon | 1,740.23 | 1,740.12 | 0.11 | 0.45 | -0.34 |
| Iron Ledge Siphon | 1,729.36 | 1,728.93 | 0.43 | 0.23 | 0.20 |
| East Thermal Siphon | 1,728.27 | 1,727.90 | 0.37 | 0.14 | 0.23 |
| West Fan Hill Siphon | 1,657.67 | 1,657.03 | 0.64 | 0.42 | 0.22 |
| Thousand Palms Siphon | 1,645.53 | 1,643.93 | 1.60 | 1.46 | 0.14 |
| Whitehouse Canyon Siphon | 1,593.82 | 1,593.27 | 0.55 | 0.40 | 0.15 |
| Big Morongo Siphon | 1,591.85 | 1,584.31 | 7.54 | 4.94 | 2.60 |
| East San Andreas Siphon | 1,574.16 | 1,573.69 | 0.47 | 0.27 | 0.20 |
| San Andreas Siphon | 1,573.22 | 1,566.84 | 6.38 | 2.62 | 3.76 |

Notes:
(1) Design slope of 0.00077 does not appear on most siphons on most hydraulic profiles, but was checked on the individual plan and profiles for all of the siphons listed in this table

As shown in Table 2, most of the siphons exhibit a deviation in surveyed slope from the design slope of between 0.1 and 0.2 feet. Big Morongo Siphon and San Andreas Siphon slope offsets of more than 2.5 feet each, showing that the slope across each of these siphons is greater than that required to meet the design slope for the siphon of 0.00077. It should be noted that the slope offset for San Andreas Siphon is calculated as 3.76 feet, 1.26 feet greater than the 2.5 feet suggested by the allowance. This may suggest the suggested mechanism for accomplishing the allowance is incorrect, or there may be other factors at play here.

While survey data has not explicitly measured the invert elevations at any point following the construction of these siphons, this calculation is based on the assumption that the siphon transition structures were constructed consistent with the construction plans. If the internal height of the transition structures is in doubt, survey of the invert elevations of the transition structures could be of value.

**Field Observations**

Given the lack of level sensors along the CRA, Water Supply Operations (WSO) staff have conducted several field investigations of depths along the CRA during periods of constant flow. These field investigations generally consist of one or two staff recording single measurements of depth at several manholes and transition structures between Hinds Pumping Plant and San Jacinto Tunnel.

Under the design flow of 1,605 cfs, the normal depth is designed as 12.96 feet in the most frequently used cut and cover conduit cross-sections, and 13.17 feet in the most frequently used tunnel sections. Figure 1 presents results from the field investigation conducted on 20 March 2013, with flow conditions near design flows.

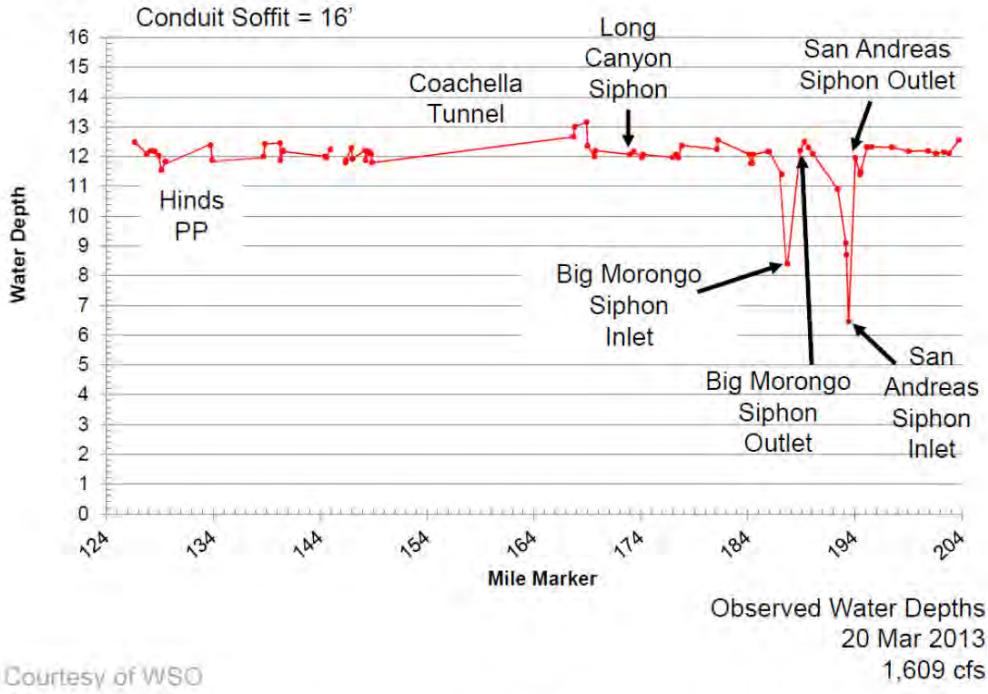


**Figure 1**
**Observed Water Depths at Design Flow**

The depth at the San Andreas Siphon and Big Morongo Siphon transition structures consistently stand out with observed water depth lower than the other siphons, dropping to less than 7 feet and less than 9 feet, respectively. These depths are fairly consistent with the depths of 7.8 feet and 8.9 feet observed in the design hydraulic profile discussed at the end of Section 0.

**Mechanism**

Some possible ideas that could have been incorporated include sizing the diameter of these siphons larger (reducing the headloss across the siphon) or including some type of weir structure.

It is surmised that the mechanism used for incorporating the additional head was to build the inlet transition structure 2.5 feet above the elevation at which the structure would have been constructed without the slope offset. Given that the pressurized pipeline within the siphon can change slope without impacting the hydraulics beyond minor losses, the slope of one of the stretches of pipeline could be raised to achieve a 2.5-foot elevation increase. The contract document suggests this -"The slope given in the hydraulic properties [0.00077] does not include the additional grade allowed to provide for adjustment if future earth movement should take place." (Contract 149)

An exaggerated demonstration of this mechanism is shown in Figure 1. The existing profile of the aqueduct, including the 2.5 foot allowance, is shown in black. A red line, lower at the upstream end of the siphon has been added to shown the 2.5-foot lower starting invert without the allowance. The blue line shows what the initial slope in the siphon would have been in the first pipeline segment without the allowance.

**Figure 1**
**Surmised Design Mechanism**

Further, exploring the different versions of the drawings prepared prior to construction suggests the addition of the grade as a slope change. Eight different record drawings are present in EDMS between August and December 1934 (the notice for bids was released 5 December 1934.) These partially correspond to four different construction methodologies and material choices prepared prior to the bid notice (jointed cast-in-place concrete, pre-cast concrete, above ground steel pipe, and buried steel pipe). Ultimately, jointed cast-in-place concrete was selected at the time of the bid notice. The upstream invert elevations of the transition structure in some of the drawings prepared in November 1934 have been raised by 2.5 feet from the August 1934 drawings, with differing slopes (however, each of the differing construction methodologies uses different slopes), with the height of the transition structures maintained between the different drawings. It should also be noted that the 2.5 foot allowance is observed on drawings dating back to 1933, so the allowance was likely planned for prior to 1934.

Assuming the head constraints on the design of the CRA would have been established first at the downstream end (either at the tunnels or of the elevation of Lake Mathews), this would suggest that if the allowance had not been included at each siphon, the CRA upstream of all three upstream siphons could have been designed 7.5 feet lower in elevation, with the lift at Hinds Pumping Plant reduced by 7.5 feet.

**Conclusions**

In review of record drawings and contract documents associated with the CRA, a tectonic allowance of 2.5 feet of HGL has been included in the design of Big Morongo Siphon, San Andreas Siphon, and the Casa Loma Siphon. Based on the above investigation into this allowance, it is believed that the mechanism for accomplishing the allowance is a slope offset in the invert elevation slope, accomplished by an increased slope in the pressurized pipeline segments within these siphons.

Based on available records, invert elevations have never been surveyed at Big Morongo Siphon, San Andreas Siphon, and the first barrel of the Casa Loma Siphon. Having invert elevation survey data will not prove the mechanism any further than currently shown on record drawings. However, if the internal height of the transition structures is in doubt, survey of the invert elevations of the transition structures could be of value.

In addition, internal inspection of the cast-in-place concrete pipeline and associated joints, as well as internal survey to determine any localized movement, may be desired for non-hydraulic reasons.

Differential survey between the inlet and outlet transition structures would likely be of little value beyond that already provided in 2014. Two additional levels of survey could be conducted—a survey of just the invert elevations of the transition structures, requiring minimal de-watering, and a survey and inspection of the entirety of the siphons, requiring full dewatering.

Estimates of effort for survey of the invert elevations in just the transition structures would be 24 staff hours plus minimal dewatering, and effort for the full siphon survey of the entire length of the two siphons would be 200 staff hours, plus staff for full dewatering.

**References and List of Record Drawings**

The following table lists record drawings and documents used in preparation of this analysis.

**Table 3 Record Drawings and Documents Consulted**

| Record or ID Number | Record Drawing Type | Siphon | Revision Date |
|---|---|---|---|
| B-363-26 | Plan and Profile | Big Morongo | 22 Nov 1934 |
| B-363-23 | Plan and Profile | San Andreas | 30 Nov 1935 |
| B-363-12 | Plan and Profile | Casa Loma Siphon | 15 June 1934 |
| B-11975 | Plan and Profile | Big Morongo | 30 Oct 1997 |
| B-11979 | Plan and Profile | San Andreas | 1 Nov 1956 |
| B-20749 | Hydraulic Profile | Multiple, including Big Morongo and San Andreas | 1 Aug 1965 |
| B-20748 | Hydraulic Profile | Multiple | 1 Aug 1965 |
| HR-149 | Contract | Big Morongo and San Andreas | 5 Feb 1937 |
| FB 2740 | Survey Field Book | Big Morongo and San Andreas | 12 July 1938 |
| 1001 29 042 | Survey Notes | Big Morongo and San Andreas | 19 May 2014 |
| 2037 01 037 | Survey Notes | Casa Loma Siphon Number 1 | 24 August 1998 |
| 2039 02 008 | Survey Notes | San Jacinto Diversion Structure | 5 May 2008 |
| B-1660 | Transitions & Sections | San Andreas | 21 Nov 1934 |
| B-1663 | Transitions & Sections | Big Morongo | 22 Nov 1934 |

Notes:
(1) Since the second barrel was never installed at Casa Loma Siphon, it does not have a

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# Appendix 4

# Summary of Damage to Metropolitan Infrastructure from Past Earthquakes

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Metropolitan experienced a significant amount of damage to its infrastructure during both the 1971 San Fernando and 1994 Northridge earthquakes. Both of these seismic events primarily impacted the Jensen Water Treatment Plant. Engineering prepared summary reports for both events. The information below represents a convenient summary of what may be found in "Report of Structural Damage to Joseph Jensen Filtration Plant, Earthquake of February 9, 1971" (Report No. 891C), "Historical Documentation of the Jensen Plant Earthquake Disaster of February 9, 1971" (Report No. 909), and "Damage and Repair Report for Joseph Jensen Filtration Plant, Northridge Earthquake of January 17, 1994 (October 1994).

## 1971 SAN FERNANDO EARTHQUAKE

The San Fernando earthquake struck the greater Los Angeles region in the early morning of February 9, 1971. The thrust earthquake, which had a moment magnitude between 6.5 and 6.7, caused severe damage in the northern San Fernando Valley, with extensive surface faulting to the south of the epicenter. The epicenter was approximately 6.8 miles from the Jensen Plant.

Metropolitan experienced widespread damage at the Jensen Plant. This included a severe break to a 72" Influent Conduit and damage to various structures including the Administration Building, Finished Water Reservoir, Access Tunnel, Mixing and Settling Basins, and Filters.

Following is a summary of the damage to these facilities.

### INFLUENT CONDUIT

- Transverse cracks up to ½-in on concrete encasement
- Three joints in the ¼-inch thick steel cylinder separated
- Joint failed and opened up to ¾-inch at the soffit
- Fracture continued thru the top half of the joint
- Much spalling of the mortar lining about 8-inches on each side of the joint
- About 113-feet south of the 72-inch outlet, 75% of the joint failed
- Joint opened up about ¾-inch near the invert and the lining was damaged for about thirty inches each side of the joint
- Entire joint was pulled apart
- Mortar lining was damaged for about 24-inches on each side of the joint
- Considerable spalling and cracking of the lining was evident around the 72-inch outlet
- Lining suffered spalling and cracking approximately 15-feet downstream of the tunnel portal
- Several additional cracks, up to 1/16-inch wide, were observed in the lining
- Two 84-inch and 72-inch welded steel pipelines suffered only minor damage and consisted of cracking of the lining
- Minor cracking at the junction of the 72-inch pipelines and the 12-foot, 6-inch square reinforced concrete box conduit

- The 12-foot wide by 12-foot high reinforced concrete box extending northerly from the main control building had three transverse cracks in the walls and slabs located between Station 5+60 and 6+00;
- Cracks varied in width from 1/32-inch to 1/16 inch;
- 5 Transverse expansion joints in this portion of the influent conduit had separations varying from ½ -inch to 2-inches horizontally, and from ¼-inch to 1-inch vertically.

**EFFLUENT CONDUIT**

- Severe damage toward the southerly end;
- Differential displacement;
- Complete fracture or shearing.

**MAIN CONTROL BUILDING**

- Considerable horizontal and vertical displacement throughout; led to multiple non-structural damaged areas throughout building
- Building moved approximately 5-inches to the south and approximately 6-3/4-inches to the east
- There was settlement of 2-inches on the south side of the building causing a slight southeasterly tilt.

**BALBOA INLET TUNNEL**

- Concrete tunnel lining badly spalled and cracked at a distance approximately 100 feet near the Olive View Fault crossing;

**CONNECTING CONDUITS**

- Significant damage occurred at expansion joints, intersection of east-west and north-south galleries, and by punching of an embedded pipe into a wall
- Several portions of the structure between expansion joints moved as separated structures, on the three axes of movement, and also moved with twisting (torsional) action on each of the three planes
- In some cases, the joint filler and sealant was compressed and squeezed out of the joint
- Individual working of the structurally separated portions of the structure caused them to pound against each other, thereby resulting in spalling of concrete adjacent to the edges of the expansion joints
- Considerable cracking and some spalling occurred at the intersection of the east-west and north-south 25-foot wide influent conduit and pipe gallery, all were repairable
- Cracks in slabs and walls occurred at the intersection of pipe galleries Nos. 1 and 2 in the north-south influent conduit and pipe gallery, but all were repairable

- The southern end of the east-west pipe that was cast into the west wall of the north-south influent conduit pipe gallery pounded and caused the wall to shatter
- Large amount of movement took place in the overhead piping at the intersection of the east-west and north-south influent conduit pipe galleries
- Movement was in several directions, with pipe having been displaced.

### MIXING AND SETTLING BASINS

- Significant damage occurred at expansion joints, and the intersection of the east-west and north-south galleries
- Several portions of the structure between expansion joints moved as separate structures on the three axes of movement
- Some cases, the joint filler and sealant was compressed and squeezed out of the joint;
- The individual working of the structurally separated portions of the structure caused them to pound against each other, thereby resulting in spalling of concrete adjacent to the edges of the expansion joint
- Cracking and some spalling occurred at the intersection of the east-west and north-south influent conduit and pipe gallery
- Cracks in slabs and walls occurred at the intersection of pipe galleries Nos. 1 and 2 in the north-south influent conduit and pipe gallery

### FILTERS

- Some vertical and lateral displacement occurred between adjacent beds at some expansion joint locations
- Compressive loads forced expansion joint material out of some joints
- Minor spalling occurred adjacent to some expansion joints
- An apparent lateral thrust from the west caused the wash troughs to pull partly out of the insets
- Wash troughs acting as struts transferred the thrust to the gullet wall, which had not been completely poured, causing the wall to split at the east line of reinforcing bars
- Cracking and spalling in other filter beds occurred at the wash troughs but were minor in nature
- Minor spalling occurred where 16-inch spray header line passes through the wall filter beds
- The west end of the conduit was damaged
- Connection between the used washwater conduit and the 48-inch diameter conduit pulled apart
- Top walkway grid slab cracked diagonally across the northeast corner of filter bed
- Filter control building No. 2 separated from the walkway at the top of the filter beds expansion joint
- Separation varied from ½-inch to 1 ¼-inch at the expansion joint between Filter Control Building No. 2 and the valve and meter structure

- Valve and meter structure settled 1” lower than Filter Control Building No. 2
- Lining on north side of the return washwater line had a spalled area.

### CHEMICAL BUILDING

- Severe lateral and vertical motion
- Column anchor bolts either stretched or pulled out of the footing concrete at all six columns
- Column in south wall buckled
- Column at northeast corner bowed out of line
- Diagonal bracing system in exterior walls failed
- Diagonals failed in tension or damaged in compression
- Upper concrete floors and roof were pierced by the diagonal bracing and columns
- Considerable cracking or spalling of slab concrete
- Building frame racked out of plumb, being tilted toward the east
- Metal door and window frames in north wall were racked out of square
- Several siding panels on the north wall broke loose from the framing
- Siding fasteners snapped off or pulled out
- All anchor bolts for the four chemical tanks failed by being sheared, bent or pulled out
- Tanks were not damaged by second floor slab; although marks on tank indicate that 6 to 8 inches of vertical movement took place
- Columns supporting exterior stairway were bent.

### BRIDGE AND BOX CULVERT FOR RAILROAD SPUR TRACK

- Vertical crack at the juncture between the north abutment and the wing wall on the west side
- Wall and abutment became offset.

### WASHWATER TANK

- Vertical movement of the tank
- Movement caused anchor bolts to either pull out or fail in tension
- Tank slammed down upon the ring wall, resulting in buckling in the upper courses of the tank skin
- Damage to stairway.

### FINISHED WATER RESERVOIR

- North Wall:
  - Did not rupture but had 3 continuous horizontal cracks
  - Cracks varied in width from hairline to 1/32 inch and were spaced
  - There were many random vertical and diagonal hairline or large cracks.

- South Wall:
  - Easterly half of the south wall had several vertical and diagonal random cracks
  - Wall between column lines 'B' and 'C' was severely shattered
  - Some earth backfill entered the reservoir thru the wall and roof rupture
  - Random vertical and diagonal wall cracks occurred in the westerly half of the south wall
  - Fracturing and spalling occurred at other locations along the south wall on both the interior and exterior surfaces
  - Lateral offset at crack, particularly where it crossed the wall corbels.
- East Wall:
  - Portion of east wall, north of outlet received extensive damage
  - Bowed inward between the floor and roof slabs
  - Series of continuous horizontal cracks
  - Extensive lengths of spalls and cracks with some fractures occurred at the base of the wall
  - Large vertical crack occurred in the east wall
  - Overflow weir wall was also damaged and laterally offset at a vertical construction joint in the same area
  - East wall, south of the outlet structure, showed some offset and spalling at the floor line
  - Random and vertical cracks occurred at about mid-height
  - East wall of the finished water reservoir was severely fractured and spalled.
- West Wall:
  - Fractured and shattered above the floor slab line;
  - Horizontal displacement of the bottom of this wall occurred at the fracture;
  - Wall shattered for its full height between column 24 and 25.
- Roof
  - Failure plane occurred in the roof slab between column lines B and C
  - Extensive damage to the roof slab occurred adjacent to the drop panel connections;
  - Fracture at the drop panel line was apparent only in the north half of the reservoir
  - Continuous east-west failure occurred in line with the south edge of the roof slab drop panels
  - Roof slab south of this line had a vertical offset approximately 12 inches lower than the roof slab on the north side
  - From column line "0", east to column line "V", spalling was evident only at the west faces of the drop panels
  - Roof slab fractured between column lines "B" and "C"
  - Continuous east-west lines of failure occurred between column lines 3 and 4, 7 and 8, and 24 and 25. These breaks or spalls exposed the reinforcement for the full length of the reservoir roof slab.

- The width of spalling at the construction joint between column lines 24 and 25 varied between 4 feet and 6 feet. During the quake, this joint opened up, allowing for considerable quantities of gravel backfill to fall through from above.
- The roof slab was also severely spalled, shattered and offset vertically at the west edge of the drop panel line adjacent to the east wall
- Spalling also occurred at the west face of the drop panels at line "B" from column line 22, to a point midway between column lines 24 and 25.

**RESERVOIR FLOOR**

- While floor slab damage was general throughout the structure it was most apparent in the southeast quadrant
- Spalled strip running east-west between column 2 and 3, from a point midway between lines B and C to the east wall
- Spalled strip at the center of the structure, between lines 13 and 14. These spalled strips averaged about 2 feet wide and many of them had vertical offsets upward from the general floor level.
- There were additional spalled construction joints in the north-south direction; however, none of these were as long as the two east-west spalls previously described
- Spalling occurred at the drainage gutters for almost the entire length in both the north-south and east-west directions
- Continuous spalls occurred throughout and between various lines
- Floor cracking occurred midway between lines 14 and 15 in the east-west direction; the south exterior wall drop panels at M-1, N-1 and U-1 spalled in the east-west direction;
- Floor slab cracks located were located as follows:
  - North-south between lines Y and Z; from midway between lines 5 and 6 to a point midway between lines 17 and 18
  - North-south between lines between Z and AA, from a point midway between lines 2 and 3 to a point midway between lines 19 and 20; diagonally across the southeast corner of drop panel W-18
  - North-south between lines P and Q; from a point midway between lines 13 and 14; to column line 15
  - East-west between lines 14 and 15, from a point midway between lines D and E, to a point midway between lines E and F.

### BAFFLE WALLS AND COLUMNS

- Damage to the baffle walls consisted of two principal types; cracking or fracturing of the vertical beams and dislodgement and fracturing of the corrugated asbestos cement panels, only one vertical concrete beam collapsed
- The other beams remained standing but were tilted out of plumb
- Many of the other vertical beams were fractured or cracked near the base or in the region slightly above the base
- There were a number of spalls in the cast-in-place concrete projections forming the panel slots on the sides of the circular roof columns
- A large number of the corrugated asbestos cement panels were damaged or completely destroyed. Some of them fell to the floor and were shattered, while others that remained in place were damaged less severely.
- Approximately 73 baffle walls vertical beams sustained cracks, fractures, spilling, etc.
- Damage to the reservoir roof columns varied widely, from hairline cracks to complete fractures
- The damage to any individual column appeared generally to be the same at the top as at the bottom
- The majority of columns were spalled, or otherwise damaged on the east and west sides
- There were two notable exceptions: The first row of columns south of the north wall and the first row of columns north of the south. In these two rows, major damage occurred on the north and south sides
- In all cases, damage to the circular columns appeared to be primarily due to flexure and not to vertical load
- A number of the columns, notably those in the first row east of the west wall, were visibly out of plumb
- The tops of these columns were displaced east. Damage to drop panels and column capitals were generally limited to minor spalls and some cracks, except for several bottom capitals located in the northeasterly quadrant of the reservoir that were fractured or shattered.

### RESERVOIR OUTLET STRUCTURE

- Severe and extensive damage;
- Fractures throughout the entire structure.

### RESERVOIR INLET STRUCTURE

- Moderate damage;
- Spalled concrete exposing reinforcement.

## 1994 NORTHRIDGE EARTHQUAKE

In 1994, the Northridge earthquake occurred on January 17, at 4:30 a.m. It had a duration of approximately 10–20 seconds. The blind thrust earthquake had a moment magnitude ($M_w$) of 6.7. The death toll was 57, with more than 8,700 injured. In addition, property damage was estimated to be between $13 and $50 billion, making it one of the costliest natural disasters in U.S. history. LADWP reported a total of 1,405 pipe repairs and that water pressure had dropped to zero in some areas. The epicenter was approximately 7.3 miles from the Jensen Plant.

Metropolitan had damage at the Jensen Plant and adjacent facilities. Following is a summary of the damage to these facilities:

**MAJOR DAMAGE**

- Jensen Plant Balboa Influent Conduit
  - 84-in influent pipeline severed approximately 3-in horizontally and 1-in vertically near venturi structure
- East Valley Feeder
  - Pipeline breaks occurred between Odessa and Rinaldi Streets (976+86.70) and Woodley Avenue and Rinaldi Street (957+66.50)
  - Sectionalizing valve damage caused damage to all electrical equipment
  - Street asphalt damage as result of pipe breaks/leaks
- West Valley Feeder No. 1
  - Crack at cut-off wall at Station 1219+10
  - Sectionalizing valve structure damaged, causing damage to all electrical equipment
- Main Electrical Center
- Service Connection CLWA-1T
  - Service connection structure settled and drifted laterally
  - Misalignment of valve assemblies
- Service Connection LA-25
  - Extensive damage at ten pipe joints in the 97-in diameter pipeline and 60-in diameter overflow pipeline; pipe joints spread 1/8” to 3/4”
  - Reinforced box conduit suffered a break and 2” separation; a 6-1/2” separation occurred at the joint where the double box conduit meets the discharge structure
  - Turnout structure moved 6 to 8 inches east
  - Double box conduit moved 3 inches to the east

- Service Connection LA-35T
  - Damage to valve structure and pipe bridge due to differential displacement
- Newhall Tunnel
  - Buckling of steel liner
  - Concrete construction joints opened and closed resulting in sand and water infiltration
  - Bulge on steel liner split at circumferential joint resulting in oil and water infiltration

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# Appendix 5

# Metropolitan Water Storage Capacity

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Over the past two decades, Metropolitan has developed a large regional storage portfolio that includes both dry year and emergency storage capacity. Storage generally takes two forms: surface reservoirs and groundwater basin storage. Heading into the most recent drought cycle, Metropolitan had developed over 5.5 million acre-feet of storage capacity and had successfully stored over 2.7 million acre-feet. This is a more than 13 times the storage capacity compared to the 1980s, with record quantities of water in reserve. This increase in storage capacity is shown in Figure 5-1.

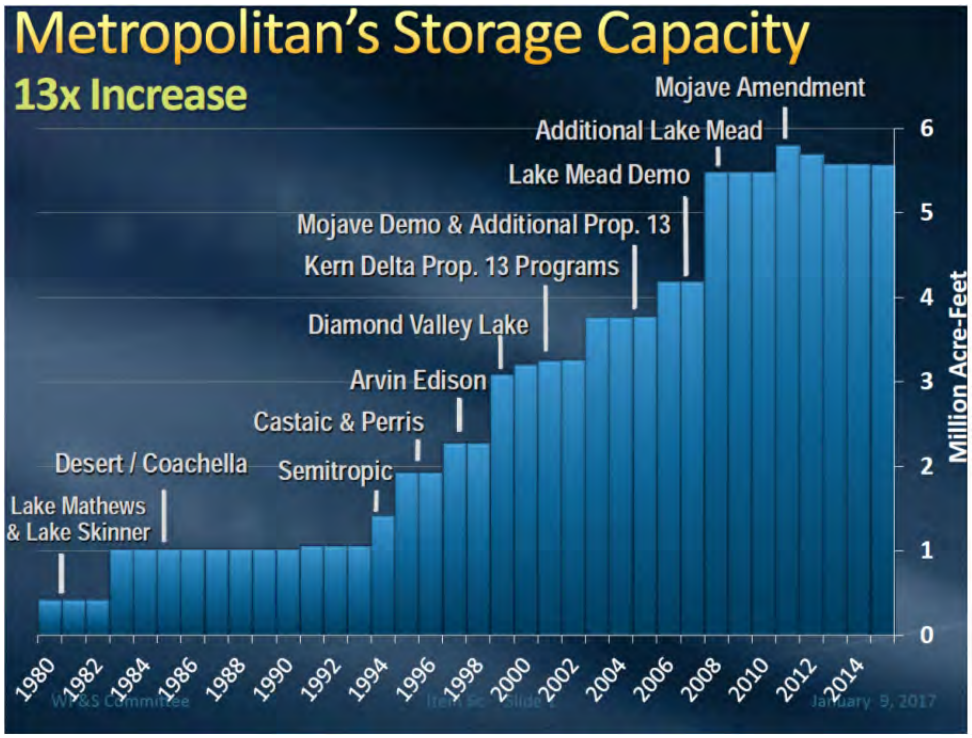


**Figure 5-1. Summary of Metropolitan's Storage Capacity Over Time**

Some examples of storage resources that have been developed since 1990 include:

- Surface Water Reservoirs:
  - Diamond Valley Lake (810,000 acre-feet)
  - SWP Article 56 Carryover Storage (up to 200,000 acre-feet)
  - Flexible Storage in Castaic Lake and Lake Perris (219,000 acre-feet)
  - Intentionally Created Surplus in Lake Mead (1.5 million acre-feet)
- Groundwater Storage:
  - Member Agency Conjunctive Use Programs (210,000 acre-feet)
  - Semitropic Storage Program (350,000 acre-feet)
  - Arvin-Edison Storage Program (350,000 acre-feet)
  - San Bernardino Municipal Water District Storage Program (50,000 acre-feet)
  - Kern Delta Water District Storage Program (250,000 acre-feet)
  - Mojave Storage Program (390,000 acre-feet)

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# Appendix 6

# Seismic Design Frequently Asked Questions

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# Seismic Design FAQs

September 2017

## What are the effects of earthquakes?

- Ground shaking
- Ground rupture
- Liquefaction
- Landslides and avalanches
- Tsunamis

## What causes earthquakes?

- Slips or rupture of faults
- Movements of tectonic plates
- Volcanic or magmatic activity
- Sudden changes in earth's crust

## What is a fault?

- Faults are fractures or discontinuities in large masses of rock, where the rocks on either side have undergone relative displacement
- Faults are planar surfaces, not lines
- Faults can be vertical, horizontal, or at some angle in between
- Faults can be divided into three basic types
  - Strike-slip
  - Thrust
  - Normal
- Strike-slip and thrust most common in So. Cal.

## Strike-Slip Faults

- Faults are primarily vertical or near-vertical
- Movement occurs primarily laterally - one side slides by the other
- Primary examples are the San Andreas and San Jacinto Faults

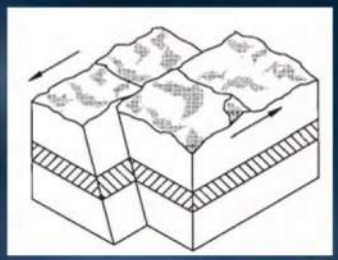

## Thrust Faults

- Faults occur at an angle to the surface
- Movement occurs primarily vertically - one side slides up over the other
- Primary examples are the Santa Susana and Bunker Hill Faults

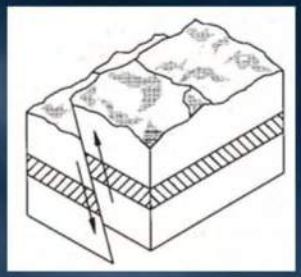

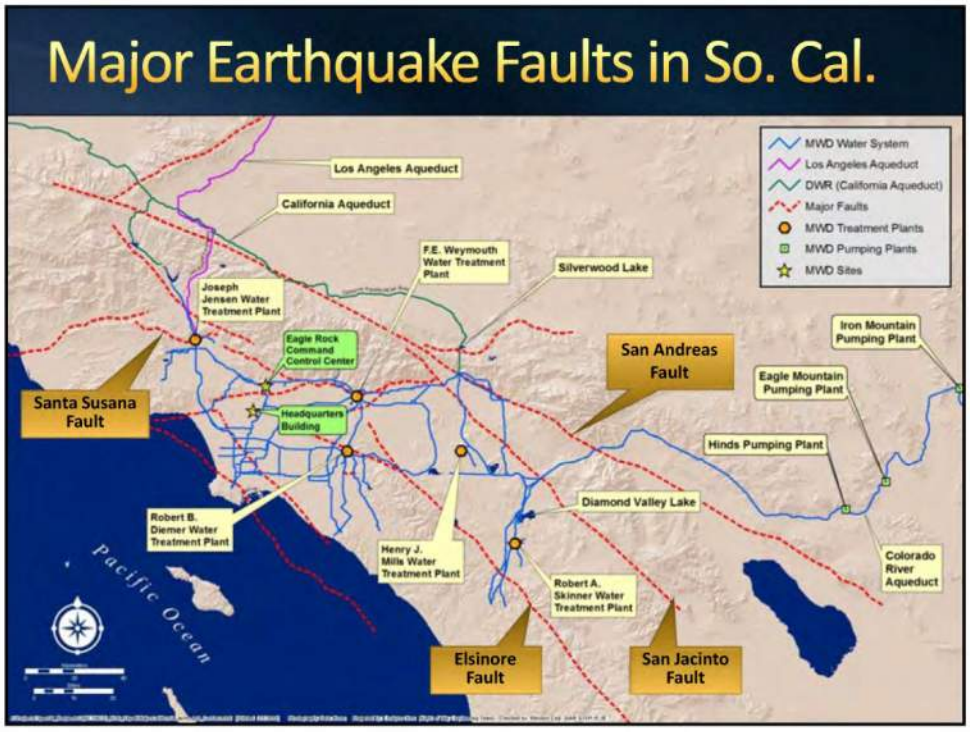


## San Andreas Fault

- Fault with the highest probability of generating a major earthquake in So. Cal.
- Potential impact on MWD operation
  - CRA
  - Hinds and Eagle Mountain Pumping Plants
  - Rialto and Inland Feeders
  - East Branch of State Water Project
  - DWR's Santa Ana Pipeline

## Liquefaction

- What is liquefaction?
  - A process by which water-saturated soils temporarily lose strength and act like liquid
- Factors needed for liquefaction
  - Loose or low density sandy soils
  - Shallow ground water
  - Strong ground shaking

## Liquefaction Susceptible Zones in So. Cal.

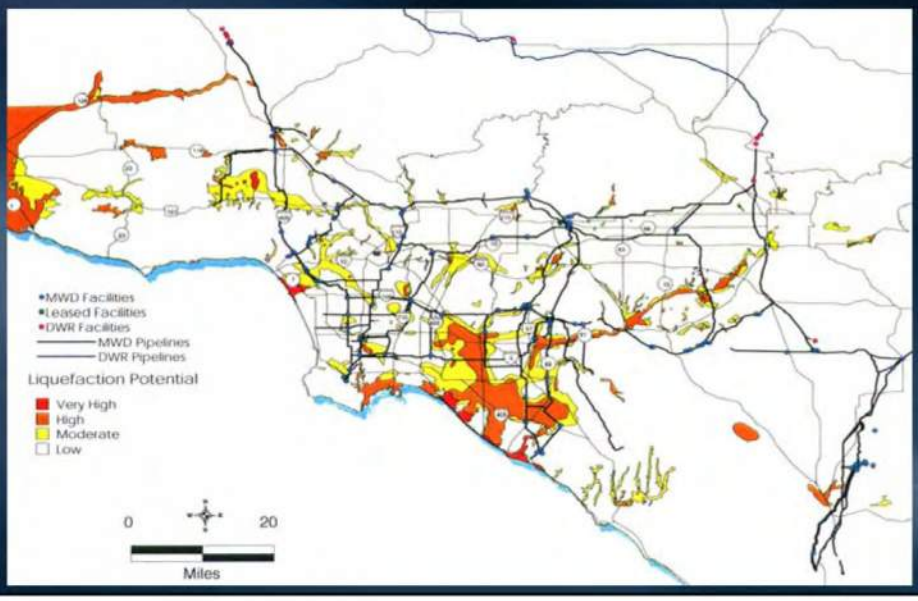

## How to measure earthquakes?

- Earthquake Magnitude
  - Describes size of earthquake
  - Unique value for each earthquake
  - Quantitative value based upon amount of released energy
- Earthquake Intensity
  - Describes effect of earthquake
  - Multiple number of values for every earthquake
  - Qualitative description or quantitative measurement of ground or structural response to earthquake

## Definitions

- Maximum Credible Earthquake
  - Largest earthquake that is physically capable of occurring on a fault
- Peak Ground Acceleration (PGA)
  - Maximum acceleration measured at ground surface during the course of earthquake motion
- %g
  - Acceleration expressed as a percentage of the force of gravity
- Maximum Considered Earthquake Ground Motion
  - Smaller of the probabilistic ground motion (2% probability of exceedance in 50 years), and the deterministic ground motion (Maximum Credible Earthquake occurring on the controlling fault)

## Earthquake Magnitude

- One unique value for each earthquake depending upon amount of energy released
- Earlier version – Richter or Local Magnitude
- Current version – Moment Magnitude
- Logarithmic-based measurement scale
- A magnitude 6 earthquake releases 32 times more energy than a magnitude 5 and 1,024 times more energy than a magnitude 4 earthquake (based on Moment Magnitude)
- Reported to the nearest 0.1, e.g., M7.1

## What affects earthquake magnitude?

- Fault rupture length - Longer rupture length releases more energy
- Length of fault – Longer faults have the potential to release more energy than shorter faults
- San Andreas is longest fault in So. Cal. and has the largest potential to generate a Magnitude 8+ earthquake.

## Earthquake Intensity

- Multiple values for each earthquake depending on location relative to earthquake epicenter
- Described qualitatively using a system such as the Modified Mercalli Scale (roman numerals between I: not felt and XII: total damage) based upon visual perception of earthquake severity in terms of effects on humans and structures
- Reported quantitatively using seismographs to measure ground motion

## What affects earthquake intensity?

- Magnitude of earthquake - increased magnitudes tend to increase intensity
- Distance from earthquake – increased distance from an earthquake tends to lessen intensity
- Fault type – thrust faults tend to increase intensity of vertical ground motions
- Site soil conditions – rock sites tend to lessen intensity compared to soil sites
- All factors interact to yield unique site-specific intensity

## Comparison of Magnitude Scale and Intensity Scale

| Richter Scale | Modified Mercalli Intensity Scale | Perception of Earthquake Intensity* |
|---|---|---|
| 2 | I-II | Detected only by instruments |
| 3 | III | Felt indoors |
| 4 | IV-V | Felt by most people; slight damage |
| 5 | VI-VII | Felt by all; damage minor to moderate |
| 6 | VII-VIII | Everyone runs outdoors; damage moderate to major |
| 7 | IX-X | Major damage |
| 8+ | X-XII | Major to total damage |

*Measured at epicenter

## How are earthquake magnitude and intensity used in design?

- Earthquake magnitudes are not specifically used in design
- Designs are based upon resisting predicted earthquake intensities (quantified by peak ground accelerations stated to nearest 0.01 or %g)
- Earthquake magnitudes and several other factors are used to estimate earthquake intensities for design

## Deterministic Seismic Hazard Assessment

- Determines the largest Peak Ground Acceleration that can occur on a site for a single magnitude earthquake at a single distance from the site, regardless of the likelihood that an earthquake event with the selected magnitude and distance will occur.
- Induced Peak Ground Accelerations at a site are evaluated assuming that the specific Maximum Credible Earthquake occurs on each of the nearby faults at the closest approach to that site.
- The fault that generates the largest Peak Ground Acceleration at a site is called the "controlling fault."
- The Peak Ground Acceleration generated by the controlling fault is the controlling ground motion.

## Probabilistic Seismic Hazard Assessment

- Considers all possible magnitude earthquakes (up to the Maximum Credible Earthquake) on all faults identified within 100km at all possible distances from a site, and the likelihood of the occurrence of each combination.
- Each identified fault is evaluated separately with regard to activity rates, the relative number of earthquakes at different magnitudes, expected earthquake magnitude range, and its location relative to the site.
- The individual fault contributions are combined to develop total probabilities for any specified Peak Ground Acceleration at a site. As a result, Peak Ground Accelerations for a site can be determined with a specified probability of exceedance.

## Current Building Code Seismic Design Requirements

- Maximum Considered Earthquake (MCE) Ground Motion
  - Probabilistic: Ground motion with 2% probability of exceedance in 50 years
  - Deterministic: Ground motion generated by Maximum Credible Earthquake occurring on the controlling fault(s)
  - Smaller ground motion determined by these two methods governs design
  - Deterministic approach usually governs in So. Cal.
- A Regular Facility is designed for 2/3 of MCE Ground Motion to achieve Life Safety performance
- An Essential Facility is design for a higher performance
  - Building codes establish the minimum seismic design criteria, and building owners can choose to design for a higher performance
- Building codes do not apply to facilities under Cal. Division of Safety of Dams (DSOD) jurisdiction

## Examples of Regular and Essential Facilities

| Facilities | Description | Examples |
|---|---|---|
| Regular | Normal occupancy | •Commercial buildings<br>•Residential buildings<br>•Manufacturing facilities |
| Essential | High occupancy/Special occupancy | •Schools<br>•Hospitals<br>•Jails, detention facilities<br>•Public utility facilities<br>•Hazardous material storage facilities<br>• Fire and police stations<br>• Emergency shelters<br>• Aviation facilities |

Based on IBC 2009, ASCE 7-05

# Examples of Design Peak Ground Acceleration in Recent Codes

| Codes | Year in Effect in Cal. | Design Peak Ground Acceleration (PGA)+ | | |
|---|---|---|---|---|
| | | Weymouth | USHQ | Skinner |
| UBC 1994 | 1995 | 0.4g | 0.4g | 0.4g |
| 1994 Northridge Earthquake - Resulted in codification of the near-source effect* | | | | |
| UBC 1997 | 1998 | 0.52g | 0.4g | 0.4g |
| Seismic hazard map updated to reflect the adoption of Maximum Considered Earthquake Ground Motion as the basis of structural design | | | | |
| IBC 2009 | 2010 | 0.71g | 0.59g | 0.4g |

+The listed PGA values are based on generic seismic hazard maps included in the codes. A site-specific analysis may result in different values.
*Other factors such as frequency contents and shaking duration will result in adverse effect on structures that cannot be captured by PGA along. The effect is more pronounced when the site is close to earthquake epicenter, and accounted for by amplifying PGA.

# How to define seismic performance of structures?

| Structural Performance Level* | Expected Performance | Post-Earthquake Assessment |
|---|---|---|
| Immediate Occupancy | • Limited structural damage<br>• Safe to occupy immediately after earthquake with minor repair | Green |
| Life Safety | • Significant structural damage; no imminent risk of collapse<br>• Occupants would safely evacuate from the building<br>• Not safe to occupy w/o major repair. Repair may be economically impractical. | Yellow or Red |
| Collapse Prevention | • Extensive structural damage and on verge of partial or total collapse<br>• Building is likely damaged beyond repair both technically and economically | Red |

*As defined in ASCE 41-06 Seismic Rehabilitation of Existing Buildings

Example of life safety performance
1999 Chi-Chi (Taiwan) Earthquake

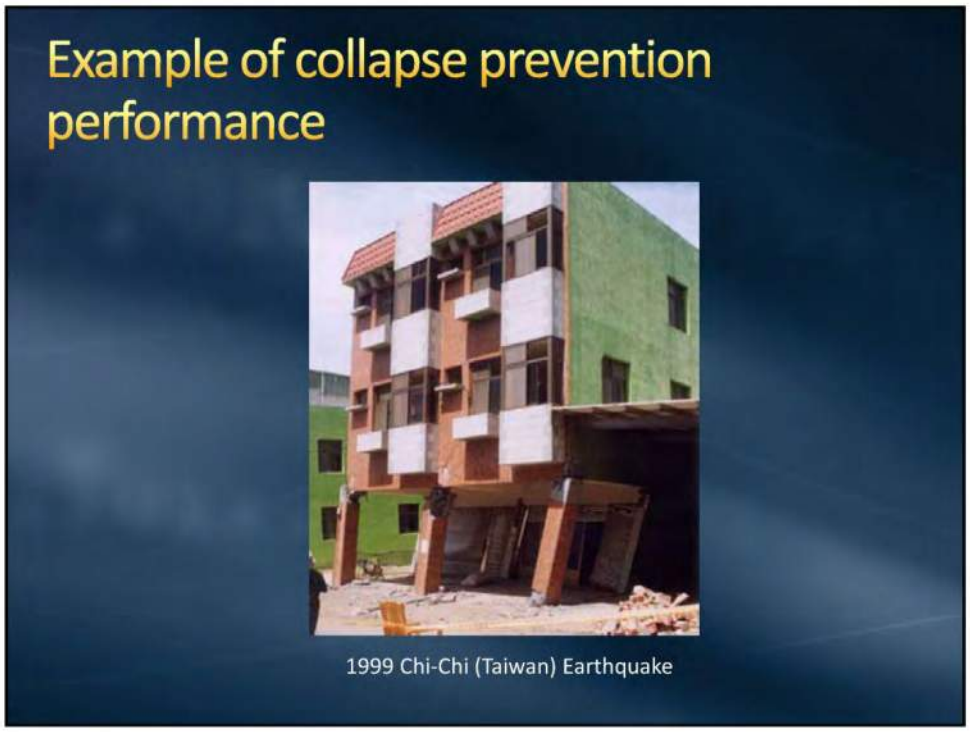
Example of collapse prevention performance
1999 Chi-Chi (Taiwan) Earthquake

## What's the expected seismic performance of a structure meeting current code requirements?

- Regular Facilities
  - The objective is to allow safe evacuation of occupants (Life Safety), instead of focusing on prevention of structural damage
- Essential Facilities
  - The objective is to allow continuous operation of the building (Immediate Occupancy) with limited structural damage
- The expected performances are for the design earthquake (2/3 of MCE Ground Motion)

## Does the building code require existing structures to be upgraded to the current code requirements?

- No, but there are a few exceptions
- Exceptions
  - Type of structural system known to have significant inherent deficiencies: unreinforced masonry or block wall structures
  - Structures required for post-earthquake disaster response: hospitals and emergency response centers
  - Extensive addition/alternation
- Owners can reduce seismic risk with voluntary upgrades

## What's the acceptable seismic performance level for an existing structure, as it may not meet the current code requirements?

- Depending on post-earthquake functions of the building, the owner may choose the desired performance level
  - Immediate Occupancy
  - Life Safety
  - Collapse Prevention
- Non-building structures (reservoirs, tanks…) are designed based on consensus standards and guidelines (e.g. ASCE, ASME, AWWA…)
  - Operational
  - Prevention of uncontrolled release of contents

## What seismic performance are specified in MWD's seismic design criteria?

| Building Type Structures | | | | |
|---|---|---|---|---|
| Importance Designation | Essential Facilities | | Regular Facilities | |
| | New | Existing | New | Existing |
| Building Code and Industry Standards | CBC<br>ASCE 7 | CBC<br>ASCE 41 | CBC<br>ASCE 7 | CBC<br>ASCE 41 |
| Design Intent Per Code/ Standard Language | Provide a larger margin against collapse in MCE and remain operational in Design Earthquake (2/3 MCE) | Enhanced performance against life safety in Design Earthquake | Collapse prevention in MCE and prevent life threatening damage in Design Earthquake | To achieve life safety in Design Earthquake |
| Metropolitan Seismic Design Objective | To remain operational following a major seismic event | Intended to maintain occupancy immediately following a major seismic event | May experience significant damage, but would prevent life threatening injury or casualty following a major seismic event | May experience significant damage, but would prevent life threatening injury or casualty following a major seismic event |

## What seismic performance are specified in MWD's seismic design criteria? (Cont.)

| Water Containing Structures | | | | |
|---|---|---|---|---|
| Importance Designation | Essential Facilities (Related to Water Delivery) | | Regular Facilities (Not Related to Water Delivery) | |
| | New | Existing | New | Existing |
| Building Code and Industry Standards | CBC<br>ASCE 7<br>ACI350<br>AWWA D100<br>API 650 | CBC<br>ASCE 41<br>ACI350<br>AWWA D100<br>API 650 | CBC<br>ASCE 7<br>ACI350<br>AWWA D100<br>API 650 | CBC<br>ASCE 41<br>ACI350<br>AWWA D100<br>API 650 |
| Design Intent Per Code/ Standard Language | Provide a larger margin against failure in MCE and require a higher level of liquid tightness to maintain serviceability in Design Earthquake (2/3 MCE) | Not differentiated. | Prevent catastrophic failure in MCE and prevent uncontrolled release of liquid in Design Earthquake | Not differentiated. |
| Metropolitan Seismic Design Objective | To remain operational following a major seismic event | To remain operational or can be restored quickly following a major seismic event | May experience significant leak and require dewatering to repair, but would prevent uncontrolled release of liquid following a major seismic event | May experience significant leak and require dewatering to repair, but would prevent uncontrolled release of liquid following a major seismic event |

## How do the design and performance for a new facility and retrofit of an existing facility compare?

# Appendix 7

# Summary of Previous Metropolitan Seismically Induced Damage Studies

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The impact of earthquakes on Southern California and on Metropolitan's system has been the subject of several previous internal and external assessments:

***Seismic Risk Assessment of Local Water Production Facilities in the Service Area of Metropolitan Water District of Southern California,* January 14, 1991, Dames & Moore.** This is a comprehensive report on the effects of a major earthquake on the Southern San Andreas Fault. The report has various models for estimating damage and concludes that there could be hundreds of local water pipelines damaged, loss of power, etc. Metropolitan feeders that are vulnerable to damage were identified, and the report estimates that Metropolitan service will be lost for 6 months or less. The report also predicts significant damage to ground water wells.

***Probable Maximum Loss Analysis for Metropolitan Water District of Southern California*. September 1998, EQE International.** This report was prepared to assess the potential monetary loss associated with several earthquake scenarios. This report highlighted the potential for widespread damage resulting from an earthquake. The study did not address the impact on deliveries or system recovery.

***Assessment of Frequency of Recovery Plan and Extreme Events within the Metropolitan Water District Service Area,* December 2001, Geomatrix Consultants.** This report was prepared to aid in the evaluation of hazards under the System Reliability Plan (see next report). This report evaluated the probability of earthquakes of two levels of severity within Metropolitan's service area. The first was a moderate (strong) earthquake similar to the Northridge earthquake (M6.7) and the second was an extreme event, on the order of M7.5. The report provided information on the probability of these earthquakes both within each of Metropolitan's operating regions and within the service area as a whole. The scope of the report did not include evaluating the impact on service or time for recovery.

***Distribution System Reliability Assessment, (Report No. 1227),* December 2006, Metropolitan Facility Planning staff.** This report evaluated the reliability of the distribution system. In addition, a separate section of the report dealt with the vulnerability of Metropolitan's facilities to various initiating events. The report addressed the probability of failures in the system due to various random causes including earthquakes. It utilized information from the Geomatrix study to estimate the probability of seismically induced failures. Estimates for the recovery time from the various events were provided.

***Facility Reliability Assessments,* 2006, Metropolitan Facility Planning staff.** Reliability assessments were conducted by Metropolitan of the five treatment plants and the Colorado River Aqueduct. These assessments evaluated the susceptibility of individual facilities to a series of hazards such as fire, flooding, and earthquakes. Earthquakes were identified as one of the highest risk hazards because of the potential to cause numerous simultaneous failures. The reliability assessments identified structures that had not been updated to the latest seismic criteria. As part of the Seismic Upgrade Program, these structures have been evaluated. Where necessary, capital projects were initiated to upgrade the facilities to the most recent building codes. Completed Facility Reliability Assessments are listed below:

- *Diemer Water Treatment Plant Reliability Assessment, (Report No. 1225),* 2006
- *Skinner Water Treatment Plant Reliability Assessment, (Report No. 1246),* 2006
- *Weymouth Water Treatment Plant Reliability Assessment, (Report No. 1255),* 2006

- *Mills Water Treatment Plant Reliability Assessment, Report No. 1269,* 2006
- *Jensen Water Treatment Plant Reliability Assessment, Report No. 1280,* 2006
- *Colorado River Aqueduct Reliability Assessment, Report No. 1297,* 2006

***System Reliability Study,* 2007, Metropolitan Facility Planning staff.** This study evaluated the reliability of the entire system. This study examined the impact of single failures within the system on the ability to deliver water to member agencies and identified existing backup options. The failures considered included individual facilities as a unit (e.g., a treatment plant or a reservoir). For pipelines, the study considered a failure in each isolatable segment of the line. The impact on deliveries to each service connection was identified and over 250 different events were studied. The study considered capabilities within Metropolitan's system, as well as the member agencies', to mitigate the failures. This study did not consider multiple failures that might be associated with an earthquake due to the almost unlimited number of combinations of failures that would have to be considered.

***Golden Guardian 2008.*** In November 2008, under the auspices of the USGS, Caltech and Earthquake Research Associates, a major disaster drill was conducted in Southern California. The drill was based on a magnitude 7.8 earthquake on the San Andreas Fault (Golden Guardian Exercise). The preliminary studies conducted as part of the exercise indicated that major damage is expected. The impact on water systems was one of the areas of focus for the drill and the related studies. The studies concluded that in areas impacted heavily, water service could be lost for six months.

***Potential Effects of Southern California Seismic Events on Metropolitan Water Deliveries (Report No. 1335)*, January 2009, Metropolitan Facility Planning staff.** This report provided a perspective on the magnitude of damage that could result from moderate and extreme earthquakes, the corresponding potential impacts on Metropolitan water deliveries, and estimated time frames for restoring service. The report also offered recommendations for reducing the potential impacts of certain significant seismic events.

***Mills Water Supply Reliability Study (Report No. 1337),* Metropolitan Facility Planning staff.** The Mills study was prepared in response to findings of the Integrated Area Study, which identified risks to the raw water supply to the Mills plant. The study evaluated alternatives to improve the reliability and redundancy of the raw water supply to Mills. A capital project has been initiated to implement one of the options.

***Potential Impact of a Seismic Event on the CRA Tunnels (Report No.* 1478), August 2014, Metropolitan Facility Planning staff.** This is the first report of a comprehensive study of the seismic vulnerability of the CRA. Five companion reports (Metropolitan Report Numbers 1470, 1484, 1485, 1490 1558) are described below. This study evaluated the vulnerability of CRA tunnels to damage from a major seismic event, provided a perspective of the level, extent and type of seismic damage that could be imposed on CRA tunnels, and estimated the time frame to restore service. The results of the study showed that most of the CRA tunnels are expected to perform well following a large seismic event. Of all the CRA tunnels, only the area near the west portal of the San Jacinto tunnel would be subject to liquefaction, but this area would be easily accessible. The area above the west portal of the San Jacinto tunnel could also be subject to seismically induced landslides, but a project was completed in 1998 to mitigate the potential damage from

a landslide at the portal. For the remainder of the tunnels, the potential to experience heavy damage from landslide or rockfalls is negligible. Despite traversing a highly seismic area, there are only three instances of the CRA tunnels crossing a known active fault: Whitewater Tunnel No. 2, Thousand Palms Tunnel No. 2, and Wide Canyon Tunnel No. 2. Of these three tunnels, Whitewater Tunnel No. 2 would likely experience the most significant displacement from a fault rupture.

For ground shaking, while a number of the tunnels could experience high levels of shaking based on estimated Peak Ground Acceleration (PGA), most of these tunnels are deep and constructed in hard rock, which is beneficial for their performance during an earthquake. However, approximately 4.2 miles of tunnel were identified as having a high potential of experiencing heavy damage from the Maximum Considered Earthquake (MCE). These are areas that have shallow cover (e.g. near portals) and experience high PGA values. It should be noted that the entire 4.2 miles would not be expected to be damaged from a single earthquake, but rather there would be isolated areas of damage with those identified tunnel sections. A CIP has been submitted to further investigate the vulnerability of these tunnel sections and to identify options to mitigate the risk.

The Whitewater Tunnel No. 2 was identified as having the greatest cumulative seismic risk. The tunnel is crossed by the Garnett Hills segment of the San Andreas Fault which, from the San Gorgonio Pass Seismic Event Vulnerability Study (Report No. 1484; 2014), could experience up to a 12 foot horizontal and 3 foot vertical offset from a rupture of the San Andreas Fault approximating the MCE. The tunnel could also experience very high levels of shaking from the MCE, and was constructed in compacted sands and gravels, which could negatively impact the performance against the shaking.

For the purpose of estimating repair times, a worst-case damage scenario was developed for the Whitewater Tunnel No. 2, and a tunnel repair workshop was conducted to get a realistic understanding of repair methods and repair times (reference Report No. 1485).

***Colorado River Aqueduct – San Gorgonio Pass Seismic Event Vulnerability Study (Report No. 1484),* July 2014, GeoPentech.** This study evaluated the potential for horizontal and vertical deformation following a large seismic event within the San Gorgonio Pass area. To assist in the study, a team of geoscientists experienced in assessing the potential for fault displacements along the southern San Andreas Fault System in the area of the San Gorgonio Pass was assembled under GeoPentech, Inc. The study incorporated the most recent information available regarding the seismicity of the area including: geology, geodesy, seismicity, paleoseismology, and tectonics.

The information gathered during the course of the study was used to develop a 3-dimensional deformation model of the San Gorgonio Pass area using Coulomb 3.3 (San Gorgonio Pass Model). The model was developed to estimate the surface fault displacement and deformation that would occur along and near the CRA within the San Gorgonio Pass as a result of future seismic events. The results of the San Gorgonio Pass Model were compared to current geologic and geomorphic data, which showed a reasonable reflection of the natural conditions of the area, validating the results of the model.

The MCE for the southern San Andreas Fault would be a rupture originating near the Salton Sea around Bombay Beach and extending through the San Gorgonio Pass up to between Wrightwood and Three

Points. Based on available geologic data, the most likely event on the San Andreas Fault to rupture in on the Garnett Hills Fault, which is a strand of the San Andreas Fault system located in the San Gorgonio Pass. Results from the San Gorgonio Pass Model indicate that an earthquake approximating the MCE for the Southern San Andreas Fault System could result in a horizontal offset of approximately 12 feet and a vertical deformation of approximately 3 feet at the Garnett Hills Fault crossing of the CRA. The vertical deformation would extend over the CRA for approximately 60 miles.

The seismic event would result in uplift along the longitudinal profile of the CRA with three separate peaks, with the last peak occurring at or near the Whitewater Tunnel No. 2 and resulting in a cumulative upward deformation of approximately 3 feet. This upward deformation of the CRA would reduce the flow carrying capacity of the aqueduct. An accompanying probabilistic rupture hazard analysis of the San Gorgonio Pass (Report No. 1470) showed that the above deformation occurring at the CRA crossing has a return period of approximately 750 years.

***The Colorado River Aqueduct San Gorgonio Pass Seismic Event Vulnerability Study – Hydraulic Analysis, (Report No. 1558),*** **September 2014, Metropolitan Facility Planning and Hydraulics staff.** This study documents a detailed hydraulics analysis that evaluated the impact of a seismically induced vertical uplift of the CRA alignment over a length of approximately 60 miles, based on the uplift profile from the San Gorgonio Pass Seismic Event Vulnerability Study (Report No. 1484). The analysis showed that despite the uplift, Metropolitan would be able to continue flowing approximately 1300 cubic feet per second, approximately 80 percent of design flow, through the aqueduct after initial rapid repairs are completed. The analysis assumed free surface flow with a 3-foot minimum freeboard, the same as the current aqueduct design. Minor pressurization of the system could allow for some additional flow if required. The analysis also assumed that repairs to the CRA following the earthquake maintained the design cross sections and friction of the non-damaged CRA sections, and that no repairs were done to reestablish the grade.

***Probabilistic Rupture Hazard Analysis of CRA at San Gorgonio Pass (Report No. 1470),*** **October 2014, Metropolitan staff.** This report is a supplemental report to Report No. 1484, "Colorado River Aqueduct – San Gorgonio Pass Seismic Event Vulnerability Study." The report documents the results of a probabilistic rupture hazard analysis of the CRA where it crosses the Garnett Hills segment of the Southern San Andreas Fault in the San Gorgonio Pass. The analysis showed that the projected 3-foot vertical and 12-foot horizontal surface deformation at the CRA crossing in the San Gorgonio Pass has a return period of approximately 750 years.

***Colorado River Aqueduct Seismic Vulnerability Investigations – Summary Report (Report No. 1490)*****, December 2014, Metropolitan Facility Planning staff.** This report briefly summarizes the results of the CRA seismic vulnerability studies (Reports 1478, 1484, 1485 and 1558).

***Seismic Risk Assessment – Conveyance and Distribution System Tunnels (Report No. 1533),*** **March 2016, GeoPentech and Metropolitan Facility Planning staff.** This study evaluated the seismic risk of the 41 tunnels within Metropolitan's Conveyance and Distribution System to heavy damage during a future maximum considered earthquake (MCE) event that would adversely impact water deliveries to member agencies while the tunnel is out of service for repairs. The study was completed through a two part

process. Part 1 screened each of the 41 tunnels and identified tunnels that were vulnerable to one or more seismic hazard, and could result in a loss of service to the member agencies (i.e., no backup capability) if flow through the tunnel is disrupted. Tunnels that met both criteria in Part 1 were deemed a potential seismic risk to Metropolitan's water delivery reliability and were pushed through to Part 2 of the process. Part 2 further evaluated each of the potential high-risk tunnels identified in Part 1 and numerically ranked each tunnels degree of seismic risk in order to identify which tunnel(s) may pose the greatest risk to Metropolitan's water delivery capability.

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# Appendix 8

# Administrative Code Section 4503 "Suspension of Deliveries" and 9/21/06 IAS Clarification

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**§ 4503. Suspension of Deliveries.**

(a) Whenever repairs or maintenance of the District's system, in the opinion of the Chief Executive Officer of the District, shall require suspension of delivery of water at any point or points, such delivery may be suspended without liability on the part of the District; provided, that except in cases of emergency, as determined by the Chief Executive Officer, notice of such suspension of service shall be given to the affected member public agency in advance of such suspension. Metropolitan will make a concerted effort to notify and work with member public agencies regarding all scheduled interruptions. The District will schedule non-emergency interruptions for the low demand months of the year, typically October through April, in coordination with the member public agencies.

(b) Each member agency shall have sufficient resources such as local reservoir storage, groundwater production capacity, system interconnections or alternate supply source to sustain a seven-day interruption in Metropolitan deliveries based on annual average demands. If a member public agency has been provided with a sixty (60) day notice of when an interruption in service is to occur, the member public agency shall be responsible for and reimburse direct costs, excluding labor costs, incurred by Metropolitan in the event that a scheduled non-emergency interruption of up to seven days is postponed or cancelled at the request of the member public agency as a result of insufficient local resources, and the District agrees to such cancellation or postponement. Direct costs shall be determined by Metropolitan's Chief Executive Officer, in consultation with the affected member agency. These direct costs shall be applied to the member public agency's water invoice following cancellation or postponement of the shutdown.

(c) Except in cases of emergency, the District, working with the member agencies, will produce a shutdown schedule each September for the annual shutdown season from October through April. The District will also develop a three-year shutdown schedule, which will give notice of the proposed shutdowns greater than seven days at least one-year in advance.

(d) Replenishment Service certifications will be adjusted for the reduction of credits that are accrued due to shutdowns that are greater than seven days. No adjustments will be made for shutdowns seven days or less unless the member agency provides a service to the District by serving another member agency in-lieu of District deliveries during a shutdown even if the shutdown is seven days or less.

Section 322.4 based on Res. 7260 – May 12, 1970, amending Res. 3896 – August 18, 1950; amended by M.I. 33642 – March 10, 1981. Section 322.4 repealed and Section 4503 adopted by M.I. 36464 – January 13, 1987, effective April 1, 1987; amended by M.I. 42278 - February 11, 1997; paragraph amended by M. I. 44812 - March 12, 2002; paragraph amended by M. I. 45943 – October 12, 2004; paragraphs assigned (a), (b), (c), & (d) designations and amended by M. I. 45988 – November 9, 2004.

# 2007 Integrated Area Study (IAS) Clarification

1. Original intent
    a. Communicated that MWD's system is interruptible
    b. Protected MWD from liability claims for required shutdowns
    c. Illustrated commitment to minimizing impacts
        i. Advanced notice & coordination
        ii. Non-emergency outages only during low flow months
    d. Required member agencies to make provisions for outages
        i. 7-day supply of average annual demands
        ii. No enforcement – no penalty

2. Updated text & interpretation
    a. Recognized changing conditions
        i. Increased member agency dependence upon MWD
        ii. Many agencies in non-compliance
        iii. Increased difficulty in storing treated water
    b. Revised requirement for member agency outage provisions
        i. Capability to sustain 7-day interruption (not limited to supply)
        ii. Penalty added for cancellation or postponement of outage

3. IAS clarification
    a. MWD planned outages are required to maintain long-term reliability
    b. Unplanned MWD outages may also occur
    c. Intent of 4503 was to encourage agency provisions for planned and unplanned outages
    d. Compliance not enforced (beyond interference with planned outages)
    e. Member agencies responsible for decisions regarding provisions for unplanned outages
    f. Regional flexibility improvements achieved through demand-driven LRP & IAS projects

REPORT

# SEISMIC RESILIENCE REPORT

## 2020 UPDATE

The Metropolitan Water District of Southern California

700 N. Alameda Street, Los Angeles, California 90012

Report No. 1551-1

February 2020

# Seismic Resilience Report 2020 Update

## Prepared By:

The Metropolitan Water District of Southern California
700 North Alameda Street
Los Angeles, California 90012

Report Number 1551-1
February 2020

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**Prepared under the direction of:**

| | |
|---|---|
| John Bednarski | Chief Engineer |

**Prepared by:**

| | |
|---|---|
| Albert Rodriguez | Engineering Services |

**Reviewed by:**

| | |
|---|---|
| Deven Upadhyay | Assistant General Manager/Chief Operating Officer |
| Brent Yamasaki | Water System Operations |
| Catherine Stites | General Counsel |
| Tobin Tellers | Engineering Services |
| Cash Spradling | Engineering Services |
| David Clark | Engineering Services |
| Arlene Arita | Engineering Services |
| John Shamma | Engineering Services |
| Howard Lum | Engineering Services |
| Grace Chan | Water Resources Management |
| Kevin Donhoff | Water Resources Management |
| Jack Safely | Water Resources Management |
| Ian Whyte | Water System Operations |
| Greg de Lamare | Engineering Services |

**Additional copies**: The Seismic Resilience Report is located on the Seismic Resilience SharePoint site. To obtain a copy of this document, please contact the Engineering Services Group.

***Disclaimer***

*Extensive efforts have been made to ensure that the material contained in this document is accurate as of the date of publication. There are many factors, however, related to the content and applicability of this document which are beyond the control of MWD. In addition, the contents of this publication will be periodically updated, so the reader should inquire about any such changes in addition to reading this document. Finally, the reader is encouraged to seek appropriate technical and/or legal advice when specific facts or circumstances arise that raise questions concerning the applicability or interpretation of the policies and procedures discussed herein.*

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Cover Photo: Test setup for large diameter seismic-resilient ductile-iron pipe to be used on Metropolitan's Casa Loma Siphon

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# EXECUTIVE SUMMARY

In February 2018, the Metropolitan Water District of Southern California (Metropolitan) published *Report No. 1551, Seismic Resilience First Biennial Report*, which defined Metropolitan's Seismic Resilience Strategy and identified a number of near-term goals to improve Metropolitan's seismic resilience. The *2020 Seismic Resilience Report Update* is a supplement to the *Seismic Resilience First Biennial Report* (2018 Report). The purpose of the update is to document revisions to Metropolitan's Seismic Resilience Strategy, document seismic-resilience-related studies completed since publication of the 2018 Report, list the achievements related to the seismic performance objectives and near-term goals identified in the 2018 Report, and communicate new performance objectives and goals that will further increase the seismic resilience of Metropolitan's system.

Since the publication of the 2018 Report, Metropolitan has initiated multiple studies that will improve planning for earthquake response. Completed studies include an evaluation of Metropolitan's emergency storage requirements and an evaluation of the susceptibility of the conveyance and distribution pipelines to liquefaction. Staff is also nearing completion of an assessment of the potential damage to the conveyance and distribution pipelines from different earthquake events.

In the last two years, Metropolitan has also completed construction for seismic upgrades to 17 structures. Additionally, Metropolitan substantially completed the initial round of seismic evaluations for above-ground structures constructed pre-1990, which in general pose an elevated seismic risk. Evaluation of above-ground structures built post-1990 has been initiated as well as evaluation of hydraulic structures (e.g., reservoir outlet towers) to assess their seismic risk when compared to current design practices.

Finally, Metropolitan conducted over 100 emergency response exercises, workshops, and seminars since February 2018, including two large functional exercises. These exercises help to ensure that Metropolitan staff is prepared for when an eventual earthquake occurs. Metropolitan also started a new five-year exercise plan in 2019 that will allow all of its member agencies to participate in at least one of Metropolitan's annual emergency exercises during the next five years.

Overall, Metropolitan has achieved many of the near-term goals that were proposed in the 2018 Report and is continuing the efforts to complete the few items that are still outstanding. The strategy outlined in the 2018 Report to develop the seismic resilience of the system is an ongoing process that will continue to evolve and adapt as new information becomes available.

Staff recommends changing the frequency of written update reports from its current two-year cycle to a frequency of a written report every five years, with the next written report to the Board in 2025. Staff will continue to provide annual oral updates on Metropolitan's Seismic Resiliency Strategy to the Board.

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# SECTION 1 PURPOSE

The Metropolitan Water District of Southern California (Metropolitan) owns and operates a complex conveyance, storage, treatment, and distribution system that serves a 5,200-square-mile service area within an active seismic region. Over its approximate 90-year history, Metropolitan has been proactive in mitigating seismic risk posed to the system, as well as improving its ability to maintain or quickly restore water deliveries following a major earthquake.

In February 2018, Metropolitan published *Report No. 1551, Seismic Resilience First Biennial Report* (2018 Report), which summarized Metropolitan's historical approach to mitigating seismic risk and defined the organization's current Seismic Resilience Strategy and the core components of that strategy. The report also identified performance objectives and near-term goals of the Seismic Resiliency Strategy. The 2018 Report is available on Metropolitan's website using the link below:

http://mwdh2o.com/PDF_About_Your_Water/SRS%20Report%201551_Final_030518A_Submit_Reduced.pdf

The *2020 Seismic Resilience Report Update* is a supplement to the 2018 *Seismic Resilience First Biennial Report*. The purpose of the update is to document recent revisions to Metropolitan's Seismic Resilience Strategy regarding emergency storage requirements, document seismic-resilience-related studies completed since publication of the 2018 Report, and list the achievements related to Metropolitan's Seismic Resilience of Structures Program, emergency response planning, and the seismic performance objectives and near-term goals identified in the 2018 Report. The report also identifies new performance objectives and goals that will further increase the seismic resilience of Metropolitan's system.

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# SECTION 2 BACKGROUND

## Seismic Risk

Southern California is crossed by numerous faults of varying levels of activity that are capable of generating large earthquakes and causing widespread damage. The 2018 Report listed six earthquakes that occurred within or near Metropolitan's service area in southern California since 1900 - four strong earthquake events (M6.0 – 6.9) and two major earthquake events (M7.0 to M7.9).

In 2019, two significant earthquakes events occurred in the region. On July 4, 2019, a M6.4 earthquake occurred near Ridgecrest, approximately 122 miles north/northeast of Los Angeles. Then on July 5$^{th}$, a M7.1 earthquake occurred in the same vicinity. While the earthquakes caused major damage to Ridgecrest and the surrounding communities, the earthquakes only caused mild shaking in the Los Angeles region due to the distance from the epicenter. However, these earthquakes are a reminder that earthquake risk is always present and that the region must take steps to prepare and respond.

A map showing significant (M6.3 and greater) earthquakes that have occurred in the southern California region since 1900 is provided in Appendix A.

## Seismic Resilience Strategy

Metropolitan's Seismic Resilience Strategy is comprised of four components that encompass the various functions that promote the organization's seismic resilience objectives.

**Planning** – Developing and maintaining a diversified water portfolio, system flexibility, and emergency storage supplies

**Engineering** – Evaluation and mitigation of seismic risks of infrastructure and the water system as a whole

**Operations** – Maintain effective emergency planning and response capabilities

**Reporting** – Increase accountability and transparency of seismic resilience programs

Metropolitan's Seismic Resilience Strategy was described in detail in the 2018 Report, and the overall structure of the strategy is unchanged. A detailed breakdown of Metropolitan's Seismic Resilience Strategy is provided in Figure 2-1. The figure provides an overview of the comprehensive actions taken to mitigate impacts from large earthquakes, to quickly respond following an earthquake event, and to provide transparency regarding seismic risk and preparedness.

As shown in Figure 2-1, in addition to the activities conducted under the Planning, Engineering, Operations, and Reporting components of the Seismic Resilience Strategy, Metropolitan has continued its involvement with the Seismic Resilient Water Supply Task Force. The Seismic Resilient Water Supply Task Force is a collaboration between Metropolitan, the Department of Water Resources (DWR), and the Los Angeles Department of Water and Power (LADWP) to improve the seismic resilience of the imported water supply aqueducts.

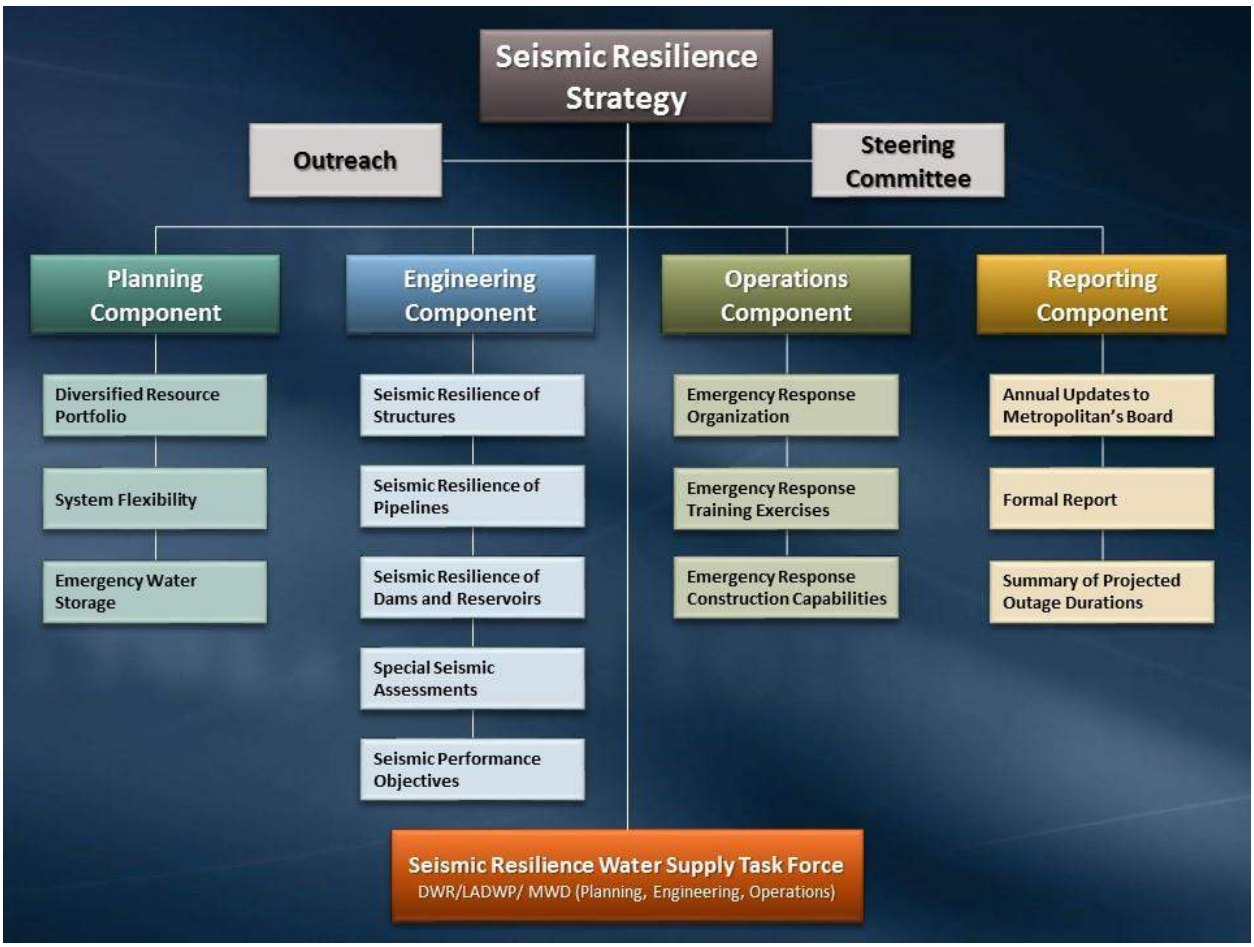


**Figure 2-1: Detailed Breakdown of Metropolitan's Seismic Resilience Strategy**

# SECTION 3 SEISMIC RESILIENCE STRATEGY UPDATES/REVISIONS

## Planning Component

### Emergency Storage

Beginning in February 2018, Metropolitan and its member agencies convened a workgroup to evaluate regional storage, including the size and management of Metropolitan's emergency storage program. The goal of the emergency storage program evaluation was to update the emergency criteria and develop a revised methodology to determine emergency storage needs. The methodology and recommendation of the workgroup were described in a draft white paper, "2018 Evaluation of Regional Storage Portfolio: Draft Evaluation of Metropolitan's Emergency Storage Objective," and presented to Metropolitan's Board in May 2019[1].

The update of the emergency criteria was based on 1) newly revised potential outage durations for the region's imported water supplies – the Colorado River Aqueduct (CRA), the Los Angeles Aqueduct, and the State Water Project east and west branches – following a seismic event, and 2) a revisit of retail water demand and locally available supplies within the service area. The revised outages were developed as part of the Seismic Resilience Water Supply Task Force. The workgroup took into account the capabilities of member agencies when identifying reduction of retail water demand and local production during an emergency outage of imported supplies. This is a critical change in that the previous storage calculation assumed 100 percent local production during the outage period.

**Diamond Valley Lake**

The new emergency storage criteria considered various combinations of local demand reduction and supply production to develop an envelope of scenarios designed to prevent a shortage during an outage. Based on the range of potential scenarios, the workgroup recommended 750,000 acre-feet for the emergency storage program target, an increase from the previous planning target of 630,000 acre-feet.

The emergency storage is assumed to be distributed among the available capacities of existing Department of Water Resources and Metropolitan surface reservoirs located on the coastal side of the San Andreas Fault. Since member agency demands for supplemental water will be met through deliveries of supplies from storage, evaluation of spatial distribution of storage and most effective operation of the

[1] The Metropolitan Water District of Southern California, Water Planning and Stewardship Committee, Board Item 9-3, "Update of Metropolitan's Emergency Storage Objective," May 2019. http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2019/05-May/Letters/064883968.pdf

distribution system will be accomplished as part of Metropolitan's continued efforts and coordination within Metropolitan's storage portfolio evaluation or other regional planning processes.

### System Flexibility

In July 2019, Metropolitan's Board of Directors authorized an amendment to the Administrative Code to enable delivery of member agency water supplies in Metropolitan's system in an emergency subject to the General Manager's approval[2]. The amendment is an effort to enhance water delivery reliability after a serious emergency in which 1) Metropolitan is unable to make deliveries to a member agency due to physical damage to Metropolitan's system resulting from a natural disaster or other emergency and 2) there are no alternate means for Metropolitan or the member agency to provide service to an area without the use of a portion of Metropolitan's system. The Administrative Code change clarifies the conditions of these emergency deliveries in a proactive way, instead of a reactive way in response to damaged infrastructure following a natural disaster or serious emergency.

## Engineering Component

### Seismic Resilience of Structures

Metropolitan has developed an ongoing program for evaluating and upgrading its above-ground facilities with the goal of protecting life safety and critical infrastructure to minimize water delivery interruptions following a seismic event. The initial round of evaluations focused on structures that were deemed likely to be more susceptible to damage from earthquakes – buildings constructed prior to 1990. Structures built after 1990 were constructed in accordance with the 1988 or later versions of the Uniform Building Code, which provides reasonable assurance of withstanding a design-level earthquake without catastrophic failure. The program procedure for the seismic resilience of Metropolitan's above-ground structures was described in the *Seismic Resilience First Biennial Report* and the program status as of January 2018 was provided. Since publication of that report, an additional 17 seismic upgrades have been completed. Figure 3-1 provides the overall status for the pre-1990 structures as of November 2019. Of the 311 pre-1990 structures identified, 63 percent were found to be acceptable and 37 percent (116 structures) potentially deficient following the rapid evaluation process. Of the 116 structures, 85 have either been seismically upgraded or are in design or construction. The remaining are largely structures that are not related to water delivery.

The program for seismically upgrading the above-ground structures is meant to be a continuous program, with the intent of reevaluating structures periodically. Structures found to be acceptable during the initial evaluation round may undergo a reevaluation, if warranted by new information such as a significant increase in seismic design force or displacement due to code revisions or newly discovered ground conditions, damage of structural components, severe material deterioration, and/or changes of occupancy.

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[2] The Metropolitan Water District of Southern California, Engineering and Operations Committee, Board Item 8-4 "Authorize Amendments to the Administrative Code Regarding Deliveries of Member Agency Supplies in Metropolitan's System in an Emergency; the General Manager has determined that the Proposed Action is Exempt or Otherwise Not Subject to CEQA", July 2019. http://www.mwdh2o.com/WhoWeAre/Board/Board-Meeting/Board%20Archives/2019/07-July/Letters/07092019%20BOD%208-4%20B-L.pdf

As shown in Figure 3-1, evaluation of the pre-1990 structures related to water delivery has been substantially complete and the deficient structures are being addressed. Following the 1994 Northridge earthquake, and subsequent earthquakes in Taiwan, Japan, and New Zealand, substantial research in seismic design and code revisions has taken place. Post-1990 structures may or may not meet the current seismic performance standards, which has prompted Metropolitan to expand the seismic evaluation to post-1990 structures, a process which was initiated in early 2019 to further improve its seismic resilience. Twenty-six structures have been identified as part of the post-1990 structure list. Rapid evaluations have been completed on six structures, and none have been identified as seismically deficient.

As Metropolitan begins its evaluation of the post-1990 above-grade structures, staff is also initiating a process to identify and systematically evaluate below-ground structures such as vaults and manholes. Similar to the evaluation of above-ground structures, the prioritization of these facilities will consider potential impacts to water delivery and potential for loss of life.

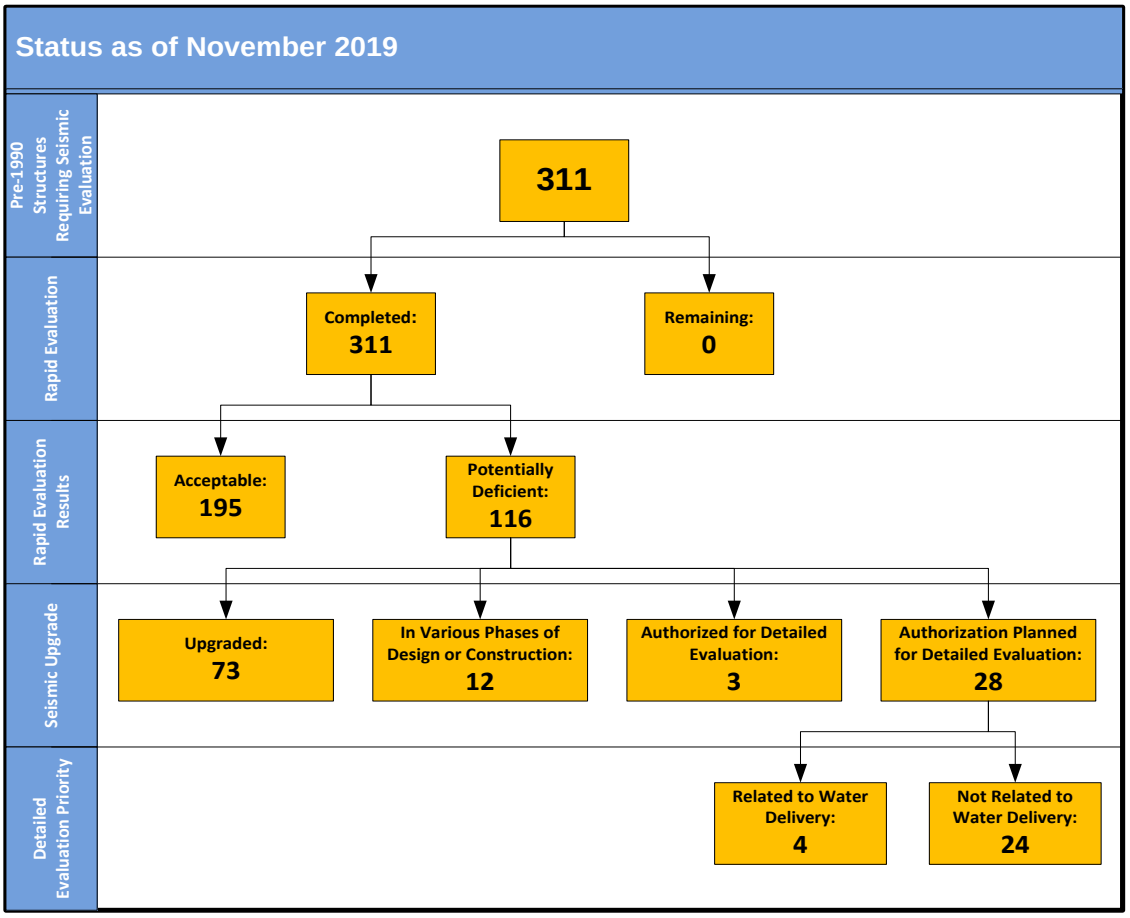


**Figure 3-1: Status of Seismic Assessment and Upgrades of Pre-1990 Structures**

### Seismic Resilience of Pipelines

Metropolitan's pipelines have been constructed in conformance with standards of practice at the time of design. Historically, there have been very few prescriptive code requirements for seismic design of pipelines. Only recently have there been developments in mitigation options for large diameter pipelines, including improved techniques to analyze the response of structures and pipelines within the ground from

shaking, increased post-earthquake data collection of ground motions and damage observations, and demonstrated performance of earthquake-resistant pipeline products.

In keeping with the goals of the Seismic Resilience Strategy, Metropolitan is developing seismic design criteria for new pipelines based on current state of practice, geotechnical and seismicity criteria, operating conditions, and asset management strategies. The planned design approach for new pipelines will be to establish performance criteria, identify seismicity and ground conditions along the alignment, and design the pipeline to resist damage from ground shaking and deformation. Specialized pipe joints and sections can be designed to accommodate ground deformation from fault displacement or liquefaction. For existing pipelines, seismic resilience will be incorporated as a component of pipeline rehabilitation projects. Metropolitan will evaluate each upgrade individually to balance risk, performance, and cost. See the Seismic Performance Objectives in this section for more information on the pipeline seismic design.

Metropolitan is in the early years of a 20-year program to rehabilitate its prestressed concrete cylinder pipelines (PCCP), which, at 163 miles, makes up approximately 20 percent of Metropolitan's conveyance and distribution system. The initial phase of the program will focus on the Second Lower Feeder, which will be upgraded with an interior steel liner. The new steel lining and the welded joints are designed to improve the seismic performance of the pipeline. For Reach 9 of the Second Lower Feeder, Metropolitan is investigating alternatives for realigning the portion of the pipeline that crosses the Newport-Inglewood Fault. One alternative being evaluated is to use specialized large-diameter earthquake-resistant steel pipe to accommodate fault displacement while maintaining structural integrity of the pipe for water conveyance.

Following this strategy, Metropolitan is completing the final design for rehabilitation of the Casa Loma Siphon Barrel No. 1 on the CRA in 2020. The Casa Loma Siphon Barrel No. 1 crosses the San Jacinto Fault Zone and is subject to long-term subsidence-induced deformation from groundwater pumping. The project will replace 800 feet of the existing 148-inch diameter concrete pipeline with two parallel barrels of 104-inch diameter earthquake resistant ductile iron pipe (ERDIP). The ERDIP joints are designed to accommodate ground displacements without failure, which will allow for uninterrupted service following a major earthquake.

**Earthquake-Resistant Pipe**

## Seismic Resilience of Dams and Reservoirs

Metropolitan's ongoing strategy for managing the safety of its 24 dams includes five major components: (1) Detailed Inspections; (2) Monitoring & Reporting; (3) Facility Assessments; (4) Emergency Action Plans, including Inundation Maps; and (5) Capital Projects for dam improvements and upgrades.

Consistent with the goals of the Seismic Resilience Strategy, Metropolitan performs cyclical assessments of its facilities that include: 1) developing dam seismic performance criteria based on current state of practice, geotechnical and seismicity criteria, and operating conditions, 2) selecting design or safety evaluation earthquakes, 3) characterizing ground motions, 4) analyzing seismic performance of the dams

and foundations, and 5) evaluating structural adequacy of dam appurtenant structures for earthquake loading.

Finally, Metropolitan has an ongoing Dam Safety Initiatives Program that has initiated several plans to improve Metropolitan's dam seismic safety and earthquake readiness. These initiatives are being coordinated with the California Division of Safety of Dams (DSOD) and Office of Emergency Services and include the following:

- Ongoing preparation of Emergency Action Plans, including inundation maps
- Performing training exercises at the dam site to test processes during a seismic event
- Providing training and guidance on overall dam safety
- Reviewing operation and maintenance methods for reservoir drawdown and operations after a seismic event
- Updating guidelines and procedures on protection against seismic risk
- Establishing a strong communications system on seismic information
- Performing structural strengthening of dams, including rehabilitation and improvement of spillways and inlet/outlet towers such as Lake Skinner Outlet Tower
- Improving dam safety instrumentation, monitoring, and reporting capabilities

### Special Seismic Assessments

Metropolitan conducts studies to further the organization's understanding of the vulnerability of the system to seismic hazards. The studies support emergency response training and planning for future earthquake events by estimating the magnitude of damage that may occur from various seismic events. Recently completed and ongoing studies are described below.

Completed Study:

> ***Report 1625 - Liquefaction Susceptibility Mapping for the Metropolitan Water District of Southern California's Feeder System*** **(Carollo Engineers, Inc., 2019)**. The liquefaction susceptibility mapping study provides a relative scale of liquefaction susceptibility of deposits along Metropolitan's conveyance and distribution system, given sufficient earthquake ground motions. Existing liquefaction maps available from the California Geological Survey provide a conservative overview of potentially liquefiable areas without any delineation for relative susceptibility. Areas are marked as either liquefiable or not liquefiable. The study utilized available geologic mapping data as well as publicly available groundwater data to map the relative liquefaction susceptibility of Metropolitan's conveyance and distribution pipelines for historical high and modern (1999 to 2019) groundwater depths providing five levels of relative scaling of susceptibility from very high to very low. The results of the study will be used to identify specific locations that may be targeted for future site-specific detailed liquefaction analyses, help prioritize pipeline replacement projects, and assess alternative pipeline alignments.

Studies currently underway:

***Earthquake Damage Assessment of Metropolitan Water District Conveyance and Distribution Feeder System* (ABS Consulting, Inc.).** The study utilizes proprietary modeling software to estimate the potential number of pipeline breaks that may occur from various extreme earthquakes such as a Magnitude 7.8 earthquake on the South San Andreas Fault. The damage assessment model takes into account pipeline material and joint type, distance from earthquake source, and regional geologic conditions when developing the damage estimate. The results of the study will provide input into Metropolitan's earthquake emergency response planning and training activities, and help prioritize future pipeline seismic resilience enhancements. Anticipated completion is March 2020.

## Seminars and Workshops

Metropolitan has recognized the importance of providing awareness of the seismic hazards and risks to Metropolitan, its member agencies, and sub-agencies and encouraging a transfer of knowledge of assessment and mitigation strategies to reduce seismic risk. Metropolitan ensures that risk awareness and knowledge transfer are promoted through active participation at various workshops.

In October 2019, Metropolitan co-hosted with LADWP the 11th Water System Seismic Conference. The conference is a bi-annual event that brings together utility, consulting, and academic professionals from the United States, Japan, and Taiwan to share knowledge in research, design practices, and construction technologies to prepare for and respond to seismic events. Conference topics included emerging design techniques, innovative construction practices, seismic damage assessments, seismic mitigation measures, and emergency response and recovery. In addition to co-hosting the conference, Metropolitan staff delivered four presentations on the organization's seismic resilience efforts. The papers and authors are listed in Appendix B.

**Metropolitan Chief Engineer Providing Opening Remarks at 11th Water System Seismic Conference**

In December 2019, Metropolitan co-sponsored the Earthquake Resilience Workshop for Water and Wastewater Utilities in Southern California. The workshop was a partnership with the United States Environmental Protection Agency and local utility and emergency management organizations to provide guidance and information to drinking water and waste water utilities to enhance their ability to enhance their resilience approach.

Staff also presented Metropolitan's seismic strategy and goals at the Member Agency Managers Meeting in August 2019. Staff described the various activities that Metropolitan conducts to understand the seismic risk and improve the overall resilience of the system. They also used the opportunity to promote the defense-in-depth approach to seismic resilience for the member agencies. This approach is a layered

strategy of system hardening, emergency water supply diversification, and increased system flexibility, including potential interties between member agencies.

## Seismic Performance Objectives

### Structures

Metropolitan's facilities are categorized as either an essential facility or regular facility, depending on performance requirements of the structure in accordance with code requirements. The structures are then designed or rehabilitated to meet the design criteria specified in the applicable seismic codes.

Essential facilities are those that are required for Metropolitan's core business-water delivery. All structures that are directly or indirectly related to water conveyance, storage, treatment and distribution are considered essential. Additionally, structures that contribute to Metropolitan's business continuity are also considered essential. The performance objective for an essential facility is to allow for continuous operation of the structure with limited damage after a maximum considered seismic event. These essential facilities are designed or improved to allow for immediate occupancy or continuous operation after a major seismic event. As an owner/operator of essential lifeline facilities, Metropolitan's water-related facilities will remain functional for disaster relief and fire suppression following a seismic event.

For regular facilities, the objective is to allow safe evacuation of occupants with possible structural and non-structural damage. The performance objective is to ensure life safety and prevent collapse of the structure. A facility designed as a regular facility may require significant repair following a major seismic event.

### Pipelines

Metropolitan's conveyance and distribution pipelines are considered essential pipelines that are required for post-earthquake response and recovery. The pipelines are intended to remain functional and operational during and following a maximum considered earthquake. No uncontrolled release of a substantial amount of water is permitted under this design scenario.

Metropolitan continuously improves its techniques to analyze the response of pipelines to a seismic event to improve its assessment and prediction of earthquake damage to these facilities. Post-earthquake data of ground motion and damage information are used to improve earthquake resilience design methodologies. The data collected is used in advanced seismic pipeline analysis that relies on finite element techniques for soil-structure 3d modeling. Innovation in the development of earthquake-resistant pipeline products contributes to better seismic performance.

For new pipeline seismic design, the performance objective is to ensure the pipeline, pipe joints, and pipe-to-structure connections are capable of resisting the seismic shaking resulting from earthquake wave propagation without permanent damage. As the pipeline crosses known earthquake faults, the system will be designed to accommodate the maximum anticipated ground movement from fault displacement using specialized joints or pipe sections. Automatic shutoff valves may be added on either side of the fault to increase system flexibility.

For existing pipeline seismic design, a comprehensive risk assessment of the system using the latest seismicity and pipeline fragility data will be performed. The vulnerabilities of each pipeline segment will be used to determine the priority and schedule of seismic rehabilitation. Seismic resilient design to resist

shaking and accommodate fault displacement will be incorporated as components of the rehabilitation program. Each upgrade will be evaluated individually to balance risk, consequence, performance, and cost to define an economical long-term approach.

## Operations Component

### Emergency Response Training Exercises

In addition to training emergency response staff on National Incident Management System procedures, Metropolitan regularly conducts emergency response training exercises which have often been based upon a postulated seismic event.

Recent examples include:

- "ShakeOut" Full-Scale Emergency Operations Center (EOC)/Incident Command Post (ICP) Exercise, October 17, 2019
- "Joint Infrastructure Security Exercise"- Tabletop Exercise with various Federal, State, and Local emergency management partner agencies- April 10, 2019
- "Operation Nomad"- Functional EOC/ICP and member agencies, November 14, 2018

In 2019, Metropolitan started a new five-year emergency exercise plan that will allow all of its member agencies to participate in at least one of Metropolitan's annual emergency exercises. The first of these exercises was a tabletop exercise for the Orange County member agencies on August 29, 2019, which focused on a hypothetical incident at the Diemer Water Treatment Plant.

Metropolitan has conducted over 100 exercises since February 2018. This included two large functional emergency exercises for the EOC and multiple tabletop exercises, workshops, and seminars for the 12 Incident Command Posts located at the water treatment plants, conveyance and distribution facilities, and other strategic locations in Metropolitan's service area.

The Metropolitan EOC also conducts monthly communication tests, which include Metropolitan's emergency two-way radio system, on-line WebEOC system, Met-Alert mass notification system, and satellite phones. These monthly tests reach out to the member agencies, Treatment Plant Control Centers, ICPs, Metropolitan management, and the Department of Water Resources. These regular exercises help prepare Metropolitan and its member agencies to respond to future emergencies.

### Emergency Response Capability

Metropolitan continues to maintain the necessary staffing, materials, and equipment to respond to two simultaneous pipeline breaks. The Machine Shop and Coating Shop at La Verne are available to fabricate pipe sizes up to 12 feet in diameter, and Metropolitan's construction forces have the necessary equipment and expertise to make the repairs in-house. In addition, Metropolitan has upgraded its satellite phones to ensure communication ability following a seismic event and is in the process of installing high frequency radios at all Incident Command Posts (formerly Incident Command Centers) and the Emergency Operations Center.

## Reporting Component

### Formal Report

The interval for development of a formal report will be changed to every five years from the original two-year interval. Increasing the time interval between report updates will allow for a full Capital Investment Plan cycle to complete and for projects to move through concept, design, and construction.

## Seismic Resilience Water Supply Task Force

The Seismic Resilience Water Supply Task Force (Task Force) is a collaborative effort involving Metropolitan, DWR, and LADWP to improve the seismic resilience of the imported water supplies to southern California. Following a major earthquake that disrupts the imported water supplies, the agencies would coordinate resources to repair the imported water supply aqueducts to ensure that deliveries are restored as quickly and to as many people as possible.

In March 2018, Metropolitan, DWR, and LADWP convened an aqueduct workshop to discuss lessons learned from recent large earthquakes in New Zealand, Japan, and Mexico; share each agency's approach to conducting seismic assessments; and discuss potential interties that may assist with recovery of water supply to the region. The group also had initial discussions on development of an emergency response plan specific to the Task Force.

**Seismic Resilience Water Supply Task Force Aqueduct Workshop – March 2018**

The Task Force also conducted two tabletop emergency exercises in 2018 and 2019. These exercises were used to give substance to some of the ideas in the Joint Agency Emergency Response Plan (ERP).

Metropolitan, DWR, and LADWP are developing a Water Mutual Assistance Agreement (WMUA), which will formalize the Task Force and define the reporting and accounting requirements for mutual assistance following a major seismic event that impacts imported water supplies. A draft of the Joint Agency ERP has also been completed. The Joint Agency ERP will be finalized along with the WMUA. The plan defines the scenarios that would trigger the deployment of the Multi-Agency Coordination Group, which enhances the collaboration in operation, reporting, and plan maintenance.

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# SECTION 4 SEISMIC RESILIENCE NEAR-TERM GOALS

## Status of 2018 Listed Goals

The 2018 Seismic Resilience First Biennial Report identified near-term goals to further Metropolitan's seismic resilience objectives. The near-term goals are listed below along with an update of the work done to date.

### System Level Goals

| Goal | Conduct Rialto Pipeline Alternative Supply Needs Study |
|---|---|
| **Status:** Metropolitan completed an initial study to identify the near-term and long-term emergency supply needs for member agency demand from the Rialto Pipeline. The Rialto Pipeline is exclusively supplied from the California Aqueduct East Branch and is susceptible to extended disruption from an earthquake on the San Andreas Fault. The study also identified options to meet emergency supply needs. Metropolitan is currently working with member agencies to expand on the emergency supply options. | |

| Goal | Complete a Re-evaluation of Metropolitan's Emergency Storage Needs |
|---|---|
| **Status:** Metropolitan, in coordination with member agencies, completed a re-evaluation of Metropolitan's emergency storage needs and presented the recommendations to increase storage from 630,000 acre-feet to 750,000 acre-feet to Metropolitan's Board in May 2019. A description of the emergency storage re-evaluation is provided in Section 3. | |

| Goal | Complete a Comprehensive Evaluation of Metropolitan's Storage Programs |
|---|---|
| **Status:** Metropolitan, in coordination with member agencies, will complete the 2020 Integrated Water Resources Plan (IRP). Metropolitan will use newly developed demand and supply forecasts to analyze its entire supply portfolio, including all storage programs, in assessing regional reliability. | |

### Facility Level Goals

| Goal | Complete Construction of Approved Seismic Upgrade Projects |
|---|---|
| **Status:** Construction has been completed for the listed projects.<br>• Carbon Creek Pressure Control Structure<br>• Ten Control Structures along the Allen-McColloch Pipeline<br>• Diemer Administration Building<br>• CRA Pump Plants Switch Houses (Five Buildings)<br>• Weymouth West Wash Water Tank | |

| Goal | Conduct Studies, and Complete Design of Approved Upgrade Projects |
|---|---|

**Status:**

- Assessment of potential seismic-induced damage to Metropolitan's water conveyance and distribution pipelines

  *Studies to estimate damage from shaking and at fault crossings from large earthquakes and liquefaction susceptibility of pipelines are in progress with an estimated completion date of March 2020. See Special Seismic Assessments under Section 3.*

- Seismic upgrade for Diemer West Filter Building

  *Completed design and construction of seismic upgrades is ongoing with an estimated completion date of December 2020.*

- Complete evaluation of options, design, and construction contract to strengthen CRA Whitewater Tunnel No. 2

  *Preliminary design is underway.*

- Investigate options to improve emergency raw water bypass capabilities at treatment plants

  *Study is ongoing.*

- Vulnerability Study of CRA electric transmission and distribution systems

  *Completed CRA Electric Transmission System Towers Reliability Study, which considered seismic vulnerability in addition to other hazards.*

- Seismic Upgrade of Water Quality Lab in La Verne

  *Project is currently in design.*

- Seismic Upgrade of Weymouth Administration Building

  *Project is currently in design.*

- Seismic Study of Lake Skinner Outlet Tower

  *Completed voluntary seismic assessment of the tower which considered current dam safety criteria*

**Emergency Response Goals**

| **Goal 1:** | **Prepare and Conduct Emergency Exercises** |
|---|---|
| **Status:**<br>• Conduct a joint agency workshop to prepare a draft Joint Agency Response Plan<br>• Conduct high-level training for DWR, LADWP, and Metropolitan staff on the Joint Agency Emergency Response Plan<br>• Run a functional exercise on the Joint Agency Emergency Response Plan<br>*Metropolitan conducted joint agency tabletop exercises to develop the Joint Agency Emergency Response Plan in 2018 and 2019. The functional exercise will be conducted following finalization of the Joint Agency Emergency Response Plan.* | |
| **Goal 2:** | **Execute MOU to Allow for Coordinated Emergency Response** |
| **Status:**<br>• Prepare draft Memorandum of Understanding (MOU) and submit for review<br>• Secure LADWP, Metropolitan, and DWR approval for the MOU<br>*The Joint Agency Mutual Assistance Agreement is in the final stages of review and is expected to be signed off by all three parties in the near future.* | |

**Seismic Task Force Goals**

| 2018 Goals: | Collaborative LADWP, Metropolitan, and DWR Goals |
|---|---|

**Status:**

- Discuss the applicability of lessons learned from seismic events in Japan, Chile, New Zealand, and Mexico

  *The organizations continue to incorporate lessons-learned from seismic events, including the July 4, 2019, M 6.4 and July 5, 2019, M 7.1 events in Ridgecrest, California*

- Compare each agency's approach to conducting seismic assessments

  *In development of the Joint Agency Emergency Response Plan, the organizations provided detailed presentations of their seismic assessments and the underlying assumptions to their anticipated damage and outage durations.*

- Meet with Southern California Edison (SCE) and Southern California Gas Co. to discuss the potential vulnerabilities of aqueduct power systems

  *Metropolitan held discussions with staff from SCE and shared information on the respective systems and seismic vulnerabilities.*

- Conduct workshops to explore potential aqueduct interties

  *DWR and LADWP continue to investigate the potential for constructing an intertie between the State Water Project East Branch and the Los Angeles Aqueduct.*

| 2019 Goals: | Collaborative LADWP, Metropolitan, and DWR Goals |
|---|---|

**Status:**

- Establish a leadership structure for a coordinated response to major events

  *The leadership structure for a coordinated response is described in the Joint Agency Emergency Response Plan*

- Finalize a three-agency database of available emergency response resources

  *Updating list of emergency response resources for 2020*

| 2019 Goals: | Collaborative LADWP, Metropolitan, and DWR Goals (cont'd) |
|---|---|

**Status:**

- Conduct a three-agency tabletop exercise

  *Metropolitan hosted a tabletop exercise in October 2019.*

- Develop a ShakeOut Scenario Response and Restoration Plan

  *The ShakeOut Scenario is identified as one of the triggers that would initiate the Joint Agency Emergency Response Plan.*

- Conduct a second three-agency functional exercise that includes energy utilities

  *Conducted a functional emergency exercise at the Robert B. Diemer Water Treatment Plant with local Sheriff and Fire Departments, SCE, City of Yorba Linda Emergency Services, Yorba Linda Water District, Orange County Emergency Management, and the Water Emergency Response of Orange County.*

## Other Near-Term Goals

1. Develop a Standard Approach for Evaluating Non-Structural Elements:

   *Metropolitan is in the process of studying industry standards applicable to Metropolitan and collecting approaches taken by other agencies.*

2. Establish Additional Performance Objectives for new pipelines, retrofit of pipelines, and new and existing tunnels:

   *Metropolitan is now designing new pipelines and tunnels and retrofitting existing pipelines and tunnels in accordance with current standards and incorporating additional seismic mitigation measures wherever practicable.*

3. Investigate the Potential for Developing a Model to Prioritize Pipeline Rehabilitation:

   *This is being addressed through the Asset Management efforts, with input from recent seismic studies on risk from potential damage from shaking, fault rupture, and liquefaction.*

4. Enhance Member Agency Planning Efforts Regarding New Facilities and Emergency Response Programs:

   *The Member Agency Managers Workshop was used to present the Seismic Resilience Strategy and objectives and Seismic Task Force findings.*

5. Seek Approval for Detailed Seismic Studies

   *This is an ongoing effort. As Metropolitan completes the rapid evaluations of the Post-1990 structures, detailed studies will be recommended for those structures found to be potentially deficient.*

6. Support the Delta Conveyance Project (part of the former proposed California WaterFix Project)

*Metropolitan will continue to support the Delta Conveyance Project to increase the seismic resiliency of the Bay-Delta portion of the State Water Project.*

## 2020 Update Near-Term Goals

The following section lists new near-term goals that will further Metropolitan's objective of seismic resilience. These goals are anticipated to be completed before the next update in 2025.

### System Level Goals

| Goal | Conduct Special Seismic Studies |
|---|---|
| • Update 2006 System Reliability Study, which analyzed the impacts of various single outage scenarios on Metropolitan's ability to meet member agency demand | |

| Goal | Conduct Planning Studies |
|---|---|
| • Complete the 2020 IRP and comprehensive distribution system study under collaborative regional process. Update the emergency storage objective based on new IRP goals and forecasts. | |

### Facility Level Goals

| Goal | Complete Construction of Approved Projects |
|---|---|
| • Weymouth West Wash Water Tank Seismic Upgrade<br>• Union Station Headquarters Building Seismic Upgrade<br>• Diemer West Filter Seismic Upgrade<br>• CRA Casa Loma Siphon Barrel No. 1 Replacement | |

| Goal | Complete Design of Approved Seismic Upgrade Projects |
|---|---|
| • Weymouth Administration Building Seismic Upgrade and Building Improvements<br>• La Verne Water Quality Lab and Field Engineering Building Seismic Upgrades and Building Improvements<br>• CRA Whitewater Tunnel No. 2 Seismic Upgrades<br>• Lake Mathews Disaster Recovery Facility Seismic Upgrades<br>• Upper Feeder San Gabriel Tower Seismic Upgrade<br>• Weymouth Inlet Channel Structural Upgrades | |

| Goal | Seismic Upgrade of Below Ground Structures |
|---|---|
| • Initiate evaluation of below-ground structures. Identify and list all structures. Develop a prioritization system for evaluation. | |

## Task Force Goals

| Goal | Emergency Response Plan and Exercises |
|---|---|
| • Conduct annual exercises to ensure familiarity with Joint Agency Emergency Response Plan<br>• Semi-annual verification of emergency contact list for DWR, Metropolitan, and LADWP | |

## Other Near-Term Goals

- Promote to member agencies the Defense-in-Depth approach to seismic resilience as recommended in *Report 1335 – Potential Effects of Southern California Seismic Events on Metropolitan Deliveries* (January 2009).
- Continue to gain and share knowledge about seismic resilience through participation in workshops and conferences.
- Complete rapid evaluations for post-1990 above-grade structures.

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# Appendix A – M6.3 or Greater Earthquakes in Southern California Region - 1900 to Present

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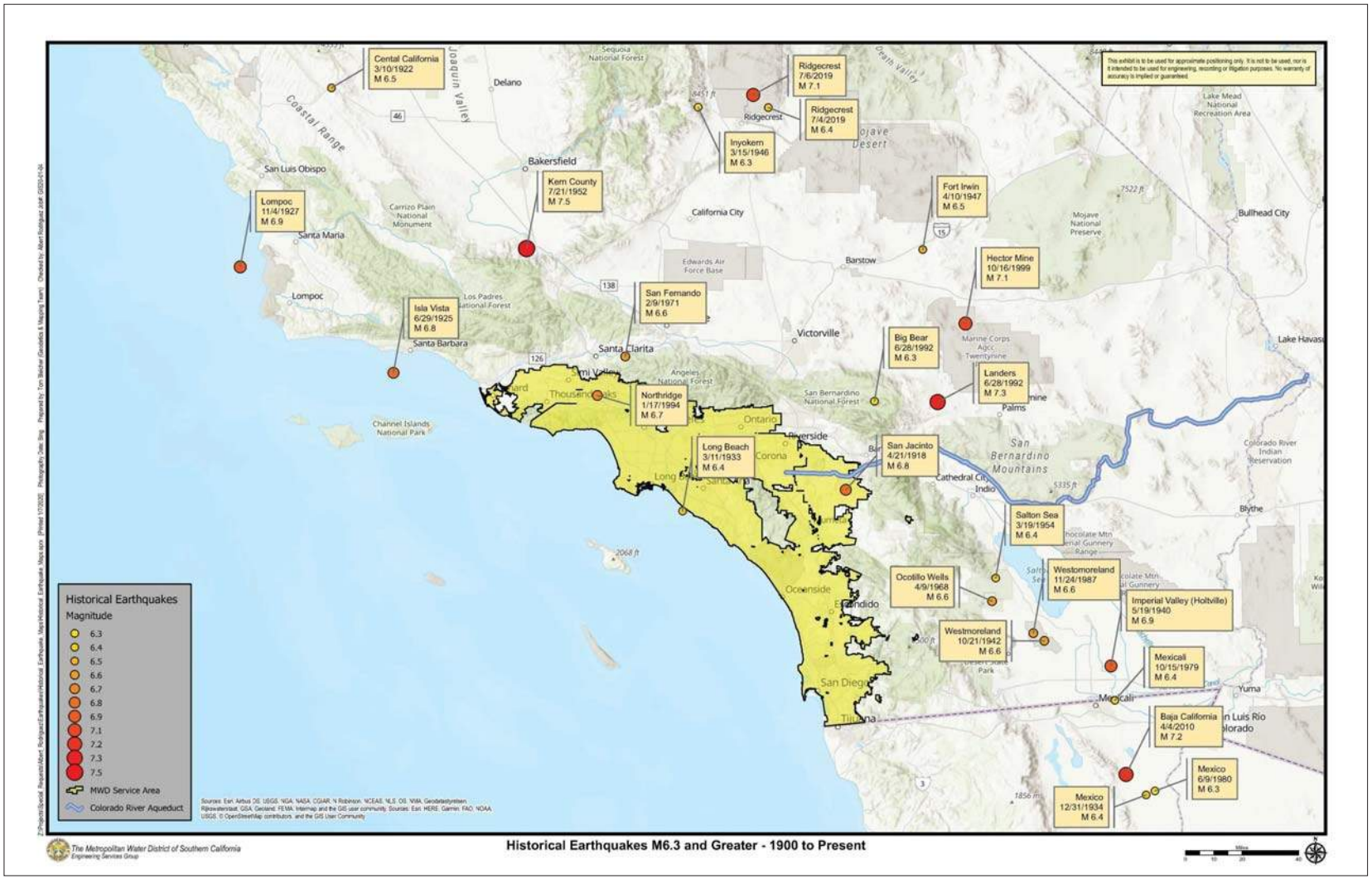
Cental California
3/10/1922
M 6.5
Ridgecrest
7/6/2019
M 7.1
Ridgecrest
7/4/2019
M 6.4
Inyokern
3/15/1946
M 6.3
Kern County
7/21/1952
M 7.5
Lompoc
11/4/1927
M 6.9
Isla Vista
6/29/1925
M 6.8
San Fernando
2/9/1971
M 6.6
Fort Irwin
4/10/1947
M 6.5
Hector Mine
10/16/1999
M 7.1
Big Bear
6/28/1992
M 6.3
Landers
6/28/1992
M 7.3
Northridge
1/17/1994
M 6.7
Long Beach
3/11/1933
M 6.4
San Jacinto
4/21/1918
M 6.8
Salton Sea
3/19/1954
M 6.4
Ocotillo Wells
4/9/1968
M 6.6
Westomoreland
11/24/1987
M 6.6
Imperial Valley (Holtville)
5/19/1940
M 6.9
Westmoreland
10/21/1942
M 6.6
Mexicali
10/15/1979
M 6.4
Baja California
4/4/2010
M 7.2
Mexico
6/9/1980
M 6.3
Mexico
12/31/1934
M 6.4
Historical Earthquakes
Magnitude
6.3
6.4
6.5
6.6
6.7
6.8
6.9
7.1
7.2
7.3
7.5
MWD Service Area
Colorado River Aqueduct
The Metropolitan Water District of Southern California
Engineering Services Group
Historical Earthquakes M6.3 and Greater - 1900 to Present

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# Appendix B – List of Metropolitan Staff Seismic Conference Papers

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# Metropolitan Staff Papers Presented at the 11th JWWA/WRF/CTWWA Water Seismic Conference

Brainard, Andrew (2019), "Evaluation of Welded Joints in Steel Pipelines by Finite Element Modeling", P*roceedings of the 11th JWWA/WRF/CTWWA Water Seismic Conference*, October 9-11 2019, pp. 42-53.

Beikae, Mohsen (2019), "Monte Carlo Simulation of Probabilistic Rupture Hazard Analysis for Lifelines Crossing Active Faults", *Proceedings of the 11th JWWA/WRF/CTWWA Water Seismic Conference*, October 9-11 2019, pp. 107-119.

Chai, Winston (2019), "Seismic Rehabilitation of Upper Feeder Pipeline Santa Ana River Crossing – An Example of Metropolitan's Seismic Upgrade Program", *Proceedings of the 11th JWWA/WRF/CTWWA Water Seismic Conference*, October 9-11 2019, pp. 1-12.

Peng, Tao (2019), "Mitigation of Fault Displacement and Ground Subsidence for Large Diameter Pipeline", *Proceedings of the 11th JWWA/WRF/CTWWA Water Seismic Conference*, October 9-11 2019, pp. 217-228.

# Appendix 10

# METROPOLITAN'S ENERGY INTENSITY INFORMATION, INCLUDING CONVEYANCE AND DISTRIBUTION GENERATION

# Appendix 10
# METROPOLITAN'S ENERGY INTENSITY INFORMATION

## Introduction

The Metropolitan Water District of Southern California is a wholesale water agency that distributes water to its 26 member agencies. These agencies receive treated and untreated water through Metropolitan's 830 miles of interconnected pipelines. There are over 400 service connections to the 26 member agencies located throughout Metropolitan's 5,200 square mile service area.

Metropolitan has always recognized the relationship between water and energy. In addition to being one of the original contractors for power from Hoover Dam in 1937, Metropolitan also paid for half of the cost of the Parker Dam power plant. The energy Metropolitan receives from these facilities provides greenhouse gas (GHG)-free electricity for pumping along the Colorado River Aqueduct. Metropolitan's conveyance and distribution system is also designed to minimize pumping. Imported supplies flow by gravity through Metropolitan's treatment plants and distribution system to the member agencies.

## Water-Related Energy Use in California

The Water-Energy Nexus (W-E Nexus) recognizes that water supplies and energy supplies are interrelated. Water supplies require energy for heating and cooling, but also for transporting, treating and disposing. Likewise, energy supplies require water for cooling, fuel extraction and processing and hydropower production.

State agencies, water districts, and other stakeholders began to study the important link between energy and water in the 2000s. Since then, it has been widely reported that California's "Water Sector" uses 19 percent of the state's electricity and 32 percent of the state's natural gas not used for power generation.

The original source for these facts is the California Energy Commission's 2005 "California's Water – Energy Relationship" report (CEC-700-2005-011-SF, Nov. 2005[1]). In the report, the CEC analyzed energy use data for 2001 and disaggregated the 19 percent into urban water supply, wastewater treatment, customer end uses, and agriculture. Based on the CEC's analysis, approximately 3 percent of California's electrical use in 2001 was associated with urban water agency conveyance, treatment, and distribution. Customer end-uses such as the heating and cooling of water represented 11.1 percent. Another 0.8 percent was attributed to wastewater treatment and 4.2 percent was associated with agricultural uses. Table A.10-1 presents the water related energy use in California adapted from the 2005 CEC report.

The 3.8 percent of electricity associated with urban water supply and wastewater treatment represent the "embedded energy" in water.

[1] https://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011.PDF

**Table A.10-1**
**Water Related Energy Use in California[2]**

| | Electricity (Gigawatt-hour) | Natural Gas (Million Therms) |
|---|---|---|
| **Urban Water Supply** | **7,554** | **19** |
| Wastewater Treatment | 2,012 | 27 |
| Urban End Users | 27,887 | 4,220 |
| Agricultural Total | 10,560 | 18 |
| Total Water Sector Use | 48,013 | 4,284 |
| **Total California Use** | **250,494** | **13,571** |
| **Urban Water Supply** | **3.0%** | **0.1%** |
| Wastewater Treatment | 0.8% | 0.2% |
| Urban End Users | 11.1% | 31.1% |
| Agricultural Total | 4.2% | 0.1% |
| Total Water Sector Use | 19.2% | 31.6% |

In 2010, the California Public Utilities Commission (PUC) reevaluated water-related energy use and estimated that 7.7 percent of the State's electricity was used for urban water supply, wastewater treatment, and agricultural-related pumping and treatment.[3] This is close to the CEC report estimate for those three sectors. While water-related electricity use varies from year to year, it has fluctuated between 6 percent and 8 percent over the past 30 years, as shown in Figure A.10-1.

**Figure A.10-1**
**Water and Agricultural Related Electricity Use in California[4]**

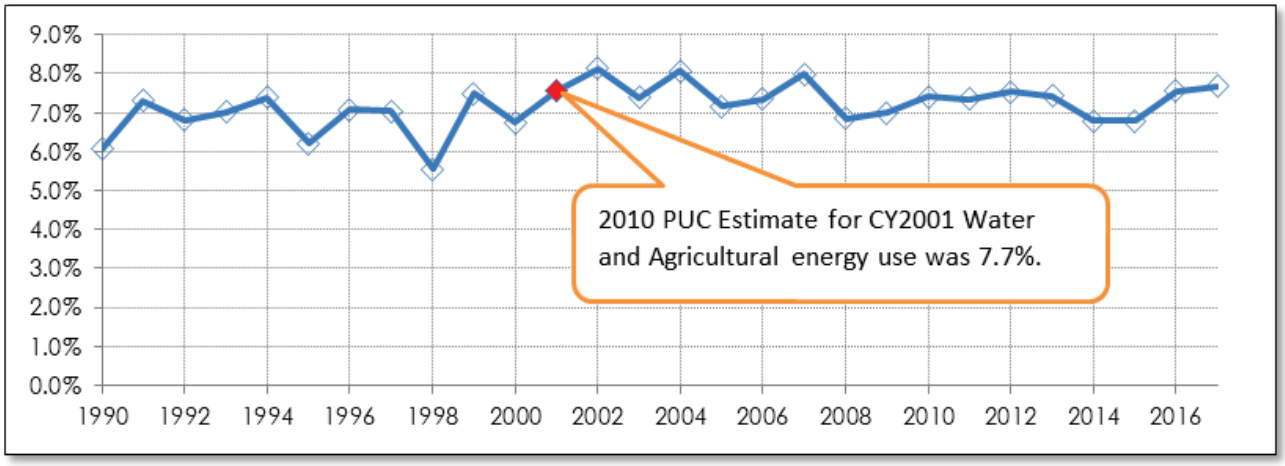


[2] "California's Water – Energy Relationship" report (CEC-700-2005-011-SF, 2005)
[3] Embedded Energy in Water Studies Study 1: Statewide and Regional Water-Energy Relationship (Public Utilities Commission, 2010, page 58)
[4] CEC: California Energy Consumption Data Base: http://ecdms.energy.ca.gov/

In response to California's GHG emission goals, Metropolitan and many other water utilities are taking steps to reduce water-related energy use and emissions. This includes increasing energy recovery in conveyance and distribution systems, developing renewable energy projects, performing energy studies, auditing facility energy usage, and other related actions. Additionally, the conservation programs administered by Metropolitan and the member agencies save embedded energy along with the energy associated with customer end uses. Section 3.8 contains a description of Metropolitan's energy sustainability initiatives and proposed Climate Action Plan.

### Metropolitan's Energy Intensity

Under CWC 10631.2(a), urban water management plans "Shall include any of the following information that the urban water supplier can readily obtain:"

1. An estimate of the amount of energy used to extract or divert water supplies.
2. An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
3. An estimate of the amount of energy used to treat water supplies.
4. An estimate of the amount of energy used to distribute water supplies through its distribution systems.
5. An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
6. An estimate of the amount of energy used to place water into or withdraw from storage.
7. Any other energy-related information the urban water supplier deems appropriate.

This section provides Metropolitan's energy intensity information according to these guidelines. Due to the mixing of water supplies before and after treatment, Metropolitan's complex distribution system, and the large number of service connections, Metropolitan provides system-wide energy intensity values. As operational conditions change from month to month and year to year, Metropolitan's energy use and energy intensity also vary.

Metropolitan's operational control includes the Colorado River Aqueduct (CRA) but does not include the State Water Project (SWP). However, excluding upstream embedded energy from the SWP would not represent an accurate estimate of the energy embedded in Metropolitan's water supplies. To avoid potential misinterpretation of the data provided, this Appendix reports Metropolitan's energy intensity information <u>with</u> upstream SWP embedded energy.

Metropolitan's energy intensity for the water it provides to its member agencies is broken down into the following functions and described below:

- Source
- Conveyance
- Treatment
- Distribution
- Storage

## Source

The water Metropolitan receives comes from two sources: (1) the California Department of Water Resources' (DWR) State Water Project, and (2) the Colorado River. The energy required to extract or divert water from these sources is reported in conveyance.

## Conveyance

The energy requirements from the two conveyance systems supplying Metropolitan's water have been combined, along with the volume of water delivered, into a single weighted energy intensity value. This method provides an energy intensity estimate which can then be used by other water agencies and stakeholders. As the blend of water from the SWP and the Colorado River changes each year, the total energy consumption for conveyance also varies.

Metropolitan's energy intensity for conveyance also accounts for consequential and non-consequential hydropower. Consequential hydropower is hydropower produced as the sole result of a water demand or use. Non-consequential hydropower is hydropower produced as the result of some combination of water demand deliveries and releases for other purposes such as flood control. The non-consequential hydropower from Hoover Dam and the SWP's Hyatt-Thermalito Complex are discussed in the following sections.

### *Colorado River*

Metropolitan conveys water from the Colorado River through its Colorado River Aqueduct (CRA). The water is pumped through five pumping plants to reach Metropolitan's service area. The nominal energy intensity of water conveyed through the CRA is 2,000 kWh/AF.

There are no recovery generating plants along the CRA. However, the water that Metropolitan pumps from the Colorado River has been released from Lake Mead through the Hoover Dam generators. Metropolitan receives 27.1 percent of the energy produced at Hoover. This energy is used to power the CRA pumps. The production rate (kWh/AF) at Hoover depends on several factors, including the elevation of Lake Mead. The USBR updates this value monthly. Metropolitan incorporates its share of the energy produced at Hoover in the calculation of the CRA conveyance energy requirement.

### *State Water Project*

Metropolitan is a contractor for water from DWR's SWP. The SWP uses a combination of natural and man-made systems to move water from Lake Oroville on the Feather River in northern California, through the Sacramento/San Joaquin River Delta (Delta), and into the California Aqueduct for delivery to Southern California and other regions. DWR conveys water through the California Aqueduct using a series of pumps and hydroelectric generators. Metropolitan receives water from DWR through the West Branch of the California Aqueduct at Castaic Lake and from the East Branch of the California Aqueduct at several locations in San Bernardino and Riverside Counties.

The California Aqueduct's net energy intensity for the water received from the West Branch is 2,580 kWh/AF and for the East Branch it is 3,236 kWh/AF. These values are the nominal pumping requirements of the SWP pumps (Banks, Dos Amigos, Buena Vista, Teerink, Chrisman, Edmonston, Oso, and Pearblossom) less the nominal generation values from the West and East Branch recovery generating plants (Warne, Castaic, Alamo, Mojave, and Devil Canyon). These values exclude pumping and generating at the San Luis Gianelli Plant.

The SWP also produces power at its Hyatt-Thermalito complex (HTC) near Lake Oroville and the Feather River in northern California. DWR releases water from Lake Oroville which flows through

the HTC hydro generators and produces power for the SWP. State Water Project Contractors, including Metropolitan, pay for the HTC based on their share of the SWP's Variable Operation, Maintenance, Power and Replacement (OMP&R) Component of the Transportation Charge. To determine the benefit Metropolitan receives from the HTC generation in calculating the Energy Intensity of SWP conveyance, this same OMP&R share (percentage) is used with the total generation from the HTC. From 2004 through 2018, Metropolitan's share of the HTC costs has ranged from 60.2 percent to 74.3 percent. A multi-year average percentage has been used to reduce the year-to-year volatility of this factor and calculate the non-consequential energy included in Metropolitan's conveyance energy intensity. Table A.10-2 presents the 2018 conveyance energy intensity with upstream SWP embedded energy.

The SWP contract has specific provisions on how and when to account for various water deliveries and the associated costs. This will result in differences between the SWP billing values and the amount of water delivered to Metropolitan from the SWP.

**Table A.10-2**
**2018 Conveyance Energy Intensity with Upstream SWP Embedded Energy**

| | With SWP Embedded Energy |
|---|---|
| Net Energy Use (kWh)* | 3,050,621,000 |
| Water Conveyed (AF) | 1,588,958 |
| Energy Intensity (kWh/AF) | 1,919.9 |

* Accounts for non-consequential hydropower generation of 94,161,800 kWh from Hoover Dam on the Colorado River and 861,900,000 kWh from the Hyatt-Thermalito Complex on the State Water Project.

## Treatment

Metropolitan operates five treatment plants to provide potable water to its Member Agencies. The estimated amount of energy used to treat water supplies has been calculated by dividing the annual amount of energy consumed at the plant sites by the amount of water treated. In order to meet water quality regulations, Metropolitan has retrofitted its treatment plants to use ozone, rather than chlorine, as the primary disinfectant during treatment (chlorine and ammonia are added after filtration for a disinfection residual in the distribution system). Metropolitan generates ozone on-site at each treatment plant. The ozone generation process has increased the energy required for treating Metropolitan's supplies. Table A.10-3 presents the treatment energy intensity for 2018.

**Table A.10-3**
**2018 Treatment Energy Intensity**

| | 2018 |
|---|---|
| Energy Use (kWh) | 53,608,000 |
| Water Treated (AF) | 769,398 |
| Energy Intensity (kWh/AF) | 69.7 |

Metropolitan has also installed solar energy at three of its treatment plants with a combined capacity of five megawatts. The electricity generated by these facilities meets between 15 percent and 20 percent of the energy demands of those plants. Solar energy is added to the grid power used at each plant to estimate a total energy intensity value. In 2018, Metropolitan generated 10,409,000 kWh of solar energy from these facilities, reducing the electricity purchased from the grid and its associated GHG emissions.

### Distribution

Due to the high elevations at which Metropolitan receives water from the SWP and CRA conveyance facilities, minimal pumping (and electricity use) is needed to distribute treated and untreated water to its Member Agencies. Gravity, not electricity, drives water supply deliveries through most of Metropolitan's distribution system.

In addition, Metropolitan has 16 recovery hydroelectric generating plants located throughout its distribution system. The generators produce electricity from the water flowing through the pipelines. These plants generate more power than is consumed from distribution pumping. Without the hydroelectric generators, embedded energy in the water would be reduced at facilities called pressure control structures and the potential for energy production would be lost. The energy used in the pumping plants and produced by the generators has been netted, with the result divided by water deliveries to calculate the distribution energy intensity.

Weather variation has a significant impact on distribution system energy intensity. In dry years with low SWP deliveries, Metropolitan generates less distribution system hydropower and may need to increase pumping to deliver CRA supplies throughout the region. Table A.10-4 presents the distribution system net energy intensity for 2018.

**Table A.10-4**
**2018 Distribution System Net Energy Intensity**

| | 2018 |
|---|---|
| Pumping (kWh) | 4,753,000 |
| Hydropower Generation (kWh) | -239,699,000 |
| Net Distribution Energy Use (kWh) | -234,946,000 |
| Water Delivered (AF) | 1,540,022 |
| Energy Intensity (kWh/AF) | -152.6 |

### Storage

Metropolitan maintains significant storage facilities and programs both inside and outside its service area. However, Metropolitan does not use any energy for storage programs under its "span of control." Water is delivered by gravity flow. External water storage and recovery are managed by other parties and are often transacted through exchange arrangements. Water delivered to Metropolitan from these storage programs is accounted for in conveyance energy intensity.

### Metropolitan's Annual Energy and Energy Intensity

Energy and energy intensity information is provided for each of the non-zero processes listed above: Conveyance; Treatment; and Distribution. As noted previously, these values vary from

year to year due to operational changes and differences in water supply availability. An estimated overall energy intensity is provided for untreated and treated water deliveries for 2018 and for a six-year average in the tables below. Both estimates account for non-consequential hydropower. Table A.10-5 presents the treated and untreated water energy intensity for year 2018. Table A.10-6 presents the average treated and untreated water energy intensity for 2013 through 2018. Figure A.10-2 shows Metropolitan's energy use for 2013 through 2018 and highlights the impacts of hydrological conditions on Metropolitan's energy use.

**Table A.10-5**
**2018 Treated and Untreated Water Energy Intensity**

| | With SWP (kWh/AF) |
|---|---|
| Conveyance* | 1,919.9 |
| Treatment | 69.7 |
| Distribution | -152.6 |
| | |
| Total Treated | 1,837.0 |
| Total Untreated | 1,767.3 |

*Accounts for hydropower generation from Hoover and Hyatt/Thermalito

**Table A.10-6**
**Average Treated and Untreated Water Energy Intensity (2013 – 2018)**

| | With SWP (kWh/AF) |
|---|---|
| Conveyance* | 1,928.0 |
| Treatment | 57.0 |
| Distribution | -121.9 |
| | |
| Total Treated | 1,863.0 |
| Total Untreated | 1,806.0 |

*Accounts for hydropower generation from Hoover and Hyatt/Thermalito

**Figure A.10-2**
**Variations in Metropolitan Energy Use (2013-2018)**

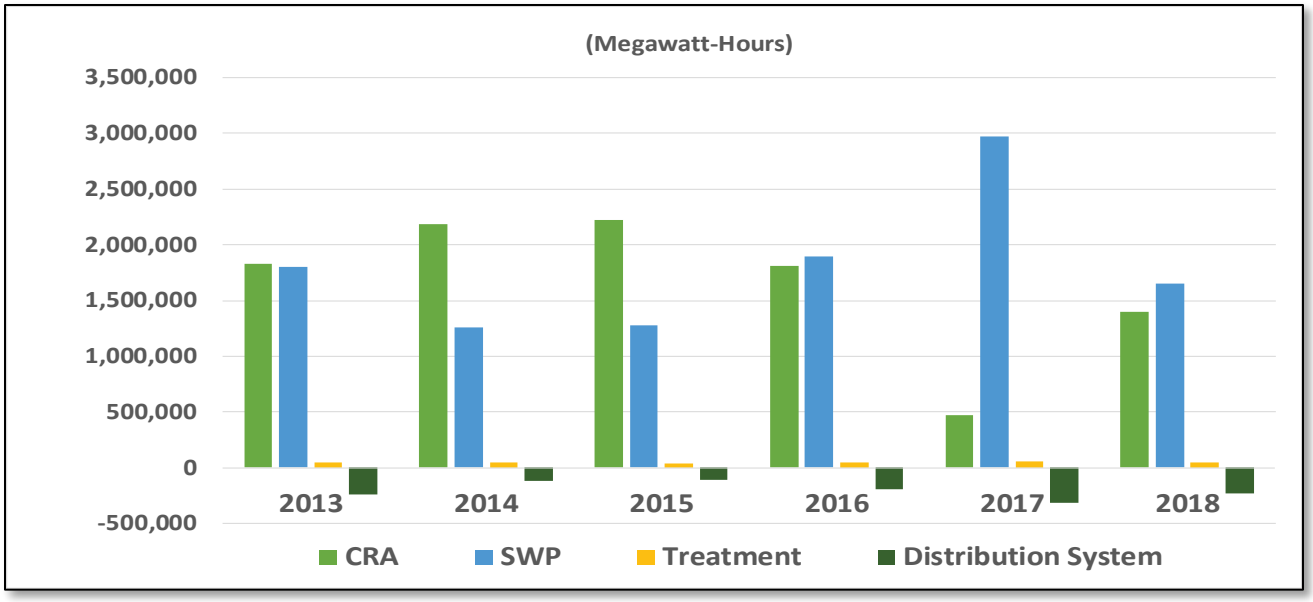


## Greenhouse Gas Emissions

Metropolitan voluntarily reports its GHG emissions from all sources to The Climate Registry (TCR). TCR implements a GHG registry for California entities and develops protocols for GHG reporting. The data provided in TCR's registry is publicly accessible and transparent. Metropolitan's annual GHG data and those for many other water agencies are available through TCR's CRIS website[5]. To guarantee data quality, TCR requires published GHG information to be audited by a certified verification expert. Metropolitan has been auditing and reporting its annual GHG emissions to TCR since 2005.

As with energy intensity, Metropolitan's GHG emissions vary due to hydrology. Over 95 percent of Metropolitan's GHG emissions are derived from electricity use, primarily from the CRA. In dry years, Metropolitan purchases additional grid electricity to accommodate higher CRA deliveries and uses more energy for distribution system pumping. The combination of higher electricity use coupled with higher GHG emission factors for purchased electricity cause Metropolitan's GHG emissions to spike in dry years. The opposite is true in wet years. Lower CRA deliveries are met with zero-carbon electricity from Hoover and Parker dams. In recent years, Metropolitan's GHG emissions have swung from 522,600 tons of CO2e emitted during the record low SWP allocation year in 2014 to 203,400 tons of CO2e emitted during the record wet year in 2017. Metropolitan's 10-year average of 317,100 tons of CO2e includes two dry-year/wet-year cycles.

[5] The Climate Registry CRIS GHG Database: https://www.theclimateregistry.org/tools-resources/reporting-toolkit/cris-resources/

Unlike Metropolitan's embedded energy described above, Metropolitan's reported GHG emissions do not include upstream SWP emissions. Metropolitan is participating in TCR's new Water-Energy Nexus GHG Registry and will be able to provide additional GHG metrics in the future.

The California Air Resources Board (CARB) tracks state-wide GHG emissions from all sources on an annual basis[6]. Compared to CARB's GHG inventory, Metropolitan's CO2e emissions represented 0.12 percent of the state's total emissions in 2014 and 0.05 percent in 2017. Additional information on Metropolitan's GHG emissions and Climate Action Plan are contained Section 3.8. Figure A.10-3 presents Metropolitan GHG emissions for 2005 through 2018.

**Figure A.10-3**
**Metropolitan GHG emissions**

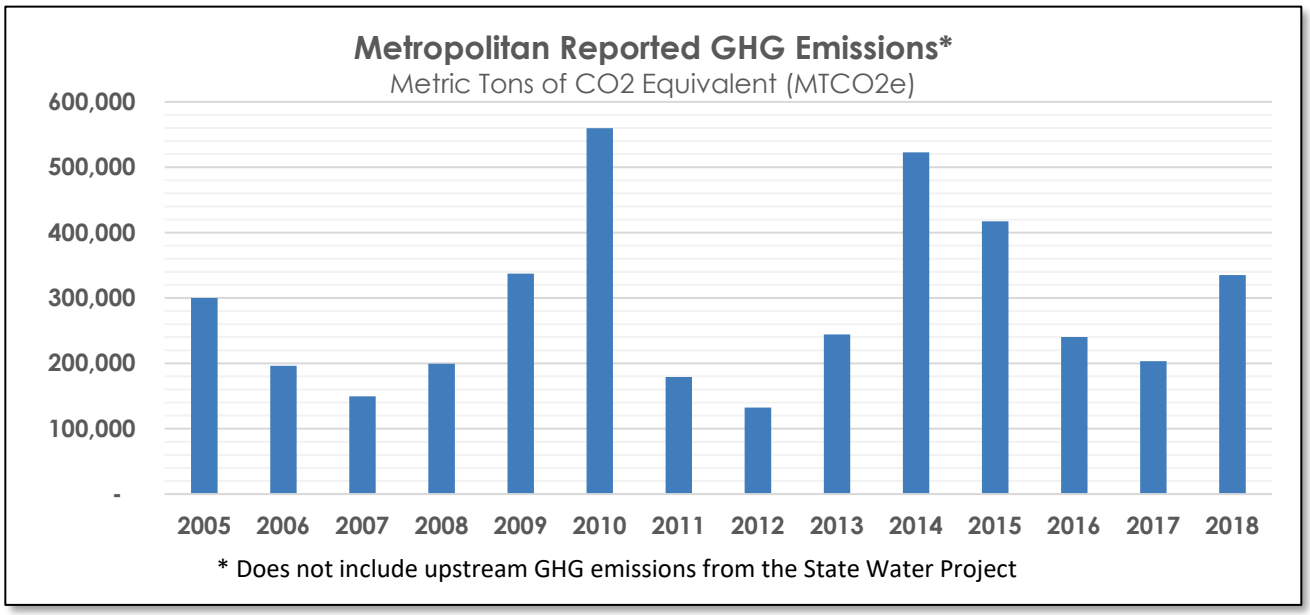


## DWR Required Water-Energy Nexus Table: Process Approach

Table A.10-7 contains Metropolitan's required Water-Energy Table for CY2018 using the Water Supply Process Approach in Table O-1A.

The table shows Metropolitan's energy intensity with upstream SWP embedded energy and non-consequential generation included.

Note that Metropolitan uses an alternative approach for calculating total or system-wide kWh/AF. Metropolitan's approach adds the energy intensity of the individual components to derive a system-wide total, where the required table divides the total net energy use by total deliveries. As a result, the system-wide kWh/AF total described in Table A.10-6 varies slightly from DWR's required Table A.10-7. Metropolitan also incorporates non-consequential hydropower production in its energy intensity calculations.

[6] https://ww2.arb.ca.gov/ghg-inventory-data; California's GHG emissions were 444.7 million tons of CO2e in 2014 and 424.1 million tons of CO2e in 2017, the latest year available.

## Table A.10-7 (Table O-1A for Year 2018): Water Supply Process Approach Including Upstream State Water Project Energy Use

***Urban Water Supplier:*** *Metropolitan Water District of Southern California*

**Water Delivery Product** (If delivering more than one type of product use Table O-1C)

*Wholesale Potable Deliveries*

**Table O-1A: Recommended Energy Intensity - Water Supply Process Approach**

Enter Start Date for Reporting Period: 1/1/18

End Date: 12/31/18

☑ Is upstream embedded in the values reported?

| | | Urban Water Supplier Operational Control | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Water Management Process | | | | | | Non-Consequential Hydropower (if applicable) | |
| | | | | | | | | See Narrative Below | |
| | *Water Volume Units Used* | Extract and Divert | Place into Storage | Conveyance | Treatment | Distribution | Total Utility | Hydropower | Net Utility |
| *Volume of Water Entering Process* | acre feet | 0 | 0 | 1,588,958 | 769,398 | 1,540,022 | 1,540,022 | 0 | 1,540,022 |
| *Energy Consumed (kWh)* | *N/A* | 0 | 0 | 3,050,621,051 | 53,607,943 | -234,945,839 | 2,869,283,155 | | 2,869,283,155 |
| *Energy Intensity (kWh/vol.)* | *N/A* | **0.0** | **0.0** | **1919.9** | **69.7** | **-152.6** | **1863.1** | **0.0** | **1863.1** |
| | | | | MWD method: process additive | | | **1837.0** | | |

**Quantity of Self-Generated Renewable Energy**

10,409,000 kWh

**Data Quality** *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

*Combination of Estimates and Metered Data*

**Data Quality Narrative:**

Assumes Colorado river energy intensity at 2,000 kWh/AF; SWP East Branch at 3,236, and SWP West Branch at 2,580.
Energy use for the treatment and distribution processes are metered. Non-consequential hyrdopower is calculated from metered data.
Detailed descriptions of the methodology are contained in the appendix.

**Narrative:**

This table incorporates upstream State Water Project conveyance deliveries, energy use, consequential and non-consequential energy generation from Hoover Dam and the SWP Hyatt-Thermalito Complex.
Including upstream SWP imbedded energy represents the applicable energy intensity of Metropolitan's water supplies as delivered to its Member Agencies.

Metropolitan uses an alternative method for calculating overall energy intensity by adding the processes to derive a total utility value as described above.
Using Metropolitan's additive methodology, the total utility energy intensity for treated water would be 1,837 kWh / AF instead of 1,863 kWh / AF in the table above

Total non-consequential hydropower included in 2018 conveyance: 956,021,000 kWh
- Hoover Dam non-consequential hydropower: 94,162,000 kWh
- Hyatt-Thermalito non-consequential hydropower: 861,859,000 kWh

Metropolitan delivers both treated and untreated water to its member agencies.

## Glossary

Water-Energy Nexus: The recognition of the link between water supplies and energy supplies

Energy Intensity: A measure of the energy required to deliver, or process water expressed in kilowatt hours per acre-foot (kWh/AF)

Embedded Energy: The amount of energy required to deliver water supplies from a source to a delivery point. Also expressed in kilowatt hours per acre-foot (kWh/AF).

Greenhouse Gas Intensity: a measure of the overall greenhouse gasses required to deliver or process water, expressed in GHG/AF.

Hydropower: Renewable energy produced by water powering a turbine to produce electricity.

Water Sector: The water sector in the W-E Nexus is broadly defined to include customer end-uses of water such as heating or cooling; pumping and treating urban and agricultural water supplies; and wastewater disposal.

Consequential Hydropower: Hydropower produced as the sole result of a water demand or use. An example would be a hydropower recovery plant on an aqueduct that generates power as demands dictate flows in the aqueduct.

Non-consequential Hydropower: Hydropower produced as the result of some combination of water demand and other requirements such as flood releases or environmental flows.

The Climate Registry: A California non-profit organization tasked with managing a voluntary GHG registry for the State as well as implementing a voluntary GHG registry specifically for water-related GHG emissions.

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# Appendix 11

# QUANTIFYING REGIONAL SELF-RELIANCE AND REDUCED RELIANCE ON WATER SUPPLIES FROM THE DELTA WATERSHED

# Appendix 11
# METROPOLITAN'S
# REDUCED DELTA RELIANCE REPORTING

## A.11.1 Background

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a covered action in the Delta,[1] prior to initiating the implementation of that action, must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with applicable Delta Plan policies and submit that certification to the Delta Stewardship Council.[2] Anyone may appeal a certification of consistency, and if the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency, and either no appeal is filed, or the Delta Stewardship Council denies the subsequent appeal.[3]

An urban water supplier that anticipates participating in or receiving water from a proposed covered action such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and 2020 Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).[4]

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

*(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:*

> *(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);*
>
> *(2) That failure has significantly caused the need for the export, transfer, or use; and*
>
> *(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.*

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

*(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*

> *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*

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[1] Water Code, § 85057.5; Cal. Code Regs. tit. 23, § 5001.
[2] Water Code, § 85225; Delta Plan, App. D.
[3] Water Code, §§ 85225.10-85225.25; Delta Plan, App. D.
[4] Cal. Code Regs., tit. 23, § 5003.

*(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*

*(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code Section 1011(a).*

The analysis and documentation provided below include all of the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action.

### A.11.2 Summary of Expected Outcomes for Reduced Reliance on the Delta

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

The expected outcomes for Metropolitan's Delta reliance and regional self-reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 (Guidebook Appendix C) issued in March 2021.

The data used in this analysis represent the total regional efforts of Metropolitan and its member agencies and their customers (many of them, retail agencies) and were developed in conjunction with Metropolitan's member agencies as part of the UWMP coordination process as described in Section 5 of Metropolitan's UWMP. In accordance with UMWP requirements, Metropolitan's member agencies and their customers (many of them, retail agencies) also report demands and supplies for their service areas in their respective UWMPs. The data reported by those agencies are not additive to the regional totals shown in Metropolitan's UWMP; rather, their reporting represents subtotals of the regional total and should be considered as such for the purposes of determining reduced reliance on the Delta.

While the demands that Metropolitan's member agencies and their customers report in their UWMPs are a good reflection of the demands in their respective service areas, they do not adequately represent each water supplier's contributions to reduced reliance on the Delta. In order to calculate and report their reliance on water supplies from the Delta watershed, water suppliers that receive water from the Delta through other regional or wholesale water suppliers would need to determine the amount of Delta water that they receive from the regional or wholesale supplier. Two specific pieces of information are needed to accomplish this: first is the quantity of demands on the regional or wholesale water supplier that accurately reflect a supplier's contributions to reduced reliance on the Delta, and second is the quantity of a supplier's demands on the regional or wholesale water supplier that are met by supplies from the Delta watershed.

For water suppliers that make investments in regional projects or programs it may be infeasible to quantify their demands on the regional or wholesale water supplier in a way that accurately reflects their individual contributions to reduced reliance on the Delta. Due to the extensive, long-

standing and successful implementation of regional demand management and local resource incentive programs in Metropolitan's service area, this infeasibility holds true for Metropolitan's members as well their customers. For Metropolitan's service area, reduced reliance on supplies from the Delta watershed can only be accurately accounted at the regional level, as is demonstrated in this analysis.

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for Metropolitan's Delta reliance and regional self-reliance. The results show that as a region, Metropolitan and its members as well as their customers are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of water used.

*Expected Outcomes for Regional Self-Reliance*

- Near-term (2025) – Normal water year regional self-reliance is expected to increase by 813 TAF from the 2010 baseline; this represents an increase of almost 25 percent of 2025 normal water year retail demands (Table A.11-2).
- Long-term (2045) – Normal water year regional self-reliance is expected to increase by more than 1.28 MAF from the 2010 baseline, this represents an increase of more than 25 percent of 2045 normal water year retail demands (Table A.11-2).

*Expected Outcomes for Reduced Reliance on Supplies from the Delta Watershed*

- Near-term (2025) – Normal water year reliance on supplies from the Delta watershed decreased by 301 TAF from the 2010 baseline, this represents a decrease of 3 percent of 2025 normal water year retail demands (Table A.11-3).
- Long-term (2045) – Normal water year reliance on supplies from the Delta watershed decreased by 314 TAF from the 2010 baseline, this represents a decrease of just over 5 percent of 2045 normal water year retail demands (Table A.11-3).

### A11.3 Demonstration of Reduced Reliance on the Delta

The methodology used to determine Metropolitan's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in DWR's UWMP Guidebook Appendix C, including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources. Some of the key assumptions underlying Metropolitan's demonstration of reduced reliance include:

- All data were obtained from the current 2020 UWMP or previously adopted UWMPs and represent average or normal water year conditions.
- All analyses were conducted at the service area level, and all data reflect the total contributions of Metropolitan and its members as well as their customers.
- No projects or programs that are described in the UWMPs as "Projects Under Development" were included in the accounting of supplies.

*Baseline and Expected Outcomes*

In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C. Data for the 2010 baseline were taken from Metropolitan's 2005 UWMP as the UWMPs generally do not provide normal water year data for

the year that they are adopted (i.e., 2005 UWMP forecasts begin in 2010, 2010 UWMP forecasts begin in 2015, and so on).

Consistent with the 2010 baseline data approach, the expected outcomes for reduced Delta reliance and improved regional self-reliance for 2015 and 2020 were taken from Metropolitan's 2010 and 2015 UWMPs respectively. Expected outcomes for 2025-2045 are from the current 2020 UWMP. Documentation of the specific data sources and assumptions are included in the discussions below.

### *Service Area Demands without Water Use Efficiency*

In alignment with the Guidebook Appendix C, this analysis uses normal water year demands, rather than normal water year supplies to calculate expected outcomes in terms of the percentage of water used. Using normal water year demands serves as a proxy for the amount of supplies that would be used in a normal water year, which helps alleviate issues associated with how supply capability is presented to fulfill requirements of the Act versus how supplies might be accounted for to demonstrate consistency with WR P1.

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as Metropolitan that explicitly calculate and report water use efficiency savings in their UWMP will need to make an adjustment to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise the effect of water use efficiency savings on regional self-reliance would be overestimated. Table A.11-1 shows the results of this adjustment for Metropolitan. Supporting narratives and documentation for all of the data shown in Table A.11-1 are provided below.

**Table A.11-1**
**Demands without Water Use Efficiency Accounted For**

| Total Service Area Water Demands (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands with Water Use Efficiency Accounted For | 4,628,000 | 4,563,000 | 4,163,000 | 3,763,000 | 3,821,000 | 3,893,000 | 3,936,000 | 3,985,000 |
| Reported Water Use Efficiency | 865,000 | 936,000 | 1,056,000 | 1,162,000 | 1,211,000 | 1,263,000 | 1,325,000 | 1,389,000 |
| **Service Area Demands without Water Use Efficiency Accounted For** | **5,493,000** | **5,499,000** | **5,219,000** | **4,925,000** | **5,032,000** | **5,156,000** | **5,261,000** | **5,374,000** |

#### *Service Area Demands without Water Use Efficiency*

The service area demands shown in Table A.11-1 represent the total retail water demands for Metropolitan's service area and include municipal and industrial demands, agricultural demands, seawater barrier demands, and storage replenishment demands. These demand types and the modeling methodologies used to calculate them are described in Section 2.2 and Appendix 1 of Metropolitan's UWMP.

#### *Water Use Efficiency*

The water use efficiency numbers shown in Table A.11-1 represent the total water use efficiency savings (conservation) for Metropolitan's region, including savings from active, code-based, price-effect and pre-1990 sources. These sources of water use efficiency and the methodologies used to calculate them are described in Section 2.2, Section 3.4, Section 3.7 and Appendix 1 of Metropolitan's UWMP.

The demand and water use efficiency data shown in Table A.11-1 were collected from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year
- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025-2045 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year

### *Supplies Contributing to Regional Self-Reliance*

For a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table A.11-2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table A.11-2 represent efforts to improve regional self-reliance for Metropolitan's entire service area and include the total contributions of Metropolitan and its members as well as their customers. Supporting narratives and documentation for the all of the data shown in Table A.11-2 are provided below.

The results shown in Table A.11-2 demonstrate that Metropolitan's service area is measurably improving its regional self-reliance. In the near-term (2025), the expected outcome for normal water year regional self-reliance increases by 747 TAF from the 2010 baseline; this represents an increase of about 23 percent of 2025 normal water year retail demands. In the long-term (2045), normal water year regional self-reliance is expected to increase by more than 1.2 MAF from the 2010 baseline; this represents an increase of 25 percent of 2045 normal water year retail demands.

**Table A.11-2**
**Supplies Contributing to Regional Self-Reliance**

| Water Supplies Contributing to Regional Self-Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Use Efficiency | 865,000 | 936,000 | 1,056,000 | 1,162,000 | 1,211,000 | 1,263,000 | 1,325,000 | 1,389,000 |
| Water Recycling | 316,000 | 348,000 | 436,000 | 550,000 | 613,000 | 687,000 | 698,000 | 706,000 |
| Stormwater Capture and Use | 100,000 | 103,000 | 110,000 | 80,000 | 82,000 | 82,000 | 82,000 | 82,000 |
| Advanced Water Technologies | 111,000 | 101,000 | 194,000 | 194,000 | 208,000 | 209,000 | 209,000 | 210,000 |
| Conjunctive Use Projects | 1,416,000 | 1,429,000 | 1,303,000 | 1,255,000 | 1,273,000 | 1,296,000 | 1,311,000 | 1,326,000 |
| Local and Regional Water Supply and Storage Projects | 252,000 | 224,000 | 261,000 | 257,000 | 257,000 | 258,000 | 258,000 | 258,000 |
| Other Programs and Projects that Contribute to Regional Self-Reliance | 875,000 | 1,250,000 | 1,200,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 |
| **Water Supplies Contributing to Regional Self-Reliance** | **3,935,000** | **4,391,000** | **4,560,000** | **4,748,000** | **4,894,000** | **5,045,000** | **5,133,000** | **5,221,000** |

| Service Area Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands without Water Use Efficiency Accounted For | 5,493,000 | 5,499,000 | 5,219,000 | 4,925,000 | 5,032,000 | 5,156,000 | 5,261,000 | 5,374,000 |

| Change in Regional Self Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Supplies Contributing to Regional Self-Reliance | 3,935,000 | 4,391,000 | 4,560,000 | 4,748,000 | 4,894,000 | 5,045,000 | 5,133,000 | 5,221,000 |
| **Change in Supplies Contributing to Regional Self-Reliance** | **NA** | **456,000** | **625,000** | **813,000** | **959,000** | **1,110,000** | **1,198,000** | **1,286,000** |

| Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Percent of Supplies Contributing to Regional Self-Reliance | 71.6% | 79.9% | 87.4% | 96.4% | 97.3% | 97.8% | 97.6% | 97.2% |
| **Change in Percent of Supplies Contributing to Regional Self-Reliance** | **NA** | **8.2%** | **15.7%** | **24.8%** | **25.6%** | **26.2%** | **25.9%** | **25.5%** |

*Water Use Efficiency*

The water use efficiency information shown in Table A.11-2 is taken directly from Table A.11-1 above.

*Water Recycling*

The water recycling values shown in Table A.11-2 reflect the total recycled water production in Metropolitan's service area as described in Section 3.5 and Appendix 2 of Metropolitan's UWMP.

*Stormwater Capture and Use*

The stormwater capture and use data shown in Table A.11-2 include supplies from local surface water production as described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

These values do not include production from regional storage reservoirs; storage in these reservoirs is comprised of previously stored water from sources already reflected in Tables A.11-2 and A.11-3. These regional storage resources are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The regional storage reservoirs and their yields are described in Section 3.6, Appendix 2 and Appendix 3 of Metropolitan's UWMP.

The stormwater capture and use values shown in Table A.11-2 also do not include stormwater capture that is used to recharge local groundwater basins. Stormwater capture for groundwater recharge supports production of groundwater in the region, and for the purposes of this analysis that production is already captured in Table A.11-2 under conjunctive use projects.

*Advanced Water Technologies*

The advanced water technologies data shown in Table A.11-2 include total groundwater recovery and seawater desalination production in Metropolitan's service area as described in Section 3.5 and Appendix 2 of Metropolitan's UWMP.

*Conjunctive Use Projects*

The values for conjunctive use projects shown in Table A.11-2 represent total groundwater production in the region as described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

The conjunctive use projects numbers shown in Table A.11-2 do not include production from regional groundwater conjunctive use programs. As described in the stormwater capture and use discussion above, these regional storage programs rely on previously stored water from sources already reflected in Tables A.11-2 and A.11-3 and are generally used to provide additional regional self-reliance in dry-years. The regional groundwater conjunctive use programs and their yields are described in Section 3.6 and Appendix 3.

*Local and Regional Water Supply and Storage Programs*

The data for local and regional water supply and storage programs shown in Table A.11-2 include supplies from the Los Angeles Aqueduct. This supply is described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

The local and regional supply numbers shown in Table A.11-2, except for "Other Programs and Projects that Contribute to Regional Self-Reliance" which is discussed below, were obtained from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year

- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025-2045 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year

*Other Programs and Projects that Contribute to Regional Self-Reliance*

Other programs and projects that contribute to regional self-reliance shown in Table A.11-2 include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct supplies and programs are described in Section 3.1 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.11-2 for other programs and projects that contribute to regional self-reliance come from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2010 (Average Year)
- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2020 (Average Year)
- 2025-2045 values – Metropolitan's 2020 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Years 2025, 2030, 2035, 2040, 2045 (Normal Water Year)

### *Reliance on Water Supplies from the Delta Watershed*

In order for a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) requires that water suppliers report the expected outcomes for measurable reductions in supplies from the Delta watershed either as an amount or as a percentage. This analysis provides both calculations. Based on the methodology described in Guidebook Appendix C, and consistent with the approach of this analysis in not including projects under development, this accounting does not include any supplies from potential future covered actions. Table A.11-3 shows the expected outcomes for reliance on supplies from the Delta watershed for Metropolitan's service area. Supporting narratives and documentation for the all of the data shown in Table A.11-3 are provided below.

The results shown in Table A.11-3 demonstrate that Metropolitan's service area is measurably reducing its Delta reliance. In the near-term (2025), the expected outcome for normal water year reliance on supplies from the Delta watershed decreased by 301 TAF from the 2010 baseline; this represents a decrease of 3 percent of 2025 normal water year retail demands. In the long-term (2045), normal water year reliance on supplies from the Delta watershed decreased by 314 TAF from the 2010 baseline; this represents a decrease of just over 5 percent of 2045 normal water year retail demands.

## Table A.11-3
## Reliance on Water Supplies from the Delta Watershed

| Water Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| CVP/SWP Contract Supplies | 1,472,000 | 1,029,000 | 984,000 | 1,133,000 | 1,130,000 | 1,128,000 | 1,126,000 | 1,126,000 |
| Delta/Delta Tributary Diversions | - | - | - | - | - | - | - | - |
| Transfers and Exchanges of Supplies from the Delta Watershed | 20,000 | 44,000 | 91,000 | 58,000 | 52,000 | 52,000 | 52,000 | 52,000 |
| Other Water Supplies from the Delta Watershed | - | - | - | - | - | - | - | - |
| **Total Water Supplies from the Delta Watershed** | **1,492,000** | **1,073,000** | **1,075,000** | **1,191,000** | **1,182,000** | **1,180,000** | **1,178,000** | **1,178,000** |

| Service Area Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands without Water Use Efficiency Accounted For | 5,493,000 | 5,499,000 | 5,219,000 | 4,925,000 | 5,032,000 | 5,156,000 | 5,261,000 | 5,374,000 |

| Change in Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Supplies from the Delta Watershed | 1,492,000 | 1,073,000 | 1,075,000 | 1,191,000 | 1,182,000 | 1,180,000 | 1,178,000 | 1,178,000 |
| **Change in Supplies from the Delta Watershed** | **NA** | **(419,000)** | **(417,000)** | **(301,000)** | **(310,000)** | **(312,000)** | **(314,000)** | **(314,000)** |

| Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Percent of Supplies from the Delta Watershed | 27.2% | 19.5% | 20.6% | 24.2% | 23.5% | 22.9% | 22.4% | 21.9% |
| **Change in Percent of Supplies from the Delta Watershed** | **NA** | **-7.6%** | **-6.6%** | **-3.0%** | **-3.7%** | **-4.3%** | **-4.8%** | **-5.2%** |

### *CVP/SWP Contract Supplies*

The CVP/SWP contract supplies shown in Table A.11-3 include Metropolitan's SWP Table A and Article 21 supplies. These supplies are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.11-3 do not include Desert Water Agency/Coachella Valley Water District SWP contract supplies. These supplies are exchanged with Desert Water Agency and Coachella Valley Water District for an equal amount of Colorado River water, which is reflected in the Colorado River Aqueduct supplies shown in Table A.11-2. In addition, Desert Water Agency and Coachella Valley Water District should include their SWP contract supplies in their own accountings of reduced reliance. Additional information on these exchange agreements can be found in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

These values also do not include supplies from San Luis Carryover storage or Central Valley storage programs because storage in these programs comprises previously stored water from sources already reflected in Table A.11-3. These storage programs are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The Central Valley storage projects and their yields are described in Section 3.3, and Appendix 3. San Luis Carryover storage is described in Section 3.2 and Appendix 3.

### *Transfers and Exchanges of Supplies from the Delta Watershed*

The transfers and exchanges of supplies from the Delta watershed shown in Table A.11-3 include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, Irvine Ranch Water District Storage and Exchange Program, and other generic SWP and Central Valley transfers and exchanges. These programs are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

Supplies from the Delta Watershed shown in Table A.11-3 are from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2010 (Average Year)

- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2020 (Average Year)
- 2025-2045 values – Metropolitan's 2020 UWMP, Table A.3-7: California Aqueduct Program Capabilities Years 2025, 2030, 2035, 2040, 2045 (Normal Water Year)

### A.11.4 UWMP Implementation

In addition to the analysis and documentation described above, WR P1 subsection (c)(1)(B) requires that all programs and projects included in the UWMP that are locally cost-effective and technically feasible, which reduce reliance on the Delta, are identified, evaluated, and implemented consistent with the implementation schedule. WR P1 (c)(1)(B) states that:

> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta*[.]

In accordance with Water Code Section 10631(f), water suppliers must already include in their UWMP a detailed description of expected future projects and programs that they may implement to increase the amount of water supply available to them in normal and single-dry water years and for a period of drought lasting five consecutive years. The UWMP description must also identify specific projects, include a description of the increase in water supply that is expected to be available from each project, and include an estimate regarding the implementation timeline for each project or program.

Section 3 of Metropolitan's UWMP summarizes the implementation plan and continued progress in developing a diversified water portfolio to meet the region's water needs.

*Water Use Efficiency*

The water use efficiency numbers used in this analysis include the total water use efficiency savings (conservation) for the service area, including savings from active, code-based, price-effect and pre-1990 savings. The specific water use efficiency programs and their implementation are described in Section 3.4 of Metropolitan's UWMP.

*Water Recycling*

The water recycling values used in this analysis reflect the total recycled water production in Metropolitan's service area. Water recycling programs and implementation are discussed in Section 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

*Stormwater Capture and Use*

The stormwater capture and use data used in this analysis include supplies from local surface water production. Local surface water production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

*Advanced Water Technologies*

The advanced water technologies data used in this analysis include total groundwater recovery and seawater desalination production in Metropolitan's service. Groundwater recovery and seawater desalination programs and implementation are described in Section 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

*Conjunctive Use Projects*

The values for conjunctive use projects used in this analysis represent total groundwater production in the region. Groundwater production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

*Local and Regional Water Supply and Storage Programs*

The data for local and regional water supply and storage programs shown this analysis include supplies from the Los Angeles Aqueduct. This program and its implementation are described in Appendix 2 of Metropolitan's UWMP.

*Other Programs and Projects that Contribute to Regional Self-Reliance*

Other programs and projects that contribute to regional self-reliance used in this analysis include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct programs and their implementation are described in Section 3.1 and Appendix 3 of Metropolitan's UWMP.

*CVP/SWP Contract Supplies*

The CVP/SWP contract supplies shown in this analysis include Metropolitan's SWP Table A and Article 21 supplies. These supplies and their implementation are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

*Transfers and Exchanges of Supplies from the Delta Watershed*

The transfers and exchanges of supplies from the Delta watershed shown in this analysis include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, Irvine Ranch Water District Storage and Exchange Program, and other generic SWP and Central Valley transfers and exchanges. These programs and their implementation are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

### A.11.5 2015 UWMP Appendix 11

The information contained in this Appendix 11 is also intended to be a new Appendix 11 attached to Metropolitan's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). Metropolitan provided notice of the availability of the draft 2020 UWMP (including this Appendix 11 which will also be a new Appendix 11 to its 2015 UWMP) and WSCP and the public hearing to consider adoption of both plans and Appendix 11 to the 2015 UWMP in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP were posted prominently on Metropolitan's website, mwdh2o.com, starting February 1, 2021, more than 60 days in advance of the public hearing on April 12, 2021. The notice of availability of the documents was sent to Metropolitan's member agencies, as well as cities and counties in Metropolitan's service area. In addition, a public notice advertising the public hearing in English and Spanish was published in 12 Southern California newspapers. The notification in English language newspapers was published on February 1 and 8, 2021. The notification was published on January 28-30, 2021 and February 1, 4-6, and 8, 2021 in Spanish language newspapers, satisfying the requirement for non-English language notification. Copies of: (1) the notification letter sent to the member agencies, cities and counties in Metropolitan's service area, and (2) the notice published in the newspapers are included in the 2020 UWMP Section 5. Thus, this Appendix 11 to Metropolitan's 2020 UWMP, which was adopted with Metropolitan's 2020 UWMP, will also be recognized and treated as Appendix 11 to Metropolitan's 2015 UWMP.

Metropolitan held the public hearing for the draft 2020 UWMP, draft Appendix 11 to the 2015 UWMP, and draft WSCP on April 12, 2021, at the Board's Water Planning and Stewardship Committee meeting, held online due to COVID-19 concerns. On May 11, 2021, Metropolitan's Board determined that the 2020 UWMP and the WSCP are consistent with the MWD Act and accurately represent the water resources plan for Metropolitan's service area. In addition, Metropolitan's Board determined that Appendix 11 to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions 9279, 9280, and 9281, the Board adopted the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP and authorized their submittal to the State of California. Copies of Resolutions 9279, 9280, and 9281 are included in the 2020 UWMP Section 5, and Resolution 9281 for the WSCP is attached to the WSCP as Attachment C.

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# Appendix 12

# DWR 2020 UWMP SUBMITTAL TABLES

# Appendix 12
# DWR 2020 UWMP SUBMITTAL TABLES

In fulfillment of California Water Code Sections, 10621(d) and 10644(a) and (b), Metropolitan's Final 2020 Urban Water Management Plan, Water Shortage Contingency Plan, and Appendix 11 Addendum to the 2015 Urban Water Management Plan were electronically submitted to the State of California through DWR's WUE Data Portal (https://wuedata.water.ca.gov/) in June 2021. This appendix contains the mandatory DWR 2020 UWMP Submittal Tables that were uploaded to the WUE data website.

| Submittal Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list) |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☐ | Water Supplier is also a member of a Regional Alliance | |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

| Submittal Table 2-3: Supplier Identification | |
|---|---|
| Type of Supplier (select one or both) | |
| ☑ | Supplier is a wholesaler |
| ☐ | Supplier is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☑ | UWMP Tables are in calendar years |
| ☐ | UWMP Tables are in fiscal years |
| If using fiscal years provide month and date that the fiscal year begins (mm/dd) | |
| | |
| Units of measure used in UWMP * (select from drop down) | |
| Unit | AF |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | |
| NOTES: | |

| Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one) | |
|---|---|
| ☑ | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed. |
| Section 5 pp. 5-8 to 5-9 | **Provide page number for location of the list.** |
| ☐ | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.** |
| Water Supplier Name | |
| *Add additional rows as needed* | |
| | |
| | |
| | |
| NOTES: NOTES: See 2020 UWMP Sections 2 and 5 for discussion of Metropolitan's planning coordination, outreach, and notification (list provided in Section 5 Table 5-3 pp. 5-8 and 5-9). | |

| Submittal Table 3-1 Wholesale: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2020 | 2025 | 2030 | 2035 | 2040 | 2045*(opt)* |
| | **19,035,000** | **20,089,000** | **20,634,000** | **21,145,000** | **21,610,000** | **22,026,000** |
| NOTES: See 2020 UWMP Appendix 1 Tabel A.1-2. | | | | | | |

| Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual | | | |
|---|---|---|---|
| Use Type | 2020 Actual | | |
| **Drop down list** May select each use multiple times These are the only use types that will be recognized by the WUE data online submittal tool | Additional Description (as needed) | Level of Treatment When Delivered Drop down list | Volume[2] |
| Add additional rows as needed | | | |
| Sales to other agencies | | Drinking Water | 789,218 |
| Sales to other agencies | | Raw Water | 605,043 |
| Losses | | | 48,520 |
| | | | |
| | | **TOTAL** | 1,442,781 |
| [1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.* [2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.* | | | |
| NOTES: Sales to other agencies include Metropolitan deliveries to member and non-member agencies and deliveries from conjunctive use programs. Some of these deliveries are not revenue producing nor sales. Losses include evaporation losses from storage reservoirs and distribution system (2019 estimate). Water losses are both drinking and raw water. | | | |

| Submittal Table 4-2 Wholesale: Use for Potable and Raw Water [1] - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type | | Projected Water Use [2] Report To the Extent that Records are Available | | | | |
| Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool. | Additional Description (as needed) | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Add additional rows as needed | | | | | | |
| Other | | 1,149,000 | 1,110,000 | 1,084,000 | 1,100,000 | 1,125,000 |
| Exchanges to other agencies | | 278,000 | 278,000 | 278,000 | 278,000 | 278,000 |
| | | | | | | |
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| | | | | | | |
| | | | | | | |
| | TOTAL | 1,427,000 | 1,388,000 | 1,362,000 | 1,378,000 | 1,403,000 |

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: See 2020 UWMP detailed discussion in Section 2, Metropolitan's Regional Water Demands Table 2-3 for Normal Water Year, and Supply Capability and Projected Demands Table 2-6 for Normal Water Year (average of 1922 to 2017 historic hydrologies).

| Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable) | | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Potable and Raw Water From Tables 4-1W and 4-2W | 1,442,781 | 1,427,000 | 1,388,000 | 1,362,000 | 1,378,000 | 1,403,000 |
| Recycled Water Demand* From Table 6-4W | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL WATER DEMAND** | 1,442,781 | 1,427,000 | 1,388,000 | 1,362,000 | 1,378,000 | 1,403,000 |

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES:

| OPTIONAL Table 4-4 Wholesale: Last Five Years of Water Loss Audit Reporting | |
|---|---|
| Reporting Period Start Date (mm/yyyy) | Volume of Water Loss [1,2] |
| 01/2015 | 10,628 |
| 01/2016 | 8,545 |
| 01/2017 | 7,928 |
| 01/2018 | 4,991 |
| 01/2019 | 6,907 |

[1] *Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*
[2] ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: See 2020 UWMP discussions in Section 2.6 and Appendix 7, and estimate of distribution system water losses in Tables A.7-1, A.7-2, A.7-3, A.7-4, and A.7-5.

| Submittal Table 6-1 Wholesale: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | Supplier does not pump groundwater. The supplier will not complete the table below. | | | | | |
| ☐ | All or part of the groundwater described below is desalinated. | | | | | |
| Groundwater Type | Location or Basin Name | 2016* | 2017* | 2018* | 2019* | 2020* |
| *Add additional rows as needed* | | | | | | |
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| | | | | | | |
| | | | | | | |
| | TOTAL | 0 | 0 | 0 | 0 | 0 |
| **** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

| Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☑ | Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water. The Supplier will not complete the table below. | | | | | | | | | | |
| | | | | | | | 2020 volumes [1] | | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* [2] | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list* | Treatment Level *Drop down list* | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area | Instream Flow Permit Requirement |
| *Add additional rows as needed* | | | | | | | | | | | |
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| | | | | | | | | | | | |
| | | | | | | Total | 0 | 0 | 0 | 0 | 0 |
| [1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.<br>[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | |

| Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☑ | Recycled water is not directly treated or distributed by the Supplier. The Supplier will not complete the table below. | | | | | | |
| Name of Receiving Supplier or Direct Use by Wholesaler | Level of Treatment *Drop down list* | 2020* | 2025* | 2030* | 2035* | 2040* | 2045* *(opt)* |
| *Add additional rows as needed* | | | | | | | |
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| | | | | | | | |
| | Total | 0 | 0 | 0 | 0 | 0 | 0 |
| *** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3. | | | | | | | |
| NOTES: | | | | | | | |

| Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual | | |
|---|---|---|
| ☑ | Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020.<br>The wholesale supplier will not complete the table below. | |
| Name of Receiving Supplier or Direct Use by Wholesaler | 2015 Projection for 2020* | 2020 Actual Use* |
| *Add additional rows as needed* | | |
| | | |
| | | |
| | | |
| | | |
| **Total** | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | |

NOTES: The 2015 UWMP Table 2-3 included projection for recycled water use in 2020 of 436 TAF under average hydrology. In 2020, the actual recycled water use (regional total within Metropolitan service area) is estimated at 441 TAF (excluding Santa Ana River baseflow), as discussed in this 2020 UWMP Section 3.5 on Table 3-14 p. 3-78 and Appendix 2 p. A.2-8. Regional total represents the projected production of projects by Metropolitan member agencies. Metropolitan's Regional Recycled Water Program is still a pilot project, with recent Board approval to proceed with environmental planning.

| Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☑ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| 2020 UWMP Section 3 and Appendix 3 | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other suppliers? | | Description *(if needed)* | Planned Implementation Year | Planned for Use in Year Type *Drop Down list* | Expected Increase in Water Supply to Supplier* |
| | *Drop Down Menu* | *If Yes, Supplier Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
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| | | | | | | |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |

NOTES: See 2020 UWMP Section 3 description of resources and program development for CRA, SWP, Central Valley/SWP storage and transfers programs, conservation, LRP (groundwater recovery, recycling, desalination), and groundwater. Also, see Appendix 3 detailed discussion of all supply programs and justification for supply projections.

| Submittal Table 6-8 Wholesale: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | | 2020 | | |
| **Drop down list** May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool | Additional Detail on Water Supply | Actual Volume* | Water Quality Drop Down List | Total Right or Safe Yield* (optional) |
| Add additional rows as needed | | | | |
| Purchased or Imported Water | | 1,069,648 | Other Non-Potable Water | |
| Supply from Storage | | 367,069 | Other Non-Potable Water | |
| Transfers | | 6,064 | Other Non-Potable Water | |
| | | | | |
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| | | | | |
| | **Total** | 1,442,781 | | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | |
| NOTES: Actual volume of water reported in this table are raw water. The "Other Non-Potable Water" from the Water Quality column drop down list is the closest description to raw water. | | | | |

| Submittal Table 6-9 Wholesale: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | | Projected Water Supply* Report To the Extent Practicable | | | | | | | | | |
| | | 2025 | | 2030 | | 2035 | | 2040 | | 2045 (opt) | |
| **Drop down list** May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool | Additional Detail on Water Supply | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Add additional rows as needed | | | | | | | | | | | |
| Other | | 3,912,000 | | 3,906,000 | | 3,903,000 | | 3,901,000 | | 3,898,000 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | **Total** | 3,912,000 | 0 | 3,906,000 | 0 | 3,903,000 | 0 | 3,901,000 | 0 | 3,898,000 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | | | | | | |
| NOTES: See 2020 UWMP detailed discussion in Section 2 and Supply Capability and Projected Demands Table 2-6 for Normal Water Year (average of 1922-2017 hydrologies). Projected water supply includes capability of current and proposed programs. | | | | | | | | | | | |

| Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment) | | | |
|---|---|---|---|
| Year Type | Base Year If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000 | Available Supplies if Year Type Repeats | |
| | | ☑ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: 2020 UWMP Section 2 Tables 2-4, 2-5, 2-6, and Appendix 3. | |
| | | ☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | Volume Available * | % of Average Supply |
| Average Year | 1922-2017 | | 100% |
| Single-Dry Year | 1977 | | |
| Consecutive Dry Years 1st Year | 1988 | | |
| Consecutive Dry Years 2nd Year | 1989 | | |
| Consecutive Dry Years 3rd Year | 1990 | | |
| Consecutive Dry Years 4th Year | 1991 | | |
| Consecutive Dry Years 5th Year | 1992 | | |
| | | | |

*Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.*

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: See 2020 UWMP Section 2.3 discussion of sources of supply and water reliability assessment under normal water year, single dry year, and five consecutive drought years (summarized in Tables 2-4, 2-5, and 2-6). See Section 3 and Appendix 3 for a detailed discussion of all supply programs and justifications for supply projections. See Section 2 p. 2-7 for description, assumption, and basis of the three year types.

| Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 3,912,000 | 3,906,000 | 3,903,000 | 3,901,000 | 3,898,000 |
| Demand totals *(autofill fm Table 4-3)* | 1,427,000 | 1,388,000 | 1,362,000 | 1,378,000 | 1,403,000 |
| Difference | 2,485,000 | 2,518,000 | 2,541,000 | 2,523,000 | 2,495,000 |

NOTES: See 2020 UWMP detailed discussion in Section 2, and Supply Capabilities and reliability assessment in Table 2-6 for Normal Water Year condition (average of 1922-2017 historic hydrology).

| Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 (Opt) |
| Supply totals* | 2,772,000 | 2,761,000 | 2,760,000 | 2,760,000 | 2,757,000 |
| Demand totals* | 1,544,000 | 1,500,000 | 1,473,000 | 1,496,000 | 1,525,000 |
| Difference | 1,228,000 | 1,261,000 | 1,287,000 | 1,264,000 | 1,232,000 |

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: See 2020 UWMP detailed discussion in Section 2, and Supply Capabilities and reliability assessment in Table 2-4 for Single Dry Year condition (repeat of 1977 hydrology).

| Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2025* | 2030* | 2035* | 2040* | 2045* (Opt) |
| First year | Supply totals | 2,178,800 | 2,219,000 | 2,241,000 | 2,263,000 | 2,239,000 |
| | Demand totals | 1,592,000 | 1,570,000 | 1,537,000 | 1,539,000 | 1,564,000 |
| | Difference | 586,800 | 649,000 | 704,000 | 724,000 | 675,000 |
| Second year | Supply totals | 2,178,800 | 2,219,000 | 2,241,000 | 2,263,000 | 2,239,000 |
| | Demand totals | 1,592,000 | 1,570,000 | 1,537,000 | 1,539,000 | 1,564,000 |
| | Difference | 586,800 | 649,000 | 704,000 | 724,000 | 675,000 |
| Third year | Supply totals | 2,178,800 | 2,219,000 | 2,241,000 | 2,263,000 | 2,239,000 |
| | Demand totals | 1,592,000 | 1,570,000 | 1,537,000 | 1,539,000 | 1,564,000 |
| | Difference | 586,800 | 649,000 | 704,000 | 724,000 | 675,000 |
| Fourth year | Supply totals | 2,178,800 | 2,219,000 | 2,241,000 | 2,263,000 | 2,239,000 |
| | Demand totals | 1,592,000 | 1,570,000 | 1,537,000 | 1,539,000 | 1,564,000 |
| | Difference | 586,800 | 649,000 | 704,000 | 724,000 | 675,000 |
| Fifth year | Supply totals | 2,178,800 | 2,219,000 | 2,241,000 | 2,263,000 | 2,239,000 |
| | Demand totals | 1,592,000 | 1,570,000 | 1,537,000 | 1,539,000 | 1,564,000 |
| | Difference | 586,800 | 649,000 | 704,000 | 724,000 | 675,000 |
| Sixth year *(optional)* | Supply totals | | | | | |
| | Demand totals | | | | | |
| | Difference | 0 | 0 | 0 | 0 | 0 |

***Units of measure (AF, CCF, MG) m** ust remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: See 2020 UWMP detailed discussion in Section 2, and Supply Capabilities and reliability assessment in Table 2-5 for Five Consecutive Drought Year condition (repeat of 1988-1992 hydrology). Similar to the multiple dry-year reporting in past UWMPs, Metropolitan's reliability assessment for the five consecutive year drought is developed by simulating the five-year driest sequence leading to each of the fifth year reporting. This allows impacts of multiple consecutive years of droughts to be captured within the sequential accounting of Metropolitan's various supply program storage balance. The five consecutive years of supply and demand are then averaged and presented every five years rather than a year by-year display. Over the years, Metropolitan has developed numerous programs to increase its water supply capabilities, dry year supplies, and regional storage. These programs may be exercised in conjunction with effective demand management measures during drought years. Under this reliability planning, if a five consecutive year drought sequence was to repeat, Metropolitan could exercise similar supply augmentation and demand management options for each of the five drought years at the appropriate level to meet demands. This methodology best captures Metropolitan's complex demand and supply planning with appropriate flexibility.

| Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b) | |
|---|---|
| **2021** | **Total** |
| Total Water Use | 1,596,000 |
| Total Supplies | 1,164,000 |
| Surplus/Shortfall w/o WSCP Action | (432,000) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 432,000 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |

| 2022 | Total |
|---|---|
| Total Water Use | 1,669,000 |
| Total Supplies | 1,903,000 |
| Surplus/Shortfall w/o WSCP Action | 234,000 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 234,000 |
| Resulting % Use Reduction from WSCP action | 0% |

| 2023 | Total |
|---|---|
| Total Water Use | 1,688,000 |
| Total Supplies | 1,300,000 |
| Surplus/Shortfall w/o WSCP Action | (388,000) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 388,000 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |

| 2024 | Total |
|---|---|
| Total Water Use | 1,491,000 |
| Total Supplies | 1,468,000 |
| Surplus/Shortfall w/o WSCP Action | (23,000) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 23,000 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |

| 2025 | Total |
|---|---|
| Total Water Use | 1,592,000 |
| Total Supplies | 1,369,000 |
| Surplus/Shortfall w/o WSCP Action | (223,000) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 223,000 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |

Note: See 2020 UWMP discussion in Section 2.4 Drought Risk Assessment and the supply augmentation actions that may be exercised to meet demands through 2025.

| Submittal Table 8-1<br>Water Shortage Contingency Plan Levels | | |
|---|---|---|
| **Shortage Level** | **Percent Shortage Range** | **Shortage Response Actions**<br>***(Narrative description)*** |
| 1 | Up to 10% | Shortage response actions will be customized to meet the circumstances for the particular shortage. Response actions may include a combination of supply augmentation from flexible supplies and dry year storage, demand response actions, and operational measures. |
| 2 | Up to 20% | Shortage response actions will be customized to meet the circumstances for the particular shortage. Response actions may include a combination of supply augmentation from flexible supplies and dry year storage, demand response actions, and operational measures. |
| 3 | Up to 30% | Shortage response actions will be customized to meet the circumstances for the particular shortage. Response actions may include a combination of supply augmentation from flexible supplies and dry year storage, demand response actions, and operational measures. |
| 4 | Up to 40% | Shortage response actions will be customized to meet the circumstances for the particular shortage. Response actions may include a combination of supply augmentation from flexible supplies and dry year storage, demand response actions, and operational measures. |
| 5 | Up to 50% | Shortage response actions will be customized to meet the circumstances for the particular shortage. Response actions may include a combination of supply augmentation from flexible supplies and dry year storage, demand response actions, and operational measures. |
| 6 | >50% | Shortage response actions will be customized to meet the circumstances for the particular shortage. Response actions may include a combination of supply augmentation from flexible supplies and dry year storage, demand response actions, operational measures, and emergency storage if needed. |
| NOTES: Actions taken will be based on resource and operational conditions throughout the year. To determine specific actions that would be taken at each level, Metropolitan will evaluate circumstances including cost, timing, distribution needs and capabilities, and other variables that include SWP allocation, Colorado River conditions, take capacities, and storage balances. See Table A.4-5 Shortage Stages and Response Actions from Appendix 4: Water Shortage Contingency Plan. | | |

| Submittal Table 8-2: Demand Reduction Actions | | | | |
|---|---|---|---|---|
| Shortage Level | Demand Reduction Actions<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference *(optional)* | Penalty, Charge, or Other Enforcement?<br>***For Retail Suppliers Only***<br>*Drop Down List* |
| *Add additional rows as needed* | | | | |
| 1 to 6 | Expand Public Information Campaign | Range between 160,000 to 320,000 acre-feet | Assumed range of between 5% and 10% effectiveness in demand reduction realized at the wholesale level, using a hypothetical single dry year assessment of wholesale demand within the 2020 Urban Water Management Plan (2025 single-dry year). Based on assumptions of service area retail M&I demand of 4.379 MAF and up to 20 percent of retail demands could be reduced if a successful media campaign reached and influenced the entire service area population (source: American Water Works Association. 2019. Manual of Water Supply Practices – M60, Second Edition: Drought Preparedness and Response. p. 35) | |
| 1 to 6 | Other | Up to 900,000 acre-feet | Water Supply Allocation Plan (WSAP) allocates Metropolitan's wholesale water supplies among its member agencies. The WSAP is designed to reduce demands by up to approximately 50 percent of the WSAP's calculated base demand. Up to 900,000 AF of savings is based on a hypothetical WSAP base demand of 1.8 MAF. Actual reductions and base demands are based on a formula that includes various factors such as actual local supply production, population growth, and conservation. | |
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| | | | | |
| | | | | |
| NOTES: Total estimated savings potential from differerent Demand Reducation Actions are nonadditive. Savings potential from voluntary actions overlaps with savings from supply allocations. | | | | |

| Submittal Table 8-3: Supply Augmentation and Other Actions | | | |
|---|---|---|---|
| Shortage Level | Supply Augmentation Methods and Other Actions by Water Supplier<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference *(optional)* |
| *Add additional rows as needed* | | | |
| 1 to 6 | Transfers | Up to 64,000 acre-feet | Based on a hypothetical 2025 single dry year assessment within the 2020 Urban Water Management Plan. See Table 2-1 in the 2020 UWMP. |
| 1 to 6 | Other Actions (describe) | Up to 1,714,000 acre-feet | Dry year storage. Based on a hypothetical 2025 single dry year assessment within the 2020 Urban Water Management Plan. |
| 6 | Stored Emergency Supply | Up to 750,000 acre-feet | Based on Metropolitan's Emergency Storage Objective, set at 750,000 AF. Emergency storage represents water Metropolitan reservees for the region for use in the event of supply interruptions from earthquakes or similar emergencies. |
| | | | |
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| | | | |
| NOTES: | | | |

| Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one) | | |
|---|---|---|
| ☑ | Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642.<br>**Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.** | |
| 2020 UWMP Section 5 Table 5-3 | Provide the page or location of this list in the UWMP. | |
| ☐ | Supplier has notified 10 or fewer cities or counties.<br>**Complete the table below.** | |
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| | | |
| | | |
| | | |
| County Name<br>*Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| | | |
| | | |
| NOTES: See 2020 UWMP Section 5 discussion on Metropolitan's notification to cities and counties (list provided in Table 5-3). Metropolitan sent a total of 195 notification letters to cities, counties, and member agencies within its service area. | | |

WATER TOMORROW

Planning for the Future

*THE METROPOLITAN WATER DISTRICT*
*OF SOUTHERN CALIFORNIA*

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

June 2021

KJ 2044518*00

# 2020 Urban Water Management Plan

FINAL

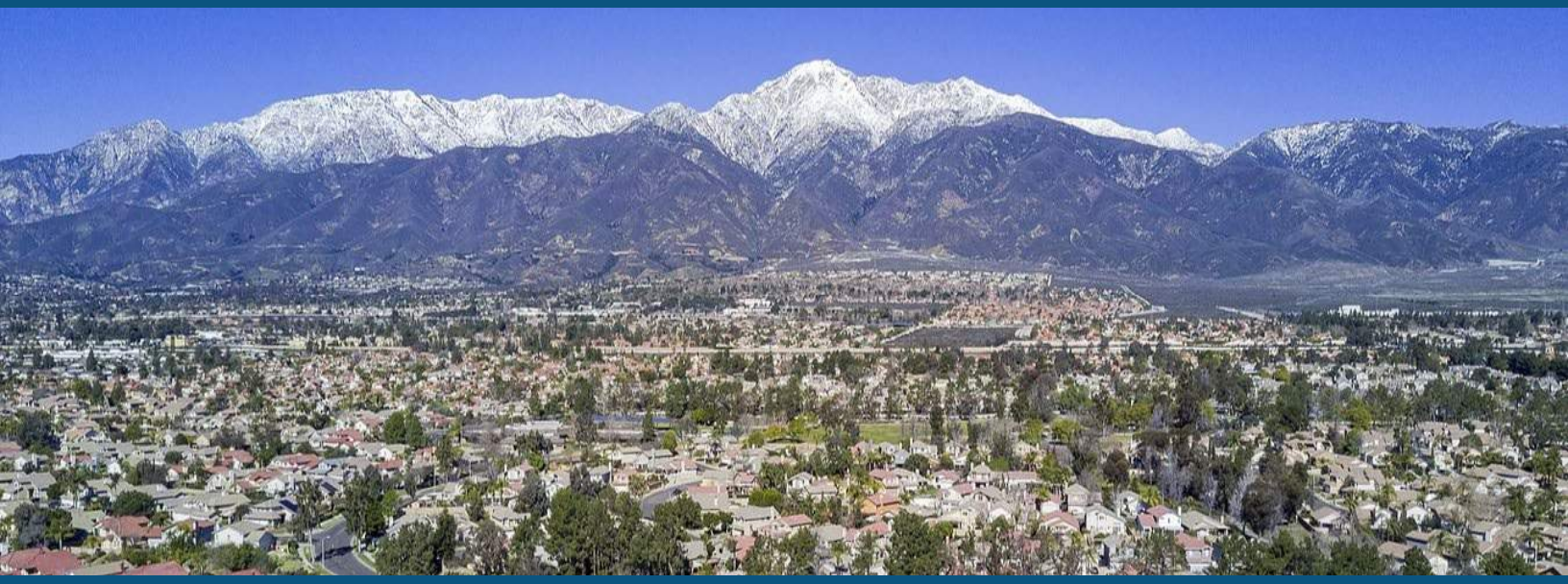

Kennedy Jenks

Kennedy Jenks

300 N. Lake Ave, Suite 1020
Pasadena, CA 91101
626-568-4300

# 2020 Urban Water Management Plan
# FINAL

29 June 2021

*6/29/2021*

Prepared for

**Inland Empire Utilities Agency**
6075 Kimball Avenue
Chino, CA 91708

KJ Project No. 2044518.00

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## Acronyms

The following abbreviations and acronyms are used in this report.

| | |
|---|---|
| °F | degree Fahrenheit |
| µg/L | micrograms per liter |
| % | percent |
| 1,1-DCE | 1,1-dichloroethene |
| 1,2,3-TCP | 1,2,3-Trichloropropane |
| AB | Assembly Bill |
| Act | Urban Water Management Planning Act |
| AF | acre-feet |
| AFY | acre-feet per year |
| Agency | Inland Empire Utilities Agency |
| AWE | Alliance for Water Efficiency |
| AWPF | Advanced Water Purification Facility |
| BMP | best management practice |
| CBFIP | Chino Basin Facilities Improvement Program |
| CBWCD | Chino Basin Water Conservation District |
| CBWM | Chino Basin Watermaster |
| CCAP | Climate Change Action Plan |
| CCR | California Code of Regulations |
| CCWRF | Carbon Canyon Water Recycling Facility |
| CDA | Chino Basin Desalter Authority |
| cfs | cubic feet per second |
| Chino Basin | Chino Groundwater Basin |
| CII | Commercial, Industrial, and Institutional |
| CIM | California Institution for Men |
| CIMIS | California Irrigation Management Information System |
| CRA | Colorado River Aqueduct |
| CUWCC | California Urban Water Conservation Council |
| CVWD | Cucamonga Valley Water District |
| CWC | California Water Code |
| DAC | Disadvantaged Community |
| DCP | Drought Contingency Plan |
| DDW | State Water Resources Control Board Division of Drinking Water |
| Delta | Sacramento-San Joaquin Delta |

## Acronyms (cont'd)

| | |
|---|---|
| DMM | Demand Management Measure |
| DRA | Drought Risk Assessment |
| DWR | Department of Water Resources |
| EDU | equivalent service unit |
| EPA | U.S. Environmental Protection Agency |
| EMP | Energy Management Plan |
| ETo | evapotranspiration |
| Freon 39 | dichloromethane |
| FWC | Fontana Water Company |
| FY | Fiscal Year |
| GMZ | Groundwater Management Zone |
| GPCD | gallons per capita per day |
| HAL | Health Advisory Level |
| HET | high efficiency toilet |
| IEBL | Inland Empire Brine Line |
| IEUA | Inland Empire Utilities Agency |
| IRP | Integrated Water Resources Plan |
| IRP Model | 2020 IRP Regional Water Supply Infrastructure Model |
| IX | ion exchange |
| JPA | Joint Powers Authority |
| kWh | kilowatt-hour |
| LEAP | Landscape Evaluation and Audit Program |
| LRP | Local Resources Program |
| LUBDM | Land Use-Based Demand Model |
| M&I | municipal and industrial |
| MAF | million acre-feet |
| MCL | maximum contaminant level |
| Metropolitan | Metropolitan Water District of Southern California |
| MG | million gallons |
| mg/L | milligrams per liter |
| MGD | million gallons per day |
| MHI | Median Household Income |
| MOU | Memorandum of Understanding |
| MVWD | Monte Vista Water District |
| MWD | Metropolitan Water District of Southern California |
| MWELO | Model Water Efficiency Landscape Ordinance |

## Acronyms (cont'd)

| | |
|---|---|
| NDMA | N-Nitroso dimethylamine |
| NDEA | N-Nitrosodiethylamine |
| ng/L | nanograms per liter |
| NL | Notification Level |
| No. | number |
| NPDES | National Pollutant Discharge Elimination System |
| NRWS | non-reclaimable wastewater system |
| NTC | National Theater for Children |
| OBMP | Optimum Basin Management Program |
| OBMPU | Optimum Basin Management Program Update |
| OCSD | Orange County Sanitation District |
| OSY | Operating Safe Yield |
| OWOW | “One Water One Watershed” |
| PCE | tetrachloroethene |
| pCi/L | picocuries per liter |
| PFAS | poly- and per-fluorinated compounds |
| PFOA | perfluorooctanoic acid |
| PFOS | perfluorooctane sulfonate |
| PHG | Public Health Goal |
| Plan | Urban Water Management Plan |
| ppm | parts per million |
| ppt | parts per trillion |
| PRV | Pressure Regulating Valve |
| RO | reverse osmosis |
| RP | Recycling Plant |
| RTP/SCS | Regional Transportation Plan/Sustainable Communities Strategy |
| RUWMP | Regional Urban Water Management Plan |
| RWIP | Recycled Water Implementation Plan |
| RWQCB | Regional Water Quality Control Board |
| RWPS | Recycled Water Program Strategy |
| SARWQCB | Santa Ana Regional Water Quality Control Board |
| SAWCo | San Antonio Water Company |
| SAWPA | Santa Ana Watershed Project Authority |
| SB | Senate Bill |
| SBCFCD | San Bernardino County Flood Control District |
| SBX7-7 | Senate Bill 7 of Special Extended Session 7 aka Water Conservation Act of 2009 |

## Acronyms (cont'd)

| | |
|---|---|
| SCAB | South Coast Air Basin |
| SCAG | Southern California Association of Governments |
| SCWS | SoCal Water Smart |
| SGMA | Sustainable Groundwater Management Act |
| SWP | State Water Project |
| TAF | thousand acre-feet |
| TAZ | Transportation Analysis Zone |
| TCE | trichloroethylene |
| TDS | Total Dissolved Solids |
| TYCIP | Ten-Year Capital Improvement Plan |
| TYF | Ten-Year Forecast |
| UWMP | Urban Water Management Plan |
| UWMP Act | Urban Water Management Planning Act of 1983 |
| VOC | volatile organic compound |
| Watermaster | Chino Basin Watermaster |
| WFA | Water Facilities Authority |
| WSAP | Water Supply Allocation Plan |
| WSCP | Water Shortage Contingency Plan |
| WUE | Water Use Efficiency |
| WUEBP | Water Use Efficiency Business Plan |
| WVWD | West Valley Water District |

# Section 1: Introduction/Lay Person Description

## 1.1 Overview

This document presents the 2020 Urban Water Management Plan (UWMP, Plan) for the Inland Empire Utilities Agency (IEUA or Agency) wholesale water service area. This section describes the general purpose of the Plan, discusses Plan implementation, and provides general information about IEUA and service area characteristics.

The State of California mandates that all urban water suppliers within the state prepare an UWMP. Detailed information on what must be included in these plans, as well as whom must complete them can be found in California Water Code (CWC) sections 10610 through 10657. According to the Urban Water Management Planning Act (UWMP Act) of 1983, an urban water supplier is defined as a supplier, either public or private, that provides water for municipal purposes either directly or indirectly to more than 3,000 customers or supplies more than 3,000 acre-feet (AF) annually. Urban water suppliers are required to prepare, adopt, and file an UWMP with the California Department of Water Resources (DWR) every 5 years. The 2020 UWMP updates are due to DWR by July 1, 2021.

## 1.2 Purpose

An UWMP is a planning tool that generally guides the actions of urban water suppliers. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section which "…describes the opportunities for exchanges or water transfers on a short-term or long-term basis." [Wat. Code, § 10631, subd. (d)]. The identification of such opportunities and the inclusion of those opportunities in a plan's general water service reliability analysis neither commits an urban water supplier to pursue a particular water exchange/transfer opportunity, nor precludes it from exploring exchange/transfer opportunities never identified in its plan. Before an urban water supplier is able to implement any potential future sources of water supply identified in a plan, detailed project plans are prepared and approved, financial and operational plans are developed, and all required environmental analysis is completed.

"A plan is intended to function as a planning tool to guide broad-perspective decision making by the management of water suppliers." [Sonoma County Water Coalition v. Sonoma County Water Agency (2010) 189 Cal. App. 4th 33, 39.] It should not be viewed as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty and planning projections may change in response to a number of factors. "[L]ong-term water planning involves expectations and not certainties. Our Supreme Court has recognized the uncertainties inherent in long-term land use and water planning and observed that the generalized information required . . . in the early stages of the planning process are replaced by firm assurances of water supplies at later stages." (Id., at 41.) From this perspective, it is appropriate to look at the UWMP as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions such as:

- What are the potential sources of supply and what amounts are estimated to be available from them?
- What is the projected demand, given a reasonable set of assumptions about growth and implementation of water management practices?
- How do the projected supply and demands compare and relate to each other?

Using these “framework” questions and resulting answers, the implementing agency will pursue feasible and cost-effective options and opportunities to develop long-term supplies and sustainably meet demands.

Water suppliers can explore enhancing basic supplies from traditional sources such as local groundwater and imported water, as well as other options. These include groundwater extraction, water exchanges and transfers, water conservation, recycling, brackish water desalination, and water banking/conjunctive use. Additional specific planning efforts may be undertaken in regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, potential environmental impacts, and how each option would affect customers.

The UWMP Act requires preparation of a plan that, among other things:

- Accomplishes water supply planning over a 20-year period in 5-year increments. (IEUA is going beyond the requirements of the Act by developing a plan which spans 25 years.)
- Identifies and quantifies existing and projected water supply opportunities, including recycled water, for existing and future demands, in normal, single-dry, and multiple-dry years.
- Implements conservation and efficient use of urban water supplies.

Additionally, Senate Bill (SB) 7 of Special Extended Session 7 (SBX7-7) was signed into law in November 2009, which calls for progress towards a 20 percent (%) reduction in per capita water use statewide by 2020. SBX7-7, otherwise referred to as the Water Conservation Act of 2009, requires each urban retail water supplier to develop and report a water use target in its 2010 UWMP, and to develop and report an interim 2015 water use target, baseline daily per capita use, and 2020 compliance daily per capita use, along with the basis for determining those estimates. Beginning in 2016, retail water suppliers were required to comply with the water conservation requirements in SBX7-7 in order to be eligible for State water grants or loans. Water suppliers have the ability to revisit the SBX7-7 baseline and water use targets determined in the 2010 UWMPs and update them in the 2020 UWMP.

In addition to the relatively new requirements of SBX7-7, a number of other changes to the Water Code have been enacted since 2010 which apply to the preparation of the 2020 Plan. These changes include:

- UWMP Submittal Date: 2020 UWMP updates must be adopted and submitted to DWR by July 1, 2021.

- Reporting on Compliance with SBX7-7 Targets: The 2020 UWMP will be required to document compliance with the 20% reduction described in the 20 by 2020 Water Conservation Plan, and a comparison of actual water use against the target.

- 5-year Drought Risk Assessment: In past UWMPs, suppliers were to conduct a drought risk assessment assuming a period of drought lasting 3 consecutive years. This requirement has changed, and suppliers must now assess a drought lasting 5 years.

- Sustainable Groundwater Management Act (AB 1739, SB1168, and SB1319): Requires UWMPs to show consistency with Groundwater Sustainability Plan (GSP) supply protections, if applicable.

- Seismic Risk Assessment (SB 664): If applicable, requires an urban water supplier to include within its plan a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

- Water Shortage Contingency Plan (WSCP) Updates: State requirements call for an update to the existing WSCP and that it be formally adopted as a stand-alone plan. The WSCP must be updated in parallel with the UWMP.

- Making Water Conservation a California Way of Life [Assembly Bill (AB) 1668 and SB 606]: Regulations targeting indoor water demand and affecting the need for additional water use efficiency in the State.

- Annual Water Supply and Demand Assessments: Assessments will be required, starting June 2022, and the process to do the assessment must be described in the 2020 UWMP.

- Items optional in the past, but now required, include: calculating the energy intensity of water, incorporation of land use changes in demand forecasting, and estimating water savings from codes and standards.

A checklist to ensure compliance of this Plan with the UWMP Act requirements is provided in Appendix A.

## 1.3 IEUA UWMP Preparation

In accordance with the CWC, urban water suppliers with 3,000 or more service connections, or supplying 3,000 or more acre-feet of water per year (AFY), are required to prepare a UWMP every 5 years. The 2020 UWMP must be approved and submitted to DWR by July 1, 2021.

This 2020 UWMP is an update of IEUA's portion of the IEUA and Water Facilities Authority (WFA) 2015 UWMP. In 2015, IEUA prepared a Regional UWMP (RUWMP) in collaboration with WFA, a wholesale supplier of imported water (State Water Project water) purchased from Metropolitan Water District of Southern California (MWD or Metropolitan) via IEUA. WFA provides services to five retail agencies that are encompassed within IEUA's service area, including the Cities of Chino, Chino Hills, Ontario, Upland, and Monte Vista Water District (MVWD). This 2020 Wholesale UWMP was not prepared as an RUWMP and was developed by IEUA individually in coordination with its retail agencies.

While this 2020 UWMP provides water demand, water supply, and supply reliability assessment for the entire IEUA region, all requirements of the CWC for each of IEUA's retail agencies will be met through each retail agency's individual 2020 UWMP. Additionally, as reported in the 2015 UWMP, IEUA formed a regional alliance consisting of seven of its retail agencies (all retail agencies excluding SAWCo and WVWD) to comply with SB x7-7 goals. The regional alliance will also allow IEUA and its retail agencies to continue to cooperatively participate in developing Water Use Efficiency (WUE) programs and meeting water conservation goals. Table 1-1 identifies this as an individual UWMP prepared by IEUA. Table 1-2 indicates that IEUA is a wholesale supplier.

A water supplier may report on a fiscal year or calendar year basis but must clearly state in its UWMP the type of year that is used for reporting. The type of year should remain consistent throughout the Plan. All data in this Plan is reported in fiscal years and volumes are reported in AF, as shown in Table 1-2.

**Table 1-1: DWR Plan Identification (DWR Table 2-2)**

| Select Only One | Type of Plan | Name of RUWMP or Regional Alliance if applicable |
|---|---|---|
| X | Individual UWMP | |
| | Water Supplier is also a member of a RUWMP | |
| | Water Supplier is also a member of a Regional Alliance | |
| | RUWMP | |

Notes:

**Table 1-2: DWR Supplier Identification (DWR Table 2-3)**

| | **DWR Supplier (select one)** |
|---|---|
| X | Supplier is a wholesaler |
| | Supplier is a retailer |
| | **Fiscal or Calendar Year (select one)** |
| | UWMP Tables are in calendar years |
| X | UWMP Tables are in fiscal years |
| *If using fiscal years provide month and date that the fiscal year begins (mm/dd)* | |
| | 07/01 |
| | **Units of measure used in UWMP** |
| | AF |

### 1.3.1 Relationship to Other Planning by IEUA

IEUA has developed plans to expand and provide an adequate water supply for its retail agencies. The plans include:

- 2020 Water Use Efficiency Business Plan (WUEBP) – The WUEBP is updated every 5 years with input from IEUA's regional WUE partners to increase regional sustainability through using water more efficiently, eliminating water waste, and drought-proofing the region through increased use of recycled water, groundwater, stormwater, and other local water supplies. The 2020 WUEBP is currently in development and will provide updated analyses and recommended methods to improve efficiency and achieve regional sustainability.

- 2020 Regional Drought Contingency Plan (DCP) – The DCP was developed to define regional shortage conditions, identify vulnerabilities, build resiliency through mitigation and response actions, and facilitate consistent communication within the service area while ensuring equity and fairness. The DCP was also developed to support the needs of the WSCP, a requirement of this 2020 UWMP.

- 2015 Integrated Water Resources Plan (IRP) and 2020 Modeling – The IRP and modeling was conducted to support regional and local water supply planning by assessing water supply vulnerabilities and evaluate collaborative infrastructure and management strategies to increase water supply resiliency in the region.

- 2018 Climate Change Action Plan (CCAP) – The CCAP was developed to identify local impacts of climate change and lay the groundwork for projects and management practices that will allow IEUA to continue providing reliable services to the region while remaining a steward to the environment.

- 2015 Recycled Water Program Strategy (RWPS) Report – The purpose of the RWPS Report was to update recycled water Direct Use demand projections and changes to IEUA's groundwater recharge program, as well as investigate operational changes to the recycled water conveyance system as a result of increasing reuse of the recycled water supply availability.

- 2015 Energy Management Plan (EMP) – The EMP analyzed historical energy usage, established a current energy and Greenhouse Gas emissions baseline, forecasted future demand, examined procurement strategies, and explored measures to ease IEUA's energy load while cultivating a reliable and sustainable energy infrastructure across its facilities.

### 1.3.2 Relationship to Water Shortage Contingency Plan

Several elements of the 2020 UWMP, especially Section 7, Reliability Planning, and Section 8, Demand Management Measures, are coordinated with the WSCP which is a separate document. The WSCP is a detailed plan of how IEUA intends to act in the case of water shortage conditions. The WSCP identifies specific response actions that align with six standard

water shortage levels. The information in the WSCP was prepared using the information developed in the 2020 DCP. The 2020 WSCP is included in Appendix B.

## 1.4 Structure and Organization of the Plan

The content presented in this UWMP corresponds to the outline of the Act, specifically Article 2, Contents of Plans, which correspond to the CWC Sections 10631, 10632, and 10633. The organization of the report differs slightly from the DWR UWMP Guidebook's organization in order to reflect the unique characteristics of IEUA's systems, as well as to be as consistent as possible with IEUA's IRP and Water Use Efficiency Business Plan. This UWMP is organized as follows:

- Section 1 – Introduction
- Section 2 – Water Demands
- Section 3 – SBX7-7 Baseline and Targets
- Section 4 – Water Resources
- Section 5 – Recycled Water and Reuse
- Section 6 – Water Quality
- Section 7 – Reliability Planning
- Section 8 – Demand Management Measures
- Section 9 – Energy Intensity Reporting
- Section 10 – Seismic Risk Assessment

The UWMP Checklist has been completed, which identifies the location of the UWMP Act requirements in this UWMP and is included in Appendix A.

## 1.5 System Description

IEUA was formed as a municipal water district by popular vote of its residents in June 1950 to become a member agency of MWD for the purpose of importing water to its retail agencies. IEUA has significantly expanded its water and wastewater utility services since 1950 to also include wastewater treatment, recycled water production and distribution, co-composting of green waste and municipal biosolids, desalination of brackish water, and disposal of non-reclaimable industrial wastewater and brine. IEUA is governed by a five-member Board of Directors. Each Director is publicly elected for a 4-year term and represents one of the five divisions:

- Division 1 – Upland, Montclair, portion of Ontario, and portion of Rancho Cucamonga.
- Division 2 – Ontario, portion of Chino, and portion of Fontana.

- Division 3 – Chino and Chino Hills.
- Division 4 – Fontana, portion of Rialto, and portion of Bloomington.
- Division 5 – Rancho Cucamonga and portion of Fontana.

2021 IEUA Board members are:

- Marco Tule – Director, Division 1.
- Paul Hofer – Director, Division 2.
- Steven Elie – Secretary/Treasurer, Division 3.
- Jasmin Hall – President, Division 4.
- Michael Camacho – Vice President, Division 5.

IEUA owns and operates four regional water recycling plants in its service area: Regional Water Recycling Plant Number (No.) 1, Regional Water Recycling Plant No. 4, Regional Water Recycling Plant No. 5, and the Carbon Canyon Water Recycling Facility (RP-1, RP-4, RP-5, and the CCWRF). IEUA's regional recycled water plants produce disinfected, tertiary treated recycled water in compliance with California's Title 22 regulations. Wastewater is collected with regional wastewater interceptors and two non-reclaimable wastewater pipeline systems. Biosolids produced at the water recycling plants are handled by three facilities: RP-1 Solids Handling Facility, Regional Water Recycling Plant No. 2 (RP-2) Solids Handling Facility, and the Inland Empire Regional Composting Facility. IEUA owns and operates sewer lines and recycled water pipelines. The recycled water systems include pump stations, reservoirs, and pressure regulating stations to serve numerous pressure zones. IEUA also operates groundwater recharge facilities in cooperation with the Chino Basin Watermaster (CBWM or Watermaster), San Bernardino County Flood Control District (SBCFCD), and the Chino Basin Water Conservation District. The Chino I Desalter is managed by IEUA under an agreement with the Chino Basin Desalter Authority (CDA). IEUA does not own or operate drinking water facilities.

### 1.5.1 Service Area

IEUA provides a number of services for the southwestern section of San Bernardino County in the Santa Ana River Watershed. The IEUA service area almost entirely overlies the Chino Groundwater Basin (Chino Basin). The 242-square mile service area encompasses the Chino Basin which consists of a relatively flat alluvial valley from east to west and slopes from north to south at a 1 to 2% grade. Valley elevation ranges from about 2,000 feet above sea level in the foothills below the San Gabriel Mountains to about 500 feet near Prado Dam. Figure 1 shows the IEUA service area and its retail agencies.

IEUA's service area population has grown quickly in the past decade and is expected to increase in the future. The region's growth underlies the need for careful water resources planning and management to ensure adequate water supplies and address water quality challenges.

\\sfo2\z_drive\Projects\IEUA\Events\2020 UWMP\Fig1_ServiceArea.mxd Date: 11/18/2020 Printed by: CaylaWhiteside

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

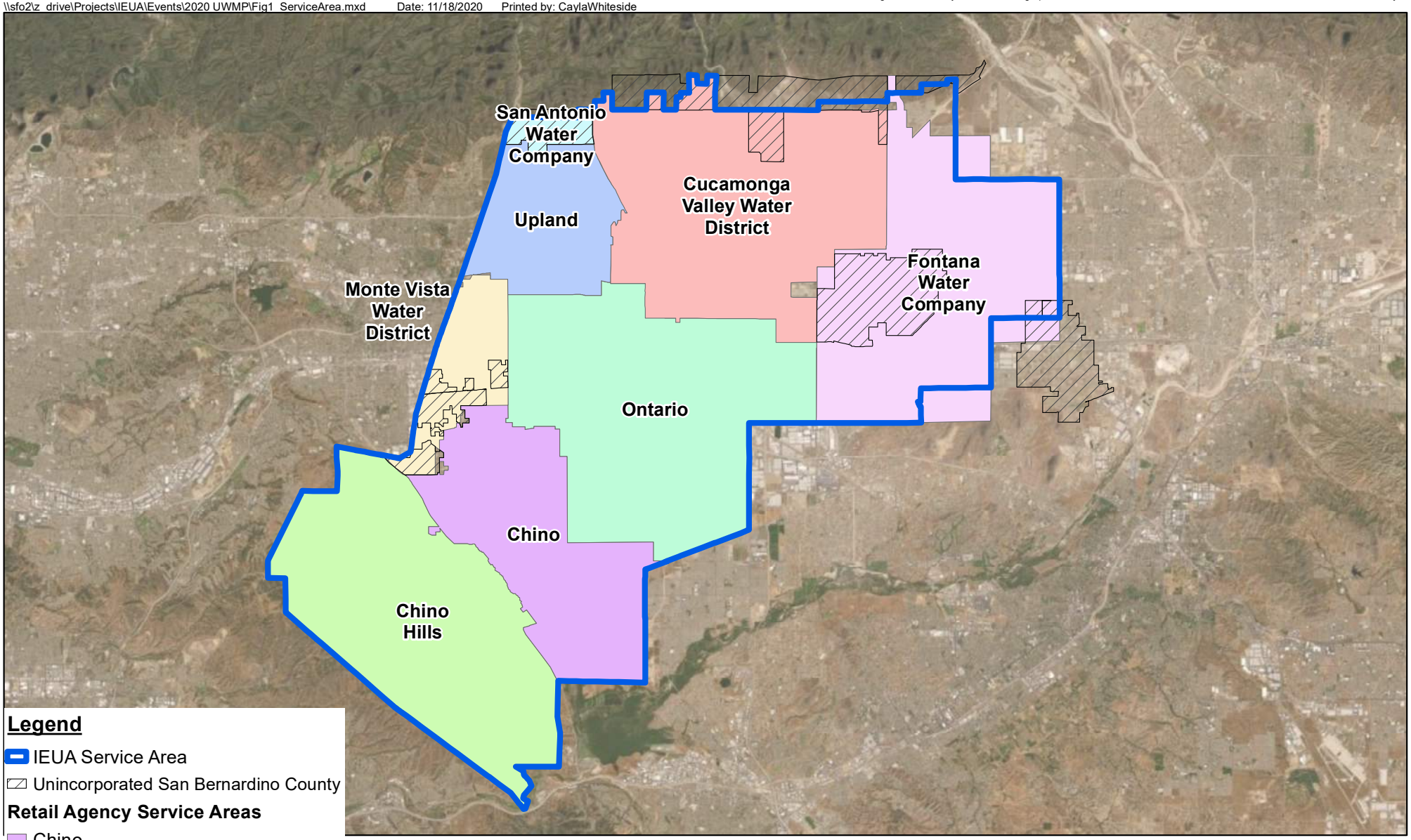


**Legend**

- IEUA Service Area
- Unincorporated San Bernardino County

**Retail Agency Service Areas**

- Chino
- Chino Hills
- Cucamonga Valley Water District
- Fontana Water Company
- Monte Vista Water District
- Ontario
- San Antonio Water Company
- Upland

N

0 12,500 25,000

Scale: Feet

Kennedy Jenks

Inland Empire Utilities Agency
Chino, CA

**IEUA & Retail Agency Service Areas**

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November 2020

**Figure 1**

### 1.5.2 Retail Agencies

The IEUA service area consists of the cities of Chino, Chino Hills, Montclair, Upland, Ontario, Rancho Cucamonga, and Fontana, and unincorporated areas within San Bernardino County. There are nine retail water agencies within IEUA's service area which are described in Table 1-3. Two of IEUA's retail water agencies, (Fontana Water Company (FWC) and Cucamonga Valley Water District (CVWD)) purchase untreated water directly from IEUA and provide their own treatment. Five of IEUA's retail water agencies purchase treated water from WFA. WFA purchases untreated imported water from IEUA, treats and delivers the water to the cities of Chino, Chino Hills, Ontario, Upland, and MVWD. IEUA also provides wastewater services to seven agencies including the cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Upland, and CVWD in the city of Rancho Cucamonga.

**Table 1-3: IEUA Retail Agencies**

| Agency Name | Description |
|---|---|
| City of Chino | The City of Chino serves water to a population of approximately 74,000 in the City and some unincorporated areas in San Bernardino County. |
| City of Chino Hills | The City of Chino Hills provides water to a population of approximately 77,600 in the City within its 46 square mile service area that also includes small portions of Chino and Pomona. |
| Cucamonga Valley Water District | CVWD is a special district that provides water to approximately 200,460 residents within a 47-square mile area comprised mainly of the City of Rancho Cucamonga. CVWD also provides water to small portions of the cities of Upland, Ontario, Fontana, and unincorporated areas of San Bernardino County. |
| Fontana Water Company | Fontana Water Company is a retail investor-owned utility company that provides water to approximately 215,500 residents mainly in the City of Fontana, and also serves portions of the cities of Rancho Cucamonga and Rialto, outside the IEUA service area. |
| Monte Vista Water District | MVWD is a county water district that provides retail water services to a population of approximately 54,200 in the City of Montclair, portions of the City of Chino, and unincorporated areas of San Bernardino County between Chino, Ontario, and Pomona. MVWD is also a wholesale water supplier to the City of Chino Hills, providing up to 21 MGD of water. |
| City of Ontario | The City of Ontario supplies water to a population of approximately 168,780 in the city and some unincorporated areas of San Bernardino County. The City of Ontario also serves a small portion of the City of Rancho Cucamonga. |
| San Antonio Water Company | SAWCo is a mutual water company organized as a private non-profit corporation, with more than 70% of shares owned by municipalities. SAWCo wholesales surface water from San Antonio Creek and potable groundwater to Upland, Ontario, and irrigation customers. |
| City of Upland | The City of Upland encompasses 15 square miles and serves water to approximately 75,790 people. |
| West Valley Water District | WVWD is a retail water agency serving over 80,000 residents, some of which fall into an overlapping service area with IEUA. Through an assistance agreement, WVWD has the potential to receive imported water for up to 1,500 AFY through San Bernardino Valley Municipal Water District and MWD during supply outages, emergencies, or loss of local water supply through December 2035. |

## 1.6 Population

The Southern California Association of Governments (SCAG) conducts a forecast process every 4 years to project growth in employment, population, and households at the regional, county, jurisdictional, and sub-jurisdictional levels for use in its Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) and other planning documents. The forecasting process includes a review of US Census Bureau and California Department of Finance projections, development of key input assumptions, and meetings with all 197 local jurisdictions one-on-one to review the draft growth forecast. The growth forecast for population, household, and employment are developed for the years 2020, 2030, 2035, and 2045. The preliminary range of growth figures are produced first at the county level and then refined to smaller areas, called city and transportation analysis zones (TAZs), which are then released to local jurisdictions for comments and input. Once the growth forecasts for these TAZs are finalized, they are adopted by the Regional Council.

The 2020 SCAG RTP/SCS data and associated TAZs for San Bernardino County were obtained and used to calculate the current and projected population within IEUA's service area. A geospatial analysis was used to identify the TAZs within the IEUA service area and the population associated with each of these zones was summed to find the total population within IEUA's service areas for the years provided by SCAG. It should be noted that the FWC is only partially within the service area and only the population within IEUA's service boundary is considered in this UWMP. For 2025 and 2040, the population value was interpolated between the years provided before and after.

From these calculations, IEUA's service area currently serves a population of approximately 906,046 in 2020 and has an expected growth rate of approximately 0.90% per year. With this growth rate, IEUA's service area is expected to reach a population of 1,119,568 in 2045. Table 1-4 shows the projected population for every 5 years from 2020 through 2045. Table 1-4 is equivalent to DWR Table 3-1; all tables within the Plan that are DWR Standardized Tables have the DWR Table number in parentheses in the title. All completed DWR Standardized Tables are included in Appendix C.

**Table 1-4: IEUA Population – Current and Projected (DWR Table 3-1)**

| Population Served | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| | 906,046 | 945,849 | 987,401 | 1,031,771 | 1,074,773 | 1,119,568 |

**Note**: Population projections calculated using the 2020 Southern California Association of Governments population forecast.

## 1.7 Demographics and Socioeconomics

Approximately 25% of the IEUA service area population is considered a designated disadvantaged community (DAC) based on the American Community Survey Median Household Income (MHI) data. Census tracts are determined to be disadvantaged when the average household income is 80% or less than statewide median household income. The city of Montclair is a DAC, as is a large portion of the FWC's service area. There are also additional census tract areas that are designated as disadvantaged communities based on the MHI

throughout the service area, primarily between HWY 10 and Mission Boulevard in the cities of Ontario and Montclair and between HWY 10 and HWY 66 in Rancho Cucamonga and Upland. The disadvantaged communities in the region are shown on Figure 2.

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

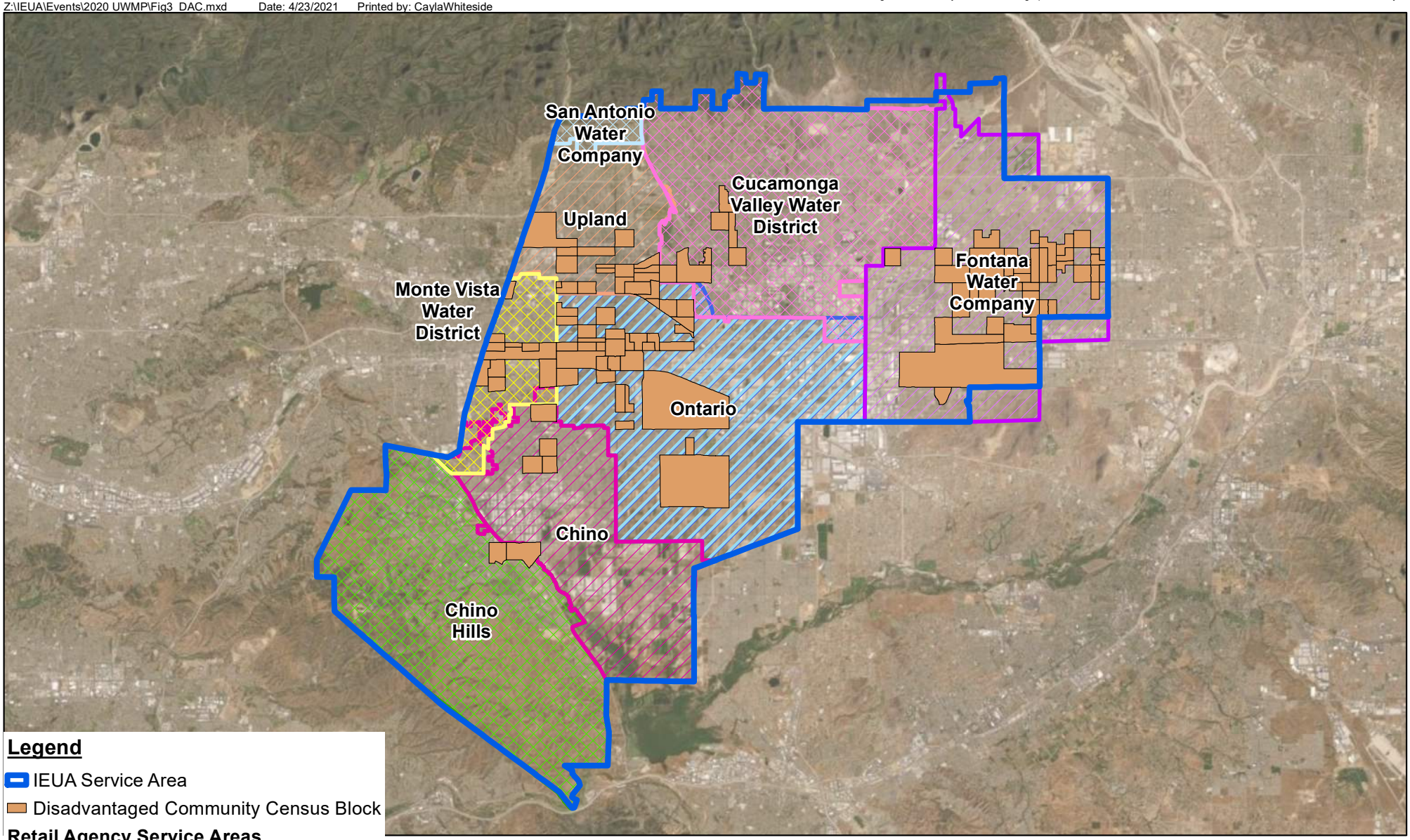


**Legend**

- IEUA Service Area
- Disadvantaged Community Census Block

**Retail Agency Service Areas**

- Chino
- Chino Hills
- Ontario
- Cucamonga Valley Water District
- Fontana Water Company
- Monte Vista Water District
- San Antonio Water Company
- Upland

Source: Department of Water Resources' Disadvantaged Communities Mapping Tool using U.S. Census (American Community Survey) 2018 data.

N

0 12,500 25,000

Scale: Feet

Kennedy Jenks

Inland Empire Utilities Agency
Chino, CA

**Disadvantaged Community Areas**

K/J 2044518*00
April 2021

**Figure 2**

## 1.8 COVID-19 Impacts

As with most water service agencies in the state of California, the COVID-19 pandemic beginning in fiscal year 19/20 period impacted IEUA and its service area's operations. Transitions were made to remote or virtual activities where possible, and some capital improvement projects experienced delays until proper safety attire, such as masks, could be secured to ensure work could be continued safely. Some in-person public outreach and education events were cancelled. In addition, IEUA deferred its equivalent service unit (EDU) rate for 12 months and held water connection fees constant to compensate for the economic downturn and job loss in its service area. On May 6, 2020, the IEUA Board voted to defer the increase in sewer EDU rates established in Resolution No. 2019-11-2; the sewer EDU rate increase will be deferred 12 months, until July 1, 2021. IEUA held water connection fees constant from fiscal year 19/20 to fiscal year 20/21 as outlined in Resolution No. 2020-7-11. IEUA remains considerate of the continuation of the ongoing impacts of the pandemic and how it may impact future activities and operations.

## 1.9 Land Use in the Service Area

When IEUA was formed in 1950, its service area was primarily field crops, citrus, and vineyards with a total urban area land use of less than 8%. Since 1950, urban areas have expanded significantly and replaced most agricultural land in the northern and central portions of the Chino Basin. The conversion of agricultural land to urban development is anticipated to continue within the Chino Basin.

SCAG's 2020 RTP/SCS includes land use information. The SCAG worked with the region's 197 local jurisdictions to refine their land use dataset that was drafted in 2016. The most recent update was finalized on April 29, 2020. The land use dataset includes general plan land use, specific plan land use, zoning code, and existing land use. Figure 3 shows the land use code present in the IEUA service area. The majority of the service area is comprised of single family residential, industrial, and commercial areas. There are also large areas of open space in the service area, such as the Chino Hills State Park.

The 2015 Land Use Based Demand Model evaluated the existing and planned land uses within the service area out to 2040. The future land uses were calculated based on the general plans for each city in the service area using city spheres of influence as boundaries to prevent overlap. Residential land use is expected to have the largest growth, approximately 31% by 2040. Medium, high, and very high-density residential land uses are projected to increase more than low and very low-density residential land use. Industrial land use is projected to grow at 20%, while vacant land will decrease 98%and agriculture use will decrease by 96%.

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

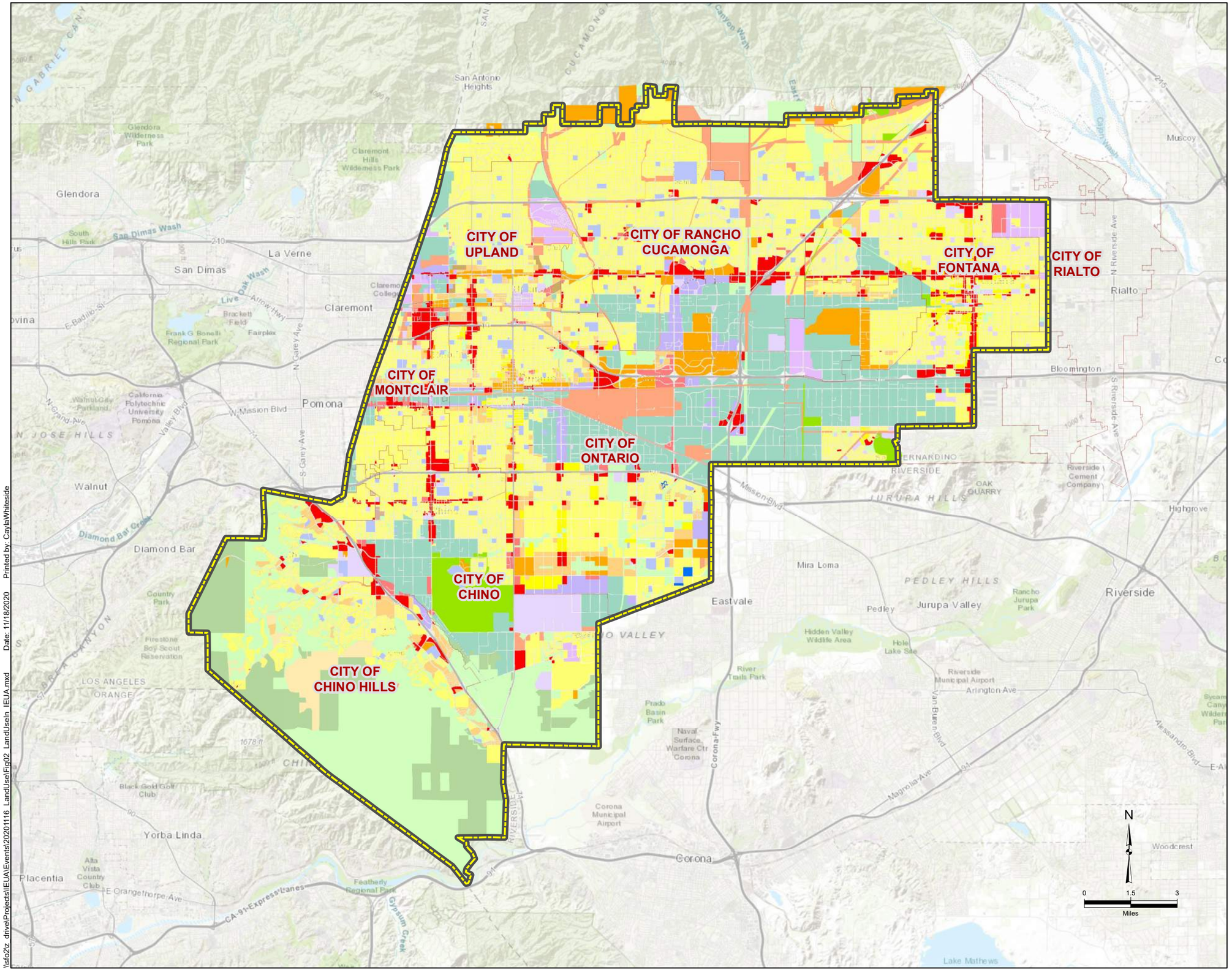


## Legend

IEUA Service Area

**Land Use**

- Agriculture
- Commercial and Services
- Education
- Facilities
- General Office
- Industrial
- Mixed Commercial and Industrial
- Mixed Residential
- Mixed Residential and Commercial
- Mobile Homes and Trailer Parks
- Multi-Family Residential
- Open Space and Recreation
- Rural Residential
- Single Family Residential
- Specific Plan
- Transportation, Communications, and Utilities
- Undefined
- Undevelopable or Protected Land
- Water

**Source:**
Southern California Association of Government's 2020 Land Use GIS Dataset. Updated April 29, 2020.

Kennedy Jenks

Inland Empire Utilities Agency
Chino, CA

**Land Use in IEUA Service Area**

K/J 2044518*00
November 2020

**Figure 3**

\\sfo2\z_drive\Projects\IEUA\Events\20201116_LandUse\Fig02_LandUseIn_IEUA.mxd Date: 11/18/2020 Printed by: CaylaWhiteside

## 1.10 Climate

IEUA is located within the South Coast Air Basin (SCAB) that encompasses all of Orange County and the urban areas of Los Angeles, San Bernardino, and Riverside counties. The SCAB climate is characterized as "Mediterranean" with a semi-arid environment with mild winters, warm summers, and moderate rainfall. The average annual rainfall in the IEUA water service area is approximately 15 inches, most of which occurs during the winter months.

Temperatures range in average from 41 to 67 degrees Fahrenheit (°F) during the winter and from 60 to 90°F degrees during the summer. Table 1-5 presents the region's annual average climate data. The temperature, rainfall, and standard monthly average evapotranspiration (ETo) is provided by the California Irrigation Management Information System (CIMIS) Station Number 78 in Pomona.

**Table 1-5: IEUA Service Area Annual Climate**

| Month | Standard Monthly Average Evapotranspiration (ETo) (inches) | Average Total Rainfall (inches) | Average Temperature (degrees Fahrenheit) | |
|---|---|---|---|---|
| | | | Max | Min |
| January | 1.97 | 3.22 | 67.46 | 42.29 |
| February | 2.36 | 3.34 | 68.03 | 42.91 |
| March | 3.67 | 2.16 | 70.13 | 45.21 |
| April | 4.68 | 1.10 | 73.20 | 47.24 |
| May | 5.22 | 0.40 | 76.10 | 51.71 |
| June | 5.90 | 0.18 | 81.95 | 56.38 |
| July | 6.61 | 0.09 | 87.56 | 60.34 |
| August | 6.49 | 0.16 | 89.31 | 60.36 |
| September | 4.96 | 0.45 | 87.17 | 58.41 |
| October | 1.74 | 0.84 | 80.07 | 52.75 |
| November | 2.35 | 1.06 | 73.32 | 45.86 |
| December | 1.78 | 2.41 | 66.74 | 40.98 |

Source: California Irrigation Management System (CIMIS) data provided from Station No. 78 in Pomona, Los Angeles County, March 14, 1989 to October 31, 2020 http://wwwcimis.water.ca.gov/cimis/welcome.jsp.

## 1.11 Potential Effects of Climate Change

### 1.11.1 Overview

The topic of growing interest and research for water planners and managers is climate change and the potential impacts it could have on California's future water supplies. DWR's California Water Plan considers how climate change may affect water availability, water use, water quality, and the ecosystem. The California Water Plan Update 2018 builds upon previous updates and provides recommended actions, funding scenarios, and an investment strategy to meet the challenges and goals laid out in the prior 2013 Plan.

Chapter 3 of the California Water Plan, "Actions for Sustainability", and Volume 1, Chapter 5 of the California Water Plan, "Managing an Uncertain Future," evaluated three different scenarios of future water demand based on alternative but plausible assumptions on population growth, land use changes, water conservation and future climate change (DWR 2019). Future updates

will test different response packages, or combinations of resource management strategies, for each future scenario. These response packages help decision-makers, water managers, and planners develop integrated water management plans that provide for resource sustainability and investments in actions with more sustainable outcomes. The 2018 Update provides recommended actions in order to support each of the identified goals of the plan. The goals are 1) Improve Integrated Watershed Management, 2) Strengthen Resiliency and Operational Flexibility of Existing and Future Infrastructure, 3) Restore Critical Ecosystem Functions, 4) Empower California's Under-Represented or Vulnerable Communities, 5) Improve Inter-Agency Alignment and Address Persistent Regulatory Challenges, and 6) Support Real-Time Decision-Making, Adaptive Management, and Long-Term Planning (DWR 2019).

California faces the prospect of additional water management challenges due to a variety of issues including population growth, regulatory restrictions, and climate change. Climate change is of particular interest because of the range of possibilities and their potential impacts on essential operations. The most likely scenarios involve increased temperatures, which will reduce the Sierra Nevada snowpack and shift more runoff to winter months, and accelerated sea level rise. The other much-discussed climate change scenario is an increase in precipitation variability, with more extreme drought and flood events posing additional challenges to water managers (DWR 2014). Even without population changes, water demand could increase. Precipitation and temperature influence water demand for outdoor landscapes and irrigated agriculture. Lower spring rainfall increases the need to apply irrigation water. Further, warmer temperatures increase crop evapotranspiration, which increases water demand. Water-related resources that are considered important and potentially sensitive to future climate change include water demands, water supplies, water quality, sea level rise, flooding, and ecosystem and habitat.

### 1.11.2 IEUA Climate Change Vulnerabilities

Climate analysis conducted for the 2015 IRP suggests that temperatures within the IEUA service area will rise over the coming decades and that precipitation will continue to be highly variable, with no consensus on a trend towards wetter or drier conditions. It is therefore important to identify water management options that will ensure future demand can be met under a variety of different hydrologic circumstances. Despite uncertainty over the specific effect of climate change on IEUA's water supply, the various projections showed an overall tendency of future decreases in supply sources. The largest potential impact on supply is the vulnerability of imported water from the State Water Project (SWP), indicating a need to improve regional sustainability and decrease dependency on the SWP supply. The 2015 IRP analysis identified recycled water supplies as a critical asset in bolstering a flexible management portfolio since these supplies are generated locally and not impacted by climate. In conjunction with maximizing recycled water supplies, the 2015 IRP also found that the implementation of additional water use efficiency programs would bolster the resiliency of IEUA's water portfolio against climate impacts.

The 2020 Regional DCP also assessed climate change vulnerabilities within the regional's water supply sources. The DCP found that while precipitation variability is expected to align with historical trends, the wet years will likely be wetter and the dry years drier, exacerbating an already highly variable water supply reliability factor (DCP 2020). It is anticipated that the groundwater supply will be adversely impacted by increased temperatures and drought.

Groundwater elevation and water quality are both dependent upon rainfall and supplemental sources of recharge. Droughts similar to the 2011 to 2017 drought could significantly decrease natural groundwater recharge and an increased intensity of storm events could lead to an inability to capture and recharge stormwater (DCP 2020). Stormwater is a high-quality water source that can improve the quality of groundwater supplies once it has infiltrated and blended with the aquifer; a reduction in stormwater recharge could result in a degradation of groundwater quality. In addition, reduced rainfall and increased groundwater withdrawal may lead to more salinity buildup and increased concentrations of salt, nitrate, and other constituents, requiring the need for additional water supply for blending or investment in advanced treatment technologies (DCP 2020). Applications for recycled water in the basin become constrained if the salinity in the basin rises beyond the Regional Water Quality Control Board's (RWQCB's) specified limits.

The largest potential climate change impact on supply is the effect of shifting snowmelt and resulting runoff patterns on the SWP. The SWP's infrastructure was designed to capture snowmelt from the Sierra Nevada snowpack, and when snow melts during the spring and summer months, a combination of reservoirs and conveyance facilities provide a steady water supply throughout the year. The reservoirs were sized based on historical precipitation patterns, so with more precipitation falling as rain instead of snow in the winter months, more water will be required to be released from reservoirs and will not be available during the higher summer demand periods (DCP 2020). The reliability of imported SWP is expected to decrease as the changes in precipitation caused by climate change continue. This decrease in reliability indicates a need to improve regional sustainability and decrease dependency on the SWP supply. The 2015 IRP analysis identified recycled water supplies and WUE as a critical asset in bolstering a flexible management portfolio since these supplies are generated locally and not impacted by climate. In addition, MWD is considering investments in Delta conveyance to minimize potential SWP reductions and has developed a conceptual 150 million gallons per day (MGD) Regional Recycled Water program to further reduce climate change impacts on the SWP.

Local surface water is also an important resource for retail agencies within the IEUA service area. These supplies are dependent on precipitation and temperature, which are influenced by climate change. Extreme precipitation events can result in short periods with high volumes of runoff that will be difficult to capture, while extended droughts or dry years will result in long periods without these supplies. Higher temperatures will also cause more evaporation and transpiration, reducing the volume of water bodies such as lakes, as well as the amount of soil moisture. Reduced soil moisture means that soil may absorb and hold more water when rain occurs, which would reduce the amount of water flowing into creeks and streams.

The climate change effects and their potential to impact supply and demand are considered throughout this document.

## 1.12 Implementation of the Plan

This subsection provides a cooperative framework within which the Plan will be implemented including agency coordination, public outreach, and resources maximization.

### 1.12.1 Preparation of the Plan

IEUA's water supply planning relates to the policies, rules, and regulations of its regional and local water providers. IEUA's service area is dependent on imported water from MWD, its regional wholesaler. As such, this 2020 UWMP was developed from a wholesale perspective. While the Wholesale UWMP provides water demand, water supply, and supply reliability assessment for the service area, all requirements of the CWC for each of IEUA's retail agencies will be met through each retail agency's individual 2020 UWMP. This Plan was prepared at a wholesale level, in coordination with retail water agencies within IEUA's service area for consistency. Table 1-6 summaries the varying levels of contribution. Furthermore, IEUA regularly coordinates with retail and regional water agencies for the planning of this UWMP and other documents to support the long-term water planning and management for the region. A detailed description of regional water agency coordination is included in Section 1.13.

**Table 1-6: Coordination with Appropriate Agencies**

| Agency Name | Participated in Plan Development | Commented on Draft | Attended Public Meetings | Sent Notice of Plan in Preparation[a] | Received Copy of Draft Plan[b] | Sent Notice of Intent to Adopt[a] | Received Copy of Adopted Plan[b] |
|---|---|---|---|---|---|---|---|
| City of Chino | Yes | No | No | Yes | Yes | Yes | Yes |
| City of Chino Hills | Yes | No | No | Yes | Yes | Yes | Yes |
| Cucamonga Valley Water District | Yes | No | No | Yes | Yes | Yes | Yes |
| Fontana Water Company | Yes | No | No | Yes | Yes | Yes | Yes |
| Monte Vista Water District | Yes | No | No | Yes | Yes | Yes | Yes |
| City of Ontario | Yes | No | No | Yes | Yes | Yes | Yes |
| San Antonio Water Company | No | No | No | Yes | Yes | Yes | Yes |
| City of Upland | Yes | No | No | Yes | Yes | Yes | Yes |
| West Valley Water District | No | No | No | Yes | Yes | Yes | Yes |
| Chino Basin Desalter Authority | No | No | No | Yes | Yes | Yes | Yes |

| Agency Name | Participated in Plan Development | Commented on Draft | Attended Public Meetings | Sent Notice of Plan in Preparation[(a)] | Received Copy of Draft Plan[(b)] | Sent Notice of Intent to Adopt[(a)] | Received Copy of Adopted Plan[(b)] |
|---|---|---|---|---|---|---|---|
| Chino Basin Water Master | No | Yes | No | Yes | Yes | Yes | Yes |
| Chino Basin Water Conservation District | No | No | No | Yes | Yes | Yes | Yes |
| Formation Commission for San Bernardino County | No | No | No | Yes | Yes | Yes | Yes |
| Metropolitan Water District | Yes | No | No | Yes | Yes | Yes | Yes |
| City of Montclair | No | No | No | Yes | Yes | Yes | Yes |
| San Bernardino County Flood Control District | No | No | No | Yes | Yes | Yes | Yes |
| San Bernardino County Planning Department | No | No | No | Yes | Yes | Yes | Yes |
| Santa Ana Watershed Project Authority | No | No | No | Yes | Yes | Yes | Yes |
| Santa Ana Regional Water Quality Control Board | No | No | No | Yes | Yes | Yes | Yes |
| Water Facilities Authority | Yes | No | No | Yes | Yes | Yes | Yes |

**Notes:**

(a) IEUA sent notice of plan in preparation in November of 2020 and notice of intent to adopt in April 2021 to all retail agencies, except for WVWD; IEUA sent notice of preparation and notice of intent to adopt with WVWD in May 2021. Both notices are included in Appendix E.

(b) IEUA posted the draft 2020 UWMP to its website on 11 May 2021 and the adopted final 2020 UWMP to its website by July 1, 2021.

### 1.12.2 Plan Adoption and Amendment Process

IEUA began preparation of this Plan in October 2020. The final version of the Plan was adopted by IEUA Board on June 16, 2021 and submitted to DWR within 30 days of Board approval. The Board Resolution stating the adoption of the 2020 UWMP (Resolution No. 2021-6-10) is included in Appendix D.

Notification of IEUA's intent to amend the UWMP was posted on IEUA's website and provided to the relevant agencies at least 60 days prior to the public hearing. Table 1-7 lists the relevant water suppliers and agencies that IEUA sent a Letter of Notification on November 24 and 30, 2020 that it was in the process of preparing an updated UWMP. A copy of the Letter of Notification is included in Appendix E. A public hearing was held and the final amended UWMP was adopted by the IEUA Board on June 16, 2021 and submitted to DWR within 30 days of Board approval. The amended final UWMP was also submitted to the California State Library, City and County.

This plan includes all information necessary to meet the requirements of the Water Conservation Act of 2009 (Wat. Code, §§ 10608.12-10608.64) and the Urban Water Management Planning Act (Wat. Code, §§ 10610-10656).

**Table 1-7: DWR Wholesale: Water Supplier Information Exchange (DWR Table 2-4)**

| Select One | Supplier |
|---|---|
| X | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed. |
| | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. |
| | **Water Supplier or Agency Name** |
| | Chino Basin Water Master |
| | Chino Basin Desalter Authority |
| | City of Chino |
| | City of Chino Hills |
| | Cucamonga Valley Water District |
| | Fontana Water Company |
| | Local Agency Formation Commission for San Bernardino County |
| | City of Montclair |
| | Monte Vista Water District |
| | Metropolitan Water District |
| | City of Ontario |
| | City of Rancho Cucamonga |
| | Santa Ana Regional Water Quality Control Board |
| | San Antonio Water Company |
| | Santa Ana Watershed Project Authority |
| | San Bernardino County Planning Department |
| | Three Valleys Municipal Water District |
| | City of Upland |
| | Water Facilities Authority |
| | West Valley Water District |

### 1.12.3 Public Outreach

IEUA encouraged community and public interest involvement in the plan update through a public hearing and inspection of the draft document on June 16, 2021. Public hearing notifications were published in local newspapers. A copy of the published Notice of Public Hearing is included in Appendix E. The hearing provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply in addition to IEUA's plans for providing a reliable, safe, high-quality water supply. Copies of the draft plan were made available for public inspection at the IEUA headquarters and website.

Table 1-8 presents a timeline for external coordination and outreach during the development of the Plan. A copy of the public outreach materials is provided in Appendix E.

**Table 1-8: External Coordination and Outreach**

| Date | Milestone | External Coordination and Outreach |
|---|---|---|
| November 24 and 30, 2020 | Notification of Preparation | Encouraged public involvement |
| April 5, 2021 | Notice of Intent to Adopt | Notified the public of the intent to adopt the UWMP and WSCP |
| May 11, 2021 | Draft UWMP and WSCP | Draft UWMP and WSCP released to solicit input |
| June 16, 2021 | Public Hearing | Review contents of Draft UWMP and WSCP and take comments |
| June 16, 2021 | Board Adoption | UWMP and WSCP considered for approval by the Board |
| By July 1, 2021 | Made UWMP and WSCP Available to the Public | Posted on IEUA's website for public access (no later than 30 days after filing with DWR) |
| By July 13, 2021 | Submittal to Library and City/County | Submit the UWMP and WSCP to the California State Library and city or county within service area (no later than 30 days after adoption) |

### 1.12.4 Resource Maximization

Several documents have been developed to enable IEUA and the region to maximize the use of available water resources, including IEUA's 2015 UWMP, the plans described in Section 1.3.1, DWR's 2019 State Water Project Delivery Capability Report (DWR 2019), IEUA's draft 2020 Water Use Efficiency Business Plan, IEUA's Water Shortage Contingency Plan, and communication with IEUA staff. A complete reference list is provided in Section 11 of this Plan.

## 1.13 Regional Water Agency Coordination

There are many agencies involved in water management within the service area. IEUA is working in cooperation with each of these agencies to achieve water supply reliability, water quality, and watershed management goals for the Santa Ana River Watershed and the Inland Empire. This section provides a description of these agencies.

### 1.13.1 Metropolitan Water District of Southern California

IEUA is a member agency of MWD, which is a public agency that provides supplemental imported water from the northern California SWP and the Colorado River Aqueduct (CRA) to 26 member agencies located in the Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura Counties. Nearly 90%of the population within these counties, approximately 19 million people, resides within MWD's 5,200-square mile service area.

As a water wholesaler, MWD has no retail customers. It distributes treated and untreated imported water from the CRA and SWP to its member agencies. MWD provides an average of 50% of the municipal, industrial, and agricultural water used within its service area. The remaining 50% comes from local groundwater, local surface water, recycling, and from the City of Los Angeles' Owen's Valley Aqueduct in the eastern Sierra Nevada. MWD prepares its own UWMP. MWD currently provides financial support for local water projects and water conservation projects implemented by its member agencies that increase the reliability of water supplies to the region.

MWD sponsors the Local Resources Program (LRP), established in June 1998, to encourage member agencies to develop and use recycled water and recover groundwater to reduce dependence on imported water supplies. IEUA currently receives financial contributions from MWD from the following programs:

- Conservation Credits Program – MWD pays the lesser of one-half the program cost or the equivalent of $195 per AF of water saved through conservation. A variation of this policy provides funding for programs that document water savings.

MWD also provides financial and technical assistance to its member agencies for implementing the water conservation measures, such as Best Management Practices (BMP), that were initiated by the California Urban Water Conservation Council (CUWCC) Best Management Practices Memorandum of Understanding. CUWCC is now known as the California Water Efficiency Partnership. IEUA currently receives financial contribution from MWD for the following conservation programs:

- Residential and Commercial SoCal Water Smart Program - MWD sponsors a region-wide program that offers single family residents' rebates for high efficiency toilets (HET) and washers, weather-based irrigation controllers, rotating nozzles, and synthetic turf. MWD also provides rebates for plumbing fixture upgrades, landscaping devices, turf replacement, and some industry specific technologies for commercial, industrial, and institutional (CII) customers.

- Residential Landscape Retrofit Program - MWD sponsors outdoor irrigation evaluations and retrofits of high efficiency landscape devices for residential water customers with lot sizes of ¼ acre or larger.

- Residential Pressure Regulation Program – MWD funding supports installation of pressure regulating valves (PRVs) at meters, homes, or at the point-of-connection for irrigation systems to automatically reduce high incoming water pressure from water mains and provide a lower, more functional pressure distribution. PRVs ensure that end-

use plumbing fixtures operate at the intended flow rate and reduce the incidence of excessively leaky pipes and fixtures.

- Residential Education, Survey, and Controller Upgrade Program – Focused on the higher water use demographic within the small residential landscape sector, this program promotes an improved understanding of landscape irrigation control technologies while ensuring more efficient scheduling and operation of automated irrigation systems through required training class attendance, landscape evaluations, and smart controller technology upgrades.

- FreeSprinklerNozzles.com Program - This program, which ended in 2019, enabled residential and commercial customers within IEUA's service area to obtain a voucher for free high efficiency irrigation spray nozzles through a web-based portal.

### 1.13.2 Santa Ana Watershed Project Authority

The Santa Ana River Watershed faces enormous challenges as it strives to adapt to changing conditions, many of which are at an unprecedented scale in its modern history. The Santa Ana Watershed Project Authority (SAWPA) acts as the Regional Water Management Group and its mission is to facilitate communication, identify emerging opportunities, develop regional plans, secure funding, implement programs, build projects, and operate and maintain facilities.

IEUA is a member of SAWPA, which was formed in 1972. SAWPA is a Joint Powers Authority (JPA) that coordinates regional planning within the Santa Ana River Watershed to address water quality and supply improvements. SAWPA is comprised of the five major water supply and wastewater management agencies within the Santa Ana Watershed including: IEUA, Eastern Municipal Water District, Orange County Water District, San Bernardino Valley Municipal Water District, and Western Municipal Water District.

Since the early 1970s, SAWPA has played a key role in developing and updating the Regional Basin Plan for the California Regional Water Quality Control Board. SAWPA conducts water-related investigations and planning studies, and builds facilities needed for regional water supply and water quality remediation.

The "One Water One Watershed" (OWOW) is the Santa Ana River Watershed's integrated regional water management plan. This plan reflects a collaborative planning process that addresses all aspects of water resources throughout the region and watershed. OWOW integrates different disciplines such as: water supply, water quality, recycled water, stormwater management, water use efficiency, land use, energy use, climate change, and habitat. It includes planning of future water demands and supplies over a 20-year time horizon within the watershed as a hydrologic and interconnected system. The plan represents collaboration across jurisdictions, and political boundaries involving multiple agencies, stakeholders, individuals, and groups; and attempts to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions. The plan's comprehensive view of the watershed and water issues is one in which all types of water (imported, local surface and groundwater, stormwater, and wastewater effluent) are viewed as components of a single water system, inextricably linked to land use and land cover.

### 1.13.3 Chino Basin Watermaster

IEUA is a member of the CBWM Board of Directors. CBWM was established in 1978 by a judgment entered by the Superior Court of California. The judgment requires that the CBWM develop a management plan for the Chino Groundwater Basin that meets water quality and quantity objectives for the region.

In 1998, CBWM developed an integrated set of water management goals and actions for the Chino Basin known as the Optimum Basin Management Program (OBMP) that describes nine program elements to meet the water quality and local production objectives in the Chino Groundwater Basin. The OBMP encourages the increased use of local supplies to help "drought proof" the Chino Basin.

In July 2000, CBWM adopted the "Peace Agreement" that ended over 15 years of litigation within the Chino Basin. The Peace Agreement outlined the schedule and actions for implementing the OBMP. In December 2007, CBWM adopted the "Peace II Agreement" that redefined the future programs and actions required to implement the OBMP, based on the 9 years of experience and accomplishments in implementing the OBMP. Between 2009 and 2010, CBWM updated the Groundwater Recharge Master Plan in response to changes in demand, recharge capacity, safe yield, and other factors.

CBWM recently concluded the 2020 OBMP Update through a year-and-a-half long process that gathered input from all stakeholders. The management plan contained in the 2020 OBMP outlines a series of activities proposed by the stakeholders to achieve the goals of the 2020 OBMP which are: 1) Enhance Basin Water Supplies, 2) Protect and Enhance Water Quality, 3) Enhance Management of the Basin, and 4) Equitably Finance the OBMP. Implementation of the management plan will require an updated Implementation Plan, and amendments to the Peace Agreement. This is especially true of the storage management component of the OBMP, which needs to be updated and adopted by the Court before June 30, 2021.

As the environmental review of the 2020 OBMP Update has not yet been completed, CBWM developed a Local Storage Limitation Solution addendum, which allows the continued temporary utilization of managed storage under the 2000 OBMP. The efforts to fully complete the 2020 OBMP Update environmental review and Implementation Plan should advance in a timely manner to ensure the adequate protection of the regional groundwater supply. The Chino Ground Basin is a very important resource that the region relies on for supporting its vibrant economy and growing population. The 2020 OBMP and future Implementation Plan, including the revised Storage Management Plan is essential to reliably maintain this significant groundwater resource.

### 1.13.4 Chino Basin Water Conservation District

The Chino Basin Water Conservation District (CBWCD) was established in 1949 to protect and replenish the Chino Groundwater Basin with rainfall and stormwater runoff from the San Gabriel Mountains. CBWCD uses an extensive system of percolation ponds and spreading grounds to augment the natural capacity of the region to capture runoff for recharge. CBWCD also promotes water conservation through public education programs. IEUA works closely with the CBWCD. IEUA, CBWM, the San Bernardino County Flood Control District, and CBWCD jointly

sponsor the Chino Basin Recycled Water Groundwater Recharge Program that is an integral part of basin water management.

### 1.13.5 Santa Ana Regional Water Quality Control Board

The Santa Ana Regional Water Quality Control Board (SARWQCB) is responsible for the development and enforcement of water quality objectives to meet the requirements of the Federal Clean Water Act, California Porter-Cologne Act, and the National Pollutant Discharge Elimination System (NPDES).

In 1975, the SARWQCB completed the Water Quality Control Plan for the upper portion of the Santa Ana Watershed. The plan outlined specific water quality management actions to address water quality and salt build up, in the form of total dissolved solids (TDS) within the Chino Groundwater Basin. These included the construction of a large well field and desalters in the lower part of the Chino Basin to extract and treat poor quality water, and construction of a pipeline to export brine from the upper Basin to the Orange County Sanitation District (OCSD) Plant 1. The Water Quality Control Plan was updated in 1995, 2008, 2011, 2016, and 2019.

The Inland Empire Brine Line (IEBL), previously known as the Santa Ana River Interceptor, was built and has been in operation since 1975. The 2020 OBMP Update by CBWM has been developed to meet the requirements of the 1975 Plan.

### 1.13.6 Chino Basin Desalter Authority

The CDA is a JPA consisting of the cities of Chino, Chino Hills, Norco and Ontario, the Jurupa Community Services District, the Santa Ana River Water Company, Western Municipal Water District, and IEUA. The CDA treats brackish groundwater from the lower Chino Basin with the Chino I and II Desalter facilities along with distribution of drinking water to retail agencies. IEUA operates and maintains the Chino I Desalter while Jurupa Community Services District operates and maintains the Chino II Desalter. These desalter facilities consist of groundwater wells and associated raw water pipelines, treatment facilities, pumps, and water distribution pipelines. Treatment processes include ion exchange (IX) and reverse osmosis (RO). Three of the nine retail agencies currently purchase desalted water as part of their water supply.

### 1.13.7 San Bernardino County Flood Control District

The SBCFCD is partnering with IEUA, CBWM, and CBWCD in implementation of the Chino Basin Groundwater Recharge Master Plan. The implementation is known as Chino Basin Facilities Improvement Program (CBFIP). The CBFIP includes modifications to several SBCFCD basins and flood control channels including the installation of five rubber dams and three drop inlet diversion structures to divert imported, storm and recycled water to 16 groundwater recharge sites.

## 1.14 Fundamental Findings of the Urban Water Management Plan

It is the stated goal of the IEUA to deliver a reliable and high-quality water supply to its service area, even during dry periods. The analysis in this Plan documents that IEUA and its service area will have sufficient supply to meet water use demands out to 2045 during all considered dry period scenarios. The region has also successfully achieved its goal of reducing water use by 20% by 2020 as part of SBX7-7. The Plan documents IEUA's commitment to conservation and support of water use efficiency programs for its retail agencies to continue water demand reduction. IEUA has identified recycled water use as an important source of supply currently and in the future and continues to explore other potential supply opportunities which are described throughout the document. Finally, the Plan considers potential impacts to each of its supply sources due to climate change, regulations, and water quality changes and addresses potential future actions needed to increase the resiliency of the region.

# Section 2: Water Demands

This section describes historical, current, and projected water usage and demands within IEUA's service area. Regional water demands represent the total demand of all agencies within IEUA's service area over the planning horizon. These demands are broken down by retail agency in the following subsections.

Since the 1990s, approximately 90% of the region's water demands have come from urban municipal and industrial (M&I) users with the remaining 10% coming from agricultural users. Overall urban water demand since 1995 has increased by approximately 20%, despite a regional growth of 30% (approximately 200,000 more residents). This is indicative of new water use behaviors, such as efficient irrigation and the use of more efficient indoor fixtures, which prolong the availability of current regional water supplies into the future. Water use efficiency measures implemented by IEUA and its retail agencies are discussed in detail in Section 8.

The 2015 UWMP projected 2020 total urban demand to be approximately 210,500 AFY. However, actual demands have decreased over the past 5 years from 200,000 AF in FY 14/15 to 192,202 AF in FY 19/20. Over the past 5 years, the average water usage has been even lower, approximately 187,500 AFY (ranging from 168,800 AF in FY 15/16 to 203,400 AF in FY 17/18). This decrease is in part due to slow population growth (approximately 0.9% growth per year), changes in plumbing codes, implementation of water use efficiency programs, and the increased education and of consumers about California drought conditions and their subsequent conservation measures.

While IEUA anticipates a slight increase in water usage in the future due to the growing population in the region and the projected temperature increases, long-term demands are not expected to exceed the peak 10-year demand of 227,586 AF reached during the FY 13/14 drought. The 2015 Integrated Water Resources Plan demand modeling found that new developments in the region are more efficient due to changes in the plumbing code, higher density developments with less landscaping, and compliance with landscape ordinance requirements set forth in AB 1881. A continued focus on water use efficiency and per capita reductions, as required in SBX7-7, AB 1668, and SB 606, is anticipated to continue reducing overall water demands.

The impact of state-wide mandates has also affected demand in the region. The Water Conservation Act of 2009 (SBX7-7) provides the regulatory framework to support the statewide reduction in urban per capita water use described in the 20x2020 Water Conservation Plan (DWR 2010). As detailed in Section 3, the IEUA region has reduced its gallons per capita per day water usage by more than 20% compared to the baseline value calculated in 2010.

These findings suggest that future developments will require less water than in the past, reducing the previous projected regional need for additional water supplies. This shift has significant implications for future wastewater and recycled water planning. Regional treatment plants may not need to be expanded for hydraulic capacity as quickly as previously thought; however, treatment plants will have to be expanded to treat increased wastewater strength due to greater solids concentration, and future available recycled water supplies may be lower than previously expected.

Several factors can affect demands and associated projections, including:

- Land use revisions
- New regulations
- Consumer choice
- Economic conditions
- Transportation needs
- Environmental factors
- Conservation programs
- Building and plumbing codes.

These factors affect the amount of water needed, as well as the timing of when it is needed. During an economic recession, there is a major downturn in development and a subsequent slowing of the projected demand for water. The projections in this Plan do not attempt to forecast recessions or droughts. Likewise, no speculation is made about future building and plumbing codes or other regulatory changes.

### 2.1.1 Demand Projection Methodology

IEUA has been working with its consultant and its contracting agencies on wastewater and recycled water land use-based demand forecasts. The goal of this effort is to develop potential demand projections that disaggregates regional data to the agency level. The project is collecting and compiling data, developing flow factors, unit demands, and agency demands in 5-year increments, and preparing a spreadsheet model and technical memorandum. The effort is estimated to be completed by the submission of IEUA's 2020 UWMP. Draft projections were provided for inclusion in this 2020 UWMP.

In addition, projections on local water supply and demand and retail agency demands on IEUA were gathered from each of IEUA's retail agencies. These projections were prepared by retail agencies for use in their respective 2020 UWMPs. Retail agencies within the service area used various methodologies based on the best available data, land use changes, climate change, and conservation efforts to create their retail demand projections. These agencies also worked with others, such as developers and municipal departments, to refine their projections. Retail agency projections were also informed by the comprehensive IEUA IRP developed in 2014-2016 and the 2020 IRP Regional Water Supply Infrastructure Model (IRP Model). These planning documents were developed in collaboration with IEUA's retail agencies for the purpose of assessing water supply vulnerabilities and evaluating infrastructure and management strategies that will improve near-term and long-term water resources management for the region. The IRP evaluated new growth, development, and water demand patterns within the service area and assessed water needs and supply source vulnerabilities under climate change. The IRP provided aggregated water demand projections based on an econometric demand forecasting model. The IRP Model incorporated existing regional and local supplies, key local

and regional infrastructure, interconnections between agencies, and current and projected annual potable water demands to simulate requirements for imported water or other sources to blend with and utilize wells with impaired groundwater quality. The IRP Model evaluated multiple scenarios to identify areas with unmet water demands and areas with water surpluses.

IEUA coordinated with its retail agencies to collect retail supply and demand data that was gathered into regional totals. Additional details on the demand projection methodology completed by each retail agency can be found in their respective 2020 UWMPs. Coordination with land use agencies to develop water projections for both IEUA and its retail agencies are detailed in the following section.

### 2.1.2 Coordination with Land Use Agency to Develop Water Projections

It is important to have city land use planners identify anticipated timing of development as they are the most knowledgeable of development activities, growth patterns, and trends within their city. The 2015 IRP and 2015 Land Use-Based Demand Model (LUBDM) included significant considerations of land use and coordination with regional agencies to develop accurate water projections that were again referenced for the development of the 2020 UWMP water projections. Land use data used for the 2015 LUBDM were sourced from the General Plans of the cities in the region, the Metropolitan Water District's 2010 water demand model, and regional growth plans, such as SCAG's 2012-2035 RTP/SCS. The 2015 LUBDM and IRP were created to provide consistently developed agency demand projections through 2040. In addition to the sources mentioned, this model developed land use designations for the service area using existing land use geospatial information system databases, Google Earth, windshield surveys, and meetings with community development departments. The 2015 IRP project team met with planning or community development departments for each City within IEUA's service area: the cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Rancho Cucamonga, and Rialto. These meetings focused on confirmation of general plan land use for vacant land that is developable and confirmation of boundaries and existing land uses. The extensive effort to improve the classification accuracy of over 70% of the existing land use resulted in a detailed database of existing land use.

Additional details on land use agency coordination conducted by retail agencies for the 2020 planning effort can be found in each individual retail agencies' 2020 UWMP.

### 2.1.3 Current and Projected Land Use

As discussed in Section 1.7, when IEUA was formed, land use within the service area was primarily field crops, citrus, and vineyards. Since then, urban areas have expanded significantly and replaced many agricultural uses in the northern and central portions of the Chino Basin. The conversion of agricultural land to urban developments is anticipated to continue for land use within the Chino Basin based on the region's general plans. Residential land use is expected to grow significantly over the next two decades, while vacant and agricultural land is expected to decrease by over 85%. Industrial land use is projected to increase as well, although not as much as residential land use.

## 2.2 Non-Potable Versus Potable Water Use

Water use in IEUA's service area includes both potable and non-potable water. While IEUA does have a non-reclaimable water system, which includes industrial wastewater that cannot be feasibly reclaimed and exported for disposal, the only non-potable water reported in this UWMP is recycled water. Within Section 3, gross water use indicates water use that does not include recycled water. IEUA water demands have been split into imported water and recycled water for clarity. It is important to distinguish between potable and non-potable demands because recycled water supplies have limited permitted uses. Where possible, retail agencies' demands have been split into potable and non-potable demand. Additional details on recycled water uses and projections are included in Section 5.

It should be noted that water use may shift from potable to non-potable water use or vice versa. As IEUA works to maximize and optimize recycled water use and decrease reliance on imported water, some potable water demands may shift over time to become non-potable water demands. In addition, there is some overlap between recycled water demands and potable water supplies. Recycled water that is used for groundwater recharge will eventually be used as potable local groundwater supply.

## 2.3 Past, Current, and Projected Water Use by Sector

Retail suppliers must identify water use for at least each of the 10 water use sectors identified in Water Code Section 10631(d), which include:

- Single-family residential
- Multi-family
- Commercial
- Industrial
- Institutional and governmental
- Landscape
- Sales to other agencies
- Saline water intrusion barriers, groundwater recharge, or conjunctive use
- Agricultural
- Distribution system water losses.

Wholesale suppliers are only required to report their direct uses but may choose to report an aggregation of all customer reported water uses by sector. Additional water use sectors may be necessary to account for the entirety of an agencies water uses. "Other" water use sectors may

include exchanges, surface water augmentation, transfers, wetlands or wildlife habitat, or other, as appropriate.

IEUA has worked with its retail agencies to provide water use data for IEUA as a wholesaler and by retail agency for the purposes of transparency and comprehensive future planning. IEUA's retail agencies have also prepared 2020 UWMPs that include details on their individual water use by sector.

### 2.3.1 IEUA Water Use

As a wholesaler, IEUA supplies untreated imported water that is purchased from MWD and supplied to its retail agencies. In FY 2019-2020, 66,438 AF of untreated imported water was supplied to its retail agencies, as shown in Table 2-1.

**Table 2-1: Demands for Potable and Non-Potable Water – Actual (DWR Table 4-1)**

| 2020 Actual | | | |
|---|---|---|---|
| **Use Type** | **Additional Description** | **Level of Treatment When Delivered** | **Volume (acre-feet)** |
| Sales to other agencies | MWD Imported Water | Raw Water | 66,438 |
| | | **TOTAL** | **66,438** |

**Note**: Volume values from IEUA Annual Water Use Database.

### 2.3.2 Water Use by Retail Agency

The total water use of IEUA's eight retail agencies for FY 19-20 is shown in Table 2-2. Total water use includes recycled water for direct use but not recycled water for groundwater recharge. The total water use for FY 19-20 was 192,100 AF. The water use of the retail agencies is met by local surface water, stormwater, Chino Basin groundwater, non-Chino groundwater, and the Chino Basin Desalters, in addition to the imported water supplies by MWD through IEUA and the recycled water for direct use shown in Table 2-1.

**Table 2-2: Water Demand by Retail Agency – Actual**

| Retail Agency | Volume in Acre-Feet (2020 Actual) |
|---|---|
| City of Chino | 19,303 |
| City of Chino Hills | 14,493 |
| Cucamonga Valley Water District | 47,059 |
| Fontana Water Company[(a)] | 37,804 |
| Monte Vista Water District | 9,035 |
| City of Ontario | 39,666 |
| San Antonio Water Company | 6,219 |
| City of Upland | 18,520 |
| **TOTAL** | **192,100** |

**Notes**: Volume values from FY 19/20 Annual Water Use Report; includes recycled water for direct use; does not include recycled water for groundwater recharge. Interagency transfers within the region are not included.
(a) Includes demands within IEUA service area only.

## 2.4 Distribution System Water Losses

In addition to the traditional demand sources, there is another component that impacts water resources – "water losses." Water losses are typically defined as the difference between water production and water sales. These water losses can come from authorized, but unmetered sources, such as firefighting and main flushing, or unauthorized sources such as leakage, illegal connections, and inaccurate flow meters. Retail water agencies are required to calculate their current and projected water losses using the American Water Works Association Method (Title 23 California Code of Regulations Section 638.1 et seq).

Wholesale suppliers are not required to perform water loss audits or report any distribution system losses, although it is recommended that they estimate losses for reliability planning and projecting water needs.

IEUA does not own or operate any potable water infrastructure, and therefore, does not have any distribution losses to report.

## 2.5 Projected Water Use

Estimating future water demand is a function of several factors. Water usage is influenced by geographic location, topography, land use, demographics, and water system characteristics (i.e., system pressures, water quality, and metering of connections).

### 2.5.1 IEUA Projected Water Use

A key component of the 2020 UWMP is to provide insight into the future water demand outlook of the region in addition to IEUA's service area. Demand is met through a diverse portfolio of groundwater, purchased imported water from MWD, local surface water, desalinated water, and recycled water (all of which are described in Section 4). IEUA, as the regional wholesaler, is responsible for the purchase of imported water and the provision of recycled water.

Table 2-3 identifies IEUA's projected demand for imported water, which is the maximum volume its retail agencies are contracted to purchase within a given year. Resolution No. 2014-12-1 (also known as the Purchase Order Agreement) establishes the allocations for the purchase of imported water from IEUA by WFA, CVWD, and FWC for a volume less than or equal to 69,572 AFY. Under the IEUA-MWD contract, IEUA is able to purchase up to 93,283 AFY of imported water from MWD at the Tier 1 rate. If the projected imported water demand for a retail agency increases above the values in Resolution No. 2014-12-1, updates to the Resolution may be required. The quantity of imported water available may be less than the contract amount during drought years; water supply reliability is discussed in detail in Section 7. In FY19/20, IEUA's service area purchased 66,438 AF of imported water from MWD, which met 35% of the region's total water use. IEUA and its retail agencies aim to decrease their reliance on imported water by pursuing a variety of water use efficiency and conservation strategies, along with maximizing the recycled water use within the region. While efforts are being made to reduce IEUA's imported water demand to less than its contract amount with the retail agencies in the future, conservative planning assumptions are being made by retail agencies regarding imported water needs in case projects are delayed and/or savings are not realized. This conservative planning approach, and the relatively low imported water use compared to historical use in FY

19/20, accounts for the increase in potable and raw water use between 2020 and 2025 in Table 2-4.

Table 2-4 identifies IEUA's total water demands, which includes the imported water demand projections and the recycled water demand projections. Recycled water demand is projected to increase modestly over the planning horizon, to approximately 9% of total demands by 2045. For additional details on IEUA's recycled water program, refer to Section 5. IEUA currently meets 37% of total water demands within the region; this percentage is expected to decrease to 32% of total demands within the service area by 2045. The IEUA region plans to meet future demand through the diversification of local supply sources, water use efficiency measures, improved groundwater basin management, and the maximization of recycled water use.

**Table 2-3: Use for Potable and Raw Water – Projected (DWR Table 4-2)**

| Use Type | Additional Description | Projected Water Use | | | | |
|---|---|---|---|---|---|---|
| | | 2025 | 2030 | 2035 | 2040 | 2045 |
| Sales to other agencies | | 77,416 | 79,630 | 81,974 | 84,021 | 84,065 |
| **TOTAL** | | **77,416** | **79,630** | **81,974** | **84,021** | **84,065** |

**Note**: Values from retail agency projections for use of imported water from MWD through IEUA.

**Table 2-4: Total Water Use (Potable and Non-Potable) (DWR Table 4-3)**

| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Potable and Raw Water | 66,438 | 77,416 | 79,630 | 81,974 | 84,021 | 84,065 |
| Recycled Water Demand | 30,496 | 39,300 | 41,297 | 42,162 | 44,191 | 44,691 |
| **TOTAL WATER DEMAND** | **96,934** | **116,716** | **120,927** | **124,136** | **128,212** | **128,756** |

**Note**: 2020 Values from FY 19/20 Recycled Water Annual Report and Annual Water Use Database. Projected potable and raw water volumes is the sum of each retail agency's expected use of imported water from MWD through IEUA. Recycled water direct use projections from retail agencies and groundwater recharge projections from IEUA.

### 2.5.2 Projected Water Use by Retail Agency

Table 2-5 presents the water demands for the IEUA service area by retail agency for the years 2020 to 2045. These demands include imported water, surface water, groundwater, desalinated water, and recycled water.

**Table 2-5: Water Demand by Retail Agency – Projected**

| Retail Agency | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| City of Chino | 20,843 | 22,310 | 23,087 | 23,963 | 25,108 |
| City of Chino Hills | 17,120 | 17,334 | 17,678 | 17,725 | 17,769 |
| Cucamonga Valley Water District | 53,369 | 58,092 | 59,650 | 60,949 | 60,949 |
| Fontana Water Company | 45,593 | 46,909 | 47,665 | 50,442 | 51,943 |
| Monte Vista Water District | 14,232 | 14,564 | 15,175 | 15,437 | 15,706 |
| City of Ontario | 52,550 | 58,513 | 63,406 | 73,668 | 73,668 |
| City of Upland | 25,328 | 25,328 | 25,328 | 25,328 | 25,328 |
| **TOTAL** | **229,035** | **243,050** | **251,989** | **267,512** | **270,471** |

**Note**: Provided by retail agencies in preparation of their respective 2020 UWMPs. SAWCo is not included in the table because transfers from SAWCo are reported within receiving member agency values. Wholesale demands from MVWD to Chino Hills are reflected under Chino Hills' retail demands.

### 2.5.3 Water Use Projections for Lower Income Households

SB 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. This requirement only applies to retail suppliers; therefore, IEUA is exempt from this requirement. Details on water use projections for lower income households completed by IEUA's retail agencies can be found in each individual retail agency's UWMP.

## 2.6 Effects of Climate Change on Water Usage

A major factor that affects water usage is weather. Historically, when the weather is hot and dry, water usage increases. The amount of increase varies according to the number of consecutive years of hot, dry weather and the conservation activities imposed. During cool, wet years, historical water usage has decreased, reflecting less water usage for exterior landscaping. Therefore, even without population changes, water demand could increase as a result of climatic conditions. Precipitation and temperature influence water demand for outdoor landscaping and irrigated agriculture. Lower spring rainfall increases the need to apply irrigation water. Further, warmer temperatures increase crop evapotranspiration, which increases water demand.

Climate projections suggest that temperatures within the IEUA service area will rise over the coming decades; there is also expected to be an increase in the frequency, magnitude, and duration of heat waves, causing longer, drier, and more frequent periods of drought. The 2015 IRP found that water demand in its service area may increase by 4.3% for a 3.6$^{o}$ F temperature increase by 2040. In addition, dry years are expected to result in increased water demand; IEUA estimates that 1 dry year would increase demand by up to 5.6% by 2040 while a longer period of dry weather (3+ years) would increase demand by up to 8.9% by 2040.

## 2.7 Effects of Codes, Standards, and Ordinances

In recent years, water conservation has become an increasingly important factor in water supply planning and management in California. Over the past 10 years there have been a number of regulatory changes related to conservation including new standards for plumbing fixtures, a new statewide landscape ordinance, a state universal retrofit ordinance, new Green Building standards, demand reduction goals and more. In 2018, the California State Legislature enacted Assembly Bill 1668 and Senate Bill 606 to establish a new foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts in California. The California plumbing code has also instituted requirements for new construction that mandate the installation of ultra-low-flow toilets and low-flow showerheads. It is assumed that these changes in water use behavior will continue as the state continues to pass legislation like AB 1668 and SB 606 that create a long-term water conservation framework. A summary of current codes, standards, and regulations impacting regional water demand is included in Table 2-6.

Residential, commercial, and industrial usage can be expected to further decrease as a result of the implementation of more aggressive water conservation practices. In southern California, the greatest opportunity for conservation is in developing greater efficiency and reduction in landscape irrigation. The irrigation demand can typically represent as much as 70% of the water demand for residential customers depending on lot size and amount of irrigated turf and plants. Conservation efforts will increasingly target this component of water demand. IEUA's WUEBP includes "passive" policy initiatives, such as landscape ordinances, and "active savings" that reduce water demand.

"Passive" water saving initiatives that IEUA has employed include residential and commercial high-efficiency toilets, high efficiency clothes washers, and turf replacement. Table 8-6 in Section 8 shows the estimated annual water savings to be achieved over the next 5 years. More details on IEUA's conservation efforts are provided in Section 8.

**Table 2-6: Codes, Standards, and Regulations Impacting Water Demand**

| Regulatory Statute | Requirements | Agency or Regional Implementation | Approach |
|---|---|---|---|
| Assembly Bill 1668 and Senate Bill 606 | Compliance with new water use targets, development of Water Shortage Contingency Plans, water loss audits | Implemented locally by water agency | Continuation of water use efficiency programs and policy initiatives. Development of WSCP and 5-year Drought Risk Assessment within the UWMP |
| 20x2020 (SB X7-7) | Reduce per capita water use 20% over baseline by 2020 | Implemented by the Regional Alliance | Implementing active water use efficiency programs and policy initiatives within the region |
| AB1881 – Model Water Efficiency Landscape Ordinance | ETo Allowances: Residential 0.55 Commercial 0.45 | Implemented locally by city and/or county | Agencies need to educate customers and developers about ordinance requirements |
| Assembly Bill 715 | Requires any toilet or urinal sold or installed in California cannot have a flush rating exceeding 1.28 and 0.125, respectively | Manufacturers, distributors, retailers, plumbers, and customers must all adhere to new standards | Supply chain removes non-conforming fixtures from marketplace and supplies only efficient and conforming fixtures |
| Senate Bill 407 | Requires existing buildings comply with 1992 standards | Implemented locally by city and county | Difficult to enforce. Could be added to current criteria for change of ownership inspections and reporting |

| Regulatory Statute | Requirements | Agency or Regional Implementation | Approach |
|---|---|---|---|
| CalGreen | 20% reduction of water use. Designated irrigation controllers shall be weather- or soil moisture-based | Implemented locally by city and county | Difficult to enforce. Could be added to current criteria for change of ownership inspections and reporting |
| Senate Bill 555 | Requires water agencies to submit annual water loss reports | Implemented by Agencies | Agencies compile data and submit report to DWR |
| Assembly Bill 1 | City or county cannot fine customers for failure to water | Local agencies to follow requirements of the bill | Agencies need to communicate requirements with cities and counties |
| Assembly Bill 349 | HOAs cannot prohibit installation of artificial turf and allows for turf removal and installation of low water use plants | Local agencies to follow requirements of the bill | Agencies need to work with HOA's and community groups to educate about the bill |

# Section 3: SB X7-7 Baseline and Targets

## 3.1 Existing and Target Per Capita Water Use

The Water Conservation Act of 2009 (SBX7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond Summary). The Water Conservation Act of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the 20x2020 Water Conservation Plan (DWR 2010). Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish water use targets in gallons per capita per day (GPCD) and compare actual water use against the target; reporting began with the 2010 UWMP. The primary calculations required by SBX7-7 are summarized in Table 3-1.

IEUA, as an urban wholesale water supplier, is not required to develop a baseline or set reduction targets to achieve a 20% reduction in GPCD by 2020. However, as the statute does require urban retail water suppliers to comply, IEUA prepared a regional approach establishing a baseline and setting targets based on regional demands in support of its retail agencies. All retail agencies within IEUA's service area have agreed to the formation of a regional alliance and will continue to cooperatively participate in developing WUE programs and meeting water conservation goals.

As a wholesale water supplier, IEUA is required to provide an assessment of its present and proposed WUE measures, programs, and policies that will help its retail water suppliers achieve their water reduction goals. IEUA and its retail agencies have developed core strategies to meet compliance requirements through a collaborative process that focuses on aligning activities with established regional water use efficiency principles and goals.

**Table 3-1: SBX7-7 Calculation Requirements**

| | 2010 UWMP | 2015 UWMP | 2020 UWMP |
|---|---|---|---|
| Base Daily Water Use calculation (average GPCD used in past years) | First calculated and reported in the 2010 plan | May be revised in 2015 Plan; must be revised if 2010 Census data not used in original calculation | NA |
| Interim Water Use Target (target GPCD in 2015) | First calculated and reported in 2010 Plan | May be revised in 2015 Plan; must be revised if 2010 Census data not used in original calculation | NA |
| Compliance Water Use Target (target GPCD in 2020) | First calculated and reported in 2010 Plan | May be revised in 2015 Plan; must be revised if 2010 Census data not used in original calculation | NA |
| Actual 2015 Water Use (in GPCD) | NA | In 2015, Plan must compare actual 2015 GPCD against 2015 target | NA |

| | 2010 UWMP | 2015 UWMP | 2020 UWMP |
|---|---|---|---|
| Actual 2020 Water Use (in GPCD) | NA | NA | In 2020, Plan must compare actual 2020 GPCD against 2020 target |

In the 2020 UWMP, a water supplier must demonstrate compliance with the target established in 2015. Compliance is done through the review of the SBX7-7 Verification Tables submitted with the 2020 Plan (included as Appendix F).

The Base Daily Water Use calculation is based on gross water use by an agency in each year and can be based on a 10-year average ending no earlier than 2004 and no later than 2010, or a 15-year average if 10% of 2008 demand was met by recycled water. Base Daily Water Use must account for all water sent to retail customers, excluding:

- Recycled water
- Water sent to another water agency
- Water that went into storage.

It is at an agency's discretion whether to exclude agricultural water use from the Base Daily Water Use Calculation. If agricultural water use is excluded from the Base Daily Water Use calculation, it must also be excluded from the calculation of actual water use in later urban water management plans. IEUA did not adjust for agriculture exclusions in the SBX7-7 calculations.

Finally, the selected Compliance Water Use Target must be compared against what DWR calls the "Maximum Allowable GPCD." The Maximum Allowable GPCD is based on 95% of a 5-year average base gross water use ending no earlier than 2007 and no later than 2010. The Maximum Allowable GPCD is used to determine whether a supplier's 2015 and 2020 per capita water use targets meet the minimum water use reduction requirements of SBX7-7. If an agency's Compliance Water Use Target is higher than the Maximum Allowable GPCD, the agency must instead use the Maximum Allowable GPCD as its target.

### 3.1.1 Historical Demand, Selected Baseline, and 20x2020 Targets

In the 2010 UWMP, the baseline and water use targets for the IEUA regional alliance were calculated using an aggregate of individual agency water use and population information to calculate one baseline GPCD for the whole IEUA region. To do this, IEUA along with its retail agencies analyzed historical retail demand data from 1995 to 2010 and selected a 10-year baseline period (1999 to 2008). The aggregate of individual agency water use and population information for the same period were used to calculate the regional alliance's baseline GPCD and water use targets for 2015 and 2020. The targets set in the 20x2020 Water Conservation Plan do not include recycled water use. Thus, recycled water use was subtracted from historical recycled water production to get retail demands for non-recycled supplies. The 2015 interim target and the 2020 target was a 10 and 20% reduction from the baseline GPCD, respectively.

The GPCD baselines and targets found using the regional aggregate approach are summarized in Table 3-2.

**Table 3-2: 2010 Regional Alliance GPCD Baseline and Targets**

| Baseline Period | Baseline | 2015 Target (10% Reduction) | 2015 Actual | 2020 Target (20% Reduction) |
|---|---|---|---|---|
| 1999-2008 | 251 | 226 | 160 | 201 |

Note: From 2010 IEUA UWMP.

In 2015, an alternative approach to calculating the regional water use targets was carried out to compare findings. For this method, each water supplier in the regional alliance first calculated its individual target in its retail UWMP as if it were complying individually. Then, the individual targets were weighted by each supplier's population and averaged over all members in the alliance to determine the regional water use target. The GPCD baseline and target found for the 10-year baseline period using the population weighted average approach is summarized in Table 3-3. The 2020 Target in Table 3-3 is used to determine 2020 compliance.

In the 2015 UWMP, IEUA demonstrated compliance with its regional alliance 2015 interim target, indicating that the alliance was on track to meet the 2020 water use target.

**Table 3-3: 2015 Regional Alliance GPCD Baseline and Targets (DWR Table 5-1R)**

| Baseline Period | Year Span | Average Baseline[(a)] | 2020 Target[(a)] (20% Reduction) |
|---|---|---|---|
| 10 year | 1995 – 1999 to 2004 - 2008 | 245 | 193 |

**Notes**:
The 10-year baseline period was selected for the 2020 Compliance Water Use Target.
The 5-year period average baseline value in included in DWR Table 5-1 in Appendix C.
(a) All values reported as gallons per capita per day (GPCD).

### 3.1.2 2020 Compliance

In this 2020 UWMP, the regional alliance must demonstrate compliance with its 2020 water use target. IEUA chose to use the same approach that was completed in 2015. Each of IEUA's retail agencies first calculated its individual target in its retail UWMP, then the individual targets were weighted by each supplier's population over the total population in the IEUA region to determine the 2020 water use in GPCD.

The 2020 population for the total IEUA region, the sum of the populations of each of its retail agencies, is 905,816. This population includes IEUA's total service area, as well as areas outside the service area that are part of its retail agencies, as is the case for Fontana Water Company. This population is used for the calculation of the regional alliance's 2020 GPCD. The retail agencies used different sources for calculating their service area populations, including

SCAG, the DWR Population Tool, and the California Department of Finance. All retail agencies selected compliance method 1.

Table 3-4 summarizes the baseline, 2015 target, 2015 actual, and 2020 target GPCDs as calculated in the 2015 UWMP and includes the 2020 actual GPCD reported by each retail agency. The resulting weighted IEUA region GCPD for 2020 is included in the table.

The actual 2020 water use in the region is 171 GPCD, approximately 11% lower than the 2020 Target of 193 GPCD, indicating compliance and the success of the collective efforts of IEUA and its retail agencies to reduce water use in the region. These efforts include regional and local actions such as:

1. Water Use Efficiency Active Programs – offering customers a portfolio of programs including cost-effective indoor and outdoor water efficiency measures.

2. WUE Passive Policy Initiatives – including building codes and landscape ordinances.

3. Recycled Water Use – reducing demand for potable water by increasing recycled water supply.

IEUA and its retail agencies did not have any applicable optional adjustments for extraordinary events, economic adjustments, or weather normalization, as shown in DWR Table 5-2 in Appendix C, DWR's SBX7-7 compliance verification table.

**Table 3-4: 2020 Regional Alliance GPCD Compliance by Retail Agency**

| Retail Agency | 10-15-yr Baseline (GPCD) | 2020 Target (GPCD) | 2020 Service Area Population | 2020 Actual (GPCD) |
|---|---|---|---|---|
| **Chino** | 237 | 189 | 80,808 | 169 |
| **Chino Hills** | 217 | 173 | 82,409 | 157 |
| **CVWD** | 290 | 232 | 198,979 | 206 |
| **Fontana** | 216 | 176 | 229,041 | 154 |
| **MVWD** | 205 | 167 | 57,787 | 124 |
| **Ontario** | 245 | 196 | 178,409 | 161 |
| **Upland** | 275 | 220 | 78,383 | 210 |
| **IEUA Region** | **245** | **193** | **905,816** | **171** |

**Note**: Data provided by retail agencies. IEUA Regional values calculated using weighted average of population and demand.

# Section 4: Water Resources

## 4.1 Overview

IEUA and its retail agencies have developed a diverse portfolio of water supply sources, including groundwater from the Chino Basin and other basins (Cucamonga, Rialto, Lytle Creek, Colton, and the Six Basins groundwater basins), local surface water from creeks originating in the San Gabriel Mountains, recycled water produced locally, and imported water from the SWP via MWD. This section describes the water resources available to IEUA and its service area for the 25-year period covered by the Plan. Both currently available and planned supplies are discussed. Table 4-1 includes the 2020 actual water supplies available for each of IEUA's retail agencies. Table 4-2 shows the projected water supply by category for each of the retail agencies out to 2045. IEUA's supply for its retail agencies, both actual and projected, are included in Section 4.3, which discusses imported water from MWD.

**Table 4-1: Retail Agency Water Supplies – Actual (DWR Table 6-8R)**

| | | 2020 | | |
|---|---|---|---|---|
| **Water Supply** | **Additional Detail on Water Supply** | **Actual Volume** | **Water Quality** | **Total Right or Safe Yield *(optional)*** |
| Purchased or Imported Water | MWD/IEUA | 66,438 | Other Non-Potable Water | |
| Groundwater (not desalinated) | Chino Basin | 51,749 | Drinking Water | |
| Groundwater (not desalinated) | Other Basins | 26,436 | Drinking Water | |
| Surface water (not desalinated) | | 16,652 | Drinking Water | |
| Recycled Water | IEUA | 16,278 | Recycled Water | |
| Desalinated Water - Groundwater | Chino Desalter Authority | 14,649 | Drinking Water | |
| **Total** | | **192,108** | | |

**Note**: Data from IEUA Annual Water Use Report Database. Includes recycled water for direct use; does not include recycled water for groundwater recharge. Excludes interagency transfers within the region.

**Table 4-2: Retail Agency Water Supplies – Projected (DWR Table 6-9)**

| Water Supply | Additional Details on Water Supply | 2025 Reasonably Available Volume | 2030 Reasonably Available Volume | 2035 Reasonably Available Volume | 2040 Reasonably Available Volume | 2045 Reasonably Available Volume |
|---|---|---|---|---|---|---|
| **City of Chino** | | | | | | |
| Purchased or Imported | WFA | 5,353 | 5,353 | 5,353 | 5,353 | 5,353 |
| Groundwater | Chino Basin | 5,990 | 7457 | 8,734 | 9,810 | 10,955 |
| Groundwater - Desalinated | CDA | 5,000 | 5000 | 5,000 | 5,000 | 5,000 |
| Recycled | IEUA | 4,500 | 4500 | 4,000 | 3,800 | 3,800 |
| **City of Chino Hills** | | | | | | |
| Purchased or Imported | IEUA | 14,258 | 14,258 | 14,258 | 14,258 | 14,258 |
| Purchased or Imported | MVWD | 8,407 | 8,407 | 8,407 | 8,407 | 8,407 |
| Groundwater | Chino Hills Wells | 4,158 | 4,158 | 4,158 | 4,158 | 4,158 |
| Groundwater - Desalinated | CDA | 4,200 | 4,200 | 4,200 | 4,200 | 4,200 |
| Recycled | IEUA | 2,661 | 2,661 | 2,661 | 2,661 | 2,661 |
| **Cucamonga Valley Water District** | | | | | | |
| Purchased or Imported | IEUA | 28,369 | 28,369 | 28,369 | 28,369 | 28,369 |
| Groundwater | Other | 10,250 | 14,773 | 16,331 | 17,630 | 17,630 |
| Groundwater | Cucamonga Basin | 10,000 | 10,000 | 10,000 | 10,000 | 10,000 |
| Surface | Cucamonga Canyon | 800 | 800 | 800 | 800 | 800 |
| Surface | Deer Canyon | 50 | 50 | 50 | 50 | 50 |
| Surface | Day/East Canyon | 2,100 | 2,100 | 2,100 | 2,100 | 2,100 |
| Recycled | IEUA | 1,800 | 2,000 | 2,000 | 2,000 | 2,000 |
| **Fontana Water Company** | | | | | | |
| Purchased or Imported | IEUA | 15,000 | 15,000 | 15,000 | 15,000 | 15,000 |
| Purchased or Imported | SBVMWD | 3,200 | 3,200 | 3,200 | 3,200 | 3,200 |
| Groundwater | Chino Basin | 9,278 | 9,983 | 10,128 | 12,293 | 13,183 |
| Groundwater | Rialto – Colton Basin | 5,865 | 5,976 | 6,087 | 6,199 | 6,310 |
| Groundwater | Lytle Basin | 6,390 | 6,390 | 6,390 | 6,390 | 6,390 |
| Groundwater | No Man's Land Basin | 4,860 | 4,860 | 4,860 | 4,860 | 4,860 |
| Surface | Lytle Creek | 1,000 | 1,500 | 2,000 | 2,500 | 3,000 |

| Water Supply | Additional Details on Water Supply | 2025 Reasonably Available Volume | 2030 Reasonably Available Volume | 2035 Reasonably Available Volume | 2040 Reasonably Available Volume | 2045 Reasonably Available Volume |
|---|---|---|---|---|---|---|
| **Monte Vista Water District** | | | | | | |
| Purchased or Imported | IEUA/WFA | 5,000 | 5,000 | 5,000 | 5,000 | 5,000 |
| Purchased or Imported | SAWCo | 671 | 671 | 671 | 671 | 671 |
| Groundwater | Chino Basin | 7,461 | 7,793 | 8,404 | 8,666 | 8,935 |
| Recycled | IEUA | 1,100 | 1,100 | 1,100 | 1,100 | 1,100 |
| **City of Ontario** | | | | | | |
| Purchased or Imported | IEUA/WFA | 20,249 | 22,915 | 24,943 | 31,476 | 31,476 |
| Groundwater | Chino Basin | 11,000 | 13,000 | 15,000 | 17,000 | 17,000 |
| Groundwater - Desalinated | CDA | 8,533 | 8,533 | 8,533 | 8,533 | 8,533 |
| Surface | SAWCo | 600 | 600 | 600 | 600 | 600 |
| Recycled | IEUA | 12,168 | 13,465 | 14,330 | 16,059 | 16,059 |
| **City of Upland** | | | | | | |
| Purchased or Imported | IEUA/WFA | 5,541 | 5,541 | 5,541 | 5,541 | 5,541 |
| Purchased or Imported | SAWCo | 6,857 | 6,857 | 6,857 | 6,857 | 6,857 |
| Groundwater | Chino Basin | 5,743 | 5,743 | 5,743 | 5,743 | 5,743 |
| Groundwater | Six Basins | 4,122 | 4,122 | 4,122 | 4,122 | 4,122 |
| Groundwater | Cucamonga Basin | 683 | 683 | 683 | 683 | 683 |
| Surface | SAWCo | 1,679 | 1,679 | 1,679 | 1,679 | 1,679 |
| Recycled | IEUA | 703 | 703 | 703 | 703 | 703 |
| **Total** | | **245,599** | **259,400** | **267,995** | **283,471** | **286,386** |

**Note**: Data provided to IEUA from retail agencies as part of their 2020 UWMP with adjustments made by IEUA to account for interagency transfers. SAWCo transfers/purchases are reported within receiving member agency values. Data shown above includes a transfer from MVWD to Chino Hills of 8,407 AFY.

## 4.2 Historical and Current Local Water Supplies

### 4.2.1 Local Surface Water

Several of the retail agencies within the northern part of IEUA's service area have long standing legal rights to divert and treat water supplies from local surface sources in the Santa Ana River watershed. These sources include San Antonio Canyon, Cucamonga Canyon, Day Creek, Deer Creek, Lytle Creek, and several smaller surface streams (DCP 2020). IEUA does not provide local surface water directly to its retail agencies, although it does participate in the capture and recharge of stormwater caused by surface water runoff. Stormwater is discussed in Section 4.2.3.

Production from surface supplies varies dramatically depending on climate conditions. However, when available, local surface water is an extremely valuable resource as it is essentially "free,"

with the only cost to retail agencies being the operation of necessary facilities to capture, treat and distribute this water (DCP 2020). This is due in part to the high quality of local surface water. Nevertheless, surface water is treated to state and federal drinking water quality standards before it can be served for public use.

## 4.2.2 Groundwater

### 4.2.2.1 Historical Groundwater Pumping

Retail agencies within IEUA's service area use local groundwater as a significant source of the water supply. Most of the groundwater comes from the Chino Basin, which is detailed in the following section. Historical groundwater pumping by retail agency for the last 5 years is presented in Table 4-3. The groundwater pumping volume HAS decreased every year since 2016.

**Table 4-3: Groundwater Volume Pumped Over Past 5 Years by Retail Agencies**

| Groundwater Type | Location or Basin Name | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Alluvial Basin | Chino Basin Groundwater | 76,302 | 71,272 | 63,255 | 60,417 | 51,749 |
| Alluvial Basin | Other Groundwater Basins | 26,607 | 28,490 | 28,819 | 24,294 | 26,436 |
| | **TOTAL** | **102,909** | **99,762** | **92,074** | **84,711** | **78,185** |

**Note**: Groundwater volume pumped by IEUA retail agencies. Years represent fiscal year ending. Data from Annual Water Use Reports and Annual Water Use Report Database.

### 4.2.2.2 Chino Basin Groundwater

The Chino Basin is one of the largest groundwater basins in southern California, containing approximately 5 million acre-feet (MAF) of water with an unused storage capacity of approximately 1 MAF for a total potential of 6 MAF. Groundwater from the Chino Basin accounts for approximately 45% to 60% of the total water used by IEUA's retail agencies in IEUA's service area over the last 10 years. The Chino groundwater basin is managed by the Chino Basin Watermaster established under the 1978 Judgment. IEUA does not provide groundwater directly to its retail agencies.

Approximately 5% of Chino Basin is located in Los Angeles County, 15% in Riverside County, and 80% in San Bernardino County. Chino Basin is bounded by Cucamonga Basin and the San Gabriel Mountains to the north, the Temescal Basin to the south, Chino Hills and Puente Hills to the southwest, San Jose Hills, Pomona, and Claremont basins on the northwest, and the Rialto/Colton Basins on the east. IEUA's service area overlies approximately 70% of Chino Basin.

San Bernardino County Superior Court created the CBWM in 1978 as a solution to lawsuits over historical water right allocations. CBWM is responsible for managing Chino Basin in accordance with the 2000 Peace Agreement, 2007 Peace II Agreement, and the OBMP. CBWM is governed by three stakeholder groups, called Pools. The three Pools consist of:

- Overlying Agricultural Pool: Representing dairymen, farmers, and the State of California

- Overlying Non-Agricultural Pool: Representing area industries

- Appropriative Pool: Representing local cities, public water districts, and private water companies.

Although groundwater is an important local supply, the water quality in the lower Chino Basin area has been impacted by historical agricultural uses and now has high levels of nitrates and TDS (OBMPU 2020). There are also some areas that exceed standards for perchlorate and volatile organic compounds (VOCs). These groundwater supplies require additional treatment, and/or blending with higher quality imported water before it can be used as a potable supply. CBWM works in partnership with municipalities, IEUA, and the SARWQCB to address these water quality problems and to manage the groundwater basin sustainably. Water quality of the Chino Basin groundwater is discussed in detail in Section 6.

Chino Basin is hydrologically subdivided into five groundwater zones or systems, referred to as management zones. Each management zone has a unique hydrology, and actions within one zone have little or no impact on adjacent zones. Management zones are used to characterize the groundwater level, storage, production, and water quality conditions. Throughout these management zones, there are 19 existing spreading basins that have the capability of recharging stormwater, recycled water, and/or imported water into the Chino Basin (OBMPU 2020). A description of each of the management zones is listed below.

- Management Zone 1: This zone is bounded on the southwest by Chino and Puente Hills, on the northwest by the San Jose fault that separates the Chino Basin from the Pomona and Claremont Heights Basins, on the north by an unnamed non-echelon fault system, and on the east by a line that stretches from the southernmost edge of the Red Hill fault to Prado Dam. Groundwater generally flows south with some localized flows to the west in response to groundwater production.

- Management Zone 2: This zone is bounded on the west by Management Zone 1, on the north by the Red Hill fault, on the northeast by a segment of the Rialto-Colton fault, and on the east by a segment of Barrier J. Groundwater generally flows in a southwesterly direction in the northern half of the zone and then due south in the southern half of the zone.

- Management Zone 3: This zone is bounded on the west by Management Zone 2, on the northeast by the Rialto Colton fault, and on the southeast by the Bloomington divide. Groundwater generally flows in a southwesterly direction.

- Management Zone 4: This zone is bounded on the west by Management Zone 3, on the north by the Jurupa Hills, on the southeast by the Pedley Hills, and on the south by Management Zone 5. Groundwater flows west.

- Management Zone 5: This zone is bounded on the north and west by Management Zones 3 and 4, on the east by the Riverside Narrows, and on the south by the La Sierra area and Temescal Basin.

#### *4.2.2.2.1 Sustainable Groundwater Management Act*

The Sustainable Groundwater Management Act (SGMA), passed in 2014 and amended in 2015, creates a framework for sustainable, local groundwater management in California. SGMA directed DWR to identify priority groundwater basins for the purpose of implementing SGMA. SGMA requirements to create sustainable groundwater management agencies and sustainable groundwater management plans no later than 2022 applies only to high and medium priority basins. SGMA exempts adjudicated groundwater basins – those that already operate under a court-ordered water management plan – from the requirements of designating a Groundwater Sustainability Agency and developing a Groundwater Sustainability Plan. The Chino Basin is an adjudicated basin and is included in SGMA's list of exempt basins. The Chino Basin priority is "very low" as established by the DWR in the 2019 Basin Prioritization Report.

#### *4.2.2.2.2 Chino Basin Management and Safe Yield*

The Chino Basin is managed according to the 1978 Judgement described in Section 1. In 1998, the Chino Basin Watermaster developed an integrated set of water management goals and actions for the basin known as the Optimum Basin Management Program (OBMP). The goals of the OBMP are to enhance basin water supplies, protect and enhance water quality, enhance basin management, and equitably finance the OBMP.

The court judgement allocates groundwater rights by establishing an annual pumping "safe yield" for each Pool described above. The Operating Safe Yield (OSY) is the annual amount of groundwater that can be pumped from the Chino Basin by the Pool parties free of replenishment obligations. For planning purposes, controlled overdraft for the Appropriative Pool was not included. Annual groundwater production in excess of the OSY is allowed by the adjudication, provided that the pumped water is replaced and recharged back into the groundwater basin.

In 2011, the OSY for the basin was reassessed and was estimated to be 135,000 AFY for the period FY 2010/2011 to FY 2019/20. The next effort to recalculate the Safe Yield was recently completed in 2020 for the period FY 2020/21 to FY 2029/30 at 131,000 AFY.

As discussed in Section 1, the land use in the region has changed from primarily agricultural to primarily urban in the past several decades. It was anticipated that municipal pumping would be less than the agricultural pumping. The Chino Basin Desalters were identified as the optimal multi-benefit project to replace the expected decrease in agricultural production while also pumping and treating contaminated and high-salinity groundwater.

### 4.2.2.3 Chino Basin Desalter Facilities

The Chino Basin Desalters provide a local source of potable water supply through treatment of unusable groundwater. They also provide hydraulic control of the lower Chino Groundwater Basin. These facilities are critical to the continued use of recycled water in the region as well as the improvement of groundwater quality and yield in the Chino Basin. IEUA operates one of the facilities (Chino I Desalter) under contract with the CDA. The City of Chino, City of Chino Hills, and City of Ontario purchase water from the CDA.

The CDA was formed to manage the production, treatment, and distribution of highly treated potable water to cities and water agencies throughout the Chino Basin. A Joint Exercise of

Powers Agency, the CDA was formed by the Jurupa Community Services District; Santa Ana River Water Company; Western Municipal Water District; the Cities of Chino, Chino Hills, Norco, and Ontario; and IEUA to treat brackish groundwater extracted from the lower portion of the Chino Basin. Brackish water is water that has more salt [about 1,000 parts per million (ppm) of TDS] than fresh water, but not as high as seawater (about 35,000 ppm of TDS).

The Chino I Desalter was constructed in 2000 through a Joint Participation Agreement among five agencies: SAWPA, Western Municipal Water District, Orange County Water District, MWD, and IEUA. The Chino II Desalter was constructed in 2007 and provides a supplemental supply to the Cities of Chino, Chino Hills, and Ontario located within IEUA's service area as well as to the Jurupa Community Services District, City of Norco and the Santa Ana River Water Company located outside of IEUA's service area. The treatment processes at the Chino I and Chino II Desalters include RO and IX for the removal of nitrate and TDS. The treatment processes at Chino I Desalter also includes air stripping for the removal of VOCs.

These facilities serve three purposes. First, they convert unusable groundwater into a reliable potable water supply for the region and are part of a long-term pollution cleanup strategy for the Chino Basin. Second, they provide hydraulic control over the lower Chino Basin, which prevents the migration of poor-quality water into the Santa Ana River as well as downstream impacts on groundwater basins in Orange County. Third, they maintain and enhance groundwater yield for the Chino Basin.

Currently, there are 31 Chino Desalter wells with the capacity to pump about 37,600 AFY of groundwater from the southern portion of the Chino Basin, but not all wells are in operation (OBMPU 2020). Over the last 5 years, the Chino I and Chino II Desalters have produced between 28,100 and 30,000 AFY, averaging 29,200 AFY of treated groundwater combined (OBMPU 2020). IEUA retail agencies who receive water from the Desalter facilities as part of their water supply portfolios include the cities of Chino, Chino Hills, and Ontario. The Phase III expansion of the program was completed in 2016 which provided an additional 10,000 AFY of capacity. This final expansion of the system allows the Desalters to meet the 40,000 AFY pumping per the OBMP Peace Agreements. Table 4-4 shows the amount of groundwater purchased by IEUA retail agencies from the CDA for water from the Chino I Desalter over the past 5 years. IEUA retail agencies only purchase a portion of the total groundwater produced; the Western Municipal Water District also purchases groundwater from the CDA.

**Table 4-4: CDA I Volume (AFY) Purchased by IEUA Retail Agencies Over Past 5 Years (DWR Table 6-8ds)**

| Plant Name or Well ID | Plant Capacity (AFY) | Intake Type | Source Water Type | Influent TDS | Brine Discharge | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|
| Chino Desalter Authority | 40,000 | Open water Intake | Ground water | 1,000 ppm | Brine Line | 11,883 | 12,292 | 13,242 | 15,010 | 14,649 |
| | | | | | **TOTAL** | **11,883** | **12,292** | **13,242** | **15,010** | **14,649** |

**Note**: Purchased by the cities of Chino, Chino Hills, and Ontario from Chino I Desalter. These three IEUA retail agencies only purchase a portion of the total water produced by the CDA. Data from the IEUA FY 19/20 Annual Water Use Report.

#### 4.2.2.4 Other Groundwater

Local groundwater supplies from basins other than the Chino Basin are a significant supplemental source of water for the retail water agencies within IEUA's service area. These basins include the Cucamonga, Rialto, Lytle Creek, Colton, and the Six Basins groundwater basins. The Six Basins is comprised of the Ganesha, Live Oak, Pomona, Lower Claremont Heights, Upper Claremont Heights, and Canyon Basin.

IEUA's retail agencies that use groundwater from all or some of these basins include the City of Upland, CVWD, and FWC. IEUA does not provide groundwater directly to its retail agencies.

### 4.2.3 Stormwater

Stormwater is water that originates during rainfall and snow melt. IEUA does not provide stormwater directly to its retail agencies. The stormwater primarily comes from surface water runoff from rain and snow that falls in the San Gabriel Mountains and moves down through the Santa Ana watershed. In undeveloped areas, the soil absorbs much of the runoff and helps retain the water within the groundwater basin. However, developed areas with a significant amount of impermeable surfaces tent to accumulate runoff in large quantities in a relatively short amount of time. Stormwater runs off roofs, through streets, and into regional storm drains, which are largely diverted into the region's flood control channels.

There are six major flood control channels spread throughout the Chino Basin region. These channels collect and manage the stormwater generated within the watershed. Major flood control channels that convey stormwater within IEUA's service area include:

- San Sevaine Creek
- Day Creek
- Deer Creek
- Cucamonga Creek
- West Cucamonga Creek
- San Antonio Creek.

Located adjacent to the channels are detention basins that are operated regionally under a multiple-use agreement for both flood control and groundwater recharge operations. IEUA, the Chino Basin Watermaster, the Chino Basin Water Conservation District and others work closely with the San Bernardino Flood Control District to maximize the amount of stormwater that can be captured and recharged into the Chino Groundwater Basin. These channels also carry dry weather runoff from excessive outdoor irrigation. Stormwater percolates to groundwater and is not utilized directly as a supply type but is counted in the volume of annual groundwater supply.

Runoff that is not captured by detention basins ultimately flows to the Santa Ana River. While there are efforts by agencies further downstream to capture these flows, large amounts of water discharge into the ocean during storm events.

### 4.2.4 Recycled Water and Reuse

IEUA has produced and distributed high quality recycled water since 1972 when the Agency expanded its services to include regional wastewater treatment. IEUA serves recycled water for both indirect use (outdoor irrigation, industrial processing) and groundwater recharge.

IEUA owns and operates four regional recycled water plants that produce disinfected and filtered tertiary treated recycled water in compliance with California's Title 22 regulations. The four water recycling plants are: Regional Water RP-1, RP-4, and RP-5, and the CCWRF. These four plants treated 55,233 AF of wastewater and produced approximately 30,495 AF of recycled water during FY 2019-20. The volume not used for recycled water (24,715 AF) was discharged to the discharge locations described in Table 5-1. IEUA also owns an additional regional recycled water plant, RP-2, which only performs solids handling and is scheduled for decommissioning due to its location. More details about IEUA's recycled water system are included in Section 5.

### 4.2.5 Transfers, Exchanges, and Groundwater Banking Programs

Water transfers are a water management tool used to alleviate water shortages in IEUA's service area and the Santa Ana River Basin. Water transfers allow an agency to move or sell water from one service area to another, even when the agencies are not connected by pipelines. Water transfers can be effective during periods of severe drought or emergencies and take multiple forms to increase local reliability among agencies. The Chino Basin is a valuable resource for water transfers because it acts as a storage facility that has a capacity of up to 6 MAF.

IEUA provides imported water from MWD to WFA, CVWD, and FWC directly. WFA provides water via interconnections to Upland, Ontario, MVWD, and the City of Chino. MVWD has an interconnection that provides an annual supplemental water supply to the City of Chino Hills. In FY 19-20, MVWD sold approximately 7,707 AFY to the City of Chino Hills. Interconnections also exist between CVWD and FWC. Upland has interconnections with SAWCo, CVWD, Ontario, and Chino. The CDA's Chino I and Chino II Desalters have interconnections with all participating agencies with a common supply with booster pumps and storage reservoirs that provide flexibility and reliability during emergencies and drought conditions. The CDA provides water to Chino, Chino Hills, Ontario, and other external agencies.

The Chino Basin Recycled Water Groundwater Recharge Program was created as part of the Chino Basin OBMP and is jointly sponsored by IEUA, CBWM, CBWCD, and the SBCFCD. The purpose of the program is to enhance water supply reliability and improve drinking water quality throughout the basin. A network of pipelines direct stormwater run-off, imported water, and IEUA recycled water to 16 recharge sites throughout the IEUA service area. These recharge basins hold the water so it can percolate into the ground and replenish the groundwater supply. Currently, only 10 of the 16 groundwater recharge basins are permitted to receive recycled water.

## 4.3 Historical and Current Imported Supplies

### 4.3.1 Metropolitan Water District

IEUA was originally formed in 1950 to act as a municipal wholesale water district in order to provide regional municipalities with imported water purchased from MWD as a supplemental source of water. Due to water quality considerations in the Chino Basin, IEUA only purchases State Water Project water from MWD for its supplies. Table 4-5 and Table 4-6 show the current and projected amount of water supplies that IEUA will have available to supply its retail agencies.

**Table 4-5: IEUA Water Supplies – Actual (DWR Table 6-8)**

| | | 2020 | | |
|---|---|---|---|---|
| **Water Supply** | **Additional Detail on Water Supply** | **Actual Volume** | **Water Quality** | **Total Right or Safe Yield *(optional)*** |
| Purchased or Imported Water | MWD | 66,438 | Raw Water | |
| Recycled Water | Direct Use and Groundwater Recharge | 30,495 | Recycled Water | |
| | **Total** | **96,933** | | |

**Note**: Recycled water supply includes recycled water for both direct use and groundwater recharge. From IEUA Annual Water Use Database and FY 19/20 Recycled Water Annual Report.

**Table 4-6: IEUA Water Supplies – Projected (DWR Table 6-9)**

| | | Projected Water Supply Report to the Extent Practicable | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2025 | | 2030 | | 2035 | | 2040 | | 2045 *(opt)* | |
| **Water Supply** | **Additional Detail on Water Supply** | **Reasonably Available Volume** | **Total Right or Safe Yield *(optional)*** | **Reasonably Available Volume** | **Total Right or Safe Yield *(optional)*** | **Reasonably Available Volume** | **Total Right or Safe Yield *(optional)*** | **Reasonably Available Volume** | **Total Right or Safe Yield *(optional)*** | **Reasonably Available Volume** | **Total Right or Safe Yield *(optional)*** |
| Purchased or Imported | MWD | 93,283 | | 93,283 | | 93,283 | | 93,283 | | 93,283 | |
| Recycled Water | Direct Use and Groundwater Recharge | 60,073 | | 63,207 | | 64,142 | | 66,836 | | 66,836 | |
| | **Total** | **152,356** | | **156,490** | | **157,425** | | **160,119** | | **160,119** | |

**Note**: Purchased or Imported Water from MWD is IEUA's maximum contract amount for MWD water from Resolution 2014-12-1. Recycled Water projections from draft wastewater plant flow projections.

### 4.3.2 Imported Water Rates

The IEUA Board of Directors established the most recent rates for the delivery of imported water supplies on July 15, 2020. Effective July 1, 2020 and January 1, 2021, IEUA's rates for imported water are listed in Table 4-7 for the 2020, 2021, and 2022 Calendar Years (IEUA, Resolution No. 2020-7-7, July 2020).

**Table 4-7: MWD Imported Water Rates**

| Rate Type | 2020 | 2021 | 2022 |
|---|---|---|---|
| Tier 1 Full Service Untreated | $755 per AF | $777 per AF | $799 per AF |
| Tier 2 Full Service Untreated | $842 per AF | $819 per AF | $841 per AF |
| WSAP Penalty[(a)] | 2 X Tier 1 (100% - 115%)<br>4 X Tier 2 (115% or greater)<br>Imposed by MWD | | |
| Capacity Charge | $8,800 per cfs | $10,700 per cfs | $12,200 per cfs |

**Notes:**

(a) Metropolitan Water Supply Allocation Plan (WSAP) Penalty rates are applied for exceedances of reduced imported water allocations from MWD caused by the adoption of a WSAP. Any penalty rates are "passed through" to the appropriate agency that caused the imposition of a penalty rate by MWD.

cfs = cubic feet per second

## 4.4 Planned Water Supply Projects and Programs

IEUA's Ten-Year Forecast (TYF) includes wastewater, recycled water, groundwater, stormwater, and conservation projects to enhance local supplies and reliability for the service area. These projects provide supply reliability and consist of groundwater recharge basin improvements, improving treatment and distribution of wastewater and recycled water facilities, and increasing conservation. These plans are described generally in the following sections and a summary of these projects are included in Table 4-8.

**Table 4-8: IEUA's Expected Future Water Supply Projects or Programs (DWR Table 6-7)**

| | |
|---|---|
| **X** | Some or all the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format in this section (Section 4.4). |

| Name of Future Projects or Programs | Joint Project with other suppliers? | Description | Planned Implementation Year | Planned for Use in Year Type | Expected Increase in Water Supply to Supplier |
|---|---|---|---|---|---|
| Recharge Basin Improvements | Yes, Chino Basin Watermaster | See Section 4.4.5 | 2021 | All Year Types | 11,852 AF |

| Name of Future Projects or Programs | Joint Project with other suppliers? | Description | Planned Implementation Year | Planned for Use in Year Type | Expected Increase in Water Supply to Supplier |
|---|---|---|---|---|---|
| Water Use Efficiency Business Plan | Yes, Retail Agencies, MWD, and others | See Section 4.4.1 and Section 8 | 2020/2025 | All Year Types | 9,008 AF |
| Recycled Water Interties | Yes, Western Riverside County Regional Wastewater Authority | See Section 4.4.3 | To be determined | All Year Types | 6,000 AFY |
| RP-5 Liquids Treatment Expansion | No | See Section 4.4.3 | 2020/2025 | All Year Types | See Note |
| RP-1 Liquids Capacity Recovery and Solids Treatment Expansion | No | See Section 4.4.3 | 2030/2035 | All Year Types | See Note |

**Note**: The projects and schedule detailed in this table are subject to change. Expected Increase in Water Supply is not compatible with some of these projects as they give IEUA the capacity to meet flows and do not provide water on their own. Recharge Basin improvements increase the amount of stormwater and recycled water that can be recharged to the Chino Basin.

### 4.4.1 Water Management Tools

Resource optimization such as groundwater recharge minimizes IEUA's reliance on imported water. Optimization efforts are typically led by regional agencies in collaboration with local/retail agencies. The 2020 WUEBP is under development, and may focus on using water more efficiently, eliminating water waste, and drought-proofing the region. The plan identifies inefficient water use within the region and provides recommended programs and tools that can be implemented by IEUA's retail agencies to continue increasing water use efficiency.

### 4.4.2 Transfer or Exchange Opportunities

Since IEUA receives its SWP imported water through MWD, any transfer or exchange opportunities related to SWP allocation would be coordinated by MWD. IEUA does not have any current projects or plans related to the transfer or exchange of its imported water.

The Chino Basin area itself is a large area and consists of many other water agencies outside of IEUA's retail agencies. To increase water supplies and provide flexibility, IEUA is continuing conversations amongst water agencies within the Santa Ana River Watershed and its retail agencies to further explore the opportunity to secure long-term partnerships. Various inter-agency connections would also enhance flexibility and increase reliability in local areas, as well as regional supplies. This would allow IEUA and its retail agencies to have a more robust system for aid during outages, emergencies and to optimize the use of local water supplies.

### 4.4.3 Non-Potable Reuse Opportunities

By emphasizing local water supply development within the service area, the region has developed and will continue to develop cost-effective supplies that reduces the dependence on imported supplies. Non-potable reuse of current supplies, as well as expansion and robust improvement of facilities and standards will further help IEUA and the region answer challenges and increase supply benefits.

One of the larger supply projects is the expansion of the liquids treatment and the construction of a wastewater solids handling facility at RP-5. The solids handling will replace the solids handling currently at RP-2, since the plant is located in a flood zone and will be decommissioned. There are also potential recycled water connections to neighboring agencies being explored to increase non-potable reuse and improve recycled water supply reliability for the region. These potential connections include extending pipelines and adding pumping facilities to serve additional recycled water to the eastern portion of its service area and the construction of a pipeline that will function as a recycled water intertie between the Western Riverside County Regional Wastewater Authority and IEUA, as well as a potential recycled water intertie between the City of Rialto and IEUA.

A future Advanced Water Purification Facility (AWPF) is also included in the TYF to ensure compliance with regulatory requirements, as well as a long-term component of regional water supply enhancement. This project was included in the IEUA Master Plan, IRP, and TYF to anticipate compliance with future standards expected in the 2030s. The project may potentially include the evaluation and forecasting of the AWPF, injection wells, and conveyance and other auxiliary facilities. IEUA is regularly monitoring its compliance metrics to address TDS and other regulatory challenges.

A liquids capacity recovery and solids treatment expansion of the Regional Water RP-1 project is expected to begin construction in FY 2026/27.

TYF recycled water projects to increase both direct use and groundwater recharge are expected to provide approximately 30,000 AFY of direct use and 18,700 AFY of groundwater recharge supply by as early as 2025.

### 4.4.4 Desalination Opportunities

The UWMP Act requires a discussion of potential opportunities for use of desalinated water (Water Code Section 10631[i]). IEUA operates and maintains the Chino I Desalter that is managed by the CDA. The CDA Program is a significant source of groundwater production for the region. Since the completion of the Phase III expansion project in 2016, the total pumping capacity of the CDA program is approximately 40,000 AFY of potable water. Over the last 5 years, the Chino I and Chino II Desalters have produced between 28,100 and 30,000 AFY, averaging 29,200 AFY of treated groundwater combined. In 2020, the Chino I and II Desalter's produced approximately 30,246 AFY of treated groundwater, of which approximately 14,649 AFY was delivered to IEUA retail agencies.

The future AWPF mentioned above is also an opportunity to increase available groundwater desalination supply. Advanced treatment would sufficiently reduce the salinity of brackish

groundwater and remove other possible contaminants to create additional water supply for the region.

### 4.4.5 Groundwater Recharge

Groundwater recharge and production are an integral part of IEUA's water system due to the substantial storage in the Chino Basin. As part of IEUA's commitment to its retail agencies and region, there are various projects working towards efficient means of groundwater production and increasing recharge capacity for the area.

As part of the Recharge Master Plan Update completed in 2013, IEUA and the CBWM evaluated 27 yield enhancing capital projects for the Chino Basin. In 2017, CBWM and IEUA approved the implementation of recharge improvements as part of the Update for the following basins: Wineville Basin, Jurupa Basin, Victoria Basin, Lower Day Basin, and Montclair Basin. The recharge improvement project design began in 2017, construction started in 2018, and project completion is expected to occur in 2020/2021. The next Recharge Master Plan Update is scheduled to be kicked off in 2021 and completed by 2023, as a collaborative effort to continue evaluating recent efforts and explore further enhancements.

In conjunction with CBWM, IEUA and retail agencies also worked with the region on the 2020 Optimum Basin Management Program Update (OBMPU). This Update includes multiple potential improvements to recycled water, groundwater, stormwater, and other existing systems. Potential improvements are outlined for existing facilities and operations and new facilities to achieve additional stormwater recharge potential alongside other program elements in the Update. IEUA has also worked with its retail agencies and the larger region to explore concepts for possible future enhancements through its Integrated Water Resources Plan and modeling effort. To answer challenges associated with groundwater contamination and increasing regulations, concepts discussed include use of turnouts as extra supply for hard reaching areas, well-head treatment, and the benefit of centralized treatment plants. These plans are currently only in the conceptual phase and may be further modeled and explored in the coming years.

### 4.4.6 Stormwater Management

It is widely recognized that the patterns of urban development, including hard surfacing (roads, roofs) and storm water management systems (concrete channels) have resulted in a significant reduction in natural infiltration of storm water into the groundwater within southern California and throughout the nation. CBWM estimated that the Chino Basin was losing on average about 40,000 AF of stormwater annually that previously replenished the groundwater basin because of historical patterns of development. The 2020 OBMPU identifies maximizing stormwater recharge as a primary goal for the Basin and has identified improvements to existing facilities and operations to be made. The theoretical average annual stormwater discharge available for diversion is about 74,000 AFY and the annual average stormwater recharge volume is approximately 15,000 AFY (OBMPU). In 2018, IEUA and the CBWM identified potential new stormwater recharge projects. Due to the unit cost of the new projects, which was greater that the projected cost of imported water supplied by MWD, no project was recommended for implementation at that time. The evaluation of stormwater recharge projects will again be completed in the 2021 Recharge Master Plan Update.

## 4.5 Effects of Climate Change

As discussed in Section 1.10.2, IEUA's service area faces hydrologic changes and uncertainty caused by the effects of climate change that may impact its water supplies. In general, the IEUA region expects an overall decrease in supply sources, caused by increased temperatures, increased intensity of extreme weather events, and shifting snowmelt and runoff patterns.

IEUA's imported water supply may be impacted by shifting snowmelt and runoff patterns that affect the capture and storage of snowmelt for the SWP. The reliability of SWP water is expected to decrease as climate change-caused precipitation changes continue. This decrease in reliability indicates a need to improve regional sustainability and decreased dependency on the SWP. In order to increase its resiliency in the face of climate change impacts, IEUA and the region plans to further develop its recycled water and local water supplies.

Local supplies are not immune to the effects of climate change, however. Local surface water supplies are dependent on precipitation and temperature, which are influenced by climate change. Extreme precipitation events can result in short periods with high volumes of runoff that will be difficult to capture, while extended droughts or dry years will result in long periods without these supplies. Higher temperatures will also cause more evaporation and transpiration, reducing the volume of water bodies such as lakes, as well as the amount of soil moisture.

Local groundwater may be adversely impacted by increased temperatures as well. Groundwater elevation and water quality may decrease during periods of drought or by the inability to capture and recharge stormwater due to increased storm intensity. Reduced rainfall and increased groundwater withdrawal may lead to more salinity buildup and increased concentrations of nitrate and other constituents, requiring the need for additional water supply for blending or investment in advanced treatment technologies (DCP 2020). Reductions in groundwater recharge caused by lower levels or precipitation or stormwater infiltration could impact the quality of the groundwater and result in regulatory violations that preclude the use of the source. A description of the water quality concerns and their possible impacts on reliability within the IEUA region is included in Section 6.

The 2018 CCAP identified recycled water supplies as a critical asset in bolstering a flexible management portfolio since these supplies are generated locally and not impacted by climate. While not directly impacted by climate change effects, applications for recycled water in the basin may become constrained if the salinity in the basin rises beyond the RWQCB's specified limits. In addition, reduced wastewater flows during drought periods due to conservation mandates may impact the volume of recycled water available for use.

The impacts of climate change of the region's water supplies are not insignificant and must be addressed to ensure the availability of sufficient water supplies. IEUA will continue assessing and addressing climate change vulnerabilities moving forward through development of its CCAP, development of its WUEBP, and participation in MWD's Local Resource Program to develop local supplies.

## 4.6 Reduced Delta Reliance

The Delta Plan is a comprehensive, long-term resource management plan for the Sacramento-San Joaquin Delta (Delta) that was developed as part of the Delta Reform Act of 2009 (Water code section 85000 et seq) and includes both regulatory policies and recommendations, aimed at promoting a healthy Delta ecosystem. Delta Plan Policy WR P1 [California Code of Regulations (CCR), Title 23, § 5003] is one of 14 regulatory policies in the Delta Plan. WR P1 identifies UWMPs as the tool to demonstrate consistency with state policy to reduce reliance on the Delta for any Supplier that is participating in or carrying out a proposed covered action or receiving Delta water from a proposed covered action. Within the supplier's UWMP, information should be provided that can be used to demonstrate consistency with this policy. Section (c)(1) of WR P1 states that suppliers that have (A) completed an urban water management plan, (B) implemented the efficiency measures in that plan, and (C) shown a measurable reduction in Delta reliance and improvement in regional self-reliance in the plan, are contributing to reduced reliance on the Delta and are therefore consistent with WR P1 [CCR, Title 23, § 5003(c)(1)].

IEUA is an urban water supplier and a member agency of MWD. As a recipient of imported water delivered via MWD, IEUA may indirectly receive water through a proposed project (covered action) and/or receive water from the Delta. MWD has prepared a detailed analysis that demonstrates consistency with the Delta Plan Policy (MWD 2020 UWMP, Appendix 11). In addition, IEUA has completed its own analysis, which is included in Appendix G. The analysis show that IEUA expects to increase its supplies contributing to regional self-reliance as a percent of demand by approximately 17.5% by 2045. As a recipient of water from MWD, it is infeasible for IEUA to determine the volume of its imported water supplies that come directly from the Delta. Therefore, IEUA's calculation of reduced reliance on Delta water supplies comes from MWD's regional analysis. This analysis shows that MWD's expects to reduce the percent of water supplies expected to come from the Delta by 5.2% by 2045.

In addition, this document also identifies future local supply opportunities (Section 4.3) and WUE measures (Section 8) that will increase IEUA's regional self-reliance and reduce demand for imported water. IEUA is continuing to look into local, cost-effective, and technically feasible water supply sources, as described in these sections and its WUEBP. A measurable reduction in Delta reliance and improvement in regional self-reliance can be seen from the achievements of the past 5 years of WUE and the projections for recycled water use. Over the past 5 years, IEUA's water use efficiency program has saved approximately 30,974 AF of water over the lifetime of the measure (Section 8.8). Over the next 5 years, the WUE program expects to save an additional 9,008 AF of water. By 2045, the IEUA region expects 10% of its supply to come from recycled water. Non-potable reuse is expected to increase through 2045 to 30,424 AFY and groundwater recharge is expected to increase to 16,420 AFY by 2025 and remain fairly constant through 2045 (Section 5.4). IEUA and its retail agencies remain committed to enhancing local supply and implementing water use efficiency measures to reduce their demand on imported water, thereby reducing reliance on the Delta.

# Section 5: Recycled Water and Reuse

## 5.1 Recycled Water Planning

Recycled water opportunities have continued to grow in southern California as public education and the need to expand local water supplies continues to be a priority. Recycled water also provides a degree of flexibility and added reliability during drought conditions when imported water supplies are restricted. Recycled water is wastewater that is treated through primary, secondary, and tertiary processes and is acceptable for most non-potable water purposes such as irrigation, and commercial and industrial process water following Title 22 requirements.

IEUA began providing recycled water to customers in 1972. Initially, recycled water was delivered to a few large water users such as the Whispering Lakes Golf Course and Westwind Park in the City of Ontario, and Prado Park and Golf Course in the City of Chino.

In the early 1990s, IEUA began the construction of the first phase of the CCWRF that included treatment facilities and distribution pipelines to serve customers in Chino and Chino Hills. In conjunction with the construction of the first phase of the CCWRF, IEUA began planning for a regional recycled water delivery system to provide recycled water throughout its service area. This planning effort culminated with the completion of the IEUA Regional Recycled Water Program Feasibility Study in January 2002.

In 2004, IEUA developed a regional recycled water program implementation plan to prioritize the phased construction of the adopted 2002 Recycled Water Program Feasibility Study. This major planning effort resulted in the completion of the 2005 Recycled Water Implementation Plan (RWIP).

In 2007, IEUA developed the Recycled Water Three-Year Business Plan. The Business Plan was intended to guide the expansion of IEUA's recycled water system. The Plan focused on the most cost effective and quickest ways to increase the amount of recycled water available and used within IEUA's service area. The Plan focused on the following 3 years, to be revised and updated on an annual basis. Metrics and an annual use goal were identified for each year. Revisions/updates to the Plan were made with an FY 2010-11 update memo, the Wastewater Facilities Master Plan in 2014, the RWPS in 2015, and the IEUA FY 2015-16 Budget and Ten-Year Capital Improvement Plan (TYCIP).

More recently, the IEUA FY 2020-21 TYF, the 2018 CCAP, and the 2020 Regional Drought Contingency Plan have been used to evaluate future recycled water system projects that would benefit IEUA and its retail agencies. All three reports identified the goal of maximizing recycled water production and usage as crucial for increasing IEUA's independence from imported water supply and its resiliency during drought scenarios. As discussed in Section 2.1.2, additional studies related to wastewater flows and recycled water production are currently underway.

## 5.2 Regional Facilities

Regional recycled water facilities are plants, pipelines, pump stations, and reservoirs that serve recycled water to a recharge site or to more than one contracting agency. Regional facilities are

constructed, owned, and operated by IEUA. Local facilities deliver recycled water from the regional facilities to customers within a contracting agency's service area and are maintained by the contracting agency. These local facilities consist mainly of pipelines (local laterals) but can also include pump stations and reservoirs. Joint regional/local facilities can be financed by IEUA to ensure timely implementation of the recycled water program. Local agencies are responsible for the planning, design, construction, and operation of local laterals and other local recycled water facilities. IEUA works closely with each agency to coordinate their recycled water planning efforts.

The regional recycled water facilities consist of a looped pipeline system that connects all four Regional Water RPs. The treated effluent from the four regional wastewater recycling effluent pump stations is delivered to the recycled water retail agencies and customers through five pressure zones, several hundred miles of pipelines, three booster pump stations, three storage reservoirs, and pressure regulating stations. The IEUA recycled water system is shown on Figure 4.

# Recycled Water Distribution System

## Legend Key

**Pipeline Status**

- Design
- Bid
- Construction
- Operating

**Pump Station Status**

- Design
- Bid
- Construction
- Operating

**Reservoirs Status**

- Design
- Bid
- Construction
- Operating

**Recharge Improvement Status**

- Design
- Bid
- Construction
- Operating

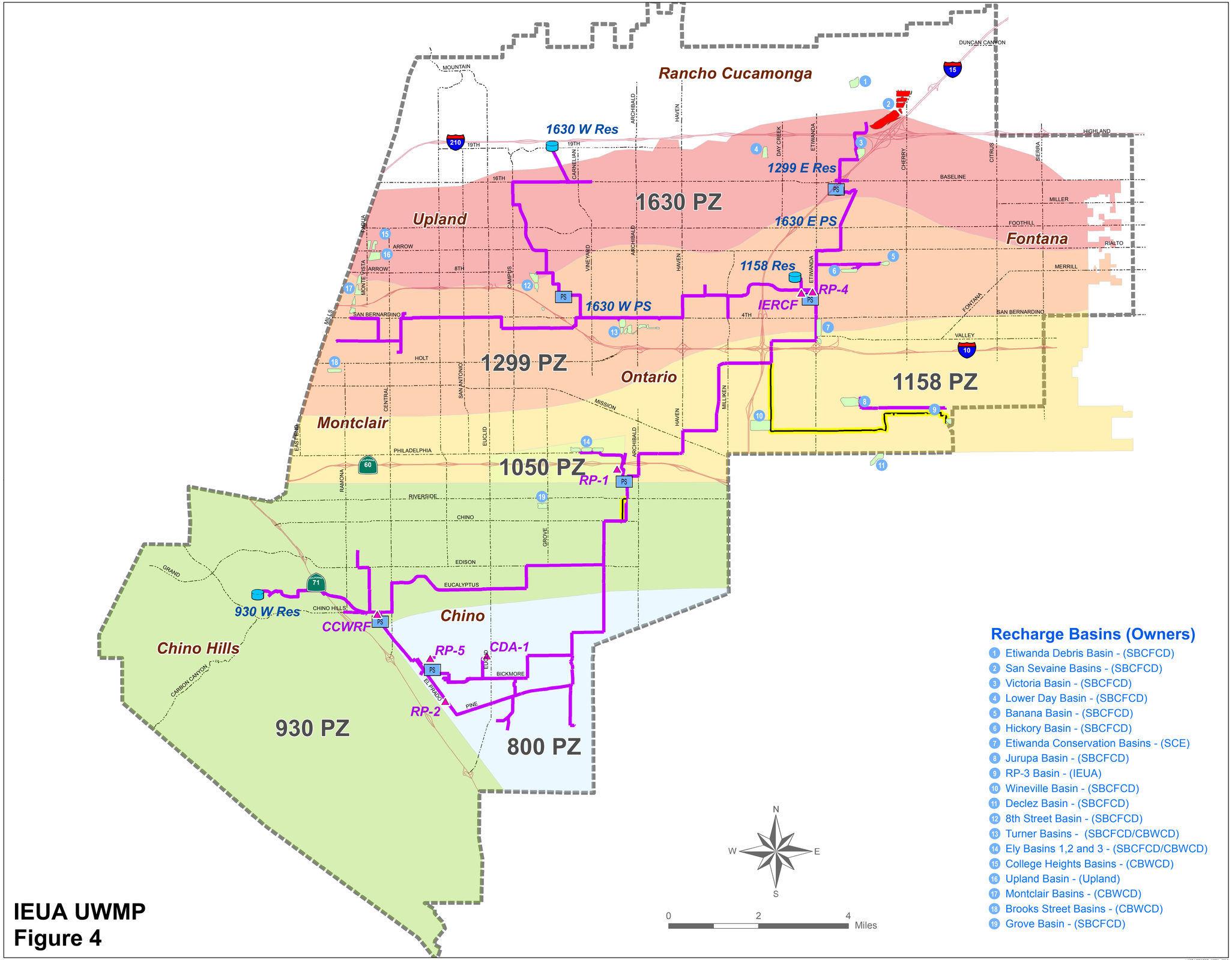


## Recharge Basins (Owners)

1. Etiwanda Debris Basin - (SBCFCD)
2. San Sevaine Basins - (SBCFCD)
3. Victoria Basin - (SBCFCD)
4. Lower Day Basin - (SBCFCD)
5. Banana Basin - (SBCFCD)
6. Hickory Basin - (SBCFCD)
7. Etiwanda Conservation Basins - (SCE)
8. Jurupa Basin - (SBCFCD)
9. RP-3 Basin - (IEUA)
10. Wineville Basin - (SBCFCD)
11. Declez Basin - (SBCFCD)
12. 8th Street Basin - (SBCFCD)
13. Turner Basins - (SBCFCD/CBWCD)
14. Ely Basins 1,2 and 3 - (SBCFCD/CBWCD)
15. College Heights Basins - (CBWCD)
16. Upland Basin - (Upland)
17. Montclair Basins - (CBWCD)
18. Brooks Street Basins - (CBWCD)
19. Grove Basin - (SBCFCD)

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**IEUA UWMP**
**Figure 4**

LAST UPDATED: APRIL 2015

### 5.2.1 Wastewater Collection and Treatment

IEUA manages the Regional Sewage Service within its 242-square mile service area to collect, treat, and dispose of wastewater delivered by contracting local agencies. IEUA's facilities serve seven contracting agencies: cities of Chino, Chino Hills, Fontana, Montclair, Ontario, and Upland, and the CVWD. A system of regional trunk and interceptor sewers convey sewage to regional recycled water plants that are owned and operated by IEUA. Local sewer systems are owned and operated by local agencies.

IEUA also operates a non-reclaimable wastewater system (NRWS) that includes pipelines and pump stations that export the high-salinity industrial wastewater generated within the service area for treatment and eventual discharge to the Pacific Ocean. These water sources are not suitable for non-potable reuse. The NRWS is comprised of two separate collection systems independent of the regional wastewater system. The North System which discharges to the Sanitation District of Los Angeles County treatment facility in the city of Carson, and the South System which discharges to the Santa Ana Watershed Project Authority and the Orange County Sanitation District facility in Fountain Valley. The treated brine is then discharged to the Pacific Ocean.

### 5.2.2 Wastewater Treatment Plants

The wastewater collected in the regional sewer system is treated at the four RPs that IEUA owns and operates. The recycled water produced at the RPs meets Title 22 standards for non-potable reuse and groundwater recharge. All the RPs have primary, secondary, and tertiary treatment and recycled water pumping facilities that are interconnected in a regional network that IEUA also owns and operates. Effluent that is not beneficially reused from the RPs is discharged to nearby creeks that feed into the Santa Ana River where a portion of the water is recharged into the Chino Basin.

The four regional facilities are the RP-1, RP-4, RP-5, and CCWRF. RP-1 and RP-4 serve mostly the northern parts of the service area and RP-5 and CCWRF serve mostly the southern parts of the service area.

RP-1 is located in the City of Ontario and was originally commissioned in 1948. The current wastewater treatment capacity of RP-1 is 44 MGD, although it currently treats approximately 21 MGD. There are three sets of effluent pump stations that pump from RP-1 to four different pressure zones. RP-1 also has a 60 MGD biosolids treatment capacity, to treat biosolids which come from both RP-1 and RP-4. The stabilized, dewatered solids are trucked from RP-1 to the Inland Empire Regional Composting Facility for further treatment to produce Grade A compost.

RP-4 is located in the City of Rancho Cucamonga and has been in operation since 1997. RP-4 has a capacity of 14 MGD, and currently treats approximately 10 MGD. Waste sludge from RP-4 is discharged back to the sewer and flows by gravity to RP-1. RP-4 serves three pressure zones.

RP-5 is located in the City of Chino and has been in operation since 2004. The plant has a 15 MGD capacity for raw sewage and 1.3 MGD capacity for solids processing from RP-2. Currently, RP-5 is treating approximately 8.4 MGD. Ultimately, RP-5 is planned to treat up to

60 MGD of wastewater and 68 MGD of solids combined from both RP-5 and the CCWRF. The disinfected effluent from RP-5 flows to a common channel where it can be discharged to a creek or pumped to a single pressure zone.

The CCWRF is located in the City of Chino and has been in operation since 1992. The plant was designed to treat up to 11.4 MGD and currently treats approximately 9.5 MGD. The removed biosolids are pumped to RP-2 for processing. RP-2 is an older plant that is owned by IEUA and is only used for solids handling. RP-2 is scheduled for decommissioning within the next 10 years. The CCWRF serves one pressure zone.

IEUA uses bypass and diversion facilities to optimize flow and capacity within the system through the San Bernardino Avenue Lift Station, Montclair Lift Station and Diversion Structure, RP-4 and CCWRF influent bypass (CCWRF influent bypass), RP-1 primary effluent diversion, and Etiwanda Trunk Line. Flows are routed between RPs to maximize recycled water deliveries while minimizing overall pumping and treatment costs. Aside from the San Bernardino Avenue Lift Station and the Montclair Lift Station, IEUA also operates the Prado Park Lift Station and RP-2 Lift Station in the sewer collection system to shift flows from one portion of the service area to another, and to pump from low points to high points.

## 5.3 Historical and Current Wastewater Flows

IEUA uses sewage bypass and diversion facilities to optimize the flows and capacity utilization. In general, flows are routed between plants to maximize recycled water deliveries and recharge while minimizing overall pumping and treatment costs. Currently, the regional interceptors can bypass flow from RP-4 to RP-1 and from CCWRF to RP-5. Primary effluent can also be bypassed from the RP-1 equalization basins to RP-5. The four sewer lift stations are also used to balance flows and keep water in the northern portion of the service area. Table 5-1 shows wastewater treated, recycled, and disposed of in IEUA's service area in FY 2019-20.

Over the past decade, the region has experienced increased indoor water use efficiency as a result of drought, public policy, more efficient building codes and devices, and effective conservation program campaigns. At regional facilities, this has resulted in a decrease in the volume of sewage flows of approximately 10% since 2013, as reported in the FY 2020-21 TYF. Despite this decrease, the population has increased, resulting in increased sewage strength. Even with decreasing wastewater flows, IEUA has been able to recycle more water through diversion with the Montclair and San Bernardino Avenue Lift Stations. These lift stations provide the RPs in the northern service area with more wastewater as the recycled system has been expanded and is near the groundwater recharge basins.

In FY 19-20, a total of 56,384 AF of wastewater was treated, of which 25,899 AF was discharged and 30,495 AF was recycled within the IEUA service area. The wastewater treatment and discharge volumes for FY 19-20 are included in Table 5-1.

The 2015 Wastewater Facilities Master Plan Update projections were revised in 2020 to account for reduced wastewater flows observed at the treatment plants. The revised projected wastewater flows are expected to reach approximately 56 MGD by 2040. Forecast flows are based on historical flow trends and future growth provided by contracting agencies. As discussed in Section 2.1.2, wastewater flow projections are currently being updated.

**Table 5-1: Wastewater Treatment and Discharge Within Service Area in 2020 (DWR Table 6-3)**

| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(Optional)* | Method of Disposal | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area | Instream Flow Permit Requirement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| RP-1 | DP-001 | Prado Lake | 8 332818001 | Lake outfall | Yes | Tertiary | 26,932 | 25,889 | 30,495 | 0 | N/A |
| | DP-002 | Cucamonga Creek | 8 332818001 | River or creek outfall | Yes | Tertiary | | | | 0 | N/A |
| RP-4 | DP-002 | Cucamonga Creek | 8 332818001 | River or creek outfall | Yes | Tertiary | 10,718 | | | 0 | N/A |
| RP-5 | DP-003 | Chino Creek | 8 332818001 | River or creek outfall | No | Tertiary | 9,699 | | | 0 | N/A |
| CCWRF | DP-004 | Chino Creek | 8 332818001 | River or creek outfall | No | Tertiary | 9,035 | | | 0 | N/A |
| | | | **Total** | | | | **56,834** | **25,889** | **30,495** | **0** | N/A |

**Note**:
Data from FY 19/20 Recycled Water Annual Report and wastewater treatment plant flow data. Flow data is in acre-feet.

## 5.4 Current Recycled Water Uses

IEUA's recycled water distribution facilities consist of a pipeline network, booster pump stations, pressure regulating stations, and reservoirs as shown previously on Figure 4. These facilities allow distribution of recycled water into six pressure zones for non-potable reuse and groundwater recharge. A large transmission line connects RP-1 and RP-4 and serves the northern portion of IEUA's service area. The Edison and San Antonio Channel Pipelines were constructed to provide recycled water to areas of Ontario, Chino, and Montclair. Another transmission line ties RP-1 into RP-5 and CCWRF. Four storage reservoirs provide operational storage and have capacities varying from 3 million gallons (MG) to 5 MG. The three booster pump stations provide water from lower to higher pressure zones and three pressure reducing stations provide flow from higher pressure zones to lower pressure zones when the pressure drops below a certain point (Stantec, Recycled Water Program Strategy, April 2015). This system provides water for irrigating parks and golf courses. CCWRF's distribution system delivers water to the cities of Chino and Chino Hills.

Currently, there are over 1,300 recycled water metered connections to the recycled water distribution system. Delivered recycled water is beneficially reused for a variety of applications, including landscape and agricultural irrigation, school yards, commercial car washes and laundries, industrial process water, construction, dust control, and groundwater recharge.

A network of pipelines also directs stormwater run-off, imported water, and IEUA recycled water to 16 recharge sites throughout the IEUA service area. These recharge basins hold the water so it can percolate into the ground and replenish the groundwater supply. Currently,10 of the 16 groundwater recharge basins are permitted to received recycled water. Annually over the last 5 years, IEUA has recharged approximately 10,000 to 15,000 AF, the majority of which is recycled water.

In addition to the direct use demands and groundwater recharge program, IEUA maintains an annual base flow to the Santa Ana River at Prado Dam of up to 17,000 AF, which is currently met with recycled water. Groundwater recharge was the largest use in FY 2018/19, accounting for 41% of recycled water, followed by landscape irrigation (33%), and agricultural irrigation (21%).

In FY 2019-20, IEUA's recycled water usage was approximately 30,495 AF, of which approximately 16,278 AF was used for non-potable reuse (outdoor irrigation, industrial processes, and agriculture) by IEUA member agencies, approximately 773 AF was used directly by IEUA, and approximately 65 AF was used by San Bernardino County. An additional 13,381 AF was used for groundwater recharge. The total recycled water demand was 8% greater than FY 2018-19, with recycled water recharge up 16% and direct use up 2%. The remaining 25,889 AF wastewater not used for recharge or recycling was discharged to the Santa Ana River. Recycled water demands for the combined direct use and recharge purposes were approximately 57% of available supply, with a maximum demand of approximately 75% of available supply occurring during July through September.

Current and projected recycled water volumes through 2045 are shown in Table 5-2. Non-potable direct use is expected to increase to 27,571 AFY by 2045 and groundwater recharge is expected to increase to 16,420 AFY by 2025 and then remain constant through 2045.

**Table 5-2: Current and Projected Retailers Provided Recycled Water Within Service Area (DWR Table 6-4)**

| Name of Receiving Supplier or Direct Use by Wholesaler | Level of Treatment | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 *(opt)* |
|---|---|---|---|---|---|---|---|
| Direct Use | Tertiary | 17,115 | 22,880 | 25,742 | 25,742 | 27,771 | 28,271 |
| Groundwater Recharge | Tertiary | 13,381 | 16,420 | 16,420 | 16,420 | 16,420 | 16,420 |
| **Total** | | **30,495** | **39,300** | **41,297** | **42,162** | **44,191** | **44,691** |

**Note**: 2020 value from FY 19/20 Recycled Water Annual Report. Projected values from retail agencies. No projections were made for 2045, so the projected volume is held constant from 2040. Groundwater recharge projections from IEUA projections based on groundwater recharge annual report data. 2020 Direct Use Value includes 16,278 AF from IEUA's member agencies, 773 AF used by IEUA, and 65 AF used by San Bernardino County.

The projected 2015 recycled water use from IEUA's 2015 UWMP was compared to the 2020 actual recycled water use as shown in Table 5-3. Recycled water direct use for 2020 was projected higher in 2015 than the actual recycled water direct use in 2020. The recycled water groundwater recharge volume projected for 2020 in 2015 is approximately the same as the 2020 actual recycled groundwater recharge volume. The discrepancy between the 2015 projected recycled water direct use and the 2020 actual recycled water direct use is largely due to significant land use conversions from agricultural to commercial and residential in IEUA's service area.

**Table 5-3: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual (DWR Table 6-5)**

| | 2015 Projection for 2020 | 2020 Actual Use |
|---|---|---|
| Direct Use | 30,757 | 17,115 |
| Groundwater Recharge | 13,977 | 13,381 |
| **Total** | **44,734** | **30,495** |

**Note**: From 2015 IEUA UWMP and FY 19/20 Recycled Water Annual Report.

## 5.5 Potential and Projected Recycled Water Uses

The regional recycled water program is committed to maximizing the beneficial use of recycled water. IEUA will continue to develop, expand, and provide flexibility to allow the region to use available recycled water supplies. Expansion of the recycled water program relies on the treatment capacity of the water reclamation facilities and wastewater flow projections. IEUA's overall goal is to achieve maximum reuse of available recycled water within its service area.

### 5.5.1 Non-Potable Reuse

Major projects to be completed in the next 10 years are outlined in the TYF. There are several projects planned for the recycled water facilities. RP-1 projects include mechanical upgrades, effluent conveyance and flare system improvements, and energy recovery. For RP-4, process improvements, outfall repairs, and a potential plant expansion are planned for the next decade. The CCWRF has projects planned for headworks rehabilitation, aeration blower replacement, and odor control system replacement. There are no major expansion projects planned for the

CCWRF in the next 30 years. The RP-2 is located within the redefined flood zone behind Prado Dam, and since the plant does not have physical flood protection, the solids handling done at RP-2 will be relocated to RP-5 by 2023 and RP-2 will be decommissioned. RP-5 will also undergo an expansion of its liquid treatment capacity and the construction of a wastewater solids handling facility within the next 10 years. A liquids capacity recovery and solids treatment expansion of the Regional Water RP-1 project is expected to begin construction in FY 2026/27.

Another major potential project is the recycled water interties to neighboring agencies within the Santa Ana River Watershed that will increase the availability of local, resilient recycled water supplies within the IEUA service area. The construction of a pipeline that will function as a recycled water interties between the Western Riverside County Regional Wastewater Authority and the City of Rialto with IEUA are also being considered. As detailed in Section 4.4.3, a future AWPF was considered in the TYF to increase recycled water use. TYF recycled water projects to increase both direct use and groundwater recharge are expected to provide approximately 30,000 AFY of direct use and 16,420 AFY of groundwater recharge supply by 2025.

### 5.5.2 Indirect Potable Reuse

In conjunction with CBWM, CBWCD, and SBCFCD, IEUA conducts the groundwater recharge program within Chino Basin to replenish and maintain the Chino Groundwater Basin. Recharged water includes captured stormwater, recycled water, and imported water. The groundwater recharge projects are a means to diversify the water supply for the region and maximize the beneficial reuse of recycled water and the yield of the Chino Basin. Recycled water recharge is a key component of the region's water supply portfolio. The more recycled water that is recharged into the Chino Groundwater Basin, the more resilient the region becomes.

## 5.6 Recycled Water Rates

IEUA's recycled water volumetric rate reflects the costs associated with the operations and maintenance of its water recycling and distribution facilities, operating costs for groundwater basins, associated administration expenses, and debt service costs related to the financing of infrastructure construction. Total recycled water sales in FY19-20 were approximately $15.8 million. Adopted recycled water rates for 2019-2020 are included in Table 5-4. This table also includes the rates from the 2015 UWMP and the adopted rate for FY 20-21. A rate study will be initiated in 2021 to evaluate and provide recommendations on the future recycled water rates; FY 22-23 rates and beyond will be updated as needed based on the study and related efforts.

**Table 5-4: IEUA Recycled Water Program Rates**

| Rate Description | 2015-16 | 2019-20 | 2020-21 |
|---|---|---|---|
| Direct Delivery ($/AF) | $350 | $490 | $490 |
| Groundwater Recharge ($/AF) | $410 | $550 | $550 |
| Effective Date | 10/01/15 | 7/01/19 | 7/01/20 |
| Deliveries (AF) | 32,619 | 30,495 | - |

**Notes**: Current rate Resolution No. 2020-7-9 is effective through June 30, 2022.
FY 2020-21 total deliveries volume not available until July 1, 2021.

## 5.7 Methods to Encourage Recycled Water Use

In May 2002, IEUA's Board adopted Ordinance No. 75 establishing incentives and the mandatory use of recycled water when available. Under the provisions of Ordinance No. 75, which is consistent with the CWC Sec 13550 and the SWRCB guidelines, potential recycled water customers who do not use recycled water when it is available are subject to a 50% surcharge on their potable water rate.

IEUA also provides technical assistance to prepare necessary engineering reports and coordinate SWRCB, Division of Drinking Water (DDW) approval of recycled water use at each customer's site. IEUA has also retained experts in industrial water use and quality to assist customers in assessing operational needs associated with using recycled water.

### 5.7.1 Funding

Implementation of the regional recycled water program has historically been coordinated with the availability of state and federal funds to minimize use of regional capital funds. IEUA has adopted a TYF that has a budget that breaks out the federal, state, and local funding for recycled water projects. Local funding will be through the Regional Capital Fund, state grants, loans through DWR and the SWRCB, and federal grant funding through the US Bureau of Reclamation's Title XVI program.

The proposed FY 2020 TYF cost is $920.6 million, which includes water, wastewater, and recycled water projects, including the RP-1 Capacity Recovery project. The TYF is funded by a combination of pay-as-you-go, low interest State Revolving Fund loans, IEUA revenues, grants, and contributions.

# Section 6: Water Quality

The quality of any natural water is dynamic in nature. This is true of local groundwater basins with the quality of water changing over the course of a year. Depending on water depth, groundwater will pass through different layers of rock and sediment and leach different materials from those strata. During periods of drought, the mineral content of groundwater increases. Water quality is not a static feature of water, and these dynamic variables must be recognized.

Water quality regulations also change. This is the result of the discovery of new contaminants, changing understanding of the health effects of previously known, as well as new contaminants, development of new analytical technology, and the introduction of new treatment technology. All water purveyors are subject to drinking water standards set by the U.S. Environmental Protection Agency (EPA) and the SWRCB DDW.

Planning efforts of IEUA, the CBWM, and retail agencies emphasize the importance of water quality. The region generally enjoys good water quality, but isolated areas of poor quality require blending of certain water sources or treatment to meet drinking water standards. Significant increases in the use of groundwater, recycled water, and demineralized groundwater can reduce reliance on imported MWD water and increase focus on local water quality monitoring. It is projected that a significant portion of urban water demand will continue to be met using Chino Basin groundwater. Thus, the discussion of water quality focuses primarily on water quality in the Chino Basin.

This section provides a general description of the water quality of the local supplies, the Chino Basin supply, and a discussion of potential water quality impacts on the reliability of these supplies.

## 6.1 Local Supplies

Local water supplies include surface water from nearby mountain streams, recycled water from IEUA treatment plants, recovered groundwater from the Chino Basin Desalters, and groundwater extracted from the Chino Basin and other groundwater basins in the area.

### 6.1.1 Surface Water

Surface water from local sources that originate in the San Antonio Canyon, Cucamonga Canyon, Day Creek, Deer Creek, Lytle Creek, and other smaller surface streams is generally of high quality since these creeks are fed by snowmelt and other precipitation in the San Gabriel Mountains. Surface water sources are treated prior to introduction to the potable water supply to ensure bacteriological quality and compliance with state and federal water quality standards.

### 6.1.2 Recycled Water

Recycled water holds the greatest potential as a new source of supply in the Chino Basin and in the southern California region as a whole. By the year 2045, direct recycled water use is

projected at 27,571 AFY and another 16,420 AFY of recycled water will be used for groundwater replenishment.

All IEUA water recycling treatment plants produce recycled water suitable for full body contact recreation and generally meet the more stringent aquatic habitat criteria. The continued use of recycled water is driven by compliance with regulatory limitations for IEUA's recycled water and groundwater recharge operations. In the event of non-compliance, assets would become stranded and IEUA would need to supplement its water supply portfolio with more expensive and/or less reliable sources. Numeric limitations for TDS are imposed upon recycled water and groundwater recharge. In addition, an ambient water quality TDS concentration, a statistical construct that represents an estimate of the volume-weighted TDS concentration of groundwater, is established to determine the assimilative capacity within the basin.

The ambient TDS concentration in the Chino Basin groundwater has been gradually increasing over the past several years, due to climate change, conservation, and drought periods, thus reducing the basin's assimilative capacity. In addition, emerging contaminants of concern, such as 1,2,3-Trichloropropane (1,2,3-TCP), perfluorooctanoic acid (PFOA), and microplastics could impact IEUA's ability to maximize recycled water use. The April 2020 Regulatory Challenges memorandum prepared by IEUA evaluates water quality regulatory challenges for the future of its water supply.

During the 2012 to 2016 drought, the 12-month running-average TDS concentration in recycled water approached the permit limit for TDS due to an increase in TDS concentration from water supplies used by retail agencies and indoor water conservation. The Regulatory Challenges memorandum estimated that, without taking additional action, TDS limit for recycled water use may be exceeded within the next 10 years. IEUA and the CBWM petitioned the RWQCB to consider updating the maximum-benefit Salt and Nutrient Management Plan to incorporate a revised compliance metric for recycled water TDS and nitrate to allow a longer-term averaging period, which would provide an average concentration that is less susceptible to exceedances during drought. This evaluation is currently ongoing. As of the last annual report, submitted in April 2019, the TDS and nitrate maximum concentration limits have never been exceeded; however, the IEUA-established "trigger limit", which is 20 milligrams per liter (mg/L) below the permit limit and triggers a water quality evaluation, was reached in 2015.

Poly- and per-fluorinated compounds (PFAS) are known to be present in recycled water and any new regulatory standards for PFAS could impact the ability to reuse recycled water without treatment. 1,2,3-TCP is a chlorinated hydrocarbon with high chemical stability that is very persistent in groundwater and the regional water recycling facilities IEUA operates were not designed to remove it. During 2019, recycled water used for groundwater recharge exceeded the 1,2,3-TCP maximum contaminant limit (MCL) and PFOA notification level (NL) and went into an accelerated monitoring schedule for 16 weeks. Corrective action reports were submitted to the DDW and RWQCB in February 2020 and source evaluation for both compounds is ongoing. Advanced treatment may be required to meet future regulations of these two contaminants.

Finally, there are other contaminants of emerging concern, such as microplastics, which are likely to emerge over the next 10 years which could also require advanced treatment to continue recharge of recycled water, further underscoring the need for advanced treatment in the region.

Based on these water quality trends, IEUA has concluded that the implementation of AWPFs may likely be required to address increasing salinity in the 2030s. Though there are a number of solutions that IEUA could implement to address groundwater quality challenges, none are as optimal as the implementation of advanced treatment. Advanced treatment would address TDS levels for both direct use and groundwater recharge while also addressing contaminants of emerging concern. In addition, advanced water purification has the potential to be integrated into future recycled water uses, such as direct potable reuse.

### 6.1.3 Treated Groundwater

Treated groundwater from the Chino Desalters 1 and 2 is very high quality since it is treated by RO, IX, and air stripping. Groundwater from the lower part of the Chino Basin is treated by the desalters, as it has high TDS and nitrate concentration. TDS and nitrate are reduced by the RO process and nitrate concentration is further reduced by the IX process. Two of the Chino Desalter 2 expansion wells are being used to capture groundwater contaminants from the South Archibald plume. Some of the groundwater wells for Desalter 1 have been impacted by a VOC plume located near the Chino Airport. VOCs are removed by an air stripping facility at Desalter 1. Other identified plumes (CIM plume and an Ontario Airport Plume) could impact desalter wells and increase treatment needs. The operation of the Chino Desalters 1 and 2 is a critical component of maximum benefit commitments under the Basin Plan and a long-term salinity management strategy that enables the region to use recycled water within the Chino Basin.

### 6.1.4 Other Groundwater Basins

Limited information is available on water quality from the groundwater basins surrounding Chino Basin. Most of the basins have elevated concentrations of nitrate. Use of these local groundwater supplies by retail water agencies for potable water supply suggests that any present water quality issues can be resolved by blending or well head treatment.

### 6.1.5 Imported Water

MWD supplies about half the water used in southern California from its two main sources of water: 1) water from the SWP delivered via the California Aqueduct and 2) water from the Colorado River delivered via the Colorado River Aqueduct. The TDS in the Colorado River water averages about 700 mg/L during normal water years. Water supplies from the SWP have significantly lower TDS levels, averaging 275 mg/L. IEUA's service area is a SWP-exclusive area, only importing MWD water from the SWP in order to meet TDS objectives in the Chino Basin.

Other major water quality concerns include:

- Perchlorate in local groundwater supplies
- Hexavalent chromium in groundwater
- 1,2,3-TCP in groundwater
- Disinfection by-products.

## 6.2 Chino Basin Groundwater Quality

Chino Basin groundwater is a critical resource to the entire Santa Ana River Watershed. The Chino Basin Watermaster performed monitoring of over 600 wells in the period from 1999 to 2001 to establish a baseline of groundwater quality for the basin to assist with the implementation of the Optimum Basin Management Program. Groundwater quality data has been obtained periodically since 1990. Since 2000, the Chino Basin Watermaster has assessed groundwater quality in the basin using data compiled through its own monitoring activities and the efforts of other cooperating entities, and has reported on the water quality trends and findings related to regulated contaminates and contaminants of emerging concern in a biannual State of the Basin report. The water monitoring program has been periodically refined as needed to support the detection of water quality anomalies and contaminants of concern.

The most recent groundwater quality data comes from sampling done over the 5-year period from July 2013 to June 2018. This included 141 “active municipal supply wells” (wells that pumped groundwater anytime during 2017 or 2018), other municipal supply wells not determined to be active, and private agricultural, non-agricultural, and monitoring wells, whether recently active or not.

From these groundwater monitoring results, the three most common contaminants that exceed a primary MCL in the Chino Basin at active municipal wells are nitrate (71 wells), 1,2,3-TCP (33 wells), and perchlorate (27 wells). Of the recently active 141 municipal supply wells, 45 have at least one drinking water contaminant, 17 wells have two contaminants, 14 have three contaminants, five have four contaminants, and five have five contaminants. The wells with drinking water contaminants are located in the southern (south of the 60 freeway) and western (west of Euclid Avenue) areas of the basin. Of the 141 recently active municipal supply wells, only two wells shown an exceedance of a California NL for 1,4-dioxane. There may be additional exceedances for 1,4-dioxane and other contaminants, but since the monitoring of contaminants with an NL is not required by DDW or testing may be performed using analytical methods with the lowest detection limits that are greater than the NLs. Table 6-1 and Table 6-2 provide a summary of active municipal supply wells with exceedances of primary MCLs and NLs.

Perchlorate and hexavalent chromium are also the two contaminants characterized in the basin that are undergoing review and consideration by the DDW for a primary MCL revision.

**Table 6-1: Summary of Drinking Water Contaminants with Primary MCLs**

| Analyte | Primary CA MCL | Number of Active Municipal Supply Wells with Exceedance of MCL | Number of Municipal Supply Wells with Exceedance of MCL | Number of Total Wells in the Chino Basin with Exceedance of MCL |
|---|---|---|---|---|
| Nitrate-Nitrogen | 10 mg/L | 71 | 80 | 553 |
| 1,2,3-Trichloropropane | 0.005 µg/L | 33 | 36 | 111 |
| Perchlorate | 6 µg/L | 27 | 30 | 387 |

| Analyte | Primary CA MCL | Number of Active Municipal Supply Wells with Exceedance of MCL | Number of Municipal Supply Wells with Exceedance of MCL | Number of Total Wells in the Chino Basin with Exceedance of MCL |
|---|---|---|---|---|
| Trichloroethylene (TCE) | 5 µg/L | 11 | 14 | 269 |
| Gross Alpha | 15 pCi/L | 6 | 7 | 14 |
| Chromium | 50 µg/L | 4 | 4 | 4 |
| Arsenic | 0.01 mg/L | 3 | 5 | 74 |
| 1,2-Dibromo-3-chloropropane | 0.2 µg/L | 3 | 3 | 4 |
| Tetrachloroethene (PCE) | 5 µg/L | 3 | 3 | 96 |
| Trihalomethanes | 10 µg/L | 2 | 3 | 2 |
| Nitrite-Nitrogen | 1 mg/L | 2 | 2 | 17 |
| 1,1-Dichloroethene (1,1-DCE) | 5 µg/L | 1 | 1 | 13 |
| Dichloromethane (Freon 39) | 5 µg/L | 1 | 1 | 91 |
| Uranium | 20 pCi/L | 1 | 1 | 1 |

**Notes**: Data collected for FY 2013/2014 to FY 2017/2018. "Active" Municipal supply wells are those that have been pumped at least once during the years 2017 and 2018.
µg/L = micrograms per liter; pCi/L = picocuries per liter

### Table 6-2: Summary of Drinking Water Contaminants with Notification Levels

| Analyte | CA Drinking Water NL | Number of Active Municipal Supply Wells with Exceedance of NL | Number of Municipal Supply Wells with Exceedance of NL | Number of Total Wells in the Chino Basin with Exceedance of NL |
|---|---|---|---|---|
| 1,4-Dioxane | 1 µg/L | 2 | 2 | 133 |
| Manganese | 0.5 mg/L | 0 | 0 | 118 |
| N-Nitroso dimethylamine (NDMA) | 0.01 µg/L | 0 | 0 | 60 |
| Vanadium | 0.05 mg/L | 0 | 0 | 55 |
| Naphthalene | 0.017 mg/L | 0 | 0 | 48 |
| 1,2,4-Trimethylbenzene | 0.33 mg/L | 0 | 0 | 26 |
| 1,3,5-Trimethylbenzene | 0.33 mg/L | 0 | 0 | 19 |
| Methyl Isobutyl Ketone | 0.12 mg/L | 0 | 0 | 11 |
| n-Propyl benzene | 0.26 mg/L | 0 | 0 | 11 |
| HMX (Octogen) | 0.35 mg/L | 0 | 0 | 11 |
| Chlorate | 0.8 mg/L | 0 | 0 | 4 |

| Analyte | CA Drinking Water NL | Number of Active Municipal Supply Wells with Exceedance of NL | Number of Municipal Supply Wells with Exceedance of NL | Number of Total Wells in the Chino Basin with Exceedance of NL |
|---|---|---|---|---|
| formaldehyde | 0.1 mg/L | 0 | 0 | 3 |
| N-Nitrosodiethylamine (NDEA) | 0.01 µg/L | 0 | 0 | 3 |
| Ethylene Glycol | 14 mg/L | 0 | 0 | 1 |
| n-Butylbenzene | 0.26 mg/L | 0 | 0 | 1 |

**Note**: Data collected for FY 2013/2014 to FY 2017/2018. "Active" Municipal supply wells are those that have been pumped at least once during the years 2017 and 2018.

### 6.2.1 1,2,3-TCP

The occurrence of 1,2,3-TCP in nearly 25% of active municipal supply wells is noteworthy. The MCL for 1,2,3-TCP is 0.005 micrograms per liter (µg/L), which is 5 parts per trillion (ppt). This is the lowest numerical value for a MCL established to date in California. Unlike newly adopted MCLs, the MCL for 1,2,3-TCP became immediately effective upon its adoption in December 2017, requiring municipal water agencies to either cease using active wells with 1,2,3-TCP concentrations in excess of the new MCL immediately or implement treatment or blending to ensure their water supplies have concentrations below the MCL. Before 2018, municipal water supplies were not routinely tested for 1,2,3-TCP, or when testing occurred it was not always done using the lowest available detection limit. For this reason, the DDW also required municipal water agencies to perform quarterly compliance monitoring in 2018 using laboratory detection limits low enough to test for concentrations equivalent to the MCL of 0.005 µg/L. The wells producing 1,2,3-TCP concentrations equal to or greater than the MCL are primarily located in the western half of the Basin. At least three agencies within the IEUA service area have had to shut down supply wells or modify operations as a result of the new MCL.

### 6.2.2 Perchlorate

An MCL of 6 µg/L was established in 2007. The Public Health Goal (PHG) for perchlorate was reduced from 6 µg/L to 1 µg/L in 2015 after scientific literature indicated the possible health effects to infants from exposure to perchlorate in drinking water. The DDW thereby lowered its required detection limit for the purposes of reporting from 4 µg/L to 1 or less µg/L to gather state-wide data to determine whether a revision to the MCL is warranted.

Over the 5-year period of measurement, 49% of the wells in the Chino Basin had a 5-year maximum concentration that exceeds the MCL of 6 µg/L and 95% of the detectable concentrations of perchlorate in the basin were above the PHG of 1 µg/lL Perchlorate is prevalent throughout the basin. If the MCL were lowered from 6 µg/L, treatment facilities could be required across most of the Chino Basin.

### 6.2.3 Hexavalent Chromium

Hexavalent Chromium (Chromium VI) is produced from by-products of industrial applications and the manufacturing of stainless steel and other alloys as well as occurring naturally in some locations. The PHG for Chromium VI is 0.02 µg/L. In 2013, DDW adopted an MCL for Chromium

VI of 10 µg/L, which was then challenged in court. In 2017, a judgment was issued invalidating the Primary MCL for drinking water since there was no consideration of the economic feasibility of complying with it. The court ordered DDW to conduct an economic evaluation and establish and adopt a new MCL, which could be the same or different from the now invalidated MCL of 10 µg/L. 7% of all wells sampled in the basin have a concentration above 10 µg/L; 127 of the 141 municipal wells have detectable concentrations of Chromium VI, and nine of the 141 active municipal wells exceeded 10 µg/L. Hexavalent chromium is not a widespread compliance issue based on the 10 µg/L, but compliance could be problematic in the future if a new, lower MCL is established.

### 6.2.4 Poly- and Per-fluorinated Compounds

In 2009, the EPA published provisional Health Advisory Levels (HALs) for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) of 400 nanograms per liter (ng/L) and 200 ng/L, respectively. In 2016, the EPA significantly lowered the HAL for PFOA and PFOS to a combined 70 ng/L and in 2018, the DDW established NLs for PFOA and PFOS of 14 and 13 ng/L, respectively. The majority of wells in the Chino Basin have not been sampled for either of these contaminants. The 30 wells that have been sampled were tested in 2015 using laboratory detection limits of 20 and 40 ng/L, which is higher than the current NLs. Monitoring or recycled water recharge blending sources shows that many of the sources have detectable concentrations of PFOA and PFAS, some of which are above the NLs. The EPA and DDW have indicated that they are moving forward with adopting MCLs for PFOA and PFAS in the near future. The occurrence of these contaminants in Chino Basin groundwater as of March 2019 is not well characterized and there are recharge water sources with concentrations above the NLs. Widespread monitoring is necessary to understand the occurrence of PFOA and PFAS in the basin to plan for compliance with potential future drinking water regulations.

### 6.2.5 Total Dissolved Solids and Salts

During the development of the 2000 OBMP, IEUA and the Watermaster recognized that implementing a recycled water recharge and reuse program would require large scale treatment and mitigation of salt loading for TDS and nitrate. The Watermaster and IEUA petitioned the RWQCB to establish a maximum benefit-based salt and nutrient management plan that involved increasing the TDS and nitrate objectives for the Chino-North groundwater management zone (GMZ) to numerically higher value to enable recycled water reuse without mitigation or treatment. The plan included the implementation of a monitoring, analysis, and reporting program, the construction and future expansion of the Chino Basin Desalters to attain hydraulic control of the GMZ to protect the Santa Ana River, the construction of recharge facilities to increase storm and recycled water recharge, and a commitment to future treatment of recycled water or groundwater, as needed, to protect beneficial uses and comply with the maximum benefit TDS and nitrate objectives. The maximum benefit SNMP was incorporated into the Basin Plan in January 2004.

TDS has a California secondary MCL of 500 mg/L. Over the 5-year period from July 2013 to June 2018, 61% of wells measured had 5-year maximum values exceeding the MCL. The average and median values were 778 and 614 mg/L, respectively. The wells with the highest TDS concentrations are predominantly located south of Highway 60 in the area of historical and

current agricultural land uses. It is expected that TDS concentrations in the basin will increase over time since it is operated as a closed basin.

Nitrate has a primary MCL of 10 mg/L. Over the 5-year period, 68% of the wells measured had 5-year maximum values exceeding the MCL. The average and median values were 26 and 17 mg/L, respectively. As with TDS, the wells with the highest nitrate concentrations are located in the historical and current agricultural land use areas.

### 6.2.6 Other Contaminants

There are other active municipal supply wells with exceedances of primary MCLs in the IEUA service area, as listed in Table 6-1, including trichloroethylene (TCE), gross alpha, chromium, arsenic, 1,2-dibromo-3-chlorpropane, tetrachloroethene (PCE), trihalomethanes, nitrite-nitrogen, 1,1-dichloroethene (1,1-DCE), dichloromethane (Freon 39), and uranium. The percentage of wells with 5-year maximum concentrations exceeding the primary MCLs for some of these contaminants are 14% for arsenic, 26% for TCE, 10% for PCE, and 6% for 1,2-DCA.

The number of active municipal wells with exceedances for any of these contaminants is less than 11, indicating they are not widespread compliance issues. However, these contaminants should be observed, and planning should be conducted to ensure the ability to adapt to any increases in the number of wells with exceedances or changes to MCLs for these contaminants that could cause future water supply issues.

## 6.3 Water Quality Impacts on Reliability

Maintaining the quality of the groundwater and other water supply increases the reliability by ensuring that deliveries are not interrupted due to water quality concerns. A direct result from the degradation of any water supply is increased treatment cost before consumption. The poorer the quality of the source water, the greater the treatment cost. Water may degrade in quality to the point that it is not economically feasible for treatment. In this scenario, the degraded source water is taken off-line. This in turn can decrease water supply reliability by potentially decreasing the total supply and increasing demands on alternative water supplies.

Groundwater quality impairment has impacted significant supplies across the basin. Including CDA, approximately one-third of existing groundwater supply capacity is currently offline due to impairment or requires clean water for blending purposes to meet water quality regulations. Water quality issues are constantly evolving, and IEUA will have to continue to take action to protect and treat water supplies when needed. Potential future impacts to water supply reliability could be caused by increasing TDS concentration in recycled water, revisions on DDW MCLs, and changes in contamination plume characteristics.

The use of recycled water could become more difficult in the future because the ambient TDS concentration in the Chino Basin groundwater is increasing, thereby reducing assimilative capacity. Increases in TDS concentration from water supplies used by retail agencies and from the SWP could further increase the TDS concentration of recycled water, especially if coupled with an increase in indoor water conservation.

The Watermaster monitors and delineates the extents of the contaminant plumes located in the basin, including the Chino Airport and South Archibald plumes, General Electric Test Cell and Flatiron plumes, the former Kaiser Steel Mill Facility plume, the California Institution for Men plume, the Stringfellow plume, and the Milliken Landfill plume. Currently, the Chino Airport and South Archibald plumes are undergoing remedial strategies using the Chino Basin Desalters for pumping and treating the contaminated groundwater. Any subsequent movement of contaminant plumes could affect additional groundwater wells and the water supply of the basin, and therefore, the water supply reliability of IEUA.

Changes in DDW MCL values can also affect groundwater supply in the Chino Basin. The adoption of an immediately effective MCL for 1,2,3-TCP as discussed above resulted in the cessation of use of wells with concentrations in excess of the new MCL. Some supply wells were shut down or had to modify their operations due to this new MCL. The EPA is currently developing MCLs for PFOA and PFOS. Given that recycled water used for groundwater recharge exceeded the PFOA notification level in 2019, a newly established MCL would impact the ability to use both recycled water and groundwater sources. Similarly, revisions in primary MCL values for perchlorate and hexavalent chromium could cause compliance issues in the future if new, lower MCLs are established. Prolonged reductions in groundwater pumping due to groundwater contamination could reduce the safe yield and potentially contribute to the loss of hydraulic control and the spread of contamination in the basin. It will become increasingly necessary to pump and treat groundwater to comply with drinking water standards and maintain Safe Yield and hydraulic control of the basin.

# Section 7: Reliability Planning

## 7.1 Overview

The UWMP Act requires urban water suppliers to assess water supply reliability that compares total projected water use with the expected water supply over the next 20 years in 5-year increments. The UWMP Act also requires an assessment for a single-dry year and multiple-dry years. Water Code section 10635(b) is a new requirement for the 2020 UWMPs and requires suppliers to prepare a drought risk assessment, which enables suppliers to evaluate their risk under a severe drought period lasting for 5 consecutive years starting in 2021. This section presents the reliability and drought risk assessments for the IEUA service area.

## 7.2 Supply Challenges

As discussed throughout this document, especially in Sections 2, 4, 5, and 6, supply can be affected by a variety of factors, including water quality regulations and climate change impacts. Some sources are more vulnerable to seasonal or climatic shortage than others. The supply challenges for each of the region's water sources are discussed in this section. A summary of the factors that may result in inconsistency of supply for each source in IEUA's service area are included in Table 7-1.

**Table 7-1: Factors Resulting in Inconsistency of Supply**

| Water Supply Source | Legal | Environmental | Water Quality | Climatic |
|---|---|---|---|---|
| Local Surface Water | None identified. | None identified. | None identified. | Shifting precipitation patterns; reduced snowpack; increased evaporation. |
| Stormwater | None identified. | Increases in impervious surfaces. | Storm water quality may require treatment prior to infiltration | Reduced infiltration rates and stormwater capture. |
| Chino Basin Groundwater | Development of new MCLs for contaminants present in the basin. | Safe yield operating constraints. | Contaminants exceeding MCLs. | Changes in rainfall frequency and intensity; impacts to recharge and runoff. |
| Other Groundwater | Development of new MCLs for contaminants present. | Safe yield operating constraints. | Contaminants exceeding MCLs. | Reduced natural infiltration. |

| Water Supply Source | Legal | Environmental | Water Quality | Climatic |
|---|---|---|---|---|
| Chino Basin Desalter | Groundwater replenishment obligation. | None identified. | Shifts in contaminant plume characteristics or location. | None identified. |
| Recycled Water | Changes in water quality requirements. | None identified. | Increasing TDS levels. See Legal. | Reduction in amount of wastewater and impacted by increase in imported water TDS during drought periods |
| Imported Water | Potential cutbacks. | None identified. | Disinfection byproduct precursors; arsenic; nutrient levels. | Shifts in precipitation patterns; reduced snowpack; and potential for increased TDS in drought periods |

### 7.2.1 Local Surface Water

Local surface water is impacted by climate due to its dependence on precipitation and snow melt. Changes in precipitation patterns and earlier snow melt due to increased temperatures will affect local surface water both in quantitatively and temporally. Higher temperatures could also result in increased evaporation of soil moisture or exposed water bodies, reducing surface water supplies. Surface water supplies are also highly variable on a yearly basis.

Surface water is generally of high quality and is anticipated to be unaffected by water quality changes.

### 7.2.2 Stormwater

Increases in temperature and evaporation rates can dry out soil, resulting in increased water runoff as water is unable to penetrate dry soil. Climate change is expected to cause higher intensity rainfall storms on a more infrequent basis, which could also reduce the amount of stormwater runoff able to be captured. Annual snow melt patterns are also expected to change, which could affect water supply planning and stormwater capture.

Other challenges include reductions in natural infiltration into the ground due to channelization, new development, increased outdoor water efficiency, and open space conversion. Construction of additional stormwater recharge facilities may be limited in the highly urbanized service area. Water quality of stormwater may require treatment, especially in green infrastructure, integrated with stormwater recharge facilities.

### 7.2.3 Chino Basin Groundwater

Chino Basin groundwater supplies are dependent on rainfall and supplemental sources for recharge, as well as the ability of soil to absorb water during rainfall events. These dependencies make this groundwater supply vulnerable to climate change impacts, such as warmer temperatures and drought increasing the dryness of soil, resulting in less absorption and an increase of water runoff instead of percolation through the soil. Chino Basin groundwater supplies are not impacted by climate once the water is stored in the groundwater basin.

As discussed in Section 6, there are several common contaminants that exceed primary MCLs or NLs in the basin at active municipal wells, including nitrate, 1,2,3-TCP, perchlorate, hexavalent chromium, and 1,4-dioxane. Increases in the prevalence of these, and other contaminants, may result in the closure of supply wells which would impact water supply reliability. In addition, the use of recycled water could become more difficult in the future due to increasing TDS concentration in the groundwater. Finally, any changes in or development of new MCLs or other legislative concentration requirements would affect groundwater supply.

### 7.2.4 Other Groundwater

Climate effects on non-Chino Basin groundwater is expected to be similar to those identified for the Chino Basin, including a reduction in reduced natural infiltration, safe yield operating constraints, and water quality issues.

### 7.2.5 Chino Basin Desalter

Water supply from the Chino Basin Desalters is not affected by climate change, but may be affected by the outstanding obligation for groundwater replenishment to the Chino Basin through the duration of the Peace Agreement and the high energy needs and costs of the treatment of brackish water and brine disposal. In addition, any changes or movement of the contaminant plumes that are being treated by the Desalters could affect nearby groundwater wells or result in increased treatment costs.

### 7.2.6 Recycled Water

Recycled water holds the greatest potential as a source of reliable supply in the IEUA service area. Recycled water is the most climate resilient water supply available to the region as wastewater flows were shown not to be impacted by climate according to the 2015 IEUA IRP. However, since the service area's water supply can include 20 to 30% of SWP imported water, droughts have resulted in higher salinity levels in source water supply, which directly impacts the salinity in the treated recycled water. Additionally, increases in more efficient indoor water use may reduce the amount of wastewater available for recycled water in the future.

Recycled water is also vulnerable to increasingly strict regulatory and environmental issues related to the construction and operation of recycled water systems, especially the high amount of energy consumption required in recycled water treatment. Recycled water requires the highest level of treatment to meet Title 22 water quality requirements, which can be very energy intensive.

### 7.2.7 Imported Water

Changing climate patterns are expected to shift precipitation patterns and affect water supply. The areas of concern for California include a reduction in Sierra Nevada Mountain snowpack, increased intensity and frequency of extreme weather events, rising sea levels causing increased risk of Delta levee failure, seawater intrusion of coastal groundwater basins, and potential cutbacks on SWP to meet ecological and other needs. The major impact in California is that without additional surface and groundwater storage, the earlier and heavier runoff (rather than snowpack retaining water in storage in the mountains), will result in more water being lost to the oceans. A heavy emphasis on storage is needed in the State of California.

MWD is responsible for providing high quality potable water throughout its service area. Over 300,000 water quality tests are performed per year on MWD's water to test for regulated contaminants and additional contaminants of concern to ensure the safety of its waters.

The key water quality issues for SWP waters are disinfection byproduct precursors, in particular, total organic carbon and bromide. Disinfection byproducts result from total organic carbon and bromide in the source water reacting with disinfectants at the water treatment plant. MWD has resolved these treatment restrictions by using ozone disinfection at its treatment plants. All MWD's treatment plants currently have ozone treatment facilities.

Arsenic is also of concern in some groundwater storage/transfer programs that MWD participates in. Groundwater inflows into the California Aqueduct are managed to comply with water quality regulations and protect downstream water quality while meeting supply targets. Additionally, nutrient levels in SWP system are relatively high, leading to the potential for algal related taste and odor issues that can affect water management strategies. MWD is engaged in efforts to protect the quality of SWP water from potential increases in nutrient loading from wastewater treatment plants (MWD, 2020 UWMP, June 2021).

Imported SWP water is an important water supply source for the water agencies in the Chino Basin, and its TDS concentration is an important consideration in the salt and nutrient management plan in the Basin Plan. The TDS concentration in SWP water at Lake Silverwood, the point from which SWP water is distributed to the Chino Basin, has historically varied from 74 to 430 mg/L, with the lower TDS concentrations associated with above normal to wet hydrologic conditions and the higher TDS concentrations associated with below normal to dry hydrologic conditions.

## 7.3 Supply and Demand Comparisons

IEUA's service area relies on a variety of supply types, as detailed above. The available baseline water supply projections for the entire IEUA region by source type are included in Table 7-2 below. The imported water supply type is broken into imported water to be supplied by IEUA via MWD and imported water delivered to IEUA retail agencies from other wholesale agencies.

While this summary of baseline regional water supply sources is useful for IEUA's planning purposes, the reliability assessment was completed using only supplies/demands for imported water from MWD and IEUA recycled water, as these are the water supply sources that IEUA manages. Each retail agency is completing its own reliability assessment which are included in

their respective 2020 UWMPs. IEUA's ability to satisfy demands during three scenarios: a normal water year, single-dry year, and multiple-dry years was completed and described in the following sections.

The available imported water supply is not expected to decrease or change for these years due to the redundancy and reliability provided by MWD's extensive storage and water management system. As discussed in MWD's 2020 UWMP, MWD does not anticipate a shortfall in water supply for any of the dry year scenarios. While the California Aqueduct supplies are anticipated to decrease during dry years, overall, MWD does not expect any shortfall due to their diligent efforts to increase resiliency to drought over the past several years by using off-stream storage and other means. While IEUA only receives water from the California Aqueduct, they still expect to receive up to their full contract amount for both single dry and multiple dry years. The recycled water supply is not expected to dramatically decrease during drought periods; however, there are some slight fluctuations due to changes in water use behaviors during drought periods.

Since imported water is expected to be available during all year types, the basis of water year data that was used for the reliability assessment is therefore based on recycled water conditions. The average year supply is the average recycled water supply (total wastewater plant effluent flows) for FY 15/16 through FY 19/20. The single dry year supply basis is the wastewater treatment plant flows during FY 15/16, a hydrologically dry year with relatively low wastewater plant flows. This year was one of the last years of California's historic 2011-2017 drought, when almost 80% of the state was in a state of severe drought from 2013 through 2017 (National Oceanic and Atmospheric Administration, n.d.). The basis water years were limited to the past 5 years to accurately account for the growth in recycled water supply and demand that has occurred. The multiple dry year supply basis is based on repeated FY 15/16 conditions. Table 7-3 shows the basis of water year data used to define each scenario. The single and multiple dry year percentage of average supply was used as a multiplier to calculate the reduced volume of supplies available in the single dry and multiple dry years scenario. Since recycled water is not strongly influenced by drought periods, the available supply during the dry year scenarios is just 26 AF less than the average year supplies, which rounds to 100% of average year supplies.

### Table 7-2: Projected Regional Baseline Water Supply Sources

| Supply Type | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Imported Water – IEUA | 66,438 | 92,928 | 94,928 | 96,928 | 98,928 | 98,928 |
| Imported Water – Other | 17,667 | 10,728 | 10,728 | 10,728 | 10,728 | 10,728 |
| Chino Basin Groundwater | 51,749 | 63,129 | 72,822 | 78,441 | 89,776 | 92,080 |
| Other Groundwater | 26,436 | 27,060 | 27,171 | 27,282 | 27,394 | 27,505 |
| Surface Water | 16,652 | 10,089 | 10,089 | 10,089 | 10,089 | 10,089 |
| Recycled Water - Direct Use | 16,278 | 23,932 | 25,929 | 26,794 | 28,823 | 29,323 |
| Recycled Water - Groundwater Recharge | 13,381 | 16,420 | 16,420 | 16,420 | 16,420 | 16,420 |
| Chino Basin Desalter | 14,649 | 17,733 | 17,733 | 17,733 | 17,733 | 17,733 |
| Water Use Efficiency | 3,292 | 9,788 | 11,984 | 17,257 | 22,570 | 27,802 |
| **TOTAL** | **226,542** | **271,807** | **287,804** | **301,672** | **322,461** | **330,608** |

**Note:** Roll up of retail agency projections except for 2020, which are actual values. SAWCo is not included in the table because transfers from SAWCo are reported within receiving member agency values. The values in this table match the retail agency water supplies shown in Table 4-2, with the additional inclusion of recycled water for

groundwater recharge and water use efficiency as supply sources. For the "Imported water – IEUA" supply, water purchases in excess of Tier 1 allocation of Resolution 2014-12-01 will be assessed at the Tier 2 rate.

**Table 7-3: IEUA Service Area: Basis of Water Year Data (Reliability Assessment) (DWR Table 7-1)**

| Year Type | Base Year<br>*If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000* | Available Supplies if Year Type Repeats | |
|---|---|---|---|
| | | | Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP Location: |
| | | X | Quantification of available supplies is provided in this table as either volume only, percent only, or both. |
| | | **Volume Available (acre-feet)** | **% of Average Supply** |
| Average Year | FY 15/16 - FY 19/20 | 147,503 | 100% |
| Single-Dry Year | FY 15/16 | 147,477 | 100% |
| Multiple-Dry Years 1st Year | FY 15/16 | 147,477 | 100% |
| Multiple-Dry Years 2nd Year | FY 15/16 | 147,477 | 100% |
| Multiple-Dry Years 3rd Year | FY 15/16 | 147,477 | 100% |
| Multiple-Dry Years 4th Year | FY 15/16 | 147,477 | 100% |
| Multiple-Dry Years 5th Year | FY 15/16 | 147,477 | 100% |

**Note**: Average year is the average of FY 15/16 through FY 19/20 wastewater plant flows plus the MWD contract amount from Resolution 2014-12-1. Single and multiple dry years is FY 2015/16.

As described in the sections that follow, Table 7-4 through Table 7-6 present the supplies and demands under the various water year scenarios for the 25-year planning period in 5-year increments for combined potable (imported) and non-potable (recycled) water sources.

### 7.3.1 Normal Water Year

The normal water year is a year in the historical sequence that most closely represents median runoff levels and patterns. Table 7-4 shows the expected imported and recycled water supplies available over the planning period during an average/normal year and compares them to demands for the same period. The expected imported water supply is equivalent to IEUA's purchase order agreement amount with MWD. The expected recycled water supply is based on wastewater plant flow projections from Table 4-6.

The numbers in Table 7-4 demonstrate that the IEUA region anticipates adequate supplies for 2025 to 2045 under normal water conditions.

### 7.3.2 Single-Dry Year

The water supplies and demands for the IEUA service area over the 25-year planning period were analyzed in the event that a single-dry year occurs. FY 15/16 was selected as a representative single dry year since it was one of the last years of the historic 2011-2017 drought and was hydrologically dry year with low wastewater plant flows that still reflects current recycled water supply and demand trends. Table 7-5 shows the IEUA supply available to meet demands during a single-dry year based on its contract with MWD and 100% of the recycled water projections available during a normal year. As noted above, the imported supply is not expected to decrease during a 5-year drought. The recycled water supplies are based on the percentage of average influent water flows available during FY15/16. The 2015 IRP found that demand during a single dry year is expected to increase by up to 3.74% more than normal year demands by 2040. To account for this increase in demand, a demand increase factor was applied to each 5-year period, ramping up from a 0.62% increase in 2025 to a 3.74% increase in 2040. The 3.74% increase was also applied to calculate the increased demand for 2045.

Despite the demand increase, Table 7-5 still shows a surplus for each 5-year period under single-dry year conditions.

### 7.3.3 Multiple-Dry Year (5-Year)

The water supplies and demands for the IEUA service area over the 25-year planning period were analyzed in the event that a multiple-dry year occurs, specifically a 5-year drought period. This drought is considered to be equivalent to 5 years of conditions similar to FY 15/16. Table 7-6 shows the supply available to meet demands during a multiple-dry year. As noted above, the imported supply is not expected to decrease during a 5-year drought. The recycled water supplies are based on the percentage of average influent water flows available during FY 15/16. However, the 2015 IRP found that demand during a prolonged drought year is expected to increase by up to 5.98% more than normal year demands by 2040. To account for this increase in demand, a demand increase factor was applied to each 5-year period, ramping up from a 1% increase in 2025 to a 5.98% increase in 2040. This 5.98% increase was also used to calculate the increased demand for 2045.

Despite the demand increase, Table 7-6 still shows a surplus for each 5-year period for each year of the 5-year drought conditions.

**Table 7-4: IEUA Service Area: Normal Year Supply and Demand Comparison – in Acre-Feet (DWR Table 7-2)**

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply totals | 153,356 | 156,490 | 157,425 | 160,119 | 160,119 |
| Demand totals | 116,716 | 120,927 | 124,136 | 128,212 | 128,756 |
| **Difference** | **36,640** | **35,563** | **33,289** | **31,907** | **31,363** |

**Note**: Normal year based on the average of FY 2015/16- FY 2019/20 conditions.

**Table 7-5: IEUA Service Area: Single Dry Year Supply and Demand Comparison - in Acre-Feet (DWR Table 7-3)**

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| Demand totals | 118,899 | 123,938 | 128,009 | 133,007 | 133,571 |
| **Difference** | **34,431** | **32,524** | **29,388** | **27,084** | **26,519** |

**Note**: IEUA considers FY 15/16 to represent the single dry year hydrologic conditions. The expected supply is 100% of normal year supply. The IEUA IRP forecasts a regional demand increase of 3.74% by 2040 for a single dry year due to above normal temperature and reduced wet periods (IEUA IRP Appendix E, 2016). Demand increase for prior years is interpolated (from 0.62% in 2015 to 3.74% in 2040). The demand increases for 2045 is assumed to be the same as 2040.

**Table 7-6: IEUA Service Area: Multiple Dry Years Supply and Demand Comparison – in Acre-Feet (DWR Table 7-4)**

| Dry Years | Supply | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| First year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | **Difference** | **33,124** | **30,710** | **27,079** | **24,212** | **23,635** |
| Second year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | **Difference** | **33,124** | **30,710** | **27,079** | **24,212** | **23,635** |
| Third year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | **Difference** | **33,124** | **30,710** | **27,079** | **24,212** | **23,635** |
| Fourth year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | **Difference** | **33,124** | **30,710** | **27,079** | **24,212** | **23,635** |
| Fifth year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | **Difference** | **33,124** | **30,710** | **27,079** | **24,212** | **23,635** |

**Note**: IEUA considers FY 15/16 to represent each year of the multiple dry year hydrologic conditions. The expected supply is 100% of normal year supply. The IEUA IRP forecasts a regional demand increase of 5.98% by 2040 for a multi-dry year due to above normal temperature and reduced wet periods (IEUA IRP Appendix E, 2016). Demand increase for prior years is interpolated (from 1.00% in 2015 to 5.98% in 2040). The demand increases for 2045 is assumed to be the same as 2040. The supply and demand for each year of the multi-year drought is expected to be the same.

## 7.4 Summary of Comparisons

As shown in the analyses above, IEUA has adequate supplies to meet demands during normal, single-dry, and multiple-dry years throughout the 25-year planning period. Based on the reliability analysis completed by MWD for their 2020 UWMP, no decrease in imported water from MWD is expected during dry years due to MWD's extensive storage, transfer, and water supply management efforts. Recycled water supplies are also not expected to decrease overall during drought periods since wastewater flows are typically not significantly affected by drought periods. While IEUA does not expect a shortfall under the scenarios considered, they continue to support reduction in water use through demand management measures, as described in Section 8, and consideration of other supply opportunities to increase the resiliency of their water supply. IEUA is also aware of the potential disruption of supply due to water quality changes and is considering future actions that will help to mitigate any impacts, as discussed in Section 6.

## 7.5 Drought Risk Assessment

The California Legislature created the new Drought Risk Assessment (DRA) requirement for the 2020 UWMP in part because of the significant duration of recent California droughts and the predictions about hydrological variability attributable to climate change. The DRA requires suppliers to assess water supply reliability over a 5-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for 5 consecutive dry years. Table 7-7 shows the expected water use (in AF) and the expected total supplies for each year from 2021 to 2025 for both potable water from MWD and IEUA recycled water. As with the reliability assessment, the water supplies and demands only include imported water from MWD and recycled water. The water use for each year was found by interpolating between the 2020 actual water demand total (from the FY 19/20 Annual Water Use Report and the FY 19/20 Recycled Water Annual Report) and the 2025 projected water use during a multiple-year drought (from Table 7-6 above). The expected total supplies were calculated by interpolating between the average year supply estimate from Table 7-1 and the 2025 projected supply available during a multiple year drought (from Table 7-6 above).

As shown in Table 7-7, IEUA expects to have a surplus for each of the 5 years of the consecutive 5-year drought. Therefore, no Water Shortage Contingency Plan actions are required to be implemented. However, in the case of a shortfall in supply, the use reduction and supply augmentation measures described in the WSCP (see Appendix B) are available to be implemented. In addition, IEUA is aware of future impacts to their water supplies and is always considering additional potential opportunities for water supplies or use reduction. IEUA may explore the future water supply projects and programs described in Section 4-4 to further increase their resiliency to drought conditions.

**Table 7-7: DWR Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b) (DWR Table 7-5)**

| 2021 | Total |
|---|---|
| Total Water Use (AF) | 100,497 |
| Total Supplies (AF) | 148,650 |

| 2021 | Total |
|---|---|
| Surplus/Shortfall w/o WSCP Action (AF) | 48,153 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **48,153** |
| Resulting % Use Reduction from WSCP action | 0% |
| **2022** | **Total** |
| Total Water Use (AF) | 105,098 |
| Total Supplies (AF) | 149,806 |
| Surplus/Shortfall w/o WSCP Action (AF) | 44,708 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **44,708** |
| Resulting % Use Reduction from WSCP action | 0% |
| **2023** | **Total** |
| Total Water Use (AF) | 109,911 |
| Total Supplies (AF) | 150,972 |
| Surplus/Shortfall w/o WSCP Action (AF) | 41,061 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **41,061** |
| Resulting % Use Reduction from WSCP action | 0% |
| **2024** | **Total** |
| Total Water Use (AF) | 114,943 |
| Total Supplies (AF) | 152,146 |
| Surplus/Shortfall w/o WSCP Action (AF) | 37,203 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **37,203** |
| Resulting % Use Reduction from WSCP action | 0% |
| **2025** | **Total** |
| Total Water Use (AF) | 120,206 |
| Total Supplies (AF) | 153,329 |
| Surplus/Shortfall w/o WSCP Action (AF) | 33,124 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **33,124** |
| Resulting % Use Reduction from WSCP action | 0% |

**Note**: Years 2021 through 2024 are interpolated between the 2020 actual supply and use values and the 2025 projected supply and use for multi-year drought (from Table 7-4). 2020 actual supply is the average year supply from Table 7-1.

## 7.6 Description of Management Tools and Options

While IEUA does not anticipate any shortfall during drought periods, they are committed to supporting the water reliability of the region overall. Some of the management tools and options available to IEUA for increasing their regional water supply and reducing water demand have been described within other sections of this document. These tools and options include prioritizing maximizing the use of local water resources and minimizing the need for imported water due to the vulnerability of MWD imported water to climate change impacts such as changing precipitation patterns. IEUA also has a robust water use efficiency program detailed in Section 8 that identifies the most effective water use efficiency measures and partnerships for implementation in the region. This program coupled with savings from codes and standards and increased conservation-related messaging during drought periods can be a strong tool for reducing water use. IEUA has also made increasing the use of their recycled water a priority for future planning efforts, which will increase this source of supply for the region. Additional tools available to the region include water agency interconnections, service line capital improvements by MWD, and mutual aid agreements with other local agencies. Finally, enhanced groundwater management efforts and improvements in regional water management and coordination are also important for maintaining and enhancing the long-term overall resiliency of the region.

# Section 8: Demand Management Measures

The purpose of the Demand Management Measures (DMMs) section of this UWMP is to (a) provide a description of the past water conservation programs that IEUA has implemented since 2015 to support its retail agencies in meeting their urban water use reduction targets and (b) describe the activities and actions IEUA may implement in the future.

## 8.1 Demand Management

For the purposes of this UWMP, DMMs are categorized as "Foundational" and "Other" DMMs. Listed below are those DMMs that the UWMP Act and Water Code specifically mention for wholesalers:

a) Metering
b) Public education and outreach
c) Water conservation program coordination and staffing support.

Activities in addition to the Foundational DMMs that encourage lower water use in the Agency's service area fall in the "Other DMM" category.

In addition, wholesalers must include a narrative description of its distribution system asset management and wholesale supplier assistance programs. In IEUA's case, the majority of its "Other DMMs" are included in the wholesale supplier assistance programs section (Section 8.7), which has been broken into the following categories: residential; CII; and landscape.

### 8.1.1 Legislative and Regulatory Requirements

As can be expected in a state with ongoing water resource challenges, California's governing entities have issued a number of regulatory requirements and policies over the past decade. Some of the regulations focus on manufacturing standards while others aim to achieve higher levels of water conservation.

State water use efficiency standards are included in SB X7-7, which requires 20% per capita water use reduction by 2020, and Assembly Bill 1881, the Model Water Efficiency Landscape Ordinance (MWELO). The Indoor efficiency standard is set at 55 gallons per person per day and the outdoor efficiency standard is set at 80% of the local evapotranspiration for existing landscapes (2015 WUEBP).

In 2018, the California State Legislature enacted AB 1668 and SB 606 to establish a new foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts in California. The two bills were developed based on Governor Brown's "Making Water Conservation a California Way of Life" Executive Order B-37-16 signed in May 2016, which sets forth actions to use water wisely, eliminate water waste, strengthen local drought resilience, and improve agricultural water use efficiency and drought planning. The two bills provide requirements that affect water use efficiency and drought planning for urban water suppliers, agricultural water suppliers, and small

water suppliers and rural communities. The bills also require water suppliers to develop a Water Shortage Contingency Plan and conduct 5-year Drought Risk Assessment every 5 years. IEUA's WSCP and Drought Risk Assessment are included in this UWMP (Appendix B and Section 7.5, respectively).

There are other relevant standards and regulations that establish water use requirements for water agencies and customers that are included in Table 2-8 in Section 2. IEUA's water use efficiency programs and planning efforts comply with all current state legislative and regulatory requirements and increase the resiliency and sustainability of the region's water supplies. IEUA plans to continue its demand management measures to meet any potential future WUE legislation and regulations.

### 8.1.2 COVID-19 Considerations for FY 19/20

As noted throughout the following sub-sections, the COVID-19 pandemic that began towards the end of FY 19/20 affected IEUA and its retail agencies' delivery and participation of in-person programs. Staff at the retail agencies and IEUA rethought delivery of each program to keep customers, staff, and contractors safe. Programs were adapted to be contactless or virtual where possible. It is a testament to the resiliency and creativity of IEUA's retail agencies and contractors that the programs were adapted and continued with minimal downtime. Despite the pandemic, activity actually increased year-over-year.

While the future remains uncertain, most agree that the impacts of COVID-19 will be felt for some time. As IEUA and its retail agencies look toward the implementation of WUE programs in this new environment, they remain committed to ensuring the health and safety of its personnel, contractors, and customers. The WUE programs will look to leverage this new normal and come up with fresh ideas for the implementation of traditional programs. Among the accommodations and new practices, IEUA foresees a continued shift towards virtual or video-based workshops and services, a greater emphasis of bill savings in promotional materials, and evaluation of alternative program formats such as online stores and direct delivery of free and discounted products.

## 8.2 Commitment to Water Use Efficiency

Over the last 5 years, the State of California, specifically the southern California region, has reached a critical point in water supply reliability with the convergence of several key factors that include unseasonably low rainfall, critically dry conditions, drought, economic recession, and significant population increases. As a result of these conditions, water use efficiency has become a statewide priority, and most State and local leaders recognize it as a vital component in meeting current and future water supply needs and reliability.

IEUA and retail agencies have recognized the need for developing programs that protect existing water resources so that adequate water supplies will be available for sustainability and future growth. The development of reliable local resources has been critical to maintaining current and future water supplies. In September 1991, IEUA became one of the first water agencies to sign the CUWCC's Memorandum of Understanding Regarding Urban Water Conservation (MOU), accepting and supporting to implement a prescribed set of urban water conservation BMPs. CUWCC is now known as the California Water Efficiency Partnership.

As the regional wholesale supplier of imported water for the area, IEUA has assumed the role of coordinating the region's activities and programs to reduce demand. IEUA has worked closely with IEUA's retail agencies to facilitate the installation of thousands of water saving technologies and devices, as well as the implementation of public outreach and education programs throughout the region. IEUA retail agencies, whose direct contact with retail customers is crucial to the implementation of water use efficiency measures, have co-funded these efforts with IEUA and taken a proactive approach in educating and working with their customers to conserve water.

In light of these circumstances, IEUA and its retail agencies' commitment to conservation has increased over the past 25 years as demonstrated through financial investments, policies, authorization of a broad range of WUE and conservation programs, expansion of the regional recycled water program, support for legislation, and local ordinance implementation. Moving forward, IEUA will continue to implement active and code-based BMP-related activities using strategies identified in the 2020 Regional WUEBP that is currently in development (discussed in the next section).

The future still presents uncertainties and significant challenges in maintaining regional water supply reliability, especially as the impacts of climate change begin to exacerbate the already existing challenges. The continued development of new and expanded local resources is vital to sustaining current and future water sources. Conservation and the efficient use of water is the most cost-effective source of water supply and essential to meeting the regions demand, today and for years to come.

## 8.3 Water Use Efficiency Business Plan

Over the past 28 years, IEUA and its regional partners have made great progress to attain environmental stewardship and sustainability through the development of local water supplies and reduced dependence on costly and increasingly unreliable imported water. A large part of that progress has come through the implementation of WUE programs and measures. WUE is universally regarded as the most cost-effective method to reduce water demand within a region. WUE encompasses a wide range of programs, services, devices, and innovations that IEUA captures in its Regional WUEBP, which is updated every 5 years. The most recent WUEBP is currently in development in collaboration with IEUA's regional partners. In general, the elements in the WUEBP may focus on using water more efficiently, eliminating water waste, and drought proofing the region through increased use of recycled water, groundwater, stormwater, and other local water supplies.

The WUEBP may focus on identifying target customers that are the most inefficient water users, educating them about WUE attainment, and providing a "road map" to accomplish this. To create the WUEBP, a thorough review of current, past, and potential new programs is being conducted, with calculations to be performed for costs, savings, and overall benefits to the region. The WUEBP may also evaluate developing WUE trends, emerging technologies, and potential MWD funding availability or other grants. The WUEBP may provide a portfolio of recommended programs with direct quantifiable and cost-effective water savings. Each retail agency may elect to modify the design of the programs presented in the WUEBP and may choose to participate in all programs or only a select few. IEUA collaborates with each retail

agency to continually evaluate and modify the plan to meet the goals and objectives of the region.

Each year, IEUA prepares a comprehensive annual report that captures all the implemented activities from the past fiscal year. The annual report tracks the progress that has been made against the goals and objectives, identified in the WUEBP, and provides the retail agencies with service area specific data. As part of its annual report, IEUA quantifies the water savings by sector and by measure. The lifetime water savings by measure as of FY 19/20 are shown in Table 8-1. Savings from HETs dominate the lifetime water savings by measure table, at 42% of total savings, followed by turf removal and smart controllers.

The WUEBP is a working document and, as such, must be modified and updated as changes occur, and program years roll out. IEUA regularly reviews the plan and adjusts accordingly. Changes and/or reviews of the plan take place: when programs are added, subtracted, or modified; on an annual basis to meet the annual reporting requirements; every 5 years in parallel with UWMP updates; and as the State's framework policies are finalized.

The 2020 WUEBP in development may identify the future suite of water use efficiency programs for implementation and focuses on increased efforts in landscape management and reducing outdoor water use. Programs are designed to positively impact long-term behavior regarding efficient use of water. Those activities may include device rebates for residential and commercial customers, sprinkler system tune-ups, leak detection system rebates, turf replacement incentives, landscape evaluations, and landscape retrofits which incorporate hardware and climate appropriate plant recommendations that are consistent with landscape ordinances. This is combined with the ability to initiate a comprehensive marketing, education, and outreach program which includes the combined efforts of IEUA and its retail agencies. Details on the 2020 WUEBP in development and its possible selected programs are included in Section 8.9 and throughout the rest of Section 8.

**Table 8-1: Lifetime Savings by Measure for Past Achieved Conservation**

| Measure | Lifetime Savings (AF) | Percent of Total Savings |
|---|---|---|
| High Efficiency and Ultra Low Flow Toilets (all markets) | 47,448 | 42% |
| Turf Removal (all markets) | 11,938 | 11% |
| Smart Controllers (all markets) | 11,106 | 10% |
| Residential Landscape Retrofits (small & large) | 8,554 | 8% |
| High Efficiency Sprinkler Nozzles (all markets) | 8137 | 7% |
| Ultra-Low Volume Urinals | 7,123 | 6% |
| High Efficiency Clothes Washers (all markets) | 6,502 | 6% |
| Landscape Evaluations (all markets) | 5,309 | 5% |
| Fontana USD Retrofits | 4,170 | 4% |
| Plumbing Control Valves | 476 | 0.4% |
| Water Brooms | 416 | 0.4% |
| Pre-rinse Spray Valves | 379 | 0.3% |
| X-ray Film Processors | 304 | 0.3% |

| Measure | Lifetime Savings (AF) | Percent of Total Savings |
|---|---|---|
| Sprinkler System Tune-ups | 284 | 0.3% |
| Laminar Flow Restrictors | 247 | 0.2% |
| Pressure Regulating Valves | 178 | 0.2% |
| Cooling Tower Controllers | 155 | 0.1% |
| Leak Detection Devices | 83 | 0.1% |
| Pool Covers | 28 | 0.0% |
| Large Rotary Nozzles | 22 | 0.0% |
| Air-Cooled Ice Machines | 18 | 0.0% |
| Rain Barrels & Cisterns | 13 | 0.0% |
| **Total** | **112,890** | **-** |

**Note**: Water savings are active savings only.

### 8.3.1 Core Water Use Efficiency Strategies for the Region

There are five key elements to the WUE strategy within the IEUA region:

- **Promote Water Resource Management.** Manage effective WUE programs at a regional level using sound business decision-making practices to develop and implement strategies to meet water use efficiency targets and stretch limited water resources.

- **Develop and Implement Regional Programs.** Take advantage of economies of scale and stretch the limited regional WUE budget by implementing programs on a regional basis. It is recognized that some programs may only be implemented at the individual agency level, such as budget-based tiered rate structures and WUE ordinances.

- **Build IEUA Retail Agency Cooperation.** Foster cooperation, collaboration, and active participation of all IEUA retail agencies for the successful development and implementation of WUE programs. It is recognized that successful development and implementation of regional WUE programs requires retail agency cooperation in obtaining accurate water demand data, by customer class, in a timely manner, and promotion of cost-effective programs to customers.

- **Develop Incentive-Based Programs.** Develop effective incentive programs that encourage participation, provide public benefit, and achieve quantifiable water savings.

- **Public Recognition.** Provide recognition to customers who have implemented measures resulting in extraordinary water use efficiency achievements.

## 8.4 Foundational DMMs

### 8.4.1 Metering

IEUA does not have any direct connections to potable customers. All imported water supplied to the area through IEUA is delivered through direct connections owned by MWD.

### 8.4.2 Public Education and Outreach

Developed over the last 15 years and in cooperation with its local retail agencies, IEUA participates in and offers an array of regional educational outreach activities. These programs help provide support to the local retailers to help them meet their DMM requirements.

The following is a list of programs and activities implemented over the last 5 years that will continue to be foundational elements of IEUA's regional programs:

**National Theater for Children (NTC) Program:** Delivers a package of live theater, student curriculum, and teacher guides focused on uses of water, the importance of water, ways water gets polluted, and ways to conserve water to elementary schools throughout the region. In FY 19/20, NTC visited 40 elementary schools throughout the IEUA service area and conducted 74 shows.

**Shows that Teach:** Fun, theatrical-style productions which teach students about water science, the value of water, and the importance of conservation. Over FY19/20, this program conducted 23 performances at 12 schools. Retail agencies have decided to focus efforts on only one school education program moving forward and the Shows that Teach program will be eliminated.

**Water Discovery Field Trip Program:** Prior to the COVID-19 pandemic, IEUA provided free educational field trips to the Chino Creek wetlands and Educational Park to promote understanding of the value of natural treatment wetlands, the creation of habitat for endangered/sensitive species, and environmental stewardship. Due to the pandemic, IEUA shifted all education programs from in-person to virtual. In April 2020, IEUA launched Owlie's Virtual Adventures, a program featuring virtual tours, a series of At-Home Activities, how-to videos, and more.

**Community Outreach:** IEUA annually participates in the following community outreach activities in coordination with its retail agencies: San Bernardino County Water Conference, Landscape and Water Conservation Fair, CVWD's Earth Day, Earth Day at the Chino Creek Wetlands and Educational Park, and the Smart Irrigation Month Hose Nozzle Giveaway. IEUA also participates in other community outreach events that vary year to year.

**IEUA's Social Media Outreach:** IEUA continues to offer updates via Facebook, YouTube, Twitter, Instagram, and two educational blogs. On these social media platforms, IEUA provides up-to-the-minute information on events, news, education programs, drought updates, water-wise tips, park updates, and wildlife facts.

**IEUA's Regional "Water is Life" Student Art/Poster Contest:** IEUA hosts its annual "Water is Life" student art/poster contests for grades K-12. The theme "Water is Life" is used to help students express their creativity while focusing on the importance of water. IEUA typically receives over 500 entries annually. The top five winners from each category (K-5; 6-8; 9-12) are entered into MWD's regional contest.

**Solar Cup Competition**: The annual Solar Cup competition is held each year in May at MWD's Lake Skinner reservoir in the Temecula Valley. High school students from surrounding areas designed, built, equipped, and raced solar-powered boats. This competition encourages well-

thought-out boat design, high speed, and endurance, which require participants to use an alternative power source in a real-world application. IEUA co-sponsors three local highs school teams annually. The May 2020 competition was transitioned to a virtual competition that consisted of 12 virtual challenges due to the health precautions related to the COVID-19 pandemic.

**The Water Education – Water Awareness Committee:** Since 1989, the committee promotes the importance of water conservation in southern California through coordination and participation in community outreach projects and providing grant funded opportunities for local educators. Projects include hosting booths at local resource and educational fairs, conducting water education workshops at local schools, offering grant and scholarship opportunities for educators and students, and sponsoring an annual water conservation video contest and broadcast media and digital art contest.

### 8.4.3 Water Use Efficiency Program Coordination and Staffing Support

IEUA's WUE Program consists of two full time employees and two interns. Consultants are also hired to help with reports and larger initiatives, like the 5-year WUEBP. In addition, IEUA collaborates with CBWCD, MWD, and two vendors for funding and implementation of specific WUE programs.

Currently, IEUA's WUE program budget is approximately $2.7 million annually, $1.6 million of IEUA funding and another $1.1 million of outside funding. These revenues are collected with the support and cooperation of the retail water agencies. IEUA's revenue collection for water use efficiency and conservation comes from a Meter Equivalent Unit charge, which is the number of active water accounts of each meter served by an IEUA retail agency. Over the past 5 years, IEUA has dedicated an average of $1,600,000 annually to Wholesale Assistance Programs, of which $300,000 goes to education and outreach programs. These local funds are augmented with external funding from sources such as MWD, DWR, and the U.S. Bureau of Reclamation, and other inter-agency partnering programs.

The 2020 WUEBP in development may provide annual regional WUE program budgets with line items dedicated to specific WUE activities for the next 5 years. The draft projected annual budget for each year is shown in Table 8-2. This budget is still in development and may be subject to change. The budget amount reflects the financial commitment of IEUA only and are exclusive of MWD or other external financial contributions. The budgets presented do not align exactly with actual costs because the figures are based upon estimated WUE programming activity that vary depending upon program participation rates.

**Table 8-2: IEUA Annual Water Use Efficiency Programs Budget**

| Fiscal Year | Annual Water Savings (AF) |
|---|---|
| 2020/21 | $1,600,000 |
| 2021/22 | $1,600,000 |
| 2022/23 | $1,600,000 |
| 2023/24 | $1,600,000 |

| Fiscal Year | Annual Water Savings (AF) |
|---|---|
| 2024/25 | $1,600,000 |
| **Total** | **$8,000,000** |

**Notes**:
Budget includes IEUA regional program costs exclusive of outside funding.
Budget does not include administrative overhead costs.
Budget includes $300,000 per year for education and outreach programs.
Budget subject to change during 2020 WUEBP development.

## 8.5 Other DMMs

IEUA has also provided the following programs to support its retail agencies water use efficiency over the past 5 years:

**Member Agency Administered Program**: This program provides funding support for retail agency implemented local water use efficiency projects that demonstrate water savings. Members submit proposals that include a project scope of work, estimated water savings, and cost. Proposed project may not be duplicative of existing regional programs.

**Technology Based Software:** IEUA sponsored the development of agency-specific dashboards that allowed its retail agencies to locate high water use landscapes, identify over water-use parcels, track agency use against set State WUE objectives, and direct WUE programs to customer specific needs. These data analytics tools allow IEUA's retail agencies to identify customers more accurately with excess water usage and communicate with them on how their usage compares to accepted WUE standards.

**Budget-Based Water Rates:** This is one of the most cost effective WUE programs since there is no cost to implement. These rate structures allocate each individual account an amount of water that would be required for efficient indoor and outdoor water use, adjusted to real-time actual weather and customer characteristics. Customers are able to compare their individualized water budget with their actual usage and the appropriate economic signal rewards efficient use. With a clear financial incentive, the customer is motivated to maintain efficient use patterns. Over the last 5 years, three of IEUA's retail agencies have adopted budget-based rate structures within their respective service areas.

Additional "other" DMMs implemented by IEUA are described in the Section 8.7, Wholesale Agency Support.

## 8.6 Asset Management

IEUA does not own or operate a potable water distribution system, and therefore, does not have any potable water asset management programs.

## 8.7 Wholesale Agency Support

IEUA provides financial assistance to each of the local retail agencies in an effort to support local WUE implementation efforts. Each retail agency is eligible to receive an annual grant of

$2,000 to support special events, customer surveying, outreach materials, conservation devices, and vehicle magnets. In addition, IEUA covers dues costs for memberships in the Alliance for Water Efficiency and the California Water Efficiency Partnership on behalf of its retail agencies and conducts annual technical workshops that provide retail agencies with information related to specific water use efficiency initiatives, programs, BMP implementation and compliance with new statutory requirements. This is part of IEUA's commitment to the DMMs (Wholesaler Assistance Programs) which requires a wholesaler to provide financial and/or technical assistance to their local retail agencies to implement DMMs.

IEUA has an annual average WUE budget of approximately $1.6 million that is dedicated to supporting the local retail agencies in implementing WUE and conservation related programs. The following subsections detail residential, CII, landscape, and other programs offered by IEUA and its retail agencies over the last 5 years.

### 8.7.1 Residential Programs

Between 2015 and 2020, IEUA and its retail agencies continued implementing a variety of WUE and conservation programs and products that have led to significant accomplishments in demand reduction and sustained water savings. These programs have consisted of incentives for homeowners and businesses, landscape efficiency, and educational programs. Most of these programs have been very successful and others were introduced as pilots.

The following is a list of activities and programs that were accomplished by IEUA and its retail agencies from 2015 to 2020. Savings as reported by the WUE annual report for FY 19/20 are also included below. Additional details can be found in the annual report.

**MWD SoCalWater$mart.com Residential Rebate Program:** IEUA's foundational WUE rebate program for residential customers provides incentives for HETs, washing machines, sprinkler nozzles, weather-based irrigation controllers, and rain barrels. IEUA and its retail agencies dedicate funding specifically for enhancing MWD's base rate rebate amounts to attract greater customer participation. In FY 19/20, this program had an annual water savings of 57 AF for a total lifetime savings of 731 AF. A total of 7,051 devices, from over 1,500 residential and commercial customers, were rebated in FY 19/20. High efficiency sprinkler nozzles and HETs are the largest numbers of devices rebated by residential customers. This program has the lowest cost per AF of water savings.

**Turf Replacement Program:** As part of the Turf Replacement Program, residential customers within IEUA's service area are eligible for a $3 per square-foot rebate partially funded by MWD. In FY 19/20, approximately 184,286 square feet of residential turf was replaced, for an estimated annual water savings of 24 AF and a total lifetime savings of 243 AF.

**Residential Pressure Regulation Program:** This program, launched in June 2016, installs PRVs at meters, homes, or at the point-of-connection for irrigation systems to automatically reduce high incoming water pressure from water mains and provide a lower, more functional pressure distribution. PRVs ensure that end-use plumbing fixtures operate at the intended flow rate and reduce the incidence of excessively leaky pipes and fixtures. To date, this program has replaced 1,287 PRVs throughout the IEUA service area with projected savings of 4 AF per year and lifetime savings of 45 AF over the life of the devices. MWD completed a study of the water

savings following installation of PRVs, these savings are lower than previously expected; however, IEUA's retail agencies have elected to continue with the program because of its highly valued customer service. The program is now provided on a case-by-case basis for customers experience issues with pressure.

**Leak Detection Incentive Program:** Recent studies of leak detection programs show a reduction in water use of 8% to 18%, with approximately 70% of customers finding leaks. This program, which was starting as a pilot program at the beginning of FY 19/20, provides a point of purchase discount for the Flume Smart Water System. The Flume app provides real time alerts notifying customers of excessively high volume or long duration water usage. It allows customers to better understand their water usage through user-friendly visuals. Demand for this program was unprecedented and the program is being expanded in FY 20/21. This program has an annual savings of approximately 8 AF per year and a lifetime savings of 83 AF.

**IEUA Regional Residential Landscape Retrofit Program – DWR/MWD:** Initially launched in April 2011, this program provides outdoor irrigation evaluations and retrofits of high efficiency landscape devices for residential water service customers with lot sizes of ¼ acre or larger. Since program inception, a total of 1,672 site retrofits were completed with annual water savings from device upgrades amounting to 932 AF per year and a lifetime savings of 7,962 AF.

**IEUA Residential Education, Survey, and Controller Upgrade Program:** Focused on the higher water use demographic within the small residential landscape sector, this program promotes an improved understanding of landscape irrigation control technologies while ensuring more efficient scheduling and operation of automated irrigation systems through required training class attendance, landscape evaluations, and smart controller technology upgrades. In FY 19/20, over 450 smart controllers were installed. Program water savings to date is approximately 20 AF per year for an average lifetime savings of 196 AF.

**Santa Ana River Conservation and Conjunctive Use Program Smartscape Residential Tune-Up Program:** This pilot program was starting in April 2019 to provide services to maximize the efficiency of a customer's existing irrigation system. In partnership with ConservInc., Orange County Coastkeeper, and Inland Empire Water Keeper, the program includes services such as sprinkler repairs, valve replacements, drip irrigation couplers and emitter replacements, minor lateral irrigation line repairs, and a general audit. Final water savings from the program are still being determined.

**FreeSprinklerNozzles.com Voucher Program:** Launched in April 2011, this program enabled residential and commercial customers within IEUA's service area to obtain a voucher for free high efficiency irrigation spray nozzles through a web-based portal. Since program inception, a total of 2,214 vouchers have been redeemed by residents for a total of 60,591 nozzles and an estimated water savings of 267 AF per year with a lifetime savings of 1,333 AF.

**Water Softener Rebate Program:** IEUA incentivizes customers through a rebate to remove residential self-regenerating water softeners. Over the course of the program, 901 water softeners have been removed, for water savings of approximate 17 AF per year in addition to the removal of more than 200 tons of salt.

### 8.7.2 Commercial, Industrial, Institutional Programs

IEUA's service area hosts a diverse range of CII activities, including numerous service industries (such as hotels and restaurants), manufacturing, agriculture and health care, and a large number of schools and colleges. Each of these sectors present unique opportunities to reduce water consumption. Although commercial accounts comprise only 5% of the total number accounts in the IEUA area, they use approximately 17% of overall demand.

The following is a list of activities and programs that were accomplished by IEUA and its retail agencies from 2015 to 2020:

**MWD SoCalWater$mart.com CII Rebate Program:** IEUA's foundational water use efficiency rebate program for CII customers provides incentives that include plumbing fixtures, landscaping devices, and some industry specific technologies. IEUA and its retail agencies dedicate funding specifically for enhancing MWD's base rate rebate amounts to attract greater customer participation. In FY 19/20, this program had an annual water savings of 93 AF for a total lifetime savings of 1,043 AF. Laminar flow restrictors and HETs are the largest numbers of devices rebated by commercial customers. This program has the lowest cost per AF of water savings.

**Turf Replacement Program:** As part of the Turf Replacement Program, commercial customers within IEUA's service area are eligible for a $3 per square-foot rebate, partially funded by MWD. In FY 19/20, approximately 318,778 square feet of commercial turf was replaced, for an estimated annual water savings of 42 AF and a total lifetime savings of 421 AF.

**Garden in Every School Program:** Each year, the Garden in Every School Program awards either a $4,500 grant per school for up to four schools for the establishment of a new water-wise garden or a $1,000 mini-grant to participating schools to support the sustainability of existing gardens. Due to the COVID-19 pandemic, the program was put on hold through FY 20/21.

### 8.7.3 Landscape Programs

The semi-arid climate of the IEUA service area, with only 15 inches of average rainfall, combined with the lush landscaping aesthetic that is popular in the region, creates a significant water demand for irrigation of outdoor landscaping. The IEUA service area reflects this demand, where outdoor water use is estimated to be nearly 60% of total demand across all sectors. Many of the residential programs detailed in Section 8.7.1 are landscape programs that are categorized as residential programs.

IEUA and its retail agencies have also completed the following list of activities and programs over the last 5 years:

**Sprinkler Tune-Up Program:** Begun as a pilot in FY 18/19, the program was operated during FY 19/20 by Conserv Inc, IEUA's existing vendor for smart controller installation programs. There was unprecedented customer demand for this program, with a 275% increase in activity year-over-year. The program provides customers with a free landscape irrigation tune-up that includes recommendations for repairs and upgrades, replacement or adjustment of sprinkler heads and nozzles, reparation of valves and bad wiring, controller programming and scheduling,

and minor lateral irrigation line repairs. In FY 19/20, 450 tune-up services were performed, and the program achieved an annual water savings of 104 AF for a total lifetime savings of 209 AF.

**IEUA/Chino Basin Water Conservation District Landscape Evaluation and Audit Program (LEAP):** The LEAP program provides landscape and irrigation evaluations for residential and CII customers. This program was launched in 2007 through a grant from DWR and is available region-wide annually. In FY 19/20, 91 residential and 53 commercial properties were evaluated. The program has an annual savings of 43 AF and a total lifetime savings of 213 AF, the majority of which comes from commercial customers.

**IEUA Regional Landscape Training Workshops:** In a series of IEUA-sponsored courses, customers learn the latest ways to create sustainable landscape and improve landscape efficiency to reduce outdoor water usage through workshops. The courses cover information on landscape design and preparation, water wise landscaping, mulching, and composting, and more. Only four in-person workshops were held in FY 19/20, in part due to COVID-19 health precautions but also because of decline in customer demand.

**Residential Landscape Transformation Program:** From October 2012 to June 2016, this program offered residential participants contractor services that included landscape design, selection of climate appropriate plants, removal of living turf, installation of weed barriers and plants, and conversion of overhead sprinklers to drip irrigation. A total of 263 sites were completed removing 232,655 square feet of turf, resulting in an estimated water savings of 34 AF and a lifetime savings of 341 AF.

**Landscape Design Assistance Program:** This program delivers a comprehensive landscape design package to support front and backyard renovations at no cost to participants. The service has a market value of approximately $500. A partnership between IEUA, the CBWCD, and IEUA's retail agencies, this program is designed to provide participants with a clear and inspiring design that is easily usable by residents who have no experience reading landscape plans. Since the program launch in February 2018, 32 residential landscape designs have been created, eight turf replacement projects were completed, and 19 projects are in progress.

**Residential Landscape Guidebook:** The step-by-step instruction book includes "how-to's" on resilient landscape design, building healthy soils, selecting climate appropriate plants, and installing efficient irrigation systems. The Guidebook is located online at www.ieua.org/usewaterwisely/landscaping.

**Water Saving Garden Friendly**: This program helps customers find the resources they need to be water efficient in their landscape. The program developed a micro-website called "Water Saving Garden friendly in the Inland Empire", an online plant database climate specific to the region. The website also includes garden tours, a garden gallery, a search engine for plants, problem solving plant lists, plant and garden information report printouts, a garden resources section, and water conservation tips. The micro-site can be found at www.watersavinggardenfriendly.com.

## 8.8 Demand Management Achievements (2015-2020)

The above sections detailed recent savings for each program. Majority of these values come from the Alliance for Water Efficiency (AWE) Conservation Tracking Tool, which IEUA uses to plan for and track water conservation program activity and results. The tool helps estimate the effects of plumbing/appliance standards and planned conservation programs on future water use, utility costs and sales revenue, and average customer rates and bills. Data from the region's locally administered programs as well as MWD's regional rebate programs has been collected and entered into the AWE tracking tool for every year back to 1995.

Using the AWE Tracking Tool, for calendar year 2020, IEUA's annual water savings was approximately 408 AF and 3,292 AF over the life of the measures (excludes national plumbing standards). The majority of the annual water savings come from single-family and commercial programs, which are 49% and 44% of annual water savings, respectively. Table 8-3 shows the FY 19/20 lifetime savings by sector, the year's conservation savings through the lifespan of each measure, which varies measure by measure. Again, the single-family sector accounts for the majority of the water savings, at 64%, which comes predominantly through landscape measures, followed by 29% from the commercial sector. Due to the categorization of the programs, there are no annual water savings for the multi-family sector.

**Table 8-3: Water Savings by Sector**

| Sector | Lifetime Water Savings (AF) | Percent of Total Water Savings |
|---|---|---|
| Single-Family | 13,954 | 64% |
| Multi-Family | 0 | 0% |
| Commercial | 6,372 | 29% |
| Irrigation | 1,515 | 7% |
| **Total** | **21,841** | |

The eight major IEUA WUE programs with verifiable water savings are:

- SoCal WaterSmart Rebates (accounts for 37% of FY 19/20 annual savings and 54% of the lifetime savings)
- Sprinkler Tune-Ups (accounts for 25% of FY 19/20 annual savings and 6% of the lifetime savings)
- Turf Replacement (accounts for 16% of FY 19/20 annual savings and 20% of the lifetime savings)
- Landscape Audit and Evaluations (accounts for 11% of FY 19/20 annual savings and 7% of the lifetime savings)
- Smart Controller Upgrades
- Large Landscape Retrofits

- Leak Detection Incentives
- Pressure Regulation.

The quantifiable savings by program that have been achieved over the last 5 years are included in Table 8-4. As shown in these tables, HETs and turf removal have achieved the most savings both over the last 5 years and over all time (as shown previously in Table 8-1), followed by smart controllers and residential landscape retrofits. It should be noted that the HET program was phased out in FY 2015/16 but still are most of the lifetime savings.

**Table 8-4: Savings by Program (FY 2015/16 – FY 2019/20)**

| Measure | Lifetime Savings (AF) | Percent of Total Savings |
|---|---|---|
| High Efficiency Toilets (all markets) | 10,775 | 35% |
| Turf Removal (all markets) | 9,027 | 29% |
| Residential Landscape Retrofits (small & large) | 4,450 | 14% |
| Smart Controllers (all markets) | 2,025 | 7% |
| High Efficiency Sprinkler Nozzles (all markets) | 1872 | 6% |
| High Efficiency Clothes Washers (all markets) | 890 | 3% |
| Landscape Evaluations (all markets) | 704 | 2% |
| Plumbing Control Valves | 476 | 2% |
| Sprinkler System Tune-ups | 284 | 1% |
| Pressure Regulating Valves | 178 | 1% |
| Laminar Flow Restrictors | 142 | 0.5% |
| Leak Detection Devices | 83 | 0.3% |
| Ultra-Low Volume Urinals | 29 | 0.1% |
| Air-Cooled Ice Machines | 14 | 0.0% |
| Cooling Tower Controllers | 13 | 0.0% |
| Rain Barrels & Cisterns | 12 | 0.0% |
| **Total** | **30,974** | **-** |

## 8.9 2020 WUEBP and Future Demand Management Measures

IEUA recognizes that conserving water and increasing water use efficiency is an integral component of a responsible water management strategy. The IEUA region has achieved its 2020 SBX7-7 water use target largely by focusing on offering customers a portfolio of programs to increase indoor and outdoor water efficiency measures, developing building codes and landscape ordinances, and reducing demand for potable water by increasing recycled water supply. IEUA is committed to providing its customers with the education and tools to maintain and even lower their current water use.

The most recent WUEBP is currently in development and will be completed in 2021. The document may be split into two phases. The first phase may cover the WUE plans for the next 2 years. The second phase may be released as an addendum to the WUEBP and will cover the subsequent 3 years of the 5-year planning period. This potential breakdown into two phases

would allow IEUA and its regional partners to collaborate more effectively and give more time to dive into its plans to meet upcoming water use regulations. In general, the elements in the WUEBP may focus on using water more efficiently, eliminating water waste, and drought proofing the region through increased use of recycled water, groundwater, stormwater, and other local water supplies. As of the time of this writing, the 2020 WUEBP is still in development; any information included in Section 8 related to the 2020 WUEBP is therefore, subject to change.

As part of the development of the 2020 WUEBP, a possible a portfolio of recommended programs and new technologies have been identified for implementation over the next 5 years that will help the region achieve a prolonged, increased level of water efficiency. While the IEUA regional alliance is currently exceeding water use targets set by SBX7-7, IEUA will continue to implement the DMMs to further lower water uses in anticipation of future water use objectives. The programs, policies, and technologies detailed in the WUEBP will assist in helping IEUA's retail agencies to maintain the conservation levels to allow them to stay in compliance with the SBX7-7 2020 target as described in Section 3 of this UWMP.

Along with continuing its education and outreach programs, the development of the 2020 WUEBP identified possible selected programs for implementation as shown in Table 8-5 below. The table also includes a summary of the reasoning behind the potential selection and the support actions required for each program. These selected programs are subject to change with the further development of the 2020 WUEBP.

**Table 8-5: Selected Programs and Reasoning**

| Program | Reasoning | Support Actions |
|---|---|---|
| Landscape Evaluations | • Links customer with WUE Programs<br>• Provides one-on-one customer education<br>• Starts relationship with customer | • Prioritize large landscape customers – if possible, customers that are above their water budget allocation<br>• Provide more in-depth cost/benefit information<br>• Provide personalized follow-up and support |
| Sprinkler System Tune-Up | • Nearly all irrigation systems need repairs<br>• Repairs are necessary before efficiency upgrades are made otherwise new products will not work as designed<br>• There are millions of sprinkler nozzles in the IEUA territory that are not high efficiency and need to be retrofitted<br>• Measures are professionally installed by qualified contractors | • Nearly all irrigation systems need repairs<br>• Repairs are necessary before efficiency upgrades are made otherwise new products will not work as designed<br>• There are millions of sprinkler nozzles in the IEUA territory that are not high efficiency and need to be retrofitted<br>• Measures are professionally installed by qualified contractors |
| Large Landscape Retrofit | • Targets large water use<br>• Site visit verifies there will be savings<br>• Professional installations and programming of controller | • Identify customers through Tune-up Program<br>• Additionally, market locally<br>• Provide electronic follow-up with customer to ensure sustained savings |

| Program | Reasoning | Support Actions |
|---|---|---|
| Small Smart Controller Upgrade | • Offering to smaller lots provides bigger pool of potential customers<br>• Site visits verifies there will be savings<br>• Educational workshop ensures customer can program and maintain controller and therefore, sustain savings | • Use water budget and potential savings to show return on investment<br>• Consider providing video conferencing for controller programming assistance<br>• Consider customer co-pay to lower costs |
| Turf Replacement Incentive | • There are hundreds of thousands of square feet of irrigated turf in IEUA territory<br>• Replacing turf with regionally appropriate plants aids in transforming the market<br>• Program provides long term savings | • Provide easier access to support services<br>• Link customers with design services<br>• Follow up with customers to assist them through process |
| SoCal Water Smart Rebates | • MWD funding<br>• MWD administration<br>• Most cost-effective program<br>• Ease of implementation | • Continue to add incentive dollars to priority measures<br>• Promote through all other programs<br>• Market locally |
| Leak Detection Incentive | • Many homes have leaks, currently industry estimates 10%<br>• Most leaks go undetected and customers are not aware for months until they get their bill<br>• Repairing water damage caused by leaks can cost thousands of dollars for a typical homeowner<br>• Providing customers with data on their water use gives them the necessary information and motivation to make efficiency changes | • Finalize program delivery – standard rebate vs home delivery<br>• Market locally |
| Low Income Leak Repair | • Addresses equity and affordability issues – especially increasing financial impacts of COVID-19<br>• Repairing water damage caused by leaks can cost thousands of dollars for a typical homeowner<br>• Financially vulnerable population cannot afford to fix leaks<br>• Customers value service and builds relationship with water agency<br>• Program provides excellent PR | • Consider partnering with housing agencies or energy utility<br>• Conduct outreach to targeted population<br>• Identify leaks through water use analysis and preemptively reach out to customers |
| Pressure Regulating Valve Installations | • Many home plumbing systems have leaks and operate above the intended flow rate due to high pressure | • Consider customer co-pay option to lower costs<br>• Target customers with complaints about high water pressure<br>• Use as a means for promoting other conservation measures |

**Note**: Information from Draft 2020 WUEBP, information subject to change.

The draft 2020 WUEBP currently estimates that its water conservation programs will save approximately 9,008 AF of water over the next 5 years, at a cost of $52/AF. This cost falls well below the region's cost of purchasing imported water from MWD, which is $1,122/AF. Table 8-6 shows the potential projected annual water savings to be achieved through the 5-year plan currently being outlined in the 2020 WUEBP. These plans are subject to change with further development of the 2020 WUEBP.

**Table 8-6: Projected Annual Water Savings**

| Fiscal Year | Annual Water Savings (AF) |
|---|---|
| 2020/21 | 691 |
| 2021/22 | 1,340 |
| 2022/23 | 1,851 |
| 2023/24 | 2,333 |
| 2024/25 | 2,792 |
| **Total** | **9,008** |

**Note**: Values from Draft 2020 WUEBP, information is subject to change.

These potential projected annual water savings come from the projected annual activity for each measure, shown in Table 8-7 below.

**Table 8-7: Annual Activities by Measure (units vary)**

| Measure | FY 2020/21 | FY 2021/22 | FY 2022/23 | FY 2023/24 | FY 2024/25 |
|---|---|---|---|---|---|
| SCWS Premium Efficiency Toilet Rebates | 550 | 550 | 550 | 550 | 550 |
| SCWS Res High Efficiency Clothes Washer Rebates | 600 | 600 | 600 | 600 | 600 |
| SCWS Res High Efficiency Sprinkler Nozzle Rebates | 1,200 | 1,200 | 1,200 | 1,200 | 1,200 |
| SCWS Res Smart Controller Rebates | 600 | 600 | 600 | 600 | 600 |
| Large Landscape Retrofit Program | 200 | 200 | 200 | 200 | 200 |
| SCWS Res Turf Removal Rebate - IEUA $1 (sf) | 200,000 | 200,000 | 200,000 | 200,000 | 200,000 |
| SCWS CII Premium Efficiency Toilet Rebate | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| SCWS CII Smart Controller Rebate | 100 | 100 | 100 | 100 | 100 |
| SCWS CII High Efficiency Sprinkler Nozzle Rebates | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| SCWS Laminar Flow Restrictor Rebates | 1,000 | 1,000 | 1,000 | 1,000 | 1,000 |
| CBWCD Res Landscape Evaluation | 50 | 50 | 50 | 50 | 50 |
| CBWCD CII Landscape Evaluation | 50 | 50 | 50 | 50 | 50 |
| SCWS Rain Barrel Rebates | 50 | 50 | 50 | 50 | 50 |
| SCWS CII Turf Removal Rebates - IEUA $1 (sf) | 250,000 | 250,000 | 250,000 | 250,000 | 250,000 |
| Pressure Regulating Valve Program | 50 | 50 | 50 | 50 | 50 |
| SCWS Plumbing Flow Control Rebates | 350 | 350 | 350 | 350 | 350 |
| Smart Controller Upgrade Program | 250 | 250 | 250 | 250 | 250 |
| Sprinkler Tune-Up Program | 450 | 450 | 450 | 450 | 450 |
| Landscape & Irrigation Pay for Performance Incentive | 25 | 25 | 25 | 25 | 25 |
| Leak Repair Program - DAC Low Income | 100 | 100 | 100 | 100 | 100 |

**Notes**: SCWS = SoCal Water Smart. Res = Residential. CII = Commercial, Industrial, and Institutional.
DAC = Disadvantaged Communities
Information from Draft 2020 WUEBP, information is subject to change.

# Section 9: Energy Intensity Reporting

## 9.1 Overview

Water and energy resources are inherently connected. The California Energy Commission estimates that the transport and treatment of water, treatment and disposal of wastewater, and the energy used to heat and consume water account for nearly 20% of the total electricity and 30% of non-power plant related natural gas consumed in California. In 2015, California issued new rules requiring 50% of its power to come from renewables, along with a reduction in greenhouse gas emissions to 40% below 1990 levels by 2030. In 2018, Governor Jerry Brown signed Senate Bill 100 (SB100) into law, committing California to 100% carbon-free energy by 2045. IEUA has voluntarily reported the energy intensity of its wastewater and recycled water operations to assist with this goal. IEUA does not own or operate any potable water facilities.

The methodology for calculating water energy intensity outlined in Appendix O of the UWMP Guidebook was adapted from the California Institute for Energy Efficiency exploratory research study titled “Methodology for Analysis of the Energy Intensity of California’s Water Systems” (Wilkinson 2000). The study defines water energy intensity as the total amount of energy, calculated on a whole-system basis, required for the use of a given amount of water in a specific location.

UWMP reporting is limited to energy intensity associated with water management processes occurring within an urban water supplier’s direct operational control. Operational control is defined as authority over normal business operations at the operational level. Any energy embedded in water supplies imparted by an upstream water supplier (e.g., water wholesaler) or consequently by a downstream water purveyor (e.g., retail water provider) is not included in the UWMP energy intensity tables. IEUA’s calculations for wastewater treatment and recycled water conform to methodologies outlined in the UWMP Guidebook and Wilkinson study.

The water supply energy intensity and wastewater and recycled water energy intensities were calculated for the 2019-2020 fiscal year (July 1st through June 30th). The energy use associated with the wastewater and recycled water processes is shown below in Table 9-1. IEUA’s administrative facilities do not have dedicated energy consumption meters and instead share meters with the connected wastewater and recycled water facilities. As such, the per facility energy usage below includes administrative energy use. Excluding imported electricity that may come from renewable sources, approximately 32% of the total energy associated with IEUA’s wastewater and recycled water operations came from renewable sources, specifically solar, wind, and biogas capture.

**Table 9-1: Energy Use for FY 19-20 Wastewater and Recycled Water Processes**

| Facility | Electricity (kWh) | Natural Gas (kWh) | Diesel (kWh) | Propane (kWh) | Biogas (kWh) | Renewables (kWh) |
|---|---|---|---|---|---|---|
| *Wastewater Operations (FY 19-20)* | | | | | | |
| CCWRF | 6,093,490 | 2,491 | 20,515 | 3,643 | - | 291,104 |
| RP-1 | 19,764,610 | 137,798 | 121,964 | 132,753 | 19,682,446 | 1,472,002 |
| RP-2 | 2,127,332 | 51,597 | 67,851 | 607 | 7,164,301 | - |
| RP-4 | 7,040,126 | 4,922 | 27,336 | 2,226 | - | 311,110 |
| RP-5 | 8,612,362 | 2,288,982 | 23,293 | 607 | - | 1,938,054 |
| Biosolids Handling | - | - | 875,072 | - | - | - |
| Montclair Lift Station | 93,351 | - | - | - | - | - |
| Philadelphia Lift Station | 651,913 | - | - | - | - | - |
| San Bernardino Lift Station | 492,701 | - | - | - | - | - |
| Prado Dechlorination Station | 59,073 | - | - | - | - | - |
| Prado Lift Station | 893 | - | - | - | - | - |
| *Recycled Water Operations (FY 19-20)* | | | | | | |
| CCWRF | 3,186,402 | - | - | - | - | - |
| RP-1 | 6,910,814 | - | - | - | - | - |
| RP-2 | - | - | - | - | - | - |
| RP-4 | 2,614,994 | - | - | - | - | - |
| RP-5 | 2,518,862 | - | - | - | - | - |
| 1630 E. Station | 1,108,112 | - | - | - | - | - |

**Notes**:
1. Data collected for FY 2019/2020 from metered data.
2. Energy use data includes energy used for administrative buildings.
3. Diesel numbers are based on purchases and are an average of FY18-19 and FY19-20.
4. The Philadelphia Lift Station energy use is not included in the calculation of wastewater energy intensity; the lift station pumps high strength brine to the non-reclaimable wastewater system.

kWh = kilowatt-hour

## 9.2 Water Supply Energy Intensity

IEUA is a wholesale distributor of imported water and treats and delivers recycled water to retail agencies and some large retail agricultural customers for the purposes of agriculture, municipal irrigation, industrial uses, and groundwater replenishment. Recycled water is not included in the water supply energy intensity calculations but is included in the following section with wastewater. Since IEUA does not own any water supply infrastructure, it does not have any energy use related to its water supply and distribution, resulting in an energy intensity of zero kilowatt-hours per acre-foot. Table 9-2 (DWR's Table O-1A) is included below with this information in the narrative section.

## Table 9-2: Water Supply Energy Intensity

***Urban Water Supplier:*** *IEUA*

**Water Delivery Product** (If delivering more than one type of product use Table O-1C)

*Wholesale Non-Potable Deliveries*

Table 9-2: Water Supply Energy Intensity

| Table O-1A: Recommended Energy Intensity - Water Supply Process Approach | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Enter Start Date for Reporting Period | 7/1/2019 | Urban Water Supplier Operational Control | | | | | | | |
| End Date | 6/29/2020 | Water Management Process | | | | | | Non-Consequential Hydropower (if applicable) | |
| | | Extract and Divert | Place into Storage | Conveyance | Treatment | Distribution | Total Utility | Hydropower | Net Utility |
| *Volume of Water Entering Process (AF)* | | *0* | *0* | *0* | *0* | *0* | *0* | *0* | *0* |
| *Energy Consumed (kWh)* | | *0* | *0* | *0* | *0* | *0* | *0* | | *0* |
| *Energy Intensity (kWh/AF)* | | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* | *0.0* |

**Quantity of Self-Generated Renewable Energy**

0 kWh

**Data Quality** *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

*Metered Data*

**Data Quality Narrative:**

**Narrative:**

IEUA does not use any energy for stormwater management. Any energy associated with imported water is associated with the infrastructure owned and operated by MWD. IEUA therefore has no energy use associated with its water management process. Any energy associated with groundwater recharge is included in the wastewater and recycled water energy intensity calculations. Any upstream embedded energy consumed prior to IEUA taking control of its imported MWD water or downstream embedded energy consumed by IEUA's member agencies to treat or distribute this water is not included in this analysis.

## 9.3 Wastewater and Recycled Water Energy Intensity

IEUA manages regional sewage service within its 242-square mile service area to collect, treat, and dispose of wastewater delivered by contracting local agencies. A system of regional trunk and interceptor sewers conveys sewage to five regional wastewater treatment plants owned and operated by IEUA. Wastewater facilities use tertiary treatment to produce recycled water meeting Title 22 standards for non-potable reuse and groundwater replenishment. Recycled water that is not reused is discharged to the Santa Ana River. IEUA delineates wastewater from recycled water at the point following chlorination and prior to the recycled water pump stations.

In addition to wastewater and recycled water infrastructure, IEUA also operates the Prado Dechlorination Facility, Inland Empire Regional Composting Facility, and Chino Creek Wetlands & Educational Park. While operationally controlled by IEUA, the Inland Empire Regional Composting Facility and Chino Creek Wetlands & Educational Park are not directly related to the collection, treatment, or distribution of wastewater or recycled water and thus considered outside the reporting boundaries. While the UWMP Guidebook energy intensity definition considers the energy consumed for all Wastewater Management Processes (collect, treat, and discharge wastewater) and energy consumed for all Recycled Water Management Processes (convey, treat, and distribute recycled water supplies) IEUA has also included the energy consumption from administrative buildings, such as IEUA's headquarters facility, in the energy intensity calculation. This is because IEUA administrative facilities are directly connected to and share energy meters with wastewater and recycled water facilities. The energy associated with the NRWS is not included in the energy intensity calculations.

Over FY 19-20, IEUA collected and treated 55,245 AF of wastewater. 30,495 AF of recycled water was produced, of which 17,115 AF was distributed to retail agencies and retail customers and the remaining 13,381 AF was recharged. Any wastewater that was not recycled was discharged to the Santa Ana River; in FY 19-20 this volume was 24,750. Wastewater volume is based on metered data at the recycling plants.

Table 9-3 shows the energy intensity calculated for the wastewater and recycled water operations using the energy use provided in Table 9-1. The volume of wastewater entering the process is the amount of wastewater treated at the regional water recycling plants RP-1, RP-4, RP-5, and CCWRF. The wastewater is tertiary treated to recycled water meeting Title 22 quality standards for non-potable use and groundwater recharge. Of this volume, a portion is dechlorinated and then discharged to the Santa Ana River. There is no energy associated with the collection or conveyance of recycled; this energy is captured within the energy use for the wastewater operations collection and conveyance. The Philadelphia Lift Station conveys non-reclaimable wastewater to Los Angeles County; the volume and energy use associated with this lift station is therefore, not included in the wastewater energy intensity calculations.

A portion of the energy used in the wastewater and recycled water processes comes from self-generated renewable energy. In FY 19-20, the amount of renewable energy used was 30,859,017 kWh, of which 4,012,270 kWh was from renewable energy sources (solar and wind) and 26,846,747 kWh comes from the capture of biogas. A portion of biogas produced during wastewater treatment is captured and beneficially used as part of IEUA's treatment process. Unused biogas is flared to convert methane to carbon dioxide and reduce greenhouse gas emissions from the facilities. All the self-generated renewable energy is used in the wastewater treatment process. Not included in this amount of renewable energy is the portion of purchased

electricity that is supplied through sustainable sources. IEUA purchases electricity from Southern California Edison. On average, 30% of the electricity purchased is considered sustainable.

# Table 9-3: Wastewater and Recycled Water Energy Intensity

***Urban Water Supplier:*** *Inland Empire Utility Agency*

| Table O-2: Recommended Energy Intensity - Wastewater & Recycled Water | | | | |
|---|---|---|---|---|
| Enter Start Date for Reporting Period | 7/1/2019 | Urban Water Supplier Operational Control | | |
| End Date | 6/29/2020 | Water Management Process | | |
| | Collection / Conveyance | Treatment | Discharge / Distribution | Total |
| *Volume of Wastewater Entering Process (AF)* | *55,245* | *55,245* | *24,733* | *55,245* |
| *Wastewater Energy Consumed (kWh)* | *586,945* | *88,867,952* | *-* | *89,454,897* |
| *Wastewater Energy Intensity (kWh/AF)* | *11* | *1,609* | *-* | *1,619* |
| *Volume of Recycled Water Entering Process (AF)* | *30,495* | *30,495* | *30,495* | *30,495* |
| *Recycled Water Energy Consumed (kWh)* | *-* | *15,231,073* | *1,108,112* | *16,339,185* |
| *Recycled Water Energy Intensity (kWh/AF)* | *-* | *500* | *36* | *536* |

**Quantity of Self-Generated Renewable Energy related to recycled water and wastewater operations**

34,713,912 kWh

**Data Quality** *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

*Metered Data*

**Data Quality Narrative:**

Volume of water entering process based on metered data.

**Narrative:**

The volume of wastewater entering the process is the amount of wastewater treated at the regional water recycling plants RP-1, RP-4, RP-5, and CCWRF. The wastewater is tertiary treated to recycled water meeting Title 22 quality standards for non-potable use and groundwater recharge. A portion is dechlorinated and then discharged to the Santa Ana River. The Philadelphia lift station pumps brine to the non-reclaimable water system and is therefore not included in the wastewater energy intensity calculations. All other wastewater discharge flows by gravity to the Santa Ana River. There is no energy associated with the collection or conveyance of recycled water since the volume just moves within the regional water recycling plants.

A portion of the energy used in the wastewater and recycled water processes comes from self-generated renewable energy. In FY 19-20, the amount of renewable energy used was 34,713,912 kWh, of which 7,867,165 kWh was from renewable energy sources (solar and wind) and 26,846,747 kWh comes from the capture of biogas. This amount is approximately 32% of IEUA's total energy use. A portion of biogas produced during wastewater treatment is captured and beneficially burned as part of IEUA's treatment process. Unused biogas is flared to convert methane to carbon dioxide and reduce greenhouse gas emissions from the facilities. All the self-generated renewable energy is used in the wastewater treatment process. Not included in this amount of renewable energy is the portion of purchased electricity that is supplied through sustainable sources. IEUA purchases electricity from Shell and Southern California Edison (SCE). On average, 30% of the electricity purchased from Shell and SCE is considered sustainable.

IEUA also operates the Inland Empire Regional Composting Facility and the Chino Creek Wetlands & Education Park. While operationally-controlled by IEUA, these facilities are not directly related to the collecction, treatment, or discharge of wastewater or recycled water and are considered outside the reporting boundaries. Similarly, while much of IEUA's headquarters and vehicles are dedicated to supporting wastewater and recycled water operations, to maintain consistency with the UWMP Guidebook, energy consumption from these operations has been excluded.

## 9.4 Key Findings

Calculating operational energy intensities helps agencies understand the water-energy nexus as it relates to their operations and processes. However, there is still work that needs to be done to better understand upstream and downstream water-energy impacts. Reporting boundaries are important to consider when comparing energy intensities between providers and water supply sources, since these boundaries exclude any embedded energy impacts on downstream users. Engaging the upstream and downstream supply chain can lead to more informed decisions that benefit the environment and the engaged parties.

IEUA has taken advantage of its renewable resources by developing a diverse energy portfolio, but additional planning is needed to address changing environmental regulations that may dictate available technologies. To continue providing reliable services to the region while remaining a steward of the environment, IEUA completed a CCAP in 2018. This plan outlined four business goals: maximizing local water supplies, maintaining the health of the groundwater aquifer, maximizing system efficiencies, and measuring performance. These goals will not only guide the agency's energy use but will minimize the agency's impact on the environment. Excluding imported electricity from renewable sources, approximately 32% of the total energy associated with IEUA's wastewater and recycled water operations came from renewable sources, specifically solar, wind, and biogas capture.

# Section 10: Seismic Risk Assessment

Per the Water Code Section 10632.5, suppliers are required to assess seismic risk to water supplies as part of their WSCP. The plan also must include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

Pursuant to Water Code, the seismic risk assessment must include a description of the vulnerability of each of its water system(s) facilities. Suppliers are encouraged to assess the vulnerability of external facilities or components that extend outside the supplier's service distribution area (e.g., transmission pipes, delivery canals, surface water diversion pumps) since failure of them would still ultimately disrupt the supplier's ability to serve their customers.

As a wholesaler, IEUA does not own or operate any potable water supply infrastructure and therefore, did not conduct a seismic risk assessment. IEUA purchases imported water from MWD, which conducted a seismic risk assessment as part of its 2020 UWMP. A brief summary of MWD's Seismic Risk Assessment and Mitigation Plan (Appendix 9 of MWD'S 2020 UWMP) is included here.

MWD has developed a holistic strategy for seismic resiliency that includes providing a diversified water supply portfolio, establishing system flexibility and emergency storage, preventing damage to infrastructure during seismic or other extreme events, and minimizing water delivery interruptions through a dedicated emergency response and recovery organization. MWD's water conveyance and distribution facilities are designed either to withstand a maximum probable seismic event or to minimize the potential repair time in the event of damage. MWD's ongoing program works to evaluate the seismic risk of aboveground structures, dams, and pipelines based on the current state of practice, operating conditions, seismicity criteria, and asset management strategies. Infrastructure will be prioritized for rehabilitation based on the results of these evaluations. MWD also conducts special seismic assessments periodically to increase understanding of the vulnerability of its assets and operations to various seismic hazards. In addition, MWD is working with the State of California on the Delta Risk Management Strategy to reduce impacts of a seismic event in the Delta that would cause levee failure and disruption of SWP deliveries (MWD 2021). Further information on MWD's seismic risk assessment and resiliency plan can be found in MWD's 2020 UWMP, Appendix 9.

IEUA delivers imported water to its retail agencies via MWD's infrastructure. These retail agencies then distribute the imported water via their own collection and distribution system infrastructure. As part of each retail agencies' 2020 UWMP, they have conducted seismic risk assessments to identify any existing vulnerabilities and identify mitigation measures for implementation. Details of these risk assessments can be found within each respective agencies' 2020 UWMP.

IEUA designs, builds, and operates recycled water treatment and distribution system infrastructure. The recycled water infrastructure owned by IEUA is all designed and constructed in compliance with the most recent California Building Code (CCR Title 24, Part 2) and the standards and practices in place in the time of design. The majority of IEUA's recycled water

infrastructure was constructed or retrofitted after 1994, when the 6.7 magnitude earthquake in Northridge occurred. This landmark earthquake motivated significant revisions to the California Building Code to include stronger seismic resilience design requirements, which were finalized in 1998. IEUA's first major regional recycled water pipeline was constructed in 1995 and a backbone recycled water distribution system was installed in Chino and Chino Hills from CCWRF in 1997. Some of its water recycling plants were constructed prior to 1994 but have since been updated to comply with the current seismic design standards.

# Section 11: References


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Wilkinson, Robert. Methodology for Analysis of the Energy Intensity of California's Water Systems (January 2000).

# Appendix A

UWMP Checklist

# DWR Checklist for 2020 UWMP
## Checklist Arranged by Subject

| Water Code Section | Summary as Applies to UWMP | Subject | 2020 Guidebook Location | 2020 UWMP Location *(e.g. Section(s), page number(s), table/figure number(s) or briefly describe why CWC section does not apply)* |
|---|---|---|---|---|
| 10608.20(e) | Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. | Baselines and Targets | Chapter 5 | Section 3; Tables 3-2, 3-3, and 3-4. |
| 10608.22 | Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100. | Baselines and Targets | Section 5.7.2 | Section 3; Tables 3-2, 3-3, and 3-4. |
| 10608.24(a) | Retail suppliers shall meet their water use target by December 31, 2020. | Baselines and Targets | Section 5.7 | Section 3.1.2; Table 3-4. |
| 10608.24(d)(2) | If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment. | Baselines and Targets | Sections 5.2 and 5.5.7 | Not applicable. |
| 10608.36 | Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions. | Baselines and Targets | Section 5.1 | Section 8.7. |
| 10608.4 | Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form. | Baselines and Targets | Section 5.8 and App E | Section 3.1.2, Tables 3-3 and 3-4. Also Appendix F. |
| 10631(e)(1) | Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. | Demand Management Measures | Sections 9.2 and 9.3 | Not applicable. |
| 10631(e)(2) | Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program. | Demand Management Measures | Sections 9.1 and 9.3 | Section 8.4, 8.5, 8.6, 8.7, and 8.8. |
| 10608.26(a) | Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets. | Plan Adoption, Submittal, and Implementation | Chapter 10 | Not applicable. |
| 10621(b) | Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. | Plan Adoption, Submittal, and Implementation | Section 10.2.1 | Section 1.12; Tables 1-6, 1-7, 1-8. Appendix E. |
| 10621(f) | Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021. | Plan Adoption, Submittal, and Implementation | Sections 10.3.1 and 10.4 | IEUA will comply with this provision. |
| 10635(c) | Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR. | Plan Adoption, Submittal, and Implementation | Sections 8.12, 10.4 | Appendices B and Appendix E. |
| 10642 | Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan. | Plan Adoption, Submittal, and Implementation | Sections 10.2.2, 10.3, and 10.5 | Section 1.12; Tables 1-6, 1-7, 1-8. Also Appendices E and B. |
| 10642 | The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. | Plan Adoption, Submittal, and Implementation | Section 10.2 | Section 1.12; Tables 1-6, 1-7, 1-8. Appendix E. |
| 10642 | Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified. | Plan Adoption, Submittal, and Implementation | Section 10.3.1 | Section 1.12; Tables 1-6, 1-7, 1-8. Also Appendix D. [pending ] |
| 10644(a) | Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library. | Plan Adoption, Submittal, and Implementation | Section 10.5 | Section 1.12; Tables 1-6, 1-7, 1-8. Also Appendix D. [pending ] |
| 10644(a)(1) | Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption. | Plan Adoption, Submittal, and Implementation | Section 10.5 | Section 1.12; Tables 1-6, 1-7, 1-8. Also Appendix D. [pending ] |
| 10644(a)(2) | The plan, or amendments to the plan, submitted to the department shall be submitted electronically. | Plan Adoption, Submittal, and Implementation | Sections 10.4.1 and 10.4.2 | IEUA will comply with this provision. |

# DWR Checklist for 2020 UWMP
## Checklist Arranged by Subject

| Water Code Section | Summary as Applies to UWMP | Subject | 2020 Guidebook Location | 2020 UWMP Location (e.g. Section(s), page number(s), table/figure number(s) or briefly describe why CWC section does not apply) |
|---|---|---|---|---|
| 10645(a) | Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | Section 10.5 | IEUA will comply with this provision. Section 1.12; Tables 1-6, 1-7, 1-8. Also Appendix D. |
| 10645(b) | Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | Section 10.5 | Appendix B. |
| 10620(b) | Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier. | Plan Preparation | Section 2.1 | IEUA complies with this provision. |
| 10620(d)(2) | Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. | Plan Preparation | Section 2.5.2 | Section 1.12 and 1.13. |
| 10642 | Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan. | Plan Preparation | Section 2.6 | Section 1.12; Tables 1-6, 1-7, 1-8. Also Appendix E. |
| 10630.5 | Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. | Summary | Chapter 1 | Section 1. |
| 10631(a) | Describe the water supplier service area. | System Description | Section 3.1 | Section 1.5.1. |
| 10631(a) | Describe the climate of the service area of the supplier. | System Description | Section 3.3 | Section 1.10. |
| 10631(a) | Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045. | System Description | Section 3.4 | Section 1.6; Table 1-4. |
| 10631(a) | Describe other social, economic, and demographic factors affecting the supplier's water management planning. | System Description | Section 3.4 | Section 1.7. |
| 10631(a) | Describe the land uses within the service area. | System Description | Section 3.5 | Section 1.9. |
| 10631(a) | Indicate the current population of the service area. | System Description and Baselines and Targets | Sections 3.4 and 5.4 | Section 1.6. |
| 10631(b) | Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045. | System Supplies | Section 6.2.8 | Section 4; Tables 4-3, 4-4, 4-5, 4-6, 4-8. |
| 10631(b) | Indicate whether groundwater is an existing or planned source of water available to the supplier. | System Supplies | Section 6.2 | Section 4.2.2; Table 4-3. |
| 10631(b)(1) | Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought. | System Supplies | Section 6.2 | Section 7; Tables 7-2, 7-3, 7-4, 7-5, 7-6, 7-7. |
| 10631(b)(2) | When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies. | System Supplies | Section 6.1 | Section 4. |
| 10631(b)(3) | Describe measures taken to acquire and develop planned sources of water. | System Supplies | Section 6.1 | Section 4.4; Table 4-8. |
| 10631(b)(4)(A) | Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization. | System Supplies | Section 6.2.2 | Section 4.2.2.2.1. |

# DWR Checklist for 2020 UWMP
## Checklist Arranged by Subject

| Water Code Section | Summary as Applies to UWMP | Subject | 2020 Guidebook Location | 2020 UWMP Location (e.g. Section(s), page number(s), table/figure number(s) or briefly describe why CWC section does not apply) |
|---|---|---|---|---|
| 10631(b)(4)(B) | Describe the groundwater basin. | System Supplies | Section 6.2.2 | Section 4.2.2. |
| 10631(b)(4)(B) | Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump. | System Supplies | Section 6.2.2 | Section 4.2.2.2.1. |
| 10631(b)(4)(B) | For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions. | System Supplies | Section 6.2.3 | Not applicable. |
| 10631(b)(4)(C) | Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years | System Supplies | Section 6.2.4 | Section 4.2.2.1; Table 4-3. |
| 10631(b)(4)(D) | Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped. | System Supplies | Section 6.2 | Not applicable, IEUA does not pump groundwater. |
| 10631(c) | Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis. | System Supplies | Section 6.7 | Section 4.4.2. |
| 10631(f) | Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single- dry, and for a period of drought lasting 5 consecutive water years. | System Supplies | Section 6.8 | Section 4.4 and 7.6. |
| 10631(g) | Describe desalinated water project opportunities for long-term supply. | System Supplies | Section 6.6 | Section 4.4.3. |
| 10631(h) | Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source. | System Supplies | Section 2.5.1 | Not applicable. |
| 10631(h) | Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types. | System Supplies | Section 2.5.1 | Appendix E. |
| 10633(b) | Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. | System Supplies (Recycled Water) | Section 6.2 | Section 5.3; Table 5-1. |
| 10633(c) | Describe the recycled water currently being used in the supplier's service area. | System Supplies (Recycled Water) | Section 6.2 | Section 5.3; Table 5-1. |
| 10633(d) | Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses. | System Supplies (Recycled Water) | Section 6.2 | Section 5.4 and 5.5; Table 5-2. |
| 10633(e) | Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected. | System Supplies (Recycled Water) | Section 6.2 | Section 5.4 and 5.5; Tables 5-2, 5-3. |
| 10633(f) | Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year. | System Supplies (Recycled Water) | Section 6.2 | Section 5.7. |
| 10633(g) | Provide a plan for optimizing the use of recycled water in the supplier's service area. | System Supplies (Recycled Water) | Section 6.2 | Section 5.7. |
| 10631(d)(1) | Quantify past, current, and projected water use, identifying the uses among water use sectors. | System Water Use | Section 4.2 | Section 2.3 and 2.5. Tables 2-1, 2-2, 2-3, 2-4, 2-5. |
| 10631(d)(3)(A) | Report the distribution system water loss for for each of the 5 years preceding the plan update. | System Water Use | Section 4.3 | Not applicable. |
| 10631(d)(3)(C) | Retail suppliers shall provide data to show the distribution loss standards were met. | System Water Use | Section 4.2 | Not applicable. |
| 10631.1(a) | Include projected water use needed for lower income housing projected in the service area of the supplier. | System Water Use | Section 4.5 | Not applicable. |
| 10632(a) | Provide a water shortage contingency plan (WSCP) with specified elements below. | Water Shortage Contingency Planning | Chapter 8 | Appendix B. |
| 10632(a)(2)(A) | Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability. | Water Shortage Contingency Planning | Section 8.2 | Appendix B. |
| 10632(a)(2)(B) | Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code. | Water Shortage Contingency Planning | Section 8.2 | Appendix B. |

# DWR Checklist for 2020 UWMP
## Checklist Arranged by Subject

| Water Code Section | Summary as Applies to UWMP | Subject | 2020 Guidebook Location | 2020 UWMP Location (e.g. Section(s), page number(s), table/figure number(s) or briefly describe why CWC section does not apply) |
|---|---|---|---|---|
| 10632(a)(3)(A) | Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply. | Water Shortage Contingency Planning | Section 8.3 | Appendix B. |
| 10632(a)(3)(B) | Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories. | Water Shortage Contingency Planning | Section 8.3 | Appendix B. |
| 10632(a)(4)(A) | Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions. | Water Shortage Contingency Planning | Section 8.4 | Appendix B. |
| 10632(a)(4)(B) | Specify locally appropriate demand reduction actions to adequately respond to shortages. | Water Shortage Contingency Planning | Section 8.4 | Appendix B. |
| 10632(a)(4)(C) | Specify locally appropriate operational changes. | Water Shortage Contingency Planning | Section 8.4 | Appendix B. |
| 10632(a)(4)(D) | Specify additional mandatory prohibitions against specific water use practices that are in addition to state- mandated prohibitions are appropriate to local conditions. | Water Shortage Contingency Planning | Section 8.4 | Appendix B. |
| 10632(a)(4)(E) | Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action. | Water Shortage Contingency Planning | Section 8.4 | Appendix B. |
| 10632(a)(5)(A) | Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages. | Water Shortage Contingency Planning | Section 8.5 | Appendix B. |
| 10632(a)(5)(B)<br>10632(a)(5)(C) | Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications. | Water Shortage Contingency Planning | Section 8.5, 8.6 | Appendix B. |
| 10632(a)(7)(A) | Describe the legal authority that empowers the supplier to enforce shortage response actions. | Water Shortage Contingency Planning | Section 8.7 | Appendix B. |
| 10632(a)(7)(B) | Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3. | Water Shortage Contingency Planning | Section 8.7 | Appendix B. |
| 10632(a)(7)(C) | Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency. | Water Shortage Contingency Planning | Section 8.7 | Appendix B. |
| 10632(a)(8)(A) | Describe the potential revenue reductions and expense increases associated with activated shortage response actions. | Water Shortage Contingency Planning | Section 8.8 | Appendix B. |
| 10632(a)(8)(B) | Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions. | Water Shortage Contingency Planning | Section 8.8 | Appendix B. |
| 10632(a)(8)(C) | Describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought. | Water Shortage Contingency Planning | Section 8.8 | Appendix B. |
| 10632(a)(9) | Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance. | Water Shortage Contingency Planning | Section 8.9 | Appendix B. |
| 10632(a)(10) | Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented. | Water Shortage Contingency Planning | Section 8.10 | Appendix B. |
| 10632(b) | Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas. | Water Shortage Contingency Planning | Section 8.11 | Appendix B. |
| 10620(f) | Describe water management tools and options to maximize resources and minimize the need to import water from other regions. | Water Supply Reliability Assessment | Section 7.4 | Section 4.6. |
| 10634 | Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability | Water Supply Reliability Assessment | Chapter 7 | Section 6; Tables 6-1, 6-2. |

# DWR Checklist for 2020 UWMP
## Checklist Arranged by Subject

| Water Code Section | Summary as Applies to UWMP | Subject | 2020 Guidebook Location | 2020 UWMP Location *(e.g. Section(s), page number(s), table/figure number(s) or briefly describe why CWC section does not apply)* |
|---|---|---|---|---|
| 10635(a) | Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years. | Water Supply Reliability Assessment | Section 7.3 | Section 7.3, 7.4. Tables 7-2, 7-3,7-4, 7-5, 7-6. |
| 10635(b) | Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects. | Water Supply Reliability Assessment | Section 7.3 | Section 7.5; Table 7-7. |
| 10635(b)(1) | Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years. | Water Supply Reliability Assessment | Section 7.3 | Section 7.5. |
| 10635(b)(2) | Include a determination of the reliability of each source of supply under a variety of water shortage conditions. | Water Supply Reliability Assessment | Section 7.3 | Section 7.2, 7.3, 7.4. Tables 7-2, 7-3, 7-4, 7-5, 7-6. |
| 10635(b)(3) | Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period. | Water Supply Reliability Assessment | Section 7.3 | Section 7.3, 7.4. Tables 7-2, 7-3, 7-4, 7-5, 7-6. |
| 10635(b)(4) | Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change condition, anticipated regulatory changes, and other locally applicable criteria. | Water Supply Reliability Assessment | Section 7.3 | Section 1.11 and 4.5. |
| 10631.2(a) | The UWMP must include energy intensity information as stated in the code. | System Suppliers, Energy Intensity | Section 6.4 and Appendix O | Section 9. Tables 9-2, 9-3. |

# Appendix B

Water Shortage Contingency Plan Dated June 2021

FINAL

June 2021

KJ 2044518*00

# 2020 Water Shortage Contingency Plan

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Kennedy Jenks

300 N. Lake Ave, Suite 1020
Pasadena, CA 91101
626-568-4300

# Water Shortage Contingency Plan FINAL

29 June 2021

*6/29/2021*

Prepared for

**Inland Empire Utilities Agency**
6075 Kimball Avenue
Chino, California 91708

KJ Project No. 2044518*00

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# Section 1: Overview of 2020 IEUA Water Shortage Contingency Plan

The Inland Empire Utilities Agency (IEUA) is a wholesale water agency that treats and delivers recycled water and purchases imported water supplies[1] from Metropolitan Water District of Southern California (MWD) and distributes it to its seven retail agencies. Two of IEUA's retail water agencies, [Fontana Water Company (FWC) and Cucamonga Valley Water District (CVWD)] purchase untreated water directly from IEUA and provide their own treatment. Five of IEUA's retail water agencies purchase treated water from the Water Facilities Authority (WFA). WFA purchases untreated imported water from IEUA, treats and delivers the water to the cities of Chino, Chino Hills, Ontario, Upland, and Monte Vista Water District. IEUA does not operate any facilities connecting its retail water agencies to MWD's system.

MWD water supplies account for approximately 25 to 30% of the region's annual water supplies, plus additional water is stored by MWD in the Chino Basin for use in dry years. Each of the retail agencies has other water sources including groundwater and local surface water. Each retail agency has agency-specific Water Shortage Contingency Plans (WSCPs) that account for the reliability of each suppliers' unique water portfolio. The IEUA WSCP focuses on a regional representation of the reliability of imported water supplied by MWD with additional supply reliability from IEUA's recycled water supplies and then outlines the actions that IEUA may take to support its retail agencies during water shortage conditions. The WSCP may also apply to more generalized water shortage conditions that are not necessarily attributable to imported water shortages.

This WSCP is founded on several IEUA source documents, including the 2020 Regional Drought Contingency Plan (2020 DCP, included in WSCP Appendix A), the draft 2020 Water Use Efficiency Business Plan (WUEBP), the Annual Water Use Efficiency (WUE) Reports, and the 2010 and 2015 Urban Water Management Plans. In addition, there is overlapping content with the 2020 UWMP, especially the Supply Reliability (UWMP Section 4). It also draws upon the MWD 2020 WSCP.

This WSCP covers the required elements as set forth by CWC Section 10632. It should also be noted that statute recognizes the WSCP as viable a tool for use during drought emergencies as noted in Water Code section 10632.3 indicating that the State defers to the locally adopted WSCP to the extent practicable.

[1] As of this writing, all MWD supplies are from imported water sources. However, MWD is considering a potential 150 mgd potable reuse project. For more information, please see mwdh2o.com/rrwp

Because IEUA is a wholesale urban water supplier, some of the elements that pertain only to retail water suppliers may not be addressed in this WSCP[2]. For example. IEUA's WUEBP, which is updated every 5 years and Annual WUE Reports, address monitoring and tracking of WUE measures implemented which is not a requirement of wholesalers.

This WSCP document contains 11 sections. The first section is an introduction that explains the purpose of the WSCP and gives background on IEUAs service area. Section 2 is a summary of the water reliability available to IEUA, pursuant to CWC Section 10635. Section 3 is a description of the Annual Water Supply and Demand Assessment (Annual Assessment). Section 4 explains the WSCP's six standard water shortage levels and the relationship to the DCP shortage stages. Section 5 describes the WSCP's shortage response actions that align with the defined shortage levels and the evaluation of effectiveness. Section 6 addresses communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding any current or predicted shortages and any resulting shortage response actions. Section 7 describes mechanisms to determine water use reductions. Section 8 is a description of the financial consequences of and responses for drought conditions. Section 9 describes actions to prepare for catastrophic interruption. Section 10 addresses reevaluation and improvement procedures for monitoring and evaluating the functionality of the WSCP. Section 11 describes the process to adopt, submit, and amend the WSCP.

It is important to note that outcomes of the various planning processes are not a "cast in stone" series of actions that become mandated procedures, requiring stakeholder adherence. Instead, the plan acts as a resource and general guide for IEUA and its retail agencies. It is understood that each retail agency has its own distinct supply portfolio, operating principals, and customer characteristics. As such, there may be instances when a retail agency is not experiencing the same drought or water shortage impacts and will choose to take a modified course of action. As summarized in WSCP Section 5 and detailed in the DCP, a Drought Response Taskforce of staff from IEUA and its retail agencies may be convened in the event of a water shortage to identify the specific actions of IEUA and the retail agencies as appropriate to the particular shortage condition.

## 1.1 Relationship to the Urban Water Management Plan

Water Code Section 10632(a) requires that every urban water supplier prepare and adopt a water shortage contingency plan as part of its urban water management plan. While the water shortage contingency plan is a stand-alone document it is updated and adopted in concert with the UWMP. Content of the WSCP is informed by the analysis of water supply reliability conducted pursuant to Water Code Section 10635 (contained in the UWMP). The reliability analysis of the UWMP considered under "normal", "single-dry", and "5-year drought" conditions.

[2] WSCP elements that apply specifically to retailer water suppliers are: (1) a description of customer compliance, enforcement, appeal, and exemption procedures for triggered response actions [CWC Section 10632(a)(6)]; (2) a description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1 [CWC Section 10632(a)(8)(c)]; and (3) monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements [CWC Section 10632(a)(9)] (MWD 2020).

The analysis in the UWMP documents that the IEUA region has sufficient supplies to meet normal, single-dry, and multi-dry-year demands. An area of overlap between the UWMP and WSCP is a new requirement to prepare a Drought Risk Assessment (DRA) (Section 7.5 of the 2020 UWMP) to account for the significant duration of recent California droughts and the predictions about hydrological variability attributable to climate change.

The DRA requires suppliers to assess water supply reliability over a 5-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for 5 consecutive dry years. Table 1-1 (Table 7-7 in the UWMP) shows the expected gross water use [in acre-feet (AF)] and the expected total supplies for each year from 2021 to 2025. The water supplies and demands were aggregated on a regional basis to reflect the entire IEUA service area. The gross water use for each year was found by interpolating between the 2020 actual regional water demand total (from the FY 19/20 Annual Water Use Report and the FY 19/20 Recycled Water Annual Report) and the 2025 projected water use during a multiple-year drought (from UWMP Table 7-7).

As shown in Table 1-1, the IEUA region expects to have a surplus for each of the 5 years of the consecutive 5-year drought from 2021-2025. Therefore, no Water Shortage Contingency Plan actions are anticipated to be implemented. However, in the case of a shortfall in supply, the use reduction and supply augmentation measures described in Section 5 of this WSCP are available to be implemented.

**Table 1-1: DWR Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b) (DWR Table 7-5)**

| **2021** | **Total** |
|---|---|
| Total Water Use (AF) | 99,898 |
| Total Supplies (AF) | 148,650 |
| Surplus/Shortfall w/o WSCP Action (AF) | 48,752 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **48,752** |
| Resulting % Use Reduction from WSCP action | 0% |
| **2022** | **Total** |
| Total Water Use (AF) | 103,850 |
| Total Supplies (AF) | 149,806 |
| Surplus/Shortfall w/o WSCP Action (AF) | 45,957 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **45,957** |
| Resulting % Use Reduction from WSCP action | 0% |

| 2023 | Total |
|---|---|
| Total Water Use (AF) | 107,958 |
| Total Supplies (AF) | 150,972 |
| Surplus/Shortfall w/o WSCP Action (AF) | 43,014 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **43,014** |
| Resulting % Use Reduction from WSCP action | 0% |
| **2024** | **Total** |
| Total Water Use (AF) | 112,228 |
| Total Supplies (AF) | 152,146 |
| Surplus/Shortfall w/o WSCP Action (AF) | 39,918 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **39,918** |
| Resulting % Use Reduction from WSCP action | 0% |
| **2025** | **Total** |
| Total Water Use (AF) | 116,667 |
| Total Supplies (AF) | 153,329 |
| Surplus/Shortfall w/o WSCP Action (AF) | 36,662 |
| *Planned WSCP Actions (use reduction and supply augmentation)* | |
| WSCP - supply augmentation benefit (AF) | 0 |
| WSCP - use reduction savings benefit (AF) | 0 |
| **Revised Surplus/(shortfall) (AF)** | **36,662** |
| Resulting % Use Reduction from WSCP action | 0% |

**Note**: Years 2021 through 2024 are interpolated between the 2020 actual supply and use values and the 2025 projected supply and use for multi-year drought (from Table 7-4). 2020 actual supply is the average year supply from Table 7-1.

# Section 2: Water Supply Reliability Analysis

This section addresses overall water supply reliability for IEUA and meets Water Code Section 10635. Information from the 2010 UWMP which focused on IEUA's role as a wholesaler, information from the 2015 UWMP which included IEUA and Water Facilities Authority (WFA), a retailer, and information from Section 4 of the 2020 UWMP, the 2020 DCP and MWD's draft WSCP issued in February 2021 are used to analyze supply reliability for this section. MWD has taken the lead in drought planning for the southern California region. This is particularly relevant to IEUA, as IEUA is a wholesaler of MWD water.

## 2.1 MWD Water Supply Reliability

As described in MWD's draft WSCP issued in March 2021, MWD continuously engages in planning for various aspects of its water management, including operations, long-term reliability, and emergency response. These MWD planning efforts include the 1996 Integrated Water Resources Plan (MWD IRP) and its three updates in 2004, 2010, and 2015; the 2020 MWD IRP (currently in development); the draft 2020 WSCP; the annual Water Surplus and Drought Management (WSDM) Plan; the Water Supply Allocation Plan (WSAP); the annually calculated Emergency Storage Objective; and the 2020 Seismic Risk Assessment and Mitigation Plan. These efforts provide a policy framework, operating guidelines, and resource targets for MWD to ensure regional water supply reliability. MWD's WSCP is designed to be consistent with its WSDM Plan and WSAP as described below.

### 2.1.1 Water Surplus and Drought Management Plan

In 1998, MWD's Board of Directors adopted the WSDM Plan, which addresses both surplus and shortage operating strategies (reference MWD WSDM Plan, April 1998). The WSDM plan reflects anticipated drought responses based on the water supplies available to Metropolitan. Similar in concept to MWD's WSCP, the WSDM Plan provides an overall vision for operational supply management and characterizes a flexible sequence of actions to minimize the probability of severe shortages and reduce the likelihood of extreme shortages. WSDM Plan principles guide the specific actions to be taken under MWD WSCP shortage stages. Data collection, continual analysis, and monthly reporting processes of WSDM Plan implementation will form the basis for MWD's Annual Water Supply Demand Assessment that will be provided annually to the state beginning in July 2022. Because managing MWD's water supply resources requires timely and accurate information on supply and demand conditions that change throughout the year, MWD evaluates available water supplies and existing water storage levels on a monthly basis to determine the appropriate actions identified in the WSDM Plan.

Table 2-1 (referenced from the 2010 MWD UWMP) lists the definitions used by MWD in the WSDM Plan for surplus, shortage, severe shortage, and extreme shortage conditions. Except in severe or extreme shortages or emergencies, MWD's resource management will allow imported water shortages to be mitigated without impacting municipal and industrial customers, including IEUA and IEUA's retail agencies. The WSDM Plan is detailed in Chapter 4 of the MWD UWMP.

**Table 2-1: MWD WSDM Plan Definitions**

| | |
|---|---|
| Surplus | Metropolitan can meet full-service and interruptible program demands, and it can deliver water to local and regional storage. |
| Shortage | Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfer, as necessary. |
| Severe Shortage | Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation. In a Severe Shortage, Metropolitan may have to curtail Interim Agricultural Water Program deliveries. |
| Extreme Shortage | Metropolitan must allocate available supply to full-service customers. |

The shortage stages presented in this section apply to IEUA's imported water supply only. The water shortage actions specific to IEUA's water shortage stages are discussed in Section 5.

### 2.1.2 Water Supply Allocation Plan

MWD's Board of Directors also adopted the WSAP in February 2008 in anticipation of possible water supply shortages. The WSAP provides guidance for allocating limited water supplies to member agencies should the need arise. The WSAP is integral to MWD's WSCP's shortage response strategy in the event that MWD determines that supply augmentation (including storage) and demand reduction measures would not be enough to meet a projected shortage.

MWD's WSAP was developed in consideration of the principles and guidelines in MWD's 1999 WSDM Plan. The WSAP's formula seeks to balance the impacts of a shortage at the retail level while still maintaining equity at the wholesale level for supply shortages of up to 50 percent (%). The formula takes into account the impact on retail customers and the economy, growth and population, changes in supply conditions, investments in local resources, demand hardening aspects of non-potable recycled water use, implementation of conservation savings program, participation in MWD's interruptible programs, and investments in facilities.

In order to implement the WSAP, the MWD Board annually determines the level of the regional shortage based on specific criteria each April; this information is incorporated into IEUA's Annual Water Supply and Demand Assessment discussed in MWD WSCP Section 3. MWD's allocations, if deemed necessary, go into effect in July of the same year and remain in effect for a 12-month period. The WSAP includes an annual review of all MWD supplies and regional shortages to determine overall reliability for the year under review.

The WSAP is MWDs policy and formula for equitably allocating available water supplies to the member agencies during extreme water shortages when MWD determines it is unable to meet all its demands.

### 2.1.3 Emergency Storage Objective

The MWD Emergency Storage Objective, which is the regional planning estimate for emergency storage, is based on the potential for a major earthquake that would damage all supply aqueducts, isolating Southern California from its imported water sources, or a similar disaster.

In 2019, MWD and its member agencies completed a process to update the planning estimate of MWD's Emergency Storage Objective. This emergency storage represents the amount of water that MWD would store for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct of the State Water Project (SWP), and the Los Angeles Aqueduct. The emergency storage allows MWD to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

Beginning January 2020, CWC Section 10632.5 mandates that urban water suppliers include in their UWMP a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For IEUA, this requirement was addressed as part of developing its resilience strategy and is presented in detail in MWD's seismic resiliency reports in Appendix 9 to MWD's 2020 UWMP.

## 2.2 IEUA Water Supply Reliability

IEUA's imported water supply reliability is directly tied to MWD's supply reliability and if imported shortages occur, MWD uses the WSAP to allocate the available water. Fortunately, IEUA's exposure to potential MWD shortages is minimized in that imported water represents only 25 to 30%of the total regional supplies. Member agencies have rights to local surface and groundwater for the remaining 70 to 75% of the supply needed. Moreover, IEUA provides recycled water and is able to capture stormwater during rain events to replenish the Chino Basin to maximize water reuse and offset potable water demands. The 2020 DCP included a detailed analysis to evaluate potential impacts of book end or worst-case water supply shortages in the IEUA service area; the DCP Scenarios 2 and 3 considered the following:

1. **Imported water was reduced by 67.5% (Shortage Allocation Index 9 of MWD's WSAP)** In the 2020 DCP Scenario 2 analysis, which assumed local supplies were still available, the region had an overall surplus of water supply, while three agencies that depend heavily on imported water resulted in potential shortages. The 2020 DCP Scenario 3 assumed reductions in imported and local supplies as a result of a 5-year drought. DCP Scenario 3 predicted that while two agencies showed surpluses, overall, the region has a deficit of 13% of demand with current supplies. Under DCP Scenario 3, the loss of 67.5% of the imported water supply will result in the increased reliance on local surface and groundwater sources with associated water quality impacts. The ability to use some local wells may be affected by two water quality factors as detailed in item 2 below. It should be noted that MWD's IRP indicates only one scenario in which significant shortages would be anticipated to occur; the scenario assumed no future investments which is a conservative assumption. In fact, MWD continues to provide investments towards the development of local supply projects and is considering investments in Delta conveyance and a 150 million gallon per day (mgd) Regional Recycled Water facility in-region that may further improve MWD's overall water supply reliability and minimize the occurrence of requiring a MWD WSAP Shortage Allocation Index 9. Additionally, it should be noted that demands on MWD for water supplies has dropped in half from a high of approximately 2.4 million acre-feet per year to approximately 1.2 million acre-feet today. This remarkable reduction in demand for

MWD's water supplies is due to reductions in water use at the customer level along with the development of local supply projects throughout MWD's service territory.

2. **Reductions in local supply, due to potential impairments to groundwater quality, pose the most significant water reliability risk to the IEUA service area**. Nearly all the retail agencies rely on local groundwater to meet their annual demands. DCP Scenario 3 results indicate that agencies with groundwater supplies that currently require blending lose higher quality imported blending water and agencies with impaired supplies that do not require blending would be required to blend as groundwater quality declines. Therefore, conditions related to groundwater quality and reduced water available for blending could reduce the availability and reliability of groundwater in the future. DCP Scenario 3 illustrates that reduced groundwater quality combined with a loss of imported water could cause significant shortages for multiple agencies within the service area.

It should be noted that the 2020 DCP is a forward-looking planning document that provides insight for potential future 2035 conditions for IEUA and its retail agencies. The Drought Risk Assessment for 2021-2025 presented in Section 1, is based on MWD's estimates of supply availability for the near future which does not anticipate that longer-term worst-case conditions as described in the 2020 DCP will occur.

# Section 3: Annual Water Supply and Demand Assessment Procedures

This section describes annual supply and demand assessment procedures, known as the Annual Assessment, to be performed by IEUA and submitted to DWR each year starting on July 1, 2022. The information in this section is highly reliant on the analyses presented in the 2020 DCP and UWMPs. IEUA will coordinate with both MWD and its retail agencies to meet the annual water supply and demand requirements of Water Code Section 10632(a)(2).

## 3.1 Drought Monitoring

The framework for drought monitoring largely relies on the knowledge and expertise of IEUA's retail agencies in order to interpret real time local conditions and analyze future supplies. IEUA's role is to act as a facilitator and gather supply data from all retail agencies, consolidate all collected data, and calculate the supply-demand index. Additionally, IEUA tracks potential imported water shortages through MWD and the MWD Board's annual determination each April of the level of the regional shortage based on the WSAP criteria. It is important to note that supply types and portfolios within the IEUA service area are extremely diverse and availability of supply types are dependent on several different factors.

The four primary components of the drought monitoring framework are outlined in the IEUA 2020 DCP and are as follows:

- **Indicator Data Collection and Distribution.** Key imported water availability indicators will be compiled and provided to the retail agencies annually.
- **Member Agency Reporting**. Based on the provided indicator data and their own monitoring activities, participating retail agencies will provide their annual projections for supplies and demands within their service area once a year.
- **Regional Supply-Demand Index Calculation**. The agency projections will be combined to formulate a regional supply-demand ratio (or index). The Supply-Demand Index Calculation is further described in Section 3.2.
- **Shortage Classification.** The regional index will be used to classify the level of water shortage (if any).

The monitoring framework allows current and projected water supplies to be compared against current and projected demands. Should there be a downward shift in available water supplies or an increase in customer demand, IEUA and its retail agencies will determine the severity of the change, the categorized stage level, and the required response. Figure 3-1 gives a graphic representation of the monitoring framework.

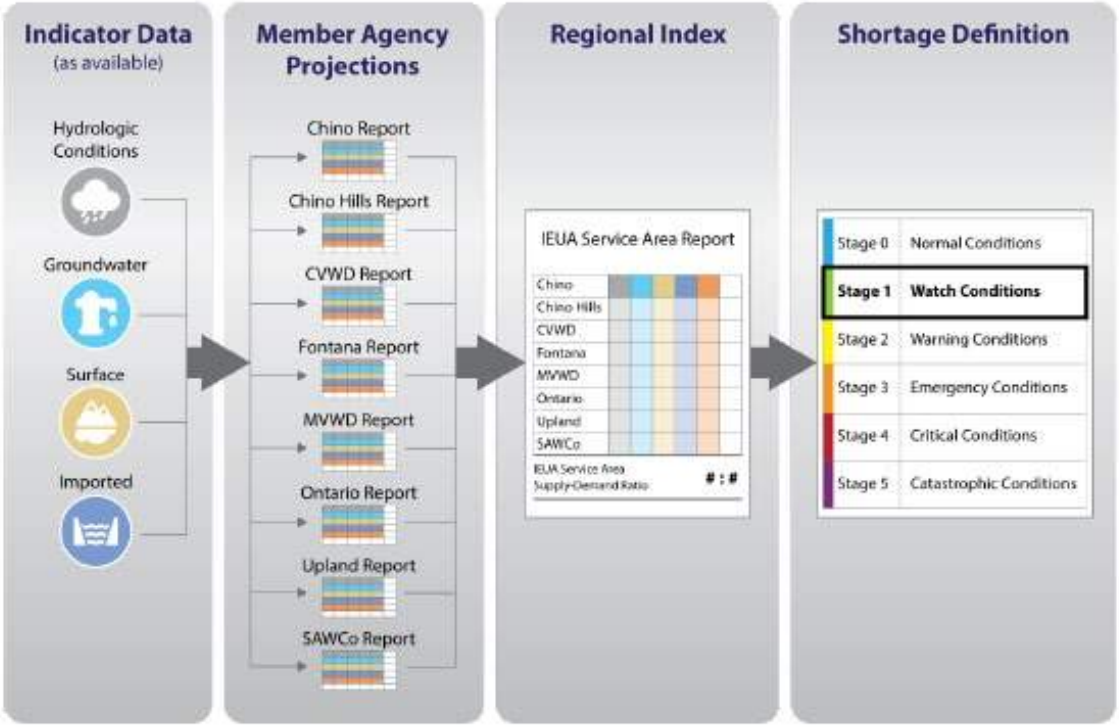


**Figure 3-1: IEUA Regional Drought Monitoring Framework (2020 DCP)**

### 3.1.1 Regional Collaborative Reporting Framework

IEUA has an established regular forum to provide and receive updates from the retail agencies on water supply conditions. Retail agencies submit annual data regarding water demands for the prior year between July and August of each year. IEUA hosts regular meetings with retail agency General Managers and IEUA also communicates with retail agency Water Managers in meetings that occur on an as-needed basis. Prior to 2020, the Water Managers typically met every 2 months. These meetings serve as a forum wherein the Water Managers review supply conditions, demand shifts, and regulatory changes that may impact supply. IEUA also prepares a Newsletter for retail agencies to communicate imported water and other regulatory conditions. If local circumstances or external drivers significantly shift, IEUA will request updated local supply data from respective retail agencies. As with the annual reporting, this information will be used to determine whether there is a regional water shortage due to these factors.

IEUA's monitoring process specific to drought will be based on an annual determination of potential drought shortage conditions, triggering the formation of a regional Drought Response Task Force that will meet periodically, as conditions warrant, and will trigger a two-step decision-making process as follows:

1. Key water supply indicators for imported water, discussed in Section 3.2, will be compiled into a standardized report and distributed to the water managers from each retail agency. A meeting with Water Managers' may be convened if needed. This will include projected deliveries of imported water from MWD as described in Section 3.2 in

addition to any potential forecasts for shortages. IEUA will also provide estimated demand projections to the participating retail agencies, as a reference or guide, based on a 5-year historical average.

2. Each retail agency will report their projected local supplies and demand for the coming year to IEUA. Table 3-1 below is a sample of the information obtained from each retail agency used to generate the supply-demand ratio.

**Table 3-1: Sample Reporting Framework for IEUA Member Agencies (2020 DCP)**

| Agency | Local Groundwater | Surface Water | Imported Water | Annual Demand | Supply Shortage |
|---|---|---|---|---|---|
| Chino | | | | | |
| Chino Hills | | | | | |
| Fontana Water Company | | | | | |
| Ontario | | | | | |
| Upland | | | | | |
| Cucamonga Valley Water District | | | | | |
| Monte Vista Water District | | | | | |
| San Antonio Water Company | | | | | |

This reporting process and structure was selected because it uses the annual reporting timeframe conducted by IEUA, the retail agencies, and MWD.

## 3.2 Imported Water WSAP Monitoring

IEUA began importing supplemental Colorado River water to the Chino Basin from MWD in 1951. In the late 1970's, MWD began delivering water from northern California via the State Water Project (SWP), offering IEUA an opportunity to connect to MWD's Rialto pipeline and switch to 100% SWP supplies after disconnecting from MWD's Upper Feeder pipeline as shown on Figure **3-2** that follows. The SWP became IEUA's exclusive source of imported water supplies in order to achieve groundwater quality requirements.

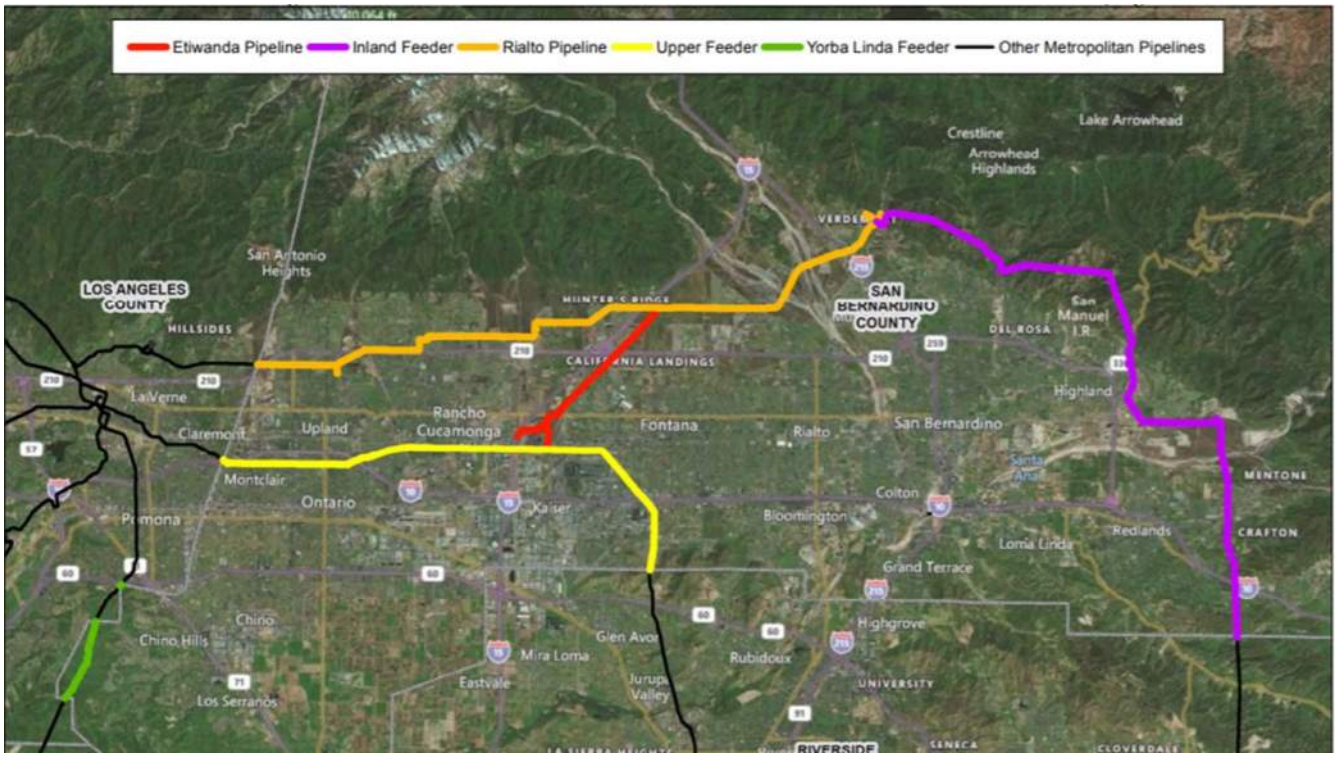


**Figure 3-2: MWD Imported Water Pipeline Network**

The SWP originates along the Feather River (a tributary to the Sacramento River) hundreds of miles north of IEUA. The SWP utilizes facilities to pump and convey water from the Sacramento-San Joaquin River Delta (Delta) to Southern California, as well as to the San Francisco Bay Area, the San Joaquin Valley, and the Central Coast. From 2009 to 2018, SWP imported water supplies delivered by MWD account for roughly 25-30% of the water supplies in the IEUA service area.

MWD actively monitors and manages the water supplies it imports to the region to assess availability and predict shortages. In response to critically dry conditions in the early 2000s and federal court rulings to protect the Delta Smelt in 2007 (which tightened regulations on Delta exports), as discussed in Section 2.1.2, MWD developed the WSAP to help manage uncertainty in the future water availability from their portfolio of sources and storage. Should a water shortage be declared by MWD's Board, the WSAP establishes MWD member agency supply allocations in a fair and reasonable way based on pre-determined formulas and key implementation elements needed to administer an allocation.

The framework of the WSAP includes an allocation year that spans from July to June, with a declaration in April. The key dates for MWD's WSAP monitoring and declaration process include the following:

**January to March**: Water Surplus and Drought Management reporting process provides updated information on storage reserve levels, projected supply, and demand conditions to the MWD Water Planning and Stewardship Committee meetings. Consideration of a potential allocation situation would be announced during this time.

**April:** Assuming supply conditions did not improve, MWD member agencies would report their projected local supplies for the coming allocation year (July to June) to update MWD's projected total supplies. Staff analysis of MWD storage reserves and projected supply and demand conditions would provide an allocation recommendation to the MWD Board of Directors. The allocation would be effective starting July 1 and held through the following June 30.

A 10-level WSAP Shortage Allocation Index would determine the Wholesale Minimum Allocation and the Maximum Retail Impact Adjustment. A "Wholesale Minimum Allocation" is defined as the minimum amount of MWD-supplied wholesale water service provided to each member agency. The Maximum Retail Impact Adjustment ensures that agencies with a high level of dependence on MWD do not encounter unequal retail shortages when experiencing a reduction in wholesale supplies.

In addition to the Wholesale Minimum Allocation and Retail Impact Adjustment, a Conservation Demand Hardening Credit and Minimum Per-Capita Water Use Credit would be considered to determine each Member Agency's WSAP Allocation. The allocation to an agency for its municipal and industrial retail demand is the sum of the above described four components, which are described in detail in the Appendix of the WSAP.

**July to June**: Member agencies would be requested by MWD to submit their local production on a monthly basis and certify the end of allocation year local supply use. Local production data must be reported to MWD by the end of the month following the month of use (i.e., use in July must be reported by the end of August). The production and supply use information is then combined with MWD sales information to track retail water use throughout MWD's service area. Each month, MWD reports on member agency water sales compared to their allocation amounts.

**June 30**: Allocation year would be complete.

**August**: MWD calculates potable water use based on supply certifications and actual sales data for the previous allocation year (July to June). Allocation surcharges are assessed for usage above a given member agency's final adjusted allocation.

It is important to note that while MWD's analysis focuses on combined SWP and Colorado River supply sufficiency, it is capable of focusing singularly on SWP-only supply sufficiency for IEUA and any other SWP-exclusive member agencies, if needed.

## 3.3 Supply/Demand Ratio

As detailed in the 2020 DCP, the supply and demand ratios for each year will be calculated based on the projections provided by the water managers. The data will be compiled into a singular supply-demand ratio for the IEUA service area and reported to the Water Managers. The regional supply-demand ratio calculation and a comparison to the DCP Drought Stages, discussed in Section 4 will then assist in determining whether there is a regional water shortage requiring action.

Figure 3-3 provides an example compilation of member agency projections and calculation of the regional supply-demand ratio. There will be considerations for expected shortages for individual retail agencies that may not be reflected in the regional ratio.

Between reporting periods, the participating retail agencies will continue their individual monitoring activities. Each of the retail agencies have developed their own approach to monitoring their supplies and have established unique definitions and responses for localized shortage conditions. “Appendix B: Summary of Member Agency Water Shortage Stages” in the 2020 DCP provides an overview of each agencies’ shortage definitions and responses.

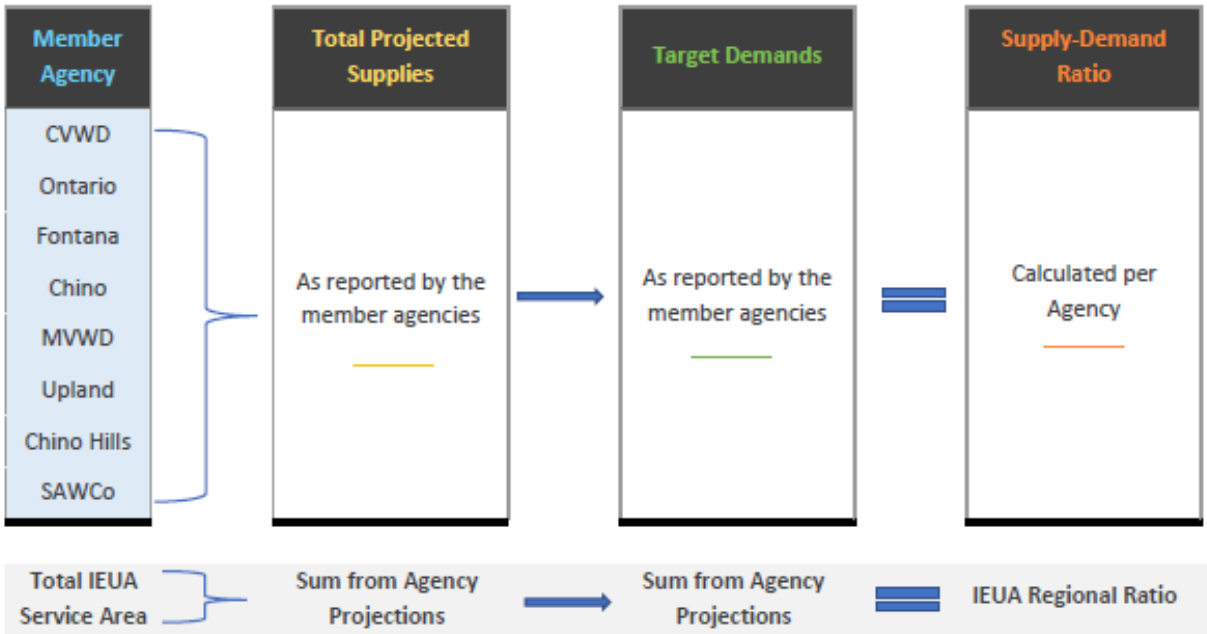


**Figure 3-3: Annual Regional Supply and Demand Projections for IEUA Service Area (2020 DCP)**

# Section 4: Shortage Stages

This section describes the water shortage stages as defined by IEUA. The water shortage stages presented meet the requirements of Water Code Section 10632(a)(3).

## 4.1 Overview of Shortage Stages

The water shortage stages described in this section are in compliance with state legislation (SB 606 and AB 1668), which now requires drought plans to be standardized, as well as include six stages of drought severity. These stages were developed in consultation with each of the member agency's own definitions for local drought or water shortage levels and can be viewed in "Appendix B: Summary of Member Agency Water Shortage Stages" in the IEUA 2020 DCP. Additionally, each member agency may have their own Water Shortage Contingency Plan for use at the retail level.

The Water Shortage Stages are defined based on the calculated supply-demand ratios for the IEUA service area and are shown into DWRs shortage levels.

Table 4-1. These stages are used to help the Drought Response Taskforce identify the most appropriate regional responses for the anticipated shortages. Table 4-1 also contains the cross reference from the DCP shortage stage to DWRs shortage levels.

**Table 4-1: IEUA Regional Water Shortage Stages (IEUA, 2020) Cross Reference with DWR Shortage**

| 2020 DCP | | | 2020 WSCP PER DWR | |
|---|---|---|---|---|
| **Drought Stage** | **Stage Descriptions** | **Triggers** | **2020 WSCP Level** | **Shortage Level** |
| **Stage 0** | Normal Conditions | No water shortages anticipated. | - | |
| **Stage 1** | Watch Conditions | IEUA regional ratio is predicting shortages between 1% and 5%. | 1 | ≤10% |
| **Stage 2** | Warning Conditions | IEUA regional ratio is predicting shortages between 6% and 15%. | 2 | 10 – 20% |
| **Stage 3** | Emergency Conditions | IEUA regional ratio is predicting shortages between 16% and 25%. | 3 | 20 – 30% |
| **Stage 4** | Critical Conditions | IEUA regional ratio is predicting shortages between 26% and 50%. | 4<br>5 | 30 – 40%<br>40 – 50% |
| **Stage 5** | Catastrophic Conditions | IEUA regional ratio is predicting shortages greater than 50%. | 6 | >50% |

It is important to note that while the water shortage stage at the time of a drought is calculated and declared for the overall region, a local retail agency may have a water supply level that varies from the regional stage due to the uniqueness of their water supply mix. When this

occurs, the local agency may develop customer messaging that is specifically applicable to their retail service area.

## 4.2 Water Shortage Stage Declaration

In the event of an emergency, IEUA may declare a Water Shortage Emergency and assemble the Drought Response Taskforce who will help inform the decision with tasks that include reviewing regional shortage conditions, deciding regional actions, budget generation and an implementation timeline. Coordination efforts may include retail agencies, MWD, Board of Directors, and regional stakeholders.

Typically, IEUA implements various stages of conservation actions based on the degree of water shortage before a state emergency is declared. If an emergency declaration is made, IEUA will coordinate with both its retail agencies and MWD to comply with all governing regulations. An unexpexted or sudden loss of water supplies may result in the expidited declaration of a water shortage emergency and associated activities.

# Section 5: Shortage Response Actions (by Water Shortage Stage)

This section describes the water shortage stage response actions as defined by IEUA and are based on IEUA's definitions of the water shortage stages. The response actions presented in this section are heavily reliant on the 2020 DCP and its UWMPs. The response actions meet the requirements of Water Code Section 10632(a)(4).

## 5.1 Shortage Response Actions Overview

With growing populations and the inevitability of future drought cycles, IEUA, has invested in local supply and demand management programs with the aim of building regional, long-term resiliency to drought and climate change that will aid the region to be able to withstand future water shortages without extreme hardships.

By leveraging funding and programs from MWD and other regional stakeholders, IEUA and its retail agencies have partnered to help reduce per capita water use by re-shaping customers' attitudes about water use efficiency and their personal role in achieving water shortage resiliency. Through education, messaging, and investments of approximately $1.6 million, annually in water use efficiency programs, IEUA has been assisting customers to make significant equipment and lifestyle changes at their homes and businesses. The more our region is able to be self-sufficient with its water supplies, the less impactful any imported water supply shortages will be.

In 2018, California chaptered into law legislation (AB 1668 and SB 606) requiring all retail water agencies to annually establish a Water Use Objective (WUO) that will serve as a standard for assuring community-wide water-use efficiency. Each of IEUA's retail water agencies is required to submit their WUO's to a State agency by November 2023. If actual water use in their service territory is lower than their WUO, then that agency's customers are considered to be using water efficiently. Some assumed values in the calculation of the WUO will reduce over time, such as the assumed per capita water used indoors in residential properties, which will start at 55 gallons per capita per day (gpcd) in 2023 and reduce to 50 gpcd after 2030. The penalty for non-compliance is up to $10,000 per day per retail water agency.

Beyond regional efforts to establish efficient water-use practices and sustainable lifestyles, extraordinary conservation may be required during periods of droughts or during other water shortages, in order to reduce regional demands sufficiently to meet allocation goals. This will need to be driven by an escalation in marketing, increased programming and services, and enhanced incentives that increase as drought stages escalate. Also, MWD and potentially the retail agencies have the option to institute water pricing mechanisms to encourage reduced water use during shortage conditions.

Several response actions for achieving extraordinary conservation are available and can be deployed relatively quickly, including increased customer messaging content and frequency, expanded outreach channels, enhanced water-use efficiency incentives and programs, and as necessary, water usage restrictions and pricing mechanisms as detailed below. Future

responses to future water shortage considerations should be mindful, however, of the effects that “demand hardening” will have on the customers’ ability to reduce water use. Demand hardening recognizes that as per capita water uses reduce down towards health and safety standards, there will be fewer discretionary uses of water that can be curtailed.

During water shortage conditions, IEUA makes itself available to assist retail agencies in implementing certain actions to alert the region to the need for extraordinary conservation by the measures identified below, , most of which are existing programs.

- **Messaging:** Creative and attention-grabbing content are needed to secure customers’ attention and motivate them to take action. Public Service Announcements (PSAs) are an effective tool for messaging the civic responsibility for undertaking extraordinary conservation efforts during water shortage conditions.

- **Expanded Outreach:** Customer attitudes and expectations continue to evolve over time. In our customer-centric world, water agencies are competing for attention. Grabbing attention requires a modern approach to outreach, including social media and potentially influencer marketing. As the need for reduced demands continues and intensifies, cities and counties and other large water users such as CalTrans will be encouraged to reduce irrigation of public lands and other highly visible reductions in water use may be required to intensify the call for reductions in per capita water use.

- **Programs:** Water efficiency programs provide customers with the means and guidance to lower their properties’ water usage. Customer-friendly programs, higher incentives, direct installation options, and strong support services drive stronger response rates. The greater the services and incentives, the greater the customer response.

- **Restrictions:** Watering restrictions further reduce water-use while reinforcing the message of community importance of “doing your part”, are highly effective in securing immediate water savings, and are a powerful tool for agencies. However, they set an authoritarian tone, which may result in negative public perceptions if the rationale is not well defined.

The Drought Taskforce, described in Section 5.7.2, can be convened to focus and coordinate the activities related to shortage response actions between IEUA and the retail agencies.

## 5.2 Strategy Per Drought Stage

Different drought stages require varying strategies. In general, drought actions will expand as drought stages escalate. As increased drought stages are declared, agencies may increase customer support and provide a higher level of program incentives and services.

Once a drought enters a specific stage, the Taskforce will assemble to finalize the Response Plan for that stage, begin the implementation process for target-marketing and increased outreach. The DCP stages and actions are summarized below and are included in Table 5-1 by stage and DWR’s defined drought response actions.

- **At DCP Stage Zero**, a non-drought stage, programs and incentives will continue to be offered to customers at standard levels. During this time, the goal will be to encourage and incentivize customers to create drought sustainable properties in advance of an emergency. The focus will be on turf replacement programs and customer education offerings.

- At **DCP Stage 1 (1-5% decrease),** customers and micro-target high potential customers will be profiled, utilizing messaging that will best resonate with those customers.

- The strategic focus for **DCP Stage 2 (6-15% decrease)** is to expand activity for irrigation equipment and direct installation programs, and to ramp up influencer marketing.

- Tactics for **DCP Stage 3 (16-25% decrease)** require incentive increases for landscape and irrigation measures, and an expansion in customer outreach.

- **DCP Stage 4 (26-50% decrease)** requires heightened messaging of urgency and put forth a community “call to action”. Additionally, there will be an increase in penalties, implementation of emergency alerts, and expanded news media coverage.

- During **DCP Stage 5 (water use for essential functions only), IEUA may consider modifying or suspending landscape and irrigation programs to focus** on indoor plumbing, property leak detection programs and other associated efforts. All landscape and irrigation programs will be suspended, and IEUA will implement crisis messaging, announcing water for essential use only.

**Table 5-1 Demand Reduction Actions (DWR Table 8-2)**

| Shortage Level | Demand Reduction Actions | How much is this going to reduce the shortage gap? *Include volume units used.* | Additional Explanation or Reference *(optional)* | Penalty, Charge, or Other Enforcement? |
|---|---|---|---|---|
| 1 | Expand Public Information Campaign | Minimum 1-5% of water use | Begin outreach, appealing to civic duty to reduce water use, identify high water waste reduction potential customers. Develop messaging that will best resonate with those customers | No |
| 1 | Provide Rebates on Plumbing Fixtures and Devices | | SoCal WaterSmart Residential and Commercial Rebates | No |
| 1 | Provide Rebates for Landscape Irrigation Efficiency | | Residential Irrigation Tune-Up, Home Surveys, Landscape Workshops, and Design Services | No |
| 1 | Provide Rebates for Turf Replacement | | Turf Replacement Program | No |
| 2 | Expand Public Information Campaign | Minimum 6-15% of water use | Ramp up outreach messaging to emphasize importance of taking action. Continue targeting high water waste potential customers | No |
| 2 | Provide Rebates on Plumbing Fixtures and Devices | | Implement direct installation programs | No |
| 2 | Provide Rebates for Landscape Irrigation Efficiency | | Expand Landscape Design Services; offer more frequent landscape workshops and home surveys | No |
| 2 | Provide Rebates for Landscape Irrigation Efficiency | | Continue Turf Replacement Program and consider increased funding | No |

| Shortage Level | Demand Reduction Actions | How much is this going to reduce the shortage gap? *Include volume units used.* | Additional Explanation or Reference *(optional)* | Penalty, Charge, or Other Enforcement? |
|---|---|---|---|---|
| 3 | Expand Public Information Campaign | Minimum 16-25% of water use | Continue to expand outreach and marketing efforts to mid-tier water waste potential customers | No |
| 3 | Provide Rebates on Plumbing Fixtures and Devices | | Continue base programs; Consider increase incentive amounts for certain programs; continue smart irrigation direct installation programs | No |
| 3 | Provide Rebates for Landscape Irrigation Efficiency | | Continue Stage 2 Actions | No |
| 3 | Provide Rebates for Turf Replacement | | Consider increase incentive amounts | No |
| 4, 5 | Expand Public Information Campaign | Minimum 24-50% of water use | Strengthen message of urgency and community call to action | No |
| 4, 5 | Provide Rebates on Plumbing Fixtures and Devices | | Continue exploring incentive increase and smart irrigation direct installation programs | No |
| 4, 5 | Provide Rebates for Landscape Irrigation Efficiency | | Continue Stage 2 Actions | No |
| 4, 5 | Provide Rebates for Turf Replacement | | Consider increase incentive amounts | No |

| Shortage Level | Demand Reduction Actions | How much is this going to reduce the shortage gap? *Include volume units used.* | Additional Explanation or Reference *(optional)* | Penalty, Charge, or Other Enforcement? |
|---|---|---|---|---|
| 6 | Expand Public Information Campaign | Minimum 50% of water use | Implement catastrophic messaging, explore essential use only | No |
| 6 | Provide Rebates on Plumbing Fixtures and Devices | | Continue exploring incentive increase and smart irrigation direct installation programs. | No |
| 6 | Provide Rebates for Landscape Irrigation Efficiency | | Consider modifying or suspending programs to support other efforts | No |
| 6 | Provide Rebates for Turf Replacement | | Consider modifying or suspending programs to support other efforts | No |

**Note**: Each IEUA retail agency has local authority to enforce local water waste ordinances; details of the restrictions by agency can be found in the 2020 DCP and each individual retail agency's 2020 WSCP. Additional details on drought response actions can be found in the IEUA's 2020 DCP and WSCP.

## 5.3 Supply Augmentation Actions

While IEUA and its retail agencies recognize the need for additional supply during drought years, as a wholesaler, IEUA is limited in its ability to implement water supply augmentation actions. The applicable DWR supply augmentation actions that may be available to IEUA during a water shortage condition are presented in Table 5-2.

**Table 5-2: Supply Augmentation and Other Actions (DWR Table 8-3)**

| Shortage Level | Supply Augmentation Methods and Other Actions by Water Supplier | How much is this going to reduce the shortage gap? *Include volume units used.* | Additional Explanation or Reference *(optional)* |
|---|---|---|---|
| 1 through 6 | Other actions (describe) | Undetermined amount | IEUA is always exploring opportunities for supplemental recycled water connections and conjunctive use to increase supply and flexibility. |
| 6 | Other purchases | Up to 23,531AFY (MWD Contract Amount) | Difference between Resolution No. 2014-12-1 imported amount of 69,752 AFY and MWD tier 1 imported water annual maximum of 93,283 AFY |

**Note**:.

The supply augmentation actions overlap other long-term regional supply reliability activities identified in the IRP as described below; it should be noted that not all IRP activities address a specific water shortage condition in the region.

Additional stored water, in the form of new groundwater production facilities, Chino Desalters with new water transmission lines, pumping plants, and storage tanks significantly increase local supplies and reliability to meet shortages and emergency outages by individual agencies. Interconnections between utilities also allow for mutual supply arrangements and enhances local reliability.

Additionally, through the existing and ongoing regional plans, such as the IRP, there has been considerable effort and extensive stakeholder engagement aimed specifically at developing mitigation-type actions to improve regional water supply reliability.

The mitigation actions identified through the IRP fall into two core strategies.

1. **Invest in Cost-Effective Local Supplies**: As the availability of imported water potentially becomes less reliable in the future, it will be ever more important to continue to invest in cost-effective forms of local water supplies, including groundwater, surface water, and recycled water and conjunctive management of all supplies. It should be noted that MWD is considering investments in new supply projects, both in and out of region. As such, analysis should be undertaken to find the balance of supply-reliability being developed by MWD, IEUA and its retail agencies in any given moment. Building the right amount of local water supply capacity decreases reliance on imported supplies and improves resiliency for the regional water supply portfolio.

2. **Enhance Groundwater Availability**: Groundwater is the most heavily relied on local water supply type. The Chino Groundwater Basin provided approximately 40% of the regional water supply portfolio over the last decade. The vulnerability assessment for the DCP illustrated how compromised groundwater quality poses a significant threat to local water supply reliability and can be compounded as other supplies currently used for blending, such as imported water, become less reliable. Enhancing groundwater treatment and groundwater recharge opportunities will be crucial as groundwater quality issues mount within the basin and dependence on groundwater potentially increases as other sources become less reliable. Groundwater recharge with good quality water sources provides the benefits of both groundwater quality management and increased groundwater storage.

## 5.4 Prohibitions, Penalties, and Consumption Reduction Methods

This section describes several prohibitions, penalties, and consumption reduction methods including drought ordinances and restrictions.

### 5.4.1 Emergency Drought Ordinances within IEUA Service Area

IEUA does not have its own drought ordinances concerning drought measures. However, IEUA's retail agencies have several ordinances and measures in place concerning water waste, conservation efforts, and more. Table 5-3 from the DCP lists several ordinances for IEUA's retail agencies.

**Table 5-3: Water Waste Ordinance by Agency (IEUA 2020)**

| Agency | Ordinance/Code Title |
|---|---|
| City of Chino | Municipal Code Water Conservation 13.-5.010 – 13.05.120 |
| City of Chino Hills | Ordinance 300u |
| Cucamonga Valley Water District | Ordinance 2019-5-1 |
| Fontana Water Company | San Gabriel Valley Water Company Rule No. 14 & Schedule 14.1 |
| Monte Vista Water District | Ordinance 33 |
| City of Ontario | Municipal Code Water Conservation Plan Title 6, Section 8A |
| City of Upland | Municipal Code 13.16.020 & 13.16.05.050 |

### 5.4.2 Voluntary and Mandatory Restrictions

Both voluntary and mandatory restrictions are coupled with public education campaigns to provide customers with information about the purpose for the restriction(s) and the call-to-action. Restrictions are typically highly publicized through local media, web pages, social media, mailings, and water bills.

Mandatory restrictions are a more effective tool for drought coping than voluntary measures; however, mandatory restrictions may create heightened negativity directed at the customer's water provider.

Common restrictions include partial or total prohibitions against using hoses to wash paved areas, limits on car washing and filling or refilling swimming pools, and restrictions on watering times.

As drought stages are declared, each agency will implement voluntary and mandatory restrictions as dictated by their respective Water Waste Ordinance. It is important to note the following:

1. Each ordinance is unique to a specific water provider and the ordinances differ slightly from one another.

2. Ordinance stages are locally declared and therefore, may not align with other agencies or a regionally declared stage.

Although enforcement is difficult to maintain, each agency is responsible for locally enforcing each ordinance. In order to accomplish this, agencies must add field staffing, coordinate with administration of the water waste ordinance, and manage the increased level of customer phone calls.

Enforcement has been critical to the integrity of the ordinance in the past and remains critical for future water shortages as well. Without action and penalties, the ordinance will not be taken seriously by customers, which then nullifies the effectiveness of the initiative. Typically, violations are reported by community members or visually seen by agency staff. Enforcement staff will then send letters, visit customer properties, and educate customers on the importance of adherence for both the resident and the overall community.

## 5.5 Operational Changes

IEUA does not operate any imported water systems and therefore, does not require operational changes during a water shortage. Changes to supply augmentation are described in Section 5.3 and consumption reduction methods are described in Section 5.4.

## 5.6 Customer Compliance, Enforcement and Appeal, and Exemption Procedures for Triggered Response Actions

IEUA does not have direct retail customers. However, IEUA is part of the Drought Response Taskforce (described in Section 5.7.2), which supports retail agencies with various resources for coordination, outreach, enforcement and more. The Taskforce coordinates with retail agencies and staff to identify resource and funding needs. Further explanation of the current funds and the funding process is described in the Regional Water Use Efficiency Business Plan (IEUA 2019).

## 5.7 Description of Legal Authorities to Implement and Enforce Shortage Response Actions

This section describes the legal authorities that implement and enforce shortage response actions, including their roles and responsibilities. Additionally, mutual aid agreements are described.

### 5.7.1 Roles and Responsibilities

**IEUA:** IEUA serves as the administrative facilitator of all components of the DCP. IEUA is responsible for developing regional demand and supply projections, calculating supply/demand ratio, communicating outcomes, convening the Drought Response Taskforce, implementing response strategies and actions as determined by the Drought Response Taskforce, conducting vulnerability assessments, evaluating and implementing IEUA controlled mitigation actions, and updating the plan.

**Retail Agencies:** Retail agencies are responsible for providing demand and supply projections, implementing agency-selected local mitigation actions, participating on the Drought Taskforce, and implementing response actions including local water waste restrictions.

### 5.7.2 Drought Response Taskforce Process

Once the drought monitoring framework indicates that the region has reached a specific stage of drought conditions, several actions will occur.

First, the Drought Response Taskforce (Taskforce) will assemble. The Drought Response Taskforce is the organizational group empowered to:

1. Create the Drought Response Plan blueprint.
2. Assemble the Taskforce to finalize strategic response actions during drought condition stages.
3. Work with their respective organization to implement response actions, according to plan.

The Taskforce is comprised of representatives from each of the retail agencies, in addition to personnel from IEUA. The group works in a collaborative effort to gain consensus on appropriate regional response actions.

The Taskforce will make decisions about the level of programming and services, restrictions, and messaging to regional customers. Additionally, the group determines the level taken for each element of the plan.

It is important to note that during a regional drought, an individual retail agency may not be experiencing a drought condition due to their local supply mix. In this circumstance, the agency may elect the capacity in which to participate on the Taskforce. The agency may determine how

best to communicate with its customers when there are no water supply issues, locally while the region is undergoing a drought stage.

Moving forward, the Taskforce will work to balance the effectiveness of regional messaging with the differing needs of individual retail agencies. There are no pre-determined mandates regarding service offerings, restrictions, communications, or budgets. The Taskforce will collaborate on policies, while fully supporting flexibility for each agency.

The group will review the proposed actions set forth in the existing plan and make modifications, as necessary. The plan was intended to be flexible and changeable. Modifications to the plan might include a change in incentive levels or program delivery mechanisms. There may also be a new water-saving technology that may be available to customers. The Taskforce may be able to secure additional grant funds, as well. Once the action plan is finalized, the Taskforce will implement the programs, penalties, and communications plan, as agreed upon.

An overview of the DCP drought response process is provided on Figure 5-1.

**Figure 5-1 Drought DCP Response Process**

### 5.7.3 Mutual Aid Agreements

IEUA currently has no mutual agreements except those concerning the sanitary sewer system. Additionally, retail agencies typically coordinate with other agencies to balance water uses.

## 5.8 Effectiveness of Shortage Response Actions (by Water Shortage Stage)

This section describes the annual review of the shortage response actions outlined in Section 5.1. Additional reviews for effectiveness are outlined in the WUE Business Plan (IEUA 2020), which is updated every 5 years.

The Drought Response Taskforce process described in Section 5.7.2 resulted in several programs that would address water shortages. The following process was used to determine the effectiveness of each program. It is important to note that the ranking process provides general consensus and structure for planning, but program ranking is fluid and, as circumstances evolve in the future, selected programs and priority levels may change.

1. Each of the selected programs addressing water shortages were ranked by agency representatives to determine its viability during each advancing drought stage. The selection process for these programs and services was conducted by having agency representatives individually rank viable programs as a high (3 points), medium (2 points), or low (1 point) at each respective drought stage level.

2. This ranking criterion was based on the level of feasibility, appropriateness, and overall impact provided by that program/service at each drought stage. Budgets and program scalability were additional considerations factored into the ranking process. The group also assessed the effect and motivation that escalating drought stages would have on customers and how that, in turn, might drive customers' response for each program/service.

3. The results were totaled and averaged for each program/service at each drought stage. Higher numbers reflected a greater expected effectiveness for that program or service. Lower numbers indicated reduced support for the program or service and less likelihood for inclusion in the list of program offerings.

4. Using the high, medium, or low point rubric program rankings were compiled and recorded.

In general, it was found that the higher the drought stage, the more program services were to be provided by agencies. It was also found that there is heightened customer response and program participation during higher drought stages. This is especially true when customers are provided with free installation and low-cost product or, as with turf incentives, the rebate level is enticingly high. Additionally, as stages escalate, agencies are prepared to ramp up activity for all programs, but will rely most heavily on Turf Replacement, FreeSprinklerNozzles.com, and direct installation of landscape measures. The number of home surveys, workshops, and design services may also increase. Home Leak Detection was ranked as the lowest priority program during Stage 0 and Stage 1, and only ramps up significantly in the later drought stages.

At each drought stage, it is anticipated that the highest-ranking programs will be those most actively promoted, and those offering attractive customer enticements to participate.

However, it is important to reinforce that the program and services rankings are not absolute and are a suggested template to be adjusted according to circumstances that exist at each actual drought stage. Actual incentives, services, and roll out schedules will be determined by the Taskforce when the drought stage is declared and the group is assembled.

# Section 6: Communication Protocols

This section describes communication protocols as outlined in the 2020 DCP.

## 6.1 Messaging and Outreach

Communication and outreach play as crucial a role in the delivery of water savings as the programs themselves. A strong plan will ensure that IEUA reaches the target audience, boosts awareness, and ultimately, delivers water savings. For this reason, the Response Plan communication must:

- Be heard by the right customers, understood, and favorably received.
- Clearly inform the customer of the current stage, tell them what action is desired, and motivate them to respond to the request.

Ultimately, all forms of communications and outreach must work together throughout the region to raise response and increase water savings per household. The combination of regional drought messaging paired with the retail agencies' individual outreach efforts will create a stronger, more unified message.

## 6.2 Requirements for An Effective Message and Campaign

The key principles of a successful outreach and communication campaign are:

1. Know Your Customer.
2. Get the Message Right.
3. Craft an Outreach Plan that Drives Customer Response.

### 6.2.1 Know Your Customer

An organization must understand each customer's needs in order to provide the "I can't say no" offer. Companies experience much higher response rates when they understand and effectively respond to customers' needs.

Target audiences are single family households with high water-use and large landscape customers. Reaching these customers requires data analysis, creation of customer personas, and micro-targeting. There are numerous analytics programs available today that help agencies identify distinct customer groups and personas. Statistics show that micro-targeting greatly boosts customer response, which in turns leads to higher water savings as well.

### 6.2.2 Get the Messaging Right

Marketing campaigns are highly successful when they evoke emotion and resonate with a human need. An emotional message strategy uses feeling, which is a much more powerful motivator than logic, to sell. An outreach vehicle using this tactic will make the target audience feel an emotional connection to the agency, program, water efficiency measure, and/or call-to-action. IEUA will need to utilize the following messaging strategies to garner interest and participation from customers:

- **Emphasize the benefits**: What does this specific customer need? Present a solution to their problem.
- **Keep it simple**: A confused mind says "no." People worry that deceit is hidden amongst complexity.
- **Make it Fun**: Draw customers in by using fun and catchy messaging, stories, eye-catching visuals, and humor.
- **Use Authority**: Influencing others is easier if customers view the person making the pitch as an authority figure. We all like to listen to and follow an expert. We trust that they know what they are doing.

### 6.2.3 Two Types of Messaging Required

There are reasons for creating and driving mass audiences through broad messaging as opposed to targeted action messaging directed to specific audiences. IEUA will need to effectively provide both types of communication during drought conditions.

1. **Broad Messaging:** Broad messaging (delivered via news stories, radio/TV ads, billboards, etc.) provides the widest reach and allows IEUA to communicate overarching messages including:
    a. Water Scarcity Issue
    b. Urgency to Act
    c. Commitment to continue to provide safe, reliable water supply.
2. **Targeted Action Messaging:** Targeted action messaging is typically aimed at specific groups of customers (i.e., those most likely to respond to your request for program participation or water-use reduction). To promote action, IEUA and the retail agencies must create messaging content and outreach such as those described below.
    a. Design messaging to motivate landscape changes for single family customers
    b. Post success stories: community members, people of prominence, business leaders
    c. Promote stories from micro-influencers: Q&A blogs with customers, homeowner success stories, "Did You Know?" educational snippets

d. Consider the utilization of third-party influencers: these individuals are more trusted than a company itself

e. Create a community call to action: “your community needs your help” messaging.

### 6.2.4 Craft an Outreach Plan that Drives Customer Response

Successful outreach campaigns utilize the following strategies:

- Profile your customers to understand customer’s persona
- Micro-target to prospect the right customers for each offer
- Incorporate your strong messaging and influencer authority figures in all offers
- Add personalization
- Demonstrate value and generous offer
- Include a call to action
- Make it easy for customers to say “YES”
- Follow up
- Track results
- As stages advance, increase frequency, urgency, and intensity.

IEUA and its retail agencies will need a creative and dynamic approach in order to increase customer response and water use reduction, especially during higher drought stages.

## 6.3 Successful Outreach Methods

There are major outreach mechanisms to be utilized for general categories of customers. Each outreach approach should be personalized to the group being targeted, as follows:

- Direct outreach to high users via personalized means (phone, letter, email, etc.)
- Regional outreach through broad media channels
- Earned media
- Social media
- Grassroots and community outreach.

## 6.4 Importance of Influencers and Relationships

Influencer marketing is another effective strategy to enhance response. Influencers are trusted individuals who have a large audience and can reach across media and social platforms. Because of their high level of “trust-ability”, they’re often able to persuade (or “influence”) readers and viewers to purchase products or endorse causes that they promote.

Influencer marketing is a highly effective way to reach interested customers and dramatically increase response. They act as a trusted and respected “friend”, as customers trust third party influencers more than a company itself. Those prominent in the Inland Empire include:

- Well known business owners/leaders
- Local sports or entertainment figures
- Elected officials
- Active Parent Teacher Association members
- High profile community organizers.

## 6.5 Drought Outreach Matrix

The urgency for communications increases as drought stages escalate. Because customers are essential to water-savings solutions, it is imperative that they understand each drought stage and what is required of them. Quality messaging will clearly communicate the current drought stage, define the condition, request a desired customer behavior, and direct them to tangible solutions. Table 6-1 shows the DCP drought outreach matrix for IEUA, which outlines the possible outreach methods for each water shortage stage.

**Table 6-1: DCP Drought Outreach Matrix for IEUA**

| Stages | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **Messaging** | Overall preparedness and drought resiliency. Drought will be regular occurrence. | What ***Watch*** Condition Means | What ***Warning*** Condition Means | What ***Emergency*** Condition Means | What ***Critical*** Condition Means | What ***Catastrophic*** Condition Means |
| **Desired Behavior** | Get customers to install drought resilient landscapes & smart irrigation prior to the next drought. | Minimum 1-5% decrease in water use. | Minimum 6-15% decrease in water use. | Minimum 16-25% decrease in water use. | Minimum 25-50% decrease in water use. | Water used for only essential functions. |
| **Outreach Strategies** | Evaluate your specific community and the customers in your service territory to determine a compressive plan using a combination of the following strategies and tactics. Each approach should be personalized to the group you are targeting.<br>- Direct outreach to high users<br>- Regional outreach through broad media channels<br>- Social media outreach<br>- Grassroots and community outreach | | | | | |

# Section 7: Mechanism to Determine Reductions in Water Use and to Meet State Reporting Requirements

Water Code Section 10632(a)(9) is not applicable for IEUA, as it is a requirement for urban retail water suppliers. However, the IEUA WUE Business Plan addresses methodologies for and the effectiveness of attaining water use efficiency. The IEUA WUE Business Plan is a working document and, as such, must be modified and updated as changes occur, and program years roll out. IEUA regularly reviews the plan and makes adjustments accordingly.

**Changes and/or reviews of the plan take place in line with the following conditions:**

- When programs are added, subtracted, or modified.
- On a yearly basis in order to meet the annual reporting requirements.
- Every 5 years to meet the Urban Water Management Plan report cycle.
- As the State's Framework policies are finalized.

# Section 8: Impacts to Revenue

This section addresses Water Code Section 10632(a)(8).

If a drought is declared, financial impacts to the local retail water agencies will vary from one agency to another. As a wholesale water agency, IEUA is simply a “pass-through” wholesaler, so loss of revenue has no significant impacts. One exception may include the loss of revenue due to conservation programs that receive a portion of funding through a surcharge on each acre-foot of imported water sold. Otherwise, IEUA’s revenue is no longer based on water sales. Revenue is currently based on the number of meters as well as meter size within its area.

Current rates are outlined in Resolution No. 2019-6-1.

# Section 9: Actions to Prepare for Catastrophic Supply Interruption

This section largely relies on the analyses performed in previous UWMPs and meets Water Code Section 10632(a)(3).

## 9.1 Planning for a Catastrophe

Southern California's three imported water supplies (State Water Project, Colorado River Aqueduct, and Los Angeles Aqueduct) cross the San Andreas Fault. Many other fault lines bisect major water facilities throughout the region. Experts consider it likely that one or more of these supplies will be disrupted in the event of a major earthquake. Given the great distances that imported supplies travel to reach the Inland Empire, the region is vulnerable to imported water interruptions along hundreds of miles of aqueducts, pipelines and other facilities associated with delivering the supplies to the region.

MWD has comprehensive plans for stages of actions it would undertake to address a catastrophic interruption in water supplies through its WSDM and WSAP. MWD also developed an Emergency Storage Requirement to mitigate against potential interruption in water supplies resulting from catastrophic occurrences within the southern California region, including seismic events along the San Andreas Fault. For MWD, the required planning is captured in its Emergency Storage Objective, Seismic Resiliency Reports, and Emergency Response Plans. For greater detail on MWD's planned responses to catastrophic interruption, please refer to MWDs 2020 UWMP.

MWD estimates that restoring service on any of these facilities following a catastrophic outage could take up to 6 months. This, in turn, could reduce annual deliveries by roughly up to 50% for MWD-supplied water. The UWMP requires agencies to consider the effect of a 50% cutback in water supplies. This corresponds approximately to the degree of cutback contemplated by MWD's earthquake disruption scenario.

IEUA is unique among MWD member agencies in that it only has access to imported water off the eastern branch of the State Water Project and does not have access to most of MWD's in-region surface storage supplies. Therefore, a catastrophic interruption of SWP supplies would be particularly impactful on IEUA.

In September 2005, IEUA adopted federal emergency response procedures called NIMS (National Incident Management System) which can be implemented by IEUA personnel for a localized event such as an accident at one of IEUA's facilities or on a broader based regional event such as an earthquake or flood. This system provides a consistent nationwide template to enable federal, state, and local governments (and local private sector and non-governmental organizations) to work together effectively and efficiently to prepare for, prevent, respond to, and recover from domestic incidents, regardless of cause, size, or complexity, including acts of terrorism. Complementary to NIMS, IEUA has completed Mutual Aid Agreements between itself and its local retail agencies (see Appendix R of 2010 UWMP).

## 9.2 Supply Augmentation Actions

The methods described in Section 5.3 will apply during emergencies.

## 9.3 Emergency Curtailment of Imported Water

In June 2004, MWD conducted an unplanned shutdown of the Rialto Feeder pipeline. The pipeline was discovered to be in danger of collapse and repairs were needed immediately. Because the Rialto Feeder is the only source of significant imported water deliveries to the IEUA and the Three Valleys Municipal Water District (TVMWD) service areas, the loss of that supply during the summer when municipal and industrial water demand was high, could have had a devastating impact on local agencies. The Rialto Pipeline Shutdown occurred from Monday, June 7, 2004 through Saturday, June 12, 2004.

To prepare their customers for the shutdown, the local agencies coordinated among themselves, MWD, and the local television and newspaper media. Water agencies asked their largest customers to stop irrigating their landscapes and stop all non-essential water uses during the 5-day shutdown for repairs. Also, local agencies asked their residential customers to eliminate landscape irrigation and to reduce or eliminate their non-essential water use practices. Because each local agency has a different resource mix, each agency was affected somewhat differently by the shutdown. Some retail agencies rely on imported water to supply a large portion (as much as 50%) of their demand during that time of the year.

One retail agency determined that the best course of action was to declare a “state of water supply emergency” and issued an emergency shutdown notice to all their customers. Their customers responded well to the request by reducing overall water use by 60% during the repairs. This response allowed CVWD to successfully meet all essential municipal and industrial demands, as well as fire flow requirements. Other local agencies saw similar responses from their customers.

In the weeks following the shutdown, MWD, IEUA, and TVMWD issued a survey questionnaire to the affected water agencies asking for their assessment of the way the shutdown was handled.

The responses to the survey showed, that overall, the lead agencies response to the shutdown and coordination with local media were reasonably successful. There was some confusion by commercial and residential properties owners on how to operate their irrigation controllers. As a result, a few landscapes remained watered during the first days of the shutdown. There was also some confusion by the public as to why several large landscapes in certain cities were being watered. As it turned out, these sites were using recycled water to irrigate. Ultimately, the irrigation was turned off to avoid further confusion.

Each of the agencies learned valuable lessons during this water emergency. Clearly, when the public is informed about the issue, water supply officials can expect a generally positive response from the public. The coordination with local agencies, the distribution of information, and conservation suggestions to the residents are the keys to maintaining credibility and confidence with the public.

MWD has initiated a program to rehabilitate 100 miles of pre-stressed concrete cylinder pipe (PCCP) on five at-risk major feeders with ongoing monitoring, evaluation, and prioritization for immediate repair and rehabilitation over 20 years. MWD is closely coordinating with IEUA and its retail agencies to help mitigate immediate emergency concerns on the Rialto Pipeline by continuing regular inspection and monitoring for stray currents and/or installation of cathodic protection and performing individual segment repairs as needed. MWD has also developed an extensive rehabilitation effort expected to cost over $600 million for the Rialto Pipeline alone that is in its early stages of planning and design.

# Section 10: Reevaluation and Improvement Procedures

The WSCP is founded on several planning documents including the IEUA WUE Business Plan. The IEUA WUE Business Plan outlines methodologies and sets goals that measure the effectiveness of water use efficiency programming. The IEUA WUE Business Plan is a working document and, as such, must be modified and updated as changes occur and program years roll out. IEUA reviews the plan every 5 years in conjunction with the UWMP and adjusts accordingly. The WSCP will also be evaluated and updated on the same 5-year cycle.

IEUA is in the process of updating the 2015-2020 Water Use Efficiency Business Plan. The State is tentatively scheduled to finalize the new water use efficiency standard/objective and establish water use objectives for Retailers by 2023. IEUA's WUE Business Plan is being completed in two phases. Phase I will cover FY 2021-2023 and incorporate existing and newly proposed programs and measures. Phase II will cover FY 2023-2025, expand on Phase I existing and new programming, and develop a pathway to meet or exceed compliance with the new State regulations.

# Section 11: Water Shortage Contingency Plan – Adoption Resolution

## 11.1 Overview

During the process of preparation of the UWMP, IEUA also reviewed related information from regional and local agencies and developed this WSCP, which was largely founded on the 2020 DCP. An extensive coordination effort occurred during the DCP preparation between September 2017 to September 2019 which included five workshops, as well as four Response Action Taskforce meetings. IEUA also encouraged public involvement in the UWMP and WSCP by holding a public hearing for residents to learn and ask questions about their water supply.

This section provides the information required in Water Code Section 10632(a)(c) related to adoption and implementation of the WSCP. Table 11-1 summarizes external coordination and outreach activities carried out by the IEUA and the corresponding dates.

**Table 11-1: External Coordination and Outreach**

| External Coordination and Outreach | Date | Reference |
|---|---|---|
| Notification of Preparation; Encouraged public involvement | November 24 and 30, 2020 | WSCP Appendix B |
| Notified city or county within supplier's service area that water supplier is preparing an updated UWMP (at least 60 days prior to public hearing) | April 5, 2021 | WSCP Appendix C |
| Newspaper notice of public hearing and intent to adopt UWMP and WSCP | May 17 and May 24, 2021 | WSCP Appendix D |
| Adopted UWMP and WSCP by Resolution | June 16, 2021 | WSCP Appendix E |
| Submitted UWMP and WSCP to DWR (no later than 30 days after adoption) | By July 1, 2021 | - |
| Made UWMP and WSCP available for public review (no later than 30 days after filing with DWR) | By July 1, 2021 | - |
| Submitted UWMP and WSCP to the California State Library and city or county within the supplier's service area (no later than 30 days after adoption) | By July 13, 2021 | - |

The UWMP and WSCP was adopted by IEUA's Board of Directors on June 16, 2021. A copy of the adopted resolution is provided in WSCP Appendix E.

IEUA also notified any city or county within its service area at least 60 days prior to the public hearing. As indicated in Table 11-2, IEUA sent a Letter of Notification to the County of San Bernardino and cities within its service area in November 2020 and again in April 2021 to state that it was in the process of preparation to meet the DWR requirements (WSCP Appendices A and B).

**Table 11-2:Notification to Cities and Counties (DWR Table 10-1)**

| | | |
|---|---|---|
| ☑ | Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642.<br>**Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.** | |
| Table 11-2 of the WSCP | Provide the page or location of this list in the UWMP. | |
| | Supplier has notified 10 or fewer cities or counties.<br>**Complete the table below.** | |
| **City Name** | **60 Day Notice** | **Notice of Public Hearing** |
| *Add additional rows as needed* | | |
| City of Chino | ☑ | ☑ |
| City of Chino Hills | ☑ | ☑ |
| Cucamonga Valley Water District | ☑ | ☑ |
| Fontana Water Company | ☑ | ☑ |
| Monte Vista Water District | ☑ | ☑ |
| City of Ontario | ☑ | ☑ |
| San Antonio Water Company | ☑ | ☑ |
| City of Upland | ☑ | ☑ |
| City of Rancho Cucamonga | ☑ | ☑ |
| City of Montclair | ☑ | ☑ |
| West Valley Water District | ☑ | ☑ |
| **County Name** | **60-Day Notice** | **Notice of Public Hearing** |
| *Add additional rows as needed* | | |
| San Bernardino County | ☑ | ☑ |

**Notes**: In addition, the following agencies were also given a 60-Day Notice and Notice of Public Hearing: Chino Basin Water Master, Chino Basin Desalter Authority, Local Agency Formation Commission for San Bernardino County, Metropolitan Water District, Santa Ana Regional Water Quality Control Board, Santa Ana Watershed Project Authority, Three Valleys Municipal Water District, and the Water Facilities Authority.
Notification letters were sent out in November 2020 and April 2021. Copies of these notification letters are included in WSCP Appendices A and B.

## 11.2 Public Participation

IEUA encouraged community and public interest involvement in the plan update through a public hearing and inspection of the draft document on June 16, 2021. Public hearing notifications were published in local newspapers. A copy of the published Notice of Public Hearing is included in WSCP Appendix D. The hearing provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply in addition to the IEUA's plans for providing a reliable, safe, high-quality water supply. Copies of the draft plan were made available for public inspection at the IEUA headquarters and website.

## 11.3 Agency Coordination

IEUA's water supply planning relates to the policies, rules, and regulations of its regional and local water providers. IEUA is dependent on imported water from MWD, its regional wholesaler. As such, IEUA involved the water providers in this 2020 UWMP at various levels of contribution as summarized in Table 11-3.

## 11.4 WSCP Submittal

IEUA's five-member Board of Directors reviewed and approved the Final 2020 WSCP on June 16, 2021 (Resolution No. 2021-06-10). See WSCP Appendix E for the resolution approving the Plan.

By July 1, 2021, the adopted 2020 WSCP was filed with DWR and posted to IEUA's website. By July 13, 2021, the adopted 2020 WSCP was filed with the California State Library, County of San Bernardino, and cities within its service area, if applicable.

**Table 11-3: Coordination with Appropriate Agencies**

| Agency Name | Participated in Plan Development | Commented on Draft | Attended Public Meetings | Sent Notice of Plan in Preparation[a] | Received Copy of Draft Plan[b] | Sent Notice of Intent to Adopt[a] | Received Copy of Adopted Plan[b] |
|---|---|---|---|---|---|---|---|
| City of Chino | No | No | No | Yes | Yes | Yes | Yes |
| City of Chino Hills | No | No | No | Yes | Yes | Yes | Yes |
| Cucamonga Valley Water District | No | No | No | Yes | Yes | Yes | Yes |
| Fontana Water Company | No | No | No | Yes | Yes | Yes | Yes |
| Monte Vista Water District | No | No | No | Yes | Yes | Yes | Yes |
| City of Ontario | No | No | No | Yes | Yes | Yes | Yes |
| San Antonio Water Company | No | No | No | Yes | Yes | Yes | Yes |
| City of Upland | No | No | No | Yes | Yes | Yes | Yes |
| Chino Basin Desalter Authority | No | No | No | Yes | Yes | Yes | Yes |
| Chino Basin Water Master | No | No | No | Yes | Yes | Yes | Yes |

| Agency Name | Participated in Plan Development | Commented on Draft | Attended Public Meetings | Sent Notice of Plan in Preparation[(a)] | Received Copy of Draft Plan[(b)] | Sent Notice of Intent to Adopt[(a)] | Received Copy of Adopted Plan[(b)] |
|---|---|---|---|---|---|---|---|
| Chino Basin Water Conservation District | No | No | No | Yes | Yes | Yes | Yes |
| Formation Commission for San Bernardino County | No | No | No | Yes | Yes | Yes | Yes |
| Metropolitan Water District | No | No | No | Yes | Yes | Yes | Yes |
| City of Montclair | No | No | No | Yes | Yes | Yes | Yes |
| San Bernardino County Flood Control District | No | No | No | Yes | Yes | Yes | Yes |
| San Bernardino County Planning Department | No | No | No | Yes | Yes | Yes | Yes |
| Santa Ana Watershed Project Authority | No | No | No | Yes | Yes | Yes | Yes |
| Santa Ana Regional Water Quality Control Board | No | No | No | Yes | Yes | Yes | Yes |
| Water Facilities Authority | No | No | No | Yes | Yes | Yes | Yes |

**Notes:**

(a) IEUA sent notice of plan in preparation in November of 2020 and notice of intent to adopt in April 2021. Both notices are included in WSCP Appendices A and B.
(b) IEUA posted the draft 2020 WSCP to its website on 11 May 2021 and the adopted final 2020 WSCP to its website prior to July 1, 2021.
(c) While stakeholders did not participate directly in the development of the WSCP, stakeholders participated in the development of the foundational 2020 DCP, provided supply and demand data, and/or provided input to the Draft 2020 Water Use Efficiency Business Plan.

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# WSCP Appendix A

Regional Drought Contingency Plan

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

# Inland Empire Utilities Agency Regional Drought Contingency Plan

April 2020

Contact Information:
Jesse Pompa P.E., BCEE
Manager of Grants, Inland Empire Utilities Agency
6075 Kimball Ave., Chino, California 91708
Tel: 909-993-1545 / E-mail: jpompa@ieua.org / Website: www.ieua.org

BUREAU OF RECLAMATION

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Appendix D. 2015 Integrated Water Resource Plan: Mitigation Actions

Appendix E. Response Action Program Cut Sheets

**Acronyms and Abbreviations**

| | |
|---|---|
| AF | acre feet |
| AFY | acre feet per year |
| CBWM | Chino Basin Watermaster |
| CCAP | Climate Change Action Plan |
| CCCA | California's Climate Change Assessment |
| CCWRF | Carbon Canyon Water Recycling Facility |
| CDA | Chino Basin Desalter Authority |
| CVWD | Cucamonga Valley Water District |
| Delta | Sacramento-San Joaquin River Delta |
| DCP | Regional Drought Contingency Plan |
| FWC | Fontana Water Company |
| IEUA | Inland Empire Utilities Agency |
| IRP | IEUA Integrated Water Resources Plan |
| Model | Chino Basin Regional Water Supply Infrastructure Model |
| MVWD | Monte Vista Water District |
| MWD | Metropolitan Water District of Southern California |
| OBMP | Optimum Basin Management Program |
| OSY | Operating Safe Yield |
| RCAs | Regional Contracting Agencies |
| RCP | Representative Concentration Pathways |
| RMPU | Recharge Master Plan Update |
| RWPS | Recycled Water Program Strategy |
| RWQCB | Regional Water Quality Control Board |
| SAR | Santa Ana River |
| SAWCo | San Antonio Water Company |
| SCAB | South Coast Air Basin |
| SRI | Sacramento River Index |
| SWP | State Water Project |
| TDS | total dissolved solids |

USBR U.S. Bureau of Reclamation

UWMP Urban Water Management Plan

VOCs volatile organic chemicals

WFA Water Facilities Authority

WFMP Wastewater Facilities Master Plan

WSAP Water Supply Allocation Plan

*IEUA is a wholesale distributor of imported water and a regional wastewater treatment agency, serving 875,000 residents over 242 square miles.*

*As a public agency, IEUA purchases imported water from the MWD Water District of Southern California (MWD) and is situated on the largest groundwater storage basin in Southern California.*

*IEUA wholesales water purchased from Metropolitan Water District of Southern California (MWD) to cities, municipal water districts, investor-owned utilities and special districts. IEUA's retail agencies include: the cities of Chino, Chino Hills, Ontario, and Upland, Cucamonga Valley Water District in the city of Rancho Cucamonga, the Fontana Water Company in the city of Fontana, Monte Vista Water District in the city of Montclair, and San Antonio Water Company in the city of Upland.*

## What Defines a Drought?

A *drought* is a natural prolonged period of abnormally low rainfall, leading to a shortage of water. Drought is a weather-related recurring feature in Southern California and the Inland Empire region.

While drought cannot be prevented by local water management, the impacts can be mitigated by preparing the region for the eventuality of a future drought cycle.

## What Defines a Water Shortage?

A *water shortage* is the lack of sufficient available water resources to meet the demands of water usage within a region, either for a short-term or long-term duration. The shortage can be caused by a variety of reasons including groundwater contamination or other water quality constraints.

While noting the distinction between drought and water shortage, both of these conditions are impactful. The Inland Empire may find that there is a situation wherein there isn't a drought, but instead, a groundwater quality issue, causing a shortage that impacts the entire area.

IEUA and its member agencies are acutely cognizant that preparedness for either occurrence is critical to the region.

# 1 Introduction

## A Look Back

IEUA created the 2009 Drought Plan at the time when the region was in the midst of a prolonged three-year drought. The main objective of the plan was to implement Metropolitan Water District's Water Supply Allocation Plan. This well-reasoned plan provided a fair and equitable process for allocating potential future limited water supplies.

Two years later, IEUA and its member agencies faced one of the most intense droughts in California history (2011 – 2017); with the period of late 2011 through 2014 being the driest in California's recorded history.

## Gaining Insight

With tremendous collective efforts on the part of IEUA and retail member agencies, the region endured the demanding years of these drought cycles. Despite the many dead lawns and unwashed cars, thanks to regional and local response actions, adequate supply was never a question.

The numerous challenges that arose during this time period yielded much gained insight for water resource managers throughout the State.

It was clear that the great majority of customer sites were not drought resilient going in, or coming out, of the drought. Water savings came about predominantly through restrictions; not customer drought preparedness.

Breaking from this trend, customers in the IEUA service area did respond to the turf removal program; removing over 7 million square feet of turf AND customers rallied and reduced water usage by over 30%. While this occurred rather late in the drought cycle, the focus on long term drought preparedness was a welcomed sight.

The 2011 – 2017 drought illustrated the growing evidence that climate change is causing longer and more frequent droughts. The 2009 Drought Plan, while appropriate for its time, needed to be expanded.

## USBR Grant Funding

Coinciding with the need for a more robust plan, the United States Bureau of Reclamation (USBR) provided a funding opportunity for development of Drought Contingency Plans (DCP), with the aim of building long-term resiliency to drought and climate change.

In 2016, IEUA submitted a proposal and received grant award for development of a DCP. The objectives of the planning process, as put forth by USBR, were to help resource planners to 1) recognize drought in

its early stages; 2) identify the effects of drought or water shortages; and 3) provide water supply protection into the future.

As required under this grant, IEUA has documented the input and participation of our multiple stakeholders, factored climate change impacts to drought conditions, and identified potential drought mitigation and response actions, to enhance the IEUA region's resilience to drought, as exacerbated by climate change.

The DCP, as a federally sanctioned plan, not only provides the IEUA region with an increased level of proactivity and preparedness, it also better positions IEUA and its member agencies, should there be a need for federal emergency relief funds.

## Goals of the Drought Contingency Plan

The DCP is a comprehensive plan, designed to:

- ✓ **Define regional shortage conditions** to tailored stages, responses, and mitigation actions for the IEUA service area needs and resources.
- ✓ **Build resiliency** by identifying and facilitating investment in local projects that strengthen and further diversify water portfolios within the service area (i.e. conservation, recycled water, interconnections, and groundwater recharge).
- ✓ **Facilitate consistent communication** for the service area to ensure consistency and effectiveness during times requiring reduced water usage.
- ✓ Maintain a commitment to **sustainability and environmental stewardship** by meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- ✓ **Maintain consistency** with Metropolitan Water District's Water Shortage Allocation Plan and Dry Year Yield policies, as well as other IEUA and member agency water resource planning documents.
- ✓ Ensure **equity and fairness** throughout the service area.

## Plan Components

There are five distinct components to IEUA's plan, as required by the USBR grant:

1. The Drought Monitoring Framework
2. The Vulnerability Assessment

3. Mitigation Actions
4. Response Actions (Drought Communications & Outreach Plan)
5. The Operational & Administrative Framework

The **Drought Monitoring Framework** provides the tools and data metrics necessary to determine the existence and severity of a drought or water shortage.

The **Vulnerability Assessment** identifies and quantifies the key factors that can negatively affect water supply reliability.

The **Mitigation Actions** are prioritized projects and strategies that can be implemented prior to a drought situation in order to lessen the risks and impacts of water shortages.

The **Response Actions** provide a blueprint for deployment of strategic response actions for each stage of water shortage or drought condition.

The **Operational and Administrative Framework** describes the roles, responsibilities and procedures to implement each element of the Plan.

## Plan Development Process

The development of the drought plan was intentionally crafted to be a highly collaborative and inclusive process.

IEUA launched the project by assembling a taskforce, inclusive of each retail agency's management, planning and conservation staff as well as other regional stakeholders.

GEI Consultants, one of nations leading engineering firms with a known capability for drought planning, was awarded the contract to develop the plan.

Periodic taskforce meetings were held to present the outcomes of each planning component. Taskforce members were solicited for feedback, after which final technical memos were produced for:

1) Drought Monitoring
2) Vulnerability Assessment
3) Mitigation Actions

Additionally, consultant Maureen Erbeznik, a conservation program design and implementation expert, was hired to develop the response actions also known as the Communications & Outreach Plan. Four additional stakeholder workshops were convened with IEUA and retail member agency conservation staff. Over the course of the four workshops, the group ranked and selected programs best suited for drought response, established a strategy for restrictions & enforcement, identified communication

tactics, and aligned these response actions with drought stages. The Communications & Outreach Plan was then integrated with the technical memos produced by the taskforce to create the final Drought Contingency Plan.

*It is important to note that outcomes of the planning process are not a "cast in stone" series of actions that become mandated procedures, requiring stakeholder adherence. Instead the plan results act as a resource and general guide for IEUA and the member agencies. It is understood that each retail agency has its own distinct supply portfolio, operating principals, and customer characteristics. As such, there may be instances when a retail agency is not experiencing the same drought or water shortage impacts and will choose to take a modified course of action.*

*When the time comes and a regional drought is declared, a Drought Response Taskforce will be assembled with representatives from each agency. This group will review the recommended response actions for that particular drought stage, modify according to the "real life" conditions, set a budget, and finalize the drought response course of action.*

## Additional Benefits of the Plan

The USBR grant has allowed IEUA and the member agencies to create a plan that will deliver an increased level of proactivity and preparedness in advance of future water shortages. It integrates multiple local drought planning initiatives, tools and resources under one umbrella. At the same time, it increases the speed that drought response actions can be rolled out by providing a more detailed guide.

The plan provides a medium to document and attest to the completeness of drought planning activities. In addition, the plan meets federal and states "checklists" for drought and water shortage contingency planning. The DCP not only meets the requirements for USBR grants, but also directly aligns with the State of California's requirements for a Water Shortage Contingency Plan (WSCP).

In other words, the retail agencies are each required to create a WSCP as part of their Urban Water Management Plans. Should the agencies choose to create, instead, a Regional WSCP, the Drought Contingency Plan provides nearly all of the component requirements of the Regional WSCP.

Table 1 below lists and compares the contents of the DCP with the requirements of the WSCP:

***Table 1 . DCP Components Compared to Water Shortage Contingency Plan Requirements***

| Contents | DCP | WSCP |
|---|---|---|
| Analysis of water supply reliability | ✓ | ✓ |
| Written decision making process to determine water supply reliability | ✓ | ✓ |
| Key data inputs and assessment methodology used to evaluate the water supply reliability | ✓ | ✓ |
| Unconstrained demand, considering weather, growth, and other influencing factors | ✓ | ✓ |
| Available supply, considering hydrological and regulatory conditions in the current year and one dry year | ✓ | ✓ |
| Existing infrastructure capabilities and plausible constraints | ✓ | ✓ |
| Evaluation criteria water supply and demand assessment | ✓ | ✓ |
| Description and quantification of each source of water supply | ✓ | ✓ |
| Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage | ✓ | ✓ |
| Water shortage response actions that align with the defined shortage level | ✓ | ✓ |
| Mandatory prohibitions against specific water use practices | ✓ | ✓ |
| Communication protocols and procedures | ✓ | ✓ |
| Description of the financial consequences of, and responses for, drought conditions | -- | ✓ |
| Mitigation actions needed to address revenue reductions and expense increases | -- | ✓ |
| Monitoring and reporting requirements and procedures | ✓ | ✓ |
| Monitoring and evaluating the functionality of the water shortage contingency plan to ensure mitigation strategies are implemented as needed | ✓ | ✓ |

# 2 Background

## 2.1 IEUA Service Area

Formed in 1950, Inland Empire Utilities Agency was originally created with a mission to supply supplemental imported water purchased from the Metropolitan Water District of Southern California (MWD) to municipalities in the Chino Groundwater Basin.

Since then, IEUA has expanded its mission and, today is focused on providing the following key areas of service:

- Securing and supplying imported water.
- Collecting and treating wastewater.
- Producing high-quality renewable products such as recycled water, compost, and energy.
- Promoting sustainable use of groundwater and development of local water supplies.

The area is relatively flat alluvial valley from east to west and slopes from north to south at a one to two percent grade. Valley elevation ranges from about 2,000 feet above sea level in the foothills below the San Gabriel Mountains to about 500 feet near Prado Dam.

The IEUA service area almost entirely overlies the Chino Groundwater Basin and covers approximately 242 square miles in western San Bernardino County (see Figure 1).

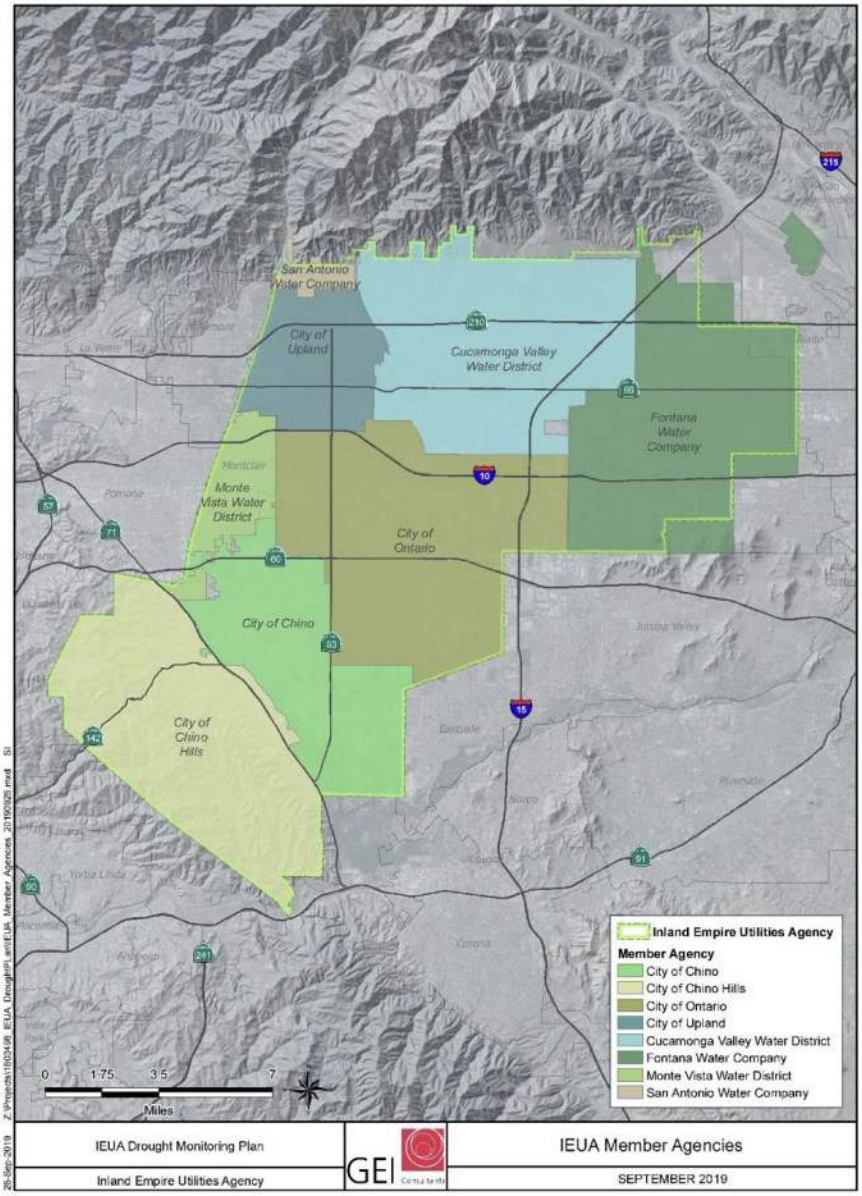


***Figure 1. IEUA Service Boundary Map***

## 2.2 CLIMATE

IEUA is located within the South Coast Air Basin (SCAB) that encompasses all of Orange County and the urban areas of Los Angeles, San Bernardino, and Riverside counties. The SCAB climate is characterized as "Mediterranean" with a semi-arid environment and mild winters, warm summers, and moderate rainfall. A summary of the annual precipitation is provided in Figure 2.

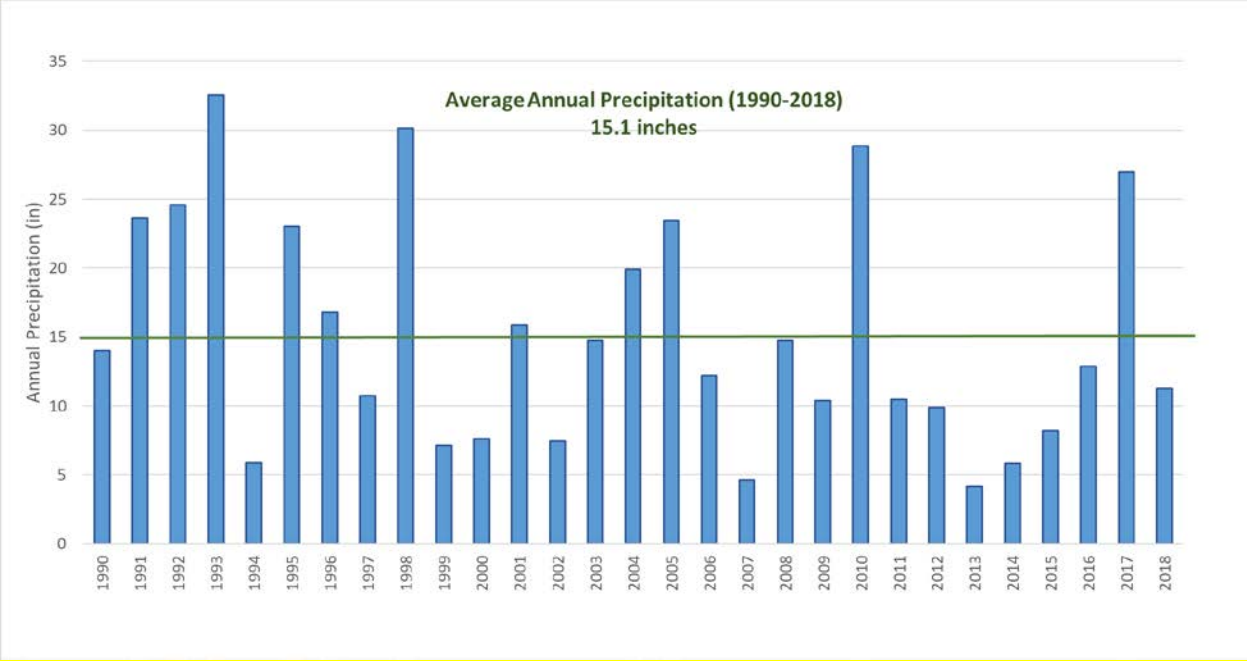


***Figure 2. Historical Annual Regional Rainfall (Pomona CIMIS Station #78)***

## 2.3 Regional Water Demand Forecasts

Within the IEUA service area, water demand since 1995 has increased by approximately 20 percent, despite a regional growth of 30 percent. This is indicative of new water use behaviors, including increasing efficiency in outdoor irrigation and indoor fixtures. This improved efficiency prolongs the availability of current regional water supplies into the future.

More recently, census data for 2014 to 2017 shows that annual population growth rates have been slightly less than one percent per year. Table 2 provides the regional municipal and industrial (M&I) water demand forecasts for 2020 and 2040 as reported in the IEUA 2015 Integrated Water Resources Plan (IRP). The IRP demand forecasts were developed based on the member agencies' Urban Water Management Plans (UWMPs). Three ranges of growth were reported based on varying assumptions related to future developments, housing density, and water practices.

***Table 2. M&I Regional Demand Forecast (from 2015 IRP)***

| Total Regional Demand Forecast (AC-FT) | 2020 | 2040 |
|---|---|---|
| High Demand Forecast[1] | 230,000 | 267,000 |
| Medium Demand Forecast[2] | 220,000 | 238,000 |
| Low Demand Forecast[3] | 212,000 | 217,400 |

1. *Traditional development and current usage patterns (55 GPCD indoor water use).*

2. *Higher density development based on the Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) average housing density. Existing outdoor use is limited to 70% of reference evapotranspiration (ETo). Future outdoor use is limited to 60% ETo, and indoor water use is reduced from 55 GPCD in 2015 to 35 GPCD by 2040 for new development.*
3. *High density development based on the SCAG RTP high housing density. Existing outdoor use is limited to 70% of reference ETo and future outdoor use is limited to 60% ETo. Indoor water use is reduced from 55 GPCD in 2015 to 35 GPCD by 2040 for new development.*

## 2.4 Planning Steps

The Drought Contingency Plan was developed following the USBR "*Guidance Regarding the Drought Contingency Planning Process*" as a framework. Below are the steps undertaken to develop the plan, resources utilized, and the associated deliverables.

***Table 3. Planning Steps***

| Approach/Steps | Resources Utilized | Deliverable |
|---|---|---|
| **Step 1** | | |
| Reviewed regional and local master planning documents and determined goals and factors impacting the DCP. | ▪ 2009 IEUA Drought Response Plan<br>▪ 2015 IEUA Integrated Water Resources Plan<br>▪ 2015 IEUA Water Use Efficiency Business Plan update<br>▪ 2015 Urban Water Management Plans – local and regional<br>▪ Recharge Master Plan Update<br>▪ MWD Water Surplus & Drought Management Plan<br>▪ MWD Water Savings Allocation Plan<br>▪ Existing IRP modeling data | Drought Goals documented |
| **Step 2** | | |
| Created a framework for predicting and confirming future droughts by establishing data metrics used to indicate drought conditions in the region. | ▪ Input and collaboration from the *DCP Taskforce* meetings | Drought Monitoring Technical Memo |
| **Step 3** | | |
| Evaluated the risks and impact of current and future drought in the IEUA service area. Assessed the region's vulnerabilities in terms of water supply reliability for each water supply type and effects by climate change, growth and other reliability factors. | ▪ 2015 IEUA Integrated Water Resources Plan<br>▪ Chino Basin Regional Water Supply Infrastructure Model results | Vulnerability Assessment Technical Memo |

| Approach/Steps | Resources Utilized | Deliverable |
|---|---|---|
| **Step 4** | | |
| Developed mitigation actions | ▪ Chino Basin Water Master's Optimum Basin Management Program (2000)<br>▪ Chino Basin Organics Management Strategy (2001)<br>▪ Recycled Water System Feasibility Study (2002)<br>▪ Wastewater Facilities Master Plan (2002)<br>▪ 2015 IEUA Integrate Resource Plan | Mitigation Actions Technical Memo |
| **Step 5** | | |
| Developed strategies and response actions for each stage of drought condition. | ▪ Consensus outputs from *Response Actions Taskforce* meetings<br>▪ 2015 IEUA WUE Business Plan<br>▪ 2015 – 2018 WUE Program Activity and Final Reports<br>▪ 2011 – 2017 Customer Water Use | Drought Response Action Plan (Communications & Outreach Plan) |
| **Step 6** | | |
| Developed and documented the roles, responsibilities and procedures for ongoing monitoring, vulnerability assessment, mitigation and response actions. | ▪ Feedback and outcomes from taskforce meetings | Operational & Administrative Framework |
| **Step 7** | | |
| Produced comprehensive Drought Contingency Plan. | ▪ Drought Monitoring Technical Memo<br>▪ Vulnerability Assessment Technical Memo<br>▪ Mitigation Actions Technical Memo<br>▪ Drought Response Action Plan (Communications & Outreach Plan) | Drought Contingency Plan |

The DCP was developed in coordination with IEUA's eight retail member agencies. IEUA invited representatives from each member agency's management, planning and conservation groups as well as other stakeholders including representatives from Chino Basin Watermaster, Water Facilities Authority and the Chino Basin Water Conservation District.

There were five workshops held over a two-year period, starting in September 2017 and concluding in September 2019. The Drought Contingency Taskforce members were given the opportunity to review and comment on technical memorandums for each plan component and the draft DCP, as well as to guide the development of the plan.

Below is the list of DCP Taskforce participants and their respective organizations:

| IEUA | |
|---|---|
| *Joshua Aguilar* | *Elizabeth Hurst* |
| *Andrea Carruthers* | *Lisa Morgan-Perales* |
| *Pietro Cambiaso* | *Kenneth Tam* |
| *Shivaji Deshmukh* | |
| *Sylvie Lee* | |

| Retail Member Agencies | |
|---|---|
| *May Atencio*<br>CITY OF FONTANA | *Courtney Jones*<br>CITY OF ONTARIO |
| *Joslyn Blakely*<br>CITY OF CHINO | *Mark Kinsey*<br>MONTE VISTA WATER DISTRICT |
| *Amy Bonczewski*<br>ONTARIO MUNICIPAL UTILITIES COMPANY | *Praseetha Krishnan*<br>CUCAMONGA VALLEY WATER DISTRICT |
| *John Bosler*<br>CUCAMONGA VALLEY WATER DISTRICT | *Teri Layton*<br>SAN ANTONIO WATER COMPANY |
| *Scott Burton*<br>ONTARIO MUNICIPAL UTILITIES COMPANY | *Brian Lee*<br>SAN ANTONIO WATER COMPANY |
| *Noel Castillo*<br>CITY OF MONTCLAIR | Michelle Licea<br>MONTE VISTA WATER DISTRICT |
| *Amanda Coker*<br>CITY OF CHINO | *Gisela Lopez*<br>MONTE VISTA WATER DISTRICT |
| *David Crosley*<br>CITY OF CHINO | *Jake Loukeh*<br>CITY OF CHINO HILLS |
| *Ron Craig*<br>CITY OF CHINO HILLS/RBF | *Michelle Madriz*<br>CITY OF UPLAND |
| *Gabriela De La Cruz*<br>MONTE VISTA WATER DISTRICT | *Dennis Mejia*<br>ONTARIO MUNICIPAL UTILITIES COMPANY |
| *Nicole deMoet*<br>CITY OF UPLAND | *Erin Morales*<br>CUCAMONGA VALLEY WATER DISTRICT |
| *Chris Diggs*<br>CITY OF POMONA | *Harrison Nguyen*<br>CITY OF UPLAND |
| *Kelley Donaldson*<br>MONTE VISTA WATER DISTRICT | *Jerry Perez*<br>CITY OF FONTANA |
| *Eduardo Espinosa*<br>CUCAMONGA VALLEY WATER DISTRICT | *Darron Poulsen*<br>CITY OF POMONA |

## Retail Member Agencies (con't)

*Cris Fealy*
FONTANA WATER COMPANY

*Raul Garibay*
CITY OF POMONA

*Katie Gienger*
ONTARIO MUNICIPAL UTILITIES COMPANY

*Eric Grubb*
CUCAMONGA VALLEY WATER DISTRICT

*Chris Hamilton*
FONTANA WATER COMPANY

*Chuck Hays*
CITY OF FONTANA

*Rob Hills*
CUCAMONGA VALLEY WATER DISTRICT

*Rosemary Hoerning*
CITY OF UPLAND

*Van Jew*
MONTE VISTA WATER DISTRICT

*John Robles*
CITY OF UPLAND

*Justin Scott-Coe*
MONTE VISTA WATER DISTRICT

*Patrick Soto*
FONTANA WATER COMPANY

*Josh Swift*
FONTANA WATER COMPANY

*Kevin Watson*
CITY OF UPLAND

*Mark Wiley*
CITY OF CHINO HILLS

*Braden Yu*
CUCAMONGA VALLEY WATER DISTRICT

*Seth Zielke*
FONTANA WATER COMPANY

## Other Regional Stakeholders

*Chris Berch*
JURUPA COMMUNITY SERVICES DISTRICT

*Vivian Castro*
CHINO BASIN WATER CONSERVATION DISTRICT

*Terry Catlin*
WATER FACILITIES AUTHORITY

*Leslie Cleveland*
UNITED STATE BUREAU OF RECLAMATION

*Lindsay Kaufman*
JURUPA COMMUNITY SERVICES DISTRICT

*Peter Kavounas*
CHINO BASIN WATERMASTER

*Scott Kleinrock*
CHINO BASIN WATER CONSERVATION DISTRICT

*Matthew Litchfield*
THREE VALLEYS MWD

*Nadia Loukeh*
WEST VALLEY WATER DISTRICT

*Todd Minten*
CHINO BASIN DESALTER AUTHORITY

*Tom O'Neill*
CHINO BASIN DESALTER AUTHORITY

*Jason Pivovaroff*
WESTERN MWD

*Ben Peralta*
THREE VALLEYS MWD

*Steven Popelar*
JURUPA COMMUNITY SERVICES DISTRICT

*Ryan Shaw*
WESTERN MWD

*Jake Stepp*
WATER FACILITIES AUTHORITY

*Elizabeth Skrzat*
CHINO BASIN WATER CONSERVATION DISTRICT

*Edgar Tellez Foster*
CHINO BASIN WATERMASTER

*Kristen Weger*
CHINO BASIN WATER CONSERVATION DISTRICT

| Consultants | |
|---|---|
| *Samantha Adams*<br>WILDERMUTH ENVIRONMENTAL INC. | *Roger Putty*<br>GEI CONSULTANTS |
| Mark Cowin<br>GEI CONSULTANTS | *Carolina Sanchez*<br>WILDERMUTH ENVIRONMENTAL INC. |
| *Ashlee Casey*<br>GEI CONSULTANTS | *Abhishek Singh*<br>INTERA |
| *Maureen Erbeznik*<br>MAUREEN ERBEZNIK & ASSOC. | *Mark Wildermuth*<br>WILDERMUTH ENVIRONMENTAL INC. |

The first workshop on December 11, 2017, served as an initial kick-off meeting to review the purpose and scope of the DCP, as well as to establish the participants for future workshop. The subsequent four workshops were held to review the results for each component of the plan.

The dates and topics discussed for each of the workshops are shown in Figure 3. Also shown in Figure 3 are the interim draft materials that were shared for review and comment by the taskforce, including the:

- Annotated DCP outline
- Drought Monitoring Technical Memorandum
- Vulnerability Assessment Technical Memorandum
- Mitigation Actions Technical Memorandum

In addition, one-on-one meetings were held between IEUA and member agencies as needed in order to provide an added forum for discussion and clarification.

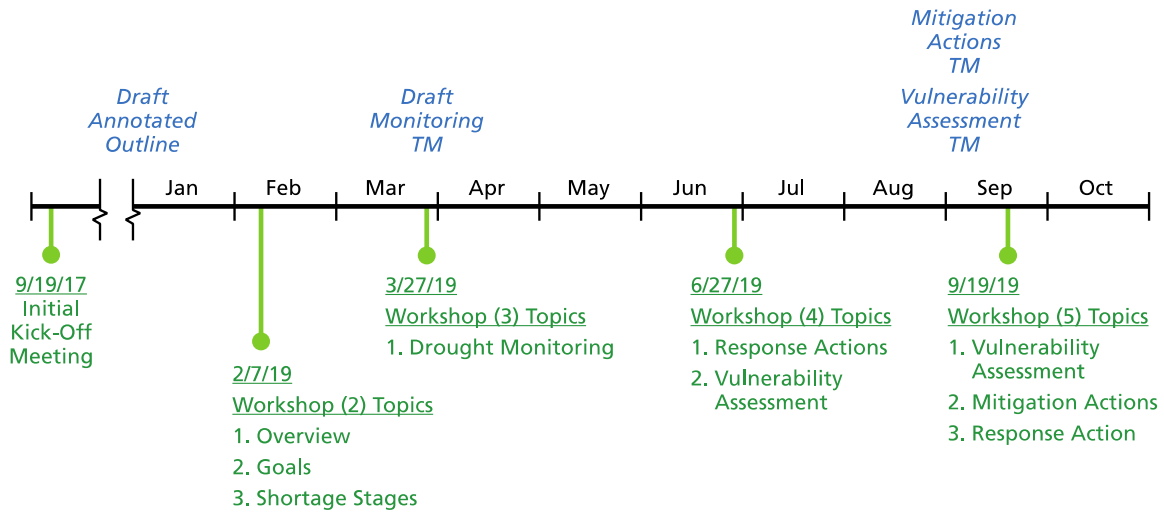


***Figure 3. DCP Technical Taskforce Workshop Schedule***

During this same time period, a Response Actions Taskforce was operating with the mission to create the Response Action (Communication & Outreach) Plan. The response action taskforce was comprised of retail member agency conservation staff and IEUA.

Below are the IEUA and Retail Agency participants:

| Response Actions Taskforce Participants | |
|---|---|
| *Lisa Morgan-Perales*<br>INLAND EMPIRE UTILITIES AGENCY | *Michelle Madriz*<br>CITY OF UPLAND |
| *Joslyn Blakely*<br>CITY OF CHINO | *Erin Morales*<br>CUCAMONGA VALLEY WATER DISTRICT |
| *Amy Bonczewski*<br>ONTARIO MUNICIPAL UTILITIES COMPANY | *Aaron Ramirez*<br>INLAND EMPIRE UTILITIES AGENCY |
| *Chris Garcia*<br>INLAND EMPIRE UTILITIES AGENCY | *Elizabeth Skrzat*<br>CHINO BASIN WATER CONSERVATION DISTRICT |
| *Gisela Lopez*<br>MONTE VISTA WATER DISTRICT | *Patrick Soto*<br>FONTANA WATER COMPANY |
| *Scott Kleinrock*<br>CHINO BASIN WATER CONSERVATION DISTRICT | *Kristen Weger*<br>CHINO BASIN WATER CONSERVATION DISTRICT |
| *Jake Loukeh*<br>CITY OF CHINO HILLS | |

Over the course of the four workshops, the group ranked and selected programs best suited for drought response, identified a strategy for restrictions & enforcement, and aligned these response actions with drought stages.

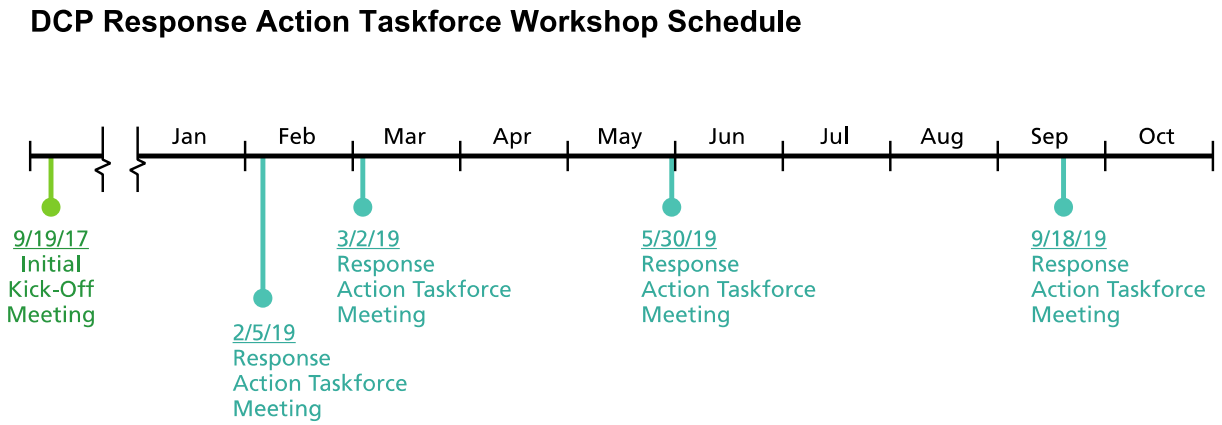


***Figure 4: DCP Response Action Taskforce Workshop Schedule***

# 3 Drought Monitoring

The **Drought Monitoring Framework** provides the tools to determine the existence and severity of a drought or water shortage.

This framework will rely largely on the knowledge and expertise of IEUA's member agencies for interpretation of real time conditions and prediction of future supply. IEUA's role is to act as the facilitator to, track potential water shortages through MWD, gather supply data from retail member agencies, consolidate the data and calculate the supply-demand index. It's important to note that the supply types and portfolios within the IEUA service area are extremely diverse, and the availability of supply types can depend on many factors.

There are four primary components to the drought monitoring framework:

1. **Indicator Data Collection and Distribution**- Key imported water availability indicators will be compiled and provided to the member agencies annually.

2. **Member Agency Reporting**- Based on the provided indicator data and their own monitoring activities, the member agencies will provide their annual forecast for available local supplies and demands.

3. **Regional Supply-Demand Index Calculation**- The agency projections will be combined to formulate a regional supply-demand ratio (or index).

4. **Shortage Classification**- The regional index will be used to classify the level of water shortage (if any).

Simply stated, the assessment looks at current and future projected water supplies as compared to current and projected water demand. Should there be a downward shift in available water supplies or an increase in customer demand, IEUA and its member agencies will determine the severity of the change, the categorized stage level, and the determine the required response.

This Drought Monitoring section:

- Provides background and operational information on the IEUA service area supply types and their conditions.
- Summarizes and describe the data to be used for monitoring each of the water supplies (also called indicators).
- Describes the member agency reporting process for the drought monitoring framework.
- Defines the water shortage stages to be implemented within the drought monitoring framework and associated regional supply-demand index calculation.

## 3.1 Drought Indicators

Given the diversity in the supply types and portfolios within the IEUA service area, the data available to inform water supply availability and conditions are abundant and often interconnected. The supply types reviewed here include Chino Basin groundwater, non-Chino Basin groundwater, imported water, and local surface water.

### *3.1.1 Groundwater*

*Chino Basin Groundwater*

The Chino Basin is an adjudicated groundwater basin and is one of the largest groundwater basins in Southern California. San Bernardino County Superior Court created the Chino Basin Watermaster (CBWM) in 1978 as a solution to lawsuits over water rights. The CBWM is responsible for management of the Chino Basin in accordance with the Judgement, 2000 Peace Agreement, 2007 Peace II Agreement, and the Chino Basin Optimum Basin Management Program (OBMP).

Water rights in the Chino Basin are held by representatives of three stakeholder groups, called Pools. The three Pools are:

- Overlying Agricultural Pool: representing dairymen, farmers, and the State of California
- Overlying Non-agricultural Pool: representing area industries
- Appropriative Pool: representing local cities, public water districts, and private water companies

The court judgment allocates groundwater rights by establishing an annual pumping "safe yield" for each Pool. The Operating Safe Yield (OSY) is the annual amount of groundwater that can be pumped from the basin by the Pool parties, free of replenishment obligations. Annual groundwater production in excess of the OSY is allowed by the adjudication, provided that the pumped water is replaced and recharged back into the groundwater basin. In addition, stakeholders within the different Pools can reach agreements to exchange groundwater rights for other water sources. For example, there have been agreements between dairymen in the agricultural pool and purveyors in the appropriative pool to exchange recycled water for groundwater rights. The OSY and the average total groundwater production since 1978 for each Pool is summarized in Table 4.

***Table 4. Chino Basin Groundwater Operational Safe Yield and Historical Production***

| Stakeholder Pool | Operational Safe Yield[1] (AF) | Average Groundwater Production[2] 1977-2017 (AF) |
|---|---|---|
| **Agricultural** | 82,800 | 42,248 |
| **Non-agricultural** | 7,366 | 3,984 |
| **Appropriative** | 54,834 | 97,215 |
| **Total** | 145,000 | 143,447 |

[1] Values represent the OSY from 1978 to June 2018. The appropriative rights toward the safe yield were reduced by 5,000 AF to 49,834 AF in June 2018.
**[2]Based on the 41st Annual Chino Basin Report (Fiscal Year 2017-18) (**http://www.cbwm.org/rep_annual.htm**)**

The quantity of groundwater stored in the Chino Basin has been carefully managed by the CBWM. Currently, there are numerous efforts to increase the amount of groundwater recharge. There are 19 active spreading basins that are operated to capture stormwater, recycled water, and/or imported water for recharge into the Chino Basin. The safe storage for the groundwater basin was previously defined as 500,000 acre-feet (AF), and there are investigations underway regarding the feasibility of increasing that storage to as much as 1,000,000 AF.

The water quality in the southern portion of the Chino Basin has been impacted by historical agricultural uses and now has high levels of nitrate and total dissolved solids (TDS) in certain areas. There are also some areas that exceed standards for perchlorate and volatile organic chemicals (VOCs). Most recently, there have been growing concerns around the occurrence of perfluorinated chemicals (PFOS and PFOA) and there are efforts to understand their occurrence in the regional water supply as they may become subject to regulatory limits.

Lower quality groundwater requires additional treatment, and/or blending with higher quality imported water. The CBWM works in partnership with local municipalities, IEUA, and the Santa Ana Regional Water Quality Control Board to address these water quality issues. In addition, IEUA is part of a Joint Powers Agency, the Chino Basin Desalter Authority (CDA), which was formed to manage the production, treatment, and distribution of treated potable water. Treatment occurs at two plants – Chino I and II Desalters – to remove salts and volatile organic chemicals through reverse osmosis, ion-exchange, and air stripping. A detailed summary of the general conditions of the Chino Basin can be found in the 2016 State of the Basin Report on the CBWM website. The 2016 State of the Basin is an atlas-style report with maps and figures displaying the conditions and trends within the basin.

Because of these conditions, the availability of Chino Basin groundwater is largely driven by quality as opposed to quantity. For example, for the period of 2009 to 2018, Chino Basin groundwater comprised roughly 15 percent of the total water supply for the Chino Hills service area (not including the water received from the CDA, which comprised 26 percent of the annual supplies for the same time period). However, in 2018, quality concerns in their area required that all groundwater wells within the service

area be taken offline for an extended duration and alternative water supplies be utilized. The resiliency of the regional supply portfolio and the interconnections between the member agencies facilitated access to alternative water supplies.

The availability of real-time groundwater quality data within the Chino Basin varies significantly depending on location, well type, and constituent of interest, complicating the selection of groundwater availability indicators for the IEUA drought monitoring framework. However, due to the active management and monitoring of the basin by the CBWM, along with each of the IEUA member agencies and other stakeholders, the conditions and availability of the groundwater are generally known by the stakeholders. The drought monitoring framework will rely on the collective expertise of the IEUA member agencies and their water managers to define groundwater availability conditions and inform the regional drought monitoring framework.

*Non-Chino Basin Groundwater*

There are four agencies within the IEUA service area that utilize groundwater from basins adjacent to the Chino Basin as a water supply source: Upland, Cucamonga Valley Water District (CVWD), Fontana Water Company (FWC), and San Antonio Water Company (SAWCo). The additional basins include Cucamonga, Rialto, Lytle Creek, Colton, and the Six Basins groundwater basins. The Six Basins are comprised of the Ganesha, Live Oak, Pomona, Lower Claremont Heights, Upper Claremont Heights and Canyon Basin. These basins combined provided approximately 13 percent of the regional water supply portfolio between 2009 and 2018.

The trends and conditions in other groundwater basins are unique and the supply availability has specific implications for each member agency. The drought monitoring framework will allow the member agencies relying on non-Chino Basin groundwater to provide their insights into the conditions of each of the groundwater basins. The member agencies' individual insights will serve as the key indicators for non-Chino Basin groundwater.

### 3.1.2 Imported Water

IEUA began importing supplemental surface water to the Chino Basin from MWD in 1951. While MWD also imports water from the Colorado River, the State Water Project (SWP) is the primary source of imported water supplies delivered to IEUA. The SWP originates along the Feather River (a tributary to the Sacramento River), hundreds of miles north of IEUA, and includes facilities to pump and convey water from the Sacramento-San Joaquin River Delta (Delta) to Southern California as well as to the San Francisco Bay Area, the San Joaquin Valley, and the Central Coast. From 2009 to 2018, imported water supplies delivered by MWD have accounted for roughly 25 percent of the water supplies in the IEUA service area.

There are numerous conditions that contribute to the relative availability of the imported water supplies, including current hydrologic conditions along the Feather and Sacramento Rivers and in the Delta, the regulatory restrictions on Delta exports, the amount of water remaining in SWP storage

facilities from previous years, the conditions of the conveyance infrastructure south of the Delta, the water management strategies of MWD, and numerous other operational and legal constraints. While some of these constraints can be difficult to quantify or consolidate, there are several metrics available to quantify the hydrologic conditions of the Feather and Sacramento Rivers that may be useful in predicting the availability of imported supplies.

The Sacramento River Index (SRI) published by DWR provides a quantification of Delta inflows from the Sacramento River by estimating the sum of runoff for the four major rivers within the river basin (Sacramento, Feather, Yuba, and American Rivers). The SRI is reflective of the overall water year and classifies each year as wet, above normal, below normal, dry, or critical. The historical relationship between imported water availability in the IEUA service area and the hydrologic conditions in the Sacramento River basin was examined by comparing the SRI to historical MWD deliveries to IEUA (see Figure 5). This comparison indicates that hydrologic conditions in the Sacramento River basin are not directly correlated with imported water deliveries in that year.

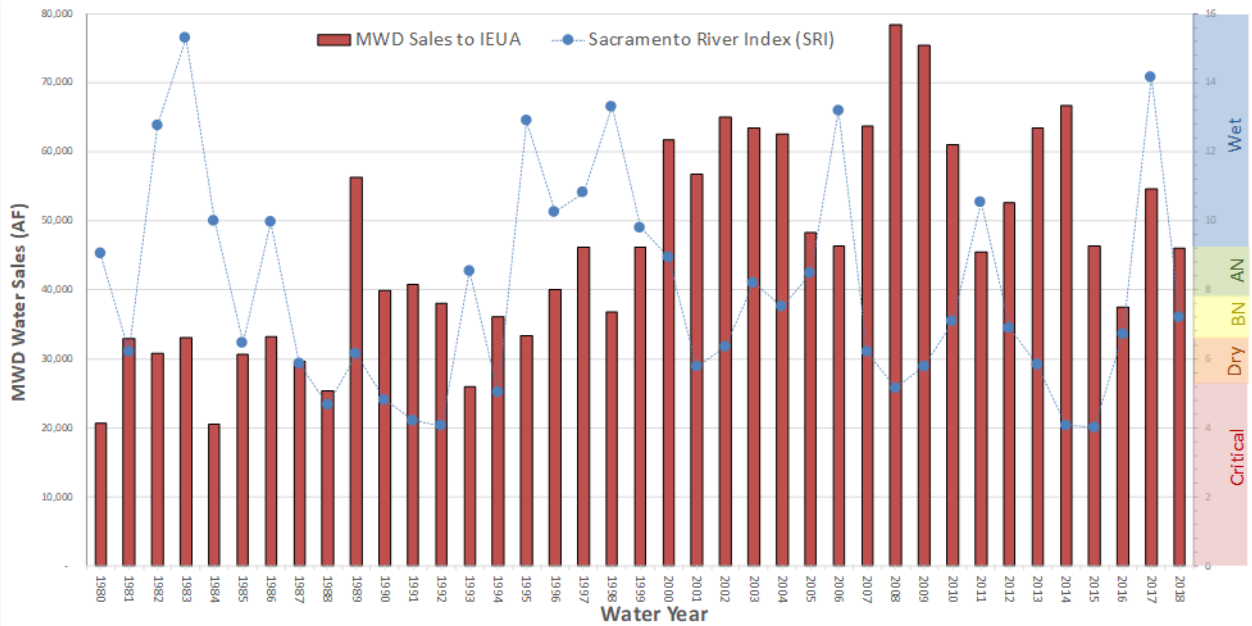


*Note: A data request was fulfilled by MWD for all water sales to IEUA from water years 1980 to 2018. Categories include: Agricultural, Full Service, Interruptible Programs, Local Projects, and Storage Programs. Of these categories, Full Service and Interruptible Programs were summed to determine MWD deliveries that meet municipal demand. Agency Sales Report data for 29 water years (1980 to 2018).*

***Figure 5. MWD Water Sales to IEUA with the Sacramento River Index (SRI)***

Since water year 2000, the largest and second largest MWD sales occurred in critical and dry years, respectively. Deliveries for water years classified as wet or above normal typically coincide with relatively average deliveries. This indirect relationship between hydrologic conditions and water deliveries is indicative of MWD and IEUA's long-term water management strategies, including use of carryover storage from year to year and real-time portfolio management to optimize use of available sources of water to meet water demands in any given year.

MWD actively monitors and manages the water supplies it imports to the region to assess availability and predict shortages. In response to critically dry conditions in the early 2000s and federal court rulings to protect the Delta Smelt in 2007 (which tightened regulations on Delta exports), MWD developed the Water Supply Allocation Plan (WSAP) to help manage uncertainty in the SWP's future water availability. The WSAP includes the specific formulas for determining member agency supply allocations in a fair and reasonable way and the key implementation elements needed to administer an allocation should a shortage be declared. The framework of the WSAP includes an allocation year that spans from July to June, with a declaration in April.

The key dates for the WSAP monitoring and declaration process are as follows:

**January to March**: Water Surplus and Drought Management reporting process provides updated information on storage reserve levels, projected supply, and demand conditions to the MWD Water Planning and Stewardship Committee meetings.

**April:** Member agencies report their projected local supplies for the coming allocation year (July to June) to update projected supplies. Staff analysis of storage reserves and projected supply and demand conditions provide an allocation recommendation to the MWD Board of Directors. This allocation is effective starting July 1 and held through the following June 30.

A 10-level Shortage Allocation Index determines the Wholesale Minimum Allocation and the Maximum Retail Impact Adjustment. Wholesale Minimum Allocation is defined as the minimum amount of MWD-supplied wholesale water service provided to each member agency. The Maximum Retail Impact Adjustment ensures that agencies with a high level of dependence on MWD do not encounter unequal retail shortages when experiencing a reduction in wholesale supplies.

In addition to the Wholesale Minimum Allocation and Retail Impact Adjustment, a Conservation Demand Hardening Credit and Minimum Per-Capita Water Use Credit are considered to determine the total WSAP Allocation. The allocation to an agency for its municipal and industrial retail demand is the sum of these four calculations, which are described in detail in the Appendix of the WSAP.

**July to June**: Member agencies are requested to submit their local production on a monthly basis and certify end of allocation year local supply use. Local production data must be reported to MWD by the end of the month following the month of use (i.e., use in July must be reported by the end of August). This information is combined with MWD sales information to track retail water use throughout MWD's service area. Each month MWD reports on member agency water sales compared to their allocation amounts.

**June 30**: Allocation year is complete.

**August**: MWD calculates potable water use based on supply certifications and actual sales data for the previous allocation year (July to June). Allocation surcharges are assessed for usage above a given member agency's final adjusted allocation.

Given the complexity of the various factors influencing the availability of imported water, the drought monitoring framework will rely on the monitoring efforts and allocation procedures of MWD to inform the availability of the imported supplies.

### *3.1.3 Local Surface Water*

Three IEUA member agencies utilize local surface water supplies to meet demand, CVWD, Fontana Water Company, and SAWCo.

CVWD local surface water supplies come from streams, springs, and tunnels within canyons located in the northern area of the CVWD boundary. CVWD has rights to six sources of canyon water, three of which are currently utilized (Cucamonga Canyon, Day/East Canyon, and Deer Canyon). Based on historical data, CVWD estimates a reasonable available volume of 4,540 acre-feet per year (AFY) from local surface water supplies.

Fontana Water Company receives local surface water supplies from Lytle Creek, which is then treated at the Sandhill Plant. Lytle Creek supplies from 2011 to 2015 averaged 6,250 AFY. The Lytle Creek sum is augmented with water obtained from the Grapeland Tunnel. The Grapeland Tunnel has extensive collector lines in the Lytle Creek Canyon tributaries and a large line running below the streambed of Lytle Creek.

SAWCo has rights to surface flow from San Antonio Creek that are pre-1914 rights and over the years have been supported by Court Judgments per a confidential report entitled "Opinion Re Water Rights of San Antonio Water Company," dated June 1993. In 2011, a wet year, SAWCo diverted 8,800 AF from San Antonio Creek. The average diversion from 2012 to 2015 was 1,963 AFY.

Figure 6 compares the monthly local surface water deliveries for Fontana Water Company, CVWD, and SAWCo with monthly precipitation from a nearby weather station (CIMIS Station #78, Pomona). Local surface water supplies for each of these member agencies are highly reliant on local precipitation, and months of high local precipitation typically correspond with a greater volume of local surface water supply for the months to follow. Local precipitation provides a helpful predictor for local surface water availability and is a valuable indicator for the drought monitoring framework.

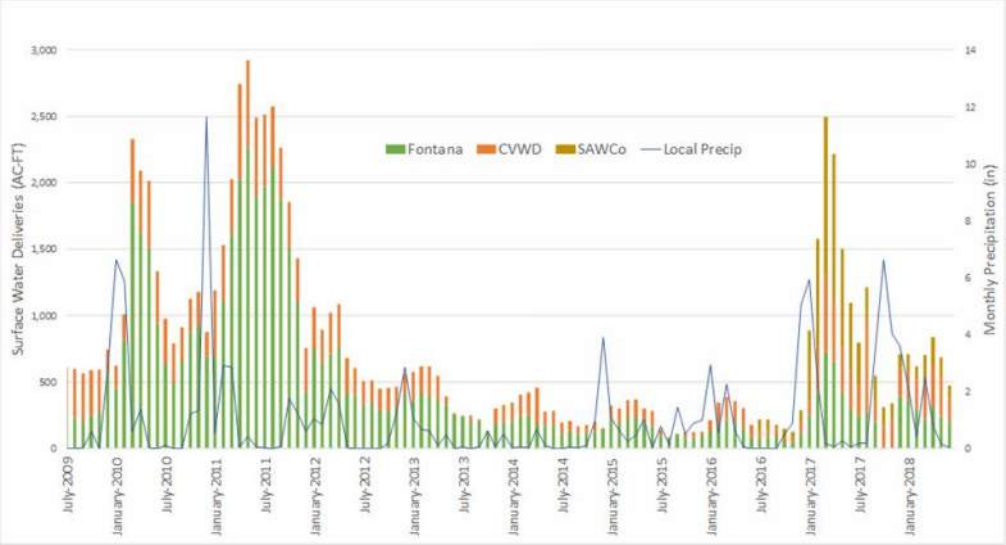


*Note: Local precipitation was collected from CIMIS station in Pomona (#78). A Chino CIMIS station (#255) was added in March 2018 and could be used for future applications.*

***Figure 6. Historical Local Surface Water Supplies and Local Precipitation***

## 3.2 DROUGHT MONITORING

The supply types and portfolios within the IEUA service area are extremely diverse, and the relative availability of supply types can depend on many factors. The IEUA drought monitoring framework will rely largely on the knowledge and expertise of IEUA's member agencies to interpret real-time conditions and predict and define regional water shortages due to the disparate nature of the indicators of drought conditions throughout the region. There are four key cornerstones of the IEUA drought monitoring framework as described below and shown in Figure 7.

- **Indicator Data Collection and Distribution.** Key imported water availability indicators will be compiled and provided to the member agencies annually.
- **Member Agency Reporting**. Based on the provided indicator data and their own monitoring activities, participating member agencies will provide their annual projections for supplies and demands within their service area once a year.
- **Regional Supply-Demand Index Calculation**. The agency projections will be combined to formulate a regional supply-demand ratio (or index).
- **Shortage Classification.** The regional index will be used to classify the level of water shortage (if any).

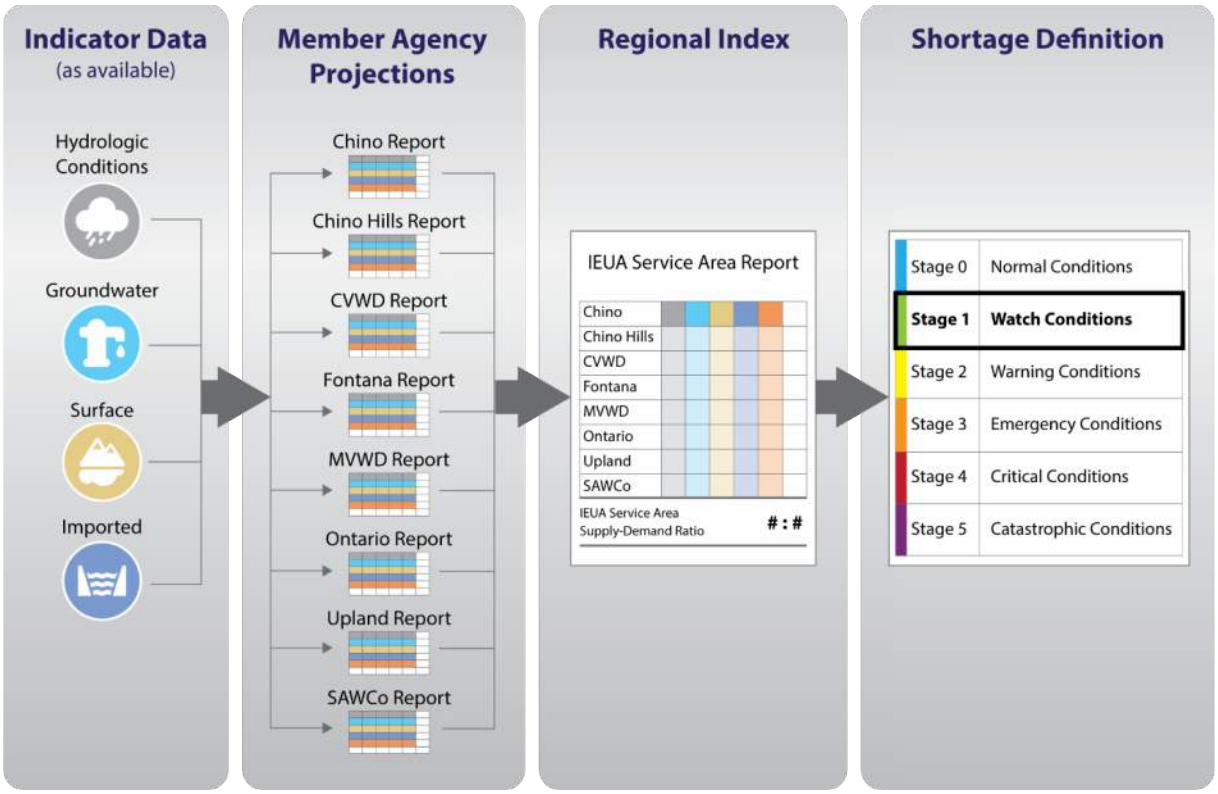


***Figure 7. IEUA Regional Drought Monitoring Framework***

### *3.2.1 Reporting Framework*

The drought monitoring reporting will occur on an annual basis and will be a two-step process. First, key water supply indicators for imported water will be compiled into a standardized report and distributed to the water managers from each member agency. This will include projected deliveries of imported water from MWD in addition to any potential forecasts for shortages. IEUA will also provide estimated demand projections to the participating member agencies, as a reference or guide, based on a five-year historical average.

Second, each retail member agency will report their projected local supplies and demand for the coming year. Figure 8 below is the information obtained from each member agency that will be utilized to generate the supply-demand ratio.

| Annual Supply Projections | | | | | |
|---|---|---|---|---|---|
| Agency | Local Groundwater | Surface Water | Imported Water | Annual Demand | Supply Shortage |
| Chino | | | | | |
| Chino Hills | | | | | |
| Fontana Water Company | | | | | |
| Ontario | | | | | |
| Upland | | | | | |
| Cucamonga valley Water District | | | | | |
| Monte Vista Water District | | | | | |
| San Antonio Water Company | | | | | |

***Figure 8. Sample Reporting Framework***

This reporting time frame and structure was selected because it piggy-backs the annual reporting time frame conducted by IEUA, the retail member agencies and MWD.

As well, there is an additional review process. IEUA has an established monthly forum to provide and receive updates from the member agencies on water supply conditions. IEUA hosts member agency Water Manager meetings each month, where the managers review supply conditions, demand shifts and regulatory changes that may impact supply. If local circumstances or external drivers significantly shift, IEUA will request updated local supply data from respective member agencies. As with the annual reporting, this information will be used to determine if there is a regional water shortage due to these factors.

### *3.2.2 Supply and Demand Ratios*

The supply and demand ratios for each year will be calculated based on the projections provided by the water managers. The data will be compiled into a singular supply-demand ratio for the IEUA service area. The regional supply-demand ratio will serve as the trigger to inform the regional water shortage.

Figure 9, on the following page, provides an example compilation of member agency projections and the calculation of the regional supply-demand ratio. There will be considerations for expected shortages for individual member agencies that may not be reflected in the regional ratio.

Between reporting periods, the participating member agencies will continue their individual monitoring activities. Each of the member agencies have developed their own approach to monitoring their supplies and have established unique definitions and responses for localized shortage conditions. *Appendix B:*

*Summary of Member Agency Water Shortage Stages* provides an overview of each agencies' shortage definitions and responses.

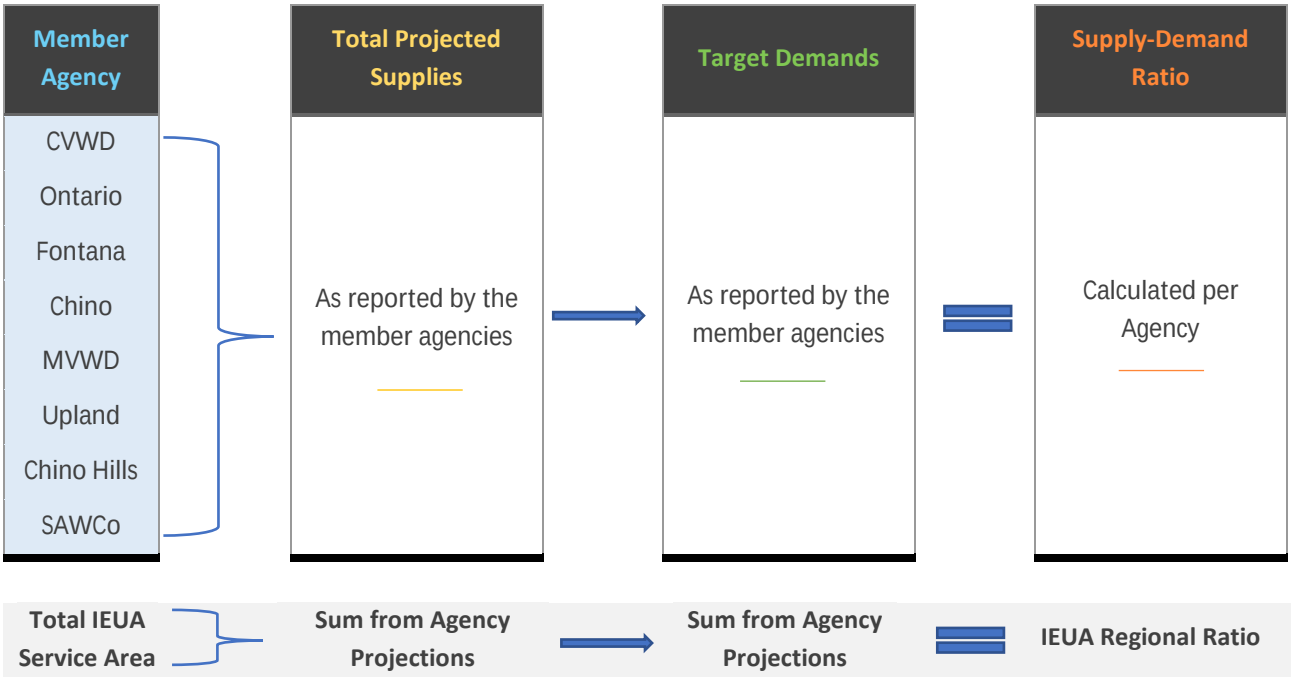


***Figure 9. Annual Regional Supply and Demand Projects for IEUA Service Area***

### *3.2.3 Water Shortage Stages*

Stages will be defined based on the calculated supply-demand ratios for the IEUA service area. The water shortage stages and descriptions are shown in Table 5.

These stages will be used to help the Drought Response Taskforce identify the most appropriate regional responses for the anticipated shortages.

The stages are in compliance with the newly passed state legislation (SB 606 and AB 1668), which now requires drought plans to be standardized and include six stages of drought severity. These stages were developed in consultation with each of the member agency's own definitions for local drought or water shortage levels and can be viewed in *Appendix B: Summary of Member Agency Water Shortage Stages.*

It is important to understand that the stage is calculated and declared for the overall region, and at the time, a local retail agency may have a water supply level that varies from the regional stage due to the uniqueness of their water supply mix. When this occurs, the local agency may develop customer messaging that clarifies that their agency is not directly impacted to the same level as the region.

Water shortage stages and triggers for IEUA region are below:

***Table 5. IEUA Regional Water Shortage Stages***

| Drought Stage: | Stage Descriptions: | Triggers: |
|---|---|---|
| **Stage 0** | Normal Conditions | No water shortages anticipated. |
| **Stage 1** | Watch Conditions | IEUA regional ratio is predicting shortages between 1% and 5%. |
| **Stage 2** | Warning Conditions | IEUA regional ratio is predicting shortages between 6% and 15%. |
| **Stage 3** | Emergency Conditions | IEUA regional ratio is predicting shortages between 16% and 25%. |
| **Stage 4** | Critical Conditions | IEUA regional ratio is predicting shortages between 26% and 50%. |
| **Stage 5** | Catastrophic Conditions | IEUA regional ratio is predicting shortages greater than 50%. |

# 4 Vulnerability Assessment

In the western part of the United States, climate change is predicted to cause increased temperatures, less mountain snowpack, more severe and frequent droughts, changes in runoff patterns and overall negative impacts on regional water supplies.

Climate related factors may make it more challenging for water planners to manage demand needs. Add population growth into the mix and the picture becomes even more complicated.

A **vulnerability assessment** predictively identifies, quantifies, and prioritizes the potential susceptibilities of a region's complex and dynamic water supply sources. The assessment takes into consideration climate conditions, as well as other factors such as environmental and political policy, and population growth.

The desired outcome of the vulnerability assessment is to improve understanding of 1) the potential for, and 2) the characteristics of, future drought conditions.

This section is organized into four parts.

**First**, the regional water resources are reviewed and described.

**Then**, potential future conditions are discussed related specifically to climate change and growth and how they may impact each of the regional water supply types.

**Next**, results from IEUA's Integrated Resource Plan modeling efforts, which explores the potential impacts to the regional water supplies based on simulated future scenarios, are presented.

**Lastly**, the key vulnerabilities are reviewed and discussed.

## 4.1 Regional Water Supplies

As described in previous sections, the region relies on imported water, groundwater from both the Chino and non-Chino groundwater basins, IEUA-supplied recycled water, exchanges and purchases from other agencies, and local surface water from local creeks and canyons to meet demands. The composition of the regional and member agency supply portfolios based on the average annual deliveries from 2009 to 2018 are shown in Figure 10. Chino Basin groundwater provides the largest portion of the annual regional supply at 40 percent and imported water accounts for about 30 percent. Each of the member agencies also has their own unique portfolio as shown in Figure 10.

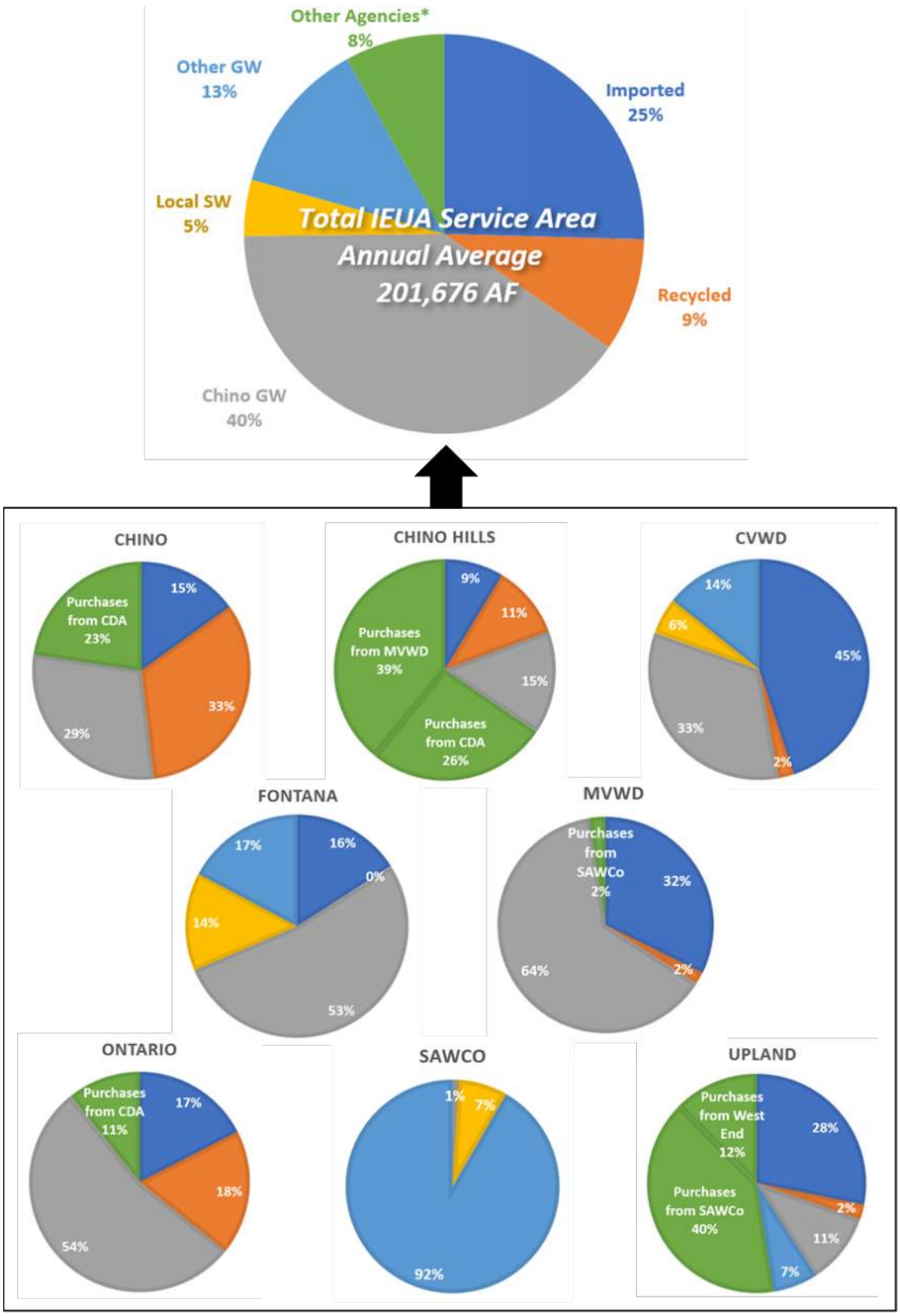


Note: "Other Agencies" in the regional portfolio are reflective of purchases from non-member agencies. The member agencies' supply portfolios show all purchases (whether from member or non-member agencies).

***Figure 10. Regional and Member Agency Supply Portfolios (2009-2018 Averages)***

## 4.2 Future Conditions

This section addresses predictive impacts to regional water resources and imported supply resulting from growth, climate change, and other possible factors. To support this process, resource information was gleaned from the following sources:

- California's Fourth Climate Change Assessment (2018 CCCA)
  - Mean and Extreme Climate Change Impacts on the State Water Project [CCCA SWP]
  - Los Angeles Region Report [CCCA LA]
- IEUA's Integrated Water Resources Plan (2015 IRP)
- IEUA's Climate Change Action Plan (2018 CCAP)

The CCCA's Los Angeles Region Report was utilized because it encompasses Los Angeles, Ventura and Orange counties, and most importantly, urbanized portions of San Bernardino County.

Los Angeles region topography and boundary definition as a solid red line, which encompasses Los Angeles, Ventura, and Orange Counties, and adjacent urbanized portions of San Bernardino and Riverside Counties.

Like the rest of the state, the Los Angeles region is expected to face a challenging combination of decreased water supply and increased water demand. The future reliability for IEUA's water resources are dependent upon climate conditions (both local and at the source of supplies), environmental and political drivers, and growth. Climate change-induced temperature increases, changes in runoff patterns, and drought are some of the key factors that will have a substantial impact on regional water supplies. Additionally, growth in the region will create new demand for potentially strained water supplies. The effects of climate change and growth are discussed in a general sense in Sections 4.2.1 and 4.2.2, respectively. Regional water supplies within the IEUA service are then summarized and analyzed through three lenses: climate change, growth, and other supply reliability factors.

### *4.2.1 General Effects of Climate Change*

The effects of a changing climate are apparent throughout California, including increased temperatures, prolonged drought, rising sea levels, severe atmospheric river events, and extreme wildfires. Figure 11 shows the predicted trends for temperature in the Los Angeles area, as reported by the CCCA LA report, based on global climate models. In the figure, modeled scenarios are described as Representative

Concentration Pathways (RCP) 4.5 and 8.5. RCP4.5 represents a mitigation scenario where global $CO_2$ emissions peak by 2040, while RCP8.5 represents a "business-as-usual" scenario where $CO_2$ emissions continue to rise throughout the 21st century. Both scenarios show a predicted increase in average temperatures in the Los Angeles region. Though projections are similar during the early 21st century regardless of the emissions scenario, later in the 21st century the projections diverge as emissions continue to rise under RCP8.5 and they level off in the mid-century under RCP4.5. Based on the modeled results, average annual temperatures in the region could rise 4 to 5 degrees Fahrenheit by the mid-21st century, and 5 to 8 degrees Fahrenheit by the late 21st century.

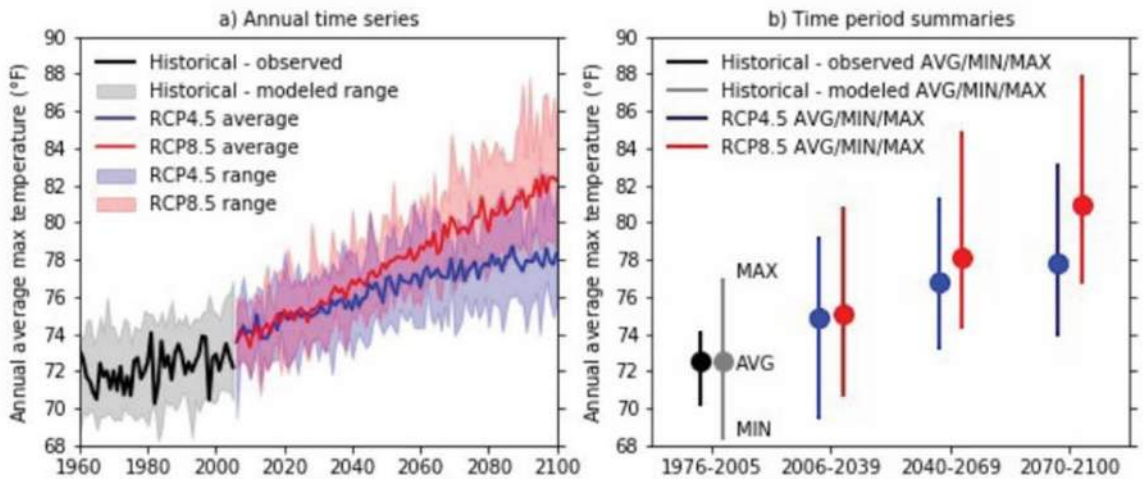


Historical-observed (black), historical-modeled (grey), and projected future (RCP4.5 - blue, RCP8.5 - red) annual average maximum temperature over the LA region. (a) Annual time series of data (future projections begin in 2006), with solid lines representing model-averages and shading representing model spread. (b) Summary of model-average (circles) and spread (vertical lines) across four time periods: 1976-2005 (historical), 2006-2039 (early-21st century), 2040-2069 (mid-21st century), and 2070-2100 (late-21st century). Unit is °F.

Source: CCCA LA

***Figure 11. Historical and Projected Temperatures for the Los Angeles Region***

Annual precipitation in the Los Angeles/San Bernardino region is highly variable and a significant portion of the regional rainfall is concentrated in the winter months from November to April. Figure 2 (provided in Section 2) shows the annual precipitation from 1990 to 2018. As the figure shows, while the average annual precipitation is slightly more than 15 inches, there have been very few years that have reflected that average. There are typically years with much greater than average precipitation or much less. The climate science regarding the future magnitude and timing of precipitation in the region is still an active area of research, though the consensus is that dry and wet extremes are both expected to increase in the future (CCCA LA); meaning that, while the projected average annual precipitation may align with historical trends, the wet years will likely be wetter and the dry years drier, thus exacerbating an already highly variable water supply reliability factor.

The reliabilities of imported surface water, local groundwater, recycled water, and local surface water are all susceptible to the effects of climate change and are discussed in the following sections.

### 4.2.2 General Effects from Growth

Population growth within IEUA's service area creates new demand for water supplies, but regional planning efforts such as IEUA's 2015 IRP and 2018 CCAP provide a path forward that strives to decrease demands and optimize resource allocations. Through thoughtful planning and development, sustainable growth within IEUA is a probable outcome. In the 2015 IRP demand analysis, it was found that per capita water usage decreases as development trends shift toward higher density and smaller landscaped areas. Also, the public has shown a willingness to reduce total water usage in response to statewide calls for conservation. Both factors suggest that increases in population do not necessarily constitute substantial increase in water use.

### 4.2.3 Groundwater

Groundwater within the IEUA service area is, and will continue to be, crucial to the water supply portfolio. The Chino and non-Chino Basin groundwater supplies have accounted for 53 percent of the regional supply portfolio for the last decade. In addition, each of the member agencies rely, to some degree, on groundwater to meet their annual demands. Per the 2015 IRP, the baseline amount of groundwater production between 2020 and 2040 is assumed to be 91,300 AF for Chino Basin, and 22,000 AF for non-Chino basins.

Future conditions for Chino and non-Chino Basin groundwater are discussed below through the lenses of climate change, growth, and other reliability factors.

*Climate Change Impacts*

It is anticipated that the groundwater supply will likely be adversely impacted by climate change-induced temperature increases and drought. As discussed above, impacts of climate change for the Los Angeles/San Bernardino region are likely to include increased temperatures and more extreme precipitation events. Groundwater elevation and water quality within the region are both dependent upon rainfall and supplemental sources of recharge. Although the effect of climate change on precipitation in California is still unclear, more frequent occurrences of extreme events similar to the 2011 to 2017 drought could significantly decrease natural groundwater recharge. In addition, as other supplies become constrained in a drought situation, there is potential for less water availability for groundwater recharge purposes. Current supplies utilized for groundwater recharge include surface water, imported water, and recycled water. The 2015 IRP, which was informed by model simulations performed by Wildermuth Environment Inc., showed that natural groundwater recharge would decrease by 0.44 percent for each 1 percent decline in long-term precipitation. A key conclusion drawn from the simulations is that it is important to secure supplemental water when available to recharge the Chino Basin (through direct or in lieu practices) to enable increased groundwater production during droughts and emergencies (2015 IRP).

Groundwater quality is susceptible to climate change because as other sources become less available, groundwater will likely be more heavily relied upon, and if, in addition to those stresses, recharge is also reduced, the groundwater quality issues in the basin may be exacerbated.

*Growth Impacts*

The 2015 IRP assumed that baseline groundwater production between 2020 and 2040 to be 91,300 AFY, which is only 750 AFY more than the current baseline amount of groundwater production. This shows that groundwater pumping is not anticipated to ramp up to meet increased demand.

Future development patterns with increased hardscaping and more efficient irrigation practices (2015 IRP) also have the potential to impact the groundwater supply. Hardscaping and increased irrigation efficiency coupled with warmer surface air temperatures, will change urban landscapes. Lawns reliant on irrigation may be converted to low-water yards of mulch, rock, shrubs, and other ground cover (CCCA LA). These changes in urban landscapes have a dual effect – one lessens the demand and the other decreases the amount of recharge from deep percolation of applied water.

*Other Reliability Factors*

Other factors that will impact the future viability of local groundwater within IEUA include changes in stormwater volume and timing, as well as salinity, nitrogen, and other constituent build-up in the groundwater aquifer.

Stormwater caused by surface water runoff originating from both rain and snow in the San Gabriel Mountains and locally within the IEUA service area is an important source of groundwater recharge. Future conditions for stormwater are closely related to both climate change and growth as described above. As climactic events become more extreme, it is likely that there will often be times of minimal stormwater due to drought, and other times of far too much stormwater resulting from atmospheric rivers and other extreme storm events. Additionally, increased growth in the region will likely convert agricultural or non-developed land to hardscapes, which generate more surface runoff and, consequently, stormwater.

IEUA, the CBWM, the Chino Basin Water Conservation District (CBWCD), and San Bernardino Flood Control District will need to continue cooperative management of flood control channels to capture stormwater in adjacent detention basins. Runoff not captured during these large storm events will likely reach the Santa Ana River and the Pacific Ocean, resulting in a lost opportunity to recharge stormwater flows during large storm events. The CBWM Recharge Master Plan Update (RMPU) recommended projects to increase stormwater recharge increasing the recharge capacity by 6,400 AFY (2013 CBWM RMPU). Stormwater is an extremely valuable resource to the region because it is considered “free” once the necessary facilities to capture and use this water have been constructed. It is also a high-quality water source that can improve the quality of the groundwater supplies once it has infiltrated and become blended with the aquifer (2015 IRP).

Groundwater quality in the Chino Basin has historically been impacted by high salt, nitrate, and other constituent concentrations and water quality is therefore a crucial constraint on future groundwater production. Although much of the historical agricultural land within the IEUA service area has been urbanized, agricultural operations continue to use water supplies to irrigate crops and raise livestock. Reduced rainfall and increased groundwater withdrawal may lead to more salinity buildup in topsoil and increased concentrations within the aquifer posing problems for the region's salt-sensitive crops (CCCA LA), increasing the need to secure fresh water supplies for blending or to invest in advanced treatment technologies. In addition, the CDA is an important element of the long-term salinity management strategy for the basin.

### *4.2.4 Imported Water*

The availability of imported water supplies is heavily dependent on the regional hydrology of the SWP as well as environmental regulations. This dependency can lead to high variability in the annual amount of water available to the Southern California region. For example, during the most recent California drought (December 2011 to March 2017), the California SWP was able to supply only five percent of its contract allocation in 2013-2014, which is a significant reduction from past allocations (2015 IRP).

Imported water purchased from MWD is limited by a purchase order agreement. The agreement allows the region to purchase up to a total of 93,283 AFY at its lowest (Tier I untreated) rate. This limit is based on historical imported water purchases for municipal use by the member agencies and for regional groundwater recharge. The agreement includes an annual minimum purchase commitment of 39,835 AF, which is slightly less than the 40,000 AFY minimum needed to operate the region's water treatment facilities. The future of SWP supplies to MWD is uncertain, but it is projected that climate change and other factors will curtail allocations and ultimately increase the cost of water.

Future conditions for imported water are discussed below through the lenses of climate change, growth, and other reliability factors.

*Climate Change Impacts*

Climate change is expected to continue to significantly impact the timing and characteristics of snowpack, on which the SWP system depends. The SWP's infrastructure was designed to capture snowmelt from Sierra Nevada snowpack, and when snow melts during the warmer spring and summer months, a combination of reservoirs and conveyance facilities provides a steady water supply throughout the year. This system is particularly effective during the summer and fall seasons when water demands peak and the precipitation is limited. The reservoirs were sized based on the historical precipitation patterns, and as more precipitation falls as rain in the winter months, more water will be required to be released from the reservoirs. The challenge of the shifting snowmelt and resulting runoff patterns is illustrated in Figure 12. The reliability of imported SWP water has declined in recent years and climate change predictions appear to show further decreases in reliability.

The CCCA SWP reported that changing seasonal precipitation and flow patterns, combined with sea level rise, could result in an annual 500,000 AF reduction of Delta export as well as a roughly 25 percent decrease of north-of-Delta carryover storage by around 2060. The results also indicate that the extra runoff from early snow melting and higher percentage of rain in the winter and early spring is not conserved in reservoirs and thus cannot be used to meet the higher summer demand in the current SWP system. This extra water is released as flood water in the winter and early spring to become Delta outflow. Most climate models reviewed for the CCCA indicate that the south-of-Delta exports are anticipated to be reduced from 4 to 44 percent annually compared to historical deliveries (CCCA SWP).

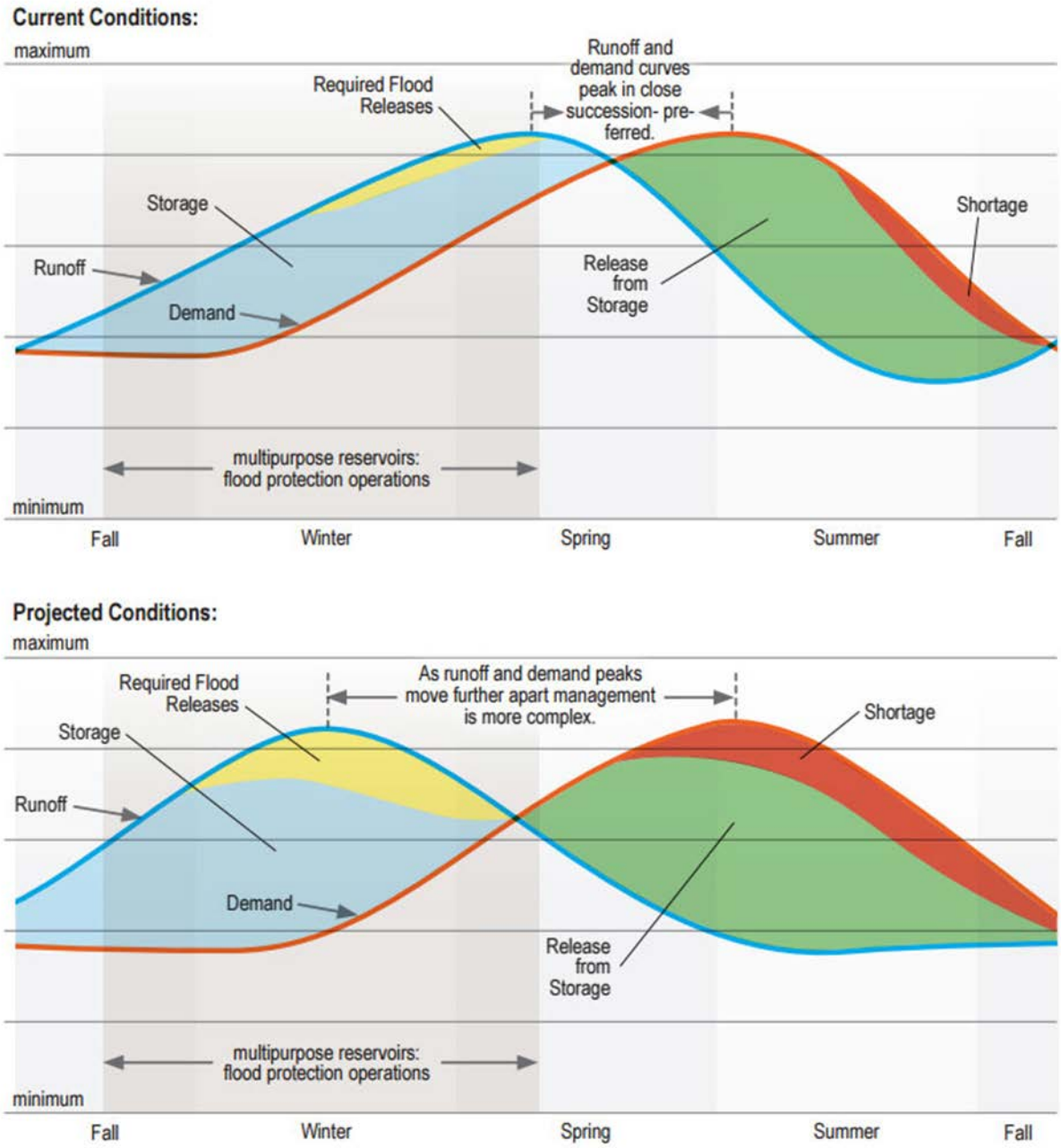


Source: California Department of Water Resources

***Figure 12. Changes in Runoff versus Demand for Reservoirs Dependent on Snowmelt***

*Growth Impacts*

There are no specific challenges posed to imported supplies due to growth. The challenges associated with growth will be general in that the regional water demand increases as imported water supplies become less reliable.

*Other Reliability Factors*

The existing SWP infrastructure relies on the ability to pump water from the Sacramento-San Joaquin Delta where local water rights, environmental protections, and imported water conveyance are often in competition with one another. Because of these frequently competing interests and the factors described above, regulations and restrictions on Delta Exports could potentially increase in the future.

### 4.2.5 Recycled Water

IEUA owns and operates four water recycling plants. These facilities provide tertiary-treated wastewater, also known as recycled water. Recycled water supplies can be used for three different applications, direct non-potable uses, groundwater recharge for the Chino Basin, and other regional discharge obligations.

Recharge of recycled water is allowed by the Regional Water Quality Control Board (RWQCB) through the OBMP. In addition, the region secured several permits allowing for the direct use and groundwater recharge of recycled water. These permits define requirements for the use of non-potable recycled water, including, but not limited to, uses, water quality limits, and monitoring requirements.

The recycled water program is operated based on the following order of priorities for recycled water supply:

1. Regional discharge obligations (Santa Ana River Judgement, environmental, etc.)
2. Agency direct use demands
3. Regional groundwater recharge

Based on recent wastewater projections that were calculated as part of the Wastewater Facilities Master Plan (WFMP), treated flows are expected to increase to over 85,000 AFY by 2040. These flow estimates were based on current existing indoor water usage levels (to ensure that facilities and pipelines are adequately sized) and are consistent with the IEUA's upper demand forecast. However, indoor water use efficiency is increasing, and new plumbing code and appliance standards are being implemented. As a result, available wastewater flows by 2040 are expected to be lower than 80,000 AFY. These water flow trends are being carefully tracked by IEUA.

Because recycled water supplies, their uses, and additional source water needs are under development by IEUA and the Regional Contracting Agencies (RCAs), the DCP conservatively assumes these surplus recycled water supplies will generally be used for the purposes stated above and additional source water will be further defined by ongoing studies and reflected in IEUA's other planning efforts.

Future conditions for recycled water are discussed below through the lenses of climate change, growth, and other reliability factors.

*Climate Change Impacts*

The reliability of recycled water supplies is not negatively impacted by climate change. While the treatment and distribution of recycled water supplies for re-use is energy intensive, which does lead to climate change inducing greenhouse gasses, the treatment and distribution of recycled water is *less* energy intensive than imported water supplies, creating statewide reductions in greenhouse gas emissions (2015 IRP).

*Growth Impacts*

The volume of recycled water available to IEUA and its member agencies is dependent on indoor urban water use, which has historically steadily increased. Based on the 2015 IRP demand predictions, this trend is anticipated to continue and should provide IEUA with increased volumes of recycled water supply. However, trends in indoor water efficiency must be considered when projecting supply volume.

Current demands for recycled water include non-potable applications such as irrigation and groundwater recharge. Applications for recycled water face challenges in terms of changing wastewater quality and treatment requirements due to increases in indoor water use efficiency and outdoor water use efficiency standards and increasing regulatory and environmental requirements. Additionally, the use of recycled water is impacted by the groundwater quality of the Chino Groundwater Basin. Specifically, the applications for recycled water become constrained if the salinity in the basin rises beyond the Regional Water Board's specified limits. Maintaining and potentially expanding recycled water projects to manage these challenges will increase the resiliency of the regional water supplies. Therefore, the vulnerability of recycled water supplies diminishes with increased growth.

*Other Reliability Factors*

The ability to collect, treat, and reuse recycled supplies relies on infrastructure that is intertied with all the member agencies. The maintenance and continued expansion of collection pipelines, water treatment facilities, pumps, and distribution pipelines are necessary for the success of IEUA's recycled water efforts. In addition, for recycled water to be a reliable source of supply there must be a demand for the supply. Meaning that as regulations and public opinion evolves there is the potential for more, or less, demands for recycled water.

An additional factor related to recycled water use in the region is tied to the Chino Basin groundwater quality. Requirements from the Santa Ana Regional Water Quality Board and the State Water Resources Control Board necessitate ongoing implementation of regional salt management and reduction actions as a condition of the regional recycled water use permits for outdoor irrigation and groundwater recharge. The applications for recycled water become considerably constrained if it is expected that its use will exacerbate salinity issues within the Chino Basin.

### 4.2.6 Local Surface Water

Agencies located in the northern part of the IEUA service area have long-standing legal rights to divert and treat water from local creeks. The amount of water from these local surface supplies is variable depending on climate conditions, and currently accounts for approximately five percent of the regional water supply portfolio.

Local surface water is recognized as an important resource since the only cost to the member agencies is the operation of the facilities to capture, treat, and distribute this water. IEUA member agencies recognize the value of local surface water and are investing in the capture and treatment of these supplies.

*Climate Change Impacts*

Local surface supplies are dependent on precipitation and temperature, and each of these factors is predicted to be influenced by climate change, creating uncertainty from year-to-year. The predictions for precipitation in the Los Angeles/San Bernardino region, as discussed above, are still uncertain but it is expected that the extremes will be more severe, and temperatures are expected to increase.

Extreme precipitation events can result in short periods with high volumes of runoff that will be difficult to capture. Conversely, extended droughts and dry years will result in long periods without available local surface water supplies, which will increase demands on other supply types.

Higher temperatures also impact local surface water. Warmer temperatures cause more evaporation and transpiration, reducing the amount of soil moisture. This means that the soil may absorb and hold more water when rain occurs, and this can reduce the amount of water flowing into creeks and streams.

*Growth Impacts*

There are no specific challenges posed to local surface water supplies due to growth.

*Other Reliability Factors*

The ability to collect, treat, and use local surface water relies on infrastructure. The maintenance of collector pipelines, water treatment facilities, pumps, and distribution pipelines are necessary for the success of IEUA's local surface water use efforts.

### 4.2.7 Future Conditions Impacts by Sector

One of the major impacts to all sectors will be the new state legislation setting water use standards. On May 31, 2018, Gov. Jerry Brown signed into law two new bills that will require urban water providers throughout California to set new permanent water use targets for their service areas by 2022. Senate Bill 606 (Hertzberg) and Assembly Bill 1668 (Friedman) provide a framework for setting water use targets, as well as implementing and enforcing the new water use requirements.

While many details for implementing the new water use requirements will be determined over the next several years, the overall framework includes:

- A standard for indoor residential water use of 55 gallons per person per day— dropping incrementally to 50 gallons beginning in 2030.
- A standard for outdoor water use (to be determined) based upon and the amount of irrigable landscaped area for a residential or dedicated irrigation commercial account and the community's climate.
- A standard for water loss due to leaks in water system pipes (to be determined).

These three standards will be calculated and added together to represent an overall water use target (in gallons) for the water provider. Although some IEUA member agencies base their rates on a water budget for each customer, the new state laws do not contain water use targets for individual residents or businesses. These laws outline an overall framework to guide urban water providers in setting water use targets, which must be approved by the State Water Resources Control Board. However, urban water providers will need to determine how their service area can best achieve the new water use target.

*Impact to Residential Customer Base*

The residential sector represents the largest number of customers within the IEUA service area. Future conditions indicate that shortages are likely to increase due to the combination of increased population growth and added strains on water supplies. The new state water use standards will require that customers use water more efficiently.

Newer high-density housing developments will likely include indoor water use appliances and fixtures with increased efficiencies. Residential properties with irrigated landscaping will likely be faced with more stringent restrictions on irrigation. In addition, increased average regional temperatures, and longer and drier droughts, may pose challenges with maintaining green spaces within residential neighborhoods. Lost urban greenery can further increase urban temperatures.

There will be costs associated with achieving increased efficiency both indoors and outdoors, and while there are rebates and other financial incentives offered to customers some of these costs will be placed on individual residents. Water rates may also increase as supplemental and alternative supply types and are implemented.

*Impacts to Commercial, Industrial, and Institutional Customer Base*

Commercial, industrial and institutional (CII) customer represent approximately 14% of water consumption in the IEUA service area. While the new laws do not set specific water use targets for CII customers, they do outline a framework for creating new water efficiency performance measures for businesses. As with residential customers, the CII customer base will be required to use water more

efficiently. Impacts of future shortages to the CII sectors may extend beyond the direct reductions in water supply.

Reduced water supply will impact industries which rely more heavily on water services such as food processing and other highly water dependent manufacturing. In addition, there may be increased costs for other materials and services due to water shortages and drought conditions (i.e. energy, agriculture). As with the residential sector, water rates may also increase as supplemental and alternative supply types are implemented.

*Impacts for Irrigation at Schools, Parks and Other Large Landscape Properties*

Dedicated irrigation meter accounts account for almost 14% of water consumption in the IEUA service area. The demands for irrigation are likely to increase in the future due to warmer temperatures and more variable precipitation. Meeting those demands with recycled water would offer a more drought resilient supply type. Additionally, other demands for recycled water may also increase (i.e. groundwater recharge, and regional discharge obligations) as supplies become more constrained. In the event of an extreme shortage, outdoor irrigation will become a lower priority to residential and commercial uses.

## 4.3 Vulnerability Assessment Modeling

Investigations performed as part of the regional IRP were used to inform this DCP vulnerability assessment. As part of the IRP efforts, the Chino Basin Regional Water Supply Infrastructure Model (Model) was developed to simulate existing and future conditions of the IEUA water supplies and infrastructure. The model incorporates existing regional and local potable water demands, supplies, key regional infrastructure, and interconnections allowing the movement of water from agency-to-agency within the IEUA service area.

In June 2019, the IRP team reported the modeling results for a 2020 baseline with five scenarios reflecting various future conditions. Two of the scenarios (Scenarios 2 and 3 referred to here as “DCP scenarios”) were developed in collaboration with the DCP team with the goal of bracketing potential future drought conditions from a moderate shortage condition with some consideration for climate change, and a more severe scenario beyond what has been experienced previously but which is possible based on current trends and research.

The two DCP scenarios that were modelled are described below and illustrate a range of potential drought severity conditions:

| IRP Scenario 2 | IRP Scenario 3 |
|---|---|
| ***Imported Water Shortage (Level 9 WSAP)*** | ***Import Water Shortage (Level 9 WSAP) & Local Supply Shortage*** |
| An isolated water shortage condition for imported water while local supplies remain relatively unaffected. | A more widespread water shortage resulting from statewide drought conditions impacting both imported *and* local water supplies, including long-term groundwater impairment. |

Recent California legislation requires urban water agencies to include considerations for a five-year drought in their water supply reliability planning efforts (SB 606 and AB 1668), and Scenario 3 is a helpful building block toward compliance. The following pages summarize the assumptions and results for each of the DCP scenarios. More information on the model and other results are provided in the Technical Memo "*DRAFT Integrated Water Resources Plan Regional Water Supply Infrastructure Model TM-2: 2020 Baseline and Evaluation of Water Supply Vulnerabilities for Scenarios 1 to 5,*" dated June 21, 2019, and will be provided in the forthcoming IRP update. It should also be noted that at this stage in the modeling efforts, the interconnections and the ability to transfer water between member agencies is not enabled. Later phases of the IRP modeling effort will explore opportunities for inter-agency transfers.

### *4.3.1 Scenario 2: Imported Water Shortage*

Scenario 2 of the IRP modeling effort is intended to simulate potential reductions in imported water supply due to future drought and climate change conditions, while also considering that local conditions may *not* be impacted to the same degree as imported supplies. The assumptions for this scenario are based on historical deliveries for imported water, member agency projections, existing infrastructure, and recent research and climate models. Key assumptions and associated datasets are described below.

*Scenario 2 Assumptions*

**Future Demands**

The projected water demands for the year 2035 were used for Scenario 2. The projected demands from the 2015 IRP were used for each member agency, which assumed three ranges for future demands based on potential water use practices and ranged from low, medium, to high (Table 2). The medium demand forecast were used for the Scenario 2 simulation.

**Imported Water Supplies**

In the CCCA there are numerous predictions related to future conditions in the Los Angeles/San Bernardino region, specifically related to drought and the availability of imported water. Some predictions state that south-of-Delta exports by the SWP and the Central Valley Project could be reduced by 50 percent more than during historical droughts (Wang et al., 2018). Meaning that as drought intensity and frequency increases, strains on imported water supply will also intensify beyond what has been seen in the past. The reasons for the reductions are likely to be numerous, interconnected, and complicated, but the primary causes of the increased reductions are expected to be reduced carry-over storage in reservoirs as precipitation patterns shift and sea-level rise and the resulting increased salinity in Delta exports.

This prediction is corroborated by Delta supply water quality and MWD's SWP supply availability during the drought in water years 2015-17, which provides a benchmark for future drought conditions. During this time period, the IEUA region had the lowest three-year average of imported water deliveries. See Figure 13 for historical deliveries from MWD to IEUA. Due to a low SWP allocation of 0% which was increased to 5%, MWD implemented the WSAP, and deliveries to IEUA were reduced by 41% of the supplies delivered in 2008 (the highest year in the 2000-2017 record). As a result, Scenario 2 assumed a WSAP shortage level of 9 (67.5% reduction) as a representation for future drought conditions, reflecting the CCCA's predicted deeper reductions. See Table 6 for a summary of the ten WSAP levels.

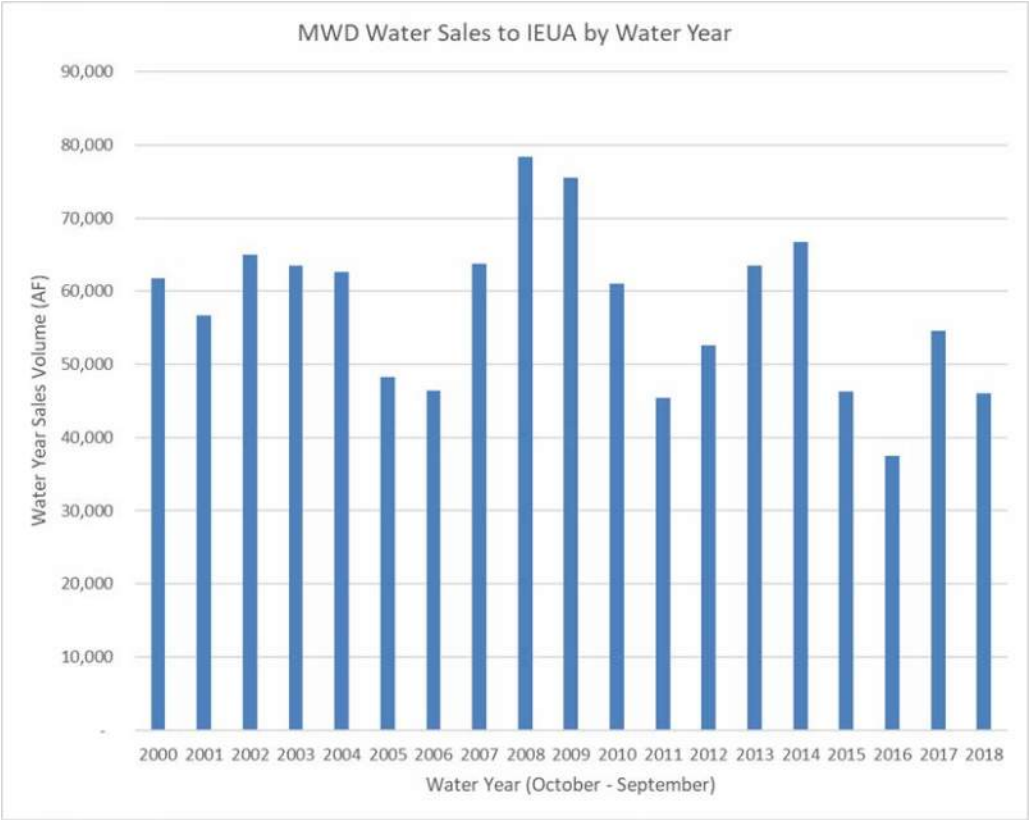


***Figure 13. Historical MWD Deliveries to IEUA (Sum of Full Service and Interruptible Programs)***

*Table 6. MWD WSAP Shortage Allocation Index*

| Regional Shortage Level | Wholesale Minimum Percentage | Wholesale Reduction Percentage |
|---|---|---|
| 1 | 92.5% | 7.5% |
| 2 | 85.0% | 15.0% |
| 3 | 77.5% | 22.5% |
| 4 | 70.0% | 30.0% |
| 5 | 62.5% | 37.5% |
| 6 | 55.0% | 45.0% |
| 7 | 47.5% | 52.5% |
| 8 | 40.0% | 60.0% |
| 9 | 32.5% | 67.5% |
| 10 | 25.0% | 75.0% |

**Surface Water Supplies**

Surface water supplies were simulated based on the 2035 projected availability as stated by each of the member agencies in their respective UWMPs. It is assumed that these supplies are unaffected by drought conditions in other areas of the State.

**Groundwater Supplies**

Local groundwater supplies were simulated at current available capacities and blending requirements. In addition, projected additional groundwater supplies for the year 2035 were included as reported in the member agencies' 2015 UWMPs. Details regarding how this information was collected and simulated are described in the August 2018 IEUA/INTERA Technical Memo titled *"IEUA Infrastructure Model and 2015 Baseline Scenario Results,"* and in a subsequent June 2019 Technical Memo (IEUA 2019).

### *4.3.2 Scenario 3: Five-Year Drought and Local Supply Shortage*

Scenario 3 is intended to be representative of a severe five-year drought with a combination of shortages in imported supplies and local supplies. In a five-year drought condition, it is expected that imported water supplies would be drastically reduced as was simulated in Scenario 2 and the local surface and groundwater supplies would also be diminished. Key assumptions and associated datasets are described below.

*Scenario 3 Assumptions*

**Future Demands**

The 2035 demands from the IRP were used for Scenario 3 and are the same as for Scenario 2 (as described above).

**Imported Water Supplies**

The imported water supplies delivered by MWD to the IEUA service area for Scenario 3 are the same as for Scenario 2 and are set at WSAP Regional Shortage Level 9 (see Scenario 2 described above).

**Local Surface Water**

The local surface water supplies simulated for Scenario 3 were based on the projected supplies as reported by the member agencies in their respective 2015 UWMPs for a multiple dry year condition. In the UWMPs there was not an expected change in the projected surface water supplies from the single dry year or a multiple dry year. The multiple dry year surface water supplies were considered to be a reasonable source to represent a five-year drought condition.

**Local Groundwater**

In an extended five-year drought scenario, it is assumed that local groundwater supplies will be impaired due to quality as opposed to quantity. In the Chino Groundwater Basin there are trends of slowly rising TDS and nitrate levels, as well as new emerging constituents such as 1,2,3, - Trichloropropane (1,2,3 – TCP), PFOS, and PFOA, which could result in a future loss of available supply. In addition, in an extended drought scenario when other supplies like imported water are reduced, local groundwater will be relied on more heavily. Increased production from the basin could exacerbate water quality issues.

For Scenario 3, local groundwater was simulated based on current well capacities and the additional 2035 projected supplies as reported by the member agencies (as with Scenario 2). To simulate compromised groundwater quality, the wells with current blending requirements were removed from service. In addition, wells currently with noted impairment but without blending requirements, would have blending requirements of 50 percent.

### *4.3.3 Results*

*Scenario 2 Imported Water Shortage Results*

The results of this modeling scenario indicate that under WSAP Shortage Level 9, three member agencies experience supply deficits ranging from 10 percent to 74 percent of 2035 demand with the current supply mix.

Other member agencies have surpluses and overall the region has a slight surplus of 2 percent of 2035 demand with current supplies, and a 10 percent surplus with 2035 projected new supplies.

The loss of imported water means that there is less water to blend, thus impacting groundwater quality. There are five agencies that use imported water for groundwater blending that would be impacted.

*Scenario 3 Five-Year Drought and Local Supply Shortage Results*

The results of this scenario indicate that under a severe, multi-year drought, six of the eight member agencies experience supply deficits ranging from 9 percent to 74 percent of 2035 demand with current supplies. Two member agencies have surpluses, but overall the region has a deficit of 13 percent of 2035 demand with current supplies, and 6 percent with projected 2035 supplies.

In this scenario, agencies with groundwater supplies that currently require blending lose that capacity and those with impaired supplies that do not currently require blending are impacted by a new 50 percent blending requirement.

## 4.4 Summary of Key Vulnerabilities

Based on the review of potential impacts to regional resources and the IRP modeling results, two key vulnerabilities are identified.

1. **Imported water will likely become less reliable in the future** and pose a considerable risk for overall regional water supply reliability. While within Scenario 2, the region showed an overall surplus, there are three agencies that currently depend more heavily on imported water and showed shortages in this situation. As Scenario 3 showed, while the region does not rely on imported water as heavily as it does local groundwater, there are ripple effects related to a loss of imported water. The loss of imported water could result in the increased reliance on local surface and groundwater sources, and increased groundwater production could cause groundwater quality issues to worsen in areas.

2. **Reductions, due to potential impairments to groundwater quality, pose the most significant water reliability risk to the IEUA service area**. All the member agencies, with the exception of SAWCo, rely on local groundwater to meet their annual demands. While groundwater has been a relatively reliable source of water in the past, conditions related to groundwater quality and reduced water available for blending may reduce the reliability of groundwater in the future. As the results from Scenario 3 illustrated, reduced groundwater quality combined with a loss of imported water could cause significant shortages for multiple agencies within the service area.

# 5 Mitigation Actions

**Mitigation actions** are projects, programs, and strategies implemented prior to a drought situation to lessen the risks and impacts of future water shortages.

IEUA and the retail member agencies developed and prioritized the list of mitigation actions through an inclusive and collaborative means as part of the IRP process. The mitigation projects were selected because they effectively address one or more of the key vulnerabilities; *future imported water supply reliability* and *ground water quality impairment*.

Both regional and local projects are included on the list. They include a combination of near- and long-term actions consisting of local supply and groundwater improvement, system interconnections, and capital improvement projects. A full list of the projects is included as an Appendix D to this document.

The timing and sequencing of project implementation is dependent on many factors. Although IEUA and member agencies will look to implementing the highest priority projects first, budget limitations and planning complexities will impact the actual timing. A lesser priority mitigation project may take precedence over a top priority one because, for example, there is outside funding available, resulting in expedited implementation.

The region is actively working on advancement of the mitigation actions included in this DCP. Through the 2015 IRP, IEUA and its member agencies explored and analyzed projects that resulted in the core recommendations discussed in this section.

This section provides an overview of the mitigation action planning efforts, strategy for mitigation action implementation, current regional planning efforts, and the context under which the actions will be advanced.

## 5.1 Planning Documents Utilized to Identify Mitigation Actions

Within the IEUA service area, there have been multiple planning efforts tasks initiated for the development of mitigation actions. In the early 2000s the region developed four foundational master planning documents. These historical documents illustrate how, for nearly the last 20 years, the region has recognized the increasingly uncertain future of imported water supply availability and the importance of local water supplies, particularly in changing climate conditions. As part of its response, the region has focused infrastructure investments on local water supply development strategies to reduce dependence on imported supplies and increase drought resiliency. These foundational documents are:

- Chino Basin Watermaster's Optimum Basin Management Program (2000)

- Chino Basin Organics Management Strategy (2001)
- Recycled Water System Feasibility Study (2002)
- Wastewater Facilities Master Plan (2002)

More recently, the 2015 IRP further evaluated the resiliency of the region's water resources under future climate conditions and identified strategies for ensuring that the region's future water needs through 2040 can be sustainably met.

The 2015 IRP was considered Phase I of the IRP process and provided an extensive list of potential supply projects (both local and regional) based on regional collaboration. At the time of this DCP effort, the 2020 IRP (Phase II) is currently underway. Phase II will provide a regional implementation strategy for long-term water resource management, strategically positioning the region for funding opportunities.

## 5.2 Mitigation Actions Strategy

Through the existing and ongoing regional plans there has been considerable effort and extensive stakeholder engagement aimed specifically at developing mitigation-type actions to improve regional water supply reliability.

The mitigation actions identified through the IRP fall into two core strategies:

1) Invest in Local Supplies
2) Enhance Groundwater Availability

### *5.2.1 Invest in Local Supplies*

As the availability of imported water becomes less reliable in the future, it will be ever more important to continue to invest in all forms of local water supplies, including groundwater, surface water, and recycled water. Building the local water supply capacity decreases reliance on imported supplies and improves resiliency for the regional water supply portfolio. The 2015 IRP had two major mitigation recommendations for increased local water supply capacity:

- **"Implement water use efficiency measures to decrease demand and enhance water supply resiliency."**
  Water use efficiency is universally regarded as the most cost effective method to reduce water demand and ultimately creates an additional water supply source since the water conserved can be applied to other demands.

- **"Continue investment in recycled water projects to maximize the beneficial reuse."**
  Recycled water provides one the most reliable supply types for the region. Current demands for recycled water include non-potable applications such as irrigation and groundwater recharge.

Applications for recycled water face challenges in terms of changing wastewater quality and treatment requirements due to increases in indoor water use efficiency and outdoor water use efficiency standards and increasing regulatory and environmental requirements. Additionally, the use of recycled water is impacted by the groundwater quality of the Chino Groundwater Basin. Specifically, the applications for recycled water become constrained if the salinity in the basin rises beyond the Regional Water Board's specified limits. Maintaining and potentially expanding recycled water projects to manage these challenges will increase the resiliency of the regional water supplies.

### *5.2.2 Enhance Groundwater Availability*

Groundwater is the most heavily relied on local water supply type. The Chino Groundwater Basin provided approximately 40 percent of the regional water supply portfolio over the last decade. The vulnerability assessment for the DCP illustrated how compromised groundwater quality poses a significant threat to local water supply reliability and can be compounded as other supplies currently used for blending, such as imported water, become less reliable. Enhancing groundwater treatment and groundwater recharge opportunities will be crucial as groundwater quality issues mount within the basin and dependence on groundwater potentially increases as other sources become less reliable. Groundwater recharge with good quality water sources provides the benefits of both groundwater quality management and increased groundwater storage. The 2015 had several recommendations related specifically to groundwater recharge:

- **"Strive to acquire low TDS supplemental water to enhance groundwater quality to sustain production and reduce salinity."**
  It is important that water used for recharge helps to support the salinity management measures within the Chino Basin. Identifying and securing low TDS water will help to increase the resiliency of the local groundwater supplies.

- **"Strategically maximize the purchase of supplemental water for recharge or in-lieu when available."**
  Periods of surplus supplies from imported water, exchanges, or other sources provide an excellent opportunity to acquire additional water supplies for groundwater recharge, or to offset the groundwater demands at the time. Positioning the region in terms of awareness, finances, and infrastructure to be able to maximize the purchases of those supplies creates greater resiliency for the region's water supply portfolio.

- **"Continue to maximize stormwater recharge projects, including rainwater capture and infiltration."**
  Local precipitation in the region is highly variable seasonally and annually, and it is expected that future rain events will become more intense in terms of magnitude and duration resulting in large volumes of stormwater. Improving the regional infrastructure to capture and utilize stormwater provides a low TDS water supply for groundwater recharge.

## 5.3 Mitigation Action Project Evaluation

A comprehensive list of potential mitigation actions was developed through the IRP process based on numerous planning efforts, including:

- 2015 Recycled Water Program Strategy
- 2015 Wastewater Facilities Master Plan Update
- 2013 Recharge Master Plan Update
- 2015 Water Use Efficiency Business Plan
- FY15/16 Ten Year Capital Improvement Plan (TYCIP)
- Santa Ana River Conservation and Conjunctive Use Program (SARCCUP)
- 2013 Upper Santa Ana River Habitat Conservation Plan

A full list of the projects can be found in *Appendix D: 2015 IRP Mitigation Actions*.

During the IRP planning process, the Technical Work Group crafted **five water resource strategies**. Each strategy had an underlying theme to address the region's water supply vulnerabilities. Below are the five strategies:

***Strategy 1:*** Maximize Chino Basin groundwater, including prior stored groundwater.

***Strategy 2:*** Recycled water program expansion.

***Strategy 3:*** Recycled water & conservation program expansions.

***Strategy 4:*** Maximize supplemental water supplies and recycled water supplies.

***Strategy 5:*** Maximize imported water supplies with moderate conservation.

Each of the strategies required building a mix of projects that would best meet the supply needs under the respective strategy.

In order to determine the value of each specific project, as well as its means of water supply creation, every project underwent a series of evaluation steps. First, the anticipated acre-feet yield was calculated for each of the 100 projects and, next, a determination of the number of years that it will take to yield the water.

From this, a list of the desired project outcomes was developed. These outcomes were selected because they specifically address the region's major water supply vulnerabilities. Projects were then assessed and tagged *yes, no, or neutral* on its ability to impact desired project outcomes. For example, *does the project provide increased groundwater*? *Does the project reduce TDS in the groundwater?*

These are examples of desirable project outcomes because they provide a positive contribution to local water supply.

Table 7 provides a list of the desired outcomes used as metrics to evaluate each potential mitigation action project.

***Table 7. Desired Mitigation Project Outcomes***

| Desired Mitigation Project Outcomes | |
|---|---|
| ▪ Increases groundwater storage | ▪ Provides emergency local supply redundancy |
| ▪ Increases water level in critical groundwater management zones | ▪ Decreases reliance on local surface water during dry years |
| ▪ Increases stormwater capture/recharge | ▪ Reduces TDS and/or nitrates in groundwater |
| ▪ Increases permeability or natural infiltration | ▪ Decrease net energy consumption |
| ▪ Provides additional recycled water | ▪ Increases capacity for wet water years |
| ▪ Reduces dependence on imported water during dry years | ▪ Eligible for grant funding |
| ▪ Increases local water supply | ▪ Technical feasibility/ease of implementation |

Once the projects were evaluated against the desired outcomes, they were uploaded into a data visualization software tool. The tool then created and compared theoretical combinations of various projects. After analysis, the tool generated the mix of projects that delivered optimum results for each of the five resource strategies developed by the Technical Work Group during the IRP planning process.

The highest performing mix of projects were selected as prioritized mitigation actions for retail agency implementation.

Although the planning process resulted in the optimal choices, actual timing and sequencing of project implementation is dependent on many factors. IEUA and member agencies will look to implement the highest priority projects first, however budget limitations and planning complexities will impact the actual timing. A lesser priority mitigation project may take precedence over a top priority one because, for example, there is outside funding available, resulting in expedited implementation.

# 6 Response Actions

With growing populations and the inevitability of future drought cycles, IEUA's and its member agencies' overarching goal is to create a water efficient region that can successfully withstand future water shortages without hardship.

IEUA and its member agencies have been arduously working to re-shape customers' attitudes about water sustainability and their personal role in achieving water shortage resiliency. Through education, messaging, and programs IEUA and its member agencies have been driving change, however, customers still have a way to go to fully make the transition. A percentage of customers have made significant equipment and lifestyle changes at their properties, but most have not.

Regional water sustainability can be achieved only when:

1. Customers fully understand the value of water and the unique conditions of the Inland Empire.
2. Customers create drought sustainable properties prior to emergency conditions.
3. Customers experience no water deprivation hardship during a drought cycle due to the sustainable landscape design of their properties and their water-consuming equipment.

While striving for full water efficiency is the goal, IEUA understands we're not there yet. With this knowledge, IEUA recognizes that water savings, during droughts or other water shortages, will need to be driven through an escalation in marketing, increased programs service offers, and enhanced incentives that rise as drought stages advance.

Table 8 provides a rough estimate of overall acre-feet savings necessary to meet the requirements at each drought stage. The calculations are based on the 2020 projected demand as well as single dry year and multiple year projected demands. The Acre-feet savings are calculated by using the highest percentage savings number desired for each stage. The table illustrates the need for sharp increases in incremental water savings from Stage 1 through Stage 5 during a potential future drought cycle.

***Table 8. Estimated Required Water Reduction per Drought Stage***

| | STAGE 1 Est Savings (AF) 5% reduction | STAGE 2 Est Savings (AF) 15% reduction | STAGE 3 Est Savings (AF) 25% reduction | STAGE 4 Est Savings (AF) 50% reduction | STAGE 5 Est Savings (AF) 50%+ reduction |
|---|---|---|---|---|---|
| **Projected Demand** | 9,985 | 29,955 | 49,926 | 99,851 | 99,851+ |
| **Single Dry Year Projected Demand** | 10,529 | 31,588 | 52,647 | 105,294 | 105,294+ |
| **Multiple Dry Year Projected Demand** | 11,296 | 33,888 | 56,481 | 112,962 | 112,962+ |

## 6.1 Previous Droughts and Lessons Learned

Historical review is useful when conducting planning activities. By looking at the previous drought cycle, we see the quantity of water conserved over the course of the drought and customers' overall response time to reach reduction levels. This and other historical information were taken into account in the crafting of the Response Action Plan, as well as the Programs and Services.

The chart below provides a look-back at the annual total water usage for reporting years 2010-2016:

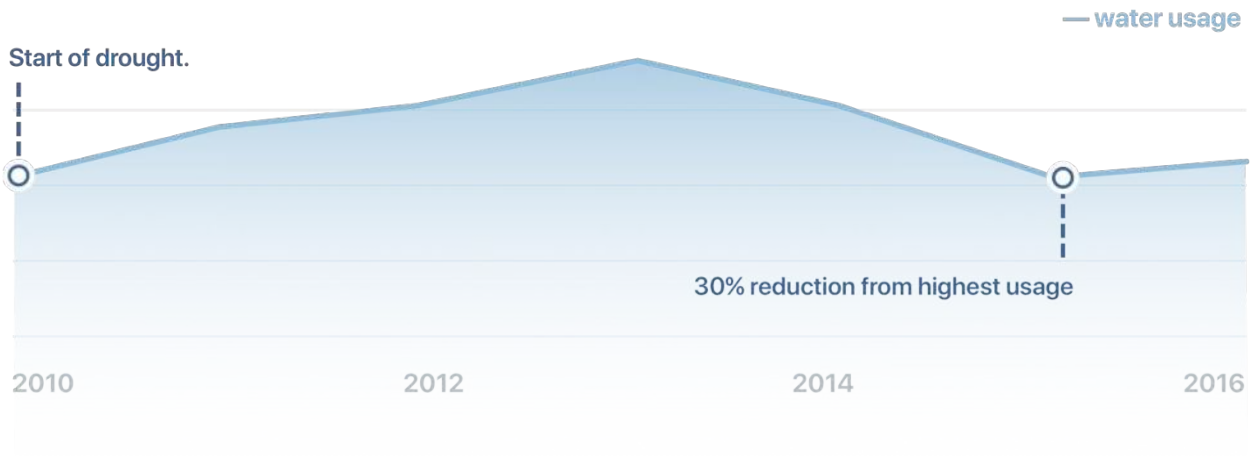


The take-aways that merit consideration in future planning include the following:

- Water use increased during the first couple of years of the drought.
- Customers' drought actions only reached an impactful level **late into the drought cycle,** in Year Four 2015-2016.
- Customers reacted when the situation became **extended and urgent**.
- The majority of **water savings were realized through mandatory restrictions** and water deprivation; not upgraded landscapes and efficiency equipment.
- During crisis times we need to **balance Carrots vs Sticks** in order to entice customers to make permanent changes**.**
- Today's **water usage has bounced back** to a volume above 2014 levels because the changes were not permanent.
- To drive **permanent savings** and **early response** it is desirable to have Messaging, Outreach and Programs that **Motivate vs Penalize.**

## 6.2 GOALS

The Response Action Plan described in the following sections, is modelled after the format of previous IEUA Water Use Efficiency Business Plans. The goals of the Response Plan are to:

- Increase the speed that drought response actions can be rolled out by pre-planning.
- Reduce workload for agencies by providing a blueprint for deployment of strategic actions as drought stages are declared.
- Provide recommendations on the optimal measures, activity levels, incentives, and services that will drive water savings according to need.
- Create an avenue for member agencies to provide input into a Regional drought response.
- Act as a starting point for creating a final plan of action during a drought event. The finalized plan may include adjustments from member agency input, new technologies, increased MWD Water District incentives, new grants, or other circumstances.

The plan is devised to balance *customer incentives and programs* with *prohibitions and penalties*. This balance between "carrot and stick" will give IEUA the flexibility to achieve quick-hit savings through restrictions, while enticing customers to move to long-term market transformation through program participation.

## 6.3 TYPES OF RESPONSE ACTIONS

There are a number of response actions available to IEUA agencies. These include escalation of customer messaging content and frequency, expanded outreach channels, enhanced water efficiency incentives and programs, and as necessary, water usage restrictions.

- **Messaging**
  Agencies can, and should, use creativity and attention-grabbing content to secure customers' attention and motivate them to take action.

- **Expanded Outreach**
  Customer attitudes and expectations have changed dramatically over the past decade, driven by consumers who have higher demands for expanded outreach vehicles. It's a customer-centric world and water agencies are competing for attention. This requires a modern approach to outreach including social media and influencer marketing.

- **Programs**
  Water efficiency programs provide customers with the means and guidance to lower their properties' water usage. Customer-friendly programs, substantial incentives, direct installation options and strong support services drive stronger response rates. The higher the services and incentives; the higher the customer response.

- **Restrictions**
  Watering restrictions further reduce water usage while reinforcing the message of community importance and "doing your part". They set an authoritarian tone, which can result in negative PR if the reasoning is not well communicated, however they are highly effective in securing immediate water savings and are a powerful tool for agencies.

## 6.4 DCP Response Process and Taskforce Operation

Once the drought monitoring framework indicates that the region has reached a specific stage of drought conditions, several actions will occur.

First, the Drought Response Taskforce will assemble.

The Drought Response Taskforce is the organizational group empowered to:

1) Create the Drought Response Plan blueprint.
2) During drought condition stages, assemble taskforce to finalize strategic response actions.
3) Work with their respective agency to implement response actions, according to plan.

The taskforce is comprised of representatives from each of the eight member agencies, and regional personnel from IEUA. The group works in a collaborative fashion to gain consensus on appropriate regional response actions.

The taskforce will make recommendations about the level of program and services, restrictions, and messaging to regional customers. These recommendations will be brought to each agency's respective management for approval.

It's important to note that, during a regional drought, an individual member agency may not be experiencing a drought condition due to their local supply mix. In this circumstance, the agency may elect in what capacity to participate in the taskforce and how to best communicate to their customers that locally there are no water supply issues, although the region is undergoing a drought stage.

Looking forwards, the taskforce will work to balance the effectiveness of regional messaging with the differing needs of individual member agencies. There are no pre-determined mandates regarding service offerings, restrictions, communications or budgets. The taskforce will collaborate on policies, while fully supporting flexibility for each agency.

The group will review the proposed actions set forth in the existing plan and make modifications as necessary. The plan was intended to be flexible and changeable. Modifications to the plan might include a change in incentive levels or program delivery mechanisms. There may also be a new water-saving technology that should be offered to customers. The taskforce might be able to secure additional grant funding, as well. Once the action plan is finalized and approved, the taskforce will implement the programs, penalties, and communications plan.

An overview of the drought response process is below:

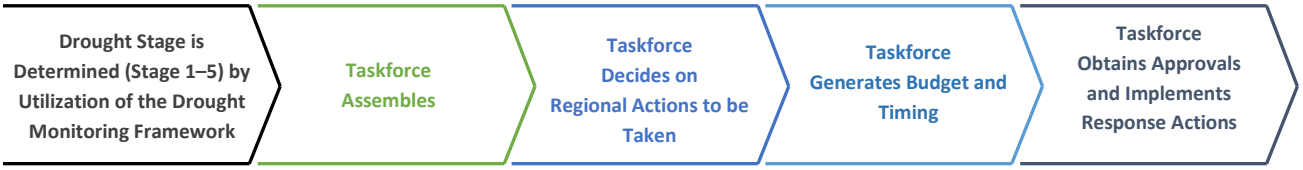


***Figure 14. Drought Response Process***

## 6.5 Response Action Plan Objectives

The objectives of the Response Plan are to integrate the drought response actions into a cohesive whole that improves the effectiveness of each component. The plan's objectives are to:

- Outline programs that are highly appealing to customers.
- Provide targeted marketing and communications for programs and restrictions.
- Guide escalation of response actions as drought stages increase.
- Allow for a consistent regional rollout that reduces customer confusion, raises response, and increases savings per household.
- Ensure communication, marketing, programs, and restrictions are interconnected and support each other in achieving water savings goals.

## 6.6 Response Plan Goals and Strategies

IEUA's overall goals are straightforward:

Agencies have long struggled to make significant water savings headway with high water users. To accomplish this goal, there are several strategies and tactics that must be successfully employed.

**Provide Improved Target Marketing and Communications:**

An essential portion of the Response Plan is deploying an effective customer marketing and outreach strategy. This is because the greatest contingency plan is worthless if the target audience is: 1) unaware of your offer, and 2) unresponsive. Retail water agency customers are widely diverse in their

characteristics, desires, and motivations. The combination of regional drought messaging paired with the member agencies' individual marketing will create a stronger more unified message.

Target audiences are single family households with high water user and large landscape customers. Reaching these customers is best accomplished by first profiling and micro-targeting customers and then employing a targeted and creative messaging and outreach campaign. It has been shown that customers have a strong, positive response to respected influencers and member agencies should utilize this strategy as a part of their marketing and outreach.

**Create Programs That Are Highly Appealing to Customers:**

Today's customers have little patience with processes that are time consuming and complicated. Programs must be customer-friendly and provide easy access to knowledgeable individuals that can answer customer questions and guide them through difficult processes.

As experienced in the previous drought cycle, customers are motivated by generous incentives or direct installation services that make it worthwhile to commit their valuable time and resources to a program.

Scalable programs allow customers to participate with relative ease, avoiding long processing times and capacity limitations for customer sign-ups.

**Reach Higher Water Savings:**

As drought stages escalate, there is an ever-increasing need to "dig deeper" and reach a higher level of water savings per site.

To accomplish this, tactics need to be escalated to higher levels. This includes the deployment of customer communications that contain a heightened level of urgency and at increased intervals. It also means that restrictions and penalties must be increased, as well.

## 6.7 Strategy Per Drought Stage

Tactics will expand as drought stages escalate. Agencies will increase staffing capability, add more customer support, and provide a higher level of program incentives and services as increased drought stages are declared.

**At Stage Zero**, a non-drought stage, programs and incentives will continue to be offered to customers at standard levels. During this time, the goal will be to encourage and incentivize customers to create drought sustainable properties in advance of an emergency. The focus will be on turf replacement programs and customer education offerings.

Once a drought enters a specific stage, the taskforce will assemble to finalize the Response Plan for that stage and begin the implementation process for customer targeting and increased outreach.

At **Stage 1 (1-5% decrease),** the plan is to profile customers and micro-target high potential customers, utilizing messaging that will best resonate with those customers.

The strategic focus for **Stage 2 (6-15% decrease)** is to expand activity for irrigation equipment direct installation programs and ramp up influencer marketing.

Tactics for **Stage 3 (16-25% decrease)** require incentive increases for landscape and irrigation measures and an expansion in outreach to customers.

**Stage 4 (26-50% decrease)** requires IEUA and its agencies to heighten the message of urgency and put forth a community call to action. Additionally, there will be an increase in penalties, implementation of emergency alerts and expanded news media coverage.

During **Stage 5 (water use for essential functions only),** only indoor plumbing and property leak detection programs will be offered. All landscape & irrigation programs will be suspended and IEUA will implement crisis messaging, announcing water for essential use only.

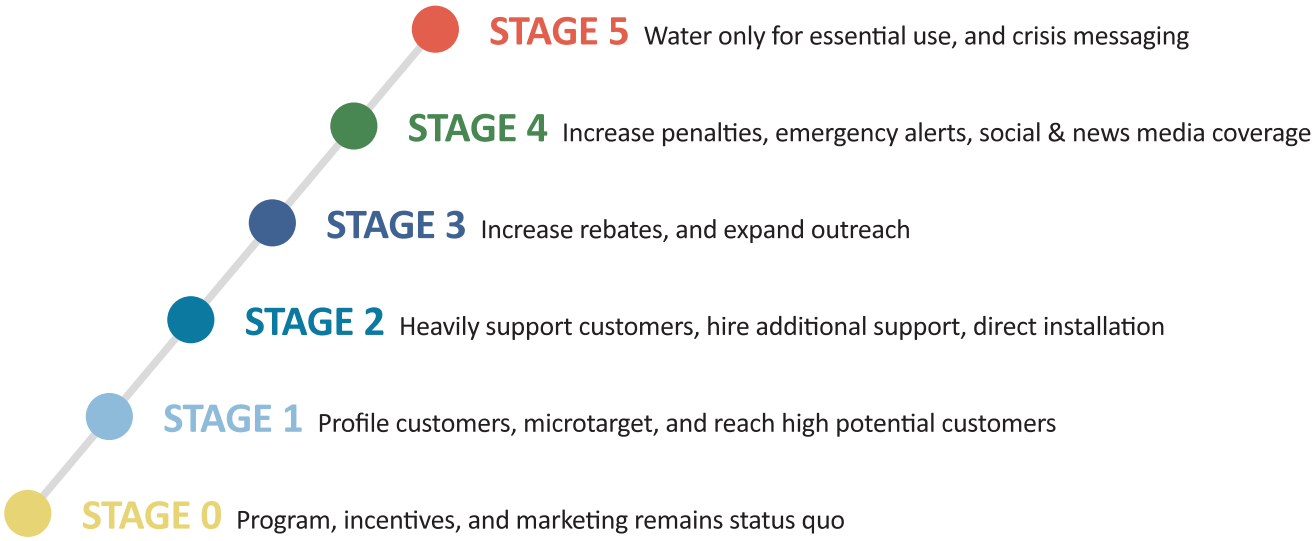


***Figure 15. Drought Stage Strategy***

## 6.8 Selected Programs and Services

There are numerous water-saving programs being offered to customers throughout the U.S. today. IEUA and its member agencies selected programs that best meet the needs of the Inland Empire during the next drought cycle.

These programs were selected because: *First*, they target the highest water savings opportunity which is outdoor water usage, and, *Second*, each program is fully scalable to meet escalating needs.

A scalable program Is designed to expand or contract *with ease* for the purpose of aligning with changing circumstances. This is particularly important during escalating drought stages where water agencies have an urgent need to drive increased participation and water savings.

A scalable program typically has mechanisms that can be ratcheted up or down without unbearable stress to the operating organization. Rebate programs are perhaps the most scalable incentive offering. Response can be driven up by increases in incentives and decreases in the complexities of program requirements. A scalable program has 1) market potential, 2) market readiness and 3) market momentum. Each of these has following characteristics:

**Market Potential**

- Large universe of potential customers
- A high potential for total water savings

**Market Momentum**

- Customers are interested
- Saturation is on the upswing

**Market Readiness**

- Sound technologies & solutions that are "tried and true"
- Technologies & solutions are readily available to customers

IEUA and the member agencies, through the plan development taskforce process, identified and selected seven programs and three support services as having the highest market potential, readiness and momentum.

The response programs are described below:

***Table 9: Selected Programs***

| PROGRAMS | DESCRIPTION |
|---|---|
| **Turf Replacement Incentives** | $3 per sq. ft. incentive level for turf replacement. |
| **Residential Irrigation Tune Up** | Irrigation repairs, nozzle installations, and controller programming provided at no cost to the customer. |
| **Residential Smart Irrigation Direct Installation** | Customers receive installation of nozzles, controllers, and flow sensors. |
| **School Smart Irrigation Direct Installation** | Provide schools with installation of spray heads, nozzles, and controller programming. |
| **FreeSprinklerNozzles.com** | Online ordering and mail delivery of high efficiency nozzles. |
| **Qualified Contractor Smart Irrigation Incentives** | Provide approved contractors incentives for nozzles, controllers, drip, and flow sensors. |
| **Home Leak Detection** | Provide an incentive for a home leak detection device. |

| SUPPORT SERVICES | |
|---|---|
| **Landscape Surveys** | Provides homeowners with water savings recommendations and links to programs. |
| **Landscape Workshops** | Provides instruction on turf replacement & maintenance. |
| **Landscape Design Services** | Provides customers with help regarding irrigation system layout, plant selection, soil considerations, and overall design for their WE landscape upgrade project. |

Recognizing that the future is unknowable, IEUA understands that unforeseen marketing and water savings opportunities may present themselves at some point during a drought cycle. For this reason, it is recommended to implement a mechanism to fund new, creative approaches or temporary resources.

This plan includes the creation of the WEFlex program which would offer IEUA's retail agencies funds for locally administered activities. The budget would be allocated to each agency based upon the water agencies size (or water sales). An agency could use the funds for local activities such as water waste enforcement and education or recycled water hook ups and permit fees. New technologies or other programs and services could be funded through WEFlex Fund, if approved by the drought response taskforce.

An agency will submit a description of the local activity, estimated costs and potential benefits or results. When accepted, the response taskforce will allocate the funds.

**Program and Service Ranking by Drought Stage**

Each of the selected programs was ranked by agency representatives to determine its viability during each advancing drought stage. The selection process for these programs and services was conducted by having agency representatives individually rank viable programs as a high (3 points), medium (2 points), or low (1 point) at each respective drought stage level.

This ranking criterion was based on the level of feasibility, appropriateness, and overall impact provided by that program/service at each drought stage. Budgets and program scalability were additional considerations factored into the ranking process. The group also assessed the effect and motivation that escalating drought stages would have on customers and how that, in turn, might drive customers' response for each program/service.

The results were totaled and averaged for each program at each drought stage. Higher numbers reflected a greater expected effectiveness for that program or service. Lower numbers indicated reduced support for the program or service and less likelihood for inclusion in the list of program offerings.

It's important to note that the ranking process provides general consensus and structure for planning, but program ranking is fluid and, as circumstances evolve in the future, the selections and priority levels may change.

Using the high, medium, or low point rubric program rankings were compiled and recorded as shown in the chart on the following page.

| | STAGE 0 | STAGE 1 | STAGE 2 | STAGE 3 | STAGE 4 | STAGE 5 |
|---|---|---|---|---|---|---|
| **PROGRAMS** | | | | | | |
| **Turf Replacement** | 1.71 | 1.86 | 2.14 | 2.43 | 2.71 | 2.71 |
| **Residential Irrigation Tune Up** | 2.00 | 2.14 | 2.43 | 2.29 | 2.43 | 2.43 |
| **FreeSprinklerNozzles.com** | 1.83 | 1.71 | 2.00 | 2.00 | 2.57 | 2.57 |
| **Qualified Contractor Smart Irrigation Incentives** | 1.67 | 1.67 | 1.67 | 1.86 | 2.29 | 2.29 |
| **Residential Smart Irrigation Direct Installation** | 1.57 | 1.86 | 2.14 | 2.43 | 2.57 | 2.57 |
| **School Smart Irrigation Direct Installation** | 1.80 | 2.20 | 2.17 | 2.43 | 2.57 | 2.71 |
| **Home Leak Detection** | 1.33 | 1.33 | 1.71 | 1.86 | 2.43 | 2.57 |
| **SERVICES** | | | | | | |
| **Landscape Surveys** | 2.00 | 2.00 | 2.20 | 2.00 | 2.60 | 2.40 |
| **Landscape Workshops** | 2.00 | 2.00 | 2.14 | 2.43 | 2.57 | 2.57 |
| **Landscape Design Services** | 1.57 | 1.71 | 1.86 | 2.14 | 2.43 | 2.57 |

*Figure 16. Program Evaluation per Stages*

As is shown, generally, the higher the drought stage, the higher the level of program services to be provided by agencies. The reasoning for this is common-sense. Agencies need heightened customer response and they are much more likely to participate in a program when they are provided with free installation and low-cost product or, as with turf incentives, the rebate level is enticingly high.

At each drought stage, it is anticipated that the highest-ranking programs will be those most actively promoted, and those offering attractive customer enticements to participate.

As stages escalate, agencies are prepared to ramp up activity for all programs, but will rely most heavily on Turf Replacement, FreeSprinklerNozzles.com, and direct installation of landscape measures. The number of home surveys, workshops, and design services will also increase.

Home Leak Detection was ranked as the lowest priority program during Stage 0 and Stage 1, and only ramps up significantly in the later drought stages.

It's important to reinforce that the program and services rankings are not absolute and are a suggested template to be adjusted according to circumstances that exist at each actual drought stage.

Actual incentives, services, and roll out schedules will be determined by the taskforce, when the drought stage is declared, and the group is assembled.

### *6.8.1 Program Cut Sheets*

IEUA and its member agencies collectively has selected seven customer programs to be offered during drought conditions. Each program is detailed in an individual write-up contained in Appendix E.

The components of each cut sheet are explained in the diagram on the following page. Following the guide is an example of a program cut sheet for the Turf Replacement Program.

## PROGRAM CUT SHEET GUIDE

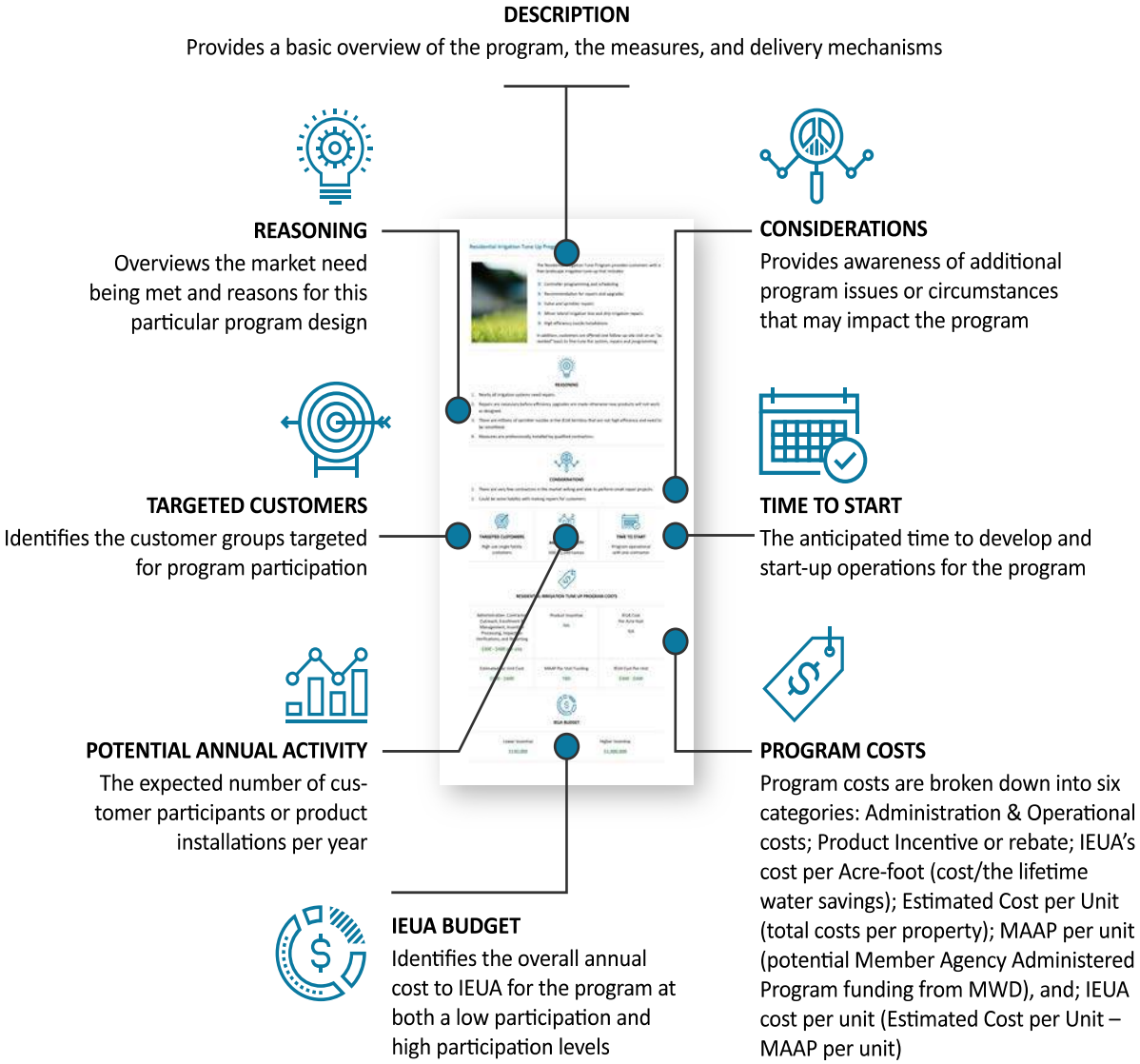


*Figure 17: Program Cut Sheet Guide*

## *PROGRAM CUT SHEET EXAMPLE- TURF REPLACEMENT PROGRAM*

## Turf Replacement Program

The Turf Replacement Program encourages customers to remove high water-consuming turf and replace it with alternative solutions such as low water-using, regionally appropriate plants and surfaces that allow for ground water infiltration and elimination of runoff. Qualifying applicants are eligible to receive $3 per square foot of turf removed with a maximum incentive of 5,000 square feet for residential customers and 50,000 square feet for commercial customers. Eligible projects must have:

- Three plants per 100 square feet of area transformed
- No hardscape within the transformed area, except permeable hardscape
- A stormwater retention feature
- Replacement or modification of overhead spray sprinklers

For reference, the historical program activity of square feet removed is listed below.

| | Residential | Commercial | Total |
|---|---|---|---|
| FY 14/15 | 119,130 | 1,136,334 | 1,255,464 |
| FY 15/16 | 1,596,789 | 3,337,120 | 4,933,909 |
| FY 16/17 | 255,091 | 637,916 | 893,007 |

REASONING

1. There are hundreds of thousands of square feet of irrigated turf in the IEUA territory.
1. Replacing turf with regionally appropriate plants aids in transforming the market. In a recent analysis done by Western MWD, for every customer replacing their turf, another customer did so without an incentive.
2. Provides long term savings- Current studies have shown that savings increase after the initial plant stabilization period and persist over 10 years or more.

**CONSIDERATIONS**

1. Turf replacement has an extremely high cost per acre-foot.
1. The market acceptance is low during non-drought times.
2. There are numerous customer barriers: costs, concerns about the new look, and lack of ability to execute projects.
3. Contractors are not interested in projects smaller than 1,000 sf.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| All customers with live turf | 500,000 – 5 Million SF | Currently operational |

**TURF REPLACEMENT PROGRAM COSTS**

| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting | Product Incentive | IEUA Cost Per Acre-foot |
|---|---|---|
| ***Covered by Metropolitan through regional vendor*** | **$3 per square foot** | **$769 ($ per sf)** |
| Estimated Per Unit Cost | MAAP Per Unit Funding | IEUA Cost Per Unit |
| **$3 per sf** | **$2.00 (regional rebate)** | **$1 per sf** |

**BUDGET**

| Lower Incentive | Higher Incentive |
|---|---|
| **$500,000** | **$5,000,000** |

*Figure 18. Sample Cut Sheet – Turf Replacement Program*

## 6.9 Messaging and Outreach

If you don't nail the messaging and outreach, the programs are meaningless.

Communication and outreach play a crucial a role in the delivery of water savings as the programs themselves. A strong plan will ensure that IEUA reaches the target audience, boosts awareness, and ultimately, delivers water savings.

For this reason, the Response Plan communications need to:

- Be heard by the right customers, understood, and favorably received.
- Clearly inform the customer of the current stage, tell them what action is desired, and motivate them to respond to the request.

Ultimately, all forms of communications and outreach need to work together throughout the region to raise response and increase water savings per household.

### *6.9.1 Requirements for An Effective Message and Campaign*

The key principle of a successful outreach and communications campaign are:

1. Know Your Customer
2. Get the Message Right
3. Craft an Outreach Plan that Drives Customer Response

***Know Your Customer***

An organization needs to understand what each customer wants and then provide the I-can't-say-no-offer. Companies experience much higher response rates when they understand and effectively respond to customers' desires.

This requires data analysis, creation of customer personas, and micro-targeting to particular groups of customers. There are numerous analytics programs available today that will help agencies to identify distinct customer groups and personas. By knowing this, IEUA can target market services and program offers with intelligence and precision. Statistics show that micro-targeting greatly boosts customer response. For IEUA, this converts to higher water savings as well.

***Get the Messaging Right***

Marketing campaigns are most successful when they evoke emotion and resonate with a human need.

An emotional message strategy uses feeling to sell – and this is a much more powerful motivator than logic. An outreach vehicle using this tactic will make the target audience feel an emotional connection to the agency, program, water efficiency measure, and/or call-to-action.

IEUA will need to utilize the following messaging strategies to garner interest and participation from customers:

- *Emphasize the benefits* - What does this particular customer need? Present a solution to their problem.
- *Keep it simple.* - A confused mind says "no." People worry that deceit is hidden amongst the complexity.
- *Make it Fun* - Draw customers in by using fun and catchy messaging, stories, eye-catching visuals, and humor.
- *Use Authority*- Influencing others is easier if customers view the person making the pitch as an authority figure. We all like to listen to and follow an expert. We trust that they know what they're doing.

**Two Types of Messaging Required**

There are reasons for creating and driving mass audiences through broad messaging and other reasons for targeted action messaging directed to specific audiences. IEUA will need to provide both types effectively during drought conditions.

1. **Broad Messaging:** Broad messaging (delivered via news stories, radio/tv ads, billboards, etc.) gives the widest reach and allows IEUA to communicate overarching messages including:
    - Water Scarcity Issue
    - Urgency to Act
    - Commitment to continue to provide safe, reliable water supply
2. **Targeted Action Messaging:** Targeted action messaging is typically aimed at specific groups of customers, those most likely to respond to your request for program participation or water-use reduction. To promote action, IUEA and the member agencies will need to create messaging content and outreach such as below:
    - Design messaging to motivate landscape changes for single family customers
    - Post success stories – community members, people of prominence, business leaders
    - Promote stories from micro-influencers – Q&A blogs with customers, homeowner success stories, Did-You-Know educational snippets
    - Utilize 3rd party influencers – these individuals are more trusted than a company itself
    - Create a community call to action – "your community needs your help" messaging

**Craft an Outreach Plan that Drives Customer Response**

Successful outreach campaigns utilize the following strategies:

- Profile your customers to understand each customer's persona
- Micro-target to prospect the right customers for each offer
- Incorporate your strong messaging and influencer authority figures in all offers
- Add personalization
- Demonstrate value and generous offer
- Include a call to action
- Make it easy for customers to say YES
- Follow up and
- Track results
- As stages advance, increase frequency, urgency and intensity

IEUA and its agencies will need a creative and dynamic plan in order to increase customer response and water use reduction, especially during the higher stages.

It's important to note that most agencies still utilize antiquated marketing techniques, with little-to-no market research, standard messages and rudimentary outreach methods.

### *6.9.2 Successful Outreach Methods*

There are major outreach mechanisms to be utilized for general categories of customers. Each outreach approach should be personalized to the group being targeted.

- Direct outreach to high users via personalized means (phone, letter, email, etc.)
- Regional outreach through broad media channels
- Earned media
- Social media
- Grassroots and community outreach

### *6.9.3 Importance of Influencers & Relationships*

It's important to reiterate the essential need for influencers. Influencers are trusted individuals who have a large audience and can reach across media and social platforms. Because of their high level of trust-ability, they're often able to persuade (or "influence") readers and viewers to purchase products or endorse causes that they promote.

Influencer marketing is a highly effective way to reach interested customers and dramatically increase response. They act as a trusted and respected "friend" and customers trust third party influencers more than a company itself.

Who's Prominent in the Inland Empire:

- Well known business owners/leaders
- Local sports or entertainment figures
- Respected church leaders
- Active PTA parents
- High profile community organizers

### *6.9.4 Drought Outreach Matrix*

Communications and urgency increase as drought stages escalate. Since customers are the means to the water-savings solution, it's imperative that they understand each drought stage and what's required of them. Quality messaging will clearly communicate the current drought stage, define the condition, request a desired customer behavior, and direct them to solutions.

An overview of Drought Outreach per Stage is provided on the following pages.

| **Stages** | **0** | **1** | **2** | **3** | **4** | **5** |
|---|---|---|---|---|---|---|
| **Messaging** | Overall preparedness and drought resiliency. Drought will be a regular occurrence. | What ***Watch*** Condition Means | What ***Warning*** Condition Means | What ***Emergency*** Condition Means | What ***Critical*** Condition Means | What ***Catastrophic*** Condition Means |
| **Desired Behavior** | Get customers to install drought resilient landscapes & smart irrigation prior to the next drought. | Minimum **1-5%** decrease in water use | Minimum **6-15%** decrease in water use | Minimum **16-25%** decrease in water use | Minimum **25-50%** decrease in water use | **Water used for only essential functions** |
| **Outreach Strategies** | Evaluate your specific community and the customers in your service territory to determine a compressive plan using a combination of the following strategies and tactics. Each approach should be personalized to the group you are targeting.<br>☐ Direct outreach to high users<br>☐ Regional outreach through broad media channels<br>☐ Social media outreach<br>☐ Grassroots and community outreach | | | | | |
| **Tactics** | ☐ Social media toolkit for community influencers<br>☐ Grassroots training program for community groups, local organizers and high school students to share messages in their community (includes toolkit) | | | | | |
| | ☐ Fact sheet describing each stage, the meaning and the impact to both current landscapes and drought resilient landscapes | | ☐ Fact sheet describing the stage level and how that impacts customers – one per stage with need action for each level<br>☐ Social media posts with messages and steps for how customers can respond to the appropriate stage<br>☐ "How to respond" fact sheet for each stage | | | |
| | ☐ Case studies and feature pitches of successful landscape transformations (videos telling the stories, write-ups and photos)<br>☐ By-line articles by local influencers placed in local publications | | ☐ News release about stage and actions that need to be taken | | | |

| Stages | 0 | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **Tactics (con't)** | ☐ General informational flyers about drought resiliency and sustainable landscaping | | ☐ Website<br>☐ Bill inserts<br>☐ Social media reminders (some promoted posts) | | ☐ Wireless Emergency Alerts<br>☐ Personal Localized Alert Network<br>☐ Website<br>☐ Social Media | |
| **Message Frequency** | ☐ Ongoing – worked into all regular organizational messages<br>☐ Plan for regular messaging | | ☐ Frequency escalates depending upon budget | | | |

***Figure 19. Drought Outreach Matrix***

## 6.10 Voluntary and Mandatory Restrictions

Both voluntary and mandatory restrictions are coupled with public education campaigns to provide customers with information about the purpose for the restriction(s) and the call-to-action. Restrictions are typically highly publicized through local media, web pages, social media, mailings and water bills.

Mandatory restrictions are a more effective tool for drought coping than voluntary measures; however, mandatory restrictions can create heightened negativity directed at the customer's water provider.

Common restrictions include partial or total prohibitions against using hoses to wash paved areas, limits on car washing and filling or refilling swimming pools, and restrictions on watering times.

As drought stages are declared, each agency will implement voluntary and mandatory restrictions as dictated by their respective Water Waste Ordinance. It's important to note a couple details:

1. Each ordinance is unique to a specific water agency and the ordinances differ slightly from one another.
2. Ordinance stages are locally declared and therefore may not align with other agencies or a regionally-declared stage.

*Table 10. Water Waste Ordinance by Agency*

| Agency | Ordinance/Code Title |
|---|---|
| **City of Chino** | Municipal Code Water Conservation 13.-5.010 – 13.05.120 |
| **City of Chino Hills** | Ordinance 300u |
| **Cucamonga Valley Water District** | Ordinance 2019-5-1 |
| **Fontana Water Company** | San Gabriel Valley Water Company Rule No. 14 & Schedule 14.1 |
| **Monte Vista Water District** | Ordinance 22 |
| **City of Ontario** | Municipal Code Water Conservation Plan Title 6, Section 8A |
| **City of Upland** | Municipal Code 13.16.020 & 13.16.05.050 |

Each agency is responsible for locally enforcing the ordinance, although enforcement is difficult to maintain. In order to accomplish this, agencies have to add field staffing, deal with administration of the water waste ordinance, and handle the increased level of customer phone calls.

Enforcement is critical to the integrity of the ordinance in the past and remains so for future water shortages. Without action and penalties, the ordinance has no teeth and customers soon recognize this thus nullifying the effectiveness of the initiative.

Typically, violations are reported by community members or visually seen by agency staff. Enforcement staff will then send letters, visit customer properties and educate customers on the importance of adherence for both the resident and the overall community.

The new WEFlex Fund (full description can be found in Appendix E. Response Action Program Cut Sheets) will be available to support agencies' enforcement costs. An agency will be required to present their plan and budget to the taskforce for approval of funds.

Below is a snapshot of each agency's water waste ordinance at respective stages as designated by that agency. As can be seen, not every restriction is required by every agency. Absence of a restriction is shown on the chart by a white square.

### *6.10.1 Restrictions by Agency*

| | Chino | Chino Hills | Ontario | Upland | CVWD | Fontana | MVWD |
|---|---|---|---|---|---|---|---|
| No irrigation run off | Stage 0 | Stage 2 | Stage 1 | Stage 0 | Stage 0 | Stage 1 | Stage 0 (BP) |
| No irrigation more than 10 minutes | | | | | | Stage 1 | |

| | Chino | Chino Hills | Ontario | Upland | CVWD | Fontana | MVWD |
|---|---|---|---|---|---|---|---|
| No irrigation more than 15 minutes | Stage 0 | Stage 2 | | | | | Stage 0 (BP) |
| No irrigation from 10am - 6pm | | | | Stage 0 | | | |
| No irrigation from 9am - 4pm | | | | | Stage 1 | | |
| No irrigation from 9am - 5pm | | | | | | Stage 1 | |
| No irrigation from 8am - 8pm | | | | | | | Stage 0 (BP) |
| No irrigation from 6am - 8pm | Stage 0 | | Stage 1 (6am-6pm) | | | | |
| Irrigation only every other day | Stage 2 | | | Stage 1 based upon address | | | |
| Irrigation only 2 days per week | Stage 1 4pm - 9am | | | Stage 2 based upon address | | | |
| Irrigation only one day per week | | | | Stage 3 based upon address | | | Stage 2 Saturday only |
| Irrigation three days per week between 6pm - 6am; based upon address odd/even | | Stage 2 | | | | | |
| Irrigation two days per week between 6pm - 6am; based upon address odd/even | | Stage 3 | | | | | |
| Irrigation two days per week between 4pm - 9am; based upon address odd/even | | | Stage 2 | | | | |
| Irrigation only on Tuesday and Saturday | | | | | | | Stage 1 |
| Irrigation only three days per week - Tues., Thurs., Sat. | | | | | | | Stage 1 |
| Irrigation only 3 days per week depending upon street address | | | | | | Stage 1 | |
| Irrigation only 2 days per week depending upon street address | | | | | | Stage 2 | |
| Irrigation only 1 days per week depending upon street address | | | | | | Stage 3 | |
| No landscape irrigation | | Stage 4 | Stage 4 | | | Stage 4 | |

| | Chino | Chino Hills | Ontario | Upland | CVWD | Fontana | MVWD |
|---|---|---|---|---|---|---|---|
| Irrigation shall not exceed 75% of the amount of water used during the same billing period | | | | | | | Stage 1 |
| Irrigation shall not exceed 50% of the amount of water used during the same billing period | | | | | | | Stage 1 |
| Irrigation shall not exceed 33% of the amount of water used during the same billing period | | | | | | | Stage 2 |
| Irrigation only every other day - May 1 - Sept 30 | Stage 1 | | | | | | |
| No irrigation on rainy days | Stage 0 | Stage 2 1/10" or more within a 48 hour period | | | | | Stage 0 (BP) |
| No irrigation during and for 48 hours after measurable precipitation | | Stage 2 | | | Stage 0 | Stage 1 | |
| No irrigation on turf areas public street medians | | | | | Stage 6 | Stage 2 | |
| No irrigation of landscapes outside newly constructed homes and buildings | | | | | Stage 6 | Stage 2 | |
| No washing down pavement | Stage 0 | Stage 2 | Stage 1 | Stage 0 if runoff<br>otherwise Stage 3 | Stage 0 can use water broom | Stage 1 | Stage 0 (BP) with waterbroom |
| No excess use - breaks and leaks | Stage 0 | Stage 2 repair within 48 hours | Stage 1 | Stage 0 | Stage 0 | Stage 1 repair within 48 hours<br>Stage 2 repair within 24 hours<br>Stage 4 repair immediately | Stage 0 (BP) within 7 days |
| No washing vehicles without bucket or shutoff nozzle | Stage 0 | Stage 2 | Stage 1 | Stage 0 | Stage 0 | Stage 1 | |
| Restaurants prohibited to serve water - except upon request | Stage 0 | Stage 2 | Stage 1 | Stage 0 | Stage 0 | Stage 1 | |
| Water fountain or feature without recirculated water prohibited | Stage 0 | Stage 2 | Stage 0 | | Stage 0 | Stage 1 | |

| | Chino | Chino Hills | Ontario | Upland | CVWD | Fontana | MVWD |
|---|---|---|---|---|---|---|---|
| Hotels/motels laundering sheets/towels everyday - except upon request | Stage 2 | Stage 3 | | Stage 0 | Stage 0 | Stage 1 | Stage 0 (BP) |
| No leaving water running while brushing teeth, shaving, soaping, shower or washing dishes | | | | | | Stage 1 | |
| Commercial car wash not using recirculated water | Stage 0 | | Stage 0 | Stage 1 Also coin-op laundry | | | Stage 0 (BP) |
| Single-pass cooling systems | Stage 0 | | Stage 0 | | | | |
| New cooling towers, decorative fountain and car washes must have reuse system | | | | | | | Stage 0 (BP) |
| Industrial customer must evaluate their processes for ways to conserve water | | | | | Stage 0 | | |
| Restaurant using non-conserving spray valves | Stage 1 | | | | | | |
| Ornamental lakes/ponds filling or refilling - except to sustain aquatic life | Stage 1 | | Stage 1 | Stage 1 | | Stage 3 | |
| Filling or refilling pools only allowed from 4pm - 8am | | | | | | Stage 1 | |
| All decorative fountains and pools (non-swimming) shall be drained | | Stage 4 | | | | | |
| Irrigation of golf course fairways prohibited | | | | Stage 1 | | | |
| No use of water from fire hydrant other than fire fighting | | Stage 2 | Stage 1 | Stage 1 | | Stage 1 allows utility maintenance | Stage 1 |
| No vehicle washing except on designated outdoor water use days - Midnight - noon after sundown | | | | Stage 1 | | | |
| Only fill pool on allowed odd/even irrigation days | | Stage 2 | Stage 2 | | | | |
| Nurseries, golf courses and other water dependent industries only allowed to irrigate every other day | | | Stage 2 | | | | |
| No new meters - unless already permitted or to protect public health | Stage 3 | | | | | Stage 4 | |

| | Chino | Chino Hills | Ontario | Upland | CVWD | Fontana | MVWD |
|---|---|---|---|---|---|---|---|
| No commitments shall be made to provide water service as part of new land use entitlements | | Stage 4 | | | | | |
| Nurseries, golf courses and other water dependent industries only allowed to irrigate every third day | | | Stage 3 | | | | |
| No installation of new landscapes | | | | | | | Stage 2 |
| No water used for construction and dust control | | Stage 3 if recycled water is available | | | Stage 8 | | Stage 2 |
| No vehicle washing | | | | Stage 3 | | | Stage 1 |
| Nurseries, golf courses and other water dependent industries only allowed to irrigate with handheld | | | Stage 4 | | | | |
| No non-essential water use i.e. filling pools | | | Stage 4 | Stage 1 | | | Stage 1 |
| | | | | *Stages are not numbered: Year round, Moderate shortage, High shortage* | *Stages provide ability to mandate % reductions* | | *Stages are not numbers: Best practices, Significant shortage, Critical, Emergency* |

***Figure 20. Water Waste Restrictions per Agency***

## 6.11 Staging Strategy

As drought levels increase, more effort is required from agency customers.

This will happen only if IEUA and member agencies are effective in their mission to reach the right customers and provide the necessary incentive and support.

- Early profiling and micro-targeting of customers will provide great benefit in reaching the right customers, especially as drought stages escalate.
- Stage-by-stage increases in direct installation services, incentives, and penalties will drive higher water savings.
- Clear and frequent communications with customers is required at each stage to inform and motivate.

Below is a recap of the suggested strategic actions to be taken at each drought stage:

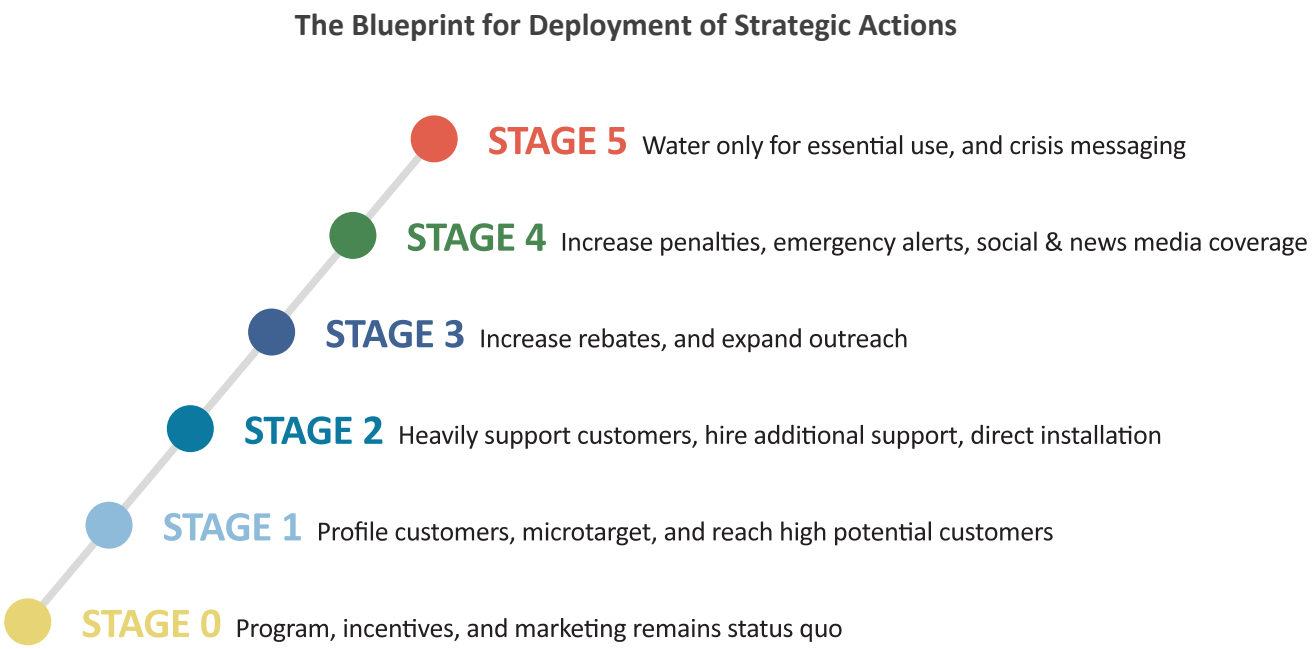


***Figure 21. Blueprint for Deployment of Strategic Actions***

On the following pages are snapshots of the programs, messaging, and activities for each drought stage:

## STAGE 0

**Goal:** Customers to create drought sustainable properties prior to emergency conditions. Continue working towards goal with current strategies.

**Programs:**

- SoCal WaterSmart Residential and Commercial Rebates
- Turf Replacement Program
- Residential Irrigation Tune-up
- Home Surveys
- Landscape Workshops
- Design Services

Continue the success of the Residential Irrigation Tune Up Program. Work to increase response for the Turf Replacement Program through increased outreach and a higher level of linkage to support services. Implement the FreeSprinklerNozzles.com with online nozzle ordering and home delivery program. Implement the Leak Detection Pilot program.

**Messaging: & Outreach**: Reinforce the importance of creating/maintaining a water efficient property as preparedness for future water shortages.

**Restrictions**: Continue with current restrictions. Stage 0 restrictions vary agency-by-agency.

## STAGE 1

**Goal:** Minimum 1 – 5% decrease in water use.

**Programs:** Programs remain the same.

**Messaging & Outreach:** Define ***Watch*** Condition and utilize in general customer messaging.

Begin profiling customers and micro-target high potential customers, utilizing messaging that will best resonate with those customers.

**Restrictions**: Consider escalation of local water waste prohibitions.

At this stage, agencies will communicate to their customers that there's a need to increase water efficiency levels and will ask everyone to do their part to save.

## STAGE 2

**Goal:** Minimum 6 – 15% decrease in water use.

**Programs:** Implement direct installation programs including the Residential Smart Irrigation Direct Installation and the School Smart Irrigation Direct Installation. Hire additional landscape designers to expand Landscape Design services. Hold more frequent Landscape Workshops. Increase the volume of Home Surveys performed.

**Messaging & Outreach:** Define ***Warning*** Condition to use in general customer messaging.

IEUA continues profiling and micro-targeting of high potential customers. Introduce influencer marketing (role models and respected community members).

**Restrictions**: Prepare WEFlex proposals and plans for expanded customer communication and enforcement administration.

## STAGE 3

**Goal:** Minimum 16 - 25% decrease in water use.

**Programs:** Continue base programs and increase incentive amounts for turf replacement, high efficiency nozzles, smart controllers, laminar flow restrictor and plumbing flow control valves. Continue smart irrigation direct installation programs.

**Messaging & Outreach:** Define ***Emergency*** Condition and utilize as general customer messaging.

IEUA expands profiling and micro-targeting to include mid-range water users as well as high-water use customers. Ramp up influencer marketing.

**Restrictions**: Hire additional local staff and set up operations for expanded customer communication and enforcement administration.

## STAGE 4

**Goal:** Minimum 25 - 50% decrease in water use.

**Programs:** Continue increased incentives and smart irrigation direct installation programs.

**Messaging & Outreach:** Define ***Critical*** Condition and use as general customer messaging

IEUA and Agencies strengthen the message of urgency and the community call to action.

**Restrictions**: Increase penalties, implement emergency alerts and new media coverage.

## STAGE 5

**Goal:** Minimum 50% decrease in water use.

**Programs:** Only offer indoor plumbing and property leak detection programs. Suspend all landscape & irrigation programs.

**Messaging & Outreach:** Define ***Catastrophic*** Condition and utilize as general customer messaging.

Implement crisis messaging, announcing essential use only.

**Restrictions**: Conduct stringent enforcement of restrictions.

# 7 Operational and Administrative Framework

The general process and respective agency roles for each major plan component are documented in their respective sections. Additionally, this section provides a summarization of tasks and responsibilities as well as the process for updating the plan. The major tasks are:

- Conduct drought monitoring
- Investigate mitigation actions and capital improvement programs (long-term)
- Initiate regional response actions (short-term)
- Update the Drought Contingency Plan

## 7.1 Roles and Responsibilities

**IEUA:** IEUA acts as the administrative facilitator of all components of the plan. IEUA is responsible for developing regional demand and supply projections, calculating supply/demand ratio, communicating outcomes, convening the Drought Response Taskforce, implementing response strategies and actions as determined by the Drought Response Taskforce, conducting vulnerability assessments, evaluating and implementing IEUA controlled mitigation actions, and updating the plan.

**Member Agencies:** Member agencies are responsible for providing demand and supply projections, implementing agency-selected local mitigation actions, participation in the Drought Taskforce, and implementation of response actions including of local programs water waste restrictions.

## 7.2 Drought Response Taskforce Process

Once the drought monitoring framework indicates that the region has reached a specific stage of drought conditions, several actions will occur.

First, the Drought Response Taskforce will assemble.

The Drought Response Taskforce is the organizational group empowered to:

1) Create the Drought Response Plan blueprint.
2) During drought condition stages, assemble taskforce to finalize strategic response actions.
3) Work with their respective agency to implement response actions, according to plan.

The taskforce is comprised of representatives from each of the eight member agencies, and regional personnel from IEUA. The group works in a collaborative fashion to gain consensus on appropriate regional response actions.

The taskforce will make decisions about the level of program and services, restrictions, and messaging to regional customers. Additionally, it's within the group's purview to determine the level of aggressiveness taken for each element of the plan.

It's important to note that, during a regional drought, an individual member agency may not be experiencing a drought condition due to their local supply mix. In this circumstance, the agency may elect in what capacity to participate in the taskforce and how to best communicate to their customers that locally there are no water supply issues, although the region is undergoing a drought stage.

Looking forwards, the taskforce will work to balance the effectiveness of regional messaging with the differing needs of individual member agencies. There are no pre-determined mandates regarding service offerings, restrictions, communications or budgets. The taskforce will collaborate on policies, while fully supporting flexibility for each agency.

The group will review the proposed actions set forth in the existing plan and make modifications as necessary. The plan was intended to be flexible and changeable. Modifications to the plan might include a change in incentive levels or program delivery mechanisms. There may also be a new water-saving technology that should be offered to customers. The taskforce might be able to secure additional grant funding, as well. Once the action plan is finalized, the taskforce will implement the programs, penalties, and communications plan, as agreed upon.

An overview of the drought response process is below:

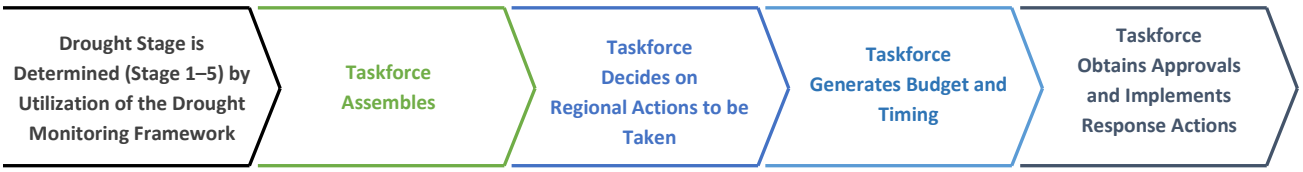


## 7.3 Drought Contingency Plan Update

The Drought Contingency Plan is a working document and, as such, may be modified and updated as impactful changes occur such as another prolonged drought or increased legislative mandates. IEUA will regularly review the plan and make adjustments accordingly.

Changes and/or reviews of the plan should take place in line with the following conditions:

- Annually to assess the functionality and overall performance
- Updates to the Integrated Resource Plan
- Every 5 years to meet the Urban Water Management Plan report cycle
- As the State's Water Use Efficiency Framework policies are finalized

## 7.4 Operational and Administrative Summary

The table below overviews the activities, responsibilities, roles, for procedures for the operation and administration of the DCP.

***Table 11. Operational and Administrative Framework***

| Activity | Responsibilities | Roles | Procedures |
|---|---|---|---|
| Monitoring | Collect and distribute indicator data | IEUA | Distribute identified data to member agencies via email, once a year. |
| | Develop annual demand projections | IEUA | Include demand projections with indicator data, annually. |
| | Report on projected annual supplies and demands | Member Agency Water Managers | Provide annual supply and demand projections, each year to IEUA via email. |
| | Review projection data and convene Taskforce (as needed) | IEUA | Determine the supply/demand ratio (regionally and for the individual member agencies) and if a regional shortage is predicted, convene the Taskforce within two weeks. |
| Mitigation Actions | Evaluate and prioritize mitigation projects | IEUA and Member Agencies | Continued support of regional planning efforts. |
| | Strategically pursue Implementation | IEUA and Member Agencies | Identify and secure funding for high-priority actions. |
| Response Actions | Review regional shortage conditions | Drought Response Taskforce | Once shortage is predicted, meet and review the regional conditions. |
| | Decide what regional actions to take | Drought Response Taskforce | Considering regional and agency-level shortage, formulate a strategy to achieve needed reductions based on consensus of the Taskforce. |
| | Generate budget and timing for implementation | Drought Response Taskforce | Based on consensus of the Taskforce. |
| | Obtain approval and implement actions | Drought Response Taskforce | Present proposed actions and budget to the IEUA Board and member agency Boards as appropriate. |
| Update DCP | Plan evaluation | IEUA | Annually conduct a review of the supply/demand projection reporting, identify data gaps and inefficiencies. Streamline and correct shortfalls. If response actions initiated, conduct review of results and modify plan. |
| | Updating the plan | IEUA and Member Agencies | Comprehensive review of DCP and updates to the framework as needed. |

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# Appendix A: Summary of Demand Projections Method and Rationale

IEUA Drought Contingency Plan

## Demand Projections

There are numerous approaches available for projecting urban water demands. Both the 2015 IEUA Regional Urban Water Management Plan (UWMP) and the 2016 Integrated Water Resources Plan (IRP) applied elaborate data intensive methodologies to develop long-term projections within the service area for planning purposes. Included in these projections are varying levels of uncertainty as the time-horizon extends ten, fifteen, twenty, and out to thirty-five years into the future. Factors that influence demands include indoor and outdoor water use practices, urban development, annual precipitation, and population growth. Due to the nature of these uncertainties, the IRP provides ranges for future demands as low-, medium-, and high-projections.

For the purposes of the drought monitoring framework however, the demand projections are needed for very near-term planning and are intended to reflect the estimated water-use from one year to the next on a monthly time-step. Water demands are often strongly correlated from one year to the next as water practices are generally slow to shift to more or less efficient practices, and development is typically a gradual process. On the other hand, annual precipitation and other water restrictions can vary significantly from one year to the next.

The proposed approach for the IEUA drought monitoring framework demand projections would rely on the rolling average for the previous five years for each member agency. This approach is consistent with the timeframe used for wastewater projections which also relies on a five-year historical average. In addition, the five-year averages for the monthly demands were compared to the three-year averages for each of the member agencies and found to be relatively similar in most cases, though there were some variations. The member agency monthly averages for the previous three- and five-year periods are attached are on pages 3-5 of this Appendix.

For the drought monitoring framework, monthly demands for the five previous years would be averaged and used for the current year's monthly projections. These demand values would be provided as reference to the water managers when they generate their four-month supply projections for the drought monitoring purposes. If there are local circumstances or external drivers that have significantly shifted the expected demands from the historical averages, the water managers could adjust the demands as they saw necessary. For reference, Table 1 provides the five-year averages for each member agency based on data from the Chino Basin Watermaster for the fiscal years 2013/2014 through 2017/2018. In addition,

Table 2 shows an example of the projected 4-month demands for the City of Chino starting at the end of July 2019.

Based on further feedback from the member agencies, this approach for generating demand projections will be incorporated into the Drought Monitoring TM, and eventually the Drought Contingency Plan.

**TABLE 1. FIVE-YEAR MONTHLY AVERAGES FOR IEUA MEMBER AGENCIES (AC-FT)**

| | *Chino* | *Chino Hills* | *CVWD* | *Fontana* | *MVWD* | *Ontario* | *Upland* | *SAWCo* |
|---|---|---|---|---|---|---|---|---|
| **July** | 1,503 | 1,526 | 5,183 | 4,121 | 1,721 | 3,428 | 2,181 | 1,156 |
| **August** | 1,516 | 1,505 | 5,227 | 4,050 | 1,645 | 3,436 | 2,207 | 955 |
| **September** | 1,390 | 1,393 | 4,622 | 3,669 | 1,602 | 3,165 | 1,937 | 921 |
| **October** | 1,292 | 1,246 | 4,159 | 3,417 | 1,400 | 2,921 | 1,764 | 864 |
| **November** | 1,119 | 1,046 | 3,416 | 2,860 | 1,136 | 2,476 | 1,399 | 813 |
| **December** | 933 | 810 | 2,846 | 2,539 | 988 | 2,173 | 1,152 | 770 |
| **January** | 886 | 793 | 2,730 | 2,477 | 936 | 2,084 | 1,103 | 734 |
| **February** | 859 | 759 | 2,583 | 2,381 | 1,022 | 1,964 | 1,091 | 770 |
| **March** | 973 | 870 | 2,945 | 2,699 | 915 | 2,229 | 1,259 | 857 |
| **April** | 1,197 | 1,064 | 3,778 | 3,132 | 1,195 | 2,645 | 1,498 | 1,005 |
| **May** | 1,281 | 1,207 | 4,076 | 3,374 | 1,395 | 2,842 | 1,634 | 975 |
| **June** | 1,383 | 1,327 | 4,642 | 3,706 | 1,483 | 3,118 | 1,885 | 1,075 |
| **Total** | 14,332 | 13,545 | 46,206 | 38,427 | 15,437 | 32,481 | 19,109 | 10,894 |

**TABLE 2. CITY OF CHINO 4-MONTH PROJECTION EXAMPLE – END OF JULY**

| | *Projected 2019* | | | |
|---|---|---|---|---|
| **Supplies** | *Aug.* | *Sept.* | *Oct.* | *Nov.* |
| Chino Basin GW | | | | |
| Other GW (CDA, desalted) | | *To be provided by the Member Agency* | | |
| Imported (IEUA, treated by WFA) | | | | |
| Recycled[1] | | | | |
| **Shortage Verification** | *Target (AC-FT)* | | | |
| Demand[2] | ***1,516*** | ***1,390*** | ***1,292*** | ***1,119*** |
| **Supply/Demand Ratio** | | | | |

[1] For information only (not used in calculation of Supply/Demand Ratio)

[2] Not including non-potable demands (i.e. purple pipe deliveries)

# Monthly Demand Averages for IEUA Member Agencies

## 3-Year Average (FY15/16 -FY17/18) and 5-Year Average (FY13/14-FY17/18)

| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3year Average | 1,400 | 1,416 | 1,305 | 1,226 | 1,081 | 951 | 771 | 812 | 895 | 1,142 | 1,257 | 1,356 |
| 5year Average | 1,503 | 1,516 | 1,390 | 1,292 | 1,119 | 933 | 886 | 859 | 973 | 1,197 | 1,281 | 1,383 |

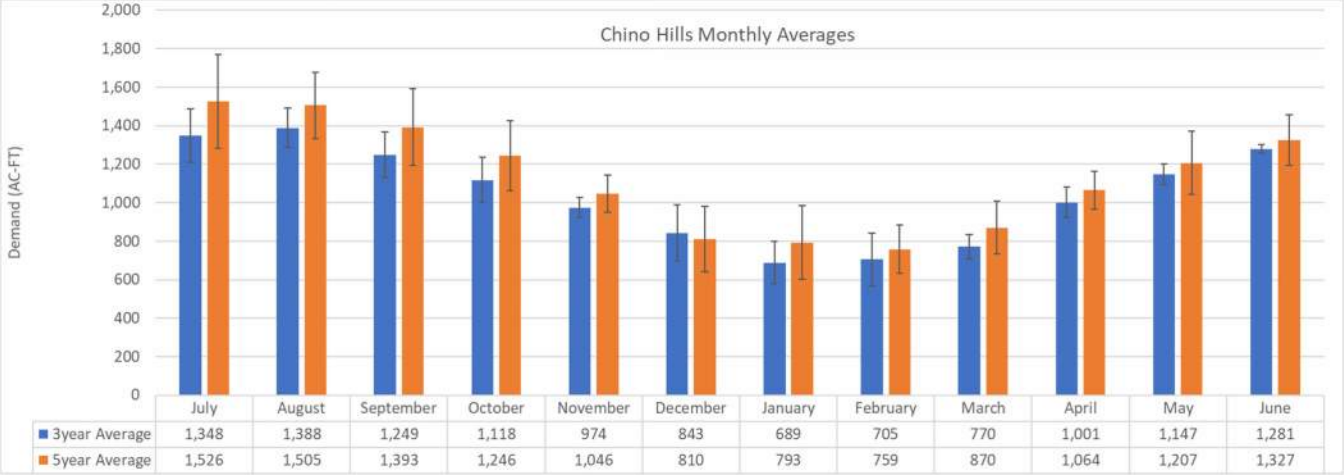


| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3year Average | 1,348 | 1,388 | 1,249 | 1,118 | 974 | 843 | 689 | 705 | 770 | 1,001 | 1,147 | 1,281 |
| 5year Average | 1,526 | 1,505 | 1,393 | 1,246 | 1,046 | 810 | 793 | 759 | 870 | 1,064 | 1,207 | 1,327 |

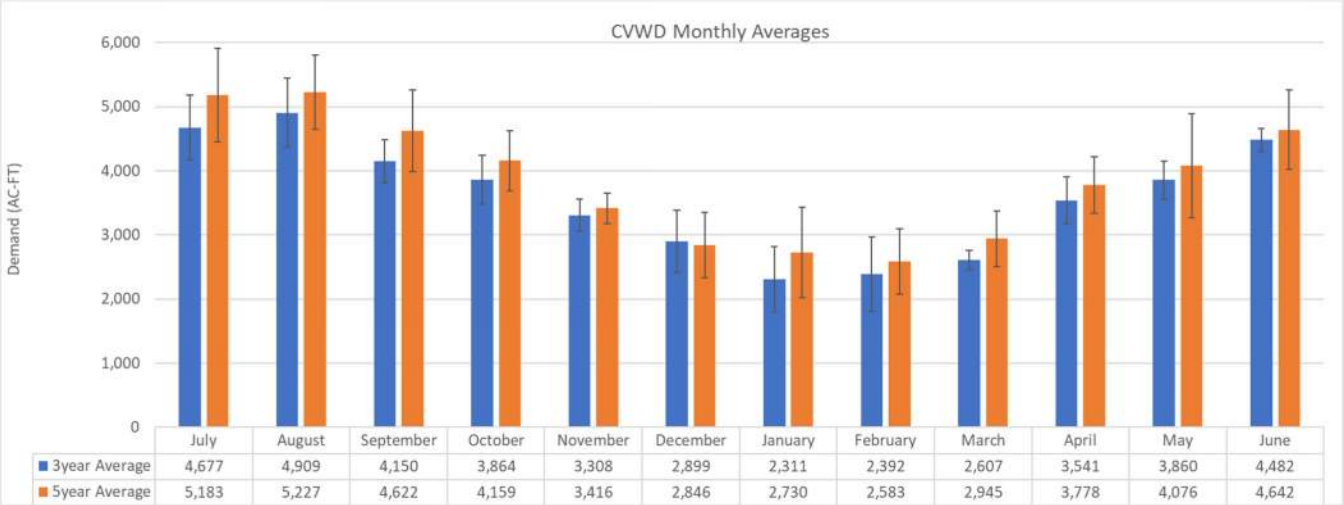


| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3year Average | 4,677 | 4,909 | 4,150 | 3,864 | 3,308 | 2,899 | 2,311 | 2,392 | 2,607 | 3,541 | 3,860 | 4,482 |
| 5year Average | 5,183 | 5,227 | 4,622 | 4,159 | 3,416 | 2,846 | 2,730 | 2,583 | 2,945 | 3,778 | 4,076 | 4,642 |

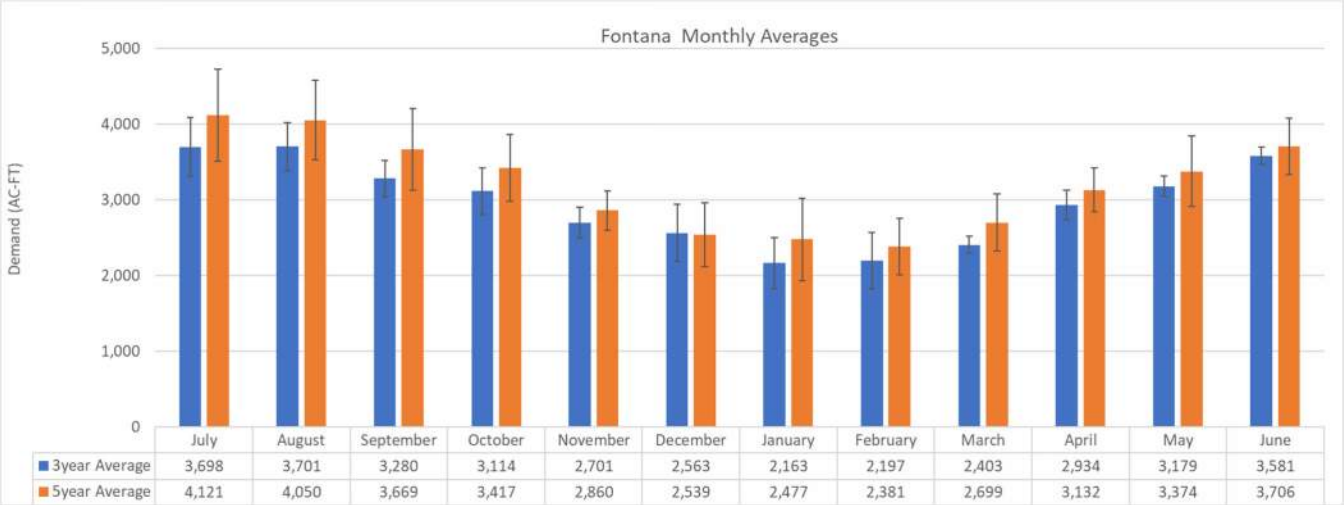


| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3year Average | 3,698 | 3,701 | 3,280 | 3,114 | 2,701 | 2,563 | 2,163 | 2,197 | 2,403 | 2,934 | 3,179 | 3,581 |
| 5year Average | 4,121 | 4,050 | 3,669 | 3,417 | 2,860 | 2,539 | 2,477 | 2,381 | 2,699 | 3,132 | 3,374 | 3,706 |

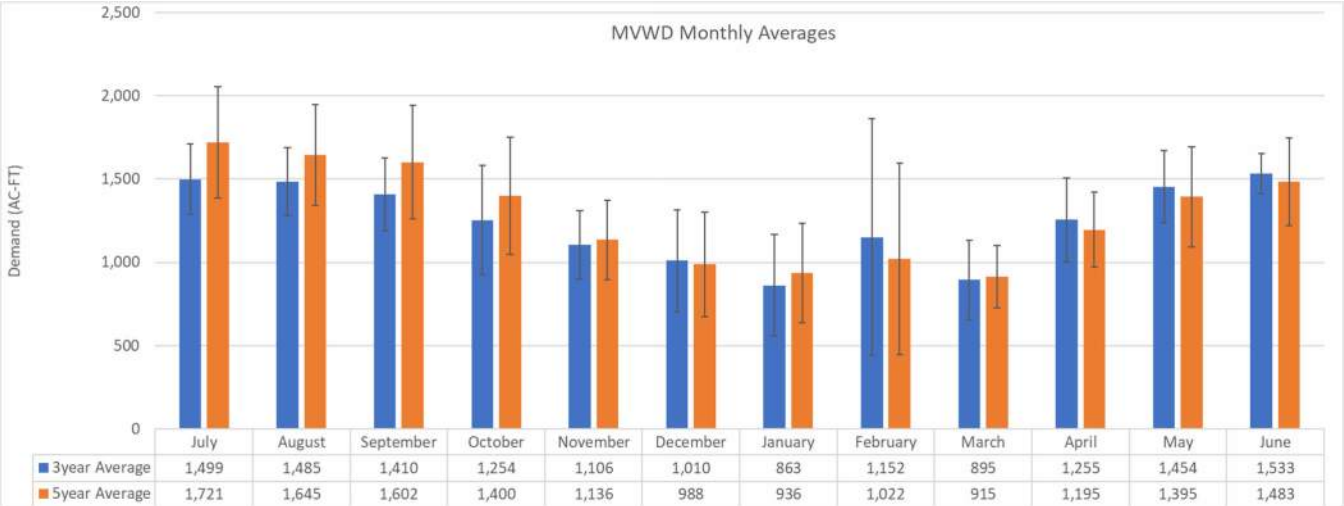


| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3year Average | 1,499 | 1,485 | 1,410 | 1,254 | 1,106 | 1,010 | 863 | 1,152 | 895 | 1,255 | 1,454 | 1,533 |
| 5year Average | 1,721 | 1,645 | 1,602 | 1,400 | 1,136 | 988 | 936 | 1,022 | 915 | 1,195 | 1,395 | 1,483 |

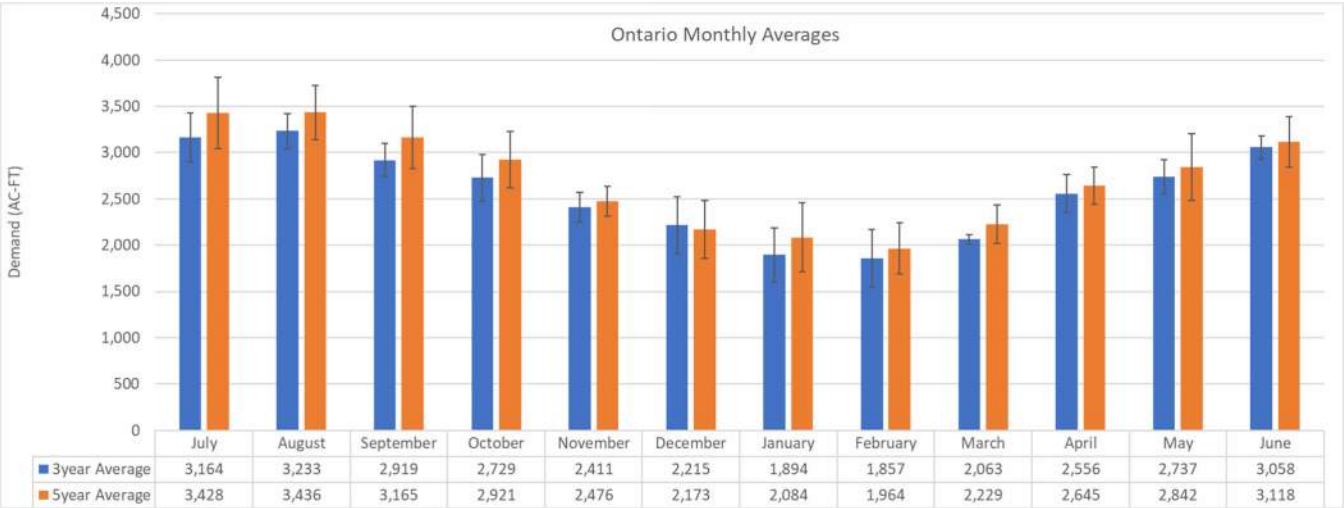


| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3year Average | 3,164 | 3,233 | 2,919 | 2,729 | 2,411 | 2,215 | 1,894 | 1,857 | 2,063 | 2,556 | 2,737 | 3,058 |
| 5year Average | 3,428 | 3,436 | 3,165 | 2,921 | 2,476 | 2,173 | 2,084 | 1,964 | 2,229 | 2,645 | 2,842 | 3,118 |

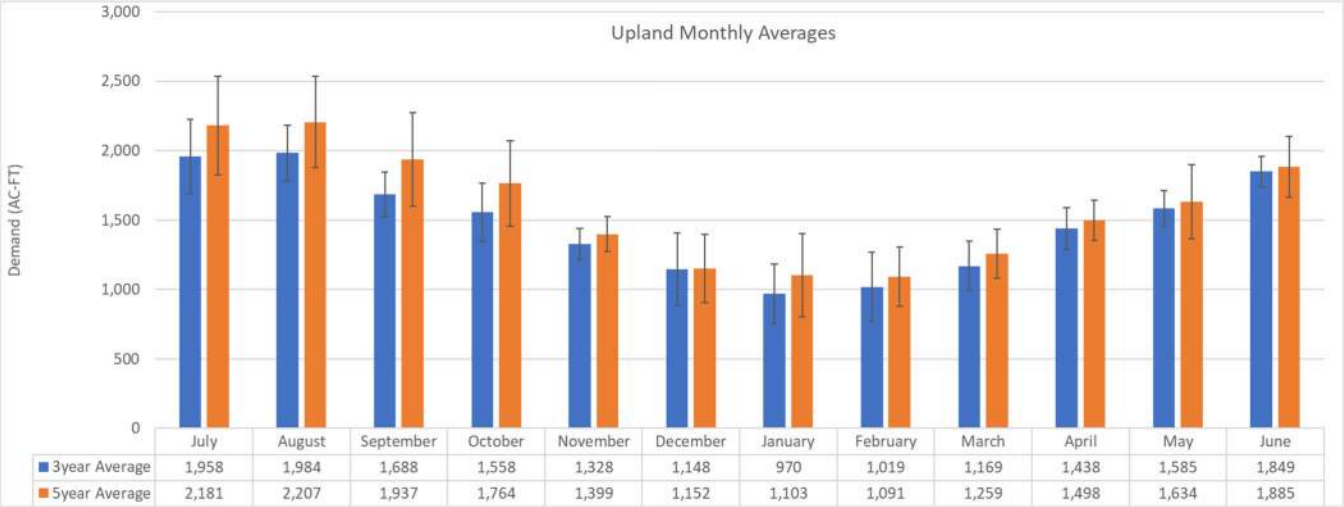


| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3year Average | 1,958 | 1,984 | 1,688 | 1,558 | 1,328 | 1,148 | 970 | 1,019 | 1,169 | 1,438 | 1,585 | 1,849 |
| 5year Average | 2,181 | 2,207 | 1,937 | 1,764 | 1,399 | 1,152 | 1,103 | 1,091 | 1,259 | 1,498 | 1,634 | 1,885 |

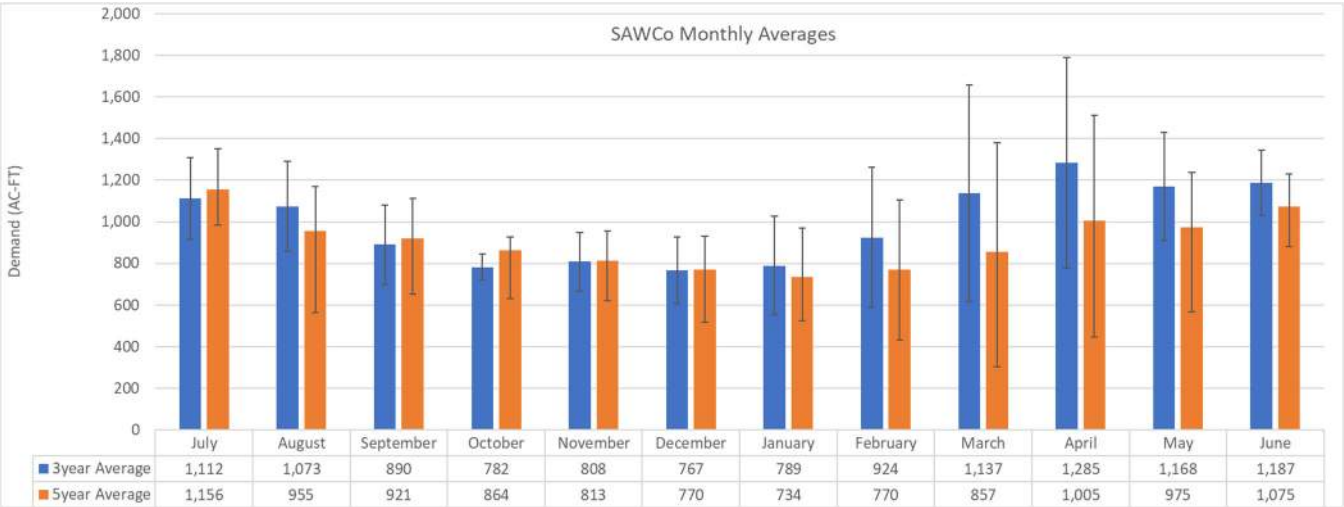


| | July | August | September | October | November | December | January | February | March | April | May | June |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3year Average | 1,112 | 1,073 | 890 | 782 | 808 | 767 | 789 | 924 | 1,137 | 1,285 | 1,168 | 1,187 |
| 5year Average | 1,156 | 955 | 921 | 864 | 813 | 770 | 734 | 770 | 857 | 1,005 | 975 | 1,075 |

# Appendix B: Summary of Member Agency Water Shortage Stages

IEUA Drought Contingency Plan

## Cucamonga Valley Water District Existing Water Shortage Stages

| Stage | Water Supply Condition* | Reduction (shortage imposed) | Response Action Type |
|---|---|---|---|
| 1 - Encouraging Water Use Efficiency | Normal Supply | 0% | Stage 1 = Mandatory Prohibited Water Practices. |
| 2 - Water Watch | Supplies reduced by 10% | 10% | In addition to Stage 1, reduce water usage by 10%, invoke outdoor watering conditions. |
| 3 - Water Alert | Supplies reduced by 15% | 15% | In addition to Stage 2, reduce water usage by 15%, invoke additional outdoor watering conditions. |
| 4 - Critical Water Alert | Supplies reduced by 20% | 20% | In addition to Stage 3, reduce water usage by 20%. |
| 5 - Water Emergency | Supplies reduced by 25% | 25% | In addition to Stage 4, reduce water usage by 25%. |
| 6- Severe Water Emergency | Supplies reduced by 35% | 35% | In addition to Stage 5, reduce water usage by 35% due to catastrophic event or severe drought, and additional end-user prohibitions. |
| 7 - Water Crisis - Catastrophic | Supplies reduced by 50% | 50% | In addition to Stage 6, reduce water usage by 50% due to catastrophic event or severe drought, and non-essential outdoor water may be prohibited and water for construction purposes curtailed. |

* Supplies may be reduced below the planned levels due to such causes as extreme (worst case) drought conditions, unplanned outages of local and imported water supply facilities due to earthquakes or other major disasters, prolonged power outages, water contamination, or any other catastrophic loss of supply.

## City of Ontario Existing Water Shortage Stages

| Stage* | Water Supply Condition | Reduction (shortage imposed) | Response Action Type |
|---|---|---|---|
| 0 | Normal Supply | 5% | Voluntary reductions for water use efficiency. |
| 1 | When water conservation goals not met through voluntary reduction or supplies reduced by 10% | Up to 10% | Stage 1 prohibitions implemented to reach 10% mandatory reduction (voluntary restrictions become mandatory). |
| 2 | Supplies reduced by 10% to 20% | > 15% | Stage 2 prohibitions implemented to reach at least 15% mandatory reduction. |
| 3 | Supplies reduced by more than 20% | > 20% | Stage 3 prohibitions implemented to reach greater than 20% mandatory reduction (includes no use of potable water for construction/grading). |
| 4 | Supplies reduced by more than 50% | Up to 50% | State 4 prohibitions implemented to reach up to 50% mandatory reduction (includes significant restrictions on landscape irrigation). |

* Stage 0 prohibitions are entirely voluntary. Stages 1 to 4 prohibitions will be progressively implemented according to the severity of the water crisis.

## City of Chino Existing Water Shortage Stages

| Stage* | Water Supply Condition | Reduction (shortage imposed) | Response Action Type |
|---|---|---|---|
| 0 | Adequate Water Supply Conditions | 0% | Permanent measures / restrictions to ensure water use efficiency. |
| 1 | When water conservation goals not met through voluntary reduction or supplies reduced by 10% | Up to 10% | Stage 1 restrictions implemented upon city council declaration of anticipated supply reduction of 10% or less (restricted outdoor irrigation and refill of lakes/ponds). |
| 2 | Supplies reduced by 10% to 20% | 10% - 20% | Stage 2 restrictions implemented upon city council declaration of anticipated supply reduction of 10% to 20% (increased outdoor irrigation restrictions). |
| 3 | Supplies reduced by more than 20% | > 20% | Stage 3 restrictions implemented upon city council declaration of anticipated supply reduction of more than 20% (no water to new land development projects). |

## City of Chino Hills Existing Water Shortage Stages

| Stage* | Water Supply Condition | Reduction (shortage imposed) | Response Action Type |
|---|---|---|---|
| 1 | Normal Supply | 0% | Voluntary Water Conservation Alert: all elements of Stage 2-4 restrictions on voluntary basis. |
| 2 | Moderate Water Conservation Alert | Up to 10% | Stage 2 restrictions implemented upon city council declaration of anticipated supply reduction of 10% or less and voluntary conservation does not achieve the desired reduction (restrictions on outdoor irrigation and water features). |
| 3 | High Water Conservation Alert | 10% - 25% | Stage 3 restrictions implemented upon city council declaration of anticipated supply reduction of 10% to 25% (no refilling of swimming pools or construction dust control). |
| 4 | Severe Water Conservation Alert | <25% | Stage 4 restrictions implemented upon city council declaration of anticipated supply reduction of more than 25% (no outdoor water use at any time). |

* Stage 1 prohibitions are entirely voluntary. Stages 2 to 4 prohibitions will be progressively implemented according to the severity of the water crisis.

## City of Upland Existing Water Shortage Stages

| Stage* | Water Supply Condition | Reduction (shortage imposed) | Response Action Type |
|---|---|---|---|
| 0 | Adequate Water Supply Conditions | 0% | Permanent measures / restrictions to ensure water use efficiency. |
| 1 | Significant Shortage | n/a | Stage 1 restrictions implemented upon city council declaration of anticipated supply not enough to meet demand (restrictions on outdoor irrigation). |
| 2 | High Shortage | n/a | Stage 1 restrictions implemented upon city council declaration of anticipated supply not enough to meet demand, despite Stage 1 restrictions (restrictions for washing vehicles and surfaces outdoors). |

* percentages not associated with Stages 1-2

## Fontana Water Company Water Shortage Stages

| Stage* | Water Supply Condition | Reduction (shortage imposed) | Response Action Type |
|---|---|---|---|
| 0 | Adequate Water Supply Conditions | 0% | Permanent measures / restrictions to ensure water use efficiency. |
| 1 | Water Alert | n/a | Stage 1 restrictions implemented if Commission, the utility, or authorized government agency determines that measures are needed to reduce water consumption (restrictions on timing and frequency of outdoor irrigation). |
| 2 | Water Shortage | n/a | Stage 2 restrictions implemented if Commission, the utility, or authorized government agency determines that measures are needed to reduce water consumption and further reduction is needed to provide utility service (increased irrigation restrictions). |
| 3 | Water Shortage - further demand reductions | n/a | Stage 2 restrictions implemented if Commission, the utility, or authorized government agency determines that measures are needed to reduce water consumption and further reduction is needed to respond to existing available water supply conditions (no dust control or filling of ponds / lakes). |
| 4 | "Emergency" Water Shortage | n/a | Stage 3 restrictions implemented upon Commission, the utility, or authorized government agency determines that measures are needed to reduce water consumption due to a critical water shortage emergency. Stage 1-3 are not sufficient to comply with demand reductions (no outdoor water use). |

* percentages not associated with Stages 1-3

## Monte Vista Water District Existing Water Shortage Stages

| Stage* | Water Supply Condition | Reduction (shortage imposed) | Response Action Type |
|---|---|---|---|
| 1 | Adequate Water Supply Conditions | 0% | Permanent measures / restrictions to ensure water use efficiency. |
| 2 | Significant Water Supply Shortage | 10% - 25% | Stage 2 restrictions implemented if Board of Directors finds that current or near-term water supply conditions require a 10% to 25% reduction (outdoor irrigation restrictions). |
| 3 | Critical Water Supply Shortage | 25% - 40% | Stage 3 restrictions implemented if Board of Directors finds that current or near-term water supply conditions require a 25% to 40% reduction (irrigation restrictions, no vehicle washing, no refilling of pools) . |
| 4 | Emergency Water Supply Shortage | > 40% | Stage 4 restrictions implemented if Board of Directors finds that current or near-term water supply conditions require greater than 40% reduction (no new landscaping, dust control for construction, or water to maintain pools and spas). |

# Appendix C:
# 2015 Integrated Water Resources Plan:
# Water Supply & Climate Change Impacts 2015—2040

IEUA Drought Contingency Plan

2016

# Integrated Water Resources Plan:

## Water Supply & Climate Change Impacts 2015—2040

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

**"Our climate is rapidly changing, our population is growing and more extreme weather looms on the horizon. Now is not the time to shirk from responsibility. Storage or conveyance alone will not solve all of our problems. Recycling, groundwater management and conservation, individually, won't get us there either. It will take all of the above. *We must think differently and act boldly* -- and that's exactly what California is doing."**

**—Governor Brown**

# Integrated Water Resources Plan:

## Water Supply & Climate Change Impacts 2015—2040

**Prepared by:**
Inland Empire Utilities Agency

**Technical Modeling by:**
A&N Technical Services
RAND Corp.
Wildermuth Environmental Inc.

**Technical Advisory Committee:**
City of Chino
City of Chino Hills
City of Ontario
City of Upland
Chino Basin Water Master
Cucamonga Valley Water District
Fontana Water Company
Monte Vista Water District

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# Acronyms

| | |
|---|---|
| **AF** | Acre-Feet |
| **AFY** | Acre-Feet of water per Year |
| **CBWM** | Chino Basin Watermaster |
| **CDA** | Chino Desalter Authority |
| **CUWCC** | California Urban Water Conservation Council |
| **CVWD** | Cucamonga Valley Water District |
| **DWR** | Department of Water Resources |
| **DYY** | Dry Year Yield |
| **EDU** | Equivalent Dwelling Unit |
| **ET** | Evapotranspiration |
| **GPD** | Gallons per Day |
| **IERCF** | Inland Empire Regional Composting Facility |
| **IEUA** | Inland Empire Utilities Agency |
| **IRP** | Integrated Resource Plan |
| **MGD** | Million Gallons per Day |
| **MG** | Million Gallons |
| **M&I** | Municipal and Industrial |
| **MVWD** | Monte Vista Water District |
| **MWD** | Metropolitan Water District of Southern California |
| **NPDES** | National Pollutant Discharge Elimination System |
| **NRW** | Non-Reclaimable Wastewater |
| **OBMP** | Optimum Basin Management Plan |
| **OSY** | Operating Safe Yield |
| **OWOW** | One Water One Watershed |

| | |
|---|---|
| **PEIR** | Program Environmental Impact Report |
| **RMPU** | Recharge Master Plan Update |
| **RTP** | Regional Transportation Plan |
| **SAWPA** | Santa Ana Watershed Project Authority |
| **SARCCUP** | Santa Ana River Conservation and Conjunctive Use Project |
| **SBCFCD** | San Bernardino County Flood Control District |
| **SCAG** | Southern California Association of Governments |
| **SFR** | Single Family Residential |
| **SRF** | State Revolving Fund |
| **SWRCB** | State Water Resources Control Board |
| **TDS** | Total Dissolved Solids |
| **TYCIP** | Ten-Year Capital Improvement Plan |
| **USBR** | United States Bureau of Reclamation |
| **UWMP** | Urban Water Management Plan |
| **WEAP** | Water Evaluation And Planning Model |
| **WFMP** | Wastewater Facilities Master Plan |
| **WUE** | Water Use Efficiency |
| **WUEBP** | Water Use Efficiency Business Plan |

# 1. Overview & Purpose

**Project Background**

**Climate Change**

**Phases of the IRP**

**IRP Development**

**Planning Process**

Agricultural fields, in the City of Ontario.

# I. Overview & Purpose

## PROJECT BACKGROUND

The 2015 "Integrated Resources Plan: Water Supply & Climate Change Impacts 2015—2040" (IRP) is our region's blueprint for ensuring reliable, cost-effective, and environmentally responsible water supplies for the next 25 years. It takes into consideration availability of current and future water supplies and accounts for possible fluctuations in demand forecasts and climate change impacts. This is the first time that the region's planning has gone beyond a regional Urban Water Management Plan (UWMP) and the cities and water agencies (Agencies) have worked collaboratively to develop a comprehensive water resources plan. The sphere of influence for the 2015 IRP is the Inland Empire Utilities Agency's (IEUA) service area which is in southwestern San Bernardino County shown in Figure 1-1.

Two key goals of this IRP are to integrate and update water resource planning documents in a focused, holistic manner and to develop an implementation strategy that will improve near-term and long-term water resources management for the region. In addition, the IRP evaluates new growth, development, and water demand patterns within the service area and conducts an assessment of water needs and supply source vulnerabilities under climate change.

Although this is the first IRP that the region has developed, from 2000 to 2002 the region developed four foundational master planning documents which, together, functioned as an IRP. These historical documents illustrated how, since 2000, the region has recognized the increasingly uncertain future of imported water supply availability and the importance of local water supplies, particularly now with changing climate conditions. As part of its response, the region has focused infrastructure investments on local water supply development strategies to reduce dependence on imported supplies and increase drought resilient water sources (see Appendix 1 for a detailed description of foundational planning documents). These foundational documents are:

1. Chino Basin Water Master's Optimum Basin Management Plan (2000)
2. Chino Basin Organics Management Strategy (2001)
3. Recycled Water System Feasibility Study (2002)
4. Wastewater Facilities Master Plan (2002)

These documents were linked together in the 2002 IEUA Facilities Master Plan Programmatic Environmental Impact Report (EIR).

Water resources management strategies were further updated as part of the 2005 and 2010 UWMP. Individual programs were developed in reports such as the 2002 Salinity Management Plan, 2005 Recycled Water Implementation Plan, 2007 Recycled Water Three Year Business Plan, 2013 Recharge Master Plan Update, 2015 Recycled Water Program Strategy, 2015 Facilities Master

Plan Update, 2015 WUE Business Plan Update, and 2015 Energy Management Plan. The number and scope of regional planning documents that have been developed in the past 15 years illustrate both the commitment to local resource development and the emphasis on water resources sustainability.

An additional driver for the creation of the IRP was the need to strategically position the region for upcoming funding opportunities. By leveraging these funding opportunities for local projects, the region will be less vulnerable to the anticipated imported water rate increases of 4-5% annually through the next decade (MWD 2016 Forecast). The past success of the region to secure grant funding of over $258 million has made the expansion of the groundwater recharge, recycled water, and conservation programs possible. Over the next two years, more than a billion dollars of state and federal grants and loans will be available to support additional water supply development. The IRP will help position the region to pursue these funding opportunities by identifying regional water resources programs and ultimately project priorities.

## CLIMATE CHANGE

Climate change impacts have already started to create critical challenges for water resources management in Southern California. More intense storm events and the changing frequency and duration of drought years are becoming evident throughout the State and the West. This makes future water supplies available to the region more uncertain, particularly imported water resources that are uniquely vulnerable to changes in the state's snowpack.

General climate change trends projected for California are that temperatures will increase and precipitation will increasingly fall as rain rather than snow. These trends will impact water supplies in two ways: higher

The planning principal which guides the IRP is:

***"… to plan for a deeply uncertain future and develop a robust strategy that can adapt and respond to a wide range of possible futures with changing conditions."***

**Figure 1-1:** IRP Regional Planning Area Boundary

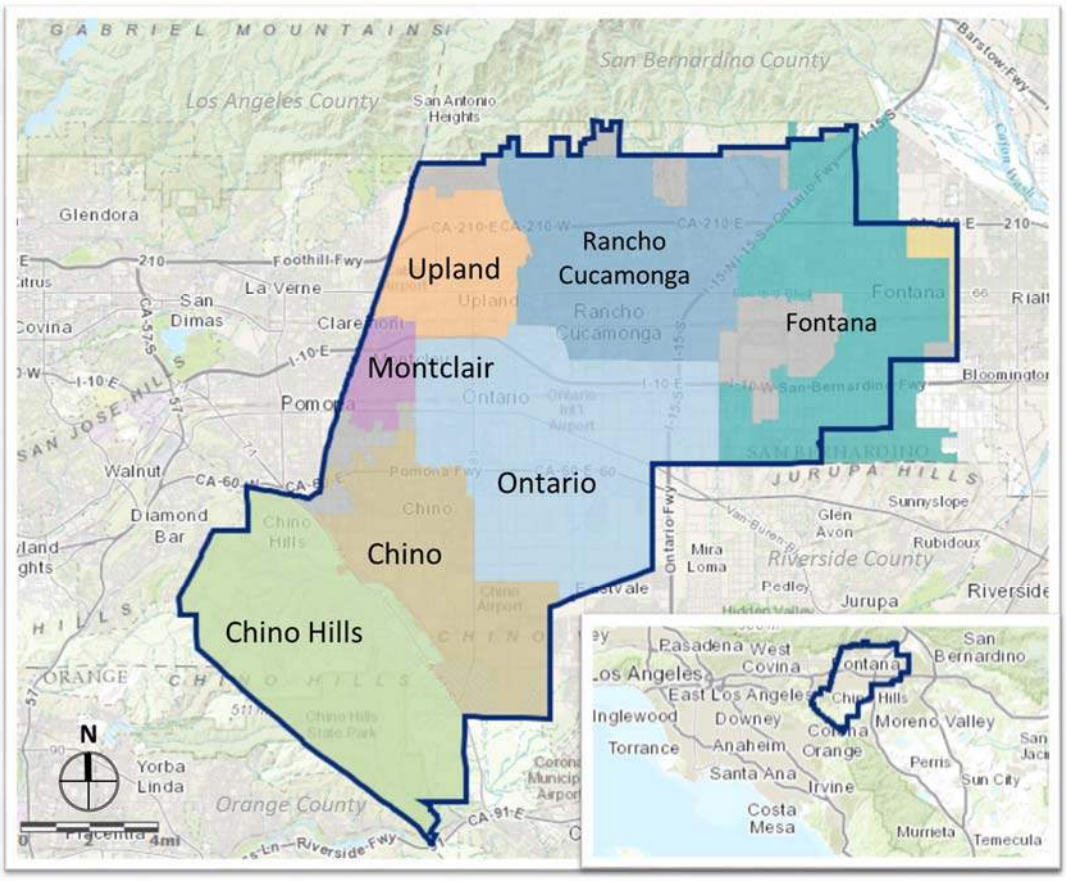

temperatures will cause increased water demands; however, infrastructure to capture rain runoff is limited as water infrastructure in California was designed to capture slow melting snowpack not rapid stormwater.

In addition, droughts are expected to occur more frequently, more intensely, and last longer. The Natural Resources Defenses Council (NRDC) estimates that if nothing is done to address the implications associated with climate change, between the years 2025 and 2100, the cost of providing water to the western United States will increase from $200 billion to $950 billion per year.

The IRP recognizes and incorporates an assessment of a range of impacts that climate change could have on water supplies for the State and region. This is done by using downscaled climate models from the Intergovernmental Panel on Climate Change (IPCC) Assessment. This IRP does not rely on historical hydrology to predict the future, but instead gathers data available from the latest climate models to project a wide range of possible future climate conditions. The information was used as a sensitivity analysis to help identify the most climate resilient water strategies and priorities for the region. This approach was selected to provide the region with a better understanding of how to effectively plan and prepare for how climate uncertainty affects our water supplies.

*"Paleoclimate climate analysis has established that hydrology has the potential to vary far more widely than has been recorded in the observed record. This means that, given the scientific evidence supporting climate change, we need to look beyond historical observations to ensure that we have adequate water supplies."*

*"Strategies and Resources for Evaluating and Adapting to Climate Change Effects: Climate Change is Real –Now What?" Stanford Report. Fall 2014.*

## PHASES OF THE IRP

The development of the IRP is being done in two phases.

**Phase 1 – Analysis and Recommendations**: Phase 1 focuses on an extensive analysis of future projected water needs and water supply strategies under conditions of climate change and growth. Results from Phase 1 include summaries of the recommended regional water resource strategies; corresponding ranges of costs for the various supply categories; and a regionally developed, all-inclusive list of potential supply projects (local and regional). This information will be used to complete a Programmatic Environmental Impact Report (PEIR), which is needed to ensure that selected projects are grant eligible. The IRP report is the culmination of Phase 1.

**Phase 2 – Implementation and Capital Improvement Program (CIP)**: Phase 2 will address additional detailed project level analysis including project scopes, costs, prioritization, and implementation scheduling. Phase 2 will also include the disaggregation of the regional demand and supply to the local retail level. Continued discussions will be facilitated through a Regional Water Forum. Phase 2 is anticipated to begin in Summer 2016.

## IRP DEVELOPMENT

The IRP was developed from 2013-2015 by the IEUA Planning and Environmental Resources Department in conjunction with stakeholders including regional technical staff, water managers, and joint IEUA Board and Regional Policy Committee workshops.

**IRP Technical Work Group:** The IRP Technical Work Group consisted of IEUA member agencies, which includes the seven contracting sewerage agencies, and the retail water agencies within the IEUA service area. Meetings were held one to two times each month to discuss modeling assumptions, verify projections, establish project lists, and examine modeling results in detail. Modifications to methodology and clarifications were made with this group.

**Water Managers Work Group:** After technical items had been discussed and vetted, core findings and recommendations were presented at the monthly Water Managers Work Group meetings.

**Joint Board and Policy Committee Workshops:** The results from the IRP modeling and recommendations from the Technical and Water Managers Work Groups were presented to regional policy makers. These special joint workshops included members from IEUA's Board of Directors and the regional policy makers from the Regional Sewerage Policy Committee, as well as board members from the Monte Vista Water District (MVWD), and the General Manager from Fontana Water Company. These meetings served to update policy makers about the progress being made with the IRP as well as to receive policy direction.

**Goals & Objectives:** IRP Goals and Phase 1 objectives were developed by stakeholders during multiple workshops with the IRP Technical and Water Managers Work Groups, and joint IEUA Board and Regional Policy committee workshops. The overarching goals that guided the IRP process and analysis are:

- *Resilience* — Develop regional water management flexibility to adapt to climate change and economic growth and to any changes that limit, reduce, or make water supplies unavailable.
- *Water Efficiency* — Meet or exceed rules and regulations for reasonable water use.
- *Sustainability* — Provide environmental benefits, including energy efficiency, reduced greenhouse gas emissions, and water quality improvements, to meet the needs of the present without compromising the ability of future generations to meet their own needs.
- *Cost-Effectiveness* — Supply regional water in a cost effective manner and maximize outside funding.

Planning objectives for the 2015 IRP were also developed by the stakeholders. These objectives are:

- Identify key water resource supply vulnerabilities and evaluate different options that could reduce these vulnerabilities.
- Develop multiple water supply strategies to reduce future water supply imbalances.
- Evaluate strategies with different project combinations, or portfolios, to assess resiliency to climate change, including mega droughts and decadal drought impacts across future scenarios, and how the portfolios could improve regional supplies.
- Analyze portfolio results from the Water Evaluation and Planning (WEAP) model simulations to identify key tradeoffs among the portfolios.
- Develop a long-term grant application strategy for priority water resources projects.

## PLANNING PROCESS

Phase 1 of the IRP was developed in three parts. The primary objective of Part I was to identity the water resource needs. Needs were developed based on an inventory of current and projected water supplies and demands. In Part 2, the IRP Technical Work Group discussed and developed regional water supply strategies that were then tested through modeling runs completed in Part 3. Individual Stages completed under each part are illustrated in Figure 1-2.

**Part 1: Needs Assessment**

***Stage 1 - Regional Demand Forecast.*** Water demands for the region were projected from 2015 to 2040 using an econometric model that incorporated factors for economic conditions, growth, water efficiency, housing density, and conservation program investments approved in the FY15/16 Capital Improvement Program. Projected demands were displayed as a range to reflect trend uncertainties. The regional demand forecast is further described in Section 2 of the IRP. A complete technical description of the demand projection modeling by A&N Technical Services for this project is contained in Appendix 1.

***Stage 2 - Regional Baseline Supply Forecast.*** Existing water resources utilized by the region were identified and analyzed to determine trends in water availability and usage through 2040. Water supplies from projects approved in the FY15/16 Ten Year Capital Improvement Program were included in this assessment. Together, these existing and new water supplies are defined as the baseline supplies through 2040.

***Stage 3 - Climate Change Impacts.*** IEUA worked with the RAND Corporation to develop a water demand and supply model to evaluate the impact of climate change

**Figure 1-2:** IRP Phase 1 Planning Process Diagram

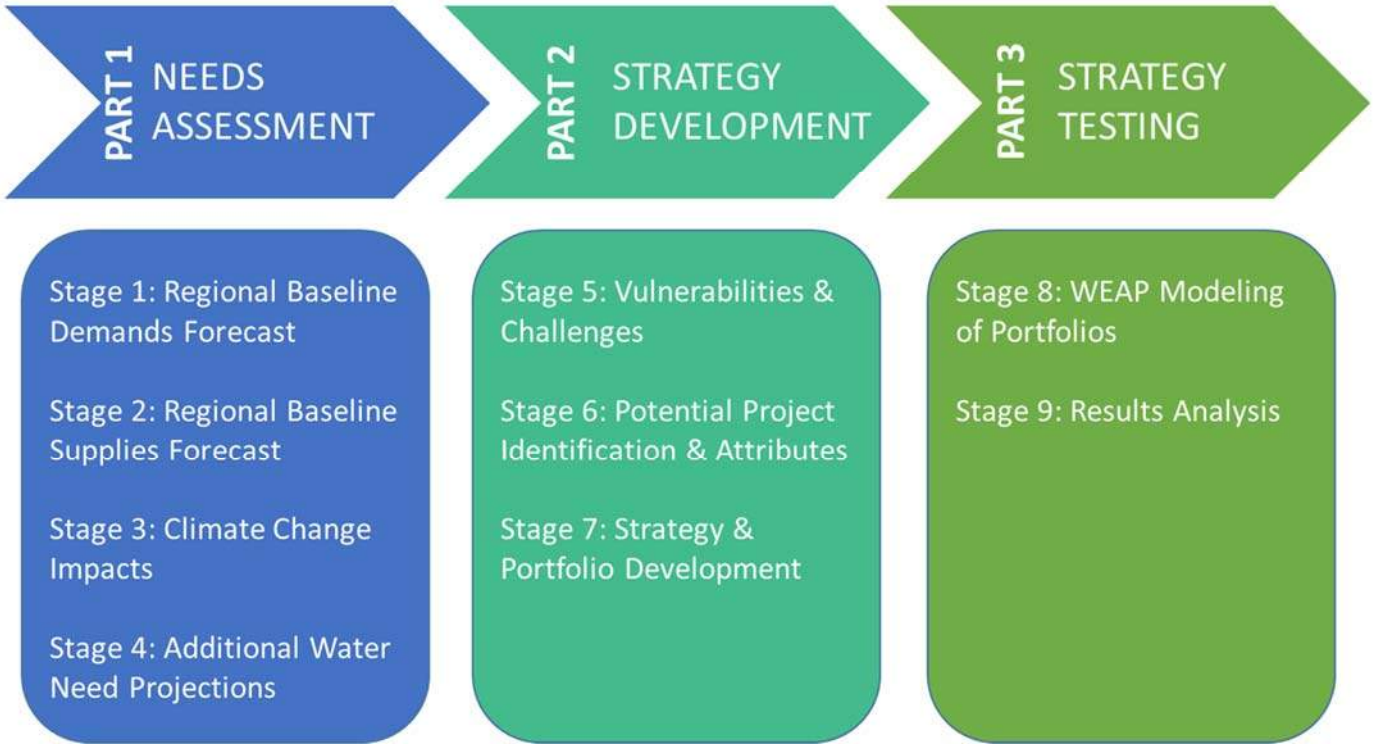


on the IEUA service area. The model, used as a baseline, tabular estimates of IEUA's supplies and demands. A set of 106 climate scenarios for the IEUA region were derived from downscaled general circulation model results used for the Intergovernmental Panel on Climate Change Assessment Reports 3 & 5. These data suggest that regional temperatures would likely increase between 0.5-3.5°F by 2040. Precipitation was highly variable and showed no clear trend across the ensemble of scenarios.

The climate scenarios and baseline water demands and supplies were then entered into a water management model developed in the Water Evaluation and Planning (WEAP) modeling system. The WEAP model used these inputs to estimate how water demands, supplies, runoff, flows, and storage would change under the 106 climate scenarios. This approach highlighted supplies that provided greater reliability and were resilient to climate change impacts. The WEAP model results are summarized in Section 3 of the IRP. A technical description of the modeling and climate assessment is presented in Appendix 3.

***Stage 4 - Additional Water Need Projections.*** Based on the results from Stage 3, the IRP Technical Work Group evaluated the results of the climate modeling to identify the potential water supply shortfalls that the region would need to address to meet future demands. These potential shortfalls were used to develop regional water resources strategies and portfolios during Stage 7.

**Part 2: Regional Strategy Development**

***Stage 5 - Vulnerabilities & Challenges.*** Key water resources vulnerabilities and challenges facing the region were identified and prioritized by the IRP Technical Work Group. Vulnerabilities and challenges for the region include:

- *Groundwater & Stormwater* — maintaining operational safe yield (OSY); preventing land subsidence; maintaining water quality; and preventing loss of natural infiltration
- *Recycled Water* — addressing increased total dissolved solids (TDS) as a result of indoor water use efficiency programs; regional interest in recycled water exceeding local supplies; competing uses of

existing supplies for direct use and for groundwater recharge; and energy intensity of additional treatment levels for direct potable.

- *Imported Water*— potential for catastrophic interruption; dependence on the MWD Rialto feeder pipeline; and constraints on supplies due to State Water Project (SWP) availability and Colorado River Basin over allocation and drought.
- *Other*— need for infrastructure redundancy; variability of surface water supplies; impact of new energy and water use efficiency standards; increasing salinity in source water; and avoiding stranded assets.

***Stage 6 - Potential Project Identification and Attributes.*** A comprehensive list of potential water supply projects was developed based on previous and parallel planning efforts, including the Recycled Water Program Strategy, Wastewater Facilities Master Plan Update, 2013 Recharge Master Plan Update, Water Use Efficiency Business Plan (WUEBP), FY15/16 Ten Year Capital Improvement Plan (TYCIP), Santa Ana River Conservation and Conjunctive Use Program (SARCCUP), drought project list, and conceptual projects identified during the IRP process.

Individual projects were grouped into larger project categories. In some cases, categories were divided into multiple tiers which allowed the IRP Technical Work Group to either phase in similar projects over time or accelerate implementation by selected multiple tiers. Individual projects were also tagged according to their ability to address challenges and constraints facing the region.

***Stage 7 - Strategy and Portfolio Development.*** Drawing upon information from Stages 3 and 4, the IRP Technical Work Group developed five water supply strategies to understand how combinations of projects could meet future water needs and address the challenges and constraints facing the region. A decision support tool, developed by the RAND Corporation and described in Appendix 3, supported this process. The five water supply strategies are:

- *Strategy 1:* Maximize Chino Basin groundwater, including prior stored groundwater
- *Strategy 2:* Recycled water program expansion
- *Strategy 3:* Recycled water & conservation program expansions
- *Strategy 4:* Maximize supplemental water supplies and recycled water supplies
- *Strategy 5:* Maximize imported water supplies with moderate conservation

A total of eight project portfolios were developed to test the five strategies under the WEAP model. Strategies and results are fully described in Section 4 of the IRP.

**Part 3: Strategy Testing**

***Stage 8 - WEAP Modeling of Portfolios.*** Each portfolio was run through the WEAP model against the 106 climate scenarios. For comparison, a baseline portfolio that was limited to the baseline supplies identified in Stage 2, was also run through the WEAP model. WEAP model results were evaluated both in terms of the portfolio's ability to meet projected demands and whether surplus supplies were stored or used over time. Results are fully described in Section 4 of the IRP.

***Stage 9 - Results Analysis.*** Portfolio performances were compared to the baseline portfolio results in order to determine the affect of the each portfolio on water supplies. Since there were 106 results per portfolio from the climate runs, it was beyond the scope of Phase 1 of the IRP to evaluate the nuances of the individual climate runs. Instead, the range of results that fell within 75% of the model runs were analyzed. The 75% criteria was chosen to eliminate outlier results which could have large cost implications.

Regional recommendations were developed based on: (a) the ability of a strategy to meet future demands and develop a surplus supply buffer and (b) input from the IRP Technical Work Group on the strategies that best met regional interests. Conclusions are discussed in Section 5 of the IRP. These recommendations will be used to target future grant applications. The development of future water resources projects will be done during Phase 2 of the IRP.

# 2. Water Demand Forecast

**Introduction to Water Demands**

**Water Demand Setting**

**Methodology**

**Urban M&I Demand Projection Variables**

**Urban M&I Demand Forecast**

**Additional Water Needs Forecast**

**Total Regional Demand Forecast**

View of single family residential homes in Chino Hills

# II. Water Demand Forecast

## INTRODUCTION TO WATER DEMANDS

Section 2 outlines the process used to identify water demands for the region through 2040. These water demands include urban, environmental, and regulatory needs. Urban demands, also known as retail municipal and industrial (M&I) demands, represent the full spectrum of urban water use within the service area including commercial, institutional, industrial uses, and residential service for approximately 844,000 people. In addition to urban demands, regional water demands also include environmental discharge obligations to the Santa Ana River and contractual water commitments.

## WATER DEMAND SETTING

Since the 1990s, approximately 90% of the region's water demands have come from urban M&I users with the remaining 10% coming from agricultural users (source: 2010 IEUA UWMP). Overall urban water demand since 1995 has increased by approximately 20%, despite a regional growth of 30% (approximately 200,000 more residents). This is indicative of new water use behaviors, such as efficient irrigation and more efficient indoor fixtures, which prolong the availability of current regional water supplies into the future. The 2010 UWMP estimated total urban demand by the year 2015 to be approximately 272,000 acre-feet per year (AFY). However, actual demands have grown more slowly, increasing by only 3,000 acre-feet (AF) over the past four years from approximately 197,000 AFY in FY2010/11 to 200,000 AFY in FY2014/15 as shown in Figure 2-1. This is due in part to delayed growth as a result of the economic recession, as well as changes in plumbing code, implementation of water use efficiency programs, and responses to current water supply challenges such as the drought that California has been experiencing since 2012.

The impact of plumbing code changes and the implementation of water use efficiency programs was quantified in the recent 2015 WFMP flow monitoring. IEUA monitoring of new versus older residential developments showed that urban usage patterns have decreased from a regional indoor flow average of 55 gallons per capita per day (GPCD) down to 37 GPCD in new developments. This is consistent with new development trends throughout California (Codes and Standards Research Report: California's Residential Indoor Water Use. May 2015). This indicates that future developments will require less water, reducing the overall regional need for additional water supplies. This shift has significant implications for future wastewater and recycled water planning. Regional treatment plants may not need to be expanded for hydraulic capacity as quickly as previously thought (potentially saving regional capital); however, treatment plants will have to be expanded for treatment capacity for wastewater strength (because there will be greater concentrations of solids and TDS), and future available recycled water supplies may be lower than projected.

Outdoor water use provides the largest potential for improved water efficiency and additional water savings

in the region. As part of the IRP, A&N Technical Services conducted a study to estimate the amount of indoor and outdoor water use in the region. The study, which used data from the City of Ontario, found that outdoor irrigation accounts for approximately 60% of total urban demand. (Refer to Appendix 3 for the full technical memo.)

### METHODOLOGY

This IRP uses an econometric model to forecast urban water demands. This water demand model incorporates various influences which impact urban water demand such as population, employment, economics, weather, and conservation activities.

The IRP water demand model was developed by:

- Acquiring the latest regional demographic forecasts from the Southern California Association of Government "2012 Regional Transportation Plan".
- Inputting the demographic data into the econometric model equations to generate a base demand forecast.
- Calibrating the base demand forecast to identify corresponding water demand influences caused by factors including weather, employment, and economic cycles. For this IRP, a total of 12 factors were identified.
- Inputting the latest version of the Alliance for Water Efficiency (AWE) tracking tool for water savings that result from building codes and appliance standards (passive conservation) as well as regional programs that promote conservation (active conservation). Water savings are subtracted from water demand forecasts to ensure that water conservation is incorporated into the projections.
- Developing multiple water demand scenarios to plan for a range of possible futures.

### URBAN M&I DEMAND PROJECTION FACTORS

To forecast urban M&I water demand through 2040, past and present urban water uses were assessed. This included an evaluation to determine which factors or influences impact demands and the corresponding

**Figure 2-1:** Regional Annual Water Use

Note: Annual water use includes imported water, surface water, groundwater, recycled and desalter production. FY 15/16 usage is projected based on 25% reduction from FY13/14

magnitude of their effect. A total of twelve water demand factors were identified along with their corresponding influence on water demand. Factors that influenced regional water demand were as follows:

1. Household size — single family residential (SFR), multi-family residential (MFR)
2. Land development and community density
3. Median household income
4. Customer response and water use behavior
5. Marginal water price
6. Active and passive conservation
7. Weather and climate change
8. Economic cycle
9. Short-term weather
10. Residential community mix of SFR and MFR
11. Weather and climate change
12. Conservation activities (demand management and water use efficiency)

Of the twelve factors, four were found to have a significant impact on regional urban M&I water demands and are described below. The remaining factors are described in Appendix 4. The four main factors were:

- ***Land Development and Community Density:*** regional development trends show that per capita water usage decreases with the shift towards higher density developments featuring smaller landscape areas.
- ***Weather and Climate Change:*** water use increases under hotter and drier conditions.
- ***Customer Response and Water Use Behavior:*** public increases conservation in response to statewide calls for conservation and permanent water use reductions.
- ***Economic Cycle:*** market conditions impact water usage, with recessions reducing water use and periods of growth increasing water use.

**Land Development and Community Density**

In the last decade, a relatively new type of housing development has emerged with higher housing densities. This is a national as well as a regional trend. These developments feature medium to large single family homes, usually built with minimal landscaping on small lots, also known as "zero-lot-line" housing. Irrigable landscaped areas in these developments are much smaller than traditional developments in the region have been. As a result, the higher density housing caused by these type of development trends lead to lower water use per housing unit because the reduced space for landscaping requires less irrigation.

For comparison purposes and to help anticipate a range of uncertain futures, Tables 2-1 and 2-2 summarize the sources of land use data and ranges of housing density incorporated into the demand forecast model. Land use data was sourced from the General Plans of the cities in the region, the Metropolitan Water District's (MWD) 2010 water demand model (2010 MWD_MAIN), and regional growth plans such as SCAG's 2012-2035 RTP/ Sustainable Communities Strategy (SCS) (2012 RTP/SCS).

Land use density is the variable that will have the largest impact on future demands. Comparing the demand forecast from the cities' General Plan data to the forecast presented in the 2010 Urban Water Management Plan (UWMP), there is a difference of at least 60,000 AF in total urban M&I demand by the year 2040.

This difference is further heightened when the UWMP urban M&I demand forecast is compared to the demands tied to higher housing density values described in recent General Plan EIR amendments throughout the region. These higher densities are also consistent with SCAG's 2012 SCS density levels. For example, when the 2010 UWMP demands are compared to the demand associated with high density presented in Tables 2-1 and 2-2, there is a difference in total urban M&I demand in the year 2040 of approximately 105,000 AF.

**Weather and Climate Change**

Weather has a large impact on the amount of water that customers need. Under hotter and drier conditions, water use increases at the same time that supplies may be constrained. With climate change, this trend is likely

### Table 2-1: Single Family Housing Density Variability

| Data Source | Low (Units per Acre) | Average (Units per Acre) | High (Units per Acre) |
|---|---|---|---|
| **General Plans** | 1.2 | 2.7 | 4.2 |
| **2012 RTP/SCS** | 2.3 | 3.7 | 5.4 |
| **2010 MWD_MAIN** | 3.2 | 3.2 | 3.2 |

### Table 2-2: Multi-Family Housing Density Variability

| Data Source | Low (Units per Acre) | Average (Units per Acre) | High (Units per Acre) |
|---|---|---|---|
| **General Plans** | 9.7 | 13.5 | 17.3 |
| **2012 RTP/SCS** | 8.4 | 13.5 | 17.0 |
| **2010 MWD_MAIN** | 10.9 | 10.9 | 10.9 |

### Table 2-3: Climate and Weather Effect on Water Demands

| By Year | Increase in Temp. (F) | Effect on Water Demand | Probability |
|---|---|---|---|
| 2040 | 3.6 degrees | +4.3% | 80th percentile |
| Multiple Dry Years | | +5.98% | Varies by climate run |

to be exacerbated in the near future.

In fact, climatologists have changed the way they view drought in years past and now recognize ongoing higher temperatures and longer drought conditions may be the "new normal" for California. A study conducted by scientists at Stanford University entitled "Anthropogenic Warming Has Increased Drought Risk in California" has linked climate change with "more frequent occurrences of high temperatures and low precipitation that will lead to increased severe drought conditions" (Stanford, 2015). In addition, over the past two decades, droughts have occurred more frequently than in the previous century, with 14 droughts occurring between 1896 and 1994, and six occurring between 1995 and 2014.

Weather-induced change in demands was accounted for in two ways. First, an adjustment was made for long term climate change based on the National Oceanic and Atmospheric Administration (NOAA) Technical Report, the National Environmental Satellite, Data, and Information Service (NESDIS) 142-5: Regional Climate Trends and Scenarios for U.S. National Climate Assessment. The report stated that increased atmospheric emissions have the potential to increase water use by as much as 4.3%.

As a result of these outlooks on future climate conditions and recent weather trends, the 2015 IRP demand forecast model includes outdoor water demand adjustments to account for climate change. IEUA performed a series of sensitivity analyses of urban outdoor demand and weather conditions. By 2040, IEUA estimates that one dry year would increase demand by 5.6%. Similarly, a one wet year would decrease outdoor demand by 5.6%. A longer period of dry weather (3-years) would increase demand by 8.9%. Separately IEUA estimates the long-term effect of warming on outdoor

## Table 2-4: Urban M&I Forecast

| Urban M&I Forecast | 2015 | 2020 | 2040 |
|---|---|---|---|
| High Forecast | 225,000 | 230,000 | 267,000 |
| Medium Demand Forecast | 225,000 | 220,100 | 238,600 |
| Low Demand Forecast | 225,000 | 212,000 | 217,400 |

## Figure 2-2: Regional Urban Water Demand Forecast

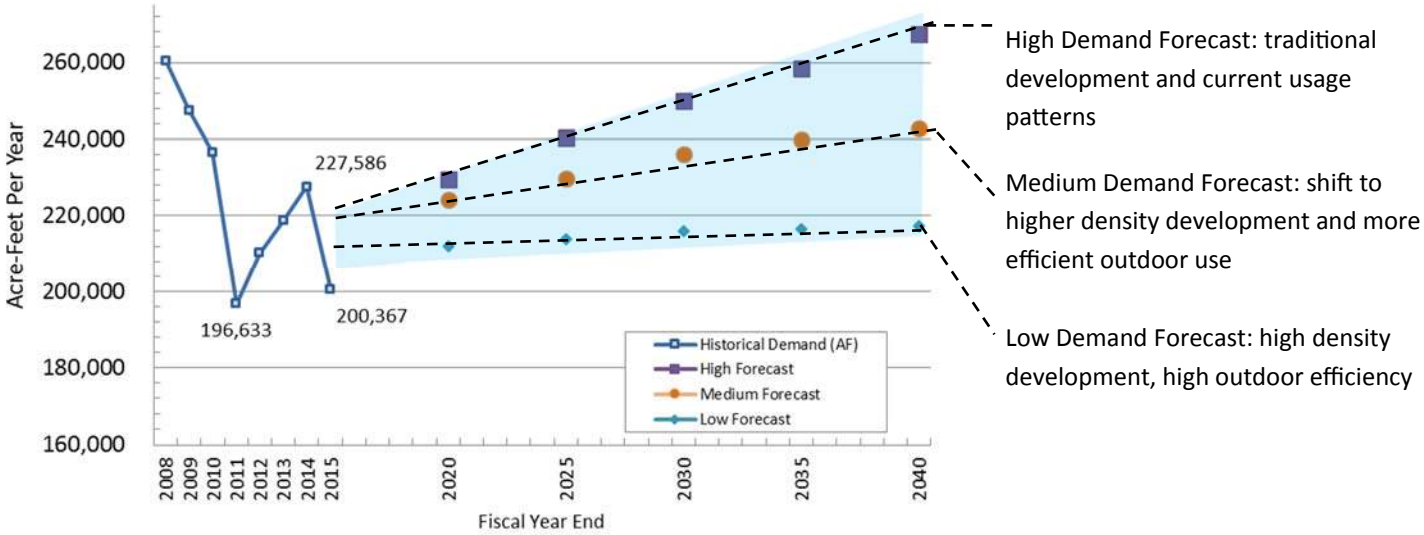


demand. It was found that for each degree temperature increase (in Celsius), outdoor demand would increase by 3%. Together these factors were applied to the climate scenarios to estimate how outdoor demand could change due to weather in the future.

Table 2-3 summarizes the climate and weather factors applied to urban outdoor demand used during WEAP modeling outlined in Section 4.

**Customer Response and Water Use Behavior**

Since 2012, Southern California has been challenged by drought conditions. This led to calls for voluntary and mandatory water use reductions from Governor Brown, numerous news articles about water supply conditions, and massive public outreach campaigns from water agencies across the State. Increased public awareness of water supply conditions resulted in measurable water savings across the State.

Regionally, these behavioral changes reduced urban M&I demands by 4.6% in FY14/15. Lifestyle changes in combination with the anticipated permanent state water restrictions are expected to keep demands suppressed.

For the purpose of the IRP demand forecast model, it is assumed that changes in water use behavior will continue into the future and will maintain a reduced demand by 4.6% through the year 2040.

**Economic Cycle**

The economy is also susceptible to change and it is likely to continue to change between strong and weak market conditions. During weak market conditions, urban M&I demands decrease by 7%; conversely, during strong market conditions, demands increase by 7%.

Although this is a significant impact, for the purpose of the 2015 IRP M&I demand forecast model it is assumed that the market conditions remain normal and so no adjustment was incorporated.

## URBAN M&I DEMAND FORECAST

The IRP developed a range of demand possibilities to accommodate for future uncertainty caused by the various demand factors. To determine a range of urban demand possibilities, three water demand forecasts were created:

- *High Demand Forecast* – utilized housing densities from each city's General Plan and assumed that new development would use water consistent with current usage patterns—no change for outdoor, 55 GPCD indoor.
- *Medium Demand Forecast* — utilized 2012 SCAG RTP average housing density for occupied housing units and applied indoor and outdoor landscape efficiency standards established by Assembly Bill 1881 (also known as the Model Water Efficient Landscape Ordinance) for existing and future development. For the medium demand forecast, existing outdoor use is limited to 70% of evapotranspiration (ETo). Future outdoor use is limited to 60% ETo, and indoor water use is reduced from 55 GPCD in 2015 to 35 GPCD by 2040 for new development.
- *Low Demand Forecast* – utilized 2012 SCAG RTP high housing density and applied indoor and outdoor landscape efficiency standards established by AB 1881. For the low demand forecast, existing outdoor use is limited to 70% of ETo. Future outdoor use is limited to 60% ETo, and indoor water use is reduced from 55 GPCD in 2015 to 35 GPCD by 2040 for new development.

The range of urban water demand possibilities for the region through 2040 are shown in Table 2-4. When compared to historical demands, the region has experienced over 25,000 acre-feet (AF), or 12% reduction since FY2013/14 as shown in Figure 2-2. This is due in part to delayed growth as a result of the economic recession, but primarily from customer response from continued drought conditions and the State mandated water use restrictions. If demand continues to trend at FY2014/15 levels, the 2015 IRP demand model (which was created in 2014) will need to be updated to account for this regional shift in water use behavior. Additional technical data is provided in Appendix 1 which includes technical memorandums that detail the process used to develop the econometric water demand model.

To prepare the region for future uncertainty and to ensure sufficient water resources and adequate infrastructure capacity, the high urban water demand forecast was selected by the IRP Technical Work Group. This planning assumption was recognized to be a conservative forecast as recent residential developments within the region are currently more efficient (given that they use less water for indoors and outdoor landscaped areas) than presumed in the model.

The benefits of using this conservative forecast for the baseline demand are that it:

- Provides a sizeable water supply buffer which protects the region from future uncertainties.
- Allows conservation to be counted as a future water supply in the demand model.

### Table 2-5: Additional Continuing Operational Water Needs Forecast

| Additional Water Needs Forecast | 2015 | 2020 | 2040 |
|---|---|---|---|
| SAR Discharge Joint Obligation (Chino Basin share) | 17,000 | 17,000 | 17,000 |
| Management Zone 1 Supplemental Recharge | 6,500 | 6,500 | 0 |
| Chino Desalter Replenishment | 1,145 | 2,290 | 11,035 |
| **Total Additional Demand** | **24,645** | **25,790** | **28,035** |

## Figure 2-3: Total Regional Demand Forecast

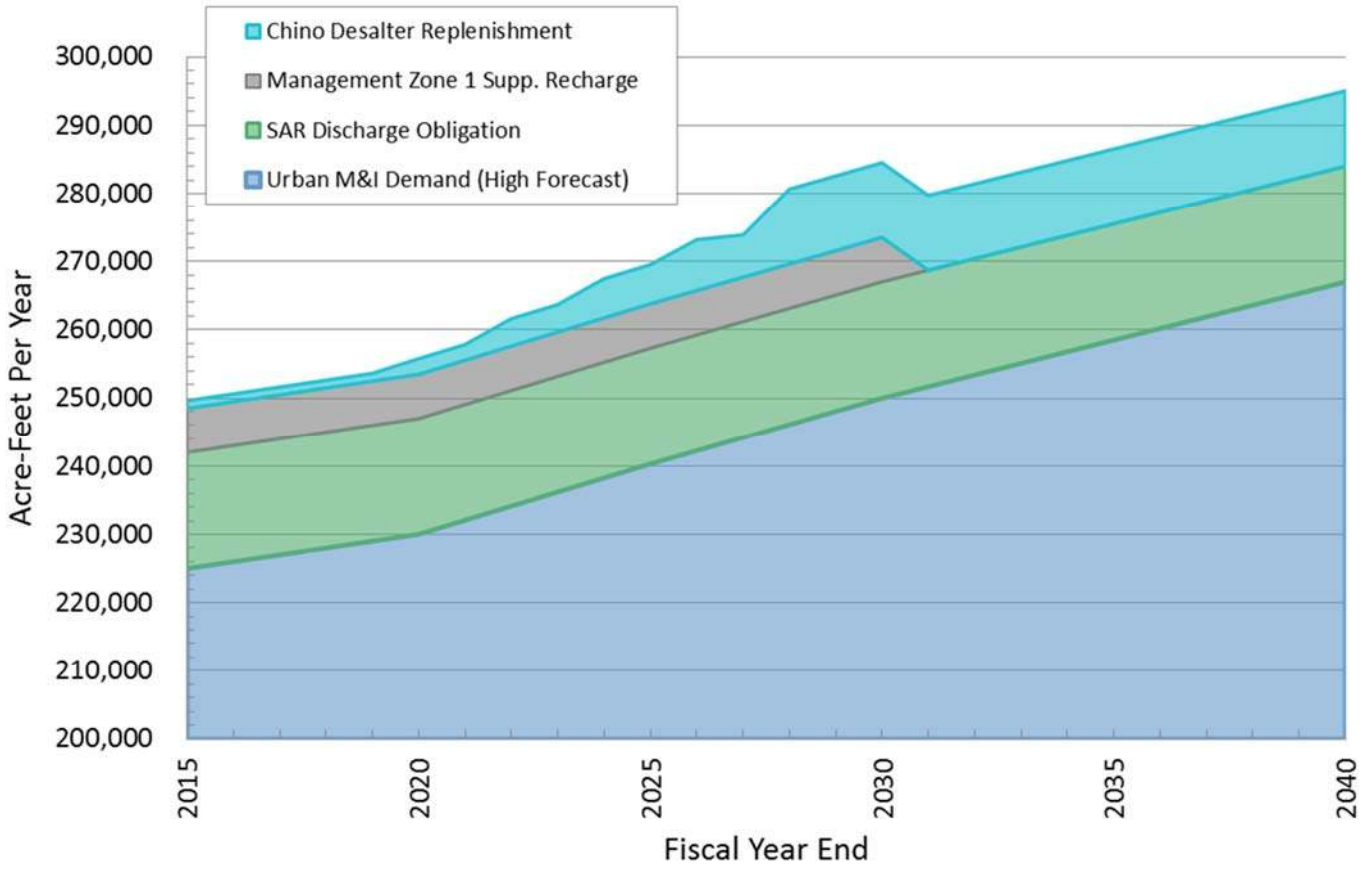


## Table 2-6: Total Regional Demand Forecast

| Total Regional Demand Forecast | 2015 | 2020 | 2040 |
|---|---|---|---|
| Urban M&I Demand (High Forecast) | 225,000 | 230,000 | 267,000 |
| Additional Continuing Operational Water Needs | 24,645 | 25,790 | 28,035 |
| **Total Regional Demand** | **249,645** | **255,790** | **295,035** |

### ADDITIONAL CONTINUING OPERATIONAL WATER NEEDS FORECAST

Current and future water demands include regional environmental and/or contractual stream flow obligations. These continuing operational water needs are not subject to the same variables as the urban M&I demands and instead are tied to standing contractual agreements and legal requirements. The water demand and supply models incorporate the following assumptions into the IRP forecasts:

- **Santa Ana River (SAR) Discharge Obligation** Santa Ana River (SAR) Discharge Obligation is a regional obligation that requires annual water discharges to the Santa Ana River above Prado dam. For the purposes of the IRP, 17,000 AFY is used as the Agency's requirement to fulfill the obligation through 2040. This is half of the 34,000 AFY minimum obligation shared with Western Municipal Water District. The region currently meets this

obligation by discharging treated wastewater to the Cucamonga and Chino Creeks.

- **Management Zone 1 Supplemental Recharge** pursuant to the Peace II Agreement, Section 8.4. For the purposes of the IRP 6,500 acre-foot per year will be used to fulfill the supplemental groundwater recharge obligation within Management Zone 1. The obligation is met by Chino Basin Watermaster through recycled water recharge and/or imported water recharge.
- **Chino Desalter Replenishment** pursuant to the Peace II Agreement, Section 6.2. For the purposes of the IRP, Exhibit C dated August 16, 2015 of the safe yield reset implementation plan will be used for the groundwater replenishment obligation.

## TOTAL REGIONAL DEMAND FORECAST

Regional water demands for the 2015 IRP Phase 1 are the sum of the high urban M&I demand forecast and the total additional continuing operational water needs forecast. Total water needs for the 2015 IRP are shown in Table 2-6. By 2040 it is projected that 45,400 AFY of additional supply will be needed to accommodate regional growth and other environmental and/or legally obligated stream flows.

**Low water use plants, including succulents, on display at a local garden center**

# 3. Resources Inventory

**Water Resource Setting**

**Potential Water Resource Projects**

**Chino Basin Groundwater**

**Stormwater**

**Recycled Water**

**Chino Basin Desalter**

**Local Surface Water**

**Non-Chino Groundwater**

**Imported Water**

**Conservation**

A bio-swale slowly infiltrates stormwater runoff after a winter rain event in the City of Chino.

# Resources Inventory

## WATER RESOURCE SETTING

The region relies on imported and recycled water supplies provided by IEUA in addition to groundwater from both the Chino and non-Chino basins and local surface water from various creeks flowing through the service area which originate in the San Gabriel Mountains. As a response to the series of droughts that have impacted Southern California over the past 100 years, including the current drought that has lasted since 2012, the region has developed a sophisticated network of water supply facilities.

Climate change is one of the key factors that will have a substantial impact on water supplies. While recent droughts in California have been significant, climate change trends indicate a future of unprecedented "megadroughts" that have the potential to last multiple decades (Science Advances, 2015). To analyze the impact of potential climate change, RAND Corporation (a nonprofit research organization) evaluated IEUA's supply and demand balance under 106 climate scenarios that were selected from the IPCC Assessment Reports 3 & 5. Climate simulations were downscaled for the region and indicated that temperatures in the region would increase between 0.5-3.5°F. Indications for changes in precipitation varied greatly and had no clear trend.

Baseline water resource supplies were stress-tested across the 106 climate simulations to determine supply availability from 2015 to 2040 in order to establish annual expected resources. The simulations included water demand and supply inputs and calculated how demands, supplies, runoff, flows, and storage would function under each climate scenario. The individual sections of this section provide the results which illustrate the impact of climate change on future water supply. For a complete technical description of the climate simulation work by RAND, see Appendix 2.

This Resources Inventory section provides an overview of the water supplies that the region relies upon:

- Chino Basin Groundwater
- Stormwater
- Recycled Water
- Chino Basin Desalter
- Local Surface Water
- Non-Chino Basin Groundwater
- Imported Water
- Water Use Efficiency

Each supply section includes an overview of current supply use, management, and prioritization; baseline assumptions through 2040; supply challenges that may impact the future availability; additional potential water resource projects by supply type; and water management implications for the region.

## POTENTIAL WATER RESOURCE PROJECTS

Future water resource projects were identified through the IRP Technical Work Group discussions. These projects are listed by category of supply. Many of these proposed projects were culled from existing planning documents, such as the Recharge Master Plan Update (RMPU) and the Recycled Water Program Strategy. The list includes conceptual projects as well as those that have been under development but have not yet been included in adopted regional Ten Year Capitol Improvement Plans (TYCIP). For the full project list compiled by the IRP Technical Work Group, see Appendix 2.

The proposed projects include capacity building and reliability investments, as well new sources of supply. Due to technical constraints, the Phase I RAND climate simulations focused on the water supply benefits of these projects and to what extent they meet water demands. This information was used to identify opportunities and build portfolio scenarios where new supplies were added to the baseline annual supplies to assess water supply resilience in 2040. These scenarios are described in Section 4.

California Buckwheat growing near San Antonio Dam

## CHINO BASIN GROUNDWATER

**Resource Overview**

The Chino Basin is one of the largest groundwater basins in Southern California containing approximately 5,000,000 AF of water with an unused storage capacity of approximately 1,000,000 AF (source: CBWM website). Groundwater from the Chino Basin accounts for approximately 40% of regional water supplies.

San Bernardino County Superior Court created the Chino Basin Watermaster (CBWM) in 1978 as a solution to lawsuits over water rights. CBWM is responsible for management of the Chino Basin in accordance with the 1989 Judgement, 2000 Peace Agreement, 2007 Peace II Agreement, and the Chino Basin Optimum Basin Management Program (OBMP).

Water rights in the Chino Basin are held by representatives to three stakeholder groups, called Pools. The three Pools are:

- **Overlying Agricultural Pool**: representing dairymen, farmers, and the State of California
- **Overlying Non-Agricultural Pool**: representing area industries
- **Appropriative Pool**: representing local cities, public water districts, and private water companies

Although groundwater is an important local supply, the water quality in the lower Chino Basin area has been impacted by historical agricultural uses and now has high levels of nitrate and total dissolved solids (TDS). There are also some areas that exceed standards for perchlorate and volatile organic chemicals (VOCs). This lower quality water requires additional treatment, and/or blending with higher quality imported water. The Chino Basin Watermaster works in partnership with municipalities, IEUA, and the Santa Ana Regional Water Quality Control Board to address these water quality problems, including construction and operation of the Chino Basin Desalters.

The Chino Basin is subdivided into five groundwater zones, referred to as management zones. Each management zone has unique groundwater management issues. Management zones 1, 2, and 3 comprise the Chino North Management Zone. Management Zones 4 and 5 are outside of the IEUA service area. Throughout these management zones, there are 19 active spreading basins that are operated to capture stormwater, recycled water, and/or imported water for recharge into the Chino Basin.

**Baseline Supply**

The court judgment allocates groundwater rights by establishing an annual pumping "safe yield" for each Pool. The Operating Safe Yield (OSY) is the annual amount of groundwater that can be pumped from the basin by the Pool parties free of replenishment obligations. For planning purposes, controlled overdraft for the Appropriative Pool was not included in the IRP. Annual groundwater production in excess of the OSY is allowed by the adjudication, provided that the pumped water is replaced and recharged back into the groundwater basin.

The baseline amount for groundwater production between 2015 and 2020 is assumed to be 90,550 AFY, based on historical production of the appropriative pool parties within the IEUA service area. This amount of groundwater pumping includes recharge from natural rainfall, stormwater capture, and recharge. It does not include recharge from recycled water.

Baseline groundwater production between 2020 and 2040 is assumed to be 91,300 AFY, which is the Agencies' share of the forecasted OSY for this period and increased stormwater (SW) recharge from the Chino Basin Facilities Improvement Project. The Baseline does not include stormwater recharge from the proposed 2013 RMPU projects or recharged recycled water.

**Climate**

Chino Basin groundwater is dependent on rainfall and supplemental sources for recharge. Groundwater supply is impacted by climate change given that warmer temperatures and droughts increase the dryness of soil which results in less absorption when precipitation occurs and with predicted more intense periods of rainfall, water runoff will increase instead of percolating into the soil. Simulations by Wildermuth Environment Inc. showed that natural groundwater recharge (GWR) would decrease by 0.44% for each 1% decline in long-term precipitation. Groundwater supply is also impacted by development patterns (increased hardscaping) and

## Table 3-1: Chino Basin Groundwater Supplies & Projects

| Baseline Chino Groundwater | | | |
|---|---|---|---|
| **Project Name** | **Description** | | **AF** |
| Baseline Chino Basin Groundwater -2015 – 2020 | Baseline groundwater production through 2020 is assumed to be 90,550 AFY, based on historical groundwater production by the Agencies from 2009-2014. Includes replenishment from natural rainfall, SW capture, and recharge. | | 90,550 |
| Baseline Chino Basin Groundwater | Baseline groundwater production from 2020 through 2040 is assumed to be 91,300 AFY: Includes Agencies' share of OSY (71.9%) of 127,000 AFY. Does not include SW from the 2013 CBWM RMPU or recycled water recharge as these are accounted for separately and in addition to the baseline Chino groundwater. | | 91,300 |

| Chino Basin Groundwater Projects | | | |
|---|---|---|---|
| **Project Name** | **Description** | **ID** | **AF** |
| Groundwater Treatment (Rehab)-Increment 1, 2 | This project category will rehabilitate existing groundwater production wells decommissioned due to water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over OSY). Increased well operation could supplement annual demands or help offset losses in another water supply. Increment 1 will provide up to 5,000 AFY of production. Increment 1 & 2 will provide up to 10,000 AF. | 1 | 5,000 |
| | | 2 | 5,000 |
| Groundwater Treatment (new)-Increment 1, 2 | This project category will construct a new groundwater production well and treatment facility to address water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over OSY). Increased well operation could supplement annual demands or help offset losses in another water supply. Each increment will provide 5,000 AF. If all increments are selected, there is a potential of up to 10,000 AFY of production. | 3 | 5,000 |
| | | 4 | 5,000 |
| Production Wells-Increment 1, 2, 3, 4 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over OSY). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Each increment will provide 5,000 AF. If all increments are selected, there is a potential of up to 20,000 AFY of production. | 5 | 5,000 |
| | | 6 | 5,000 |
| | | 7 | 5,000 |
| | | 8 | 5,000 |
| Desalter Recovery Improvement | The existing Chino Basin I Desalter (CD-1) recovers approximately 75 percent of water. Improvements could be done to increase recovery to approximately 90 percent. This water would be conveyed through the existing potable water system. | 18 | 1,500 |
| Six Basin Water Transfer | This project would explore the idea of developing a water transfer agreement with Six Basins. One concept is to purchase imported water for recharge into Six Basins and get in return equal volume of groundwater underflow plus agreed amount of stormwater. For example, 10,000 AF of imported water could be purchased in exchange for 10,000 AF of groundwater plus 7,000 AF of stormwater. Assume benefit 1 in 5 years. | 38 | 17,000 |
| Cucamonga Basin Improvements | This project category will identify projects that would result in additional groundwater production benefits coming into the IEUA service area from the Cucamonga Basin. Includes recharge facilities, treatment and production facilities to maximize supply coming into the Chino Basin. | 62 | 2,500 |
| Prior Stored Chino Groundwater | This category will allow supply to be taken from groundwater stored in the Chino Basin, pre 2014. It is estimated that approximately 400,000 AF of stored groundwater is available, of which 280,000 AF is made available for Agencies. This supply category will be managed on a case by case basis as selected into the Regional supply portfolios. The supply will be limited, but can be used annually or intermittent as needed. | 87 | 8,400 |
| Watershed Wide Water Transfers | This category of projects will construct or arrange other water transfers external to the Chino Basin. For example, dry weather flow exchange of recycled water to Orange County Water District for an equivalent amount of purchased imported water. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but increases reliability and/or quality. To occur annually or intermittent. Resiliency and flexibility benefit only. | 98 | 5,000 |
| Chino Basin Water Transfers | This category of projects will construct or arrange other water transfers within the Chino Basin. Projects to also include inter-agency interties for increased reliability. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but increases reliability. To occur annually or intermittent. | 99 | 5,000 |
| Reliability Production Wells | This project category will construct new production wells needed to replace lost production or under-performing facilities. These projects will maintain current annual groundwater production deliveries and are intended to increase operational flexibility and reliability. Increment 1 varies in capacity and will be determined on a case by case basis as selected into each of the regional supply portfolios. | 100 | 5,000 |

more efficient irrigation practices.

A key conclusion drawn from the simulations is that it is important to secure supplemental water when available to recharge the Chino Basin (through direct or in lieu practices) to enable sustained or allow increased groundwater production during droughts and emergencies.

**Supply Challenges**

Supply challenges facing the Chino Groundwater Basin include the need to address:

- Sustainability or increased OSY for the Chino Basin.
- Loss of natural infiltration caused by higher density development, reduced outdoor landscaping, and irrigation efficiency measures.
- Targeting of groundwater recharge or limiting localized groundwater production in specific areas to help mitigate and/or prevent land subsidence.
- Recognition that different management practices may be required for groundwater recharge in each of the five management zones.
- Identification of additional supply sources for groundwater recharge to help meet Chino Basin recharge goals.
- Slowly rising levels total dissolved solids and nitrate levels in groundwater basin and corresponding potential future loss of available supply caused by this long term trend.
- Consideration of possible additional treatment infrastructure for groundwater.
- Containment of existing groundwater contamination plumes.

**Supply Opportunities**

The IRP process identified the potential projects listed in Table 3-1. Potential projects range from conceptual to well-developed proposals. Each project has the ability to increase the amount of supply available for groundwater recharge and/or increased groundwater production.

**Implications**

Groundwater stored in the Chino basin increases regional water supply reliability and resilience with minimal impacts from climate. It is important that the region account for diminished natural recharge resulting from climate and/or development impacts and take action to minimize these losses and to secure replacement sources. Otherwise future groundwater production will exceed sustainable levels. In addition, water quality is a key future constraint on groundwater production. The region will need to evaluate water quality improvement actions including the identification of potential blending water sources for recharge to attain long term salinity management and reliability goals.

Key implications for the Chino Basin groundwater supplies:

- Are not impacted by climate once water is stored in the groundwater basin.
- Are slightly impacted by receiving reduced natural recharge within the basin resulting from climate and/or development impacts.
- Can be sustained or increased through use of supplemental water for groundwater recharge (through in lieu or direct recharge) when these resources are available.
- Are a vital local emergency resource to help mitigate abnormal or catastrophic events through additional groundwater production.
- Are a climate flexible supply that can be tapped to offset either short- or long-term water supply needs.
- Provide a means for sustainable regional water management by enabling exchanges and transfers among agencies within the watershed.
- Are generated locally and are the region's least energy intensive water supply and have minimal greenhouse gas emissions relative to imported water.
- Are cost effective relative to imported water supplies.
- Are critical to improving the region's water self-reliance and reducing dependence on climate variable supplies such as imported water.

## STORMWATER

### Resource Overview

Stormwater is water that originates during rainfall and snow melt. In the region, stormwater comes primarily from surface water runoff from rain and snow starting in the San Gabriel Mountains and moving down through the Santa Ana watershed. In undeveloped areas, the soil absorbs some of the runoff and helps replenish the groundwater basin. However, developed areas with a significant amount of hardscape tend to concentrate and accumulate stormwater runoff in large quantities in a relatively short amount of time. Stormwater also runs off roofs, through streets, and into stormdrains, where these flows are largely diverted into the region's flood control channels.

The Chino Basin has 6 main flood control channels spread throughout the region. These channels collect and manage the stormwater generated within the watershed. Major flood control channels that convey stormwater within IEUA's service area include:

- San Sevaine Creek
- Day Creek
- Deer Creek
- Cucamonga and West Cucamonga Creek
- San Antonio Creek

Located on and adjacent to the channels are detention basins that are operated under a multiple-use agreement for both flood control and groundwater recharge operations. IEUA, Chino Basin Watermaster, and other agencies work closely with the San Bernardino Flood Control District to maximize the amount of stormwater that can be captured and recharged into the Chino groundwater basin. These channels also carry dry weather runoff from excessive outdoor irrigation.

Runoff that is not captured by these detention basins ultimately flows to the Santa Ana River. While there are efforts by agencies further downstream to capture these storm flows, large amounts of water can discharge to the ocean during large storm events.

### Baseline Supply

The baseline amount of water that is available for stormwater recharge from existing projects is already included in the groundwater supply, described under the Chino Basin Groundwater resource sub-section. To ensure there is no double-counting in the IRP simulations, this part of the supply is not counted in the stormwater baseline.

The stormwater supply projection through 2040 includes additional water captured as the result of the construction of projects listed in the 2013. As a result, the baseline stormwater supply assumed to be available between 2020 and 2040 is 6,400 AFY as in the 2013 RMPU.

### Climate

Stormwater supplies may also be impacted by temperature. Warmer temperatures cause soils to dry out through evaporation. This can lead to two competing effects. Because it is more difficult for water to penetrate dry soil, water runoff could increase. However, once the water is in the soil column, the ground retains this moisture until the soil is saturated which helps to replenish groundwater supplies. This outcome is also consistent with other larger basin studies performed by the Bureau of Reclamation and the Colorado River District. During dry conditions, IEUA has documented reductions in the expected amount of runoff from rain events into the groundwater recharge basins.

In absence of more detailed information on how future stormwater would vary with respect to precipitation, a regression formula was applied to develop baseline supplies as well as any additional supply that was selected as part of a water management strategy (see Section 4). Based on the results of the climate simulations, the 6,410 AFY baseline stormwater supply could vary from 2015 and 2020 between 900 AFY to 7,400 AFY.

### Supply Challenges

Supply challenges facing stormwater supplies include the need to address:

- Dependence of these supplies on annual rainfall and snow melt.

## Table 3-2: Stormwater Supplies & Projects

| Stormwater Baseline | | |
|---|---|---|
| **Project Name** | **Description** | **AF** |
| Baseline Stormwater 2015-2020 | 0 AF through 2020: Estimated completion of 2013 RMPU is 2020, therefore no new stormwater supply will be available until after 2020. | 0 |
| Baseline Stormwater 2021-2040 | 6,410 AFY for 2020 thru 2040: New stormwater supply generated from additional stormwater recharge from the recommended projects included in the 2013 CBWM RMPU. | 6,400 |

| Stormwater Projects | | | |
|---|---|---|---|
| **Project Name** | **Description** | **ID** | **AF** |
| Day Creek SW Capture | Modify existing basins along Day Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the "big gulp" concept of approximately 2,500 AF. Assume benefit 1 in 5 years. | 54 | 2,500 |
| San Sevaine Creek SW Capture | Modify existing basins along San Sevaine Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the "big gulp" concept of approximately 2,500 AF. Assume benefit 1 in 5 years. | 55 | 2500 |
| Regional LID-Increments 1, 2 | Construct or modify urban development to better manage and infiltrate rainfall at the source. Projects could include bioswales and or pervious concrete installation in parking lots, street drainages. Each increment could provide up to 5,000 AFY of recharge for a total of up to 10,000 AFY recharge. | 58<br>59 | 5000<br>5000 |

- Supply variability such as storm frequency, intensity, seasonality of rainfall events which are exacerbated by climate change.
- Reductions in natural infiltration into the groundwater basin caused by channelization, new development, hardscape, increased outdoor water efficiency, and open space conversion.
- Construction of additional stormwater recharge facilities in a highly urbanized area where available land may not be available or not available in the right places to capture and recharge significant volumes of water.
- Compliance with Municipal Separate Storm Sewer System (MS4) Permit low impact development (LID) stormwater retention/recharge requirements for new and existing development and quantification of corresponding water supply benefits.

**Supply Opportunities**

The IRP process utilized the list of potential stormwater projects shown in Table 3-2. Potential projects range from conceptual to well-developed proposals. Each project has the ability to increase the amount of supply available from stormwater by improving diversions to existing basins, constructing new basins and pumping facilities, and through on-site MS4 low impact development improvements.

**Implications**

Stormwater is an extremely valuable resource to the region because it is considered a "free" once the necessary facilities to capture and use this water have been constructed and maintained. It is also a high quality water source that can improves the quality of the groundwater supplies once it has infiltrated and become blended within the aquifer. Stormwater has and will likely continue to be an important element of the region's water resources as it can be stored and subsequently used. To capture large storm events additional infrastructure should be constructed. In addition, to help offset lost infiltration from increased urbanization and more efficient outdoor landscaping, increasing regional investment in MS4-compliant low impact development projects will be necessary.

Key implications for stormwater supplies:

- Are generated locally, are the least energy intensive water supply and have minimal greenhouse gas emissions relative to imported water.
- Are cost effective relative to imported water supplies.
- Are highly dependent on weather and impacted by climate.
- Will be significantly reduced during droughts when below average precipitation and drier conditions

exist.

- Require well-designed facilities that can operate under a wide range of flows.
- Are a high quality water supply and provide a supplemental source of water to blend with and improve groundwater quality.

## RECYCLED WATER

**Resource Overview**

IEUA owns and operates four water reclamation plants: Regional Plant No. 1 (RP-1), Regional Plant No. 2 (RP-2), Regional Plant No. 4 (RP-4), Regional Plant No. 5 (RP-5), and the Carbon Canyon Water Reclamation Facility (CCWRF). These facilities provide tertiary-treated wastewater, also known as recycled water. Recycled water supplies can be used for direct non-potable uses, groundwater recharge for the Chino Basin, and for other regional discharge obligations.

Recharge of recycled water is allowed by the Regional Water Quality Control Board (RWQCB) through the OBMP, and currently provides approximately 17% of the region's urban water supply. The region secured a number of permits allowing for the direct use and groundwater recharge of recycled water. These permits define requirements for the use of recycled water (both direct use and recharge), including, but not limited to, uses, water quality limits, and monitoring requirements.

The recycled water program makes up approximately 15% of the regional water portfolio and is operated based on the following order of priorities for recycled water supply:

- Regional discharge obligations (Santa Ana River Judgement, environmental, etc.)
- Agency direct use demands
- Regional groundwater recharge

Although recycled water is an important component of the groundwater recharge program, not all of the recharge basins are able to use recycled water. Currently, 10 of the region's 16 groundwater recharge basins are permitted to receive recycled water.

During FY2014-15, the 4 regional water reclamation plants produced approximately 62,000 AF of recycled water. Based on recent wastewater projections that were calculated as part of the Wastewater Facilities Master Plan (WFMP), treated flows are expected to increase to over 85,000 AFY by 2040 as shown in Table 3-4. It is important to note that these flow estimates were based on current existing indoor water usage levels in order to ensure that facilities and pipelines are adequately sized, and are consistent with the IRP's upper demand forecast (see Section 2). However, indoor water use efficiency is increasing and new plumbing code and appliance standards are being implemented. As a result, available wastewater flows by 2040 are expected to be lower than 80,000 AFY. These water flow trends are being carefully tracked by IEUA.

**Baseline Supply**

As part of the 2015 Recycled Water Program Strategy (RWPS), regional direct use demand forecasts were developed. Direct use for recycled water is defined in the RWPS as the amount of water needed for landscaping, agricultural, and industrial processes. The forecasts indicate that by 2025 direct use demands will increase by 5,000 AFY. The projects required to achieve the direct use demand forecast by 2025 are included in IEUA's FY2015-16 Ten Year Capital Improvement Plan (TYCIP).

The TYCIP includes recycled water projects that will allow the region to increase both direct use and groundwater recharge deliveries. These projects will provide 30,640 AFY of direct use (including approximately 1,700 AF agriculture use) and 18,700 AFY of groundwater recharge supply by 2025. Because the TYCIP includes recycled water projects with prior commitments from the region, the corresponding amount of recycled water supply from those projects is considered baseline recycled water supply for the IRP.

In summary, the baseline recycled water supply for direct use demands is assumed to be:

- Near Term (2015 to 2020) = 25,000 AFY by 2020
- Mid Term (2020 to 2030) = 28,960 AFY by 2025
- Long Term (2030 to 2040) = 28,960 AFY by 2025

Recycled water deliveries for groundwater recharge were also updated as part of the 2015 RWPS. Similar to

## Table 3-3: Wastewater Projection

| | 2015 | 2020 | 2030 | 2040 |
|---|---|---|---|---|
| **Regional Recycled Water Supply** | 63,900 AF | 66,300 AF | 77,500 AF | 85,500 AF |

direct use deliveries, projects required to contribute 18,700 AFY to the groundwater recharge program by 2025 are included in the TYCIP.

Therefore, baseline recycled water supply for groundwater recharge is assumed to be:

- Near Term (2015 to 2020) = 16,900 AFY by 2020
- Mid Term (2020 to 2030) = 18,700 AFY by 2025
- Long Term (2030 to 2040) = 18,700 AFY by 2025

Table 3-4 summarizes the baseline assumptions compared to the total available recycled water supply produced by the four water reclamation plants. Beyond 2025, there is a significant amount of recycled water supply that can be delivered for beneficial reuse. Additional projects will need to be constructed to increase the baseline amount of recycled water beneficially used to help meet the urban water demand for the region. Additional projects for increasing recycled water reuse are outlined below.

**Climate**

Under the climate simulations, wastewater flows were not impacted by climate. As a result, recycled water is the most climate resilient water supply available to the region.

**Supply Challenges**

Supply challenges facing recycled water supplies include the need to address:

- Projected available wastewater supply is not adequate to fulfill future demands for recycled water.
- Changes in the future amount of available wastewater as well as increases in wastewater strength (total dissolved solids and nitrate levels) and changes in treatment resulting from trend towards more efficient indoor water use.
- The efficient use of recycled water for outdoor irrigation (both urban and agriculture) and whether this use should be consistent with existing state efficiency standards.
- Increased energy needs for treatment and delivery of recycled water.
- Increasing regulatory and environmental issues for construction and operation of recycled water systems, in particular surface recharge of recycled water.

**Supply Opportunities**

The IRP process identified the following list of potential projects. Potential projects range from conceptual to well-developed proposals. Each project has the ability to increase the amount of supply available for recycled water direct use and groundwater recharge.

**Implications**

Due to its reliability and climate resilience, recycled water is one of the most valuable water supplies for the

## Table 3-4: Recycled Water Supply & Baseline Demands

| | 2015 | 2020 | 2025 | 2030 | 2040 |
|---|---|---|---|---|---|
| **Recycled Water Supply(1)** | 60,200 | 64,300 | 69,700 | 75,100 | 82,900 |
| **SAR Discharge Obligation(2)** | 17,000 | 17,000 | 17,000 | 17,000 | 17,000 |
| **Direct Use Demands(3,4)** | 24,700 | 28,800 | 30,700 | 30,700 | 30,700 |
| **Groundwater Recharge (3)** | 14,500 | 16,900 | 18,700 | 18,700 | 18,700 |
| **Remaining Recycled Water Supply** | ***4,000*** | ***1,600*** | ***3,300*** | ***8,700*** | ***16,500*** |

Notes:
(1) Regional supply per Wastewater Facilities Master Plan, includes 3% loss due to treatment waste streams.
(2) Minimum discharge required by SAR Obligation is 16,850 AFY. For planning purposes, assume 17,000 AFY
(3) Per 2015 Recycled Water Program Strategy and Agency FY2015/16 TYCIP.
(4) Includes agricultural demands.

## Table 3-5: Recycled Water Supplies & Projects

| Recycled Water Baseline | | |
|---|---|---|
| **Project Name** | **Description** | **AF** |
| Baseline Recycled Water for Groundwater Recharge 2015-2020 | 14,500 AFY by 2015 based on 5-year historical average from 2009-2014 | 14,500 |
| Baseline Recycled Water Direct Use 2015-2020 | 16,100 AFY by 2015 based on 5-year historical average from 2009-2014 | 16,100 |
| Baseline Recycled Water for Groundwater Recharge 2021-2025 | 2,400 AFY of additional Recycled water by 2020 for groundwater recharge per IEUA FY15-16 TYCIP | 2,400 |
| Baseline Recycled Water Direct Use 2021-2025 | 8,900 AFY of additional Recycled water direct use by 2020 per IEUA FY15-16 TYCIP | 8,900 |
| Baseline Recycled Water for Groundwater Recharge 2026-2040 | 1,800 AFY of additional Recycled water for groundwater recharge by 2025 per IEUA FY15-16 TYCIP | 1,800 |
| Baseline Recycled Water Direct Use 2026-2040 | 4,000 AFY of additional Recycled water for direct use by 2025 per IEUA FY15-16 TYCIP | 4,000 |

| Recycled Water Projects | | | |
|---|---|---|---|
| **Project Name** | **Description** | **ID** | **AF** |
| WRCRWA Recyled Water Intertie | The Western Riverside County Regional Wastewater Authority (WRCRWA) Plant intertie would allow for the delivery of recycled water from the WRCRWA Plant to be used in the IEUA southern service area. This would also allow additional recycled water to be delivered into the northern service area groundwater recharge basins by reducing the demand from the RP-1 930 pressure zone pump station. Intertie would occur within the 800/930 Pressure Zones. | 9 | 4,500 |
| Rialto Recycled Water Intertie | The Rialto intertie project would allow for delivery of recycled water from the Rialto Wastewater Treatment Plant (WWTP) to be used in the IEUA service area. The intertie could occur near the RP-3 groundwater recharge basins. This concept could involve the Inland Valley Pipeline, LLC to convey water between Rialto WWTP and IEUA's recycled water distribution system. Supply could be used for direct, groundwater recharge, or other reuse strategy. | 10 | 4,500 |
| Pomona Recycled Water Exchange/Transfer | The City of Pomona does not currently use all of the treated effluent from the Pomona Water Reclamation Plant. One concept would involve partnering to develop and expand their recycled water facilities in exchange for an agreed amount of their Chino Basin groundwater right. Could include other supply transfer agreement such as reclaimable waste and/or groundwater. | 11 | 2,500 |
| RP-1 Recycled Water Injection-Increment 1, 2, 3 | This project would construct an advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) facility at RP-1 to further treat tertiary effluent to allow the water to be injected directly into Chino Basin. The sizing of the facility and the volume to be produced will be determined as part of the portfolio development process. Increments 1-3 facility would be sized for 7,500 AFY. | 12<br>13<br>14 | 2,500<br>2,500<br>2,500 |
| Satellite Recycled Water Injection-Increment 1, 2, 3 | This project category would construct a satellite (outside of RP-1) wastewater treatment plant with advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) to allow the water to be injected directly into Chino Basin. The location, sizing, and volume to be produced will be determined as part of the portfolio development process. Increments 1-3 facility or facilities would have a capacity of 7,500 AFY. | 15<br>16<br>17 | 2,500<br>2,500<br>2,500 |
| Recycled Water Direct Use Expansion-Increment 1, 2, 3, 4 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond IEUA's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035, and potential recycled water interties. Each increment would increase direct use beyond baseline supply by 5,000 AFY. Increment 1-4 facilities would increase direct use beyond baseline supply by 20,000 AFY. | 19<br>20<br>21<br>22 | 5,000<br>5,000<br>5,000<br>5,000 |
| Existing Groundwater Recharge Basin Improvements beyond RMPU-Increment 1, 2, 3, 4 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1-4 facilities would increase recharge at existing basins within the Chino Basin by an additional 15,000 AF. | 23<br>24<br>25<br>26 | 2,500<br>2,500<br>5,000<br>5,000 |

## Table 3-6: Recycled Water Projects Continued

| Recycled Water Projects (*continued*) | | | |
|---|---|---|---|
| **Project Name** | **Description** | **ID** | **AF** |
| Construct New Groundwater Recharge Basins-Increment 1, 2, 3, 4 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water, and/or imported water for groundwater recharge. Increment 1-4 would provide up to an additional 9,800 AFY of recharge capacity, which is approximately 4 new basins at 350 AF per month for 7 months of operation. | 27<br>28<br>29<br>30 | 2,450<br>2,450<br>2,450<br>2,450 |
| Direct Potable Reuse-Increment 1, 2 | This project would construct an advanced water filtration and treatment (e.g. process treatment that combines micro or ultrafiltration) facility at a Regional Plant. The treatment process would allow the recycled water to be introduced into the potable water system. Increment 1+2 facility would have a capacity of 10,000 AFY. | 60<br>61 | 5,000<br>5,000 |
| RP-1 NRWS Treatment | The north Non-Reclaimable Wastewater System (NRWS) discharges approximately 3.5 MGD of brine to Los Angeles County annually. The project would construct a treatment facility to allow the Region to reuse this supply into the recycled water system. Requires plant expansion and partial reverse osmosis for blending. | 65 | 3,920 |
| Watershed Wide Water Transfers | This category of projects will construct or arrange other water transfers external to the Chino Basin. For example, dry weather flow exchange of recycled water to Orange County Water District for an equivalent amount of purchased imported water. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but will increase reliability and/or quality. To occur annually or intermittently. Resiliency and flexibility benefit only. | 98 | 5,000 AF |
| Chino Basin Water Transfers | This category of projects will construct or arrange other water transfers within the Chino Basin. Projects to also include inter-agency interties for increased reliability. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but will increase reliability. To occur annually or intermittently. | 99 | 5,000 AF |

region and is a high priority for additional investment. The region needs to account for the trend towards increased indoor water efficiency and evaluate opportunities to bring in supplemental wastewater flows through construction of collection systems in non-sewered areas and collaboration with neighboring jurisdictions to optimize regional infrastructure. Further, the region needs to improve efficiency of direct recycled water use to maximize its availability to all Agencies. This is particularly important for outdoor irrigation as improved efficiency can help make more recycled water available during the summer and fall when demands for recycled water are at their highest.

Implications for recycled water supplies:

- Are not impacted by climate making recycled water the region's most climate resilient water supply.
- Are needed to maximize supplemental water for groundwater recharge.
- Are generated locally and can be beneficially used by all Agencies.
- Are critical to improving the region's water self-reliance and reducing dependence on climate variable supplies such as imported water.
- Are being impacted by indoor water efficiency trends so the region must anticipate the amount of supply that is likely to be available in the future and the changes in treatment that may be required to maintain the water quality of these supplies.
- Are a supplemental water source for the entire region with infrastructure that can be intertied with that of neighboring agencies to optimize availability and use of recycled water.
- Generally require a higher level of energy than other water supplies for treatment and distribution, but are less energy intensive than imported water supplies and use of this water can contribute to statewide reductions in greenhouse gas emissions.

### CHINO BASIN DESALTER

**Resource Overview**

The Chino Basin Desalter Authority (CDA) was formed to manage the production, treatment, and distribution of highly-treated potable water to cities and water agencies throughout the southern Chino Basin. A Joint

Powers Agency, the CDA was formed by the Jurupa Community Services District; Santa Ana River Water Company; Western Municipal Water District; the Cities of Chino, Chino Hills, Norco, and Ontario; and the Inland Empire Utilities Agency to treat saline groundwater extracted from the southern portion of the Chino Basin. Saline water is water that has more salt (about 1000 ppm of total dissolved solids) than fresh water, but not as high as seawater (about 3000 ppm of total dissolved solids).

The CDA operates two desalters: Chino I Desalter which began operation in 2001 and Chino II Desalter which began operation in 2006. The treatment processes at the Chino I and Chino II Desalters include Reverse Osmosis (RO) and Ion-Exchange (IX) for removal of nitrate and total dissolved solids (TDS). The Chino I Desalter also includes air stripping for removal of volatile organic chemicals (VOC).

These facilities serve three purposes. First, they convert unusable groundwater into a reliable potable water supply for the region and are part of a long-term pollution cleanup strategy for the Chino Basin. Second, they provide hydraulic control over the lower Chino Basin, which prevents the migration of poor quality water into the Santa Ana River as well as downstream impacts on groundwater basins in Orange County. Third, they maintain and enhance groundwater yield for the Chino Basin.

The Desalters are a critical component of a long-term salinity management strategy that enables the region to use recycled water in the Chino Basin. The Peace Agreement, OBMP, and Maximum Benefit Plan approved by the Santa Ana Regional Water Quality Board and the State Water Resources Control Board require ongoing implementation of regional salt management and reduction actions as a condition of the regional recycled water use permits for outdoor irrigation as well as for groundwater recharge. CDA accounts for approximately 5% of the regional water supply portfolio.

**Baseline Supply**

Chino I Desalter and Chino II Desalter currently produce 25,000 AFY of treated groundwater. These facilities are being expanded and will have the capacity to treat 35,200 AFY by 2017. The amount of water received by member agencies within IEUA's service area is approximately 50% of the total production from these facilities. The remaining water is sent to agencies within the Western Municipal Water District service area.

Member agencies that receive water from the Desalter facilities within IEUA's service area are:

- City of Chino
- City of Chino Hills
- City of Ontario

Based on information from the CDA, the baseline Chino Desalter supply for the Agency's service area is assumed to be 17,300 AFY through 2040.

**Climate**

The effect of climate on water supply produced from the Chino Desalter facilities was not modeled as part of the IRP. Climate impacts were considered to be negligible as the quantity of water produced is dependent upon the capacity of the desalter facility and is not supply limited.

**Supply Challenges**

Supply challenges facing the Chino Desalters include the need to address:

The outstanding groundwater replenishment obligation to the Chino Basin of 152,900 AF through the duration of the Peace Agreement that must be fulfilled by the region.

Increased energy needs and costs for the expanded treatment of saline water and brine disposal

The location of Desalter production wells near existing contamination plumes in the groundwater basin, including potential costly impacts on Desalter treatment processes as well as opportunities to use the Desalters as part of a groundwater clean-up strategy.

**Supply Opportunities**

The IRP process identified of potential projects that are listed in Table 3-7. Each project has the ability to increase the amount of supply available, treated, or produced by the Desalter facilities.

**Implications**

The Chino Desalters provide a new source of potable water supplies for the region by treating currently unusable groundwater, as well as providing hydraulic control of the southern Chino Groundwater Basin. This infrastructure is critical to the continued use of recycled water in the region as well as improving groundwater quality and yield in the Chino Basin.

Key implications for the Chino Desalter water supplies:

- Are not impacted by climate.
- Are critical to improving the region's water self-reliance and reducing dependence on climate variable supplies such as imported water.
- Generally require a higher level of energy than other water supplies for treatment and distribution.
- Are an essential component of the regional commitment to remove salt and nitrates in the Chino Basin.
- Are critical to the continued use of recycled water in the region for groundwater recharge.
- Provide hydraulic control for the Chino Basin which prevents poor quality water from migrating into the Santa Ana River and downstream groundwater basins.
- Are managed under the Peace Agreement and the Optimum Basin Management Plan, which require fulfillment of a groundwater replenishment obligation of 152,900 AF.
- Are limited on the amount of water that can be produced based on the capacity and performance of the Desalter facilities.

## LOCAL SURFACE WATER

**Resource Overview**

Agencies located in the northern part of the region have long standing legal rights to divert and treat water from local creeks in the Santa Ana River watershed, including San Antonio Canyon, Cucamonga Canyon, Day Creek, Deer Creek, Lytle Creek, and other small surface creeks and tunnels. The amount of water from these local surface supplies is variable, depending on climate conditions, and currently accounts for approximately 5% of the regional water supply portfolio.

The quality of local surface water is typically quite high as the creeks are filled by rainfall and snowmelt from the San Gabriel Mountains. However, the surface water must receive treatment to comply with state and federal drinking water quality standards before it can be served for public use. Large storm events can cause sedimentation levels to rise to levels that impact the water treatment plants. During these times, water is bypassed downstream where it may be available for groundwater recharge.

**Baseline Supply**

The most recent local surface water production data received from Agencies was used to forecast the baseline water supply. The amount of local surface water supply was established using a 5-year average of production during the period of FY2009-10 through

### Table 3-7: Chino Basin Desalter Baseline & Projects

| Baseline Chino Desalter Projects | | |
|---|---|---|
| Project Name | Description | AF |
| Baseline Chino Desalter | Phase 2 Chino Basin Desalter production for IEUA service area | 15,000 AF |
| Baseline Chino Desalter | Phase 3 Chino Basin Desalter production for IEUA service area | 2,730 AF |

| Chino Desalter Projects | | | |
|---|---|---|---|
| Project Name | Description | ID | AF |
| Desalter Recovery Improvement | The existing Chino Basin I Desalter (CD-1) recovers approximately 75 percent of water. Improvements could be done to increase recovery to approximately 90 percent. This water would be conveyed through the existing potable water system. | 18 | 1,500 AF |

FY2013-14. This period of time includes 3 consecutive years of below average precipitation and 2 years of normal or above normal precipitation, providing a conservative projection. Baseline local surface water before considering climate modeling effects is therefore assumed to be 11,700 AFY through year 2040.

**Climate**
Local surface supplies are highly impacted by climate. Due to their dependence on precipitation and snow melt, the amount of water that can be obtained from local surface sources is highly variable from year to year.

Historical variability in local surface supplies is highly correlated with precipitation but also temperature. Annual surface water supplies are highly dependent on the weather and susceptible to changes in climate and were modeled under climate influences. Based on the results of the climate simulations, the projected baseline local surface water supplies available between 2015 and 2020 ranges from 2,000 to 12,600 AFY.

Local surface supplies may also be impacted by temperature. Higher temperatures cause more evaporation, reducing the amount of soil moisture. This means that the soil is more likely to absorb and hold water when rain occurs and this can reduce the amount of water flowing into creeks and streams.

Records indicate that local surface flows have declined and projections indicate that flows will decline in the near future from at least 2021 to 2040 (Seager 2012).

**Supply Challenges**
Supply challenges facing local surface water supplies include the need to address:

- High variability due to their dependence on rainfall and snow melt .

**Supply Opportunities**
The IRP process identified potential projects listed in Table 3-8. Each project has the ability to increase the amount of supply available from local surface water by either diversion and/or treatment improvements.

### Implications
Local surface water, when available, is an extremely valuable resource because it is considered relatively "free", with the cost to the Agencies being the operation of the necessary facilities to capture and use this water. Where possible, use of local surface water should be maximized.

Key implications for local surface water supplies:

- Are generated locally and are the region's least energy intensive water supply and have minimal greenhouse gas emissions relative to imported water .
- Are cost effective relative to imported water supplies.
- Are highly dependent on weather and driven by climate.
- Will be significantly reduced during droughts when below average precipitation and drier conditions exist.
- Are a high quality water supply and provide a supplemental source of water to blend with and improve groundwater quality.
- Are highly variable and require facilities to operate under a wide range of flows .

## NON-CHINO BASIN GROUNDWATER

**Resource Overview**
Member agencies pump groundwater from basins adjacent to the Chino Basin. These basins include Cucamonga, Rialto, Lytle Creek, Colton, and the Six Basins groundwater basins. The Six Basins are comprised of the Ganesha, Live Oak, Pomona, Lower Claremont Heights, Upper Claremont Heights and Canyon Basin. These basins currently provide approximately 10% of the regional water supply portfolio.

There are four agencies within the IEUA service area that include non-Chino groundwater as a water supply source. These agencies are the City of Upland, Cucamonga Valley Water District, Fontana Water Company, and San Antonio Water Company.

**Baseline Supply**
The most recent water production data was used to forecast the baseline water supply. The amount of non-

Chino Basin groundwater supply was based on a five-year production average from FY2009-10 to FY2013-14. Baseline non-Chino groundwater supply is assumed to be 22,000 AFY through 2040.

**Climate**
Climate effect on non-Chino Basin groundwater was not evaluated as part of the IRP. However, it is expected that climate will have a slight impact on these groundwater supplies based on the climate simulations performed on the Chino Basin. The non-Chino Basin groundwater baseline supply is assumed to remain constant at 22,100 through 2040.

**Supply Challenges**
These groundwater basins face similar supply challenges to those identified for the Chino Basin. Challenges include reduced natural infiltration, safe yield operating constraints, and water quality issues.

**Supply Opportunities**
The IRP process identified the following list of potential projects. Each project has the ability to increase the amount of supply available for groundwater recharge and/or increased groundwater production.

**Implications**
Groundwater basins outside of the Chino Basin face similar implementation hurdles as the Chino Basin.

Key implications for non-Chino Basin groundwater supplies:

- Are not impacted by climate once water is stored in the groundwater basin.
- Are slightly impacted by receiving reduced natural recharge within the basin resulting from climate and/or development impacts.
- Can be sustained or increased through use of supplemental water for groundwater recharge (through in lieu or direct recharge) when these resources are available.
- Are a vital local emergency resource to help mitigate abnormal or catastrophic events through additional groundwater production.
- Provide a means for sustainable regional water management by enabling exchanges and transfers among agencies within the watershed.
- Are generated locally and are the region's least energy intensive water supply and have minimal greenhouse gas emissions relative to imported water.
- Are cost effective relative to imported water supplies.
- Are critical to improving the region's water self-reliance and reducing dependence on climate variable supplies such as imported water.
- Reduce the water resource needs in the Chino Basin.

## IMPORTED WATER

**Overview**
IEUA was originally formed in 1950 as a municipal wholesale water district for the purpose of providing municipalities in the Chino Basin with supplemental

### Table 3-8: Local Surface Water Baseline & Projects

| Baseline Local Surface | | |
|---|---|---|
| Project Name | Description | AF |
| Baseline Local Surface | 11,700 AF based on 5-year historical average from 2009-2014. | 11,700 AF |

| Local Surface Projects | | | |
|---|---|---|---|
| Project Name | Description | ID | AF |
| Dry Weather Flow Diversions | Capture and treat urban dry weather flow from Chino, Cucamonga and San Sevaine Creek into the Regional Plants. For the purposes of the IRP, a volume of 3,500 AFY was assumed as total available dry weather flow. | 48 | 3,500 AF |
| Maximize Local Surface Water | This category of projects will construct facilities needed to capture additional local surface water. Projects to be defined by IEUA's Agencies. For example, increase surface flows off Lytle Creek in wet years. Assume benefit 3 in 5 years. | 88 | 1,000 AF |

imported water purchased from the Metropolitan Water District of Southern California (MWD).

MWD is a contractor to both the State Water Project (SWP), which imports water from northern California, and Colorado River Aqueduct (CRA) systems. The availability of imported water supplies is heavily dependent on hydrology and environmental regulations. This dependency can lead to high variability in the annual amount of water available to the Southern California region. For example, in the midst of the great drought, the California State Water Project was able to supply only 5 percent of its contract allocation in 2013-2014, which is a significant reduction from past allocations.

Due to salinity management concerns in the Chino Basin, the region can only use imported water from the State Water Project. Imported purchases from MWD in recent decades have averaged about 70,000 AFY, providing about 30% of the water supply for the service area.

Imported water purchased from the MWD is limited by a purchase order agreement. The agreement allows the region to purchase up to a total of 93,283 AF per year at its lowest (Tier I) rate. This limit is based on historical imported water purchases for municipal use by the member agencies and for regional groundwater recharge. The agreement includes an annual minimum purchase commitment of 39,835 AF. Note that this amount is slightly less than the 40,000 AFY minimum needed for the operation of the region's water treatment facilities.

There are four water treatment plants that treat imported water purchased from the MWD. These treatment facilities include:

- Water Facilities Authority's Agua de Lejos Treatment Plant (81 mgd capacity)
- Fontana Water Company's Sandhill Surface Water Treatment Plant (29 mgd capacity)
- CVWD's Lloyd W. Michael Water Treatment Plant (60 mgd capacity)
- CVWD's Royer-Nesbit Water Treatment Plant (11 mgd capacity)

Each agency is allocated an annual portion of MWD's available Tier 1 water supply (shown below). The allocations do not confer a contractual right to MWD imported water but are used to determine the price paid for the water. Purchases in excess of the Tier 1 allocation are assessed by MWD at a higher Tier 2 rate.

- Water Facilities Authority - 31,384 AFY
- Cucamonga Valley Water District - 28,368 AFY
- Fontana Water Company - 10,000 AFY
- Inland Empire Utilities Agency/Chino Basin Watermaster – 23,531 AFY

Imported water currently accounts for approximately 25% of the regional water supply portfolio. The amount available to IEUA and/or the Chino Basin Watermaster is used only for groundwater recharge.

**Baseline Supply**

The baseline supplies for imported water are based on IEUA Resolution 2014-12-1. Supplies were set as follows:

- Current imported purchases by Agencies are assumed to be 65,000 AFY (consistent with FY2014/15 purchases).
- Imported water purchases between 2020 and 2040 are assumed to be 69,752 AFY.
- Minimum imported purchases are assumed to be 40,000 AFY to meet retail agency water treatment operational requirements .

**Climate**

The State Water Project's infrastructure was designed to capture snowmelt from snowpack in the Sierra Nevada Mountains. When the snow melts during the warmer spring months, this combination of reservoirs and conveyance facilities provides a steady water supply throughout the year but especially during the summer and fall when water demands peak and precipitation is limited.

However, climate change is expected to continue to significantly impact the timing and characteristics of snowpack on which the SWP system depends. Predicting MWD's ability to supply specific amounts of imported water to IEUA were beyond the scope of climate simulation. Instead, the IRP considered a wide range of potential changes in imported supply availability,

## Table 3-9: Non-Chino Basin Groundwater Supplies & Projects

| Non Chino Basin Groundwater Baseline | | |
|---|---|---|
| **Project Name** | **Description** | **AF** |
| Baseline Non-Chino Groundwater | 22,100 AF Amount of water produced by an Agency from outside the Chino basin | 22,100 AF |

| Non Chino Basin Groundwater Projects | | | |
|---|---|---|---|
| **Project Name** | **Description** | **ID** | **AF** |
| Maximize Other Groundwater | This project category will identify Agency projects that would result in additional groundwater production benefits coming into the IEUA service area outside of the Chino Basin. Such projects may have the potential of an additional 5,000 AF. | 63 | 5,000 AF |

including assumptions in which SWP supplies decline by 2040. To explore a range of possible climate effects of MWD supplies, the analysis varied the amount of reduction of the Tier 1 water above the minimum purchase level. Two levels were selected—a 40% reduction and an 80% reduction. This corresponds to a range of reduction of 17% to 34% in total MWD Tier 1 supplies.

An interesting finding from the climate modeling was the identification of times, particularly in the next ten years, when imported MWD water may not be needed to meet regional demand. This water, if purchased, could be placed into the Chino Basin for storage and made available during future droughts, or catastrophic events (see Figure 3-11). The modeling also shows that beyond the first ten years there are periods when there is shortage in the MWD supply, and available water is lower than the baseline assumption.

**Supply Challenges**

Supply challenges facing imported water supplies from MWD and the SWP include the need to address:

- Catastrophic interruption—for example, an earthquake affecting the Delta or Tehachapis, or a break along the Delta levee, MWD feeder, or pump station.
- Maintenance interruptions—for example, Rialto line repairs.
- Operational constraints without improvements to the Bay Delta conveyance, such as the Delta Fix proposed by the Department of Water Resources.
- Colorado River over-allocation and the status of Lake Mead, including the potential impact on availability of MWD supplies which could constrain distribution of water from the State Water Project.
- Cost of MWD supplies that are expected to increase 4-5% annually during the next decade.
- Vulnerability to climate change conditions, such as warmer temperatures, reduced snowpack, and more frequent droughts that will reduce supplies available from CRA and SWP given that both infrastructure projects are designed to capture slow melting snowpack.

**Supply Opportunities**

Additional opportunities for increasing supplemental water supplies from imported sources, both through MWD and from other locations, were identified during the IRP process and are summarized in Table 3-10.

**Implications**

Climate conditions, conveyance reliability, and the need to improve SWP infrastructure all affect the future availability of imported water to the region. Due to its high quality, including having low TDS, SWP water should be purchased when it is available to enhance groundwater recharge and to leverage other water supply programs that benefit the region.

Key implications for imported water supplies:

- Are less reliable now than they have been in the past and may further decrease in reliability with climate change and continued uncertainty about infrastructure improvements.
- Are not fully reliable, and it will be important to develop alternative supplies so that the region has the flexibility to withstand reduced SWP supply caused by extended years of limited/reduced snowpack.
- Are not fully reliable, and so additional investments may need to be made to meet water quality restrictions if low-salinity imported water is not available, such as considerations to include CRA supply.
- Should be leveraged, when available in the near-term, by the region for storage, groundwater recharge, exchanges, transfers, or in-lieu.
- Will be more expensive. The cost of supplies is expected to increase 4-5% annually during the next decade .

## CONSERVATION

**Overview**

Unlike traditional water supplies, efficient use of water reduces demand in ways that are quantified indirectly. Demand is reduced through changes in consumer behavior and savings from water-efficient fixtures like toilets and showerheads. These water savings come from both "active" and passive "code-based" conservation efforts. "Active" efforts are Agency funded programs such as rebates, installations, and education. "Code-based" conservation consists of demand reductions attributable to more water-efficient plumbing codes and appliance standards and from customer response to higher water costs and rates that encourage water efficiency.

Over the past 24 years, since signing the 1991 California Urban Water Conservation Council's (CUWCC) memorandum of understanding (MOU) regarding Urban Water Conservation, the region has been committed to developing and implementing conservation programs that serve as a key component in the overall water resource management portfolio for the region. Such active conservation programs have traditionally included rebates for water saving devices such as ultra-low-flow toilets and high efficiency clothes washers, which are primarily administered through MWD's "Save Water-Save A Buck" program for commercial, residential, and multi-family properties. Other programs include educational programs such as the award-winning

### Figure 3-11: Potential Climate Change Impact on SWP Supplies

## Table 3-10: Imported Water Baseline & Projects

| Baseline Imported Water | | |
|---|---|---|
| **Project Name** | **Description** | **AF** |
| Baseline Imported Water | Agencies can purchase up to 69,750 AFY per the Member Agency Tier 1 purchase limit per Resolution 2014-12-1 | 69,750 AF |

| Imported Water Projects | | | |
|---|---|---|---|
| **Project Name** | **Description** | **ID** | **AF** |
| Existing Groundwater Recharge Basin Improvements beyond RMPU-Increment 1 ,2, 3, 4 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1 and 2 would increase recharge at existing basins within the Chino Basin by 2,500 AFY each. Increments 3 and 4 are 5,000 AF each. If all increments are selected there is a potential of up to 15,000 AFY of production. | 23 | 2,500 AF |
| | | 24 | 2,500 AF |
| | | 25 | 5,000 AF |
| | | 26 | 5,000 AF |
| Construct New Groundwater Recharge Basins-Increment 1, 2, 3, 4 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Each increment would provide up to an additional 2,450 AFY of recharge capacity, which is approximately one new basin at 350 AF per month for 7 months of operation. If all increments are selected, there is a potential production of 9,800 AFY. | 27 | 2,450 AF |
| | | 28 | 2,450 AF |
| | | 29 | 2,450 AF |
| | | 30 | 2,450 AF |
| ASR wells MZ1 and MZ2 | Construct aquifer storage and recovery (ASR) wells to increase imported water groundwater recharge within management zone 1 and 2. Reference projects were taken from the 2010 RMPU, Sections 6.7.2.1 and 3 for CVWD and the City of Ontario. | 31 | 11,500 AF |
| ASR wells MZ3 | Construct ASR wells to increase imported water groundwater recharge within management zone 3. Reference projects were taken from the 2010 RMPU, Sections 6.7.2.2 for JCSD. | 32 | 3,500 AF |
| Maximize ASR wells | Construct other ASR wells to increase imported water recharge by 3,500 AFY within the Chino Basin during wet and dry years. Assume benefit 40% of the time (2 in 5 years). Storage to be dependent on supplemental water availability in wet years. | 33 | 3,500 AF |
| Cadiz IW Transfer | The Cadiz project would allow for the import of unused groundwater from the remote Fenner Valley near Cadiz, California. For the purposes of the IRP, a 5,000 AFY increment of water is assumed. The Cadiz supply would be transferred and taken as SWP water into the Chino Basin. | 34 | 5,000 AF |
| Secure SWP IW transfer outside MWD | Imported water supply is solely from MWD via the SWP and is limited by the Agency's purchase order. Other permanent, temporary or seasonally available imported water supplies could be purchased and wheeled into the Chino Basin. The volume of water available varies depending on the source of water and timing. Supplies could be purchased from various Irrigation Districts or secured via Ag Transfer. Assume benefit 1 in 10 years. | 35 | 5,000 AF |
| SBVMWD IW Transfer | As a SWP contractor, San Bernardino Valley MWD (SBVMWD) has a Table A allocation. This option would involve constructing an intertie between SBVMWD's imported water system. The supply would be temporary or seasonally available and could be purchased and wheeled into the Chino Basin. Assume benefit 1 in 5 years. | 36 | 5,000 AF |
| Ocean Desalination Exchange | This project category would involve a partnership with another water agency pursuing ocean water desalination; through in-lieu exchange, the Chino basin would obtain an agreed amount of imported water. For the purposes of the IRP, a volume of 5,000 AFY was chosen. Opportunity to invest in upcoming ocean desalination plants includes Huntington Beach, Carlsbad and West Basin. | 37 | 5,000 AF |
| Water Banking Facility | This project category would invest into the Semitropic Groundwater Storage Bank in Kern County or similar program. The Chino Basin could bank additional purchases of wet year water when these supplies are available and Chino Basin facilities are capacity limited. | 56 | 5,000 AF |

## Table 3-10: Imported Water Baseline & Projects *(continued)*

| Imported Water Projects (*continued*) | | | |
|---|---|---|---|
| **Project Name** | **Description** | **ID** | **AF** |
| Max Tier 1 MWD Imported Water-Increment 1, 2, 3 | Maximize imported water from MWD at Tier 1 rate. Total available supply at Tier 1 rate is 93,283 AFY or cumulative purchase order maximum of 932,830 AF through December 31, 2024. Supply can be taken directly, in-lieu or for supplemental recharge. Each increment would allow for the purchase of an additional 7,850 AFY. If all increments are selected up to 23,550 AFY could be purchased purchased annually or intermittently. | 89 | 7,850 AF |
| | | 90 | 7,850 AF |
| | | 91 | 7,850 AF |
| Max Tier 2 MWD Imported Water-Increment 1, 2, 3 | Maximize imported water from MWD at Tier 2 rate. Could be taken annually or intermittent, availability pending MWD supply. Supply can be taken directly, in-lieu or for supplemental recharge. Each increment would allow for the purchase of an additional 5,000 AFY . If all increments are selected up to 15,000 AFY could be purchased annually or intermitently. | 92 | 5,000 AF |
| | | 93 | 5,000 AF |
| | | 94 | 5,000 AF |
| MWD Replenishment or discount wet year water-Increment 1, 2, 3 | Maximize replenishment or discount wet year imported water from MWD. Availability pending MWD supply and pricing. Supply can be taken in-lieu or for supplemental recharge. Each increment would allow for the purchase of an additional 10,000 AFY. If all increments are selected up to 30,000 AFY could be purchased annually or intermittently. Assumes benefits after 2 consecutive wet years (approx. 1 in 15 years) | 95 | 10,000 AF |
| | | 96 | 10,000 AF |
| | | 97 | 10,000 AF |
| Watershed Wide Water Transfers | This category of projects will construct or arrange other water transfers external to the Chino Basin. For example, dry weather flow exchange of recycled water to Orange County Water District for an equivalent amount of purchased imported water. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but increases reliability and/or quality. To occur annually or intermittent. Resiliency and flexibility benefit only | 98 | 5,000 AF |
| Chino Basin Water Transfers | This category of projects will construct or arrange other water transfers within the Chino Basin. Projects to also include inter-agency interties for increased reliability. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but increases reliability. To occur annually or intermittent. | 99 | 5,000 AF |

Garden in Every School Program, National Theatre for Children, monthly water conservation tips, landscape audits, and turf-grass removal programs.

Water conservation, also called water use efficiency strategies, have changed dramatically over the past few years as a result of state and local policies that require increased conservation and improved efficiency, technological improvements that increase water savings potential, and advancements in methods of communication that provide new opportunities to engage and educate the public. To address the shift, regional efforts include securing funding for technology-based software and supporting the development of sustainable water rate structures. Both technology-based software and sustainable rate structures establish an efficiency standard for each individual customer based on their existing indoor and outdoor water use profile. These programs also have the added benefit of targeting outdoor water use, which accounts for approximately 60% of urban M&I demands.

**Baseline Supply**

Conservation baseline supplies are water savings from existing conservation programs' active and passive savings. Baseline conservation savings are embedded in the demands forecast, based on current annual savings (see Table 3-11). These programs are expected to continue through 2040.

**Climate**

Climate does not appear to impact water supply savings from conservation.

**Supply Challenges**

Supply challenges facing conservation programs include the need to address:

- Existing development will need incentives such as conservation rebates to meet state regulations.
- Existing development will also need targeted messaging based on state established efficiency standards to meet responsible water use and establish a new water use practices.

*"And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way."*

**—John Steinbeck**

East of Eden

- Current efficiency standards do not include recycled water use.

**Supply Opportunities**

The IRP process identified potential projects that are listed in Table 3-11. Efficiency savings beyond baseline are shown as new water supplies because they offset water demands. Conservation project savings are tied to the IRP's upper demand forecast; therefore if actual demands are lower, there will be a corresponding reduction in projected water savings.

**Implications**

This is a key climate resistant water supply that has the best potential to augment and extend current available supplies. Since outdoor irrigation makes up 60% of urban M&I demands, this supply category has the largest potential impact for the region. The region will need to evaluate how to achieve targeted efficiency goals.

Key implications for water conservation programs:

- Are cost effective relative to imported water supplies.
- Extend other water supplies and delay the need for additional system expansion because it is a demand offset.
- Are instrumental for the region to reduce dependence on climate variable supplies such as imported water.
- Are not impacted by climate change or water quality concerns.

## Table 3-11: Water Use Efficiency Baseline & Projects

| Water Use Efficiency Baseline | | |
|---|---|---|
| **Project Name** | **Description** | **AF** |
| Baseline Conservation | 1,000 AF per year from existing conservation programs' active and passive savings. | 1,000 AF |

| Water Use Effiency Projects | | | |
|---|---|---|---|
| **Project Name** | **Description** | **ID** | **AF** |
| Expand WUE Devices | Implement additional targeted device related savings to reduce demand beyond current annual water use efficiency (WUE) savings. Provide incentives and pilot programs to roll out extremely high efficient indoor fixtures and toilets. To be verified with Water Use Efficiency Business Plan (WUEBP). | 39 | 5,000 AF |
| WUE - Turf Removal-Increment 1, 2, 3 | Implement turf removal and landscape transformational programs to reduce outdoor demand. To be verified with WUEBP. Each increment would provide up to 5,000 AFY of savings. If all are selected, they can result in up to 15,000 AFY savings | 40<br>41<br>42 | 5,000 AF<br>5,000 AF<br>5,000 AF |
| WUE - Budget Rates-Increment 1, 2, 3 | Implement water budget based rates for 2 Agencies (assuming 15% total savings per Agency after 3 years). To be verified with WUEBP. Each increment would provide up to 13,350 AFY of savings. If all increments are selected, they can result in up to 40,050 AFY savings. | 43<br>44<br>45 | 13,350 AF<br>13,350 AF<br>13,350 AF |
| WUE- Recycled Water Demand Management-Increment 1, 2 | Implement demand management devices and programs for direct recycled water customers. Does not generate additional supply, aids in managing the supply during peak demand. Each increment would provide 2,500 AFY of demand management. If both are selected they could provide 5,000 AFY additional recycled water. This supply could be used for increasing direct use demands, groundwater recharge or other reuse strategy | 46<br>47 | 2,500 AF<br>2,500 AF |
| WUE - Advanced Metering Technologies | Install advanced metering infrastructure (AMI) between retail meters and a utility provider. Will provide real-time data about consumption and allow customers to make informed choices about usage. | 66 | 5,000 AF |

## Figure 3-12: Sample Model Run of Climate Impacts on Imported Water Supply Availability

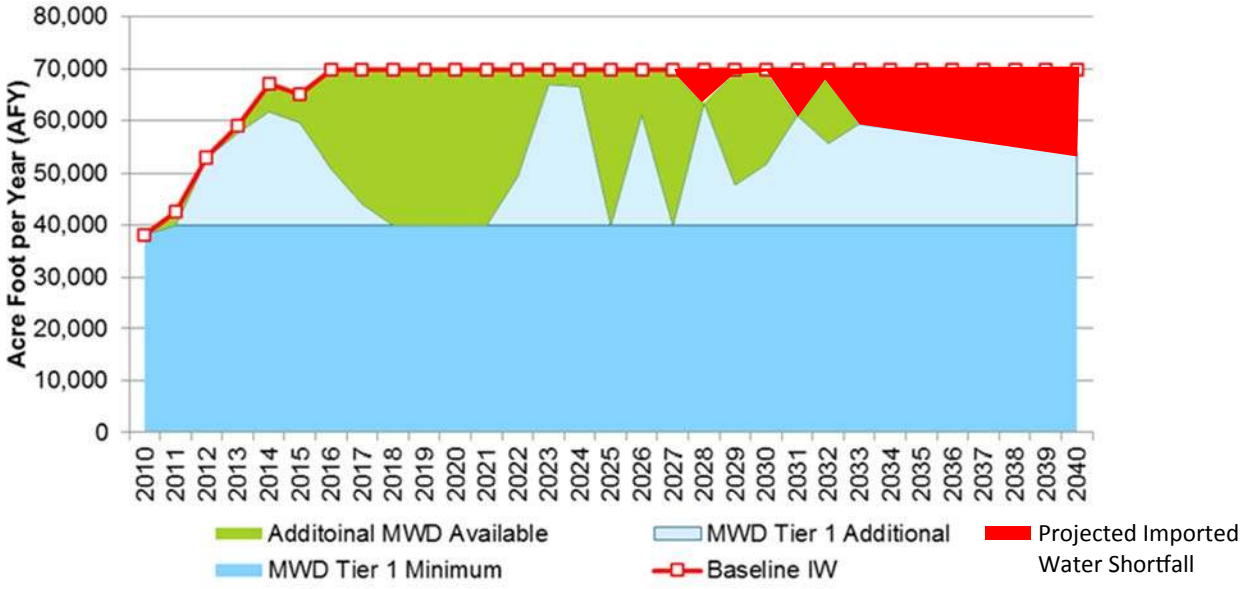

# 4. Supply Portfolio Themes

**Baseline Assessment**

**Single Variable Tests**

**Water Resource Strategies**

The desert globemallow, which requires very little water, grows in a low water use landscape.

# Supply Portfolio Themes

Section 4 presents the different water resource strategies developed through the IRP Technical Work Group. The purpose of each water resource strategy is to increase future water supplies, including water efficiency as a source of supply, to reduce the region's vulnerability to climate change and to ensure that future water needs for the region are met.

First, a baseline assessment was conducted to evaluate the ability of the baseline water supplies, established in Section 3, to meet projected baseline water demands. To do this, a water management mass balance model was developed by IEUA's technical consultants (see Appendix 2) to compare projections of water demand and supply under historical and future climate change conditions. Three demand scenarios were then evaluated across 106 different projections of future climate derived from two archives of downscaled global circulation models simulations. The results were reviewed to assess the extent to which baseline water supplies could NOT fulfill demands (described as supply shortfalls) under each future. This baseline assessment provided the foundation for the Work Group to identify the additional water resources needed to meet future demands.

Next, single variable tests were conducted to determine how well specific types of new water supplies could help the region meet projected demands under climate change. Single variable tests added individual supplies to the baseline to determine how well that single change performed under each of the 106 climate scenarios in the model.

Based on the outcomes of the single variable tests, the IRP Technical Work Group crafted 5 water resource strategies for further evaluation. Each strategy had an underlying theme, such as maximizing the use of recycled water or securing additional supplemental water supplies for groundwater replenishment. These 5 strategies were turned into project portfolios by selecting representative projects from proposed lists of future projects (see Section 3) that could be implemented to increase future water supplies above the baseline projections.

Finally, the performance of each water resource strategy was compared to the baseline assessment. The evaluation focused on two IRP criteria: (1) the ability of the scenario to generate sufficient water to meet future regional water demands under climate change conditions and (2) the amount of surplus water produced, defined as water not needed to meet demand, and placed into long-term groundwater storage.

## BASELINE ASSESSMENT

The regional baseline supplies and demand projections were developed in the first part of the IRP planning process. To establish how this baseline could be impacted by climate change, these projections were modeled and stress-tested under 106 separate climate scenarios, as referenced above and included in Appendix 2.

As a reminder, each of the 106 climate scenarios yields an independent model result and is depicted with a

separate colored line in the figures below. Note that no one run is "more accurate" than another. However, some of the runs stand out as "outlying" results that are either higher or lower than the majority of the runs. These results are not included in the scenario evaluations. For the purposes of the IRP, the analysis focused on the range of results for the majority (75%) of the climate scenarios.

Figure 4-1 shows the amount of unmet demand through 2040 under the baseline assessment with climate change. For the purposes of the IRP, unmet demands are defined as those times when demands exceed available water supplies. For the baseline conditions with climate change, the range of unmet demand is 0 AFY to 60,000 AFY . Note that the amount of unmet demand is smaller in the near term (about 20,000 AFY by 2030) and increases to 60,000 AFY by 2040. It is also important to note that without additional water supply development the region would struggle to meet future

## Figure 4-1: Baseline Unmet Demands

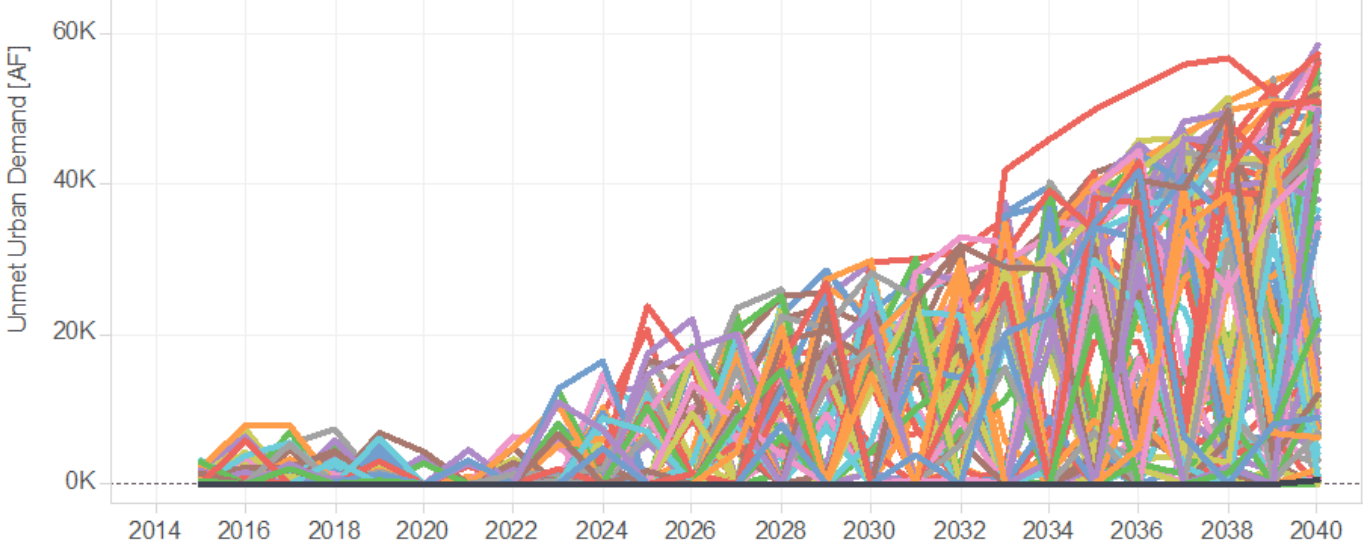


## Figure 4-2: Baseline Stored Water Balance

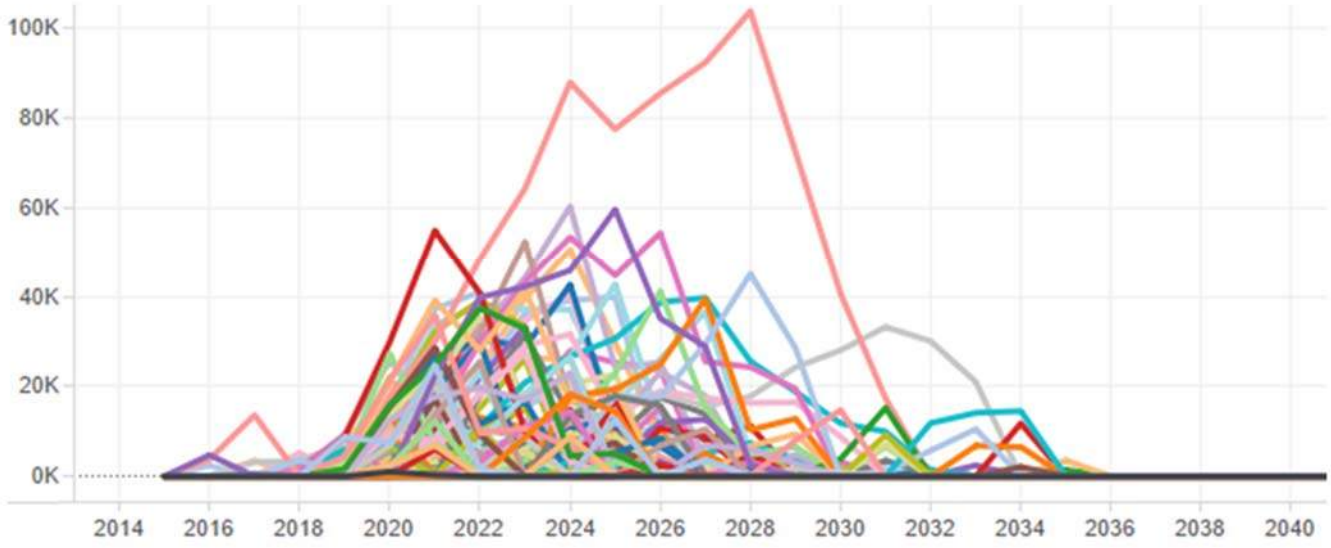

water demands under climate change conditions.

In each climate run, there may be periods when water supplies exceed demands, creating surplus water supplies. The WEAP model tracks these surplus supplies by allocating the water to a groundwater storage account.

The IRP uses the 2014 groundwater storage level as the baseline for tracking the addition of surplus water to groundwater storage. Similarly, during periods when demands exceed supplies, the model deducts water from groundwater storage tracking account but cannot lower the groundwater below its 2014 level.

Figure 4-2 illustrates how stored water accumulates under each climate scenario through 2040. A positive or upward slope on the graphic indicates water surplus conditions and the excess water is added to the storage tracking account. A negative, or downward slope, indicates that demand is exceeding supplies, and water is pulled out of storage to meet, in whole or in part, the excess demands. As a result, the stored water creates a buffer supply that can be used offset future shortfalls. The model shows "unmet demands" only when demands exceed supplies AND no water remains in the storage tracking account created by the model.

For comparison, the thick black line in Figure 4-2 represents baseline assessment conditions without climate change. Note there is no accumulation of surplus supplies and therefore all available water supplies are needed to meet the regional demand, and no water is stored for future use.

Results of the baseline assessment with climate change indicate that the following is likely to be experienced by the region:

- 79% of the regional water demands are met by 2040.
- Water supply shortages, or unmet demand, will be more intense and frequent under climate change.
- Climate will drive unmet demand to 25,000 AFY by 2030 and up to 60,000 AFY by 2040.
- Significant water supply shortfalls could occur as soon as 2022.
- A "do nothing" approach is not sustainable, as projected demands exceed supplies under all scenarios.
- It may be possible to accumulate additional groundwater under baseline conditions, but the amount would depend on future climate scenarios (e.g., more rainfall, less variability, cooler temperatures) than currently predicted.

## SINGLE VARIABLE TESTS

To evaluate how the addition of a new water supply could enhance the region's current, or baseline water supplies under climate change, a series of four single variable tests were evaluated. These tests were used to determine the potential improvement of implementing an isolated or single water supply source to help improve baseline conditions impacted by climate change.

The four single variable tests are:

1. Maximizing the Use of Prior Stored Chino Basin Groundwater
2. Maximizing the Purchase of MWD Imported Water
3. Maximizing Recycled Water Supply for Groundwater Recharge
4. Reducing Urban Water Demand by Increased Conservation and Water Use Efficiency

Conclusions from comparing the tests to the baseline assessment are summarized below.

**1 — Maximizing the use of prior stored Chino Basin groundwater.**

Test 1, Maximizing the Use of Prior Stored Chino Basin Groundwater does not produce new water supplies because it relies only on prior (pre-2013) stored groundwater. It is assumed that up to 8,400 AFY of groundwater can be pumped above baseline levels, and that the total amount of additional groundwater pumping cannot exceed 280,000 AF.

Results of this test are illustrated in Figure 4-3. If the region only relies upon the addition of prior stored Chino Basin groundwater to meet future water resource

needs:

- 91% of regional demands are met by 2040.
- Water supply shortages, or unmet demands, will be moderately improved by 2040 over baseline conditions.
- Unmet demand would be reduced to approximately 18,000 AFY by 2030 and 40,000 AFY by 2040.
- Significant water supply shortfalls could occur as early as 2024.
- The approach is not sustainable given that a significant amount of prior stored groundwater is needed to meet regional demands through 2040. The median of the climate scenarios shows a reduction in this storage from 280,000 AFY to approximately 130,000 AFY by 2040, with scenarios dropping as low as 80,000 AF.
- It may be possible to accumulate more stored water under this strategy, but the amount would depend on more benign future climate scenarios (e.g., more rainfall, less variability, cooler temperatures) than currently predicted.

**2 – Maximizing the Purchase of Metropolitan Water District (MWD) Imported Water**

IEUA member agencies (agencies) have the ability to purchase up to 70,000 AFY of imported water from the MWD. As discussed in Section 3, the baseline modeling assumption for imported water is that member Agencies could purchase up to 69,752 AFY (consistent with Resolution 2014-12-1), with a minimum total purchase of 40,000 AFY.

Due to the cost of imported water, agencies typically only purchase the amount of water needed to meet their operational requirements or fulfill water demands that cannot be met through local supplies. This means there may be times when agencies don't need the imported water but could decide to purchase this water and place it into storage for future use.

The approach of Maximizing the Purchase of MWD imported water does not add new imported water supplies to the baseline supply. However, the region's agencies will purchase all of the water available, up to 70,000 AFY. This purchase would occur even if water supplies exceed demand. In years where agencies make these purchases, the additional water would be put into storage via groundwater recharge or in-lieu of

**Figure 4-3:** Baseline vs Test 1 Unmet Demand Comparison

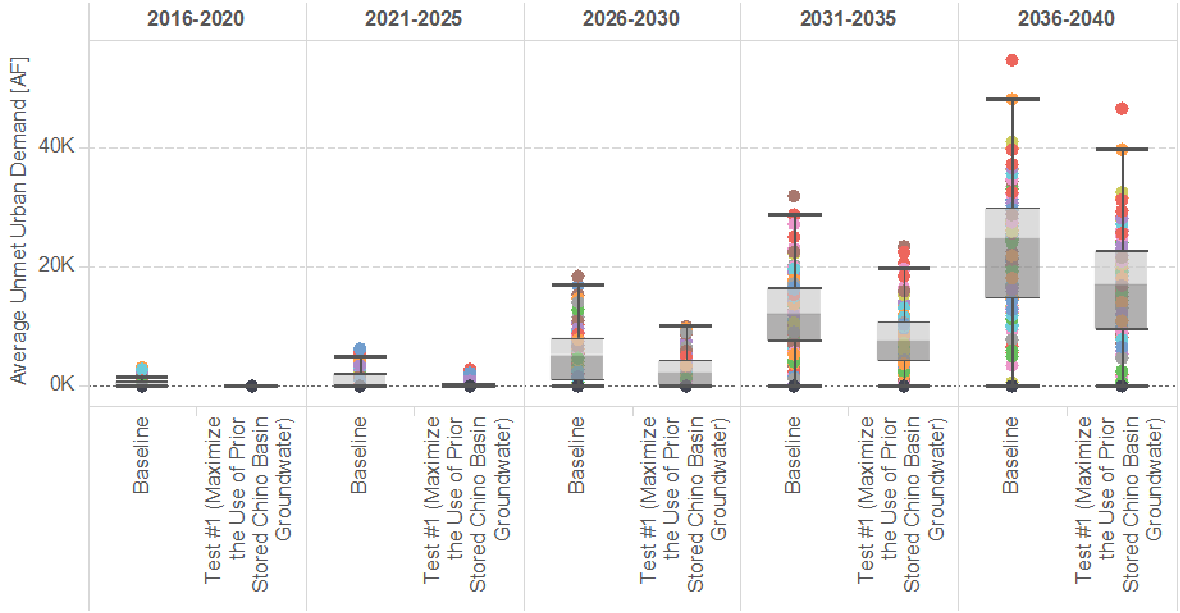

groundwater pumping. The quantity of supply would be dependent on imported water availability.

Results of this test are illustrated in Figure 4-4. If the region relies only upon maximizing imported water purchases to meet future needs:

- 85% of regional demands are met by 2040.
- Water supply shortages, or unmet demands, will be slightly improved by 2040 over baseline conditions because imported water availability is adversely impacted by climate change.
- Unmet demand would be reduced to 22,000 AFY by 2030 and 55,000 AFY by 2040.
- Significant water supply shortfalls could occur as soon as 2024.
- This approach is not sustainable as a stand-alone approach and must be combined with other water resources to improve water supply conditions for the region.
- It may be possible to accumulate more stored water under this strategy, but the amount would depend on more benign future climate scenarios (e.g. more rainfall, less variability, cooler temperatures) than currently predicted.
- This approach could increase the region's dependence on imported water supplies, which could make the region more vulnerable to climate change.

**3 – Maximizing Recycled Water Supply for Groundwater Recharge**

The region has developed a successful regional Recycled Water Program for both direct use (landscaping, agricultural irrigation and industrial processing uses) and indirect use (groundwater recharge). In 2000, the region identified recycled water as a critical resource needed for drought-proofing the region and maintaining its economic growth.

The approach of Maximizing Recycled Water Supply for Groundwater Recharge builds on the successful regional Recycled Water Program. As discussed in Section 3, the baseline assumption for available recycled water is 47,700 AFY by 2025. As the region continues to grow, new communities will be sewered and additional recycled water supplies will be generated. It is estimated that there will be approximately 85,500 AFY of recycled water supply from regional development by 2040.

**Figure 4-4:** Baseline vs Test 2 Unmet Demand Comparison

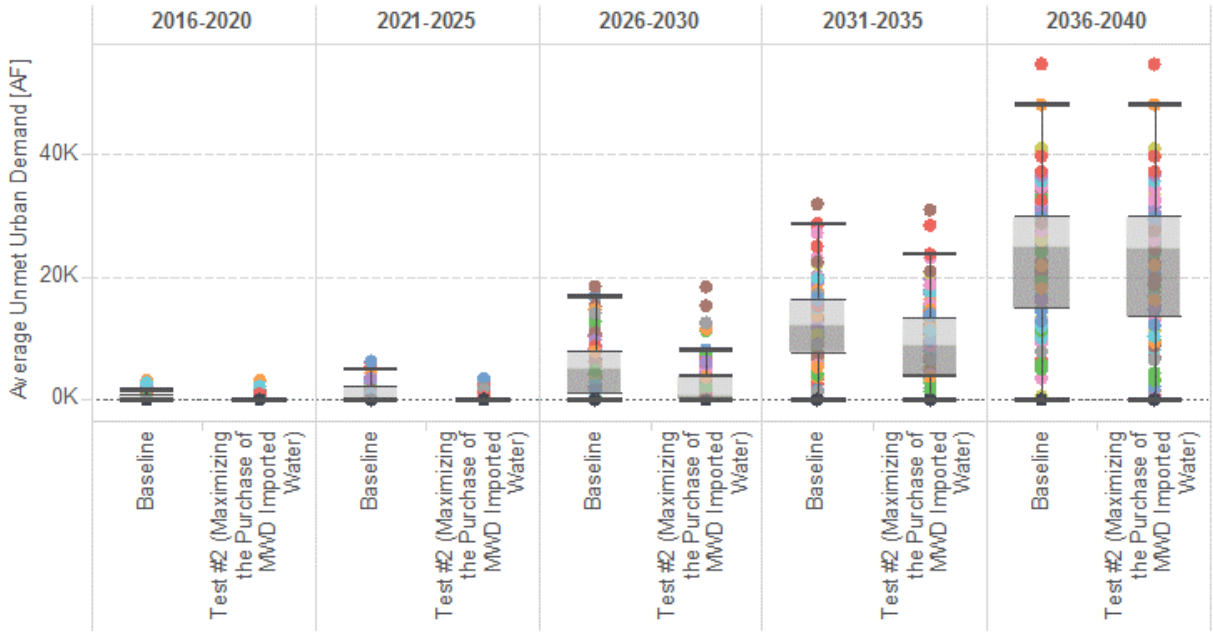

Therefore, this will deliver 37,800 AFY of additional recycled water to the groundwater recharge program.

Results of this test are illustrated in Figure 4-5. If the region relies only upon maximizing recycled water supply for groundwater recharge for future water needs:

- 95% of the regional demands are met by 2040.
- Water supply shortages, or unmet demand, will be greatly improved by 2040 over baseline conditions.
- Unmet demand would be reduced to 10,000 AFY by 2030 and 17,000 AFY by 2040.
- Although water supply shortfalls are reduced, they could occur as early as 2024.
- Maximizing recycled water for groundwater recharge is sustainable as a stand-alone strategy, but would provide greater benefits if combined with other programs to enhance water supply conditions for the region.
- Provides flexibility by maximizing the amount of water stored in the Chino groundwater basin for future use.
- Recycled water is the most climate resilient water supply available to the region.
- It may is possible to accumulate more stored water under this strategy, but the amount depends on more benign future climate scenarios (e.g. more rainfall, less variability, cooler temperatures) than currently predicted.
- The volume of future recycled water supply is impacted by the amount and timing of new development in the region and indoor water efficiency trends. Additional tracking of wastewater flows is needed to accurately anticipate the amount of recycled water that will be available by 2040.

**4 – Reducing Urban Water Demand by Increased Outdoor Water Use Efficiency and Conservation**

Approximately 60% of the region's urban water use is for outdoor irrigation, particularly lawns. The IRP Technical Work Group requested a scenario to evaluate the implications of an increased outdoor efficiency and conservation program.

The approach of Reducing Urban Demand by Increasing Water Use Efficiency assumes that the region achieves a level of water savings that will reduce residential outdoor water usage to levels consistent with the requirements of the Department of Water Resources State Model Water Efficiency Landscape Ordinance (AB

**Figure 4-5:** Baseline vs Test 3 Unmet Demand Comparison

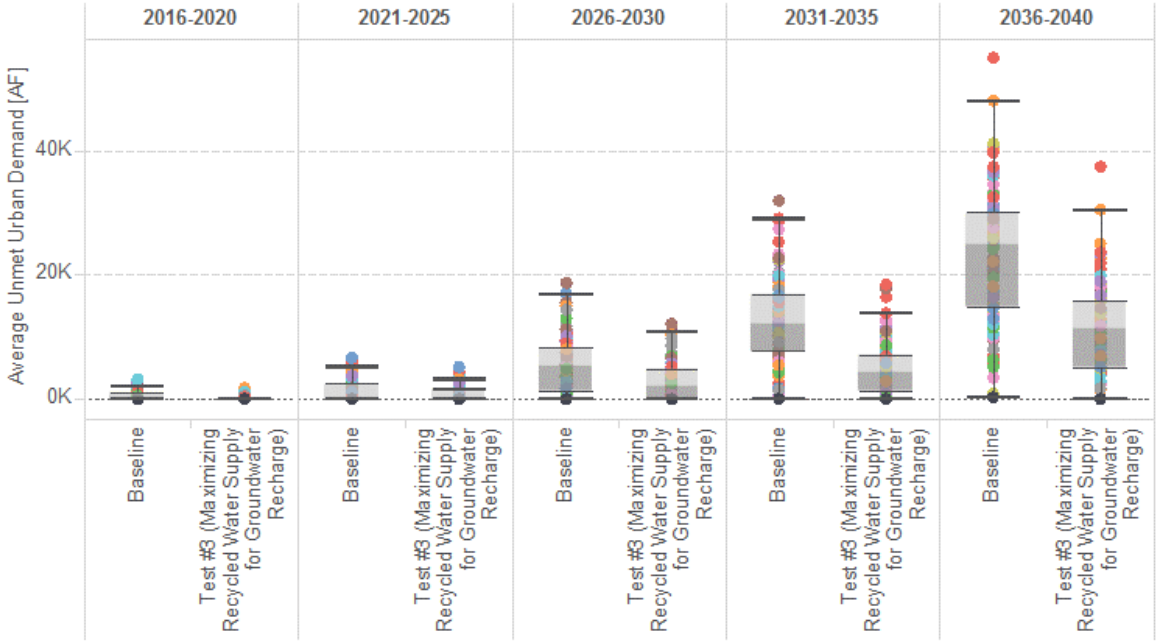

1881). This could be achieved by programs such as budget-based rates and continuation of active conservation programs. The region currently has one water agency on budget based rates.

This test assumed that four retail agencies would implement budget based rates structures by 2020. The savings are estimated to be 27,000 AFY from the rate structure changes and 11,000 AFY from active potable and recycled water conservation programs. Combined these measures are assumed to reduce urban demands by approximately 17% from 2013-14.

Results of this test are illustrated in Figure 4-6. If the region relies upon only reducing urban water demand by Increased Outdoor Water Use Efficiency and Conservation to meet future water needs:

- 100% of the regional demands are met by 2040.
- Water supply shortages, or unmet demand, would be eliminated by 2040.
- Water supply shortfalls are delayed beyond 2040.
- Accumulation of stored water is very likely to occur, with more than 50% of the climate scenarios producing over 200,000 AFY of stored water by 2040.
- Regional recycled water supplies would not be impacted because this approach targets outdoor conservation.
- Reduces dependence on climate dependent supplies and reduces the volume of additional water supplies needed to meet future demand.
- Requires expansion of water efficiency programs to support transition to budget based rate structure to achieve outdoor efficiency standards.

**Single Variable Test Conclusions**

Results from the four single variable tests show that all of the strategies helped to reduce and delay water supply shortages when compared to baseline conditions under climate change. Notably, water efficiency/ conservation is the only water supply approach that could eliminate water supply shortages through 2040 as a "stand-alone" approach. However, the expansion of local supplies such as recycled water and storm water ensures that the region is insulated from unforeseen or cataclysmic conditions.

The recommended approach in the IRP is to diversify the region's water supplies. The following conclusions were

**Figure 4-6:** Baseline vs Test 4 Unmet Demand Comparison

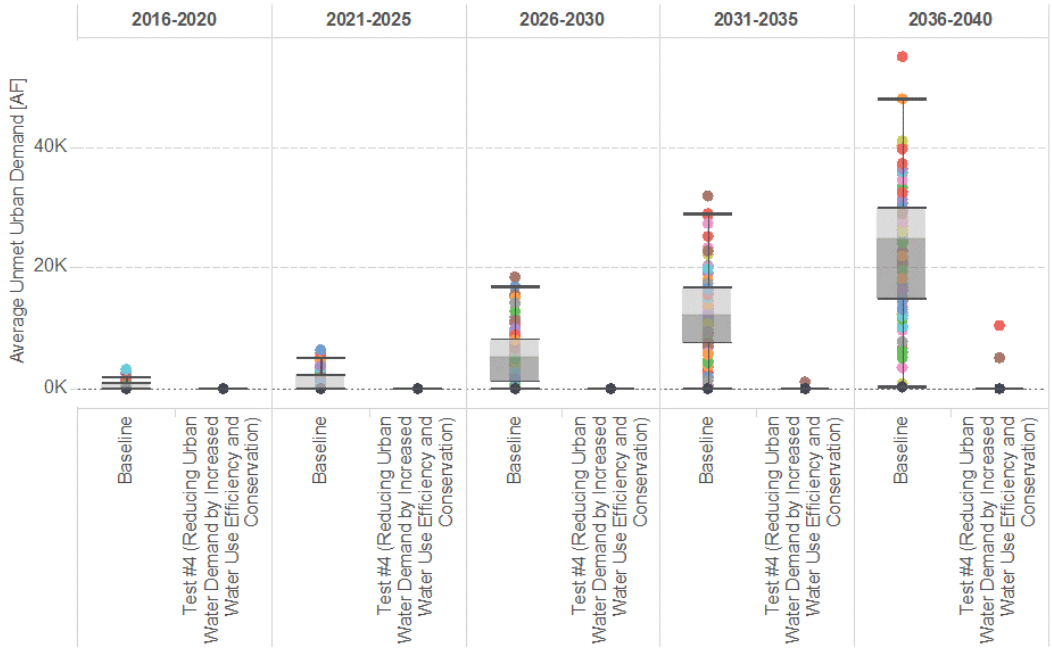

used as the basis for developing the next step in the IRP, the creation of water strategies:

- Water use efficiency and conservation provides the region with the greatest level of water supply reliability and resiliency.
- Diversification of region's water supplies minimizes the potential for water shortages under climate change and from catastrophic events.
- Increasing water supplies for Chino groundwater recharge increases storage and provides a supply buffer, enhancing the region's water supply flexibility and resilience.
- Implementing outdoor water use efficiency and conservation minimizes climate change impacts on urban water demand.

## WATER RESOURCE STRATEGIES

Each water resource strategy is a combination of water supply and conservation projects or opportunities that the region could pursue to achieve the goals of the IRP. Five water resource strategies were developed during the course of the IRP workshops, with a total of eight project portfolios. Each portfolio was modeled to determine performance and resiliency across the 106 climate scenarios. These strategies and portfolios are as follows:

**Strategy A** – Increase Chino Basin Groundwater Production

- ***Portfolio 1****:* Maximize the Use of Prior Stored Groundwater

**Strategy B–** Recycled Water Program Expansion

- ***Portfolio 2****:* Maximize Recycled Water (Including External Supplies) and Local Supply Projects and Implement Minimal Water Efficiency
- ***Portfolio 3****:* Portfolio 2 Plus Secure Supplemental Imported Water from MWD and Non-MWD Sources

**Strategy C**– Recycled Water & Water Efficiency Program Expansions

- ***Portfolio 4****:* Maximize Recycled Water (Including External Supplies) and Implement Moderate Water Efficiency
- ***Portfolio 5****:* Portfolio 4 Plus Implement High Water Efficiency

**Strategy D**– Increase Groundwater Recharge Supplies

- ***Portfolio 6*****:** Maximize Supplemental Water Supplies and Recycled Water Supplies

**Strategy E** – Maximize Imported Water Supplies with Moderate Water Efficiency

- ***Portfolio 7***: Maximize the Purchase of Imported Water from MWD and Implement Minimal-Moderate Level of Water Efficiency
- ***Portfolio 8***: Portfolio 7 Plus Maximize Recycled Water

## Table 4-1: Supply Totals for Portfolio 1

| Supply Type | Baseline | Portfolio 1 |
|---|---|---|
| **Chino Groundwater** | 91,300 | 8,400 |
| **Stormwater** | 6,400 | - |
| **Recycled Water** | | - |
| Locally Developed[1] | 64,700 | - |
| External Supplies | | - |
| **Chino Desalter** | 17,700 | - |
| **Local Surface** | 22,100 | - |
| **Non-Chino Groundwater** | 11,600 | - |
| **Imported Water** | | - |
| MWD | 69,750 | - |
| Other | | - |
| **WUE** [2] | 1,000 | - |
| *add'l supplies subtotal* | | *8,400* |
| **Total Water Supply** | **283,550** | **291,950** |

Notes:

(1) Baseline Supply of 18,700 GWR + 29,000 Direct + 17,000 SAR, or total of 64,700 AFY, based on Agency TYCIP and not total available wastewater supply. Estimated total available local RW supply by 2040 to be 85,550 AFY based on 2015 WWFMPU flow monitoring.

(2) Baseline WUE of 1,000 AFY already included in the Urdan Demand forecast. Therefore, not included in Supply Table to avoid double counting. Only new WUE in addition to Baseline to be counted in Total Supply.

**Strategy A – Increase Chino Basin Groundwater Production (Portfolio 1)**

Under Strategy A, the IRP Technical Work Group explored the implications of expanding groundwater production without bringing in additional water resources. Strategy A is similar to Single Variable Test 1 – Maximizing the Use of Prior Stored Chino Basin Groundwater. It includes capacity building projects, the use groundwater that was previously stored in the Chino Basin, and the implementation of water efficiency programs for direct recycled water customers. Although strategy this does not generate additional recycled water supply, it allows for additional recycled water to be used for groundwater recharge. One water supply portfolio, Portfolio 1, was developed for Strategy A, with additional supply amounts shown in Table 4-1.

Portfolio 1 assumes that an additional 8,400 AFY of groundwater supply would be pumped from the Chino Basin, with a 2040 "not-to-exceed" limit of 280,000 AF.

Since new supplies in Portfolio 1 are limited to 8,400 AFY from stored Chino Basin groundwater the results are identical to the first test strategy. Implicit in this scenario, when there are periods where the portfolio's water supplies exceed demands, the resulting surplus water supplies is assumed to be recharged into the groundwater basin. When this occurs, the stored water can be used at a later time.

Figure 4-7 shows unmet demands for Portfolio 1 in comparison to the baseline model run. Potential shortfalls begin to appear around 2022, which is the same as the baseline. In the majority (75%) of model runs, Portfolio 1 reduces unmet demands by 2040 from up to 27,900 AFY to 12,500 AF.

Stored water balances are shown in Figure 4-8. As illustrated, groundwater balances begin to accumulate in Portfolio 1 by 2020 with storage peaking around 2025. Stored groundwater starts to be used to meet demands by 2028 and continue to be drawn down through 2040.

In summary, Portfolio 1

- Provides 95% of the demands under majority of climate scenarios
- Shows a 5% improvement over baseline conditions by utilizing existing stored groundwater on an annual basis
- However, the groundwater pulled from storage is a finite resource and due to the continued drawdown, this strategy is not sustainable without additional projects to replenish the storage or reduce demands.

**Strategy B– Recycled Water Program Expansion (Portfolios 2 & 3)**

Under Strategy B, the IRP Technical Work Group explores the continued expansion of the recycled water program. Strategy B focuses on how achieving a 40% increase in recycled water supply over the baseline condition would benefit the region. The strategy accomplishes this goal by using an additional 17,000 AFY of locally generated recycled water. As mentioned in Section 3, these additional recycled water supplies will be available as growth occurs in the service area. In addition, this strategy secures 10,500 AFY of external recycle water supply from neighboring jurisdictions by

**Figure 4-7:** Unmet Demands of Portfolio 1 Compared to Baseline

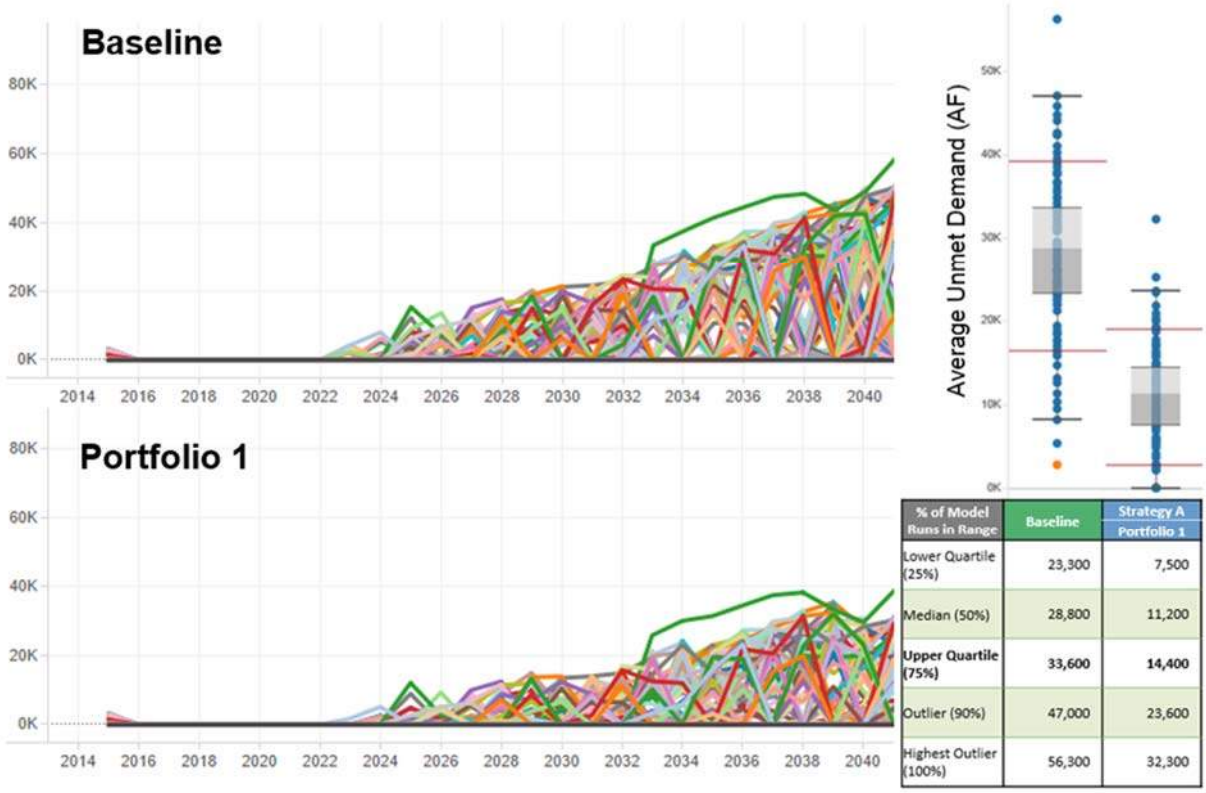


| % of Model Runs in Range | Baseline | Strategy A Portfolio 1 |
|---|---|---|
| Lower Quartile (25%) | 23,300 | 7,500 |
| Median (50%) | 28,800 | 11,200 |
| **Upper Quartile (75%)** | **33,600** | **14,400** |
| Outlier (90%) | 47,000 | 23,600 |
| Highest Outlier (100%) | 56,300 | 32,300 |

**Figure 4-8:** Stored Groundwater Balance of Portfolio 1

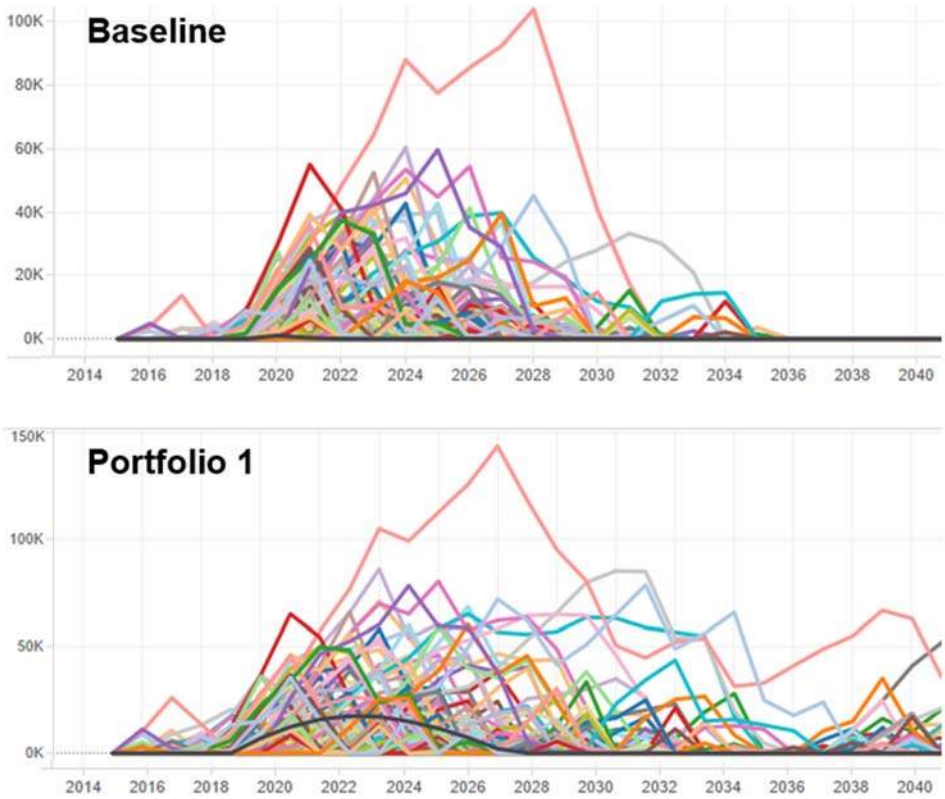

## Table 4-2: Supply Totals for Portfolio 2 & 3

| Supply Type | Baseline | Portfolio 2 | Portfolio 3 |
|---|---|---|---|
| **Chino Groundwater** | 91,300 | - | - |
| **Stormwater** | 6,400 | - | - |
| **Recycled Water** | | - | - |
| Locally Developed[1] | 64,700 | 17,000 | 17,000 |
| External Supplies | | 10,500 | 10,500 |
| **Chino Desalter** | 17,700 | - | - |
| **Local Surface** | 22,100 | - | - |
| **Non-Chino Groundwater** | 11,600 | - | - |
| **Imported Water** | | - | - |
| MWD | 69,750 | - | 7,850 |
| Other | | - | 4,900 |
| **WUE [2]** | 1,000 | 5,000 | 5,000 |
| *add'l supplies subtotal* | | *32,500* | *45,250* |
| **Total Water Supply** | **283,550** | **316,050** | **328,800** |

Notes:

(1) Baseline Supply of 18,700 GWR + 29,000 Direct + 17,000 SAR, or total of 64,700 AFY, based on Agency TYCIP and not total available wastewater supply. Estimated total available local RW supply by 2040 to be 85,550 AFY based on 2015 WWFMPU flow monitoring.

(2) Baseline WUE of 1,000 AFY already included in the Urdan Demand forecast. Therefore, not included in Supply Table to avoid double counting. Only new WUE in addition to Baseline to be counted in Total Supply.

2040. Strategy B also includes 5,000 AFY of additional device based conservation savings.

Two water supply portfolios were developed for Strategy B. The first, Portfolio 2, models the additional water supplies as described above. The second, Portfolio 3 includes all of Portfolio 2 supplies plus additional imported water as shown in Table 4-2. Imported water supplies include MWD Tier 1 and/or wet year purchases of supplemental water for groundwater replenishment. A complete list of projects in Portfolios 2 and 3 can be found in Appendix 6.

Figure 4-10 shows unmet demands for Portfolio 2 in comparison to the baseline model run. Potential shortfalls for Portfolio 2 begin to appear around 2024, which is two years later than baseline conditions. In the majority of model runs, Portfolio 2 reduces unmet demands by 2040 from to 27,900 AFY to 9,000 AF.

Stored groundwater balances for Portfolio 2 are illustrated in Figure 4-10. Groundwater balances begin to accumulate by 2018 with the majority of the model runs building around 25,000 AFY or less of stored water. By 2040 the quantity of stored water is depleted in approximately 90% of the climate runs.

Unmet demands for Portfolio 3 in comparison to the baseline model run are shown in Figure 4-11. Potential shortfalls for Portfolio 3 begin to appear after 2035, 13 years after the baseline condition. In the majority of model runs, Portfolio 3 reduces unmet demands in 2040 from 27,900 AFY to 9,000 AF.

Stored water balances for Portfolio 3 are illustrated in Figure 4-12. Portfolio 3 behaves in a similar fashion to Portfolio 2, however there is a much greater probability of accumulating stored water. Approximately 70% of the runs in Portfolio 3 have water in storage by 2040. The range of stored water falls between 0 AFY and 280,000 AF.

In summary, Portfolios 2 and 3 under 75% of the climate scenarios:

- Provide 90% supply reliability under majority of climate conditions.
- Show a 5% improvement over baseline conditions by utilizing existing stored groundwater on an annual basis
- Water supply shortfalls are delayed by two years as compared to baseline conditions.
- Extend the ability to produce water stored water, with the majority of climate runs having the ability to build and maintain stored supplies through 2040

**Figure 4-9:** Unmet Demands of Portfolio 2 Compared to Baseline

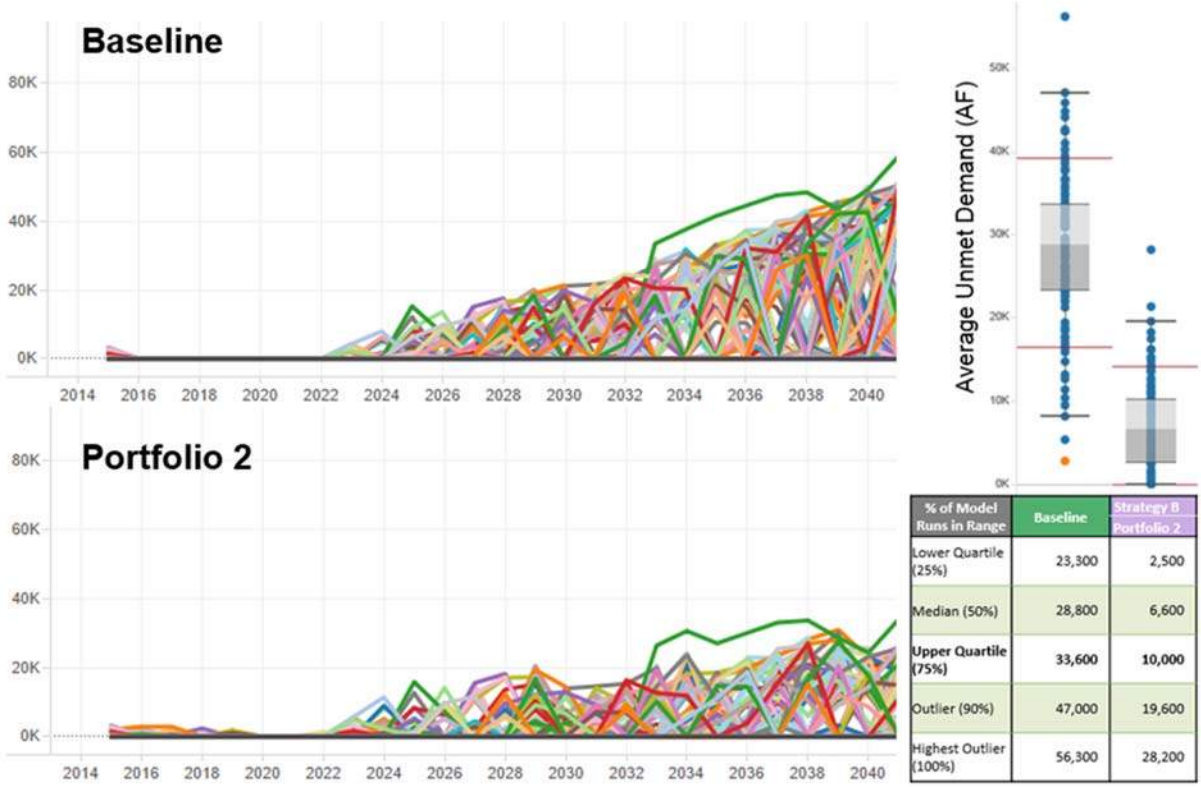


| % of Model Runs in Range | Baseline | Strategy B Portfolio 2 |
|---|---|---|
| Lower Quartile (25%) | 23,300 | 2,500 |
| Median (50%) | 28,800 | 6,600 |
| **Upper Quartile (75%)** | **33,600** | **10,000** |
| Outlier (90%) | 47,000 | 19,600 |
| Highest Outlier (100%) | 56,300 | 28,200 |

**Figure 4-10:** Stored Groundwater Balance of Portfolio 2

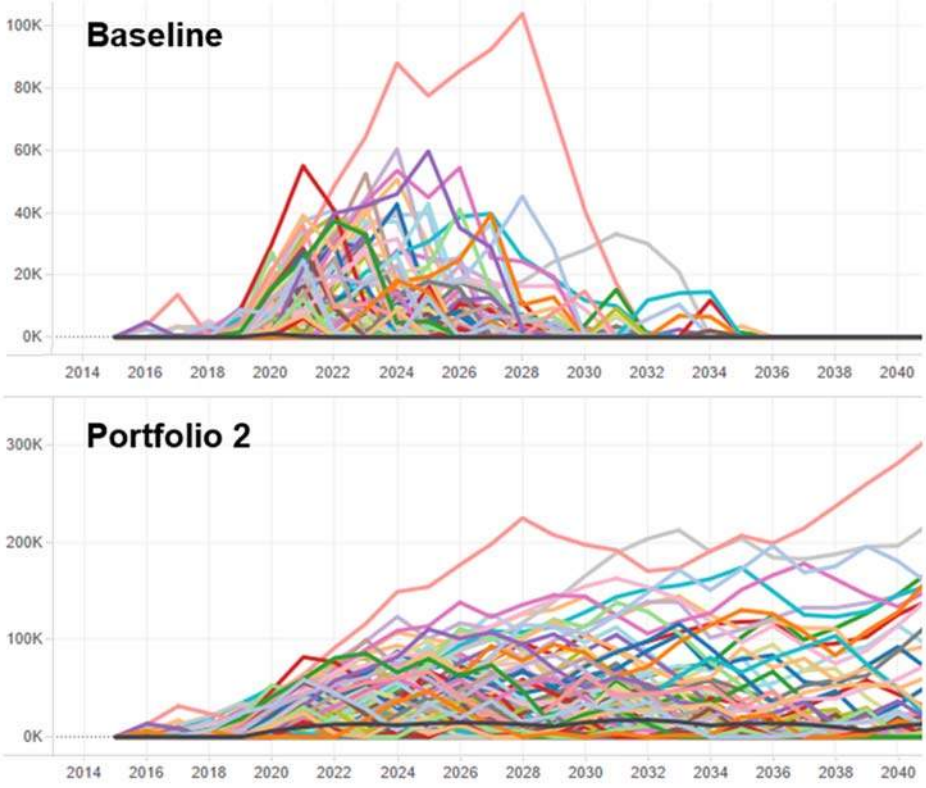

**Figure 4-11:** Unmet Demands of Portfolio 3 Compared to Baseline

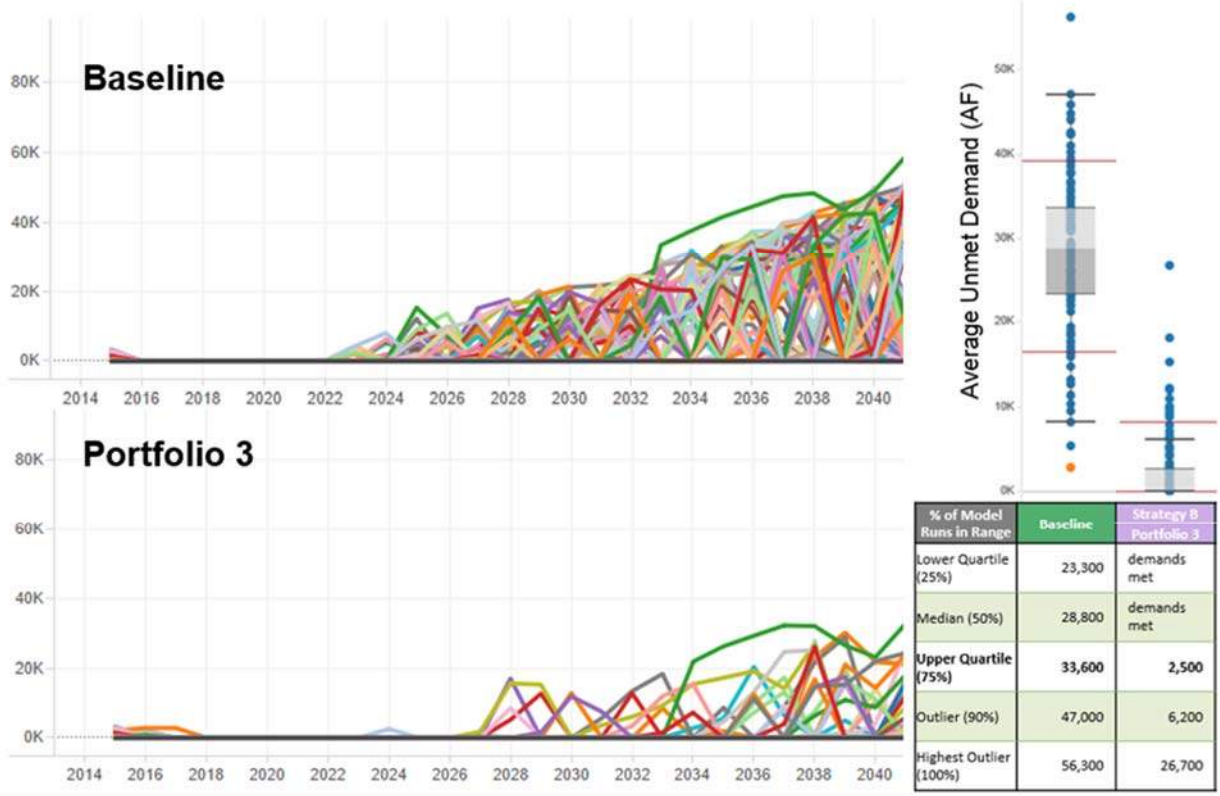


| % of Model Runs in Range | Baseline | Strategy B Portfolio 3 |
|---|---|---|
| Lower Quartile (25%) | 23,300 | demands met |
| Median (50%) | 28,800 | demands met |
| **Upper Quartile (75%)** | **33,600** | **2,500** |
| Outlier (90%) | 47,000 | 6,200 |
| Highest Outlier (100%) | 56,300 | 26,700 |

**Figure 4-12:** Stored Groundwater Balance of Portfolio 3

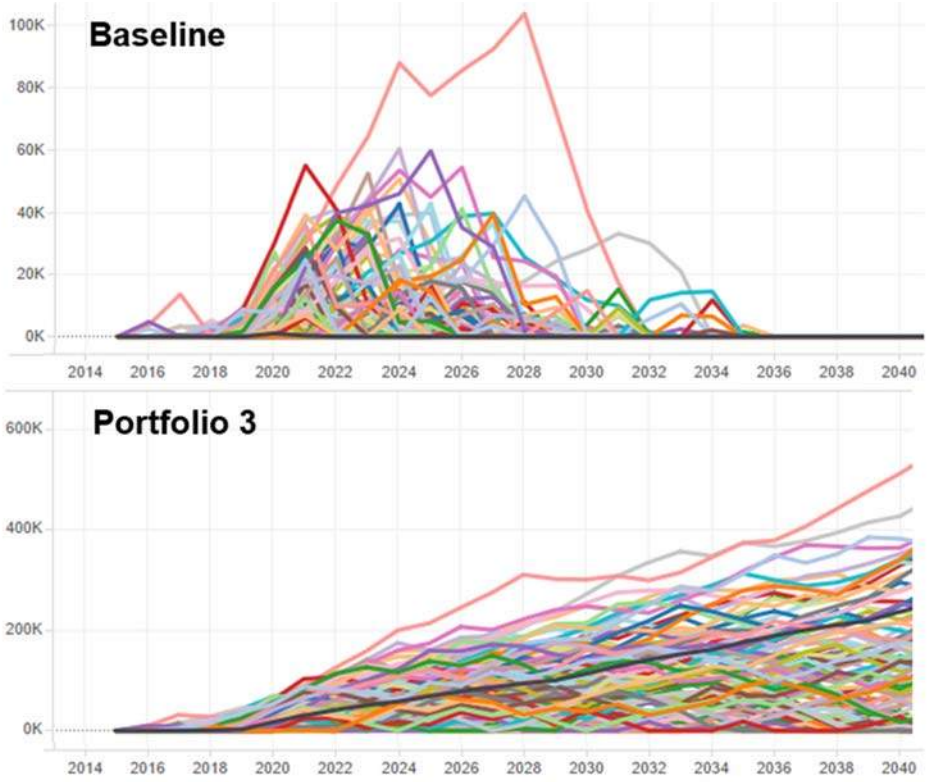

**Strategy C – Recycled Water & Water Efficiency/ Conservation Program Expansions (Portfolios 4 & 5)**

Under Strategy C, the IRP Technical Work Group evaluated how increased recycled water and water efficiency/conservation programming could benefit the region. With the focus on outdoor irrigation efficiency, there is a signification amount of water savings that could be achieved in both existing and future developments when compared with baseline conditions.

Strategy C assumes that a minimum of four agencies within IEUA's service area are implementing budget-based rates and increasing device-based conservation programming by 2020. This strategy also increases recycled water supply by utilizing an additional 17,000 AFY of locally generated recycled water, securing 10,500 AFY of an external recycle water supply by 2040, and implementing recycled water use efficiency programs to extend supplies.

Two water supply portfolios were developed for Strategy C. The first, Portfolio 4, models the additional water supplies as described above. The second, Portfolio 5, includes all of Portfolio 4 supplies plus the addition of two additional agencies adopting budget-based rates by 2020 and the addition of supplemental imported water as shown in Table 4-3. Imported water supplies include MWD Tier 1 and/or wet year purchases of supplemental water for groundwater replenishment. A complete list of projects in the portfolios can be found in Appendix 6.

Unmet demands for Portfolio 4 are shown in comparison to the baseline conditions in Figure 4-13. Portfolio 4 meets projected demands through 2040 100% of the time.

Stored water balances are illustrated in Figure 4-14 As illustrated, groundwater balances begin to accumulate in Portfolio 4 by 2022 with the majority of model runs continuing to build stored water through 2040. By 2040, 105 of the 106 model runs accumulated a minimum of 200,000 AFY of stored water.

Unmet demands for Portfolio 5 are shown in comparison to the baseline model run in Figure 4-15. Portfolio 5 meets projected demands through 2040 100% of the time.

## Table 4-3: Supply Totals for Portfolio 4 & 5

| Supply Type | Baseline | Portfolio 4 | Portfolio 5 |
|---|---|---|---|
| **Chino Groundwater** | 91,300 | - | - |
| **Stormwater** | 6,400 | - | - |
| **Recycled Water** | | - | - |
| Locally Developed(1) | 64,700 | 17,000 | 17,000 |
| External Supplies | | 10,500 | 10,500 |
| **Chino Desalter** | 17,700 | - | - |
| **Local Surface** | 22,100 | - | - |
| **Non-Chino Groundwater** | 11,600 | - | - |
| **Imported Water** | | - | - |
| MWD | 69,750 | 667 | 667 |
| Other | | - | 4,900 |
| **WUE (2)** | 1,000 | 36,700 | 55,050 |
| *add'l supplies subtotal* | | *64,867* | *88,117* |
| **Total Water Supply** | **283,550** | **348,417** | **371,667** |

Notes:

(1) Baseline Supply of 18,700 GWR + 29,000 Direct + 17,000 SAR, or total of 64,700 AFY, based on Agency TYCIP and not total available wastewater supply. Estimated total available local RW supply by 2040 to be 85,550 AFY based on 2015 WWFMPU flow monitoring.

(2) Baseline WUE of 1,000 AFY already included in the Urdan Demand forecast. Therefore, not included in Supply Table to avoid double counting. Only new WUE in addition to Baseline to be counted in Total Supply.

Stored water balances for Portfolio 5 are illustrated in Figure 4-16. As illustrated, groundwater balances begin to accumulate in Portfolio 3B by 2020 with majority of model runs continuing to build stored water through 2040. By 2040, 105 of the 106 model runs accumulated a minimum of 500,000 AFY of stored water.

In summary, Portfolios 4 and 5 perform under 75% of the climate scenarios:

- Have no unmet demands across all climate scenarios due to reduced need for water
- Build water in storage consistently across climate scenarios, which could create an opportunity to sell surplus water
- Portfolio 4 has the potential for stored groundwater to build to over 200,000 AFY by 2040
- Portfolio 5 has the potential for stored groundwater to build to over 500,000 AFY by 2040

**Figure 4-13:** Unmet Demands of Portfolio 4 Compared to Baseline

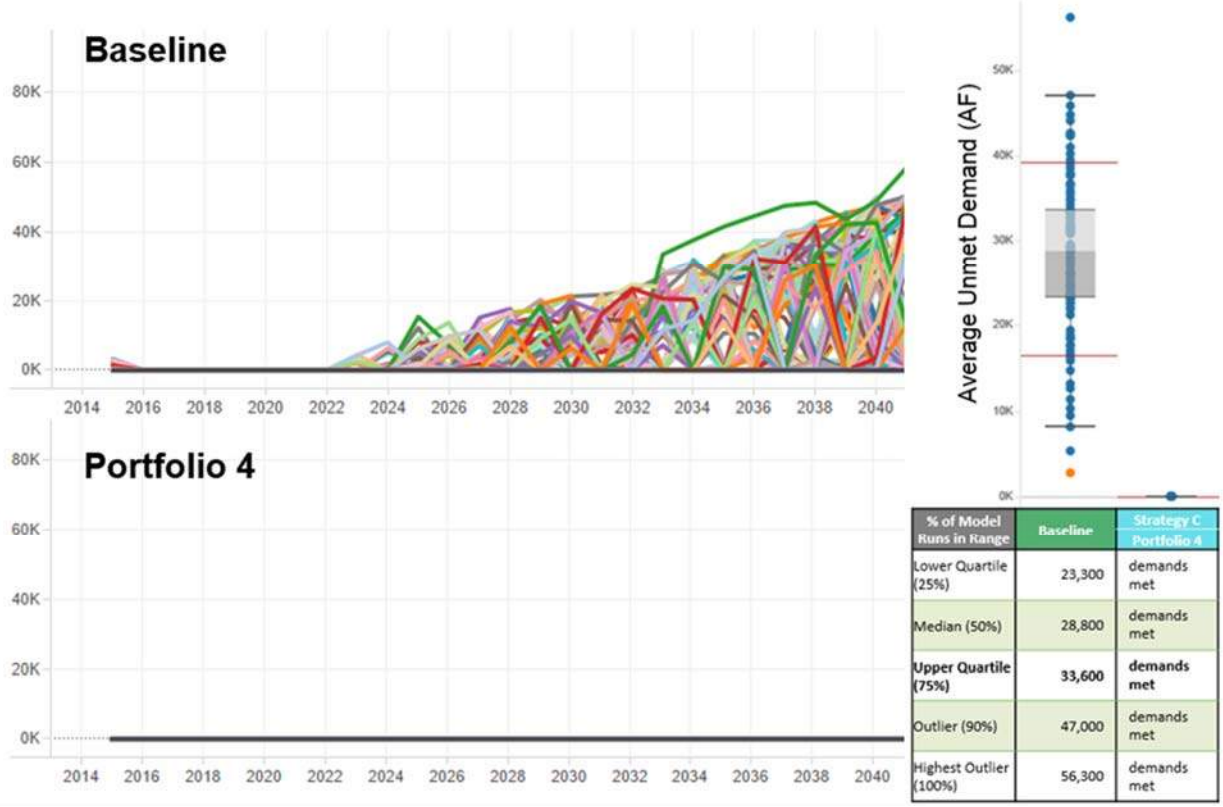


| % of Model Runs in Range | Baseline | Strategy C Portfolio 4 |
|---|---|---|
| Lower Quartile (25%) | 23,300 | demands met |
| Median (50%) | 28,800 | demands met |
| **Upper Quartile (75%)** | **33,600** | **demands met** |
| Outlier (90%) | 47,000 | demands met |
| Highest Outlier (100%) | 56,300 | demands met |

**Figure 4-14:** Stored Groundwater Balance of Portfolio 4

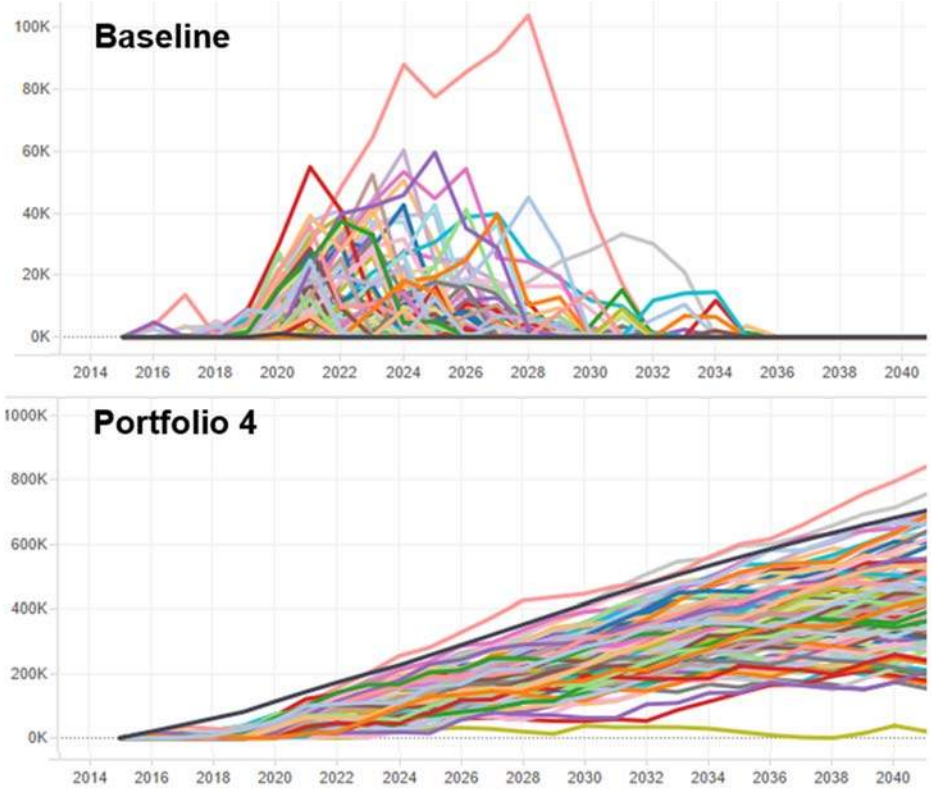

**Figure 4-15:** Unmet Demands of Portfolio 5 Compared to Baseline

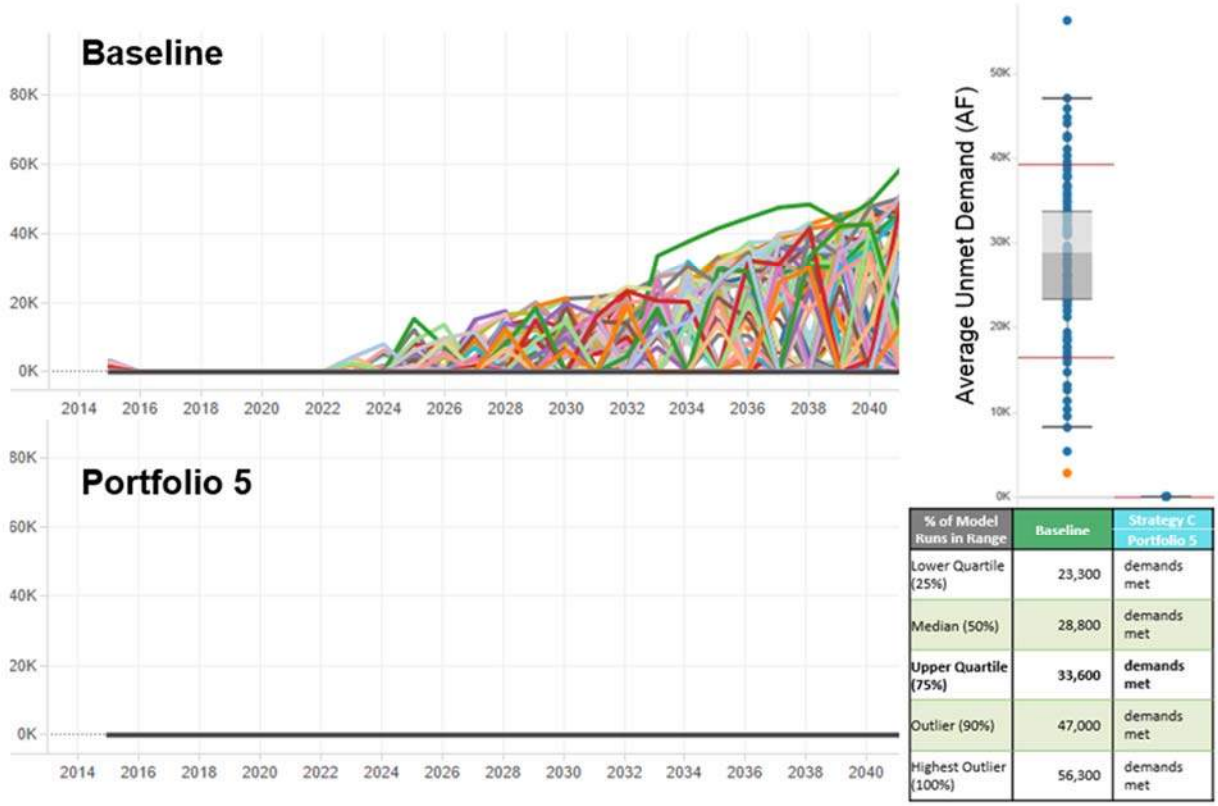


| % of Model Runs in Range | Baseline | Strategy C Portfolio 5 |
|---|---|---|
| Lower Quartile (25%) | 23,300 | demands met |
| Median (50%) | 28,800 | demands met |
| **Upper Quartile (75%)** | **33,600** | **demands met** |
| Outlier (90%) | 47,000 | demands met |
| Highest Outlier (100%) | 56,300 | demands met |

**Figure 4-16:** Stored Groundwater Balance of Portfolio 5

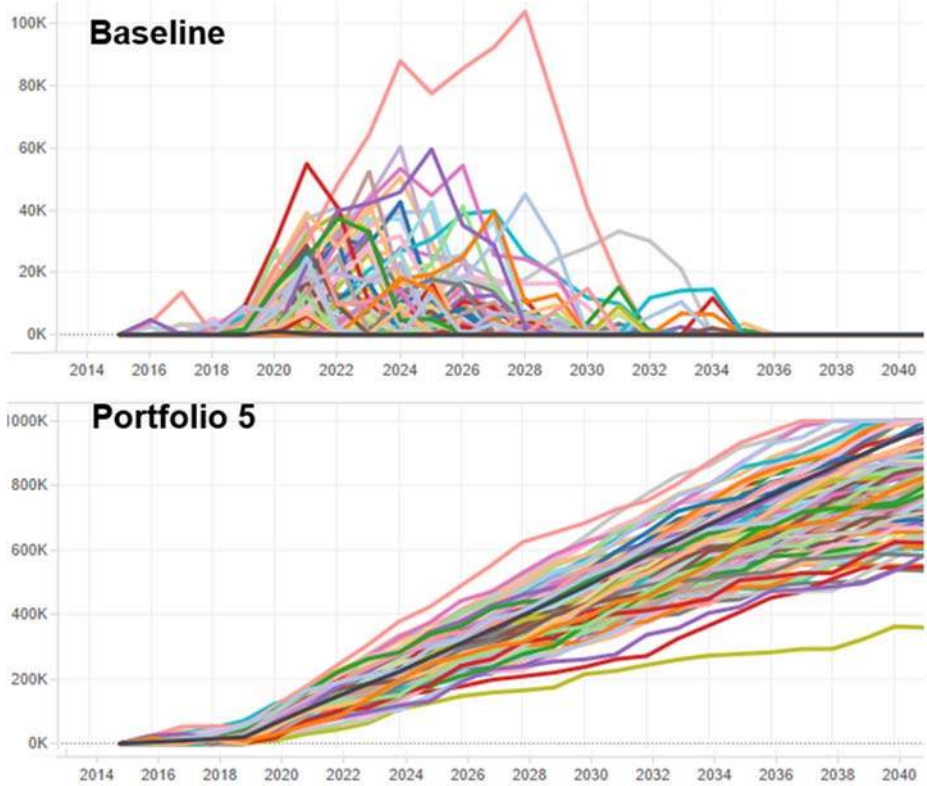

## Table 4-4: Supply Totals for Portfolio 6

| Supply Type | Baseline | Portfolio 6 |
|---|---|---|
| **Chino Groundwater** | 91,300 | 8,400 |
| **Stormwater** | 6,400 | - |
| **Recycled Water** | | - |
| Locally Developed[1] | 64,700 | 20,800 |
| External Supplies | | 9,000 |
| **Chino Desalter** | 17,700 | - |
| **Local Surface** | 22,100 | - |
| **Non-Chino Groundwater** | 11,600 | 2,500 |
| **Imported Water** | | - |
| MWD | 69,750 | 667 |
| Other | | 6,400 |
| **WUE [2]** | 1,000 | 13,500 |
| *add'l supplies subtotal* | | *61,267* |
| **Total Water Supply** | **283,550** | **344,817** |

Notes:

(1) Baseline Supply of 18,700 GWR + 29,000 Direct + 17,000 SAR, or total of 64,700 AFY, based on Agency TYCIP and not total available wastewater supply. Estimated total available local RW supply by 2040 to be 85,550 AFY based on 2015 WWFMPU flow monitoring.

(2) Baseline WUE of 1,000 AFY already included in the Urdan Demand forecast. Therefore, not included in Supply Table to avoid double counting. Only new WUE in addition to Baseline to be counted in Total Supply.

**Strategy D– Increase Groundwater Recharge Supplies**

Under Strategy D, the IRP Technical Work Group focused on developing water supply interties with neighboring agencies in the watershed. Intermediate levels of water use efficiency/conservation are implemented in the form of two agencies adopting budget-based rates by 2020. In addition, all potential locally produced recycled water would be utilized in this strategy. One water supply portfolio, Portfolio 6, was developed for Strategy 6, with water supplies shown in Table 4-4. A complete list of projects in Portfolio 6 can be found in Appendix 6.

Unmet demands for Portfolio 6 in comparison to the baseline conditions are shown in Figure 4-17. Portfolio 6 meets projected demands through 2040 95% of the time.

Stored water balances are shown in Figure 4-18. As illustrated, groundwater balances begin to accumulate in Portfolio 6 by 2020. Due to variability in wet year supplemental supplies, stored water balances become highly variable and it is unclear whether stored water continues to build or draw down through 2040.

In summary, 75% of the time Portfolio 6:

- Eliminates unmet demand through 2040 due to reduced outdoor water demands from increased water use efficiency/conservation programming
- Has the potential to build stored groundwater through 2040, but the amount varies with climate conditions
- Takes advantage of climate resistant supplies by maximizing recycled water and water use efficiency

**Strategy E – Maximize Imported Water Supplies with Moderate Conservation**

Under Strategy E, the IRP Technical Work Group evaluated how maximizing the purchase of imported water could alleviate pressure on and extend the availability of local water resources. This strategy allows for the purchase of up to 93,300 AFY of imported water to meet urban demand or to be used for groundwater replenishment. In addition, the strategy includes an intermediate level of water use efficiency/conservation in the form of two agencies adopting budget-based rates by 2020.

Two water supply portfolios were developed for Strategy E. The first, Portfolio 7, models the additional water supplies as described above. The second, Portfolio 8, includes all of the supplies of Portfolio 7 plus the addition of maximizing all locally produced recycled water as shown in Table 4-5. A complete list of projects in Portfolios 7 and 8 can be found in Appendix 6.

Unmet demands for Portfolio 7 in comparison to the baseline conditions are shown in Figure 4-19. Portfolio 7 meets projected demands through 2040 across 25% of the model runs.

Stored water balances are illustrated in Figure 4-20. As shown, groundwater balances begin to accumulate in Portfolio 7 by 2020 with the majority of model runs continuing to build stored water through 2040. Due to variability in wet year supplemental supplies, stored water balances become highly variable and unclear

**Figure 4-17:** Unmet Demands of Portfolio 6 Compared to Baseline

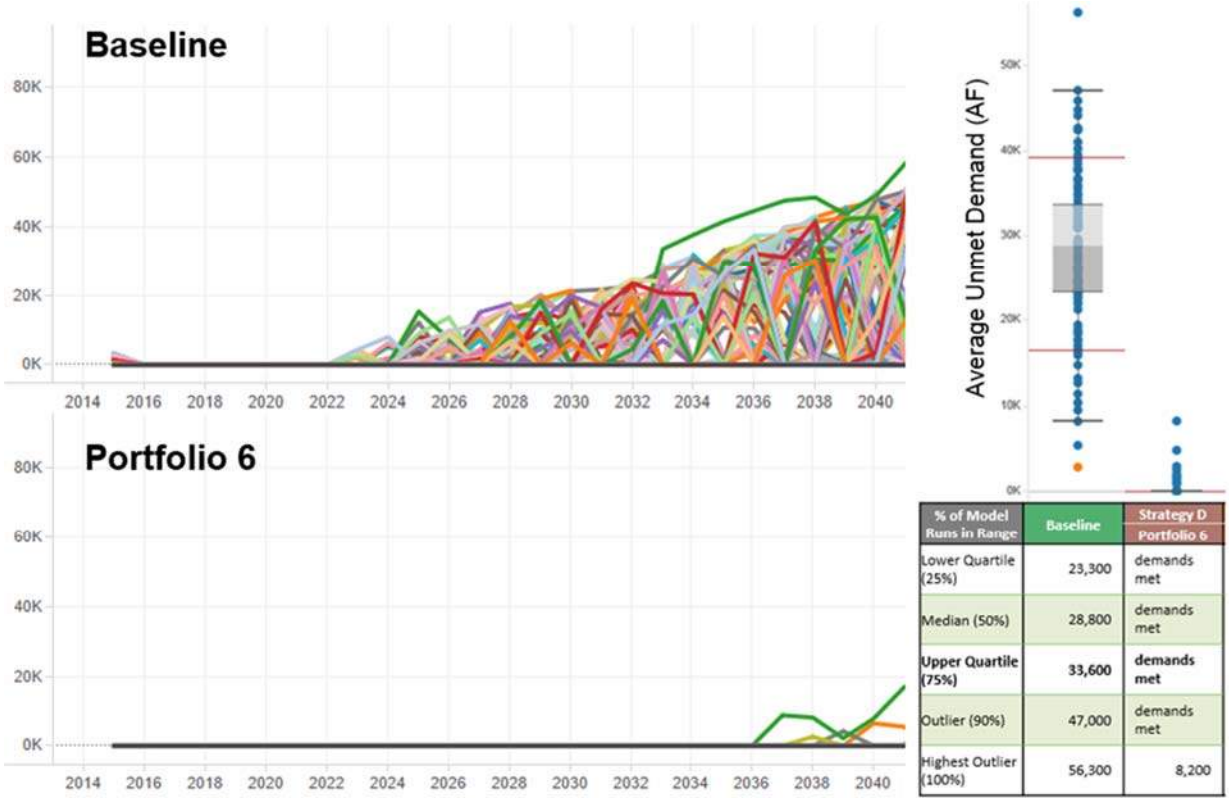


| % of Model Runs in Range | Baseline | Strategy D Portfolio 6 |
|---|---|---|
| Lower Quartile (25%) | 23,300 | demands met |
| Median (50%) | 28,800 | demands met |
| **Upper Quartile (75%)** | **33,600** | **demands met** |
| Outlier (90%) | 47,000 | demands met |
| Highest Outlier (100%) | 56,300 | 8,200 |

**Figure 4-18:** Stored Groundwater Balance of Portfolio 6

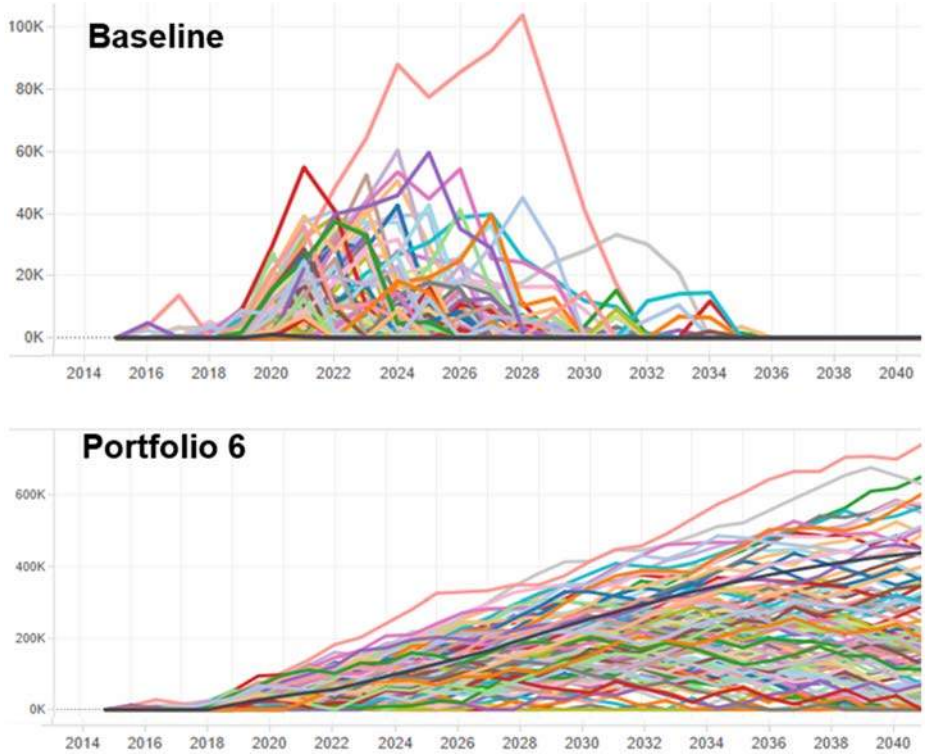

**Figure 4-19:** Unmet Demands of Portfolio 7 Compared to Baseline

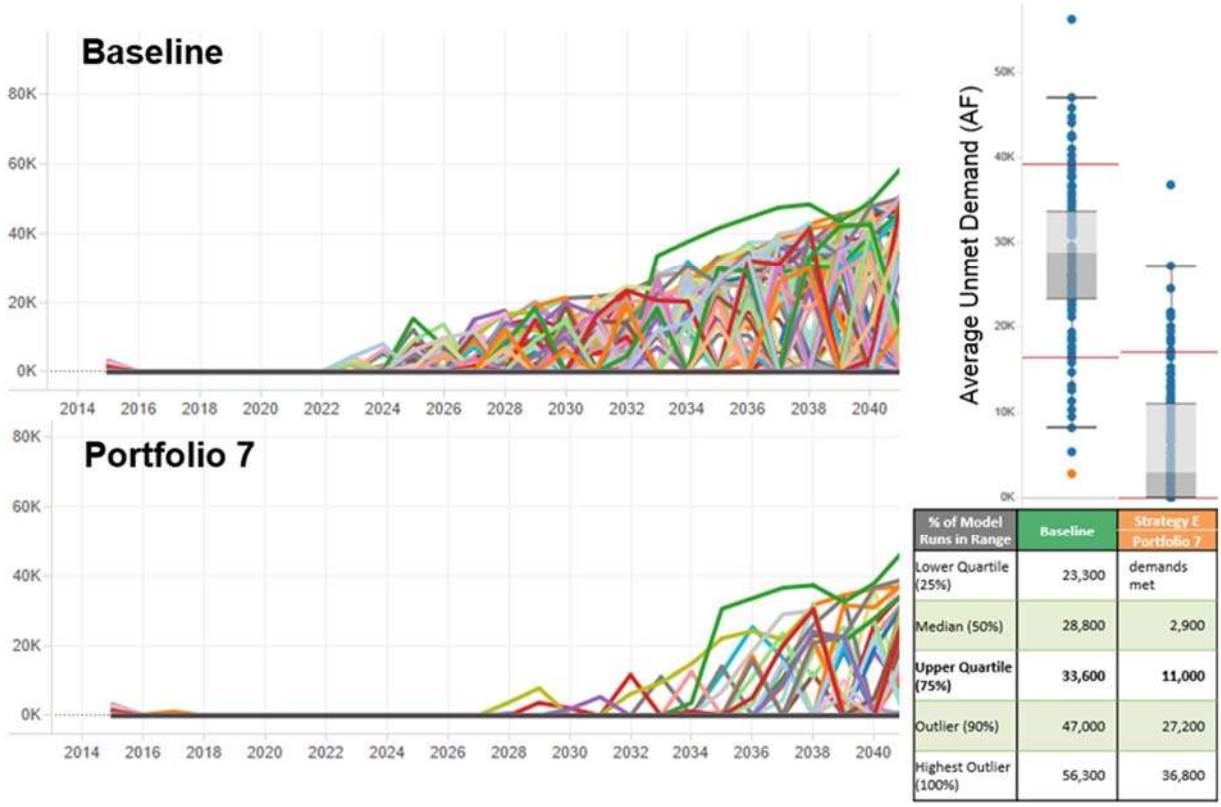


| % of Model Runs in Range | Baseline | Strategy E Portfolio 7 |
|---|---|---|
| Lower Quartile (25%) | 23,300 | demands met |
| Median (50%) | 28,800 | 2,900 |
| **Upper Quartile (75%)** | **33,600** | **11,000** |
| Outlier (90%) | 47,000 | 27,200 |
| Highest Outlier (100%) | 56,300 | 36,800 |

**Figure 4-20:** Stored Groundwater Balance of Portfolio 7

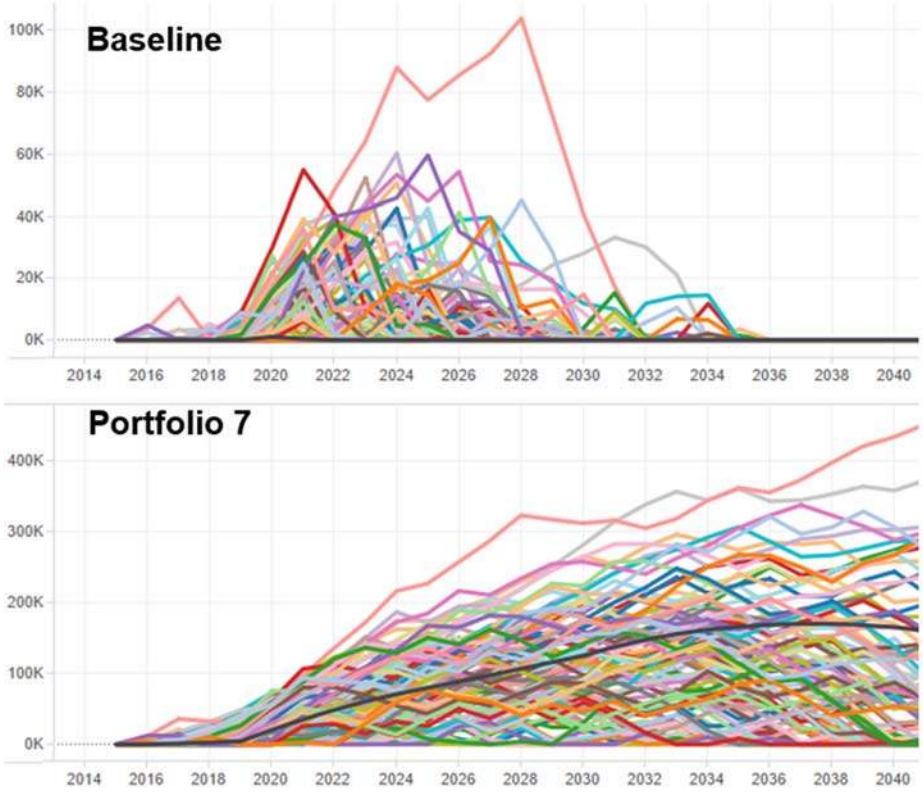

whether stored water continues to build or drawn down through 2040.

Unmet demands for Portfolio 8 in comparison to the baseline model run are shown in Figure 4-21. Portfolio 8 meets projected demands through 2040 100% of the time.

Stored water balances are illustrated in Figure 4-22. As shown, groundwater balances begin to accumulate in Portfolio 8 by 2020 with majority of model runs continuing to build stored water through 2040. Due to variability in wet year supplemental supplies, stored water balances become highly variable and unclear whether stored water continues to build or drawn down through 2040.

In summary, Portfolio 7 and 8:

- Portfolio 7 has a supply shortfall of up to 11,000 AFY under 75% of the climate scenarios
- Portfolio 8 meets demand under 100% of the climate scenarios, this increase in performance is due to the addition of recycled water.
- Both portfolios have the potential to build stored groundwater through 2040, but the amount in storage varies by climate conditions
- After 2030, Portfolio 8 builds stored groundwater under majority of climate scenarios due to the addition of recycled water.

## Table 4-5: Supply Totals for Portfolio 7 & 8

| Supply Type | Baseline | Portfolio 7 | Portfolio 8 |
|---|---|---|---|
| **Chino Groundwater** | 91,300 | - | - |
| **Stormwater** | 6,400 | - | - |
| **Recycled Water** | | - | - |
| Locally Developed(1) | 64,700 | - | 20,800 |
| External Supplies | | - | 7,000 |
| **Chino Desalter** | 17,700 | - | - |
| **Local Surface** | 22,100 | - | - |
| **Non-Chino Groundwater** | 11,600 | - | - |
| **Imported Water** | | - | - |
| MWD | 69,750 | 23,550 | 23,550 |
| Other | | 1,000 | 1,000 |
| **WUE (2)** | 1,000 | 18,500 | 18,500 |
| *add'l supplies subtotal* | | *43,050* | *70,850* |
| **Total Water Supply** | **283,550** | **326,600** | **354,400** |

Notes:

(1) Baseline Supply of 18,700 GWR + 29,000 Direct + 17,000 SAR, or total of 64,700 AFY, based on Agency TYCIP and not total available wastewater supply. Estimated total available local RW supply by 2040 to be 85,550 AFY based on 2015 WWFMPU flow monitoring.

(2) Baseline WUE of 1,000 AFY already included in the Urdan Demand forecast. Therefore, not included in Supply Table to avoid double counting. Only new WUE in addition to Baseline to be counted in Total Supply.

**Figure 4-19:** Unmet Demands of Portfolio 7 Compared to Baseline

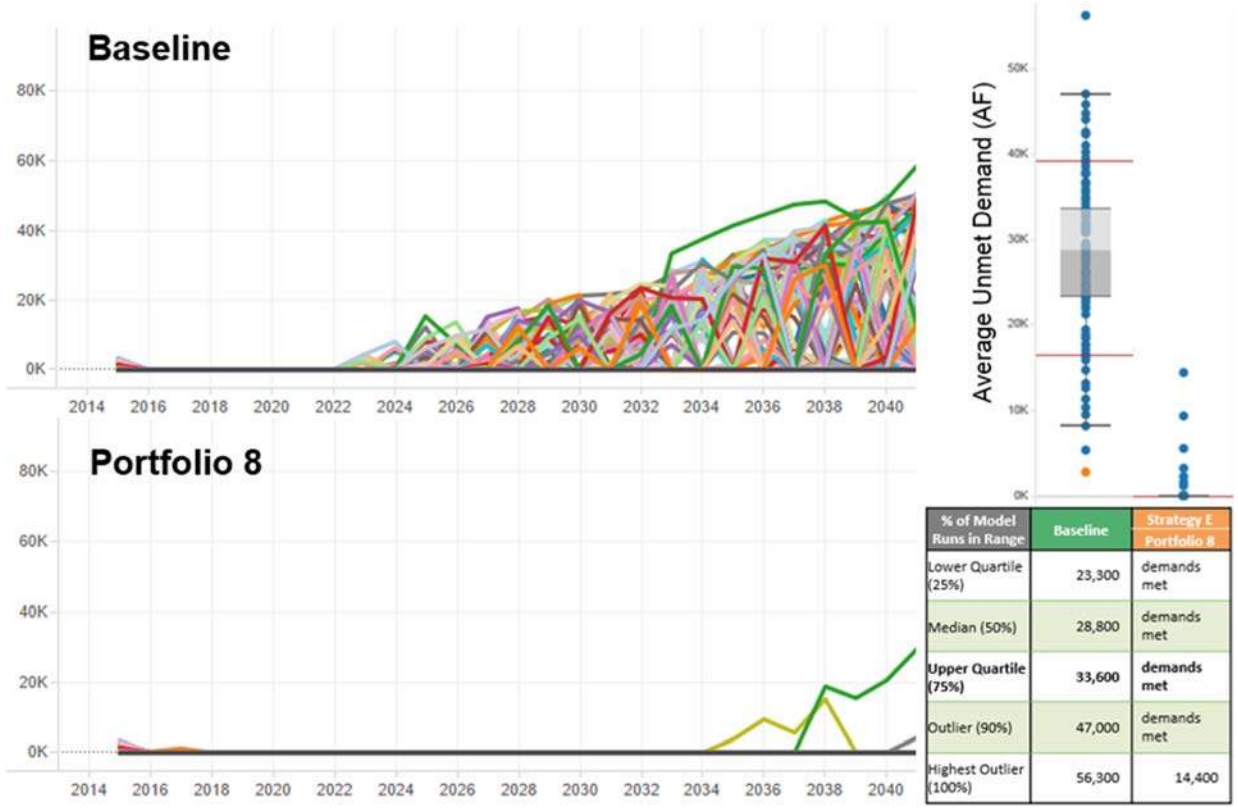


| % of Model Runs in Range | Baseline | Strategy E Portfolio 8 |
|---|---|---|
| Lower Quartile (25%) | 23,300 | demands met |
| Median (50%) | 28,800 | demands met |
| **Upper Quartile (75%)** | **33,600** | **demands met** |
| Outlier (90%) | 47,000 | demands met |
| Highest Outlier (100%) | 56,300 | 14,400 |

**Figure 4-20:** Stored Groundwater Balance of Portfolio 7

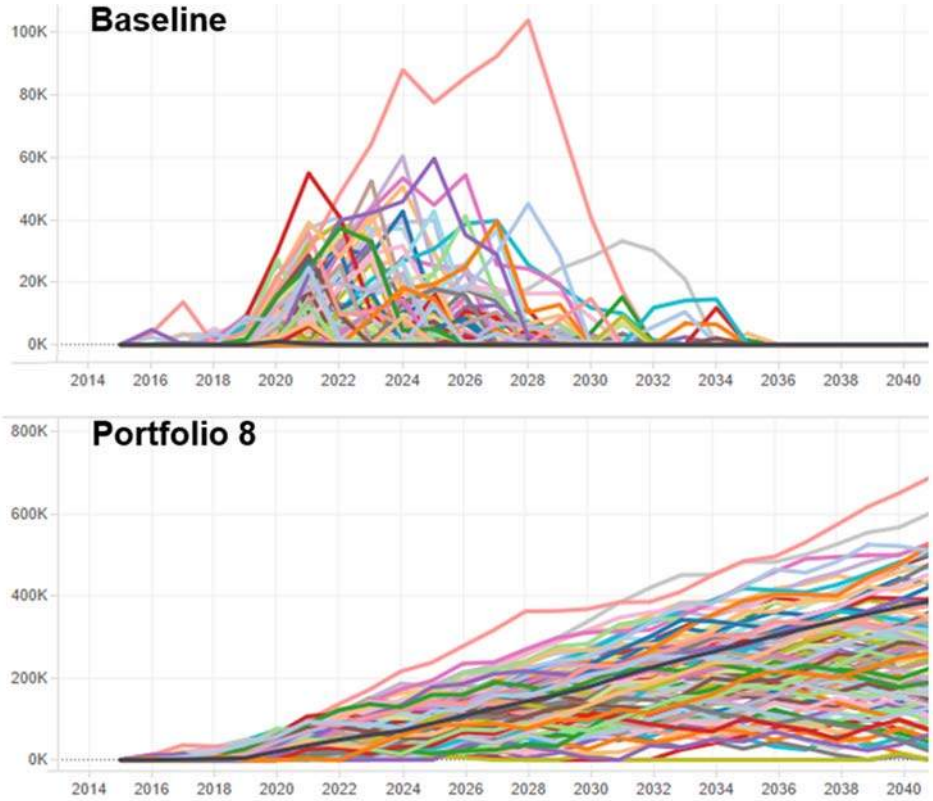

**Low water-use California native plants in a garden setting**

OPEN

# 5. Conclusions & Next Steps

**Core Findings of the 2015 IRP**

**Lessons Learned from the Climate Simulations**

**Final IRP Recommendations and Next Steps**

Strawberry fields near a new development in Ontario.

# Conclusions & Next Steps

With the adoption of the Chino Basin OBMP in 2000, the region embarked on a new era of water management. Over the past 15 years, more than $500 million was invested in the development of local water supplies. This resulted in the expansion of the regional recycled water program as well as in the development of significant groundwater capture, treatment, and storage programs.

As a result, when the record-breaking drought of 2012 began, the region was prepared. The region has had sufficient water supplies available to meet water needs during the drought of the last 4 years without constraining new development or economic growth. These local water resource programs form the foundation for the region's future water resiliency.

Climate change is now creating uncertain conditions and new water management challenges for the region's future. The purpose of the 2015 IRP is to evaluate the resiliency of the region's water resources under climate change and to identify the best strategies for ensuring that the region's future water needs through 2040 can be sustainably met. With the information from the IRP, the region has a roadmap to guide the next 25 years of regional investments in water supply development and management programs.

## CORE FINDINGS

The region adopted goals for the 2015 IRP. In looking to the future, the region wanted a water development and management plan that would accomplish the following:

**Resilience —** Regional water management flexibility to adapt to climate change, economic growth, and any changes that limit, reduce, or make water supplies unavailable.

**Water Efficiency —** Meet or exceed rules and regulations for reasonable water use.

**Sustainability —** Provide environmental benefits, including energy efficiency, reduced green house gas emissions, and water quality improvements to meet the needs of the present without compromising the ability of future generations to meet their own needs.

**Cost Effectiveness —** Supply regional water in a cost-effective manner and maximize outside funding.

To achieve these goals, the IRP evaluated projected water needs and available water supplies through 2040. Future climate change scenarios were then used to "stress-test" an array of water development actions that were organized into "portfolios".

These results form the basis for the IRP's final recommendations. The core findings are:

1. The region's past investments in local water supplies and the diversification of the available water resources have positioned the region well to deal with the future impacts of climate change. If no further actions were taken beyond the currently planned investments in regional supplies and water use efficiency, the region would be able to meet 80-

90% of its projected water needs by 2040 .

2. Portfolios that combined water supply and water efficiency actions yielded the most adaptive strategies for the region. Many portfolios were able to reduce the region's risk of not having sufficient water supplies to meet future needs. Several portfolios were able to dramatically increase the amount of water stored in the Chino Basin. The portfolios that performed the best under the climate change scenarios were:

   - 2B – Maximize recycled water (includes bringing in external recycled water supplies), implement modest water use efficiency, and access supplemental imported water
   - 3A – Maximize recycled water (includes bringing in external recycled water supplies) and implement moderate water use efficiency
   - 3B – Maximize recycled water (includes bringing in external recycled water supplies) and implement high water use efficiency
   - 4 – Maximize supplemental water supplies and recycled water (includes bringing in external recycled water supplies)
   - 5B – Maximize the purchase of MWD water supplies, use of recycled water (includes bringing in external recycled water), and implementation of modest water use efficiency

## LESSONS LEARNED FROM THE CLIMATE SIMULATIONS

**Value of Water Use Efficiency** — The climate scenarios reveal that the addition of very modest levels of water use efficiency (such as 10% reduction in water use) improved the performance of all portfolios and yielded significant benefits the region. The regional benefit is demonstrated through Portfolio 3B in which the actions of two Agencies achieving the State's existing water use efficiency standards results in the region's capacity to increase supplies in groundwater storage while meeting water needs through 2040.

**Value of Recycled Water —** The climate scenarios confirmed that recycled water is the region's most climate resilient water supply because the amount of available water to the region is not impacted by dry years. The regional benefit of maximizing recycled water is demonstrated through the comparison of Strategy B and C in which the use of recycled water enables the region to increase supplies in groundwater storage, especially in combination with increased water use efficiency.

**Value of Supplemental Water —** The climate scenarios highlight the importance of securing supplemental water – surface, imported, and external recycled water supplies – when it is available to build a stronger supply buffer for dry years or when State Water Project availability is limited. The regional benefit of opportunistically securing these external water supplies is demonstrated through the comparison of Portfolios 4, 5, and 6 which enables the region to increase supplies in groundwater storage, especially in combination with increased water use efficiency.

**Value of Increasing Groundwater Storage —** The climate scenarios affirmed the importance of adequate groundwater reserves in addressing future climate uncertainties or catastrophic events, such as a major facility or pipeline break or a loss in supplies. A broader regional benefit is the role that these reserves can play when managed as a regional water bank to enhance water supply reliability within the Santa Ana Watershed and across Southern California. Portfolios 4, 5, 6 and 8 highlight the value to the region of the increased flexibility and resiliency resulting from increased groundwater storage.

## RECOMMENDATIONS & NEXT STEPS

*Plans to protect air and water, wilderness and wildlife are in fact plans to protect man.*

-Stewart Udall

The region adopted the following core recommendations for the 2015 IRP:

- **Continue investment in recycled water** projects to maximize the beneficial reuse.
- **Acquire low TDS supplemental water to enhance groundwater quality** to sustain production and reduce salinity.
- **Implement water use efficiency measures** to reduce current urban demand by at least 10% to enhance water supply resiliency.
- **Strategically maximize the purchase of supplemental water** for recharge or in-lieu when available.
- **Include external supplies**, consisting of exchanges, storage, and water transfers, **strategically in combination with conservation** to augment groundwater recharge, recycled water, **and build storage reserves**. External supplies include surface, imported, and non-potable water.
- **Continue to maximize stormwater recharge projects**, including rainwater capture and infiltration.

These recommendations will be evaluated through a Programmatic Environmental Impact Report in mid-2016. As funding opportunities become available, specific project cost and environmental assessments will be conducted as needed, particularly in relation to the regional benefit of the proposed actions. Phase 2 of the IRP will address additional detailed project level analysis including project scopes, costs, prioritization, and implementation schedule.

## Table 5-1: Summary of How Phase 1 Recommendations Meet the IRP Goals

| Water Use Efficiency | |
|---|---|
| ***Water Efficiency*** | This would help meet rules and regulations for reasonable water use now and in the future. |
| ***Sustainability*** | Savings realized through the implementation of the program extends the groundwater production for future generations. |
| ***Resilience*** | When combined with other programs, such as recycled water, creates storage to accommodate for abnormal and catastrophic events. |

| Recycled Water | |
|---|---|
| ***Water Efficiency*** | This would help meet rules and regulations for reasonable water use now and in the future, especially meeting current state mandates. |
| ***Sustainability*** | As a climate resistant supply, the beneficial use of recycled water when combined with Water Use Efficiency builds reserves within the Chino Basin. |
| ***Resilience*** | When combined with other programs, such as Water Use Efficiency, creates storage to accommodate for abnormal and catastrophic events. |

| Supplemental Water | |
|---|---|
| ***Water Efficiency*** | This would help meet rules and regulations for reasonable water use now and in the future, especially meeting current state mandates. |
| ***Sustainability*** | This would help meet rules and regulations for reasonable water use now and in the future, especially meeting current state mandates. |
| ***Resilience*** | as a climate resistant supply, the beneficial use of recycled water when combined with Water Use Efficiency builds reserves within the Chino Basin. |

| Groundwater Storage | |
|---|---|
| ***Sustainability*** | Storage reserves reduce dependence on climate variable supplies and are not impacted by climate once the supplies are in storage. As a climate resistant supply, the reserves can be used responsibly by future generations without depleting the Chino Basin. |
| ***Resilience*** | When combined with other programs, such as Water Use Efficiency, Recycled Water and Supplemental Water, creates storage to accommodate for abnormal and catastrophic events. |

# Appendices

1. A&N Technical Services Demand Forecast
2. Draft RAND Memo: "Evaluating Options for Improving the Climate Resilience of the Inland Empire Utilities Agency in Southern California"
3. A&N Technical Services Indoor/Outdoor Demands
4. A&N Technical Services Demand Influencing Factors
5. Full IRP Technical Committee Identified Project List
6. Project Lists for Water Resource Strategy Portfolios 1-8

California native plant, *Heteromeles arbutifolia*, displays crimson berries during the winter in the Chino Creek Wetlands and Educational Park.

# Appendix 1:
# A&N Technical Services Demand Forecast

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

# IEUA Long Term Demand Forecast Model User Guide

DRAFT

A & N Technical Services, Inc.

May 20, 2015

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# Abbreviations List

AWE – Alliance for Water Efficiency
CDR – Center for Demographic Research
CII – Commercial-Industrial-Institutional
CVWD – Cucamonga Valley Water District
FIRE – Financial Activity & Real Estate
FWC – Fontana Water Company
GIS – Geographic Information Systems
IEUA – Inland Empire Utilities Agency
IRP – Integrated Resource Plane
MVWD – Monte Vista Water District
MWD – Metropolitan Water District of Southern California
NAICS – North American Industry Classification Systems
RMC – Raines Melton and Carella
RTP - Regional Transportation Plan
SCAG – Southern California Association of Governments
SCS – Sustainable Communities Strategy
SIC – Standard Industrial Classification
TAZ – Traffic Analysis Zone

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# Introduction

This user guide documents the structure and use of the IEUA Long Term Demand Forecast Model.

### Objectives

The model was constructed with the following objectives:

- Forecast demand and demand variability to 2040 in support of the IRP development process.
- Forecast demand as consumption, which we define as all of the consumption within IEUA service area boundaries.
- Base the demand forecast on the latest demographic forecast.
- Utilize a demand forecast method consistent with the MWD demand forecast methods.
- Utilize a conservation forecast method consistent with the AWE Tracking Tool that IEUA currently uses for conservation planning.
- Provide a way to assess the variability of future water demand forecasts to a wide range of scenarios that are built with a range of best-available data sources to accurately depict the effect of future uncertainties.

### Approach

The approach in model development can be characterized as:

1. Acquiring the latest demographic forecast data from the SCAG 2012 RTP for all of the area within IEUA, for its retail water service areas, for its cities, and for its waste water tributary areas. (Enacted by the Center for Demographic Research.)
2. Inputting the demographic forecast into the demand forecast econometric equations to create a base forecast.
3. Calibrating the base forecast to normal demand (weather-normalized, employment-normalized). A separate statistical model of historical IEUA monthly water demand was estimated to develop empirical relationships between weather variation, the business cycle, and IEUA demand variability.
4. Inputting the quantified active and passive conservation forecast from the latest version of the AWE Tracking Tool that IEUA uses for conservation planning.

### Discussion

Econometric Equations. MWD has cooperated with IEUA in the development of the demand forecast methods. Appendix A provides a review of the analytic structure of their long term water demand models.

Demand as Consumption. The base forecast has been calibrated to normalize demand –that is demand conditional on normal weather and normal economic activity. Note the caveat that some pumpers who are not accounted for by retailers may not be included.

Demographics 2035 to 2040. The SCAG 2012 RTP demographics only go out to the year 2035. We utilize a trend method similar to MWD for the years 2035 to 2040.

# Section A: Index

The sections of this document correspond to the worksheets in the Long Term Demand Forecast Model. The following table provides the view of the first worksheet "Index". Clicking on any hyperlink will navigate to that section of the spreadsheet.

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

## IEUA Long Term Demand Forecast Model

### Index of Worksheets

| Sheet Name | Description |
|---|---|
| Index | Index of worksheets for navigation |
| ControlPanel | Make scenario choices and see results. |
| Chart_Data | Arrays of data for charts |
| Model_Base | Base Case Scenario |
| Model_Scenario1 | Scenario 1 |
| Model_Scenario2 | Scenario 2 |
| Model_Scenario3 | Scenario 3 |
| WBBRS_Implementation | Inputs for water budget |
| WUE_Inputs | Inputs for water use efficiency plans |

# Section B: Control Panel

The *Control Panel* worksheet contains the "Scenario Manager" that allows the user to explore up to three different scenarios that use different combinations of future demand drivers. Demand drivers can include both short term drivers—such as one year weather swings--and long term drivers of future water demand such as population or employment growth. Water Use Efficiency drivers are broken out separately and include Water Budget Based Rate Structures and more traditional WUE/conservation programs. For more information on statistical analysis of Short Term IEUA Demand refer to Appendix E.

Each demand driver is discussed in sequence.

| | Scenario Manager |
|---|---|
| **Item** | |
| | Scenario Name |
| Short Term Drivers | Drought Persistence |
| | Economic Cycle |
| | Short-Term Weather |
| Long Term Drivers | Sustainable Communities Housing |
| | Dwelling Units per Land Area |
| | Median Household Income Growth |
| | Long Term Climate Change |
| WUE Drivers | Water Budget Based Rate Structure (WBBRS) |
| | WUE Level |

## Short Term Drivers – 5 Years – 2015 to 2020

- **Drought Persistence** defines how much of recent demand reductions will persist into the future
    - amount of recent reduction that is permanent
        - 0 percent implies that everything will return to the baseline forecast
        - 4.6% percent implies that the 4.6% recent reduction is a permanent lifestyle change

The unexpressed bugbear is what is the "recent reduction"? It is reasonable to assume that one would want to know how much of a raw change in consumption is due to recession or weather. Fortunately IEUA has an empirical basis for such a determination in the short term IEUA demand model that is the source of the 4.6% recent reduction in demand (not attributable to recessionary effects.)

- **Economic Cycle** –The user can specify how much recession or boom could bump demand in a single year using the estimated annual standard deviation of business cycle effects from the short term IEUA demand model.
    - Recession year – demand minus 1 standard deviation from the IEUA short run water demand forecasting model
    - Baseline year—normal business cycle, no change
    - Growth year – demand plus 1 standard deviation from the IEUA short run water demand forecasting model

- **Short Term Weather** – Single wet, single dry, three consecutive dry years (required by UWMP). The effect of weather variation is defined using the estimated annual standard deviation of weather effects from the short term IEUA demand model.
    - Single wet year – demand minus 1 standard deviation from the IEUA short run water demand forecasting model
    - Single dry year – demand plus 1 standard deviation from the IEUA short run water demand forecasting model
    - Multiple dry year – demand plus 1.6 standard deviations from the IEUA short run water demand forecasting model

## Long Term Drivers—2021 - 2050

- **Sustainable Communities Housing –** Derived scenarios explored in the SCAG Sustainable Communities Strategy, 2012 Regional Transportation Plan (p.114).
    - Baseline—future residential growth resembles the past, of which approximately 40% was high density multiple family.
    - More Sustainable—future residential growth resembles is approximately 71% high density multiple family.
    - Max Sustainable—future residential growth resembles is approximately 71% high density multiple family.

- **Dwelling Units per Land Area –**This driver allows another method of exploring effects of potential future densification.
    - Low Growth—future dwelling units per land area becomes less dense (minus one percent per year)
    - Baseline—future residential growth resembles past dwelling units per land area.
    - High Growth—future dwelling units per land area becomes more dense (plus one percent per year)
    - Very High Growth—future dwelling units per land area becomes more dense (plus two percent per year)

- **Median Household Income Growth –**3 alternative assumptions: low, baseline (2012 RTP), and high
    - Low Growth—median household income grows lower (minus one percent per year)
    - Baseline— median household income grows lower at predicted rate
    - High Growth— median household income grows faster than the baseline (plus one percent per year)

- **Long Term Climate Change –** Long term climate change is modeled by using recent GCC model predictions of potential increases in temperature with the short term IEUA demand model estimated temperature elasticity to depict this effect. (http://scenarios.globalchange.gov/report/regional-climate-trends-and-scenarios-us-national-climate-assessment-part-5-climate-southwest)
    - No Change— no long term climate change
    - P50 Median Expected Climate Change— 3.2% by 2040
    - P80 Median Expected Climate Change— 4.3% by 2040

## WUE Drivers

- **Water Budget Based Rate Structure (WBBRS)** are depicted with alterative assumptions of how many agencies will adopt and roll out WBBRS over the next 5 years. These will be modeled as separate activities within the AWE Water Conservation Tracking Tool.
    - Low_Rollout_1 Agency—This results in approximately 10% of Single Family and Irrigation customers being affected within 5 years.
    - Mid_Rollout_2 Agencies--This results in approximately 30% of Single Family and Irrigation customers being affected.
    - High_Rollout_All Agencies-- This results in all Single Family and Irrigation customers being affected.

Note that the Baseline IEUA Demand Model allows a "pure price" effect—how customers would respond to an increase in the real average price of water

- **WUE Level –** the level of WUE Programs being implemented derives from separate account in the AWE Water Conservation Tracking Tool

    - Programmatic (Device-driven) WUE Programs -- Tiers 1, 2, 3 developed as part of the WUE Business Plan.

The Control Panel Worksheet contains drop down boxes to select values of demand drivers. A Collection of assumptions on demand drivers constitutes a demand forecasting scenario. Three scenarios are allowed. By allowing the user to define and control sources of forecast uncertainty in this control panel, one can more quickly develop a feel for which sources of uncertainty matter more than others using the visual feedback of dynamically changing plots of future water demand forecasts.

Each green box contains drop down boxes to choose values for each demand driver.

| Scenario Manager | | Use drop down box to enter values. Do not copy and paste unless you paste values only. | | |
|---|---|---|---|---|
| Item | | Scenario 1: | Scenario 2: | Scenario 3: |
| | Scenario Name | High | Intermediate | Low |
| Short Term | Drought Persistence | Drought_4.6%Permanent | Baseline | Drought_4.6%Permanent |
| Drivers | Economic Cycle | Growth Year | Baseline | Recession Year |
| | Short-Term Weather | Multi-Yr Dry | 1-Yr Dry | 1-Yr Wet |
| Long Term | Sustainable Communities Housing | Baseline (40% MF) | More Sustainable (71% MF) | Max Sustainable (96% MF) |
| Long Term | Dwelling Units per Land Area | Baseline | Baseline | Baseline |
| Drivers | Median Household Income Growth | Baseline | High Growth | Low Growth |
| | Long Term Climate Change | Change 4.3%_P80 | Change 3.2%_P50 | No Change |
| WUE | Water Budget Based Rate Structure (WBBRS) | None | Low_Rollout_10pctSF/Irr | High_Rollout_100All |
| Drivers | WUE Level | Level 3 | Level 2 | Level 3 |

The results can be readily observed in the forecast chart below the control panel.

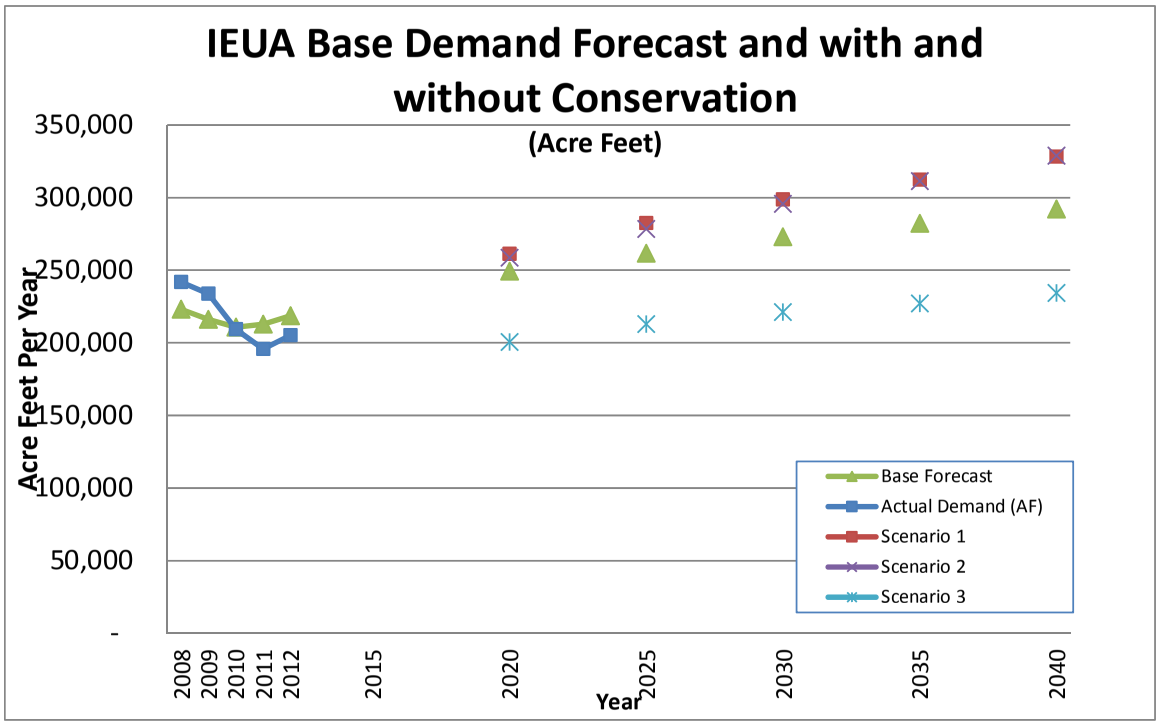


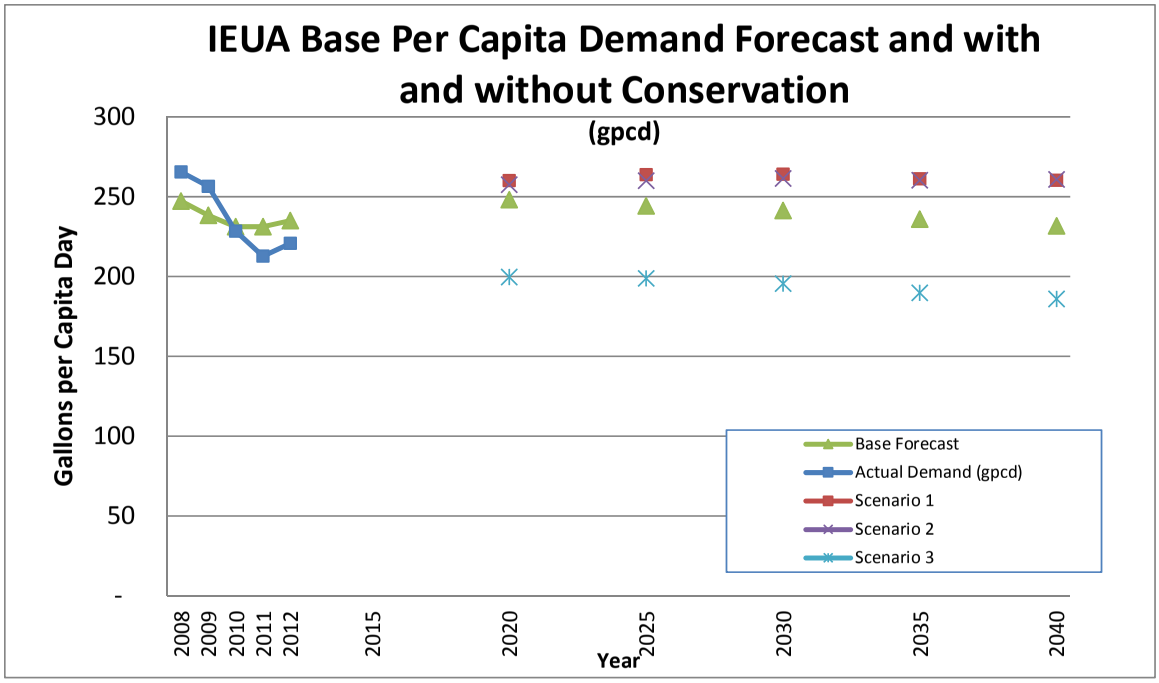

## Section C: Chart Data

This worksheet collects and arranges data needed to create charts on the Control Panel worksheet.

# Section D: Model Base

The Model_Base worksheet contains the following:

- Base Model Parameters
  - Single Family
  - Multi-Family
  - Revised Non-Residential Models
  - Price effect
- Base Model Input - Region Dependent
- Base Model Output - Demand Forecast with Price-effect
- Demand Forecast Model

## *Base Model Parameters*

The Base Model Parameters table contains the econometric parameter estimates that drive the base model forecast. The Base Model Parameters are revised only for major updates and revisions to the model. For everyday policy scenario runs, the Base Model Parameters are left alone, generally, except for possible sensitivity testing. The lag variables refer to statistical effect at different periods of time. For example, Lag 1 indicates the effect that weather in one year has on the subsequent year. The Base Model Parameters table starts in Row 5 of the Model_Base worksheet, and the values are reproduced in Appendix D:

**Single Family Model**. The single family model was estimated as a function of the following:

1. Weather variables that include the amount of rain, rainy days, and temperature— all of which also included lag variables of one period. Rain and temperature included additional lag 2 variables in the model.
2. Socioeconomic variables include marginal price, income, density (housing units per acre), and people (persons per household).
3. Conservation variables include one that indicates mandatory conservation, and another that indicates voluntary conservation.
4. Drought indicates drought during the period.
5. Month variables are used to estimate the effect of month on seasonal demand.

| MODEL PARAMETERS | | | | | | |
|---|---|---|---|---|---|---|
| Single Family Model | | | | | | |
| WEATHER | LAG 0 | LAG 1 | LAG 2 | | | |
| Rain | -0.0482 | -0.0589 | -0.0192 | | | |
| Rainy Days | -0.0088 | -0.0047 | | | | |
| Temperature | 0.4647 | 0.3482 | 0.2942 | | | |
| | | | | | | |
| SOCIOECONOMIC | | | | | | |
| Marginal Price | -0.1947 | | | | | |
| Income | 0.2722 | | MONTH | | | |
| Density | -0.6154 | | January | 0.0233 | July | 0.5785 |
| People | 0.5485 | | February | | August | 0.5603 |
| | | | March | 0.0659 | September | 0.4775 |
| CONSERVATION | | | April | 0.2166 | October | 0.3361 |
| Voluntary | -0.0258 | | May | 0.3799 | November | 0.1993 |
| Mandatory | -0.1033 | | June | 0.5128 | December | 0.1056 |
| | | | | | | |
| DROUGHT | | | | | | |
| | -0.0503 | | | | | |

## Multi-Family Model:

1. Weather variables include the amount of rain and temperature. Rain includes a variable with no lag, and also variables with 1 and 2 lag periods. Temperature includes one variable with 1 lag period.
2. Socioeconomic variables included are the same set as for the single family model.
3. Conservation variables include one that indicates mandatory conservation, and another that indicates voluntary conservation.
4. Month variables included are the same set as for the single family model.

| Multi-Family Model | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **WEATHER** | LAG 0 | LAG 1 | LAG 2 | LAG 3 | | |
| | Rain | -0.0343 | -0.0205 | -0.0069 | | | |
| | Temperature | | 0.1375 | | | | |
| | | | | | | | |
| | **SOCIOECONOMIC** | | | | | | |
| | Marginal Price | -0.1626 | | **MONTH** | | | |
| | Income | 0.3102 | | January | 0.037 | July | 0.2255 |
| | Density | -0.5262 | | February | | August | 0.2353 |
| | People | 0.4496 | | March | 0.0009 | September | 0.1997 |
| | | | | April | 0.0715 | October | 0.1414 |
| | **CONSERVATION** | | | May | 0.1405 | November | 0.1037 |
| | Voluntary | -0.0452 | | June | 0.1951 | December | 0.0858 |
| | Mandatory | -0.1162 | | | | | |

## Revised Non-Residential Model:

1. Weather variables include the amount of rain and cooling degree days, both with no lag, one period lag, and two periods lag.
2. Socioeconomic variables include one for the marginal price of water.
3. Conservation variables include one that indicates mandatory conservation, and another that indicates voluntary conservation.
4. Month variables included are the same set as for the single family model.
5. Employment variables included are Manufacture and Services as it is consistent with current MWD implementation. The model has the structure to accept, in addition, variables for Construction, Transportation, Wholesale, Retail, Finance, and Government employment.

| Revised Non-Residential Model | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **WEATHER** | LAG 0 | LAG 1 | LAG 2 | | | |
| | Rain | -0.05817 | -0.04906 | -0.01905 | | | |
| | Cooling degree Days | 0.01037 | 0.01171 | 0.01200 | | | |
| | | | | | | | |
| | **SOCIOECONOMIC** | | | **MONTH** | | | |
| | Marginal Price | -0.158920 | | January | 0.0005 | July | 0.4163 |
| | | | | February | | August | 0.4308 |
| | **CONSERVATION** | | | March | 0.0425 | September | 0.3713 |
| | Voluntary | -0.06655 | | April | 0.1613 | October | 0.2561 |
| | Mandatory | -0.13011 | | May | 0.2980 | November | 0.1438 |
| | | | | June | 0.3623 | December | 0.0658 |
| **EMPLOYMENT COEFFICIENTS** | | | | | | | |
| Construction | Manufacture | Transportation | Wholesale | Retail | Finance | Services | Government |
| 0.0000 | **0.80297** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | **0.55242** | 0.0000 |

### Price Effect

The price effect parameters reduce the effect of price on demand to account for increasing levels of conservation over time. Customers may have fewer opportunities to conserve if they already have conservation devices and behaviors.

The Constant Price parameter (Cell J79) toggles on and off the use of constant 1990 prices. When prices are constant, there are no price impacts on demand. This parameter could be used for sensitivity testing.

| Price Effect | | | | | |
|---|---|---|---|---|---|
| The price effect is reduced to | Year | Price Effect | Year | Price Effect | |
| account for the effects of price | 2008 | 56% | 2025 | 33% | |
| captured in the End-Use module. | 2009 | 54% | 2030 | 33% | |
| | 2010 | 52% | 2035 | 33% | |
| The original MWD model had one | 2011 | 50% | 2040 | 33% | |
| price effect across the forecast. | 2012 | 48% | 2045 | 33% | |
| This updated model allows for the | 2015 | 42% | 2050 | 33% | |
| effect to be reduced in phases, as | 2020 | 33% | | | |
| End-Use conservation increases. | | | | | |
| Constant Price (effects of 1990 price across all years) Toggle: 1 = use current rate, 0 use 1990 rates | | | | | 1 |

## *Base Model Input*

The Base Model Input tables start in Row 82 of the Model_Base worksheet. These tables contain the demographic input data and the equations to create the demand forecast. The Base Forecast is the forecast under the assumption of no new conservation savings.

### Demographic Inputs

The latest demographic forecast for IEUA was acquired from the SCAG 2012 RTP data base. The Center for Demographic Research (CDR) at California State University, Fullerton utilized geographic information system (GIS) methods to extract data only for the area within IEUA service area boundaries. Detailed analysis of boundaries was conducted to assure that households, population, and employment were properly allocated. Appendix B contains detailed description of the GIS methods used to generate the demographic data set. Appendix D contains demographic input tables. The complete set of demographic inputs is as follows:

1. Population (Total Population, SCAG 2012 RTP data from CDR)
2. Occupied Housing Units (Households, SCAG 2012 RTP data from CDR)
3. Household size (Persons per Household, MWD)
4. Housing Density (Units per Acre, MWD)
5. Median Household Income (MWD)
6. Urban Employment by Sector (SCAG 2012 RTP data from CDR)
7. Marginal Water Price (MWD)

Demographics 2035 to 2040. The SCAG 2012 RTP demographics only go out to the year 2035. We utilize a trend method similar to MWD for the years 2035 to 2040, by applying the compounded average growth rate from 2008 to 2035.

The MWD employment categories are by grouped SIC codes and the SCAG 2012 RTP are grouped by NAICS codes. The following cross walk—developed by consulting SIC and NAICS definitions—was used to group SCAG NAICS into MWD SIC categories.

| MWD (SIC) | SCAG (NAICS) |
|---|---|
| Construction | CONST |
| Manufacturing | MANU, AG |
| Utilities | TRANS, .5*INFO |
| Trade | WHOLE |
| Retail Trade | RET |
| Real Estate | FIRE |
| Service | PROF, EDU, ARTENT, OTHER, .5*INFO |
| Government | PUBADM |

Source: Demographics_Compare_1.xlsx

**Employment Productivity Factors by Year**

1. Construction (MWD)
2. Manufacturing (MWD)
3. Transportation & Utility's Comm (MWD)
4. Wholesale Trade (MWD)
5. Retail Trade (MWD)
6. Finance, Insurance, and Real Estate (MWD)
7. Service (MWD)
8. Government (MWD)

**Drought Restrictions**

The table of drought restrictions contains the set of indicator variables that can be used to create forecast scenarios with conditions of drought and conservation restrictions.

1. Residential (Voluntary/Mandatory)
    a. Single Family
    b. Multi-Family
2. Employment (Voluntary/Mandatory)
3. Hot & Dry

**Model Intercept and Calibration Inputs**

The table labeled Model Intercept and Calibration Inputs contains the parameters to adjust the demand forecast to calibrate to the best estimate of normal weather demand. The table contains adjustments for the single family, multi family, and non-residential sectors. In addition the table below labeled Percentage Other can be used to adjust the other demand sector.

| Model Intercept and Calibration Inputs | | |
|---|---|---|
| **Model Intercept Adjustments** | | |
| | Adjusted | Model Interc |
| Single-Family | 5.10 | 4.83 |
| Multi-Family | 5.31 | 5.66 |
| Non-Residential | 0.86 | 0.94 |
| | | med |
| Model Calibration | 0.96 | |
| SF Site Adjustment | 0.5065 | |
| MF Site Adjustment | -0.1143 | |
| NR Site Adjustment | -0.0441 | |

All of the values in the table are sourced from MWD with the exception of Model Calibration. Since we are calibrating for one agency, we set the Model Calibration parameter by minimizing the difference between the modeled demand and normal demand.

Normal demand was estimated by methods described in the technical memo "Statistical Analysis of Short Term IEUA Demand: Empirical Estimates of Demand Trends." This memo documents the weather-normalization and employment-normalization of time series data provided by IEUA. Water demand was approximated as the sum of delivered supplies. The advantage of using this data source is that the modeling effort was based on consistent system-wide monthly data. And in addition, the monthly water production could be adjusted for changes in storage. Although these models may be described as "demand" models, the data on which the models are estimates would be better described as "supply" measures. To the extent that storage issues are accounted for, the difference between these two constructs should be made small.

We have also provided a second calibration that isolates differences between IEUA and MWD methods. The second calibration option takes actual demand history provided by MWD and then applies the weather and employment effects from our statistical analysis to yield normal demand based on MWD data. The model provides a toggle to switch between the two calibration methods for comparison purposes (Cell G161).

| Minimize Delta to 2012 Normalized Demand by Adjusting Model Calibration in Cell E138 | | | | | |
|---|---|---|---|---|---|
| **Source of Actual Demand** | **Normal Effects Estimation** | **2012 Demand** | **Delta** | **Model Calibration** | **Toggle 1=IEUA** |
| IEUA | A&N | 218,614 | (0) | 0.956 | 1 |
| MWD | A&N | 243,922 | 25,308 | 0.983 | |

To run the calibration, run a Goal Seek in Excel that sets delta in Cell E161 (or E162) to zero by changing Cell E138. (In Excel, click on Data, What If, and then Goal Seek). This method calibrates the model to normal demand in the most recent year from the statistical analysis (2012).

### Adjusted Normal Weather by Month

These values are from MWD and are calculated from tables labeled Actual Climate Data, which contain Median Rainfall, Median Rain Days, Normal Temperature, and Normal Cooling Degree Days.

## *Base Model Output*

The Base Model Output table (Row 171) is the base forecast that includes the price effect, but it does not include new conservation savings. The following is an example of the Base Model Output table for single family multi-family and total acre feet demand (Non-Residential and Other are not shown separately, but they are included in Total demand).

| ACRE-FEET | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Municipal and Industrial Water Demand - Base Forecast with Price Effect (Acre-Feet) | | | | | | | | |
| | | | | by Sector | | | | | |
| | | TOTAL | | Single-Family | | | Multi-Family | | |
| YEAR | Annual | Summer | Winter | Annual | Summer | Winter | Annual | Summer | Winter |
| 2008 | 223,185 | 147,008 | 76,177 | 103,644 | 69,914 | 33,730 | 25,879 | 15,963 | 9,916 |
| 2009 | 216,118 | 142,398 | 73,720 | 103,031 | 69,501 | 33,531 | 25,815 | 15,924 | 9,891 |
| 2010 | 210,826 | 138,957 | 71,869 | 103,262 | 69,656 | 33,606 | 25,979 | 16,025 | 9,954 |
| 2011 | 212,918 | 140,330 | 72,588 | 103,706 | 69,956 | 33,750 | 25,967 | 16,018 | 9,949 |
| 2012 | 218,614 | 144,088 | 74,526 | 106,581 | 71,895 | 34,686 | 26,645 | 16,436 | 10,209 |
| 2015 | 232,443 | 153,406 | 79,037 | 113,054 | 76,315 | 36,740 | 27,994 | 17,268 | 10,726 |
| 2020 | 249,390 | 164,505 | 84,885 | 120,523 | 81,356 | 39,167 | 31,667 | 19,533 | 12,133 |
| 2025 | 263,113 | 173,501 | 89,613 | 126,358 | 85,295 | 41,063 | 34,301 | 21,158 | 13,143 |

## *Demand Forecast Model*

The Demand Forecast Model tables (starting in Row 225) contain the demand forecast equations for each forecast period.

## *Conservation Inputs*

The Conservation Inputs tables (starting in Row 696) contain output from the AWE Tracking Tool that IEUA uses to plan conservation activities.

- Plumbing Code Savings by sector
- Historically Achieved (Retrospective) Active Savings by sector for peak and off-peak sectors

The demand forecast calls for Summer and Winter demand, so we apply the peak and off-peak conservation estimates from the AWE Tracking tool to Summer and Winter respectively.

The demand forecast also calls for the following sectors: Single Family, Multi Family, Non Residential, and Other. The AWE Tracking Tool has Commercial, Industrial, and Institutional separately categorized as well as an Irrigation category. We summed these into the Non-Residential sector on the Conservation_Inputs Worksheet.

Note that refined adjustments to the conservation forecast are possible in the AWE Tracking Tool that accompanies the demand forecast model. For example, past and future conservation activities can be added or updated. Past active conservation is entered on the Model_Base worksheet. The Base

Scenario on the Model_Base worksheet assumes there is not additional future active conservation. Scenarios 1 – 3 each have different plans for future active conservation that are linked to the active conservation input worksheets on Model_Scenario1, Model_Scenario2, and Model_Scenario3 respectively.

Note also that the Conservation_Inputs Worksheet takes the results from the AWE Tracking Tool and calculates the future addition to active and passive conservation beyond what is embedded in 2012. That is the latest year of the statistical normalization analysis based on actual demand (which by definition embodies all past active and passive conservation to date). The calculations for the future additions to active conservation accounts for the fact that active conservation has a defined savings life. Unless the conservation activity is replicated in the AWE Tracking Tool, the conservation effect will expire and result in an increment rather than a decrement to future demand. As a default conditions, the model assumes that future active conservation will be maintained at the same level as the present active savings level. This is a place holder until IEUA has developed the next phase of their conservation planning.

## *Conservation Forecast*

The Conservation Forecast tables (Row 832) contains a forecast that is constructed by starting with the Base Forecast and subtracting out the added passive and active conservation forecast moving forward.

Note that since we have calibrated to a current estimate of normal demand, we subtract out only added future conservation above and beyond what is already embedded in the current estimates. The advantage of this approach is that it allows us to anchor the demand forecast to the best estimate of current measured demand data.

## *Cities Forecast*

The Cities Forecast (Row 937) was created by disaggregating the IEUA forecast using the following method:

- Single Family was disaggregated by the share of single family housing units in the city
- Multi Family was disaggregated by the share of multi-family housing units in the city
- Non Residential was disaggregated by the share of employment in the city
- Other was disaggregated by the share of population in the city

When comparing a disaggregate forecast of base demand at a City level to recent realized water demand, analysts will need to recognize that realized demand does not reflect, in general, normal weather and normal business cycle conditions. When comparing alternative forecasts, analysts should begin by comparing the demand driver measures of population, housing stock, and employment.

## *Retail Service Areas Forecast*

The Retail Service Areas Forecast (Row 1219) was created by disaggregating the IEUA forecast using the following method:

- Single Family was disaggregated by the share of single family housing units in the retail water service area

- Multi Family was disaggregated by the share of multi-family housing units in the retail water service area
- Non Residential was disaggregated by the share of employment in the retail water service area
- Other was disaggregated by the share of population in the retail water service area

When comparing a disaggregate forecast of base demand at a Retail Service Area level to recent realized water demand, analysts will need to recognize that realized demand does not reflect, in general, normal weather and normal business cycle conditions. When comparing alternative forecasts, analysts should begin by comparing the demand driver measures of population, housing stock, and employment.

## *Indoor/Outdoor Forecast*

The Indoor/Outdoor Forecast tables break down total forecasted demand into indoor and outdoor components (Row 1560).

Please refer to Appendix C for documentation on the estimate of Indoor/Outdoor end uses in the IEUA service area.

Two methods were examined to estimate outdoor use across customer classes (See Appendix C). The minimum month method is common practice, yet it ignores outdoor use in climates where there is winter irrigation. The seasonal variation method applies the seasonal variation from dedicated irrigation meters to mixed meter customer classes. This method definitively establishes that the assumption of zero winter irrigation is untenable. The recommended seasonal variation method estimates that 62 percent of total water demand in the IEUA service area is outdoor water use. The model can provide additional estimates of how indoor and outdoor end uses are divided seasonally:

| Summer (April to Oct.) | | Winter (Nov. to March) | |
|---|---|---|---|
| Indoor | Outdoor | Indoor | Outdoor |
| 33% | 67% | 49% | 51% |

Note that this split occurs in the model after the Base and Conservation Forecasts, and thus proportions of indoor and outdoor added active conservation savings will not be reflected. However, for the indoor outdoor analysis of passive conservation savings we performed to assist wastewater design team, we disaggregated passive conservation coming out of the AWE Tracking Tool into indoor and outdoor components. In addition, we disaggregated passive conservation into components derived from new construction and components derived from existing sites.

## Section E: Model Scenarios (1-3)

There are three Model_Scenario worksheets that contain each of three scenarios controlled by the Control Panel. Each of these worksheets is based structurally on the Base_Model worksheet with differences in either data sources or assumptions that comprise the defined scenarios.

## Section F: WBBRS Implementation

The WBBRS_Implementation worksheet contains the calculations and assumptions that underlie the alternative water budget based rate structures and their estimated water savings.

## Section G: WUE Inputs

The WUE_Inputs worksheet contains the planned active conservation savings from the alternative water use efficiency scenarios.

# Appendix A: Review of MWD Demand Model

## *Current econometric model specification*

Metropolitan currently uses a customized version of the IWR-MAIN (Municipal and Industrial) sometimes referred to as MWD-MAIN. This demand model features a separate model for different customer sectors—Single Family Residential, Multifamily Residential, and Commercial, Industrial, and Institutional (CII). Table 1 depicts these key relationships in the MWD demand model. In the residential sector, the forecasts of water demand per dwelling unit are ultimately combined with the forecasts of dwelling units from the regional planning agencies to yield an estimate of total sector water demand. Similarly, in the nonresidential sector, water use per employee is combined with forecasts of employment to yield an estimate of total nonresidential water demand.

**Table 1 MWD Demand Model Variables**

| Demand Sector | Projected Demographic | Dependent Variable | Explanatory Variables |
|---|---|---|---|
| Single Family Residential | Number of Single Family Households | Water use per household | Climate<br>Household Size<br>Income<br>Price and Conservation<br>Housing Density<br>Service Area Location |
| Multifamily Residential | Number of Multifamily Households | Water use per household | Climate<br>Household Size<br>Income<br>Price and Conservation<br>Housing Density<br>Service Area Location |
| Commercial, Industrial, Institutional (CII) | Total Urban Employment | Water use per employee | Climate<br>Price and Conservation<br>Industrial / Service Employment Share |
| System Loss / Unmetered Use | | | Percentage of total use |

Each statistical model will be analytically described.

### Specification of Single Family Residential Model

The systematic form of the single family residential model is:

**Equation 1**

$$\ln \frac{Use_{i,t}}{Unit_{i,t}} = \mu_i + \beta_M \cdot Month_t + \beta_W \cdot Weather_{i,t} + \beta_S \cdot SocioEconomic_{i,t} + \beta_D \cdot Drought_t$$

where $\frac{Use_{i,t}}{Unit_{i,t}}$ is the interpolated quantity of single family water use per occupied single family residence of retail agency *i* within month *t*,
the parameter $\mu_i$ represents a fixed intercept parameter for each agency *i*,
$Month_t$ is an indicator variable for the month,
$Weather_t$ is weather component,
$SocioEconomic_t$ is a set of socioeconomic measures, and
*Drought, are* indicator variables for the presence of drought response.

Taking a closer look at each component, the dependent variable is interpolated to reflect the fact that it is a measure taken from billed consumption data. (This type of "sales" data is required for the customer class specific models of MWDMAIN.) The interpolation was performed as follows:

$$\hat{U}se_t = 0.5 \cdot Use_t + 0.5 \cdot Use_{t-1}; monthly_data$$

$$or$$

$$\hat{U}se_t = 0.25 \cdot Use_t + 0.5 \cdot Use_{t-1} + 0.25 \cdot Use_{t-2}; bimonthly_data$$

The monthly seasonal component includes 11 binary indicator variables, one for each month:

$$Month_t = Jan + Mar + Apr + May + Jun + Jul + Aug + Sep + Oct + Nov + Dec$$

Since 12 monthly indicator variables are perfectly correlated with the intercept, one must be excluded. Identical predictions are generated no matter which month is excluded; only the interpretation of the monthly coefficients changes.

The weather component is comprised of weather measures (monthly rainfall, rainy days in the month, and air temperature) that are transformed logarithmically with their monthly average subtracted away. Contemporaneous values (rain in the same month as use) as well as lagged values are included.

$$Weather_{i,t} \equiv dlR_{i,t} + dlR_{i,t-1} + dlR_{i,t-2} + lRDays_{i,t} + lRDays_{i,t-1} + dlT_{i,t} + dlT_{i,t-1} + dlT_{i,t-2}$$

$$dlR_{i,t} \equiv \ln(Rain_{i,t} + 1) - \overline{\ln(Rain_{i,t} + 1)}$$

$$lRDays_{i,t} \equiv \ln(number_of_rainy_days_in_month + 1)$$

$$dlT_{i,t} \equiv \ln(Temp_{i,t}) - \overline{\ln(Temp_{i,t})}$$

The socioeconomic component for single family residential includes measures of water price, the number of occupied housing units per acre in 1990, the number of persons per household in 1990, and median household income in 1990.

$$Socioeconomic_{i,t} = \ln(real_marginal_price_{i,t}) + \ln(\frac{Units_{i,1990}}{Acres_{i,1990}}) + \ln(\frac{Persons_{i,1990}}{Units_{i,1990}}) + \ln(\frac{\overline{Income_{i,1990}}}{Unit_{i,1990}})$$

Because the estimation period included periods of drought, the model controlled for customer response to agency requested curtailments by using additional, agency-specific, binary indicators for voluntary or mandatory curtailments. An additional indicator for the severe drought period 1990-1992 was also included.

$$Drought_t = IndicatorforVoluntaryConservation_{i,t} + IndicatorforMandatoryConservation_{i,t} + IndicatorforDroughtPeriod(1990-1992)$$

The single family residential model was weighted by single family use/deliveries and estimated using ordinary least squares.

## Multifamily Residential

The systematic form of the multifamily residential model is:

**Equation 2**

$$\ln \frac{Use_{i,t}}{Unit_{i,t}} = \mu_i + \beta_M \cdot Month_t + \beta_W \cdot Weather_{i,t} + \beta_S \cdot SocioEconomic_{i,t} + \beta_D \cdot Drought_t$$

where $\frac{Use_{i,t}}{Unit_{i,t}}$ is the interpolated quantity of water use per occupied multifamily residence of retail agency *i* within month *t*, as in the single family model.

The parameter $\mu_i$ represents a fixed intercept parameter for each agency *i*,
$Month_t$ is an indicator variable for eleven months,
$Weather_t$ is a somewhat simpler weather component,
$SocioEconomic_t$ is a set of socioeconomic measures, and
$Drought_t$ are indicator variables for the presence of drought response.

The components of the multifamily residential model are somewhat simpler.

$$Weather_{i,t} \equiv dlR_{i,t} + dlR_{i,t-1} + dlR_{i,t-2} + dlT_{i,t-1}$$
$$dlR_{i,t} \equiv \ln(Rain_{i,t}+1) - \overline{\ln(Rain_{i,t}+1)}$$
$$dlT_{i,t} \equiv \ln(Temp_{i,t}) - \overline{\ln(Temp_{i,t})}$$
$$Drought_t = IndicatorforVoluntaryConservation_{i,t} + IndicatorforMandatoryConservation_{i,t}$$

The multifamily residential model was weighted by multifamily use/deliveries and estimated using ordinary least squares.

## Nonresidential—CII

For the nonresidential sector, the dependent variable is specified in terms of use per employee.

$$\ln \frac{Use_{i,t}}{Employee_{i,t}} = \mu_i + \beta_M \cdot Month_t + \beta_W \cdot Weather_{i,t} + \beta_S \cdot SocioEconomic_{i,t} + \beta_D \cdot Drought_t$$

In the documentation provided, the *Socioeconomic* component is formed by measures of eight major types of employment (the eight two digit SIC classifications of employment), that are adjusted for changes in productivity. A simpler form of this model is currently being used to generate nonresidential

projections; the working form of the nonresidential equation uses (unadjusted) measures of employment for the two largest employment groupings.

The nonresidential model was weighted by nonresidential use/deliveries and estimated using ordinary least squares.

## *Evaluation of current econometric model specification and estimation*

Any water demand model can be described as deriving from a separation of the explanatory variable into systematic and nonsystematic portions: $Y=f(X) + \varepsilon$.

Dependent Variable: Y

This type of "smoothing" will reduce variation in the original measure and can attenuate the effect of explanatory variables that vary monthly (e.g., weather measures). This said, the use of estimated monthly data represents an improvement over the annual or semi-annual measures used in previous MAIN modeling exercises.

Functional Form of Model: f(X)

The only agency-specific parameter is the intercept. This implies that all slope parameters are restricted to be the same for each agency. Though this may not appear to be a very plausible assumption on the face of it, it does reflect some of the difficult choices between available data and the number of parameters that the modeler attempts to estimate. For example, the current model specification imposes the restriction that the seasonal shape is identical for each agency *i*. Thus, in the single family model, each agency will have January use that is 2 percent above its intercept. Further, the weather effect is identical for each agency. It is implausible that inland agencies would have the same response to weather variation that primarily coastal agencies would have.

The weather effect also imposes the restriction that the percentage response to changes in temperature or rainfall are identical throughout the year. It is implausible that rainfall in June would have the same response as rainfall in January. The specification of the climate effects constitutes an area of potential further refinement.

Estimation Method of Model: $\hat{f}$ and $\varepsilon$

It is well known that fixed effect models, such as those used in estimating equations for MWD-MAIN cannot directly yield slope estimates for explanatory variables that only vary cross-sectionally. Thus, the elasticity's attached to variables that do not vary with time—housing density, persons per household, and median household income—are the result of the weighting procedure and a very small amount of cross-sectionally varying agency data from 1990. The signs of the estimated coefficients are correct but I cannot attest to their validity. However, the magnitude and signs of the estimated parameters are within reasonable ranges, based on my professional experience with demand models in the literature and in use nationally. The model would be improved by the use of modern panel data estimators.

Summary

The current MWD-MAIN models represent an improvement over previous models. The evolutionary path of the MWD-MAIN has several promising alternatives for further improvement.

This review was based on documents, interviews, and data provided by Metropolitan. These included:

*Development of Water Use Models for the Interim #5 Forecast: Memorandum Report*, January 1995, Jack C. Kiefer, Jerzy W. Kocik, Eva M. Opitz, and Benedykt Dziegielewski of PMCL, A report for the Metropolitan Water District of Southern California.

*Development of Water Use Models for the Interim #5 Forecast, ADDENDUM REPORT: MWDMOD Implementation and Calibration*, May 1995, Jack C. Kiefer, Jerzy W. Kocik, Eva M. Opitz, and Benedykt Dziegielewski of PMCL, A report for the Metropolitan Water District of Southern California.

*Development and Verification of Sectorial Water Demand Forecasting Models for the Metropolitan Water District of Southern California,* Draft Report, Feb. 1997, Jack C. Kiefer, Jerzy W. Kocik of PMCL, A report for the Metropolitan Water District of Southern California.

# Appendix B: Demographic Data Development

## *Summary Methodology for Socioeconomic Data Disaggregation to IEUA*

In fall 2013, the Center for Demographic Research (CDR) at California State University, Fullerton was contracted to disaggregate regional socioeconomic data for a water demand model for the Inland Empire Utilities Agency (IEUA). The specific objectives of this project were to develop estimates and projections of the following variables for 2008 and 2010 through 2035 for the cities, Retail Water Service Agencies, and Wastewater Tributaries within IEUA:

1. Total Population
2. Resident/Household Population
3. Group Quarters Population
4. Households (Occupied Housing Units)
5. Single-Family Households
6. Multi-Family Households
7. Employment (Jobs) by sector:
    a. Agriculture & Mining
    b. Construction
    c. Manufacturing
    d. Wholesale
    e. Retail
    f. Transportation, Warehousing, & Utility
    g. Information
    h. Financial Activity & Real Estate (FIRE)
    i. Professional & Business Services
    j. Education & Health Services
    k. Leisure & Hospitality
    l. Other Services
    m. Public Administration

The projections database used is the Southern California Association of Governments (SCAG) 2012-2035 Regional Transportation Plan/Sustainable Communities Strategy (2012 RTP/SCS), which was allocated to the Traffic Analysis Zones (TAZ).

These were developed by first overlaying the city, water agency, and tributary boundaries on the TAZ boundaries using GIS software. Prior to overlaying the geographies, corrections and adjustments were made to the boundaries to minimize errors and differences.
First, a union of TAZ data to each of the three primary geographies (cities, Retail Service Water Agencies, and Wastewater Tributaries) was done using GIS software. TAZs wholly contained within a primary geography were assigned to that geography.
If a TAZ was split by a primary geography, the TAZ data was redistributed between two or more split polygons using a combination of GIS and Microsoft Excel. To distribute population and housing data, an area allocation method was used and then supplemented with a review of the 2010 aerial photo from ESRI. This was done by counting rooftops of single family detached homes. For multi-family housing,

Google Maps were used to find the property information, and then properties were contacted to obtain the number of housing units in the development.

Population was allocated based on the share of housing units in the split compared to the total number for the original TAZ data. For employment, employer point data from D&B was used which contained the address and number of employees by NAICS code. Each 2-digit NAICS code was assigned to one of the SCAG 13 employment sector categories. These were then subtotaled by the split TAZ geographies, and then controlled by sector to the original TAZ totals.

Summary Methodology for Socioeconomic Data Disaggregation to IEUA 2 of 2
Future growth after 2010 was allocated based on aerial review of open land by TAZ where splits occurred. After all population, housing, and employment data were allocated, the data were joined to each primary geography boundary file using GIS software. Each boundary file (shapefile) was quality-checked to verify the split TAZs correctly followed the source data for each geography type. Finally, the split TAZ data were dissolved on each of the primary geographies for cartographic representation. The outcomes were GIS shapefiles with spatially accurate, allocated population, housing, and employment data for three primary geographies: cities, Retail Water Service Agencies, and Wastewater Tributaries.

1. Total Population- Refers to all persons; sum of resident/household population and group quarters population.
2. Resident/Household Population- Resident population refers to the segment of the population that resides in non-institutionalized quarters, such as single and multiple family units, mobile homes, oats, recreational vehicles, and other miscellaneous types of residences. The resident population is synonymous with household population as defined by the California State Department of Finance.
3. Group Quarters Population- Group Quarters Population refers to the population residing in non-institutionalized group quarters, such as college dormitories, military barracks, convalescent hospitals, and shelters.
4. Total Households (Occupied Housing Units) - Occupied Total Dwelling Units and Households are synonymous. Households were calculated by summing Occupied Single-Family Households and Multi-Family Households.
5. Single-Family Households- Occupied single-family detached housing units.
6. Multi-Family Households- All other occupied housing units (includes single-family attached, multi-family, duplex, triplex, fourplex, mobile homes.
7. Employment: Total number of jobs, includes full time and part time jobs by sector
    a. Agriculture & Mining
    b. Construction
    c. Manufacturing
    d. Wholesale
    e. Retail
    f. Transportation, Warehousing, & Utility
    g. Information
    h. Financial Activity & Real Estate (FIRE)
    i. Professional & Business Services
    j. Education & Health Services
    k. Leisure & Hospitality
    l. Other Services
    m. Public Administration

**Boundary Details Documentation**

The IEUA official shape file was available for all IEUA-wide demographics.

To get the city boundaries, CDR utilized the RTP city files which are more accurate than the Census Tiger files.

To get the retail service area boundaries, CDR utilized the city files, and then overlaid the non-city water companies (MVWD, FWC, and CVWD).

Then special corrections were made for the following:

- West Valley Water District (northeastern IEUA area)
- Golden State Water Company (border of Upland and MVWD)
- Power Plant (Reliant Energy Etiwanda)
- IEUA facilities (adjacent to power plant)
- Yellowstone Circle (Chino Hills for water and Chino for wastewater)

To get the wastewater tributaries, RMC developed a boundary file in cooperation with IEUA.

# Appendix C: Indoor/Outdoor End Uses

## *Introduction*

This Appendix documents the estimation of indoor and outdoor water end uses for water demand in the IEUA service area. This estimation of indoor/outdoor end uses is conducted by customer class—single family residential, multi-family residential, and commercial-industrial-institutional (CII). Indoor end uses are of particular interest to planners tasked with designing wastewater systems and recycled water systems because it helps them establish capacity requirements. Both indoor and outdoor use is of great interest to planners tasked with designing Water Use Efficiency (conservation) programs. Although much has already been accomplished with indoor conservation, there is some level of remaining potential for water savings. WUE planners have particular interest in outdoor use because it is generally assumed to be a large share of total use with large remaining potential for savings.

Two methods were used to estimate outdoor use across customer classes. The first method is the minimum month method that has been historically used in the water industry—this method assumes that the minimum month of water demand is 100 percent indoor end uses. Though we believe that this is a counterfactual assumption in the IEUA service area (it assumes exactly zero outdoor irrigation in the winter) we provide estimates using the minimum month method to serve as a point of comparison. The second method develops an estimate of winter irrigation from dedicated irrigation meters and applies this nonzero assumption instead. Termed a "seasonal variation" method, it applies the seasonal variation from dedicated irrigation meters to mixed meter customer classes.

The seasonal variation method estimates outdoor end uses to compose 62 percent of overall water demand in the IEUA service area. (Presuming all water demand in the minimum month to be all indoor end use would estimate outdoor end uses to be 46 percent of total demand.) We recommend using the seasonal variation method because we know the minimum month method systematically underestimates outdoor water use in climates where there is winter irrigation such as IEUA.

## *Data*

The data used are from the California Department of Water Resources, Public Water System Statistics filings for the City of Ontario for the years 1993 to 2012. These data are billing system summaries at the monthly level. Several other retailers provided monthly use summaries; however, these were generated with bimonthly billing cycles. Since different retailers can apportion bimonthly billing into calendar using different methods, we stick to the monthly data generated with monthly billing.

Table 1 shows the average use from 2008 to 2012 summed by customer class. Figure 1 shows the sum of water use by month. The strong seasonal pattern reflects irrigation needs during the characteristic hot and dry summers.

**Table 1 – Average Use, 2008 to 2012, City of Ontario**

| Class | Use (AF) | Percent |
|---|---|---|
| Single Family Residential | 13,993 | 36.7% |
| Multi-family Residential | 5,647 | 14.8% |
| Commercial/Industrial/Institutional | 9,666 | 25.4% |
| Landscape Irrigation | 8,259 | 21.7% |
| Other | 549 | 1.4% |
| Total | 38,114 | 100.0% |

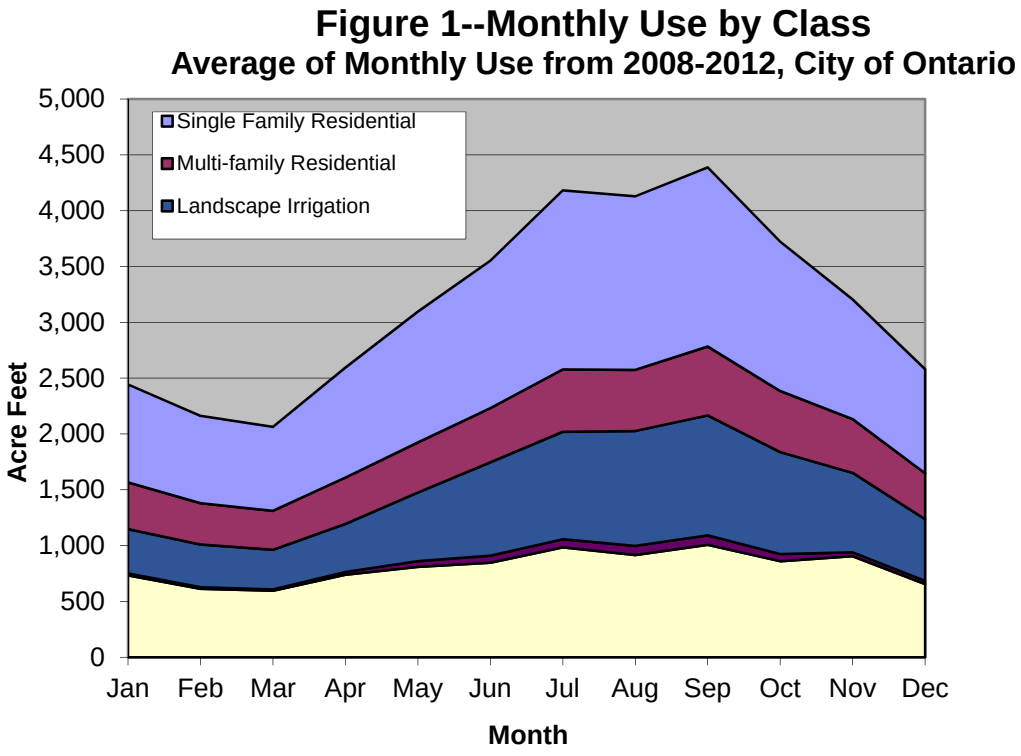


## *Methods*

Outdoor end uses are directly measured by dedicated irrigation meters. Many other types of water meters--single family, multi family, commercial, industrial, and institutional--can be measuring both indoor and outdoor end uses. If not measured or observed directly, planners are forced to rely on inference or judgment. For IEUA, we have conducted two methods to infer outdoor use for all sectors.

### *Minimum Month Method*

The most common method employed to infer outdoor use is to assume the winter use is all indoors. (This assumption may be closer to the truth in wetter or colder climates.) For example, if we calculate winter minimum use times 12 months we have inferred total indoor use for the year. Total use for the year minus indoor use then equals outdoor use.

In Table 2 below, we find that outdoor use calculated with the "minimum winter use is indoor use" method is 46%. The method underestimates outdoor use because there is likely to be at least some winter irrigation in dry climates. Variations on this method include daily accounting and various ways

to define winter minimum. Note the results of this method will vary considerably from year to year; the reader is cautioned when using results from one year for planning
Purposes and we used for this analysis the monthly average over the five most recent years for which data were available (2008 to 2012).

**Table 2 – Percent Outdoor Use**

| Class | Total | Minimum Month Method | Seasonal Variation Method |
|---|---|---|---|
| Single Family Residential | 13,993 | 36% | 58% |
| Multi-family Residential | 5,647 | 26% | 43% |
| Commercial/Industrial/Institutional | 9,666 | 26% | 42% |
| Landscape Irrigation | 8,259 | 100% | 100% |
| Other | 549 | 75% | 100% |
| Total | 38,114 | 46% | 62% |

### *Seasonal Variation Method*

The second method to infer outdoor use consists of employing the pattern of seasonal variation with dedicated irrigation meters and applying it to other sectors with mixed meters. The reasoning is that with dedicated irrigation meters we can measure winter irrigation. Thus, we can observe the relative water use in winter and summer irrigation seasons and calculate a parameter from variables that are observable in other sectors. For example, by calculating the ratio of winter minimum to the seasonal range we have a function of variables observable for sectors other than dedicated irrigation meters. This method will result in a higher estimate of outdoor water use than using minimum month. The method relies on the assumption that the seasonal variation of outdoor use is the same for sites with dedicated meters as for sites with mixed meters.
Due to the variability of landscape water use from year to year, we expect the calculated parameter to vary considerably from year to year. For this reason, we calculated the parameter (ratio of winter minimum to seasonal range) for each year for which we could collect data (1993 to 2012) and took the average. We applied this long term average to the monthly average of the most recent five years of consumption data (2008 to 2012) because of the changing distribution of water use by customer class as more dedicated irrigation meters are employed.

Figure 2 shows the use from irrigation-only meters, with winter irrigation illustrated in blue and the seasonal range in red for one example year (2011).

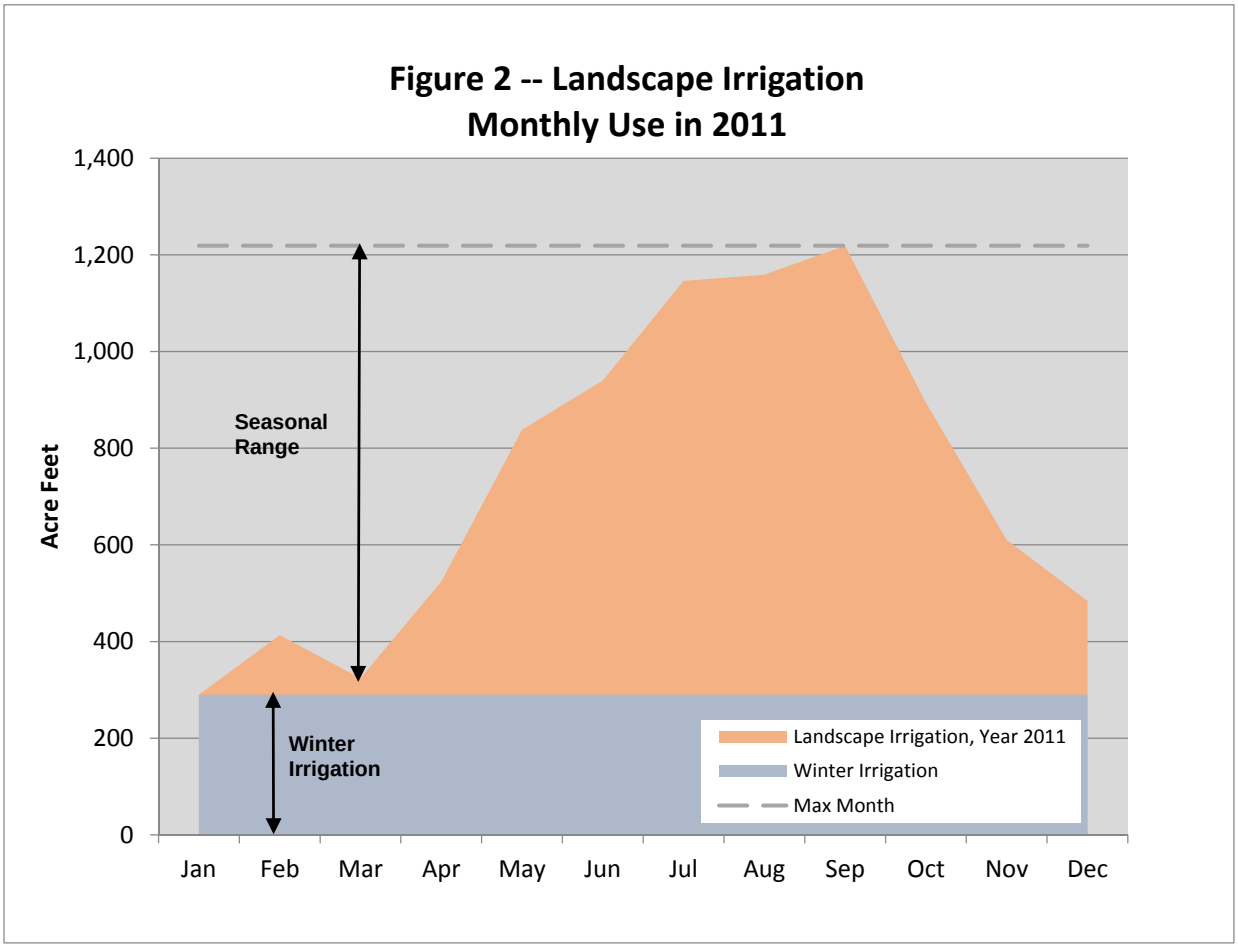


Figure 2 shows winter irrigation is 31% of seasonal range between summer and winter for dedicated irrigation accounts for the year 2011. We repeated this calculation for each year for which were able to collect data (1993 to 2012) and averaged the values to get the result we apply to customer sectors with mixed meters (31%).

Seasonal range and winter minimum are observable for non-irrigation classes. If we assume that winter irrigation is also 31% of seasonal range for the non-irrigation customer categories, we can infer their winter irrigation, and thus indoor and outdoor use.

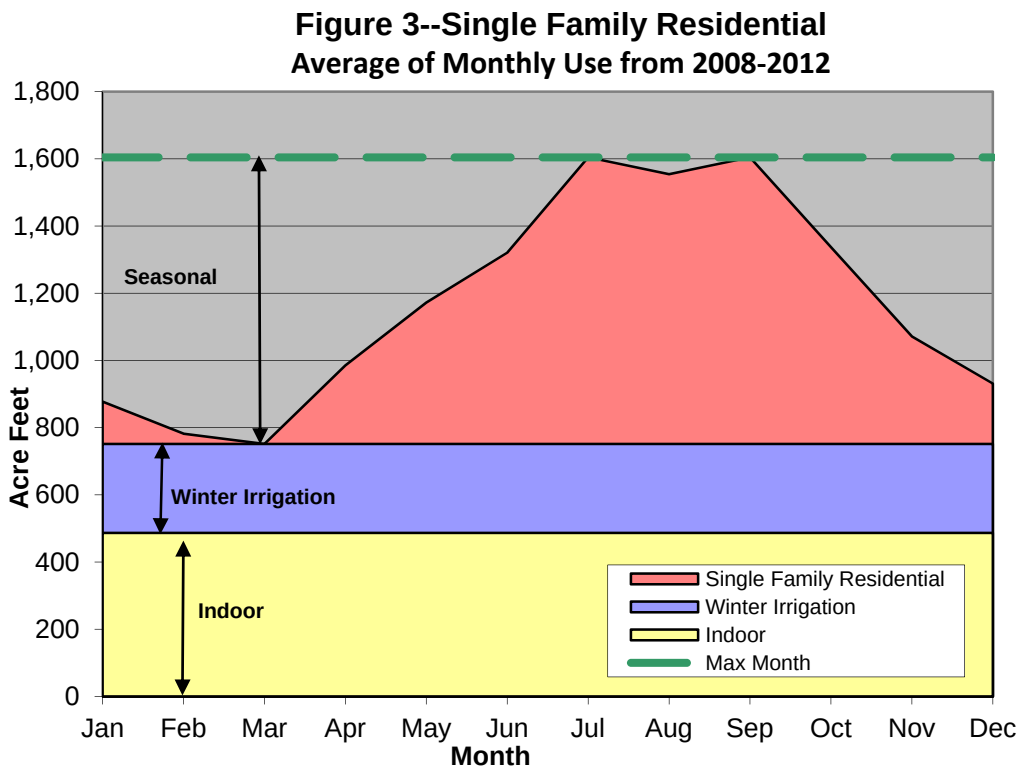


For example, Figure 3 shows winter irrigation calculated as 31% of seasonal range for the single family residential sector. Total outdoor use (red+blue in this graph) is, thus, 58% of total use for the year (red+blue+yellow). In contrast, using the minimum month for the single family sector results in 36% outdoor use (red area only).

## *Recommendations*

The minimum month method systematically underestimates outdoor use and overestimates indoor use. As such we do not recommend using it for planning water resource investments in the IEUA service area. Since it is a commonly used method, it may have comparison value. We can improve the reliability of the results by using a longer time series of data to see how the percent outdoor varies from year to year with changes in weather; however, the systematic estimation bias remains.

We recommend the seasonal variation method over the minimum month in this analysis for IEUA because the seasonal variation method does not contain the same source of systematic bias. We have reliable empirical measures using monthly-billed data from one of the larger retail water service areas.

# Appendix D: Data Inputs

The following table is from the Parameters_Inputs Worksheet and it summarizes the econometrically estimated parameters that drive the demand equations. Section A defines these parameters in detail. These tables show the socioeconomic inputs from the Base_Forecast Worksheet as described in Section B:

**MODEL PARAMETERS**

**Single Family Model**

| | | | | | | |
|---|---|---|---|---|---|---|
| **WEATHER** | LAG 0 | LAG 1 | LAG 2 | | | |
| Rain | -0.0482 | -0.0589 | -0.0192 | | | |
| Rainy Days | -0.0088 | -0.0047 | | | | |
| Temperature | 0.4647 | 0.3482 | 0.2942 | | | |
| **SOCIOECONOMIC** | | | | | | |
| Marginal Price | -0.1947 | | | | | |
| Income | 0.2722 | | **MONTH** | | | |
| Density | -0.6154 | | January | 0.0233 | July | 0.5785 |
| People | 0.5485 | | February | | August | 0.5603 |
| | | | March | 0.0659 | September | 0.4775 |
| **CONSERVATION** | | | April | 0.2166 | October | 0.3361 |
| Voluntary | -0.0258 | | May | 0.3799 | November | 0.1993 |
| Mandatory | -0.1033 | | June | 0.5128 | December | 0.1056 |
| **DROUGHT** | | | | | | |
| | -0.0503 | | | | | |

**Multi-Family Model**

| | | | | | | |
|---|---|---|---|---|---|---|
| **WEATHER** | LAG 0 | LAG 1 | LAG 2 | LAG 3 | | |
| Rain | -0.0343 | -0.0205 | -0.0069 | | | |
| Temperature | | 0.1375 | | | | |
| **SOCIOECONOMIC** | | | | | | |
| Marginal Price | -0.1626 | | **MONTH** | | | |
| Income | 0.3102 | | January | 0.037 | July | 0.2255 |
| Density | -0.5262 | | February | | August | 0.2353 |
| People | 0.4496 | | March | 0.0009 | September | 0.1997 |
| | | | April | 0.0715 | October | 0.1414 |
| **CONSERVATION** | | | May | 0.1405 | November | 0.1037 |
| Voluntary | -0.0452 | | June | 0.1951 | December | 0.0858 |
| Mandatory | -0.1162 | | | | | |

**Revised Non-Residential Model**

| | | | | | | |
|---|---|---|---|---|---|---|
| **WEATHER** | LAG 0 | LAG 1 | LAG 2 | | | |
| Rain | -0.05817 | -0.04906 | -0.01905 | | | |
| Cooling degree Days | 0.01037 | 0.01171 | 0.01200 | | | |
| **SOCIOECONOMIC** | | | **MONTH** | | | |
| Marginal Price | -0.158920 | | January | 0.0005 | July | 0.4163 |
| | | | February | | August | 0.4308 |
| **CONSERVATION** | | | March | 0.0425 | September | 0.3713 |
| Voluntary | -0.06655 | | April | 0.1613 | October | 0.2561 |
| Mandatory | -0.13011 | | May | 0.2980 | November | 0.1438 |
| | | | June | 0.3623 | December | 0.0658 |

**EMPLOYMENT COEFFICIENTS**

| Construction | Manufacture | Transportation | Wholesale | Retail | Finance | Services | Government |
|---|---|---|---|---|---|---|---|
| 0.0000 | **0.80297** | 0.0000 | 0.0000 | 0.0000 | 0.0000 | **0.55242** | 0.0000 |

**Price Effect**

The price effect is reduced to account for the effects of price captured in the End-Use module.

The original MWD model had one price effect accross the forecast.

This updated model allows for the effect to be reduced in phases, as End-Use conservation increases.

| Year | Price Effect | Year | Price Effect |
|---|---|---|---|
| 2008 | 56% | 2025 | 33% |
| 2009 | 54% | 2030 | 33% |
| 2010 | 52% | 2035 | 33% |
| 2011 | 50% | 2040 | 33% |
| 2012 | 48% | 2045 | 33% |
| 2015 | 42% | 2050 | 33% |
| 2020 | 33% | | |

| YEAR | Population | | Occupied Housing Units | | | Household Size (persons / household) | | | Housing Density (units / acre | | Median Household Income (1990 dollars) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | by Sector | | | by Sector | | by Sector | | |
| | TOTAL Population | Household Population | TOTAL | Single-Family | Multi-Family | AVERAGE | Single-Family | Multi-Family | Single-Family | Multi-Family | |
| 2008 | 805,506 | 787,995 | 230,915 | 158,948 | 71,967 | 3.42 | 3.60 | 2.89 | 3.20 | 10.90 | 38.18 |
| 2009 | 809,590 | 792,072 | 232,091 | 159,548 | 72,542 | 3.41 | 3.59 | 2.87 | 3.20 | 10.90 | 37.38 |
| 2010 | 813,695 | 796,170 | 233,272 | 160,150 | 73,122 | 3.42 | 3.60 | 2.88 | 3.20 | 10.90 | 37.06 |
| 2011 | 822,018 | 804,344 | 235,913 | 162,158 | 73,754 | 3.43 | 3.61 | 2.90 | 3.20 | 10.90 | 35.82 |
| 2012 | 830,425 | 812,603 | 238,583 | 164,192 | 74,391 | 3.45 | 3.62 | 2.91 | 3.20 | 10.90 | 37.72 |
| 2015 | 856,168 | 837,890 | 246,777 | 170,447 | 76,337 | 3.40 | 3.58 | 2.87 | 3.20 | 10.90 | 41.70 |
| 2020 | 896,533 | 877,494 | 262,894 | 178,394 | 84,500 | 3.34 | 3.52 | 2.80 | 3.20 | 10.90 | 46.30 |
| 2025 | 955,569 | 935,762 | 279,209 | 187,488 | 91,721 | 3.35 | 3.54 | 2.82 | 3.20 | 10.90 | 46.05 |
| 2030 | 1,009,349 | 988,771 | 295,545 | 197,642 | 97,903 | 3.35 | 3.55 | 2.82 | 3.20 | 10.90 | 45.81 |
| 2035 | 1,067,946 | 1,046,605 | 311,860 | 207,794 | 104,066 | 3.36 | 3.56 | 2.83 | 3.20 | 10.90 | 45.59 |
| 2040 | 1,125,203 | 1,103,084 | 329,707 | 218,366 | 111,422 | 3.33 | 3.54 | 2.81 | 3.20 | 10.90 | 45.43 |
| 2045 | 1,185,530 | 1,162,611 | 348,575 | 229,475 | 119,298 | 3.33 | 3.53 | 2.81 | 3.20 | 10.90 | 45.23 |
| 2050 | 1,249,091 | 1,225,350 | 368,522 | 241,150 | 127,731 | 3.32 | 3.53 | 2.80 | 3.20 | 10.90 | 45.03 |

| YEAR | Urban Employment by Sector (Major SIC Code) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | by Sector | | | | | | | |
| | TOTAL | Construction | Manufacturing | Transportation and Public Utilities | Wholesale Trade | Retail Trade | Finance, Insurance, and Real Estate | Service | Government |
| 2008 | 330,533 | 21,107 | 42,701 | 39,443 | 24,545 | 46,478 | 13,138 | 137,549 | 5,572 |
| 2009 | 315,381 | 17,722 | 38,572 | 38,242 | 22,820 | 44,094 | 12,236 | 132,535 | 8,168 |
| 2010 | 300,924 | 14,880 | 34,843 | 37,077 | 21,217 | 41,833 | 11,396 | 127,704 | 11,974 |
| 2011 | 310,237 | 16,141 | 35,615 | 38,214 | 21,663 | 42,684 | 11,653 | 132,151 | 11,984 |
| 2012 | 319,838 | 17,510 | 36,404 | 39,385 | 22,118 | 43,552 | 11,915 | 136,754 | 11,993 |
| 2015 | 350,461 | 22,351 | 38,878 | 43,121 | 23,542 | 46,265 | 12,738 | 151,545 | 12,022 |
| 2020 | 375,653 | 29,099 | 41,667 | 45,467 | 25,409 | 53,494 | 13,213 | 159,272 | 8,032 |
| 2025 | 422,424 | 33,652 | 42,577 | 50,597 | 27,167 | 57,670 | 14,636 | 184,170 | 11,956 |
| 2030 | 462,518 | 37,906 | 43,051 | 54,733 | 28,720 | 62,530 | 16,165 | 206,525 | 12,888 |
| 2035 | 488,928 | 41,547 | 42,659 | 57,937 | 29,258 | 65,765 | 17,118 | 222,942 | 11,702 |
| 2040 | 525,693 | 47,098 | 42,651 | 62,213 | 30,225 | 70,131 | 17,978 | 243,799 | 13,426 |
| 2045 | 565,222 | 53,391 | 42,643 | 66,804 | 31,225 | 74,787 | 18,881 | 266,607 | 15,403 |
| 2050 | 607,724 | 60,525 | 42,636 | 71,734 | 32,257 | 79,752 | 19,829 | 291,549 | 17,672 |

# Appendix E: Statistical Analysis of Short Term IEUA Demand: Empirical Estimates of Demand Trends

## Introduction

For purposes of quantifying trends in IEUA Demand, one must estimate how water demand responds to predictable variations. There are numerous forces that drive demand growth in the long-term. These include changes in land use patterns and household size, growth in personal income and employment, and price and conservation. Weather conditions tend to make water demand go up or down in any given year.

For use in the Integrated Resource Plan and for calibrating long term water demand forecasts, the IEUA needs depiction of the predictable forces that cause demand to vary in the short-term so as to clarify remaining long term trends. This memorandum describes an empirical model developed to predict daily demand fluctuations. By nature, these models cannot replace long-term predictive models of water demand. However, by providing a better understanding of short-term demand variations, these models can clarify the direction of long term trends. The explanatory variables in this short-term model include:

- Deterministic functions of calendar time, including
  - The seasonal shape of demand
- Weather conditions
  - measures of maximum daily temperature, contemporaneous and time of year
  - measures of rainfall, contemporaneous and time of year
- Measures to control for long-term growth in demand
  - Trend
  - Employment growth different than trend
  - Customer response to voluntary curtailment in 2013 and 2014

The model documented here is used to create high resolution depictions of how variations in weather and the business cycle affect water demand over a wide range of conditions. These model-estimated weather and employment effects can then be used to (1) normalize observed demand and (2) serve as the basis for defining near term variability of demand and any planning dependent upon the trajectory of long term demand.

## Data and Methods

### *Data*

Water demand in the IEUA service area is approximated in this analysis as the sum of delivered supplies. This modeling effort used consistent system-wide monthly data—that is monthly water production adjusted for changes in storage. The reader is urged to keep in mind that though these models maybe described as “demand” models, the data on which these models are estimated would be better described as “supply” measures. To the extent that storage issues can be accounted for, the difference between these two constructs should be made small. Nonetheless, the issue remains.

The second major issue with using production data is the level and magnitude of noise in the data. The data generating mechanism for recording production can change over time as flow meters age or are replaced. Constructing a consistent time series requires matching two different—and possibly inconsistent—time-series. The records of flow can also embed non-ignorable meter miss-measurement.

To keep data inconsistencies from corrupting statistical estimates of model parameters, this modeling effort employed a sophisticated range of outlier-detection methods and models.

# Specification

## *A Model of Per Capita Water Demand*

The model for IEUA per capita water demand seeks to separate several important driving forces. In the short run, changes in weather can make demand increase or decrease in a given year. In the long run, increased population can drive demand higher. Strong regional economic growth can increase water demand through additional commercial or industrial water use. In addition, a rising economic tide can broadly increase personal income levels and economic activity can encourage or discourage additional population growth. Changes in water rates will change the relative attractiveness of water conservation.

These models are estimated at an aggregate level and, as such, should be interpreted as a condensation of many types of relationships — meteorological, physical, behavioral, managerial, legal, and chronological. Nonetheless, these models depict key short-run and long-run relationships and should serve as a solid point of departure for improved quantification of these linkages.

## *Systematic Effects*

This section specifies a water demand function that has several unique features. First, it models seasonal and climatic effects as continuous (as opposed to discrete monthly, semi-annual, or annual) function of time. Thus, the seasonal component in the water demand model can be specified on a continuous basis, then aggregated to a level comparable to measured water use (e.g. monthly). Second, the climatic component is specified in "difference" form as a similar continuous function of time. The climate measures are thereby made independent of the seasonal component. Third, the model permits interactions of the seasonal component and the climatic component. Thus, the season-specific response of water use can be specific to the season of the year.

The general form of the model is:

**Equation 2**

$$PerCapitaWaterUse_t[GPCD] = \frac{Use_t}{Pop_t} = f(S_t + C_t + T_t)$$

where ***Use*** is the volumetric quantity of retail water use within time *t*, $\boldsymbol{S_t}$ is a seasonal component, $\boldsymbol{C_t}$ is a climatic component, and $\boldsymbol{T_t}$ is the trend component of GPCD Demand. The function *f* is the functional form of the connection between per capita water use and its explanatory components. Each of these components is described below.

**Seasonal Component:** A monthly seasonal component could be formed using monthly dummy variables to represent a seasonal step function. Equivalently, one may form a combination of sine and cosine terms in a Fourier series to define the seasonal component as a continuous function of time.[1] The following harmonics are defined for a given day *T*, ignoring the slight complication of leap years:

[1] The use of a harmonic representation for a seasonal component in a regression context dates back to *Hannan* [1960]. *Jorgenson* [1964] extended these results to include least squares estimation of both trend and seasonal components.

**Equation 3**

$$S_t \equiv \sum_{1}^{6}\left[\beta_{i,j}\cdot\sin\left(\frac{2\pi\cdot jT}{365}\right)+\beta_{i,j}\cdot\cos\left(\frac{2\pi\cdot jT}{365}\right)\right]=Z\cdot\beta_S$$

where $T = (1,...365)$ and $j$ represents the frequency of each harmonic. Because the lower frequencies tend to explain most of the seasonal fluctuation, the higher frequencies can often be omitted with little predictive loss.

The percentage effect of the seasonal component on normal demand is given by:

**Equation 3**

$$S_t\% = \left[\frac{\exp(\widehat{Y}_t - T_t) - \exp(\widehat{Y}_t - T_t - S_t)}{\exp(\widehat{Y}_t - T_t - S_t)}\right]$$

where $\widehat{Y}$ is the predicted demand.

**Climatic Component:** The model incorporates two types of climate measures into the climatic component–rainfall and maximum daily air temperature.[2] The measures of temperature and rainfall are then logarithmically transformed to yield:

**Equation 4**

$$R_t \equiv \ln\left[1+\sum_{t=T}^{T_d} Rain_t\right], T_t \equiv \ln\left[\sum_{t=T}^{T_d}\frac{T_t}{d}\right]$$

Though this model extends to monthly measures while for daily measures, $d$ takes on the value of one. Because weather exhibits strong seasonal patterns, climatic measures are strongly correlated with the seasonal measures. In addition, the occurrence of rainfall can reduce expected temperature. To obtain valid estimates of a constant seasonal effect, the seasonal component is removed from the climatic measures by construction.

Specifically, climatic measures are constructed as a departure from their "normal" or expected value at a given time of the year. The expected value for rainfall during the year, for example, is derived from regression against the seasonal harmonics. The expected value of the climatic measures ($\hat{\boldsymbol{C}}=\boldsymbol{Z}\cdot\beta_C$) is subtracted from the original climatic measures:

**Equation 5**

$$C_t \equiv (R_t - \widehat{R}_t)\cdot\beta_R + (E_t - \widehat{E}_t)\cdot\beta_T$$

The climatic measures in this deviation-from-mean form are thereby separated from the constant seasonal effect.[3] Thus, the seasonal component of the model captures all constant seasonal effects, as it

[2] Specifically it uses the daily temperature and the total daily precipitation at the Ontario NOAA station summarized to a monthly level.

[3] The logarithmic transformation of the original climate variable implies that the seasonal mean climate effect is a geometric mean. Because the model is estimated on the logarithmic scale the departure-from-mean climatic effects would be more accurately termed departure-from-median. See *Goldberger* [1968].

should, even if these constant effects are due to normal climatic conditions. The remaining climate measures capture the effect of climate departing from its normal pattern.

The model can also specify a richer texture in the temporal effect of climate than the usual fixed contemporaneous effect. Seasonally-varying climatic effects can be created by interacting the climatic measures with the harmonic terms. In addition, the measures can be constructed to detect lagged effects of climate, such as the effect of rainfall a month ago on today's water demand.

The percentage effect of the climate on normal demand is given by:

**Equation 6**

$$C_t\% = \left[ \frac{\exp(\hat{Y}_t - T_t) - \exp(\hat{Y}_t - T_t - C_t)}{\exp(\hat{Y}_t - T_t - C_t)} \right]$$

where $\hat{Y}$ is the predicted demand.

**Trend Component :** For the IEUA Demand model, a deterministic annual trend term was used as the primary determinant of trends in per capita water demand in the long term.

**Equation 7**

$$\mathbf{T}_t \equiv AnnualTrend_t \cdot \beta_T + (\ln EmpDetrended) \cdot \beta_E$$

Thus the annual long term trend in IEUA Demand from 2002-2012 on is captured by $\beta_T$ while the effects of the business cycle are captured by the departure of employment from its long term trend.

## *Stochastic Effects*

To complete the model, we must account for the fact that not every data point will lie on the plane defined by Equation **(1)**. This fundamental characteristic of all systematic models can impose large inferential costs if ignored. Misspecification of this "error component" can lead to inefficient estimation of the coefficients defining the systematic forces, incorrect estimates of coefficient standard errors, and an invalid basis for inference about forecast uncertainty. The specification of the error component involves defining what departures from <u>pure</u> randomness are allowed. What is the functional form of model error? Just as the model of systematic forces can be thought of as an estimate of a function for the "mean" or expected value, so too can a model be developed to explain departures from the mean—i.e., a "variance function" If the vertical distance from any observation to the plane defined by **(1)** is the quantity $\boldsymbol{\varepsilon}$, then the error component is added to Equation **(1)**:

**Equation 8**

$$\ln \frac{Use}{Pop} = \mathbf{f}(\mathbf{S}_t, \mathbf{C}_t, \mathbf{T}_t) + \varepsilon$$

In an Ordinary Least Squares (OLS) Regression, the error term is assumed to be distributed normally with a constant variance.

$$\varepsilon \sim N(\mu_\varepsilon, \sigma_\varepsilon)$$

In the estimated retail demand model below, the variance is allowed to be nonconstant and separately modeled as an empirical variance (or link) function.

$$\sigma_{\varepsilon} = g(\mathbf{S}_t, \mathbf{C}_t, \mathbf{T}_t)$$

A variance function was estimated using the methods of Carroll and Ruppert as a two stage weighted least squares regression[4]. Briefly described, the first stage uses an OLS regression of the mean function (Equation 7) to derive a consistent estimate of the estimated error. The absolute value of the estimated error is used to estimate the variance function. The inverse of the predicted variance is used to weight the regression of the mean function in the second stage.

## *Estimated Per Capita Demand Model for IEUA*

Table C1 presents the estimation results for the model of mean monthly per capita demand in IEUA. The independent variables 1 to 8—made up of the sines and cosines of the Fourier series described in Equation 2—are used to depict the seasonal shape of daily retail water demand (that is, $Z \cdot \widehat{\beta}_S$); this is the shape of demand in a normal weather year. This seasonal shape is important in that it represents the point of departure for the estimated climate effects (expressed as departure from what is expected in an average month).

The estimated weather effect is specified in "departure-from-normal" form. Variable 9 is the departure of monthly precipitation from the average precipitation for that month in the season. (Average seasonal precipitation is derived from a regression of monthly precipitation on the seasonal harmonics—exactly equal to monthly precipitation averaged over all years in the record.) Temperature is treated in an analogous fashion (Variables 11). The contemporaneous weather effect is interacted with the harmonics (Variables 10, 12, and 13) to produce a seasonal shape to both the rainfall and the temperature elasticities. Thus, departures of temperature from normal produce the largest percentage effect in the spring. Similarly, departures from normal rainfall produce a larger effect upon daily demand in the summer than in the winter. The lagged effect of temperature can also be detected further in time than rainfall—a detectable effect one month long.

The departure of employment growth from trend (13) and the annual trend term (variable 14) and comprise the long term determinants of demand.[5] Indicators ("dummy") variables for the years 2013 and 2014 were used to detect any customer response to the drought-induced calls for voluntary demand curtailment. (These measure the annual change in demand that was surprising: not explainable due to weather variation, recession, or ongoing trends in demand.) The constant term (17) describes the intercept for this equation.

---

[4] See Carroll, R. J. and Ruppert, D. (1988). *Transformation and Weighting in Regression*. Chapman and Hall, London.

[5] A variation of the model was used to test for a detectable trend in the seasonal shape of demand by including an interaction of the trend term and the annual harmonic.

**Table 1-- Estimated IEUA Per Capita Demand Model (Mean Function)**

| Estimated IEUA Demand Model (Mean Function)<br>Ln IEUA Per Capita Use (Gl. Per Capita Per Day) | | |
|---|---|---|
| Independent Variable | **Coefficient** | **Std. Error** |
| 1. First Sine harmonic, 12 month (annual) frequency | -0.10278 | 0.00714 |
| 2. First Cosine harmonic, 12 month (annual) frequency | -0.37889 | 0.00642 |
| 3. Second Sine harmonic, 6 month (biannual) frequency | -0.00489 | 0.00688 |
| 4. Second Cosine harmonic, 6 month (biannual) frequency | -0.00438 | 0.00723 |
| 5. Third Sine harmonic, 4/12 frequency | -0.00510 | 0.00849 |
| 6. Third Cosine, 4/12 frequency | 0.02987 | 0.00699 |
| 7. Fourth Sine harmonic, 3 month (quarterly) frequency | 0.01300 | 0.00857 |
| 8. Fourth Cosine, 3 month (quarterly) frequency | 0.02357 | 0.00820 |
| 9. Contemporaneous Rainfall Deviation [(ln (Rain+1)) – Monthly mean] | -0.13102 | 0.02219 |
| 10. Interaction of contemporaneous rain with annual cosine harmonic | -0.04787 | 0.02701 |
| 11. Contemporaneous deviation from mean ln (temperature) in the month | 0.87760 | 0.12878 |
| 12. Interaction of contemporaneous temperature deviation with annual sine harmonic | 0.14438 | 0.16733 |
| 13. Deviation of ln(Employment in San Bernardino County) from Trend | 0.96640 | 0.09765 |
| 14. Overall Annual Trend 2003-2014 | -0.00147 | 0.00207 |
| 15. Indicator for 2013 | -0.02098 | 0.01367 |
| 16. Indicator for 2014 | -0.04618 | 0.02613 |
| 17. Intercept | 5.46346 | 0.01788 |
| Obs | 139 | |
| R^2 | 0.9760 | |
| Root Mean Squared Error | 0.03816 | |
| Time period (Fiscal Years) | 2003-2014 | |

Figures 1 and 2 plot Actual IEUA Per Capita Demand against the model predictions ($\hat{Y}$) and reveals a very tight fit of predictions to actual.

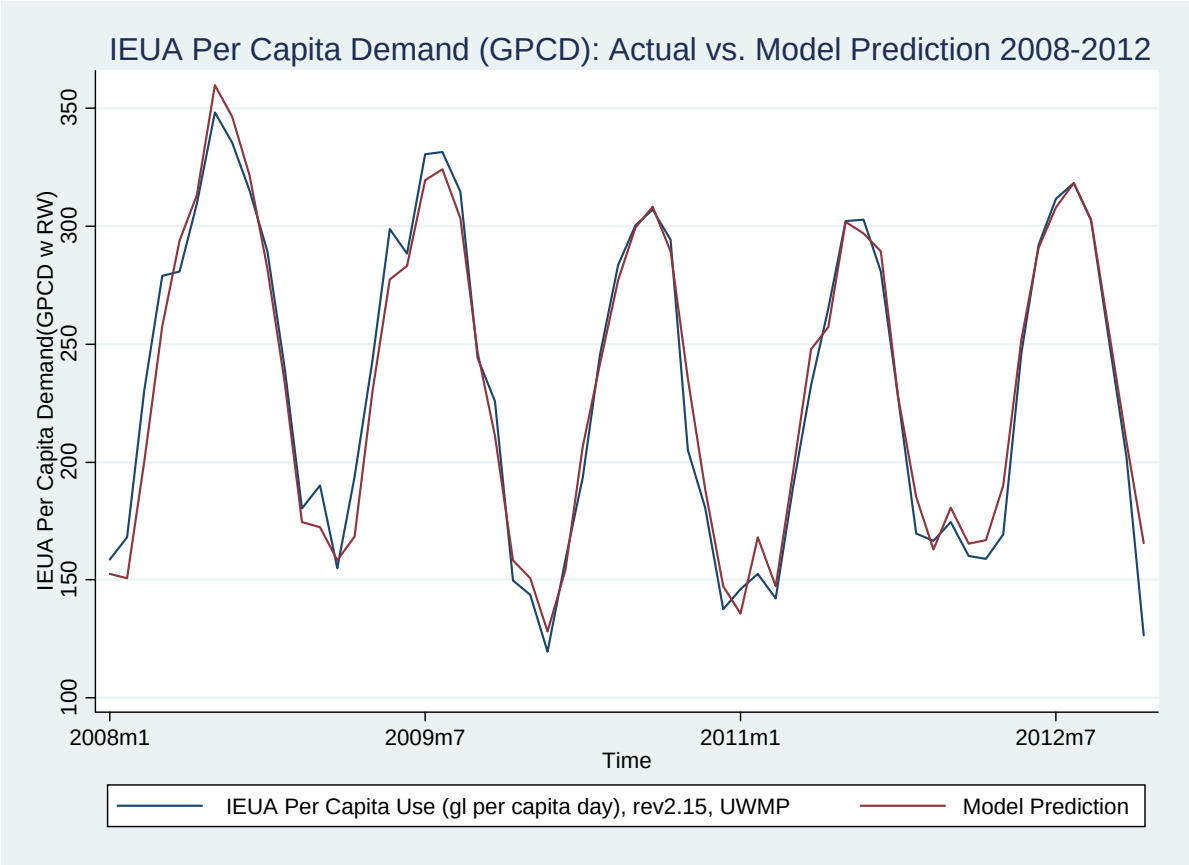


**Figure 1-- IEUA Per Capita Demand (GPCD): Actual vs. Model Prediction , FY 2008-2012**

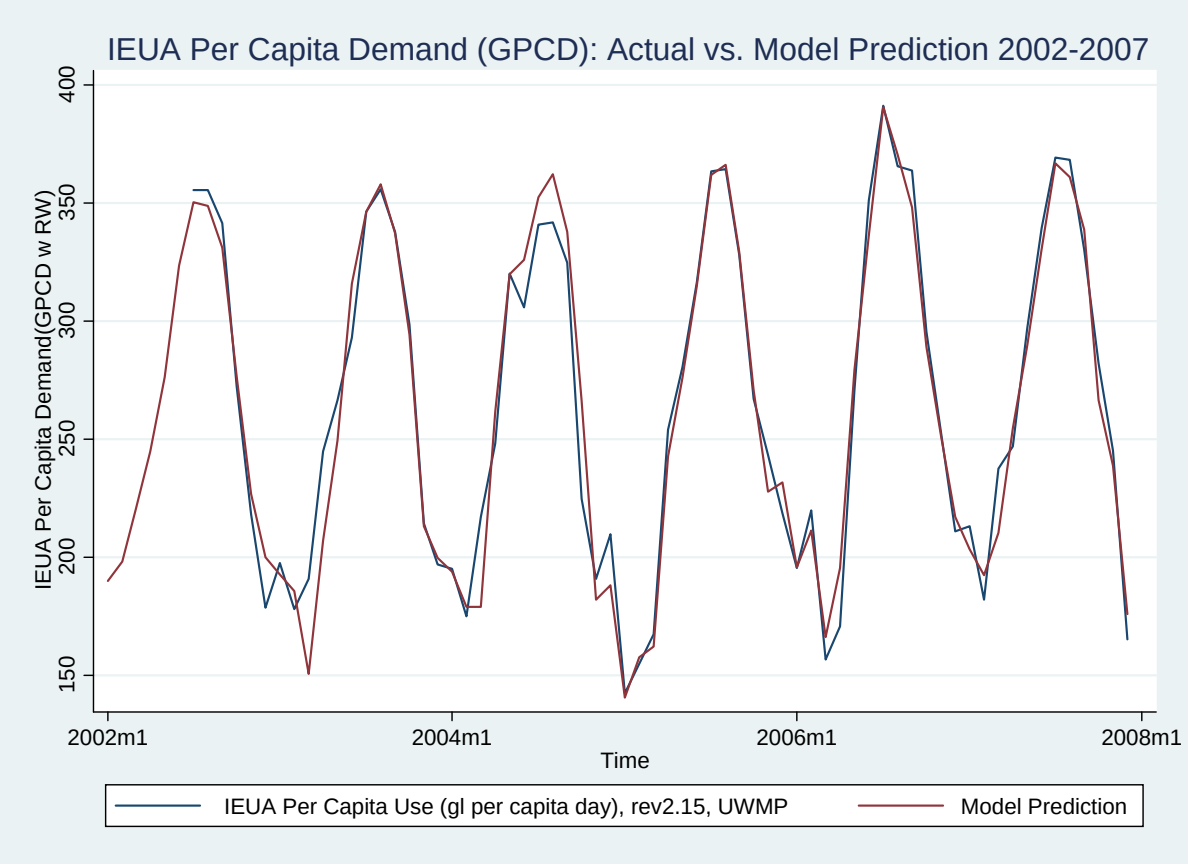


**Figure 2-- IEUA Per Capita Demand (GPCD): Actual vs. Model Prediction , FY 2002-2007**

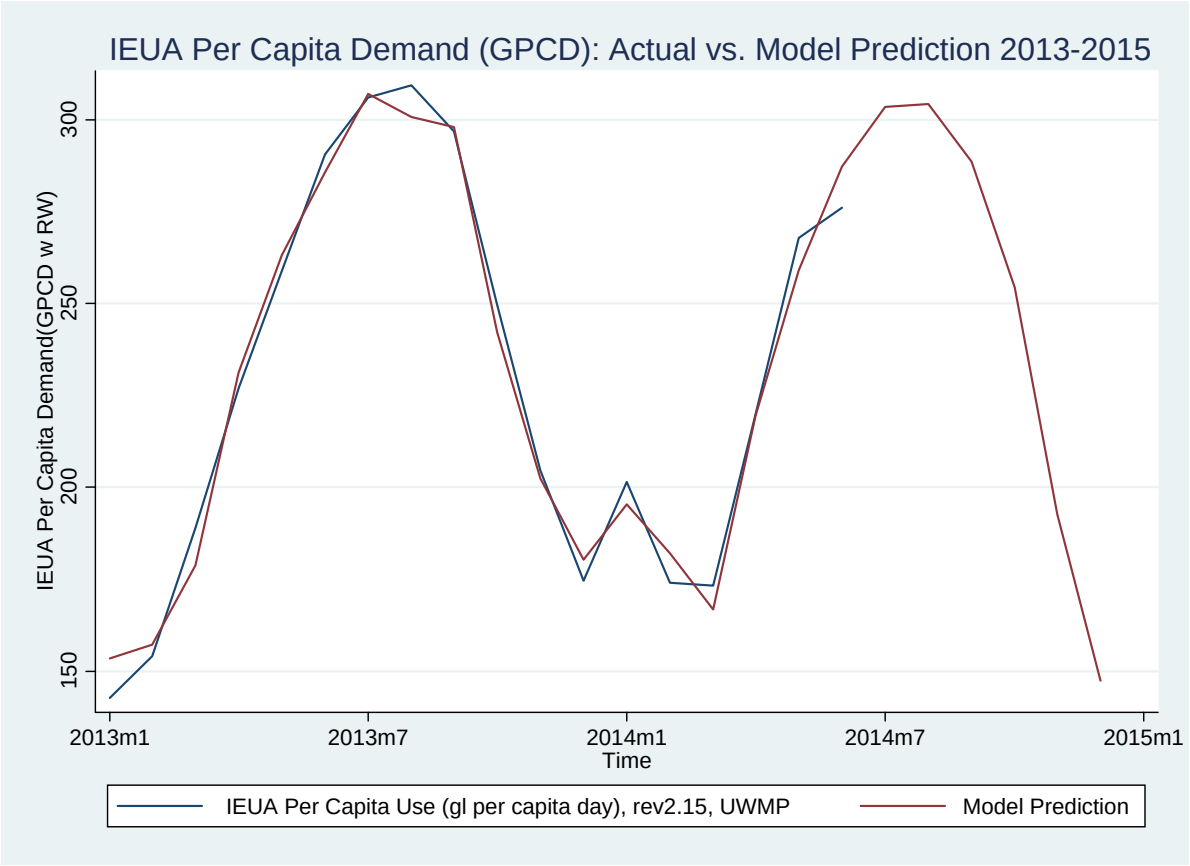


**Figure 3-- IEUA Per Capita Demand (GPCD): Actual vs. Model Prediction, 2013-2014**

## *Application to Demand Trends*

From the statistically estimated model documented above, one can calculate the effect of weather on per capita water demand as the difference between two predictions: a prediction of demand conditional on actual weather and a prediction of demand "as if" weather were normal[6]. Equation 5 specifies this relationship in percentage terms. Table 2 presents the summation of the estimated effect of weather for each year.

[6] Normal weather is defined as the average values of each weather variable in each month over the period of record 1950-2012.

**Table 2-- Effect of Weather on IEUA Per Capita Demand (GPCD)**

| IEUA Water Demand (GPCD) | | | | |
|---|---|---|---|---|
| | IEUA Water Demand | | | |
| **Year** | Effect of Weather on Water Demand (Change in GPCD) | Effect of Weather on Water Demand (Percent) | Precipitation (inches) | Max Temperature (F) |
| 2003 | -22.85 | -0.75% | 16.71 | 77.15 |
| 2004 | 114.88 | 3.58% | 8.66 | 79.71 |
| 2005 | -170.88 | -5.73% | 28.20 | 76.19 |
| 2006 | -10.02 | -0.32% | 12.78 | 78.15 |
| 2007 | 190.90 | 5.70% | 3.73 | 79.78 |
| 2008 | 43.61 | 1.40% | 11.75 | 78.58 |
| 2009 | 111.29 | 3.70% | 9.40 | 79.50 |
| 2010 | -15.18 | -0.56% | 15.34 | 77.95 |
| 2011 | -75.60 | -2.89% | 16.45 | 76.47 |
| 2012 | 14.05 | 0.52% | 9.12 | 78.14 |
| 2013 | 142.80 | 5.05% | 5.54 | 80.35 |
| 2014 | 197.84 | 6.97% | 4.38 | 81.13 |
| **Long Term Average** | 2003-2014 | | 11.84 | 78.6 |
| **Weather Station** | Ontario NOAA | | | |

Finally, these estimated effects of non-normal weather and employment different from trend are next used to estimate what per capita water demand would have been if weather had been normal and if employment had not differed from its historical trend (that is, if the recession had not occurred.) Actual demand with weather and employment effects removed will be referred to as "normalized" per capita water demand. Figure 4 below plots the mean monthly employment for San Bernardino County and reveals the sharp effects of the recent recession.

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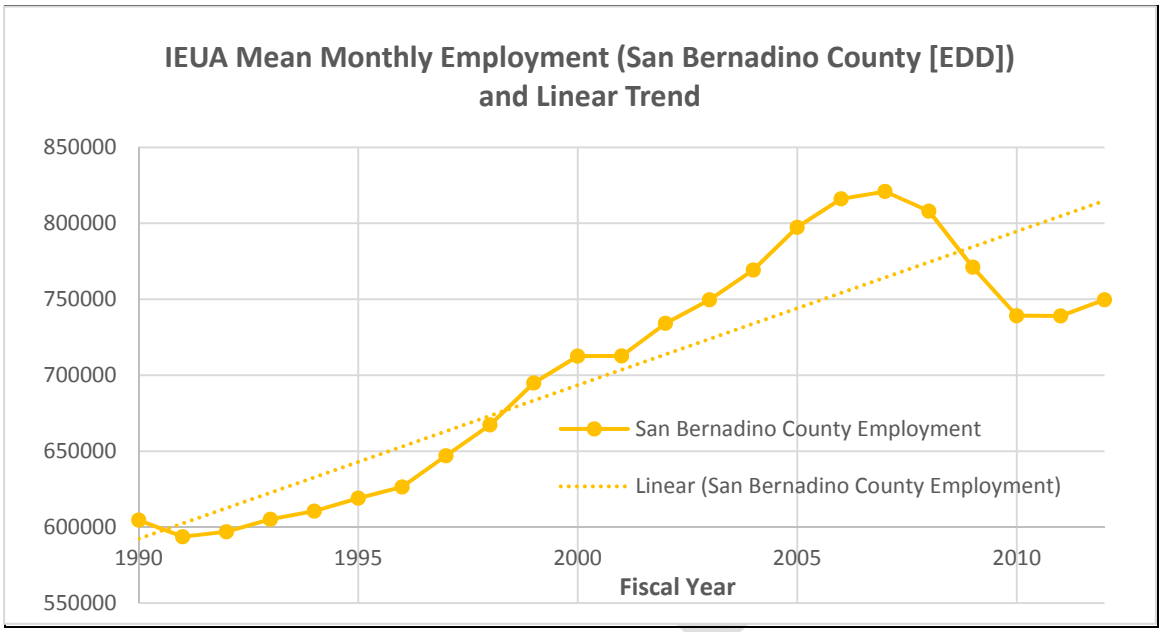


**Figure 4-- IEUA Mean Monthly Employment (San Bernardino County [EDD]) and Linear Trend**

Table 3 presents the derivation of normalized IEUA per capita water demand. The first column of raw demand data ("Actual Demand") is followed by demand normalized for weather. The estimated percentage effect of weather different from normal ("Effect of Weather on Water Demand (Percent)") explains how weather affected actual demand and is used to estimate the third column of retail demand ("Demand Normalized for Weather (GPCD)"). A similar estimate for the effect of employment different than trend is used to estimate the last column of retail demand ("Demand Normalized for Weather and Employment"). The assumptions implied by this "normalization" include that realized weather is exactly equal to average weather (monthly averages based on the period of record 1950-2012) and that employment continued along its long term trend (as depicted by the straight line in Figure 3).

Note that the variation of the percentage annual effect of weather and employment is summarized at the bottom of the table and is useful for risk analysis. Weather could knock per capita demand 7.3 percent either way in any year (90 percent confidence interval). The effect of the business cycle—as captured by the effect of employment swings—is very pronounced in recent years due to the Great Recession. Single year swings of 5 and a half percent occurred more than once with a very wide confidence interval required to contain 90 percent of expected annual variation due to employment variation (approximately 12.8 percent either way in any year).

The model also detects customer response in 2013 and 2014 to drought-induced calls for customers to voluntarily curtail water demand. These effects, though targeted mostly to residential customers, provide evidence of some customer response that cannot be

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explained by the other forces in the model—weather variation, variation in employment, and long term trends in water demand.

**Table 3-- IEUA Per Capita Use (GPCD): Actual and Normalized**

| | IEUA Water Demand | | | | |
|---|---|---|---|---|---|
| **Fiscal Year** | Actual Demand (GPCD) | Effect of Weather on Water Demand (Percent) | Demand Normalized for Weather (GPCD) | Effect of Employment on Water Demand (Percent) | Demand Normalized for Weather and Employment (GPCD) |
| 2003 | 257.77 | -0.75% | 259.7 | 4.54% | 247.92 |
| 2004 | 267.63 | 3.58% | 258.1 | 5.64% | 243.51 |
| 2005 | 245.78 | -5.73% | 259.9 | 7.71% | 239.83 |
| 2006 | 262.56 | -0.32% | 263.4 | 8.70% | 240.47 |
| 2007 | 283.06 | 5.70% | 266.9 | 8.11% | 245.29 |
| 2008 | 265.58 | 1.40% | 261.9 | 5.52% | 247.43 |
| 2009 | 256.55 | 3.70% | 247.1 | 0.10% | 246.82 |
| 2010 | 228.42 | -0.56% | 229.7 | -5.56% | 242.47 |
| 2011 | 212.70 | -2.89% | 218.8 | -7.04% | 234.25 |
| 2012 | 220.83 | 0.52% | 219.7 | -7.08% | 235.24 |
| 2013 | 231.40 | 5.05% | 219.7 | -6.06% | 233.03 |
| 2014 | 237.75 | 6.97% | 221.2 | -5.25% | 232.80 |
| | **Standard Deviation of % Effects** | **+/- 3.74%** | | **+/- 6.55%** | |
| | **95% Confidence Interval** | **+/- 7.3%** | | **+/- 12.8%** | |
| **Percentage Annual Trend, FY2003-2007** | 2.4% | | | 0.7% | -0.3% |
| **Percentage Annual Trend, 2007-2012** | -2.7% | | | -3.8% | -0.8% |

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Table 4 presents the same results as in Table 3, but in terms of acre feet rather than GPCD. Again, the first column of raw demand data ("Actual Demand") is followed by demand normalized for weather. The estimated percentage effect of weather different from normal ("Effect of Weather on Water Demand (Percent)") explains how weather affected actual demand and is used to estimate the third column of retail demand ("Demand Normalized for Weather (AF)"). A similar estimate for the effect of employment different than trend is used to estimate the last column of retail demand ("Demand Normalized for Weather and Employment").

Taken from "peak to trough," from 2007 to 2012, Table 4 also shows the decline in actual demand was an average of 4.3 percent per year, for a total of 19.6 percent decline over the five-year period. After normalizing for weather and employment, the decline was an average of 0.2 percent per year, or about a one percent decline over the five-year period.

The effect on the trend in per capita demand is easier to discern in Figures 4 and 5. Figure C5 plots actual and normalized demand in terms of GPCD. The near three percent annual decline (2.7 percent) in actual GPCD demand between fiscal years 2007 and 2012 is reduced in magnitude to less than one percent decline (0.8 percent) after normalizing for weather and employment. Figure 5 plots actual and normalized demand in terms of acre feet. The decline in actual demand (in acre feet per year) between fiscal years 2007 and 2012 was 4.3 percent per year on average. After normalizing for weather and employment, there was actually a slight decrease of 0.2 percent.

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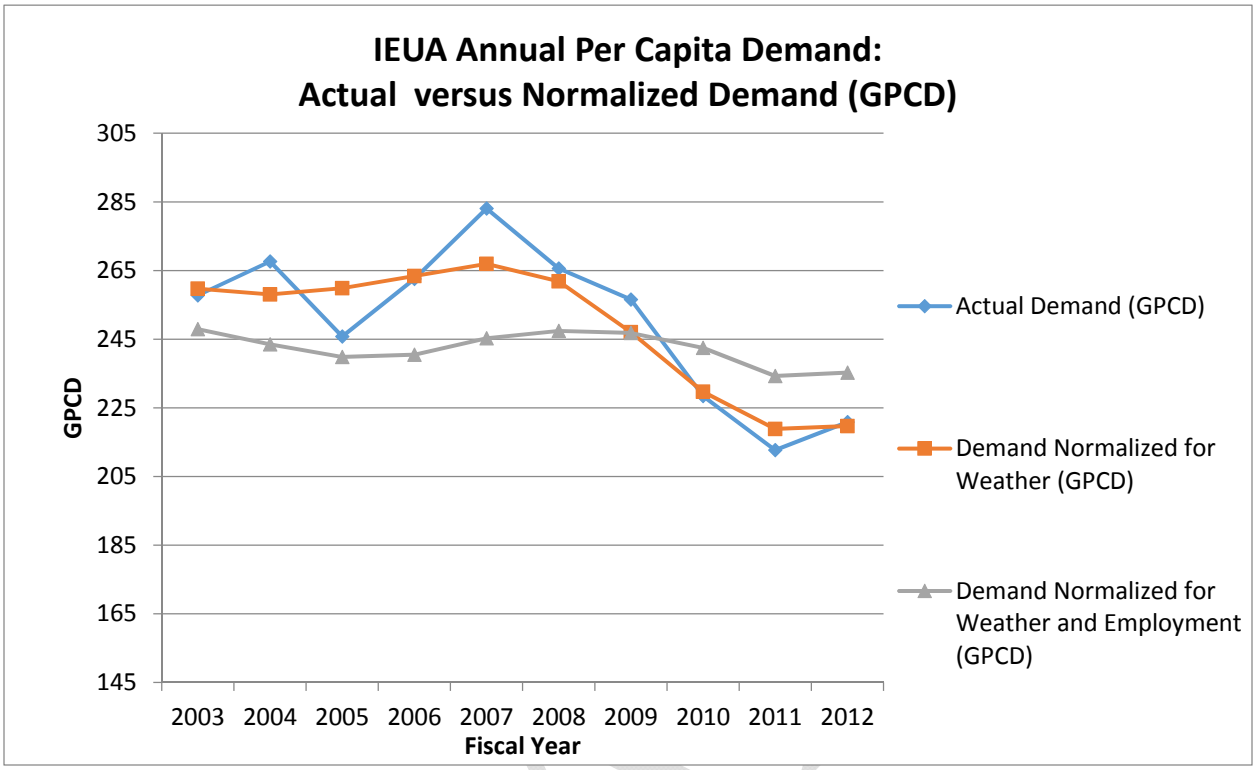


**Figure 5-- IEUA Annual Per Capita Demand: Actual versus Normalized Demand (GPCD)**

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**Table 4-- IEUA Use (Acre Feet): Actual and Normalized**

| | IEUA Water Demand | | | | |
|---|---|---|---|---|---|
| **Fiscal Year** | Actual Demand (AF) | Effect of Weather on Water Demand (Percent) | Demand Normalized for Weather (AF) | Effect of Employment on Water Demand (Percent) | Demand Normalized for Weather and Employment (AF) |
| 2003 | 215685 | -0.75% | 217309.4 | 4.54% | 207434.07 |
| 2004 | 230498 | 3.58% | 222247.4 | 5.64% | 209718.74 |
| 2005 | 213262 | -5.73% | 225476.5 | 7.71% | 208098.51 |
| 2006 | 230911 | -0.32% | 231640.4 | 8.70% | 211482.21 |
| 2007 | 255280 | 5.70% | 240727.8 | 8.11% | 221216.62 |
| 2008 | 241913 | 1.40% | 238528.0 | 5.52% | 225372.92 |
| 2009 | 233799 | 3.70% | 225147.9 | 0.10% | 224930.13 |
| 2010 | 209290 | -0.56% | 210457.9 | -5.56% | 222162.16 |
| 2011 | 195745 | -2.89% | 201392.7 | -7.04% | 215570.59 |
| 2012 | 205231 | 0.52% | 204166.6 | -7.08% | 218614.07 |
| 2013 | 216004 | 5.05% | 205103.5 | -6.06% | 217527.39 |
| 2014 | 223435 | 6.97% | 207870.6 | -5.25% | 218784.24 |
| | **Standard Deviation of % Effects** | **+/- 3.74%** | | **+/- 6.55%** | |
| | **95% Confidence Interval** | **+/- 7.3%** | | **+/- 12.8%** | |
| **Percentage Annual Trend, FY2003-2007** | 4.3% | | 2.6% | | 1.6% |
| **Percentage Annual Trend, 2007-2012** | -4.3% | | -3.2% | | -0.2% |

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# Appendix 2:

# RAND Memo "Evaluating Options for Improving Climate Resilience of the Inland Empire Utilities Agency in Southern California"

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Project Report

# Evaluating Options for Improving the Climate Resilience of the Inland Empire Utilities Agency in Southern California

Abbie H. Tingstad, David G. Groves, and James Syme (RAND Corporation)
Elizabeth Hurst and Jason Pivovaroff (Inland Empire Utilities Agency)

March 2016

# Preface

The Inland Empire Utilities Agency (IEUA) and RAND worked together in 2003-2005 to demonstrate and evaluate how new approaches to decisionmaking under uncertainty could help a water utility evaluate the potential threats of climate change in their long-term planning. This work was performed outside IEUA's planning process and was documented in several RAND reports and scientific journal articles (Groves, Davis, *et al.*, 2008; Groves, Knopman, *et al.*, 2008; Groves, Lempert, *et al.*, 2008). In 2015, IEUA asked RAND to help it re-evaluate its water management system under a range of future conditions reflecting climate change and other drivers for its Integrated Resources Plan (IRP). This report documents the tools developed and analysis performed during 2015 for this effort. Questions or comments about this report should be sent to the project leaders, David Groves (groves@rand.org) and Abbie Tingstad (tingstad@rand.org).

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# Abbreviations

| | |
|---|---|
| BCSD | Bias-Corrected Statistically Downscaled |
| CMIP | Coupled Model Intercomparison Project |
| FWOA | Future Without Action |
| GCM | General Circulation Model |
| GHCND | Global Historical Climatology Network Database |
| IEUA | Inland Empire Utilities Agency |
| IRP | Integrated Resources Plan |
| MWD | Metropolitan Water District of Southern California |
| NOAA | National Oceanographic and Atmospheric Administration |
| PDT | Portfolio Development Tool |
| RDM | Robust Decision Making |
| SAR | Santa Ana River |
| SEI | Stockholm Environment Institute |
| UWMP | Urban Water Management Plan |
| WCRP | World Climate Research Programme |
| WEAP | Water Evaluation and Planning System |
| WEI | Wildermuth Environmental Inc. |

# Introduction

Water managers continue to face challenges related to climate non-stationarity (Milly *et al.*, 2008) in their long-term planning. Even when water supplies appear sufficient to meet present and short-term demand, uncertain future changes in temperature and precipitation make decisions about investments to ensure longer-term supply sufficiency difficult. In Southern California, the recent drought has refocused attention on water resources in this semi-arid, populous area. Although this drought appears to be consistent with long-term patterns of climate variability, its effects may be exacerbated by ongoing climate change, which is anticipated to have a strong effect on the region, including on its water supplies (e.g., with respect to the length and magnitude of droughts, timing of precipitation, and temperature-driven demand) (Diffenbaugh *et al.*, 2015; Mao *et al.*, 2015; Shukla *et al.*, 2015)

Adaptive management plans are designed to evolve over time in response to new information regarding future conditions. This type of flexible approach is becoming increasingly favored in the water management community as a mechanism for planning under uncertainty. Integrative approaches, which help facilitate adaptive plans, focus on combining a variety of management options, rather than a single type of solution.

The Inland Empire Utilities Agency (IEUA), a water management agency in Southern California, recently partnered with the RAND Corporation, a multi-disciplinary, non-partisan research organization and educational institution headquartered in Santa Monica, California, to evaluate how adaptive, integrative water management options could improve IEUA's abilities to meet customer needs under a wide range of futures. This analysis was used to support the development of its Integrated Resources Plan (IRP). The purpose of the IRP is to evaluate the resiliency of water resources in the IEUA's service area over the next twenty-five years and to evaluate alternative management options for ensuring water deliveries to urban users. The IRP results will be used to recommend regional strategies and identify preferred water supply projects that, in turn, will help the IEUA and its member agencies to apply for grants and loans to implement new projects. RAND supported IEUA's IRP by developing a tool for constructing and visualizing different portfolios for water management investments and actions, and enabling an analysis of *status quo* and potential future water management activity success in meeting future urban water demand under different demand and climate change-impacted water supply conditions. This follows RAND's previous work supporting the IEUA's 2005 Urban Water Management Plan (UWMP) (Groves, Knopman, *et al.*, 2008; Groves, Lempert, *et al.*, 2008).

Current water demands in the IEUA service area are serviced by groundwater from the Chino Basin in addition to local surface supplies, recycled water, and imported water from Northern California via Metropolitan Water District of Southern California (MWD). In addition, IEUA implements water efficiency projects, such as low-flow toilet rebate programs. Depending on different estimates of future infrastructure water efficiency, this "baseline" supply (current and planned supplies from groundwater and other sources plus savings from water efficiency projects) is likely sufficient, or very nearly so, for meeting future demand assuming climatic conditions remain similar to those experienced in recent history. However, IEUA wanted to explore how shifts in stationarity assumptions through climate change, along with possible changes in demand, could impact its future water supplies and demands, and what water management projects could help meet future demand under uncertain future temperature and precipitation conditions.

A suite of global climate models suggests that temperatures over the IEUA service area will rise over the coming decades and that annual precipitation will continue to be highly variable, with no consensus on trends towards wetter or drier conditions. Figure 1 displays the annual average temperature and total precipitation estimates from 1950 to 2050 for the IEUA service area based on 106 downscaled projections of climate from a range of general circulation models (GCMs).[1] The temperature increases seen beginning around the 1980s and the uncertainty associated with local precipitation underscores the importance of carrying out an analysis of IEUA water management options to ensure that future demand can be met under a variety of different hydrologic circumstances against the backdrop of rising temperatures.

[1] Note that GCMs are not expected to simulate the precise interannual fluctuations of the historical period, because stochastic forces and sequences of events that are unresolvable by numerical models drive such historical variability. Instead, GCMs are validated based on their ability to characterize the statistical characteristics of historical climate, such as maximum and minimum temperatures or precipitation.

**Figure 1: Estimates of historical and future annual average temperature and total precipitation for the IEUA service area**

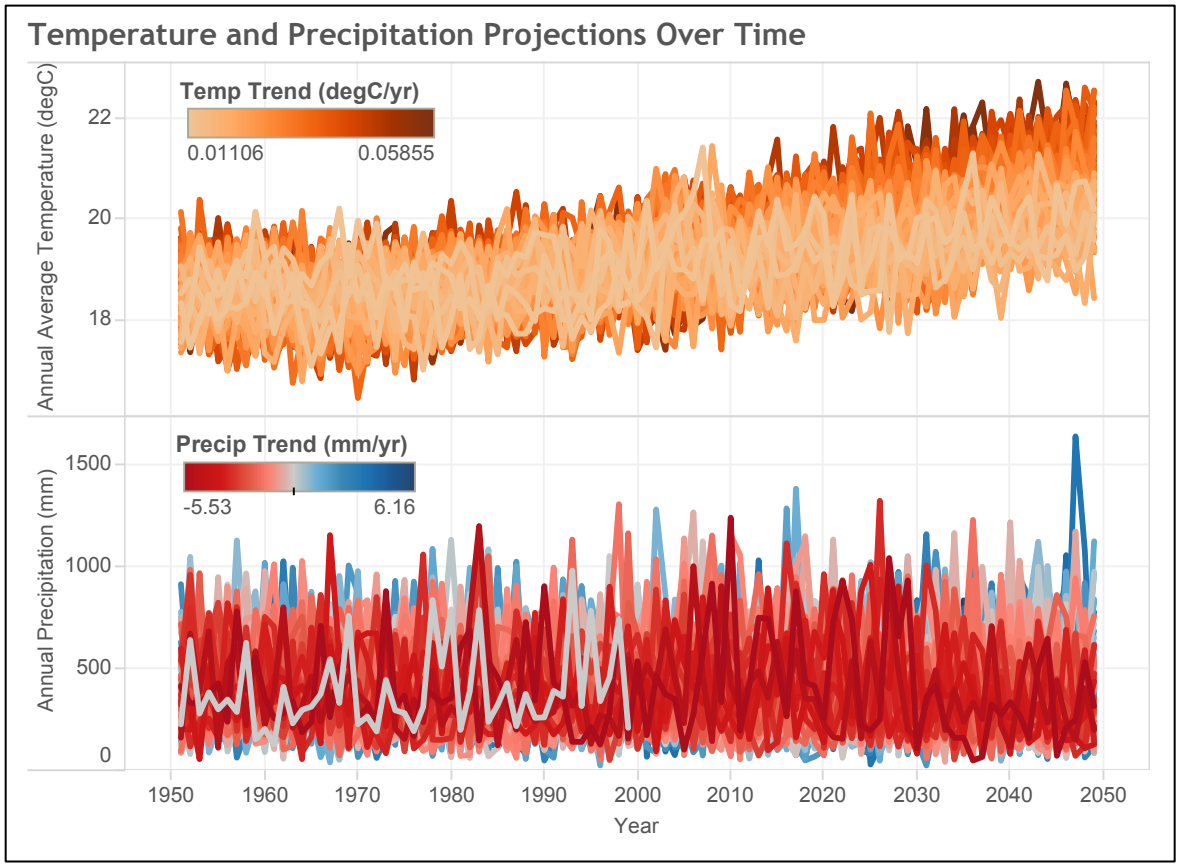


To support this analysis we developed (1) a simple mass balance water management model to estimate future supplies and demand across different future and (2) a decision support tool to help IEUA planners and stakeholders to compare attributes of different management options and develop portfolios for evaluation. We then performed a three-step analysis:

1. Evaluated the performance of the IEUA system under a wide range of futures to evaluate its vulnerability to climate and future demand
2. Constructed portfolios of water management projects that could help increase water management supplies in the future
3. Tested and compared how each proposed water management portfolio enhances the IEUA's ability to deliver urban water supplies in the future

In the next section we describe the methods and models used in each step. Due to the limited scope of this effort, we did not attempt to evaluate the cost-effectiveness or finer details (e.g., implementation potential at specific locations) of the different water management projects. We also did not conduct statistical analysis to determine the specific climatic conditions most

conducive to different portfolio success or failure in meeting urban water demand, nor did we consider uncertainties related to budget and/or other factors that could impact our results.

# Methods

The overarching methodological framework for this project is Robust Decision Making (RDM) (Groves and Lempert, 2007; Lempert *et al.*, 2003). RDM is an approach that seeks to determine what plans reduce risk over a range of assumptions, thereby facilitating deliberation among stakeholders that may have differing values and expectations about the future (Lempert, 2013). It is a methodological process, involving iterative steps including stakeholder interactions, modeling, and statistical analysis, that facilitates interactions and aims to shape decision-maker discussions around which factors lead to plan success or failure and the identification of robust solutions – those that perform well under a range of futures—rather than a single "best" solution (Hallegatte *et al.*, 2012; Lempert *et al.*, 2006). The RDM approach runs models on tens to thousands of different sets of assumptions to describe how plans perform in a range of plausible futures. Analysts then use visualization and statistical analysis of the resulting large database of model runs to help decision-makers distinguish future conditions in which their plans will perform well from those in which they will perform poorly (Bryant and Lempert, 2010). RDM has been used in a range of contexts, to include water management, flood risk assessment, and sea level rise planning (Groves *et al.*, 2013, 2014; Herman *et al.*, 2015; Tingstad *et al.*, 2013).

Many RDM analyses are conceptually organized using a framework called "XLRM", where key uncertainties (X), policy levers or strategies (L), relationships or models (R), and metrics or outcome measures (M) are summarized in a quad chart. The principal considerations around which this project is organized are summarized in XLRM format below.

**Table 1: Summary of uncertainties, projects, models, and outcome measures considered**

| Uncertainties (X) | Projects (L) |
|---|---|
| Climate conditions<br>Demand | 75 different projects in categories<br>• Chino Basin projects (13)<br>• Imported Water Direct, Imported Water Recharge (14)<br>• Imported Water Recharge (3)<br>• Imported Water Recharge / Recycled Water (4)<br>• Local Surface (2)<br>• Other Groundwater (1)<br>• Recycled Water (16)<br>• Stormwater (6)<br>• Stormwater, Recharge, Imported Water Recharge, Recycled Water (4)<br>• Water Use Efficiency (10)<br>• Chino Basin Groundwater, Recycled Water, Imported Water (2) |
| **Models (R)** | **Performance Metrics (M)** |
| WEAP IEUA<br>IEUA Portfolio Development Tool | Demand<br>Sources of supply to meet demand<br>Unmet demand |

## Water Management Mass Balance Model

RAND developed a water management model developed for the IEUA service area using a simulation platform called the Water Evaluation and Planning system (WEAP) (Yates *et al.*, 2005). The purpose of this model was to help address Step One of our analysis by creating a simulation model that could evaluate the performance of the IEUA system under a wide range of futures. In brief, WEAP enables integration of physical hydrologic processes with management of water demands and supplies using a link-and-node representation of a water management system, as constructed by a user. The WEAP model was used primarily to evaluate projected annual urban demands, sources of supply, and unmet demands.

RAND previously developed a WEAP model for the IEUA service area (Groves, Lempert, *et al.*, 2008) based on information available during the 2003-2005 time period. For the present study, RAND developed a new WEAP model based primarily on IEUA's latest spreadsheet-based information about current water supplies and demands, and annual projections of them through 2050. See Appendix 2 for more detail.

Absent available detailed analyses of how climate change could affect each element of IEUA's water supply portfolio, RAND worked with the best available data to develop some coarse approximations of how different supplies and demand would change under different assumptions and projections of climate conditions. These analyses were developed as a first step towards a more comprehensive assessment of IEUA resilience to climate change, and were vetted by IEUA water managers. For the purposes of this initial work, these coarse approximations provided sufficient insights into the potential impacts of climatic changes on supply and demand to facilitate deliberation over the usefulness of different types of water management projects.

Several "simple models" were developed to estimate the impacts of climatic changes on the following elements of the IEUA system (see Appendix 2 for details):

- *Local surface supplies, storm water, and replenishment supplies*: two regression models of historical annual local surface supplies and annual climate were used to estimate future local surface supplies based on projections of temperature and precipitation. These models were applied to estimate local surface supplies, available storm water supplies, and non-MWD replenishment supplies.
- *Groundwater safe yield*: Projections of future safe yield under different trends in climate conditions were developed by Wildermuth Environmental Inc. (WEI) and provided to IEUA and the study team. The current long-term sustainable yield of the groundwater basin was then modified for each climate projection based long-term precipitation trend perturbation factors derived from the WEI analysis.
- *Imported supplies via Metropolitan Water District*: A simple linear model of supply availability over time from Northern California via MWD was used to modify IEUA's contractually available supply from MWD. Two different climate response rates were

evaluated that effectively assumed a 17% and 34% reduction in imported available water by 2040.

- *Water demand*: Demand climate adjustment factors were developed using IEUA calculations of the sensitivity of demand to climate using MWD-MAIN. These factors were used together with the climate scenarios (annual average temperature and precipitation) to adjust the demand annually.

By imbedding these models into the WEAP model, we estimated future local surface water production, groundwater sustainable yield and replenishment, outdoor urban demand, and possible adjustments to water imports under changing climate. This WEAP model was used to both test baseline supply resiliency to climate change as well as determine expected benefits from new water management projects.

## Portfolio Development Tool

With inputs from the IEUA and its member agencies, RAND created a Portfolio Development Tool (PDT) using the visualization software platform Tableau. The purpose of this activity was to support Step Two of our analysis by creating a user-friendly interface through which the IEUA and its member agencies could explore a variety of water management projects and develop portfolios that included one or more projects. The PDT enables users to review individual project attributes—both quantitative (i.e., how much water they produce) and qualitative (e.g., whether they contribute to different IEUA regional goals)—and determine how combinations of these projects together would increase future supplies, moderate demand, and meet qualitative, regional goals. IEUA and RAND used the PDT to support a series of meetings between the IEUA and member agencies and a workshop co-run with member agency representatives to create different adaptive, integrative options for increasing future water supplies. The final list of portfolios selected by the IEUA using the PDT is represented in the table below (Table 2), and the IEUA IRP includes more detailed description and rationale for these portfolios.

**Table 2: Management portfolios developed using the Portfolio Development Tool**

| Portfolio Name | Portfolio Description |
|---|---|
| Portfolio #1 | Maximize the Use of Prior Stored Groundwater |
| Portfolio #2A | Maximize Recycled Water (Including External Supplies) and Local Supply Projects and Implement Minimal Water Efficiency |
| Portfolio #2B | Portfolio 2A Plus Secure Supplemental Imported Water from MWD and Non-MWD Sources |
| Portfolio #3A | Maximize Recycled Water (Including External Supplies) and Implement Moderate Water Efficiency |
| Portfolio #3B | Portfolio 3A Plus Implement High Water Efficiency |

| | |
|---|---|
| Portfolio #4 | Maximize Supplemental Water Supplies and Recycled Water Supplies |
| Portfolio #5A | Maximize the Purchase of Imported Water from MWD and Implement Minimal-Moderate Level of Water Efficiency |
| Portfolio #5B | Portfolio 5A Plus Maximize Recycled Water |

## Climate and Demand Futures

The WEAP model was then used to "stress test" the resiliency of the IEUA service area's baseline water supplies, and baseline supplies plus the different future water management project portfolios, under different conditions of climate change and demand. This is Step Three of our analysis. The study considered the 106 projections of future climate displayed in Figure 1. These were downloaded from an archive of downscaled global climate model simulations, described in Appendix 2. These 106 projections of future climate were integral to our ability to stress test the IEUA water management system in its ability to meet future demand. Each projection represents a plausible climate future in our analysis. Although we cannot know with certainty what type of climatic change the future holds, having a diverse set of projections enables development of management alternatives that could be robust in adapting to a range of different conditions. Figure 2 plots the average annual temperature and precipitation from 2040-2049 for this set of climate projections.

**Figure 2: Average annual temperature and precipitation over the Inland Empire Utilities Agency service area from 106 climate projections (2040-2049)**

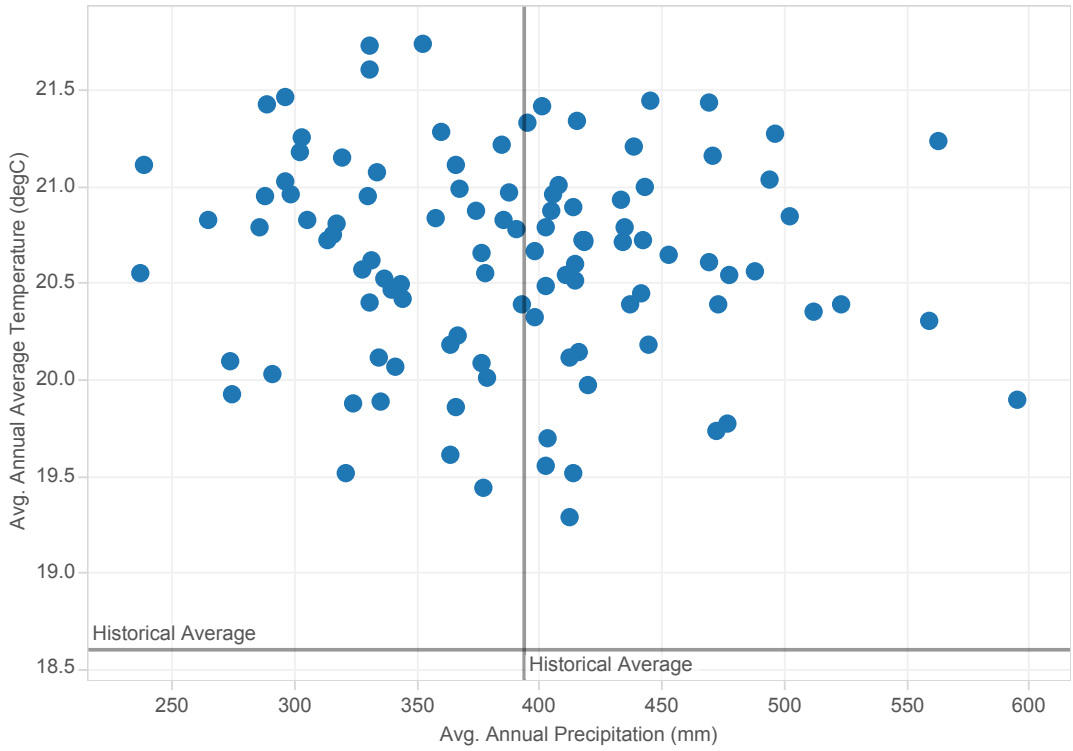


All the climate projections show higher average annual temperatures from 2040 – 2049 than the historical average (1951-1999). This is consistent with observed and projected changes around the world (IPCC, 2014). About half of the climate projections show higher precipitation and half show lower precipitation. Specifically, annual average precipitation varies between 237 mm/year to 595 mm/year, or between 60% and 151% of the historical record. This uncertainty in precipitation trends reflects the difficulty in modeling the complex atmospheric and oceanic processes that govern precipitation patterns in the Southwest United States and the stochasticity of these processes (Peterson *et al.*, 2013). Although these projections do not indicate whether the climate will get drier or wetter in the coming decades in the IEUA service area, they do provide a useful test bed of plausible climate conditions for which to stress test water management plans. Dry conditions can challenge the ability of the system to meet user demand whereas wet conditions can render additional supply investments unnecessary expenditures.

Scientists have confidence that the projections in Figure 2 are suggestive of future climate conditions that are impacted by higher greenhouse gas concentrations in the atmosphere. One reason is that these climate models, when evaluated for historical periods of time (e.g. 1950-2000), estimate past variability that is similar to the observed historical values. To illustrate this, Figure 3 shows the historical, observed annual average temperature and annual total precipitation from 1951 – 1999 for the IEUA service area (blue line on the left), along side the maximum and

minimum projected annual average temperature from the 106 climate scenarios for the same time period (box charts on the right). The models, when "backcasting" the same historical time period, estimate a range of maximum and minimum temperatures that are inclusive of the historical observed maximum and minimum temperature. Figure 4 shows the same comparison for annual total precipitation. Once again, the future and historical maxima and minima appear to have some overlap.

**Figure 3: Observed historical annual temperature record for the IEUA service area from 1951 – 1999 (left) compared to the distribution of predicted maximum and minimum temperatures across the 106 climate scenarios for the same historical time period (right)**

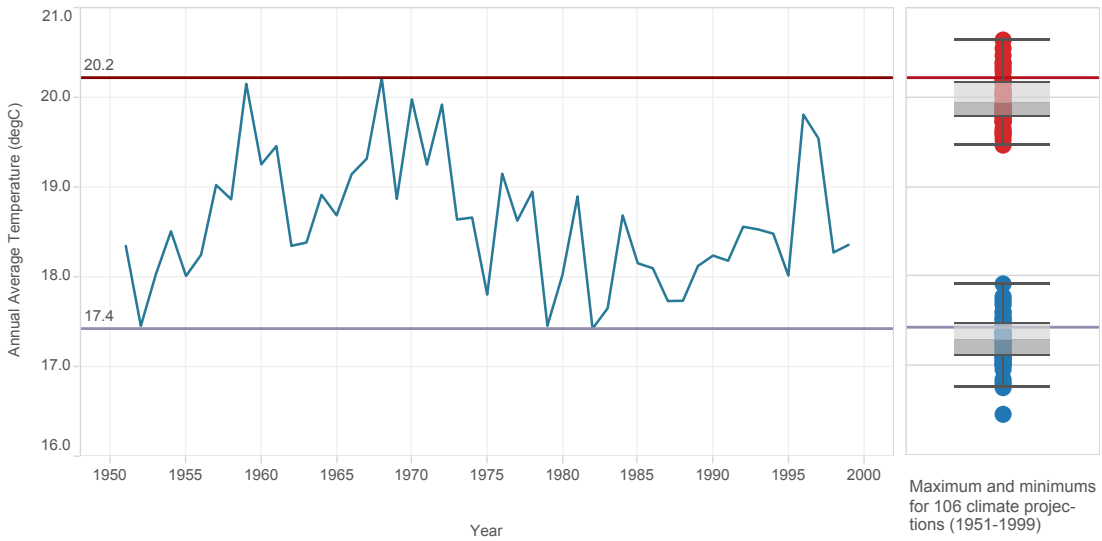

**Figure 4: Observed historical annual total precipitation record for the IEUA service area from 1951 – 1999 (left) compared to the distribution of predicted maximum and minimum precipitation across the 106 climate scenarios for the same historical time period (right)**

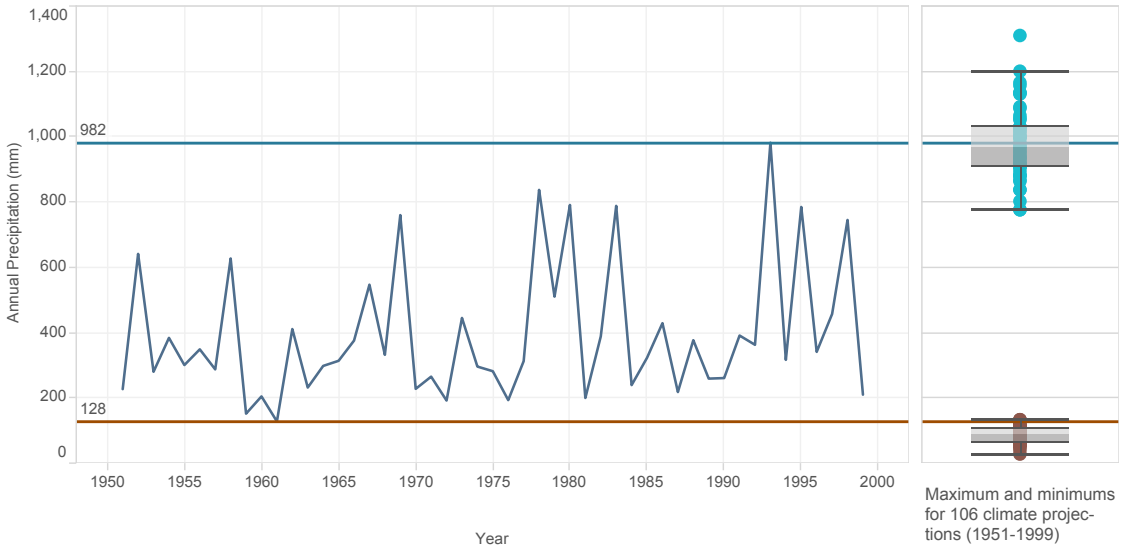


In addition to future climate, this work also examined impact of future demand. IEUA supplied two projections of future demand—a low and high demand estimate. A middle projection was then estimated within the water management model by specifying indoor and outdoor water use rates that were between those used for the high and low demand estimate. Figure 5 shows these three demand scenarios under conditions of no climate change. It also shows unmet demand under historical climate conditions.

**Figure 5: IEUA demand scenarios under no climate change**

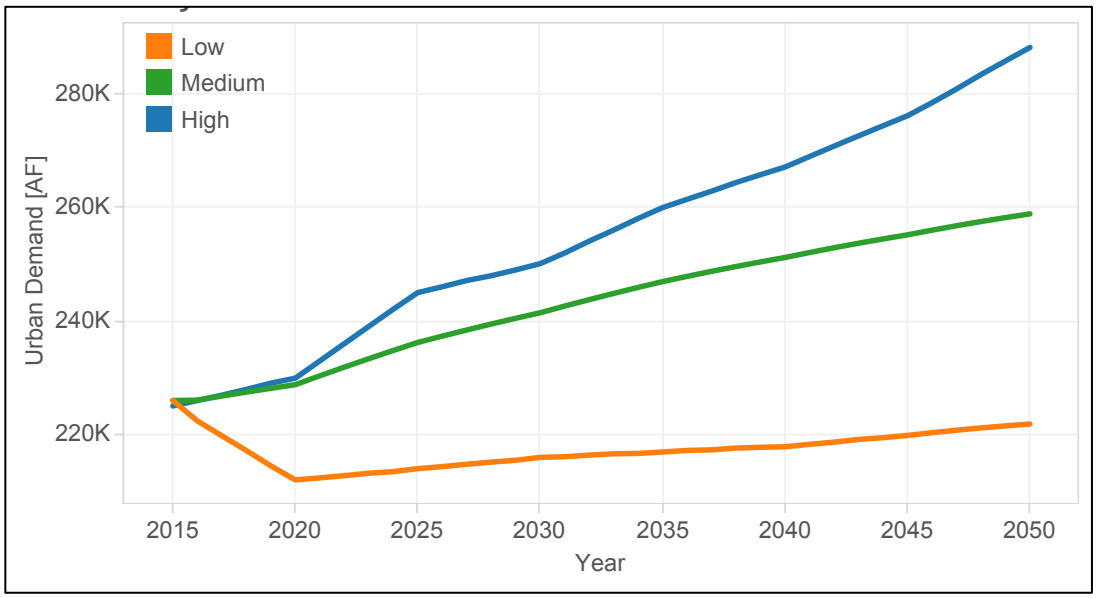


## Simulating future conditions

The study team used the WEAP IEUA model to stress test the IEUA's baseline supplies and proposed supply augmentation portfolios, and evaluated urban demand, supplies, and unmet demand from 2015 to 2050 for each of the 106 climate change projections as well as a projection that repeated historical climate conditions. Impacts of these 107 climate futures on IEUA's baseline supplies and proposed portfolios to augment supplies were examined in the context of the three future demand scenarios, as well as assumptions about the strength of climate change on imports, and the sensitivity of local supplies to temperature. In sum, IEUA's baseline supplies and each augmentation portfolio were tested against 1,284 futures (107 climate projections x 3 demand scenarios x 2 regressions to estimate climate impacts on local supplies x 2 levels of climate impact on water imports). The necessary computing capacity was obtained via Amazon Web Service, which enabled the WEAP model to be run hundreds of times simultaneously.

# Results

## IEUA baseline supplies may be insufficient to meet future demand

We found that, under the low demand scenario, supplies were sufficient under historical climate and mostly sufficient through mid-century with climate change (Figure 6). After 2035, some shortages begin to appear. The figure below shows results that assume the strongest effect of climate on imports, and that temperature changes affect local supplies. See Appendix 2 for more detail.

**Figure 6: Unmet demand for IEUA service area by climate change scenario over time (low demand scenario)**

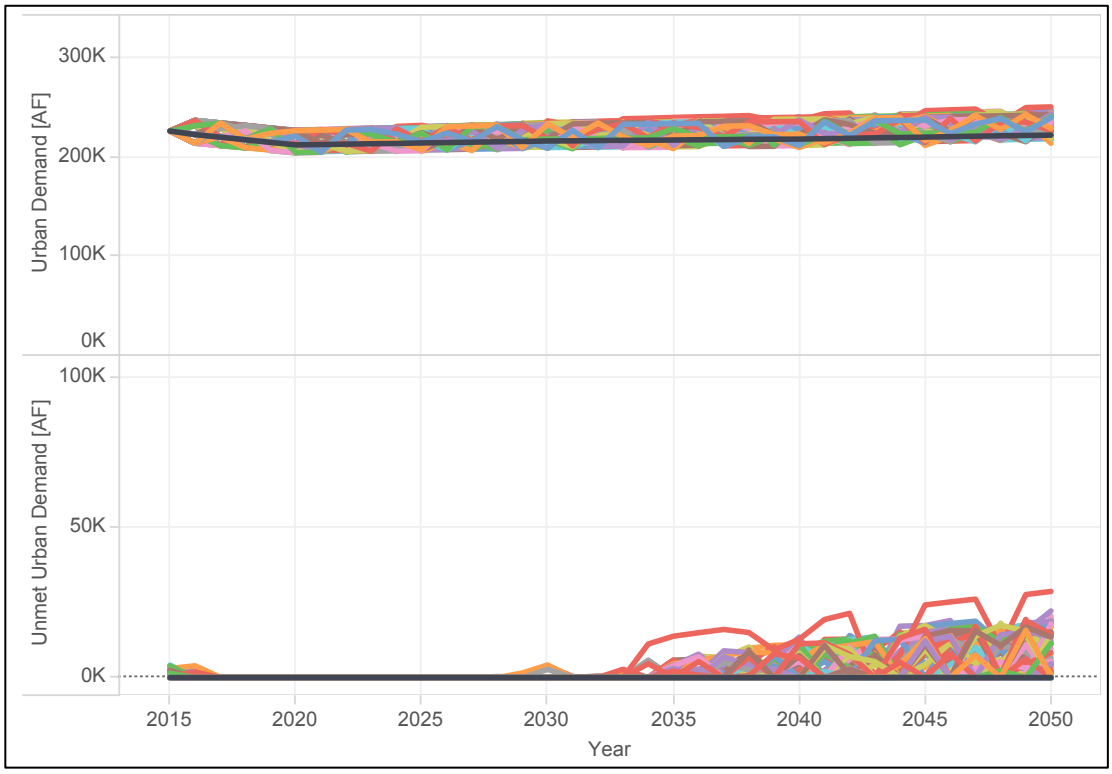


Note: Colored lines correspond to the individual 106 climate scenarios. The black lines correspond to the historical climate scenario.

However, supplies do not appear sufficient to meet demand in the medium (not shown) and high demand scenarios as early as 2016, with the level of unmet demand ramping up significantly after 2020. Under the high demand scenario, unmet demand is nonzero even under historical climate conditions (Figure 7).

**Figure 7: Unmet demand for IEUA service area by climate change scenario over time (high demand scenario)**

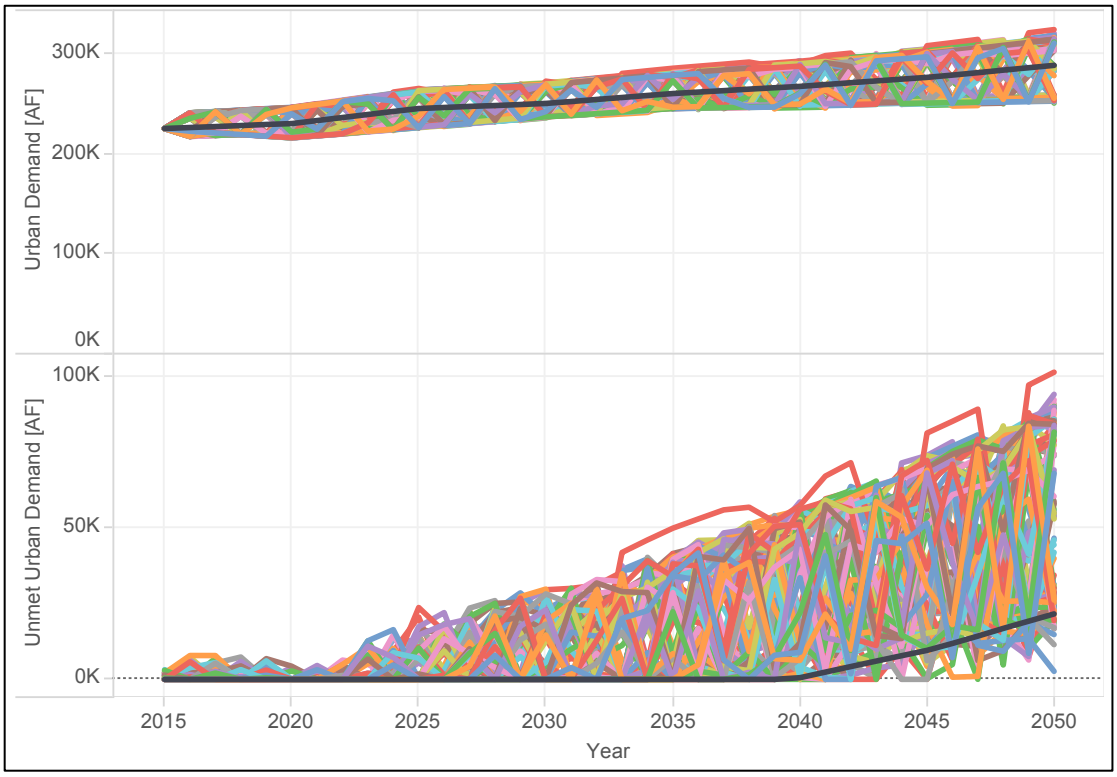


Note: Colored lines correspond to the individual 106 climate scenarios. The black lines correspond to the historical climate scenario.

Figure 8 summarizes the results shown above by 5-year period. For the 2036-2040 period, which essentially reflects the end of IEUA's IRP timeframe, there is virtually no unmet demand for half of the 106 climate projections under the low demand scenario. In contrast, under the high demand scenario, the median result for unmet demand is about 25 TAF/year, and there is unmet demand in most of the future climates considered. Note that the IEUA IRP reports the 75$^{th}$ percentile unmet demand results as a characterization of the majority of plausible futures. The 75$^{th}$ percentile results are seen in the figure as the top of the shaded boxes.

**Figure 8: Summaries of unmet demand across climate scenarios by demand scenario and 5-year period**

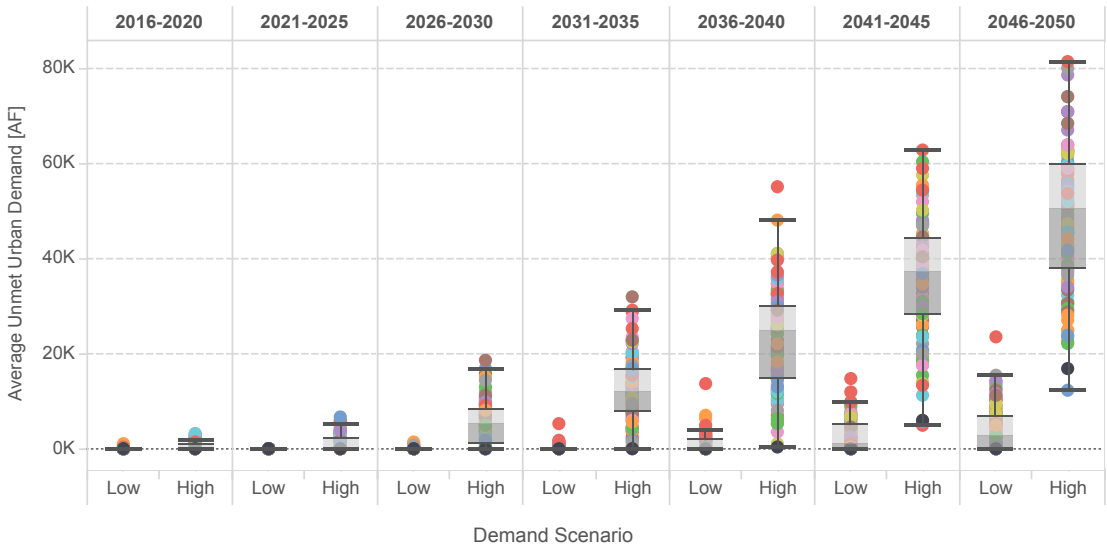


Note: Colored dots correspond to the individual 106 climate scenarios. The black dots correspond to the historical climate scenario. The boxes show the 25th, median, and 75th quartile results, with the vertical stems indicates 1.5 times the 25th-75th quartile range.

RAND also investigated how the results vary with different assumptions about how much MWD supplies might decline over time in response to climate change, and whether or not local supplies, stormwater, and non-MWD replenishment supplies will fluctuate due to temperature in addition to precipitation (see Appendix 2 for more detail). Figure 9 compares the range of unmet demands for the 2036-2040 period under different assumptions about temperature effects on local supplies and climate change on MWD supplies. For the low demand scenario, the assumptions appear to have little effect on the unmet demand results across the climate scenarios. For the high demand scenario, however, there are some modest changes. The effect of going from modest to high climate impact on MWD supplies is about equal to the effect of including the temperature impacts on local, stormwater, and replenishment water supplies. For both types of uncertainties, however, the effects on the results are modest, and are much smaller in scale than differences in results between demand scenarios.

For the IRP, IEUA selected the assumptions that (1) climate change would have a high impact on MWD supplies and that (2) there would be temperature effects on local, stormwater, and replenishment supplies in order to be able to plan for more stressing future situations. These assumptions were made to ensure that IEUA has sufficient resources and necessary infrastructure under a wide range of plausible futures.

**Figure 9: Average urban demand and unmet demand (2036-2040) across climate scenarios (boxes), demand scenarios (Low, Wide), climate effects on MWD supplies (modest, high), and temperature effects on local, stormwater, and replenishment supplies (No, Yes)**

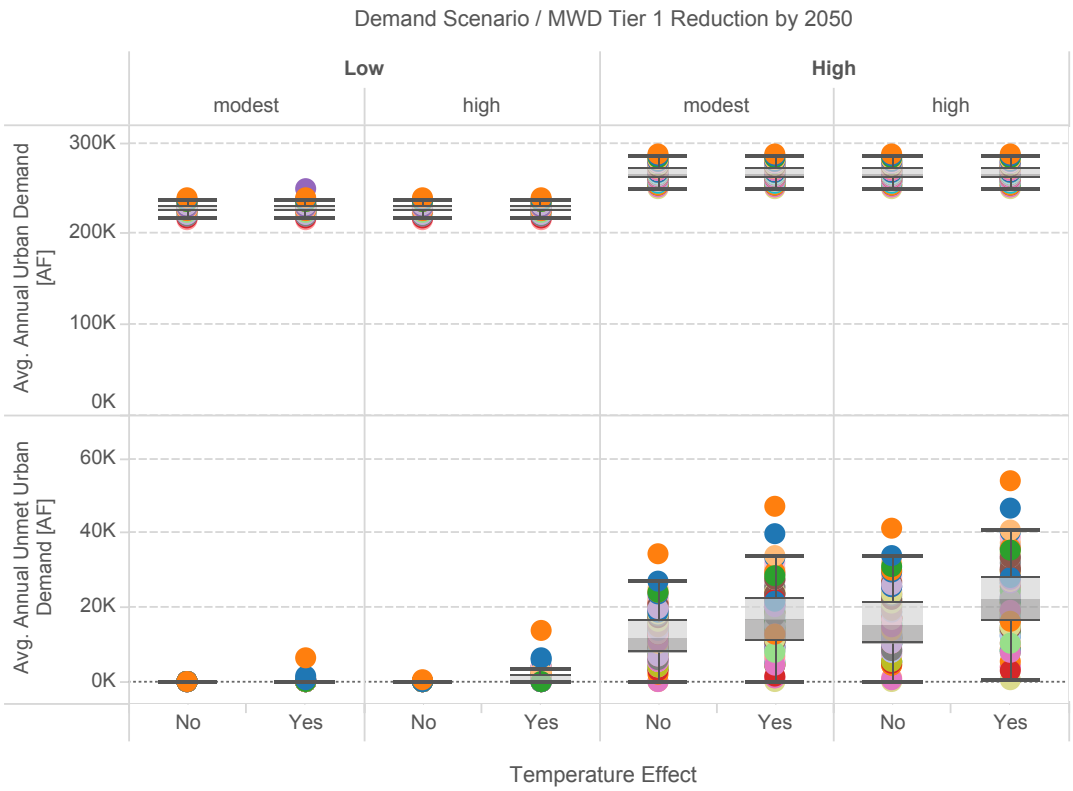


Note: Colored dots correspond to the individual 106 climate scenarios. The black dots correspond to the historical climate scenario. The boxes show the 25th, median, and 75th quartile results, with the vertical stems indicates 1.5 times the 25th-75th quartile range.

Figure 10 shows the major climate-dependent supplies used to meet demand over time for the 107 climate scenarios. The top panel shows these results for Chino Basin groundwater. The figure shows that during the next 15 years, when supplies generally exceed demand, there is a range of groundwater supply use, depending on the demand and availability of cheaper local surface supplies. The increased use during some years reflects deferred use of these supplies during wet years. Around 2030, increasing demand, coupled with declining surface supplies, groundwater supply becomes more stable at the maximum amount available. The slight range of use across the climate scenarios in the out years reflects the different climate effects on safe yield—which is small.

Local supply, some types of which are relatively low-cost (notably excluding recycled and desalted water), fluctuates due to its availability. Figure 10 shows significant variability as well as a tendency for declining amounts of supply, as compared to the typical IEUA assumption of stable supplies based on historical yields (the solid black line). These results reflect the projected warming conditions for all climate scenarios and variability in projected precipitation.

Lastly, the bottom panel of Figure 10 shows use of MWD Tier 1 water over time across the 107 climate scenarios. Future use under assumptions of historical climate declines initially as other supplies are developed. After 2020, however, IEUA increasingly relies on the assumed available MWD Tier 1 supply to meet growing demands. By 2040, all cheaper supplies are completely utilized and MWD Tier 1 supply is used at its maximum level. Note that 2040 is the year in which shortages are also shown to begin (see Figure 7). There is significant interannual variability in the use of MWD Tier 1 supplies across the futures, in response to variable demands and other supplies. In many years, Tier 1 use reaches the maximum available amount. Per the assumptions about climate's impact on available MWD supplies, the maximum amount available begins to decline in 2020. In those years and scenarios in which the MWD Tier 1 use is at this declining maximum level, there is also unmet demand as seen in Figure 7.

**Figure 10: Baseline supply ability to meet IEUA service area in the high demand scenario by climate projection**

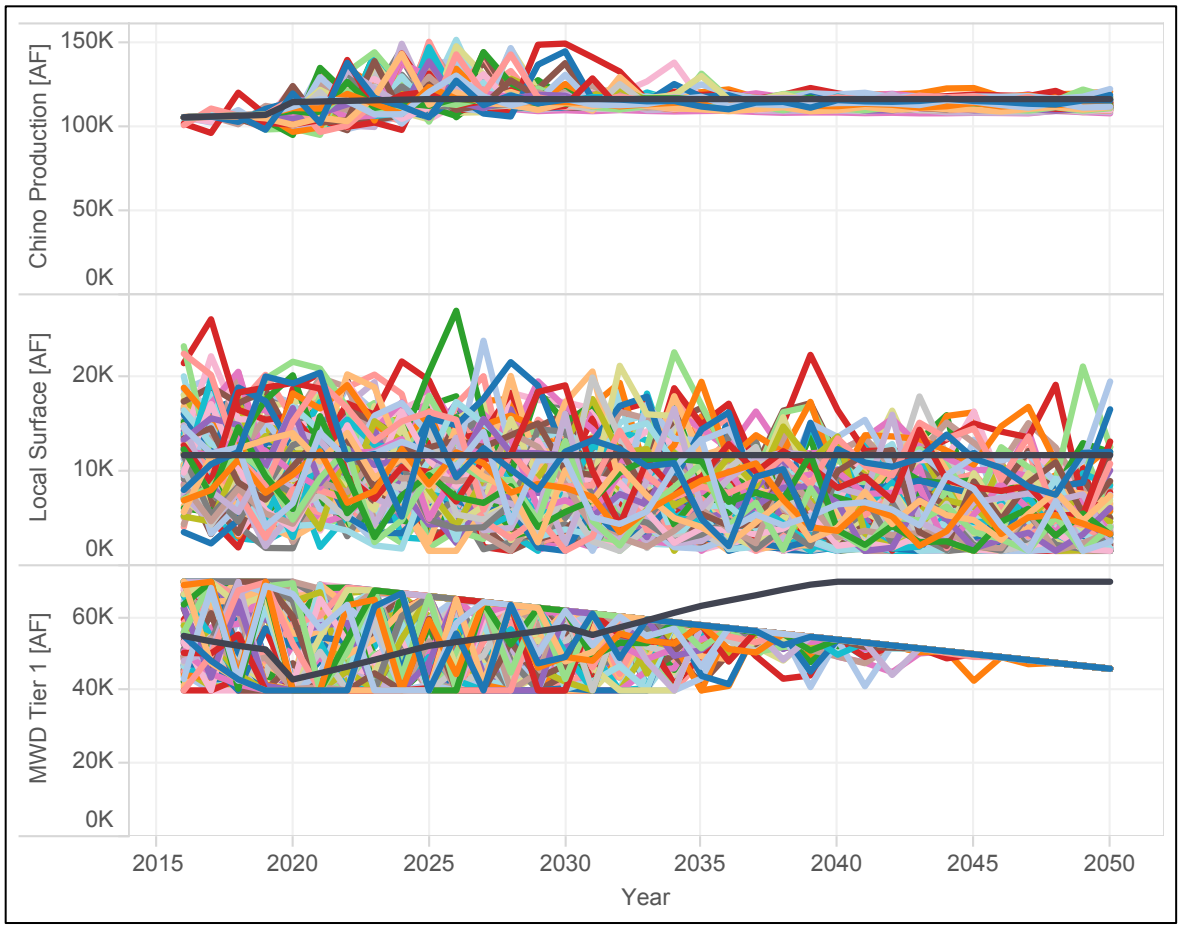

While there is uncertainty over how climate change might affect IEUA's supplies, the climate scenarios used, combined with assumptions made in this analysis, show a tendency for supply reductions. The top panel of Figure 11 shows that for most scenarios, supplies are lower than they would be under historical climate conditions. The largest potential impact on supply is on MWD imported supply—with all climate scenarios showing a decline in accordance with the assumption that MWD supplies could experience a gradual decline in response to climate change. The second most impacted supply is on local surface supply, with a median decline of about 5 TAF/year. The overall effect on groundwater production is small, consistent with the assumptions about climate's effect on safe yield.

The bottom panel of Figure 11 shows the range in use of future supplies across the climate scenarios. For the resources that are utilized fully due to their lower cost, such as Chino groundwater and local surface supplies, the variability reflects the range of climate impacts on these supplies. For these, the larger range of uncertainty is seen in the local supplies. The range in uses of MWD Tier 1, however, reflects the range of availability of the less expensive supplies—not any assumptions of climate effects on MWD supplies. As described above, the only climate effect on MWD Tier 1 availability is specified through a steady decline in supply availability.

**Figure 11: Impacts of climate on IEUA supplies across climate futures (colored dots) (2036-2040) (top) and uncertainty in the magnitude of climate impacts uncertainty (bottom)**

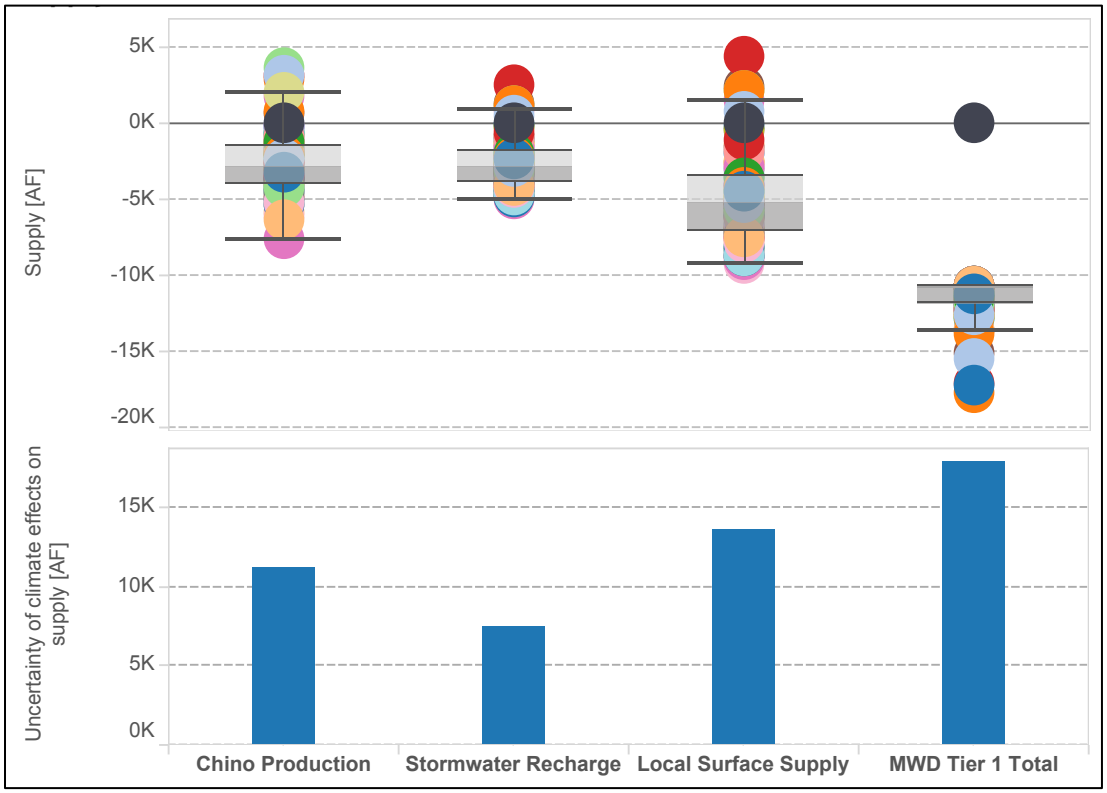


Note: Colored dots correspond to the individual 106 climate scenarios. The black dots correspond to the historical climate scenario. The boxes show the 25th, median, and 75th quartile results, with the vertical stems indicates 1.5 times the 25th-75th quartile range. The blue bars indicate the range of supply outcomes across the climate scenarios (excluding the historical simulation shown by the black dot).

## Management strategies that focus on efficiency and maximizing use of recycled and imported water help close future gaps between supply and demand

Through interactions with member agencies and other stakeholders, the IEUA developed the seven portfolios discussed above in Table 2, consisting of different water management actions aimed at closing the future gap between supply and demand, and meeting other qualitative regional goals.

Using the WEAP model and the same climate projections used to "stress test" the IEUA baseline water supplies, we evaluated how well each of the seven strategies would meet demand in the future. Figure 12 summarizes the performance of the baseline strategy and the seven portfolios in terms on unmet demand from 2036-2040. All portfolios lead to an improvement in

unmet demand over the baseline supply. Portfolio 1, which uses previously stored groundwater, reduces unmet demand by more than half for the median climate scenario. Portfolio #2A, which increases use of recycled water and external supplies as well as implements additional efficiency, eliminates unmet demand for more than 25% of scenarios and reduces the median unmet demand to below 10 TAF. Portfolio #2B improves upon portfolio #2A by adding additional imports—all but eliminating unmet demand. Portfolio #5A combines moderate efficiency with increased imports to eliminate unmet demand in more than half of the scenarios. Lastly, four portfolios—#3A, #3B, #4, and #5B—eliminate unmet demand in at least 90% of the scenarios. The first two do so by significantly increasing efficiency—effectively ensuring that demand follow the low growth demand trajectory. The other two (#3B and #5B) improve performance by maximizing recycled water use while also increasing imported water supplies.

**Figure 12: Average unmet demand (2036-2040) across climates projections for high demand projection and different IEUA portfolios**

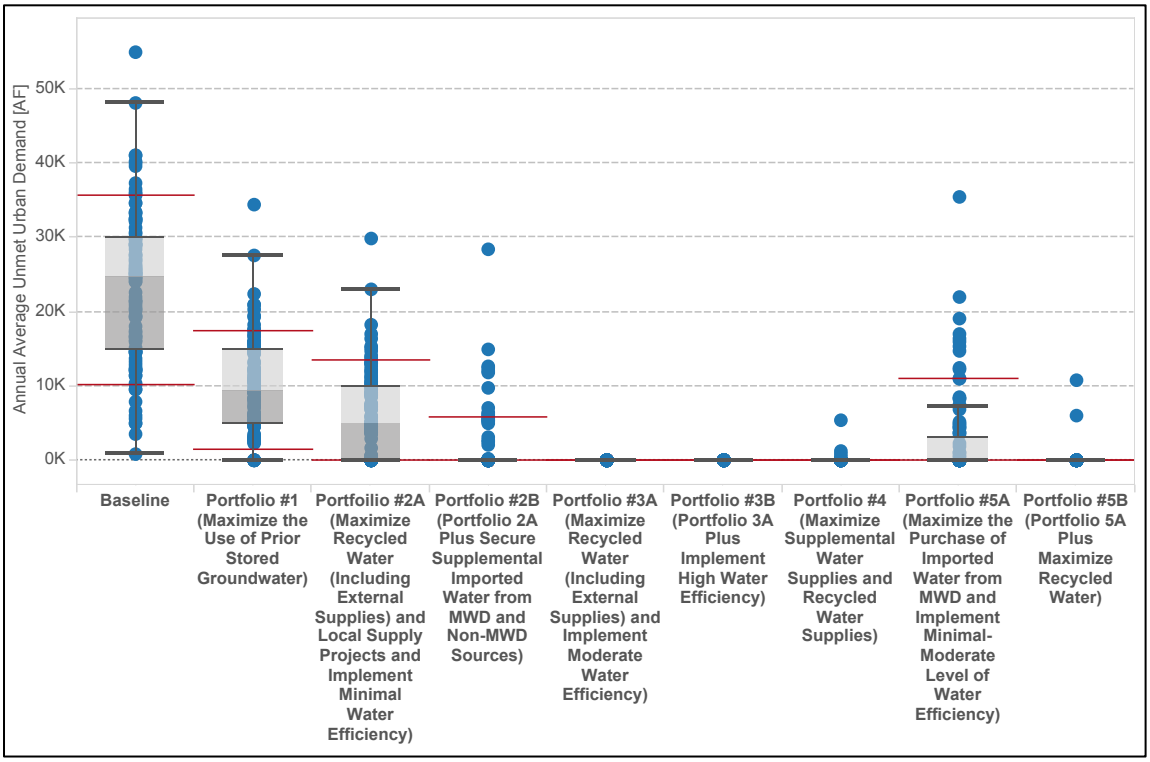

# Conclusion

This is one of a growing number of water planning examples that highlights the benefits of examining the impacts of different climate change futures on meeting consumer demand. Here, assumptions about demand growth and climate future both had substantial impacts on ability to meet demand, and level of climate change impact on imported water as well as temperature impacts on local supplies also had some effect, especially in the most stressing demand future. Using these results, RAND and IEUA were able to identify types of management strategies focused on efficiency and maximizing available supplies that helped close the modeled future gaps between supply and demand. This work also demonstrates the value of visualization tools and water management simulations that can help facilitate discussion of alternatives for managing water resources in a very uncertain future.

For IEUA, participating in this process was not academic. As reported by IEUA management, it was a "game changer". This is because the analytic process described herein enabled understanding of how powerful water use efficiency and local supplies are in reducing the risk of future supply shortfalls in IEUA's service area, and also provided reassurance that their region is prepared for a future with uncertain shifts in climate. By engaging in this process, IEUA has not only identified how and when changes in temperature and precipitation could impact its water supplies, but also how demand influences the delicate balance between supply and demand. Both the timing of surges in unmet demand and the types of management actions that could help mitigate anticipated gaps in supply are helping to inform the construction of the IRP in a way that encourages adaptation and the use of integrative plans. Future work could investigate more specifically which assumptions related to future climate, demand, and supply lead to the greatest challenges in unmet demand, which could further help IEUA refine management practices and future plans.

# Appendix 1 – Portfolio Development Tool

This appendix describes the IEUA Portfolio Development Tool (PDT) developed by RAND (Figure 13), with input from IEUA on its function, design, and input data. The PDT is a decision support tool designed to help IEUA and its member agencies assemble different portfolios of water management options that could help ensure the IEUA meets future water demands. IEUA used the PDT to develop a set of portfolios that were then evaluated across different climate and demand scenarios using a water management model described in Appendix 2. Although the information within and specific design of the PDT are specific to IEUA's needs, the visualization platform and methodological process could be used in the context of any water agency with similar needs for long-range planning under uncertain future conditions.

**Figure 13: Title screen for the Portfolio Development Tool**

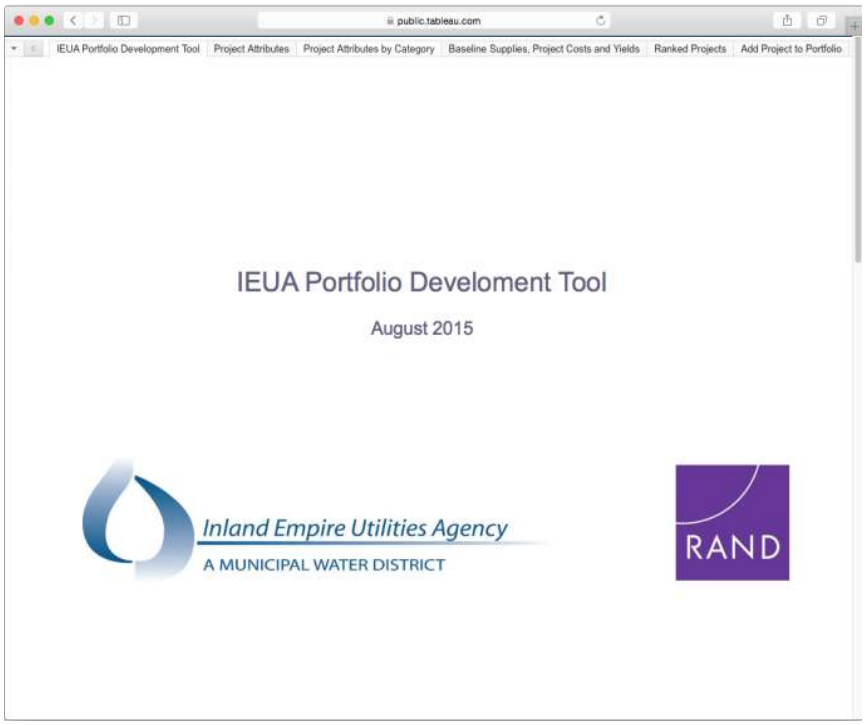


The PDT was developed using Tableau—a business analytics and visualization software package. All the data used to develop the PDT were provided to RAND by IEUA, and the PDT was deployed via the Internet for IEUA and stakeholders. In the series of figures below, we walk through each of the PDT's visualizations. Once again, the design and data shown here are

specific to IEUA, but this type of tool could be configured to support decision-making within numerous types of organizations.

## Overview of the Portfolio Development Tool

The PDT's main function is to help the user develop a portfolio of management options that meets specified near-term and long-term water supply and demand targets. To do this, the user first specifies the projects that he or she wishes to consider. Next, the user specifies the near-term and long-term targets. The PDT then identifies the projects that would best achieve the targets from the set of eligible projects using a cost effectiveness criterion. In this context cost effectiveness is expressed in terms of levelized cost—or average cost per unit of new supply or demand reduction. Lastly, the PDT summarizes the included projects, their overall attributes, their cumulative yields, and their cumulative costs.

## Portfolio Development Tool Visualizations

Figure 14 shows one visualization used to concisely display qualitative information about the attributes of different water management projects. Here, each row pertains to a different project, organized by type, with each column indicating one of 16 qualitative attributes related to IEUA's future goals (e.g., increasing water levels in critical groundwater management zones, increasing stormwater capture and associated groundwater recharge). Filled circles indicate that projects help meet certain goals, half circles indicate that a projects have no impact on goals, and open circles indicate that projects detract from efforts to meet goals. This visualization provided a reference for IEUA and member agencies used this tab to contrast how well different types of and individual projects helped meet goals.

**Figure 14: Summary of how a sample of IEUA potential projects would help meet qualitative goals**

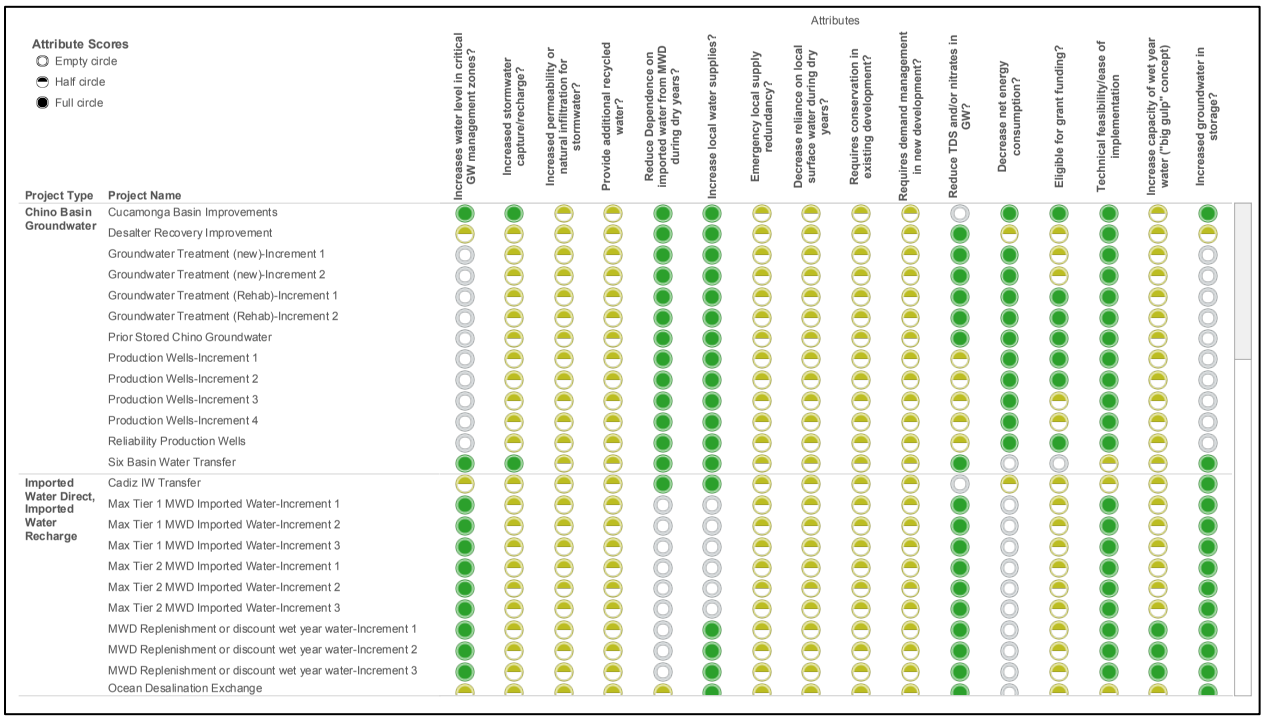


Figure 15 displays the same IEUA qualitative goals as in the previous screenshot (above), but summarizes their values within the different project categories. This shows, for example, how many projects within the more general category of "Chino Basin Groundwater" add to, detract from, or have neutral effects on different goals. This assists decision makers in identifying which categories have the most projects that might contribute to the achievement of particular goals.

**Figure 15: Summary of how well projects in different categories meet various IEUA qualitative goals**

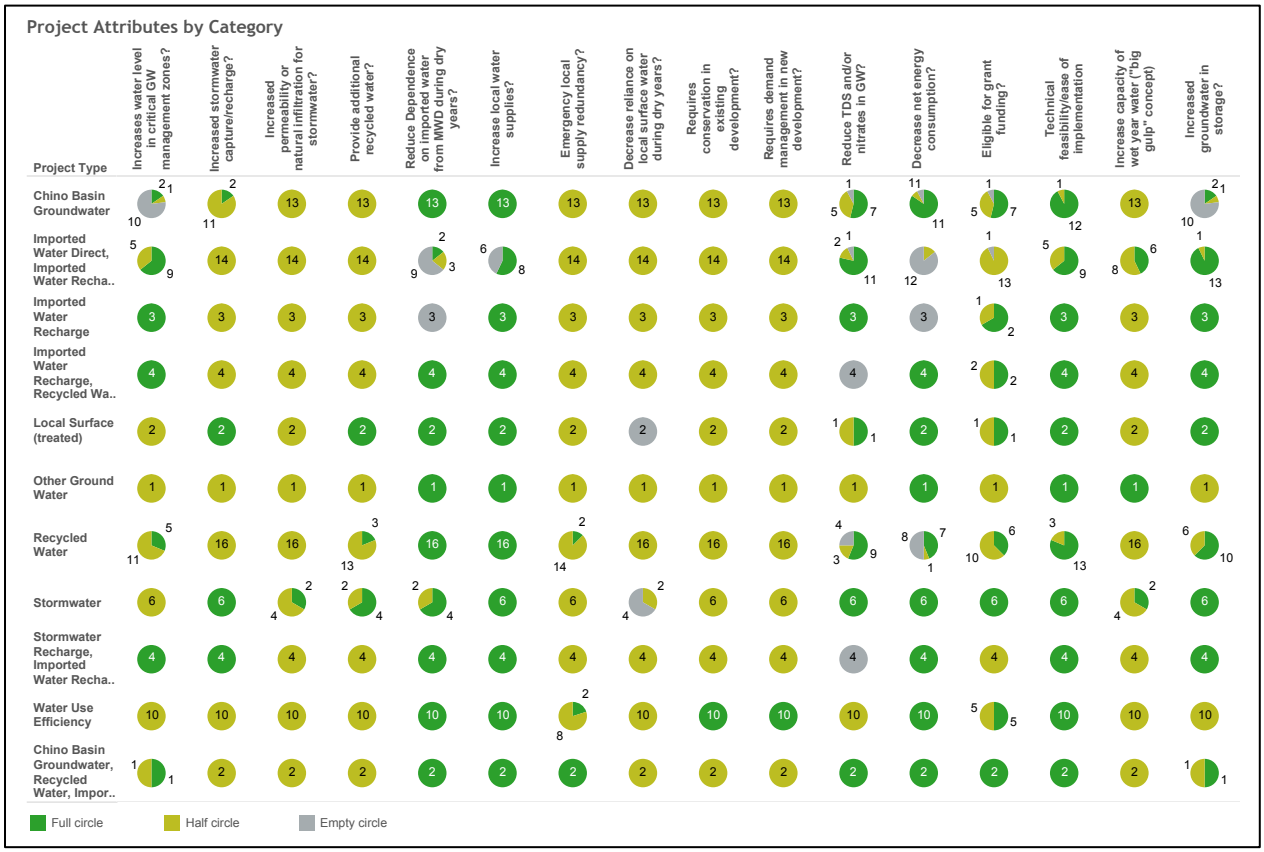


IEUA has considerable supplies to meet current and future needs already. These are highlighted in the top panel of Figure 16, and include groundwater, recycled water, imported water, conservation measures, and other sources. The color bars indicate when these sources come online, and most are already available. (Note that those that come online in the future are already planned for implementation and are thus not considered in the portfolio options directly.) IEUA and member agencies requested this view of the baseline supplies because it serves as a useful perspective upon which to layer projects to bring additional future supplies. Below the baseline supply panel are the different potential projects, sorted by general categories, and with information about cost and amount of supply each is estimated to provide. Note that not all projects are visible in this screen shot.

**Figure 16: Summary of baseline supplies, estimated new project supply amounts, and new project costs**

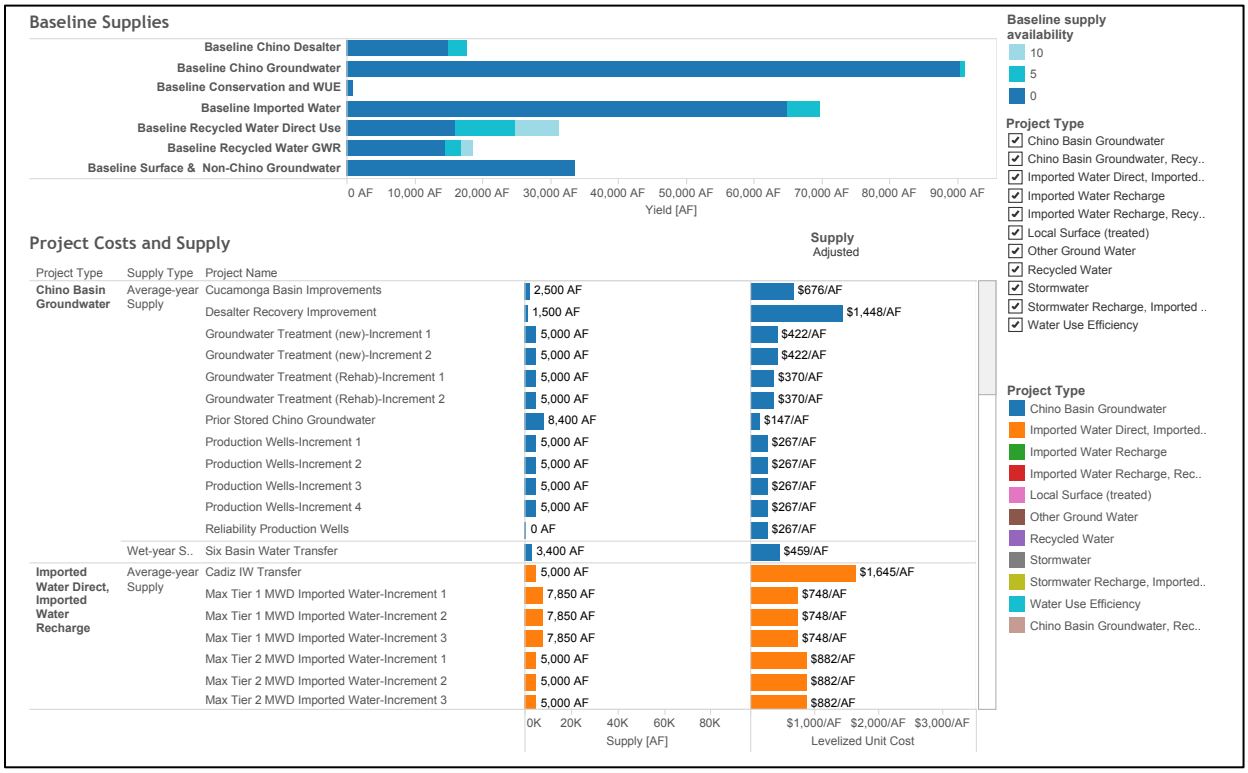


Figure 17 displays all the projects, sorted by preliminary estimates of per unit water cost (these have yet to be finalized). Symbol coloring indicates its category, size indicates its estimated volume; horizontal position indicates the number of years until which the project produces enough water to add to the supply IEUA distributes to stakeholders; the text label indicates its cost; and its symbol indicates whether the water is available during any given year or only under particularly wet or dry conditions. This view was useful for stakeholders to compare projects, and general categories of projects, by supply amount, timing, and cost.

**Figure 17: Project cost per acre-foot, with information on project type, supply amount, supply type, and number of years to "wet water" supply**

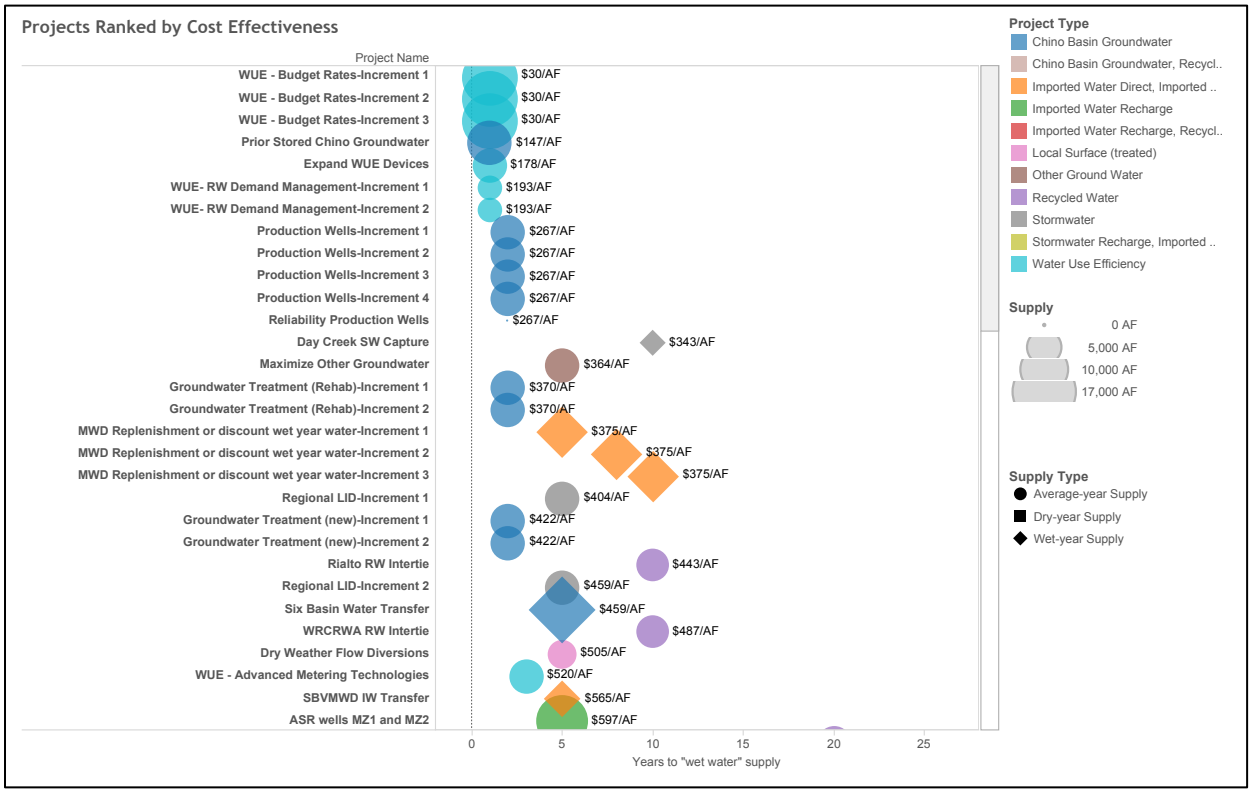


The next figures show how IEUA and member agencies were able to use the tool to create different potential portfolios of water management options. Figure 18 shows a tab in which the user is able to select individual projects to be considered in a portfolio. The user can exclude or include a project with a single click of the toggles on the right side of the screen shot. Projects' inclusion, category, cost, and years to wet water supply are tracked in real time on the left side of the screen. Aggregate summaries of the project attribute measures are shown as pie charts at the bottom of the screen. In this figure, a subset of projects is selected for inclusion, and only some projects are shown in the figure. In the tool, the user is able to scroll to see projects from all project categories.

**Figure 18: Portfolio building tab enabling user to include and exclude specific projects in real time and visually track different project categories, costs, and years to "wet water" supply**

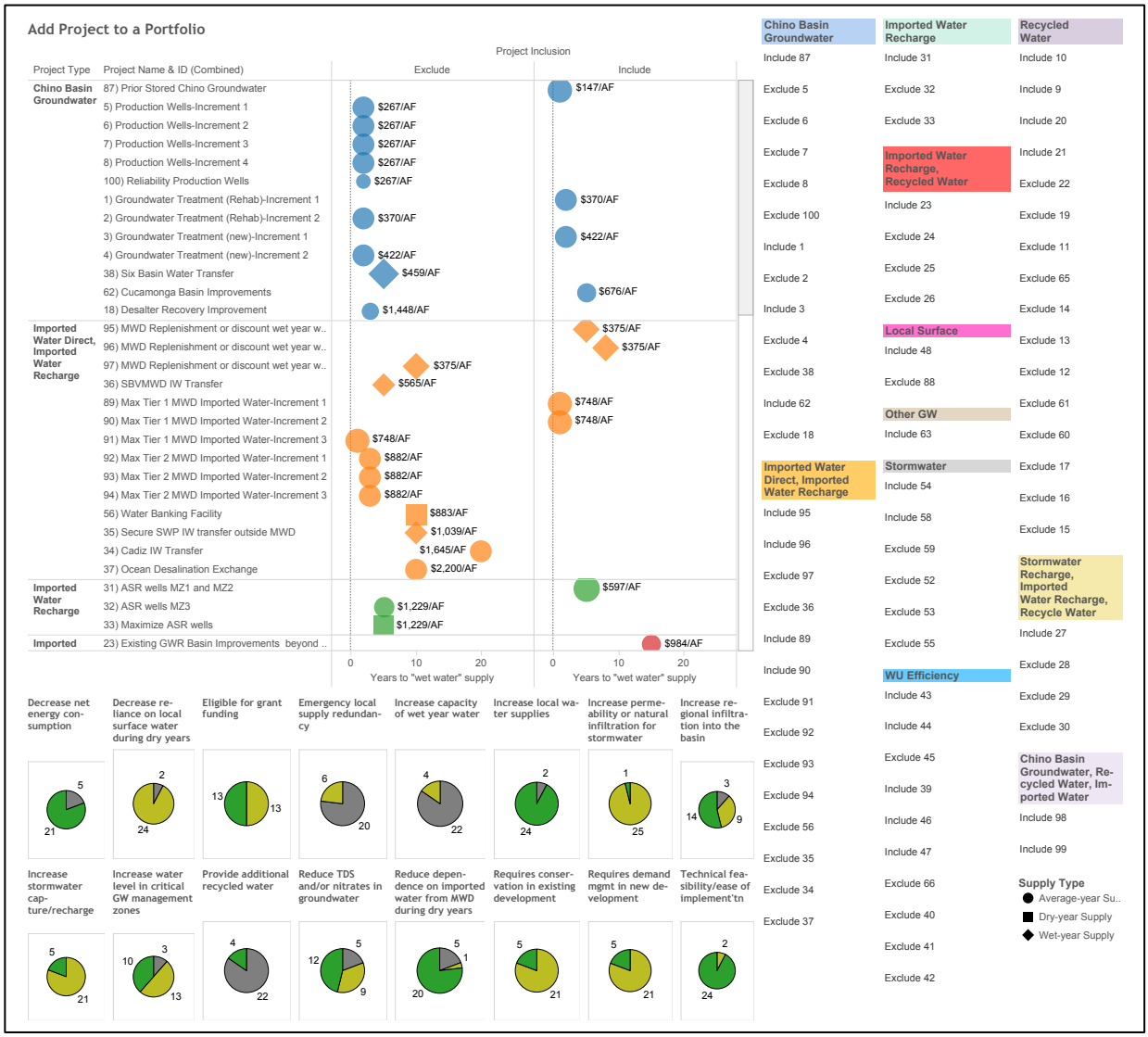


The next visualization (Figure 19) takes the options included in the previous screens and sorts them by cost effectiveness and availability to meet user-specified near-term (year 10) and long-term (year 25) targets. In this example, the near-term target is set to 50 TAF, whereas the long-term target is set to 101 TAF. On the left, projects are shown ordered by cost effectiveness. The bar chart to the right shows the cumulative new supply or demand reduction. Projects that meet the near-term or long-term targets are shaded green, indicating that they are included in the final portfolio. The project shaded dark green are only available to meet long-term demand. On the right, a pie chart summarizes the mixture of projects used to meet the supply targets and the type of projects with respect to availability (all year, wet year, or dry year).

**Figure 19: Example portfolio with information on projects included therein, and how well projects meet supply goals**

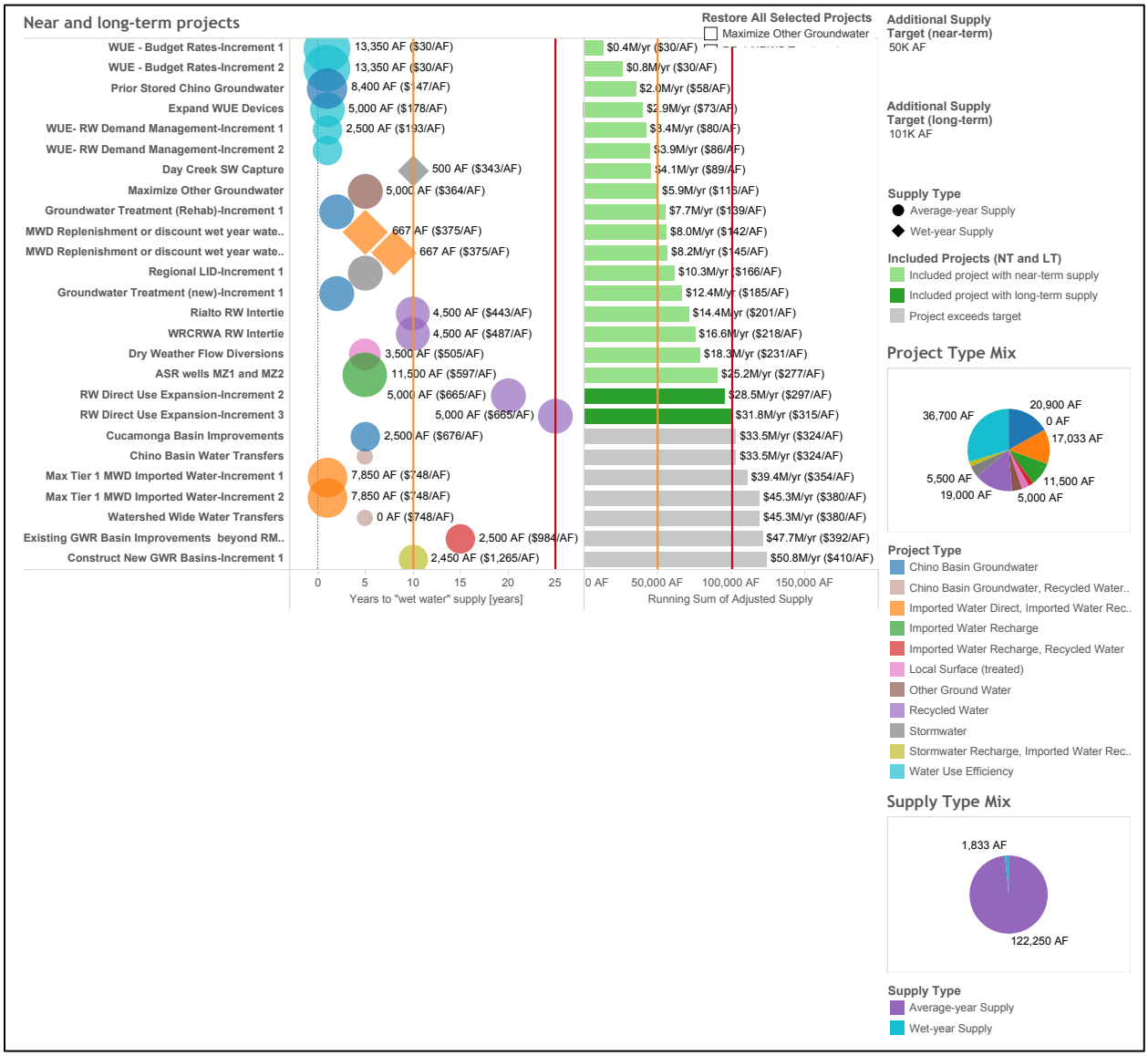


Lastly, Figure 20 provides another summary of the defined portfolio. This includes a summary of the supply and project category information in Figure 19, but also displays summaries of the project attributes—suggesting how well a particular portfolio meets different IEUA qualitative goals. IEUA and member agencies were able to use this display as a final summary chart for each portfolio they explored.

**Figure 20: Example project portfolio summary, including how well projects meet IEUA qualitative goals**

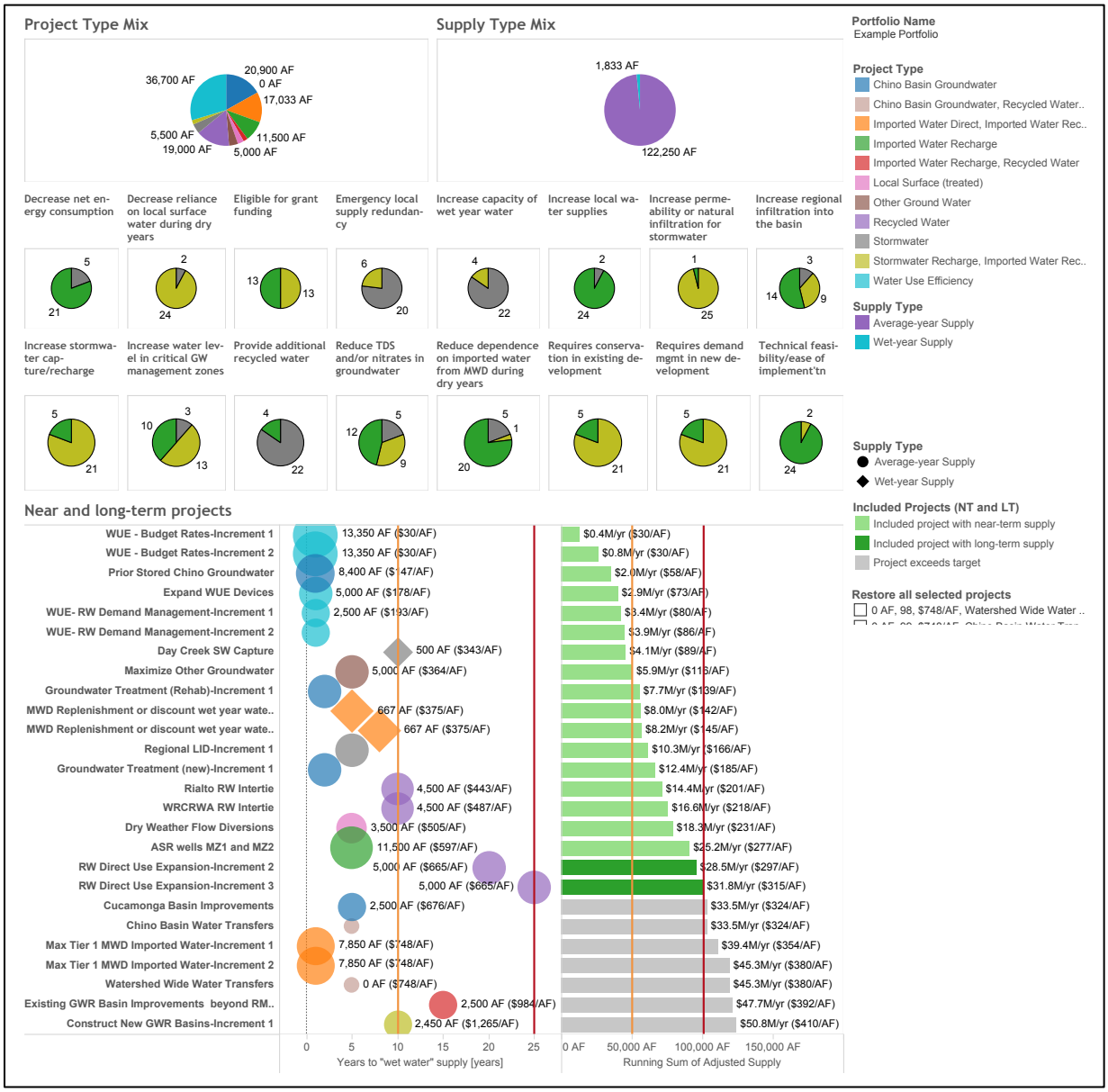

# Appendix 2 – Water Management Model And Assumptions

## Model Overview

The study team built a model of the IEUA water management system, based on tabular monthly and annual information on historical and projected IEUA water supplies and demands provided by IEUA. The model includes simple relationships and data on estimated future climate conditions to evaluate water supply and demand balance conditions under alternative futures. Lastly, the model evaluates how different water management portfolios, developed using the Portfolio Development Tool (see Appendix 1), would improve performance over these futures.

The model is built in the Water Evaluation And Planning (WEAP) system, developed by the Stockholm Environment Institute (SEI) (Yates *et al.*, 2005). The WEAP IEUA water management model represents the IEUA system through a set of arcs and nodes. Nodes represent locations of water inflows, storage (surface or groundwater), outflows, or demand. Arcs represent conveyance, either natural or constructed, between different nodes.

The IEUA WEAP model calculates how water demand would be met by various supplies based on a system of supply preferences and priorities for each demand node. The model schematic shows the connectivity of water flows among the nodes via the arcs within the model (Figure 21). The schematic is not intended to represent the specific locations of IEUA system elements, but rather show their connectivity. Table 3 lists and describes the demand and supply nodes shown in the model schematic. More details on select demands and supplies are provided in the sections below.

**Figure 21: Schematic of the WEAP model of the Inland Empire Utilities Agency service area**

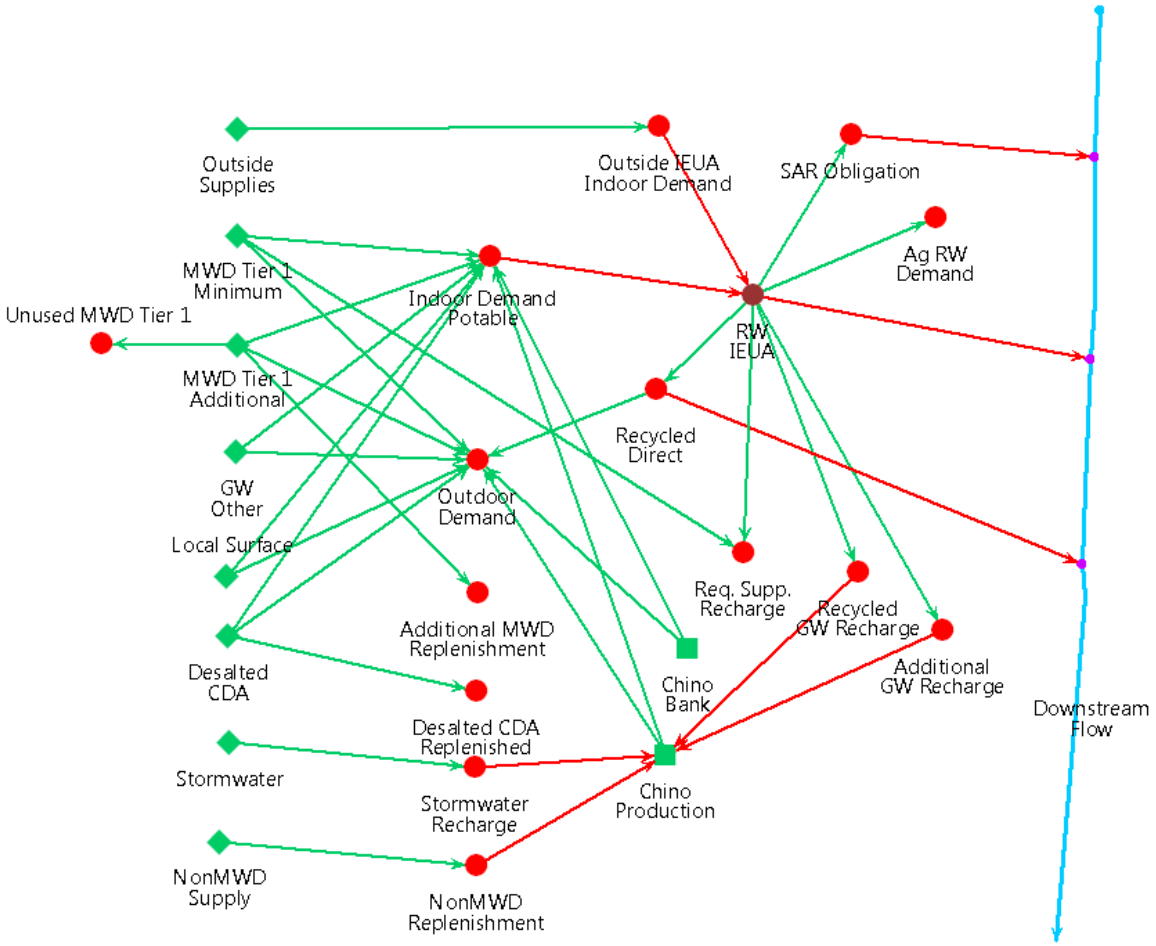


Note: RW = recycled water; Ag = agricultural; SAR = Santa Ana River; MWD = Metropolitan Water District of Southern California; CDA = Chino Desalter Authority; GW = Groundwater.

**Table 3: IEUA WEAP model supply and demands**

| Node Name | Description |
|---|---|
| ***Demand*** | |
| Indoor Demand Potable | Indoor demand for potable (non recycled) water |
| Outdoor Demand | Outdoor demand for potable and recycled water |
| Recycled Direct | Total recycled water demand for outdoor use; met demand passes through to Outdoor Demand node or downstream flow if unneeded |
| Recycled GW Recharge | Demand for groundwater replenishment water; passes to Chino Production node |
| Additional GW Recharge | Demand for additional groundwater replenishment as specified by water management strategies; passes to Chino Production node |
| Outside IEUA Indoor Demand | Demand for water outside IEUA that is provided to IEUA for recycling via RW IEUA node |

| | |
|---|---|
| SAR Obligation | Santa Ana River flow obligation; met by recycled water |
| Ag RW Demand | Agricultural water demand in IEUA service area met with recycled water |
| ***Supplies*** | |
| MWD Tier 1 Minimum | Specified annual minimum Tier 1 MWD imports (about 40 TAF) |
| MWD Tier 1 Additional | Additional annual Tier 1 MWD imports, constrained by contract with MWD |
| Local Surface | Water supplies obtained from watersheds within the IEUA boundary |
| Desalted CDA | Desalted brackish groundwater from the Chino Desalter Authority facilities |
| Chino Production | Groundwater from the Chino Basins |
| GW Other | Groundwater from sources outside the Chino Basin |
| Stormwater | Additional runoff from storms captured and treated for use |
| NonMWD Supply | External sources of water used for groundwater replenishment |

## Climate Scenarios

The study uses downscaled climate data from general circulation models as the basis for a wide range of plausible future climate conditions. Historical and projected climate data from the World Climate Research Programme's (WCRP's) Coupled Model Intercomparison Project phase 3 (CMIP3) multi-model dataset were downloaded from the Downscaled CMIP3 and CMIP5 Climate and Hydrology Projections archive (Maurer *et al.*, 2007).[2] Climate data retrieved from this archive included bias-corrected statistically downscaled (BCSD) global climate model (GMD) monthly mean temperature and total precipitation observations and projections for 36 CMIP3 simulations and 70 CMIP5 model runs for years 1950-2050 (Brekke *et al.*, 2013). Note, however, that observed BCSD data were available only for years 1950-1999. These gridded climate data represented the gridded area bounded by latitudes 34.0N and 34.125N and longitudes 117.625W and 117.5W, roughly centered at Ontario International Airport (Figure 22).

[2] Data is available online at: http://gdo-dcp.ucllnl.org/downscaled_cmip_projections/.

**Figure 22: Geographic scale of climate sources for CMIP-3 data (left) and CMIP-5 date (right)**

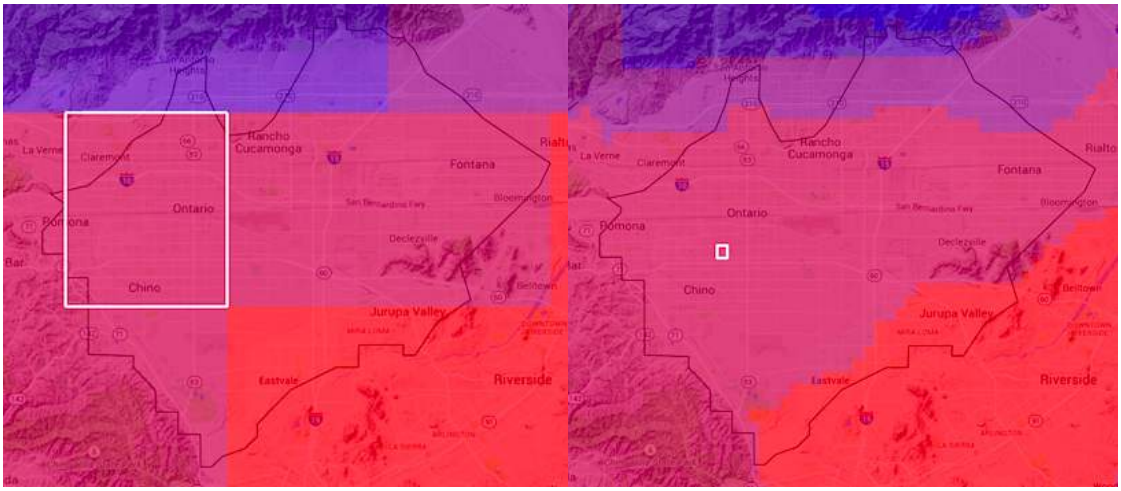


## Select Demands

### *Indoor Potable*

Indoor potable demand is calculated as the population within the IEUA service area times an annual water use rate. IEUA, assisted by A&N Technical Services, specified the high and low demand scenario by varying annual water use rates. The middle demand scenario is user definable by setting the indoor and water use rates for 2050. Indoor potable demand does not vary by climate.

**Table 4: Indoor potable demand parameters for historical data and scenario projections**

| Model Parameter | 2010 (data) | 2014 (data) | 2020 (projection) | 2050 (projection) |
|---|---|---|---|---|
| Population (people) | 813,695 | 847,587 | 896,533 | 1,249,091 (all) |
| Water Use rates (gal/person/year) | 26,061 | 23,981 | 24,090 (high)<br>22,959 (low) | 24,017 (high)<br>17,082 (low) |
| Water Use/Demand (taf/year) | 65.1 | 62.4 | 66.3 (high)<br>63.2 (low) | 92.1 (high)<br>65.5 (low) |

### *Outdoor*

Outdoor demand is calculated as the population within the IEUA service area times an annual water use rate. IEUA, assisted by A&N Technical Services, specified the high and low demand scenario by varying annual water use rates. The middle demand scenario is user definable by setting the nominal outdoor and water use rates for 2050.

IEUA performed a series of sensitivity analyses of urban outdoor demand and weather conditions. By 2040, IEUA estimated that one dry year would increase demand by 5.6%. Similarly, a one wet year would decrease outdoor demand by 5.6%. A longer period of dry weather (3-years) would increase demand by 8.9%. Separately IEUA estimated the long-term effect of warming on outdoor demand. They found that for each degree temperature increase (in Celsius), outdoor demand would increase by 3%. Together these factors were applied to the climate scenarios to estimate how outdoor demand could change due to weather in the future.

Outdoor demand varies by three outdoor water demand factors that are applied depending up the projected precipitation difference from historical (or perturbation), as shown in Table 5. The outdoor water demand factors were derived from IEUA analysis.

**Table 5: Climate effect factors on outdoor water demand**

| Precipitation Condition | Perturbation Threshold | Outdoor Water Demand Factor |
|---|---|---|
| Very dry | -5 cm/year | -0.089 |
| Dry | 0 cm/year | -0.056 |
| Wet | + 25 cm/year | +0.56 |

### *Agricultural recycled water demand*

Agricultural recycled water demand is specified based on IEUA projections and does not vary by climate. This demand declines from about 10,000 AF in 2015 to 2,000 AF by 2025 and then remains constant through 2050. This is due to the transition of agricultural land to urban use.

### *SAR Obligations*

IEUA's Santa Ana River (SAR) obligations are specified to be 17,000 AF/year per IEUA agreement.

## Select Supplies

### *Local Surface supplies*

Total monthly local surface supplies within the IEUA management boundary for water years (July through June) 2010 through 2015 were provided by IEUA member agencies and represent the amount of water that is diverted, not total stream flow. To estimate these total local surface water supplies under different climate scenarios, relationships between climate variables and surface supply were derived using historical data. These relationships were then used to estimate future supplies under each climate scenario included in the analysis. Several different regression models were evaluated, and two models were found to reasonably represent the relationship

between historical climate and historical supplies. One included both temperature and precipitation variables and the other only precipitation.

At the time of the analysis, the gridded BCSD historical climate observations were available only between 1950 and 1999. Therefore, to compare climate observations to the surface supply results for 2010 to 2015 an additional proxy data set for the 2010 to 2015 period was developed. Specifically, we used weather station observation at Ontario International Airport[3] (coordinates 34.05N, 117.61667W) contained in the Global Historical Climatology Network Database (GHCND) (Menne *et al.*, 2012), maintained by the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center. The Ontario International Airport observation station reports monthly total precipitation and mean temperature observations from 1998 to present day.

We compared the monthly mean NOAA observed data to the monthly mean BCSD observed data for the overlapping period of May 1998 to June 2015. As expected we found very strong relationships for both monthly temperature and precipitation, although the NOAA observations were generally slightly drier than the BCSD data. We calculated a correction factor that we subsequently applied to the NOAA observed data to generate bias corrected datasets. Figure 23 shows a comparison of BCSD observed precipitation, NOAA observed monthly precipitation, and NOAA bias-corrected precipitation. This figure shows the strong relationship between the NOAA and BCSD datasets during the overlapping period of 1998 to 2000 and the very slight adjustment that was made to the NOAA data for months from 2000 and later.

[3] This station has Station ID GHCND:USW00003102 with latitude/longitude coordinates 34.05N, 117.61667W.

**Figure 23: Comparison of BCSD, NOAA, and NOAA bias corrected monthly precipitation data on overlapping dates**

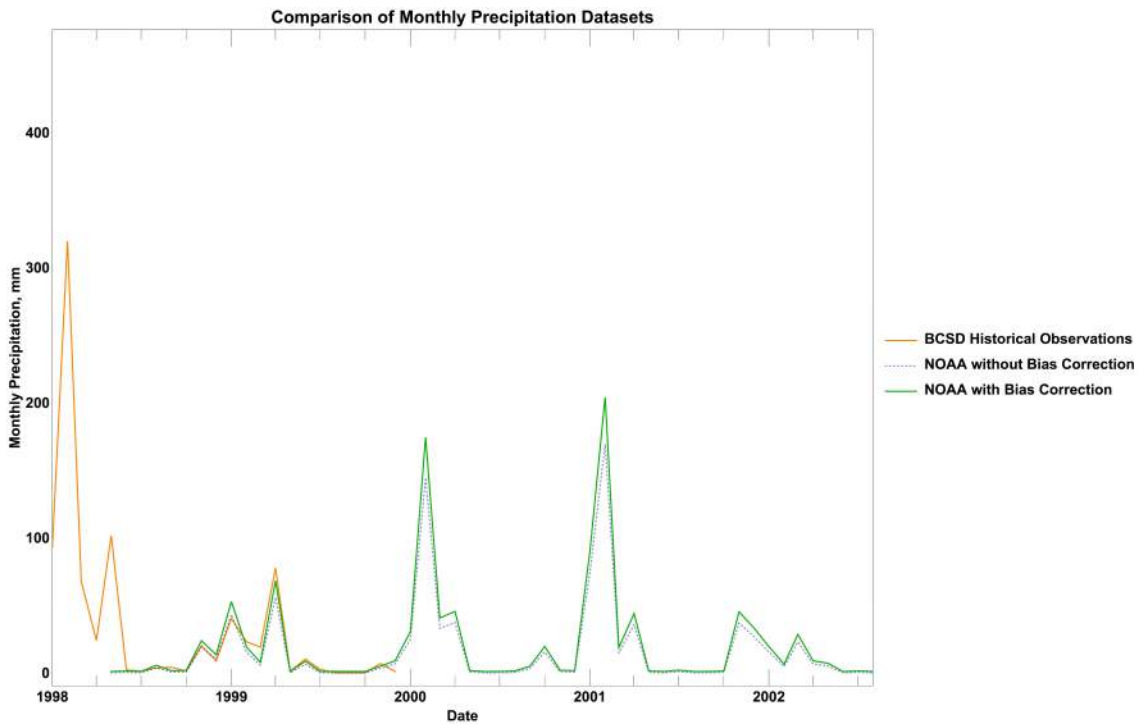


NOAA bias corrected temperature and precipitation data, which were available until June 2015, were used to assess linear regressions relating monthly mean temperature and mean precipitation to total observed IEUA surface supplies. Additionally, given that a significant component of surface supply is due to melting snow pack, the potential of a delayed precipitation signal was evaluated. Four regressions were considered to estimate stream flow: (1) precipitation alone, (2) temperature alone, (3) precipitation and temperature, and (4) precipitation and a 12-month moving average of temperature. These regressions were analyzed with various lag times—applied to both temperature and precipitation—ranging from 0 to 6 months to search for a significant signal; a lag time of three months was found to have the lowest p-value among for all regressions and appeared to best reflect observed stream flow patterns. Note that the minimum p-value found with a lag time of 0 months was ≈ 0.429, while the p-values of the three best-fitting regression models at a lag time of three months were < 0.005. Shown below in Figure 24 is a comparison of each of the four regressions considered—each mapped over the NOAA bias corrected precipitation and/or temperature data—against observed surface flows. Figure 25 shows the same models aggregated to annual totals.

**Figure 24: The four regression models versus observed flows**

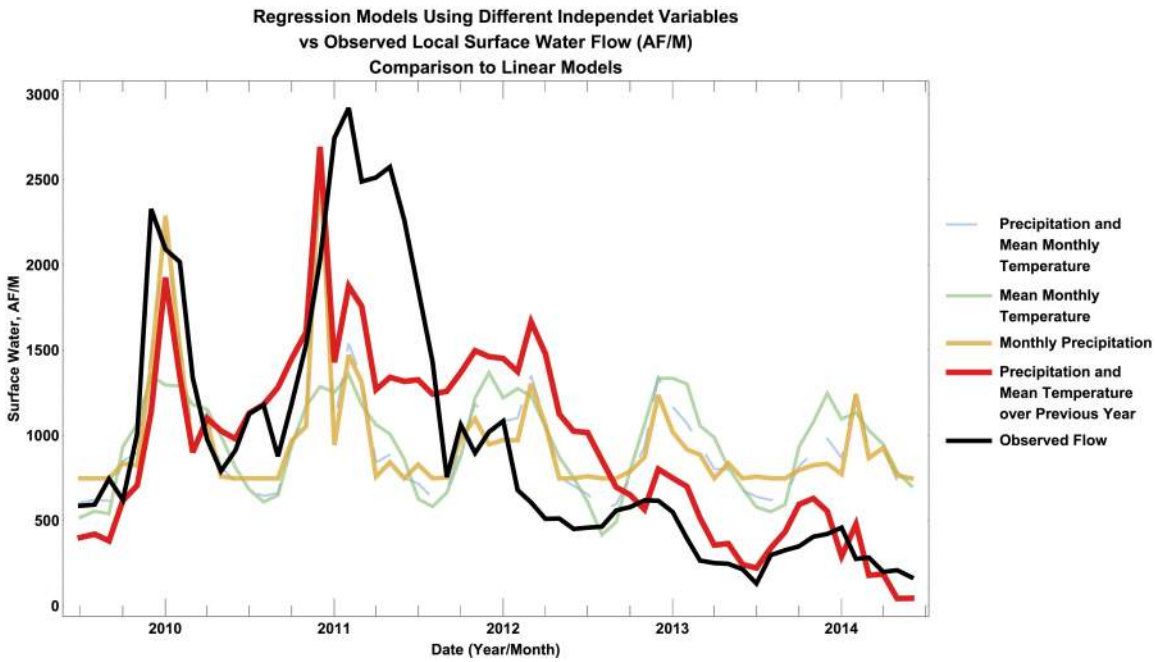


**Figure 25: Four regression models averaged annually**

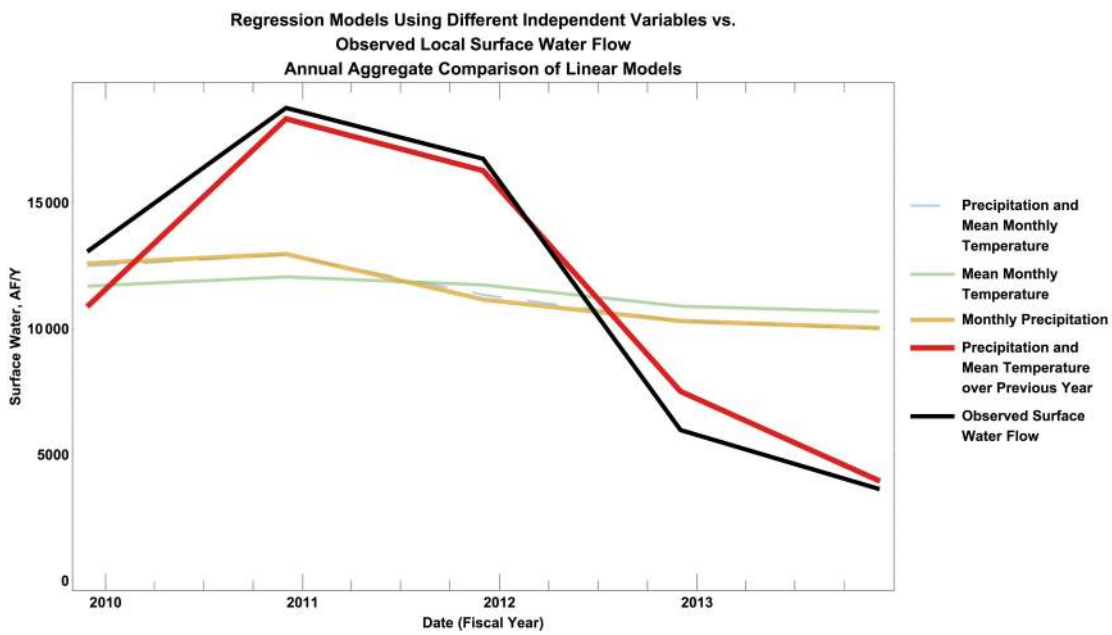


The regression model using precipitation and the mean temperature of the previous year (a moving average of twelve months) appears to generally follow the downward trend, while the

precipitation only model, while accounting for much of the same variance, does not reflect the monthly downward trend in flow shown in Figure 24.

Estimated flows using both the precipitation and mean annual temperature under all 343 climate scenarios included, in addition to the mean estimated flow across all climate model outcomes, are shown in Figure 26. These same estimates generated using the precipitation only model are shown below in Figure 27.

**Figure 26: Annual projected IEUA surface supplies using the Precipitation and Temperature regression model**

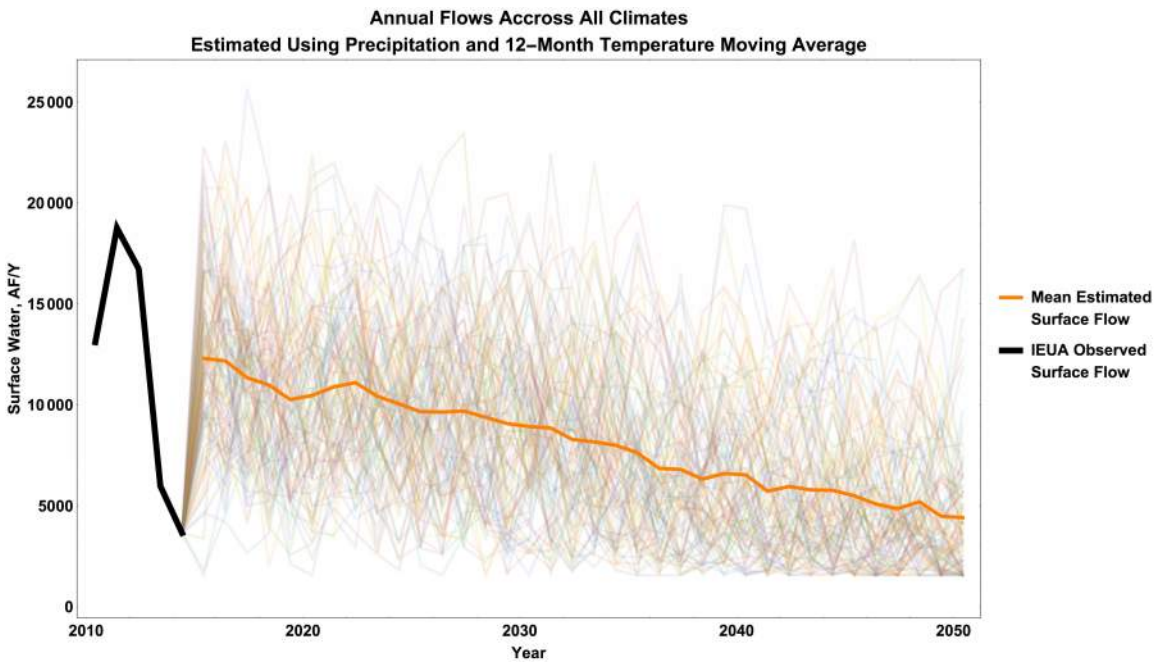

**Figure 27: Annual projected IEUA surface supplies using the Precipitation regression model**

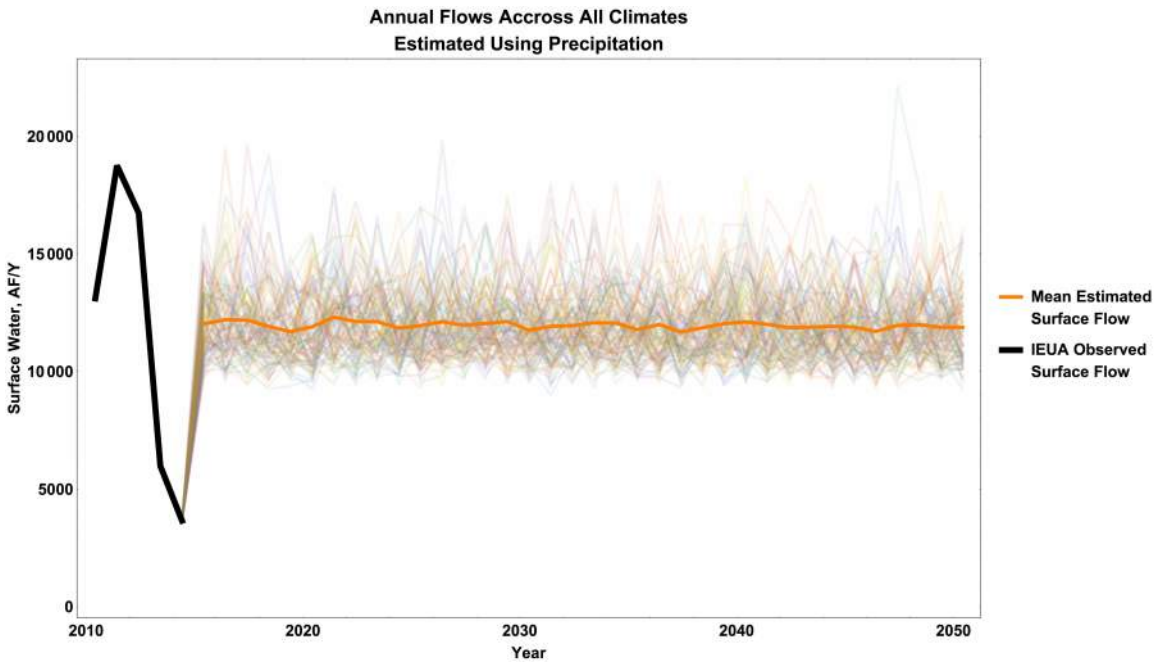


### *Stormwater*

Stormwater used for Chino Basin groundwater replenishment is projected to increase from effectively 0 to 6,400 AF by 2020. The historical stormwater recharge has been included in the Chino basin groundwater supply. Any "new" stormwater supply could be from projects constructued under the 2013 Recharge Master Plan Update prepared by the Chino Basin Water Master. In absence of more detailed information on how future stormwater would vary with respect to precipitation, we apply the same regression formula develop for surface water supply to the baseline supply as well as any additional supply specified as part of a water management strategy.

### *Imports via Metropolitan Water District*

IEUA purchases water from MWD. Tier 1 water is generally used to meet urban indoor and outdoor demands. Per contract with MWD, IEUA must purchase at least 39,835 AF/year. Additional Tier 1 water, up to a total of 93,283 AF/year, is also typically made available to IEUA and is purchased when needed for direct use or groundwater replenishment. The baseline assumption for available additional Tier 1 water is 26,600 AF/year, for a total of just under 67,000 AF/year.

For this study we evaluate two possible levels of climate effect on additional Tier 1 water. In both cases, the total amount available declines beginning in 2021 through 2050. In one scenario, we assume additional Tier 1 water declines by 40%. In the other scenario, we assume declines of 80%. Note that these two level of water declines imply a total reduction in MWD Tier 1 water

from 62,600 AF in the without climate change condition to 51,960 (for the 40% decline in additional supplies) and to 41,320 (for the 80% decline in additional supplies).

### *Chino Groundwater Basin*

IEUA's share of Chino Basin's sustainable groundwater yield is set through actions of the Chino Basin Water Master. Under current basin conditions, the amount of groundwater available to the appropriators within the IEUA service area is 91,266 AF. An analysis by Wildermuth Environmental Inc. determined the sensitivity of IEUA's allowable production as a function of long-term precipitation trends (Figure 28). These data show that across the four scenarios evaluated, the safe yield would decline 0.44% for each 1% decline in long-term precipitation.

**Figure 28: Safe yield over time for the baseline and four trends in precipitation (top); change in safe yield (as compared to 2015 across four trends in precipitation (bottom)**

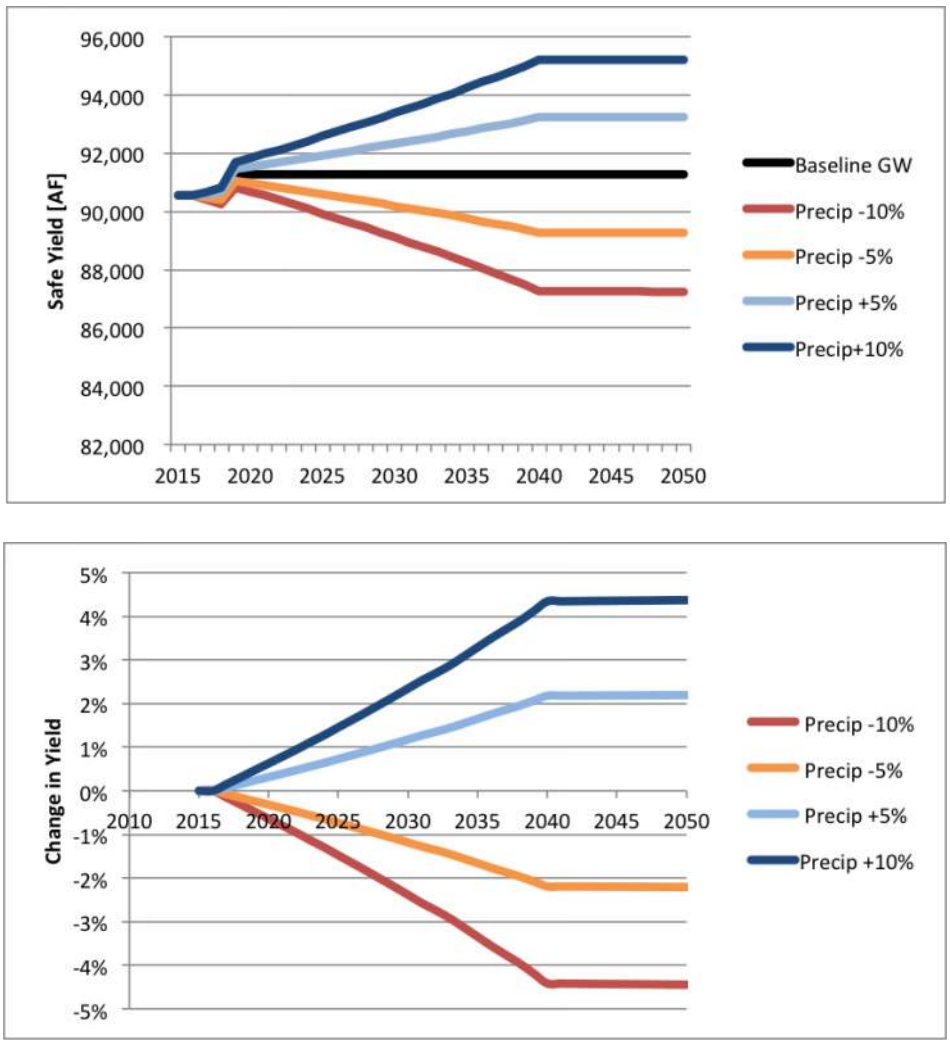

We then modified the Chino Basin safe yield by the product of the long-term precipitation trend and the empirically derived scaling factor. For example, groundwater safe yield would be reduced 4.4% by 2040 for a climate scenario that exhibits a long-term precipitation trend of -10%.

## Key Simulation Results

The WEAP IEUA model simulates annual water supply and demand from 2010 to 2015. For this analysis, the key outputs reviewed included:

- Urban indoor and outdoor demand
- Supplies used to meet urban demand
- Unmet urban demand
- Recycled water inflows and outflows
- Chino Basin inflows and outflows

This section shows results for these outputs from the WEAP IEUA model for a single simulation—high demand scenario and historical climate.

Figure 29 shows annual indoor potable demand and outdoor demand—both potable and recycled. Note that indoor demand gradually increases each year, whereas outdoor demand varies year-to-year. The outdoor demand variation is due to the historical climate used in this simulation.

**Figure 29: Urban indoor and outdoor demand for high demand scenario and historical climate**

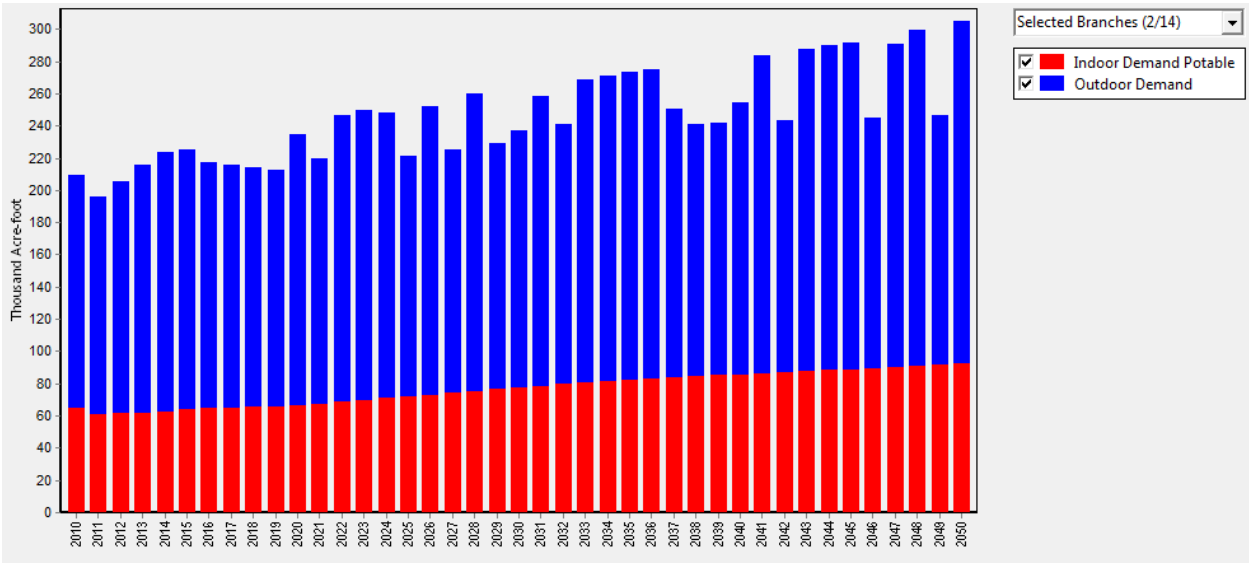


Figure 30 shows the mixture of supplies used to meet the demands in Figure 29. The largest source is Chino groundwater supplies. MWD Tier 1 supplies (minimum and additional) provide significant water. Lastly, recycled water provides about 20 percent of the supply.

**Figure 30: Supplies used to meet demand for high demand scenario and historical climate**

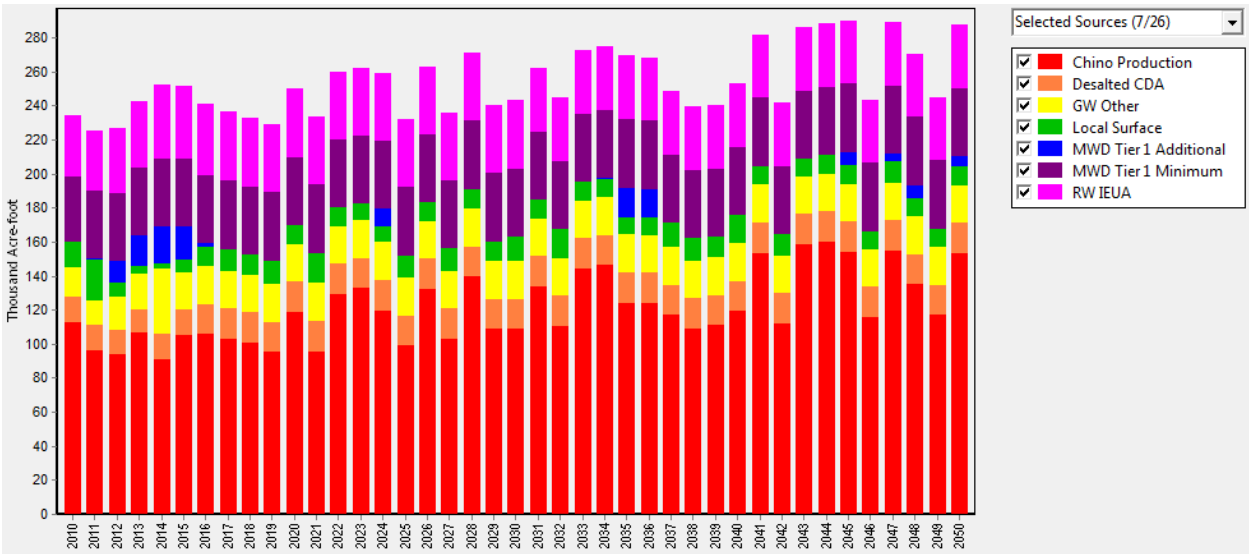


Figure 31 focuses on the recycled water portion of the IEUA system. The top bars show the inflows—return flow from IEUA indoor demand and some small amount of wastewater from outside the IEUA service area. The bottom bars show the destinations for the recycled water supply including: outdoor urban use (Recycled Direct), agricultural use (Ag RW Demand), the Santa Ana River (SAR Obligation and Downstream Flow), recharge to the Chino Basin (Req. Supp. Recharge and Recycled GW Recharge, Additional GW Recharge). Note that Downstream Flow represents more available recycled water than is needed to meet demand for recycled water. In simulations with low urban demand, there is no excess recycled water and instead shortages.

**Figure 31: Sources of recycled water (top) and uses of recycled water (bottom) for high demand scenario and historical climate**

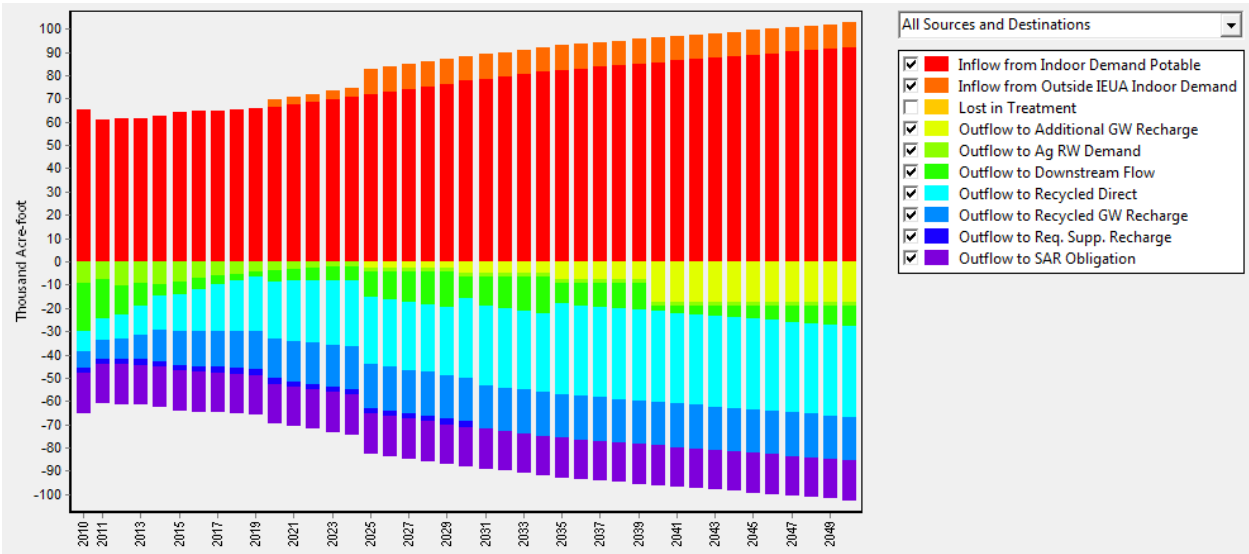


Figure 32 shows the inflows and outflows to the Chino Groundwater Basin. Natural Recharge is the largest source, but one can see how the different replenishment sources increase the inflows over time. The primary use of groundwater is to meet outdoor demands.[4] There is some modest increase and decrease in storage over the years.

[4] In reality, potable water for indoor and outdoor use are served using common water mains. The partitioning of supplies to indoor and outdoor potable use in the model reflects the priority structure used to ensure that shortages, if any, are experienced by outdoor uses first.

**Figure 32: Inflows (top) and outflows (bottom) to the Chino Basin for high demand scenario and historical climate**

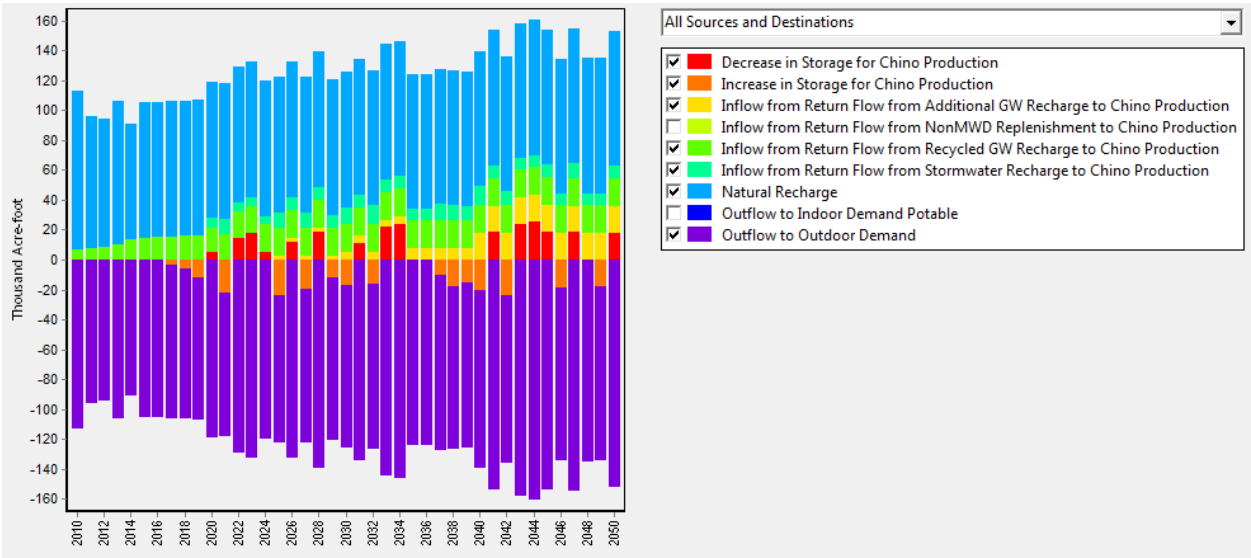

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# Appendix 3:

# A&N Technical Services “Indoor and Outdoor Demands”

A & N Technical Services, Inc.

# Memorandum

**To:** Jason Pivovaroff, IEUA

**From:** **David Pekelney and Thomas Chesnutt**

**Date:** January 24, 2014

**Re:** **Inferring Indoor and Outdoor Water End Uses in the IEUA Service Area**

## *Introduction*

This memo documents the estimation of indoor and outdoor water end uses for water demand in the IEUA service area. This estimation of indoor/outdoor end uses is conducted by customer class—single family residential, multi-family residential, and commercial-industrial-institutional (CII). Indoor end uses are of particular interest to planners tasked with designing wastewater systems and recycled water systems because it helps them establish capacity requirements. Both indoor and outdoor use is of great interest to planners tasked with designing Water Use Efficiency (conservation) programs. Although much has already been accomplished with indoor conservation, there is some level of remaining potential for water savings. WUE planners have particular interest in outdoor use because it is generally assumed to be a large share of total use with large remaining potential for savings.

Two methods were used to estimate outdoor use across customer classes. The first method is the minimum month method that has been historically used in the water industry—this method assumes that the minimum month of water demand is 100 percent indoor end uses. Though we believe that this is a counterfactual assumption in the IEUA service area (it assumes exactly zero outdoor irrigation in the winter) we provide estimates using the minimum month method to serve as a point of comparison. The second method develops an estimate of winter irrigation from dedicated irrigation meters and applies this nonzero assumption instead. Termed a "seasonal variation" method, it applies the seasonal variation from dedicated irrigation meters to mixed meter customer classes.

## *Data*

The data used are from the California Department of Water Resources, Public Water System Statistics filings for the City of Ontario for the years 1993 to 2012. These data are billing system summaries at the monthly level. Several other retailers provided monthly use summaries; however, these were generated with bimonthly billing cycles. Since different retailers can apportion bimonthly billing into calendar months using different methods, it is more consistent to stick to the monthly data generated with monthly billing. Although CVWD, Upland, and MVWD

839 Second Street, Suite 5 • Encinitas, CA 92024-4452 • Voice: 760.942.5149 • Fax: 760.942.6853
11808 Stanwood Dr. • Los Angeles, CA 90066 • Voice: 310.439.1883 • Fax: 310.439.1884

provided monthly data (based on bimonthly billing), we used the City of Ontario data for this analysis because it was the only retailer to provide monthly use data generated by monthly billing.

Table 1 shows the average use from 2008 to 2012 summed by customer class. Figure 1 shows the sum of water use by month. The strong seasonal pattern reflects irrigation needs during the characteristic hot and dry summers.

**Table 1 – Average Use, 2008 to 2012, City of Ontario**

| Class | Use (AF) | Percent |
|---|---|---|
| Single Family Residential | 13,993 | 36.7% |
| Multi-family Residential | 5,647 | 14.8% |
| Commercial/Industrial/Institutional | 9,666 | 25.4% |
| Landscape Irrigation | 8,259 | 21.7% |
| Other | 549 | 1.4% |
| Total | 38,114 | 100.0% |

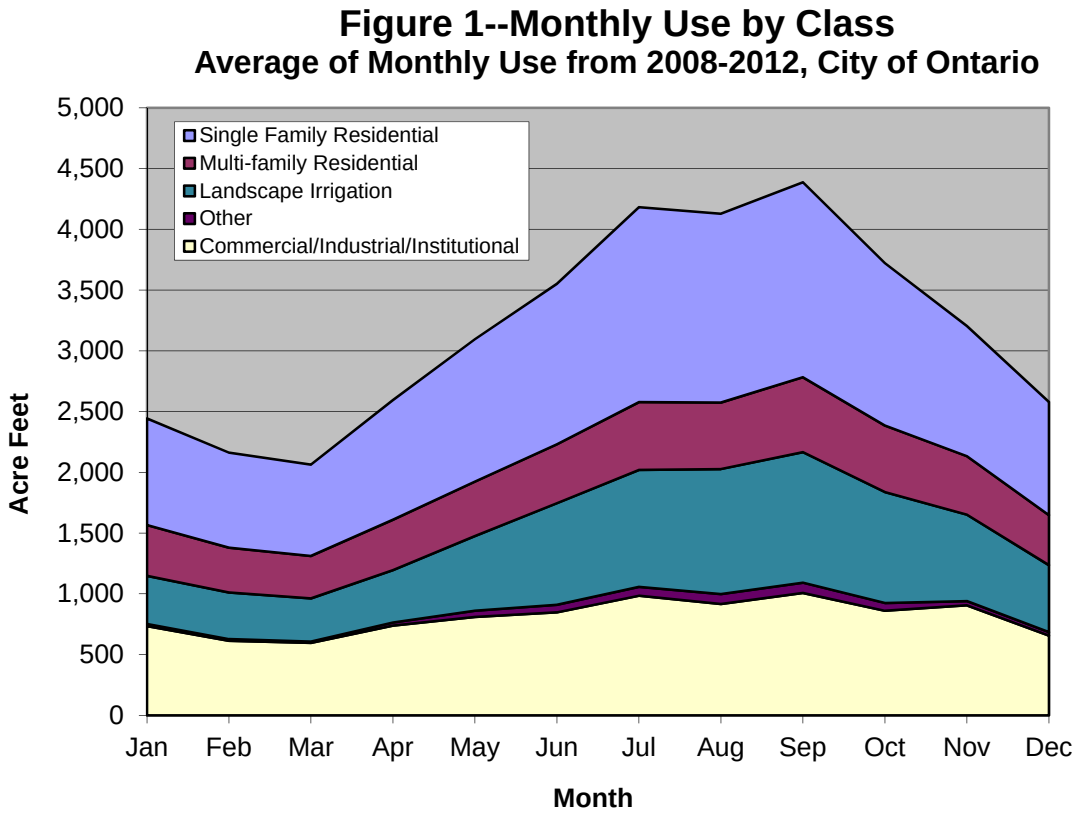


### *Methods*

Outdoor end uses are directly measured by dedicated irrigation meters. Many other types of water meters--single family, multi family, commercial, industrial, and institutional--can be measuring

both indoor and outdoor end uses. If not measured or observed directly, planners are forced to rely on inference or judgment. For IEUA, we have conducted two methods to infer outdoor use for all sectors.

**Minimum Month Method**

The most common method employed to infer outdoor use is to assume the winter use is all indoors. (This assumption may be closer to the truth in wetter or colder climates.) For example, if we calculate winter minimum use times 12 months we have inferred total indoor use for the year. Total use for the year minus indoor use then equals outdoor use.

In Table 2 below, we find that outdoor use calculated with the "minimum winter use is indoor use" method is 46%. The method underestimates outdoor use because there is likely to be at least some winter irrigation in dry climates. Variations on this method include daily accounting and various ways to define winter minimum. Note the results of this method will vary considerably from year to year; the reader is cautioned when using results from one year for planning purposes and we used for this analysis the monthly average over the five most recent years for which data were available (2008 to 2012).

**Table 2 – Percent Outdoor Use**

| Class | Total | Minimum Month Method | Seasonal Variation Method |
|---|---|---|---|
| Single Family Residential | 13,993 | 36% | 58% |
| Multi-family Residential | 5,647 | 26% | 43% |
| Commercial/Industrial/Institutional | 9,666 | 26% | 42% |
| Landscape Irrigation | 8,259 | 100% | 100% |
| Other | 549 | 75% | 100% |
| Total | 38,114 | 46% | 62% |

**Seasonal Variation Method**

The second method to infer outdoor use consists of employing the pattern of seasonal variation with dedicated irrigation meters and applying it to other sectors with mixed meters. The reasoning is that with dedicated irrigation meters we can measure winter irrigation. Thus, we can observe the relative water use in winter and summer irrigation seasons and calculate a parameter from variables that are observable in other sectors. For example, by calculating the ratio of winter minimum to the seasonal range we have a function of variables observable for sectors other than dedicated irrigation meters. This method will result in a higher estimate of outdoor water use than using minimum month. The method relies on the assumption that the seasonal variation of outdoor use is the same for sites with dedicated meters as for sites with mixed meters.

Due to the variability of landscape water use from year to year, we expect the calculated parameter to vary considerably from year to year. For this reason, we calculated the parameter (ratio of winter minimum to seasonal range) for each year for which we could collect data (1993 to 2012) and took the average. We applied this long term average to the monthly average of the most recent five years of consumption data (2008 to 2012) because of the changing distribution of water use by customer class as more dedicated irrigation meters are employed.

Figure 2 shows the use from irrigation-only meters, with winter irrigation illustrated in blue and the seasonal range in red for one example year (2011).

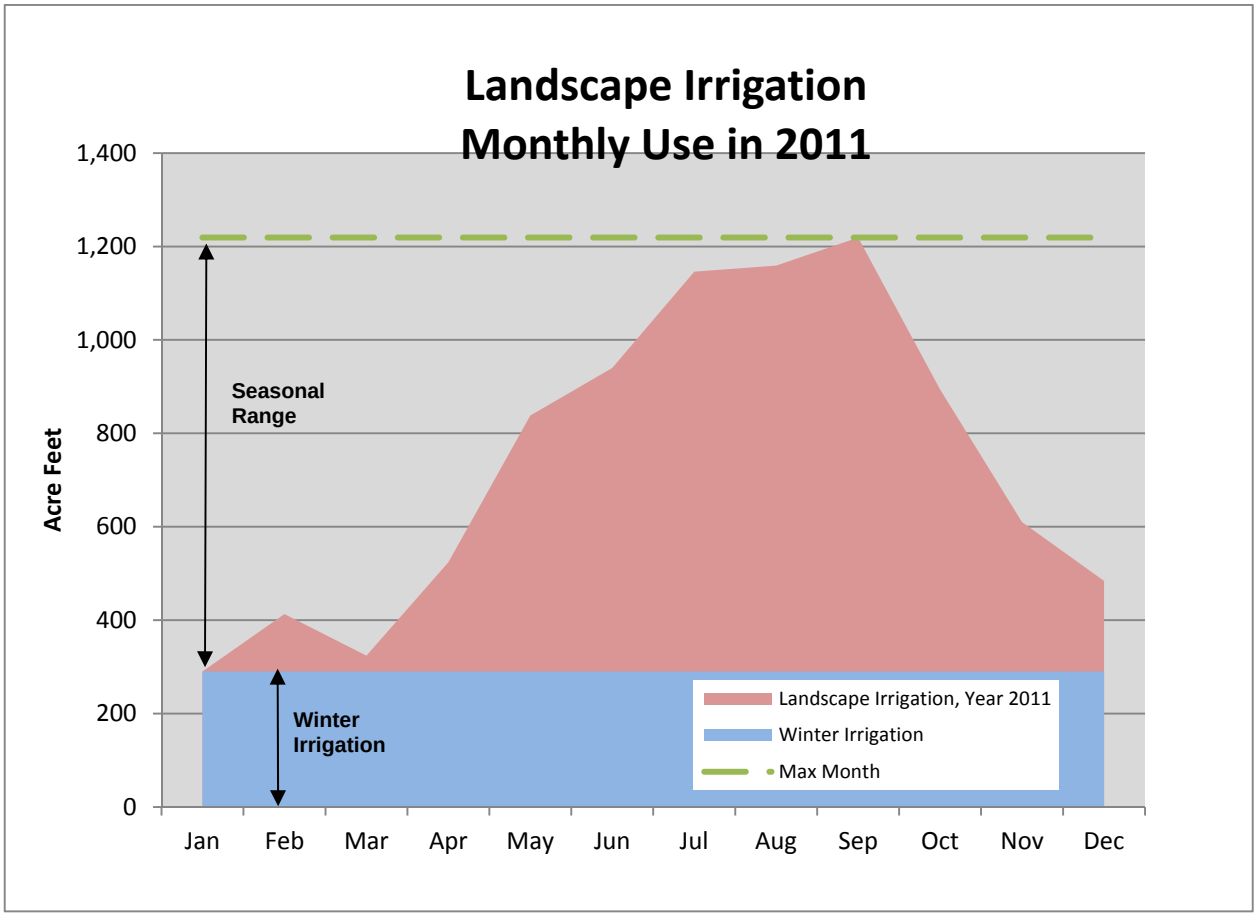


Figure 2 shows winter irrigation is 31% of seasonal range between summer and winter for dedicated irrigation accounts for the year 2011. We repeated this calculation for each year for which were able to collect data (1993 to 2012) and averaged the values to get the result we apply to customer sectors with mixed meters (31%).

Seasonal range and winter minimum are observable for non-irrigation classes. If we assume that winter irrigation is also 31% of seasonal range for the non-irrigation customer categories, we can infer their winter irrigation, and thus indoor and outdoor use.

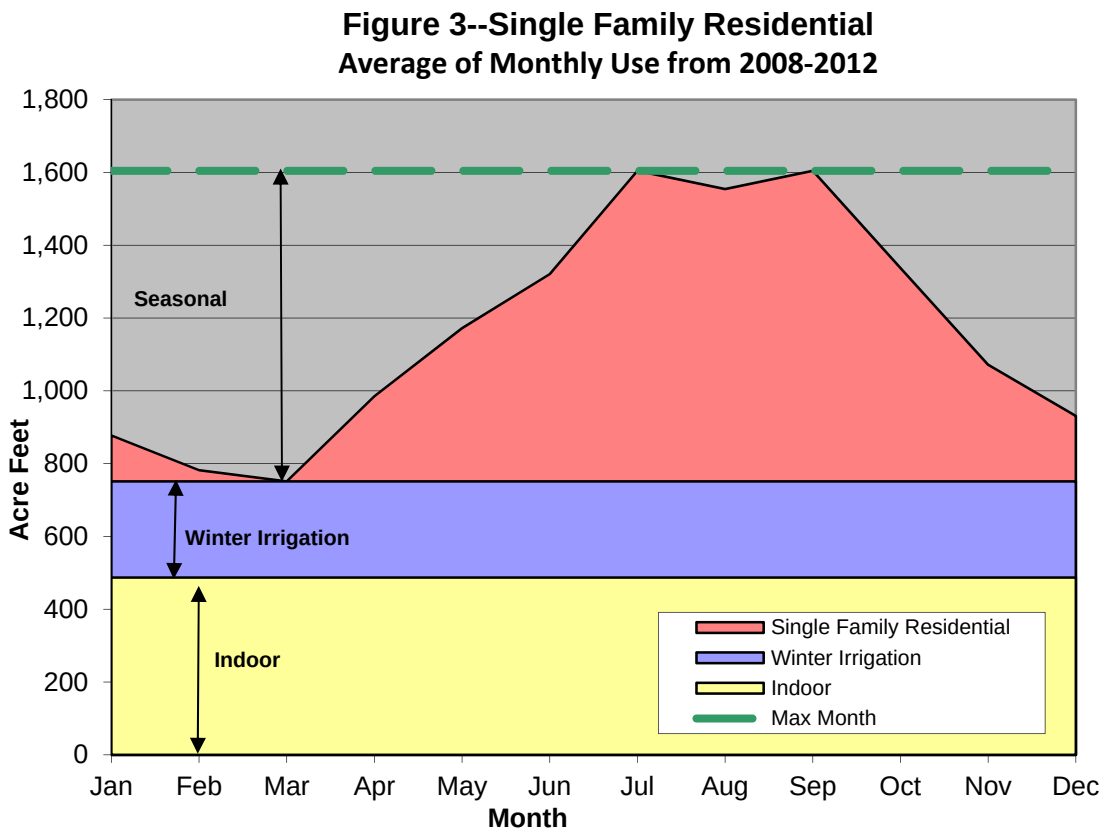


For example, Figure 3 shows winter irrigation calculated as 31% of seasonal range for the single family residential sector. Total outdoor use (red+blue in this graph) is, thus, 58% of total use for the year (red+blue+yellow). In contrast, using the minimum month for the single family sector results in 36% outdoor use (red area only).

### *Conclusions and Recommendations*

The seasonal variation method estimates outdoor end uses to compose 62 percent of M&I water demand (across all customer sectors) in the IEUA service area. We recommend using the seasonal variation method because we know the minimum month method systematically underestimates outdoor water use in climates where there is winter irrigation such as IEUA.

Although the minimum month method systematically underestimates outdoor use and overestimates indoor use--and we do not recommend using it for planning water resource investments--it is a commonly used method that is simple to implement and, thus, it may have value as a comparison benchmark.

This analysis used empirical measures using monthly-billed data from one of the larger retail water service areas. We can improve the reliability of the results by expanding the data set to include other IEUA service areas that utilize monthly billing.

As stated in the Introduction, estimation of indoor/outdoor split is of particular interest because it aids with designing wastewater system and recycled water systems to establish capacity requirements. Indoor use is directly related to wastewater flows; however, that does not mean

they should be directly compared. Indoor use and wastewater flows are not commensurate without accounting for the following:

- The water volume used in the indoor/outdoor estimate derives from customer consumption measures. If a comparison to production measures is desired, one must account for factors that explain the differences between production and consumption measures: system loss, unaccounted for water, meter accuracy, and unmetered water. Additionally, if applying the estimate of indoor water use to total production, agricultural use needs to be separately accounted for because the estimates of indoor water use were constructed with M&I consumption data only.
- Some indoor use does not go down the drain because of cooking, consumption, cleaning, indoor plants, and other uses. These indoor water uses do not translate into wastewater flows.
- Parts of the unincorporated areas of IEUA are not hooked up to the sewer system—they still use septic systems—and their indoor use also does not translate to sewer flow.
- Any loss or gain in volume between the customer and the wastewater treatment plant would also need to be accounted for. For example, infiltration and inflows, wastewater system loss, and evaporation are potential effects on wastewater volume.
- It is easy to observe that water consumption data is inherently more variable than wastewater inflow measures due to outdoor use and weather variability. The estimate of indoor water use as a proportion of total M&I use in the City of Ontario is 38% over the years 1992-2012. If this proportion is calculated using the most recent five years from 2008 to 2012, the proportion of indoor water use is only 36%. This proportion should clearly not be thought of as a constant over time.

In sum, although most of indoor water use does indeed flow to the treatment plant, the estimates of wastewater flow and the indoor water use are not directly comparable without accounting for the above factors.

# Appendix 4:

# A&N Technical Services “Demand Influencing Factors”

# Baseline Demand Influences

Table 1 summarizes the demand influences that were incorporated into the corresponding baseline demand forecast. The following sections define each level of influence, or adjustment that was applied to the normalized demand forecast.

Table 1: Baseline demand influences incorporated within each demand forecast

| | Baseline Demand Influences | | | | | |
|---|---|---|---|---|---|---|
| | **Economic Cycle** | **Household Income** | **Housing Density** | **Weather** | **Climate Change** | **Customer Response** |
| Upper Forecast | Baseline | Baseline | City General Plan | Multiple Dry | High | Permanent |
| Lower Forecast | Baseline | Baseline | SCAG | Dry | Baseline | Permanent |
| Planning Forecast | NA | NA | DWR | NA | NA | NA |

Notes: NA = Not Applicable

## Economic Cycle

Ability to specify how strong and weak market conditions impact demand. The effect from market conditions was defined from historical demand data through the normalizing process.

- **Weak** – implies weak market conditions and demand is reduced by 6.55%.
- **Baseline** – implies that demand will not change and market conditions will remain normal/average.
- **Strong** – implies strong market conditions and demand will increase by 6.55%

## Median Household Income

Ability to incorporate potential changes in demand related to household income. The following alternatives were based on the following assumptions.

- **Low** – median household income growth is below the baseline rate and reduces over time at minus 1% percent per year. Implies that demand will potentially be reduced.
- **Baseline**— median household income trends at the predicted rate per the 2012 SCAG RTP/SCS. Implies that demand will not change and will remain normal/average.
- **High** – median household income growth increases faster than the baseline rate and increases at plus 1% percent per year. Implies that demand will potentially be increased.

# Housing Density

Ability to adjust the water use factor applied to each occupied housing unit based upon the expected density of future development. The density values below are aggregated regional values for the Agency's service area. In general, higher housing densification tends to have lower water use per unit caused by reduced landscape areas and more stringent water use efficiency standards.

- **City General Plan –** incorporates housing density reflective of the 2014 City General Plans.
    - Single family residential density range 1.2 – 4.2 units per acre
    - Multi-family residential density range 9.7 – 17.3 units per acre
- **Baseline –** implies that future residential development resembles past/traditional dwelling units per land area.
- **SCAG -** incorporates housing density reflective of the 2012 S.California Association of Governments Regional Transportation Plan/Sustainable Communities Strategy (2012 SCAG RTP/SCS).
    - Single family residential density range 2.3 – 5.4 units per acre
    - Multi-family residential density range 8.4 – 17.0 units per acre
- **DWR –** does not incorporate housing density, assumed a modified version of the current DWR State Model Water Efficient Landscape Ordinance. Assumed the following efficiency standards:
    - 70% relative evapotranspiration (Eto) for existing landscapes
    - 60% relative Eto for new landscapes
    - Indoor water use for future development of 55 gallons per capita day (GPCD) in 2015 to 35 GPCD by 2040.
    - Number of occupied housing units per SCAG RTP/SCS
    - Assumed 62% of total demand for residential use

# Weather

Ability to specify how weather conditions impact demand from below and above average/normal conditions. The effect of weather variation was defined from historical demand data through the normalizing process.

- **Wet –** implies that demand will be decreased by 3.74% due to below normal temperature and increased wet periods.
- **Baseline -** implies that demand will not change and weather will remain normal/average conditions.
- **Dry –** implies that demand will increase by 3.74% due to above normal temperature and reduced wet periods.
- **Multiple Dry –** implies that demand will increase by 5.98% due to extended periods of above normal temperature and reduced wet periods.

# Climate Change

Long term climate change is modeled by using recent Global Climate Change model predictions of potential increases in temperature and corresponding impact to demands. The Regional Climate Trends and Scenarios from the Southwest U.S. were referenced from the National Oceanic and Atmospheric Administration (NOAA) Technical Report NESDIS 142-5. (http://scenarios.globalchange.gov/report/regional-climate-trends-and-scenarios-us-nationalclimate-assessment-part-5-climate-southwest)

- **Baseline -** implies that demand will not change and climate will remain at normal/average conditions.
- **Median** (50$^{th}$ percentile) – implies that expected temperature will increase by 2.7 degree Fahrenheit due to climate change. This would increase demands by 3.2% by 2040.
- **High** (80$^{th}$ percentile) – implies that expected temperature will increase by 3.6 degree Fahrenheit due to climate change. This would increase demands by 4.3% by 2040.

# Customer Response and Water Use Behavior

Defines how much of recent demand reductions will persist into the future that is permanent. The effect from recent customer response and water use behavior was defined from historical demand data through the normalizing process.

- **Baseline** – implies that demand will not change and everything will return to the normal, or bounce back to normal/average conditions.
- **Permanent** – implies that the 4.6% recent reduction is a permanent lifestyle change and continues to 2040.

# Baseline Demand Comparison: Normalized vs. Adjusted

Figure A presents the Upper, Lower and Planning Forecasts under Baseline assumptions, therefore all demand influences are assumed to be normal or under average conditions, except for housing density. Housing density remained as indicated in Table 1. Figure B presents the same demand forecasts with the demand influences indicated in Table 1. As shown, there is a slight difference in the forecast envelope when you compare Figure A to B. The common attribute between the two Figures is housing density; therefore as shown, the other demand influences did not have as much impact to the demand forecasts as housing density did. To note, each demand influence adjusts the normalized water use factors that are applied regional growth projections for number of households and employees per sector.

Figure A: Baseline demand forecasts under normal or average conditions.

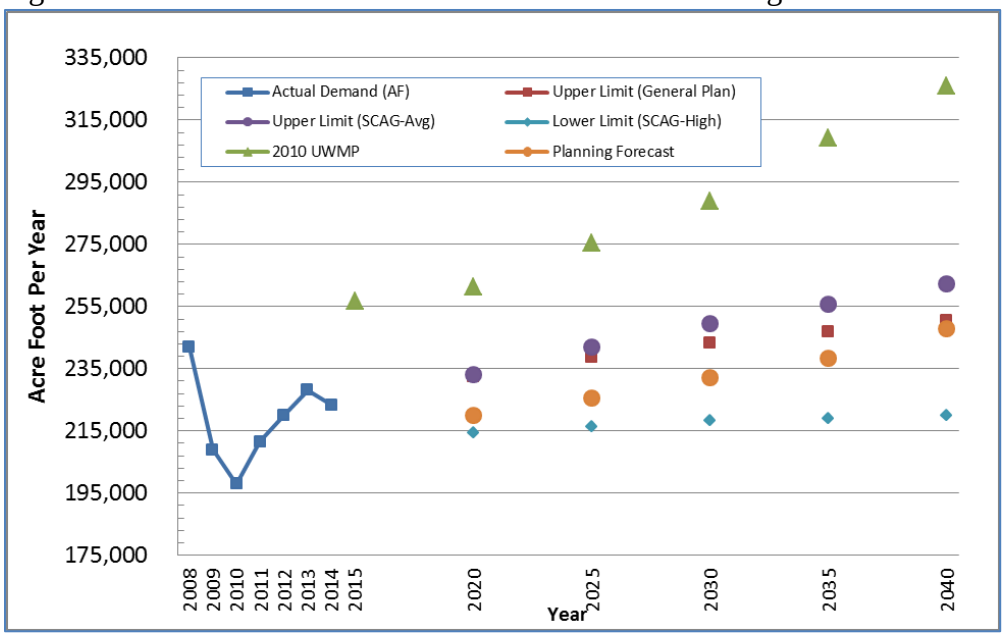


Figure B: Baseline demand forecasts under demand influences per Table 1.

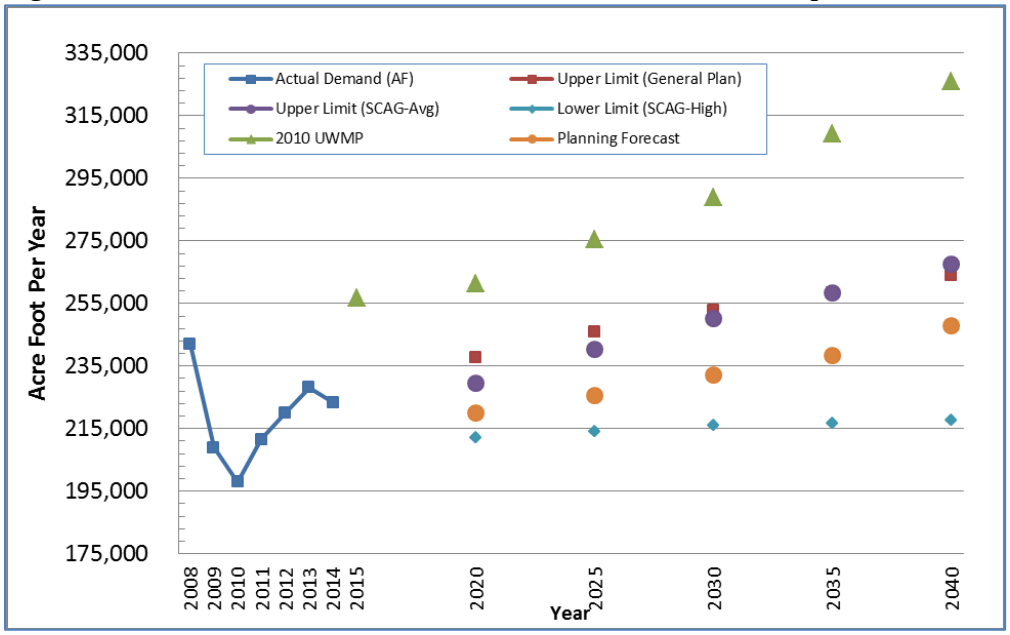

# Appendix 5:

# Full IRP Technical Committee Identified Project List

| ID | Project Name | Description | AF yield | Years to "wet water" yield | Increased groundwater in storage? | Increases water level in critical GW management zones? | Increased stormwater capture/recharge? | Increased permeability or natural infiltration for | Provide additional recycled water? | Reduce Dependence on imported water from MWD during dry | Increase local water supplies? | Emergency local supply redundancy? | Decrease reliance on local surface water during dry years? | Requires conservation in existing development? | Requires demand management in new development? | Reduce TDS and/or nitrates in GW? | Decrease net energy consumption? | Increase capacity of wet year water ("big | Eligible for grant funding? | Technical feasibility/ease of |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Groundwater Treatment (Rehab)-Increment 1 | This project category will rehabilitate an existing groundwater production wells decommissioned due to water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Increased well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 will provide up to 5,000 AFY of production. | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 2 | Groundwater Treatment (Rehab)-Increment 2 | This project category will rehabilitate an existing groundwater production wells decommissioned due to water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Increased well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 + 2 will provide up to 10,000 AFY of production. | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 3 | Groundwater Treatment (new)-Increment 1 | This project category will construct a new groundwater production well and treatment facility to address water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Increased well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 will provide up to 5,000 AFY of production. | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| 4 | Groundwater Treatment (new)-Increment 2 | This project category will construct a new groundwater production well and treatment facility to address water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Increased well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 + 2 will provide up to 10,000 AFY of production. | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| 5 | Production Wells-Increment 1 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 will provide up to 5,000 AFY of production | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| 6 | Production Wells-Increment 2 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1+2 will provide up to 10,000 AFY of production | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| 7 | Production Wells-Increment 3 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1-3 will provide up to 15,000 AFY of production | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| 8 | Production Wells-Increment 4 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1-4 will provide up to 20,000 AFY of production | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| 9 | WRCRWA RW Intertie | The Western Riverside County Regional Wastewater Authority (WRCRWA) Plant intertie would allow for the delivery of recycled water from the WRCRWA Plant to be used in the IEUA southern service area. This would also allow additional recycled water to be delivered into the northern service area groundwater recharge basins by reducing the demand from the RP-1 930 pressure zone pump station. Intertie would occur within the 800/930 Pressure Zones. | 4,500 | 10 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 10 | Rialto RW Intertie | The Rialto intertie project would allow for delivery of recycled water from the Rialto WWTP to be used in the IEUA service area. The intertie could occur near the RP-3 groundwater recharge basins. This concept could involve the Inland Valley Pipeline, LLC (IVP) to convey water between Rialto WWTP and IEUA's recycled water distribution system. Supply could be used for direct, GWR or other reuse strategy. | 4,500 | 10 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 11 | Pomona RW Exchange/Transfer | The City of Pomona does not currently use all of the treated effluent from the Pomona WRP. One concept would involve partnering to develop and expand their recycled water facilities in exchange for an agreed amount of their Chino Basin groundwater right. Could include other supply transfer agreement such as reclaimable waste and/or groundwater. | 2,500 | 10 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 12 | RP-1 RW Injection-Increment 1 | This project would construct an advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) facility at RP-1 to further treat tertiary effluent to allow the water to be injected directly into Chino Basin. The sizing of the facility and the volume to be produced will be determined as part of the portfolio development process. Increment 1 facility would be sized for 2,500 AFY. | 2,500 | 9 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | RP-1 RW Injection-Increment 2 | This project would construct an advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) facility at RP-1 to further treat tertiary effluent to allow the water to be injected directly into Chino Basin. The sizing of the facility and the volume to be produced will be determined as part of the portfolio development process. Increment 1+2 facility would be sized for 5,000 AFY. | 2,500 | 9 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 14 | RP-1 RW Injection-Increment 3 | This project would construct an advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) facility at RP-1 to further treat tertiary effluent to allow the water to be injected directly into Chino Basin. The sizing of the facility and the volume to be produced will be determined as part of the portfolio development process. Increment 1-3 facility would be sized for 7,500 AFY. | 2,500 | 9 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 15 | Satellite RW Injection-Increment 1 | This project category would construct a satellite (outside of RP-1) wastewater treatment plant with advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) to allow the water to be injected directly into Chino Basin. The location, sizing and volume to be produced will be determined as part of the portfolio development process. Increment 1 facility, or facilities would have a capacity of 2,500 AFY. | 2,500 | 5 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 16 | Satellite RW Injection-Increment 2 | This project category would construct a satellite (outside of RP-1) wastewater treatment plant with advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) to allow the water to be injected directly into Chino Basin. The location, sizing and volume to be produced will be determined as part of the portfolio development process. Increment 1+2 facility, or facilities would have a capacity of 5,000 AFY. | 2,500 | 5 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 17 | Satellite RW Injection-Increment 3 | This project category would construct a satellite (outside of RP-1) wastewater treatment plant with advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) to allow the water to be injected directly into Chino Basin. The location, sizing and volume to be produced will be determined as part of the portfolio development process. Increment 1-3 facility, or facilities would have a capacity of 7,500 AFY. | 2,500 | 5 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 18 | Desalter Recovery Improvement | The existing Chino Basin I Desalter (CD-1) recovers approximately 75 percent of water. Improvements could be done to increase recovery to approximately 90 percent. This water would be conveyed through the existing potable water system. | 1,500 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| 19 | RW Direct Use Expansion-Increment 1 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond the Agency's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035 and potential recycled water interties. Increment 1 facilities would increase direct use beyond baseline supply by 5,000 AFY. | 5,000 | 15 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 2 |
| 20 | RW Direct Use Expansion-Increment 2 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond the Agency's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035 and potential recycled water interties. Increment 1+2 facilities would increase direct use beyond baseline supply by 10,000 AFY. | 5,000 | 20 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 21 | RW Direct Use Expansion-Increment 3 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond the Agency's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035 and potential recycled water interties. Increment 1-3 facilities would increase direct use beyond baseline supply by 15,000 AFY. | 5,000 | 25 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 22 | RW Direct Use Expansion-Increment 4 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond the Agency's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035 and potential recycled water interties. Increment 1-4 facilities would increase direct use beyond baseline supply by 20,000 AFY. | 5,000 | 25 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 23 | Existing GWR Basin Improvements beyond RMPU-Increment 1 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1 facilities would increase recharge at existing basins within the Chino Basin by an additional 2,500 AFY. | 2,500 | 15 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 2 |
| 24 | Existing GWR Basin Improvements beyond RMPU-Increment 2 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1+2 facilities would increase recharge at existing basins within the Chino Basin by an additional 5,000 AFY. | 2,500 | 20 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 2 |
| 25 | Existing GWR Basin Improvements beyond RMPU-Increment 3 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1-3 facilities would increase recharge at existing basins within the Chino Basin by an additional 10,000 AFY. | 5,000 | 25 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |

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| 26 | Existing GWR Basin Improvements beyond RMPU-Increment 4 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1-4 facilities would increase recharge at existing basins within the Chino Basin by an additional 15,000 AFY. | 5,000 | 25 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 27 | Construct New GWR Basins-Increment 1 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Increment 1 would provide up to an additional 2,450 AFY of recharge capacity, which is approximately one new basin at 350 AF per month for 7 months of operation. | 2,450 | 10 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 28 | Construct New GWR Basins-Increment 2 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Increment 1+2 would provide up to an additional 4,900 AFY of recharge capacity, which is approximately 2 new basins at 350 AF per month for 7 months of operation. | 2,450 | 15 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 29 | Construct New GWR Basins-Increment 3 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Increment 1-3 would provide up to an additional 7,350 AFY of recharge capacity, which is approximately 3 new basins at 350 AF per month for 7 months of operation. | 2,450 | 20 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 30 | Construct New GWR Basins-Increment 4 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Increment 1-4 would provide up to an additional 9,800 AFY of recharge capacity, which is approximately 4 new basins at 350 AF per month for 7 months of operation. | 2,450 | 20 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 31 | ASR wells MZ1 and MZ2 | Construct aquifer storage and recovery (ASR) wells to increase improted water groundwater recharge within management zone 1 and 2. Reference projects were taken from the 2010 RMPU, Sections 6.7.2.1 and 3 for CVWD and the City of Ontario. | 11,500 | 5 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 32 | ASR wells MZ3 | Construct aquifer storage and recovery (ASR) wells to increase imported water groundwater recharge within management zone 3. Reference projects were taken from the 2010 RMPU, Sections 6.7.2.2 for JCSD. | 3,500 | 5 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 33 | Maximize ASR wells | Construct other aquifer storage and recovery (ASR) wells to increase imported water groundwater recharge by 3,500 AFY within the Chino Basin during wet and dry years. Assume benefit 40% of the time (2 in 5 years). Storage to be dependent on supplemental water availability in wet years | 3,500 | 5 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 34 | Cadiz IW Transfer | The Cadiz project would allow for the import of unused groundwater from the remote Fenner Valley near Cadiz, California. For the purposes of the IRP, a 5,000 AFY increment of water is assumed. The Cadiz supply would be transferred and taken as SWP water into the Chino Basin. | 5,000 | 20 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 35 | Secure SWP IW transfer outside MWD | Imported water supply is solely from MWD via the SWP and is limited by the Agency's purchase order. Other permanent, temporary or seasonally available imported water supplies could be purchased and wheeled into the Chino Basin. The volume of water available varies depending on the source of water and timing. Supplies could be purchased from various Irrigation Districts or secured via Ag Transfer. Assume benefit 1 in 10 years | 5,000 | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 |
| 36 | SBVMWD IW Transfer | As a SWP contractor, San Bernardino Valley MWD (SBVMWD) has a Table A allocation. This option would involve constructing an intertie between SBVMWD's imported water system. The supply would be temporary or seasonally available and could be purchased and wheeled into the Chino Basin. Assume benefit 1 in 5 years. | 5,000 | 5 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 1 |
| 37 | Ocean Desalination Exchange | This project category would involve a partnership with another water agency pursuing ocean water desalination; through in-lieu exchange, the Chino basin would obtain an agreed amount of imported water. For the purposes of the IRP, a volume of 5,000 AFY was chosen. Opportunity to invest in upcoming ocean desalination plants includes Huntington Beach, Carlsbad and West Basin. | 5,000 | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| 38 | Six Basin Water Transfer | This project would explore the idea of developing a water transfer agreement with Six Basins. One concept is to purchase imported water for recharge into Six Basins and get in return equal volume of groundwater underflow plus agreed amount of stormwater. For example, could purchase 10,000 AF of IW for exchange of 10,000 AF of groundwater plus 7,000 AF of stormwater. Assume benefit 1 in 5 years. | 17,000 | 5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 |
| 39 | Expand WUE Devices | Implement additional targeted device related savings to reduce demand beyond current annual water use efficiency savings. Provide incentives and pilot programs to roll out extremely high efficient indoor fixtures and toilets. To be verified with WUEBP. | 5,000 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 40 | WUE - Turf Removal-Increment 1 | Implement turf removal and landscape transformational programs to reduce outdoor demand. To be verified with WUEBP. Increment 1 would provide up to 5,000 AFY of savings. | 5,000 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 41 | WUE - Turf Removal-Increment 2 | Implement turf removal and landscape transformational programs to reduce outdoor demand. To be verified with WUEBP. Increment 1+2 would provide up to 10,000 AFY of savings. | 5,000 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 42 | WUE - Turf Removal-Increment 3 | Implement turf removal and landscape transformational programs to reduce outdoor demand. To be verified with WUEBP. Increment 1-3 would provide up to 15,000 AFY of savings. | 5,000 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 43 | WUE - Budget Rates-Increment 1 | Implement water budget based rates for 2 member agencies (assuming 15% total savings per Agency after 3 years). To be verified with WUEBP. Increment 1 would provide up to 13,350 AFY of savings. | 13,350 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |

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| 44 | WUE - Budget Rates-Increment 2 | Implement water budget based rates for 2 member agencies (assuming 15% total savings per Agency after 3 years). To be verified with WUEBP. Increment 1 would provide up to 26,700 AFY of savings. | 13,350 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| 45 | WUE - Budget Rates-Increment 3 | Implement water budget based rates for 2 member agencies (assuming 15% total savings per Agency after 3 years). To be verified with WUEBP. Increment 1 would provide up to 40,050 AFY of savings. | 13,350 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| 46 | WUE- RW Demand Management-Increment 1 | Implement demand management devices and programs for direct recycled water customers. Does not generate additional supply, aids in managing the supply during peak demand. Increment 1 would provide 2,500 AFY of demand management, this supply could be used for increasing direct use demands, groundwater recharge or other reuse strategy. | 2,500 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| 47 | WUE- RW Demand Management-Increment 2 | Implement demand management devices and programs for direct recycled water customers. Does not generate additional supply, aids in managing the supply during peak demand. Increment 1+2 would provide 5,000 AFY of demand management, this supply could be used for increasing direct use demands, groundwater recharge or other reuse strategy. | 2,500 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| 48 | Dry Weather Flow Diversions | Capture and treat urban dry weather flow from Chino, Cucamonga and San Sevaine Creek into the Regional Plants. For the purposes of the IRP, a volume of 3,500 AFY was assumed as total available dry weather flow. | 3,500 | 5 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| 52 | San Antonio Creek SW Capture | Modify existing basins along San Antonio Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the “big gulp” concept. Assume benefit 1 in 5 years | 1,000 | 10 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 53 | Cucamonga Creek SW Capture | Modify existing basins along Cucamonga Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the “big gulp” concept. Assume benefit 1 in 5 years. | 2,500 | 10 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 54 | Day Creek SW Capture | Modify existing basins along Day Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the “big gulp” concept. Assume benefit 1 in 5 years. | 2,500 | 10 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 55 | San Sevaine Creek SW Capture | Modify existing basins along San Sevaine Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the “big gulp” concept. Assume benefit 1 in 5 years. | 2,500 | 10 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 56 | Water Banking Facility | This project category would invest into the Semitropic Groundwater Storage Bank in Kern County or similar program. The Chino Basin could bank additional purchases of wet year water when these supplies are available and Chino Basin facilities are capacity limited. | 5,000 | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 |
| 58 | Regional LID-Increment 1 | Construct or modify urban development to better manage and infiltrate rainfall at the source. Projects could include bioswales and or pervious concrete installation in parking lots, street drainages. Increment 1 facilities could provide up to 5,000 AFY of recharge. | 5,000 | 5 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 59 | Regional LID-Increment 2 | Construct or modify urban development to better manage and infiltrate rainfall at the source. Projects could include bioswales and or pervious concrete installation in parking lots, street drainages. Increment 1+2 facilities could provide up to 10,000 AFY of recharge. | 5,000 | 5 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 60 | Direct Potable Reuse-Increment 1 | This project would construct an advanced water filtration and treatment (e.g. process treatment that combines micro or ultrafiltration) facility at a Regional Plant. The treatment process would allow the recycled water to be introduced into the potable water system. Increment 1 facility would have a capacity of 5,000 AFY. | 5,000 | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 61 | Direct Potable Reuse-Increment 2 | This project would construct an advanced water filtration and treatment (e.g. process treatment that combines micro or ultrafiltration) facility at a Regional Plant. The treatment process would allow the recycled water to be introduced into the potable water system. Increment 1+2 facility would have a capacity of 10,000 AFY. | 5,000 | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 62 | Cucamonga Basin Improvements | This project category will identify projects that would result in additional groundwater production benefits coming into the IEUA service area from the Cucamonga Basin. Includes recharge facilities, treatment and production facilities to maximize supply coming into the Chino Basin. | 2,500 | 5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 2 |
| 63 | Maximize Other Groundwater | This project category will identify local member agency projects that would result in additional groundwater production benefits coming into the IEUA service area outside of the Chino Basin. | 5,000 | 5 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 |
| 65 | RP-1 NRWS Treatment | The north Non Reclaimable Wastewater System (NRWS) discharges approx.. 3.5 MGD of brine to Los Angeles County annually. The project would construct a treatment facility to allow the Region to reuse this supply into the recycled water system. Requires plant expansion and partial reverse osmosis for blending. | 3,920 | 9 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| 66 | WUE - Advanced Metering Technologies | Install advanced metering infrastructure (AMI) between retail meters and a utility provider. Will provide real-time data about consumption and allow customers to make informed choices about usage. | 5,000 | $ 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 87 | Prior Stored Chino Groundwater | This category will allow supply to be taken from groundwater stored in the Chino Basin, pre 2014. It is estimated that approximately 400,000 AF of stored groundwater is available, of which 280,000 AF is made available for IEUA member agencies. This supply category will be managed on a case by case basis as selected into the Regional supply portfolios. The supply will be limited, but can be used annually or intermittent as needed. | 8,400 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 88 | Maximize Local Surface Water | This category of projects will construct facilities needed to capture additional local surface water. Projects to be defined by IEUA's member agencies. For example, increase surface flows off Lytle Creek in wet years. Assume benefit 3 in 5 years | 1,000 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 89 | Max Tier 1 MWD Imported Water-Increment 1 | Maximize imported water from MWD at Tier 1 rate. Total available supply at Tier 1 rate is 93,283 AFY or cumulative purchase order maximum of 932,830 AF through December 31, 2024. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1 would allow for the purchase of an additional 7,850 AFY. Can be purchased annually or intermittently. | 7,850 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 90 | Max Tier 1 MWD Imported Water-Increment 2 | Maximize imported water from MWD at Tier 1 rate. Total available supply at Tier 1 rate is 93,283 AFY or cumulative purchase order maximum of 932,830 AF through December 31, 2024. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1+2 would allow for the purchase of an additional 15,700 AFY. Can be purchased annually or intermittent. | 7,850 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 91 | Max Tier 1 MWD Imported Water-Increment 3 | Maximize imported water from MWD at Tier 1 rate. Total available supply at Tier 1 rate is 93,283 AFY or cumulative purchase order maximum of 932,830 AF through December 31, 2024. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1-3 would allow for the purchase of an additional 23,550 AFY. Can be purchased annually or intermittent. | 7,850 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 92 | Max Tier 2 MWD Imported Water-Increment 1 | Maximize imported water from MWD at Tier 2 rate. Could be taken annually or intermittent, availability pending MWD supply. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1 would allow for the purchase of an additional 5,000 AFY. Can be purchased annually or intermittent. | 5,000 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 93 | Max Tier 2 MWD Imported Water-Increment 2 | Maximize imported water from MWD at Tier 2 rate. Could be taken annually or intermittent, availability pending MWD supply. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1+2 would allow for the purchase of an additional 10,000 AFY. Can be purchased annually or intermittent. | 5,000 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 94 | Max Tier 2 MWD Imported Water-Increment 3 | Maximize imported water from MWD at Tier 2 rate. Could be taken annually or intermittent, availability pending MWD supply. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1-3 would allow for the purchase of an additional 15,000 AFY. Can be purchased annually or intermittently. | 5,000 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 95 | MWD Replenishment or discount wet year water-Increment 1 | Maximize replenishment or discount wet year imported water from MWD. Availability pending MWD supply and pricing. Supply can be taken in-lieu or for supplemental recharge. Increment 1 would allow for the purchase of an additional 10,000 AFY. Can be purchased annually or intermittently. Assume benefit after 2 consecutive wet years (assume 1 in 15 years) | 10,000 | 5 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 |
| 96 | MWD Replenishment or discount wet year water-Increment 2 | Maximize replenishment or discount wet year imported water from MWD. Availability pending MWD supply and pricing. Supply can be taken in-lieu or for supplemental recharge. Increment 1+2 would allow for the purchase of an additional 20,000 AFY. Can be purchased annually or intermittently. Assume benefit after 2 consecutive wet years (assume 1 in 15 years) | 10,000 | 8 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 |
| 97 | MWD Replenishment or discount wet year water-Increment 3 | Maximize replenishment or discount wet year imported water from MWD. Availability pending MWD supply and pricing. Supply can be taken in-lieu or for supplemental recharge. Increment 1-3 would allow for the purchase of an additional 30,000 AFY. Can be purchased annually or intermittently. Assume benefit after 2 consecutive wet years (assume 1 in 15 years) | 10,000 | 10 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 |
| 98 | Watershed Wide Water Transfers | This category of projects will construct or arrange other water transfers external to the Chino Basin. For example, dry weather flow exchange of recycled water to Orange County Water District for an equivalent amount of purchased imported water. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but increases reliability and/or quality. To occur annually or intermittent. Resiliency and flexibility benefit only | - | 5 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 99 | Chino Basin Water Transfers | This category of projects will construct or arrange other water transfers within the Chino Basin. Projects to also include inter-agency interties for increased reliability. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but increases reliability. To occur annually or intermittent. | - | 5 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 100 | Reliability Production Wells | This project category will construct new production wells needed to replace lost production or under performing facilities. These projects will maintain current annual groundwater production deliveries and are intended to increase operational flexibility and reliability. Increment 1 varies in capacity and will be determined on a case by case basis as selected into each of the regional supply portfolios. | - | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |

# Appendix 6:

# Project Lists for Water Resource Strategy Portfolios 1-8

# Project List for Strategy A Portfolio 1

| Strategy A | | |
|---|---|---|
| Project ID # | Portfolio 1 | Project Name |
| 1 | x | Groundwater Treatment (Rehab)-Increment 1 |
| 2 | x | Groundwater Treatment (Rehab)-Increment 2 |
| 5 | x | Production Wells-Increment 1 |
| 6 | x | Production Wells-Increment 2 |
| 23 | x | Existing GWR Basin Improvements beyond RMPU-Increment 1 |
| 24 | x | Existing GWR Basin Improvements beyond RMPU-Increment 2 |
| 25 | x | Existing GWR Basin Improvements beyond RMPU-Increment 3 |
| 26 | x | Existing GWR Basin Improvements beyond RMPU-Increment 4 |
| 46 | x | WUE- RW Demand Management-Increment 1 |
| 47 | x | WUE- RW Demand Management-Increment 2 |
| 87 | x | Prior Stored Chino Groundwater |
| 88 | x | Maximize Local Surface Water |

# Project List for Strategy B Portfolios 2 & 3

| Strategy B | | | |
|---|---|---|---|
| Project ID # | Portfolio 2 | Portfolio 3 | Project Name |
| 1 | x | x | Groundwater Treatment (Rehab)-Increment 1 |
| 5 | x | x | Production Wells-Increment 1 |
| 9 | x | x | WRCRWA RW Intertie |
| 11 | x | x | Pomona RW Exchange/Transfer |
| 12 | x | x | RP-1 RW Injection-Increment 1 |
| 19 | x | x | RW Direct Use Expansion-Increment 1 |
| 20 | x | x | RW Direct Use Expansion-Increment 2 |
| 23 | x | x | Existing GWR Basin Improvements beyond RMPU-Increment 1 |
| 24 | x | x | Existing GWR Basin Improvements beyond RMPU-Increment 2 |
| 25 | x | x | Existing GWR Basin Improvements beyond RMPU-Increment 3 |
| 26 | x | x | Existing GWR Basin Improvements beyond RMPU-Increment 4 |
| 27 | x | x | Construct New GWR Basins-Increment 1 |
| 35 | | x | Secure SWP IW transfer outside MWD from Irrigation Districts or Ag Transfers |
| 36 | | x | SBVMWD IW Transfer |
| 38 | | x | Six Basin Groundwater Transfer |
| 39 | x | x | Expand WUE Devices |
| 48 | x | x | Dry Weather Flow Diversions |
| 89 | | x | Max Tier 1 MWD Imported Water-Increment 1 |

# Project List for Strategy C Portfolios 4 & 5

| Strategy C | | | |
|---|---|---|---|
| Project ID # | Portfolio 4 | Portfolio 5 | Project Name |
| 12 | x | x | RP-1 RW Injection-Increment 1 |
| 13 | x | x | RP-1 RW Injection-Increment 2 |
| 14 | x | x | RP-1 RW Injection-Increment 3 |
| 21 | x | x | RW Direct Use Expansion-Increment 3 |
| 23 | x | x | Existing GWR Basin Improvements beyond RMPU-Increment 1 |
| 24 | x | x | Existing GWR Basin Improvements beyond RMPU-Increment 2 |
| 25 | x | x | Existing GWR Basin Improvements beyond RMPU-Increment 3 |
| 33 | x | x | Maximize ASR wells |
| 35 | | x | Secure SWP IW transfer outside MWD |
| 36 | | x | SBVMWD IW Transfer |
| 38 | | x | Six Basin Water Transfer |
| 39 | x | x | Expand WUE Devices |
| 40 | | x | WUE - Turf Removal-Increment 1 |
| 43 | x | x | WUE - Budget Rates-Increment 1 |
| 44 | x | x | WUE - Budget Rates-Increment 2 |
| 45 | | x | WUE - Budget Rates-Increment 3 |
| 46 | x | x | WUE- RW Demand Management-Increment 1 |
| 47 | x | x | WUE- RW Demand Management-Increment 2 |
| 66 | x | x | WUE - Advanced Metering Technologies |
| 88 | x | x | Maximize Local Surface Water |
| 95 | x | x | MWD Replenishment or discount wet year water-Increment 1 |
| 96 | | x | MWD Replenishment or discount wet year water-Increment 2 |

# Project List for Strategy D Portfolio 6

| Strategy D | | |
|---|---|---|
| Project ID # | Portfolio 6 | Project Name |
| 9 | x | WRCRWA Intertie |
| 10 | x | Rialto Intertie |
| 36 | x | SBVMWD IW Transfer |
| 38 | x | Six Basin Groundwater Transfer |
| 43 | x | WUE - Budget Rates- Increment 1 (2 agencies, 15% savings per agency) |
| 56 | x | Water Banking Facility - Increment 1 |
| 62 | x | Cucamonga Basin Upgrades |
| 87 | x | Prior Stored Chino Groundwater |
| 95 | x | MWD Replenishment or discount wet year water-Increment 1 |

# Project List for Strategy E Portfolios 7 & 8

| Strategy E | | | |
|---|---|---|---|
| Project ID # | Portfolio 7 | Portfolio 8 | Project Name |
| 9 | | x | WRCRWA Intertie |
| 11 | | x | Pomona RW Exchange/Transfer |
| 12 | | x | RP-1 advanced treatment RW Injection - Increment 1 |
| 19 | | x | Recycled Water Direct Use System Expansion - Increment 1 |
| 20 | | x | Recycled Water Direct Use System Expansion- 5,000 AF increment 2 |
| 23 | | x | Existing GWR Basin Improvements beyond RMPU - Increment 1 |
| 24 | | x | Existing GWR Basin Improvements beyond RMPU- 2,500 AF increment 2 |
| 25 | | x | Existing GWR Basin Improvements beyond RMPU- 5,000 AF increment 3 |
| 26 | | x | Existing GWR Basin Improvements beyond RMPU- 5,000 AF increment 4 |
| 27 | | x | Purchase Land to Construct New GWR Basins - Increment 1 |
| 36 | x | x | SBVMWD IW Transfer |
| 43 | x | x | WUE - Budget Rates- Increment 1 (2 agencies, 15% savings per agency) |
| 66 | x | x | Advanced Metering Technologies |
| 89 | x | x | Max Tier 1 MWD Imported Water-Increment 1 |
| 90 | x | x | Max Tier 1 MWD Imported Water-Increment 2 |
| 91 | x | x | Max Tier 1 MWD Imported Water-Increment 3 |

# Baseline Supply Forecast to 2040

Acre-Foot per Year (AFY)

| FY End | Total Regional Supply | Total Urban Supply | Total Potable Supply | Imported-MWD | GW-Chino | GW-Other | Local Surface | Total RW-Direct | RW-Direct Ag | StormWater | RW-Direct | RW-GWR | Desalted-CDA | Other | RW-SAR Obligation | Supp. Recharge |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09-10 | 226,290.0 | 209,290.0 | 201,004.1 | 38,243.9 | 105,594.8 | 17,286.6 | 13,109.9 | 17,312.8 | 9,026.9 | - | 8,285.9 | 7,208.0 | 14,623.6 | 12,145.4 | 17,000.0 | |
| 11 | 212,744.8 | 195,744.8 | 186,762.4 | 42,730.2 | 88,366.5 | 14,459.1 | 18,761.3 | 16,655.9 | 7,673.5 | - | 8,982.4 | 8,028.0 | 14,440.8 | 8,004.6 | 17,000.0 | |
| 12 | 222,230.9 | 205,230.9 | 194,886.1 | 53,876.1 | 85,345.8 | 19,507.2 | 16,744.3 | 20,605.5 | 10,260.8 | - | 10,344.8 | 8,634.0 | 13,961.0 | 6,451.8 | 17,000.0 | |
| 13 | 233,004.3 | 216,004.3 | 203,379.7 | 59,013.0 | 95,955.5 | 21,145.4 | 5,980.2 | 21,840.0 | 9,215.4 | - | 12,624.6 | 10,479.0 | 13,671.4 | 7,614.2 | 17,000.0 | |
| 14 | 240,435.2 | 223,435.2 | 208,836.9 | 67,055.4 | 77,429.9 | 38,092.2 | 3,658.3 | 24,657.2 | 10,058.9 | - | 14,598.3 | 13,593.0 | 14,735.4 | 7,865.8 | 17,000.0 | |
| 15 | 251,837.3 | 234,837.3 | | 65,000.0 | 90,538.5 | 22,098.1 | 11,650.8 | 24,600.0 | 8,550.0 | - | 16,050.0 | 14,500.0 | 15,000.0 | | 17,000.0 | |
| 16 | 261,910.8 | 244,910.8 | | 69,752.0 | 90,538.5 | 22,098.1 | 11,650.8 | 25,426.0 | 7,267.5 | - | 18,158.5 | 14,980.0 | 17,733.0 | - | 17,000.0 | |
| 17 | 264,306.9 | 247,306.9 | | 69,752.0 | 90,538.5 | 22,098.1 | 11,650.8 | 26,252.0 | 6,177.4 | - | 20,074.6 | 15,460.0 | 17,733.0 | - | 17,000.0 | |
| 18 | 266,539.6 | 249,539.6 | | 69,752.0 | 90,538.5 | 22,098.1 | 11,650.8 | 27,078.0 | 5,250.8 | - | 21,827.2 | 15,940.0 | 17,733.0 | - | 17,000.0 | |
| 19 | 268,633.2 | 251,633.2 | | 69,752.0 | 90,538.5 | 22,098.1 | 11,650.8 | 27,904.0 | 4,463.2 | - | 23,440.8 | 16,420.0 | 17,733.0 | - | 17,000.0 | |
| 20 | 277,736.2 | 260,736.2 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 28,730.0 | 3,793.7 | 6,400 | 24,936.3 | 16,900.0 | 17,733.0 | - | 17,000.0 | |
| 21 | 279,047.2 | 262,047.2 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 29,112.0 | 3,224.6 | 6,400 | 25,887.4 | 17,260.0 | 17,733.0 | - | 17,000.0 | |
| 22 | 280,272.9 | 263,272.9 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 29,494.0 | 2,740.9 | 6,400 | 26,753.1 | 17,620.0 | 17,733.0 | - | 17,000.0 | |
| 23 | 281,426.1 | 264,426.1 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 29,876.0 | 2,329.8 | 6,400 | 27,546.2 | 17,980.0 | 17,733.0 | - | 17,000.0 | |
| 24 | 282,517.5 | 265,517.5 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,258.0 | 1,980.3 | 6,400 | 28,277.7 | 18,340.0 | 17,733.0 | - | 17,000.0 | |
| 25 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | |
| 26 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | |
| 27 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | |
| 28 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | |
| 29 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | |
| 30 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | |
| 31 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 32 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 33 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 34 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 35 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 36 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 37 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 38 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 39 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |
| 40 | 283,556.6 | 266,556.6 | | 69,752.0 | 91,266.0 | 22,098.1 | 11,650.8 | 30,640.0 | 1,683.3 | 6,400 | 28,956.7 | 18,700.0 | 17,733.0 | - | 17,000.0 | - |

# Chino Basin Groundwater - Baseline Supply Calculation

Chino Groundwater baseline Supply Calculation Sheet

| | | |
|---|---|---|
| GW Pumping - Available to Appropriators | Year 2040 | |
| Developed Yield | 135,000 | |
| SARUNY | - | 50% of CDA Production |
| Operating Safe Yield | 135,000 | OSY = DY - SARUNY |
| Ag | 5,000 | at 2040 |
| Non-Ag | 3,000 | at 2040 |
| Operating Safe Yield Available to Appropriators | 127,000 | AFY |
| IEUA Member Share of OSY Available to Appropriators (%) | 71.9% | See below |
| IEUA Member Share of OSY Available to Appropriators | 91,266 | AFY |
| IEUA Member Share of SARUNY Credit (%) | 57% | Based upon FY2012-13 productions |
| IEUA Member Share of SARUNY Credit | - | AFY |
| Total IEUA Member Share of GW available to Appropriators | 91,266 | Included SY + SARUNY credit |

**APPROPRIATIVE RIGHTS**
**(AS OF JUNE 30, 2011)**

| Party | Appropriative Right (Acre-Feet) | Share of Initial Operating Safe Yield (Acre-Feet) | Share of Operating Safe Yield (Percent) |
|---|---|---|---|
| City of Chino [A] | 5,796.25 | 4,033.857 | 7.356 |
| City of Chino Hills [B] | 3,032.86 | 2,111.422 | 3.851 |
| City of Norco | 289.50 | 201.545 | 0.368 |
| City of Ontario | 16,337.40 | 11,373.515 | 20.742 |
| City of Pomona | 16,110.50 | 11,215.852 | 20.454 |
| City of Upland | 4,007.20 | 2,862.401 | 5.202 |
| Cucamonga Valley Water District [C] | 5,195.00 | 3,619.454 | 6.601 |
| Jurupa Community Services District [D] | 2,960.50 | 2,061.115 | 3.759 |
| Monte Vista Water District [E] | 6,929.15 | 4,823.954 | 8.797 |
| West Valley Water District [F] | 925.50 | 644.317 | 1.175 |
| Fontana Union Water Company [G] | 9,181.12 | 6,391.736 | 11.657 |
| Fontana Water Company [H] | 1.44 | 1.000 | 0.002 |
| Los Serranos County Club [I] | - | - | - |
| Marygold Mutual Water Company | 941.30 | 655.317 | 1.195 |
| Monte Vista Irrigation Company | 872.10 | 676.759 | 1.234 |
| Niagara Bottling, LLC [J] | - | - | - |
| Nicholson Trust [K] | 5.75 | 4.000 | 0.007 |
| San Antonio Water Company | 2,164.50 | 1,506.888 | 2.748 |
| Santa Ana River Water Company | 1,860.30 | 1,301.374 | 2.373 |
| Golden State Water Company [L] | 591.05 | 411.470 | 0.750 |
| West End Consolidated Water Company | 1,361.30 | 947.714 | 1.728 |
| San Bernardino County (Shooting Park) [M] | - | - | - |
| Arrowhead Mountain Springs Water Company [N] | - | - | - |
| City of Fontana [O] | - | - | - |
| Total | 78,763.52 | 54,834.000 | 100.000 |

[A] In 1990, Chino received a portion of San Bernardino County Water Works #9 (WW#9) OSY (363.750 AF) as a result of a permanent transfer.
[B] City of Chino Hills incorporated in 1991 and assumed the responsibility for providing the public services formerly provided by WW#9. Water acquired a portion of the rights of Pomona Valley Water Companies in 1949.
[C] CCWD acquired the rights to Etiwanda Water Company (upon dissolution) in 1966. CCWD changed its name to CVWD in 2004.
[D] JCSD acquired the rights of Mira Loma Water Company in 1979 (775.040 AF OSY), Fieldspar Gardens in 1986 (47.545AF OSY) and Mutual Water Company of Glen Avon Heights in 1997 (487.974 AF OSY).
[E] MVCWD changed its name to MVWD in 1980. In 1990, MVWD received 675.518 AF of WW#9 OSY as a result of a permanent transfer.
[F] WVBCWD changed its name to WVWD in 2003.
[G] In FY 01-02, 5,000 AF OSY was reassigned: 1,000 AF to FWC and 4,000 AF to the Nicholson Trust.
[H] FWC intervened in 1989 and was assigned 1.000 AF OSY as a result of a permanent transfer of water rights from FUWC.
[I] Los Serranos intervened into the Appropriative Pool in 1990 with 0.000 AF OSY, and it was later determined that they are not within the basin.
[J] Niagara Bottling intervened in FY 02-03 with 0.000 AF OSY.
[K] Nicholson Trust intervened in FY 01-02 and was assigned 4.000 AF OSY as a result of a permanent transfer of water rights from FUWC.
[L] GSWC permanently transferred 923.500 AF OSY to Park Water Company in 1990. Park Water Co was acquired by WW#4 which was subsequently acquired by the City of CVWD #4B. GCWC changed its name to GSWC in 2005.
[M] San Bernardino County Prado Tire (now known as Prado Shooting Park) was involuntarily reassigned to the Appropriative Pool from the Agricultural Pool in 1995.
[N] Arrowhead intervened in 1992 with 0.000 AF OSY.
[O] City of Fontana intervened in 1996 with 0.000 AF OSY.

**Inland Empire Utilities Agency**
6075 Kimball Avenue
Chino, CA 91708
Phone: (909) 993-1600
**www.ieua.org**

# Appendix D:
# 2015 Integrated Water Resources Plan: Mitigation Actions
## IEUA Drought Contingency Plan

# Appendix 5:

# Full IRP Technical Committee Identified Project List

| ID | Project Name | Description | AF yield | Years to "wet water" yield | Increased groundwater in storage? | Increases water level in critical GW management zones? | Increased stormwater capture/recharge? | Increased permeability or natural infiltration for | Provide additional recycled water? | Reduce Dependence on imported water from MWD during dry | Increase local water supplies? | Emergency local supply redundancy? | Decrease reliance on local surface water during dry years? | Requires conservation in existing development? | Requires demand management in new development? | Reduce TDS and/or nitrates in GW? | Decrease net energy consumption? | Increase capacity of wet year water ("big | Eligible for grant funding? | Technical feasibility/ease of |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Groundwater Treatment (Rehab)-Increment 1 | This project category will rehabilitate an existing groundwater production wells decommissioned due to water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Increased well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 will provide up to 5,000 AFY of production. | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 2 | Groundwater Treatment (Rehab)-Increment 2 | This project category will rehabilitate an existing groundwater production wells decommissioned due to water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Increased well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 + 2 will provide up to 10,000 AFY of production. | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 3 | Groundwater Treatment (new)-Increment 1 | This project category will construct a new groundwater production well and treatment facility to address water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Increased well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 will provide up to 5,000 AFY of production. | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| 4 | Groundwater Treatment (new)-Increment 2 | This project category will construct a new groundwater production well and treatment facility to address water quality concerns. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Increased well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 + 2 will provide up to 10,000 AFY of production. | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 |
| 5 | Production Wells-Increment 1 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1 will provide up to 5,000 AFY of production | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| 6 | Production Wells-Increment 2 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1+2 will provide up to 10,000 AFY of production | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |
| 7 | Production Wells-Increment 3 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1-3 will provide up to 15,000 AFY of production | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| 8 | Production Wells-Increment 4 | With increasing groundwater recharge to the Chino Basin, new production wells may need to be constructed to recover the additional groundwater. It is assumed that additional pumping would be limited by the volume of recharge occurring (over operating safe yield). Well operation could supplement annual demands or intermittent to help offset losses in another water supply. Increment 1-4 will provide up to 20,000 AFY of production | 5,000 | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| 9 | WRCRWA RW Intertie | The Western Riverside County Regional Wastewater Authority (WRCRWA) Plant intertie would allow for the delivery of recycled water from the WRCRWA Plant to be used in the IEUA southern service area. This would also allow additional recycled water to be delivered into the northern service area groundwater recharge basins by reducing the demand from the RP-1 930 pressure zone pump station. Intertie would occur within the 800/930 Pressure Zones. | 4,500 | 10 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 10 | Rialto RW Intertie | The Rialto intertie project would allow for delivery of recycled water from the Rialto WWTP to be used in the IEUA service area. The intertie could occur near the RP-3 groundwater recharge basins. This concept could involve the Inland Valley Pipeline, LLC (IVP) to convey water between Rialto WWTP and IEUA's recycled water distribution system. Supply could be used for direct, GWR or other reuse strategy. | 4,500 | 10 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 11 | Pomona RW Exchange/Transfer | The City of Pomona does not currently use all of the treated effluent from the Pomona WRP. One concept would involve partnering to develop and expand their recycled water facilities in exchange for an agreed amount of their Chino Basin groundwater right. Could include other supply transfer agreement such as reclaimable waste and/or groundwater. | 2,500 | 10 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| 12 | RP-1 RW Injection-Increment 1 | This project would construct an advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) facility at RP-1 to further treat tertiary effluent to allow the water to be injected directly into Chino Basin. The sizing of the facility and the volume to be produced will be determined as part of the portfolio development process. Increment 1 facility would be sized for 2,500 AFY. | 2,500 | 9 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |

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| 13 | RP-1 RW Injection-Increment 2 | This project would construct an advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) facility at RP-1 to further treat tertiary effluent to allow the water to be injected directly into Chino Basin. The sizing of the facility and the volume to be produced will be determined as part of the portfolio development process. Increment 1+2 facility would be sized for 5,000 AFY. | 2,500 | 9 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 14 | RP-1 RW Injection-Increment 3 | This project would construct an advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) facility at RP-1 to further treat tertiary effluent to allow the water to be injected directly into Chino Basin. The sizing of the facility and the volume to be produced will be determined as part of the portfolio development process. Increment 1-3 facility would be sized for 7,500 AFY. | 2,500 | 9 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 15 | Satellite RW Injection-Increment 1 | This project category would construct a satellite (outside of RP-1) wastewater treatment plant with advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) to allow the water to be injected directly into Chino Basin. The location, sizing and volume to be produced will be determined as part of the portfolio development process. Increment 1 facility, or facilities would have a capacity of 2,500 AFY. | 2,500 | 5 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 16 | Satellite RW Injection-Increment 2 | This project category would construct a satellite (outside of RP-1) wastewater treatment plant with advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) to allow the water to be injected directly into Chino Basin. The location, sizing and volume to be produced will be determined as part of the portfolio development process. Increment 1+2 facility, or facilities would have a capacity of 5,000 AFY. | 2,500 | 5 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 17 | Satellite RW Injection-Increment 3 | This project category would construct a satellite (outside of RP-1) wastewater treatment plant with advanced water filtration (e.g. process treatment that combines micro or ultrafiltration) to allow the water to be injected directly into Chino Basin. The location, sizing and volume to be produced will be determined as part of the portfolio development process. Increment 1-3 facility, or facilities would have a capacity of 7,500 AFY. | 2,500 | 5 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 18 | Desalter Recovery Improvement | The existing Chino Basin I Desalter (CD-1) recovers approximately 75 percent of water. Improvements could be done to increase recovery to approximately 90 percent. This water would be conveyed through the existing potable water system. | 1,500 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| 19 | RW Direct Use Expansion-Increment 1 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond the Agency's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035 and potential recycled water interties. Increment 1 facilities would increase direct use beyond baseline supply by 5,000 AFY. | 5,000 | 15 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 2 |
| 20 | RW Direct Use Expansion-Increment 2 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond the Agency's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035 and potential recycled water interties. Increment 1+2 facilities would increase direct use beyond baseline supply by 10,000 AFY. | 5,000 | 20 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 21 | RW Direct Use Expansion-Increment 3 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond the Agency's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035 and potential recycled water interties. Increment 1-3 facilities would increase direct use beyond baseline supply by 15,000 AFY. | 5,000 | 25 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 22 | RW Direct Use Expansion-Increment 4 | IEUA developed a new Recycled Water Program Strategy concurrent with the IRP. This project category will be used to determine the potential interest in expanding the direct use system beyond the Agency's Ten Year CIP. Includes the reuse of regional wastewater supply, approximately 83,000 AFY by 2035 and potential recycled water interties. Increment 1-4 facilities would increase direct use beyond baseline supply by 20,000 AFY. | 5,000 | 25 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 23 | Existing GWR Basin Improvements beyond RMPU-Increment 1 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1 facilities would increase recharge at existing basins within the Chino Basin by an additional 2,500 AFY. | 2,500 | 15 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 2 |
| 24 | Existing GWR Basin Improvements beyond RMPU-Increment 2 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1+2 facilities would increase recharge at existing basins within the Chino Basin by an additional 5,000 AFY. | 2,500 | 20 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 2 |
| 25 | Existing GWR Basin Improvements beyond RMPU-Increment 3 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1-3 facilities would increase recharge at existing basins within the Chino Basin by an additional 10,000 AFY. | 5,000 | 25 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |

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| 26 | Existing GWR Basin Improvements beyond RMPU-Increment 4 | The 2013 Chino Basin RMPU recommended a set of preferred projects to improve recharge at the existing groundwater spreading basins. This project category represents the next increment of additional groundwater recharge (imported water and/or recycled water) capable at the existing facilities. Increment 1-4 facilities would increase recharge at existing basins within the Chino Basin by an additional 15,000 AFY. | 5,000 | 25 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 27 | Construct New GWR Basins-Increment 1 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Increment 1 would provide up to an additional 2,450 AFY of recharge capacity, which is approximately one new basin at 350 AF per month for 7 months of operation. | 2,450 | 10 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 28 | Construct New GWR Basins-Increment 2 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Increment 1+2 would provide up to an additional 4,900 AFY of recharge capacity, which is approximately 2 new basins at 350 AF per month for 7 months of operation. | 2,450 | 15 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 29 | Construct New GWR Basins-Increment 3 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Increment 1-3 would provide up to an additional 7,350 AFY of recharge capacity, which is approximately 3 new basins at 350 AF per month for 7 months of operation. | 2,450 | 20 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 30 | Construct New GWR Basins-Increment 4 | Purchase land to construct new groundwater recharge basins in the service area to capture additional stormwater, recycled water and/or imported water for groundwater recharge. Increment 1-4 would provide up to an additional 9,800 AFY of recharge capacity, which is approximately 4 new basins at 350 AF per month for 7 months of operation. | 2,450 | 20 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 2 |
| 31 | ASR wells MZ1 and MZ2 | Construct aquifer storage and recovery (ASR) wells to increase improted water groundwater recharge within management zone 1 and 2. Reference projects were taken from the 2010 RMPU, Sections 6.7.2.1 and 3 for CVWD and the City of Ontario. | 11,500 | 5 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 32 | ASR wells MZ3 | Construct aquifer storage and recovery (ASR) wells to increase imported water groundwater recharge within management zone 3. Reference projects were taken from the 2010 RMPU, Sections 6.7.2.2 for JCSD. | 3,500 | 5 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 33 | Maximize ASR wells | Construct other aquifer storage and recovery (ASR) wells to increase imported water groundwater recharge by 3,500 AFY within the Chino Basin during wet and dry years. Assume benefit 40% of the time (2 in 5 years). Storage to be dependent on supplemental water availability in wet years | 3,500 | 5 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 34 | Cadiz IW Transfer | The Cadiz project would allow for the import of unused groundwater from the remote Fenner Valley near Cadiz, California. For the purposes of the IRP, a 5,000 AFY increment of water is assumed. The Cadiz supply would be transferred and taken as SWP water into the Chino Basin. | 5,000 | 20 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 35 | Secure SWP IW transfer outside MWD | Imported water supply is solely from MWD via the SWP and is limited by the Agency's purchase order. Other permanent, temporary or seasonally available imported water supplies could be purchased and wheeled into the Chino Basin. The volume of water available varies depending on the source of water and timing. Supplies could be purchased from various Irrigation Districts or secured via Ag Transfer. Assume benefit 1 in 10 years | 5,000 | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 1 |
| 36 | SBVMWD IW Transfer | As a SWP contractor, San Bernardino Valley MWD (SBVMWD) has a Table A allocation. This option would involve constructing an intertie between SBVMWD's imported water system. The supply would be temporary or seasonally available and could be purchased and wheeled into the Chino Basin. Assume benefit 1 in 5 years. | 5,000 | 5 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 1 |
| 37 | Ocean Desalination Exchange | This project category would involve a partnership with another water agency pursuing ocean water desalination; through in-lieu exchange, the Chino basin would obtain an agreed amount of imported water. For the purposes of the IRP, a volume of 5,000 AFY was chosen. Opportunity to invest in upcoming ocean desalination plants includes Huntington Beach, Carlsbad and West Basin. | 5,000 | 10 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 1 |
| 38 | Six Basin Water Transfer | This project would explore the idea of developing a water transfer agreement with Six Basins. One concept is to purchase imported water for recharge into Six Basins and get in return equal volume of groundwater underflow plus agreed amount of stormwater. For example, could purchase 10,000 AF of IW for exchange of 10,000 AF of groundwater plus 7,000 AF of stormwater. Assume benefit 1 in 5 years. | 17,000 | 5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 0 | 1 |
| 39 | Expand WUE Devices | Implement additional targeted device related savings to reduce demand beyond current annual water use efficiency savings. Provide incentives and pilot programs to roll out extremely high efficient indoor fixtures and toilets. To be verified with WUEBP. | 5,000 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 40 | WUE - Turf Removal-Increment 1 | Implement turf removal and landscape transformational programs to reduce outdoor demand. To be verified with WUEBP. Increment 1 would provide up to 5,000 AFY of savings. | 5,000 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 41 | WUE - Turf Removal-Increment 2 | Implement turf removal and landscape transformational programs to reduce outdoor demand. To be verified with WUEBP. Increment 1+2 would provide up to 10,000 AFY of savings. | 5,000 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 42 | WUE - Turf Removal-Increment 3 | Implement turf removal and landscape transformational programs to reduce outdoor demand. To be verified with WUEBP. Increment 1-3 would provide up to 15,000 AFY of savings. | 5,000 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 43 | WUE - Budget Rates-Increment 1 | Implement water budget based rates for 2 member agencies (assuming 15% total savings per Agency after 3 years). To be verified with WUEBP. Increment 1 would provide up to 13,350 AFY of savings. | 13,350 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |

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| 44 | WUE - Budget Rates-Increment 2 | Implement water budget based rates for 2 member agencies (assuming 15% total savings per Agency after 3 years). To be verified with WUEBP. Increment 1 would provide up to 26,700 AFY of savings. | 13,350 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| 45 | WUE - Budget Rates-Increment 3 | Implement water budget based rates for 2 member agencies (assuming 15% total savings per Agency after 3 years). To be verified with WUEBP. Increment 1 would provide up to 40,050 AFY of savings. | 13,350 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| 46 | WUE- RW Demand Management-Increment 1 | Implement demand management devices and programs for direct recycled water customers. Does not generate additional supply, aids in managing the supply during peak demand. Increment 1 would provide 2,500 AFY of demand management, this supply could be used for increasing direct use demands, groundwater recharge or other reuse strategy. | 2,500 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| 47 | WUE- RW Demand Management-Increment 2 | Implement demand management devices and programs for direct recycled water customers. Does not generate additional supply, aids in managing the supply during peak demand. Increment 1+2 would provide 5,000 AFY of demand management, this supply could be used for increasing direct use demands, groundwater recharge or other reuse strategy. | 2,500 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 2 | 2 |
| 48 | Dry Weather Flow Diversions | Capture and treat urban dry weather flow from Chino, Cucamonga and San Sevaine Creek into the Regional Plants. For the purposes of the IRP, a volume of 3,500 AFY was assumed as total available dry weather flow. | 3,500 | 5 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 2 |
| 52 | San Antonio Creek SW Capture | Modify existing basins along San Antonio Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the “big gulp” concept. Assume benefit 1 in 5 years | 1,000 | 10 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 53 | Cucamonga Creek SW Capture | Modify existing basins along Cucamonga Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the “big gulp” concept. Assume benefit 1 in 5 years. | 2,500 | 10 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 54 | Day Creek SW Capture | Modify existing basins along Day Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the “big gulp” concept. Assume benefit 1 in 5 years. | 2,500 | 10 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 55 | San Sevaine Creek SW Capture | Modify existing basins along San Sevaine Creek to increase stormwater capture beyond the 2013 RMPU. Increase facilities to better accommodate the “big gulp” concept. Assume benefit 1 in 5 years. | 2,500 | 10 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 56 | Water Banking Facility | This project category would invest into the Semitropic Groundwater Storage Bank in Kern County or similar program. The Chino Basin could bank additional purchases of wet year water when these supplies are available and Chino Basin facilities are capacity limited. | 5,000 | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 1 |
| 58 | Regional LID-Increment 1 | Construct or modify urban development to better manage and infiltrate rainfall at the source. Projects could include bioswales and or pervious concrete installation in parking lots, street drainages. Increment 1 facilities could provide up to 5,000 AFY of recharge. | 5,000 | 5 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 59 | Regional LID-Increment 2 | Construct or modify urban development to better manage and infiltrate rainfall at the source. Projects could include bioswales and or pervious concrete installation in parking lots, street drainages. Increment 1+2 facilities could provide up to 10,000 AFY of recharge. | 5,000 | 5 | 2 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 60 | Direct Potable Reuse-Increment 1 | This project would construct an advanced water filtration and treatment (e.g. process treatment that combines micro or ultrafiltration) facility at a Regional Plant. The treatment process would allow the recycled water to be introduced into the potable water system. Increment 1 facility would have a capacity of 5,000 AFY. | 5,000 | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 61 | Direct Potable Reuse-Increment 2 | This project would construct an advanced water filtration and treatment (e.g. process treatment that combines micro or ultrafiltration) facility at a Regional Plant. The treatment process would allow the recycled water to be introduced into the potable water system. Increment 1+2 facility would have a capacity of 10,000 AFY. | 5,000 | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 |
| 62 | Cucamonga Basin Improvements | This project category will identify projects that would result in additional groundwater production benefits coming into the IEUA service area from the Cucamonga Basin. Includes recharge facilities, treatment and production facilities to maximize supply coming into the Chino Basin. | 2,500 | 5 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 2 | 2 |
| 63 | Maximize Other Groundwater | This project category will identify local member agency projects that would result in additional groundwater production benefits coming into the IEUA service area outside of the Chino Basin. | 5,000 | 5 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 |
| 65 | RP-1 NRWS Treatment | The north Non Reclaimable Wastewater System (NRWS) discharges approx.. 3.5 MGD of brine to Los Angeles County annually. The project would construct a treatment facility to allow the Region to reuse this supply into the recycled water system. Requires plant expansion and partial reverse osmosis for blending. | 3,920 | 9 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 2 |
| 66 | WUE - Advanced Metering Technologies | Install advanced metering infrastructure (AMI) between retail meters and a utility provider. Will provide real-time data about consumption and allow customers to make informed choices about usage. | 5,000 | $ 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 |
| 87 | Prior Stored Chino Groundwater | This category will allow supply to be taken from groundwater stored in the Chino Basin, pre 2014. It is estimated that approximately 400,000 AF of stored groundwater is available, of which 280,000 AF is made available for IEUA member agencies. This supply category will be managed on a case by case basis as selected into the Regional supply portfolios. The supply will be limited, but can be used annually or intermittent as needed. | 8,400 | 1 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 88 | Maximize Local Surface Water | This category of projects will construct facilities needed to capture additional local surface water. Projects to be defined by IEUA's member agencies. For example, increase surface flows off Lytle Creek in wet years. Assume benefit 3 in 5 years | 1,000 | 1 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 89 | Max Tier 1 MWD Imported Water-Increment 1 | Maximize imported water from MWD at Tier 1 rate. Total available supply at Tier 1 rate is 93,283 AFY or cumulative purchase order maximum of 932,830 AF through December 31, 2024. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1 would allow for the purchase of an additional 7,850 AFY. Can be purchased annually or intermittently. | 7,850 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 90 | Max Tier 1 MWD Imported Water-Increment 2 | Maximize imported water from MWD at Tier 1 rate. Total available supply at Tier 1 rate is 93,283 AFY or cumulative purchase order maximum of 932,830 AF through December 31, 2024. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1+2 would allow for the purchase of an additional 15,700 AFY. Can be purchased annually or intermittent. | 7,850 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 91 | Max Tier 1 MWD Imported Water-Increment 3 | Maximize imported water from MWD at Tier 1 rate. Total available supply at Tier 1 rate is 93,283 AFY or cumulative purchase order maximum of 932,830 AF through December 31, 2024. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1-3 would allow for the purchase of an additional 23,550 AFY. Can be purchased annually or intermittent. | 7,850 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 92 | Max Tier 2 MWD Imported Water-Increment 1 | Maximize imported water from MWD at Tier 2 rate. Could be taken annually or intermittent, availability pending MWD supply. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1 would allow for the purchase of an additional 5,000 AFY. Can be purchased annually or intermittent. | 5,000 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 93 | Max Tier 2 MWD Imported Water-Increment 2 | Maximize imported water from MWD at Tier 2 rate. Could be taken annually or intermittent, availability pending MWD supply. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1+2 would allow for the purchase of an additional 10,000 AFY. Can be purchased annually or intermittent. | 5,000 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 94 | Max Tier 2 MWD Imported Water-Increment 3 | Maximize imported water from MWD at Tier 2 rate. Could be taken annually or intermittent, availability pending MWD supply. Supply can be taken directly, in-lieu or for supplemental recharge. Increment 1-3 would allow for the purchase of an additional 15,000 AFY. Can be purchased annually or intermittently. | 5,000 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 0 | 1 | 1 | 2 |
| 95 | MWD Replenishment or discount wet year water-Increment 1 | Maximize replenishment or discount wet year imported water from MWD. Availability pending MWD supply and pricing. Supply can be taken in-lieu or for supplemental recharge. Increment 1 would allow for the purchase of an additional 10,000 AFY. Can be purchased annually or intermittently. Assume benefit after 2 consecutive wet years (assume 1 in 15 years) | 10,000 | 5 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 |
| 96 | MWD Replenishment or discount wet year water-Increment 2 | Maximize replenishment or discount wet year imported water from MWD. Availability pending MWD supply and pricing. Supply can be taken in-lieu or for supplemental recharge. Increment 1+2 would allow for the purchase of an additional 20,000 AFY. Can be purchased annually or intermittently. Assume benefit after 2 consecutive wet years (assume 1 in 15 years) | 10,000 | 8 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 |
| 97 | MWD Replenishment or discount wet year water-Increment 3 | Maximize replenishment or discount wet year imported water from MWD. Availability pending MWD supply and pricing. Supply can be taken in-lieu or for supplemental recharge. Increment 1-3 would allow for the purchase of an additional 30,000 AFY. Can be purchased annually or intermittently. Assume benefit after 2 consecutive wet years (assume 1 in 15 years) | 10,000 | 10 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 2 |
| 98 | Watershed Wide Water Transfers | This category of projects will construct or arrange other water transfers external to the Chino Basin. For example, dry weather flow exchange of recycled water to Orange County Water District for an equivalent amount of purchased imported water. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but increases reliability and/or quality. To occur annually or intermittent. Resiliency and flexibility benefit only | - | 5 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 99 | Chino Basin Water Transfers | This category of projects will construct or arrange other water transfers within the Chino Basin. Projects to also include inter-agency interties for increased reliability. For the purposes of the IRP, it is assumed that this category of projects will not increase supply, but increases reliability. To occur annually or intermittent. | - | 5 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 |
| 100 | Reliability Production Wells | This project category will construct new production wells needed to replace lost production or under performing facilities. These projects will maintain current annual groundwater production deliveries and are intended to increase operational flexibility and reliability. Increment 1 varies in capacity and will be determined on a case by case basis as selected into each of the regional supply portfolios. | - | 2 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 |

# Appendix E: Response Action Program Cut Sheets

IEUA Drought Contingency Plan

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## Guide to the Program Write-Ups

IEUA has selected seven customer programs to be offered during drought conditions. Each program is detailed in an individual write-up contained in this section.

The sections contained in each write-up are explained in the diagram below:

**DESCRIPTION**
Provides a basic overview of the program, the measures, and delivery mechanisms

**REASONING**
Overviews the market need being met and reasons for this particular program design

**CONSIDERATIONS**
Provides awareness of additional program issues or circumstances that may impact the program

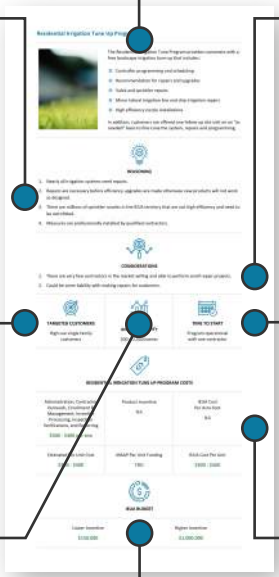

**TARGETED CUSTOMERS**
Identifies the customer groups targeted for program participation

**TIME TO START**
The anticipated time to develop and start-up operations for the program

**POTENTIAL ANNUAL ACTIVITY**
The expected number of customer participants or product installations per year

**PROGRAM COSTS**
Program costs are broken down into six categories: Administration & Operational costs; Product Incentive or rebate; IEUA's cost per Acre-foot (cost/the lifetime water savings); Estimated Cost per Unit (total costs per property); MAAP per unit (potential Member Agency Administered Program funding from MWD), and; IEUA cost per unit (Estimated Cost per Unit – MAAP per unit)

**IEUA BUDGET**
Identifies the overall annual cost to IEUA for the program at both a low participation and high participation levels

## Turf Replacement Program

The Turf Replacement Program encourages customers to remove high water-consuming turf and replace it with alternative solutions such as low water-using, regionally appropriate plants and surfaces that allow for ground water infiltration and elimination of runoff. Qualifying applicants are eligible to receive $3 per square foot of turf removed with a maximum incentive of 5,000 square feet for residential customers and 50,000 square feet for commercial customers. Eligible projects must have:

- Three plants per 100 square feet of area transformed
- No hardscape within the transformed area, except permeable hardscape
- A stormwater retention feature
- Replacement or modification of overhead spray sprinklers

For reference, the historical program activity of square feet removed is listed below.

| | Residential | Commercial | Total |
|---|---|---|---|
| FY 14/15 | 119,130 | 1,136,334 | 1,255,464 |
| FY 15/16 | 1,596,789 | 3,337,120 | 4,933,909 |
| FY 16/17 | 255,091 | 637,916 | 893,007 |

**REASONING**

1. There are hundreds of thousands of square feet of irrigated turf in the IEUA territory.
1. Replacing turf with regionally appropriate plants aids in transforming the market. In a recent analysis done by Western MWD, for every customer replacing their turf, another customer did so without an incentive.
2. Provides long term savings- Current studies have shown that savings increase after the initial plant stabilization period and persist over 10 years or more.

**CONSIDERATIONS**

1. Turf replacement has an extremely high cost per acre-foot.
3. The market acceptance is low during non-drought times.
4. There are numerous customer barriers: costs, concerns about the new look, and lack of ability to execute projects.
5. Contractors are not interested in projects smaller than 1,000 sf.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| All customers with live turf | 500,000 – 5 Million SF | Currently operational |

**TURF REPLACEMENT PROGRAM COSTS**

| | | |
|---|---|---|
| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting<br>**Covered by Metropolitan through regional vendor** | Product Incentive<br>**$3 per square foot** | IEUA Cost Per Acre-foot<br>**$769 ($ per sf)** |
| Estimated Per Unit Cost<br>**$3 per sf** | MAAP Per Unit Funding<br>**$2.00 (regional rebate)** | IEUA Cost Per Unit<br>**$1 per sf** |

**IEUA BUDGET**

| Lower Incentive | Higher Incentive |
| --- | --- |
| **$500,000** | **$5,000,000** |

## Residential Irrigation Tune Up Program

The Residential Irrigation Tune Program provides customers with a free landscape irrigation tune-up that includes:

- Controller programming and scheduling
- Recommendation for repairs and upgrades
- Valve and sprinkler repairs
- Minor lateral irrigation line and drip irrigation repairs
- High efficiency nozzle installations

In addition, customers are offered one follow-up site visit on an "as needed" basis to fine-tune the system, repairs and programming.

**REASONING**

1. Nearly all irrigation systems need repairs.
6. Repairs are necessary before efficiency upgrades are made otherwise new products will not work as designed.
7. There are millions of sprinkler nozzles in the IEUA territory that are not high efficiency and need to be retrofitted.
8. Measures are professionally installed by qualified contractors.

**CONSIDERATIONS**

1. There are very few contractors in the market willing and able to perform small repair projects.
9. Could be some liability with making repairs for customers.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| High use single family customers | 500 – 2,500 homes | Program operational with one contractor |

**RESIDENTIAL IRRIGATION TUNE UP PROGRAM COSTS**

| | | |
|---|---|---|
| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting<br>**$300 - $400 per site** | Product Incentive<br>**NA** | IEUA Cost Per Acre-foot<br>**NA** |
| Estimated Per Unit Cost<br>**$300 - $400** | MAAP Per Unit Funding<br>**TBD** | IEUA Cost Per Unit<br>**$300 - $400** |

**IEUA BUDGET**

| Lower Incentive | Higher Incentive |
|---|---|
| **$150,000** | **$1,000,000** |

## Smart Irrigation Direct Installation

### DESCRIPTION

The Smart Irrigation Direct Installation Program offers the installation of smart irrigation devices, potentially free to the customer. The Program could offer:

- Smart cloud-based controllers
- High efficiency sprinkler nozzles
- Wireless flow sensors

In order to maximize water savings, a qualification consideration could be that customers must have one acre or more of irrigated area or water usage of over 450,000 gallons per year per household. The Program could be designed with a customer co-pay, which would boost cost effectiveness. The inclusion of nozzle installations adds tremendous costs and could be eliminated if the budget does not allow it.

**REASONING**

1. Top water users and large landscape properties offer maximum water savings due to the expansive volume of acreage of irrigated lawns and gardens. In addition, over one-acre sites provide additional MAAP funding.
2. Single family properties with irrigated area have controllers and spray heads, but most do not have the latest smart irrigation technologies.
3. The smart irrigation package includes proven technologies that will be appealing to customers.
4. Addition of flow sensors will provide the ability to detect abnormal water use and alert property owners via text or email.
5. Measures will be professionally installed by contractors ensuring quality installations and programming.
6. Direct installation contractors typically meet installation goals on schedule due to proactive sales activities.

**CONSIDERATIONS**

1. High cost to provide direct installations.
2. Sometimes customers do not buy into new measures, specifically programming of the controller and they will override efficiency schedule.
3. Could be some liability with providing product and installation.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| Single-family, multi-family, commercial 1 acre or larger | 1,000 – 5,000 properties | 6 – 8 months |

**SMART IRRIGATION DIRECT INSTALLATION PROGRAM COSTS**

| | | |
|---|---|---|
| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting<br>**$400** | Product Incentive<br>**Free to customer** | IEUA Cost Per Acre-foot<br>**$327** |
| Estimated Per Unit Cost<br>**$1,550** | MAAP Per Unit Funding<br>**$600** | IEUA Cost Per Unit<br>**$950** |

**IEUA BUDGET**

| Lower Incentive | Higher Incentive |
| --- | --- |
| **$950,000** | **$4,750,000** |

## School Smart Irrigation Direct Installation

### DESCRIPTION

Schools use a tremendous amount of water for irrigation, specifically for watering their lawn areas. These lawns are frequently used for student sports and recreation and therefore not candidates for turf replacement. The School Smart Irrigation Program would offer local schools free installation of smart irrigation devices. Measures to include:

- Pressure regulating spray heads
- High efficiency sprinkler nozzles
- Flow sensors and master valves (if practical)
- Smart cloud-based controllers (if practical)

If cost prohibitive flow sensors, master valves and smart controllers can be eliminated.

**REASONING**

1. Schools have large areas of functional lawn area, used for sports and recreation.

2. School properties typically have irrigation systems with old malfunctioning equipment. Much of the time the spray heads are broken, clogged, below grade or too high.

3. Most schools have limited budgets and resources to purchase and install irrigation equipment.

4. The program addition of flow sensors and master valves eliminates water waste due to leaks by shutting off the valve. In addition, the flow sensing data provides information on actual water usage.

5. Smart cloud-based controllers can provide and share water use information.

6. Improved irrigation efficiency in schools can significantly reduce their utility costs.

7. The program provides opportunity for schools to demonstrate leadership and educate students on water use efficiency.

**CONSIDERATIONS**

1. High cost to provide direct installations.
2. School personnel may override programming of the controller.
3. Could be some liability with providing product and installation.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| Public schools | Schools | 6 – 8 months |

**SCHOOL SMART IRRIGATION DIRECT INSTALLATION PROGRAM COSTS**

| | | |
|---|---|---|
| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting<br>$ | Product Incentive<br>**Free to customer** | IEUA Cost Per Acre-foot<br>$ |
| Estimated Per Unit Cost<br>$ | MAAP Per Unit Funding<br>$ | IEUA Cost Per Unit<br>$ |

**IEUA BUDGET**

| Lower Incentive | Higher Incentive |
| --- | --- |
| $ | $ |

## Qualified Contractor Irrigation Incentive Program

**DESCRIPTION**

Program will allow customers to receive a comprehensive package of innovative and proven irrigation technologies from qualified contractors, for the following discounted prices:

- Smart controllers $35 - $50 per station
- High efficiency sprinkler nozzles **$6 - $10 per nozzle**
- Flow sensors with master valves **$60 - $100 per sensor**
- Drip irrigation **$0.40 - $0.60**

Eligible contractors would include: QWEL, CLCA and IA certified firms. Customers would be responsible for installation costs.

Targeted properties would include all customer segments (commercial, multi-family and residential) with one acre or more of irrigated area, with a program focus on commercial and HOA common areas.

**REASONING**

1. Large landscape properties offer maximum water savings due to the expansive acreage of irrigated lawns and gardens.
2. MF, CII and SF properties with irrigated area have irrigation controllers and spray heads, but most do not have the latest water-efficient smart irrigation technologies.
3. The smart irrigation package includes proven technologies that will be of interest to customers and their contractors.
4. Measures will be professionally installed by qualified contractors.

**CONSIDERATIONS**

1. In order to achieve activity goals, it will be necessary to offer the higher incentive making the program more costly.

2. Enlisting and managing contractors will take expert resources and add significant costs to the program.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| All customer segments with one acre or more of irrigated area | 250 – 1,000 homes | 6 months |

**QUALIFIED CONTRACTOR IRRIGATION INCENTIVE PROGRAM COSTS**

| | | |
|---|---|---|
| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting<br>**$300 per property** | Product Incentive (24-station controller, 150 nozzles, 46 sf of drip, 25 flow sensor/master valve)<br>**Average of $1,809 per property**<br>**(assumes full MAAP funding)** | IEUA Cost Per Acre-foot<br>**$31 - $450** |
| Estimated Per Unit Cost<br>**$2,109 - $3,227** | MAAP Per Unit Funding<br>**$1,809** | IEUA Cost Per Unit<br>**$300 - $1,418** |

**IEUA BUDGET**

| Lower Incentive | Higher Incentive |
| --- | --- |
| **$75,000 - $300,000** | **$354,500 - $1,418,000** |

## FreeSprinklerNozzles.com

The FreeSprinklerNozzles.com Program provides participating water agencies with a full-service approach to distribution of high efficiency sprinkler nozzles to their residential and commercial customers while requiring only minimal staffing. Nozzles are provided free to customers. Customer are responsible for installation.

With eight years of successful implementation, program management is looking to overhaul the FreeSprinklerNozzles.com program. The goal is for the new program to be a 100% online fulfilment program.

The new program would include an online application that would utilize aerial imagery to map a customer's landscaped area and irrigation system. The customer would use the tool to measure their irrigated area and note head locations. The system would automatically generate a nozzle inventory which would be sent to the irrigation equipment fulfilment center electronically. The nozzles would then be shipped to the customer.

**REASONING**

1. Nearly all properties in IEUA's territory with irrigated area have spray heads that can be retrofitted with efficient nozzles – there are literally millions of nozzles in this market available to be upgraded.
2. The product is easy to install and inexpensive.
3. The program offers a turnkey approach requiring minimal resources from IEUA or its member agencies.

**CONSIDERATIONS**

1. With a small device that many customers store in their garage until needed, a higher percentage of customers may not install the nozzles.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| All customers with irrigated area & spray heads | 50,000 – 200,000 | Expected launch date of December 2019 |

**FREESPRINKLERNOZZLES.COM PROGRAM COSTS**

| | | |
|---|---|---|
| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting<br>**Estimated $2 per nozzle** | Product Incentive<br>**Free to customer** | IEUA Cost Per Acre-foot<br>**$92 - $450** |
| Estimated Per Unit Cost<br>**$5 - $6** | MAAP Per Unit Funding<br>**$2 - $4** | IEUA Cost Per Unit<br>**$2 - $4** |

**IEUA BUDGET**

| Lower Incentive | Higher Incentive |
|---|---|
| **$100,000** | **$800,000** |

## Leak Detection Incentive

### DESCRIPTION

Household leaks can result in thousands of gallons of wasted water and potential property damage.

Smart leak detector devices can now monitor use, detect anomalies and alert homeowners of potential leaks. Some devices can even shut off use, mitigating water damage.

The Leak Detection Incentive would offer customers a rebate for purchase of an approved monitoring and leak detection device. There are currently five viable products on the market including Flume, Buoy, Flo, Phyn and Saya. Some devices require tapping into the existing plumbing system and may require a licensed plumber for installation, while others simply attach to the customer's water meter.

The water savings are unknown at the time and cost for product with installation ranges from $200 - $700+. The program could also offer free installation for customers with high use or could be an incentive offered to the manufacturer. The manufacturer would offer an incentive off the purchase price and bill IEUA for those properties.

**REASONING**

1. Many homes have leaks, currently industry estimates 10%.
2. Most leaks go undetected and customers are not aware for months until they get their bill and many times not even then.
3. Repairing water damage caused by leaks can cost thousands of dollars for a typical homeowner.
4. Providing customers with data on their water use gives them the necessary information and motivation to make efficiency changes.
5. Several water agencies have incentive and installation programs including: Southern Nevada Water Authority, Jurupa Community Services District, Contra Costa Water District, Rainbow Municipal Water District, and San Antonio Water System.

**CONSIDERATIONS**

1. Savings are unknown.
2. If water agency already has AMI, service is duplicative.
3. Program not applicable to all customers, must target customers with potential leaks and ones that value monitoring data.
4. Customer still has to fix leaks to secure savings.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| Single-family homes, potentially in high pressure areas or with a significant increase in use | 500 – 1,000 homes | 4 months |

**LEAK DETECTION INCENTIVE PROGRAM COSTS**

| | | |
|---|---|---|
| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting<br>**$25 per home** | Product Incentive<br>**$100 per home** | IEUA Cost Per Acre-foot<br>**TBD** |
| Estimated Per Unit Cost<br>**$125** | MAAP Per Unit Funding<br>**TBD** | IEUA Cost Per Unit<br>**$125** |

**IEUA BUDGET**

| Lower Incentive | Higher Incentive |
| --- | --- |
| **$62,500** | **$125,000** |

## WEFlex Fund

**DESCRIPTION**

Recognizing that the future is unknowable, IEUA understands that unforeseen marketing and water savings opportunities may present themselves at some point during a drought cycle. For this reason, the WEFlex Fund was created to allow IEUA to quickly respond and fund a new, creative approach.

The program will offer IEUA's retail agencies funds for locallyadministered activities. The budget will be allocated to each agency based upon the water agencies size (or water sales). An agency could use the funds for local activities such as water waste enforcement and education or recycled water hook up and permit fees. Other programs or services could be funded through WE Flex Fund, if approved by the drought response committee.

An agency will submit a description of the local activity, estimated costs and potential benefits or results. When accepted, IEUA will provide the funds.

**REASONING**

1. Should an effective new technology, marketing/promotional initiative, or delivery mechanism become available, IUEA does not want an agency to be limited to the pre-selected list of programs.
2. The program allows for retail agencies to choose a program or service that best serves their needs and those of their customers.
3. Typically, approval and funding of new initiatives take significant time to work their way through the management hierarchy. The WE Flex Fund will allow for an expedited process to implement new tactics.

**CONSIDERATIONS**

1. In order to achieve activity goals, it will be necessary to offer the higher incentive making the program more costly.
2. Enlisting and managing contractors will take expert resources and add significant costs to the program.

| TARGETED CUSTOMERS | POTENTIAL ANNUAL ACTIVITY | TIME TO START |
|---|---|---|
| All customer segments | NA | Immediate |

**WEFLEX PROGRAM COSTS**

| | | |
|---|---|---|
| Administration, Contractor Outreach, Enrollment & Management, Incentive Processing, Inspection Verifications, and Reporting<br>**TBD** | Product Incentive (24-station controller, 150 nozzles, 46 sf of drip, 25 flow sensor/master valve)<br>**TBD** | IEUA Cost Per Acre-foot<br>**TBD** |
| Estimated Per Unit Cost<br>**TBD** | MAAP Per Unit Funding<br>**TBD** | IEUA Cost Per Unit<br>**TBD** |

## Services Offered

In addition to Programs, three Support Services are offered to provide customers with knowledge and information about water efficient landscaping. These Services are:

1. Landscape Surveys
2. Landscape Workshops
3. Landscape Design Services

### Landscape Surveys

Administered by the Chino Basin Water Conservation District (CBWCD), in partnership with IEUA and the member agencies, the Landscape Survey Program offers customers a free evaluation of their landscape and irrigation system.

The survey includes:

- A complete evaluation of the customer's irrigation system
- Determination of the landscape's water needs
- Accurate profile of the property's water consumption
- Generation of a water budget based on the local evapotranspiration and irrigated landscape area

Customer's also receive:

- Water saving tips
- Recommendations on how to improve overall efficiency of your irrigation system
- Rebate opportunities

In order to ensure water savings, it is recommended that the surveys also include follow up to verify any recommendations have been implemented and assist customers in making the upgrades and receiving the incentives.

### Landscape Workshops

The landscape classes offered through the IEUA service areas are FREE of charge. The descriptions below provide a basic overview of the topics covered.

**Drought Tolerant Plants** - This class provides information on a variety of water efficient plants that fit both our climate and landscape design. The instructor will discuss native and other California friendly plants, the benefits they provide to your landscape, and when and how to plant them.

**Landscape Design** - This class provides residents with the initial basics on how to develop a landscape that combines both beauty and environmental benefits to their home. Both preparation and design techniques will be discussed.

**Water Efficient Irrigation Systems** - This class teaches residents the importance of using water wisely and how an efficient irrigation system enables them to play their part in efficient water use. Overhead sprinklers, drip systems and irrigation controllers will be discussed.

**Turf Remov**al - This class is specialized to instruct residents on the proper techniques to remove turf and replace it with a water efficient landscape.

**Composting, Fertilizer, & Maintenance** - This class teaches residents about compost, fertilizer and their correct usage to help plants flourish. Participants will also learn about the correct maintenance to ensure growth for their plants.

**How the Drought Affects Your Water Timer** - This class will help residents understand the watering restrictions and how to program their controller to align with their retail agency's outdoor watering restrictions.

**Composting, Water Management, & Pest Control** - This class provides instruction on composting, proper watering techniques, and integrated pest management. Participants will learn how often and how much to water plants, how to identify what can be used to compost, how to properly apply compost, and how to sustainably control pests.

**Drought, El Nino, & What to do with Your Landscap**e - This class gives residents tips and tricks on how to maintain their landscape during transitioning seasons and weather changes.

**Mini Class** - Comprehensive four-hour class covering Landscape design basics, California friendly & native plants, landscape sprinkler systems, and planting and maintenance.

## Landscape Design Services

Through a collaboration between CBWCD, IEUA and its member agencies, customers are offered landscape design services free of charge. This service has a market value of approximately $500.

Participants are required to attend a two-hour "What You Need to Know Before Your Landscape Transformation" class before they become eligible to register for the Landscape Design Assistance Program. The class is focused on providing all the information most people need to be successful with a turf replacement project, whether they are doing the work themselves or hiring a contractor.

Due to program demand, customers are provided design services for EITHER their front yard OR back yard. If a customer completes the first project, they can receive additional design services.

A CBMWD staff member consults with participants for approximately 1.5 - 2 hours in person at the Waterwise Community Center. At the appointment, customers discuss goals for their landscape area and then work with staff to create a computer-generated design for the landscape project.

After the consultation meeting, CBWCD staff finish the design, create a plant identification key and a custom plant list with the names and information about each plant selected for the designed landscape. Customers are also provided with a list of resources including sources of plants and other landscape materials.

# WSCP Appendix B

November 2020 Notification Letter To
Encourage Public Involvement

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

6075 Kimball Avenue • Chino, CA 91708
P.O. Box 9020 • Chino Hills, CA 91709
TEL (909) 993-1600 • FAX (909) 993-1985
www.ieua.org

24 November 2020

GM Name
GM Title
Agency Name
Street Address
City, State, Zip

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Agency Representative:

The Inland Empire Utilities Agency (IEUA) is undertaking the review, update, and revision of its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act requires every urban water supplier of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. IEUA is in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the IEUA is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the IEUA will be reviewing the UWMP and will make amendments or changes, as appropriate. Based on the IEUA's current schedule, we expect to have a draft available for public review by April 2021, at which point your agency will receive notification that the draft UWMP is available for public review and comment.

The IEUA invites you to submit written comments in anticipation of the development of our 2020 UWMP Update within the next 30 days to IEUA. If your agency would like to learn more about the UWMP, please feel free to contact me at 909.993.1698 or jaguilar@ieua.org.

Sincerely,

Joshua Aguilar
Senior Engineer

*Water Smart - Thinking in Terms of Tomorrow*

Kati Parker, President | Jasmin A. Hall, Vice President | Steven J. Elie, Secretary/Treasurer | Michael E. Camacho, Director | Paul Hofer, Director | Shivaji Deshmukh, General Manager

# WSCP Appendix C

April 2021 60-Day Notification Letter to City, County and Others Within IEUA Service Area

**NOTICE OF PUBLIC HEARING**
**BY THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY***
**TO ADOPT THE 2020 URBAN WATER MANAGEMENT PLAN (UWMP),**
**ADDENDUM OF APPENDIX G TO THE 2015 UWMP,**
**AND WATER SHORTAGE CONTINGENCY PLAN**
**SAN BERNARDINO COUNTY, STATE OF CALIFORNIA**

NOTICE IS HEREBY GIVEN that the Board of Directors of the Inland Empire Utilities Agency intends to hold a public hearing for adoption of the 2020 Urban Water Management Plan (UWMP), Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan.

NOTICE IS FURTHER GIVEN that said public hearing will be held on the following date and time for the purpose of hearing any and all public testimony on the above-stated issue.

DATE: Wednesday, June 16, 2021 – 10:00 a.m.

The meeting will be accessible via teleconference at:
Phone Number: (415) 856-9169 / Conference ID: 811 284 110#

In the effort to prevent the spread of COVID-19, until further notice, the Inland Empire Utilities Agency will hold all Board and Committee meetings by video and audio conference. As of the posting/publication of this notice, it is anticipated that the public hearing will be conducted virtually by video and audio conference. (Please visit www.ieua.org for the most up-to-date information regarding meeting participation.) There will be no public location available to attend the meeting; all interested persons are invited to participate in the public hearing and provide comments regarding the proposed 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan by calling into the number provided above. The public may also view the meeting live through the Agency's website at www.ieua.org. Oral statements will be heard, but for the accuracy of the record all important testimony should be submitted in writing. Written comments may be emailed to the Board Secretary/Office Manager Denise Garzaro at dgarzaro@ieua.org no later than 24 hours prior to the scheduled meeting time. Comments submitted in advance will be read into the record during the hearing.

NOTICE IS FURTHER GIVEN that the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan will be available on the Agency's website at www.ieua.org and via hard-copy upon request in Spring of 2021, no less than two weeks prior to the public hearing. All interested parties are noticed and invited to submit comments and consult with the Agency regarding its forthcoming 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan to the Strategic Planning and Resources Department, attention Joshua Aguilar at jaguilar@ieua.org. For additional information regarding the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan, please contact Senior Engineer, Joshua Aguilar at (909) 993-1694.

*a municipal water district

# WSCP Appendix D

Newspaper Notice of Public Hearing

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

6075 Kimball Avenue • Chino, CA 91708
P.O. Box 9020 • Chino Hills, CA 91709
TEL (909) 993-1600 • FAX (909) 993-1985
www.ieua.org

May 11th, 2021

Retail Agency
Contact Information
Placed Here

**SUBJECT: Posting of the 2020 Urban Water Management Plan, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan**

Dear Agency Representative:

The Inland Empire Utilities Agency (IEUA) is inviting public review and comment on its Draft 2020 Urban Water Management Plan (UWMP). The Plan includes an updated Addendum of Appendix G to the 2015 UWMP and 2020 Water Shortage Contingency Plan (WSCP).

In compliance with California Water Code (§10610-10656, §10608 and §10632) the UWMP and WSCP are required to contain detailed evaluations of water supplies necessary to reliably meet demands of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP and other plans.

All plan documents are now available on IEUA's website here: https://www.ieua.org/read-our-reports/other-reports/.

Comments must be received no later than **5:00 p.m. Monday, May 24, 2021** and sent to the attention of Joshua Aguilar, 909.993.1698 or jaguilar@ieua.org.

If you or your agency would like more information on IEUA's UWMP, Addendum, or WSCP, please contact me.

Sincerely,

Joshua Aguilar
Senior Engineer

# CALIFORNIA NEWSPAPER SERVICE BUREAU

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Denise Garzaro
INLAND EMPIRE UTILITIES AGENCY
6075 KIMBALL AVE BUILDING A
CHINO, CA 91710

CNS 3471155

# COPY OF NOTICE

Notice Type: HRG NOTICE OF HEARING

Ad Description Urban Water Management Plan (UWMP)- 5/17 and 5/24

To the right is a copy of the notice you sent to us for publication in the INLAND VALLEY DAILY BULLETIN/ONTARIO. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/17/2021 , 05/24/2021

The charge(s) for this order is as follows. An invoice will be sent after the last date of publication. If you prepaid this order in full, you will not receive an invoice.


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## NOTICE OF PUBLIC HEARING BY THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY* TO ADOPT THE 2020 URBAN WATER MANAGEMENT PLAN (UWMP), ADDENDUM OF APPENDIX G TO THE 2015 UWMP, AND 2020 WATER SHORTAGE CONTINGENCY PLAN SAN BERNARDINO COUNTY, STATE OF CALIFORNIA

NOTICE IS HEREBY GIVEN that the Board of Directors of the Inland Empire Utilities Agency intends to hold a public hearing for adoption of the 2020 Urban Water Management Plan (UWMP), Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan.

NOTICE IS FURTHER GIVEN that said public hearing will be held on the following date and time for the purpose of hearing any and all public testimony on the above-stated issue.

DATE: Wednesday, June 16, 2021 – 10:00 a.m.

The meeting will be accessible via teleconference at:
**Phone Number: (415) 856-9169 / Conference ID: 811 284 110#**

In the effort to prevent the spread of COVID-19, until further notice, the Inland Empire Utilities Agency will hold all Board and Committee meetings by video and audio conference. As of the posting/publication of this notice, it is anticipated that the public hearing will be conducted virtually by video and audio conference. (Please visit www.ieua.org for the most up-to-date information regarding meeting participation.) There will be no public location available to attend the meeting; all interested persons are invited to participate in the public hearing and provide comments regarding the proposed 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan by calling into the number provided above. The public may also view the meeting live through the Agency's website at www.ieua.org. Oral statements will be heard, but for the accuracy of the record all important testimony should be submitted in writing. Written comments may be emailed to the Board Secretary/Office Manager Denise Garzaro at dgarzaro@ieua.org no later than 24 hours prior to the scheduled meeting time. Comments

! A 0 0 0 0 0 5 7 1 8 2 7 3 !

submitted in advance will be read into the record during the hearing.

NOTICE IS FURTHER GIVEN that the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan will be available on the Agency's website at www.ieua.org and via hard-copy upon request in Spring of 2021, no less than two weeks prior to the public hearing. All interested parties are noticed and invited to submit comments and consult with the Agency regarding its forthcoming 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan to the Strategic Planning and Resources Department, attention Joshua Aguilar at jaguilar@ieua.org. For additional information regarding the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan, please contact Senior Engineer, Joshua Aguilar at (909) 993-1694.

5/17, 5/24/21

**CNS-3471155#**

**INLAND VALLEY DAILY BULLETIN/ONTARIO**

**Inland Valley Daily Bulletin**
(formerly The Daily Report)
9616 Archibald Avenue Suite 100
Rancho Cucamonga, CA 91730
909-987-6397
legals@inlandnewspapers.com

(Space below for use of County Clerk Only)

5005702

Legal No. **0011462691**

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PO BOX 60460
LOS ANGELES, CA 90060

**FILE NO. 3471155**

# PROOF OF PUBLICATION
(2015.5 C.C.P.)

## STATE OF CALIFORNIA
## County of San Bernardino

I am a citizen of the United States, I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of INLAND VALLEY DAILY BULLETIN, a newspaper of general circulation printed and published daily for the City of Ontario, County of San Bernardino, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California, on the date of August 24, 1951, Case Number 70663. The notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

**05/17/2021, 05/24/2021**

I declare under the penalty of perjury that the foregoing is true and correct.

Executed at Rancho Cucamonga, San Bernardino Co., California, on this 8th day of June, 2021.

Signature

**NOTICE OF PUBLIC HEARING BY THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY* TO ADOPT THE 2020 URBAN WATER MANAGEMENT PLAN (UWMP), ADDENDUM OF APPENDIX G TO THE 2015 UWMP, AND 2020 WATER SHORTAGE CONTINGENCY PLAN SAN BERNARDINO COUNTY, STATE OF CALIFORNIA**

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Phone Number: (415) 856-9169 / Conference ID: 811 284 110#

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and consult with the Agency regarding its forthcoming 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan to the Strategic Planning and Resources Department, attention Joshua Aguilar at jaguilar@ieua.org. For additional information regarding the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan, please contact Senior Engineer, Joshua Aguilar at (909) 993-1694.

5/17, 5/24/21

**CNS-3471155#**

**INLAND VALLEY DAILY BULLETIN/ONTARIO #11462691**

# WSCP Appendix E

Resolution of Adoption of UWMP, WSCP, and Addendum

**RESOLUTION NO.2021-6-10**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY (IEUA), SAN BERNARDINO COUNTY, CALIFORNIA, ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN, 2020 WATER SHORTAGE CONTINGENCY PLAN, AND APPENDIX G AS AN ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN**

**Whereas**, the California Legislature enacted Assembly Bill 797, (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act) during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every urban water supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare an Urban Water Management Plan at least once every five years; and

**Whereas**, the Urban Water Management Planning Act requires the preparation and adoption of a Water Shortage Contingency Plan, in accordance with prescribes requirements; and

**Whereas**, the Urban Water Management Planning Act specifies the requirements and procedures for amending and adopting such Urban Water Management Plans; and

**Whereas**, the Inland Empire Utilities Agency* is a wholesale supplier of water for 242-square miles in the western portion of San Bernardino; and

**Whereas**, pursuant to Section 10620 of the Urban Water Management Planning Act, the Inland Empire Utilities Agency has prepared the 2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, and Appendix G as an addendum to the 2015 Urban Water Management Plan; and

**Whereas**, the Board of Directors of the Inland Empire Utilities Agency has duly reviewed, discussed, and considered the 2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, and Appendix G as an addendum to the 2015 Urban Water Management Plan.

NOW, THEREFORE, BE IT RESOLVED, DETERMINED AND ORDERED BY THE INLAND EMPIRE UTILITIES AGENCY AS FOLLOWS:

Section 1. The 2020 Urban Water Management Plan is hereby adopted; and

Section 2. The 2020 Water Shortage Contingency Plan is hereby adopted; and

Section 3. The addendum of Appendix G to the 2015 Urban Water Management Plan is hereby adopted; and

Section 4. The General Manager is hereby authorized to file an electronic copy of the 2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, and Appendix G to the 2015 Urban Water Management Plan with the State Department of Water Resources within 30

days following its adoption and no later than July 1, 2021.

Section 5. The General Manager is hereby authorized to file a CD or hardcopy of aforementioned plans with the California State Library no later than 30 days after its adoption.

Section 6. The General Manager is hereby authorized to submit an electronic copy or a CD or hardcopy of the adopted aforementioned plans to any city or county in which the suppliers provide water no later than 30 days after its adoption.

Section 7. The General Manager is hereby authorized and directed to implement the adopted aforementioned plans, including recommendations to the Board of Directors regarding necessary procedures, rules, and regulations in an effort to carry out effective and equitable water programs.

Section 8. The Resolution shall take effect upon adoption.

ADOPTED this 16th day of June 2021.

Jasmin A. Hall, President of the Inland Empire Utilities Agency* and the Board of Directors thereof

ATTEST:

Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency* and of the Board of Directors thereof

The undersigned certifies that this is a true copy as on file in the permanent records of the Agency. This stamp must be in purple ink to constitute a certified copy.
Inland Empire Utilities Agency*
*A Municipal Water Agency*
By Denise Gp Date 6/16/2021

STATE OF CALIFORNIA )
)SS
COUNTY OF )
SAN BERNARDINO

I, Steven J. Elie, Secretary of the Inland Empire Utilities Agency*, DO HEREBY CERTIFY that the foregoing Resolution being No. 2021-6-10, was adopted at a regular Board Meeting on June 16, 2021, of said Agency by the following vote:

| | |
|---|---|
| AYES: | Camacho, Elie, Hall, Hofer, Tule |
| NOES: | None |
| ABSTAIN: | None |
| ABSENT: | None |

Steven J. Elie, Secretary/Treasurer of the
Inland Empire Utilities Agency* and of
the Board of Directors thereof

(Seal)

*A Municipal Water District

# 2020 Water Shortage Contingency Plan

## Project Lead

**Joshua Aguilar, MsEM, P.E.**
Senior Engineer

## Prepared For

The Inland Empire Utilities Agency

6075 Kimball Avenue,

Chino, California 91708

## Prepared By

Kennedy Jenks

300 N. Lake Ave, Suite 1020

Pasadena, CA 91101

Phone: 626-568-4300

Fax: 626-683-8938

**Sachi Itagaki, P.E./QSD**

## Kennedy Jenks Reference

KJ 2044518*00

Kennedy Jenks

# 2020 Water Shortage Contingency Plan

## Project Lead

**Joshua Aguilar, MsEM, P.E.**
Senior Engineer

## Prepared For

The Inland Empire Utilities Agency

6075 Kimball Avenue,

Chino, California 91708

## Prepared By

Kennedy Jenks

300 N. Lake Ave, Suite 1020

Pasadena, CA 91101

Phone: 626-568-4300

Fax: 626-683-8938

**Sachi Itagaki, P.E./QSD**

## Kennedy Jenks Reference

KJ 2044518*00

Kennedy Jenks

# Appendix C

DWR Planning Tool and Standardized Tables

| Submittal Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list) |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☐ | Water Supplier is also a member of a Regional Alliance | |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

| Submittal Table 2-3: Supplier Identification | |
|---|---|
| Type of Supplier (select one or both) | |
| ☑ | Supplier is a wholesaler |
| ☐ | Supplier is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☐ | UWMP Tables are in calendar years |
| ☑ | UWMP Tables are in fiscal years |
| If using fiscal years provide month and date that the fiscal year begins (mm/dd) | |
| *7/1* | |
| Units of measure used in UWMP * (select from drop down) | |
| Unit | AF |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | |
| NOTES: | |

| Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one) | |
|---|---|
| ☑ | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed. |
| | **Provide page number for location of the list.** |
| ☐ | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.** |

| Water Supplier Name |
|---|
| *Add additional rows as needed* |
| Chino Basin Water Master |
| Chino Basin Desalter Authority |
| City of Chino |
| City of Chino Hills |
| Cucamonga Valley Water District |
| Fontana Water Company |
| Local Agency Formation Commission for San Bernardino County |
| City of Montclair |
| Monte Vista Water District |
| Metropolitan Water District |
| City of Ontario |
| City of Rancho Cucamonga |
| Santa Ana Regional Water Quality Control Board |
| San Antonio Water Company |
| Santa Ana Watershed Project Authority |
| San Bernardino County Planning Department |
| Three Valleys Municipal Water District |
| City of Upland |
| Water Facilities Authority |
| West Valley Water District |
| NOTES: |

| Submittal Table 3-1 Wholesale: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2020 | 2025 | 2030 | 2035 | 2040 | 2045*(opt)* |
| | 906,046 | 945,849 | 987,401 | 1,031,771 | 1,074,773 | 1,119,568 |
| NOTES: Population projections calculated using the 2020 Southern California Association of Government's population forecast. | | | | | | |

| Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable Water - Actual | | | |
|---|---|---|---|
| Use Type | 2020 Actual | | |
| **Drop down list**<br>May select each use multiple times<br>These are the only use types that will be recognized by the WUE data online submittal tool | Additional Description<br>(as needed) | Level of Treatment When Delivered<br>Drop down list | Volume* |
| Add additional rows as needed | | | |
| Sales to other agencies | MWD Imported Water | Raw Water | 66,438 |
| | | **TOTAL** | 66,438 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | |
| NOTES: Volume values from IEUA Annual Water Use Database. | | | |

| Submittal Table 4-2 Wholesale: Use for Potable and Raw Water - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type | | Projected Water Use * Report To the Extent that Records are Available | | | | |
| **Drop down list** May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool. | Additional Description (as needed) | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Add additional rows as needed | | | | | | |
| Sales to other agencies | Imported Water from MWD provided to Retail Agencies | 77,416 | 79,630 | 81,974 | 84,021 | 84,065 |
| | **TOTAL** | 77,416 | 79,630 | 81,974 | 84,021 | 84,065 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

| Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable) | | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Potable and Raw Water<br>From Tables 4-1W and 4-2W | 66,438 | 77,416 | 79,630 | 81,974 | 84,021 | 84,065 |
| Recycled Water Demand*<br>From Table 6-4W | 30,496 | 39,300 | 41,297 | 42,162 | 44,191 | 44,691 |
| **TOTAL WATER DEMAND** | 96,934 | 116,716 | 120,927 | 124,136 | 128,212 | 128,756 |
| **Recycled water demand fields will be blank until Table 6-4 is complete.* | | | | | | |
| NOTES: 2020 Values from FY 19/20 Recycled Water Annual Report and FY 19/20 Annual Water Use Report. Projected potable and raw water volumes is the sum of each retail agency's expected use of imported water from IEUA. Recycled water projections are the sum of direct use from member agencies and groundwater recharge projections from IEUA. | | | | | | |

**Submittal Table 5-1 Baselines and Targets Summary**
**From SB X7-7 Verification Form**
*Retail Supplier or Regional Alliance Only*

| Baseline Period | Start Year * | End Year * | Average Baseline GPCD* | Confirmed 2020 Target* |
|---|---|---|---|---|
| 10-15 year | 1995 - 1999 | 2004 - 2008 | 245 | 193 |
| 5 Year | 2003 - 2005 | 2007 - 2009 | 227 | |

**All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)*

NOTES:

| **Submittal Table 5-2: 2020 Compliance**<br>**SB X7-7 2020 Compliance Form**<br>*Retail Supplier or Regional Alliance Only* | | | | **From** |
|---|---|---|---|---|
| **2020 GPCD** | | | 2020 Confirmed Target GPCD* | Did Supplier Achieve Targeted Reduction for 2020? Y/N |
| Actual 2020 GPCD* | 2020 TOTAL Adjustments* | Adjusted 2020 GPCD* *(Adjusted if applicable)* | | |
| 171 | 0 | 0 | 193 | Yes |
| **All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)* | | | | |
| NOTES: | | | | |

| Submittal Table 6-1 Wholesale: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | Supplier does not pump groundwater.<br>The supplier will not complete the table below. | | | | | |
| ☐ | All or part of the groundwater described below is desalinated. | | | | | |
| Groundwater Type<br>Drop Down List | Location or Basin Name | 2016* | 2017* | 2018* | 2019* | 2020* |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| | | | | | | |
| | **TOTAL** | 0 | 0 | 0 | 0 | 0 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

| Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water.<br>The Supplier will not complete the table below. | | | | | | | | | | |
| | | | | | | | 2020 volumes [1] | | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* [2] | Method of Disposal ***Drop down list*** | Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list*** | Treatment Level ***Drop down list*** | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area | Instream Flow Permit Requirement |
| *Add additional rows as needed* | | | | | | | | | | | |
| RP-1 | DP-001 | Prado Lake | 8332818001 | Lake outfall | Yes | Tertiary | 26,932 | 25,889 | 30,495 | 0 | 0 |
| | DP-002 | Cucamonga Creek | 8332818001 | River or creek outfall | Yes | Tertiary | | | | 0 | 0 |
| RP-4 | DP-002 | Cucamonga Creek | 8332818001 | River or creek outfall | Yes | Tertiary | 10,718 | | | 0 | 0 |
| RP-5 | DP-003 | Chino Creek | 8332818001 | River or creek outfall | Yes | Tertiary | 9,699 | | | 0 | 0 |
| CCWRF | DP-004 | Chino Creek | 8332818001 | River or creek outfall | Yes | Tertiary | 9,035 | | | 0 | 0 |
| | | | | | | **Total** | 56,384 | 25,889 | 30,495 | 0 | 0 |

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

| Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☐ | Recycled water is not directly treated or distributed by the Supplier.<br>The Supplier will not complete the table below. | | | | | | |
| Name of Receiving Supplier or Direct Use by Wholesaler | Level of Treatment<br>*Drop down list* | 2020* | 2025* | 2030* | 2035* | 2040* | 2045* *(opt)* |
| *Add additional rows as needed* | | | | | | | |
| Direct Use | Tertiary | 17,115 | 22,880 | 24,877 | 25,742 | 27,771 | 28,271 |
| Groundwater Recharge | Tertiary | 13,381 | 16,420 | 16,420 | 16,420 | 16,420 | 16,420 |
| | **Total** | 30,496 | 39,300 | 41,297 | 42,162 | 44,191 | 44,691 |
| *** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3. | | | | | | | |
| NOTES: 2020 value from FY 19/20 Recycled Water Annual Report. Direct use projected values from retail agencies. No projections were made for 2045, so the projected volume is set equal to 2040. Groundwater recharge projections from IEUA projections based on groundwater recharge annual report data. | | | | | | | |

| Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual | | |
|---|---|---|
| ☐ | Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020.<br>The wholesale supplier will not complete the table below. | |
| Name of Receiving Supplier or Direct Use by Wholesaler | 2015 Projection for 2020* | 2020 Actual Use* |
| *Add additional rows as needed* | | |
| Direct Use | 30,757 | 17,115 |
| Groundwater Recharge | 13,977 | 13,381 |
| **Total** | 44,734 | 30,496 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | |
| NOTES: From 2015 IEUA UWMP and FY 19/20 Recycled Water Annual Report. | | |

| Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other suppliers? | | Description *(if needed)* | Planned Implementation Year | Planned for Use in Year Type *Drop Down list* | Expected Increase in Water Supply to Supplier* |
| | *Drop Down Menu* | *If Yes, Supplier Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| Recharge Basin Improvements | *Yes* | *Chino Basin Watermaster* | See Section 4.4.5 | 2021 | All Year Types | 11,852 AF |
| Water Use Efficiency Business Plan | *Yes* | *Retail Agencies, MWD, and other agencies detailed in Section 8* | See Section 4.4.1 | 2020/2025 | All Year Types | 9,008 AF |
| Recycled Water and Intertie | *Yes* | *Western Riverside County Regional Wastewater Authority* | See Section 4.4.3 | To be determined | All Year Types | 6,000 AFY |
| RP-5 Liquids Treatment Expansion | *No* | | See Section 4.4.3 | 2020/2025 | All Year Types | See Notes |
| RP-1 Liquids Capacity Recovery and Solids Treatment Expansion | *No* | | See Section 4.4.3 | 2030/2035 | All Year Types | See Notes |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: The projects and schedule detailed in this table are subject to change. Expected Increase in Water Supply is not compatible with some of these projects as they give IEUA the capacity to meet flows and don't provide water on their own. Recharge Basin improvements increase the amount of stormwater and recycled water that can be recharged to the Chino Basin. | | | | | | |

| Submittal Table 6-8 Wholesale: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | | 2020 | | |
| **Drop down list**<br>May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool | Additional Detail on Water Supply | Actual Volume* | Water Quality<br>Drop Down List | Total Right or Safe Yield* (optional) |
| Add additional rows as needed | | | | |
| Purchased or Imported Water | From MWD | 66,438 | Other Non-Potable Water | |
| Recycled Water | Direct Use and GWR | 30,495 | Recycled Water | |
| | **Total** | 96,933 | | 0 |
| ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | |
| NOTES: GWR = Groundwater Recharge. Values from IEUA FY 19/20 Annual Water Use Report and FY19/20 Recycled Water Annual Report. | | | | |

**OPTIONAL Table 6-8ds: Source Water Desalination**

| ☐ | Neither groundwater nor surface water are reduced in salinity prior to distribution. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Plant Name or Well ID | Plant Capacity | Intake Type *Drop down list* | Source Water Type *Drop down list* | Influent TDS | Brine Discharge *Drop down list* | Volume of Water Desalinated | | | | |
| | | | | | | 2016 | 2017 | 2018 | 2019 | 2020 |
| Chino Desalter Authority | 40,000 | open-water intake (screened or unscreened) | groundwater | 1,000 ppm | Brine Line | 11,883 | 12,292 | 13,242 | 15,010 | 15,415 |
| | | | | | **Total** | 11883 | 12292 | 13242 | 15010 | 15415 |

**Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

Notes: Purchased by the cities of Chino, Chino Hills, and Ontario from Chino I Desalter. These three IEUA member agencies only purchase a portion of t

| Submittal Table 6-9 Wholesale: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | | Projected Water Supply* Report To the Extent Practicable | | | | | | | | | |
| | | 2025 | | 2030 | | 2035 | | 2040 | | 2045 (opt) | |
| **Drop down list** May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool | Additional Detail on Water Supply | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Add additional rows as needed | | | | | | | | | | | |
| Purchased or Imported Water | From MWD | 93,283 | | 93,283 | | 93,283 | | 93,283 | | 93,283 | |
| Recycled Water | Wastewater Plant Flows | 60,073 | | 63,207 | | 64,142 | | 66,836 | | 66,836 | |
| | **Total** | 153,356 | 0 | 156,490 | 0 | 157,425 | 0 | 160,119 | 0 | 160,119 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | |

| Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment) | | | |
|---|---|---|---|
| **Year Type** | **Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000 | **Available Supplies if Year Type Repeats** | |
| | | ☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ | |
| | | ☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | **Volume Available *** | **% of Average Supply** |
| Average Year | FY 15/16 - FY 19/20 | 147,503 | 100% |
| Single-Dry Year | FY 15/16 | 147,477 | 100% |
| Consecutive Dry Years 1st Year | FY 15/16 | 147,477 | 100% |
| Consecutive Dry Years 2nd Year | FY 15/16 | 147,477 | 100% |
| Consecutive Dry Years 3rd Year | FY 15/16 | 147,477 | 100% |
| Consecutive Dry Years 4th Year | FY 15/16 | 147,477 | 100% |
| Consecutive Dry Years 5th Year | FY 15/16 | 147,477 | 100% |
| | | | |

*Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.*

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: Average year is the average of FY15/16 through FY19/20 wastewater plant flows plus the MWD contract amount from resolution 2014-12-1.

| Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 153,356 | 156,490 | 157,425 | 160,119 | 160,119 |
| Demand totals *(autofill fm Table 4-3)* | 116,716 | 120,927 | 124,136 | 128,212 | 128,756 |
| Difference | 36,640 | 35,563 | 33,289 | 31,907 | 31,363 |
| NOTES: Normal year based on the average of 2016-2020 conditions. | | | | | |

| Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
| Supply totals* | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| Demand totals* | 118,899 | 123,938 | 128,009 | 133,007 | 133,571 |
| Difference | 34,431 | 32,524 | 29,388 | 27,084 | 26,519 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | |

NOTES:
IEUA considers FY15/16 to represent the single dry year hydrologic conditions. The expected supply is 100% of normal year supply. The IEUA IRP forecasts a regional demand increase of 3.74% by 2040 for a single dry year due to above normal temperature and reduced wet periods (IEUA IRP Appendix E, 2016). Demand increase for prior years are interpolated (from 0.62% in 2015 to 3.74% in 2040). The demand increases for 2045 is assumed to be the same as 2040.

| Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2025* | 2030* | 2035* | 2040* | 2045* (Opt) |
| First year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | Difference | 33,124 | 30,710 | 27,079 | 24,212 | 23,635 |
| Second year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | Difference | 33,124 | 30,710 | 27,079 | 24,212 | 23,635 |
| Third year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | Difference | 33,124 | 30,710 | 27,079 | 24,212 | 23,635 |
| Fourth year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | Difference | 33,124 | 30,710 | 27,079 | 24,212 | 23,635 |
| Fifth year | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | Difference | 33,124 | 30,710 | 27,079 | 24,212 | 23,635 |
| Sixth year *(optional)* | Supply totals | 153,329 | 156,462 | 157,397 | 160,091 | 160,091 |
| | Demand totals | 120,206 | 125,752 | 130,318 | 135,879 | 136,456 |
| | Difference | 33,124 | 30,710 | 27,079 | 24,212 | 23,635 |

***Units of measure (AF, CCF, MG) m** ust remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:
IEUA considers FY15/16 to represent each year of the multiple dry year hydrologic conditions. The expected supply is 100% of normal year supply. The IEUA IRP forecasts a regional demand increase of 5.98% by 2040 for a multi-dry year due to above normal temperature and reduced wet periods (IEUA IRP Appendix E, 2016). Demand increase for prior years are interpolated (from 1.00% in 2015 to 5.98% in 2040). The demand increases for 2045 is assumed to be the same as 2040. The supply and demand for each year of the multi-year drought is expected to be the same.

**Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)**

| 2021 | Total |
|---|---|
| Total Water Use | 100,497 |
| Total Supplies | 148,650 |
| Surplus/Shortfall w/o WSCP Action | 48,153 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 48,153 |
| Resulting % Use Reduction from WSCP action | 0% |

| 2022 | Total |
|---|---|
| Total Water Use | 105,098 |
| Total Supplies | 149,806 |
| Surplus/Shortfall w/o WSCP Action | 44,708 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 44,708 |
| Resulting % Use Reduction from WSCP action | 0% |

| 2023 | Total |
|---|---|
| Total Water Use | 109,911 |
| Total Supplies | 150,972 |
| Surplus/Shortfall w/o WSCP Action | 41,061 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 41,061 |
| Resulting % Use Reduction from WSCP action | 0% |

| 2024 | Total |
|---|---|
| Total Water Use | 114,943 |
| Total Supplies | 152,146 |
| Surplus/Shortfall w/o WSCP Action | 37,203 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 37,203 |
| Resulting % Use Reduction from WSCP action | 0% |

| 2025 | Total |
|---|---|
| Total Water Use | 120,206 |
| Total Supplies | 153,329 |
| Surplus/Shortfall w/o WSCP Action | 33,124 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 33,124 |
| Resulting % Use Reduction from WSCP action | 0% |

Notes: Years 2021 through 2024 are interpolated between the 2020 actual supply and use values and the 2025 projected supply and use for multi-year drought (from Table 7-4). 2020 actual supply is the average year supply from Table 7-1.

**Submittal Table 8-1**
**Water Shortage Contingency Plan Levels**

| Shortage Level | Percent Shortage Range | Shortage Response Actions (*Narrative description)* |
|---|---|---|
| 1 | Up to 10% | Watch (DCP Level 1: 1-5%) |
| 2 | Up to 20% | Warning (DCP Level 2: 6-15%) |
| 3 | Up to 30% | Emergency (DCP Level 3: 16-25%) |
| 4 | Up to 40% | Critical (DCP Level 4: 26-50%) |
| 5 | Up to 50% | |
| 6 | >50% | Catastrophic (DCP Level 5: >50%) |

NOTES: IEUA's 2020 DCP defined five drought stage conditions noted in the Water Shortage Condition column above. The cross-reference between these shortage stages and the water shortage levels in this table is included in Table 4-1 in the WSCP.

| Submittal Table 8-2: Demand Reduction Actions | | | | |
|---|---|---|---|---|
| Shortage Level | Demand Reduction Actions<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.* | How much is this going to reduce the shortage gap?<br>*Include units used (volume type or percentage)* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>***For Retail Suppliers Only***<br>*Drop Down List* |
| *Add additional rows as needed* | | | | |
| 1 | Expand Public Information Campaign | Minimum 1-5% of water use | Begin profiling high potential customers and develop messaging that will best resonate with those customers | |
| 1 | Provide Rebates on Plumbing Fixtures and Devices | | SoCal WaterSmart Residential and Commercial Rebates | |
| 1 | Provide Rebates for Landscape Irrigation Efficiency | | Residential Irrigation Tune-Up, Home Surveys, Landscape Workshops, and Design Services | |
| 1 | Provide Rebates for Turf Replacement | | Turf Replacement Program | |
| 2 | Expand Public Information Campaign | Minimum 6-15% of water use | Introduce influencer marketing; continue targeting high potential customers | |
| 2 | Provide Rebates on Plumbing Fixtures and Devices | | Implement direct installation programs | |
| 2 | Provide Rebates for Landscape Irrigation Efficiency | | Expand Landscape Design Services; offer more frequent landscape workshops and home surveys | |
| 2 | Provide Rebates for Landscape Irrigation Efficiency | | Continue Turf Replacement Program | |
| 3 | Expand Public Information Campaign | Minimum 16-25% of water use | Expand profiling and micro-targeting to include mid-range water users; increase influencer marketing | |
| 3 | Provide Rebates on Plumbing Fixtures and Devices | | Continue base programs; Increase incentive amounts for certain programs; continue smart irrigation direct installation programs | |

| Submittal Table 8-2: Demand Reduction Actions | | | | |
|---|---|---|---|---|
| Shortage Level | Demand Reduction Actions<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.* | How much is this going to reduce the shortage gap?<br>*Include units used (volume type or percentage)* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>***For Retail Suppliers Only***<br>*Drop Down List* |
| 3 | Provide Rebates for Landscape Irrigation Efficiency | | Continue Stage 2 Actions | |
| 3 | Provide Rebates for Turf Replacement | | Increase incentive amounts | |
| 4, 5 | Expand Public Information Campaign | Minimum 24-50% of water use | Strengthen message of urgency and community call to action | |
| 4, 5 | Provide Rebates on Plumbing Fixtures and Devices | | Continue increase incentives and smart irrigation direct installation programs | |
| 4, 5 | Provide Rebates for Landscape Irrigation Efficiency | | Continue Stage 2 Actions | |
| 4, 5 | Provide Rebates for Turf Replacement | | Increase incentive amounts | |
| 6 | Expand Public Information Campaign | Minimum 50% of water use | Implement catastrophic messaging, announce essential use only | |
| 6 | Provide Rebates on Plumbing Fixtures and Devices | | Only offer indoor plumbing and property leak detection programs. | |
| 6 | Provide Rebates for Landscape Irrigation Efficiency | | Suspend all programs | |
| 6 | Provide Rebates for Turf Replacement | | Suspend all programs | |
| NOTES: Each IEUA retail agency is responsible for enforcing local water waste ordinances; details of the restrictions by agency can be found in the 2020 DCP and each individual retail agency's 2020 WSCP. Additional details on drought response actions can be found in the IEUA's 2020 DCP and WSCP. | | | | |

| Submittal Table 8-3: Supply Augmentation and Other Actions | | | |
|---|---|---|---|
| Shortage Level | Supply Augmentation Methods and Other Actions by Water Supplier<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference *(optional)* |
| *Add additional rows as needed* | | | |
| 1 through 6 | Other Actions (describe) | Undetermined amount | IEUA is always looking for opportunities to explore additional recycled water connections to increase supply. |
| 6 | Other Purchases | Up to 93,283 AFY (MWD Contract Amount) | Purchase MWD Tier 2 Imported Water |
| NOTES: MWD Contract Amount from Resolution No. 2014-12-1 | | | |

| Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one) | | |
|---|---|---|
| ☑ | Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.** | |
| Table 10-1 | Provide the page or location of this list in the UWMP. | |
| ☐ | Supplier has notified 10 or fewer cities or counties. **Complete the table below.** | |
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| City of Chino | Yes | Yes |
| City of Chino Hills | Yes | Yes |
| Cucamonga Valley Water | Yes | Yes |
| Fontana Water Company | Yes | Yes |
| Monte Vista Water District | Yes | Yes |
| City of Ontario | Yes | Yes |
| San Antonio Water Company | Yes | Yes |
| City of Upland | Yes | Yes |
| City of Rancho Cucamonga | Yes | Yes |
| City of Montclair | Yes | Yes |
| West Valley Water District | Yes | Yes |
| County Name *Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| San Bernardino County | Yes | Yes |

NOTES: In addition, the following agencies were also given a 60 Day Notice and Notice of Public Hearing: Chino Basin Water Master, Chino Basin Desalter Authority, Local Agency Formation Commission for San Bernardino County, Metropolitan Water District, Santa Ana Regional Water Quality Control Board, Santa Ana Watershed Project Authority, Three Valleys Municipal Water District, West Valley Water District, and the Water Facilities Authority.
Notification letters were sent out in November 2020, April 2021, and May 2021. Copies of these notification letters are included in Appendix E of the 2020 UWMP.

# Appendix D

IEUA Resolution 2021-6-10 2020,
Adopting the UWMP, 2020 WSCP

**RESOLUTION NO.2021-6-10**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY (IEUA), SAN BERNARDINO COUNTY, CALIFORNIA, ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN, 2020 WATER SHORTAGE CONTINGENCY PLAN, AND APPENDIX G AS AN ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN**

**Whereas**, the California Legislature enacted Assembly Bill 797, (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act) during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every urban water supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare an Urban Water Management Plan at least once every five years; and

**Whereas**, the Urban Water Management Planning Act requires the preparation and adoption of a Water Shortage Contingency Plan, in accordance with prescribes requirements; and

**Whereas**, the Urban Water Management Planning Act specifies the requirements and procedures for amending and adopting such Urban Water Management Plans; and

**Whereas**, the Inland Empire Utilities Agency* is a wholesale supplier of water for 242-square miles in the western portion of San Bernardino; and

**Whereas**, pursuant to Section 10620 of the Urban Water Management Planning Act, the Inland Empire Utilities Agency has prepared the 2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, and Appendix G as an addendum to the 2015 Urban Water Management Plan; and

**Whereas**, the Board of Directors of the Inland Empire Utilities Agency has duly reviewed, discussed, and considered the 2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, and Appendix G as an addendum to the 2015 Urban Water Management Plan.

NOW, THEREFORE, BE IT RESOLVED, DETERMINED AND ORDERED BY THE INLAND EMPIRE UTILITIES AGENCY AS FOLLOWS:

Section 1. The 2020 Urban Water Management Plan is hereby adopted; and

Section 2. The 2020 Water Shortage Contingency Plan is hereby adopted; and

Section 3. The addendum of Appendix G to the 2015 Urban Water Management Plan is hereby adopted; and

Section 4. The General Manager is hereby authorized to file an electronic copy of the 2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, and Appendix G to the 2015 Urban Water Management Plan with the State Department of Water Resources within 30

days following its adoption and no later than July 1, 2021.

Section 5. The General Manager is hereby authorized to file a CD or hardcopy of aforementioned plans with the California State Library no later than 30 days after its adoption.

Section 6. The General Manager is hereby authorized to submit an electronic copy or a CD or hardcopy of the adopted aforementioned plans to any city or county in which the suppliers provide water no later than 30 days after its adoption.

Section 7. The General Manager is hereby authorized and directed to implement the adopted aforementioned plans, including recommendations to the Board of Directors regarding necessary procedures, rules, and regulations in an effort to carry out effective and equitable water programs.

Section 8. The Resolution shall take effect upon adoption.

ADOPTED this 16th day of June 2021.

Jasmin A. Hall, President of the Inland Empire Utilities Agency* and the Board of Directors thereof

ATTEST:

Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency* and of the Board of Directors thereof

The undersigned certifies that this is a true copy as on file in the permanent records of the Agency. This stamp must be in purple ink to constitute a certified copy.
Inland Empire Utilities Agency*
*A Municipal Water Agency*
By Denise Gp Date 6/16/2021

STATE OF CALIFORNIA )
)SS
COUNTY OF )
SAN BERNARDINO

I, Steven J. Elie, Secretary of the Inland Empire Utilities Agency*, DO HEREBY CERTIFY that the foregoing Resolution being No. 2021-6-10, was adopted at a regular Board Meeting on June 16, 2021, of said Agency by the following vote:

| | |
|---|---|
| AYES: | Camacho, Elie, Hall, Hofer, Tule |
| NOES: | None |
| ABSTAIN: | None |
| ABSENT: | None |

Steven J. Elie, Secretary/Treasurer of the
Inland Empire Utilities Agency* and of
the Board of Directors thereof

(Seal)

*A Municipal Water District

# Appendix E

Outreach Materials

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

6075 Kimball Avenue • Chino, CA 91708
P.O. Box 9020 • Chino Hills, CA 91709
TEL (909) 993-1600 • FAX (909) 993-1985
www.ieua.org

24 November 2020

GM Name
GM Title
Agency Name
Street Address
City, State, Zip

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Agency Representative:

The Inland Empire Utilities Agency (IEUA) is undertaking the review, update, and revision of its Urban Water Management Plan (UWMP). The Urban Water Management Planning Act requires every urban water supplier of a certain size to prepare and adopt an UWMP at least once every five years. The UWMP is a planning document in which water suppliers evaluate and compare their water supply and reliability to their existing and projected demands. IEUA is in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the IEUA is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the IEUA will be reviewing the UWMP and will make amendments or changes, as appropriate. Based on the IEUA's current schedule, we expect to have a draft available for public review by April 2021, at which point your agency will receive notification that the draft UWMP is available for public review and comment.

The IEUA invites you to submit written comments in anticipation of the development of our 2020 UWMP Update within the next 30 days to IEUA. If your agency would like to learn more about the UWMP, please feel free to contact me at 909.993.1698 or jaguilar@ieua.org.

Sincerely,

Joshua Aguilar
Senior Engineer

*Water Smart - Thinking in Terms of Tomorrow*

Kati Parker, President | Jasmin A. Hall, Vice President | Steven J. Elie, Secretary/Treasurer | Michael E. Camacho, Director | Paul Hofer, Director | Shivaji Deshmukh, General Manager

**NOTICE OF PUBLIC HEARING**
**BY THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY***
**TO ADOPT THE 2020 URBAN WATER MANAGEMENT PLAN (UWMP),**
**ADDENDUM OF APPENDIX G TO THE 2015 UWMP,**
**AND WATER SHORTAGE CONTINGENCY PLAN**
**SAN BERNARDINO COUNTY, STATE OF CALIFORNIA**

NOTICE IS HEREBY GIVEN that the Board of Directors of the Inland Empire Utilities Agency intends to hold a public hearing for adoption of the 2020 Urban Water Management Plan (UWMP), Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan.

NOTICE IS FURTHER GIVEN that said public hearing will be held on the following date and time for the purpose of hearing any and all public testimony on the above-stated issue.

DATE: Wednesday, June 16, 2021 – 10:00 a.m.

The meeting will be accessible via teleconference at:
Phone Number: (415) 856-9169 / Conference ID: 811 284 110#

In the effort to prevent the spread of COVID-19, until further notice, the Inland Empire Utilities Agency will hold all Board and Committee meetings by video and audio conference. As of the posting/publication of this notice, it is anticipated that the public hearing will be conducted virtually by video and audio conference. (Please visit www.ieua.org for the most up-to-date information regarding meeting participation.) There will be no public location available to attend the meeting; all interested persons are invited to participate in the public hearing and provide comments regarding the proposed 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan by calling into the number provided above. The public may also view the meeting live through the Agency's website at www.ieua.org. Oral statements will be heard, but for the accuracy of the record all important testimony should be submitted in writing. Written comments may be emailed to the Board Secretary/Office Manager Denise Garzaro at dgarzaro@ieua.org no later than 24 hours prior to the scheduled meeting time. Comments submitted in advance will be read into the record during the hearing.

NOTICE IS FURTHER GIVEN that the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan will be available on the Agency's website at www.ieua.org and via hard-copy upon request in Spring of 2021, no less than two weeks prior to the public hearing. All interested parties are noticed and invited to submit comments and consult with the Agency regarding its forthcoming 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan to the Strategic Planning and Resources Department, attention Joshua Aguilar at jaguilar@ieua.org. For additional information regarding the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and Water Shortage Contingency Plan, please contact Senior Engineer, Joshua Aguilar at (909) 993-1694.

*a municipal water district

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Denise Garzaro
INLAND EMPIRE UTILITIES AGENCY
6075 KIMBALL AVE BUILDING A
CHINO, CA 91710

CNS 3471155

# COPY OF NOTICE

Notice Type: HRG NOTICE OF HEARING

Ad Description Urban Water Management Plan (UWMP)- 5/17 and 5/24

To the right is a copy of the notice you sent to us for publication in the INLAND VALLEY DAILY BULLETIN/ONTARIO. Please read this notice carefully and call us with any corrections. The Proof of Publication will be filed with the County Clerk, if required, and mailed to you after the last date below. Publication date(s) for this notice is (are):

05/17/2021 , 05/24/2021

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## NOTICE OF PUBLIC HEARING BY THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY* TO ADOPT THE 2020 URBAN WATER MANAGEMENT PLAN (UWMP), ADDENDUM OF APPENDIX G TO THE 2015 UWMP, AND 2020 WATER SHORTAGE CONTINGENCY PLAN SAN BERNARDINO COUNTY, STATE OF CALIFORNIA

NOTICE IS HEREBY GIVEN that the Board of Directors of the Inland Empire Utilities Agency intends to hold a public hearing for adoption of the 2020 Urban Water Management Plan (UWMP), Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan.

NOTICE IS FURTHER GIVEN that said public hearing will be held on the following date and time for the purpose of hearing any and all public testimony on the above-stated issue.

DATE: Wednesday, June 16, 2021 – 10:00 a.m.

The meeting will be accessible via teleconference at:
**Phone Number: (415) 856-9169 / Conference ID: 811 284 110#**

In the effort to prevent the spread of COVID-19, until further notice, the Inland Empire Utilities Agency will hold all Board and Committee meetings by video and audio conference. As of the posting/publication of this notice, it is anticipated that the public hearing will be conducted virtually by video and audio conference. (Please visit www.ieua.org for the most up-to-date information regarding meeting participation.) There will be no public location available to attend the meeting; all interested persons are invited to participate in the public hearing and provide comments regarding the proposed 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan by calling into the number provided above. The public may also view the meeting live through the Agency's website at www.ieua.org. Oral statements will be heard, but for the accuracy of the record all important testimony should be submitted in writing. Written comments may be emailed to the Board Secretary/Office Manager Denise Garzaro at dgarzaro@ieua.org no later than 24 hours prior to the scheduled meeting time. Comments

! A 0 0 0 0 0 5 7 1 8 2 7 3 !

submitted in advance will be read into the record during the hearing.

NOTICE IS FURTHER GIVEN that the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan will be available on the Agency's website at www.ieua.org and via hard-copy upon request in Spring of 2021, no less than two weeks prior to the public hearing. All interested parties are noticed and invited to submit comments and consult with the Agency regarding its forthcoming 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan to the Strategic Planning and Resources Department, attention Joshua Aguilar at jaguilar@ieua.org. For additional information regarding the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan, please contact Senior Engineer, Joshua Aguilar at (909) 993-1694.

5/17, 5/24/21

**CNS-3471155#**

**INLAND VALLEY DAILY BULLETIN/ONTARIO**

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

6075 Kimball Avenue • Chino, CA 91708
P.O. Box 9020 • Chino Hills, CA 91709
TEL (909) 993-1600 • FAX (909) 993-1985
www.ieua.org

May 11th, 2021

Retail Agency
Contact Information
Placed Here

**SUBJECT: Posting of the 2020 Urban Water Management Plan, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan**

Dear Agency Representative:

The Inland Empire Utilities Agency (IEUA) is inviting public review and comment on its Draft 2020 Urban Water Management Plan (UWMP). The Plan includes an updated Addendum of Appendix G to the 2015 UWMP and 2020 Water Shortage Contingency Plan (WSCP).

In compliance with California Water Code (§10610-10656, §10608 and §10632) the UWMP and WSCP are required to contain detailed evaluations of water supplies necessary to reliably meet demands of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP and other plans.

All plan documents are now available on IEUA's website here: https://www.ieua.org/read-our-reports/other-reports/.

Comments must be received no later than **5:00 p.m. Monday, May 24, 2021** and sent to the attention of Joshua Aguilar, 909.993.1698 or jaguilar@ieua.org.

If you or your agency would like more information on IEUA's UWMP, Addendum, or WSCP, please contact me.

Sincerely,

Joshua Aguilar
Senior Engineer

**Inland Valley Daily Bulletin**
(formerly The Daily Report)
9616 Archibald Avenue Suite 100
Rancho Cucamonga, CA 91730
909-987-6397
legals@inlandnewspapers.com

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**FILE NO. 3471155**

# PROOF OF PUBLICATION
(2015.5 C.C.P.)

## STATE OF CALIFORNIA
## County of San Bernardino

I am a citizen of the United States, I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the principal clerk of the printer of INLAND VALLEY DAILY BULLETIN, a newspaper of general circulation printed and published daily for the City of Ontario, County of San Bernardino, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California, on the date of August 24, 1951, Case Number 70663. The notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

**05/17/2021, 05/24/2021**

I declare under the penalty of perjury that the foregoing is true and correct.

Executed at Rancho Cucamonga, San Bernardino Co., California, on this 8th day of June, 2021.

Signature

**NOTICE OF PUBLIC HEARING BY THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY* TO ADOPT THE 2020 URBAN WATER MANAGEMENT PLAN (UWMP), ADDENDUM OF APPENDIX G TO THE 2015 UWMP, AND 2020 WATER SHORTAGE CONTINGENCY PLAN SAN BERNARDINO COUNTY, STATE OF CALIFORNIA**

NOTICE IS HEREBY GIVEN that the Board of Directors of the Inland Empire Utilities Agency intends to hold a public hearing for adoption of the 2020 Urban Water Management Plan (UWMP), Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan.

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**DATE: Wednesday, June 16, 2021 – 10:00 a.m.**

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and consult with the Agency regarding its forthcoming 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan to the Strategic Planning and Resources Department, attention Joshua Aguilar at jaguilar@ieua.org. For additional information regarding the 2020 UWMP, Addendum of Appendix G to the 2015 UWMP, and 2020 Water Shortage Contingency Plan, please contact Senior Engineer, Joshua Aguilar at (909) 993-1694.

5/17, 5/24/21

**CNS-3471155#**

**INLAND VALLEY DAILY BULLETIN/ONTARIO #11462691**

# Appendix F

SBX7-7 Verification Tables and DWR Population Tool Output

**City of Chino**

| **SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*** *(select one from the drop down list)* |
| --- |
| Acre Feet |
| **The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.* |
| NOTES: |

**City of Chino**

| SB X7-7 Table 2: Method for 2020 Population Estimate | |
|---|---|
| **Method Used to Determine 2020 Population** (may check more than one) | |
| ☑ | **1. Department of Finance** (DOF) or **American Community Survey** (ACS) |
| ☐ | **2. Persons-per-Connection Method** |
| ☐ | **3. DWR Population Tool** |
| ☑ | **4. Other** DWR recommends pre-review |
| NOTES: Data from the Department of Finance and the City of Chino's Water Master Plan was used to estimate the 2020 population. | |

**City of Chino**

| SB X7-7 Table 3: 2020 Service Area Population | |
|---|---|
| **2020 Compliance Year Population** | |
| **2020** | 80,808 |
| NOTES: | |

## City of Chino

| SB X7-7 Table 4: 2020 Gross Water Use | | | | | | | |
|---|---|---|---|---|---|---|---|
| Compliance Year 2020 | 2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.* | 2020 Deductions | | | | | 2020 Gross Water Use |
| | | Exported Water * | Change in Dist. System Storage* (+/-) | Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.* | Water Delivered for Agricultural Use* | Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.* | |
| | 15,273 | | | - | | - | **15,273** |

* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

## City of Chino

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| | |
|---|---|
| **Name of Source** | Chino Basin Groundwater |
| **This water source is** *(check one)* **:** | |
| ☑ | The supplier's own water source |
| ☐ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 5,149 | - | 5,149 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

## City of Chino

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | Water Facilities Authority |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 5,756 | | 5,756 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment -*** *See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: 694 AF of water from City of Ontario was wheeled through WFA in 2020.

## City of Chino

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | Chino Basin Desalter Authority |
|---|---|

**This water source is** *(check one)* **:**

| | |
|---|---|
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 4,368 | | 4,368 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

## City of Chino

**SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction** *(For use only by agencies that are deducting indirect recycled water)*

| 2020 Compliance Year | 2020 Surface Reservoir Augmentation | | | | | 2020 Groundwater Recharge | | | Total Deductible Volume of Indirect Recycled Water Entering the Distribution System |
|---|---|---|---|---|---|---|---|---|---|
| | Volume Discharged from Reservoir for Distribution System Delivery[1] | Percent Recycled Water | Recycled Water Delivered to Treatment Plant | Transmission/ Treatment Loss[1] | Recycled Volume Entering Distribution System from Surface Reservoir Augmentation | Recycled Water Pumped by Utility[1,2] | Transmission/ Treatment Losses[1] | Recycled Volume Entering Distribution System from Groundwater Recharge | |
| | | | - | | - | | | - | - |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

NOTES:

**City of Chino**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

| **SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One** | |
|---|---|
| ☐ | **Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use.<br>Complete SB X7-7 Table 4-C.1 |
| ☐ | **Criteria 2** - Industrial water use is equal to or greater than 15 GPCD.<br>Complete SB X7-7 Table 4-C.2 |
| ☐ | **Criteria 3** - Non-industrial use is equal to or less than 120 GPCD.<br>Complete SB X7-7 Table 4-C.3 |
| ☐ | **Criteria 4** - Disadvantaged Community.<br>Complete SB x7-7 Table 4-C.4 |
| NOTES: | |

**City of Chino**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

| **SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 1)* | | | | |
|---|---|---|---|---|
| **Criteria 1**<br>Industrial water use is equal to or greater than 12% of gross water use | | | | |
| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction | 2020 Industrial Water Use | Percent Industrial Water | **Eligible for Exclusion Y/N** |
| | 15,273 | | 0% | NO |
| NOTES: | | | | |

**City of Chino**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 2)*

**Criteria 2**
Industrial water use is equal to or greater than 15 GPCD

| **2020 Compliance Year** | 2020 Industrial Water Use | 2020 Population | 2020 Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | | 80,808 | - | NO |

NOTES:

**City of Chino**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 3)*

**Criteria 3**
Non-industrial use is equal to or less than 120 GPCD

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4* | 2020 Industrial Water Use | 2020 Non-industrial Water Use | 2020 Population *Fm SB X7-7 Table 3* | Non-Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|---|---|
| | 15,273 | | 15,273 | 80,808 | 169 | NO |

NOTES:

**City of Chino**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility** ***(For** use only by agencies that are deducting process water using Criteria 4)*

**Criteria 4**

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

**SELECT ONE**

"Disadvantaged Community" status was determined using one of the methods listed below:

**1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/**

| | |
|---|---|
| ☐ | If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC. |

**2. 2020 Median Income**

| | California Median Household Income* | | Service Area Median Household Income | Percentage of Statewide Average | **Eligible for Exclusion? Y/N** |
|---|---|---|---|---|---|
| ☐ | **2020** | **$75,235** | | 0% | YES |
| | *California median household income 2015 -2019 as reported in US Census Bureau QuickFacts. | | | | |

NOTES

**City of Chino**

| SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD) | | |
|---|---|---|
| **2020 Gross Water** *Fm SB X7-7 Table 4* | **2020 Population** *Fm SB X7-7 Table 3* | **2020 GPCD** |
| 15,273 | 80,808 | **169** |
| NOTES: | | |

## City of Chino

| SB X7-7 Table 9: 2020 Compliance | | | | | | | |
|---|---|---|---|---|---|---|---|
| Actual 2020 GPCD[1] | Optional Adjustments to 2020 GPCD | | | | | 2020 Confirmed Target GPCD [1, 2] | **Did Supplier Achieve Targeted Reduction for 2020?** |
| | Enter "0" if Adjustment Not Used | | | TOTAL Adjustments[1] | Adjusted 2020 GPCD [1] *(Adjusted if applicable)* | | |
| | Extraordinary Events[1] | Weather Normalization[1] | Economic Adjustment[1] | | | | |
| 169 | - | - | - | - | 169 | 189 | **YES** |

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

## City of Chino Hills

| **SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*** *(select one from the drop down list)* |
| --- |
| Acre Feet |
| **The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.* |
| NOTES: |

**City of Chino Hills**

| SB X7-7 Table 2: Method for 2020 Population Estimate | |
|---|---|
| **Method Used to Determine 2020 Population** (may check more than one) | |
| ☑ | **1. Department of Finance** (DOF) or **American Community Survey** (ACS) |
| ☐ | **2. Persons-per-Connection Method** |
| ☐ | **3. DWR Population Tool** |
| ☐ | **4. Other** DWR recommends pre-review |
| NOTES: | |

## City of Chino Hills

| SB X7-7 Table 3: 2020 Service Area Population | |
|---|---|
| **2020 Compliance Year Population** | |
| **2020** | 82,409 |
| NOTES: | |

# City of Chino Hills

| SB X7-7 Table 4: 2020 Gross Water Use | | | | | | | |
|---|---|---|---|---|---|---|---|
| Compliance Year 2020 | 2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.* | 2020 Deductions | | | | | 2020 Gross Water Use |
| | | Exported Water * | Change in Dist. System Storage* (+/-) | Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.* | Water Delivered for Agricultural Use* | Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.* | |
| | 14,493 | - | - | - | - | - | **14,493** |

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

## City of Chino Hills

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | WFA |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 1,700 | - | 1,700 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | MVWD |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 7,707 | | 7,707 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

## City of Chino Hills

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | Chino Hills Wells |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☑ | The supplier's own water source |
| ☐ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | - | | 0 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | CDA |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 3,669 | | 3,669 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

## City of Chino Hills

| SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment<br>Complete one table for each source. | | | |
|---|---|---|---|
| **Name of Source** | IEUA (Recycled) | | |
| **This water source is** *(check one)* **:** | | | |
| ☐ | The supplier's own water source | | |
| ☑ | A purchased or imported source | | |
| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
| | 1,417 | | 1,417 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

# City of Chino Hills

**SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction** *(For use only by agencies that are deducting indirect recycled water)*

| 2020 Compliance Year | 2020 Surface Reservoir Augmentation | | | | | 2020 Groundwater Recharge | | | Total Deductible Volume of Indirect Recycled Water Entering the Distribution System |
|---|---|---|---|---|---|---|---|---|---|
| | Volume Discharged from Reservoir for Distribution System Delivery[1] | Percent Recycled Water | Recycled Water Delivered to Treatment Plant | Transmission/ Treatment Loss[1] | Recycled Volume Entering Distribution System from Surface Reservoir Augmentation | Recycled Water Pumped by Utility[1,2] | Transmission/ Treatment Losses[1] | Recycled Volume Entering Distribution System from Groundwater Recharge | |
| | | | - | | - | | | - | - |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

**City of Chino Hills**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

| **SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One** | |
|---|---|
| ☐ | **Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use.<br>Complete SB X7-7 Table 4-C.1 |
| ☐ | **Criteria 2** - Industrial water use is equal to or greater than 15 GPCD.<br>Complete SB X7-7 Table 4-C.2 |
| ☐ | **Criteria 3** - Non-industrial use is equal to or less than 120 GPCD.<br>Complete SB X7-7 Table 4-C.3 |
| ☐ | **Criteria 4** - Disadvantaged Community.<br>Complete SB x7-7 Table 4-C.4 |
| NOTES: No Deductions | |

## City of Chino Hills

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

| **SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 1)* | | | | |
|---|---|---|---|---|
| **Criteria 1**<br>Industrial water use is equal to or greater than 12% of gross water use | | | | |
| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction | 2020 Industrial Water Use | Percent Industrial Water | **Eligible for Exclusion Y/N** |
| | 14,493 | | 0% | NO |
| NOTES: | | | | |

## City of Chino Hills

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 2)*

**Criteria 2**
Industrial water use is equal to or greater than 15 GPCD

| **2020 Compliance Year** | 2020 Industrial Water Use | 2020 Population | 2020 Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | | 82,409 | - | NO |

NOTES:

**City of Chino Hills**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 3)*

**Criteria 3**
Non-industrial use is equal to or less than 120 GPCD

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4* | 2020 Industrial Water Use | 2020 Non-industrial Water Use | 2020 Population *Fm SB X7-7 Table 3* | Non-Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|---|---|
| | 14,493 | | 14,493 | 82,409 | 157 | NO |

NOTES:

## City of Chino Hills

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility** ***(For** use only by agencies that are deducting process water using Criteria 4)*

**Criteria 4**
Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

**SELECT ONE**
"Disadvantaged Community" status was determined using one of the methods listed below:

**1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/**

| | |
|---|---|
| ☐ | If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC. |

**2. 2020 Median Income**

| | California Median Household Income* | | Service Area Median Household Income | Percentage of Statewide Average | **Eligible for Exclusion? Y/N** |
|---|---|---|---|---|---|
| ☐ | **2020** | **$75,235** | $102,746 | 137% | NO |
| | *California median household income 2015 -2019 as reported in US Census Bureau QuickFacts. | | | | |

NOTES

## City of Chino Hills

| SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD) | | |
|---|---|---|
| **2020 Gross Water** *Fm SB X7-7 Table 4* | **2020 Population** *Fm SB X7-7 Table 3* | **2020 GPCD** |
| 14,493 | 82,409 | **157** |
| NOTES: | | |

## City of Chino Hills

| SB X7-7 Table 9: 2020 Compliance | | | | | | | |
|---|---|---|---|---|---|---|---|
| Actual 2020 GPCD[1] | Optional Adjustments to 2020 GPCD | | | | | 2020 Confirmed Target GPCD [1, 2] | **Did Supplier Achieve Targeted Reduction for 2020?** |
| | Enter "0" if Adjustment Not Used | | | TOTAL Adjustments[1] | Adjusted 2020 GPCD [1] *(Adjusted if applicable)* | | |
| | Extraordinary Events[1] | Weather Normalization[1] | Economic Adjustment[1] | | | | |
| 157 | - | - | - | - | 157 | 173 | **YES** |

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

**Cucamonga Valley Water District**

| **SB X7-7 Table 0: Units of Measure Used in UWMP*** *(select one from the drop down list)* |
|---|
| Acre Feet |
| **The unit of measure must be consistent with Table 2-3* |
| NOTES: |

## Cucamonga Valley Water District

| SB X7-7 Table-1: Baseline Period Ranges | | | |
|---|---|---|---|
| **Baseline** | **Parameter** | **Value** | **Units** |
| 10- to 15-year baseline period | 2008 total water deliveries | 58,175 | Acre Feet |
| | 2008 total volume of delivered recycled water | 635 | Acre Feet |
| | 2008 recycled water as a percent of total deliveries | 1.09% | Percent |
| | Number of years in baseline period[1, 2] | 10 | Years |
| | Year beginning baseline period range | 1995 | |
| | Year ending baseline period range[3] | 2004 | |
| 5-year baseline period | Number of years in baseline period | 5 | Years |
| | Year beginning baseline period range | 2004 | |
| | Year ending baseline period range[4] | 2008 | |

*[1] If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. [2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

*[3] The ending year must be between December 31, 2004 and December 31, 2010.*

*[4] The ending year must be between December 31, 2007 and December 31, 2010.*

NOTES:

**Cucamonga Valley Water District**

| SB X7-7 Table 2: Method for Population Estimates | |
|---|---|
| **Method Used to Determine Population** (may check more than one) | |
| ☐ | **1. Department of Finance** (DOF)<br>DOF Table E-8 (1990 - 2000) and (2000-2010) and<br>DOF Table E-5 (2010 - 2020) when available |
| ☐ | **2. Persons-per-Connection Method** |
| ☐ | **3. DWR Population Tool** |
| ☑ | **4. Other**<br>DWR recommends pre-review |
| NOTES: Historical Population within the service area is estimated based on average person per connection, based on the total number of dwelling units in District's financial software. This is multiplied by the average number of people per household, and also considered the | |

## Cucamonga Valley Water District

| SB X7-7 Table 3: Service Area Population | | |
|---|---|---|
| Year | | Population |
| 10 to 15 Year Baseline Population | | |
| Year 1 | 1995 | 132,882 |
| Year 2 | 1996 | 135,001 |
| Year 3 | 1997 | 136,874 |
| Year 4 | 1998 | 139,556 |
| Year 5 | 1999 | 143,175 |
| Year 6 | 2000 | 148,159 |
| Year 7 | 2001 | 152,221 |
| Year 8 | 2002 | 161,267 |
| Year 9 | 2003 | 166,359 |
| Year 10 | 2004 | 170,784 |
| Year 11 | | |
| Year 12 | | |
| Year 13 | | |
| Year 14 | | |
| Year 15 | | |
| 5 Year Baseline Population | | |
| Year 1 | 2004 | 170,784 |
| Year 2 | 2005 | 179,523 |
| Year 3 | 2006 | 182,035 |
| Year 4 | 2007 | 184,369 |
| Year 5 | 2008 | 184,669 |
| 2020 Compliance Year Population | | |
| **2020** | | 198,979 |
| NOTES: | | |

## Cucamonga Valley Water District

| SB X7-7 Table 4: Annual Gross Water Use * | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Baseline Year** *Fm SB X7-7 Table 3* | | **Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.* | **Deductions** | | | | | **Annual Gross Water Use** |
| | | | **Exported Water** | **Change in Dist. System Storage** (+/-) | **Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.* | **Water Delivered for Agricultural Use** | **Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.* | |
| 10 to 15 Year Baseline - Gross Water Use | | | | | | | | |
| Year 1 | 1995 | 42,131 | - | | - | 101 | - | 42,030 |
| Year 2 | 1996 | 45,476 | - | | - | 151 | - | 45,325 |
| Year 3 | 1997 | 47,219 | - | | - | 133 | - | 47,086 |
| Year 4 | 1998 | 41,864 | - | | - | 88 | - | 41,776 |
| Year 5 | 1999 | 49,409 | - | | - | 103 | - | 49,306 |
| Year 6 | 2000 | 50,718 | 73 | | - | 112 | - | 50,533 |
| Year 7 | 2001 | 48,063 | - | | - | 73 | - | 47,990 |
| Year 8 | 2002 | 52,423 | 307 | | - | 80 | - | 52,036 |
| Year 9 | 2003 | 51,899 | 437 | | - | 54 | - | 51,408 |
| Year 10 | 2004 | 54,826 | 385 | | - | 55 | - | 54,386 |
| Year 11 | 0 | - | | | - | | - | - |
| Year 12 | 0 | - | | | - | | - | - |
| Year 13 | 0 | - | | | - | | - | - |
| Year 14 | 0 | - | | | - | | - | - |
| Year 15 | 0 | - | | | - | | - | - |
| **10 - 15 year baseline average gross water use** | | | | | | | | **48,188** |
| 5 Year Baseline - Gross Water Use | | | | | | | | |
| Year 1 | 2004 | 54,826 | 385 | | - | 55 | - | 54,386 |
| Year 2 | 2005 | 55,978 | 437 | | - | 18 | - | 55,523 |
| Year 3 | 2006 | 57,977 | 165 | | - | 18 | - | 57,794 |
| Year 4 | 2007 | 61,034 | 165 | | - | 22 | - | 60,847 |
| Year 5 | 2008 | 57,541 | - | | - | 16 | - | 57,525 |
| **5 year baseline average gross water use** | | | | | | | | **57,215** |
| 2020 Compliance Year - Gross Water Use | | | | | | | | |
| **2020** | | 46,021 | - | | - | **11** | - | **46,010** |

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

## Cucamonga Valley Water District

| SB X7-7 Table 4-A: Volume Entering the Distribution System(s)<br>Complete one table for each source. | | | | |
|---|---|---|---|---|
| **Name of Source** | Chino Basin Groundwater | | | |
| **This water source is:** | | | | |
| ☑ | The supplier's own water source | | | |
| ☐ | A purchased or imported source | | | |
| **Baseline Year**<br>*Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment*<br>*Optional*<br>*(+/-)* | Corrected Volume Entering Distribution System |
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1995 | 6,297 | | 6,297 |
| Year 2 | 1996 | 7,311 | | 7,311 |
| Year 3 | 1997 | 7,764 | | 7,764 |
| Year 4 | 1998 | 5,101 | | 5,101 |
| Year 5 | 1999 | 7,737 | | 7,737 |
| Year 6 | 2000 | 6,195 | | 6,195 |
| Year 7 | 2001 | 6,899 | | 6,899 |
| Year 8 | 2002 | 10,580 | | 10,580 |
| Year 9 | 2003 | 10,020 | | 10,020 |
| Year 10 | 2004 | 12,582 | | 12,582 |
| Year 11 | 0 | | | - |
| Year 12 | 0 | | | - |
| Year 13 | 0 | | | - |
| Year 14 | 0 | | | - |
| Year 15 | 0 | | | - |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2004 | 12,582 | | 12,582 |
| Year 2 | 2005 | 13,328 | | 13,328 |
| Year 3 | 2006 | 16,814 | | 16,814 |
| Year 4 | 2007 | 16,781 | | 16,781 |
| Year 5 | 2008 | 19,232 | | 19,232 |
| 2020 Compliance Year - Water into Distribution System | | | | |
| **2020** | | 23,315 | | 23,315 |
| ** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document* | | | | |
| **NOTES: 17,394.77 AF of Chino Basin production is pumped as part of MWD's conjunctive-use program (in lieu of imported water).** | | | | |

| SB X7-7 Table 4-A: Volume Entering the Distribution | |
|---|---|
| **Name of Source** | Cucamonga Basin Groundwater |
| **This water source is:** | |
| ☑ | The supplier's own water source |

## Cucamonga Valley Water District

| ☐ | A purchased or imported source | | | |
|---|---|---|---|---|
| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1995 | 14,200 | | 14,200 |
| Year 2 | 1996 | 15,319 | | 15,319 |
| Year 3 | 1997 | 14,180 | | 14,180 |
| Year 4 | 1998 | 9,764 | | 9,764 |
| Year 5 | 1999 | 13,661 | | 13,661 |
| Year 6 | 2000 | 10,642 | | 10,642 |
| Year 7 | 2001 | 6,604 | | 6,604 |
| Year 8 | 2002 | 6,719 | | 6,719 |
| Year 9 | 2003 | 5,051 | | 5,051 |
| Year 10 | 2004 | 6,714 | | 6,714 |
| Year 11 | 0 | | | 0 |
| Year 12 | 0 | | | 0 |
| Year 13 | 0 | | | 0 |
| Year 14 | 0 | | | 0 |
| Year 15 | 0 | | | 0 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2004 | 6,714 | | 6,714 |
| Year 2 | 2005 | 7,518 | | 7,518 |
| Year 3 | 2006 | 6,497 | | 6,497 |
| Year 4 | 2007 | 5,019 | | 5,019 |
| Year 5 | 2008 | 4,450 | | 4,450 |
| 2020 Compliance Year - Water into Distribution System | | | | |
| **2020** | | 3,618 | | 3,618 |
| ** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document* | | | | |
| NOTES: | | | | |

| **SB X7-7 Table 4-A: Volume Entering the Distribution** | | | | |
|---|---|---|---|---|
| **Name of Source** | Imported Water (State Water Project) | | | |
| **This water source is:** | | | | |
| ☐ | The supplier's own water source | | | |
| ☑ | A purchased or imported source | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1995 | 12,412 | | 12,412 |

## Cucamonga Valley Water District

| | | | | |
|---|---|---|---|---|
| Year 2 | 1996 | 16,932 | | 16,932 |
| Year 3 | 1997 | 18,587 | | 18,587 |
| Year 4 | 1998 | 17,419 | | 17,419 |
| Year 5 | 1999 | 21,854 | | 21,854 |
| Year 6 | 2000 | 29,460 | | 29,460 |
| Year 7 | 2001 | 28,905 | | 28,905 |
| Year 8 | 2002 | 32,635 | | 32,635 |
| Year 9 | 2003 | 33,329 | | 33,329 |
| Year 10 | 2004 | 33,638 | | 33,638 |
| Year 11 | 0 | | | 0 |
| Year 12 | 0 | | | 0 |
| Year 13 | 0 | | | 0 |
| Year 14 | 0 | | | 0 |
| Year 15 | 0 | | | 0 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2004 | 33,638 | | 33,638 |
| Year 2 | 2005 | 28,109 | | 28,109 |
| Year 3 | 2006 | 29,318 | | 29,318 |
| Year 4 | 2007 | 36,041 | | 36,041 |
| Year 5 | 2008 | 28,551 | | 28,551 |
| 2020 Compliance Year - Water into Distribution System | | | | |
| **2020** | | 14,343 | | 14,343 |
| ** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document* | | | | |
| NOTES: | | | | |

| **SB X7-7 Table 4-A: Volume Entering the Distribution** | | | | |
|---|---|---|---|---|
| **Name of Source** | Cucamonga Canyon Water | | | |
| **This water source is:** | | | | |
| ☑ | The supplier's own water source | | | |
| ☐ | A purchased or imported source | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System | |
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1995 | 0 | | 0 |
| Year 2 | 1996 | 0 | | 0 |
| Year 3 | 1997 | 586 | | 586 |
| Year 4 | 1998 | 1,612 | | 1,612 |
| Year 5 | 1999 | 1,664 | | 1,664 |
| Year 6 | 2000 | 1,053 | | 1,053 |
| Year 7 | 2001 | 1,648 | | 1,648 |
| Year 8 | 2002 | 492 | | 492 |
| Year 9 | 2003 | 958 | | 958 |

## Cucamonga Valley Water District

| | | | | |
|---|---|---|---|---|
| Year 10 | 2004 | 410 | | 410 |
| Year 11 | 0 | | | 0 |
| Year 12 | 0 | | | 0 |
| Year 13 | 0 | | | 0 |
| Year 14 | 0 | | | 0 |
| Year 15 | 0 | | | 0 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2004 | 410 | | 410 |
| Year 2 | 2005 | 0 | | 0 |
| Year 3 | 2006 | 0 | | 0 |
| Year 4 | 2007 | 141 | | 141 |
| Year 5 | 2008 | 1,700 | | 1,700 |
| 2020 Compliance Year - Water into Distribution System | | | | |
| **2020** | | 931 | | 931 |
| ** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document* | | | | |
| NOTES: | | | | |

| **SB X7-7 Table 4-A: Volume Entering the Distribution** | |
|---|---|
| **Name of Source** | Deer Canyon Water |
| **This water source is:** | |
| ☑ | The supplier's own water source |
| ☐ | A purchased or imported source |

| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|---|
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1995 | 2,355 | | 2,355 |
| Year 2 | 1996 | 1,091 | | 1,091 |
| Year 3 | 1997 | 1,033 | | 1,033 |
| Year 4 | 1998 | 2,028 | | 2,028 |
| Year 5 | 1999 | 640 | | 640 |
| Year 6 | 2000 | 504 | | 504 |
| Year 7 | 2001 | 579 | | 579 |
| Year 8 | 2002 | 209 | | 209 |
| Year 9 | 2003 | 453 | | 453 |
| Year 10 | 2004 | 249 | | 249 |
| Year 11 | 0 | | | 0 |
| Year 12 | 0 | | | 0 |
| Year 13 | 0 | | | 0 |
| Year 14 | 0 | | | 0 |
| Year 15 | 0 | | | 0 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2004 | 249 | | 249 |

## Cucamonga Valley Water District

| | | | | |
|---|---|---|---|---|
| Year 2 | 2005 | 603 | | 603 |
| Year 3 | 2006 | 187 | | 187 |
| Year 4 | 2007 | 73 | | 73 |
| Year 5 | 2008 | 78 | | 78 |
| 2020 Compliance Year - Water into Distribution System | | | | |
| **2020** | | 0 | | 0 |
| ** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document* | | | | |
| NOTES: | | | | |

| **SB X7-7 Table 4-A: Volume Entering the Distribution** | | | | |
|---|---|---|---|---|
| **Name of Source** | Day/East Canyon Water | | | |
| **This water source is:** | | | | |
| ☑ | The supplier's own water source | | | |
| ☐ | A purchased or imported source | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1995 | 6,867 | | 6,867 |
| Year 2 | 1996 | 4,823 | | 4,823 |
| Year 3 | 1997 | 5,069 | | 5,069 |
| Year 4 | 1998 | 5,940 | | 5,940 |
| Year 5 | 1999 | 3,853 | | 3,853 |
| Year 6 | 2000 | 2,864 | | 2,864 |
| Year 7 | 2001 | 3,428 | | 3,428 |
| Year 8 | 2002 | 1,775 | | 1,775 |
| Year 9 | 2003 | 2,088 | | 2,088 |
| Year 10 | 2004 | 1,233 | | 1,233 |
| Year 11 | 0 | | | 0 |
| Year 12 | 0 | | | 0 |
| Year 13 | 0 | | | 0 |
| Year 14 | 0 | | | 0 |
| Year 15 | 0 | | | 0 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2004 | 1233 | | 1,233 |
| Year 2 | 2005 | 6374 | | 6,374 |
| Year 3 | 2006 | 5161 | | 5,161 |
| Year 4 | 2007 | 2979 | | 2,979 |
| Year 5 | 2008 | 3485 | | 3,485 |
| 2020 Compliance Year - Water into Distribution System | | | | |
| **2020** | | 3,813 | | 3,813 |
| ** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document* | | | | |

## Cucamonga Valley Water District

NOTES:

| SB X7-7 Table 4-A: Volume Entering the Distribution | | | | |
|---|---|---|---|---|
| **Name of Source** | FWC Interconnection - Transfer from FWC | | | |
| **This water source is:** | | | | |
| ☐ | The supplier's own water source | | | |
| ☑ | A purchased or imported source | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1995 | 0 | | 0 |
| Year 2 | 1996 | 0 | | 0 |
| Year 3 | 1997 | 0 | | 0 |
| Year 4 | 1998 | 0 | | 0 |
| Year 5 | 1999 | 0 | | 0 |
| Year 6 | 2000 | 0 | | 0 |
| Year 7 | 2001 | 0 | | 0 |
| Year 8 | 2002 | 13 | | 13 |
| Year 9 | 2003 | 0 | | 0 |
| Year 10 | 2004 | 0 | | 0 |
| Year 11 | 0 | | | 0 |
| Year 12 | 0 | | | 0 |
| Year 13 | 0 | | | 0 |
| Year 14 | 0 | | | 0 |
| Year 15 | 0 | | | 0 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2004 | 0 | | 0 |
| Year 2 | 2005 | 45.51 | | 46 |
| Year 3 | 2006 | 0.18 | | 0 |
| Year 4 | 2007 | 0 | | 0 |
| Year 5 | 2008 | 45 | | 45 |
| 2020 Compliance Year - Water into Distribution System | | | | |
| **2020** | | 0 | | 0 |

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

# Cucamonga Valley Water District

**SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction** *(For use only by agencies that are deducting indirect recycled water)*

| **Baseline Year** *Fm SB X7-7 Table 3* | | Surface Reservoir Augmentation | | | | | Groundwater Recharge | | | **Total Deductible Volume of Indirect Recycled Water Entering the Distribution System** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Volume Discharged from Reservoir for Distribution System Delivery | Percent Recycled Water | Recycled Water Delivered to Treatment Plant | Transmission/ Treatment Loss | Recycled Volume Entering Distribution System from Surface Reservoir Augmentation | Recycled Water Pumped by Utility* | Transmission/ Treatment Losses | Recycled Volume Entering Distribution System from Groundwater Recharge | |
| 10-15 Year Baseline - Indirect Recycled Water Use | | | | | | | | | | |
| Year 1 | 1995 | | | - | | - | | | - | - |
| Year 2 | 1996 | | | - | | - | | | - | - |
| Year 3 | 1997 | | | - | | - | | | - | - |
| Year 4 | 1998 | | | - | | - | | | - | - |
| Year 5 | 1999 | | | - | | - | | | - | - |
| Year 6 | 2000 | | | - | | - | | | - | - |
| Year 7 | 2001 | | | - | | - | | | - | - |
| Year 8 | 2002 | | | - | | - | | | - | - |
| Year 9 | 2003 | | | - | | - | | | - | - |
| Year 10 | 2004 | | | - | | - | | | - | - |
| *Year 11* | 0 | | | - | | - | | | - | - |
| *Year 12* | 0 | | | - | | - | | | - | - |
| *Year 13* | 0 | | | - | | - | | | - | - |
| *Year 14* | 0 | | | - | | - | | | - | - |
| *Year 15* | 0 | | | - | | - | | | - | - |
| 5 Year Baseline - Indirect Recycled Water Use | | | | | | | | | | |
| Year 1 | 2004 | | | - | | - | | | - | - |
| Year 2 | 2005 | | | - | | - | | | - | - |
| Year 3 | 2006 | | | - | | - | | | - | - |
| Year 4 | 2007 | | | - | | - | | | - | - |
| Year 5 | 2008 | | | - | | - | | | - | - |
| 2020 Compliance - Indirect Recycled Water Use | | | | | | | | | | |
| **2020** | | | | - | | - | | | - | - |

**Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

NOTES:

**Cucamonga Valley Water District**

| **SB X7-7 Table 4-C: Process Water Deduction Eligibility**<br>*(For use only by agencies that are deducting process water) Choose Only One* | |
|---|---|
| ☐ | **Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use.<br>Complete SB X7-7 Table 4-C.1 |
| ☐ | **Criteria 2** - Industrial water use is equal to or greater than 15 GPCD.<br>Complete SB X7-7 Table 4-C.2 |
| ☐ | **Criteria 3** - Non-industrial use is equal to or less than 120 GPCD.<br>Complete SB X7-7 Table 4-C.3 |
| ☐ | **Criteria 4** - Disadvantaged Community.<br>Complete SB x7-7 Table 4-C.4 |
| NOTES: | |

## Cucamonga Valley Water District

| SB X7-7 Table 4-C.1: Process Water Deduction Eligibility | | | | | |
|---|---|---|---|---|---|
| **Criteria 1**<br>Industrial water use is equal to or greater than 12% of gross water use | | | | | |
| **Baseline Year**<br>*Fm SB X7-7 Table 3* | | Gross Water Use Without Process Water Deduction | Industrial Water Use | Percent Industrial Water | **Eligible for Exclusion Y/N** |
| 10 to 15 Year Baseline - Process Water Deduction Eligibility | | | | | |
| Year 1 | 1995 | 42,030 | 2,220 | 5% | NO |
| Year 2 | 1996 | 45,325 | 2,020 | 4% | NO |
| Year 3 | 1997 | 47,086 | 2,317 | 5% | NO |
| Year 4 | 1998 | 41,776 | 2,254 | 5% | NO |
| Year 5 | 1999 | 49,306 | 2,367 | 5% | NO |
| Year 6 | 2000 | 50,533 | 2,598 | 5% | NO |
| Year 7 | 2001 | 47,990 | 2,426 | 5% | NO |
| Year 8 | 2002 | 52,036 | 2,465 | 5% | NO |
| Year 9 | 2003 | 51,408 | 2,462 | 5% | NO |
| Year 10 | 2004 | 54,386 | 2,495 | 5% | NO |
| Year 11 | 0 | - | | | NO |
| Year 12 | 0 | - | | | NO |
| Year 13 | 0 | - | | | NO |
| Year 14 | 0 | - | | | NO |
| Year 15 | 0 | - | | | NO |
| 5 Year Baseline - Process Water Deduction Eligibility | | | | | |
| Year 1 | 2004 | 54,386 | 2,495 | 5% | NO |
| Year 2 | 2005 | 55,523 | 2,446 | 4% | NO |
| Year 3 | 2006 | 57,794 | 2,755 | 5% | NO |
| Year 4 | 2007 | 60,847 | 2,506 | 4% | NO |
| Year 5 | 2008 | 57,525 | 2,589 | 5% | NO |
| 2020 Compliance Year - Process Water Deduction Eligiblity | | | | | |
| **2020** | | 46,010 | 2,097 | 5% | NO |
| NOTES: | | | | | |

## Cucamonga Valley Water District

| SB X7-7 Table 4-C.2: Process Water Deduction Eligibility | | | | | |
|---|---|---|---|---|---|
| **Criteria 2**<br>Industrial water use is equal to or greater than 15 GPCD | | | | | |
| **Baseline Year**<br>*Fm SB X7-7 Table 3* | | Industrial Water Use | Population | Industrial GPCD | **Eligible for Exclusion Y/N** |
| 10 to 15 Year Baseline - Process Water Deduction Eligibility | | | | | |
| Year 1 | 1995 | 2,220 | 132,882 | 15 | NO |
| Year 2 | 1996 | 2,020 | 135,001 | 13 | NO |
| Year 3 | 1997 | 2,317 | 136,874 | 15 | YES |
| Year 4 | 1998 | 2,254 | 139,556 | 14 | NO |
| Year 5 | 1999 | 2,367 | 143,175 | 15 | NO |
| Year 6 | 2000 | 2,598 | 148,159 | 16 | YES |
| Year 7 | 2001 | 2,426 | 152,221 | 14 | NO |
| Year 8 | 2002 | 2,465 | 161,267 | 14 | NO |
| Year 9 | 2003 | 2,462 | 166,359 | 13 | NO |
| Year 10 | 2004 | 2,495 | 170,784 | 13 | NO |
| *Year 11* | 0 | | - | | NO |
| *Year 12* | 0 | | - | | NO |
| *Year 13* | 0 | | - | | NO |
| *Year 14* | 0 | | - | | NO |
| *Year 15* | 0 | | - | | NO |
| 5 Year Baseline - Process Water Deduction Eligibility | | | | | |
| Year 1 | 2004 | 2,495 | 170,784 | 13 | NO |
| Year 2 | 2005 | 2,446 | 179,523 | 12 | NO |
| Year 3 | 2006 | 2,755 | 182,035 | 14 | NO |
| Year 4 | 2007 | 2,506 | 184,369 | 12 | NO |
| Year 5 | 2008 | 2,589 | 184,669 | 13 | NO |
| 2020 Compliance Year - Process Water Deduction Eligibility | | | | | |
| **2020** | | 2,097 | 198,979 | 9 | NO |
| NOTES: | | | | | |

## Cucamonga Valley Water District

| SB X7-7 Table 4-C.3: Process Water Deduction Eligibility | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Criteria 3**<br>Non-industrial use is equal to or less than 120 GPCD | | | | | | | |
| **Baseline Year**<br>*Fm SB X7-7 Table 3* | | Gross Water Use Without Process Water Deduction<br>*Fm SB X7-7 Table 4* | Industrial Water Use | Non-industrial Water Use | Population<br>*Fm SB X7-7 Table 3* | Non-Industrial GPCD | **Eligible for Exclusion Y/N** |
| 10 to 15 Year Baseline - Process Water Deduction Eligibility | | | | | | | |
| Year 1 | 1995 | 42,030 | | 42,030 | 132,882 | 282 | NO |
| Year 2 | 1996 | 45,325 | | 45,325 | 135,001 | 300 | NO |
| Year 3 | 1997 | 47,086 | | 47,086 | 136,874 | 307 | NO |
| Year 4 | 1998 | 41,776 | | 41,776 | 139,556 | 267 | NO |
| Year 5 | 1999 | 49,306 | | 49,306 | 143,175 | 307 | NO |
| Year 6 | 2000 | 50,533 | | 50,533 | 148,159 | 304 | NO |
| Year 7 | 2001 | 47,990 | | 47,990 | 152,221 | 281 | NO |
| Year 8 | 2002 | 52,036 | | 52,036 | 161,267 | 288 | NO |
| Year 9 | 2003 | 51,408 | | 51,408 | 166,359 | 276 | NO |
| Year 10 | 2004 | 54,386 | | 54,386 | 170,784 | 284 | NO |
| *Year 11* | 0 | - | | - | - | | NO |
| *Year 12* | 0 | - | | - | - | | NO |
| *Year 13* | 0 | - | | - | - | | NO |
| *Year 14* | 0 | - | | - | - | | NO |
| *Year 15* | 0 | - | | - | - | | NO |
| 5 Year Baseline - Process Water Deduction Eligibility | | | | | | | |
| Year 1 | 2004 | 54,386 | | 54,386 | 170,784 | 284 | NO |
| Year 2 | 2005 | 55,523 | | 55,523 | 179,523 | 276 | NO |
| Year 3 | 2006 | 57,794 | | 57,794 | 182,035 | 283 | NO |
| Year 4 | 2007 | 60,847 | | 60,847 | 184,369 | 295 | NO |
| Year 5 | 2008 | 57,525 | | 57,525 | 184,669 | 278 | NO |
| 2020 Compliance Year - Process Water Deduction Eligiblity | | | | | | | |
| **2020** | | 46,010 | | 46,010 | 198,979 | 206 | NO |
| NOTES: | | | | | | | |

## Cucamonga Valley Water District

**SB X7-7 Table 4-C.4: Process Water Deduction Eligibility**

**Criteria 4**

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

**SELECT ONE**

"Disadvantaged Community" status was determined using one of the methods listed below:

☐ **1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/**

If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC.

☑ **2. 2020 Median Income**

| California Median Household Income | | Service Area Median Household Income | Percentage of Statewide Average | **Eligible for Exclusion? Y/N** |
|---|---|---|---|---|
| 2020 Compliance Year - Process Water Deduction Eligibility | | | | |
| 2020 | $80,440 | $92,773 | 115% | NO |

NOTES: Data obtained from data.census.gov/cedsci (California Business and Economy, Financial Characteristics)

## Cucamonga Valley Water District

| SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD) | | | | |
|---|---|---|---|---|
| **Baseline Year** *Fm SB X7-7 Table 3* | | Service Area Population *Fm SB X7-7 Table 3* | Annual Gross Water Use *Fm SB X7-7 Table 4* | Daily Per Capita Water Use (GPCD) |
| 10 to 15 Year Baseline GPCD | | | | |
| Year 1 | 1995 | 132,882 | 42,030 | 282 |
| Year 2 | 1996 | 135,001 | 45,325 | 300 |
| Year 3 | 1997 | 136,874 | 47,086 | 307 |
| Year 4 | 1998 | 139,556 | 41,776 | 267 |
| Year 5 | 1999 | 143,175 | 49,306 | 307 |
| Year 6 | 2000 | 148,159 | 50,533 | 304 |
| Year 7 | 2001 | 152,221 | 47,990 | 281 |
| Year 8 | 2002 | 161,267 | 52,036 | 288 |
| Year 9 | 2003 | 166,359 | 51,408 | 276 |
| Year 10 | 2004 | 170,784 | 54,386 | 284 |
| *Year 11* | 0 | - | - | |
| *Year 12* | 0 | - | - | |
| *Year 13* | 0 | - | - | |
| *Year 14* | 0 | - | - | |
| *Year 15* | 0 | - | - | |
| **10-15 Year Average Baseline GPCD** | | | | **290** |
| 5 Year Baseline GPCD | | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Service Area Population *Fm SB X7-7 Table 3* | Gross Water Use *Fm SB X7-7 Table 4* | Daily Per Capita Water Use |
| Year 1 | 2004 | 170,784 | 54,386 | 284 |
| Year 2 | 2005 | 179,523 | 55,523 | 276 |
| Year 3 | 2006 | 182,035 | 57,794 | 283 |
| Year 4 | 2007 | 184,369 | 60,847 | 295 |
| Year 5 | 2008 | 184,669 | 57,525 | 278 |
| **5 Year Average Baseline GPCD** | | | | **283** |
| 2020 Compliance Year GPCD | | | | |
| **2020** | | 198,979 | 46,010 | **206** |
| NOTES: | | | | |

**Cucamonga Valley Water District**

| **SB X7-7 Table 6**: Gallons per Capita per Day<br>*Summary From Table SB X7-7 Table 5* | |
|---|---|
| 10-15 Year Baseline GPCD | 290 |
| 5 Year Baseline GPCD | 283 |
| 2020 Compliance Year GPCD | 206 |
| NOTES: | |

## Cucamonga Valley Water District

**SB X7-7 Table 8: 2020 Compliance**

| Actual 2020 GPCD | 2020 Interim Target GPCD | Optional Adjustments *(in GPCD)* Enter "0" if Adjustment Not Used | | | TOTAL Adjustments | Adjusted 2020 GPCD | 2020 GPCD *(Adjusted if applicable)* | **Did Supplier Achieve Targeted Reduction for 2020?** |
|---|---|---|---|---|---|---|---|---|
| | | Extraordinary Events | Weather Normalization | Economic Adjustment | | | | |
| 206 | 261 | *From Methodology 8 (Optional)* | *From Methodology 8 (Optional)* | *From Methodology 8 (Optional)* | - | 206 | 206 | **YES** |

NOTES:

**Fontana Water Company**

| **SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*** *(select one from the drop down list)* |
| --- |
| Acre Feet |
| **The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.* |
| NOTES: |

**Fontana Water Company**

| SB X7-7 Table 2: Method for 2020 Population Estimate | |
|---|---|
| **Method Used to Determine 2020 Population** (may check more than one) | |
| ☐ | **1. Department of Finance** (DOF) or **American Community Survey** (ACS) |
| ☐ | **2. Persons-per-Connection Method** |
| ☑ | **3. DWR Population Tool** |
| ☐ | **4. Other** DWR recommends pre-review |
| NOTES: | |

## Fontana Water Company

| SB X7-7 Table 3: 2020 Service Area Population | |
|---|---|
| **2020 Compliance Year Population** | |
| **2020** | 229,041 |
| NOTES: | |

# Fontana Water Company

| SB X7-7 Table 4: 2020 Gross Water Use | | | | | | | |
|---|---|---|---|---|---|---|---|
| Compliance Year 2020 | 2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.* | 2020 Deductions | | | | | 2020 Gross Water Use |
| | | Exported Water * | Change in Dist. System Storage* (+/-) | Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.* | Water Delivered for Agricultural Use* | Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.* | |
| | 39,445 | | | - | | - | **39,445** |

* **Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

## Fontana Water Company

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | GW + Local |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☑ | The supplier's own water source |
| ☐ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 29,418 | - | 29,418 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | IEUA + SBVMWD |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 10,027 | | 10,027 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

# Fontana Water Company

**SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction** *(For use only by agencies that are deducting indirect recycled water)*

| 2020 Compliance Year | 2020 Surface Reservoir Augmentation | | | | | 2020 Groundwater Recharge | | | Total Deductible Volume of Indirect Recycled Water Entering the Distribution System |
|---|---|---|---|---|---|---|---|---|---|
| | Volume Discharged from Reservoir for Distribution System Delivery[1] | Percent Recycled Water | Recycled Water Delivered to Treatment Plant | Transmission/ Treatment Loss[1] | Recycled Volume Entering Distribution System from Surface Reservoir Augmentation | Recycled Water Pumped by Utility[1,2] | Transmission/ Treatment Losses[1] | Recycled Volume Entering Distribution System from Groundwater Recharge | |
| | | | - | | - | | | - | - |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

**Fontana Water Company**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

| **SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One** | |
|---|---|
| ☐ | **Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use.<br>Complete SB X7-7 Table 4-C.1 |
| ☐ | **Criteria 2** - Industrial water use is equal to or greater than 15 GPCD.<br>Complete SB X7-7 Table 4-C.2 |
| ☐ | **Criteria 3** - Non-industrial use is equal to or less than 120 GPCD.<br>Complete SB X7-7 Table 4-C.3 |
| ☐ | **Criteria 4** - Disadvantaged Community.<br>Complete SB x7-7 Table 4-C.4 |
| NOTES: | |

## Fontana Water Company

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 1)*

**Criteria 1**
Industrial water use is equal to or greater than 12% of gross water use

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction | 2020 Industrial Water Use | Percent Industrial Water | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | 39,445 | | 0% | NO |

NOTES:

## Fontana Water Company

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 2)*

**Criteria 2**
Industrial water use is equal to or greater than 15 GPCD

| **2020 Compliance Year** | 2020 Industrial Water Use | 2020 Population | 2020 Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | | 229,041 | - | NO |

NOTES:

**Fontana Water Company**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 3)*

**Criteria 3**
Non-industrial use is equal to or less than 120 GPCD

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4* | 2020 Industrial Water Use | 2020 Non-industrial Water Use | 2020 Population *Fm SB X7-7 Table 3* | Non-Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|---|---|
| | 39,445 | | 39,445 | 229,041 | 154 | NO |

NOTES:

**Fontana Water Company**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility** ***(For** use only by agencies that are deducting process water using Criteria 4)*

**Criteria 4**

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

**SELECT ONE**

"Disadvantaged Community" status was determined using one of the methods listed below:

**1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/**

| | |
|---|---|
| ☐ | If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC. |

**2. 2020 Median Income**

| | California Median Household Income* | | Service Area Median Household Income | Percentage of Statewide Average | **Eligible for Exclusion? Y/N** |
|---|---|---|---|---|---|
| ☐ | **2020** | **$75,235** | | 0% | YES |

*California median household income 2015 -2019 as reported in US Census Bureau QuickFacts.

NOTES

## Fontana Water Company

| SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD) | | |
|---|---|---|
| **2020 Gross Water** *Fm SB X7-7 Table 4* | **2020 Population** *Fm SB X7-7 Table 3* | **2020 GPCD** |
| 39,445 | 229,041 | **154** |
| NOTES: | | |

## Fontana Water Company

| SB X7-7 Table 9: 2020 Compliance | | | | | | | |
|---|---|---|---|---|---|---|---|
| Actual 2020 GPCD[1] | Optional Adjustments to 2020 GPCD | | | | | 2020 Confirmed Target GPCD [1, 2] | **Did Supplier Achieve Targeted Reduction for 2020?** |
| | Enter "0" if Adjustment Not Used | | | TOTAL Adjustments[1] | Adjusted 2020 GPCD [1] *(Adjusted if applicable)* | | |
| | Extraordinary Events[1] | Weather Normalization[1] | Economic Adjustment[1] | | | | |
| 154 | - | - | - | - | 154 | 176 | **YES** |

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

**Monte Vista Water District**

| **SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*** *(select one from the drop down list)* |
| --- |
| Acre Feet |
| **The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.* |
| NOTES: |

**Monte Vista Water District**

| SB X7-7 Table 2: Method for 2020 Population Estimate | |
|---|---|
| **Method Used to Determine 2020 Population** (may check more than one) | |
| ☐ | **1. Department of Finance** (DOF) or **American Community Survey** (ACS) |
| ☐ | **2. Persons-per-Connection Method** |
| ☐ | **3. DWR Population Tool** |
| ☑ | **4. Other** DWR recommends pre-review |
| NOTES: Data from the Southern California Association of Governments was used to estimate 2020 population. | |

## Monte Vista Water District

| SB X7-7 Table 3: 2020 Service Area Population | |
|---|---|
| **2020 Compliance Year Population** | |
| **2020** | 57,787 |
| NOTES: | |

## Monte Vista Water District

| SB X7-7 Table 4: 2020 Gross Water Use | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2020 Deductions | | | | | |
| Compliance Year 2020 | 2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.* | Exported Water * | Change in Dist. System Storage* (+/-) | Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.* | Water Delivered for Agricultural Use* | Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.* | 2020 Gross Water Use |
| | 15,740 | 7,707 | | - | | - | **8,033** |

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

## Monte Vista Water District

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | Chino Basin Groundwater |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☑ | The supplier's own water source |
| ☐ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 8,197 | - | 8,197 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Includes deliveries to the City of Chino Hills.

## Monte Vista Water District

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment**

Complete one table for each source.

| | |
|---|---|
| **Name of Source** | Water Facilities Authority |
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 6,886 | | 6,886 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment -*** *See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: Includes direct WFA deliveries to the City of Chino Hills. Excludes WFA deliveries for groundwater injection.

## Monte Vista Water District

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | San Antonio Water Company |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 657 | | 657 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

# Monte Vista Water District

**SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction** *(For use only by agencies that are deducting indirect recycled water)*

| 2020 Compliance Year | 2020 Surface Reservoir Augmentation | | | | | 2020 Groundwater Recharge | | | Total Deductible Volume of Indirect Recycled Water Entering the Distribution System |
|---|---|---|---|---|---|---|---|---|---|
| | Volume Discharged from Reservoir for Distribution System Delivery[1] | Percent Recycled Water | Recycled Water Delivered to Treatment Plant | Transmission/ Treatment Loss[1] | Recycled Volume Entering Distribution System from Surface Reservoir Augmentation | Recycled Water Pumped by Utility[1,2] | Transmission/ Treatment Losses[1] | Recycled Volume Entering Distribution System from Groundwater Recharge | |
| | | | - | | - | | | - | - |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

NOTES:

**Monte Vista Water District**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

| **SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One** | |
|---|---|
| ☐ | **Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use.<br>Complete SB X7-7 Table 4-C.1 |
| ☐ | **Criteria 2** - Industrial water use is equal to or greater than 15 GPCD.<br>Complete SB X7-7 Table 4-C.2 |
| ☐ | **Criteria 3** - Non-industrial use is equal to or less than 120 GPCD.<br>Complete SB X7-7 Table 4-C.3 |
| ☐ | **Criteria 4** - Disadvantaged Community.<br>Complete SB x7-7 Table 4-C.4 |
| NOTES: | |

## Monte Vista Water District

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 1)*

**Criteria 1**
Industrial water use is equal to or greater than 12% of gross water use

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction | 2020 Industrial Water Use | Percent Industrial Water | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | 8,033 | | 0% | NO |

NOTES:

## Monte Vista Water District

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 2)*

**Criteria 2**
Industrial water use is equal to or greater than 15 GPCD

| **2020 Compliance Year** | 2020 Industrial Water Use | 2020 Population | 2020 Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | | 57,787 | - | NO |

NOTES:

**Monte Vista Water District**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 3)*

**Criteria 3**
Non-industrial use is equal to or less than 120 GPCD

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4* | 2020 Industrial Water Use | 2020 Non-industrial Water Use | 2020 Population *Fm SB X7-7 Table 3* | Non-Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|---|---|
| | 8,033 | | 8,033 | 57,787 | 124 | NO |

NOTES:

## Monte Vista Water District

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility** ***(For** use only by agencies that are deducting process water using Criteria 4)*

**Criteria 4**

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

**SELECT ONE**

"Disadvantaged Community" status was determined using one of the methods listed below:

**1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/**

| | |
|---|---|
| ☐ | If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC. |

**2. 2020 Median Income**

| | California Median Household Income* | | Service Area Median Household Income | Percentage of Statewide Average | **Eligible for Exclusion? Y/N** |
|---|---|---|---|---|---|
| ☐ | **2020** | **$75,235** | | 0% | YES |

*California median household income 2015 -2019 as reported in US Census Bureau QuickFacts.

NOTES

## Monte Vista Water District

| SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD) | | |
|---|---|---|
| **2020 Gross Water** *Fm SB X7-7 Table 4* | **2020 Population** *Fm SB X7-7 Table 3* | **2020 GPCD** |
| 8,033 | 57,787 | **124** |
| NOTES: | | |

## Monte Vista Water District

| SB X7-7 Table 9: 2020 Compliance | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Optional Adjustments to 2020 GPCD | | | | | | |
| | Enter "0" if Adjustment Not Used | | | | | | |
| Actual 2020 GPCD[1] | Extraordinary Events[1] | Weather Normalization[1] | Economic Adjustment[1] | TOTAL Adjustments[1] | Adjusted 2020 GPCD [1] *(Adjusted if applicable)* | 2020 Confirmed Target GPCD [1, 2] | **Did Supplier Achieve Targeted Reduction for 2020?** |
| 124 | - | - | - | - | 124 | 167 | **YES** |

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

**City of Ontario**

| **SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*** *(select one from the drop down list)* |
| --- |
| Acre Feet |
| **The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.* |
| NOTES: |

**City of Ontario**

| SB X7-7 Table 2: Method for 2020 Population Estimate | |
|---|---|
| **Method Used to Determine 2020 Population** (may check more than one) | |
| ☑ | **1. Department of Finance** (DOF) or **American Community Survey** (ACS) |
| ☐ | **2. Persons-per-Connection Method** |
| ☐ | **3. DWR Population Tool** |
| ☐ | **4. Other** DWR recommends pre-review |
| NOTES: Used service area boundary to approximate population determined by the Department of Finance for the City of Ontario. | |

**City of Ontario**

| SB X7-7 Table 3: 2020 Service Area Population | |
|---|---|
| **2020 Compliance Year Population** | |
| **2020** | 178,409 |
| NOTES: | |

## City of Ontario

| SB X7-7 Table 4: 2020 Gross Water Use | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2020 Deductions | | | | | |
| **Compliance Year 2020** | **2020 Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.* | **Exported Water *** | **Change in Dist. System Storage*** (+/-) | **Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.* | **Water Delivered for Agricultural Use*** | **Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.* | **2020 Gross Water Use** |
| | 32,109 | | | - | | - | **32,109** |

*** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.

NOTES:

## City of Ontario

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| | |
|---|---|
| **Name of Source** | Chino Basin Groundwater |
| **This water source is** *(check one)* **:** | |
| ☑ | The supplier's own water source |
| ☐ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 18,395 | - | 18,395 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

**City of Ontario**

| **SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment**<br>Complete one table for each source. | | | |
|---|---|---|---|
| **Name of Source** | Water Facilities Authority | | |
| **This water source is** *(check one)* **:** | | | |
| ☐ | The supplier's own water source | | |
| ☑ | A purchased or imported source | | |
| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
| | 6,513 | | 6,513 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment -*** *See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

**City of Ontario**

| **SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**<br>Complete one table for each source. | | | |
|---|---|---|---|
| **Name of Source** | Chino Basin Desalter Authority | | |
| **This water source is** *(check one)* **:** | | | |
| ☐ | The supplier's own water source | | |
| ☑ | A purchased or imported source | | |
| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
| | 6,636 | | 6,636 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

## City of Ontario

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| | |
|---|---|
| **Name of Source** | San Antonio Water Company |
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 565 | | 565 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

## City of Ontario

| SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **2020 Compliance Year** | **2020 Surface Reservoir Augmentation** | | | | | **2020 Groundwater Recharge** | | | **Total Deductible Volume of Indirect Recycled Water Entering the Distribution System** |
| | Volume Discharged from Reservoir for Distribution System Delivery[1] | Percent Recycled Water | Recycled Water Delivered to Treatment Plant | Transmission/ Treatment Loss[1] | Recycled Volume Entering Distribution System from Surface Reservoir Augmentation | Recycled Water Pumped by Utility[1,2] | Transmission/ Treatment Losses[1] | Recycled Volume Entering Distribution System from Groundwater Recharge | |
| | | | - | | - | | | - | - |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

**City of Ontario**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

| **SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One** | |
|---|---|
| ☐ | **Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use.<br>Complete SB X7-7 Table 4-C.1 |
| ☐ | **Criteria 2** - Industrial water use is equal to or greater than 15 GPCD.<br>Complete SB X7-7 Table 4-C.2 |
| ☐ | **Criteria 3** - Non-industrial use is equal to or less than 120 GPCD.<br>Complete SB X7-7 Table 4-C.3 |
| ☐ | **Criteria 4** - Disadvantaged Community.<br>Complete SB x7-7 Table 4-C.4 |
| NOTES: | |

## City of Ontario

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 1)*

**Criteria 1**
Industrial water use is equal to or greater than 12% of gross water use

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction | 2020 Industrial Water Use | Percent Industrial Water | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | 32,109 | | 0% | NO |

NOTES:

## City of Ontario

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 2)*

**Criteria 2**
Industrial water use is equal to or greater than 15 GPCD

| 2020 Compliance Year | 2020 Industrial Water Use | 2020 Population | 2020 Industrial GPCD | Eligible for Exclusion Y/N |
|---|---|---|---|---|
| | | 178,409 | - | NO |

NOTES:

**City of Ontario**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 3)*

**Criteria 3**
Non-industrial use is equal to or less than 120 GPCD

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4* | 2020 Industrial Water Use | 2020 Non-industrial Water Use | 2020 Population *Fm SB X7-7 Table 3* | Non-Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|---|---|
| | 32,109 | | 32,109 | 178,409 | 161 | NO |

NOTES:

**City of Ontario**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility** ***(For** use only by agencies that are deducting process water using Criteria 4)*

**Criteria 4**

Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

**SELECT ONE**

"Disadvantaged Community" status was determined using one of the methods listed below:

**1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/**

| | |
|---|---|
| ☐ | If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC. |

**2. 2020 Median Income**

| | California Median Household Income* | | Service Area Median Household Income | Percentage of Statewide Average | **Eligible for Exclusion? Y/N** |
|---|---|---|---|---|---|
| ☐ | **2020** | **$75,235** | | 0% | YES |
| | *California median household income 2015 -2019 as reported in US Census Bureau QuickFacts. | | | | |

NOTES

**City of Ontario**

| SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD) | | |
|---|---|---|
| **2020 Gross Water** *Fm SB X7-7 Table 4* | **2020 Population** *Fm SB X7-7 Table 3* | **2020 GPCD** |
| 32,109 | 178,409 | **161** |
| NOTES: | | |

## City of Ontario

| SB X7-7 Table 9: 2020 Compliance | | | | | | | |
|---|---|---|---|---|---|---|---|
| Actual 2020 GPCD[1] | Optional Adjustments to 2020 GPCD | | | | | 2020 Confirmed Target GPCD [1, 2] | **Did Supplier Achieve Targeted Reduction for 2020?** |
| | Enter "0" if Adjustment Not Used | | | TOTAL Adjustments[1] | Adjusted 2020 GPCD [1] *(Adjusted if applicable)* | | |
| | Extraordinary Events[1] | Weather Normalization[1] | Economic Adjustment[1] | | | | |
| 161 | - | - | - | - | 161 | 196 | **YES** |

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

**City of Upland**

| **SB X7-7 Table 0: Units of Measure Used in 2020 UWMP*** *(select one from the drop down list)* |
|---|
| Acre Feet |
| **The unit of measure must be consistent throughout the UWMP, as reported in Submittal Table 2-3.* |
| NOTES: |
| **Conversion Rate to Gallons:** |
| 325851 |
| **Conversion Rate to Gallons per Day:** |
| 892.7424658 |

**City of Upland**

| SB X7-7 Table 2: Method for 2020 Population Estimate | |
|---|---|
| **Method Used to Determine 2020 Population** (may check more than one) | |
| ☐ | **1. Department of Finance** (DOF) or **American Community Survey** (ACS) |
| ☐ | **2. Persons-per-Connection Method** |
| ☐ | **3. DWR Population Tool** |
| ☑ | **4. Other** DWR recommends pre-review |
| NOTES: Data developed by SCAG and provided by IEUA. Similar data as DOF. | |

## City of Upland

| SB X7-7 Table 3: 2020 Service Area Population | |
|---|---|
| **2020 Compliance Year Population** | |
| **2020** | 78,383 |
| NOTES: | |

# City of Upland

| SB X7-7 Table 4: 2020 Gross Water Use | | | | | | | |
|---|---|---|---|---|---|---|---|
| Compliance Year 2020 | 2020 Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.* | 2020 Deductions | | | | | 2020 Gross Water Use |
| | | Exported Water * | Change in Dist. System Storage* (+/-) | Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.* | Water Delivered for Agricultural Use* | Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.* | |
| | 18,431 | | | - | | - | **18,431** |
| *** Units of measure (AF, MG , or CCF)** must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3. | | | | | | | |
| NOTES: | | | | | | | |

## City of Upland

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | Purchased or Imported Water |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 3,395 | - | 3,395 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES

**SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s) Meter Error Adjustment**

Complete one table for each source.

| **Name of Source** | Local Surface Water |
|---|---|
| **This water source is** *(check one)* **:** | |
| ☑ | The supplier's own water source |
| ☐ | A purchased or imported source |

| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|
| | 3,365 | | 3,365 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

## City of Upland

| SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment<br>Complete one table for each source. | | | |
|---|---|---|---|
| **Name of Source** | Groundwater | | |
| **This water source is** *(check one)* **:** | | | |
| ☑ | The supplier's own water source | | |
| ☐ | A purchased or imported source | | |
| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
| | 6,120 | | 6,120 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

| SB X7-7 Table 4-A: 2020 Volume Entering the Distribution System(s), Meter Error Adjustment<br>Complete one table for each source. | | | |
|---|---|---|---|
| **Name of Source** | Purchased groundwater | | |
| **This water source is** *(check one)* **:** | | | |
| ☐ | The supplier's own water source | | |
| ☑ | A purchased or imported source | | |
| **Compliance Year 2020** | Volume Entering Distribution System [1] | Meter Error Adjustment [2] *Optional (+/-)* | Corrected Volume Entering Distribution System |
| | 5,551 | | 5,551 |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.* [2] ***Meter Error Adjustment*** *- See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

# City of Upland

**SB X7-7 Table 4-B: 2020 Indirect Recycled Water Use Deduction** *(For use only by agencies that are deducting indirect recycled water)*

| 2020 Compliance Year | 2020 Surface Reservoir Augmentation | | | | | 2020 Groundwater Recharge | | | Total Deductible Volume of Indirect Recycled Water Entering the Distribution System |
|---|---|---|---|---|---|---|---|---|---|
| | Volume Discharged from Reservoir for Distribution System Delivery[1] | Percent Recycled Water | Recycled Water Delivered to Treatment Plant | Transmission/ Treatment Loss[1] | Recycled Volume Entering Distribution System from Surface Reservoir Augmentation | Recycled Water Pumped by Utility[1,2] | Transmission/ Treatment Losses[1] | Recycled Volume Entering Distribution System from Groundwater Recharge | |
| | | | - | | - | | | - | - |

[1] ***Units of measure (AF, MG , or CCF)*** *must remain consistent throughout the UWMP, as reported in SB X7-7 Table 0 and Submittal Table 2-3.*

[2] *Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

Although indirect recycled water use was credited to Upland by IEUA, the amount was not needed to meet its target.

**City of Upland**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

| **SB X7-7 Table 4-C: 2020 Process Water Deduction Eligibility (For use only by agencies that are deducting process water) Choose Only One** | |
|---|---|
| ☐ | **Criteria 1**- Industrial water use is equal to or greater than 12% of gross water use.<br>Complete SB X7-7 Table 4-C.1 |
| ☐ | **Criteria 2** - Industrial water use is equal to or greater than 15 GPCD.<br>Complete SB X7-7 Table 4-C.2 |
| ☐ | **Criteria 3** - Non-industrial use is equal to or less than 120 GPCD.<br>Complete SB X7-7 Table 4-C.3 |
| ☐ | **Criteria 4** - Disadvantaged Community.<br>Complete SB x7-7 Table 4-C.4 |
| NOTES: | |

## City of Upland

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.1: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 1)*

**Criteria 1**
Industrial water use is equal to or greater than 12% of gross water use

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction | 2020 Industrial Water Use | Percent Industrial Water | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | 18,431 | | 0% | NO |

NOTES:

## City of Upland

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.2: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 2)*

**Criteria 2**
Industrial water use is equal to or greater than 15 GPCD

| **2020 Compliance Year** | 2020 Industrial Water Use | 2020 Population | 2020 Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|
| | | 78,383 | - | NO |

NOTES:

**City of Upland**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.3: 2020 Process Water Deduction Eligibility** *(For use only by agencies that are deducting process water using Criteria 3)*

**Criteria 3**
Non-industrial use is equal to or less than 120 GPCD

| **2020 Compliance Year** | 2020 Gross Water Use Without Process Water Deduction *Fm SB X7-7 Table 4* | 2020 Industrial Water Use | 2020 Non-industrial Water Use | 2020 Population *Fm SB X7-7 Table 3* | Non-Industrial GPCD | **Eligible for Exclusion Y/N** |
|---|---|---|---|---|---|---|
| | 18,431 | | 18,431 | 78,383 | 210 | NO |

NOTES:

**City of Upland**

Data from this table will not be entered into WUEdata.
Instead, the entire table will be uploaded to WUEdata as a separate upload in Excel format.

**SB X7-7 Table 4-C.4: 2020 Process Water Deduction Eligibility** ***(For** use only by agencies that are deducting process water using Criteria 4)*

**Criteria 4**
Disadvantaged Community. A "Disadvantaged Community" (DAC) is a community with a median household income less than 80 percent of the statewide average.

**SELECT ONE**
"Disadvantaged Community" status was determined using one of the methods listed below:

**1. IRWM DAC Mapping tool https://gis.water.ca.gov/app/dacs/**

| | |
|---|---|
| ☐ | If using the IRWM DAC Mapping Tool, include a screen shot from the tool showing that the service area is considered a DAC. |

**2. 2020 Median Income**

| | California Median Household Income* | | Service Area Median Household Income | Percentage of Statewide Average | **Eligible for Exclusion? Y/N** |
|---|---|---|---|---|---|
| ☐ | **2020** | **$75,235** | | 0% | YES |

*California median household income 2015 -2019 as reported in US Census Bureau QuickFacts.

NOTES

**City of Upland**

| SB X7-7 Table 5: 2020 Gallons Per Capita Per Day (GPCD) | | |
|---|---|---|
| **2020 Gross Water** *Fm SB X7-7 Table 4* | **2020 Population** *Fm SB X7-7 Table 3* | **2020 GPCD** |
| 18,431 | 78,383 | **210** |
| | | |

## City of Upland

| SB X7-7 Table 9: 2020 Compliance | | | | | | | |
|---|---|---|---|---|---|---|---|
| Actual 2020 GPCD[1] | Optional Adjustments to 2020 GPCD | | | | | 2020 Confirmed Target GPCD [1, 2] | **Did Supplier Achieve Targeted Reduction for 2020?** |
| | Enter "0" if Adjustment Not Used | | | TOTAL Adjustments[1] | Adjusted 2020 GPCD [1] *(Adjusted if applicable)* | | |
| | Extraordinary Events[1] | Weather Normalization[1] | Economic Adjustment[1] | | | | |
| 210 | - | - | - | - | 210 | 220 | **YES** |

[1] *All values are reported in GPCD*

[2] ***2020 Confirmed Target GPCD*** *is taken from the Supplier's SB X7-7 Verification Form Table SB X7-7, 7-F.*

NOTES:

# Appendix G

Addendum to the 2015 UWMP

Kennedy Jenks

ARCADIS Design & Consultancy for natural and built assets

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

# ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN

## Addendum prepared by Kennedy Jenks Consultants

June 2021

# 2020 UWMP Appendix G
# & 2015 UWMP Appendix P

Reduced Delta Reliance Reporting

*6/29/2021*

# Inland Empire Utilities Agency Reduced Delta Reliance Reporting

## G.1 Background

IEUA is an urban water supplier and a member agency of MWD. MWD provides IEUA with imported water supplies, which IEUA in turn distributes on a wholesale basis to its retail water purveyors. MWD is a contractor on the State Water Project (SWP) and, due to water quality considerations, all imported water supplies IEUA receives from MWD originate from the SWP system. The SWP system runs from Lake Oroville in Northern California to Southern California, crossing the Sacramento-San Joaquin Delta (Delta) along the way. MWD and its member agencies have made investments into water supply and demand management to regionally reduce impacts on the Delta. These investments bring regional reliability and reduced Delta reliance that make it infeasible for individual MWD member agencies to determine their individual Delta reliance.

As a recipient of imported water from the SWP delivered via MWD, IEUA may indirectly receive water through a proposed covered action, such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta. Through this appendix, IEUA is providing information in its 2015 and 2020 UWMPs that may be used in the covered action process, to demonstrate consistency with Delta Plan Policy WR P1, *Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance* (WR P1) [California Code of Regulations (CCR), Title 23, § 5003].

The Delta Plan is a comprehensive, long-term resource management plan for the Sacramento-San Joaquin Delta (Delta) that was developed as part of the Delta Reform Act of 2009 (Water code section 85000 et seq) and includes both regulatory policies and recommendations, aimed at promoting a healthy Delta ecosystem. Delta Plan Policy WR P1 is one of 14 regulatory policies in the Delta Plan. WR P1 identifies UWMPs as the tool to demonstrate consistency with state policy to reduce reliance on the Delta for any Supplier that is participating in or carrying out a proposed covered action or receiving Delta water from a proposed covered action.

Within the supplier's UWMP, information should be provided that can be used to demonstrate consistency with this policy. Section (c)(1) of WR P1 states that suppliers that have (A) completed an urban water management plan, (B) implemented the efficiency measures in that plan, and (C) shown a measurable reduction in Delta reliance and improvement in regional self-reliance in the plan, are contributing to reduced reliance on the Delta and are therefore consistent with WR P1 [CCR, Title 23, § 5003(c)(1)].

The analysis and documentation provided below include all elements described in WR P1(c)(1) and are included in IEUA's 2015 and 2020 UWMP to support a certification of consistency in the case of a future covered action.

## G.2 Demonstration of Reduced Reliance

The methodology used to determine IEUA's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in DWR's UWMP Guidebook Appendix C, including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources. Some of the key assumptions underlying IEUA's demonstration of reduced reliance includes:

- All data were obtained from the current 2020 UWMP or previously adopted UWMPs and represent average or normal water year conditions.

- All analyses were conducted at the IEUA service area level. Demands on IEUA are the total demands from all its retail agencies. Supplies are the total supplies IEUA manages, which are imported water from MWD and recycled water from its regional water recycling plants.

- No projects or programs that are described in the UWMPs as "Projects Under Development" were included in the accounting of supplies.

## G.3 Summary of Expected Outcomes for Reduced Reliance on the Delta

As stated in WR P1(c)(1), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

It is important to note that MWD has prepared a detailed analysis that demonstrates the consistency with the Delta Plan Policy in its 2020 UWMP on a region-wide scale that includes its Member Agencies (MWD 2020 UWMP, Appendix 11). From its 2010 baseline, both long-term Regional Self-Reliance and Reduced Reliance on Supplies from the Delta are expected to increase over time. IEUA has adopted MWD's calculation of Reduced Reliance on Supplies from the Delta due to the infeasibility of separating out the delta supplies that IEUA receives from MWD (see Section G.6 and G.7 for details).

IEUA will report its own expected outcomes for Regional Self-Reliance in the following sections (G.4 and G.5). These expected outcomes use the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 (Guidebook Appendix C), finalized on March 29, 2021.

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for IEUA's regional self-reliance and MWD's regional reduction in reliance on Delta water supplies. The results show that IEUA is measurably improving regional self-reliance and MWD and its member agencies are reducing reliance on Delta supplies, both as an amount of water used and as a percentage of water used.

- Near-term (2025) – IEUA's normal water regional self-reliance is expected to increase by 25 thousand acre-feet (TAF) from the 2010 baseline; this represents an increase of about 10 percent of 2025 normal water year demands (Table G-2).

- Long-term (2045) – IEUA's normal water regional self-reliance is expected to increase by 50 TAF from the 2010 baseline; this represents an increase of about 17 percent of 2045 normal water year demands (Table G-2).

- Near-term (2025) – MWD's normal reliance on water supplies from the Delta Watershed is expected to decrease by 300 thousand acre-feet (TAF) from the 2010 baseline; this represents a decrease of about 3 percent of 2025 normal water year demands (Table G-3).

- Long-term (2045) – MWD's normal reliance on water supplies from the Delta Watershed is expected to decrease by 314 thousand acre-feet (TAF) from the 2010 baseline; this represents a decrease of about 5 percent of 2045 normal water year demands (Table G-3).

## G.4 Baseline and Calculation of Service Area Water Demands

In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C.

Table G-1 shows the total service area water demands for IEUA for 2010 through 2045. These water demands include recycled water and imported water demand on IEUA from its retail agencies. The table also shows reported water use efficiency and calculates the total service area water demands without water use efficiency.

The data sources for the values in this table and calculations are explained below.

*Service Area Demands with Water Use Efficiency Accounted For:*

- Baseline (2010) value: The sum of the imported water and recycled water demands, as reported in IEUA's 2010 UWMP, Tables 3-10 and 3-15.

- 2015 value: The sum of the imported water and recycled water demands on IEUA, as reported in IEUA's 2015 UWMP, Table 2-8: IEUA Total Water Demands.

- 2020-2045 values: The sum of imported water and recycled water demands, from IEUA's 2020 UWMP, Table 2-4: Total Water Use (Potable and Non-Potable).

*Reported Water Use Efficiency:*

- Baseline (2010) value: No water use efficiency value is estimated to establish a conservative baseline.

- 2015 value: From IEUA's 2015 UWMP, Table 3-1. Only the 2015 value for WUE was selected.

- 2020 value: The volume of savings over the lifetime of water use efficiency measures implemented during FY 19/20, as reported in IEUA's Annual UWE FY19/20 report and detailed in Section 8.8 of IEUA's 2020 UWMP.

- 2025-2045 values: Projected water use efficiency savings, from IEUA's 2020 UWMP, Table 7-2.

The Service Area Water Demands without Water Use Efficiency Accounted For is the sum of the two volumes above for each year.

## G.5 Calculation of Supplies Contributing to Regional Self-Reliance

For a covered action to demonstrate consistency with the Delta Plan, WR P1(c)(1) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table G-2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table G-2 represent efforts to improve regional self-reliance for the IEUA service area, focused only on the supplies IEUA manages, which are water use efficiency and water recycling. Supporting narratives and documentation for the all the data shown in the table are provided below:

Water Use Efficiency

The water use efficiency information shown in Table G-2 is taken directly from Table G-1. It is now reflected as a supply contributing to regional self-reliance.

Water Recycling

The water recycling values shown in Table G-2 are the recycled water supplies to meet the recycled water portion of the projected "service area water demands with water use efficiency accounted for" shown in Table G-1. These values come from IEUA's 2010 UWMP Table 3-15, IEUA's 2015 UWMP Table 2-8, and IEUA's 2020 UWMP Table 2-4. A description on these water supplies can be found in Section 5.4 – Current Recycled Water Uses in IEUA's 2020 UWMP.

The results shown in Table G-2 demonstrate that IEUA is improving its regional self-reliance, since the volume of water supplies contributing to regional self-reliance are projected to increase over time. In the near term (2025), the expected outcome for normal water year regional self-reliance increases by over 25,000 AF from the 2010 baseline; this represents an increase of about 10 percent of 2025 normal water year demands. In the long term (2045), normal water year regional self-reliance is expected to increase by more than 50,000 AF from the 2010 baseline.

## G.6 Calculation of Reliance on Water Supplies from the Delta Watershed

WR P1(c)(1) requires that water suppliers report the expected outcomes for measurable reductions in supplies from the Delta watershed either as an amount or as a percentage. This analysis provides both calculations.

Although IEUA is currently a SWP-exclusive MWD member agency, it is infeasible to individually account for the independent impact on the Delta. IEUA participates, through MWD, in various water supply investment and demand management programs that reduce reliance on the Delta. Reliance on water supplies from the Delta are taken from MWD's Reduced Delta Reliance assessment (MWD 2020 UWMP, Appendix 11).

Regional reliance on supplies from the Delta watershed are expected to decrease by 314 TAF over the 2010 baseline, a decrease of about 5.2% of 2045 demands. Increased regional self-reliance primarily comes from water use efficiency, conjunctive use projects, water recycling, and local/regional water supply and storage projects. The water supply accounting completed by MWD does not include any supplies from potential future covered actions.

## G.7 Infeasibility of Accounting Supplies from the Delta Watershed for Metropolitan's Member Agencies and their Customers

Metropolitan's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures. Metropolitan's member agencies coordinate reliance on the Delta through their membership in Metropolitan, a regional cooperative providing wholesale water service to its 26 member agencies. Accordingly, regional reliance on the Delta can only be measured regionally—not by individual Metropolitan member agencies and not by the customers of those member agencies.

Metropolitan's member agencies, and those agencies' customers, indirectly reduce reliance on the Delta through their collective efforts as a cooperative. Metropolitan's member agencies do not control the amount of Delta water they receive from Metropolitan. Metropolitan manages a statewide integrated conveyance system consisting of its participation in the State Water Project (SWP), its Colorado River Aqueduct (CRA) including Colorado River water resources, programs and water exchanges, and its regional storage portfolio. Along with the SWP, CRA, storage programs, and Metropolitan's conveyance and distribution facilities, demand management programs increase the future reliability of water resources for the region. In addition, demand management programs provide system-wide benefits by decreasing the demand for imported water, which helps to decrease the burden on Metropolitan's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

Metropolitan's costs are funded almost entirely from its service area, with the exception of grants and other assistance from government programs. Most of Metropolitan's revenues are collected directly from its member agencies. Properties within Metropolitan's service area pay a property tax that currently provides approximately 8 percent of the fiscal year 2021 annual budgeted revenues. The rest of Metropolitan's costs are funded through rates and charges paid by Metropolitan's member agencies for the wholesale services it provides to them. Thus, Metropolitan's member agencies fund nearly all operations Metropolitan undertakes to reduce reliance on the Delta, including Colorado River Programs, storage facilities, Local Resources Programs and Conservation Programs within Metropolitan's service area.

Because of the integrated nature of Metropolitan's systems and operations, and the collective nature of Metropolitan's regional efforts, it is infeasible to quantify each of Metropolitan member agencies' individual reliance on the Delta. It is infeasible to attempt to segregate an entity and a system that were designed to work as an integrated regional cooperative.

In addition to the member agencies funding Metropolitan's regional efforts, they also invest in their own local programs to reduce their reliance on any imported water. Moreover, the customers of those member agencies may also invest in their own local programs to reduce water demand. However, to the extent those efforts result in reduction of demands on Metropolitan, that reduction may not equate to a like reduction of reliance on the Delta. Demands on Metropolitan are not commensurate with demands on the Delta because most of Metropolitan member agencies receive blended resources from Metropolitan as determined by Metropolitan—not the individual member agency—and for most member agencies, the blend varies from month-to-month and year-to-year due to hydrology, operational constraints, use of storage and other factors.

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the individual member agencies or their customers. As described above, the region (through Metropolitan) makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of Metropolitan's investments in Colorado River supplies, groundwater and surface storage, local resources development and demand management measures that reduce reliance on the Delta are collectively funded by revenues generated from the member agencies through rates and charges.

Metropolitan's revenues cannot be matched to the demands or supply production history of an individual agency, or consistently across the agencies within the service area. Each project or program funded by the region has a different online date, useful life, incentive rate and structure, and production schedule. It is infeasible to account for all these things over the life of each project or program and provide a nexus to each member agency's contributions to Metropolitan's revenue stream over time. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by member agencies and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, Metropolitan's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

**Colorado River Programs**

As a regional cooperative of member agencies, Metropolitan invests in programs to ensure the continued reliability and sustainability of Colorado River supplies. Metropolitan was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the CRA. The CRA consists of five pumping plants, 450 miles of high voltage power lines, one electric substation, four regulating reservoirs, and 242 miles of aqueducts, siphons, canals, conduits and pipelines terminating at Lake Mathews in Riverside County. Metropolitan owns, operates, and manages the CRA. Metropolitan is responsible for operating, maintaining, rehabilitating, and repairing the CRA, and is responsible for obtaining and scheduling energy resources adequate to power pumps at the CRA's five pumping stations.

Colorado River supplies include Metropolitan's basic Colorado River apportionment, along with supplies that result from existing and committed programs, including supplies from the Imperial Irrigation District (IID)-Metropolitan Conservation Program, the implementation of the Quantification Settlement Agreement (QSA) and related agreements, and the exchange agreement with San Diego County Water Authority (SDCWA). The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's CRA supplies. These include the PVID Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead.

IEUA has emergency service connections to the MWD's Upper Feeder, which includes CRA supplies. However, these connections are not currently utilized due to water quality concerns.

**Storage Investments/Facilities**

Surface and groundwater storage are critical elements of Southern California's water resources strategy and help Metropolitan reduce its reliance on the Delta. Because California experiences dramatic swings in weather and hydrology, storage is important to regulate those swings and mitigate possible supply shortages. Surface and groundwater storage provide a means of storing water during normal and wet years for later use during dry years, when imported supplies are limited. The Metropolitan system, for purposes of meeting demands during times of shortage, regulating system flows, and ensuring system reliability in the event of a system outage, provides over 1,000,000 acre-feet of system storage capacity. Diamond Valley Lake provides 810,000 acre-feet of that storage capacity, effectively doubling Southern California's previous surface water storage capacity. Other existing imported water storage available to the region consists of Metropolitan's raw water reservoirs, a share of the SWP's raw water reservoirs in and near the service area, and the portion of the groundwater basins used for conjunctive-use storage.

Since the early twentieth century, DWR and Metropolitan have constructed surface water reservoirs to meet emergency, drought/seasonal, and regulatory water needs for Southern California. These reservoirs include Pyramid Lake, Castaic Lake, Elderberry Forebay, Silverwood Lake, Lake Perris, Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, Orange County Reservoir, and Metropolitan's Diamond Valley Lake (DVL). Some reservoirs such as Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, and Orange County Reservoir, which have a total combined capacity of about 3,500 AF, are used solely for regulating purposes. The total gross storage capacity for the larger remaining reservoirs is 1,757,600 AF. However, not all of the gross storage capacity is available to Metropolitan; dead storage and storage allocated to others reduce the amount of storage that is available to Metropolitan to 1,665,200 AF.

Conjunctive use of the aquifers offers another important source of dry year supplies. Unused storage in Southern California groundwater basins can be used to optimize imported water supplies, and the development of groundwater storage projects allows effective management and regulation of the region's major imported supplies from the Colorado River and SWP. Over the years, Metropolitan has implemented conjunctive use through various programs in the service area; the following table lists the groundwater conjunctive use programs that have been developed in the region.

**MWD Table 1: Metropolitan Groundwater Conjunctive Use Programs**

| Program | Metropolitan Agreement Partners | Program Term | Max Storage AF | Dry-Year Yield AF/Yr |
|---|---|---|---|---|
| Long Beach Conjunctive Use Storage Project (Central Basin) | Long Beach | June 2002-2027 | 13,000 | 4,300 |
| Foothill Area Groundwater Storage Program (Monkhill/ Raymond Basin) | Foothill MWD | February 2003-2028 | 9,000 | 3,000 |
| Orange County Groundwater Conjunctive Use Program | MWDOC<br>OCWD | June 2003-2028 | 66,000+ | 22,000 |
| Chino Basin Conjunctive Use Programs | IEUA<br>TVMWD<br>Watermaster | June 2003-2028 | 100,000 | 33,000 |
| Live Oak Basin Conjunctive Use Project (Six Basins) | TVMWD<br>City of La Verne | October 2002-2027 | 3,000 | 1,000 |
| City of Compton Conjunctive Use Project (Central Basin) | Compton | February 2005-2030 | 2,289 | 763 |
| Long Beach Conjunctive Use Program Expansion in Lakewood (Central Basin) | Long Beach | July 2005-2030 | 3,600 | 1,200 |
| Upper Claremont Basin Groundwater Storage Program (Six Basins) | TVMWD | Sept. 2005- 2030 | 3,000 | 1,000 |
| Elsinore Basin Conjunctive Use Storage Program | Western MWD<br>Elsinore Valley MWD | May 2008- 2033 | 12,000 | 4,000 |
| **TOTAL** | | | **211,889** | **70,263** |

**Metropolitan Demand Management Programs**

Demand management costs are Metropolitan's expenditures for funding local water resource development programs and water conservation programs. These Demand Management Programs incentivize the development of local water supplies and the conservation of water to reduce the need to import water to deliver to Metropolitan's member agencies. These programs are implemented below the delivery points between Metropolitan's and its member agencies' distribution systems and, as such, do not add any water to Metropolitan's supplies. Rather, the effect of these downstream programs is to produce a local supply of water for the local agencies and to reduce demands by member agencies for water imported through Metropolitan's system. The following discussions outline how Metropolitan funds local resources and conservation programs for the benefit of all of its member agencies and the entire Metropolitan service area. Notably, the history of demand management by Metropolitan's member agencies and the local agencies that purchase water from Metropolitan's members has spanned more than four decades. The significant history of the programs is another reason it would be difficult to attempt to assign a portion of such funding to any one individual member agency.

## Section 1: Local Resources Programs

In 1982, Metropolitan began providing financial incentives to its member agencies to develop new local supplies to assist in meeting the region's water needs. Because of Metropolitan's regional distribution system, these programs benefit all member agencies regardless of project location because they help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs and free up conveyance capacity to the benefit of all the agencies that rely on water from Metropolitan.

For example, the Groundwater Replenishment System (GWRS) operated by the Orange County Water District is the world's largest water purification system for indirect potable reuse. It was funded, in part, by Metropolitan's member agencies through the Local Resources Program. Annually, the GWRS produces approximately 103,000 acre-feet of reliable, locally controlled, drought-proof supply of high-quality water to recharge the Orange County Groundwater Basin and protect it from seawater intrusion. The GWRS is a premier example of a regional project that significantly reduced the need to utilize imported water for groundwater replenishment in Metropolitan's service area, increasing regional and local supply reliability and reducing the region's reliance on imported supplies, including supplies from the State Water Project.

Metropolitan's local resource programs have evolved through the years to better assist Metropolitan's member agencies in increasing local supply production. The following is a description and history of the local supply incentive programs.

### *Local Projects Program*

In 1982, Metropolitan initiated the Local Projects Program (LPP), which provided funding to member agencies to facilitate the development of recycled water projects. Under this approach, Metropolitan contributed a negotiated up-front funding amount to help finance project capital costs. Participating member agencies were obligated to reimburse Metropolitan over time. In 1986, the LPP was revised, changing the up-front funding approach to an incentive-based approach. Metropolitan contributed an amount equal to the avoided State Water Project pumping costs for each acre-foot of recycled water delivered to end-use consumers. This funding incentive was based on the premise that local projects resulted in the reduction of water imported from the Delta and the associated pumping cost. The incentive amount varied from year to year depending on the actual variable power cost paid for State Water Project imports. In 1990, Metropolitan's Board increased the LPP contribution to a fixed rate of $154 per acre-foot, which was calculated based on Metropolitan's avoided capital and operational costs to convey, treat, and distribute water, and included considerations of reliability and service area demands.

### *Groundwater Recovery Program*

The drought of the early 1990s sparked the need to develop additional local water resources, aside from recycled water, to meet regional demand and increase regional water supply reliability. In 1991, Metropolitan conducted the Brackish Groundwater Reclamation Study which determined that large amounts of degraded groundwater in the region were not being utilized. Subsequently, the Groundwater Recovery Program (GRP) was established to assist the recovery of otherwise unusable groundwater degraded by minerals and other contaminants,

provide access to the storage assets of the degraded groundwater, and maintain the quality of groundwater resources by reducing the spread of degraded plumes.

*Local Resources Program*

In 1995, Metropolitan's Board adopted the Local Resources Program (LRP), which combined the LPP and GRP into one program. The Board allowed for existing LPP agreements with a fixed incentive rate to convert to the sliding scale up to $250 per acre-foot, similar to GRP incentive terms. Those agreements that were converted to LRP are known as "LRP Conversions."

*Competitive Local Projects Program*

In 1998, the Competitive Local Resources Program (Competitive Program) was established. The Competitive Program encouraged the development of recycled water and recovered groundwater through a process that emphasized cost-efficiency to Metropolitan, timing new production according to regional need while minimizing program administration cost. Under the Competitive Program, agencies requested an incentive rate up to $250 per acre-foot of production over 25 years under a Request for Proposals (RFP) for the development of up to 53,000 acre-feet per year of new water recycling and groundwater recovery projects. In 2003, a second RFP was issued for the development of an additional 65,000 acre-feet of new recycled water and recovered groundwater projects through the LRP.

*Seawater Desalination Program*

Metropolitan established the Seawater Desalination Program (SDP) in 2001 to provide financial incentives to member agencies for the development of seawater desalination projects. In 2014, seawater desalination projects became eligible for funding under the LRP, and the SDP was ended.

*2007 Local Resources Program*

In 2006, a task force comprised of member agency representatives was formed to identify and recommend program improvements to the LRP. As a result of the task force process, the 2007 LRP was established with a goal of 174,000 acre-feet per year of additional local water resource development. The new program allowed for an open application process and eliminated the previous competitive process. This program offered sliding scale incentives of up to $250 per acre-foot, calculated annually based on a member agency's actual local resource project costs exceeding Metropolitan's prevailing water rate.

*2014 Local Resources Program*

A series of workgroup meetings with member agencies was held to identify the reasons why there was a lack of new LRP applications coming into the program. The main constraint identified by the member agencies was that the $250 per acre-foot was not providing enough of an incentive for developing new projects due to higher construction costs to meet water quality requirements and to develop the infrastructure to reach end-use consumers located further from treatment plants. As a result, in 2014, the Board authorized an increase in the maximum incentive amount, provided alternative payment structures, included onsite retrofit costs and reimbursable services as part of the LRP, and added eligibility for seawater desalination projects. The current LRP incentive payment options are structured as follows:

- Option 1 – Sliding scale incentive up to $340/AF for a 25-year agreement term
- Option 2 – Sliding scale incentive up to $475/AF for a 15-year agreement term
- Option 3 – Fixed incentive up to $305/AF for a 25-year agreement term

*On-site Retrofit Programs*

In 2014, Metropolitan's Board also approved the On-site Retrofit Pilot Program which provided financial incentives to public or private entities toward the cost of small-scale improvements to their existing irrigation and industrial systems to allow connection to existing recycled water pipelines. The On-site Retrofit Pilot Program helped reduce recycled water retrofit costs to the end-use consumer which is a key constraint that limited recycled water LRP projects from reaching full production capacity. The program incentive was equal to the actual eligible costs of the on-site retrofit, or $975 per acre-foot of up-front cost, which equates to $195 per acre-foot for an estimated five years of water savings ($195/AF x 5 years) multiplied by the average annual water use in previous three years, whichever is less. The Pilot Program lasted two years and was successful in meeting its goal of accelerating the use of recycled water.

In 2016, Metropolitan's Board authorized the On-site Retrofit Program (ORP), with an additional budget of $10 million. This program encompassed lessons learned from the Pilot Program and feedback from member agencies to make the program more streamlined and improve its efficiency. As of fiscal year 2019/20, the ORP has successfully converted 440 sites, increasing the use of recycled water by 12,691 acre-feet per year.

*Stormwater Pilot Programs*

In 2019, Metropolitan's Board authorized both the Stormwater for Direct Use Pilot Program and a Stormwater for Recharge Pilot Program to study the feasibility of reusing stormwater to help meet regional demands in Southern California. These pilot programs are intended to encourage the development, monitoring, and study of new and existing stormwater projects by providing financial incentives for their construction/retrofit and monitoring/reporting costs. These pilot programs will help evaluate the potential benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches. Metropolitan's Board authorized a total of $12.5 million for the stormwater pilot programs ($5 million for the District Use Pilot and $7.5 million for the Recharge Pilot).

*Current Status and Results of Metropolitan's Local Resource Programs*

Today, nearly one-half of the total recycled water and groundwater recovery production in the region has been developed with an incentive from one or more of Metropolitan's local resource programs. During fiscal year 2020, Metropolitan provided about $13 million for production of 71,000 acre-feet of recycled water for non-potable and indirect potable uses. Metropolitan provided about $4 million to support projects that produced about 50,000 acre-feet of recovered groundwater for municipal use. Since 1982, Metropolitan has invested $680 million to fund 85 recycled water projects and 27 groundwater recovery projects that have produced a cumulative total of about 4 million acre-feet.

<u>Conservation Programs</u>

Metropolitan's regional conservation programs and approaches have a long history. Decades ago, Metropolitan recognized that demand management at the consumer level would be an

important part of balancing regional supplies and demands. Water conservation efforts were seen as a way to reduce the need for imported supplies and offset the need to transport or store additional water into or within the Metropolitan service area. The actual conservation of water takes place at the retail consumer level. Regional conservation approaches have proven to be effective at reaching retail consumers throughout Metropolitan's service area and successfully implementing water saving devices, programs and practices. Through the pooling of funding by Metropolitan's member agencies, Metropolitan is able to engage in regional campaigns with wide-reaching impact. Regional investments in demand management programs, of which conservation is a key part along with local supply programs, benefit all member agencies regardless of project location. These programs help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

*Incentive-Based Conservation Programs*

*Conservation Credits Program*

In 1988, Metropolitan's Board approved the Water Conservation Credits Program (Credits Program). The Credits Program is similar in concept to the Local Projects Program (LPP). The purpose of the Credits Program is to encourage local water agencies to implement effective water conservation projects through the use of financial incentives. The Credits Program provides financial assistance for water conservation projects that reduce demands on Metropolitan's imported water supplies and require Metropolitan's assistance to be financially feasible.

Initially, the Credits Program provided 50 percent of a member agency's program cost, up to a maximum of $75 per acre-foot of estimated water savings. The $75 Base Conservation Rate was established based Metropolitan's avoided cost of pumping SWP supplies. The Base Conservation Rate has been revisited by Metropolitan's Board and revised twice since 1988, from $75 to $154 per acre-foot in 1990 and from $154 to $195 per acre-foot in 2005.

In fiscal year 2020 Metropolitan processed more than 30,400 rebate applications totaling $18.9 million.

*Member Agency Administered Program*

Some member agencies also have unique programs within their service areas that provide local rebates that may differ from Metropolitan's regional program. Metropolitan continues to support these local efforts through a member agency administered funding program that adheres to the same funding guidelines as the Credits Program. The Member Agency Administered Program allows member agencies to receive funding for local conservation efforts that supplement, but do not duplicate, the rebates offered through Metropolitan's regional rebate program.

*Water Savings Incentive Program*

There are numerous commercial entities and industries within Metropolitan's service area that pursue unique savings opportunities that do not fall within the general rebate programs that Metropolitan provides. In 2012, Metropolitan designed the Water Savings Incentive Program (WSIP) to target these unique commercial and industrial projects. In addition to rebates for devices, under this program, Metropolitan provides financial incentives to businesses and

industries that created their own custom water efficiency projects. Qualifying custom projects can receive funding for permanent water efficiency changes that result in reduced potable demand.

*Non-Incentive Conservation Programs*

In addition to its incentive-based conservation programs, Metropolitan also undertakes additional efforts throughout its service area that help achieve water savings without the use of rebates. Metropolitan's non-incentive conservation efforts include:

- residential and professional water efficient landscape training classes
- water audits for large landscapes
- research, development and studies of new water saving technologies
- advertising and outreach campaigns
- community outreach and education programs
- advocacy for legislation, codes, and standards that lead to increased water savings

*Current Status and Results of Metropolitan's Conservation Programs*

Since 1990, Metropolitan has invested $824 million in conservation rebates that have resulted in a cumulative savings of 3.27 million acre-feet of water. These investments include $450 million in turf removal and other rebates during the last drought which resulted in 175 million square feet of lawn turf removed. During fiscal year 2020, 1.06 million acre-feet of water is estimated to have been conserved. This annual total includes Metropolitan's Conservation Credits Program; code-based conservation achieved through Metropolitan-sponsored legislation; building plumbing codes and ordinances; reduced consumption resulting from changes in water pricing; and pre-1990 device retrofits.

**Infeasibility of Accounting Regional Investments in Reduced Reliance Below the Regional Level**

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the individual member agencies or their customers. As described above, the region (through Metropolitan) makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of Metropolitan's investments in Colorado River supplies, groundwater and surface storage, local resources development and demand management measures that reduce reliance on the Delta are collectively funded by revenues generated from the member agencies through rates and charges.

Metropolitan's revenues cannot be matched to the demands or supply production history of an individual agency, or consistently across the agencies within the service area. Each project or program funded by the region has a different online date, useful life, incentive rate and structure, and production schedule. It is infeasible to account for all these things over the life of each project or program and provide a nexus to each member agency's contributions to Metropolitan's revenue stream over time. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by member agencies

and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, Metropolitan's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

## G.8 2015 UWMP Appendix P

The information contained in this Appendix G is also intended to be a new Appendix P attached to IEUA's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). IEUA provided notice of the availability of the draft 2020 UWMP (including this Appendix G which will also be a new Appendix P to its 2015 UWMP) and WSCP and the public hearing to consider adoption of both plans and the addendum to the 2015 UWMP in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The notice of availability of the documents was sent to IEUA's member agencies, as well as cities and counties in IEUA service area. In addition, a public notice advertising the public hearing in English was published in the Inland Valley Daily Bulletin. The notification in English language newspapers was published on 17 May and 24 May 2021. Copies of: (1) the notification letter sent to the member agencies, cities and counties in IEUA service area, and (2) the notice published in the newspapers are included in the 2020 UWMP Appendix E.

Thus, this Appendix G to IEUA's 2020 UWMP, which was adopted with IEUA's 2020 UWMP, will also be recognized and treated as Appendix P to IEUA's 2015 UWMP. IEUA held the public hearing for the draft 2020 UWMP, draft Appendix G as an addendum to the 2015 UWMP, and draft WSCP on June 16, 2021, at the Board of Directors meeting, held online due to COVID-19 concerns. On June 16, IEUA's Board determined that the 2020 UWMP and the WSCP accurately represent the water resources plan for IEUA's service area. IEUA's Board determined that Appendix G to the 2020 UWMP and Appendix P to the 2015 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolution No. 2021-06-10, the Board adopted the 2020 UWMP, Appendix G as an addendum to the 2015 UWMP, and the WSCP and authorized their submittal to the State of California. Copies of Resolution No. 2021-06-10 is included in the 2020 UWMP Appendix D.

**Table G-1: Calculation of IEUA Service Area Water Demands Without Water Use Efficiency**

| Total Service Area Water Demands (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands with Water Use Efficiency Accounted For* | 79,440 | 92,325 | 96,934 | 113,280 | 117,752 | 121,438 | 126,072 | 126,664 |
| Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline | - | 1,975 | 3,292 | 9,788 | 11,984 | 17,257 | 22,570 | 27,802 |
| Service Area Water Demands without Water Use Efficiency Accounted For | 79,440 | 94,300 | 100,226 | 123,068 | 129,736 | 138,695 | 148,642 | 154,466 |

*Demands include imported and recycled water, as found in 2020 UWMP Table 4-3W

**Table G-2: Calculation of IEUA Supplies Contributing to Regional Self-Reliance**

| Water Supplies Contributing to Regional Self-Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Use Efficiency | - | 1,975 | 3,292 | 9,788 | 11,984 | 17,257 | 22,570 | 27,802 |
| Water Recycling | 24,506 | 33,419 | 30,495 | 40,495 | 42,697 | 44,122 | 46,504 | 46,844 |
| Stormwater Capture and Use | - | - | - | - | - | - | - | - |
| Advanced Water Technologies | - | - | - | - | - | - | - | - |
| Conjunctive Use Projects | - | - | - | - | - | - | - | - |
| Local and Regional Water Supply and Storage Projects | - | - | - | - | - | - | - | - |
| Other Programs and Projects the Contribute to Regional Self-Reliance | - | - | - | - | - | - | - | - |
| Water Supplies Contributing to Regional Self-Reliance | 24,506 | 35,394 | 33,787 | 50,283 | 54,681 | 61,379 | 69,074 | 74,646 |

| Service Area Water Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands without Water Use Efficiency Accounted For | 79,440 | 94,300 | 100,226 | 123,068 | 129,736 | 138,695 | 148,642 | 154,466 |

| Change in Regional Self Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Supplies Contributing to Regional Self-Reliance | 24,506 | 35,394 | 33,787 | 50,283 | 54,681 | 61,379 | 69,074 | 74,646 |
| Change in Water Supplies Contributing to Regional Self-Reliance | | 10,888 | 9,281 | 25,777 | 30,175 | 36,873 | 44,568 | 50,140 |

| Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Percent of Water Supplies Contributing to Regional Self-Reliance | 30.8% | 37.5% | 33.7% | 40.9% | 42.1% | 44.3% | 46.5% | 48.3% |
| Change in Percent of Water Supplies Contributing to Regional Self-Reliance | | 6.7% | 2.9% | 10.0% | 11.3% | 13.4% | 15.6% | 17.5% |

**Table G-3: Calculation of MWD Reliance on Water Supplies from the Delta Watershed**

| Water Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| CVP/SWP Contract Supplies | 1,472,000 | 1,029,000 | 984,000 | 1,133,000 | 1,130,000 | 1,128,000 | 1,126,000 | 1,126,000 |
| Delta/Delta Tributary Diversions | | | | | | | | |
| Transfers and Exchanges | 20,000 | 44,000 | 91,000 | 58,000 | 52,000 | 52,000 | 52,000 | 52,000 |
| Other Water Supplies from the Delta Watershed | | | | | | | | |
| Total Water Supplies from the Delta Watershed | 1,492,000 | 1,073,000 | 1,075,000 | 1,191,000 | 1,182,000 | 1,180,000 | 1,178,000 | 1,178,000 |

| Service Area Water Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands without Water Use Efficiency Accounted For | 5,493,000 | 5,499,000 | 5,219,000 | 4,925,000 | 5,032,000 | 5,156,000 | 5,261,000 | 5,374,000 |

| Change in Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Supplies from the Delta Watershed | 1,492,000 | 1,073,000 | 1,075,000 | 1,191,000 | 1,182,000 | 1,180,000 | 1,178,000 | 1,178,000 |
| Change in Water Supplies from the Delta Watershed | | (419,000) | (417,000) | (301,000) | (310,000) | (312,000) | (314,000) | (314,000) |

| Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Percent of Water Supplies from the Delta Watershed | 27.2% | 19.5% | 20.6% | 24.2% | 23.5% | 22.9% | 22.4% | 21.9% |
| Change in Percent of Water Supplies from the Delta Watershed | | -7.6% | -6.6% | -3.0% | -3.7% | -4.3% | -4.8% | -5.2% |

# 2020 Urban Water Management Plan

## Project Lead

**Joshua Aguilar, MsEM, P.E.**
Senior Engineer

## Prepared For

The Inland Empire Utilities Agency

6075 Kimball Avenue,

Chino, California 91708

## Lead Consultant

**Sachi Itagaki, P.E./QSD**
Principal Engineer

## Prepared By

Kennedy Jenks

300 N. Lake Ave, Suite 1020

Pasadena, CA 91101

Phone: 626-568-4300

Fax: 626-683-8938

**Sachi Itagaki, P.E./QSD**

## Kennedy Jenks Reference

KJ 2044518*00

Kennedy Jenks

# WATER FACILITIES AUTHORITY

JUNE 2021

FINAL

# 2020 URBAN WATER MANAGEMENT PLAN

STETSON ENGINEERS INC.

Northern California • Southern California • Arizona • Colorado • Oregon

# Water Facilities Authority
# (WFA)
# 2020 Urban Water Management Plan

**JUNE 2021**

STETSON ENGINEERS INC.

861 Village Oaks Drive, Suite 100 • Covina , California 91724
Phone: (626) 967-6202 • FAX: (626) 331-7065 • Web site: www.stetsonengineers.com

Northern California • Southern California • New Mexico • Arizona • Nevada • Colorado

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## LIST OF ACRONYMS

| | |
|---|---|
| AF | Acre-Feet |
| AFY | Acre-Feet per Year |
| CY | Calendar Year |
| CIMIS | California Irrigation Management Information System |
| CWC | California Water Code |
| DOF | California Department of Finance |
| Delta | Sacramento- San Joaquin Delta |
| DMM | Demand Management Measures |
| DRA | Drought Risk Assessment |
| DWR | California Department of Water Resources |
| EOP | San Bernardino County Emergency Operations Plan |
| ERP | Emergency Response Plan |
| ETo | Evapotranspiration |
| FEMA | Federal Emergency Management Agency |
| FY | Fiscal Year |
| GPCD | Gallons per Capita per Day |
| GIS | Geographical Information Systems |
| HECW | High- Efficiency Clothes Washing Machine |
| HETS | High Efficiency Toilets |
| IEUA | Inland Empire Utilities Agency |
| JPA | Joint Exercise of Powers Agreement |
| kWh | Kilowatt Hours |
| MGD | Million gallons per day |
| MWD | Metropolitan Water District of Southern California |
| M&I | Municipal and Industrial |
| PHET | Premium High- Efficiency Toilets |
| Plan | Urban Water Management Plan |
| PWS | Public Water System |
| RDM | Robust Decision Making |
| RRA | Risk and Resilience Assessment |
| SB | Senate Bill |
| SB X7-7 | The Water Conservation Act of 2009 |
| SCAG | Southern California Association of Governments |
| SCE | Southern California Edison |
| SWRCB-DDW | State Water Resources Control Board - Division of Drinking Water |
| USEPA | United States Environmental Protection Agency |
| UWMP | Urban Water Management Plan |
| WEWAC | Water Education Water Awareness Committee |
| WSAP | MWD's Water Supply Allocation Plan |

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# CHAPTER 1

# URBAN WATER MANAGEMENT PLAN INTRODUCTION AND OVERVIEW

## LAY DESCRIPTION - INTRODUCTION

*An urban water supplier is defined (pursuant to Section 10617 of the California Water Code (CWC)[1]) as "a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers."*

The Water Facilities Authority (WFA) is classified as an urban water supplier because it indirectly serves more than 3,000 customers (i.e. individual metered accounts) and it directly supplies more than 3,000 acre-feet of water annually to its member agency customers for municipal purposes.

In accordance with the "Urban Water Management Planning Act", which was enacted by the California Legislature in 1983, every urban water supplier (including WFA) is required to prepare and adopt an Urban Water Management Plan (UWMP), periodically review its UWMP, and incorporate updated and new information into an updated UWMP at least once every five years.

WFA's most recent update was its 2015 UWMP (or 2015 Plan) which was submitted to, and approved by, the California Department of Water Resources (DWR). Urban water suppliers (including WFA) are required to complete and submit their 2020 UWMPs to DWR by July 1st, 2021.

The current requirements for preparing the UWMP are included in California Water Code (CWC) Sections 10608 and 10610 through 10657. WFA's 2020 UWMP (or 2020 Plan) was prepared consistent with the CWC and the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020" (Final 2020 UWMP Guidebook), dated March 2021.

The UWMP provides urban water suppliers (including WFA) with a planning document for long-term resource planning to ensure adequate water supplies are available to meet existing and future water supply needs. In addition, the 2020 UMWP incorporates water supply reliability determinations resulting from potential prolonged drought, regulatory revisions, and/or changing climatic conditions.

[1] References to CWC Sections in this 2020 UWMP were obtained from https://leginfo.legislature.ca.gov/

WFA's 2020 Plan consists of the following Chapters:

Chapter 1 Urban Water Management Plan Introduction and Overview
Chapter 2 Plan Preparation
Chapter 3 System Description
Chapter 4 Water Use Characterization
Chapter 5 SB X7-7 Baselines, Targets, and 2020 Compliance
Chapter 6 Water Supply Characterization
Chapter 7 Water Service Reliability and Drought Risk Assessment
Chapter 8 Water Shortage Contingency Plan
Chapter 9 Demand Management Measures
Chapter 10 Plan Adoption, Submittal, and Implementation

A lay description is presented at the beginning of each of these Chapters.

## LAY DESCRIPTION – CHAPTER 1

**URBAN WATER MANAGEMENT PLAN INTRODUCTION AND OVERVIEW**

Chapter 1 (Urban Water Management Plan Introduction and Overview) of WFA's 2020 Plan discusses and provides the following:

- An overall lay description of the 2020 Plan, including California Water Code and Urban Water Management Plan Act requirements, is provided. WFA is required to prepare an Urban Water Management Plan.

- WFA's 2020 Plan was prepared consistent with the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020", dated March2021. A description regarding the organization of the 2020 Plan, including a summary of each Chapter, is provided. WFA's Water Shortage Contingency Plan (discussed in Chapter 8) is also included in the 2020 Plan.

- The 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data. These tables are included within the respective sections of the 2020 Plan and in Appendix A.

- WFA's coordination efforts with other planning agencies are discussed, including coordination efforts with the Inland Empire Utilities Agency and the Southern California Association of Governments.

- WFA's eligibility to receive grants and loans administered by the State of California and/or DWR, as a result of preparing the 2020 Plan, is discussed.

- Information is provided which demonstrates WFA's prior, continued, and projected reduction on imported water supplies obtained (either directly or indirectly) from the Sacramento-San Joaquin Delta (Delta). WFA's member agencies collectively have reduced its reliance on imported water supplies for Fiscal Year 2014-15 and Fiscal Year 2019-2020.

- In addition, WFA's member agencies are projected to continue reducing its reliance on imported water supplies through Fiscal Year 2044-45.

- The checklist developed by DWR and used by WFA to incorporate the specific UWMP requirements is discussed. The completed checklist is provided in Appendix C.

## 1.1 RECOMMENDED UWMP ORGANIZATION

WFA's 2020 UWMP (2020 Plan) was prepared consistent with the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020" (Final 2020 UWMP Guidebook), dated March2021. WFA's 2020 Plan consists of the following Chapters:

| | |
|---|---|
| Chapter 1 | Urban Water Management Plan Introduction and Overview |
| Chapter 2 | Plan Preparation |
| Chapter 3 | System Description |
| Chapter 4 | Water Use Characterization |
| Chapter 5 | SB X7-7 Baselines, Targets, and 2020 Compliance |
| Chapter 6 | Water Supply Characterization |
| Chapter 7 | Water Service Reliability and Drought Risk Assessment |
| Chapter 8 | Water Shortage Contingency Plan |
| Chapter 9 | Demand Management Measures |
| Chapter 10 | Plan Adoption, Submittal, and Implementation |

Pursuant to CWC requirements, WFA's 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data. DWR's standardized tables are provided within the body of the 2020 Plan text as well as in Appendix A. WFA also submitted the UWMP data (standardized tables) electronically through DWR's Online Submittal Tool.

WFA's 2020 Plan also provides supporting documents (appendices) including notification letters of the Plan update, public notice of the Plan hearing, and adoption resolution from WFA's governing body. Further discussions regarding these supporting documents are provided within the individual Chapters of WFA's 2020 Plan.

## 1.2 UWMPS IN RELATION TO OTHER EFFORTS

WFA is a wholesale water agency which treats and distributes imported water from Inland Empire Utilities Agency (IEUA), which in-turn is a wholesale supplier of imported water from Metropolitan Water District of Southern California (MWD). WFA's 2020 Plan was prepared in coordination with planning agencies including IEUA's Planning Division, MWD's Planning Division, the San Bernardino County Planning Division, and the

Southern California Association of Governments (SCAG). In addition, WFA's 2020 Plan was prepared using management documents including IEUA's "Strategic Plan Fiscal Years 2015 – 2019" and "Regional Water Use Efficiency Business Plan 2015 – 2020", MWD's "2020 Integrated Water Resources Plan", and San Bernardino County's 2017 "San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan" and "San Bernardino County Emergency Operations Plan (EOP).

WFA is a public water system formed under a Joint Exercise of Powers Agreement (JPA) by a group of local agencies including the Cities of Chino, Chino Hills, Ontario, Upland, and the Monte Vista Water District. Each of WFA's member agencies prepared a 2020 Plan which is incorporated in WFA's 2020 Plan by reference. In addition, WFA provided its 2020 Plan to its member agencies which includes water use projections of its water sales to its member agencies in five-year increments for a normal year, a single dry year, and a five consecutive year drought over the next 25 years.

WFA is a sub-agency of IEUA. WFA purchases untreated, imported water from IEUA. Some of IEUA's retail agencies, which include all of WFA's member agencies, then purchase treated water from WFA. IEUA prepared a 2020 Plan which is incorporated in WFA's 2020 Plan by reference. In addition, WFA provided its 2020 Plan to IEUA which includes water use projections of its water sales to its member agencies in five-year increments for a normal year, a single dry year, and a five consecutive year drought over the next 25 years.

## 1.3 UWMPS AND GRANT OR LOAN ELIGIBILITY

Pursuant to DWR's Final 2020 UWMP Guidebook:

"*In order for a Supplier to be eligible for any water grant or loan administered by DWR, the Supplier must have a current UWMP on file that has been determined by DWR to address the requirements of the Water Code. A current UWMP must also be maintained by the Supplier throughout the term of any grant or loan administered by DWR.*

*A UWMP may also be required in order to be eligible for other state funding, depending on the conditions that are specified in the funding guidelines. Suppliers are encouraged to seek guidance on the specifics of any state funding source from the respective funding agencies. The following sections of the Water Code are pertinent to Suppliers considering pursuit of grants or loans*."

WFA's 2020 Plan has been prepared to meet eligibility requirements for grants and loans administered by the State and/or DWR.

## 1.4 DEMONSTRATION OF CONSISTENCY WITH THE DELTA PLAN FOR PARTICIPANTS IN COVERED ACTIONS

Pursuant to DWR, an urban water supplier that anticipates participating in or receiving water from a proposed project (or "covered action") such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta) should provide information in their 2015 and 2020 UWMPs for use in demonstrating consistency with Delta Plan Policy WR P1, "*Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance.*" In addition, pursuant to California Code of Regulations, Title 23, § 5003:

> *(c)(1) Water suppliers that have done all of the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*
>
> > *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
> >
> > *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*
> >
> > *(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

WFA's member agencies collectively have reduced their reliance on imported water supplies for FY 2014-15 and FY 2019-20. In addition, WFA's member agencies are projected to continue reducing their reliance on imported water supplies through FY 2044-45. A further discussion of WFA's member agencies' collective measurable reduction in imported water reliance and improvement in regional self-reliance is provided in Appendix B.

## 1.5 TIPS FOR UWMP PREPARERS

WFA's 2020 Plan (which includes WFA's 2020 Water Shortage Contingency Plan (WSCP)) is considered an update to WFA's 2015 Plan. However, the 2020 Plan and the WSCP are considered
stand-alone documents. As discussed in Section 1.1, WFA's 2020 Plan was prepared consistent with the recommended organization provided in DWR's Final 2020 UWMP Guidebook.

A checklist of specific UWMP requirements is included in Appendix C. The checklist includes the page number where the required elements are addressed to assist in DWR's review of the submitted Plan.

# CHAPTER 2

# PLAN PREPARATION

## LAY DESCRIPTION – CHAPTER 2

### PLAN PREPARATION

Chapter 2 (Plan Preparation) of WFA's 2020 Plan discusses and provides the following:

- The basis for preparing an Urban Water Management Plan is provided. WFA is required to prepare the 2020 Plan because it is an "urban water supplier" (WFA indirectly serves more than 3,000 customers and it directly supplies more than 3,000 acre-feet of water annually to its customers for municipal purposes).

- WFA's Plan has been prepared as an "individual" plan rather than a "regional" plan in an effort to provide information specific to WFA to best inform its employees, management, and its member agencies.

- Information presented in WFA's 2020 Plan is provided on "Fiscal Year" basis which is from July 1 through June 30 of the following year.

- Water quantities presented in WFA's 2020 Plan are provided on an "acre-foot" basis.

- WFA's coordination and outreach efforts with wholesale water agencies, other retail water agencies, and the community are described. WFA coordinated the preparation of its 2020 Plan with the following:

    - County of San Bernardino
    - City of Ontario
    - City of Chino
    - City of Chino Hills
    - Cucamonga Valley Water District
    - Monte Vista Water District
    - San Antonio Water Company
    - City of Upland
    - Fontana Water Company
    - Local Agency Formation Commission
    - Chino Basin Watermaster
    - Inland Empire Utilities Agency
    - Chino Basin Water Conservation District

- WFA's notification process to the cities and county within which WFA provides water supplies is discussed.

## 2.1 PLAN PREPARATION

As discussed in Section 1.1, WFA's 2020 Plan was prepared consistent with the recommended organization provided in DWR's Final 2020 UWMP Guidebook. Pursuant to DWR's Final 2020 UWMP Guidebook:

"*The California Water Code (Water Code) specifies several requirements for preparing a UWMP, including who is required to prepare a UWMP; how to prepare a UWMP, depending on whether the Supplier choses to participate in a regional or individual planning effort; selection of reporting year-type; and coordination, notification, and outreach.*"

Pursuant to CWC requirements, WFA's 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data.

## 2.2 BASIS FOR PREPARING A PLAN

***CWC 10617.***

> *"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.*

***CWC 10620.***

> *(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*

***CWC 10621.***

> *(a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.*

WFA's 2020 Plan was prepared in accordance with the UWMP Act which was established in 1983. The UWMP Act requires every "urban water supplier" to prepare and adopt a Plan, to periodically review its Plan at least once every five years and make any amendments or changes which are indicated by the review. An "Urban Water Supplier" is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually.

Section 10621(a) of the CWC states, "*Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update".* As a result, DWR requires the 2020 Plans be submitted by July 1, 2021.

WFA is an "urban water supplier" pursuant to Section 10617 of the CWC and indirectly serves potable water to more than 3,000 customers and directly supplies more than 3,000 acre-feet per year (AFY) at retail for municipal purposes. WFA's 2020 Plan is an update to WFA's 2015 Plan.

### *2.2.1* PUBLIC WATER SYSTEMS

**CWC 10644.**

> *(a)(2) The plan, or amendments to the plan, submitted to the department … shall include any standardized forms, tables, or displays specified by the department.*

**California Health and Safety Code 116275.**

> *(h) "Public water system" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.*

Pursuant to CWC requirements, WFA's 2020 Plan incorporates DWR's standardized tables for the reporting and submittal of UWMP data. The standardized tables are provided within the body of the 2020 Plan text as well as in Appendix A. WFA also submitted the UWMP data (from the standardized tables) electronically through DWR's Online Submittal Tool.

WFA is a Public Water System (PWS) which is regulated by the State Water Resources Control Board - Division of Drinking Water (SWRCB-DDW). The PWS number for WFA is CA3610006. However, as a wholesale water agency, WFA is not required by DWR to provide PWS information.

**Table 2-1 Public Water Systems (Not Applicable to Wholesalers)**

### 2.2.2 SUPPLIERS SERVING MULTIPLE SERVICE AREAS / PUBLIC WATER SYSTEMS

WFA has developed its 2020 Plan reporting solely on its water sales to its member agencies to address all requirements of the CWC. However, based upon their 2020 water production and imported water deliveries, the following urban water suppliers (or PWS) receiving water supplies from WFA are also required to prepare a Plan:

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Upland
- Monte Vista Water District

## 2.3 REGIONAL PLANNING

WFA has developed its 2020 Plan reporting solely on its water sales to its member agencies to address all requirements of the CWC. WFA's 2020 Plan was not developed as a Regional Plan. However, WFA's Plan is available for use and reference to its member agencies.

WFA coordinated with its member agencies regarding the development of their 2020 Plans. Likewise, IEUA's and MWD's 2020 Plans are available for use and reference by its member agencies and urban water suppliers within those member agencies.

## 2.4 INDIVIDUAL OR REGIONAL PLANNING AND COMPLIANCE

As shown in Table 2-2, WFA's 2020 Plan is an "Individual UWMP". WFA has developed its 2020 Plan reporting solely on its water sales to its member agencies to address all requirements of the CWC. WFA notified and coordinated with appropriate regional agencies and constituents (See Section 2.6).

**Table 2-2 Plan Identification Type**

| Submittal Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list) |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☐ | Water Supplier is also a member of a Regional Alliance | |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

## 2.4.1 REGIONAL UWMP

**CWC 10620.**

> *(d)(1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.*

As indicated in Table 2-2, WFA's 2020 Plan was developed as an "Individual UWMP" and not part of a Regional Plan.

### 2.4.2 REGIONAL ALLIANCE

**CWC 10608.20.**

*(a)(1) …Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28…*

**CWC 10608.28.**

*(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:*

*(1) Through an urban wholesale water supplier.*
*(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).*
*(3) Through a regional water management group as defined in Section 10537.*
*(4) By an integrated regional water management funding area.*
*(5) By hydrologic region.*
*(6) Through other appropriate geographic scales for which computation methods have been developed by the department.*

*(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.*

As indicated in Table 2-2, WFA's 2020 Plan was developed as an "Individual UWMP" and not part of a Regional Alliance.

## 2.5 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

**CWC 10608.20.**

*(a)(1) Urban retail water suppliers…may determine the targets on a fiscal or calendar year basis.*

### 2.5.1 FISCAL OR CALENDAR YEAR

The data provided in WFA's 2020 Plan is reported on a fiscal year (FY) basis, unless noted otherwise, as shown in Table 2-3. A FY begins on July 1st of every year.

### 2.5.2 REPORTING COMPLETE 2020 DATA

The data provided in WFA's 2020 Plan is provided on a FY basis through June 30, 2020.

### 2.5.3 UNITS OF MEASURE

As shown in Table 2-3, the data provided in WFA's 2020 Plan is reported in units of AF, unless noted otherwise.

**Table 2-3 Supplier Identification**

| Submittal Table 2-3: Supplier Identification | |
|---|---|
| Type of Supplier (select one or both) | |
| ☑ | Supplier is a wholesaler |
| ☐ | Supplier is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☐ | UWMP Tables are in calendar years |
| ☑ | UWMP Tables are in fiscal years |
| If using fiscal years provide month and date that the fiscal year begins (mm/dd) | |
| *07/01* | |
| Units of measure used in UWMP * (select from drop down) | |
| Unit | AF |
| **** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | |
| NOTES: | |

## 2.6 COORDINATION AND OUTREACH

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

### 2.6.1 WHOLESALE AND RETAIL COORDINATION

WFA is a wholesale agency serving five (5) member agencies. The following is a list of WFA's member agencies:

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Upland
- Monte Vista Water District

As indicated in Table 2-4, WFA has provided its 2020 Plan to its member agencies which includes water use projections of its water sales to its member agencies in five-year increments for a normal year, a single dry year, and a five consecutive year drought conditions over the next 25 years.

**Table 2-4 Water Supplier Information Exchange**

| Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one) | |
|---|---|
| ☑ | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed. |
| Section 2.6 | **Provide page number for location of the list.** |
| ☐ | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.** |
| Water Supplier Name | |
| *Add additional rows as needed* | |
| | |
| | |
| | |
| NOTES: | |

### 2.6.2 COORDINATION WITH OTHER AGENCIES AND THE COMMUNITY

**CWC 10620.**

> *(d)(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

**CWC 10642.**

> *Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan…*

WFA is a wholesale water supplier that provides treated imported water from the State Water Project through IEUA to its member agencies. WFA notified its member agencies (including cities within the area receiving its water supplies) and public agencies that share a common source of supply of the preparation of WFA's 2020 Plan. WFA regularly updated its member agencies on the development of its 2020 Plan. In addition to its member agencies, WFA informed the following agencies regarding the availability of copies of the draft plan for their review:

- County of San Bernardino
- City of Ontario
- City of Chino
- City of Chino Hills
- Cucamonga Valley Water District
- Monte Vista Water District
- San Antonio Water Company
- City of Upland
- Fontana Water Company
- Local Agency Formation Commission
- Chino Basin Watermaster
- Inland Empire Utilities Agency
- Chino Basin Water Conservation District

As discussed in Section 10.2, WFA notified these agencies, as well as the cities and county within which WFA provides water supplies, at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited them to participate in the development of the 2020 Plan. A copy of the notification letters sent to these agencies is provided in Appendix D.

### 2.6.3 NOTICE TO CITIES AND COUNTIES

**CWC 10621.**

> *(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

As discussed in Section 10.2, notification was provided to the cities and county within which WFA provides water supplies that WFA was reviewing and considering amendments (updates) to the previous 2015 Plan, and as a result prepare the 2020 Plan. Notification was provided at least 60 days prior to the public hearing (see Appendix D).

# CHAPTER 3

# SYSTEM DESCRIPTION

## LAY DESCRIPTION – CHAPTER 3

### SYSTEM DESCRIPTION

Chapter 3 (System Description) of WFA's 2020 Plan discusses and provides the following:

- A description of the area receiving water supplies from WFA is provided. The area receiving water supplies from WFA encompasses the Cities of Chino, Chino Hills, Montclair, Ontario, and Upland and portions of San Bernardino County. WFA was formed under a JPA to acquire and construct facilities to supply and distribute potable water to its member agencies.

- The area receiving water supplies from WFA encompasses an area of approximately 148 square miles. The location of the area receiving water supplies form WFA is provided in Figure 1.

- A description regarding the climate of the area receiving water supplies from WFA is provided. The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly evapotranspiration in the vicinity of the area receiving water supplies from WFA area is summarized. The sources of the climate information are also discussed.

- The population within the area receiving water supplies from WFA is discussed and projected. The sources of the population information are also discussed. WFA provides water service to an area with a current population of 476,580. The area receiving water supplies from WFA is projected to have a population of 588,893 by Fiscal Year 2044-45.

- A discussion of land use information used by WFA to develop the 2020 Plan is provided. WFA reviewed the current and projected land uses within its service area. WFA also reviewed data provided by the Southern California of Governments, the Department of Finance, and the United States Census Bureau and prepared for counties, cities, and unincorporated areas within Southern California.

## 3.1 GENERAL DESCRIPTION

**CWC 10631.**

*(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.*

On February 19, 1980, WFA was formed under a JPA to acquire and construct facilities to supply and distribute potable water to its member agencies. Member agencies are entirely within San Bernardino County. A map showing the area which receives water supplies from WFA, which is 148 square miles, is provided in Figure 1.

WFA purchases untreated imported water from MWD through IEUA, then treats and delivers the water to its member agencies. WFA owns and operates the Agua de Lejos Treatment Plant in the City of Upland, a conventional surface water treatment facility that treats and disinfects water supplies from the State Water Project provided by MWD. The Agua de Lejos Treatment Plant began operating in 1988 and has a treatment capacity of 81 million gallons per day (MGD).

WFA is guided by a five-member Board of Directors. Each retail agency of WFA appoints, by Resolution of its governing body, one member of its governing body to act as its representative on the Board.

## 3.2 SERVICE AREA BOUNDARY MAPS

As discussed in Section 3.1, the area receiving water supplies from WFA covers approximately 148 square miles, encompassing the Cities of Chino, Chino Hills, Montclair, Ontario, and Upland and portions of San Bernardino County. The area receiving water supplies from WFA relative to the municipal boundaries within the Counties of Los Angeles, San Bernardino, and Riverside is also provided in Figure 2. The locations of WFA's member agency service areas are provided in Figure 3.

A map of the area receiving water supplies from WFA was submitted online through DWR's Population Tool in a "KML" file format (i.e. Google Earth format). The KML file was originally

FIGURE 1

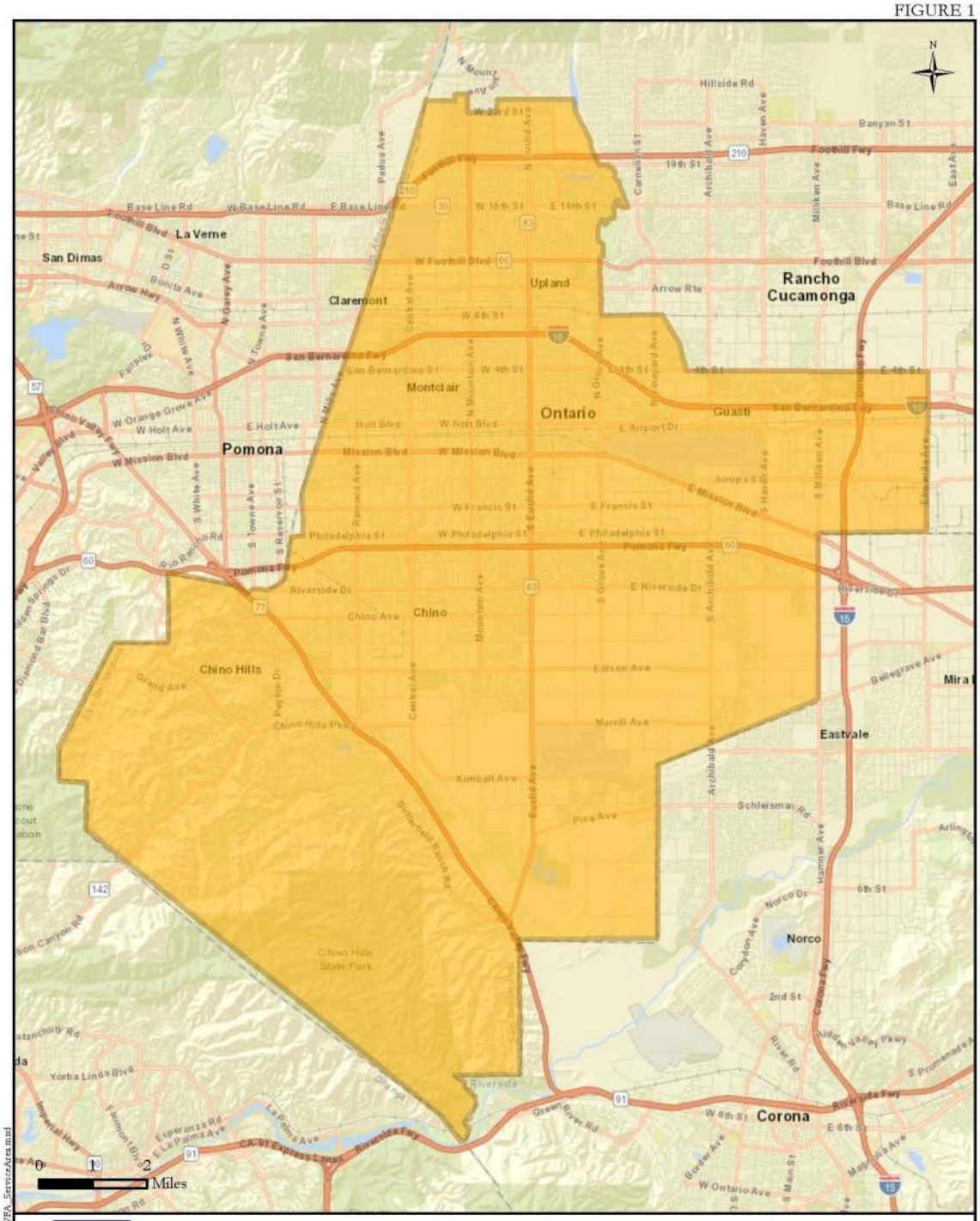


WATER FACILITIES AUTHORITY
WATER SERVICE AREA

STETSON ENGINEERS INC.

Document Path: \\n2741\WFA_ServiceArea.mxd

FIGURE 2

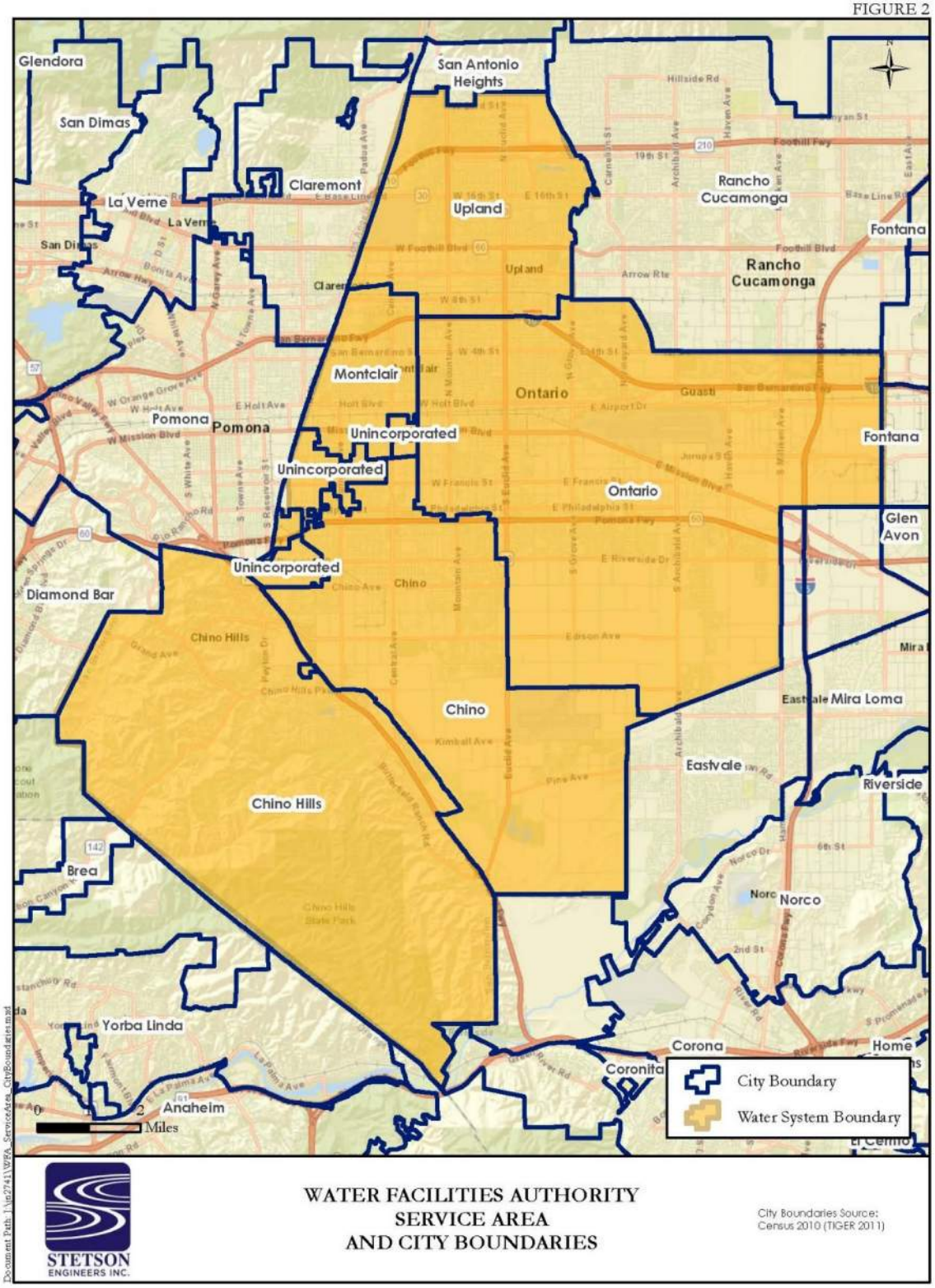
Glendora
San Antonio Heights
San Dimas
Claremont
La Verne
Upland
Rancho Cucamonga
Fontana
Montclair
Ontario
Pomona
Unincorporated
Unincorporated
Unincorporated
Glen Avon
Diamond Bar
Chino
Chino Hills
Mira Loma
Eastvale
Riverside
Brea
Norco
Yorba Linda
Corona
Coronita
Anaheim
0
2
Miles
City Boundary
Water System Boundary
STETSON ENGINEERS INC.
WATER FACILITIES AUTHORITY
SERVICE AREA
AND CITY BOUNDARIES
City Boundaries Source:
Census 2010 (TIGER 2011)

FIGURE 3

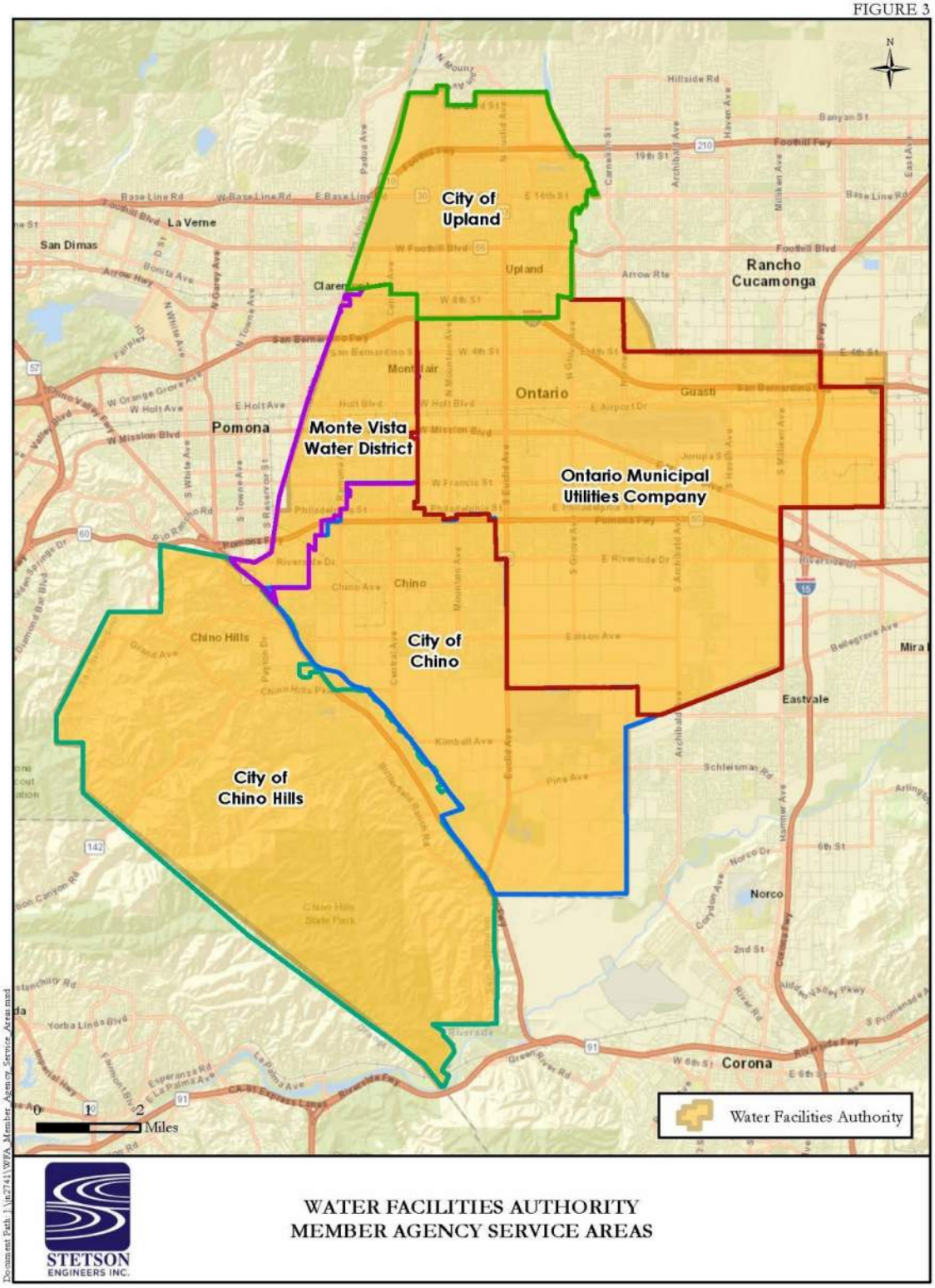


WATER FACILITIES AUTHORITY
MEMBER AGENCY SERVICE AREAS

STETSON ENGINEERS INC.

Document Path: J:\jn2741\WFA_Member_Agency_Service_Areas.mxd

created in a Geographical Information Systems (GIS) shape file format and converted into a KML format. To the extent information was available, metadata was included in the KML file (including map projection, contact information, start and end dates for which the map is valid, constraints, attribute table definitions, and digitizing base).

## 3.3 SERVICE AREA CLIMATE

**CWC 10631.**

*(a) Describe the service area of the supplier, including … climate…*

**CWC 10630.**

*It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.*

The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly evapotranspiration in the vicinity of the area receiving water supplies from WFA is summarized in the tabulation below. Historical climate information was obtained from the Western Regional Climate Center (WRCC), the National Oceanic and Atmospheric Administration, and from DWR's California Irrigation Management Information System (CIMIS).

## Service Area Climate Information

| Month | Average Temperature (F) | Average Minimum Temperature (F) | Average Maximum Temperature (F) | Average Total Precipitation (Inches) | ETo (Inches) |
|---|---|---|---|---|---|
| **January** | 55.5 | 44.1 | 67.6 | 2.2 | 1.95 |
| **February** | 55.1 | 44.9 | 67.4 | 2.7 | 2.41 |
| **March** | 58.8 | 48.2 | 58.8 | 1.3 | 3.75 |
| **April** | 60.9 | 51.0 | 74.8 | 0.9 | 4.55 |
| **May** | 67.9 | 55.6 | 79.6 | 0.3 | 5.19 |
| **June** | 71.2 | 59.8 | 86.2 | 0.0 | 5.97 |
| **July** | 77.8 | 64.7 | 93.1 | 0.1 | 6.60 |
| **August** | 78.9 | 65.2 | 94.2 | 0.0 | 6.41 |
| **September** | 75.4 | 62.9 | 90.7 | 0.1 | 4.88 |
| **October** | 67.8 | 56.6 | 82.0 | 0.5 | 3.46 |
| **November** | 58.9 | 48.6 | 73.9 | 0.8 | 2.31 |
| **December** | 54.7 | 43.2 | 66.2 | 1.9 | 1.72 |
| **Annual** | 65.2 | 53.7 | 77.9 | 10.7 | 49.20 |

**Source:**

Historical average monthly precipitation and temperature information was obtained from the National Oceanic and Atmospheric Administration (https://search.usa.gov/search?utf8=%E2%9C%93&affiliate=noaa.gov&query=ontario+ca) from 1998 through 2020 (for Ontario International Airport). Historical monthly average ETo information was obtained from the California Irrigation Management Information Systems (http://wwwcimis.water.ca.gov) and is based on data collected from Station 255 (Chino).

The historical average rainfall in the vicinity of the area receiving water supplies from WFA is 10.7 inches. WFA's service area has a Mediterranean climate and summers can reach maximum daily temperatures of over 90 degrees Fahrenheit. Although changes in climatic conditions may have an impact (as discussed in Section 4.5), the projected water supply demands of its member agencies will be based on an average year, a single dry year, and a five consecutive year drought conditions, based on historical data and projected member agency demands. Precipitation within the vicinity of the area receiving water supplies from WFA is discussed further in Section 7.2. A discussion of WFA's source of supply, how that may be impacted by climate change, and the

proactive actions WFA and other local/regional water managers may take to address the potential climate change on the water supply is provided in Section 4.5.

## 3.4 SERVICE AREA POPULATION AND DEMOGRAPHICS

### 3.4.1 *SERVICE AREA POPULATION*

**CWC 10631.**

> *(a) Describe the service area of the supplier, including current and projected population… The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

WFA provides water service to an area with a current population of 476,580. Table 3-1 presents the current and projected population of the area receiving water supplies from WFA from FY 2019-20 to FY 2044-45. The area receiving water supplies from WFA is projected to have a population of 588,893 by FY 2044-45.

A discussion of the methodology used to calculate the current FY 2019-20 population within the area receiving water supplies from WFA is provided in Section 5.4 and is consistent with DWR requirements.

Projected populations in the area receiving water supplies from WFA were based on growth rate projections obtained from data provided by the SCAG. The data provided by SCAG was based on their "The 2020-2045 Regional Transportation Plan / Sustainable Communities Strategy of the SCAG", dated September 2020, and incorporates demographic trends, existing land use, general plan land use policies, and input and projections through the year 2045 from the Department of Finance (DOF) and the U.S. Census Bureau for counties, cities, and unincorporated areas within Southern California.

**Table 3-1 Population – Current and Projected**

| Submittal Table 3-1 Wholesale: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 *(opt)* |
| | 476,580 | 497,517 | 519,373 | 542,712 | 565,331 | 588,893 |
| NOTES: The 2020 population and the populations projected through 2045 were based on SCAG population data, IEUA's projected population, and the percentage of WFA's service area within IEUA's service area (See Section 3.4.1 and Section 5.4.1). | | | | | | |

### 3.4.2 OTHER SOCIAL, ECONOMIC, AND DEMOGRAPHIC FACTORS

**CWC 10631.**

*(a) Describe the service area of the supplier, including… other social, economic, and demographic factors affecting the supplier's water management planning.*

No other demographic factors affect WFA's water management planning. However, increased population in general will have an impact on water demand. WFA's member agencies have limited allocations of treated water from the treatment plant, based on their ownership and treatment capacity. Further, the Tier 1 allocation of imported water available to the treatment plant is also limited to 31,384 AF per year by Inland Empire Utilities Agency (IEUA), under normal conditions. Under dry conditions, this allocation can be further reduced by Metropolitan Water District's (MWD) implementation of their Water Supply Allocation Plan. As a result, while the member agencies, as retail agencies, may directly experience additional urban development (where available), changing demographics and economic factors, their imported water supply from the WFA is limited, as indicated. To exceed their annual allocated supply, significant price increases are imposed by MWD for those purchases made in excess of the Tier 1 allocation. For the WFA, the individual demands from its member agencies for imported water supply collectively creates the demand at the treatment plant. Before exceeding their Tier 1 allocation, the member agencies will draw from their other sources of supply in their water supply portfolio and examine their opportunities for improved efficiencies. The imported water supply made available to WFA limits what is made available to its member agencies through the Tier 1 allocation. Other factors may influence how the member agencies utilize their water supply portfolio, including their limited imported water supply, with WFA's management planning focused primarily on the factors impacting the imported water supply allocation from MWD. During shortage allocations, IEUA has the ability to augment its imported water supply to its member agencies up to 23,531 AF per year in accordance with its contract with MWD (Draft IEUA 2020 WSCP Section 5.3). Therefore, WFA's imported water allocation may be supplemented by IEUA's augmented imported water supply.

## 3.5 LAND USES WITHIN SERVICE AREA

WFA is a wholesale water agency which treats and provides imported water to its retail member agencies. Therefore, WFA does not provide water directly to retail customers. As discussed in Section 3.4, WFA also obtained data from the SCAG document entitled "The 2020-2045 Regional Transportation Plan / Sustainable Communities Strategy of the SCAG", dated September 2020. Projected populations in the area receiving water supplies from WFA were based on growth rate projections developed by SCAG. The data provided by SCAG incorporates demographic trends,

existing land use, general plan land use policies, and input and projections through the year 2045 from the Department of Finance and the U.S. Census Bureau for counties, cities, and unincorporated areas within Southern California. The projected population within the area receiving water supplies from WFA was used to project future demand from its member agencies through the year 2045. As discussed in Section 2.6, WFA coordinated the preparation of the 2020 Plan with the Cities of Chino, Chino Hills, Ontario, Upland, the County of San Bernardino, Monte Vista Water District, and other agencies.

# CHAPTER 4
# WATER USE CHARACTERIZATION

## LAY DESCRIPTION – CHAPTER 4

**WATER USE CHARACTERIZATION**

Chapter 4 (Water Use Characterization) of WFA's 2020 Plan discusses and provides the following:

- WFA provides water service to an individual water use category. This water use category is sales to other agencies. A description for this water use category is provided in Section 4.2.1.
- WFA's total water demands from its member agencies over the past 10 years have ranged from 15,387 AFY to 28,455 AFY, with an average of 23,952 AFY. WFA currently measures its water use through meter data and billing records.
- WFA's current and projected water demands from its member agencies are provided in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 4-3.
- WFA's source of water supply and how that source may be impacted by climate change are discussed. The proactive actions WFA and other local/regional water managers may take to address the potential climate change impacts on water supplies are also discussed.

## 4.1 NON-POTABLE VERSUS POTABLE WATER USE

Chapter 4 addresses WFA's potable water demands. Recycled water demands are addressed separately in Section 6.5; however, recycled water is not served by WFA, as shown in Table 4-3. Raw water also is not served by WFA and is not applicable.

## 4.2 PAST, CURRENT, AND PROJECTED WATER USES BY SECTOR

**CWC 10635.**

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following…*

*(2) The water use projections shall be in the same five-year increments described in subdivision (a).*

*(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

*(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:*

*(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.*
*(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

The current and projected water demands from WFA's member agencies are provided in five-year increments over the next 25 years (through FY 2044-45) in Tables 4-1, 4-2, and 4-3. Total water demands from its member agencies were projected based on the current water use factor incorporating recent water demands from member agencies within the area receiving water supplies from WFA.

WFA provides water service to one individual "water use sector" as identified by the CWC. The water use sector supplied by WFA is discussed in Section 4.2.1. The water use for this sector during FY 2019-20 is provided in Table 4-1. The projected water use for this water use sector is provided in Table 4-2 and is based on the water use factor from the water use sector in FY 2019-20 (the projected populations within the area receiving water supplies from WFA were then applied to the water use factor).

### 4.2.1 WATER USE SECTORS LISTED IN WATER CODE

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:*

*(A) Single-family residential.*
*(B) Multifamily.*
*(C) Commercial.*
*(D) Industrial.*
*(E) Institutional and governmental.*
*(F) Landscape.*
*(G) Sales to other agencies.*
*(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.*
*(I) Agricultural.*
*(J) Distribution system water loss.*

As shown in Table 4-1, WFA's includes the following water use sector listed in the CWC:

- Sales to Other Agencies
  (Water sales made to another agency. Projected sales may be based on projected demand provided by the receiving agency. There is inherent uncertainty in future projections, therefore, any projected sales reported in the Plan are for planning purposes only and are not considered a commitment on the part of the seller. This is a wholesale demand.)

### 4.2.2 WATER USE SECTORS IN ADDITION TO THOSE LISTED IN WATER CODE

WFA's does not include other water demand sectors which are not listed in the CWC (including exchanges, surface water augmentation, transfers, and wetlands or wildlife habitat).

### 4.2.3 PAST WATER USE

Chapter 6 provides a discussion of the source of water supply WFA uses to meet its water demands from its member agencies. Section 6.1 provides a tabulation of WFA's historical annual water demands from its member agencies for its water supply source. Over the past ten years, the total water demands have ranged from 15,387 AFY to 28,455 AFY, with an

average of 23,952 AFY. In addition, WFA recently experienced a five consecutive year drought within the area receiving its water supplies from FY 2011-12 to FY 2015-16. WFA also reviewed its historical water demands from its member agencies to determine the projected water demands from its member agencies and water supply reliability (discussed in Chapter 7).

### 4.2.4 DISTRIBUTION SYSTEM WATER LOSS

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following…*

*(J) Distribution system water loss.*

**CWC 10631.**

*(3)(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.*

*(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.*

*(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.*

As a wholesale supplier, WFA is not required by DWR to perform water loss audits and report distribution system water loss.

### 4.2.5 CURRENT WATER USE

WFA currently measures its water use through meter data and billing records. The water use for WFA's water use sector during FY 2019-20 is provided in Table 4-1. Recycled water demands are addressed separately in Section 6.5; however, recycled water is not served by WFA, as shown in Table 4-3. Raw water also is not served by WFA and is not applicable.

DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and

assess monthly water use trends. However, DWR has deemed the tool as optional and WFA is not required by DWR to use the tool. However, Section 6.1 provides a tabulation of WFA's historical annual water use for its water supply source. During the past 10 years, WFA experienced a five consecutive year drought within the area receiving its water supplies from FY 2011-12 to FY 2015-16. A further discussion regarding the reliability of WFA's water supply source is provided in Chapter 7.

### 4.2.6 PROJECTED WATER USE

**CWC 10635.**

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

**CWC 10631.**

*(d)(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

*(d)(4)(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:*

> *(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.*
> *(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

WFA's projected water demands from its member agencies are provided in five-year increments over the next 25 years (through FY 2044-45) in Table 4-3. WFA's projected water demands from its member agencies and water supplies during a normal year, a single dry year, and a five consecutive year drought are provided in Chapter 7. The projected water demands for WFA's water use sector is provided in Table 4-2.

WFA's water demands from its member agencies were projected based on the existing water use factor incorporating recent water demands from its member agencies, and the total population projections based on land use trends within the area receiving water supplies from WFA. A discussion of WFA's water supplies from IEUA, a wholesaler, are discussed in Section 6.2. As discussed in Section 2.6, WFA has coordinated its water demand projections from its member agencies with IEUA for the water use sector.

As a wholesale supplier, WFA's water demand projections from its member agencies are not required by DWR to incorporate water savings, or "passive savings", which are the result of implementation of new plumbing codes along with consumer awareness of the need to conserve water.

### *4.2.7 CHARACTERISTIC FIVE-YEAR WATER USE*

**CWC 10635.**

> *(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:*
>
> *(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.*
>
> *(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

WFA's projected water demands from its member agencies are provided in five-year increments over the next 25 years (and through FY 2044-45) in Table 4-3. WFA's projected water demands from its member agencies and water supply during a normal year, a single dry year, and a five consecutive year drought over the next 25 years (and through FY 2044-45) are provided in Chapter 7.

WFA's "Drought Risk Assessment" (DRA) for the next five years (from FY 2020-21 through FY 2024-25) is discussed in Section 7.3. The DRA includes WFA's projected annual water demands from its member agencies and supplies for each of the next five years and was prepared based on the five driest consecutive years on record. The DRA provides an assessment of WFA's water service reliability during a drought lasting five years. The DRA reflects anticipated water demands from its member agencies and supplies

prior to any expected benefits associated with water supply shortage responses included in WFA's WSCP (provided in Chapter 8). In addition to historical drought hydrology, WFA considered impacts to water supplies and demands from its member agencies based on climate change conditions (discussed in Section 4.5).

## 4.3 WORKSHEETS AND REPORTING TABLES

WFA's current and projected water demands from its member agencies, including the water demands for WFA's water use sector, is provided in five-year increments over the next 25 years (and through FY 2044-45) in Tables 4-1, 4-2, and 4-3.

### *4.3.1 OPTIONAL PLANNING TOOL USE ANALYSIS WORKSHEET*

As discussed in Section 4.2.5, DWR has deemed the "Planning Tool Worksheet" as optional and WFA is not required by DWR to use the tool. A further discussion regarding the reliability of WFA's water supply source is provided in Chapter 7.

### *4.3.2 DWR 2020 UWMP SUBMITTAL TABLES*

WFA's current water demands from its member agencies for its water use sector during FY 2019- 20 are provided in Table 4-1. WFA's projected water demands from its member agencies for the water use sector, in five-year increments over the next 25 years (and through FY 2044-45), are provided in Table 4-2. WFA's total projected water demands from its member agencies in five- year increments over the next 25 years (and through FY 2044-45), are summarized in Table 4-3. As a wholesale supplier, WFA is not required by DWR to perform water loss audits and report distribution system water loss.

**Table 4-1 Demands for Potable and Non-Potable Water – Actual**

| Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual | | | |
|---|---|---|---|
| Use Type | 2020 Actual | | |
| **Drop down list**<br>May select each use multiple times<br>These are the only use types that will be recognized by the WUE data online submittal tool | Additional Description (as needed) | Level of Treatment When Delivered<br>Drop down list | Volume[2] |
| Add additional rows as needed | | | |
| Sales to other agencies | Member Agencies | Drinking Water | 23,435 |
| Groundwater recharge | MVWD Aquifer Injection | Drinking Water | 2,051 |
| Other Non-Potable | Upland #3 | Raw Water | 5 |
| | | | |
| | | **TOTAL** | 25,491 |

*[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
*[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: "Other Non-Potable" was a temporary connection that is no longer in use.

**Table 4-2 Use for Potable and Non-Potable Water – Projected**

| Submittal Table 4-2 Wholesale: Use for Potable and Raw Water [1] - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type | Additional Description (as needed) | Projected Water Use [2]<br>Report To the Extent that Records are Available | | | | |
| **Drop down list**<br>May select each use multiple times<br>These are the only Use Types that will be recognized by the WUEdata online submittal tool. | | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Add additional rows as needed | | | | | | |
| Sales to other agencies | | 28,185 | 29,422 | 30,745 | 32,027 | 33,361 |
| Groundwater recharge | | 2,466 | 2,575 | 2,690 | 2,802 | 2,919 |
| | **TOTAL** | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |

*[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
*[2] Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

**Table 4-3 Total Gross Water Use (Potable and Non-Potable)**

| Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable) | | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Potable and Raw Water<br>From Tables 4-1W and 4-2W | 25,491 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Recycled Water Demand*<br>From Table 6-4W | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL WATER DEMAND** | 25,491 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| **Recycled water demand fields will be blank until Table 6-4 is complete.* | | | | | | |
| NOTES: | | | | | | |

**Table 4-4 12 Month Water Loss Audit Report (Not Applicable to Wholesalers)**

## 4.4 WATER USE FOR LOWER INCOME HOUSEHOLDS

**CWC 10631.1.**

*(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.*

**California Health and Safety Code 50079.5.**

*(a) "Lower income households" means persons and families whose income does not exceed the qualifying limits for lower income families… In the event the federal standards are discontinued, the department shall, by regulation, establish income limits for lower income households for all geographic areas of the state at 80 percent of area median income, adjusted for family size and revised annually.*

As a wholesale supplier, WFA is not required by DWR to report projected water demands for lower income single-family and multi-family households.

## 4.5 CLIMATE CHANGE CONSIDERATIONS

**CWC 10630.**

> *It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.*

**CWC 10635.**

> *(b)Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…*
>
> *(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

Climate is defined as "the average course or condition of the weather at a place usually over a period of years as exhibited by temperature, wind velocity and precipitation[2]". A change in the climate which produces a greater amount of precipitation (i.e. more runoff and/or snowpack) and lower temperatures is generally a benefit to water supplies. However, drought conditions which may result in decreased precipitation, decreased runoff, and increased temperature may adversely affect an urban water supplier's ability to meet demands by potentially impacting supplies. Consequently, the focus of impacts of climate change is on these adverse consequences.

Section 6.2 of this Plan describes WFA's source of water supply, management practices associated with that source, and the long-term reliability of that source. Section 7.3 includes a Drought Risk Assessment which considers the potential impacts of climate change to WFA's water supply source. Chapter 8 provides a detailed discussion of WFA's WSCP, including but not limited to, the six standard water shortage levels in the event climate change results in a reduction to water supplies associated with a periodic drought condition. The following is a discussion of WFA's source of supply, how that source may be impacted by climate change, and the proactive actions WFA and other local/regional water managers may take to address the potential climate change impacts on water supplies.

[2] www.merriam-webster.com

Imported Water Supplies

WFA receives untreated imported from MWD through IEUA as discussed in Section 6.2.1. MWD has prepared a Regional 2020 UWMP which includes a discussion (Section 2.6 in MWD's 2020 UWMP) of the reliability of its water supplies and the impacts of climate change and is incorporated by reference in this Plan. Furthermore, WFA is a sub-agency of IEUA which has also provided a discussion of climate change considerations and that discussion is included by reference. The following is a brief summary of MWD's efforts:

Resource Planning

- MWD has established the Robust Decision Making (RDM) approach to identify vulnerabilities to its water supplies. Climate change information was applied to MWD's simulated water supply scenarios to demonstrate the vulnerability of water supplies to climate change.

Knowledge Sharing and Research Support

- MWD is an active and founding member of the Water Utility Climate Alliance (WUCA) which includes 12 nationwide partners collaborating on climate change considerations. As such, MWD shares agency actions on climate change and adaptation. WUCA has also released numerous research papers on climate change.

Implementation of Programs and Policies

- MWD's programs include the use of solar energy, use of ride share programs, and reduction of greenhouse emissions. Collectively these actions are intended to impact the effects of climate change.

# CHAPTER 5
# SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

## LAY DESCRIPTION – CHAPTER 5

**SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE**

Chapter 5 (SB X7-7 Baselines, Targets, and 2020 Compliance) of WFA's 2020 Plan discusses and provides the following:

- The Water Conservation Act of 2009 (or SB X7-7) required the State of California achieve a 20 percent reduction in urban water use by the year 2020.
- SB X7-7 required urban water suppliers to develop a "2020 Water Use Target" to assist the State of California to achieve the 20 percent reduction. The 2020 Water Use Target represents the amount of water each person should use per day (i.e. gallons per capita per day or GPCD) by the year 2020.
- As a wholesale water agency, WFA is not required to calculate a 2020 Water Use Target or show compliance with the 2020 Water Use Target. However, an assessment regarding WFA's present and proposed future measures, programs, and policies to assist the retail water suppliers in WFA's service area achieve their individual 2020 Water Use Targets is provided (in Chapter 9).

## 5.1 GUIDANCE FOR WHOLESALE AGENCIES

**CWC 10608.12.**

> *(I) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.*

WFA is a wholesale agency and is not required by DWR to complete Section 5.2 through Section 5.8. However, an assessment of present and proposed future measures, programs, and policies that will assist retail water agencies within WFA's service area to achieve their water use reduction targets is provided in Chapter 9.

## 5.2 SB X7-7 FORMS AND SUMMARY TABLE

**CWC 10608.20.**

*(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

WFA is a wholesale agency and is not required by DWR to complete Section 5.2.

### *5.2.1 SB X7-7 VERIFICATION FORM (BASELINES AND TARGETS)*

### *5.2.2 SB X7-7 COMPLIANCE FORM*

### *5.2.3 SUBMITTAL TABLES 5-1 AND 5-2*

**Table 5-1 Baselines and Targets Summary from SB X7-7 Verification Form (Not Applicable to Wholesalers)**

**Table 5-2 2020 Compliance from SB X7-7 2020 Compliance Form (Not Applicable to Wholesalers)**

### *5.2.4 REGIONAL UWMP/ REGIONAL ALLIANCE*

## 5.3 BASELINE AND TARGET CALCULATIONS FOR 2020 UWMPs

WFA is a wholesale agency and is not required by DWR to complete Section 5.3.

### *5.3.1 SUPPLIER SUBMITTED 2015 UWMP, NO CHANGE TO SERVICE AREA*

## 5.4 METHODS FOR CALCULATING POPULATION AND GROSS WATER USE

WFA is a wholesale agency and is not required by DWR to complete Section 5.4.

### 5.4.1 SERVICE AREA POPULATION

**CWC 10608.20.**

*(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

*(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.*

**CWC 10644.**

*(a)(2) The plan… shall include any standardized forms, tables, or displays specified by the department.*

### 5.4.2 GROSS WATER USE

## 5.5 2020 COMPLIANCE DAILY PER CAPITA WATER USE (GPCD)

**CWC 10608.12.**

*(h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*

*(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.*
*(2) The net volume of water that the urban retail water supplier places into long-term storage.*
*(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.*
*(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*

**California Code of Regulations Title 23 Division 2 Chapter 5.1 Article 1, Section 596.**

*(a) An urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.*

WFA is a wholesale agency and is not required by DWR to complete Section 5.5.

*5.5.1 2020 ADJUSTMENTS FOR FACTORS OUTSIDE OF SUPPLIER'S CONTROL*

*5.5.2 SPECIAL SITUATIONS*

*5.5.3 IF SUPPLIER DOES NOT MEET 2020 TARGET*

## 5.6 REGIONAL ALLIANCE

WFA is a wholesale agency and is not required by DWR to complete Section 5.6.

# CHAPTER 6

# WATER SUPPLY CHARACTERIZATION

## LAY DESCRIPTION – CHAPTER 6

### WATER SUPPLY CHARACTERIZATION

Chapter 6 (Water Supply Characterization) of WFA's 2020 Plan discusses and provides the following:

- WFA's water supply source consists of imported surface water from Metropolitan Water District of Southern California purchased through Inland Empire Utilities Agency and treated at WFA's treatment facility. A tabulation of WFA's historical water supplies is provided in Section 6.1.

- A discussion regarding WFA's purchased imported water supplies from MWD through IEUA is provided. Information regarding imported water connections, capacities, reliability, and historical production is provided.

- WFA's proposed future projects to maximize its water supply resources are discussed.

- WFA's "energy intensity" is discussed and represents the quantity of energy consumed, measured in kilowatt hours, divided by the volume of water, measured in acre-feet over a one-year period. The total energy intensity associated with WFA's water management processes was estimated during FY 2019-20.

  In this Chapter, WFA will identify and describe its source of water supply. In addition, WFA will describe the following:

- Management of the water supply source;

- Measures WFA is taking to develop potential new sources of water supply (as applicable); and

- Opportunities for exchanges and transfers on a long- or short-term basis.

The characterization of WFA's water supply source will account for the anticipated availability during a normal year, a single dry year, a five consecutive year drought, along with projections through FY 2044-45.

## 6.1 WATER SUPPLY ANALYSIS OVERVIEW

**CWC 10631.**

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:*

*(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.*

*(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies*

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five- year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

WFA's water supply source consists of imported surface water from Metropolitan Water District of Southern California purchased through Inland Empire Utilities Agency and treated at WFA's treatment facility. A tabulation of WFA's historical imported water purchases to meet its collective demand from its member agencies is provided in the following tabulation on the next page. WFA's allocated imported water supply from IEUA is 31,384 AF per year, unless reduced by MWD's implementation of its Water Supply Allocation Plan under dry conditions.

.

| Fiscal Year | Purchased Water (AF) |
|---|---|
| | Inland Empire Utilities Agency Imported Water |
| 2010-11 | 21,069 |
| 2011-12 | 25,676 |
| 2012-13 | 27,954 |
| 2013-14 | 28,455 |
| 2014-15 | 27,606 |
| 2015-16 | 15,387 |
| 2016-17 | 18,280 |
| 2017-18 | 25,022 |
| 2018-19 | 24,575 |
| 2019-20 | 25,492 |

Source: Data provided by Water Facilities Authority

### *6.1.1 SPECIFIC ANALYSIS APPLICABLE TO ALL WATER SUPPLY SOURCES*

The section below provides a discussion of the following information to the extent practical:

- WFA's existing and planned source of water supplies are identified;
- The source of supply is quantified in five-year increments through FY 2044-45;
- The anticipated supply availability under normal, single dry, and five consecutive dry years, and any other water year conditions included in the DRA (see Chapter 7) are described;
- The management of the water supply in correlation with other identified supplies is described; and,
- Information pertinent to the reliability analysis, is considered.

WFA has historically relied on imported surface water supplies purchased from MWD through IEUA to serve its member agencies. The following descriptions summarize WFA's source of supply (detailed descriptions are provided in Section 6.2).

Existing and Planned Sources of Supply

Purchased Untreated Imported Water

WFA has historically purchased untreated imported water from MWD through IEUA, as described in Section 6.2.1. In addition, Section 6.2.1 provides a detailed discussion of the existing and planned supply of the untreated imported water, including a description of the management and reliability of those untreated imported water supplies. Table 6-8 summarizes the actual untreated imported water supply for FY 2019-20. In addition, Table 6-9 summarizes the projected water supply, in five-year increments, through FY 2044-45 under varying water supply conditions.

Groundwater

WFA does not use groundwater supplies to meet its water demands from its member agencies.

Surface Water

WFA does not use self-supplied surface water sources to meets its water demands from its member agencies. WFA purchases untreated surface water supplies from MWD through IEUA, as discussed in Section 6.2.1.

Storm Water

WFA has historically received untreated imported water purchased from MWD through IEUA. Management and use of the stormwater runoff from the groundwater basin watershed, which is crucial to groundwater management and surface water supplies, is described in Section 6.2.4. However, WFA currently does not have its own program to beneficially use stormwater runoff as a direct source of supply.

Wastewater and Recycled Water

WFA does not use wastewater and recycled water supplies to meet its water demands from its member agencies.

### 6.1.2 OTHER CHARACTERIZATION CONSIDERATIONS

A description of WFA's water system along with a map of the area which receives water supplies from WFA is included in Chapter 3. In addition, the agencies which manage the water supply treated by WFA are identified in Section 6.2.1 (imported water), 6.2.2 (groundwater), 6.2.3 (surface water), 6.2.4 (stormwater), and 6.2.5 (recycled water).

### 6.1.3 OPTIONAL PLANNING TOOL

As discussed in Section 4.2.5, DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and assess monthly water use trends. However, DWR has deemed the tool as optional and WFA is not required by DWR to use the tool. However, Section 6.1 provides a tabulation of WFA's historical annual water use. During the past 10 years, WFA's member agencies experienced a five consecutive year drought from FY 2011-12 to FY 2015-16.

## 6.2 NARRATIVE SECTIONS FOR SUPPLIER'S UWMP WATER SUPPLY CHARACTERIZATION

### 6.2.1 PURCHASED OR IMPORTED WATER

WFA receives untreated imported water supplies from MWD, through IEUA, and may be impacted during a five consecutive year drought or other conditions which limits MWD from delivering sufficient water supplies to all of its member agencies, and consequently to WFA. In anticipation of such a reduction in supplies, MWD developed a Water Supply Allocation Plan (WSAP) which is briefly described below. The WSAP provides a means of equitably providing reduced water supplies to each of MWD's member agencies for up to 10 levels of reduction representing up to a 50 percent reduction.

During calendar year 2007, critically dry conditions impacted MWD's water supply sources. In addition, a ruling in the Federal Courts in August 2007 provided protective measures for the Delta Smelt (and subsequently other aquatic species) in the Sacramento-San Joaquin River Delta resulting in restrictions on the availability of State Water Project water. As a result, MWD adopted a Water Supply Allocation Plan in February 2008 to allocate available water supplies to its member agencies. MWD revised the WSAP in December 2014.

The WSAP establishes ten different shortage levels and a corresponding Allocation to each member agency, including IEUA. Based on the shortage levels established by MWD, the WSAP provides a separate reduced Allocation to a member agency for its 1) Municipal and Industrial (M&I) retail demand and 2) replenishment demand. The WSAP formula considers historical local water production, full service treated water deliveries, agricultural deliveries and water conservation efforts when calculating each member agency's Allocation.

In general, the WSAP process calculates total historical member agency demand. That historical demand is then compared to member agency projected local supply for a specific Allocation year. The balance required from MWD, less an Allocation reduction factor, is the member agency's "Water Supply Allocation" of imported water from MWD. When a member agency reduces its local demand through conservation or other means, the Allocation of imported water will increase. Depending on MWD's available supply, MWD can establish a specific WSAP shortage level. The shortage level causes a regional reduction and calculates an allocation for each of its member agency. Additional information about MWD's WSAP is provided in MWD's Regional 2020 UWMP which is incorporated by reference. The following is a summary of MWD's water shortage levels:

Level 1 – Regional Percent Reduction of 5%

Level 2 – Regional Percent Reduction of 10%

Level 3 – Regional Percent Reduction of 15%

Level 4 – Regional Percent Reduction of 20%

Level 5 – Regional Percent Reduction of 25%

Level 6 – Regional Percent Reduction of 30%

Level 7 – Regional Percent Reduction of 35%

Level 8 – Regional Percent Reduction of 40%

Level 9 – Regional Percent Reduction of 45%

Level 10 – Regional Percent Reduction of 50%

In response to a fourth consecutive year of below average rainfall and critically dry conditions, MWD declared a WSAP Allocation Level 3 for FY 2015-16, which represented a regional reduction of 15 percent. MWD rescinded the WSAP for FY 2016-17 and has not reinstated the WSAP since that time.

WFA can purchase untreated imported water from MWD, through IEUA. WFA's imported water purchases over the past five years have been tabulated in Section 6.1. Over the past five years, the WFA purchased 15,387 AFY to 25,492 AFY, with an average of 21,751 AFY. WFA's projected purchases of untreated imported water, over the next 25 years in five-year increments, is provided in Table 6-9.

### *6.2.2 GROUNDWATER*

**CWC 10631.**

*(b)(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:*

*(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.*

*(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).*

*(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

*(D) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

WFA has a Local Groundwater Supply Connection Agreement (dated September 3, 2014) with San Antonio Water Company, to provide for the opportunity to bring in additional groundwater supplies to the WFA treatment plant in an attempt to further develop options for San Antonio Water Company and Cities of Chino, Ontario, and Upland and Monte Vista Water District. However, WFA does not purchase this groundwater supply. San Antonio Water Company simply uses the WFA treatment plant as indirect pass-through conveyance of their limited supplies for delivery to its shareholders.

**Table 6-1 Groundwater Volume Pumped**

| Submittal Table 6-1 Wholesale: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | Supplier does not pump groundwater.<br>The supplier will not complete the table below. | | | | | |
| ☐ | All or part of the groundwater described below is desalinated. | | | | | |
| Groundwater Type | Location or Basin Name | 2016* | 2017* | 2018* | 2019* | 2020* |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| | TOTAL | 0 | 0 | 0 | 0 | 0 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

### 6.2.3 SURFACE WATER

WFA does not directly use surface water to meet its water demands from its member agencies.

### 6.2.4 STORMWATER

WFA does not use stormwater to meet its water demands from its member agencies.

### 6.2.5 WASTEWATER AND RECYCLED WATER

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:*

*(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

*(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

*(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

*(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

*(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

*(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*

*(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

As a wholesale water supplier, WFA provides water to its member agencies which in turn provides water to their retail customers. Wholesale suppliers are not required to summarize wastewater generation or treatment within their service area. WFA does not provide supplemental treatment to recycled water prior to distribution.

WFA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by WFA and there are no plans for its use within the planning horizon of this UWMP.

### *6.2.5.1 RECYCLED WATER COORDINATION*

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area…*

WFA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by WFA and there are no plans for its use within the planning horizon of this UWMP. This section is not applicable to WFA.

### *6.2.5.2 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL*

**CWC 10633.**

> *(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

WFA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by WFA and there are no plans for its use within the planning horizon of this UWMP. This section is not applicable to WFA.

**Table 6-2 Wastewater Collected Within Area in 2020 (Not Applicable to Wholesalers)**

**Table 6-3 Wastewater Treatment and Discharge within Service Area in 2020**

| Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☑ | Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water. The Supplier will not complete the table below. | | | | | | | | | | |
| | | | | | | | 2020 volumes [1] | | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* [2] | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list* | Treatment Level *Drop down list* | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area | Instream Flow Permit Requirement |
| *Add additional rows as needed* | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | Total | 0 | 0 | 0 | 0 | 0 |

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

### 6.2.5.3 RECYCLED WATER SYSTEM DESCRIPTION

**CWC 10633.**

> *(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

WFA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by WFA and there are no plans for its use within the planning horizon of this UWMP. This section is not applicable to WFA.

### 6.2.5.4 POTENTIAL, CURRENT, AND PROJECTED RECYCLED WATER USES

**CWC 10633.**

> *(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use. A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*
>
> *(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*
>
> *(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

WFA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by WFA and there are no plans for its use within the planning horizon of this UWMP. This section is not applicable to WFA.

**Table 6-4 Current and Projected Recycled Water Direct Beneficial Uses Within Service Area**

| Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☑ | Recycled water is not directly treated or distributed by the Supplier.<br>The Supplier will not complete the table below. | | | | | | |
| Name of Receiving Supplier or Direct Use by Wholesaler | Level of Treatment<br>*Drop down list* | 2020* | 2025* | 2030* | 2035* | 2040* | 2045* *(opt)* |
| *Add additional rows as needed* | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | **Total** | 0 | 0 | 0 | 0 | 0 | 0 |
| *** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3. | | | | | | | |
| NOTES: | | | | | | | |

**Table 6-5 2015 Recycled Water Use Projection Compared to 2020 Actual**

| Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual | | |
|---|---|---|
| ☑ | Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020.<br>The wholesale supplier will not complete the table below. | |
| Name of Receiving Supplier or Direct Use by Wholesaler | 2015 Projection for 2020* | 2020 Actual Use* |
| *Add additional rows as needed* | | |
| | | |
| | | |
| | | |
| | | |
| **Total** | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | |
| NOTES: | | |

#### 6.2.5.5 ACTIONS TO ENCOURAGE AND OPTIMIZE FUTURE RECYCLED WATER USE

WFA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by WFA and there are no plans for its use within the planning horizon of this UWMP. This section is not applicable to WFA.

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:*

*(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

**Table 6-6 Methods to Expand Future Recycled Water Use (Not Applicable to Wholesalers)**

### 6.2.6 DESALINATED WATER OPPORTUNITIES

**CWC 10631.**

*(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

WFA's water supply source consists of imported water from Metropolitan Water District of Southern California purchased through Inland Empire Utilities Agency and treated at WFA's treatment facility. WFA does not use groundwater supplies to meet its water demands from its member agencies. No desalinated water opportunities presently exist for WFA.

### 6.2.7 WATER EXCHANGES AND TRANSFERS

**CWC 10631.**

*(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

#### 6.2.7.1 EXCHANGES

Pursuant to DWR's 2020 Final Guidebook, "*Water exchanges are typically water delivered by one water user to another water user, with the receiving water user providing water in return at a specified time or when the conditions of the parties' agreement are met. Water exchanges can be strictly a return of water on a basis agreed upon by the participants or it can include payment and the return of water.*"

WFA does not have any current or planned water exchange opportunities. However, WFA's member agencies participate in MWD's Dry-Year Yield Program. The DYYP is a groundwater storage and recovery program where supplemental water is stored in the Chino Basin during surplus years and could be recovered in-lieu of imported water from MWD through IEUA. The DYYP allows maximum use of imported water supplies available during wet years and stored groundwater in the Chino Basin during dry years. The DYYP can store up to 100,000 AF with maximum replenishment of 25,000 AFY and maximum extraction of 33,000 AFY. During FY 2019-20, there was 45,961 AF within the DYYP account. The agreement that authorized the DYYP will expire in 2028.

#### 6.2.7.2 TRANSFERS

Pursuant to DWR's 2020 Final Guidebook, "*The Water Code defines a water transfer as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights.*"

Transfers are not generally available to WFA from a supplier because WFA is a wholesale water supplier that provides treated imported water from the State Water Project through IEUA to its member agencies. However, WFA's member agencies are able to make transfers between each other pursuant to the Optimum Basin Management Plan and the Peace Agreement which provide for interagency transfer of water rights.

#### 6.2.7.3 EMERGENCY INTERTIES

Emergency interconnections are distribution system interconnections between water agencies for use during critical situations where one system or the other is temporarily unable to provide sufficient potable water to meet its water demands and/or fire protection needs. An emergency interconnection will allow a water system to continue serving water during critical situations such as local water

supply shortages as a result of earthquakes, fires, prolonged power outages, and droughts.

WFA is a wholesale water agency that treats, and provides imported water supplies, solely to its member agencies and has no emergency interconnections. However, WFA is able to provide additional treated imported water in the event that one or several of its member agencies has a need for additional emergency supplies, subject to imported water availability from MWD. In addition, WFA's member agencies have emergency interconnections between each other which can be utilized during emergency situations.

### *6.2.8 FUTURE WATER PROJECTS*

**CWC 10631.**

> *(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

WFA currently has no future water projects in development. WFA is part of a regional task force exploring concepts that might provide alternative water supply options to mitigate the planned long-term shutdown of the Rialto Feeder in approximately 10 to 13 years. The Rialto Reliability Long-Term Shutdown Task Force includes IEUA, Cucamonga Valley Water District, Three Valleys Municipal Water District, Fontana Water Company, and MWD. A list of regional project concepts can be found in IEUA's 2015 Integrated Water Resources Plan, incorporated in this UWMP by reference.

**Table 6-7 Expected Future Water Supply Projects or Programs**

| Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other suppliers? | | Description *(if needed)* | Planned Implementation Year | Planned for Use in Year Type *Drop Down list* | Expected Increase in Water Supply to Supplier* |
| | *Drop Down Menu* | *If Yes, Supplier Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

## 6.2.9 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

**CWC 10631.**

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following…*

*(b)(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.*

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five- year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

#### 6.2.9.1 DESCRIPTION OF SUPPLIES

As discussed in Section 6.2, WFA's water supply source consists of untreated imported water purchased from MWD through IEUA (see Section 6.2.1). The actual quantity of the water supply source available to WFA during FY 2019-20 is summarized in Table 6-8. The reliable quantity of projected water supply source available to WFA in five-year increments through FY 2044-45 during normal or average years is summarized in Table 6-9. The reliability of this source of supply is addressed in Section 7.2.3, including during normal years, single dry years, and five consecutive year droughts.

#### 6.2.9.2 QUANTIFICATION OF SUPPLIES

The actual quantity of the water supply source available to WFA during FY 2019-20 is summarized in Table 6-8. The reliable quantity of projected water supply source available to WFA in five-year increments through FY 2044-45 during average years is summarized in Table 6-9. The reliability of this source of supply is addressed in Section 7.2.3, including during normal years, single dry years, and five consecutive year droughts.

WFA's projected quantities of untreated imported water supplies are based on historical long-term averages and available supplies during previous dry year conditions. Consequently, it is anticipated WFA will have sufficient water supplies available to meet projected demands from its member agencies.

**Table 6-8 Water Supplies – Actual**

| Submittal Table 6-8 Wholesale: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | 2020 | | |
| **Drop down list** May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool | | Actual Volume* | Water Quality Drop Down List | Total Right or Safe Yield* (optional) |
| Add additional rows as needed | | | | |
| Purchased or Imported Water | Inland Empire Utilities Agency | 25,492 | Drinking Water | |
| | | | | |
| | **Total** | 25,492 | | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | |
| NOTES: | | | | |

**Table 6-9 Water Supplies – Projected**

| Submittal Table 6-9 Wholesale: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | Projected Water Supply* Report to the Extent Practicable | | | | | | | | | |
| | | 2025 | | 2030 | | 2035 | | 2040 | | 2045 (opt) | |
| **Drop down list** May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool | | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Add additional rows as needed | | | | | | | | | | | |
| Purchased or Imported Water | Inland Empire Utilities Agency | 30,651 | | 31,997 | | 33,435 | | 34,829 | | 36,280 | |
| | **Total** | 30,651 | 0 | 31,997 | 0 | 33,435 | 0 | 34,829 | 0 | 36,280 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | |

## 6.2.10 SPECIAL CONDITIONS

### 6.2.10.1 CLIMATE CHANGE EFFECTS

WFA receives untreated imported surface water from MWD through IEUA as discussed in Section
6.2.1. MWD has prepared a Regional 2020 UWMP which includes a discussion (Section 2.6 in MWD's 2020 UWMP) of the reliability of its water supplies and the impacts of climate change and is incorporated by reference in this Plan.

MWD has almost one hundred years of hydrological data regarding weather and water supply, providing a foundation for forecasting drought conditions and above-average rainfall. However, they recognize that weather patterns can shift dramatically and unpredictably due to climate change. MWD believes that the region's reliability will be more secure with a long-term plan that recognizes risk and provides resource development to offset that risk. MWD has established an intensive, comprehensive technical process to identify key vulnerabilities to regional reliability. When their analyses and modeling indicate unacceptable levels of reliability in the future, MWD will use this as a "signpost" to take action. Further, MWD's reliance on climate change experts and their active participation in the Water Utility Climate Alliance provides a collaborative approach toward climate change adaptation.

Furthermore, WFA is a sub-agency of IEUA which has also provided a discussion of climate change considerations in their Regional 2020 UWMP (Section 7.2.7). IEUA recognizes that changing climate patterns are expected to shift precipitation patterns and affect water supply. Further, it believes that adequate supplies are available to meet demands throughout the 25-year planning period. Decreases in imported water supplies from MWD are not expected due to its extensive storage, transfer, and water supply management efforts. IEUA prioritizes maximizing the use of local water resources and focus on their water use efficiency program, to reduce the regions reliance on imported water supplies.

### 6.2.10.2 REGULATORY CONDITIONS AND PROJECT DEVELOPMENT

WFA has considered the implications of changing regulatory conditions and project development on the availability of planned water supplies.

#### 6.2.10.3 OTHER LOCALLY APPLICABLE CRITERIA

There are no locally applicable criteria which applies to WFA.

## 6.3 SUBMITTAL TABLES COMPLETION USING THE OPTIONAL PLANNING TOOL

As discussed in Section 4.2.5, DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and assess monthly water use trends. However, DWR has deemed the tool as optional and WFA is not required by DWR to use the tool. However, Section 6.1 provides a tabulation of WFA's historical annual water use. During the past 10 years, WFA's member agencies experienced a five consecutive year drought from FY 2011-12 to FY 2015-16.

## 6.4 ENERGY USE

**CWC 10631.2.**

*(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:*

*(1) An estimate of the amount of energy used to extract or divert water supplies.*

*(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.*

*(3) An estimate of the amount of energy used to treat water supplies.*

*(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.*

*(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.*

*(6) An estimate of the amount of energy used to place water into or withdraw from storage.*

*(7) Any other energy-related information the urban water supplier deems appropriate.*

"Energy intensity" is defined as the quantity of energy consumed, measured in kilowatt hours (kWh), divided by the volume of water, measured in AF for a water management process over a one-year period. The information used to calculate the estimated energy intensity associated with WFA's water system is provided below. The energy intensity information is based on readily obtainable energy and water use data for the following water management processes: 1) extraction or diversion of water supplies; 2) placement into storage; 3) conveyance to distribution; 4) treatment; and 5) water system distribution.

WFA has tabulated its energy intensity using readily obtainable energy consumption data obtained from monthly electricity bills from Southern California Edison (SCE) for the whole water system and the corresponding water use data obtained from available water meter readings. WFA has reported the energy intensity associated with the water management processes which occur within its operational control. Because WFA does not track individual energy usage for each water management process identified above, WFA has estimated the energy intensity using the "total utility approach" (i.e. sum of all water management processes). The total energy consumed was approximately 473,145 kWh during FY 2019-20. Although the total energy consumption reported includes electricity usage for general administration (e.g. at WFA's main office) which is not associated with any water management processes, the general administration energy usage is considered negligible compared to overall water system use and has not been netted out.

The total volume of water entering the potable water system was approximately 25,492 AF during FY 2019-20 and is consistent with the total volume of water provided in Table 4-1.

The total energy intensity associated with WFA's water management processes is estimated at 19 kWh/AF. The energy intensity data and calculations based on the "total utility approach" are provided in Table O-1B below.

WFA's water management processes do not include "consequential hydropower generation" where the energy generation is a direct consequence of water delivery (i.e. all water passing through the energy generation devices is delivered to users. WFA's water management processes do not include "non-consequential hydropower generation" where the energy generation is not a direct consequence of water delivery (i.e. energy could be generated even if no water was being delivered to water users). In addition, WFA's water management processes do not include any substantial "self-generated energy sources" including solar, wind, geothermal, biomass, and co-generation sources WFA does have an emergency diesel generator to maintain operations in the event of an SCE power outage, however, this is not a substantial "self-generated energy source" and is considered negligible.

**Table O-1B. Recommended Energy Reporting — Total Utility Approach**

***Urban Water Supplier:*** *Water Facilities Authority*

**Water Delivery Product** (If delivering more than one type of product use Table O-1C)

*Wholesale Potable Deliveries*

| Table O-1B: Recommended Energy Reporting - Total Utility Approach | | | | |
|---|---|---|---|---|
| Enter Start Date for Reporting Period | 7/1/2019 | Urban Water Supplier Operational Control | | |
| End Date | 6/30/2020 | | | |
| ☐ Is upstream embedded in the values reported? | | Sum of All Water Management Processes | Non-Consequential Hydropower | |
| *Water Volume Units Used* | *AF* | Total Utility | Hydropower | Net Utility |
| *Volume of Water Entering Process (volume unit)* | | *25492* | *0* | *25492* |
| *Energy Consumed (kWh)* | | *473145* | *0* | *473145* |
| *Energy Intensity (kWh/volume)* | | *18.6* | *0.0* | *18.6* |

**Quantity of Self-Generated Renewable Energy**

kWh

**Data Quality** *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

*Combination of Estimates and Metered Data*

**Data Quality Narrative:**

The total energy consumed was identified based on Southern California Edison (SCE) billing records. Although the total energy consumed includes electricity usage for general administration (which is not an identified water management process), general administration energy use is considered to be negligible compared to overall water system use and has not been netted out.

**Narrative:**

The total energy consumption includes energy associated with operating surface water treatment, including plant lighting and air conditioning, the Supervisory Control and Data Acquisition (SCADA) system, and chemical pumps (including chlorination injection).

# CHAPTER 7

# WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

## LAY DESCRIPTION – CHAPTER 7

### WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

Chapter 7 (Water Service Reliability and Drought Risk Assessment) of WFA's 2020 Plan discusses and provides the following:

- FY 2019-20 represents an "average" or "normal" water year for WFA in which the total amount of rainfall was similar to the historical average rainfall.
- A "single dry" year for WFA was represented in FY 2017-18, in which the total amount of rainfall was below the historical average rainfall.
- A "five consecutive year drought" period for WFA is represented from FY 2011-12 to FY 2015-16, where the total amount of rainfall during each of these years was less than the historical average rainfall.
- WFA's current and projected water supplies available during normal years in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-2.
- WFA's current and projected water supplies available during single dry years in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-3.
- WFA's current and projected water supplies available during each year of a five consecutive year drought in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-4.
- The reliability of WFA's water supply source, including a review of water supply constraints, is provided. A single dry year or a five consecutive year drought period will not compromise WFA's ability to provide a reliable supply of water to its member agencies.

- A Drought Risk Assessment is provided which includes an assessment of WFA's water supply reliability over a five consecutive year drought period. WFA's DRA assumes a five consecutive year drought from FY 2020-21 through FY 2024-25 and includes a review of water supplies, water uses, and water supply reliability during this period. WFA has the ability to pass through varying water shortage levels imposed by IEUA and MWD (see Chapter 8) to its member agencies.

## 7.1 INTRODUCTION

This section of WFA's UWMP describes WFA's ability to meet water demands from its member agencies by analyzing a variety of factors which affect WFA's water supply. This section assesses WFA's water service reliability during average years, single dry years, and during a five consecutive year drought period to meet the water needs of its member agencies. This section also includes the discussion of a DRA which provides a mechanism for WFA to evaluate the risk to its water supply under a drought lasting for the next five consecutive years.

## 7.2 WATER SERVICE RELIABILITY ASSESSMENT

**CWC 10635.**

> *(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

Information regarding the reliability of WFA's water supplies is based on the availability of imported water from IEUA and MWD. and Table 7-1 summarizes these "base years" foraverage, single dry, and five consecutive year drought and provides the total amount of water supplies available to WFA during those base years. The following discussion assesses the water service reliability of WFA's water supply sources.

**Water Service Reliability - Imported Water**

WFA's untreated imported water supplies from MWD, through IEUA, may be impacted during a five consecutive year drought or other conditions which limits MWD from delivering sufficient water supplies to all of its member agencies, and consequently to WFA. In anticipation of such a

reduction in supplies, MWD developed a WSAP which is briefly described below. The WSAP provides a means of equitably providing reduced water supplies to each of MWD's member agencies for up to 10 levels of reduction representing up to a 50 percent reduction.

During calendar year 2007, critically dry conditions impacted MWD's water supply sources. In addition, a ruling in the Federal Courts in August 2007 provided protective measures for the Delta Smelt (and subsequently other aquatic species) in the Sacramento-San Joaquin River Delta resulting in restrictions on the availability of State Water Project water. As a result, MWD adopted a WSAP in February 2008 to allocate available water supplies to its member agencies. MWD revised the WSAP in December 2014.

The WSAP establishes ten different shortage levels and a corresponding Allocation to each member agency. Based on the shortage levels established by MWD, the WSAP provides a separate reduced Allocation to a member agency for its 1) M&I retail demand and 2) replenishment demand. The WSAP formula considers historical local water production, full service treated water deliveries, agricultural deliveries, and water conservation efforts when calculating each member agency's Allocation.

In general, the WSAP process calculates total historical member agency demand. That historical demand is then compared to member agency projected local supply for a specific Allocation year. The balance required from MWD, less an Allocation reduction factor, is the member agency's "Water Supply Allocation" of imported water from MWD. When a member agency reduces its local demand through conservation or other means, the Allocation of imported water will increase. Depending on MWD's available supply, MWD can establish a specific WSAP shortage level. The shortage level causes a regional reduction and calculates an allocation for each of its member agencies. Additional information about MWD's WSAP is provided in MWD's Regional 2020 UWMP which is incorporated by reference. The following is a summary of MWD's water shortage levels:

Level 1 – Regional Percent Reduction of 5%

Level 2 – Regional Percent Reduction of 10%

Level 3 – Regional Percent Reduction of 15%

Level 4 – Regional Percent Reduction of 20%

Level 5 – Regional Percent Reduction of 25%

Level 6 – Regional Percent Reduction of 30%

Level 7 – Regional Percent Reduction of 35%

Level 8 – Regional Percent Reduction of 40%

Level 9 – Regional Percent Reduction of 45%

Level 10 – Regional Percent Reduction of 50%

In response to a fourth consecutive year of below average rainfall and critically dry conditions, MWD declared a WSAP Allocation Level 3 for FY 2015-16, which represented a regional reduction of 15 percent. MWD rescinded the WSAP for FY 2016-17 and has not reinstated the WSAP since that time.

**Water Service Reliability Summary**

Table 7-1 shows the water supplies during the base years (for average year, single dry year, and a five consecutive year drought). WFA will provide all available treated water to its member agencies, but it is the member agencies' responsibility to manage their water supplies during a five consecutive year drought.

### *7.2.1 CONSTRAINTS ON WATER SOURCES*

**CWC 10631.**

> *(b)(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.*

WFA's source of supply consists of imported surface water from Metropolitan Water District of Southern California purchased through Inland Empire Utilities Agency and treated at WFA's treatment facility, as described in Section 6.2. Although this supply is managed, the following constraints may occur which WFA has considered in this reliability analysis.

Imported Water

WFA receives untreated surface water from MWD through IEUA, from the State Water Project. Water quality from MWD relating to supply reliability is addressed separately in MWD's 2020 Regional Urban Water Management Plan.

MWD estimates its SWP supply using the 2019 SWP Delivery Capability Report distributed by DWR in August 2020 (Draft MWD 2020 UWMP, Section 2.3). Accordingly, the 2019 SWP Delivery Capability Report presents current Department of Water Resources' estimates of the amount of water deliveries for current conditions and conditions 20 years in the future, assuming the use of existing SWP facilities and does not include new facilities proposed under the Delta Conveyance Project and Sites Reservoir.

Further, their estimates include restrictions on SWP and Central Valley Project operations with water quality objectives established by the State Water Resources Control Board, the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fisheries Service issued on October 21, 2019, and the Incidental Take Permit issued by the California Department of Fish and Wildlife on March 31, 2020. Additionally, these estimates also incorporate amendments to the Coordinated Operations Agreement between the Central Valley Project and the State Water Project made in 2018.

A detailed description of SWP supply programs are included in MWD's Draft MWD 2020 UWMP Section 3.2 and Appendix 3.2. MWD has the flexibility to increase SWP supplies by developing flexible Central Valley/SWP storage and transfer programs, with the goal to develop additional dry-year supplies that can be conveyed through the California Aqueduct during dry hydrologic conditions and regulatory restrictions. MWD describes these storage and transfer programs in their Draft MWD 2020 UWMP Section 3.3 and Appendix 3.2.

A key component of MWD's water supply capability is their development of a large regional storage portfolio that includes both dry-year and emergency storage capacity, which is a key component of water management. Storage enables their capture of surplus amounts of water in normal and wet climate and hydrologic conditions when it is plentiful for supply and environmental uses. Stored water can then be used in dry years and in conditions where augmented water supplies are needed to meet demands.

MWD's long-term water service reliability assessment performed for the UWMP forecasts sufficient supplies to meet projected demands from 2025 through 2045 under a normal water year, a single dry year, and five consecutive drought year conditions as specified by the Act. Their assessment is restricted to the specific conditions and assumptions stated in the UWMP.

The key water quality issues for the SWP are disinfection byproduct precursors, in particular, total organic carbon, bromide, and low alkalinity (Draft MWD 2020 UWMP Section 4). Disinfection byproducts (DBPs) result from total organic carbon and bromide in the source water reacting with disinfectants at the water treatment plant. At the treatment plant, WFA conducts online monitoring of the total organic carbon levels to ensure operational measures are taken for a higher level of total organic carbon removal in order to reduce disinfection byproduct formation.

The Federal Stage 1 Disinfectants and Disinfection Byproducts (D/DBP) Rule, requires water systems to comply with new MCLs and a treatment technique to improve control of DBPs. USEPA then promulgated the Stage 2 D/DBP Rule in January 2006 requiring systems to comply at terminus locations in the distribution system to be more

representative of maximum residence time and to protect the public. WFA has been in compliance with the Stage 2 D/DBP Rule since it became effective.

MWD recognizes that arsenic is also of concern in some groundwater storage programs. Groundwater inflows into the California Aqueduct are managed by MWD to comply with regulations and protect downstream water quality while meeting supply targets. Additionally, nutrient levels are significantly higher in the SWP than within the Colorado River, leading to the potential for algal related concerns that may lead to treatment strategies in the California aqueduct and/or natural reservoirs.

MWD can implement selective withdrawals from storage programs and exchanges to improve water quality. Although these programs were initially designed to provide dry-year supply reliability, they can also be used to store SWP water at periods of better water quality so the stored water may be withdrawn at times of lower water quality, thus diluting SWP water deliveries.

## 7.2.2 YEAR TYPE CHARACTERIZATION

### 7.2.2.1 TYPES OF YEARS

WFA's base years for an average year, a single dry year, and a five consecutive year drought and are summarized in Table 7-1. As indicated in Chapter 6, WFA has provided all available treated imported water supplies to help meet its member agencies' water demands during an average year, a single dry year, and a five consecutive year drought.

**Table 7-1 Basis of Water Year Data (Reliability Assessment)**

| Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment) | | | |
|---|---|---|---|
| Year Type | Base Year<br>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000 | Available Supplies if Year Type Repeats | |
| | | ☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP.<br>Location _____ | |
| | | ☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | Volume Available * | % of Average Supply |
| Average Year | 2020 | 25,492 | 100% |
| Single-Dry Year | 2018 | 25,022 | 98.2% |
| Consecutive Dry Years 1st Year | 2012 | 25,676 | 100.7% |
| Consecutive Dry Years 2nd Year | 2013 | 27,954 | 109.7% |
| Consecutive Dry Years 3rd Year | 2014 | 28,455 | 111.6% |
| Consecutive Dry Years 4th Year | 2015 | 27,606 | 108.3% |
| Consecutive Dry Years 5th Year | 2016 | 15,387 | 60.4% |
| | | | |
| *Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.* | | | |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | |
| NOTES: | | | |

### *7.2.2.2 SOURCES FOR WATER DATA*

The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly ETo in the vicinity of the area receiving water supplies from WFA are discussed in Section 3.3 Historical climate information was obtained from the WRCC, the National Oceanic and Atmospheric Administration, and from DWR's CIMIS.

### 7.2.3 WATER SERVICE RELIABILITY – SUPPLY AND DEMAND COMPARISON

**CWC 10635.**

> *(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

WFA obtains its water supplies from imported surface water from Metropolitan Water District of Southern California purchased through Inland Empire Utilities Agency, and treated at WFA's treatment facility and made available to its member agencies.

As previously discussed in Section 4.2.6, WFA's projected normal year water demands from its member agencies over the next 25 years, in five-year increments is provided in Table 4-3. The ratio of total water supplies available to WFA during a historical average year in FY 2019-20 (or 25,492 AF) and during a historical single dry year in FY 2017-18 (or 25,022 AF) was used to estimate WFA's projected water demands from its member agencies during single dry years. The ratio of total water supplies available to WFA during a historical average year in FY 2019-20 (or 25,492 AF) and a historical five consecutive year drought period from FY 2011-12 to FY 2015-16 (or 25,676 AF, 27,954 AF, 28,455 AF, 27,606 AF, and 15,387 AF, respectively) was used to estimate WFA's projected water demands from its member agencies during a five consecutive year drought period. WFA's projected dry year water supplies over the next 25 years were based on the minimum supplies needed by WFA to meet projected single-dry year demands from its member agencies. Table 7-2, Table 7-3, and Table 7-4 summarize WFA's projected water demands from its member agencies and supplies over the next 25 years in five-year increments, including during normal years, single dry years, and a five consecutive year drought periods. These tables indicate WFA will provide all available water to assist its member agencies meet their water demands during normal years, single dry years, and a five consecutive year drought periods over the next 25 years.

#### 7.2.3.1 WATER SERVICE RELIABILITY – NORMAL YEAR

Table 7-2 summarizes WFA's projected water demands from its member agencies and supplies over the next 25 years in five-year increments during normal years. Table 7-2 indicates WFA can meet water demands from its member agencies during normal years over the next 25 years.

**Table 7-2 Normal Year Supply and Demand Comparison**

| Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Demand totals *(autofill from Table 4-3)* | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| NOTES: | | | | | |

### *7.2.3.2 WATER SERVICE RELIABILITY – SINGLE DRY YEAR*

Table 7-3 summarizes WFA's projected water demands from its member agencies and supplies over the next 25 years in five-year increments during single dry years. Table 7-3 indicates WFA can meet water demands from its member agencies during single dry years over the next 25 years.

**Table 7-3 Single Dry Year Supply and Demand Comparison**

| Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 (Opt) |
| Supply totals* | 30,086 | 31,408 | 32,819 | 34,187 | 35,612 |
| Demand totals* | 30,086 | 31,408 | 32,819 | 34,187 | 35,612 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | |
| NOTES: | | | | | |

#### *7.2.3.3 WATER SERVICE RELIABILITY – FIVE CONSECUTIVE DRY YEARS*

Table 7-4 summarizes WFA's projected water demands from its member agencies and supplies over the next 25 years in five-year increments during five consecutive year drought periods. Table 7-4 indicates WFA can meet water demands from its member agencies during five consecutive year drought periods over the next 25 years.

**Table 7-4 Multiple Dry Years Supply and Demand Comparison**

| Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2025* | 2030* | 2035* | 2040* | 2045* (Opt) |
| First year | Supply totals | 30,873 | 32,229 | 33,678 | 35,081 | 36,543 |
| | Demand totals | 30,873 | 32,229 | 33,678 | 35,081 | 36,543 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Second year | Supply totals | 33,611 | 35,088 | 36,665 | 38,193 | 39,784 |
| | Demand totals | 33,611 | 35,088 | 36,665 | 38,193 | 39,784 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Third year | Supply totals | 34,214 | 35,717 | 37,322 | 38,877 | 40,498 |
| | Demand totals | 34,214 | 35,717 | 37,322 | 38,877 | 40,498 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fourth year | Supply totals | 33,193 | 34,651 | 36,208 | 37,717 | 39,289 |
| | Demand totals | 33,193 | 34,651 | 36,208 | 37,717 | 39,289 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fifth year | Supply totals | 18,502 | 19,314 | 20,182 | 21,023 | 21,900 |
| | Demand totals | 18,502 | 19,314 | 20,182 | 21,023 | 21,900 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Sixth year *(optional)* | Supply totals | | | | | |
| | Demand totals | | | | | |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| ***Units of measure (AF, CCF, MG) m** ust remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

### 7.2.4 DESCRIPTION OF MANAGEMENT TOOLS AND OPTIONS

**CWC 10620.**

> *(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

WFA obtains imported water from the Metropolitan Water District of Southern California through IEUA. Section 6.2.1 describes the planning conducted by MWD regarding untreated imported water supplies available to WFA. The reliability of MWD's supplies is also discussed in its 2020 Regional UWMP and is incorporated by reference. WFA purchases untreated imported water which is delivered directly within its distribution system, after treatment.

## 7.3 DROUGHT RISK ASSESSMENT

**CWC 10635.**

*(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:*

*(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.*

*(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.*

*(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.*

*(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

WFA's sources of supplies consist of imported surface water from Metropolitan Water District of Southern California purchased through Inland Empire Utilities Agency and treated at WFA's treatment facility. The following discussion provides a DRA which assesses WFA's water supply reliability over a five consecutive year drought period. WFA's DRA incorporates a five consecutive year drought from FY 2020-21 through FY 2024-25 and includes a review of water supplies, water uses, and water supply reliability.

### *7.3.1 DRA DATA, METHODS, AND BASIS FOR WATER SHORTAGE CONDITIONS*

WFA's DRA was prepared using historical production data from WFA's water supply source. The following assumptions were considered during the preparation of WFA's DRA for each year of the five consecutive year drought.

- The five consecutive year drought period associated with the 2020 UWMP is based on five consecutive dry years from FY 2020-21 through FY 2024-25.
- The projected water supplies available during each year of this five consecutive year drought are assumed to be identical to the water supplies produced during each year between FY 2011-12 and FY 2015-16 (which represents the most recent and historical five consecutive year drought).
- The projected demands from its member agencies during this five consecutive year drought are based on water demands from its member agencies from FY 2019-20 (a normal year) which were adjusted based on projected population within the area receiving water supplies from WFA over the next five years along with the ratio of the normal year demands from its member agencies to actual demands from its member agencies over each year of the most recent and historical five consecutive year drought period (from FY 2011-12 and FY 2015-16).
- The projected demands from its member agencies were compared to the projected supplies to identify potential water supply deficits which may require implementation of the Water Shortage Contingency Plan (discussed further in Chapter 8).

The following methodologies were considered during the preparation of WFA's DRA during for each year of the five consecutive year drought:

- Drought Year 1: The region receiving water supplies from WFA had experienced an average to above average year of precipitation in the prior year. Member agencies' retail water use in the prior year had been below average due to a reduced need for outdoor water use, the groundwater basin had been replenished from above average local stormwater runoff, and imported water supplies were not restricted.

- Drought Year 2: The region receiving water supplies from WFA experienced a second year of below average precipitation and runoff. Member agencies' retail customers increased water use for outdoor irrigation to compensate for lack of precipitation. Groundwater and imported water supplies have not been impacted.

- Drought Year 3: The region receiving water supplies from WFA experienced a third year of below average precipitation and runoff. Member agencies' retail customers increase water use for outdoor irrigation to compensate for lack of precipitation. Groundwater and imported water supplies have not been impacted. However, there is an increased demand on both groundwater and treated imported water.

- Drought Year 4: The region receiving water supplies from WFA experienced a fourth year of below average precipitation and runoff. Groundwater supplies have not been impacted. However, there is an increased demand on groundwater and treated imported because member agencies' local surface water supplies continue to be significantly impacted.
- Drought Year 5: Fifth year of below average precipitation and runoff. Groundwater supplies have not been impacted. However, there is an increased demand on groundwater and treated imported water because member agencies' local surface water supplies continue to be significantly impacted.

### *7.3.2 DRA WATER SOURCE RELIABILITY*

WFA's DRA incorporates a five consecutive year drought based on five consecutive dry years commencing in FY 2021-22. WFA obtains imported water from Metropolitan Water District of Southern California through IEUA, and treats the imported water on behalf of its member agencies. The quantity of water supplies that WFA is able to treat and provide to its member agencies is based on the availability of water supplies from MWD and IEUA. However, for the purposes of the DRA, the quantity of water supplies available for each year during this five consecutive year drought period included in WFA's DRA is assumed9 to be the same as the quantity of water supplies produced by WFA (i.e. demands) during the most recent and historical five consecutive year drought which occurred from FY 2011-12 through FY 2015-16. Production data for those years have been tabulated in Section 6.1. The following describes the anticipated reliability of the water source for each year of the five consecutive year drought based on recent experience.

Imported Water

WFA obtains imported water from the Metropolitan Water District of Southern California through IEUA. Section 6.2.1 describes the planning conducted by MWD regarding untreated imported water supplies available to WFA. The reliability of MWD's supplies is also discussed in its 2020 Regional UWMP and its 2021 WSCP and are incorporated by reference. MWD's long-term water service reliability assessment performed for the UWMP forecasts sufficient supplies to meet projected demands from 2025 through 2045 under a normal water year, a single dry year, and five consecutive drought year conditions as specified by the Act. Their assessment is restricted to the specific conditions and assumptions stated in the UWMP Section 2.3 and 2021 WSCP Section A.4.2. IEUA expects to have surplus supplies for each year of their DRA, tabulated Table 7-7 (Draft IEUA 2020 UWMP, Section 7.5), due to their ability to augment with recycled water and imported water surplus to the allocated imported water supplies.

WFA purchases untreated imported water which is delivered directly within its distribution system, after treatment. WFA's purchases of untreated imported water over the past ten years have been tabulated in Section 6.1.

The imported water purchases by WFA during the most recent and historical five consecutive year drought period have been tabulated in Section 6.1. Because WFA's DRA assumes the most recent and historical five consecutive year drought scenario will be repeated over the next five years, it is assumed the quantity of untreated imported water supplies purchased during the most recent and historical five consecutive year drought scenario will be available. Furthermore, this constitutes the minimum amount of untreated imported water which may be available in a future five consecutive year drought absent MWD's programs which it has since implemented.

Summary

WFA's water system has previously experienced a five consecutive year drought. WFA has the ability to pass along varying water shortage levels (see Chapter 8) to encourage its member agencies to reduce demand in response to water shortages.

### *7.3.3 DRA TOTAL WATER SUPPLY AND USE COMPARISON*

Gross water use for the projected five consecutive year drought is shown on Table 7-5, relying on estimates described in Section 7.2.3. Section 7.3.2 describes the water source reliability for the source of supply WFA will rely on during a five consecutive year drought. WFA obtains imported water from Metropolitan Water District of Southern California through IEUA, and treats this imported water on behalf of its member agencies. The quantity

of water supplies that WFA is able to treat and provide to its member agencies is based on the availability of water supplies from MWD and IEUA. However, when necessary, WFA's member agencies can implement various water shortage levels of their respective Water Shortage Contingency Plans (discussed in Chapter 8) in order to reduce their water demands placed on WFA.

For the purposes of the DRA, the total water supplies available to WFA shown in Table 7-5 to meet its member agencies' demands are based on the quantity of supplies produced by WFA (i.e. demands) relying on information from the most recent historical five consecutive year drought period (from FY 2011- 12 through FY 2015-16), as a recent example. As shown in Table 7-5, WFA will provide treated imported water to meet its member agencies' requests up to the quantity of imported water made available from IEUA and MWD. WFA's member agencies will implement various stages of their respective Water Shortage Contingency Plans to balance water demands with available supplies during years 1, 2, 3, 4, and 5 of the projected five consecutive year drought.

MWD 's DRA indicates total supply shortfalls in years 2021 and 2023 while the other years indicate surpluses in Table 2-7 (Draft 2020 UWMP, Section 2.4). For the shortfalls, MWD provides a supply augmentation benefit to fill the gap. It should be noted that their total supplies include both Colorado River Aqueduct supplies in fixed volumes and variable supplies from the State Water Project, for each of the study years.

IEUA expects to have surplus supplies for each year of their DRA, tabulated Table 7-7 (Draft IEUA 2020 UWMP, Section 7.5), due to their ability to augment with recycled water and imported water surplus to the allocated imported water supplies.

**Table 7-5 Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b)**

| Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b) | |
|---|---|
| **2021** | **Total** |
| Total Water Use | 26,716 |
| Total Supplies | 25,676 |
| Surplus/Shortfall w/o WSCP Action | (1,040) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 1,040 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 4% |
| **2022** | **Total** |
| Total Water Use | 30,217 |
| Total Supplies | 27,954 |
| Surplus/Shortfall w/o WSCP Action | (2,263) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 2,263 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 7% |
| **2023** | **Total** |
| Total Water Use | 31,910 |
| Total Supplies | 28,455 |
| Surplus/Shortfall w/o WSCP Action | (3,455) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 3,455 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 11% |
| **2024** | **Total** |
| Total Water Use | 32,076 |
| Total Supplies | 27,606 |
| Surplus/Shortfall w/o WSCP Action | (4,470) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 4,470 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 14% |
| **2025** | **Total** |
| Total Water Use | 18,502 |
| Total Supplies | 15,387 |
| Surplus/Shortfall w/o WSCP Action | (3,115) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 3,115 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 17% |

### 7.3.4 OPTIONAL PLANNING TOOL WORKBOOK

DWR has deemed the "Planning Tool Worksheet" as optional and WFA is not required by DWR to use the tool. WFA has provided sufficient water supplies to its member agencies, including during long-term droughts and years with historically high water demands from its member agencies. WFA has also been able to provide water service to meet maximum day water demands from its member agencies for these years, including during the summer months. Consequently, an evaluation regarding water supplies on a monthly basis was not considered.

# CHAPTER 8

# WATER SHORTAGE CONTINGENCY PLAN

## LAY DESCRIPTION – CHAPTER 8

### WATER SHORTAGE CONTINGENCY PLAN

Chapter 8 (Water Shortage Contingency Plan) of WFA's 2020 Plan discusses and provides the following:

- WFA's Water Shortage Contingency Plan serves as a guide which presents how WFA intends to act, or respond, in the case of an actual water shortage contingency.

- Preparation of WFA's "Annual Water Supply and Demand Assessment" (or Annual Assessment) is discussed. Commencing July 1, 2022, WFA is required to submit the Annual Assessment. The Annual Assessment will include a review of WFA's "unconstrained" water demands from its member agencies for the current year and for a potential upcoming single dry year. Unconstrained water demands from its member agencies represent WFA's water demands from its member agencies prior to any "response actions" WFA may invoke pursuant to WFA's Water Shortage Contingency Plan.

- WFA will manage water supplies, in collaboration with its member agencies to minimize the adverse impacts of water shortages. WFA's plan for water usage during periods of shortage is designed to incorporate <u>six standard water shortage levels</u> corresponding to progressive ranges from up to a 10, 20, 30, 40, and 50 percent shortage, and greater than a 50 percent shortage, as required.

- For each declared water supply shortage level, member agencies are encouraged to reduce their consumption by the percentage specified in the corresponding water supply shortage level.

- For each declared water supply shortage level, WFA has established response actions to assist member agencies to reduce their demand on limited water supplies and to mitigate any shortage gaps in water supplies.

- The operational changes WFA will consider in addressing water shortages on a short-term basis are discussed to encourage demand reduction measures.

- WFA's Emergency Response Plan is summarized. The Emergency Response Plan provides the management, procedures, and designated actions WFA and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.

- The preparation of WFA's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of the area receiving water supplies from WFA are provided.

- The effectiveness of the shortage response actions for each of WFA's standard water shortage levels is presented. WFA has been able to provide sufficient water supplies to its member agencies, including during long-term droughts and years with historically high water demands.

- The communication protocols implemented by WFA when it declares any water shortage level are presented.

- The legal authorities associated with WFA's standard water shortage levels are presented.

- The financial consequences associated with WFA's standard water shortage levels are presented.

- WFA will evaluate the need for revising the Water Shortage Contingency Plan in order to resolve any water shortage gaps, as necessary. The steps necessary for WFA to adopt and amend its Water Shortage Contingency Plan are presented.

The following Water Shortage Contingency Plan includes references to Chapters and Sections from Water Facilities Authority's 2020 Urban Water Management Plan:

## 8.1 WATER SUPPLY RELIABILITY ANALYSIS

**CWC 10632.**

*(a)(1)* The analysis of water supply reliability conducted pursuant to Section 10635.

WFA's source of supply was discussed in Section 6.2 of the 2020 UWMP and consists of untreated imported water purchased from IEUA. The reliability of the source of supply is discussed in Chapter 7 of this UWMP. Imported water supplies may be impacted in the event MWD implements its WSAP due to a water supply shortage.

MWD's long-term water service reliability assessment performed for the UWMP forecasts sufficient supplies to meet projected demands from 2025 through 2045 under a normal water year, a single dry year, and five consecutive drought year conditions as specified by the Act. Their assessment is restricted to the specific conditions and assumptions stated in the UWMP Section 2.3 and 2021 WSCP Section A.4.2. IEUA expects to have surplus supplies for each year of their DRA, tabulated Table 7-7 (Draft IEUA 2020 UWMP, Section 7.5), due to their ability to augment with recycled water and imported water surplus to the allocated imported water supplies.

IEUA expects to have surplus supplies for each year of their DRA, tabulated Table 7-7 (Draft IEUA 2020 UWMP, Section 7.5), due to their ability to augment with recycled water and imported water surplus to the allocated imported water supplies.

## 8.2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

**CWC 10632.**

*(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:*

*(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.*

*(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of thefollowing:*

*(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.*

*(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.*

*(iii) Existing infrastructure capabilities and plausible constraints.*

*(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.*

*(v) A description and quantification of each source of water supply.*

**CWC 10632.1.**

> *An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.*

Commencing July 1, 2022, WFA is required to submit an "Annual Water Supply and Demand Assessment" (Annual Assessment) in accordance with DWR's guidance and requirements. The Annual Assessment will include a review of WFA's unconstrained water demands from its member agencies (i.e. water demands from its member agencies prior to any projected response actions WFA may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. WFA will also include information regarding anticipated shortages, triggered shortage response actions, and communication actions consistent with WFA's WSCP.

For each Annual Assessment, WFA plans to prepare a preliminary assessment which evaluates the adequacy of its water supplies for the current and upcoming years by April of each year. The preliminary assessment will include a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

### *8.2.1 DECISION MAKING PROCESS*

WFA purchases untreated water from MWD through IEUA, then treats and delivers the potable water for use by its member agencies. WFA owns and operates the Agua de Lejos Treatment Plant in the City of Upland, a conventional surface water treatment facility that treats and disinfects surface water from MWD's State Water Project. This information will be used to help develop the Annual Assessment. A draft of the Annual Assessment will be circulated internally within WFA for peer review and comment by the Technical Advisory Committee, consisting of representatives from each of the member agencies, for approval and recommendation to the Board of Directors. Based on comments received, a redraft will be prepared and provided to the General Manager for final review. Subsequently, a final draft of the Annual Assessment will be provided to WFA's Board of Directors for review and included in the agenda as part of a Board meeting such that it can be approved and any

recommended specific shortage response actions may be enacted. The final Annual Assessment will be provided to DWR no later than July 1 of each year.

The Annual Assessments will be instrumental in providing guidance to WFA and its member agencies regarding decisions regarding potential declarations of a water supply shortage and implementation of water reduction stages, instituting mandatory water restrictions, promoting water use efficiency and conservation programs, water rates and drought rate surcharges, and the necessity of pursuing alternative water supplies. This process will help ensure adequate water supply resources are available to WFA.

### *8.2.2 DATA AND METHODOLOGIES*

The key data inputs and methodologies which will be evaluated by WFA during the preparation of the preliminary assessment will include the following:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment will be identified. The evaluation criteria will include, but is not limited to, an analysis of current water demands from WFA's member agencies, and a review of water treatment system improvement plans which may impact infrastructure availability.

2) Water Supply: A description of the available water supply source will be provided. The description will include a quantification of the available imported water supply source from MWD and will be based on review of the State's water supply conditions, (e.g. State Water Project), current treatment capacities, historical deliveries, Urban Water Management Plans, and pertinent water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands from its member agencies during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, will be reviewed. The review will include factors effecting member agencies' demands such as weather, existing and projected land growth projections, actual member agency consumption and water use factors, and existing water shortage levels (see Section 8.3).

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands from its member agencies during the current year and the upcoming (potential single dry) year will be considered. The evaluation will include factors such as estimated water demands from its member agencies, weather, water quality results, available treatment capacities, imported water allocations, contractual obligations, regulatory issues, and the costs associated with treating the imported water supply source.

5) Infrastructure Considerations: The capabilities of the water treatment and distribution system infrastructure to meet the water demands from its member agencies during the current year and the upcoming (potential single dry) year will be considered. In addition, capital improvement and replacement projects, as well as potential projects which may increase water system and treatment capacities (see Section 6.2.8), will be considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies will be described.

## 8.3 SIX STANDARD WATER SHORTAGE LEVELS

**CWC 10632.**

*(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.*
*(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross reference relating its existing categories to the six standard water shortage levels.*

WFA obtains imported water from Metropolitan Water District of Southern California through IEUA, and treats the imported water on behalf of its member agencies. The quantity of water supplies that WFA is able to treat and provide to its member agencies is based on the availability of water supplies from MWD and IEUA. However, WFA will manage water supplies, in collaboration with its member agencies to minimize the adverse impacts of water shortages. WFA's member agencies have water usage plans during periods of shortage which are designed to incorporate six standard water shortage levels corresponding to progressive ranges from up to 10, 20, 30, 40, and 50 percent shortages, and greater than 50 percent shortage, as required.

WFA is a wholesale water supplier that treats and provides imported water from the State Water Project through IEUA to its member agencies upon request. However, imported supplies from WFA are usually one of several supply sources available to its member agencies. Depending on their individual water supply constraints, member agencies may employ their appropriate water shortage level. The standard shortage levels for each member agency can be found in their individual 2020 UWMPs. These standard shortage levels are executed by the individual member agency, independent of WFA.

WFA's member agencies are also retail member agencies of IEUA. As a result, member agencies may be subject to IEUA's "Regional Drought Contingency Plan", adopted in April 2020, which previously established six (6) water shortage levels. However, IEUA's "Regional Drought Contingency Plan" notes that a retail agency may employ a shortage level that varies from the regional shortage level. A copy of the "Regional Drought Contingency Plan" is provided and incorporated by reference. In accordance with the CWC in which urban water suppliers are required to define six standard water shortage levels, WFA has provided the crosswalk illustrated below that translates IEUA's previously established shortage levels to the mandated standard shortage levels for its member agencies.

**Corresponding Relationships Between IEUA's 2015 Shortage Levels and the 2020 WSCP Mandated Shortage Levels**

| Established Level | Supply Condition/ Shortage |
|---|---|
| 0 | 0% |
| 1 | 1 to 5% |
| 2 | 6 to 15% |
| 3 | 16 to 25% |
| 4 | 26 to 50% |
| 5 | > 50% |

| 2020 Standard Level | Shortage Level |
|---|---|
| 1 | ≤10% |
| 2 | 10 to 20% |
| 3 | 20 to 30% |
| 4 | 30 to 40% |
| 5 | 40 to 50% |
| 6 | > 50% |

Table 8-1 provides a description of the six water shortage levels, which may be triggered by a shortage in WFA's imported water supply source, depending on the severity of the shortage and its anticipated duration.

**Table 8-1 Water Shortage Contingency Planning Levels**

| Submittal Table 8-1<br>Water Shortage Contingency Plan Levels | | |
|---|---|---|
| **Shortage Level** | **Percent Shortage Range** | **Shortage Response Actions**<br>(*Narrative description)* |
| 1 | Up to 10% | IEUA member agencies may be subject to implement direct installation programs, hold more landscape workshops, consider escalation of local water waste prohibitions, etc. |
| 2 | Up to 20% | In addition to Shortage Level 1; IEUA member agencies may expand micro-targeting customers and increase marketing efforts. |
| 3 | Up to 30% | In addition to Shortage Level 2; IEUA member agencies may increase penalties, implement emergency alerts, etc. |
| 4 | Up to 40% | In addition to Shortage Level 3; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 5 | Up to 50% | In addition to Shortage Level 4; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 6 | >50% | In addition to Shortage Level 5; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| NOTES: | | |

## 8.4 SHORTAGE RESPONSE ACTIONS

**CWC 10632.**

*(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:*

*(A) Locally appropriate supply augmentation actions.*

*(B) Locally appropriate demand reduction actions to adequately respond to shortages.*

*(C) Locally appropriate operational changes.*

*(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.*

*(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.*

### *8.4.1 DEMAND REDUCTION*

WFA obtains imported water from Metropolitan Water District of Southern California through IEUA, and treats the imported water on behalf of its member agencies. The quantity of water supplies that WFA is able to treat and provide to its member agencies is based on the availability of water supplies from MWD and IEUA. However, WFA encourages prudent water shortage response actions for its member agencies to reduce demand on water supplies. Member agencies may employ their own demand reduction actions and/or IEUA demand reduction actions at their own discretion.

Once a drought enters a specific stage, the IEUA Drought Response Taskforce will assemble to finalize the Response Plan for that stage and begin the implementation process for retail customer targeting and increased outreach. The taskforce is comprised of representatives from IEUA's retail agencies, other stakeholders and regional personnel from IEUA. The group, including WFA's member agencies, works in a collaborative fashion to gain consensus on appropriate regional response actions. These recommendations will be brought to each agency's respective management for approval.

There are a number of response actions available to WFA's member agencies which are provided by IEUA. These include escalation of customer messaging content and frequency, expanded outreach channels, enhanced water efficiency incentives and programs, and as necessary, water use restrictions. Suggested actions for retail member agencies are available, as follows:

Standard Water Shortage Level 1

The following may be implemented by WFA's member agencies during a Standard Water Shortage Level 1:

- Implement direct installation programs including the Residential Smart Irrigation Direct Installation and the School Smart Irrigation Direct Installation.
- Hire additional landscape designers to expand landscape design services.
- Hold more frequent landscape workshops.
- Increase the volume of home surveys performed.
- Utilize general customer messaging to communicate need to increase water efficiency levels.
- Profile customers and micro-target high potential customers, utilizing messaging that will best resonate with those customers.
- Consider escalation of local water waste prohibitions.
- Introduce influencer marketing (role models and respected community members)
- Prepare IEUA WEFlex funding proposal and plans for expanded customer communication and enforcement administration.
- Additional requirements deemed necessary by WFA, IEUA, and individual member agencies.

Standard Water Shortage Level 2

In addition to tasks implemented in Standard Water Shortage Level 1, the following may be applied to Standard Water Shortage Level 2 by WFA's member agencies:

- Continue base programs and incentive amounts for turf replacement, high efficiency nozzles, smart controllers, laminar flow restrictor, and plumbing control valves.
- Continue smart irrigation direct installation programs.
- Expand profiling and micro-targeting to include mid-range water users as well as high- water use customers.
- Increase influencer marketing.
- Hire additional local staff and set up operations for expanded customer communication and enforcement administration.
- Additional requirements deemed necessary by WFA, IEUA, and/or individual member agencies.

Standard Water Shortage Level 3

In addition to tasks implemented in Standard Water Shortage Level 2, the following may be applied to Standard Water Shortage Level 3 by WFA's member agencies:

- Increase penalties.
- Implement emergency alerts.
- Implement news media coverage.
- Additional requirements deemed necessary by WFA, IEUA, and/or individual member agencies.

Standard Water Shortage Level 4

In addition to tasks implemented in Standard Water Shortage Level 3, the following may be applied to Standard Water Shortage Level 4 by WFA's member agencies:

- Additional requirements deemed necessary by WFA, IEUA, and/or individual member agencies.

Standard Water Shortage Level 5

In addition to tasks implemented in Standard Water Shortage Level 4, the following may be applied to Standard Water Shortage Level 5 by WFA's member agencies:

- Additional requirements deemed necessary by WFA, IEUA, and/or individual member agencies.

Standard Water Shortage Level 6

In addition to tasks implemented in Standard Water Shortage Level 5, the following may be applied to Standard Water Shortage Level 6 by WFA's member agencies:

- Only offer indoor plumbing and property leak detection programs.
- Suspend all landscape and irrigation programs.
- Conduct stringent enforcement of restrictions.
- Additional requirements deemed necessary by WFA, IEUA, and/or individual member agencies.

**Table 8-2 Demand Reduction Actions**

| Submittal Table 8-2: Demand Reduction Actions | | | | |
|---|---|---|---|---|
| Shortage Level | Demand Reduction Actions<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.* | How much is this going to reduce the shortage gap?<br>*Include units used (volume type or percentage)* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>***For Retail Suppliers Only***<br>*Drop Down List* |
| *Add additional rows as needed* | | | | |
| 1 | Expand Public Information Campaign | Collective reduction from all Shortage Level 1 actions is up to 3,065 AFY | Applicable to IEUA member agencies | No |
| 1 | Increase Frequency of Meter Reading | Collective reduction from all Shortage Level 1 actions is up to 3,065 AFY | Applicable to IEUA member agencies | No |
| 1 | Increase Water Waste Patrols | Collective reduction from all Shortage Level 1 actions is up to 3,065 AFY | Applicable to IEUA member agencies | Yes |
| 2 | Other | Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 6,130 AFY | All actions under Shortage Level 1 | Yes |
| 2 | Moratorium or Net Zero Demand Increase on New Connections | Collective reduction from all Shortage Level 2 actions is up to 6,130 AFY | Applicable to IEUA member agencies | No |
| 3 | Other | Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 9,195 AFY | All actions under Shortage Level 2 | Yes |
| 4 | Other | Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 12,260 AFY | All actions under Shortage Level 3 | Yes |
| 5 | Other | Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 15,325 AFY | All actions under Shortage Level 4 | Yes |
| 6 | Other | Collective reduction from Shortage Level 6 actions is greater than 15,325 AFY | All actions under Shortage Level 5 | Yes |
| NOTES: WFA encourages IEUA water shortage response actions for its member agencies to reduce demand on water supplies. Member agencies may employ their own demand reduction actions and/or IEUA demand reduction actions at their own discretion. | | | | |

### *8.4.2 SUPPLY AUGMENTATION*

As discussed in Chapter 6, WFA's source of water supply is strictly imported surface water from Metropolitan Water District of Southern California purchased through Inland Empire Utilities Agency and treated at WFA's treatment facility. WFA does not anticipate augmenting water supplies. However, WFA's member agencies will consider increased supplies from other existing sources. Table 8-3 reflects this approach and does not identify any new supplies. Additionally, WFA's member agencies will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet retail customer demands. As noted in Section 8.2, beginning July 1, 2022, WFA will prepare and submit an Annual Assessment which will include a review of its water supply available to meet water demands from its member agencies for the current and upcoming years.

Due to previous critically dry conditions, MWD developed the WSAP whereby available supplies are equitably allocated to its member agencies, including IEUA. The WSAP establishes ten

different shortage levels and a corresponding drought allocation to each member agency. Based on the shortage level established by MWD, the WSAP provides a reduced drought allocation to a member agency for its M&I retail demand. The ratio of MWD water supply drought allocation to local water supply will change based on the WSAP stage. The MWD drought allocation can be used to make Full Service untreated water deliveries at the Tier 1 rate up to a Tier 1 allocation.

Any Full-Service untreated water delivered in excess of a drought allocation is subject to a penalty rate in addition to the normal rate paid for the water. In addition to the WSAP, MWD describes supply augmentation actions in its Regional 2020 UWMP, which is incorporated by reference. MWD's primary first response to any gap between core supplies (from the State Water Project and Colorado River) and demand is to make optimal use of its supply augmentation options, consisting of drawing from flexible supply programs and storage reserves. MWD has developed and actively manages a portfolio of water supply programs including water transfer, storage, and exchange agreements. MWD pursues voluntary water transfer and exchange programs to help mitigate supply/demand imbalances and provide additional dry-year supply sources. In addition, MWD has developed significant storage capacity in reservoirs, conjunctive use, and other groundwater storage programs totaling approximately 6.0 million AF. Pursuant to MWD's "Emergency Storage Objective", updated in 2019, approximately 750,000 AF of total stored water is emergency storage reserved by MWD for use in the event of supply interruptions. Based on MWD's historical and on-going water supply and storage programs and management practices, WFA will purchase its allocated untreated imported water supply made available from MWD through IEUA in association with each of the standard water shortage levels identified in Section 8.3. Member agencies' water demands will be addressed through increased use of member agencies' local groundwater supplies and implementation of demand reduction measures through the various stages of action.

**Table 8-3 Supply Augmentation and Other Actions**

| Submittal Table 8-3: Supply Augmentation and Other Actions | | | |
|---|---|---|---|
| Shortage Level | Supply Augmentation Methods and Other Actions by Water Supplier<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference *(optional)* |
| *Add additional rows as needed* | | | |
| 1 | Transfers | Not applicable (see Notes) | |
| 2 | Transfers | Not applicable (see Notes) | |
| 3 | Transfers | Not applicable (see Notes) | |
| 4 | Transfers | Not applicable (see Notes) | |
| 5 | Transfers | Not applicable (see Notes) | |
| 6 | Transfers | Not applicable (see Notes) | |
| | | | |
| | | | |
| | | | |
| NOTES: WFA is a wholesale water supplier that provides treated imported water from the State Water Project through IEUA to its member agencies. WFA does not anticipate augmenting water supplies. However, WFA's member agencies will consider increased production from the Chino Basin (through potential transfer of water rights) using existing facilities to address increased demands. As noted on Table 8-2, WFA's member agencies plan to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands. | | | |

### *8.4.3 OPERATIONAL CHANGES*

During a water supply shortage situation, WFA will collaborate with its member agencies to determine how best to manage its reduced imported water supply to meet its member agencies' demands. Section 8.4.1 describes WFA's water supply source. Section 8.4.2 describes WFA's standard water shortage levels and associated demand reduction measures. Demand reduction measures, when implemented, may also potentially result in short-term operational changes which are necessary to allow WFA to utilize all available water supply sources in response to water shortage situations.

As noted in Section 8.2, beginning July 1, 2022, WFA will prepare and submit an Annual Assessment which will include a review of the water supplies available to meet water demands from member agencies for the current and upcoming years. Preparation of the Annual Assessment will assist WFA in determining any potential operational changes. The operational changes WFA will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- The reduced annual volume of available water supply may be distributed throughout the year whereby more volume is allocated to high demand summer months with lower volumes made available in the lower demand winter months. WFA may consider brief short-term treatment plant shutdowns during the winter.

- Improved monitoring, maintenance, and repairs to reduce water distribution system losses.

### 8.4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are implemented by WFA to reduce member agencies' demands are discussed in Section 8.4.2. There are no additional mandatory restrictions planned at this time.

### 8.4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in WFA's standard water shortage levels (identified in Section 8.3) and the associated demand reduction measures (described in Section 8.4.2). In addition to potential operational changes (Section 8.4.3) which WFA may consider in order to continue providing water supplies, WFA will review and implement any necessary steps included in its "Emergency Response Plan".

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including WFA, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated "Emergency Response Plan" (ERP) every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States Environment Protection Agency (USEPA), from March 31, 2020 and December 30, 2021, confirming the current RRA and ERP have been reviewed and updated.

WFA's RRA, prepared in 2020, evaluates the vulnerabilities, threats, and consequences from potential hazards to WFA's water system. WFA prepared its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards).
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems).
- Monitoring practices.
- Financial systems (e.g., billing systems).
- Chemical storage and handling.
- Operation and maintenance.

WFA's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with WFA's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

WFA's ERP Update, prepared in 2020, provides the management, procedures, and designated actions WFA and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures and other unforeseen circumstances. WFA's ERP Update (which is incorporated by reference) provides the guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP Update includes emergencies which directly affect the water system and the ability to maintain safe operations (such as a chlorine release, and earthquake or a threat of contamination). The ERP Update also incorporates the results of WFA's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity.
- Plans and procedures for responding to a natural hazard or malevolent act.
- Actions and equipment to lessen the impact of a natural hazard or malevolent act.
- Strategies to detect natural hazards or malevolent act.

WFA will review the ERP Update for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. WFA will also review applicable procedures described in the ERP Update regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

### *8.4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN*

**CWC 10632.5.**

*(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.*

*(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.*

*(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.*

The County of San Bernardino prepared a "Multi-Jurisdictional Hazard Mitigation Plan" which was approved by the Federal Emergency Management Agency (FEMA) in June 2017. The County's Multi-Jurisdictional Hazard Mitigation Plan identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout San Bernardino County, and the mitigation strategies necessary to reduce risks, including seismic risk. The County's Multi- Jurisdictional Hazard Mitigation Plan is provided in Appendix E.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of the area receiving water from WFA are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in the area receiving water supplies from WFA include the San Andreas fault, the Walnut Creek fault, the San Jose fault, the Red Hill fault, the Cucamonga fault, the Chino fault, the Central Avenue fault, and the Sierra Madre fault.

**Location of Earthquake Faults**

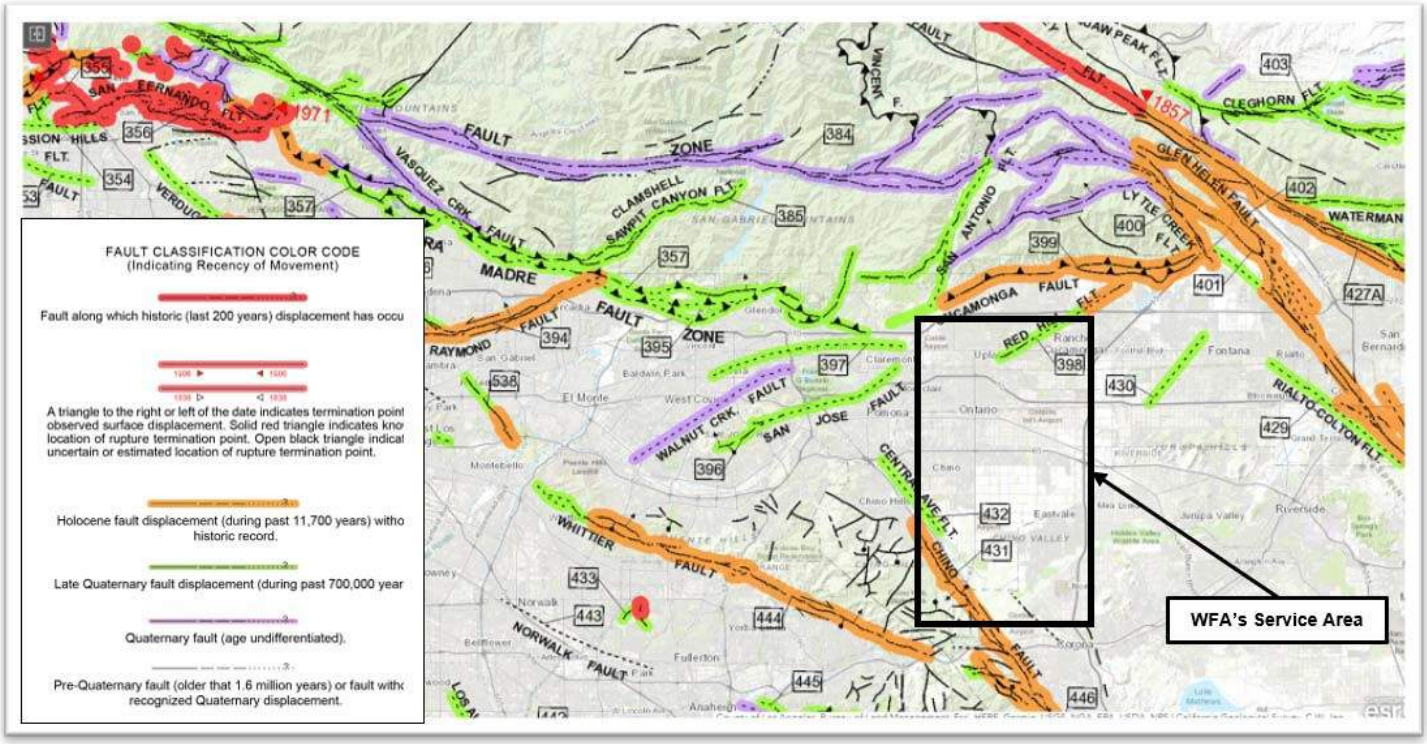


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of the area receiving water supplies from WFA from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including within the area receiving water supplies from WFA, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground- shaking with an approximate 2,500-year average repeat time). As discussed in Section 8.4.5, WFA has prepared an Emergency Response Plan Update which provides the management, procedures, and designated actions WFA and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that customers receive a reliable and adequate supply of potable water. WFA's ERP Update is incorporated by reference.

**Earthquake Shaking Potential**

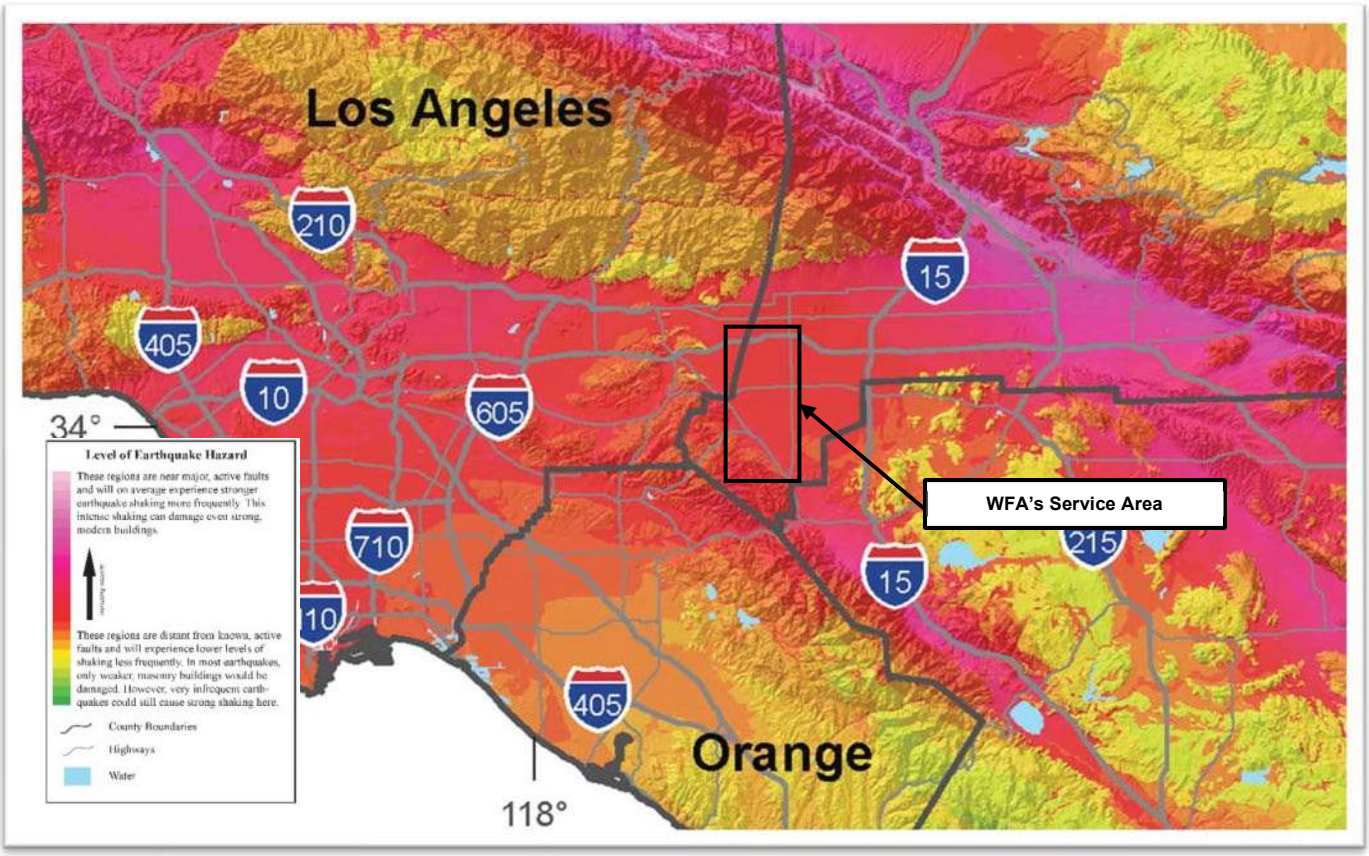


Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

### 8.4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

The effectiveness of the shortage response actions for each of the standard water shortage levels identified in Section 8.3 is evident in WFA's member agencies' historical ability to meet its their water demands in response to a water supply shortage. The effectiveness of each of the WFA's member agencies' shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction provided in Table 8-2 and Table 8-3.

Section 6.1 provides a tabulation of WFA's historical annual water demands. During the past 10 years, WFA experienced a five consecutive year drought within the area receiving its water supplies from FY 2011-12 to FY 2015-16. Throughout this extended dry year period, WFA's annual water production ranged from 15,387 AF to 28,455 AF, with an average of approximately 25,015 AF. In addition, historical records indicate WFA previously produced a maximum of up to 28,455 AF during FY 2013-14. WFA has been able to provide water supplies to its member agencies, including during long-term droughts and years with historically high water demands.

WFA's projected collective water demands from its member agencies (during normal, single dry, and multiple dry years) are provided in Section 7.2.3 and are anticipated to incorporate similar reductions in water use rates as a result of the shortage response actions, ongoing conservation efforts, and demand management measures. In addition, as discussed in Section 8.4.1, based on historical and on-going management practices, WFA member agencies will be able to continue relying on their water supply source from local groundwater supplies for adequate supply augmentation in response to each of the standard water shortage levels identified in Section 8.3.

Although adequate water supplies are anticipated, the cost of those water supplies may become incrementally more expensive. WFA's member agencies' will enact varying levels of their WSCP to encourage retail customers to reduce water consumption and at the same time reduce the need to use the more expensive water supplies. Notwithstanding, the effectiveness of each of WFA's shortage response actions, in order to reduce any potential gaps between supply and demand, has been quantified in the expected demand reduction section provided in Table 8-2 and Table 8-3. The effectiveness of WFA's member agencies' shortage response actions is based on WFA's water demands prior to 2015 (unconstrained demands). WFA experienced reduced water demands from its member agencies in 2015 in response to the Governor's April 1, 2015 Executive Order B-29- 15 which mandated statewide reduction in water use of 25 percent. WFA's actual water demand reduction during this period was used to estimate the extent of water use reductions for WFA's Water Shortage Stages. WFA's Water Shortage Levels 1, 2, 3, 4, 5, and 6 are expected to reduce water demands by up to 10%, 20%, 30%, 40%, 50%, and greater than 50%, respectively.

## 8.5 COMMUNICATION PROTOCOLS

**CWC 10632.**

*(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:*

*(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.*

*(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.*

*(C) Any other relevant communications.*

Pursuant to CWC 10632.1, WFA's Annual Assessment will be submitted to DWR by July1 of each year or within 14 days of receiving its final allocation, whichever is later. The Annual Assessment will include a review of WFA's unconstrained water demands from its member agencies (i.e. water demands from its member agencies prior to any projected response actions WFA may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. WFA will also include information regarding anticipated shortages, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with WFA's WSCP. See Section 8.2 for more information regarding the Annual Assessment.

WFA will participate in the IEUA Drought Response Taskforce to gain consensus on appropriate regional response actions, in collaboration with WFA's member agencies. These recommendations will be considered by each member agency's respective management for approval.

WFA will support its member agencies' broad messaging (news stories, radio/tv ads, billboards, etc.) to communicate water scarcity, urgency to act, and commitment to continue to provide safe, reliable supply. Additionally, IEUA and its member agencies will utilize targeted action messaging aimed towards specific customers via phone, letter, email, etc.

## 8.6 COMPLIANCE AND ENFORCEMENT

**CWC 10632.**

*(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

As a wholesale supplier, WFA is not required by DWR to complete Section 8.6. However, a discussion regarding enforcement and customer compliance actions are discussed in Section 8.4.1.

## 8.7 LEGAL AUTHORITIES

**CWC 10632.**

*(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.*

*(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.*

*(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.*

**CWC Division 1, Section 350**

*The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.*

WFA will manage its imported water supplies prudently to minimize the adverse impacts of water shortages. WFA's response actions during periods of shortage is described in Section 8.4.

Member agencies may employ their own appropriate water shortage level and response actions. The standard shortage levels for each member agency can be found in their individual 2020 UWMPs. These standard shortage levels are executed by the individual member agency, independent of WFA.

WFA may declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1 or one of the standard shortage levels, in collaboration with its member agencies, and encourage the response actions noted in the appropriate level designated in this WSCP. The list of measures of the designated water shortage level will then be considered by WFA's member agencies for their implementation at the retail level. Implementation of operational adjustments at the treatment plant in response to a water shortage will be considered by WFA.

Upon proclamation by the Governor of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions, the state will defer to implementation of locally adopted water shortage contingency plans to the extent practicable.

WFA shall coordinate with any city, county, or agency within which it provides water supply services for the possible proclamation of a local emergency as necessary under California Government Code, California Emergency Services Act (Article 2, Section 8558).

## 8.8 FINANCIAL CONSEQUENCES OF WSCP

**CWC 10632.**

> *(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:*
>
> *(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).*
>
> *(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).*
>
> *(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.*

A reduction of imported water supply will increase the unit cost of treatment for each member agency, depending on the proportionate water deliveries. WFA has a mixture of cost recovery mechanisms based on entitlement, flow and member agencies 10-year average, and maintains a reserve for annual capital cost replacements with some limited funds to cover operating expenses for a short period of time. WFA plans to review its reserve policy and consider additional actions that will make WFA's finances less vulnerable to unexpected and drastic reductions in water supply.

## 8.9 MONITORING AND REPORTING

**CWC 10632.**

> *(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

As a wholesale supplier, WFA is not required by DWR to complete Section 8.9.

## 8.10 WSCP REFINEMENT PROCEDURES

**CWC 10632.**

> *(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

WFA's Water Shortage Contingency Plan has been prepared as an adaptive management plan. WFA will review the implementation results for any current or potential shortage gaps between water supplies and demands. WFA will evaluate the need for revising the Water Shortage Contingency Plan in order to resolve any shortage gaps, as necessary. WFA will consider the following potential revisions in the event of a potential shortage gap:

- Additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 9) to WFA's member agencies for their implementation at the retail level.
- Implementation of more stringent water use restrictions under the standard water shortage levels (discussed in Section 8.4.2).
- Improvements to the water supply augmentation responses (discussed in Section 8.4.1), as well as any associated operational changes (discussed in Section 8.4.3) which may be required.
- Incorporation of additional actions recommended by WFA staff and/or the Technical Advisory Committee, consisting of representatives from each of the member agencies.

This Water Shortage Contingency Plan is adopted as part of WFA's 2020 Urban Water Management Plan adoption process discussed in Section 10.3. It is anticipated WFA will review, revise, and adopt an updated Water Shortage Contingency Plan as part of preparing its 2025 Urban Water Management Plan as necessary. However, WFA will continue to review the monitoring and reporting data, and if needed, update the Water Shortage Contingency Plan more frequently. Any updates to WFA's Water Shortage Contingency Plan will include a public hearing and adoption process by WFA's Board (see Section 8.12).

## 8.11 SPECIAL WATER FEATURE DISTINCTION

**CWC 10632.**

> *(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.*

As a wholesale supplier, WFA is not required by DWR to complete Section 8.11.

## 8.12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

**CWC 10632.**

> *(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

WFA's Water Shortage Contingency Plan is adopted as part of WFA's 2020 Urban Water Management Plan adoption process discussed in Chapter 10. The process for adopting WFA's Water Shortage Contingency Plan includes the following:

- WFA will conduct a public hearing and make the Water Shortage Contingency Plan available for public inspection.
- WFA will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- WFA will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- WFA's Board will adopt the 2020 Urban Water Management Plan and the Water Shortage Contingency Plan.
- As part of submitting the 2020 Urban Water Management Plan to DWR, WFA will also submit the Water Shortage Contingency Plan (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2021. WFA will submit a copy of the Water Shortage Contingency Plan to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, WFA will make the Water Shortage Contingency Plan available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended Water Shortage Contingency Plan includes the following:

- WFA will conduct a public hearing and make the amended Water Shortage Contingency Plan available for public inspection.

- WFA's Board will adopt the amended Water Shortage Contingency Plan.
- WFA will submit the amended Water Shortage Contingency Plan to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.

Additional information regarding the adoption, submittal, and availability of WFA's Water Shortage Contingency Plan (and 2020 Urban Water Management Plan) is provided in Chapter 10.

# CHAPTER 9

# DEMAND MANAGEMENT MEASURES

## LAY DESCRIPTION – CHAPTER 9

### DEMAND MANAGEMENT MEASURES

Chapter 9 (Demand Management Measures) of WFA's 2020 Plan discusses and provides the following:

- WFA works closely with its member agencies regarding "Demand Management Measures" to reduce the member agencies' water demands to allow them to achieve their individual retail water use targets.
- WFA's Demand Management Measures include metering of all its water supply connections with its retail member agencies.
- WFA's Demand Management Measures supports its member agencies' public education and outreach programs regarding water conservation.
- Additional Demand Management Measures including rebate, conservation, and asset management are discussed, which may be offered by its member agencies.
- A summary of the Demand Management Measures WFA has implemented or supported over the past five (5) years is provided.

## 9.1 DEMAND MANAGEMENT MEASURES FOR WHOLESALE SUPPLIERS

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1)(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*
*(ii) Metering.*
*(iii) Public education and outreach.*
*(vi) Water conservation program coordination and staffing support.*
*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*
*(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1), and a narrative description of its distribution system asset management and wholesale supplier assistance programs.*

WFA was formed under a JPA to acquire and construct facilities to supply and distribute potable water to its member agencies. WFA purchases untreated imported water from MWD through IEUA, then treats and delivers the water to its member agencies. WFA owns and operates the Agua de Lejos Treatment Plant in the City of Upland, a conventional surface water treatment facility that treats and disinfects water supplies from the State Water Project provided by MWD. WFA's member agencies work closely with IEUA to facilitate the installation of water savingtechnology and devices and the implementation of public outreach and education programs. Water use efficiency programs are a significant part of IEUA's Water Resources Program.

### *9.1.1 METERING*

WFA fully meters its connections to its member agencies. WFA's meters are maintained by WFA staff and supplemented by third party evaluations.

### *9.1.2 PUBLIC EDUCATION AND OUTREACH*

WFA's member agencies are also retail member agencies of IEUA. As a result, WFA's member agency customers have direct access to IEUA's Regional Water Use Efficiency Program, promoting water conservation or indirect access through WFA's member agencies. IEUA provides marketing and outreach materials to their retail member agencies' customers by using social media platforms, IEUA's website, community events, education training, and monthly newsletters. Those customers also learn about rebates and additional programs through the member agencies' websites and promotional materials and IEUA's website.

IEUA offers conservation programs, water saving tips, and rebates to WFA's member agencies for their retail customers. Programs include free landscape design training, consultations, design renderings, irrigation auditing, and pressure regulation valve installation, repair, and maintenance. IEUA also participates in a wide range of community events including Earth Day Celebration, compost giveaways, Days at the LA Fair, and a Landscape Water Conservation Fair, for the public's benefit.

IEUA conducts water conservation school education programs to the regional elementary schools. Programs include school assemblies and lesson materials to educate students on the topics of water conservation. IEUA is also a member of the Water Education Water Awareness Committee (WEWAC) that promotes the education of water issues to local schools, including schools within WFA's member agencies' service areas. WEWAC hosts art and essay contests and provides financial support for lesson plan materials about water issues. IEUA plans to continue the school education programs to further promote water conservation.

### 9.1.3 WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT

WFA supports IEUA's Regional Water Use Efficiency Program for the benefit of its member agencies. WFA's member agencies maintain staff who are responsible for setting policies and priorities for their respective agencies. Monthly board and city council meetings are conducted to adopt policies and programs contributing to water reliability which the WFA member agency staff then implement through conservation programs, including individual and regional programs. Key objectives include promoting water education and water use efficiency to enhance water supplies and to reduce demand on water supplies, including imported water. WFA's member agency staff are responsible for marketing, outreach, and possible augmentation programs within their individual service areas.

### 9.1.4 OTHER DEMAND MANAGEMENT MEASURES

In addition to the DMMs discussed above, WFA supports MWD's SoCal Water$mart Program through IEUA and offered to WFA's member agencies. This program is a regional rebate program available to residential and commercial customers. There are rebates available for indoor plumbing including high efficiency clothes washers and toilets. Rebates are also available for outdoor plumbing, including those for weather-based irrigation controllers, rotating sprinkler nozzles, and replacement of irrigated lawn with drought tolerant plants or other approved landscape options. IEUA plans to continue implementation of these programs to promote water conservation.

### 9.1.5 ASSET MANAGEMENT

WFA's treatment facility and distribution system assets are maintained by monthly water delivery reports, annual budget allocations, annual financial reports, and annual water quality reports. All report documents are available on WFA's website. Further, these assets are managed and maintained by a formal asset management plan, including maintenance tracking software.

WFA identifies capital improvement projects to provide greater operational flexibility, efficiency, and service life extension. Capital improvement projects are funded by WFA's member agencies through the normal annual budget process based on each agency's percent ownership or entitlement of the treatment plant. In addition, capital replacement projects are forecasted and budgeted through the normal annual budget process and are funded by the member agencies based on different criteria, including how the equipment

service life is utilized in the treatment plant process, if the replacement is part of a member agency-owned turnout or by other funding mechanisms. WFA conducts routine preventative maintenance on a regular basis and repairs are made upon failure of certain equipment, when there are signs of fatigue or depending upon the criticality of the asset.

### *9.1.6 WHOLESALE SUPPLIER ASSISTANCE PROGRAMS*

In addition to the conservation assistance programs discussed in Section 9.1.2, WFA supports IEUA's water use efficiency programs, offered to WFA's member agencies. Some of these programs include (but are not limited to) incentives for indoor appliances, outdoor irrigation devices, commercial plumbing & equipment rebates, turf removal and landscape evaluation & audit program administered by Chino Basin Water Conservation District.

IEUA's Regional Water Use Efficiency Program is further described in its Regional 2020 UWMP and on its website, which is incorporated herein by reference. WFA, representing its five member agencies, recognizes the individuality of its member agencies and their desire to support their retail customers. Retail agencies may supplement or customize how these programs are promoted and offered, to meet their specific needs.

## 9.2 EXISTING DEMAND MANAGEMENT MEASURES FOR RETAIL SUPPLIERS

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1)(A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

*(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

*(i) Water waste prevention ordinances.*

*(ii) Metering.*

*(iii) Conservation pricing.*

*(iv) Public education and outreach.*

*(v) Programs to assess and manage distribution system real loss.*

*(vi) Water conservation program coordination and staffing support.*

*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

As a wholesale agency, WFA is not required by DWR to complete Section 9.2.

## 9.3 REPORTING IMPLEMENTATION

### *9.3.1 IMPLEMENTATION OVER THE PAST FIVE YEARS*

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1) (A) ...a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.*

WFA supports water conservation programs and demand management measures implemented by its member agencies, some of which may be offered through IEUA or through their own programs to promote water conservation to their customers.

As discussed in Section 9.1.1, WFA fully meters its connections to its member agencies. WFA's meters are maintained by WFA staff and supplemented by third party evaluations.

As discussed in Section 9.1.2, WFA's member agency customers have direct access to IEUA's Regional Water Use Efficiency Program promoting water conservation or indirect access through WFA's member agencies. IEUA provides marketing and outreach materials to their retail member agencies' customers by using social media platforms, IEUA's website, community events (such as Earth Day Celebration, compost giveaways, Days at the LA Fair, and a Landscape Water Conservation Fair) for the public's benefit, education training, and monthly newsletters. Programs include free landscape design training, consultations, design renderings, irrigation auditing, and pressure regulation valve installation, repair, and maintenance. School education programs include school assemblies and lesson materials to educate students on the topics of water conservation. IEUA is also a member of the Water Education Water Awareness Committee that promotes the education

of water issues to local schools, including schools within WFA's member agencies' service areas. WEWAC hosts art and essay contests and provides financial support for lesson plan materials about water issues.

As discussed in Section 9.1.3, WFA's member agencies maintain staff who are responsible for setting policies and priorities for their respective agencies. Monthly board and city council meetings are conducted to adopt objectives towards water reliability which the WFA member agency staff implements through conservation programs, including IEUA's water use efficiency programs.

As discussed in Section 9.1.4, WFA supports MWD's SoCal Water$mart Program through IEUA and offered by WFA's member agencies. This program is a regional rebate program available to residential and commercial customers. There are rebates available for indoor plumbing including high efficiency clothes washers and toilets. Rebates are also available for outdoor plumbing include those for weather-based irrigation controllers, rotating sprinkler nozzles, and replacement of irrigated lawn with drought tolerant plants or other approved landscape options.

As described in Section 9.1.5, WFA's treatment facility and distribution system assets are maintained by monthly delivery reports, annual budget allocations, annual financial reports, and annual water quality reports. All report documents are available on WFA's website. Further, these assets are managed and maintained by a formal asset management plan, including maintenance tracking software. WFA identifies capital improvement projects to provide greater operational flexibility, efficiency, and service life extension. Capital replacement projects are forecasted and budgeted through the normal annual budget process and are funded by the member agencies based on different criteria, including how the equipment service life is utilized in the treatment plant process, if the replacement is part of a member agency owned turnout or by other funding mechanisms. WFA conducts routine preventative maintenance on a regular basis and repairs are made upon failure of certain equipment, when there are signs of fatigue or depending upon the criticality of the asset.

As summarized in Section 9.1.6, in addition to the conservation assistance programs discussed in Section 9.1.2, WFA supports the following IEUA programs:

- MWD So Cal Water$mart Residential Rebate Program
- Multi-Family Toilet Installation Program
- IEUA Water Softener Rebate Program
- MWD SoCalWaterSmart.com CII Rebate Program
- MWD CII Save-A-Buck Program
- Weather-Based Irrigation Controller Rebate
- Residential Landscape Transformation Program

- IEUA Regional Residential Landscape Retrofit Program
- FreeSpinklerNozzles.com Voucher Program
- Landscape Evaluation and Audit Program (LEAP)

Retail agencies may supplement or customize how these programs are promoted and offered, to meet their specific needs.

### *9.3.2 IMPLEMENTATION TO ACHIEVE WATER USE TARGETS*

**CWC 10631.**

*(F)(1)(A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

The Demand Management Measures implemented by WFA are discussed in Section 9.1. Descriptions regarding the nature and extent of these Demand Management Measures implemented or supported by WFA over the past five years are discussed in Section 9.3. WFA will continue to support these Demand Management Measures and other water conservation programs and work collaboratively with IEUA to provide water conservation programs for its member agencies' residents.

## 9.4 WATER USE OBJECTIVES (FUTURE REQUIREMENTS)

Retail water agencies are currently working with DWR to develop Water Use Objectives pursuant to AB 1668 and SB 606. Beginning in 2024, retail water agencies are required to begin reporting compliance of their Water Use Objectives consisting of indoor residential water use, outdoor residential water use, commercial, industrial and institutional, irrigation with dedicated meters, water loss, and other unique local uses.

WFA is not a retail water agency and is not required to comply with the Water Use Objectives. However, WFA will continue to implement the Demand Management Measures discussed in Section 9.1.

# CHAPTER 10

# PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

## LAY DESCRIPTION – CHAPTER 10

### PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Chapter 10 (Plan Adoption, Submittal, and Implementation) of WFA's 2020 Plan discusses and provides the following:

- The steps WFA has performed to adopt and submit its 2020 Plan are detailed.
- The steps WFA has performed to adopt and submit its Water Shortage Contingency Plan are detailed.
- WFA coordinated the preparation of its 2020 Plan with the following:
    - County of San Bernardino
    - City of Ontario
    - City of Chino
    - City of Chino Hills
    - Cucamonga Valley Water District
    - Monte Vista Water District
    - San Antonio Water Company
    - City of Upland
    - Fontana Water Company
    - Local Agency Formation Commission
    - Chino Basin Watermaster
    - Inland Empire Utilities Agency
    - Chino Basin Water Conservation District

- WFA notified these agencies at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited these agencies to participate in the development of the 2020 Plan.
- WFA provided a notice of the public hearing to the same agencies regarding the time, date, and place of the public hearing.
- WFA published a newspaper notification of the public hearing, once a week for two successive weeks.
- WFA conducted a public hearing to discuss and adopt WFA's 2020 Plan and WFA's Water Shortage Contingency Plan.
- Within 30 days of adoption, WFA submitted the 2020 Plan and Water Shortage Contingency Plan to the California Department of Water Resources.

- Within 30 days of adoption, WFA submitted all data tables associated with the 2020 Plan to the California Department of Water Resources.
- Within 30 days of adoption, WFA submitted a copy of the 2020 Plan to the State of California Library.
- Within 30 days of adoption, WFA submitted a copy of the 2020 Plan (and Water Shortage Contingency Plan) to the County of San Bernardino Assessor- Recorder/ Clerk's office and the County of Riverside Assessor- County Clerk-Recorder's office.
- Within 30 days after submittal of the 2020 Plan to the California Department of Water Resources, WFA made the 2020 Plan (including the Water Shortage Contingency Plan) available at WFA's main office and on WFA's website.
- The steps WFA will perform to amend the 2020 Plan and/or the Water Shortage Contingency Plan, if necessary, are provided.

## 10.1 INCLUSION OF ALL 2020 DATA

The data provided in WFA's 2020 Plan and the WSCP is provided on a FY basis through June 30, 2020 (as discussed in Section 2.5).

## 10.2 NOTICE OF PUBLIC HEARING

WFA's public hearing notification process for its 2020 Plan and the WSCP is discussed below.

### *10.2.1 NOTICE TO CITIES AND COUNTIES*

**CWC 10621.**

> *(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

**CWC 10642.**

> *…The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area…*

#### *10.2.1.1 60 DAY NOTIFICATION*

As discussed in Section 2.6.2., WFA coordinated the preparation of the 2020 Plan with the following:

- County of San Bernardino
- City of Ontario
- City of Chino
- City of Chino Hills
- Cucamonga Valley Water District
- Monte Vista Water District
- San Antonio Water Company
- City of Upland
- Fontana Water Company
- Local Agency Formation Commission
- Chino Basin Watermaster
- Inland Empire Utilities Agency
- Chino Basin Water Conservation District

WFA notified these agencies, as well as the cities and county within which WFA provides water supplies, at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited them to participate in the development of the Plan. A copy of the notification letters sent to these agencies is provided in Appendix D.

#### *10.2.1.2 NOTICE OF PUBLIC HEARING*

WFA provided a notice of the public hearing to the cities, county, and other agencies listed in Section 2.6.2. The notice includes the time and place of the public hearing. To ensure that the Plan and the WSCP were available for review, WFA placed a copy of the draft 2020 Plan and the draft WSCP for review on its website. Copies of the notice of the public hearing are provided in Appendix D.

### *10.2.1.3 SUBMITTAL TABLES*

**Table 10-1 Notification to Cities and Counties**

| Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one) | | |
|---|---|---|
| ☐ | Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.** | |
| | Provide the page or location of this list in the UWMP. | |
| ☑ | Supplier has notified 10 or fewer cities or counties. **Complete the table below.** | |
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| Chino | Yes | Yes |
| Chino Hills | Yes | Yes |
| Ontario | Yes | Yes |
| Upland | Yes | Yes |
| County Name *Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| San Bernardino County | Yes | Yes |
| | | |
| NOTES: | | |

### 10.2.2 NOTICE TO THE PUBLIC

**CWC 10642.**

> *...Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies.*

**Government Code 6066.**

*Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.*

WFA encouraged the active involvement of the population within its service area prior to and during the preparation of the Plan. Pursuant to Section 6066 of the Government Code, WFA published a notice of public hearing in the newspaper during the weeks of June 3, 2021 and June 10, 2021. A notice of public hearing was also provided to IEUA and was posted on WFA's website. A copy of the published notice is provided in Appendix D. To ensure that the draft 2020 Plan and the draft WSCP were available for review, WFA placed a copy for review on its website.

## 10.3 PUBLIC HEARING AND ADOPTION

**CWC 10642.**

> *...Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon.*

**CWC 10608.26.**

*(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:*
- *(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.*
- *(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.*
- *(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.*

### 10.3.1 PUBLIC HEARING

Prior to adopting the draft 2020 Plan and the WSCP, WFA held a public hearing on June 17, 2021 which included input from the community regarding WFA's draft 2020 Plan and the draft WSCP. In addition, WFA considered the economic impacts measures described in Section 8.8.

### 10.3.2 ADOPTION

**CWC 10642.**

> *... After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.*

Following the public hearing, WFA adopted both the draft 2020 Plan and the draft WSCP (included in Chapter 8). Copies of the resolutions adopting the 2020 Plan, the 2015 Plan Addendum, and the WSCP, are provided in Appendix F and CEQA Notice of Exemption is provided in Appendix G.

## 10.4 PLAN SUBMITTAL

**CWC 10621.**

> *(e) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.*

**CWC 10644.**

> *(a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption.*

**CWC 10635.**

> *(c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*

WFA's submittal process for its 2020 Plan and the WSCP is discussed below.

### 10.4.1 SUBMITTING A UWMP AND WATER SHORTAGE CONTINGENCY PLAN TO DWR

WFA's Board of Directors adopted the 2020 Plan on June 17, 2021 and within 30 days, WFA submitted the adopted 2020 Plan (including the WSCP) to DWR. The 2020 Plan and WSCP were submitted through DWR's "Water Use Efficiency (WUE) Data Portal" website.

DWR developed a checklist which was used by WFA to assist DWR with its determination that WFA's 2020 Plan has addressed the requirements of the CWC. WFA has completed the DWR checklist by indicating where the required CWC elements can be found within WFA's 2020 Plan (See Appendix C).

### 10.4.2 ELECTRONIC DATA SUBMITTAL

**CWC 10644.**

> *(a)(2) The plan, or amendments to the plan, submitted to the department …shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.*

Within 30 days of adoption of the 2020 Plan, WFA submitted all data tables associated with the 2020 Plan through DWR's "Water Use Efficiency Data Portal" website.

### 10.4.3 SUBMITTING A UWMP, INCLUDING WSCP, TO THE CALIFORNIA STATE LIBRARY

Within 30 days of adoption of the 2020 Plan by the WFA Board of Directors, a copy (CD or hardcopy) of the 2020 Plan was submitted to the State of California Library. A copy of the letter to the State Library will be maintained in WFA's file. The 2020 Plan will be mailed to the following address if sent by regular mail:

California State Library
Government Publications Section
Attention: Coordinator, Urban Water Management Plans
P.O. Box 942837
Sacramento, CA 94237-0001

The 2020 Plan will be mailed to the following address if sent by courier or overnight carrier:

California State Library
Government Publications Section
Attention: Coordinator, Urban Water Management Plans
900 N Street
Sacramento, CA 95814

### 10.4.4 SUBMITTING A UWMP TO CITIES AND COUNTIES

Within 30 days of adoption of the 2020 Plan (including the WSCP) by the WFA Board of Directors, a copy of the 2020 Plan was submitted to the County of San Bernardino's Assessor- Recorder/ Clerk's office and IEUA. A copy of the letter to the County of San Bernardino will be maintained in WFA's file.

## 10.5 PUBLIC AVAILABILITY

**CWC 10645.**

*(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

*(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

Within 30 days after submittal of the 2020 Plan to DWR, WFA made the 2020 Plan (including the WSCP) available at the WFA's main office during normal business hours and on WFA's website.

## 10.6 NOTIFICATION TO PUBLIC UTILITIES COMMISSION

**CWC 10621.**

*(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.*

WFA is not regulated by the California Public Utilities Commission.

## 10.7 AMENDING AN ADOPTED UWMP OR WATER SHORTAGE CONTINGENCY PLAN

**CWC 10621.**

*(d) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).*

**CWC 10644.**

*(a)(1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.*

WFA's amendment process for its 2020 Plan is discussed below.

### *10.7.1 AMENDING A UWMP*

If WFA amends the adopted 2020 Plan (and/or the WSCP), the amended Plan will undergo adoption by WFA's governing board. Within 30 days of adoption, the amended Plan will then be submitted to DWR, the State of California Library, the County of San Bernardino's Assessor- Recorder/ Clerk's office, and IEUA.

### *10.7.2 AMENDING A WATER SHORTAGE CONTINGENCY PLAN*

**CWC 10644.**

*(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.*

If WFA amends the adopted 2020 Plan (including the WSCP), the amended Plan (and WSCP) will undergo adoption by WFA's governing board. Within 30 days of adoption, the amended Plan will then be submitted to DWR, the State of California Library, the County of San Bernardino's Assessor-Recorder/ Clerk's, and IEUA.

# APPENDIX A

# DWR STANDARDIZED TABLES

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| Submittal Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list) |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☐ | Water Supplier is also a member of a Regional Alliance | |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

| Submittal Table 2-3: Supplier Identification | |
|---|---|
| Type of Supplier (select one or both) | |
| ☑ | Supplier is a wholesaler |
| ☐ | Supplier is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☐ | UWMP Tables are in calendar years |
| ☑ | UWMP Tables are in fiscal years |
| If using fiscal years provide month and date that the fiscal year begins (mm/dd) | |
| *07/01* | |
| Units of measure used in UWMP * (select from drop down) | |
| Unit | AF |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | |
| NOTES: | |

| Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one) | |
|---|---|
| ☑ | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed. |
| Section 2.6 | **Provide page number for location of the list.** |
| ☐ | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.** |
| Water Supplier Name | |
| *Add additional rows as needed* | |
| | |
| | |
| | |
| NOTES: | |

| Submittal Table 3-1 Wholesale: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2020 | 2025 | 2030 | 2035 | 2040 | 2045*(opt)* |
| | 476,580 | 497,517 | 519,373 | 542,712 | 565,331 | 588,893 |
| NOTES: The 2020 population and the populations projected through 2045 were based on SCAG population data, IEUA's projected population, and the percentage of WFA's service area within IEUA's service area (See Section 3.4.1 and Section 5.4.1). | | | | | | |

| Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual | | | |
|---|---|---|---|
| Use Type | 2020 Actual | | |
| **Drop down list**<br>May select each use multiple times<br>These are the only use types that will be recognized by the WUE data online submittal tool | Additional Description<br>(as needed) | Level of Treatment When Delivered<br>Drop down list | Volume[2] |
| Add additional rows as needed | | | |
| Sales to other agencies | Member Agencies | Drinking Water | 23,435 |
| Groundwater recharge | MVWD Aquifer Injection | Drinking Water | 2,051 |
| Other Non-Potable | Upland #3 | Raw Water | 5 |
| | | | |
| | | **TOTAL** | 25,491 |

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: "Other Non-Potable" was a temporary connection that is no longer in use.

| Submittal Table 4-2 Wholesale: Use for Potable and Raw Water [1] - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type | Additional Description (as needed) | Projected Water Use [2] Report To the Extent that Records are Available | | | | |
| **Drop down list** May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool. | | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Add additional rows as needed | | | | | | |
| Sales to other agencies | | 28,185 | 29,422 | 30,745 | 32,027 | 33,361 |
| Groundwater recharge | | 2,466 | 2,575 | 2,690 | 2,802 | 2,919 |
| | **TOTAL** | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

| Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable) | | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Potable and Raw Water<br>From Tables 4-1W and 4-2W | 25,491 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Recycled Water Demand*<br>From Table 6-4W | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL WATER DEMAND** | 25,491 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| **Recycled water demand fields will be blank until Table 6-4 is complete.* | | | | | | |
| NOTES: | | | | | | |

| Submittal Table 6-1 Wholesale: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | Supplier does not pump groundwater.<br>The supplier will not complete the table below. | | | | | |
| ☐ | All or part of the groundwater described below is desalinated. | | | | | |
| Groundwater Type | Location or Basin Name | 2016* | 2017* | 2018* | 2019* | 2020* |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| | **TOTAL** | 0 | 0 | 0 | 0 | 0 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

| Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☑ | Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water.<br>The Supplier will not complete the table below. | | | | | | | | | | |
| | | | | | | | 2020 volumes [1] | | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* [2] | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list* | Treatment Level *Drop down list* | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area | Instream Flow Permit Requirement |
| *Add additional rows as needed* | | | | | | | | | | | |
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| | | | | | | | | | | | |
| | | | | | | **Total** | 0 | 0 | 0 | 0 | 0 |

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.

[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

| Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☑ | Recycled water is not directly treated or distributed by the Supplier.<br>The Supplier will not complete the table below. | | | | | | |
| Name of Receiving Supplier or Direct Use by Wholesaler | Level of Treatment<br>*Drop down list* | 2020* | 2025* | 2030* | 2035* | 2040* | 2045* *(opt)* |
| *Add additional rows as needed* | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | **Total** | 0 | 0 | 0 | 0 | 0 | 0 |
| *** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3. | | | | | | | |
| NOTES: | | | | | | | |

| Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual | | |
|---|---|---|
| ☑ | Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020.<br>The wholesale supplier will not complete the table below. | |
| Name of Receiving Supplier or Direct Use by Wholesaler | 2015 Projection for 2020* | 2020 Actual Use* |
| *Add additional rows as needed* | | |
| | | |
| | | |
| | | |
| | | |
| **Total** | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | |
| NOTES: | | |

| Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other suppliers? | | Description *(if needed)* | Planned Implementation Year | Planned for Use in Year Type *Drop Down list* | Expected Increase in Water Supply to Supplier* |
| | *Drop Down Menu* | *If Yes, Supplier Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

| Submittal Table 6-8 Wholesale: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | | 2020 | | |
| **Drop down list**<br>May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool | Additional Detail on Water Supply | Actual Volume* | Water Quality<br>Drop Down List | Total Right or Safe Yield* (optional) |
| Add additional rows as needed | | | | |
| Purchased or Imported Water | Inland Empire Utilities Agency | 25,492 | Drinking Water | |
| | | | | |
| | **Total** | 25,492 | | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | |
| NOTES: | | | | |

| Submittal Table 6-9 Wholesale: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | | Projected Water Supply* Report To the Extent Practicable | | | | | | | | | |
| | | 2025 | | 2030 | | 2035 | | 2040 | | 2045 (opt) | |
| **Drop down list** May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool | Additional Detail on Water Supply | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Add additional rows as needed | | | | | | | | | | | |
| Purchased or Imported Water | Inland Empire Utilities Agency | 30,651 | | 31,997 | | 33,435 | | 34,829 | | 36,280 | |
| | **Total** | 30,651 | 0 | 31,997 | 0 | 33,435 | 0 | 34,829 | 0 | 36,280 | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | |

| Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment) | | | |
|---|---|---|---|
| **Year Type** | **Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000 | **Available Supplies if Year Type Repeats** | |
| | | ☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ | |
| | | ☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | **Volume Available *** | **% of Average Supply** |
| Average Year | 2020 | 25,492 | 100% |
| Single-Dry Year | 2018 | 25,022 | 98.2% |
| Consecutive Dry Years 1st Year | 2012 | 25,676 | 100.7% |
| Consecutive Dry Years 2nd Year | 2013 | 27,954 | 109.7% |
| Consecutive Dry Years 3rd Year | 2014 | 28,455 | 111.6% |
| Consecutive Dry Years 4th Year | 2015 | 27,606 | 108.3% |
| Consecutive Dry Years 5th Year | 2016 | 15,387 | 60.4% |
| | | | |

*Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.*

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

| Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 *(Opt)* |
| Supply totals<br>*(autofill from Table 6-9)* | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Demand totals<br>*(autofill fm Table 4-3)* | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| NOTES: | | | | | |

| Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 (Opt) |
| Supply totals* | 30,086 | 31,408 | 32,819 | 34,187 | 35,612 |
| Demand totals* | 30,086 | 31,408 | 32,819 | 34,187 | 35,612 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | |
| NOTES: | | | | | |

| Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2025* | 2030* | 2035* | 2040* | 2045* (Opt) |
| First year | Supply totals | 30,873 | 32,229 | 33,678 | 35,081 | 36,543 |
| | Demand totals | 30,873 | 32,229 | 33,678 | 35,081 | 36,543 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Second year | Supply totals | 33,611 | 35,088 | 36,665 | 38,193 | 39,784 |
| | Demand totals | 33,611 | 35,088 | 36,665 | 38,193 | 39,784 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Third year | Supply totals | 34,214 | 35,717 | 37,322 | 38,877 | 40,498 |
| | Demand totals | 34,214 | 35,717 | 37,322 | 38,877 | 40,498 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fourth year | Supply totals | 33,193 | 34,651 | 36,208 | 37,717 | 39,289 |
| | Demand totals | 33,193 | 34,651 | 36,208 | 37,717 | 39,289 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fifth year | Supply totals | 18,502 | 19,314 | 20,182 | 21,023 | 21,900 |
| | Demand totals | 18,502 | 19,314 | 20,182 | 21,023 | 21,900 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Sixth year *(optional)* | Supply totals | | | | | |
| | Demand totals | | | | | |
| | Difference | 0 | 0 | 0 | 0 | 0 |

***Units of measure (AF, CCF, MG) m** ust remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

| Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b) | |
|---|---|
| **2021** | **Total** |
| Total Water Use | 26,716 |
| Total Supplies | 25,676 |
| Surplus/Shortfall w/o WSCP Action | (1,040) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 1,040 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 4% |
| **2022** | **Total** |
| Total Water Use | 30,217 |
| Total Supplies | 27,954 |
| Surplus/Shortfall w/o WSCP Action | (2,263) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 2,263 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 7% |
| **2023** | **Total** |
| Total Water Use | 31,910 |
| Total Supplies | 28,455 |
| Surplus/Shortfall w/o WSCP Action | (3,455) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 3,455 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 11% |
| **2024** | **Total** |
| Total Water Use | 32,076 |
| Total Supplies | 27,606 |
| Surplus/Shortfall w/o WSCP Action | (4,470) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 4,470 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 14% |
| **2025** | **Total** |
| Total Water Use | 18,502 |
| Total Supplies | 15,387 |
| Surplus/Shortfall w/o WSCP Action | (3,115) |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 3,115 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 17% |

| Submittal Table 8-1<br>Water Shortage Contingency Plan Levels | | |
|---|---|---|
| **Shortage Level** | **Percent Shortage Range** | **Shortage Response Actions**<br>(***Narrative description***) |
| 1 | Up to 10% | IEUA member agencies may be subject to implement direct installation programs, hold more landscape workshops, consider escalation of local water waste prohibitions, etc. |
| 2 | Up to 20% | In addition to Shortage Level 1; IEUA member agencies may expand micro-targeting customers and increase marketing efforts. |
| 3 | Up to 30% | In addition to Shortage Level 2; IEUA member agencies may increase penalties, implement emergency alerts, etc. |
| 4 | Up to 40% | In addition to Shortage Level 3; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 5 | Up to 50% | In addition to Shortage Level 4; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 6 | >50% | In addition to Shortage Level 5; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| NOTES: | | |

| Submittal Table 8-2: Demand Reduction Actions | | | | |
|---|---|---|---|---|
| Shortage Level | Demand Reduction Actions<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.* | How much is this going to reduce the shortage gap?<br>*Include units used (volume type or percentage)* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>***For Retail Suppliers Only***<br>*Drop Down List* |
| *Add additional rows as needed* | | | | |
| 1 | Expand Public Information Campaign | Collective reduction from all Shortage Level 1 actions is up to 3,065 AFY | Applicable to IEUA member agencies | No |
| 1 | Increase Frequency of Meter Reading | Collective reduction from all Shortage Level 1 actions is up to 3,065 AFY | Applicable to IEUA member agencies | No |
| 1 | Increase Water Waste Patrols | Collective reduction from all Shortage Level 1 actions is up to 3,065 AFY | Applicable to IEUA member agencies | Yes |
| 2 | Other | Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 6,130 AFY | All actions under Shortage Level 1 | Yes |
| 2 | Moratorium or Net Zero Demand Increase on New Connections | Collective reduction from all Shortage Level 2 actions is up to 6,130 AFY | Applicable to IEUA member agencies | No |
| 3 | Other | Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 9,195 AFY | All actions under Shortage Level 2 | Yes |
| 4 | Other | Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 12,260 AFY | All actions under Shortage Level 3 | Yes |
| 5 | Other | Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 15,325 AFY | All actions under Shortage Level 4 | Yes |
| 6 | Other | Collective reduction from Shortage Level 6 actions is greater than 15,325 AFY | All actions under Shortage Level 5 | Yes |
| NOTES: WFA encourages IEUA water shortage response actions for its member agencies to reduce demand on water supplies. Member agencies may employ their own demand reduction actions and/or IEUA demand reduction actions at their own discretion. | | | | |

| Submittal Table 8-3: Supply Augmentation and Other Actions | | | |
|---|---|---|---|
| Shortage Level | Supply Augmentation Methods and Other Actions by Water Supplier<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference *(optional)* |
| *Add additional rows as needed* | | | |
| 1 | Transfers | Not applicable (see Notes) | |
| 2 | Transfers | Not applicable (see Notes) | |
| 3 | Transfers | Not applicable (see Notes) | |
| 4 | Transfers | Not applicable (see Notes) | |
| 5 | Transfers | Not applicable (see Notes) | |
| 6 | Transfers | Not applicable (see Notes) | |
| | | | |
| | | | |
| | | | |
| NOTES: WFA is a wholesale water supplier that provides treated imported water from the State Water Project through IEUA to its member agencies. WFA does not anticipate augmenting water supplies. However, WFA's member agencies will consider increased production from the Chino Basin (through potential transfer of water rights) using existing facilities to address increased demands. As noted on Table 8-2, WFA's member agencies plan to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands. | | | |

| Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one) | | |
|---|---|---|
| ☐ | Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.** | |
| | Provide the page or location of this list in the UWMP. | |
| ☑ | Supplier has notified 10 or fewer cities or counties. **Complete the table below.** | |
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| Chino | Yes | Yes |
| Chino Hills | Yes | Yes |
| Ontario | Yes | Yes |
| Upland | Yes | Yes |
| County Name *Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| San Bernardino County | Yes | Yes |
| | | |
| NOTES: | | |

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# 2020 URBAN WATER MANAGEMENT PLAN

## APPENDIX B

### ADDENDUM TO 2015 URBAN WATER MANAGEMENT PLAN

## DEMONSTRATION OF REDUCED IMPORTED WATER RELIANCE

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**DEMONSTRATION OF CONSISTENCY WITH THE DELTA PLAN**
**FOR PARTICIPANTS IN COVERED ACTIONS**
**(FY 2014-2015 THROUGH FY 2044-45)**
**WATER FACILITIES AUTHORITY (WFA)**

The information contained in this document is intended to be Appendix B to WFA's 2020 Urban Water Management Plan (UWMP) as well as an Addendum attached to WFA's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). WFA provided notice of the availability of the draft 2020 UWMP (including Appendix B which is also a new Addendum to its 2015 UWMP) and the Water Shortage contingency Plan (WSCP) for the public hearing to consider adoption of both the 2020 UWMP and WSCP and the new Addendum to the 2015 UWMP in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. Thus, this Appendix B to WFA's 2020 UWMP, which was adopted with WFA's 2020 UWMP, will also serve as an Addendum to WFA's 2015 UWMP.

## Introduction

Pursuant to the California Department of Water Resources (DWR), an urban water supplier that anticipates participating in or receiving water from a proposed project (or "covered action") such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta) should provide information in their 2015 and 2020 Urban Water Management Plans (UWMPs) for use in demonstrating consistency with Delta Plan Policy WR P1, "*Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance"*. In addition, pursuant to California Code of Regulations, Title 23, § 5003:

> *(c)(1) Water suppliers that have done all of the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*

> *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
>
> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*
>
> *(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

WFA is member agency of the Inland Empire Utilities Agency (IEUA), which in turn is a member agency of the Metropolitan Water District of Southern California (MWD).

IEUA is an urban water supplier and a member agency of MWD. MWD provides IEUA with imported water supplies, which IEUA in turn distributes on a wholesale basis to its retail water purveyors. MWD is a contractor on the State Water Project (SWP) and, due to water quality considerations, all imported water supplies IEUA receives from MWD originate from the SWP system. The SWP system runs from Lake Oroville in Northern California to Southern California, crossing the Sacramento-San Joaquin Delta (Delta) along the way. MWD and its member agencies have made investments into water supply and demand management to regionally reduce impacts on the Delta. These investments bring regional reliability and reduced Delta reliance that make it infeasible for individual MWD member agencies to determine their individual Delta reliance. As a recipient of imported water from the SWP delivered via MWD, IEUA may indirectly receive water through a proposed covered action, such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta. Through this appendix, IEUA and WFA are providing information

in its 2015 and 2020 UWMPs that may be used in the covered action process, to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1) [California Code of Regulations (CCR), Title 23, § 5003].

As noted in MWD's document entitled "*Infeasibility of Accounting Supplies from the Delta Watershed for Metropolitan's Member Agencies and their Customers*" (which is included in MWD's Regional 2020 UWMP and is provided as Attachment 1 below), "... Metropolitan's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures. Metropolitan's member agencies coordinate reliance on the Delta through their membership to Metropolitan, a regional cooperative providing wholesale water service to its 26 member agencies. Accordingly, regional reliance on the Delta can only be measured regionally—not by individual Metropolitan member agencies and not by the customers of those member agencies...."

In addition, MWD's 2020 Regional UWMP indicates "...in accordance with UMWP requirements, Metropolitan's member agencies and their customers (many of them, retail agencies) also report demands and supplies for their service areas in their respective UWMPs. The data reported by those agencies are not additive to the regional totals shown in Metropolitan's UWMP; rather, their reporting represents subtotals of the regional total and should be considered as such for the purposes of determining reduced reliance on the Delta…While the demands that Metropolitan's member agencies and their customers report in their UWMPs are a good reflection of the demands in their respective service areas, they do not adequately represent each water supplier's contributions to reduced reliance on the Delta. In order to calculate and report their reliance on water supplies from the Delta watershed, water suppliers that receive water from the Delta through other regional or wholesale water suppliers would need to determine the amount of Delta water that they receive from the regional or wholesale supplier. Two specific pieces of information are needed to accomplish this: first is the quantity of demands on the regional or wholesale water supplier that accurately reflect a supplier's contributions

to reduced reliance on the Delta, and second is the quantity of a supplier's demands on the regional or wholesale water supplier that are met by supplies from the Delta watershed…For water suppliers that make investments in regional projects or programs it may be infeasible to quantify their demands on the regional or wholesale water supplier in a way that accurately reflects their individual contributions to reduced reliance on the Delta." Nonetheless, WFA has taken proactive measures to help reduce regional reliance on imported water supplies and is discussed in the following sections.

**Reduced Reliance Calculation Tables**

Pursuant to DWR guidance, Tables C-1 through C-4 were prepared to show the potential reduction of reliance on imported water supplies for WFA. WFA has used these tables to demonstrate its reduced regional reliance on imported water supplies, but not specifically Delta Watershed supplies. For each of the tables, a "Baseline year" was selected. Water demands from member agencies during subsequent years (from 2015 through 2045 in five-year increments) were compared to water demands from member agencies during the Baseline year. Table C-1 considers the population and water demands within the area receiving water supplies from WFA, and a demand per capita per day (GPCD) water use rate was calculated for each of the years following the Baseline year. The calculated reduction in GPCD from the Baseline year was then translated to an estimated amount of water saved as a result of water conservation measures. Table C-2 references the estimated amount of water saved from Table C-1 and shows WFA water demand from member agencies without water use efficiency in effect.

The calculation of reduced regional reliance on imported water supplies is shown on Table C-4. Table C-4 also shows the percent change in imported water supplies relative to WFA's total supply. A negative percent change of imported water supplies indicates WFA has reduced its regional reliance on imported water supplies.

Since the Baseline year, WFA has decreased regional reliance on imported water supplies in 2015, 2020, and anticipates doing so through 2045.

WFA has reduced its regional reliance on imported water supplies by the following:

- The collective demand in GPCD from its member agencies for the "Baseline year" was compared to the GPCD in subsequent years (from FY 2014-15 through FY 2044-45, in five-year increments). The reduced GPCD multiplied by the collective population within the area served by WFA water supplies in these subsequent years is indicative of the potential reduced regional reliance on imported water supplies and is included in Table C-1.

This category of reduced regional reliance on imported water supplies is discussed below. The sum of the reduced regional reliance on imported water supplies resulting from this category is reflected on Table C-1 and is reflective of WFA's overall reduced reliance.

**Reduced GPCD**

WFA relies on purchases of untreated imported water from IEUA. The imported water which is subsequently treated by WFA and delivered to its member agencies can be quantified on a GPCD basis. The reduced GPCD from the baseline year is indicative of a reduced reliance on imported water supplies.

Chapter 9 of this Plan describes the Demand Management Measures (DMMs) which member agencies have implemented to reduce the amount of water used. Collectively these actions translate to a reduction in the GPCD usage rate by its member agencies which is described in their 2020 UWMPs regarding SB X7-7 water use targets. These actions directly impact total water demands from its member agencies, and consequently, the quantity of water which may be required imported water supplies. Absent the proactive measures taken by WFA's member agencies, it is anticipated there may have been a greater demand on imported water.

Pursuant to DWR guidance, reduced regional reliance on imported water supplies can be demonstrated by first selecting a "Baseline" water demand from its member agencies, represented by total potable water demands from its member agencies during FY 2007-

08. Table C-1 summarizes the “Baseline” water usage by WFA in FY 2007-08 (assuming demand reduction efforts had not been implemented); actual water usage in FY 2014-15 and FY 2019-20; and projected water usage through CY 2044-45 in five-year increments. Table C-2 demonstrates that if water conservation measures had not been implemented by WFA’s member agencies, there may have been a greater reliance on untreated imported water supplies during subsequent years as compared to the Baseline year. However, as discussed below and shown in Table C-1, the reduced water demands have resulted in reduced regional reliance on imported water supplies as compared to the Baseline year.

WFA’s potable water demand from its member agencies of 33,571 AF during FY 2007-08, along with the corresponding population within the area receiving its water supplies of approximately 438,000, were used to determine the Baseline GPCD. Subsequently, the actual demands from its member agencies for FY 2014-15 and FY 2019-20 were compared to the calculated population within the area receiving its water supplies to obtain the recent GPCD which includes the water conservations measures which have been implemented (those DMMs are described in Chapter 9 of this Plan). The differences between the Baseline GPCD and the FY 2014-15 and FY 2019-20 GPCDs are effectively considered a demonstration of the reduced regional reliance on imported water supplies with the understanding that any potential increased demand from WFA’s member agencies resulting from increased population within the area receiving its water supplies, could have been required from imported water, absent WFA’s new water supplies which contribute to self-reliance. A similar methodology is used for the projected potable water demands from its member agencies (2020 UWMP Table 4-3) and populations within the area receiving its water supplies (2020 UWMP Table 3-1).

**Metropolitan Water District of Southern California**

In addition, as the wholesale provider, MWD has included a detailed discussion regarding measurable reduction in Delta reliance in Appendix 11 for 2015 and 2020 as part of its 2015 Regional Urban Water Management Plan and 2020 Regional Urban Water Management Plan, respectively, and are also included in Attachment 1 below.

**Inland Empire Utilities Agency**

As the wholesale provider, IEUA has included a detailed discussion regarding measurable reduction in Delta reliance in Appendix G for 2015 and 2020 as part of its 2020 Regional Urban Water Management Plan, respectively, and is also included in Attachment 2 below.

## Reduced Reliance Calculation - Water Facilities Authority

**Table C-1: Optional Calculation of Water Use Efficiency -To be completed if Water Supplier does not specifically estimate Water Use Efficiency as a supply**

| Service Area Water Use Efficiency Demands (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands with Water Use Efficiency Accounted For | 33,571 | 15,387 | 25,492 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Non-Potable Water Demands | - | - | - | - | - | - | - | - |
| Potable Service Area Demands with Water Use Efficiency Accounted For | 33,571 | 15,387 | 25,492 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |

| Total Service Area Population | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Population | 438,000 | 450,041 | 476,580 | 497,517 | 519,373 | 542,712 | 565,331 | 588,893 |

| Water Use Efficiency Since Baseline (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Per Capita Water Use (GPCD) | 68 | 31 | 48 | 55 | 55 | 55 | 55 | 55 |
| Change in Per Capita Water Use from Baseline (GPCD) | | (38) | (21) | (13) | (13) | (13) | (13) | (13) |
| Estimated Water Use Efficiency Since Baseline | | 19,107 | 11,037 | 7,482 | 7,810 | 8,161 | 8,502 | 8,856 |

**Table C-2: Calculation of Service Area Water Demands Without Water Use Efficiency**

| Total Service Area Water Demands (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands with Water Use Efficiency Accounted For | 33,571 | 15,387 | 25,492 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline | - | 19,107 | 11,037 | 7,482 | 7,810 | 8,161 | 8,502 | 8,856 |
| Service Area Water Demands without Water Use Efficiency Accounted For | 33,571 | 34,494 | 36,528 | 38,133 | 39,808 | 41,597 | 43,330 | 45,136 |

**Table C-3: Calculation of Supplies Contributing to Regional Self-Reliance**

| Water Supplies Contributing to Regional Self-Reliance (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Use Efficiency | - | 19,107 | 11,037 | 7,482 | 7,810 | 8,161 | 8,502 | 8,856 |
| Water Recycling | | | | | | | | |
| Stormwater Capture and Use | | | | | | | | |
| Advanced Water Technologies | | | | | | | | |
| Conjunctive Use Projects | | | | | | | | |
| Local and Regional Water Supply and Storage Projects | | | | | | | | |
| Other Programs and Projects the Contribute to Regional Self-Reliance | | | | | | | | |
| Water Supplies Contributing to Regional Self-Reliance | - | 19,107 | 11,037 | 7,482 | 7,810 | 8,161 | 8,502 | 8,856 |

| Service Area Water Demands without Water Use Efficiency (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands without Water Use Efficiency Accounted For | 33,571 | 34,494 | 36,528 | 38,133 | 39,808 | 41,597 | 43,330 | 45,136 |

| Change in Regional Self Reliance (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Supplies Contributing to Regional Self-Reliance | - | 19,107 | 11,037 | 7,482 | 7,810 | 8,161 | 8,502 | 8,856 |
| Change in Water Supplies Contributing to Regional Self-Reliance | | 19,107 | 11,037 | 7,482 | 7,810 | 8,161 | 8,502 | 8,856 |

| Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Percent of Water Supplies Contributing to Regional Self-Reliance | 0.0% | 55.4% | 30.2% | 19.6% | 19.6% | 19.6% | 19.6% | 19.6% |
| Change in Percent of Water Supplies Contributing to Regional Self-Reliance | | 55.4% | 30.2% | 19.6% | 19.6% | 19.6% | 19.6% | 19.6% |

**Table C-4: Calculation of Reliance on Water Supplies from the Delta Watershed**

| Water Supplies from the Delta Watershed (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| CVP/SWP Contract Supplies | | | | | | | | |
| Delta/Delta Tributary Diversions | | | | | | | | |
| Transfers and Exchanges | | | | | | | | |
| Other Water Supplies from the Delta Watershed[1] | 33,571 | 15,387 | 25,492 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Total Water Supplies from the Delta Watershed | 33,571 | 15,387 | 25,492 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |

| Service Area Water Demands without Water Use Efficiency (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands without Water Use Efficiency Accounted For | 33,571 | 34,494 | 36,528 | 38,133 | 39,808 | 41,597 | 43,330 | 45,136 |

| Change in Supplies from the Delta Watershed (Acre-Feet) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Supplies from the Delta Watershed | 33,571 | 15,387 | 25,492 | 30,651 | 31,997 | 33,435 | 34,829 | 36,280 |
| Change in Water Supplies from the Delta Watershed | | (18,184) | (8,080) | (2,920) | (1,574) | (136) | 1,258 | 2,709 |

| Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE) | Baseline (2008) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Percent of Water Supplies from the Delta Watershed | 100.0% | 44.6% | 69.8% | 80.4% | 80.4% | 80.4% | 80.4% | 80.4% |
| Change in Percent of Water Supplies from the Delta Watershed | | -55.4% | -30.2% | -19.6% | -19.6% | -19.6% | -19.6% | -19.6% |

Baseline Year is FY 2007-08

[1] Represents imported water from Inland Empire Utilities Agency.

# APPENDIX B
# ATTACHMENT 1

- **Infeasibility of Accounting Supplies from the Delta Watershed for Metropolitan's Member Agencies and their Customers**

- **Appendix 11 Addendum to the Metropolitan Water District of Southern California's 2015 Urban Water Management Plan**

- **Appendix 11 "Quantifying Regional Self-Reliance and Reliance on Water Supplies from the Delta Watershed", Metropolitan Water District of Southern California's 2020 Urban Water Management Plan**

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# Infeasibility of Accounting Supplies from the Delta Watershed for Metropolitan's Member Agencies and their Customers

Metropolitan's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures. Metropolitan's member agencies coordinate reliance on the Delta through their membership in Metropolitan, a regional cooperative providing wholesale water service to its 26 member agencies. Accordingly, regional reliance on the Delta can only be measured regionally—not by individual Metropolitan member agencies and not by the customers of those member agencies.

Metropolitan's member agencies, and those agencies' customers, indirectly reduce reliance on the Delta through their collective efforts as a cooperative. Metropolitan's member agencies do not control the amount of Delta water they receive from Metropolitan. Metropolitan manages a statewide integrated conveyance system consisting of its participation in the State Water Project (SWP), its Colorado River Aqueduct (CRA) including Colorado River water resources, programs and water exchanges, and its regional storage portfolio. Along with the SWP, CRA, storage programs, and Metropolitan's conveyance and distribution facilities, demand management programs increase the future reliability of water resources for the region. In addition, demand management programs provide system-wide benefits by decreasing the demand for imported water, which helps to decrease the burden on the district's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

Metropolitan's costs are funded almost entirely from its service area, with the exception of grants and other assistance from government programs. Most of Metropolitan's revenues are collected directly from its member agencies. Properties within Metropolitan's service area pay a property tax that currently provides approximately 8 percent of the fiscal year 2021 annual budgeted revenues. The rest of Metropolitan's costs are funded through rates and charges paid by Metropolitan's member agencies for the wholesale services it provides to them.[1] Thus, Metropolitan's member agencies fund nearly all operations Metropolitan undertakes to reduce reliance on the Delta, including Colorado River Programs, storage facilities, Local Resources Programs and Conservation Programs within Metropolitan's service area.

Because of the integrated nature of Metropolitan's systems and operations, and the collective nature of Metropolitan's regional efforts, it is infeasible to quantify each of Metropolitan member agencies' individual reliance on the Delta. It is infeasible to attempt to segregate an entity and a system that were designed to work as an integrated regional cooperative.

In addition to the member agencies funding Metropolitan's regional efforts, they also invest in their own local programs to reduce their reliance on any imported water. Moreover, the customers of those member agencies may also invest in their own local programs to reduce water demand. However, to the extent those efforts result in reduction of demands on Metropolitan, that reduction does not equate to a like reduction of reliance on the Delta. Demands on Metropolitan are not commensurate with demands on the Delta because most of Metropolitan member agencies receive blended resources from

[1] A standby charge is collected from properties within the service areas of 21 of Metropolitan's 26 member agencies, ranging from $5 to $14.20 per acre annually, or per parcel if smaller than an acre. Standby charges go towards those member agencies' obligations to Metropolitan for the Readiness-to-Serve Charge. The total amount collected annually is approximately $43.8 million, approximately 2 percent of Metropolitan's fiscal year 2021 annual budgeted revenues.

Metropolitan as determined by Metropolitan—not the individual member agency—and for most member agencies, the blend varies from month-to-month and year-to-year due to hydrology, operational constraints, use of storage and other factors.

## Colorado River Programs

As a regional cooperative of member agencies, Metropolitan invests in programs to ensure the continued reliability and sustainability of Colorado River supplies. Metropolitan was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the CRA. The CRA consists of five pumping plants, 450 miles of high voltage power lines, one electric substation, four regulating reservoirs, and 242 miles of aqueducts, siphons, canals, conduits and pipelines terminating at Lake Mathews in Riverside County. Metropolitan owns, operates, and manages the CRA. Metropolitan is responsible for operating, maintaining, rehabilitating, and repairing the CRA, and is responsible for obtaining and scheduling energy resources adequate to power pumps at the CRA's five pumping stations.

Colorado River supplies include Metropolitan's basic Colorado River apportionment, along with supplies that result from existing and committed programs, including supplies from the Imperial Irrigation District (IID)-Metropolitan Conservation Program, the implementation of the Quantification Settlement Agreement (QSA) and related agreements, and the exchange agreement with San Diego County Water Authority (SDCWA). The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's CRA supplies. These include the PVID Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead.

## Storage Investments/Facilities

Surface and groundwater storage are critical elements of Southern California's water resources strategy and help Metropolitan reduce its reliance on the Delta. Because California experiences dramatic swings in weather and hydrology, storage is important to regulate those swings and mitigate possible supply shortages. Surface and groundwater storage provide a means of storing water during normal and wet years for later use during dry years, when imported supplies are limited. The Metropolitan system, for purposes of meeting demands during times of shortage, regulating system flows, and ensuring system reliability in the event of a system outage, provides over 1,000,000 acre-feet of system storage capacity. Diamond Valley Lake provides 810,000 acre-feet of that storage capacity, effectively doubling Southern California's previous surface water storage capacity. Other existing imported water storage available to the region consists of Metropolitan's raw water reservoirs, a share of the SWP's raw water reservoirs in and near the service area, and the portion of the groundwater basins used for conjunctive-use storage.

Since the early twentieth century, DWR and Metropolitan have constructed surface water reservoirs to meet emergency, drought/seasonal, and regulatory water needs for Southern California. These reservoirs include Pyramid Lake, Castaic Lake, Elderberry Forebay, Silverwood Lake, Lake Perris, Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, Orange County Reservoir, and Metropolitan's Diamond Valley Lake (DVL). Some reservoirs such as Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, and Orange County Reservoir, which have a total combined capacity of about 3,500 AF, are used solely for regulating purposes. The total gross storage capacity for

the larger remaining reservoirs is 1,757,600 AF. However, not all of the gross storage capacity is available to Metropolitan; dead storage and storage allocated to others reduce the amount of storage that is available to Metropolitan to 1,665,200 AF.

Conjunctive use of the aquifers offers another important source of dry year supplies. Unused storage in Southern California groundwater basins can be used to optimize imported water supplies, and the development of groundwater storage projects allows effective management and regulation of the region's major imported supplies from the Colorado River and SWP. Over the years, Metropolitan has implemented conjunctive use through various programs in the service area; the following table lists the groundwater conjunctive use programs that have been developed in the region.

| Program | Metropolitan Agreement Partners | Program Term | Max Storage AF | Dry-Year Yield AF/Yr |
|---|---|---|---|---|
| Long Beach Conjunctive Use Storage Project (Central Basin) | Long Beach | June 2002-2027 | 13,000 | 4,300 |
| Foothill Area Groundwater Storage Program (Monkhill/ Raymond Basin) | Foothill MWD | February 2003-2028 | 9,000 | 3,000 |
| Orange County Groundwater Conjunctive Use Program | MWDOC<br>OCWD | June 2003-2028 | 66,000+ | 22,000 |
| Chino Basin Conjunctive Use Programs | IEUA<br>TVMWD<br>Watermaster | June 2003-2028 | 100,000 | 33,000 |
| Live Oak Basin Conjunctive Use Project (Six Basins) | TVMWD<br>City of La Verne | October 2002-2027 | 3,000 | 1,000 |
| City of Compton Conjunctive Use Project (Central Basin) | Compton | February 2005-2030 | 2,289 | 763 |
| Long Beach Conjunctive Use Program Expansion in Lakewood (Central Basin) | Long Beach | July 2005-2030 | 3,600 | 1,200 |
| Upper Claremont Basin Groundwater Storage Program (Six Basins) | TVMWD | Sept. 2005- 2030 | 3,000 | 1,000 |
| Elsinore Basin Conjunctive Use Storage Program | Western MWD<br>Elsinore Valley MWD | May 2008- 2033 | 12,000 | 4,000 |
| **TOTAL** | | | **211,889** | **70,263** |

## Metropolitan Demand Management Programs

Demand management costs are Metropolitan's expenditures for funding local water resource development programs and water conservation programs. These Demand Management Programs incentivize the development of local water supplies and the conservation of water to reduce the need to import water to deliver to Metropolitan's member agencies. These programs are implemented below the delivery points between Metropolitan's and its member agencies' distribution systems and, as such, do not add any water to Metropolitan's supplies. Rather, the effect of these downstream programs is to

produce a local supply of water for the local agencies and to reduce demands by member agencies for water imported through Metropolitan's system. The following discussions outline how Metropolitan funds local resources and conservation programs for the benefit of all of its member agencies and the entire Metropolitan service area. Notably, the history of demand management by Metropolitan's member agencies and the local agencies that purchase water from Metropolitan's members has spanned more than four decades. The significant history of the programs is another reason it would be difficult to attempt to assign a portion of such funding to any one individual member agency.

## Local Resources Programs

In 1982, Metropolitan began providing financial incentives to its member agencies to develop new local supplies to assist in meeting the region's water needs. Because of Metropolitan's regional distribution system, these programs benefit all member agencies regardless of project location because they help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs and free up conveyance capacity to the benefit of all the agencies that rely on water from Metropolitan.

For example, the Groundwater Replenishment System (GWRS) operated by the Orange County Water District is the world's largest water purification system for indirect potable reuse. It was funded, in part, by Metropolitan's member agencies through the Local Resources Program. Annually, the GWRS produces approximately 103,000 acre-feet of reliable, locally controlled, drought-proof supply of high-quality water to recharge the Orange County Groundwater Basin and protect it from seawater intrusion. The GWRS is a premier example of a regional project that significantly reduced the need to utilize imported water for groundwater replenishment in Metropolitan's service area, increasing regional and local supply reliability and reducing the region's reliance on imported supplies, including supplies from the State Water Project.

Metropolitan's local resource programs have evolved through the years to better assist Metropolitan's member agencies in increasing local supply production. The following is a description and history of the local supply incentive programs.

### *Local Projects Program*

In 1982, Metropolitan initiated the Local Projects Program (LPP), which provided funding to member agencies to facilitate the development of recycled water projects. Under this approach, Metropolitan contributed a negotiated up-front funding amount to help finance project capital costs. Participating member agencies were obligated to reimburse Metropolitan over time. In 1986, the LPP was revised, changing the up-front funding approach to an incentive-based approach. Metropolitan contributed an amount equal to the avoided State Water Project pumping costs for each acre-foot of recycled water delivered to end-use consumers. This funding incentive was based on the premise that local projects resulted in the reduction of water imported from the Delta and the associated pumping cost. The incentive amount varied from year to year depending on the actual variable power cost paid for State Water Project imports. In 1990, Metropolitan's Board increased the LPP contribution to a fixed rate of $154 per acre-foot, which was calculated based on Metropolitan's avoided capital and operational costs to convey, treat, and distribute water, and included considerations of reliability and service area demands.

### *Groundwater Recovery Program*

The drought of the early 1990s sparked the need to develop additional local water resources, aside from recycled water, to meet regional demand and increase regional water supply reliability. In 1991, Metropolitan conducted the Brackish Groundwater Reclamation Study which determined that large

amounts of degraded groundwater in the region were not being utilized. Subsequently, the Groundwater Recovery Program (GRP) was established to assist the recovery of otherwise unusable groundwater degraded by minerals and other contaminants, provide access to the storage assets of the degraded groundwater, and maintain the quality of groundwater resources by reducing the spread of degraded plumes.

### *Local Resources Program*

In 1995, Metropolitan's Board adopted the Local Resources Program (LRP), which combined the LPP and GRP into one program. The Board allowed for existing LPP agreements with a fixed incentive rate to convert to the sliding scale up to $250 per acre-foot, similar to GRP incentive terms. Those agreements that were converted to LRP are known as "LRP Conversions."

### *Competitive Local Projects Program*

In 1998, the Competitive Local Resources Program (Competitive Program) was established. The Competitive Program encouraged the development of recycled water and recovered groundwater through a process that emphasized cost-efficiency to Metropolitan, timing new production according to regional need while minimizing program administration cost. Under the Competitive Program, agencies requested an incentive rate up to $250 per acre-foot of production over 25 years under a Request for Proposals (RFP) for the development of up to 53,000 acre-feet per year of new water recycling and groundwater recovery projects. In 2003, a second RFP was issued for the development of an additional 65,000 acre-feet of new recycled water and recovered groundwater projects through the LRP.

### *Seawater Desalination Program*

Metropolitan established the Seawater Desalination Program (SDP) in 2001 to provide financial incentives to member agencies for the development of seawater desalination projects. In 2014, seawater desalination projects became eligible for funding under the LRP, and the SDP was ended.

### *2007 Local Resources Program*

In 2006, a task force comprised of member agency representatives was formed to identify and recommend program improvements to the LRP. As a result of the task force process, the 2007 LRP was established with a goal of 174,000 acre-feet per year of additional local water resource development. The new program allowed for an open application process and eliminated the previous competitive process. This program offered sliding scale incentives of up to $250 per acre-foot, calculated annually based on a member agency's actual local resource project costs exceeding Metropolitan's prevailing water rate.

### *2014 Local Resources Program*

A series of workgroup meetings with member agencies was held to identify the reasons why there was a lack of new LRP applications coming into the program. The main constraint identified by the member agencies was that the $250 per acre-foot was not providing enough of an incentive for developing new projects due to higher construction costs to meet water quality requirements and to develop the infrastructure to reach end-use consumers located further from treatment plants. As a result, in 2014, the Board authorized an increase in the maximum incentive amount, provided alternative payment structures, included onsite retrofit costs and reimbursable services as part of the LRP, and added eligibility for seawater desalination projects. The current LRP incentive payment options are structured as follows:

- Option 1 – Sliding scale incentive up to $340/AF for a 25-year agreement term
- Option 2 – Sliding scale incentive up to $475/AF for a 15-year agreement term
- Option 3 – Fixed incentive up to $305/AF for a 25-year agreement term

### *On-site Retrofit Programs*

In 2014, Metropolitan's Board also approved the On-site Retrofit Pilot Program which provided financial incentives to public or private entities toward the cost of small-scale improvements to their existing irrigation and industrial systems to allow connection to existing recycled water pipelines. The On-site Retrofit Pilot Program helped reduce recycled water retrofit costs to the end-use consumer which is a key constraint that limited recycled water LRP projects from reaching full production capacity. The program incentive was equal to the actual eligible costs of the on-site retrofit, or $975 per acre-foot of up-front cost, which equates to $195 per acre-foot for an estimated five years of water savings ($195/AF x 5 years) multiplied by the average annual water use in previous three years, whichever is less. The Pilot Program lasted two years and was successful in meeting its goal of accelerating the use of recycled water.

In 2016, Metropolitan's Board authorized the On-site Retrofit Program (ORP), with an additional budget of $10 million. This program encompassed lessons learned from the Pilot Program and feedback from member agencies to make the program more streamlined and improve its efficiency. As of fiscal year 2019/20, the ORP has successfully converted 440 sites, increasing the use of recycled water by 12,691 acre-feet per year.

### *Stormwater Pilot Programs*

In 2019, Metropolitan's Board authorized both the Stormwater for Direct Use Pilot Program and a Stormwater for Recharge Pilot Program to study the feasibility of reusing stormwater to help meet regional demands in Southern California. These pilot programs are intended to encourage the development, monitoring, and study of new and existing stormwater projects by providing financial incentives for their construction/retrofit and monitoring/reporting costs. These pilot programs will help evaluate the potential benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches. Metropolitan's Board authorized a total of $12.5 million for the stormwater pilot programs ($5 million for the District Use Pilot and $7.5 million for the Recharge Pilot).

### *Current Status and Results of Metropolitan's Local Resource Programs*

Today, nearly one-half of the total recycled water and groundwater recovery production in the region has been developed with an incentive from one or more of Metropolitan's local resource programs. During fiscal year 2020, Metropolitan provided about $13 million for production of 71,000 acre-feet of recycled water for non-potable and indirect potable uses. Metropolitan provided about $4 million to support projects that produced about 50,000 acre-feet of recovered groundwater for municipal use. Since 1982, Metropolitan has invested $680 million to fund 85 recycled water projects and 27 groundwater recovery projects that have produced a cumulative total of about 4 million acre-feet.

## Conservation Programs

Metropolitan's regional conservation programs and approaches have a long history. Decades ago, Metropolitan recognized that demand management at the consumer level would be an important part of balancing regional supplies and demands. Water conservation efforts were seen as a way to reduce the need for imported supplies and offset the need to transport or store additional water into or within the Metropolitan service area. The actual conservation of water takes place at the retail consumer level. Regional conservation approaches have proven to be effective at reaching retail consumers throughout Metropolitan's service area and successfully implementing water saving devices, programs and practices. Through the pooling of funding by Metropolitan's member agencies, Metropolitan is able to engage in regional campaigns with wide-reaching impact. Regional investments in demand management programs, of which conservation is a key part along with local supply programs, benefit all member agencies regardless of project location. These programs help to increase regional water supply

reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

### *Incentive-Based Conservation Programs*

#### *Conservation Credits Program*

In 1988, Metropolitan's Board approved the Water Conservation Credits Program (Credits Program). The Credits Program is similar in concept to the Local Projects Program (LPP). The purpose of the Credits Program is to encourage local water agencies to implement effective water conservation projects through the use of financial incentives. The Credits Program provides financial assistance for water conservation projects that reduce demands on Metropolitan's imported water supplies and require Metropolitan's assistance to be financially feasible.

Initially, the Credits Program provided 50 percent of a member agency's program cost, up to a maximum of $75 per acre-foot of estimated water savings. The $75 Base Conservation Rate was established based Metropolitan's avoided cost of pumping SWP supplies. The Base Conservation Rate has been revisited by Metropolitan's Board and revised twice since 1988, from $75 to $154 per acre-foot in 1990 and from $154 to $195 per acre-foot in 2005.

In fiscal year 2020 Metropolitan processed more than 30,400 rebate applications totaling $18.9 million.

#### *Member Agency Administered Program*

Some member agencies also have unique programs within their service areas that provide local rebates that may differ from Metropolitan's regional program. Metropolitan continues to support these local efforts through a member agency administered funding program that adheres to the same funding guidelines as the Credits Program. The Member Agency Administered Program allows member agencies to receive funding for local conservation efforts that supplement, but do not duplicate, the rebates offered through Metropolitan's regional rebate program.

#### *Water Savings Incentive Program*

There are numerous commercial entities and industries within Metropolitan's service area that pursue unique savings opportunities that do not fall within the general rebate programs that Metropolitan provides. In 2012, Metropolitan designed the Water Savings Incentive Program (WSIP) to target these unique commercial and industrial projects. In addition to rebates for devices, under this program, Metropolitan provides financial incentives to businesses and industries that created their own custom water efficiency projects. Qualifying custom projects can receive funding for permanent water efficiency changes that result in reduced potable demand.

### *Non-Incentive Conservation Programs*

In addition to its incentive-based conservation programs, Metropolitan also undertakes additional efforts throughout its service area that help achieve water savings without the use of rebates. Metropolitan's non-incentive conservation efforts include:

- residential and professional water efficient landscape training classes
- water audits for large landscapes
- research, development and studies of new water saving technologies
- advertising and outreach campaigns
- community outreach and education programs
- advocacy for legislation, codes, and standards that lead to increased water savings

### *Current Status and Results of Metropolitan's Conservation Programs*

Since 1990, Metropolitan has invested $824 million in conservation rebates that have resulted in a cumulative savings of 3.27 million acre-feet of water. These investments include $450 million in turf removal and other rebates during the last drought which resulted in 175 million square feet of lawn turf removed. During fiscal year 2020, 1.06 million acre-feet of water is estimated to have been conserved. This annual total includes Metropolitan's Conservation Credits Program; code-based conservation achieved through Metropolitan-sponsored legislation; building plumbing codes and ordinances; reduced consumption resulting from changes in water pricing; and pre-1990 device retrofits.

## Infeasibility of Accounting Regional Investments in Reduced Reliance Below the Regional Level

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the individual member agencies or their customers. As described above, the region (through Metropolitan) makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of Metropolitan's investments in Colorado River supplies, groundwater and surface storage, local resources development and demand management measures that reduce reliance on the Delta are collectively funded by revenues generated from the member agencies through rates and charges.

Metropolitan's revenues cannot be matched to the demands or supply production history of an individual agency, or consistently across the agencies within the service area. Each project or program funded by the region has a different online date, useful life, incentive rate and structure, and production schedule. It is infeasible to account for all these things over the life of each project or program and provide a nexus to each member agency's contributions to Metropolitan's revenue stream over time. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by member agencies and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, Metropolitan's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

## References


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Link to Metropolitan's 2020 UWMP once final

# Appendix 11

## Addendum to
## The Metropolitan Water District of Southern California's
# 2015 Urban Water Management Plan

# Quantifying Regional Self-Reliance and Reduced Reliance on Water Supplies from the Delta Watershed

## June 2021

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# Appendix 11
# METROPOLITAN'S REDUCED DELTA RELIANCE REPORTING
## Addendum to Metropolitan's 2015 Urban Water Management Plan

### A.11.1 Background

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a covered action in the Delta,[1] prior to initiating the implementation of that action, must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with applicable Delta Plan policies and submit that certification to the Delta Stewardship Council.[2] Anyone may appeal a certification of consistency, and if the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency, and either no appeal is filed, or the Delta Stewardship Council denies the subsequent appeal.[3]

An urban water supplier that anticipates participating in or receiving water from a proposed covered action such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and 2020 Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).[4]

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

*(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:*

> *(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);*
>
> *(2) That failure has significantly caused the need for the export, transfer, or use; and*
>
> *(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.*

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

*(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*

> *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*

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[1] Water Code, § 85057.5; Cal. Code Regs. tit. 23, § 5001.
[2] Water Code, § 85225; Delta Plan, App. D.
[3] Water Code, §§ 85225.10-85225.25; Delta Plan, App. D.
[4] Cal. Code Regs., tit. 23, § 5003.

*(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*

*(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

The analysis and documentation provided below include all of the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action.

### A.11.2 Summary of Expected Outcomes for Reduced Reliance on the Delta

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

The expected outcomes for Metropolitan's Delta reliance and regional self-reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 (Guidebook Appendix C) issued in March 2021.

The data used in this analysis represent the total regional efforts of Metropolitan and its member agencies and their customers (many of them, retail agencies) and were developed in conjunction with Metropolitan's member agencies as part of the UWMP coordination process as described in Section 5 of Metropolitan's UWMP. In accordance with UMWP requirements, Metropolitan's member agencies and their customers (many of them, retail agencies) also report demands and supplies for their service areas in their respective UWMPs. The data reported by those agencies are not additive to the regional totals shown in Metropolitan's UWMP; rather, their reporting represents subtotals of the regional total and should be considered as such for the purposes of determining reduced reliance on the Delta.

While the demands that Metropolitan's member agencies and their customers report in their UWMPs are a good reflection of the demands in their respective service areas, they do not adequately represent each water supplier's contributions to reduced reliance on the Delta. In order to calculate and report their reliance on water supplies from the Delta watershed, water suppliers that receive water from the Delta through other regional or wholesale water suppliers would need to determine the amount of Delta water that they receive from the regional or wholesale supplier. Two specific pieces of information are needed to accomplish this: first is the quantity of demands on the regional or wholesale water supplier that accurately reflect a supplier's contributions to reduced reliance on the Delta, and second is the quantity of a supplier's demands on the regional or wholesale water supplier that are met by supplies from the Delta watershed.

For water suppliers that make investments in regional projects or programs it may be infeasible to quantify their demands on the regional or wholesale water supplier in a way that accurately reflects their individual contributions to reduced reliance on the Delta. Due to the extensive, long-standing and successful implementation of regional demand management and local resource

incentive programs in Metropolitan's service area, this infeasibility holds true for Metropolitan's members as well their customers. For Metropolitan's service area, reduced reliance on supplies from the Delta watershed can only be accurately accounted at the regional level, as is demonstrated in this analysis.

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for Metropolitan's Delta reliance and regional self-reliance. The results show that as a region, Metropolitan and its members as well as their customers are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of water used.

*Expected Outcomes for Regional Self-Reliance*

- Near-term (2025) – Normal water year regional self-reliance is expected to increase by 813 TAF from the 2010 baseline; this represents an increase of almost 25 percent of 2025 normal water year retail demands (Table A.11-2).
- Long-term (2045) – Normal water year regional self-reliance is expected to increase by more than 1.28 MAF from the 2010 baseline, this represents an increase of more than 25 percent of 2045 normal water year retail demands (Table A.11-2).

*Expected Outcomes for Reduced Reliance on Supplies from the Delta Watershed*

- Near-term (2025) – Normal water year reliance on supplies from the Delta watershed decreased by 301 TAF from the 2010 baseline, this represents a decrease of 3 percent of 2025 normal water year retail demands (Table A.11-3).
- Long-term (2045) – Normal water year reliance on supplies from the Delta watershed decreased by 314 TAF from the 2010 baseline, this represents a decrease of just over 5 percent of 2045 normal water year retail demands (Table A.11-3).

## A11.3 Demonstration of Reduced Reliance on the Delta

The methodology used to determine Metropolitan's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in DWR's UWMP Guidebook Appendix C, including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources. Some of the key assumptions underlying Metropolitan's demonstration of reduced reliance include:

- All data were obtained from the current 2020 UWMP or previously adopted UWMPs and represent average or normal water year conditions.
- All analyses were conducted at the service area level, and all data reflect the total contributions of Metropolitan and its members as well as their customers.
- No projects or programs that are described in the UWMPs as "Projects Under Development" were included in the accounting of supplies.

*Baseline and Expected Outcomes*

In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C. Data for the 2010 baseline were taken from Metropolitan's 2005 UWMP as the UWMPs generally do not provide normal water year data for the year that they are adopted (i.e., 2005 UWMP forecasts begin in 2010, 2010 UWMP forecasts begin in 2015, and so on).

Consistent with the 2010 baseline data approach, the expected outcomes for reduced Delta reliance and improved regional self-reliance for 2015 and 2020 were taken from Metropolitan's 2010 and 2015 UWMPs respectively. Expected outcomes for 2025-2045 are from the current 2020 UWMP. Documentation of the specific data sources and assumptions are included in the discussions below.

### *Service Area Demands without Water Use Efficiency*

In alignment with the Guidebook Appendix C, this analysis uses normal water year demands, rather than normal water year supplies to calculate expected outcomes in terms of the percentage of water used. Using normal water year demands serves as a proxy for the amount of supplies that would be used in a normal water year, which helps alleviate issues associated with how supply capability is presented to fulfill requirements of the Act versus how supplies might be accounted for to demonstrate consistency with WR P1.

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as Metropolitan that explicitly calculate and report water use efficiency savings in their UWMP will need to make an adjustment to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise the effect of water use efficiency savings on regional self-reliance would be overestimated. Table A.11-1 shows the results of this adjustment for Metropolitan. Supporting narratives and documentation for all of the data shown in Table A.11-1 are provided below.

**Table A.11-1**
**Demands without Water Use Efficiency Accounted For**

| Total Service Area Water Demands (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands with Water Use Efficiency Accounted For | 4,628,000 | 4,563,000 | 4,163,000 | 3,763,000 | 3,821,000 | 3,893,000 | 3,936,000 | 3,985,000 |
| Reported Water Use Efficiency | 865,000 | 936,000 | 1,056,000 | 1,162,000 | 1,211,000 | 1,263,000 | 1,325,000 | 1,389,000 |
| **Service Area Demands without Water Use Efficiency Accounted For** | **5,493,000** | **5,499,000** | **5,219,000** | **4,925,000** | **5,032,000** | **5,156,000** | **5,261,000** | **5,374,000** |

#### *Service Area Demands without Water Use Efficiency*

The service area demands shown in Table A.11-1 represent the total retail water demands for Metropolitan's service area and include municipal and industrial demands, agricultural demands, seawater barrier demands, and storage replenishment demands. These demand types and the modeling methodologies used to calculate them are described in Section 2.2 and Appendix 1 of Metropolitan's UWMP.

#### *Water Use Efficiency*

The water use efficiency numbers shown in Table A.11-1 represent the total water use efficiency savings (conservation) for Metropolitan's region, including savings from active, code-based, price-effect and pre-1990 sources. These sources of water use efficiency and the methodologies used to calculate them are described in Section 2.2, Section 3.4, Section 3.7 and Appendix 1 of Metropolitan's UWMP.

The demand and water use efficiency data shown in Table A.11-1 were collected from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year
- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025-2045 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year

### *Supplies Contributing to Regional Self-Reliance*

For a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table A.11-2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table A.11-2 represent efforts to improve regional self-reliance for Metropolitan's entire service area and include the total contributions of Metropolitan and its members as well as their customers. Supporting narratives and documentation for the all of the data shown in Table A.11-2 are provided below.

The results shown in Table A.11-2 demonstrate that Metropolitan's service area is measurably improving its regional self-reliance. In the near-term (2025), the expected outcome for normal water year regional self-reliance increases by 747 TAF from the 2010 baseline; this represents an increase of about 23 percent of 2025 normal water year retail demands. In the long-term (2045), normal water year regional self-reliance is expected to increase by more than 1.2 MAF from the 2010 baseline; this represents an increase of 25 percent of 2045 normal water year retail demands.

**Table A.11-2**
**Supplies Contributing to Regional Self-Reliance**

| Water Supplies Contributing to Regional Self-Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Use Efficiency | 865,000 | 936,000 | 1,056,000 | 1,162,000 | 1,211,000 | 1,263,000 | 1,325,000 | 1,389,000 |
| Water Recycling | 316,000 | 348,000 | 436,000 | 550,000 | 613,000 | 687,000 | 698,000 | 706,000 |
| Stormwater Capture and Use | 100,000 | 103,000 | 110,000 | 80,000 | 82,000 | 82,000 | 82,000 | 82,000 |
| Advanced Water Technologies | 111,000 | 101,000 | 194,000 | 194,000 | 208,000 | 209,000 | 209,000 | 210,000 |
| Conjunctive Use Projects | 1,416,000 | 1,429,000 | 1,303,000 | 1,255,000 | 1,273,000 | 1,296,000 | 1,311,000 | 1,326,000 |
| Local and Regional Water Supply and Storage Projects | 252,000 | 224,000 | 261,000 | 257,000 | 257,000 | 258,000 | 258,000 | 258,000 |
| Other Programs and Projects that Contribute to Regional Self-Reliance | 875,000 | 1,250,000 | 1,200,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 |
| **Water Supplies Contributing to Regional Self-Reliance** | **3,935,000** | **4,391,000** | **4,560,000** | **4,748,000** | **4,894,000** | **5,045,000** | **5,133,000** | **5,221,000** |

| Service Area Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands without Water Use Efficiency Accounted For | 5,493,000 | 5,499,000 | 5,219,000 | 4,925,000 | 5,032,000 | 5,156,000 | 5,261,000 | 5,374,000 |

| Change in Regional Self Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Supplies Contributing to Regional Self-Reliance | 3,935,000 | 4,391,000 | 4,560,000 | 4,748,000 | 4,894,000 | 5,045,000 | 5,133,000 | 5,221,000 |
| **Change in Supplies Contributing to Regional Self-Reliance** | **NA** | **456,000** | **625,000** | **813,000** | **959,000** | **1,110,000** | **1,198,000** | **1,286,000** |

| Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Percent of Supplies Contributing to Regional Self-Reliance | 71.6% | 79.9% | 87.4% | 96.4% | 97.3% | 97.8% | 97.6% | 97.2% |
| **Change in Percent of Supplies Contributing to Regional Self-Reliance** | **NA** | **8.2%** | **15.7%** | **24.8%** | **25.6%** | **26.2%** | **25.9%** | **25.5%** |

*Water Use Efficiency*

The water use efficiency information shown in Table A.11-2 is taken directly from Table A.11-1 above.

*Water Recycling*

The water recycling values shown in Table A.11-2 reflect the total recycled water production in Metropolitan's service area as described in Section 3.5 and Appendix 2 of Metropolitan's UWMP.

*Stormwater Capture and Use*

The stormwater capture and use data shown in Table A.11-2 include supplies from local surface water production as described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

These values do not include production from regional storage reservoirs; storage in these reservoirs is comprised of previously stored water from sources already reflected in Tables A.11-2 and A.11-3. These regional storage resources are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The regional storage reservoirs and their yields are described in Section 3.6, Appendix 2 and Appendix 3 of Metropolitan's UWMP.

The stormwater capture and use values shown in Table A.11-2 also do not include stormwater capture that is used to recharge local groundwater basins. Stormwater capture for groundwater recharge supports production of groundwater in the region, and for the purposes of this analysis that production is already captured in Table A.11-2 under conjunctive use projects.

*Advanced Water Technologies*

The advanced water technologies data shown in Table A.11-2 include total groundwater recovery and seawater desalination production in Metropolitan's service area as described in Section 3.5 and Appendix 2 of Metropolitan's UWMP.

*Conjunctive Use Projects*

The values for conjunctive use projects shown in Table A.11-2 represent total groundwater production in the region as described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

The conjunctive use projects numbers shown in Table A.11-2 do not include production from regional groundwater conjunctive use programs. As described in the stormwater capture and use discussion above, these regional storage programs rely on previously stored water from sources already reflected in Tables A.11-2 and A.11-3 and are generally used to provide additional regional self-reliance in dry-years. The regional groundwater conjunctive use programs and their yields are described in Section 3.6 and Appendix 3.

*Local and Regional Water Supply and Storage Programs*

The data for local and regional water supply and storage programs shown in Table A.11-2 include supplies from the Los Angeles Aqueduct. This supply is described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

The local and regional supply numbers shown in Table A.11-2, except for "Other Programs and Projects that Contribute to Regional Self-Reliance" which is discussed below, were obtained from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year

- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025-2045 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year

*Other Programs and Projects that Contribute to Regional Self-Reliance*

Other programs and projects that contribute to regional self-reliance shown in Table A.11-2 include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct supplies and programs are described in Section 3.1 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.11-2 for other programs and projects that contribute to regional self-reliance come from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2010 (Average Year)
- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2020 (Average Year)
- 2025-2045 values – Metropolitan's 2020 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Years 2025, 2030, 2035, 2040, 2045 (Normal Water Year)

### *Reliance on Water Supplies from the Delta Watershed*

In order for a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) requires that water suppliers report the expected outcomes for measurable reductions in supplies from the Delta watershed either as an amount or as a percentage. This analysis provides both calculations. Based on the methodology described in Guidebook Appendix C, and consistent with the approach of this analysis in not including projects under development, this accounting does not include any supplies from potential future covered actions. Table A.11-3 shows the expected outcomes for reliance on supplies from the Delta watershed for Metropolitan's service area. Supporting narratives and documentation for the all of the data shown in Table A.11-3 are provided below.

The results shown in Table A.11-3 demonstrate that Metropolitan's service area is measurably reducing its Delta reliance. In the near-term (2025), the expected outcome for normal water year reliance on supplies from the Delta watershed decreased by 301 TAF from the 2010 baseline; this represents a decrease of 3 percent of 2025 normal water year retail demands. In the long-term (2045), normal water year reliance on supplies from the Delta watershed decreased by 314 TAF from the 2010 baseline; this represents a decrease of just over 5 percent of 2045 normal water year retail demands.

## Table A.11-3
## Reliance on Water Supplies from the Delta Watershed

| Water Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| CVP/SWP Contract Supplies | 1,472,000 | 1,029,000 | 984,000 | 1,133,000 | 1,130,000 | 1,128,000 | 1,126,000 | 1,126,000 |
| Delta/Delta Tributary Diversions | - | - | - | - | - | - | - | - |
| Transfers and Exchanges of Supplies from the Delta Watershed | 20,000 | 44,000 | 91,000 | 58,000 | 52,000 | 52,000 | 52,000 | 52,000 |
| Other Water Supplies from the Delta Watershed | - | - | - | - | - | - | - | - |
| **Total Water Supplies from the Delta Watershed** | **1,492,000** | **1,073,000** | **1,075,000** | **1,191,000** | **1,182,000** | **1,180,000** | **1,178,000** | **1,178,000** |

| Service Area Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands without Water Use Efficiency Accounted For | 5,493,000 | 5,499,000 | 5,219,000 | 4,925,000 | 5,032,000 | 5,156,000 | 5,261,000 | 5,374,000 |

| Change in Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Supplies from the Delta Watershed | 1,492,000 | 1,073,000 | 1,075,000 | 1,191,000 | 1,182,000 | 1,180,000 | 1,178,000 | 1,178,000 |
| **Change in Supplies from the Delta Watershed** | **NA** | **(419,000)** | **(417,000)** | **(301,000)** | **(310,000)** | **(312,000)** | **(314,000)** | **(314,000)** |

| Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Percent of Supplies from the Delta Watershed | 27.2% | 19.5% | 20.6% | 24.2% | 23.5% | 22.9% | 22.4% | 21.9% |
| **Change in Percent of Supplies from the Delta Watershed** | **NA** | **-7.6%** | **-6.6%** | **-3.0%** | **-3.7%** | **-4.3%** | **-4.8%** | **-5.2%** |

### *CVP/SWP Contract Supplies*

The CVP/SWP contract supplies shown in Table A.11-3 include Metropolitan's SWP Table A and Article 21 supplies. These supplies are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.11-3 do not include Desert Water Agency/Coachella Valley Water District SWP contract supplies. These supplies are exchanged with Desert Water Agency and Coachella Valley Water District for an equal amount of Colorado River water, which is reflected in the Colorado River Aqueduct supplies shown in Table A.11-2. In addition, Desert Water Agency and Coachella Valley Water District should include their SWP contract supplies in their own accountings of reduced reliance. Additional information on these exchange agreements can be found in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

These values also do not include supplies from San Luis Carryover storage or Central Valley storage programs because storage in these programs comprises previously stored water from sources already reflected in Table A.11-3. These storage programs are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The Central Valley storage projects and their yields are described in Section 3.3, and Appendix 3. San Luis Carryover storage is described in Section 3.2 and Appendix 3.

### *Transfers and Exchanges of Supplies from the Delta Watershed*

The transfers and exchanges of supplies from the Delta watershed shown in Table A.11-3 include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, Irvine Ranch Water District Storage and Exchange Program, and other generic SWP and Central Valley transfers and exchanges. These programs are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

Supplies from the Delta Watershed shown in Table A.11-3 are from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2010 (Average Year)

- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2020 (Average Year)
- 2025-2045 values – Metropolitan's 2020 UWMP, Table A.3-7: California Aqueduct Program Capabilities Years 2025, 2030, 2035, 2040, 2045 (Normal Water Year)

### A.11.4 UWMP Implementation

In addition to the analysis and documentation described above, WR P1 subsection (c)(1)(B) requires that all programs and projects included in the UWMP that are locally cost-effective and technically feasible, which reduce reliance on the Delta, are identified, evaluated, and implemented consistent with the implementation schedule. WR P1 (c)(1)(B) states that:

> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta*[.]

In accordance with Water Code Section 10631(f), water suppliers must already include in their UWMP a detailed description of expected future projects and programs that they may implement to increase the amount of water supply available to them in normal and single-dry water years and for a period of drought lasting five consecutive years. The UWMP description must also identify specific projects, include a description of the increase in water supply that is expected to be available from each project, and include an estimate regarding the implementation timeline for each project or program.

Section 3 of Metropolitan's UWMP summarizes the implementation plan and continued progress in developing a diversified water portfolio to meet the region's water needs.

*Water Use Efficiency*

The water use efficiency numbers used in this analysis include the total water use efficiency savings (conservation) for the service area, including savings from active, code-based, price-effect and pre-1990 savings. The specific water use efficiency programs and their implementation are described in Section 3.4 of Metropolitan's UWMP.

*Water Recycling*

The water recycling values used in this analysis reflect the total recycled water production in Metropolitan's service area. Water recycling programs and implementation are discussed in Section 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

*Stormwater Capture and Use*

The stormwater capture and use data used in this analysis include supplies from local surface water production. Local surface water production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

*Advanced Water Technologies*

The advanced water technologies data used in this analysis include total groundwater recovery and seawater desalination production in Metropolitan's service. Groundwater recovery and seawater desalination programs and implementation are described in Section 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

*Conjunctive Use Projects*

The values for conjunctive use projects used in this analysis represent total groundwater production in the region. Groundwater production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

*Local and Regional Water Supply and Storage Programs*

The data for local and regional water supply and storage programs shown this analysis include supplies from the Los Angeles Aqueduct. This program and its implementation are described in Appendix 2 of Metropolitan's UWMP.

*Other Programs and Projects that Contribute to Regional Self-Reliance*

Other programs and projects that contribute to regional self-reliance used in this analysis include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct programs and their implementation are described in Section 3.1 and Appendix 3 of Metropolitan's UWMP.

*CVP/SWP Contract Supplies*

The CVP/SWP contract supplies shown in this analysis include Metropolitan's SWP Table A and Article 21 supplies. These supplies and their implementation are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

*Transfers and Exchanges of Supplies from the Delta Watershed*

The transfers and exchanges of supplies from the Delta watershed shown in this analysis include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, Irvine Ranch Water District Storage and Exchange Program, and other generic SWP and Central Valley transfers and exchanges. These programs and their implementation are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

### A.11.5 2015 UWMP Appendix 11

The information contained in this Appendix 11 is also intended to be a new Appendix 11 attached to Metropolitan's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). Metropolitan provided notice of the availability of the draft 2020 UWMP (including this Appendix 11 which will also be a new Appendix 11 to its 2015 UWMP) and WSCP and the public hearing to consider adoption of both plans and Appendix 11 to the 2015 UWMP in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP were posted prominently on Metropolitan's website, mwdh2o.com, starting February 1, 2021, more than 60 days in advance of the public hearing on April 12, 2021. The notice of availability of the documents was sent to Metropolitan's member agencies, as well as cities and counties in Metropolitan's service area. In addition, a public notice advertising the public hearing in English and Spanish was published in 12 Southern California newspapers. The notification in English language newspapers was published on February 1 and 8, 2021. The notification was published on January 28-30, 2021 and February 1, 4-6, and 8, 2021 in Spanish language newspapers, satisfying the requirement for non-English language notification. Copies of: (1) the notification letter sent to the member agencies, cities and counties in Metropolitan's service area, and (2) the notice published in the newspapers are included in the 2020 UWMP Section 5. Thus, this Appendix 11 to Metropolitan's 2020 UWMP, which was adopted with Metropolitan's 2020 UWMP, will also be recognized and treated as Appendix 11 to Metropolitan's 2015 UWMP.

Metropolitan held the public hearing for the draft 2020 UWMP, draft Appendix 11 to the 2015 UWMP, and draft WSCP on April 12, 2021, at the Board's Water Planning and Stewardship Committee meeting, held online due to COVID-19 concerns. On May 11, 2021, Metropolitan's Board determined that the 2020 UWMP and the WSCP are consistent with the MWD Act and accurately represent the water resources plan for Metropolitan's service area. In addition, Metropolitan's Board determined that Appendix 11 to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions 9279, 9280, and 9281, the Board adopted the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP and authorized their submittal to the State of California. Copies of Resolutions 9279, 9280, and 9281 are included in the 2020 UWMP Section 5, and Resolution 9281 for the WSCP is attached to the WSCP as Attachment C.

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# Appendix 11

# QUANTIFYING REGIONAL SELF-RELIANCE AND REDUCED RELIANCE ON WATER SUPPLIES FROM THE DELTA WATERSHED

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# Appendix 11
# METROPOLITAN'S
# REDUCED DELTA RELIANCE REPORTING

## A.11.1 Background

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a covered action in the Delta,[1] prior to initiating the implementation of that action, must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with applicable Delta Plan policies and submit that certification to the Delta Stewardship Council.[2] Anyone may appeal a certification of consistency, and if the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency, and either no appeal is filed, or the Delta Stewardship Council denies the subsequent appeal.[3]

An urban water supplier that anticipates participating in or receiving water from a proposed covered action such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and 2020 Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).[4]

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

*(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:*

> *(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);*
>
> *(2) That failure has significantly caused the need for the export, transfer, or use; and*
>
> *(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.*

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

*(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*

> *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*

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[1] Water Code, § 85057.5; Cal. Code Regs. tit. 23, § 5001.
[2] Water Code, § 85225; Delta Plan, App. D.
[3] Water Code, §§ 85225.10-85225.25; Delta Plan, App. D.
[4] Cal. Code Regs., tit. 23, § 5003.

*(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*

*(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code Section 1011(a).*

The analysis and documentation provided below include all of the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action.

### A.11.2 Summary of Expected Outcomes for Reduced Reliance on the Delta

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

The expected outcomes for Metropolitan's Delta reliance and regional self-reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 (Guidebook Appendix C) issued in March 2021.

The data used in this analysis represent the total regional efforts of Metropolitan and its member agencies and their customers (many of them, retail agencies) and were developed in conjunction with Metropolitan's member agencies as part of the UWMP coordination process as described in Section 5 of Metropolitan's UWMP. In accordance with UMWP requirements, Metropolitan's member agencies and their customers (many of them, retail agencies) also report demands and supplies for their service areas in their respective UWMPs. The data reported by those agencies are not additive to the regional totals shown in Metropolitan's UWMP; rather, their reporting represents subtotals of the regional total and should be considered as such for the purposes of determining reduced reliance on the Delta.

While the demands that Metropolitan's member agencies and their customers report in their UWMPs are a good reflection of the demands in their respective service areas, they do not adequately represent each water supplier's contributions to reduced reliance on the Delta. In order to calculate and report their reliance on water supplies from the Delta watershed, water suppliers that receive water from the Delta through other regional or wholesale water suppliers would need to determine the amount of Delta water that they receive from the regional or wholesale supplier. Two specific pieces of information are needed to accomplish this: first is the quantity of demands on the regional or wholesale water supplier that accurately reflect a supplier's contributions to reduced reliance on the Delta, and second is the quantity of a supplier's demands on the regional or wholesale water supplier that are met by supplies from the Delta watershed.

For water suppliers that make investments in regional projects or programs it may be infeasible to quantify their demands on the regional or wholesale water supplier in a way that accurately reflects their individual contributions to reduced reliance on the Delta. Due to the extensive, long-

standing and successful implementation of regional demand management and local resource incentive programs in Metropolitan's service area, this infeasibility holds true for Metropolitan's members as well their customers. For Metropolitan's service area, reduced reliance on supplies from the Delta watershed can only be accurately accounted at the regional level, as is demonstrated in this analysis.

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for Metropolitan's Delta reliance and regional self-reliance. The results show that as a region, Metropolitan and its members as well as their customers are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of water used.

*Expected Outcomes for Regional Self-Reliance*

- Near-term (2025) – Normal water year regional self-reliance is expected to increase by 813 TAF from the 2010 baseline; this represents an increase of almost 25 percent of 2025 normal water year retail demands (Table A.11-2).
- Long-term (2045) – Normal water year regional self-reliance is expected to increase by more than 1.28 MAF from the 2010 baseline, this represents an increase of more than 25 percent of 2045 normal water year retail demands (Table A.11-2).

*Expected Outcomes for Reduced Reliance on Supplies from the Delta Watershed*

- Near-term (2025) – Normal water year reliance on supplies from the Delta watershed decreased by 301 TAF from the 2010 baseline, this represents a decrease of 3 percent of 2025 normal water year retail demands (Table A.11-3).
- Long-term (2045) – Normal water year reliance on supplies from the Delta watershed decreased by 314 TAF from the 2010 baseline, this represents a decrease of just over 5 percent of 2045 normal water year retail demands (Table A.11-3).

### A11.3 Demonstration of Reduced Reliance on the Delta

The methodology used to determine Metropolitan's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in DWR's UWMP Guidebook Appendix C, including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources. Some of the key assumptions underlying Metropolitan's demonstration of reduced reliance include:

- All data were obtained from the current 2020 UWMP or previously adopted UWMPs and represent average or normal water year conditions.
- All analyses were conducted at the service area level, and all data reflect the total contributions of Metropolitan and its members as well as their customers.
- No projects or programs that are described in the UWMPs as "Projects Under Development" were included in the accounting of supplies.

*Baseline and Expected Outcomes*

In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C. Data for the 2010 baseline were taken from Metropolitan's 2005 UWMP as the UWMPs generally do not provide normal water year data for

the year that they are adopted (i.e., 2005 UWMP forecasts begin in 2010, 2010 UWMP forecasts begin in 2015, and so on).

Consistent with the 2010 baseline data approach, the expected outcomes for reduced Delta reliance and improved regional self-reliance for 2015 and 2020 were taken from Metropolitan's 2010 and 2015 UWMPs respectively. Expected outcomes for 2025-2045 are from the current 2020 UWMP. Documentation of the specific data sources and assumptions are included in the discussions below.

### *Service Area Demands without Water Use Efficiency*

In alignment with the Guidebook Appendix C, this analysis uses normal water year demands, rather than normal water year supplies to calculate expected outcomes in terms of the percentage of water used. Using normal water year demands serves as a proxy for the amount of supplies that would be used in a normal water year, which helps alleviate issues associated with how supply capability is presented to fulfill requirements of the Act versus how supplies might be accounted for to demonstrate consistency with WR P1.

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as Metropolitan that explicitly calculate and report water use efficiency savings in their UWMP will need to make an adjustment to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise the effect of water use efficiency savings on regional self-reliance would be overestimated. Table A.11-1 shows the results of this adjustment for Metropolitan. Supporting narratives and documentation for all of the data shown in Table A.11-1 are provided below.

**Table A.11-1**
**Demands without Water Use Efficiency Accounted For**

| Total Service Area Water Demands (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands with Water Use Efficiency Accounted For | 4,628,000 | 4,563,000 | 4,163,000 | 3,763,000 | 3,821,000 | 3,893,000 | 3,936,000 | 3,985,000 |
| Reported Water Use Efficiency | 865,000 | 936,000 | 1,056,000 | 1,162,000 | 1,211,000 | 1,263,000 | 1,325,000 | 1,389,000 |
| **Service Area Demands without Water Use Efficiency Accounted For** | **5,493,000** | **5,499,000** | **5,219,000** | **4,925,000** | **5,032,000** | **5,156,000** | **5,261,000** | **5,374,000** |

#### *Service Area Demands without Water Use Efficiency*

The service area demands shown in Table A.11-1 represent the total retail water demands for Metropolitan's service area and include municipal and industrial demands, agricultural demands, seawater barrier demands, and storage replenishment demands. These demand types and the modeling methodologies used to calculate them are described in Section 2.2 and Appendix 1 of Metropolitan's UWMP.

#### *Water Use Efficiency*

The water use efficiency numbers shown in Table A.11-1 represent the total water use efficiency savings (conservation) for Metropolitan's region, including savings from active, code-based, price-effect and pre-1990 sources. These sources of water use efficiency and the methodologies used to calculate them are described in Section 2.2, Section 3.4, Section 3.7 and Appendix 1 of Metropolitan's UWMP.

The demand and water use efficiency data shown in Table A.11-1 were collected from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year
- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025-2045 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year

### *Supplies Contributing to Regional Self-Reliance*

For a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table A.11-2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table A.11-2 represent efforts to improve regional self-reliance for Metropolitan's entire service area and include the total contributions of Metropolitan and its members as well as their customers. Supporting narratives and documentation for the all of the data shown in Table A.11-2 are provided below.

The results shown in Table A.11-2 demonstrate that Metropolitan's service area is measurably improving its regional self-reliance. In the near-term (2025), the expected outcome for normal water year regional self-reliance increases by 747 TAF from the 2010 baseline; this represents an increase of about 23 percent of 2025 normal water year retail demands. In the long-term (2045), normal water year regional self-reliance is expected to increase by more than 1.2 MAF from the 2010 baseline; this represents an increase of 25 percent of 2045 normal water year retail demands.

**Table A.11-2**
**Supplies Contributing to Regional Self-Reliance**

| Water Supplies Contributing to Regional Self-Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Use Efficiency | 865,000 | 936,000 | 1,056,000 | 1,162,000 | 1,211,000 | 1,263,000 | 1,325,000 | 1,389,000 |
| Water Recycling | 316,000 | 348,000 | 436,000 | 550,000 | 613,000 | 687,000 | 698,000 | 706,000 |
| Stormwater Capture and Use | 100,000 | 103,000 | 110,000 | 80,000 | 82,000 | 82,000 | 82,000 | 82,000 |
| Advanced Water Technologies | 111,000 | 101,000 | 194,000 | 194,000 | 208,000 | 209,000 | 209,000 | 210,000 |
| Conjunctive Use Projects | 1,416,000 | 1,429,000 | 1,303,000 | 1,255,000 | 1,273,000 | 1,296,000 | 1,311,000 | 1,326,000 |
| Local and Regional Water Supply and Storage Projects | 252,000 | 224,000 | 261,000 | 257,000 | 257,000 | 258,000 | 258,000 | 258,000 |
| Other Programs and Projects that Contribute to Regional Self-Reliance | 875,000 | 1,250,000 | 1,200,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 | 1,250,000 |
| **Water Supplies Contributing to Regional Self-Reliance** | **3,935,000** | **4,391,000** | **4,560,000** | **4,748,000** | **4,894,000** | **5,045,000** | **5,133,000** | **5,221,000** |

| Service Area Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands without Water Use Efficiency Accounted For | 5,493,000 | 5,499,000 | 5,219,000 | 4,925,000 | 5,032,000 | 5,156,000 | 5,261,000 | 5,374,000 |

| Change in Regional Self Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Supplies Contributing to Regional Self-Reliance | 3,935,000 | 4,391,000 | 4,560,000 | 4,748,000 | 4,894,000 | 5,045,000 | 5,133,000 | 5,221,000 |
| **Change in Supplies Contributing to Regional Self-Reliance** | **NA** | **456,000** | **625,000** | **813,000** | **959,000** | **1,110,000** | **1,198,000** | **1,286,000** |

| Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Percent of Supplies Contributing to Regional Self-Reliance | 71.6% | 79.9% | 87.4% | 96.4% | 97.3% | 97.8% | 97.6% | 97.2% |
| **Change in Percent of Supplies Contributing to Regional Self-Reliance** | **NA** | **8.2%** | **15.7%** | **24.8%** | **25.6%** | **26.2%** | **25.9%** | **25.5%** |

*Water Use Efficiency*

The water use efficiency information shown in Table A.11-2 is taken directly from Table A.11-1 above.

*Water Recycling*

The water recycling values shown in Table A.11-2 reflect the total recycled water production in Metropolitan's service area as described in Section 3.5 and Appendix 2 of Metropolitan's UWMP.

*Stormwater Capture and Use*

The stormwater capture and use data shown in Table A.11-2 include supplies from local surface water production as described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

These values do not include production from regional storage reservoirs; storage in these reservoirs is comprised of previously stored water from sources already reflected in Tables A.11-2 and A.11-3. These regional storage resources are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The regional storage reservoirs and their yields are described in Section 3.6, Appendix 2 and Appendix 3 of Metropolitan's UWMP.

The stormwater capture and use values shown in Table A.11-2 also do not include stormwater capture that is used to recharge local groundwater basins. Stormwater capture for groundwater recharge supports production of groundwater in the region, and for the purposes of this analysis that production is already captured in Table A.11-2 under conjunctive use projects.

*Advanced Water Technologies*

The advanced water technologies data shown in Table A.11-2 include total groundwater recovery and seawater desalination production in Metropolitan's service area as described in Section 3.5 and Appendix 2 of Metropolitan's UWMP.

*Conjunctive Use Projects*

The values for conjunctive use projects shown in Table A.11-2 represent total groundwater production in the region as described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

The conjunctive use projects numbers shown in Table A.11-2 do not include production from regional groundwater conjunctive use programs. As described in the stormwater capture and use discussion above, these regional storage programs rely on previously stored water from sources already reflected in Tables A.11-2 and A.11-3 and are generally used to provide additional regional self-reliance in dry-years. The regional groundwater conjunctive use programs and their yields are described in Section 3.6 and Appendix 3.

*Local and Regional Water Supply and Storage Programs*

The data for local and regional water supply and storage programs shown in Table A.11-2 include supplies from the Los Angeles Aqueduct. This supply is described in Section 1.4 and Appendix 2 of Metropolitan's UWMP.

The local and regional supply numbers shown in Table A.11-2, except for "Other Programs and Projects that Contribute to Regional Self-Reliance" which is discussed below, were obtained from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year

- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025-2045 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year

*Other Programs and Projects that Contribute to Regional Self-Reliance*

Other programs and projects that contribute to regional self-reliance shown in Table A.11-2 include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct supplies and programs are described in Section 3.1 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.11-2 for other programs and projects that contribute to regional self-reliance come from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2010 (Average Year)
- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2020 (Average Year)
- 2025-2045 values – Metropolitan's 2020 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Years 2025, 2030, 2035, 2040, 2045 (Normal Water Year)

### *Reliance on Water Supplies from the Delta Watershed*

In order for a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) requires that water suppliers report the expected outcomes for measurable reductions in supplies from the Delta watershed either as an amount or as a percentage. This analysis provides both calculations. Based on the methodology described in Guidebook Appendix C, and consistent with the approach of this analysis in not including projects under development, this accounting does not include any supplies from potential future covered actions. Table A.11-3 shows the expected outcomes for reliance on supplies from the Delta watershed for Metropolitan's service area. Supporting narratives and documentation for the all of the data shown in Table A.11-3 are provided below.

The results shown in Table A.11-3 demonstrate that Metropolitan's service area is measurably reducing its Delta reliance. In the near-term (2025), the expected outcome for normal water year reliance on supplies from the Delta watershed decreased by 301 TAF from the 2010 baseline; this represents a decrease of 3 percent of 2025 normal water year retail demands. In the long-term (2045), normal water year reliance on supplies from the Delta watershed decreased by 314 TAF from the 2010 baseline; this represents a decrease of just over 5 percent of 2045 normal water year retail demands.

## Table A.11-3
## Reliance on Water Supplies from the Delta Watershed

| Water Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| CVP/SWP Contract Supplies | 1,472,000 | 1,029,000 | 984,000 | 1,133,000 | 1,130,000 | 1,128,000 | 1,126,000 | 1,126,000 |
| Delta/Delta Tributary Diversions | - | - | - | - | - | - | - | - |
| Transfers and Exchanges of Supplies from the Delta Watershed | 20,000 | 44,000 | 91,000 | 58,000 | 52,000 | 52,000 | 52,000 | 52,000 |
| Other Water Supplies from the Delta Watershed | - | - | - | - | - | - | - | - |
| **Total Water Supplies from the Delta Watershed** | **1,492,000** | **1,073,000** | **1,075,000** | **1,191,000** | **1,182,000** | **1,180,000** | **1,178,000** | **1,178,000** |

| Service Area Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Service Area Demands without Water Use Efficiency Accounted For | 5,493,000 | 5,499,000 | 5,219,000 | 4,925,000 | 5,032,000 | 5,156,000 | 5,261,000 | 5,374,000 |

| Change in Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Water Supplies from the Delta Watershed | 1,492,000 | 1,073,000 | 1,075,000 | 1,191,000 | 1,182,000 | 1,180,000 | 1,178,000 | 1,178,000 |
| **Change in Supplies from the Delta Watershed** | **NA** | **(419,000)** | **(417,000)** | **(301,000)** | **(310,000)** | **(312,000)** | **(314,000)** | **(314,000)** |

| Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|
| Percent of Supplies from the Delta Watershed | 27.2% | 19.5% | 20.6% | 24.2% | 23.5% | 22.9% | 22.4% | 21.9% |
| **Change in Percent of Supplies from the Delta Watershed** | **NA** | **-7.6%** | **-6.6%** | **-3.0%** | **-3.7%** | **-4.3%** | **-4.8%** | **-5.2%** |

### *CVP/SWP Contract Supplies*

The CVP/SWP contract supplies shown in Table A.11-3 include Metropolitan's SWP Table A and Article 21 supplies. These supplies are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.11-3 do not include Desert Water Agency/Coachella Valley Water District SWP contract supplies. These supplies are exchanged with Desert Water Agency and Coachella Valley Water District for an equal amount of Colorado River water, which is reflected in the Colorado River Aqueduct supplies shown in Table A.11-2. In addition, Desert Water Agency and Coachella Valley Water District should include their SWP contract supplies in their own accountings of reduced reliance. Additional information on these exchange agreements can be found in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

These values also do not include supplies from San Luis Carryover storage or Central Valley storage programs because storage in these programs comprises previously stored water from sources already reflected in Table A.11-3. These storage programs are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The Central Valley storage projects and their yields are described in Section 3.3, and Appendix 3. San Luis Carryover storage is described in Section 3.2 and Appendix 3.

### *Transfers and Exchanges of Supplies from the Delta Watershed*

The transfers and exchanges of supplies from the Delta watershed shown in Table A.11-3 include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, Irvine Ranch Water District Storage and Exchange Program, and other generic SWP and Central Valley transfers and exchanges. These programs are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

Supplies from the Delta Watershed shown in Table A.11-3 are from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2010 (Average Year)

- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2020 (Average Year)
- 2025-2045 values – Metropolitan's 2020 UWMP, Table A.3-7: California Aqueduct Program Capabilities Years 2025, 2030, 2035, 2040, 2045 (Normal Water Year)

### A.11.4 UWMP Implementation

In addition to the analysis and documentation described above, WR P1 subsection (c)(1)(B) requires that all programs and projects included in the UWMP that are locally cost-effective and technically feasible, which reduce reliance on the Delta, are identified, evaluated, and implemented consistent with the implementation schedule. WR P1 (c)(1)(B) states that:

> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta*[.]

In accordance with Water Code Section 10631(f), water suppliers must already include in their UWMP a detailed description of expected future projects and programs that they may implement to increase the amount of water supply available to them in normal and single-dry water years and for a period of drought lasting five consecutive years. The UWMP description must also identify specific projects, include a description of the increase in water supply that is expected to be available from each project, and include an estimate regarding the implementation timeline for each project or program.

Section 3 of Metropolitan's UWMP summarizes the implementation plan and continued progress in developing a diversified water portfolio to meet the region's water needs.

*Water Use Efficiency*

The water use efficiency numbers used in this analysis include the total water use efficiency savings (conservation) for the service area, including savings from active, code-based, price-effect and pre-1990 savings. The specific water use efficiency programs and their implementation are described in Section 3.4 of Metropolitan's UWMP.

*Water Recycling*

The water recycling values used in this analysis reflect the total recycled water production in Metropolitan's service area. Water recycling programs and implementation are discussed in Section 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

*Stormwater Capture and Use*

The stormwater capture and use data used in this analysis include supplies from local surface water production. Local surface water production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

*Advanced Water Technologies*

The advanced water technologies data used in this analysis include total groundwater recovery and seawater desalination production in Metropolitan's service. Groundwater recovery and seawater desalination programs and implementation are described in Section 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

*Conjunctive Use Projects*

The values for conjunctive use projects used in this analysis represent total groundwater production in the region. Groundwater production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

*Local and Regional Water Supply and Storage Programs*

The data for local and regional water supply and storage programs shown this analysis include supplies from the Los Angeles Aqueduct. This program and its implementation are described in Appendix 2 of Metropolitan's UWMP.

*Other Programs and Projects that Contribute to Regional Self-Reliance*

Other programs and projects that contribute to regional self-reliance used in this analysis include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct programs and their implementation are described in Section 3.1 and Appendix 3 of Metropolitan's UWMP.

*CVP/SWP Contract Supplies*

The CVP/SWP contract supplies shown in this analysis include Metropolitan's SWP Table A and Article 21 supplies. These supplies and their implementation are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

*Transfers and Exchanges of Supplies from the Delta Watershed*

The transfers and exchanges of supplies from the Delta watershed shown in this analysis include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, Irvine Ranch Water District Storage and Exchange Program, and other generic SWP and Central Valley transfers and exchanges. These programs and their implementation are described in Section 3.2 and Appendix 3 of Metropolitan's UWMP.

### A.11.5 2015 UWMP Appendix 11

The information contained in this Appendix 11 is also intended to be a new Appendix 11 attached to Metropolitan's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). Metropolitan provided notice of the availability of the draft 2020 UWMP (including this Appendix 11 which will also be a new Appendix 11 to its 2015 UWMP) and WSCP and the public hearing to consider adoption of both plans and Appendix 11 to the 2015 UWMP in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP were posted prominently on Metropolitan's website, mwdh2o.com, starting February 1, 2021, more than 60 days in advance of the public hearing on April 12, 2021. The notice of availability of the documents was sent to Metropolitan's member agencies, as well as cities and counties in Metropolitan's service area. In addition, a public notice advertising the public hearing in English and Spanish was published in 12 Southern California newspapers. The notification in English language newspapers was published on February 1 and 8, 2021. The notification was published on January 28-30, 2021 and February 1, 4-6, and 8, 2021 in Spanish language newspapers, satisfying the requirement for non-English language notification. Copies of: (1) the notification letter sent to the member agencies, cities and counties in Metropolitan's service area, and (2) the notice published in the newspapers are included in the 2020 UWMP Section 5. Thus, this Appendix 11 to Metropolitan's 2020 UWMP, which was adopted with Metropolitan's 2020 UWMP, will also be recognized and treated as Appendix 11 to Metropolitan's 2015 UWMP.

Metropolitan held the public hearing for the draft 2020 UWMP, draft Appendix 11 to the 2015 UWMP, and draft WSCP on April 12, 2021, at the Board's Water Planning and Stewardship Committee meeting, held online due to COVID-19 concerns. On May 11, 2021, Metropolitan's Board determined that the 2020 UWMP and the WSCP are consistent with the MWD Act and accurately represent the water resources plan for Metropolitan's service area. In addition, Metropolitan's Board determined that Appendix 11 to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions 9279, 9280, and 9281, the Board adopted the 2020 UWMP, Appendix 11 to the 2015 UWMP, and the WSCP and authorized their submittal to the State of California. Copies of Resolutions 9279, 9280, and 9281 are included in the 2020 UWMP Section 5, and Resolution 9281 for the WSCP is attached to the WSCP as Attachment C.

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# APPENDIX B

# ATTACHMENT 2

- **Appendix G "Inland Empire Utilities Agency Reduced Delta Reliance Reporting", Inland Empire Utilities Agency's 2020 Urban Water Management Plan**

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Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

# ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN

## Addendum prepared by Kennedy Jenks Consultants

June 2021

# 2020 UWMP Appendix G
# & 2015 UWMP Appendix P

Reduced Delta Reliance Reporting

*6/29/2021*

# Inland Empire Utilities Agency Reduced Delta Reliance Reporting

## G.1 Background

IEUA is an urban water supplier and a member agency of MWD. MWD provides IEUA with imported water supplies, which IEUA in turn distributes on a wholesale basis to its retail water purveyors. MWD is a contractor on the State Water Project (SWP) and, due to water quality considerations, all imported water supplies IEUA receives from MWD originate from the SWP system. The SWP system runs from Lake Oroville in Northern California to Southern California, crossing the Sacramento-San Joaquin Delta (Delta) along the way. MWD and its member agencies have made investments into water supply and demand management to regionally reduce impacts on the Delta. These investments bring regional reliability and reduced Delta reliance that make it infeasible for individual MWD member agencies to determine their individual Delta reliance.

As a recipient of imported water from the SWP delivered via MWD, IEUA may indirectly receive water through a proposed covered action, such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta. Through this appendix, IEUA is providing information in its 2015 and 2020 UWMPs that may be used in the covered action process, to demonstrate consistency with Delta Plan Policy WR P1, *Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance* (WR P1) [California Code of Regulations (CCR), Title 23, § 5003].

The Delta Plan is a comprehensive, long-term resource management plan for the Sacramento-San Joaquin Delta (Delta) that was developed as part of the Delta Reform Act of 2009 (Water code section 85000 et seq) and includes both regulatory policies and recommendations, aimed at promoting a healthy Delta ecosystem. Delta Plan Policy WR P1 is one of 14 regulatory policies in the Delta Plan. WR P1 identifies UWMPs as the tool to demonstrate consistency with state policy to reduce reliance on the Delta for any Supplier that is participating in or carrying out a proposed covered action or receiving Delta water from a proposed covered action.

Within the supplier's UWMP, information should be provided that can be used to demonstrate consistency with this policy. Section (c)(1) of WR P1 states that suppliers that have (A) completed an urban water management plan, (B) implemented the efficiency measures in that plan, and (C) shown a measurable reduction in Delta reliance and improvement in regional self-reliance in the plan, are contributing to reduced reliance on the Delta and are therefore consistent with WR P1 [CCR, Title 23, § 5003(c)(1)].

The analysis and documentation provided below include all elements described in WR P1(c)(1) and are included in IEUA's 2015 and 2020 UWMP to support a certification of consistency in the case of a future covered action.

## G.2 Demonstration of Reduced Reliance

The methodology used to determine IEUA's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in DWR's UWMP Guidebook Appendix C, including the use of narrative justifications for the accounting of supplies and the documentation of specific data sources. Some of the key assumptions underlying IEUA's demonstration of reduced reliance includes:

- All data were obtained from the current 2020 UWMP or previously adopted UWMPs and represent average or normal water year conditions.

- All analyses were conducted at the IEUA service area level. Demands on IEUA are the total demands from all its retail agencies. Supplies are the total supplies IEUA manages, which are imported water from MWD and recycled water from its regional water recycling plants.

- No projects or programs that are described in the UWMPs as "Projects Under Development" were included in the accounting of supplies.

## G.3 Summary of Expected Outcomes for Reduced Reliance on the Delta

As stated in WR P1(c)(1), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

It is important to note that MWD has prepared a detailed analysis that demonstrates the consistency with the Delta Plan Policy in its 2020 UWMP on a region-wide scale that includes its Member Agencies (MWD 2020 UWMP, Appendix 11). From its 2010 baseline, both long-term Regional Self-Reliance and Reduced Reliance on Supplies from the Delta are expected to increase over time. IEUA has adopted MWD's calculation of Reduced Reliance on Supplies from the Delta due to the infeasibility of separating out the delta supplies that IEUA receives from MWD (see Section G.6 and G.7 for details).

IEUA will report its own expected outcomes for Regional Self-Reliance in the following sections (G.4 and G.5). These expected outcomes use the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2020 (Guidebook Appendix C), finalized on March 29, 2021.

The following provides a summary of the near-term (2025) and long-term (2045) expected outcomes for IEUA's regional self-reliance and MWD's regional reduction in reliance on Delta water supplies. The results show that IEUA is measurably improving regional self-reliance and MWD and its member agencies are reducing reliance on Delta supplies, both as an amount of water used and as a percentage of water used.

- Near-term (2025) – IEUA's normal water regional self-reliance is expected to increase by 25 thousand acre-feet (TAF) from the 2010 baseline; this represents an increase of about 10 percent of 2025 normal water year demands (Table G-2).

- Long-term (2045) – IEUA's normal water regional self-reliance is expected to increase by 50 TAF from the 2010 baseline; this represents an increase of about 17 percent of 2045 normal water year demands (Table G-2).

- Near-term (2025) – MWD's normal reliance on water supplies from the Delta Watershed is expected to decrease by 300 thousand acre-feet (TAF) from the 2010 baseline; this represents a decrease of about 3 percent of 2025 normal water year demands (Table G-3).

- Long-term (2045) – MWD's normal reliance on water supplies from the Delta Watershed is expected to decrease by 314 thousand acre-feet (TAF) from the 2010 baseline; this represents a decrease of about 5 percent of 2045 normal water year demands (Table G-3).

## G.4 Baseline and Calculation of Service Area Water Demands

In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C.

Table G-1 shows the total service area water demands for IEUA for 2010 through 2045. These water demands include recycled water and imported water demand on IEUA from its retail agencies. The table also shows reported water use efficiency and calculates the total service area water demands without water use efficiency.

The data sources for the values in this table and calculations are explained below.

*Service Area Demands with Water Use Efficiency Accounted For:*

- Baseline (2010) value: The sum of the imported water and recycled water demands, as reported in IEUA's 2010 UWMP, Tables 3-10 and 3-15.

- 2015 value: The sum of the imported water and recycled water demands on IEUA, as reported in IEUA's 2015 UWMP, Table 2-8: IEUA Total Water Demands.

- 2020-2045 values: The sum of imported water and recycled water demands, from IEUA's 2020 UWMP, Table 2-4: Total Water Use (Potable and Non-Potable).

*Reported Water Use Efficiency:*

- Baseline (2010) value: No water use efficiency value is estimated to establish a conservative baseline.

- 2015 value: From IEUA's 2015 UWMP, Table 3-1. Only the 2015 value for WUE was selected.

- 2020 value: The volume of savings over the lifetime of water use efficiency measures implemented during FY 19/20, as reported in IEUA's Annual UWE FY19/20 report and detailed in Section 8.8 of IEUA's 2020 UWMP.

- 2025-2045 values: Projected water use efficiency savings, from IEUA's 2020 UWMP, Table 7-2.

The Service Area Water Demands without Water Use Efficiency Accounted For is the sum of the two volumes above for each year.

## G.5 Calculation of Supplies Contributing to Regional Self-Reliance

For a covered action to demonstrate consistency with the Delta Plan, WR P1(c)(1) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table G-2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table G-2 represent efforts to improve regional self-reliance for the IEUA service area, focused only on the supplies IEUA manages, which are water use efficiency and water recycling. Supporting narratives and documentation for the all the data shown in the table are provided below:

Water Use Efficiency

The water use efficiency information shown in Table G-2 is taken directly from Table G-1. It is now reflected as a supply contributing to regional self-reliance.

Water Recycling

The water recycling values shown in Table G-2 are the recycled water supplies to meet the recycled water portion of the projected "service area water demands with water use efficiency accounted for" shown in Table G-1. These values come from IEUA's 2010 UWMP Table 3-15, IEUA's 2015 UWMP Table 2-8, and IEUA's 2020 UWMP Table 2-4. A description on these water supplies can be found in Section 5.4 – Current Recycled Water Uses in IEUA's 2020 UWMP.

The results shown in Table G-2 demonstrate that IEUA is improving its regional self-reliance, since the volume of water supplies contributing to regional self-reliance are projected to increase over time. In the near term (2025), the expected outcome for normal water year regional self-reliance increases by over 25,000 AF from the 2010 baseline; this represents an increase of about 10 percent of 2025 normal water year demands. In the long term (2045), normal water year regional self-reliance is expected to increase by more than 50,000 AF from the 2010 baseline.

## G.6 Calculation of Reliance on Water Supplies from the Delta Watershed

WR P1(c)(1) requires that water suppliers report the expected outcomes for measurable reductions in supplies from the Delta watershed either as an amount or as a percentage. This analysis provides both calculations.

Although IEUA is currently a SWP-exclusive MWD member agency, it is infeasible to individually account for the independent impact on the Delta. IEUA participates, through MWD, in various water supply investment and demand management programs that reduce reliance on the Delta. Reliance on water supplies from the Delta are taken from MWD's Reduced Delta Reliance assessment (MWD 2020 UWMP, Appendix 11).

Regional reliance on supplies from the Delta watershed are expected to decrease by 314 TAF over the 2010 baseline, a decrease of about 5.2% of 2045 demands. Increased regional self-reliance primarily comes from water use efficiency, conjunctive use projects, water recycling, and local/regional water supply and storage projects. The water supply accounting completed by MWD does not include any supplies from potential future covered actions.

## G.7 Infeasibility of Accounting Supplies from the Delta Watershed for Metropolitan's Member Agencies and their Customers

Metropolitan's service area, as a whole, reduces reliance on the Delta through investments in non-Delta water supplies, local water supplies, and regional and local demand management measures. Metropolitan's member agencies coordinate reliance on the Delta through their membership in Metropolitan, a regional cooperative providing wholesale water service to its 26 member agencies. Accordingly, regional reliance on the Delta can only be measured regionally—not by individual Metropolitan member agencies and not by the customers of those member agencies.

Metropolitan's member agencies, and those agencies' customers, indirectly reduce reliance on the Delta through their collective efforts as a cooperative. Metropolitan's member agencies do not control the amount of Delta water they receive from Metropolitan. Metropolitan manages a statewide integrated conveyance system consisting of its participation in the State Water Project (SWP), its Colorado River Aqueduct (CRA) including Colorado River water resources, programs and water exchanges, and its regional storage portfolio. Along with the SWP, CRA, storage programs, and Metropolitan's conveyance and distribution facilities, demand management programs increase the future reliability of water resources for the region. In addition, demand management programs provide system-wide benefits by decreasing the demand for imported water, which helps to decrease the burden on Metropolitan's infrastructure and reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

Metropolitan's costs are funded almost entirely from its service area, with the exception of grants and other assistance from government programs. Most of Metropolitan's revenues are collected directly from its member agencies. Properties within Metropolitan's service area pay a property tax that currently provides approximately 8 percent of the fiscal year 2021 annual budgeted revenues. The rest of Metropolitan's costs are funded through rates and charges paid by Metropolitan's member agencies for the wholesale services it provides to them. Thus, Metropolitan's member agencies fund nearly all operations Metropolitan undertakes to reduce reliance on the Delta, including Colorado River Programs, storage facilities, Local Resources Programs and Conservation Programs within Metropolitan's service area.

Because of the integrated nature of Metropolitan's systems and operations, and the collective nature of Metropolitan's regional efforts, it is infeasible to quantify each of Metropolitan member agencies' individual reliance on the Delta. It is infeasible to attempt to segregate an entity and a system that were designed to work as an integrated regional cooperative.

In addition to the member agencies funding Metropolitan's regional efforts, they also invest in their own local programs to reduce their reliance on any imported water. Moreover, the customers of those member agencies may also invest in their own local programs to reduce water demand. However, to the extent those efforts result in reduction of demands on Metropolitan, that reduction may not equate to a like reduction of reliance on the Delta. Demands on Metropolitan are not commensurate with demands on the Delta because most of Metropolitan member agencies receive blended resources from Metropolitan as determined by Metropolitan—not the individual member agency—and for most member agencies, the blend varies from month-to-month and year-to-year due to hydrology, operational constraints, use of storage and other factors.

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the individual member agencies or their customers. As described above, the region (through Metropolitan) makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of Metropolitan's investments in Colorado River supplies, groundwater and surface storage, local resources development and demand management measures that reduce reliance on the Delta are collectively funded by revenues generated from the member agencies through rates and charges.

Metropolitan's revenues cannot be matched to the demands or supply production history of an individual agency, or consistently across the agencies within the service area. Each project or program funded by the region has a different online date, useful life, incentive rate and structure, and production schedule. It is infeasible to account for all these things over the life of each project or program and provide a nexus to each member agency's contributions to Metropolitan's revenue stream over time. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by member agencies and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, Metropolitan's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

**Colorado River Programs**

As a regional cooperative of member agencies, Metropolitan invests in programs to ensure the continued reliability and sustainability of Colorado River supplies. Metropolitan was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the CRA. The CRA consists of five pumping plants, 450 miles of high voltage power lines, one electric substation, four regulating reservoirs, and 242 miles of aqueducts, siphons, canals, conduits and pipelines terminating at Lake Mathews in Riverside County. Metropolitan owns, operates, and manages the CRA. Metropolitan is responsible for operating, maintaining, rehabilitating, and repairing the CRA, and is responsible for obtaining and scheduling energy resources adequate to power pumps at the CRA's five pumping stations.

Colorado River supplies include Metropolitan's basic Colorado River apportionment, along with supplies that result from existing and committed programs, including supplies from the Imperial Irrigation District (IID)-Metropolitan Conservation Program, the implementation of the Quantification Settlement Agreement (QSA) and related agreements, and the exchange agreement with San Diego County Water Authority (SDCWA). The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's CRA supplies. These include the PVID Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead.

IEUA has emergency service connections to the MWD's Upper Feeder, which includes CRA supplies. However, these connections are not currently utilized due to water quality concerns.

**Storage Investments/Facilities**

Surface and groundwater storage are critical elements of Southern California's water resources strategy and help Metropolitan reduce its reliance on the Delta. Because California experiences dramatic swings in weather and hydrology, storage is important to regulate those swings and mitigate possible supply shortages. Surface and groundwater storage provide a means of storing water during normal and wet years for later use during dry years, when imported supplies are limited. The Metropolitan system, for purposes of meeting demands during times of shortage, regulating system flows, and ensuring system reliability in the event of a system outage, provides over 1,000,000 acre-feet of system storage capacity. Diamond Valley Lake provides 810,000 acre-feet of that storage capacity, effectively doubling Southern California's previous surface water storage capacity. Other existing imported water storage available to the region consists of Metropolitan's raw water reservoirs, a share of the SWP's raw water reservoirs in and near the service area, and the portion of the groundwater basins used for conjunctive-use storage.

Since the early twentieth century, DWR and Metropolitan have constructed surface water reservoirs to meet emergency, drought/seasonal, and regulatory water needs for Southern California. These reservoirs include Pyramid Lake, Castaic Lake, Elderberry Forebay, Silverwood Lake, Lake Perris, Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, Orange County Reservoir, and Metropolitan's Diamond Valley Lake (DVL). Some reservoirs such as Live Oak Reservoir, Garvey Reservoir, Palos Verdes Reservoir, and Orange County Reservoir, which have a total combined capacity of about 3,500 AF, are used solely for regulating purposes. The total gross storage capacity for the larger remaining reservoirs is 1,757,600 AF. However, not all of the gross storage capacity is available to Metropolitan; dead storage and storage allocated to others reduce the amount of storage that is available to Metropolitan to 1,665,200 AF.

Conjunctive use of the aquifers offers another important source of dry year supplies. Unused storage in Southern California groundwater basins can be used to optimize imported water supplies, and the development of groundwater storage projects allows effective management and regulation of the region's major imported supplies from the Colorado River and SWP. Over the years, Metropolitan has implemented conjunctive use through various programs in the service area; the following table lists the groundwater conjunctive use programs that have been developed in the region.

**MWD Table 1: Metropolitan Groundwater Conjunctive Use Programs**

| Program | Metropolitan Agreement Partners | Program Term | Max Storage AF | Dry-Year Yield AF/Yr |
|---|---|---|---|---|
| Long Beach Conjunctive Use Storage Project (Central Basin) | Long Beach | June 2002-2027 | 13,000 | 4,300 |
| Foothill Area Groundwater Storage Program (Monkhill/ Raymond Basin) | Foothill MWD | February 2003-2028 | 9,000 | 3,000 |
| Orange County Groundwater Conjunctive Use Program | MWDOC<br>OCWD | June 2003-2028 | 66,000+ | 22,000 |
| Chino Basin Conjunctive Use Programs | IEUA<br>TVMWD<br>Watermaster | June 2003-2028 | 100,000 | 33,000 |
| Live Oak Basin Conjunctive Use Project (Six Basins) | TVMWD<br>City of La Verne | October 2002-2027 | 3,000 | 1,000 |
| City of Compton Conjunctive Use Project (Central Basin) | Compton | February 2005-2030 | 2,289 | 763 |
| Long Beach Conjunctive Use Program Expansion in Lakewood (Central Basin) | Long Beach | July 2005-2030 | 3,600 | 1,200 |
| Upper Claremont Basin Groundwater Storage Program (Six Basins) | TVMWD | Sept. 2005- 2030 | 3,000 | 1,000 |
| Elsinore Basin Conjunctive Use Storage Program | Western MWD<br>Elsinore Valley MWD | May 2008- 2033 | 12,000 | 4,000 |
| **TOTAL** | | | **211,889** | **70,263** |

**Metropolitan Demand Management Programs**

Demand management costs are Metropolitan's expenditures for funding local water resource development programs and water conservation programs. These Demand Management Programs incentivize the development of local water supplies and the conservation of water to reduce the need to import water to deliver to Metropolitan's member agencies. These programs are implemented below the delivery points between Metropolitan's and its member agencies' distribution systems and, as such, do not add any water to Metropolitan's supplies. Rather, the effect of these downstream programs is to produce a local supply of water for the local agencies and to reduce demands by member agencies for water imported through Metropolitan's system. The following discussions outline how Metropolitan funds local resources and conservation programs for the benefit of all of its member agencies and the entire Metropolitan service area. Notably, the history of demand management by Metropolitan's member agencies and the local agencies that purchase water from Metropolitan's members has spanned more than four decades. The significant history of the programs is another reason it would be difficult to attempt to assign a portion of such funding to any one individual member agency.

## Section 1: Local Resources Programs

In 1982, Metropolitan began providing financial incentives to its member agencies to develop new local supplies to assist in meeting the region's water needs. Because of Metropolitan's regional distribution system, these programs benefit all member agencies regardless of project location because they help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs and free up conveyance capacity to the benefit of all the agencies that rely on water from Metropolitan.

For example, the Groundwater Replenishment System (GWRS) operated by the Orange County Water District is the world's largest water purification system for indirect potable reuse. It was funded, in part, by Metropolitan's member agencies through the Local Resources Program. Annually, the GWRS produces approximately 103,000 acre-feet of reliable, locally controlled, drought-proof supply of high-quality water to recharge the Orange County Groundwater Basin and protect it from seawater intrusion. The GWRS is a premier example of a regional project that significantly reduced the need to utilize imported water for groundwater replenishment in Metropolitan's service area, increasing regional and local supply reliability and reducing the region's reliance on imported supplies, including supplies from the State Water Project.

Metropolitan's local resource programs have evolved through the years to better assist Metropolitan's member agencies in increasing local supply production. The following is a description and history of the local supply incentive programs.

### *Local Projects Program*

In 1982, Metropolitan initiated the Local Projects Program (LPP), which provided funding to member agencies to facilitate the development of recycled water projects. Under this approach, Metropolitan contributed a negotiated up-front funding amount to help finance project capital costs. Participating member agencies were obligated to reimburse Metropolitan over time. In 1986, the LPP was revised, changing the up-front funding approach to an incentive-based approach. Metropolitan contributed an amount equal to the avoided State Water Project pumping costs for each acre-foot of recycled water delivered to end-use consumers. This funding incentive was based on the premise that local projects resulted in the reduction of water imported from the Delta and the associated pumping cost. The incentive amount varied from year to year depending on the actual variable power cost paid for State Water Project imports. In 1990, Metropolitan's Board increased the LPP contribution to a fixed rate of $154 per acre-foot, which was calculated based on Metropolitan's avoided capital and operational costs to convey, treat, and distribute water, and included considerations of reliability and service area demands.

### *Groundwater Recovery Program*

The drought of the early 1990s sparked the need to develop additional local water resources, aside from recycled water, to meet regional demand and increase regional water supply reliability. In 1991, Metropolitan conducted the Brackish Groundwater Reclamation Study which determined that large amounts of degraded groundwater in the region were not being utilized. Subsequently, the Groundwater Recovery Program (GRP) was established to assist the recovery of otherwise unusable groundwater degraded by minerals and other contaminants,

provide access to the storage assets of the degraded groundwater, and maintain the quality of groundwater resources by reducing the spread of degraded plumes.

*Local Resources Program*

In 1995, Metropolitan's Board adopted the Local Resources Program (LRP), which combined the LPP and GRP into one program. The Board allowed for existing LPP agreements with a fixed incentive rate to convert to the sliding scale up to $250 per acre-foot, similar to GRP incentive terms. Those agreements that were converted to LRP are known as "LRP Conversions."

*Competitive Local Projects Program*

In 1998, the Competitive Local Resources Program (Competitive Program) was established. The Competitive Program encouraged the development of recycled water and recovered groundwater through a process that emphasized cost-efficiency to Metropolitan, timing new production according to regional need while minimizing program administration cost. Under the Competitive Program, agencies requested an incentive rate up to $250 per acre-foot of production over 25 years under a Request for Proposals (RFP) for the development of up to 53,000 acre-feet per year of new water recycling and groundwater recovery projects. In 2003, a second RFP was issued for the development of an additional 65,000 acre-feet of new recycled water and recovered groundwater projects through the LRP.

*Seawater Desalination Program*

Metropolitan established the Seawater Desalination Program (SDP) in 2001 to provide financial incentives to member agencies for the development of seawater desalination projects. In 2014, seawater desalination projects became eligible for funding under the LRP, and the SDP was ended.

*2007 Local Resources Program*

In 2006, a task force comprised of member agency representatives was formed to identify and recommend program improvements to the LRP. As a result of the task force process, the 2007 LRP was established with a goal of 174,000 acre-feet per year of additional local water resource development. The new program allowed for an open application process and eliminated the previous competitive process. This program offered sliding scale incentives of up to $250 per acre-foot, calculated annually based on a member agency's actual local resource project costs exceeding Metropolitan's prevailing water rate.

*2014 Local Resources Program*

A series of workgroup meetings with member agencies was held to identify the reasons why there was a lack of new LRP applications coming into the program. The main constraint identified by the member agencies was that the $250 per acre-foot was not providing enough of an incentive for developing new projects due to higher construction costs to meet water quality requirements and to develop the infrastructure to reach end-use consumers located further from treatment plants. As a result, in 2014, the Board authorized an increase in the maximum incentive amount, provided alternative payment structures, included onsite retrofit costs and reimbursable services as part of the LRP, and added eligibility for seawater desalination projects. The current LRP incentive payment options are structured as follows:

- Option 1 – Sliding scale incentive up to $340/AF for a 25-year agreement term
- Option 2 – Sliding scale incentive up to $475/AF for a 15-year agreement term
- Option 3 – Fixed incentive up to $305/AF for a 25-year agreement term

*On-site Retrofit Programs*

In 2014, Metropolitan's Board also approved the On-site Retrofit Pilot Program which provided financial incentives to public or private entities toward the cost of small-scale improvements to their existing irrigation and industrial systems to allow connection to existing recycled water pipelines. The On-site Retrofit Pilot Program helped reduce recycled water retrofit costs to the end-use consumer which is a key constraint that limited recycled water LRP projects from reaching full production capacity. The program incentive was equal to the actual eligible costs of the on-site retrofit, or $975 per acre-foot of up-front cost, which equates to $195 per acre-foot for an estimated five years of water savings ($195/AF x 5 years) multiplied by the average annual water use in previous three years, whichever is less. The Pilot Program lasted two years and was successful in meeting its goal of accelerating the use of recycled water.

In 2016, Metropolitan's Board authorized the On-site Retrofit Program (ORP), with an additional budget of $10 million. This program encompassed lessons learned from the Pilot Program and feedback from member agencies to make the program more streamlined and improve its efficiency. As of fiscal year 2019/20, the ORP has successfully converted 440 sites, increasing the use of recycled water by 12,691 acre-feet per year.

*Stormwater Pilot Programs*

In 2019, Metropolitan's Board authorized both the Stormwater for Direct Use Pilot Program and a Stormwater for Recharge Pilot Program to study the feasibility of reusing stormwater to help meet regional demands in Southern California. These pilot programs are intended to encourage the development, monitoring, and study of new and existing stormwater projects by providing financial incentives for their construction/retrofit and monitoring/reporting costs. These pilot programs will help evaluate the potential benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches. Metropolitan's Board authorized a total of $12.5 million for the stormwater pilot programs ($5 million for the District Use Pilot and $7.5 million for the Recharge Pilot).

*Current Status and Results of Metropolitan's Local Resource Programs*

Today, nearly one-half of the total recycled water and groundwater recovery production in the region has been developed with an incentive from one or more of Metropolitan's local resource programs. During fiscal year 2020, Metropolitan provided about $13 million for production of 71,000 acre-feet of recycled water for non-potable and indirect potable uses. Metropolitan provided about $4 million to support projects that produced about 50,000 acre-feet of recovered groundwater for municipal use. Since 1982, Metropolitan has invested $680 million to fund 85 recycled water projects and 27 groundwater recovery projects that have produced a cumulative total of about 4 million acre-feet.

<u>Conservation Programs</u>

Metropolitan's regional conservation programs and approaches have a long history. Decades ago, Metropolitan recognized that demand management at the consumer level would be an

important part of balancing regional supplies and demands. Water conservation efforts were seen as a way to reduce the need for imported supplies and offset the need to transport or store additional water into or within the Metropolitan service area. The actual conservation of water takes place at the retail consumer level. Regional conservation approaches have proven to be effective at reaching retail consumers throughout Metropolitan's service area and successfully implementing water saving devices, programs and practices. Through the pooling of funding by Metropolitan's member agencies, Metropolitan is able to engage in regional campaigns with wide-reaching impact. Regional investments in demand management programs, of which conservation is a key part along with local supply programs, benefit all member agencies regardless of project location. These programs help to increase regional water supply reliability, reduce demands for imported water supplies, decrease the burden on Metropolitan's infrastructure, reduce system costs, and free up conveyance capacity to the benefit of all member agencies.

*Incentive-Based Conservation Programs*

*Conservation Credits Program*

In 1988, Metropolitan's Board approved the Water Conservation Credits Program (Credits Program). The Credits Program is similar in concept to the Local Projects Program (LPP). The purpose of the Credits Program is to encourage local water agencies to implement effective water conservation projects through the use of financial incentives. The Credits Program provides financial assistance for water conservation projects that reduce demands on Metropolitan's imported water supplies and require Metropolitan's assistance to be financially feasible.

Initially, the Credits Program provided 50 percent of a member agency's program cost, up to a maximum of $75 per acre-foot of estimated water savings. The $75 Base Conservation Rate was established based Metropolitan's avoided cost of pumping SWP supplies. The Base Conservation Rate has been revisited by Metropolitan's Board and revised twice since 1988, from $75 to $154 per acre-foot in 1990 and from $154 to $195 per acre-foot in 2005.

In fiscal year 2020 Metropolitan processed more than 30,400 rebate applications totaling $18.9 million.

*Member Agency Administered Program*

Some member agencies also have unique programs within their service areas that provide local rebates that may differ from Metropolitan's regional program. Metropolitan continues to support these local efforts through a member agency administered funding program that adheres to the same funding guidelines as the Credits Program. The Member Agency Administered Program allows member agencies to receive funding for local conservation efforts that supplement, but do not duplicate, the rebates offered through Metropolitan's regional rebate program.

*Water Savings Incentive Program*

There are numerous commercial entities and industries within Metropolitan's service area that pursue unique savings opportunities that do not fall within the general rebate programs that Metropolitan provides. In 2012, Metropolitan designed the Water Savings Incentive Program (WSIP) to target these unique commercial and industrial projects. In addition to rebates for devices, under this program, Metropolitan provides financial incentives to businesses and

industries that created their own custom water efficiency projects. Qualifying custom projects can receive funding for permanent water efficiency changes that result in reduced potable demand.

*Non-Incentive Conservation Programs*

In addition to its incentive-based conservation programs, Metropolitan also undertakes additional efforts throughout its service area that help achieve water savings without the use of rebates. Metropolitan's non-incentive conservation efforts include:

- residential and professional water efficient landscape training classes
- water audits for large landscapes
- research, development and studies of new water saving technologies
- advertising and outreach campaigns
- community outreach and education programs
- advocacy for legislation, codes, and standards that lead to increased water savings

*Current Status and Results of Metropolitan's Conservation Programs*

Since 1990, Metropolitan has invested $824 million in conservation rebates that have resulted in a cumulative savings of 3.27 million acre-feet of water. These investments include $450 million in turf removal and other rebates during the last drought which resulted in 175 million square feet of lawn turf removed. During fiscal year 2020, 1.06 million acre-feet of water is estimated to have been conserved. This annual total includes Metropolitan's Conservation Credits Program; code-based conservation achieved through Metropolitan-sponsored legislation; building plumbing codes and ordinances; reduced consumption resulting from changes in water pricing; and pre-1990 device retrofits.

**Infeasibility of Accounting Regional Investments in Reduced Reliance Below the Regional Level**

The accounting of regional investments that contribute to reduced reliance on supplies from the Delta watershed is straightforward to calculate and report at the regional aggregate level. However, any similar accounting is infeasible for the individual member agencies or their customers. As described above, the region (through Metropolitan) makes significant investments in projects, programs and other resources that reduce reliance on the Delta. In fact, all of Metropolitan's investments in Colorado River supplies, groundwater and surface storage, local resources development and demand management measures that reduce reliance on the Delta are collectively funded by revenues generated from the member agencies through rates and charges.

Metropolitan's revenues cannot be matched to the demands or supply production history of an individual agency, or consistently across the agencies within the service area. Each project or program funded by the region has a different online date, useful life, incentive rate and structure, and production schedule. It is infeasible to account for all these things over the life of each project or program and provide a nexus to each member agency's contributions to Metropolitan's revenue stream over time. Accounting at the regional level allows for the incorporation of the local supplies and water use efficiency programs done by member agencies

and their customers through both the regional programs and through their own specific local programs. As shown above, despite the infeasibility of accounting reduced Delta reliance below the regional level, Metropolitan's member agencies and their customers have together made substantial contributions to the region's reduced reliance.

## G.8 2015 UWMP Appendix P

The information contained in this Appendix G is also intended to be a new Appendix P attached to IEUA's 2015 UWMP consistent with WR P1 subsection (c)(1)(C) (Cal. Code Regs. tit. 23, § 5003). IEUA provided notice of the availability of the draft 2020 UWMP (including this Appendix G which will also be a new Appendix P to its 2015 UWMP) and WSCP and the public hearing to consider adoption of both plans and the addendum to the 2015 UWMP in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The notice of availability of the documents was sent to IEUA's member agencies, as well as cities and counties in IEUA service area. In addition, a public notice advertising the public hearing in English was published in the Inland Valley Daily Bulletin. The notification in English language newspapers was published on 17 May and 24 May 2021. Copies of: (1) the notification letter sent to the member agencies, cities and counties in IEUA service area, and (2) the notice published in the newspapers are included in the 2020 UWMP Appendix E.

Thus, this Appendix G to IEUA's 2020 UWMP, which was adopted with IEUA's 2020 UWMP, will also be recognized and treated as Appendix P to IEUA's 2015 UWMP. IEUA held the public hearing for the draft 2020 UWMP, draft Appendix G as an addendum to the 2015 UWMP, and draft WSCP on June 16, 2021, at the Board of Directors meeting, held online due to COVID-19 concerns. On June 16, IEUA's Board determined that the 2020 UWMP and the WSCP accurately represent the water resources plan for IEUA's service area. IEUA's Board determined that Appendix G to the 2020 UWMP and Appendix P to the 2015 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003), which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolution No. 2021-06-10, the Board adopted the 2020 UWMP, Appendix G as an addendum to the 2015 UWMP, and the WSCP and authorized their submittal to the State of California. Copies of Resolution No. 2021-06-10 is included in the 2020 UWMP Appendix D.

**Table G-1: Calculation of IEUA Service Area Water Demands Without Water Use Efficiency**

| Total Service Area Water Demands (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands with Water Use Efficiency Accounted For* | 79,440 | 92,325 | 96,934 | 113,280 | 117,752 | 121,438 | 126,072 | 126,664 |
| Reported Water Use Efficiency or Estimated Water Use Efficiency Since Baseline | - | 1,975 | 3,292 | 9,788 | 11,984 | 17,257 | 22,570 | 27,802 |
| Service Area Water Demands without Water Use Efficiency Accounted For | 79,440 | 94,300 | 100,226 | 123,068 | 129,736 | 138,695 | 148,642 | 154,466 |

*Demands include imported and recycled water, as found in 2020 UWMP Table 4-3W

**Table G-2: Calculation of IEUA Supplies Contributing to Regional Self-Reliance**

| Water Supplies Contributing to Regional Self-Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Use Efficiency | - | 1,975 | 3,292 | 9,788 | 11,984 | 17,257 | 22,570 | 27,802 |
| Water Recycling | 24,506 | 33,419 | 30,495 | 40,495 | 42,697 | 44,122 | 46,504 | 46,844 |
| Stormwater Capture and Use | - | - | - | - | - | - | - | - |
| Advanced Water Technologies | - | - | - | - | - | - | - | - |
| Conjunctive Use Projects | - | - | - | - | - | - | - | - |
| Local and Regional Water Supply and Storage Projects | - | - | - | - | - | - | - | - |
| Other Programs and Projects the Contribute to Regional Self-Reliance | - | - | - | - | - | - | - | - |
| Water Supplies Contributing to Regional Self-Reliance | 24,506 | 35,394 | 33,787 | 50,283 | 54,681 | 61,379 | 69,074 | 74,646 |

| Service Area Water Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands without Water Use Efficiency Accounted For | 79,440 | 94,300 | 100,226 | 123,068 | 129,736 | 138,695 | 148,642 | 154,466 |

| Change in Regional Self Reliance (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Supplies Contributing to Regional Self-Reliance | 24,506 | 35,394 | 33,787 | 50,283 | 54,681 | 61,379 | 69,074 | 74,646 |
| Change in Water Supplies Contributing to Regional Self-Reliance | | 10,888 | 9,281 | 25,777 | 30,175 | 36,873 | 44,568 | 50,140 |

| Percent Change in Regional Self Reliance (As Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Percent of Water Supplies Contributing to Regional Self-Reliance | 30.8% | 37.5% | 33.7% | 40.9% | 42.1% | 44.3% | 46.5% | 48.3% |
| Change in Percent of Water Supplies Contributing to Regional Self-Reliance | | 6.7% | 2.9% | 10.0% | 11.3% | 13.4% | 15.6% | 17.5% |

**Table G-3: Calculation of MWD Reliance on Water Supplies from the Delta Watershed**

| Water Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| CVP/SWP Contract Supplies | 1,472,000 | 1,029,000 | 984,000 | 1,133,000 | 1,130,000 | 1,128,000 | 1,126,000 | 1,126,000 |
| Delta/Delta Tributary Diversions | | | | | | | | |
| Transfers and Exchanges | 20,000 | 44,000 | 91,000 | 58,000 | 52,000 | 52,000 | 52,000 | 52,000 |
| Other Water Supplies from the Delta Watershed | | | | | | | | |
| Total Water Supplies from the Delta Watershed | 1,492,000 | 1,073,000 | 1,075,000 | 1,191,000 | 1,182,000 | 1,180,000 | 1,178,000 | 1,178,000 |

| Service Area Water Demands without Water Use Efficiency (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Service Area Water Demands without Water Use Efficiency Accounted For | 5,493,000 | 5,499,000 | 5,219,000 | 4,925,000 | 5,032,000 | 5,156,000 | 5,261,000 | 5,374,000 |

| Change in Supplies from the Delta Watershed (Acre-Feet) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Water Supplies from the Delta Watershed | 1,492,000 | 1,073,000 | 1,075,000 | 1,191,000 | 1,182,000 | 1,180,000 | 1,178,000 | 1,178,000 |
| Change in Water Supplies from the Delta Watershed | | (419,000) | (417,000) | (301,000) | (310,000) | (312,000) | (314,000) | (314,000) |

| Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE) | Baseline (2010) | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (Optional) |
|---|---|---|---|---|---|---|---|---|
| Percent of Water Supplies from the Delta Watershed | 27.2% | 19.5% | 20.6% | 24.2% | 23.5% | 22.9% | 22.4% | 21.9% |
| Change in Percent of Water Supplies from the Delta Watershed | | -7.6% | -6.6% | -3.0% | -3.7% | -4.3% | -4.8% | -5.2% |

# APPENDIX C

# COMPLETED PLAN CHECKLIST

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| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | x | Chapter 1 | A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. | Introduction and Overview | Chapter 1 Lay Description |
| x | x | Chapter 1 | Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter. | Summary | Beginning of each Chapter |
| x | x | Section 2.2 | Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier. | Plan Preparation | Section 2.2 |
| x | x | Section 2.6 | Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. | Plan Preparation | Section 2.6 |
| x | x | Section 2.6.2 | Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan. | Plan Preparation | Section 2.6.2 |
| x | | Section 2.6, Section 6.1 | Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source. | System Supplies | Not applicable |
| | x | Section 2.6 | Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types. | System Supplies | Section 2.6 |
| x | x | Section 3.1 | Describe the water supplier service area. | System Description | Section 3.1 |
| x | x | Section 3.3 | Describe the climate of the service area of the supplier. | System Description | Section 3.3 |
| x | x | Section 3.4 | Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045. | System Description | Section 3.4 |
| x | x | Section 3.4.2 | Describe other social, economic, and demographic factors affecting the supplier's water management planning. | System Description | Section 3.4.2 |
| x | x | Sections 3.4 and 5.4 | Indicate the current population of the service area. | System Description and Baselines and Targets | Sections 3.4 and 5.4 |
| x | x | Section 3.5 | Describe the land uses within the service area. | System Description | Section 3.5 |
| x | x | Section 4.2 | Quantify past, current, and projected water use, identifying the uses among water use sectors. | System Water Use | Section 4.2 |
| x | x | Section 4.2.4 | Retail suppliers shall provide data to show the distribution loss standards were met. | System Water Use | Not applicable |
| x | x | Section 4.2.6 | In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws. | System Water Use | Section 4.2.6 |
| x | x | Section 4.2.6 | Provide citations of codes, standards, ordinances, or plans used to make water use projections. | System Water Use | Section 4.2.6 |
| x | optional | Section 4.3.2.4 | Report the distribution system water loss for each of the 5 years preceding the plan update. | System Water Use | Not applicable |
| x | optional | Section 4.4 | Include projected water use needed for lower income housing projected in the service area of the supplier. | System Water Use | Not applicable |
| x | x | Section 4.5 | Demands under climate change considerations must be included as part of the drought risk assessment. | System Water Use | Section 4.5 |
| x | | Chapter 5 | Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. | Baselines and Targets | Not applicable |
| x | | Chapter 5 | Retail suppliers shall meet their water use target by December 31, 2020. | Baselines and Targets | Not applicable |
| | x | Section 5.1 | Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions. | Baselines and Targets | Section 5.1 |

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | | Section 5.2 | If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment. | Baselines and Targets | Not applicable |
| x | | Section 5.5 | Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100. | Baselines and Targets | Not applicable |
| x | | Section 5.5 and Appendix E | Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form. | Baselines and Targets | Not applicable |
| x | x | Sections 6.1 and 6.2 | Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought. | System Supplies | Sections 6.1, 6.2, 7.1, and 7.2 |
| x | x | Sections 6.1 | Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.* | System Supplies | Section 6.1 |
| x | x | Section 6.1 | When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies. | System Supplies | Section 6.1 |
| x | x | Section 6.1.1 | Describe measures taken to acquire and develop planned sources of water. | System Supplies | Section 6.1.1 |
| x | x | Section 6.2.8 | Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045. | System Supplies | Section 6.2.8 |
| x | x | Section 6.2 | Indicate whether groundwater is an existing or planned source of water available to the supplier. | System Supplies | Section 6.2 |
| x | x | Section 6.2.2 | Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization. | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.2 | Describe the groundwater basin. | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.2 | Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump. | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.2.1 | For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions. | System Supplies | Not applicable |
| x | x | Section 6.2.2.4 | Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.2 | Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped. | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.7 | Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis. | System Supplies | Section 6.2.7 |
| x | x | Section 6.2.5 | Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Describe the recycled water currently being used in the supplier's service area. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Provide a plan for optimizing the use of recycled water in the supplier's service area. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.6 | Describe desalinated water project opportunities for long-term supply. | System Supplies | Section 6.2.6 |
| x | x | Section 6.2.5 | Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.8, Section 6.3.7 | Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years. | System Supplies | Sections 6.2.8 and 6.2.9 |

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | x | Section 6.4 and Appendix O | The UWMP must include energy information, as stated in the code, that a supplier can readily obtain. | System Suppliers, Energy Intensity | Section 6.4 |
| x | x | Section 7.2 | Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability | Water Supply Reliability Assessment | Section 7.2 |
| x | x | Section 7.2.4 | Describe water management tools and options to maximize resources and minimize the need to import water from other regions. | Water Supply Reliability Assessment | Section 7.2.4 |
| x | x | Section 7.3 | Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Include a determination of the reliability of each source of supply under a variety of water shortage conditions. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Chapter 8 | Provide a water shortage contingency plan (WSCP) with specified elements below. | Water Shortage Contingency Planning | Chapter 8 |
| x | x | Chapter 8 | Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP | Water Shortage Contingency Planning | Chapter 8 |
| x | x | Section 8.10 | Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented. | Water Shortage Contingency Planning | Section 8.10 |
| x | x | Section 8.2 | Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability. | Water Shortage Contingency Planning | Section 8.2 |
| x | x | Section 8.2 | Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code. | Water Shortage Contingency Planning | Section 8.2 |
| x | x | Section 8.3 | Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply. | Water Shortage Contingency Planning | Section 8.3 |
| x | x | Section 8.3 | Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories. | Water Shortage Contingency Planning | Section 8.3 |
| x | x | Section 8.4 | Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions. | Water Shortage Contingency Planning | Section 8.4.2 |
| x | x | Section 8.4 | Specify locally appropriate demand reduction actions to adequately respond to shortages. | Water Shortage Contingency Planning | Section 8.4.1 |
| x | x | Section 8.4 | Specify locally appropriate operational changes. | Water Shortage Contingency Planning | Section 8.4.3 |
| x | x | Section 8.4 | Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions. | Water Shortage Contingency Planning | Section 8.4.4 |
| x | x | Section 8.4 | Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action. | Water Shortage Contingency Planning | Section 8.4.7 |
| x | x | Section 8.4.6 | The plan shall include a seismic risk assessment and mitigation plan. | Water Shortage Contingency Plan | Section 8.4.6 |
| x | x | Section 8.5 | Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages. | Water Shortage Contingency Planning | Section 8.5 |

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | x | Section 8.5 and 8.6 | Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications. | Water Shortage Contingency Planning | Section 8.5 |
| x | | Section 8.6 | Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP. | Water Shortage Contingency Planning | Not applicable |
| x | | Section 8.7 | Describe the legal authority that empowers the supplier to enforce shortage response actions. | Water Shortage Contingency Planning | Not applicable |
| x | x | Section 8.7 | Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3. | Water Shortage Contingency Planning | Section 8.7 |
| x | x | Section 8.7 | Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency. | Water Shortage Contingency Planning | Section 8.7 |
| x | x | Section 8.8 | Describe the potential revenue reductions and expense increases associated with activated shortage response actions. | Water Shortage Contingency Planning | Section 8.8 |
| x | x | Section 8.8 | Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions. | Water Shortage Contingency Planning | Section 8.8 |
| x | | Section 8.8 | Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought | Water Shortage Contingency Planning | Section 8.8 |
| x | | Section 8.9 | Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance. | Water Shortage Contingency Planning | Section 8.9 |
| x | | Section 8.11 | Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas. | Water Shortage Contingency Planning | Not applicable |
| x | x | Sections 8.12 and 10.4 | Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR. | Plan Adoption, Submittal, and Implementation | Sections 8.12 and 10.4 |
| x | x | Section 8.12 | Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan. | Water Shortage Contingency Planning | Section 8.12 |
| | x | Sections 9.1 and 9.3 | Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program. | Demand Management Measures | Sections 9.1 and 9.3 |
| x | | Sections 9.2 and 9.3 | Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code. | Demand Management Measures | Not applicable |
| x | | Chapter 10 | Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance). | Plan Adoption, Submittal, and Implementation | Not applicable |
| x | x | Section 10.2.1 | Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1. | Plan Adoption, Submittal, and Implementation | Section 10.2.1 |
| x | x | Section 10.4 | Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021. | Plan Adoption, Submittal, and Implementation | Section 10.4 |
| x | x | Sections 10.2.2, 10.3, and 10.5 | Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan. | Plan Adoption, Submittal, and Implementation | Sections 10.2, 10.3, and 10.5 |
| x | x | Section 10.2.2 | The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. | Plan Adoption, Submittal, and Implementation | Section 10.2.2 |
| x | x | Section 10.3.2 | Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified. | Plan Adoption, Submittal, and Implementation | Section 10.3.2 |
| x | x | Section 10.4 | Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library. | Plan Adoption, Submittal, and Implementation | Section 10.4.3 |
| x | x | Section 10.4 | Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption. | Plan Adoption, Submittal, and Implementation | Section 10.4 |
| x | x | Sections 10.4.1 and 10.4.2 | The plan, or amendments to the plan, submitted to the department shall be submitted electronically. | Plan Adoption, Submittal, and Implementation | Sections 10.4.1 and 10.4.2 |
| x | x | Section 10.5 | Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | Section 10.5 |

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | x | Section 10.5 | Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | Section 10.5 |
| x | x | Section 10.6 | If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings. | Plan Adoption, Submittal, and Implementation | Section 10.6 |
| x | x | Section 10.7.2 | If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption. | Plan Adoption, Submittal, and Implementation | Section 10.7.2 |

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# APPENDIX D

# 60 – DAY NOTIFICATION LETTERS AND PUBLIC HEARING NOTIFICATIONS

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# 60-DAY NOTIFICATION LETTERS

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WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Leonard X. Hernandez
Chief Executive Officer
County of San Bernardino
385 North Arrowhead Avenue
San Bernardino, CA 92415

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Hernandez:

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the Water Facilities Authority is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the Water Facilities Authority will be reviewing the UWMP and will make amendments or changes, as appropriate. The Water Facilities Authority invites you to submit comments in anticipation of the development of our 2020 UWMP Update. Please provide written comments within the next 30 days to the Water Facilities Authority.

For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Scott Burton
General Manager
Municipal Utilities Company
City of Ontario
1425 South Bon View Avenue
Ontario, CA 91761

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. ~~Burton~~: SCOTT

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

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For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Matt Ballantyne
City Manager
City of Chino
13220 Central Avenue
Chino, CA 91710

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. ~~Ballantyne~~: MATT

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

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For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Benjamin Montgomery
City Manager
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Montgomery:

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

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For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. John Bosler
General Manager
Cucamonga Valley Water District
10440 Ashford Street
Rancho Cucamonga, CA 91730

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear ~~Mr. Bosler~~: JOHN

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

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For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Dr. Justin Scott-Cole
General Manager
Monte Vista Water District
10575 Central Avenue
Montclair, CA 91763

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Dr. ~~Scott-Cole~~ JUSTIN:

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

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For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Brian Lee
General Manager
San Antonio Water Company
139 North Euclid Avenue
Upland, CA 91786

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear ~~Mr. Lee~~ BRIAN:

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

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For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Ms. Rosemary Hoerning
City Manager
City of Upland
460 North Euclid Avenue
Upland, CA 91786

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Ms. ~~Hoerning~~: ROSEMARY

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

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For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Josh Swift
General Manager
Fontana Water Company
15966 Arrow Route
Fontana, CA 92335

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear ~~Mr. Swift~~: JOSH

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

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For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Samuel Martinez
Executive Officer
Local Agency Formation Commission
1170 West Third Street, Unit 150
San Bernardino, CA 92415-0490

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Martinez:

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the Water Facilities Authority is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the Water Facilities Authority will be reviewing the UWMP and will make amendments or changes, as appropriate. The Water Facilities Authority invites you to submit comments in anticipation of the development of our 2020 UWMP Update. Please provide written comments within the next 30 days to the Water Facilities Authority.

For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Peter Kavounas
General Manager
Chino Basin Watermaster
9641 San Bernardino Road
Rancho Cucamonga, CA 91730

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. ~~Kavounas~~: PETER

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the Water Facilities Authority is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the Water Facilities Authority will be reviewing the UWMP and will make amendments or changes, as appropriate. The Water Facilities Authority invites you to submit comments in anticipation of the development of our 2020 UWMP Update. Please provide written comments within the next 30 days to the Water Facilities Authority.

For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Mr. Shivaji Deshmukh
General Manager
Inland Empire Utilities Agency
P.O. Box 9020
Chino Hills, CA 91709

**SUBJECT: 2020 Urban Water Management Plan Update**

SHIVAJI

Dear Mr. Deshmukh:

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the Water Facilities Authority is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the Water Facilities Authority will be reviewing the UWMP and will make amendments or changes, as appropriate. The Water Facilities Authority invites you to submit comments in anticipation of the development of our 2020 UWMP Update. Please provide written comments within the next 30 days to the Water Facilities Authority.

For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

November 10, 2020

Ms. Elizabeth Skrzat
Executive Director
Chino Basin Water Conservation District
4594 San Bernardino Street
Montclair, CA 91763

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear ~~Ms. Skrzat~~: ELIZABETH

The Water Facilities Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Water Facilities Authority is currently in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the Water Facilities Authority is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the Water Facilities Authority will be reviewing the UWMP and will make amendments or changes, as appropriate. The Water Facilities Authority invites you to submit comments in anticipation of the development of our 2020 UWMP Update. Please provide written comments within the next 30 days to the Water Facilities Authority.

For additional information and/or further clarification, please feel free to contact me at 909.981.9454, extension 12 or tlcatlin@wfajpa.org.

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

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# PUBLIC HEARING NOTIFICATIONS

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WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Ms. Elizabeth Skrzat
Executive Director
Chino Basin Water Conservation District
4594 San Bernardino Street
Montclair, CA 91763

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Ms. Skrzat:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

The 2020 Urban Water Management Plan and Water Shortage Contingency Plan were prepared pursuant to the "Urban Water Management Planning Act" and the California Water Code. The California Department of Water Resources requires every urban water supplier to prepare and adopt an Urban Water Management Plan, including the Water Shortage Contingency Plan, and periodically update the Urban Water Management Plan at least once every five years, in years ending in six and one.

Information regarding WFA's PUBLIC HEARING follows:

| | |
|---|---|
| Date: | **June 17, 2021** |
| Time: | **7:30 AM** |
| Place: | Remote video conference via **Zoom (Meeting ID: 916 2511 9632; Passcode: 547375)** |

Additionally, the meeting link will be posted on the WFA's website in the Board of Directors Special Meeting Agenda by June 3, 2021 at the following address: http://www.wfajpa.org/#Board_Agendas_&_Minutes .

WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Peter Kavounas
General Manager
Chino Basin Watermaster
9641 San Bernardino Road
Rancho Cucamonga, CA 91730

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Kavounas:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Matt Ballantyne
City Manager
City of Chino
13220 Central Avenue
Chino, CA 91710

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Ballantyne:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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| Time: | **7:30 AM** |
| Place: | Remote video conference via **Zoom (Meeting ID: 916 2511 9632; Passcode: 547375)** |

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Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Benjamin Montgomery
City Manager
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Montgomery:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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| Date: | **June 17, 2021** |
| Time: | **7:30 AM** |
| Place: | Remote video conference via **Zoom (Meeting ID: 916 2511 9632; Passcode: 547375)** |

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WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

WATER FACILITIES AUTHORITY

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. John Bosler
General Manager
Cucamonga Valley Water District
10440 Ashford Street
Rancho Cucamonga, CA 91730

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Bosler:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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| Time: | **7:30 AM** |
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WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Josh Swift
General Manager
Fontana Water Company
15966 Arrow Route
Fontana, CA 92335

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Swift:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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Information regarding WFA's PUBLIC HEARING follows:

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|---|---|
| Date: | **June 17, 2021** |
| Time: | **7:30 AM** |
| Place: | Remote video conference via **Zoom (Meeting ID: 916 2511 9632; Passcode: 547375)** |

Additionally, the meeting link will be posted on the WFA's website in the Board of Directors Special Meeting Agenda by June 3, 2021 at the following address: http://www.wfajpa.org/#Board_Agendas_&_Minutes .

WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Shivaji Deshmukh
General Manager
Inland Empire Utilities Agency
P.O. Box 9020
Chino Hills, CA 91709

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Deshmukh:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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| Time: | **7:30 AM** |
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WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Samuel Martinez
Executive Officer
Local Agency Formation Commission
1170 West Third Street, Unit 150
San Bernardino, CA 92415-0490

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Martinez:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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| Time: | **7:30 AM** |
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WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Dr. Justin Scott-Cole
General Manager
Monte Vista Water District
10575 Central Avenue
Montclair, CA 91763

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Dr. Scott-Cole:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Scott Burton, General Manager
Municipal Utilities Company
City of Ontario
1425 South Bon View Avenue
Ontario, CA 91761

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Burton:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Brian Lee
General Manager
San Antonio Water Company
139 North Euclid Avenue
Upland, CA 91786

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Lee:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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| Place: | Remote video conference via **Zoom (Meeting ID: 916 2511 9632; Passcode: 547375)** |

Additionally, the meeting link will be posted on the WFA's website in the Board of Directors Special Meeting Agenda by June 3, 2021 at the following address: http://www.wfajpa.org/#Board_Agendas_&_Minutes .

WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Leonard X. Hernandez
Chief Executive Officer
County of San Bernardino
385 North Arrowhead Avenue
San Bernardino, CA 92415

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Hernandez:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

The 2020 Urban Water Management Plan and Water Shortage Contingency Plan were prepared pursuant to the "Urban Water Management Planning Act" and the California Water Code. The California Department of Water Resources requires every urban water supplier to prepare and adopt an Urban Water Management Plan, including the Water Shortage Contingency Plan, and periodically update the Urban Water Management Plan at least once every five years, in years ending in six and one.

Information regarding WFA's PUBLIC HEARING follows:

| | |
|---|---|
| Date: | **June 17, 2021** |
| Time: | **7:30 AM** |
| Place: | Remote video conference via **Zoom (Meeting ID: 916 2511 9632; Passcode: 547375)** |

Additionally, the meeting link will be posted on the WFA's website in the Board of Directors Special Meeting Agenda by June 3, 2021 at the following address: http://www.wfajpa.org/#Board_Agendas_&_Minutes .

WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

May 24, 2021

Mr. Stephen Parker
Acting City Manager
City of Upland
460 North Euclid Avenue
Upland, CA 91786

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Parker:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

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WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

T. 909.981.9454 | F. 909.981.6760
1775 North Benson Avenue, Upland, CA 91784
www.wfajpa.org

June 9, 2021

Mr. Edward C. Starr
City Manager
City Hall
5111 Benito Street
Montclair, CA 91763

**SUBJECT:** **Notice of Public Hearing for**
**2020 Urban Water Management Plan**
**2020 Water Shortage Contingency Plan**
**2015 Urban Water Management Plan Addendum**

Dear Mr. Starr:

The Water Facilities Authority (WFA) will hold a PUBLIC HEARING on **June 17, 2021** for the purposes of adopting its 2020 Urban Water Management Plan, its Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum. WFA's 2020 Urban Water Management Plan incorporates WFA's Water Shortage Contingency Plan.

The 2020 Urban Water Management Plan and Water Shortage Contingency Plan were prepared pursuant to the "Urban Water Management Planning Act" and the California Water Code. The California Department of Water Resources requires every urban water supplier to prepare and adopt an Urban Water Management Plan, including the Water Shortage Contingency Plan, and periodically update the Urban Water Management Plan at least once every five years, in years ending in six and one.

Information regarding WFA's PUBLIC HEARING follows:

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| Date: | **June 17, 2021** |
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| Place: | Remote video conference via **Zoom (Meeting ID: 916 2511 9632; Passcode: 547375)** |

Additionally, the meeting link will be posted on the WFA's website in the Board of Directors Special Meeting Agenda by June 3, 2021 at the following address: http://www.wfajpa.org/#Board_Agendas_&_Minutes .

WFA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan, Water Shortage Contingency Plan and 2015 Urban Water Management Plan Addendum will be available at WFA's website (http://www.wfajpa.org/#Regulatory_Reports) and its main office. **Please provide written comments by 5 PM on June 15, 2021** delivered to the Water Facilities Authority at the address listed above or by email to tlcatlin@wfajpa.org .

Sincerely,

Terry Catlin
General Manager

Cc: Stan Chen, Stetson Engineers

# LEGAL NOTICE PUBLICATION

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WATER FACILITIES AUTHORITY

PUBLIC HEARING NOTICE

2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, Addendum to 2015 Urban Water Management Plan

Notice is hereby given that on JUNE 17, 2021, at 7:30 AM, in a virtual location via Zoom with Meeting ID: 916 2511 9632 and Passcode: 547375 (Join Zoom Meeting: https://zoom.us/j/91625119632?pwd=aWF3ZVJGeGxXVmlZdVFCOXlDaU5rZz09 or call 669.900.6833), the Board of Directors will conduct public hearings to receive public comments and consider adoption of a Draft 2020 Urban Water Management Plan (UWMP), Draft Water Shortage Contingency Plan (WSCP), and Draft Addendum to Water Facilities Authority's 2015 UWMP. Due to the COVID-19 State of Emergency and pursuant to the Brown Act waiver provided under the Governor's Executive Order, the meeting will be held virtually via Zoom, and it is anticipated that there will be no physical location from which members of the public may participate. Members of the public may listen and provide comments using the meeting access information supplied in this notice. Following the public hearing, the Board of Directors may adopt the 2020 UWMP, WSCP, and 2015 UWMP Addendum with recommended modifications as a result of public input.

A copy of the Draft 2020 UWMP, Draft WSCP, and Draft 2015 UWMP Addendum can be accessed at the main office of the Water Facilities Authority, 1775 North Benson Avenue, Upland, CA 91784 or at its website, http://www.wfajpa.org/#Regulatory_Reports.

If you have any questions regarding Water Facilities Authority's 2020 UWMP, WSCP, 2015 UWMP Addendum, or the public hearing, please contact Terry Catlin at 909.981.9454, x12 or tlcatlin@wfajpa.org. Written comments may be delivered at the above-mentioned address or submitted to tlcatlin@wfajpa.org by June 15, 2021.

Dates: June 3, 2021 & June 10, 2021

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# APPENDIX E

# SAN BERNARDINO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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# SAN BERNARDINO COUNTY

## MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**FEMA Approved: July 13, 2017**

San Bernardino County Unincorporated Area
San Bernardino County Fire Protection District
San Bernardino County Flood Control District
San Bernardino County Special Districts Department

This document was supported by HSGP Grant No. 2015-0078 awarded by the U.S. Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA). Points of view, opinions, findings, and conclusions expressed in this document are those of the authors and do not necessarily represent the official position of policies of FEMA or DHS. DHS/FEMA reserves a royalty-free, non-exclusive, and irrevocable license to reproduce, publish, and use these materials and to authorize others to do so.

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**RESOLUTION NO. 2017-_____**

**A RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ADOPTING THE SAN BERNARDINO COUNTY UNINCORPORATED AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN DATED MARCH 2017, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN**

On Tuesday, _____, 2017, on motion of Supervisor _____, duly seconded by Supervisor _____ and carried, the following resolution is adopted by the Board of Supervisors of San Bernardino County, State of California.

**WHEREAS,** the preservation of life and property is an inherent responsibility of local, state and federal government, including the County of San Bernardino, and the San Bernardino County Office of Emergency Services, to prepare a local Multi-Jurisdictional Hazard Mitigation Plan (HMP) for the unincorporated area of San Bernardino County to define hazard mitigation measures to reduce or eliminate loss of life and/or property; and

**WHEREAS,** this HMP represents a comprehensive description of the County's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural hazards; and

**WHEREAS,** the HMP is a Federal requirement under the Disaster Mitigation Act of 2000 for the County to be eligible to apply for federal funds for disaster recovery and mitigation assistance; and

**WHEREAS,** the HMP established a coordinated effort to support mitigation activities, identifies measures to combat natural hazards within our County; and

**WHEREAS,** the HMP is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed periodically and revised as necessary to meet changing conditions; and

**WHEREAS,** the Board of Supervisors agrees to adopt this HMP and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the preparation of hazard mitigation within the County of San Bernardino;

**NOW, THEREFORE, BE IT RESOLVED THAT:**

The Board of Supervisors of the County of San Bernardino, a public entity established under the laws of the State of California, hereby authorizes this HMP to be adopted, that the San Bernardino County Fire Protection District Office of Emergency Services Division Manager is hereby authorized to implement future non-substantive amendments, recommended by the Federal Emergency Management Agency upon their review, to the HMP, that a copy of the Board of Supervisors' approved San Bernardino County Unincorporated Area Hazard Mitigation Plan be forwarded to the Federal Emergency Management Agency and CalOES, that once approved the HMP will be considered to be incorporated into the County's General Plan, and this plan become effective immediately.

PASSED AND ADOPTED by the Board of Supervisors of the County of San Bernardino, State of California, by the following vote:

AYES: SUPERVISORS:





NOES: SUPERVISORS:

ABSENT: SUPERVISORS:

* * * * *

STATE OF CALIFORNIA )
) ss.
COUNTY OF SAN BERNARDINO )

I, **LAURA H. WELCH,** Clerk of the Board of Supervisors of the County of San Bernardino, State of California, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by the Board of Supervisors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of _____, 2017.

LAURA H. WELCH
Clerk of the Board of Supervisors

By _____
Deputy

**RESOLUTION NO. 2017-_____**

**A RESOLUTION OF THE BOARD OF SUPERVISORS OF THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT, STATE OF CALIFORNIA, ADOPTING THE SAN BERNARDINO COUNTY UNINCORPORATED AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN DATED MARCH 2017, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN**

On Tuesday, _____, 2017, on motion of Supervisor _____, duly seconded by Supervisor _____ and carried, the following resolution is adopted by the Board of Supervisors of the San Bernardino County Flood Control District, State of California.

**WHEREAS,** the preservation of life and property is an inherent responsibility of local, state and federal government, including the County of San Bernardino, and the San Bernardino County Office of Emergency Services, to prepare a local Multi-Jurisdictional Hazard Mitigation Plan (HMP) for the unincorporated area of San Bernardino County to define hazard mitigation measures to reduce or eliminate loss of life and/or property; and

**WHEREAS,** this HMP represents a comprehensive description of the County's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural hazards; and

**WHEREAS,** the HMP is a Federal requirement under the Disaster Mitigation Act of 2000 for the County to be eligible to apply for federal funds for disaster recovery and mitigation assistance; and

**WHEREAS,** the HMP established a coordinated effort to support mitigation activities, identifies measures to combat natural hazards within our County; and

**WHEREAS,** the HMP is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed periodically and revised as necessary to meet changing conditions; and

**WHEREAS,** the Board of Supervisors agrees to adopt this HMP and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the preparation of hazard mitigation within the County of San Bernardino

**NOW, THEREFORE, BE IT RESOLVED THAT:**

The Board of Supervisors of the San Bernardino County Flood Control District, a public entity established under the laws of the State of California, hereby authorizes this HMP to be adopted, that the San Bernardino County Fire Protection District Office of Emergency Services Division Manager is hereby authorized to implement future non-substantive amendments, recommended by the Federal Emergency Management Agency upon their review, to the HMP, that a copy of the Board of Supervisors' approved San Bernardino County Unincorporated Area Hazard Mitigation Plan be forwarded to the Federal Emergency Management Agency and the CalOES, that once





approved the HMP will be considered to be incorporated into the County's General Plan, and this plan become effective immediately.

PASSED AND ADOPTED by the Board of Supervisors of the San Bernardino County Flood Control District, State of California, by the following vote:

AYES: SUPERVISORS:

NOES: SUPERVISORS:

ABSENT: SUPERVISORS:

* * * * *

STATE OF CALIFORNIA )
) ss.
COUNTY OF SAN BERNARDINO )

I, **LAURA H. WELCH,** Clerk of the Board of Supervisors of the San Bernardino County Flood Control District, State of California, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by the Board of Supervisors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of _____, 2017.

LAURA H. WELCH
Clerk

By _____
Deputy

**RESOLUTION NO. 2017-**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BOARD GOVERNED COUNTY SERVICE AREAS ADOPTING THE SAN BERNARDINO COUNTY UNINCORPORATED AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN DATED MARCH 2017, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN**

On Tuesday, , 2017, on motion of Director , duly seconded by Director and carried, the following resolution is adopted by the Board of Directors of the Board Governed County Service Areas and their Zones.

**WHEREAS,** the preservation of life and property is an inherent responsibility of local, state and federal government, including the County of San Bernardino, and the San Bernardino County Office of Emergency Services, to prepare a local Multi-Jurisdictional Hazard Mitigation Plan (HMP) for the unincorporated area of San Bernardino County to define hazard mitigation measures to reduce or eliminate loss of life and/or property; and

**WHEREAS,** this HMP represents a comprehensive description of the County's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural hazards; and

**WHEREAS,** the HMP is a Federal requirement under the Disaster Mitigation Act of 2000 for the County to be eligible to apply for federal funds for disaster recovery and mitigation assistance; and

**WHEREAS,** the HMP established a coordinated effort to support mitigation activities, identifies measures to combat natural hazards within our County; and

**WHEREAS,** the HMP is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed periodically and revised as necessary to meet changing conditions; and

**WHEREAS,** the Board of Directors agrees to adopt this HMP and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the preparation of hazard mitigation within the County of San Bernardino;

**NOW, THEREFORE, BE IT RESOLVED THAT:**

The Board of Directors of the Board Governed County Service Areas and their Zones, a public entity established under the laws of the State of California, hereby authorizes this HMP to be adopted, that the San Bernardino County Fire Protection District Office of Emergency Services Division Manager is hereby authorized to implement future non-substantive amendments, recommended by the Federal Emergency Management Agency upon their review, to the HMP, that a copy of the Board of Directors' approved San Bernardino County Unincorporated Area Hazard Mitigation Plan be forwarded to the Federal Emergency Management Agency and CalOES, that





once approved the HMP will be considered to be incorporated into the County's General Plan, and this plan become effective immediately.

PASSED AND ADOPTED by the Board of Directors of the Board Governed County Service Areas and their Zones by the following vote:

AYES: DIRECTORS:

NOES: DIRECTORS:

ABSENT: DIRECTORS:

* * * * *

STATE OF CALIFORNIA )
) ss.
COUNTY OF SAN BERNARDINO )

I, **LAURA H. WELCH,** Secretary of Board of Directors of the Board Governed County Service Areas and their Zones, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by the Board of Directors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of Tuesday, , 2017.

LAURA H. WELCH
Secretary

By _____
Deputy

**RESOLUTION NO. 2017-**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT ADOPTING THE SAN BERNARDINO COUNTY UNINCORPORATED AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN DATED MARCH 2017, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN**

On Tuesday, , 2017, on motion of Director , duly seconded by Director and carried, the following resolution is adopted by the Board of Directors of San Bernardino County Fire Protection District.

**WHEREAS,** the preservation of life and property is an inherent responsibility of local, state and federal government, including the County of San Bernardino, and the San Bernardino County Office of Emergency Services, to prepare a local Multi-Jurisdictional Hazard Mitigation Plan (HMP) for the unincorporated area of San Bernardino County to define hazard mitigation measures to reduce or eliminate loss of life and/or property; and

**WHEREAS,** this HMP represents a comprehensive description of the County's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural hazards; and

**WHEREAS,** the HMP is a Federal requirement under the Disaster Mitigation Act of 2000 for the County to be eligible to apply for federal funds for disaster recovery and mitigation assistance; and

**WHEREAS,** the HMP established a coordinated effort to support mitigation activities, identifies measures to combat natural hazards within our County; and

**WHEREAS,** the HMP is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed periodically and revised as necessary to meet changing conditions; and

**WHEREAS,** the Board of Directors agrees to adopt this HMP and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the preparation of hazard mitigation within the County of San Bernardino;

**NOW, THEREFORE, BE IT RESOLVED THAT:**

The Board of Directors of the San Bernardino County Fire Protection District, a public entity established under the laws of the State of California, hereby authorizes this HMP to be adopted, that the San Bernardino County Fire Protection District Office of Emergency Services Division Manager is hereby authorized to implement future non-substantive amendments, recommended by the Federal Emergency Management Agency upon their review, to the HMP, that a copy of the Board of Directors' approved San Bernardino County Unincorporated Area Hazard Mitigation Plan be forwarded to the Federal Emergency Management Agency and CalOES, that once approved





the HMP will be considered to be incorporated into the County's General Plan, and this plan become effective immediately.

PASSED AND ADOPTED by the Board of Directors of the San Bernardino County Fire Protection District by the following vote:

AYES: DIRECTORS:

NOES: DIRECTORS:

ABSENT: DIRECTORS:

* * * * *

STATE OF CALIFORNIA )
) ss.
COUNTY OF SAN BERNARDINO )

I, **LAURA H. WELCH,** Secretary of Board of Directors of the San Bernardino County Fire Protection District, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by the Board of Directors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of Tuesday, , 2017.

LAURA H. WELCH
Secretary

By _____
Deputy

# Section 1. Introduction

The Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) update is a “living document” that should be reviewed, monitored, and updated to reflect changing conditions and new information. As required, the MJHMP must be updated every five (5) years to remain in compliance with regulations and Federal mitigation grant conditions. In that spirit, this MJHMP is an update of the San Bernardino County Unincorporated Area MJHMP approved by FEMA on October 11, 2011. This MJHMP presents updated information regarding hazards being faced by the County, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and those Board-governed Special Districts administered by the San Bernardino County Special Districts Department.

These Board-Governed Special Districts were formed by the Board of Supervisors to provide a specific service for a specific area of San Bernardino County. Additionally, these Special Districts are treated as an all-inclusive County Organization, not as separate or independent entities. Each Special District is governed cooperatively by the San Bernardino County Board of Supervisors acting as the Board of Supervisors for each of the individual districts.

The County of San Bernardino is governed by five (5) Supervisors; one for each supervisorial district who collectively make up the County Board of Supervisors. The Board of Supervisors is responsible for the County department and agencies, including Board Governed Special Districts, providing services to the unincorporated area.

The Board of Supervisors acts as the Board of Directors for the County Fire Protection District, the County Flood Control District, and the Special Districts Department as part of their responsibilities as an elected member of the County of San Bernardino Board of Supervisors.

The San Bernardino County Organizational Chart clearly shows the relationships between these Board-governed Special Districts and other County departments as one of equal relationship Departments/Districts. See Figure 1-1.





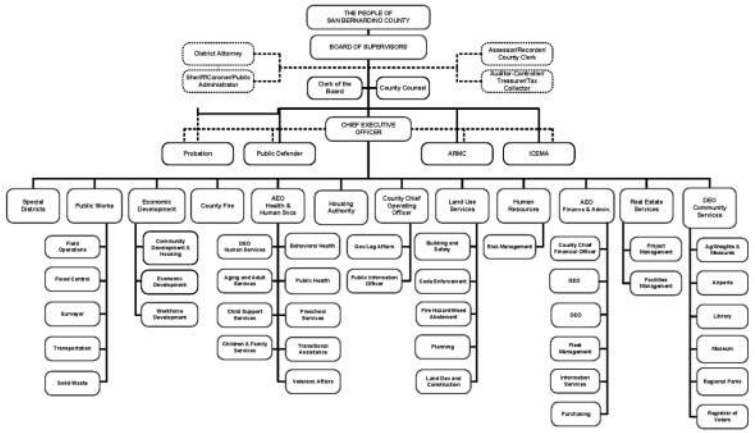


**Figure 1-1: Organizational Chart for San Bernardino County**

## 1.1 San Bernardino County Unincorporated Area

The Unincorporated Area of San Bernardino County has a population of 309,759 persons (14.48%) of the entire County Population) and covers 19,233 square miles (95.67% of the entire County land area). There are approximately 61 unincorporated communities within the unincorporated County. San Bernardino County is the largest County in the continental United States. San Bernardino County provides basic services to the residents and citizens of the unincorporated areas. These services include Law Enforcement, Fire Protection, Building and Safety Services, Public Health Services, Library, and Human Services (social services). Five Interstate Highways and four inter-continental railroad lines cross the County, providing vital transportation links from southern California to the remainder of the United States.

### 1.1.1 San Bernardino County Fire Protection District

San Bernardino County Fire Protection District is a community based all-risk emergency services organization dedicated to the health and well-being of the citizens of San Bernardino County through a balance of regionalized services delivery and accountability to the local community. On July 1, 2008, twenty-seven separate fire districts were merged into one single board governed fire protection district with four regional service zones. The reorganization was not only an administrative advancement but also a significant advancement in operations and delivery of emergency response services.

It has resulted in simplified budgeting and fiscal operations, greater flexibility in the use in the use of department resources and assets and more effective use of day-to-day operations. The reorganization will continue to improve the delivery of fire services and overall operating efficiency.

The San Bernardino County Fire Protection District (County Fire) covers 19,278 square miles, operates 85 fire stations and facilities within 6 Regional Service Zones (Mountain, North Desert, South Desert, High Desert, West Valley and East Valley), and serves 64 unincorporated communities, the City of Grand Terrace, and the Town of Yucca Valley. There are also 6 ambulance enterprise operations that provide service within these Regional Service Zones. In addition, 7 cities are Independent Fire Protection Districts that contract with County Fire: Adelanto, Fontana, Hesperia, Needles, Twentynine Palms, San Bernardino and Victorville. County Fire's executive management is provided by the Fire Chief/County Fire Warden, Deputy Chief, Assistant Chief of Operations as well as Division Managers and Division Chiefs.

County Fire is an all-risk department providing emergency mitigation and management for fire suppression, emergency medical services (paramedic and non-paramedic), ambulance services, HAZMAT response, arson investigation, technical rescue including water borne, flooding and mudslide, winter rescue operations, terrorism and weapons of mass destruction. As part of disaster preparation, response, and mitigation, the department's Office of Emergency Services specifically provides support and assistance to the 24 cities and towns, as well as, all the unincorporated portions of the county. The field functions are supported by a countywide management system that includes organizational business practices, human resources, financial and accounting services, vehicles services and support, and equipment warehousing and distribution. County Fire also provides for the management of community safety services such as: fire prevention, building construction plans and permits, household hazardous waste, Local Oversight Program for hazardous materials, HAZMAT facility inspections, planning and engineering, and public education and outreach.

Figure 1-2: San Bernardino County Fire Protection District

### 1.1.2 San Bernardino County Flood Control District

#### 1.1.2.1 Description of Major Services

The San Bernardino County Flood Control District (District) was created in 1939 under special state legislation. Since its inception, the District has developed a very extensive system of flood control and water conservation facilities, including dams, conservation basins, debris basins, channels and storm drains. The purpose of these facilities is to intercept and convey flood flows through and away from developed areas of the county, as well as to promote water conservation and improved water quality.

The District covers the entire county, including all of the incorporated cities. The District is divided into six geographic flood zones (in recognition of the different characteristics and flood control needs in various areas).

- Zone 1 encompasses the county's West End, from the Los Angeles and Riverside County lines to West Fontana.
- Zone 2 encompasses the central area of the San Bernardino Valley easterly of Zone 1 to approximately the Santa Ana River and City Creek demarcations.
- Zone 3 covers the east end of San Bernardino valley, east of Zone 2.

- Zone 4 covers the Mojave River valley region, from the San Bernardino Mountains to Silver Lakes.
- Zone 5 primarily includes the San Bernardino Mountains.
- Zone 6 encompasses the remainder of the county not covered by other zones.

The District has also established a countywide administrative zone (Zone 7)

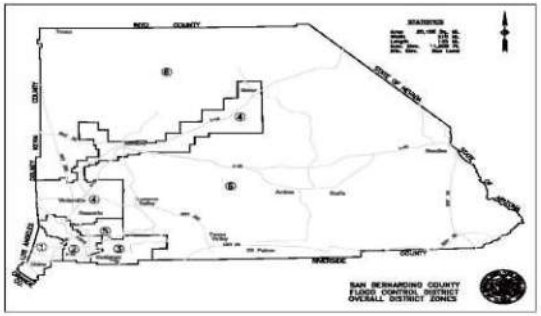


**Figure 1-3: Map of San Bernardino County Flood Control District**

The District's funding is primarily derived from property taxes, federal and state aid on specific projects, subdivision and permit fees, rents and royalties, and revenue from local water agencies for water spreading services. The District's principal functions are as follows:

- **Flood Protection on Major Streams:** In cooperation with the federal government, the District conducts programs for channel and levee construction, floodwater retention, and debris basin maintenance. Programs or projects are often done in cooperation with the incorporated cities, the U.S. Army Corps of Engineers, and the U.S. Bureau of Reclamation.

- **Water Conservation:** The District operates and maintains water conservation basins and spreading grounds. Water from the local mountains and northern California is spread and percolated into the groundwater basins underlying the county. The District has numerous joint use agreements with water districts allowing use of District facilities for groundwater recharge.

- **Storm Drain Construction:** The District is active in comprehensive storm drain master





planning/construction and cooperates with incorporated cities and other agencies in storm drain projects.

- **Facility Maintenance:** The District has a proactive maintenance program for its facilities. Regular inspections of the storm drains, channels, and basins are made as required by various state and federal agencies.

- **National Pollution Discharge Elimination System (NPDES):** The District is the lead permittee in the San Bernardino valley area-wide NPDES permit with 16 cities as co-permittees. The NPDES program, through the State Water Quality Management Board, regulates storm water quality through very detailed and complex permits, which affect everyone within the Santa Ana River Watershed and is expanding into the high desert area of the Victor Valley under Phase II of the permit.

- **State Water Quality Management Board:** regulates storm water quality through very detailed and complex permits, which affect everyone within the Santa Ana River Watershed and is expanding into the high desert area of the Victor Valley under Phase II of the permit.

- **Flood Operations:** During the flood season, the District maintains telemetry systems for monitoring rainfall and runoff and dispatches storm patrols as dictated by the projected severity of a storm. The District has access to a weather satellite data delivery system to provide state-of-the-art weather information. The system provides advance warning of major storm activity.

- **Flood Area Safety Task Force (FAST):** As a result of the October/November fires of 2003, the FAST organization was created. The District is a key component of this task force, which is meant to respond to the elevated flood risk associated with the aftermath of these devastating fires.

### 1.1.3 Special Districts Department

***The Special Districts Department promotes safe, healthy, enjoyable and dynamic communities by providing essential programs and municipal services that meet the current and future needs of the communities served.***

The San Bernardino County Board of Supervisors is the governing body for all Board governed Districts, County Service Areas (CSA), and Improvement Zones. The day-to-day management and administration is done through the Special Districts Department. The County Board of Supervisors and the Special Districts Department depend quite heavily on input from the community. The successful operation of a District, CSA and Improvement Zone is a team effort between County staff and property owners. Where needed, the Board of Supervisors will set up a

property owner Advisory Commission or Municipal Advisory Council (MAC) to work with and make recommendations to the Board and County staff.

The formation process begins with a request from property owners and then involves a feasibility study performed by the Special District Department with the assistance of many other County Departments. The final approval of the District, CSA and Improvement Zone is done by the County Board of Supervisors at a public hearing. Depending on the complexity of the issues, the process can take from three (3) months to one (1) year to complete.

There are various forms of financial mechanisms that can be used to fund services such as fees, special taxes, assessments, etc. Prior to a new funding source being implemented, it must receive approval from either the property owners or the registered voters in the area. It is important to understand that all funding is generated through the Districts, CSAs, and Improvement Zones. No County general funds are used or are available.

Special Districts Department is responsible for operating the Board-governed Special Districts within San Bernardino County. There are 102 special districts managed by the Special Districts Department:

**Table 1-1: Special Districts Department District Listing**

| | District Type | Number |
|---|---|---|
| **1** | Special Revenue Districts | 11 |
| **2** | Enterprise Funds (Airport and Refuse) | 3 |
| **3** | Parks Districts | 19 |
| **4** | Road Districts | 41 |
| **5** | Enterprise Funds (Sewer) | 9 |
| **6** | Street Light Districts | 11 |
| **7** | Enterprise Funds (Water) | 8 |
| **Total Special Districts** | | 102 |

- **Special Revenue Districts** were created to provide a service to the property owners within the Special Revenue District.
- **Enterprise Funds Districts** derive their funds through fees collected for delivery of a service or good such as water, sewer, refuse or airport fees from the users within the individual District.
- **Parks Districts** derive their funds through property taxes levied on property owners





within the individual Park District.
- **Road Districts** derive their funds through property taxes levied on property owners within the Road District.
- **Street Light Districts** derive their funds through property taxes levied on property owners within the Street Light District.

The two Special Districts listed below were formed differently than the other special districts listed above managed by the Special Districts Department. These two districts were formed with a Board of Directors. (San Bernardino County Board of Supervisors) and are not independently elected. All governance actions are by the elected members of the Board of Supervisors acting as the Board of Directors for the Recreation and Park District.

**Big Bear Valley Recreation and Parks District**

Big Bear Valley Recreation and Park District currently maintains 6 developed parks, 2 undeveloped parks, several community buildings including the Big Bear Valley Senior Center, 3 ball fields, and a swim beach. Moonridge Animal Park is administered by the Big Bear Valley Recreation and Park District. The Zoo is open year round for visitors to see alpine species on exhibit. The Zoo receives approximately 99,600 visitors annually.

**Bloomington Recreation and Parks District**

Bloomington Recreation and Park District maintains two community parks, an equestrian arena, sports fields, and a community center.

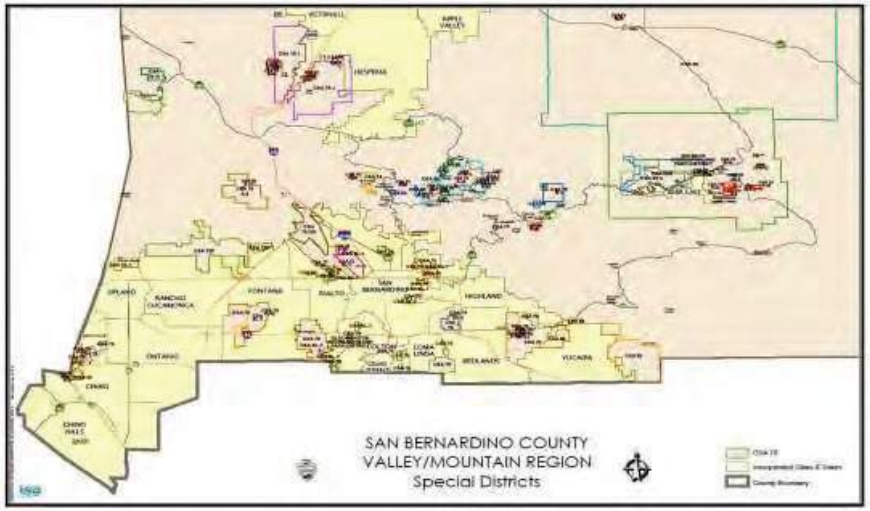


Figure 1-4: Map of Special District Department Districts

Figure 1-5: Special Districts Valley/Mountain Region

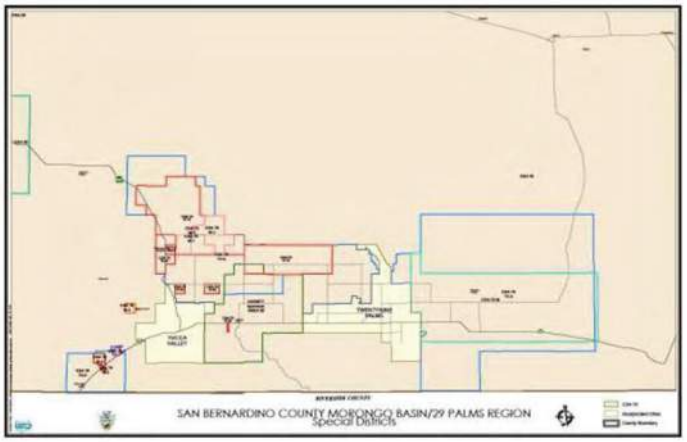


Figure 1-6: Morongo Basin/Twentynine Palms Region

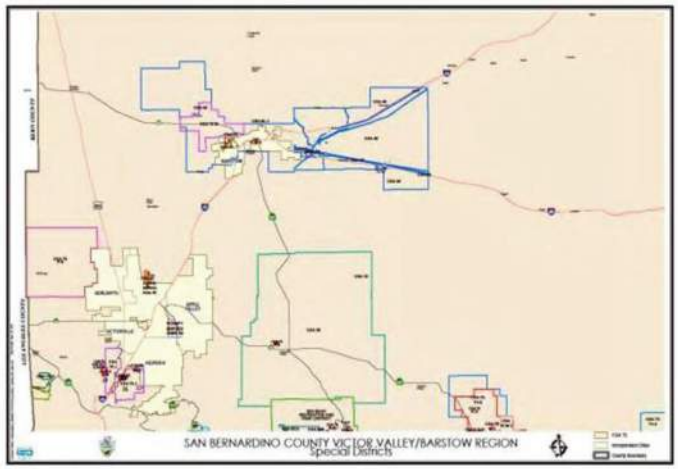


Figure 1-7: Special Districts Victor Valley/Barstow Region

## 1.2 Purpose of the Plan

The intent of hazard mitigation is to reduce and/or eliminate loss of life and property. Hazard mitigation is defined by FEMA as "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." A "hazard" is defined by FEMA as "any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other loss."

The purpose of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) is to demonstrate the plan for reducing and/or eliminating risk in the unincorporated area of the County and within areas overseen or managed by the Flood Control District, Fire District and Special Districts Department. The MJHMP process encourages communities within the unincorporated county to develop goals and projects that will reduce risk and build a more disaster resilient community by analyzing potential hazards. By cooperatively and jointly together as a Multi-Jurisdictional Planning team, the partners were able to develop common goals and objectives for mitigation efforts. The individual stakeholders can then take the goals and objectives back to their individual Special Districts for discussion, ranking and project development, and then bring the resulting projects back to the Multi-Jurisdictional Planning Team. The Multi-Jurisdictional Planning Team can then





integrate all projects into the appropriate project listing to be acted upon by the most appropriate managing department or district for the listed projects.

After disasters, repairs and reconstruction are often completed in such a way as to simply restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, the restoring of things to pre-disaster conditions sometimes result in feeding the disaster cycle; damage, reconstruction, and repeated damage. Mitigation is one of the primary phases of emergency management specifically dedicated to breaking the cycle of damage. Hazard mitigation is distinguished from other disaster management functions by measures that make County development and the natural environment safer and more disaster resilient. Mitigation generally involves alteration of physical environments, significantly reducing risks and vulnerability to hazards by altering the built environment so that life and property losses can be avoided or reduced. Mitigation also makes it easier and less expensive to respond to and recover from disasters.

## 1.3 Authority

In 2000, FEMA adopted revisions to the Code of Federal Regulations. This revision is known as "Disaster Mitigation Act (DMA)." DMA 2000, Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) that describes the process for assessing hazards, risks and vulnerabilities, identifying and prioritizing mitigation actions, and engaging/soliciting input from the community (public), key stakeholders, and adjacent jurisdictions/agencies.

With an approved (and adopted) MJHMP, the County and participating jurisdictions are eligible for federal disaster mitigation funds/grants (Hazard Mitigation Grant Program, Pre-Disaster Mitigation, and Flood Management Assistance) aimed to reduce and/or eliminate risk.

## 1.4 What's New

The 2011 San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) contained a detailed description of the planning process, a risk assessment of identified hazards for the San Bernardino County Planning Area and an overall mitigation strategy for reducing the risk and vulnerability from these hazards. Since approval of the plan by FEMA, much progress has been made by San Bernardino County and the participating County Districts on implementation of the mitigation strategy. As part of this 2016 MJHMP Update, a thorough review and update of the 2011 plan was conducted to ensure that this update reflects current community conditions and priorities in order to realign the overall mitigation strategy for the next five-year planning period. This section of the plan includes the following:

- **What's New in the Plan Update** This section provides an overview of the approach to updating the plan and identifies new analyses, data and information included in this Plan Update to reflect current community conditions. This includes a summary of new hazard and risk assessment data as it relates to the San Bernardino Planning Area as well as information on current and future development trends affecting community vulnerability

and related issues. The actual updated data, discussions, and associated analyses are contained in their respected sections within this 2016 MJHMP Update.

- **Summary of Significant Changes to Current Conditions and Hazard Mitigation Program Priorities.** This section provides a summary of significant changes in current conditions, changes in vulnerability, and any resulting modifications to the community's mitigation program priorities.

- **2011 Mitigation Strategy Status and Successes.** This section provides a description of the status of mitigation actions from the 2011 plan and also indicates whether a project is no longer relevant or is recommended for inclusion in the updated 2016 mitigation strategy. This section also highlights key mitigation success stories of the County and participating jurisdictions since the 2011 MJHMP.

This What's New section provides documentation of San Bernardino County Planning Area's progress or changes in their risk and vulnerability to hazards and their overall hazard mitigation program. Completion of this 2016 MJHMP Update further provides documentation of the San Bernardino County community's continued commitment and engagement in the mitigation planning process.

### 1.4.1 Updates to the Current Plan

This MJHMP update involved a comprehensive review and update of each section of the 2011 plan and includes an assessment of the success of the participating County Districts in evaluating, monitoring and implementing the mitigation strategy outlined in the initial plan. Only the information and data still valid from the 2011 plan was carried forward as applicable into this MJHMP update. In fact, based in part on the issuance of new 2011 and 2013 planning guidance, this 2016 plan has been significantly updated and rewritten.

The San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan (2011) focused on integrating the MJHMP with the County General Plan goals and policies as well as incorporating specific flood mitigation projects that were programmed for completion over the five (5) year period. The Plan did not clearly identify mitigation projects the County would focus on for all priority hazards identified in the plan. However, the County has been very active and engaged in implementing and supporting projects and programs designed to reduce and/or eliminate risk in the County. The list of successful projects in this section represents the activities that the County has undertaken and/or supported to reduce the risks from Wildfire, Earthquake, Flood, Drought, Terrorism, and Climate Change.

### 1.4.2 New Jurisdictional Annexes

Newly refined and reconfigured Jurisdictional Annexes detail the hazard mitigation planning elements specific to the participating jurisdiction to the San Bernardino County MJHMP Update.





The Annexes are not intended to be a standalone document, but appends to and supplements the information contained in the 2016 base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the participating jurisdictions. The newly refined Jurisdictional Annexes provide additional information specific to county participating special district or departments, with a focus on providing additional details on the mitigation strategies for the Fire Protection District, Flood Control District and Special Districts Department. The three annexes provide more detail on mitigation strategies, mitigation projects and existing implementation mechanism for each participating jurisdiction.

The 2011 MJHMP included the Big Bear Valley Recreation and Parks District and Bloomington Recreation and Parks District as standalone jurisdictions. For purposes of this 2016 plan update, Big Bear Valley Recreation and Parks District, and Bloomington Recreation and Parks District hazard mitigation planning efforts are included under the supervision of the Special Districts hazard mitigation planning efforts.

### 1.4.3 New Risk Assessment

As part of its comprehensive review and update of each section of the plan, San Bernardino County and participating jurisdictions recognized that updated data, if available, would enhance the analysis presented in the risk assessment and utilized in the development of the updated mitigation strategy. Highlights of new data used for this Plan Update is identified below in this Section and is also sourced in context within Chapter 4, Risk Assessment. Specific data used is sourced throughout this plan document. This new data and associated analysis provided valuable input for the development of the mitigation strategy presented in Chapter 5 of this plan. A highlight of new information and analyses contained in this plan update includes the following:

- A new assessment of updated hazards affecting the San Bernardino Planning Area was completed resulting in additional hazards added to planning documents the new hazards include climate change, drought and terrorism.

- The drought hazard was expanded to include water shortage impacts to the County, to better align with the State of California Hazard Mitigation Plan and to reflect the significant issues related to drought conditions resulting from the current and ongoing drought within the County and State of California.

- The climate change hazard was added to include to comply and align with the State of California Hazard Mitigation Plan and to reflect recent SB 379 initiatives. Climate change is affecting and will continue to affect the frequency and severity of natural hazard events, a trend that is of concern across the United States.

- An entire rework of the risk assessment for each identified hazard. This included reworking the hazard profile and adding new hazard event occurrences; redoing the entire vulnerability analysis to add items identified below and updating the vulnerability assessment based on more recent hazard data as well as using the most current parcel and assessor data for the existing built environment.

- An update of the flood hazard analysis to include an updated analysis of the 100-year flood, an analysis of the 500-year flood, including the use the new and updated DFIRMs.
- Utilizing updated critical facility GIS mapping for the Planning Area to provide an updated inventory of critical facilities by jurisdiction (including all municipalities) and a GIS analysis of critical facilities vulnerable to hazards with spatial footprints which include: flood, wildfire, and earthquake.
- An enhanced vulnerability assessment which added a GIS analysis of updated future development areas in the Planning Area and specific to each of the mapped hazards.
- Incorporation and analysis of the new 2010 Census data was utilized for this LHMP update. Census data was used in an intersect analysis to determine how much of the population is exposed to flood, wildfire and earthquake hazards.
- Also, as required by current FEMA planning guidance, an analysis of the County's ongoing and continued compliance with the NFIP is included in the Flood Hazard profile.
- Terrorism is now a reoccurring possibility within the United States, due to the terror attack in San Bernardino County in December of 2015, a hazard profile on this matter has been added to this plan.

## 1.4.4 Successful Wildfire Mitigation Implementation

### 1.4.4.1 Fire Safe Councils (FSC) Fuel Reduction Program Success

Fire Safe Councils have received and implemented millions of dollars in grant money for fuels reduction and for public education. Of note recently the Arrowhead Communities FSC developed a grant that did fuels reduction but used the existing staff at the County Tree Removal Program rather than pay additional consultants to do the same work. The benefit of this is that the FSC was able to maximize their expenditure and give the contractor a check upon completion of the project. This way 100% of their grant money went directly to the contractor and none went to administrative overhead.

### 1.4.4.2 Red Cross Grant Fuel Reduction Success

Although this grant was just recently started, the ARC has successfully removed and reduced fuels on several properties. They have also met with County Roads Sign Division and created the correct number of evacuation directional signs. Fifty signs will be posted in the Moon Ridge area of Big Bear Lake in 2010 and 2011. During an emergency, these directional signs will direct people out of a very confusing network of streets.





### 1.4.4.3 USFS Grants ARRA and Otherwise and Chipping Program Success

San Bernardino County and its Special Districts were successful in obtaining $3 million in American Recovery and Reinvestment Act funding to support ongoing fuel reduction programs and to create new jobs for the recovering economy. The USFS also funded an additional $13 million to carry on after the NRCS projects were closed out.

Project design, contracting and operations are managed by the County's Public Works Department but the priorities are set by local fire chiefs in monthly MAST Operations Meetings. It is the oldest and most significant program for reducing wildfire threat on a mountain wide basis. Table 1-2 shows current and planned fuels reduction Projects for the San Bernardino County Mountain areas.

**Table 1-2: Hazardous Tree Removal Project and Fuel Modification Projects**

| Project Name | Contract No | Funding | Cost | Project Stage |
|---|---|---|---|---|
| Mojave view | FM179USFS | USFS | $23,840.00 | Complete 2013 |
| Strawberry Lodge | n/a | USFS | n/a | Complete 2013 |
| Harich | n/a | USFS | n/a | Complete 2013 |
| Camp Oaks | n/a | USFS | n/a | Complete 2013 |
| Swinson/Arrowbear | n/a | USFS | n/a | Complete 2013 |
| Osito Rancho/Cedar | n/a | USFS* | n/a | Complete 2013 |
| BBV286SP | n/a | USFS | n/a | Complete 2013 |
| BBV287SP | n/a | USFS | n/a | Complete 2013 |
| BBV280SP | n/a | USFS | n/a | Complete 2013 |
| FF288SP | n/a | USFS | n/a | Complete 2013 |
| LA291SP | n/a | USFS | n/a | Complete 2013 |
| RS292SP | n/a | USFS | n/a | Complete 2013 |
| GVL293SP | n/a | USFS | n/a | Complete 2013 |
| AB294SP | n/a | USFS | n/a | Complete 2013 |
| BBV295SP | n/a | USFS | n/a | Complete 2013 |
| Green Briar | FM100ARRA | ARRA** | $88,000.00 | Complete 2013 |
| West Hook Creek | n/a | ARRA | $14,700.00 | Complete 2013 |
| Silverwood Lake | n/a | ARRA | $21,000.00 | Complete 2013 |
| Weesha | n/a | ARRA | n/a | Complete 2013 |
| Erwin Lake | n/a | ARRA | n/a | Complete 2013 |
| Wrightwood | n/a | ARRA | n/a | Complete 2013 |
| Camp Tahquitz | n/a | ARRA | n/a | Complete 2013 |

| Project Name | Contract No | Funding | Cost | Project Stage |
|---|---|---|---|---|
| West Cajon | n/a | ARRA | n/a | Complete 2013 |
| LA285SP | n/a | ARRA | n/a | Complete 2013 |
| WW290SP | n/a | ARRA | n/a | Complete 2013 |
| CL289SP | n/a | ARRA | n/a | Complete 2013 |
| Rob Roy | n/a | ARRA | n/a | Complete 2013 |
| Santa's Village | n/a | ARRA | n/a | Complete 2013 |
| Saw Pitt II | n/a | ARRA | n/a | Complete 2013 |
| Oak Hills | n/a | ARRA | n/a | Complete 2013 |
| Fawnskin | n/a | ARRA | n/a | Complete 2013 |
| Heaps Peak | n/a | ARRA | n/a | Complete 2013 |
| Houston | n/a | ARRA | n/a | Complete 2013 |
| Calvary | n/a | ARRA | n/a | Complete 2013 |
| WW298SP | n/a | ARRA | n/a | Complete 2013 |
| LG299SP | n/a | ARRA | n/a | Complete 2013 |
| **Project Name** | **Contract No** | **Funding** | **Cost** | Complete 2013 |
| Waterman Canyon | n/a | ARRA | n/a | Complete 2013 |
| Willow Creek | FM6501AFSC | ACFSC*** | $11,900.00 | Complete 2013 |
| LA191EVA | EVA191AFSC | ACFSC | n/a | Complete 2013 |
| NorthBay | FM192AFCS | ACFSC | n/a | Complete 2013 |
| **LA215EVA** | **n/a** | **ACFSC** | **n/a** | **Complete 2013** |

** Funded by United States Forest Service*
*** Funder by American Reinvestment and Recovery Act of 2009*
**** Funded by Arrowhead Communities Fire Safe Council*

#### 1.4.4.4 NRCS Fuel Reduction Project Success

San Bernardino County was the recipient of 72 million dollars that were granted from the National Resource Conservation Service (NRCS) to San Bernardino County Fire Protection District to reduce the amount of fuel and the potential for ignitability. In February of 2010, the grant was successfully closed out one month in advance of the target date. The $72,000,000 provided for almost 1,000 projects substantially reducing heavy fuels on tens of thousands of properties at risk across all mountain communities. Within that grant, $6.7million was provided to the USFS to conduct fuel modifications on Federal land and $7.2 million was provided to Cal Trans to remove fuels along evacuation routes. An additional $2 million was forwarded to San Diego to assist them. The activities funded under this program represent the first of their kind to be accomplished by local/state governments with federal grant funding.





To date the Fuel Management Program has removed over 450,000 trees, improving the overall health of the forested areas in the San Bernardino Mountains and reduced the overall fire threat. On several occasions completed projects have resulted in assisting fire suppression efforts and allowing fire to be contained before it threatens a local community, including Deer Lodge Park in Lake Arrowhead and Nob Hill in Running Springs during the Grass Valley and Slide Fires of 2007.

### 1.4.5 Flood Hazard Mitigation Success

#### 1.4.5.1 2011 General Plan Amendments

A General Plan Amendment to the Safety Element of the County of San Bernardino 2007 General Plan amended the Flood Plain Overlay District, which became effective on March 11, 2010. The Safety Element includes several layers of hazard overlays that are included in the General Plan mapping system to inform the public of potential hazards to development of property within certain areas of the County and to enable the County to mitigate the risks presented to property owners by these hazards. These overlays include potential flood hazards. Over the past twenty years, certain federal and state agencies have been in the process of digitizing much of this hazard data. The digitization of this data has allowed for greater accuracy as well as more timely updates. In recognition of the new data from various federal and state agencies, the County updated the Flood Hazard Overlay Maps contained within the Safety Element of the General Plan. The Flood Plain Safety Overlay District is amended to incorporate revised FEMA (Federal Emergency Management Agency) Flood Plain data, modifying 47 detail and seven regional General Plan Quad Maps. The FEMA Digital Flood Insurance Rate Map database was adopted in the General Plan Amendment as released by FEMA as it exists as of February 9, 2010 and will updated in the future for the County, by integrating automatic map updates as new data is published by FEMA.

Below is a list of the updated Flood Plain Safety Overlay District Maps effective March 11, 2010.

| Map | Quad Name | Map # | Quad Name | Map | Quad Name |
|---|---|---|---|---|---|
| DI16B | Baker | FH12B | Telegraph Peak | FH21 | Devore |
| EH07 | Hinkley | FH13B | Cajon | FH22 | San Bernardino N. |
| EH14 | Wild Crossing | FH14B | Silverwood Lake | FH23 | Harrison Mtn. |
| EH15 | Hodge | /FJ B | S Portion of County | FH28 | Guasti |
| EH16 | Barstow SE | FH11B | Mt. San Antonio | FH29 | Fontana |
| EH22 | Helendale | CK/DK | NE Portion of County | FH30 | San Bernardino S. |
| EH29 | Adelanto | EH/FH | SW Portion of County | FH31 | Redlands |
| EH30 | Victorville | EI/FI B | S Portion of County | FH32 | Yucaipa |
| EH31 | Apple Valley N. | EK/FK B | SW Portion of County | FI09B | Fawnskin |
| EI01B | Nebo | FH06B | Hesperia | FI10B | Big Bear City |
| EI02B | Yermo | FH07B | Apple Valley S. | FI17B | Big Bear Lake |

| Map | Quad Name | Map # | Quad Name | Map | Quad Name |
|---|---|---|---|---|---|
| EI03B | Harvard Hill | CH/DH | NW Portion of County | FI18B | Moonridge |
| EI04B | Manix | CI/DI B | N Portion of County | FH15 | Lake Arrowhead |
| EI09B | Daggett | FH03B | Mescal Creek | FH19 | Mt. Baldy |
| EK03 | Needles NW | FH04B | Phelan | FH20 | Cucamonga Peak |
| EK11 | Needles SW | FI30B | Joshua Tree S. | FI23B | Sunfair |
| EK12 | Needles | FI32B | Queen Mountain | FI25B | Forest Falls |
| **EK20** | **Whale Mountain** | **FI28B** | **Morongo Valley** | | |

Completed Flood Control Projects with Mitigation Characteristics

**Table 1-3: Completed Flood Control Projects**

| Project Number | Completion Date | Total Cost | Total Funding |
|---|---|---|---|
| F02527 | 2016 | $392,885 | $392,885 |
| F00282 | 2016 | $4,100,000 | $4,100,000 |
| 1- | 2010 | $7,770,000 | $7,700,000 |
| F01761 | 2016 | $4,000,000 | $4,000,000 |
| F02234 | 2016 | $1,100,000 | $1,100,000 |
| F01767 | 2014 | $3,700,000 | $3,700,000 |
| F01389- | 2008 | $1,300,000 | $1,300,000 |
| F01545 | 2009 | $1,500,000 | $1,500,000 |
| F01566- | 2010 | $3,300,000 | $3,300,000 |

### 1.4.5.2 F02527 29TH Street Basin Levee Certification Restoration Project - Completed

*Ensure that the surrounding residential and commercial areas will not be re-mapped as floodplain areas.*
*Status: Completed*
*Completion Date: March 2016*
*Local Priority: High*
*Total Cost: $392,885*
*Funding Description: From Flood Control District Budget through Property Tax*
*Project Selected for: Public safety: history of flood damage at this location*
*Hazard Mitigated: Potential flooding*
*Resources to Implement: High*





*Cost to Implement: High*
*Time to Implement: High*

### 1.4.5.3 F00282 Alabama at City Creek - Completed

*Construct RCB and channel improvements to increase capacity and minimize the possibility of road closures and flood damage.*
*Status: Completed*
*Completion Date: January 2016*
*Local Priority: High*
*Total Cost: $4.1 million*
*Funding Description: San Bernardino County Flood Control Tax Revenues*
*Project Selected for: Public safety & convenience*
*Hazard Mitigated: Flooding, flood damage, road closures and road damage*
*Resources to Implement: Low*
*Cost to Implement: High*
*Time to Implement: Medium*

### 1.4.5.1 F02234 Wilson Creek - Completed

*Status: Completed June, 2016*
*Local Priority: Low*
*Total Cost: $1.1 million*
*Funding Description: San Bernardino County Flood Control Property Taxes, City of Yucaipa*
*Project Selected for: public safety and infrastructure protection*
*Hazard Mitigated: attenuation of high velocities (50 fps); slope protection*
*Resources to Implement: Low*
*Cost to Implement: High*
*Time to Implement: High*

### 1.4.5.2 F01767 Lytle Cajon – Completed

Replacement of damaged concrete invert
Status: completed
Completion Date: 2014
Local Priority: High
Total Cost: $3.7million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and to prevent additional channel damage
Hazard Mitigated: Additional damage to invert and walls; potential flooding and washouts of nearby area
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### 1.4.5.3 F01761 Kitchen Wash – Completed

To intercept flows upstream of Rimrock Road to capture headwaters and re-route them to the Mojave River
Status: In preliminary design process
Completion Date: Estimated 2017/2018
Local Priority: Low
Total Cost: $4.0 million
Funding Description: San Bernardino County Flood Control Property Taxes
Project Selected for: Public safety; protection of commercial center
Hazard Mitigated: local flooding, road damage
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### 1.4.5.4 Successful "Finalization" of Drainage Feasibility Study Report

The final Drainage Feasibility Study has been completed to evaluate the continuing landslide hazard within Rimforest and the role of concentrated storm runoff in propagating slope failure. The village of Rimforest has eroding cliff-side property and bluff retreat in the Southern part of the village.

This problem is primarily caused by storm runoff from either rainstorms or snowmelt after winter storms. The runoff flows to the south side of Rimforest and is discharged over the cliff at two principal locations. This study report evaluated a number of options to re-direct the majority of the runoff to other discharge locations for the purpose of reducing and mostly eliminating the cliff-side erosion. Two options presented the study appear to be feasible if new conventional storm drain systems are installed. One of the options is now included as potential future mitigation action presented in Section 6 of this plan.

### 1.4.6 Geologic Hazard Mitigation Success

#### 1.4.6.1 Successful Geologic Hazard Prevention General Plan Amendments

Twenty two overlay maps were completed as part of the 2007 General Plan Amendment which became effective on March 11th, 2010. For more information on the overlay maps, see Section 6.2.2.3.

#### 1.4.6.2 Amendment to Title 6 County Code to Adopt by Reference the 2010 Editions of the California Building Standards Codes

An amendment to Title 6 of the County of San Bernardino Code to adopt by reference the 2010 Editions of the California Building Standards Codes went before the Board of Supervisors on November 2, 2010 and was continued for a second reading on November 16, 2010 and approved unanimously. The amendment became effective on January 1, 2011.





The County of San Bernardino amendment to Title 6 of the County Code to adopt by reference the 2010 Editions of the California Building Standards Codes repealed the current chapters of Division 3 of Title 6 that reflect the 1994/1995 editions of the California Building Standards Codes and adopt the 2010 editions of these codes by reference.

The California Building Standards Commission approved the California Building Standards Code (Code) for a statewide effective date of January 1, 2011 and requires this Code apply in all parts of the state. This Code consists of the California Building, Residential, Plumbing, Mechanical, Electrical, Energy, Historical Buildings, Existing Building (Unreinforced Masonry) and the Green Building Standards Codes. Since this 2010 Edition was adopted by local ordinance, the prior editions of this code will be repealed and the most recent editions of the codes with applicable amendments requiring express findings and certain appendices necessary for the health and safety of the citizens of this County will be in effect within the unincorporated areas of San Bernardino County. The benefit of adopting this Code is that it provides consistency and clarification for the building community as well as building inspectors and plans examiners. State law (Health & Safety Code 18941.5 and 17958.7) requires the local government make express findings in order to amend building standards and the amendments must be necessary due to local climatic, geological, or topographical conditions.

Those amendments and findings are included in the County's ordinance and were filed with the California Building Standards Commission.

The recommended modifications not requiring express findings are administrative or procedural in nature and concern the local implementation issues that are not covered by building standards.

An example of this type of modification is to the California Residential Code, Section R105.3.1.1 which requires the Board of Appeals to confirm substantial valuations in the flood plain. The traditional purpose of the Board of Appeals has been reserved for a contested decision of the Building Official, and it is felt that it should remain as such.

With respect to grading and excavation regulations found in Appendix J of the 2010 State published code, the 2001 California Building Code dealt with grading with more clarity in regards to what activities require a permit and set forth rules to ensure large grading projects are scrutinized in greater detail than smaller projects by requiring more reporting and inspection of such work. The grading chapter in the 2001 Code has been trusted and in use in its primary form for years. The 2010 Appendix J grading chapter needs substantial amendment and modification to address all grading issues and is not recommended for adoption in its present form. The Board adopted the 2001 Appendix Chapter 33 regulations as part of this proposed ordinance. Relocation permit requirements have been moved to a new section of the Code, and it retains specific standards for relocation procedures in details not found in the 2010 State-published code. Clarification of the types of buildings affected by the new regulations has also been made.

Administrative changes to the 2010 California Existing Building Code (Part 10 of Title 24) were approved to outline the procedures required to set allowable time limits for the retrofit and repair

of unreinforced masonry buildings. Staff is also recommending that authorization be given to the Building and Safety Division of the Land Use Services Department to issue Administrative Citations as an alternative means of enforcement of the County Code provisions.

Express findings are made for changes to the California Plumbing Code, Appendix K regarding the soil conditions that exist in this county. These changes are supported by the Environmental Health Division. These express findings are iterated in the ordinance and will be filed with the Building Standards Commission as required by law in order to become effective.

## 1.5 Community Profile

### 1.5.1 Physical Setting

The County is bounded by the states of Arizona and Nevada on the east, Inyo County on the north, Kern and Los Angeles Counties on the west, and Orange and Riverside Counties on the south.

San Bernardino County covers 20,102 square miles and is geographically the largest county in the continental United States. The States of Hawaii, Connecticut, Delaware, and Rhode Island and the District of Columbia could all fit inside the County boundary at the same time. The unincorporated area of San Bernardino County covers approximately 19,848 square miles; this is 98.7% of the entire County.

The remaining 1.3% of acreage (254 square miles) is under the jurisdiction of incorporated cities or towns. Figure 7 displays the unincorporated area and the cities/towns. The cities/towns on the map are concentrated in the south/west portion of the county and are color-coded.

San Bernardino County is characterized by three (3) distinct geographic areas: Valley, Mountains, and Desert: the Valley Region contains the majority of the county's incorporated areas and is the most populous region; the

Mountain Region is primarily comprised of public lands owned and managed by federal and state agencies; and, the Desert Region is the largest region (over 93% of the county's land area) and includes parts of the Mojave Desert.4 Aside from open or undeveloped land, the largest land use in the county is for military purposes.

The mountains stretch across the south end of the county. The mountain elevations range from 2,000 feet along the foothills to the 11,502-foot summit of Mount San Gorgonio, the highest peak in Southern California. Figure 8 displays the terrain/topographic features throughout San Bernardino County.

The San Bernardino Mountains feature four (4) large lakes (Big Bear Lake, Silverwood Lake, Lake Arrowhead, and Lake Gregory), and many smaller lakes. The majority of the lakes are the headwaters of the Santa Ana River and the Mojave River.





The Santa Ana River originates in the San Bernardino Mountains and flows southwest to the ocean. The Santa Ana Watershed includes streams flowing south from the San Gabriel Mountains and streams flowing north and west from the San Jacinto Mountains in Riverside County.

The desert area contains low mountains, valleys, and dry lakebeds. The elevations within the valley range of the County is from about 500 feet on the valley floor to 1,700 feet in Live Oak Canyon, and to about 5,400 feet in the hills in Yucaipa. The desert area is an assemblage of mountain ranges interspersed with long, broad valleys that often contain dry lakes. Many of these mountains rise from 1,000 to 4,000 feet above the valleys. Due to the persistent winds that blow throughout the year, large portions of the desert surface have been modified into a mosaic of pebbles and stones known as desert pavement.

A major physical resource of the desert area is the Mojave River, a critical water source for many of its residents. Among the few rivers that both flow north and do not empty into an ocean, the Mojave River travels north and east away from its watershed in the San Bernardino Mountains. The major part of it is over 100-mile length is marked by a dry riverbed that only on occasion reveals the water within it. Except in exceedingly wet years, the Mojave River ends its flow at Soda Dry Lake near Baker. The Colorado River, at the California and Arizona border, borders the County on the east. Streams in the eastern areas of the County area flow into the Colorado River which eventually ends at the Gulf of California.

The densely urban southern part of the County is at the headwaters of the Santa Ana River with its tributaries crossing the valley floor. With the construction of the Seven Oaks Dam the main river source has been controlled. However, Mill Creek, City Creek, Lytle Creek, and Cajon Creek still have the potential to flood areas of the valley if levees fail. A similar potential occurs with the high desert portion of the County with the Mojave River, which is controlled by the Mojave River Falls Dam that flows north from the San Bernardino Mountains to the city of Barstow. The San Antonio Dam on the southwest side of the county provides more than 100-year flood protection to the west end of the San Bernardino Valley. The Colorado River is on the eastern border of the County. The dams along the river have controlled the flow but bank erosion and damage to roads in the area have been experienced during periods of high water.

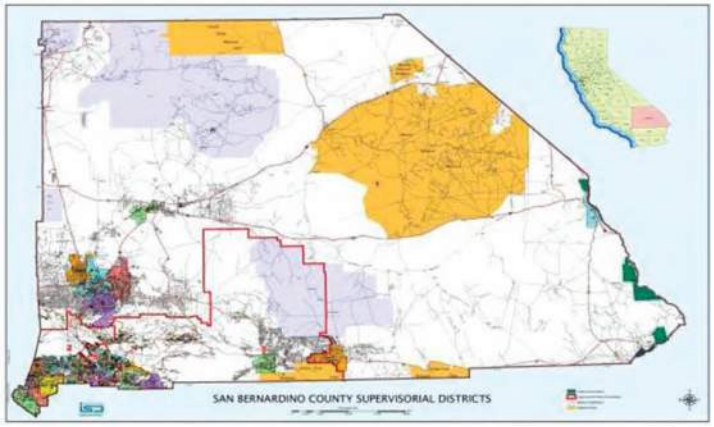


Figure 1-8: Unincorporated and Corporate Areas in San Bernardino County

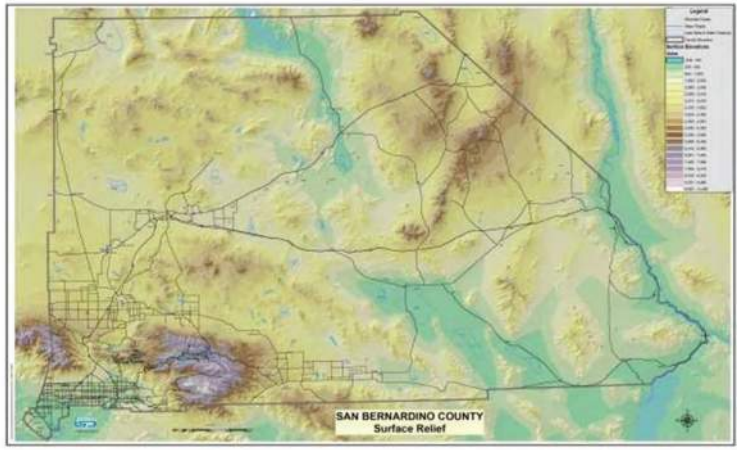


Figure 1-9: Topographic Features in San Bernardino County





### 1.5.2 History

Paleo-Indian sites dating from c. 10,000 BC show that the San Bernardino County area has been inhabited for at least 12,000 years. Artifacts in the Calico area suggest much earlier human occupation, but this has not been confirmed. In the past three thousand years, various Indian tribes flourished in the area: the Gabrielenos occupied the West Valley; the Serranos lived in the foothills of the San Bernardino Mountains; the Vanyumes lived along the Mojave River; the Mohave lived along the Colorado River; and the Chemehuevi occupied the Mojave Desert.

The first European explorers to enter the area were Pedro Fages, Military Commander of California, in 1772 and Fr. Francisco Garces, a missionary priest, in 1774. On May 20, 1810, Franciscan missionary Francisco Dumatz, of the San Gabriel Mission, led his company into a valley. In observance of the feast day of St. Bernardine of Siena, Dumatz named the valley San Bernardino. This name was later given to the nearby mountain range, and later the city and county.

In 1842 the Lugo family was granted the Rancho San Bernardino, a holding of 37,700 acres encompassing the entire San Bernardino Valley. Captain Jefferson Hunt, of the Mormon Battalion, led a group of settlers into San Bernardino and founded a Mormon Colony. In 1851 the Mormon Colony purchased the Rancho from the Lugo family.

In 1850 California was admitted into the United States. On April 26, 1853, San Bernardino County was created from parts of Los Angeles, San Diego, and Mariposa Counties. In 1854 the City of San Bernardino was incorporated as the county seat.
In 1857, three orange trees were set out on a farm in Old San Bernardino. By 1882 a rail car load of oranges and lemons grown in the East Valley was shipped to Denver, Colorado. As early as the 1840s, vineyards were planted in the Cucamonga area and in the 1870 census; San Bernardino County was credited with producing 48,720 gallons of wine.

In 1860, gold was discovered in Holcomb and Bear Valleys in the San Bernardino Mountains, and placer mining began in Lytle Creek. Silver was being mined at Ivanpah in 1870, and the rich silver mines of the Calico district were developed in the 1880s. Borax was first discovered in 1761 at Searles Dry Lake near Trona, and transported out by twelve-, eighteen- or twenty-mule team wagons.

As a county, San Bernardino has been uniquely endowed with rich mineral deposits. Large deposits of gold have been mined at Stedman and Vanderbilt, with smaller but still important deposits at Alvord, Oro Grande, Old Dad Mountain, Dale and Nantan, Calico, Ivanpah, Waterman and Providence were the largest silver deposits, with lesser, but important deposits in the Mescal Mountains and at the Death Valley Mine. The most important copper mines are the Copper World and the Bagdad Chase (known usually for its gold production).

Except for a brief period after World War I when silver prices were high, low metal prices and inflation put a damper on mining in the 1920s. However, with the Great Depression of the 1930's

and an increase in the price of gold by nearly $15 an ounce, many small operators reactivated old mines. The region around Barstow, Vanderbilt, Stedman, and Dale were the principal centers of mining activity until World War II.

During World War II, iron was extracted from the Vulcan Mine in the Providence Mountains, and the Bagdad Chase Mine remained active. Since the war, there has been sporadic mining of gold, silver, and tungsten in the county. A major new mine opened during the 1950s, the Mountain Pass rare earth mine. Recently, exploration has outlined potential large tonnage molybdenum properties in the New York and Ord Mountains, copper in the Cooper Basin area of the Whipple Mountains and gold in the Clark Mountains.

After World War II, the citrus industry slowly declined. However, dairies relocating out of Los Angeles County settled in the Chino Valley area, creating a robust dairy industry in San Bernardino County.

Elsewhere in the Valley region, suburbs grew as moderate priced housing developments were built. By the late 1980's, the county had grown into bedroom communities and warehousing for southern California.

### 1.5.3 Climate

The valleys between mountain ranges experience very high temperatures, while the adjacent mountains often experience much cooler temperatures, particularly at their summits. Rainfall and humidity are low. The annual average precipitation for the area is approximately 30 inches. The differences in elevation and topography are in part responsible for variations in temperature and precipitation from the Valley and Desert areas.

Winter temperatures in some areas of the Desert range near zero, the cold often compounded by the wind-chill factor. In the summer, temperatures can reach as high as 134°F in the lower elevations and along the Colorado River area. Temperatures in the San Bernardino valley area range from an average high of 80ºF and an average low of 53ºF. The record high for the area is 117ºF and the record low is 17ºF. The annual average rainfall for the area is 15.6 inches. During the fall and winter months, strong "Santa Ana" winds blow across the area.

The mountains experience a four-season climate. Temperatures in the Mountain area range from an average high of 62ºF and an average low of 36ºF. The record high for the area is 106ºF and the record low is -25ºF. With the possible exception of some of the higher elevations in the mountains, precipitation throughout the Desert area is less than four inches per year, usually of short duration and high intensity. The resulting flash floods rapidly modify the terrain that is exposed to the erosive surface runoff. Unusually heavy or persistent rains often result in the temporary filling of a number of dry lakes until the surface water evaporates or infiltrates the soil. Persistent winds blow throughout the year





### 1.5.4 Demographics

The total population of San Bernardino County is approximately 2,139,570 people *(State of California, Department of Finance, E-4 Population Estimates for Cities, Counties, and the State, 2011-2016, with 2010 Census Benchmark. Sacramento, California, May 2016)*. Most of the County's population is in the valley areas located in the south west portion of the County. The County's population has grown by 4.13%, 84,835 people, since 2011 (population in 2011 was 2,054,735 people).

The population of the unincorporated area of the County in 2011 was 294,753 people. In 2016, the population is 309,759; an increase of 14,976 persons (or 1.05%) *(State of California, Department of Finance, E-4 Population Estimates for Cities, Counties, and the State, 2011-2016, with 2010 Census Benchmark. Sacramento, California, May 2016)*

**Population Growth 2011 - 2016**

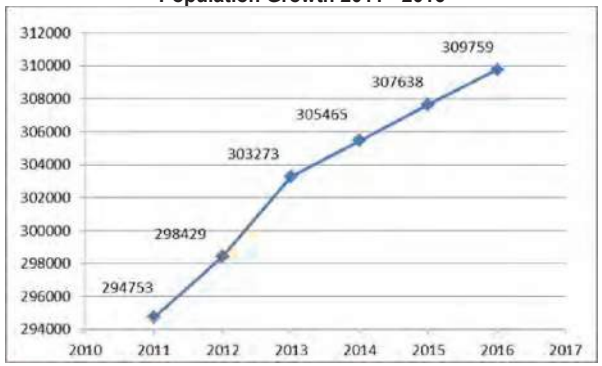


**Figure 1-10: San Bernardino County Unincorporated Area Population Changes 2011 - 2016**

Source: California Department of Finance E-4

Ethnic composition includes Hispanics (48%) who form the largest share of the County's population, followed by Whites (34%). Blacks (9%) and Asians (5%) form a relatively lower share of the total population. It should be noted that the Hispanic population is growing at the fastest rate among all ethnic groups. From 2000 to 2010, the Hispanic population increased by 44%. This trend is consistent with that of the neighboring counties of Riverside and Orange, where the

Latino population grew by 63% and 24%, respectively. During this period, the Asian population grew by 38%, whereas the Black population grew by 15%. The population of Whites declined in

all the six counties in Southern California; San Bernardino County experienced a decline of 7% in its White population. Changes in Ethnicity are from the California Department of Finance, Demographics Unit.

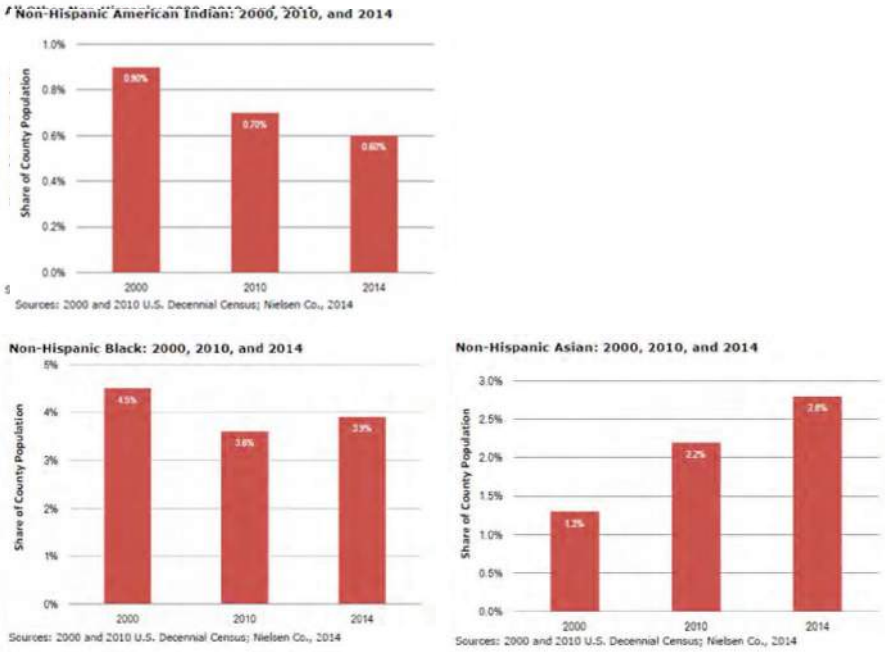


**Figure 1-11: San Bernardino County Unincorporated Area 2014 Population by Ethnicity**





### 1.5.5 Existing Land Use

The County has adopted a “one-map approach.” The “one-map approach” permits the use of a single map showing both General Plan land use designations and zoning classifications. The one-map approach assures that there will always be land use consistency between the County's General Plan and its Zoning Code.

There are 18 land use zoning districts that apply only to privately owned lands in the County and not to the lands controlled by other jurisdictions. Lands that are controlled by other jurisdictions, including lands controlled by federal and state agencies as well as incorporated cities, are mapped to identify the public agencies that control them. The 18 land use zoning districts are as follows:

- Resource Conservation (RC)
- Agriculture (AG)
- Rural Living (RL),
- Single Residential (RS),
- Multiple Residential (RM),
- Office Commercial (CO),
- Neighborhood Commercial (CN),
- Rural Commercial (CR),
- Highway Commercial (CH),
- General Commercial (CG),
- Service Commercial (CS),
- Community Industrial (IC),
- Regional Industrial (IR),
- Institutional (IN),
- Special Development (SD),
- Floodway (FW),
- Specific Plan (SP), and
- Open Space (OS).

Resource Conservation (RC) comprises the majority (55.98 percent) of the designated land uses in the County. This land use designation covers over 1 million acres, or about 1,500 square miles of land. Most of the land within this designation is publicly owned (federal and state) and includes national parks, military bases, conservation areas, and lands owned by other federal and state agencies. The County has designated approximately 681,500 acres or 1,065 square miles (37.92 percent) for residential uses. Out of this, about 587,535 acres (32.76 percent of total unincorporated area) are designated Rural Living, 67,691 acres are designated Single Residential, while 4,986 acres are designated Multiple Residential.

Commercial land use zoning districts (Office Commercial, Neighborhood Commercial, Rural Commercial, Highway Commercial, General Commercial, and Service Commercial) occupy a total of 12,177 acres or 0.68 percent of the total unincorporated area. Industrial land use zoning districts (including Community Industrial and Regional Industrial) occupy 21,834 acres or 1.21

percent of the total unincorporated area. Other land use designations include Agriculture occupying 41,793 acres (2.32 percent), Institutional occupying 8,567.51 acres (0.48 percent), Floodway occupying 20,281 acres (1.13 percent), and Specific Plan occupying 4,861.37 acres (0.27 percent).

Because of the size of the County, the San Bernardino County General Plan divides the county into 8 quadrants (Figure 1-12). The “one-map approach” allows the quadrant maps to be used for many different planning and development purposes. Figure 1-13 presents the Land Use Zoning for each quadrant. The Land Use Zoning identifies the type of construction and growth that exists or may occurs in area.

County designated Land Use Zoning Districts do not apply to Federal, State, or incorporated owned property.

The County’s General Plan can be found at: http://countywideplan.com/home/about/

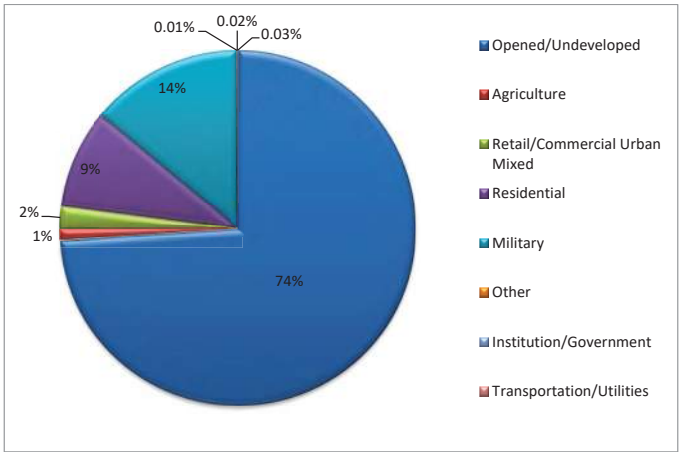


Figure 1-12: San Bernardino County Land Use





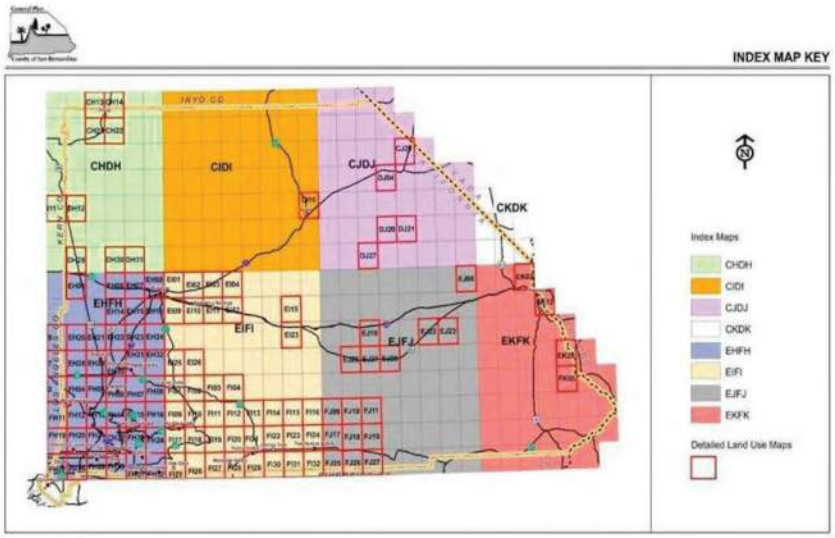


Figure 1-13: San Bernardino County Land Use Map

### 1.5.6 Development Trends

No major developments occurred in the unincorporated area of the county since the 2010 MJHMP was adopted. The limited development that did occur was scattered throughout the unincorporated area; with no one area being singled out. All development was in accordance with the pre-designated Land Use Zones development zones and complied with all Fire, Flood, and Seismic codes of the County and State at the time of development. This includes commercial, industrial, and residential developments.

The County is optimistic about the potential for future development. The High Desert area of San Bernardino County is one of the best places in the world for solar energy development because of its high altitude, the number of sunny days each year and existing power infrastructure.

- Many large solar energy projects are being proposed in California's desert area on federal Bureau of Land Management (BLM) land. BLM has received right-of-way requests encompassing more than 300,000 acres for the development of approximately 34 large solar thermal power plants totaling approximately 24,000 megawatts. This number of projects has not yet reached the stage of an Application for Certification (AFC) with the California Energy Commission.
- California's electric utility companies are required to use renewable energy to produce 20 percent of their power by 2010 and 33 percent by 2020. A main source of renewable power will be solar energy. Within the County of San Bernardino a Hybrid Power Project has been approved in the Victor Valley area. As of August 2010, three large Solar Projects to be placed in the County are in review by the California Energy Commission.

Once built, these projects will not impact the area to a great extent. Minimal staffing is required to operate these facilities and their very nature places them in remote locations of the County.

Additionally, with the completion of the Alameda Corridor and the emergence of the Ports of Los Angeles and Long Beach as the largest ports in the U.S., shipping trans-Pacific goods from the booming Asian economies, San Bernardino County has evolved as the logistics and distribution hub for the 20 million resident Southern California market and into the rest of the nation. As the international economy recovers amidst tightening land availability for warehousing and transit, San Bernardino County is better positioned than other areas in the region to harness the opportunity to become an even more important logistics hub.

The County has also started development of a bullet train. The bullet train will connect Victorville, CA and Las Vegas NV generally following the I-15 corridor (NOTE: There are discussions of additional bullet trains connecting San Bernardino with Los Angeles and San Diego and San Bernardino County and San Francisco/Sacramento).

While all of these development trends may not be recognized over the next 5 years, all future development that will take place is planned to occur in accordance with the General Plan Land Use Zones and will consider all potential hazards identified within this plan. Additionally, all development will be in compliance with all Fire, Flood, and Seismic codes of the County and State at the time of development.





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# Section 2. Plan Adoption

## 2.1 Adoption by Local Governing Body

The San Bernardino County Board of Supervisors created "districts" to provide a specific service to an area / population of San Bernardino County. These Districts are Board Governed in that the Board of Supervisors has direct control and legislative oversight of the Districts. The Board of Supervisors acts on behalf of each District whenever governance items are necessary. The participating jurisdictions listed in this plan are separate legal entities from the County of San Bernardino. For tax/revenue purposes the Board of Supervisors, acting as the Board of Directors for each participating jurisdiction or "District", will be adopting the Multi-Jurisdictional Hazard Mitigation Plan on behalf of each District. The Districts are not independent from San Bernardino County but are controlled and administered as any other County Department is administered.

This plan represents mitigation efforts for the unincorporated portions of the County and the efforts of three jurisdictions participating in this Multi-Jurisdictional Hazard Mitigation planning effort. The participating jurisdictional special districts include:

**San Bernardino County Fire District**
**San Bernardino County Flood Control District**
**San Bernardino County Special Districts Department**

San Bernardino County Board of Supervisors is responsible for the review, approval, and adoption of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) update for the unincorporated area of San Bernardino County, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and for the County's Board Governed Special Districts Department. It is also the intent of the San Bernardino County Board of Supervisors to take appropriate actions to incorporate the MJHMP update into the San Bernardino County General Plan.

## 2.2 Promulgation Authority

The Promulgator Authority for the adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the unincorporated area of San Bernardino County, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and for the County's Board Governed Special Districts Department and incorporation of the MJHMP into the San Bernardino County General Plan is:





- Chairman Robert A. Lovingood First District
- Janice Rutherford Second District Supervisor
- James Ramos Third District Supervisor
- Vice Chairman Curt Hagman Fourth District Supervisor
- Josie Gonzales Fifth District Supervisor

**The Point of Contact for information regarding this MJHMP is:**

Michael Antonucci, Emergency Services Manager
San Bernardino County Fire
Office of Emergency Services
1743 Miro Way
Rialto, CA 92376
(909) 356-3998

# Section 3. Planning Process

## 3.1 Preparing the Plan

Multi-Jurisdictional Hazard Mitigation Planning is a process State, Tribal, and local governments use to identify risks and vulnerabilities associated with natural disasters, and to develop long-term strategies for protecting people and property from future hazard events.

Planning creates a way to solicit and consider input from diverse interests. Involving stakeholders is essential to building community-wide support for the plan. In addition to emergency managers, the planning process involves other government agencies (e.g., zoning, floodplain management, public works, community, and economic development), businesses, civic groups, environmental groups, and schools.

To assist with the updating of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), a Multi-Jurisdictional Planning Team (Planning Team) was established. The Planning Team was the lynchpin for all activities to update the MJHMP. The Planning Team was established to define and identify the strategies, goals, activities, and development of the MJHMP. The Planning Team represents a comprehensive team of subject matter experts from a range of areas that the team felt was affected by the plan or could provide great benefit to the team. Members of the Planning Team were drawn from San Bernardino County Departments, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and the San Bernardino County Special Districts Department.

The Multi-Jurisdictional Planning Team members worked together to jointly determine and rank the risks facing the six participating agencies, develop goals and objectives to mitigate the risks, and identify which of the participating jurisdictions would be most appropriate for leading any particular project area identified by the Multi-Jurisdictional Planning Team. The individual Planning Team members then returned to their respective Special Districts where discussions were held, input sought, and potential projects developed and ranked for each of the Planning Team identified risks and projects relevant to the Special District. The Planning Team members then returned to the Multi-Jurisdictional Planning Team and provided the Planning Team with their vetted, prioritized list of potential projects and budgets to include in the Multi-Jurisdictional Hazard Mitigation Plan. These projects and budgets were integrated into the Multi-Jurisdictional Hazard Mitigation Plan. Upon approval, each participating jurisdiction would then be able to apply for grant funding for their prioritized projects without interference from another participating jurisdiction as funding became available.

The Planning Team was led by a representative from the San Bernardino County Fire Protection District-Office of Emergency Service. This representative took on the responsibilities of a Project Manager and facilitated and coordinated activates.





The Project Manager also represented the Unincorporated County at the San Bernardino County Operational Area (OA) Stakeholder meetings. San Bernardino County OES led the effort to coordinate Stakeholder in the Operational Area update their local MJHMP. This effort included: proving technical support, establishing a platform to encourage the exchange of ideas, and help coordination among neighboring stakeholders. The Project Manager was responsible for attending these meetings and incorporating the material into their planning process. One of the resource materials provided through the OA Stakeholder meetings was a suggested Table of Contents (TOC) the purpose of the TOC was to ensure all aspect of the MJHMP requirements were being met and could be found in similar sections in each of the Stakeholders updated MJHMPs.

This sample TOC was reviewed by the Planning Team and incorporated into the unincorporated county's MJHMP update efforts. Using the TOC, the Planning Team decided to conduct a section by section; page by page review of the 2016 MJHMP. To assist with this effort, a proposed project timeline was developed. The proposed Project Timeline illustrates the windows when each section of the 2016 MJHMP will be reviewed and the section revised.

**Table 3-1: Proposed Project Timeline**

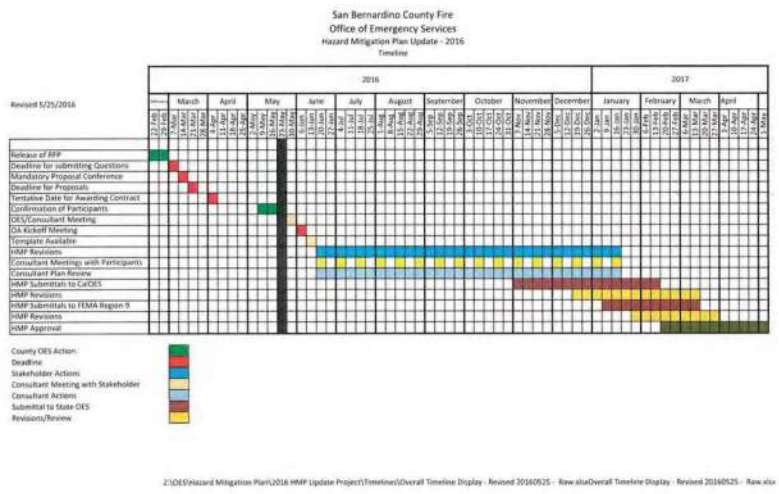


Based on the TOC, the Planning Team divided the update process into seven (7) phases; one for each section of the TOC. This approach allowed for a much focused review of the material and

provided an organized method to introduce new or updated material. The Project Manager led the discussion, solicited comments, took notes, and incorporated results in the MJHMP. Additionally, the Project Manager collected and summarized material provide by Planning Team members. During the Planning Team meetings some members were assigned tasks or action items which were to be completed prior to the next meeting.

Staff assigned to the MJHMP Update reviewed the 2016 MJHMP and provided comments referencing updated information such as current population statistics, new HAZUS-MH MR3 analysis of floods and earthquakes, and provide suggestions for updating the MJHMP. The Planning Team then reviewed the update information and validated/identified Goals, Objectives, and Projects. This step included discussion of how the projects would be prioritized.

### 3.1.1 Project Prioritization Involved Comprehensive Consideration of Criteria/Factors

While there is not a standard process followed by each of San Bernardino County Departments, and Districts; they all considered social, technological, administrative, political, legal, economic, and environmental factors. The County and each district participated on the Planning Team, and then took the risks, goals, objectives and projects back to their respective jurisdiction for discussion and vetting. After vetting, the individual Planning Team members returned to the Multi-Jurisdictional Planning Team where the individual materials were combined into a single Multi-Jurisdictional Hazard Mitigation Plan. This Multi-Jurisdictional effort resulted in goals, objectives and projects for all participants being listed under the appropriate hazard sections and not by individual participants. This reflects the overall County philosophy of allowing the department/district with the most expertise to suggest and/or manage a project that may affect another participant who does not have expertise in the hazard.

### 3.1.2 Planning Team

Much of the Planning Team is composed of representatives who were part of the development of the 2010 Unincorporated Area County MJHMP. This provided added value to the team in that they were familiar with the process and provided continuity in the updating of the 2010 MJHMP.

The Planning Team is comprised of representatives from San Bernardino County Departments, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and the San Bernardino County Special Districts Department who specialize in mitigation type activities/planning.





The Planning Team members represented select aspects of the community and were thought of as liaisons to the greater community. Each Planning Team member was responsible for communicating the direction and status of the planning effort to their outside members and in return they are expected to bring to the team outside perspectives. Additionally, the individual Planning Team members acted as liaisons for their respective Special Districts and were responsible for ensuring that the Special Districts provide appropriate input from their respective internal planning processes. Potential projects/budget meetings were held where alternative mitigation actions were discussed and potential mitigation projects were developed and prioritized along with budget development for the individual participating Special Districts and Departments. Additional prioritization after budgets were developed to ensure proper Benefit Cost Analysis (BCA) techniques were applied.

Representation was present on the Multi-Jurisdictional Planning Team from various County Departments and the three participating jurisdictional departments. Planning Team included representatives from all the participating San Bernardino County Special Districts and Departments. See Table 3-2 and Table 3-3.

**Table 3-2: Multi-Jurisdictional Planning Team**

| Multi-Jurisdictional Planning Team Members | Title / Role |
|---|---|
| **Unincorporated County** | |
| *Suzanne Peterson* | *Countywide Plan Coordinator / Land Use Services / Mitigation Review* |
| *Jerry Blum* | *Countywide Plan Coordinator /* |
| *Brent Rolf* | *County GIS / Hazus Data Coordinator / Information Services* |
| *Frank Jordan* | *Land Use Services / Mitigation Review* |
| *Jim Sowers* | *Building and Safety / Risk Assessment Review and Mitigation Action Plan Development* |
| *Patricia Cole* | *Economic Development Agency / Implementation and Funding Review* |
| *Carl Alban* | *Architecture and Engineering Department* |
| *John Amrhein* | *Sherriff's Corner Department Rep. / Mitigation Action Review* |
| *Mazin Kasey* | *Public Works Dept. /Transportation Division* |
| *Art Rivera* | *Solid Waste Management Division* |
| *Norma Spencer* | *Superintendent of Schools* |
| **Fire Protection District** | |
| *Michael Antonucci* | *OES Director / MJHMP Plan Representative* |
| *Cindy Serrano,* | *Project Manager for Planning Process* |
| *Miles Wagner* | *Emergency Services Officer, GIS Representative and Stakeholder Coordination.* |
| *David Davis* | *Emergency Services Officer / Fire District Representative and Technical Writer* |
| *Mary Barnett* | *Technical Writer / Plan Update and Edits* |

| Multi-Jurisdictional Planning Team Members | Title / Role |
|---|---|
| Cheryl Nagy | Emergency Services Officer |
| Carrie Cruz | Emergency Services Officer |
| Elli Maldonado | Elli Maldonado – Office Assistant |
| Michael Horton | Michael Horton – Fire Marshal |
| **Flood Control District** | |
| Kevin Blakeslee, Deputy Director – Flood Control | Deputy Director – Flood Control |
| Kenneth Eke, Chief, Flood Control Planning/ Water Resources Division | Chief, Flood Control Planning/ Water Resources Division |
| Michael Fam | Flood Control Planning |
| Mona Sadek | Flood Control Planning |
| Marjorie Schrage | Flood Control Planning |
| **Special Districts Department** | |
| Jeff Rigney | Special Districts Dept. Director |
| Steve Samaras | Special Districts Dept. Acting Deputy Director |
| Erin Opliger | Big Bear Valley Recreation and Parks District Rep. |
| Erin Opliger | Bloomington Recreation and Parks District Rep. |

**Table 3-3: Stakeholder List**

| Stakeholder Members | Name | Title / Role |
|---|---|---|
| **Municipal Partners** | | |
| City of Barstow | Jamie Williams | Fire Chief |
| City of San Bernardino | Eric Fyvie | Sergeant |
| City of Chino | Chris Wolff | Administrative Services Manager |
| City of Chino Hills | Bonnie Michaels | Emergency Services Analyst |
| City of Colton | Shannon Kendall | Emergency Services Coordinator |
| City of Fontana | Cheryl Nagy/ Mary | Emergency Services Officer |
| City of Grand Terrace | Haide Aguirre | Management Analyst |
| City of Hesperia | Rachel Molina | Public Information Officer |
| City of Loma Linda | Shannon Kendall | Emergency Services Coordinator |
| City of Montclair | Angelic Bird | Emergency Services Coordinator |
| City of Ontario | Raymond Cheung | New Emergency Manager |
| City of Rancho Cucamonga | Breanna Medina/ Denise School | Emergency Manager |
| City of Redlands | Fay Glass/ Wanda Viser | Emergency Operations Manager |





| Stakeholder Members | Name | Title / Role |
|---|---|---|
| City of Rialto | Art Podeska | Battalion Chief |
| City of Upland | Angelic Bird | Emergency Services Coordinator |
| City of Victorville | Dana Wellborn | Emergency Services Manager |
| Town of Apple Valley | Joseph Ramos | Emergency Services Officer |
| Town of Yucca Valley | Jessica Rice | Management Analyst |
| **School District Partners** | | |
| Apple Valley Unified School District | Janet Gould | Director, Risk Management |
| Chino Valley Unified School District | Dr. Grace Park | Assistant Superintendent |
| San Bernardino County Superintendent of Schools | Norma Spencer | Risk Management Analyst |
| Snowline Joint Unified School District | Robert Chacon | Director of Risk Management |
| **Special District Partners** | | |
| Inland Empire Utilities Agency District Headquarters | Claudia Neighbors/ Tony Arellano | Safety Officer |
| Newberry Community Services District | Stephen Miller | Fire Chief- Barstow Fire Protection District |
| Omnitrans | Mark Crosby | Security and Emergency Preparedness Coordinator |
| Santa Ana Watershed Project Authority | Richard Haller/ Carlos Quintero | Exec. Manager of Engineering and Operations |
| **Water District Partners** | | |
| Crestline Village Water District | Larrie Ann Davis | Office Manager |
| Cucamonga Valley Water District | Rosanna Ammari / Maria Kennedy | Maria Kennedy Consultant Representative |
| East Valley Water District | Cecilia Contreras / Gary Sturdivan | Administrative Assistant |
| Monte Vista Water District | Jonathon Dizon | Engineering Technician |
| San Bernardino Valley Municipal Water District | Dan Borrell/ Brent Adair | Project manager- Construction |
| Twenty-nine Palms Water District | Gary Sturdivan | Consultant Rep. |
| Yucaipa Valley Water District | John Hull | Public Works Management |
| **CERT Teams** | | |
| Wrightwood | | CERT Citizens |
| Phelan/Pinion Hills | | CERT Citizens |
| Angelus Oaks | | CERT Citizens |
| Big Bear Valley | | CERT Citizens |
| Helendale | | CERT Citizens |
| Lucerne Valley | | CERT Citizens |
| Lytle Creek | | CERT Citizens |
| Mill Creek Canyon | | CERT Citizens |

| Stakeholder Members | Name | Title / Role |
|---|---|---|
| *Morongo Basin* | | *CERT Citizens* |
| *Mountain* | | *CERT Citizens* |
| *Oak Hills* | | *CERT Citizens* |
| *Rosena Ranch* | | *CERT Citizens* |
| *San Antonio Heights* | | *CERT Citizens* |
| *Silver Valley* | | *CERT Citizens* |
| **Public Representatives** | | |
| - | *Destiny Davis* | *Interested Citizen* |
| - | *John Ferdon* | *Interested Citizen* |
| **Other Partner Agencies** | | |
| *San Manuel Band of Mission Indians* | *Michael Russ* | *Disaster Services Manager* |
| *Arrowhead Regional Medical Center* | *Weston Scott Smith* | *Emergency Preparedness* |
| *United States Forest Service* | *Marc Stamer* | *San Bernardino National Forest and Angeles National Forest Rep.* |
| *Wrightwood Fire Safe Council* | *John Aziz* | *Fire Safe Council* |
| *Rim of the World Mountain Mutual Aid Association* | *Aaron Scullin* | *President* |

There were a series of meetings held with the Planning Team. Each meeting had a primary focus and provided an opportunity to discuss updates and exchange ideas. Below is a list of the Planning Team meetings:

**Table 3-4: Planning Team Meetings**

| Date | Activity |
|---|---|
| February 4, 2016 | In person meeting to discuss revisions and additions to the Planning Process, Risk Assessment, Community Capability Assessment, Mitigation Strategies, Plan Maintenance, Fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion into the plan. |
| June 23, 2016 | Organizational Meeting for County Unincorporated Area Planning team. Planning Team members were introduced to the project and assigned to review 2016 MJHMP and update risks and mitigation projects as needed. |
| July 19,2016 | Conference Call with participants to discuss revisions and additions to the Planning Process, risk Assessment, Community capability Assessment, Mitigation Strategies, Plan maintenance, fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion into the plan. |





| | |
|---|---|
| August 4, 2010 | In person meeting to discuss revisions and additions to the Planning Process, risk Assessment, Community capability Assessment, Mitigation Strategies, Plan maintenance, fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion into the plan |
| August 30, 2016 | In person meeting to discuss revisions and additions to the Planning Process, risk Assessment, Community Capability Assessment, Mitigation Strategies, Plan Maintenance, Fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion in the plan. |
| September 14, 2016 | In Person meeting of the Morongo Basin COAD Community Organizations Active in Disaster. Hazard Mitigations Plan Discussion and outreach for public input on the update of the Hazard Mitigation Plan, and contact information given to the public. |
| September 20, 2016 | In person meeting to discuss changes suggestions with the Fire Safe Council for the following communities: Wrightwood, Phelan, Pinion hills, West Cajon Valley, and Baldy Mesa. The first item on the agenda was the discussion of the LHMP update and explained how to review the current HMP and instructions were given on who and how to contact OES and about 79 persons of the public were present |
| September 21, 2016 | Rim of the World Mountains Mutual Aid Association in Person meeting to discuss Planning Team Goals and Objectives, and any public concerns and contact information was given and it was the first item on the agenda for the meeting. And continuing fire fuel thinning programs (MAST) and Bark Beetle tree removal. |
| September 24, 2016 | In Person meeting of CERT Training on Terrorism, The hazard Mitigation Plan was brought up and discussed and contact information given to the public, a few topics and subjects were brought up. |

## 3.2 Coordination with Other External Jurisdictions, Agencies and Organizations

### 3.2.1 Internal Coordination

Because of the size and geographical location of Unincorporated County area, there are many jurisdictions, agencies, and organizations that are affected by or have influence on the county and the mitigation planning process. As part of the planning process, the Planning Team, and particularly the Project Manager, took great efforts to engage and include as many members as possible. These members were drawn from San Bernardino County Departments, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and the San Bernardino County Special Districts Department.

One of the first efforts that were made was when the Planning Team was being established. The Planning Team members gave special considerations as to what they thought needed to be in the MJHMP and attempted to identify a person who could representative that area. This consideration went beyond the county departments.

As mentioned above, in addition to being required to participate in the Planning Team meetings, the Planning Team members were also required to liaison with other groups including their own

department/districts planning and project staff and with cooperating agencies to provide updates on the project and to bring to the team the different perspectives and comments. The Planning Team conducted a very extensive outreach effort.

This was done mostly through leveraging of existing meetings and efforts. In this liaison role, the Planning Team members coordinated with CalFire; the United States Forest Service, San Bernardino National Forest and Angeles National Forest; Natural Resource Conservation Service, Special Districts, and the 24 cities and towns within the County. This allowed for the Planning Team to capture a larger perspective; while keeping the Planning Team at a manageable level. The information was then brought back to the Multi-Jurisdictional Planning Team by the individual Planning Team members. At these meeting, potential cooperative projects were discussed, categorized, and prioritized for inclusion in the Multi-Jurisdictional Hazard Mitigation Plan.

As previously mentioned, the Unincorporated County and special districts were also active members of the San Bernardino OA Stakeholder Group meetings. These meetings provided an opportunity to coordinate with all cities/towns and special districts in the county. Through this venue, the Planning Team and the Project Manager reached out to adjacent jurisdictions and associated special districts to ensure that their efforts and findings were not in conflict. Stakeholder Meetings include the primary, alternate, and any consultants for all the participating jurisdictions.

As part of this effort, an OA Stakeholder Web Portal was developed to assist the jurisdictions update their MJHMPs, and encouraged sharing information, resources, and ideas necessary to complete the update process. Meetings, attended by the County Project Manager, were both in person and by conference call; many including a webinar. The Project Manager then brought the materials and discussions held at these meetings back to the Planning Team for review and action wherever applicable to the MJHMP effort. Participating Stakeholders are listed in Annex 5. A list of the OA Stakeholder Meetings is listed below:

- September 21, 2016
  Stakeholders Conference Call/Webinar at OES Headquarters
  1:30 p.m. to 2:30 p.m.

  8 participants in MJHMP Update Project Portal Rollout participated in the Conference Call and Webinar to introduce MJHMP Update Portal. Portal has public and stakeholder sections. During this conference call participants were shown the portal and walked through the log-in process to access the stakeholders' side of the website. Also discussed having weekly and some occasions office calls to update plan progress and needs for information.





- September 28, 2016
  Production team conference call OES Headquarters
  1:30 p.m. to 2:30 p.m.

  This meeting presented the website updates, progress chart and needs from other stakeholder departments to provide data such as proposed, in progress and completed hazard mitigating projects. The MJHMP Resource material was also reviewed. The tentative schedule of Production group meetings was reviewed.

- October 5, 2016
  Production Group Conference Call
  1:30 p.m. to 2:30 a.m.

  Stakeholders discussed MJHMP progress of the MJHMP updates. Revised timelines for updates were presented. New Reference Materials now available on the Web Portal were presented. Questions from the participants were discussed and answered.

- October 12, 2016
  Production team conference call
  OES Headquarters
  1:30 p.m. to 2:30 p.m.

  This meeting presented the website updates, progress chart and needs from other stakeholder departments to provide data such as proposed, in progress and completed hazard mitigating projects. The MJHMP Resource material was also reviewed. The tentative schedule of Production group meetings was reviewed.

- October 19, 2016
  OES Headquarters
  1:30 p.m. to 2:30 p.m.

  This meeting presented the website updates, progress chart and needs from other stakeholder departments to provide data such as proposed, in progress and completed hazard mitigating projects. The MJHMP Resource material was also reviewed. The tentative schedule of Production group meetings was reviewed.

- October 26, CISN
  Project Management Team Meeting
  San Bernardino County Government Center Community Room,
  10:00 a.m. to 12:00 a.m.

  This meeting was with 12 county members and any public to go over changes in the general plan and updates the County Hazard Mitigation plan with current and proposed and approved projects as well as code updates and ordinance changes and draft safety proposals.

- October 26, 2016
  Entire project Teams representatives via in person or video and voice call in
  Video Conference Call
  2 p.m. to 4 p.m.

  All project team stakeholder representatives discussed progress of the MJHMP updates. And timelines were discussed. Questions from the participants were discussed and answered. Also a live meeting in conjunction with Land Use representatives and Fire also consultant staff. 32 in attendance and 108 called in or video linked. Internal and External groups

### 3.2.2 External Coordination

The unincorporated county also had representation on the OA Working Group team. The Working Group is a small group of OA Stakeholders with experience in developing Multi-Jurisdictional Hazard Mitigation Plans. Members are drawn from the 24 cities/towns, 33 special districts, and the County. The goal of the Working Group is to vet the direction and material being provided to the larger Stakeholder Group such as crosswalk, Web Portal, use of maps, and a method to prioritize and rank the existing and any new hazards. The Working Group also discusses problems and solutions that arise during the MJHMP update process. Meetings were either in person or by conference call.

- June 23, 2016
  Stakeholders Meeting
  San Bernardino Unified School District Community Room, San Bernardino, CA
  2:00 p.m. to 4:00 p.m.

  54 Participants representing 24 cities/towns, 30 special districts, and the unincorporated area of participated. This Stakeholders Meeting introduced the Web Portal and the process to develop a current MJHMP from the 2010 MJHMP. Timelines were presented as well as templates for use in updating the project. Copies of the 2010 MJHMP for the jurisdictions were made available on the Web Portal to use as a starting point in the update process.

- August 30, 2016
  Stakeholders Meeting at OES Headquarters 1:30 p.m. to 2:30 p.m.

  In person meeting to discuss revisions and additions to the Planning Process, risk Assessment, Community capability Assessment, Mitigation Strategies, Plan maintenance, fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion in the plan.





- October 26, 2016
  Entire project Teams representatives via in person, video or voice call in
  Video Conference Call
  2 p.m. to 4 p.m.

  All project team stakeholder representatives discussed progress of the MJHMP updates. Timelines were discussed.
  Questions from the participants were discussed and answered. Also a live meeting in conjunction with Land Use representatives and Fire also consultant staff. 32 in attendance and 108 called in or video linked.

## 3.3 Public Involvement/Outreach

Public involvement was solicited throughout the process. Since the 2016 MJHMP approval, the County and its special districts have taken several steps to educate the public on the hazards facing the county and had several public forums where mitigation projects were discussed and identified. At all events, public opinion and comments are solicited.

The Planning Team also considered the possibility of including public members on the Planning Team. However, because of the vast size of the county and the volume of possibilities, it was determined that having the Planning Team members liaison with the public would better serve and capture the public interest.

During this process, the County and Special Districts also used several platforms to reach out and inform the public of the MJHMP update. Wherever possible, a joint effort was made by the Planning Team members to include discussion for each participating jurisdictions hazards, goals, and objectives. These joint meetings of the Special Districts and County resulted in joint leverage of the planning effort and a resulting joint benefit of goals/objectives, and project development for the MJHMP development. Public Involvement consisted of meetings for County Departments or Special Districts which gave the public the direct opportunity to comment on the County Unincorporated Area MJHMP, meetings of County Department or Special District advisory committees where hazard specific information and possible projects were discussed, updates on the County website, press releases regarding the MJHMP, and public hearing regarding the MJHMP. All participants collectively supported the following public outreach meetings. Below is a summary list of the public outreach:

### 3.3.1 Public Meetings

- Wrightwood Fire Safe Council
  Wrightwood Museum, Wrightwood, CA
  July 19, 2016
  7:00 p.m. to 9:00 p.m.

17 community members and 7 Wrightwood Fire Safe Council members attended. A demonstration of Thermo-Gel and various application methods was demonstrated by a private vendor.

Reports of activities were given by the Angeles National Forest and the San Bernardino National Forest.
San Bernardino County Fire Protection District Office of Emergency Services presented a PowerPoint presentation on the effort to update the MJHMP for the unincorporated area of the County. A copy of this PowerPoint is in Annex 9 of the MJHMP.

- Rim of the World Mutual Aid Association
  100 W. Meadow Lane, Big Bear City, CA
  August 21, 2016
  6:00 p.m. to 7:30 a.m.

  24 representatives of local agencies, special districts, utilities, and the public in the Big Bear Valley attended the meeting. The City of Big Bear Lake and the Big Bear City CSD reported on the status of their MJHMP Update efforts. Both are proceeding with the goal of submitting the plan following the Group 1 timelines. Both agencies made presentations to their residents explaining the MJHMP Update Process, public involvement, and timelines.

  San Bernardino County Fire Protection District Office of Emergency Services presented a PowerPoint presentation on the effort to update the MJHMP for the unincorporated area of the County.

- Morongo Basin COAD Community Organizations Active in Disasters
  September 14, 2016
  10:00 a.m. to 12:00 p.m.

  This was a public meeting to discuss volunteers in disasters and the Local Hazard Mitigation Plan and the future of volunteer organizations in active disasters in the areas of Morongo and the entire county of San Bernardino County.

- Wrightwood Fire Safe Council
  Wrightwood Elementary School, Wrightwood, Ca
  September 20, 2016

  Community meeting of the fire safe council for the communities of Wrightwood, Pinion Hills, Phelan, West Cajon Valley, Baldy mesa the meeting covered topics of Emergency Alert System and notifications, repopulation and evacuation pans as well as the Local Hazard Mitigation Plan Update





- Rim of the World Mountain Mutual Aid Association
  September 21, 2016

  Rim of the World Mountains Mutual Aid Association in Person meeting to discuss Planning Team Goals and Objectives, and any public concerns and contact information was given and it was the first item on the agenda for the meeting; continuing on with fire fuel thinning programs (MAST) and Bark Beetle tree removal.

- CERT Terrorism Meeting/Training
  Victoria Gardens Community Center Rancho Cucamonga, CA
  September 24, 2016
  8:00 a.m. to 4:00 p.m.

  This was a CERT Symposium on Terrorism that covered the December 2nd Terror Attack and mass shooting incidents and how to react. An Active Shooter Awareness Course and discussion on the Local Hazard Mitigation Plan Update and Counter Terrorism Awareness courses were all presented to 100 CERT Members and public attendees.

### 3.3.2 Ready SB County Preparedness App Message/Web Postings

An App message was sent out to alert the public about the hazard mitigation process. The message was sent to over 15,000 people via the SB County Preparedness Mobile App and it is attached to the San Bernardino County Fire Website https://sbcfire.org as referenced in Annex 6. Ready SB County Preparedness Mobile App can be used on either an Android or iPhone. This app provides multiple resources for our residents that will assist them in preparing for a disaster and enhancing the recovery process. Protect yourself and your loved ones before, during and after a disaster.

In addition to hazard mitigation plan updates the public can get the Latest News from SBCounty.gov, CalTrans, National Weather Service, and San Bernardino County Fire Office of Emergency Services. This app provides the public with emergency supply kit lists, grocery lists and checklists tailored to an individual. The public can access and update preparedness plans as needed. Learn all you need to plan for and respond to natural disasters, terrorism and pandemic flu in San Bernardino County.

### 3.3.3 CERT Teams

The Press Release and Executive Summary were forwarded to the CERT Team leaders for those CERT Teams located in the unincorporated County area. The Team Leaders forwarded the MJHMP Press Release and Executive summary to their team members with the request for comments on the MJHMP. The fourteen (14) CERT Teams within the unincorporated County include:

| | | |
|---|---|---|
| Angelus Oaks CERT | Big Bear Valley CERT | Helendale CERT |
| Lucerne Valley CERT | Lytle Creek CERT | Mill Creek Canyon CERT |
| Morongo Basin CERT | Mountain CERT | Oak Hills CERT |
| Phelan/Pinon Hills CERT | Rosena Beach CERT | San Antonio Heights CERT |
| Silver Valley CERT | Wrightwood CERT | |

### 3.3.4 Public Hearing Process (to be completed upon FEMA Approval)

Once FEMA "approval pending adoption" notification is received, the Board of Supervisors reviewed, approved, and adopted the Unincorporated Area Multi-Jurisdictional Hazard Mitigation Plan for the County and its Special Districts at the Public Hearing meeting (**date to be determined**). The Board of Supervisors issued a Letter of Promulgation and Resolution denoting approval of the Multi-Jurisdictional Hazard Mitigation Plan for the County and its special Districts.

Prior to the Public Adoption Hearing Date (date to be determined), the Plan will be posted on the San Bernardino County website as part of the Agenda for the meeting. The Agenda with all attachments is posted the Wednesday prior to the hearing date as a public review requirement. Members of the public were invited to review and make comments at the meeting on (date to be determined). The Multi-Jurisdictional Hazard Mitigation Plan for the County and its Special Districts was on the Board of Supervisors agenda for review and adoption at their regularly scheduled meeting on (date to be determined).Residents of the County were requested to make comments or request information on the Multi-Jurisdictional Hazard Mitigation Plan during the regularly scheduled meeting. After the public had an opportunity to review and comment on the Plan the Board of Supervisors took action on the Board Agenda items.

## 3.4 Planning Process

As discussed, the planning process followed FEMA How to guides which includes; organizing resources, conducting the risk assessment, developing a capabilities assessment, developing a mitigation strategy and providing implementation measures for continued mitigation success, The Risk Assessment process includes four (4) basic step; 1) hazard identification and screening; 2) hazard profiling; 3) hazard exposure; and, 4) hazard vulnerability. The Project Manager, working with the Planning Team, facilitated discussions around these steps.
The first step in this process was to identify all natural hazards present in the community. The Planning Team started with the 2010 MJHMP and augmented as necessary. This augmentation





considered both adding and removing of hazards to develop a list of potential natural hazards in the community. The Planning Team utilized several sources to ensure they were considering all potential hazards. Material reviewed included the following: 2010 San Bernardino County Operational Area MJHMP, State of California MJHMP, FEMA "How-to Guides," and several surround community MJHMPs. After the list of potential hazards in the community is generated, the hazards were screened. For a full listing of documents see Section 5.1.1

### 3.4.1 Hazard Screening

The intent of screening hazards is to help prioritize which hazard creates the greatest concern in the community. In 2010, the MJHMP process used Critical Priority Risk Index (CPRI) software to evaluate hazards. In 2016 an alternative approach was implemented. The Planning Team agreed to utilize a non-numerical ranking system for the MJHMP update process. This process consists of generating a qualitative ranking (High, Medium, or Low) rating for: 1) probability; and, 2) impact from each hazard. To further assist with the process, the following definition of "High", "Medium", and "Low" probability and impacts are being provided (NOTE: these definitions we utilized in the 2010 MJHMP process):

**Probability**
High-Highly Likely/Likely
Medium-Possible
Low-Unlikely
**Impact**
High-Catastrophic/Critical
Medium-Limited
Low-Negligible

The hazards were then placed into a matrix with the appropriate/corresponding box/cell. The table below is an example of how the process will capture the results.

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | | | |
| | Medium | | | |
| | Low | | | |

After all hazards had been analyzed, the Planning Team then determined which Probability and Impact category (i.e., High Impact; High Probability, Medium Impact) the community will focus on over the next five (5) years. An example of how the hazards may be prioritized is below (Red equaling high priority):

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | | | |
| | Medium | | | |
| | Low | | | |

After identifying the "higher" priority hazards in the community, each of the "high" priority hazards were profiled. The hazard profiling include the incorporation of all new information, material, and reports to better help the Planning Team and the community understand the hazard.

Additionally, for each of the profiled hazards, the Planning Team then analyzed the community's exposure to each hazard (inventory of assets) and the potential impact under scenario events. The Planning Team used HAZUS and hazards intersect analyses recently completed within San Bernardino County to produce this information. See Section 4 for more information.

### 3.4.2 Set Goals

Goal setting was approached by the Planning Team as a two layered process. The first layer involved the stakeholders acting together as the Planning Team. The second layer involved the individual Special Districts working internally to coordinate those goals identified by the Planning Team with the goals identified internally by the Special Districts. The Planning Team validated and identified new Goals and Objectives for the MJHMP update in 2016. The Planning Team reviewed the hazard exposure and scenario impacts developed during the Risk Assessment portion of the process. With a firm understanding of the risk the community is potentially facing, the Planning Team then re-evaluated the 2010 Multi-Jurisdictional Hazard Mitigation Plan Goals and Objectives; assessed their status and effectiveness in meeting the 2010 Mitigation Measures and identified new Goals and Objectives.

As part of this process, the Planning Team also reviewed the County's General Plan, the State of California MJHMP, Floodplain Management Plans, Task Force After Action, and/or documents, and adjacent local jurisdiction MJHMPs to ensure the Goals and Objectives were comprehensive and compatible with those outlined in this plan.





### 3.4.3 Review and Propose Mitigation Measures

After the Goals and Objectives were established, the Planning Team then turned to identifying projects under each Goal and Objective that could be implemented to help reduce and/or eliminate the impacts from the priority hazards. As part of this process, the Planning Team reviewed the projects in the 2010 MJHMP to determine which are completed, which are ongoing, and which were deferred. For projects that were not completed the Planning Team validated whether or not the project was necessary.

With a firm understanding of past accomplishments and a good understanding of the potential exposure and scenario impacts from the Risk Assessment section, the Planning Team then started to identify projects that will help reduce and/or eliminate the risk for the high priority hazards. Again, a two-layer approach was used. The Planning Team as a whole identified common projects. These common projects were then coordinated internally by the Special Districts and the County to develop a common list of projects. After a list of all possible projects has been identified, the Planning Team then went through the process of prioritizing the projects.

To assist with this effort the Planning Team adopted the STAPLEE methodology. STAPLEE stands for:

- Social - The public must support the overall implementation strategy and specific mitigation actions. Therefore, the projects will have to be evaluated in terms of community acceptance.
- Technology - It is important to determine if the proposed action is technically feasible, will help to reduce losses in the long term, and has minimal secondary impacts. Determine whether the alternative action is a whole or partial solution, or not a solution at all.
- Administrative - Under this part of the evaluation criteria, examine the anticipated staffing, funding, and maintenance requirements for the mitigation action to determine if the jurisdiction/special district has the personnel and administrative capabilities necessary to implement the action or whether outside help will be needed
- Political - Understanding how your current community and State political leadership feel's about issues related to the environment, economic development, safety, and emergency management. This will provide valuable insight into the level of political support you may have for the mitigation activities and programs. Proposed mitigation objectives sometimes fail because of a lack of political acceptability.
- Legal - Without the appropriate legal authority, the action cannot lawfully be undertaken. When considering this criterion, determine whether your jurisdiction has the legal authority at the State, or local level to implement the action, or whether the jurisdiction must pass new laws or regulations. Each level of government operates under a specific source of delegated authority. As a general rule, most local governments operate under enabling legislation that gives them the power to engage in different activities. Identify the unit of government undertaking the mitigation action, and include an analysis of the interrelationships between local, regional, State, and Federal governments. Legal authority is likely to have a significant role later in the process when your State, or community will

have to determine how mitigation activities can best be carried out, and to what extent mitigation policies and programs can be enforced.

- Economic - Every local government experiences budget constraints at one time or another. Cost effective mitigation actions that can be funded in current or upcoming budget cycles are much more likely to be implemented than mitigation actions requiring general obligation bonds or other instruments that would incur long-term debt to a community. Local communities with tight budgets or budget shortfalls may be more willing to undertake a mitigation initiative if it can be funded, at least in part, by outside sources. “Big ticket” mitigation actions, such as large-scale acquisitions and relocation, are often considered for implementation in a post-disaster scenario when additional Federal and State funding for mitigation is available.
- Environmental - Impact on the environment is an important consideration because of public desire for sustainable and environmentally healthy communities and the many statutory considerations, such as NEPA, to keep in mind when using Federal funds. The Planning Team needed to evaluate whether, when implementing mitigation actions, there would be negative consequences to environmental assets such as threatened and endangered species, wetlands, and other protected natural resources.

In addition to the STAPLEE methodology, the Planning Team incorporated other criteria/factor questions into the process to help engage and solicit input from members. Examples of these criteria/factor questions are:

- Does the Action:
  - Solve the problem?
  - Address Vulnerability Assessment?
  - Reduce the exposure or vulnerability to the highest priority hazard?
  - Address multiple hazards?
  - Address more than one (1) Goal/Objective?
  - Benefits equal or exceed costs?

- Can the Action:
  - Be implemented with existing funds?
  - Be implemented by existing state or federal grant programs?
  - Be completed within the 5-year life cycle of the LMJHMP?
  - Be implemented with currently available technologies?

- Will the Action:
  - Be accepted by the community?
  - Be supported by community leaders?
  - Adversely impact segments of the population or neighborhoods?
  - Require a change in local ordinances or zoning laws?
  - Result in legal action such as a lawsuit?
  - Positively or negatively impact the environment?
  - Comply with all local, state, and federal environmental laws and regulations?





- Is there:
  - Sufficient staffing to undertake the project?
  - Existing authority to undertake the project?

After going through the above mentioned process for each project, the Planning Team identified higher priority projects.

### 3.4.4 Draft the Multi-Jurisdictional Hazard Mitigation Plan

The Multi-Jurisdictional Hazard Mitigation Plan Update was drafted by the Project Manager, based on input and comments provided by the Planning Team. As indicated previously, the Planning Team used the 2010 MJHMP as a starting point but revised it to reflect updated information). The 2016 MJHMP format and is similar to the 2010 plan with slight heading changes and differences in content. In addition to the heading changes and improved risk assessment information, the Planning Team also uses the FEMA Guidance and materials provided by the consultant hired to coordinate the Operational Area MJHMP and Stakeholder groups. This material aided in the Planning Team’s understanding of the level of detail and type of information that is excepting in each section.

This process started with the Special Districts and County providing information to the Planning Team through their liaison on the planning team. After the Planning Team ranked and prioritized the materials, the liaisons returned to their respective Special Districts to vet the Planning Team’s work. The Planning Team then worked together with the vetted materials to produce the draft MJHMP. As mentioned earlier, each section was reviewed and updated as necessary. While some Planning Team members are responsible for the updating select sections, all members are responsible for reviewing and commenting on the entire MJHMP. The Planning Team Project Manager was responsible for version control and distribution of the final MJHMP for review.

Once the MJHMP update was drafted, the Planning Team provided opportunities for the public to review and comment on the plan. After the public comment period was closed, the Planning Team finalized the plan and forwarded to Cal EMA and FEMA for approval.

### 3.4.5 Adopt the Plan

The San Bernardino County Board of Supervisors created each of the Special Districts to provide a specific service to a particular area/population of San Bernardino County. These Special Districts are Board Governed in that the Board of Supervisors has direct control and legislative oversight of the Special Districts. The Board of Supervisors takes action on behalf of each Special District whenever governance items are necessary. As the Five special districts are separate legal entities from the County of San Bernardino for tax/revenue purposes the Board of supervisors, acting as the Board of Directors for each Special District, will be adopting the Multi-

Jurisdictional Hazard Mitigation Plan on behalf of each Special District. The Special Districts are not independent from San Bernardino County but are controlled and administered as any other County Department is administered. In order to comply with legal requirement for each of the five Special Districts, separate resolutions are required. Copies of these resolutions are attached at the front of this MJHMP.

San Bernardino County Board of Supervisors is responsible for the review, approval, and adoption of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) update for the unincorporated area of San Bernardino County, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, the Big Bear Valley Recreation and Park District, Bloomington Recreation and Park District and for the County's board governed Special Districts Department. It is also the intent of the San Bernardino County Board of Supervisors to take appropriate actions to incorporate the MJHMP update into the San Bernardino County General Plan.

After Cal EMA and FEMA have approved the HMP update, it will be adopted by the San Bernardino County Board of Supervisors. Currently, the adoption process is scheduled for **(date to be determined)**. The item will be part of the consent calendar subject to a public hearing if necessary. The HMP will be listed on the agenda with the plan being made available electronically to the general public for at least three (3) business days prior to the Board of Supervisor's meeting date. Any member of the public can make comments on the Plan during the meeting prior to any action by the Board of Supervisors.





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# Section 4. Risk Assessment

The goal of mitigation is to reduce and/or eliminate the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. However, mitigation should be based on an assessment of the risk.

This Risk Assessment Section evaluates the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure, and people. It identifies the characteristics and potential consequences of hazards, how much of the unincorporated areas of the County could be affected by a hazard, and the impact on unincorporated County area assets. The Risk Assessment approach consists of three (3) components:

- ***Hazard Identification*** *– Identification and screening of hazards (Section 4.1)*
- ***Hazard Profiles*** *– Review of historic occurrences and assessment of the potential for future events (Section 4.2)*
- ***Vulnerability Assessment*** *– Determination of potential losses or impacts to buildings, infrastructure and population (Section 4.3)*

## 4.1 Hazard Identification

### 4.1.1 Hazard Screening Criteria

Per FEMA Guidance, the first step in developing the Risk Assessment is identifying the hazards. The County's HMP Planning Team reviewed a number of previously prepared hazard mitigation plans and other relevant documents to determine the universe of natural hazards that have the potential to affect the County and the nearby region. Table 4-1 provides a crosswalk of hazards identified in the 2010 San Bernardino County Multijurisdictional Hazard Mitigation Plan Update, the County of San Bernardino 2007 General Plan Safety Element, Single Jurisdictional Plans and the 2013 CA State Hazard Mitigation Plan. Seventeen different hazards were identified based on a thorough document review. The crosswalk was used to develop a preliminary hazards list providing a framework for County HMP Planning Team members to evaluate which hazards were truly relevant to the County and which ones are not. For example, volcanic activity was considered to be of little relevance to the County, while earthquake, flooding, and wildfire were indicated in almost all hazard documentation.





**Table 4-1: Document Review Crosswalk**

| Hazards | 2010 San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan | County of San Bernardino 2007 General Plan Safety Element | Single Jurisdictional Plans | 2013 CA State Hazard Mitigation Plan |
|---|---|---|---|---|
| Climate Change | | | | ■ |
| Dam Inundation | | | ■ | ■ |
| Drought | | | ■ | ■ |
| Earthquake/ Geologic Hazards | ■ | ■ | ■ | ■ |
| Extreme Heat | | | | ■ |
| Extreme Cold | | | | ■ |
| Flood | ■ | ■ | ■ | ■ |
| Hazardous Waste | | ■ | ■ | ■ |
| High Winds/ Straight Line Winds | | ■ | ■ | |
| Hail | | | | |
| Infestation | | | | |
| Lightning | | | | |
| Terrorism | | | ■ | ■ |
| Tornado | | | | |
| Volcanic Activity | | ■ | | ■ |
| Wildfire | ■ | ■ | ■ | ■ |
| Winter Storm (Heavy Snowfall) | | | | ■ |

In addition to a document review, previous hazard occurrences were used to identify hazards for this hazard mitigation plan. Previous hazard occurrences provide a historical view of hazards that have affected the County in the past, and thus provide a window into the potential hazards that can affect the County in the future. Information about federal and state disaster declarations in San Bernardino County (declarations are declared by County) was compiled from FEMA and Cal EMA's databases, as shown in Table 4-2. Though not a complete snapshot of hazard incidences in the County (since not all hazard events are federally or state declared), Table 4-2 provided the County HMP Planning Team with solidified accounts of the types and extent of disasters that have affected the County dating back to 1965 when flooding affected entire regions of San Bernardino County. As indicated in Table 4-2 large regional incidents have affected San Bernardino County, including the California Wildfires of 1999. Most recently, disasters for terrorist attacks (2015), flood (2011) and severe storms (2010) were declared in San Bernardino County. The disaster declarations in Table 4-2 provide a baseline for consideration in the hazard prioritization process.

**Table 4-2: Federal, State and County Declared Disasters**

| Disaster Number | Declaration Date | Disaster Type | Incident Type | Title |
|---|---|---|---|---|
| **Federal Declarations** | | | | |
| **Major Disaster Declarations** | | | | |
| **1952** | 1/26/2011 | DR | Flood | Severe Winter Storms, Flooding, and Debris and Mud Flows |
| **1884** | 3/8/2010 | DR | Severe Storm(s) | Severe Winter Storms, Flooding, and Debris and Mud Flows |
| **1731** | 10/24/2007 | DR | Fire | Wildfires, Flooding, Mud Flows, and Debris Flows |
| **1689** | 3/13/2007 | DR | Freezing | Severe Freeze |
| **1585** | 4/14/2005 | DR | Severe Storm(s) | Severe Storms, Flooding, Landslides, and Mud and Debris Flows |
| **1577** | 2/4/2005 | DR | Severe Storm(s) | Severe Storms, Flooding, Debris Flows, and Mudslides |
| **1498** | 10/27/2003 | DR | Fire | Wildfires, Flooding, Mudflow and Debris Flow Directly Related T |
| **1203** | 2/9/1998 | DR | Severe Storm(s) | Severe Winter Storms and Flooding |
| **1046** | 3/12/1995 | DR | Severe Storm(s) | Severe Winter Storms, Flooding Landslides, Mud Flow |
| **1044** | 1/10/1995 | DR | Severe Storm(s) | Severe Winter Storms, Flooding, Landslides, Mud Flows |
| **1005** | 10/28/1993 | DR | Fire | Fires, Mud/Landslides, Flooding, Soil Erosion |
| **979** | 2/3/1993 | DR | Flood | Severe Winter Storm, Mud & Land Slides, & Flooding |
| **947** | 7/2/1992 | DR | Earthquake | Earthquake & Aftershocks |
| **935** | 2/25/1992 | DR | Flood | Rain/Snow/Wind Storms, Flooding, Mudslides |
| **894** | 2/11/1991 | DR | Freezing | Severe Freeze |
| **872** | 6/30/1990 | DR | Fire | Fires |
| **690** | 9/22/1983 | DR | Flood | Flash Flooding |
| **687** | 7/1/1983 | DR | Flood | Flooding |
| **677** | 2/9/1983 | DR | Coastal Storm | Coastal Storms, Floods, Slides & Tornadoes |
| **635** | 11/27/1980 | DR | Fire | Brush & Timber Fires |
| **615** | 2/21/1980 | DR | Flood | Severe Storms, Mudslides & Flooding |
| **547** | 2/15/1978 | DR | Flood | Coastal Storms, Mudslides & Flooding |
| **521** | 9/21/1976 | DR | Flood | Flooding, Tropical Storm Kathleen |
| **295** | 9/29/1970 | DR | Fire | Forest & Brush Fires |
| **253** | 1/26/1969 | DR | Flood | Severe Storms & Flooding |
| **223** | 1/2/1967 | DR | Flood | Severe Storms & Flooding |
| **211** | 12/7/1965 | DR | Flood | Heavy Rains & Flooding |
| **Fire Management Assistance Declarations** | | | | |
| **2955** | 9/2/2011 | FM | Fire | Hill Fire |
| **2841** | 10/4/2009 | FM | Fire | Sheep Fire |
| **2836** | 9/1/2009 | FM | Fire | Pendleton Fire |
| **2833** | 8/31/2009 | FM | Fire | Oak Glen Fire |
| **2792** | 11/15/2008 | FM | Fire | Freeway Fire Complex |
| **3279** | 10/23/2007 | EM | Fire | Wildfires |
| **2738** | 10/22/2007 | FM | Fire | Grass Valley Fire |
| **2728** | 9/15/2007 | FM | Fire | Butler 2 Fire |
| **2653** | 7/12/2006 | FM | Fire | Sawtooth Fire Complex |





| Disaster Number | Declaration Date | Disaster Type | Incident Type | Title |
|---|---|---|---|---|
| **3248** | 9/13/2005 | EM | Hurricane | Hurricane Katrina Evacuation |
| **2503** | 10/25/2003 | FM | Fire | Old Fire |
| **2501** | 10/23/2003 | FM | Fire | Ca-Grand Prix Fire-10-23-2003 |
| **2497** | 9/6/2003 | FM | Fire | Ca-Bridge Fire-09-05-2003 |
| **2491** | 8/19/2003 | FM | Fire | Ca-Locust Wildfire-08-19-2003 |
| **Emergency Declarations** | | | | |
| **3140** | 9/1/1999 | EM | Fire | Ca-Wildfires-08/25/1999 |
| **CALOES Emergency and Disaster Proclamations/ Executive Orders** | | | | |
| **Other Disasters** | | | | |
| **2464** | 9/24/2002 | FS | Fire | Williams Fire |
| **2433** | 6/27/2002 | FS | Fire | Louisiana Fire |
| **2425** | 6/17/2002 | FS | Fire | Blue Cut Fire |
| **###** | 12/18/2015 | EM | Terrorist Attack | Mass Shooting |
| **State Declarations** | | | | |
| **145** | 2/14/1963 | | Severe Storms | California Severe Storms, Heavy Rains, & Flooding |
| **47** | 12/22/1955 | | Flood | California Flood |
| **15** | 2/5/1954 | | Flood | California Flood & Erosion |
| **County Declarations** | | | | |
| | 3/13/1990 | | Earthquake | Upland Earthquake |
| | 10/31/1988 | | Fire | Texas Fire (Watershed Damage) |
| | 9/3/1987 | | Fire | Wildland Fires |
| | 7/13/1984 | | Weather | Unstable Weather Conditions (City of Big Bear Lake, CSD, Co. Flood Control, Victor Valley Waste Water Authority, Juniper Riviera County Water District) |
| | 9/29/1979 | | Gasoline Shortage | Gasoline Shortage Emergency |
| | 6/28/1979 | | Water Shortage | Water Shortage (Lake Gregory) |
| | 7/22/1960 | | Fire | Major and Widespread Fires |

### 4.1.2 Hazard Prioritization

The Planning Team determined that the County and its Special Districts should focus over the next five (5) years on hazards that fell within the HIGH and MEDIUM "Probability" and "Impact" categories. While all the hazards present a potential problem in the County, the Planning Team felt that if they were able to reduce or eliminate the risk from these hazards, it would provide a greater service to the people within the jurisdiction. Table 4-3 illustrates how the final prioritization of the hazard; the "Green" colored box represents the highest priority hazards; and the "White" colored boxes represent lower (second and third tier) priority hazards.

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | Wildfire<br>Flood<br>Earthquake/ Geologic Hazards | Drought | |
| | Medium | Terrorism | Climate Change (Extreme Heat and other) | Hail<br>Infestation |
| | Low | | Dam Inundation | Tornado<br>High Winds<br>Winter Storm<br>Lightning<br>Extreme Cold |

**Table 4-3: Prioritized Hazard Assessment Matrix**

## 4.2 Hazard Profiles

Although the County faces the risk of experiencing many natural and manmade hazards, this section profiles only the County's highest priority natural hazards the unincorporated County areas and Special District areas are expected to experience; earthquake, wildfire, flood, drought, terrorism and climate change. The priority hazards are based on the Calculated Priority Risk Index (CPRI) explained in Section 4.1.2.





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## 4.3 Earthquake Geologic Hazards

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the earth as the huge plates that form the earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free, causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.
Earthquakes can strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world.

### 4.3.1 Regulatory Environment

The Alquist-Priolo Earthquake Fault Zoning (AP) Act was passed into law following the destructive February 9, 1971 San Fernando earthquake. The AP Act provides a mechanism for reducing losses from surface fault rupture on a statewide basis. The intent of the AP Act is to ensure public safety by prohibiting the siting of most structures for human occupancy across traces of active faults that constitute a potential hazard to structures from surface faulting or fault creep.

The 2013 California Building Standards Code (also known as Title 24) became effective for the County on January 1st, 2014. Title 24 includes CBC Section 3417: Earthquake Evaluation and Design for Retrofit of Existing Buildings which can be viewed at http://www.bsc.ca.gov/codes.aspx

Changes or additions to the seismic provisions come from many different sources, including new research results and documentation of performance in past earthquakes. A primary resource is the National Earthquake Hazard Reduction Program (NEHRP) Recommended Seismic Provisions for New Buildings and Other Structures (FEMA P-750: http://www.fema.gov/media-library/assets/documents/18152). FEMA's companion document Earthquake Resistant Design





Concepts (FEMA P-749: http://www.fema.gov/media-library/assets/documents/21866) provides a nontechnical background explanation.

### 4.3.2 Past Occurrences

Table 4-4 shows earthquakes greater than Magnitude 4.0 that have been felt within the San Bernardino County area in the last five years.

**Table 4-4: Earthquakes: 2010-2015 San Bernardino County**

| Date | Name |
|---|---|
| 9/14/2011 | Calimesa 4.1 |
| 1/15/2014 | Fontana 4.4 |
| 7/5/2014 | Running Springs 4.6 |
| 3/29/2014 | Brea 5.1 |
| 7/25/2015 | Fontana 4.2 |
| 9/16/15 | Big Bear Lake 4.0 |
| 12/30/2015 | Muscoy 4.4 |
| 1/6/2016 | Banning 4.4 |

There are hundreds more small (M<4.0) earthquakes that have occurred within San Bernardino County during this same time frame. Those with a magnitude of below 4.0 are not listed.

### 4.3.3 Location/Geographic Extent

Figure 4-1 shows the locations of major faults in California, including the four (4) major faults in Southern California in relation to San Bernardino County. These faults are the Southern San Andreas, the San Jacinto, the Elsinore, and the Garlock Faults. There are also many smaller faults within San Bernardino County capable of producing significant earthquakes. However, these four faults are considered by the United States Geological Survey (USGS) and the California Geological Survey (CGS) to be the most dangerous in the County. (California Geological Survey Special Publication 42, Interim Revision 2007, "Fault-Rupture Hazard Zones in California" - Alquist-Priolo Earthquake Fault Zoning Act). Other geologic hazards include liquefaction and landslides. Both occur during and after earthquakes.

Figure 4-1: Major California Faults

Liquefaction of the ground occurs when the groundwater table is high and soil conditions are favorable. Liquefaction Susceptibility Zones as mapped by the USGS for the 2008 ShakeOut Scenario1 shows areas of the County susceptible to liquefaction during an earthquake. See Figure 4-2





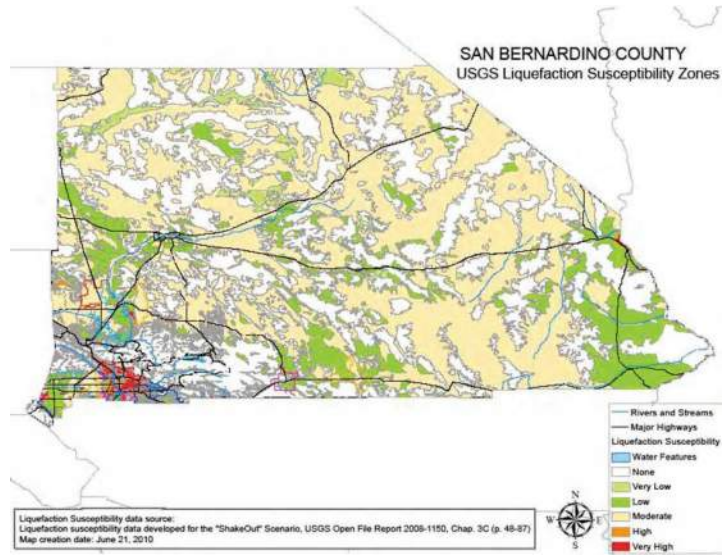


Figure 4-2: USGS Liquefaction Susceptibility Zone

### 4.3.4 Magnitude/Severity

The MMI Scale measures earthquake intensity as shown in Table 4-5. The MMI Scale has 12 intensity levels. Each level is defined by a group of observable earthquake effects, such as ground shaking and/or damage to infrastructure. Levels I through VI describe what people see and feel during a small to moderate earthquake. Levels VII through XII describe damage to infrastructure during a moderate to catastrophic earthquake.

See Section 4.3.5 to see how magnitude and severity are linked to the probability of earthquake occurrences.

Table 4-5: MMI Scale

| Earthquake Magnitude and Intensity | | |
|---|---|---|
| **Magnitude ($M_w$)** | **Intensity (Modified Mercalli Scale)** | **Description** |
| 1.0 – 3.0 | I | I. Not felt except by very few people under especially favorable conditions. |
| 3.0 – 3.9 | II – III | II. Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing. |
| | | III. Felt quite noticeably indoors. Many do not recognize it as an earthquake. Standing motorcars may rock slightly. |
| 4.0 – 4.9 | IV – V | IV. Felt by many who are indoors; felt by a few outdoors. At night, some awakened. Dishes, windows and doors rattle. |
| | | V. Felt by nearly everyone; many awakened. Some dishes and windows broken; some cracked plaster; unstable objects overturned. |
| 5.0 – 5.9 | VI – VII | VI. Felt by everyone; many frightened and run outdoors. Some heavy furniture moved; some fallen plaster or damaged chimneys. |
| | | VII. Most people alarmed and run outside. Damage negligible in well-constructed buildings; considerable damage in poorly constructed buildings. |
| 6.0 – 6.9 | VII – IX | VIII. Damage slight in special designed structures; considerable in ordinary buildings; great in poorly built structures. Heavy furniture overturned. Chimneys, monuments, etc. may topple. |
| | | IX. Damage considerable in specially designed structures. Buildings shift from foundations and collapse. Ground cracked. Underground pipes broken. |
| 7.0 and Higher | VIII and Higher | X. Some well-built wooden structures destroyed. Most masonry structures destroyed. Ground badly cracked. Landslides on steep slopes. |
| | | XI. Few, if any, masonry structures remain standing. Railroad rails bent; bridges destroyed. Broad fissure in ground. |
| | | XII. Virtually total destruction. Waves seen on ground. Objects thrown into the air. |

### 4.3.5 Frequency and Probability of Occurrence

Several of the major Southern California faults have a high probability of experiencing a Magnitude 6.7 or greater earthquake within the next 30 years (Figure 4-2); 59% probability of a M6.7 or greater on the Southern San Andreas Fault, 31% probability on the San Jacinto Fault, and 11% probability on the Elsinore Fault. These probabilities were determined by the USGS and CGS in a 2008 study (2007 Working Group on California Earthquake Probabilities, 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2): U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 http://pubs.usgs.gov/of/2007/1437/).





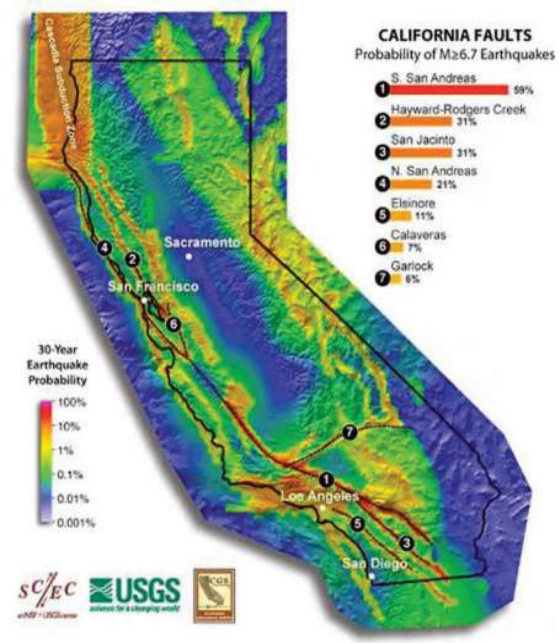


Figure 4-3: California Faults Probability of ≥ M 6.7 Earthquake

As shown in Figure 4-3 the probability of an earthquake with a Magnitude 6.7 or greater occurring somewhere in Southern California within the next 30 years is estimated to be 97% (2007 Working Group on California Earthquake Probabilities, 2008). As can be seen in the table, earthquake probabilities in Southern California are higher than those for Northern California.

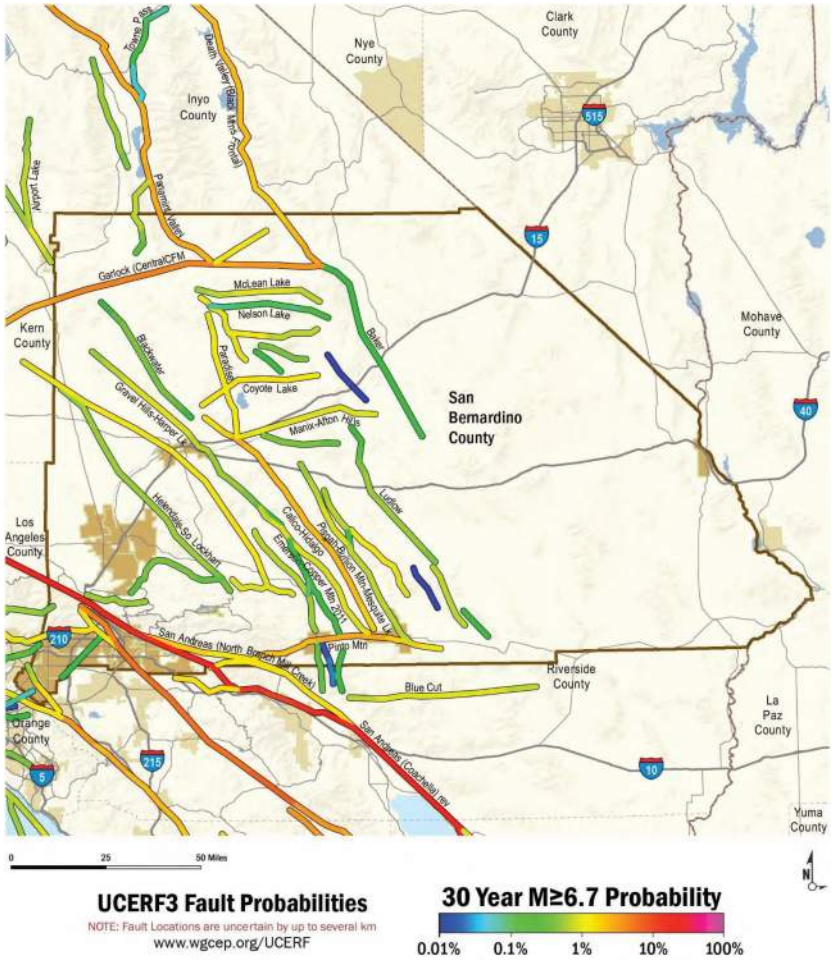


Figure 4-4: California Area Earthquake Probabilities by Magnitude





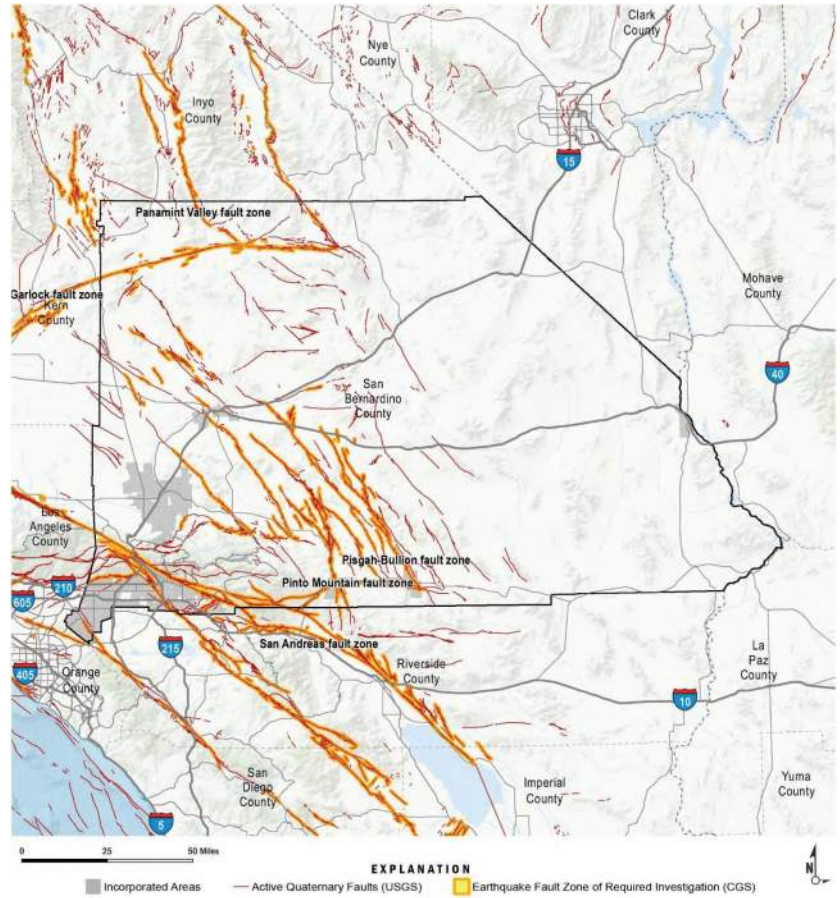


Figure 4-5: Earthquake Fault Zone

## 4.4 Wildfire

Wildfires present a significant potential for disaster in the County, a region of relatively high temperatures, low humidity, and low precipitation during the summer. This long summer season is followed by a fall season that is famous for high velocity, very dry winds that come out of the desert. The Santa Ana winds very consistently arrive from the middle of October to the end of November. In and of themselves, these weather patterns would be of little significance without the un-naturally dense forest and the dense undergrowth that has been allowed to grow unabated for the last several decades. Compounding the vegetative growth that has occurred is the unchecked development of substantial housing and businesses in mountain communities. This urbanized growth has required parallel growth and sophistication in the fire service that responds to wildfires in the wild land urban interface. With immediate responses to initial fire starts, the vast majority of fires are successfully extinguished in short order. In doing so, this eliminates nature's way of thinning the forest through smaller fires.

Another factor that is a potential for disaster is the number of dead trees in the mountain region. Due to the over densification of the forest combined with drought conditions during the past ten years, trees in the local mountains have become weakened, creating a perfect environment for Bark Beetles to proliferate from 2003 to 2008. Combine these severe burning conditions with people or lightning and the stage is set for the occurrence of large, destructive wildfires. In addition, the forested areas of the County are not only the most popular, with the most visitors in the Nation, but are also the most populated in residences and businesses in the Nation as well. The final element in this catastrophe waiting to happen is that because of the steep mountain terrain, there are only five routes in and out for almost 60,000 residents. On a holiday weekend though, this population can dramatically increase by 50,000 to 100,000 people as weekend vacationers.

### 4.4.1 Regulatory Environment

#### 4.4.1.1 State

Wildfire State Responsibility Area (SRA) Fire Safe Regulations outline basic wildland fire protection standards for local jurisdictions. SRA Fire Safe Regulations (if policed) can decrease the risk of wildfire events in the wildland interface. SRA Fire Safe Regulations do not supersede local regulations, which equal or exceed minimum state regulations. The State statute for wildfire protection is Public Resources Code, Section 4290. Requirements in the code include information on the following (CA Fire Alliance):

- Road Standards for Fire Equipment Access
- Standards for Signs Identifying Streets, Roads and Buildings
- Minimum Private Water Supply Reserves for Emergency Fire Use
- Fuel Breaks and Greenbelts





#### 4.4.1.2 Local

##### 4.4.1.2.1 Fire Hazard Abatement Program

In an effort to reduce the threat of wild fires, the San Bernardino County Fire Hazard Abatement (FHA) Program enforces the fire hazard requirements outlined in San Bernardino County Code Section 23.0301–23.0319. The primary function of the Fire Hazard Abatement Program is to reduce the risk of fires within communities by pro-actively establishing defensible space and reduction/removal of flammable materials on properties.

The Fire Hazard Abatement Program conducts surveys to identify fire hazards throughout the year. Fire hazards are identified and notices to abate the hazard(s) are mailed to property owners. Property owners are given 30 days to abate the violations. Failure to abate may result in citations, penalties, and/or fees for abatement by the County. The Fire Hazard Abatement Program responds to complaints year round in the unincorporated areas and contracting Cities and Fire Districts.

### 4.4.2 Past Occurrences

Wildfire locations from 1900 – 2016 are shown in Figure 4-6. In the past five years (since the 2010 MJHMP was approved) there have been 13 significant wildland fires within San Bernardino County. These fires are listed in Table 4-7, and several of the more damaging fires are discussed below.

**Table 4-6: Wildfire Occurrences 2010-2016**

| Number | Date | Name | Acres |
|---|---|---|---|
| 1. | 9/5/2011 | Hill Fire | 1,158 |
| 2. | 11/5/2012 | Devore Fire | 335 |
| 3. | 6/28/2013 | Mill Fire | 534 |
| 4. | 8/8/2013 | Sharp Fire | 243 |
| 5. | 9/24/2013 | Sierra Fire | 200 |
| 6. | 4/30/2014 | Etiwanda Fire | 2,143 |
| 7. | 5/13/2014 | Rancho Incident | 1,548 |
| 8. | 3/31/2015 | River Bottom Fire | 185 |
| 9. | 6/17/2015 | Lake Fire | 31,359 |
| 10. | 7/17/2015 | North Fire/ Pines Fire | 4,250 |
| 11. | 8/23/2015 | Summit Fire | 555 |
| 12. | 8/7/2016 | Pilot Fire | 8,110 |
| 13. | 8/16/2016 | Blue Cut Fire | 36,274 |
| | | | **86,894** |

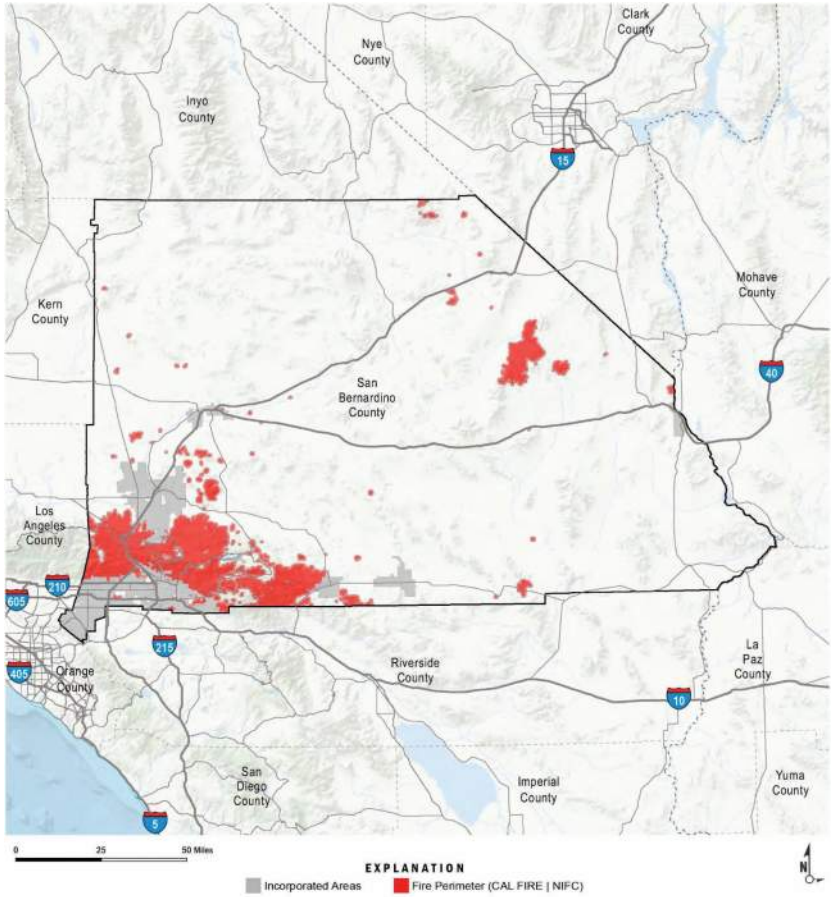


**Figure 4-6: Wildfire History 1900 – 2016 (CalFire and USFS Data 2010)**





The 2016 Blue Cut Fire was a reminder that wildfires are a significant threat to lives and property in the unincorporated San Bernardino County area. The Blue Cut Fire burned 36,274 acres, destroying an estimated 105 single family residences and 216 outbuildings. In addition, 3 single family residences and 5 other structures were damaged.

In 2015 The Lake Fire burned 31,359 acres and was the cause of 6 minor firefighter injuries and 1 residence and 3 outbuildings were destroyed.

North Fire/Pines Fire in 2015 burned a total of 4,250 acres, destroying 7 homes, 16 outbuildings and 44 vehicles in the community of Baldy Mesa. No injuries were reported.

The Blue Cut Fire, Lake Fire, and North Fire/ Pines Fire all occurred in the County's mapped Very High Fire Severity Zone. Mitigation efforts have reduced but not eliminated the threat from wildfire. The strong fall winds that are capable of creating firestorms cannot be controlled. Drought cannot be controlled. Fuels reduction programs reduce the potential spread of fire, upgraded Building Codes make structures more fire resistant, and public education prepares residents for wildfires. However, the threat of wildfire remains. The continuing goal is to reduce the threat from wildfire wherever possible.

### 4.4.3 Location/Geographic Extent

Using information from the California Department of Forestry (CAL FIRE) Figure 4-8, illustrates the areas at risk to a wildfire event. The areas with the highest risk of wildfire are the in the southwestern portions of County in the mountainous region.

Figure 4-7 illustrates vegetation mortality due to bark beetle infestation, drought, and other factors in San Bernardino County. These conditions create extreme fire hazards.

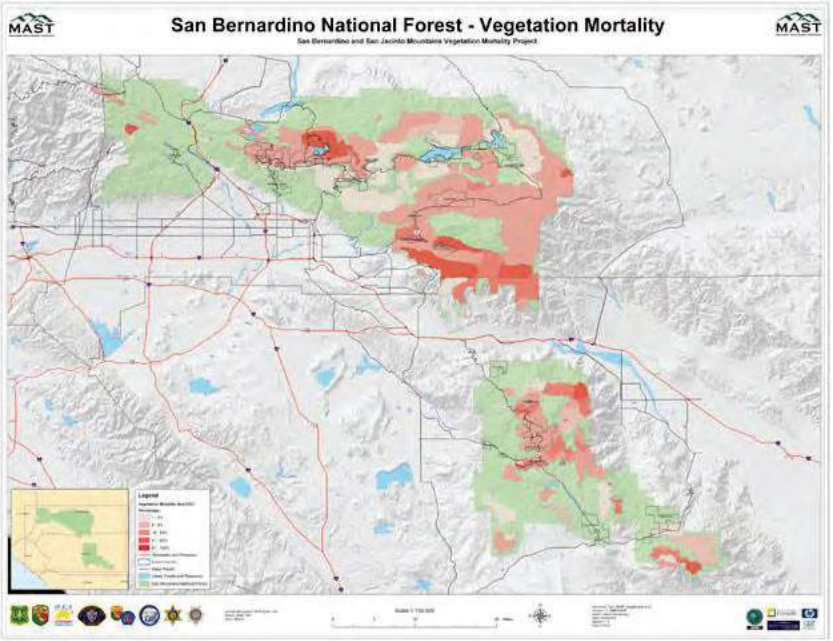


**Figure 4-7: San Bernardino National Forest – Vegetation Mortality**





### 4.4.4 Magnitude/Severity

Fire Severity Zones are used in determining additional protective measures required when building new structures or remodeling older structures within the particular zone. Additional measures must be taken on the property around a structure in the higher ranked fire Severity Zones.

CAL FIRE adopted Fire Hazard Severity Zone maps for LRA in June 2008. The Fire Severity Zones for County identifies areas of Very High, High, and Moderate fire hazard severity throughout the County and are mapped in Figure 4-8.

Fire Severity Zones are used in determining additional protective measures required when building new structures or remodeling older structures within the particular zone. Additional measures must be taken on the property around a structure in the higher ranked fire Severity Zones.

Fire hazard mapping is a way to measure the physical fire behavior to predict the damage a fire is likely to cause. Fire hazard measurement includes vegetative fuels, probability of speed at which a wildfire moves the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The model used to develop the information in accounts for topography, especially the steepness of the slopes (fires burn faster as they burn up-slope.). Weather (temperature, humidity, and wind) also has a significant influence on fire behavior. The areas depicted as moderate and high in are of particular concern and potential fire risk in these are constantly increasing as human development, and the wildland urban interface areas expand.

### 4.4.5 Frequency/Probability of Future Occurrences

In San Bernardino County, wildfire season commences in the summer when temperatures are high, humidity is low, and conditions remain dry. The season continues into the fall, when the County experiences high velocity, very dry winds coming out of the desert. A statewide drought beginning in 2011 has caused the state to be the driest it's been since record keeping began back in 1895 (California 2016). This has caused extremely dry conditions in unincorporated areas of the County creating plentiful fuel sources for wildfires.

USGS LANDFIRE (Landscape Fire and Resource Management Planning Tools), is a shared program between the wildland fire management programs of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior, providing landscape scale geo-spatial products to support cross-boundary planning, management, and operations. Historical fire regimes, intervals, and vegetation conditions are mapped using the Vegetation Dynamics Development Tool (VDDT). This USGS data supports fire and landscape management planning goals in the National Cohesive Wildland Fire Management Strategy, the Federal Wildland Fire Management Policy, and the Healthy Forests Restoration Act.

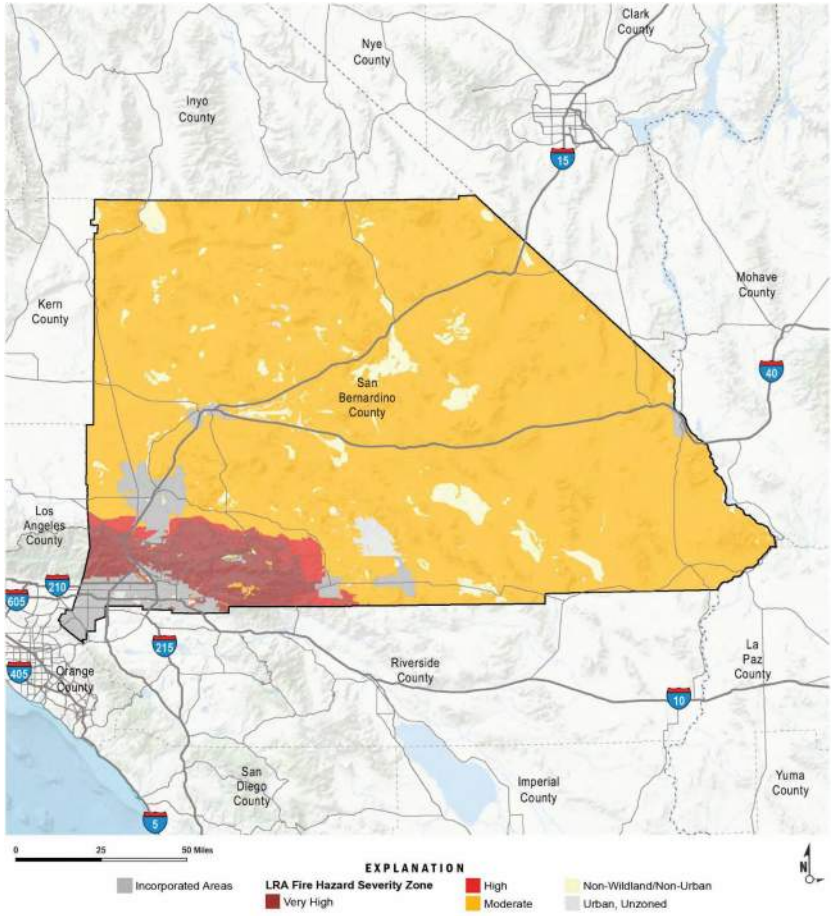


Figure 4-8: Fire Hazard Severity Zone





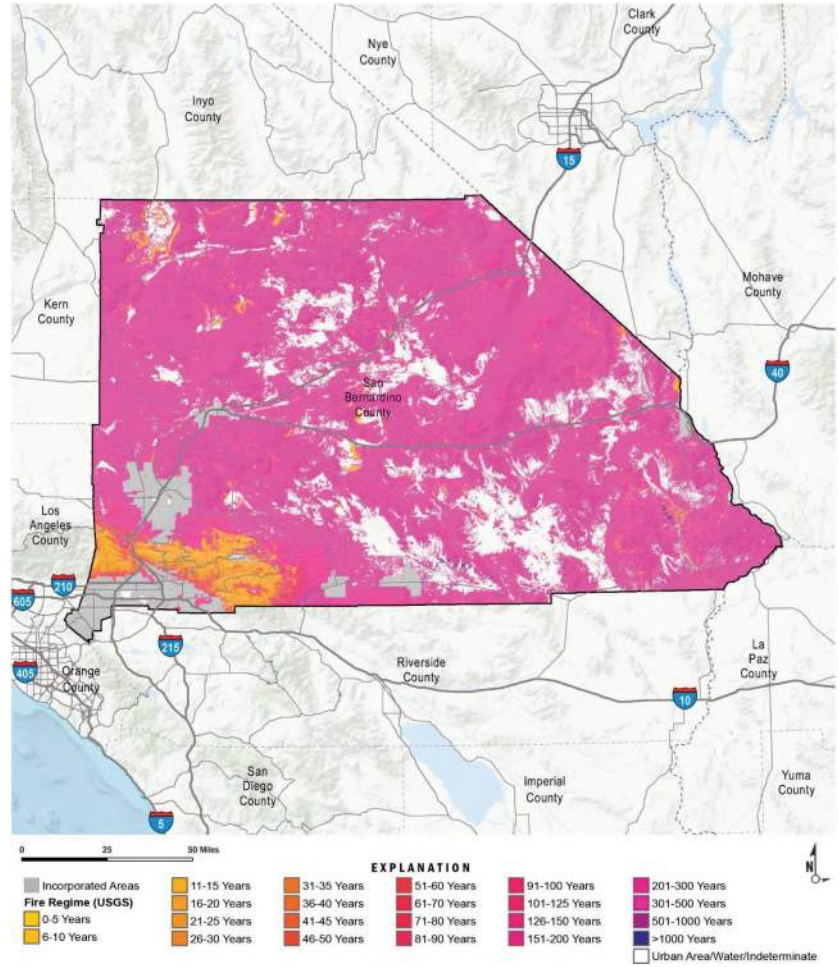


Figure 4-9: USGS Mean Fire Return Interval Map

As part of the USGS Landfire data sets, the Mean Fire Return Interval (MFRI) layer quantifies the average period between fires under the presumed historical fire regime. MFRI is intended to describe one component of historical fire regime characteristics in the context of the broader historical time period represented by the LANDFIRE Biophysical Settings (BPS) layer and BPS Model documentation.

MFRI is derived from the vegetation and disturbance dynamics model VDDT (Vegetation Dynamics Development Tool) (LF_1.0.0 CONUS only used the vegetation and disturbance dynamics model LANDSUM). This layer is created by linking the BpS Group attribute in the BpS layer with the Refresh Model Tracker (RMT) data and assigning the MFRI attribute. This geospatial product should display a reasonable approximation of MFRI, as documented in the RMT. See Figure 4-9 for predicted fire return interval for the jurisdictional area.





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## 4.5 Flood

Floods are the second most common and widespread of all natural disasters faced by the County and its Special Districts. Most communities in the United States have experienced some kind of flooding during or after spring rains, heavy thunderstorms, winter snow thaws, or summer thunderstorms.

A flood, as defined by the National Flood Insurance Program is: "A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from:

- Overflow of inland or tidal waters, or
- Unusual and rapid accumulation or runoff of surface waters from any source, or
- Mudflow, or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels."

Floods can be slow or fast rising but generally develop over a period of hours or days. Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Investing in mitigation measures now, such as: engaging in floodplain management activities, constructing barriers such as levees, and purchasing flood insurance will help reduce the amount of structural damage to structures and financial loss from building and crop damage should a flood or flash flood occur.

The standard for flooding is the 1% annual chance flood, commonly called the 100-year flood, the benchmark used by the Federal Emergency Management Agency (FEMA) to establish a standard of flood control in communities throughout the country. The 1% annual chance flood is also referred to as the base flood.

The 1% annual chance flood is the flood that has a 1% chance of being equaled or exceeded in any given year and it could occur more than once in a relatively short period of time. By comparison, the 10% flood (10-year flood) means that there is a 10% chance for a flood of its size to occur in any given year.





### 4.5.1 Regulatory Environmental

#### 4.5.1.1 County of San Bernardino 2007 Development Code and Zoning Ordinances

One of the purposes of this Development Code is to create a comprehensive and stable pattern of land uses upon which to plan drainage/flood control and other public facilities and utilities. The follow chapters of the development code address floodways, flood control and development near such:

Chapter 82.14 Flood Plain Safety (FP) Overlay
Chapter 85.07 Flood Hazard Development Review
Chapter 86.04 Flood Plain Management Administrator

The County has also adopted Zoning Ordinances that are not part of the County Code but are part of the General Plan. These ordinances regulate land use; map the official land use and hazard overlay districts to include safety hazard and environmental protection areas.

#### 4.5.1.2 National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. As a participating member of the NFIP, San Bernardino County is dedicated to protecting homes with more than 1,000 policies currently in force. Like most communities participating in NFIP, FEMA has prepared a detailed Flood Insurance Study (FIS) for areas of San Bernardino County. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance of flood (the 100-year flood) and the 0.2-percent annual chance of flood (the 500-year flood). Base flood elevations and the boundaries of the 100 and 500 year floodplains are shown on the Flood Insurance Rate Maps (FIRM). More information on location and geographic extent of the FIRMs are provided in this section.
The County of San Bernardino entered the regular phase of the NFIP on September 09, 1978; in 2016 the County Floodplain Administrator is Marlene Mioyshi. As a participant in the NFIP, San Bernardino County is dedicated to regulating development in the FEMA regulated floodplain areas in accordance with NFIP criteria. Before a permit to build in a floodplain area is issued, San Bernardino County ensures that two basic criteria are met:

- All new buildings and developments undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain developments must not aggravate existing flood problems or increase damage to other properties.

Structures permitted or built in the County/City before the NFIP regulatory requirements were incorporated into the San Bernardino County ordinances (before the effective date of the San Bernardino County FIRM) are called "pre-FIRM" structures. For the San Bernardino County, pre-FIRM structures are those permitted or built before September 09, 1978

Extensive FEMA NFIP databases are used to track claims for every participating community including San Bernardino County. NFIP insurance data provided by FEMA indicates that as of September 02, 2016, there were 1,772 policies in San Bernardino County, resulting in $403,874,500 of insurance in force; this amounts to $1,758,534 in total premiums. Of the 1,772 policies, only 1,070 are for structures located within the 1% annual chance flood zones, while the remaining 701 policies are for structures located outside of the FEMA identified floodplain.

Based on this analysis of insurance coverage, San Bernardino County has significant assets at risk to the 100-year flood. Of the 3,426 improved parcels within the 100-year floodplain, only 1,070 of those parcels maintain flood insurance[1]. That means approximately 2,356 improved parcels are without flood insurance in high risk areas according to FEMA. This condition could exist for a number of different reasons. Ground floor elevations are one foot above the 100-year floodplain and home owners and business that wish not to purchase floodplain insurance (non-federally backed loans, home with no mortgage, homes that are "grandfathered" into the NFIP). The 2,356 uninsured structures located in mapped floodplain areas are especially vulnerable.

Currently, San Bernardino County contains 12 Repetitive Loss (RL) properties under their jurisdictional umbrella. The total dollar amount of claims paid to date by the NFIP is $2,606,098. San Bernardino County also contains zero (0) Severe Repetitive Loss (SRL) structure.

Most of the RL properties that have experienced flooding are in the High Desert and Mountain areas of San Bernardino County are due to debris flow in localized areas. Every loss claim is seasonal in nature as all loss claims have been in December, January or February. Some mitigation on these properties has been conducted and San Bernardino County is currently tracking mitigation actions through standardized forms as required by FEMA.

***NOTE: A property does not have to be currently carrying a flood insurance policy to be considered a RL or SRL property. Often homes in communities are not carrying flood insurance but are still on the community's repetitive loss list. The "repetitive loss" designation follows a property from owner to owner; from insurance policy to no insurance policy, and even after the property has been mitigated. Having an insurance policy and making claims that fall into the repetitive loss criteria will put a property on the RL list. Even after the policy on a property has lapsed or been terminated, the property will remain on San Bernardino County RL list.***

***NOTE: The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.***
***For more information on California Regulation and the NFIP, please see California's Department of Water Resources Quick Guide here: http://www.water.ca.gov/floodmgmt/lrafmo/fmb/docs/CAQG-screen.pdf***

### 4.5.2 Past Occurrences

Severe weather events leading to flooding are listed in Table 4-7; several major events are discussed below.

[1] An improved property owner may not carry flood insurance for a number of reasons; not everyone is required to carry flood insurance. Structures carrying federally-backed mortgages that are in a SFHA are required to carry flood insurance in the County of San Bernardino. Owners who have completed the terms of the mortgage or who purchased their property outright may not choose to carry flood insurance and instead bear the costs of recovery on their own.





**Table 4-7: Severe Weather Events 2010-Present**

| Date | Type |
|---|---|
| 1/18/2010 | January 2010 Winter Storms |
| 12/17/2010 | Highland Flooding Incident |
| 8/25/2013 | Flooding- Remnants of Tropical Storm Ivo |
| 11/21/2013 | Winter Storms |
| 2/28/2014 | Winter Storm |
| 8/3/2014 | Thunderstorms, heavy rain, flash flooding, mudslides |
| 7/6/2015 | Flash flooding resulting from Lake Fire |
| 7/30/2015 | Severe Thunderstorms |
| 1/6/2016 | Strong rain, flooding and mudslides |
| 8/22/16 | Flash flooding from storm system |

### 4.5.3 Location/Geographic Extent

Table 4-8 shows the number of acres and square miles that lie in flood hazard areas within the County. Figure 4-10 provides flood hazard data for San Bernardino County as mapped in FEMA's National Flood Hazard Layer for California (April, 2010). Mapped areas include areas subject to inundation by the 1% Annual Chance Flood (also referred to as the 100-year flood), and areas subject to inundation in the 0.2% Annual Chance Flood (500-year flood).

**Table 4-8: San Bernardino County Flood Hazard Area**

| Flood Hazard Type | Sum of Acres | Sum of Square Miles |
|---|---|---|
| 100-Year Flood | 65,209 | 101.89 |
| 100-Year, Floodway | 13,968 | 21.83 |
| 500-Year Flood | 13,838 | 21.62 |
| 500-Year, Protected by Levee | 4,336 | 7 |
| **Total** | **97,351** | **152.11** |

Table 4-9 shows a land use compatibility chart for 100 year flood plains.

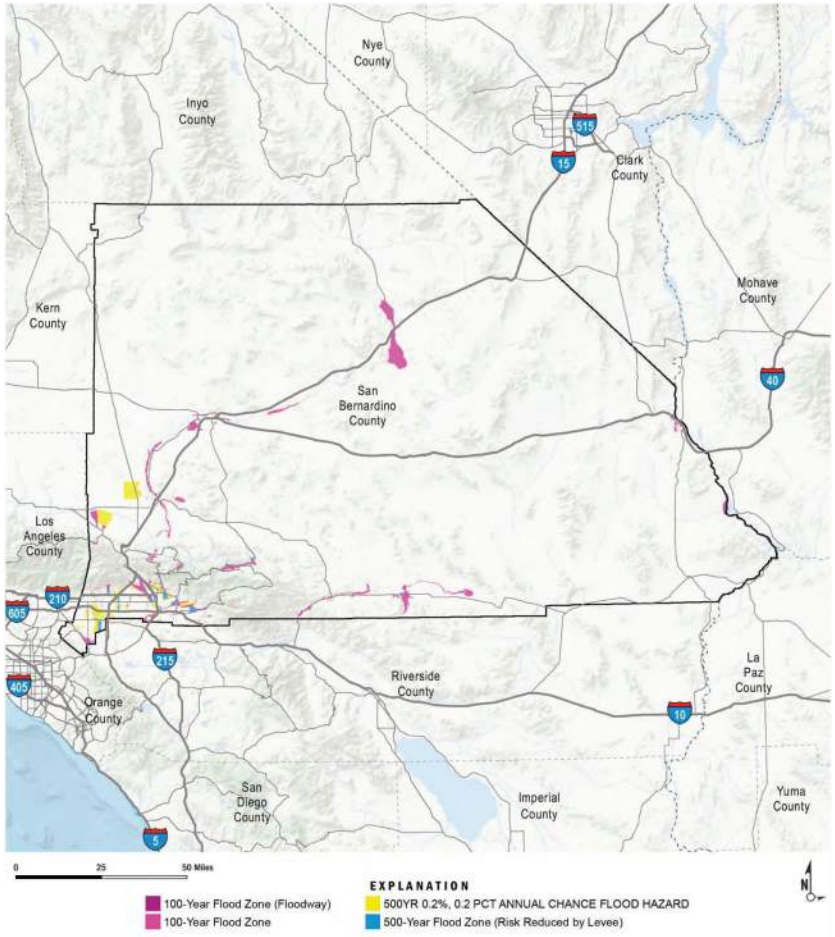


**Figure 4-10: Flood Hazard Severity Zone Map**





**Table 4-9: Land Use Compatibility Chart for 100 Year Flood Plains (General Plan Table S-1)**

| Land Uses | Compatibility in 100-Year Floodplains |
|---|---|
| **Critical**<br>Nuclear related systems; explosives or hazardous materials/ manufacturing, handling or storage; hospitals and other emergency medical facilities. | Restricted |
| **Essential**<br>Police, fire and communications systems; Emergency Operations Centers (EOC's); electric power inter-tie systems; power plants; utility substations; sewage treatment plants; water-works; local gas and electric distribution lines; aqueducts; major pipelines; major highways, bridges and tunnels; ambulance services; public assembly sites with 300 or more capacity; schools. | Restricted |
| **High Occupancy**<br>Multi-family residential of 20 or more units; major commercial including large shopping centers; office buildings; large hotels; health care clinics and convalescent homes; heavy industry; gas stations. | Generally Incompatible |
| Normal-Low Risk<br>Single-family and two-family residential; multi-family of less than 20 units; small scale commercial; small hotels, motels; light industry; warehousing. | Generally Incompatible |

*Restricted unless alternative sites are not available or feasible and it is demonstrated that, although mitigation may be difficult, hazards will be adequately mitigated. Generally Incompatible Restricted unless site investigation demonstrates that site is suitable or that hazards will be adequately mitigated.*

## 4.5.4 Magnitude/Severity

### 4.5.4.1 Flash Flooding

Flash flooding tends to occur in the summer and early fall because of the monsoon rains and is typified by increased humidity and high summer temperatures.

The desert area contains many mountain ranges that are steep and experience summer thunder storms causing flash floods in many dry washes on the desert floor. The water collects in dry lake beds throughout the desert area.

Environmental permit processing has delayed or prohibited work in the washes to provide flow lines to many bridges on county highways. Many highways do not have bridges but convey water across the road with dip crossings. Flash flooding cause's road and bridge wash outs and erosion of earthen channels and basins when they occur near these facilities.

Cities and towns often experience street closures for several days due to sediment transport and road damage. Because of the sheet flow character of the desert, many private properties experience erosion and sediment deposits. The urban valley also can experience flash flooding in its narrow canyons and within the many unimproved creeks and interim channels feeding the Santa Ana River. The valley floor in many areas is very flat so even minor rain events can produce flooding of roads and private property. In coordination with local jurisdictions, the County of San Bernardino Flood Control District has prepared Master Drainage plans for many cities and towns to provide a plan for reducing flooding due to minor storms. Maps can be found on the County's Department of Public Works website here:
http://cms.sbcounty.gov/dpw/FloodControl/Planning/MPD.aspx

However, local resources are not sufficient to cover the cost of the construction of the drainage systems. The densely populated (75% of the county population) urban valley region contains the headwaters of the Santa Ana River. The San Gabriel and San Bernardino Mountains border the North side of the valley are steep reaching 5,000 feet with alluvial fans which are developed and densely populated.

### 4.5.5 Frequency/Probability of Future Occurrences

The Flood Insurance Rate Map (FIRM) not only identifies the flood hazard zones for insurance and floodplain management purposes, but also provides a statement of probability of future occurrence.

A 500-year flood has a 0.2-percent chance of occurring in any given year; a 100-year flood has a 1-percent chance, a 50-year flood has a 2-percent chance, and a 10-year flood has a 10-percent chance of occurrence. Although the recurrence interval represents the long-term average period between floods of specific magnitude, significant floods could occur at shorter intervals or even within the same year. The FIRM maps typically identify components of the 500-year and 100-year floodplains





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## 4.6 Drought

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. Drought severity depends on numerous factors, including duration, intensity, and geographic extent, as well as regional water supply demands by humans and vegetation. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity.

Drought originates from a deficiency of precipitation over an extended period, usually one or more seasons. Drought can result in a water shortage for some activity, group, or environmental sector. Drought is a complex natural hazard, which is reflected in the following four definitions commonly used to describe it:

- Agricultural – drought is defined principally in terms of naturally occurring soil moisture deficiencies relative to water demands of plant life, usually arid crops.
- Hydrological – drought is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- Meteorological – drought is defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- Socioeconomic – drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall. It may also be called a water management drought.

Although climate is a primary contributor to hydrological drought, other factors such as changes in land use (e.g., deforestation), land degradation, and the construction of dams all affect the hydrological characteristics of the basin. Since regions are interconnected by hydrologic systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area. Similarly, changes in land use upstream may alter hydrologic characteristics such as infiltration and runoff rates, resulting in more variable streamflow and a higher incidence of hydrologic drought downstream. Land use change is one of the ways human actions alter the frequency of water shortage even when no change in the frequency of meteorological drought has been observed.





### 4.6.1 Regulatory Environment

The County and participating jurisdictions have a number of regulatory requirements and documents to address planning for drought in the County. This includes Watershed Water Quality Management Plans (WQMP) for San Bernardino County and the Mojave and Santa Ana Watersheds. On June 21st, 2013, the Executive Officer approved the revised Technical Guidance Document for Water Quality Management Plan (TGD-WQMP).

The 1972 Federal Water Pollution Control Act, also known as the Clean Water Act (CWA) provides the basis for the protection of all inland surface waters, estuaries, and coastal waters. California's Porter-Cologne Water Quality Control Act of 1970 established the Regional Water Quality Control Board as the agency responsible for implementing the CWA and Porter-Cologne requirements in the Santa Ana Watershed.

In 2006, California State lawmakers adopted AB 1881. This provided guidelines and timelines for the revision of the State's Model Water Efficient Landscape Ordinance (MWELO) and mandated that every city, county or other agency within the State adopt MWELO or be in compliance with it through their own ordinance by January 2010. On January 1, 2010 the San Bernardino County Water Efficient Landscape Ordinance was implemented. It can be obtained on the county website.

#### 4.6.1.1 Watershed Water Quality Management Plan

San Bernardino County's WQMP draft was written in 2013 and final approval was given on June 21, 2013.

#### 4.6.1.2 Technical Guidance Document for Water Quality Management Plan (TGD-WQMP)

Approved on June 21, 2013, this document provides direction to project proponents on the regulatory requirements applicable to a private or public development activity, including public works transportation projects, from project conception to completion.

### 4.6.2 Past Occurrences

- The 2013 California State MHMP states that from 1950 to 2012, there has been eight-drought State Emergency Proclamations in California. Specifically for San Bernardino County, there have been six drought events since 1896. Previous occurrences of drought are described as follows:

- **1975 to 1977:** California experienced the two driest years (1976 and 1977) in the State's history in 1976 and 1977. The drought was declared an Emergency (FEMA-EM-3023) on January 20, 1977. Total crop damages statewide totaled $2.67 billion dollars for both years ($888.5 million in 1976 and $1.8 billion in 1977).

- **2006 to 2009:** A California State-declared three-year drought of below-average rainfall, low snowmelt runoff, and the largest court-ordered water restricting in state's history. The dry conditions damaged crops, deteriorated water quality, and caused extreme wildfire danger. Approximately $300 million in agricultural revenue loss, and a potential $3 billion in economic losses over time.

- **2012 to 2016:** San Bernardino County first declared a local drought emergency in 2014. As of May 23rd, 2016, San Bernardino County and the City of Rancho Cucamonga had both submitted local Emergency Proclamations. This ongoing drought is the most severe drought in over 100 years. In order to abide by the State Water Resources Control Board's mandatory water reductions, the San Bernardino Municipal Water Department Board of Water Commissioners authorized implementation of Stage IIA of the department's Water Supply Contingency Plan on June 1, 2015. The State Water Board will adjust emergency water conservation regulations through the end of January 2017, in recognition of the differing water supply conditions across the state, and develop proposed emergency water restrictions for 2017 if the drought persists.

Additional information about previous occurrences of droughts in California (in general) can be obtained from the California DWR.

### 4.6.3 Location/Geographic Extent

Drought can affect the County, region, and the State of California as a whole. The County's primary source of water is imported by the San Bernardino Valley Municipal Water District (http://www.sbvmwd.com/about-us/what-we-do) through participation in the State Water Project (SWP). It is received at the Devil Canyon Power Plant Afterbay. This supply is supplemented by groundwater basins in the County. Drought has no defined geographical boundaries and cannot be depicted in map form. As such, the entire County is subject to drought.

### 4.6.4 Magnitude/Severity

The magnitude of drought is usually measured in time and the severity of the hydrologic deficit. There are several resources available to evaluate drought status and estimate future expected conditions. The National Integrated Drought Information System (NIDIS) Act of 2006 (Public Law 109-430) prescribes an interagency approach for drought monitoring, forecasting, and early warning. The NIDIS maintains the U.S. Drought Portal (www.drought.gov) which is a web-based





access point to several drought related resources. Resources include the U.S. Drought Monitor (USDM) and the U.S. Seasonal Drought Outlook (USSDO).

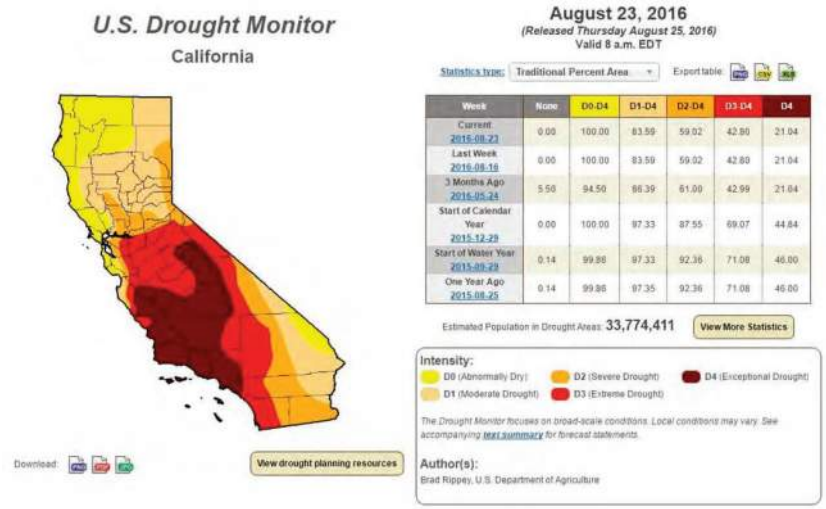


**Figure 4-11: US Drought Monitor Map for the State of California on August 23, 2016**

The USDM provides a summary of drought conditions across the United States and Puerto Rico and is developed and maintained by the National Drought Mitigation Center (www.drought.unl.edu). USDM includes the U.S. Drought Monitor Map. This map is updated weekly by combining a variety of drought database and indicators, and local expert input into a single composite drought indicator. The map denotes four levels of drought intensity (ranging from D1 - D4) and one level of "abnormal dryness" (D0). In addition, the map depicts areas experiencing agricultural (A) or hydrological (H) drought impacts. These impact indicators help communicate whether short or long-term precipitation deficits are occurring. An example Drought Monitor Map for the State of California for August 23, 2016 is illustrated in Figure 4-11.

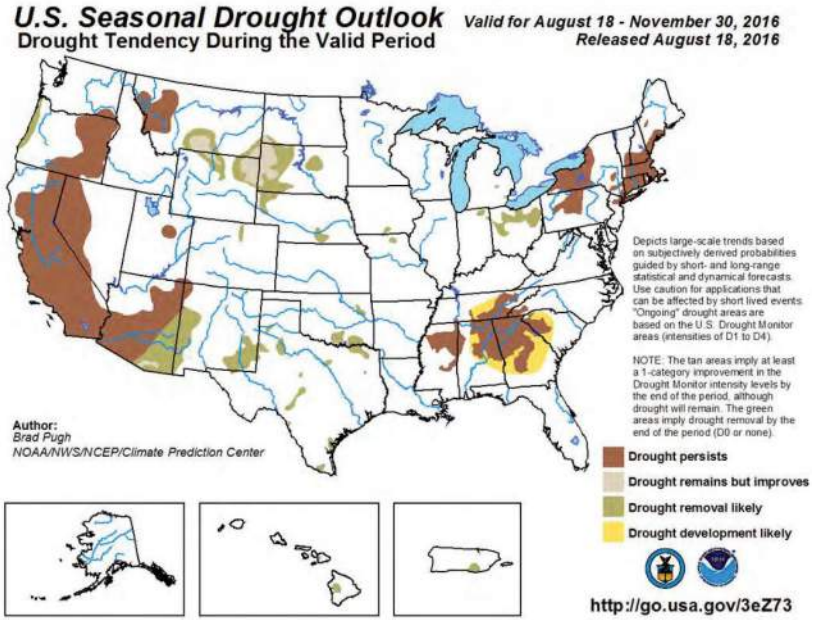


**Figure 4-12: USSDO Drought Tendency Map (Valid August 18-November 30, 2016**

For western States with mountainous terrain and complex regional microclimates, it is also useful to supplement the PDSI values with other indices such as Surface Water Supply Index and Standardized Precipitation Index (SPI). The Surface Water Supply Index takes snowpack and other unique conditions into account. The National Drought Mitigation Center (NDMC) uses the SPI to identify emerging drought months sooner than the PDSI. It is computed on various time scales to monitor moisture supply conditions. The SPI is the number of standard deviations that precipitation value would deviate from the long-term mean. As shown in Figure 4-13 the 72-month SPI through the end of August 2016 for San Bernardino County is low.





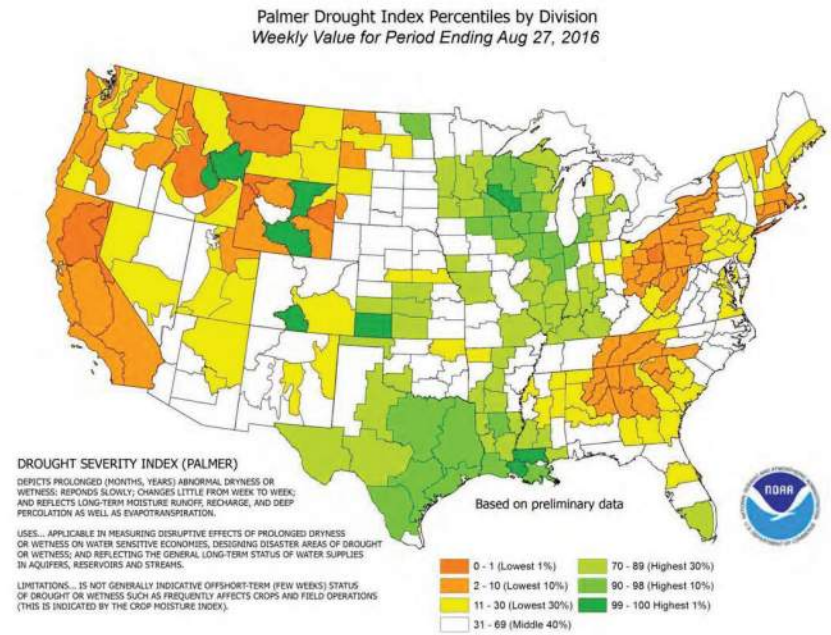


**Figure 4-13: Month SPI through the end of August 2016 for San Bernardino County**

A number of indices measure how much precipitation for a given period has deviated from historically established norms. The primary indicator for the USDM and USSDO for the western United States is the Palmer Drought Severity Index (PDSI). The PDSI is widely used by the USDA to determine when to grant emergency drought assistance to affected areas. PDSI is a commonly used index that measures the severity of drought for agriculture and water resource management. It is calculated from observed temperature and precipitation values and estimates soil moisture. However, the PDSI is not considered consistent enough to characterize the risk of drought on a nationwide basis (FEMA, 1997) and is not well suited to the dry, mountainous areas in the western U.S.

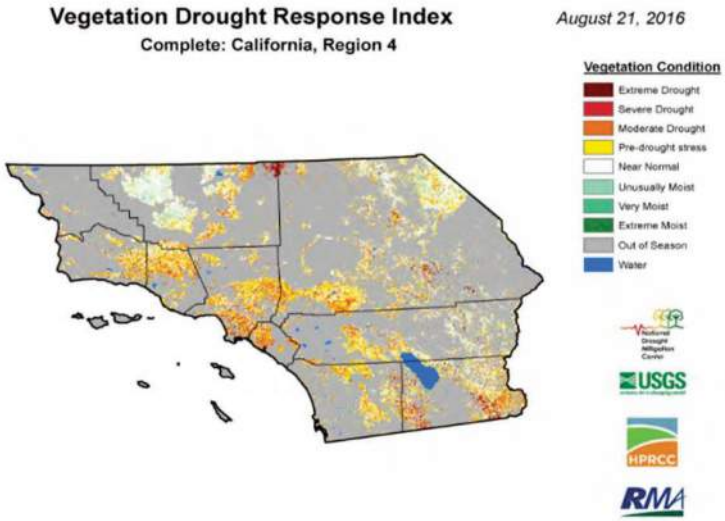


**Figure 4-14: Vegetation Drought Response Index – California Region 4 for August 21, 2016**

The Vegetation Drought Response Index, or VegDRI, is a bi-weekly depiction of vegetation stress across the contiguous United States. VegDRI is a fine resolution (1-km$^2$) index based on remote sensing data, and incorporates climate and biophysical data to determine the cause of vegetation stress. Development of the VegDRI map and associated products is a joint effort by the National Drought Mitigation Center (NDMC), the U.S. Geological Survey's (USGS) National Center for Earth Resources Observation and Science (EROS), and the High Plains Regional Climate Center (HPRCC). Figure 4-14 illustrates the VegDRI results for Southern California for August 21, 2016.

### 4.6.5 Frequency/Probability of Future Occurrences

Currently there is no data on the probability of drought that would be comparable to the USGS effort on earthquakes in the region, or how 100-year flood maps are created.





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## 4.7 Terrorism

This section was added due to the December 2, 2015 terror attack in San Bernardino County. There is no single, universally accepted definition of terrorism; however, FEMA defines "terrorism" as intentional, criminal, malicious acts. FEMA document 386-7 refers to terrorism specifically as the use of Weapons of Mass Destruction (WMD), including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and "cyberterrorism."

FEMA developed the Integrated Emergency Management System (IEMS) using an all-hazards approach. While the IEMS was established as an "all-hazard" approach, responding to the threat of terrorism (referred to as counterterrorism) came to be viewed as the responsibility of law enforcement, defense, and intelligence agencies. Furthermore, defensive efforts to protect people and facilities from terrorism (referred to as antiterrorism) were generally limited to the government sector, the military, and some industrial interests.

While the term "mitigation" refers generally to activities that reduce loss of life and property by eliminating or reducing the effects of disasters, in the terrorism context it is often interpreted to include a wide variety of preparedness and response actions. For the purposes of this document, the traditional meaning will be assumed; that mitigation refers to specific actions that can be taken to reduce loss of life and property from manmade hazards by "modifying the built environment" or antiterrorism to reduce the risk and potential consequences of these hazards.

### 4.7.1 Antiterrorism Regulatory Environment

Adopted on February 9, 2012 and updated on October 1, 2013, United Facilities Criteria (UFC) 4-010-01 defines the United States Department of Defense's (DoD) minimum antiterrorism standards for both new and existing buildings. The document applies to DoD buildings, National Guard buildings, visitor centers and museums, visitor control facilities and expeditionary structures. Historic preservation compliance for implementation of anti-terrorism standards, philosophy, design strategies and assumptions are all taken into account. Site planning, structural design, architectural design, and electrical and mechanical design are discussed in detail in Appendix B.
https://www.fema.gov/news-release/2004/01/13/dhs-announces-new-building-science-guidelines-enhance-terrorism-resistance





### 4.7.2 Counterterrorism Regulatory Environment

After the 12/2/15 mass shooting, two full time positions with a regional FBI-led terrorist task force (FBI's Joint Terrorism Task Force) were created. These task force officers have the clearance to conduct terrorism investigations in the County. The Task Force includes partners from Homeland Security Investigations (HSI), the San Bernardino Police Department, the San Bernardino County Sheriff's Department, the Riverside County Sheriff's Department, the Ontario Police Department, the Riverside Police Department, the Corona Police Department and the Chino Police Department. For more information regarding the positions, contact the San Bernardino Police Department at (909) 384-5742. Read more here: http://www.pe.com/articles/task-789539-force-san.html

The State of California Department of Justice's Anti-terrorism program works with federal, state and local law enforcement agencies to detect, investigate, prosecute, dismantle, prevent and respond to domestic and international terrorist activities. Read more here: https://oag.ca.gov/bi/atp

The State of California Bureau of Security and Investigative Services' Power to Arrest Course includes a Weapons of Mass Destruction (WMD) & Terrorism Awareness section. Read More Here: http://www.bsis.ca.gov/about_us/laws/bsis_regulations.pdf

### 4.7.3 Past Occurrences

There have been two terrorist attacks recorded in San Bernardino County. Table 4-10 describes both attacks.
Source: https://www.start.umd.edu/gtd/search/Results.aspx?search=san+bernardino&sa.x=0&sa.y=0&sa=Search

**Table 4-10: Terrorist Attacks in San Bernardino County**

| Date | Perpetrator Group | Fatalities | Injured | Target Type |
|---|---|---|---|---|
| **3/16/1970** | White Extremists | 0 | 1 | Government (General) |
| **12/2/2015** | Unaffiliated Individuals | 16 | 17 | Government (General) |

The state of California has experienced 574 terrorist attacks from 1970-2011 (Integrated United States Security Database (IUSSD): Data on the Terrorist Attacks in the United States Homeland, 1970-2011 2012). Figure 4-17 shows the types of terrorist attacks in the state of California from 1970 to the present.

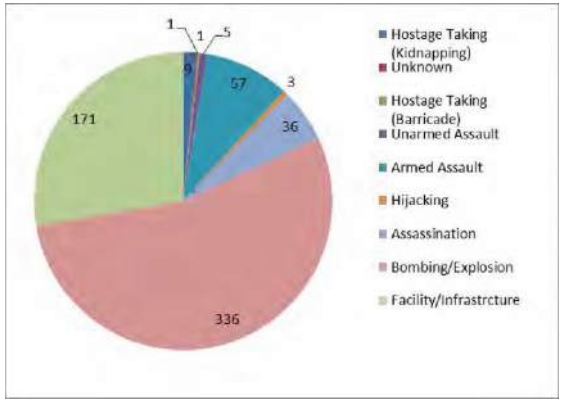


**Figure 4-15: Types of Terrorist Attacks in California from 1970-Present**

As seen in Figure 4-15 since 1970, the number of terrorist attacks in the United States has steadily decreased. According to http://www.heritage.org most terrorist attacks on America happen outside our nation's borders. The number of international terrorist attacks against the United States from 1970-2011 is shown in Figure 4-16 and Figure 4-17.





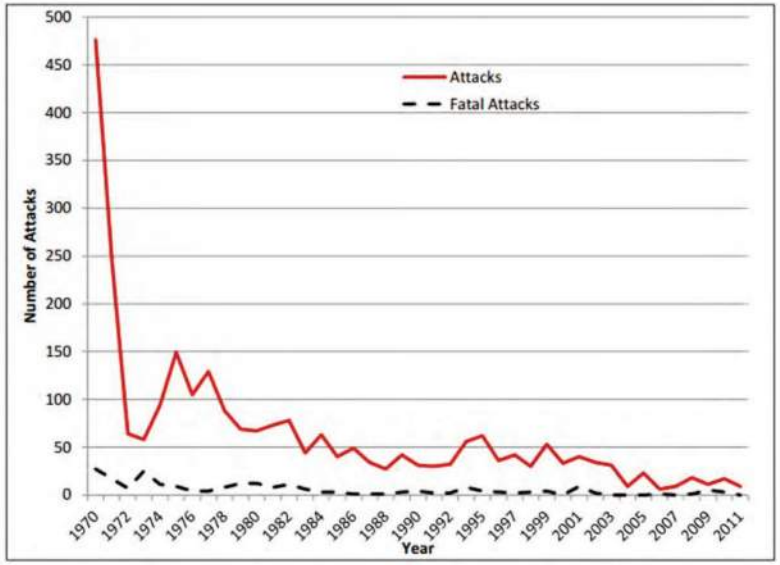


Note: There were 2,608 total attacks and 226 fatal attacks between 1970 and 2011.

**Figure 4-16: Total and Fatal Terrorist Attacks in the United States by Year**

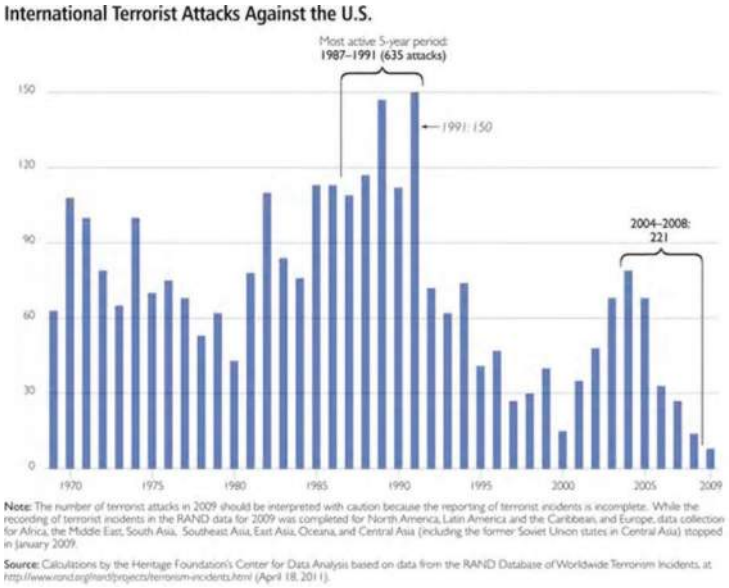


**Figure 4-17: International Terrorist Attacks Against the United States**

### 4.7.4 Location/Geographic Extent

Unlike natural hazards, which often follow patterns and can be forecasted, manmade hazards such as acts of terrorism are much more unpredictable. Terrorists have the ability to choose targets and tactics and can often adjust conditions to achieve their objective. Terrorist attacks are often in a more specific location rather than a widespread, more predictable area such as a flood plain. As demonstrated in the 12/2/15 mass shooting, “homegrown terrorists” (self-radicalizing and pulls off their attacks without any help or communication with people in other countries) are even harder to detect and predict.

Translating most manmade hazard profiles into meaningful geospatial information is difficult at best. Instead, the planning team will use an asset-specific approach, identifying potentially at-risk critical facilities and systems in the community. Once a comprehensive list of assets has been developed, it will be prioritized so that the community’s efforts can be directed to protect the most





important assets first. Then, beginning with the highest priority assets, the vulnerabilities of each facility or system to each type of hazard will be assessed (FEMA 2003).

### 4.7.5 Magnitude/Severity

As previously discussed, predicting terrorist attacks cannot be done with the same level of accuracy as predicting a natural hazard and its potential impacts on the community. However, we can learn from past terrorist incidents. Table 4-11 profiles 10 different types of terrorist attacks and technological hazards.

**Table 4-11: Event Profiles for Terrorism and Technological Hazards**

| Hazard | Application Mode | Hazard Duration | Extent of Effects; Static/Dynamic | Mitigating and Exacerbating Conditions |
|---|---|---|---|---|
| Conventional Bomb/ Improvised Explosive Device | Detonation of explosive device on or near target; delivery via person, vehicle, or projectile. | Instantaneous; additional "secondary devices" may be used, lengthening the time duration of the hazard until the attack site is determined to be clear | Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc. | Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers/shielding; poor construction; and ease of concealment of device |
| Chemical Agent * | Liquid/aerosol contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions. | Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists. | Contamination can be carried out of the initial target area by persons, vehicles, water and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated. | Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but |

| Hazard | Application Mode | Hazard Duration | Extent of Effects; Static/Dynamic | Mitigating and Exacerbating Conditions |
|---|---|---|---|---|
| | | | | can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. |
| Arson/ Incendiary Attack | Initiation of fire or explosion on or near target via direct contact or remotely via projectile. | Generally minutes to hours. | Extent of damage is determined by type and quantity of device/ accelerant and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc. | Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device and undetected initiation of a fire. Non-compliance with fire and building codes as well as failure to maintain existing fire protection systems can substantially increase the effectiveness of a fire weapon. |
| Armed Attack | Tactical assault or sniping from remote location. | Generally minutes to days. | Varies based upon the perpetrators' intent and capabilities | Inadequate security can allow easy access to target, easy concealment of weapons and undetected initiation of an attack. |
| Biological Agent * | Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point or line | Biological agents may pose viable threats for hours to years depending on the agent and the | Depending on the agent used and the effectiveness with which it is deployed, contamination can | Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to |





| Hazard | Application Mode | Hazard Duration | Extent of Effects; Static/Dynamic | Mitigating and Exacerbating Conditions |
|---|---|---|---|---|
| | sources such as munitions, covert deposits and moving sprayers. | conditions in which it exists | be spread via wind and water. Infection can be spread via human or animal vectors. | moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of building and terrain can influence aerosolization and travel of agents. |
| Cyberterrorism | Electronic attack using one computer system against another. | Minutes to days | Generally no direct effects on built environment. | Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks. |
| Agriterrorism | Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock. | Days to months | Varies by type of incident. Food contamination events may be limited to discrete distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment. | Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock. |
| Radiological Agent ** | Radioactive contaminants can be dispersed using sprayers/aerosol generators, or by point or line sources such as munitions, covert deposits and moving sprayers. | Contaminants may remain hazardous for seconds to years depending on material used. | Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic. | Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation. |
| Nuclear Bomb ** | Detonation of nuclear device underground, at the surface, in the air or at high altitude. | Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high altitude detonation lasts for seconds and affects only | Initial light, heat and blast effects of a subsurface, ground or air burst are static and are determined by the device's characteristics and employment; fallout of radioactive contaminants may | Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by |

| Hazard | Application Mode | Hazard Duration | Extent of Effects; Static/Dynamic | Mitigating and Exacerbating Conditions |
|---|---|---|---|---|
| | | unprotected electronic systems. | be dynamic, depending on meteorological conditions. | absorbing and/or deflecting radiation and radioactive contaminants. |
| Hazardous Material Release (fixed facility or transportation) | Solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers. | Hours to days | Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind. | As with chemical weapons, weather conditions will directly affect how the hazard develops. The micro-meteorological effects of building and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes as well as failure to maintain existing fire protection and containment features can substantially increase the damage from a hazardous materials release. |

* Source: Jane's Chem-Bio Handbook
** Source: FEMA, Radiological Emergency Management Independent Study Course

### 4.7.6 Frequency/Probability of Future Occurrences

We can usually forecast the type, frequency and location of a natural hazard thanks to the laws of physics and nature. However, when dealing with manmade hazards such as terrorism, we are often dealing with functions of the human mind-malevolence, incompetence, carelessness and other behaviors. These actions cannot be predicted with any accuracy; therefore, there is the potential for an act of terrorism to occur anywhere, at any time.





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## 4.8 Climate Change

Climate change refers to any distinct change in measures of climate lasting for a long period of time, more specifically major changes in temperature, rainfall, snow, or wind patterns. Climate change may be limited to a specific region, or may occur across the whole Earth. Climate change may result from:

- Natural factors (e.g., changes in the Sun's energy or slow changes in the Earth's orbit around the Sun);
- Natural processes within the climate system (e.g., changes in ocean circulation); and
- Human activities that change the atmosphere's make-up (e.g., burning fossil fuels) and the land surface (e.g., cutting down forests, planting trees, building developments in cities and suburbs, etc.).

The effects of climate change are varied: warmer and more varied weather patterns, melting ice caps, and poor air quality, for example. As a result, climate change impacts a number of natural hazards.

The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

### 4.8.1 Regulatory Environment

California's response to climate change is directed by Legislation and Regulations and by other Mandates such as executive orders.

#### 4.8.1.1 The Sustainable Communities and Climate Protection Act of 2008

The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) looks to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities. Regional targets are established for GHG emissions reductions from passenger vehicle use by the sustainable communities strategy (SCS) established by each metropolitan planning organization (MPO). The SCS is an integral part of the regional transportation plan (RTP) and contains land use, housing, and transportation strategies to meet GHG reductions targets. In San Bernardino County, the South Coast Air Quality Management District facilitates compliance with the federal Clean Air Act and implements the state's air quality program.





The Office of Planning and Research's General Plan Guidelines and SB 375 builds upon Assembly Bill 162 (flood protection) and Senate Bill 1241 (fire protection) and supports Safeguarding California implementation.

SB 375 also supports Assembly Bill 2140 which requires that a City/County General Plan contains a safety element in addition to a Hazard Mitigation Plan. AB 2140 also requires a vulnerability assessment, adaptation goals, policies and objectives, and a set of feasible implementation measures.

#### 4.8.1.2 California Adaptation Planning Guide (APG)

The State of California has been taking action to address climate change for over 20 years, focusing on both greenhouse gas emissions reduction and adaptation. The California Adaptation Planning Guide (APG) continues the state's effort by providing guidance and support for communities addressing the unavoidable consequences of climate change.

Based on upon specific factors, 11 Climate impact regions were identified. Some of the regions were based on specific factors particularly relevant to the region. As illustrated in Figure 4-18 San Bernardino County is located in the Desert Region.

The Desert is a heavily urbanized inland region (4.3+ million people) made up of sprawling suburban development in the west near the South Coast region and vast stretches of open, largely federally owned desert land to the east. Prominent cities within the desert portion include Palm Springs (44,500+) and El Centro (42,500+). The region's character is defined largely by the San Gabriel Mountains, San Gorgonio Mountains, San Jacinto Mountains, and smaller inland mountains reaching through the desert to the Colorado River, which borders the region on the east. Communities in the Desert region should consider evaluating the following climate change impacts:

- Reduced water supply
- Increased temperature
- Reduced precipitation
- Diminished snowpack
- Wildfire risk
- Public health and social vulnerability
- Stress on special-status species

**Figure 4-18: Climate Impact Regions**

## 4.8.2 Past Occurrences

Climate change has never been directly responsible for any declared disasters. Past flooding, wildfire, levee failure, and drought disasters may have been exacerbated by climate change, but it is impossible to make direct connections to individual disasters. In addition, unlike earthquake and floods that occur over a finite time period, climate change is an on-going hazard the effects of which some are already experiencing. Other effects may not be seriously experienced for decades, or may be avoided altogether by mitigation actions taken today.





## 4.8.3 Location/Geographic Extent

The effects of climate change are not limited by geographical borders. San Bernardino County, the State of California, the United States, and the rest of the world are all at risk to climate change. As such, the entire County is at risk to the effects of climate change.

Figure 4-19 and Figure 4-20 provide Cal Adapt[2] modeled decadal July high temperature averages for 2010 and 2090. These figures provide current decade-long July temperature averages and possible annual high heating trends for the remaining portion of the century. The data presented in the figures represent a “projection” of potential future climate scenarios, they are not predictions. These figures illustrate how the climate may change based on a variety of different potential social and economic factors. The visualizations are comprised of average values from Coupled Climate model 2.1 (GFDL), Community Climate System Model Version 3 (CCSM3), Coupled Global Climate Model Version 3 (CNRM) and Parallel Climate Model 1 (PCM1). During the next few decades, scenarios project average temperature to rise between 1° and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario (A2) are approximately twice as high as those projected in the lower emissions scenario (B1). Customizable maps can be viewed at http://cal-adapt.org/temperature/decadal/

[2] Cal-Adapt has been funded to provide access to data and information that has been produced by the State's scientific and research community. The data available in this site offer a view of how climate change might affect California at the local level.

Figure 4-19: July Decadal Average High Temperature Map; 2010

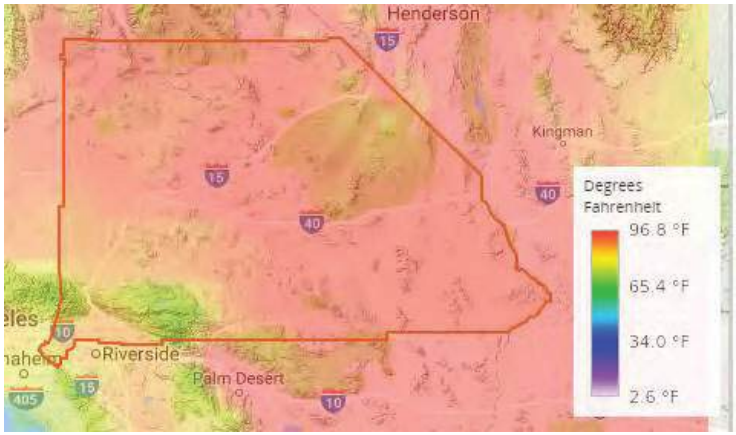


Figure 4-20: July Decadal Average High Temperature Map; 2090





### 4.8.4 Magnitude/Severity

The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat, as shown in Figure 4-21: California Historical and Projected Temperature Increases 1961 to 2099

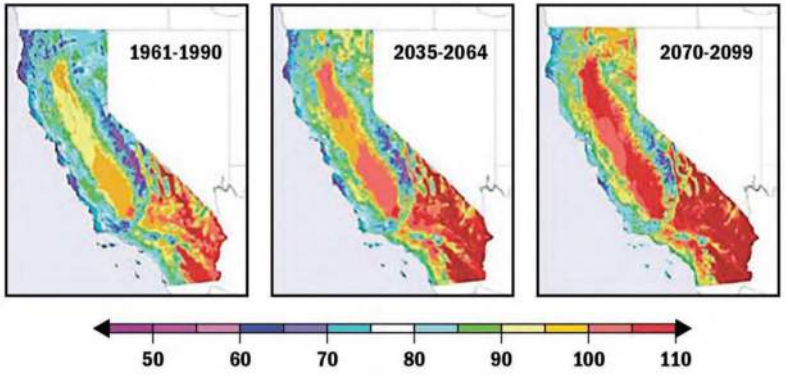


Figure 4-21: California Historical and Projected Temperature increases 1961-2099

*Source: Dan Cayan; California Climate Adaptation Strategy*

### 4.8.5 Frequency/Probability of Future Occurrences

According to the ABAG 2010 Local Hazard Mitigation Plan (LHMP), climate change is one of the few natural hazards where the probability of occurrence is influenced by human action. In addition, unlike earthquake and floods that occur over a finite time period, climate change is an on-going hazard.

The 2009 Climate Adaptation Strategy (CAS) delineated how climate change may impact and exacerbate natural hazards in the future, including wildfires, extreme heat, floods, drought, and levee failure:

Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in San Bernardino County and the rest of California, which

are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.

- Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff from the landward side, while accelerating sea-level rise will produce higher storm surges during coastal storms. Together, these changes will increase the probability of levee and dam failures in the Sacramento-San Joaquin Delta.
- Warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions and habitat fragmentation.

### 4.8.6 El Niño Effect

El Niño is defined as an abnormal weather pattern that is caused by the warming of the Pacific Ocean near the equator, off the coast of South America. This occurs when the normal trade winds weaken (or even reverse), which lets the warm water that is usually found in the western Pacific flow instead towards the east. This warm water displaces the cooler water that is normally found near the surface of the eastern Pacific, setting off atmospheric changes that affect weather patterns in many parts of the world.

As a result of the predicted El Niño in 2015 the following meetings were held during the months of January – December 2015:

**El Niño Awareness Program**

- **January - December 2015**





- **October 28, 2015** (Two meetings) two separate meetings one with the Public with 200 High Desert residents attending, the other meeting was at the same location of the Victor Ville City Council Chambers of 80 operators
- **November 9, 2015** South Desert Meeting at the Town of Yucca Valley Community Center, with 50 Operators and 235 general public ,residents
- **November 12, 2015** 2:30pm-4:30pm Valley Cooperators Meeting, City of Rancho Cucamonga, Victoria Gardens, 90 Operators and 2nd Meeting at the same location held at 530pm-730pm meeting with 205 public and residents
- **November 16, 2015** Public Meeting at Upland city Hal l for San Antonio heights, Mt. Baldy and local residents 110 Public and Residents in attendance .
- **November 23, 2015** Wrightwood Community Center, 80 Operators and 330 Public and Residents
- **November 24, 2015** City of Yucaipa 40 operators at Yucaipa City Hall
- **December, 2015** 5000 English pamphlets and 5000 Spanish pamphlets distributed Winter Weather Workshop meetings (discuss long term weather models and predictions as far as estimated rain fall anticipated. and Extreme Heat Program meetings (stakeholder and Red Cross and SCE and other responders/operators meetings on anticipated overly hot days and local assistance plans. program in place by OES.

### 4.8.7 Extreme Weather

The Extreme Weather – Excessive Heat Standard Operating Guidelines (SOG) were developed in response to the potential for Excessive Heat and heat related Power Outage events in San Bernardino County. The following objectives and activities have been established to prevent the harmful effects of excessive heat on at-risk populations and the potential for life-threatening repercussions of power outages during excessive heat events.

The Extreme Weather – Excessive Heat SOG describe the County operations during heat related emergencies and provide guidance for local jurisdictions in their preparation for heat emergencies and other related activities.

The information included in this document is “situation” and/or “incident” driven and subject to revision by the Extreme Weather Committee as conditions warrant. Notifications are information dependent and modification of the activities in these guidelines may be required in response to changing conditions, situations and/or inaccurate weather predictions.
The Extreme Weather – Excessive Heat Standard Operating Guidelines (SOG) were developed through the collaborative efforts of the “Extreme Weather Committee”. The committee consists of

representatives from key County Departments and private sector partners who have a shared interest, responsibility and/or expertise in the County's preparation for an Excessive Heat event. It is designed to protect all of the County's population especially the most vulnerable populations.

For the last ten years the annual Winter Weather Workshop and Meeting brings together San Bernardino County Fire Office of Emergency Services with The San Bernardino County Special Districts key stakeholders and first responders as well as weather experts. The annual meeting is an accumulation of meetings with NOAA and other Meteorological experts on the possible winter weather outlook and forecast including possible precipitation levels and wide ranging forecasts.

The meeting includes discussions on possible plans of actions and response to flooding emergencies and or snow or white out events and the other possibility of continuing long duration droughts.

## 4.9 Other Hazards

As mentioned earlier, lower priority hazards are addressed at a lesser level of detail due to their relatively fewer impacts, as identified in the preceding hazard assessment section. The lower priority hazards for the unincorporated area are:

- Severe Thunderstorm
- Infestation
- Drought
- High Winds/Straight Line Winds
- Lightning
- Extreme Heat
- Hail
- Tornado

Although not part of the MJHMP, the remaining hazards are a part of the San Bernardino County 2007 General Plan and are addressed in the County Building Codes and Ordinance.

The information in this section provides an explicit representation of what a community stands to lose in a disaster. This is useful for county officials and other decision makers who will need to balance the costs of mitigation against the potential harm to citizens and damage to property. It provides comparable measurements of community natural hazard exposure and assists in determining which hazards and/or what parts of San Bernardino County to focus on making resilient to disaster first. Based upon possible assets at risk, hazard mitigation resources can be directed where need be, in-part, by a vulnerability assessment and information found in hazard profiles presented in Section 4.8.





## 4.10 Vulnerability Assessment

The information in this section provides an explicit representation of what a community stands to lose in a disaster. This is useful for county officials and other decision makers who will need to balance the costs of mitigation against the potential harm to citizens and damage to property. It provides comparable measurements of community natural hazard exposure[3] and assists in determining which hazards and/or what parts of San Bernardino County to focus on making resilient to disaster first. Based upon possible assets at risk, hazard mitigation resources can be directed where need be, in-part, by a vulnerability assessment and information found in hazard profiles presented in Section 4.2.

The vulnerability assessment is developed by providing the hazard mitigation analysts with quantitative and qualitative information for each hazard identified by the HMP Planning Team Through an exposure analysis, quantitative data is developed for each hazard. An exposure analysis provides quantities of people and assets at risk to particular hazards. Qualitative data has been developed and presented in this section for hazards without measurable data. Qualitative data provides information beyond quantities of people and assets at risk, but rather a description of how the hazard could affect a region like San Bernardino County.

***Note: The hazard exposure analysis has been developed with best available data and follows methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses.***

***Note: There are other intangible losses that could result from a natural hazard event, such as losses of historic or cultural integrity or damage to the environment that are difficult to quantify. Other costs, including response and recovery costs, are often unrecoverable and are not addressed in this document.***

### 4.10.1 Methodology

A vulnerability assessment was conducted for each of the identified priority hazards. Geospatial data is essential in determining population and assets exposed to particular hazards. Geospatial analysis can be conducted if a natural hazard has a particular spatial footprint that can be overlaid against the locations of people and assets. In San Bernardino County, wildfire, flood, earthquake, and landslides have known geographic extents and corresponding spatial information about each hazard.

Several sources of data are necessary to conduct a vulnerability analysis. Figure 4-22provides an exhibit of the data inputs and outputs used to create the vulnerability analysis results presented in this section. U.S. Census data is the primary source in determining natural hazard exposure to residents. Census data has been used to determine the population at risk, which is generally referred to as population exposure. Population exposure is provided for wildfire, flooding, earthquakes and landslides as potential hazards later in this section.

[3] Elements at risk; Risk inventory; Exposure encompasses all elements, processes, and subjects that might be affected by a hazardous event. Consequently, exposure is the presence of social, economic, environmental or cultural assets in areas that may be impacted by a hazard.

Together with the U.S. Census data, asset data was used to provide a snapshot of how City assets are affected by natural hazards. For purposes of this vulnerability analysis, asset data includes parcels and critical infrastructure within the San Bernardino County boundaries. Critical infrastructure is described as assets that are essential for people and a community to function. Critical infrastructure includes such as utilities, San Bernardino County owned facilities, bridges, schools, and other community facilities that provide essential services to residents.

Critical facilities data was developed from a variety of sources including San Bernardino County owned and maintained data, state and federal government datasets, and private industry datasets. A critical infrastructure spatial database was developed to translate critical facilities information into georeferenced[4] points. Critical facility points are intersected with the spatial hazard layers to develop a list of "at risk" critical facilities. The San Bernardino County critical facilities that intersect with natural hazards are referred to as facilities with hazard "exposure". Exposure results are presented later in this section.

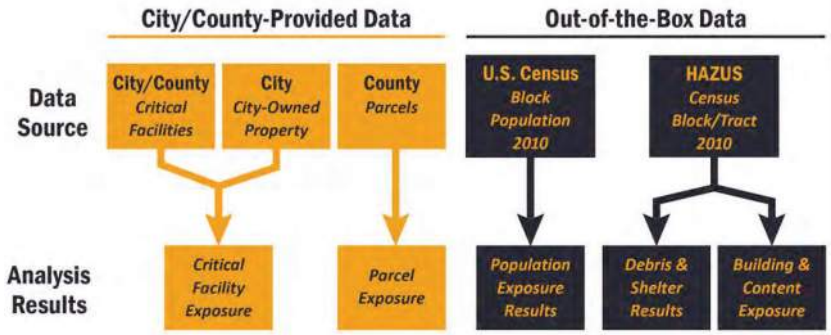


**Figure 4-22: Data Source and Methodology**

Lastly, FEMA's Hazus-MH MR5 (Hazus) software was implemented to conduct detailed loss estimation for flood and earthquake. Hazus is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes. HAZUS uses Geographic Information Systems (GIS) technology to estimate physical, economic, and social impacts of disasters. For purposes of this planning effort, Hazus was used to graphically illustrate the limits of identified high-risk locations due to possible earthquakes and floods.

[4] To georeference something means to define its existence in physical space. That is, establishing its location in terms of map projections or coordinate systems. The term is used both when establishing the relation between raster or vector images and coordinates, and when determining the spatial location of other geographical features.





The vulnerability and potential impacts from priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analyses are discussed in more general terms in alphabetical order following the discussion on wildfire, flooding and earthquake hazards.

### 4.10.2 Hazus MH Inputs

FEMA's loss estimation software, Hazus MH, was used to analyze the San Bernardino County building risk to flood and earthquake hazards. Hazus contains a database of economic, demographic, building stock, transportation facilities, local geology, and other information that can be used for several steps in the risk assessment process. Hazus software operates on structure square footage, structure replacement, and content replacement costs aggregated to the census block and tract levels depending on type of hazard analysis. The following table provides value data for building categories at the census block and census tract levels. Census block and census tracts are used to provide input information for the Hazus analysis presented in this report.

The project team used the San Bernardino County Essential Facilities Risk Assessment (SBEFRA) project and incorporated the newly updated DFIRM data into HAZUS to assess potential losses in the mapped 100-year (with and without levee protection) and 500-year flood zones.

***Note: The Hazus software utilizes different census level information inputs to develop loss estimates depending on the hazard module. The flood module uses census block information while the earthquake module uses census track information. It is important to understand the total values of each as estimated damage to the community is presented on a percent of total value basis.***

**Table 4-12: Hazus Flood Census Block Input Values**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (%) | Content Replacement Cost ($000) | Content Replacement Cost (%) | Total Value ($000) | Total Value (%) |
|---|---|---|---|---|---|---|
| Agricultural | $ 70,841 | 0.3% | $ 70,841 | 0.3% | $ 141,682 | 1% |
| Commercial | $ 1,208,163 | 4.4% | $ 1,231,690 | 4.5% | $ 2,439,853 | 9% |
| Education | $ 120,017 | 0.4% | $ 127,161 | 0.5% | $ 247,178 | 1% |
| Governmental | $ 34,216 | 0.1% | $ 43,192 | 0.2% | $ 77,408 | 0% |
| Industrial | $ 452,710 | 1.6% | $ 610,063 | 2.2% | $ 1,062,773 | 4% |
| Religion | $ 176,012 | 0.6% | $ 176,012 | 0.6% | $ 352,024 | 1% |
| Residential | $ 15,483,634 | 56.2% | $ 7,744,650 | 28.1% | $ 23,228,284 | 84% |
| **Total** | **$ 17,545,593** | **64%** | **$ 10,003,609** | **36%** | **$ 27,549,202** | **100 %** |

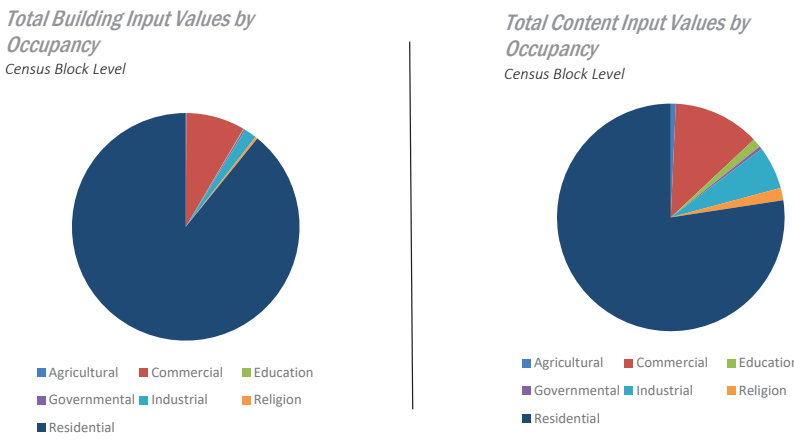


**Figure 4-23: Census Block Building and Content Exposure Values**





**Table 4-13: Hazus Earthquake Census Tract Input Values**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (%) | Content Replacement Cost ($000) | Content Replacement Cost (%) | Total Value ($000) | Total Value (%) |
|---|---|---|---|---|---|---|
| Agricultural | $ 264,949 | 50.0% | $ 264,949 | 50.0% | $ 529,898 | 1% |
| Commercial | $ 11,056,871 | 48.5% | $ 11,756,479 | 51.5% | $ 22,813,350 | 9% |
| Education | $ 819,946 | 48.4% | $ 874,703 | 51.6% | $ 1,694,649 | 1% |
| Governmental | $ 265,933 | 45.6% | $ 316,930 | 54.4% | $ 582,863 | 0% |
| Industrial | $ 3,733,265 | 41.4% | $ 5,276,431 | 58.6% | $ 9,009,696 | 4% |
| Religion | $ 958,122 | 50.0% | $ 958,122 | 50.0% | $ 1,916,244 | 1% |
| Residential | $ 84,302,884 | 66.7% | $ 42,159,954 | 33.3% | $ 126,462,838 | 84% |
| **Total** | **$ 101,401,970** | **62%** | **$ 61,607,568** | **38%** | **$ 163,009,538** | **100 %** |

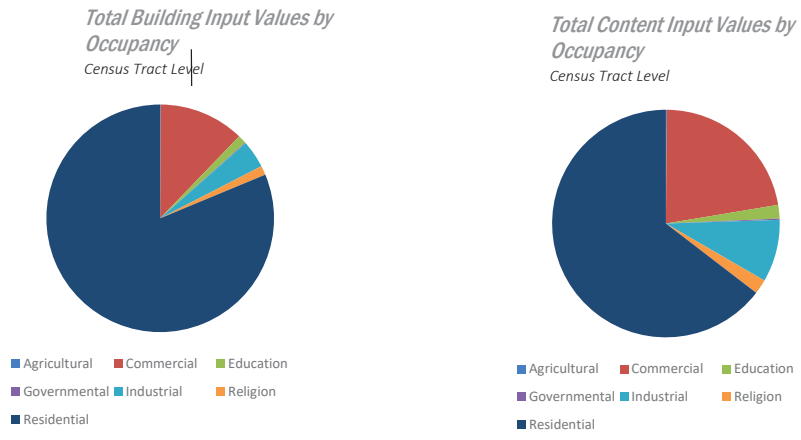


**Figure 4-24: Census Tract Building and Content Exposure Values**

## 4.11 Population and Assets

To describe vulnerability for each hazard, it is important to understand the "total" population and "total" assets at risk. The exposure for each hazard described in this section will refer to the percent of total population or percent of total assets. This provides the possible significance or vulnerability to people and assets for the natural hazard event and the estimated damage and losses expected during a "worst case scenario" event for each hazard. Sections below provide a description of the total population, critical facilities, and parcel exposure inputs.

Table 4-12 and Table 4-13 provide an estimate of the number and size of buildings in the County's unincorporated areas and its Special Districts, as well as the replacement value of the buildings and their contents. The table provides information by occupancy class (e.g., residential, commercial, etc.), as well as by construction type (e.g., concrete, wood frame, etc.).

### 4.11.1 Population

To develop hazard-specific vulnerability assessments, population near natural hazard risks should be determined to understand the total "at risk" population. We can understand how geographically defined hazards may affect San Bernardino County by analyzing the extent of the hazard in relation to the location of population. For purposes of the vulnerability assessment approximately 292,152 (100 %) of the San Bernardino County's population is exposed to one or more hazards within or near the County of San Bernardino boundaries. Each natural hazard scenario affects the San Bernardino County residents differently depending on the location of the hazard and the population density of where the hazard could occur. Vulnerability assessment sections presented later in this section summarize the population exposure for each natural hazard.

#### 4.11.1.1 Vulnerable Populations

The severity of a disaster depends on both the physical nature of the extreme event and the socioeconomic nature of the populations affected by the event. Important socioeconomic factors tend to influence disaster severity. A core concept in a vulnerability analysis is that different people, even within the same region, have a different vulnerability to natural hazards.

#### 4.11.1.2 Income and Housing Condition





Income or wealth is one of the most important factors in natural hazard vulnerability. This economic factor affects vulnerability of low income populations in several ways. Lower income populations are less able to afford housing and other infrastructure that can withstand extreme events. Low income populations are less able to purchase resources needed for disaster response and are less likely to have insurance policies that can contribute to recovery efforts. Lower income elderly populations are less likely to have access to medical care due to financial hardship. Because of these and other factors, when disaster strikes, low income residences are far more likely to be injured or left without food and shelter during and after natural disasters.

Figure 4-25 shows the median household income distribution for the County of San Bernardino in 2012. The "median" is the value that divides the distribution of household income into two equal parts (e.g., the middle). The average median household income in the County of San Bernardino between 2010 and 2014 was $54,100, in the United States during the same period the median house household income was $51,759.

#### 4.11.1.3 Age

Children and the elderly tend to be more vulnerable during an extreme natural disaster. They have less physical strength to survive disasters and are often more susceptible to certain diseases. The elderly often also have declining vision and hearing and often miss reports of upcoming natural hazard events. Children, especially young children, have the inability to provide for themselves. In many cases, both children and the elderly depend on others to care for them during day to day life.

Finally, both children and the elderly have fewer financial resources and are frequently dependent on others for survival. In order for these populations to remain resilient before and after a natural hazard event, it may be necessary to augment city residents with resources provided by the City, state and federal emergency management agencies and organizations. See Figure 4-26 and Figure 4-27 for location of vulnerable population by age within the County of San Bernardino.

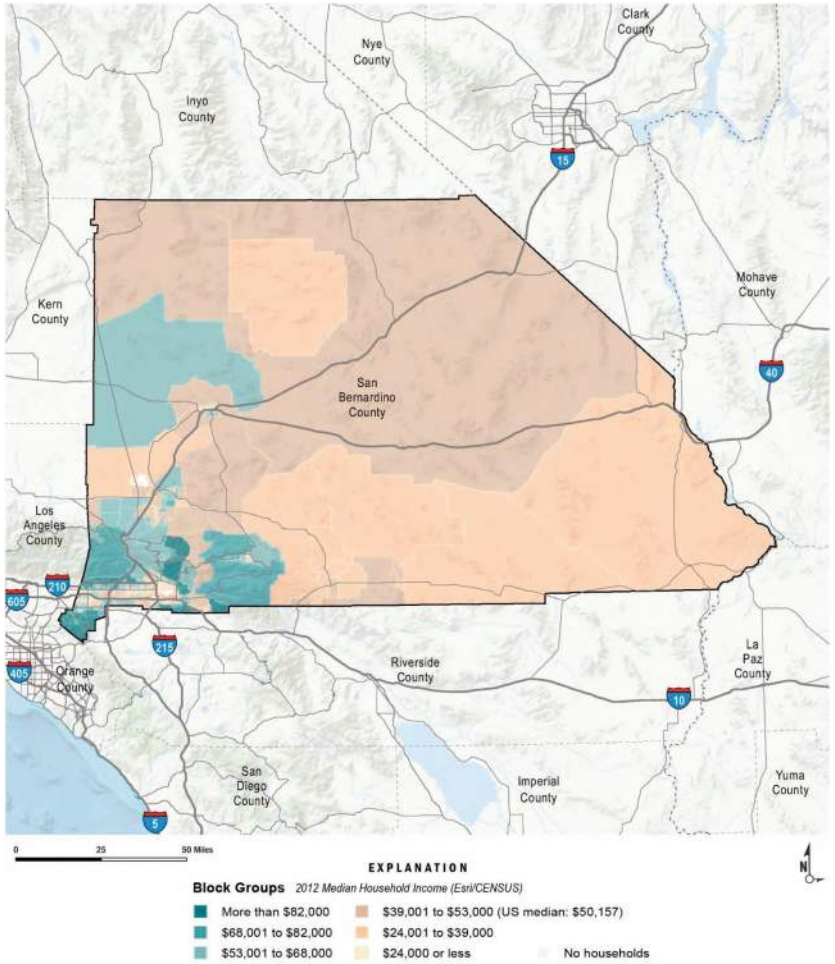


Figure 4-25: Median Household Income Distribution Maps





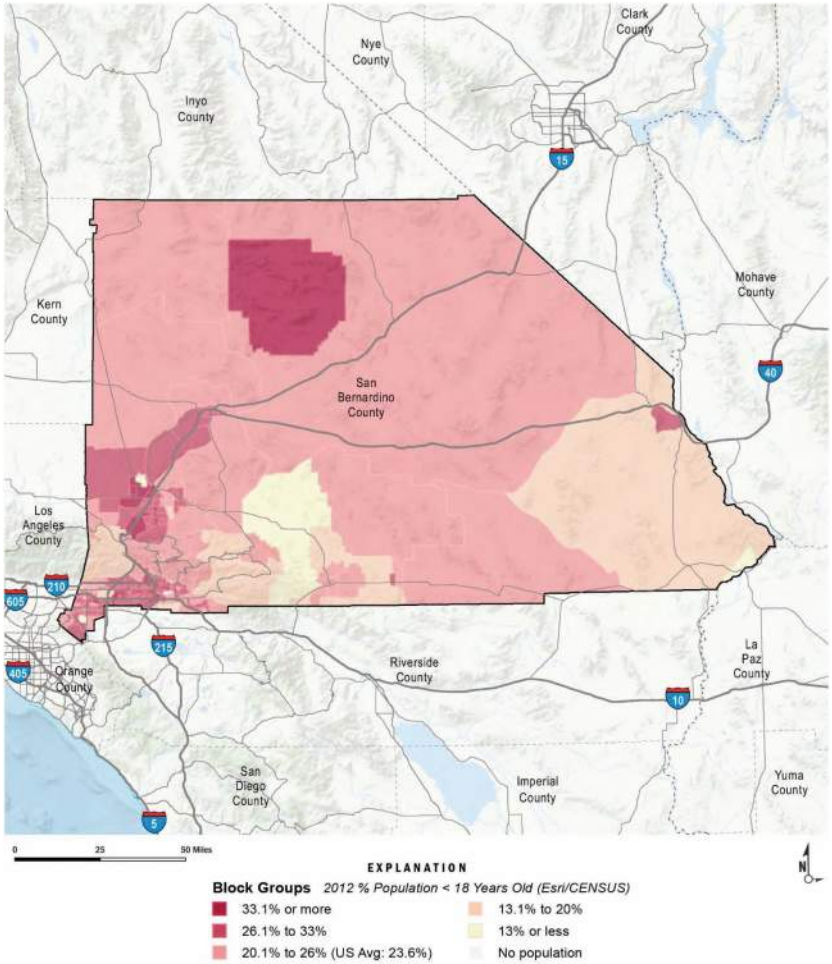


Figure 4-26: Population Under Age 18

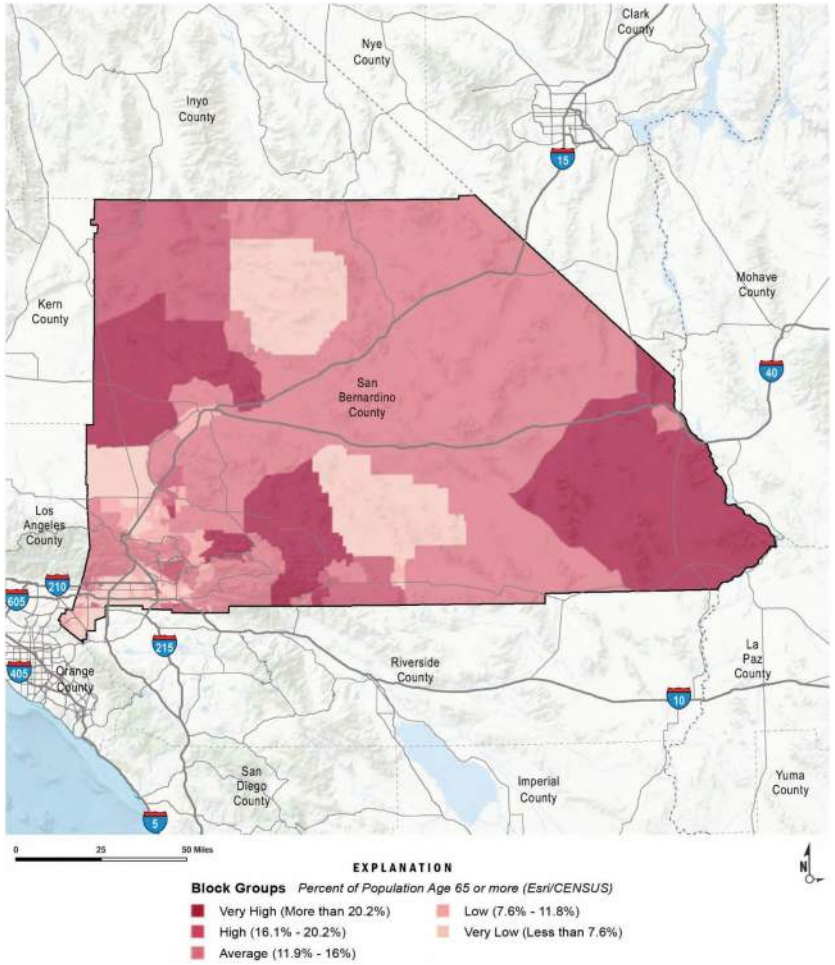


Figure 4-27: Population Over Age 65





### 4.11.1.4 Critical Facility List

As stated in the San Bernardino County Emergency Operations Plan (EOP), the San Bernardino County Sheriff's Department (Sheriff) is the lead County agency in identifying critical infrastructure in the County and its Special Districts. A Sheriff's Department Working Group was established to identify Critical Facilities throughout San Bernardino County. Due to Homeland Security and issues related to terrorism, this list is not included in the MJHMP, but is available through the Sheriff's Department.

The Sheriff's Department maintains a Critical Infrastructure Database listing the site name, location, critical level, threat level, site type, and contact information. This database was created for the 2010 MJHMP and has been updated regularly by the Intelligence Division. The Sheriff's Intelligence Division has created Emergency Response Folders (Folders) on each of the locations. The Folders contain site-specific information needed by emergency personnel to respond to any type of emergency. The Folders contain floor plans, photographs, entry/exit points, utility locations, ingress and egress locations, known hazardous materials on site, and emergency contact information for the responsible persons of the site. The Sheriff's Department maintains control and transport of this information to an Incident Command Post/Department Operations Center/Emergency Operations Center when needed.

Table 4-14: Critical Facility Points

| Infrastructure Type | Feature Count |
|---|---|
| **Essential Facility** | **268** |
| EOC | 2 |
| Fire Station | 99 |
| Hospital | 9 |
| Police Station | 28 |
| School | 130 |
| **High Potential Loss** | **1,155** |
| Child Care Center | 91 |
| Child Residential Care - 24 hour | 2 |
| Foster Family Agency | 2 |
| Adult Residential Care | 52 |
| Home Care Organization | 2 |
| Elder Residential Care | 35 |
| Communication Facility | 40 |
| Dam | 24 |
| Waste Water Facility | 2 |

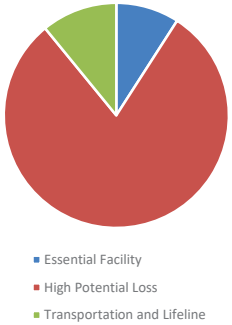

| Infrastructure Type | Feature Count |
|---|---|
| HAZMAT | 51 |
| EPA FRS Facility | 731 |
| FCC ASR | 107 |
| Electric Power Facility | 6 |
| Natural Gas Facility | 7 |
| Potable Water Facility | 3 |
| **Transportation and Lifeline** | **636** |
| Airport | 34 |
| Runway | 36 |
| Bus Facility | 2 |
| Highway Bridge | 553 |
| Railway Bridge | 11 |
| **Grand Total** | **2,059** |

**Table 4-15: Linear Utilities**

| Infrastructure Type | Total Linear Mileage |
|---|---|
| **Transportation and Lifeline** | **16,992** |
| **Railway** | **719** |
| **Roads** | **16,273** |
| Interstate Highway | 587 |
| State / County Highway | 1,259 |
| Primary Highway | 308 |
| Local Road, Major | 2,928 |
| Local Road | 6,530 |
| Other Minor Road | 4,031 |
| Vehicular Trail | 543 |
| Cul-de-Sac / Traffic Circle | 11 |
| Ramp | 68 |
| Service Road | 8 |
| **Grand Total** | **16,992** |





#### 4.11.1.5 Utility Agencies

The utilities and transportation infrastructure is another significant concern for the County and its Special Districts. Various laws, ordinances, regulations, standards, and guidelines have been established to ensure proper and thorough mitigation measures to decrease the effects of hazards.

The following are two of the major utility agencies:

**Southern California Edison (SCE)** has undertaken an all-hazards approach to planning for an emergency event. SCE has developed an Emergency Response and Recovery Plan to provide a safe and reliable electric service. SCE also has a long-standing relationship with the County and is an active member of several local, state, and federal organizations. According to SCE they have acted to mitigate the impacts of hazards on their electrical system.

**Southwest Gas Corporation (SWG)** has also coordinated with the County, maintains a natural gas high-pressure system within the County, and consists of approximately 100 miles of underground pipelines. The system also includes some above ground facilities. The total replacement cost for the entire system is approximately $40,000,000. Southwest Gas conducts annual training for the first responders within their service territories to teach the proper methods of responding to and working with natural gas leaks. Staff from SWG serves on local emergency management committees within their service territory.

## 4.12 Hazard Specific Vulnerabilities

This section summarizes the possible impacts and quantifies, where data permits, the County's vulnerability to each of the priority hazards identified in the hazard profiles earlier in this section.

An estimate of the vulnerability of the County to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, geographic extent, and damage and casualty potential. It is categorized into the following classifications:

**Low:** Minimal potential impact the occurrence and potential cost of damage to life and property is minimal.

**Medium:** Moderate potential impact this ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.

**High:** Widespread potential impact this ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.

**Extremely High:** Very widespread with catastrophic impact.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be inventoried and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of critical community facilities, historic structures, and valued natural resources. Together, this information conveys the vulnerability of that area to a hazard.





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## 4.13 Earthquake

Major Impacts from earthquakes are primarily the probable number of casualties and damage to infrastructure occurring from ground movement along a particular fault (USGS, 2016). The degree of infrastructure damage depends on the magnitude, focal depth, distance from fault, duration of shaking, type of surface deposits, presence of high groundwater, topography, and the design, type, and quality of infrastructure construction.

To analyze the risk to San Bernardino County residents, the Great Shakeout scenario was chosen modeled by the California Integrated Seismic Network (CISN). The 2016 Great Southern California ShakeOut was based on a potential magnitude 7.8 Earthquake on the southern San Andreas Fault approximately 5,000 times larger than the magnitude 5.4 earthquake that shook southern California on July 29, 2008. Such an earthquake will cause unprecedented damage to Southern California greatly dwarfing the massive damage that occurred in Northridge's 6.7-magnitude earthquake in 1994. The hazard foot print for this scenario was used to develop exposure results for population, critical facilities, and single family residential parcel values. FEMA Hazus analyses was used to conducted loss estimation for both scenarios and include building and content loss estimation results based on peak ground acceleration, peak ground velocity, and peak spectral acceleration modeled for the 7.8 earthquake on the San Andreas Fault.

### 4.13.1 Population at Risk

According to the 2010 US Census, the population of jurisdiction is 297,425. Though rural residential construction is not particularly vulnerable to earthquakes, the chosen earthquake scenarios will directly or indirectly expose the entire population of San Bernardino County to ground shaking. Depending on the time of day (the population differs based on employment opportunities) and exact location of the modeled epicenter, the earthquake scenarios could be experienced differently. Figure 4-28 exhibit the population totals in each modeled earthquake severity zone. Population location is based upon information taken during the 2010 U.S. Census.





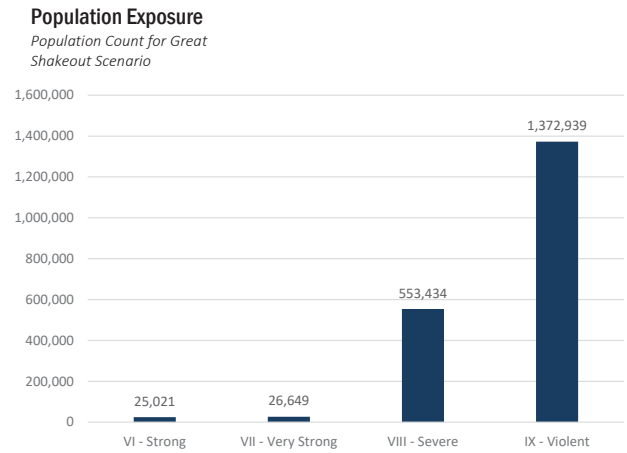


**Figure 4-28: Population Exposure to the Great Shakeout EQ Shake Severity Zone**

### 4.13.2 Improved Parcel Value at Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels. GIS was used to create centroids, or points, to represent the center of each parcel polygon this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the shake severity zones to determine the at-risk structures. Only improved parcels greater than $20,000 were analyzed. The analysis indicates residential parcels the chosen scenario will experience similar, but different shaking patterns. The type and year of construction will greatly influence damage for structures subject to similar shaking. Table 4-16 shows the count of at-risk structures and their associated improvement and land exposure values.

**Table 4-16: Improved Parcel Value Exposure from Southern California Great ShakeOut**

| Shake Severity Zone | Improved Parcel Count | Improvement Value Exposure ($000) | Land Value Exposure ($000) | Total Exposure ($000) |
|---|---|---|---|---|
| IV - Light | 1,099 | $ 181,952 | $ 64,548 | $ 246,499 |
| V - Moderate | 4,382 | $ 485,082 | $ 215,875 | $ 700,956 |

| Shake Severity Zone | Improved Parcel Count | Improvement Value Exposure ($000) | Land Value Exposure ($000) | Total Exposure ($000) |
|---|---|---|---|---|
| VI - Strong | 1,340 | $ 142,763 | $ 63,941 | $ 206,704 |
| VII - Very Strong | 7,669 | $ 824,794 | $ 206,725 | $ 1,031,519 |
| VIII - Severe | 46,889 | $ 8,741,904 | $ 3,039,484 | $ 11,781,388 |
| IX - Violent | 46,974 | $ 9,068,446 | $ 3,591,379 | $ 12,659,825 |
| **Grand Total** | **108,353** | **$ 19,444,940** | **$ 7,181,951** | **$ 26,626,891** |

### 4.13.3 Critical Facilities with Damage Potential

Earthquakes pose numerous risks to critical facilities and infrastructure. Seismic risks, or losses, that are likely to result from exposure to seismic hazards include:

- Casualties (fatalities and injuries).
- Utility outages.
- Economic losses for repair and replacement of critical facilities, roads, buildings, etc.
- Indirect economic losses such as income lost during downtime resulting from damage to private property or public infrastructure.

Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.

Linear utilities and transportation routes are vulnerable to rupture and damage during and after a significant earthquake event. The cascading impact of a single failure can have affects across multiple systems and utility sectors. Degrading infrastructure systems and future large earthquakes with epicenters near critical regional infrastructure could result in system outages that last weeks for the most reliable systems, and multiple months for others.
Table 4-17provides an inventory of critical facility locations (points only) with earthquake exposure to the Great Shakeout Scenario. The building codes have been amended to include provisions for seismic safety at various bench marks years. Depending on “year built”, each critical facility presented in the tables may have varying damage potential.

**Table 4-17: Critical Facilities with Earthquake Risk Southern California Great ShakeOut**

| Infrastructure Type | Violent Shake Zone (IX) | Severe Shake Zone (VIII) | Very Strong (VII) | Strong Shake Zone (VI) | Feature Count |
|---|---|---|---|---|---|
| **Essential Facility** | 3 | 12 | 80 | 122 | 217 |
| EOC | - | - | 2 | - | 2 |
| Fire Station | 3 | 7 | 31 | 34 | 75 |
| Hospital | - | - | 9 | - | 9 |
| Police Station | - | - | 3 | 24 | 27 |
| School | - | 5 | 35 | 64 | 104 |





| Infrastructure Type | Violent Shake Zone (IX) | Severe Shake Zone (VIII) | Very Strong (VII) | Strong Shake Zone (VI) | Feature Count |
|---|---|---|---|---|---|
| **High Potential Loss** | 31 | 56 | 213 | 484 | 784 |
| Child Care Center | 1 | 3 | 25 | 56 | 85 |
| Child Residential Care – 24 hour | - | - | - | 2 | 2 |
| Foster Family Agency | - | - | - | 2 | 2 |
| Adult Residential Care | 2 | 5 | 10 | 34 | 51 |
| Home Care Organization | - | - | 1 | 1 | 2 |
| Elder Residential Care | - | 1 | 9 | 25 | 35 |
| Communication Facility | 1 | 9 | 9 | 8 | 27 |
| Dam | 1 | - | 11 | 4 | 16 |
| Electric Power Facility | 1 | - | - | - | 1 |
| Natural Gas Facility | 2 | - | - | - | 2 |
| Waste Water Facility | - | 2 | - | - | 2 |
| HAZMAT | - | - | 6 | 16 | 22 |
| EPA FRS Facility | 21 | 27 | 115 | 307 | 470 |
| FCC ASR | 2 | 9 | 27 | 29 | 67 |
| **Transportation and Lifeline** | 16 | 20 | 41 | 131 | 208 |
| Airport | 5 | 5 | 8 | - | 18 |
| Runway | 5 | 6 | 7 | 1 | 19 |
| Bus Facility | - | - | 1 | - | 1 |
| Highway Bridge | 6 | 8 | 24 | 124 | 162 |
| Railway Bridge | - | 1 | 1 | 6 | 8 |
| **Grand Total** | **50** | **88** | **334** | **737** | **1,209** |

***HazMat Fixed Facilities***
Although earthquakes are low probability events, they produce hazardous materials (HazMat) threats at very high levels when they do occur. Depending on the year built and construction of each facility containing HazMat, earthquake initiated hazardous material releases (EIHR) potential will vary. HazMat contained within masonry or concrete structures built before certain benchmark years reflecting code improvements may be of particular vulnerability.

***Transportation***
Earthquake events can significantly impact bridges which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since most of the San Bernardino County bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the bridge’s age and type of construction which indicate the standards to which the bridge was built. Special attention will be paid to the multiple bridges that cross interstates. Interstates would serve as major emergency response and evacuation routes.

***Utilities***

Linear utilities and transportation infrastructure would likely suffer considerable damage in the event of an earthquake. Due to the amount of infrastructure and sensitivity of utility data, linear utilities are difficult to analyze without further investigation of individual system components. Table 4-18 provides the best available linear data and it should be assumed that these systems are exposed to breakage and failure.

**Table 4-18: Lifeline with Earthquake Risk Southern California Great ShakeOut**

| Facility Type | Strong | Very Strong | Severe | Violent | Total Mileage |
|---|---|---|---|---|---|
| Transportation and Lifeline | 1,324 | 1,951 | 2,796 | 2,624 | 8,697 |
| Railway | 47 | 22 | 22 | 99 | 191 |
| Roads | 1,277 | 1,929 | 2,774 | 2,525 | 8,506 |
| Interstate Highway | 22 | 7 | - | 48 | 77 |
| State / County Highway | 57 | 90 | 263 | 233 | 644 |
| Primary Highway | 34 | 15 | 19 | 27 | 95 |
| Local Road, Major | 102 | 207 | 625 | 792 | 1,726 |
| Local Road | 540 | 1,153 | 1,728 | 1,128 | 4,550 |
| Other Minor Road | 494 | 423 | 109 | 96 | 1,122 |
| Vehicular Trail | 25 | 32 | 26 | 178 | 261 |
| Cul-de-Sac / Traffic Circle | - | 1 | 2 | 2 | 5 |
| Ramp | 2 | 1 | 2 | 20 | 25 |
| Service Road | - | - | - | 1 | 1 |
| **Grand Total** | **1,324** | **1,951** | **2,796** | **2,624** | **8,695** |

## 4.13.4 Loss Estimation Results

The Hazus Level 2 analysis was used to assess the risk from and vulnerability to earthquake shaking within San Bernardino County. Hazus buildings data is aggregated to the census tract level for earthquake models, known as the general building stock (GBS), which has a level of accuracy acceptable for planning purposes. Where possible the GBS was enhanced using GIS data from the county as described previously. The following sections describe risk to and vulnerability of the GBS within the San Bernardino County Hazus calculates losses to structures from earthquake shaking by considering the amount of ground displacement and type of structure. The software estimates the percentage of damage to structures and their contents by applying established building fragility curves. Damage estimates are then translated to estimated dollar losses.

For each Great ShakeOut Scenario ground shaking data (shakemaps) were acquired from CISN and imported into Hazus. The shakemap data consist of peak ground velocity, peak





ground acceleration, peak spectral acceleration at 0.3 seconds, and peak spectral acceleration at 1.0 seconds. The earthquake module operates on census tracts that often include population and structures in the incorporated cities and the unincorporated area within a single tract. Due to this fact the results include census tracts that have a substantial portion of land within the incorporated area (loss estimates for some tracts will include structures in incorporated cities).

The results are summarized in Table 4-17 for the Great ShakeOut Scenario. It is important to understand that the Hazus earthquake module uses the census tract as its enumeration unit rather than the more detailed census block. The loss estimation values for earthquakes are much higher than those of the flooding and dam failure due to this fact. The portions of incorporated areas included within boundary census tracts elevate the values due to the inclusion of additional GBS. Though the difference between census tracts and census blocks are extremely disparate, the most important summary information is the percent of loss estimation against the total value.

Residential building and content loss estimation from the Great ShakeOut Scenario is *$9.3* billion dollars and 57 percent of the total value of the residential buildings. In Great ShakeOut Scenario, residential damage will be the greatest. While there are several limitations to the FEMA Hazus model, it does allow for potential loss estimation. It is important to remember that the replacement costs are well below actual market values, thus, the actual value of assets at risk may be significantly higher than those included herein.

**Table 4-19: Estimated Building and Content Loss Great ShakeOut Scenario Earthquake**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (% of Total Value) | Content Replacement Cost ($000) | Content Replacement Cost (% of Total Value) | Total Estimated Loss ($000) | Total Loss Estimation (% of Total Value) |
|---|---|---|---|---|---|---|
| Agricultural | $ 51,431 | 9.7% | $ 17,215.68 | 3.2% | $ 68,646.80 | 13.0% |
| Commercial | $ 3,286,331 | 14.4% | $ 1,110,422.84 | 4.9% | $ 4,396,754.29 | 19.3% |
| Educational | $ 175,987 | 10.4% | $ 56,822.89 | 3.4% | $ 232,810.20 | 13.7% |
| Government | $ 53,348 | 9.2% | $ 20,298.84 | 3.5 | $ 73,647.28 | 12.6% |
| Industrial | $ 1,179,339 | 13.1% | $ 590,913.81 | 6.6% | $ 1,770,253.41 | 19.6% |
| Religious | $ 243,891 | 12.7% | $ 80,862.72 | 4.2% | $ 324,754.33 | 16.9% |
| Residential | $ 7,841,645 | 6.2% | $ 1,525,181.65 | 1.2% | $ 9,366,826.84 | 7.4% |
| **Grand Total** | **$ 12,831,972** | **7.9%** | **$ 3,401,718.42** | **2.1%** | **$ 16,233,693.14** | **10.0%** |

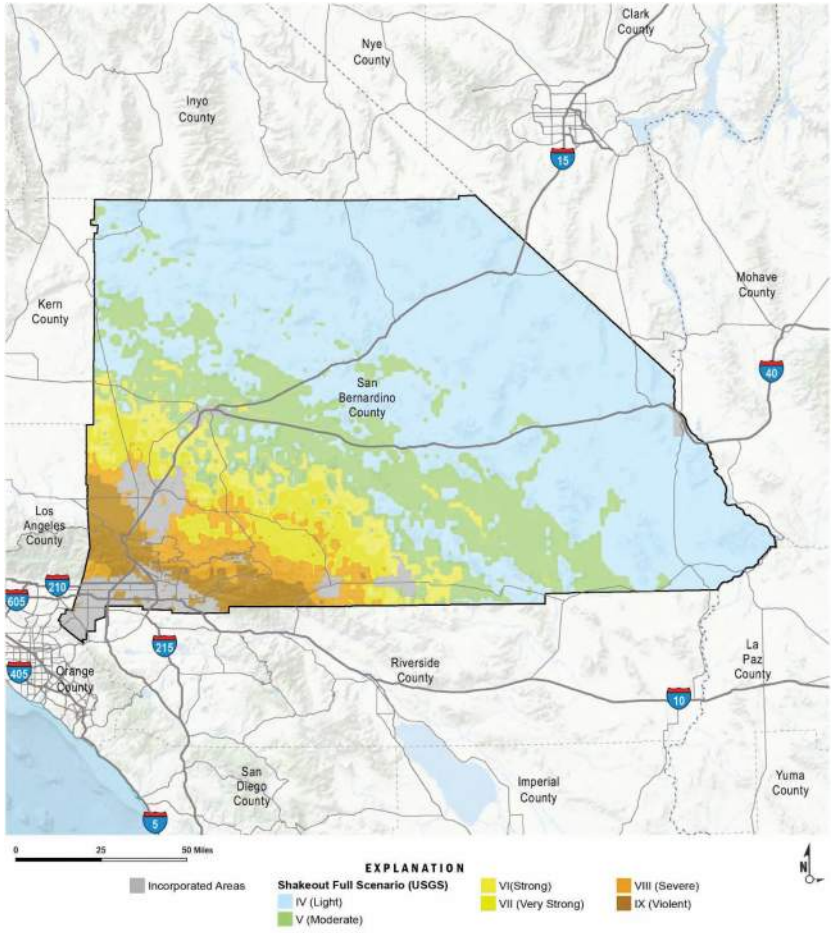


**Figure 4-29: Great Shakeout Scenario MMI Classes**





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## 4.14 Wildfire

Risk to the County of San Bernardino from wildfire is of significant concern. High fuel loads in the hills, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to October fire season the dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become large and out-of-control.

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Short and long-term economic losses could also result due to loss of business and other economic drivers associated with San Bernardino County summer season activities. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Generally, there are three major factors that sustain wildfires and predict a given area's potential vulnerability to burn. These factors are fuel, topography, and weather.

- Fuel – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches, to dead standing trees, live trees, brush, and cured grasses. Manmade structures are also considered a fuel source, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control. Development in the mountain region currently possesses the highest vulnerability to wildfire.

- The residents of this region are also considered to be the most vulnerable due to their age and income levels. This area is comprised of lower income (that is, lower than the US median income) homes as well as a higher than average amount of residents under age 18 and an average amount of residents 65 or older.
- Topography – An area's terrain and slope affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.





- Weather – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought the threat of wildfire increases. Wind is the most treacherous weather factor. The greater the wind, the faster a fire can spread and the more intense it can be. Wind shifts, in addition to wind speed, can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. As part of a weather system, lightning also ignites wildfires, often in difficult to reach terrain for firefighters.

Factors contributing to the high, widespread wildfire risk in San Bernardino County include:

- Narrow and often one-lane and/or dead-end roads complicating evacuation and emergency response.
- Nature and frequency of ignitions; and increasing population density leading to more ignitions.
- Slope of the foothills;
- Residential development along the foothills;

### 4.14.1 Population at Risk

Wildfire risk is of greatest concern to populations residing in the moderate, high, and very high wildfire hazard zones. The San Bernardino County census block data was used to estimate populations within the hazard zones. There are a significant number of people living within the WUI described in the wildfire profiles. More than 34,000 residents in the unincorporated county live within areas considered very high fire hazard and more than 63,000 residents live within a very high hazard

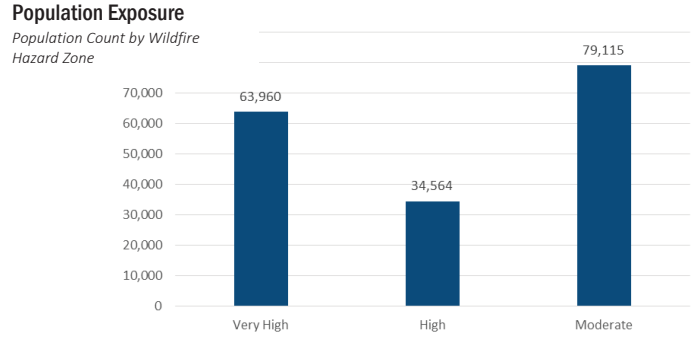


**Figure 4-30: Population at Risk from Wildfire Hazards**

### 4.14.2 Improved Parcel Value at Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels. In some cases, a parcel will be within in multiple fire threat zones. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the fire threat layer to determine the risk for each structure. The fire threat zone in which the centroid was located was assigned to the entire parcel. This methodology assumed that every parcel with a square footage value greater than zero was developed in some way. Only improved parcels were analyzed. Table 4-20 exhibits portions of San Bernardino County that have significant assets at risk to wildfire in the Moderate, High and Very High fire severity zones.

**Table 4-20: Residential Buildings and Content at Risk from Wildfire**

| Fire Hazard Severity Hazard Zone | Improved Parcel Count | Improvement Value Exposure ($000) | Land Value Exposure ($000) | Total Exposure ($000) |
|---|---|---|---|---|
| Very High | 43,794 | $ 8,602,590 | $ 3,075,148 | $ 11,677,739 |
| High | 11,512 | $ 1,822,731 | $ 551,160 | $ 2,373,892 |
| Moderate | 25,477 | $ 3,221,982 | $ 950,044 | $ 4,172,026 |
| Non-Wildland/Non-Urban | 621 | $ 573,866 | $ 294,283 | $ 868,148 |
| Urban Un-zoned | 26,974 | $ 5,223,286 | $ 2,310,932 | $ 7,534,219 |
| **Grand Total** | **108,378** | **$ 19,444,456** | **$ 7,181,567** | **$ 26,626,023** |

Note:
1-The table above does not display loss estimation results; the table exhibits total value at risk based upon the hazard overlay and San Bernardino County Assessor data.
2- Parcel information is for all county parcels with greater than $20,000 in assessed parcel improvement value only. The San Bernardino County Assessor's roles only provide spatial information on assessed improvement and land values.

### 4.14.3 Critical Facilities at Risk

Critical facilities data were overlain with fire hazard severity zone data to determine the type and number of facilities within each risk classification. Tables 4-21 and 4-22 list the critical facilities in the High and Very High wildfire hazard zones for San Bernardino County.





**Table 4-21: Critical Facilities at Risk from Wildfire**

| Infrastructure Type | High | Very High | Feature Count |
|---|---|---|---|
| Essential Facility | 11 | 105 | 116 |
| EOC | 2 | 0 | 2 |
| Fire Station | 4 | 45 | 49 |
| Hospital | 0 | 5 | 5 |
| Police Station | 0 | 24 | 24 |
| School | 5 | 31 | 36 |
| High Potential Loss | 72 | 177 | 249 |
| Child Care Center | 3 | 29 | 32 |
| Child Residential Care - 24 hour | 1 | 0 | 1 |
| Foster Family Agency | 0 | 0 | 0 |
| Adult Residential Care | 11 | 4 | 15 |
| Home Care Organization | 0 | 0 | 0 |
| Elder Residential Care | 8 | 5 | 13 |
| Communication Facility | 2 | 13 | 15 |
| Dam | 0 | 14 | 14 |
| Electric Power Facility | 0 | 0 | 0 |
| Natural Gas Facility | 0 | 0 | 0 |
| Potable Water Facility | 0 | 0 | 0 |
| Waste Water Facility | 0 | 0 | 0 |
| HAZMAT | 0 | 2 | 2 |
| EPA FRS Facility | 37 | 83 | 120 |
| FCC ASR | 10 | 27 | 37 |
| Transportation and Lifeline | 10 | 103 | 113 |
| Airport | 1 | 0 | 1 |
| Runway | 1 | 0 | 1 |
| Bus Facility | 1 | 0 | 1 |
| Highway Bridge | 7 | 101 | 108 |
| Railway Bridge | 0 | 2 | 2 |
| **Grand Total** | **93** | **385** | **478** |

**Table 4-22: Lifelines with Wildfire Risk**

| Facility Type | High | Very High | Total Mileage |
|---|---|---|---|
| Transportation and Lifeline | 819 | 1,906 | 2,725 |
| Railway | 19 | 47 | 66 |
| Roads | 800 | 1,859 | 2,659 |
| Interstate Highway | 4 | 37 | 41 |
| State / County Highway | 33 | 226 | 259 |
| Primary Highway | 17 | 13 | 30 |
| Local Road, Major | 311 | 521 | 832 |
| Local Road | 389 | 806 | 1,195 |
| Other Minor Road | 34 | 56 | 91 |
| Vehicular Trail | 10 | 184 | 195 |
| Cul-de-Sac / Traffic Circle | 1 | 2 | 3 |
| Ramp | 2 | 12 | 13 |
| Service Road | 0 | 1 | 1 |
| **Grand Total** | **819** | **1,906** | **2,725** |

### 4.14.4 Loss Estimation Results

Wildland fire cost impacts of damage done to land and structures and also to critical infrastructure

It is impossible to estimate the possible cost in dollars to replace and pay for actual firefighting as the damage costs that incur from wildland fires varies so greatly. One of the varied costs is the replacement and repair of structures and remediate of the damaged properties. Then the rebuilding costs and replacing of the structures with laws requiring new buildings to meet new criteria as a result of state laws that may require more stringent building and construction practices far greater than the original building of the said structure. Also the estimate of damages to critical infrastructures such as power lines and delivery systems as it is difficult the collateral loses to businesses and individuals losing power for and unknown time. Also damages to railroads and bridges also to road way, freeways as it is impossible to gauge the actual lose amounts from commerce being impeded.

Many of the County's landfills, transfer stations, and closed disposal sites are situated in areas subject to wildfires. In 2003, the Old Fire burned through three separate sites and caused major damage at the Heaps Peak Transfer Station when the fire burned through the office building and Transfer Station site.

None of this takes into account the costs of labor and retardants, vehicle damages and fuel and wear and tear as well as equipment expended and used and or damaged. Along with replace any safety gear or injuries to any persons working to mitigate the wildland fire

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## 4.15 Flooding

The County has experienced severe and widespread flooding throughout its history. Several major drainage basins have the potential to subject residents and structures to a high risk of flooding. In addition, the cumulative increase in impervious surfaces has increased problems related to surface run- off. While complete avoidance or protection through control facilities is not practical, considerable improvement can be made through structural and non-structural methods.

The County currently utilizes land use zoning districts to prohibit habitable structures in floodways as defined by the federal requirements necessary to participate in the National Flood Insurance Program. The consistent adoption of overlays is needed to require special review, conditions, and the prohibition of some uses in floodplain areas (areas subject to 100-year floods), including dry lakes. In addition, there are land use policies and development standards that can be implemented, including reduction of impervious surfaces; increase of percolation, infiltration, and recharge; and the control of urban run-off. There is a need for the County to identify all areas of flood and drainage hazards, especially in the Desert Region where mapping is sparse, as well as areas with a heavy concentration of debris or the potential for dam inundation. Flood hazards are more comprehensively discussed in the Safety Background Report.

The vulnerable areas are addressed in the County's General Plan. See Sections 5 and 6 for additional information. San Bernardino County has seven (7) properties listed in the Repetitive Loss and Severe Repetitive Loss properties. All of the properties are single-family residences. The properties are located in:

- Barstow – 2 properties (1999 and 2005)
- Crestline (1980 and 1982)
- Forest Falls (1995 and 1999)
- Lake Arrowhead (1998 and 2005)
- Lytle Creek (1998 and 2005)
- Sugarloaf (1993 and 1995)

These properties were damaged during unusual storms and/or immediately after a wildfire in the area and are isolated properties in widely scattered areas of the County. The properties were not damaged during the 2009 or 2010 winter storm events. Property addresses are not listed to comply with privacy laws.

The areas are now covered by the County General Plan and County Ordinance. These are in compliance with the National Flood Insurance Program.

### 4.15.1 Population at Risk

Of greatest concern in the event of a flood is the potential for loss of life. Using 2012 population data aggregated by census blocks, an estimate was made of the population exposed to the 100 and 500-year floodplain. To account for census blocks that were partially within the floodplain, a weighted average was employed to calculate the proportion of the population within the floodplain. The results of the population overlay are shown in Figure 4-31. More than 9,500 residents live near or within the 100-year floodplain and approximately 13,346 county residents live within the 500-year floodplain. Approximately 18,816 county residents live within areas protected by levees.

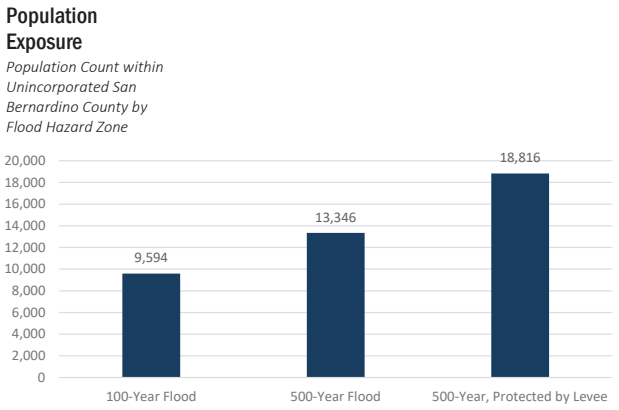


**Figure 4-31: Population Exposed to NFIP Flood Zones**

### 4.15.2 Residential Parcel Value with Flood Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels within the FEMA NFIP flood zones. In some cases, a parcel will be within in multiple flood zones. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the floodplain layer to determine the flood risk for each structure. The flood zone in which the centroid was located was assigned to the entire parcel. This methodology assumed that every parcel with a square footage value greater than zero was developed in some way. Only improved parcels greater than $20,000 were analyzed.





Table 4-23 shows the count of at-risk parcels and their improvement and land exposure values.

**Table 4-23: Parcels Exposed to NFIP Flood Zones**

| Flood Hazard Zone | Improved Parcel Count | Improvement Value Exposure ($000) | Land Value Exposure ($000) | Total Exposure ($000) |
|---|---|---|---|---|
| 100-Year Flood | 3,426 | $ 518,483 | $ 368,058 | $ 886,541 |
| 500-Year Flood | 3,397 | $ 833,287 | $ 338,728 | $ 1,172,014 |
| 500-Year, Protected by Levee | 4,608 | $ 1,327,942 | $ 527,317 | $ 1,855,259 |
| Grand Total | 11,431 | $ 2,679,711 | $ 1,234,103 | $ 3,913,814 |

While there are several limitations to this methodology, it does allow for potential loss estimation. It should be noted that the analysis may include structures in the floodplain that are elevated at or above the level of the base flood elevation, which will most likely decrease potential flood damage to these structures. Also, it is important to remember that the County Assessor's values are well below actual market values; thus, the actual value of assets at risk may be significantly higher than those included herein.

### 4.15.3 Critical Facilities Exposure

Critical facilities data were overlain with flood hazard data to determine the type and number of facilities within the 100- and 500-year floodplain. Flooding poses numerous risks to critical facilities and infrastructure:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.
- Bridges washed out or blocked by floods or debris from floods also can cause isolation.
- Creek or river floodwaters can back up drainage systems causing localized flooding.
- Floodwaters can get into drinking water supplies causing contamination.
- Sewer systems can be backed up causing waste to spill into homes, neighborhoods, rivers, and streams.
- Underground utilities can also be damaged.

Tables 4-24 and 4-25 provide an inventory of critical facilities in the floodplain for San Bernardino County and it provides the location of lifelines relative to the floodplain in the areas of the San Bernardino County. With a total of 810 essential facilities, high potential losses, and transportation and lifeline structures located in either the 100 or 500-year flood zone, the impact to the community could be devastating if these critical facilities were damaged or destroyed during a flood event.





**Table 4-24: Critical Facility Exposed to NFIP Flood Zones**

| Infrastructure Type | 100 Year Flood Zone | 500 Year Flood Zone | 500 Year Flood Zone, Protected by Levee | Feature Count |
|---|---|---|---|---|
| Essential Facility | 21 | 114 | 5 | 140 |
| EOC | 0 | 1 | 0 | 1 |
| Fire Station | 4 | 27 | 2 | 33 |
| Hospital | 0 | 4 | 0 | 4 |
| Police Station | 2 | 23 | 0 | 25 |
| School | 15 | 59 | 3 | 77 |
| High Potential Loss | 52 | 458 | 52 | 562 |
| Child Care Center | 13 | 57 | 3 | 73 |
| Child Residential Care - 24 hour | 0 | 2 | 0 | 2 |
| Foster Family Agency | 0 | 2 | 0 | 2 |
| Adult Residential Care | 0 | 37 | 3 | 40 |
| Home Care Organization | 0 | 2 | 0 | 2 |
| Elder Residential Care | 0 | 24 | 8 | 32 |
| Communication Facility | 0 | 7 | 0 | 7 |
| Dam | 2 | 3 | 0 | 5 |
| Waste Water Facility | 1 | 0 | 0 | 1 |
| HAZMAT | 0 | 16 | 1 | 17 |
| EPA FRS Facility | 33 | 286 | 35 | 354 |
| FCC ASR | 3 | 22 | 2 | 27 |
| Transportation and Lifeline | 26 | 77 | 5 | 108 |
| Airport | 2 | 5 | 0 | 7 |
| Runway | 2 | 5 | 0 | 7 |
| Bus Facility | 1 | 1 | 0 | 2 |
| Highway Bridge | 20 | 65 | 5 | 90 |
| Railway Bridge | 1 | 1 | 0 | 2 |
| **Grand Total** | **99** | **649** | **62** | **810** |

**Table 4-25: Lifelines Exposure to NFIP Flood Zones**

| Facility Type | 100 Year | 500 Year Flood Zone | 500 Year Flood Zone, Protected by Levee | Total Mileage |
|---|---|---|---|---|
| Transportation and Lifeline | 204 | 1,952 | 69 | 2,225 |
| Railway | 9 | 44 | 6 | 59 |
| Roads | 195 | 1,908 | 63 | 2,166 |
| Interstate Highway | 1 | 34 | 1 | 36 |
| State / County Highway | 20 | 189 | 9 | 218 |
| Primary Highway | 7 | 20 | - | 28 |

| Facility Type | 100 Year | 500 Year Flood Zone | 500 Year Flood Zone, Protected by Levee | Total Mileage |
|---|---|---|---|---|
| Local Road, Major | 32 | 377 | 38 | 447 |
| Local Road | 115 | 1,168 | 13 | 1,295 |
| Other Minor Road | 18 | 86 | 2 | 107 |
| Vehicular Trail | 2 | 15 | - | 17 |
| Cul-de-Sac / Traffic Circle | 0 | 1 | - | 1 |
| Ramp | 0 | 18 | 0 | 19 |
| **Grand Total** | **204** | **1,952** | **69** | **2,225** |

## 4.15.4 Loss Estimation Results

The Hazus analysis was used to assess the risk from and vulnerability to flooding within San Bernardino County. Hazus buildings data is aggregated to the census block level, known as the general building stock (GBS), which has a level of accuracy acceptable for hazard mitigation planning purposes. The following sections describe risk to and vulnerability of the GBS within the San Bernardino County mapped regulatory floodplain. The total value of exposed buildings and content within the San Bernardino planning area was generated using Hazus and is previously summarized.

Hazus calculates losses to structures from flooding by considering the depth of flooding and type of structure. Using historical flood insurance claim data, the software estimates the percentage of damage to structures and their contents by applying established depth-damage curves. Damage estimates are then translated to estimated dollar losses. The results are summarized in Tables 4-26 and 4-27 and Figure 4-32. While there are several limitations to the FEMA Hazus model, it does allow for potential loss estimation. It should be noted that the analysis may include structures in the floodplain that are elevated at or above the level of the base flood elevation, which will likely mitigate flood damage. Also, it is important to remember that the replacement costs are well below actual market values, thus, the actual value of assets at risk may be significantly higher than those included herein.

**Table 4-26: Flood Loss Estimation (Based on Depth) in NFIP Flood Zones**

| Flood Hazard Zone | Building Loss ($000) | Building Loss (% of Total Value) | Content Loss ($000) | Content Loss (% of Total Value) | Total Estimated Loss ($000) | Total Estimated (% of Total Value) |
|---|---|---|---|---|---|---|
| 100-Year | $ 34,749.00 | 0.1% | $ 24,858.00 | 0.1% | $ 59,849.00 | 0.2% |
| 500-Year | $ 218,454.00 | 0.8% | $ 173,304.00 | 0.6% | $ 396,336.00 | 1.4% |





**Table 4-27: 100 Year Flood Los Estimation (Based on Depth) in NFIP Flood Zones by Occupancy Type**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (% of Total Value) | Content Replacement Cost ($000) | Content Replacement Cost (% of Total Value) | Total Estimated Loss ($000) | Total Loss Estimation (% of Total Value) |
|---|---|---|---|---|---|---|
| Agriculture | $ 147.00 | 0.10% | $ 246.00 | 0.17% | $ 427.00 | 0.30% |
| Commercial | $ 1,874.00 | 0.08% | $ 4,458.00 | 0.18% | $ 6,463.00 | 0.26% |
| Education | $ 46.00 | 0.02% | $ 271.00 | 0.11% | $ 319.00 | 0.13% |
| Government | $ 56.00 | 0.07% | $ 304.00 | 0.39% | $ 370.00 | 0.48% |
| Industrial | $ 201.00 | 0.02% | $ 389.00 | 0.04% | $ 624.00 | 0.06% |
| Religious/Non-Profit | $ 326.00 | 0.09% | $ 1,946.00 | 0.55% | $ 2,279.00 | 0.65% |
| Residential | $ 32,099.00 | 0.14% | $ 17,244.00 | 0.07% | $ 49,367.00 | 0.21% |
| **Grand Total** | **$ 34,749** | **0.13%** | **$ 24,858** | **0.09%** | **$ 59,849** | **0.22%** |

**100 YR Flood Hazard**

*Estimated Content Loss by Occupancy Type*

**100 YR Flood Hazard**

*Estimated Building Loss by Occupancy Type*

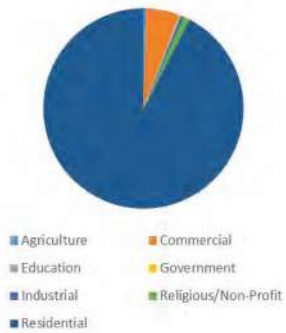


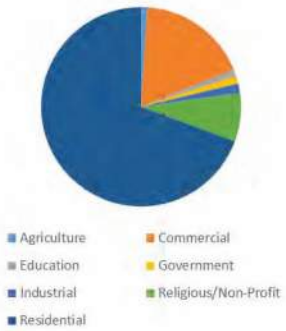


**Figure 4-32: Total Building and Content Loss by Occupancy Type for 100 Year Flood**





**Table 4-28: 500 Year Flood Loss Estimation (Based on Depth) In NFIP Flood Zones by Occupancy Type**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (% of Total Value) | Content Replacement Cost ($000) | Content Replacement Cost (% of Total Value) | Total Estimated Loss ($000) | Total Loss Estimation (% of Total Value) |
|---|---|---|---|---|---|---|
| Agriculture | $ 674.00 | 0.48% | $ 981.00 | 0.69% | $ 1,781.00 | 1.26% |
| Commercial | $ 10,080.00 | 0.41% | $ 27,640.00 | 1.13% | $ 39,179.00 | 1.61% |
| Education | $ 720.00 | 0.29% | $ 3,563.00 | 1.44% | $ 4,355.00 | 1.76% |
| Government | $ - | 0.00% | $ 2.00 | 0.00% | $ 9.00 | 0.01% |
| Industrial | $ 6,036.00 | 0.57% | $ 13,975.00 | 1.31% | $ 22,438.00 | 2.11% |
| Religious/Non-Profit | $ 1,210.00 | 0.34% | $ 6,070.00 | 1.72% | $ 7,332.00 | 2.08% |
| Residential | $ 199,734.00 | 0.86% | $ 121,073.00 | 0.52% | $321,242.00 | 1.38% |
| **Grand Total** | **$ 218,454** | **0.79%** | **$ 173,304** | **0.63%** | **$ 396,336** | **1.44%** |

**500 YR Flood Hazard**

*Estimated Content Loss by Occupancy Type*

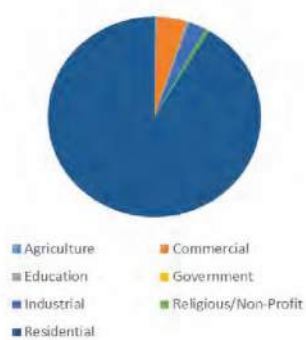


**500 YR Flood Hazard**

*Estimated Building Loss by Occupancy Type*

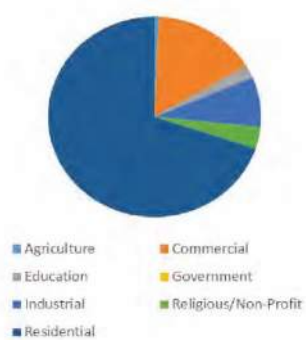


**Figure 4-33: Total Building and Content Loss by Occupancy Type for 500 Year Flood**

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## 4.16 Drought

Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply.

Due to the lack of defined geographical boundaries, the vulnerability assessment for drought differs from other natural hazards. The impacts of drought can be categorized as economic, environmental, or social. Many economic impacts occur in agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to obvious losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and diseases to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn places human and wildlife populations, buildings, infrastructure and critical facilities, at higher levels of risk.

Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Reduced income for farmers has a ripple effect. Retailers and others who provide goods and services to farmers face reduced business. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls and loss of tax revenue for local, state and federal government. Less discretionary income affects the recreation and tourism industries. Prices for food, energy and other products increase as supplies are reduced. In some cases, local shortages of certain goods result in the need to import these goods from outside the stricken region.

### 4.16.1 Loss Estimation Results

No standardized methodology exists for estimating losses due to drought. Drought does not generally have a direct impact on critical and non-critical facilities and building stock. Instead, drought vulnerability is primarily measured by its potential impact to sectors of the County's economy and natural resources. In San Bernardino County some of the potential impacts to the economy include the following:

- Reduced agricultural and livestock production;
- Loss of timber from increased wildfires;
- Decreased municipal and industrial water supply;
- Loss of recreation/tourism; and
- Decreased wildlife and wildlife habitat.

### 4.16.2 Statewide Mandatory Water Reductions

Recognizing persistent, yet less severe, drought conditions throughout California, on May 18, 2016 the State Water Resources Control Board adopted an emergency water conservation

regulation requiring locally developed conservation standards based upon each water supplier's specific circumstances. It replaces the prior percentage reduction-based water conservation standard. In San Bernardino County, each water wholesaler (Mojave Water Agency) was required to calculate the supply of water for the next three years, considering drought conditions persist. Each water supply retailer subsequently self-certified the expected demand on water resources, determining whether or not there is sufficient supply to meet demand. Our Department certified that there is sufficient water supply to meet the demand over the next three years; however due to ongoing drought conditions in the region, water conservation efforts should continue. The County has developed a watering schedule, watering hour restrictions and additional end user watering restrictions which can be viewed here: http://www.specialdistricts.org/index.aspx?page=548





## 4.17 Terrorism

Translating most manmade hazard profiles into meaningful geospatial information is difficult at best. Instead, the planning team will use an asset-specific approach. Population, facilities, systems and assets will be prioritized and assessed in this vulnerability assessment.

Special consideration should be given to areas with high density and those containing vulnerable populations (young, old, and those whose primary language is not English).

Facilities at high risk may include gathering places, critical facilities/ transportation and lifelines and utilities.

### 4.17.1 Population at Risk

Since terrorism can happen anytime, anywhere, 100% of the population is vulnerable to terrorism. In particular, people with access and functional needs, the elderly and the very young are especially vulnerable because they often rely heavily on others in their daily lives. Persons with English as a second language are also vulnerable as they may not receive warnings or notifications related to an incident in their primary language.

### 4.17.2 Critical Facilities Exposure

Critical facilities may include essential facilities (such as hospitals, police and fire stations, evacuation centers, etc.), transportation systems, lifeline utility systems, high potential loss facilities (such as nuclear power plants, dams and military installations, etc.), and hazardous material facilities.

Gathering facilities should also receive special attention. Places of mass gathering not only present terrorists with potential opportunities for mass casualties, symbolism and high impact media coverage, they pose a broad range of security challenges for their owners and operators. The National Counter Terrorism Committee has noted that places of mass gathering have been specifically identified by religious and political extremists as attractive targets.

Places of mass gathering incorporate a diverse range of facilities including, but not limited to, sporting venues, shopping and business precincts, tourism/entertainment venues/attractions, hotels and convention centers, major events and public transport hubs. This also includes significant one off events.

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## 4.18 Climate Change

The vulnerability assessment for climate change is different from other natural hazards discussed in this HMP due to the lack of defined geographical boundaries. This section provides a summary of San Bernardino County's vulnerability to climate change.

The most serious threats to the public health of Californians will stem primarily from the higher frequency of extreme conditions, principally more frequent, more intense, and longer heat waves. A heat wave is defined as 5 or more consecutive extreme heat days. An increase in heat waves may increase the risk of directly related conditions such as heat stroke and dehydration.

In the desert areas of the County, the Extreme Heat Day Threshold temperatures are around 110°F and in the mountainous regions it is in the mid 80's. According to the Cal-Adapt Extreme Heat Tool, the number of extreme heat days (a day in April through October where the maximum temperature (Tmax) exceeds the 98th historical percentile of maximum temperatures based on daily temperature data between 1961 and 1990) will continue to increase rapidly from the present day to 2090.

Projections by Scripps Institution of Oceanography show little change in total annual precipitation in San Bernardino County. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. In the mountainous areas of the County, it is projected that the decadal average of snowpack will continue to decrease until 2090. As shown in Figure 4-34 the sharpest decreases in snowpack are projected to begin around 2030. The area projected to be burnt by wildfire toward the end of the century will not increase substantially in the County. The most change will be experienced in the mountainous regions.

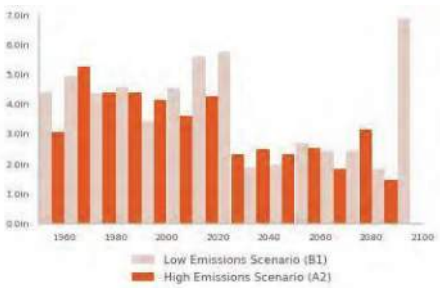


**Figure 4-34: Decadal Snowpack Averages 1960-2090**

***Source: cal-adapt.org/snowpack/decadal***

### 4.18.1 Population at Risk

Vulnerable populations should receive special attention when assessing the community's vulnerability to climate change. For example, care and sheltering during extreme heat conditions must be provided for vulnerable populations such as the elderly. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornados, floods, or earthquakes—takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died.





# Section 5. Community Capability Assessment

## 5.1 Existing Plans, Policies and Programs

San Bernardino County is encouraging all departments, special districts, and agencies to share reports and common information. This sharing and exchanging of ideas has led to more coordinated efforts and better planning. The driving document in the County of San Bernardino is the County's General Plan. The County General Plan provides the foundation on which all development and future programs are built upon.

### 5.1.1 San Bernardino County General Plan

The State of California recommends that the General Plan is updated every 10-20 years; depending mostly on whether or not the plan is meeting the community's needs. The San Bernardino County General Plan was last updated and adopted in 2007. There are seven (7) mandatory elements in a General Plan:

- Circulation Element,
- Conservation Element,
- Housing Element,
- Land Use Element,
- Noise Element,
- Open Space Element, and
- Safety Element.

However, there are several optional elements. The County of San Bernardino General Plan includes an optional element, the Economic Development Element.

The Land Use Element of the General Plan establishes 18 land use zoning districts that apply only to lands governed by the County; not for lands controlled by other jurisdictions or lands controlled by federal and state government (see Section 1.3.5, page 8 for a listing of the 18 Land Use districts in the Land Use Element). The Land Use Element also describes land use compatibility for the primary three (3) hazards: Geologic; Flood; and, Wildfire. Because of these commonalities between the General Plan and the MJHMP, the county Board of Supervisors has adopted the MJHMP as part of the County's General Plan.

### 5.1.2 Regulations, Code, Policies and Ordinances

The following titles of the San Bernardino County Code include regulations and ordinances on the following issues and topics related to hazard mitigation:

**Table 5-1: County Development Code Hazard Crosswalk**

| Hazard | Plan/Program/ Regulation | Description |
|---|---|---|
| **Multi-Hazard** | **Title 2** | Emergency Services<br>Uniform Fire Code and related miscellaneous fire regulations<br>Police Regulations and Public Protection |
| **Multi-Hazard** | **Title 3** | Emergency Medical Services<br>Domestic Water Sources and Systems<br>Hazardous Materials and Toxics Control<br>Waste Management |
| **Multi-Hazard** | **Title 6** | California Building Code<br>California Electrical Code<br>California Plumbing Code<br>California Mechanical Code |
| **Multi-Hazard** | **Title 7** | Airport Rules and Regulations |
| **Multi-Hazard** | **Title 8** | Development Code includes regulations relative to Land Use, Development Standards, Safety Standards, and Environmental Protection. |
| **Multi-Hazard** | **Zoning Ordinances** | The County has also adopted Zoning Ordinances that are not part of the County Code but are part of the General Plan. These ordinances regulate land use; map the official land use and hazard overlay districts to include safety hazard and environmental protection areas. |

### 5.1.3 Local Programs for Mitigation Implementation

The information in Table 5-2 is used to construct mitigation actions aligned with existing planning and regulatory capabilities of the County. Planning and regulatory tools typically used by local jurisdictions to implement hazard mitigation activities are building codes, zoning regulations, floodplain management policies, and other County programs or planning documents.





**Table 5-2: Planning and Regulatory Mitigation Capabilities Summary**

| Hazard | Plan/Program/ Regulation | Responsible Agency | Comments |
|---|---|---|---|
| Multi-Hazard | Mountain Mutual Aid | Fire District | Mountain Mutual Aid is an operational group of emergency responders. It is comprised of all of the agencies and volunteer relief groups that would be and have been involved in any and all disasters on the mountain. It is of note to that their main and most frequent call to service is in response to a wildfire. They meet monthly and maintain themselves in a constant state of readiness. |
| Wildfire | Forest Care | Cal Fire | Forest Care is a program dedicated to creating a healthier forest. This program provides foresters to assess individual properties for thinning the vegetation and then provides 75% of the funding to do so. Funding originates at the Federal level but is passed through Cal Fire and it employs Cal Fire Foresters as well as staff from the National Forest Association |

#### 5.1.3.1 Public Education and Alert Programs

**Table 5-3: Public Education and Alert Programs**

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Multi-Hazard | MAST | Multiple | Mountain Area Safety Taskforce (MAST) has a substantial public education component. All agencies participate with the goal to have no one on the mountain uneducated about creating a thinner forest which is a more fire safe forest. For more information on MAST, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Multi-Hazard | CERT | Fire District | The Community Emergency Response Team (CERT) Program educates people about disaster preparedness and trains them in basic response |

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| | | | skills. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Multi-Hazard | Listos | Fire District | Listos, which means “ready” in Spanish, is a twelve-hour disaster preparedness course created specifically for the Spanish-speaking community and is delivered entirely in Spanish. The program is intended to be adaptable, flexible and culturally relevant. This means participants are encouraged to involve the entire family and accommodations are made for young children. San Bernardino County Fire, Office of Emergency Services currently partners with the Cities of Fontana and Rialto to bring Listos to their communities |
| Multi-Hazard | California Disaster Corps | Fire District | The Disaster Corps is a first-in-the-nation effort to professionalize, standardize and coordinate highly trained disaster volunteers statewide. This program initiative was built collaboratively in partnership with California Volunteers from the ground up through public-private partnerships and with a wide range of subject matter experts. See Annex A Section A.6 Fire Protection District Mitigation Project . |
| Multi-Hazard | TENS | Fire District | Telephone Emergency Notification Systems (TENS) During an emergency, public safety can be a direct function of the speed and accuracy of the dissemination of information. This is particularly important during emergencies that require evacuations. To that end the Board of Supervisors dedicated General Fund money in 2003 to the implementation of an automated phone dialing system that calls telephones in specific geographic areas of concern. All areas of San Bernardino County have all been preprogrammed so that during an emergency, the specific target group can be notified as quickly as possible. |





| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Multi-Hazard | ECS | Fire District | The Emergency Communications Service (ECS) is a volunteer group providing front-line communications, technical and logistical support to the San Bernardino County Fire Department and Office of Emergency Services. Their primary mission is to support County Fire, County Government and other local agencies in time of disaster. In addition, ECS has provided telecommunications and event support to other County departments including Public Health, Behavioral Health, Public Works, Pre-School Services, Sheriff's Search and Rescue and other County Departments. |
| Multi-Hazard | AM Radio | Fire District | Community Based AM Radio Transmitters The Fire Safe Councils discovered the existence of very inexpensive but very effective community based AM radio transmitters. The transmitters are very effective for providing information and updates to a community that is either preparing for a community emergency or just had one. As a delivery modality they are extremely reliable because in most all emergencies the AM radio in your car is likely to be operational particularly when the electricity is out in your house. |
| Multi-Hazard | IPAWS | Fire District | During an emergency, alert and warning officials need to provide the public with life-saving information quickly. The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation’s alert and warning infrastructure and will save time when time matters most, protecting life and property.<br><br>Federal, State, Territorial, Tribal, and local alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the |

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| | | | National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface. |

### 5.1.3.2 Wildfire Mitigation Programs

San Bernardino County has one of the most comprehensive set of programs to mitigate the potential for catastrophic wildfires in the Nation. There is no other jurisdiction that has the comprehensive, multi-agency cooperation and coordination as is found in San Bernardino County. See Annex A Section A.6 Fire Protection District Mitigation Project to see how the Fire Protection District will implement the following programs:

**Table 5-4: Wildfire Mitigation Programs**

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Wildfire | MAST | Multiple | The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for protection from wildfire. For more information on MAST, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Community Based Fuels Reduction program | Fire District | This program is designed to create community based fuel modification programs across the mountain communities. For more information see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Cal Fire | Cal Fire | Cal Fire provides programs to increase fire safety in high fire hazard severity zones. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | County Fire Hazard Abatement | Fire District | Fire Hazard Abatement works to reduce the potential for an individual's property to be the source of fire and structural ignitability. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |





| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Wildfire | Contractor Certification | City of Big Bear Lake Fire Department | This program trains and certifies landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Southern California Edison (SCE) | Southern California Edison (SCE) | SCE removes dead trees near power lines to reduce fire hazards. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Wood Shake Roof Replacement | County | This code requires that all Wood Shake Roofs in the Fire Safety Overlay, as defined in the Development Code, ongoing effort. |
| Wildfire | Inland Empire Fire Safe Alliance | Inland Empire Fire Safe Alliance | The Alliance was created to act as a forum for all Fire Safe Councils in San Bernardino County. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Community Wildfire Protection Plans (CWPP) | Fire District | CWPPs are designed to provide a means for a community to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Organized Group Volunteer Activities | Fire District | There are several volunteer citizen groups throughout the County that are capable of providing significant resources that are not provided by traditional governmental agency services. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |

### 5.1.3.3 Earthquake/Geologic Mitigation Programs

San Bernardino County's seismic mitigation programs focus on two areas that have historically resulted in the greatest amount of damage and life loss from major earthquakes in California.

#### 5.1.3.3.1 Bridge Retrofit Program

Caltrans inspects County and City bridges yearly every 2 years for structural sufficiency (which applies to earthquake) and functional obsolescence (which applies to floods). Caltrans provides reports that include recommended repairs or replacement. The County and Cities make the repairs and/or apply for bridge replacement funds thru the Federal Highway Bridge Program (HBR). Currently the County has 5 funded HBR replacements due to structural deficiencies:

- Dola Ditch, (out for bid to construct)
- Lanzit Ditch, (out for bid to construct)
- Garnett at Mill Creek (under construction)
- Yermo Rd at Manix Wash.(waiting for SCAG approval for additional funds to move forward with the Design & Environmental)
- Baker Blvd west of SR127. (waiting for HBP fund for Design & Environmental)
- National Trails Hwy at Kalmia Bridge (waiting for HBP funds)
- National Trails HWY @ Adena Ditch (Received HBP funds for design phase)
- Bridge Management (consultant on board that has prioritized all timber bridges on National Trails Highway and DPW is submitting groups of bridges for funding over a ten year period)

The design and environmental work has been started for Rock Springs Road (functionally obsolete bridge) using DPW funds, waiting for HBP funds for R/W phase.

The County has completed the construction of the Alabama Street at Plunge Creek bridge replacement using Federal Emergency Relief funds.

##### 5.1.3.3.2 Unreinforced Masonry Building Program

In the 1990's, the County of San Bernardino compiled a master list of suspected Unreinforced Masonry Buildings within the unincorporated areas. Since that time, several sites have been incorporated and therefore, are now removed from County jurisdiction. In addition, several appear to have been demolished or retrofitted since the 1990's. The Land Use Services Department's Building and Safety Division is currently in the process of re-evaluating the URM list. Re-evaluation will include a field visit to each site photographing structures and verifying the occurrence of unreinforced masonry. This process is scheduled to be completed by the end of the 2010.The program would be an inspection program and maintenance and inspections as warranted.

There are no large publically utilized URM structures currently on the list. These types of structures are typically restricted to the incorporated areas of the County. There are only twenty-two (22) structures remaining on the list.





##### 5.1.3.3.3 Geologic Hazard Mapping

The Seismic Hazards Mapping Act (Public Resources Code, Chapter 7.8 Section 2690-2699.6) directs the Department of Conservation, California Geological Survey (CGS) to identify and map areas prone to liquefaction, earthquake-induced landslides and amplified ground shaking. Although the San Bernardino area has a full spectrum of geologic hazards, CGS does not have adequate funding to complete the hazard mapping within the County.

#### 5.1.3.4 Flood Mitigation Programs

The flood mitigation projects are programs that were established by San Bernardino County Flood Control District to protect life and property. These projects are typically designed to convey 1% annual chance or greater storm flows in order to mitigate danger to life and property, and critical infrastructure consisting of existing, new and future structures. Also, these projects include revisions to local land use and building codes where analysis or experience shows the need for code revisions or amendments to meet previously unidentified circumstances.

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Flood | Flood Area Safety Taskforce(FAST) | Flood Control District | The FAST Organization stresses liaison with the communities, provides for community education and information, and places emphases on Community and city partnerships. For more information on FAST, see Annex B Section B.6 Flood Project Prioritization and Implementation. |
| Flood | Alluvial Fan Task Force | Alluvial Fan Task Force | The Task Force reviews the state of knowledge regarding alluvial fan floodplains, determine future research needs, and, if appropriate, develop recommendations relating to alluvial fan floodplain management, with an emphasis on alluvial fan floodplains that are being considered for development. For more information, see Annex B Section B.6 Flood Project Prioritization and Implementation. |
| Flood | StormReady | Flood Control District | San Bernardino County is a StormReady County. For more information, see Annex B Section B.6 Flood Project Prioritization and Implementation. |

### 5.1.3.5 Climate Change Programs

#### 5.1.3.5.1 Extreme Heat, Extreme Cold Programs

This document is a contingency plan supporting the San Bernardino County Emergency Operations Plan (EOP).

Excessive Cold events are commonplace in San Bernardino County and most often warrant monitoring activities only. These Standard Operating Guidelines provide GUIDANCE based on the most likely scenario, and can be expanded to meet the parameters of a “disaster” scenario if necessary.

The Extreme Weather – Excessive Cold Standard Operating Guidelines (SOG) were developed in response to the potential for Excessive Cold and cold related Power Outage events in San Bernardino County. The following objectives and activities are to prevent the harmful effects of excessive cold on at-risk populations and the potential for life-threatening repercussions of power outages during excessive cold events.

The information included in this plan is “situation” and/or “incident” driven and subject to revision by the Extreme Weather Committee as conditions warrant. Notifications are information dependent and modification of the activities in these guidelines may be required in response to changing conditions, situations and/or inaccurate weather predictions

#### 5.1.3.5.2 San Bernardino County Fire Office of Emergency Services Heat Plan

This document is a contingency plan supporting the San Bernardino County Emergency Operations Plan (EOP). The Extreme Weather – Excessive Heat Standard Operating Guidelines (SOG) were developed in response to the potential for Excessive Heat and heat related Power Outage events in San Bernardino County. The following objectives and activities have been established to prevent the harmful effects of excessive heat on at-risk populations and the potential for life-threatening repercussions of power outages during excessive heat events. The Extreme Weather – Excessive Heat SOG describe the County operations during heat related emergencies and provide guidance for local jurisdictions in their preparation for heat emergencies and other related activities. The information included in this plan is “situation” and/or “incident” driven and subject to revision by the Extreme Weather Committee as conditions warrant. Notifications are information dependent and modification of the activities in these guidelines may be required in response to changing conditions, situations and/or inaccurate weather predictions.





## 5.2 Fiscal Resources

The 2016-17 recommended budgets of $5.4 Billion are balanced and consistent with policy and direction received from the Board of Supervisors. The 2016-17 Recommended Budgets address the following key issues:

- Ongoing funding for neglected raises for County employees
- Ongoing funding for maintenance of County roads
- Continues investment in facilities, infrastructure and operating systems.
- Ongoing funding of mental health and medical services for County residents.
- Maintains fiscal responsibility through contributions to the reserves of $62.8 million.

The budget represents the County General Fund and County restricted general funds .It also presents capitol project funds, special revenue funds, enterprise funds, internal service funds and permanent funds for all entities in the 2016-17 Recommended Budget including the County Board Governed County Service Areas, San Bernardino County Fire Protection District, San Bernardino County Flood Control District. Other agencies presented in the budget include County Industrial Development Authority, Inland Counties Emergency Medical Agency and the recently added Housing Authority of the County of San Bernardino. The total requirements for these funds in the 2016-17 are $5.4 billion, which includes amounts budgeted as contingencies or contributions to reserves. Excluding these amounts, total projected expenditures for the 2016-17 are $5.3 billion. The General fund Requirements total $2.9 billion and are funded by countywide discretionary revenues (primary property taxes), departmental revenues and other funding sources of the General Fund, of this $2.9 billion, only $558.3 million is truly discretionary.

### 5.2.1 The Budget in Brief

This budget book collectively presents the general fund, special revenue funds, capital project funds, internal service funds, and enterprise funds for the county and its Special Districts. The total spending authority for these funds in 2016– 2017 is $5.4 billion. The general fund spending authority totals $5.3 billion and is funded by countywide discretionary, and the beginning fund balance of the General Fund. Of this $2.9 billion, only $558.5 million is truly discretionary.

Table 5-5: Spending Authority for San Bernardino County

| | Spending Authority (in Millions) | | |
|---|---|---|---|
| | 2015-16 | 2016–2017 | Change |
| General Fund | $ 2,984.3 | $ 2,911.1 | $ (73.2) |
| Restricted Funds | 49.3 | 49.7 | (.4) |
| Capital Project Funds | 1169. | 911.3 | (258.4) |
| Special Revenue Funds | 257.6 | 298.4 | 40.7 |
| Enterprise Funds | 984.9 | 1001. | 16.5 |
| Internal Service Funds | 1.6 | 0.0 | (1.6) |
| | **$ 5,692.0** | **$ 5,420.0** | **272.0** |

There is a $73.2 million net decrease in General Fund requirements due to a $106.1 million reduction in contributions to General Fund reserves, as the Board of Supervisors approved an increase to multiple County General Fund operational groups' requirements are increasing by $32.9 million. There are Law and Justice ($12.5 million). The Human Services Operational Group is anticipating increased State and Federal funding that will support Department of Behavioral Health services, including inpatient hospitalization, indigent hospital care, general mental health services, and services for children, youth, and families .The County is also continuing to allocate additional resources to meet the growing need for augmented health and mental health correctional services associated with Public Safety Realignment.

The net reduction of $258.4 Million is Special Revenue Funds is associated with the County's shift in 2015-16 from budgeting contingencies to instead placing unallocated resources in reserves. This technical change resulted in a large one-time contribution to reserves in 2015-16 that is not required in 2016-17. This reduction in contributions to reserves totaling $289.6 million is offset by increased operational costs of $31.2 million. This is due to increases within the Department of Behavioral Health's Mental Health Services Act (MHSA) budget unit and the County Fire Protection budget is increasing as a result of the pending annexation of fire prevention and suppression services from the City of San Bernardino (429.6 million) and Twentynine Palms ($1.7 million).

The $40.7 million increase in Capital Project Funds is primarily due to the planned construction of two Department of Behavioral funded Crisis Stabilization Centers and four Crisis Residential Treatment Centers totaling $36.5 million. This will enable Community Crisis Response Team (CCRT) clinics throughout the County to be expanded to provide 24 hour services and to respond to request by law enforcement for support during the night hours.

Enterprise Funds requirements are increasing a net $16.5 million. Notably, the Housing Authority of the County of San Bernardino has been added to the budget book and is contributing to the overall increase in Enterprise Fund requirements, including additional assumed payments for Housing Assistance and increased Capital Expenditures.





Table 5-6: 2015-2017 Staffing Budget

| | Budgeted Staffing | | |
|---|---|---|---|
| | 2015–2016 | 2016–2017 | Change |
| General Fund | 14,332 | 14,425 | 93 |
| Other Funds | 6,375 | 6,508 | 133 |
| Special Districts and Other Agencies | 1402 | 15601 | 159 |
| **Total:** | **22,109** | **36,534** | **385** |

### 5.2.2 Budget Highlights (2016 – 2017)

**Create and Maintain and Grow Jobs and Economic Value in the County**

- The Real Estate Services Department of Project Management Division (formerly Architecture and Engineering) Capital improvement budget includes 355 active projects with total requirements of $295.2 million, including $128.2 million in new projects funded with $57.7 million of Discretionary General Funding includes an ongoing base budget of $12.0 million for maintenance and non-major Capital Improvement Plan (CIP) projects ,and $45.7 million for construction and major CIP projects .These major projects include $26.4 million for the 800 Megahertz Upgrade Project ,$12.2 million for various Sheriff's facility improvements ,$8.0 million for the County Buildings Acquisition and Retrofit Project including the upgrade of the County Government Center parking lots and grounds ,and $7.6 million for a variety of other projects.

**Improve County Government Operations**

- Enterprise Financial Management System: Implementation of the new system began in May 2016 with the first phase (out of two phases) continuing into 2016-17 at an estimated cost of $7.1 million. The total cost for the financial system is estimated to be $25.0 million and will streamline business processes and provide better management information.

- Public Health will continue its efforts to achieve and maintain National Accreditation, through the Public Health Accreditation Board (PHAB). Accreditation ensures the Department's continued focus on quality and performance improvement, transparency and accountability to all stakeholders, and the capacity to deliver core Public Health functions. The department will be submitting the required application to PHAB in December 2016.

- The County Library continues its plans to enhance service by replacing outdated computer hardware and software. Funding has been included in the Library's material's budget, which adds high demand items to the collection, including an expanded digital book collection.
- Land Use Services, in conjunction with Public Works, Information Services, and other County departments, continues to upgrade to a new enterprise permit solution, Accela. The new system will include a shared database, precise digital maps, and satellite images of land data that are linked to the County's GIS database. It will also provide field staff remote real-time access to the database. This solution will streamline the permitting process, offering the public access to a web portal to manage and monitor applications and permits online.

**Operate in a Fiscally-Responsible and Business-like Manner**

- The County Museum's budget of $3.8 million demonstrates the County's commitment to support the Museum through a time of transition. The budget includes $1.1 million in one-time Discretionary General Funding which includes bridge funds to support current operations and funding for activities related to re-accreditation. The County Museum continues to implement the consultant study recommendations as approved by the Board of Supervisors, to address organizational and financial challenges.

- The Transitional Assistance Department is in the second of a four year reduction to the State's CalFresh Match Waiver pursuant to the phase-out agreement adopted in the prior year State budget. This wavier allowed the County to draw additional Federal and half of the State funding without increasing the County's Maintenance of Effort. The budget includes the use of $2.5 million of the original $5.0 million general fund reserve that the Board approved in 2014-15 for this phase-out period.

**Ensure Development of a Well-Planned, Balanced, and Sustainable County**

- The County continues work on a complete overhaul of the County's General Plan, referred to as the Countywide Plan. This Countywide Plan will be a comprehensive web-based system to document land use planning and organizational governance policies. It will be comprised of three basic components: The Policy Plan (a comprehensive general plan); the County Business Plan (a system that will define and guide how the County government operates and manages itself); and the Regional Issues Forum (a web-based resource center containing information regarding shared Countywide issues). Additionally, the County is updating and expanding the community plans. When completed, there will be 27 web-based community plans involving 49 communities.

- A team of County departments will continue to monitor the drought and develop ways to reduce water usage at County facilities to show good stewardship of this valuable resource. The Special Districts Department, in collaboration with other County





departments, will continue to implement water conservation programs/strategies at various County Service Areas and Districts throughout the County.

- The Registrar of Voters budget fluctuates based on the 4-year election cycle, with the Presidential Election being the largest and most costly of the major elections. The Department is transitioning from a one minor and two major election cycles in 2015-16 to a one minor and one major election cycle for 2016-17. The budget includes provisions for the following: November 8, 2016 Presidential General Election (major); December 6, 2016 San Bernardino County Employees' Retirement Association Election (minor); and three anticipated, but unscheduled special elections (minor). The minor elections are 100% reimbursable; however, the November Presidential General Election is only 30% reimbursable and thus requires one-time Discretionary General Funding (Net County Cost) of $3.7 million for the year.

- The Public Works – Transportation budget includes over $35.0 million in major infrastructure projects, funded in part with Discretionary General Funding. Budgeted activities include design, right of way and/or construction for major projects including:
  - Bridge replacements on: Glen Helen Parkway, Baker Boulevard, Garnet Street, Rock Springs Road, Dola Ditch Bridge, Lanzit Ditch Bridge, Yermo Road and Arrowbear Drive;
  - New bridge on Shadow Mountain Road;
  - Widening of Slover Avenue in the Bloomington Area;
  - Installation of raised pavement markers on National Trails Highway in the Amboy area;
  - Reconstruction of Institution Road to improve access to the Sheriff facility in San Bernardino;
  - National Trails Highway Bridges: Bridge management plan for the repair, rehabilitation or replacement of 127 bridges on National Trails Highway and starting the design phase for replacement of 10 bridges:
  - Rehabilitation and re-profiling at various locations on Needles Highway in the Needles area;
  - Improvements to alleviate congestion and improve circulation of the interchange on Interstate 10 at Cedar Avenue

- The Public Works – Transportation budget includes $31.5 million worth of pavement improvement projects, funded in part with ongoing Discretionary General Funding, to preserve the County's roadways by investing enough to keep the system from deteriorating further.

- The Public Works – Solid Waste Management Division plans to complete $8.9 million of capital improvement projects, which includes the following:
  - $2.0 million for resurfacing the entrance and haul roads at the San Timoteo Landfill;
  - $957,000 for construction of Groundwater Treatment Systems at the closed Lenwood-Hinkley Landfill and Yucaipa Disposal Site;

- $1.5 million for the East Slope Stabilization and Mitigation project at the closed Heaps Peak Disposal Site;
- $1.5 million for construction of Landfill Gas Extraction Systems at the Barstow and Big Bear Landfills which includes $300,000 to bring electrical power to the Barstow Landfill

- The Public Works – Flood Control District (District) budget includes $37.6 million in capital improvement projects. The District anticipates completion of the following projects: Cactus Basin # 3, Wilson Creek Channel, Santa Ana River Flood Wall Repair, and the waterline relocations for Bandicoot Basin and Amethyst Basin. The District also plans to start construction on the following projects: Levee Certification Restoration for Patton Basin, Mojave River Levee, and Sand Creek/Warm Creek Confluence.

- Land Use Services Planning budget includes $150,000 of Discretionary General Funding for the preparation of a Morongo Basin Cultural Plan.

- The Special Districts department's budget includes $45.3 million capital improvement projects including the design and construction of the Big Bear Alpine Zoo relocation, rehabilitation of the Lake Gregory Dam, and construction of Snow Drop Road. Water and sanitation infrastructure projects of $19.2 million include pipeline replacements; water system improvements, and design and construction of a pipeline, a 75,000-gallon water reservoir, and a pump station in CSA 70 W-4 – Pioneertown.

- Community Development & Housing is constructing Phase 2 of the Bloomington Community and Neighborhood Revitalization. A total of 190 multi-generational affordable housing units include 120 family units and 70 senior units and the Bloomington Branch Library. The Bloomington Branch Library and the first phase of housing are completed. The second phase is currently under construction and will be completed by spring 2017.

**Provide for the Safety, Health and Social Service Needs of County Residents**

- The County is expanding efforts to provide homeless support to County residents through the flowing allocations included in the 2016-17 budget:
  - The Department of Behavioral Health is investing $4.0 million by providing basic needs, case management, outreach services, and additional built and supportive housing opportunities.
  - The Sheriff/Coroner/Public Administrator is continuing to fund the HOPE Program (Homeless Outreach Proactive Enforcement) Team ($620,000), which provides services to the homeless population by connecting them to the appropriate agencies for much needed services that help in the transition from homelessness.
  - The Probation Department has included $3.2 million towards transitional housing for adult offenders requiring Probation Department supervision.





- The Department of Behavioral Health is expanding Mental Health Treatment Services, notable in the following areas:
  - $1.0 million towards staffing Community Crisis Response Team clinics, which will now provide 24 hour services to departmental consumers and respond to requests by law enforcement for support during night hours. The department has also allocated $36.5 million towards the construction of new CCRT clinics throughout the County to expand these services.
  - $8.5 million for the Mental Health Act (MHSA) Comprehensive Children and Family Support Services program to support expanded mental health services for children.
  - $4.3 million for the MHSA Regional Adult Full Service Partnership (FSP) program support expanded mental health services to adults.
  - $1.0 million for the MHSA Forensic Integrated Mental Health Partnership program to expand services to develop peer support and mentoring strategies for individuals who have been released early from County jail or State prison.

- The Sheriff/Coroner/Public Administrator budget included $1.1 million of existing departmental resources for a program authorized by the Board as a pilot on December 15, 2015 (Item No. 72) related to the delivery of law enforcement services to unincorporated areas of the West End including the North Rancho/Etiwanda Preserve and the Mission Corridor, respectively. The program was successful and is now being incorporated as an ongoing service beginning in 2016-17 ,

- The Sheriff/Coroner/Public Administrator budget includes $9.0 million of one-time Discretionary General Funding (Net County Cost) to replace 2 aging and obsolete patrol helicopters: including equipment, travel and training for pilots and mechanics, installation of equipment, and delivery charges. The helicopter replacements will provide newer more reliable aircraft.
- The Public Defender Proposition 47 program will use media resources to reach all potential citizens who have convictions eligible for reclassification to further enhance their ability to rehabilitate within the community.

- County Fire is assuming fire, rescue, Emergency Medical Services (EMS), and prevention responsibilities within the Cities of San Bernardino ($29.6 million) and Twentynine Palms ($1.7 million) as a result of the pending annexations. This continued expansion of a regional approach will provide a more effective and efficient delivery of fire services for County residents.

- Land Use Services Code Enforcement is continuing to pilot various strategic initiatives to address issues with short-term rentals, particularly in the mountain areas. For 2016-17, a pilot program for a short-term rental hotline will be established where the public can report illegal or disruptive activities at short-term rental properties.

- The Information Services Department Telecommunication Services division is in the process of upgrading the County's Regional Public Safety Radio System (800 Mhz Upgrade Project). The project is currently on schedule, with an estimated completion date of 2020-21. The estimated cost of the project is $158.2 million primarily funded with Discretionary General Funding.

- The Department of Aging and Adult Services (DAAS) budget of $8.3 million will supplement programs such as the Elderly Nutrition, Supportive Services, Medicare Improvements for Patients and Providers Act, and Family Caregiver.

- The Arrowhead Regional Medical Center (ARMC) budget includes the addition of 14 positions to strengthen the Sterile Processing division to meet operational needs and ensure compliance with regulatory standards.

- The Department of Children and Family Services is implementing an After Hours Response Center (ARC) in June 2016 to provide optimal customer services to our community partners, children and families. The Center will enhance the departments critical after hour function of responding to child abuse, neglect and exploitation referrals called into the Child and Adult Abuse Hotline (CAAHL).

**Pursue County Goals and Objectives by Working with Other Agencies**

- ARMC is participating in California's 1115 waiver Renewal (Medi-Cal 2020), working alongside the California Association of Public Hospitals, the State of California, The Centers for Medicare & Medicaid Services, and multiple County departments focusing on improved patient outcomes, efficiencies and access in patient care integrated care models and procuring maximum reimbursement for performance of prescriptive clinical measures. The budget includes $52.5 million in revenues related to the Medicaid Waiver programs.

**Focus on Recovery and Resiliency Following the December 2, 2015 Terrorist Attack (SB Strong)**

- The County Administrative Office has commenced a countywide effort to document the impact and ongoing response to the December 2, 2015 terrorist attack while pursuing multiple sources of potential cost-reimbursement and to create a historic and best-practices document.

- The County has allocated approximately $10.2 million in funds towards improving security at County facilities. This includes $8.2 million in immediate improvements to facilities, such as expanded security guard services, upgraded security camera and key card access installations, and $2.0 million to conduct a security assessment of all County facilities.





**Challenges in Fiscal Year 2016-17 and Beyond**

Although the balancing of future costs with projected revenue has improved compared to prior County five year forecasts, broad economic challenges remain. The current economic expansion will be 7 years at the end of June 2016, which is the fourth longest in the history of the United States and cannot be assumed to last indefinitely. In addition, the fiscal uncertainly inherent in the State budget process continues to present a major challenge to the County's fiscal planning efforts.

**Economic Challenges**

The County's Five Year Financial Forecast covers July 2016 through June 2021 and includes moderate growth of major revenue streams throughout the period. Not included in the forecast are the impacts of a potential recession or the unknown economic impacts of the coming statewide $15 minimum wage.

By the end of the third year of the County's forecast the current economic expansion would match the longest expansion in history. Although the weakness of the current recovery and quantitative easing may have pushed off the next recession temporarily, it would be without precedent for the economy to expand throughout the County's entire five year forecast. In response to these unknown variables, the County has taken the approach of budgeting revenue growth in a conservative fashion over the entire five year forecast rather than assuming greater potential revenue increase in the immediate future with reductions in the later part of the forecast.

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# Section 6. Mitigation Strategy

## 6.1 Mitigation Goals and Objectives

Goals and objectives discussed in this section help describe what actions should occur, using increasingly narrow descriptors. Long-term goals are developed which can be accomplished by objectives. To achieve the stated objectives "mitigation actions" provide specific measurable descriptors on how to accomplish the objective. The goals, objectives, and actions form the basis for the development of a Mitigation Action Strategy and specific mitigation projects to be considered for implementation.

The process consists of 1) setting goals and objectives, 2) considering mitigation alternatives, 3) identifying strategies or "actions", and 4) developing a prioritized action plan resulting in a mitigation strategy.

The following section provides an overview of the Mitigation Goals and Objectives for profiled hazards, Wildfire, Earthquake, Flood, Drought, Terrorism, and Climate Change for the County Unincorporated Area and the County's Special Districts. These goals were compiled from various sources including the County of San Bernardino 2007 General Plan. (See Section 3.5 for a detailed description of the process used by the County Planning Team)

### 6.1.1 All Hazard (AH)

**AH GOAL:** Increase readiness for all hazards in the unincorporated areas of San Bernardino County.

**OBJECTIVE 1: Construct All-Hazard Response Facilities:** Construct facilities to increase operational readiness to reduce impacts of natural hazards.

> **AH Action 1.1: Construct Valley Dispatch and Operations Center.** Construct facility and ensure cohesive working and response to any scale emergency and operations in a secure complex
>
> **AH Action 1.2: Construct Shelter Operations Compound (SHOC).** This shelter concept provides a new one-stop shelter concept. The SHOC combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location.

**OBJECTIVE 2: Special District Funding:** Continue Special Districts Projects relating to all hazards.

**AH Action 2.1:** Continue funding and support for Special Districts Projects relating to water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big

Bear Valley Recreation Park District and Bloomington Recreation and Park District for all hazards.

**AH Action 2.2: Install Generators at Critical Facilities** Retrofit existing buildings and facilities with connectors/ ATS for emergency generators and/or install permanent emergency generators at critical facilities, including wells and booster station locations.

**AH Action 2.3: Water Systems Repair Plan** Develop a plan for speeding the repair of and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies.

**AH Action 2.4: Smart Water Meters and SCADA** Utilization of SCADA and Smart Water Meters to get real time data on problems with the system and reduce drive time emissions as a result of traditional meter reading.

**AH Action 2.5: Provide Employees with Emergency Supplies** Provide emergency supplies of food, water, and portable generators for employees at office and field locations.

**AH Action 2.6: Annual Tower and Guide Wire Inspections** Conduct annual tower and guide wire inspections to mitigate storm/wind/earthquake hazards from knocking out communications.

**AH Action 2.7**: **Maintain Tower Lighting** Maintain lights on all tower locations.

**AH Action 2.8: Designate Emergency Operations Sites** Conduct an inventory or list of County Park Facilities and Community Centers to establish a list of pre-designated emergency operations or disaster relief sites. Not all Community Centers are an appropriate size to accommodate large numbers of evacuees and may only serve as command and control centers or distribution centers.

**AH Action 2.9: Establish Power Sources for Emergency Operations Sites** Establish small solar energy fields or other forms of renewable power at County Community Centers to
facilitate stand-alone emergency operations for the community.

**AH Action 2.10: Connect Water Systems to Generators** Connect water systems to generators to ensure delivery even in disaster situations.

**AH Action 2.11: Establish a Centralized Communications Network** Establish a centralized communications network to monitor channel output for TV Districts and provide emergency information by way of character generator tied to channel transmissions.





**AH Action 2.12:** Incorporate as appropriate requirements from the State of California's most recent land use regulations regarding the hazard mitigation planning process (Government Code 65302 and 8685.9).

### 6.1.2 Wildfire (WF)

**WF GOAL:** Continue to reduce fire hazards in the unincorporated areas of San Bernardino County.

**WILDFIRE OBJECTIVE 1**: **Mountain Area Safety Taskforce.** Continue the cooperation and coordination of Fire Hazard Mitigation efforts with all stakeholders in the mountain areas of San Bernardino County through participation in MAST.

**WF Action 1.1:** Continue Mountain Area Safety Taskforce (MAST) funding to support mitigation activity.

**WILDFIRE OBJECTIVE 2: Support Mountain Mutual Aid Objectives.** Continue development of and continue the mission of mutual aid between the first responders in the County mountain areas through County Mitigation Planning.

**WF Action 2.1:** Update Mountain Mutual Aid Mapbook to document.

**WF Action 2.2:** Update Community Structure Protection Plans as necessary.

**WILDFIRE OBJECTIVE 3: Community Based Fuels Reduction Program.** Continue the community based Fuels Reduction Program through community based programs, both volunteer and government funded.

**WF Action 3.1:** Implement identified community based fuels reduction projects.

**WF Action 3.2:** Develop fuels reduction "maintenance program" by obtaining participation from citizens and/or homeowners associations.

**WF Action 3.3: Vegetation Removal** Clear vegetation from Road District facilities/yards.

**WILDFIRE OBJECTIVE 4: Forest Care.** Continue providing assistance to homeowners by expanding services to all communities in the Mountain areas of the County.

**WF Action 4.1:** Increase homeowner assistance services to mountain residents for fuel reduction.

**WF Action 4.2:** Continue working with Southern California Edison to remove dead trees near power lines.

**WILDFIRE OBJECTIVE 5: County Fire Hazard Abatement.** Overcome funding shortfalls while improving service delivery.

**WF Action 5.1:** Inspect every residence in the mountain communities within the next two years to enforce the new Fire Hazard Abatement code that addresses green fuels.

**WF Action 5.2:** Continue to collaborate with Forest Care, Red, Cross and Cal Fire to overcome increased costs of enforcement.

**WILDFIRE OBJECTIVE 6: Decrease Wildfire Hazards at Private Property through the Fire Hazard Abatement Programs**

**WF Action 6.1:** Train and Certify landscape contractors to comply with the new Fire Hazard Abatement Code.

**WF Action 6.2:** Continue wildfire mitigation efforts under the Wood Shake Roof Replacement Program.

**WF Action 6.3: Protect Property in Wilderness Areas** Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks.

**WILDFIRE OBJECTIVE 7: Support Mitigation Strategies in Community Wildfire Protection Plans. Continue to improve CWPP's in cooperation with Cal Fire, the IEFSA and individual Fire Safe Councils.**

**WF Action 7.1:** Modify independent and unique CWPPs into a more common framework making them similar but leaving room to provide specific hazard characteristics and mitigation actions for each community.

**WILDFIRE OBJECTIVE 8: Improve Emergency Access.** Improve and maintain emergency access for wildfire protection.

**WF Action 8.1:** Construct Arrowbear Drive Realignment and Widening

**WF Action 8.2:** Construct Cedar Glen Fire Access Road

**WF Action 8.3: Structural Fire Breaks Widening** Double the width of external fire breaks on grounds which have structures located in wilderness and or areas prone to wildfires.

**WILDFIRE OBJECTIVE 9: Special District Funding:** Continue Special Districts Projects relating to wildfire.





**WF Action 9.1:** Continue funding and support for Special Districts Projects relating to wildfire in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

**WF Action 9.2: Emergency Water Supplies** Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal. (completed with continuous fresh of supplies and rotation)

### 6.1.3 Earthquake/Geologic Hazards (EQ)

**GOAL:** Minimize exposure to structural and contents damage from geologic and seismic conditions. (Complements General Plan, Section VIII, Safety Element (Goal S 7)

**EARTHQUAKE OBJECTIVE 1:** Educate the public on reducing earthquake risk.

**EQ Action 1.1:** Improve public education programs and practices to residents for earthquake risk.

**EARTHQUAKE OBJECTIVE 2:** Protect occupants and structures in proposed developments from high levels of risk caused by rupture of the ground surface during an earthquake (Complements General Plan, Section VIII Safety Element Policy S 7.4).

**EQ Action 2.1:** Evaluate single family homes for Earthquake hazard when conducting permit applications and plan reviews.

**EQ Action 2.2: Seismic Strapping** for existing water tanks and future construction.

**EQ Action 2.3: Employee Emergency Sheltering** Develop a plan for short-term and intermediate-term sheltering of employees.

**EARTHQUAKE OBJECTIVE 3:** Continue geologic hazard mapping projects to minimize and prevent damage caused by earthquakes and other geologic hazards.

**EQ Action 3.1:** Identify liquefaction hazard areas outside the currently designated Geologic Hazard Overlay Districts.

**EARTHQUAKE OBJECTIVE 4:** Protect life and property from risks resulting from gravity-derived and/or earthquake-triggered landslides, expansive soils and/or other poor soil conditions. (Complements General Plan, Section VIII, Safety Element Policy § 7.6)

**EQ Action 4.1:** Require development on hillsides to minimizes the extent of topographic alteration and erosion, to maintain slope stability, and to reduce the potential for offsite sediment transport (Complements General Plan, Section VIII, Safety Element Policy § 6.1).

**EQ Action 4.2:** Generator Installation Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment.

**EARTHQUAKE OBJECTIVE 5:** Reduce runoff over the cliffs in the Rimforest neighborhood. (Complements Rimforest Drainage Feasibility Study)

**EQ Action 5.1:** Divert runoff to Little Bear Creek.

**EARTHQUAKE OBJECTIVE 6: Special District Funding:** Continue Special Districts Projects relating to earthquake hazards.

**EQ Action 6.1:** Continue funding and support for Special Districts Projects relating to earthquake hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

### 6.1.4 Flood (FL)

**GOAL:** Provide adequate flood protection to minimize hazards and structural damage. (General Plan, Safety Element, Goal S 5)

**FLOOD OBJECTIVE 1: National Flood Insurance Program.** Participate in the National Flood Insurance Program (NFIP), which provides flood insurance within designated floodplains. (General Plan, Safety Element, Policy S 5)

**FL Action 1.1:** Update NFIP data and maps with newly identified flood hazard areas in the County, as new information becomes available.

**FLOOD OBJECTIVE 2: Alluvial Task Force.** Review and analyze the findings and recommendations from the recently released Alluvial Fan Task Force reports, as funding permits.

**FL Action 2.1:** Determine whether or not additional amendments to development standards or policies are merited, based on the completed analysis.

**FLOOD OBJECTIVE 3: Flood Hazard Reduction.** Reduce flood hazards through development standards and policies stated in the County of San Bernardino General Plan and County of San Bernardino 2010 Development Code.

**FL Action 3.1:** Amend the Flood Plain Safety Overlay District through automatic map updates as new data is released and published by FEMA.





**FL Action 3.2:** Review development plans to ensure compliance with ordinances.

**FL Action 3.3: I**nspect construction to ensure compliance with approved development plans.

**FL Action 3.4: Soil Stabilization on Roadways and Along Roadway Shoulders** Soil stabilization on roadway shoulders and dirt roads. This will prevent erosion caused by flood conditions.

**FL Action 3.5: Encasing Pipelines** Encase water pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods.

**FLOOD OBJECTIVE 4: Future Flood Mitigation Projects**. Improve existing facilities and construct new facilities to mitigate flooding with the County.

**FL Action 4.1:** In each flood control zone, construct facilities identified in those zones by the Flood Control Advisory Committee. See Flood Control District Annex for a listing of projects.

**FLOOD OBJECTIVE 5: Special District Funding:** Continue Special Districts Projects relating to flood hazards.

**FL Action 6.1:** Continue funding and support for Special Districts Projects relating to flood hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

**FL Action 6.2: On Call Contractors** Employ on call contractors to assist in emergency situations.

### 6.1.5 Drought (DR)

**GOAL:** Minimize the effects of drought on the County in all aspects including economically and socially.

**DROUGHT OBJECTIVE 1:** Educate the public on water conservation methods.

**DR Action 1.1:** Create a public awareness campaign advising citizens, business owners and farmers on water conservation.

**DR Action 1.2:** Provide incentives for farmers to grow crops that are less water intensive.

**DR Action 1.3:** Continue to coordinate with the San Bernardino Valley Water Conservation District to provide Qualified Water Efficient Landscaper (QWEL) training.

**DR Action 1.4:** Continue to enforce the watering schedule and watering restrictions throughout the County.

**DROUGHT OBJECTIVE 2:** Protect the quality of the County's watersheds.

**DR Action 2.1:** Approve the County's Watershed Water Quality Management Plan written in 2013.

**DROUGHT OBJECTIVE 3: Special District Funding:** Continue Special Districts Projects relating to drought hazards.

**DR Action 3.1:** Continue funding and support for Special Districts Projects relating to drought hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

### 6.1.6 Anti-Terrorism (AT)

**GOAL:** Use antiterrorism strategies to discourage terrorism and protect the people, infrastructure and assets in San Bernardino County from the effects of terrorism.

**ANTI-TERRORISM OBJECTIVE 1:** Use anti-terrorism design strategies to discourage / prevent acts of terrorism.

**AT Action 1.1:** Identify and prioritize mitigation activities (anti-terrorism force protection) at critical facilities and gathering places that are vulnerable to terrorist attacks.

**ANTI-TERRORISM OBJECTIVE 2: Special District Funding:** Continue Special Districts Projects relating to terrorism hazards.

**AT Action 2.1:** Continue funding and support for Special Districts Projects relating to terrorism hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.





### 6.1.7 Climate Change (CC)

**GOAL:** Reduce the impacts of climate change on the County and limit human activities that change the atmosphere's makeup.

**CLIMATE CHANGE OBJECTIVE 1:** Meet greenhouse gas (GHG) reductions targets set forth by the Clean Air Act.

**CC Action 1.1:** Continue working with the South Coast Air Quality Management District and the Mojave Desert AQMD to meet GHG reductions targets.

**CC Action 1.2:** Continue implementing the energy conservation and efficiency measures identified in the County of San Bernardino Greenhouse Gas Emissions Reduction Plan. (San Bernardino County Renewable Energy and conservation Element)

**CLIMATE CHANGE OBJECTIVE 2:** Educate the public on the effects of climate change and reducing our impact.

**CC Action 2.1:** Encourage carpooling and the use of public/ alternative transportation methods.

**CC Action 2.2:** Optimize energy efficiency in the built environment and promote the local economic benefits of energy efficiency retrofits. (San Bernardino County Renewable Energy and conservation Element)

**CC Action 2.3:** Encourage residents and businesses to conserve energy. (San Bernardino County Renewable Energy and conservation Element)

**CLIMATE CHANGE OBJECTIVE 3: Special District Funding:** Continue Special Districts Projects relating to climate change hazards.

**CC Action 3.1:** Continue funding and support for Special Districts Projects relating to climate change hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

## 6.2 Mitigation Strategy

To narrow mitigation alternatives for inclusion, FEMA's six broad categories of mitigation alternatives were used. Each FEMA category is listed below. The HMP Planning Committee developed several mitigation alternatives for implementation under each mitigation category.

- Prevention (PRV)

- Property Protection (PPRO)
- Public Education and Awareness (PE&A)
- Natural Resource Protection (NRP)
- Emergency Services (ES)
- Structural Projects (SP)

Table 6-1 summarizes the mitigation alternatives for categories of projects addressing the hazards in the San Bernardino County Unincorporated Area Multi-Jurisdictional Hazard Mitigation Plan. The Table includes implementation strategies for the wildfire, earthquake/geologic hazards, flood, drought, climate change and terrorism.

**Table 6-1: Mitigation Alternative Summary**

| Action | Lead Agency | Hazard | Funding Source |
|---|---|---|---|
| **Prevention (PRV):** **Preventative activities are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. This includes the development of additional code requirements to further reduce or eliminate damages from the identified hazards.** | County Land Use Services | All Hazards | General Fund |
| **Natural Resource Protection (NRP):** **To locate and protect natural and cultural resources at risk from the identified hazards.** | Fire Protection District / Flood Control District | Wildfire and Flood | General Fund, Grants |
| **Property Protection (PPRO):** **Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations.** | Fire Protection District. | Wildfire | General Fund, Grants |
| **Public Education and Awareness (PE&A):** **To continue and develop new public education programs targeting the top identified hazards.** | Fire Protection District. | All Hazards | General Fund, Grants |





| Action | Lead Agency | Hazard | Funding Source |
|---|---|---|---|
| **Emergency Services (ES):** **Although not typically considered a "mitigation" technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:** | Fire Protections District | All Hazards | General Fund, Special District Funds, Grants |
| **Structure Protection (SP) – Flooding** **To continue to identify, fund, and build projects that reduce or eliminate flood hazards in the County.** | Flood Control District | Flooding Hazards | General Fund, Special District Funds, Grants |
| **Structure Protection (SP)– Geological Hazards** **To identify unknown hazards and develop additional new and retrofit requirements or programs to reduce or eliminate damage from geological hazards.** | Land Use Services | Geological Hazards | General Fund Grants |
| **Structure Protection (SP) – Wildfire** **To further protect structures at risk from wildfire through education, building, and enforcement codes and actions.** | Fire Protections District | Wildfire | General Fund, Special District Funds, Grants |

### 6.2.1 Mitigation Action Plan

This section serves to identify *on-going* actions and projects in the County Unincorporated Area. With the results of the hazard risk assessment finalized, mitigation goal established, and capabilities assessed, the County and participating districts then set out to identify new mitigation actions that would reduce the outlined in the vulnerability assessment.

Not all identified mitigation actions are implementable in the 5-year plan cycle, due to technical feasibility, political acceptance, lack of funding, or other constraints. Once the mitigation actions for each participating jurisdiction were identified, they were evaluated and prioritized (by providing a time frame) to identify the most suitable mitigation actions for each participating jurisdiction to implement.

Cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural projects, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. While detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

Based upon the participating jurisdiction capabilities, Table 6-2 shows primary actions selected for further implementation and development during the next planning cycle. Table 6-2 provides details for each mitigation action with mitigation action descriptions, FEMA mitigation category, responsible party, and timeframe.

***Important to Note: See Jurisdictional Annexes for more information on implementation mechanisms and mitigation projects for each participating jurisdiction. If a participating jurisdiction is identified as a primary lead for implementation, the mitigation actions are also contained the corresponding jurisdictional annex.***



Table 6-2: Mitigation Action Descriptions

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| ALL Hazard | **AH Action 1.1:** Valley Dispatch and Operations Center. | Update and maintain the operations of the facility and ensure cohesive working and response to any scale emergency and operations in a secure complex | ES | Budgetary Items from County and Federal Grant Funding, EMPG, HMPG, UASI. | Fire Protection District. | 1-3 Years | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| ALL Hazard | **AH Action 1.2:** Maintain Shelter Operations Compound (SHOC). This shelter concept provides a new one-stop shelter concept. The SHOC combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location. | After the 2003 Wildland Fires, the County and American Red Cross recognized the need to provide services beyond basic care and short-term sheltering, especially during large fires, floods, and earthquakes The Mass Care & Shelter Plan and Concept of Operations, outlines the framework of a new one-stop shelter concept. Shelter Operations Compound (SHOC). It combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location. Residents can access public information and referral services through the LAC, and then take a short walk to the Non-LAC Unit for communication, postal services, and other private organizations/business at little to no cost. The completion of the Plan in 2012 will help to sync local resources, encourage local self-sufficiency, foster partnership between public and private agencies, and serve as a reference document for the region.<br><br>By June 2017, the program will have 32 trailers/caches equipped with mass care and shelter supplies, strategically placed throughout the County and ready for rapid deployment. It is expected to serve over 12,000 residents. In addition to enhancing the comfort levels of shelter residents, the program will produce standardized documents and protocols for procuring and maintaining Mass Care and Shelter trailers/caches. These plans and programs will help the County prepare for and mitigate damages from hazards. This is an update and expansion of the plan and done without more grant funds. | ES | To increase Mass Care and Shelter capability of the county, grants from 2008-2009 Homeland Security Grant Program (HSGP) and 2009 Riverside Regional Urban Area Security Initiative (UASI) funded the Mass Care and Shelter Trailer/Cache Program. | Fire Protection District/ | 1-5 Years | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| All-Hazard | **AH Action 2.1:** Continue funding and support for Special Districts Projects relating to all hazards. | Continue funding and support for Special Districts Projects relating to water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District for all hazards. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| All-Hazard | **AH Action 2.2:** Install Generators at Critical Facilities | Retrofit existing buildings and facilities with connectors/ ATS for emergency generators and/or install permanent emergency generators at critical facilities, including wells and booster station locations. | ES, SP | TBD | Water Systems | TBD | Critical sites are already set up for connection or has a permanently installed generator |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **All-Hazard** | **AH Action 2.3:** Water Systems Repair Plan | Develop a plan for speeding the repair of and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies. | PRV | SDD WAS | Water Systems | TBD | We have a warehouse and inventory. Add'l inventory would need to be purchased from local wholesaler |
| **All-Hazard** | **AH Action 2.4:** Smart Water Meters and SCADA | Utilization of SCADA and Smart Water Meters to get real time data on problems with the system and reduce drive time emissions as a result of traditional meter reading. | PRV | Individual CSAs | Water Systems | Ongoing | Both SCADA and Smart Meters have been installed and continue to be installed |
| **All-Hazard** | **AH Action 2.5:** Provide Employees with Emergency Supplies | Provide emergency supplies of food, water, and portable generators for employees at office and field locations. | ES | SDD/WAS | Water Systems | Ongoing | WAS has a stock of emergency food supplies, water, and generators. |
| **All-Hazard** | **AH Action 2.6:** Annual Tower and Guide Wire Inspections | Conduct annual tower and guide wire inspections to mitigate storm/wind/earthquake hazards from knocking out communications. | PRV | TBD | TV Districts | 7/1/2016-7/1/2017 | All Districts |
| **All-Hazard** | **AH Action 2.7**: Maintain Tower Lighting | Maintain lights on all tower locations. | SP | TBD | TV Districts | June-17 | |
| **All-Hazard** | **AH Action 2.8:** Designate Emergency Operations Sites | Conduct an inventory or list of County Park Facilities and Community Centers to establish a list of pre-designated emergency operations or disaster relief sites. Not all Community Centers are an appropriate size to accommodate large numbers of evacuees and may only serve as command and control centers or distribution centers. | PRV | TBD | Park Districts | April-17 | All Districts |
| **All-Hazard** | **AH Action 2.9:** Establish Power Sources for Emergency Operations Sites | Establish small solar energy fields or other forms of renewable power at County Community Centers to facilitate stand-alone emergency operations for the community. | PRV, SP | TBD | Park Districts | 12/1/2016-7/1/2018 | Lucerne Valley Joshua Tree |
| **All-Hazard** | **AH Action 2.10:** Connect Water Systems to Generators | Connect water systems to generators to ensure delivery even in disaster situations. | PRV, SP | TBD | Park Districts | TBD | |
| **All-Hazard** | **AH Action 2.11:** Establish a Centralized Communications Network | Establish a centralized communications network to monitor channel output for TV Districts and provide emergency information by way of character generator tied to channel transmissions. | PRV | TBD | TV Districts | 7/1/2017-12/1/2017 | All districts |
| **All-Hazard** | **AH Action 2.12** Incorporate as appropriate requirements from the State of California's | Government Code 65302.6 requires the following elements to be included in the hazard mitigation plan:<br><br>(1) An initial earthquake performance evaluation of public facilities that provide essential services, shelter, and critical governmental functions. | PRV, NRP | TBD | Primary: Land Use Services | 1-3 years | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | most recent land use regulations regarding the hazard mitigation planning process (Government Code 65302 and 8685.9). | (2) An inventory of private facilities that are potentially hazardous, including, but not limited to, multiunit, soft story, concrete tilt-up, and concrete frame buildings.<br>(3) A plan to reduce the potential risk from private and governmental facilities in the event of a disaster.<br><br>Government Code 8685.9 requires that the state share shall not exceed 75 percent of total state eligible costs unless the local agency is located within a city, county, or city and county that has adopted a local hazard mitigation plan as part of the safety element of its general plan. In that situation, the Legislature may provide for a state share of local costs that exceeds 75 percent of total state eligible costs. | | | Secondary: Fire Protection District/ | | |
| **All-Hazard** | **AH Action 3.1:** Continue funding and support for Special Districts Projects relating to all hazards. | Continue funding and support for Special Districts Projects relating to water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District for all hazards. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| **Wildfire** | **WF Action 1.1** Continue Mountain Area Safety Taskforce (MAST) funding to support mitigation activity. | MAST was formed to mitigate the region wide risk of a catastrophic wildfire due to dead and dying trees in the mountain communities. The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for the protection of property owners, residents, and property subject to the risk of catastrophic wildfire that could occur in San Bernardino County with an initial emphasis on the threat resulting from the Old and Grand Prix fires in 2003. MAST priorities are to continue reducing fire hazards through fuel reduction programs and hazard abatement though enforcement of county ordinances.<br><br>The Mountain Area Safety Taskforce (MAST) Operations Section meets monthly. MAST Operations Section determines project priorities based on the benefit cost analysis of the projects and the effect of the project on the overall goals of the MAST organization.<br><br>Goals can change as detailed Benefit Cost Analysis is conducted and CEQA/NEPA reviews are completed. | NRP, PPRO | Seeking additional funding through HMPG. | San Bernardino County Fire Protection District | On-Going | See Implementation plan on more information on MAST.<br><br>See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| **Wildfire** | **WF Action 2.1:** Update Mountain Mutual Aid Map Book to document updated information contained in 2016 HMP. | The Map Book portion of the Community Safety and Structure Protection Plan provides not only a street network of the area but more importantly it provides the locations of strategic and critical resources for fire fighters. These include but are not limited to safe zones, open areas, locations for refuge. They also identify areas within communities that have narrow and steep winding streets and or with limited ingress and egress. The document is handed out to all responding strike teams from out of the area and has proved invaluable in directing and coordinating an effective firefighting response and reduces the potential for life loss and property damage. | ES | Seeking additional funding through HMPG. | San Bernardino County Fire Protection District | On-Going | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Wildfire** | **WF Action 2.2** Update Community Structure Protection Plans as necessary. | This is an on-going action (from the 2011 MJHMP) with the goal to continue development of and continue the mission of mutual aid between first responders in the County mountain areas. | PPRO | | Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 3.1:** Implement identified community based fuels reduction projects. | The Fuels Reduction Program is designed to create community based fuel modification programs across the mountain communities.<br>These projects are selected specifically to reduce the potential for catastrophic wildfires and the damage that they can do to the communities. Project design, contracting, and operations are managed by the County's Public Works Department with priorities set by local fire chiefs in monthly MAST Operations Meetings. This program is the oldest and most significant for reducing wildfire threat on a mountain wide basis. | PPRO | Current Funding:<br><br>Seeking additional funding through HMPG. | Primary: San Bernardino Public Works Department<br><br>Secondary: County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 3.2:** Develop fuels reduction "maintenance program" by obtaining participation from citizens and/or homeowners associations. | To survive a wildfire, property owners need to manage the land surrounding their homes and communities effectively. Removing fuels in the wildland fuel reduction zone beyond the defensible space can reduce the speed and intensity of an oncoming wildfire. But if these areas aren't regularly **maintained**, they lose their effectiveness. Plants grow back, and flammable vegetation needs to be routinely removed and disposed of properly. This guide provides tips on how to create and maintain defensible space and wildland fuels treatments around your property. | PPRO, PE&A | Seeking additional funding through HMPG | Primary: Public Works<br><br>Secondary: Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 4.1** Increase homeowner assistance services to mountain residents for fuel reduction. | This is an ongoing wildfire mitigation action (from the 2011 MJHMP) for the group Forest Care to achieve the goal of providing assistance to homeowners by expanding services to all communities in the Mountain areas of the County.<br><br>Forest Care is a program dedicated to creating a healthier forest. This program provides foresters to assess individual properties for thinning the vegetation and then provides 75% of the funding to do so. | PPRO, PE&A | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 4.2** Continue working with Southern California Edison (SCE) to remove dead trees near power lines. | A significant number of fires across the State are caused by trees falling into power lines. When the forests in the mountain communities became infested with bark beetles the pine tree die off was unprecedented. Thousands of these dead trees were standing precariously close to power lines. Early in the Bark Beetle Emergency in 2004, Southern California Edison swiftly initiated a program to remove all trees that were dead, dying, and/or diseased that had the potential to fall into any SCE power lines. | PRV, PPRO | As of July of 2010 Southern California Edison (SCE) has spent $179,758,978 to remove dead dying and diseased trees. | San Bernardino County Fire Protection District | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | The role of Southern California Edison was critical to the success of MAST both operationally and financially. Edison still removes the most difficult trees, the most costly trees; and the ones that are most likely to be the source of ignition for a wild land fire. They are also removing the trees that are immediately threatening homes.<br><br>They have removed 118,305 trees since the inception of the program in 2004. They also provided reimbursements to people that removed their own trees. | | | | | |
| **Wildfire** | **WF Action 5.1:** Inspect every residence in the mountain communities throughout the year to enforce the Fire Hazard Abatement code that addresses green fuels. | The Fire Hazard Abatement Program conducts surveys to identify fire hazards throughout the year. Fire hazards are identified and notices to abate the hazard(s) are mailed to property owners. Property owners are given 30 days to abate the violations. Failure to abate may result in citations, penalties, and/or fees for abatement by the County. The Fire Hazard Abatement Program responds to complaints year round in the unincorporated areas and contracting Cities and Fire Districts.<br><br>The Division completes more than 430,000 inspections, issues more than 45,000 Notices to Abate Fire Hazards, issues over 4,000 citations for non-compliance, and abates the fire hazards on more than 2,000 parcels annually. Within the last 5 years, the Fire Hazard Abatement Division has received even more financial resources that enable them to abate all properties declared a fire hazard. | PRV, PPRO, PE&A | Seeking additional funding through HMPG | Primary: Land Use Services<br><br>Secondary: Fire Protection District | On-Going | For more information on Contractor Certification, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| **Wildfire** | **WF Action 5.2:** Continue to collaborate with Forest Care, Red, Cross and Cal Fire to overcome increased costs of enforcement. | This is an on-going action from the 2011 MJHMP with the goal of overcoming funding shortfalls for the County Fire Hazard Abatement Program. | PRV | | San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 6.1** Train and Certify landscape contractors to comply with the Fire Hazard Abatement Code. | The City of Big Bear Lake created a program to train and certify landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. The contractors are trained to comply with the new Fire Hazard Abatement Code that exists both in the City of Big Bear and the County unincorporated area. The City of Big Bear Lake Fire Department conducts the classes for landscapers and handy persons. This provides an incentive for the contractors and provides a level of certification that the homeowner can rely on when they are deciding to hire a landscape contractor to conduct fuels abatement around their home. | PRV, PPRO | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | On-Going |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Wildfire** | **WF Action 6.2:** Continue wildfire mitigation efforts under the Wood Shake Roof Replacement Program. | The County successfully passed an ordinance that requires the replacement of wood shake roofs by 2014. MAST has successfully mapped all of the wood shake roofs in the fire safety overlay and has created a strategy as to which roofs will be selected to participate in the FEMA funded project. This is an on-going project in cooperation with Big Bear Lake Fire Protection District in order to provide more funding for wood shake roof replacements by property owners. | PRV, PPRO, SP | | Primary: MAST<br><br>Secondary: San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 6.3:** Protect Property in Wilderness Areas | Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks. | PPRO, PRV, SP | TBD | Sewer Systems | January-17 | All sewer pump stations have paving |
| **Wildfire** | **WF Action 7.1:** Modify independent and unique CWPPs into a more common framework making them similar but leaving room to provide specific hazard characteristics and mitigation actions for each community. | Community Wildfire Protection Plans are designed to provide a means for a community, usually through the Fire Safe Council, to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. | PRV | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | On-Going<br><br>For more information on CWPP see Annex A Section A.6 Fire Protection District Mitigation Project . |
| **Wildfire** | **WF Action 8.1:** Construct Arrowbear Drive Realignment and Widening. | The Arrowbear community off State Highway 18 has limited access to State Highway 138. The existing bridge/spillway and road needs to be realigned and widened to facilitate access by emergency personnel during wildfires and flooding. Mitigation strategy for this is to remove and replace existing bridge/spillway, realign and widen the road. | SP | Seeking grant funding<br><br>Total Cost: $3,000,000 Approx. | Primary: Public Works<br><br>Secondary: San Bernardino County Fire Protection District | 1-3 Years | |
| **Wildfire** | **WF Action 8.2:** Construct Cedar Glen Fire Access Road. | Lack of paved roads inhibits traffic circulation and the ability to enter and exit the area without backtracking during wildfire emergencies. Strategy is to Construct road and drainage improvements to Little Bear Creek Road and Elder Drive. | SP | Seeking grant funding<br><br>**Total Cost:** $2,500,000 | Public Works | 1-3 Years | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Wildfire** | **WF Action 8.3:** Structural Fire Breaks Widening | Double the width of external fire breaks on grounds which have structures located in wilderness and or areas prone to wildfires. | SP, PRV | Individual CSAs | Water Systems | 7/1/2017-7/19/2019 | |
| **Wildfire** | **WF Action 9.1:** Continue funding and support for Special Districts Projects relating to wildfire. | Continue funding and support for Special Districts Projects relating to wildfire in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| **Wildfire** | **WF Action 9.2:** Emergency Water Supplies | Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.(completed with continuous fresh of supplies and rotation) | ES | TBD | Roads | TBD | |
| **Earthquake** | **EQ Action 1.1:** Improve public education programs and practices to residents for earthquake risk. | Public education and outreach programs are an efficient and cost-effective way to promote meaningful changes within a community. A Program for Public Information (PPI) for earthquake awareness and mitigation could significantly reduce injury and property damage to earthquake. Use a suite of partnerships, activities, and products to educate the public about earthquake science and motivating homeowners to become prepared for earthquakes. | PE&A | | Human Resources | 5-10 Years | |
| **Earthquake** | **EQ Action 2.1:** Evaluate single family homes for Earthquake hazard when conducting permit applications and plan reviews. | 82.15.040 Development Standards states that a structure used for human occupancy shall be located 50 feet or farther from any active earthquake fault traces. Lesser setbacks may be applicable in certain situations as determined by an appropriate geologic investigation and approved by the County Geologist or other engineering geologist designated by the Building Official.<br><br>Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Section 2621 et seq.) requires the delineation of potential damage areas along known active faults throughout California. It requires local governments to withhold approval of construction permits in those zones until geologic investigation has determined that the site is not threatened by surface displacement from future faulting. | PRV | | Land Use Services | TBD | On-Going |
| **Earthquake** | **EQ Action 2.2:** Seismic Strapping | Seismic strapping for existing water tanks and future construction. | SP, PRV | CSA 64 | Water Systems | 7/17/2017-7/1/2019 | Ongoing currently |
| **Earthquake** | **EQ Action 2.3:** Employee Emergency Sheltering | Develop a plan for short-term and intermediate-term sheltering of employees. | PRV | WAS | Sewer Systems | 7/17/2017-7/19/2019 | To purchase cots, small portable generators, tents, etc. |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| Earthquake | **EQ Action 3.1:** Identify liquefaction hazard areas outside the currently designated Geologic Hazard Overlay Districts. | Supported by General Plan mechanism (General Plan, Section VIII, Safety Element Policy § 7.5; California Building Code §1803.5.11);<br><br>Seismically- induced lateral spreading, and/or seismically-induced lateral flow, can cause devastating structural damage and a high potential for saturation exists when the groundwater level is within the upper 50 feet of alluvial material. | PRV | | Land Use Services | 5-10 Years | |
| Earthquake | **EQ Action 4.1**: Require development on hillsides to minimizes the extent of topographic alteration and erosion, to maintain slope stability, and to reduce the potential for offsite sediment transport (Complements General Plan, Section VIII, Safety Element Policy § 6.1). | This mitigation action is especially important in the San Bernardino and San Gabriel Mountains which have high slope failure / erosion potential.<br><br>Typical slope mitigation techniques that are used include:<br><br>Drainage Improvements - Since water is the biggest culprit in failing slopes, drainage improvements should be the first priority. Some drainage improvements may include:<br>▪ Collect or divert surface water from the problem slope. This may include catch basins, swales, or sealing tension cracks to prevent infiltration.<br>▪ Collect and remove subsurface water. This may include drains constructed within the subsurface to remove excess seepage, or lower ground water.<br><br>Some earthwork mitigation techniques are as follows:<br>▪ Remove the upper soils of the slope to create a flatter slope.<br>▪ Buttress the slope toe by filling with rock, gravel, or soil.<br>▪ Benching the slope if each bench is on competent subgrade.<br>▪ Structural Improvements - Structural improvements include:<br>▪ Friction Piles<br>▪ Retaining walls<br>▪ Geo Grid<br>▪ Sheet Piles<br>▪ Rock Bolts<br>▪ Vegetative Cover<br><br>Complements General Plan, Section VIII, Safety Element Policy § 7.6<br><br>Complements General Plan, Section VIII, Safety Element Policy § 6.1) | PRV | N/A | Land Use Services | On-Going | Provide enhanced information during the development review process to address slope failure concerns. |
| Earthquake | **EQ Action 4.2:** Generator Installation | Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment. | SP, PPRO | TBD | Roads | TBD | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| Earthquake | **EQ Action 5.1:** Divert runoff to Little Bear Creek. | To reduce the runoff over the cliff(s) in the Rimforest neighborhood, the runoff must be diverted to another path. This will be accomplished over three phases:<br>• Phase 1: Reduce Runoff Tributary Area by 64%- 50.35 AC<br>• Phase 2: Reduce Runoff Tributary Area by 30%- 23.79 AC<br>• Phase 3: Reduce Runoff Tributary Area by 5%- 3.99 AC | SP, NRP, PRV | | Primary: Public Works<br><br>Secondary: Flood Control District | | |
| Earthquake | **EQ Action 6.1:** Continue funding and support for Special Districts Projects relating to earthquake hazards. | Continue funding and support for Special Districts Projects relating to earthquake hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| Flood | **FL Action 1.1:** Update NFIP data and maps with newly identified flood hazard areas in the County, as new information becomes available. | As required by the State of California, National Flood Insurance Program (NFIP) maps published by FEMA must be included in the HMP or General Plan Safety Element. Keeping this information current is an important mitigation action. | PRV, PPRO | | San Bernardino County Flood Control District | On-Going | |
| Flood | **FL Action 2.1:** Determine whether or not additional amendments to development standards or policies are merited, based on the Alluvial Fan Task Force Recommendation. | This is an on-going mitigation action from the 2011 MJHMP. | PRV | | Primary: San Bernardino County Flood Control District<br><br>Secondary: Land Use Services | On-Going | |
| Flood | **FL Action 3.1:** Amend the Flood Plain Safety Overlay District through automatic map updates as new data is released and published by FEMA. | Current San Bernardino County Hazard Maps can be found at: http://cms.sbcounty.gov/lus/Planning/ZoningOverlayMaps/HazardMaps.aspx. | PRV, NRP | | Primary: San Bernardino County Flood Control District<br><br>Secondary: Land Use Services | On-Going | |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Flood** | **FL Action 3.2:** Review development plans to ensure compliance with ordinances. | This is an on-going mitigation action from the 2011 MJHMP in order to reduce the flood hazards through development standards and policies stated in the General Plan and San Bernardino 2077 Development Code. | PRV | | Primary: Land Use Services<br><br>Secondary: San Bernardino County Flood Control District | On-Going | |
| **Flood** | **FL Action 3.3:** Inspect construction to ensure compliance with approved development plans. | This is an on-going mitigation action from the 2011 MJHMP in order to reduce the flood hazards through development standards and policies stated in the General Plan and San Bernardino 2077 Development Code. | PRV, PPRO, SP | | Primary: Public Works<br><br>Secondary: Flood Control District | On-Going | |
| **Flood** | **FL Action 3.4:** Soil Stabilization on Roadways and Along Roadway Shoulders | Soil stabilization on roadway shoulders and dirt roads. This will prevent erosion caused by flood conditions. | SP, PRV | TBD | Roads | TBD | |
| **Flood** | **FL Action 3.5:** Encasing Pipelines | Encase water pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods. | SP, PRV | CSA 70 J | Water Systems | 7/17/2017-7/1/2027 | |
| **Flood** | **FL Action 4.1:** In each flood control zone, construct facilities identified in those zones by the Flood Control Advisory Committee. See Flood Control District Annex for a listing of projects. | This is an ongoing mitigation action from the 2011 MJHMP to achieve the goal of improving existing facilities and construct new facilities to mitigate flooding within the County. | SP | | Primary: Public Works<br><br>Secondary: San Bernardino County Flood Control District | On-Going | |
| **Flood** | **FL Action 6.1:** Continue funding and support for Special Districts Projects relating to flood hazards. | Continue funding and support for Special Districts Projects relating to flood hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Flood** | **FL Action 6.2:** On Call Contractors | Employ on call contractors to assist in emergency situations. | PRV, ES | TBD | Roads | TBD | |
| **Drought** | **DR Action 1.1:** Create a public awareness campaign advising citizens, business owners and farmers on water conservation. | Public education and outreach programs are an efficient and cost-effective way to promote meaningful changes within a community. A program to raise awareness on the importance of water conservation could significantly reduce the amount of water used by the public. | PE&A, NRP | | Human Resources | TBD | |
| **Drought** | **DR Action 1.2:** Provide incentives for farmers to grow crops that are less water intensive. | Farmers use 80% of the State's water. By offering incentives to produce less water intensive foods (such as beets, carrots and potatoes) as opposed to more water intensive foods such as almonds, beef and pork) would make a substantial difference in water consumption. | NRP, PRV, | | DAO Community Services? | On-Going | |
| **Drought** | **DR Action 1.3:** Continue to coordinate with the San Bernardino Valley Water Conservation District to provide Qualified Water Efficient Landscaper (QWEL) training. | The Qualified Water Efficient Landscaper training presents an affordable proactive local approach to reducing landscape water demand. QWEL provides graduates with knowledge in water efficient and sustainable landscape practices including water management and preservation of other valuable resources. | PE&A | | Economic Development Agency? | On-Going | |
| **Drought** | **DR Action 1.2:** Approve the County's Watershed Water Quality Management Plan. | The County's Watershed Water Quality Management Plan written in 2013. | PRV, NRP | | | On-Going | |
| **Drought** | **DR Action 1.4:** Continue to enforce the watering schedule and watering restrictions throughout the County. | In response to the State Water Resources Control Board's 2016 emergency water conservation regulation, the County enforces a watering schedule for residential and commercial addresses. | PRV, NRP | | Land Use Services | On-Going | |
| **Drought** | **DR Action 3.1:** Continue funding and support for Special Districts Projects relating to drought hazards. | Continue funding and support for Special Districts Projects relating to drought hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7 | VARIES | VARIES | VARIES | On-Going | |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Anti-Terrorism** | **AT Action 1.1:** Identify and prioritize mitigation activities (anti-terrorism force protection) at critical facilities and gathering places that are vulnerable to terrorist attacks. | Critical facilities may include essential facilities (such as hospitals, police and fire stations, evacuation centers, etc.), transportation systems, lifeline utility systems, high potential loss facilities (such as nuclear power plants, dams and military installations, etc.), and hazardous material facilities.<br><br>Gathering facilities should also receive special attention. Places of mass gathering not only present terrorists with potential opportunities for mass casualties, symbolism and high impact media coverage, they pose a broad range of security challenges for their owners and operators. | PRV, PPRO | | Land Use Services | On-Going | |
| **Anti-Terrorism** | **AT Action 2.1:** Continue funding and support for Special Districts Projects relating to terrorism hazards. | Continue funding and support for Special Districts Projects relating to terrorism hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| **Climate Change** | **CC Action 1.1:** Continue working with the South Coast Air Quality Management District to meet GHG reductions targets. | The San Bernardino County General Plan Amendment and Greenhouse Gas Reduction Plan addresses the environmental effects specific to the proposed General Plan Amendment, Greenhouse Gas Reduction Plan, and associated Development Code Amendment and can be found here: http://www.sbcounty.gov/Uploads/lus/Countywide/GreenhouseGas/Full-Vol-1.pdf | PRV, NRP | | Land Use Services | On-Going | |
| **Climate Change** | **CC Action 1.2:** Continue implementing the energy conservation and efficiency measures identified in the County of San Bernardino Greenhouse Gas Emissions Reduction Plan. | According to the San Bernardino County Renewable Energy and conservation Element, San Bernardino County's commercial, institutional and residential communities will continue to grow in the foreseeable future. Access to dependable and affordable energy sources is critical to maintaining and enhancing the quality of life enjoyed by San Bernardino residents and businesses. As energy needs grow, so do the needs to develop new energy sources. | PRV, NRP | | Land Use Services | On-Going | |
| **Climate Change** | **CC Action 2.1:** Encourage carpooling and the use of public/ alternative transportation methods. | Reduction Measure R2T1 of the County of San Bernardino Greenhouse Gas Emissions Reduction Plan establishes an Employment Based Trip and VMT Reduction Policy. Some features include a compressed work week, car/vanpools, employee bicycle/pedestrian programs, and shuttle/ transit programs. | PE&A, PRV, NRP | | Human Resources | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Climate Change** | **CC Action 2.2:** Optimize energy efficiency in the built environment and promote the local economic benefits of energy efficiency retrofits. (San Bernardino County Renewable Energy and Conservation Element) | This is an on-going mitigation policy from the San Bernardino County Renewable Energy and Conservation Element. | SP, PE&A, PRV | | Public Works | On-Going | |
| **Climate Change** | **CC Action 2.3:** Encourage residents and businesses to conserve energy. (San Bernardino County Renewable Energy and conservation Element) | This is an on-going mitigation policy from the San Bernardino County Renewable Energy and Conservation Element. | PE&A, NRP, PRV | | Human Resources | On-Going | |
| **Climate Change** | **CC Action 3.1:** Continue funding and support for Special Districts Projects relating to climate change hazards. | Continue funding and support for Special Districts Projects relating to climate change hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |

# Section 7. Plan Maintenance

## 7.1 Monitoring Evaluating and Updating the HMP

The San Bernardino County Fire Protection District Office of Emergency Services (OES) is the custodian of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). In the 2010 MJHMP, County of San Bernardino indicated that the MJHMP would be reviewed annually. Although no formal meetings were held, OES reviewed the plan annually and collected new hazard mitigation information and mitigation efforts throughout the county. Additionally, OES referenced/reviewed the MJHMP before submitting grant applications to ensure the project was captured in the plan when applying for all grants to assist their mitigation efforts.

There are three (3) main components to the MJHMP: hazards, projects, and stakeholder involvement (public, as well as, county staff). The County and its Special Districts have focused on these components and over the last 5 years have made steady improvements in all areas. The County and its Special Districts participated and facilitated several meetings and established several tasks forces to help advance the understanding of hazards in the community. This information was shared with other county personnel and the general public. OES believes that this sharing of information leads to a more informed community, thus a more robust MJHMP.

Departments and Special Districts with projects track the status of the projects through the entire life cycle from concept to completion. Projects in progress are tracked to ensure all milestones are met and payments are made in a timely manner. Each year proposed projects are reviewed during budget development every spring and selected projects are submitted for funding to the appropriate funding source. These funding sources include but are not limited to grant funding, General Fund funding, and Special District funding.

Because the MJHMP is a living document that reflects ongoing hazard mitigation activities, the process of monitoring, evaluating, and updating will be critical to the effectiveness of hazard mitigation within the County Unincorporated Area. The County and its Special Districts will hold internal planning meetings to discuss current projects and evaluate newly proposed projects resulting from internal staff meetings and input from the public. The results of these Departmental/Special District meetings will be presented to the Multi-Jurisdictional Planning Team meetings at their annual meetings. To facilitate the Multi-Jurisdictional Hazard Mitigation Planning process, OES is proposing to conduct these annual meeting with the Multi-Jurisdictional County Planning Team where the Team Members will discuss the projects, priorities, and goals in the current plan and from individual Special District meetings and suggest any necessary changes. Results of the annual meeting will be retained and compiled for the 2016 update. The County Planning Team will continue to support focused outreach for county Departments and Districts as well as support Countywide activities.





### 7.1.1 Plan Adoption

To comply with DMA 2000, the San Bernardino County Board of Supervisors has officially adopted the 2016 San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan. The adoption of the 2016 MJHMP recognizes the County's commitment to reducing the impacts of natural hazards within the County limits. A copy of the 2016 MJHMP adoption resolution is included after the table of contents in this document.

### 7.1.2 Implementation

The knowledge gained from the MJHMP has helped the county enhance other planning efforts. One of the biggest results from the 2010 MJHMP efforts was the incorporation of the MJHMP into the 2007 General Plan's Safety Element. This merging of plans has help ensure development decisions are considering the most recent hazard information. It is the County's intent to incorporate by reference the updated MJHMP into the County General Plan upon approval from FEMA.

The MJHMP has also led to the strengthening and improvement of several County Ordinances, which are designed to ensure proper fuels reduction was completed in the Severe Fire Hazard Zones. Two new ordinances were passed requiring replacement of wood shake roofs in the Severe Fire Hazard Severity Zones by 2014 and the reduction of live fuel loads around structures in the Very High Fire Hazard zone.

The MJHMP goals and actions will be incorporated into various general operations of government. For example, much of the information from the MJHMP will be included in the County Operational Area Emergency Operation Plan (EOP). As any future County plans are developed, the Multi-Jurisdictional Hazard Mitigation Plan will be a great asset in any plan development efforts. As noted earlier, much of the information contained in this MJHMP is from the County General Plan and is already part of the planning process.

Additional benefit is gained from the County and its Special Districts reviewing existing mitigation projects and development of additional mitigation projects at their internal annual Planning Team meetings. This input includes comments and suggestions from the public as well as from the internal planning process of each County department and District.

#### 7.1.2.1 Implementation through Existing County Mechanisms

##### 7.1.2.1.1 All Hazards

##### 7.1.2.1.2 Amendment to Title 6 County Code

An amendment to Title 6 of the County of San Bernardino Code to adopt by reference the 2010 Editions of the California Building Standards Codes went before the Board of Supervisors on

November 2, 2010 and was continued for a second reading on November 16, 2010 and approved unanimously. The amendment became effective on January 1, 2011.

The County of San Bernardino amendment to Title 6 of the County Code to adopt by reference the 2010 Editions of the California Building Standards Codes repealed the current chapters of Division 3 of Title 6 that reflect the 1994/1995 editions of the California Building Standards Codes and adopt the 2010 editions of these codes by reference.

The California Building Standards Commission approved the California Building Standards Code (Code) for a statewide effective date of January 1, 2011 and requires this Code apply in all parts of the state. This Code consists of the California Building, Residential, Plumbing, Mechanical, Electrical, Energy, Historical Buildings, Existing Building (Unreinforced Masonry) and the Green Building Standards Codes. Since this 2010 Edition was adopted by local ordinance, the prior editions of this code will be repealed and the most recent editions of the codes with applicable amendments requiring express findings and certain appendices necessary for the health and safety of the citizens of this County will be in effect within the unincorporated areas of San Bernardino County. The benefit of adopting this Code is that it provides consistency and clarification for the building community as well as building inspectors and plans examiners. State law (Health & Safety Code 18941.5 and 17958.7) requires the local government make express findings in order to amend building standards and the amendments must be necessary due to local climatic, geological, or topographical conditions.

Those amendments and findings are included in the County's ordinance and were filed with the California Building Standards Commission.

The recommended modifications not requiring express findings are administrative or procedural in nature and concern the local implementation issues that are not covered by building standards.

An example of this type of modification is to the California Residential Code, Section R105.3.1.1 which requires the Board of Appeals to confirm substantial valuations in the flood plain. The traditional purpose of the Board of Appeals has been reserved for a contested decision of the Building Official, and it is felt that it should remain as such.

With respect to grading and excavation regulations found in Appendix J of the 2010 State published code, the 2001 California Building Code dealt with grading with more clarity in regards to what activities require a permit and set forth rules to ensure large grading projects are scrutinized in greater detail than smaller projects by requiring more reporting and inspection of such work. The grading chapter in the 2001 Code has been trusted and in use in its primary form for years. The 2010 Appendix J grading chapter needs substantial amendment and modification to address all grading issues and is not recommended for adoption in its present form. The Board adopted the 2001 Appendix Chapter 33 regulations as part of this proposed ordinance. Relocation permit requirements have been moved to a new section of the Code, and it retains specific standards for relocation procedures in details not found in the 2010 State-published code. Clarification of the types of buildings affected by the new regulations has also been made.





Administrative changes to the 2010 California Existing Building Code (Part 10 of Title 24) were approved to outline the procedures required to set allowable time limits for the retrofit and repair of unreinforced masonry buildings. Staff is also recommending that authorization be given to the Building and Safety Division of the Land Use Services Department to issue Administrative Citations as an alternative means of enforcement of the County Code provisions.

Express findings are made for changes to the California Plumbing Code, Appendix K regarding the soil conditions that exist in this county. These changes are supported by the Environmental Health Division. These express findings are iterated in the ordinance and will be filed with the Building Standards Commission as required by law in order to become effective.

### 7.1.2.2 Wildfire

#### 7.1.2.2.1 Inland Empire Fire Safe Alliance (IEFSA)

The Inland Empire Fire Safe Alliance (IEFSA) was created to act as a forum for all Fire Safe Councils in San Bernardino County. Some of the benefits are developing a consistent and comprehensive message to citizens about fire safety; coordinating efforts for grant administration, writing, and reporting; a one-stop shop for information, resources and research; and a centralized source for sharing of updates from cooperating governmental agencies. There are approximately 20 Fire Safe Councils active in San Bernardino County.

IEFSA has held bimonthly meetings for over 5 years and have been the focal point for all regional Fire Safe Councils including some from Riverside County. They have also held numerous workshops and seminars regarding fire resistive construction, and materials, BAER reports, CWPPs and grant writing. The IEFSA was the focal point for Fire Safe Councils (FSCs) that were working on completing their CWPPs and created a focus group and a steering committee to accomplish these critical plans. To support public education and involvement,

IEFSA created the web site www.fireinformation.com as well as participated in countless safety fairs and fire wise awareness activities. They also conducted a Public Education Media Exchange where all FSC and Agencies got together to share educational modalities and create common thought and educational threads. They have reached out to thousands of mountain residents in preparing them for wildfires.

#### 7.1.2.2.2 Mountain Area Safety Taskforce (MAST)

MAST was formed to mitigate the region wide risk of a catastrophic wildfire due to dead and dying trees in the mountain communities. The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for the protection of property owners, residents, and property subject to the risk of catastrophic wildfire that could occur in San Bernardino County with an initial emphasis on the threat resulting from the Old and Grand Prix fires in 2003. MAST priorities are to continue reducing fire hazards through fuel reduction programs and hazard abatement though enforcement of county ordinances.

The Mountain Area Safety Taskforce (MAST) Operations Section meets monthly. MAST Operations Section determines project priorities based on the benefit cost analysis of the projects and the effect of the project on the overall goals of the MAST organization.

The MAST Unified Command identified the following objectives as their focus and direction:

- Provide for Community Safety.
- Develop Coordinated Public Information Dissemination Between Cities, County, Special Districts, State, Federal, and Non-Profit Agencies.
- Develop Immediate, Mid-range and Long-range Coordinated Agency Plans.
- Identify and Secure Potential Funding Resources to Provide Protective Measures.
- Document Task Force Activities Including Mission, Goals and Objectives, Policies, Procedures, and Outcomes. Prior to any type of flood threat, the following precautionary measures may be taken by MAST members to reduce the impact of impending fires:
- Review mutual aid agreements
- Define evacuation areas and trigger points
- Review the use of alert and warning systems
- Provide information to the public of fire prone areas and protective measures in progress or planned for those areas
- Educate public on emergency self-help and preparedness
- Develop and maintain emergency notification procedures and checklists

MAST is the central point of coordination for all projects related to the reduction of the potential for catastrophic wildfires. There are numerous participants and all levels of government. MAST partners collaborate to provide multi-agency technical support to ensure project success. Economic impacts are considered and the result has been significant increase in economic activity through thoughtful application of grant funding. MAST has been so successful in the environmental management of projects that all of the local environmental groups including national affiliates are now supporters of MAST fuels projects.

The MAST group includes:

- San Bernardino County Board of Supervisors
- County Administrative Office
- County Public Works-Flood Control/Transportation/Solid Waste





- County Fire Protection District
- County Fire Protection District/Office of Emergency Services (OES)
- County Sheriff's Department
- Southern California Edison
- Bear Valley Electric
- Arrowbear Lake Fire Department
- Big Bear City Fire Protection District
- City of Big Bear Lake Fire Department
- Crest Forest Fire Protection District
- Running Springs Fire Department
- USFS
- San Bernardino National Forest Association
- Forest Care
- Cal Fire
- Caltrans
- California Highway Patrol
- Inland Empire Fire Safe Alliance
- Angelus Oaks Fire Safe Council
- Arrowhead Communities Fire Safe Council
- Bear Valley Fire Safe Council
- Lytle Creek Fire Safe Council
- Mill Creek Fire Safe Council
- Mountain Rim Fire Safe Council
- Wrightwood Fire Safe Council

Since its beginnings, MAST has been the Unified Command that has successfully implemented and completed numerous programs leading to safer communities, a more educated public and an improved environment.

MAST provides an extensive Fuels Reduction Program. The Fuels Reduction Program began with removal of dead hazardous trees from areas threatening electrical transmission lines, evacuation routes, and structures within the San Bernardino Mountains. Dead and dying trees pose an extreme fire danger, and MAST members began removing these trees under state and federal grants, including a $70 million grant from the USDA Natural Resources Conservation Service. At the height of the program, Southern California Edison contractors were taking out 650 trees a day. As the program developed, additional hazards were identified, such as green fuel load density and wood shake roofs on structures within the San Bernardino Mountains

The MAST mission has expanded to include reducing green fuel by thinning live trees in densely wooded areas. Property owners also are being urged to thin the live trees and vegetation on their property to gain an upper hand on the bark beetle infestation and reduce the risk of catastrophic wildfires like the Grand Prix and Old fires in 2003.

Other MAST Achievements include:

- Increasing awareness of the drought-related bark beetle emergency and the threat of catastrophic wildfires
- Distributing fire safety and prevention information to the public
- Developing evacuation plans and distributing emergency planning information to the public
- Developing commercial use or disposal options for waste wood products.

The Mountain Area Safety Taskforce (MAST) Operations Section meets monthly. MAST Operations Section determines project priorities based on the benefit cost analysis of the projects and the effect of the project on the overall goals of the MAST organization.

Goals can change as detailed Benefit Cost Analysis is conducted and CEQA/NEPA reviews are completed.

#### 7.1.2.2.3 Fire Safety Overlay District Mitigation

A General Plan Amendment to the Safety Element of the County of San Bernardino 2007 General Plan updated the Fire Safety Overlay District effective March 11, 2010. The Safety Element includes several hazard overlays that are included in the General Plan mapping system to inform the public of potential hazards to development of property within certain areas of the County and to enable the County to mitigate the risks presented to property owners by these hazards, by requiring fire resistant building construction methods. The overlays include potential fire hazards within the mountain regions as well as the valley and desert “interface”. Over the past twenty years, certain federal and state agencies have been in the process of digitizing much of this hazard data. The digitization of this data has allowed for greater accuracy as well as more timely updates. In recognition of the new data from various federal and state agencies, the County updated the Fire Safety Overlay District contained within the Safety Element of the General Plan. The Fire Safety Overlay District is amended by modifying four General Plan Quad Maps to incorporate updated fire safety mapping published by Cal Fire for the Valley area.

As new information is received, the overlay maps are updated to reflect changes. These updates are made by the Land Use Services Department in collaboration with County Fire Protection District. More areas have been added through annexation and contract for services and so there has been large growth and the overlay will be updated. The future 2018 CountyWide Plan will replace the General Plan, and will contain more update maps and regulations that will allow development to occur but ensure safety and sustainability within the Fire Safety Overlay District.

#### 7.1.2.2.4 Public Education Programs

The County through MAST conducted a comprehensive mountain-wide multi-modality Public Outreach Program from 2006 to 2008. It can be found at www.CalMAST.org. The program in both English and Spanish created and presented multiple public educational meetings, newsletters,





brochures, calendars, and posters. Because of the large number of visitors to the forest, MAST also created Emergency Information Visitors brochure and glove box sized Emergency Response Evacuation maps for the mountain communities. The program won national awards for advertising and public relations. Other jurisdictions initiated their own public education activities but brought them back through MAST so that the entire group could receive the benefit. The City of Big Bear Lake Fire Department was the most prolific in developing innovative and creative educational programs. They developed the Thin-Is-In website at (www.thinisin.org) that is an excellent site for citizens and agencies as well. Since the Big Bear Valley is served by an excellent radio station KBHR (k-bear) they have posted numerous public safety messages. Also during the Butler, Butler II and Slide Fires, KBHR provided constant updates to the community regarding the fire.

#### 7.1.2.2.5 County Fire Hazard Abatement

Land Use Services Department, Environmental Health Division is responsible for Fire Hazard Abatement (FHA). Fire Hazard Abatement works to reduce the potential for an individual’s property to be the source of fire and structural ignitability. Failing to maintain private property in a fire safe condition is seen as a fire threat and is considered a threat to neighbor’s property rights. To obtain compliance, FHA issues notices of violation to properties that have dry vegetation and flammable green vegetation. If the property owner doesn’t comply with the notice, FHA then obtains a warrant to go onto the property and abate the fire hazard.

The Fire Hazard Abatement portion of the County Code was completely rewritten and redesigned around real flammable fuels. The most significant change was to include certain types of green fuels as flammable vegetation.

Following in the City of Big Bear Lake’s path, the County adopted the new code in the fall of 2008. In January of 2010 the County amended the Hazard Overlay maps.

The Fire Hazard Abatement Division of the Land Use Services Department conducts annual inspections of all parcels of land in mountain regions for the purpose of identifying exterior fire hazards. Biannual inspections are completed in valley and desert serviced areas. The targeted hazards include high energy release shrubs, dead and hazardous trees, flammable vegetation, weeds, grasses and combustible rubbish. The Division completes more than 430,000 inspections, issues more than 45,000 Notices to Abate Fire Hazards, issues over 4,000 citations for non-compliance, and abates the fire hazards on more than 2,000 parcels annually. Within the last 5 years, the Fire Hazard Abatement Division has received even more financial resources that enable them to abate all properties declared a fire hazard.

#### 7.1.2.2.6 Countywide Fuels Management Program

In May of 2005 the San Bernardino County Fire Protection District and the San Bernardino County Flood Control District formed a partnership to implement the Hazardous Tree Removal Program, later the Fuels Management Program. In this endeavor the Flood Control District

formed the Hazardous Tree Removal Operations Division which was tasked with developing, bidding and administering Tree Removal and Fuel Reduction Contracts funded by various grants. Contracts originally focused on removing dead, dying, and diseased trees caused by the drought conditions and the bark beetle infestation. The program has evolved to include fuel modification projects which remove hazardous vegetative fuels through the thinning of live vegetation. In addition the location of the fuel reduction projects are moving beyond the limits of the San Bernardino Mountains and into the interface between the Mountain foothills and the high desert.

The following are the types of programs/projects included in the Fuels Management Program:

- Emergency Tree Removal Projects consist of the removal of a tree (or trees) that poses an immediate threat to safety, a structure, or the public right-of-way.
- Block Projects are dead dying diseased tree removal projects on multiple parcels which are located in close proximity to one another.
- Large Urban Parcel Projects are dead dying diseased tree removal projects on a single or multiple large parcels.
- Fuel Modification Projects focus on the removal of hazardous fire fuels in the wildland/urban interface. The fuels removed in these projects are both live and dead vegetation. The goal of these projects is to reduce a future forest fire's intensity as well as the removal of ladder fuels which carry the fire from the forest floor to the forest canopy and result in a crownfire.

In addition to the Hazardous Tree Removal Operations Division, the San Bernardino County Fire Fuels Management Crews are also funded by the same grant sources. The primary focus of the crews is to create and maintain fuel modification projects in the vicinity of communities at risk and construct fuel breaks. In addition the crews assist the public with curb side chipping programs throughout local partner jurisdictions.

#### 7.1.2.2.7 Fireworks Interdiction

The unlawful transport of dangerous fireworks continues to be enforced by several local and state fire and law enforcement agencies, The program continues ensures that thousands of pounds of fireworks per year are seized and properly disposed of, preventing fires, fire injuries and fire deaths.





#### 7.1.2.2.8 Programs Listed in Fire District Annex

**Table 7-1: Wildfire Mitigation Implementation Methods**

| Mitigation type | Description |
|---|---|
| **PPRO** | SCE removes dead trees near power lines to reduce fire hazards. For more information, see Annex A Section A.6 Mitigation Project Prioritization and Implementation. |
| **ES** | Mountain Mutual Aid is an operational group of emergency responders. |
| **PRV** | The Alliance was created to act as a forum for all Fire Safe Councils in San Bernardino County. For more information, see Annex A Section A.6 Mitigation Project Prioritization and Implementation. |
| **PRV** | Fire Hazard Abatement works to reduce the potential for an individual's property to be the source of fire and structural ignitability. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| **PE&A** | Cal Fire provides programs to increase fire safety in high fire hazard severity zones. For more information, see Annex A Section A.6 Mitigation Project Prioritization and Implementation. |
| **PRV, PPRO** | The Contractor Certification program trains and certifies landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| **PRV, PPRO** | CWPPs are designed to provide a means for a community to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |

### 7.1.2.3 Earthquake / Geologic

A General Plan Amendment to the Safety Element of the County of San Bernardino 2007 General Plan updated the Geologic Hazard Overlay Maps which became effective on March 11, 2010. The Safety Element includes several layers of hazard overlays that are included in the General Plan mapping system to inform the public of potential hazards to development of property within certain areas of the County and to enable the County to mitigate the risks presented to property owners by these hazards. These overlays include potential geologic hazards. Over the past twenty years, certain federal and state agencies have been in the process of digitizing much of this hazard data. The digitization of this data has allowed for greater accuracy as well as more timely updates. In recognition of the new data from various federal and state agencies, the County updated the geologic hazard overlay maps, specifically the Generalized Liquefaction

Susceptibility layer and the Generalized Landslide Susceptibility layer, contained within the Safety Element of the General Plan.

The Generalized Liquefaction Susceptibility layer was amended to modify four General Plan Quad Maps to incorporate new liquefaction data in the Big Bear Lake area designated by the County Geologist for the Big Bear Lake Valley. This information was then incorporated into the County-designated Geologic Hazard Overlay District.

The Generalized Landslide Susceptibility layer was amended by modifying 17 General Plan Quad Maps and one regional Quad Map, to incorporate updated existing landslide data published by the U. S. Geological Survey for the Mountain area. The County Geologist updated the landslide inventory within the Geologic Hazard Overlay District by incorporating new geologic mapping by the U.S. Geological Survey.

The following is a list of the updated General Plan Geologic Hazard Overlay Maps effective on March 11, 2010:

**Table 7-2: General Plan Geologic Hazard Overlay Maps**

| Map # | Quad Name |
|---|---|
| FH08C | Fifteen Mile Valley |
| FH11C | Mt. San Antonio |
| FH12C | Telegraph Peak |
| FH13C | Cajon |
| FH14C | Silverwood Lake |
| FH15C | Lake Arrowhead |
| FH16C | Butler Peak |
| FH19C | Mt. Baldy |
| FH20C | Cucamonga Peak |
| FH21C | Devore |
| FH22C | San Bernardino North. |
| FH24C | Keller Peak |
| FH27C | Ontario |
| FH30C | San Bernardino South |
| FH31C | Redlands |
| FH32C | Yucaipa |
| FI09C | Fawnskin |
| FI10C | Big Bear City |





| Map # | Quad Name |
|---|---|
| FI17C | Big Bear Lake |
| FI18C | Moonridge |
| EH/FH C | SW Portion of County |
| **FH23C** | **Harrison Mtn.** |

### 7.1.2.4 Flood

#### 7.1.2.4.1 Existing Drainage Studies

Drainage studies including review of upstream properties, site drainage area, potential upstream development, and site-specific development will help to mitigate damage from future storm events. San Bernardino County owns landfill sites, transfer stations and closed disposal sites where combined site property totals several hundred acres. Landfills and disposal site properties include acreage that has been constructed to design grades and may include improved drainage systems. Also, within most landfill and disposal site properties there are many acres of property that remain in its natural state including native vegetation and natural grades. During severe weather events, both engineered areas and undisturbed areas are subject to erosion from storm run-off. The erosion can range from minor to severe depending on the storm event and amount of precipitation. Most sites where engineered drainage systems are in place hold up well experiencing only minor erosion and debris flow. However, during major storm events, runoff from native and unimproved areas carrying solids and debris flow may compromise downstream drainage systems and overwhelm system facilities. Much of the damage to landfill and disposal sites during the December 2010 Winter Storm event was caused by erosion with sediment carried from undeveloped/undisturbed areas or where no improved drainage system is in place.

Other events that may cause damage to property and structures include earthquakes, wildfires, high winds, extreme freezes, and lightning storms.

- Earthquakes have the potential of causing damage to site roadways, structures, and systems including concrete drainage systems, Landfill Gas systems (LFG) and Leachate Collection Recovery Systems (LCRS). With earthquakes, there is always the potential of slope failure and slides on the landfill surface. Damage to any of these facilities has the potential to result in an inability to temporarily service the community.
- High Winds can cause damage to temporary drainage structures, fencing, and metal structures. During past high wind events, Transfer Stations have experienced roof panels being torn from the beams. Landfill sites with exposed geo-synthetic liners may experience damage if the winds lift and tear the liners.
- In January 2007, the County experienced a loss of over $21,000 in damage when water pipes at three separate Transfer Stations froze, then burst, causing damage to offices and electrical equipment.

- Lightning storms have the potential to damage electrical components in scale houses, in-ground scales, LFG, and LCRS.

#### 7.1.2.4.2 NFIP Program and County General Plan Policies

Because the County has entered into an agreement to participate in the National Flood Insurance Program (NFIP) which provides flood insurance within designated floodplains, the following goals, policies and programs shall apply:

**As stated in the San Bernardino County General Plan Safety Element:**

**GOAL S 5**
The County will provide adequate flood protection to minimize hazards and structural damage.

**Policy S 5.1:** Participate in the National Flood Insurance Program (NFIP), which provides flood insurance within designated floodplains.

**Programs**

1) Designate Floodway and Floodplain areas, as identified by the Federal Emergency Management Agency (FEMA) on flood insurance rate maps and flood boundary maps, as Floodway (FW) on the Land Use Maps and Floodplain Overlays on the Hazards Overlay Maps.

2) Designated floodway areas will be preserved for non-structural uses through restrictions of the FW Land Use Zoning District

3) All new development, including filling, grading, and construction, proposed within designated floodplains, will require submission of a written assessment prepared by a qualified hydrologist or engineer, in accordance with the latest "San Bernardino County Hydrology Manual" and the various detention basin policies (see Existing Policy FL-11), to determine whether the development will significantly increase flood hazard and to show that all new structures will be adequately protected. Development will be conditioned on receiving approval of this assessment by the San Bernardino County Surveyor Division of the Public Works Department. All new construction in a Floodplain Overlay area will be required to be flood-proofed, located, and designed to allow unrestricted flow of floodwaters.

4) The Land Use Compatibility Chart for 100-Year Flood Plains Table 5-1 will apply to County reviews of all discretionary and ministerial actions in County designated floodplains.





5) Lands within floodplain areas may be developed with non-critical and non-essential uses if mitigation measures are incorporated to ensure that the proposed development will not be hazardous, increase flood depths or velocities downstream, or degrade water quality, especially uses such as parks, trails, and open space.

6) Provide known flood hazard information with every discretionary or ministerial application.

7) When no mapped data exist, existing topographical, watershed, and drainage course data will be evaluated for a determination of potential flood hazard for every discretionary and ministerial action.

**Policy S 5.2:** Update data and maps with newly identified flood hazard areas in the County, as new information becomes available.

**Programs**

1) As new overflow studies and mapping are completed and approved by either the County's Land Development Engineer or the San Bernardino County Flood Control District, they will supplement the FEMA mapping and will be incorporated into Flood Hazard Overlay mapping.

2) Initiate and finance programs for the continuous evaluation and designation of floodway, floodplain, and drainage areas.

3) Timely application for FEMA mapping changes will be initiated to reflect any additions to or alterations in identified Floodways or Floodplains by the County Floodplain Management Administrator.

### 7.1.2.5 Drought

#### 7.1.2.5.1 Water Efficient Landscape Ordinance

Over the years, the State of California has been promoting water conservation for all new development within the State. In a drought-prone California, where approximately 60 percent of all residential water is used in landscape applications, California lawmakers have adopted such legislation as Assembly Bill (AB) 325 (1990), AB 2717 (2004), and AB 1881 (2006) that outline, and in some instances mandate, the practice of water conservation in landscape applications. As part of AB 325, the Department of Water Resources (DWR) was charged to assemble a task force of stakeholders representing the landscape, water, and building industries as well as cities, counties, and other agencies that would help DWR prepare and promote the State's first Model Water Efficient Landscape Ordinance (MWELO).

While AB 325 did not require cities, counties, and other agencies within the State to comply with the first adopted MWELO, it did encourage local agencies to implement water conservation techniques into their local ordinances and codes. The County adopted Administrative Guidelines

that were amended several times and ultimately given the status of "regulation" when they were incorporated into the Development Code (Chapter 83.10) during the 2007 General Plan Update process.

In 2006, State lawmakers adopted AB 1881, which gave guidelines and timelines for revision of the State's MWELO and mandated that every city, county, or other agency within the State of California adopt the State's revised MWELO, or be in compliance with it through their own ordinance, by January 2010. Local agencies are required to report their final action, along with findings of ordinance effectiveness, to DWR by January 2011. While this process was underway, Senate Bill X7-7 was enacted (2009). This bill requires the State of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020; additionally, it requires the State to make incremental progress towards this goal by reducing per capita water use by at least 10 percent by December 31, 2015. These requirements were incorporated into the MWELO and, in February 2008, DWR made a draft of the State's revised MWELO available to all cities, counties, and other agencies within the State. The final version of the revised MWELO was released in September 2009.

Upon review of the final version of the State's MWELO and the provisions of AB 1881, staff determined the County would need to revise Development Code Chapter 83.10 which sets forth landscaping and irrigation standards within the unincorporated areas of the County. This would in part, become a mitigation measure to assist with any drought hazard the County may encounter. In the meanwhile, the County began enforcing the State's revised MWELO in January 2010, as required by law.
Once the proposed changes to the Development Code have been adopted by the Board of Supervisors, staff will notify and forward all required information regarding the adoption and effectiveness of the County's Water Efficient Landscaping Ordinance to the State DWR as required by January 2011.

The proposed Development Code Amendment will revise the landscaping standards to reflect the changes governed by and to be as effective as, the State of California's revised Model Water Efficient Landscape Ordinance, while continuing to recognize the unique character of the regions that make up the County of San Bernardino.
The ***proposed revisions*** will require the applicant/developer to:

- Design and install systems that meet more effective and efficient water conservation standards in all landscaped areas on a project site, including residential;
- Comply with the revised standards for all new and rehabilitated landscape areas regardless of square footage for projects that are not homeowner installed and for all new and rehabilitated landscape areas, that are homeowner installed, that are 5,000 square feet or greater. This includes the following:
    - Submit a comprehensive Landscape Documentation Package, which has been prepared by a landscape architect licensed to work in the State of California or other licensed professional authorized to design and prepare Landscape Plans within the State of California;





    - Submit estimated annual water budget calculations for compliance with water conservation practices and the efficient use of water for each new or rehabilitated landscape. Calculations for the annual water budget for a project/site specific landscape shall use the formulas for the Maximum Applied Water Allowance (MAWA) and the Estimated Annual Water Use (EAWU) outlined in the ordinance;
    - Submit a Landscape Certificate of Compliance prepared by the landscape professional who prepared the Landscape Documentation Package conveying the project's compliance with the requirements of Development Code prior to final inspection;
    - Planting material within landscaped areas shall be chosen based on the information found in the Water Use Classification of Landscape Species, third edition (WUCOLS III) and the climate zone for the region based on information found in Sunset Western Garden Book;
    - Irrigation systems shall be equipped with a "smart" irrigation controller, which automatically adjusts the frequency and/or duration of irrigation events in response to changing environmental conditions.
    - Submit a rough and/or precise grading plan on all projects proposing more than 50 cubic yards of grading;
    - Submit a soil management report, that includes recommendations for soil modification and/or amendment;
    - Submit a project-specific regular maintenance schedule and two project-specific irrigation schedules for those projects subject to the ordinance.

Other provisions of the new regulations include standards for non-potable/recycled water use where it is available and new enforcement standards for compliance with water conservation practices.

Since the State law became effective on January 1, 2010, the Landscape Plan Review Fee was adjusted (Ordinance #4412, June 22, 2010) to reflect the increase in staff time necessary to meet these additional requirements.

The Planning Commission considered this ordinance on October 21, 2010. There was no one at the hearing who wished to address the Commission on this issue. The Commission recommended that the Board adopt the ordinance as presented on a vote of four commissioners in favor and one absent.

The proposed amendment is exempt from the California Environmental Quality Act (CEQA) in accordance with Section 15061(b) (3) of the CEQA Guidelines as the proposed change does not have the potential to cause a significant effect on the environment.

The proposed Ordinance is to be presented to the County of San Bernardino Board of Supervisors for adoption in the first quarter of 2011. Utilizing either the State Water Efficient Landscape Ordinance, which is in effect currently, or the County's specific Water Efficient Landscape Ordinance; the drought mitigation for this hazard is positive.

#### 7.1.2.5.2 San Bernardino County Desert Area Groundwater Inventory and Atlas

As of January 2011, the California Department of Water Resources anticipates releasing the Final Local Groundwater Assistance (LGA) Guidelines later this calendar year. In December 2009, the draft LGA Guidelines and Proposal Solicitation Package (PSP) was available for public comment. The comment period ended on January 12, 2010.

Local public agencies with authority to manage groundwater resources are encouraged to apply Examples of projects that may be considered are: Groundwater data collection, modeling, monitoring and management studies; monitoring programs and installation of equipment; basin management; development of information systems; and other groundwater related work.

The County of San Bernardino Board of Supervisors may consider an action directing staff to apply for the grant when it becomes available for a Desert Area Groundwater Inventory (DGI) and Atlas. The DGI falls within the scope of the Local Groundwater Assistance (LGA) Program, which is funded with Prop 84 IRWM funds anticipated to be available for fiscal year 2010-2011. Grants are limited to $250,000 per recipient, and total funding is $4.7 million.

California Department of Water Resources will give priority to local agencies with adopted groundwater management plans (SB1938 compliant), and which demonstrate collaboration with other local agencies in managing groundwater basins. County's groundwater management ordinance satisfies this requirement.

By having a Desert Area Groundwater Inventory and Atlas, this would enable the County to have a database providing locational and water depth information for specific regions of the County that currently do not have a groundwater inventory. This Inventory and Atlas would provide information applicable for flood mitigation or ground water availability for usage during severe drought. The location and water depth in the inventory are important for an earthquake hazard analysis, if liquefaction potential exists.

Since there is not a Desert Area Groundwater Inventory currently, and if liquefaction is a concern in a specific region of the County, then the water depth data would estimate the vertical distance from the land surface to the top of the groundwater aquifer (i.e., the groundwater-saturated layer.)

**Table 7-3: Tentative Schedule for the LGA Grant**

| Date | Event | |
|---|---|---|
| TBD | Release Final LGA Guidelines and PSP | Dependent upon Grant approval |
| TBD | Proposal Applications Due | Dependent upon Grant approval |
| TBD | Public Release of Draft Award Recommendations | Dependent upon Grant approval |

*Fund Source: Proposition 84*





### 7.1.3 Continued Public Involvement

As indicated earlier, the County will continue to engage the general public and seek input on the mitigation and preparedness planning process. In addition to the San Bernardino County Board of Supervisor meetings, the actions include:

- Municipal Advisory Communities throughout the unincorporated County area,
- Flood Zone Advisor Committees,
- Special District Advisory Committees,
- Public hearings for County General Plan updates held four times a year,
- MAST and FAST meetings,
- Fire Safe Council meetings,
- Community Emergency Response Team meetings, and
- Public events where educational efforts are undertaken in the unincorporated areas.

Additionally, the public is kept involved through annual programs such as the Great Shakeout held annually in October, SKY Warn events sponsored by the National Weather Service, and other monthly safety programs. The County will continue to use several different methods to reach out to the public: mailers, cable TV, website, social networks, e-mail, posting in public libraries, and fairs.

# Section 8. Works Cited

USGS. (2009).
USGS. (2016, April 7). *USGS Earthquake Hazards Program*. Retrieved from https://earthquake.usgs.gov/learn/glossary/?term=earthquake





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# Appendix A. Outreach Documentation

## A.1 Ready SB County Preparedness App Message

An App message was sent out to over 15,000 persons with the App and it is attached to the San Bernardino County Fire Website. .Ready SB County Preparedness Mobile App can be used on either an Android or iPhone. This app provides multiple resources for our residents that will assist them in preparing for a disaster and enhancing the recovery process. Protect yourself and your loved ones before, during and after a disaster.

Get the Latest News from SBCounty.gov, CalTrans, National Weather Service, and San Bernardino County Fire Office of Emergency Services. This app will provide you with an emergency supply kit list, grocery list and checklists tailored to your needs. You can access and update your plan as needed. Learn all you need to plan for and respond to natural disasters, terrorism and pandemic flu in San Bernardino County

## A.2. San Bernardino County Fire Public Input Requested

San Bernardino County Fire Department/Office of Emergency Services (OES) is coordinating the update of the San Bernardino County Unincorporated Area Multi Hazard Mitigation Plan. Hazard Mitigation Plans are updated every five years and must be approved by Cal OES and FEMA. The purpose of the public input and comment is to show progress being made and elimination of hazards since the last plan. Your input is appreciated by reviewing and commenting on the current plan (link below) by calling OES at 909-356-3998 – ask for David Davis. Comment period **closed at 5:00 p.m., Wednesday, November 3, 2016.**
http://www.sbcfire.org/oes/Documents.aspx





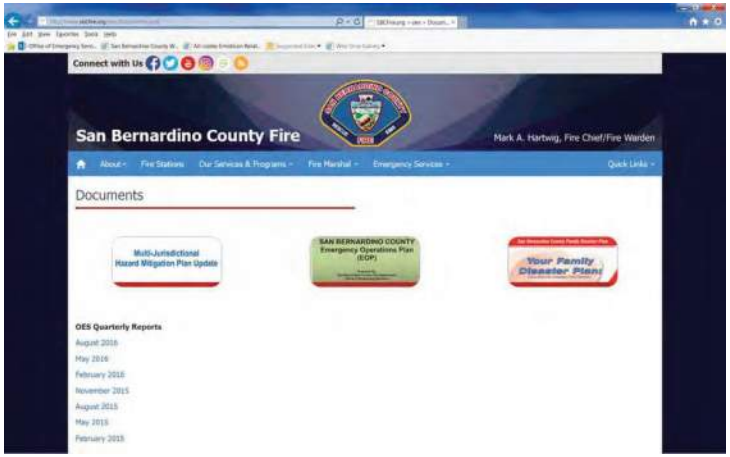

## A.3. MJHMP PowerPoint Presentation

# Annex A. Fire Protection District

## A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Fire Protection District, a previously participating jurisdiction to the 2011 San Bernardino County Hazard Mitigation Plan Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the Fire Protection District. This Annex provides additional information specific to the Fire Protection District, with a focus on providing additional details on mitigation actions and projects.

The Board of Supervisors acts as the Board of Directors for the County Flood Control District, and as part of their responsibilities as an elected member of the County of San Bernardino Board of Supervisors.

## A.2 Fire District Profile

The San Bernardino County Fire Department is an all-risk/full-service fire department committed to providing the highest level of service in the most efficient and cost effective manner to the citizens and communities that we serve. At 20,160 square miles, San Bernardino County is the largest county in the continental United States. Our jurisdiction encompasses 19,278 square miles of extremely diverse environments that stretch from the Los Angeles County line on the west, to the Colorado River on the east, to the Nevada State line and Kern and Inyo counties on the north. We provide services to more than 60 communities/cities and all unincorporated areas of the county.

**Mission Statement**
Community-based all-risk emergency services organization dedicated to the health and well-being of the citizens of San Bernardino County through a balance of regionalized services delivery and accountability to the local community supported by centralized management and services.

**Service Motto**
Duty, Honor, Community.

**Standard of Commitment**
"Where Courage, Integrity, and Service Meet."

**Vision Statement**
Committed to Providing Premier Fire Services.

**Hazard Mitigation Planning Group:**
Michael Antonucci – Emergency Services Manager





## A.3 Planning Process

As described above, the County Fire District followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the San Bernardino County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table A-1. Additional details on plan participation and District representatives are included in Appendix A.

**Table A-1: Fire District Planning Team**

| Name | Title / Role |
|---|---|
| Michael Antonucci | Emergency Services Manager |
| Cindy Serrano | Assistant Emergency Services Manager |
| David Davis | Emergency Services Officer |
| Miles Wagner | Emergency Services Officer |
| Cheryl Nagy | Emergency Services Officer |
| Carrie Cruz | Emergency Services Officer |
| Elli Maldonado | Office Assistant |
| Mary Barnett | Technical Writer / Plan Update and Edits |
| Michael Horton | Fire Marshal |

Weekly meetings held every Tuesday since July 2016 with conference calls to the consultant group and other stakeholders plus all meetings listed in this document.

## A.4 Hazard Identification and Prioritization

The County Fire Protection District Planning Team participated in the County hazard identification and prioritization process described in the base plan. The Fire District Planning Team assisted to summarize the extent, probability of future occurrences, potential magnitude/severity, and significance specific to the Fire District in the base plan.

The Planning Team (all participating jurisdictions) determined that the County and its Special Districts should focus over the next five (5) years on hazards that fell within the HIGH and MEDIUM “Probability” and “Impact” categories. While all the hazards present a potential problem in the County, the Planning Team felt that if they were able to reduce or eliminate the risk from “fire related” hazards, it would provide a greater service to the people within the jurisdiction. Table 4-3 illustrates how the final prioritization of the hazard; the “Green” colored box represents the highest priority hazards; and the “White” colored boxes represent lower (second and third tier) priority hazards.

Table A-2: Fire District Hazard Priority Matrix

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | **Wildfire**<br>Flood<br>Earthquake/ Geologic Hazards | Drought | |
| | Medium | Terrorism | Climate Change (Extreme Heat and other) | Hail<br>Infestation |
| | Low | | Dam Inundation | Tornado<br>High Winds<br>Winter Storm<br>Lightning<br>Extreme Cold |

## A.5 Coordination with existing Fire District Mechanisms

Coordination with other District planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the Fire Protection District integrated the previously-approved 2011 Plan into existing planning mechanisms and programs.

While not designed or proposed specifically as mitigation projects, the County Fire Protection District undertakes many activities that incorporate mitigation elements and integrate risk reduction as an additional benefit. The following describes a number of these projects which exemplify how the County integrates hazard mitigation into county-wide programs.

### A.5.1 Critical Route Planning Committee

San Bernardino County Fire Protection District Office of Emergency Services has a “Critical Route Planning Committee” that is developing countywide routes and alternate routes for use in evacuating residents from a disaster area while simultaneously allowing first responders’ access into a disaster area without congestion and gridlock. The Committee members are from County departments, City and Town representatives, and key state and federal agencies. The Critical Route Planning effort is being coordinated with surrounding counties to prevent congestion and gridlock at the County boundaries.





### A.5.2 Public Alert and Education Programs

#### A.5.2.1 Wireless Emergency Alerts (WEA)

During threatening emergencies in your area, authorized government agencies can send Wireless emergency Alerts to your mobile device. Messages regarding extreme weather, life threatening emergencies, AMBER alerts, and Presidential Alerts during a national emergency are all sent through the WEA system

#### A.5.2.2 Emergency Alert System (EAS)

The Emergency Alert Systems: national public warning system that requires TV and radio broadcasters, cable television systems, wireless cable systems, satellite digital audio radio service providers, direct broadcast satellite service providers and wireline video service providers to offer to the President the communications capability to address the American public during a national emergency. The FCC works with the Federal Emergency Management Agency and the National Oceanic and Atmospheric
Administration's National Weather Service to implement the EAS at the national level. Only the President determines when the EAS will be activated at the national level, and has delegated the administration of this function to FEMA.
Accordingly, FEMA activates the national EAS, and directs national EAS tests and exercises. The NWS uses the EAS on a local and statewide basis to provide the public with alerts and warnings regarding dangerous weather and other emergency conditions.

The EAS allows participating providers to send and receive emergency information quickly and automatically, even if their facilities are unattended. If one link in the system for spreading emergency alert information is broken, members of the public have multiple alternate sources of warning. EAS equipment also provides a method for automatic interruption of regular programming, and in certain instances is able to relay emergency messages in languages other than English.

#### A.5.2.3 Integrated Public Alert & Warning System (IPAWS)

During an emergency, alert and warning officials need to provide the public with lite-saving Information quickly. The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure and will save time when time matters most, protecting life and property. Federal, State, territorial, tribal and local alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System {EAS}, Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio and other public alerting systems from a single interface.

#### A.5.2.4 Telephone Emergency Notification System (TENS) Implementation

Emergency service agencies like the Sheriff's Office have implemented TENS on numerous occasions to notify residents in specified areas to evacuate. Most recently it was used to evacuate hundreds of homes in the eastern portion of Yucaipa during the Pendleton Fire and in Wrightwood during the Sheep Fire when the entire community was ordered evacuated.

#### A.5.2.5 Emergency Communications Services (ECS)

In the last 10 year the ECS program has continually provided support to all major and minor incidents. The more recent events were the Pilot Fire and the Blue Cut Fire in 2016. ECS provides communications and logistical support to public safety and disaster preparedness events. They have also set up a training program for other County Departments that are not typical emergency responders but provided support in an emergency. ECS delivered and set up amateur radio equipment for Department of Public Works, Department of Public Health, Preschool Services Department, and Department of Behavioral Health and provided training for the employees.

#### A.5.2.6 Fire Safe Council/CERT Community Based AM Radio Transmitters

The Wrightwood Fire Safe Council and the Big Bear City CSD set up and operates a local AM radio transmitter. It has been brought into use during local incidents including a power outage where it is very useful. In power outages, the AM radio in a person's car still works. It was also used to provide preparatory information to the citizens of Wrightwood as the Station Fire was approaching the community from the west. It is also used extensively during the Wrightwood Fire Wise Awareness Days to keep citizens apprised of community events.

### A.5.3 OES Volunteer Programs

The San Bernardino County Fire, Office of Emergency Services (County OES) is proud to provide residents of San Bernardino County with meaningful disaster-related volunteer opportunities. Recognizing that during disasters and other emergencies professional responders may be overwhelmed or need assistance County OES trains residents to integrate with and support professional responders during incidents. County OES currently does these through three volunteer programs; the Community Emergency Response Team (CERT), Emergency Communications Service (ECS) and California Disaster Corps programs. Please visit the links below to learn about the programs offered.

#### A.5.3.1 Community Emergency Response Team (CERT)

The Community Emergency Response Team (CERT) Program educates people about disaster preparedness and trains them in basic response skills. Following a catastrophic event CERT





Members can assist themselves, their families, and others in their neighborhood or workplace until professional responders arrive. Fourteen (14) CERT programs are in the communities of:

- Angelus Oaks
- Big Bear Valley
- Helendale
- Lucerne Valley
- Lytle Creek
- Mill Creek Canyon
- Morongo Basin
- Mountain
- Oak Hills
- Phelan/Pinon Hills
- Rosena Ranch
- San Antonio Heights
- Silver Valley
- Wrightwood CERT

San Bernardino County Fire Protection District Office of Emergency Services has sworn in over 1000 CERT participants as California Disaster Service Workers. These participants have gone on to receive a Sheriff's Department background check to become members of their community's CERT.

The program receives guidance and resources from Department of Homeland Security, FEMA, Citizen Corps, and California Volunteers. The program is administered locally by the San Bernardino County Fire Protection District Office of Emergency Services.

#### A.5.3.2 LISTOS

Listos, which means "ready" in Spanish, is a twelve-hour disaster preparedness course created specifically for the Spanish-speaking community and is delivered entirely in Spanish. The program is intended to be adaptable, flexible and culturally relevant. This means participants are encouraged to involve the entire family and accommodations are made for young children. San Bernardino County Fire, Office of Emergency Services currently partners with the Cities of Fontana and Rialto to bring Listos to their communities

#### A.5.3.3 California Disaster Corps

The Disaster Corps is a first-in-the-nation effort to professionalize, standardize and coordinate highly trained disaster volunteers statewide. This program initiative was built collaboratively in partnership with California Volunteers from the ground up through public-private partnerships and with a wide range of subject matter experts including representatives from all levels of government, local emergency managers, state agency volunteer coordinators, and leaders in non-governmental volunteer programs.

Disaster Corps programs reside only in San Bernardino, San Francisco and Riverside Counties. San Bernardino County Disaster Corps volunteers are those volunteers participating in the volunteer programs residing within the unincorporated communities of San Bernardino County and have demonstrated commitment to their volunteer program and strive to continue developing their skills and training to better support their program and their community.

Within San Bernardino County Disaster Corps volunteers are set aside from regular CERT (Community Emergency Response Team) and ECS (Emergency Communication Services) volunteers by having the ability to be deployed throughout other areas of San Bernardino County and the state. They have received specialized training in SEMS and NIMS, plus have completed many other ICS courses and First Aid and CPR training. In addition there are additional training opportunities not offered to the regular CERT and ECS volunteers.

#### A.5.3.4 ECS Emergency Communications Service

The Emergency Communications Service (ECS) is a volunteer group providing front-line communications, technical and logistical support to the San Bernardino County Fire Department and Office of Emergency Services. Their primary mission is to support County Fire, County Government and other local agencies in time of disaster. In addition, ECS has provided telecommunications and event support to other County departments including Public Health, Behavioral Health, Public Works, Pre-School Services, Sheriff's Search and Rescue and other County Departments.

ECS coordinates disaster communications between city and county agencies, provides a communication link to Cal OES and ensures backup communication channels are kept open in times of a major disaster.

In an average calendar year, ECS supports approximately two-dozen events and incidents throughout the County. These events range from parades and community events, to major public safety incidents including fires and floods. The 200 ECS volunteers donate an average of 9,100 hours per year to the County of San Bernardino.

ECS currently provides multiple HAM licensing classes to County Departments and the residents of San Bernardino County each year.

### A.5.4 ROPE Plan (Responders Organized For Pass Emergencies)

ROPE Field Operations Guide (FOG) and Standard Operating Guide (SOG) for use by participating Federal, State, County, and Municipal agencies and industries for day-to-day incidents in the Cajon Pass, as well as for larger regional incidents requiring coordinated and unified multi agency response. The ROPE FOG contains; communications information, emergency contact information, critical infrastructure mapping and ICS planning tools.





### A.5.5 Great ShakeOut County Drill in all Disciplines (held annually)

The San Bernardino County Operational Area will be participating in the annual The Great ShakeOut drill which will focus on the Southern California Regional Catastrophic Plan (SCRCP). This plan is based on a large scale magnitude earthquake scenario along the southern section of the San Andres Fault. The purpose for participation in the Great ShakeOut Exercise is to address the County's potential to respond to a catastrophic earthquake event based on the plan, and to better prepare for such an occurrence. The goal of the exercise will be to conduct an effective multiagency/multi-jurisdictional evaluation of the Regional Catastrophic Plan with our Operational Area response partners.

### A.5.6 "Ready SB" Smart Phone App for Disaster Preparedness Program

The new mobile app, Ready SB, provides residents with multiple resources that will assist them in preparing for a disaster. Ready SB is now available as a free download from the Apple App Store and the Google Play Store it can immediately help residents prepare themselves for emergencies.

Ready SB features include: "My Plan", an individual emergency plan and/or a family or group plan. The person that downloads the application will receive county wide alerts and notifications of emergency situations in that person's area. There is a feature called "Share My Status" it is a place to update your status via text or email.

The app also includes information about areas that need to be evacuated, where to go, what routes are open and also what resources are available during that emergency.
The app features include: Evacuation Routes and Shelters, Need to Know, and has a Resources List.

### A.5.7 Cal Fire

Cal Fire provides programs to increase fire safety in high fire hazard severity zones. It funds and staffs programs from public education activities to performing fuel modifications with inmate crews. One example is the active Re-Leaf program where mountain residents are educated about drought tolerant and fire resistive landscaping that is available and sustainable. Cal Fire is also the lead agency on reforestation after a wildfire to ensure the stability of the environment. Cal Fire Foresters are active participants in the MAST process helping educate citizens and leading forestry activities on private lands within the USFS boundary.

Numerous fuels projects have been completed by State inmate crews that do significant hand work in dense fuels adjacent to communities. Cal Fire has also led the way in countless re-forestation projects that ensure that new stands of the same trees will repopulate an area and that the original forest won't be overtaken by a different type of replacement forest.

### A.5.8 Organized Group Volunteer Activities

Mountain communities are populated by several volunteer citizen groups that are capable of providing significant resources that are not provided by traditional governmental agency services.

Volunteer groups particularly “Mountain Hearts and Lives” (MHL) responded to numerous emergencies particularly of note the Grass Valley and Slide Fires. These groups have also spent significant time working to prepare citizens for disasters. MHL has coordinated CERT training as well as HAM radio operator training. Other activities can be found at www.heartsandlives.org. Other partners that assist in coordinated endeavors for disaster preparedness and disaster relief are Rim Family Services and the Rim Resource Community Network. Members of these and other groups work very closely with MAST, Mountain Mutual Aid and the American Red Cross.

## A.6 Fire Protection District Mitigation Project Prioritizing

Cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural projects, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. While detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

Based upon the Fire Districts capabilities, Table A-3: Mitigation Project Prioritization and Implementation shows primary actions selected for further implementation and development during the next planning cycle. Table A-3 provides details for each mitigation action with mitigation action descriptions, FEMA mitigation category, responsible party, and timeframe.





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Table A-3: Mitigation Project Prioritization and Implementation

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| ALL Hazard | **AH Action 1.1:** Valley Dispatch and Operations Center. | Update and maintain the operations of the facility and ensure cohesive working and response to any scale emergency and operations in a secure complex | ES | General Fund and HMP Grant | Fire Protection District/ | 1-3 Years | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| ALL Hazard | **AH Action 1.2:** Maintain Shelter Operations Compound (SHOC). This shelter concept provides a new one-stop shelter concept. The SHOC combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location. | After the 2003 Wildland Fires, the County and American Red Cross recognized the need to provide services beyond basic care and short-term sheltering, especially during large fires, floods, and earthquakes The Mass Care & Shelter Plan and Concept of Operations, outlines the framework of a new one-stop shelter concept, Shelter Operations Compound (SHOC). It combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location. Residents can access public information and referral services through the LAC, and then take a short walk to the Non-LAC Unit for communication, postal services, and other private organizations/business at little to no cost. The completion of the Plan in 2012 will help to sync local resources, encourage local self-sufficiency, foster partnership between public and private agencies, and serve as a reference document for the region.<br><br>By June 2017, the program will have 32 trailers/caches equipped with mass care and shelter supplies, strategically placed throughout the County and ready for rapid deployment. It is expected to serve over 12,000 residents. In addition to enhancing the comfort levels of shelter residents, the program will produce standardized documents and protocols for procuring and maintaining Mass Care and Shelter trailers/caches. These plans and programs will help the County prepare for and mitigate damages from hazards. This is an update and expansion of the plan and done without more grant funds. | ES | To increase Mass Care and Shelter capability of the county, grants from 2008-2009 Homeland Security Grant Program (HSGP) and 2009 Riverside Regional Urban Area Security Initiative (UASI) funded the Mass Care and Shelter Trailer/Cache Program. | Fire Protection District/ | 1-5 Year | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| All-Hazard | **AH Action 2.1** Incorporate as appropriate requirements from the State of California's most recent land use regulations regarding the hazard mitigation planning process (Government Code 65302 and 8685.9). | Government Code 65302.6 requires the following elements to be included in the hazard mitigation plan:<br><br>(1) An initial earthquake performance evaluation of public facilities that provide essential services, shelter, and critical governmental functions. | PRV, NRP | General Fund | Primary: Land Use Services<br><br>Secondary: Fire Protection District/ | 1-3 years | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | (2) An inventory of private facilities that are potentially hazardous, including, but not limited to, multiunit, soft story, concrete tilt-up, and concrete frame buildings.<br>(3) A plan to reduce the potential risk from private and governmental facilities in the event of a disaster.<br><br>Government Code 8685.9 requires that the state share shall not exceed 75 percent of total state eligible costs unless the local agency is located within a city, county, or city and county that has adopted a local hazard mitigation plan as part of the safety element of its general plan. In that situation, the Legislature may provide for a state share of local costs that exceeds 75 percent of total state eligible costs. | | | | | |
| Wildfire | **WF Action 1.1** Continue Mountain Area Safety Taskforce (MAST) funding to support mitigation activity. | MAST was formed to mitigate the region wide risk of a catastrophic wildfire due to dead and dying trees in the mountain communities. The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for the protection of property owners, residents, and property subject to the risk of catastrophic wildfire that could occur in San Bernardino County with an initial emphasis on the threat resulting from the Old and Grand Prix fires in 2003. MAST priorities are to continue reducing fire hazards through fuel reduction programs and hazard abatement though enforcement of county ordinances.<br><br>The Mountain Area Safety Taskforce (MAST) Operations Section meets monthly. MAST Operations Section determines project priorities based on the benefit cost analysis of the projects and the effect of the project on the overall goals of the MAST organization.<br><br>Goals can change as detailed Benefit Cost Analysis is conducted and CEQA/NEPA reviews are completed. | NRP, PPRO | Seeking additional funding through HMPG. | San Bernardino County Fire Protection District | On-Going | See Implementation plan on more information on MAST.<br><br>See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | **WF Action 2.1:** Update Mountain Mutual Aid Map Book to document updated information contained in 2016 HMP. | The Map Book portion of the Community Safety and Structure Protection Plan provides not only a street network of the area but more importantly it provides the locations of strategic and critical resources for fire fighters. These include but are not limited to safe zones, open areas, locations for refuge. They also identify areas within communities that have narrow and steep winding streets and or with limited ingress and egress. The document is handed out to all responding strike teams from out of the | ES | Seeking additional funding through HMPG. | San Bernardino County Fire Protection District | On-Going | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | area and has proved invaluable in directing and coordinating an effective fire-fighting response and reduces the potential for life loss and property damage. | | | | | |
| **Wildfire** | **WF Action 2.2** Update Community Structure Protection Plans as necessary. | This is an on-going action (from the 2011 MJHMP) with the goal to continue development of and continue the mission of mutual aid between first responders in the County mountain areas. | PPRO | HMP Grant Funding | Primary: San Bernardino County Fire Protection District<br><br>Secondary: Land Use Services | On-Going | |
| **Wildfire** | **WF Action 3.1:** Implement identified community based fuels reduction projects. | The Fuels Reduction Program is designed to create community based fuel modification programs across the mountain communities.<br>These projects are selected specifically to reduce the potential for catastrophic wildfires and the damage that they can do to the communities. Project design, contracting, and operations are managed by the County's Public Works Department with priorities set by local fire chiefs in monthly MAST Operations Meetings. This program is the oldest and most significant for reducing wildfire threat on a mountain wide basis. | PPRO | Current Funding:<br><br>Seeking additional funding through HMPG. | Primary: San Bernardino Public Works Department<br><br>Secondary: County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 3.2:** Develop fuels reduction "maintenance program" by obtaining participation from citizens and/or homeowners associations. | To survive a wildfire, property owners need to manage the land surrounding their homes and communities effectively. Removing fuels in the wildland fuel reduction zone beyond the defensible space can reduce the speed and intensity of an oncoming wildfire. But if these areas aren't regularly **maintained**, they lose their effectiveness. Plants grow back, and flammable vegetation needs to be routinely removed and disposed of properly. This guide provides tips on how to create and maintain defensible space and wildland fuels treatments around your property. | PPRO, PE&A | Seeking additional funding through HMPG | Primary: Public Works<br><br>Secondary: Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 4.1** Increase homeowner assistance services to mountain residents for fuel reduction. | This is an ongoing wildfire mitigation action (from the 2011 MJHMP) for the group Forest Care to achieve the goal of providing assistance to homeowners by expanding services to all communities in the Mountain areas of the County.<br><br>Forest Care is a program dedicated to creating a healthier forest. This program provides foresters to assess individual properties for thinning the vegetation and then provides 75% of the funding to do so. | PPRO, PE&A | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Wildfire** | **WF Action 4.2** Continue working with Southern California Edison (SCE) to remove dead trees near power lines. | A significant number of fires across the State are caused by trees falling into power lines. When the forests in the mountain communities became infested with bark beetles the pine tree die off was unprecedented. Thousands of these dead trees were standing precariously close to power lines. Early in the Bark Beetle Emergency in 2004, Southern California Edison swiftly initiated a program to remove all trees that were dead, dying, and/or diseased that had the potential to fall into any SCE power lines.<br><br>The role of Southern California Edison was critical to the success of MAST both operationally and financially. Edison still removes the most difficult trees, the most costly trees; and the ones that are most likely to be the source of ignition for a wild land fire. They are also removing the trees that are immediately threatening homes.<br><br>They have removed 118,305 trees since the inception of the program in 2004. They also provided reimbursements to people that removed their own trees. | PRV, PPRO | As of July of 2010 Southern California Edison (SCE) has spent $179,758,978 to remove dead dying and diseased trees. | San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 5.1:** Inspect every residence in the mountain communities throughout the year to enforce the Fire Hazard Abatement code that addresses green fuels. | The Fire Hazard Abatement Program conducts surveys to identify fire hazards throughout the year. Fire hazards are identified and notices to abate the hazard(s) are mailed to property owners. Property owners are given 30 days to abate the violations. Failure to abate may result in citations, penalties, and/or fees for abatement by the County. The Fire Hazard Abatement Program responds to complaints year round in the unincorporated areas and contracting Cities and Fire Districts.<br><br>The Division completes more than 430,000 inspections, issues more than 45,000 Notices to Abate Fire Hazards, issues over 4,000 citations for non-compliance, and abates the fire hazards on more than 2,000 parcels annually. Within the last 5 years, the Fire Hazard Abatement Division has received even more financial | PRV, PPRO, PE&A | Seeking additional funding through HMPG | Primary: Land Use Services<br><br>Secondary: San Bernardino County Fire Protection District | On-Going | For more information on Contractor Certification, see Annex A Section A.6 Fire Protection District Mitigation Project . |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | resources that enable them to abate all properties declared a fire hazard. | | | | | |
| **Wildfire** | **WF Action 5.2:** Continue to collaborate with Forest Care, Red, Cross and Cal Fire to overcome increased costs of enforcement. | This is an on-going action from the 2011 MJHMP with the goal of overcoming funding shortfalls for the County Fire Hazard Abatement Program. | PRV | HMP Grant Funding | San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 6.1** Train and Certify landscape contractors to comply with the Fire Hazard Abatement Code. | The City of Big Bear Lake created a program to train and certify landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. The contractors are trained to comply with the new Fire Hazard Abatement Code that exists both in the City of Big Bear and the County unincorporated area. The City of Big Bear Lake Fire Department conducts the classes for landscapers and handy persons. This provides an incentive for the contractors and provides a level of certification that the homeowner can rely on when they are deciding to hire a landscape contractor to conduct fuels abatement around their home. | PRV, PPRO | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | On-Going |
| **Wildfire** | **WF Action 6.2:** Continue wildfire mitigation efforts under the Wood Shake Roof Replacement Program. | The County successfully passed an ordinance that requires the replacement of wood shake roofs by 2014. MAST has successfully mapped all of the wood shake roofs in the fire safety overlay and has created a strategy as to which roofs will be selected to participate in the FEMA funded project. This is an on-going project in cooperation with Big Bear Lake Fire Protection District in order to provide more funding for wood shake roof replacements by property owners. | PRV, PPRO, SP | Various Grant Funding from Edison, FEMA, Cal Fire | Primary: MAST<br><br>Secondary: San Bernardino County fire Protection District | On-Going | |
| **Wildfire** | **WF Action 7.1:** Modify independent and unique CWPPs into a more common framework making them similar but leaving room to provide specific hazard characteristics and mitigation actions for each community. | Community Wildfire Protection Plans are designed to provide a means for a community, usually through the Fire Safe Council, to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. | PRV | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | On-Going<br><br>For more information on CWPP see Annex A Section A.6 Fire Protection District Mitigation Project . |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Wildfire** | **WF Action 8.1:** Construct Arrowbear Drive Realignment and Widening. | The Arrowbear community off State Highway 18 has limited access to State Highway 138. The existing bridge/spillway and road needs to be realigned and widened to facilitate access by emergency personnel during wildfires and flooding. Mitigation strategy for this is to remove and replace existing bridge/spillway, realign and widen the road. | SP | Seeking grant funding<br><br>Total Cost: $2,000,000 | Primary: Public Works<br><br>Secondary: San Bernardino County Fire Protection District | 1-3 Years | |
| **Wildfire** | **WF Action 8.2:** Construct Cedar Glen Fire Access Road. | Lack of paved roads inhibits traffic circulation and the ability to enter and exit the area without backtracking during wildfire emergencies. Strategy is to Construct road and drainage improvements to Little Bear Creek Road and Elder Drive. | SP | Seeking grant funding<br><br>**Total Cost:** $2,500,000 | Primary: Public Works<br><br>Secondary: San Bernardino County Fire Protection District | 1-3 Years | |
| **Wildfire** | **WF Action 9.1:** Continue funding and support for Special Districts Projects relating to wildfire. | Continue funding and support for Special Districts Projects relating to wildfire in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| **Wildfire** | **WF Action 9.2:** Emergency Water Supplies | Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.(completed with continuous fresh of supplies and rotation) | ES | TBD | Roads | TBD | |

# Annex B. Flood Control District

## B.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Flood Control District, a previously participating jurisdiction to the 2010 San Bernardino County Hazard Mitigation Plan Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the Flood Control District. This Annex provides additional information specific to the Flood Control District, with a focus on providing additional details on mitigation actions and projects.

The Board of Supervisors acts as the Board of Directors for the County Flood Control District, and as part of their responsibilities as an elected member of the County of San Bernardino Board of Supervisors.

## B.2 Flood District Profile

***Flood Control District Functions:***
The Flood Control functions are handled through the San Bernardino County Flood Control District under State legislation enacted in 1939. The District has developed a very extensive system of facilities, including dams, conservation basins, channels, and storm drains. The purpose of these facilities is to intercept and convey flood flows through and away from the major developed areas of the County. The principle functions are:

- Flood protection on major streams.
- Water conservation.
- Storm Drain construction.

***Mission:***
To enhance the quality of life for our communities by developing and maintaining public infrastructure, and providing a variety of municipal services that complements our natural resources and environment.

***Vision:***
Lead the way to a thriving community through innovation in public works, fiscal responsibility, and environmental stewardship.

## B.3 Planning Process

As described above, the County Flood Control District followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the San Bernardino County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table B-4. Additional details on plan participation and District representatives are included in Appendix A.





**Table B-4: Flood Control District Hazard Mitigation Planning Team**

| Name | Title | Role |
|---|---|---|
| Kevin Blakeslee | Deputy Director – Flood Control | Public Works Deputy Director |
| Kenneth Eke | Chief Flood Control Planning/ Water Resources Division | Public Works Engineer |
| Michael Fam | Flood Control Planning | Public Works Engineer |
| Mona Sadek | Flood Control Planning | Flood Control Planner |
| Marjorie Schrage | Flood Control Planning | Public Works Engineer Technician |

## B.4 Hazard Identification and Prioritization

The Flood Control District Planning Team participated in the County hazard identification and prioritization process described in the base plan. The Flood Control District Planning Team assisted to summarize the extent, probability of future occurrences, potential magnitude/severity, and significance specific to the Flood Control District (See Section 4).

The Planning Team determined that the County and its Special Districts should focus over the next five (5) years on hazards that fell within the HIGH and MEDIUM "Probability" and "Impact" categories. While all the hazards present a potential problem in the County, the Planning Team felt that if they were able to reduce or eliminate the risk from "food and drought related" hazards, it would provide a greater service to the people within the jurisdiction. Table 4-3 illustrates how the final prioritization of the hazard; the "Green" colored box represents the highest priority hazards; and the "White" colored boxes represent lower (second and third tier) priority hazards.

**Table B-5: Prioritized Hazard Assessment Matrix**

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | Wildfire<br>**Flood**[x]<br>Earthquake/ Geologic Hazards | Drought | |
| | Medium | Terrorism | Climate Change (Extreme Heat and other) | Hail<br>Infestation |
| | Low | | Dam Inundation | Tornado<br>High Winds<br>Winter Storm<br>Lightning<br>Extreme Cold |

[x] = Flood District Area of Concentration

## B.5 Coordination with Existing Flood District Mechanisms

Coordination with other County planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the Flood Control District integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2011 MJHMP through other plans and programs shown below.

### B.5.1 Flood Area Safety Taskforce (FAST)

During the devastating fires in the fall of 2003, there was great concern of what the ramifications might be for flooding in the burned areas, as well as in the valleys. In response to these concerns, an organization was established that mirrored the Mountain Area Safety Taskforce (MAST), mentioned above, which played a key role in minimizing damage.

While the fires were ravishing the countryside, representatives from multiple agencies met often to address potential issues associated with flood, mud and debris flows develop a strategy and to protect communities from flooding incidents. These agencies united together to become the Flood Area Safety Taskforce (FAST). FAST is structured as an ICS/SEMS Organization for managing incident activities both readiness and response. The FAST Organization stresses liaison with the communities, provides for community education and information, and places emphases on Community and city partnerships.

The FAST group includes:

- Elected State officials
- Representatives from all five (5) County Supervisorial Districts
- State Office of Emergency Services
- County Administrative Office
- County Public Works-Flood Control/ Transportation/Solid Waste
- County Fire Protection District
- County Fire Protection District/Office of Emergency Services (OES)
- County Sheriff's Department
- Representatives from the cities of Fontana, Highland Rancho Cucamonga, Rialto, and San Bernardino.
- USFS
- Caltrans
- CHP

The mission of the FAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for the protection of property owners, residents, and property subject to the risk of erosion, mudflows, and flooding that could occur in San Bernardino County with an initial emphasis on the threat resulting from the Old and Grand Prix fires in 2003.





The FAST Unified Command identified the following objectives as the focus and direction of the FAST:

- Provide for Community Safety.
- Develop Coordinated Public Information Dissemination between Cities, County, State, Federal and Non-Profit Agencies.
- Develop Immediate, Mid-range and Long-range Coordinated Agency Plans.
- Identify and Secure Potential Funding Resources to Provide Document Task Force Activities Including Mission, Goals and Objectives, Policies, Procedures, and Outcomes.

Prior to any type of flood threat, the following precautionary measures may be taken by FAST members to reduce the impact of impending flooding:

- Review mutual aid agreements
- Define evacuation areas and trigger points
- Review the use of alert and warning systems
- Provide information to the public of potentially susceptible flooding areas and protective measures in progress or planned for those areas
- Educate public on emergency self-help and preparedness
- Develop and maintain emergency notification procedures and checklists.

A FAST Concept of Operations (CONOPS) was developed to provide activity guidelines for pre-flood activities related to National Weather Service (NWS) watches and warnings. Due to the unstable condition of the burned areas, activities and coordination needed to be established and implemented between departments.

The CONOPS is "situation" and "incident" driven and subject to revision by the Unified Command which includes County Flood Control District & Co Roads, County Fire Protection District, United States Forest Service (USFS), California Department of Transportation (Caltrans), California Highway Patrol (CHP), County Sheriff, City of Fontana, City of Highland, City of Rancho Cucamonga, City of Rialto, and City of San Bernardino. The Unified Command has the ability to modify activities in these guidelines in response to current situations and predicted changes. Currently, the CONOPS includes both summer and Winter Storm Event Readiness.

In addition, the CONOPS includes the San Bernardino County Flood Area Safety Taskforce Paging Network and a draft of the Alert Communication Matrix by Rain Amount/NWS Warning.

Over the past 10 years, the County has used the FAST CONOPS many times, greatly enhancing the County's ability to respond to flash flood in the desert and foothill areas. The CONOPS activity coordination between the agencies has been very successful. Because of the great success of the CONOPS, State Emergency Management Agency (Cal EMA) is using the CONOPS as a model for other agencies throughout the State.

In addition, San Bernardino County the CONOPS and FAST Plan is updated every two years and has done so since been put in to action the latest update being May of 2015.

### B.5.2 Alluvial Fan Task Force

In December of 2002, the California Floodplain Management Task Force Report recommended that "The State should convene a task force specifically for alluvial fans, with stakeholder participation, to review the state of knowledge regarding alluvial fan floodplains, determine future research needs, and, if appropriate, develop recommendations relating to alluvial fan floodplain management, with an emphasis on alluvial fan floodplains that are being considered for development."

In September of 2004, Governor Arnold Schwarzenegger signed Assembly Bill 2141, which recommended the creation of the Alluvial Fan Task Force (Task Force). The Director of the Department of Water Resources (DWR) convened the Task Force in December of 2007 after funding to support Task Force activities was secured from a Pre-Disaster Mitigation Planning Grant from the Federal Emergency Management Agency (FEMA) and a state match was authorized by Assembly Bill 466. Funding supported the tasks charged to the Task Force including:

- Review the state of knowledge regarding alluvial fan floodplains;
- Determine future research needs;
- Develop a voluntary locally-adopted model ordinance for communities subject to alluvial fan flooding that supports land use decisions on alluvial fans;
- Develop local planning tools to assist local communities evaluate development on alluvial fans;
- Prepare recommendations relating to alluvial fan floodplain management.

Appointments to the Task Force by DWR Director Lester Snow represented a broad range of interests. Members included elected officials, represented by five Supervisors from Kern, Los Angeles, Riverside, San Diego and San Bernardino County where future alluvial fan development is projected. Appointments also included representatives of the development and environmental community, local floodplain managers and associated state and federal agencies, including the Federal Emergency Management Agency (FEMA), plus at-large members representing other issues related to future development on alluvial fans. The entire process was coordinated by the Water Resources Institute at California State University San Bernardino.

Primarily, the purpose of the Alluvial Fan Taskforce *Findings and Recommendations Report* (July 2010) and *The Integrated Approach for Sustainable Development on Alluvial Fans* (July 2010) documents are to provide a non-prescriptive and flexible model that local governments can use at their own discretion adapting to local conditions and needs that supports wise future land use decisions associated with development on alluvial fans.





As one of the ten Southern California counties studied by the Task Force, the County may review the development of the suite of local planning tools for pre-project screening for future development proposals on alluvial fans. If funding allows for the review, these planning tools may be useful as an optional database reference for project management. Additionally, the flood management tools designed to analyze alluvial fan flood hazards and formulate flood hazard protection, which were developed to be consistent with FEMA guidelines, may provide an optional data source for project development. Long term funding for updating and maintaining the pre-project screening tools database is a concern regarding the reliability for current data.

If funding exists, for the implementation of the *Integrated Approach for Sustainable Development on Alluvial Fans*, the methods contained therein may be used as some of the approaches for planning and evaluating the suitability of development on alluvial fans. During the analysis and review, if budgets allow, the long term ecological and financial sustainability issues would also be evaluated.

Based on the Findings from the Alluvial Fan Task Force process, recommendations were made for specific future actions that the State and other public agencies should consider regarding alluvial fans. The San Bernardino County Departments of Land Use, Special Districts and the Flood Control District are all coordinating on the below recommendations:

**Recommendation 1:** *on-going*

In February 2010, a General Plan Amendment (GPA) to the Safety Element of the 2007 General Plan was adopted to amend the Flood Plain Safety Overlay District to incorporate revised FEMA (Federal Emergency Management Agency) Flood Plain data, modifying 47 detail and seven regional General Plan Quad Maps. The GPA also adopted the FEMA Digital Flood Insurance Rate Map database as released by FEMA as it currently exists and as updated in the future for the County allowing for automatic map updates as new data are published by FEMA. This action by the County of San Bernardino Board of Supervisors implements the portion of the first recommendation from the Alluvial Fan Task Force by working with FEMA to continue updating flood insurance rate maps.

In addition, the GPA for the Safety Element in 2010 (a) amended the Generalized Landslide Susceptibility layer, modifying 17 General Plan Quad Maps and one regional Quad Map, to incorporate updated existing landslide data published by the U. S. Geological Survey for the Mountain area; (b) amended the Fire Safety Overlay District, modifying four General Plan Quad Maps to incorporate updated fire safety mapping published by Cal Fire for the Valley area; and (c) amended the Generalized Liquefaction Susceptibility layer, modifying four General Plan Quad Maps to incorporate new liquefaction data in the Big Bear Lake area designated by the County Geologist for the Big Bear Lake area.

**Recommendation 2:** *on-going*

The County will coordinate with the California Geological Survey (CGS) and the United States Geological Survey (USGS) to review any newly developed Quaternary geologic maps in alluvial fan areas in order to identify potential hazards in areas projected for future development.

**Recommendation 4:** *on-going*

Historical, documentation of flooding occurrences are preserved by the County's Flood Control District that would review the recommendation to identify flooding events that were associated with alluvial fans.

**Recommendation 6:** *on-going*

The increased severity and intensity of wildfires in Southern California increase flood risk because the same structures subject to fire risk are also prone to post-fire debris flows. Many of the debris basins that were constructed some time ago did not anticipate the increased severity and intensity of wildfires or the additional developments that would follow. The CalOES projects that climate change will further increase the severity of storms, wildland fires, flooding, mudslides and landslides in areas of Southern California where existing debris basins are located.

All of San Bernardino County Flood Control District's Debris Basins in the valley area; from the Los Angeles County Line to Yucaipa, were analyzed after the Grand Prix and Old Fires. Flood Control District Safety Assessment Teams utilized the Corps of Engineers' Los Angeles District methodology to determine debris production, the same methodology the Corps uses when designing debris basins. In many cases basins were physically expanded and additional measures such as K-rails and debris racks were installed. The understanding of post-fire debris flows continues to evolve; we work closely with the USGS as they develop Post Wildfire Debris Flow Hazard Assessments. The rainfall "Trigger Points" in our FAST CONOPS is a result of the USGS assessments. All Flood Control Basins are also studied on an annual basis to determine existing capacity.

Any additional funding to support our efforts will meet the intent of recommendation #6 which states that the State and local agencies should conduct assessments of the adequacy of strategically located debris basins under a range of scenarios in urbanized areas in light of increased fire and post-fire debris-flow events.

**Recommendation 8:** *on-going*

When funding sources become available for the maintenance and further development of the database for the web-based portal; which would be utilized as a pre-project screening and flood management tool for special alluvial fan areas, the County may evaluate the benefits of its use in the planning process.





**Recommendation 9:** future proposal

As financial resources are allocated, the County will consider the analysis of the Integrated Approach tools to be studied for use in land use planning for development on alluvial fans.

**Recommendation 10:** *future proposal*

If funding is provided, the County will review and propose for adoption a model ordinance tailored for the specific needs of the County.

**Recommendation 12:** *future proposal*

The County's Office of Legislative Affairs, after consulting with the appropriate departments and staff, may explore supporting the economic strategies recommended in the Integrated Approach regarding future maintenance of flood management infrastructure.

### B.5.3 StormReady

On July 29, 2009, the National Weather Service recognized San Bernardino County as a "StormReady County". This recognition is valid until July 29, 2012 and has been renewed in use (2016) when the National Weather Service will review the County's weather related planning and notification procedures prior to renewing the "StormReady County" status.

San Bernardino County is the only StormReady jurisdiction in the United States covered by three Weather Forecast Offices. The NWS Offices are:

- San Diego, CA;
- Las Vegas, NV; and
- Phoenix, AZ.

This NWS Recognition may provide the County residents with a discount on their Flood Insurance premiums.

Flood Project Prioritization and Implementation

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| Earthquake | **EQ Action 5.1:** Divert runoff to Little Bear Creek. | To reduce the runoff over the cliff(s) in the Rimforest neighborhood, the runoff must be diverted to another path. This will be accomplished over three phases:<br>• Phase 1: Reduce Runoff Tributary Area by 64%- 50.35 AC<br>• Phase 2: Reduce Runoff Tributary Area by 30%- 23.79 AC<br>• Phase 3: Reduce Runoff Tributary Area by 5%- 3.99 AC | SP, NRP, PRV | TBD | Primary: Public Works<br><br>Secondary: San Bernardino County Flood Control District | | |
| Flood | **FL Action 1.1:** Update NFIP data and maps with newly identified flood hazard areas in the County, as new information becomes available. | As required by the State of California, National Flood Insurance Program (NFIP) maps published by FEMA must be included in the HMP or General Plan Safety Element. Keeping this information current is an important mitigation action. | PRV, PPRO | TBD | San Bernardino County Flood Control District | On-Going | |
| Flood | **FL Action 2.1:** Determine whether or not additional amendments to development standards or policies are merited, based on the Alluvial Fan Task Force Recommendations. | This is an on-going mitigation action from the 2011 MJHMP. | PRV | TBD | Primary: San Bernardino County Flood Control District<br><br>Secondary: Land Use Services | On-Going | |
| Flood | **FL Action 3.1:** Amend the Flood Plain Safety Overlay District through automatic map updates as new data is released and published by FEMA. | Current San Bernardino County Hazard Maps can be found at: http://cms.sbcounty.gov/lus/Planning/ZoningOverlayMaps/HazardMaps.aspx. | PRV, NRP | TBD | Primary: San Bernardino County Flood Control District<br><br>Secondary: Land Use Services | On-Going | |
| Flood | **FL Action 3.2:** Review development plans to ensure compliance with ordinances. | This is an on-going mitigation action from the 2011 MJHMP in order to reduce the flood hazards through development standards and policies stated in the General Plan and San Bernardino 2077 Development Code. | PRV | TBD | Primary: Land Use Services<br><br>Secondary: San Bernardino | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | | | | County Flood Control District | | |
| Flood | **FL Action 3.3:** Inspect construction to ensure compliance with approved development plans. | This is an on-going mitigation action from the 2011 MJHMP in order to reduce the flood hazards through development standards and policies stated in the General Plan and San Bernardino 2077 Development Code. | PRV, PPRO, SP | TBD | Primary: Public Works<br><br>Secondary: San Bernardino County Flood Control District | On-Going | |
| Flood | **FL Action 4.1:** In each flood control zone, construct facilities identified in those zones by the Flood Control Advisory Committee. See the following pages for a listing of projects. | This is an ongoing mitigation action from the 2011 MJHMP to achieve the goal of improving existing facilities and construct new facilities to mitigate flooding within the County. | SP | TBD | Primary: Public Works<br><br>Secondary: San Bernardino County Flood Control District | On-Going | |

## B.7 Flood Project Prioritization and Implementation

The Flood District project rankings utilize the same format as the 2011 Multi-Jurisdictional Hazard Mitigation Plan, and rankings are based on the current project funding status as shown on the County Flood Control District's 10 year Plan. A 'High' Local Priority, or (3), indicates that project funding is expected to be complete within about the next three years, depending on the Flood Zone and its' available revenue. A 'Medium' Local Priority (2) indicates that project funding is expected to be complete within about four to seven years. A 'Low' Local Priority (1) indicates that the project is on the 10-Year Plan but complete funding is likely eight to ten years or more in the future.

The task of determining local project priority is the responsibility of the County Flood Control District's staff and City Engineers. Each of the six zones of the District is represented by a Citizens Advisory Committee, composed of eleven members and serving by appointment of the Board of Supervisors without compensation. Each committee is formed of spirited citizens and public officials with unselfish and devoted interests, organized to meet annually or on call to afford recommendations to the Board of Supervisors on matters of tax levies, budgets, work programs, priority of projects, ventures and other counsel. The Mayor of each incorporated city in the District is a committee member with full standing for the appropriate zone.

County Flood Control District staff and the City Engineers for each zone meet twice per year to discuss future project needs and current project status. Projects are proposed based on the public safety needs within the particular zone. In addition to public safety, other issues are considered in the prioritization process such as grant funding, environmental reviews and approvals, and other impediments that may cause construction of the project to be delayed. (See Annex 1 for examples of how these prioritization factors are applied to proposed projects.)

Almost without reservation, the recommendations of these organized committees have been accepted by the Board of Supervisors in its administration of County Flood Control District functions.

Each flood control zone constructs facilities identified in those zones by the Flood Control Advisory Committee. The City Engineers for each zone along with the Flood Control District l Advisory Committee establishes Project Priorities based on Benefit Cost Analysis, Community input, and fiscal resources available for the project in addition to any other noted factors. The following three tables illustrate priority rankings based on three key factors: Total Cost, Hazard Assessment, and Potential Fatalities.

**Table B-6: Priority Flood Control Projects**

| Project No | Completion Date | Total Cost | Total Funding | Status |
|---|---|---|---|---|
| 1-112 | 5 Year Plan | $10,000,000 | $10,000,000 | Priority |
| 1-114 | 10 Year Plan | $15,000,000 | $1,000,000 | Priority |





| Project No | Completion Date | Total Cost | Total Funding | Status |
|---|---|---|---|---|
| 1-701 | 5 Year Plan | $1,100,000 | $1,100,000 | Priority |
| 1-806 | 10 Year Plan | $5,000,000 | $1,000,000 | Priority |
| 1-809 | 5 Year Plan | $8,500,000 | $1,000,000 | Priority |
| 1-910 | 10 Year Plan | $10,000,000 | $2,000,000 | Priority |
| 2-113 | 10 Year Plan | $3,100,000 | $500,000 | Priority |
| 2-308 | 10 Year Plan | $27,000,000 | $500,000 | Priority |
| F01272 | 10 Year Plan | $31,600,000 | $600,000 | Priority |
| F01336 | 2017-2018 | $12,800,000 | $13,740,000 | Priority |
| F01389-2 | 10 Year Plan | $2,700,000 | $1,430,000 | Priority |
| F01417 | 10 Year Plan | $39,500,000 | $21,150,000 | Priority |
| F01452-2 | 2017-2018 | $38,400,000 | $1,170,000 | Priority |
| F01473 | 10 Year Plan | $8,100,000 | $5,001,000 | Priority |
| F01650 | 2017-2018 | $5,200,000 | $3,440,000 | Priority |
| F01667 | 10 Year Plan | $26,900,000 | $16,000,000 | Priority |
| F01911 | 2018-2019 | $8,700,000 | $3,140,000 | Priority |
| F02129 | 10 Year Plan | $16,700,000 | $1,024,000 | Priority |
| F02228 | 10 Year Plan | $8,700,000 | $7,600,000 | Priority |
| F02243 | 10 Year Plan | $2,400,000 | $400,000 | Priority |
| | | | | |
| | Totals: | $281,400,000 | $91,795,000 | |

### B.7.1 Priority Project Descriptions

#### B.7.1.1 1-112 West State Storm Drain – Priority

Channel Invert Repair
*Status:* Proposed
*Completion Date:* 5-year plan
*Total Cost:* 11.4 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure
*Hazard Mitigated:* Downstream flooding

#### B.7.1.2 1-114 Carbon Canyon Channel – Priority

Channel improvement
*Status:* Proposed
*Completion Date:* 10-year plan
*Total Cost:* 15 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure
*Hazard Mitigated:* Downstream flooding

#### B.7.1.3 1-701 Etiwanda Channel Invert Repair – Priority

Channel Invert Repair
*Status:* Proposed
*Completion Date:* 5-year plan
*Total Cost:* 1.1 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure
*Hazard Mitigated:* Downstream flooding

#### B.7.1.4 1-806 Hawker Crawford Channel and Rich Basin – Priority

Channel / Basin improvement
*Status:* Proposed
*Completion Date:* 10-year plan
*Total Cost:* 5 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure by reducing peak Q
*Hazard Mitigated:* Downstream flooding

#### B.7.1.5 1-809 West Fontana Channel (From Banana Basin to Hickory Basin) – Priority

Channel Repair
*Status:* Proposed
*Completion Date:* 5-year plan
*Total Cost:* 8.5 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure
*Hazard Mitigated:* Downstream flooding

#### B.7.1.6 1-910 Grove Basin-Priority

Basin out improvement
*Status:* Proposed
*Completion Date:* 10-year plan
*Total Cost:* 10 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure by reducing peak Q
*Hazard Mitigated:* Downstream flooding

#### B.7.1.7 2-113 Randal Basin outlet improvement – Priority

Outlet improvements D/S of the Basin
*Status:* Proposed
*Completion Date:* On 10-year plan





*Local Priority:* Medium
*Total Cost:* $3.1 million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* Public Safety
*Hazard Mitigated:* Potential failure & flooding downstream
*Resources to Implement:* Medium
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.8 2-308 Cable Creek Channel – Priority

Channel improvements
*Status:* Proposed
*Completion Date:* On 10-year plan
*Local Priority:* Low
*Total Cost:* $27 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Compliance with FEMA Levee Certification program
*Hazard Mitigated:* Reduction of floodplain; reduction of potential for major flooding
*Resources to Implement:* High
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.9 F01272 Rialto Channel, Etiwanda Avenue to Willow Avenue – Priority

Construct Rialto channel to ultimate condition
Status: Proposed
Completion Date: On 10-year plan
Local Priority: Low
Total Cost: $31.6 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Rialto
Project Selected for: Public Safety & convenience Hazard Mitigated: Residential area flooding and road closures due to wash-outs
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.1.10 F01336 Amethyst Detention Basin – Priority

Construct a detention basin at Amethyst and Sycamore
*Status: Design completed, Permits* In process
*Completion Date:* Estimated 2017/2018
*Local Priority:* High
*Total Cost:* $12.8 million
*Funding Description:* San Bernardino County Flood Control Property Taxes, City of Victorville
*Project Selected for:* Public Safety; protection of local and downstream infrastructure by reducing peak Q
*Hazard Mitigated:* downstream flooding

*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.11 F01389-2 Mojave River Phase II – Priority

Construct earthen levee lined with 1/2 ton rock slope protection between Oro Grande Wash and Mojave River Phase I
*Status:* Proposed
*Completion Date:* On 10-year plan
*Local Priority:* Low
*Total Cost:* $2.7million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* To finalize levee improvement construction; protection of Amtrak station
*Hazard Mitigated:* Local flooding, railroad flooding
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.12 F01417 Bandicoot Detention Basin (Phase I&II) – Priority

Construction of detention basin, inlet/outlet facilities, fencing to attenuate 10-year storm flows adjacent to California Aqueduct and downstream residential and commercial properties developments.
*Status:* Proposed
*Completion Date:* On 10-year plan
*Local Priority:* Low
*Total Cost:* $39.5 million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* To protect the State water aqueduct
*Hazard Mitigated:* Flood damage to aqueduct & local area
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.13 F01452-2 West Fontana Channel, Phase I – Priority

Construction of concrete channel from Juniper to Banana Basin
Status: In process
Completion Date: Estimated 2017/2018
Local Priority: Medium
Total Cost: $38.4 million
Funding Description: San Bernardino County Flood Control Taxes, City of Fontana
Project Selected for: Public safety & convenience
Hazard Mitigated: Flooding of railroad & Metrolink tracks; road damage & closure
Resources to Implement: Medium
Cost to Implement: High





Time to Implement: High

#### B.7.1.14 F01473 Rialto Channel – Priority

Construct channel improvements south of Interstate 10
Status: Proposed
Completion Date: On 10-year plan
Local Priority: Medium
Total Cost: $8.1 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Rialto
Project Selected for: Public Safety
Hazard Mitigated: Existing channel is interim and undersized
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.1.15 F01650 Sand Creek/ Warm Creek Channels – Priority

Improve existing confluence of Sand Creek and Warm Creek Channels
*Status:* In process
*Completion Date:* Estimated 2017/2018
*Local Priority:* Medium
*Total Cost:* $5.2 million
*Funding Description:* San Bernardino County Flood Control
*Project Selected for:* channel improvements to interim storm drain system
*Hazard Mitigated:* Potential damage to infrastructure
*Resources to Implement:* High
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.16 F01667 Cactus Basins #4 & 5 – Priority

Construction of detention basins to mitigate downstream flooding of Rialto Channel Work includes inlet/outlet structures
Status: Proposed
Completion Date: 10-year plan
Local Priority: Low
Total Cost: $26.9 million
Funding Description: San Bernardino County Flood Control, City of Rialto
Project Selected for: Ability to reduce downstream peak Q
Hazard Mitigated: flooding of nearby area

#### B.7.1.17 F01911 Elder Gulch – Priority

Construct trapezoidal rock-lined channel
*Status:* Proposed
*Completion Date:* Estimated FY 18/19
*Local Priority:* High

*Total Cost:* $8.7 million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* Public safety
*Hazard Mitigated:* Flooding of local area
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* Medium

#### B.7.1.18 F02129 Wildwood Channel – Priority

Channel improvement
Status: In preliminary design process
Completion Date: On 10-year plan
Local Priority: High
Total Cost: $16.7 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Yucaipa
Project Selected for: History of flooding due to high debris flows
Hazard Mitigated: reduction in size of floodplain; minimized flooding
Resources to Implement: Low
Cost to Implement: High
Time to Implement: Low

#### B.7.1.19 F02228 Plunge Creek Spillway – Priority

Repair of severe damage caused by storms in 2005
*Status:* Proposed
*Completion Date:* On 10-year plan
*Local Priority:* High
*Total Cost:* $3 million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* Necessary repairs due to previous flood damage
*Hazard Mitigated:* Potential failure & flooding downstream
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.20 F02243 Rialto Channel Priority Crossings – Priority

Status: In preliminary design process
Completion Date: On 10-year plan
Local Priority: Low
Total Cost: $2.4 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Rialto





Project Selected for: Public Safety & convenience
Hazard Mitigated: Elimination of flooding at intersections
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

### B.7.2 Projects with Mitigation Benefits

Table B-7 is a list of the proposed projects to mitigate the Flood hazard within the County Unincorporated Area.

**Table B-7: In Progress Flood Control Mitigation Projects**

| Project No | Completion Date | Total Cost | Total Funding | Status |
|---|---|---|---|---|
| F01312 | 2017/2018 | 4,400,000 | 2,200,000 | Under Construction |
| F01666 | 2017/2018 | 17,800,000 | 17,800,000 | Under Construction |
| F02094 | 2017 | 4,000,000 | 4,000,000 | Under Construction |
| F02126 | 2017/2018 | 8,300,000 | 6,180,000 | Under Construction |
| | Totals: | 34,500,000 | 30,180,000 | |

#### B.7.2.1 F01312 English Channel/ Peyton Drive (Under Construction)

*Construct triple RCB and channel upstream and downstream of Peyton Drive.*
*Status: In preliminary design process*
*Completion Date: Estimated 2017/2018*
*Local Priority: High*
*Total Cost: $4.4 million*
*Funding Description: San Bernardino County Flood Control Property Taxes, 50% and City of Chino Hills 50%*
*Project Selected for: Public safety & convenience*
*Hazard Mitigated: Flooding of roads in residential area*
*Resources to Implement: High*
*Cost to Implement: High*
*Time to Implement: Medium*

#### B.7.2.2 F01666 Cactus Basin #3/ Expansion of Basin #3 – (Under Construction)

*Status:* In process
*Completion Date:* Estimated 2017/2018
*Local Priority:* High
*Total Cost:* $17.8 million
*Funding Description:* San Bernardino County Flood Control Property Taxes, City of Rialto

*Project Selected for:* Public safety & improved future development; protection of water filtration plant across the street; reduction of peak Q downstream.
*Hazard Mitigated:* Flooding of immediate area and downstream along Rialto Channel
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* Medium

#### B.7.2.3 F02094 Cucamonga Basin #6, Phase II – (Under Construction)

Landscaping improvements
Status: Partial Completed
Completion Date: Mid-2011 – (Landscaping Phase Completion date end of 2017)
Local Priority: High
Total Cost: $4.0 million
Funding Description: San Bernardino County Flood Control Tax Revenues
Project Selected for: Environmental compliance & aesthetics
Hazard Mitigated:
Resources to Implement: Low
Cost to Implement: High
Time to Implement: Low

#### B.7.2.4 F02126 Francis Street Storm Drain (Under Construction)

*Construct ultimate storm drain improvements from Sultana Avenue east to beyond Grove Avenue*
*Status: In preliminary design process*
*Completion Date: Estimated 2017/2018*
*Local Priority: Low*
*Total Cost: $8.3 million*
*Funding Description: San Bernardino County Flood Control Property Taxes 75% and City of Ontario 25%*
*Project Selected for: Public safety & convenience*
*Hazard Mitigated: Existing storm drain is undersized/interim; local flooding*
*Resources to Implement: Medium*

### B.7.3 Future Year Projects

**Table B-8: Future Year Projects**

| Project Number/Name | Completion Date | Total Cost | Status |
|---|---|---|---|
| 2-509 Little Sand Creek | 10 Year Plan | $10,500,000 | Future |
| 3-501 Mission Channel | 10 Year Plan | $28,800,000 | Future |
| 3-601 Wilson Creek (10th St-I-10) | 10 Year Plan | $38,800,000 | Future |
| CSDP Drain Project | 10 Year Plan | $18,500,000 | Future |
| Extension of VV Line E-01 | 10 Year Plan | $2,000,000 | Future |
| F01284 | 10 Year Plan | $7,200,000 | Future |
| F01582 | 10 Year Plan | $19,000,000 | Future |
| F01584 | 2018/2019 | $11,700,000 | Future |
| F01609 | 10 Year Plan | $32,500,000 | Future |





| Project Number/Name | Completion Date | Total Cost | Status |
|---|---|---|---|
| F02225 | 10 Year Plan | $33,100,000 | Future |
| F02475 | 10 Year Plan | $9,000,000 | Future |
| F02476 | 10 Year Plan | $32,300,000 | Future |
| H1458 | 2021 | $3,000,000 | Future |
| Institution Road | 2021 | $30,000,000 | Future |
| Line C-01 Hesperia | 10 Year Plan | $5,300,000 | Future |
| Line D-01 Hesperia | 10 Year Plan | $32,500,000 | Future |
| Line E-01 Apple Valley | 10 Year Plan | $36,300,000 | Future |
| Lone Pine Canyon Road Culvert | TBD | $25,000,000 | Future |
| National Trails Hwy Bridge | TBD | $40,000,000 | Future |
| Old Waterman Canyon Rd Culvert | TBD | $2,500,000 | Future |
| Pine View Dr. Storm Drain | TBD | $6,000,000 | Future |
| Piute Wash | 2021 | $34,500,000 | Future |
| Rimforest Drainage Project | 10 Year Plan | $6,900,000 | Future |
| Rock Springs Rd Bridge Replacement | TBD | $32,876,000 | Future |
| Tussing Ranch-Juniper Basin | 10 Year Plan | $6,500,000 | Future |
| Yermo Rd/National Trails Hwy Bridge | TBD | $40,000,000 | Future |
| | Totals: | $544,776,000 | |

#### B.7.3.1 2-509 Little Sand Creek

Creek improvements between Date Street and Del Lemon basin
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $10.5 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety; residential area with school nearby
Hazard Mitigated: Flooding and pedestrian hazards
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.3.2 3-501 Mission Channel

Channel Repair, Construct concrete channel improvements
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $28.8 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety; residential area with school nearby
Hazard Mitigated: Flooding and pedestrian hazards
Resources to Implement: Medium

Cost to Implement: High
Time to Implement: High

#### B.7.3.3 3-601 Wilson Creek (from 10st Street to I-10)

Channel Repair, between 10st Street to I-10
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $38.8 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety; residential area with school nearby
Hazard Mitigated: Flooding and pedestrian hazards
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.3.4 CSDP -- Storm Drain Project – Colton

Construction of storm drains from Randall Basin to the Santa Ana River according to Comprehensive Storm Drain Plan (CSDP) 3-5 and 3-8
Status: Proposed
Completion Date: On 10-year plan
Local Priority: Medium
Total Cost: $18.5 million
Funding Description: San Bernardino County Flood Control Property Taxes
Hazard Mitigated: Existing channel is interim and undersized
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.3.5 Extension of Victorville Line E-01

Construct Storm Drain line E-01
Status: In preliminary design process
Completion Date: On 10-year plan
Local Priority: High
Total Cost: $2.0 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Victorville
Project Selected for: Public safety of commercial area
Hazard Mitigated: local flooding; road closure/road damage (State Hwy)
Resources to Implement: High
Cost to Implement: High
Time to Implement: Low





#### B.7.3.6 F01284 Donnell Basin (Phase I&II)

Construct detention basin.
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $7.2 million
Funding Description: San Bernardino County Flood Control Property Taxes
Project Selected for: Public Safety; roadway protection; Safe Routes to School Program (SR2S)
Hazard Mitigated: Flood protection for homes, infrastructure, and pedestrians
Resources to Implement: Low

#### B.7.3.7 F01582 Desert Knolls II

Construct flood control channel from Apple Valley Road to Tuscola Road
Status: Proposed
Completion Date: On 10-year plan
Local Priority: High
Total Cost: $19 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety/future development
Hazard Mitigated: Potential localized flooding due to increased development
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.3.8 F01584 Desert Knolls

Construct channel improvements from the Mojave River to Phase I
Strategy: Construct concrete lined channel to provide for 100 year storm flows and debris flows.
Status: Proposed
Completion Date: Estimated FY 18/19
Local Priority: High
Total Cost: $11.7 million
Funding Description: San Bernardino County Flood Control Tax Revenues
Project Selected for: Environmental requirements
Hazard Mitigated: This project is the mitigation aspect of Phase II
Resources to Implement: Low
Cost to Implement: High
Time to Implement: Medium

#### B.7.3.9 F01609 Ranchero Basin

Construct detention basin
Status: Proposed

Completion Date: 10-year plan
Local Priority: High
Total Cost: $32.5 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and reduction of peak Q
Hazard Mitigated: Potential damage to bridges and roads downstream due to high flows
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.3.10 F02225 Del Rosa

Channel Repair, Construct concrete channel improvements between Pacific Street and Del Rosa Avenue
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $33.1 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety; residential area with school nearby
Hazard Mitigated: Flooding and pedestrian hazards
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.3.11 F02475 Seneca Basin

Construct detention basin
Status: Proposed
Completion Date: 10-year plan
Local Priority: High
Total Cost: $9 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and reduction of peak Q
Hazard Mitigated: Potential damage to bridges and roads downstream due to high flows
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.3.12 F02476 Oak Hills Basin

Construct detention basin
Status: Proposed
Completion Date: 10-year plan
Local Priority: High
Total Cost: $32.3 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and reduction of peak Q
Hazard Mitigated: Potential damage to bridges and roads downstream due to high flows
Resources to Implement: Low





Cost to Implement: High
Time to Implement: High

#### B.7.3.13 H1458 Arrowbear Dr. Bridge Replacement

Replacement of bridge crossing on Arrowbear Drive and increase spillway flow capacity to prevent flooding
Status: Proposed
Completion Date: 2021
Total Cost: $3,000,000.00
Funding Description: Major Local Highway Project Funds
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

#### B.7.3.14 Institution Road

Construction of bridge crossing along Institution Road on Cajon Wash
Status: Proposed
Completion Date: 2021
Total Cost: $30,000,000.00
Funding Description: seeking grant funding
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

#### B.7.3.15 Line C-01 Hesperia

Construction of concrete trapezoidal channel improvements, short reach of levee along the channel, 96 inch RCP and reconstruction of the existing deficient reach as a concrete trapezoidal channel with a portion of riprap channel
Status: Proposed
Completion Date: 10-year plan
Total Cost: $5.3 million
Funding Description: San Bernardino County flood Control
Project selected for: Public safety and roadway protection
Hazard Mitigated: Flooded roads and residential area
Resources to implement: High
Cost to implement: High
Time to implement: High

#### B.7.3.16 Line D-01 Hesperia

Improve the storm drain facility.
Status: Proposed
Completion Date: 10-year plan
Total Cost: $32.5 million
Funding Description: San Bernardino County flood Control
Project selected for: Public safety and roadway protection
Hazard Mitigated: Flooded roads and residential area
Resources to implement: High
Cost to implement: High

Time to implement: High

#### B.7.3.17 Line E-01 Apple Valley

Improve the storm drain facility.
Status: Proposed
Completion Date: 10-year plan
Total Cost: $36.3 million
Funding Description: San Bernardino County flood Control
Project selected for: Public safety and roadway protection
Hazard Mitigated: Flooded roads and residential area
Resources to implement: High
Cost to implement: High
Time to implement: High

#### B.7.3.18 Lone Pine Canyon Road Culvert

Construction of Culvert on Long Pine Canyon Road
Status: Proposed
Completion Date: No date until funding is available
Total Cost: $2,500,000.00
Funding Description: TBD
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

#### B.7.3.19 National Trails Highway Bridge Replacement

*Removal of approximately 31 old timber bridges and construction of replacement bridges spanning Under 20' on National Trails Highway*
*Status: Preliminary engineering and environmental study only*
*Completion Date: No date until funding is available*
*Total Cost: $40,000,000.00*
*Funding Description: TBD*
*Project Selected for: Public Safety and convenience*
*Hazard Mitigated: flood damage, road closures and road damage*

#### B.7.3.20 Old Waterman Canyon Road Culvert

Removal of approximately 31 old timber bridges and construction of replacement bridges spanning less than 20' on National Trails Highway
Status: Preliminary engineering and environmental study only
Completion Date: No date until funding is available
Total Cost: $2,500,000.00
Funding Description:
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage





#### B.7.3.21 Pine View Dr. Storm Drain

Construction of storm drain on Pine View Drive
Status: Proposed
Completion Date: Shelf ready but no date until funding is available
Total Cost: $6,000,000.00
Funding Description: TBD
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

#### B.7.3.22 Piute Wash

Construction of bridge crossing along Needles highway road on Piute washes to prevent flooding and washing the road out.
Status: Proposed
Completion Date: 2021
Total Cost: $34,500,000
Funding Description: seeking grant funding
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

#### B.7.3.23 Rimforest Drainage Project – Rimforest Area

Capture the surface water within Rimforest and convey it to Little Bear Creek, away from the escarpment.
Status: In preliminary design process
Completion Date: On 10-year plan
Local Priority: High
Total Cost: $6.9 million
Funding Description: San Bernardino County Flood Control Property Taxes
Project Selected for: Public safety of commercial area
Hazard Mitigated: Public safety and reduction of peak Q
Resources to Implement: High
Cost to Implement: High
Time to Implement: Low

#### B.7.3.24 Rock Springs Road Bridge Replacement

Construct Replacement Bridge on Glen Helen Parkway over Cajon Wash It will increase flow capacity with a longer span and reduce flooding of the roadway.
Status: Proposed
Completion Date: No date until full funding is available
Total Cost: $32,876,000
Funding Description: Partially funded with General Fund Money
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

#### B.7.3.25 Tussing Ranch – Juniper Basin

Construct detention basin
Status: Proposed
Completion Date: 10-year plan
Local Priority: High
Total Cost: $6.5 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and reduction of peak Q
Hazard Mitigated: Potential damage to bridges and roads downstream due to high flows
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.3.26 Yermo Road and National Trails Highway Bridge Replacement

Removal of approximately 11 old timber bridges and construction of replacement bridges spanning under 20' on National Trails Highway and Yermo Road. The military is using high load tractors and trailers warranting the need to increase the load capacity of the bridges.
Status: Preliminary engineering and environmental study only
Completion Date: No date until funding is available
Total Cost: $40,000,000.00
Funding Description: TBD
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage





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# Annex C. Special Districts Department

## C.1 Introduction

Special Districts Department, under the direction of the San Bernardino County Board of Supervisors, provides administrative oversight and manages the operation of over 100 special districts throughout San Bernardino County. Through the formation of County Service Areas (CSAs) and Improvement Zones, these special districts provide a variety of municipal-type services to unincorporated areas of the county.

## C.2 Special Districts Profile

***Special District Functions:***
The County Service Areas (CSAs) and Improvement Zones can provide one or all of the following services to meet the individual needs of communities, neighborhoods and new developments depending on needs and financial feasibility:

- Cemetery
- Dam Operation
- Detention Basin
- Engineering and Construction
- Landscaping
- Open Spaces
- Park and Recreation
- Public Financing
- Refuse
- Roads
- Streetlights
- Television Translator
- Water and Sanitation

***Mission:***
The Special Districts Department works to ensure safe, healthy, and enjoyable communities by providing customizable programs and municipal services for those who work, play and stay in San Bernardino County.

***Vision:***
To be recognized as the preeminent provider of customized municipal services focusing on improved quality of life for the residents and visitors of San Bernardino County.





## C.3 Planning Process

As described above, the County Flood Control District followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the San Bernardino County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table C-9. Additional details on plan participation and District representatives are included in Appendix A.

**Table C-9: Special District Hazard Mitigation Planning Team**

| Name | Title |
|---|---|
| Jeffrey Rigney | Director of Special Districts |
| Steve Samaras | Water and Sanitation Division Manager |
| Tim Millington | Engineering Division Manager, |
| Reese Troublefield | Operations Division Manager |
| Erin Opliger | Districts Services Coordinator |

The Special Districts Department has attending the following planning meetings:

| Meeting Date | Meeting Type | Attendees | Additional Details |
|---|---|---|---|
| 6/23/16 | LHMP Update - Kickoff Meeting | Steve Samaras, Erin Opliger | |
| 8/30/16 | LHMP Group Meeting | Erin Opliger | |
| 10/26/16 | LHMP Blue Jeans Meeting | Erin Opliger | |

The County of San Bernardino Special Districts Department (Department) has historically identified goals, objectives, and projects to mitigate the negative effects of hazards. The Department continues to work with various Advisory Commissions and the public to identify and mitigate the impacts of hazards to the various services that the Department provides, including: cemetery operations, dam operations, detention basin operations, landscaping services, open space, parks and recreation, refuse services, roads, streetlights, television translator, water distribution and treatment system operations, sewer collection system operations, and wastewater treatment plant operations.

The Department diligently identifies the hazards that each service district or County Service Area (CSA) and its zones face, and has assessed the vulnerability according to the potential event. Hazards, whether they are technological or natural, affect CSAs with varying frequency and can cause injury, impose monetary losses, and the disruption of services, affecting the Department's mission as a public agency service provider. Losses can be substantially reduced or eliminated through comprehensive pre- disaster planning and mitigation actions.

Many groups and individuals have contributed to the Department's planning for Disasters and the necessary hazard mitigation efforts. Advisory Committees, located in the Department's various CSAs, provide on-going input and support for the various aspects of hazard mitigation, including identifying persistent hazards that develop after storm events and options for mitigation.

Department staff participates in the hazard mitigation process by completing semi-annual audits of various CSAs, recommending temporary fixes and/or permanent solutions. CSA customers and the public have also participated in hazard mitigation planning by approaching staff in the field, contacting the office, and/or attending public meetings to identify temporary and ongoing hazards that need to be addressed. These resources have proved valuable to the Department in identifying and mitigating potential hazards. The Department also uses the following process to prepare hazard mitigation plans:

- Identify and prioritize disaster events that are most probable and destructive;
- Identify critical facilities;
- Identify areas within communities that are most vulnerable;
- Develop goals and objectives for reducing the effects of a disaster event;
- Develop specific projects to be implemented for each goal;
- Identify funding sources;
- Develop procedures for monitoring progress;
- Mitigate identified potential hazards.

The Department has identified areas for mitigation projects within the Special Districts of San Bernardino County as a result of their internal planning processes. These projects, shown below, are organized by type of special district these proposed projects are in the conceptual stage and detailed planning will be done in the future as funding becomes available. Prioritization of projects will be done in the planning stages, based on the risk prioritizations developed for the current Multi-Jurisdictional Hazard Mitigation Plan.

## C.4 Hazard Identification and Prioritization

The Special Districts Planning Team participated in the County hazard identification and prioritization process described in the base plan. The Special Districts Planning Team assisted to summarize the extent, probability of future occurrences, potential magnitude/severity, and significance specific to the Special Districts (See Section 4).

## C.5 Coordination with County Planning Efforts

Coordination with other County planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the Special Districts integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2011 MJHMP through other plans and programs shown below.





### C.5.1 3.2 Water Systems (Distribution Systems):

**Fire:**

- Rockscape or paved property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks.
- Re-roof buildings and structures with tile, metal or fire resistant material.

**Flood:**

- Add drainage, elevate facilities and adjust sloping for facilities in low-lying areas and in natural waterways or floodplains. (Recent Completion)
- Conduct hydrologic and hydraulic studies for all facilities located near flood plains/natural waterways.
- Encase water pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods.

**Earthquake:**

- Retrofit structures to higher seismic standards.
- Purchase portable containers (Conex containers) to stage emergency supplies and equipment for the first responders (i.e. water, food, small off road vehicles, fuel, cots, toiletries, communication devices, blankets, wet weather gear, etc.) at strategic water system locations throughout County of San Bernardino. Conex containers can be relocated if necessary to assist field staff during a disaster to maintain the operations of water systems. (Recent Completion and in implementation phase)

**General Hazard (Fire/Flood/Earthquake):**

- Retrofit existing buildings and facilities with connectors/ATS for emergency generators and/or install permanent emergency generators at critical facilities, including wells and booster station locations.
- Develop a plan for speeding the repair of and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies.
- Develop a plan for areas subject to high ground shaking, earthquake-induced ground failure, and surface fault rupture to determine a replacement schedule for pipelines (along with importance, age, type of construction material, size, condition, and maintenance or repair history).(Project now in effect)
- Develop a plan for short-term and intermediate-term sheltering of employees.
- Develop a plan to work with local agencies that handle hazardous materials to coordinate mitigation efforts for the possible release of these materials due to a natural disaster such as an earthquake, flood, fire, or landslide.

- Utilization of SCADA and Smart Water Meters to get real time data on problems with the system and reduce drive time emissions as a result of traditional meter reading.
- Provide emergency supplies of food, water, and portable generators for employees at office and field locations.
- Install emergency generators at district facilities

### C.5.2 3.3 Sewer Systems (Collection Systems):

**Fire:**

- Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks.(Completion and program implementation by January 2017 estimated)
- Re-roof buildings and structures with tile or fire resistant material.

**Flood:**

- Add drainage, elevate facilities and adjust sloping for facilities in low-lying areas and in natural waterways or floodplains.
- Encase sewer pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods.

**Earthquake:**

- Develop a plan for short-term and intermediate-term sheltering of employees.
- Retrofit structures to higher seismic standards.

**General Hazard (Fire/Flood/Earthquake):**

- Retrofit existing buildings and facilities with connectors/ATS for emergency generators and/or install permanent emergency generators.

- Develop a plan for speeding the repair and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies.
- Develop a plan for areas subject to high ground shaking, earthquake-induced ground failure, and surface fault rupture to determine a replacement schedule for pipelines (along with importance, age, type of construction material, size, condition, and maintenance or repair history).
- Install emergency power generators at district facilities.





### C.5.3 3.4 Wastewater Treatment Plant

**Fire:**

- Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks.
- Purchase and store water pumps capable of suppressing fire.

**Flood**

- Add drainage, elevate facilities and adjust sloping for facilities in low-lying areas and in natural waterways or floodplains.

**Earthquake**:

- Develop a plan for short-term and intermediate-term sheltering of employees.

### C.5.4 3.5 Roads

**Fire:**

- Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment.
- Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.(completed with continuous fresh of supplies and rotation)
- Clear vegetation from Road District facilities/yards

**Flood:**

- Upgrade culverts in all flood prone areas. Most existing culvert sizes were never designed for high water volume. Upgrading will prevent roadway washouts caused by water bypassing existing culverts.(Complete and continuous maintenance)
- Upgrade culvert sizes in Main Channels and replace old culverts in Main Channels as required.(complete and continuous maintenance)
- Slope stabilization at water crossing areas along roadways. This will prevent the loss of the roadways at these areas by preventing undermining by the water.
- Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment.
- Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.
- Soil stabilization on roadway shoulders. This will prevent erosion caused by flood conditions.

- Soil stabilization of dirt roadways. This will help mitigate the loss of material from the roadway during flooding conditions.
- Employ on call contractors to assist in emergency situations.

**Earthquake:**
Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment.
Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal. (Completed and refresh of supplies as needed)

### C.5.5 3.6 Television Translator Districts

**General Hazard (Fire, Flooding, Earthquake):**

- Install and maintain emergency generators at all TV Translator sites. Newberry Springs, Lucerne Valley, and Morongo Valley TV Transmitter sites are in need emergency generators. Pinto and Elephant Mountain sites have existing generators. Installing emergency generators at these sites will enable emergency information to be disseminated to the residents living in these remote locations.(Complete and maintenance of upgrades)
- Establish a centralized communications network to monitor channel output for TV Districts and provide emergency information by way of character generator tied to channel transmissions.
- Conduct annual tower and guide wire inspections to mitigate storm/wind/earthquake hazards from knocking out communications.
- Install poly insulators on power poles with high voltage power lines for Pinto Mountain. Establish an open purchase order for a High Voltage Electrician to provide annual inspections of power poles and service lines.(Completed and continuous maintenance )
- Maintain roadways on mountaintops and within washes leading to remote tower sites. Earthquakes and flash floods can block roadways, making them impassable to restore emergency communications.
- Maintain lights on all tower locations.

### C.5.6 3.7 Parks Districts

- Trim large trees in parks to avert limb breakage and toppling during storm events.
- Establish emergency centers to ration drinking water at various County Park Community Centers.
- Establish community garden plots in designated County Park areas as an ongoing and emergency food source, including planting fruit bearing trees.
- Conduct an inventory or list of County Park Facilities and Community Centers to establish a list of pre-designated emergency operations or disaster relief sites. Not all Community





Centers are an appropriate size to accommodate large numbers of evacuees and may only serve as command and control centers or distribution centers.
- Establish small solar energy fields or other forms of renewable power at County Community Centers to facilitate stand-alone emergency operations for the community.
- Conduct repair and replacement of old roofs, and clearing of gutters and roof drains to minimize potential damage from major storm events.(Completed and continuous maintenance)
- Conduct an evaluation or study of County Park and Community Center facilities to install curbs, retaining walls, and drains to carry or divert water away from buildings.
- Connect water systems to generators to ensure delivery even in disaster situations.
- Provide emergency supply of food and water for employees in disaster situations.

## C.6 Special Districts Mitigation Project Prioritizing

Cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural projects, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. While detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

Based upon the Special Districts capabilities, Table C-10 shows primary actions selected for further implementation and development during the next planning cycle. Table C-10 provides details for each mitigation action with mitigation action descriptions, FEMA mitigation category, responsible party, and timeframe.

## C.7 Special Districts Mitigation Actions

Table C-10: Mitigation Project Prioritization and Implementation

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| All-Hazard | **AH Action 2.1:** Continue funding and support for Special Districts Projects relating to all hazards. | Continue funding and support for Special Districts Projects relating to water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District for all hazards. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| All-Hazard | **AH Action 2.2:** Install Generators at Critical Facilities | Retrofit existing buildings and facilities with connectors/ ATS for emergency generators and/or install permanent emergency generators at critical facilities, including wells and booster station locations. | ES, SP | TBD | Water Systems | TBD | Critical sites are already set up for connection or has a permanently installed generator |
| All-Hazard | **AH Action 2.3:** Water Systems Repair Plan | Develop a plan for speeding the repair of and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies. | PRV | SDD WAS | Water Systems | TBD | We have a warehouse and inventory. Add'l inventory would need to be purchased from local wholesaler |
| All-Hazard | **AH Action 2.4:** Smart Water Meters and SCADA | Utilization of SCADA and Smart Water Meters to get real time data on problems with the system and reduce drive time emissions as a result of traditional meter reading. | PRV | Individual CSAs | Water Systems | Ongoing | Both SCADA and Smart Meters have been installed and continue to be installed |
| All-Hazard | **AH Action 2.5:** Provide Employees with Emergency Supplies | Provide emergency supplies of food, water, and portable generators for employees at office and field locations. | ES | SDD/WAS | Water Systems | Ongoing | WAS has a stock of emergency food supplies, water, and generators. |
| All-Hazard | **AH Action 2.6:** Annual Tower and Guide Wire Inspections | Conduct annual tower and guide wire inspections to mitigate storm/wind/earthquake hazards from knocking out communications. | PRV | TBD | TV Districts | 7/1/2016-7/1/2017 | All Districts |
| All-Hazard | **AH Action 2.7**: Maintain Tower Lighting | Maintain lights on all tower locations. | SP | TBD | TV Districts | June-17 | |
| All-Hazard | **AH Action 2.8:** Designate Emergency Operations Sites | Conduct an inventory or list of County Park Facilities and Community Centers to establish a list of pre-designated emergency operations or disaster relief sites. Not all Community Centers are an appropriate size to accommodate large numbers of evacuees and may only serve as command and control centers or distribution centers. | PRV | TBD | Park Districts | April-17 | All Districts |
| All-Hazard | **AH Action 2.9:** Establish Power Sources for Emergency Operations Sites | Establish small solar energy fields or other forms of renewable power at County Community Centers to facilitate stand-alone emergency operations for the community. | PRV, SP | TBD | Park Districts | 12/1/2016-7/1/2018 | Lucerne Valley Joshua Tree |
| All-Hazard | **AH Action 2.10:** Connect Water Systems to Generators | Connect water systems to generators to ensure delivery even in disaster situations. | PRV, SP | TBD | Park Districts | TBD | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| All-Hazard | **AH Action 2.11:** Establish a Centralized Communications Network | Establish a centralized communications network to monitor channel output for TV Districts and provide emergency information by way of character generator tied to channel transmissions. | PRV | TBD | TV Districts | 7/1/2017-12/1/2017 | All districts |
| Wildfire | **WF Action 3.3:** Vegetation Removal | Clear vegetation from Road District facilities/yards | PRV | TBD | Roads | TBD | |
| Wildfire | **WF Action 6.3:** Protect Property in Wilderness Areas | Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks. | PPRO, PRV, SP | TBD | Sewer Systems | January-17 | All sewer pump stations have paving |
| Wildfire | **WF Action 8.3:** Structural Fire Breaks Widening | Double the width of external fire breaks on grounds which have structures located in wilderness and or areas prone to wildfires. | SP, PRV | Individual CSAs | Water Systems | 7/1/2017-7/19/2019 | |
| Wildfire | **WF Action 9.1:** Continue funding and support for Special Districts Projects relating to wildfire. | Continue funding and support for Special Districts Projects relating to wildfire in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| Wildfire | **WF Action 9.2:** Emergency Water Supplies | Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.(completed with continuous fresh of supplies and rotation) | ES | TBD | Roads | TBD | |
| Earthquake | **EQ Action 2.2:** Seismic Strapping | Seismic strapping for existing water tanks and future construction. | SP, PRV | CSA 64 | Water Systems | 7/17/2017- 7/1/2019 | Ongoing currently |
| Earthquake | **EQ Action 2.3:** Employee Emergency Sheltering | Develop a plan for short-term and intermediate-term sheltering of employees. | PRV | WAS | Sewer Systems | 7/17/2017-7/19/2019 | To purchase cots, small portable generators, tents, etc. |
| Earthquake | **EQ Action 4.2:** Generator Installation | Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment. | SP, PPRO | TBD | Roads | TBD | |
| Earthquake | **EQ Action 6.1:** Continue funding and support for Special Districts Projects relating to earthquake hazards. | Continue funding and support for Special Districts Projects relating to earthquake hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| Flood | **FL Action 3.4:** Soil Stabilization on Roadways and Along Roadway Shoulders | Soil stabilization on roadway shoulders and dirt roads. This will prevent erosion caused by flood conditions. | SP, PRV | TBD | Roads | TBD | |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Flood** | **FL Action 3.5:** Encasing Pipelines | Encase water pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods. | SP, PRV | CSA 70 J | Water Systems | 7/17/2017-7/1/2027 | |
| **Flood** | **FL Action 6.1:** Continue funding and support for Special Districts Projects relating to flood hazards. | Continue funding and support for Special Districts Projects relating to flood hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **Flood** | **FL Action 6.2:** On Call Contractors | Employ on call contractors to assist in emergency situations. | PRV, ES | TBD | Roads | TBD | |
| **Drought** | **DR Action 3.1:** Continue funding and support for Special Districts Projects relating to drought hazards. | Continue funding and support for Special Districts Projects relating to drought hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **Anti-Terrorism** | **AT Action 2.1:** Continue funding and support for Special Districts Projects relating to terrorism hazards. | Continue funding and support for Special Districts Projects relating to terrorism hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **Climate Change** | **CC Action 3.1:** Continue funding and support for Special Districts Projects relating to climate change hazards. | Continue funding and support for Special Districts Projects relating to climate change hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |



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# APPENDIX F

# RESOLUTIONS ADOPTING 2020 UWMP, 2020 WSCP AND 2015 UWMP ADDENDUM

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RESOLUTION 2021-06-01

RESOLUTION OF THE WATER FACILITIES AUTHORITY
ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN

WHEREAS, The California Urban Water Management Planning Act, (Wat. Code § 10610, et seq. (the Act)), mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare, and adopt an Urban Water Management Plan (Plan); and

WHEREAS, the Act generally requires that said Plan be updated and adopted at least once every five years on or before July 1, in years ending in six and one; and

WHEREAS, pursuant to recent amendments to the Act, urban water suppliers are required to update and electronically submit their 2020 Plans to the California Department of Water Resources (DWR) by July 1, 2021; and

WHEREAS, pursuant to Water Conservation Act of 2009, also referred to as SB X7-7 (Wat. Code § 10608 et seq.), an "urban retail water supplier" is defined as a water supplier that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre feet of potable water annually at retail for municipal purposes, and an "urban wholesale water supplier" is defined as a water supplier that provides more than 3,000 acre feet of water annually at wholesale for potable municipal purposes; and

WHEREAS, Water Facilities Authority meets the definition of an urban retail water supplier for purposes of the Act and SB X7-7; and

WHEREAS, Water Facilities Authority has prepared a 2020 Plan in accordance with the Act and SB X7-7, and in accordance with applicable legal requirements, has undertaken certain coordination, notice, public involvement, public comment, and other procedures in relation to its 2020 Plan; and

WHEREAS, in accordance with the Act and SB X7-7, Water Facilities Authority has prepared its 2020 Plan with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its 2020 Plan, and has also utilized DWR's Urban Water Management Plan Guidebook 2020, including its related appendices, in preparing its 2020 Plan; and

WHEREAS, in accordance with applicable law, including Water Code sections 10608.26 and 10642, and Government Code section 6066, a Notice of a Public Hearing regarding Water Facilities Authority's 2020 Plan was published within the jurisdiction of Water Facilities Authority on June 3, 2021 and June 10, 2021; and

WHEREAS, in accordance with applicable law, including but not limited to Water Code sections 10608.26 and 10642, a public hearing was held on June 17, 2021 at 7:30 AM, or soon thereafter, via Zoom web conference and teleconference in order to provide members of the

public and other interested entities with the opportunity to be heard in connection with proposed adoption of the 2020 Plan and issues related thereto; and

WHEREAS, pursuant to said public hearing on Water Facilities Authority's 2020 Plan, Water Facilities Authority, among other things, encouraged the active involvement of diverse social, cultural, and economic members of the community within Water Facilities Authority's service area with regard to the 2020 Plan and encouraged community input regarding Water Facilities Authority's 2020 Plan; and

WHEREAS, the Board of Directors has reviewed and considered the purposes and requirements of the Act and SB X7-7, the contents of the 2020 Plan, and the documentation contained in the administrative record in support of the 2020 Plan, and has determined that the factual analyses and conclusions set forth in the 2020 Plan are legally sufficient; and

WHEREAS, the Board of Directors desires to adopt the 2020 Plan prior to July 1, 2021 in order to comply with the Act and SB X7-7; and

WHEREAS, Section 10652 of the California Water Code provides that the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) (CEQA) does not apply to the preparation and adoption of the 2020 Plan pursuant to this part.

NOW THEREFORE BE IT RESOLVED, the Board of Directors of the Water Facilities Authority hereby resolves as follows:

1. The Water Facilities Authority's 2020 Plan is hereby adopted as amended by changes incorporated by the Board of Directors as a result of input received (if any) at the public hearing.

2. The General Manager is hereby authorized and directed to include a copy of this Resolution in Water Facilities Authority's 2020 Plan.

3. The General Manager is hereby authorized and directed, in accordance with Water Code sections 10621(d) and 10644(a)(1)-(2), to electronically submit a copy of the 2020 Plan to the DWR no later than July 1, 2021.

4. The General Manager is hereby authorized and directed, in accordance with Water Code section 10644(a), to submit a copy of the 2020 Plan to the California State Library, and any city of county within which Water Facilities Authority provides water supplies no later than thirty (30) days after this adoption date.

5. The General Manager is hereby authorized and directed, in accordance with Water Code section 10645, to make the 2020 Plan available for public review at the Water Facilities Authority's offices during normal business hours or on the Water Facilities Authority's website no later than thirty (30) days after filing a copy of the Plan with DWR.

6. The General Manager is hereby authorized and directed, in accordance with Water Code Section 10635(c), to provide that portion of the 2020 Plan prepared pursuant to Water Code Section 10635(a)-(b) to any city or county within which Water Facilities Authority

provides water supplies no later than sixty (60) days after submitting a copy of the Plan with DWR.

7. The General Manager is hereby authorized and directed to implement the 2020 Plan in accordance with the Act and SB X7-7 and to provide recommendations to the Board of Directors regarding the necessary budgets, procedures, rules, regulations, or further actions to carry out the effective and equitable implementation of the 2020 Plan.

8. Board of Directors finds and determines that this resolution is not subject to CEQA pursuant to Water Code Section 10652 because CEQA does not apply to the preparation and adoption, including addenda thereto, of an urban water management plan or to the implementation of the actions taken pursuant to such plans. Because this resolution comprises Board of Director's adoption of the 2020 Plan and involves its implementation, no CEQA review is required.

9. Pursuant to CEQA, the Board of Directors directs staff to file a Notice of Exemption with the Clerk's office of San Bernardino County within five (5) working days of adoption of this resolution.

10. The document and materials that constitute the record of proceedings on which this resolution and the above findings have been based are located at Water Facilities Authority's main office. The custodian for these records is the Office Manager.

**APPROVED AND ADOPTED** at a regular meeting of the Governing Board of Water Facilities Authority held on the 17th day of June, 2021, by the following vote, to wit:

| | |
|---|---|
| Ayes: | Dorst-Porada, Milhiser, Rogers, Ulloa, Velto |
| Nays: | None |
| Absent: | None |
| Abstain: | None |

Peter Rogers, Chairman

**ATTEST:**

Debra Dorst-Porada, Board Secretary

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RESOLUTION 2021-06-02

RESOLUTION OF THE WATER FACILITIES AUTHORITY
ADOPTING A WATER SHORTAGE CONTINGENCY PLAN (WSCP)

WHEREAS, The California Urban Water Management Planning Act, (Wat. Code §10610, et seq. (the Act)), mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare and adopt, in accordance with prescribed requirements, a Water Shortage Contingency Plan (WSCP) as part of its Urban Water Management Plan (Plan); and

WHEREAS, the Act specifies the requirements and procedures for adopting such WSCPs; and

WHEREAS, pursuant to recent amendments to the Act, urban water suppliers are required to adopt and electronically submit their WSCPs to the California Department of Water Resources (DWR) by July 1, 2021; and

WHEREAS, pursuant to the Act, "urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers; and

WHEREAS, Water Facilities Authority meets the definition of an urban water supplier for purposes of the Act and is required to prepare and adopt and WSCP as part of its 2020 Plan; and

WHEREAS, Water Facilities Authority has prepared a WSCP in accordance with the Act, and in accordance with applicable legal requirements, has undertaken certain coordination, notice, public involvement, public comment, and other procedures in relation to its WSCP; and

WHEREAS, in accordance with the Act, Water Facilities Authority has prepared its WSCP with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its WSCP, and has also utilized DWR's Urban Water Management Plan Guidebook 2020, including its related appendices, in preparing its WSCP; and

WHEREAS, in accordance with applicable law, including Water Code section 10642, and Government Code section 6066, a Notice of a Public Hearing regarding Water Facilities Authority's WSCP was published within the jurisdiction of Water Facilities Authority on June 3, 2021 and June 10, 2021; and

WHEREAS, in accordance with applicable law, including but not limited to Water Code section 10642, a public hearing was held on June 17, 2021 at 7:30 AM, or soon thereafter, via zoom web conference and teleconference in order to provide members of the public and other

interested entities with the opportunity to be heard in connection with proposed adoption of the WSCP and issues related thereto; and

WHEREAS, pursuant to said public hearing on Water Facilities Authority's WSCP, Water Facilities Authority, among other things, encouraged the active involvement of diverse social, cultural, and economic members of the community within Water Facilities Authority's service area with regard to the WSCP, and encouraged community input regarding Water Facilities Authority's WSCP; and

WHEREAS, the Board of Directors has reviewed and considered the purposes and requirements of the Act, the contents of the WSCP, and the documentation contained in the administrative record in support of the WSCP, and has determined that the factual analyses and conclusions set forth in the WSCP are legally sufficient; and

WHEREAS, the Board of Directors desires to adopt the WSCP and to incorporate it as part of its 2020 Plan prior to July 1, 2021 in order to comply with the Act.

WHEREAS, Section 10652 of the California Water Code provides that the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) (CEQA) does not apply to the preparation and adoption of a WSCP as part of Plan pursuant to California Water Code section 10632.

NOW THEREFORE BE IT RESOLVED, the Board of Directors of the Water Facilities Authority hereby resolves as follows:

1. The Water Shortage Contingency Plan (WSCP) is hereby adopted as amended by changes incorporated by the Board of Directors as a result of input received (if any) at the public hearing and shall be incorporated into Water Facilities Authority's 2020 Plan;

2. The General Manager is hereby authorized and directed to include a copy of this Resolution in Water Facilities Authority's WSCP and/or in Water Facilities Authority's 2020 Plan;

3. The General Manager is hereby authorized and directed, in accordance with Water Code sections 10621(d) and 10644(a)(1)-(2), to electronically submit a copy of the WSCP, as part of its 2020 Plan, to DWR no later than July 1, 2021;

4. The General Manager is hereby authorized and directed, in accordance with Water Code section 10644(a), to submit a copy of the WSCP, as part of its 2020 Plan, to the California State Library, and to any city or county within which Water Facilities Authority provides water supplies no later than thirty (30) days after this adoption date;

5. The General Manager is hereby authorized and directed, in accordance with Water Code section 10645, to make the WSCP available for public review at Water Facilities Authority's offices during normal business hours and on its website at www.wfajpa.org no later than thirty (30) days after filing a copy of the WSCP, as part of its 2020 Plan, with DWR;

6. The General Manager is hereby authorized and directed to implement the WSCP in accordance with the Act and to provide recommendations to the Board of Directors regarding the necessary budgets, procedures, rules, regulations, or further actions to carry out the effective and equitable implementation of the WSCP.

7. Board of Directors finds and determines that this resolution is not subject to CEQA pursuant to Water Code Section 10652 because CEQA does not apply to the preparation and adoption of a WSCP or to the implementation of the actions taken pursuant to such plans. Because this resolution comprises Board of Director's adoption of its WSCP and involves its implementation, no CEQA review is required.

8. Pursuant to CEQA, the Board of Directors directs staff to file a Notice of Exemption with the clerk's office at County of San Bernardino within five (5) working days of adoption of this resolution.

9. The document and materials that constitute the record of proceedings on which this resolution and the above findings have been based are located at Water Facilities Authority's main office. The custodian for these records is the Office Manager.

**APPROVED AND ADOPTED** at a regular meeting of the Governing Board of Water Facilities Authority held on the 17th day of June, 2021, by the following vote, to wit:

| | |
|---|---|
| Ayes: | Dorst-Porada, Milhiser, Rogers, Ulloa, Velto |
| Nays: | None |
| Absent: | None |
| Abstain: | None |

Peter Rogers, Chairman

**ATTEST:**

Debra Dorst-Porada, Board Secretary

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RESOLUTION 2021-06-03

RESOLUTION OF THE WATER FACILITIES AUTHORITY
ADOPTING AN ADDENDUM TO THE 2015 URBAN WATER MANAGEMENT PLAN

WHEREAS, The California Urban Water Management Planning Act, (Wat. Code §10610, et seq. (the Act)), mandates that every urban supplier of water providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan (Plan); and

WHEREAS, the Act generally requires that said Plan be updated and adopted at least once every five years on or before July 1, in years ending in six and one; and

WHEREAS, pursuant to the Sacramento-San Joaquin Delta Reform Act of 2009 (Wat. Code § 85000, et seq.), the Delta Plan, and Water Code section 85021, which declares that the State's policy is to "reduce reliance on the Delta in meeting California's future water needs through a statewide strategy of investing in improved regional supplies, conservation, and water use efficiency," urban water suppliers are encouraged by the California Department of Resources (DWR) and the Delta Stewardship Council (DSC) to consider adopting an Addendum to their 2015 Plans to demonstrate consistency with the Delta Plan Policy WR P1 to Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003); and

WHEREAS, Water Facilities Authority meets the definition of an urban retail water supplier for purposes of the Act; and

WHEREAS, Water Facilities Authority has prepared an Addendum to its 2015 Plan in accordance with Delta Plan Policy WR P1, and in accordance with applicable legal requirements, has undertaken certain coordination, notice, public involvement, public comment, and other procedures in relation to its Addendum; and

WHEREAS, in accordance with the Act and Delta Plan Policy WR P1, Water Facilities Authority has prepared its Addendum to the 2015 Plan with its own staff, with the assistance of consulting professionals, and in cooperation with other governmental agencies, and has utilized and relied upon industry standards and the expertise of industry professionals in preparing its Addendum to its 2015 Plan, and has also utilized DWR's Urban Water Management Plan Guidebook 2020, including its related appendices, in preparing its Addendum to the 2015 Plan; and

WHEREAS, in accordance with applicable law, including Water Code section 10642, and Government Code section 6066, a Notice of a Public Hearing regarding Water Facilities Authority's Addendum to the 2015 Plan was published within the jurisdiction of Water Facilities Authority on June 3, 2021 and June 10, 2021; and

WHEREAS, in accordance with applicable law, including but not limited to Water Code section 10642, a public hearing was held on June 17, 2021 at 7:30 AM, or soon thereafter, via Zoom web conference and teleconference in order to provide members of the public and other interested entities with the opportunity to be heard in connection with proposed adoption of the Addendum to the 2015 Plan and issues related thereto; and

WHEREAS, pursuant to said public hearing on Water Facilities Authority's Addendum to the 2015 Plan, Water Facilities Authority, among other things, encouraged the active involvement of diverse social, cultural, and economic members of the community within Water Facilities Authority's service area with regard to the Addendum to the 2015 Plan and encouraged community input regarding Water Facilities Authority's Addendum to the 2015 Plan; and

WHEREAS, the Board of Directors has reviewed and considered the purposes and requirements of the Act and Delta Plan Policy WR P1, the contents of the Addendum to the 2015 Plan, and the documentation contained in the administrative record in support of the Addendum to the 2015 Plan, and has determined that the factual analyses and conclusions set forth in the Addendum to the 2015 Plan are legally sufficient; and

WHEREAS, the Board of Directors desires to adopt the Addendum to the 2015 Plan prior to July 1, 2021 in order to comply with the Act and Delta Plan Policy WR P1.

WHEREAS, Section 10652 of the California Water Code provides that the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) (CEQA) does not apply to the preparation and adoption, including addenda thereto, of urban water management plans pursuant to this part.

NOW THEREFORE BE IT RESOLVED, the Board of Directors of the Water Facilities Authority hereby resolves as follows:

1. The Addendum to Water Facilities Authority's 2015 Urban Water Management Plan to demonstrate consistency with the Delta Plan Policy to Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance is hereby adopted as amended by changes incorporated by the Board of Directors as a result of input received (if any) at the public hearing;

2. The General Manager is hereby authorized and directed to include a copy of this Resolution in Water Facilities Authority's 2015 Plan Addendum;

3. The General Manager is hereby authorized and directed, in accordance with Water Code sections 10621(d) and 10644(a)(1)-(2), to electronically submit a copy of the Addendum to the 2015 Plan to DWR no later than July 1, 2021;

4. The General Manager is hereby authorized and directed, in accordance with Water Code section 10644(a), to submit a copy of the Addendum to the 2015 Plan to the California State Library, and to any city or county within which Water Facilities Authority provides water supplies no later than thirty (30) days after this adoption date;

5. The General Manager is hereby authorized and directed, in accordance with Water Code section 10645, to make the Addendum to the 2015 Plan available for public review at Water Facilities Authority's offices during normal business hours and on its website at www.wfajpa.org no later than thirty (30) days after filing a copy of the Addendum to the 2015 Plan with DWR.

6. Board of Directors finds and determines that this resolution is not subject to CEQA pursuant to Water Code Section 10652 because CEQA does not apply to the preparation and

adoption, including addenda thereto, of an urban water management plan or to the implementation of the actions taken pursuant to such plans. Because this resolution comprises Board of Director's adoption of its Addendum to the 2015 Plan and involves its implementation, no CEQA review is required.

7. Pursuant to CEQA, the Board of Director directs staff to file a Notice of Exemption with the clerk's office at County of San Bernardino within five (5) working days of adoption of this resolution.

8. The document and materials that constitute the record of proceedings on which this resolution and the above findings have been based are located at Water Facilities Authority's main office. The custodian for these records is the Office Manager.

**APPROVED AND ADOPTED** at a regular meeting of the Governing Board of Water Facilities Authority held on the 17th day of June, 2021, by the following vote, to wit:

Ayes: Dorst-Porada, Milhiser, Rogers, Ulloa, Velto
Nays:
Absent:
Abstain:

Peter Rogers, Chairman

**ATTEST:**

Debra Dorst-Porada, Board Secretary

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# APPENDIX G

# CEQA NOTICE OF EXEMPTION

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NOTICE OF EXEMPTION

| | | |
|---|---|---|
| TO: | ☐ Clerk of the Board of Supervisors<br>or<br>☒ County Clerk<br>County of: San Bernardino | FROM: Terry Catlin<br>Water Facilities Authority<br>1775 North Benson Avenue<br>Upland, CA 91784 |
| 1. | Project Title: | 2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, and Addendum to 2015 Urban Water Management Plan |
| 2. | Project Location – Identify street address and cross streets or attach a map showing project site (preferably a USGS 15' or 7 1/2' topographical map identified by quadrangle name): | Water Facilities Authority<br>1775 North Benson Avenue (between 17th & 18th Streets)<br>Upland, CA 91784 |
| 3. | (a) Project Location – City: | Upland |
| | (b) Project Location – County: | San Bernardino |
| 4. | Description of nature, purpose, and beneficiaries of Project: | Statutory requirement to provide information regarding wholesaler's existing and projected sources of water supply, existing and projected water demands, water service reliability, demand management measures, and water shortage contingency planning. Beneficiaries are the Department of Water Resources, the public and those served within the service area of the Water Facilities Authority. |
| 5. | Name of Public Agency approving project: | Water Facilities Authority |
| 6. | Name of Person or Agency carrying out project: | Terry Catlin, General Manager |
| 7. | Exempt status: (check one) | |
| | (a) ☐ Ministerial project. | |
| | (b) ☐ Not a project. | |
| | (c) ☐ Emergency Project. | |
| | (d) ☐ Categorical Exemption.<br>State type and class number: | |
| | (e) ☐ Declared Emergency. | |
| | (f) ☒ Statutory Exemption.<br>State Code section number: | California Water Code §10652 |
| | (g) ☐ Other. Explanation: | |
| 8. | Reason why project was exempt: | The Project is statutorily exempt from CEQA pursuant to California Water Code §10652 because CEQA does not apply to the preparation and adoption of an (urban water management plan/water shortage contingency plan) or to the implementation of the actions taken pursuant to such plans. Because this Project comprises of Water Facilities Authority's urban water management plan/water shortage contingency plan and involves its implementation, no CEQA review is required. |
| 9. | Contact Person: | Terry Catlin, General Manager |
| | Telephone: | 909.981.9454, x12 |
| 10. | Attach Preliminary Exemption Assessment (Form "A") before filing. | |

NOTICE OF EXEMPTION

| | |
|---|---|
| Date Received for Filing: _____ | _____<br>Signature (Lead Agency Representative)<br>TERRY CATLIN |
| (Clerk Stamp Here) | General Manager<br>Title |

PRELIMINARY EXEMPTION ASSESSMENT

(Certificate of Determination
When Attached to Notice of Exemption)

| | | | |
|---|---|---|---|
| 11. | Name or description of project: | 2020 Urban Water Management Plan, 2020 Water Shortage Contingency Plan, and Addendum to 2015 Urban Water Management Plan | |
| 12. | Project Location – Identify street address and cross streets or attach a map showing project site (preferably a USGS 15' or 7 1/2' topographical map identified by quadrangle name): | Water Facilities Authority<br>1775 North Benson Avenue (between 17th & 18th Streets)<br>Upland, CA 91784 | |
| 13. | Entity or person undertaking project:<br>Water Facilities Authority | A. 909.981.9454, 12 | |
| | | B. Other (Private) | |
| | | (1) Name | Terry Catlin, General Manager |
| | | (2) Address | 1775 North Benson Avenue<br>Upland, CA 91784 |

14. Staff Determination:

The Lead Agency's Staff, having undertaken and completed a preliminary review of this project in accordance with the Lead Agency's "Local Guidelines for Implementing the California Environmental Quality Act (CEQA)" has concluded that this project does not require further environmental assessment because:

| | | | |
|---|---|---|---|
| (a) | ☐ | The proposed action does not constitute a project under CEQA. | |
| (b) | ☐ | The project is a Ministerial Project. | |
| (c) | ☐ | The project is an Emergency Project. | |
| (d) | ☐ | The project constitutes a feasibility or planning study. | |
| (e) | ☐ | The project is categorically exempt. | |
| | | Applicable Exemption Class: | |
| (f) | ☒ | The project is statutorily exempt. | |
| | | Applicable Exemption: | California Water Code §1652 |
| (g) | ☐ | The project is otherwise exempt on the following basis: | |
| (h) | ☐ | The project involves another public agency which constitutes the Lead Agency. | |
| | | Name of Lead Agency: | |

Date: June 17, 2021

Staff: _____
Terry Catlin, General Manager

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# CHINO BASIN DESALTER AUTHORITY

CDA CHINO BASIN DESALTER AUTHORITY

JUNE 2021

FINAL

# 2020 URBAN WATER MANAGEMENT PLAN

STETSON ENGINEERS INC.

Northern California • Southern California • Arizona • Colorado • Oregon

# Chino Basin Desalter Authority (CDA) 2020 Urban Water Management Plan

**JUNE 2021**

STETSON ENGINEERS INC.

861 Village Oaks Drive, Suite 100 • Covina , California 91724
Phone: (626) 967-6202 • FAX: (626) 331-7065 • Web site: www.stetsonengineers.com

Northern California • Southern California • New Mexico • Arizona • Nevada • Colorado

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## LIST OF ACRONYMS

| | |
|---|---|
| AB | Assembly Bill |
| AF | Acre-Feet |
| AFY | Acre-Feet per Year |
| AWWA | American Water Works Association |
| CY | Calendar Year |
| CIMIS | California Irrigation Management Information System |
| CWC | California Water Code |
| CDA | Chino Basin Desalter Authority |
| CEQA | California Environmental Quality Act |
| COCs | Constituents of Concern |
| Delta | Sacramento- San Joaquin Delta |
| DOF | California Department of Finance |
| DMM | Demand Management Measures |
| DRA | Drought Risk Assessment |
| DWR | California Department of Water Resources |
| DYYP | MWD's Dry-Year Yield Program |
| EOP | San Bernardino County Emergency Operations Plan |
| ERP | Emergency Response Plan |
| ETo | Evapotranspiration |
| FEMA | Federal Emergency Management Agency |
| FY | Fiscal Year |
| GAC | Granular Activated Carbon |
| GPCD | Gallons per Capita per Day |
| GPM | Gallons per Minute |
| GIS | Geographical Information Systems |
| GSP | Groundwater Sustainability Plan |
| IEUA | Inland Empire Utilities Agency |
| InSAR | Remote Sensing Techniques |
| JCSD | Jurupa Community Services District |
| JPA | Joint Exercise of Powers Agreement |
| kWh | Kilowatt Hours |
| MGD | Million gallons per day |
| MWD | Metropolitan Water District of Southern California |
| M&I | Municipal and Industrial |
| MZ | Management Zone |
| OBMP | Chino Basin Optimum Basin Management Program |
| PCE | Perchloroethylene |
| Plan | Urban Water Management Plan |
| PWS | Public Water System |

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| | |
|---|---|
| RRA | Risk and Resilience Assessment |
| SARWC | Santa Ana River Water Company |
| SB | Senate Bill |
| SBCFCD | San Bernardino County Flood Control District |
| SB X7-7 | The Water Conservation Act of 2009 |
| SCAG | Southern California Association of Governments |
| SCE | Southern California Edison |
| SGMA | Sustainable Groundwater Management Act of 2014 |
| SWRCB-DDW | State Water Resources Control Board - Division of Drinking Water |
| SWP | State Water Project |
| TCE | Trichloroethylene |
| 1,2,3- TCP | Trichloropropane |
| TDS | Total Dissolved Solids |
| USEPA | United States Environmental Protection Agency |
| UWMP | Urban Water Management Plan |
| VOCs | Volatile Organic Chemicals |
| WEWAC | Water Education Water Awareness Committee |
| WMWD | Western Municipal Water District |
| WRCC | Western Regional Climate Center |
| WSCP | Water Shortage Contingency Plan |
| WUE | Water Use Efficiency |

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# Chapter 1

## URBAN WATER MANAGEMENT PLAN INTRODUCTION AND OVERVIEW

## LAY DESCRIPTION - INTRODUCTION

An urban water supplier is defined (pursuant to Section 10617 of the California Water Code1) as "*a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers.*"

The Chino Basin Desalter Authority (CDA) is classified as an urban water supplier because it serves more than 3,000 customers (i.e. individual metered accounts) and it supplies more than 3,000 acre-feet of water annually to its member agency customers for municipal purposes.

In accordance with the "Urban Water Management Planning Act", which was enacted by the California Legislature in 1983, every urban water supplier (including CDA) is required to prepare and adopt an Urban Water Management Plan (UWMP), periodically review its UWMP, and incorporate updated and new information into an updated UWMP at least once every five years.

CDA's most recent update was its 2015 UWMP (or 2015 Plan) which was submitted to, and approved by, the California Department of Water Resources (DWR). Urban water suppliers (including CDA) are required to complete and submit their 2020 UWMPs to DWR by July 1st, 2021.

The current requirements for preparing the UWMP are included in California Water Code (CWC) Sections 10608 through 10657. CDA's 2020 UWMP (or 2020 Plan) was prepared consistent with the CWC and the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020" (Final 2020 UWMP Guidebook), dated March 2021.

The UWMP provides urban water suppliers (including CDA) with a reliable management action plan for long-term resource planning to ensure adequate water supplies are available to meet existing and future water supply needs. In addition, the 2020 UMWP incorporates water supply reliability determinations resulting from potential prolonged drought, regulatory revisions, and/or changing climatic conditions.

1 References to CWC Sections in this 2020 UWMP were obtained from https://leginfo.legislature.ca.gov/

CDA's 2020 Plan consists of the following Chapters:

Chapter 1 Urban Water Management Plan Introduction and Overview
Chapter 2 Plan Preparation
Chapter 3 System Description
Chapter 4 Water Use Characterization
Chapter 5 SB_X7-7 Baselines, Targets, and 2020 Compliance
Chapter 6 Water Supply Characterization
Chapter 7 Water Service Reliability and Drought Risk Assessment
Chapter 8 Water Shortage Contingency Plan
Chapter 9 Demand Management Measures
Chapter 10 Plan Adoption, Submittal, and Implementation

A lay description is presented at the beginning of each of these Chapters.

## LAY DESCRIPTION – CHAPTER 1

### URBAN WATER MANAGEMENT PLAN INTRODUCTION AND OVERVIEW

Chapter 1 (Urban Water Management Plan Introduction and Overview) of CDA's 2020 Plan discusses and provides the following:

- An overall lay description of the 2020 Plan, including California Water Code and Urban Water Management Plan Act requirements, is provided. CDA is required to prepare an Urban Water Management Plan.
- CDA's 2020 Plan was prepared consistent with the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020", dated March 2021. A description regarding the organization of the 2020 Plan, including a summary of each Chapter, is provided. CDA's Water Shortage Contingency Plan (discussed in Chapter 8) is also included in the 2020 Plan.
- The 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data. These tables are included within the respective sections of the 2020 Plan and in Appendix A.
- CDA's coordination efforts with other planning agencies are discussed, including coordination efforts with the Inland Empire Utilities Agency and the Southern California Association of Governments.
- CDA's eligibility to receive grants and loans administered by the State of California and/or DWR, as a result of preparing the 2020 Plan, is discussed.
- The checklist developed by DWR and used by CDA to incorporate the specific UWMP requirements is discussed. The completed checklist is provided in Appendix B.

## 1.1 RECOMMENDED UWMP ORGANIZATION

CDA's 2020 Urban Water Management Plan (2020 Plan) was prepared consistent with the recommended organization provided in DWR's Final "Urban Water Management Plan Guidebook 2020" (Final 2020 UWMP Guidebook), dated March 2021. CDA's 2020 Plan consists of the following Chapters:

| | |
|---|---|
| Chapter 1 | Urban Water Management Plan Introduction and Overview |
| Chapter 2 | Plan Preparation |
| Chapter 3 | System Description |
| Chapter 4 | Water Use Characterization |
| Chapter 5 | SB X7-7 Baselines, Targets, and 2020 Compliance |
| Chapter 6 | Water Supply Characterization |
| Chapter 7 | Water Service Reliability and Drought Risk Assessment |
| Chapter 8 | Water Shortage Contingency Plan |
| Chapter 9 | Demand Management Measures |
| Chapter 10 | Plan Adoption, Submittal, and Implementation |

Pursuant to CWC requirements, CDA's 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data. DWR's standardized tables are provided within the body of the 2020 Plan text as well as in Appendix A. CDA also submitted the UWMP data (standardized tables) electronically through DWR's Online Submittal Tool.

CDA's 2020 Plan also provides supporting documents (appendices) including notification letters of the Plan update, public notice of the Plan hearing, and adoption resolution from CDA's governing body. Further discussions regarding these supporting documents are provided within the individual Chapters of CDA's 2020 Plan.

## 1.2 UWMPS IN RELATION TO OTHER EFFORTS

CDA's 2020 Plan was prepared in coordination with planning agencies including the Inland Empire Utilities Agency (IEUA) Planning Division, the San Bernardino County Planning Division, and the Southern California Association of Governments (SCAG). In addition, CDA's 2020 Plan was prepared using management documents including IEUA's "Regional Water Use Efficiency Business Plan 2015 – 2020" and San Bernardino County's 2017 "San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan" and "San Bernardino County Emergency Operations Plan (EOP)".

CDA is a wholesale water agency formed under a Joint Exercise of Powers Agreement by a group of local agencies including the Jurupa Community Services District (JCSD), Santa Ana River

Water Company (SARWC), IEUA, Western Municipal Water District (WMWD), and the Cities of Chino, Chino Hills, Norco, and Ontario. CDA provided its 2020 Plan to its member agencies which includes projections of its water deliveries to CDA's member agencies in five-year increments for a normal year, a single dry year, and a five consecutive year drought conditions over the next 25 years.

## 1.3 UWMPS AND GRANT OR LOAN ELIGIBILITY

Pursuant to DWR's Final 2020 UWMP Guidebook:

"*In order for a Supplier to be eligible for any water grant or loan administered by DWR, the Supplier must have a current UWMP on file that has been determined by DWR to address the requirements of the Water Code. A current UWMP must also be maintained by the Supplier throughout the term of any grant or loan administered by DWR. A UWMP may also be required in order to be eligible for other state funding, depending on the conditions that are specified in the funding guidelines. Suppliers are encouraged to seek guidance on the specifics of any state funding source from the respective funding agencies. The following sections of the Water Code are pertinent to Suppliers considering pursuit of grants or loans*."

CDA's 2020 Plan has been prepared to meet eligibility requirements for grants and loans administered by the State and/or DWR.

## 1.4 DEMONSTRATION OF CONSISTENCY WITH THE DELTA PLAN FOR PARTICIPANTS IN COVERED ACTIONS

Pursuant to DWR, an urban water supplier that anticipates participating in or receiving water from a proposed project (or "covered action") such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Sacramento-San Joaquin Delta (Delta) should provide information in their 2015 and 2020 UWMPs for use in demonstrating consistency with Delta Plan Policy WR P1, "*Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance"*. In addition, pursuant to California Code of Regulations, Title 23, § 5003:

> *(c)(1) Water suppliers that have done all of the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:*
>
> > *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for*

*compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*

*(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*

*(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

CDA was formed to treat contaminated groundwater from the southwesterly portion of Chino Basin and provide that treated water to its member agencies. The quantity of groundwater being treated is fixed, regardless of climate change conditions, in order to control contaminant migration. In this context, each member agency's UWMP will describe the agency's reduced regional reliance on imported water supplies from the Delta. However, CDA does not have a demand on the imported water supplies and this section is not applicable.

## 1.5 TIPS FOR UWMP PREPARERS

CDA's 2020 Plan (which includes CDA's 2020 Water Shortage Contingency Plan (WSCP)) is considered an update to CDA's 2015 Plan. However, the 2020 Plan and the WSCP are considered stand-alone documents. As discussed in Section 1.1, CDA's 2020 Plan was prepared consistent with the recommended organization provided in DWR's Final 2020 UWMP Guidebook.

A checklist of specific UWMP requirements is included in Appendix B. The checklist includes the page number where the required elements are addressed to assist in DWR's review of the submitted Plan.

Chapter 2

# PLAN PREPARATION

## LAY DESCRIPTION – CHAPTER 2

### PLAN PREPARATION

Chapter 2 (Plan Preparation) of CDA's 2020 Plan discusses and provides the following:

- The basis for preparing an Urban Water Management Plan is provided. CDA is required to prepare the 2020 Plan because it is an "urban water supplier" (CDA serves more than 3,000 customers and it supplies more than 3,000 acre-feet of water annually to its customers for municipal purposes).
- CDA's Plan has been prepared as an "individual" plan rather than a "regional" plan in an effort to provide information specific to CDA to best inform its employees, management, and customers.
- Information presented in CDA's 2020 Plan is provided on "Fiscal Year" basis which is from July 1 through June 30 of the following year.
- Water quantities presented in CDA's 2020 Plan are provided on an "acre-foot" basis.
- CDA's coordination and outreach efforts with wholesale water agencies, other retail water agencies, and the community are described. CDA coordinated the preparation of its 2020 Plan with the following:
    - City of Chino
    - City of Chino Hills
    - City of Eastvale
    - City of Jurupa Valley
    - City of Norco
    - City of Ontario
    - County of San Bernardino
    - County of Riverside
    - Jurupa Community Services District
    - Santa Ana Watershed Project Authority
    - Inland Empire Utilities Agency
    - Metropolitan Water District of Southern California
    - Chino Basin Watermaster
- CDA's notification process to the cities and county within which CDA provides water supplies to is discussed.

## 2.1 PLAN PREPARATION

As discussed in Section 1.1, CDA's 2020 Plan was prepared consistent with the recommended organization provided in DWR's Final 2020 UWMP Guidebook. Pursuant to DWR's Final 2020 UWMP Guidebook:

"*The California Water Code (Water Code) specifies several requirements for preparing a UWMP, including who is required to prepare a UWMP; how to prepare a UWMP, depending on whether the Supplier choses to participate in a regional or individual planning effort; selection of reporting year-type; and coordination, notification, and outreach.*"

Pursuant to CWC requirements, CDA's 2020 Plan incorporates DWR's water use and supply tables (standardized tables) for the reporting and submittal of UWMP data.

## 2.2 BASIS FOR PREPARING A PLAN

**CWC 10617.**

*"Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.*

**CWC 10620.**

*(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*

**CWC 10621.**

*(a) Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update.*

CDA's 2020 Plan was prepared in accordance with the UWMP Act which was established in 1983. The UWMP Act requires every "urban water supplier" to prepare and adopt a Plan, to periodically review its Plan at least once every five years and make any amendments or changes which are indicated by the review. An "Urban Water Supplier" is defined as a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually.

Section 10621(a) of the CWC states, "*Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update".* As a result, DWR requires the 2020 Plans be submitted by July 1, 2021.

CDA is an "urban water supplier" pursuant to Section 10617 of the CWC and indirectly serves potable water to more than 3,000 customers and supplies more than 3,000 acre-feet per year (AFY) at retail for municipal purposes. CDA's 2020 Plan is an update to CDA's 2015 Plan.

### 2.2.1 PUBLIC WATER SYSTEMS

**CWC 10644.**

*(a)(2) The plan, or amendments to the plan, submitted to the department ... shall include any standardized forms, tables, or displays specified by the department.*

**California Health and Safety Code 116275.**

*(h) "Public water system" means a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.*

Pursuant to CWC requirements, CDA's 2020 Plan incorporates DWR's standardized tables for the reporting and submittal of UWMP data. The standardized tables are provided within the body of the 2020 Plan text as well as in Appendix A. CDA also submitted the UWMP data (from the standardized tables) electronically through DWR's Online Submittal Tool.

CDA consists of two Public Water Systems (PWS) which are regulated by the State Water Resources Control Board - Division of Drinking Water (SWRCB-DDW). The PWS number for CDA – Desalter 1 is CA3610075 and the PWS number for CDA – Desalter 2 is CA3310083. However, as a wholesale water agency, CDA is not required by DWR to provide PWS information in this Plan, therefore Table 2-1 is not applicable.

**Table 2-1 Public Water Systems (Not Applicable)**
Table 2-1 is not applicable for wholesalers.

### 2.2.2 SUPPLIERS SERVING MULTIPLE SERVICE AREAS / PUBLIC WATER SYSTEMS

CDA has developed its 2020 Plan, based solely on its water sales to its member agencies, to address all requirements of the CWC. However, based upon their 2020 water production and imported water deliveries, the following urban water suppliers (or Public Water Systems) receiving CDA water supplies may be required to prepare a Plan:

- Jurupa Community Services District
- Santa Ana River Water Company
- Western Municipal Water District
- City of Chino
- City of Chino Hills
- City of Norco
- City of Ontario

## 2.3 REGIONAL PLANNING

CDA has developed its 2020 Plan based on water sales to its member agencies to address all requirements of the CWC. CDA's 2020 Plan was not developed as a Regional Plan. However, CDA's Plan is available for use and reference to its member agencies.

CDA coordinated with its member agencies regarding the development of the 2020 Plan. Likewise, IEUA and WMWD's 2020 Plans are available for use and reference by its member agencies and urban water suppliers within those member agencies.

## 2.4 INDIVIDUAL OR REGIONAL PLANNING AND COMPLIANCE

As shown in Table 2-2, CDA's 2020 Plan is an "Individual UWMP". CDA has developed its 2020 Plan reporting solely on its water sales to its member agencies to address all requirements of the CWC. CDA notified and coordinated with appropriate regional agencies and constituents (See Section 2.6).

**Table 2-2 Plan Identification Type**

| Submittal Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list) |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☐ | Water Supplier is also a member of a Regional Alliance | |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

## 2.4.1 REGIONAL UWMP

**CWC 10620.**

*(d)(1) An urban water supplier may satisfy the requirements of this part by participation in area wide, regional, watershed, or basin wide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.*

As indicated in Table 2-2, CDA's 2020 Plan was developed as an "Individual UWMP" and not part of a Regional Plan.

### 2.4.2 REGIONAL ALLIANCE

**CWC 10608.20.**

*(a)(1) …Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28…*

**CWC 10608.28.**

*(a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:*

*(1) Through an urban wholesale water supplier.*

*(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).*

*(3) Through a regional water management group as defined in Section 10537.*

*(4) By an integrated regional water management funding area.*

*(5) By hydrologic region.*

*(6) Through other appropriate geographic scales for which computation methods have been developed by the department.*

*(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.*

As indicated in Table 2-2, CDA's 2020 Plan was developed as an "Individual UWMP" and not part of a Regional Alliance.

## 2.5 FISCAL OR CALENDAR YEAR AND UNITS OF MEASURE

***CWC 10608.20.***

*(a)(1) Urban retail water suppliers…may determine the targets on a fiscal or calendar year basis.*

### 2.5.1 FISCAL OR CALENDAR YEAR

The data provided in CDA's 2020 Plan is reported on a fiscal year (FY) basis, unless noted otherwise, as shown in Table 2-3. A FY begins on July 1st of every year.

**Table 2-3 Supplier Identification**

| Submittal Table 2-3: Supplier Identification | |
|---|---|
| Type of Supplier (select one or both) | |
| ☑ | Supplier is a wholesaler |
| ☐ | Supplier is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☐ | UWMP Tables are in calendar years |
| ☑ | UWMP Tables are in fiscal years |
| If using fiscal years provide month and date that the fiscal year begins (mm/dd) | |
| *07/01* | |
| Units of measure used in UWMP * (select from drop down) | |
| Unit | AF |
| **** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | |
| NOTES: | |

### 2.5.2 REPORTING COMPLETE 2020 DATA

The data provided in CDA's 2020 Plan is provided on a FY basis through June 30, 2020.

### 2.5.3 UNITS OF MEASURE

As shown in Table 2-3, the data provided in CDA's 2020 Plan is reported in units of AF, unless noted otherwise.

## 2.6 COORDINATION AND OUTREACH

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

### *2.6.1 WHOLESALE AND RETAIL COORDINATION*

CDA is a wholesale agency comprised of eight (8) member agencies. The following list is a list of CDA's member agencies:

- Jurupa Community Services District
- Santa Ana River Water Company
- Inland Empire Utilities Agency
- Western Municipal Water District
- City of Chino
- City of Chino Hills
- City of Norco
- City of Ontario

CDA provides water supplies to its member agencies, with the exception of Inland Empire Utilities Agency. As indicated in Table 2-4, CDA has provided its 2020 Plan to its member agencies which includes water use projections of its water sales to its member agencies in five-year increments for a normal year, a single dry year, and a five consecutive year drought conditions over the next 25 years.

**Table 2-4 Water Supplier Information Exchange**

| Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one) | |
|---|---|
| ☑ | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed. |
| Section 2.6 | **Provide page number for location of the list.** |
| ☐ | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.** |
| Water Supplier Name | |
| *Add additional rows as needed* | |
| | |
| | |
| | |
| NOTES: | |

## 2.6.2 COORDINATION WITH OTHER AGENCIES AND THE COMMUNITY

**CWC 10620.**

*(d)(3) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

**CWC 10642.**

*Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of both the plan…*

CDA is a wholesale water supplier that provides treated groundwater from the Chino Basin to its member agencies. CDA notified its member agencies (including cities and counties within the area receiving its water supplies) and public agencies that share a common source of supply from the Chino Basin about the preparation of CDA's 2020 Plan. CDA provided copies of the draft plan to the following:

- City of Chino
- City of Chino Hills
- City of Eastvale
- City of Jurupa Valley
- City of Norco
- City of Ontario
- County of San Bernardino
- County of Riverside
- Jurupa Community Services District
- Santa Ana Watershed Project Authority
- Inland Empire Utilities Agency
- Metropolitan Water District of Southern California
- Chino Basin Watermaster

As discussed in Section 10.2, CDA notified these agencies, as well as the cities and counties within which CDA provides water supplies, at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited them to participate in the development of the 2020 Plan. A copy of the notification letters sent to these agencies is provided in Appendix C.

### *2.6.3 NOTICE TO CITIES AND COUNTIES*

**CWC 10621.**

*(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

As discussed in Section 10.2, notification was provided to the cities and counties within which CDA provides water supplies that CDA was reviewing and considering amendments (updates) to the previous 2015 Plan and as a result, prepare the 2020 Plan. Notification was provided at least 60 days prior to the public hearing (see Appendix C).

Chapter 3

# SYSTEM DESCRIPTION

## LAY DESCRIPTION – CHAPTER 3

### SYSTEM DESCRIPTION

Chapter 3 (System Description) of CDA's 2020 Plan discusses and provides the following:

- A description of the area receiving water supplies from CDA is provided. The area receiving water supplies from CDA is located within the Western Municipal Water District in Riverside County and/or within the Inland Empire Utilities Agency in San Bernardino County. CDA was formed under a Joint Exercise of Powers Agreement to remove salts from brackish groundwater extracted from the lower Chino Basin and distribute it to its member agencies.
- The area receiving water supplies from CDA encompasses an area of approximately 304 square miles. The location of the area receiving water supplies form CDA is provided in Figure 1.
- A description regarding the climate of the area receiving water supplies from CDA is provided. The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly evapotranspiration in the vicinity of the area receiving water supplies from CDA area is summarized. The sources of the climate information are also discussed.
- The population within the area receiving water supplies from CDA is discussed and projected. The sources of the population information are also discussed. CDA provides water service to an area with a current population of 664,270. The area receiving water supplies from CDA is projected to have a population of 963,819 by Fiscal Year 2044-45.
- A discussion of land use information used by CDA to develop the 2020 Plan is provided. CDA reviewed the current and projected land uses within its service area. CDA also reviewed data provided by the Southern California Association of Governments, the Department of Finance, and the United States Census Bureau and prepared for counties, cities, and unincorporated areas within Southern California.

## 3.1 GENERAL DESCRIPTION

**CWC 10631.**

*(a) Describe the service area of the supplier, including current and projected population, climate, and other social, economic, and demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available. The description shall include the current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Urban water suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information, including, where appropriate, land use information obtained from local or regional land use authorities, as developed pursuant to Article 5 (commencing with Section 65300) of Chapter 3 of Division 1 of Title 7 of the Government Code.*

In June 2000, the Optimum Basin Management Program was adopted by Chino Basin Watermaster and approved by the Superior Court to address water quality problems with the Chino Basin and to increase and improve the water supply. On September 25, 2001, CDA was formed under a Joint Exercise of Powers Agreement to remove salts from brackish groundwater extracted from the lower Chino Basin and distribute it to its member agencies. The CDA member agencies are located within the Western Municipal Water District in Riverside County and/or within the Inland Empire Utilities Agency in San Bernardino County. The area which receives water supplies from CDA is 304 square miles. A map showing the area which receives water supplies from CDA is provided in Figure 1.

CDA removes salts from brackish groundwater extracted from the lower Chino Basin with the Chino I and II Desalter facilities. The Chino I Desalter commenced operation in 2001 and was expanded in 2005. The Chino II Desalter is located in Jurupa Valley began operation in 2006 utilizing ion exchange (IX) and reverse osmosis (RO) treatment to treat brackish groundwater wells that also have elevated nitrate concentration. The original combined IX and RO treatment capacity was 10 million gallons per day (MGD). A 10.5 MGD expansion (6.5-mgd RO, 4.0-mgd IX) was subsequently constructed in 2011, for a total capacity of 20.5 (10 + 10.5) MGD. The expansion was constructed as part of the Phase 3 Expansion Project, to reach the groundwater extraction goal of 40,000 acre-feet per year (AFY) through upgrades to both desalters (Chino I and Chino II), new wells, pipelines, and pumping stations. Product water from the Chino II Desalter meets all state and federal drinking water regulations and provides 21,000 AFY (20.5 MGD) to the Cites of Ontario and Norco, Jurupa Community Services District, Santa Ana River Water Company, and Western Municipal Water District.

The overall RO process at the Chino II Desalter consists of five RO trains that normally operate at a recovery of 83.5 percent. The capacities of these trains are not identical. The permeate and concentrate production capacities of the three original RO trains are 2.0 and 0.04 MGD, respectively. The permeate and concentrate production capacities of the two RO trains added as

part of the Chino II expansion are 3.25 MGD and 0.64 MGD, respectively. There are a total of eight IX vessels. The facility also has the capability to bypass a portion of the raw groundwater flow around the treatment processes to blend with the treated water, while meeting the final product water quality goals of 350 mg/L total dissolved solids (TDS) and 25 mg/L nitrate.

Subsequent to the plant expansion, CDA constructed the Concentrate Reduction Facility in 2017, which utilizes chemical softening to remove the limiting foulants (specifically, calcium and silica) from the RO concentrate. Softened water is then passed through granular media filters to provide particulate removal upstream of a secondary RO (SRO) process. Treated water (SRO permeate) is blended with the primary RO permeate, and SRO concentrate is disposed of into the Inland Empire Brine Line (IEBL), that conveys the concentrate to Orange County Sanitation District. Using this approach, total water recovery from the RO system at the Chino II Desalter is increased from 83.5 percent to as high as 95 percent, substantially reducing the volume of brine disposed into the IEBL while increasing permeate production.

The Chino II Desalter's original wellfield consisted of eight wells that supplied groundwater to the Chino II Desalter through a PVC pressure raw water pipeline. An additional three wells have been constructed for a total of eleven groundwater wells supplying the Desalter system. The wells are primarily located within the Cities of Ontario, Eastvale, and Jurupa Valley.

Additional components of the Chino II Desalter System were constructed as part of the South Archibald Plume Project to be operational in 2021, with the goal of removing and treated trichloroethylene (TCE) from groundwater wells impacted by the South Archibald Plume. The project entails integrating additional improvements into the Chino II system, including construction of dedicated transmission pipeline to convey impacted groundwater to the Desalter, and treating the high TCE ground water using CDA's existing reverse osmosis (RO) system, and a new air stripper system.

These Desalter systems collectively include 30 groundwater extraction wells, pumps, and pipelines that produce and convey untreated groundwater to treatment facilities. Waste process water is discharged to the Inland Empire Brine Line and conveyed to the Orange County Sanitation District for treatment and discharge to the Pacific Ocean.

## 3.2 SERVICE AREA BOUNDARY MAPS

As discussed in Section 3.1, the area which receives water supplies from CDA covers approximately 304 square miles, encompassing portions of the Counties of San Bernardino and Riverside. The area which receives water supplies from CDA relative to the municipal boundaries within the Counties of San Bernardino and Riverside is provided in Figure 2. The location of the service areas for CDA's member agencies is provided in Figure 3.

The map of the area receiving water supplies from CDA was submitted online through DWR's Population Tool in a "KML" file format (i.e. Google Earth format). The KML file was originally

created in a Geographical Information Systems (GIS) shape file format and converted into a KML format. To the extent information was available, metadata was included in the KML file (including map projection, contact information, start and end dates for which the map is valid, constraints, attribute table definitions, and digitizing base).

## 3.3 SERVICE AREA CLIMATE

**CWC 10631.**

*(a) Describe the service area of the supplier, including … climate…*

**CWC 10630.**

*It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.*

The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly evapotranspiration (ETo) in the vicinity of the area receiving water supplies from CDA is summarized in the tabulation below. Historical climate information was obtained from the Western Regional Climate Center (WRCC), the National Oceanic and Atmospheric Administration, and from DWR's California Irrigation Management Information System (CIMIS).

## Service Area Climate Information

| Month | Average Temperature (F) | Average Minimum Temperature (F) | Average Maximum Temperature (F) | Average Total Precipitation (Inches) | ETo (Inches) |
|---|---|---|---|---|---|
| **January** | 55.5 | 44.1 | 67.6 | 2.2 | 1.95 |
| **February** | 55.1 | 44.9 | 67.4 | 2.7 | 2.41 |
| **March** | 58.8 | 48.2 | 58.8 | 1.3 | 3.75 |
| **April** | 60.9 | 51.0 | 74.8 | 0.9 | 4.55 |
| **May** | 67.9 | 55.6 | 79.6 | 0.3 | 5.19 |
| **June** | 71.2 | 59.8 | 86.2 | 0.0 | 5.97 |
| **July** | 77.8 | 64.7 | 93.1 | 0.1 | 6.60 |
| **August** | 78.9 | 65.2 | 94.2 | 0.0 | 6.41 |
| **September** | 75.4 | 62.9 | 90.7 | 0.1 | 4.88 |
| **October** | 67.8 | 56.6 | 82.0 | 0.5 | 3.46 |
| **November** | 58.9 | 48.6 | 73.9 | 0.8 | 2.31 |
| **December** | 54.7 | 43.2 | 66.2 | 1.9 | 1.72 |
| **Annual** | 65.2 | 53.7 | 77.9 | 10.7 | 49.20 |

**Source:**

Historical average monthly precipitation and temperature information was obtained from the National Oceanic and Atmospheric Administration (https://search.usa.gov/search?utf8=%E2%9C%93&affiliate=noaa.gov&query=ontario+ca) from 1998 through 2020 (for Ontario International Airport). Historical monthly average ETo information was obtained from the California Irrigation Management Information Systems (http://wwwcimis.water.ca.gov) and is based on data collected from Station 255 (Chino).

The historical average rainfall in the vicinity of the area receiving CDA's water supplies is 10.7 inches. This area has a dry climate and summers can reach average maximum daily temperatures of over 90 degrees Fahrenheit. Although changes in climatic conditions may have an impact (as discussed in Section 4.5) on the total demands of CDA's member agencies, the projected water supply sales to CDA's member agencies will be constant to control groundwater contamination regardless of an average year, a single dry year, and five consecutive year drought conditions. Precipitation within the vicinity of the area receiving water supplies from CDA is discussed further in Section 7.2.

## 3.4 SERVICE AREA POPULATION AND DEMOGRAPHICS

### *3.4.1 SERVICE AREA POPULATION*

**CWC 10631.**

*(a) Describe the service area of the supplier, including current and projected population… The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

The area receiving water supplies from CDA has a current population of 664, 270. Table 3-1 presents the current and projected population of the area receiving water supplies from CDA from FY 2019-20 to FY 2044-45. The area receiving water supplies from CDA is projected to have a population of 963, 819 by FY 2044-45.

The projected population in the areas receiving water supplies from CDA was based on growth rate projections obtained from data provided by the Southern California Association of Governments. The data provided by SCAG was based on their "The 2020-2045 Regional Transportation Plan / Sustainable Communities Strategy of the SCAG", dated September 2020, and incorporates demographic trends, existing land use, general plan land use policies, and input and projections through the year 2045 from the Department of Finance (DOF) and the U.S. Census Bureau for counties, cities, and unincorporated areas within Southern California.

**Table 3-1 Population – Current and Projected**

| Submittal Table 3-1 Wholesale: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2020 | 2025 | 2030 | 2035 | 2040 | 2045*(opt)* |
| | 664,270 | 715,607 | 770,912 | 830,491 | 894,675 | 963,819 |
| NOTES: The 2020 population and the populations projected through 2045 were based on ACS population data (2019 Census) and an average between CDA's historical annual population growth rate and IEUA's current projected growth rate (See Section 3.4.1 and Section 5.4.1). | | | | | | |

### *3.4.2 OTHER SOCIAL, ECONOMIC, AND DEMOGRAPHIC FACTORS*

**CWC 10631.**

*(a) Describe the service area of the supplier, including… other social, economic, and demographic factors affecting the supplier's water management planning.*

No other demographic factors affect CDA's water management planning. However, increased population will have an impact on water demand.

## 3.5 LAND USES WITHIN SERVICE AREA

CDA is a wholesale water agency which provides treated groundwater water to its retail member agencies. Therefore, CDA does not provide water directly to retail customers. As discussed in Section 3.4, CDA obtained data from the SCAG document entitled "The 2020-2045 Regional Transportation Plan / Sustainable Communities Strategy of the SCAG", dated September 2020. Projected populations in the area receiving water supplies from CDA were based on growth rate projections developed by SCAG. The data provided by SCAG incorporates demographic trends, existing land use, general plan land use policies, and input and projections through the year 2045 from the Department of Finance and the U.S. Census Bureau for counties, cities, and unincorporated areas within Southern California. The projected population was used to project future demand from its member agencies through the year 2045. As discussed in Section 2.6, CDA coordinated the preparation of the 2020 Plan with the Cities of Chino, Chino Hills, Eastvale, Jurupa Valley, Norco, Ontario, the Counties of San Bernardino and Riverside, and other agencies.

Chapter 4

# WATER USE CHARACTERIZATION

## LAY DESCRIPTION – CHAPTER 4

**WATER USE CHARACTERIZATION**

Chapter 4 (Water Use Characterization) of CDA's 2020 Plan discusses and provides the following:

- CDA provides water service to an individual water use category. This water use category is sales to other agencies. A description for this water use category is provided in Section 4.2.1.
- CDA's total water demands from its member agencies over the past 10 years have ranged from 27,098 AFY to 35,003 AFY, with an average of 29,673 AFY. CDA currently measures its water use through meter data and billing records.
- CDA's current and projected water demands from its member agencies are provided in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 4-3.

## 4.1 NON-POTABLE VERSUS POTABLE WATER USE

Chapter 4 addresses CDA's potable water demands. Recycled water is not served by CDA, as shown in Table 4-3. Raw water is also not served by CDA and is not applicable.

## 4.2 PAST, CURRENT, AND PROJECTED WATER USES BY SECTOR

**CWC 10635.**

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following…*

*(2) The water use projections shall be in the same five-year increments described in subdivision (a).*

*(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

*(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:*

> *(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.*
> *(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

CDA's current and projected water demands are provided in five-year increments over the next 25 years (through FY 2044-45) in Tables 4-1, 4-2, and 4-3. CDA's total water demands for sale to its member agencies were projected based on the current capacity of the desalters.

CDA provides water service to one individual water use category. The water use category supplied by CDA is discussed in Section 4.2.1. The water use for this category during FY 2019-20 is provided in Table 4-1. The projected water use for this water use category is provided in Table 4-2 and is based on the water use from the water use sector in FY 2019-20.

### 4.2.1 WATER USE SECTORS LISTED IN WATER CODE

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following:*

*(A) Single-family residential.*
*(B) Multifamily.*
*(C) Commercial.*
*(D) Industrial.*
*(E) Institutional and governmental.*
*(F) Landscape.*
*(G) Sales to other agencies.*
*(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.*
*(I) Agricultural.*
*(J) Distribution system water loss.*

As shown in Table 4-1, CDA includes the following water use category listed in the CWC:

- Sales to Other Agencies
  (Water sales made to another agency. Projected sales may be based on projected demand provided by the receiving agency. There is inherent uncertainty in future projections, therefore, any projected sales reported in the Plan are for planning purposes only and are not considered a commitment on the part of the seller. This is a wholesale demand.)

### 4.2.2 WATER USE SECTORS IN ADDITION TO THOSE LISTED IN WATER CODE

CDA does not include other water demand categories which are not listed in the CWC (including exchanges, surface water augmentation, transfers, and wetlands or wildlife habitat).

### 4.2.3 PAST WATER USE

Chapter 6 provides a discussion of the source of water supply CDA uses to meet its water demands from its member agencies. Section 6.1 provides a tabulation of CDA's historical annual water demands for the source of water supply. Over the past ten years, CDA's water demands have ranged from 27,098 AFY to 35,003 AFY, with an average of 29,673 AFY.

### 4.2.4 DISTRIBUTION SYSTEM WATER LOSS

**CWC 10631.**

*(d)(1) For an urban retail water supplier, quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, based upon information developed pursuant to subdivision (a), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following…*

*(J) Distribution system water loss.*

**CWC 10631.**

*(3)(A) The distribution system water loss shall be quantified for each of the five years preceding the plan update, in accordance with rules adopted pursuant to Section 10608.34.*

*(B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.*

*(C) In the plan due July 1, 2021, and in each update thereafter, data shall be included to show whether the urban retail water supplier met the distribution loss standards enacted by the board pursuant to Section 10608.34.*

As a wholesale supplier, CDA is not required by DWR to perform water loss audits and report distribution system water loss.

### 4.2.5 CURRENT WATER USE

CDA currently measures its water use through meter data and billing records. The water use for CDA's individual water use category during FY 2019-20 is provided in Table 4-1. CDA does not produce recycled water as shown in, Table 4-3.

DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and assess monthly water use trends. However, DWR has deemed the tool as optional and CDA is not required by DWR to use the tool. However, Section 6.1 provides a tabulation of CDA's historical annual water use. During the past 10 years, CDA's member agencies experienced a five consecutive year drought from FY 2011-12 to FY 2015-16.

### 4.2.6 PROJECTED WATER USE

**CWC 10635.**

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

**CWC 10631.**

*(d)(4)(A) Water use projections, where available, shall display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

*(d)(4)(B) To the extent that an urban water supplier reports the information described in subparagraph (A), an urban water supplier shall do both of the following:*

*(i) Provide citations of the various codes, standards, ordinances, or transportation and land use plans utilized in making the projections.*
*(ii) Indicate the extent that the water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. Water use projections that do not account for these water savings shall be noted of that fact.*

CDA's projected water demands are provided in five-year increments over the next 25 years (through FY 2044-45) in Table 4-3. CDA's projected water demands during a normal year, a single dry year, and a five consecutive year drought are provided in Chapter 7. The projected water demands for CDA's water use category is provided in Table 4-2.

As a wholesale supplier, CDA's water demand projections are not required by DWR to incorporate water savings, or "passive savings", which are the result of implementation of new plumbing codes along with consumer awareness of the need to conserve water.

### 4.2.7 CHARACTERISTIC FIVE-YEAR WATER USE

**CWC 10635.**

*(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:*

*(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.*

*(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

CDA's projected water demands are provided in five-year increments over the next 25 years (and through FY 2044-45) in Table 4-3. CDA's projected water demands and water supplies during a normal year, a single dry year, and a five consecutive year drought over the next 25 years (and through FY 2044-45) are provided in Chapter 7.

CDA's "Drought Risk Assessment" (DRA) for the next five years (from FY 2020-21 through FY 2024-25) is discussed in Section 7.3. The DRA includes CDA's projected annual water demands and supplies for each of the next five years and was prepared based on the five driest consecutive years on record. The DRA provides an assessment of CDA's water service reliability during a drought lasting five years.

## 4.3 WORKSHEETS AND REPORTING TABLES

CDA's current and projected water demands from its member agencies, including the water demands from its member agencies for CDA's water use category, are provided in five-year increments over the next 25 years (and through FY 2044-45) in Tables 4-1, 4-2, and 4-3.

### 4.3.1 OPTIONAL PLANNING TOOL USE ANALYSIS WORKSHEET

As discussed in Section 4.2.5, DWR has deemed the "Planning Tool Worksheet" as optional and CDA is not required by DWR to use the tool. A further discussion regarding the reliability of CDA's water supply source is provided in Chapter 7.

### 4.3.2 DWR 2020 UWMP SUBMITTAL TABLES

CDA's current water demands for its water use category during FY 2019-20 are provided in Table 4-1. CDA's projected total water demands for the water use sector, in five-year increments over the next 25 years (and through FY 2044-45), are provided in Table 4-2. CDA's total projected water demands for potable water, in five-year increments over the next 25 years (and through FY 2044-45), are summarized in Table 4-3. As a wholesale supplier, CDA is not required by DWR to perform water loss audits and report distribution system water loss.

**Table 4-1 Demands for Potable and Non-Potable Water – Actual**

| Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual | | | |
|---|---|---|---|
| Use Type | 2020 Actual | | |
| **Drop down list**<br>May select each use multiple times<br>These are the only use types that will be recognized by the WUE data online submittal tool | Additional Description (as needed) | Level of Treatment When Delivered<br>Drop down list | Volume[2] |
| Add additional rows as needed | | | |
| Sales to other agencies | | Drinking Water | 30,247 |
| Other Non-Potable | Waste Process Water | Raw Water | 4,756 |
| | | | |
| | | **TOTAL** | 35,003 |
| [1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*<br>[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.* | | | |
| NOTES: | | | |

**Table 4-2 Use for Potable and Non-Potable Water – Projected**

| Submittal Table 4-2 Wholesale: Use for Potable and Raw Water [1] - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type | Additional Description (as needed) | Projected Water Use [2] Report To the Extent that Records are Available | | | | |
| Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool. | | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Add additional rows as needed | | | | | | |
| Sales to other agencies | | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| Other Non-Potable | | 4,800 | 4,800 | 4,800 | 4,800 | 4,800 |
| | TOTAL | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |

*[1] Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.* [2]

NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2.

**Table 4-3 Total Gross Water Use (Potable and Non-Potable)**

| Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable) | | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Potable and Raw Water From Tables 4-1W and 4-2W | 35,003 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Recycled Water Demand* From Table 6-4W | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL WATER DEMAND** | 35,003 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2.

**Table 4-4 12 Month Water Loss Audit Report (Not Applicable)**

Table 4-4 is not applicable for wholesalers.

## 4.4 WATER USE FOR LOWER INCOME HOUSEHOLDS

**CWC 10631.1.**

*(a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.*

**California Health and Safety Code 50079.5.**

*(a) "Lower income households" means persons and families whose income does not exceed the qualifying limits for lower income families… In the event the federal standards are discontinued, the department shall, by regulation, establish income limits for lower income households for all geographic areas of the state at 80 percent of area median income, adjusted for family size and revised annually.*

As a wholesale supplier, CDA is not required by DWR to report projected water demands for lower income single-family and multi-family households.

**Table 4-5 Inclusion in Water Use Projections (Not Applicable)**

Table 4-5 is not applicable for wholesalers.

## 4.5 CLIMATE CHANGE CONSIDERATIONS

**CWC 10630.**

*It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied, while accounting for impacts from climate change.*

**CWC 10635.**

*(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following…*

*(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

CDA removes salts from brackish groundwater extracted from the lower Chino Basin with the Chino I and II Desalter facilities. The Chino I Desalter commenced operation in 2001 and was expanded in 2005. The Chino II Desalter became operational in 2006. These systems include 30 groundwater extraction wells, pumps, and pipelines that produce and convey untreated groundwater to treatment facilities. CDA produces approximately 35,200 AF from the Chino Basin every year for the purpose of groundwater cleanup and control of contaminant migration. This production is fixed to achieve the desired groundwater cleanup goal and is not impacted by climate change. Impacts of climate change to CDA's member agencies and their sources of supply are included in their respective UWMPs.

Chapter 5

# SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE

## LAY DESCRIPTION – CHAPTER 5

**SB X7-7 BASELINES, TARGETS, AND 2020 COMPLIANCE**

Chapter 5 (SB X7-7 Baselines, Targets, and 2020 Compliance) of CDA's 2020 Plan discusses and provides the following:

- The Water Conservation Act of 2009 (or SB X7-7) required the State of California achieve a 20 percent reduction in urban water use by the year 2020.
- SB X7-7 required urban water suppliers to develop a "2020 Water Use Target" to assist the State of California to achieve the 20 percent reduction. The 2020 Water Use Target represents the amount of water each person should use per day (i.e. gallons per capita per day or GPCD) by the year 2020.
- As a wholesale water agency, CDA is not required to calculate a 2020 Water Use Target or show compliance with the 2020 Water Use Target. However, an assessment regarding CDA's present and proposed future measures, programs, and policies to assist the retail water suppliers in CDA's service area achieve their individual 2020 Water Use Targets is provided (in Chapter 9).

## 5.1 GUIDANCE FOR WHOLESALE AGENCIES

**CWC 10608.12.**

*(I) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.*

CDA is a wholesale agency and is not required by DWR to complete Section 5.2 through 5.8.

## 5.2 SB X7-7 FORMS AND SUMMARY TABLE

**CWC 10608.20.**

*(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*

CDA is a wholesale agency and is not required by DWR to complete Section 5.2.

### *5.2.1 SB X7-7 VERIFICATION FORM (BASELINES AND TARGETS)*

### *5.2.2 SB X7-7 COMPLIANCE FORM*

### *5.2.3 SUBMITTAL TABLES 5-1 AND 5-2*

### *5.2.4 REGIONAL UWMP/ REGIONAL ALLIANCE*

**Table 5-1 Baselines and Targets Summary from SB X7-7 Verification Form (Not Applicable)**
Table 5-1 is not applicable for wholesalers.

**Table 5-2 2020 Compliance from SB X7-7 2020 Compliance Form (Not Applicable)**
Table 5-2 is not applicable for wholesalers.

## 5.3 BASELINE AND TARGET CALCULATIONS FOR 2020 UWMPS

CDA is a wholesale agency and is not required by DWR to complete Section 5.3.

### *5.3.1 SUPPLIER SUBMITTED 2015 UWMP, NO CHANGE TO SERVICE AREA*

## 5.4 METHODS FOR CALCULATING POPULATION AND GROSS WATER USE

**CWC 10608.20.**

*(e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

*(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.*

**CWC 10644.**

*(a)(2) The plan… shall include any standardized forms, tables, or displays specified by the department.*

CDA is a wholesale agency and is not required by DWR to complete Section 5.4.

### *5.4.1 SERVICE AREA POPULATION*

### *5.4.2 GROSS WATER USE*

## 5.5 2020 COMPLIANCE DAILY PER CAPITA WATER USE (GPCD)

**CWC 10608.12.**

*(h) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:*

*(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.*
*(2) The net volume of water that the urban retail water supplier places into long-term storage.*
*(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.*
*(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.*

**California Code of Regulations Title 23 Division 2 Chapter 5.1 Article 1, Section 596.**

*(a) An urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector.*

CDA is a wholesale agency and is not required by DWR to complete Section 5.5.

### *5.5.1 2020 ADJUSTMENTS FOR FACTORS OUTSIDE OF SUPPLIER'S CONTROL*

### 5.5.2 SPECIAL SITUATIONS

### 5.5.3 IF SUPPLIER DOES NOT MEET 2020 TARGET

## 5.6 REGIONAL ALLIANCE

CDA is a wholesale agency and is not required by DWR to complete Section 5.6.

Chapter 6

# WATER SUPPLY CHARACTERIZATION

## LAY DESCRIPTION – CHAPTER 6

### WATER SUPPLY CHARACTERIZATION

Chapter 6 (Water Supply Characterization) of CDA's 2020 Plan discusses and provides the following:

- CDA's water supply source consists of groundwater from the southwesterly portion of the Chino Basin which is treated at its treatment facilities. A tabulation of CDA's historical water supplies is provided in Section 6.1.
- A discussion regarding CDA's groundwater supplies from the Chino Basin is provided. Information regarding basin location, adjudication, management, water levels, water quality, water rights, and historical production is provided.
- CDA's proposed future projects to maximize its water supply resources are discussed.
- CDA's "energy intensity" is discussed and represents the quantity of energy consumed, measured in kilowatt hours, divided by the volume of water, measured in acre-feet over a one-year period. The total energy intensity associated with CDA's water management processes was estimated during FY 2019-20.

In this Chapter, CDA will identify and describe its source of water supply. In addition, CDA will describe the following:

- Management of the water supply source;
- Current provisions of a basin adjudication or Groundwater Sustainability Plan (GSP), as applicable, pertaining to management of groundwater supplies;
- Measures CDA is taking to develop potential new sources of water supply (as applicable); and
- Opportunities for exchanges and transfers on a long- or short-term basis.

The characterization of CDA's water supply source will account for the anticipated availability during a normal year, a single dry year, a five consecutive year drought, along with projections through FY 2044-45.

## 6.1 WATER SUPPLY ANALYSIS OVERVIEW

**CWC 10631.**

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following:*

*(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.*

*(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies*

**CWC 10631.**

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

CDA's water supply source consists of groundwater from the southwesterly portion of the Chino Basin which is treated at its treatment facilities. A tabulation of CDA's historical water supply is provided below.

| Fiscal Year | System Water Supply Sources (AF) | Total |
|---|---|---|
| | Groundwater | |
| | Chino Basin | |
| 2010-11 | 29,349 | 29,349 |
| 2011-12 | 28,381 | 28,381 |
| 2012-13 | 27,098 | 27,098 |
| 2013-14 | 29,282 | 29,282 |
| 2014-15 | 30,022 | 30,022 |
| 2015-16 | 28,191 | 28,191 |
| 2016-17 | 28,284 | 28,284 |
| 2017-18 | 29,918 | 29,918 |
| 2018-19 | 31,199 | 31,199 |
| 2019-20 | 35,003 | 35,003 |

Source: Data provided by the Chino Basin Desalter Authority

### 6.1.1 SPECIFIC ANALYSIS APPLICABLE TO ALL WATER SUPPLY SOURCES

The section below provides a discussion of the following information to the extent practical:

- CDA's existing and planned sources of water supply are identified;
- The source of supply is quantified in five-year increments through FY 2044-45;
- The anticipated supply availability under normal, single dry, and five consecutive dry years, and any other water year conditions included in the DRA (see Chapter 7) are described;
- The management of the water supply in correlation with other identified supplies is described; and,
- Information pertinent to the reliability analysis is considered.

CDA has historically relied on groundwater supplies from the Chino Basin to serve its member agencies. The following descriptions summarize CDA's source of supply (detailed descriptions are provided in Section 6.2).

Existing and Planned Sources of Supply

Purchased Imported Water

CDA does not purchase imported water supplies to meet its water demands.

Groundwater

CDA has historically pumped groundwater directly from the Chino Basin as described in Section 6.2.2. In addition, Section 6.2.2 provides a detailed discussion of the existing and planned supply of the groundwater, including a description of the management and reliability of those groundwater supplies. Table 6-8 summarizes the actual groundwater supplies for FY 2019-20. In addition, Table 6-9 summarizes the projected water supply, in five-year increments, through FY 2044-45 under varying water supply conditions.

Surface Water

CDA does not use surface water supplies to meet its water demands.

Storm Water

CDA has historically treated groundwater from the Chino Basin. Management and use of the stormwater runoff from the groundwater basin watershed, which is crucial to groundwater management, is described in Section 6.2.4. However, CDA currently does not have its own program to beneficially use stormwater runoff as a direct source of supply.

Wastewater and Recycled Water

CDA does not use wastewater and recycled water supplies to meet its water demands.

### *6.1.2 OTHER CHARACTERIZATION CONSIDERATIONS*

A description of CDA's water system along with a map of the area which receives water supplies from CDA is included in Chapter 3. In addition, the agencies which manage the water supplies treated by CDA are identified in Section 6.2.1 (imported water), 6.2.2 (groundwater), 6.2.3 (surface water), 6.2.4 (stormwater), and 6.2.5 (recycled water).

### *6.1.3 OPTIONAL PLANNING TOOL*

As discussed in Section 4.2.5, DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and assess monthly water use trends. However, DWR has deemed the tool as optional and CDA is not required by DWR to use the tool. However, Section 6.1 provides a

tabulation of CDA's historical annual water use. During the past 10 years, CDA's member agencies experienced a five consecutive year drought from FY 2011-12 to FY 2015-16.

## 6.2 NARRATIVE SECTIONS FOR SUPPLIER'S UWMP WATER SUPPLY CHARACTERIZATION

### *6.2.1 PURCHASED OR IMPORTED WATER*

CDA does not use purchased or imported water supplies to meet its water demands.

### *6.2.2 GROUNDWATER*

**CWC 10631.**

*(b)(4) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information:*

*(A) The current version of any groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720), any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management for basins underlying the urban water supplier's service area.*

*(B) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For basins that a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For a basin that has not been adjudicated, information as to whether the department has identified the basin as a high- or medium-priority basin in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to coordinate with groundwater sustainability agencies or groundwater management agencies listed in subdivision (c) of Section 10723 to maintain or achieve sustainable groundwater conditions in accordance with a groundwater sustainability plan or alternative adopted pursuant to Part 2.74 (commencing with Section 10720).*

*(C) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

*(D) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

## CHINO BASIN

### Chino Basin - Sustainable Groundwater Management Act

The Chino Basin is a sub-basin of the Upper Santa Ana Valley Groundwater Basin pursuant to DWR Bulletin 118, Basin Number 8-2.01. Pursuant to the Sustainable Groundwater Management Act of 2014 (SGMA), the Chino Basin was named as an adjudicated groundwater basin and is exempt from the requirements of developing a GSP and subsequently was designated a very-low-priority basin in DWR's 2019 SGMA Basin Prioritization report. In compliance with SGMA, the Chino Basin Watermaster submits its Annual Report to DWR.

### Chino Basin - Adjudication

The Chino Basin was adjudicated under the Chino Basin Judgment, entered on January 27, 1978 by the Superior Court for the County of San Bernardino. A copy of the Chino Basin Judgment is provided in Appendix D. The provisions of the Judgment are administered and managed by the court-ordered Chino Basin Watermaster.

The Chino Basin Judgment originally established a Safe Yield for the Chino Basin of 140,000 AFY. Pursuant to the most recent Safe Yield reset effective in 2020, the Safe Yield in the Chino Basin is currently 131,000 AFY (July 1 to June 30). The Safe Yield is recalculated every 10 years and is defined in the Chino Basin Judgment as "the long-term average annual quantity of ground water (excluding replenishment of stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Chino Basin under conditions of a particular year without causing an undesirable result". The Chino Basin Judgment's allocation of the Safe Yield includes three separate Pools: (1) the "Overlying Agricultural Pool"; (2) the "Overlying Non-Agricultural Pool"; and (3) the "Appropriative Pool".

Appropriators who are Parties to the Chino Basin Judgment, are authorized to produce groundwater in excess of their rights. Appropriators pay assessments for such production to the Chino Basin Watermaster. The assessments are used to replenish the Chino Basin through replenishment of imported surface water. The Chino Basin Watermaster purchases water from Metropolitan Water District of Southern California through Inland Empire Utilities Agency and Three Valleys Municipal Water District, on behalf of the Parties, to replenish the Chino Basin. Occasionally, Watermaster has purchased water from storage accounts from Parties within the Chino Basin.

The Chino Basin Watermaster can reallocate the unused portion of the Chino Basin Safe Yield from the Overlying Agricultural Pool to the Appropriative Pool members as a supplement to the Appropriative Pool share of Operating Safe Yield rights in any year. These transfers are permanent if agricultural land has been converted to non-agricultural use, or temporary if agricultural pool

extractions are less than their share of the Safe Yield. From FY 2000-01 to FY 2019-20, the annual quantity of the Agricultural Pool share available for reallocation to Appropriative Pool members[2] ranged from 40,822 AF to 61,014 AF, with an annual average of approximately 50,457 AF. As Agricultural Pool production declines within the Chino Basin, the reallocation of water to the Appropriative Pool will increase.

**Chino Basin - Description**

The Chino Basin is located within the Upper Santa Ana Valley, which is located in San Bernardino County and is bounded on the east by the Rialto-Colton fault; on the southeast by the contact with impermeable rocks forming the Jurupa Mountains; on the south by impermeable rocks of the Puente Hills and by the Chino fault; on the northwest by the San Jose fault; and on the north by the impermeable rocks of the San Gabriel Mountains and by the Cucamonga fault. The location of the Chino Basin is provided in Figure 4. The surface area of the Chino Basin is approximately 154,000 acres (or 240 square miles). The San Antonio Creek and Cucamonga Creek drain the Chino Basin area southward and flow into the Santa Ana River. Pursuant to DWR Bulletin 118 (for Basin Number 8-2.01), the total storage capacity of the Chino Basin is approximately 18,300,000 AF.

The water-bearing units in the Chino Basin includes Holocene and Upper Pleistocene alluvium. This Holocene alluvium consists mainly of alluvial-fan deposits, with maximum thickness of 150 feet that are coarsest in and near the mouths of the canyons and are finer away from canyon mouths in the southern part of the Chino Basin. The Pleistocene alluvium is exposed mainly in the northern part of the subbasin and supplies most of the water to wells located within the Chino Basin. The Pleistocene alluvium is about 600 to 700 feet thick throughout most of the Chino Basin. The alluvium contains interfingering finer, alluvial-fan deposits and coarser, fluvial deposits.

The Chino Basin is bounded by three major fault systems. Many of the faults within the Chino Basin form groundwater barriers marked by discontinuities in groundwater elevations. The Rialto-Colton fault forms the eastern boundary of the Chino Basin. Although it has no surface expression, it forms a major barrier to groundwater movement. The San Jose fault forms the northwest boundary of the Chino Basin. The Cucamonga fault zone forms part of the northern boundary of the Chino Basin. Displacement on the Cucamonga fault amounts to about 1,000 feet on its west end to 4,000 feet at its east end.

2 Pursuant to the Chino Basin Watermaster "*Fiscal Year 2019-20, 43rd Annual Report*", Appendix G

## Chino Basin - Management

### Basin Production

Over the past 20 years, total groundwater production from the Chino Basin has ranged from approximately 133,275 AFY to 188,910 AFY[3]. A majority of production currently is pumped for municipal and agricultural purposes and the remaining production is pumped by non-agricultural Parties.

### Groundwater Level Monitoring

Groundwater elevation contours in the Chino Basin Watermaster's 2018 State of the Basin Report show a regional depression of groundwater surrounding the Chino-II Desalter well field and the eastern half of the Chino-I Desalter well field. Hydraulic Control of the Chino Basin is achieved east of Chino Desalter Well I-20. The contours also indicate groundwater flowing past the desalter wells west of Chino Desalter Well I-20, indicating only partial Hydraulic Control.

### Chino Basin Desalter Authority

On September 25, 2001, CDA was formed under a Joint Exercise of Powers Agreement to remove salts from brackish groundwater extracted from the lower Chino Basin. The area which receives water supplies from CDA is 304 square miles. A map showing CDA Desalter facilities and associated wells is provided below.

CDA removes salts from brackish groundwater extracted from the lower Chino Basin through the Chino I and II Desalter facilities. The Chino I Desalter is located in the City of Chino and commenced operation in 2001 and was expanded in 2005 to have a total capacity of 14.2 MGD. The Chino I Desalter includes reverse osmosis, ion exchange, and air stripper treatment for treating brackish water and removing nitrate and volatile organic chemicals (VOCs). The Chino II Desalter is located in Jurupa Valley and began operation in 2006 and was expanded in 2011 and again in 2017 to have a total capacity of 33 MGD. The Chino II Desalter includes reverse osmosis and ion exchange treatment for treating brackish water and removing nitrate. Following the expansion, CDA constructed the Concentrate Reduction Facility in 2017, which utilizes chemical softening to remove the limiting foulants (specifically, calcium and silica) from the reverse osmosis concentrate. Additional components of the Chino II Desalter were constructed as part of the South Archibald Plume Project which will be operational in 2021, with the goal of removing and treated trichloroethylene (TCE) from groundwater wells impacted by the South Archibald Plume.

3 Pursuant to the Chino Basin Watermaster "*Fiscal Year 2019-20, 43rd Annual Report*", Appendix H http://www.cbwm.org/rep_annual.htm

## Location of CDA Facilities

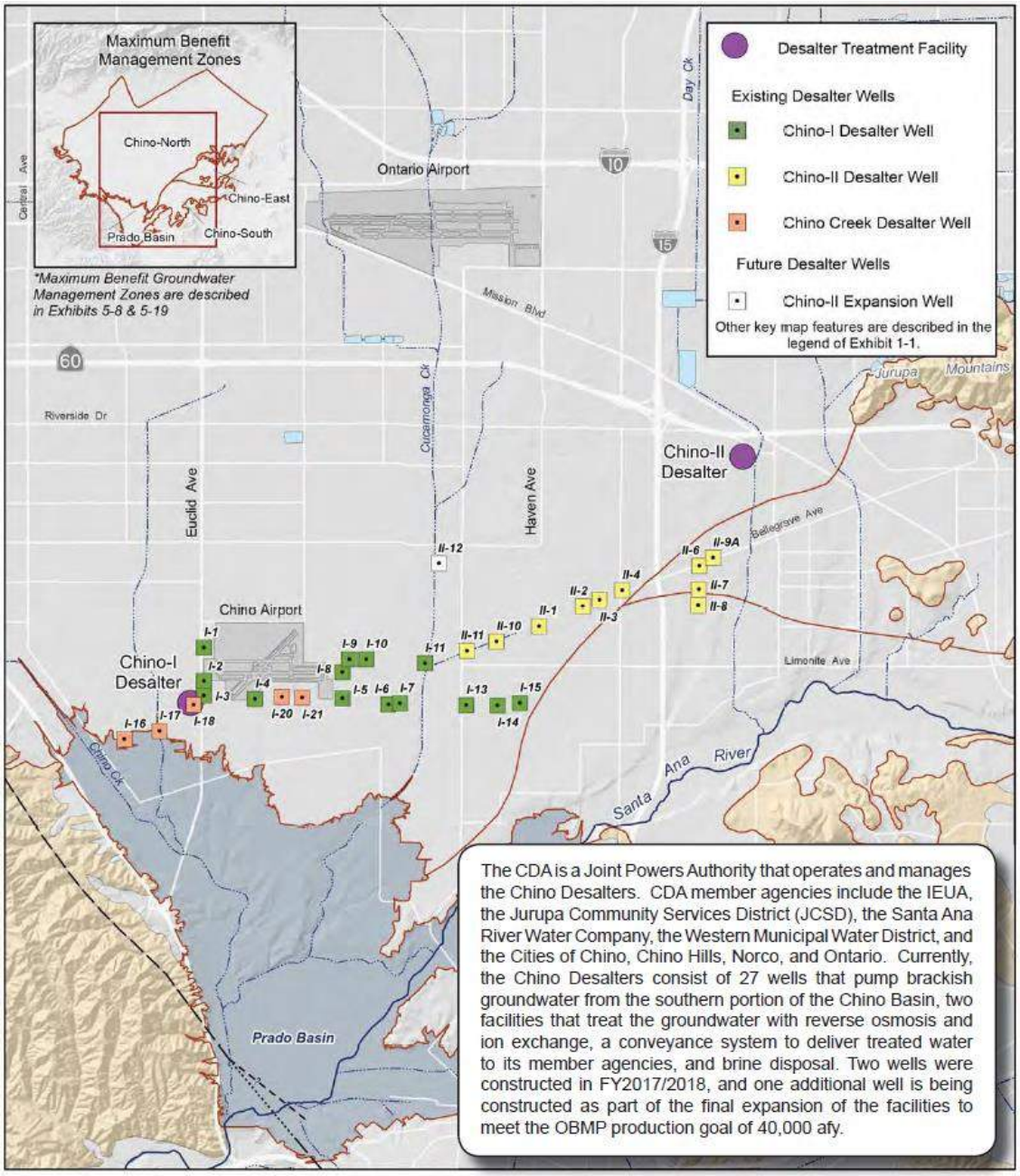


(source: Chino Basin Optimum Basin Management Program 2018 State of the Basin Report)

Treated water is distributed to CDA's member agencies which include the City of Chino, City of Chino Hills, City of Norco, City of Ontario, Inland Empire Utilities Agency, Jurupa Community

Services District, Santa Ana River Water Company, and Western Municipal Water District. The CDA's member agencies provide water service within Riverside County and San Bernardino County. The member agencies have contract entitlements to receive a total of 35,200 AFY of treated water from CDA.

A portion of the production is in-lieu of those CDA member agencies producing an equal amount of groundwater from their own groundwater wells using their individual water rights. An additional portion of the production is temporarily assigned as "controlled overdraft". Pursuant to the Chino Basin Judgment, a total of 200,000 AF was authorized for controlled overdraft between the period of 1978 through 2017. In 2007, the Peace II Agreement was adopted to establish measures for achieving hydraulic control of the Chino Basin. One of the measures put forth included increasing the authorized controlled overdraft to 600,000 AF. This increase in controlled overdraft is separate from, and in addition to, the 200,000 AF authorized in the Chino Basin Judgment and is available for utilization until December 31, 2030. For the balance of the production, the Chino Basin Watermaster levies an annual Replenishment Assessment to purchase replenishment water to replace that overproduced water. The untreated imported water demands are shared proportionally amongst CDA's member agencies.

Chino Basin Optimum Basin Management Program

In 2000, the Chino Basin Watermaster developed the Chino Basin Optimum Basin Management Program (OBMP). The OBMP was developed in a collaborative process that identified the needs of the stakeholders, described the physical state of the basin, defined a set of management goals, identified impediments to these goals, and established a series of actions that would remove these impediments and achieve the management goals. The goals identified in the 2000 OBMP included: (1) Enhance Basin Water Supplied; (2) Protect and Enhance Water Quality; (3) Enhance Management of the Basin; and (4) Equitably Finance the OBMP.

In September 2018, the Chino Basin Watermaster initiated the process to update the OBMP and its Implementation Plan. Throughout 2019, the Chino Basin Watermaster held a series of public listening sessions to support the development process of the 2020 OBMP Update. The purpose of the listening sessions was to confirm the need to update the OBMP, to identify the issues, needs, and wants of the stakeholders, to define the goals for the 2020 OBMP Update, and to identify new and revised actions that could be included in to 2020 OBMP Update to remove the impediments to achieving the 2020 OBMP Update goals. After an assessment of the basin, the stakeholders concluded that the four (4) goals defined in the 2000 OBMP are unchanged and still relevant for the 2020 OBMP Update.

In 2019, the stakeholders identified and described 12 management activities that, if implemented, would address their issues, needs, and wants. The 12 management activities addressed 55 of the 57 needs identified by the stakeholders. Nine of the activities (A, B, C, D, E, F, G, K, and L) were combined into seven basin management activities and the remaining three activities (H, I, and J)

were identified as actions that can be accomplished by incorporating them into the scope of work of every activity or were more appropriate for inclusion within an implementation agreement. The seven basin management activities selected to help achieve the goals of the 2020 OBMP Update are:

- *Activity A – Increase the capacity to store and recharge storm and supplemental water*
- *Activity B – Develop, implement, and optimize Storage and Recovery Programs*
- *Activity C and G – Identify and implement regional conveyance and treatment projects/ programs and optimize the use of all water supply sources*
- *Activity D – Maximize the reuse of recycled water produced by the IEUA and others*
- *Activity E and F – Develop and implement a groundwater-quality management plan to address contaminants of emerging concern*
- *Activity K – Develop a management strategy within the maximum-benefit salt and nutrient management plan to ensure compliance with recycled water recharge dilution requirements*
- *Activity L – Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory requirements*

Each activity is a management process to optimize some aspect of basin management. The actions defined by the stakeholders to remove the impediments to the four OBMP goals were grouped into Program Elements, each of which included a list of implementation actions and an implementation schedule. The nine Program Elements defined in the 2000 OBMP were retained for the 2020 OBMP Update. Each of the seven activities, and the associated implementation actions, were incorporated into Program Elements, which were updated based on feedback from the stakeholders. The Program Elements defined in the 2020 OBMP Update include:

- Program Element 1 - Develop and Implement Comprehensive Monitoring Program
- Program Element 2 - Develop and Implement Comprehensive Recharge Program
- Program Element 3 - Develop and Implement a Water Supply Plan for Impaired Areas
- Program Element 4 - Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1
- Program Element 5 - Develop and Implement Regional Supplemental Water Program
- Program Element 6 - Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin
- Program Element 7 - Develop and Implement Salt Management Plan
- Program Element 8 - Develop and Implement Groundwater Storage Management Program
- Program Element 9 - Develop and Implement Storage and Recovery Programs

<u>Chino Basin Storage Management Plan</u>

The Chino Basin Storage Management Plan was created to mitigate adverse impacts to the Chino Basin from factors including reductions in net recharge and Safe Yield, and increased groundwater discharge to the Santa Ana River contributing to the loss of Hydraulic Control. The Chino Basin Storage Management Plan identifies technical storage management issues within the Chino Basin, establishes storage management activities for producers, and outlines key measures for the Storage and Recovery Programs.

Since the Chino Basin Judgment came into effect in 1978, the Chino Basin Watermaster developed rules and regulations, standard storage agreements, and related forms. Since 2000, Chino Basin Watermaster administered groundwater storage in the Chino Basin pursuant to the storage management plan described in Program 8 of the 2000 OBMP and evaluated in the Programmatic Environmental Impact Report. Since then, Parties have indicated that they will likely exceed the storage space initially estimated in the OBMP Implementation Plan. Thus, Chino Basin Watermaster found it necessary to develop a new storage management plan.

The three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield and Basin Water purchased or transferred from other Parties. A Local Supplemental Water account includes any imported and/or recycled water that is recharged by a producer and similar water acquired from other Parties. A Storage and Recovery Account includes Supplemental Water and is intended to produce a broad and mutual benefit to the Parties of the Judgement." The Chino Basin Watermaster tracks the puts, takes, losses, and end-of-year storage totals for all storage accounts and reports on this accounting on an annual basis. The Chino Basin Watermaster assesses losses by considering water in managed storage (excluding Carryover) and offsets the increases in groundwater discharge to the Santa Ana River and from the Chino Basin attributable to managed storage (excluding Carryover). Chino Basin Watermaster also considers losses due to evaporation on the puts when water is recharged in spreading basins.

The individual Parties are involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Chino Basin Watermaster has an application and review process for these transfers. The Parties engage in conjunctive-use activities individually by storing Chino Basin and Supplemental Water that are in excess of their demands and recover that water as necessary. These activities collectively cause a temporary increase in the managed storage. The Parties' aggregate amount of water in managed storage was 541,845 AF as of June 30, 2020.

The Metropolitan Water District's Dry-Year Yield Program (DYYP) is an active storage and Recovery Program in Chino Basin. The DYYP can store up to 100,000 AF with maximum replenishment of 25,000 AFY and maximum extraction of 33,000 AFY. As of June 30, 2020, there was 45,961 AF within the DYYP account, resulting in a total managed storage volume of 587,806 AF (541,845 AF + 45,961 AF). The agreement that authorized the DYYP will expire in

2028. The combined volume of managed storage by Metropolitan's DYYP and the Parties is projected to have a maximum of 790,000 AF in 2028, assuming DYYP has 100,000 AF in storage and that MWD removes the contract rate of 33,000 AFY starting in 2029.

Of the first 1,000,000 AF of managed storage, 800,000 AF is reserved for the Parties' conjunctive-use activities (including Carryover, Excess Carryover, and Supplemental Accounts) and MWD's DYYP. This 800,000 AF is referred to as the "First Managed Storage Band". The managed storage between 800,000 AF and 1,000,000 AF is reserved for Storage and Recovery Programs. Allocation of storage space reservations may be revised in subsequent updates of the Storage Management Plan. Use of managed storage greater than 1,000,000 AF is allowed if the storing entity submits a Storage and Recovery Program application, demonstrates that the program will have broad mutual benefits, ensure there will be no adverse impacts, meets mitigation requirements of the Chino Basin Watermaster, complies with the California Environmental Quality Act (CEQA), and obtains approval from the Chino Basin Watermaster.

The Parties and IEUA, through the OBMP, have substantially increased the amount of storm and supplemental water recharge capacity in the Chino Basin. The increase in supplemental water recharge capacity was done to ensure that the Chino Basin Watermaster is able to meet replenishment requirements pursuant to Regional Board and Court orders. The Chino Basin Watermaster indicates that it will prioritize the use spreading basins to satisfy replenishment obligations over the use of spreading basins for other uses.

Storage and Recovery programs are applied in Management Zone 2 and Management Zone 3 to avoid new land subsidence and interfering with land subsidence management in Management Zone 1, to minimize the impact of storage and recovery operations on solvent plumes, to retain hydraulic control, and to utilize the larger groundwater storage capacity of Management Zone 2 and Management Zone 3. The Chino Basin Watermaster reviews each Storage and Recovery Program application, estimates the surface and groundwater level response, prepares a report that describes potential adverse impacts, and develops mitigation requirements.

Chino Basin Watermaster will periodically and review the Storage Management Plan on no less than a five-year frequency, when the Safe Yield is recalculated, or when the Chino Basin Watermaster determines an update is warranted based on new information or needs of the Parties or the Chino Basin.

The Storage Management Plan was prepared in parallel with the 2020 OBMP Update. Chino Basin Watermaster published the final Storage Management Plan report and it was incorporated into Program Elements 8 and 9 (Storage and Recovery Programs) of the OBMP update process and was approved in June 2020.

Chino Basin Subsidence Management Plan

The Chino Basin Subsidence Management Plan was developed in 2015 and its purpose was to: minimize subsidence and fissuring; collect information necessary to understand the extent, rate, and mechanisms of subsidence and fissuring; and establish a management plan to reduce tolerable levels or abate future subsidence and fissuring.
From 2001 to 2005, Chino Basin Watermaster developed, coordinated, and conducted the MZ-1 Interim Monitoring Program and the main conclusions derived were:

1. Groundwater production from the deep, confined aquifer system in the southwestern region of MZ-1 causes the greatest stress to the aquifer system.
2. Groundwater-level decline due to pumping of the deep aquifer can cause irreversible compaction of the aquifer-system sediments, resulting in land subsidence.
3. The state of aquifer-system deformation in southern MZ-1 (in the vicinity of Ayala Park) was essentially elastic. Very little non-recoverable compaction was occurring in MZ-1, which contrasted historical measurements when about 2.2 feet of land subsidence occurred from about 1987 to 1995 and was accompanied by ground fissuring.
4. During this study, a previously undetected barrier to groundwater flow, the "Riley Barrier," was identified. The Riley Barrier is located within the deep aquifer system and aligned with the historical zone of ground fissuring. Pumping from the deep aquifer system was limited to the area west of the barrier, and the resulting groundwater-level decline did not propagate eastward across the barrier.
5. InSAR and ground-level survey data indicated that subsidence had occurred in the central region of MZ-1 in the past and was continuing to occur. The InSAR data also suggested that the groundwater barrier extends northward into central MZ-1.

The Chino Basin Watermaster currently conducts the monitoring program as described below:

- Production - Production data will be collected from the owners of wells.
- Recharge - The volumes of imported, storm, and recycled waters that are artificially recharged at basins in the Area, and of recycled water that is used for direct use will be collected from IEUA for each fiscal year.
- Piezometric Levels - Piezometric levels will be measured and recorded once every 15 minutes using pressure transducers at select wells. The wells used in the monitoring program will be periodically assessed, and transducers in wells will be removed or added as deemed necessary by the Ground-Level Monitoring Committee.
- Vertical Aquifer-System Deformation - Watermaster will measure and record the vertical component of aquifer-system deformation at the Ayala Park Extensometer (MZ-1 Managed Area) and the Chino Creek Extensometer (Southeast Area) once every 15 minutes.

- Vertical Ground-Surface Deformation - Watermaster will measure vertical ground motion via traditional leveling surveys and remote sensing techniques (InSAR). The Ground-Level Monitoring Committee will annually recommend the scope and frequency of leveling surveys and InSAR measurements within the Area.
- Horizontal Ground-Surface Deformation - Watermaster will measure horizontal ground motion across areas that are susceptible to ground fissuring in the MZ-1 Managed Area and Northwest MZ-1 Area via EDMs.

At the beginning of each calendar year, Chino Basin Watermaster staff and engineers will analyze the data generated during the prior calendar year. Results and interpretations generated from the analysis will be documented in an annual report and is used to prepare recommendations for future planning.

Groundwater Clean-up

Groundwater in areas of the Chino Basin is currently contaminated with Perchlorate and VOCs, including 1,2,3-Tricholropropane (1,2,3-TCP), trichloroethylene (TCE), and perchloroethylene (PCE). In addition, nitrates and TDS concentrations in areas of the Chino Basin exceed drinking water quality standards. Wellhead treatment is necessary in these areas to allow delivery of the groundwater for potable purposes.

**Chino Basin - Historical and Projected Basin Production**

CDA can produce approximately 40,000 AF from the Chino Basin every year for the purpose of groundwater cleanup and control of contaminant migration. This production is fixed to achieve the desired groundwater cleanup goal. CDA's member agencies have contract entitlements to receive a total 35,200 AFY of treated water from CDA. CDA's treatment process also results in waste process water (i.e. brine) which is discharged to the Inland Empire Brine Line and conveyed to the Orange County Sanitation District for treatment and disposal to the Pacific Ocean. Over the past five years, CDA has produced 28,191 AFY to 35,003 AFY, with an average of 30,519 AFY from the Chino Basin.

**Table 6-1 Groundwater Volume Pumped**

| Submittal Table 6-1 Wholesale: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | Supplier does not pump groundwater.<br>The supplier will not complete the table below. | | | | | |
| ☑ | All or part of the groundwater described below is desalinated. | | | | | |
| Groundwater Type | Location or Basin Name | 2016* | 2017* | 2018* | 2019* | 2020* |
| *Add additional rows as needed* | | | | | | |
| Alluvial Basin | Chino Basin | 28,191 | 28,284 | 29,918 | 31,199 | 35,003 |
| | **TOTAL** | 28,191 | 28,284 | 29,918 | 31,199 | 35,003 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

### 6.2.3 SURFACE WATER

CDA does not use surface water supplies to meet its water demands.

### 6.2.4 STORMWATER

CDA does not use stormwater to meet its water demands.

### 6.2.5 WASTEWATER AND RECYCLED WATER

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:*

*(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

*(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

*(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

*(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands,*

*industrial reuse, potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

*(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

*(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*

*(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

As a wholesale water supplier, CDA provides treated groundwater to its member agencies which in turn provides water to their retail customers. Wholesale suppliers are not required to summarize wastewater generation or treatment within their service area. CDA does not provide supplemental treatment to recycled water prior to distribution.

CDA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by CDA and there are no plans for use within the planning horizon of this UWMP.

### *6.2.5.1 RECYCLED WATER COORDINATION*

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area…*

CDA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by CDA and there are no plans for use within the planning horizon of this UWMP. This section is not applicable to CDA.

### 6.2.5.2 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

**CWC 10633.**

*(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*

CDA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by CDA and there are no plans for use within the planning horizon of this UWMP. This section is not applicable to CDA.

**Table 6-2 Wastewater Collected Within Area in 2020 (Not Applicable)**

Table 6-2 is not applicable for wholesalers.

**Table 6-3 Wastewater Treatment and Discharge within Service Area in 2020**

| Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ☑ | Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water. The Supplier will not complete the table below. | | | | | | | | | | |
| | | | | | | | 2020 volumes [1] | | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* [2] | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list* | Treatment Level *Drop down list* | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area | Instream Flow Permit Requirement |
| *Add additional rows as needed* | | | | | | | | | | | |
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| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | Total | 0 | 0 | 0 | 0 | 0 |

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.
[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

### 6.2.5.3 RECYCLED WATER SYSTEM DESCRIPTION

**CWC 10633.**

*(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

CDA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by CDA and there are no plans for use within the planning horizon of this UWMP. This section is not applicable to CDA.

### 6.2.5.4 POTENTIAL, CURRENT, AND PROJECTED RECYCLED WATER USES

**CWC 10633.**

*(b) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use. A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

*(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*

*(e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

CDA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by CDA and there are no plans for use within the planning horizon of this UWMP. This section is not applicable to CDA.

**Table 6-4 Current and Projected Recycled Water Direct Beneficial Uses Within Service Area**

| Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☑ | Recycled water is not directly treated or distributed by the Supplier.<br>The Supplier will not complete the table below. | | | | | | |
| Name of Receiving Supplier or Direct Use by Wholesaler | Level of Treatment<br>*Drop down list* | 2020* | 2025* | 2030* | 2035* | 2040* | 2045* *(opt)* |
| *Add additional rows as needed* | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |
| | | | | | | | |
| | **Total** | 0 | 0 | 0 | 0 | 0 | 0 |
| *** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3. | | | | | | | |
| NOTES: | | | | | | | |

**Table 6-5 2015 Recycled Water Use Projection Compared to 2020 Actual**

| Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual | | |
|---|---|---|
| ☑ | Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020.<br>The wholesale supplier will not complete the table below. | |
| Name of Receiving Supplier or Direct Use by Wholesaler | 2015 Projection for 2020* | 2020 Actual Use* |
| *Add additional rows as needed* | | |
| | | |
| | | |
| | | |
| | | |
| **Total** | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | |
| NOTES: | | |

#### 6.2.5.5 ACTIONS TO ENCOURAGE AND OPTIMIZE FUTURE RECYCLED WATER USE

**CWC 10633.**

*The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:*

*(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

CDA does not have a service area, but rather provides potable water supplies within the service areas of its member agencies. Recycled water is not used by CDA and there are no plans for use within the planning horizon of this UWMP. This section is not applicable to CDA.

**Table 6-6 Methods to Expand Future Recycled Water Use (Not Applicable)**
Table 6-6 is not applicable for wholesalers.

### 6.2.6 DESALINATED WATER OPPORTUNITIES

**CWC 10631.**

*(g) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

Chino Basin

As discussed in Section 6.2.2, CDA removes salts from brackish groundwater extracted from the lower Chino Basin through the Chino I and II Desalter facilities. The Chino I Desalter is located in the City of Chino and commenced operation in 2001 and was expanded in 2005 to have a total capacity of 14.2 MGD. The Chino I Desalter includes reverse osmosis, ion exchange, and air stripper treatment for treating brackish water and removing nitrate and VOCs. The Chino II Desalter is located in Jurupa Valley and began operation in 2006 and was expanded in 2011, and again in 2017 to have a total capacity of 33 MGD. The Chino II Desalter includes reverse osmosis and ion exchange treatment for treating brackish water and removing nitrate. Following the expansion, CDA constructed the Concentrate Reduction Facility in 2017, which utilizes chemical softening to remove the limiting foulants (specifically, calcium and silica) from the reverse osmosis concentrate. Additional components of the Chino II Desalter were constructed as part of

the South Archibald Plume Project which will be operational in 2021, with the goal of removing and treated TCE from groundwater wells impacted by the South Archibald Plume. Information regarding the Chino I and II Desalter facilities is provided in Table 6-8ds.

**OPTIONAL Table 6-8ds: Source Water Desalination**

| ☐ | Neither groundwater nor surface water are reduced in salinity prior to distribution. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Plant Name or Well ID | Plant Capacity | Intake Type *Drop down list* | Source Water Type *Drop down list* | Influent TDS | Brine Discharge *Drop down list* | Volume of Water Desalinated | | | | |
| | | | | | | 2016 | 2017 | 2018 | 2019 | 2020 |
| Chino I Desalter | 14.2 MGD | vertical well | groundwater | 1,330 mg/L | Brine Line | 28191 | 28284 | 29918 | 31199 | 35003 |
| Chino II Desalter | 33 MGD | vertical well | groundwater | 640 mg/L | Brine Line | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | **Total** | 28191 | 28284 | 29918 | 31199 | 35003 |

**Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

Notes: "Brine Discharge" is to the Santa Ana River Interceptor. "Volume of Water Desalinated" for Chino 1 Desalter is based on the combined volume for both the Chino I and Chino II Desalters

Treated water is distributed to CDA's member agencies which include the City of Chino, City of Chino Hills, City of Norco, City of Ontario, Inland Empire Utilities Agency, Jurupa Community Services District, Santa Ana River Water Company, and Western Municipal Water District. The member agencies have contract entitlements to receive a total of 35,200 AFY of treated water from CDA. A portion of the production is in-lieu of those CDA member agencies producing an equal amount of groundwater from their own groundwater wells from the Chino Basin using their individual water rights.

## 6.2.7 WATER EXCHANGES AND TRANSFERS

**CWC 10631.**

*(c) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

### 6.2.7.1 EXCHANGES

Pursuant to DWR's 2020 Final Guidebook, "*Water exchanges are typically water delivered by one water user to another water user, with the receiving water user providing water in return at a specified time or when the conditions of the parties' agreement are met. Water exchanges can be strictly a return of water on a basis agreed upon by the participants or it can include payment and the return of water.*"

CDA does not have any current or planned water exchange opportunities. CDA's purpose is to produce treated groundwater for its member agencies. However, CDA's member agencies participate in MWD's Dry-Year Yield Program. The DYYP is a groundwater storage and recovery program where supplemental water is stored in the Chino Basin during surplus years and could be recovered in-lieu of imported water from MWD through IEUA. The DYYP allows maximum use of imported water supplies available during wet years and stored groundwater in the Chino Basin during dry years. The DYYP can store up to 100,000 AF with maximum replenishment of 25,000 AFY and maximum extraction of 33,000 AFY. During FY 2019-20, there was 45,961 AF within the DYYP account. The agreement that authorized the DYYP will expire in 2028.

#### *6.2.7.2 TRANSFERS*

Pursuant to DWR's 2020 Final Guidebook, "*The Water Code defines a water transfer as a temporary or long-term change in the point of diversion, place of use, or purpose of use due to a transfer, sale, lease, or exchange of water or water rights.*"

Transfers are not generally available to CDA from a supplier because CDA's purpose is to produce treated groundwater for its member agencies. However, CDA's member agencies are able to make transfers between each other pursuant to the Optimum Basin Management Plan and the Peace Agreement which provide for interagency transfer of water rights.

#### *6.2.7.3 EMERGENCY INTERTIES*

Emergency interconnections are distribution system interconnections between water agencies for use during critical situations where one system or the other is temporarily unable to provide sufficient potable water to meet its water demands and/or fire protection needs. An emergency interconnection will allow a water system to continue serving water during critical situations such as local water supply shortages as a result of earthquakes, fires, prolonged power outages, and droughts.

Emergency interconnections are not available to CDA because CDA is a wholesale water agency that provides treated groundwater supplies to its member agencies. However, CDA has multiple connections with several of its member agencies to provide these agencies with water supplies during emergency situations.

### 6.2.8 FUTURE WATER PROJECTS

**CWC 10631.**

*(f) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use, as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in normal and single-dry water years and for a period of drought lasting five consecutive water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

The water supply potential of the Chino Basin has been limited over the years due to multiple contamination threats from historical agricultural and industrial operations, leading to basin-wide concerns with total dissolved solids and nitrate, as well as localized plumes of multiple constituents of concern (COCs). CDA is now facing challenges from new COCs stemming from the nearby Chino Airport Plume. In July 2020, CDA proposed Granular Activated Carbon (GAC) treatment to provide groundwater treatment for existing and proposed CDA and County-owned wells. The North GAC Treatment expansion of the Chino I Desalter facility would be designed to accommodate a total flow of 1,255 gallons per minute (GPM). The South GAC Treatment would be designed to treat a total flow of 3,125 GPM. An additional 800 GPM of GAC absorption capacity can be acquired should more wells be added.

Table 6-7 quantifies the increase in CDA's water supply reliability per completion of these projects.

**Table 6-7 Expected Future Water Supply Projects or Programs**

| Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| Section 6.2.8 | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other suppliers? | | Description *(if needed)* | Planned Implementation Year | Planned for Use in Year Type *Drop Down list* | Expected Increase in Water Supply to Supplier* |
| | *Drop Down Menu* | *If Yes, Supplier Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| Chino I Desalter VOC Treatment Facilities Project | *Yes* | San Bernardino County | Install Granular Activated Carbi treatment to to treat existing CDA and proposed County-owned wells | 2023 | All Year Types | 3,000 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: Information obtained from CDA's "Chino I Desalter VOC Treatment Facilities Project Final Draft Basis of Design Report (BODR)", dated July 2020 | | | | | | |

## 6.2.9 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

**CWC 10631.**

*(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a), providing supporting and related information, including all of the following…*

*(b)(2) When multiple sources of water supply are identified, a description of the management of each supply in correlation with the other identified supplies.*

*(h) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (f). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (f).*

### 6.2.9.1 DESCRIPTION OF SUPPLIES

As discussed in Section 6.2, CDA's water supply source consists of groundwater from the Chino Basin (see Section 6.2.2). CDA's member agencies have contract entitlements to receive a total of 35,200 AFY of treated water from CDA. However, additional groundwater must be produced by CDA to account for waste process water which is discharged. The actual quantity of the water supply source produced by CDA during FY 2019-20 is summarized in Table 6-8. The reliable quantity of projected water supply source available to CDA in five-year increments through FY 2044-45 during normal or average years are summarized in Table 6-9. The reliability of this source of supply are addressed in Section 7.2.3, including during normal years, single dry years, and five consecutive year droughts.

### 6.2.9.2 QUANTIFICATION OF SUPPLIES

The actual quantity of the water supply source produced by CDA during FY 2019-20 are summarized in Table 6-8. The reliable quantity of projected water supply source produced by CDA in five-year increments through FY 2044-45 during average years are summarized in Table 6-9. The reliability of this source of supply are addressed in Section 7.2.3, including during normal years, single dry years, and five consecutive year droughts.

CDA's projected quantities of groundwater supplies from the Chino Basin are based on the requirement to pump and treat contaminated groundwater to control contaminant migration.

**Table 6-8 Water Supplies – Actual**

| Submittal Table 6-8 Wholesale: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | 2020 | | |
| **Drop down list** May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool | | Actual Volume* | Water Quality Drop Down List | Total Right or Safe Yield* (optional) |
| Add additional rows as needed | | | | |
| Desalinated Water - Groundwater | | 35,003 | Drinking Water | |
| | | | | |
| | **Total** | 35,003 | | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | |
| NOTES: | | | | |

**Table 6-9 Water Supplies – Projected**

| Submittal Table 6-9 Wholesale: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | Projected Water Supply* Report To the Extent Practicable | | | | | | | | | |
| | | 2025 | | 2030 | | 2035 | | 2040 | | 2045 (opt) | |
| **Drop down list** May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool | | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Add additional rows as needed | | | | | | | | | | | |
| Desalinated Water - Groundwater | | 40,000 | | 40,000 | | 40,000 | | 40,000 | | 40,000 | |
| | **Total** | 40,000 | 0 | 40,000 | 0 | 40,000 | 0 | 40,000 | 0 | 40,000 | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | | | | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | | | | | | | | | |

## 6.2.10 SPECIAL CONDITIONS

### 6.2.10.1 CLIMATE CHANGE EFFECTS

CDA removes salts from brackish groundwater extracted from the lower Chino Basin with the Chino I and II Desalter facilities. The Chino I Desalter commenced operation in 2001 and was

expanded in 2005. The Chino II Desalter became operational in 2006 and was expanded in 2011 and again in 2017. These systems include 30 groundwater extraction wells, pumps, and pipelines that produce and convey untreated groundwater to treatment facilities. CDA produces approximately 40,000 AF from the Chino Basin every year for the purpose of groundwater cleanup and control of contaminant migration. This production is fixed to achieve the desired groundwater cleanup goal and is not impacted by climate change. Impacts of climate change to CDA's member agencies and their sources of supply are included in their respective UWMPs.

#### *6.2.10.2 REGULATORY CONDITIONS AND PROJECT DEVELOPMENT*

CDA has considered the implications of changing regulatory conditions and project development on the availability of planned water supplies.

#### *6.2.10.3 OTHER LOCALLY APPLICABLE CRITERIA*

There are no locally applicable criteria which applies to CDA.

## 6.3 SUBMITTAL TABLES COMPLETION USING THE OPTIONAL PLANNING TOOL

As discussed in Section 4.2.5, DWR has created an optional "Planning Tool Worksheet" for water suppliers to review and assess monthly water use trends. However, DWR has deemed the tool as optional and CDA is not required by DWR to use the tool. However, Section 6.1 provides a tabulation of CDA's historical annual water use. During the past 10 years, CDA's member agencies experienced a five consecutive year drought from FY 2011-12 to FY 2015-16.

## 6.4 ENERGY USE

**CWC 10631.2.**

*(a) In addition to the requirements of Section 10631, an urban water management plan shall include any of the following information that the urban water supplier can readily obtain:*

*(1) An estimate of the amount of energy used to extract or divert water supplies.*

*(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.*

*(3) An estimate of the amount of energy used to treat water supplies.*

*(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.*

*(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.*

*(6) An estimate of the amount of energy used to place water into or withdraw from storage.*

*(7) Any other energy-related information the urban water supplier deems appropriate.*

"Energy intensity" is defined as the quantity of energy consumed, measured in kilowatt hours (kWh), divided by the volume of water, measured in AF for a water management process over a one-year period. The information used to calculate the estimated energy intensity associated with CDA's water system is provided below. The energy intensity information is based on readily obtainable energy and water use data for the following water management processes: 1) extraction or diversion of water supplies; 2) placement into storage; 3) conveyance to distribution; 4) treatment; and 5) water system distribution.

CDA has tabulated its energy intensity using readily obtainable energy consumption data obtained from monthly electricity bills from Southern California Edison (SCE) for the whole water system and the corresponding water use data obtained from available water meter readings. CDA has reported the energy intensity associated with the water management processes which occur within its operational control. Because CDA does not track individual energy usage for each water management process identified above, CDA has estimated the energy intensity using the a "total utility approach" (i.e. sum of all water management processes). The total energy consumed was approximately 48,998,850 kWh during FY 2019-20. The total energy consumption reported does not include electricity usage for general administration (e.g. at CDA's headquarters) which is not associated with any water management processes.
The total volume of water entering the potable water system was approximately 35,003 AF during FY 2019-20 and is consistent with the total volume of water provided in Table 4-1.

The total energy intensity associated with CDA's water management processes is estimated at 1,400 kWh/AF. The energy intensity data and calculations based on the "total utility approach" are provided in Table O-1B below.

CDA's water management processes do not include "consequential hydropower generation" where the energy generation is a direct consequence of water delivery (i.e. all water passing through the energy generation devices is delivered to users). CDA's water management processes do not include "non-consequential hydropower generation" where the energy generation is not a direct consequence of water delivery (i.e. energy could be generated even if no water was being delivered to water users). In addition, CDA's water management processes do not include any substantial "self-generated energy sources" including solar, wind, geothermal, biomass, co-generation, and diesel generator sources.

**Table O-1B. Recommended Energy Reporting — Total Utility Approach**

***Urban Water Supplier:*** *Chino Basin Desalter Authority*

**Water Delivery Product** (If delivering more than one type of product use Table O-1C)

*Wholesale Potable Deliveries*

| Table O-1B: Recommended Energy Reporting - Total Utility Approach | | | | |
|---|---|---|---|---|
| Enter Start Date for Reporting Period | 7/1/2019 | Urban Water Supplier Operational Control | | |
| End Date | 6/30/2020 | | | |
| ☐ Is upstream embedded in the values reported? | | Sum of All Water Management Processes | Non-Consequential Hydropower | |
| *Water Volume Units Used* | *AF* | Total Utility | Hydropower | Net Utility |
| *Volume of Water Entering Process (volume unit)* | | *35003* | *0* | *35003* |
| *Energy Consumed (kWh)* | | *48998850* | *0* | *48998850* |
| *Energy Intensity (kWh/volume)* | | *1399.8* | *0.0* | *1399.8* |

**Quantity of Self-Generated Renewable Energy**

0 kWh

**Data Quality** *(Estimate, Metered Data, Combination of Estimates and Metered Data)*

*Combination of Estimates and Metered Data*

**Data Quality Narrative:**

The total energy consumed was identified based on Southern California Edison (SCE) billing records. The total energy consumption reported does not include electricity usage for general administration (e.g. at CDA's headquarters) which is not associated with any water management processes.

**Narrative:**

The total energy consumption includes energy associated with operating groundwater production wells and booster pumps to deliver water in the distribution system. Energy consumption is associated with operating groundwater treatment. Energy consumption is also associated with plant lighting and air conditioning, and operating the Supervisory Control and Data Acquisition (SCADA) system and chlorination injection pumps.

Chapter 7

# WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

## LAY DESCRIPTION – CHAPTER 7

### WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

Chapter 7 (Water Service Reliability and Drought Risk Assessment) of CDA's 2020 Plan discusses and provides the following:

- FY 2019-20 represents an "average" or "normal" water year for CDA in which the total amount of rainfall was similar to the historical average rainfall.
- A "single dry" year for CDA was represented in FY 2017-18, in which the total amount of rainfall was below the historical average rainfall.
- A "five consecutive year drought" period for CDA is represented from FY 2011-12 to FY 2015-16, where the total amount of rainfall during each of these years was less than the historical average rainfall.
- CDA's current and projected water supplies available during normal years in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-2.
- CDA's current and projected water supplies available during single dry years in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-3.
- CDA's current and projected water supplies available during each year of a five consecutive year drought in five-year increments over the next 25 years are provided (through Fiscal Year 2044-45) as shown on Table 7-4.
- The reliability of CDA's water supply source, including a review of water supply constraints, is provided. A single dry year or a five consecutive year drought period will not compromise CDA's ability to provide a reliable supply of water to its member agencies.
- A Drought Risk Assessment is provided which includes an assessment of CDA's water supply reliability over a five consecutive year drought period. CDA's DRA assumes a five consecutive year drought from FY 2020-21 through FY 2024-25 and includes a review of water supplies, water uses, and water supply reliability during this period. CDA's water system has experienced a prior five consecutive year drought with no limitation to its water supplies CDA has the ability to enact varying water shortage levels (see Chapter 8) to help educate its customers and provide an economic incentive for the retail customers to reduce their water consumption.

## 7.1 INTRODUCTION

CDA serves a dual purpose of providing reliable water supply and improving groundwater quality in the Chino Basin. Member agencies are required to purchase a minimum amount of treated water production to support this function. This section of CDA's UWMP describes CDA's ability to meet member agency water demands, including minimum purchase allocations, from its member agencies. This section assesses CDA's water service reliability during average years, single dry years, and during a five consecutive year drought period to meet the water needs of its member agencies' customers. This section also includes the discussion of a DRA which provides a mechanism for CDA to evaluate the risk to its water supply under a drought lasting for the next five consecutive years.

## 7.2 WATER SERVICE RELIABILITY ASSESSMENT

**CWC 10635.**

> *(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

Information regarding the reliability of CDA's water supplies is based on the historical precipitation data in the Chino Basin area. Historical annual precipitation in the Chino Basin area is discussed in Section 3.3 and is based on historical data collected from Station 255 (Chino, California). Furthermore, Section 4.5 of this Plan notes that potential future climate change impacts may result in an increase in the average annual precipitation within the area receiving water supplies from CDA, thus indicating use of historical data is a reasonable and conservative approach. As indicated in Section 3.3, the historical average rainfall in the area receiving water supplies from CDA is 10.7 inches. FY 2019-20 represents an average or normal water year for CDA in which the total amount of rainfall was similar to the historical average rainfall. A single dry year for CDA was represented in FY 2017-18, in which the total amount of rainfall was below the historical average rainfall. A five consecutive year drought period for CDA is represented from FY 2011-12 to FY 2015-16, where the total amount of rainfall during each of these years was less than the historical average rainfall. Table 7-1 summarizes these "base years" for average, single dry, and five consecutive year drought and provides the total amount of water supplies available to CDA during those base years. The following discussion assesses the water service reliability of CDA's water supply sources.

**Water Service Reliability - Groundwater**

Chino Basin

The Chino Basin groundwater supplies are managed by the Chino Basin Watermaster, as discussed in Section 6.2.2. During a normal year (FY 2019-20), CDA pumped 35,003 AF of groundwater supplies to meet the demands from its member agencies with its supplies from the Chino Basin. During a single dry year (FY 2017-18), CDA pumped 29,918 AF of groundwater supplies to meet the demands from its member agencies with its supplies from the Chino Basin. During a five consecutive year drought multiple dry year period (FY 2011-12 to FY 2015-16), CDA pumped between 27,098 AF and 30,022 AF of groundwater supplies to meet the demands from its member agencies with its supplies from the Chino Basin.

**Water Service Reliability Summary**

Table 7-1 shows the water supplies during the base years (for average year, single dry year, and a five consecutive year drought). As a result of CDA's water supply , water supplies are expected to be sufficient during a five consecutive year drought to meet CDA's water demands from its member agencies.

### *7.2.1 SERVICE RELIABILITY - CONSTRAINTS ON WATER SOURCES*

**CWC 10631.**

*(b)(1) A detailed discussion of anticipated supply availability under a normal water year, single dry year, and droughts lasting at least five years, as well as more frequent and severe periods of drought, as described in the drought risk assessment. For each source of water supply, consider any information pertinent to the reliability analysis conducted pursuant to Section 10635, including changes in supply due to climate change.*

CDA's source of supply consists of contaminated groundwater pumped from the Chino Basin which is then treated and provided to its member agencies, as described in Section 6.2. Although this supply is managed, the following constraints may occur which CDA has considered in this reliability analysis.

Chino Basin

CDA produces contaminated groundwater from the Chino Basin which is then treated and provided to its member agencies. The groundwater historically had been impacted by contamination. However, CDA has developed and implemented appropriate treatment (blending and/or treatment facilities) which have been approved by SWRCB-DDW. These groundwater supplies are considered reliable both from a water quality and quantity standpoint.

## 7.2.2 SERVICE RELIABILITY - YEAR TYPE CHARACTERIZATION

### 7.2.2.1 TYPES OF YEARS

CDA's base years for an average year, a single dry year, and a five consecutive year drought are discussed in Section 7.2 and are summarized in Table 7-1. As indicated in Chapter 6, CDA's water supplies sources have been sufficient in meeting CDA's historical water demands from its member agencies during an average year, a single dry year, and a five consecutive year drought. An average year was based on a historical year during the past 10 years with a total precipitation similar to the historical average precipitation in the area receiving water supplies from CDA. Because a single dry year or a five consecutive year drought period will not compromise CDA's ability to provide a reliable supply of water to its member agencies, a single dry year in this Plan was selected based on one of the driest years during the past 10 years. The five consecutive year drought period was based on a period of five consecutive dry years during the past 10 years.

As indicated in Section 3.3, the historical average rainfall in the area receiving water supplies from CDA is 10.7 inches. FY 2019-20 represents an average or normal water year for CDA in which the total amount of rainfall was similar to the historical average rainfall. A single dry year for CDA was represented in FY 2017-18, in which the total amount of rainfall was less than the historical average rainfall. A five consecutive year drought period for CDA is represented from FY 2011-12 to FY 2015-16, where the total amount of rainfall during each of these years was less than the historical average rainfall. Table 7-1 summarizes these "base years" for an average year, a single dry year, and a five consecutive year drought period and provides the total amount of water supplies available to CDA during those base years.

**Table 7-1 Basis of Water Year Data (Reliability Assessment)**

| Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment) | | | |
|---|---|---|---|
| **Year Type** | **Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000 | **Available Supplies if Year Type Repeats** | |
| | | ☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ | |
| | | ☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | **Volume Available *** | **% of Average Supply** |
| Average Year | 2020 | 40,000 | 100% |
| Single-Dry Year | 2018 | 40,000 | 100.0% |
| Consecutive Dry Years 1st Year | 2012 | 40,000 | 100.0% |
| Consecutive Dry Years 2nd Year | 2013 | 40,000 | 100.0% |
| Consecutive Dry Years 3rd Year | 2014 | 40,000 | 100.0% |
| Consecutive Dry Years 4th Year | 2015 | 40,000 | 100.0% |
| Consecutive Dry Years 5th Year | 2016 | 40,000 | 100.0% |
| | | | |
| *Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.* | | | |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | |

#### 7.2.2.2 SOURCES FOR WATER DATA

The monthly historical average temperatures (including minimum and maximum), monthly historical average rainfall, and monthly ETo in the vicinity of the area receiving water supplies from CDA are discussed in Section 3.3 Historical climate information was obtained from the WRCC, the National Oceanic and Atmospheric Administration, and from DWR's CIMIS.

### 7.2.3 WATER SERVICE RELIABILITY – SUPPLY AND DEMAND COMPARISON

**CWC 10635.**

*(a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the long-term total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

CDA obtains its water supplies from groundwater wells located in the Chino Basin. As previously discussed in Section 7.2.1, a single dry year or a five consecutive year drought period will not compromise CDA's ability to provide a reliable supply of water to its member agencies' customers.

As previously discussed in Section 4.2.6, CDA's projected normal year water demands from its member agencies over the next 25 years, in five-year increments is provided in Table 4-3. Table 7-2, Table 7-3, and Table 7-4 summarize CDA's projected groundwater demands and supplies over the next 25 years in five-year increments, including during normal years, single dry years, and a five consecutive year drought period. These tables indicate CDA can meet water demands from its member agencies during normal years, single dry years, and a five consecutive year drought period over the next 25 years.

#### 7.2.3.1 WATER SERVICE RELIABILITY – NORMAL YEAR

Table 7-2 summarizes CDA's projected groundwater demands to meet the demands from its member agencies and supplies over the next 25 years in five-year increments during normal years. Table 7-2 indicates CDA can meet water demands from its member agencies during normal years over the next 25 years.

**Table 7-2 Normal Year Supply and Demand Comparison**

| Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Demand totals *(autofill fm Table 4-3)* | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | | | |

### *7.2.3.2 WATER SERVICE RELIABILITY – SINGLE DRY YEAR*

Table 7-3 summarizes CDA's projected groundwater demands to meet the demands from its member agencies and supplies over the next 25 years in five-year increments during single dry years. Table 7-3 indicates CDA can meet water demands from its member agencies during single dry years over the next 25 years.

**Table 7-3 Single Dry Year Supply and Demand Comparison**

| Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 (Opt) |
| Supply totals* | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Demand totals* | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | | | |

### *7.2.3.3 WATER SERVICE RELIABILITY – FIVE CONSECUTIVE DRY YEARS*

Table 7-4 summarizes CDA's projected groundwater demands to meet the demands from its member agencies and supplies over the next 25 years in five-year increments during five consecutive year drought periods. Table 7-4 indicates CDA can meet water demands from its member agencies during five consecutive year drought periods over the next 25 years.

**Table 7-4 Multiple Dry Years Supply and Demand Comparison**

| Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2025* | 2030* | 2035* | 2040* | 2045* (Opt) |
| First year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Second year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Third year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fourth year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fifth year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Sixth year *(optional)* | Supply totals | | | | | |
| | Demand totals | | | | | |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| ***Units of measure (AF, CCF, MG) m** ust remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | | | | |

### 7.2.4 DESCRIPTION OF MANAGEMENT TOOLS AND OPTIONS

**CWC 10620.**

*(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

Chino Basin

As noted in Section 6.2.2, the Chino Basin is managed by the Chino Basin Watermaster. During the period of management under the Judgment, significant drought events have occurred. In each drought cycle, the Chino Basin has been managed to maintain water levels. Therefore, based on historical and on-going management practices, CDA will be able to rely on the Chino Basin for adequate supply over the next 25 years under single dry years and a five consecutive year drought periods.

Section 6.2.2 provides a description of the management of groundwater resources in the Chino Basin, as well as information on basin management. Chapter 6 also demonstrates the management structure of the Chino Basin which provides a reliable source of groundwater supply for CDA during a normal year, a single-dry year and a five consecutive year drought. Historical data indicates the Chino Basin has been well managed for the full period of the adjudication, resulting in a stable and reliable water supply. Basin management changes are discussed in Section 6.2.2, and include increased direct use of recycled water (see Section 6.5) and the continued use of recycled water for groundwater replenishment in the Chino Basin to reduce the need to import water from other regions. Therefore, the groundwater supplies in the Chino Basin are deemed reliable.

## 7.3 DROUGHT RISK ASSESSMENT

**CWC 10635.**

*(b) Every urban water supplier shall include, as part of its urban water management plan, a drought risk assessment for its water service to its customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the urban water management plan. The urban water supplier may conduct an interim update or updates to this drought risk assessment within the five-year cycle of its urban water management plan update. The drought risk assessment shall include each of the following:*

*(1) A description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted.*

*(2) A determination of the reliability of each source of supply under a variety of water shortage conditions. This may include a determination that a particular source of water supply is fully reliable under most, if not all, conditions.*

*(3) A comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period.*

*(4) Considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria.*

CDA's source of supply consists of contaminated groundwater pumped from the Chino Basin which is then treated and provided to its member agencies. The following discussion provides a DRA which assesses CDA's water supply reliability over a five consecutive year drought period. CDA's DRA incorporates a five consecutive year drought from FY 2020-21 through FY 2024-25 and includes a review of water supplies, water uses, and water supply reliability.

### *7.3.1 DRA DATA, METHODS, AND BASIS FOR WATER SHORTAGE CONDITIONS*

CDA's DRA was prepared using historical production data from CDA's water supply source. The following assumptions were considered during the preparation of CDA's DRA for each year of the five consecutive year drought.

- The five consecutive year drought period associated with the 2020 UWMP is based on five consecutive dry years from FY 2020-21 through FY 2024-25.
- The projected water supplies available during each year of this five consecutive year drought are assumed to be equal to the amount of groundwater pumped by CDA for water quality management purposes and for maintaining hydraulic control within Chino Basin.
- The projected demands during this five consecutive year drought is assumed to be equal to the projected water supplies.

- The projected demands were compared to the projected supplies to identify potential water supply deficits which may require implementation of the Water Shortage Contingency Plan (discussed further in Chapter 8).

The following methodologies were considered during the preparation of CDA's DRA during for each year of the five consecutive year drought:

- Drought Year 1: The region receiving water supplies from CDA had experienced an average to above average year of precipitation in the prior year. Member agencies' retail water use in the prior year had been below average due to a reduced need for outdoor water use, the groundwater basin had been replenished from above average local stormwater runoff, and imported water supplies were not restricted.
- Drought Year 2: The region receiving water supplies from CDA experienced a second year of below average precipitation and runoff. Member agencies' retail customers increased water use for outdoor irrigation to compensate for lack of precipitation. Groundwater and imported water supplies have not been impacted. Local surface water supplies have not been impacted.
- Drought Year 3: The region receiving water supplies from CDA experienced a third year of below average precipitation and runoff. Member agencies' retail customers increase water use for outdoor irrigation to compensate for lack of precipitation. Groundwater and imported water supplies have not been impacted. However, there is an increased demand on both groundwater and treated imported water because local surface water supplies have been significantly impacted.
- Drought Year 4: The region receiving water supplies from CDA experienced a fourth year of below average precipitation and runoff. Groundwater supplies have not been impacted. However, there is an increased demand on groundwater because member agencies' local surface water supplies continue to be significantly impacted.
- Drought Year 5: Fifth year of below average precipitation and runoff. Groundwater supplies have not been impacted. However, there is an increased demand on groundwater because member agencies' local surface water supplies continue to be significantly impacted.

### *7.3.2 DRA INDIVIDUAL WATER SOURCE RELIABILITY*

CDA pumps up to 40,000 AFY of contaminated groundwater from the Chino Basin and provides up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2 of the 2020 UWMP. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. However, for the purposes of the DRA, CDA has incorporated a five consecutive year drought based on five consecutive dry years commencing in FY 2021-22. The quantity of water supplies available for each year during this five consecutive year drought period included in CDA's DRA is assumed to be the same as the projected quantity of water supplies produced by CDA (to meet its member agency demands). Production data for those years have

been tabulated in Section 6.1. The following describes the anticipated reliability of the water source for each year of the five consecutive year drought based on recent experience.

Groundwater – Chino Basin

CDA receives water supplies from the Chino Basin, which is actively managed by the Chino Basin Watermaster, as described in Section 6.2.2. Each year, the Chino Basin Watermaster reviews water supply conditions including local rainfall, groundwater levels, local stormwater runoff available for replenishment, imported water availability, and the amount of imported water stored in the groundwater basin for future demands. The Watermaster identifies the annual amount of groundwater which may be pumped (such as an Operating Safe Yield) before more expensive imported water would need to be purchased from MWD through IEUA to replenish the Basin for all production in excess of the water rights. Regardless of the annual safe yield adopted, there is never a restriction on the amount of water which may be pumped from the Chino Basin, only the cost of producing the groundwater is impacted. The Chino Basin Watermaster is not restricted as to when or how much untreated imported water be delivered to the Chino Basin, only that it ultimately be delivered. The quantity of groundwater used (and reliably available) during the most recent and historical five consecutive year drought period have been tabulated in Section 6.1. During this period, CDA was able to maintain its production of its groundwater supplies from an adjudicated and managed groundwater basin. As a result of these collective actions (and experience during and prior to five consecutive year droughts), CDA does not anticipate a water supply shortage from the Chino Basin.

Summary

CDA's water system has previously experienced a five consecutive year drought with no limitation to its water supplies. CDA's member agencies have the ability to enact varying water shortage levels (see Chapter 8) to help educate its customers and provide an economic incentive for the member agency retail customers to reduce their water consumption.

### 7.3.3 DRA TOTAL WATER SUPPLY AND USE COMPARISON

Gross water use for the projected five consecutive year drought is shown on Table 7-5. Section 7.3.2 describes the water source reliability for the source of supply CDA will rely on during a five consecutive year drought. CDA pumps up to 40,000 AFY of contaminated groundwater from the Chino Basin and provides up to 35,200 AFY of treated water to its member agencies. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. However, when necessary, CDA's member agencies can implement various water shortage levels of their respective Water Shortage Contingency Plans (discussed in Chapter 8) in order to reduce water demands. For the purposes of the DRA, the total water supplies available to CDA are based on the quantity of supplies pumped by CDA during the most recent historical five consecutive drought period (from FY 2011-12 through FY 2015-16). As shown in Table 7-5, assuming no additional water supply benefits will be available from groundwater supplies, CDA's member agencies will implement various stages of its Water Shortage Contingency Plan to balance water demands with available supplies during years 1, 2, 3, 4, and 5 of the projected five consecutive year drought.

**Table 7-5 Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b)**

| Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b) | |
|---|---|
| **2021** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |
| **2022** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |
| **2023** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |
| **2024** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |
| **2025** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |

### 7.3.4 OPTIONAL PLANNING TOOL WORKBOOK

DWR has deemed the "Planning Tool Worksheet" as optional and CDA is not required by DWR to use the tool. CDA has provided sufficient water supplies to its member agencies, including during long-term droughts and years with historically high water demands from its member agencies. CDA has also been able to provide water service to meet maximum day water demands from its member agencies for these years, including during the summer months. CDA obtains its water supplies from a managed groundwater basin which is not subject to seasonal fluctuation. Consequently, an evaluation regarding water supplies on a monthly basis was not considered.

Chapter 8

# WATER SHORTAGE CONTINGENCY PLAN

## LAY DESCRIPTION – CHAPTER 8

### WATER SHORTAGE CONTINGENCY PLAN

Chapter 8 (Water Shortage Contingency Plan) of CDA's 2020 Plan discusses and provides the following:

- CDA pumps up to 40,000 AFY of contaminated groundwater from the Chino Basin and provides up to 35,200 AFY of treated water to its member agencies. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. Consequently, development of a Water Shortage Contingency Plan by CDA is not required; however, CDA coordinates its activities with its member agencies, and CDA's member agencies are required to develop a Water Shortage Contingency Plan. Preparation of CDA's "Annual Water Supply and Demand Assessment" (or Annual Assessment) is discussed. Commencing July 1, 2022, CDA is required to submit the Annual Assessment. The Annual Assessment will include a review of CDA's "unconstrained" water demands from its member agencies for the current year and for a potential upcoming single dry year.
- For each declared water supply shortage level, CDA's member agencies' customers will be required to reduce their consumption by the percentage specified in the corresponding water supply shortage level. These demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, and other water use prohibitions.
- The operational changes CDA will consider in addressing water shortages on a short-term basis are discussed to enforce demand reduction measures.
- CDA's Emergency Response Plan is summarized. The Emergency Response Plan provides the management, procedures, and designated actions CDA and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures, and other unforeseen circumstances.
- The preparation of CDA's seismic risk assessment and mitigation plan is discussed. The locations of earthquake faults in the vicinity of the area receiving water supplies from CDA are provided.

The following Water Shortage Contingency Plan includes references to Chapters and Sections from the Chino Basin Desalter Authority's 2020 Urban Water Management Plan:

## 8.1 WATER SUPPLY RELIABILITY ANALYSIS

**CWC 10632.**

*(a)(1)* The analysis of water supply reliability conducted pursuant to Section 10635.

CDA pumps up to 40,000 AFY of contaminated groundwater from the Chino Basin and provides up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2 of the 2020 UWMP. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. Consequently, development of a WSCP by CDA is not required; however, CDA coordinates it activities with its member agencies, and CDA's member agencies are required to develop a WSCP. The Chino Basin is adjudicated and groundwater supplies are managed. The reliability of this source of supply is discussed in Chapter 7 of this UWMP.

## 8.2 ANNUAL WATER SUPPLY AND DEMAND ASSESSMENT PROCEDURES

**CWC 10632.**

*(a)(2) The procedures used in conducting an annual water supply and demand assessment that include, at a minimum, both of the following:*

*(A) The written decision-making process that an urban water supplier will use each year to determine its water supply reliability.*

*(B) The key data inputs and assessment methodology used to evaluate the urban water supplier's water supply reliability for the current year and one dry year, including all of the following:*

*(i) Current year unconstrained demand, considering weather, growth, and other influencing factors, such as policies to manage current supplies to meet demand objectives in future years, as applicable.*

*(ii) Current year available supply, considering hydrological and regulatory conditions in the current year and one dry year. The annual supply and demand assessment may consider more than one dry year solely at the discretion of the urban water supplier.*

*(iii) Existing infrastructure capabilities and plausible constraints.*

*(iv) A defined set of locally applicable evaluation criteria that are consistently relied upon for each annual water supply and demand assessment.*

*(v) A description and quantification of each source of water supply.*

**CWC 10632.1.**

*An urban water supplier shall conduct an annual water supply and demand assessment pursuant to subdivision (a) of Section 10632 and, on or before July 1 of each year, submit an annual water shortage assessment report to the department with information for anticipated shortage, triggered shortage response actions, compliance and enforcement actions, and communication actions consistent with the supplier's water shortage contingency plan. An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later.*

Commencing July 1, 2022, CDA is required to submit an "Annual Water Supply and Demand Assessment" (Annual Assessment) in accordance with DWR's guidance and requirements. The Annual Assessment will include a review of CDA's unconstrained water demands from its member agencies (i.e. water demands from its member agencies prior to any projected response actions CDA may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. . CDA pumps up to 40,000 AFY of contaminated groundwater from the Chino Basin and provides up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2 of the 2020 UWMP. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption.
For each Annual Assessment, CDA plans to prepare a preliminary assessment of its water supplies for the current and upcoming years by April of each year. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. The preliminary assessment will include a review of water supplies for at least a single dry year.

The components of an Annual Assessment consist of the following:

- A written decision-making process
- Key data inputs and assessment methodology

### *8.2.1 DECISION MAKING PROCESS*

CDA produces contaminated groundwater from the Chino Basin which is then treated and provided to its member agencies. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. The Chino basin is managed on a fiscal year basis. Consequently, during the third quarter of each fiscal year CDA will review its water demands from its member agencies from the initial six months along with the current groundwater basin conditions and local hydrology. Member agencies also have minimum purchase commitments from CDA. This information will be used to help develop the Annual Assessment. A draft of the Annual Assessment will be circulated internally within CDA for peer review and comment. Based on comments received, a redraft will be prepared and provided to CDA managers

during the Spring of each year. The draft will subsequently be provided to the General Manager for final review. Subsequently, a final draft of the Annual Assessment will be provided to CDA's Board of Directors for review and included in the agenda as part of a Board meeting such that it can be approved and any recommended specific shortage response actions may be enacted. The final Annual Assessment will be provided to DWR no later than July 1 of each year.

### *8.2.2 DATA AND METHODOLOGIES*

The key data inputs and methodologies which will be evaluated by CDA during the preparation of the preliminary assessment will include the following. However, the groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption.:

1) Evaluation Criteria: The locally applicable evaluation criteria used to prepare the Annual Assessment will be identified. The evaluation criteria will include, but is not limited to, an analysis of current local hydrology (including rainfall and groundwater levels) within the area receiving water supplies from CDA, current water demands from its member agencies, and water quality regulations which may impact groundwater availability.

2) Water Supply: A description of the available water supply source will be provided. The description will include a quantification of the available water supply source and will be based on review of current production capacities, historical production, Urban Water Management Plans, and prior water supply studies (including Water Supply Assessments and/or Master Plans).

3) Unconstrained Water Demand: The potential unconstrained water demands from its member agencies during the current year and the upcoming (potential single dry) year, prior to any special shortage response actions, will be reviewed. The review will include factors such as weather, existing and projected land uses and populations, actual customer consumption and the water use factor, and monthly Urban Water Supplier Monthly Reports.

4) Planned Water Use for Current Year Considering Dry Subsequent Year: The water supplies available to meet the demands, including the minimum demand pursuant to the purchase agreements of its member agencies during the current year and the upcoming (potential single dry) year will be considered and identified by each type of supply. The evaluation will include factors such as weather, water quality, existing available pumping capacities, contractual obligations, and regulatory issues.

5) Infrastructure Considerations: The capabilities of the water distribution system infrastructure to meet the water demands from its member agencies during the current year and the upcoming (potential single dry) year will be considered. Available production capacities (e.g. groundwater well capacities) and distribution system water losses (see

Section 4.2.4) will be reviewed. In addition, capital improvement and replacement projects will be considered.

6) Other Factors: Additional local considerations, if any, which can affect the availability of water supplies will be described.

## 8.3 SIX STANDARD WATER SHORTAGE LEVELS

**CWC 10632.**

*(a)(3)(A) Six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage. Urban water suppliers shall define these shortage levels based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other local conditions indicative of the water supply available for use. Shortage levels shall also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events.*
*(a)(3)(B) An urban water supplier with an existing water shortage contingency plan that uses different water shortage levels may comply with the requirement in subparagraph (A) by developing and including a cross reference relating its existing categories to the six standard water shortage levels.*

CDA serves a dual purpose of providing reliable water supply and improving groundwater quality in the Chino Basin. Member agencies are required to purchase a minimum amount of treated water production to support this function. These minimum purchase agreements form a fixed portion of the water supply portfolios of each of the CDA retail member agencies. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption.

However, depending on their individual water supply constraints, member agencies may employ plans for water usage appropriate to their water shortage levels. The standard shortage levels for each member agency can be found in their individual 2020 UWMPs. These standard shortage levels and corresponding response actions are executed by the individual member agency, independent of CDA. CDA's member agencies plans for water usage during periods of shortage is designed to incorporate six standard water shortage levels corresponding to progressive ranges from up to 10, 20, 30, 40, and 50 percent shortages, and greater than 50 percent shortage.

CDA member agencies are located within the Western Municipal Water District in Riverside County and/or within the Inland Empire Utilities Agency in San Bernardino County. IEUA member agencies are subject to IEUA's "Regional Drought Contingency Plan", adopted in April 2020, which previously established five (5) water shortage levels. WMWD member agencies are subject to WMWD's Ordinance 386 "Updated Retail Customer Water Supply Shortage Contingency Program," which previously established five (5) water shortage levels. In accordance with the CWC in which urban water suppliers are required to define six standard water shortage

levels, CDA has provided the crosswalks illustrated below that translates IEUA's and WMWD's previously established shortage levels to the mandated standard shortage levels for their respective member agencies.

**Corresponding Relationships Between IEUA's 2015 Shortage Levels and the 2020 WSCP Mandated Shortage Levels**

| Established Level | Supply Condition/ Shortage |
|---|---|
| 0 | 0% |
| 1 | 1 to 5% |
| 2 | 6 to 15% |
| 3 | 16 to 25% |
| 4 | 26 to 50% |
| 5 | > 50% |

| 2020 Standard Level | Shortage Level |
|---|---|
| 1 | ≤10% |
| 2 | 10 to 20% |
| 3 | 20 to 30% |
| 4 | 30 to 40% |
| 5 | 40 to 50% |
| 6 | > 50% |

**Corresponding Relationships Between WMWD's 2015 Shortage Levels and the 2020 WSCP Mandated Shortage Levels**

| Established Level | Supply Condition/ Shortage |
|---|---|
| 1 | 0% |
| 2 | Up to 4% |
| 3 | 5 to 15% |
| 4 | 16 to 50% |
| 5 | > 50% |

| 2020 Standard Level | Shortage Level |
|---|---|
| 1 | ≤10% |
| 2 | 10 to 20% |
| 3 | 20 to 30% |
| 4 | 30 to 40% |
| 5 | 40 to 50% |
| 6 | > 50% |

Table 8-1 provides a description of the six stages of action, or water shortage levels, which may be triggered by a shortage in CDA's member agencies' water supply, depending on the severity of the shortage and its anticipated duration.

**Table 8-1 Water Shortage Contingency Planning Levels**

| Submittal Table 8-1<br>Water Shortage Contingency Plan Levels | | |
|---|---|---|
| **Shortage Level** | **Percent Shortage Range** | **Shortage Response Actions**<br>(*Narrative description)* |
| 1 | Up to 10% | IEUA member agencies may be subject to implement direct installation programs, hold more landscape workshops, consider escalation of local water waste prohibitions, etc. WMWD member agencies' customers may be subject to a 5 to 15% water use reduction. |
| 2 | Up to 20% | In addition to Shortage Level 1; IEUA member agencies may expand micro-targeting customers and increase marketing efforts. WMWD member agencies may be subject to prohibition of new water service and reductions in water budgets. |
| 3 | Up to 30% | In addition to Shortage Level 2; IEUA member agencies may increase penalties, implement emergency alerts, etc. WMWD member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 4 | Up to 40% | In addition to Shortage Level 3; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. WMWD member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 5 | Up to 50% | In addition to Shortage Level 4; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. WMWD member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 6 | >50% | In addition to Shortage Level 5; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. WMWD member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| NOTES: | | |

## 8.4 SHORTAGE RESPONSE ACTIONS

**CWC 10632.**

*(a)(4) Shortage response actions that align with the defined shortage levels and include, at a minimum, all of the following:*

*(A) Locally appropriate supply augmentation actions.*

*(B) Locally appropriate demand reduction actions to adequately respond to shortages.*

*(C) Locally appropriate operational changes.*

*(D) Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions.*

*(E) For each action, an estimate of the extent to which the gap between supplies and demand will be reduced by implementation of the action.*

The wholesale members of IEUA and WMWD have approved WSCP's with shortage response actions, which are outlined in each of their 2020 UWMPs. A summary of these shortage response actions imposed on CDA's member agencies is provided in this section.

### *8.4.1 DEMAND REDUCTION*

CDA recognizes IEUA and WMWD water shortage response actions for its member agencies to reduce demand on water supplies. Member agencies may employ their own demand reduction actions and/or IEUA or WMWD demand reduction actions at their own discretion. Demand reduction actions include irrigation and other outdoor use restrictions, rate structure changes, public outreach strategies, other water use prohibitions. Many demand reduction actions are applicable to all levels of water shortages while others are exclusive to certain levels of shortage. The structure of demand reduction actions under a specific water shortage level are designed to encourage those customers with high gallon per capita usage to achieve proportionally greater reduction than those with low use. Violations of these demand reduction actions will be considered waste and an unreasonable use of water. Table 8-2 describes each demand reduction action and its effect on reducing the shortage gap.

**STANDARD DEMAND REDUCTION ACTIONS**

The following demand reduction actions are in effect at all times, regardless of a declared standard water shortage level:

IEUA Member Agencies

- Implement the following programs:
  - SoCal WaterSmart Residential and Commercial Rebates
  - Turf Replacement Program
  - Residential Irrigation Tune-up
  - Home Surveys
  - Landscape Workshops
  - Design Services
- Promote water efficient properties.

WMWD Member Agencies

The following permanent prohibitions shall be continually in effect at all levels of standard water shortage level declarations in addition to the requirements specific to each level:

- All irrigators shall ensure automatic irrigation times are adjusted according to changing weather patterns and landscape requirements.
- All open hoses shall be equipped with automatic, positive shut-off nozzles.
- Watering of lawns and/or groundcovers and irrigating landscaping is permitted only between the hours of 8:00 PM and 8:00 AM.
- All swimming pools, spas, ponds, and fountains shall be equipped with re-circulating pumps.
- All plumbing leaks, improperly adjusted sprinklers, or other water conduits/ fixtures that require repair or adjustment shall be corrected to the satisfaction of WMWD within 96 hours of notification by MWMD.
- No person shall use water to wash down sidewalks, driveways, parking areas, except to alleviate immediate fire or sanitation hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with an automatic, positive self-closing shut-off device, or a low volume, high-pressure cleaning machine.
- No person shall allow water to leave his or her property by drainage onto adjacent properties or public or private roadways or streets due to excessive irrigation and/ or uncorrected leaks.
- The washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment is permitted at any time with a hand-held bucket or a hand-held hose equipped with an automatic, positive shut-off nozzle. Provided, however, such washing may be done at any time on the immediate premises of a commercial service station or a car dealership with commercial car washing equipment, or by a licensed mobile detailing/ car wash professional using low volume, high pressure washing equipment. Further, such washings are exempted from these regulations where the health, safety, and welfare of the public is

contingent upon frequent vehicle cleanings, such as garbage trucks and vehicles used to transport food and perishables.

- Construction operations receiving water from a construction meter, hydrant meter, or water truck shall not use water for any purpose other than those required by regulatory agencies. Construction projects requiring watering for new landscaping materials shall adhere to the designated irrigation requirements set forth in this WSCP.

**STANDARD WATER SHORTAGE LEVEL 1**

The following are implemented during a Standard Water Shortage Level 1:

IEUA Member Agencies

- Implement direct installation programs including the Residential Smart Irrigation Direct Installation and the School Smart Irrigation Direct Installation.
- Hire additional landscape designers to expand landscape design services.
- Hold more frequent landscape workshops.
- Increase the volume of home surveys performed.
- Utilize general customer messaging to communicate need to increase water efficiency levels.
- Profile customers and micro-target high potential customers, utilizing messaging that will best resonate with those customers.
- Consider escalation of local water waste prohibitions.
- Introduce influencer marketing (role models and respected community members)
- Prepare IEUA WEFlex funding proposal and plans for expanded customer communication and enforcement administration.
- Additional requirements deemed necessary by individual member agencies.

WMWD Member Agencies

- Potable water customers in areas directly served by WMWD that do not have water budgets shall reduce water use by 5 to 15% from the Base Period during declarations of any Sub-level under Standard Water Shortage Level 1.
- Sub-levels under Standard Water Shortage Level
    - Sub-level 1A: WMWD shall eliminate all adjustments to existing residential customer's outdoor Water Budgets including, but not limited to, increases for landscape size, and/or swimming pool, spa, or pond maintenance adjustments. New water using features or expanded landscapes shall not quality for a Water Budget adjustment.
    - Sub- level 1B: Tier 4 water rates shall be eliminated. Customers with Water Budgets, and whose water use exceeds one hundred and twenty-five percent (125%) of their total water Budget during a Billing Period will be charged the applicable Tier 5 water rates.
    - Sub-level 1C: Tier 3 water rates shall be eliminated. Customers who have Water Budgets, and whose water use exceeds 100% of their total Water Budgets during a Billing Period, shall be charged the applicable Tier 5 water rates.

**STANDARD WATER SHORTAGE LEVEL 2**

In addition to tasks implemented in Standard Water Shortage Level 1, the following applies to Standard Water Shortage Level 2:

IEUA Member Agencies

- Continue base programs and incentive amounts for turf replacement, high efficiency nozzles, smart controllers, laminar flow restrictor, and plumbing control valves.
- Continue smart irrigation direct installation programs.
- Expand profiling and micro-targeting to include mid-range water users as well as high-water use customers.
- Increase influencer marketing.
- Hire additional local staff and set up operations for expanded customer communication and enforcement administration.
- Additional requirements deemed necessary by individual member agencies.

WMWD Member Agencies

- No new potable water service connections shall be provided, no new temporary meters or permanent meters shall be provided, and no statements of immediate ability to serve or provide potable water service (such as will serve letters, certificates, or letters of availability) shall be issued, except under the following circumstances:
    - A valid, unexpired building permit has been issued for the project; or
    - The project is necessary to protect the public's health, safety, and welfare; or
    - The applicant provides a Conservation Offset or pays a Conservation Offset Fee established by WMWD in an amount necessary to cover the cost of implementing such conservation techniques or acquiring alternative water sources, to offset the new demand. The fee will be based on the Conservation Offset required to meet the projected demand of the proposed project. Such fee shall apply to residential as well as commercial and industrial building and may be adjusted from time to time as determined by WMWD. The existence and application of a Conservation Offset, and the amount of Conservation Offset Fee and other terms and conditions for any Conservation Offset, shall be determined at WMWD's sole discretion. The existence and application of any water meter moratorium or other similar restrictions shall be determined by separate and subsequent action of the Board of Directors, or;
    - Where an existing service connection exists and an existing water meter is inoperable and cannot be repaired. In such an instance, the size of the new water meter shall be the same or smaller than the water meter being replaced.
- Sub-levels under Standard Water Shortage Level 2
    - Sub-level 2A
        - All landscape water budgets shall be reduced by 10%. Residential customers who have Water Budgets, and whose water use exceeds 100% of their Tier 1 and 90% of their Tier 2 Water Budgets during a Billing Period, shall be charged at the applicable Tier 5 water rates. Landscape customers who have Water Budgets, and whose water use exceeds 90% of their Water

Budget during a Billing Period shall be charged the applicable Tier 5 water rates.
    - Commercial or industrial customers who are served through mixed-use meter, and who have Water Budgets, shall reduce landscape and non-essential outdoor water use by 25%.
    - Potable water customers in areas directly served by WMWD and who do not have Water Budgets shall reduce their outdoor water use by 10% from the Base Period.
  - Sub-level 2B
    - All outdoor Water Budgets shall be reduced be 40%. Residential customers who have Water Budgets, and whose water use exceeds 100% of their Tier 1 and 40% of their Tier 2 Water Budgets during a Billing Period, shall be charged at the applicable Tier 5 water rates. Landscape customers who have Water Budgets, and whose water use exceeds 40% of their Water Budget during a Billing Period shall be charged the applicable Tier 5 water rates.
    - Commercial or industrial customers who are served through dedicated or mixed-use meter, and who have Water Budgets, shall reduce landscape and non-essential outdoor water use by 10%.
    - Potable water customers in areas directly served by WMWD and who do not have Water Budgets shall reduce their outdoor water use by 40% from the Base Period.
  - Sub-level 2C
    - All outdoor Water Budgets shall be reduced be 65%. Residential customers who have Water Budgets, and whose water use exceeds 100% of their Tier 1 and 35% of their Tier 2 Water Budgets during a Billing Period, shall be charged at the applicable Tier 5 water rates. Landscape customers who have Water Budgets, and whose water use exceeds 35% of their Water Budget during a Billing Period shall be charged the applicable Tier 5 water rates.
    - Installation of new landscapes shall be prohibited unless irrigated with recycled water. Exceptions may be provided for projects with prior approval by the appropriate jurisdiction.
    - Commercial or industrial customers who are served through dedicated or mixed-use meters, and who have Water Budgets, shall water use by 20%.
    - Potable water customers in areas directly served by WMWD and who do not have Water Budgets shall reduce their outdoor water use by 65% from the Base Period.
    - No new construction or hydrant meters will be issued. Potable water shall not be used for earth work, road construction purposes, dust control, compaction, or trenching jetting. Construction projects necessary to maintain the health, safety, and welfare of the public are exempt from these regulations.

- WMWD shall develop a public information campaign to provide customers with options for achieving demand reduction goals and complying with their applicable allocation. WMWD may explore increased customer incentives for conservation measures.

**STANDARD WATER SHORTAGE LEVEL 3**

In addition to tasks implemented in Standard Water Shortage Level 2, the following applies to Standard Water Shortage Level 3:

IEUA Member Agencies

- Increase penalties.
- Implement emergency alerts.
- Implement news media coverage.
- Additional requirements deemed necessary by individual member agencies.

WMWD Member Agencies

- Additional requirements deemed necessary by individual member agencies.

**STANDARD WATER SHORTAGE LEVEL 4**

In addition to tasks implemented in Standard Water Shortage Level 3, the following applies to Standard Water Shortage Level 4:

IEUA Member Agencies

- Additional requirements deemed necessary by individual member agencies.

WMWD Member Agencies

- Additional requirements deemed necessary by individual member agencies.

**STANDARD WATER SHORTAGE LEVEL 5**

In addition to tasks implemented in Standard Water Shortage Level 4, the following applies to Standard Water Shortage Level 5:

IEUA Member Agencies

- Additional requirements deemed necessary by individual member agencies.

WMWD Member Agencies

- Additional requirements deemed necessary by individual member agencies.

**STANDARD WATER SHORTAGE LEVEL 6**

In addition to tasks implemented in Standard Water Shortage Level 5, the following applies to Standard Water Shortage Level 6:

IEUA Member Agencies

- Only offer indoor plumbing and property leak detection programs.
- Suspend all landscape and irrigation programs.
- Conduct stringent enforcement of restrictions.
- Additional requirements deemed necessary by individual member agencies.

WMWD Member Agencies

- All landscape and non-essential outdoor water use for all customers in all areas of WMWD's retail water service area shall be prohibited.
- Except as to property for which a building permit has been heretofore issued, no new water meter(s) shall be provided, except in the following circumstances:
    - For projects necessary to protect the public's health, safety, and welfare; or
    - When using recycled water
- Sub-levels under Standard Water Shortage Level 6
    - Sub-level 6A
        - All indoor residential Water Budgets shall be reduced by 10% to 54 GPCD. Residential customers who have Water Budgets and whose water use exceeds 90% of their modified Tier 1 Water Budget and 0% of Tier 2 Water Budget during a Billing Period, or 50 GPCD, shall be charged at the applicable Tier 5 water rates.
        - Commercial and industrial customers who are served through dedicated or mixed-use meters, and who have Water Budgets, shall reduce their water consumption by 30%.
        - Potable water customers in areas directly served by WMWD that do not have Water Budgets shall reduce their indoor water use by 10%
    - Sub-level 6B
        - All indoor residential Water Budgets shall be reduced by 15% to 51 GPCD. Residential customers who have Water Budgets and whose water use exceeds 85% of their modified Tier 1 Water Budget and 0% of Tier 2 Water Budget during a Billing Period, or 51 GPCD, shall be charged at the applicable Tier 5 water rates.
        - Commercial and industrial customers who are served through dedicated or mixed-use meters, and who have Water Budgets, shall reduce their water consumption by 40%.
        - Potable water customers in areas directly served by WMWD that do not have Water Budgets shall reduce their indoor water use by 15% from the Base Period. All non-essential outdoor and landscape water use shall be prohibited.
    - Sub-level 6C

    - All residential customers who have Water Budgets shall have their indoor Water Budgets reduced by 20% to 48 GPCD. Residential customers who have Water Budgets and whose water use exceeds 80% of their modified Tier 1 Water Budget and 0% of Tier 2 Water Budget during a Billing Period, or 48 GPCD, shall be charged at the applicable Tier 5 water rates.
    - Commercial and industrial customers who are served through dedicated or mixed-use meters, and who have Water Budgets, shall reduce their water consumption by 50%.
    - Potable water customers in areas directly served by WMWD that do not have Water Budgets shall reduce their indoor water use by 20% from the Base Period.
- The use of water for commercial, manufacturing, or processing purposes may be further reduced in volume than is indicated in the sub-stages of this section if it is determined to be in the best interest of the health, sanitation, and fire flow protection in the communities served by WMWD. This determination may be made by the WMWD Board of Directors, the General Manager, or his or her authorized designee.
- All dedicated irrigation meters will be locked off by WMWD personnel.
- Customers with a WMWD authorized Medical Adjustment to their Tier 1 allocation will be permitted 100% of their Tier 1 Water Budget.
- WMWD shall develop a public information campaign to provide customers with options for achieving Level 6 demand reduction goals and complying with their allocation. WMWD may explore increased customer incentives for conservation measures.

**Table 8-2 Demand Reduction Actions**

| Submittal Table 8-2: Demand Reduction Actions | | | | |
|---|---|---|---|---|
| Shortage Level | Demand Reduction Actions<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.* | How much is this going to reduce the shortage gap?<br>*Include units used (volume type or percentage)* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>***For Retail Suppliers Only***<br>*Drop Down List* |
| *Add additional rows as needed* | | | | |
| 1 | Expand Public Information Campaign | Collective reduction from all Shortage Level 1 actions is up to 596 AFY | Applicable to IEUA member agencies | No |
| 1 | Increase Frequency of Meter Reading | Collective reduction from all Shortage Level 1 actions is up to 596 AFY | Applicable to IEUA member agencies | No |
| 1 | Increase Water Waste Patrols | Collective reduction from all Shortage Level 1 actions is up to 596 AFY | Applicable to IEUA member agencies | Yes |
| 1 | Implement or Modify Drought Rate Structure or Surcharge | Collective reduction from all Shortage Level 1 actions is up to 596 AFY | Applicable to WMWD member agencies | Yes |
| 2 | Other | Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 1,193 AFY | All actions under Shortage Level 1 | Yes |
| 2 | Moratorium or Net Zero Demand Increase on New Connections | Collective reduction from all Shortage Level 2 actions is up to 1,193 AFY | Applicable to IEUA member agencies | Yes |
| 2 | Implement or Modify Drought Rate Structure or Surcharge | Collective reduction from all Shortage Level 2 actions is up to 1,193 AFY | Applicable to WMWD member agencies | Yes |
| 3 | Other | Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 1,789 AFY | All actions under Shortage Level 2 | Yes |
| 4 | Other | Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 2,386 AFY | All actions under Shortage Level 3 | Yes |
| 5 | Other | Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 2,982 AFY | All actions under Shortage Level 4 | Yes |
| 6 | Other | Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 2,982 AFY | All actions under Shortage Level 5 | Yes |
| NOTES: CDA promotes IEUA and WMWD water shortage response actions for its member agencies to reduce demand on their individual water supplies. Member agencies may employ their own demand reduction actions and/or IEUA or WMWD demand reduction actions at their own discretion. | | | | |

### 8.4.2 SUPPLY AUGMENTATION

CDA's purpose is to produce treated groundwater for its member agencies. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption.CDA does not anticipate augmenting water supplies. However, CDA's member agencies may consider increased supplies from existing sources. Table 8-3 reflects this approach and does not identify any new supplies. Instead, CDA's member agencies will focus on demand reduction measures in the event existing sources of supply are not sufficient to meet customer demands. As discussed in Chapter 6, CDA's source of water supply is groundwater produced from the Chino Basin. As noted in Section 8.2, beginning July 1, 2022, CDA will prepare and submit an Annual Assessment which will include a review of the water supply available to help meet water demands for the current and upcoming years.

As noted in Section 6.2.2, the Chino Basin is managed by the Chino Basin Watermaster. During the period of management under the Chino Basin Judgment, significant drought events have occurred. In each drought cycle, the Chino Basin has been managed to maintain water levels. Groundwater quality is carefully monitored and managed by the Chino Basin Watermaster. Treatment facilities, including CDA, and/or blend plans have been developed by water agencies to meet potable water standards and to prevent the spread of any groundwater contamination. Groundwater quality in the Chino Basin is not expected to impact potable supplies or constrain supply reliability. Based on historical and on-going management practices, CDA continue to provide potable water to its member agencies from the Chino Basin.

**Table 8-3 Supply Augmentation and Other Actions**

| Submittal Table 8-3: Supply Augmentation and Other Actions | | | |
|---|---|---|---|
| Shortage Level | Supply Augmentation Methods and Other Actions by Water Supplier<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference *(optional)* |
| *Add additional rows as needed* | | | |
| 1 | Transfers | Not applicable (see Notes) | |
| 2 | Transfers | Not applicable (see Notes) | |
| 3 | Transfers | Not applicable (see Notes) | |
| 4 | Transfers | Not applicable (see Notes) | |
| 5 | Transfers | Not applicable (see Notes) | |
| 6 | Transfers | Not applicable (see Notes) | |
| | | | |
| | | | |
| | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. CDA does not anticipate augmenting water supplies. However, CDA's member agencies will consider increased production from the Chino Basin (through potential transfer of water rights) using existing facilities to address increased demands. As noted on Table 8-2, CDA's member agencies plan to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands. | | | |

### *8.4.3 OPERATIONAL CHANGES*

During a water supply shortage situation, CDA will manage its water supply resource to provide water supplies capable of meeting a portion of the demands of its member agencies. Section 8.4.1 describes CDA's member agencies' demand reduction actions such as rate structure changes, public outreach strategies, other operational changes. Section 8.4.2 describes CDA's water supply source.

As noted in Section 8.2, beginning July 1, 2022, CDA will prepare and submit an Annual Assessment which will include a review of the water supplies available to meet a portion of the water demands from its member agencies for the current and upcoming years. Preparation of the Annual Assessment will assist CDA in determining any potential operational changes. The operational changes CDA will consider in addressing non-catastrophic water shortages on a short-term basis include the following:

- Improved monitoring, maintenance, and repairs to reduce water distribution system losses.

### 8.4.4 ADDITIONAL MANDATORY RESTRICTIONS

The mandatory restrictions which are promoted by CDA to reduce member agencies' customer demands are discussed in Section 8.4.1. There are no additional mandatory restrictions planned at this time.

### 8.4.5 EMERGENCY RESPONSE PLAN

Catastrophic water shortages are incorporated in CDA's member agencies' standard water shortage levels (identified in Section 8.3) and the associated demand reduction measures (described in 8.4.1). In addition to potential operational changes (Section 8.4.3) which CDA may consider in order to continue providing water supplies, CDA will review and implement any necessary steps included in its "Emergency Response Plan".

As part of the "America's Water Infrastructure Act of 2018", community water systems serving a population greater than 3,300 people, including CDA, are required to review and update their "Risk and Resilience Assessment" (RRA) and the associated "Emergency Response Plan" (ERP) every five (5) years. However, due to security concerns regarding the submitting of these reports, water systems are required to submit certifications to the United States Environment Protection Agency (USEPA), from March 31, 2020 and December 30, 2021, confirming the current RRA and ERP have been reviewed and updated.

CDA's RRA, which is currently being prepared, evaluates the vulnerabilities, threats, and consequences from potential hazards to CDA's water system. CDA is preparing its RRA (which is incorporated by reference) by evaluating the following items:

- Natural hazards and malevolent acts (i.e., all hazards);
- Resilience of water facility infrastructure (including pipes, physical barriers, water sources and collection, treatment, storage and distribution facilities, and electronic, computer and other automated systems);
- Monitoring practices;
- Financial systems (e.g., billing systems);
- Chemical storage and handling; and
- Operation and maintenance.

CDA's RRA evaluated a series of potential malevolent acts, natural hazards, and other threats in order to estimate the potential "monetized risks" (i.e. associated economic consequences to both the water system and surrounding region, and the likelihood of occurrence) associated with CDA's water facility assets. The cost-effectiveness of implementing potential countermeasures to reduce risks was also reviewed.

CDA's ERP, which is currently being prepared, provides the management, procedures, and designated actions CDA and its employees will implement during emergency situations (including catastrophic water shortages) resulting from natural disasters, system failures and other unforeseen circumstances. CDA's ERP (which is incorporated by reference) provides the guidelines for evaluating an emergency situation, procedures for activating an emergency response, and details of the different response phases in order to ensure that customers receive a reliable and adequate supply of potable water. The scope of the ERP includes emergencies which directly affect the water system and the ability to maintain safe operations (such as a chlorine release, and earthquake or a threat of contamination). The ERP also incorporates the results of CDA's RRA and includes the following:

- Strategies and resources to improve resilience, including physical and cybersecurity
- Plans and procedures for responding to a natural hazard or malevolent act
- Actions and equipment to lessen the impact of a natural hazard or malevolent act
- Strategies to detect natural hazards or malevolent act

CDA will review the ERP for procedures regarding the utilization of alternative water supply sources in response to water supply shortages, including during the standard water shortage levels. CDA will also review applicable procedures described in the ERP regarding any necessary temporary shutdown of water supply facilities, including appropriate regulatory and public notifications.

### *8.4.6 SEISMIC RISK ASSESSMENT AND MITIGATION PLAN*

**CWC 10632.5.**

*(a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.*

*(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.*

*(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.*

The County of San Bernardino prepared a "Multi-Jurisdictional Hazard Mitigation Plan" which was approved by the Federal Emergency Management Agency (FEMA) in June 2017. The County's Multi-Jurisdictional Hazard Mitigation Plan identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout San Bernardino County, and the mitigation strategies necessary to reduce risks, including seismic risk. The County's Multi-Jurisdictional Hazard Mitigation Plan is provided in Appendix E.

The County of Riverside prepared a "Multi-Jurisdictional Local Hazard Mitigation Plan" which was approved by FEMA in June 2018. The County's Multi-Jurisdictional Local Hazard Mitigation Plan identified methods to assess significant natural hazards (including earthquakes) affecting areas throughout Riverside County, and the mitigation strategies necessary to reduce risks, including seismic risk. The County's Multi-Jurisdictional Local Hazard Mitigation Plan is provided in Appendix F.

The California Geological Survey has published the locations of numerous faults which have been mapped in the Southern California region. Although the San Andreas fault is the most recognized and is capable of producing an earthquake with a magnitude greater than 8 on the Richter scale, some of the lesser-known faults have the potential to cause significant damage. The locations of these earthquake faults in the vicinity of the area receiving water supplies form CDA are provided in the figure below. The faults that are located in close proximity to and could potentially cause significant shaking in the area receiving water supplies from CDA include the San Andreas fault, the San Jose fault, the Red Hill fault, the Cucamonga fault, the Chino fault, the Central Avenue fault, and the Sierra Madre fault.

**Location of Earthquake Faults**

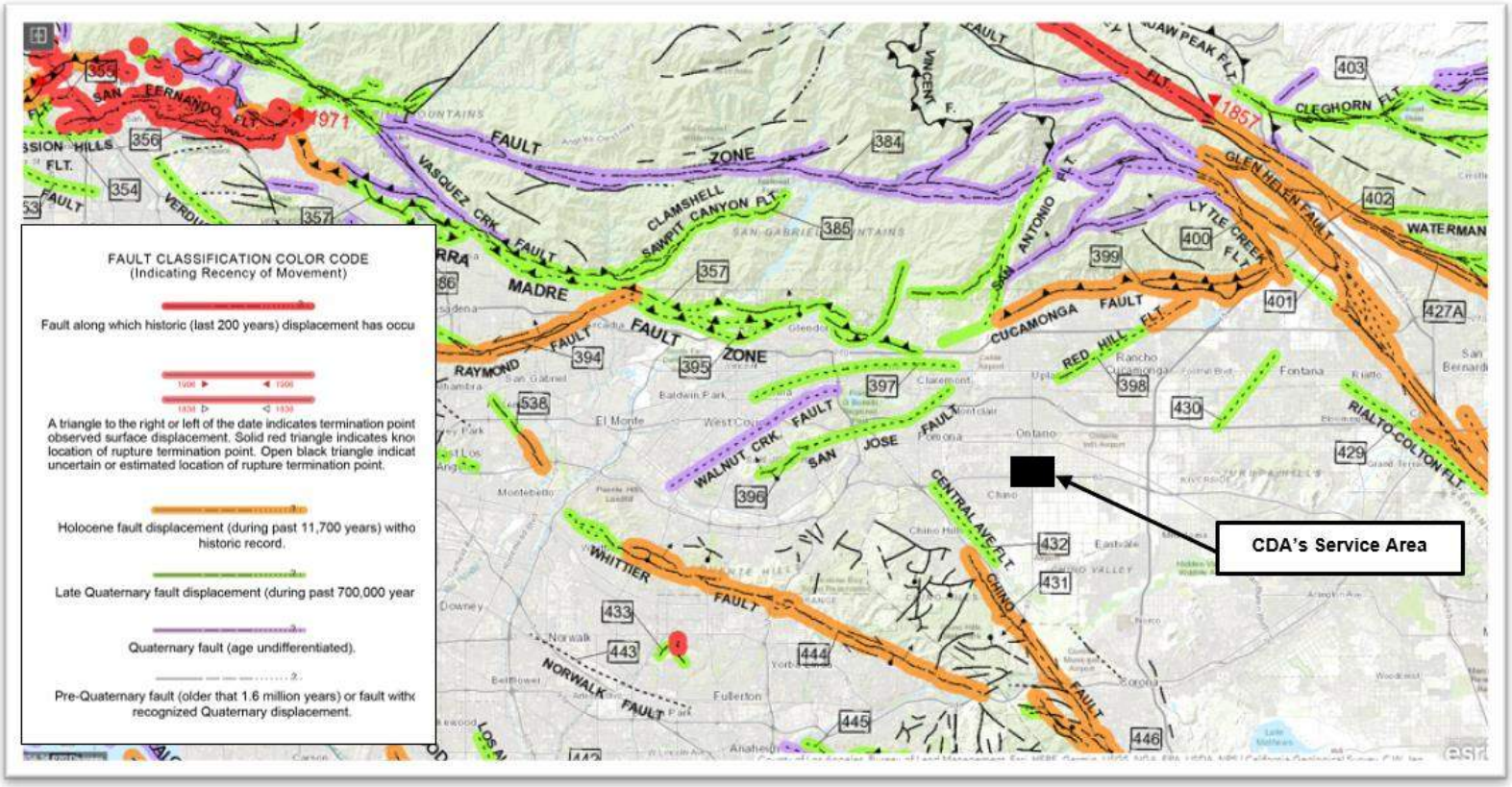


Source: https://maps.conservation.ca.gov/cgs/fam/App/

The following figure provides the relative intensity of ground shaking in the vicinity of the area receiving water supplies from CDA from anticipated future earthquakes. The locations of relatively long-period (1.0 second) earthquake shaking, including the are receiving water supplies from CDA, are provided. Long-period shaking affects tall, relatively flexible buildings, but also correlates with earthquake damage. The shaking potential is calculated based on the level of ground motion that has a 2 percent chance of being exceeded in 50 years (or the level of ground-shaking with an approximate 2,500-year average repeat time). As discussed in Section 8.4.5, CDA has prepared an Emergency Response Plan which provides the management, procedures, and designated actions CDA and its employees will implement during emergency situations resulting from natural disasters, including during earthquakes, to ensure that member agencies receive a reliable and adequate supply of potable water. CDA's ERP is incorporated by reference.

**Earthquake Shaking Potential**

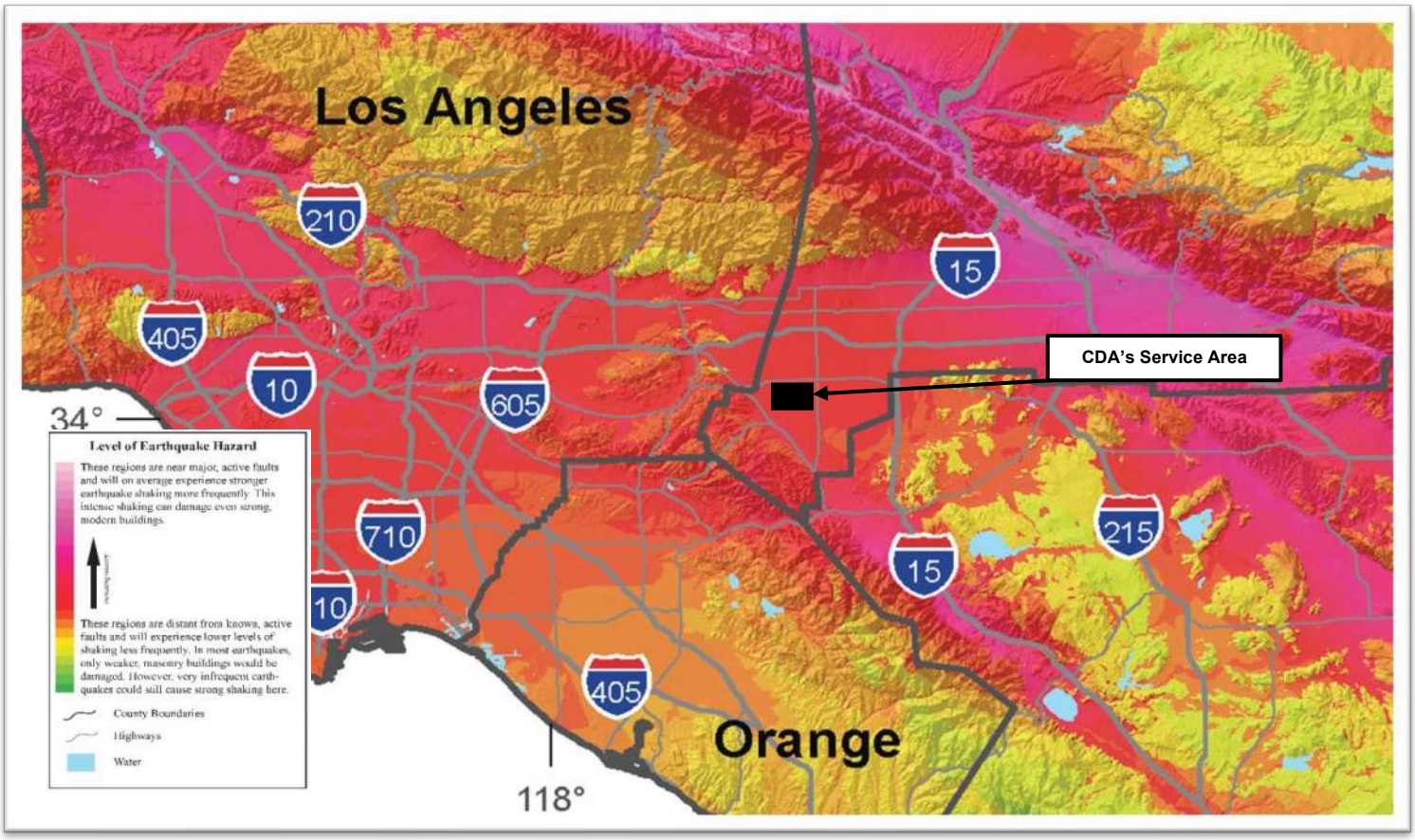


Source: "Earthquake Shaking Potential for California", 2016, California Geological Survey and United States Geological Survey

## 8.4.7 SHORTAGE RESPONSE ACTION EFFECTIVENESS

CDA serves a dual purpose of providing reliable water supply and improving groundwater quality in the Chino Basin. CDA's member agencies are required to purchase a minimum amount of treated water production to support this function. The groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. Nonetheless, CDA supports local agencies in efforts to enforce regulations and prohibitions on water use. The effectiveness of each of CDA's member agencies' shortage response actions, designed in support of IEUA's and WMWD's shortage response actions for its member agencies to reduce any potential gaps between their individual portfolios of supply and demand, has been quantified in Table 8-2 and Table 8-3. These tables are representative of CDA's member agencies' expected demand reduction pursuant to IEUA's and/or WMWD's shortage response actions described in Section 8.4.1.

Section 6.1 provides a tabulation of CDA's historical annual water demands from its member agencies for its water supply source. During the past 10 years, CDA experienced a five consecutive year drought within the area receiving its water supplies from FY 2011-12 to FY 2015-16. Throughout this extended dry year period, CDA's annual water production ranged from 27,098 AF to 30,022 AF, with an average of approximately 28,595 AF. In addition, historical records indicate CDA previously produced a maximum of up to 35,003 AF during FY 2019-20.

CDA's water demands from its member agencies during the most recent five years (from FY 2015-16 to FY 2019-20) averaged approximately 30,519 AFY. As discussed in Section 8.4.2, based on historical and on-going management practices, CDA will be able to continue providing potable water to its member agencies from the Chino Basin in response to each of the standard water shortage levels identified in Section 8.3.

## 8.5 COMMUNICATION PROTOCOLS

**CWC 10632.**

*(a)(5) Communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments, regarding, at a minimum, all of the following:*

*(A) Any current or predicted shortages as determined by the annual water supply and demand assessment described pursuant to Section 10632.1.*

*(B) Any shortage response actions triggered or anticipated to be triggered by the annual water supply and demand assessment described pursuant to Section 10632.1.*

*(C) Any other relevant communications.*

Pursuant to CWC 10632.1, CDA's Annual Assessment will be submitted to DWR by July 1 of each year or within 14 days of receiving its final allocation, whichever is later. The Annual Assessment will include a review of CDA's unconstrained water demands from its member agencies (i.e. water demands from its member agencies prior to any projected response actions CDA may trigger under this WSCP) for the current year and the upcoming (potential single dry) year. However, the groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. See Section 8.2 for more information regarding the Annual Assessment.

IEUA Member Agencies

IEUA's communication protocols and procedures to inform its customers, the public, interested parties, and local, regional, and state governments, of current or predicted shortages and any triggered shortage response actions can be found in IEUA's 2020 UWMP, including:

- The IEUA Drought Response Taskforce to gain consensus on appropriate regional response actions. The taskforce is comprised of representatives from each of the eight IEUA member agencies and regional personnel from IEUA. These recommendations will be brought to each agency's respective management for approval. CDA will utilize broad messaging through IEUA (news stories, radio/tv ads, billboards, etc.) to communicate water scarcity, urgency to act, and commitment to continue to provide safe, reliable supply. Additionally, CDA will utilize targeted action messaging through IEUA aimed towards specific customers via phone, letter, email, etc.

WMWD Member Agencies

WMWD's communication protocols and procedures to inform its customers, the public, interested parties, and local, regional, and state governments, of current or predicted shortages and any triggered shortage response actions can be found in WMWD's 2020 UWMP, including:

- WMWD shall provide written notice by mail of:
    - Proposed increases to such rates and charges to the record owner of each parcel upon which the rates and charges are proposed for imposition and any tenant directly liable for payment of the rates.
    - The amount of the rates and charges proposed to be implemented on each parcel.
    - The basis upon which the rates and charges were calculated.
    - The reason for the rates and charges.
    - And the date, time, and location of a public hearing on the proposed rates and charges.

  Such notice is required to be provided to the affected property owners and any tenant directly liable for the payment of the rates and charges no less than 45 days prior to the public hearing on the proposed rates and charges.
- The declaration of any water shortage level or sub-level shall be made by resolution of the Board of Directors. Within 10 calendar days of the adoption of the resolution declaring the applicable level or sub-level, WMWD shall make a public announcement and provide notice of the applicable standard water shortage level. Such declaration and notice shall provide the extent, terms, and conditions as well as the associated water budget allocations and fines and/or penalties respecting the use and consumption of water in accordance with the applicable water shortage level. Upon such declaration and publication of such notice, due and proper notice shall be deemed to have been given to each and every person supplied water with WMWD. The water shortage level designated shall become effective immediately upon announcement.

## 8.6 COMPLIANCE AND ENFORCEMENT

**CWC 10632.**

*(a)(6) For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions as determined pursuant to Section 10632.2.*

As a wholesale supplier, CDA is not required by DWR to complete Section 8.6.

## 8.7 LEGAL AUTHORITIES

**CWC 10632.**

*(a)(7)(A) A description of the legal authorities that empower the urban water supplier to implement and enforce its shortage response actions specified in paragraph (4) that may include, but are not limited to, statutory authorities, ordinances, resolutions, and contract provisions.*

*(B) A statement that an urban water supplier shall declare a water shortage emergency in accordance with Chapter 3 (commencing with Section 350) of Division 1.*

*(C) A statement that an urban water supplier shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.*

**CWC Division 1, Section 350**

*The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, shall declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection.*

CDA's groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption.

CDA's member agencies may declare a water shortage emergency and may immediately enact the response actions of any of the levels designated in this WSCP and their own individual WSCP's. The required measures of the designated water shortage level determined by the member agency will be communicated to the public within their service area.

CDA shall coordinate with any city, county, or agency within which it provides water supply services for the possible proclamation of a local emergency.

## 8.8 FINANCIAL CONSEQUENCES OF WSCP

**CWC 10632.**

*(a)(8) A description of the financial consequences of, and responses for, drought conditions, including, but not limited to, all of the following:*

*(A) A description of potential revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).*

*(B) A description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions described in paragraph (4).*

*(C) A description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1.*

CDA serves a dual purpose of providing reliable water supply and managing groundwater quantity and quality in the Chino Basin. CDA member agencies are required to purchase a minimum amount of production to support this function. These minimum purchase agreements form a fixed portion of the water supply portfolios of each of the CDA retail member agencies. Implementation of the provisions of this WSCP does not pose any impending financial consequences to CDA, due to member agencies' minimum purchase agreements. Revenues are constant, as are the expenditures.

Expenditures may be impacted only in the event of a catastrophic interruption of water supplies. Damages would increase expenditures in case of necessary emergency repairs. Expenditures on power, water treatment chemicals, and operational costs would decrease during emergency repairs, where CDA would pump less water.

## 8.9 MONITORING AND REPORTING

**CWC 10632.**

*(a)(9) For an urban retail water supplier, monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements.*

As a wholesale supplier, CDA is not required by DWR to complete Section 8.9.

## 8.10 WSCP REFINEMENT PROCEDURES

**CWC 10632.**

*(a)(10) Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan in order to ensure shortage risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented as needed.*

CDA's groundwater production is required to maintain groundwater cleanup priorities and is not subject to interruption. Nonetheless, CDA's Water Shortage Contingency Plan has been prepared as an adaptive management plan in support of CDA's member agencies' requirement to reduce demand on water supplies during designated water shortage levels. CDA's member agencies will review the implementation results for any current or potential shortage gaps between water supplies and demands. CDA will evaluate the need for revising the Water Shortage Contingency Plan, as necessary, based on IEUA and/or WMWD's implementation results of their WSCPs. CDA will consider the following potential revisions made by IEUA and/or WMWD in the event of a potential shortage gap:

- Implementation of additional public outreach, education, and communication programs (in addition to the programs discussed in Chapter 9).
- Incorporation of additional actions recommended by CDA, IEUA, and/or WMWD staff or other interested parties.

This Water Shortage Contingency Plan is adopted as part of CDA's 2020 Urban Water Management Plan adoption process discussed in Section 10.3. It is anticipated CDA will review, revise, and adopt an updated Water Shortage Contingency Plan as part of preparing its 2025 Urban Water Management Plan as necessary. However, CDA may update the Water Shortage Contingency Plan, as necessary. Any updates to CDA's Water Shortage Contingency Plan will include a public hearing and adoption process by CDA's Board (see Section 8.12).

## 8.11 SPECIAL WATER FEATURE DISTINCTION

**CWC 10632.**

*(b) For purposes of developing the water shortage contingency plan pursuant to subdivision (a), an urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.*

As a wholesale supplier, CDA is not required by DWR to complete Section 8.11.

## 8.12 PLAN ADOPTION, SUBMITTAL, AND AVAILABILITY

**CWC 10632.**

*(c) The urban water supplier shall make available the water shortage contingency plan prepared pursuant to this article to its customers and any city or county within which it provides water supplies no later than 30 days after adoption of the water shortage contingency plan.*

CDA's Water Shortage Contingency Plan is adopted as part of CDA's 2020 Urban Water Management Plan adoption process discussed in Chapter 10. The process for adopting CDA's Water Shortage Contingency Plan includes the following:

- CDA will conduct a public hearing and make the Water Shortage Contingency Plan available for public inspection.
- CDA will provide notification of the time and place of the public hearing to any city or county in which water is provided.
- CDA will publish notice of public hearing in a newspaper once a week, for two successive weeks (with at least five days between publication dates).
- CDA's Board will adopt the 2020 Urban Water Management Plan and the Water Shortage Contingency Plan.
- As part of submitting the 2020 Urban Water Management Plan to DWR, CDA will also submit the Water Shortage Contingency Plan (electronically through DWR's online submittal tool) within 30 days of adoption and by July 1, 2021. CDA will submit a copy of the Water Shortage Contingency Plan to the California State Library and to any city or county in which water is provided within 30 days of adoption. In addition, CDA will make the Water Shortage Contingency Plan available for public review within 30 days of adoption.

If there are any subsequent amendments required, the process for adopting an amended Water Shortage Contingency Plan includes the following:

- CDA will conduct a public hearing and make the amended Water Shortage Contingency Plan available for public inspection.
- CDA's Board will adopt the amended Water Shortage Contingency Plan.
- CDA will submit the amended Water Shortage Contingency Plan to DWR (electronically through DWR's online submittal tool) within 30 days of adoption.

Additional information regarding the adoption, submittal, and availability of CDA's Water Shortage Contingency Plan (and 2020 Urban Water Management Plan) is provided in Chapter 10.

Chapter 9

# DEMAND MANAGEMENT MEASURES

## LAY DESCRIPTION – CHAPTER 9

**DEMAND MANAGEMENT MEASURES**

Chapter 9 (Demand Management Measures) of CDA's 2020 Plan discusses and provides the following:

- CDA has implemented "Demand Management Measures" to reduce its water demands and achieve its water use targets (discussed in Chapter 5).
- CDA's Demand Management Measures include metering of all its water supply connections with its retail member agencies.
- CDA's Demand Management Measures include public education and outreach programs regarding water conservation.
- CDA's Demand Management Measures include staffing of its water conservation program.
- Additional Demand Management Measures including rebate, conservation, asset management, and wholesale supplier assistance programs are discussed.
- A summary of the Demand Management Measures CDA has implemented over the past five (5) years is provided.

## 9.1 DEMAND MANAGEMENT MEASURES FOR WHOLESALE SUPPLIERS

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1)(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

*(ii) Metering.*

*(iv) Public education and outreach.*
*(vi) Water conservation program coordination and staffing support.*

*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

*(2) For an urban wholesale water supplier, as defined in Section 10608.12, a narrative description of the items in clauses (ii), (iv), (vi), and (vii) of subparagraph (B) of paragraph (1),*

*and a narrative description of its distribution system asset management and wholesale supplier assistance programs.*

CDA delivers desalinated Chino Basin groundwater to its member agencies which in turn, participate in conservation efforts made by IEUA or WMWD.

### 9.1.1 METERING

CDA fully meters its connections to its member agencies. All agency connections are administered by purchasing agreements with CDA and its member agencies.

### 9.1.2 PUBLIC EDUCATION AND OUTREACH

CDA's member agencies' customers have access to IEUA and WMWD public information programs which promote water conservation. IEUA and WMWD provide marketing and outreach materials by using social media platforms, websites, community events, education training, monthly newsletters, and direct communication to retail consumers regarding water use. Retail consumers learn about rebates and additional programs through the IEUA and WMWD websites.

WMWD provides customer support programs such as free efficiency evaluations for irrigation systems and tips for efficient landscaping. WMWD also promotes regional programs such as Riverside County gardening workshops, national green plumbing training programs, and water efficient landscape training programs.

IEUA provides water use efficiency programs, water saving tips, and rebates to retail consumers. Water use efficiency programs include free landscape design training, consultations, and design renderings; irrigation auditing; and pressure regulation valve installation, repair, and maintenance. IEUA also offers a residential automatic water softener rebate. IEUA also hosts and sponsors a wide range of community events including Earth Day Celebration, compost giveaways, Days at the LA Fair, and a Landscape Water Conservation Fair.

IEUA and WMWD conduct water conservation school education programs to the regional elementary schools. Programs include school assemblies and lesson materials to educate students on water conservation. IEUA and WMWD are members of the Water Education Water Awareness Committee (WEWAC) which provides water education to local schools, including schools within CDA's member agencies' service areas. WEWAC hosts art and essay contests and provides financial support for lesson plan materials about water issues.

### 9.1.3 WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT

CDA's member agencies maintain staff who are responsible for setting policies and priorities of their respective agencies. Monthly board and city council meetings are conducted to adopt programs contributing to water reliability which the CDA member agency staff then implement through conservation programs. Key objectives include promoting education and water use efficiency to enhance water supplies. CDA's member agency staff are responsible for marketing, outreach, and possible augmentation programs within their individual service areas.

### 9.1.4 OTHER DEMAND MANAGEMENT MEASURES

In addition to the Demand Management Measures (DMMs) discussed above, IEUA and WMWD participate in MWD's SoCal Water$mart Program, a regional rebate program available to residential and commercial customers. There are rebates available for indoor plumbing including high efficiency clothes washers and toilets. Rebates are also available for outdoor plumbing, including those for weather-based irrigation controllers, rotating sprinkler nozzles, and replacement of irrigated lawn with drought tolerant plants or other approved landscape options. IEUA and WMWD plan to continue implementation of these programs to promote water conservation for CDA's member agencies.

### 9.1.5 ASSET MANAGEMENT

CDA manages long-term assets through its Capital Improvement Program. Renewal and replacement activities are anticipated and budgeted through annual budget planning and financial reports. Short-term asset management is addressed through preventative and corrective maintenance programs for the desalter facilities.

### 9.1.6 WHOLESALE SUPPLIER ASSISTANCE PROGRAMS

Wholesale supplier assistance programs are administered by IEUA and WMWD for CDA's member agencies. As discussed in the introduction to Chapter 9, CDA promotes conservation through IEUA and WMWD, who provide marketing and outreach materials to its retail consumers using social media platforms, their websites, community events, education training, monthly newsletters, and direct communication to consumers regarding their water use.

## 9.2 EXISTING DEMAND MANAGEMENT MEASURES FOR RETAIL SUPPLIERS

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1)(A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

*(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

*(i) Water waste prevention ordinances.*

*(ii) Metering.*

*(iii) Conservation pricing.*

*(iv) Public education and outreach.*

*(v) Programs to assess and manage distribution system real loss.*

*(vi) Water conservation program coordination and staffing support.*

*(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

As a wholesale agency, CDA is not required by DWR to complete Section 9.2.

## 9.3 REPORTING IMPLEMENTATION

### *9.3.1 IMPLEMENTATION OVER THE PAST FIVE YEARS*

**CWC 10631.**

*(e) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*

*(1) (A) ...a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.*

CDA is committed to implementing water conservation programs through IEUA and WMWD to provide water conservation programs for their member agencies' customers. The highlights of DMM implementation over the past five years are described below.

As discussed in Section 9.1.1, CDA fully meters its connections to its member agencies. All agency connections are administered by purchasing agreements between the member agencies and CDA.

As discussed in Section 9.1.2, CDA customers have access to IEUA and WMWD public information programs to promote water conservation. IEUA and WMWD provide marketing and outreach materials by using social media platforms, their websites, community events, education training, monthly newsletters, and direct communication to retail consumers regarding their water use. Customers learn about rebates and additional programs through the IEUA and WMWD websites. IEUA and WMWD are also members of the WEWAC that promotes the education of water issues to local schools, including schools within CDA's member agency service areas.

As discussed in Section 9.1.3, CDA's member agency staff are responsible for setting policies and priorities of the agencies. Monthly board and city council meetings are conducted to adopt programs contributing to water reliability which CDA member agency staff then implement through conservation programs. Key objectives include promoting education and water use efficiency to enhance water supplies and reduce demand on imported water supply.

As discussed in Section 9.1.4, in addition to the DMMs discussed above, IEUA and WMWD participate in MWD's regional rebate program, the SoCal Water$mart Program, which is available to residential and commercial customers.

As described in Section 9.1.5, CDA manages long-term assets through the Capital Improvement Program. Renewal and replacement activities are anticipated and budgeted through annual budget planning and financial reports. Short-term asset management is handled through preventative and corrective maintenance programs for the desalter facilities.

As described in Section 9.1.6, wholesale supplier assistance programs are administered by IEUA and WMWD for CDA's member agencies.

### 9.3.2 IMPLEMENTATION TO ACHIEVE WATER USE TARGETS

**CWC 10631.**

*(F)(1)(A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

The Demand Management Measures implemented by CDA are discussed in Section 9.2. Descriptions regarding the nature and extent of these Demand Management Measures implemented by CDA over the past five years are discussed in Section 9.3. CDA will continue to implement these Demand Management Measures and other water conservation programs and work collaboratively with IEUA and WMWD to provide water conservation programs for CDA's member agencies' residents.

## 9.4 WATER USE OBJECTIVES (FUTURE REQUIREMENTS)

Retail water agencies are currently working with DWR to develop Water Use Objectives pursuant to Assembly Bill (AB) 1668 and Senate Bill (SB) 606. Beginning in 2024, retail water agencies are required to begin reporting compliance of their Water Use Objectives consisting of indoor residential water use, outdoor residential water use, commercial, industrial and institutional, irrigation with dedicated meters, water loss, and other unique local uses.

CDA is not a retail water agency and is not required to comply with the Water Use Objectives. However, CDA will continue to implement the Demand Management Measures discussed in Section 9.2.

Chapter 10

# PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

## LAY DESCRIPTION – CHAPTER 10

### PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Chapter 10 (Plan Adoption, Submittal, and Implementation) of CDA's 2020 Plan discusses and provides the following:

- The steps CDA has performed to adopt and submit its 2020 Plan are detailed.
- The steps CDA has performed to adopt and submit its Water Shortage Contingency Plan are detailed.
- CDA coordinated the preparation of its 2020 Plan with Cities of Chino, Chino Hills, Eastvale, Jurupa Valley, Norco, Ontario, the Counties of San Bernardino and Riverside, and other agencies. CDA notified these agencies at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited these agencies to participate in the development of the 2020 Plan.
- CDA provided a notice of the public hearing to the same agencies regarding the time, date, and place of the public hearing.
- CDA published a newspaper notification of the public hearing, once a week for two successive weeks
- CDA conducted a public hearing to discuss and adopt CDA's 2020 Plan and CDA's Water Shortage Contingency Plan.
- Within 30 days of adoption, CDA submitted the 2020 Plan and Water Shortage Contingency Plan to the California Department of Water Resources.
- Within 30 days of adoption, CDA submitted all data tables associated with the 2020 Plan to the California Department of Water Resources.
- Within 30 days of adoption, CDA submitted a copy of the 2020 Plan to the State of California Library.
- Within 30 days of adoption, CDA submitted a copy of the 2020 Plan (and Water Shortage Contingency Plan) to the County of San Bernardino Assessor- Recorder/ Clerk's office and the County of Riverside Assessor- County Clerk-Recorder's office.
- Within 30 days after submittal of the 2020 Plan to the California Department of Water Resources, CDA made the 2020 Plan (including the Water Shortage Contingency Plan) available at CDA's headquarters and on CDA's website.
- The steps CDA will perform to amend the 2020 Plan and/or the Water Shortage Contingency Plan, if necessary, are provided.

## 10.1 WSCP INCLUSION OF ALL 2020 DATA

The data provided in CDA's 2020 Plan and the WSCP is provided on a FY basis through June 30, 2020 (as discussed in Section 2.5).

## 10.2 NOTICE OF PUBLIC HEARING

CDA's public hearing notification process for its 2020 Plan and the WSCP is discussed below.

### *10.2.1 NOTICE TO CITIES AND COUNTIES*

**CWC 10621.**

*(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.*

**CWC 10642.**

*…The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies. Notices by a local public agency pursuant to this section shall be provided pursuant to Chapter 17.5 (commencing with Section 7290) of Division 7 of Title 1 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area…*

#### *10.2.1.1 60 DAY NOTIFICATION*

As discussed in Section 2.6.2., CDA coordinated the preparation of the 2020 Plan with the Cities of Chino, Chino Hills, Eastvale, Jurupa Valley, Norco, Ontario, the Counties of San Bernardino and Riverside, and other agencies. CDA notified these agencies, as well as to the cities and county within which CDA provides water supplies, at least sixty (60) days prior to the public hearing of the preparation of the 2020 Plan and invited them to participate in the development of the Plan. A copy of the notification letters sent to these agencies is provided in Appendix C.

#### *10.2.1.2 NOTICE OF PUBLIC HEARING*

CDA provided a notice of the public hearing to the Cities of Chino, Chino Hills, Eastvale, Jurupa Valley, Norco, Ontario, the Counties of San Bernardino and Riverside, and other agencies. The notice includes the time and place of the public hearing. To ensure that the Plan and the WSCP were available for review, CDA placed a copy of the draft 2020 Plan and the draft WSCP at the

CDA headquarters and made a copy available for review on its website. Copies of the notice of the public hearing are provided in Appendix C.

### *10.2.1.3 SUBMITTAL TABLES*

Table 10-1 summarizes the agencies which were provided notifications by CDA.

**Table 10-1 Notification to Cities and Counties**

| Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one) | | |
|---|---|---|
| ☐ | Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.** | |
| | Provide the page or location of this list in the UWMP. | |
| ☑ | Supplier has notified 10 or fewer cities or counties. **Complete the table below.** | |
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| Chino | Yes | Yes |
| Chino Hills | Yes | Yes |
| Eastvale | Yes | Yes |
| Jurupa Valley | Yes | Yes |
| Norco | Yes | Yes |
| Ontario | Yes | Yes |
| County Name *Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| Riverside County | Yes | Yes |
| San Bernardino County | Yes | Yes |
| NOTES: | | |

### 10.2.2 NOTICE TO THE PUBLIC

CDA encouraged the active involvement of the population within the area which receives water supplies from CDA prior to and during the preparation of the Plan. Pursuant to Section 6066 of the Government Code, CDA published a notice of public hearing in the newspaper during the weeks of May 12, 2021 and May 19, 2021. A notice of public hearing was CDA's website. A copy of the published notice is provided in Appendix C. To ensure that the draft 2020 Plan and the draft WSCP were available for review, CDA placed a copy at the CDA's headquarters and made a copy available for review on its website.

**CWC 10642.**

*...Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon. Prior to any of these hearings, notice of the time and place of the hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of a hearing to any city or county within which the supplier provides water supplies.*

**Government Code 6066.**

*Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.*

## 10.3 PUBLIC HEARING AND ADOPTION

**CWC 10642.**

*...Prior to adopting either, the urban water supplier shall make both the plan and the water shortage contingency plan available for public inspection and shall hold a public hearing or hearings thereon.*

**CWC 10608.26.**

*(a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:*

*(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.*

*(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.*

*(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.*

### 10.3.1 PUBLIC HEARING

Prior to adopting the draft 2020 Plan and the WSCP, CDA held a public hearing on July 3, 2021 which included input from the community regarding CDA's draft 2020 Plan and the draft WSCP. In addition, CDA considered the economic impacts of meeting these water use targets; including measures described in Section 8.8.

### 10.3.2 ADOPTION

**CWC 10642.**

*… After the hearing or hearings, the plan or water shortage contingency plan shall be adopted as prepared or as modified after the hearing or hearings.*

Following the public hearing, CDA adopted both the draft 2020 Plan and the draft WSCP (included in Chapter 8). A copy of the resolution adopting the 2020 Plan and the WSCP is provided in Appendix G.

## 10.4 PLAN SUBMITTAL

**CWC 10621.**

*(e) Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021.*

**CWC 10644.**

*(a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption.*

**CWC 10635.**

*(c) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*

CDA's submittal process for its 2020 Plan and the WSCP is discussed below.

### 10.4.1 SUBMITTING A UWMP AND WATER SHORTAGE CONTINGENCY PLAN TO DWR

CDA's Board of Directors adopted the 2020 Plan on June 3, 2021 and within 30 days of adoption, CDA submitted the adopted 2020 Plan (including the WSCP) to DWR. The 2020 Plan and WSCP were submitted through DWR's "Water Use Efficiency (WUE) Data Portal" website.

DWR developed a checklist which was used by CDA to assist DWR with its determination that CDA's 2020 Plan has addressed the requirements of the CWC. CDA has completed the DWR checklist by indicating where the required CWC elements can be found within CDA's 2020 Plan (See Appendix B).

### 10.4.2 ELECTRONIC DATA SUBMITTAL

**CWC 10644.**

> *(a)(2) The plan, or amendments to the plan, submitted to the department …shall be submitted electronically and shall include any standardized forms, tables, or displays specified by the department.*

Within 30 days of adoption of the 2020 Plan, CDA submitted all data tables associated with the 2020 Plan through DWR's "Water Use Efficiency Data Portal" website.

### 10.4.3 SUBMITTING A UWMP, INCLUDING WSCP, TO THE CALIFORNIA STATE LIBRARY

Within 30 days of adoption of the 2020 Plan by the Board of Directors, a copy (CD or hardcopy) of the 2020 Plan was submitted to the State of California Library. A copy of the letter to the State Library will be maintained in CDA's file. The 2020 Plan will be mailed to the following address if sent by regular mail:

California State Library
Government Publications Section
Attention: Coordinator, Urban Water Management Plans
P.O. Box 942837
Sacramento, CA 94237-0001

The 2020 Plan will be mailed to the following address if sent by courier or overnight carrier:

California State Library
Government Publications Section
Attention: Coordinator, Urban Water Management Plans
900 N Street
Sacramento, CA 95814

### *10.4.4 SUBMITTING A UWMP TO CITIES AND COUNTIES*

Within 30 days of adoption of the 2020 Plan (including the WSCP) by the Board of Directors, a copy of the 2020 Plan was submitted to the County of San Bernardino Assessor- Recorder/ Clerk's office and the County of Riverside Assessor- County Clerk-Recorder's office. A copy of the letters to the County of Riverside and San Bernardino will be maintained in CDA's file.

## 10.5 PUBLIC AVAILABILITY

**CWC 10645.**

*(a) Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

*(b) Not later than 30 days after filing a copy of its water shortage contingency plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

Within 30 days after submittal of the 2020 Plan to DWR, CDA made the 2020 Plan (including the WSCP) available at the CDA headquarters during normal business hours and on CDA's website.

## 10.6 NOTIFICATION TO PUBLIC UTILITIES COMMISSION

**CWC 10621.**

*(c) An urban water supplier regulated by the Public Utilities Commission shall include its most recent plan and water shortage contingency plan as part of the supplier's general rate case filings.*

CDA is not regulated by the California Public Utilities Commission.

## 10.7 AMENDING AN ADOPTED UWMP OR WATER SHORTAGE CONTINGENCY PLAN

**CWC 10621.**

*(d)The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).*

**CWC 10644.**

*(a)(1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.*

CDA's amendment process for its 2020 Plan is discussed below.

### *10.7.1 AMENDING A UWMP*

If CDA amends the adopted 2020 Plan, the amended Plan will undergo adoption by CDA's governing board. Within 30 days of adoption, the amended Plan will then be submitted to DWR, the State of California Library, the County of San Bernardino Assessor- Recorder/ Clerk's office and the County of Riverside Assessor- County Clerk-Recorder's office.

### *10.7.2 AMENDING A WATER SHORTAGE CONTINGENCY PLAN*

**CWC 10644.**

*(b) If an urban water supplier revises its water shortage contingency plan, the supplier shall submit to the department a copy of its water shortage contingency plan prepared pursuant to subdivision (a) of Section 10632 no later than 30 days after adoption, in accordance with protocols for submission and using electronic reporting tools developed by the department.*

If CDA amends the adopted 2020 Plan (including the WSCP), the amended Plan (and WSCP) will undergo adoption by CDA's governing board. Within 30 days of adoption, the amended Plan (and WSCP) will then be submitted to DWR, the State of California Library, the County of San Bernardino Assessor- Recorder/ Clerk's office and the County of Riverside Assessor- County Clerk-Recorder's office.

FIGURE 1

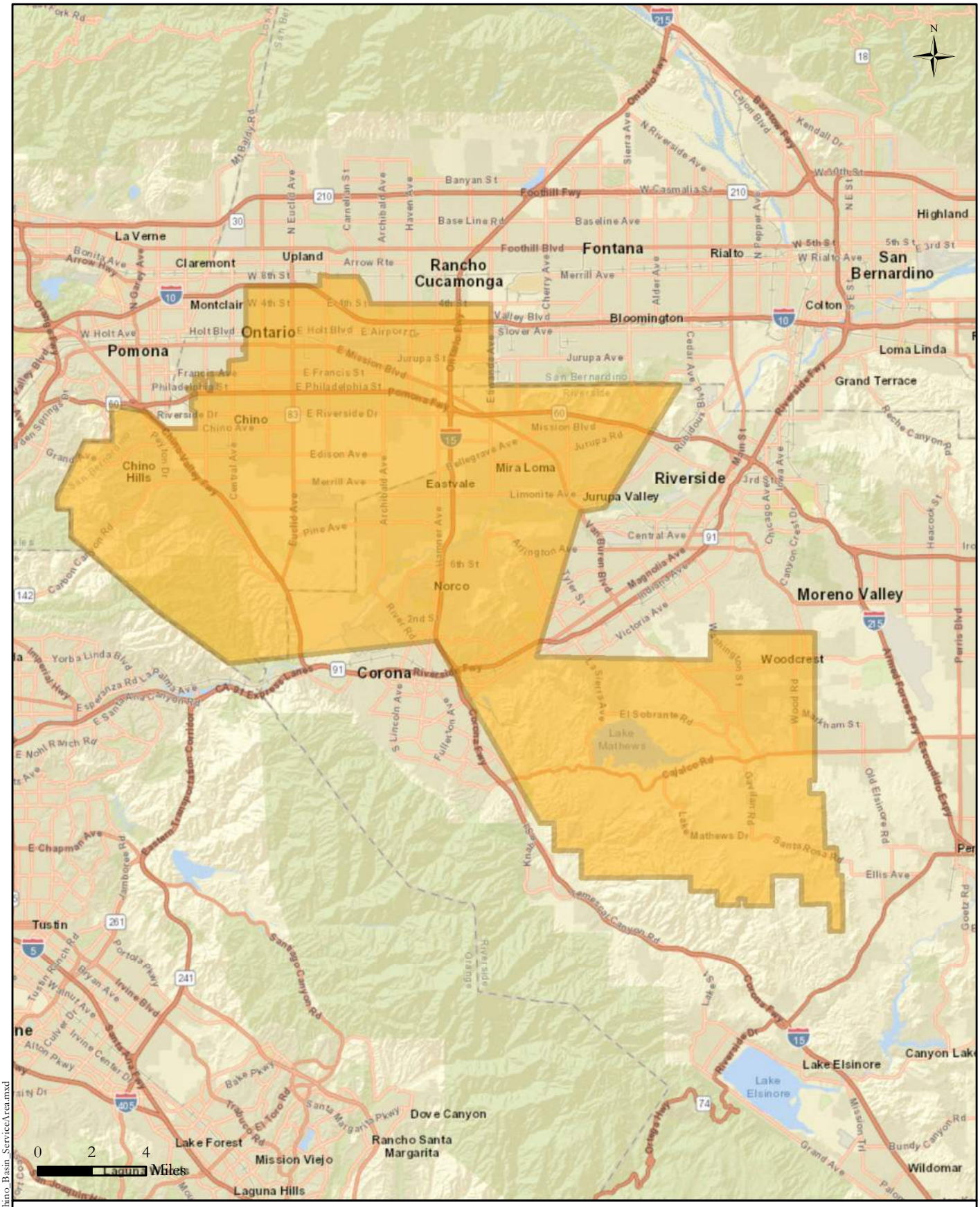


**CHINO BASIN DESALTER AUTHORITY**
**WATER SERVICE AREA**

STETSON ENGINEERS INC.

Document Path: J:\jn2741\Chino_Basin_ServiceArea.mxd

FIGURE 2

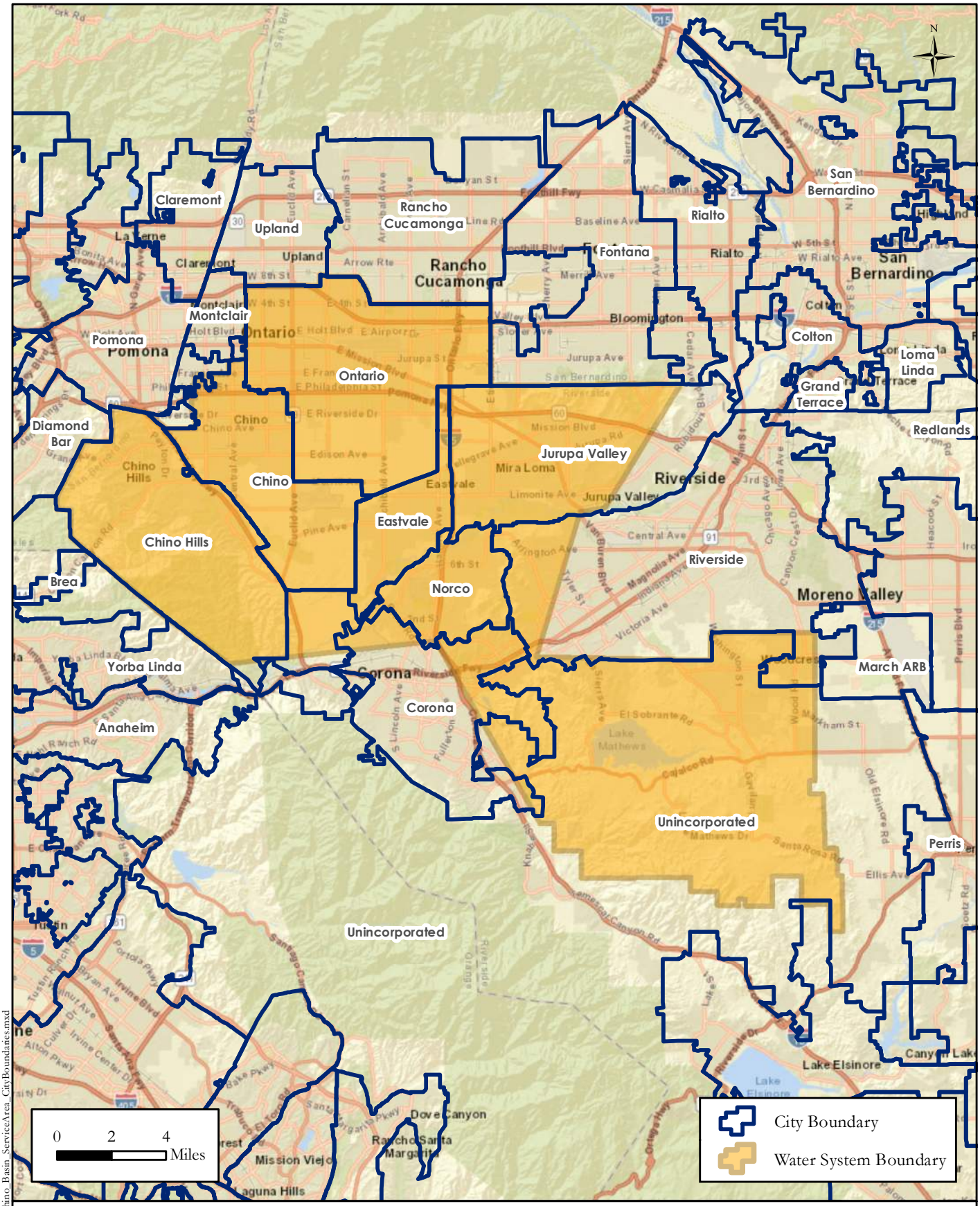


STETSON ENGINEERS INC.

**CHINO BASIN DESALTER AUTHORITY**
**SERVICE AREA**
**AND CITY BOUNDARIES**

City Boundaries Source:
Census 2010 (TIGER 2011)

Document Path: J:\jn2741\Chino_Basin_ServiceArea_CityBoundaries.mxd

FIGURE 3

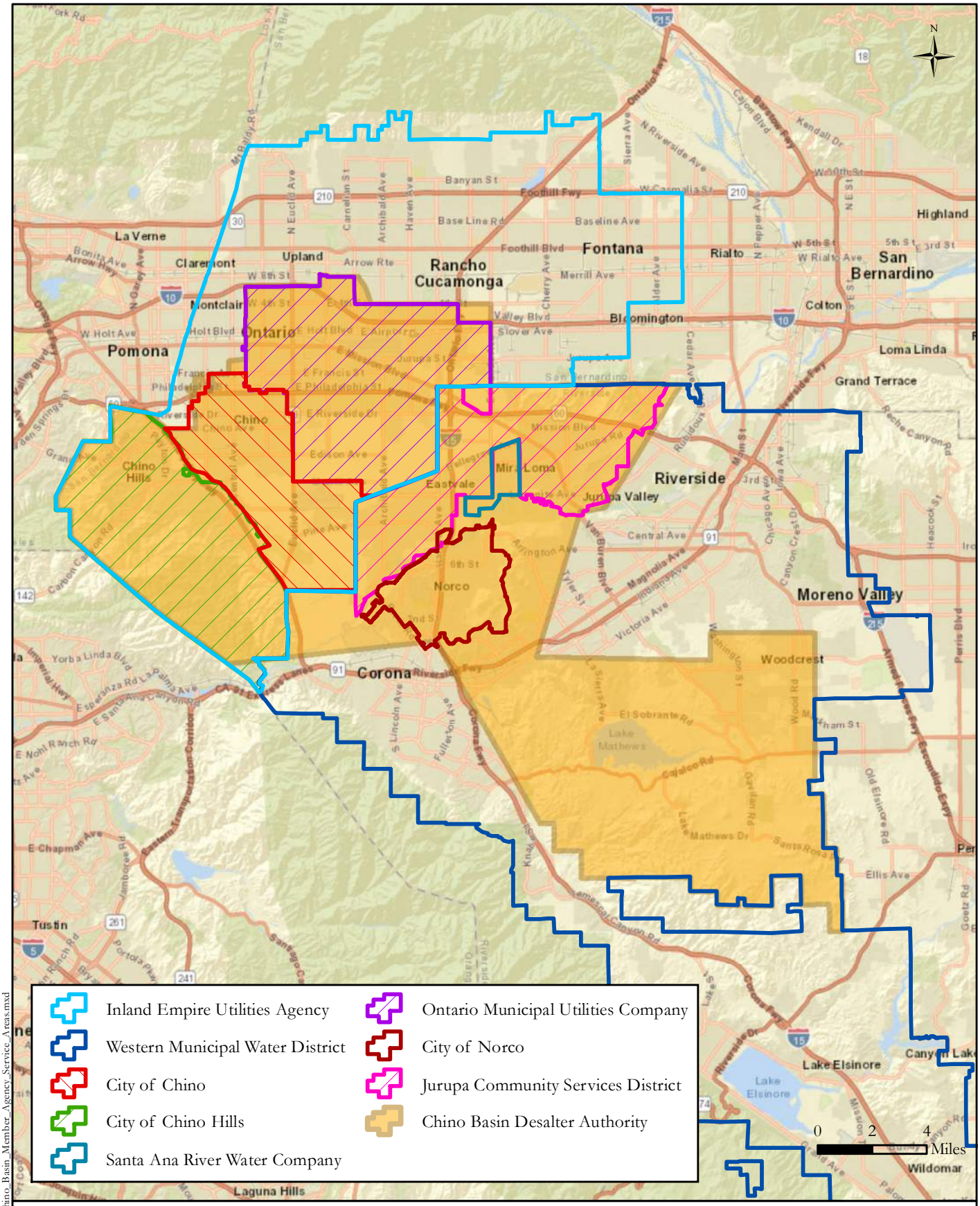


STETSON ENGINEERS INC.

**CHINO BASIN DESALTER AUTHORITY**
**MEMBER AGENCY SERVICE AREAS**

Document Path: J:\jn2741\Chino_Basin_Member_Agency_Service_Areas.mxd

Document Path: J:\jn2741\CDA_Chino_Basin_Location.mxd

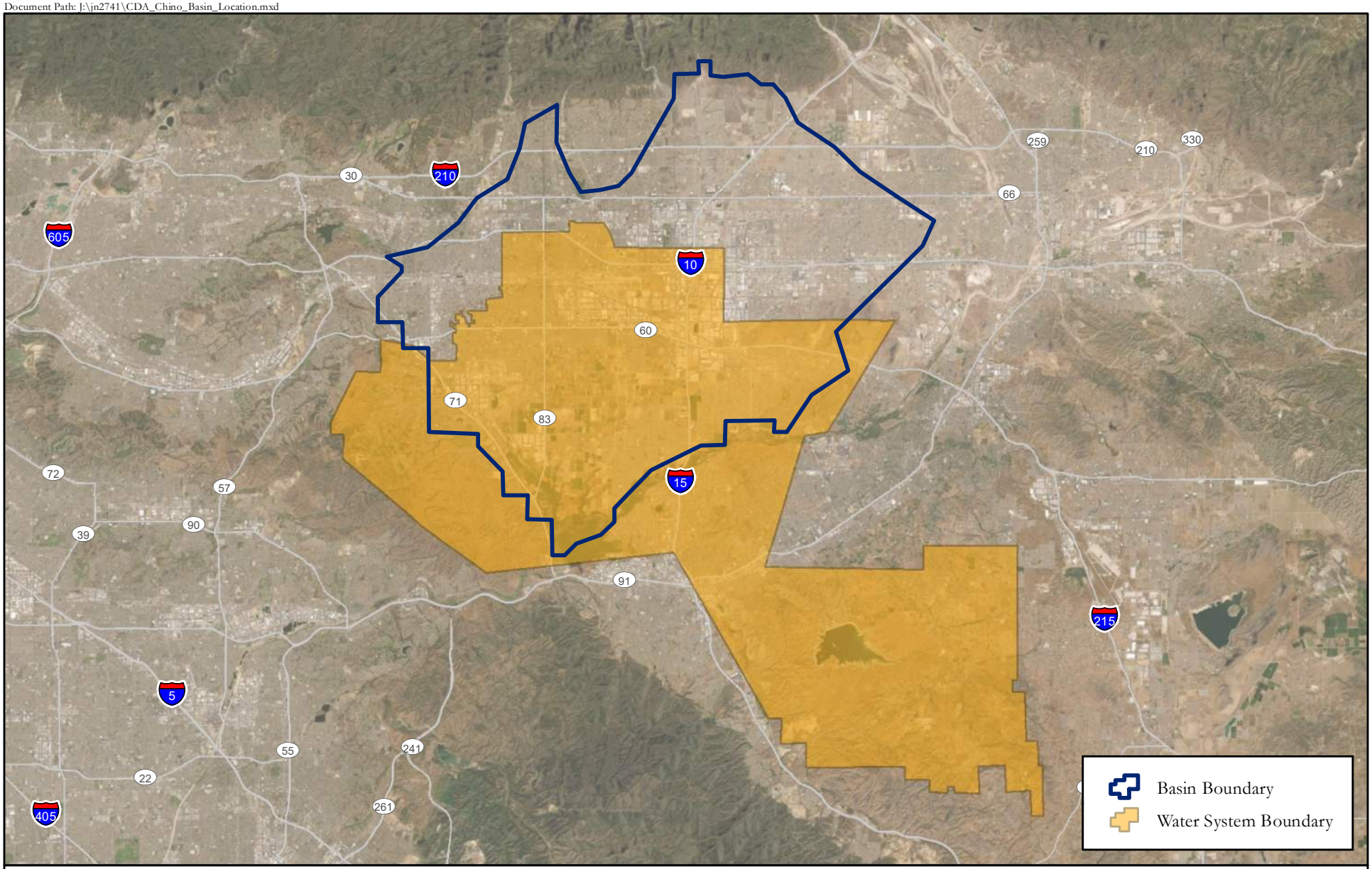


STETSON ENGINEERS INC.

**CHINO BASIN DESALTER AUTHORITY**
**CHINO BASIN LOCATION**

0 2.5 5 Miles

N

FIGURE 4

# APPENDIX A

# DWR STANDARDIZED TABLES

| Submittal Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* (select from drop down list) |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☐ | Water Supplier is also a member of a Regional Alliance | |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

| Submittal Table 2-3: Supplier Identification | |
|---|---|
| Type of Supplier (select one or both) | |
| ☑ | Supplier is a wholesaler |
| ☐ | Supplier is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☐ | UWMP Tables are in calendar years |
| ☑ | UWMP Tables are in fiscal years |
| If using fiscal years provide month and date that the fiscal year begins (mm/dd) | |
| *07/01* | |
| Units of measure used in UWMP * (select from drop down) | |
| Unit | AF |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | |
| NOTES: | |

| **Submittal Table 2-4 Wholesale: Water Supplier Information Exchange (select one)** | |
|---|---|
| ☑ | Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631. Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed. |
| Section 2.6 | **Provide page number for location of the list.** |
| ☐ | Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. **Complete the table below.** |
| Water Supplier Name | |
| *Add additional rows as needed* | |
| | |
| | |
| | |
| NOTES: | |

| Submittal Table 3-1 Wholesale: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2020 | 2025 | 2030 | 2035 | 2040 | 2045*(opt)* |
| | 664,270 | 715,607 | 770,912 | 830,491 | 894,675 | 963,819 |
| NOTES: The 2020 population and the populations projected through 2045 were based on ACS population data (2019 Census) and an average between CDA's historical annual population growth rate and IEUA's current projected growth rate (See Section 3.4.1 and Section 5.4.1). | | | | | | |

| Submittal Table 4-1 Wholesale: Demands for Potable and Non-Potable[1] Water - Actual | | | |
|---|---|---|---|
| Use Type | 2020 Actual | | |
| **Drop down list**<br>May select each use multiple times<br>These are the only use types that will be recognized by the WUE data online submittal tool | Additional Description<br>(as needed) | Level of Treatment When Delivered<br>Drop down list | Volume[2] |
| Add additional rows as needed | | | |
| Sales to other agencies | | Drinking Water | 30,247 |
| Other Non-Potable | Waste Process Water | Raw Water | 4,756 |
| | | | |
| | | **TOTAL** | 35,003 |

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*

[2] *Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES:

| Submittal Table 4-2 Wholesale: Use for Potable and Raw Water [1] - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type | Additional Description (as needed) | Projected Water Use [2] Report To the Extent that Records are Available | | | | |
| **Drop down list** May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool. | | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Add additional rows as needed | | | | | | |
| Sales to other agencies | | 35,200 | 35,200 | 35,200 | 35,200 | 35,200 |
| Other Non-Potable | | 4,800 | 4,800 | 4,800 | 4,800 | 4,800 |
| | **TOTAL** | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |

[1] *Recycled water demands are NOT reported in this table. Recycled water demands are reported in Table 6-4.*
*Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Table 2-3.* [2]

NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2.

| Submittal Table 4-3 Wholesale: Total Water Use (Potable and Non-Potable) | | | | | | |
|---|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 (opt) |
| Potable and Raw Water<br>From Tables 4-1W and 4-2W | 35,003 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Recycled Water Demand*<br>From Table 6-4W | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL WATER DEMAND** | 35,003 | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| **Recycled water demand fields will be blank until Table 6-4 is complete.* | | | | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | | | | |

| Submittal Table 6-1 Wholesale: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | Supplier does not pump groundwater.<br>The supplier will not complete the table below. | | | | | |
| ☑ | All or part of the groundwater described below is desalinated. | | | | | |
| Groundwater Type<br>Drop Down List | Location or Basin Name | 2016* | 2017* | 2018* | 2019* | 2020* |
| *Add additional rows as needed* | | | | | | |
| Alluvial Basin | Chino Basin | 28,191 | 28,284 | 29,918 | 31,199 | 35,003 |
| | **TOTAL** | 28,191 | 28,284 | 29,918 | 31,199 | 35,003 |
| **** Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: | | | | | | |

**Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2020**

| | |
|---|---|
| ☑ | Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water.<br>The Supplier will not complete the table below. |

| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* [2] | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? *Drop down list* | Treatment Level *Drop down list* | 2020 volumes [1] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area | Instream Flow Permit Requirement |
| *Add additional rows as needed* | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | **Total** | 0 | 0 | 0 | 0 | 0 |

[1] **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.

[2] If the **Wastewater Discharge ID Number** is not available to the UWMP preparer, access the SWRCB CIWQS regulated facility website at https://ciwqs.waterboards.ca.gov/ciwqs/readOnly/CiwqsReportServlet?inCommand=reset&reportName=RegulatedFacility

NOTES:

| Submittal Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area | | | | | | | |
|---|---|---|---|---|---|---|---|
| ☑ | Recycled water is not directly treated or distributed by the Supplier.<br>The Supplier will not complete the table below. | | | | | | |
| Name of Receiving Supplier or Direct Use by Wholesaler | Level of Treatment<br>*Drop down list* | 2020* | 2025* | 2030* | 2035* | 2040* | 2045* *(opt)* |
| *Add additional rows as needed* | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | **Total** | 0 | 0 | 0 | 0 | 0 | 0 |
| *** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3. | | | | | | | |
| NOTES: | | | | | | | |

| Submittal Table 6-5 Wholesale: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual | | |
|---|---|---|
| ☑ | Recycled water was not used or distributed by the supplier in 2015, nor projected for use or distribution in 2020.<br>The wholesale supplier will not complete the table below. | |
| Name of Receiving Supplier or Direct Use by Wholesaler | 2015 Projection for 2020* | 2020 Actual Use* |
| *Add additional rows as needed* | | |
| | | |
| | | |
| | | |
| | | |
| **Total** | 0 | 0 |
| ***Units of measure (AF, CCF, MG)*** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | |
| NOTES: | | |

| Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| Section 6.2.8 | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other suppliers? | | Description *(if needed)* | Planned Implementation Year | Planned for Use in Year Type *Drop Down list* | Expected Increase in Water Supply to Supplier* |
| | *Drop Down Menu* | *If Yes, Supplier Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| Chino I Desalter VOC Treatment Facilities Project | *Yes* | San Bernardino County | Install Granular Activated Carbi treatment to to treat existing CDA and proposed County-owned wells | 2023 | All Year Types | 3,000 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | |
| NOTES: Information obtained from CDA's "Chino I Desalter VOC Treatment Facilities Project Final Draft Basis of Design Report (BODR)", dated July 2020 | | | | | | |

| Submittal Table 6-8 Wholesale: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | 2020 | | |
| **Drop down list** May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool | | Actual Volume* | Water Quality Drop Down List | Total Right or Safe Yield* (optional) |
| Add additional rows as needed | | | | |
| Desalinated Water - Groundwater | | 35,003 | Drinking Water | |
| | | | | |
| | **Total** | 35,003 | | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | |
| NOTES: | | | | |

| Submittal Table 6-9 Wholesale: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | | Projected Water Supply* Report To the Extent Practicable | | | | | | | | | |
| | | 2025 | | 2030 | | 2035 | | 2040 | | 2045 (opt) | |
| Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool | Additional Detail on Water Supply | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Add additional rows as needed | | | | | | | | | | | |
| Desalinated Water - Groundwater | | 40,000 | | 40,000 | | 40,000 | | 40,000 | | 40,000 | |
| | **Total** | 40,000 | 0 | 40,000 | 0 | 40,000 | 0 | 40,000 | 0 | 40,000 | 0 |
| ***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | | | | | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | | | | | | | | | |

| Submittal Table 7-1 Wholesale: Basis of Water Year Data (Reliability Assessment) | | | |
|---|---|---|---|
| **Year Type** | **Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000 | **Available Supplies if Year Type Repeats** | |
| | | ☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ | |
| | | ☑ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | **Volume Available *** | **% of Average Supply** |
| Average Year | 2020 | 40,000 | 100% |
| Single-Dry Year | 2018 | 40,000 | 100.0% |
| Consecutive Dry Years 1st Year | 2012 | 40,000 | 100.0% |
| Consecutive Dry Years 2nd Year | 2013 | 40,000 | 100.0% |
| Consecutive Dry Years 3rd Year | 2014 | 40,000 | 100.0% |
| Consecutive Dry Years 4th Year | 2015 | 40,000 | 100.0% |
| Consecutive Dry Years 5th Year | 2016 | 40,000 | 100.0% |
| | | | |

*Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.*

***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2.

| Submittal Table 7-2 Wholesale: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Demand totals *(autofill fm Table 4-3)* | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | | | |

| Submittal Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2025 | 2030 | 2035 | 2040 | 2045 (Opt) |
| Supply totals* | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Demand totals* | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| ***Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.* | | | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. | | | | | |

| Submittal Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2025* | 2030* | 2035* | 2040* | 2045* (Opt) |
| First year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Second year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Third year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fourth year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Fifth year | Supply totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Demand totals | 40,000 | 40,000 | 40,000 | 40,000 | 40,000 |
| | Difference | 0 | 0 | 0 | 0 | 0 |
| Sixth year *(optional)* | Supply totals | | | | | |
| | Demand totals | | | | | |
| | Difference | 0 | 0 | 0 | 0 | 0 |

***Units of measure (AF, CCF, MG) m** ust remain consistent throughout the UWMP as reported in Table 2-3.*

NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2.

| Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b) | |
|---|---|
| **2021** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |
| **2022** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |
| **2023** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |
| **2024** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |
| **2025** | **Total** |
| Total Water Use | 40,000 |
| Total Supplies | 40,000 |
| Surplus/Shortfall w/o WSCP Action | 0 |
| **Planned WSCP Actions** (use reduction and supply augmentation) | |
| WSCP - supply augmentation benefit | 0 |
| WSCP - use reduction savings benefit | 0 |
| Revised Surplus/(shortfall) | 0 |
| Resulting % Use Reduction from WSCP action | 0% |

| Submittal Table 8-1<br>Water Shortage Contingency Plan Levels | | |
|---|---|---|
| **Shortage Level** | **Percent Shortage Range** | **Shortage Response Actions**<br>(*Narrative description)* |
| 1 | Up to 10% | IEUA member agencies may be subject to implement direct installation programs, hold more landscape workshops, consider escalation of local water waste prohibitions, etc. WMWD member agencies' customers may be subject to a 5 to 15% water use reduction. |
| 2 | Up to 20% | In addition to Shortage Level 1; IEUA member agencies may expand micro-targeting customers and increase marketing efforts. WMWD member agencies may be subject to prohibition of new water service and reductions in water budgets. |
| 3 | Up to 30% | In addition to Shortage Level 2; IEUA member agencies may increase penalties, implement emergency alerts, etc. WMWD member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 4 | Up to 40% | In addition to Shortage Level 3; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. WMWD member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 5 | Up to 50% | In addition to Shortage Level 4; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. WMWD member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| 6 | >50% | In addition to Shortage Level 5; IEUA member agencies may be subject to additional requirements deemed necessary by individual member agencies. WMWD member agencies may be subject to additional requirements deemed necessary by individual member agencies. |
| NOTES: | | |

| Submittal Table 8-2: Demand Reduction Actions | | | | |
|---|---|---|---|---|
| Shortage Level | Demand Reduction Actions<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.* | How much is this going to reduce the shortage gap?<br>*Include units used (volume type or percentage)* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>***For Retail Suppliers Only***<br>*Drop Down List* |
| *Add additional rows as needed* | | | | |
| 1 | Expand Public Information Campaign | Collective reduction from all Shortage Level 1 actions is up to 596 AFY | Applicable to IEUA member agencies | No |
| 1 | Increase Frequency of Meter Reading | Collective reduction from all Shortage Level 1 actions is up to 596 AFY | Applicable to IEUA member agencies | No |
| 1 | Increase Water Waste Patrols | Collective reduction from all Shortage Level 1 actions is up to 596 AFY | Applicable to IEUA member agencies | Yes |
| 1 | Implement or Modify Drought Rate Structure or Surcharge | Collective reduction from all Shortage Level 1 actions is up to 596 AFY | Applicable to WMWD member agencies | Yes |
| 2 | Other | Collective reduction from Shortage Level 1 plus all Shortage Level 2 actions is up to 1,193 AFY | All actions under Shortage Level 1 | Yes |
| 2 | Moratorium or Net Zero Demand Increase on New Connections | Collective reduction from all Shortage Level 2 actions is up to 1,193 AFY | Applicable to IEUA member agencies | Yes |
| 2 | Implement or Modify Drought Rate Structure or Surcharge | Collective reduction from all Shortage Level 2 actions is up to 1,193 AFY | Applicable to WMWD member agencies | Yes |
| 3 | Other | Collective reduction from Shortage Level 2 plus all Shortage Level 3 actions is up to 1,789 AFY | All actions under Shortage Level 2 | Yes |
| 4 | Other | Collective reduction from Shortage Level 3 plus all Shortage Level 4 actions is up to 2,386 AFY | All actions under Shortage Level 3 | Yes |
| 5 | Other | Collective reduction from Shortage Level 4 plus all Shortage Level 5 actions is up to 2,982 AFY | All actions under Shortage Level 4 | Yes |
| 6 | Other | Collective reduction from Shortage Level 5 plus all Shortage Level 6 actions is greater than 2,982 AFY | All actions under Shortage Level 5 | Yes |
| NOTES: CDA promotes IEUA and WMWD water shortage response actions for its member agencies to reduce demand on their individual water supplies. Member agencies may employ their own demand reduction actions and/or IEUA or WMWD demand reduction actions at their own discretion. | | | | |

| Submittal Table 8-3: Supply Augmentation and Other Actions | | | |
|---|---|---|---|
| Shortage Level | Supply Augmentation Methods and Other Actions by Water Supplier<br>***Drop down list***<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)* | Additional Explanation or Reference *(optional)* |
| *Add additional rows as needed* | | | |
| 1 | Transfers | Not applicable (see Notes) | |
| 2 | Transfers | Not applicable (see Notes) | |
| 3 | Transfers | Not applicable (see Notes) | |
| 4 | Transfers | Not applicable (see Notes) | |
| 5 | Transfers | Not applicable (see Notes) | |
| 6 | Transfers | Not applicable (see Notes) | |
| | | | |
| | | | |
| | | | |
| NOTES: CDA will pump up to 40,000 AFY of contaminated groundwater from the Chino Basin for water quality management purposes, groundwater cleanup, and hydraulic control required by the Regional Water Quality Control Board. CDA will provide up to 35,200 AFY of treated water to its member agencies, as discussed in Section 6.2. CDA does not anticipate augmenting water supplies. However, CDA's member agencies will consider increased production from the Chino Basin (through potential transfer of water rights) using existing facilities to address increased demands. As noted on Table 8-2, CDA's member agencies plan to implement demand reduction measures in the event water supplies from existing sources are not sufficient to meet anticipated demands. | | | |

| Submittal Table 10-1 Wholesale: Notification to Cities and Counties (select one) | | |
|---|---|---|
| ☐ | Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.** | |
| | Provide the page or location of this list in the UWMP. | |
| ☑ | Supplier has notified 10 or fewer cities or counties. **Complete the table below.** | |
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| Chino | Yes | Yes |
| Chino Hills | Yes | Yes |
| Eastvale | Yes | Yes |
| Jurupa Valley | Yes | Yes |
| Norco | Yes | Yes |
| Ontario | Yes | Yes |
| County Name *Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| Riverside County | Yes | Yes |
| San Bernardino County | Yes | Yes |
| NOTES: | | |

# APPENDIX B

# COMPLETED PLAN CHECKLIST

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | x | Chapter 1 | A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. | Introduction and Overview | Chapter 1 Lay Description |
| x | x | Chapter 1 | Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter. | Summary | Beginning of each Chapter |
| x | x | Section 2.2 | Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier. | Plan Preparation | Section 2.2 |
| x | x | Section 2.6 | Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. | Plan Preparation | Section 2.6 |
| x | x | Section 2.6.2 | Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan. | Plan Preparation | Section 2.6.2 |
| x | | Section 2.6, Section 6.1 | Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source. | System Supplies | Not applicable |
| | x | Section 2.6 | Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types. | System Supplies | Section 2.6 |
| x | x | Section 3.1 | Describe the water supplier service area. | System Description | Section 3.1 |
| x | x | Section 3.3 | Describe the climate of the service area of the supplier. | System Description | Section 3.3 |
| x | x | Section 3.4 | Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045. | System Description | Section 3.4 |
| x | x | Section 3.4.2 | Describe other social, economic, and demographic factors affecting the supplier's water management planning. | System Description | Section 3.4.2 |
| x | x | Sections 3.4 and 5.4 | Indicate the current population of the service area. | System Description and Baselines and Targets | Sections 3.4 and 5.4 |
| x | x | Section 3.5 | Describe the land uses within the service area. | System Description | Section 3.5 |
| x | x | Section 4.2 | Quantify past, current, and projected water use, identifying the uses among water use sectors. | System Water Use | Section 4.2 |
| x | x | Section 4.2.4 | Retail suppliers shall provide data to show the distribution loss standards were met. | System Water Use | Not applicable |
| x | x | Section 4.2.6 | In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws. | System Water Use | Section 4.2.6 |
| x | x | Section 4.2.6 | Provide citations of codes, standards, ordinances, or plans used to make water use projections. | System Water Use | Section 4.2.6 |
| x | optional | Section 4.3.2.4 | Report the distribution system water loss for each of the 5 years preceding the plan update. | System Water Use | Not applicable |
| x | optional | Section 4.4 | Include projected water use needed for lower income housing projected in the service area of the supplier. | System Water Use | Not applicable |
| x | x | Section 4.5 | Demands under climate change considerations must be included as part of the drought risk assessment. | System Water Use | Section 4.5 |
| x | | Chapter 5 | Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. | Baselines and Targets | Not applicable |
| x | | Chapter 5 | Retail suppliers shall meet their water use target by December 31, 2020. | Baselines and Targets | Not applicable |
| | x | Section 5.1 | Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions. | Baselines and Targets | Section 5.1 |

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | | Section 5.2 | If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment. | Baselines and Targets | Not applicable |
| x | | Section 5.5 | Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100. | Baselines and Targets | Not applicable |
| x | | Section 5.5 and Appendix E | Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form. | Baselines and Targets | Not applicable |
| x | x | Sections 6.1 and 6.2 | Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought. | System Supplies | Sections 6.1, 6.2, 7.1, and 7.2 |
| x | x | Sections 6.1 | Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.* | System Supplies | Section 6.1 |
| x | x | Section 6.1 | When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies. | System Supplies | Section 6.1 |
| x | x | Section 6.1.1 | Describe measures taken to acquire and develop planned sources of water. | System Supplies | Section 6.1.1 |
| x | x | Section 6.2.8 | Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045. | System Supplies | Section 6.2.8 |
| x | x | Section 6.2 | Indicate whether groundwater is an existing or planned source of water available to the supplier. | System Supplies | Section 6.2 |
| x | x | Section 6.2.2 | Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization. | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.2 | Describe the groundwater basin. | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.2 | Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump. | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.2.1 | For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions. | System Supplies | Not applicable |
| x | x | Section 6.2.2.4 | Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.2 | Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped. | System Supplies | Section 6.2.2 |
| x | x | Section 6.2.7 | Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis. | System Supplies | Section 6.2.7 |
| x | x | Section 6.2.5 | Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Describe the recycled water currently being used in the supplier's service area. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.5 | Provide a plan for optimizing the use of recycled water in the supplier's service area. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.6 | Describe desalinated water project opportunities for long-term supply. | System Supplies | Section 6.2.6 |
| x | x | Section 6.2.5 | Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods. | System Supplies (Recycled Water) | Section 6.2.5 |
| x | x | Section 6.2.8, Section 6.3.7 | Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years. | System Supplies | Sections 6.2.8 and 6.2.9 |

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | x | Section 6.4 and Appendix O | The UWMP must include energy information, as stated in the code, that a supplier can readily obtain. | System Suppliers, Energy Intensity | Section 6.4 |
| x | x | Section 7.2 | Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability | Water Supply Reliability Assessment | Section 7.2 |
| x | x | Section 7.2.4 | Describe water management tools and options to maximize resources and minimize the need to import water from other regions. | Water Supply Reliability Assessment | Section 7.2.4 |
| x | x | Section 7.3 | Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Include a determination of the reliability of each source of supply under a variety of water shortage conditions. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Section 7.3 | Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria. | Water Supply Reliability Assessment | Section 7.3 |
| x | x | Chapter 8 | Provide a water shortage contingency plan (WSCP) with specified elements below. | Water Shortage Contingency Planning | Chapter 8 |
| x | x | Chapter 8 | Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP | Water Shortage Contingency Planning | Chapter 8 |
| x | x | Section 8.10 | Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented. | Water Shortage Contingency Planning | Section 8.10 |
| x | x | Section 8.2 | Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability. | Water Shortage Contingency Planning | Section 8.2 |
| x | x | Section 8.2 | Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code. | Water Shortage Contingency Planning | Section 8.2 |
| x | x | Section 8.3 | Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply. | Water Shortage Contingency Planning | Section 8.3 |
| x | x | Section 8.3 | Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories. | Water Shortage Contingency Planning | Section 8.3 |
| x | x | Section 8.4 | Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions. | Water Shortage Contingency Planning | Section 8.4.2 |
| x | x | Section 8.4 | Specify locally appropriate demand reduction actions to adequately respond to shortages. | Water Shortage Contingency Planning | Section 8.4.1 |
| x | x | Section 8.4 | Specify locally appropriate operational changes. | Water Shortage Contingency Planning | Section 8.4.3 |
| x | x | Section 8.4 | Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions. | Water Shortage Contingency Planning | Section 8.4.4 |
| x | x | Section 8.4 | Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action. | Water Shortage Contingency Planning | Section 8.4.7 |
| x | x | Section 8.4.6 | The plan shall include a seismic risk assessment and mitigation plan. | Water Shortage Contingency Plan | Section 8.4.6 |
| x | x | Section 8.5 | Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages. | Water Shortage Contingency Planning | Section 8.5 |

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | x | Section 8.5 and 8.6 | Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications. | Water Shortage Contingency Planning | Section 8.5 |
| x | | Section 8.6 | Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP. | Water Shortage Contingency Planning | Not applicable |
| x | | Section 8.7 | Describe the legal authority that empowers the supplier to enforce shortage response actions. | Water Shortage Contingency Planning | Not applicable |
| x | x | Section 8.7 | Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3. | Water Shortage Contingency Planning | Section 8.7 |
| x | x | Section 8.7 | Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency. | Water Shortage Contingency Planning | Section 8.7 |
| x | x | Section 8.8 | Describe the potential revenue reductions and expense increases associated with activated shortage response actions. | Water Shortage Contingency Planning | Section 8.8 |
| x | x | Section 8.8 | Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions. | Water Shortage Contingency Planning | Section 8.8 |
| x | | Section 8.8 | Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought | Water Shortage Contingency Planning | Section 8.8 |
| x | | Section 8.9 | Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance. | Water Shortage Contingency Planning | Section 8.9 |
| x | | Section 8.11 | Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas. | Water Shortage Contingency Planning | Not applicable |
| x | x | Sections 8.12 and 10.4 | Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR. | Plan Adoption, Submittal, and Implementation | Sections 8.12 and 10.4 |
| x | x | Section 8.12 | Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan. | Water Shortage Contingency Planning | Section 8.12 |
| | x | Sections 9.1 and 9.3 | Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program. | Demand Management Measures | Sections 9.1 and 9.3 |
| x | | Sections 9.2 and 9.3 | Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code. | Demand Management Measures | Not applicable |
| x | | Chapter 10 | Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance). | Plan Adoption, Submittal, and Implementation | Not applicable |
| x | x | Section 10.2.1 | Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1. | Plan Adoption, Submittal, and Implementation | Section 10.2.1 |
| x | x | Section 10.4 | Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021. | Plan Adoption, Submittal, and Implementation | Section 10.4 |
| x | x | Sections 10.2.2, 10.3, and 10.5 | Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan. | Plan Adoption, Submittal, and Implementation | Sections 10.2, 10.3, and 10.5 |
| x | x | Section 10.2.2 | The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. | Plan Adoption, Submittal, and Implementation | Section 10.2.2 |
| x | x | Section 10.3.2 | Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified. | Plan Adoption, Submittal, and Implementation | Section 10.3.2 |
| x | x | Section 10.4 | Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library. | Plan Adoption, Submittal, and Implementation | Section 10.4.3 |
| x | x | Section 10.4 | Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption. | Plan Adoption, Submittal, and Implementation | Section 10.4 |
| x | x | Sections 10.4.1 and 10.4.2 | The plan, or amendments to the plan, submitted to the department shall be submitted electronically. | Plan Adoption, Submittal, and Implementation | Sections 10.4.1 and 10.4.2 |
| x | x | Section 10.5 | Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | Section 10.5 |

| Retail | Wholesale | 2020 Guidebook Location | Summary as Applies to UWMP | Subject | 2020 UWMP Location (Optional Column for Agency Review Use) |
|---|---|---|---|---|---|
| x | x | Section 10.5 | Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | Section 10.5 |
| x | x | Section 10.6 | If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings. | Plan Adoption, Submittal, and Implementation | Section 10.6 |
| x | x | Section 10.7.2 | If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption. | Plan Adoption, Submittal, and Implementation | Section 10.7.2 |

# APPENDIX C

# 60 – DAY NOTIFICATION LETTERS AND PUBLIC HEARING NOTIFICATIONS

CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Leonard Hernandez
Chief Executive Officer
County of San Bernardino
385 N. Arrowhead Avenue
San Bernardino, CA 92415

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Hernandez:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the Chino Basin Desalter Authority is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the Chino Basin Desalter Authority will be reviewing the UWMP and will make amendments or changes, as appropriate. The Chino Basin Desalter Authority invites you to submit comments in anticipation of the development of our 2020 UWMP Update. Please provide written comments within the next 30 days to the Chino Basin Desalter Authority.

Sincerely,

Thomas O'Neill
General Manager/CEO

CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. George Johnson
County Executive Officer
County of Riverside
4080 Lemon Street – 4th Floor
Riverside, CA 92501

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Johnson:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
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Greg Newton, Director
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Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Andy Okoro
City Manager
City of Norco
2870 Clark Avenue
Norco, CA 92860

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Okoro:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
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Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Scott Ochoa
City Manager
City of Ontario
303 E. "B" Street
Ontario, CA 91764

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Ochoa:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Matthew Ballantyne
City Manager
City of Chino
13220 Central Avenue
Chino, CA 91710

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Ballantyne:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Benjamin Montgomery
City Manager
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Montgomery:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

CDA | CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Bryan Jones
City Manager
City of Eastvale
12363 Limonite Avenue, Suite 910
Eastvale, CA 91752

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Jones:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

As an urban water supplier, the Chino Basin Desalter Authority is required pursuant to Section 10620(d)(3) of the California Water Code to coordinate with water management agencies, relevant public agencies, and other water suppliers regarding the preparation of the UWMP. Pursuant to Section 10621(b) of the California Water Code, the Chino Basin Desalter Authority will be reviewing the UWMP and will make amendments or changes, as appropriate. The Chino Basin Desalter Authority invites you to submit comments in anticipation of the development of our 2020 UWMP Update. Please provide written comments within the next 30 days to the Chino Basin Desalter Authority.

Sincerely,

Thomas O'Neill
General Manager/CEO

CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Rod Butler
City Manager
City of Jurupa Valley
8930 Limonite Avenue
Jurupa Valley, CA 92509

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Butler:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

CHINO BASIN DESALTER AUTHORITY

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Kati Parker, Director
Greg Newton, Director
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Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Jeffrey Kightlinger
General Manager
Metropolitan Water District
PO Box 54153
Los Angeles, CA 90054

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Kightlinger:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

CDA CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Peter Kavounas
General Manager
Chino Basin Watermaster
9641 San Bernardino Road
Rancho Cucamonga, CA 91730

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Kavounas:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Scott Burton
Utilities Manager
City of Ontario
1425 South Bon View Avenue
Ontario, CA 91761

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Burton:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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General Manager/CEO

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Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Shivaji Deshmukh, P.E.
General Manager
Inland Empire Utilities Agency
6075 Kimball Avenue
Chino, CA 91708

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Deshmukh:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Thomas O'Neill
General Manager/CEO

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Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Chris Berch
General Manager
Jurupa Community Services District
11201 Harrel Street
Jurupa Valley, CA 91752

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Berch:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Thomas O'Neill
General Manager/CEO

CDA CHINO BASIN DESALTER AUTHORITY

Tom Haughey, Chairperson
Betty Anderson, Vice Chairperson
Jim Bowman, Secretary
Kati Parker, Director
Greg Newton, Director
Peter J. Rogers, Director
Vicki Rupe, Director
Gracie Torres, Director

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 Thomas M. O'Neill, General Manager/CEO

November 10, 2020

Mr. Rich Haller
General Manager
Santa Ana Watershed Project Authority
11615 Sterling Avenue
Riverside, CA 92503

**SUBJECT: 2020 Urban Water Management Plan Update**

Dear Mr. Haller:

The Chino Basin Desalter Authority is currently in the process of reviewing its Urban Water Management Plan (UWMP) for the upcoming 2020 Update. The Urban Water Management Planning Act requires every urban water supplier, which provides water directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt an UWMP and periodically update that plan at least once every five years. The UWMP is a planning document and a source document to direct urban water suppliers to evaluate and compare their water supply and reliability to their existing water conservation efforts. The Chino Desalter Authority is currently in the process of preparing the 2020 UWMP Update.

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Sincerely,

Thomas O'Neill
General Manager/CEO

# THE PRESS-ENTERPRISE

Ad Copy:

1825 Chicago Ave, Suite 100
Riverside, CA 92507
951-684-1200
951-368-9018 FAX

**PROOF OF PUBLICATION**
**(2010, 2015.5 C.C.P)**

Publication(s): The Press-Enterprise

PROOF OF PUBLICATION OF

Ad Desc.: 2020 UWMP Hearing Notice /

I am a citizen of the United States. I am over the age of eighteen years and not a party to or interested in the above entitled matter. I am an authorized representative of THE PRESS-ENTERPRISE, a newspaper in general circulation, printed and published daily in the County of Riverside, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of Riverside, State of California, under date of April 25, 1952, Case Number 54446, under date of March 29, 1957, Case Number 65673, under date of August 25, 1995, Case Number 267864, and under date of September 16, 2013, Case Number RIC 1309013; that the notice, of which the annexed is a printed copy, has been published in said newspaper in accordance with the instructions of the person(s) requesting publication, and not in any supplement thereof on the following dates, to wit:

**05/12, 05/19/2021**

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Date: May 19, 2021
At: Riverside, California

Legal Advertising Representative, The Press-Enterprise

CHINO BASIN DESALTER AUTHORITY
3550 E. PHILADELPHIA STREET, SUITE 170
ONTARIO, CA 91761

Ad Number: 0011461427-01

P.O. Number:

**NOTICE OF PUBLIC HEARING**
**BY THE BOARD OF DIRECTORS OF**
**CHINO BASIN DESALTER AUTHORITY**
**REGARDING THE DRAFT CHINO BASIN DESALTER AUTHORITY**
**2020 URBAN WATER MANAGEMENT PLAN,**
**SAN BERNARDINO COUNTY/RIVERSIDE COUNTY, STATE OF CALIFORNIA**

**NOTICE IS HEREBY GIVEN** that the Board of Directors of the Chino Basin Desalter Authority (CDA) has scheduled a public hearing to receive comments and testimony regarding the Draft Chino Basin Desalter Authority 2020 Urban Water Management Plan (CDA 2020 UWMP), San Bernardino County/Riverside County, State of California.

**NOTICE IS FURTHER GIVEN** that said public hearing will be held at the following date, time and place for the purpose of hearing any and all public testimony and comments, for, against, or neutral, regarding the draft CDA 2020 UWMP.

According to the directives from the California Department of Public Health and Executive Order issued by Governor Gavin Newsom, members of the public are invited to participate via video or teleconference:

DATE: Thursday, June 3, 2021

TIME: 2:00 p.m.

| | | |
|---|---|---|
| VIDEO CONFERENCE: | https://zoom.us | Meeting ID: 813 5205 9101 Passcode: 380557 |
| TELECONFERENCE: | (669) 900 6833 | Meeting ID: 813 5205 9101 Passcode: 380557 |

NOTICE IS FURTHER GIVEN that all interested persons are invited and encouraged to attend the public hearing and provide testimony and written comments regarding the draft CDA 2020 UWMP. Oral statements will be heard; however, to ensure the accuracy of the record, all important testimony and comments relating to the draft CDA 2020 UWMP should be submitted in writing to Casey Costa, CDA Executive Assistant, at the address below, prior to the time set for the public hearing or directly to the CDA Board of Directors during the public hearing. If you challenge the Final CDA 2020 Urban Water Management Plan in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this Notice, or in written correspondence delivered to CDA prior to or at the public hearing.

**NOTICE IS FURTHER GIVEN** that a copy of the draft CDA 2020 UWMP can be found online at http://chinodesalter.org. A hard copy of the draft CDA 2020 UWMP is also available for inspection at the Chino Basin Desalter Authority office located at 3550 E. Philadelphia Street, Suite 170, Ontario, CA 91761. Please direct comments and questions to Casey Costa, CDA Executive Assistant, at (909) 218-3730; ccosta@chinodesalter.org.

Press-Enterprise: 5/12, 5/19

# Advertising Order Confirmation



| Ad Number | Ad Size | Color | Production Color | Ad Attributes | Production Method | Production Notes |
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| 0011462800-01 | 5 X 62 Li | | | | AdBooker | |

| External Ad Number | Pick Up | Ad Type | Released for Publication |
|---|---|---|---|
| | | Legal Liner | |

**NOTICE OF PUBLIC HEARING**
**BY THE BOARD OF DIRECTORS OF**
**CHINO BASIN DESALTER AUTHORITY**
**REGARDING THE DRAFT CHINO BASIN DESALTER AUTHORITY**
**2020 URBAN WATER MANAGEMENT PLAN,**
**SAN BERNARDINO COUNTY/RIVERSIDE COUNTY, STATE OF CALIFORNIA**

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**Published: May 11, 18 2021** **Inland Valley Daily Bulletin** **Ad#11462800**

| Product | Requested Placement | Requested Position | Run Dates | # Inserts |
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| Daily Bulletin | Legals CLS LA-SB-PE | General IE - 1076~ | 05/18/21 | 1 |
| SB Sun | Legals CLS NP | General NP - 1076~ | 05/18/21 | 1 |
| PE Riverside:Full Run | Legals CLS LA-SB-PE | General IE - 1076~ | 05/18/21 | 1 |

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| Net Amount | Tax Amount | Total Amount | Payment Amount | Amount Due |
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Please note: To meet our printer's deadline, we must have your proof returned by the published deadline, and as indicated by your sales rep.

# Advertising Order Confirmation

Please note: If you pay by bank card, your card statement will show the merchant as "SoCal Newspaper Group".

CHINO BASIN DESALTER AUTHORITY

*Ken McLaughlin, Chairperson*
*Jim Bowman, Vice Chairperson*
*Greg Newton, Director*
*Peter J. Rogers, Director*
*Vicki Rupe, Director*
*Gracie Torres, Director*
*Marco Tule, Director*
*Eunice Ulloa, Director*

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Leonard Hernandez
Chief Executive Officer
County of San Bernardino
385 N. Arrowhead Avenue
San Bernardino, CA 92415

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Hernandez,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

The 2020 Urban Water Management Plan and Water Shortage Contingency Plan were prepared pursuant to the "Urban Water Management Planning Act" and the California Water Code. The California Department of Water Resources requires every urban water supplier to prepare and adopt an Urban Water Management Plan, including the Water Shortage Contingency Plan, and periodically update the Urban Water Management Plan at least once every five years, in years ending in six and one.

Information regarding CDA's PUBLIC HEARING follows:

| | | |
|---|---|---|
| Date: | Thursday, June 3, 2021 | |
| Time: | 2:00 p.m. | |
| Place: | VIDEO CONFERENCE: | https://zoom.us Meeting ID: 813 5205 9101 Passcode: 380557 |
| | TELECONFERENCE: | (669) 900 6833 Meeting ID: 813 5205 9101 Passcode: 380557 |

The meeting link will be posted on the CDA's website at the following address: https://www.chinodesalter.org/

CDA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan will be available at the CDA's website. Please provide written comments by 5 p.m. on June 14, 2021 to the Chino Basin Desalter Authority.

CHINO BASIN DESALTER AUTHORITY

*Ken McLaughlin, Chairperson*
*Jim Bowman, Vice Chairperson*
*Greg Newton, Director*
*Peter J. Rogers, Director*
*Vicki Rupe, Director*
*Gracie Torres, Director*
*Marco Tule, Director*
*Eunice Ulloa, Director*

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. George Johnson
County Executive Officer
County of Riverside
4080 Lemon Street – 4th Floor
Riverside, CA 92501

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Johnson,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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*Peter J. Rogers, Director*
*Vicki Rupe, Director*
*Gracie Torres, Director*
*Marco Tule, Director*
*Eunice Ulloa, Director*

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Andy Okoro
City Manager
City of Norco
2870 Clark Avenue
Norco, CA 92860

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Okoro,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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*Marco Tule, Director*
*Eunice Ulloa, Director*

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Scott Ochoa
City Manager
City of Ontario
303 E. "B" Street
Ontario, CA 91764

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Ochoa,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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*Greg Newton, Director*
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*Vicki Rupe, Director*
*Gracie Torres, Director*
*Marco Tule, Director*
*Eunice Ulloa, Director*

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Matthew Ballantyne
City Manager
City of Chino
13220 Central Avenue
Chino, CA 91710

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Ballantyne,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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CDA invites all interested entities to attend and present their comments. A copy of the draft 2020 Urban Water Management Plan and Water Shortage Contingency Plan will be available at the CDA's website. Please provide written comments by 5 p.m. on June 14, 2021 to the Chino Basin Desalter Authority.

CHINO BASIN DESALTER AUTHORITY

*Ken McLaughlin, Chairperson*
*Jim Bowman, Vice Chairperson*
*Greg Newton, Director*
*Peter J. Rogers, Director*
*Vicki Rupe, Director*
*Gracie Torres, Director*
*Marco Tule, Director*
*Eunice Ulloa, Director*

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Benjamin Montgomery
City Manager
City of Chino Hills
14000 City Center Drive
Chino Hills, CA 91709

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Montgomery,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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*Eunice Ulloa, Director*

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Bryan Jones
City Manager
City of Eastvale
12363 Limonite Avenue, Suite 910
Eastvale, CA 91752

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Jones,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Rod Butler
City Manager
City of Jurupa Valley
8930 Limonite Avenue
Jurupa Valley, CA 92509

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Butler,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Jeffrey Kightlinger
General Manager
Metropolitan Water District
PO Box 54153
Los Angeles, CA 90054

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Kightlinger,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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*Eunice Ulloa, Director*

3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Peter Kavounas
General Manager
Chino Basin Watermaster
9641 San Bernardino Road
Rancho Cucamonga, CA 91730

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Kavounas,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Scott Burton
Utilities Manager
City of Ontario
1425 South Bon View Avenue
Ontario, CA 91761

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Burton,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Shivaji Deshmukh
General Manager
Inland Empire Utilities Agency
6075 Kimball Avenue
Chino, CA 91708

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Deshmukh,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Chris Berch
General Manager
Jurupa Community Services District
11201 Harrel Street
Jurupa Valley, CA 91752

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Berch,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

May 6, 2021

Mr. Jeffrey Mosher
General Manager
Santa Ana Watershed Project Authority
11615 Sterling Avenue
Riverside, CA 92503

**SUBJECT: Notice of Public Hearing for 2020 Urban Water Management Plan and Water Shortage Contingency Plan**

Dear Mr. Haller,

The Chino Basin Desalter Authority (CDA) will hold a PUBLIC HEARING on July 3, 2021 for the purposes of adopting its 2020 Urban Water Management Plan and its Water Shortage Contingency Plan. The CDA's 2020 Urban Water Management Plan incorporates the CDA's Water Shortage Contingency Plan.

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3550 E. Philadelphia Street, Suite 170 • Ontario, CA 91761 • (909) 218-3230 *Thomas M. O'Neill, General Manager/CEO*

# APPENDIX D

# CHINO BASIN JUDGMENT

DONALD D. STARK
A Professional Corporation
Suite 201 Airport Plaza
2061 Business Center Drive
Irvine, California 92715
Telephone: (714) 752-8971

CLAYSON, ROTHROCK & MANN
601 South Main Street
Corona, California 91720
Telephone: (714) 737-1910

Attorneys for Plaintiff

FILED
'78 JAN 30 AM 11 41

FILED - West District
San Bernardino County Clerk
OCT 25 1989

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

MICROFILMED

| | |
|---|---|
| CHINO BASIN MUNICIPAL WATER DISTRICT,<br><br>Plaintiff,<br><br>v.<br><br>CITY OF CHINO, et al.<br><br>Defendants. | No. 164327 |

JUDGMENT

LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971
Routing ..... Date ..... Appeal Date ..... Exhibits ..... Supervisor ..... Asst. Co. Clerk ..... Secretary ..... Other ..... Index .....

JUDGMENT

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LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971

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SUITE 201
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IRVINE, CALIFORNIA 92715
(714) 752-8971

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DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971

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LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971

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Suite 201 Airport Plaza
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Telephone: (714) 752-8971

CLAYSON, ROTHROCK & MANN
601 South Main Street
Corona, California 91720
Telephone: (714) 737-1910

Attorneys for Plaintiff

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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

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| CHINO BASIN MUNICIPAL WATER DISTRICT,<br>Plaintiff,<br>v.<br>CITY OF CHINO, et al.<br>Defendants. | No. 164327<br>JUDGMENT |

## I. INTRODUCTION

1. Pleadings, Parties and Jurisdiction. The complaint herein was filed on January 2, 1975, seeking an adjudication of water rights, injunctive relief and the imposition of a physical solution. A first amended complaint was filed on July 16, 1976. The defaults of certain defendants have been entered, and certain other defendants dismissed. Other than defendants who have been dismissed or whose defaults have been entered, all defendants have appeared herein. By answers and order of this Court, the issues have been made those of a full inter se adjudication between the

parties. This Court has jurisdiction of the subject matter of this action and of the parties herein.

2. Stipulation For Judgment. Stipulation for entry of judgment has been filed by and on behalf of a majority of the parties, representing a majority of the quantitative rights herein adjudicated.

3. Trial; Findings and Conclusions. Trial was commenced on December 16, 1977, as to the non-stipulating parties, and findings of fact and conclusions of law have been entered disposing of the issues in the case.

4. Definitions. As used in this Judgment, the following terms shall have the meanings herein set forth:

(a) Active Parties. All parties other than those who have filed with Watermaster a written waiver of service of notices, pursuant to Paragraph 58.

(b) Annual or Year -- A fiscal year, July 1 through June 30, following, unless the context shall clearly indicate a contrary meaning.

(c) Appropriative Right -- The annual production right of a producer from the Chino Basin other than pursuant to an overlying right.

(d) Basin Water -- Ground water within Chino Basin which is part of the Safe Yield, Operating Safe Yield, or replenishment water in the Basin as a result of operations under the Physical Solution decreed herein. Said term does not include Stored Water.

(e) CBMWD -- Plaintiff Chino Basin Municipal Water District.

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(f) Chino Basin or Basin -- The ground water basin underlying the area shown as such on Exhibit "B" and within the boundaries described in Exhibit "K".

(g) Chino Basin Watershed -- The surface drainage area tributary to and overlying Chino Basin.

(h) Ground Water -- Water beneath the surface of the ground and within the zone of saturation, i.e., below the existing water table.

(i) Ground Water Basin -- An area underlain by one or more permeable formations capable of furnishing substantial water storage.

(j) Minimal Producer -- Any producer whose production does not exceed five acre-feet per year.

(k) MWD -- The Metropolitan Water District of Southern California.

(l) Operating Safe Yield -- The annual amount of ground water which Watermaster shall determine, pursuant to criteria specified in Exhibit "I", can be produced from Chino Basin by the Appropriative Pool parties free of replenishment obligation under the Physical Solution herein.

(m) Overdraft -- A condition wherein the total annual production from the Basin exceeds the Safe Yield thereof.

(n) Overlying Right -- The appurtenant right of an owner of lands overlying Chino Basin to produce water from the Basin for overlying beneficial use on such lands.

(o) Person. Any individual, partnership, association, corporation, governmental entity or agency, or other organization.

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(p) PVMWD -- Defendant Pomona Valley Municipal Water District.

(q) Produce or Produced -- To pump or extract ground water from Chino Basin.

(r) Producer -- Any person who produces water from Chino Basin.

(s) Production -- Annual quantity, stated in acre feet, of water produced.

(t) Public Hearing -- A hearing after notice to all parties and to any other person legally entitled to notice.

(u) Reclaimed Water -- Water which, as a result of processing of waste water, is suitable for a controlled use.

(v) Replenishment Water -- Supplemental water used to recharge the Basin pursuant to the Physical Solution, either directly by percolating the water into the Basin or indirectly by delivering the water for use in lieu of production and use of safe yield or Operating Safe Yield.

(w) Responsible Party -- The owner, co-owner, lessee or other person designated by multiple parties interested in a well as the person responsible for purposes of filing reports hereunder.

(x) Safe Yield -- The long-term average annual quantity of ground water (excluding replenishment or stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Basin under cultural conditions of a particular year without causing an undesirable result.

(y) SBVMWD -- San Bernardino Valley Municipal Water

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District.

(z) State Water -- Supplemental Water imported through the State Water Resources Development System, pursuant to Chapter 8, Division 6, Part 6 of the Water Code.

(aa) Stored Water -- Supplemental water held in storage, as a result of direct spreading, in lieu delivery, or otherwise, for subsequent withdrawal and use pursuant to agreement with Watermaster.

(bb) Supplemental Water -- Includes both water imported to Chino Basin from outside Chino Basin Watershed, and reclaimed water.

(cc) WMWD -- Defendant Western Municipal Water District of Riverside County.

5. List of Exhibits. The following exhibits are attached to this Judgment and made a part hereof:

"A" -- "Location Map of Chino Basin" showing boundaries of Chino Basin Municipal Water District, and other geographic and political features.

"B" -- "Hydrologic Map of Chino Basin" showing hydrologic features of Chino Basin.

"C" -- Table Showing Parties in Overlying (Agricultural) Pool.

"D" -- Table Showing Parties in Overlying (Non-agricultural Pool and Their Rights.

"E" -- Table Showing Appropriators and Their Rights.

"F" -- Overlying (Agricultural) Pool Pooling Plan.

"G" -- Overlying (Non-agricultural) Pool Pooling Plan.

"H" -- Appropriative Pool Pooling Plan.

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"I" -- Engineering Appendix.

"J" -- Map of In Lieu Area No. 1.

"K" -- Legal Description of Chino Basin.

## II. DECLARATION OF RIGHTS

### A. HYDROLOGY

6. Safe Yield. The Safe Yield of Chino Basin is 140,000 acre feet per year.

7. Overdraft and Prescriptive Circumstances. In each year for a period in excess of five years prior to filing of the First Amended Complaint herein, the Safe Yield of the Basin has been exceeded by the annual production therefrom, and Chino Basin is and has been for more than five years in a continuous state of overdraft. The production constituting said overdraft has been open, notorious, continuous, adverse, hostile and under claim of right. The circumstances of said overdraft have given notice to all parties of the adverse nature of such aggregate over-production.

### B. WATER RIGHTS IN SAFE YIELD

8. Overlying Rights. The parties listed in Exhibits "C" and "D" are the owners or in possession of lands which overlie Chino Basin. As such, said parties have exercised overlying water rights in Chino Basin. All overlying rights owned or exercised by parties listed in Exhibits "C" and "D" have, in the aggregate, been limited by prescription except to the extent such rights have been preserved by self-help by said parties. Aggregate preserved overlying rights in the Safe Yield for agricultural pool use, including the rights of the State of California, total 82,800 acre feet per year. Overlying rights for non-agricultural pool use

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total 7,366 acre feet per year and are individually decreed for each affected party in Exhibit "D". No portion of the Safe Yield of Chino Basin exists to satisfy unexercised overlying rights, and such rights have all been lost by prescription. However, uses may be made of Basin Water on overlying lands which have no preserved overlying rights pursuant to the Physical Solution herein. All overlying rights are appurtenant to the land and cannot be assigned or conveyed separate or apart therefrom.

9. Appropriative Rights. The parties listed in Exhibit "E" are the owners of appropriative rights, including rights by prescription, in the unadjusted amounts therein set forth, and by reason thereof are entitled under the Physical Solution to share in the remaining Safe Yield, after satisfaction of overlying rights and rights of the State of California, and in the Operating Safe Yield in Chino Basin, in the annual shares set forth in Exhibit "E".

(a) Loss of Priorities. By reason of the long continued overdraft in Chino Basin, and in light of the complexity of determining appropriative priorities and the need for conserving and making maximum beneficial use of the water resources of the State, each and all of the parties listed in Exhibit "E" are estopped and barred from asserting special priorities or preferences, inter se. All of said appropriative rights are accordingly deemed and considered of equal priority.

(b) Nature and Quantity. All rights listed in Exhibit "E" are appropriative and prescriptive in nature. By reason of the status of the parties, and the provisions of Section

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1007 of the Civil Code, said rights are immune from reduction or limitation by prescription.

10. Rights of the State of California. The State of California, by and through its Department of Corrections, Youth Authority and Department of Fish and Game, is a significant producer of ground water from and the State is the largest owner of land overlying Chino Basin. The precise nature and scope of the claims and rights of the State need not be, and are not, defined herein. The State, through said departments, has accepted the Physical Solution herein decreed, in the interests of implementing the mandate of Section 2 of Article X of the California Constitution. For all purposes of this Judgment, all future production by the State or its departments or agencies for overlying use on State-owned lands shall be considered as agricultural pool use.

C. RIGHTS TO AVAILABLE GROUND WATER STORAGE CAPACITY

11. Available Ground Water Storage Capacity. There exists in Chino Basin a substantial amount of available ground water storage capacity which is not utilized for storage or regulation of Basin Waters. Said reservoir capacity can appropriately be utilized for storage and conjunctive use of supplemental water with Basin Waters. It is essential that said reservoir capacity utilization for storage and conjunctive use of supplemental water be undertaken only under Watermaster control and regulation, in order to protect the integrity of both such Stored Water and Basin Water in storage and the Safe Yield of Chino Basin.

12. Utilization of Available Ground Water Capacity. Any person or public entity, whether a party to this action or not, may make reasonable beneficial use of the available ground water

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storage capacity of Chino Basin for storage of supplemental water; provided that no such use shall be made except pursuant to written agreement with Watermaster, as authorized by Paragraph 28. In the allocation of such storage capacity, the needs and requirements of lands overlying Chino Basin and the owners of rights in the Safe Yield or Operating Safe Yield of the Basin shall have priority and preference over storage for export.

## III. INJUNCTION

13. Injunction Against Unauthorized Production of Basin Water. Each party in each of the respective pools is enjoined, as follows:

(a) Overlying (Agricultural) Pool. Each party in the Overlying (Agricultural) Pool, its officers, agents, employees, successors and assigns, is and they each are ENJOINED AND RESTRAINED from producing ground water from Chino Basin in any year hereafter in excess of such party's correlative share of the aggregate of 82,800 acre feet allocated to said Pool, except pursuant to the Physical Solution or a storage water agreement.

(b) Overlying (Non-Agricultural) Pool. Each party in the Overlying (Non-agricultural) Pool, its officers, agents, employees, successors and assigns, is and they each are ENJOINED AND RESTRAINED from producing ground water of Chino Basin in any year hereafter in excess of such party's decreed rights in the Safe Yield, except pursuant to the provisions of the Physical Solution or a storage water agreement.

(c) Appropriative Pool. Each party in the

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Appropriative Pool, its officers, agents, employees, successors and assigns, is and they are each ENJOINED AND RESTRAINED from producing ground water of Chino Basin in any year hereafter in excess of such party's decreed share of Operating Safe Yield, except pursuant to the provisions of the Physical Solution or a storage water agreement.

14. Injunction Against Unauthorized Storage or Withdrawal of Stored Water. Each party, its officers, agents, employees, successors and assigns is and they each are ENJOINED AND RESTRAINED from storing supplemental water in Chino Basin for withdrawal, or causing withdrawal of, water stored by that party, except pursuant to the terms of a written agreement with Watermaster and in accordance with Watermaster regulations. Any supplemental water stored or recharged in the Basin, except pursuant to such a Watermaster agreement, shall be deemed abandoned and not classified as Stored Water. This paragraph has no application, as such, to supplemental water spread or provided in lieu by Watermaster pursuant to the Physical Solution.

## IV. CONTINUING JURISDICTION

15. Continuing Jurisdiction. Full jurisdiction, power and authority are retained and reserved to the Court as to all matters contained in this judgment, except:

(a) The redetermination of Safe Yield, as set forth in Paragraph 6, during the first ten (10) years of operation of the Physical Solution;

(b) The allocation of Safe Yield as between the several pools as set forth in Paragraph 44 of the Physical Solution;

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(c) The determination of specific quantitative rights and shares in the declared Safe Yield or Operating Safe Yield herein declared in Exhibits "D" and "E"; and

(d) The amendment or modification of Paragraphs 7(a) and (b) of Exhibit "H", during the first ten (10) years of operation of the Physical Solution, and thereafter only upon affirmative recommendation of at least 67% of the voting power (determined pursuant to the formula described in Paragraph 3 of Exhibit "H"), but not less than one-third of the members of the Appropriative Pool Committee representatives of parties who produce water within CBMWD or WMWD; after said tenth year the formula set forth in said Paragraph 7(a) and 7(b) of Exhibit "H" for payment of the costs of replenishment water may be changed to 100% gross or net, or any percentage split thereof, but only in response to recommendation to the Court by affirmative vote of at least 67% of said voting power of the Appropriative Pool representatives of parties who produce ground water within CBMWD or WMWD, but not less than one-third of their number. In such event, the Court shall act in conformance with such recommendation unless there are compelling reasons to the contrary; and provided, further, that the fact that the allocation of Safe Yield or Operating Safe Yield shares may be rendered moot by a recommended change in the formula for replenishment assessments shall not be deemed to be such a "compelling reason."

Said continuing jurisdiction is provided for the purpose of enabling the Court, upon application of any party, the Watermaster, the Advisory Committee or any Pool Committee, by motion and, upon

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at least 30 days' notice thereof, and after hearing thereon, to make such further or supplemental orders or directions as may be necessary or appropriate for interpretation, enforcement or carrying out of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment.

## V. WATERMASTER

### A. APPOINTMENT

16. Watermaster Appointment. CBMWD, acting by and through a majority of its board of directors, is hereby appointed Watermaster, to administer and enforce the provisions of this Judgment and any subsequent instructions or orders of the Court hereunder. The term of appointment of Watermaster shall be for five (5) years. The Court will by subsequent orders provide for successive terms or for a successor Watermaster. Watermaster may be changed at any time by subsequent order of the Court, on its own motion, or on the motion of any party after notice and hearing. Unless there are compelling reasons to the contrary, the Court shall act in conformance with a motion requesting the Watermaster be changed if such motion is supported by a majority of the voting power of the Advisory Committee.

### B. POWERS AND DUTIES

17. Powers and Duties. Subject to the continuing supervision and control of the Court, Watermaster shall have and may exercise the express powers, and shall perform the duties, as provided in this Judgment or hereafter ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction.

18. Rules and Regulations. Upon recommendation by the

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Advisory Committee, Watermaster shall make and adopt, after public hearing, appropriate rules and regulations for conduct of Watermaster affairs, including meeting schedules and procedures, and compensation of members of Watermaster at not to exceed $25 per member per meeting, or $300 per member per year, whichever is less, plus reasonable expenses related to activities within the Basin. Thereafter, Watermaster may amend said rules from time to time upon recommendation, or with approval of the Advisory Committee after hearing noticed to all active parties. A copy of said rules and regulations, and of any amendments thereof, shall be mailed to each active party.

19. Acquisition of Facilities. Watermaster may purchase, lease, acquire and hold all necessary facilities and equipment; provided, that it is not the intent of the Court that Watermaster acquire any interest in real property or substantial capital assets.

20. Employment of Experts and Agents. Watermaster may employ or retain such administrative, engineering, geologic, accounting, legal or other specialized personnel and consultants as may be deemed appropriate in the carrying out of its powers and shall require appropriate bonds from all officers and employees handling Watermaster funds. Watermaster shall maintain records for purposes of allocation of costs of such services as well as of all other expenses of Watermaster administration as between the several pools established by the Physical Solution.

21. Measuring Devices. Watermaster shall cause parties, pursuant to uniform rules, to install and maintain in good operating condition, at the cost of each party, such necessary measuring

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devices or meters as Watermaster may deem appropriate. Such measuring devices shall be inspected and tested as deemed necessary by Watermaster, and the cost thereof shall constitute an expense of Watermaster.

22. Assessments. Watermaster is empowered to levy and collect all assessments provided for in the pooling plans and Physical Solution.

23. Investment of Funds. Watermaster may hold and invest any and all Watermaster funds in investments authorized from time to time for public agencies of the State of California.

24. Borrowing. Watermaster may borrow from time to time amounts not exceeding the annual anticipated receipts of Watermaster during such year.

25. Contracts. Watermaster may enter into contracts for the performance of any powers herein granted; provided, however, that Watermaster may not contract with or purchase materials, supplies or services from CBMWD, except upon the prior recommendation and approval of the Advisory Committee and pursuant to written order of the Court.

26. Cooperation With Other Agencies. Subject to prior recommendation or approval of the Advisory Committee, Watermaster may act jointly or cooperate with agencies of the United States and the State of California or any political subdivisions, municipalities or districts or any person to the end that the purpose of the Physical Solution may be fully and economically carried out.

27. Studies. Watermaster may, with concurrence of the Advisory Committee or affected Pool Committee and in accordance with Paragraph 54(b), undertake relevant studies of hydrologic

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conditions, both quantitative and qualitative, and operating aspects of implementation of the management program for Chino Basin.

28. Ground Water Storage Agreements. Watermaster shall adopt, with the approval of the Advisory Committee, uniformly applicable rules and a standard form of agreement for storage of supplemental water, pursuant to criteria therefor set forth in Exhibit "I". Upon appropriate application by any person, Watermaster shall enter into such a storage agreement; provided that all such storage agreements shall first be approved by written order of the Court, and shall by their terms preclude operations which will have a substantial adverse impact on other producers.

29. Accounting for Stored Water. Watermaster shall calculate additions, extractions and losses and maintain an annual account of all Stored Water in Chino Basin, and any losses of water supplies or Safe Yield of Chino Basin resulting from such Stored Water.

30. Annual Administrative Budget. Watermaster shall submit to Advisory Committee an administrative budget and recommendation for each fiscal year on or before March 1. The Advisory Committee shall review and submit said budget and their recommendations to Watermaster on or before April 1, following. Watermaster shall hold a public hearing on said budget at its April quarterly meeting and adopt the annual administrative budget which shall include the administrative items for each pool committee. The administrative budget shall set forth budgeted items in sufficient detail as necessary to make a proper allocation of the expense among the several pools, together with Watermaster's proposed allocation. The budget shall contain such additional comparative information

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or explanation as the Advisory Committee may recommend from time to time. Expenditures within budgeted items may thereafter be made by Watermaster in the exercise of powers herein granted, as a matter of course. Any budget transfer in excess of 20% of a budget category during any budget year or modification of such administrative budget during any year shall be first submitted to the Advisory Committee for review and recommendation.

31. Review Procedures. All actions, decisions or rules of Watermaster shall be subject to review by the Court on its own motion or on timely motion by any party, the Watermaster (in the case of a mandated action), the Advisory Committee, or any Pool Committee, as follows:

(a) Effective Date of Watermaster Action. Any action, decision or rule of Watermaster shall be deemed to have occurred or been enacted on the date on which written notice thereof is mailed. Mailing of copies of approved Watermaster minutes to the active parties shall constitute such notice to all parties.

(b) Noticed Motion. Any party, the Watermaster (as to any mandated action), the Advisory Committee, or any Pool Committee may, by a regularly noticed motion, apply to the Court for review of any Watermaster's action, decision or rule. Notice of such motion shall be served personally or mailed to Watermaster and to all active parties. Unless otherwise ordered by the Court, such motion shall not operate to stay the effect of such Watermaster action, decision or rule.

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(c) Time for Motion. Notice of motion to review any Watermaster action, decision or rule shall be served and filed within ninety (90) days after such Watermaster action, decision or rule, except for budget actions, in which event said notice period shall be sixty (60) days.

(d) De Novo Nature of Proceedings. Upon the filing of any such motion, the Court shall require the moving party to notify the active parties, the Watermaster, the Advisory Committee and each Pool Committee, of a date for taking evidence and argument, and on the date so designated shall review de novo the question at issue. Watermaster's findings or decision, if any, may be received in evidence at said hearing, but shall not constitute presumptive or prima facie proof of any fact in issue.

(e) Decision. The decision of the Court in such proceeding shall be an appealable supplemental order in this case. When the same is final, it shall be binding upon the Watermaster and all parties.

C. ADVISORY AND POOL COMMITTEES

32. Authorization. Watermaster is authorized and directed to cause committees of producer representatives to be organized to act as Pool Committees for each of the several pools created under the Physical Solution. Said Pool Committees shall, in turn, jointly form an Advisory Committee to assist Watermaster in performance of its functions under this judgment. Pool Committees shall be composed as specified in the respective pooling plans, and the Advisory Committee shall be composed of not to exceed ten (10) voting representatives from each pool, as designated by the

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respective Pool Committee. WMWD, PVMWD and SBVMWD shall each be entitled to one non-voting representative on said Advisory Committee.

33. Term and Vacancies. Members of any Pool Committee, shall serve for the term, and vacancies shall be filled, as specified in the respective pooling plan. Members of the Advisory Committee shall serve at the will of their respective Pool Committee.

34. Voting Power. The voting power on each Pool Committee shall be allocated as provided in the respective pooling plan. The voting power on the Advisory Committee shall be one hundred (100) votes allocated among the three pools in proportion to the total assessments paid to Watermaster during the preceding year; provided, that the minimum voting power of each pool shall be

(a) Overlying (Agricultural) Pool 20,

(b) Overlying (Non-agricultural) Pool 5, and

(c) Appropriative Pool 20.

In the event any pool is reduced to its said minimum vote, the remaining votes shall be allocated between the remaining pools on said basis of assessments paid to Watermaster by each such remaining pool during the preceding year. The method of exercise of each pool's voting power on the Advisory Committee shall be as determined by the respective pool committees.

35. Quorum. A majority of the voting power of the Advisory Committee or any Pool Committee shall constitute a quorum for the transaction of affairs of such Advisory or Pool Committee; provided, that at least one representative of each Pool Committee shall be required to constitute a quorum of the Advisory Committee. No Pool Committee representative may purposely absent himself or

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herself, without good cause, from an Advisory Committee meeting to deprive it of a quorum. Action by affirmative vote of a majority of the entire voting power of any Pool Committee or the Advisory Committee shall constitute action by such committee. Any action or recommendation of a Pool Committee or the Advisory Committee shall be transmitted to Watermaster in writing, together with a report of any dissenting vote or opinion.

36. Compensation. Pool or Advisory Committee members may receive compensation, to be established by the respective pooling plan, but not to exceed twenty-five dollars ($25.00) for each meeting of such Pool or Advisory Committee attended, and provided that no member of a Pool or Advisory Committee shall receive compensation of more than three hundred ($300.00) dollars for service on any such committee during any one year. All such compensation shall be a part of Watermaster administrative expense. No member of any Pool or Advisory Committee shall be employed by Watermaster or compensated by Watermaster for professional or other services rendered to such Pool or Advisory Committee or to Watermaster, other than the fee for attendance at meetings herein provided, plus reimbursement of reasonable expenses related to activities within the Basin.

37. Organization.

(a) Organizational Meeting. At its first meeting in each year, each Pool Committee and the Advisory Committee shall elect a chairperson and a vice chairperson from its membership. It shall also select a secretary, a treasurer and such assistant secretaries and treasurers as may be appropriate, any of whom may, but need not, be members of

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such Pool or Advisory Committee.

(b) Regular Meetings. All Pool Committees and the Advisory Committee shall hold regular meetings at a place and time to be specified in the rules to be adopted by each Pool and Advisory Committee. Notice of regular meetings of any Pool or Advisory Committee, and of any change in time or place thereof, shall be mailed to all active parties in said pool or pools.

(c) Special Meetings. Special meetings of any Pool or Advisory Committee may be called at any time by the Chairperson or by any three (3) members of such Pool or Advisory Committee by delivering notice personally or by mail to each member of such Pool or Advisory Committee and to each active party at least 24 hours before the time of each such meeting in the case of personal delivery, and 96 hours in the case of mail. The calling notice shall specify the time and place of the special meeting and the business to be transacted. No other business shall be considered at such meeting.

(d) Minutes. Minutes of all Pool Committee, Advisory Committee and Watermaster meetings shall be kept at Watermaster's offices. Copies thereof shall be mailed or otherwise furnished to all active parties in the pool or pools concerned. Said copies of minutes shall constitute notice of any Pool or Advisory Committee action therein reported, and shall be available for inspection by any party.

(e) Adjournments. Any meeting of any Pool or Advisory Committee may be adjourned to a time and place specified in the order of adjournment. Less than a quorum may so adjourn

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from time to time. A copy of the order or notice of adjournment shall be conspicuously posted forthwith on or near the door of the place where the meeting was held.

38. Powers and Functions. The powers and functions of the respective Pool Committees and the Advisory Committee shall be as follows:

(a) Pool Committees. Each Pool Committee shall have the power and responsibility for developing policy recommendations for administration of its particular pool, as created under the Physical Solution. All actions and recommendations of any Pool Committee which require Watermaster implementation shall first be noticed to the other two pools. If no objection is received in writing within thirty (30) days, such action or recommendation shall be transmitted directly to Watermaster for action. If any such objection is received, such action or recommendation shall be reported to the Advisory Committee before being transmitted to Watermaster.

(b) Advisory Committee. The Advisory Committee shall have the duty to study, and the power to recommend, review and act upon all discretionary determinations made or to be made hereunder by Watermaster.

[1] Committee Initiative. When any recommendation or advice of the Advisory Committee is received by Watermaster, action consistent therewith may be taken by Watermaster; provided, that any recommendation approved by 80 votes or more in the Advisory Committee shall constitute a mandate for action by Watermaster consistent therewith. If Watermaster is unwilling or unable to act

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pursuant to recommendation or advice from the Advisory Committee (other than such mandatory recommendations), Watermaster shall hold a public hearing, which shall be followed by written findings and decision. Thereafter, Watermaster may act in accordance with said decision, whether consistent with or contrary to said Advisory Committee recommendation. Such action shall be subject to review by the Court, as in the case of all other Watermaster determinations.

[2] Committee Review. In the event Watermaster proposes to take any discretionary action, other than approval or disapproval of a Pool Committee action or recommendation properly transmitted, or execute any agreement not theretofore within the scope of an Advisory Committee recommendation, notice of such intended action shall be served on the Advisory Committee and its members at least thirty (30) days before the Watermaster meeting at which such action is finally authorized.

(c) Review of Watermaster Actions. Watermaster (as to mandated action), the Advisory Committee or any Pool Committee shall be entitled to employ counsel and expert assistance in the event Watermaster or such Pool or Advisory Committee seeks Court review of any Watermaster action or failure to act. The cost of such counsel and expert assistance shall be Watermaster expense to be allocated to the affected pool or pools.

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## VI. PHYSICAL SOLUTION

### A. GENERAL

39. Purpose and Objective. Pursuant to the mandate of Section 2 of Article X of the California Constitution, the Court hereby adopts and orders the parties to comply with a Physical Solution. The purpose of these provisions is to establish a legal and practical means for making the maximum reasonable beneficial use of the waters of Chino Basin by providing the optimum economic, long-term, conjunctive utilization of surface waters, ground waters and supplemental water, to meet the requirements of water users having rights in or dependent upon Chino Basin.

40. Need for Flexibility. It is essential that this Physical Solution provide maximum flexibility and adaptability in order that Watermaster and the Court may be free to use existing and future technological, social, institutional and economic options, in order to maximize beneficial use of the waters of Chino Basin. To that end, the Court's retained jurisdiction will be utilized, where appropriate, to supplement the discretion herein granted to the Wastermaster.

41. Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations. Withdrawals and supplemental water replenishment of Basin Water, and the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees composed of the affected producers. Both the

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quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized.

42. General Pattern of Operations. It is contemplated that the rights herein decreed will be divided into three (3) operating pools for purposes of Watermaster administration. A fundamental premise of the Physical Solution is that all water users dependent upon Chino Basin will be allowed to pump sufficient waters from the Basin to meet their requirements. To the extent that pumping exceeds the share of the Safe Yield assigned to the Overlying Pools, or the Operating Safe Yield in the case of the Appropriative Pool, each pool will provide funds to enable Watermaster to replace such overproduction. The method of assessment in each pool shall be as set forth in the applicable pooling plan.

B. POOLING

43. Multiple Pools Established. There are hereby established three (3) pools for Watermaster administration of, and for the allocation of responsibility for, and payment of, costs of replenishment water and other aspects of this Physical Solution.

(a) Overlying (Agricultural) Pool. The first pool shall consist of the State of California and all overlying producers who produce water for other than industrial or commercial purposes. The initial members of the pool are listed in Exhibit "C".

(b) Overlying (Non-agricultural) Pool. The second pool shall consist of overlying producers who produce water for industrial or commercial purposes. The initial members of this pool are listed in Exhibit "D".

(c) Appropriative Pool. A third and separate pool shall

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consist of owners of appropriative rights. The initial members of the pool are listed in Exhibit "E".

Any party who changes the character of his use may, by subsequent order of the Court, be reassigned to the proper pool; but the allocation of Safe Yield under Paragraph 44 hereof shall not be changed. Any non-party producer or any person who may hereafter commence production of water from Chino Basin, and who may become a party to this physical solution by intervention, shall be assigned to the proper pool by the order of the Court authorizing such intervention.

44. Determination and Allocation of Rights to Safe Yield of Chino Basin. The declared Safe Yield of Chino Basin is hereby allocated as follows:

| Pool | Allocation |
|---|---|
| Overlying (Agricultural) Pool | 414,000 acre feet in any five (5) consecutive years. |
| Overlying (Non-agricultural) Pool. | 7,366 acre feet per year. |
| Appropriative Pool | 49,834 acre feet per year. |

The foregoing acre foot allocations to the overlying pools are fixed. Any subsequent change in the Safe Yield shall be debited or credited to the Appropriative Pool. Basin Water available to the Appropriative Pool without replenishment obligation may vary from year to year as the Operating Safe Yield is determined by Watermaster pursuant to the criteria set forth in Exhibit "I".

45. Annual Replenishment. Watermaster shall levy and collect assessments in each year, pursuant to the respective pooling plans, in amounts sufficient to purchase replenishment water to replace production by any pool during the preceding year which exceeds that

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pool's allocated share of Safe Yield in the case of the overlying pools, or Operating Safe Yield in the case of the Appropriative Pool. It is anticipated that supplemental water for replenishment of Chino Basin may be available at different rates to the various pools to meet their replenishment obligations. If such is the case, each pool will be assessed only that amount necessary for the cost of replenishment water to that pool, at the rate available to the pool, to meet its replenishment obligation.

46. Initial Pooling Plans. The initial pooling plans, which are hereby adopted, are set forth in Exhibits "F", "G" and "H", respectively. Unless and until modified by amendment of the judgment pursuant to the Court's continuing jurisdiction, each such plan shall control operation of the subject pool.

C. REPORTS AND ACCOUNTING

47. Production Reports. Each party or responsible party shall file periodically with Watermaster, pursuant to Watermaster rules, a report on a form to be prescribed by Watermaster showing the total production of such party during the preceding reportage period, and such additional information as Watermaster may require, including any information specified by the affected Pool Committee.

48. Watermaster Reports and Accounting. Watermaster's annual report, which shall be filed on or before November 15 of each year and shall apply to the preceding year's operation, shall contain details as to operation of each of the pools and a certified audit of all assessments and expenditures pursuant to this Physical Solution and a review of Watermaster activities.

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D. REPLENISHMENT

49. Sources of Supplemental Water. Supplemental water may be obtained by Watermaster from any available source. Watermaster shall seek to obtain the best available quality of supplemental water at the most reasonable cost for recharge in the Basin. To the extent that costs of replenishment water may vary between pools, each pool shall be liable only for the costs attributable to its required replenishment. Available sources may include, but are not limited to:

(a) Reclaimed Water. There exist a series of agreements generally denominated the Regional Waste Water Agreements between CBMWD and owners of the major municipal sewer systems within the basin. Under those agreements, which are recognized hereby but shall be unaffected and unimpaired by this judgment, substantial quantities of reclaimed water may be made available for replenishment purposes. There are additional sources of reclaimed water which are, or may become, available to Watermaster for said purposes. Maximum beneficial use of reclaimed water shall be given high priority by Watermaster.

(b) State Water. State water constitutes a major available supply of supplemental water. In the case of State Water, Watermaster purchases shall comply with the water service provisions of the State's water service contracts. More specifically, Watermaster shall purchase State Water from MWD for replenishment of excess production within CBMWD, WMWD and PVMWD, and from SBVMWD to replenish excess production within SBVMWD's boundaries in Chino Basin, except to the

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extent that MWD and SBVMWD give their consent as required by such State water service contracts.

(c) Local Import. There exist facilities and methods for importation of surface and ground water supplies from adjacent basins and watersheds.

(d) Colorado River Supplies. MWD has water supplies available from its Colorado River Aqueduct.

50. Methods of Replenishment. Watermaster may accomplish replenishment of overproduction from the Basin by any reasonable method, including:

(a) Spreading and percolation or Injection of water in existing or new facilities, subject to the provisions of Paragraphs 19, 25 and 26 hereof.

(b) In Lieu Procedures. Watermaster may make, or cause to be made, deliveries of water for direct surface use, in lieu of ground water production.

E. REVENUES

51. Production Assessment. Production assessments, on whatever basis, may be levied by Watermaster pursuant to the pooling plan adopted for the applicable pool.

52. Minimal Producers. Minimal Producers shall be exempted from payment of production assessments, upon filing of production reports as provided in Paragraph 47 of this Judgment, and payment of an annual five dollar ($5.00) administrative fee as specified by Watermaster rules.

53. Assessment Proceeds -- Purposes. Watermaster shall have the power to levy assessments against the parties (other than minimal pumpers) based upon production during the preceding period

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of assessable production, whether quarterly, semi-annually or annually, as may be determined most practical by Watermaster or the affected Pool Committee.

54. Administrative Expenses. The expenses of administration of this Physical Solution shall be categorized as either (a) general Watermaster administrative expense, or (b) special project expense.

(a) General Watermaster Administrative Expense shall include office rental, general personnel expense, supplies and office equipment, and related incidental expense and general overhead.

(b) Special Project Expense shall consist of special engineering, economic or other studies, litigation expense, meter testing or other major operating expenses. Each such project shall be assigned a Task Order number and shall be separately budgeted and accounted for.

General Watermaster administrative expense shall be allocated and assessed against the respective pools based upon allocations made by the Watermaster, who shall make such allocations based upon generally accepted cost accounting methods. Special Project Expense shall be allocated to a specific pool, or any portion thereof, only upon the basis of prior express assent and finding of benefit by the Pool Committee, or pursuant to written order of the Court.

55. Assessments -- Procedure. Assessments herein provided for shall be levied and collected as follows:

(a) Notice of Assessment. Watermaster shall give written notice of all applicable assessments to each party on

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or before ninety (90) days after the end of the production period to which such assessment is applicable.

(b) Payment. Each assessment shall be payable on or before thirty (30) days after notice, and shall be the obligation of the party or successor owning the water production facility at the time written notice of assessment is given, unless prior arrangement for payment by others has been made in writing and filed with Watermaster.

(c) Delinquency. Any delinquent assessment shall bear interest at 10% per annum (or such greater rate as shall equal the average current cost of borrowed funds to the Watermaster) from the due date thereof. Such delinquent assessment and interest may be collected in a show-cause proceeding herein instituted by the Watermaster, in which case the Court may allow Watermaster its reasonable costs of collection, including attorney's fees.

56. Accumulation of Replenishment Water Assessment Proceeds. In order to minimize fluctuation in assessment and to give Watermaster flexibility in purchase and spreading of replenishment water, Watermaster may make reasonable accumulations of replenishment water assessment proceeds. Interest earned on such retained funds shall be added to the account of the pool from which the funds were collected and shall be applied only to the purchase of replenishment water.

57. Effective Date. The effective date for accounting and operation under this Physical Solution shall be July 1, 1977, and the first production assessments hereunder shall be due after July 1, 1978. Watermaster shall, however, require installation of

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meters or measuring devices and establish operating procedures immediately, and the costs of such Watermaster activity (not including the cost of such meters and measuring devices) may be recovered in the first administrative assessment in 1978.

## VII. MISCELLANEOUS PROVISIONS

58. Designation of Address for Notice and Service. Each party shall designate the name and address to be used for purposes of all subsequent notices and service herein, either by its endorsement on the Stipulation for Judgment or by a separate designation to be filed within thirty (30) days after Judgment has been served. Said designation may be changed from time to time by filing a written notice of such change with the Watermaster. Any party desiring to be relieved of receiving notices of Watermaster or committee activity may file a waiver of notice on a form to be provided by Watermaster. Thereafter such party shall be removed from the Active Party list. Watermaster shall maintain at all times a current list of active parties and their addresses for purposes of service. Watermaster shall also maintain a full current list of names and addresses of all parties or their successors, as filed herein. Copies of such lists shall be available, without cost, to any party, the Advisory Committee or any Pool Committee upon written request therefor.

59. Service of Documents. Delivery to or service upon any party or active party by the Watermaster, by any other party, or by the Court, of any item required to be served upon or delivered to such party or active party under or pursuant to the Judgment shall be made personally or by deposit in the United States mail, first

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class, postage prepaid, addressed to the designee and at the address in the latest designation filed by such party or active party.

60. Intervention After Judgment. Any non-party assignee of the adjudicated appropriative rights of any appropriator, or any other person newly proposing to produce water from Chino Basin, may become a party to this judgment upon filing a petition in intervention. Said intervention must be confirmed by order of this Court. Such intervenor shall thereafter be a party bound by this judgment and entitled to the rights and privileges accorded under the Physical Solution herein, through the pool to which the Court shall assign such intervenor.

61. Loss of Rights. Loss, whether by abandonment, forfeiture or otherwise, of any right herein adjudicated shall be accomplished only (1) by a written election by the owner of the right filed with Watermaster, or (2) by order of the Court upon noticed motion and after hearing.

62. Scope of Judgment. Nothing in this Judgment shall be deemed to preclude or limit any party in the assertion against a neighboring party of any cause of action now existing or hereafter arising based upon injury, damage or depletion of water supply available to such party, proximately caused by nearby pumping which constitutes an unreasonable interference with such complaining party's ability to extract ground water.

63. Judgment Binding on Successors. This Judgment and all provisions thereof are applicable to and binding upon not only the parties to this action, but also upon their respective heirs, executors, administrators, successors, assigns, lessees and

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licensees and upon the agents, employees and attorneys in fact of all such persons.

64. Costs. No party shall recover any costs in this proceeding from any other party.

Dated: JAN 27 1978.

Judge

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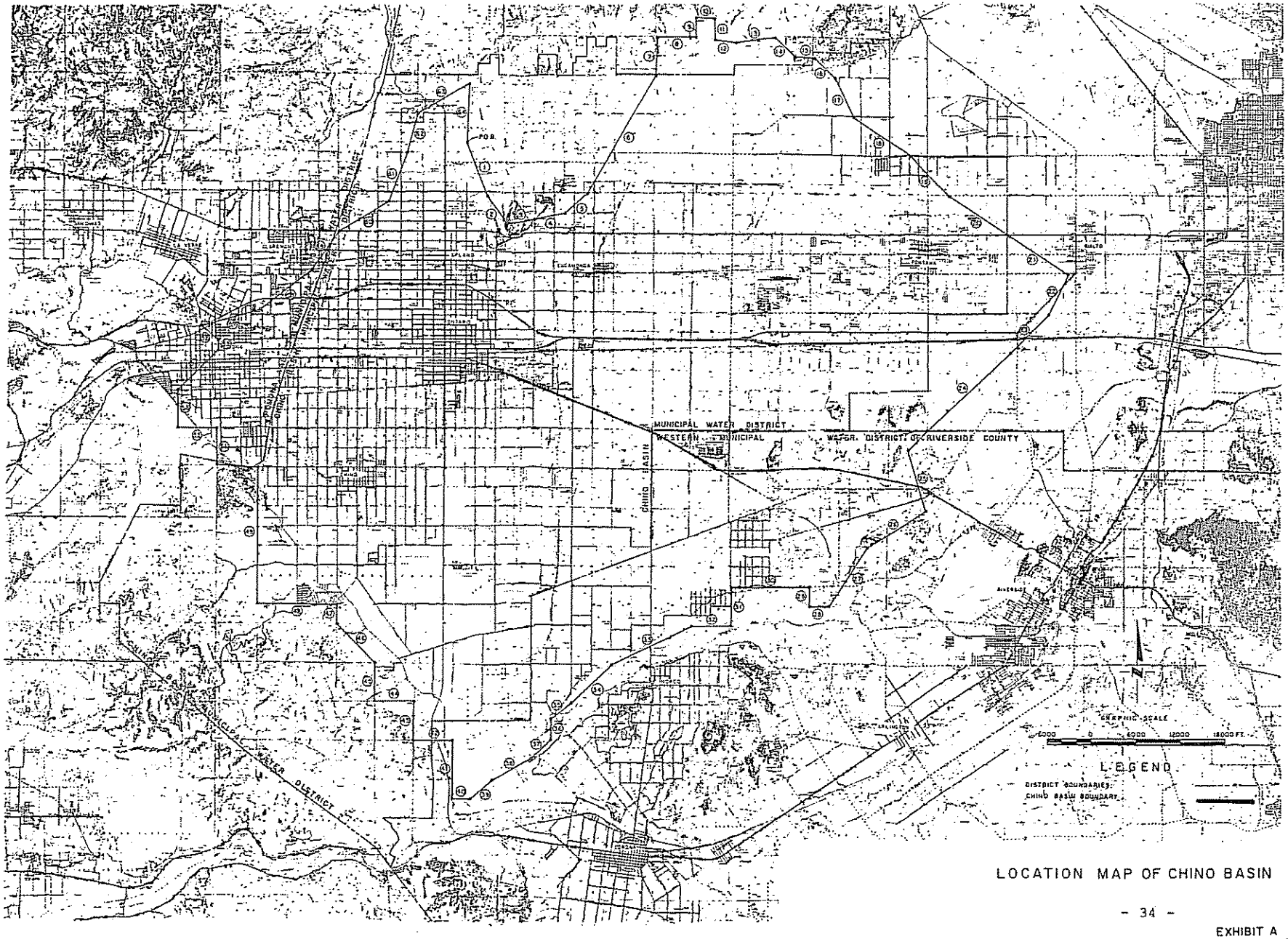


LOCATION MAP OF CHINO BASIN



EXHIBIT A

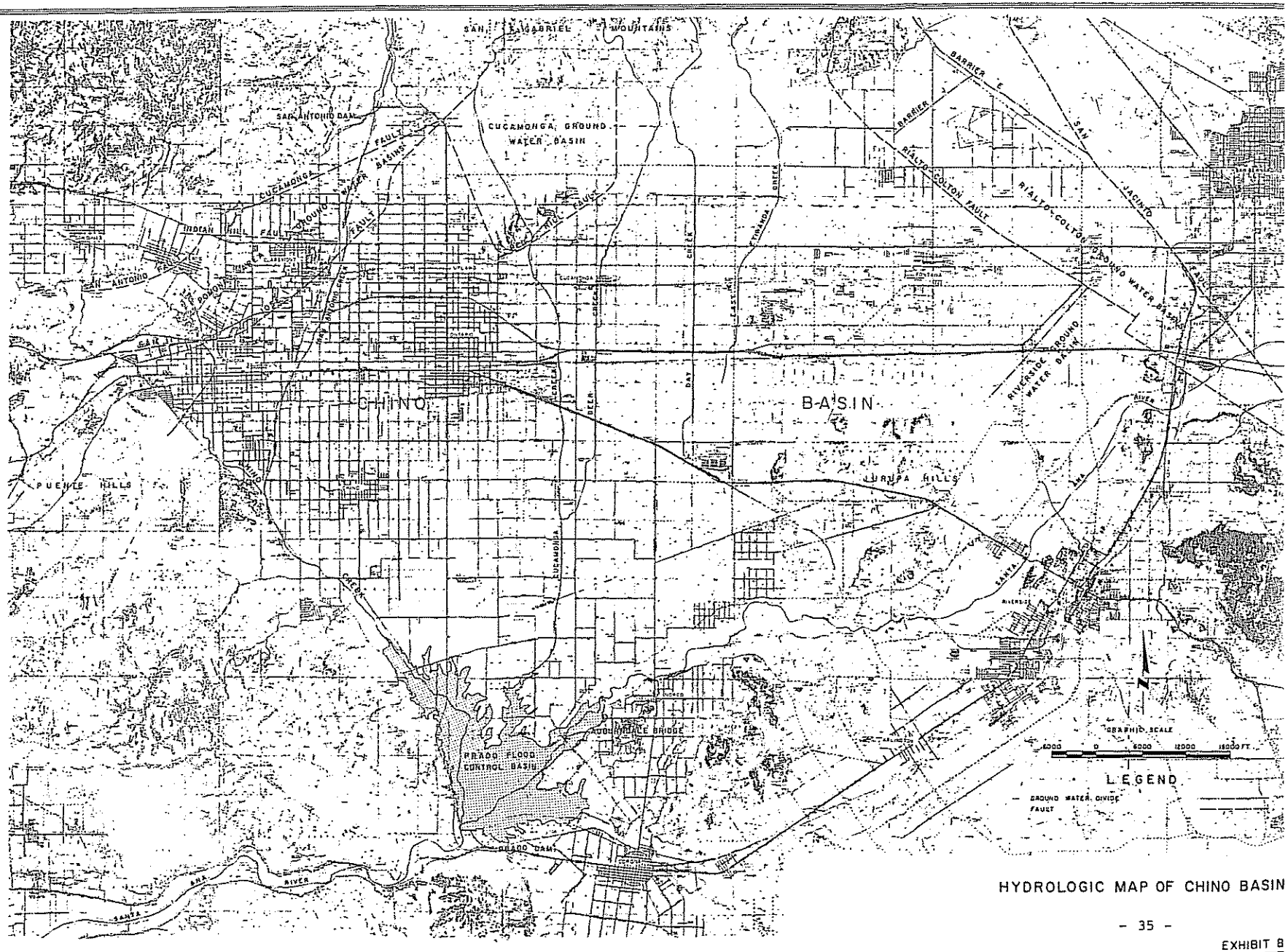


HYDROLOGIC MAP OF CHINO BASIN



EXHIBIT B

STIPULATING OVERLYING AGRICULTURAL PRODUCERS

STATE OF CALIFORNIA
COUNTY OF SAN BERNARDINO
Abacherli Dairy, Inc.
Abacherli, Frank
Abacherli, Shirley
Abbona, Anna
Abbona, James
Abbona, Jim
Abbona, Mary
Agliani, Amelia H.
Agman, Inc.
Aguerre, Louis B.
Ahmanson Trust Co.
Akiyama, Shizuye
Akiyama, Tomoo
Akkerman, Dave
Albers, J. N.
Albers, Nellie
Alewyn, Jake J.
Alewyn, Normalee
Alger, Mary D.
Alger, Raymond
Allen, Ben F.
Allen, Jane F.
Alta-Dena Dairy
Anderson Farms
Anguiano, Sarah L. S.
Anker, Gus
Aphessetche, Xavier
Arena Mutual Water Assn.
Armstrong Nurseries, Inc.
Arretche, Frank
Arretche, Jean Pierre
Arvidson, Clarence F.
Arvidson, Florence
Ashley, George W.
Ashley, Pearl E.
Atlas Farms
Atlas Ornamental Iron Works, Inc.
Aukeman, Carol
Aukeman, Lewis
Ayers, Kenneth C., aka Kelley Ayers
Bachoc, Raymond
Baldwin, Edgar A.
Baldwin, Lester
Banbury, Carolyn
Bangma Dairy
Bangma, Arthur
Bangma, Ida
Bangma, Martin
Bangma, Sam
Barba, Anthony B.
Barba, Frank
Barcellos, Joseph
Barnhill, Maurine W.

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| | | |
|---|---|---|
| 1 | Barnhill, Paul | Boersma, Angie |
| 2 | Bartel, Dale | Boersma, Berdina |
| 3 | Bartel, Ursula | Boersma, Frank |
| 4 | Bartel, Willard | Boersma, Harry |
| 5 | Barthelemy, Henry | Boersma, Paul |
| 6 | Barthelemy, Roland | Boersma, Sam |
| 7 | Bassler, Donald V., M.D. | Boersma, William L. |
| 8 | Bates, Lowell R. | Bohlander & Holmes, Inc. |
| 9 | Bates, Mildred L. | Bokma, Peter |
| 10 | Beahm, James W. | Bollema, Jacob |
| 11 | Beahm, Joan M. | Boonstoo, Edward |
| 12 | Bekendam, Hank | Bootsma, Jim |
| 13 | Bekendam, Pete | Borba, Dolene |
| 14 | Bello, Eugene | Borba, Dolores |
| 15 | Bello, Olga | Borba, Emily |
| 16 | Beltman, Evelyn | Borba, George |
| 17 | Beltman, Tony | Borba, John |
| 18 | Bergquist Properties, Inc. | Borba, John & Sons |
| 19 | Bevacqua, Joel A. | Borba, John Jr. |
| 20 | Bevacqua, Marie B. | Borba, Joseph A. |
| 21 | Bidart, Bernard | Borba, Karen E. |
| 22 | Bidart, Michael J. | Borba, Karen M. |
| 23 | Binnell, Wesley | Borba, Pete, Estate of |
| 24 | Black, Patricia E. | Borba, Ricci |
| 25 | Black, Victor | Borba, Steve |
| 26 | Bodger, John & Sons Co. | Borba, Tom |
| 27 | Boer, Adrian | Bordisso, Alleck |
| 28 | Boersma and Wind Dairy | Borges, Angelica M. |

EXHIBIT "C"

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Borges, Bernadette
Borges, John O.
Borges, Linda L.
Borges, Manual Jr.
Borges, Tony
Bos, Aleid
Bos, Gerrit
Bos, John
Bos, John
Bos, Margaret
Bos, Mary
Bos, Mary Beth
Bos, Tony
Bosch, Henrietta
Bosch, Peter T.
Boschma, Betty
Boschma, Frank
Boschma, Greta
Boschma, Henry
Bosma, Dick
Bosma, Florence G.
Bosma, Gerrit
Bosma, Jacob J.
Bosma, Jeanette Thea
Bosman, Frank
Bosman, Nellie
Bosnyak, Goldie M.
Bosnyak, Martin
Bothof, Roger W.
Bouma, Cornie
Bouma, Emma
Bouma, Henry P.
Bouma, Martin
Bouma, Peter G. & Sons Dairy
Bouma, Ted
Bouman, Helen
Bouman, Sam
Bower, Mabel E.
Boys Republic
Breedyk, Arie
Breedyk, Jessie
Briano Brothers
Briano, Albert
Briano, Albert Trustee for
Briano, Albert Frank
Briano, Lena
Brink, Russell N.
Brinkerhoff, Margaret
Brinkerhoff, Robert L.
Britschgi, Florence
Britschgi, Magdalena Garetto
Britschgi, Walter P.
Brommer, Marvin
Brookside Enterprizes, dba
Brookside Vineyard Co.
Brothers Three Dairy

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Brun, Martha M.
Brun, Peter Robert
Buma, Duke
Buma, Martha
Bunse, Nancy
Bunse, Ronnie L.
Caballero, Bonnie L.
Caballero, Richard F.
Cable Airport Inc.
Cadlini, Donald
Cadlini, Jesse R.
Cadlini, Marie Edna
Cambio, Anna
Cambio, Charles, Estate of
Cambio, William V.
Cardoza, Florence
Cardoza, Olivi
Cardoza, Tony
Carnesi, Tom
Carver, Robt M., Trustee
Cauffman, John R.
Chacon Bros.
Chacon, Elvera P.
Chacon, Joe M.
Chacon, Robert M.
Chacon, Virginia L.
Chez, Joseph C.
Chino Corona Investment
Chino Water Co.
Christensen, Leslie
Christensen, Richard G.
Christian, Ada R.
Christian, Harold F.
Christy, Ella J.
Christy, Ronald S.
Cihigoyenetche, Jean
Cihigoyenetche, Leona
Cihigoyenetche, Martin
Clarke, Arthur B.
Clarke, Nancy L.
Clarke, Phyllis J.
Coelho, Isabel
Coelho, Joe A. Jr.
Collins, Howard E.
Collins, Judith F.
Collinsworth, Ester L.
Collinsworth, John E.
Collinsworth, Shelby
Cone Estate (05-2-00648/649)
Consolidated Freightways Corp. of Delaware
Corona Farms Co.
Corra, Rose
Costa, Dimas S.
Costa, Laura

EXHIBIT "C"

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1 Costa, Myrtle
2 Costamagna, Antonio
3 Costamagna, Joseph
4 Cousyn, Claus B.
5 Cramer, Carole F.
6 Cramer, William R.
7 Crossroads Auto Dismantlers, Inc.
8 Crouse, Beatrice I.
9 Crouse, Roger
10 Crowley, Juanita C.
11 Crowley, Ralph
12 Cucamonga Vintners
13 D'Astici, Teresa
14 Da Costa, Cecilia B.
15 Da Costa, Joaquim F.
16 Daloisio, Norman
17 De Berard Bros.
18 De Berard, Arthur, Trustee
19 De Berard, Charles
20 De Berard, Chas., Trustee
21 De Berard, Helan J.
22 De Berard, Robert
23 De Berard, Robert, Trustee
24 De Bie, Adrian
25 De Bie, Henry
26 De Bie, Margaret M.
27 De Bie, Marvin
28 De Boer, Fred

De Boer, L. H.
De Boer, Sidney
De Bos, Andrew
De Graaf, Anna Mae
De Graaf, Gerrit
De Groot, Dick
De Groot, Dorothy
De Groot, Ernest
De Groot, Henrietta
De Groot, Jake
De Groot, Pete Jr.
De Haan, Bernadena
De Haan, Henry
De Hoog, Adriana
De Hoog, Joe
De Hoog, Martin
De Hoog, Martin L.
De Hoog, Mitch
De Hoog, Tryntje
De Jager, Cobi
De Jager, Edward D.
De Jong Brothers Dairy
De Jong, Cornelis
De Jong, Cornelius
De Jong, Grace
De Jong, Jake
De Jong, Lena
De Leeuw, Alice

EXHIBIT "C"

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1 De Leeuw, Sam
2 De Soete, Agnes
3 De Soete, Andre
4 De Vries, Abraham
5 De Vries, Case
6 De Vries, Dick
7 De Vries, Evelyn
8 De Vries, Henry, Estate of
9 De Vries, Hermina
10 De Vries, Jack H.
11 De Vries, Jane
12 De Vries, Janice
13 De Vries, John
14 De Vries, John J.
15 De Vries, Neil
16 De Vries, Ruth
17 De Vries, Theresa
18 De Wit, Gladys
19 De Wit, Peter S.
20 De Wyn, Evert
21 De Zoete, Hattie V.
22 De Zoete, Leo A.
23 Decker, Hallie
24 Decker, Henry A.
25 Demmer, Ernest
26 Di Carlo, Marie
27 Di Carlo, Victor
28 Di Tommaso, Frank

Dirkse, Catherine
Dirkse, Charles C.
Dixon, Charles E.
Dixon, Geraldine A.
Doesberg, Hendrica
Doesburg, Theodorus P.
Dolan, Marion
Dolan, Michael H.
Dominguez, Helen
Dominguez, Manual
Donkers, Henry A.
Donkers, Nellie G.
Dotta Bros.
Douma Brothers Dairy
Douma, Betty A.
Douma, Fred A.
Douma, Hendrika
Douma, Herman G.
Douma, Narleen J.
Douma, Phillip M.
Dow Chemical Co.
Dragt, Rheta
Dragt, William
Driftwood Dairy Farm
Droogh, Case
Duhalde, Marian
Duhalde, Lauren
Duits, Henrietta

EXHIBIT "C"

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1 Duits, John
2 Dunlap, Edna Kraemer,
3 Estate of
4 Durrington, Glen
5 Durrington, William F.
6 Dusi, John, Sr.
7 Dykstra, Dick
8 Dykstra, John
9 Dykstra, John & Sons
10 Dykstra, Wilma
11 Dyt, Cor
12 Dyt, Johanna
13 E and S Grape Growers
14 Eaton, Thomas, Estate of
15 Echeverria, Juan
16 Echeverria, Carlos
17 Echeverria, Pablo
18 Eilers, E. Myrle
19 Eilers, Henry W.
20 El Prado Golf Course
21 Ellsworth, Rex C.
22 Engelsma, Jake
23 Engelsma, Susan
24 Escojeda, Henry
25 Etiwanda Grape Products Co.
26 Euclid Ave. Investment One
27 Euclid Ave. Investment Four
28 Euclid Ave. Three Investment

Excelsior Farms
F.D.I.C.
Fagundes, Frank M.
Fagundes, Mary
Fernandes, Joseph Jr.
Fernandes, Velma C.
Ferraro, Ann
Ferreira, Frank J.
Ferreira, Joe C. Jr.
Ferreira, Narcie
Filippi, J. Vintage Co.
Filippi, Joseph
Filippi, Joseph A.
Filippi, Mary E.
Fitzgerald, John R.
Flameling Dairy Inc.
Flamingo Dairy
Foss, Douglas E.
Foss, Gerald R.
Foss, Russel
Fred & John Troost No. 1 Inc.
Fred & Maynard Troost No. 2 Inc.
Freitas, Beatriz
Freitas, Tony T.
Gakle, Louis L.
Galleano Winery, Inc.
Galleano, Bernard D.
Galleano, D.
Galleano, Mary M.

EXHIBIT "C"

LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
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1 Garcia, Pete
2 Gardner, Leland V.
3 Gardner, Lola M.
4 Garrett, Leonard E.
5 Garrett, Patricia T.
6 Gastelluberry, Catherine
7 Gastelluberry, Jean
8 Gilstrap, Glen E.
9 Gilstrap, Marjorie J.
10 Godinho, John
11 Godinho, June
12 Gonsalves, Evelyn
13 Gonsalves, John
14 Gorzeman, Geraldine
15 Gorzeman, Henry A.
16 Gorzeman, Joe
17 Govea, Julia
18 Goyenetche, Albert
19 Grace, Caroline E.
20 Grace, David J.
21 Gravatt, Glenn W.
22 Gravatt, Sally Mae
23 Greydanus Dairy, Inc.
24 Greydanus, Rena
25 Griffin Development Co.
26 Haagsma, Dave
27 Haagsma, John
28 Hansen, Mary D.

Hansen, Raymond F.
Hanson, Ardeth W.
Harada, James T.
Harada, Violet A.
Haringa, Earl and Sons
Haringa, Herman
Haringa, Rudy
Haringa, William
Harper, Cecilia de Mille
Harrington, Winona
Harrison, Jacqueline A.
Hatanaka, Kenichi
Heida, Annie
Heida, Don
Heida, Jim
Heida, Sam
Helms, Addison D.
Helms, Irma A.
Hermans, Alma I.
Hermans, Harry
Hettinga, Arthur
Hettinga, Ida
Hettinga, Judy
Hettinga, Mary
Hettinga, Wilbur
Heublein, Inc., Grocery Products Group
Hibma, Catherine M.

EXHIBIT "C"

Hibma, Sidney
Hicks, Kenneth I.
Hicks, Minnie M.
Higgins Brick Co.
Highstreet, Alfred V.
Highstreet, Evada V.
Hilarides, Bertha as Trustee
Hilarides, Frank
Hilarides, John as Trustee
Hindelang, Tillie
Hindelang, William
Hobbs, Bonnie C.
Hobbs, Charles W.
Hobbs, Hazel I.
Hobbs, Orlo M.
Hoekstra, Edward
Hoekstra, George
Hoekstra, Grace
Hoekstra, Louie
Hofer, Paul B.
Hofer, Phillip F.
Hofstra, Marie
Hogeboom, Jo Ann M.
Hogeboom, Maurice D.
Hogg, David V.
Hogg, Gene P.
Hogg, Warren G.
Hohberg, Edith J.
Hohberg, Harold C.
Hohberg, Harold W.
Holder, Arthur B.
Holder, Dorothy F.
Holmes, A. Lee
Holmes, Frances P.
Hoogeboom, Gertrude
Hoogeboom, Pete
Hoogendam, John
Hoogendam, Tena
Houssels, J. K. Thoroughbred Farm
Hunt Industries
Idsinga, Ann
Idsinga, William W.
Imbach Ranch, Inc.
Imbach, Kenneth E.
Imbach, Leonard K.
Imbach, Oscar K.
Imbach, Ruth M.
Indaburu, Jean
Indaburu, Marceline
Iseli, Kurt H.
Ito, Kow
J & B Dairy Inc.
Jaques, Johnny C. Jr.
Jaques, Mary
Jaques, Mary Lou

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| | |
|---|---|
| Jay Em Bee Farms | Knevelbaard, John |
| Johnson Bro's Egg Ranches, Inc. | Knudsen, Ejnar |
| Johnston, Ellwood W. | Knudsen, Karen M. |
| Johnston, George F. Co. | Knudsen, Kenneth |
| Johnston, Judith H. | Knudson, Robert |
| Jones, Leonard P. | Knudson, Darlene |
| Jongsma & Sons Dairy | Koel, Helen S. |
| Jongsma, Diana A. | Koetsier, Gerard |
| Jongsma, Dorothy | Koetsier, Gerrit J. |
| Jongsma, George | Koetsier, Jake |
| Jongsma, Harold | Koning, Fred W. |
| Jongsma, Henry | Koning, Gloria |
| Jongsma, John | Koning, J. W. Estate |
| Jongsma, Nadine | Koning, James A. |
| Jongsma, Tillie | Koning, Jane |
| Jordan, Marjorie G. | Koning, Jane C. |
| Jordan, Troy O. | Koning, Jennie |
| Jorritsma, Dorothy | Koning, John |
| Juliano, Albert | Koning, Victor A. |
| Kamper, Cornelis | Kooi Holstein Corporation |
| Kamstra, Wilbert | Koolhaas, Kenneth E. |
| Kaplan, Lawrence J. | Koolhaas, Simon |
| Kasbergen, Martha | Koolhaas, Sophie Grace |
| Kasbergen, Neil | Koopal, Grace |
| Kazian, Angelen Estate of | Koopal, Silas |
| Kingsway Const. Corp. | Koopman, Eka |
| Klapps Market | Koopman, Gene T. |
| Kline, James K. | Koopman, Henry G. |

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Koopman, Ted
Koopman, Tena
Koot, Nick
Koster, Aart
Koster, Frances
Koster, Henry B.
Koster, Nellie
Kroes, Jake R.
Kroeze, Bros
Kroeze, Calvin E.
Kroeze, John
Kroeze, Wesley
Kruckenberg, Naomi
Kruckenberg, Perry
L. D. S. Welfare Ranch
Labrucherie, Mary Jane
Labrucherie, Raymond F.
Lako, Samuel
Landman Corp.
Lanting, Broer
Lanting, Myer
Lass, Jack
Lass, Sandra L.
Lawrence, Cecelia, Estate of
Lawrence, Joe H., Estate of
Leal, Bradley W.
Leal, John C.
Leal, John Craig
Leck, Arthur A.
Leck, Evelyn M.
Lee, Harold E.
Lee, Helen J.
Lee, Henrietta C.
Lee, R. T. Construction Co.
Lekkerkerk, Adriana
Lekkerkerk, L. M.
Lekkerkerker, Nellie
Lekkerkerker, Walt
Lewis Homes of California
Livingston, Dorothy M.
Livingston, Rex E.
Lokey, Rosemary Kraemer
Lopes, Candida A.
Lopes, Antonio S.
Lopez, Joe D.
Lourenco, Carlos, Jr.
Lourenco, Carmelina P.
Lourenco, Jack C.
Lourenco, Manual H.
Lourenco, Mary
Lourenco, Mary
Luiten, Jack
Luiz, John M.
Luna, Christine I.
Luna, Ruben T.
Lusk, John D. and Son
a California corporation

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Lyon, Gregory E.
Lyon, Paula E.
M & W Co. #2
Madole, Betty M.
Madole, Larry B.
Marquez, Arthur
Marquine, Jean
Martin, Lelon O.
Martin, Leon O.
Martin, Maria D.
Martin, Tony J.
Martins, Frank
Mathias, Antonio
Mc Cune, Robert M.
Mc Masters, Gertrude
Mc Neill, J. A.
Mc Neill, May F.
Mees, Leon
Mello and Silva Dairy
Mello and Sousa Dairy
Mello, Emilia
Mello, Enos C.
Mello, Mercedes
Mendiondo, Catherine
Mendiondo, Dominique
Meth. Hosp. - Sacramento
Metzger, R. S.
Metzger, Winifred
Mickel, Louise
Miersma, Dorothy
Meirsma, Harry C.
Minaberry, Arnaud
Minaberry, Marie
Mistretta, Frank J.
Mocho and Plaa Inc.
Mocho, Jean
Mocho, Noeline
Modica, Josephine
Montes, Elizabeth
Montes, Joe
Moons, Beatrice
Moons, Jack
Moramarco, John A. Enterprises
Moreno, Louis W.
Moss, John R.
Motion Pictures Associates, Inc.
Moynier, Joe
Murphy, Frances V.
Murphy, Myrl L.
Murphy, Naomi
Nanne, Martin Estate of
Nederend, Betty
Nederend, Hans
Norfolk, James
Norfolk, Martha
Notrica, Louis

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Nyberg, Lillian N.
Nyenhuis, Annie
Nyenhuis, Jim
Occidental Land Research
Okumura, Marion
Okumura, Yuiche
Oldengarm, Effie
Oldengarm, Egbert
Oldengarm, Henry
Oliviera, Manuel L.
Oliviera, Mary M.
Olson, Albert
Oltmans Construction Co.
Omlin, Anton
Omlin, Elsie L.
Ontario Christian School Assn.
Oord, John
Oostdam, Jacoba
Oostdam, Pete
Oosten, Agnes
Oosten, Anthonia
Oosten, Caroline
Oosten, John
Oosten, Marinus
Oosten, Ralph
Orange County Water District
Ormonde, Manuel
Ormonde, Pete, Jr.
Ormonde, Viva
Ortega, Adeline B.
Ortega, Bernard Dino
Osterkamp, Joseph S.
Osterkamp, Margaret A.
P I E Water Co.
Palmer, Eva E.
Palmer, Walter E.
Parente, Luis S.
Parente, Mary Borba
Parks, Jack B.
Parks, Laura M.
Patterson, Lawrence E. Estate of
Payne, Clyde H.
Payne, Margo
Pearson, Athelia K.
Pearson, William C.
Pearson, William G.
Pene, Robert
Perian, Miller
Perian, Ona E.
Petrissans, Deanna
Petrissans, George
Petrissans, Jean P.
Petrissans, Marie T.
Pickering, Dora M.
(Mrs. A. L. Pickering)
Pierce, John

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1 Pierce, Sadie
2 Pietszak, Sally
3 Pine, Joe
4 Pine, Virginia
5 Pires, Frank
6 Pires, Marie
7 Plaa, Jeanne
8 Plaa, Michel
9 Plantenga, Agnes
10 Plantenga, George
11 Poe, Arlo D.
12 Pomona Cemetery Assn.
13 Porte, Cecelia, Estate of
14 Porte, Garritt, Estate of
15 Portsmouth, Vera McCarty
16 Ramella, Mary M.
17 Ramirez, Concha
18 Rearick, Hildegard H.
19 Rearick, Richard R.
20 Reinalda, Clarence
21 Reitsma, Greta
22 Reitsma, Louis
23 Rice, Bernice
24 Rice, Charlie E.
25 Richards, Karin
26 (Mrs. Ronnie Richards)
27 Richards, Ronald L.
28 Ridder, Jennie Wassenaar

Righetti, A. T.
Riley, George A.
Riley, Helen C.
Robbins, Jack K.
Rocha, John M.
Rocha, Jose C.
Rodrigues, John
Rodrigues, Manuel
Rodrigues, Manuel, Jr.
Rodrigues, Mary L.
Rodriquez, Daniel
Rogers, Jack D.
Rohrer, John A.
Rohrer, Theresa D.
Rohrs, Elizabeth H.
Rossetti, M. S.
Roukema, Angeline
Roukema, Ed.
Roukema, Nancy
Roukema, Siebren
Ruderian, Max J.
Russell, Fred J.
Rusticus, Ann
Rusticus, Charles
Rynsburger, Arie
Rynsburger, Berdena, Trust
Rynsburger, Joan Adele
Rynsburger, Thomas

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1 S. P. Annex, Inc.
2 Salisbury, Elinor J.
3 Sanchez, Edmundo
4 Sanchez, Margarita O.
5 Santana, Joe Sr.
6 Santana, Palmira
7 Satragni, John B. Jr.
8 Scaramella, George P.
9 Schaafsma Bros.
10 Schaafsma, Jennie
11 Schaafsma, Peter
12 Schaafsma, Tom
13 Schaap, Andy
14 Schaap, Ids
15 Schaap, Maria
16 Schacht, Sharon C.
17 Schakel, Audrey
18 Schakel, Fred
19 Schmid, Olga
20 Schmidt, Madeleine
21 Schoneveld, Evert
22 Schoneveld, Henrietta
23 Schoneveld, John
24 Schoneveld, John Allen
25 Schug, Donald E.
26 Schug, Shirley A.
27 Schuh, Bernatta M.
28 Schuh, Harold H.

Scott, Frances M.
Scott, Linda F.
Scott, Stanley A.
Scritsmier, Lester J.
Serl, Charles A.
Serl, Rosalie P.
Shady Grove Dairy, Inc.
Shamel, Burt A.
Shelby, Harold E.
Shelby, John A.
Shelby, Velma M.
Shelton, Alice A.
Sherwood, Robert W.
Sherwood, Sheila J.
Shue, Eva
Shue, Gilbert
Sieperda, Anne
Sieperda, James
Sigrist, Hans
Sigrist, Rita
Silveira, Arline L.
Silveira, Frank
Silveira, Jack
Silveira, Jack P. Jr.
Simas, Dolores
Simas, Joe
Singleton, Dean
Singleton, Elsie R.

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| | |
|---|---|
| Sinnott, Jim | Staal, John |
| Sinnott, Mildred B. | Stahl, Zippora P. |
| Slegers, Dorothy | Stampfl, Berta |
| Slegers, Hubert J. | Stampfl, William |
| Slegers, Jake | Stanley, Robert E. |
| Slegers, Jim | Stark, Everett |
| Slegers, Lenwood M. | Stellingwerf, Andrew |
| Slegers, Martha | Stellingwerf, Henry |
| Slegers, Tesse J. | Stellingwerf, Jenette |
| Smith, Edward S. | Stellingwerf, Shana |
| Smith, Helen D. | Stellingwerf, Stan |
| Smith, James E. | Stelzer, Mike C. |
| Smith, Keith J. | Sterk, Henry |
| Smith, Lester W. | Stiefel, Winifred |
| Smith, Lois Maxine | Stiefel, Jack D. |
| Smith, Marjorie W. | Stigall, Richard L. |
| Soares, Eva | Stigall, Vita |
| Sogioka, Mitsuyoshi | Stockman's Inn |
| Sogioka, Yoshimato | Stouder, Charlotte A. |
| Sousa, Sam | Stouder, William C. |
| Southern Pacific Land Co. | Struikmans, Barbara |
| Southfield, Eddie | Struikmans, Gertie |
| Souza, Frank M. | Struikmans, Henry Jr. |
| Souza, Mary T. | Struikmans, Henry Sr. |
| Spickerman, Alberta | Struikmans, Nellie |
| Spickerman, Florence | Swager, Edward |
| Spickerman, Rudolph | Swager, Gerben |
| Spyksma, John | Swager, Johanna |

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1 Swager, Marion
2 Swierstra, Donald
3 Swierstra, Fanny
4 Sybrandy, Ida
5 Sybrandy, Simon
6 Sytsma, Albert
7 Sytsma, Edith
8 Sytsma, Jennie
9 Sytsma, Louie
10 Te Velde, Agnes
11 Te Velde, Bay
12 Te Velde, Bernard A.
13 Te Velde, Bonnie
14 Te Velde, Bonnie G.
15 Te Velde, George
16 Te Velde, George, Jr.
17 Te Velde, Harm
18 Te Velde, Harriet
19 Te Velde, Henry J.
20 Te Velde, Jay
21 Te Velde, Johanna
22 Te Velde, John H.
23 Te Velde, Ralph A.
24 Te Velde, Zwaantina, Trustee
25 Ter Maaten, Case
26 Ter Maaten, Cleone
27 Ter Maaten, Steve
28 Terpstra, Carol

Terpstra, Theodore G.
Teune, Tony
Teunissen, Bernard
Teunissen, Jane
Thomas, Ethel M.
Thommen, Alice
Thommen, Fritz
Tillema, Allie
Tillema, Harold
Tillema, Klaas D.
Timmons, William R.
Tollerup, Barbara
Tollerup, Harold
Trapani, Louis A.
Trimlett, Arlene R.
Trimlett, George E.
Tristant, Pierre
Tuinhout, Ale
Tuinhout, Harry
Tuinhout, Hilda
Tuls, Elizabeth
Tuls, Jack S.
Tuls, Jake
Union Oil Company of California
United Dairyman's Co-op.
Urquhart, James G.
Usle, Cathryn
Usle, Faustino

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1 V & Y Properties
2 Vaile, Beryl M.
3 Valley Hay Co.
4 Van Beek Dairy Inc.
5 Van Canneyt Dairy
6 Van Canneyt, Maurice
7 Van Canneyt, Wilmer
8 Van Dam, Bas
9 Van Dam, Isabelle
10 Van Dam, Nellie
11 Van Den Berg, Gertrude
12 Van Den Berg, Joyce
13 Van Den Berg, Marinus
14 Van Den Berg, Marvin
15 Van Der Linden, Ardith
16 Van Der Linden, John
17 Van Der Linden, Stanley
18 Van Der Veen, Kenneth
19 Van Diest, Anna T.
20 Van Diest, Cornelius
21 Van Diest, Ernest
22 Van Diest, Rena
23 Van Dyk, Bart
24 Van Dyk, Jeanette
25 Van Foeken, Martha
26 Van Foeken, William
27 Van Hofwegan, Steve
28 Van Hofwegen, Adrian A.

Van Hofwegen, Clara
Van Hofwegen, Jessie
Van Klaveren, A.
Van Klaveren, Arie
Van Klaveren, Wilhelmina
Van Klaveren, William
Van Leeuwen, Arie C.
Van Leeuwen, Arie C.
Van Leeuwen, Arlan
Van Leeuwen, Clara G.
Van Leeuwen, Cornelia L.
Van Leeuwen, Harriet
Van Leeuwen, Jack
Van Leeuwen, John
Van Leeuwen, Letie
Van Leeuwen, Margie
Van Leeuwen, Paul
Van Leeuwen, William A.
Van Ravenswaay, Donald
Van Ryn Dairy
Van Ryn, Dick
Van Surksum, Anthonetta
Van Surksum, John
Van Veen, John
Van Vliet, Effie
Van Vliet, Hendrika
Van Vliet, Hugo
Van Vliet, Klaas

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| | |
|---|---|
| Vande Witte, George | Vander Laan, Katie |
| Vanden Berge, Gertie | Vander Laan, Martin Jr. |
| Vanden Berge, Gertie | Vander Laan, Tillie |
| Vanden Berge, Jack | Vander Leest, Anna |
| Vanden Berge, Jake | Vander Leest, Ann |
| Vanden Brink, Stanley | Vander Meer, Alice |
| Vander Dussen, Agnes | Vander Meer, Dick |
| Vander Dussen, Cor | Vander Poel, Hank |
| Vander Dussen, Cornelius | Vander Poel, Pete |
| Vander Dussen, Edward | Vander Pol, Irene |
| Vander Dussen, Geraldine Marie | Vander Pol, Margie |
| Vander Dussen, James | Vander Pol, Marines |
| Vander Dussen, John | Vander Pol, William P. |
| Vander Dussen, Nelvina | Vander Schaaf, Earl |
| Vander Dussen, Rene | Vander Schaaf, Elizabeth |
| Vander Dussen, Sybrand Jr. | Vander Schaaf, Henrietta |
| Vander Dussen, Sybrand Sr. | Vander Schaaf, John |
| Vander Dussen Trustees | Vander Schaaf, Ted |
| Vander Eyk, Case Jr. | Vander Stelt, Catherine |
| Vander Eyk, Case Sr. | Vander Stelt, Clarence |
| Vander Feer, Peter | Vander Tuig, Arlene |
| Vander Feer, Rieka | Vander Tuig, Sylvester |
| Vander Laan, Ann | Vander Veen, Joe A. |
| Vander Laan, Ben | Vandervlag, Robert |
| Vander Laan, Bill | Vander Zwan, Peter |
| Vander Laan, Corrie | Vanderford, Betty W. |
| Vander Laan, Henry | Vanderford, Claud R. |
| Vander Laan, James | Vanderham, Adrian |

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1 Vanderham, Cornelius
2 Vanderham, Cornelius P.
3 Vanderham, Cory
4 Vanderham, E. Jane
5 Vanderham, Marian
6 Vanderham, Martin
7 Vanderham, Pete C.
8 Vanderham, Wilma
9 Vasquez, Eleanor
10 Veenendaal, Evert
11 Veenendaal, John H.
12 Veiga, Dominick Sr.
13 Verbree, Jack
14 Verbree, Tillie
15 Verger, Bert
16 Verger, Betty
17 Verhoeven, Leona
18 Verhoeven, Martin
19 Verhoeven, Wesley
20 Vermeer, Dick
21 Vermeer, Jantina
22 Vernola Ranch
23 Vernola, Anthonietta
24 Vernola, Anthony
25 Vernola, Frank
26 Vernola, Mary Ann
27 Vernola, Pat F.
28 Vestal, Frances Lorraine

Vestal, J. Howard
Visser, Gerrit
Visser, Grace
Visser, Henry
Visser, Jess
Visser, Louie
Visser, Neil
Visser, Sam
Visser, Stanley
Visser, Tony D.
Visser, Walter G.
Von Der Ahe, Fredric T.
Von Euw, George
Von Euw, Marjorie
Von Lusk, a limited partnership
Voortman, Anna Marie
Voortman, Edward
Voortman, Edwin J.
Voortman, Gertrude Dena
Wagner, Richard H.
Walker, Carole R.
Walker, Donald E.
Walker, Wallace W.
Wardle, Donald M.
Warner, Dillon B.
Warner, Minnie
Wassenaar, Peter W.
Waters, Michael

EXHIBIT "C"

Weeda, Adriana
Weeda, Daniel
Weeks, O. L.
Weeks, Verona E.
Weidman, Maurice
Weidman, Virginia
Weiland, Adaline I.
Weiland, Peter J.
Wesselink, Jules
West, Katharine R.
West, Russel
West, Sharon Ann
Western Horse Property
Westra, Alice
Westra, Henry
Westra, Hilda
Westra, Jake J.
Weststeyn, Freida
Weststeyn, Pete
Whitehurst, Louis G.
Whitehurst, Pearl L.
Whitmore, David L.
Whitmore, Mary A.
Whitney, Adolph M.
Wiersema, Harm
Wiersema, Harry
Wiersma, Ellen H.
Wiersma, Gladys J.
Wiersma, Jake
Wiersma, Otto
Wiersma, Pete
Winchell, Verne H., Trustee
Wind, Frank
Wind, Fred
Wind, Hilda
Wind, Johanna
Woo, Frank
Woo, Sem Gee
Wybenga, Clarence
Wybenga, Gus
Wybenga, Gus K.
Wybenga, Sylvia
Wynja, Andy
Wynja, Iona F.
Yellis, Mildred
Yellis, Thomas E.
Ykema-Harmsen Dairy
Ykema, Floris
Ykema, Harriet
Yokley, Betty Jo
Yokley, Darrell A.
Zak, Zan
Zivelonghi, George
Zivelonghi, Margaret
Zwaagstra, Jake
Zwaagstra, Jessie M.
Zwart, Case

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NON-PRODUCER WATER DISTRICTS

Chino Basin Municipal Water District

Chino Basin Water Conservation District

Pomona Valley Municipal Water District

Western Municipal Water District of Riverside County

EXHIBIT "C"

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DEFAULTING OVERLYING AGRICULTURAL PRODUCERS

Cheryl L. Bain
Warren Bain
John M. Barcelona
Letty Bassler
John Brazil
John S. Briano
Lupe Briano
Paul A. Briano
Tillie Briano
Arnie B. Carlson
John Henry Fikse
Phyllis S. Fikse
Lewellyn Flory
Mary I. Flory
L. H. Glazer
Dorothy Goodman
Sidney D. Goodman
Frank Grossi
Harada Brothers
Ellen Hettinga
Hein Hettinga
Dick Hofstra, Jr.
Benjamin M. Hughey
Frieda L. Hughey
Guillaume Indart
Ellwood B. Johnston, Trustee
Perry Kruckenberg, Jr.
Roy W. Lantis
Sharon I. Lantis
Frank Lorenz
Dagney H. MacDonald
Frank E. Martin
Ruth C. Martin
Connie S. Mello
Naldiro J. Mello
Felice Miller
Ted Miller
Masao Nerio
Tom K. Nerio
Toyo Nerio
Yuriko Nerio
Harold L. Rees
Alden G. Rose
Claude Rouleau, Jr.
Patricia M. Rouleau
Schultz Enterprises
Albert Shaw
Lila Shaw
Cathy M. Stewart
Marvin C. Stewart
Betty Ann Stone
John B. Stone
Vantoll Cattle Co., Inc.
Catherene Verburg

EXHIBIT "C"

Martin Verburg

Donna Vincent

Larry Vincent

Cliff Wolfe & Associates

Ada M. Woll

Zarubica Co.

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EXHIBIT "D"

OVERLYING NON-AGRICULTURAL RIGHTS

| Party | Total Overlying Non-Agricultural Rights (Acre Feet) | Share of Safe Yield (Acre Feet) |
|---|---|---|
| Ameron Steel Producers, Inc. | 125 | 97.858 |
| County of San Bernardino | 171 | 133.870 |
| Conrock Company | 406 | 317.844 |
| Kaiser Steel Corporation | 3,743 | 2,930.274 |
| Red Star Fertilizer | 20 | 15.657 |
| Southern California Edison Co. | 1,255 | 982.499 |
| Space Center, Mira Loma | 133 | 104.121 |
| Southern Service Co., dba Blue Seal Linen | 24 | 18.789 |
| Sunkist, Orange Products Division | 2,393 | 1,873.402 |
| Carlsberg Mobile Home Properties, Ltd. '73 | 593 | 464.240 |
| Union Carbide Corporation | 546 | 427.446 |
| Quaker Chemical Co. | 0 | 0 |
| Totals | 9,409 | 7,366.000 |

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EXHIBIT "E"
APPROPRIATIVE RIGHTS

| Party | Appropriative Right (Acre Feet) | Share of Initial Operating Safe Yield (Acre Feet) | Share of Operating Safe Yield (Percent) |
|---|---|---|---|
| City of Chino | 5,271.7 | 3,670.067 | 6.693 |
| City of Norco | 289.5 | 201.545 | 0.368 |
| City of Ontario | 16,337.4 | 11,373.816 | 20.742 |
| City of Pomona | 16,110.5 | 11,215.852 | 20.454 |
| City of Upland | 4,097.2 | 2,852.401 | 5.202 |
| Cucamonga County Water District | 4,431.0 | 3,084.786 | 5.626 |
| Jurupa Community Services District | 1,104.1 | 768.655 | 1.402 |
| Monte Vista County Water District | 5,958.7 | 4,148.344 | 7.565 |
| West San Bernardino County Water District | 925.5 | 644.317 | 1.175 |
| Etiwanda Water Company | 768.0 | 534.668 | 0.975 |
| Felspar Gardens Mutual Water Company | 68.3 | 47.549 | 0.087 |
| Fontana Union Water Co. | 9,188.3 | 6,396.736 | 11.666 |
| Marygold Mutual Water Co. | 941.3 | 655.317 | 1.195 |
| Mira Loma Water Co. | 1,116.0 | 776.940 | 1.417 |
| Monta Vista Irr. Co. | 972.1 | 676.759 | 1.234 |
| Mutual Water Company of Glen Avon Heights | 672.2 | 467.974 | 0.853 |
| Park Water Company | 236.1 | 164.369 | 0.300 |
| Pomona Valley Water Co. | 3,106.3 | 2,162.553 | 3.944 |
| San Antonio Water Co. | 2,164.5 | 1,506.888 | 2.748 |
| Santa Ana River Water Company | 1,869.3 | 1,301.374 | 2.373 |
| Southern California Water Company | 1,774.5 | 1,235.376 | 2.253 |
| West End Consolidated Water Company | 1,361.3 | 947.714 | 1.728 |
| TOTAL | 78,763.8 | 54,834.000 | 100.000 |

EXHIBIT "F"
OVERLYING (AGRICULTURAL) POOL
POOLING PLAN

1. Membership in Pool. The State of California and all producers listed in Exhibit "C" shall be the initial members of this pool, which shall include all producers of water for overlying uses other than industrial or commercial purposes.

2. Pool Meetings. The members of the pool shall meet annually, in person or by proxy, at a place and time to be designated by Watermaster for purposes of electing members of the Pool Committee and conducting any other business of the pool. Special meetings of the membership of the pool may be called and held as provided in the rules of the pool.

3. Voting. All voting at meetings of pool members shall be on the basis of one vote for each 100 acre feet or any portion thereof of production from Chino Basin during the preceding year, as shown by the records of Watermaster.

4. Pool Committee. The Pool Committee for this pool shall consist of not less than nine (9) representatives selected at large by members of the pool. The exact number of members of the Pool Committee in any year shall be as determined by majority vote of the voting power of members of the pool in attendance at the annual pool meeting. Each member of the Pool Committee shall have one vote and shall serve for a two-year term. The members first elected shall classify themselves by lot so that approximately one-half serve an initial one-year term. Vacancies during any term shall be filled by a majority of the remaining members of the Pool Committee.

5. Advisory Committee Representatives. The number of

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representatives of the Pool Committee on the Advisory Committee shall be as provided in the rules of the pool from time to time but not exceeding ten (10). The voting power of the pool on the Advisory Committee shall be apportioned and exercised as determined from time to time by the Pool Committee.

6. Replenishment Obligation. The pool shall provide funds for replenishment of any production by persons other than members of the Overlying (Non-agricultural) Pool or Appropriator Pool, in excess of the pool's share of Safe Yield. During the first five (5) years of operations of the Physical Solution, reasonable efforts shall be made by the Pool Committee to equalize annual assessments.

7. Assessments. All assessments in this pool (whether for replenishment water cost or for pool administration or the allocated share of Watermaster administration) shall be in an amount uniformly applicable to all production in the pool during the preceding year or calendar quarter. Provided, however, that the Agricultural Pool Committee, may recommend to the Court modification of the method of assessing pool members, inter se, if the same is necessary to attain legitimate basin management objectives, including water conservation and avoidance of undesirable socio-economic consequences. Any such modification shall be initiated and ratified by one of the following methods:

(a) Excess Production. In the event total pool production exceeds 100,000 acre feet in any year, the Pool Committee shall call and hold a meeting, after notice to all pool members, to consider remedial modification of the assessment formula.

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(b) Producer Petition. At any time after the fifth full year of operation under the Physical Solution, a petition by ten percent (10%) of the voting power or membership of the Pool shall compel the holding of a noticed meeting to consider revision of said formula of assessment for replenishment water.

In either event, a majority action of the voting power in attendance at such pool members' meeting shall be binding on the Pool Committee.

8. Rules. The Pool Committee shall adopt rules for conducting meetings and affairs of the committee and for administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

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EXHIBIT "G"
OVERLYING (NON-AGRICULTURAL) POOL
POOLING PLAN

1. Membership in Pool. The initial members of the pool, together with the decreed share of the Safe Yield of each, are listed in Exhibit "D". Said pool includes producers of water for overlying industrial or commercial (non-agricultural) purposes, or such producers within the Pool who may hereafter take water pursuant to Paragraph 8 hereof.

2. Pool Committee. The Pool Committee for this pool shall consist of one representative designated by each member of the pool. Voting on the committee shall be on the basis of one vote for each member, unless a volume vote is demanded, in which case votes shall be allocated as follows:

> The volume voting power on the Pool Committee shall be 1,484 votes. Of these, 742 votes shall be allocated on the basis of one vote for each ten (10) acre feet or fraction thereof of decreed shares in Safe Yield. (See Exhibit "D".) The remaining 742 votes shall be allocated proportionally on the basis of assessments paid to Watermaster during the preceding year.*

3. Advisory Committee Representatives. At least three (3) members of the Pool Committee shall be designated by said committee to serve on the Advisory Committee. The exact number of such representatives at any time shall be as determined by the Pool Committee. The voting power of the pool shall be exercised in the

*Or production assessments paid under Water Code Section 72140 et seq., as to years prior to the second year of operation under the Physical Solution hereunder.

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Advisory Committee as a unit, based upon the vote of a majority of said representatives.

4. Replenishment Obligation. The pool shall provide funds for replenishment of any production in excess of the pool's share of Safe Yield in the preceding year.

5. Assessment. Each member of this pool shall pay an assessment equal to the cost of replenishment water times the number of acre feet of production by such producer during the preceding year in excess of (a) his decreed share of the Safe Yield, plus (b) any carry-over credit under Paragraph 7 hereof. In addition, the cost of the allocated share of Watermaster administration expense shall be recovered on an equal assessment against each acre foot of production in the pool during such preceding fiscal year or calendar quarter; and in the case of Pool members who take substitute ground water as set forth in Paragraph 8 hereof, such producer shall be liable for its share of administration assessment, as if the water so taken were produced, up to the limit of its decreed share of Safe Yield.

6. Assignment. Rights herein decreed are appurtenant to the land and are only assignable with the land for overlying use thereon; provided, however, that any appropriator who may, directly or indirectly, undertake to provide water service to such overlying lands may, by an appropriate agency agreement on a form approved by Watermaster, exercise said overlying right to the extent, but only to the extent necessary to provide water service to said overlying lands.

7. Carry-over. Any member of the pool who produces less than its assigned water share of Safe Yield may carry such unexercised

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right forward for exercise in subsequent years. The first water produced during any such subsequent year shall be deemed to be an exercise of such carry-over right. In the event the aggregate carry-over by any pool member exceeds its share of Safe Yield, such member shall, as a condition of preserving such surplus carry-over, execute a storage agreement with Watermaster.

8. Substitute Supplies. To the extent that any Pool member, at the request of Watermaster and with the consent of the Advisory Committee, takes substitute surface water in lieu of producing ground water otherwise subject to production as an allocated share of Safe Yield, said party shall nonetheless remain a member of this Pool.

9. Rules. The Pool Committee shall adopt rules for administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

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EXHIBIT "H"
APPROPRIATIVE POOL
POOLING PLAN

1. Qualification for Pool. Any city, district or other public entity and public utility -- either regulated under Public Utilities Commission jurisdiction, or exempt therefrom as a non-profit mutual water company (other than those assigned to the Overlying [Agricultural] Pool) -- shall be a member of this pool. All initial members of the pool are listed in Exhibit "E", together with their respective appropriative rights and acre foot allocation and percentage shares of the initial and subsequent Operating Safe Yield.

2. Pool Committee. The Pool Committee shall consist of one (1) representative appointed by each member of the Pool.

3. Voting. The total voting power on the Pool Committee shall be 1,000 votes. Of these, 500 votes shall be allocated in proportion to decreed percentage shares in Operating Safe Yield. The remaining 500 votes shall be allocated proportionally on the basis of assessments paid to Watermaster during the preceding year.* Routine business of the Pool Committee may be conducted on the basis of one vote per member, but upon demand of any member a weighted vote shall be taken. Affirmative action of the Committee shall require a majority of the voting power of members in attendance, provided that it includes concurrence by at least one-third of its total members.

4. Advisory Committee Representatives. Ten (10) members of

*Or production assessments paid under Water Code Section 72140 et seq., as to years prior to the second year of operation under the Physical Solution hereunder.

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the Pool Committee shall be designated to represent this pool on the Advisory Committee. Each major appropriator, i.e., the owner of an adjudicated appropriative right in excess of 3,000 acre feet, shall be entitled to one representative. The remaining members representing the Appropriative Pool on the Advisory Committee shall be elected at large by the remaining members of the pool. The voting power of the Appropriative Pool on the Advisory Committee shall be apportioned between the major appropriator representatives in proportion to their respective voting power in the Pool Committee. The remaining two representatives shall exercise equally the voting power proportional to the Pool Committee voting power of all remaining appropriators; provided, however, that if any representative fails to attend an Advisory Committee meeting, the voting power of that representative shall be allocated among the representatives of the Appropriator Pool in attendance in the same proportion as their own respective voting powers.

5. Replenishment Obligation. The pool shall provide funds for purchase of replenishment water to replace any production by the pool in excess of Operating Safe Yield during the preceding year.

6. Administrative Assessment. Costs of administration of this pool and its share of general Watermaster expense shall be recovered by a uniform assessment applicable to all production during the preceding year.

7. Replenishment Assessment. The cost of replenishment water required to replace production from Chino Basin in excess of Operating Safe Yield in the preceding year shall be allocated and recovered as follows:

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(a) For production, other than for increased export, within CBMWD or WMWD:

(1) Gross Assessment. 15% of such replenishment water costs shall be recovered by a uniform assessment against all production of each appropriator producing in said area during the preceding year.

(2) Net Assessment. The remaining 85% of said costs shall be recovered by a uniform assessment on each acre foot of production from said area by each such appropriator in excess of his allocated share of Operating Safe Yield during said preceding year.

(b) For production which is exported for use outside Chino Basin in excess of maximum export in any year through 1976, such increased export production shall be assessed against the exporting appropriator in an amount sufficient to purchase replenishment water from CBMWD or WMWD in the amount of such excess.

(c) For production within SBVMWD or PVMWD:

By an assessment on all production in excess of an appropriator's share of Operating Safe Yield in an amount sufficient to purchase replenishment water through SBVMWD or MWD in the amount of such excess.

8. Socio-Economic Impact Review. The parties have conducted certain preliminary socio-economic impact studies. Further and more detailed socio-economic impact studies of the assessment formula and its possible modification shall be undertaken for the Appropriator Pool by Watermaster no later than ten (10) years from the effective date of this Physical Solution, or whenever total

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production by this pool has increased by 30% or more over the decreed appropriative rights, whichever is first.

9. Facilities Equity Assessment. Watermaster may, upon recommendation of the Pool Committee, institute proceedings for levy and collection of a Facilities Equity Assessment for the purposes and in accordance with the procedures which follow:

(a) Implementing Circumstances. There exist several sources of supplemental water available to Chino Basin, each of which has a differential cost and quantity available. The optimum management of the entire Chino Basin water resource favors the maximum use of the lowest cost supplemental water to balance the supplies of the Basin, in accordance with the Physical Solution. The varying sources of supplemental water include importations from MWD and SBVMWD, importation of surface and ground water supplies from other basins in the immediate vicinity of Chino Basin, and utilization of reclaimed water. In order to fully utilize any of such alternate sources of supply, it will be essential for particular appropriators having access to one or more of such supplies to have invested, or in the future to invest, directly or indirectly, substantial funds in facilities to obtain and deliver such water to an appropriate point of use. To the extent that the use of less expensive alternate sources of supplemental water can be maximized by the inducement of a Facilities Equity Assessment, as herein provided, it is to the long-term benefit of the entire basin that such assessment be authorized and levied by Watermaster.

(b) Study and Report. At the request of the Pool

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Committee, Watermaster shall undertake a survey study of the utilization of alternate supplemental supplies by members of the Appropriative Pool which would not otherwise be utilized and shall prepare a report setting forth the amount of such alternative supplies being currently utilized, the amount of such supplies which could be generated by activity within the pool, and the level of cost required to increase such uses and to optimize the total supplies available to the basin. Said report shall contain an analysis and recommendation for the levy of a necessary Facilities Equity Assessment to accomplish said purpose.

(c) Hearing. If the said report by Watermaster contains a recommendation for imposition of a Facilities Equity Assessment, and the Pool Committee so requests, Watermaster shall notice and hold a hearing not less than 60 days after distribution of a copy of said report to each member of the pool, together with a notice of the hearing date. At such hearing, evidence shall be taken with regard to the necessity and propriety of the levy of a Facilities Equity Assessment and full findings and decision shall be issued by Watermaster.

(d) Operation of Assessment. If Watermaster determines that it is appropriate that a Facilities Equity Assessment be levied in a particular year, the amount of additional supplemental supplies which should be generated by such assessment shall be estimated. The cost of obtaining such supplies, taking into consideration the investment in necessary facilities shall then be determined and spread equitably among the producers within the pool in a manner so that those

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producers not providing such additional lower cost supplemental water, and to whom a financial benefit will result, may bear a proportionate share of said costs, not exceeding said benefit; provided that any producer furnishing such supplemental water shall not thereby have its average cost of water in such year reduced below such producer's average cost of pumping from the Basin. In so doing, Watermaster shall establish a percentage of the total production by each party which may be produced without imposition of a Facilities Equity Assessment. Any member of the pool producing more water than said percentage shall pay such Facilities Equity Assessment on any such excess production. Watermaster is authorized to transmit and pay the proceeds of such Facilities Equity Assessment to those producers who take less than their share of Basin water by reason of furnishing a higher percentage of their requirements through use of supplemental water.

10. Unallocated Safe Yield Water. To the extent that, in any five years, any portion of the share of Safe Yield allocated to the Overlying (Agricultural) Pool is not produced, such water shall be available for reallocation to members of the Appropriative Pool, as follows:

(a) Priorities. Such allocation shall be made in the following sequence:

(1) to supplement, in the particular year, water available from Operating Safe Yield to compensate for any reduction in the Safe Yield by reason of recalculation thereof after the tenth year of operation hereunder.

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(2) pursuant to conversion claims as defined in Subparagraph (b) hereof.

(3) as a supplement to Operating Safe Yield, without regard to reductions in Safe Yield.

(b) Conversion Claims. The following procedures may be utilized by any appropriator:

(1) Record of Land Use Conversion. Any appropriator who undertakes, directly or indirectly, during any year, to permanently provide water service to lands which during the immediate preceding five (5) consecutive years was devoted to irrigated agriculture may report such change in land use or water service to Watermaster. Watermaster shall thereupon verify such change in water service and shall maintain a record and account for each appropriator of the total acreage involved and the average annual water use during said five-year period.

(2) Establishment of Allocation Percentage. In any year in which unallocated Safe Yield water from the Overlying (Agricultural) Pool is available for such conversion claims, Watermaster shall establish allocable percentages for each appropriator based upon the total of such converted acreage recorded to each such appropriator's account.

(3) Allocation and Notice. Watermaster shall thereafter apply the allocated percentage to the total unallocated Safe Yield water available for special allocation to derive the amount thereof allocable to

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each appropriator; provided that in no event shall the allocation to any appropriator as a result of such conversion claim exceed 50% of the average annual amount of water actually applied to the areas converted by such appropriator prior to such conversion. Any excess water by reason of such limitation on any appropriator's right shall be added to Operating Safe Yield. Notice of such special allocation shall be given to each appropriator and shall be treated for purposes of this Physical Solution as an addition to such appropriator's share of the Operating Safe Yield for the particular year only.

(4) Administrative Costs. Any costs of Watermaster attributable to administration of such special allocations and conversion claims shall be assessed against appropriators participating in such reporting.

11. In Lieu Procedures. There are, or may develop, certain areas within Chino Basin where good management practices dictate that recharge of the basin be accomplished, to the extent practical, by taking surface supplies of supplemental water in lieu of ground water otherwise subject to production as an allocated share of Operating Safe Yield.

(a) Method of Operation. Any appropriator producing water within such designated in lieu area who is willing to abstain for any reason from producing any portion of such producer's share of Operating Safe Yield in any year may offer such unpumped water to Watermaster. In such event, Watermaster shall purchase said water in place, in lieu of spreading replenishment water, which is otherwise required to

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make up for over production. The purchase price for in lieu water shall be the lesser of:

(1) Watermaster's current cost of replenishment water, whether or not replenishment water is currently then obtainable, plus the cost of spreading; or

(2) The cost of supplemental surface supplies to the appropriator, less

a. said appropriator's average cost of ground water production, and

b. the applicable production assessment were the water produced.

Where supplemental surface supplies consist of MWD or SBVMWD supplies, the cost of treated, filtered State water from such source shall be deemed the cost of supplemental surface supplies to the appropriator for purposes of such calculation.

In any given year in which payments may be made pursuant to a Facilities Equity Assessment, as to any given quantity of water the party will be entitled to payment under this section or pursuant to the Facilities Equity Assessment, as the party elects, but not under both.

(b) Designation of In Lieu Areas. The first in lieu area is designated as the "In Lieu Area No. 1" and consists of an area wherein nitrate levels in the ground water generally exceed 45 mg/l, and is shown on Exhibit "J" hereto. Other in lieu areas may be designated by subsequent order of Watermaster upon recommendation or approval by Advisory Committee. Said in lieu areas may be enlarged, reduced or

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eliminated by subsequent orders; provided, however, that designation of In Lieu Areas shall be for a minimum fixed term sufficient to justify necessary capital investment. In Lieu Area No. 1 may be enlarged, reduced or eliminated in the same manner, except that any reduction of its original size or elimination thereof shall require the prior order of Court.

12. Carry-over. Any appropriator who produces less than his assigned share of Operating Safe Yield may carry such unexercised right forward for exercise in subsequent years. The first water produced during any such subsequent year shall be deemed to be an exercise of such carry-over right. In the event the aggregate carry-over by any appropriator exceeds its share of Operating Safe Yield, such appropriator shall, as a condition of preserving such surplus carry-over, execute a storage agreement with Watermaster. Such appropriator shall have the option to pay the gross assessment applicable to such carry-over in the year in which it accrued.

13. Assignment, Transfer and Lease. Appropriative rights, and corresponding shares of Operating Safe Yield, may be assigned or may be leased or licensed to another appropriator for exercise in a given year. Any transfer, lease or license shall be ineffective until written notice thereof is furnished to and approved as to form by Watermaster, in compliance with applicable Watermaster rules. Watermaster shall not approve transfer, lease or license of a right for exercise in an area or under conditions where such production would be contrary to sound basin management or detrimental to the rights or operations of other producers.

14. Rules. The Pool Committee shall adopt rules for

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administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

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EXHIBIT "I"

ENGINEERING APPENDIX

1. Basin Management Parameters. In the process of implementing the physical solution for Chino Basin, Watermaster shall consider the following parameters:

(a) Pumping Patterns. Chino Basin is a common supply for all persons and agencies utilizing its waters. It is an objective in management of the Basin's waters that no producer be deprived of access to said waters by reason of unreasonable pumping patterns, nor by regional or localized recharge of replenishment water, insofar as such result may be practically avoided.

(b) Water Quality. Maintenance and improvement of water quality is a prime consideration and function of management decisions by Watermaster.

(c) Economic Considerations. Financial feasibility, ecnomic impact and the cost and optimum utilization of the Basin's resources and the physical facilities of the parties are objectives and concerns equal in importance to water quantity and quality parameters.

2. Operating Safe Yield. Operating Safe Yield in any year shall consist of the Appropriative Pool's share of Safe Yield of the Basin, plus any controlled overdraft of the Basin which Watermaster may authorize. In adopting the Operating Safe Yield for any year, Watermaster shall be limited as follows:

(a) Accumulated Overdraft. During the operation of this Judgment and Physical Solution, the overdraft accumulated from and after the effective date of the Physical

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Solution and resulting from an excess of Operating Safe Yield over Safe Yield shall not exceed 200,000 acre feet.

(b) Quantitative Limits. In no event shall Operating Safe Yield in any year be less than the Appropriative Pool's share of Safe Yield, nor shall it exceed such share of Safe Yield by more than 10,000 acre feet. The initial Operating Safe Yield is hereby set at 54,834 acre feet per year. Operating Safe Yield shall not be changed upon less than five (5) years' notice by Watermaster.

Nothing contained in this paragraph shall be deemed to authorize, directly or indirectly, any modification of the allocation of shares in Safe Yield to the overlying pools, as set forth in Paragraph 44 of the Judgment.

3. Ground Water Storage Agreements. Any agreements authorized by Watermaster for storage of supplemental water in the available ground water storage capacity of Chino Basin shall include, but not be limited to:

(a) The quantities and term of the storage right.

(b) A statement of the priority or relation of said right, as against overlying or Safe Yield uses, and other storage rights.

(c) The procedure for establishing delivery rates, schedules and procedures which may include

[1] spreading or injection, or

[2] in lieu deliveries of supplemental water for direct use.

(d) The procedures for calculation of losses and annual accounting for water in storage by Watermaster.

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(e) The procedures for establishment and administration of withdrawal schedules, locations and methods.

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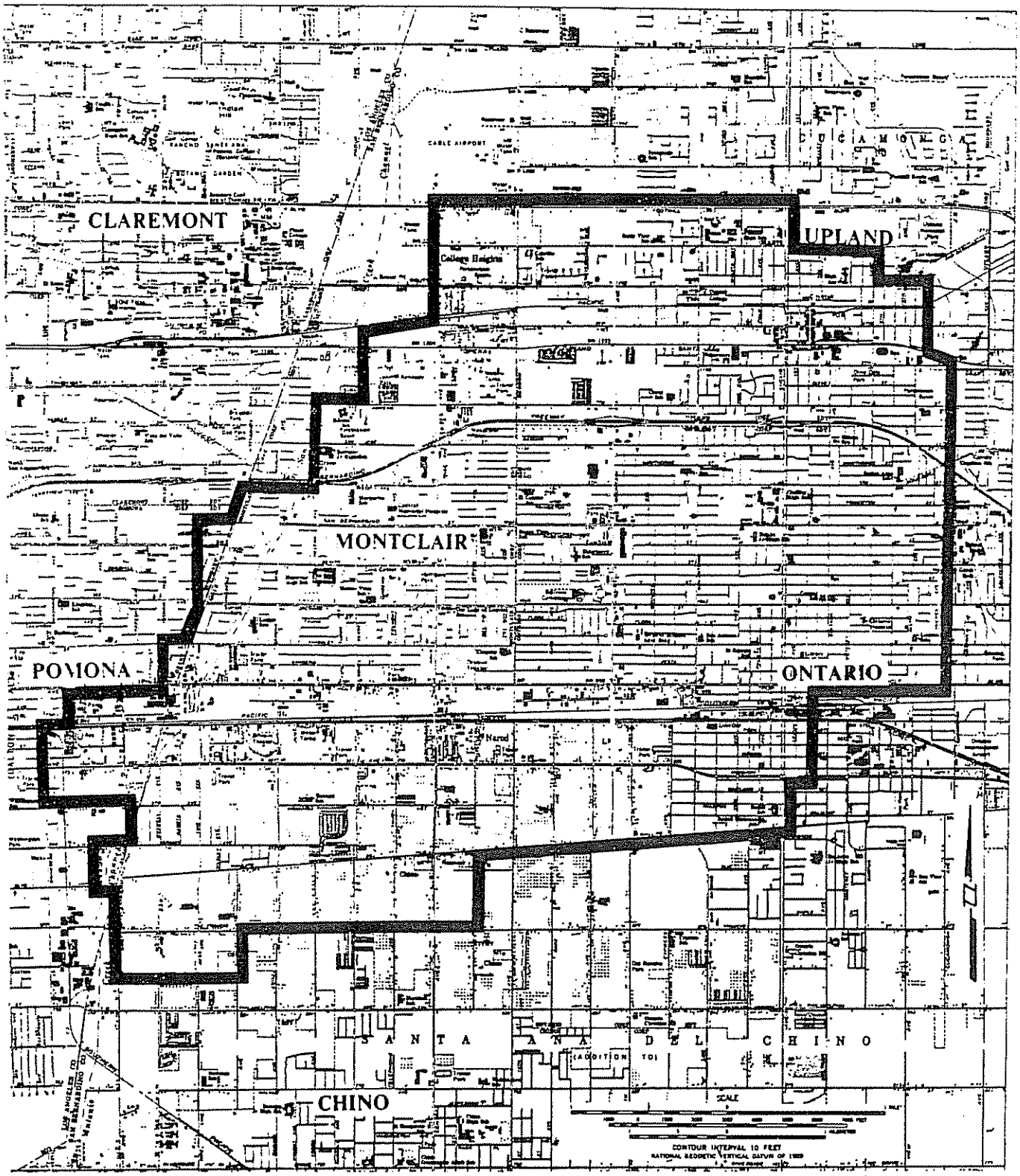


# CHINO BASIN

## IN LIEU AREA NO. 1

**EXHIBIT "J"**

LEGAL DESCRIPTION

OF CHINO BASIN

## Preamble

All of the townships and ranges referred to in the following legal description are the San Bernardino Base and Meridian. Certain designated sections are implied as the System of Government Surveys may be extended where not established. Said sections are identified as follows:

Section 20, T1N, R8W is extended across Rancho Cucamonga;

Section 36, T1N, R8W is extended across the City of Upland;

Sections 2, 3, and 4, T1S, R7W are extended across Rancho Cucamonga;

Section 10, T1S, R8W is extended across the City of Claremont;

Sections 19, 20, 21, 30, 31 and 32, T1S, R8W are extended across the City of Pomona;

Sections 4, 5, and 28, T2S, R8W are extended across Rancho Santa Ana Del Chino;

Sections 15 and 16, T3S, R7W are extended across Rancho La Sierra; and

Sections 17 and 20, T3S, R7W are extended across Rancho El Rincon.

## Description

Chino Basin is included within portions of the Counties of San Bernardino, Riverside and Los Angeles, State of California, bounded by a continuous line described as follows:

BEGINNING at the Southwest corner of Lot 241 as shown on Map of Ontario Colony Lands, recorded in Map Book 11, page 6, Office of the County Recorder of San Bernardino County, said corner being the Point of Beginning;

1. Thence Southeasterly to the Southeast corner

of Lot 419 of said Ontario Colony Lands;

2. Thence Southeasterly to a point 1300 feet North of the South line and 1300 feet East of the West line of Section 4, T1S, R7W;

3. Thence Easterly to a point on the East line of Section 4, 1800 feet North of the Southeast corner of said Section 4;

4. Thence Easterly to the Southeast corner of the Southwest quarter of the Northeast quarter of Section 3, T1S, R7W;

5. Thence Northeasterly to a point on the North line of Section 2, T1S, R7W, 1400 feet East of the West line of said Section 2;

6. Thence Northeasterly to the Southwest corner of Section 18, T1N, R6W;

7. Thence Northerly to the Northwest corner of said Section 18;

8. Thence Easterly to the Northeast corner of said Section 18;

9. Thence Northerly to the Northwest corner of the Southwest quarter of Section 8, T1N, R6W;

10. Thence Easterly to the Northeast corner of said Southwest quarter of said Section 8;

11. Thence Southerly to the Southeast corner of said Southwest quarter of said Section 8;

12. Thence Easterly to the Northeast corner of Section 17, T1N, R6W;

13. Thence Easterly to the Northeast corner of Section 16, T1N, R6W;

14. Thence Southeasterly to the Northwest corner of the Southeast quarter of Section 15, T1N, R6W;

15. Thence Easterly to the Northeast corner of said Southeast quarter of said Section 15;

16. Thence Southeasterly to the Northwest corner of the Northeast quarter of Section 23, T1N, R6W;

17. Thence Southeasterly to the Northwest corner

of Section 25, T1N, R6W;

18. Thence Southeasterly to the Northwest corner of the Northeast quarter of Section 31, T1N, R5W;

19. Thence Southeasterly to the Northeast corner of the Northwest quarter of Section 5, T1S, R5W;

20. Thence Southeasterly to the Southeast corner of Section 4, T1S, R5W;

21. Thence Southeasterly to the Southeast corner of the Southwest quarter of Section 11, T1S, R5W;

22. Thence Southwesterly to the Southwest corner of Section 14, T1S, R5W;

23. Thence Southwest to the Southwest corner of Section 22, T1S, R5W;

24. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 6, T2S, R5W;

25. Thence Southeasterly to the Northeast corner of Section 18 T2S, R5W;

26. Thence Southwesterly to the Southwest corner of the Southeast quarter of Section 13, T2S, R6W;

27. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 26, T2S, R6W;

28. Thence Westerly to the Southwest corner of the Northwest quarter of said Section 26;

29. Thence Northerly to the Northwest corner of said Section 26;

30. Thence Westerly to the Southwest corner of Section 21, T2S, R6w:

31. Thence Southerly to the Southeast corner of Section 29, T2S, R6W;

32. Thence Westerly to the Southeast corner of Section 30, T2S, R6W;

33. Thence Southwesterly to the Southwest corner of Section 36, T 2 S, R 7 W;

34. Thence Southwesterly to the Southeast corner

of Section 3, T3S, R7W;

35. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 10, T3S, R7W;

36. Thence Southerly to the Northeast corner of the Northwest quarter of Section 15, T3S, R7W;

37. Thence Southwesterly to the Southeast corner of the Northeast quarter of Section 16, T3S, R7W;

38. Thence Southwesterly to the Southwest corner of said Section 16;

39. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 20, T3S, R7W;

40. Thence Westerly to the Southwest corner of the Northwest quarter of said Section 20;

41. Thence Northerly to the Northwest corner of Section 17, T3S, R7W;

42. Thence Westerly to the Southwest corner of Section 7, T3S, R7W;

43. Thence Northerly to the Southwest corner of Section 6, T3S, R7W;

44. Thence Westerly to the Southwest corner of Section 1, T3S, R8W;

45. Thence Northerly to the Southeast corner of Section 35, T2S, R8W;

46. Thence Northwesterly to the Northwest corner of said Section 35;

47. Thence Northerly to the Southeast corner of Lot 33, as shown on Map of Tract 3193, recorded in Map Book 43, pages 46 and 47, Office of the County Recorder of San Bernardino County;

48. Thence Westerly to the Northwest corner of the Southwest quarter of Section 28, T2S, R8W;

49. Thence Northerly to the Southwest corner of Section 4, T2S, R8W;

50. Thence Westerly to the Southwest corner of Section 5, T2S, R8W;

51. Thence Northerly to the Southwest corner of Section 32, T1S, R8W;

52. Thence Westerly to the Southwest corner of Section 31, T1S, R8W;

53. Thence Northerly to the Southwest corner of Section 30, T1S, R8W;

54. Thence Northeasterly to the Southwest corner of Section 20, T1S, R8W;

55. Thence Northerly to the Northwest corner of the Southwest quarter of the Southwest quarter of said Section 20;

56. Thence Northwesterly to the Northeast corner of the Southeast quarter of the Southeast quarter of the Northwest quarter of Section 19, T1S, R8W;

57. Thence Easterly to the Northwest corner of Section 21, T1S, R8W;

58. Thence Northeasterly to the Southeast corner of the Southwest quarter of the Southwest quarter of Section 10, T1S, R8W;

59. Thence Northeasterly to the Southwest corner of Section 2, T1S, R8W;

60. Thence Northeasterly to the Southeast corner of the Northwest quarter of the Northwest quarter of Section 1, T1S, R8W;

61. Thence Northerly to the Northeast corner of the Northwest quarter of the Northeast quarter of Section 36, T1N, R8W;

62. Thence Northerly to the Southeast corner of Section 24, T1N, R8W;

63. Thence Northeasterly to the Southeast corner of the Northwest quarter of the Northwest quarter of Section 20, T1N, R7W; and

64. Thence Southerly to the Point of Beginning.

## Sections Included

Said perimeter description includes all or portions of the following Townships, Ranges and Sections of San Bernardino Base and Meridian:

| | |
|---|---|
| T1N, R5W - Sections: | 30, 31 and 32 |
| T1N, R6W - Sections: | 8, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 |
| T1N, R7W - Sections: | 19, 20, 24, 25, 26, 29, 30, 31, 32, 35 and 36 |
| T1N, R8W - Sections: | 25 and 36 |
| T1S, R5W - Sections: | 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 28, 29, 30, 31 and 32. |
| T1S, R6W - Sections: | 1 through 36, inclusive |
| T1S, R7W - Sections: | 1 through 36, inclusive |
| T1S, R8W - Sections: | 1, 2, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 |
| T2S, R5W - Sections: | 6, 7 and 18 |
| T2S, R6W - Sections: | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 29, 30 and 31 |
| T2S, R7W - Sections: | 1 through 36, inclusive |
| T2S, R8W - Sections: | 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 35 and 36 |
| T3S, R7W - Sections: | 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17 and 20 |
| T3S, R8W - Section: | 1. |

THE DOCUMENT TO WHICH THIS CERTIFICATION IS ATTACHED IS A FULL, TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE AND OF RECORD IN MY OFFICE.

ATTEST OCT 2 9 2002

Clerk of the Superior Court of the State of California, in and for the County of San Bernardino

By _____ Deputy

Terry Wittenborn

92 pages

# APPENDIX E

# SAN BERNARDINO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

# SAN BERNARDINO COUNTY

## MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

**FEMA Approved: July 13, 2017**

San Bernardino County Unincorporated Area
San Bernardino County Fire Protection District
San Bernardino County Flood Control District
San Bernardino County Special Districts Department

This document was supported by HSGP Grant No. 2015-0078 awarded by the U.S. Department of Homeland Security (DHS) Federal Emergency Management Agency (FEMA). Points of view, opinions, findings, and conclusions expressed in this document are those of the authors and do not necessarily represent the official position of policies of FEMA or DHS. DHS/FEMA reserves a royalty-free, non-exclusive, and irrevocable license to reproduce, publish, and use these materials and to authorize others to do so.

2017

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**RESOLUTION NO. 2017-_____**

**A RESOLUTION OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ADOPTING THE SAN BERNARDINO COUNTY UNINCORPORATED AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN DATED MARCH 2017, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN**

On Tuesday, _____, 2017, on motion of Supervisor _____, duly seconded by Supervisor _____ and carried, the following resolution is adopted by the Board of Supervisors of San Bernardino County, State of California.

**WHEREAS,** the preservation of life and property is an inherent responsibility of local, state and federal government, including the County of San Bernardino, and the San Bernardino County Office of Emergency Services, to prepare a local Multi-Jurisdictional Hazard Mitigation Plan (HMP) for the unincorporated area of San Bernardino County to define hazard mitigation measures to reduce or eliminate loss of life and/or property; and

**WHEREAS,** this HMP represents a comprehensive description of the County's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural hazards; and

**WHEREAS,** the HMP is a Federal requirement under the Disaster Mitigation Act of 2000 for the County to be eligible to apply for federal funds for disaster recovery and mitigation assistance; and

**WHEREAS,** the HMP established a coordinated effort to support mitigation activities, identifies measures to combat natural hazards within our County; and

**WHEREAS,** the HMP is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed periodically and revised as necessary to meet changing conditions; and

**WHEREAS,** the Board of Supervisors agrees to adopt this HMP and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the preparation of hazard mitigation within the County of San Bernardino;

**NOW, THEREFORE, BE IT RESOLVED THAT:**

The Board of Supervisors of the County of San Bernardino, a public entity established under the laws of the State of California, hereby authorizes this HMP to be adopted, that the San Bernardino County Fire Protection District Office of Emergency Services Division Manager is hereby authorized to implement future non-substantive amendments, recommended by the Federal Emergency Management Agency upon their review, to the HMP, that a copy of the Board of Supervisors' approved San Bernardino County Unincorporated Area Hazard Mitigation Plan be forwarded to the Federal Emergency Management Agency and CalOES, that once approved the HMP will be considered to be incorporated into the County's General Plan, and this plan become effective immediately.

PASSED AND ADOPTED by the Board of Supervisors of the County of San Bernardino, State of California, by the following vote:

AYES: SUPERVISORS:





NOES: SUPERVISORS:

ABSENT: SUPERVISORS:

* * * * *

STATE OF CALIFORNIA )
) ss.
COUNTY OF SAN BERNARDINO )

I, **LAURA H. WELCH,** Clerk of the Board of Supervisors of the County of San Bernardino, State of California, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by the Board of Supervisors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of _____, 2017.

LAURA H. WELCH
Clerk of the Board of Supervisors

By _____
Deputy

**RESOLUTION NO. 2017-_____**

**A RESOLUTION OF THE BOARD OF SUPERVISORS OF THE SAN BERNARDINO COUNTY FLOOD CONTROL DISTRICT, STATE OF CALIFORNIA, ADOPTING THE SAN BERNARDINO COUNTY UNINCORPORATED AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN DATED MARCH 2017, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN**

On Tuesday, _____, 2017, on motion of Supervisor _____, duly seconded by Supervisor _____ and carried, the following resolution is adopted by the Board of Supervisors of the San Bernardino County Flood Control District, State of California.

**WHEREAS,** the preservation of life and property is an inherent responsibility of local, state and federal government, including the County of San Bernardino, and the San Bernardino County Office of Emergency Services, to prepare a local Multi-Jurisdictional Hazard Mitigation Plan (HMP) for the unincorporated area of San Bernardino County to define hazard mitigation measures to reduce or eliminate loss of life and/or property; and

**WHEREAS,** this HMP represents a comprehensive description of the County's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural hazards; and

**WHEREAS,** the HMP is a Federal requirement under the Disaster Mitigation Act of 2000 for the County to be eligible to apply for federal funds for disaster recovery and mitigation assistance; and

**WHEREAS,** the HMP established a coordinated effort to support mitigation activities, identifies measures to combat natural hazards within our County; and

**WHEREAS,** the HMP is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed periodically and revised as necessary to meet changing conditions; and

**WHEREAS,** the Board of Supervisors agrees to adopt this HMP and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the preparation of hazard mitigation within the County of San Bernardino

**NOW, THEREFORE, BE IT RESOLVED THAT:**

The Board of Supervisors of the San Bernardino County Flood Control District, a public entity established under the laws of the State of California, hereby authorizes this HMP to be adopted, that the San Bernardino County Fire Protection District Office of Emergency Services Division Manager is hereby authorized to implement future non-substantive amendments, recommended by the Federal Emergency Management Agency upon their review, to the HMP, that a copy of the Board of Supervisors' approved San Bernardino County Unincorporated Area Hazard Mitigation Plan be forwarded to the Federal Emergency Management Agency and the CalOES, that once





approved the HMP will be considered to be incorporated into the County's General Plan, and this plan become effective immediately.

PASSED AND ADOPTED by the Board of Supervisors of the San Bernardino County Flood Control District, State of California, by the following vote:

AYES: SUPERVISORS:

NOES: SUPERVISORS:

ABSENT: SUPERVISORS:

* * * * *

STATE OF CALIFORNIA )
) ss.
COUNTY OF SAN BERNARDINO )

I, **LAURA H. WELCH,** Clerk of the Board of Supervisors of the San Bernardino County Flood Control District, State of California, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by the Board of Supervisors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of _____, 2017.

LAURA H. WELCH
Clerk

By _____
Deputy

**RESOLUTION NO. 2017-**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BOARD GOVERNED COUNTY SERVICE AREAS ADOPTING THE SAN BERNARDINO COUNTY UNINCORPORATED AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN DATED MARCH 2017, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN**

On Tuesday, , 2017, on motion of Director , duly seconded by Director and carried, the following resolution is adopted by the Board of Directors of the Board Governed County Service Areas and their Zones.

**WHEREAS,** the preservation of life and property is an inherent responsibility of local, state and federal government, including the County of San Bernardino, and the San Bernardino County Office of Emergency Services, to prepare a local Multi-Jurisdictional Hazard Mitigation Plan (HMP) for the unincorporated area of San Bernardino County to define hazard mitigation measures to reduce or eliminate loss of life and/or property; and

**WHEREAS,** this HMP represents a comprehensive description of the County's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural hazards; and

**WHEREAS,** the HMP is a Federal requirement under the Disaster Mitigation Act of 2000 for the County to be eligible to apply for federal funds for disaster recovery and mitigation assistance; and

**WHEREAS,** the HMP established a coordinated effort to support mitigation activities, identifies measures to combat natural hazards within our County; and

**WHEREAS,** the HMP is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed periodically and revised as necessary to meet changing conditions; and

**WHEREAS,** the Board of Directors agrees to adopt this HMP and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the preparation of hazard mitigation within the County of San Bernardino;

**NOW, THEREFORE, BE IT RESOLVED THAT:**

The Board of Directors of the Board Governed County Service Areas and their Zones, a public entity established under the laws of the State of California, hereby authorizes this HMP to be adopted, that the San Bernardino County Fire Protection District Office of Emergency Services Division Manager is hereby authorized to implement future non-substantive amendments, recommended by the Federal Emergency Management Agency upon their review, to the HMP, that a copy of the Board of Directors' approved San Bernardino County Unincorporated Area Hazard Mitigation Plan be forwarded to the Federal Emergency Management Agency and CalOES, that





once approved the HMP will be considered to be incorporated into the County's General Plan, and this plan become effective immediately.

PASSED AND ADOPTED by the Board of Directors of the Board Governed County Service Areas and their Zones by the following vote:

AYES: DIRECTORS:

NOES: DIRECTORS:

ABSENT: DIRECTORS:

* * * * *

STATE OF CALIFORNIA )
) ss.
COUNTY OF SAN BERNARDINO )

I, **LAURA H. WELCH,** Secretary of Board of Directors of the Board Governed County Service Areas and their Zones, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by the Board of Directors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of Tuesday, , 2017.

LAURA H. WELCH
Secretary

By _____
Deputy

**RESOLUTION NO. 2017-**

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SAN BERNARDINO COUNTY FIRE PROTECTION DISTRICT ADOPTING THE SAN BERNARDINO COUNTY UNINCORPORATED AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN DATED MARCH 2017, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN**

On Tuesday, , 2017, on motion of Director , duly seconded by Director and carried, the following resolution is adopted by the Board of Directors of San Bernardino County Fire Protection District.

**WHEREAS,** the preservation of life and property is an inherent responsibility of local, state and federal government, including the County of San Bernardino, and the San Bernardino County Office of Emergency Services, to prepare a local Multi-Jurisdictional Hazard Mitigation Plan (HMP) for the unincorporated area of San Bernardino County to define hazard mitigation measures to reduce or eliminate loss of life and/or property; and

**WHEREAS,** this HMP represents a comprehensive description of the County's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural hazards; and

**WHEREAS,** the HMP is a Federal requirement under the Disaster Mitigation Act of 2000 for the County to be eligible to apply for federal funds for disaster recovery and mitigation assistance; and

**WHEREAS,** the HMP established a coordinated effort to support mitigation activities, identifies measures to combat natural hazards within our County; and

**WHEREAS,** the HMP is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed periodically and revised as necessary to meet changing conditions; and

**WHEREAS,** the Board of Directors agrees to adopt this HMP and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the preparation of hazard mitigation within the County of San Bernardino;

**NOW, THEREFORE, BE IT RESOLVED THAT:**

The Board of Directors of the San Bernardino County Fire Protection District, a public entity established under the laws of the State of California, hereby authorizes this HMP to be adopted, that the San Bernardino County Fire Protection District Office of Emergency Services Division Manager is hereby authorized to implement future non-substantive amendments, recommended by the Federal Emergency Management Agency upon their review, to the HMP, that a copy of the Board of Directors' approved San Bernardino County Unincorporated Area Hazard Mitigation Plan be forwarded to the Federal Emergency Management Agency and CalOES, that once approved





the HMP will be considered to be incorporated into the County's General Plan, and this plan become effective immediately.

PASSED AND ADOPTED by the Board of Directors of the San Bernardino County Fire Protection District by the following vote:

AYES: DIRECTORS:

NOES: DIRECTORS:

ABSENT: DIRECTORS:

* * * * *

STATE OF CALIFORNIA )
) ss.
COUNTY OF SAN BERNARDINO )

I, **LAURA H. WELCH,** Secretary of Board of Directors of the San Bernardino County Fire Protection District, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by the Board of Directors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of Tuesday, , 2017.

LAURA H. WELCH
Secretary

By _____
Deputy

# Section 1. Introduction

The Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) update is a "living document" that should be reviewed, monitored, and updated to reflect changing conditions and new information. As required, the MJHMP must be updated every five (5) years to remain in compliance with regulations and Federal mitigation grant conditions. In that spirit, this MJHMP is an update of the San Bernardino County Unincorporated Area MJHMP approved by FEMA on October 11, 2011. This MJHMP presents updated information regarding hazards being faced by the County, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and those Board-governed Special Districts administered by the San Bernardino County Special Districts Department.

These Board-Governed Special Districts were formed by the Board of Supervisors to provide a specific service for a specific area of San Bernardino County. Additionally, these Special Districts are treated as an all-inclusive County Organization, not as separate or independent entities. Each Special District is governed cooperatively by the San Bernardino County Board of Supervisors acting as the Board of Supervisors for each of the individual districts.

The County of San Bernardino is governed by five (5) Supervisors; one for each supervisorial district who collectively make up the County Board of Supervisors. The Board of Supervisors is responsible for the County department and agencies, including Board Governed Special Districts, providing services to the unincorporated area.

The Board of Supervisors acts as the Board of Directors for the County Fire Protection District, the County Flood Control District, and the Special Districts Department as part of their responsibilities as an elected member of the County of San Bernardino Board of Supervisors.

The San Bernardino County Organizational Chart clearly shows the relationships between these Board-governed Special Districts and other County departments as one of equal relationship Departments/Districts. See Figure 1-1.





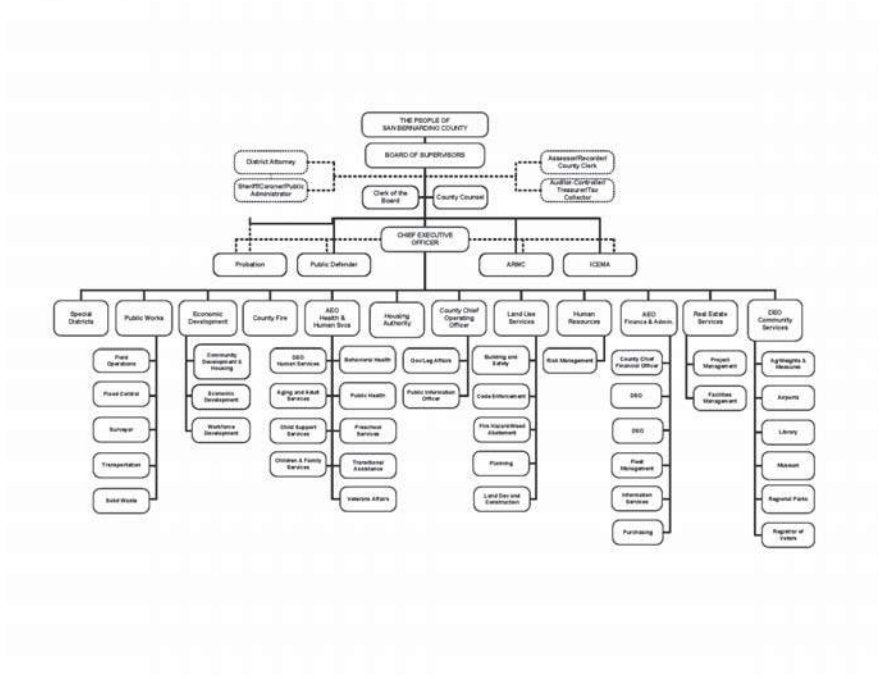


Figure 1-1: Organizational Chart for San Bernardino County

## 1.1 San Bernardino County Unincorporated Area

The Unincorporated Area of San Bernardino County has a population of 309,759 persons (14.48%) of the entire County Population) and covers 19,233 square miles (95.67% of the entire County land area). There are approximately 61 unincorporated communities within the unincorporated County. San Bernardino County is the largest County in the continental United States. San Bernardino County provides basic services to the residents and citizens of the unincorporated areas. These services include Law Enforcement, Fire Protection, Building and Safety Services, Public Health Services, Library, and Human Services (social services). Five Interstate Highways and four inter-continental railroad lines cross the County, providing vital transportation links from southern California to the remainder of the United States.

### 1.1.1 San Bernardino County Fire Protection District

San Bernardino County Fire Protection District is a community based all-risk emergency services organization dedicated to the health and well-being of the citizens of San Bernardino County through a balance of regionalized services delivery and accountability to the local community. On July 1, 2008, twenty-seven separate fire districts were merged into one single board governed fire protection district with four regional service zones. The reorganization was not only an administrative advancement but also a significant advancement in operations and delivery of emergency response services.

It has resulted in simplified budgeting and fiscal operations, greater flexibility in the use in the use of department resources and assets and more effective use of day-to-day operations. The reorganization will continue to improve the delivery of fire services and overall operating efficiency.

The San Bernardino County Fire Protection District (County Fire) covers 19,278 square miles, operates 85 fire stations and facilities within 6 Regional Service Zones (Mountain, North Desert, South Desert, High Desert, West Valley and East Valley), and serves 64 unincorporated communities, the City of Grand Terrace, and the Town of Yucca Valley. There are also 6 ambulance enterprise operations that provide service within these Regional Service Zones. In addition, 7 cities are Independent Fire Protection Districts that contract with County Fire: Adelanto, Fontana, Hesperia, Needles, Twentynine Palms, San Bernardino and Victorville. County Fire's executive management is provided by the Fire Chief/County Fire Warden, Deputy Chief, Assistant Chief of Operations as well as Division Managers and Division Chiefs.

County Fire is an all-risk department providing emergency mitigation and management for fire suppression, emergency medical services (paramedic and non-paramedic), ambulance services, HAZMAT response, arson investigation, technical rescue including water borne, flooding and mudslide, winter rescue operations, terrorism and weapons of mass destruction. As part of disaster preparation, response, and mitigation, the department's Office of Emergency Services specifically provides support and assistance to the 24 cities and towns, as well as, all the unincorporated portions of the county. The field functions are supported by a countywide management system that includes organizational business practices, human resources, financial and accounting services, vehicles services and support, and equipment warehousing and distribution. County Fire also provides for the management of community safety services such as: fire prevention, building construction plans and permits, household hazardous waste, Local Oversight Program for hazardous materials, HAZMAT facility inspections, planning and engineering, and public education and outreach.

Figure 1-2: San Bernardino County Fire Protection District

### 1.1.2 San Bernardino County Flood Control District

#### 1.1.2.1 Description of Major Services

The San Bernardino County Flood Control District (District) was created in 1939 under special state legislation. Since its inception, the District has developed a very extensive system of flood control and water conservation facilities, including dams, conservation basins, debris basins, channels and storm drains. The purpose of these facilities is to intercept and convey flood flows through and away from developed areas of the county, as well as to promote water conservation and improved water quality.

The District covers the entire county, including all of the incorporated cities. The District is divided into six geographic flood zones (in recognition of the different characteristics and flood control needs in various areas).

- Zone 1 encompasses the county's West End, from the Los Angeles and Riverside County lines to West Fontana.
- Zone 2 encompasses the central area of the San Bernardino Valley easterly of Zone 1 to approximately the Santa Ana River and City Creek demarcations.
- Zone 3 covers the east end of San Bernardino valley, east of Zone 2.

- Zone 4 covers the Mojave River valley region, from the San Bernardino Mountains to Silver Lakes.
- Zone 5 primarily includes the San Bernardino Mountains.
- Zone 6 encompasses the remainder of the county not covered by other zones.

The District has also established a countywide administrative zone (Zone 7)

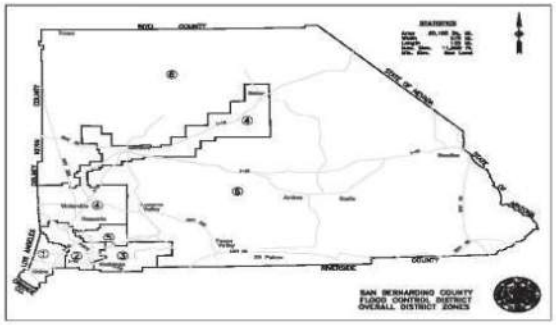


**Figure 1-3: Map of San Bernardino County Flood Control District**

The District's funding is primarily derived from property taxes, federal and state aid on specific projects, subdivision and permit fees, rents and royalties, and revenue from local water agencies for water spreading services. The District's principal functions are as follows:

- **Flood Protection on Major Streams:** In cooperation with the federal government, the District conducts programs for channel and levee construction, floodwater retention, and debris basin maintenance. Programs or projects are often done in cooperation with the incorporated cities, the U.S. Army Corps of Engineers, and the U.S. Bureau of Reclamation.

- **Water Conservation:** The District operates and maintains water conservation basins and spreading grounds. Water from the local mountains and northern California is spread and percolated into the groundwater basins underlying the county. The District has numerous joint use agreements with water districts allowing use of District facilities for groundwater recharge.

- **Storm Drain Construction:** The District is active in comprehensive storm drain master





planning/construction and cooperates with incorporated cities and other agencies in storm drain projects.

- **Facility Maintenance:** The District has a proactive maintenance program for its facilities. Regular inspections of the storm drains, channels, and basins are made as required by various state and federal agencies.

- **National Pollution Discharge Elimination System (NPDES):** The District is the lead permittee in the San Bernardino valley area-wide NPDES permit with 16 cities as co-permittees. The NPDES program, through the State Water Quality Management Board, regulates storm water quality through very detailed and complex permits, which affect everyone within the Santa Ana River Watershed and is expanding into the high desert area of the Victor Valley under Phase II of the permit.

- **State Water Quality Management Board:** regulates storm water quality through very detailed and complex permits, which affect everyone within the Santa Ana River Watershed and is expanding into the high desert area of the Victor Valley under Phase II of the permit.

- **Flood Operations:** During the flood season, the District maintains telemetry systems for monitoring rainfall and runoff and dispatches storm patrols as dictated by the projected severity of a storm. The District has access to a weather satellite data delivery system to provide state-of-the-art weather information. The system provides advance warning of major storm activity.

- **Flood Area Safety Task Force (FAST):** As a result of the October/November fires of 2003, the FAST organization was created. The District is a key component of this task force, which is meant to respond to the elevated flood risk associated with the aftermath of these devastating fires.

### 1.1.3 Special Districts Department

***The Special Districts Department promotes safe, healthy, enjoyable and dynamic communities by providing essential programs and municipal services that meet the current and future needs of the communities served.***

The San Bernardino County Board of Supervisors is the governing body for all Board governed Districts, County Service Areas (CSA), and Improvement Zones. The day-to-day management and administration is done through the Special Districts Department. The County Board of Supervisors and the Special Districts Department depend quite heavily on input from the community. The successful operation of a District, CSA and Improvement Zone is a team effort between County staff and property owners. Where needed, the Board of Supervisors will set up a

property owner Advisory Commission or Municipal Advisory Council (MAC) to work with and make recommendations to the Board and County staff.

The formation process begins with a request from property owners and then involves a feasibility study performed by the Special District Department with the assistance of many other County Departments. The final approval of the District, CSA and Improvement Zone is done by the County Board of Supervisors at a public hearing. Depending on the complexity of the issues, the process can take from three (3) months to one (1) year to complete.

There are various forms of financial mechanisms that can be used to fund services such as fees, special taxes, assessments, etc. Prior to a new funding source being implemented, it must receive approval from either the property owners or the registered voters in the area. It is important to understand that all funding is generated through the Districts, CSAs, and Improvement Zones. No County general funds are used or are available.

Special Districts Department is responsible for operating the Board-governed Special Districts within San Bernardino County. There are 102 special districts managed by the Special Districts Department:

**Table 1-1: Special Districts Department District Listing**

| | District Type | Number |
|---|---|---|
| **1** | Special Revenue Districts | 11 |
| **2** | Enterprise Funds (Airport and Refuse) | 3 |
| **3** | Parks Districts | 19 |
| **4** | Road Districts | 41 |
| **5** | Enterprise Funds (Sewer) | 9 |
| **6** | Street Light Districts | 11 |
| **7** | Enterprise Funds (Water) | 8 |
| **Total Special Districts** | | 102 |

- **Special Revenue Districts** were created to provide a service to the property owners within the Special Revenue District.
- **Enterprise Funds Districts** derive their funds through fees collected for delivery of a service or good such as water, sewer, refuse or airport fees from the users within the individual District.
- **Parks Districts** derive their funds through property taxes levied on property owners





within the individual Park District.
- **Road Districts** derive their funds through property taxes levied on property owners within the Road District.
- **Street Light Districts** derive their funds through property taxes levied on property owners within the Street Light District.

The two Special Districts listed below were formed differently than the other special districts listed above managed by the Special Districts Department. These two districts were formed with a Board of Directors. (San Bernardino County Board of Supervisors) and are not independently elected. All governance actions are by the elected members of the Board of Supervisors acting as the Board of Directors for the Recreation and Park District.

**Big Bear Valley Recreation and Parks District**

Big Bear Valley Recreation and Park District currently maintains 6 developed parks, 2 undeveloped parks, several community buildings including the Big Bear Valley Senior Center, 3 ball fields, and a swim beach. Moonridge Animal Park is administered by the Big Bear Valley Recreation and Park District. The Zoo is open year round for visitors to see alpine species on exhibit. The Zoo receives approximately 99,600 visitors annually.

**Bloomington Recreation and Parks District**

Bloomington Recreation and Park District maintains two community parks, an equestrian arena, sports fields, and a community center.

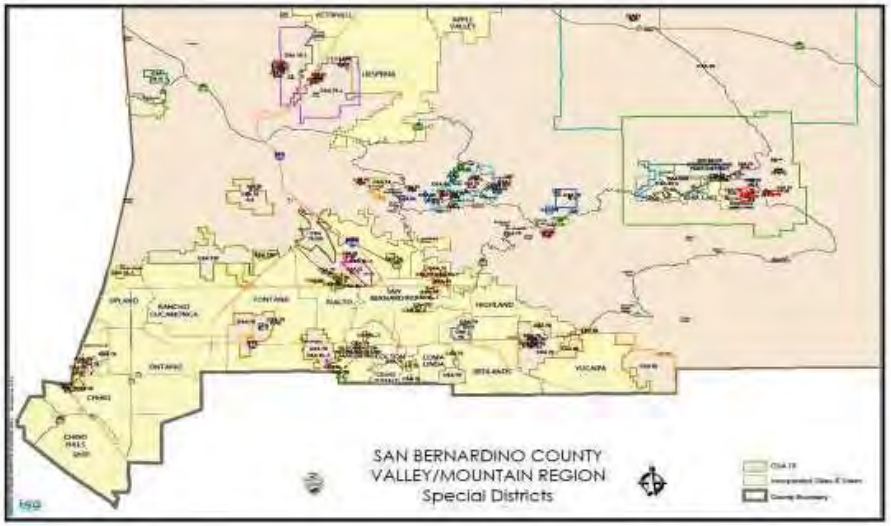


Figure 1-4: Map of Special District Department Districts

Figure 1-5: Special Districts Valley/Mountain Region

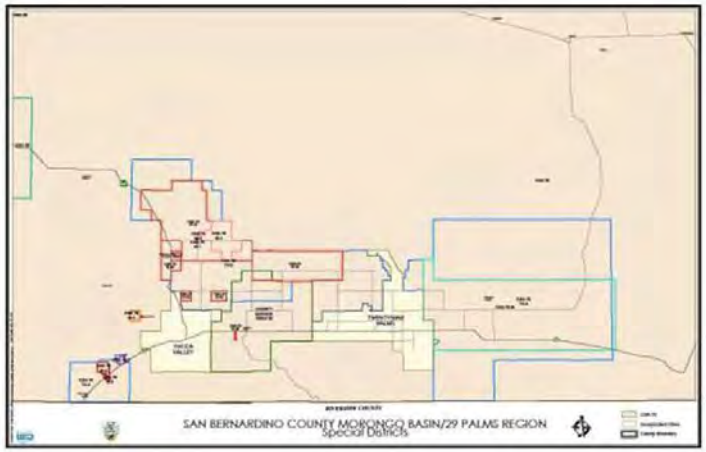


Figure 1-6: Morongo Basin/Twentynine Palms Region

Figure 1-7: Special Districts Victor Valley/Barstow Region

## 1.2 Purpose of the Plan

The intent of hazard mitigation is to reduce and/or eliminate loss of life and property. Hazard mitigation is defined by FEMA as "any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards." A "hazard" is defined by FEMA as "any event or condition with the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, environmental damage, business interruption, or other loss."

The purpose of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) is to demonstrate the plan for reducing and/or eliminating risk in the unincorporated area of the County and within areas overseen or managed by the Flood Control District, Fire District and Special Districts Department. The MJHMP process encourages communities within the unincorporated county to develop goals and projects that will reduce risk and build a more disaster resilient community by analyzing potential hazards. By cooperatively and jointly together as a Multi-Jurisdictional Planning team, the partners were able to develop common goals and objectives for mitigation efforts. The individual stakeholders can then take the goals and objectives back to their individual Special Districts for discussion, ranking and project development, and then bring the resulting projects back to the Multi-Jurisdictional Planning Team. The Multi-Jurisdictional Planning Team can then





integrate all projects into the appropriate project listing to be acted upon by the most appropriate managing department or district for the listed projects.

After disasters, repairs and reconstruction are often completed in such a way as to simply restore to pre-disaster conditions. Such efforts expedite a return to normalcy; however, the restoring of things to pre-disaster conditions sometimes result in feeding the disaster cycle; damage, reconstruction, and repeated damage. Mitigation is one of the primary phases of emergency management specifically dedicated to breaking the cycle of damage. Hazard mitigation is distinguished from other disaster management functions by measures that make County development and the natural environment safer and more disaster resilient. Mitigation generally involves alteration of physical environments, significantly reducing risks and vulnerability to hazards by altering the built environment so that life and property losses can be avoided or reduced. Mitigation also makes it easier and less expensive to respond to and recover from disasters.

## 1.3 Authority

In 2000, FEMA adopted revisions to the Code of Federal Regulations. This revision is known as "Disaster Mitigation Act (DMA)." DMA 2000, Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) that describes the process for assessing hazards, risks and vulnerabilities, identifying and prioritizing mitigation actions, and engaging/soliciting input from the community (public), key stakeholders, and adjacent jurisdictions/agencies.

With an approved (and adopted) MJHMP, the County and participating jurisdictions are eligible for federal disaster mitigation funds/grants (Hazard Mitigation Grant Program, Pre-Disaster Mitigation, and Flood Management Assistance) aimed to reduce and/or eliminate risk.

## 1.4 What's New

The 2011 San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) contained a detailed description of the planning process, a risk assessment of identified hazards for the San Bernardino County Planning Area and an overall mitigation strategy for reducing the risk and vulnerability from these hazards. Since approval of the plan by FEMA, much progress has been made by San Bernardino County and the participating County Districts on implementation of the mitigation strategy. As part of this 2016 MJHMP Update, a thorough review and update of the 2011 plan was conducted to ensure that this update reflects current community conditions and priorities in order to realign the overall mitigation strategy for the next five-year planning period. This section of the plan includes the following:

- **What's New in the Plan Update** This section provides an overview of the approach to updating the plan and identifies new analyses, data and information included in this Plan Update to reflect current community conditions. This includes a summary of new hazard and risk assessment data as it relates to the San Bernardino Planning Area as well as information on current and future development trends affecting community vulnerability

and related issues. The actual updated data, discussions, and associated analyses are contained in their respected sections within this 2016 MJHMP Update.

- **Summary of Significant Changes to Current Conditions and Hazard Mitigation Program Priorities.** This section provides a summary of significant changes in current conditions, changes in vulnerability, and any resulting modifications to the community's mitigation program priorities.

- **2011 Mitigation Strategy Status and Successes.** This section provides a description of the status of mitigation actions from the 2011 plan and also indicates whether a project is no longer relevant or is recommended for inclusion in the updated 2016 mitigation strategy. This section also highlights key mitigation success stories of the County and participating jurisdictions since the 2011 MJHMP.

This What's New section provides documentation of San Bernardino County Planning Area's progress or changes in their risk and vulnerability to hazards and their overall hazard mitigation program. Completion of this 2016 MJHMP Update further provides documentation of the San Bernardino County community's continued commitment and engagement in the mitigation planning process.

### 1.4.1 Updates to the Current Plan

This MJHMP update involved a comprehensive review and update of each section of the 2011 plan and includes an assessment of the success of the participating County Districts in evaluating, monitoring and implementing the mitigation strategy outlined in the initial plan. Only the information and data still valid from the 2011 plan was carried forward as applicable into this MJHMP update. In fact, based in part on the issuance of new 2011 and 2013 planning guidance, this 2016 plan has been significantly updated and rewritten.

The San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan (2011) focused on integrating the MJHMP with the County General Plan goals and policies as well as incorporating specific flood mitigation projects that were programmed for completion over the five (5) year period. The Plan did not clearly identify mitigation projects the County would focus on for all priority hazards identified in the plan. However, the County has been very active and engaged in implementing and supporting projects and programs designed to reduce and/or eliminate risk in the County. The list of successful projects in this section represents the activities that the County has undertaken and/or supported to reduce the risks from Wildfire, Earthquake, Flood, Drought, Terrorism, and Climate Change.

### 1.4.2 New Jurisdictional Annexes

Newly refined and reconfigured Jurisdictional Annexes detail the hazard mitigation planning elements specific to the participating jurisdiction to the San Bernardino County MJHMP Update.





The Annexes are not intended to be a standalone document, but appends to and supplements the information contained in the 2016 base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the participating jurisdictions. The newly refined Jurisdictional Annexes provide additional information specific to county participating special district or departments, with a focus on providing additional details on the mitigation strategies for the Fire Protection District, Flood Control District and Special Districts Department. The three annexes provide more detail on mitigation strategies, mitigation projects and existing implementation mechanism for each participating jurisdiction.

The 2011 MJHMP included the Big Bear Valley Recreation and Parks District and Bloomington Recreation and Parks District as standalone jurisdictions. For purposes of this 2016 plan update, Big Bear Valley Recreation and Parks District, and Bloomington Recreation and Parks District hazard mitigation planning efforts are included under the supervision of the Special Districts hazard mitigation planning efforts.

### 1.4.3 New Risk Assessment

As part of its comprehensive review and update of each section of the plan, San Bernardino County and participating jurisdictions recognized that updated data, if available, would enhance the analysis presented in the risk assessment and utilized in the development of the updated mitigation strategy. Highlights of new data used for this Plan Update is identified below in this Section and is also sourced in context within Chapter 4, Risk Assessment. Specific data used is sourced throughout this plan document. This new data and associated analysis provided valuable input for the development of the mitigation strategy presented in Chapter 5 of this plan. A highlight of new information and analyses contained in this plan update includes the following:

- A new assessment of updated hazards affecting the San Bernardino Planning Area was completed resulting in additional hazards added to planning documents the new hazards include climate change, drought and terrorism.

- The drought hazard was expanded to include water shortage impacts to the County, to better align with the State of California Hazard Mitigation Plan and to reflect the significant issues related to drought conditions resulting from the current and ongoing drought within the County and State of California.

- The climate change hazard was added to include to comply and align with the State of California Hazard Mitigation Plan and to reflect recent SB 379 initiatives. Climate change is affecting and will continue to affect the frequency and severity of natural hazard events, a trend that is of concern across the United States.

- An entire rework of the risk assessment for each identified hazard. This included reworking the hazard profile and adding new hazard event occurrences; redoing the entire vulnerability analysis to add items identified below and updating the vulnerability assessment based on more recent hazard data as well as using the most current parcel and assessor data for the existing built environment.

- An update of the flood hazard analysis to include an updated analysis of the 100-year flood, an analysis of the 500-year flood, including the use the new and updated DFIRMs.
- Utilizing updated critical facility GIS mapping for the Planning Area to provide an updated inventory of critical facilities by jurisdiction (including all municipalities) and a GIS analysis of critical facilities vulnerable to hazards with spatial footprints which include: flood, wildfire, and earthquake.
- An enhanced vulnerability assessment which added a GIS analysis of updated future development areas in the Planning Area and specific to each of the mapped hazards.
- Incorporation and analysis of the new 2010 Census data was utilized for this LHMP update. Census data was used in an intersect analysis to determine how much of the population is exposed to flood, wildfire and earthquake hazards.
- Also, as required by current FEMA planning guidance, an analysis of the County's ongoing and continued compliance with the NFIP is included in the Flood Hazard profile.
- Terrorism is now a reoccurring possibility within the United States, due to the terror attack in San Bernardino County in December of 2015, a hazard profile on this matter has been added to this plan.

## 1.4.4 Successful Wildfire Mitigation Implementation

### 1.4.4.1 Fire Safe Councils (FSC) Fuel Reduction Program Success

Fire Safe Councils have received and implemented millions of dollars in grant money for fuels reduction and for public education. Of note recently the Arrowhead Communities FSC developed a grant that did fuels reduction but used the existing staff at the County Tree Removal Program rather than pay additional consultants to do the same work. The benefit of this is that the FSC was able to maximize their expenditure and give the contractor a check upon completion of the project. This way 100% of their grant money went directly to the contractor and none went to administrative overhead.

### 1.4.4.2 Red Cross Grant Fuel Reduction Success

Although this grant was just recently started, the ARC has successfully removed and reduced fuels on several properties. They have also met with County Roads Sign Division and created the correct number of evacuation directional signs. Fifty signs will be posted in the Moon Ridge area of Big Bear Lake in 2010 and 2011. During an emergency, these directional signs will direct people out of a very confusing network of streets.





### 1.4.4.3 USFS Grants ARRA and Otherwise and Chipping Program Success

San Bernardino County and its Special Districts were successful in obtaining $3 million in American Recovery and Reinvestment Act funding to support ongoing fuel reduction programs and to create new jobs for the recovering economy. The USFS also funded an additional $13 million to carry on after the NRCS projects were closed out.

Project design, contracting and operations are managed by the County's Public Works Department but the priorities are set by local fire chiefs in monthly MAST Operations Meetings. It is the oldest and most significant program for reducing wildfire threat on a mountain wide basis. Table 1-2 shows current and planned fuels reduction Projects for the San Bernardino County Mountain areas.

**Table 1-2: Hazardous Tree Removal Project and Fuel Modification Projects**

| Project Name | Contract No | Funding | Cost | Project Stage |
|---|---|---|---|---|
| Mojave view | FM179USFS | USFS | $23,840.00 | Complete 2013 |
| Strawberry Lodge | n/a | USFS | n/a | Complete 2013 |
| Harich | n/a | USFS | n/a | Complete 2013 |
| Camp Oaks | n/a | USFS | n/a | Complete 2013 |
| Swinson/Arrowbear | n/a | USFS | n/a | Complete 2013 |
| Osito Rancho/Cedar | n/a | USFS* | n/a | Complete 2013 |
| BBV286SP | n/a | USFS | n/a | Complete 2013 |
| BBV287SP | n/a | USFS | n/a | Complete 2013 |
| BBV280SP | n/a | USFS | n/a | Complete 2013 |
| FF288SP | n/a | USFS | n/a | Complete 2013 |
| LA291SP | n/a | USFS | n/a | Complete 2013 |
| RS292SP | n/a | USFS | n/a | Complete 2013 |
| GVL293SP | n/a | USFS | n/a | Complete 2013 |
| AB294SP | n/a | USFS | n/a | Complete 2013 |
| BBV295SP | n/a | USFS | n/a | Complete 2013 |
| Green Briar | FM100ARRA | ARRA** | $88,000.00 | Complete 2013 |
| West Hook Creek | n/a | ARRA | $14,700.00 | Complete 2013 |
| Silverwood Lake | n/a | ARRA | $21,000.00 | Complete 2013 |
| Weesha | n/a | ARRA | n/a | Complete 2013 |
| Erwin Lake | n/a | ARRA | n/a | Complete 2013 |
| Wrightwood | n/a | ARRA | n/a | Complete 2013 |
| Camp Tahquitz | n/a | ARRA | n/a | Complete 2013 |

| Project Name | Contract No | Funding | Cost | Project Stage |
|---|---|---|---|---|
| West Cajon | n/a | ARRA | n/a | Complete 2013 |
| LA285SP | n/a | ARRA | n/a | Complete 2013 |
| WW290SP | n/a | ARRA | n/a | Complete 2013 |
| CL289SP | n/a | ARRA | n/a | Complete 2013 |
| Rob Roy | n/a | ARRA | n/a | Complete 2013 |
| Santa's Village | n/a | ARRA | n/a | Complete 2013 |
| Saw Pitt II | n/a | ARRA | n/a | Complete 2013 |
| Oak Hills | n/a | ARRA | n/a | Complete 2013 |
| Fawnskin | n/a | ARRA | n/a | Complete 2013 |
| Heaps Peak | n/a | ARRA | n/a | Complete 2013 |
| Houston | n/a | ARRA | n/a | Complete 2013 |
| Calvary | n/a | ARRA | n/a | Complete 2013 |
| WW298SP | n/a | ARRA | n/a | Complete 2013 |
| LG299SP | n/a | ARRA | n/a | Complete 2013 |
| **Project Name** | **Contract No** | **Funding** | **Cost** | Complete 2013 |
| Waterman Canyon | n/a | ARRA | n/a | Complete 2013 |
| Willow Creek | FM6501AFSC | ACFSC*** | $11,900.00 | Complete 2013 |
| LA191EVA | EVA191AFSC | ACFSC | n/a | Complete 2013 |
| NorthBay | FM192AFCS | ACFSC | n/a | Complete 2013 |
| **LA215EVA** | **n/a** | **ACFSC** | **n/a** | **Complete 2013** |

** Funded by United States Forest Service*
*** Funder by American Reinvestment and Recovery Act of 2009*
**** Funded by Arrowhead Communities Fire Safe Council*

#### 1.4.4.4 NRCS Fuel Reduction Project Success

San Bernardino County was the recipient of 72 million dollars that were granted from the National Resource Conservation Service (NRCS) to San Bernardino County Fire Protection District to reduce the amount of fuel and the potential for ignitability. In February of 2010, the grant was successfully closed out one month in advance of the target date. The $72,000,000 provided for almost 1,000 projects substantially reducing heavy fuels on tens of thousands of properties at risk across all mountain communities. Within that grant, $6.7million was provided to the USFS to conduct fuel modifications on Federal land and $7.2 million was provided to Cal Trans to remove fuels along evacuation routes. An additional $2 million was forwarded to San Diego to assist them. The activities funded under this program represent the first of their kind to be accomplished by local/state governments with federal grant funding.





To date the Fuel Management Program has removed over 450,000 trees, improving the overall health of the forested areas in the San Bernardino Mountains and reduced the overall fire threat. On several occasions completed projects have resulted in assisting fire suppression efforts and allowing fire to be contained before it threatens a local community, including Deer Lodge Park in Lake Arrowhead and Nob Hill in Running Springs during the Grass Valley and Slide Fires of 2007.

### 1.4.5 Flood Hazard Mitigation Success

#### 1.4.5.1 2011 General Plan Amendments

A General Plan Amendment to the Safety Element of the County of San Bernardino 2007 General Plan amended the Flood Plain Overlay District, which became effective on March 11, 2010. The Safety Element includes several layers of hazard overlays that are included in the General Plan mapping system to inform the public of potential hazards to development of property within certain areas of the County and to enable the County to mitigate the risks presented to property owners by these hazards. These overlays include potential flood hazards. Over the past twenty years, certain federal and state agencies have been in the process of digitizing much of this hazard data. The digitization of this data has allowed for greater accuracy as well as more timely updates. In recognition of the new data from various federal and state agencies, the County updated the Flood Hazard Overlay Maps contained within the Safety Element of the General Plan. The Flood Plain Safety Overlay District is amended to incorporate revised FEMA (Federal Emergency Management Agency) Flood Plain data, modifying 47 detail and seven regional General Plan Quad Maps. The FEMA Digital Flood Insurance Rate Map database was adopted in the General Plan Amendment as released by FEMA as it exists as of February 9, 2010 and will updated in the future for the County, by integrating automatic map updates as new data is published by FEMA.

Below is a list of the updated Flood Plain Safety Overlay District Maps effective March 11, 2010.

| Map | Quad Name | Map # | Quad Name | Map | Quad Name |
|---|---|---|---|---|---|
| DI16B | Baker | FH12B | Telegraph Peak | FH21 | Devore |
| EH07 | Hinkley | FH13B | Cajon | FH22 | San Bernardino N. |
| EH14 | Wild Crossing | FH14B | Silverwood Lake | FH23 | Harrison Mtn. |
| EH15 | Hodge | /FJ B | S Portion of County | FH28 | Guasti |
| EH16 | Barstow SE | FH11B | Mt. San Antonio | FH29 | Fontana |
| EH22 | Helendale | CK/DK | NE Portion of County | FH30 | San Bernardino S. |
| EH29 | Adelanto | EH/FH | SW Portion of County | FH31 | Redlands |
| EH30 | Victorville | EI/FI B | S Portion of County | FH32 | Yucaipa |
| EH31 | Apple Valley N. | EK/FK B | SW Portion of County | FI09B | Fawnskin |
| EI01B | Nebo | FH06B | Hesperia | FI10B | Big Bear City |
| EI02B | Yermo | FH07B | Apple Valley S. | FI17B | Big Bear Lake |

| Map | Quad Name | Map # | Quad Name | Map | Quad Name |
|---|---|---|---|---|---|
| EI03B | Harvard Hill | CH/DH | NW Portion of County | FI18B | Moonridge |
| EI04B | Manix | CI/DI B | N Portion of County | FH15 | Lake Arrowhead |
| EI09B | Daggett | FH03B | Mescal Creek | FH19 | Mt. Baldy |
| EK03 | Needles NW | FH04B | Phelan | FH20 | Cucamonga Peak |
| EK11 | Needles SW | FI30B | Joshua Tree S. | FI23B | Sunfair |
| EK12 | Needles | FI32B | Queen Mountain | FI25B | Forest Falls |
| **EK20** | **Whale Mountain** | **FI28B** | **Morongo Valley** | | |

Completed Flood Control Projects with Mitigation Characteristics

**Table 1-3: Completed Flood Control Projects**

| Project Number | Completion Date | Total Cost | Total Funding |
|---|---|---|---|
| F02527 | 2016 | $392,885 | $392,885 |
| F00282 | 2016 | $4,100,000 | $4,100,000 |
| 1- | 2010 | $7,770,000 | $7,700,000 |
| F01761 | 2016 | $4,000,000 | $4,000,000 |
| F02234 | 2016 | $1,100,000 | $1,100,000 |
| F01767 | 2014 | $3,700,000 | $3,700,000 |
| F01389- | 2008 | $1,300,000 | $1,300,000 |
| F01545 | 2009 | $1,500,000 | $1,500,000 |
| F01566- | 2010 | $3,300,000 | $3,300,000 |

### 1.4.5.2 F02527 29TH Street Basin Levee Certification Restoration Project - Completed

*Ensure that the surrounding residential and commercial areas will not be re-mapped as floodplain areas.*
*Status: Completed*
*Completion Date: March 2016*
*Local Priority: High*
*Total Cost: $392,885*
*Funding Description: From Flood Control District Budget through Property Tax*
*Project Selected for: Public safety: history of flood damage at this location*
*Hazard Mitigated: Potential flooding*
*Resources to Implement: High*





*Cost to Implement: High*
*Time to Implement: High*

### 1.4.5.3 F00282 Alabama at City Creek - Completed

*Construct RCB and channel improvements to increase capacity and minimize the possibility of road closures and flood damage.*
*Status: Completed*
*Completion Date: January 2016*
*Local Priority: High*
*Total Cost: $4.1 million*
*Funding Description: San Bernardino County Flood Control Tax Revenues*
*Project Selected for: Public safety & convenience*
*Hazard Mitigated: Flooding, flood damage, road closures and road damage*
*Resources to Implement: Low*
*Cost to Implement: High*
*Time to Implement: Medium*

### 1.4.5.1 F02234 Wilson Creek - Completed

*Status: Completed June, 2016*
*Local Priority: Low*
*Total Cost: $1.1 million*
*Funding Description: San Bernardino County Flood Control Property Taxes, City of Yucaipa*
*Project Selected for: public safety and infrastructure protection*
*Hazard Mitigated: attenuation of high velocities (50 fps); slope protection*
*Resources to Implement: Low*
*Cost to Implement: High*
*Time to Implement: High*

### 1.4.5.2 F01767 Lytle Cajon – Completed

Replacement of damaged concrete invert
Status: completed
Completion Date: 2014
Local Priority: High
Total Cost: $3.7million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and to prevent additional channel damage
Hazard Mitigated: Additional damage to invert and walls; potential flooding and washouts of nearby area
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### 1.4.5.3 F01761 Kitchen Wash – Completed

To intercept flows upstream of Rimrock Road to capture headwaters and re-route them to the Mojave River
Status: In preliminary design process
Completion Date: Estimated 2017/2018
Local Priority: Low
Total Cost: $4.0 million
Funding Description: San Bernardino County Flood Control Property Taxes
Project Selected for: Public safety; protection of commercial center
Hazard Mitigated: local flooding, road damage
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### 1.4.5.4 Successful "Finalization" of Drainage Feasibility Study Report

The final Drainage Feasibility Study has been completed to evaluate the continuing landslide hazard within Rimforest and the role of concentrated storm runoff in propagating slope failure. The village of Rimforest has eroding cliff-side property and bluff retreat in the Southern part of the village.

This problem is primarily caused by storm runoff from either rainstorms or snowmelt after winter storms. The runoff flows to the south side of Rimforest and is discharged over the cliff at two principal locations. This study report evaluated a number of options to re-direct the majority of the runoff to other discharge locations for the purpose of reducing and mostly eliminating the cliff-side erosion. Two options presented the study appear to be feasible if new conventional storm drain systems are installed. One of the options is now included as potential future mitigation action presented in Section 6 of this plan.

### 1.4.6 Geologic Hazard Mitigation Success

#### 1.4.6.1 Successful Geologic Hazard Prevention General Plan Amendments

Twenty two overlay maps were completed as part of the 2007 General Plan Amendment which became effective on March 11th, 2010. For more information on the overlay maps, see Section 6.2.2.3.

#### 1.4.6.2 Amendment to Title 6 County Code to Adopt by Reference the 2010 Editions of the California Building Standards Codes

An amendment to Title 6 of the County of San Bernardino Code to adopt by reference the 2010 Editions of the California Building Standards Codes went before the Board of Supervisors on November 2, 2010 and was continued for a second reading on November 16, 2010 and approved unanimously. The amendment became effective on January 1, 2011.





The County of San Bernardino amendment to Title 6 of the County Code to adopt by reference the 2010 Editions of the California Building Standards Codes repealed the current chapters of Division 3 of Title 6 that reflect the 1994/1995 editions of the California Building Standards Codes and adopt the 2010 editions of these codes by reference.

The California Building Standards Commission approved the California Building Standards Code (Code) for a statewide effective date of January 1, 2011 and requires this Code apply in all parts of the state. This Code consists of the California Building, Residential, Plumbing, Mechanical, Electrical, Energy, Historical Buildings, Existing Building (Unreinforced Masonry) and the Green Building Standards Codes. Since this 2010 Edition was adopted by local ordinance, the prior editions of this code will be repealed and the most recent editions of the codes with applicable amendments requiring express findings and certain appendices necessary for the health and safety of the citizens of this County will be in effect within the unincorporated areas of San Bernardino County. The benefit of adopting this Code is that it provides consistency and clarification for the building community as well as building inspectors and plans examiners. State law (Health & Safety Code 18941.5 and 17958.7) requires the local government make express findings in order to amend building standards and the amendments must be necessary due to local climatic, geological, or topographical conditions.

Those amendments and findings are included in the County's ordinance and were filed with the California Building Standards Commission.

The recommended modifications not requiring express findings are administrative or procedural in nature and concern the local implementation issues that are not covered by building standards.

An example of this type of modification is to the California Residential Code, Section R105.3.1.1 which requires the Board of Appeals to confirm substantial valuations in the flood plain. The traditional purpose of the Board of Appeals has been reserved for a contested decision of the Building Official, and it is felt that it should remain as such.

With respect to grading and excavation regulations found in Appendix J of the 2010 State published code, the 2001 California Building Code dealt with grading with more clarity in regards to what activities require a permit and set forth rules to ensure large grading projects are scrutinized in greater detail than smaller projects by requiring more reporting and inspection of such work. The grading chapter in the 2001 Code has been trusted and in use in its primary form for years. The 2010 Appendix J grading chapter needs substantial amendment and modification to address all grading issues and is not recommended for adoption in its present form. The Board adopted the 2001 Appendix Chapter 33 regulations as part of this proposed ordinance. Relocation permit requirements have been moved to a new section of the Code, and it retains specific standards for relocation procedures in details not found in the 2010 State-published code. Clarification of the types of buildings affected by the new regulations has also been made.

Administrative changes to the 2010 California Existing Building Code (Part 10 of Title 24) were approved to outline the procedures required to set allowable time limits for the retrofit and repair

of unreinforced masonry buildings. Staff is also recommending that authorization be given to the Building and Safety Division of the Land Use Services Department to issue Administrative Citations as an alternative means of enforcement of the County Code provisions.

Express findings are made for changes to the California Plumbing Code, Appendix K regarding the soil conditions that exist in this county. These changes are supported by the Environmental Health Division. These express findings are iterated in the ordinance and will be filed with the Building Standards Commission as required by law in order to become effective.

## 1.5 Community Profile

### 1.5.1 Physical Setting

The County is bounded by the states of Arizona and Nevada on the east, Inyo County on the north, Kern and Los Angeles Counties on the west, and Orange and Riverside Counties on the south.

San Bernardino County covers 20,102 square miles and is geographically the largest county in the continental United States. The States of Hawaii, Connecticut, Delaware, and Rhode Island and the District of Columbia could all fit inside the County boundary at the same time. The unincorporated area of San Bernardino County covers approximately 19,848 square miles; this is 98.7% of the entire County.

The remaining 1.3% of acreage (254 square miles) is under the jurisdiction of incorporated cities or towns. Figure 7 displays the unincorporated area and the cities/towns. The cities/towns on the map are concentrated in the south/west portion of the county and are color-coded.

San Bernardino County is characterized by three (3) distinct geographic areas: Valley, Mountains, and Desert: the Valley Region contains the majority of the county's incorporated areas and is the most populous region; the

Mountain Region is primarily comprised of public lands owned and managed by federal and state agencies; and, the Desert Region is the largest region (over 93% of the county's land area) and includes parts of the Mojave Desert.4 Aside from open or undeveloped land, the largest land use in the county is for military purposes.

The mountains stretch across the south end of the county. The mountain elevations range from 2,000 feet along the foothills to the 11,502-foot summit of Mount San Gorgonio, the highest peak in Southern California. Figure 8 displays the terrain/topographic features throughout San Bernardino County.

The San Bernardino Mountains feature four (4) large lakes (Big Bear Lake, Silverwood Lake, Lake Arrowhead, and Lake Gregory), and many smaller lakes. The majority of the lakes are the headwaters of the Santa Ana River and the Mojave River.





The Santa Ana River originates in the San Bernardino Mountains and flows southwest to the ocean. The Santa Ana Watershed includes streams flowing south from the San Gabriel Mountains and streams flowing north and west from the San Jacinto Mountains in Riverside County.

The desert area contains low mountains, valleys, and dry lakebeds. The elevations within the valley range of the County is from about 500 feet on the valley floor to 1,700 feet in Live Oak Canyon, and to about 5,400 feet in the hills in Yucaipa. The desert area is an assemblage of mountain ranges interspersed with long, broad valleys that often contain dry lakes. Many of these mountains rise from 1,000 to 4,000 feet above the valleys. Due to the persistent winds that blow throughout the year, large portions of the desert surface have been modified into a mosaic of pebbles and stones known as desert pavement.

A major physical resource of the desert area is the Mojave River, a critical water source for many of its residents. Among the few rivers that both flow north and do not empty into an ocean, the Mojave River travels north and east away from its watershed in the San Bernardino Mountains. The major part of it is over 100-mile length is marked by a dry riverbed that only on occasion reveals the water within it. Except in exceedingly wet years, the Mojave River ends its flow at Soda Dry Lake near Baker. The Colorado River, at the California and Arizona border, borders the County on the east. Streams in the eastern areas of the County area flow into the Colorado River which eventually ends at the Gulf of California.

The densely urban southern part of the County is at the headwaters of the Santa Ana River with its tributaries crossing the valley floor. With the construction of the Seven Oaks Dam the main river source has been controlled. However, Mill Creek, City Creek, Lytle Creek, and Cajon Creek still have the potential to flood areas of the valley if levees fail. A similar potential occurs with the high desert portion of the County with the Mojave River, which is controlled by the Mojave River Falls Dam that flows north from the San Bernardino Mountains to the city of Barstow. The San Antonio Dam on the southwest side of the county provides more than 100-year flood protection to the west end of the San Bernardino Valley. The Colorado River is on the eastern border of the County. The dams along the river have controlled the flow but bank erosion and damage to roads in the area have been experienced during periods of high water.

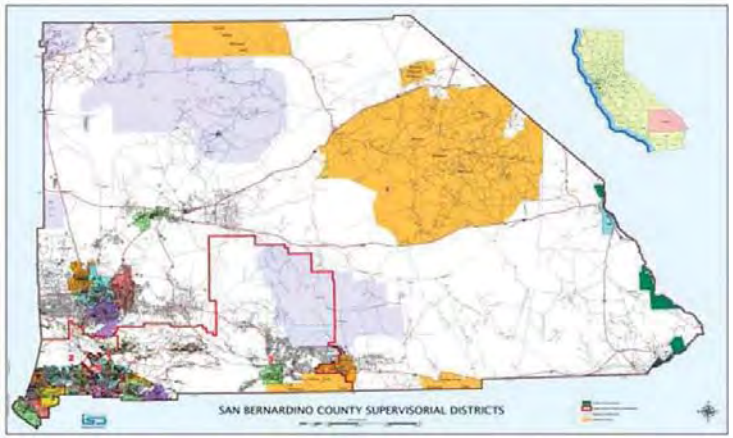


Figure 1-8: Unincorporated and Corporate Areas in San Bernardino County

Figure 1-9: Topographic Features in San Bernardino County





### 1.5.2 History

Paleo-Indian sites dating from c. 10,000 BC show that the San Bernardino County area has been inhabited for at least 12,000 years. Artifacts in the Calico area suggest much earlier human occupation, but this has not been confirmed. In the past three thousand years, various Indian tribes flourished in the area: the Gabrielenos occupied the West Valley; the Serranos lived in the foothills of the San Bernardino Mountains; the Vanyumes lived along the Mojave River; the Mohave lived along the Colorado River; and the Chemehuevi occupied the Mojave Desert.

The first European explorers to enter the area were Pedro Fages, Military Commander of California, in 1772 and Fr. Francisco Garces, a missionary priest, in 1774. On May 20, 1810, Franciscan missionary Francisco Dumatz, of the San Gabriel Mission, led his company into a valley. In observance of the feast day of St. Bernardine of Siena, Dumatz named the valley San Bernardino. This name was later given to the nearby mountain range, and later the city and county.

In 1842 the Lugo family was granted the Rancho San Bernardino, a holding of 37,700 acres encompassing the entire San Bernardino Valley. Captain Jefferson Hunt, of the Mormon Battalion, led a group of settlers into San Bernardino and founded a Mormon Colony. In 1851 the Mormon Colony purchased the Rancho from the Lugo family.

In 1850 California was admitted into the United States. On April 26, 1853, San Bernardino County was created from parts of Los Angeles, San Diego, and Mariposa Counties. In 1854 the City of San Bernardino was incorporated as the county seat.
In 1857, three orange trees were set out on a farm in Old San Bernardino. By 1882 a rail car load of oranges and lemons grown in the East Valley was shipped to Denver, Colorado. As early as the 1840s, vineyards were planted in the Cucamonga area and in the 1870 census; San Bernardino County was credited with producing 48,720 gallons of wine.

In 1860, gold was discovered in Holcomb and Bear Valleys in the San Bernardino Mountains, and placer mining began in Lytle Creek. Silver was being mined at Ivanpah in 1870, and the rich silver mines of the Calico district were developed in the 1880s. Borax was first discovered in 1761 at Searles Dry Lake near Trona, and transported out by twelve-, eighteen- or twenty-mule team wagons.

As a county, San Bernardino has been uniquely endowed with rich mineral deposits. Large deposits of gold have been mined at Stedman and Vanderbilt, with smaller but still important deposits at Alvord, Oro Grande, Old Dad Mountain, Dale and Nantan, Calico, Ivanpah, Waterman and Providence were the largest silver deposits, with lesser, but important deposits in the Mescal Mountains and at the Death Valley Mine. The most important copper mines are the Copper World and the Bagdad Chase (known usually for its gold production).

Except for a brief period after World War I when silver prices were high, low metal prices and inflation put a damper on mining in the 1920s. However, with the Great Depression of the 1930's

and an increase in the price of gold by nearly $15 an ounce, many small operators reactivated old mines. The region around Barstow, Vanderbilt, Stedman, and Dale were the principal centers of mining activity until World War II.

During World War II, iron was extracted from the Vulcan Mine in the Providence Mountains, and the Bagdad Chase Mine remained active. Since the war, there has been sporadic mining of gold, silver, and tungsten in the county. A major new mine opened during the 1950s, the Mountain Pass rare earth mine. Recently, exploration has outlined potential large tonnage molybdenum properties in the New York and Ord Mountains, copper in the Cooper Basin area of the Whipple Mountains and gold in the Clark Mountains.

After World War II, the citrus industry slowly declined. However, dairies relocating out of Los Angeles County settled in the Chino Valley area, creating a robust dairy industry in San Bernardino County.

Elsewhere in the Valley region, suburbs grew as moderate priced housing developments were built. By the late 1980's, the county had grown into bedroom communities and warehousing for southern California.

### 1.5.3 Climate

The valleys between mountain ranges experience very high temperatures, while the adjacent mountains often experience much cooler temperatures, particularly at their summits. Rainfall and humidity are low. The annual average precipitation for the area is approximately 30 inches. The differences in elevation and topography are in part responsible for variations in temperature and precipitation from the Valley and Desert areas.

Winter temperatures in some areas of the Desert range near zero, the cold often compounded by the wind-chill factor. In the summer, temperatures can reach as high as 134°F in the lower elevations and along the Colorado River area. Temperatures in the San Bernardino valley area range from an average high of 80ºF and an average low of 53ºF. The record high for the area is 117ºF and the record low is 17ºF. The annual average rainfall for the area is 15.6 inches. During the fall and winter months, strong "Santa Ana" winds blow across the area.

The mountains experience a four-season climate. Temperatures in the Mountain area range from an average high of 62ºF and an average low of 36ºF. The record high for the area is 106ºF and the record low is -25ºF. With the possible exception of some of the higher elevations in the mountains, precipitation throughout the Desert area is less than four inches per year, usually of short duration and high intensity. The resulting flash floods rapidly modify the terrain that is exposed to the erosive surface runoff. Unusually heavy or persistent rains often result in the temporary filling of a number of dry lakes until the surface water evaporates or infiltrates the soil. Persistent winds blow throughout the year





### 1.5.4 Demographics

The total population of San Bernardino County is approximately 2,139,570 people *(State of California, Department of Finance, E-4 Population Estimates for Cities, Counties, and the State, 2011-2016, with 2010 Census Benchmark. Sacramento, California, May 2016)*. Most of the County's population is in the valley areas located in the south west portion of the County. The County's population has grown by 4.13%, 84,835 people, since 2011 (population in 2011 was 2,054,735 people).

The population of the unincorporated area of the County in 2011 was 294,753 people. In 2016, the population is 309,759; an increase of 14,976 persons (or 1.05%) *(State of California, Department of Finance, E-4 Population Estimates for Cities, Counties, and the State, 2011-2016, with 2010 Census Benchmark. Sacramento, California, May 2016)*

**Population Growth 2011 - 2016**

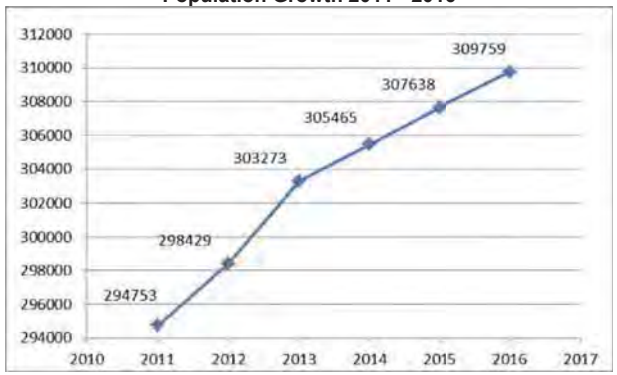


**Figure 1-10: San Bernardino County Unincorporated Area Population Changes 2011 - 2016**

Source: California Department of Finance E-4

Ethnic composition includes Hispanics (48%) who form the largest share of the County's population, followed by Whites (34%). Blacks (9%) and Asians (5%) form a relatively lower share of the total population. It should be noted that the Hispanic population is growing at the fastest rate among all ethnic groups. From 2000 to 2010, the Hispanic population increased by 44%. This trend is consistent with that of the neighboring counties of Riverside and Orange, where the

Latino population grew by 63% and 24%, respectively. During this period, the Asian population grew by 38%, whereas the Black population grew by 15%. The population of Whites declined in

all the six counties in Southern California; San Bernardino County experienced a decline of 7% in its White population. Changes in Ethnicity are from the California Department of Finance, Demographics Unit.

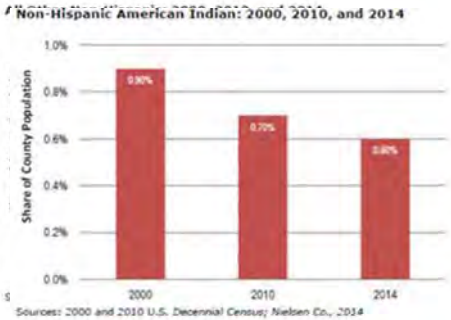


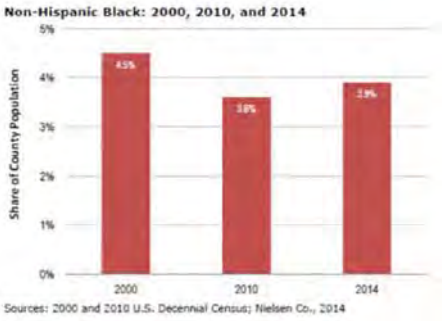


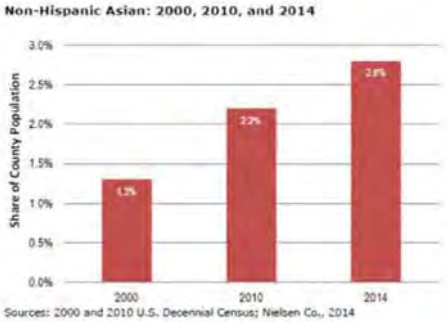


**Figure 1-11: San Bernardino County Unincorporated Area 2014 Population by Ethnicity**





### 1.5.5 Existing Land Use

The County has adopted a “one-map approach.” The “one-map approach” permits the use of a single map showing both General Plan land use designations and zoning classifications. The one-map approach assures that there will always be land use consistency between the County's General Plan and its Zoning Code.

There are 18 land use zoning districts that apply only to privately owned lands in the County and not to the lands controlled by other jurisdictions. Lands that are controlled by other jurisdictions, including lands controlled by federal and state agencies as well as incorporated cities, are mapped to identify the public agencies that control them. The 18 land use zoning districts are as follows:

- Resource Conservation (RC)
- Agriculture (AG)
- Rural Living (RL),
- Single Residential (RS),
- Multiple Residential (RM),
- Office Commercial (CO),
- Neighborhood Commercial (CN),
- Rural Commercial (CR),
- Highway Commercial (CH),
- General Commercial (CG),
- Service Commercial (CS),
- Community Industrial (IC),
- Regional Industrial (IR),
- Institutional (IN),
- Special Development (SD),
- Floodway (FW),
- Specific Plan (SP), and
- Open Space (OS).

Resource Conservation (RC) comprises the majority (55.98 percent) of the designated land uses in the County. This land use designation covers over 1 million acres, or about 1,500 square miles of land. Most of the land within this designation is publicly owned (federal and state) and includes national parks, military bases, conservation areas, and lands owned by other federal and state agencies. The County has designated approximately 681,500 acres or 1,065 square miles (37.92 percent) for residential uses. Out of this, about 587,535 acres (32.76 percent of total unincorporated area) are designated Rural Living, 67,691 acres are designated Single Residential, while 4,986 acres are designated Multiple Residential.

Commercial land use zoning districts (Office Commercial, Neighborhood Commercial, Rural Commercial, Highway Commercial, General Commercial, and Service Commercial) occupy a total of 12,177 acres or 0.68 percent of the total unincorporated area. Industrial land use zoning districts (including Community Industrial and Regional Industrial) occupy 21,834 acres or 1.21

percent of the total unincorporated area. Other land use designations include Agriculture occupying 41,793 acres (2.32 percent), Institutional occupying 8,567.51 acres (0.48 percent), Floodway occupying 20,281 acres (1.13 percent), and Specific Plan occupying 4,861.37 acres (0.27 percent).

Because of the size of the County, the San Bernardino County General Plan divides the county into 8 quadrants (Figure 1-12). The "one-map approach" allows the quadrant maps to be used for many different planning and development purposes. Figure 1-13 presents the Land Use Zoning for each quadrant. The Land Use Zoning identifies the type of construction and growth that exists or may occurs in area.

County designated Land Use Zoning Districts do not apply to Federal, State, or incorporated owned property.

The County's General Plan can be found at: http://countywideplan.com/home/about/

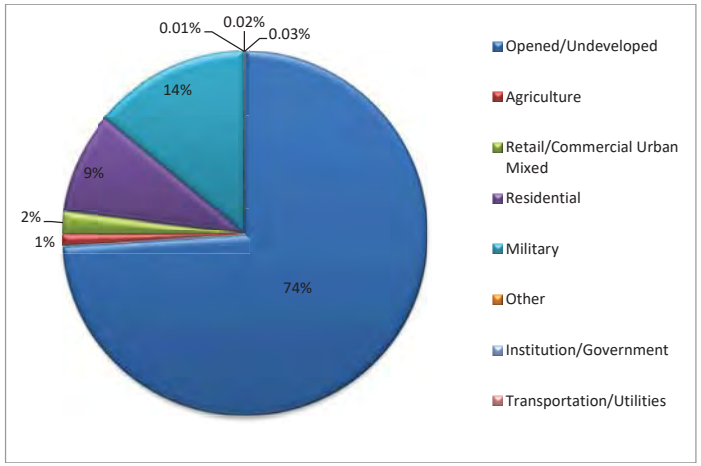


Figure 1-12: San Bernardino County Land Use





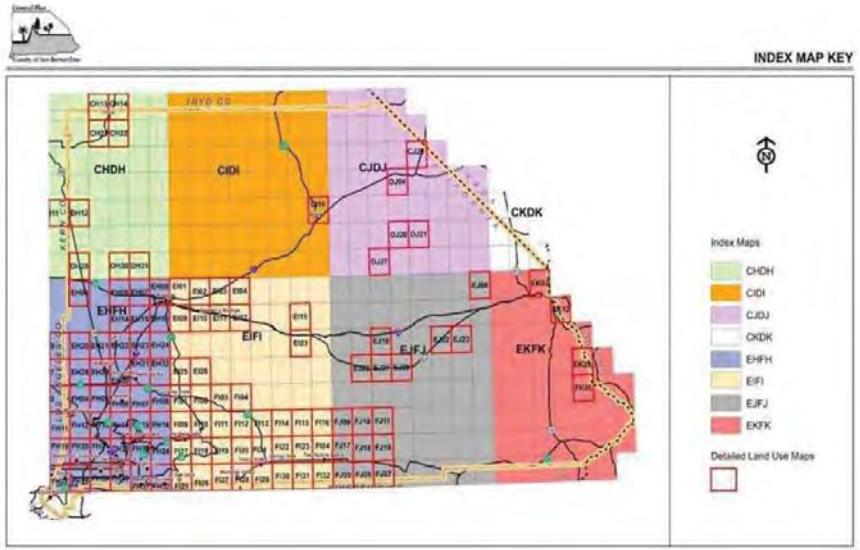


Figure 1-13: San Bernardino County Land Use Map

## 1.5.6 Development Trends

No major developments occurred in the unincorporated area of the county since the 2010 MJHMP was adopted. The limited development that did occur was scattered throughout the unincorporated area; with no one area being singled out. All development was in accordance with the pre-designated Land Use Zones development zones and complied with all Fire, Flood, and Seismic codes of the County and State at the time of development. This includes commercial, industrial, and residential developments.

The County is optimistic about the potential for future development. The High Desert area of San Bernardino County is one of the best places in the world for solar energy development because of its high altitude, the number of sunny days each year and existing power infrastructure.

- Many large solar energy projects are being proposed in California's desert area on federal Bureau of Land Management (BLM) land. BLM has received right-of-way requests encompassing more than 300,000 acres for the development of approximately 34 large solar thermal power plants totaling approximately 24,000 megawatts. This number of projects has not yet reached the stage of an Application for Certification (AFC) with the California Energy Commission.
- California's electric utility companies are required to use renewable energy to produce 20 percent of their power by 2010 and 33 percent by 2020. A main source of renewable power will be solar energy. Within the County of San Bernardino a Hybrid Power Project has been approved in the Victor Valley area. As of August 2010, three large Solar Projects to be placed in the County are in review by the California Energy Commission.

Once built, these projects will not impact the area to a great extent. Minimal staffing is required to operate these facilities and their very nature places them in remote locations of the County.

Additionally, with the completion of the Alameda Corridor and the emergence of the Ports of Los Angeles and Long Beach as the largest ports in the U.S., shipping trans-Pacific goods from the booming Asian economies, San Bernardino County has evolved as the logistics and distribution hub for the 20 million resident Southern California market and into the rest of the nation. As the international economy recovers amidst tightening land availability for warehousing and transit, San Bernardino County is better positioned than other areas in the region to harness the opportunity to become an even more important logistics hub.

The County has also started development of a bullet train. The bullet train will connect Victorville, CA and Las Vegas NV generally following the I-15 corridor (NOTE: There are discussions of additional bullet trains connecting San Bernardino with Los Angeles and San Diego and San Bernardino County and San Francisco/Sacramento).

While all of these development trends may not be recognized over the next 5 years, all future development that will take place is planned to occur in accordance with the General Plan Land Use Zones and will consider all potential hazards identified within this plan. Additionally, all development will be in compliance with all Fire, Flood, and Seismic codes of the County and State at the time of development.





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# Section 2. Plan Adoption

## 2.1 Adoption by Local Governing Body

The San Bernardino County Board of Supervisors created "districts" to provide a specific service to an area / population of San Bernardino County. These Districts are Board Governed in that the Board of Supervisors has direct control and legislative oversight of the Districts. The Board of Supervisors acts on behalf of each District whenever governance items are necessary. The participating jurisdictions listed in this plan are separate legal entities from the County of San Bernardino. For tax/revenue purposes the Board of Supervisors, acting as the Board of Directors for each participating jurisdiction or "District", will be adopting the Multi-Jurisdictional Hazard Mitigation Plan on behalf of each District. The Districts are not independent from San Bernardino County but are controlled and administered as any other County Department is administered.

This plan represents mitigation efforts for the unincorporated portions of the County and the efforts of three jurisdictions participating in this Multi-Jurisdictional Hazard Mitigation planning effort. The participating jurisdictional special districts include:

**San Bernardino County Fire District**
**San Bernardino County Flood Control District**
**San Bernardino County Special Districts Department**

San Bernardino County Board of Supervisors is responsible for the review, approval, and adoption of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) update for the unincorporated area of San Bernardino County, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and for the County's Board Governed Special Districts Department. It is also the intent of the San Bernardino County Board of Supervisors to take appropriate actions to incorporate the MJHMP update into the San Bernardino County General Plan.

## 2.2 Promulgation Authority

The Promulgator Authority for the adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the unincorporated area of San Bernardino County, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and for the County's Board Governed Special Districts Department and incorporation of the MJHMP into the San Bernardino County General Plan is:





- Chairman Robert A. Lovingood First District
- Janice Rutherford Second District Supervisor
- James Ramos Third District Supervisor
- Vice Chairman Curt Hagman Fourth District Supervisor
- Josie Gonzales Fifth District Supervisor

**The Point of Contact for information regarding this MJHMP is:**

Michael Antonucci, Emergency Services Manager
San Bernardino County Fire
Office of Emergency Services
1743 Miro Way
Rialto, CA 92376
(909) 356-3998

# Section 3. Planning Process

## 3.1 Preparing the Plan

Multi-Jurisdictional Hazard Mitigation Planning is a process State, Tribal, and local governments use to identify risks and vulnerabilities associated with natural disasters, and to develop long-term strategies for protecting people and property from future hazard events.

Planning creates a way to solicit and consider input from diverse interests. Involving stakeholders is essential to building community-wide support for the plan. In addition to emergency managers, the planning process involves other government agencies (e.g., zoning, floodplain management, public works, community, and economic development), businesses, civic groups, environmental groups, and schools.

To assist with the updating of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), a Multi-Jurisdictional Planning Team (Planning Team) was established. The Planning Team was the lynchpin for all activities to update the MJHMP. The Planning Team was established to define and identify the strategies, goals, activities, and development of the MJHMP. The Planning Team represents a comprehensive team of subject matter experts from a range of areas that the team felt was affected by the plan or could provide great benefit to the team. Members of the Planning Team were drawn from San Bernardino County Departments, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and the San Bernardino County Special Districts Department.

The Multi-Jurisdictional Planning Team members worked together to jointly determine and rank the risks facing the six participating agencies, develop goals and objectives to mitigate the risks, and identify which of the participating jurisdictions would be most appropriate for leading any particular project area identified by the Multi-Jurisdictional Planning Team. The individual Planning Team members then returned to their respective Special Districts where discussions were held, input sought, and potential projects developed and ranked for each of the Planning Team identified risks and projects relevant to the Special District. The Planning Team members then returned to the Multi-Jurisdictional Planning Team and provided the Planning Team with their vetted, prioritized list of potential projects and budgets to include in the Multi-Jurisdictional Hazard Mitigation Plan. These projects and budgets were integrated into the Multi-Jurisdictional Hazard Mitigation Plan. Upon approval, each participating jurisdiction would then be able to apply for grant funding for their prioritized projects without interference from another participating jurisdiction as funding became available.

The Planning Team was led by a representative from the San Bernardino County Fire Protection District-Office of Emergency Service. This representative took on the responsibilities of a Project Manager and facilitated and coordinated activates.





The Project Manager also represented the Unincorporated County at the San Bernardino County Operational Area (OA) Stakeholder meetings. San Bernardino County OES led the effort to coordinate Stakeholder in the Operational Area update their local MJHMP. This effort included: proving technical support, establishing a platform to encourage the exchange of ideas, and help coordination among neighboring stakeholders. The Project Manager was responsible for attending these meetings and incorporating the material into their planning process. One of the resource materials provided through the OA Stakeholder meetings was a suggested Table of Contents (TOC) the purpose of the TOC was to ensure all aspect of the MJHMP requirements were being met and could be found in similar sections in each of the Stakeholders updated MJHMPs.

This sample TOC was reviewed by the Planning Team and incorporated into the unincorporated county's MJHMP update efforts. Using the TOC, the Planning Team decided to conduct a section by section; page by page review of the 2016 MJHMP. To assist with this effort, a proposed project timeline was developed. The proposed Project Timeline illustrates the windows when each section of the 2016 MJHMP will be reviewed and the section revised.

**Table 3-1: Proposed Project Timeline**

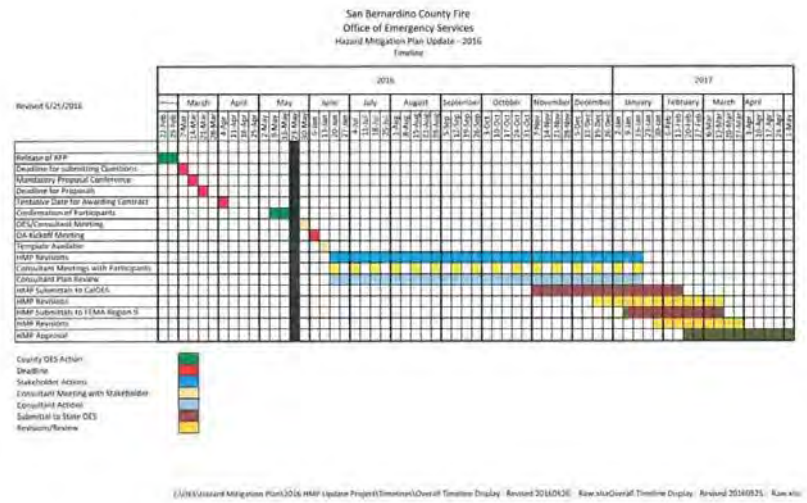


Based on the TOC, the Planning Team divided the update process into seven (7) phases; one for each section of the TOC. This approach allowed for a much focused review of the material and

provided an organized method to introduce new or updated material. The Project Manager led the discussion, solicited comments, took notes, and incorporated results in the MJHMP. Additionally, the Project Manager collected and summarized material provide by Planning Team members. During the Planning Team meetings some members were assigned tasks or action items which were to be completed prior to the next meeting.

Staff assigned to the MJHMP Update reviewed the 2016 MJHMP and provided comments referencing updated information such as current population statistics, new HAZUS-MH MR3 analysis of floods and earthquakes, and provide suggestions for updating the MJHMP. The Planning Team then reviewed the update information and validated/identified Goals, Objectives, and Projects. This step included discussion of how the projects would be prioritized.

### 3.1.1 Project Prioritization Involved Comprehensive Consideration of Criteria/Factors

While there is not a standard process followed by each of San Bernardino County Departments, and Districts; they all considered social, technological, administrative, political, legal, economic, and environmental factors. The County and each district participated on the Planning Team, and then took the risks, goals, objectives and projects back to their respective jurisdiction for discussion and vetting. After vetting, the individual Planning Team members returned to the Multi-Jurisdictional Planning Team where the individual materials were combined into a single Multi-Jurisdictional Hazard Mitigation Plan. This Multi-Jurisdictional effort resulted in goals, objectives and projects for all participants being listed under the appropriate hazard sections and not by individual participants. This reflects the overall County philosophy of allowing the department/district with the most expertise to suggest and/or manage a project that may affect another participant who does not have expertise in the hazard.

### 3.1.2 Planning Team

Much of the Planning Team is composed of representatives who were part of the development of the 2010 Unincorporated Area County MJHMP. This provided added value to the team in that they were familiar with the process and provided continuity in the updating of the 2010 MJHMP.

The Planning Team is comprised of representatives from San Bernardino County Departments, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and the San Bernardino County Special Districts Department who specialize in mitigation type activities/planning.





The Planning Team members represented select aspects of the community and were thought of as liaisons to the greater community. Each Planning Team member was responsible for communicating the direction and status of the planning effort to their outside members and in return they are expected to bring to the team outside perspectives. Additionally, the individual Planning Team members acted as liaisons for their respective Special Districts and were responsible for ensuring that the Special Districts provide appropriate input from their respective internal planning processes. Potential projects/budget meetings were held where alternative mitigation actions were discussed and potential mitigation projects were developed and prioritized along with budget development for the individual participating Special Districts and Departments. Additional prioritization after budgets were developed to ensure proper Benefit Cost Analysis (BCA) techniques were applied.

Representation was present on the Multi-Jurisdictional Planning Team from various County Departments and the three participating jurisdictional departments. Planning Team included representatives from all the participating San Bernardino County Special Districts and Departments. See Table 3-2 and Table 3-3.

**Table 3-2: Multi-Jurisdictional Planning Team**

| Multi-Jurisdictional Planning Team Members | Title / Role |
|---|---|
| **Unincorporated County** | |
| *Suzanne Peterson* | *Countywide Plan Coordinator / Land Use Services / Mitigation Review* |
| *Jerry Blum* | *Countywide Plan Coordinator /* |
| *Brent Rolf* | *County GIS / Hazus Data Coordinator / Information Services* |
| *Frank Jordan* | *Land Use Services / Mitigation Review* |
| *Jim Sowers* | *Building and Safety / Risk Assessment Review and Mitigation Action Plan Development* |
| *Patricia Cole* | *Economic Development Agency / Implementation and Funding Review* |
| *Carl Alban* | *Architecture and Engineering Department* |
| *John Amrhein* | *Sherriff's Corner Department Rep. / Mitigation Action Review* |
| *Mazin Kasey* | *Public Works Dept. /Transportation Division* |
| *Art Rivera* | *Solid Waste Management Division* |
| *Norma Spencer* | *Superintendent of Schools* |
| **Fire Protection District** | |
| *Michael Antonucci* | *OES Director / MJHMP Plan Representative* |
| *Cindy Serrano,* | *Project Manager for Planning Process* |
| *Miles Wagner* | *Emergency Services Officer, GIS Representative and Stakeholder Coordination.* |
| *David Davis* | *Emergency Services Officer / Fire District Representative and Technical Writer* |
| *Mary Barnett* | *Technical Writer / Plan Update and Edits* |

| Multi-Jurisdictional Planning Team Members | Title / Role |
|---|---|
| Cheryl Nagy | Emergency Services Officer |
| Carrie Cruz | Emergency Services Officer |
| Elli Maldonado | Elli Maldonado – Office Assistant |
| Michael Horton | Michael Horton – Fire Marshal |
| **Flood Control District** | |
| Kevin Blakeslee, Deputy Director – Flood Control | Deputy Director – Flood Control |
| Kenneth Eke, Chief, Flood Control Planning/ Water Resources Division | Chief, Flood Control Planning/ Water Resources Division |
| Michael Fam | Flood Control Planning |
| Mona Sadek | Flood Control Planning |
| Marjorie Schrage | Flood Control Planning |
| **Special Districts Department** | |
| Jeff Rigney | Special Districts Dept. Director |
| Steve Samaras | Special Districts Dept. Acting Deputy Director |
| Erin Opliger | Big Bear Valley Recreation and Parks District Rep. |
| Erin Opliger | Bloomington Recreation and Parks District Rep. |

**Table 3-3: Stakeholder List**

| Stakeholder Members | Name | Title / Role |
|---|---|---|
| **Municipal Partners** | | |
| City of Barstow | Jamie Williams | Fire Chief |
| City of San Bernardino | Eric Fyvie | Sergeant |
| City of Chino | Chris Wolff | Administrative Services Manager |
| City of Chino Hills | Bonnie Michaels | Emergency Services Analyst |
| City of Colton | Shannon Kendall | Emergency Services Coordinator |
| City of Fontana | Cheryl Nagy/ Mary | Emergency Services Officer |
| City of Grand Terrace | Haide Aguirre | Management Analyst |
| City of Hesperia | Rachel Molina | Public Information Officer |
| City of Loma Linda | Shannon Kendall | Emergency Services Coordinator |
| City of Montclair | Angelic Bird | Emergency Services Coordinator |
| City of Ontario | Raymond Cheung | New Emergency Manager |
| City of Rancho Cucamonga | Breanna Medina/ Denise School | Emergency Manager |
| City of Redlands | Fay Glass/ Wanda Viser | Emergency Operations Manager |





| Stakeholder Members | Name | Title / Role |
|---|---|---|
| City of Rialto | Art Podeska | Battalion Chief |
| City of Upland | Angelic Bird | Emergency Services Coordinator |
| City of Victorville | Dana Wellborn | Emergency Services Manager |
| Town of Apple Valley | Joseph Ramos | Emergency Services Officer |
| Town of Yucca Valley | Jessica Rice | Management Analyst |
| **School District Partners** | | |
| Apple Valley Unified School District | Janet Gould | Director, Risk Management |
| Chino Valley Unified School District | Dr. Grace Park | Assistant Superintendent |
| San Bernardino County Superintendent of Schools | Norma Spencer | Risk Management Analyst |
| Snowline Joint Unified School District | Robert Chacon | Director of Risk Management |
| **Special District Partners** | | |
| Inland Empire Utilities Agency District Headquarters | Claudia Neighbors/ Tony Arellano | Safety Officer |
| Newberry Community Services District | Stephen Miller | Fire Chief- Barstow Fire Protection District |
| Omnitrans | Mark Crosby | Security and Emergency Preparedness Coordinator |
| Santa Ana Watershed Project Authority | Richard Haller/ Carlos Quintero | Exec. Manager of Engineering and Operations |
| **Water District Partners** | | |
| Crestline Village Water District | Larrie Ann Davis | Office Manager |
| Cucamonga Valley Water District | Rosanna Ammari / Maria Kennedy | Maria Kennedy Consultant Representative |
| East Valley Water District | Cecilia Contreras / Gary Sturdivan | Administrative Assistant |
| Monte Vista Water District | Jonathon Dizon | Engineering Technician |
| San Bernardino Valley Municipal Water District | Dan Borrell/ Brent Adair | Project manager- Construction |
| Twenty-nine Palms Water District | Gary Sturdivan | Consultant Rep. |
| Yucaipa Valley Water District | John Hull | Public Works Management |
| **CERT Teams** | | |
| Wrightwood | | CERT Citizens |
| Phelan/Pinion Hills | | CERT Citizens |
| Angelus Oaks | | CERT Citizens |
| Big Bear Valley | | CERT Citizens |
| Helendale | | CERT Citizens |
| Lucerne Valley | | CERT Citizens |
| Lytle Creek | | CERT Citizens |
| Mill Creek Canyon | | CERT Citizens |

| Stakeholder Members | Name | Title / Role |
|---|---|---|
| *Morongo Basin* | | *CERT Citizens* |
| *Mountain* | | *CERT Citizens* |
| *Oak Hills* | | *CERT Citizens* |
| *Rosena Ranch* | | *CERT Citizens* |
| *San Antonio Heights* | | *CERT Citizens* |
| *Silver Valley* | | *CERT Citizens* |
| **Public Representatives** | | |
| - | *Destiny Davis* | *Interested Citizen* |
| - | *John Ferdon* | *Interested Citizen* |
| **Other Partner Agencies** | | |
| *San Manuel Band of Mission Indians* | *Michael Russ* | *Disaster Services Manager* |
| *Arrowhead Regional Medical Center* | *Weston Scott Smith* | *Emergency Preparedness* |
| *United States Forest Service* | *Marc Stamer* | *San Bernardino National Forest and Angeles National Forest Rep.* |
| *Wrightwood Fire Safe Council* | *John Aziz* | *Fire Safe Council* |
| *Rim of the World Mountain Mutual Aid Association* | *Aaron Scullin* | *President* |

There were a series of meetings held with the Planning Team. Each meeting had a primary focus and provided an opportunity to discuss updates and exchange ideas. Below is a list of the Planning Team meetings:

**Table 3-4: Planning Team Meetings**

| Date | Activity |
|---|---|
| February 4, 2016 | In person meeting to discuss revisions and additions to the Planning Process, Risk Assessment, Community Capability Assessment, Mitigation Strategies, Plan Maintenance, Fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion into the plan. |
| June 23, 2016 | Organizational Meeting for County Unincorporated Area Planning team. Planning Team members were introduced to the project and assigned to review 2016 MJHMP and update risks and mitigation projects as needed. |
| July 19,2016 | Conference Call with participants to discuss revisions and additions to the Planning Process, risk Assessment, Community capability Assessment, Mitigation Strategies, Plan maintenance, fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion into the plan. |





| | |
|---|---|
| August 4, 2010 | In person meeting to discuss revisions and additions to the Planning Process, risk Assessment, Community capability Assessment, Mitigation Strategies, Plan maintenance, fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion into the plan |
| August 30, 2016 | In person meeting to discuss revisions and additions to the Planning Process, risk Assessment, Community Capability Assessment, Mitigation Strategies, Plan Maintenance, Fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion in the plan. |
| September 14, 2016 | In Person meeting of the Morongo Basin COAD Community Organizations Active in Disaster. Hazard Mitigations Plan Discussion and outreach for public input on the update of the Hazard Mitigation Plan, and contact information given to the public. |
| September 20, 2016 | In person meeting to discuss changes suggestions with the Fire Safe Council for the following communities: Wrightwood, Phelan, Pinion hills, West Cajon Valley, and Baldy Mesa. The first item on the agenda was the discussion of the LHMP update and explained how to review the current HMP and instructions were given on who and how to contact OES and about 79 persons of the public were present |
| September 21, 2016 | Rim of the World Mountains Mutual Aid Association in Person meeting to discuss Planning Team Goals and Objectives, and any public concerns and contact information was given and it was the first item on the agenda for the meeting. And continuing fire fuel thinning programs (MAST) and Bark Beetle tree removal. |
| September 24, 2016 | In Person meeting of CERT Training on Terrorism, The hazard Mitigation Plan was brought up and discussed and contact information given to the public, a few topics and subjects were brought up. |

## 3.2 Coordination with Other External Jurisdictions, Agencies and Organizations

### 3.2.1 Internal Coordination

Because of the size and geographical location of Unincorporated County area, there are many jurisdictions, agencies, and organizations that are affected by or have influence on the county and the mitigation planning process. As part of the planning process, the Planning Team, and particularly the Project Manager, took great efforts to engage and include as many members as possible. These members were drawn from San Bernardino County Departments, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, and the San Bernardino County Special Districts Department.

One of the first efforts that were made was when the Planning Team was being established. The Planning Team members gave special considerations as to what they thought needed to be in the MJHMP and attempted to identify a person who could representative that area. This consideration went beyond the county departments.

As mentioned above, in addition to being required to participate in the Planning Team meetings, the Planning Team members were also required to liaison with other groups including their own

department/districts planning and project staff and with cooperating agencies to provide updates on the project and to bring to the team the different perspectives and comments. The Planning Team conducted a very extensive outreach effort.

This was done mostly through leveraging of existing meetings and efforts. In this liaison role, the Planning Team members coordinated with CalFire; the United States Forest Service, San Bernardino National Forest and Angeles National Forest; Natural Resource Conservation Service, Special Districts, and the 24 cities and towns within the County. This allowed for the Planning Team to capture a larger perspective; while keeping the Planning Team at a manageable level. The information was then brought back to the Multi-Jurisdictional Planning Team by the individual Planning Team members. At these meeting, potential cooperative projects were discussed, categorized, and prioritized for inclusion in the Multi-Jurisdictional Hazard Mitigation Plan.

As previously mentioned, the Unincorporated County and special districts were also active members of the San Bernardino OA Stakeholder Group meetings. These meetings provided an opportunity to coordinate with all cities/towns and special districts in the county. Through this venue, the Planning Team and the Project Manager reached out to adjacent jurisdictions and associated special districts to ensure that their efforts and findings were not in conflict. Stakeholder Meetings include the primary, alternate, and any consultants for all the participating jurisdictions.

As part of this effort, an OA Stakeholder Web Portal was developed to assist the jurisdictions update their MJHMPs, and encouraged sharing information, resources, and ideas necessary to complete the update process. Meetings, attended by the County Project Manager, were both in person and by conference call; many including a webinar. The Project Manager then brought the materials and discussions held at these meetings back to the Planning Team for review and action wherever applicable to the MJHMP effort. Participating Stakeholders are listed in Annex 5. A list of the OA Stakeholder Meetings is listed below:

- September 21, 2016
  Stakeholders Conference Call/Webinar at OES Headquarters
  1:30 p.m. to 2:30 p.m.

  8 participants in MJHMP Update Project Portal Rollout participated in the Conference Call and Webinar to introduce MJHMP Update Portal. Portal has public and stakeholder sections. During this conference call participants were shown the portal and walked through the log-in process to access the stakeholders' side of the website. Also discussed having weekly and some occasions office calls to update plan progress and needs for information.





- September 28, 2016
  Production team conference call OES Headquarters
  1:30 p.m. to 2:30 p.m.

  This meeting presented the website updates, progress chart and needs from other stakeholder departments to provide data such as proposed, in progress and completed hazard mitigating projects. The MJHMP Resource material was also reviewed. The tentative schedule of Production group meetings was reviewed.

- October 5, 2016
  Production Group Conference Call
  1:30 p.m. to 2:30 a.m.

  Stakeholders discussed MJHMP progress of the MJHMP updates. Revised timelines for updates were presented. New Reference Materials now available on the Web Portal were presented. Questions from the participants were discussed and answered.

- October 12, 2016
  Production team conference call
  OES Headquarters
  1:30 p.m. to 2:30 p.m.

  This meeting presented the website updates, progress chart and needs from other stakeholder departments to provide data such as proposed, in progress and completed hazard mitigating projects. The MJHMP Resource material was also reviewed. The tentative schedule of Production group meetings was reviewed.

- October 19, 2016
  OES Headquarters
  1:30 p.m. to 2:30 p.m.

  This meeting presented the website updates, progress chart and needs from other stakeholder departments to provide data such as proposed, in progress and completed hazard mitigating projects. The MJHMP Resource material was also reviewed. The tentative schedule of Production group meetings was reviewed.

- October 26, CISN
  Project Management Team Meeting
  San Bernardino County Government Center Community Room,
  10:00 a.m. to 12:00 a.m.

  This meeting was with 12 county members and any public to go over changes in the general plan and updates the County Hazard Mitigation plan with current and proposed and approved projects as well as code updates and ordinance changes and draft safety proposals.

- October 26, 2016
  Entire project Teams representatives via in person or video and voice call in
  Video Conference Call
  2 p.m. to 4 p.m.

  All project team stakeholder representatives discussed progress of the MJHMP updates. And timelines were discussed. Questions from the participants were discussed and answered. Also a live meeting in conjunction with Land Use representatives and Fire also consultant staff. 32 in attendance and 108 called in or video linked. Internal and External groups

### 3.2.2 External Coordination

The unincorporated county also had representation on the OA Working Group team. The Working Group is a small group of OA Stakeholders with experience in developing Multi-Jurisdictional Hazard Mitigation Plans. Members are drawn from the 24 cities/towns, 33 special districts, and the County. The goal of the Working Group is to vet the direction and material being provided to the larger Stakeholder Group such as crosswalk, Web Portal, use of maps, and a method to prioritize and rank the existing and any new hazards. The Working Group also discusses problems and solutions that arise during the MJHMP update process. Meetings were either in person or by conference call.

- June 23, 2016
  Stakeholders Meeting
  San Bernardino Unified School District Community Room, San Bernardino, CA
  2:00 p.m. to 4:00 p.m.

  54 Participants representing 24 cities/towns, 30 special districts, and the unincorporated area of participated. This Stakeholders Meeting introduced the Web Portal and the process to develop a current MJHMP from the 2010 MJHMP. Timelines were presented as well as templates for use in updating the project. Copies of the 2010 MJHMP for the jurisdictions were made available on the Web Portal to use as a starting point in the update process.

- August 30, 2016
  Stakeholders Meeting at OES Headquarters 1:30 p.m. to 2:30 p.m.

  In person meeting to discuss revisions and additions to the Planning Process, risk Assessment, Community capability Assessment, Mitigation Strategies, Plan maintenance, fiscal Resources, and Public Outreach. Each section was reviewed and discussed by the Team. Additions and corrections will be forwarded to OES for inclusion in the plan.





- October 26, 2016
  Entire project Teams representatives via in person, video or voice call in
  Video Conference Call
  2 p.m. to 4 p.m.

  All project team stakeholder representatives discussed progress of the MJHMP updates. Timelines were discussed.
  Questions from the participants were discussed and answered. Also a live meeting in conjunction with Land Use representatives and Fire also consultant staff. 32 in attendance and 108 called in or video linked.

## 3.3 Public Involvement/Outreach

Public involvement was solicited throughout the process. Since the 2016 MJHMP approval, the County and its special districts have taken several steps to educate the public on the hazards facing the county and had several public forums where mitigation projects were discussed and identified. At all events, public opinion and comments are solicited.

The Planning Team also considered the possibility of including public members on the Planning Team. However, because of the vast size of the county and the volume of possibilities, it was determined that having the Planning Team members liaison with the public would better serve and capture the public interest.

During this process, the County and Special Districts also used several platforms to reach out and inform the public of the MJHMP update. Wherever possible, a joint effort was made by the Planning Team members to include discussion for each participating jurisdictions hazards, goals, and objectives. These joint meetings of the Special Districts and County resulted in joint leverage of the planning effort and a resulting joint benefit of goals/objectives, and project development for the MJHMP development. Public Involvement consisted of meetings for County Departments or Special Districts which gave the public the direct opportunity to comment on the County Unincorporated Area MJHMP, meetings of County Department or Special District advisory committees where hazard specific information and possible projects were discussed, updates on the County website, press releases regarding the MJHMP, and public hearing regarding the MJHMP. All participants collectively supported the following public outreach meetings. Below is a summary list of the public outreach:

### 3.3.1 Public Meetings

- Wrightwood Fire Safe Council
  Wrightwood Museum, Wrightwood, CA
  July 19, 2016
  7:00 p.m. to 9:00 p.m.

17 community members and 7 Wrightwood Fire Safe Council members attended. A demonstration of Thermo-Gel and various application methods was demonstrated by a private vendor.

Reports of activities were given by the Angeles National Forest and the San Bernardino National Forest.
San Bernardino County Fire Protection District Office of Emergency Services presented a PowerPoint presentation on the effort to update the MJHMP for the unincorporated area of the County. A copy of this PowerPoint is in Annex 9 of the MJHMP.

- Rim of the World Mutual Aid Association
  100 W. Meadow Lane, Big Bear City, CA
  August 21, 2016
  6:00 p.m. to 7:30 a.m.

  24 representatives of local agencies, special districts, utilities, and the public in the Big Bear Valley attended the meeting. The City of Big Bear Lake and the Big Bear City CSD reported on the status of their MJHMP Update efforts. Both are proceeding with the goal of submitting the plan following the Group 1 timelines. Both agencies made presentations to their residents explaining the MJHMP Update Process, public involvement, and timelines.

  San Bernardino County Fire Protection District Office of Emergency Services presented a PowerPoint presentation on the effort to update the MJHMP for the unincorporated area of the County.

- Morongo Basin COAD Community Organizations Active in Disasters
  September 14, 2016
  10:00 a.m. to 12:00 p.m.

  This was a public meeting to discuss volunteers in disasters and the Local Hazard Mitigation Plan and the future of volunteer organizations in active disasters in the areas of Morongo and the entire county of San Bernardino County.

- Wrightwood Fire Safe Council
  Wrightwood Elementary School, Wrightwood, Ca
  September 20, 2016

  Community meeting of the fire safe council for the communities of Wrightwood, Pinion Hills, Phelan, West Cajon Valley, Baldy mesa the meeting covered topics of Emergency Alert System and notifications, repopulation and evacuation pans as well as the Local Hazard Mitigation Plan Update





- Rim of the World Mountain Mutual Aid Association
  September 21, 2016

  Rim of the World Mountains Mutual Aid Association in Person meeting to discuss Planning Team Goals and Objectives, and any public concerns and contact information was given and it was the first item on the agenda for the meeting; continuing on with fire fuel thinning programs (MAST) and Bark Beetle tree removal.

- CERT Terrorism Meeting/Training
  Victoria Gardens Community Center Rancho Cucamonga, CA
  September 24, 2016
  8:00 a.m. to 4:00 p.m.

  This was a CERT Symposium on Terrorism that covered the December 2nd Terror Attack and mass shooting incidents and how to react. An Active Shooter Awareness Course and discussion on the Local Hazard Mitigation Plan Update and Counter Terrorism Awareness courses were all presented to 100 CERT Members and public attendees.

### 3.3.2 Ready SB County Preparedness App Message/Web Postings

An App message was sent out to alert the public about the hazard mitigation process. The message was sent to over 15,000 people via the SB County Preparedness Mobile App and it is attached to the San Bernardino County Fire Website https://sbcfire.org as referenced in Annex 6. Ready SB County Preparedness Mobile App can be used on either an Android or iPhone. This app provides multiple resources for our residents that will assist them in preparing for a disaster and enhancing the recovery process. Protect yourself and your loved ones before, during and after a disaster.

In addition to hazard mitigation plan updates the public can get the Latest News from SBCounty.gov, CalTrans, National Weather Service, and San Bernardino County Fire Office of Emergency Services. This app provides the public with emergency supply kit lists, grocery lists and checklists tailored to an individual. The public can access and update preparedness plans as needed. Learn all you need to plan for and respond to natural disasters, terrorism and pandemic flu in San Bernardino County.

### 3.3.3 CERT Teams

The Press Release and Executive Summary were forwarded to the CERT Team leaders for those CERT Teams located in the unincorporated County area. The Team Leaders forwarded the MJHMP Press Release and Executive summary to their team members with the request for comments on the MJHMP. The fourteen (14) CERT Teams within the unincorporated County include:

| | | |
|---|---|---|
| Angelus Oaks CERT | Big Bear Valley CERT | Helendale CERT |
| Lucerne Valley CERT | Lytle Creek CERT | Mill Creek Canyon CERT |
| Morongo Basin CERT | Mountain CERT | Oak Hills CERT |
| Phelan/Pinon Hills CERT | Rosena Beach CERT | San Antonio Heights CERT |
| Silver Valley CERT | Wrightwood CERT | |

### 3.3.4 Public Hearing Process (to be completed upon FEMA Approval)

Once FEMA "approval pending adoption" notification is received, the Board of Supervisors reviewed, approved, and adopted the Unincorporated Area Multi-Jurisdictional Hazard Mitigation Plan for the County and its Special Districts at the Public Hearing meeting (**date to be determined**). The Board of Supervisors issued a Letter of Promulgation and Resolution denoting approval of the Multi-Jurisdictional Hazard Mitigation Plan for the County and its special Districts.

Prior to the Public Adoption Hearing Date (date to be determined), the Plan will be posted on the San Bernardino County website as part of the Agenda for the meeting. The Agenda with all attachments is posted the Wednesday prior to the hearing date as a public review requirement. Members of the public were invited to review and make comments at the meeting on (date to be determined). The Multi-Jurisdictional Hazard Mitigation Plan for the County and its Special Districts was on the Board of Supervisors agenda for review and adoption at their regularly scheduled meeting on (date to be determined).Residents of the County were requested to make comments or request information on the Multi-Jurisdictional Hazard Mitigation Plan during the regularly scheduled meeting. After the public had an opportunity to review and comment on the Plan the Board of Supervisors took action on the Board Agenda items.

## 3.4 Planning Process

As discussed, the planning process followed FEMA How to guides which includes; organizing resources, conducting the risk assessment, developing a capabilities assessment, developing a mitigation strategy and providing implementation measures for continued mitigation success, The Risk Assessment process includes four (4) basic step; 1) hazard identification and screening; 2) hazard profiling; 3) hazard exposure; and, 4) hazard vulnerability. The Project Manager, working with the Planning Team, facilitated discussions around these steps.
The first step in this process was to identify all natural hazards present in the community. The Planning Team started with the 2010 MJHMP and augmented as necessary. This augmentation





considered both adding and removing of hazards to develop a list of potential natural hazards in the community. The Planning Team utilized several sources to ensure they were considering all potential hazards. Material reviewed included the following: 2010 San Bernardino County Operational Area MJHMP, State of California MJHMP, FEMA "How-to Guides," and several surround community MJHMPs. After the list of potential hazards in the community is generated, the hazards were screened. For a full listing of documents see Section 5.1.1

### 3.4.1 Hazard Screening

The intent of screening hazards is to help prioritize which hazard creates the greatest concern in the community. In 2010, the MJHMP process used Critical Priority Risk Index (CPRI) software to evaluate hazards. In 2016 an alternative approach was implemented. The Planning Team agreed to utilize a non-numerical ranking system for the MJHMP update process. This process consists of generating a qualitative ranking (High, Medium, or Low) rating for: 1) probability; and, 2) impact from each hazard. To further assist with the process, the following definition of "High", "Medium", and "Low" probability and impacts are being provided (NOTE: these definitions we utilized in the 2010 MJHMP process):

**Probability**
High-Highly Likely/Likely
Medium-Possible
Low-Unlikely
**Impact**
High-Catastrophic/Critical
Medium-Limited
Low-Negligible

The hazards were then placed into a matrix with the appropriate/corresponding box/cell. The table below is an example of how the process will capture the results.

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | | | |
| | Medium | | | |
| | Low | | | |

After all hazards had been analyzed, the Planning Team then determined which Probability and Impact category (i.e., High Impact; High Probability, Medium Impact) the community will focus on over the next five (5) years. An example of how the hazards may be prioritized is below (Red equaling high priority):

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | | | |
| | Medium | | | |
| | Low | | | |

After identifying the "higher" priority hazards in the community, each of the "high" priority hazards were profiled. The hazard profiling include the incorporation of all new information, material, and reports to better help the Planning Team and the community understand the hazard.

Additionally, for each of the profiled hazards, the Planning Team then analyzed the community's exposure to each hazard (inventory of assets) and the potential impact under scenario events. The Planning Team used HAZUS and hazards intersect analyses recently completed within San Bernardino County to produce this information. See Section 4 for more information.

### 3.4.2 Set Goals

Goal setting was approached by the Planning Team as a two layered process. The first layer involved the stakeholders acting together as the Planning Team. The second layer involved the individual Special Districts working internally to coordinate those goals identified by the Planning Team with the goals identified internally by the Special Districts. The Planning Team validated and identified new Goals and Objectives for the MJHMP update in 2016. The Planning Team reviewed the hazard exposure and scenario impacts developed during the Risk Assessment portion of the process. With a firm understanding of the risk the community is potentially facing, the Planning Team then re-evaluated the 2010 Multi-Jurisdictional Hazard Mitigation Plan Goals and Objectives; assessed their status and effectiveness in meeting the 2010 Mitigation Measures and identified new Goals and Objectives.

As part of this process, the Planning Team also reviewed the County's General Plan, the State of California MJHMP, Floodplain Management Plans, Task Force After Action, and/or documents, and adjacent local jurisdiction MJHMPs to ensure the Goals and Objectives were comprehensive and compatible with those outlined in this plan.





### 3.4.3 Review and Propose Mitigation Measures

After the Goals and Objectives were established, the Planning Team then turned to identifying projects under each Goal and Objective that could be implemented to help reduce and/or eliminate the impacts from the priority hazards. As part of this process, the Planning Team reviewed the projects in the 2010 MJHMP to determine which are completed, which are ongoing, and which were deferred. For projects that were not completed the Planning Team validated whether or not the project was necessary.

With a firm understanding of past accomplishments and a good understanding of the potential exposure and scenario impacts from the Risk Assessment section, the Planning Team then started to identify projects that will help reduce and/or eliminate the risk for the high priority hazards. Again, a two-layer approach was used. The Planning Team as a whole identified common projects. These common projects were then coordinated internally by the Special Districts and the County to develop a common list of projects. After a list of all possible projects has been identified, the Planning Team then went through the process of prioritizing the projects.

To assist with this effort the Planning Team adopted the STAPLEE methodology. STAPLEE stands for:

- Social - The public must support the overall implementation strategy and specific mitigation actions. Therefore, the projects will have to be evaluated in terms of community acceptance.
- Technology - It is important to determine if the proposed action is technically feasible, will help to reduce losses in the long term, and has minimal secondary impacts. Determine whether the alternative action is a whole or partial solution, or not a solution at all.
- Administrative - Under this part of the evaluation criteria, examine the anticipated staffing, funding, and maintenance requirements for the mitigation action to determine if the jurisdiction/special district has the personnel and administrative capabilities necessary to implement the action or whether outside help will be needed
- Political - Understanding how your current community and State political leadership feel's about issues related to the environment, economic development, safety, and emergency management. This will provide valuable insight into the level of political support you may have for the mitigation activities and programs. Proposed mitigation objectives sometimes fail because of a lack of political acceptability.
- Legal - Without the appropriate legal authority, the action cannot lawfully be undertaken. When considering this criterion, determine whether your jurisdiction has the legal authority at the State, or local level to implement the action, or whether the jurisdiction must pass new laws or regulations. Each level of government operates under a specific source of delegated authority. As a general rule, most local governments operate under enabling legislation that gives them the power to engage in different activities. Identify the unit of government undertaking the mitigation action, and include an analysis of the interrelationships between local, regional, State, and Federal governments. Legal authority is likely to have a significant role later in the process when your State, or community will

have to determine how mitigation activities can best be carried out, and to what extent mitigation policies and programs can be enforced.

- Economic - Every local government experiences budget constraints at one time or another. Cost effective mitigation actions that can be funded in current or upcoming budget cycles are much more likely to be implemented than mitigation actions requiring general obligation bonds or other instruments that would incur long-term debt to a community. Local communities with tight budgets or budget shortfalls may be more willing to undertake a mitigation initiative if it can be funded, at least in part, by outside sources. “Big ticket” mitigation actions, such as large-scale acquisitions and relocation, are often considered for implementation in a post-disaster scenario when additional Federal and State funding for mitigation is available.
- Environmental - Impact on the environment is an important consideration because of public desire for sustainable and environmentally healthy communities and the many statutory considerations, such as NEPA, to keep in mind when using Federal funds. The Planning Team needed to evaluate whether, when implementing mitigation actions, there would be negative consequences to environmental assets such as threatened and endangered species, wetlands, and other protected natural resources.

In addition to the STAPLEE methodology, the Planning Team incorporated other criteria/factor questions into the process to help engage and solicit input from members. Examples of these criteria/factor questions are:

- Does the Action:
  - Solve the problem?
  - Address Vulnerability Assessment?
  - Reduce the exposure or vulnerability to the highest priority hazard?
  - Address multiple hazards?
  - Address more than one (1) Goal/Objective?
  - Benefits equal or exceed costs?

- Can the Action:
  - Be implemented with existing funds?
  - Be implemented by existing state or federal grant programs?
  - Be completed within the 5-year life cycle of the LMJHMP?
  - Be implemented with currently available technologies?

- Will the Action:
  - Be accepted by the community?
  - Be supported by community leaders?
  - Adversely impact segments of the population or neighborhoods?
  - Require a change in local ordinances or zoning laws?
  - Result in legal action such as a lawsuit?
  - Positively or negatively impact the environment?
  - Comply with all local, state, and federal environmental laws and regulations?





- Is there:
  - Sufficient staffing to undertake the project?
  - Existing authority to undertake the project?

After going through the above mentioned process for each project, the Planning Team identified higher priority projects.

### 3.4.4 Draft the Multi-Jurisdictional Hazard Mitigation Plan

The Multi-Jurisdictional Hazard Mitigation Plan Update was drafted by the Project Manager, based on input and comments provided by the Planning Team. As indicated previously, the Planning Team used the 2010 MJHMP as a starting point but revised it to reflect updated information). The 2016 MJHMP format and is similar to the 2010 plan with slight heading changes and differences in content. In addition to the heading changes and improved risk assessment information, the Planning Team also uses the FEMA Guidance and materials provided by the consultant hired to coordinate the Operational Area MJHMP and Stakeholder groups. This material aided in the Planning Team’s understanding of the level of detail and type of information that is excepting in each section.

This process started with the Special Districts and County providing information to the Planning Team through their liaison on the planning team. After the Planning Team ranked and prioritized the materials, the liaisons returned to their respective Special Districts to vet the Planning Team’s work. The Planning Team then worked together with the vetted materials to produce the draft MJHMP. As mentioned earlier, each section was reviewed and updated as necessary. While some Planning Team members are responsible for the updating select sections, all members are responsible for reviewing and commenting on the entire MJHMP. The Planning Team Project Manager was responsible for version control and distribution of the final MJHMP for review.

Once the MJHMP update was drafted, the Planning Team provided opportunities for the public to review and comment on the plan. After the public comment period was closed, the Planning Team finalized the plan and forwarded to Cal EMA and FEMA for approval.

### 3.4.5 Adopt the Plan

The San Bernardino County Board of Supervisors created each of the Special Districts to provide a specific service to a particular area/population of San Bernardino County. These Special Districts are Board Governed in that the Board of Supervisors has direct control and legislative oversight of the Special Districts. The Board of Supervisors takes action on behalf of each Special District whenever governance items are necessary. As the Five special districts are separate legal entities from the County of San Bernardino for tax/revenue purposes the Board of supervisors, acting as the Board of Directors for each Special District, will be adopting the Multi-

Jurisdictional Hazard Mitigation Plan on behalf of each Special District. The Special Districts are not independent from San Bernardino County but are controlled and administered as any other County Department is administered. In order to comply with legal requirement for each of the five Special Districts, separate resolutions are required. Copies of these resolutions are attached at the front of this MJHMP.

San Bernardino County Board of Supervisors is responsible for the review, approval, and adoption of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP) update for the unincorporated area of San Bernardino County, the San Bernardino County Fire Protection District, the San Bernardino County Flood Control District, the Big Bear Valley Recreation and Park District, Bloomington Recreation and Park District and for the County's board governed Special Districts Department. It is also the intent of the San Bernardino County Board of Supervisors to take appropriate actions to incorporate the MJHMP update into the San Bernardino County General Plan.

After Cal EMA and FEMA have approved the HMP update, it will be adopted by the San Bernardino County Board of Supervisors. Currently, the adoption process is scheduled for **(date to be determined)**. The item will be part of the consent calendar subject to a public hearing if necessary. The HMP will be listed on the agenda with the plan being made available electronically to the general public for at least three (3) business days prior to the Board of Supervisor's meeting date. Any member of the public can make comments on the Plan during the meeting prior to any action by the Board of Supervisors.





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# Section 4. Risk Assessment

The goal of mitigation is to reduce and/or eliminate the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery. However, mitigation should be based on an assessment of the risk.

This Risk Assessment Section evaluates the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure, and people. It identifies the characteristics and potential consequences of hazards, how much of the unincorporated areas of the County could be affected by a hazard, and the impact on unincorporated County area assets. The Risk Assessment approach consists of three (3) components:

- ***Hazard Identification*** *– Identification and screening of hazards (Section 4.1)*
- ***Hazard Profiles*** *– Review of historic occurrences and assessment of the potential for future events (Section 4.2)*
- ***Vulnerability Assessment*** *– Determination of potential losses or impacts to buildings, infrastructure and population (Section 4.3)*

## 4.1 Hazard Identification

### 4.1.1 Hazard Screening Criteria

Per FEMA Guidance, the first step in developing the Risk Assessment is identifying the hazards. The County's HMP Planning Team reviewed a number of previously prepared hazard mitigation plans and other relevant documents to determine the universe of natural hazards that have the potential to affect the County and the nearby region. Table 4-1 provides a crosswalk of hazards identified in the 2010 San Bernardino County Multijurisdictional Hazard Mitigation Plan Update, the County of San Bernardino 2007 General Plan Safety Element, Single Jurisdictional Plans and the 2013 CA State Hazard Mitigation Plan. Seventeen different hazards were identified based on a thorough document review. The crosswalk was used to develop a preliminary hazards list providing a framework for County HMP Planning Team members to evaluate which hazards were truly relevant to the County and which ones are not. For example, volcanic activity was considered to be of little relevance to the County, while earthquake, flooding, and wildfire were indicated in almost all hazard documentation.





**Table 4-1: Document Review Crosswalk**

| Hazards | 2010 San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan | County of San Bernardino 2007 General Plan Safety Element | Single Jurisdictional Plans | 2013 CA State Hazard Mitigation Plan |
|---|---|---|---|---|
| Climate Change | | | | ■ |
| Dam Inundation | | | ■ | ■ |
| Drought | | | ■ | ■ |
| Earthquake/ Geologic Hazards | ■ | ■ | ■ | ■ |
| Extreme Heat | | | | ■ |
| Extreme Cold | | | | ■ |
| Flood | ■ | ■ | ■ | ■ |
| Hazardous Waste | | ■ | ■ | ■ |
| High Winds/ Straight Line Winds | | ■ | ■ | |
| Hail | | | | |
| Infestation | | | | |
| Lightning | | | | |
| Terrorism | | | ■ | ■ |
| Tornado | | | | |
| Volcanic Activity | | ■ | | ■ |
| Wildfire | ■ | ■ | ■ | ■ |
| Winter Storm (Heavy Snowfall) | | | | ■ |

In addition to a document review, previous hazard occurrences were used to identify hazards for this hazard mitigation plan. Previous hazard occurrences provide a historical view of hazards that have affected the County in the past, and thus provide a window into the potential hazards that can affect the County in the future. Information about federal and state disaster declarations in San Bernardino County (declarations are declared by County) was compiled from FEMA and Cal EMA's databases, as shown in Table 4-2. Though not a complete snapshot of hazard incidences in the County (since not all hazard events are federally or state declared), Table 4-2 provided the County HMP Planning Team with solidified accounts of the types and extent of disasters that have affected the County dating back to 1965 when flooding affected entire regions of San Bernardino County. As indicated in Table 4-2 large regional incidents have affected San Bernardino County, including the California Wildfires of 1999. Most recently, disasters for terrorist attacks (2015), flood (2011) and severe storms (2010) were declared in San Bernardino County. The disaster declarations in Table 4-2 provide a baseline for consideration in the hazard prioritization process.

**Table 4-2: Federal, State and County Declared Disasters**

| Disaster Number | Declaration Date | Disaster Type | Incident Type | Title |
|---|---|---|---|---|
| **Federal Declarations** | | | | |
| **Major Disaster Declarations** | | | | |
| **1952** | 1/26/2011 | DR | Flood | Severe Winter Storms, Flooding, and Debris and Mud Flows |
| **1884** | 3/8/2010 | DR | Severe Storm(s) | Severe Winter Storms, Flooding, and Debris and Mud Flows |
| **1731** | 10/24/2007 | DR | Fire | Wildfires, Flooding, Mud Flows, and Debris Flows |
| **1689** | 3/13/2007 | DR | Freezing | Severe Freeze |
| **1585** | 4/14/2005 | DR | Severe Storm(s) | Severe Storms, Flooding, Landslides, and Mud and Debris Flows |
| **1577** | 2/4/2005 | DR | Severe Storm(s) | Severe Storms, Flooding, Debris Flows, and Mudslides |
| **1498** | 10/27/2003 | DR | Fire | Wildfires, Flooding, Mudflow and Debris Flow Directly Related T |
| **1203** | 2/9/1998 | DR | Severe Storm(s) | Severe Winter Storms and Flooding |
| **1046** | 3/12/1995 | DR | Severe Storm(s) | Severe Winter Storms, Flooding Landslides, Mud Flow |
| **1044** | 1/10/1995 | DR | Severe Storm(s) | Severe Winter Storms, Flooding, Landslides, Mud Flows |
| **1005** | 10/28/1993 | DR | Fire | Fires, Mud/Landslides, Flooding, Soil Erosion |
| **979** | 2/3/1993 | DR | Flood | Severe Winter Storm, Mud & Land Slides, & Flooding |
| **947** | 7/2/1992 | DR | Earthquake | Earthquake & Aftershocks |
| **935** | 2/25/1992 | DR | Flood | Rain/Snow/Wind Storms, Flooding, Mudslides |
| **894** | 2/11/1991 | DR | Freezing | Severe Freeze |
| **872** | 6/30/1990 | DR | Fire | Fires |
| **690** | 9/22/1983 | DR | Flood | Flash Flooding |
| **687** | 7/1/1983 | DR | Flood | Flooding |
| **677** | 2/9/1983 | DR | Coastal Storm | Coastal Storms, Floods, Slides & Tornadoes |
| **635** | 11/27/1980 | DR | Fire | Brush & Timber Fires |
| **615** | 2/21/1980 | DR | Flood | Severe Storms, Mudslides & Flooding |
| **547** | 2/15/1978 | DR | Flood | Coastal Storms, Mudslides & Flooding |
| **521** | 9/21/1976 | DR | Flood | Flooding, Tropical Storm Kathleen |
| **295** | 9/29/1970 | DR | Fire | Forest & Brush Fires |
| **253** | 1/26/1969 | DR | Flood | Severe Storms & Flooding |
| **223** | 1/2/1967 | DR | Flood | Severe Storms & Flooding |
| **211** | 12/7/1965 | DR | Flood | Heavy Rains & Flooding |
| **Fire Management Assistance Declarations** | | | | |
| **2955** | 9/2/2011 | FM | Fire | Hill Fire |
| **2841** | 10/4/2009 | FM | Fire | Sheep Fire |
| **2836** | 9/1/2009 | FM | Fire | Pendleton Fire |
| **2833** | 8/31/2009 | FM | Fire | Oak Glen Fire |
| **2792** | 11/15/2008 | FM | Fire | Freeway Fire Complex |
| **3279** | 10/23/2007 | EM | Fire | Wildfires |
| **2738** | 10/22/2007 | FM | Fire | Grass Valley Fire |
| **2728** | 9/15/2007 | FM | Fire | Butler 2 Fire |
| **2653** | 7/12/2006 | FM | Fire | Sawtooth Fire Complex |





| Disaster Number | Declaration Date | Disaster Type | Incident Type | Title |
|---|---|---|---|---|
| **3248** | 9/13/2005 | EM | Hurricane | Hurricane Katrina Evacuation |
| **2503** | 10/25/2003 | FM | Fire | Old Fire |
| **2501** | 10/23/2003 | FM | Fire | Ca-Grand Prix Fire-10-23-2003 |
| **2497** | 9/6/2003 | FM | Fire | Ca-Bridge Fire-09-05-2003 |
| **2491** | 8/19/2003 | FM | Fire | Ca-Locust Wildfire-08-19-2003 |
| **Emergency Declarations** | | | | |
| **3140** | 9/1/1999 | EM | Fire | Ca-Wildfires-08/25/1999 |
| **CALOES Emergency and Disaster Proclamations/ Executive Orders** | | | | |
| **Other Disasters** | | | | |
| **2464** | 9/24/2002 | FS | Fire | Williams Fire |
| **2433** | 6/27/2002 | FS | Fire | Louisiana Fire |
| **2425** | 6/17/2002 | FS | Fire | Blue Cut Fire |
| **###** | 12/18/2015 | EM | Terrorist Attack | Mass Shooting |
| **State Declarations** | | | | |
| **145** | 2/14/1963 | | Severe Storms | California Severe Storms, Heavy Rains, & Flooding |
| **47** | 12/22/1955 | | Flood | California Flood |
| **15** | 2/5/1954 | | Flood | California Flood & Erosion |
| **County Declarations** | | | | |
| | 3/13/1990 | | Earthquake | Upland Earthquake |
| | 10/31/1988 | | Fire | Texas Fire (Watershed Damage) |
| | 9/3/1987 | | Fire | Wildland Fires |
| | 7/13/1984 | | Weather | Unstable Weather Conditions (City of Big Bear Lake, CSD, Co. Flood Control, Victor Valley Waste Water Authority, Juniper Riviera County Water District) |
| | 9/29/1979 | | Gasoline Shortage | Gasoline Shortage Emergency |
| | 6/28/1979 | | Water Shortage | Water Shortage (Lake Gregory) |
| | 7/22/1960 | | Fire | Major and Widespread Fires |

### 4.1.2 Hazard Prioritization

The Planning Team determined that the County and its Special Districts should focus over the next five (5) years on hazards that fell within the HIGH and MEDIUM "Probability" and "Impact" categories. While all the hazards present a potential problem in the County, the Planning Team felt that if they were able to reduce or eliminate the risk from these hazards, it would provide a greater service to the people within the jurisdiction. Table 4-3 illustrates how the final prioritization of the hazard; the "Green" colored box represents the highest priority hazards; and the "White" colored boxes represent lower (second and third tier) priority hazards.

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | Wildfire<br>Flood<br>Earthquake/ Geologic Hazards | Drought | |
| | Medium | Terrorism | Climate Change (Extreme Heat and other) | Hail<br>Infestation |
| | Low | | Dam Inundation | Tornado<br>High Winds<br>Winter Storm<br>Lightning<br>Extreme Cold |

Table 4-3: Prioritized Hazard Assessment Matrix

## 4.2 Hazard Profiles

Although the County faces the risk of experiencing many natural and manmade hazards, this section profiles only the County's highest priority natural hazards the unincorporated County areas and Special District areas are expected to experience; earthquake, wildfire, flood, drought, terrorism and climate change. The priority hazards are based on the Calculated Priority Risk Index (CPRI) explained in Section 4.1.2.





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## 4.3 Earthquake Geologic Hazards

An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the earth as the huge plates that form the earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free, causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.
Earthquakes can strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world.

### 4.3.1 Regulatory Environment

The Alquist-Priolo Earthquake Fault Zoning (AP) Act was passed into law following the destructive February 9, 1971 San Fernando earthquake. The AP Act provides a mechanism for reducing losses from surface fault rupture on a statewide basis. The intent of the AP Act is to ensure public safety by prohibiting the siting of most structures for human occupancy across traces of active faults that constitute a potential hazard to structures from surface faulting or fault creep.

The 2013 California Building Standards Code (also known as Title 24) became effective for the County on January 1st, 2014. Title 24 includes CBC Section 3417: Earthquake Evaluation and Design for Retrofit of Existing Buildings which can be viewed at http://www.bsc.ca.gov/codes.aspx

Changes or additions to the seismic provisions come from many different sources, including new research results and documentation of performance in past earthquakes. A primary resource is the National Earthquake Hazard Reduction Program (NEHRP) Recommended Seismic Provisions for New Buildings and Other Structures (FEMA P-750: http://www.fema.gov/media-library/assets/documents/18152). FEMA's companion document Earthquake Resistant Design





Concepts (FEMA P-749: http://www.fema.gov/media-library/assets/documents/21866) provides a nontechnical background explanation.

### 4.3.2 Past Occurrences

Table 4-4 shows earthquakes greater than Magnitude 4.0 that have been felt within the San Bernardino County area in the last five years.

**Table 4-4: Earthquakes: 2010-2015 San Bernardino County**

| Date | Name |
|---|---|
| 9/14/2011 | Calimesa 4.1 |
| 1/15/2014 | Fontana 4.4 |
| 7/5/2014 | Running Springs 4.6 |
| 3/29/2014 | Brea 5.1 |
| 7/25/2015 | Fontana 4.2 |
| 9/16/15 | Big Bear Lake 4.0 |
| 12/30/2015 | Muscoy 4.4 |
| 1/6/2016 | Banning 4.4 |

There are hundreds more small (M<4.0) earthquakes that have occurred within San Bernardino County during this same time frame. Those with a magnitude of below 4.0 are not listed.

### 4.3.3 Location/Geographic Extent

Figure 4-1 shows the locations of major faults in California, including the four (4) major faults in Southern California in relation to San Bernardino County. These faults are the Southern San Andreas, the San Jacinto, the Elsinore, and the Garlock Faults. There are also many smaller faults within San Bernardino County capable of producing significant earthquakes. However, these four faults are considered by the United States Geological Survey (USGS) and the California Geological Survey (CGS) to be the most dangerous in the County. (California Geological Survey Special Publication 42, Interim Revision 2007, "Fault-Rupture Hazard Zones in California" - Alquist-Priolo Earthquake Fault Zoning Act). Other geologic hazards include liquefaction and landslides. Both occur during and after earthquakes.

Figure 4-1: Major California Faults

Liquefaction of the ground occurs when the groundwater table is high and soil conditions are favorable. Liquefaction Susceptibility Zones as mapped by the USGS for the 2008 ShakeOut Scenario1 shows areas of the County susceptible to liquefaction during an earthquake. See Figure 4-2





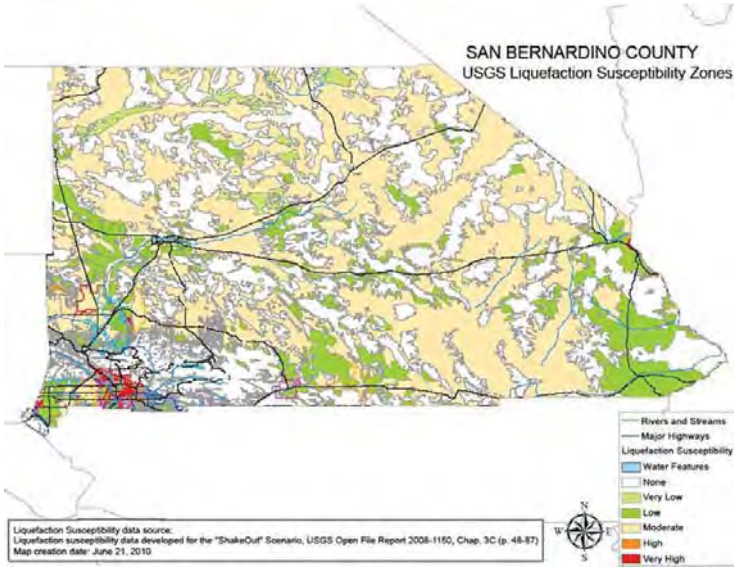


Figure 4-2: USGS Liquefaction Susceptibility Zone

### 4.3.4 Magnitude/Severity

The MMI Scale measures earthquake intensity as shown in Table 4-5. The MMI Scale has 12 intensity levels. Each level is defined by a group of observable earthquake effects, such as ground shaking and/or damage to infrastructure. Levels I through VI describe what people see and feel during a small to moderate earthquake. Levels VII through XII describe damage to infrastructure during a moderate to catastrophic earthquake.

See Section 4.3.5 to see how magnitude and severity are linked to the probability of earthquake occurrences.

**Table 4-5: MMI Scale**

| Earthquake Magnitude and Intensity | | |
|---|---|---|
| **Magnitude ($M_w$)** | **Intensity (Modified Mercalli Scale)** | **Description** |
| 1.0 – 3.0 | I | I. Not felt except by very few people under especially favorable conditions. |
| 3.0 – 3.9 | II – III | II. Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing. |
| | | III. Felt quite noticeably indoors. Many do not recognize it as an earthquake. Standing motorcars may rock slightly. |
| 4.0 – 4.9 | IV – V | IV. Felt by many who are indoors; felt by a few outdoors. At night, some awakened. Dishes, windows and doors rattle. |
| | | V. Felt by nearly everyone; many awakened. Some dishes and windows broken; some cracked plaster; unstable objects overturned. |
| 5.0 – 5.9 | VI – VII | VI. Felt by everyone; many frightened and run outdoors. Some heavy furniture moved; some fallen plaster or damaged chimneys. |
| | | VII. Most people alarmed and run outside. Damage negligible in well-constructed buildings; considerable damage in poorly constructed buildings. |
| 6.0 – 6.9 | VII – IX | VIII. Damage slight in special designed structures; considerable in ordinary buildings; great in poorly built structures. Heavy furniture overturned. Chimneys, monuments, etc. may topple. |
| | | IX. Damage considerable in specially designed structures. Buildings shift from foundations and collapse. Ground cracked. Underground pipes broken. |
| 7.0 and Higher | VIII and Higher | X. Some well-built wooden structures destroyed. Most masonry structures destroyed. Ground badly cracked. Landslides on steep slopes. |
| | | XI. Few, if any, masonry structures remain standing. Railroad rails bent; bridges destroyed. Broad fissure in ground. |
| | | XII. Virtually total destruction. Waves seen on ground. Objects thrown into the air. |

### 4.3.5 Frequency and Probability of Occurrence

Several of the major Southern California faults have a high probability of experiencing a Magnitude 6.7 or greater earthquake within the next 30 years (Figure 4-2); 59% probability of a M6.7 or greater on the Southern San Andreas Fault, 31% probability on the San Jacinto Fault, and 11% probability on the Elsinore Fault. These probabilities were determined by the USGS and CGS in a 2008 study (2007 Working Group on California Earthquake Probabilities, 2008, The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2): U.S. Geological Survey Open-File Report 2007-1437 and California Geological Survey Special Report 203 http://pubs.usgs.gov/of/2007/1437/).





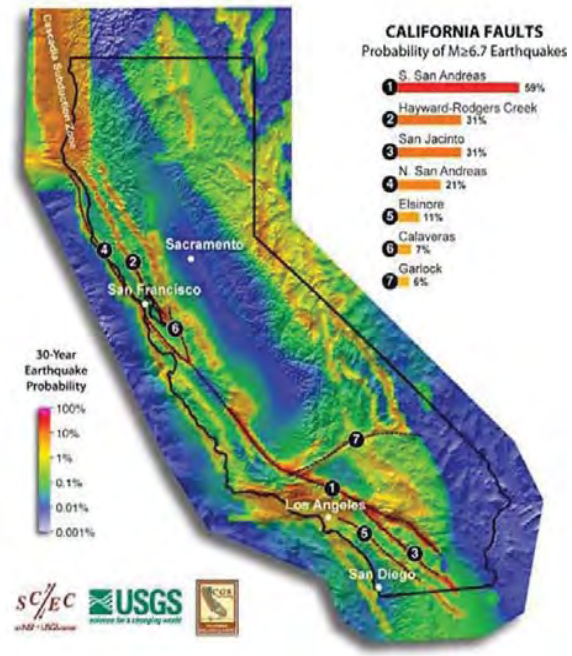


**Figure 4-3: California Faults Probability of ≥ M 6.7 Earthquake**

As shown in Figure 4-3 the probability of an earthquake with a Magnitude 6.7 or greater occurring somewhere in Southern California within the next 30 years is estimated to be 97% (2007 Working Group on California Earthquake Probabilities, 2008). As can be seen in the table, earthquake probabilities in Southern California are higher than those for Northern California.

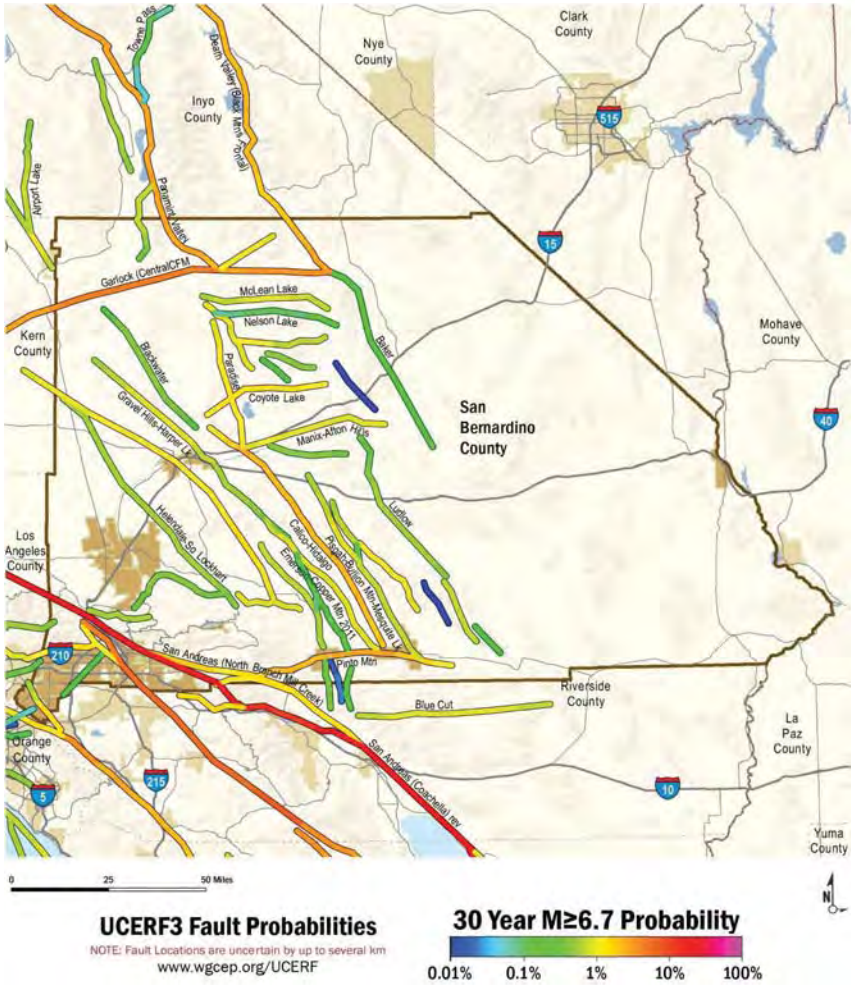


Figure 4-4: California Area Earthquake Probabilities by Magnitude





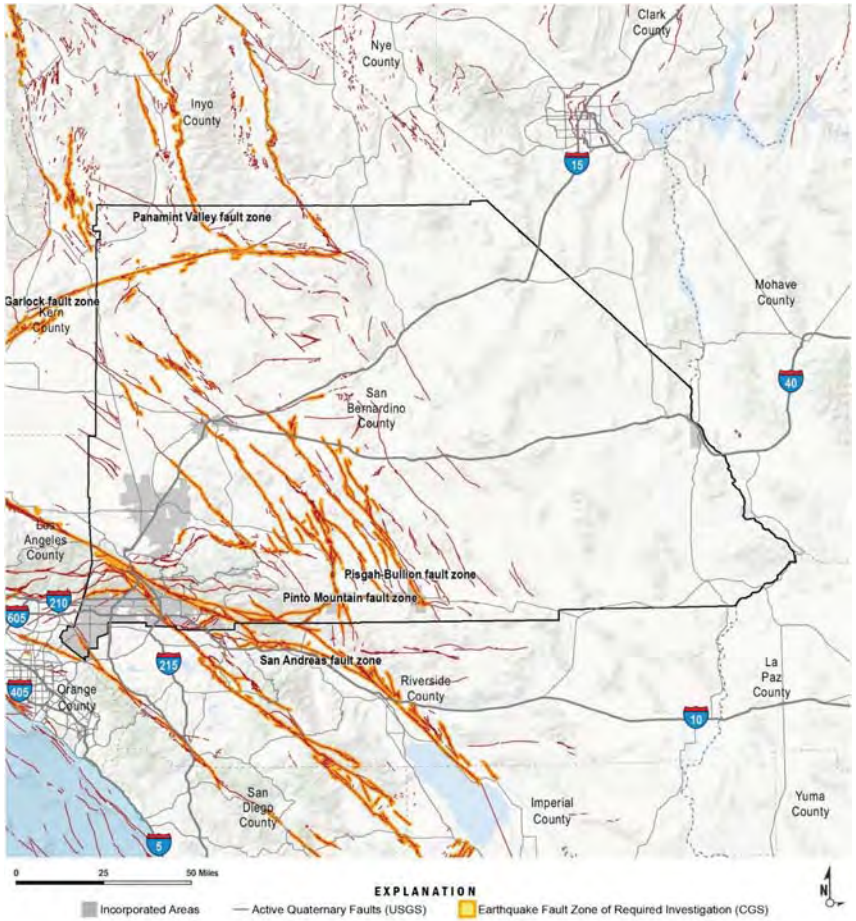


Figure 4-5: Earthquake Fault Zone

## 4.4 Wildfire

Wildfires present a significant potential for disaster in the County, a region of relatively high temperatures, low humidity, and low precipitation during the summer. This long summer season is followed by a fall season that is famous for high velocity, very dry winds that come out of the desert. The Santa Ana winds very consistently arrive from the middle of October to the end of November. In and of themselves, these weather patterns would be of little significance without the un-naturally dense forest and the dense undergrowth that has been allowed to grow unabated for the last several decades. Compounding the vegetative growth that has occurred is the unchecked development of substantial housing and businesses in mountain communities. This urbanized growth has required parallel growth and sophistication in the fire service that responds to wildfires in the wild land urban interface. With immediate responses to initial fire starts, the vast majority of fires are successfully extinguished in short order. In doing so, this eliminates nature's way of thinning the forest through smaller fires.

Another factor that is a potential for disaster is the number of dead trees in the mountain region. Due to the over densification of the forest combined with drought conditions during the past ten years, trees in the local mountains have become weakened, creating a perfect environment for Bark Beetles to proliferate from 2003 to 2008. Combine these severe burning conditions with people or lightning and the stage is set for the occurrence of large, destructive wildfires. In addition, the forested areas of the County are not only the most popular, with the most visitors in the Nation, but are also the most populated in residences and businesses in the Nation as well. The final element in this catastrophe waiting to happen is that because of the steep mountain terrain, there are only five routes in and out for almost 60,000 residents. On a holiday weekend though, this population can dramatically increase by 50,000 to 100,000 people as weekend vacationers.

### 4.4.1 Regulatory Environment

#### 4.4.1.1 State

Wildfire State Responsibility Area (SRA) Fire Safe Regulations outline basic wildland fire protection standards for local jurisdictions. SRA Fire Safe Regulations (if policed) can decrease the risk of wildfire events in the wildland interface. SRA Fire Safe Regulations do not supersede local regulations, which equal or exceed minimum state regulations. The State statute for wildfire protection is Public Resources Code, Section 4290. Requirements in the code include information on the following (CA Fire Alliance):

- Road Standards for Fire Equipment Access
- Standards for Signs Identifying Streets, Roads and Buildings
- Minimum Private Water Supply Reserves for Emergency Fire Use
- Fuel Breaks and Greenbelts





#### 4.4.1.2 Local

##### 4.4.1.2.1 Fire Hazard Abatement Program

In an effort to reduce the threat of wild fires, the San Bernardino County Fire Hazard Abatement (FHA) Program enforces the fire hazard requirements outlined in San Bernardino County Code Section 23.0301–23.0319. The primary function of the Fire Hazard Abatement Program is to reduce the risk of fires within communities by pro-actively establishing defensible space and reduction/removal of flammable materials on properties.

The Fire Hazard Abatement Program conducts surveys to identify fire hazards throughout the year. Fire hazards are identified and notices to abate the hazard(s) are mailed to property owners. Property owners are given 30 days to abate the violations. Failure to abate may result in citations, penalties, and/or fees for abatement by the County. The Fire Hazard Abatement Program responds to complaints year round in the unincorporated areas and contracting Cities and Fire Districts.

### 4.4.2 Past Occurrences

Wildfire locations from 1900 – 2016 are shown in Figure 4-6. In the past five years (since the 2010 MJHMP was approved) there have been 13 significant wildland fires within San Bernardino County. These fires are listed in Table 4-7, and several of the more damaging fires are discussed below.

**Table 4-6: Wildfire Occurrences 2010-2016**

| Number | Date | Name | **Acres** |
|---|---|---|---|
| 1. | 9/5/2011 | Hill Fire | 1,158 |
| 2. | 11/5/2012 | Devore Fire | 335 |
| 3. | 6/28/2013 | Mill Fire | 534 |
| 4. | 8/8/2013 | Sharp Fire | 243 |
| 5. | 9/24/2013 | Sierra Fire | 200 |
| 6. | 4/30/2014 | Etiwanda Fire | 2,143 |
| 7. | 5/13/2014 | Rancho Incident | 1,548 |
| 8. | 3/31/2015 | River Bottom Fire | 185 |
| 9. | 6/17/2015 | Lake Fire | 31,359 |
| 10. | 7/17/2015 | North Fire/ Pines Fire | 4,250 |
| 11. | 8/23/2015 | Summit Fire | 555 |
| 12. | 8/7/2016 | Pilot Fire | 8,110 |
| 13. | 8/16/2016 | Blue Cut Fire | 36,274 |
| | | | **86,894** |

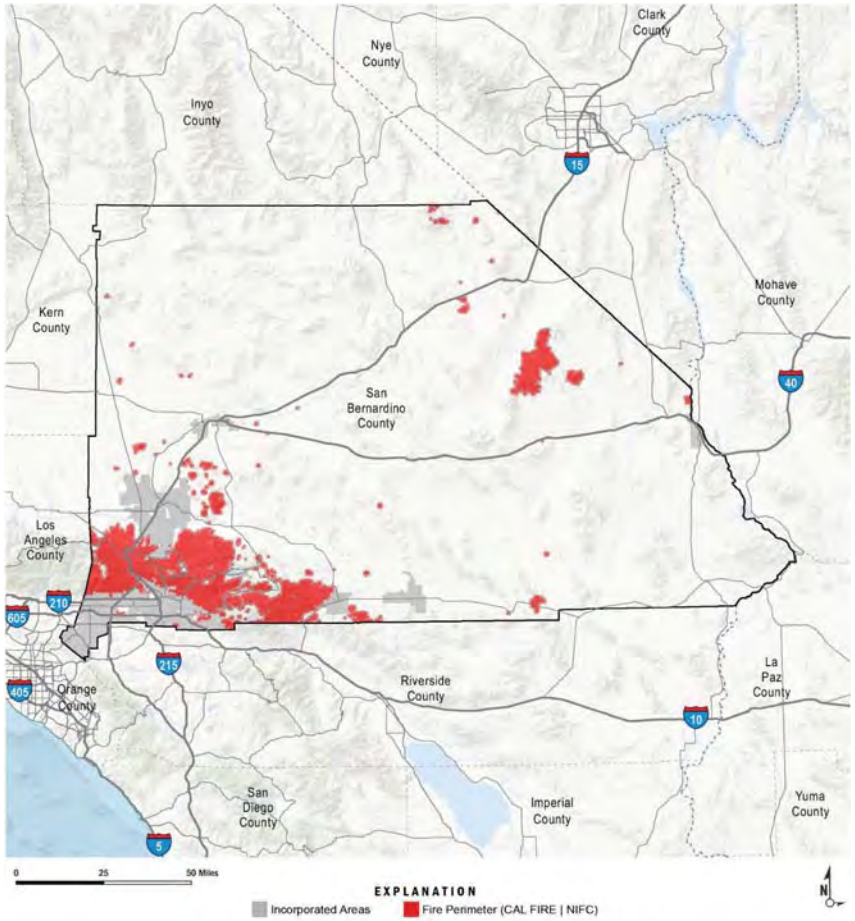


**Figure 4-6: Wildfire History 1900 – 2016 (CalFire and USFS Data 2010)**





The 2016 Blue Cut Fire was a reminder that wildfires are a significant threat to lives and property in the unincorporated San Bernardino County area. The Blue Cut Fire burned 36,274 acres, destroying an estimated 105 single family residences and 216 outbuildings. In addition, 3 single family residences and 5 other structures were damaged.

In 2015 The Lake Fire burned 31,359 acres and was the cause of 6 minor firefighter injuries and 1 residence and 3 outbuildings were destroyed.

North Fire/Pines Fire in 2015 burned a total of 4,250 acres, destroying 7 homes, 16 outbuildings and 44 vehicles in the community of Baldy Mesa. No injuries were reported.

The Blue Cut Fire, Lake Fire, and North Fire/ Pines Fire all occurred in the County's mapped Very High Fire Severity Zone. Mitigation efforts have reduced but not eliminated the threat from wildfire. The strong fall winds that are capable of creating firestorms cannot be controlled. Drought cannot be controlled. Fuels reduction programs reduce the potential spread of fire, upgraded Building Codes make structures more fire resistant, and public education prepares residents for wildfires. However, the threat of wildfire remains. The continuing goal is to reduce the threat from wildfire wherever possible.

### 4.4.3 Location/Geographic Extent

Using information from the California Department of Forestry (CAL FIRE) Figure 4-8, illustrates the areas at risk to a wildfire event. The areas with the highest risk of wildfire are the in the southwestern portions of County in the mountainous region.

Figure 4-7 illustrates vegetation mortality due to bark beetle infestation, drought, and other factors in San Bernardino County. These conditions create extreme fire hazards.

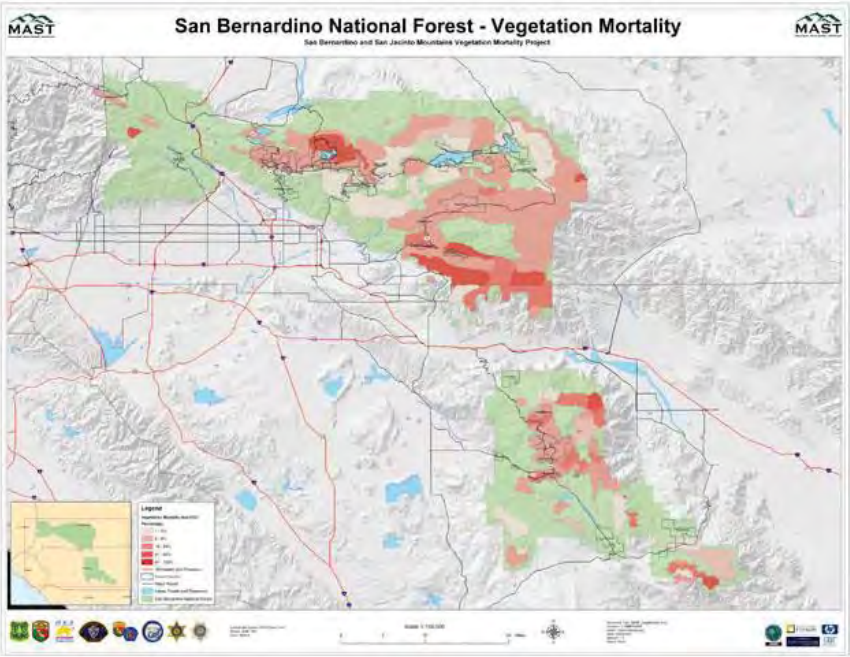


Figure 4-7: San Bernardino National Forest – Vegetation Mortality





### 4.4.4 Magnitude/Severity

Fire Severity Zones are used in determining additional protective measures required when building new structures or remodeling older structures within the particular zone. Additional measures must be taken on the property around a structure in the higher ranked fire Severity Zones.

CAL FIRE adopted Fire Hazard Severity Zone maps for LRA in June 2008. The Fire Severity Zones for County identifies areas of Very High, High, and Moderate fire hazard severity throughout the County and are mapped in Figure 4-8.

Fire Severity Zones are used in determining additional protective measures required when building new structures or remodeling older structures within the particular zone. Additional measures must be taken on the property around a structure in the higher ranked fire Severity Zones.

Fire hazard mapping is a way to measure the physical fire behavior to predict the damage a fire is likely to cause. Fire hazard measurement includes vegetative fuels, probability of speed at which a wildfire moves the amount of heat the fire produces, and most importantly, the burning fire brands that the fire sends ahead of the flaming front.

The model used to develop the information in accounts for topography, especially the steepness of the slopes (fires burn faster as they burn up-slope.). Weather (temperature, humidity, and wind) also has a significant influence on fire behavior. The areas depicted as moderate and high in are of particular concern and potential fire risk in these are constantly increasing as human development, and the wildland urban interface areas expand.

### 4.4.5 Frequency/Probability of Future Occurrences

In San Bernardino County, wildfire season commences in the summer when temperatures are high, humidity is low, and conditions remain dry. The season continues into the fall, when the County experiences high velocity, very dry winds coming out of the desert. A statewide drought beginning in 2011 has caused the state to be the driest it's been since record keeping began back in 1895 (California 2016). This has caused extremely dry conditions in unincorporated areas of the County creating plentiful fuel sources for wildfires.

USGS LANDFIRE (Landscape Fire and Resource Management Planning Tools), is a shared program between the wildland fire management programs of the U.S. Department of Agriculture Forest Service and U.S. Department of the Interior, providing landscape scale geo-spatial products to support cross-boundary planning, management, and operations. Historical fire regimes, intervals, and vegetation conditions are mapped using the Vegetation Dynamics Development Tool (VDDT). This USGS data supports fire and landscape management planning goals in the National Cohesive Wildland Fire Management Strategy, the Federal Wildland Fire Management Policy, and the Healthy Forests Restoration Act.

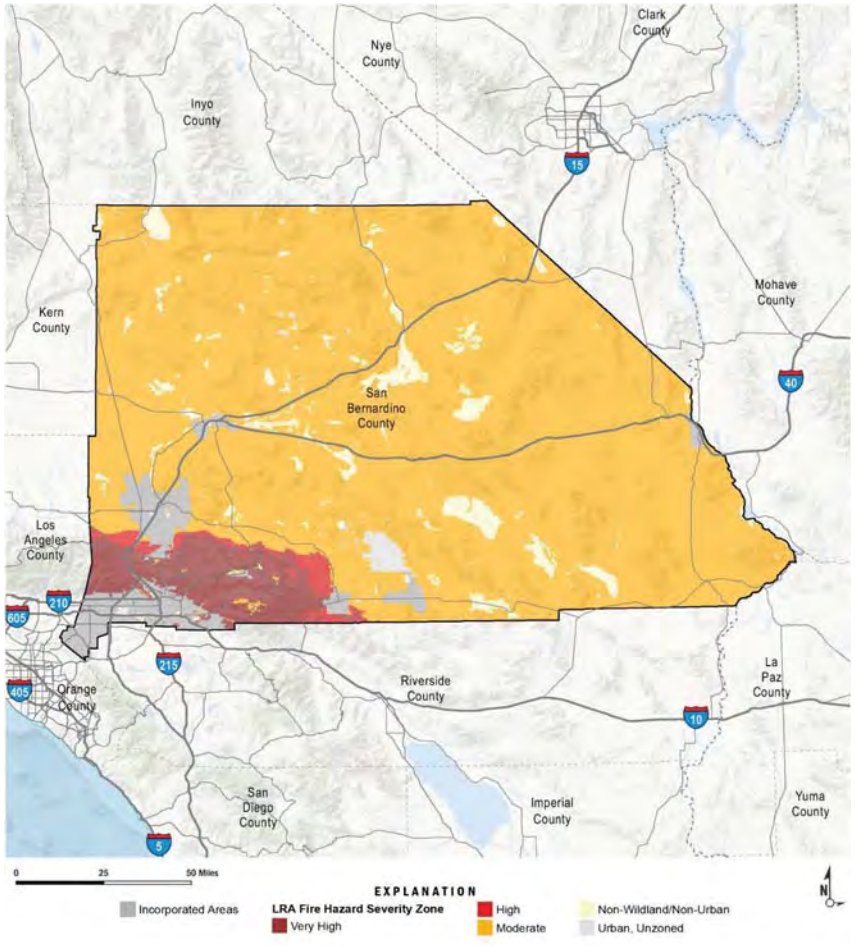


Figure 4-8: Fire Hazard Severity Zone





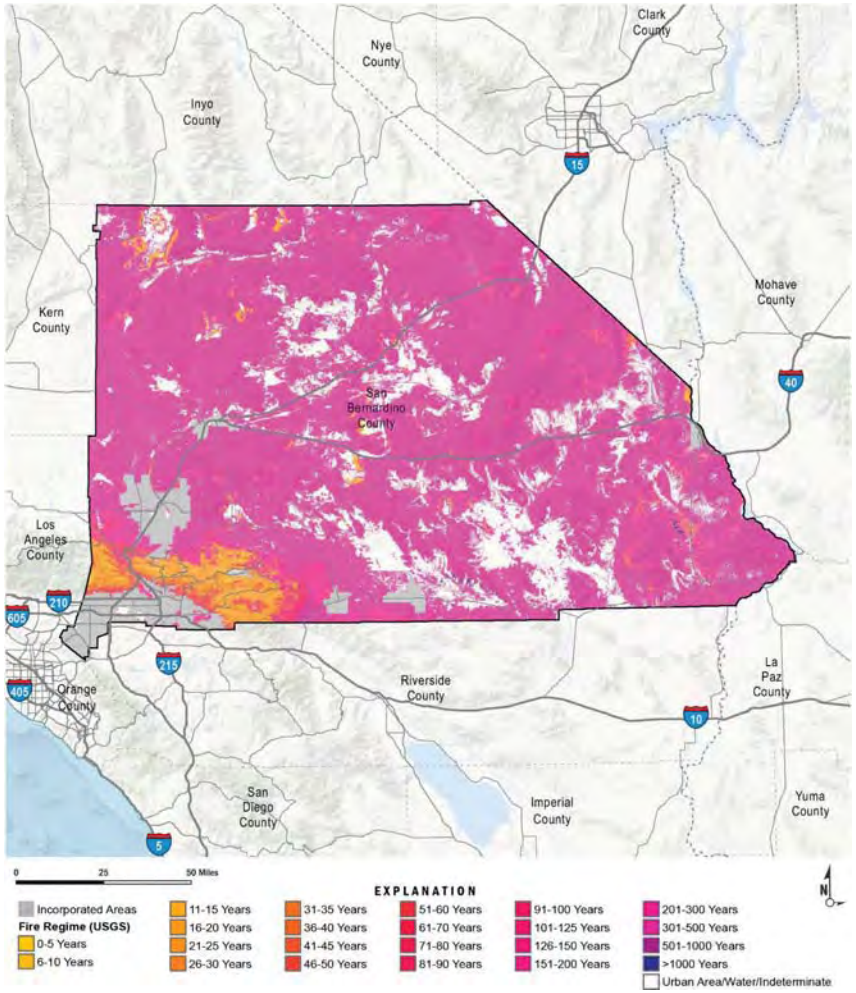


Figure 4-9: USGS Mean Fire Return Interval Map

As part of the USGS Landfire data sets, the Mean Fire Return Interval (MFRI) layer quantifies the average period between fires under the presumed historical fire regime. MFRI is intended to describe one component of historical fire regime characteristics in the context of the broader historical time period represented by the LANDFIRE Biophysical Settings (BPS) layer and BPS Model documentation.

MFRI is derived from the vegetation and disturbance dynamics model VDDT (Vegetation Dynamics Development Tool) (LF_1.0.0 CONUS only used the vegetation and disturbance dynamics model LANDSUM). This layer is created by linking the BpS Group attribute in the BpS layer with the Refresh Model Tracker (RMT) data and assigning the MFRI attribute. This geospatial product should display a reasonable approximation of MFRI, as documented in the RMT. See Figure 4-9 for predicted fire return interval for the jurisdictional area.





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## 4.5 Flood

Floods are the second most common and widespread of all natural disasters faced by the County and its Special Districts. Most communities in the United States have experienced some kind of flooding during or after spring rains, heavy thunderstorms, winter snow thaws, or summer thunderstorms.

A flood, as defined by the National Flood Insurance Program is: "A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is the policyholder's property) from:

- Overflow of inland or tidal waters, or
- Unusual and rapid accumulation or runoff of surface waters from any source, or
- Mudflow, or
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels."

Floods can be slow or fast rising but generally develop over a period of hours or days. Mitigation includes any activities that prevent an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Investing in mitigation measures now, such as: engaging in floodplain management activities, constructing barriers such as levees, and purchasing flood insurance will help reduce the amount of structural damage to structures and financial loss from building and crop damage should a flood or flash flood occur.

The standard for flooding is the 1% annual chance flood, commonly called the 100-year flood, the benchmark used by the Federal Emergency Management Agency (FEMA) to establish a standard of flood control in communities throughout the country. The 1% annual chance flood is also referred to as the base flood.

The 1% annual chance flood is the flood that has a 1% chance of being equaled or exceeded in any given year and it could occur more than once in a relatively short period of time. By comparison, the 10% flood (10-year flood) means that there is a 10% chance for a flood of its size to occur in any given year.





### 4.5.1 Regulatory Environmental

#### 4.5.1.1 County of San Bernardino 2007 Development Code and Zoning Ordinances

One of the purposes of this Development Code is to create a comprehensive and stable pattern of land uses upon which to plan drainage/flood control and other public facilities and utilities. The follow chapters of the development code address floodways, flood control and development near such:

Chapter 82.14 Flood Plain Safety (FP) Overlay
Chapter 85.07 Flood Hazard Development Review
Chapter 86.04 Flood Plain Management Administrator

The County has also adopted Zoning Ordinances that are not part of the County Code but are part of the General Plan. These ordinances regulate land use; map the official land use and hazard overlay districts to include safety hazard and environmental protection areas.

#### 4.5.1.2 National Flood Insurance Program

The National Flood Insurance Program (NFIP) makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. As a participating member of the NFIP, San Bernardino County is dedicated to protecting homes with more than 1,000 policies currently in force. Like most communities participating in NFIP, FEMA has prepared a detailed Flood Insurance Study (FIS) for areas of San Bernardino County. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance of flood (the 100-year flood) and the 0.2-percent annual chance of flood (the 500-year flood). Base flood elevations and the boundaries of the 100 and 500 year floodplains are shown on the Flood Insurance Rate Maps (FIRM). More information on location and geographic extent of the FIRMs are provided in this section.
The County of San Bernardino entered the regular phase of the NFIP on September 09, 1978; in 2016 the County Floodplain Administrator is Marlene Mioyshi. As a participant in the NFIP, San Bernardino County is dedicated to regulating development in the FEMA regulated floodplain areas in accordance with NFIP criteria. Before a permit to build in a floodplain area is issued, San Bernardino County ensures that two basic criteria are met:

- All new buildings and developments undergoing substantial improvements must, at a minimum, be elevated to protect against damage by the 100-year flood.
- New floodplain developments must not aggravate existing flood problems or increase damage to other properties.

Structures permitted or built in the County/City before the NFIP regulatory requirements were incorporated into the San Bernardino County ordinances (before the effective date of the San Bernardino County FIRM) are called "pre-FIRM" structures. For the San Bernardino County, pre-FIRM structures are those permitted or built before September 09, 1978

Extensive FEMA NFIP databases are used to track claims for every participating community including San Bernardino County. NFIP insurance data provided by FEMA indicates that as of September 02, 2016, there were 1,772 policies in San Bernardino County, resulting in $403,874,500 of insurance in force; this amounts to $1,758,534 in total premiums. Of the 1,772 policies, only 1,070 are for structures located within the 1% annual chance flood zones, while the remaining 701 policies are for structures located outside of the FEMA identified floodplain.

Based on this analysis of insurance coverage, San Bernardino County has significant assets at risk to the 100-year flood. Of the 3,426 improved parcels within the 100-year floodplain, only 1,070 of those parcels maintain flood insurance[1]. That means approximately 2,356 improved parcels are without flood insurance in high risk areas according to FEMA. This condition could exist for a number of different reasons. Ground floor elevations are one foot above the 100-year floodplain and home owners and business that wish not to purchase floodplain insurance (non-federally backed loans, home with no mortgage, homes that are "grandfathered" into the NFIP). The 2,356 uninsured structures located in mapped floodplain areas are especially vulnerable.

Currently, San Bernardino County contains 12 Repetitive Loss (RL) properties under their jurisdictional umbrella. The total dollar amount of claims paid to date by the NFIP is $2,606,098. San Bernardino County also contains zero (0) Severe Repetitive Loss (SRL) structure.

Most of the RL properties that have experienced flooding are in the High Desert and Mountain areas of San Bernardino County are due to debris flow in localized areas. Every loss claim is seasonal in nature as all loss claims have been in December, January or February. Some mitigation on these properties has been conducted and San Bernardino County is currently tracking mitigation actions through standardized forms as required by FEMA.

***NOTE: A property does not have to be currently carrying a flood insurance policy to be considered a RL or SRL property. Often homes in communities are not carrying flood insurance but are still on the community's repetitive loss list. The "repetitive loss" designation follows a property from owner to owner; from insurance policy to no insurance policy, and even after the property has been mitigated. Having an insurance policy and making claims that fall into the repetitive loss criteria will put a property on the RL list. Even after the policy on a property has lapsed or been terminated, the property will remain on San Bernardino County RL list.***

***NOTE: The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.***
***For more information on California Regulation and the NFIP, please see California's Department of Water Resources Quick Guide here: http://www.water.ca.gov/floodmgmt/lrafmo/fmb/docs/CAQG-screen.pdf***

### 4.5.2 Past Occurrences

Severe weather events leading to flooding are listed in Table 4-7; several major events are discussed below.

[1] An improved property owner may not carry flood insurance for a number of reasons; not everyone is required to carry flood insurance. Structures carrying federally-backed mortgages that are in a SFHA are required to carry flood insurance in the County of San Bernardino. Owners who have completed the terms of the mortgage or who purchased their property outright may not choose to carry flood insurance and instead bear the costs of recovery on their own.





**Table 4-7: Severe Weather Events 2010-Present**

| Date | Type |
|---|---|
| 1/18/2010 | January 2010 Winter Storms |
| 12/17/2010 | Highland Flooding Incident |
| 8/25/2013 | Flooding- Remnants of Tropical Storm Ivo |
| 11/21/2013 | Winter Storms |
| 2/28/2014 | Winter Storm |
| 8/3/2014 | Thunderstorms, heavy rain, flash flooding, mudslides |
| 7/6/2015 | Flash flooding resulting from Lake Fire |
| 7/30/2015 | Severe Thunderstorms |
| 1/6/2016 | Strong rain, flooding and mudslides |
| 8/22/16 | Flash flooding from storm system |

### 4.5.3 Location/Geographic Extent

Table 4-8 shows the number of acres and square miles that lie in flood hazard areas within the County. Figure 4-10 provides flood hazard data for San Bernardino County as mapped in FEMA's National Flood Hazard Layer for California (April, 2010). Mapped areas include areas subject to inundation by the 1% Annual Chance Flood (also referred to as the 100-year flood), and areas subject to inundation in the 0.2% Annual Chance Flood (500-year flood).

**Table 4-8: San Bernardino County Flood Hazard Area**

| Flood Hazard Type | Sum of Acres | Sum of Square Miles |
|---|---|---|
| 100-Year Flood | 65,209 | 101.89 |
| 100-Year, Floodway | 13,968 | 21.83 |
| 500-Year Flood | 13,838 | 21.62 |
| 500-Year, Protected by Levee | 4,336 | 7 |
| **Total** | **97,351** | **152.11** |

Table 4-9 shows a land use compatibility chart for 100 year flood plains.

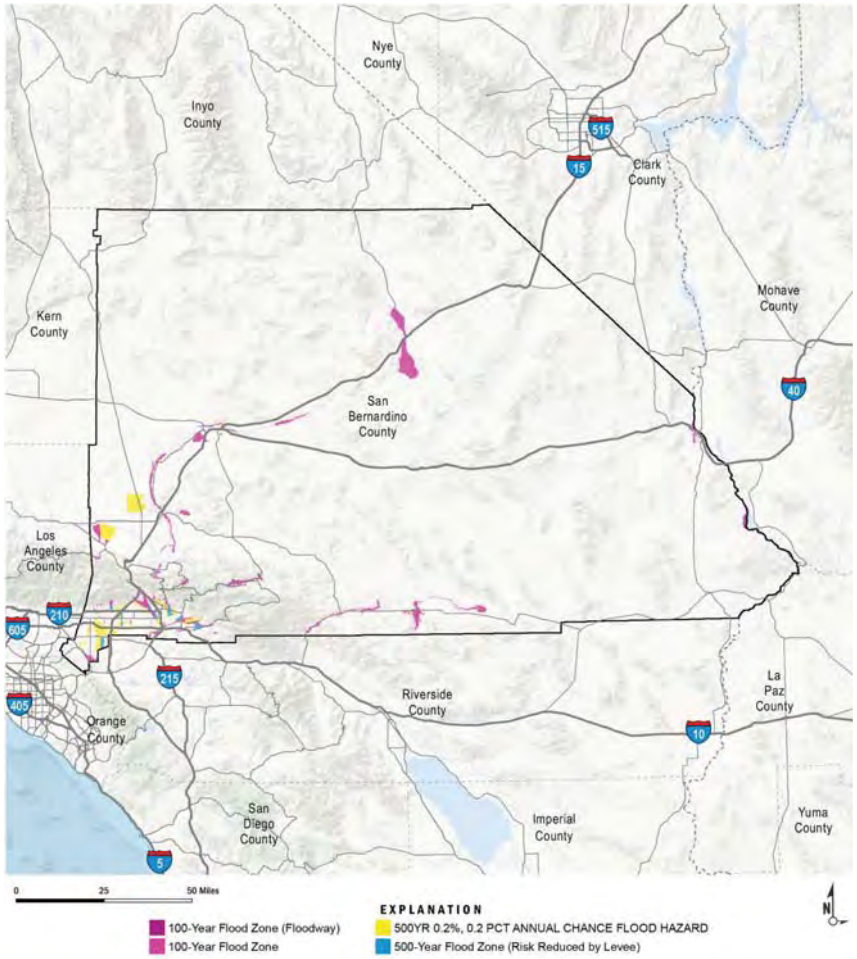


**Figure 4-10: Flood Hazard Severity Zone Map**





**Table 4-9: Land Use Compatibility Chart for 100 Year Flood Plains (General Plan Table S-1)**

| Land Uses | Compatibility in 100-Year Floodplains |
|---|---|
| **Critical**<br>Nuclear related systems; explosives or hazardous materials/ manufacturing, handling or storage; hospitals and other emergency medical facilities. | Restricted |
| **Essential**<br>Police, fire and communications systems; Emergency Operations Centers (EOC's); electric power inter-tie systems; power plants; utility substations; sewage treatment plants; water-works; local gas and electric distribution lines; aqueducts; major pipelines; major highways, bridges and tunnels; ambulance services; public assembly sites with 300 or more capacity; schools. | Restricted |
| **High Occupancy**<br>Multi-family residential of 20 or more units; major commercial including large shopping centers; office buildings; large hotels; health care clinics and convalescent homes; heavy industry; gas stations. | Generally Incompatible |
| Normal-Low Risk<br>Single-family and two-family residential; multi-family of less than 20 units; small scale commercial; small hotels, motels; light industry; warehousing. | Generally Incompatible |

*Restricted unless alternative sites are not available or feasible and it is demonstrated that, although mitigation may be difficult, hazards will be adequately mitigated. Generally Incompatible Restricted unless site investigation demonstrates that site is suitable or that hazards will be adequately mitigated.*

## 4.5.4 Magnitude/Severity

### 4.5.4.1 Flash Flooding

Flash flooding tends to occur in the summer and early fall because of the monsoon rains and is typified by increased humidity and high summer temperatures.

The desert area contains many mountain ranges that are steep and experience summer thunder storms causing flash floods in many dry washes on the desert floor. The water collects in dry lake beds throughout the desert area.

Environmental permit processing has delayed or prohibited work in the washes to provide flow lines to many bridges on county highways. Many highways do not have bridges but convey water across the road with dip crossings. Flash flooding cause's road and bridge wash outs and erosion of earthen channels and basins when they occur near these facilities.

Cities and towns often experience street closures for several days due to sediment transport and road damage. Because of the sheet flow character of the desert, many private properties experience erosion and sediment deposits. The urban valley also can experience flash flooding in its narrow canyons and within the many unimproved creeks and interim channels feeding the Santa Ana River. The valley floor in many areas is very flat so even minor rain events can produce flooding of roads and private property. In coordination with local jurisdictions, the County of San Bernardino Flood Control District has prepared Master Drainage plans for many cities and towns to provide a plan for reducing flooding due to minor storms. Maps can be found on the County's Department of Public Works website here:
http://cms.sbcounty.gov/dpw/FloodControl/Planning/MPD.aspx

However, local resources are not sufficient to cover the cost of the construction of the drainage systems. The densely populated (75% of the county population) urban valley region contains the headwaters of the Santa Ana River. The San Gabriel and San Bernardino Mountains border the North side of the valley are steep reaching 5,000 feet with alluvial fans which are developed and densely populated.

### 4.5.5 Frequency/Probability of Future Occurrences

The Flood Insurance Rate Map (FIRM) not only identifies the flood hazard zones for insurance and floodplain management purposes, but also provides a statement of probability of future occurrence.

A 500-year flood has a 0.2-percent chance of occurring in any given year; a 100-year flood has a 1-percent chance, a 50-year flood has a 2-percent chance, and a 10-year flood has a 10-percent chance of occurrence. Although the recurrence interval represents the long-term average period between floods of specific magnitude, significant floods could occur at shorter intervals or even within the same year. The FIRM maps typically identify components of the 500-year and 100-year floodplains





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## 4.6 Drought

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. Drought severity depends on numerous factors, including duration, intensity, and geographic extent, as well as regional water supply demands by humans and vegetation. The severity of drought can be aggravated by other climatic factors, such as prolonged high winds and low relative humidity.

Drought originates from a deficiency of precipitation over an extended period, usually one or more seasons. Drought can result in a water shortage for some activity, group, or environmental sector. Drought is a complex natural hazard, which is reflected in the following four definitions commonly used to describe it:

- Agricultural – drought is defined principally in terms of naturally occurring soil moisture deficiencies relative to water demands of plant life, usually arid crops.
- Hydrological – drought is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- Meteorological – drought is defined solely on the degree of dryness, expressed as a departure of actual precipitation from an expected average or normal amount based on monthly, seasonal, or annual time scales.
- Socioeconomic – drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather-related supply shortfall. It may also be called a water management drought.

Although climate is a primary contributor to hydrological drought, other factors such as changes in land use (e.g., deforestation), land degradation, and the construction of dams all affect the hydrological characteristics of the basin. Since regions are interconnected by hydrologic systems, the impact of meteorological drought may extend well beyond the borders of the precipitation-deficient area. Similarly, changes in land use upstream may alter hydrologic characteristics such as infiltration and runoff rates, resulting in more variable streamflow and a higher incidence of hydrologic drought downstream. Land use change is one of the ways human actions alter the frequency of water shortage even when no change in the frequency of meteorological drought has been observed.





### 4.6.1 Regulatory Environment

The County and participating jurisdictions have a number of regulatory requirements and documents to address planning for drought in the County. This includes Watershed Water Quality Management Plans (WQMP) for San Bernardino County and the Mojave and Santa Ana Watersheds. On June 21st, 2013, the Executive Officer approved the revised Technical Guidance Document for Water Quality Management Plan (TGD-WQMP).

The 1972 Federal Water Pollution Control Act, also known as the Clean Water Act (CWA) provides the basis for the protection of all inland surface waters, estuaries, and coastal waters. California's Porter-Cologne Water Quality Control Act of 1970 established the Regional Water Quality Control Board as the agency responsible for implementing the CWA and Porter-Cologne requirements in the Santa Ana Watershed.

In 2006, California State lawmakers adopted AB 1881. This provided guidelines and timelines for the revision of the State's Model Water Efficient Landscape Ordinance (MWELO) and mandated that every city, county or other agency within the State adopt MWELO or be in compliance with it through their own ordinance by January 2010. On January 1, 2010 the San Bernardino County Water Efficient Landscape Ordinance was implemented. It can be obtained on the county website.

#### 4.6.1.1 Watershed Water Quality Management Plan

San Bernardino County's WQMP draft was written in 2013 and final approval was given on June 21, 2013.

#### 4.6.1.2 Technical Guidance Document for Water Quality Management Plan (TGD-WQMP)

Approved on June 21, 2013, this document provides direction to project proponents on the regulatory requirements applicable to a private or public development activity, including public works transportation projects, from project conception to completion.

### 4.6.2 Past Occurrences

- The 2013 California State MHMP states that from 1950 to 2012, there has been eight-drought State Emergency Proclamations in California. Specifically for San Bernardino County, there have been six drought events since 1896. Previous occurrences of drought are described as follows:

- **1975 to 1977:** California experienced the two driest years (1976 and 1977) in the State's history in 1976 and 1977. The drought was declared an Emergency (FEMA-EM-3023) on January 20, 1977. Total crop damages statewide totaled $2.67 billion dollars for both years ($888.5 million in 1976 and $1.8 billion in 1977).

- **2006 to 2009:** A California State-declared three-year drought of below-average rainfall, low snowmelt runoff, and the largest court-ordered water restricting in state's history. The dry conditions damaged crops, deteriorated water quality, and caused extreme wildfire danger. Approximately $300 million in agricultural revenue loss, and a potential $3 billion in economic losses over time.

- **2012 to 2016:** San Bernardino County first declared a local drought emergency in 2014. As of May 23rd, 2016, San Bernardino County and the City of Rancho Cucamonga had both submitted local Emergency Proclamations. This ongoing drought is the most severe drought in over 100 years. In order to abide by the State Water Resources Control Board's mandatory water reductions, the San Bernardino Municipal Water Department Board of Water Commissioners authorized implementation of Stage IIA of the department's Water Supply Contingency Plan on June 1, 2015. The State Water Board will adjust emergency water conservation regulations through the end of January 2017, in recognition of the differing water supply conditions across the state, and develop proposed emergency water restrictions for 2017 if the drought persists.

Additional information about previous occurrences of droughts in California (in general) can be obtained from the California DWR.

### 4.6.3 Location/Geographic Extent

Drought can affect the County, region, and the State of California as a whole. The County's primary source of water is imported by the San Bernardino Valley Municipal Water District (http://www.sbvmwd.com/about-us/what-we-do) through participation in the State Water Project (SWP). It is received at the Devil Canyon Power Plant Afterbay. This supply is supplemented by groundwater basins in the County. Drought has no defined geographical boundaries and cannot be depicted in map form. As such, the entire County is subject to drought.

### 4.6.4 Magnitude/Severity

The magnitude of drought is usually measured in time and the severity of the hydrologic deficit. There are several resources available to evaluate drought status and estimate future expected conditions. The National Integrated Drought Information System (NIDIS) Act of 2006 (Public Law 109-430) prescribes an interagency approach for drought monitoring, forecasting, and early warning. The NIDIS maintains the U.S. Drought Portal (www.drought.gov) which is a web-based





access point to several drought related resources. Resources include the U.S. Drought Monitor (USDM) and the U.S. Seasonal Drought Outlook (USSDO).

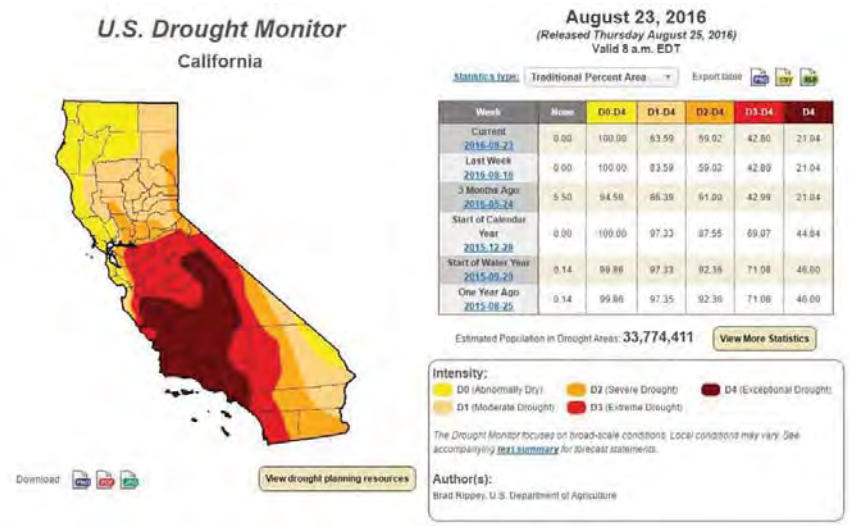


**Figure 4-11: US Drought Monitor Map for the State of California on August 23, 2016**

The USDM provides a summary of drought conditions across the United States and Puerto Rico and is developed and maintained by the National Drought Mitigation Center (www.drought.unl.edu). USDM includes the U.S. Drought Monitor Map. This map is updated weekly by combining a variety of drought database and indicators, and local expert input into a single composite drought indicator. The map denotes four levels of drought intensity (ranging from D1 - D4) and one level of "abnormal dryness" (D0). In addition, the map depicts areas experiencing agricultural (A) or hydrological (H) drought impacts. These impact indicators help communicate whether short or long-term precipitation deficits are occurring. An example Drought Monitor Map for the State of California for August 23, 2016 is illustrated in Figure 4-11.

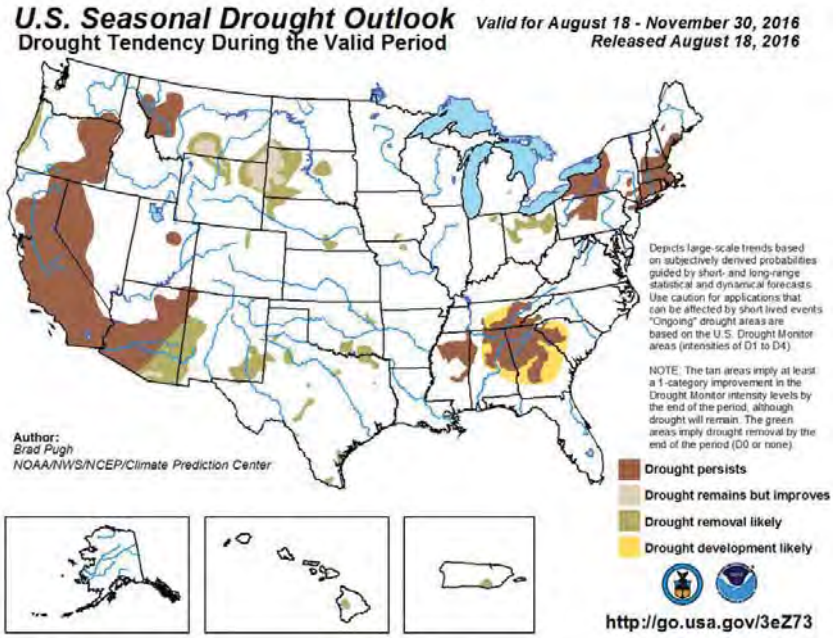


**Figure 4-12: USSDO Drought Tendency Map (Valid August 18-November 30, 2016**

For western States with mountainous terrain and complex regional microclimates, it is also useful to supplement the PDSI values with other indices such as Surface Water Supply Index and Standardized Precipitation Index (SPI). The Surface Water Supply Index takes snowpack and other unique conditions into account. The National Drought Mitigation Center (NDMC) uses the SPI to identify emerging drought months sooner than the PDSI. It is computed on various time scales to monitor moisture supply conditions. The SPI is the number of standard deviations that precipitation value would deviate from the long-term mean. As shown in Figure 4-13 the 72-month SPI through the end of August 2016 for San Bernardino County is low.





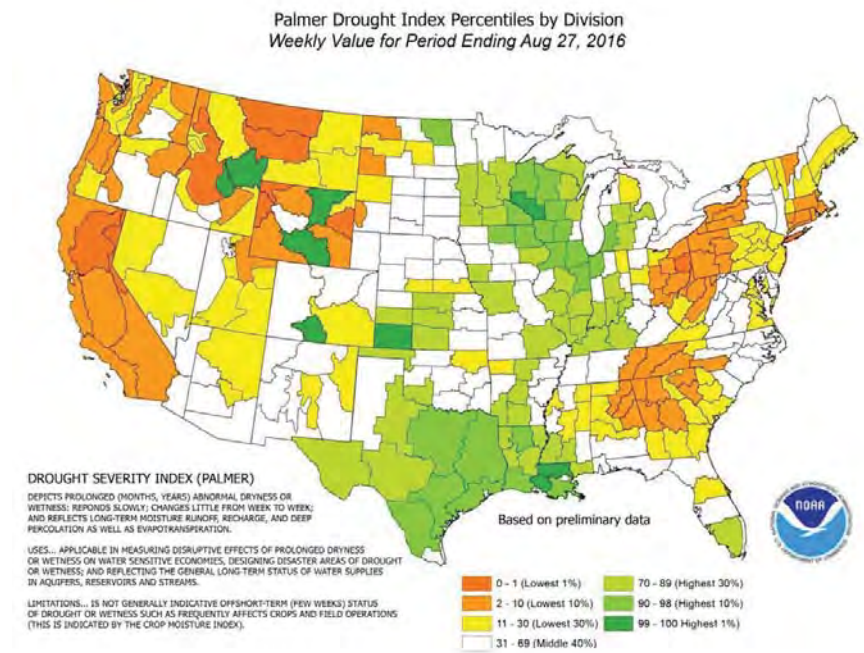


**Figure 4-13: Month SPI through the end of August 2016 for San Bernardino County**

A number of indices measure how much precipitation for a given period has deviated from historically established norms. The primary indicator for the USDM and USSDO for the western United States is the Palmer Drought Severity Index (PDSI). The PDSI is widely used by the USDA to determine when to grant emergency drought assistance to affected areas. PDSI is a commonly used index that measures the severity of drought for agriculture and water resource management. It is calculated from observed temperature and precipitation values and estimates soil moisture. However, the PDSI is not considered consistent enough to characterize the risk of drought on a nationwide basis (FEMA, 1997) and is not well suited to the dry, mountainous areas in the western U.S.

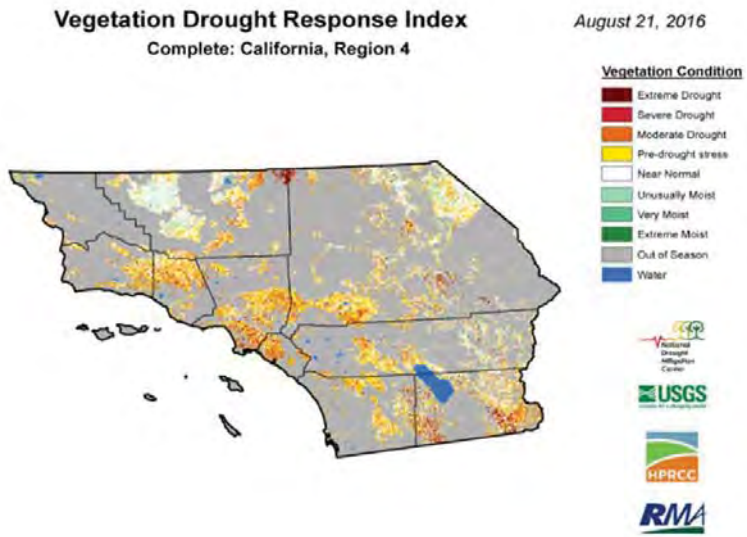


**Figure 4-14: Vegetation Drought Response Index – California Region 4 for August 21, 2016**

The Vegetation Drought Response Index, or VegDRI, is a bi-weekly depiction of vegetation stress across the contiguous United States. VegDRI is a fine resolution (1-km$^2$) index based on remote sensing data, and incorporates climate and biophysical data to determine the cause of vegetation stress. Development of the VegDRI map and associated products is a joint effort by the National Drought Mitigation Center (NDMC), the U.S. Geological Survey's (USGS) National Center for Earth Resources Observation and Science (EROS), and the High Plains Regional Climate Center (HPRCC). Figure 4-14 illustrates the VegDRI results for Southern California for August 21, 2016.

### 4.6.5 Frequency/Probability of Future Occurrences

Currently there is no data on the probability of drought that would be comparable to the USGS effort on earthquakes in the region, or how 100-year flood maps are created.





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## 4.7 Terrorism

This section was added due to the December 2, 2015 terror attack in San Bernardino County. There is no single, universally accepted definition of terrorism; however, FEMA defines "terrorism" as intentional, criminal, malicious acts. FEMA document 386-7 refers to terrorism specifically as the use of Weapons of Mass Destruction (WMD), including biological, chemical, nuclear, and radiological weapons; arson, incendiary, explosive, and armed attacks; industrial sabotage and intentional hazardous materials releases; and "cyberterrorism."

FEMA developed the Integrated Emergency Management System (IEMS) using an all-hazards approach. While the IEMS was established as an "all-hazard" approach, responding to the threat of terrorism (referred to as counterterrorism) came to be viewed as the responsibility of law enforcement, defense, and intelligence agencies. Furthermore, defensive efforts to protect people and facilities from terrorism (referred to as antiterrorism) were generally limited to the government sector, the military, and some industrial interests.

While the term "mitigation" refers generally to activities that reduce loss of life and property by eliminating or reducing the effects of disasters, in the terrorism context it is often interpreted to include a wide variety of preparedness and response actions. For the purposes of this document, the traditional meaning will be assumed; that mitigation refers to specific actions that can be taken to reduce loss of life and property from manmade hazards by "modifying the built environment" or antiterrorism to reduce the risk and potential consequences of these hazards.

### 4.7.1 Antiterrorism Regulatory Environment

Adopted on February 9, 2012 and updated on October 1, 2013, United Facilities Criteria (UFC) 4-010-01 defines the United States Department of Defense's (DoD) minimum antiterrorism standards for both new and existing buildings. The document applies to DoD buildings, National Guard buildings, visitor centers and museums, visitor control facilities and expeditionary structures. Historic preservation compliance for implementation of anti-terrorism standards, philosophy, design strategies and assumptions are all taken into account. Site planning, structural design, architectural design, and electrical and mechanical design are discussed in detail in Appendix B.
https://www.fema.gov/news-release/2004/01/13/dhs-announces-new-building-science-guidelines-enhance-terrorism-resistance





### 4.7.2 Counterterrorism Regulatory Environment

After the 12/2/15 mass shooting, two full time positions with a regional FBI-led terrorist task force (FBI's Joint Terrorism Task Force) were created. These task force officers have the clearance to conduct terrorism investigations in the County. The Task Force includes partners from Homeland Security Investigations (HSI), the San Bernardino Police Department, the San Bernardino County Sheriff's Department, the Riverside County Sheriff's Department, the Ontario Police Department, the Riverside Police Department, the Corona Police Department and the Chino Police Department. For more information regarding the positions, contact the San Bernardino Police Department at (909) 384-5742. Read more here: http://www.pe.com/articles/task-789539-force-san.html

The State of California Department of Justice's Anti-terrorism program works with federal, state and local law enforcement agencies to detect, investigate, prosecute, dismantle, prevent and respond to domestic and international terrorist activities. Read more here: https://oag.ca.gov/bi/atp

The State of California Bureau of Security and Investigative Services' Power to Arrest Course includes a Weapons of Mass Destruction (WMD) & Terrorism Awareness section. Read More Here: http://www.bsis.ca.gov/about_us/laws/bsis_regulations.pdf

### 4.7.3 Past Occurrences

There have been two terrorist attacks recorded in San Bernardino County. Table 4-10 describes both attacks.
Source: https://www.start.umd.edu/gtd/search/Results.aspx?search=san+bernardino&sa.x=0&sa.y=0&sa=Search

**Table 4-10: Terrorist Attacks in San Bernardino County**

| Date | Perpetrator Group | Fatalities | Injured | Target Type |
|---|---|---|---|---|
| **3/16/1970** | White Extremists | 0 | 1 | Government (General) |
| **12/2/2015** | Unaffiliated Individuals | 16 | 17 | Government (General) |

The state of California has experienced 574 terrorist attacks from 1970-2011 (Integrated United States Security Database (IUSSD): Data on the Terrorist Attacks in the United States Homeland, 1970-2011 2012). Figure 4-17 shows the types of terrorist attacks in the state of California from 1970 to the present.

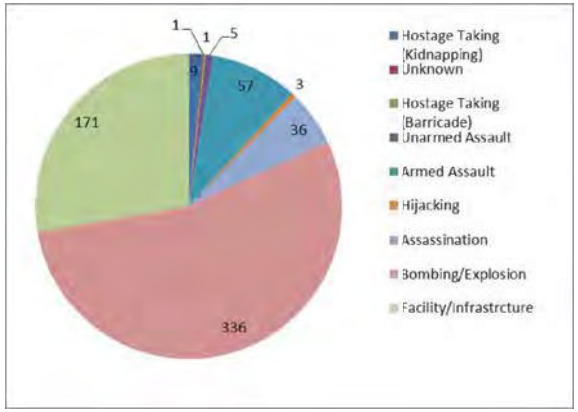


**Figure 4-15: Types of Terrorist Attacks in California from 1970-Present**

As seen in Figure 4-15 since 1970, the number of terrorist attacks in the United States has steadily decreased. According to http://www.heritage.org most terrorist attacks on America happen outside our nation's borders. The number of international terrorist attacks against the United States from 1970-2011 is shown in Figure 4-16 and Figure 4-17.





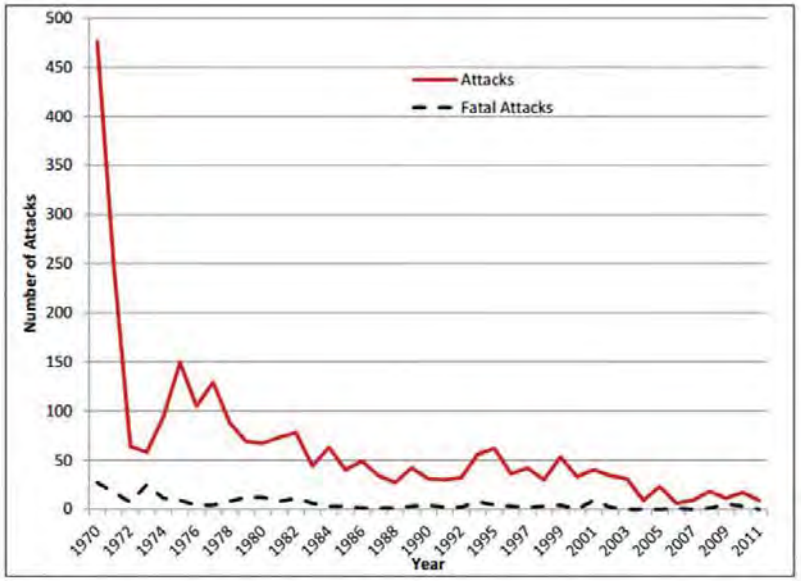


Note: There were 2,608 total attacks and 226 fatal attacks between 1970 and 2011.

**Figure 4-16: Total and Fatal Terrorist Attacks in the United States by Year**

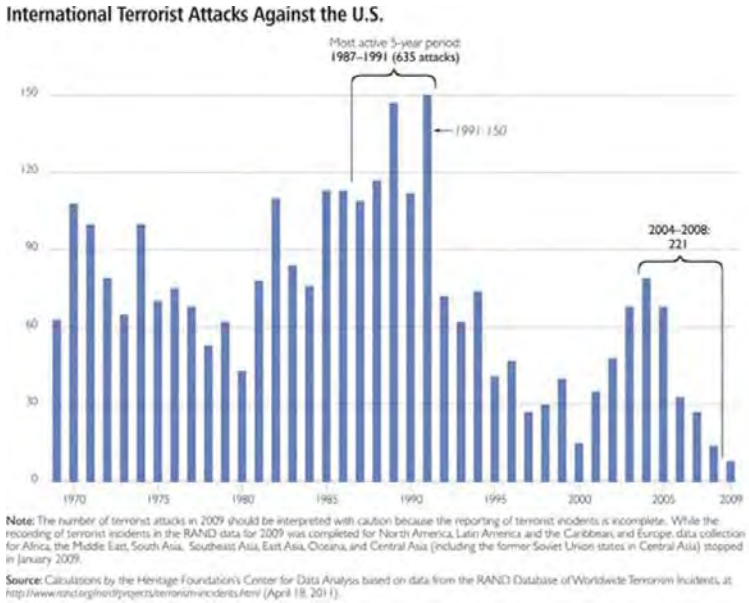


**Figure 4-17: International Terrorist Attacks Against the United States**

### 4.7.4 Location/Geographic Extent

Unlike natural hazards, which often follow patterns and can be forecasted, manmade hazards such as acts of terrorism are much more unpredictable. Terrorists have the ability to choose targets and tactics and can often adjust conditions to achieve their objective. Terrorist attacks are often in a more specific location rather than a widespread, more predictable area such as a flood plain. As demonstrated in the 12/2/15 mass shooting, “homegrown terrorists” (self-radicalizing and pulls off their attacks without any help or communication with people in other countries) are even harder to detect and predict.

Translating most manmade hazard profiles into meaningful geospatial information is difficult at best. Instead, the planning team will use an asset-specific approach, identifying potentially at-risk critical facilities and systems in the community. Once a comprehensive list of assets has been developed, it will be prioritized so that the community’s efforts can be directed to protect the most





important assets first. Then, beginning with the highest priority assets, the vulnerabilities of each facility or system to each type of hazard will be assessed (FEMA 2003).

### 4.7.5 Magnitude/Severity

As previously discussed, predicting terrorist attacks cannot be done with the same level of accuracy as predicting a natural hazard and its potential impacts on the community. However, we can learn from past terrorist incidents. Table 4-11 profiles 10 different types of terrorist attacks and technological hazards.

**Table 4-11: Event Profiles for Terrorism and Technological Hazards**

| Hazard | Application Mode | Hazard Duration | Extent of Effects; Static/Dynamic | Mitigating and Exacerbating Conditions |
|---|---|---|---|---|
| Conventional Bomb/ Improvised Explosive Device | Detonation of explosive device on or near target; delivery via person, vehicle, or projectile. | Instantaneous; additional "secondary devices" may be used, lengthening the time duration of the hazard until the attack site is determined to be clear | Extent of damage is determined by type and quantity of explosive. Effects generally static other than cascading consequences, incremental structural failure, etc. | Overpressure at a given standoff is inversely proportional to the cube of the distance from the blast; thus, each additional increment of standoff provides progressively more protection. Terrain, forestation, structures, etc. can provide shielding by absorbing and/or deflecting energy and debris. Exacerbating conditions include ease of access to target; lack of barriers/shielding; poor construction; and ease of concealment of device |
| Chemical Agent * | Liquid/aerosol contaminants can be dispersed using sprayers or other aerosol generators; liquids vaporizing from puddles/ containers; or munitions. | Chemical agents may pose viable threats for hours to weeks depending on the agent and the conditions in which it exists. | Contamination can be carried out of the initial target area by persons, vehicles, water and wind. Chemicals may be corrosive or otherwise damaging over time if not remediated. | Air temperature can affect evaporation of aerosols. Ground temperature affects evaporation of liquids. Humidity can enlarge aerosol particles, reducing inhalation hazard. Precipitation can dilute and disperse agents but |

| Hazard | Application Mode | Hazard Duration | Extent of Effects; Static/Dynamic | Mitigating and Exacerbating Conditions |
|---|---|---|---|---|
| | | | | can spread contamination. Wind can disperse vapors but also cause target area to be dynamic. The micro-meteorological effects of buildings and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. |
| Arson/ Incendiary Attack | Initiation of fire or explosion on or near target via direct contact or remotely via projectile. | Generally minutes to hours. | Extent of damage is determined by type and quantity of device/ accelerant and materials present at or near target. Effects generally static other than cascading consequences, incremental structural failure, etc. | Mitigation factors include built-in fire detection and protection systems and fire-resistive construction techniques. Inadequate security can allow easy access to target, easy concealment of an incendiary device and undetected initiation of a fire. Non-compliance with fire and building codes as well as failure to maintain existing fire protection systems can substantially increase the effectiveness of a fire weapon. |
| Armed Attack | Tactical assault or sniping from remote location. | Generally minutes to days. | Varies based upon the perpetrators' intent and capabilities | Inadequate security can allow easy access to target, easy concealment of weapons and undetected initiation of an attack. |
| Biological Agent * | Liquid or solid contaminants can be dispersed using sprayers/aerosol generators or by point or line | Biological agents may pose viable threats for hours to years depending on the agent and the | Depending on the agent used and the effectiveness with which it is deployed, contamination can | Altitude of release above ground can affect dispersion; sunlight is destructive to many bacteria and viruses; light to |





| Hazard | Application Mode | Hazard Duration | Extent of Effects; Static/Dynamic | Mitigating and Exacerbating Conditions |
|---|---|---|---|---|
| | sources such as munitions, covert deposits and moving sprayers. | conditions in which it exists | be spread via wind and water. Infection can be spread via human or animal vectors. | moderate wind will disperse agents but higher winds can break up aerosol clouds; the micro-meteorological effects of building and terrain can influence aerosolization and travel of agents. |
| Cyberterrorism | Electronic attack using one computer system against another. | Minutes to days | Generally no direct effects on built environment. | Inadequate security can facilitate access to critical computer systems, allowing them to be used to conduct attacks. |
| Agriterrorism | Direct, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock. | Days to months | Varies by type of incident. Food contamination events may be limited to discrete distribution sites, whereas pests and diseases may spread widely. Generally no effects on built environment. | Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and livestock. |
| Radiological Agent ** | Radioactive contaminants can be dispersed using sprayers/aerosol generators, or by point or line sources such as munitions, covert deposits and moving sprayers. | Contaminants may remain hazardous for seconds to years depending on material used. | Initial effects will be localized to site of attack; depending on meteorological conditions, subsequent behavior of radioactive contaminants may be dynamic. | Duration of exposure, distance from source of radiation, and the amount of shielding between source and target determine exposure to radiation. |
| Nuclear Bomb ** | Detonation of nuclear device underground, at the surface, in the air or at high altitude. | Light/heat flash and blast/shock wave last for seconds; nuclear radiation and fallout hazards can persist for years. Electromagnetic pulse from a high altitude detonation lasts for seconds and affects only | Initial light, heat and blast effects of a subsurface, ground or air burst are static and are determined by the device's characteristics and employment; fallout of radioactive contaminants may | Harmful effects of radiation can be reduced by minimizing the time of exposure. Light, heat and blast energy decrease logarithmically as a function of distance from seat of blast. Terrain, forestation, structures, etc. can provide shielding by |

| Hazard | Application Mode | Hazard Duration | Extent of Effects; Static/Dynamic | Mitigating and Exacerbating Conditions |
|---|---|---|---|---|
| | | unprotected electronic systems. | be dynamic, depending on meteorological conditions. | absorbing and/or deflecting radiation and radioactive contaminants. |
| Hazardous Material Release (fixed facility or transportation) | Solid, liquid and/or gaseous contaminants may be released from fixed or mobile containers. | Hours to days | Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. Contamination may be carried out of the incident area by persons, vehicles, water and wind. | As with chemical weapons, weather conditions will directly affect how the hazard develops. The micro-meteorological effects of building and terrain can alter travel and duration of agents. Shielding in the form of sheltering in place can protect people and property from harmful effects. Non-compliance with fire and building codes as well as failure to maintain existing fire protection and containment features can substantially increase the damage from a hazardous materials release. |

* Source: Jane's Chem-Bio Handbook
** Source: FEMA, Radiological Emergency Management Independent Study Course

### 4.7.6 Frequency/Probability of Future Occurrences

We can usually forecast the type, frequency and location of a natural hazard thanks to the laws of physics and nature. However, when dealing with manmade hazards such as terrorism, we are often dealing with functions of the human mind-malevolence, incompetence, carelessness and other behaviors. These actions cannot be predicted with any accuracy; therefore, there is the potential for an act of terrorism to occur anywhere, at any time.





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## 4.8 Climate Change

Climate change refers to any distinct change in measures of climate lasting for a long period of time, more specifically major changes in temperature, rainfall, snow, or wind patterns. Climate change may be limited to a specific region, or may occur across the whole Earth. Climate change may result from:

- Natural factors (e.g., changes in the Sun's energy or slow changes in the Earth's orbit around the Sun);
- Natural processes within the climate system (e.g., changes in ocean circulation); and
- Human activities that change the atmosphere's make-up (e.g., burning fossil fuels) and the land surface (e.g., cutting down forests, planting trees, building developments in cities and suburbs, etc.).

The effects of climate change are varied: warmer and more varied weather patterns, melting ice caps, and poor air quality, for example. As a result, climate change impacts a number of natural hazards.

The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

### 4.8.1 Regulatory Environment

California's response to climate change is directed by Legislation and Regulations and by other Mandates such as executive orders.

#### 4.8.1.1 The Sustainable Communities and Climate Protection Act of 2008

The Sustainable Communities and Climate Protection Act of 2008 (Sustainable Communities Act, SB 375, Chapter 728, Statutes of 2008) looks to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities. Regional targets are established for GHG emissions reductions from passenger vehicle use by the sustainable communities strategy (SCS) established by each metropolitan planning organization (MPO). The SCS is an integral part of the regional transportation plan (RTP) and contains land use, housing, and transportation strategies to meet GHG reductions targets. In San Bernardino County, the South Coast Air Quality Management District facilitates compliance with the federal Clean Air Act and implements the state's air quality program.





The Office of Planning and Research's General Plan Guidelines and SB 375 builds upon Assembly Bill 162 (flood protection) and Senate Bill 1241 (fire protection) and supports Safeguarding California implementation.

SB 375 also supports Assembly Bill 2140 which requires that a City/County General Plan contains a safety element in addition to a Hazard Mitigation Plan. AB 2140 also requires a vulnerability assessment, adaptation goals, policies and objectives, and a set of feasible implementation measures.

#### 4.8.1.2 California Adaptation Planning Guide (APG)

The State of California has been taking action to address climate change for over 20 years, focusing on both greenhouse gas emissions reduction and adaptation. The California Adaptation Planning Guide (APG) continues the state's effort by providing guidance and support for communities addressing the unavoidable consequences of climate change.

Based on upon specific factors, 11 Climate impact regions were identified. Some of the regions were based on specific factors particularly relevant to the region. As illustrated in Figure 4-18 San Bernardino County is located in the Desert Region.

The Desert is a heavily urbanized inland region (4.3+ million people) made up of sprawling suburban development in the west near the South Coast region and vast stretches of open, largely federally owned desert land to the east. Prominent cities within the desert portion include Palm Springs (44,500+) and El Centro (42,500+). The region's character is defined largely by the San Gabriel Mountains, San Gorgonio Mountains, San Jacinto Mountains, and smaller inland mountains reaching through the desert to the Colorado River, which borders the region on the east. Communities in the Desert region should consider evaluating the following climate change impacts:

- Reduced water supply
- Increased temperature
- Reduced precipitation
- Diminished snowpack
- Wildfire risk
- Public health and social vulnerability
- Stress on special-status species

**Figure 4-18: Climate Impact Regions**

## 4.8.2 Past Occurrences

Climate change has never been directly responsible for any declared disasters. Past flooding, wildfire, levee failure, and drought disasters may have been exacerbated by climate change, but it is impossible to make direct connections to individual disasters. In addition, unlike earthquake and floods that occur over a finite time period, climate change is an on-going hazard the effects of which some are already experiencing. Other effects may not be seriously experienced for decades, or may be avoided altogether by mitigation actions taken today.





## 4.8.3 Location/Geographic Extent

The effects of climate change are not limited by geographical borders. San Bernardino County, the State of California, the United States, and the rest of the world are all at risk to climate change. As such, the entire County is at risk to the effects of climate change.

Figure 4-19 and Figure 4-20 provide Cal Adapt[2] modeled decadal July high temperature averages for 2010 and 2090. These figures provide current decade-long July temperature averages and possible annual high heating trends for the remaining portion of the century. The data presented in the figures represent a “projection” of potential future climate scenarios, they are not predictions. These figures illustrate how the climate may change based on a variety of different potential social and economic factors. The visualizations are comprised of average values from Coupled Climate model 2.1 (GFDL), Community Climate System Model Version 3 (CCSM3), Coupled Global Climate Model Version 3 (CNRM) and Parallel Climate Model 1 (PCM1). During the next few decades, scenarios project average temperature to rise between 1° and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario (A2) are approximately twice as high as those projected in the lower emissions scenario (B1). Customizable maps can be viewed at http://cal-adapt.org/temperature/decadal/

[2] Cal-Adapt has been funded to provide access to data and information that has been produced by the State's scientific and research community. The data available in this site offer a view of how climate change might affect California at the local level.

Figure 4-19: July Decadal Average High Temperature Map; 2010

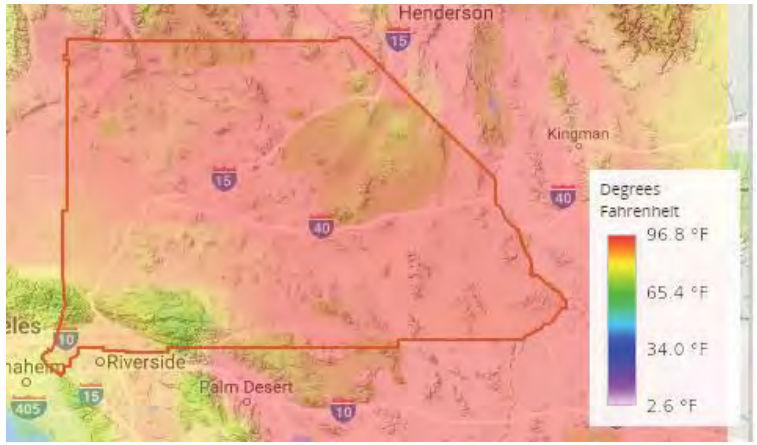


Figure 4-20: July Decadal Average High Temperature Map; 2090





### 4.8.4 Magnitude/Severity

The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat, as shown in Figure 4-21: California Historical and Projected Temperature Increases 1961 to 2099

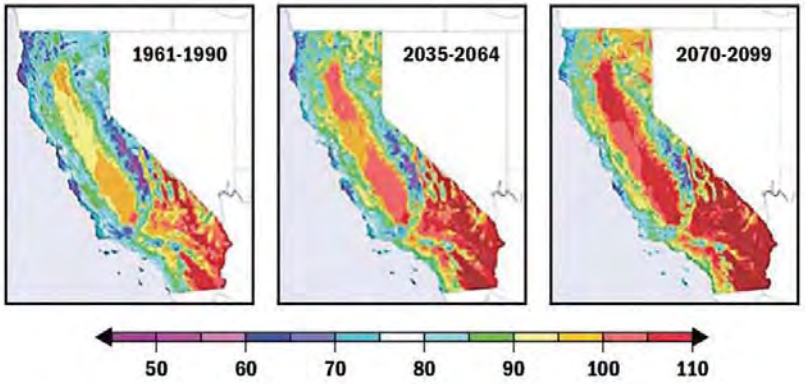


Figure 4-21: California Historical and Projected Temperature increases 1961-2099

*Source: Dan Cayan; California Climate Adaptation Strategy*

### 4.8.5 Frequency/Probability of Future Occurrences

According to the ABAG 2010 Local Hazard Mitigation Plan (LHMP), climate change is one of the few natural hazards where the probability of occurrence is influenced by human action. In addition, unlike earthquake and floods that occur over a finite time period, climate change is an on-going hazard.

The 2009 Climate Adaptation Strategy (CAS) delineated how climate change may impact and exacerbate natural hazards in the future, including wildfires, extreme heat, floods, drought, and levee failure:

Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in San Bernardino County and the rest of California, which

are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.

- Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff from the landward side, while accelerating sea-level rise will produce higher storm surges during coastal storms. Together, these changes will increase the probability of levee and dam failures in the Sacramento-San Joaquin Delta.
- Warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions and habitat fragmentation.

### 4.8.6 El Niño Effect

El Niño is defined as an abnormal weather pattern that is caused by the warming of the Pacific Ocean near the equator, off the coast of South America. This occurs when the normal trade winds weaken (or even reverse), which lets the warm water that is usually found in the western Pacific flow instead towards the east. This warm water displaces the cooler water that is normally found near the surface of the eastern Pacific, setting off atmospheric changes that affect weather patterns in many parts of the world.

As a result of the predicted El Niño in 2015 the following meetings were held during the months of January – December 2015:

**El Niño Awareness Program**

- **January - December 2015**





- **October 28, 2015** (Two meetings) two separate meetings one with the Public with 200 High Desert residents attending, the other meeting was at the same location of the Victor Ville City Council Chambers of 80 operators
- **November 9, 2015** South Desert Meeting at the Town of Yucca Valley Community Center, with 50 Operators and 235 general public ,residents
- **November 12, 2015** 2:30pm-4:30pm Valley Cooperators Meeting, City of Rancho Cucamonga, Victoria Gardens, 90 Operators and 2nd Meeting at the same location held at 530pm-730pm meeting with 205 public and residents
- **November 16, 2015** Public Meeting at Upland city Hal l for San Antonio heights, Mt. Baldy and local residents 110 Public and Residents in attendance .
- **November 23, 2015** Wrightwood Community Center, 80 Operators and 330 Public and Residents
- **November 24, 2015** City of Yucaipa 40 operators at Yucaipa City Hall
- **December, 2015** 5000 English pamphlets and 5000 Spanish pamphlets distributed Winter Weather Workshop meetings (discuss long term weather models and predictions as far as estimated rain fall anticipated. and Extreme Heat Program meetings (stakeholder and Red Cross and SCE and other responders/operators meetings on anticipated overly hot days and local assistance plans. program in place by OES.

### 4.8.7 Extreme Weather

The Extreme Weather – Excessive Heat Standard Operating Guidelines (SOG) were developed in response to the potential for Excessive Heat and heat related Power Outage events in San Bernardino County. The following objectives and activities have been established to prevent the harmful effects of excessive heat on at-risk populations and the potential for life-threatening repercussions of power outages during excessive heat events.

The Extreme Weather – Excessive Heat SOG describe the County operations during heat related emergencies and provide guidance for local jurisdictions in their preparation for heat emergencies and other related activities.

The information included in this document is “situation” and/or “incident” driven and subject to revision by the Extreme Weather Committee as conditions warrant. Notifications are information dependent and modification of the activities in these guidelines may be required in response to changing conditions, situations and/or inaccurate weather predictions.
The Extreme Weather – Excessive Heat Standard Operating Guidelines (SOG) were developed through the collaborative efforts of the “Extreme Weather Committee”. The committee consists of

representatives from key County Departments and private sector partners who have a shared interest, responsibility and/or expertise in the County's preparation for an Excessive Heat event. It is designed to protect all of the County's population especially the most vulnerable populations.

For the last ten years the annual Winter Weather Workshop and Meeting brings together San Bernardino County Fire Office of Emergency Services with The San Bernardino County Special Districts key stakeholders and first responders as well as weather experts. The annual meeting is an accumulation of meetings with NOAA and other Meteorological experts on the possible winter weather outlook and forecast including possible precipitation levels and wide ranging forecasts.

The meeting includes discussions on possible plans of actions and response to flooding emergencies and or snow or white out events and the other possibility of continuing long duration droughts.

## 4.9 Other Hazards

As mentioned earlier, lower priority hazards are addressed at a lesser level of detail due to their relatively fewer impacts, as identified in the preceding hazard assessment section. The lower priority hazards for the unincorporated area are:

- Severe Thunderstorm
- Infestation
- Drought
- High Winds/Straight Line Winds
- Lightning
- Extreme Heat
- Hail
- Tornado

Although not part of the MJHMP, the remaining hazards are a part of the San Bernardino County 2007 General Plan and are addressed in the County Building Codes and Ordinance.

The information in this section provides an explicit representation of what a community stands to lose in a disaster. This is useful for county officials and other decision makers who will need to balance the costs of mitigation against the potential harm to citizens and damage to property. It provides comparable measurements of community natural hazard exposure and assists in determining which hazards and/or what parts of San Bernardino County to focus on making resilient to disaster first. Based upon possible assets at risk, hazard mitigation resources can be directed where need be, in-part, by a vulnerability assessment and information found in hazard profiles presented in Section 4.8.





## 4.10 Vulnerability Assessment

The information in this section provides an explicit representation of what a community stands to lose in a disaster. This is useful for county officials and other decision makers who will need to balance the costs of mitigation against the potential harm to citizens and damage to property. It provides comparable measurements of community natural hazard exposure[3] and assists in determining which hazards and/or what parts of San Bernardino County to focus on making resilient to disaster first. Based upon possible assets at risk, hazard mitigation resources can be directed where need be, in-part, by a vulnerability assessment and information found in hazard profiles presented in Section 4.2.

The vulnerability assessment is developed by providing the hazard mitigation analysts with quantitative and qualitative information for each hazard identified by the HMP Planning Team Through an exposure analysis, quantitative data is developed for each hazard. An exposure analysis provides quantities of people and assets at risk to particular hazards. Qualitative data has been developed and presented in this section for hazards without measurable data. Qualitative data provides information beyond quantities of people and assets at risk, but rather a description of how the hazard could affect a region like San Bernardino County.

***Note: The hazard exposure analysis has been developed with best available data and follows methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses.***

***Note: There are other intangible losses that could result from a natural hazard event, such as losses of historic or cultural integrity or damage to the environment that are difficult to quantify. Other costs, including response and recovery costs, are often unrecoverable and are not addressed in this document.***

### 4.10.1 Methodology

A vulnerability assessment was conducted for each of the identified priority hazards. Geospatial data is essential in determining population and assets exposed to particular hazards. Geospatial analysis can be conducted if a natural hazard has a particular spatial footprint that can be overlaid against the locations of people and assets. In San Bernardino County, wildfire, flood, earthquake, and landslides have known geographic extents and corresponding spatial information about each hazard.

Several sources of data are necessary to conduct a vulnerability analysis. Figure 4-22provides an exhibit of the data inputs and outputs used to create the vulnerability analysis results presented in this section. U.S. Census data is the primary source in determining natural hazard exposure to residents. Census data has been used to determine the population at risk, which is generally referred to as population exposure. Population exposure is provided for wildfire, flooding, earthquakes and landslides as potential hazards later in this section.

[3] Elements at risk; Risk inventory; Exposure encompasses all elements, processes, and subjects that might be affected by a hazardous event. Consequently, exposure is the presence of social, economic, environmental or cultural assets in areas that may be impacted by a hazard.

Together with the U.S. Census data, asset data was used to provide a snapshot of how City assets are affected by natural hazards. For purposes of this vulnerability analysis, asset data includes parcels and critical infrastructure within the San Bernardino County boundaries. Critical infrastructure is described as assets that are essential for people and a community to function. Critical infrastructure includes such as utilities, San Bernardino County owned facilities, bridges, schools, and other community facilities that provide essential services to residents.

Critical facilities data was developed from a variety of sources including San Bernardino County owned and maintained data, state and federal government datasets, and private industry datasets. A critical infrastructure spatial database was developed to translate critical facilities information into georeferenced[4] points. Critical facility points are intersected with the spatial hazard layers to develop a list of "at risk" critical facilities. The San Bernardino County critical facilities that intersect with natural hazards are referred to as facilities with hazard "exposure". Exposure results are presented later in this section.

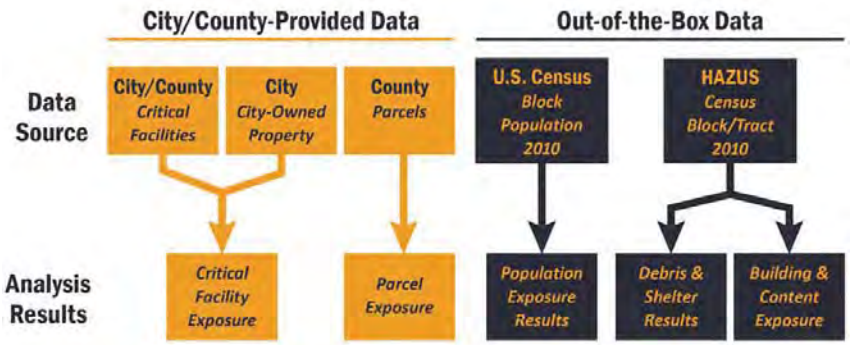


**Figure 4-22: Data Source and Methodology**

Lastly, FEMA's Hazus-MH MR5 (Hazus) software was implemented to conduct detailed loss estimation for flood and earthquake. Hazus is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes. HAZUS uses Geographic Information Systems (GIS) technology to estimate physical, economic, and social impacts of disasters. For purposes of this planning effort, Hazus was used to graphically illustrate the limits of identified high-risk locations due to possible earthquakes and floods.

[4] To georeference something means to define its existence in physical space. That is, establishing its location in terms of map projections or coordinate systems. The term is used both when establishing the relation between raster or vector images and coordinates, and when determining the spatial location of other geographical features.





The vulnerability and potential impacts from priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analyses are discussed in more general terms in alphabetical order following the discussion on wildfire, flooding and earthquake hazards.

### 4.10.2 Hazus MH Inputs

FEMA's loss estimation software, Hazus MH, was used to analyze the San Bernardino County building risk to flood and earthquake hazards. Hazus contains a database of economic, demographic, building stock, transportation facilities, local geology, and other information that can be used for several steps in the risk assessment process. Hazus software operates on structure square footage, structure replacement, and content replacement costs aggregated to the census block and tract levels depending on type of hazard analysis. The following table provides value data for building categories at the census block and census tract levels. Census block and census tracts are used to provide input information for the Hazus analysis presented in this report.

The project team used the San Bernardino County Essential Facilities Risk Assessment (SBEFRA) project and incorporated the newly updated DFIRM data into HAZUS to assess potential losses in the mapped 100-year (with and without levee protection) and 500-year flood zones.

***Note: The Hazus software utilizes different census level information inputs to develop loss estimates depending on the hazard module. The flood module uses census block information while the earthquake module uses census track information. It is important to understand the total values of each as estimated damage to the community is presented on a percent of total value basis.***

**Table 4-12: Hazus Flood Census Block Input Values**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (%) | Content Replacement Cost ($000) | Content Replacement Cost (%) | Total Value ($000) | Total Value (%) |
|---|---|---|---|---|---|---|
| Agricultural | $ 70,841 | 0.3% | $ 70,841 | 0.3% | $ 141,682 | 1% |
| Commercial | $ 1,208,163 | 4.4% | $ 1,231,690 | 4.5% | $ 2,439,853 | 9% |
| Education | $ 120,017 | 0.4% | $ 127,161 | 0.5% | $ 247,178 | 1% |
| Governmental | $ 34,216 | 0.1% | $ 43,192 | 0.2% | $ 77,408 | 0% |
| Industrial | $ 452,710 | 1.6% | $ 610,063 | 2.2% | $ 1,062,773 | 4% |
| Religion | $ 176,012 | 0.6% | $ 176,012 | 0.6% | $ 352,024 | 1% |
| Residential | $ 15,483,634 | 56.2% | $ 7,744,650 | 28.1% | $ 23,228,284 | 84% |
| **Total** | **$ 17,545,593** | **64%** | **$ 10,003,609** | **36%** | **$ 27,549,202** | **100 %** |

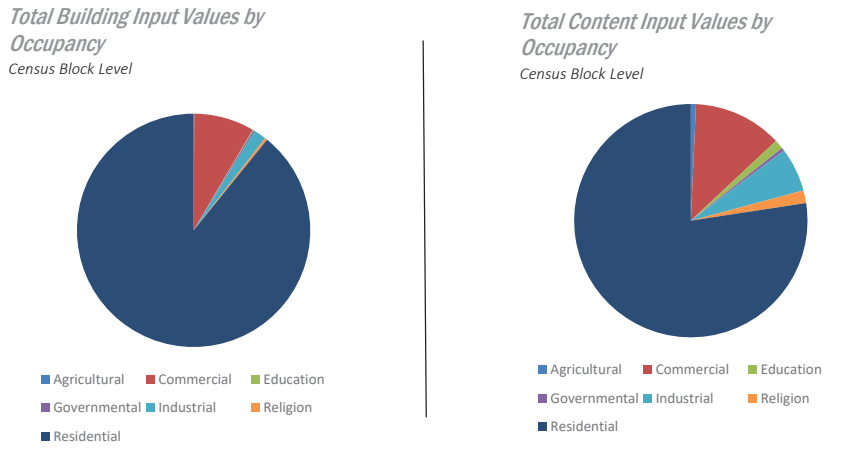


**Figure 4-23: Census Block Building and Content Exposure Values**





**Table 4-13: Hazus Earthquake Census Tract Input Values**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (%) | Content Replacement Cost ($000) | Content Replacement Cost (%) | Total Value ($000) | Total Value (%) |
|---|---|---|---|---|---|---|
| Agricultural | $ 264,949 | 50.0% | $ 264,949 | 50.0% | $ 529,898 | 1% |
| Commercial | $ 11,056,871 | 48.5% | $ 11,756,479 | 51.5% | $ 22,813,350 | 9% |
| Education | $ 819,946 | 48.4% | $ 874,703 | 51.6% | $ 1,694,649 | 1% |
| Governmental | $ 265,933 | 45.6% | $ 316,930 | 54.4% | $ 582,863 | 0% |
| Industrial | $ 3,733,265 | 41.4% | $ 5,276,431 | 58.6% | $ 9,009,696 | 4% |
| Religion | $ 958,122 | 50.0% | $ 958,122 | 50.0% | $ 1,916,244 | 1% |
| Residential | $ 84,302,884 | 66.7% | $ 42,159,954 | 33.3% | $ 126,462,838 | 84% |
| **Total** | **$ 101,401,970** | **62%** | **$ 61,607,568** | **38%** | **$ 163,009,538** | **100 %** |

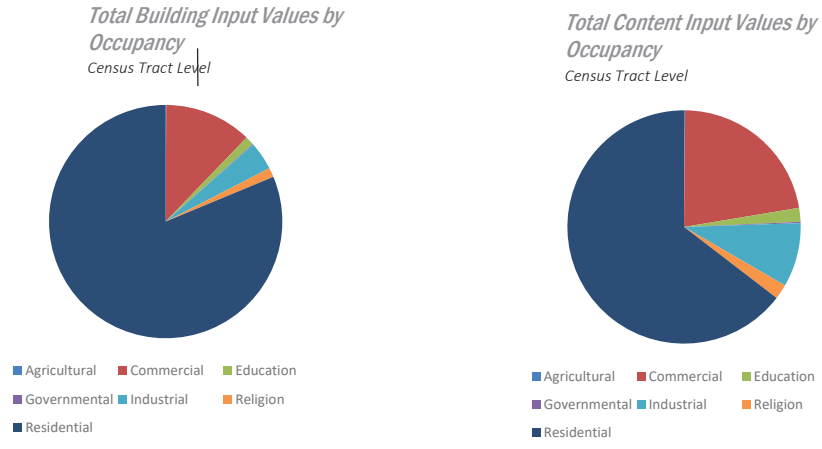


**Figure 4-24: Census Tract Building and Content Exposure Values**

## 4.11 Population and Assets

To describe vulnerability for each hazard, it is important to understand the "total" population and "total" assets at risk. The exposure for each hazard described in this section will refer to the percent of total population or percent of total assets. This provides the possible significance or vulnerability to people and assets for the natural hazard event and the estimated damage and losses expected during a "worst case scenario" event for each hazard. Sections below provide a description of the total population, critical facilities, and parcel exposure inputs.

Table 4-12 and Table 4-13 provide an estimate of the number and size of buildings in the County's unincorporated areas and its Special Districts, as well as the replacement value of the buildings and their contents. The table provides information by occupancy class (e.g., residential, commercial, etc.), as well as by construction type (e.g., concrete, wood frame, etc.).

### 4.11.1 Population

To develop hazard-specific vulnerability assessments, population near natural hazard risks should be determined to understand the total "at risk" population. We can understand how geographically defined hazards may affect San Bernardino County by analyzing the extent of the hazard in relation to the location of population. For purposes of the vulnerability assessment approximately 292,152 (100 %) of the San Bernardino County's population is exposed to one or more hazards within or near the County of San Bernardino boundaries. Each natural hazard scenario affects the San Bernardino County residents differently depending on the location of the hazard and the population density of where the hazard could occur. Vulnerability assessment sections presented later in this section summarize the population exposure for each natural hazard.

#### 4.11.1.1 Vulnerable Populations

The severity of a disaster depends on both the physical nature of the extreme event and the socioeconomic nature of the populations affected by the event. Important socioeconomic factors tend to influence disaster severity. A core concept in a vulnerability analysis is that different people, even within the same region, have a different vulnerability to natural hazards.

#### 4.11.1.2 Income and Housing Condition





Income or wealth is one of the most important factors in natural hazard vulnerability. This economic factor affects vulnerability of low income populations in several ways. Lower income populations are less able to afford housing and other infrastructure that can withstand extreme events. Low income populations are less able to purchase resources needed for disaster response and are less likely to have insurance policies that can contribute to recovery efforts. Lower income elderly populations are less likely to have access to medical care due to financial hardship. Because of these and other factors, when disaster strikes, low income residences are far more likely to be injured or left without food and shelter during and after natural disasters.

Figure 4-25 shows the median household income distribution for the County of San Bernardino in 2012. The "median" is the value that divides the distribution of household income into two equal parts (e.g., the middle). The average median household income in the County of San Bernardino between 2010 and 2014 was $54,100, in the United States during the same period the median house household income was $51,759.

#### 4.11.1.3 Age

Children and the elderly tend to be more vulnerable during an extreme natural disaster. They have less physical strength to survive disasters and are often more susceptible to certain diseases. The elderly often also have declining vision and hearing and often miss reports of upcoming natural hazard events. Children, especially young children, have the inability to provide for themselves. In many cases, both children and the elderly depend on others to care for them during day to day life.

Finally, both children and the elderly have fewer financial resources and are frequently dependent on others for survival. In order for these populations to remain resilient before and after a natural hazard event, it may be necessary to augment city residents with resources provided by the City, state and federal emergency management agencies and organizations. See Figure 4-26 and Figure 4-27 for location of vulnerable population by age within the County of San Bernardino.

Figure 4-25: Median Household Income Distribution Maps





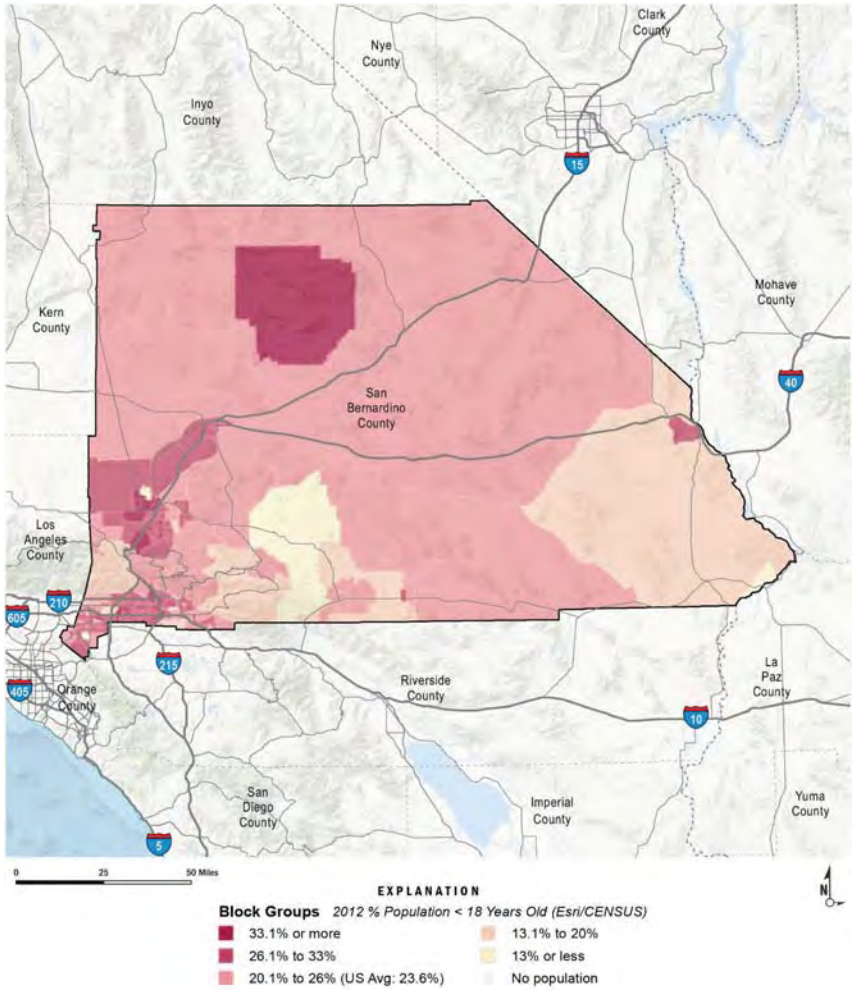


Figure 4-26: Population Under Age 18

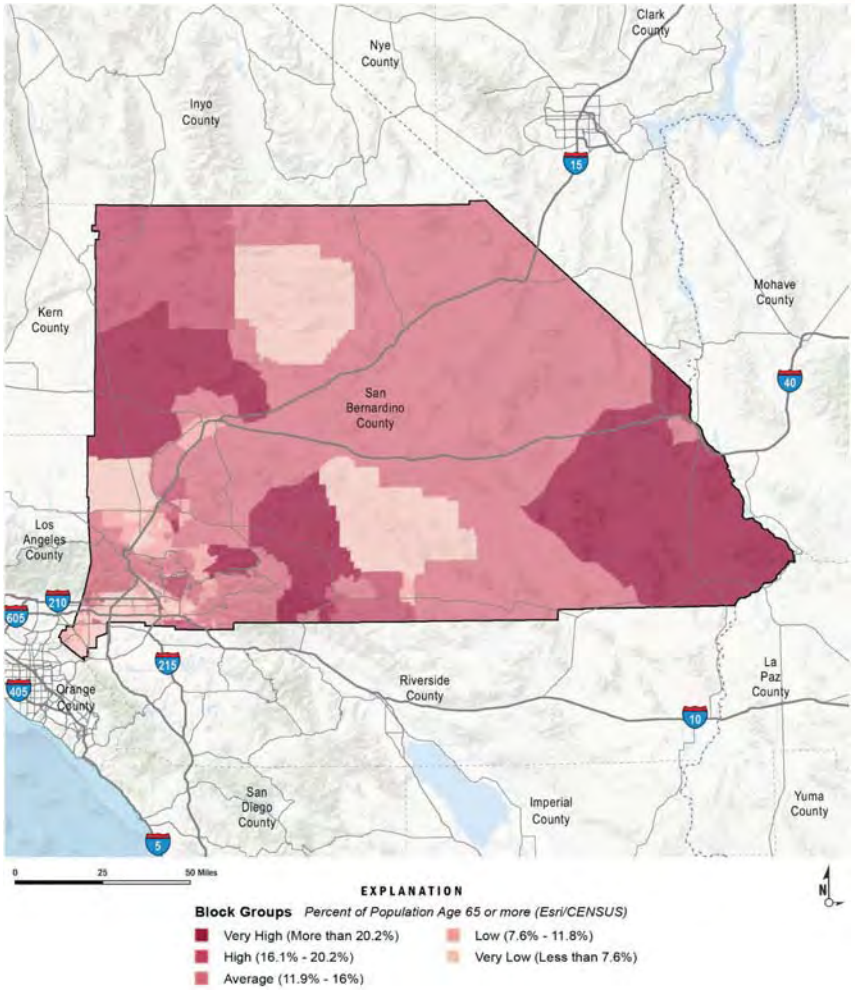


Figure 4-27: Population Over Age 65





### 4.11.1.4 Critical Facility List

As stated in the San Bernardino County Emergency Operations Plan (EOP), the San Bernardino County Sheriff's Department (Sheriff) is the lead County agency in identifying critical infrastructure in the County and its Special Districts. A Sheriff's Department Working Group was established to identify Critical Facilities throughout San Bernardino County. Due to Homeland Security and issues related to terrorism, this list is not included in the MJHMP, but is available through the Sheriff's Department.

The Sheriff's Department maintains a Critical Infrastructure Database listing the site name, location, critical level, threat level, site type, and contact information. This database was created for the 2010 MJHMP and has been updated regularly by the Intelligence Division. The Sheriff's Intelligence Division has created Emergency Response Folders (Folders) on each of the locations. The Folders contain site-specific information needed by emergency personnel to respond to any type of emergency. The Folders contain floor plans, photographs, entry/exit points, utility locations, ingress and egress locations, known hazardous materials on site, and emergency contact information for the responsible persons of the site. The Sheriff's Department maintains control and transport of this information to an Incident Command Post/Department Operations Center/Emergency Operations Center when needed.

Table 4-14: Critical Facility Points

| Infrastructure Type | Feature Count |
|---|---|
| **Essential Facility** | **268** |
| EOC | 2 |
| Fire Station | 99 |
| Hospital | 9 |
| Police Station | 28 |
| School | 130 |
| **High Potential Loss** | **1,155** |
| Child Care Center | 91 |
| Child Residential Care - 24 hour | 2 |
| Foster Family Agency | 2 |
| Adult Residential Care | 52 |
| Home Care Organization | 2 |
| Elder Residential Care | 35 |
| Communication Facility | 40 |
| Dam | 24 |
| Waste Water Facility | 2 |

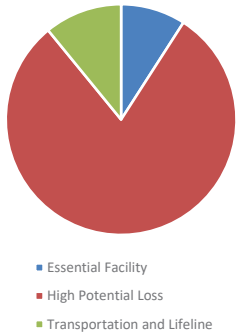

| Infrastructure Type | Feature Count |
|---|---|
| HAZMAT | 51 |
| EPA FRS Facility | 731 |
| FCC ASR | 107 |
| Electric Power Facility | 6 |
| Natural Gas Facility | 7 |
| Potable Water Facility | 3 |
| **Transportation and Lifeline** | **636** |
| Airport | 34 |
| Runway | 36 |
| Bus Facility | 2 |
| Highway Bridge | 553 |
| Railway Bridge | 11 |
| **Grand Total** | **2,059** |

**Table 4-15: Linear Utilities**

| Infrastructure Type | Total Linear Mileage |
|---|---|
| **Transportation and Lifeline** | **16,992** |
| **Railway** | **719** |
| **Roads** | **16,273** |
| Interstate Highway | 587 |
| State / County Highway | 1,259 |
| Primary Highway | 308 |
| Local Road, Major | 2,928 |
| Local Road | 6,530 |
| Other Minor Road | 4,031 |
| Vehicular Trail | 543 |
| Cul-de-Sac / Traffic Circle | 11 |
| Ramp | 68 |
| Service Road | 8 |
| **Grand Total** | **16,992** |





#### 4.11.1.5 Utility Agencies

The utilities and transportation infrastructure is another significant concern for the County and its Special Districts. Various laws, ordinances, regulations, standards, and guidelines have been established to ensure proper and thorough mitigation measures to decrease the effects of hazards.

The following are two of the major utility agencies:

**Southern California Edison (SCE)** has undertaken an all-hazards approach to planning for an emergency event. SCE has developed an Emergency Response and Recovery Plan to provide a safe and reliable electric service. SCE also has a long-standing relationship with the County and is an active member of several local, state, and federal organizations. According to SCE they have acted to mitigate the impacts of hazards on their electrical system.

**Southwest Gas Corporation (SWG)** has also coordinated with the County, maintains a natural gas high-pressure system within the County, and consists of approximately 100 miles of underground pipelines. The system also includes some above ground facilities. The total replacement cost for the entire system is approximately $40,000,000. Southwest Gas conducts annual training for the first responders within their service territories to teach the proper methods of responding to and working with natural gas leaks. Staff from SWG serves on local emergency management committees within their service territory.

## 4.12 Hazard Specific Vulnerabilities

This section summarizes the possible impacts and quantifies, where data permits, the County's vulnerability to each of the priority hazards identified in the hazard profiles earlier in this section.

An estimate of the vulnerability of the County to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, geographic extent, and damage and casualty potential. It is categorized into the following classifications:

**Low:** Minimal potential impact the occurrence and potential cost of damage to life and property is minimal.

**Medium:** Moderate potential impact this ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.

**High:** Widespread potential impact this ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.

**Extremely High:** Very widespread with catastrophic impact.

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of buildings subject to the identified hazard can be inventoried and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of critical community facilities, historic structures, and valued natural resources. Together, this information conveys the vulnerability of that area to a hazard.





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## 4.13 Earthquake

Major Impacts from earthquakes are primarily the probable number of casualties and damage to infrastructure occurring from ground movement along a particular fault (USGS, 2016). The degree of infrastructure damage depends on the magnitude, focal depth, distance from fault, duration of shaking, type of surface deposits, presence of high groundwater, topography, and the design, type, and quality of infrastructure construction.

To analyze the risk to San Bernardino County residents, the Great Shakeout scenario was chosen modeled by the California Integrated Seismic Network (CISN). The 2016 Great Southern California ShakeOut was based on a potential magnitude 7.8 Earthquake on the southern San Andreas Fault approximately 5,000 times larger than the magnitude 5.4 earthquake that shook southern California on July 29, 2008. Such an earthquake will cause unprecedented damage to Southern California greatly dwarfing the massive damage that occurred in Northridge's 6.7-magnitude earthquake in 1994. The hazard foot print for this scenario was used to develop exposure results for population, critical facilities, and single family residential parcel values. FEMA Hazus analyses was used to conducted loss estimation for both scenarios and include building and content loss estimation results based on peak ground acceleration, peak ground velocity, and peak spectral acceleration modeled for the 7.8 earthquake on the San Andreas Fault.

### 4.13.1 Population at Risk

According to the 2010 US Census, the population of jurisdiction is 297,425. Though rural residential construction is not particularly vulnerable to earthquakes, the chosen earthquake scenarios will directly or indirectly expose the entire population of San Bernardino County to ground shaking. Depending on the time of day (the population differs based on employment opportunities) and exact location of the modeled epicenter, the earthquake scenarios could be experienced differently. Figure 4-28 exhibit the population totals in each modeled earthquake severity zone. Population location is based upon information taken during the 2010 U.S. Census.





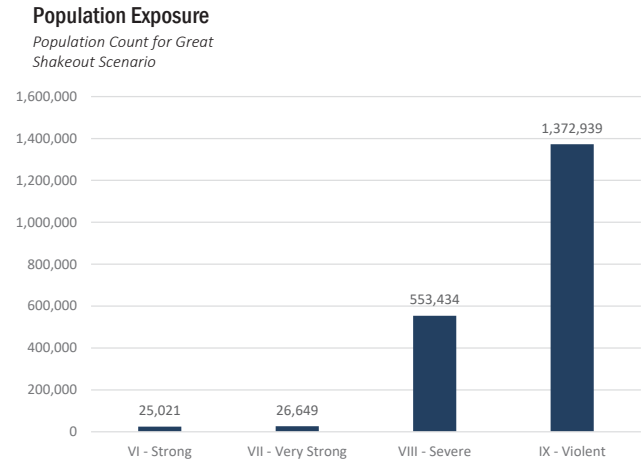


**Figure 4-28: Population Exposure to the Great Shakeout EQ Shake Severity Zone**

### 4.13.2 Improved Parcel Value at Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels. GIS was used to create centroids, or points, to represent the center of each parcel polygon this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the shake severity zones to determine the at-risk structures. Only improved parcels greater than $20,000 were analyzed. The analysis indicates residential parcels the chosen scenario will experience similar, but different shaking patterns. The type and year of construction will greatly influence damage for structures subject to similar shaking. Table 4-16 shows the count of at-risk structures and their associated improvement and land exposure values.

**Table 4-16: Improved Parcel Value Exposure from Southern California Great ShakeOut**

| Shake Severity Zone | Improved Parcel Count | Improvement Value Exposure ($000) | Land Value Exposure ($000) | Total Exposure ($000) |
|---|---|---|---|---|
| IV - Light | 1,099 | $ 181,952 | $ 64,548 | $ 246,499 |
| V - Moderate | 4,382 | $ 485,082 | $ 215,875 | $ 700,956 |

| Shake Severity Zone | Improved Parcel Count | Improvement Value Exposure ($000) | Land Value Exposure ($000) | Total Exposure ($000) |
|---|---|---|---|---|
| VI - Strong | 1,340 | $ 142,763 | $ 63,941 | $ 206,704 |
| VII - Very Strong | 7,669 | $ 824,794 | $ 206,725 | $ 1,031,519 |
| VIII - Severe | 46,889 | $ 8,741,904 | $ 3,039,484 | $ 11,781,388 |
| IX - Violent | 46,974 | $ 9,068,446 | $ 3,591,379 | $ 12,659,825 |
| **Grand Total** | **108,353** | **$ 19,444,940** | **$ 7,181,951** | **$ 26,626,891** |

### 4.13.3 Critical Facilities with Damage Potential

Earthquakes pose numerous risks to critical facilities and infrastructure. Seismic risks, or losses, that are likely to result from exposure to seismic hazards include:

- Casualties (fatalities and injuries).
- Utility outages.
- Economic losses for repair and replacement of critical facilities, roads, buildings, etc.
- Indirect economic losses such as income lost during downtime resulting from damage to private property or public infrastructure.

Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.

Linear utilities and transportation routes are vulnerable to rupture and damage during and after a significant earthquake event. The cascading impact of a single failure can have affects across multiple systems and utility sectors. Degrading infrastructure systems and future large earthquakes with epicenters near critical regional infrastructure could result in system outages that last weeks for the most reliable systems, and multiple months for others.
Table 4-17provides an inventory of critical facility locations (points only) with earthquake exposure to the Great Shakeout Scenario. The building codes have been amended to include provisions for seismic safety at various bench marks years. Depending on “year built”, each critical facility presented in the tables may have varying damage potential.

**Table 4-17: Critical Facilities with Earthquake Risk Southern California Great ShakeOut**

| Infrastructure Type | Violent Shake Zone (IX) | Severe Shake Zone (VIII) | Very Strong (VII) | Strong Shake Zone (VI) | Feature Count |
|---|---|---|---|---|---|
| **Essential Facility** | 3 | 12 | 80 | 122 | 217 |
| EOC | - | - | 2 | - | 2 |
| Fire Station | 3 | 7 | 31 | 34 | 75 |
| Hospital | - | - | 9 | - | 9 |
| Police Station | - | - | 3 | 24 | 27 |
| School | - | 5 | 35 | 64 | 104 |





| Infrastructure Type | Violent Shake Zone (IX) | Severe Shake Zone (VIII) | Very Strong (VII) | Strong Shake Zone (VI) | Feature Count |
|---|---|---|---|---|---|
| **High Potential Loss** | 31 | 56 | 213 | 484 | 784 |
| Child Care Center | 1 | 3 | 25 | 56 | 85 |
| Child Residential Care – 24 hour | - | - | - | 2 | 2 |
| Foster Family Agency | - | - | - | 2 | 2 |
| Adult Residential Care | 2 | 5 | 10 | 34 | 51 |
| Home Care Organization | - | - | 1 | 1 | 2 |
| Elder Residential Care | - | 1 | 9 | 25 | 35 |
| Communication Facility | 1 | 9 | 9 | 8 | 27 |
| Dam | 1 | - | 11 | 4 | 16 |
| Electric Power Facility | 1 | - | - | - | 1 |
| Natural Gas Facility | 2 | - | - | - | 2 |
| Waste Water Facility | - | 2 | - | - | 2 |
| HAZMAT | - | - | 6 | 16 | 22 |
| EPA FRS Facility | 21 | 27 | 115 | 307 | 470 |
| FCC ASR | 2 | 9 | 27 | 29 | 67 |
| **Transportation and Lifeline** | 16 | 20 | 41 | 131 | 208 |
| Airport | 5 | 5 | 8 | - | 18 |
| Runway | 5 | 6 | 7 | 1 | 19 |
| Bus Facility | - | - | 1 | - | 1 |
| Highway Bridge | 6 | 8 | 24 | 124 | 162 |
| Railway Bridge | - | 1 | 1 | 6 | 8 |
| **Grand Total** | **50** | **88** | **334** | **737** | **1,209** |

***HazMat Fixed Facilities***
Although earthquakes are low probability events, they produce hazardous materials (HazMat) threats at very high levels when they do occur. Depending on the year built and construction of each facility containing HazMat, earthquake initiated hazardous material releases (EIHR) potential will vary. HazMat contained within masonry or concrete structures built before certain benchmark years reflecting code improvements may be of particular vulnerability.

***Transportation***
Earthquake events can significantly impact bridges which often provide the only access to some neighborhoods. Since soft soil regions generally follow floodplain boundaries, bridges that cross water courses are considered vulnerable. Since most of the San Bernardino County bridges provide access across water courses, most are at least somewhat vulnerable to earthquakes. Key factors in the degree of vulnerability are the bridge’s age and type of construction which indicate the standards to which the bridge was built. Special attention will be paid to the multiple bridges that cross interstates. Interstates would serve as major emergency response and evacuation routes.

***Utilities***

Linear utilities and transportation infrastructure would likely suffer considerable damage in the event of an earthquake. Due to the amount of infrastructure and sensitivity of utility data, linear utilities are difficult to analyze without further investigation of individual system components. Table 4-18 provides the best available linear data and it should be assumed that these systems are exposed to breakage and failure.

**Table 4-18: Lifeline with Earthquake Risk Southern California Great ShakeOut**

| Facility Type | Strong | Very Strong | Severe | Violent | Total Mileage |
|---|---|---|---|---|---|
| Transportation and Lifeline | 1,324 | 1,951 | 2,796 | 2,624 | 8,697 |
| Railway | 47 | 22 | 22 | 99 | 191 |
| Roads | 1,277 | 1,929 | 2,774 | 2,525 | 8,506 |
| Interstate Highway | 22 | 7 | - | 48 | 77 |
| State / County Highway | 57 | 90 | 263 | 233 | 644 |
| Primary Highway | 34 | 15 | 19 | 27 | 95 |
| Local Road, Major | 102 | 207 | 625 | 792 | 1,726 |
| Local Road | 540 | 1,153 | 1,728 | 1,128 | 4,550 |
| Other Minor Road | 494 | 423 | 109 | 96 | 1,122 |
| Vehicular Trail | 25 | 32 | 26 | 178 | 261 |
| Cul-de-Sac / Traffic Circle | - | 1 | 2 | 2 | 5 |
| Ramp | 2 | 1 | 2 | 20 | 25 |
| Service Road | - | - | - | 1 | 1 |
| **Grand Total** | **1,324** | **1,951** | **2,796** | **2,624** | **8,695** |

## 4.13.4 Loss Estimation Results

The Hazus Level 2 analysis was used to assess the risk from and vulnerability to earthquake shaking within San Bernardino County. Hazus buildings data is aggregated to the census tract level for earthquake models, known as the general building stock (GBS), which has a level of accuracy acceptable for planning purposes. Where possible the GBS was enhanced using GIS data from the county as described previously. The following sections describe risk to and vulnerability of the GBS within the San Bernardino County Hazus calculates losses to structures from earthquake shaking by considering the amount of ground displacement and type of structure. The software estimates the percentage of damage to structures and their contents by applying established building fragility curves. Damage estimates are then translated to estimated dollar losses.

For each Great ShakeOut Scenario ground shaking data (shakemaps) were acquired from CISN and imported into Hazus. The shakemap data consist of peak ground velocity, peak





ground acceleration, peak spectral acceleration at 0.3 seconds, and peak spectral acceleration at 1.0 seconds. The earthquake module operates on census tracts that often include population and structures in the incorporated cities and the unincorporated area within a single tract. Due to this fact the results include census tracts that have a substantial portion of land within the incorporated area (loss estimates for some tracts will include structures in incorporated cities).

The results are summarized in Table 4-17 for the Great ShakeOut Scenario. It is important to understand that the Hazus earthquake module uses the census tract as its enumeration unit rather than the more detailed census block. The loss estimation values for earthquakes are much higher than those of the flooding and dam failure due to this fact. The portions of incorporated areas included within boundary census tracts elevate the values due to the inclusion of additional GBS. Though the difference between census tracts and census blocks are extremely disparate, the most important summary information is the percent of loss estimation against the total value.

Residential building and content loss estimation from the Great ShakeOut Scenario is *$9.3* billion dollars and 57 percent of the total value of the residential buildings. In Great ShakeOut Scenario, residential damage will be the greatest. While there are several limitations to the FEMA Hazus model, it does allow for potential loss estimation. It is important to remember that the replacement costs are well below actual market values, thus, the actual value of assets at risk may be significantly higher than those included herein.

**Table 4-19: Estimated Building and Content Loss Great ShakeOut Scenario Earthquake**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (% of Total Value) | Content Replacement Cost ($000) | Content Replacement Cost (% of Total Value) | Total Estimated Loss ($000) | Total Loss Estimation (% of Total Value) |
|---|---|---|---|---|---|---|
| Agricultural | $ 51,431 | 9.7% | $ 17,215.68 | 3.2% | $ 68,646.80 | 13.0% |
| Commercial | $ 3,286,331 | 14.4% | $ 1,110,422.84 | 4.9% | $ 4,396,754.29 | 19.3% |
| Educational | $ 175,987 | 10.4% | $ 56,822.89 | 3.4% | $ 232,810.20 | 13.7% |
| Government | $ 53,348 | 9.2% | $ 20,298.84 | 3.5 | $ 73,647.28 | 12.6% |
| Industrial | $ 1,179,339 | 13.1% | $ 590,913.81 | 6.6% | $ 1,770,253.41 | 19.6% |
| Religious | $ 243,891 | 12.7% | $ 80,862.72 | 4.2% | $ 324,754.33 | 16.9% |
| Residential | $ 7,841,645 | 6.2% | $ 1,525,181.65 | 1.2% | $ 9,366,826.84 | 7.4% |
| **Grand Total** | **$ 12,831,972** | **7.9%** | **$ 3,401,718.42** | **2.1%** | **$ 16,233,693.14** | **10.0%** |

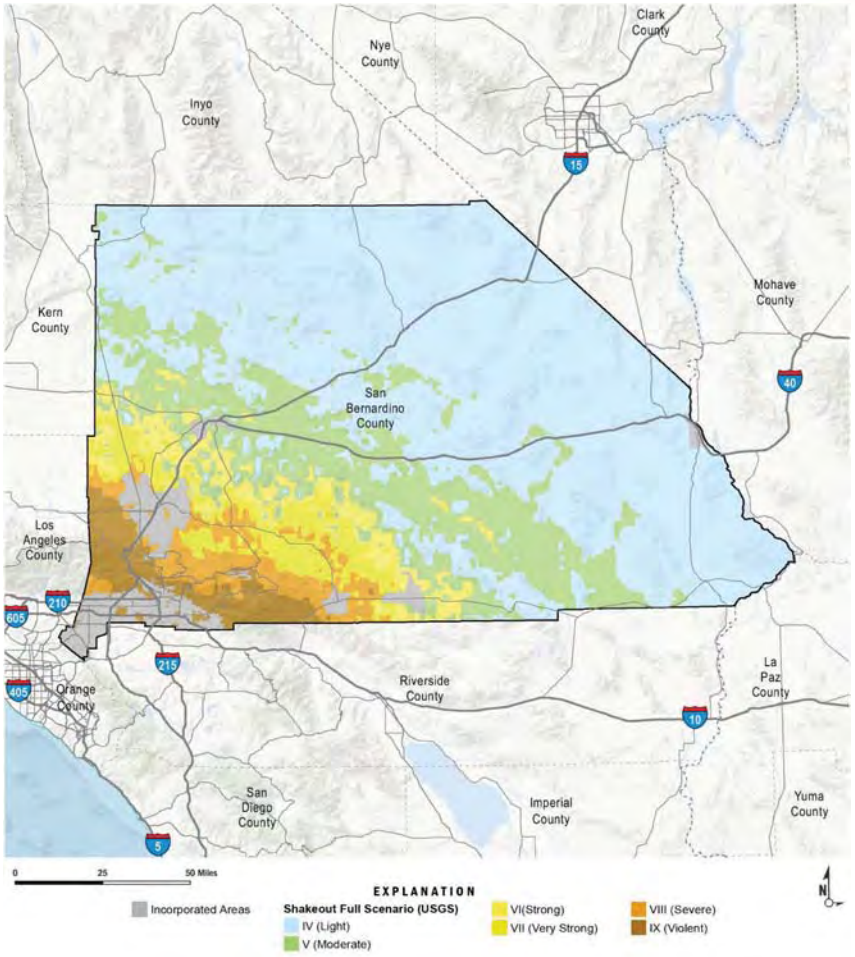


**Figure 4-29: Great Shakeout Scenario MMI Classes**





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## 4.14 Wildfire

Risk to the County of San Bernardino from wildfire is of significant concern. High fuel loads in the hills, along with geographical and topographical features, create the potential for both natural and human-caused fires that can result in loss of life and property. These factors, combined with natural weather conditions common to the area, including periods of drought, high temperatures, low relative humidity, and periodic winds, can result in frequent and sometimes catastrophic fires. During the May to October fire season the dry vegetation and hot and sometimes windy weather, combined with continued growth in the WUI areas, results in an increase in the number of ignitions. Any fire, once ignited, has the potential to quickly become large and out-of-control.

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Short and long-term economic losses could also result due to loss of business and other economic drivers associated with San Bernardino County summer season activities. Smoke and air pollution from wildfires can be a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

Generally, there are three major factors that sustain wildfires and predict a given area's potential vulnerability to burn. These factors are fuel, topography, and weather.

- Fuel – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and volume. Fuel sources are diverse and include everything from dead tree leaves, twigs, and branches, to dead standing trees, live trees, brush, and cured grasses. Manmade structures are also considered a fuel source, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control. Development in the mountain region currently possesses the highest vulnerability to wildfire.

- The residents of this region are also considered to be the most vulnerable due to their age and income levels. This area is comprised of lower income (that is, lower than the US median income) homes as well as a higher than average amount of residents under age 18 and an average amount of residents 65 or older.
- Topography – An area's terrain and slope affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.





- Weather – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought the threat of wildfire increases. Wind is the most treacherous weather factor. The greater the wind, the faster a fire can spread and the more intense it can be. Wind shifts, in addition to wind speed, can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. As part of a weather system, lightning also ignites wildfires, often in difficult to reach terrain for firefighters.

Factors contributing to the high, widespread wildfire risk in San Bernardino County include:

- Narrow and often one-lane and/or dead-end roads complicating evacuation and emergency response.
- Nature and frequency of ignitions; and increasing population density leading to more ignitions.
- Slope of the foothills;
- Residential development along the foothills;

### 4.14.1 Population at Risk

Wildfire risk is of greatest concern to populations residing in the moderate, high, and very high wildfire hazard zones. The San Bernardino County census block data was used to estimate populations within the hazard zones. There are a significant number of people living within the WUI described in the wildfire profiles. More than 34,000 residents in the unincorporated county live within areas considered very high fire hazard and more than 63,000 residents live within a very high hazard

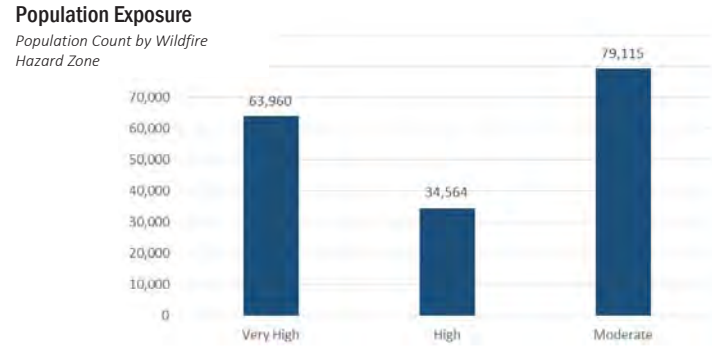


Figure 4-30: Population at Risk from Wildfire Hazards

### 4.14.2 Improved Parcel Value at Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels. In some cases, a parcel will be within in multiple fire threat zones. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the fire threat layer to determine the risk for each structure. The fire threat zone in which the centroid was located was assigned to the entire parcel. This methodology assumed that every parcel with a square footage value greater than zero was developed in some way. Only improved parcels were analyzed. Table 4-20 exhibits portions of San Bernardino County that have significant assets at risk to wildfire in the Moderate, High and Very High fire severity zones.

**Table 4-20: Residential Buildings and Content at Risk from Wildfire**

| Fire Hazard Severity Hazard Zone | Improved Parcel Count | Improvement Value Exposure ($000) | Land Value Exposure ($000) | Total Exposure ($000) |
|---|---|---|---|---|
| Very High | 43,794 | $ 8,602,590 | $ 3,075,148 | $ 11,677,739 |
| High | 11,512 | $ 1,822,731 | $ 551,160 | $ 2,373,892 |
| Moderate | 25,477 | $ 3,221,982 | $ 950,044 | $ 4,172,026 |
| Non-Wildland/Non-Urban | 621 | $ 573,866 | $ 294,283 | $ 868,148 |
| Urban Un-zoned | 26,974 | $ 5,223,286 | $ 2,310,932 | $ 7,534,219 |
| **Grand Total** | **108,378** | **$ 19,444,456** | **$ 7,181,567** | **$ 26,626,023** |

Note:
1-The table above does not display loss estimation results; the table exhibits total value at risk based upon the hazard overlay and San Bernardino County Assessor data.
2- Parcel information is for all county parcels with greater than $20,000 in assessed parcel improvement value only. The San Bernardino County Assessor's roles only provide spatial information on assessed improvement and land values.

### 4.14.3 Critical Facilities at Risk

Critical facilities data were overlain with fire hazard severity zone data to determine the type and number of facilities within each risk classification. Tables 4-21 and 4-22 list the critical facilities in the High and Very High wildfire hazard zones for San Bernardino County.





**Table 4-21: Critical Facilities at Risk from Wildfire**

| Infrastructure Type | High | Very High | Feature Count |
|---|---|---|---|
| Essential Facility | 11 | 105 | 116 |
| EOC | 2 | 0 | 2 |
| Fire Station | 4 | 45 | 49 |
| Hospital | 0 | 5 | 5 |
| Police Station | 0 | 24 | 24 |
| School | 5 | 31 | 36 |
| High Potential Loss | 72 | 177 | 249 |
| Child Care Center | 3 | 29 | 32 |
| Child Residential Care - 24 hour | 1 | 0 | 1 |
| Foster Family Agency | 0 | 0 | 0 |
| Adult Residential Care | 11 | 4 | 15 |
| Home Care Organization | 0 | 0 | 0 |
| Elder Residential Care | 8 | 5 | 13 |
| Communication Facility | 2 | 13 | 15 |
| Dam | 0 | 14 | 14 |
| Electric Power Facility | 0 | 0 | 0 |
| Natural Gas Facility | 0 | 0 | 0 |
| Potable Water Facility | 0 | 0 | 0 |
| Waste Water Facility | 0 | 0 | 0 |
| HAZMAT | 0 | 2 | 2 |
| EPA FRS Facility | 37 | 83 | 120 |
| FCC ASR | 10 | 27 | 37 |
| Transportation and Lifeline | 10 | 103 | 113 |
| Airport | 1 | 0 | 1 |
| Runway | 1 | 0 | 1 |
| Bus Facility | 1 | 0 | 1 |
| Highway Bridge | 7 | 101 | 108 |
| Railway Bridge | 0 | 2 | 2 |
| **Grand Total** | **93** | **385** | **478** |

**Table 4-22: Lifelines with Wildfire Risk**

| Facility Type | High | Very High | Total Mileage |
|---|---|---|---|
| Transportation and Lifeline | 819 | 1,906 | 2,725 |
| Railway | 19 | 47 | 66 |
| Roads | 800 | 1,859 | 2,659 |
| Interstate Highway | 4 | 37 | 41 |
| State / County Highway | 33 | 226 | 259 |
| Primary Highway | 17 | 13 | 30 |
| Local Road, Major | 311 | 521 | 832 |
| Local Road | 389 | 806 | 1,195 |
| Other Minor Road | 34 | 56 | 91 |
| Vehicular Trail | 10 | 184 | 195 |
| Cul-de-Sac / Traffic Circle | 1 | 2 | 3 |
| Ramp | 2 | 12 | 13 |
| Service Road | 0 | 1 | 1 |
| **Grand Total** | **819** | **1,906** | **2,725** |

### 4.14.4 Loss Estimation Results

Wildland fire cost impacts of damage done to land and structures and also to critical infrastructure

It is impossible to estimate the possible cost in dollars to replace and pay for actual firefighting as the damage costs that incur from wildland fires varies so greatly. One of the varied costs is the replacement and repair of structures and remediate of the damaged properties. Then the rebuilding costs and replacing of the structures with laws requiring new buildings to meet new criteria as a result of state laws that may require more stringent building and construction practices far greater than the original building of the said structure. Also the estimate of damages to critical infrastructures such as power lines and delivery systems as it is difficult the collateral loses to businesses and individuals losing power for and unknown time. Also damages to railroads and bridges also to road way, freeways as it is impossible to gauge the actual lose amounts from commerce being impeded.

Many of the County's landfills, transfer stations, and closed disposal sites are situated in areas subject to wildfires. In 2003, the Old Fire burned through three separate sites and caused major damage at the Heaps Peak Transfer Station when the fire burned through the office building and Transfer Station site.

None of this takes into account the costs of labor and retardants, vehicle damages and fuel and wear and tear as well as equipment expended and used and or damaged. Along with replace any safety gear or injuries to any persons working to mitigate the wildland fire

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## 4.15 Flooding

The County has experienced severe and widespread flooding throughout its history. Several major drainage basins have the potential to subject residents and structures to a high risk of flooding. In addition, the cumulative increase in impervious surfaces has increased problems related to surface run- off. While complete avoidance or protection through control facilities is not practical, considerable improvement can be made through structural and non-structural methods.

The County currently utilizes land use zoning districts to prohibit habitable structures in floodways as defined by the federal requirements necessary to participate in the National Flood Insurance Program. The consistent adoption of overlays is needed to require special review, conditions, and the prohibition of some uses in floodplain areas (areas subject to 100-year floods), including dry lakes. In addition, there are land use policies and development standards that can be implemented, including reduction of impervious surfaces; increase of percolation, infiltration, and recharge; and the control of urban run-off. There is a need for the County to identify all areas of flood and drainage hazards, especially in the Desert Region where mapping is sparse, as well as areas with a heavy concentration of debris or the potential for dam inundation. Flood hazards are more comprehensively discussed in the Safety Background Report.

The vulnerable areas are addressed in the County's General Plan. See Sections 5 and 6 for additional information. San Bernardino County has seven (7) properties listed in the Repetitive Loss and Severe Repetitive Loss properties. All of the properties are single-family residences. The properties are located in:

- Barstow – 2 properties (1999 and 2005)
- Crestline (1980 and 1982)
- Forest Falls (1995 and 1999)
- Lake Arrowhead (1998 and 2005)
- Lytle Creek (1998 and 2005)
- Sugarloaf (1993 and 1995)

These properties were damaged during unusual storms and/or immediately after a wildfire in the area and are isolated properties in widely scattered areas of the County. The properties were not damaged during the 2009 or 2010 winter storm events. Property addresses are not listed to comply with privacy laws.

The areas are now covered by the County General Plan and County Ordinance. These are in compliance with the National Flood Insurance Program.

### 4.15.1 Population at Risk

Of greatest concern in the event of a flood is the potential for loss of life. Using 2012 population data aggregated by census blocks, an estimate was made of the population exposed to the 100 and 500-year floodplain. To account for census blocks that were partially within the floodplain, a weighted average was employed to calculate the proportion of the population within the floodplain. The results of the population overlay are shown in Figure 4-31. More than 9,500 residents live near or within the 100-year floodplain and approximately 13,346 county residents live within the 500-year floodplain. Approximately 18,816 county residents live within areas protected by levees.

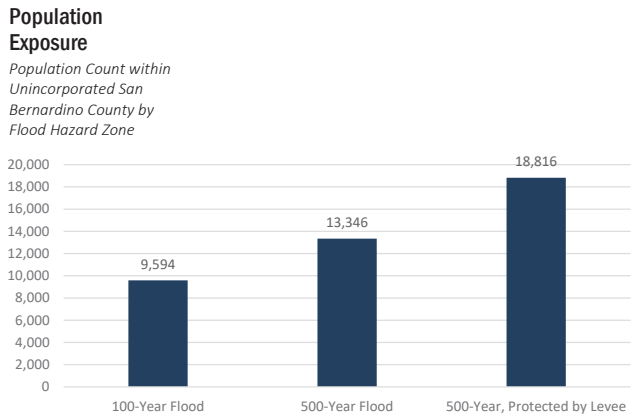


**Figure 4-31: Population Exposed to NFIP Flood Zones**

### 4.15.2 Residential Parcel Value with Flood Risk

The County's parcel layer was used as the basis for the inventory of improved residential parcels within the FEMA NFIP flood zones. In some cases, a parcel will be within in multiple flood zones. GIS was used to create centroids, or points, to represent the center of each parcel polygon – this is assumed to be the location of the structure for analysis purposes. The centroids were then overlaid with the floodplain layer to determine the flood risk for each structure. The flood zone in which the centroid was located was assigned to the entire parcel. This methodology assumed that every parcel with a square footage value greater than zero was developed in some way. Only improved parcels greater than $20,000 were analyzed.





Table 4-23 shows the count of at-risk parcels and their improvement and land exposure values.

**Table 4-23: Parcels Exposed to NFIP Flood Zones**

| Flood Hazard Zone | Improved Parcel Count | Improvement Value Exposure ($000) | Land Value Exposure ($000) | Total Exposure ($000) |
|---|---|---|---|---|
| 100-Year Flood | 3,426 | $ 518,483 | $ 368,058 | $ 886,541 |
| 500-Year Flood | 3,397 | $ 833,287 | $ 338,728 | $ 1,172,014 |
| 500-Year, Protected by Levee | 4,608 | $ 1,327,942 | $ 527,317 | $ 1,855,259 |
| Grand Total | 11,431 | $ 2,679,711 | $ 1,234,103 | $ 3,913,814 |

While there are several limitations to this methodology, it does allow for potential loss estimation. It should be noted that the analysis may include structures in the floodplain that are elevated at or above the level of the base flood elevation, which will most likely decrease potential flood damage to these structures. Also, it is important to remember that the County Assessor's values are well below actual market values; thus, the actual value of assets at risk may be significantly higher than those included herein.

### 4.15.3 Critical Facilities Exposure

Critical facilities data were overlain with flood hazard data to determine the type and number of facilities within the 100- and 500-year floodplain. Flooding poses numerous risks to critical facilities and infrastructure:

- Roads or railroads that are blocked or damaged can prevent access throughout the area and can isolate residents and emergency service providers needing to reach vulnerable populations or to make repairs.
- Bridges washed out or blocked by floods or debris from floods also can cause isolation.
- Creek or river floodwaters can back up drainage systems causing localized flooding.
- Floodwaters can get into drinking water supplies causing contamination.
- Sewer systems can be backed up causing waste to spill into homes, neighborhoods, rivers, and streams.
- Underground utilities can also be damaged.

Tables 4-24 and 4-25 provide an inventory of critical facilities in the floodplain for San Bernardino County and it provides the location of lifelines relative to the floodplain in the areas of the San Bernardino County. With a total of 810 essential facilities, high potential losses, and transportation and lifeline structures located in either the 100 or 500-year flood zone, the impact to the community could be devastating if these critical facilities were damaged or destroyed during a flood event.





**Table 4-24: Critical Facility Exposed to NFIP Flood Zones**

| Infrastructure Type | 100 Year Flood Zone | 500 Year Flood Zone | 500 Year Flood Zone, Protected by Levee | Feature Count |
|---|---|---|---|---|
| Essential Facility | 21 | 114 | 5 | 140 |
| EOC | 0 | 1 | 0 | 1 |
| Fire Station | 4 | 27 | 2 | 33 |
| Hospital | 0 | 4 | 0 | 4 |
| Police Station | 2 | 23 | 0 | 25 |
| School | 15 | 59 | 3 | 77 |
| High Potential Loss | 52 | 458 | 52 | 562 |
| Child Care Center | 13 | 57 | 3 | 73 |
| Child Residential Care - 24 hour | 0 | 2 | 0 | 2 |
| Foster Family Agency | 0 | 2 | 0 | 2 |
| Adult Residential Care | 0 | 37 | 3 | 40 |
| Home Care Organization | 0 | 2 | 0 | 2 |
| Elder Residential Care | 0 | 24 | 8 | 32 |
| Communication Facility | 0 | 7 | 0 | 7 |
| Dam | 2 | 3 | 0 | 5 |
| Waste Water Facility | 1 | 0 | 0 | 1 |
| HAZMAT | 0 | 16 | 1 | 17 |
| EPA FRS Facility | 33 | 286 | 35 | 354 |
| FCC ASR | 3 | 22 | 2 | 27 |
| Transportation and Lifeline | 26 | 77 | 5 | 108 |
| Airport | 2 | 5 | 0 | 7 |
| Runway | 2 | 5 | 0 | 7 |
| Bus Facility | 1 | 1 | 0 | 2 |
| Highway Bridge | 20 | 65 | 5 | 90 |
| Railway Bridge | 1 | 1 | 0 | 2 |
| **Grand Total** | **99** | **649** | **62** | **810** |

**Table 4-25: Lifelines Exposure to NFIP Flood Zones**

| Facility Type | 100 Year | 500 Year Flood Zone | 500 Year Flood Zone, Protected by Levee | Total Mileage |
|---|---|---|---|---|
| Transportation and Lifeline | 204 | 1,952 | 69 | 2,225 |
| Railway | 9 | 44 | 6 | 59 |
| Roads | 195 | 1,908 | 63 | 2,166 |
| Interstate Highway | 1 | 34 | 1 | 36 |
| State / County Highway | 20 | 189 | 9 | 218 |
| Primary Highway | 7 | 20 | - | 28 |

| Facility Type | 100 Year | 500 Year Flood Zone | 500 Year Flood Zone, Protected by Levee | Total Mileage |
|---|---|---|---|---|
| Local Road, Major | 32 | 377 | 38 | 447 |
| Local Road | 115 | 1,168 | 13 | 1,295 |
| Other Minor Road | 18 | 86 | 2 | 107 |
| Vehicular Trail | 2 | 15 | - | 17 |
| Cul-de-Sac / Traffic Circle | 0 | 1 | - | 1 |
| Ramp | 0 | 18 | 0 | 19 |
| **Grand Total** | **204** | **1,952** | **69** | **2,225** |

### 4.15.4 Loss Estimation Results

The Hazus analysis was used to assess the risk from and vulnerability to flooding within San Bernardino County. Hazus buildings data is aggregated to the census block level, known as the general building stock (GBS), which has a level of accuracy acceptable for hazard mitigation planning purposes. The following sections describe risk to and vulnerability of the GBS within the San Bernardino County mapped regulatory floodplain. The total value of exposed buildings and content within the San Bernardino planning area was generated using Hazus and is previously summarized.

Hazus calculates losses to structures from flooding by considering the depth of flooding and type of structure. Using historical flood insurance claim data, the software estimates the percentage of damage to structures and their contents by applying established depth-damage curves. Damage estimates are then translated to estimated dollar losses. The results are summarized in Tables 4-26 and 4-27 and Figure 4-32. While there are several limitations to the FEMA Hazus model, it does allow for potential loss estimation. It should be noted that the analysis may include structures in the floodplain that are elevated at or above the level of the base flood elevation, which will likely mitigate flood damage. Also, it is important to remember that the replacement costs are well below actual market values, thus, the actual value of assets at risk may be significantly higher than those included herein.

**Table 4-26: Flood Loss Estimation (Based on Depth) in NFIP Flood Zones**

| Flood Hazard Zone | Building Loss ($000) | Building Loss (% of Total Value) | Content Loss ($000) | Content Loss (% of Total Value) | Total Estimated Loss ($000) | Total Estimated (% of Total Value) |
|---|---|---|---|---|---|---|
| 100-Year | $ 34,749.00 | 0.1% | $ 24,858.00 | 0.1% | $ 59,849.00 | 0.2% |
| 500-Year | $ 218,454.00 | 0.8% | $ 173,304.00 | 0.6% | $ 396,336.00 | 1.4% |





**Table 4-27: 100 Year Flood Los Estimation (Based on Depth) in NFIP Flood Zones by Occupancy Type**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (% of Total Value) | Content Replacement Cost ($000) | Content Replacement Cost (% of Total Value) | Total Estimated Loss ($000) | Total Loss Estimation (% of Total Value) |
|---|---|---|---|---|---|---|
| Agriculture | $ 147.00 | 0.10% | $ 246.00 | 0.17% | $ 427.00 | 0.30% |
| Commercial | $ 1,874.00 | 0.08% | $ 4,458.00 | 0.18% | $ 6,463.00 | 0.26% |
| Education | $ 46.00 | 0.02% | $ 271.00 | 0.11% | $ 319.00 | 0.13% |
| Government | $ 56.00 | 0.07% | $ 304.00 | 0.39% | $ 370.00 | 0.48% |
| Industrial | $ 201.00 | 0.02% | $ 389.00 | 0.04% | $ 624.00 | 0.06% |
| Religious/Non-Profit | $ 326.00 | 0.09% | $ 1,946.00 | 0.55% | $ 2,279.00 | 0.65% |
| Residential | $ 32,099.00 | 0.14% | $ 17,244.00 | 0.07% | $ 49,367.00 | 0.21% |
| **Grand Total** | **$ 34,749** | **0.13%** | **$ 24,858** | **0.09%** | **$ 59,849** | **0.22%** |

**100 YR Flood Hazard**

*Estimated Content Loss by Occupancy Type*

**100 YR Flood Hazard**

*Estimated Building Loss by Occupancy Type*

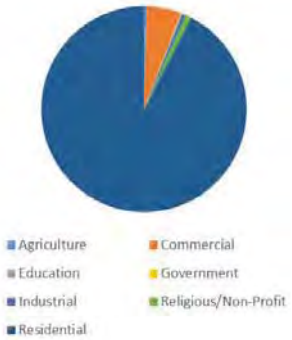

**Figure 4-32: Total Building and Content Loss by Occupancy Type for 100 Year Flood**





**Table 4-28: 500 Year Flood Loss Estimation (Based on Depth) In NFIP Flood Zones by Occupancy Type**

| Building Type | Building Replacement Costs ($000) | Building Replacement Cost (% of Total Value) | Content Replacement Cost ($000) | Content Replacement Cost (% of Total Value) | Total Estimated Loss ($000) | Total Loss Estimation (% of Total Value) |
|---|---|---|---|---|---|---|
| Agriculture | $ 674.00 | 0.48% | $ 981.00 | 0.69% | $ 1,781.00 | 1.26% |
| Commercial | $ 10,080.00 | 0.41% | $ 27,640.00 | 1.13% | $ 39,179.00 | 1.61% |
| Education | $ 720.00 | 0.29% | $ 3,563.00 | 1.44% | $ 4,355.00 | 1.76% |
| Government | $ - | 0.00% | $ 2.00 | 0.00% | $ 9.00 | 0.01% |
| Industrial | $ 6,036.00 | 0.57% | $ 13,975.00 | 1.31% | $ 22,438.00 | 2.11% |
| Religious/Non-Profit | $ 1,210.00 | 0.34% | $ 6,070.00 | 1.72% | $ 7,332.00 | 2.08% |
| Residential | $ 199,734.00 | 0.86% | $ 121,073.00 | 0.52% | $321,242.00 | 1.38% |
| **Grand Total** | **$ 218,454** | **0.79%** | **$ 173,304** | **0.63%** | **$ 396,336** | **1.44%** |

**500 YR Flood Hazard**

*Estimated Content Loss by Occupancy Type*

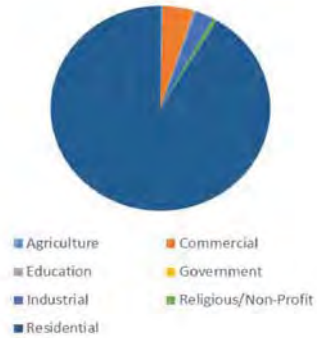


**500 YR Flood Hazard**

*Estimated Building Loss by Occupancy Type*

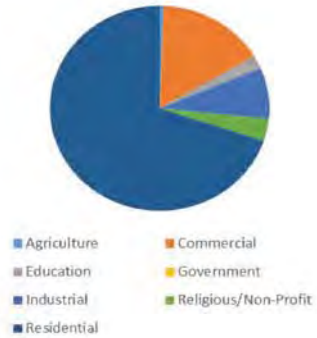


**Figure 4-33: Total Building and Content Loss by Occupancy Type for 500 Year Flood**

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## 4.16 Drought

Drought should not be viewed as merely a physical phenomenon or natural event. Its impacts on society result from the interplay between a natural event (less precipitation than expected resulting from natural climatic variability) and the demand people place on water supply.

Due to the lack of defined geographical boundaries, the vulnerability assessment for drought differs from other natural hazards. The impacts of drought can be categorized as economic, environmental, or social. Many economic impacts occur in agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to obvious losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and diseases to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn places human and wildlife populations, buildings, infrastructure and critical facilities, at higher levels of risk.

Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Reduced income for farmers has a ripple effect. Retailers and others who provide goods and services to farmers face reduced business. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls and loss of tax revenue for local, state and federal government. Less discretionary income affects the recreation and tourism industries. Prices for food, energy and other products increase as supplies are reduced. In some cases, local shortages of certain goods result in the need to import these goods from outside the stricken region.

### 4.16.1 Loss Estimation Results

No standardized methodology exists for estimating losses due to drought. Drought does not generally have a direct impact on critical and non-critical facilities and building stock. Instead, drought vulnerability is primarily measured by its potential impact to sectors of the County's economy and natural resources. In San Bernardino County some of the potential impacts to the economy include the following:

- Reduced agricultural and livestock production;
- Loss of timber from increased wildfires;
- Decreased municipal and industrial water supply;
- Loss of recreation/tourism; and
- Decreased wildlife and wildlife habitat.

### 4.16.2 Statewide Mandatory Water Reductions

Recognizing persistent, yet less severe, drought conditions throughout California, on May 18, 2016 the State Water Resources Control Board adopted an emergency water conservation

regulation requiring locally developed conservation standards based upon each water supplier's specific circumstances. It replaces the prior percentage reduction-based water conservation standard. In San Bernardino County, each water wholesaler (Mojave Water Agency) was required to calculate the supply of water for the next three years, considering drought conditions persist. Each water supply retailer subsequently self-certified the expected demand on water resources, determining whether or not there is sufficient supply to meet demand. Our Department certified that there is sufficient water supply to meet the demand over the next three years; however due to ongoing drought conditions in the region, water conservation efforts should continue. The County has developed a watering schedule, watering hour restrictions and additional end user watering restrictions which can be viewed here: http://www.specialdistricts.org/index.aspx?page=548





## 4.17 Terrorism

Translating most manmade hazard profiles into meaningful geospatial information is difficult at best. Instead, the planning team will use an asset-specific approach. Population, facilities, systems and assets will be prioritized and assessed in this vulnerability assessment.

Special consideration should be given to areas with high density and those containing vulnerable populations (young, old, and those whose primary language is not English).

Facilities at high risk may include gathering places, critical facilities/ transportation and lifelines and utilities.

### 4.17.1 Population at Risk

Since terrorism can happen anytime, anywhere, 100% of the population is vulnerable to terrorism. In particular, people with access and functional needs, the elderly and the very young are especially vulnerable because they often rely heavily on others in their daily lives. Persons with English as a second language are also vulnerable as they may not receive warnings or notifications related to an incident in their primary language.

### 4.17.2 Critical Facilities Exposure

Critical facilities may include essential facilities (such as hospitals, police and fire stations, evacuation centers, etc.), transportation systems, lifeline utility systems, high potential loss facilities (such as nuclear power plants, dams and military installations, etc.), and hazardous material facilities.

Gathering facilities should also receive special attention. Places of mass gathering not only present terrorists with potential opportunities for mass casualties, symbolism and high impact media coverage, they pose a broad range of security challenges for their owners and operators. The National Counter Terrorism Committee has noted that places of mass gathering have been specifically identified by religious and political extremists as attractive targets.

Places of mass gathering incorporate a diverse range of facilities including, but not limited to, sporting venues, shopping and business precincts, tourism/entertainment venues/attractions, hotels and convention centers, major events and public transport hubs. This also includes significant one off events.

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## 4.18 Climate Change

The vulnerability assessment for climate change is different from other natural hazards discussed in this HMP due to the lack of defined geographical boundaries. This section provides a summary of San Bernardino County's vulnerability to climate change.

The most serious threats to the public health of Californians will stem primarily from the higher frequency of extreme conditions, principally more frequent, more intense, and longer heat waves. A heat wave is defined as 5 or more consecutive extreme heat days. An increase in heat waves may increase the risk of directly related conditions such as heat stroke and dehydration.

In the desert areas of the County, the Extreme Heat Day Threshold temperatures are around 110°F and in the mountainous regions it is in the mid 80's. According to the Cal-Adapt Extreme Heat Tool, the number of extreme heat days (a day in April through October where the maximum temperature (Tmax) exceeds the 98th historical percentile of maximum temperatures based on daily temperature data between 1961 and 1990) will continue to increase rapidly from the present day to 2090.

Projections by Scripps Institution of Oceanography show little change in total annual precipitation in San Bernardino County. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. In the mountainous areas of the County, it is projected that the decadal average of snowpack will continue to decrease until 2090. As shown in Figure 4-34 the sharpest decreases in snowpack are projected to begin around 2030. The area projected to be burnt by wildfire toward the end of the century will not increase substantially in the County. The most change will be experienced in the mountainous regions.

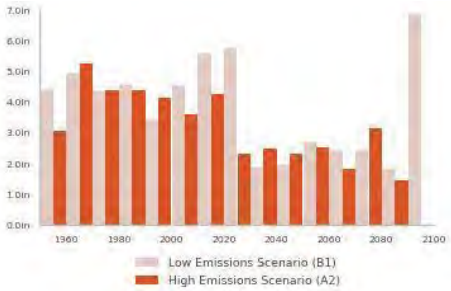


**Figure 4-34: Decadal Snowpack Averages 1960-2090**

***Source: cal-adapt.org/snowpack/decadal***

### 4.18.1 Population at Risk

Vulnerable populations should receive special attention when assessing the community's vulnerability to climate change. For example, care and sheltering during extreme heat conditions must be provided for vulnerable populations such as the elderly. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. According to the National Weather Service (NWS), among natural hazards, only the cold of winter—not lightning, hurricanes, tornados, floods, or earthquakes—takes a greater toll. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died.





# Section 5. Community Capability Assessment

## 5.1 Existing Plans, Policies and Programs

San Bernardino County is encouraging all departments, special districts, and agencies to share reports and common information. This sharing and exchanging of ideas has led to more coordinated efforts and better planning. The driving document in the County of San Bernardino is the County's General Plan. The County General Plan provides the foundation on which all development and future programs are built upon.

### 5.1.1 San Bernardino County General Plan

The State of California recommends that the General Plan is updated every 10-20 years; depending mostly on whether or not the plan is meeting the community's needs. The San Bernardino County General Plan was last updated and adopted in 2007. There are seven (7) mandatory elements in a General Plan:

- Circulation Element,
- Conservation Element,
- Housing Element,
- Land Use Element,
- Noise Element,
- Open Space Element, and
- Safety Element.

However, there are several optional elements. The County of San Bernardino General Plan includes an optional element, the Economic Development Element.

The Land Use Element of the General Plan establishes 18 land use zoning districts that apply only to lands governed by the County; not for lands controlled by other jurisdictions or lands controlled by federal and state government (see Section 1.3.5, page 8 for a listing of the 18 Land Use districts in the Land Use Element). The Land Use Element also describes land use compatibility for the primary three (3) hazards: Geologic; Flood; and, Wildfire. Because of these commonalities between the General Plan and the MJHMP, the county Board of Supervisors has adopted the MJHMP as part of the County's General Plan.

### 5.1.2 Regulations, Code, Policies and Ordinances

The following titles of the San Bernardino County Code include regulations and ordinances on the following issues and topics related to hazard mitigation:

**Table 5-1: County Development Code Hazard Crosswalk**

| Hazard | Plan/Program/ Regulation | Description |
|---|---|---|
| **Multi-Hazard** | **Title 2** | Emergency Services<br>Uniform Fire Code and related miscellaneous fire regulations<br>Police Regulations and Public Protection |
| **Multi-Hazard** | **Title 3** | Emergency Medical Services<br>Domestic Water Sources and Systems<br>Hazardous Materials and Toxics Control<br>Waste Management |
| **Multi-Hazard** | **Title 6** | California Building Code<br>California Electrical Code<br>California Plumbing Code<br>California Mechanical Code |
| **Multi-Hazard** | **Title 7** | Airport Rules and Regulations |
| **Multi-Hazard** | **Title 8** | Development Code includes regulations relative to Land Use, Development Standards, Safety Standards, and Environmental Protection. |
| **Multi-Hazard** | **Zoning Ordinances** | The County has also adopted Zoning Ordinances that are not part of the County Code but are part of the General Plan. These ordinances regulate land use; map the official land use and hazard overlay districts to include safety hazard and environmental protection areas. |

### 5.1.3 Local Programs for Mitigation Implementation

The information in Table 5-2 is used to construct mitigation actions aligned with existing planning and regulatory capabilities of the County. Planning and regulatory tools typically used by local jurisdictions to implement hazard mitigation activities are building codes, zoning regulations, floodplain management policies, and other County programs or planning documents.





**Table 5-2: Planning and Regulatory Mitigation Capabilities Summary**

| Hazard | Plan/Program/ Regulation | Responsible Agency | Comments |
|---|---|---|---|
| Multi-Hazard | Mountain Mutual Aid | Fire District | Mountain Mutual Aid is an operational group of emergency responders. It is comprised of all of the agencies and volunteer relief groups that would be and have been involved in any and all disasters on the mountain. It is of note to that their main and most frequent call to service is in response to a wildfire. They meet monthly and maintain themselves in a constant state of readiness. |
| Wildfire | Forest Care | Cal Fire | Forest Care is a program dedicated to creating a healthier forest. This program provides foresters to assess individual properties for thinning the vegetation and then provides 75% of the funding to do so. Funding originates at the Federal level but is passed through Cal Fire and it employs Cal Fire Foresters as well as staff from the National Forest Association |

#### 5.1.3.1 Public Education and Alert Programs

**Table 5-3: Public Education and Alert Programs**

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Multi-Hazard | MAST | Multiple | Mountain Area Safety Taskforce (MAST) has a substantial public education component. All agencies participate with the goal to have no one on the mountain uneducated about creating a thinner forest which is a more fire safe forest. For more information on MAST, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Multi-Hazard | CERT | Fire District | The Community Emergency Response Team (CERT) Program educates people about disaster preparedness and trains them in basic response |

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| | | | skills. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Multi-Hazard | Listos | Fire District | Listos, which means “ready” in Spanish, is a twelve-hour disaster preparedness course created specifically for the Spanish-speaking community and is delivered entirely in Spanish. The program is intended to be adaptable, flexible and culturally relevant. This means participants are encouraged to involve the entire family and accommodations are made for young children. San Bernardino County Fire, Office of Emergency Services currently partners with the Cities of Fontana and Rialto to bring Listos to their communities |
| Multi-Hazard | California Disaster Corps | Fire District | The Disaster Corps is a first-in-the-nation effort to professionalize, standardize and coordinate highly trained disaster volunteers statewide. This program initiative was built collaboratively in partnership with California Volunteers from the ground up through public-private partnerships and with a wide range of subject matter experts. See Annex A Section A.6 Fire Protection District Mitigation Project . |
| Multi-Hazard | TENS | Fire District | Telephone Emergency Notification Systems (TENS) During an emergency, public safety can be a direct function of the speed and accuracy of the dissemination of information. This is particularly important during emergencies that require evacuations. To that end the Board of Supervisors dedicated General Fund money in 2003 to the implementation of an automated phone dialing system that calls telephones in specific geographic areas of concern. All areas of San Bernardino County have all been preprogrammed so that during an emergency, the specific target group can be notified as quickly as possible. |





| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Multi-Hazard | ECS | Fire District | The Emergency Communications Service (ECS) is a volunteer group providing front-line communications, technical and logistical support to the San Bernardino County Fire Department and Office of Emergency Services. Their primary mission is to support County Fire, County Government and other local agencies in time of disaster. In addition, ECS has provided telecommunications and event support to other County departments including Public Health, Behavioral Health, Public Works, Pre-School Services, Sheriff's Search and Rescue and other County Departments. |
| Multi-Hazard | AM Radio | Fire District | Community Based AM Radio Transmitters The Fire Safe Councils discovered the existence of very inexpensive but very effective community based AM radio transmitters. The transmitters are very effective for providing information and updates to a community that is either preparing for a community emergency or just had one. As a delivery modality they are extremely reliable because in most all emergencies the AM radio in your car is likely to be operational particularly when the electricity is out in your house. |
| Multi-Hazard | IPAWS | Fire District | During an emergency, alert and warning officials need to provide the public with life-saving information quickly. The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation’s alert and warning infrastructure and will save time when time matters most, protecting life and property.<br><br>Federal, State, Territorial, Tribal, and local alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System (EAS), Wireless Emergency Alerts (WEA), the |

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| | | | National Oceanic and Atmospheric Administration (NOAA) Weather Radio, and other public alerting systems from a single interface. |

### 5.1.3.2 Wildfire Mitigation Programs

San Bernardino County has one of the most comprehensive set of programs to mitigate the potential for catastrophic wildfires in the Nation. There is no other jurisdiction that has the comprehensive, multi-agency cooperation and coordination as is found in San Bernardino County. See Annex A Section A.6 Fire Protection District Mitigation Project to see how the Fire Protection District will implement the following programs:

**Table 5-4: Wildfire Mitigation Programs**

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Wildfire | MAST | Multiple | The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for protection from wildfire. For more information on MAST, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Community Based Fuels Reduction program | Fire District | This program is designed to create community based fuel modification programs across the mountain communities. For more information see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Cal Fire | Cal Fire | Cal Fire provides programs to increase fire safety in high fire hazard severity zones. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | County Fire Hazard Abatement | Fire District | Fire Hazard Abatement works to reduce the potential for an individual's property to be the source of fire and structural ignitability. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |





| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Wildfire | Contractor Certification | City of Big Bear Lake Fire Department | This program trains and certifies landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Southern California Edison (SCE) | Southern California Edison (SCE) | SCE removes dead trees near power lines to reduce fire hazards. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Wood Shake Roof Replacement | County | This code requires that all Wood Shake Roofs in the Fire Safety Overlay, as defined in the Development Code, ongoing effort. |
| Wildfire | Inland Empire Fire Safe Alliance | Inland Empire Fire Safe Alliance | The Alliance was created to act as a forum for all Fire Safe Councils in San Bernardino County. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Community Wildfire Protection Plans (CWPP) | Fire District | CWPPs are designed to provide a means for a community to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | Organized Group Volunteer Activities | Fire District | There are several volunteer citizen groups throughout the County that are capable of providing significant resources that are not provided by traditional governmental agency services. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |

### 5.1.3.3 Earthquake/Geologic Mitigation Programs

San Bernardino County's seismic mitigation programs focus on two areas that have historically resulted in the greatest amount of damage and life loss from major earthquakes in California.

#### 5.1.3.3.1 Bridge Retrofit Program

Caltrans inspects County and City bridges yearly every 2 years for structural sufficiency (which applies to earthquake) and functional obsolescence (which applies to floods). Caltrans provides reports that include recommended repairs or replacement. The County and Cities make the repairs and/or apply for bridge replacement funds thru the Federal Highway Bridge Program (HBR). Currently the County has 5 funded HBR replacements due to structural deficiencies:

- Dola Ditch, (out for bid to construct)
- Lanzit Ditch, (out for bid to construct)
- Garnett at Mill Creek (under construction)
- Yermo Rd at Manix Wash.(waiting for SCAG approval for additional funds to move forward with the Design & Environmental)
- Baker Blvd west of SR127. (waiting for HBP fund for Design & Environmental)
- National Trails Hwy at Kalmia Bridge (waiting for HBP funds)
- National Trails HWY @ Adena Ditch (Received HBP funds for design phase)
- Bridge Management (consultant on board that has prioritized all timber bridges on National Trails Highway and DPW is submitting groups of bridges for funding over a ten year period)

The design and environmental work has been started for Rock Springs Road (functionally obsolete bridge) using DPW funds, waiting for HBP funds for R/W phase.

The County has completed the construction of the Alabama Street at Plunge Creek bridge replacement using Federal Emergency Relief funds.

##### 5.1.3.3.2 Unreinforced Masonry Building Program

In the 1990's, the County of San Bernardino compiled a master list of suspected Unreinforced Masonry Buildings within the unincorporated areas. Since that time, several sites have been incorporated and therefore, are now removed from County jurisdiction. In addition, several appear to have been demolished or retrofitted since the 1990's. The Land Use Services Department's Building and Safety Division is currently in the process of re-evaluating the URM list. Re-evaluation will include a field visit to each site photographing structures and verifying the occurrence of unreinforced masonry. This process is scheduled to be completed by the end of the 2010.The program would be an inspection program and maintenance and inspections as warranted.

There are no large publically utilized URM structures currently on the list. These types of structures are typically restricted to the incorporated areas of the County. There are only twenty-two (22) structures remaining on the list.





##### 5.1.3.3.3 Geologic Hazard Mapping

The Seismic Hazards Mapping Act (Public Resources Code, Chapter 7.8 Section 2690-2699.6) directs the Department of Conservation, California Geological Survey (CGS) to identify and map areas prone to liquefaction, earthquake-induced landslides and amplified ground shaking. Although the San Bernardino area has a full spectrum of geologic hazards, CGS does not have adequate funding to complete the hazard mapping within the County.

### 5.1.3.4 Flood Mitigation Programs

The flood mitigation projects are programs that were established by San Bernardino County Flood Control District to protect life and property. These projects are typically designed to convey 1% annual chance or greater storm flows in order to mitigate danger to life and property, and critical infrastructure consisting of existing, new and future structures. Also, these projects include revisions to local land use and building codes where analysis or experience shows the need for code revisions or amendments to meet previously unidentified circumstances.

| Hazard | Program | Responsible Agency | Comments |
|---|---|---|---|
| Flood | Flood Area Safety Taskforce(FAST) | Flood Control District | The FAST Organization stresses liaison with the communities, provides for community education and information, and places emphases on Community and city partnerships. For more information on FAST, see Annex B Section B.6 Flood Project Prioritization and Implementation. |
| Flood | Alluvial Fan Task Force | Alluvial Fan Task Force | The Task Force reviews the state of knowledge regarding alluvial fan floodplains, determine future research needs, and, if appropriate, develop recommendations relating to alluvial fan floodplain management, with an emphasis on alluvial fan floodplains that are being considered for development. For more information, see Annex B Section B.6 Flood Project Prioritization and Implementation. |
| Flood | StormReady | Flood Control District | San Bernardino County is a StormReady County. For more information, see Annex B Section B.6 Flood Project Prioritization and Implementation. |

### 5.1.3.5 Climate Change Programs

#### 5.1.3.5.1 Extreme Heat, Extreme Cold Programs

This document is a contingency plan supporting the San Bernardino County Emergency Operations Plan (EOP).

Excessive Cold events are commonplace in San Bernardino County and most often warrant monitoring activities only. These Standard Operating Guidelines provide GUIDANCE based on the most likely scenario, and can be expanded to meet the parameters of a “disaster” scenario if necessary.

The Extreme Weather – Excessive Cold Standard Operating Guidelines (SOG) were developed in response to the potential for Excessive Cold and cold related Power Outage events in San Bernardino County. The following objectives and activities are to prevent the harmful effects of excessive cold on at-risk populations and the potential for life-threatening repercussions of power outages during excessive cold events.

The information included in this plan is “situation” and/or “incident” driven and subject to revision by the Extreme Weather Committee as conditions warrant. Notifications are information dependent and modification of the activities in these guidelines may be required in response to changing conditions, situations and/or inaccurate weather predictions

#### 5.1.3.5.2 San Bernardino County Fire Office of Emergency Services Heat Plan

This document is a contingency plan supporting the San Bernardino County Emergency Operations Plan (EOP). The Extreme Weather – Excessive Heat Standard Operating Guidelines (SOG) were developed in response to the potential for Excessive Heat and heat related Power Outage events in San Bernardino County. The following objectives and activities have been established to prevent the harmful effects of excessive heat on at-risk populations and the potential for life-threatening repercussions of power outages during excessive heat events. The Extreme Weather – Excessive Heat SOG describe the County operations during heat related emergencies and provide guidance for local jurisdictions in their preparation for heat emergencies and other related activities. The information included in this plan is “situation” and/or “incident” driven and subject to revision by the Extreme Weather Committee as conditions warrant. Notifications are information dependent and modification of the activities in these guidelines may be required in response to changing conditions, situations and/or inaccurate weather predictions.





## 5.2 Fiscal Resources

The 2016-17 recommended budgets of $5.4 Billion are balanced and consistent with policy and direction received from the Board of Supervisors. The 2016-17 Recommended Budgets address the following key issues:

- Ongoing funding for neglected raises for County employees
- Ongoing funding for maintenance of County roads
- Continues investment in facilities, infrastructure and operating systems.
- Ongoing funding of mental health and medical services for County residents.
- Maintains fiscal responsibility through contributions to the reserves of $62.8 million.

The budget represents the County General Fund and County restricted general funds .It also presents capitol project funds, special revenue funds, enterprise funds, internal service funds and permanent funds for all entities in the 2016-17 Recommended Budget including the County Board Governed County Service Areas, San Bernardino County Fire Protection District, San Bernardino County Flood Control District. Other agencies presented in the budget include County Industrial Development Authority, Inland Counties Emergency Medical Agency and the recently added Housing Authority of the County of San Bernardino. The total requirements for these funds in the 2016-17 are $5.4 billion, which includes amounts budgeted as contingencies or contributions to reserves. Excluding these amounts, total projected expenditures for the 2016-17 are $5.3 billion. The General fund Requirements total $2.9 billion and are funded by countywide discretionary revenues (primary property taxes), departmental revenues and other funding sources of the General Fund, of this $2.9 billion, only $558.3 million is truly discretionary.

### 5.2.1 The Budget in Brief

This budget book collectively presents the general fund, special revenue funds, capital project funds, internal service funds, and enterprise funds for the county and its Special Districts. The total spending authority for these funds in 2016– 2017 is $5.4 billion. The general fund spending authority totals $5.3 billion and is funded by countywide discretionary, and the beginning fund balance of the General Fund. Of this $2.9 billion, only $558.5 million is truly discretionary.

Table 5-5: Spending Authority for San Bernardino County

| | Spending Authority (in Millions) | | |
|---|---|---|---|
| | 2015-16 | 2016–2017 | Change |
| General Fund | $ 2,984.3 | $ 2,911.1 | $ (73.2) |
| Restricted Funds | 49.3 | 49.7 | (.4) |
| Capital Project Funds | 1169. | 911.3 | (258.4) |
| Special Revenue Funds | 257.6 | 298.4 | 40.7 |
| Enterprise Funds | 984.9 | 1001. | 16.5 |
| Internal Service Funds | 1.6 | 0.0 | (1.6) |
| | **$ 5,692.0** | **$ 5,420.0** | **272.0** |

There is a $73.2 million net decrease in General Fund requirements due to a $106.1 million reduction in contributions to General Fund reserves, as the Board of Supervisors approved an increase to multiple County General Fund operational groups' requirements are increasing by $32.9 million. There are Law and Justice ($12.5 million). The Human Services Operational Group is anticipating increased State and Federal funding that will support Department of Behavioral Health services, including inpatient hospitalization, indigent hospital care, general mental health services, and services for children, youth, and families .The County is also continuing to allocate additional resources to meet the growing need for augmented health and mental health correctional services associated with Public Safety Realignment.

The net reduction of $258.4 Million is Special Revenue Funds is associated with the County's shift in 2015-16 from budgeting contingencies to instead placing unallocated resources in reserves. This technical change resulted in a large one-time contribution to reserves in 2015-16 that is not required in 2016-17. This reduction in contributions to reserves totaling $289.6 million is offset by increased operational costs of $31.2 million. This is due to increases within the Department of Behavioral Health's Mental Health Services Act (MHSA) budget unit and the County Fire Protection budget is increasing as a result of the pending annexation of fire prevention and suppression services from the City of San Bernardino (429.6 million) and Twentynine Palms ($1.7 million).

The $40.7 million increase in Capital Project Funds is primarily due to the planned construction of two Department of Behavioral funded Crisis Stabilization Centers and four Crisis Residential Treatment Centers totaling $36.5 million. This will enable Community Crisis Response Team (CCRT) clinics throughout the County to be expanded to provide 24 hour services and to respond to request by law enforcement for support during the night hours.

Enterprise Funds requirements are increasing a net $16.5 million. Notably, the Housing Authority of the County of San Bernardino has been added to the budget book and is contributing to the overall increase in Enterprise Fund requirements, including additional assumed payments for Housing Assistance and increased Capital Expenditures.





Table 5-6: 2015-2017 Staffing Budget

| | Budgeted Staffing | | |
|---|---|---|---|
| | 2015–2016 | 2016–2017 | Change |
| General Fund | 14,332 | 14,425 | 93 |
| Other Funds | 6,375 | 6,508 | 133 |
| Special Districts and Other Agencies | 1402 | 15601 | 159 |
| **Total:** | **22,109** | **36,534** | **385** |

### 5.2.2 Budget Highlights (2016 – 2017)

**Create and Maintain and Grow Jobs and Economic Value in the County**

- The Real Estate Services Department of Project Management Division (formerly Architecture and Engineering) Capital improvement budget includes 355 active projects with total requirements of $295.2 million, including $128.2 million in new projects funded with $57.7 million of Discretionary General Funding includes an ongoing base budget of $12.0 million for maintenance and non-major Capital Improvement Plan (CIP) projects ,and $45.7 million for construction and major CIP projects .These major projects include $26.4 million for the 800 Megahertz Upgrade Project ,$12.2 million for various Sheriff's facility improvements ,$8.0 million for the County Buildings Acquisition and Retrofit Project including the upgrade of the County Government Center parking lots and grounds ,and $7.6 million for a variety of other projects.

**Improve County Government Operations**

- Enterprise Financial Management System: Implementation of the new system began in May 2016 with the first phase (out of two phases) continuing into 2016-17 at an estimated cost of $7.1 million. The total cost for the financial system is estimated to be $25.0 million and will streamline business processes and provide better management information.

- Public Health will continue its efforts to achieve and maintain National Accreditation, through the Public Health Accreditation Board (PHAB). Accreditation ensures the Department's continued focus on quality and performance improvement, transparency and accountability to all stakeholders, and the capacity to deliver core Public Health functions. The department will be submitting the required application to PHAB in December 2016.

- The County Library continues its plans to enhance service by replacing outdated computer hardware and software. Funding has been included in the Library's material's budget, which adds high demand items to the collection, including an expanded digital book collection.
- Land Use Services, in conjunction with Public Works, Information Services, and other County departments, continues to upgrade to a new enterprise permit solution, Accela. The new system will include a shared database, precise digital maps, and satellite images of land data that are linked to the County's GIS database. It will also provide field staff remote real-time access to the database. This solution will streamline the permitting process, offering the public access to a web portal to manage and monitor applications and permits online.

**Operate in a Fiscally-Responsible and Business-like Manner**

- The County Museum's budget of $3.8 million demonstrates the County's commitment to support the Museum through a time of transition. The budget includes $1.1 million in one-time Discretionary General Funding which includes bridge funds to support current operations and funding for activities related to re-accreditation. The County Museum continues to implement the consultant study recommendations as approved by the Board of Supervisors, to address organizational and financial challenges.

- The Transitional Assistance Department is in the second of a four year reduction to the State's CalFresh Match Waiver pursuant to the phase-out agreement adopted in the prior year State budget. This wavier allowed the County to draw additional Federal and half of the State funding without increasing the County's Maintenance of Effort. The budget includes the use of $2.5 million of the original $5.0 million general fund reserve that the Board approved in 2014-15 for this phase-out period.

**Ensure Development of a Well-Planned, Balanced, and Sustainable County**

- The County continues work on a complete overhaul of the County's General Plan, referred to as the Countywide Plan. This Countywide Plan will be a comprehensive web-based system to document land use planning and organizational governance policies. It will be comprised of three basic components: The Policy Plan (a comprehensive general plan); the County Business Plan (a system that will define and guide how the County government operates and manages itself); and the Regional Issues Forum (a web-based resource center containing information regarding shared Countywide issues). Additionally, the County is updating and expanding the community plans. When completed, there will be 27 web-based community plans involving 49 communities.

- A team of County departments will continue to monitor the drought and develop ways to reduce water usage at County facilities to show good stewardship of this valuable resource. The Special Districts Department, in collaboration with other County





departments, will continue to implement water conservation programs/strategies at various County Service Areas and Districts throughout the County.

- The Registrar of Voters budget fluctuates based on the 4-year election cycle, with the Presidential Election being the largest and most costly of the major elections. The Department is transitioning from a one minor and two major election cycles in 2015-16 to a one minor and one major election cycle for 2016-17. The budget includes provisions for the following: November 8, 2016 Presidential General Election (major); December 6, 2016 San Bernardino County Employees' Retirement Association Election (minor); and three anticipated, but unscheduled special elections (minor). The minor elections are 100% reimbursable; however, the November Presidential General Election is only 30% reimbursable and thus requires one-time Discretionary General Funding (Net County Cost) of $3.7 million for the year.

- The Public Works – Transportation budget includes over $35.0 million in major infrastructure projects, funded in part with Discretionary General Funding. Budgeted activities include design, right of way and/or construction for major projects including:
  - Bridge replacements on: Glen Helen Parkway, Baker Boulevard, Garnet Street, Rock Springs Road, Dola Ditch Bridge, Lanzit Ditch Bridge, Yermo Road and Arrowbear Drive;
  - New bridge on Shadow Mountain Road;
  - Widening of Slover Avenue in the Bloomington Area;
  - Installation of raised pavement markers on National Trails Highway in the Amboy area;
  - Reconstruction of Institution Road to improve access to the Sheriff facility in San Bernardino;
  - National Trails Highway Bridges: Bridge management plan for the repair, rehabilitation or replacement of 127 bridges on National Trails Highway and starting the design phase for replacement of 10 bridges:
  - Rehabilitation and re-profiling at various locations on Needles Highway in the Needles area;
  - Improvements to alleviate congestion and improve circulation of the interchange on Interstate 10 at Cedar Avenue

- The Public Works – Transportation budget includes $31.5 million worth of pavement improvement projects, funded in part with ongoing Discretionary General Funding, to preserve the County's roadways by investing enough to keep the system from deteriorating further.

- The Public Works – Solid Waste Management Division plans to complete $8.9 million of capital improvement projects, which includes the following:
  - $2.0 million for resurfacing the entrance and haul roads at the San Timoteo Landfill;
  - $957,000 for construction of Groundwater Treatment Systems at the closed Lenwood-Hinkley Landfill and Yucaipa Disposal Site;

- $1.5 million for the East Slope Stabilization and Mitigation project at the closed Heaps Peak Disposal Site;
- $1.5 million for construction of Landfill Gas Extraction Systems at the Barstow and Big Bear Landfills which includes $300,000 to bring electrical power to the Barstow Landfill

- The Public Works – Flood Control District (District) budget includes $37.6 million in capital improvement projects. The District anticipates completion of the following projects: Cactus Basin # 3, Wilson Creek Channel, Santa Ana River Flood Wall Repair, and the waterline relocations for Bandicoot Basin and Amethyst Basin. The District also plans to start construction on the following projects: Levee Certification Restoration for Patton Basin, Mojave River Levee, and Sand Creek/Warm Creek Confluence.

- Land Use Services Planning budget includes $150,000 of Discretionary General Funding for the preparation of a Morongo Basin Cultural Plan.

- The Special Districts department's budget includes $45.3 million capital improvement projects including the design and construction of the Big Bear Alpine Zoo relocation, rehabilitation of the Lake Gregory Dam, and construction of Snow Drop Road. Water and sanitation infrastructure projects of $19.2 million include pipeline replacements; water system improvements, and design and construction of a pipeline, a 75,000-gallon water reservoir, and a pump station in CSA 70 W-4 – Pioneertown.

- Community Development & Housing is constructing Phase 2 of the Bloomington Community and Neighborhood Revitalization. A total of 190 multi-generational affordable housing units include 120 family units and 70 senior units and the Bloomington Branch Library. The Bloomington Branch Library and the first phase of housing are completed. The second phase is currently under construction and will be completed by spring 2017.

**Provide for the Safety, Health and Social Service Needs of County Residents**

- The County is expanding efforts to provide homeless support to County residents through the flowing allocations included in the 2016-17 budget:
  - The Department of Behavioral Health is investing $4.0 million by providing basic needs, case management, outreach services, and additional built and supportive housing opportunities.
  - The Sheriff/Coroner/Public Administrator is continuing to fund the HOPE Program (Homeless Outreach Proactive Enforcement) Team ($620,000), which provides services to the homeless population by connecting them to the appropriate agencies for much needed services that help in the transition from homelessness.
  - The Probation Department has included $3.2 million towards transitional housing for adult offenders requiring Probation Department supervision.





- The Department of Behavioral Health is expanding Mental Health Treatment Services, notable in the following areas:
  - $1.0 million towards staffing Community Crisis Response Team clinics, which will now provide 24 hour services to departmental consumers and respond to requests by law enforcement for support during night hours. The department has also allocated $36.5 million towards the construction of new CCRT clinics throughout the County to expand these services.
  - $8.5 million for the Mental Health Act (MHSA) Comprehensive Children and Family Support Services program to support expanded mental health services for children.
  - $4.3 million for the MHSA Regional Adult Full Service Partnership (FSP) program support expanded mental health services to adults.
  - $1.0 million for the MHSA Forensic Integrated Mental Health Partnership program to expand services to develop peer support and mentoring strategies for individuals who have been released early from County jail or State prison.

- The Sheriff/Coroner/Public Administrator budget included $1.1 million of existing departmental resources for a program authorized by the Board as a pilot on December 15, 2015 (Item No. 72) related to the delivery of law enforcement services to unincorporated areas of the West End including the North Rancho/Etiwanda Preserve and the Mission Corridor, respectively. The program was successful and is now being incorporated as an ongoing service beginning in 2016-17 ,

- The Sheriff/Coroner/Public Administrator budget includes $9.0 million of one-time Discretionary General Funding (Net County Cost) to replace 2 aging and obsolete patrol helicopters: including equipment, travel and training for pilots and mechanics, installation of equipment, and delivery charges. The helicopter replacements will provide newer more reliable aircraft.
- The Public Defender Proposition 47 program will use media resources to reach all potential citizens who have convictions eligible for reclassification to further enhance their ability to rehabilitate within the community.

- County Fire is assuming fire, rescue, Emergency Medical Services (EMS), and prevention responsibilities within the Cities of San Bernardino ($29.6 million) and Twentynine Palms ($1.7 million) as a result of the pending annexations. This continued expansion of a regional approach will provide a more effective and efficient delivery of fire services for County residents.

- Land Use Services Code Enforcement is continuing to pilot various strategic initiatives to address issues with short-term rentals, particularly in the mountain areas. For 2016-17, a pilot program for a short-term rental hotline will be established where the public can report illegal or disruptive activities at short-term rental properties.

- The Information Services Department Telecommunication Services division is in the process of upgrading the County's Regional Public Safety Radio System (800 Mhz Upgrade Project). The project is currently on schedule, with an estimated completion date of 2020-21. The estimated cost of the project is $158.2 million primarily funded with Discretionary General Funding.

- The Department of Aging and Adult Services (DAAS) budget of $8.3 million will supplement programs such as the Elderly Nutrition, Supportive Services, Medicare Improvements for Patients and Providers Act, and Family Caregiver.

- The Arrowhead Regional Medical Center (ARMC) budget includes the addition of 14 positions to strengthen the Sterile Processing division to meet operational needs and ensure compliance with regulatory standards.

- The Department of Children and Family Services is implementing an After Hours Response Center (ARC) in June 2016 to provide optimal customer services to our community partners, children and families. The Center will enhance the departments critical after hour function of responding to child abuse, neglect and exploitation referrals called into the Child and Adult Abuse Hotline (CAAHL).

**Pursue County Goals and Objectives by Working with Other Agencies**

- ARMC is participating in California's 1115 waiver Renewal (Medi-Cal 2020), working alongside the California Association of Public Hospitals, the State of California, The Centers for Medicare & Medicaid Services, and multiple County departments focusing on improved patient outcomes, efficiencies and access in patient care integrated care models and procuring maximum reimbursement for performance of prescriptive clinical measures. The budget includes $52.5 million in revenues related to the Medicaid Waiver programs.

**Focus on Recovery and Resiliency Following the December 2, 2015 Terrorist Attack (SB Strong)**

- The County Administrative Office has commenced a countywide effort to document the impact and ongoing response to the December 2, 2015 terrorist attack while pursuing multiple sources of potential cost-reimbursement and to create a historic and best-practices document.

- The County has allocated approximately $10.2 million in funds towards improving security at County facilities. This includes $8.2 million in immediate improvements to facilities, such as expanded security guard services, upgraded security camera and key card access installations, and $2.0 million to conduct a security assessment of all County facilities.





**Challenges in Fiscal Year 2016-17 and Beyond**

Although the balancing of future costs with projected revenue has improved compared to prior County five year forecasts, broad economic challenges remain. The current economic expansion will be 7 years at the end of June 2016, which is the fourth longest in the history of the United States and cannot be assumed to last indefinitely. In addition, the fiscal uncertainly inherent in the State budget process continues to present a major challenge to the County's fiscal planning efforts.

**Economic Challenges**

The County's Five Year Financial Forecast covers July 2016 through June 2021 and includes moderate growth of major revenue streams throughout the period. Not included in the forecast are the impacts of a potential recession or the unknown economic impacts of the coming statewide $15 minimum wage.

By the end of the third year of the County's forecast the current economic expansion would match the longest expansion in history. Although the weakness of the current recovery and quantitative easing may have pushed off the next recession temporarily, it would be without precedent for the economy to expand throughout the County's entire five year forecast. In response to these unknown variables, the County has taken the approach of budgeting revenue growth in a conservative fashion over the entire five year forecast rather than assuming greater potential revenue increase in the immediate future with reductions in the later part of the forecast.

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# Section 6. Mitigation Strategy

## 6.1 Mitigation Goals and Objectives

Goals and objectives discussed in this section help describe what actions should occur, using increasingly narrow descriptors. Long-term goals are developed which can be accomplished by objectives. To achieve the stated objectives "mitigation actions" provide specific measurable descriptors on how to accomplish the objective. The goals, objectives, and actions form the basis for the development of a Mitigation Action Strategy and specific mitigation projects to be considered for implementation.

The process consists of 1) setting goals and objectives, 2) considering mitigation alternatives, 3) identifying strategies or "actions", and 4) developing a prioritized action plan resulting in a mitigation strategy.

The following section provides an overview of the Mitigation Goals and Objectives for profiled hazards, Wildfire, Earthquake, Flood, Drought, Terrorism, and Climate Change for the County Unincorporated Area and the County's Special Districts. These goals were compiled from various sources including the County of San Bernardino 2007 General Plan. (See Section 3.5 for a detailed description of the process used by the County Planning Team)

### 6.1.1 All Hazard (AH)

**AH GOAL:** Increase readiness for all hazards in the unincorporated areas of San Bernardino County.

**OBJECTIVE 1: Construct All-Hazard Response Facilities:** Construct facilities to increase operational readiness to reduce impacts of natural hazards.

> **AH Action 1.1: Construct Valley Dispatch and Operations Center.** Construct facility and ensure cohesive working and response to any scale emergency and operations in a secure complex
>
> **AH Action 1.2: Construct Shelter Operations Compound (SHOC).** This shelter concept provides a new one-stop shelter concept. The SHOC combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location.

**OBJECTIVE 2: Special District Funding:** Continue Special Districts Projects relating to all hazards.

**AH Action 2.1:** Continue funding and support for Special Districts Projects relating to water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big

Bear Valley Recreation Park District and Bloomington Recreation and Park District for all hazards.

**AH Action 2.2: Install Generators at Critical Facilities** Retrofit existing buildings and facilities with connectors/ ATS for emergency generators and/or install permanent emergency generators at critical facilities, including wells and booster station locations.

**AH Action 2.3: Water Systems Repair Plan** Develop a plan for speeding the repair of and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies.

**AH Action 2.4: Smart Water Meters and SCADA** Utilization of SCADA and Smart Water Meters to get real time data on problems with the system and reduce drive time emissions as a result of traditional meter reading.

**AH Action 2.5: Provide Employees with Emergency Supplies** Provide emergency supplies of food, water, and portable generators for employees at office and field locations.

**AH Action 2.6: Annual Tower and Guide Wire Inspections** Conduct annual tower and guide wire inspections to mitigate storm/wind/earthquake hazards from knocking out communications.

**AH Action 2.7**: **Maintain Tower Lighting** Maintain lights on all tower locations.

**AH Action 2.8: Designate Emergency Operations Sites** Conduct an inventory or list of County Park Facilities and Community Centers to establish a list of pre-designated emergency operations or disaster relief sites. Not all Community Centers are an appropriate size to accommodate large numbers of evacuees and may only serve as command and control centers or distribution centers.

**AH Action 2.9: Establish Power Sources for Emergency Operations Sites** Establish small solar energy fields or other forms of renewable power at County Community Centers to
facilitate stand-alone emergency operations for the community.

**AH Action 2.10: Connect Water Systems to Generators** Connect water systems to generators to ensure delivery even in disaster situations.

**AH Action 2.11: Establish a Centralized Communications Network** Establish a centralized communications network to monitor channel output for TV Districts and provide emergency information by way of character generator tied to channel transmissions.





**AH Action 2.12:** Incorporate as appropriate requirements from the State of California's most recent land use regulations regarding the hazard mitigation planning process (Government Code 65302 and 8685.9).

### 6.1.2 Wildfire (WF)

**WF GOAL:** Continue to reduce fire hazards in the unincorporated areas of San Bernardino County.

**WILDFIRE OBJECTIVE 1**: **Mountain Area Safety Taskforce.** Continue the cooperation and coordination of Fire Hazard Mitigation efforts with all stakeholders in the mountain areas of San Bernardino County through participation in MAST.

**WF Action 1.1:** Continue Mountain Area Safety Taskforce (MAST) funding to support mitigation activity.

**WILDFIRE OBJECTIVE 2: Support Mountain Mutual Aid Objectives.** Continue development of and continue the mission of mutual aid between the first responders in the County mountain areas through County Mitigation Planning.

**WF Action 2.1:** Update Mountain Mutual Aid Mapbook to document.

**WF Action 2.2:** Update Community Structure Protection Plans as necessary.

**WILDFIRE OBJECTIVE 3: Community Based Fuels Reduction Program.** Continue the community based Fuels Reduction Program through community based programs, both volunteer and government funded.

**WF Action 3.1:** Implement identified community based fuels reduction projects.

**WF Action 3.2:** Develop fuels reduction "maintenance program" by obtaining participation from citizens and/or homeowners associations.

**WF Action 3.3: Vegetation Removal** Clear vegetation from Road District facilities/yards.

**WILDFIRE OBJECTIVE 4: Forest Care.** Continue providing assistance to homeowners by expanding services to all communities in the Mountain areas of the County.

**WF Action 4.1:** Increase homeowner assistance services to mountain residents for fuel reduction.

**WF Action 4.2:** Continue working with Southern California Edison to remove dead trees near power lines.

**WILDFIRE OBJECTIVE 5: County Fire Hazard Abatement.** Overcome funding shortfalls while improving service delivery.

**WF Action 5.1:** Inspect every residence in the mountain communities within the next two years to enforce the new Fire Hazard Abatement code that addresses green fuels.

**WF Action 5.2:** Continue to collaborate with Forest Care, Red, Cross and Cal Fire to overcome increased costs of enforcement.

**WILDFIRE OBJECTIVE 6: Decrease Wildfire Hazards at Private Property through the Fire Hazard Abatement Programs**

**WF Action 6.1:** Train and Certify landscape contractors to comply with the new Fire Hazard Abatement Code.

**WF Action 6.2:** Continue wildfire mitigation efforts under the Wood Shake Roof Replacement Program.

**WF Action 6.3: Protect Property in Wilderness Areas** Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks.

**WILDFIRE OBJECTIVE 7: Support Mitigation Strategies in Community Wildfire Protection Plans. Continue to improve CWPP's in cooperation with Cal Fire, the IEFSA and individual Fire Safe Councils.**

**WF Action 7.1:** Modify independent and unique CWPPs into a more common framework making them similar but leaving room to provide specific hazard characteristics and mitigation actions for each community.

**WILDFIRE OBJECTIVE 8: Improve Emergency Access.** Improve and maintain emergency access for wildfire protection.

**WF Action 8.1:** Construct Arrowbear Drive Realignment and Widening

**WF Action 8.2:** Construct Cedar Glen Fire Access Road

**WF Action 8.3: Structural Fire Breaks Widening** Double the width of external fire breaks on grounds which have structures located in wilderness and or areas prone to wildfires.

**WILDFIRE OBJECTIVE 9: Special District Funding:** Continue Special Districts Projects relating to wildfire.





**WF Action 9.1:** Continue funding and support for Special Districts Projects relating to wildfire in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

**WF Action 9.2: Emergency Water Supplies** Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal. (completed with continuous fresh of supplies and rotation)

### 6.1.3 Earthquake/Geologic Hazards (EQ)

**GOAL:** Minimize exposure to structural and contents damage from geologic and seismic conditions. (Complements General Plan, Section VIII, Safety Element (Goal S 7)

**EARTHQUAKE OBJECTIVE 1:** Educate the public on reducing earthquake risk.

**EQ Action 1.1:** Improve public education programs and practices to residents for earthquake risk.

**EARTHQUAKE OBJECTIVE 2:** Protect occupants and structures in proposed developments from high levels of risk caused by rupture of the ground surface during an earthquake (Complements General Plan, Section VIII Safety Element Policy S 7.4).

**EQ Action 2.1:** Evaluate single family homes for Earthquake hazard when conducting permit applications and plan reviews.

**EQ Action 2.2: Seismic Strapping** for existing water tanks and future construction.

**EQ Action 2.3: Employee Emergency Sheltering** Develop a plan for short-term and intermediate-term sheltering of employees.

**EARTHQUAKE OBJECTIVE 3:** Continue geologic hazard mapping projects to minimize and prevent damage caused by earthquakes and other geologic hazards.

**EQ Action 3.1:** Identify liquefaction hazard areas outside the currently designated Geologic Hazard Overlay Districts.

**EARTHQUAKE OBJECTIVE 4:** Protect life and property from risks resulting from gravity-derived and/or earthquake-triggered landslides, expansive soils and/or other poor soil conditions. (Complements General Plan, Section VIII, Safety Element Policy § 7.6)

**EQ Action 4.1:** Require development on hillsides to minimizes the extent of topographic alteration and erosion, to maintain slope stability, and to reduce the potential for offsite sediment transport (Complements General Plan, Section VIII, Safety Element Policy § 6.1).

**EQ Action 4.2:** Generator Installation Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment.

**EARTHQUAKE OBJECTIVE 5:** Reduce runoff over the cliffs in the Rimforest neighborhood. (Complements Rimforest Drainage Feasibility Study)

**EQ Action 5.1:** Divert runoff to Little Bear Creek.

**EARTHQUAKE OBJECTIVE 6: Special District Funding:** Continue Special Districts Projects relating to earthquake hazards.

**EQ Action 6.1:** Continue funding and support for Special Districts Projects relating to earthquake hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

### 6.1.4 Flood (FL)

**GOAL:** Provide adequate flood protection to minimize hazards and structural damage. (General Plan, Safety Element, Goal S 5)

**FLOOD OBJECTIVE 1: National Flood Insurance Program.** Participate in the National Flood Insurance Program (NFIP), which provides flood insurance within designated floodplains. (General Plan, Safety Element, Policy S 5)

**FL Action 1.1:** Update NFIP data and maps with newly identified flood hazard areas in the County, as new information becomes available.

**FLOOD OBJECTIVE 2: Alluvial Task Force.** Review and analyze the findings and recommendations from the recently released Alluvial Fan Task Force reports, as funding permits.

**FL Action 2.1:** Determine whether or not additional amendments to development standards or policies are merited, based on the completed analysis.

**FLOOD OBJECTIVE 3: Flood Hazard Reduction.** Reduce flood hazards through development standards and policies stated in the County of San Bernardino General Plan and County of San Bernardino 2010 Development Code.

**FL Action 3.1:** Amend the Flood Plain Safety Overlay District through automatic map updates as new data is released and published by FEMA.





**FL Action 3.2:** Review development plans to ensure compliance with ordinances.

**FL Action 3.3:** Inspect construction to ensure compliance with approved development plans.

**FL Action 3.4: Soil Stabilization on Roadways and Along Roadway Shoulders** Soil stabilization on roadway shoulders and dirt roads. This will prevent erosion caused by flood conditions.

**FL Action 3.5: Encasing Pipelines** Encase water pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods.

**FLOOD OBJECTIVE 4: Future Flood Mitigation Projects**. Improve existing facilities and construct new facilities to mitigate flooding with the County.

**FL Action 4.1:** In each flood control zone, construct facilities identified in those zones by the Flood Control Advisory Committee. See Flood Control District Annex for a listing of projects.

**FLOOD OBJECTIVE 5: Special District Funding:** Continue Special Districts Projects relating to flood hazards.

**FL Action 6.1:** Continue funding and support for Special Districts Projects relating to flood hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

**FL Action 6.2: On Call Contractors** Employ on call contractors to assist in emergency situations.

### 6.1.5 Drought (DR)

**GOAL:** Minimize the effects of drought on the County in all aspects including economically and socially.

**DROUGHT OBJECTIVE 1:** Educate the public on water conservation methods.

**DR Action 1.1:** Create a public awareness campaign advising citizens, business owners and farmers on water conservation.

**DR Action 1.2:** Provide incentives for farmers to grow crops that are less water intensive.

**DR Action 1.3:** Continue to coordinate with the San Bernardino Valley Water Conservation District to provide Qualified Water Efficient Landscaper (QWEL) training.

**DR Action 1.4:** Continue to enforce the watering schedule and watering restrictions throughout the County.

**DROUGHT OBJECTIVE 2:** Protect the quality of the County's watersheds.

**DR Action 2.1:** Approve the County's Watershed Water Quality Management Plan written in 2013.

**DROUGHT OBJECTIVE 3: Special District Funding:** Continue Special Districts Projects relating to drought hazards.

**DR Action 3.1:** Continue funding and support for Special Districts Projects relating to drought hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

### 6.1.6 Anti-Terrorism (AT)

**GOAL:** Use antiterrorism strategies to discourage terrorism and protect the people, infrastructure and assets in San Bernardino County from the effects of terrorism.

**ANTI-TERRORISM OBJECTIVE 1:** Use anti-terrorism design strategies to discourage / prevent acts of terrorism.

**AT Action 1.1:** Identify and prioritize mitigation activities (anti-terrorism force protection) at critical facilities and gathering places that are vulnerable to terrorist attacks.

**ANTI-TERRORISM OBJECTIVE 2: Special District Funding:** Continue Special Districts Projects relating to terrorism hazards.

**AT Action 2.1:** Continue funding and support for Special Districts Projects relating to terrorism hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.





### 6.1.7 Climate Change (CC)

**GOAL:** Reduce the impacts of climate change on the County and limit human activities that change the atmosphere's makeup.

**CLIMATE CHANGE OBJECTIVE 1:** Meet greenhouse gas (GHG) reductions targets set forth by the Clean Air Act.

**CC Action 1.1:** Continue working with the South Coast Air Quality Management District and the Mojave Desert AQMD to meet GHG reductions targets.

**CC Action 1.2:** Continue implementing the energy conservation and efficiency measures identified in the County of San Bernardino Greenhouse Gas Emissions Reduction Plan. (San Bernardino County Renewable Energy and conservation Element)

**CLIMATE CHANGE OBJECTIVE 2:** Educate the public on the effects of climate change and reducing our impact.

**CC Action 2.1:** Encourage carpooling and the use of public/ alternative transportation methods.

**CC Action 2.2:** Optimize energy efficiency in the built environment and promote the local economic benefits of energy efficiency retrofits. (San Bernardino County Renewable Energy and conservation Element)

**CC Action 2.3:** Encourage residents and businesses to conserve energy. (San Bernardino County Renewable Energy and conservation Element)

**CLIMATE CHANGE OBJECTIVE 3: Special District Funding:** Continue Special Districts Projects relating to climate change hazards.

**CC Action 3.1:** Continue funding and support for Special Districts Projects relating to climate change hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District.

## 6.2 Mitigation Strategy

To narrow mitigation alternatives for inclusion, FEMA's six broad categories of mitigation alternatives were used. Each FEMA category is listed below. The HMP Planning Committee developed several mitigation alternatives for implementation under each mitigation category.

- Prevention (PRV)

- Property Protection (PPRO)
- Public Education and Awareness (PE&A)
- Natural Resource Protection (NRP)
- Emergency Services (ES)
- Structural Projects (SP)

Table 6-1 summarizes the mitigation alternatives for categories of projects addressing the hazards in the San Bernardino County Unincorporated Area Multi-Jurisdictional Hazard Mitigation Plan. The Table includes implementation strategies for the wildfire, earthquake/geologic hazards, flood, drought, climate change and terrorism.

**Table 6-1: Mitigation Alternative Summary**

| Action | Lead Agency | Hazard | Funding Source |
|---|---|---|---|
| **Prevention (PRV):** **Preventative activities are intended to keep hazard problems from getting worse, and are typically administered through government programs or regulatory actions that influence the way land is developed and buildings are built. This includes the development of additional code requirements to further reduce or eliminate damages from the identified hazards.** | County Land Use Services | All Hazards | General Fund |
| **Natural Resource Protection (NRP):** **To locate and protect natural and cultural resources at risk from the identified hazards.** | Fire Protection District / Flood Control District | Wildfire and Flood | General Fund, Grants |
| **Property Protection (PPRO):** **Property protection measures involve the modification of existing buildings and structures to help them better withstand the forces of a hazard, or removal of the structures from hazardous locations.** | Fire Protection District. | Wildfire | General Fund, Grants |
| **Public Education and Awareness (PE&A):** **To continue and develop new public education programs targeting the top identified hazards.** | Fire Protection District. | All Hazards | General Fund, Grants |





| Action | Lead Agency | Hazard | Funding Source |
|---|---|---|---|
| **Emergency Services (ES):** **Although not typically considered a "mitigation" technique, emergency service measures do minimize the impact of a hazard event on people and property. These commonly are actions taken immediately prior to, during, or in response to a hazard event. Examples include:** | Fire Protections District | All Hazards | General Fund, Special District Funds, Grants |
| **Structure Protection (SP) – Flooding** **To continue to identify, fund, and build projects that reduce or eliminate flood hazards in the County.** | Flood Control District | Flooding Hazards | General Fund, Special District Funds, Grants |
| **Structure Protection (SP)– Geological Hazards** **To identify unknown hazards and develop additional new and retrofit requirements or programs to reduce or eliminate damage from geological hazards.** | Land Use Services | Geological Hazards | General Fund Grants |
| **Structure Protection (SP) – Wildfire** **To further protect structures at risk from wildfire through education, building, and enforcement codes and actions.** | Fire Protections District | Wildfire | General Fund, Special District Funds, Grants |

### 6.2.1 Mitigation Action Plan

This section serves to identify *on-going* actions and projects in the County Unincorporated Area. With the results of the hazard risk assessment finalized, mitigation goal established, and capabilities assessed, the County and participating districts then set out to identify new mitigation actions that would reduce the outlined in the vulnerability assessment.

Not all identified mitigation actions are implementable in the 5-year plan cycle, due to technical feasibility, political acceptance, lack of funding, or other constraints. Once the mitigation actions for each participating jurisdiction were identified, they were evaluated and prioritized (by providing a time frame) to identify the most suitable mitigation actions for each participating jurisdiction to implement.

Cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural projects, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. While detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

Based upon the participating jurisdiction capabilities, Table 6-2 shows primary actions selected for further implementation and development during the next planning cycle. Table 6-2 provides details for each mitigation action with mitigation action descriptions, FEMA mitigation category, responsible party, and timeframe.

***Important to Note: See Jurisdictional Annexes for more information on implementation mechanisms and mitigation projects for each participating jurisdiction. If a participating jurisdiction is identified as a primary lead for implementation, the mitigation actions are also contained the corresponding jurisdictional annex.***



Table 6-2: Mitigation Action Descriptions

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **ALL Hazard** | **AH Action 1.1:** Valley Dispatch and Operations Center. | Update and maintain the operations of the facility and ensure cohesive working and response to any scale emergency and operations in a secure complex | ES | Budgetary Items from County and Federal Grant Funding EMPG, HMPG, UASI. | Fire Protection District. | 1-3 Years | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| **ALL Hazard** | **AH Action 1.2:** Maintain Shelter Operations Compound (SHOC). This shelter concept provides a new one-stop shelter concept. The SHOC combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location. | After the 2003 Wildland Fires, the County and American Red Cross recognized the need to provide services beyond basic care and short-term sheltering, especially during large fires, floods, and earthquakes The Mass Care & Shelter Plan and Concept of Operations, outlines the framework of a new one-stop shelter concept. Shelter Operations Compound (SHOC). It combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location. Residents can access public information and referral services through the LAC, and then take a short walk to the Non-LAC Unit for communication, postal services, and other private organizations/business at little to no cost. The completion of the Plan in 2012 will help to sync local resources, encourage local self-sufficiency, foster partnership between public and private agencies, and serve as a reference document for the region.<br><br>By June 2017, the program will have 32 trailers/caches equipped with mass care and shelter supplies, strategically placed throughout the County and ready for rapid deployment. It is expected to serve over 12,000 residents. In addition to enhancing the comfort levels of shelter residents, the program will produce standardized documents and protocols for procuring and maintaining Mass Care and Shelter trailers/caches. These plans and programs will help the County prepare for and mitigate damages from hazards. This is an update and expansion of the plan and done without more grant funds. | ES | To increase Mass Care and Shelter capability of the county, grants from 2008-2009 Homeland Security Grant Program (HSGP) and 2009 Riverside Regional Urban Area Security Initiative (UASI) funded the Mass Care and Shelter Trailer/Cache Program. | Fire Protection District/ | 1-5 Years | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| **All-Hazard** | **AH Action 2.1:** Continue funding and support for Special Districts Projects relating to all hazards. | Continue funding and support for Special Districts Projects relating to water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District for all hazards. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **All-Hazard** | **AH Action 2.2:** Install Generators at Critical Facilities | Retrofit existing buildings and facilities with connectors/ ATS for emergency generators and/or install permanent emergency generators at critical facilities, including wells and booster station locations. | ES, SP | TBD | Water Systems | TBD | Critical sites are already set up for connection or has a permanently installed generator |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| All-Hazard | **AH Action 2.3:** Water Systems Repair Plan | Develop a plan for speeding the repair of and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies. | PRV | SDD WAS | Water Systems | TBD | We have a warehouse and inventory. Add'l inventory would need to be purchased from local wholesaler |
| All-Hazard | **AH Action 2.4:** Smart Water Meters and SCADA | Utilization of SCADA and Smart Water Meters to get real time data on problems with the system and reduce drive time emissions as a result of traditional meter reading. | PRV | Individual CSAs | Water Systems | Ongoing | Both SCADA and Smart Meters have been installed and continue to be installed |
| All-Hazard | **AH Action 2.5:** Provide Employees with Emergency Supplies | Provide emergency supplies of food, water, and portable generators for employees at office and field locations. | ES | SDD/WAS | Water Systems | Ongoing | WAS has a stock of emergency food supplies, water, and generators. |
| All-Hazard | **AH Action 2.6:** Annual Tower and Guide Wire Inspections | Conduct annual tower and guide wire inspections to mitigate storm/wind/earthquake hazards from knocking out communications. | PRV | TBD | TV Districts | 7/1/2016-7/1/2017 | All Districts |
| All-Hazard | **AH Action 2.7**: Maintain Tower Lighting | Maintain lights on all tower locations. | SP | TBD | TV Districts | June-17 | |
| All-Hazard | **AH Action 2.8:** Designate Emergency Operations Sites | Conduct an inventory or list of County Park Facilities and Community Centers to establish a list of pre-designated emergency operations or disaster relief sites. Not all Community Centers are an appropriate size to accommodate large numbers of evacuees and may only serve as command and control centers or distribution centers. | PRV | TBD | Park Districts | April-17 | All Districts |
| All-Hazard | **AH Action 2.9:** Establish Power Sources for Emergency Operations Sites | Establish small solar energy fields or other forms of renewable power at County Community Centers to facilitate stand-alone emergency operations for the community. | PRV, SP | TBD | Park Districts | 12/1/2016-7/1/2018 | Lucerne Valley Joshua Tree |
| All-Hazard | **AH Action 2.10:** Connect Water Systems to Generators | Connect water systems to generators to ensure delivery even in disaster situations. | PRV, SP | TBD | Park Districts | TBD | |
| All-Hazard | **AH Action 2.11:** Establish a Centralized Communications Network | Establish a centralized communications network to monitor channel output for TV Districts and provide emergency information by way of character generator tied to channel transmissions. | PRV | TBD | TV Districts | 7/1/2017-12/1/2017 | All districts |
| All-Hazard | **AH Action 2.12** Incorporate as appropriate requirements from the State of California's | Government Code 65302.6 requires the following elements to be included in the hazard mitigation plan:<br><br>(1) An initial earthquake performance evaluation of public facilities that provide essential services, shelter, and critical governmental functions. | PRV, NRP | TBD | Primary: Land Use Services | 1-3 years | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | most recent land use regulations regarding the hazard mitigation planning process (Government Code 65302 and 8685.9). | (2) An inventory of private facilities that are potentially hazardous, including, but not limited to, multiunit, soft story, concrete tilt-up, and concrete frame buildings.<br>(3) A plan to reduce the potential risk from private and governmental facilities in the event of a disaster.<br><br>Government Code 8685.9 requires that the state share shall not exceed 75 percent of total state eligible costs unless the local agency is located within a city, county, or city and county that has adopted a local hazard mitigation plan as part of the safety element of its general plan. In that situation, the Legislature may provide for a state share of local costs that exceeds 75 percent of total state eligible costs. | | | Secondary: Fire Protection District/ | | |
| All-Hazard | **AH Action 3.1:** Continue funding and support for Special Districts Projects relating to all hazards. | Continue funding and support for Special Districts Projects relating to water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District for all hazards. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| Wildfire | **WF Action 1.1** Continue Mountain Area Safety Taskforce (MAST) funding to support mitigation activity. | MAST was formed to mitigate the region wide risk of a catastrophic wildfire due to dead and dying trees in the mountain communities. The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for the protection of property owners, residents, and property subject to the risk of catastrophic wildfire that could occur in San Bernardino County with an initial emphasis on the threat resulting from the Old and Grand Prix fires in 2003. MAST priorities are to continue reducing fire hazards through fuel reduction programs and hazard abatement though enforcement of county ordinances.<br><br>The Mountain Area Safety Taskforce (MAST) Operations Section meets monthly. MAST Operations Section determines project priorities based on the benefit cost analysis of the projects and the effect of the project on the overall goals of the MAST organization.<br><br>Goals can change as detailed Benefit Cost Analysis is conducted and CEQA/NEPA reviews are completed. | NRP, PPRO | Seeking additional funding through HMPG. | San Bernardino County Fire Protection District | On-Going | See Implementation plan on more information on MAST.<br><br>See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | **WF Action 2.1:** Update Mountain Mutual Aid Map Book to document updated information contained in 2016 HMP. | The Map Book portion of the Community Safety and Structure Protection Plan provides not only a street network of the area but more importantly it provides the locations of strategic and critical resources for fire fighters. These include but are not limited to safe zones, open areas, locations for refuge. They also identify areas within communities that have narrow and steep winding streets and or with limited ingress and egress. The document is handed out to all responding strike teams from out of the area and has proved invaluable in directing and coordinating an effective firefighting response and reduces the potential for life loss and property damage. | ES | Seeking additional funding through HMPG. | San Bernardino County Fire Protection District | On-Going | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Wildfire** | **WF Action 2.2** Update Community Structure Protection Plans as necessary. | This is an on-going action (from the 2011 MJHMP) with the goal to continue development of and continue the mission of mutual aid between first responders in the County mountain areas. | PPRO | | Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 3.1:** Implement identified community based fuels reduction projects. | The Fuels Reduction Program is designed to create community based fuel modification programs across the mountain communities.<br>These projects are selected specifically to reduce the potential for catastrophic wildfires and the damage that they can do to the communities. Project design, contracting, and operations are managed by the County's Public Works Department with priorities set by local fire chiefs in monthly MAST Operations Meetings. This program is the oldest and most significant for reducing wildfire threat on a mountain wide basis. | PPRO | Current Funding:<br><br>Seeking additional funding through HMPG. | Primary: San Bernardino Public Works Department<br><br>Secondary: County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 3.2:** Develop fuels reduction "maintenance program" by obtaining participation from citizens and/or homeowners associations. | To survive a wildfire, property owners need to manage the land surrounding their homes and communities effectively. Removing fuels in the wildland fuel reduction zone beyond the defensible space can reduce the speed and intensity of an oncoming wildfire. But if these areas aren't regularly **maintained**, they lose their effectiveness. Plants grow back, and flammable vegetation needs to be routinely removed and disposed of properly. This guide provides tips on how to create and maintain defensible space and wildland fuels treatments around your property. | PPRO, PE&A | Seeking additional funding through HMPG | Primary: Public Works<br><br>Secondary: Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 4.1** Increase homeowner assistance services to mountain residents for fuel reduction. | This is an ongoing wildfire mitigation action (from the 2011 MJHMP) for the group Forest Care to achieve the goal of providing assistance to homeowners by expanding services to all communities in the Mountain areas of the County.<br><br>Forest Care is a program dedicated to creating a healthier forest. This program provides foresters to assess individual properties for thinning the vegetation and then provides 75% of the funding to do so. | PPRO, PE&A | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 4.2** Continue working with Southern California Edison (SCE) to remove dead trees near power lines. | A significant number of fires across the State are caused by trees falling into power lines. When the forests in the mountain communities became infested with bark beetles the pine tree die off was unprecedented. Thousands of these dead trees were standing precariously close to power lines. Early in the Bark Beetle Emergency in 2004, Southern California Edison swiftly initiated a program to remove all trees that were dead, dying, and/or diseased that had the potential to fall into any SCE power lines. | PRV, PPRO | As of July of 2010 Southern California Edison (SCE) has spent $179,758,978 to remove dead dying and diseased trees. | San Bernardino County Fire Protection District | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | The role of Southern California Edison was critical to the success of MAST both operationally and financially. Edison still removes the most difficult trees, the most costly trees; and the ones that are most likely to be the source of ignition for a wild land fire. They are also removing the trees that are immediately threatening homes.<br><br>They have removed 118,305 trees since the inception of the program in 2004. They also provided reimbursements to people that removed their own trees. | | | | | |
| **Wildfire** | **WF Action 5.1:** Inspect every residence in the mountain communities throughout the year to enforce the Fire Hazard Abatement code that addresses green fuels. | The Fire Hazard Abatement Program conducts surveys to identify fire hazards throughout the year. Fire hazards are identified and notices to abate the hazard(s) are mailed to property owners. Property owners are given 30 days to abate the violations. Failure to abate may result in citations, penalties, and/or fees for abatement by the County. The Fire Hazard Abatement Program responds to complaints year round in the unincorporated areas and contracting Cities and Fire Districts.<br><br>The Division completes more than 430,000 inspections, issues more than 45,000 Notices to Abate Fire Hazards, issues over 4,000 citations for non-compliance, and abates the fire hazards on more than 2,000 parcels annually. Within the last 5 years, the Fire Hazard Abatement Division has received even more financial resources that enable them to abate all properties declared a fire hazard. | PRV, PPRO, PE&A | Seeking additional funding through HMPG | Primary: Land Use Services<br><br>Secondary: Fire Protection District | On-Going | For more information on Contractor Certification, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| **Wildfire** | **WF Action 5.2:** Continue to collaborate with Forest Care, Red, Cross and Cal Fire to overcome increased costs of enforcement. | This is an on-going action from the 2011 MJHMP with the goal of overcoming funding shortfalls for the County Fire Hazard Abatement Program. | PRV | | San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 6.1** Train and Certify landscape contractors to comply with the Fire Hazard Abatement Code. | The City of Big Bear Lake created a program to train and certify landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. The contractors are trained to comply with the new Fire Hazard Abatement Code that exists both in the City of Big Bear and the County unincorporated area. The City of Big Bear Lake Fire Department conducts the classes for landscapers and handy persons. This provides an incentive for the contractors and provides a level of certification that the homeowner can rely on when they are deciding to hire a landscape contractor to conduct fuels abatement around their home. | PRV, PPRO | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | On-Going |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Wildfire** | **WF Action 6.2:** Continue wildfire mitigation efforts under the Wood Shake Roof Replacement Program. | The County successfully passed an ordinance that requires the replacement of wood shake roofs by 2014. MAST has successfully mapped all of the wood shake roofs in the fire safety overlay and has created a strategy as to which roofs will be selected to participate in the FEMA funded project. This is an on-going project in cooperation with Big Bear Lake Fire Protection District in order to provide more funding for wood shake roof replacements by property owners. | PRV, PPRO, SP | | Primary: MAST<br><br>Secondary: San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 6.3:** Protect Property in Wilderness Areas | Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks. | PPRO, PRV, SP | TBD | Sewer Systems | January-17 | All sewer pump stations have paving |
| **Wildfire** | **WF Action 7.1:** Modify independent and unique CWPPs into a more common framework making them similar but leaving room to provide specific hazard characteristics and mitigation actions for each community. | Community Wildfire Protection Plans are designed to provide a means for a community, usually through the Fire Safe Council, to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. | PRV | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | On-Going<br><br>For more information on CWPP see Annex A Section A.6 Fire Protection District Mitigation Project . |
| **Wildfire** | **WF Action 8.1:** Construct Arrowbear Drive Realignment and Widening. | The Arrowbear community off State Highway 18 has limited access to State Highway 138. The existing bridge/spillway and road needs to be realigned and widened to facilitate access by emergency personnel during wildfires and flooding. Mitigation strategy for this is to remove and replace existing bridge/spillway, realign and widen the road. | SP | Seeking grant funding<br><br>Total Cost: $3,000,000 Approx. | Primary: Public Works<br><br>Secondary: San Bernardino County Fire Protection District | 1-3 Years | |
| **Wildfire** | **WF Action 8.2:** Construct Cedar Glen Fire Access Road. | Lack of paved roads inhibits traffic circulation and the ability to enter and exit the area without backtracking during wildfire emergencies. Strategy is to Construct road and drainage improvements to Little Bear Creek Road and Elder Drive. | SP | Seeking grant funding<br><br>**Total Cost:** $2,500,000 | Public Works | 1-3 Years | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Wildfire** | **WF Action 8.3:** Structural Fire Breaks Widening | Double the width of external fire breaks on grounds which have structures located in wilderness and or areas prone to wildfires. | SP, PRV | Individual CSAs | Water Systems | 7/1/2017-7/19/2019 | |
| **Wildfire** | **WF Action 9.1:** Continue funding and support for Special Districts Projects relating to wildfire. | Continue funding and support for Special Districts Projects relating to wildfire in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| **Wildfire** | **WF Action 9.2:** Emergency Water Supplies | Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.(completed with continuous fresh of supplies and rotation) | ES | TBD | Roads | TBD | |
| **Earthquake** | **EQ Action 1.1:** Improve public education programs and practices to residents for earthquake risk. | Public education and outreach programs are an efficient and cost-effective way to promote meaningful changes within a community. A Program for Public Information (PPI) for earthquake awareness and mitigation could significantly reduce injury and property damage to earthquake. Use a suite of partnerships, activities, and products to educate the public about earthquake science and motivating homeowners to become prepared for earthquakes. | PE&A | | Human Resources | 5-10 Years | |
| **Earthquake** | **EQ Action 2.1:** Evaluate single family homes for Earthquake hazard when conducting permit applications and plan reviews. | 82.15.040 Development Standards states that a structure used for human occupancy shall be located 50 feet or farther from any active earthquake fault traces. Lesser setbacks may be applicable in certain situations as determined by an appropriate geologic investigation and approved by the County Geologist or other engineering geologist designated by the Building Official.<br><br>Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code Section 2621 et seq.) requires the delineation of potential damage areas along known active faults throughout California. It requires local governments to withhold approval of construction permits in those zones until geologic investigation has determined that the site is not threatened by surface displacement from future faulting. | PRV | | Land Use Services | TBD | On-Going |
| **Earthquake** | **EQ Action 2.2:** Seismic Strapping | Seismic strapping for existing water tanks and future construction. | SP, PRV | CSA 64 | Water Systems | 7/17/2017-7/1/2019 | Ongoing currently |
| **Earthquake** | **EQ Action 2.3:** Employee Emergency Sheltering | Develop a plan for short-term and intermediate-term sheltering of employees. | PRV | WAS | Sewer Systems | 7/17/2017-7/19/2019 | To purchase cots, small portable generators, tents, etc. |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| Earthquake | **EQ Action 3.1:** Identify liquefaction hazard areas outside the currently designated Geologic Hazard Overlay Districts. | Supported by General Plan mechanism (General Plan, Section VIII, Safety Element Policy § 7.5; California Building Code §1803.5.11);<br><br>Seismically- induced lateral spreading, and/or seismically-induced lateral flow, can cause devastating structural damage and a high potential for saturation exists when the groundwater level is within the upper 50 feet of alluvial material. | PRV | | Land Use Services | 5-10 Years | |
| Earthquake | **EQ Action 4.1**: Require development on hillsides to minimizes the extent of topographic alteration and erosion, to maintain slope stability, and to reduce the potential for offsite sediment transport (Complements General Plan, Section VIII, Safety Element Policy § 6.1). | This mitigation action is especially important in the San Bernardino and San Gabriel Mountains which have high slope failure / erosion potential.<br><br>Typical slope mitigation techniques that are used include:<br><br>Drainage Improvements - Since water is the biggest culprit in failing slopes, drainage improvements should be the first priority. Some drainage improvements may include:<br>▪ Collect or divert surface water from the problem slope. This may include catch basins, swales, or sealing tension cracks to prevent infiltration.<br>▪ Collect and remove subsurface water. This may include drains constructed within the subsurface to remove excess seepage, or lower ground water.<br><br>Some earthwork mitigation techniques are as follows:<br>▪ Remove the upper soils of the slope to create a flatter slope.<br>▪ Buttress the slope toe by filling with rock, gravel, or soil.<br>▪ Benching the slope if each bench is on competent subgrade.<br>▪ Structural Improvements - Structural improvements include:<br>▪ Friction Piles<br>▪ Retaining walls<br>▪ Geo Grid<br>▪ Sheet Piles<br>▪ Rock Bolts<br>▪ Vegetative Cover<br><br>Complements General Plan, Section VIII, Safety Element Policy § 7.6<br><br>Complements General Plan, Section VIII, Safety Element Policy § 6.1) | PRV | N/A | Land Use Services | On-Going | Provide enhanced information during the development review process to address slope failure concerns. |
| Earthquake | **EQ Action 4.2:** Generator Installation | Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment. | SP, PPRO | TBD | Roads | TBD | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| Earthquake | **EQ Action 5.1:** Divert runoff to Little Bear Creek. | To reduce the runoff over the cliff(s) in the Rimforest neighborhood, the runoff must be diverted to another path. This will be accomplished over three phases:<br>• Phase 1: Reduce Runoff Tributary Area by 64%- 50.35 AC<br>• Phase 2: Reduce Runoff Tributary Area by 30%- 23.79 AC<br>• Phase 3: Reduce Runoff Tributary Area by 5%- 3.99 AC | SP, NRP, PRV | | Primary: Public Works<br><br>Secondary: Flood Control District | | |
| Earthquake | **EQ Action 6.1:** Continue funding and support for Special Districts Projects relating to earthquake hazards. | Continue funding and support for Special Districts Projects relating to earthquake hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| Flood | **FL Action 1.1:** Update NFIP data and maps with newly identified flood hazard areas in the County, as new information becomes available. | As required by the State of California, National Flood Insurance Program (NFIP) maps published by FEMA must be included in the HMP or General Plan Safety Element. Keeping this information current is an important mitigation action. | PRV, PPRO | | San Bernardino County Flood Control District | On-Going | |
| Flood | **FL Action 2.1:** Determine whether or not additional amendments to development standards or policies are merited, based on the Alluvial Fan Task Force Recommendation. | This is an on-going mitigation action from the 2011 MJHMP. | PRV | | Primary: San Bernardino County Flood Control District<br><br>Secondary: Land Use Services | On-Going | |
| Flood | **FL Action 3.1:** Amend the Flood Plain Safety Overlay District through automatic map updates as new data is released and published by FEMA. | Current San Bernardino County Hazard Maps can be found at: http://cms.sbcounty.gov/lus/Planning/ZoningOverlayMaps/HazardMaps.aspx. | PRV, NRP | | Primary: San Bernardino County Flood Control District<br><br>Secondary: Land Use Services | On-Going | |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Flood** | **FL Action 3.2:** Review development plans to ensure compliance with ordinances. | This is an on-going mitigation action from the 2011 MJHMP in order to reduce the flood hazards through development standards and policies stated in the General Plan and San Bernardino 2077 Development Code. | PRV | | Primary: Land Use Services<br><br>Secondary: San Bernardino County Flood Control District | On-Going | |
| **Flood** | **FL Action 3.3:** Inspect construction to ensure compliance with approved development plans. | This is an on-going mitigation action from the 2011 MJHMP in order to reduce the flood hazards through development standards and policies stated in the General Plan and San Bernardino 2077 Development Code. | PRV, PPRO, SP | | Primary: Public Works<br><br>Secondary: Flood Control District | On-Going | |
| **Flood** | **FL Action 3.4:** Soil Stabilization on Roadways and Along Roadway Shoulders | Soil stabilization on roadway shoulders and dirt roads. This will prevent erosion caused by flood conditions. | SP, PRV | TBD | Roads | TBD | |
| **Flood** | **FL Action 3.5:** Encasing Pipelines | Encase water pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods. | SP, PRV | CSA 70 J | Water Systems | 7/17/2017-7/1/2027 | |
| **Flood** | **FL Action 4.1:** In each flood control zone, construct facilities identified in those zones by the Flood Control Advisory Committee. See Flood Control District Annex for a listing of projects. | This is an ongoing mitigation action from the 2011 MJHMP to achieve the goal of improving existing facilities and construct new facilities to mitigate flooding within the County. | SP | | Primary: Public Works<br><br>Secondary: San Bernardino County Flood Control District | On-Going | |
| **Flood** | **FL Action 6.1:** Continue funding and support for Special Districts Projects relating to flood hazards. | Continue funding and support for Special Districts Projects relating to flood hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Flood** | **FL Action 6.2:** On Call Contractors | Employ on call contractors to assist in emergency situations. | PRV, ES | TBD | Roads | TBD | |
| **Drought** | **DR Action 1.1:** Create a public awareness campaign advising citizens, business owners and farmers on water conservation. | Public education and outreach programs are an efficient and cost-effective way to promote meaningful changes within a community. A program to raise awareness on the importance of water conservation could significantly reduce the amount of water used by the public. | PE&A, NRP | | Human Resources | TBD | |
| **Drought** | **DR Action 1.2:** Provide incentives for farmers to grow crops that are less water intensive. | Farmers use 80% of the State's water. By offering incentives to produce less water intensive foods (such as beets, carrots and potatoes) as opposed to more water intensive foods such as almonds, beef and pork) would make a substantial difference in water consumption. | NRP, PRV, | | DAO Community Services? | On-Going | |
| **Drought** | **DR Action 1.3:** Continue to coordinate with the San Bernardino Valley Water Conservation District to provide Qualified Water Efficient Landscaper (QWEL) training. | The Qualified Water Efficient Landscaper training presents an affordable proactive local approach to reducing landscape water demand. QWEL provides graduates with knowledge in water efficient and sustainable landscape practices including water management and preservation of other valuable resources. | PE&A | | Economic Development Agency? | On-Going | |
| **Drought** | **DR Action 1.2:** Approve the County's Watershed Water Quality Management Plan. | The County's Watershed Water Quality Management Plan written in 2013. | PRV, NRP | | | On-Going | |
| **Drought** | **DR Action 1.4:** Continue to enforce the watering schedule and watering restrictions throughout the County. | In response to the State Water Resources Control Board's 2016 emergency water conservation regulation, the County enforces a watering schedule for residential and commercial addresses. | PRV, NRP | | Land Use Services | On-Going | |
| **Drought** | **DR Action 3.1:** Continue funding and support for Special Districts Projects relating to drought hazards. | Continue funding and support for Special Districts Projects relating to drought hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7 | VARIES | VARIES | VARIES | On-Going | |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Anti-Terrorism** | **AT Action 1.1:** Identify and prioritize mitigation activities (anti-terrorism force protection) at critical facilities and gathering places that are vulnerable to terrorist attacks. | Critical facilities may include essential facilities (such as hospitals, police and fire stations, evacuation centers, etc.), transportation systems, lifeline utility systems, high potential loss facilities (such as nuclear power plants, dams and military installations, etc.), and hazardous material facilities.<br><br>Gathering facilities should also receive special attention. Places of mass gathering not only present terrorists with potential opportunities for mass casualties, symbolism and high impact media coverage, they pose a broad range of security challenges for their owners and operators. | PRV, PPRO | | Land Use Services | On-Going | |
| **Anti-Terrorism** | **AT Action 2.1:** Continue funding and support for Special Districts Projects relating to terrorism hazards. | Continue funding and support for Special Districts Projects relating to terrorism hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| **Climate Change** | **CC Action 1.1:** Continue working with the South Coast Air Quality Management District to meet GHG reductions targets. | The San Bernardino County General Plan Amendment and Greenhouse Gas Reduction Plan addresses the environmental effects specific to the proposed General Plan Amendment, Greenhouse Gas Reduction Plan, and associated Development Code Amendment and can be found here: http://www.sbcounty.gov/Uploads/lus/Countywide/GreenhouseGas/Full-Vol-1.pdf | PRV, NRP | | Land Use Services | On-Going | |
| **Climate Change** | **CC Action 1.2:** Continue implementing the energy conservation and efficiency measures identified in the County of San Bernardino Greenhouse Gas Emissions Reduction Plan. | According to the San Bernardino County Renewable Energy and conservation Element, San Bernardino County's commercial, institutional and residential communities will continue to grow in the foreseeable future. Access to dependable and affordable energy sources is critical to maintaining and enhancing the quality of life enjoyed by San Bernardino residents and businesses. As energy needs grow, so do the needs to develop new energy sources. | PRV, NRP | | Land Use Services | On-Going | |
| **Climate Change** | **CC Action 2.1:** Encourage carpooling and the use of public/ alternative transportation methods. | Reduction Measure R2T1 of the County of San Bernardino Greenhouse Gas Emissions Reduction Plan establishes an Employment Based Trip and VMT Reduction Policy. Some features include a compressed work week, car/vanpools, employee bicycle/pedestrian programs, and shuttle/ transit programs. | PE&A, PRV, NRP | | Human Resources | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Climate Change** | **CC Action 2.2:** Optimize energy efficiency in the built environment and promote the local economic benefits of energy efficiency retrofits. (San Bernardino County Renewable Energy and Conservation Element) | This is an on-going mitigation policy from the San Bernardino County Renewable Energy and Conservation Element. | SP, PE&A, PRV | | Public Works | On-Going | |
| **Climate Change** | **CC Action 2.3:** Encourage residents and businesses to conserve energy. (San Bernardino County Renewable Energy and conservation Element) | This is an on-going mitigation policy from the San Bernardino County Renewable Energy and Conservation Element. | PE&A, NRP, PRV | | Human Resources | On-Going | |
| **Climate Change** | **CC Action 3.1:** Continue funding and support for Special Districts Projects relating to climate change hazards. | Continue funding and support for Special Districts Projects relating to climate change hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |

# Section 7. Plan Maintenance

## 7.1 Monitoring Evaluating and Updating the HMP

The San Bernardino County Fire Protection District Office of Emergency Services (OES) is the custodian of the Multi-Jurisdictional Hazard Mitigation Plan (MJHMP). In the 2010 MJHMP, County of San Bernardino indicated that the MJHMP would be reviewed annually. Although no formal meetings were held, OES reviewed the plan annually and collected new hazard mitigation information and mitigation efforts throughout the county. Additionally, OES referenced/reviewed the MJHMP before submitting grant applications to ensure the project was captured in the plan when applying for all grants to assist their mitigation efforts.

There are three (3) main components to the MJHMP: hazards, projects, and stakeholder involvement (public, as well as, county staff). The County and its Special Districts have focused on these components and over the last 5 years have made steady improvements in all areas. The County and its Special Districts participated and facilitated several meetings and established several tasks forces to help advance the understanding of hazards in the community. This information was shared with other county personnel and the general public. OES believes that this sharing of information leads to a more informed community, thus a more robust MJHMP.

Departments and Special Districts with projects track the status of the projects through the entire life cycle from concept to completion. Projects in progress are tracked to ensure all milestones are met and payments are made in a timely manner. Each year proposed projects are reviewed during budget development every spring and selected projects are submitted for funding to the appropriate funding source. These funding sources include but are not limited to grant funding, General Fund funding, and Special District funding.

Because the MJHMP is a living document that reflects ongoing hazard mitigation activities, the process of monitoring, evaluating, and updating will be critical to the effectiveness of hazard mitigation within the County Unincorporated Area. The County and its Special Districts will hold internal planning meetings to discuss current projects and evaluate newly proposed projects resulting from internal staff meetings and input from the public. The results of these Departmental/Special District meetings will be presented to the Multi-Jurisdictional Planning Team meetings at their annual meetings. To facilitate the Multi-Jurisdictional Hazard Mitigation Planning process, OES is proposing to conduct these annual meeting with the Multi-Jurisdictional County Planning Team where the Team Members will discuss the projects, priorities, and goals in the current plan and from individual Special District meetings and suggest any necessary changes. Results of the annual meeting will be retained and compiled for the 2016 update. The County Planning Team will continue to support focused outreach for county Departments and Districts as well as support Countywide activities.





### 7.1.1 Plan Adoption

To comply with DMA 2000, the San Bernardino County Board of Supervisors has officially adopted the 2016 San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan. The adoption of the 2016 MJHMP recognizes the County's commitment to reducing the impacts of natural hazards within the County limits. A copy of the 2016 MJHMP adoption resolution is included after the table of contents in this document.

### 7.1.2 Implementation

The knowledge gained from the MJHMP has helped the county enhance other planning efforts. One of the biggest results from the 2010 MJHMP efforts was the incorporation of the MJHMP into the 2007 General Plan's Safety Element. This merging of plans has help ensure development decisions are considering the most recent hazard information. It is the County's intent to incorporate by reference the updated MJHMP into the County General Plan upon approval from FEMA.

The MJHMP has also led to the strengthening and improvement of several County Ordinances, which are designed to ensure proper fuels reduction was completed in the Severe Fire Hazard Zones. Two new ordinances were passed requiring replacement of wood shake roofs in the Severe Fire Hazard Severity Zones by 2014 and the reduction of live fuel loads around structures in the Very High Fire Hazard zone.

The MJHMP goals and actions will be incorporated into various general operations of government. For example, much of the information from the MJHMP will be included in the County Operational Area Emergency Operation Plan (EOP). As any future County plans are developed, the Multi-Jurisdictional Hazard Mitigation Plan will be a great asset in any plan development efforts. As noted earlier, much of the information contained in this MJHMP is from the County General Plan and is already part of the planning process.

Additional benefit is gained from the County and its Special Districts reviewing existing mitigation projects and development of additional mitigation projects at their internal annual Planning Team meetings. This input includes comments and suggestions from the public as well as from the internal planning process of each County department and District.

#### 7.1.2.1 Implementation through Existing County Mechanisms

##### 7.1.2.1.1 All Hazards

##### 7.1.2.1.2 Amendment to Title 6 County Code

An amendment to Title 6 of the County of San Bernardino Code to adopt by reference the 2010 Editions of the California Building Standards Codes went before the Board of Supervisors on

November 2, 2010 and was continued for a second reading on November 16, 2010 and approved unanimously. The amendment became effective on January 1, 2011.

The County of San Bernardino amendment to Title 6 of the County Code to adopt by reference the 2010 Editions of the California Building Standards Codes repealed the current chapters of Division 3 of Title 6 that reflect the 1994/1995 editions of the California Building Standards Codes and adopt the 2010 editions of these codes by reference.

The California Building Standards Commission approved the California Building Standards Code (Code) for a statewide effective date of January 1, 2011 and requires this Code apply in all parts of the state. This Code consists of the California Building, Residential, Plumbing, Mechanical, Electrical, Energy, Historical Buildings, Existing Building (Unreinforced Masonry) and the Green Building Standards Codes. Since this 2010 Edition was adopted by local ordinance, the prior editions of this code will be repealed and the most recent editions of the codes with applicable amendments requiring express findings and certain appendices necessary for the health and safety of the citizens of this County will be in effect within the unincorporated areas of San Bernardino County. The benefit of adopting this Code is that it provides consistency and clarification for the building community as well as building inspectors and plans examiners. State law (Health & Safety Code 18941.5 and 17958.7) requires the local government make express findings in order to amend building standards and the amendments must be necessary due to local climatic, geological, or topographical conditions.

Those amendments and findings are included in the County's ordinance and were filed with the California Building Standards Commission.

The recommended modifications not requiring express findings are administrative or procedural in nature and concern the local implementation issues that are not covered by building standards.

An example of this type of modification is to the California Residential Code, Section R105.3.1.1 which requires the Board of Appeals to confirm substantial valuations in the flood plain. The traditional purpose of the Board of Appeals has been reserved for a contested decision of the Building Official, and it is felt that it should remain as such.

With respect to grading and excavation regulations found in Appendix J of the 2010 State published code, the 2001 California Building Code dealt with grading with more clarity in regards to what activities require a permit and set forth rules to ensure large grading projects are scrutinized in greater detail than smaller projects by requiring more reporting and inspection of such work. The grading chapter in the 2001 Code has been trusted and in use in its primary form for years. The 2010 Appendix J grading chapter needs substantial amendment and modification to address all grading issues and is not recommended for adoption in its present form. The Board adopted the 2001 Appendix Chapter 33 regulations as part of this proposed ordinance. Relocation permit requirements have been moved to a new section of the Code, and it retains specific standards for relocation procedures in details not found in the 2010 State-published code. Clarification of the types of buildings affected by the new regulations has also been made.





Administrative changes to the 2010 California Existing Building Code (Part 10 of Title 24) were approved to outline the procedures required to set allowable time limits for the retrofit and repair of unreinforced masonry buildings. Staff is also recommending that authorization be given to the Building and Safety Division of the Land Use Services Department to issue Administrative Citations as an alternative means of enforcement of the County Code provisions.

Express findings are made for changes to the California Plumbing Code, Appendix K regarding the soil conditions that exist in this county. These changes are supported by the Environmental Health Division. These express findings are iterated in the ordinance and will be filed with the Building Standards Commission as required by law in order to become effective.

### 7.1.2.2 Wildfire

#### 7.1.2.2.1 Inland Empire Fire Safe Alliance (IEFSA)

The Inland Empire Fire Safe Alliance (IEFSA) was created to act as a forum for all Fire Safe Councils in San Bernardino County. Some of the benefits are developing a consistent and comprehensive message to citizens about fire safety; coordinating efforts for grant administration, writing, and reporting; a one-stop shop for information, resources and research; and a centralized source for sharing of updates from cooperating governmental agencies. There are approximately 20 Fire Safe Councils active in San Bernardino County.

IEFSA has held bimonthly meetings for over 5 years and have been the focal point for all regional Fire Safe Councils including some from Riverside County. They have also held numerous workshops and seminars regarding fire resistive construction, and materials, BAER reports, CWPPs and grant writing. The IEFSA was the focal point for Fire Safe Councils (FSCs) that were working on completing their CWPPs and created a focus group and a steering committee to accomplish these critical plans. To support public education and involvement,

IEFSA created the web site www.fireinformation.com as well as participated in countless safety fairs and fire wise awareness activities. They also conducted a Public Education Media Exchange where all FSC and Agencies got together to share educational modalities and create common thought and educational threads. They have reached out to thousands of mountain residents in preparing them for wildfires.

#### 7.1.2.2.2 Mountain Area Safety Taskforce (MAST)

MAST was formed to mitigate the region wide risk of a catastrophic wildfire due to dead and dying trees in the mountain communities. The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for the protection of property owners, residents, and property subject to the risk of catastrophic wildfire that could occur in San Bernardino County with an initial emphasis on the threat resulting from the Old and Grand Prix fires in 2003. MAST priorities are to continue reducing fire hazards through fuel reduction programs and hazard abatement though enforcement of county ordinances.

The Mountain Area Safety Taskforce (MAST) Operations Section meets monthly. MAST Operations Section determines project priorities based on the benefit cost analysis of the projects and the effect of the project on the overall goals of the MAST organization.

The MAST Unified Command identified the following objectives as their focus and direction:

- Provide for Community Safety.
- Develop Coordinated Public Information Dissemination Between Cities, County, Special Districts, State, Federal, and Non-Profit Agencies.
- Develop Immediate, Mid-range and Long-range Coordinated Agency Plans.
- Identify and Secure Potential Funding Resources to Provide Protective Measures.
- Document Task Force Activities Including Mission, Goals and Objectives, Policies, Procedures, and Outcomes. Prior to any type of flood threat, the following precautionary measures may be taken by MAST members to reduce the impact of impending fires:
- Review mutual aid agreements
- Define evacuation areas and trigger points
- Review the use of alert and warning systems
- Provide information to the public of fire prone areas and protective measures in progress or planned for those areas
- Educate public on emergency self-help and preparedness
- Develop and maintain emergency notification procedures and checklists

MAST is the central point of coordination for all projects related to the reduction of the potential for catastrophic wildfires. There are numerous participants and all levels of government. MAST partners collaborate to provide multi-agency technical support to ensure project success. Economic impacts are considered and the result has been significant increase in economic activity through thoughtful application of grant funding. MAST has been so successful in the environmental management of projects that all of the local environmental groups including national affiliates are now supporters of MAST fuels projects.

The MAST group includes:

- San Bernardino County Board of Supervisors
- County Administrative Office
- County Public Works-Flood Control/Transportation/Solid Waste





- County Fire Protection District
- County Fire Protection District/Office of Emergency Services (OES)
- County Sheriff's Department
- Southern California Edison
- Bear Valley Electric
- Arrowbear Lake Fire Department
- Big Bear City Fire Protection District
- City of Big Bear Lake Fire Department
- Crest Forest Fire Protection District
- Running Springs Fire Department
- USFS
- San Bernardino National Forest Association
- Forest Care
- Cal Fire
- Caltrans
- California Highway Patrol
- Inland Empire Fire Safe Alliance
- Angelus Oaks Fire Safe Council
- Arrowhead Communities Fire Safe Council
- Bear Valley Fire Safe Council
- Lytle Creek Fire Safe Council
- Mill Creek Fire Safe Council
- Mountain Rim Fire Safe Council
- Wrightwood Fire Safe Council

Since its beginnings, MAST has been the Unified Command that has successfully implemented and completed numerous programs leading to safer communities, a more educated public and an improved environment.

MAST provides an extensive Fuels Reduction Program. The Fuels Reduction Program began with removal of dead hazardous trees from areas threatening electrical transmission lines, evacuation routes, and structures within the San Bernardino Mountains. Dead and dying trees pose an extreme fire danger, and MAST members began removing these trees under state and federal grants, including a $70 million grant from the USDA Natural Resources Conservation Service. At the height of the program, Southern California Edison contractors were taking out 650 trees a day. As the program developed, additional hazards were identified, such as green fuel load density and wood shake roofs on structures within the San Bernardino Mountains

The MAST mission has expanded to include reducing green fuel by thinning live trees in densely wooded areas. Property owners also are being urged to thin the live trees and vegetation on their property to gain an upper hand on the bark beetle infestation and reduce the risk of catastrophic wildfires like the Grand Prix and Old fires in 2003.

Other MAST Achievements include:

- Increasing awareness of the drought-related bark beetle emergency and the threat of catastrophic wildfires
- Distributing fire safety and prevention information to the public
- Developing evacuation plans and distributing emergency planning information to the public
- Developing commercial use or disposal options for waste wood products.

The Mountain Area Safety Taskforce (MAST) Operations Section meets monthly. MAST Operations Section determines project priorities based on the benefit cost analysis of the projects and the effect of the project on the overall goals of the MAST organization.

Goals can change as detailed Benefit Cost Analysis is conducted and CEQA/NEPA reviews are completed.

#### 7.1.2.2.3 Fire Safety Overlay District Mitigation

A General Plan Amendment to the Safety Element of the County of San Bernardino 2007 General Plan updated the Fire Safety Overlay District effective March 11, 2010. The Safety Element includes several hazard overlays that are included in the General Plan mapping system to inform the public of potential hazards to development of property within certain areas of the County and to enable the County to mitigate the risks presented to property owners by these hazards, by requiring fire resistant building construction methods. The overlays include potential fire hazards within the mountain regions as well as the valley and desert “interface”. Over the past twenty years, certain federal and state agencies have been in the process of digitizing much of this hazard data. The digitization of this data has allowed for greater accuracy as well as more timely updates. In recognition of the new data from various federal and state agencies, the County updated the Fire Safety Overlay District contained within the Safety Element of the General Plan. The Fire Safety Overlay District is amended by modifying four General Plan Quad Maps to incorporate updated fire safety mapping published by Cal Fire for the Valley area.

As new information is received, the overlay maps are updated to reflect changes. These updates are made by the Land Use Services Department in collaboration with County Fire Protection District. More areas have been added through annexation and contract for services and so there has been large growth and the overlay will be updated. The future 2018 CountyWide Plan will replace the General Plan, and will contain more update maps and regulations that will allow development to occur but ensure safety and sustainability within the Fire Safety Overlay District.

#### 7.1.2.2.4 Public Education Programs

The County through MAST conducted a comprehensive mountain-wide multi-modality Public Outreach Program from 2006 to 2008. It can be found at www.CalMAST.org. The program in both English and Spanish created and presented multiple public educational meetings, newsletters,





brochures, calendars, and posters. Because of the large number of visitors to the forest, MAST also created Emergency Information Visitors brochure and glove box sized Emergency Response Evacuation maps for the mountain communities. The program won national awards for advertising and public relations. Other jurisdictions initiated their own public education activities but brought them back through MAST so that the entire group could receive the benefit. The City of Big Bear Lake Fire Department was the most prolific in developing innovative and creative educational programs. They developed the Thin-Is-In website at (www.thinisin.org) that is an excellent site for citizens and agencies as well. Since the Big Bear Valley is served by an excellent radio station KBHR (k-bear) they have posted numerous public safety messages. Also during the Butler, Butler II and Slide Fires, KBHR provided constant updates to the community regarding the fire.

#### 7.1.2.2.5 County Fire Hazard Abatement

Land Use Services Department, Environmental Health Division is responsible for Fire Hazard Abatement (FHA). Fire Hazard Abatement works to reduce the potential for an individual’s property to be the source of fire and structural ignitability. Failing to maintain private property in a fire safe condition is seen as a fire threat and is considered a threat to neighbor’s property rights. To obtain compliance, FHA issues notices of violation to properties that have dry vegetation and flammable green vegetation. If the property owner doesn’t comply with the notice, FHA then obtains a warrant to go onto the property and abate the fire hazard.

The Fire Hazard Abatement portion of the County Code was completely rewritten and redesigned around real flammable fuels. The most significant change was to include certain types of green fuels as flammable vegetation.

Following in the City of Big Bear Lake’s path, the County adopted the new code in the fall of 2008. In January of 2010 the County amended the Hazard Overlay maps.

The Fire Hazard Abatement Division of the Land Use Services Department conducts annual inspections of all parcels of land in mountain regions for the purpose of identifying exterior fire hazards. Biannual inspections are completed in valley and desert serviced areas. The targeted hazards include high energy release shrubs, dead and hazardous trees, flammable vegetation, weeds, grasses and combustible rubbish. The Division completes more than 430,000 inspections, issues more than 45,000 Notices to Abate Fire Hazards, issues over 4,000 citations for non-compliance, and abates the fire hazards on more than 2,000 parcels annually. Within the last 5 years, the Fire Hazard Abatement Division has received even more financial resources that enable them to abate all properties declared a fire hazard.

#### 7.1.2.2.6 Countywide Fuels Management Program

In May of 2005 the San Bernardino County Fire Protection District and the San Bernardino County Flood Control District formed a partnership to implement the Hazardous Tree Removal Program, later the Fuels Management Program. In this endeavor the Flood Control District

formed the Hazardous Tree Removal Operations Division which was tasked with developing, bidding and administering Tree Removal and Fuel Reduction Contracts funded by various grants. Contracts originally focused on removing dead, dying, and diseased trees caused by the drought conditions and the bark beetle infestation. The program has evolved to include fuel modification projects which remove hazardous vegetative fuels through the thinning of live vegetation. In addition the location of the fuel reduction projects are moving beyond the limits of the San Bernardino Mountains and into the interface between the Mountain foothills and the high desert.

The following are the types of programs/projects included in the Fuels Management Program:

- Emergency Tree Removal Projects consist of the removal of a tree (or trees) that poses an immediate threat to safety, a structure, or the public right-of-way.
- Block Projects are dead dying diseased tree removal projects on multiple parcels which are located in close proximity to one another.
- Large Urban Parcel Projects are dead dying diseased tree removal projects on a single or multiple large parcels.
- Fuel Modification Projects focus on the removal of hazardous fire fuels in the wildland/urban interface. The fuels removed in these projects are both live and dead vegetation. The goal of these projects is to reduce a future forest fire's intensity as well as the removal of ladder fuels which carry the fire from the forest floor to the forest canopy and result in a crownfire.

In addition to the Hazardous Tree Removal Operations Division, the San Bernardino County Fire Fuels Management Crews are also funded by the same grant sources. The primary focus of the crews is to create and maintain fuel modification projects in the vicinity of communities at risk and construct fuel breaks. In addition the crews assist the public with curb side chipping programs throughout local partner jurisdictions.

##### 7.1.2.2.7 Fireworks Interdiction

The unlawful transport of dangerous fireworks continues to be enforced by several local and state fire and law enforcement agencies, The program continues ensures that thousands of pounds of fireworks per year are seized and properly disposed of, preventing fires, fire injuries and fire deaths.





##### 7.1.2.2.8 Programs Listed in Fire District Annex

**Table 7-1: Wildfire Mitigation Implementation Methods**

| Mitigation type | Description |
|---|---|
| PPRO | SCE removes dead trees near power lines to reduce fire hazards. For more information, see Annex A Section A.6 Mitigation Project Prioritization and Implementation. |
| ES | Mountain Mutual Aid is an operational group of emergency responders. |
| PRV | The Alliance was created to act as a forum for all Fire Safe Councils in San Bernardino County. For more information, see Annex A Section A.6 Mitigation Project Prioritization and Implementation. |
| PRV | Fire Hazard Abatement works to reduce the potential for an individual's property to be the source of fire and structural ignitability. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| PE&A | Cal Fire provides programs to increase fire safety in high fire hazard severity zones. For more information, see Annex A Section A.6 Mitigation Project Prioritization and Implementation. |
| PRV, PPRO | The Contractor Certification program trains and certifies landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |
| PRV, PPRO | CWPPs are designed to provide a means for a community to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. For more information, see Annex A Section A.6 Fire Protection District Mitigation Project . |

### 7.1.2.3 Earthquake / Geologic

A General Plan Amendment to the Safety Element of the County of San Bernardino 2007 General Plan updated the Geologic Hazard Overlay Maps which became effective on March 11, 2010. The Safety Element includes several layers of hazard overlays that are included in the General Plan mapping system to inform the public of potential hazards to development of property within certain areas of the County and to enable the County to mitigate the risks presented to property owners by these hazards. These overlays include potential geologic hazards. Over the past twenty years, certain federal and state agencies have been in the process of digitizing much of this hazard data. The digitization of this data has allowed for greater accuracy as well as more timely updates. In recognition of the new data from various federal and state agencies, the County updated the geologic hazard overlay maps, specifically the Generalized Liquefaction

Susceptibility layer and the Generalized Landslide Susceptibility layer, contained within the Safety Element of the General Plan.

The Generalized Liquefaction Susceptibility layer was amended to modify four General Plan Quad Maps to incorporate new liquefaction data in the Big Bear Lake area designated by the County Geologist for the Big Bear Lake Valley. This information was then incorporated into the County-designated Geologic Hazard Overlay District.

The Generalized Landslide Susceptibility layer was amended by modifying 17 General Plan Quad Maps and one regional Quad Map, to incorporate updated existing landslide data published by the U. S. Geological Survey for the Mountain area. The County Geologist updated the landslide inventory within the Geologic Hazard Overlay District by incorporating new geologic mapping by the U.S. Geological Survey.

The following is a list of the updated General Plan Geologic Hazard Overlay Maps effective on March 11, 2010:

**Table 7-2: General Plan Geologic Hazard Overlay Maps**

| Map # | Quad Name |
|---|---|
| FH08C | Fifteen Mile Valley |
| FH11C | Mt. San Antonio |
| FH12C | Telegraph Peak |
| FH13C | Cajon |
| FH14C | Silverwood Lake |
| FH15C | Lake Arrowhead |
| FH16C | Butler Peak |
| FH19C | Mt. Baldy |
| FH20C | Cucamonga Peak |
| FH21C | Devore |
| FH22C | San Bernardino North. |
| FH24C | Keller Peak |
| FH27C | Ontario |
| FH30C | San Bernardino South |
| FH31C | Redlands |
| FH32C | Yucaipa |
| FI09C | Fawnskin |
| FI10C | Big Bear City |





| Map # | Quad Name |
|---|---|
| FI17C | Big Bear Lake |
| FI18C | Moonridge |
| EH/FH C | SW Portion of County |
| **FH23C** | **Harrison Mtn.** |

### 7.1.2.4 Flood

#### 7.1.2.4.1 Existing Drainage Studies

Drainage studies including review of upstream properties, site drainage area, potential upstream development, and site-specific development will help to mitigate damage from future storm events. San Bernardino County owns landfill sites, transfer stations and closed disposal sites where combined site property totals several hundred acres. Landfills and disposal site properties include acreage that has been constructed to design grades and may include improved drainage systems. Also, within most landfill and disposal site properties there are many acres of property that remain in its natural state including native vegetation and natural grades. During severe weather events, both engineered areas and undisturbed areas are subject to erosion from storm run-off. The erosion can range from minor to severe depending on the storm event and amount of precipitation. Most sites where engineered drainage systems are in place hold up well experiencing only minor erosion and debris flow. However, during major storm events, runoff from native and unimproved areas carrying solids and debris flow may compromise downstream drainage systems and overwhelm system facilities. Much of the damage to landfill and disposal sites during the December 2010 Winter Storm event was caused by erosion with sediment carried from undeveloped/undisturbed areas or where no improved drainage system is in place.

Other events that may cause damage to property and structures include earthquakes, wildfires, high winds, extreme freezes, and lightning storms.

- Earthquakes have the potential of causing damage to site roadways, structures, and systems including concrete drainage systems, Landfill Gas systems (LFG) and Leachate Collection Recovery Systems (LCRS). With earthquakes, there is always the potential of slope failure and slides on the landfill surface. Damage to any of these facilities has the potential to result in an inability to temporarily service the community.
- High Winds can cause damage to temporary drainage structures, fencing, and metal structures. During past high wind events, Transfer Stations have experienced roof panels being torn from the beams. Landfill sites with exposed geo-synthetic liners may experience damage if the winds lift and tear the liners.
- In January 2007, the County experienced a loss of over $21,000 in damage when water pipes at three separate Transfer Stations froze, then burst, causing damage to offices and electrical equipment.

- Lightning storms have the potential to damage electrical components in scale houses, in-ground scales, LFG, and LCRS.

#### 7.1.2.4.2 NFIP Program and County General Plan Policies

Because the County has entered into an agreement to participate in the National Flood Insurance Program (NFIP) which provides flood insurance within designated floodplains, the following goals, policies and programs shall apply:

**As stated in the San Bernardino County General Plan Safety Element:**

**GOAL S 5**
The County will provide adequate flood protection to minimize hazards and structural damage.

**Policy S 5.1:** Participate in the National Flood Insurance Program (NFIP), which provides flood insurance within designated floodplains.

**Programs**

1) Designate Floodway and Floodplain areas, as identified by the Federal Emergency Management Agency (FEMA) on flood insurance rate maps and flood boundary maps, as Floodway (FW) on the Land Use Maps and Floodplain Overlays on the Hazards Overlay Maps.

2) Designated floodway areas will be preserved for non-structural uses through restrictions of the FW Land Use Zoning District

3) All new development, including filling, grading, and construction, proposed within designated floodplains, will require submission of a written assessment prepared by a qualified hydrologist or engineer, in accordance with the latest "San Bernardino County Hydrology Manual" and the various detention basin policies (see Existing Policy FL-11), to determine whether the development will significantly increase flood hazard and to show that all new structures will be adequately protected. Development will be conditioned on receiving approval of this assessment by the San Bernardino County Surveyor Division of the Public Works Department. All new construction in a Floodplain Overlay area will be required to be flood-proofed, located, and designed to allow unrestricted flow of floodwaters.

4) The Land Use Compatibility Chart for 100-Year Flood Plains Table 5-1 will apply to County reviews of all discretionary and ministerial actions in County designated floodplains.





5) Lands within floodplain areas may be developed with non-critical and non-essential uses if mitigation measures are incorporated to ensure that the proposed development will not be hazardous, increase flood depths or velocities downstream, or degrade water quality, especially uses such as parks, trails, and open space.

6) Provide known flood hazard information with every discretionary or ministerial application.

7) When no mapped data exist, existing topographical, watershed, and drainage course data will be evaluated for a determination of potential flood hazard for every discretionary and ministerial action.

**Policy S 5.2:** Update data and maps with newly identified flood hazard areas in the County, as new information becomes available.

**Programs**

1) As new overflow studies and mapping are completed and approved by either the County's Land Development Engineer or the San Bernardino County Flood Control District, they will supplement the FEMA mapping and will be incorporated into Flood Hazard Overlay mapping.

2) Initiate and finance programs for the continuous evaluation and designation of floodway, floodplain, and drainage areas.

3) Timely application for FEMA mapping changes will be initiated to reflect any additions to or alterations in identified Floodways or Floodplains by the County Floodplain Management Administrator.

### 7.1.2.5 Drought

#### 7.1.2.5.1 Water Efficient Landscape Ordinance

Over the years, the State of California has been promoting water conservation for all new development within the State. In a drought-prone California, where approximately 60 percent of all residential water is used in landscape applications, California lawmakers have adopted such legislation as Assembly Bill (AB) 325 (1990), AB 2717 (2004), and AB 1881 (2006) that outline, and in some instances mandate, the practice of water conservation in landscape applications. As part of AB 325, the Department of Water Resources (DWR) was charged to assemble a task force of stakeholders representing the landscape, water, and building industries as well as cities, counties, and other agencies that would help DWR prepare and promote the State's first Model Water Efficient Landscape Ordinance (MWELO).

While AB 325 did not require cities, counties, and other agencies within the State to comply with the first adopted MWELO, it did encourage local agencies to implement water conservation techniques into their local ordinances and codes. The County adopted Administrative Guidelines

that were amended several times and ultimately given the status of "regulation" when they were incorporated into the Development Code (Chapter 83.10) during the 2007 General Plan Update process.

In 2006, State lawmakers adopted AB 1881, which gave guidelines and timelines for revision of the State's MWELO and mandated that every city, county, or other agency within the State of California adopt the State's revised MWELO, or be in compliance with it through their own ordinance, by January 2010. Local agencies are required to report their final action, along with findings of ordinance effectiveness, to DWR by January 2011. While this process was underway, Senate Bill X7-7 was enacted (2009). This bill requires the State of California to achieve a 20 percent reduction in urban per capita water use by December 31, 2020; additionally, it requires the State to make incremental progress towards this goal by reducing per capita water use by at least 10 percent by December 31, 2015. These requirements were incorporated into the MWELO and, in February 2008, DWR made a draft of the State's revised MWELO available to all cities, counties, and other agencies within the State. The final version of the revised MWELO was released in September 2009.

Upon review of the final version of the State's MWELO and the provisions of AB 1881, staff determined the County would need to revise Development Code Chapter 83.10 which sets forth landscaping and irrigation standards within the unincorporated areas of the County. This would in part, become a mitigation measure to assist with any drought hazard the County may encounter. In the meanwhile, the County began enforcing the State's revised MWELO in January 2010, as required by law.
Once the proposed changes to the Development Code have been adopted by the Board of Supervisors, staff will notify and forward all required information regarding the adoption and effectiveness of the County's Water Efficient Landscaping Ordinance to the State DWR as required by January 2011.

The proposed Development Code Amendment will revise the landscaping standards to reflect the changes governed by and to be as effective as, the State of California's revised Model Water Efficient Landscape Ordinance, while continuing to recognize the unique character of the regions that make up the County of San Bernardino.
The ***proposed revisions*** will require the applicant/developer to:

- Design and install systems that meet more effective and efficient water conservation standards in all landscaped areas on a project site, including residential;
- Comply with the revised standards for all new and rehabilitated landscape areas regardless of square footage for projects that are not homeowner installed and for all new and rehabilitated landscape areas, that are homeowner installed, that are 5,000 square feet or greater. This includes the following:
    - Submit a comprehensive Landscape Documentation Package, which has been prepared by a landscape architect licensed to work in the State of California or other licensed professional authorized to design and prepare Landscape Plans within the State of California;





    - Submit estimated annual water budget calculations for compliance with water conservation practices and the efficient use of water for each new or rehabilitated landscape. Calculations for the annual water budget for a project/site specific landscape shall use the formulas for the Maximum Applied Water Allowance (MAWA) and the Estimated Annual Water Use (EAWU) outlined in the ordinance;
    - Submit a Landscape Certificate of Compliance prepared by the landscape professional who prepared the Landscape Documentation Package conveying the project's compliance with the requirements of Development Code prior to final inspection;
    - Planting material within landscaped areas shall be chosen based on the information found in the Water Use Classification of Landscape Species, third edition (WUCOLS III) and the climate zone for the region based on information found in Sunset Western Garden Book;
    - Irrigation systems shall be equipped with a "smart" irrigation controller, which automatically adjusts the frequency and/or duration of irrigation events in response to changing environmental conditions.
    - Submit a rough and/or precise grading plan on all projects proposing more than 50 cubic yards of grading;
    - Submit a soil management report, that includes recommendations for soil modification and/or amendment;
    - Submit a project-specific regular maintenance schedule and two project-specific irrigation schedules for those projects subject to the ordinance.

Other provisions of the new regulations include standards for non-potable/recycled water use where it is available and new enforcement standards for compliance with water conservation practices.

Since the State law became effective on January 1, 2010, the Landscape Plan Review Fee was adjusted (Ordinance #4412, June 22, 2010) to reflect the increase in staff time necessary to meet these additional requirements.

The Planning Commission considered this ordinance on October 21, 2010. There was no one at the hearing who wished to address the Commission on this issue. The Commission recommended that the Board adopt the ordinance as presented on a vote of four commissioners in favor and one absent.

The proposed amendment is exempt from the California Environmental Quality Act (CEQA) in accordance with Section 15061(b) (3) of the CEQA Guidelines as the proposed change does not have the potential to cause a significant effect on the environment.

The proposed Ordinance is to be presented to the County of San Bernardino Board of Supervisors for adoption in the first quarter of 2011. Utilizing either the State Water Efficient Landscape Ordinance, which is in effect currently, or the County's specific Water Efficient Landscape Ordinance; the drought mitigation for this hazard is positive.

#### 7.1.2.5.2 San Bernardino County Desert Area Groundwater Inventory and Atlas

As of January 2011, the California Department of Water Resources anticipates releasing the Final Local Groundwater Assistance (LGA) Guidelines later this calendar year. In December 2009, the draft LGA Guidelines and Proposal Solicitation Package (PSP) was available for public comment. The comment period ended on January 12, 2010.

Local public agencies with authority to manage groundwater resources are encouraged to apply Examples of projects that may be considered are: Groundwater data collection, modeling, monitoring and management studies; monitoring programs and installation of equipment; basin management; development of information systems; and other groundwater related work.

The County of San Bernardino Board of Supervisors may consider an action directing staff to apply for the grant when it becomes available for a Desert Area Groundwater Inventory (DGI) and Atlas. The DGI falls within the scope of the Local Groundwater Assistance (LGA) Program, which is funded with Prop 84 IRWM funds anticipated to be available for fiscal year 2010-2011. Grants are limited to $250,000 per recipient, and total funding is $4.7 million.

California Department of Water Resources will give priority to local agencies with adopted groundwater management plans (SB1938 compliant), and which demonstrate collaboration with other local agencies in managing groundwater basins. County's groundwater management ordinance satisfies this requirement.

By having a Desert Area Groundwater Inventory and Atlas, this would enable the County to have a database providing locational and water depth information for specific regions of the County that currently do not have a groundwater inventory. This Inventory and Atlas would provide information applicable for flood mitigation or ground water availability for usage during severe drought. The location and water depth in the inventory are important for an earthquake hazard analysis, if liquefaction potential exists.

Since there is not a Desert Area Groundwater Inventory currently, and if liquefaction is a concern in a specific region of the County, then the water depth data would estimate the vertical distance from the land surface to the top of the groundwater aquifer (i.e., the groundwater-saturated layer.)

**Table 7-3: Tentative Schedule for the LGA Grant**

| Date | Event | |
|---|---|---|
| TBD | Release Final LGA Guidelines and PSP | Dependent upon Grant approval |
| TBD | Proposal Applications Due | Dependent upon Grant approval |
| TBD | Public Release of Draft Award Recommendations | Dependent upon Grant approval |

*Fund Source: Proposition 84*





### 7.1.3 Continued Public Involvement

As indicated earlier, the County will continue to engage the general public and seek input on the mitigation and preparedness planning process. In addition to the San Bernardino County Board of Supervisor meetings, the actions include:

- Municipal Advisory Communities throughout the unincorporated County area,
- Flood Zone Advisor Committees,
- Special District Advisory Committees,
- Public hearings for County General Plan updates held four times a year,
- MAST and FAST meetings,
- Fire Safe Council meetings,
- Community Emergency Response Team meetings, and
- Public events where educational efforts are undertaken in the unincorporated areas.

Additionally, the public is kept involved through annual programs such as the Great Shakeout held annually in October, SKY Warn events sponsored by the National Weather Service, and other monthly safety programs. The County will continue to use several different methods to reach out to the public: mailers, cable TV, website, social networks, e-mail, posting in public libraries, and fairs.

# Section 8. Works Cited

USGS. (2009).
USGS. (2016, April 7). *USGS Earthquake Hazards Program*. Retrieved from https://earthquake.usgs.gov/learn/glossary/?term=earthquake





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# Appendix A. Outreach Documentation

## A.1 Ready SB County Preparedness App Message

An App message was sent out to over 15,000 persons with the App and it is attached to the San Bernardino County Fire Website. .Ready SB County Preparedness Mobile App can be used on either an Android or iPhone. This app provides multiple resources for our residents that will assist them in preparing for a disaster and enhancing the recovery process. Protect yourself and your loved ones before, during and after a disaster.

Get the Latest News from SBCounty.gov, CalTrans, National Weather Service, and San Bernardino County Fire Office of Emergency Services. This app will provide you with an emergency supply kit list, grocery list and checklists tailored to your needs. You can access and update your plan as needed. Learn all you need to plan for and respond to natural disasters, terrorism and pandemic flu in San Bernardino County

## A.2. San Bernardino County Fire Public Input Requested

San Bernardino County Fire Department/Office of Emergency Services (OES) is coordinating the update of the San Bernardino County Unincorporated Area Multi Hazard Mitigation Plan. Hazard Mitigation Plans are updated every five years and must be approved by Cal OES and FEMA. The purpose of the public input and comment is to show progress being made and elimination of hazards since the last plan. Your input is appreciated by reviewing and commenting on the current plan (link below) by calling OES at 909-356-3998 – ask for David Davis. Comment period **closed at 5:00 p.m., Wednesday, November 3, 2016.**
http://www.sbcfire.org/oes/Documents.aspx

## A.3. MJHMP PowerPoint Presentation

# Annex A. Fire Protection District

## A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Fire Protection District, a previously participating jurisdiction to the 2011 San Bernardino County Hazard Mitigation Plan Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the Fire Protection District. This Annex provides additional information specific to the Fire Protection District, with a focus on providing additional details on mitigation actions and projects.

The Board of Supervisors acts as the Board of Directors for the County Flood Control District, and as part of their responsibilities as an elected member of the County of San Bernardino Board of Supervisors.

## A.2 Fire District Profile

The San Bernardino County Fire Department is an all-risk/full-service fire department committed to providing the highest level of service in the most efficient and cost effective manner to the citizens and communities that we serve. At 20,160 square miles, San Bernardino County is the largest county in the continental United States. Our jurisdiction encompasses 19,278 square miles of extremely diverse environments that stretch from the Los Angeles County line on the west, to the Colorado River on the east, to the Nevada State line and Kern and Inyo counties on the north. We provide services to more than 60 communities/cities and all unincorporated areas of the county.

**Mission Statement**
Community-based all-risk emergency services organization dedicated to the health and well-being of the citizens of San Bernardino County through a balance of regionalized services delivery and accountability to the local community supported by centralized management and services.

**Service Motto**
Duty, Honor, Community.

**Standard of Commitment**
"Where Courage, Integrity, and Service Meet."

**Vision Statement**
Committed to Providing Premier Fire Services.

**Hazard Mitigation Planning Group:**
Michael Antonucci – Emergency Services Manager





## A.3 Planning Process

As described above, the County Fire District followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the San Bernardino County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table A-1. Additional details on plan participation and District representatives are included in Appendix A.

**Table A-1: Fire District Planning Team**

| Name | Title / Role |
|---|---|
| Michael Antonucci | Emergency Services Manager |
| Cindy Serrano | Assistant Emergency Services Manager |
| David Davis | Emergency Services Officer |
| Miles Wagner | Emergency Services Officer |
| Cheryl Nagy | Emergency Services Officer |
| Carrie Cruz | Emergency Services Officer |
| Elli Maldonado | Office Assistant |
| Mary Barnett | Technical Writer / Plan Update and Edits |
| Michael Horton | Fire Marshal |

Weekly meetings held every Tuesday since July 2016 with conference calls to the consultant group and other stakeholders plus all meetings listed in this document.

## A.4 Hazard Identification and Prioritization

The County Fire Protection District Planning Team participated in the County hazard identification and prioritization process described in the base plan. The Fire District Planning Team assisted to summarize the extent, probability of future occurrences, potential magnitude/severity, and significance specific to the Fire District in the base plan.

The Planning Team (all participating jurisdictions) determined that the County and its Special Districts should focus over the next five (5) years on hazards that fell within the HIGH and MEDIUM “Probability” and “Impact” categories. While all the hazards present a potential problem in the County, the Planning Team felt that if they were able to reduce or eliminate the risk from “fire related” hazards, it would provide a greater service to the people within the jurisdiction. Table 4-3 illustrates how the final prioritization of the hazard; the “Green” colored box represents the highest priority hazards; and the “White” colored boxes represent lower (second and third tier) priority hazards.

Table A-2: Fire District Hazard Priority Matrix

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | **Wildfire**<br>Flood<br>Earthquake/ Geologic Hazards | Drought | |
| | Medium | Terrorism | Climate Change (Extreme Heat and other) | Hail<br>Infestation |
| | Low | | Dam Inundation | Tornado<br>High Winds<br>Winter Storm<br>Lightning<br>Extreme Cold |

## A.5 Coordination with existing Fire District Mechanisms

Coordination with other District planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the Fire Protection District integrated the previously-approved 2011 Plan into existing planning mechanisms and programs.

While not designed or proposed specifically as mitigation projects, the County Fire Protection District undertakes many activities that incorporate mitigation elements and integrate risk reduction as an additional benefit. The following describes a number of these projects which exemplify how the County integrates hazard mitigation into county-wide programs.

### A.5.1 Critical Route Planning Committee

San Bernardino County Fire Protection District Office of Emergency Services has a “Critical Route Planning Committee” that is developing countywide routes and alternate routes for use in evacuating residents from a disaster area while simultaneously allowing first responders’ access into a disaster area without congestion and gridlock. The Committee members are from County departments, City and Town representatives, and key state and federal agencies. The Critical Route Planning effort is being coordinated with surrounding counties to prevent congestion and gridlock at the County boundaries.





### A.5.2 Public Alert and Education Programs

#### A.5.2.1 Wireless Emergency Alerts (WEA)

During threatening emergencies in your area, authorized government agencies can send Wireless emergency Alerts to your mobile device. Messages regarding extreme weather, life threatening emergencies, AMBER alerts, and Presidential Alerts during a national emergency are all sent through the WEA system

#### A.5.2.2 Emergency Alert System (EAS)

The Emergency Alert Systems: national public warning system that requires TV and radio broadcasters, cable television systems, wireless cable systems, satellite digital audio radio service providers, direct broadcast satellite service providers and wireline video service providers to offer to the President the communications capability to address the American public during a national emergency. The FCC works with the Federal Emergency Management Agency and the National Oceanic and Atmospheric
Administration's National Weather Service to implement the EAS at the national level. Only the President determines when the EAS will be activated at the national level, and has delegated the administration of this function to FEMA.
Accordingly, FEMA activates the national EAS, and directs national EAS tests and exercises. The NWS uses the EAS on a local and statewide basis to provide the public with alerts and warnings regarding dangerous weather and other emergency conditions.

The EAS allows participating providers to send and receive emergency information quickly and automatically, even if their facilities are unattended. If one link in the system for spreading emergency alert information is broken, members of the public have multiple alternate sources of warning. EAS equipment also provides a method for automatic interruption of regular programming, and in certain instances is able to relay emergency messages in languages other than English.

#### A.5.2.3 Integrated Public Alert & Warning System (IPAWS)

During an emergency, alert and warning officials need to provide the public with lite-saving Information quickly. The Integrated Public Alert and Warning System (IPAWS) is a modernization and integration of the nation's alert and warning infrastructure and will save time when time matters most, protecting life and property. Federal, State, territorial, tribal and local alerting authorities can use IPAWS and integrate local systems that use Common Alerting Protocol (CAP) standards with the IPAWS infrastructure. IPAWS provides public safety officials with an effective way to alert and warn the public about serious emergencies using the Emergency Alert System {EAS}, Wireless Emergency Alerts (WEA), the National Oceanic and Atmospheric Administration (NOAA) Weather Radio and other public alerting systems from a single interface.

#### A.5.2.4 Telephone Emergency Notification System (TENS) Implementation

Emergency service agencies like the Sheriff's Office have implemented TENS on numerous occasions to notify residents in specified areas to evacuate. Most recently it was used to evacuate hundreds of homes in the eastern portion of Yucaipa during the Pendleton Fire and in Wrightwood during the Sheep Fire when the entire community was ordered evacuated.

#### A.5.2.5 Emergency Communications Services (ECS)

In the last 10 year the ECS program has continually provided support to all major and minor incidents. The more recent events were the Pilot Fire and the Blue Cut Fire in 2016. ECS provides communications and logistical support to public safety and disaster preparedness events. They have also set up a training program for other County Departments that are not typical emergency responders but provided support in an emergency. ECS delivered and set up amateur radio equipment for Department of Public Works, Department of Public Health, Preschool Services Department, and Department of Behavioral Health and provided training for the employees.

#### A.5.2.6 Fire Safe Council/CERT Community Based AM Radio Transmitters

The Wrightwood Fire Safe Council and the Big Bear City CSD set up and operates a local AM radio transmitter. It has been brought into use during local incidents including a power outage where it is very useful. In power outages, the AM radio in a person's car still works. It was also used to provide preparatory information to the citizens of Wrightwood as the Station Fire was approaching the community from the west. It is also used extensively during the Wrightwood Fire Wise Awareness Days to keep citizens apprised of community events.

### A.5.3 OES Volunteer Programs

The San Bernardino County Fire, Office of Emergency Services (County OES) is proud to provide residents of San Bernardino County with meaningful disaster-related volunteer opportunities. Recognizing that during disasters and other emergencies professional responders may be overwhelmed or need assistance County OES trains residents to integrate with and support professional responders during incidents. County OES currently does these through three volunteer programs; the Community Emergency Response Team (CERT), Emergency Communications Service (ECS) and California Disaster Corps programs. Please visit the links below to learn about the programs offered.

#### A.5.3.1 Community Emergency Response Team (CERT)

The Community Emergency Response Team (CERT) Program educates people about disaster preparedness and trains them in basic response skills. Following a catastrophic event CERT





Members can assist themselves, their families, and others in their neighborhood or workplace until professional responders arrive. Fourteen (14) CERT programs are in the communities of:

- Angelus Oaks
- Big Bear Valley
- Helendale
- Lucerne Valley
- Lytle Creek
- Mill Creek Canyon
- Morongo Basin
- Mountain
- Oak Hills
- Phelan/Pinon Hills
- Rosena Ranch
- San Antonio Heights
- Silver Valley
- Wrightwood CERT

San Bernardino County Fire Protection District Office of Emergency Services has sworn in over 1000 CERT participants as California Disaster Service Workers. These participants have gone on to receive a Sheriff's Department background check to become members of their community's CERT.

The program receives guidance and resources from Department of Homeland Security, FEMA, Citizen Corps, and California Volunteers. The program is administered locally by the San Bernardino County Fire Protection District Office of Emergency Services.

#### A.5.3.2 LISTOS

Listos, which means "ready" in Spanish, is a twelve-hour disaster preparedness course created specifically for the Spanish-speaking community and is delivered entirely in Spanish. The program is intended to be adaptable, flexible and culturally relevant. This means participants are encouraged to involve the entire family and accommodations are made for young children. San Bernardino County Fire, Office of Emergency Services currently partners with the Cities of Fontana and Rialto to bring Listos to their communities

#### A.5.3.3 California Disaster Corps

The Disaster Corps is a first-in-the-nation effort to professionalize, standardize and coordinate highly trained disaster volunteers statewide. This program initiative was built collaboratively in partnership with California Volunteers from the ground up through public-private partnerships and with a wide range of subject matter experts including representatives from all levels of government, local emergency managers, state agency volunteer coordinators, and leaders in non-governmental volunteer programs.

Disaster Corps programs reside only in San Bernardino, San Francisco and Riverside Counties. San Bernardino County Disaster Corps volunteers are those volunteers participating in the volunteer programs residing within the unincorporated communities of San Bernardino County and have demonstrated commitment to their volunteer program and strive to continue developing their skills and training to better support their program and their community.

Within San Bernardino County Disaster Corps volunteers are set aside from regular CERT (Community Emergency Response Team) and ECS (Emergency Communication Services) volunteers by having the ability to be deployed throughout other areas of San Bernardino County and the state. They have received specialized training in SEMS and NIMS, plus have completed many other ICS courses and First Aid and CPR training. In addition there are additional training opportunities not offered to the regular CERT and ECS volunteers.

#### A.5.3.4 ECS Emergency Communications Service

The Emergency Communications Service (ECS) is a volunteer group providing front-line communications, technical and logistical support to the San Bernardino County Fire Department and Office of Emergency Services. Their primary mission is to support County Fire, County Government and other local agencies in time of disaster. In addition, ECS has provided telecommunications and event support to other County departments including Public Health, Behavioral Health, Public Works, Pre-School Services, Sheriff's Search and Rescue and other County Departments.

ECS coordinates disaster communications between city and county agencies, provides a communication link to Cal OES and ensures backup communication channels are kept open in times of a major disaster.

In an average calendar year, ECS supports approximately two-dozen events and incidents throughout the County. These events range from parades and community events, to major public safety incidents including fires and floods. The 200 ECS volunteers donate an average of 9,100 hours per year to the County of San Bernardino.

ECS currently provides multiple HAM licensing classes to County Departments and the residents of San Bernardino County each year.

### A.5.4 ROPE Plan (Responders Organized For Pass Emergencies)

ROPE Field Operations Guide (FOG) and Standard Operating Guide (SOG) for use by participating Federal, State, County, and Municipal agencies and industries for day-to-day incidents in the Cajon Pass, as well as for larger regional incidents requiring coordinated and unified multi agency response. The ROPE FOG contains; communications information, emergency contact information, critical infrastructure mapping and ICS planning tools.





### A.5.5 Great ShakeOut County Drill in all Disciplines (held annually)

The San Bernardino County Operational Area will be participating in the annual The Great ShakeOut drill which will focus on the Southern California Regional Catastrophic Plan (SCRCP). This plan is based on a large scale magnitude earthquake scenario along the southern section of the San Andres Fault. The purpose for participation in the Great ShakeOut Exercise is to address the County's potential to respond to a catastrophic earthquake event based on the plan, and to better prepare for such an occurrence. The goal of the exercise will be to conduct an effective multiagency/multi-jurisdictional evaluation of the Regional Catastrophic Plan with our Operational Area response partners.

### A.5.6 "Ready SB" Smart Phone App for Disaster Preparedness Program

The new mobile app, Ready SB, provides residents with multiple resources that will assist them in preparing for a disaster. Ready SB is now available as a free download from the Apple App Store and the Google Play Store it can immediately help residents prepare themselves for emergencies.

Ready SB features include: "My Plan", an individual emergency plan and/or a family or group plan. The person that downloads the application will receive county wide alerts and notifications of emergency situations in that person's area. There is a feature called "Share My Status" it is a place to update your status via text or email.

The app also includes information about areas that need to be evacuated, where to go, what routes are open and also what resources are available during that emergency.
The app features include: Evacuation Routes and Shelters, Need to Know, and has a Resources List.

### A.5.7 Cal Fire

Cal Fire provides programs to increase fire safety in high fire hazard severity zones. It funds and staffs programs from public education activities to performing fuel modifications with inmate crews. One example is the active Re-Leaf program where mountain residents are educated about drought tolerant and fire resistive landscaping that is available and sustainable. Cal Fire is also the lead agency on reforestation after a wildfire to ensure the stability of the environment. Cal Fire Foresters are active participants in the MAST process helping educate citizens and leading forestry activities on private lands within the USFS boundary.

Numerous fuels projects have been completed by State inmate crews that do significant hand work in dense fuels adjacent to communities. Cal Fire has also led the way in countless re-forestation projects that ensure that new stands of the same trees will repopulate an area and that the original forest won't be overtaken by a different type of replacement forest.

### A.5.8 Organized Group Volunteer Activities

Mountain communities are populated by several volunteer citizen groups that are capable of providing significant resources that are not provided by traditional governmental agency services.

Volunteer groups particularly “Mountain Hearts and Lives” (MHL) responded to numerous emergencies particularly of note the Grass Valley and Slide Fires. These groups have also spent significant time working to prepare citizens for disasters. MHL has coordinated CERT training as well as HAM radio operator training. Other activities can be found at www.heartsandlives.org. Other partners that assist in coordinated endeavors for disaster preparedness and disaster relief are Rim Family Services and the Rim Resource Community Network. Members of these and other groups work very closely with MAST, Mountain Mutual Aid and the American Red Cross.

## A.6 Fire Protection District Mitigation Project Prioritizing

Cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural projects, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. While detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

Based upon the Fire Districts capabilities, Table A-3: Mitigation Project Prioritization and Implementation shows primary actions selected for further implementation and development during the next planning cycle. Table A-3 provides details for each mitigation action with mitigation action descriptions, FEMA mitigation category, responsible party, and timeframe.





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## A.7 Fire Protection District Mitigation Project Actions

Table A-3: Mitigation Project Prioritization and Implementation

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| ALL Hazard | **AH Action 1.1:** Valley Dispatch and Operations Center. | Update and maintain the operations of the facility and ensure cohesive working and response to any scale emergency and operations in a secure complex | ES | General Fund and HMP Grant | Fire Protection District/ | 1-3 Years | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| ALL Hazard | **AH Action 1.2:** Maintain Shelter Operations Compound (SHOC). This shelter concept provides a new one-stop shelter concept. The SHOC combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location. | After the 2003 Wildland Fires, the County and American Red Cross recognized the need to provide services beyond basic care and short-term sheltering, especially during large fires, floods, and earthquakes The Mass Care & Shelter Plan and Concept of Operations, outlines the framework of a new one-stop shelter concept, Shelter Operations Compound (SHOC). It combines a shelter, a Local Assistance Center (LAC) and a Non-LAC Unit in one easy location. Residents can access public information and referral services through the LAC, and then take a short walk to the Non-LAC Unit for communication, postal services, and other private organizations/business at little to no cost. The completion of the Plan in 2012 will help to sync local resources, encourage local self-sufficiency, foster partnership between public and private agencies, and serve as a reference document for the region.<br><br>By June 2017, the program will have 32 trailers/caches equipped with mass care and shelter supplies, strategically placed throughout the County and ready for rapid deployment. It is expected to serve over 12,000 residents. In addition to enhancing the comfort levels of shelter residents, the program will produce standardized documents and protocols for procuring and maintaining Mass Care and Shelter trailers/caches. These plans and programs will help the County prepare for and mitigate damages from hazards. This is an update and expansion of the plan and done without more grant funds. | ES | To increase Mass Care and Shelter capability of the county, grants from 2008-2009 Homeland Security Grant Program (HSGP) and 2009 Riverside Regional Urban Area Security Initiative (UASI) funded the Mass Care and Shelter Trailer/Cache Program. | Fire Protection District/ | 1-5 Year | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| All-Hazard | **AH Action 2.1** Incorporate as appropriate requirements from the State of California's most recent land use regulations regarding the hazard mitigation planning process (Government Code 65302 and 8685.9). | Government Code 65302.6 requires the following elements to be included in the hazard mitigation plan:<br><br>(1) An initial earthquake performance evaluation of public facilities that provide essential services, shelter, and critical governmental functions. | PRV, NRP | General Fund | Primary: Land Use Services<br><br>Secondary: Fire Protection District/ | 1-3 years | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | (2) An inventory of private facilities that are potentially hazardous, including, but not limited to, multiunit, soft story, concrete tilt-up, and concrete frame buildings.<br>(3) A plan to reduce the potential risk from private and governmental facilities in the event of a disaster.<br><br>Government Code 8685.9 requires that the state share shall not exceed 75 percent of total state eligible costs unless the local agency is located within a city, county, or city and county that has adopted a local hazard mitigation plan as part of the safety element of its general plan. In that situation, the Legislature may provide for a state share of local costs that exceeds 75 percent of total state eligible costs. | | | | | |
| Wildfire | **WF Action 1.1** Continue Mountain Area Safety Taskforce (MAST) funding to support mitigation activity. | MAST was formed to mitigate the region wide risk of a catastrophic wildfire due to dead and dying trees in the mountain communities. The mission of the MAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for the protection of property owners, residents, and property subject to the risk of catastrophic wildfire that could occur in San Bernardino County with an initial emphasis on the threat resulting from the Old and Grand Prix fires in 2003. MAST priorities are to continue reducing fire hazards through fuel reduction programs and hazard abatement though enforcement of county ordinances.<br><br>The Mountain Area Safety Taskforce (MAST) Operations Section meets monthly. MAST Operations Section determines project priorities based on the benefit cost analysis of the projects and the effect of the project on the overall goals of the MAST organization.<br><br>Goals can change as detailed Benefit Cost Analysis is conducted and CEQA/NEPA reviews are completed. | NRP, PPRO | Seeking additional funding through HMPG. | San Bernardino County Fire Protection District | On-Going | See Implementation plan on more information on MAST.<br><br>See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |
| Wildfire | **WF Action 2.1:** Update Mountain Mutual Aid Map Book to document updated information contained in 2016 HMP. | The Map Book portion of the Community Safety and Structure Protection Plan provides not only a street network of the area but more importantly it provides the locations of strategic and critical resources for fire fighters. These include but are not limited to safe zones, open areas, locations for refuge. They also identify areas within communities that have narrow and steep winding streets and or with limited ingress and egress. The document is handed out to all responding strike teams from out of the | ES | Seeking additional funding through HMPG. | San Bernardino County Fire Protection District | On-Going | See Fire Protection District Annex A. Section A.6 Fire Protection District Mitigation Project . |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | area and has proved invaluable in directing and coordinating an effective fire-fighting response and reduces the potential for life loss and property damage. | | | | | |
| **Wildfire** | **WF Action 2.2** Update Community Structure Protection Plans as necessary. | This is an on-going action (from the 2011 MJHMP) with the goal to continue development of and continue the mission of mutual aid between first responders in the County mountain areas. | PPRO | HMP Grant Funding | Primary: San Bernardino County Fire Protection District<br><br>Secondary: Land Use Services | On-Going | |
| **Wildfire** | **WF Action 3.1:** Implement identified community based fuels reduction projects. | The Fuels Reduction Program is designed to create community based fuel modification programs across the mountain communities.<br>These projects are selected specifically to reduce the potential for catastrophic wildfires and the damage that they can do to the communities. Project design, contracting, and operations are managed by the County's Public Works Department with priorities set by local fire chiefs in monthly MAST Operations Meetings. This program is the oldest and most significant for reducing wildfire threat on a mountain wide basis. | PPRO | Current Funding:<br><br>Seeking additional funding through HMPG. | Primary: San Bernardino Public Works Department<br><br>Secondary: County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 3.2:** Develop fuels reduction "maintenance program" by obtaining participation from citizens and/or homeowners associations. | To survive a wildfire, property owners need to manage the land surrounding their homes and communities effectively. Removing fuels in the wildland fuel reduction zone beyond the defensible space can reduce the speed and intensity of an oncoming wildfire. But if these areas aren't regularly **maintained**, they lose their effectiveness. Plants grow back, and flammable vegetation needs to be routinely removed and disposed of properly. This guide provides tips on how to create and maintain defensible space and wildland fuels treatments around your property. | PPRO, PE&A | Seeking additional funding through HMPG | Primary: Public Works<br><br>Secondary: Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 4.1** Increase homeowner assistance services to mountain residents for fuel reduction. | This is an ongoing wildfire mitigation action (from the 2011 MJHMP) for the group Forest Care to achieve the goal of providing assistance to homeowners by expanding services to all communities in the Mountain areas of the County.<br><br>Forest Care is a program dedicated to creating a healthier forest. This program provides foresters to assess individual properties for thinning the vegetation and then provides 75% of the funding to do so. | PPRO, PE&A | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| **Wildfire** | **WF Action 4.2** Continue working with Southern California Edison (SCE) to remove dead trees near power lines. | A significant number of fires across the State are caused by trees falling into power lines. When the forests in the mountain communities became infested with bark beetles the pine tree die off was unprecedented. Thousands of these dead trees were standing precariously close to power lines. Early in the Bark Beetle Emergency in 2004, Southern California Edison swiftly initiated a program to remove all trees that were dead, dying, and/or diseased that had the potential to fall into any SCE power lines.<br><br>The role of Southern California Edison was critical to the success of MAST both operationally and financially. Edison still removes the most difficult trees, the most costly trees; and the ones that are most likely to be the source of ignition for a wild land fire. They are also removing the trees that are immediately threatening homes.<br><br>They have removed 118,305 trees since the inception of the program in 2004. They also provided reimbursements to people that removed their own trees. | PRV, PPRO | As of July of 2010 Southern California Edison (SCE) has spent $179,758,978 to remove dead dying and diseased trees. | San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 5.1:** Inspect every residence in the mountain communities throughout the year to enforce the Fire Hazard Abatement code that addresses green fuels. | The Fire Hazard Abatement Program conducts surveys to identify fire hazards throughout the year. Fire hazards are identified and notices to abate the hazard(s) are mailed to property owners. Property owners are given 30 days to abate the violations. Failure to abate may result in citations, penalties, and/or fees for abatement by the County. The Fire Hazard Abatement Program responds to complaints year round in the unincorporated areas and contracting Cities and Fire Districts.<br><br>The Division completes more than 430,000 inspections, issues more than 45,000 Notices to Abate Fire Hazards, issues over 4,000 citations for non-compliance, and abates the fire hazards on more than 2,000 parcels annually. Within the last 5 years, the Fire Hazard Abatement Division has received even more financial | PRV, PPRO, PE&A | Seeking additional funding through HMPG | Primary: Land Use Services<br><br>Secondary: San Bernardino County Fire Protection District | On-Going | For more information on Contractor Certification, see Annex A Section A.6 Fire Protection District Mitigation Project . |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | resources that enable them to abate all properties declared a fire hazard. | | | | | |
| **Wildfire** | **WF Action 5.2:** Continue to collaborate with Forest Care, Red, Cross and Cal Fire to overcome increased costs of enforcement. | This is an on-going action from the 2011 MJHMP with the goal of overcoming funding shortfalls for the County Fire Hazard Abatement Program. | PRV | HMP Grant Funding | San Bernardino County Fire Protection District | On-Going | |
| **Wildfire** | **WF Action 6.1** Train and Certify landscape contractors to comply with the Fire Hazard Abatement Code. | The City of Big Bear Lake created a program to train and certify landscape contractors to provide a qualified workforce to conduct fuels reduction activities on individual properties. The contractors are trained to comply with the new Fire Hazard Abatement Code that exists both in the City of Big Bear and the County unincorporated area. The City of Big Bear Lake Fire Department conducts the classes for landscapers and handy persons. This provides an incentive for the contractors and provides a level of certification that the homeowner can rely on when they are deciding to hire a landscape contractor to conduct fuels abatement around their home. | PRV, PPRO | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | On-Going |
| **Wildfire** | **WF Action 6.2:** Continue wildfire mitigation efforts under the Wood Shake Roof Replacement Program. | The County successfully passed an ordinance that requires the replacement of wood shake roofs by 2014. MAST has successfully mapped all of the wood shake roofs in the fire safety overlay and has created a strategy as to which roofs will be selected to participate in the FEMA funded project. This is an on-going project in cooperation with Big Bear Lake Fire Protection District in order to provide more funding for wood shake roof replacements by property owners. | PRV, PPRO, SP | Various Grant Funding from Edison, FEMA, Cal Fire | Primary: MAST<br><br>Secondary: San Bernardino County fire Protection District | On-Going | |
| **Wildfire** | **WF Action 7.1:** Modify independent and unique CWPPs into a more common framework making them similar but leaving room to provide specific hazard characteristics and mitigation actions for each community. | Community Wildfire Protection Plans are designed to provide a means for a community, usually through the Fire Safe Council, to have input into and actively participate in the planning, strategy, goals, and objectives of creating a fire safe community. | PRV | Seeking additional funding through HMPG | San Bernardino County Fire Protection District | On-Going | On-Going<br><br>For more information on CWPP see Annex A Section A.6 Fire Protection District Mitigation Project . |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Wildfire** | **WF Action 8.1:** Construct Arrowbear Drive Realignment and Widening. | The Arrowbear community off State Highway 18 has limited access to State Highway 138. The existing bridge/spillway and road needs to be realigned and widened to facilitate access by emergency personnel during wildfires and flooding. Mitigation strategy for this is to remove and replace existing bridge/spillway, realign and widen the road. | SP | Seeking grant funding<br><br>Total Cost: $2,000,000 | Primary: Public Works<br><br>Secondary: San Bernardino County Fire Protection District | 1-3 Years | |
| **Wildfire** | **WF Action 8.2:** Construct Cedar Glen Fire Access Road. | Lack of paved roads inhibits traffic circulation and the ability to enter and exit the area without backtracking during wildfire emergencies. Strategy is to Construct road and drainage improvements to Little Bear Creek Road and Elder Drive. | SP | Seeking grant funding<br><br>**Total Cost:** $2,500,000 | Primary: Public Works<br><br>Secondary: San Bernardino County Fire Protection District | 1-3 Years | |
| **Wildfire** | **WF Action 9.1:** Continue funding and support for Special Districts Projects relating to wildfire. | Continue funding and support for Special Districts Projects relating to wildfire in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | On-Going | |
| **Wildfire** | **WF Action 9.2:** Emergency Water Supplies | Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.(completed with continuous fresh of supplies and rotation) | ES | TBD | Roads | TBD | |

# Annex B. Flood Control District

## B.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Flood Control District, a previously participating jurisdiction to the 2010 San Bernardino County Hazard Mitigation Plan Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the base plan document. As such, all sections of the base plan, including the planning process and other procedural requirements apply to and were met by the Flood Control District. This Annex provides additional information specific to the Flood Control District, with a focus on providing additional details on mitigation actions and projects.

The Board of Supervisors acts as the Board of Directors for the County Flood Control District, and as part of their responsibilities as an elected member of the County of San Bernardino Board of Supervisors.

## B.2 Flood District Profile

***Flood Control District Functions:***
The Flood Control functions are handled through the San Bernardino County Flood Control District under State legislation enacted in 1939. The District has developed a very extensive system of facilities, including dams, conservation basins, channels, and storm drains. The purpose of these facilities is to intercept and convey flood flows through and away from the major developed areas of the County. The principle functions are:

- Flood protection on major streams.
- Water conservation.
- Storm Drain construction.

***Mission:***
To enhance the quality of life for our communities by developing and maintaining public infrastructure, and providing a variety of municipal services that complements our natural resources and environment.

***Vision:***
Lead the way to a thriving community through innovation in public works, fiscal responsibility, and environmental stewardship.

## B.3 Planning Process

As described above, the County Flood Control District followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the San Bernardino County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table B-4. Additional details on plan participation and District representatives are included in Appendix A.





**Table B-4: Flood Control District Hazard Mitigation Planning Team**

| Name | Title | Role |
|---|---|---|
| Kevin Blakeslee | Deputy Director – Flood Control | Public Works Deputy Director |
| Kenneth Eke | Chief Flood Control Planning/ Water Resources Division | Public Works Engineer |
| Michael Fam | Flood Control Planning | Public Works Engineer |
| Mona Sadek | Flood Control Planning | Flood Control Planner |
| Marjorie Schrage | Flood Control Planning | Public Works Engineer Technician |

## B.4 Hazard Identification and Prioritization

The Flood Control District Planning Team participated in the County hazard identification and prioritization process described in the base plan. The Flood Control District Planning Team assisted to summarize the extent, probability of future occurrences, potential magnitude/severity, and significance specific to the Flood Control District (See Section 4).

The Planning Team determined that the County and its Special Districts should focus over the next five (5) years on hazards that fell within the HIGH and MEDIUM "Probability" and "Impact" categories. While all the hazards present a potential problem in the County, the Planning Team felt that if they were able to reduce or eliminate the risk from "food and drought related" hazards, it would provide a greater service to the people within the jurisdiction. Table 4-3 illustrates how the final prioritization of the hazard; the "Green" colored box represents the highest priority hazards; and the "White" colored boxes represent lower (second and third tier) priority hazards.

**Table B-5: Prioritized Hazard Assessment Matrix**

| | | Impact | | |
|---|---|---|---|---|
| | | High | Medium | Low |
| Probability | High | Wildfire<br>**Flood**[x]<br>Earthquake/ Geologic Hazards | Drought | |
| | Medium | Terrorism | Climate Change (Extreme Heat and other) | Hail<br>Infestation |
| | Low | | Dam Inundation | Tornado<br>High Winds<br>Winter Storm<br>Lightning<br>Extreme Cold |

[x] = Flood District Area of Concentration

## B.5 Coordination with Existing Flood District Mechanisms

Coordination with other County planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the Flood Control District integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2011 MJHMP through other plans and programs shown below.

### B.5.1 Flood Area Safety Taskforce (FAST)

During the devastating fires in the fall of 2003, there was great concern of what the ramifications might be for flooding in the burned areas, as well as in the valleys. In response to these concerns, an organization was established that mirrored the Mountain Area Safety Taskforce (MAST), mentioned above, which played a key role in minimizing damage.

While the fires were ravishing the countryside, representatives from multiple agencies met often to address potential issues associated with flood, mud and debris flows develop a strategy and to protect communities from flooding incidents. These agencies united together to become the Flood Area Safety Taskforce (FAST). FAST is structured as an ICS/SEMS Organization for managing incident activities both readiness and response. The FAST Organization stresses liaison with the communities, provides for community education and information, and places emphases on Community and city partnerships.

The FAST group includes:

- Elected State officials
- Representatives from all five (5) County Supervisorial Districts
- State Office of Emergency Services
- County Administrative Office
- County Public Works-Flood Control/ Transportation/Solid Waste
- County Fire Protection District
- County Fire Protection District/Office of Emergency Services (OES)
- County Sheriff's Department
- Representatives from the cities of Fontana, Highland Rancho Cucamonga, Rialto, and San Bernardino.
- USFS
- Caltrans
- CHP

The mission of the FAST is to facilitate a coordinated effort by cities, county, state, federal, and non-profit agencies to provide for the protection of property owners, residents, and property subject to the risk of erosion, mudflows, and flooding that could occur in San Bernardino County with an initial emphasis on the threat resulting from the Old and Grand Prix fires in 2003.





The FAST Unified Command identified the following objectives as the focus and direction of the FAST:

- Provide for Community Safety.
- Develop Coordinated Public Information Dissemination between Cities, County, State, Federal and Non-Profit Agencies.
- Develop Immediate, Mid-range and Long-range Coordinated Agency Plans.
- Identify and Secure Potential Funding Resources to Provide Document Task Force Activities Including Mission, Goals and Objectives, Policies, Procedures, and Outcomes.

Prior to any type of flood threat, the following precautionary measures may be taken by FAST members to reduce the impact of impending flooding:

- Review mutual aid agreements
- Define evacuation areas and trigger points
- Review the use of alert and warning systems
- Provide information to the public of potentially susceptible flooding areas and protective measures in progress or planned for those areas
- Educate public on emergency self-help and preparedness
- Develop and maintain emergency notification procedures and checklists.

A FAST Concept of Operations (CONOPS) was developed to provide activity guidelines for pre-flood activities related to National Weather Service (NWS) watches and warnings. Due to the unstable condition of the burned areas, activities and coordination needed to be established and implemented between departments.

The CONOPS is "situation" and "incident" driven and subject to revision by the Unified Command which includes County Flood Control District & Co Roads, County Fire Protection District, United States Forest Service (USFS), California Department of Transportation (Caltrans), California Highway Patrol (CHP), County Sheriff, City of Fontana, City of Highland, City of Rancho Cucamonga, City of Rialto, and City of San Bernardino. The Unified Command has the ability to modify activities in these guidelines in response to current situations and predicted changes. Currently, the CONOPS includes both summer and Winter Storm Event Readiness.

In addition, the CONOPS includes the San Bernardino County Flood Area Safety Taskforce Paging Network and a draft of the Alert Communication Matrix by Rain Amount/NWS Warning.

Over the past 10 years, the County has used the FAST CONOPS many times, greatly enhancing the County's ability to respond to flash flood in the desert and foothill areas. The CONOPS activity coordination between the agencies has been very successful. Because of the great success of the CONOPS, State Emergency Management Agency (Cal EMA) is using the CONOPS as a model for other agencies throughout the State.

In addition, San Bernardino County the CONOPS and FAST Plan is updated every two years and has done so since been put in to action the latest update being May of 2015.

### B.5.2 Alluvial Fan Task Force

In December of 2002, the California Floodplain Management Task Force Report recommended that "The State should convene a task force specifically for alluvial fans, with stakeholder participation, to review the state of knowledge regarding alluvial fan floodplains, determine future research needs, and, if appropriate, develop recommendations relating to alluvial fan floodplain management, with an emphasis on alluvial fan floodplains that are being considered for development."

In September of 2004, Governor Arnold Schwarzenegger signed Assembly Bill 2141, which recommended the creation of the Alluvial Fan Task Force (Task Force). The Director of the Department of Water Resources (DWR) convened the Task Force in December of 2007 after funding to support Task Force activities was secured from a Pre-Disaster Mitigation Planning Grant from the Federal Emergency Management Agency (FEMA) and a state match was authorized by Assembly Bill 466. Funding supported the tasks charged to the Task Force including:

- Review the state of knowledge regarding alluvial fan floodplains;
- Determine future research needs;
- Develop a voluntary locally-adopted model ordinance for communities subject to alluvial fan flooding that supports land use decisions on alluvial fans;
- Develop local planning tools to assist local communities evaluate development on alluvial fans;
- Prepare recommendations relating to alluvial fan floodplain management.

Appointments to the Task Force by DWR Director Lester Snow represented a broad range of interests. Members included elected officials, represented by five Supervisors from Kern, Los Angeles, Riverside, San Diego and San Bernardino County where future alluvial fan development is projected. Appointments also included representatives of the development and environmental community, local floodplain managers and associated state and federal agencies, including the Federal Emergency Management Agency (FEMA), plus at-large members representing other issues related to future development on alluvial fans. The entire process was coordinated by the Water Resources Institute at California State University San Bernardino.

Primarily, the purpose of the Alluvial Fan Taskforce *Findings and Recommendations Report* (July 2010) and *The Integrated Approach for Sustainable Development on Alluvial Fans* (July 2010) documents are to provide a non-prescriptive and flexible model that local governments can use at their own discretion adapting to local conditions and needs that supports wise future land use decisions associated with development on alluvial fans.





As one of the ten Southern California counties studied by the Task Force, the County may review the development of the suite of local planning tools for pre-project screening for future development proposals on alluvial fans. If funding allows for the review, these planning tools may be useful as an optional database reference for project management. Additionally, the flood management tools designed to analyze alluvial fan flood hazards and formulate flood hazard protection, which were developed to be consistent with FEMA guidelines, may provide an optional data source for project development. Long term funding for updating and maintaining the pre-project screening tools database is a concern regarding the reliability for current data.

If funding exists, for the implementation of the *Integrated Approach for Sustainable Development on Alluvial Fans*, the methods contained therein may be used as some of the approaches for planning and evaluating the suitability of development on alluvial fans. During the analysis and review, if budgets allow, the long term ecological and financial sustainability issues would also be evaluated.

Based on the Findings from the Alluvial Fan Task Force process, recommendations were made for specific future actions that the State and other public agencies should consider regarding alluvial fans. The San Bernardino County Departments of Land Use, Special Districts and the Flood Control District are all coordinating on the below recommendations:

**Recommendation 1:** *on-going*

In February 2010, a General Plan Amendment (GPA) to the Safety Element of the 2007 General Plan was adopted to amend the Flood Plain Safety Overlay District to incorporate revised FEMA (Federal Emergency Management Agency) Flood Plain data, modifying 47 detail and seven regional General Plan Quad Maps. The GPA also adopted the FEMA Digital Flood Insurance Rate Map database as released by FEMA as it currently exists and as updated in the future for the County allowing for automatic map updates as new data are published by FEMA. This action by the County of San Bernardino Board of Supervisors implements the portion of the first recommendation from the Alluvial Fan Task Force by working with FEMA to continue updating flood insurance rate maps.

In addition, the GPA for the Safety Element in 2010 (a) amended the Generalized Landslide Susceptibility layer, modifying 17 General Plan Quad Maps and one regional Quad Map, to incorporate updated existing landslide data published by the U. S. Geological Survey for the Mountain area; (b) amended the Fire Safety Overlay District, modifying four General Plan Quad Maps to incorporate updated fire safety mapping published by Cal Fire for the Valley area; and (c) amended the Generalized Liquefaction Susceptibility layer, modifying four General Plan Quad Maps to incorporate new liquefaction data in the Big Bear Lake area designated by the County Geologist for the Big Bear Lake area.

**Recommendation 2:** *on-going*

The County will coordinate with the California Geological Survey (CGS) and the United States Geological Survey (USGS) to review any newly developed Quaternary geologic maps in alluvial fan areas in order to identify potential hazards in areas projected for future development.

**Recommendation 4:** *on-going*

Historical, documentation of flooding occurrences are preserved by the County's Flood Control District that would review the recommendation to identify flooding events that were associated with alluvial fans.

**Recommendation 6:** *on-going*

The increased severity and intensity of wildfires in Southern California increase flood risk because the same structures subject to fire risk are also prone to post-fire debris flows. Many of the debris basins that were constructed some time ago did not anticipate the increased severity and intensity of wildfires or the additional developments that would follow. The CalOES projects that climate change will further increase the severity of storms, wildland fires, flooding, mudslides and landslides in areas of Southern California where existing debris basins are located.

All of San Bernardino County Flood Control District's Debris Basins in the valley area; from the Los Angeles County Line to Yucaipa, were analyzed after the Grand Prix and Old Fires. Flood Control District Safety Assessment Teams utilized the Corps of Engineers' Los Angeles District methodology to determine debris production, the same methodology the Corps uses when designing debris basins. In many cases basins were physically expanded and additional measures such as K-rails and debris racks were installed. The understanding of post-fire debris flows continues to evolve; we work closely with the USGS as they develop Post Wildfire Debris Flow Hazard Assessments. The rainfall "Trigger Points" in our FAST CONOPS is a result of the USGS assessments. All Flood Control Basins are also studied on an annual basis to determine existing capacity.

Any additional funding to support our efforts will meet the intent of recommendation #6 which states that the State and local agencies should conduct assessments of the adequacy of strategically located debris basins under a range of scenarios in urbanized areas in light of increased fire and post-fire debris-flow events.

**Recommendation 8:** *on-going*

When funding sources become available for the maintenance and further development of the database for the web-based portal; which would be utilized as a pre-project screening and flood management tool for special alluvial fan areas, the County may evaluate the benefits of its use in the planning process.





**Recommendation 9:** future proposal

As financial resources are allocated, the County will consider the analysis of the Integrated Approach tools to be studied for use in land use planning for development on alluvial fans.

**Recommendation 10:** f*uture proposal*

If funding is provided, the County will review and propose for adoption a model ordinance tailored for the specific needs of the County.

**Recommendation 12:** *future proposal*

The County's Office of Legislative Affairs, after consulting with the appropriate departments and staff, may explore supporting the economic strategies recommended in the Integrated Approach regarding future maintenance of flood management infrastructure.

### B.5.3 StormReady

On July 29, 2009, the National Weather Service recognized San Bernardino County as a "StormReady County". This recognition is valid until July 29, 2012 and has been renewed in use (2016) when the National Weather Service will review the County's weather related planning and notification procedures prior to renewing the "StormReady County" status.

San Bernardino County is the only StormReady jurisdiction in the United States covered by three Weather Forecast Offices. The NWS Offices are:

- San Diego, CA;
- Las Vegas, NV; and
- Phoenix, AZ.

This NWS Recognition may provide the County residents with a discount on their Flood Insurance premiums.

## B.6 Mitigation Project Prioritization and Implementation

**Flood Project Prioritization and Implementation**

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Earthquake** | **EQ Action 5.1:** Divert runoff to Little Bear Creek. | To reduce the runoff over the cliff(s) in the Rimforest neighborhood, the runoff must be diverted to another path. This will be accomplished over three phases:<br>• Phase 1: Reduce Runoff Tributary Area by 64%- 50.35 AC<br>• Phase 2: Reduce Runoff Tributary Area by 30%- 23.79 AC<br>• Phase 3: Reduce Runoff Tributary Area by 5%- 3.99 AC | SP, NRP, PRV | TBD | Primary: Public Works<br><br>Secondary: San Bernardino County Flood Control District | | |
| **Flood** | **FL Action 1.1:** Update NFIP data and maps with newly identified flood hazard areas in the County, as new information becomes available. | As required by the State of California, National Flood Insurance Program (NFIP) maps published by FEMA must be included in the HMP or General Plan Safety Element. Keeping this information current is an important mitigation action. | PRV, PPRO | TBD | San Bernardino County Flood Control District | On-Going | |
| **Flood** | **FL Action 2.1:** Determine whether or not additional amendments to development standards or policies are merited, based on the Alluvial Fan Task Force Recommendations. | This is an on-going mitigation action from the 2011 MJHMP. | PRV | TBD | Primary: San Bernardino County Flood Control District<br><br>Secondary: Land Use Services | On-Going | |
| **Flood** | **FL Action 3.1:** Amend the Flood Plain Safety Overlay District through automatic map updates as new data is released and published by FEMA. | Current San Bernardino County Hazard Maps can be found at: http://cms.sbcounty.gov/lus/Planning/ZoningOverlayMaps/HazardMaps.aspx. | PRV, NRP | TBD | Primary: San Bernardino County Flood Control District<br><br>Secondary: Land Use Services | On-Going | |
| **Flood** | **FL Action 3.2:** Review development plans to ensure compliance with ordinances. | This is an on-going mitigation action from the 2011 MJHMP in order to reduce the flood hazards through development standards and policies stated in the General Plan and San Bernardino 2077 Development Code. | PRV | TBD | Primary: Land Use Services<br><br>Secondary: San Bernardino | On-Going | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| | | | | | County Flood Control District | | |
| **Flood** | **FL Action 3.3:** Inspect construction to ensure compliance with approved development plans. | This is an on-going mitigation action from the 2011 MJHMP in order to reduce the flood hazards through development standards and policies stated in the General Plan and San Bernardino 2077 Development Code. | PRV, PPRO, SP | TBD | Primary: Public Works<br><br>Secondary: San Bernardino County Flood Control District | On-Going | |
| **Flood** | **FL Action 4.1:** In each flood control zone, construct facilities identified in those zones by the Flood Control Advisory Committee. See the following pages for a listing of projects. | This is an ongoing mitigation action from the 2011 MJHMP to achieve the goal of improving existing facilities and construct new facilities to mitigate flooding within the County. | SP | TBD | Primary: Public Works<br><br>Secondary: San Bernardino County Flood Control District | On-Going | |

## B.7 Flood Project Prioritization and Implementation

The Flood District project rankings utilize the same format as the 2011 Multi-Jurisdictional Hazard Mitigation Plan, and rankings are based on the current project funding status as shown on the County Flood Control District's 10 year Plan. A 'High' Local Priority, or (3), indicates that project funding is expected to be complete within about the next three years, depending on the Flood Zone and its' available revenue. A 'Medium' Local Priority (2) indicates that project funding is expected to be complete within about four to seven years. A 'Low' Local Priority (1) indicates that the project is on the 10-Year Plan but complete funding is likely eight to ten years or more in the future.

The task of determining local project priority is the responsibility of the County Flood Control District's staff and City Engineers. Each of the six zones of the District is represented by a Citizens Advisory Committee, composed of eleven members and serving by appointment of the Board of Supervisors without compensation. Each committee is formed of spirited citizens and public officials with unselfish and devoted interests, organized to meet annually or on call to afford recommendations to the Board of Supervisors on matters of tax levies, budgets, work programs, priority of projects, ventures and other counsel. The Mayor of each incorporated city in the District is a committee member with full standing for the appropriate zone.

County Flood Control District staff and the City Engineers for each zone meet twice per year to discuss future project needs and current project status. Projects are proposed based on the public safety needs within the particular zone. In addition to public safety, other issues are considered in the prioritization process such as grant funding, environmental reviews and approvals, and other impediments that may cause construction of the project to be delayed. (See Annex 1 for examples of how these prioritization factors are applied to proposed projects.)

Almost without reservation, the recommendations of these organized committees have been accepted by the Board of Supervisors in its administration of County Flood Control District functions.

Each flood control zone constructs facilities identified in those zones by the Flood Control Advisory Committee. The City Engineers for each zone along with the Flood Control District I Advisory Committee establishes Project Priorities based on Benefit Cost Analysis, Community input, and fiscal resources available for the project in addition to any other noted factors. The following three tables illustrate priority rankings based on three key factors: Total Cost, Hazard Assessment, and Potential Fatalities.

**Table B-6: Priority Flood Control Projects**

| Project No | Completion Date | Total Cost | Total Funding | Status |
|---|---|---|---|---|
| 1-112 | 5 Year Plan | $10,000,000 | $10,000,000 | Priority |
| 1-114 | 10 Year Plan | $15,000,000 | $1,000,000 | Priority |





| Project No | Completion Date | Total Cost | Total Funding | Status |
|---|---|---|---|---|
| 1-701 | 5 Year Plan | $1,100,000 | $1,100,000 | Priority |
| 1-806 | 10 Year Plan | $5,000,000 | $1,000,000 | Priority |
| 1-809 | 5 Year Plan | $8,500,000 | $1,000,000 | Priority |
| 1-910 | 10 Year Plan | $10,000,000 | $2,000,000 | Priority |
| 2-113 | 10 Year Plan | $3,100,000 | $500,000 | Priority |
| 2-308 | 10 Year Plan | $27,000,000 | $500,000 | Priority |
| F01272 | 10 Year Plan | $31,600,000 | $600,000 | Priority |
| F01336 | 2017-2018 | $12,800,000 | $13,740,000 | Priority |
| F01389-2 | 10 Year Plan | $2,700,000 | $1,430,000 | Priority |
| F01417 | 10 Year Plan | $39,500,000 | $21,150,000 | Priority |
| F01452-2 | 2017-2018 | $38,400,000 | $1,170,000 | Priority |
| F01473 | 10 Year Plan | $8,100,000 | $5,001,000 | Priority |
| F01650 | 2017-2018 | $5,200,000 | $3,440,000 | Priority |
| F01667 | 10 Year Plan | $26,900,000 | $16,000,000 | Priority |
| F01911 | 2018-2019 | $8,700,000 | $3,140,000 | Priority |
| F02129 | 10 Year Plan | $16,700,000 | $1,024,000 | Priority |
| F02228 | 10 Year Plan | $8,700,000 | $7,600,000 | Priority |
| F02243 | 10 Year Plan | $2,400,000 | $400,000 | Priority |
| | | | | |
| | Totals: | $281,400,000 | $91,795,000 | |

### B.7.1 Priority Project Descriptions

#### B.7.1.1 1-112 West State Storm Drain – Priority

Channel Invert Repair
*Status:* Proposed
*Completion Date:* 5-year plan
*Total Cost:* 11.4 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure
*Hazard Mitigated:* Downstream flooding

#### B.7.1.2 1-114 Carbon Canyon Channel – Priority

Channel improvement
*Status:* Proposed
*Completion Date:* 10-year plan
*Total Cost:* 15 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure
*Hazard Mitigated:* Downstream flooding

#### B.7.1.3 1-701 Etiwanda Channel Invert Repair – Priority

Channel Invert Repair
*Status:* Proposed
*Completion Date:* 5-year plan
*Total Cost:* 1.1 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure
*Hazard Mitigated:* Downstream flooding

#### B.7.1.4 1-806 Hawker Crawford Channel and Rich Basin – Priority

Channel / Basin improvement
*Status:* Proposed
*Completion Date:* 10-year plan
*Total Cost:* 5 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure by reducing peak Q
*Hazard Mitigated:* Downstream flooding

#### B.7.1.5 1-809 West Fontana Channel (From Banana Basin to Hickory Basin) – Priority

Channel Repair
*Status:* Proposed
*Completion Date:* 5-year plan
*Total Cost:* 8.5 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure
*Hazard Mitigated:* Downstream flooding

#### B.7.1.6 1-910 Grove Basin-Priority

Basin out improvement
*Status:* Proposed
*Completion Date:* 10-year plan
*Total Cost:* 10 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Public Safety; protection of local and downstream infrastructure by reducing peak Q
*Hazard Mitigated:* Downstream flooding

#### B.7.1.7 2-113 Randal Basin outlet improvement – Priority

Outlet improvements D/S of the Basin
*Status:* Proposed
*Completion Date:* On 10-year plan





*Local Priority:* Medium
*Total Cost:* $3.1 million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* Public Safety
*Hazard Mitigated:* Potential failure & flooding downstream
*Resources to Implement:* Medium
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.8 2-308 Cable Creek Channel – Priority

Channel improvements
*Status:* Proposed
*Completion Date:* On 10-year plan
*Local Priority:* Low
*Total Cost:* $27 million
*Funding Description:* San Bernardino County Flood Control Tax Revenues
*Project Selected for:* Compliance with FEMA Levee Certification program
*Hazard Mitigated:* Reduction of floodplain; reduction of potential for major flooding
*Resources to Implement:* High
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.9 F01272 Rialto Channel, Etiwanda Avenue to Willow Avenue – Priority

Construct Rialto channel to ultimate condition
Status: Proposed
Completion Date: On 10-year plan
Local Priority: Low
Total Cost: $31.6 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Rialto
Project Selected for: Public Safety & convenience Hazard Mitigated: Residential area flooding and road closures due to wash-outs
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.1.10 F01336 Amethyst Detention Basin – Priority

Construct a detention basin at Amethyst and Sycamore
*Status: Design completed, Permits* In process
*Completion Date:* Estimated 2017/2018
*Local Priority:* High
*Total Cost:* $12.8 million
*Funding Description:* San Bernardino County Flood Control Property Taxes, City of Victorville
*Project Selected for:* Public Safety; protection of local and downstream infrastructure by reducing peak Q
*Hazard Mitigated:* downstream flooding

*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.11 F01389-2 Mojave River Phase II – Priority

Construct earthen levee lined with 1/2 ton rock slope protection between Oro Grande Wash and Mojave River Phase I
*Status:* Proposed
*Completion Date:* On 10-year plan
*Local Priority:* Low
*Total Cost:* $2.7million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* To finalize levee improvement construction; protection of Amtrak station
*Hazard Mitigated:* Local flooding, railroad flooding
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.12 F01417 Bandicoot Detention Basin (Phase I&II) – Priority

Construction of detention basin, inlet/outlet facilities, fencing to attenuate 10-year storm flows adjacent to California Aqueduct and downstream residential and commercial properties developments.
*Status:* Proposed
*Completion Date:* On 10-year plan
*Local Priority:* Low
*Total Cost:* $39.5 million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* To protect the State water aqueduct
*Hazard Mitigated:* Flood damage to aqueduct & local area
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.13 F01452-2 West Fontana Channel, Phase I – Priority

Construction of concrete channel from Juniper to Banana Basin
Status: In process
Completion Date: Estimated 2017/2018
Local Priority: Medium
Total Cost: $38.4 million
Funding Description: San Bernardino County Flood Control Taxes, City of Fontana
Project Selected for: Public safety & convenience
Hazard Mitigated: Flooding of railroad & Metrolink tracks; road damage & closure
Resources to Implement: Medium
Cost to Implement: High





Time to Implement: High

#### B.7.1.14 F01473 Rialto Channel – Priority

Construct channel improvements south of Interstate 10
Status: Proposed
Completion Date: On 10-year plan
Local Priority: Medium
Total Cost: $8.1 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Rialto
Project Selected for: Public Safety
Hazard Mitigated: Existing channel is interim and undersized
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.1.15 F01650 Sand Creek/ Warm Creek Channels – Priority

Improve existing confluence of Sand Creek and Warm Creek Channels
*Status:* In process
*Completion Date:* Estimated 2017/2018
*Local Priority:* Medium
*Total Cost:* $5.2 million
*Funding Description:* San Bernardino County Flood Control
*Project Selected for:* channel improvements to interim storm drain system
*Hazard Mitigated:* Potential damage to infrastructure
*Resources to Implement:* High
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.16 F01667 Cactus Basins #4 & 5 – Priority

Construction of detention basins to mitigate downstream flooding of Rialto Channel Work includes inlet/outlet structures
Status: Proposed
Completion Date: 10-year plan
Local Priority: Low
Total Cost: $26.9 million
Funding Description: San Bernardino County Flood Control, City of Rialto
Project Selected for: Ability to reduce downstream peak Q
Hazard Mitigated: flooding of nearby area

#### B.7.1.17 F01911 Elder Gulch – Priority

Construct trapezoidal rock-lined channel
*Status:* Proposed
*Completion Date:* Estimated FY 18/19
*Local Priority:* High

*Total Cost:* $8.7 million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* Public safety
*Hazard Mitigated:* Flooding of local area
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* Medium

#### B.7.1.18 F02129 Wildwood Channel – Priority

Channel improvement
Status: In preliminary design process
Completion Date: On 10-year plan
Local Priority: High
Total Cost: $16.7 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Yucaipa
Project Selected for: History of flooding due to high debris flows
Hazard Mitigated: reduction in size of floodplain; minimized flooding
Resources to Implement: Low
Cost to Implement: High
Time to Implement: Low

#### B.7.1.19 F02228 Plunge Creek Spillway – Priority

Repair of severe damage caused by storms in 2005
*Status:* Proposed
*Completion Date:* On 10-year plan
*Local Priority:* High
*Total Cost:* $3 million
*Funding Description:* San Bernardino County Flood Control Property Taxes
*Project Selected for:* Necessary repairs due to previous flood damage
*Hazard Mitigated:* Potential failure & flooding downstream
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* High

#### B.7.1.20 F02243 Rialto Channel Priority Crossings – Priority

Status: In preliminary design process
Completion Date: On 10-year plan
Local Priority: Low
Total Cost: $2.4 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Rialto





Project Selected for: Public Safety & convenience
Hazard Mitigated: Elimination of flooding at intersections
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

### B.7.2 Projects with Mitigation Benefits

Table B-7 is a list of the proposed projects to mitigate the Flood hazard within the County Unincorporated Area.

**Table B-7: In Progress Flood Control Mitigation Projects**

| Project No | Completion Date | Total Cost | Total Funding | Status |
|---|---|---|---|---|
| F01312 | 2017/2018 | 4,400,000 | 2,200,000 | Under Construction |
| F01666 | 2017/2018 | 17,800,000 | 17,800,000 | Under Construction |
| F02094 | 2017 | 4,000,000 | 4,000,000 | Under Construction |
| F02126 | 2017/2018 | 8,300,000 | 6,180,000 | Under Construction |
| | Totals: | 34,500,000 | 30,180,000 | |

#### B.7.2.1 F01312 English Channel/ Peyton Drive (Under Construction)

*Construct triple RCB and channel upstream and downstream of Peyton Drive.*
*Status: In preliminary design process*
*Completion Date: Estimated 2017/2018*
*Local Priority: High*
*Total Cost: $4.4 million*
*Funding Description: San Bernardino County Flood Control Property Taxes, 50% and City of Chino Hills 50%*
*Project Selected for: Public safety & convenience*
*Hazard Mitigated: Flooding of roads in residential area*
*Resources to Implement: High*
*Cost to Implement: High*
*Time to Implement: Medium*

#### B.7.2.2 F01666 Cactus Basin #3/ Expansion of Basin #3 – (Under Construction)

*Status:* In process
*Completion Date:* Estimated 2017/2018
*Local Priority:* High
*Total Cost:* $17.8 million
*Funding Description:* San Bernardino County Flood Control Property Taxes, City of Rialto

*Project Selected for:* Public safety & improved future development; protection of water filtration plant across the street; reduction of peak Q downstream.
*Hazard Mitigated:* Flooding of immediate area and downstream along Rialto Channel
*Resources to Implement:* Low
*Cost to Implement:* High
*Time to Implement:* Medium

#### B.7.2.3 F02094 Cucamonga Basin #6, Phase II – (Under Construction)

Landscaping improvements
Status: Partial Completed
Completion Date: Mid-2011 – (Landscaping Phase Completion date end of 2017)
Local Priority: High
Total Cost: $4.0 million
Funding Description: San Bernardino County Flood Control Tax Revenues
Project Selected for: Environmental compliance & aesthetics
Hazard Mitigated:
Resources to Implement: Low
Cost to Implement: High
Time to Implement: Low

#### B.7.2.4 F02126 Francis Street Storm Drain (Under Construction)

*Construct ultimate storm drain improvements from Sultana Avenue east to beyond Grove Avenue*
*Status: In preliminary design process*
*Completion Date: Estimated 2017/2018*
*Local Priority: Low*
*Total Cost: $8.3 million*
*Funding Description: San Bernardino County Flood Control Property Taxes 75% and City of Ontario 25%*
*Project Selected for: Public safety & convenience*
*Hazard Mitigated: Existing storm drain is undersized/interim; local flooding*
*Resources to Implement: Medium*

### B.7.3 Future Year Projects

**Table B-8: Future Year Projects**

| Project Number/Name | Completion Date | Total Cost | Status |
|---|---|---|---|
| 2-509 Little Sand Creek | 10 Year Plan | $10,500,000 | Future |
| 3-501 Mission Channel | 10 Year Plan | $28,800,000 | Future |
| 3-601 Wilson Creek (10th St-I-10) | 10 Year Plan | $38,800,000 | Future |
| CSDP Drain Project | 10 Year Plan | $18,500,000 | Future |
| Extension of VV Line E-01 | 10 Year Plan | $2,000,000 | Future |
| F01284 | 10 Year Plan | $7,200,000 | Future |
| F01582 | 10 Year Plan | $19,000,000 | Future |
| F01584 | 2018/2019 | $11,700,000 | Future |
| F01609 | 10 Year Plan | $32,500,000 | Future |





| Project Number/Name | Completion Date | Total Cost | Status |
|---|---|---|---|
| F02225 | 10 Year Plan | $33,100,000 | Future |
| F02475 | 10 Year Plan | $9,000,000 | Future |
| F02476 | 10 Year Plan | $32,300,000 | Future |
| H1458 | 2021 | $3,000,000 | Future |
| Institution Road | 2021 | $30,000,000 | Future |
| Line C-01 Hesperia | 10 Year Plan | $5,300,000 | Future |
| Line D-01 Hesperia | 10 Year Plan | $32,500,000 | Future |
| Line E-01 Apple Valley | 10 Year Plan | $36,300,000 | Future |
| Lone Pine Canyon Road Culvert | TBD | $25,000,000 | Future |
| National Trails Hwy Bridge | TBD | $40,000,000 | Future |
| Old Waterman Canyon Rd Culvert | TBD | $2,500,000 | Future |
| Pine View Dr. Storm Drain | TBD | $6,000,000 | Future |
| Piute Wash | 2021 | $34,500,000 | Future |
| Rimforest Drainage Project | 10 Year Plan | $6,900,000 | Future |
| Rock Springs Rd Bridge Replacement | TBD | $32,876,000 | Future |
| Tussing Ranch-Juniper Basin | 10 Year Plan | $6,500,000 | Future |
| Yermo Rd/National Trails Hwy Bridge | TBD | $40,000,000 | Future |
| | Totals: | $544,776,000 | |

#### B.7.3.1 2-509 Little Sand Creek

Creek improvements between Date Street and Del Lemon basin
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $10.5 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety; residential area with school nearby
Hazard Mitigated: Flooding and pedestrian hazards
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.3.2 3-501 Mission Channel

Channel Repair, Construct concrete channel improvements
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $28.8 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety; residential area with school nearby
Hazard Mitigated: Flooding and pedestrian hazards
Resources to Implement: Medium

Cost to Implement: High
Time to Implement: High

#### B.7.3.3 3-601 Wilson Creek (from 10st Street to I-10)

Channel Repair, between 10st Street to I-10
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $38.8 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety; residential area with school nearby
Hazard Mitigated: Flooding and pedestrian hazards
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.3.4 CSDP -- Storm Drain Project – Colton

Construction of storm drains from Randall Basin to the Santa Ana River according to Comprehensive Storm Drain Plan (CSDP) 3-5 and 3-8
Status: Proposed
Completion Date: On 10-year plan
Local Priority: Medium
Total Cost: $18.5 million
Funding Description: San Bernardino County Flood Control Property Taxes
Hazard Mitigated: Existing channel is interim and undersized
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.3.5 Extension of Victorville Line E-01

Construct Storm Drain line E-01
Status: In preliminary design process
Completion Date: On 10-year plan
Local Priority: High
Total Cost: $2.0 million
Funding Description: San Bernardino County Flood Control Property Taxes, City of Victorville
Project Selected for: Public safety of commercial area
Hazard Mitigated: local flooding; road closure/road damage (State Hwy)
Resources to Implement: High
Cost to Implement: High
Time to Implement: Low





#### B.7.3.6 F01284 Donnell Basin (Phase I&II)

Construct detention basin.
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $7.2 million
Funding Description: San Bernardino County Flood Control Property Taxes
Project Selected for: Public Safety; roadway protection; Safe Routes to School Program (SR2S)
Hazard Mitigated: Flood protection for homes, infrastructure, and pedestrians
Resources to Implement: Low

#### B.7.3.7 F01582 Desert Knolls II

Construct flood control channel from Apple Valley Road to Tuscola Road
Status: Proposed
Completion Date: On 10-year plan
Local Priority: High
Total Cost: $19 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety/future development
Hazard Mitigated: Potential localized flooding due to increased development
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.3.8 F01584 Desert Knolls

Construct channel improvements from the Mojave River to Phase I
Strategy: Construct concrete lined channel to provide for 100 year storm flows and debris flows.
Status: Proposed
Completion Date: Estimated FY 18/19
Local Priority: High
Total Cost: $11.7 million
Funding Description: San Bernardino County Flood Control Tax Revenues
Project Selected for: Environmental requirements
Hazard Mitigated: This project is the mitigation aspect of Phase II
Resources to Implement: Low
Cost to Implement: High
Time to Implement: Medium

#### B.7.3.9 F01609 Ranchero Basin

Construct detention basin
Status: Proposed

Completion Date: 10-year plan
Local Priority: High
Total Cost: $32.5 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and reduction of peak Q
Hazard Mitigated: Potential damage to bridges and roads downstream due to high flows
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.3.10 F02225 Del Rosa

Channel Repair, Construct concrete channel improvements between Pacific Street and Del Rosa Avenue
Status: Proposed
Completion Date: 10-year plan
Local Priority: Medium
Total Cost: $33.1 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety; residential area with school nearby
Hazard Mitigated: Flooding and pedestrian hazards
Resources to Implement: Medium
Cost to Implement: High
Time to Implement: High

#### B.7.3.11 F02475 Seneca Basin

Construct detention basin
Status: Proposed
Completion Date: 10-year plan
Local Priority: High
Total Cost: $9 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and reduction of peak Q
Hazard Mitigated: Potential damage to bridges and roads downstream due to high flows
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

#### B.7.3.12 F02476 Oak Hills Basin

Construct detention basin
Status: Proposed
Completion Date: 10-year plan
Local Priority: High
Total Cost: $32.3 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and reduction of peak Q
Hazard Mitigated: Potential damage to bridges and roads downstream due to high flows
Resources to Implement: Low





Cost to Implement: High
Time to Implement: High

#### B.7.3.13 H1458 Arrowbear Dr. Bridge Replacement

Replacement of bridge crossing on Arrowbear Drive and increase spillway flow capacity to prevent flooding
Status: Proposed
Completion Date: 2021
Total Cost: $3,000,000.00
Funding Description: Major Local Highway Project Funds
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

#### B.7.3.14 Institution Road

Construction of bridge crossing along Institution Road on Cajon Wash
Status: Proposed
Completion Date: 2021
Total Cost: $30,000,000.00
Funding Description: seeking grant funding
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

#### B.7.3.15 Line C-01 Hesperia

Construction of concrete trapezoidal channel improvements, short reach of levee along the channel, 96 inch RCP and reconstruction of the existing deficient reach as a concrete trapezoidal channel with a portion of riprap channel
Status: Proposed
Completion Date: 10-year plan
Total Cost: $5.3 million
Funding Description: San Bernardino County flood Control
Project selected for: Public safety and roadway protection
Hazard Mitigated: Flooded roads and residential area
Resources to implement: High
Cost to implement: High
Time to implement: High

#### B.7.3.16 Line D-01 Hesperia

Improve the storm drain facility.
Status: Proposed
Completion Date: 10-year plan
Total Cost: $32.5 million
Funding Description: San Bernardino County flood Control
Project selected for: Public safety and roadway protection
Hazard Mitigated: Flooded roads and residential area
Resources to implement: High
Cost to implement: High

Time to implement: High

### B.7.3.17 Line E-01 Apple Valley

Improve the storm drain facility.
Status: Proposed
Completion Date: 10-year plan
Total Cost: $36.3 million
Funding Description: San Bernardino County flood Control
Project selected for: Public safety and roadway protection
Hazard Mitigated: Flooded roads and residential area
Resources to implement: High
Cost to implement: High
Time to implement: High

### B.7.3.18 Lone Pine Canyon Road Culvert

Construction of Culvert on Long Pine Canyon Road
Status: Proposed
Completion Date: No date until funding is available
Total Cost: $2,500,000.00
Funding Description: TBD
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

### B.7.3.19 National Trails Highway Bridge Replacement

*Removal of approximately 31 old timber bridges and construction of replacement bridges spanning Under 20' on National Trails Highway*
*Status: Preliminary engineering and environmental study only*
*Completion Date: No date until funding is available*
*Total Cost: $40,000,000.00*
*Funding Description: TBD*
*Project Selected for: Public Safety and convenience*
*Hazard Mitigated: flood damage, road closures and road damage*

### B.7.3.20 Old Waterman Canyon Road Culvert

Removal of approximately 31 old timber bridges and construction of replacement bridges spanning less than 20' on National Trails Highway
Status: Preliminary engineering and environmental study only
Completion Date: No date until funding is available
Total Cost: $2,500,000.00
Funding Description:
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage





### B.7.3.21 Pine View Dr. Storm Drain

Construction of storm drain on Pine View Drive
Status: Proposed
Completion Date: Shelf ready but no date until funding is available
Total Cost: $6,000,000.00
Funding Description: TBD
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

### B.7.3.22 Piute Wash

Construction of bridge crossing along Needles highway road on Piute washes to prevent flooding and washing the road out.
Status: Proposed
Completion Date: 2021
Total Cost: $34,500,000
Funding Description: seeking grant funding
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

### B.7.3.23 Rimforest Drainage Project – Rimforest Area

Capture the surface water within Rimforest and convey it to Little Bear Creek, away from the escarpment.
Status: In preliminary design process
Completion Date: On 10-year plan
Local Priority: High
Total Cost: $6.9 million
Funding Description: San Bernardino County Flood Control Property Taxes
Project Selected for: Public safety of commercial area
Hazard Mitigated: Public safety and reduction of peak Q
Resources to Implement: High
Cost to Implement: High
Time to Implement: Low

### B.7.3.24 Rock Springs Road Bridge Replacement

Construct Replacement Bridge on Glen Helen Parkway over Cajon Wash It will increase flow capacity with a longer span and reduce flooding of the roadway.
Status: Proposed
Completion Date: No date until full funding is available
Total Cost: $32,876,000
Funding Description: Partially funded with General Fund Money
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage

### B.7.3.25 Tussing Ranch – Juniper Basin

Construct detention basin
Status: Proposed
Completion Date: 10-year plan
Local Priority: High
Total Cost: $6.5 million
Funding Description: San Bernardino County Flood Control
Project Selected for: Public safety and reduction of peak Q
Hazard Mitigated: Potential damage to bridges and roads downstream due to high flows
Resources to Implement: Low
Cost to Implement: High
Time to Implement: High

### B.7.3.26 Yermo Road and National Trails Highway Bridge Replacement

Removal of approximately 11 old timber bridges and construction of replacement bridges spanning under 20' on National Trails Highway and Yermo Road. The military is using high load tractors and trailers warranting the need to increase the load capacity of the bridges.
Status: Preliminary engineering and environmental study only
Completion Date: No date until funding is available
Total Cost: $40,000,000.00
Funding Description: TBD
Project Selected for: Public Safety and convenience
Hazard Mitigated: flood damage, road closures and road damage





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# Annex C. Special Districts Department

## C.1 Introduction

Special Districts Department, under the direction of the San Bernardino County Board of Supervisors, provides administrative oversight and manages the operation of over 100 special districts throughout San Bernardino County. Through the formation of County Service Areas (CSAs) and Improvement Zones, these special districts provide a variety of municipal-type services to unincorporated areas of the county.

## C.2 Special Districts Profile

***Special District Functions:***
The County Service Areas (CSAs) and Improvement Zones can provide one or all of the following services to meet the individual needs of communities, neighborhoods and new developments depending on needs and financial feasibility:

- Cemetery
- Dam Operation
- Detention Basin
- Engineering and Construction
- Landscaping
- Open Spaces
- Park and Recreation
- Public Financing
- Refuse
- Roads
- Streetlights
- Television Translator
- Water and Sanitation

***Mission:***
The Special Districts Department works to ensure safe, healthy, and enjoyable communities by providing customizable programs and municipal services for those who work, play and stay in San Bernardino County.

***Vision:***
To be recognized as the preeminent provider of customized municipal services focusing on improved quality of life for the residents and visitors of San Bernardino County.





## C.3 Planning Process

As described above, the County Flood Control District followed the planning process detailed in Section 3 of the base plan. In addition to providing representation on the San Bernardino County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table C-9. Additional details on plan participation and District representatives are included in Appendix A.

**Table C-9: Special District Hazard Mitigation Planning Team**

| Name | Title |
|---|---|
| Jeffrey Rigney | Director of Special Districts |
| Steve Samaras | Water and Sanitation Division Manager |
| Tim Millington | Engineering Division Manager, |
| Reese Troublefield | Operations Division Manager |
| Erin Opliger | Districts Services Coordinator |

The Special Districts Department has attending the following planning meetings:

| Meeting Date | Meeting Type | Attendees | Additional Details |
|---|---|---|---|
| 6/23/16 | LHMP Update - Kickoff Meeting | Steve Samaras, Erin Opliger | |
| 8/30/16 | LHMP Group Meeting | Erin Opliger | |
| 10/26/16 | LHMP Blue Jeans Meeting | Erin Opliger | |

The County of San Bernardino Special Districts Department (Department) has historically identified goals, objectives, and projects to mitigate the negative effects of hazards. The Department continues to work with various Advisory Commissions and the public to identify and mitigate the impacts of hazards to the various services that the Department provides, including: cemetery operations, dam operations, detention basin operations, landscaping services, open space, parks and recreation, refuse services, roads, streetlights, television translator, water distribution and treatment system operations, sewer collection system operations, and wastewater treatment plant operations.

The Department diligently identifies the hazards that each service district or County Service Area (CSA) and its zones face, and has assessed the vulnerability according to the potential event. Hazards, whether they are technological or natural, affect CSAs with varying frequency and can cause injury, impose monetary losses, and the disruption of services, affecting the Department's mission as a public agency service provider. Losses can be substantially reduced or eliminated through comprehensive pre- disaster planning and mitigation actions.

Many groups and individuals have contributed to the Department's planning for Disasters and the necessary hazard mitigation efforts. Advisory Committees, located in the Department's various CSAs, provide on-going input and support for the various aspects of hazard mitigation, including identifying persistent hazards that develop after storm events and options for mitigation.

Department staff participates in the hazard mitigation process by completing semi-annual audits of various CSAs, recommending temporary fixes and/or permanent solutions. CSA customers and the public have also participated in hazard mitigation planning by approaching staff in the field, contacting the office, and/or attending public meetings to identify temporary and ongoing hazards that need to be addressed. These resources have proved valuable to the Department in identifying and mitigating potential hazards. The Department also uses the following process to prepare hazard mitigation plans:

- Identify and prioritize disaster events that are most probable and destructive;
- Identify critical facilities;
- Identify areas within communities that are most vulnerable;
- Develop goals and objectives for reducing the effects of a disaster event;
- Develop specific projects to be implemented for each goal;
- Identify funding sources;
- Develop procedures for monitoring progress;
- Mitigate identified potential hazards.

The Department has identified areas for mitigation projects within the Special Districts of San Bernardino County as a result of their internal planning processes. These projects, shown below, are organized by type of special district these proposed projects are in the conceptual stage and detailed planning will be done in the future as funding becomes available. Prioritization of projects will be done in the planning stages, based on the risk prioritizations developed for the current Multi-Jurisdictional Hazard Mitigation Plan.

## C.4 Hazard Identification and Prioritization

The Special Districts Planning Team participated in the County hazard identification and prioritization process described in the base plan. The Special Districts Planning Team assisted to summarize the extent, probability of future occurrences, potential magnitude/severity, and significance specific to the Special Districts (See Section 4).

## C.5 Coordination with County Planning Efforts

Coordination with other County planning efforts is paramount to the successful implementation of this plan. This Section provides information on how the Special Districts integrated the previously-approved 2011 Plan into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2011 MJHMP through other plans and programs shown below.





### C.5.1 3.2 Water Systems (Distribution Systems):

**Fire:**

- Rockscape or paved property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks.
- Re-roof buildings and structures with tile, metal or fire resistant material.

**Flood:**

- Add drainage, elevate facilities and adjust sloping for facilities in low-lying areas and in natural waterways or floodplains. (Recent Completion)
- Conduct hydrologic and hydraulic studies for all facilities located near flood plains/natural waterways.
- Encase water pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods.

**Earthquake:**

- Retrofit structures to higher seismic standards.
- Purchase portable containers (Conex containers) to stage emergency supplies and equipment for the first responders (i.e. water, food, small off road vehicles, fuel, cots, toiletries, communication devices, blankets, wet weather gear, etc.) at strategic water system locations throughout County of San Bernardino. Conex containers can be relocated if necessary to assist field staff during a disaster to maintain the operations of water systems. (Recent Completion and in implementation phase)

**General Hazard (Fire/Flood/Earthquake):**

- Retrofit existing buildings and facilities with connectors/ATS for emergency generators and/or install permanent emergency generators at critical facilities, including wells and booster station locations.
- Develop a plan for speeding the repair of and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies.
- Develop a plan for areas subject to high ground shaking, earthquake-induced ground failure, and surface fault rupture to determine a replacement schedule for pipelines (along with importance, age, type of construction material, size, condition, and maintenance or repair history).(Project now in effect)
- Develop a plan for short-term and intermediate-term sheltering of employees.
- Develop a plan to work with local agencies that handle hazardous materials to coordinate mitigation efforts for the possible release of these materials due to a natural disaster such as an earthquake, flood, fire, or landslide.

- Utilization of SCADA and Smart Water Meters to get real time data on problems with the system and reduce drive time emissions as a result of traditional meter reading.
- Provide emergency supplies of food, water, and portable generators for employees at office and field locations.
- Install emergency generators at district facilities

### C.5.2 3.3 Sewer Systems (Collection Systems):

**Fire:**

- Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks.(Completion and program implementation by January 2017 estimated)
- Re-roof buildings and structures with tile or fire resistant material.

**Flood:**

- Add drainage, elevate facilities and adjust sloping for facilities in low-lying areas and in natural waterways or floodplains.
- Encase sewer pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods.

**Earthquake:**

- Develop a plan for short-term and intermediate-term sheltering of employees.
- Retrofit structures to higher seismic standards.

**General Hazard (Fire/Flood/Earthquake):**

- Retrofit existing buildings and facilities with connectors/ATS for emergency generators and/or install permanent emergency generators.

- Develop a plan for speeding the repair and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies.
- Develop a plan for areas subject to high ground shaking, earthquake-induced ground failure, and surface fault rupture to determine a replacement schedule for pipelines (along with importance, age, type of construction material, size, condition, and maintenance or repair history).
- Install emergency power generators at district facilities.





### C.5.3 3.4 Wastewater Treatment Plant

**Fire:**

- Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks.
- Purchase and store water pumps capable of suppressing fire.

**Flood**

- Add drainage, elevate facilities and adjust sloping for facilities in low-lying areas and in natural waterways or floodplains.

**Earthquake**:

- Develop a plan for short-term and intermediate-term sheltering of employees.

### C.5.4 3.5 Roads

**Fire:**

- Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment.
- Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.(completed with continuous fresh of supplies and rotation)
- Clear vegetation from Road District facilities/yards

**Flood:**

- Upgrade culverts in all flood prone areas. Most existing culvert sizes were never designed for high water volume. Upgrading will prevent roadway washouts caused by water bypassing existing culverts.(Complete and continuous maintenance)
- Upgrade culvert sizes in Main Channels and replace old culverts in Main Channels as required.(complete and continuous maintenance)
- Slope stabilization at water crossing areas along roadways. This will prevent the loss of the roadways at these areas by preventing undermining by the water.
- Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment.
- Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.
- Soil stabilization on roadway shoulders. This will prevent erosion caused by flood conditions.

- Soil stabilization of dirt roadways. This will help mitigate the loss of material from the roadway during flooding conditions.
- Employ on call contractors to assist in emergency situations.

**Earthquake:**
Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment.
Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal. (Completed and refresh of supplies as needed)

### C.5.5 3.6 Television Translator Districts

**General Hazard (Fire, Flooding, Earthquake):**

- Install and maintain emergency generators at all TV Translator sites. Newberry Springs, Lucerne Valley, and Morongo Valley TV Transmitter sites are in need emergency generators. Pinto and Elephant Mountain sites have existing generators. Installing emergency generators at these sites will enable emergency information to be disseminated to the residents living in these remote locations.(Complete and maintenance of upgrades)
- Establish a centralized communications network to monitor channel output for TV Districts and provide emergency information by way of character generator tied to channel transmissions.
- Conduct annual tower and guide wire inspections to mitigate storm/wind/earthquake hazards from knocking out communications.
- Install poly insulators on power poles with high voltage power lines for Pinto Mountain. Establish an open purchase order for a High Voltage Electrician to provide annual inspections of power poles and service lines.(Completed and continuous maintenance )
- Maintain roadways on mountaintops and within washes leading to remote tower sites. Earthquakes and flash floods can block roadways, making them impassable to restore emergency communications.
- Maintain lights on all tower locations.

### C.5.6 3.7 Parks Districts

- Trim large trees in parks to avert limb breakage and toppling during storm events.
- Establish emergency centers to ration drinking water at various County Park Community Centers.
- Establish community garden plots in designated County Park areas as an ongoing and emergency food source, including planting fruit bearing trees.
- Conduct an inventory or list of County Park Facilities and Community Centers to establish a list of pre-designated emergency operations or disaster relief sites. Not all Community





Centers are an appropriate size to accommodate large numbers of evacuees and may only serve as command and control centers or distribution centers.
- Establish small solar energy fields or other forms of renewable power at County Community Centers to facilitate stand-alone emergency operations for the community.
- Conduct repair and replacement of old roofs, and clearing of gutters and roof drains to minimize potential damage from major storm events.(Completed and continuous maintenance)
- Conduct an evaluation or study of County Park and Community Center facilities to install curbs, retaining walls, and drains to carry or divert water away from buildings.
- Connect water systems to generators to ensure delivery even in disaster situations.
- Provide emergency supply of food and water for employees in disaster situations.

## C.6 Special Districts Mitigation Project Prioritizing

Cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the reduced damages over the life of the measure are likely to be greater than the project cost. For structural projects, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. While detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For measures that do not result in a quantifiable reduction of damages, such as public education and outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

Based upon the Special Districts capabilities, Table C-10 shows primary actions selected for further implementation and development during the next planning cycle. Table C-10 provides details for each mitigation action with mitigation action descriptions, FEMA mitigation category, responsible party, and timeframe.

## C.7 Special Districts Mitigation Actions

Table C-10: Mitigation Project Prioritization and Implementation

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **All-Hazard** | **AH Action 2.1:** Continue funding and support for Special Districts Projects relating to all hazards. | Continue funding and support for Special Districts Projects relating to water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District for all hazards. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **All-Hazard** | **AH Action 2.2:** Install Generators at Critical Facilities | Retrofit existing buildings and facilities with connectors/ ATS for emergency generators and/or install permanent emergency generators at critical facilities, including wells and booster station locations. | ES, SP | TBD | Water Systems | TBD | Critical sites are already set up for connection or has a permanently installed generator |
| **All-Hazard** | **AH Action 2.3:** Water Systems Repair Plan | Develop a plan for speeding the repair of and functional restoration of water and wastewater systems through stockpiling of shoring materials, temporary pumps, surface pipelines, portable hydrants, and other supplies. | PRV | SDD WAS | Water Systems | TBD | We have a warehouse and inventory. Add'l inventory would need to be purchased from local wholesaler |
| **All-Hazard** | **AH Action 2.4:** Smart Water Meters and SCADA | Utilization of SCADA and Smart Water Meters to get real time data on problems with the system and reduce drive time emissions as a result of traditional meter reading. | PRV | Individual CSAs | Water Systems | Ongoing | Both SCADA and Smart Meters have been installed and continue to be installed |
| **All-Hazard** | **AH Action 2.5:** Provide Employees with Emergency Supplies | Provide emergency supplies of food, water, and portable generators for employees at office and field locations. | ES | SDD/WAS | Water Systems | Ongoing | WAS has a stock of emergency food supplies, water, and generators. |
| **All-Hazard** | **AH Action 2.6:** Annual Tower and Guide Wire Inspections | Conduct annual tower and guide wire inspections to mitigate storm/wind/earthquake hazards from knocking out communications. | PRV | TBD | TV Districts | 7/1/2016-7/1/2017 | All Districts |
| **All-Hazard** | **AH Action 2.7**: Maintain Tower Lighting | Maintain lights on all tower locations. | SP | TBD | TV Districts | June-17 | |
| **All-Hazard** | **AH Action 2.8:** Designate Emergency Operations Sites | Conduct an inventory or list of County Park Facilities and Community Centers to establish a list of pre-designated emergency operations or disaster relief sites. Not all Community Centers are an appropriate size to accommodate large numbers of evacuees and may only serve as command and control centers or distribution centers. | PRV | TBD | Park Districts | April-17 | All Districts |
| **All-Hazard** | **AH Action 2.9:** Establish Power Sources for Emergency Operations Sites | Establish small solar energy fields or other forms of renewable power at County Community Centers to facilitate stand-alone emergency operations for the community. | PRV, SP | TBD | Park Districts | 12/1/2016-7/1/2018 | Lucerne Valley Joshua Tree |
| **All-Hazard** | **AH Action 2.10:** Connect Water Systems to Generators | Connect water systems to generators to ensure delivery even in disaster situations. | PRV, SP | TBD | Park Districts | TBD | |



| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **All-Hazard** | **AH Action 2.11:** Establish a Centralized Communications Network | Establish a centralized communications network to monitor channel output for TV Districts and provide emergency information by way of character generator tied to channel transmissions. | PRV | TBD | TV Districts | 7/1/2017-12/1/2017 | All districts |
| **Wildfire** | **WF Action 3.3:** Vegetation Removal | Clear vegetation from Road District facilities/yards | PRV | TBD | Roads | TBD | |
| **Wildfire** | **WF Action 6.3:** Protect Property in Wilderness Areas | Rockscape or pave property grounds which have structures located in wilderness and or areas prone to wildfires. Double the width of external fire breaks. | PPRO, PRV, SP | TBD | Sewer Systems | January-17 | All sewer pump stations have paving |
| **Wildfire** | **WF Action 8.3:** Structural Fire Breaks Widening | Double the width of external fire breaks on grounds which have structures located in wilderness and or areas prone to wildfires. | SP, PRV | Individual CSAs | Water Systems | 7/1/2017-7/19/2019 | |
| **Wildfire** | **WF Action 9.1:** Continue funding and support for Special Districts Projects relating to wildfire. | Continue funding and support for Special Districts Projects relating to wildfire in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **Wildfire** | **WF Action 9.2:** Emergency Water Supplies | Purchase emergency water supply or water purification devices to ensure uninterrupted supply of water to emergency response personal.(completed with continuous fresh of supplies and rotation) | ES | TBD | Roads | TBD | |
| **Earthquake** | **EQ Action 2.2:** Seismic Strapping | Seismic strapping for existing water tanks and future construction. | SP, PRV | CSA 64 | Water Systems | 7/17/2017- 7/1/2019 | Ongoing currently |
| **Earthquake** | **EQ Action 2.3:** Employee Emergency Sheltering | Develop a plan for short-term and intermediate-term sheltering of employees. | PRV | WAS | Sewer Systems | 7/17/2017-7/19/2019 | To purchase cots, small portable generators, tents, etc. |
| **Earthquake** | **EQ Action 4.2:** Generator Installation | Install generators at all road facilities. This will allow uninterrupted communications and provide power to refuel critical emergency response equipment. | SP, PPRO | TBD | Roads | TBD | |
| **Earthquake** | **EQ Action 6.1:** Continue funding and support for Special Districts Projects relating to earthquake hazards. | Continue funding and support for Special Districts Projects relating to earthquake hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **Flood** | **FL Action 3.4:** Soil Stabilization on Roadways and Along Roadway Shoulders | Soil stabilization on roadway shoulders and dirt roads. This will prevent erosion caused by flood conditions. | SP, PRV | TBD | Roads | TBD | |

| Hazard | Mitigation Action | Description / Background | Mitigation Strategy Type | Funding | Responsible Agency | Time Frame | Status / Comments / Implementation Mechanisms |
|---|---|---|---|---|---|---|---|
| **Flood** | **FL Action 3.5:** Encasing Pipelines | Encase water pipelines with specific sized rock, gravel, and road base in natural waterways to prevent continual washout or exposure during heavy storm events/floods. | SP, PRV | CSA 70 J | Water Systems | 7/17/2017-7/1/2027 | |
| **Flood** | **FL Action 6.1:** Continue funding and support for Special Districts Projects relating to flood hazards. | Continue funding and support for Special Districts Projects relating to flood hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **Flood** | **FL Action 6.2:** On Call Contractors | Employ on call contractors to assist in emergency situations. | PRV, ES | TBD | Roads | TBD | |
| **Drought** | **DR Action 3.1:** Continue funding and support for Special Districts Projects relating to drought hazards. | Continue funding and support for Special Districts Projects relating to drought hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **Anti-Terrorism** | **AT Action 2.1:** Continue funding and support for Special Districts Projects relating to terrorism hazards. | Continue funding and support for Special Districts Projects relating to terrorism hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |
| **Climate Change** | **CC Action 3.1:** Continue funding and support for Special Districts Projects relating to climate change hazards. | Continue funding and support for Special Districts Projects relating to climate change hazards in the categories of water systems, sewer systems, wastewater treatment, roads, TV districts, park districts, Big Bear Valley Recreation Park District and Bloomington Recreation and Park District. For more information regarding these projects, see Annex C Section C.7. | VARIES | VARIES | VARIES | Ongoing | |



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# APPENDIX F

# RIVERSIDE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

# COUNTY OF RIVERSIDE

## Multi-Jurisdictional

## Local Hazard Mitigation Plan

July 2018

Bruce Barton, Director

County of Riverside Emergency Management Department

## Contact Information

| | |
|---|---|
| Name: | Bruce Barton |
| Title: | Director, Riverside County EMD |
| Address: | 4210 Riverwalk Parkway |
| City, State, and Zip: | Riverside, CA 92505 |
| Office: | (951) 358-7100 |
| Email: | BBarton@rivco.org |

| | |
|---|---|
| Name: | Ramon Leon |
| Title: | Deputy Director, Riverside County EMD |
| Address: | 4210 Riverwalk Parkway |
| City, State, and Zip: | Riverside, CA 92505 |
| Office: | (951) 358-7100 |
| Email: | raleon@rivco.org |

| | |
|---|---|
| Name: | Melanie Gonzalez |
| Title: | Health Education Assistance II, Riverside County EMD |
| Address: | 4210 Riverwalk Parkway |
| City, State, and Zip: | Riverside, CA 92505 |
| Office: | (951) 355-5505 |
| Email: | Melanie.gonzalez@rivco.org |





## Executive Summary

The purpose of the Riverside County Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan is to identify the County's hazards, review and assess past disaster occurrences, estimate the probability of future occurrences and set goals to mitigate potential risks to reduce or eliminate long-term risk to people and property from natural and man-made hazards.

The plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to achieve eligibility and potentially secure mitigation funding through Federal Emergency Management Agency (FEMA) Flood Mitigation Assistance, Pre-Disaster Mitigation, and Hazard Mitigation Grant Programs.

Riverside County's continual efforts to maintain a disaster-mitigation strategy is on-going. Our goal is to develop and maintain an all-inclusive plan to include all jurisdictions, special districts, businesses and community organizations and to promote consistency, continuity and unification.

The County's planning process followed a methodology presented by FEMA and Cal-OES which included conducting meetings with the Operational Area Planning Committee (OAPC) coordinated by Riverside County Emergency Management Department comprised of participating Federal, State and local jurisdictions agencies, special districts, school districts, non-profit communities, universities, businesses, Tribal Leaders, Healthcare Facilities and general public.

The plan identifies vulnerabilities, provides recommendations for prioritized mitigation actions, evaluates resources and identifies mitigation shortcomings, provides future mitigation planning and maintenance of existing plan.

The plan will be implemented upon FEMA approval.

## Plan Adoption/Resolution

The County and its participating jurisdictions will submit plans to Cal OES for review prior to being submitted to FEMA and will adhere to the recommended process. In addition, the County and its participants will wait to receive an "Approval Pending Adoption" before taking the plan to the local governing bodies for adoption. Upon approval, County and participating jurisdictions will insert signed resolution.

(See Appendix A for Draft Resolution)





## Acknowledgments

**County Board of Supervisors:**
District 1 – Kevin Jeffries
District 2 – John F. Tavaglione
District 3 – Chuck Washington
District 4 – Manuel Perez
District 5 – Marion Ashley

**Riverside County EMD:**
Bruce Barton, Director - EMD
Victoria Burns, Deputy Director - EMD
Ramon Leon, Program Chief II - EMD
Mark Bassett, Emergency Services Manager - EMD

**Planning Team:**
Laronte Groom, Program Coordinator II
Sarah Bruns, Emergency Services Coordinator
Melanie Gonzalez, Health Education Assistant II
Brooke Federico, Senior Public Information Specialist
Shane Reichardt, Emergency Services Coordinator

**Support Staff:**
Angie Johnson, Administrative Services Analyst II
Nicole Foust, Office Assistant III
Christina Rich, Secretary I
Verna Liles, Office Assistant III
Dennis Day, Emergency Services Coordinator
Ralph Mesa, Emergency Services Coordinator
Jerry Hagen, Emergency Services Coordinator
Martin Baxter, Senior Health Educator
Dan Bates, Sr. EMS Specialist
Nick Ritchey, EMS Specialist
Patricia Uematsu, Supervising Account Technician
Renee Poselski, Contracts and Grants Analyst
Sandy Olinga, Administrative Services Analyst I

**Local Hazard Mitigation Plan External Steering Committee (OAPC)**
Federal, State and Local Government, Special Districts, Tribal Leaders, Healthcare Facilities, Non-Governmental Organizations, Faith- based organizations, businesses, Emergency Services Coordinators and other key Stakeholders.

**Local Hazard Mitigation Internal Planning Steering Committee**
Cal OES
Agricultural Commissioner's Office
Environmental Health
Riverside County Animal Services
Riverside County Fire- CAL FIRE
Riverside County Flood Control
Riverside County Human Resources
Riverside County Office of Education
Riverside County University Health System
Riverside County Sheriff's Office
Riverside County Information Technology
Riverside County Transportation and Land Management Agency
SoCal Edison
SoCal Gas
NOAA

**Jurisdictional Participation**
Special thanks to the participating local jurisdictions and special districts for collecting and compiling historical disaster information, providing area hazard identification summaries and completing their stand-alone local hazard mitigation plans. The local hazard assessments and insight are very instrumental to incorporate mitigation actions in the Riverside County Multi-Jurisdictional Hazard Mitigation Plan

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## Participant Annexes for 2017 Plan

**Table 1**: Annexes for 2017 Plan

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| A-1 | City of Banning | | Agua Caliente Band of Cahuilla Indians - DROPPED OUT |
| A-2 | City of Beaumont | | |
| A-3 | City of Blythe | A-27 | Morongo Band of Mission Indians |
| A-4 | City of Calimesa | | Ramona Band of Indians - DROPPED OUT |
| A-5 | City of Canyon Lake | | |
| A-6 | City of Cathedral | **Special Districts** | |
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| A-8 | City of Corona | A-29 | Desert Sands USD |
| A-9 | City of Desert Hot Springs | A-30 | Eastern Municipal Water |
| A-10 | City of Eastvale | A-31 | Hemet Unified School District |
| A-11 | City of Hemet | A-32 | High Valley Water |
| A-12 | City of Indian Wells | A-33 | Idyllwild Fire Protection |
| A-13 | City of Indio | A-34 | Imperial Irrigation District |
| A-14 | City of Jurupa Valley | A-35 | Kaiser Hospital - Riverside |
| A-15 | City of La Quinta | A-36 | Lake Elsinore USD |
| A-16 | City of Lake Elsinore | | March Air Force Base – DROPPED OUT |
| A-17 | City of Murrieta | A-37 | Moreno Valley USD |
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| A-21 | City of Perris | A-41 | Riverside County Office of Education |
| A-22 | City of Rancho Mirage | A-42 | Riverside Unified School District |
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## Appendices

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**APPENDIX B** – Participating Jurisdictions and Letters of Commitment

**APPENDIX C** - Mitigation Action Table

**APPENDIX D** – Public Outreach Meetings

**APPENDIX E** – Inventory Template

**APPENDIX F** – Historical Landmarks

**APPENDIX G** – Trends Questionnaire

**APPENDIX H** – Mitigation Cost Analysis Guidelines

**APPENDIX I** – Acronyms

**APPENDIX J** – References





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# Section 1.0 – Local Hazard Mitigation Plan

## 1.1 Plan Description

The 2017 Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) was written with the assistance and cooperation of multiple departments within the County of Riverside and multiple cities, tribes and special districts. This plan is an update to the 2012 LHMP and reaffirms the commitment of the Riverside County Operational Area to reduce risks from natural and other hazards.

Since 1965, Riverside County has had 44 Federal Disaster Declarations. The most recent Federally Declared Disaster was in March, 2017 and was the result of winter storms and flooding. In addition, the county has experienced 22 Governor-Proclaimed State Disasters, with the most recent in February 2017. In 2016, Riverside County was impacted by earthquakes, floods, high winds, high heat and fires. These natural disasters will occur again, many on a yearly basis.

Riverside County cities, tribes, communities and special districts share the common goal of becoming a disaster resistant county.

## 1.2 Purpose of Plan and Authority

Disaster Mitigation Act of 2000 (DMA 2000) (Public Law 106-390) provides the legal basis for FEMA mitigation planning requirements for State, local and Indian Tribal governments as a condition of mitigation grant assistance. DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for State, local, and Indian Tribal entities to closely coordinate mitigation planning and implementation efforts. The requirement for a State Hazard Mitigation Plan (SHMP) is continued as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the State level. DMA 2000 also established a new requirement for local mitigation plans and authorized up to seven (7) percent of Hazard Mitigation Grant Program (HMPG) funds available to a State for development of State, local, and Indian Tribal mitigation plans.

The FEMA Mitigation and Insurance Strategic Plan for 2014-2018 identifies critical goals, objectives, and strategies to enhance the way FEMA carries out its mitigation and insurance mission. The plan is designed to help build and sustain collaboration with Federal, State, Tribal, Territorial, and community partners through a strategic framework that guides day-to-day work leading to more resilient communities nationwide.





The County of Riverside Emergency Management Department shares many of FEMA's goals and objectives including the following:

**FEMA Objective 1.2: Provide support to local leaders and tribal officials to strengthen recovery and mitigation core capabilities**

*"Pursue a proactive approach in building stakeholder relationships FEMA Strategic Plan 2014–2018 with local leaders to help them better identify and address their disaster recovery challenges."*

**FEMA Objective 1.3: Increase disaster awareness and action by improving communication**

*"Pre-disaster preparedness communication aims to make the public aware of potential hazard risks and the steps they should take to stay safe when a disaster strikes."*

**FEMA Objective 4.3: Enhance the effectiveness, financial stability, and affordability of the National Flood Insurance Program**

*"The National Flood Insurance Program (NFIP) serves as a keystone for national efforts to reduce the loss of life and property from flood disasters…NFIP will explore ways to develop and implement more accurate methods of calculating risk, and place a greater emphasis on cost-effective mitigation as a way of lowering long-term expenses"*

## 1.3 Grant Programs with Mitigation Plan Requirements

The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, United States Code (U.S.C.) 5170c. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas of the State requested by the Governor. The amount of HMGP funding available to the Applicant is based upon the total Federal assistance to be provided by FEMA for disaster recovery under the Presidential major disaster declaration.

The Flood Mitigation Assistance (FMA) program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). FEMA requires that the state, tribal, or local government applying for this form of assistance have adopted a hazard mitigation plan as a condition of receiving funding.

The Pre-Disaster Mitigation (PDM) program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist States, Territories, Indian

Tribal governments, and local communities in implementing a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and mitigate structures during future hazard events, reducing reliance on Federal assistance during future disasters.

See section 7.4 for Fiscal Mitigation Capabilities

Section 322 of DMA 2000 specifically addresses mitigation planning at the state and local levels. It identifies new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funds available to states that have developed a comprehensive, enhanced mitigation plan prior to a disaster. States and communities must have an approved mitigation plan on file prior to receiving post-disaster HMGP funds. Local and tribal mitigation plans must demonstrate that their proposed mitigation measures are based on a sound planning process that accounts for the risk to and the capabilities of the individual communities.

State governments have certain responsibilities for implementing Section 322, including:

- Preparing and submitting a standard or enhanced state mitigation plan
- Reviewing and updating the state mitigation plan every five years

Providing technical assistance and training to local governments to assist them in applying for HMGP grants and in developing local mitigation plans; and reviewing and approving local plans if the state is designated a managing state and has an approved enhanced plan.

DMA 2000 is intended to facilitate cooperation between state and local authorities. It encourages and rewards local and state pre-disaster planning and promotes sustainability as a strategy for disaster resistance. This enhanced planning network is intended to enable local and state governments to articulate accurate needs for mitigation, resulting in faster allocation of funding and more effective risk reduction projects.

FEMA prepared an Interim Final Rule, published in the Federal Register on February 26, 2002 (44 CFR Parts 201 and 206), which establishes planning and funding criteria for states and local communities.

The Riverside County Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) supports the values and goals of the Federal Emergency Management Agency, and the California Office of Emergency Services. The 2013 State Hazard Mitigation Plan was used as a reference and source for relevant information and changes in the State of California Hazard Mitigation Planning process. The County of Riverside Emergency Management Department is also participating in the 2018 State Hazard Mitigation update planning process.





### *The 2013 State Hazard Mitigation Plan – An Enhanced State Mitigation Plan*

The document is a comprehensive update of the 2010 SHMP. It performs the following functions:

1. Documents statewide hazard mitigation systems implemented in California
2. Describes strategies and priorities for future mitigation activities
3. Highlights new hazard mitigation initiatives since the 2010 SHMP
4. Describes and illustrates mitigation progress and success stories
5. Facilitates integration of local, state, tribal, and private sector hazard mitigation activities into a comprehensive statewide effort
6. Meets state and federal statutory and regulatory requirements for an enhanced State Mitigation Plan

### *Goals Shared with State Multi-Hazard Mitigation Plan*

The Riverside Operational Area's LHMP goals are shared with the State of California 2018 Multi- Hazard Mitigation Plan.

**Goal 1:** Significantly reduce life loss and injuries

**Goal 2:** Minimize damage to structures and property, as well as interruption of essential services and activities

**Goal 3:** Protect the Environment

**Goal 4:** Promote hazard mitigation and community resilience as both integrated public policy and standard business practice

While the Disaster Mitigation Act of 2000 ("DMA 2000") requires that local communities address only natural hazards, the Federal Emergency Management Agency (FEMA) recommends that local comprehensive mitigation plans address man-made and technological hazards to the extent possible. In the 2012 Plan, Riverside OA addressed an expansive set of hazards. Upon review of the hazards since 2012, and the numbers of man-made incidents, the OA will continue to address the large set of man-made, technological and natural hazards. Communication Failure and Cyber Attacks have been added to the 2017 list of hazards.

In developing the original 2005 hazard list, the goal was to create a list by identifying as many hazards as could be found in the county. This list was used as part of the planning process. Some of the disasters identified on the list were found to have a limited amount of

supporting information about the potential impact, specific locations in the county where the hazard might arise, and the magnitude of that hazard on the economy, infrastructure, and residents of the County.

The 2012 update used the 2005 hazard list as a reference. The hazards were reassessed to ensure that the threat of the hazard was still viable. The same process was used for the 2017 plan update. The 2017 LHMP Steering Committee met to address each hazard individually. Probability, severity, health systems impact, and mitigation capabilities were all taken into consideration while reorganizing the hazard ranking.

### *Support of Broader County Vision*

The Riverside County Operational Area Multi-Jurisdictional LHMP supports the broader vision and values of the County of Riverside, along with the cities, special districts, and Tribal Leaders within the County. As stated in Riverside County General Plan of December 2015, Riverside County's vision is summarized by saying:

***"Riverside County is a family of special communities in a remarkable environmental setting."***

The values embodies in the General Plan vision are:

*"Our vision is based on values that provide the foundation for common ground that, in turn; underpin the General Plan's goals, policies, and actions. The people of Riverside County declare that they join together in holding the following values and seeking a community future based on them. It can be argued that our values are optimistic and very ambitious: that they require our best instincts to prevail. Of course-why would we seek less in shaping our communities? So, with that theme in mind, let us express the values that have motivated our community building and that will continue to do so in the future."*

- Community
- Health
- Inter-relatedness
- Rights
- Responsibilities
- Risks
- Diversity
- Equity
- Valued Contributions
- Varied Communities
- Balance
- Participation
- Volunteerism
- Decision Making
- Creativity and Innovation
- Distinctiveness
- Livable Centers
- Housing
- Natural Environment
- Man-made Environment
- Multi-Modal Transportation
- Employment





- Safety
- Planning Integration
- Communication and Information
- Quality Management
- Sustainability
- Recreation
- Healthy Food
- Costs
- Governmental Cooperation
- Youth in the Community

### *Riverside County Emergency Management Department Mission*

The Riverside County Operational Area Multi-Jurisdictional LHMP supports the mission of the Emergency Management Department, through focusing efforts on mitigation actions intended to lessen the impact of natural, man-made, and technological disasters.

EMD Mission:

*The mission of the Riverside County Emergency Management Department is to be a leader in emergency management to ensure the safety and security of the residents and visitors of Riverside County and to facilitate and support County Government and stakeholder efforts to mitigate, prepare for, respond to, and recover from natural and human caused emergencies and disasters.*

The EMD Director expands on this Mission by stating:

*"The Riverside County Emergency Management Department is comprised of dedicated personnel who strive to ensure the safety and security of the residents, businesses and visitors of Riverside County"*

## 1.4 Multi-Jurisdictional Participants

**Table 2**: Multi-Jurisdictional Participants

| Local City Jurisdictions | *City of San Jacinto |
|---|---|
| *City of Banning | *City of Temecula |
| *City of Beaumont | *City of Wildomar |
| *City of Blythe | **Tribes** |
| *City of Calimesa | Morongo Band of Mission Indians |
| *City of Canyon Lake | **Special Districts** |
| *City of Cathedral | *Beaumont Unified School District |
| *City of Coachella | Desert Sands Unified School District |
| *City of Corona | Eastern Municipal Water District |
| *City of Desert Hot Springs | *Hemet Unified School District |
| *City of Eastvale | *High Valley Water District |
| *City of Hemet | *Idyllwild Fire Protection District |
| *City of Indian Wells | *Imperial Irrigation District |
| *City of Indio | Kaiser Hospital - Riverside |
| *City of Jurupa Valley | *Lake Elsinore Unified School District |
| *City of La Quinta | Moreno Valley Unified School District |
| *City of Lake Elsinore | *Perris Union High School District |
| *City of Murrieta | *Rancho California Water District |
| *City of Norco | *Riverside Community College |
| *City of Palm Desert | *Riverside County Office of Education |
| *City of Palm Spring | *Riverside Unified School District |
| *City of Perris | *San Jacinto Unified School District |
| *City of Rancho Mirage | Santa Ana Watershed |
| *City of Riverside | *Western Municipal Water District |

*Participated in 2012 Plan





*2017 Cities, Tribes and Special Districts*

In the 2005 plan we had a total of 53 cities and special districts that participated: 24 Cities, 1 Tribe, 10 Hospitals, 8 School Districts and 10 special districts.

In the 2012 plan we had a total 53 cities and special districts that participated: 27 Cities, 1 Community Service District, 14 School District/Education, 1 Fire Protection District, 1 Hospital, 1 Sanitary District and 8 Water Districts.

In the 2017 plan, we have a total of 45 cities, special districts and tribes that participated: 26 Cities, 1 Tribe, 10 School District/Education, 1 Hospital, 1 Fire Protection District and 7 Special Districts.

The decrease in participation for the 2017 plan is primarily economic. Several previous participants had expressed that budget cuts have affected their staff and level of dedication participating mitigation efforts with in their jurisdictions.

# Section 2.0 – Community Profile

## 2.1 History

Taking its name from the City of Riverside, the county was formed in 1893 from a small portion of San Bernardino County and a larger part of San Diego County.

Although the county marks its political beginnings in 1893, the land was occupied long before Europeans and their descendants entered the areas, by several Native American groups including the Serranos, the Luisenos, the Cupenos, the Chemehuevi, and the Cahuillas.

When Spain claimed California from the Native Americans the Spaniards began putting a series of missions in what was then called Alta California. The San Gabriel mission claimed lands in what are now Jurupa, Riverside, San Jacinto, and the San Gorgonio Pass, while the San Luis Rey mission claimed land in what are now Lake Elsinore, Temecula, and Murrieta. These lands were used for grazing of the large herds of cattle and sheep that belonged to the missions. In 1776, and again in 1778, Juan Bautista de Anza, an army captain charged with discovering an overland route from the Mexican state of Sonora to San Gabriel and Los Angeles, passed through much of Riverside County and described fertile valleys, lakes, and sub-desert areas.

In 1822, Mexico successfully revolted against Spain, and California came under Mexican jurisdiction. The missions and their lands were secularized beginning in 1834 and the land was transferred as "grants" to Californians who were citizens of Mexico. The "grants" were called ranchos, and many of the ranchos in Riverside County have lent their names to modern-day locales - Jurupa, San Jacinto, San Gorgonio, Temecula, and La Laguna (Lake Elsinore). The first land grant in what is now Riverside County, Rancho Jurupa, was given to Juan Bandini in 1838.

With the advent of the transcontinental railroad in 1869, land speculators, developers, and colonists came to Southern California. The first colony in what would become Riverside County was Riverside itself. Judge John Wesley North brought a group of associates and co-investors out to Southern California, and founded Riverside on part of the Jurupa Rancho.

By the late 1880's and early 1890's, there was growing discontent between Riverside and San Bernardino, its neighbor 10 miles to the north. There were many differences between the two towns. San Bernardino was predominantly Democratic in nature, allowed saloons, and had been a hot-bed of secessionist sympathy during the Civil War. Riverside was temperance minded (few saloons if any were allowed in Riverside proper) and Republican. After a series of charges about unfair use of tax monies to the benefit





of the City of San Bernardino only, several people from Riverside decided to investigate the possibility of a new county. Joined by San Diego County residents in the Temecula and San Jacinto Valleys and the desert region who were tired of living so far from their county seat, they petitioned the State legislature, held an election, and on May 9, 1893 the County of Riverside officially formed.

The County's early years were linked to the agriculture industry. The navel orange tree was planted and found to be such a success that full-scale planting started. By the time of Riverside County's formation, Riverside had grown to become the wealthiest city per capita in the country, due to the riches of the navel orange.

Further residential developments in Riverside County included Banning and Beaumont in the San Gorgonio Pass; Hemet south of San Jacinto; Moreno Valley east of Riverside; Perris, Lake Elsinore, Murrieta and Temecula along the California Southern Railroad; Palm Springs, Palm Desert, Indio and Coachella along the Southern Pacific route to Yuma; and Blythe on the Colorado River.

The last 35 years have brought dramatic population growth to Riverside County. Between 1980 and 1990, the number of residents grew by over 76% making Riverside the fastest-growing County in California. By 1992, the County was "home" to over 1.3 million residents. The County experienced a growth rate of 7.8 percent from 2010-2015.

The U.S. Census Bureau 2016 estimates show that the County has nearly doubled its population in the last 25 years with the current population at 2.4 million residence. The County population is now larger than that of 16 states, among them, Alaska, Hawaii, Maine, New Mexico, and West Virginia.

## 2.2 Geography and Climate

Riverside County is the fourth largest county in the State of California, stretching nearly 200 miles west to east and comprising over 7,200 square miles of fertile river valleys, low deserts, mountains, foothills, and rolling plains. Riverside County shares borders with densely populated Orange, San Diego, San Bernardino and Imperial Counties. The County extends from within 14 miles of the Pacific Ocean, as the crow flies, to the Colorado River and La Paz County, Arizona.

### *Geographically*

Riverside County is mostly desert in the central and eastern portions of the county, and has a Mediterranean climate in the western portion of the County. The County lies inland of Los Angeles County and is bordered by Orange County to the west, San Bernardino County to the north, and San Diego County and Imperial County to the south.

Riverside County extends from the Santa Ana River at the eastern end of the Los Angeles basin, eastward to the Colorado River. It includes the desert regions of the Coachella Valley and Palm Springs, as well as the San Jacinto, Little San Bernardino and Santa Rosa mountains. It contains portions of Anza-Borrego Desert State Park and Salton Sea State Recreation Area, as well as most of Joshua Tree National Park. Riverside County has five nationally protected areas: the Cleveland National Forest, Coachella Valley National Wildlife Refuge, and Joshua Tree National Park, a portion of the San Bernardino National Forest and the Santa Rosa and San Jacinto Mountains National Monument. The county has visitors all year round because of the varied climates and ability to visit mountains and deserts all in one day.

The county has a total area of 7,303.13 square miles (18,915.0 km2), of which 7,207.37 square miles (18,667.0 km2) (or 98.69%) is land and 95.76 square miles (248.0 km2) (or 1.31%) is water. At roughly 180 miles (290 km) wide in the east-west dimension, the area of the county is massive. Riverside County is roughly the size of the State of New Jersey in total area. The Colorado River town of Blythe is a three-hour drive from the county seat, Riverside.

There are at least three geomorphic provinces: the Inland Empire western portion, the Santa Rosa Mountains communities and the desert region. Other possible subdivisions include tribal lands, the Colorado River communities, and the Salton Sea. The Inland Empire area of southern California is made up of the western portion of Riverside County.

Geographically from east to west, Riverside County is mostly desert, with high heat in the summer and comfortable weather in the winter. Most of Joshua Tree National Park is located in the eastern part of the county. Elevations range from 11,499 feet (3,505 m) at the top of the San Gorgonio Mountain to 220 ft. (-67.1 m) below sea level at the Salton Sea. As you move towards the west, the San Jacinto Mountains separate the desert from the valleys. The summit of Mount San Jacinto stands 10,834 feet above sea level, and the San Jacinto Mountains are the second highest mountain range in Southern California. The Santa Ana River travels from Mt. San Gorgonio for nearly 100 miles (160 km) through San Bernardino, Riverside, and Orange counties before it eventually spills into the Pacific Ocean at Newport Beach and Huntington Beach. The western portion of the county has a Mediterranean climate and is the most densely populated area. The Santa Rosa Mountains, as well as the Southern California portion of the Sonoran Desert, physically divide Riverside County from San Diego County.

Riverside County is home to a variety of endangered and protected species. Skillful planning and negotiation have resulted in the creation of several large habitat preserves, and the development of a multi-species habitat protection plan (MSHCP) for the western County area. The Plan protects 146 native species of plants, birds and animals and





covers 1.26 million acres. The County is also participating in a MSHCP with the Coachella Valley Association of Governments in the Coachella Valley and surrounding mountains.

Famous resort cities of the Coachella Valley such as Indian Wells, La Quinta, Rancho Mirage, Palm Springs and Palm Desert are located in Riverside County. Riverside County is also home to many famous concerts and tournaments. The Coachella Valley Music and Arts Festival is a two weekend event that attracts 198 thousand attendees and affects the local economy by over 84 million dollars a year. Stagecoach is a country music festival that attracts about 190 thousand over a three day period. The BNP Paribas Open is the largest professional combined ATP and WTA tennis tournament in the world. It houses 96 single players and 32 teams within the two stadiums.

Another factor that brings people into Riverside County is the agriculture. There is an influx of farm workers according to the crop. Indio is the center of an important date growing region.

In the Desert areas, there is an increase in population during the winter by “Snow Birds”. Many of the desert visitors are elderly or retired, and may have Access and Functional Needs requirements. The term snowbird is used to describe people from the U.S. Northeast, U.S. Midwest, or Canada who spend a large portion of winter in warmer locales such as California, Arizona, Florida, Texas, the Carolinas, or elsewhere along the Sun Belt region of the southern and southwest United States, Mexico, and areas of the Caribbean.

Snowbirds are typically retirees, and business owners who have a second home in a warmer location or whose business can be easily moved from place to place, such as flea market and swap meet vendors. Some snowbirds carry their homes with them, as campers (mounted on bus or truck frames) or as boats following the east coast Intracoastal water-way.

### *Climate*

On average, there are 272 sunny days per year in Riverside County. The County average July high is around 95 degrees and the January low is 43. Riverside County has on average 10 inches of rain per year. The US average is 37. Riverside County average snowfall is one (1) inch. The average US city gets 25 inches of snow per year. The number of days with any measurable precipitation is 30.

**Figure 1**: Riverside County Climate

| Climate | Riverside, CA | United States |
|---|---|---|
| Rainfall (in.) | 10.3 | 36.5 |
| Snowfall (in.) | 0.003 | 25 |
| Precipitation Days | 20 | 100 |
| Sunny Days | 277 | 205 |
| Avg. High | 92.8 | 86.5 |
| Avg. Low | 41.6 | 20.5 |
| UV Index | 5.7 | 4.3 |
| Elevation ft. | 1,231 | 1,060 |

*Chart is current as of December 2016

The information regarding the averages of the county does not accurately reflect the drastic differences in climate between the East and West portions of the county. The East County climate is a hot desert atmosphere. It faces average highs in the summer months that reach into the 100's. The West County however, stays closer to the low 90's. The following charts represent the two sides of the county:





**Figure 2**: East County Average Annual Temperature

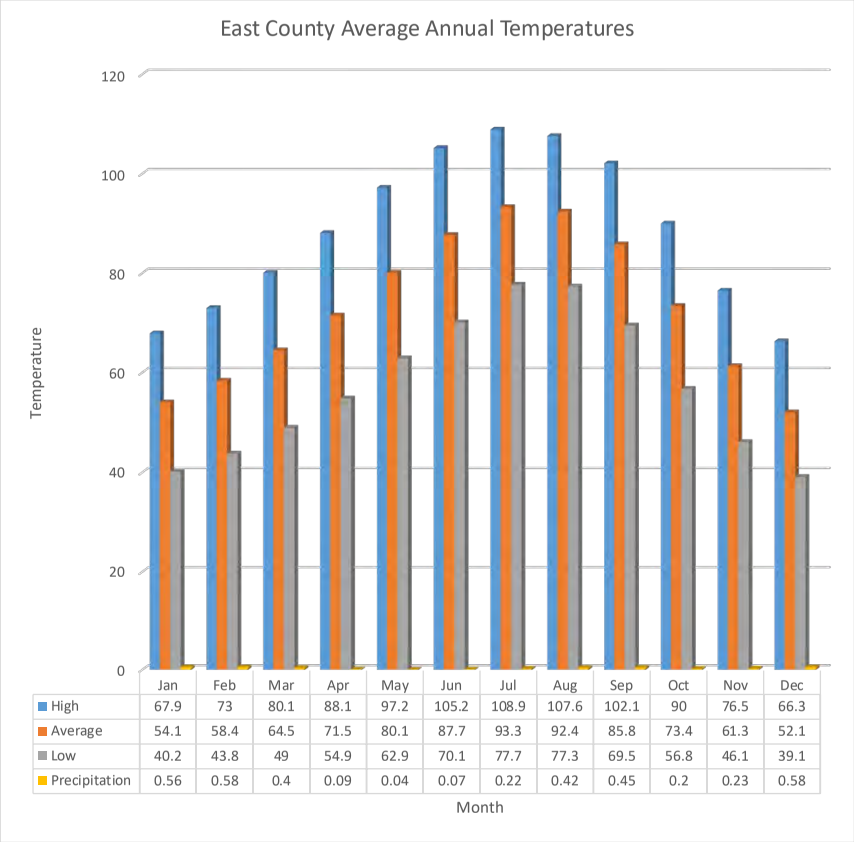


| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High | 67.9 | 73 | 80.1 | 88.1 | 97.2 | 105.2 | 108.9 | 107.6 | 102.1 | 90 | 76.5 | 66.3 |
| Average | 54.1 | 58.4 | 64.5 | 71.5 | 80.1 | 87.7 | 93.3 | 92.4 | 85.8 | 73.4 | 61.3 | 52.1 |
| Low | 40.2 | 43.8 | 49 | 54.9 | 62.9 | 70.1 | 77.7 | 77.3 | 69.5 | 56.8 | 46.1 | 39.1 |
| Precipitation | 0.56 | 0.58 | 0.4 | 0.09 | 0.04 | 0.07 | 0.22 | 0.42 | 0.45 | 0.2 | 0.23 | 0.58 |

**Figure 3**: West County Average Annual Temperature

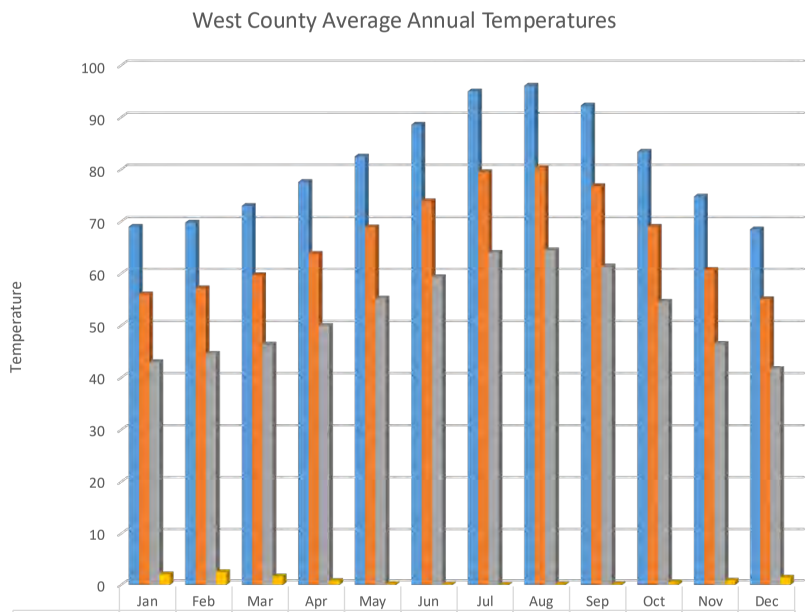


| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High | 69 | 69.8 | 73 | 77.6 | 82.5 | 88.6 | 95 | 96.1 | 92.3 | 83.4 | 74.8 | 68.5 |
| Average | 56 | 57.2 | 59.7 | 63.8 | 68.9 | 73.9 | 79.5 | 80.3 | 76.8 | 69 | 60.7 | 55.1 |
| Low | 43 | 44.6 | 46.4 | 50 | 55.2 | 59.3 | 64 | 64.5 | 61.4 | 54.6 | 46.5 | 41.7 |
| Precipitation | 2.09 | 2.51 | 1.66 | 0.77 | 0.15 | 0.08 | 0.04 | 0.11 | 0.13 | 0.51 | 0.83 | 1.45 |

Month

*Charts are based on the most current information gathered from NOAA as of May 2017
Source:
http://www.bestplaces.net/climate/city/california/riverside
https://www.ncdc.noaa.gov/cdo-web/datatools/normals





## 2.3 Population Trends

Population growth in Riverside County has been quite rapid over the past two decades as can be seen in Figure 3 on the next page. According to the California Department of Finance, the population grew from approximately 1.2 million 1990 to nearly 2.3 million as of January 1, 2016. During this period, the county's population nearly doubled, making it one of the fastest growing counties in California.

**Figure 4**: Unincorporated Area Population

# RIVERSIDE COUNTY

7,295.6 sq.miles — Incorporated in 1893

## POPULATION CHARACTERISTICS

**Population**

| | |
|---|---|
| 1970 | 459,074 (*1) |
| 1980 | 663,166 (*1) |
| 1990 | 1,170,413 (*1) |
| 1995 | 1,365,500 (*2) |
| 1996 | 1,391,800 (*2) |
| 1997 | 1,420,600 (*2) |
| 1998 | 1,451,400 (*2) |
| 1999 | 1,490,500 (*2) |
| 2000 | 1,545,387 (*1) |
| 2001 | 1,589,708 (*2) |
| 2002 | 1,655,291 (*2) |
| 2003 | 1,730,219 (*2) |
| 2004 | 1,814,485 (*2) |
| 2005 | 1,895,695 (*2) |
| 2006 | 1,975,913 (*2) |
| 2007 | 2,049,902 (*2) |
| 2008 | 2,102,741 (*2) |
| 2009 | 2,140,626 (*2) |
| 2010 | 2,189,641 (*1) |
| 2011 | 2,205,731 (*2) |
| 2012 | 2,227,577 (*2) |
| 2013 | 2,255,059 (*2) |
| **Projections** | |
| 2020 | 2,595,259 (*3) |
| 2035 | 3,354,958 (*3) |

**2013 Racial & Ethnic Population (*4)**

| | Number | Percent |
|---|---|---|
| White | 904,279 | 40.1% |
| African American | 135,304 | 6.0% |
| Asian | 130,793 | 5.8% |
| Amer Indian/Alaska Native | 11,275 | 0.5% |
| Hawaiian and Pac Islander | 6,765 | 0.3% |
| Some Other Races | 6,765 | 0.3% |
| Two or More Races | 45,101 | 2.0% |
| Hispanic* | 1,014,777 | 45.0% |
| Total | 2,255,059 | 100.0% |

* Hispanic can be of any race

**Vital Statistics (*5)**

| Year | Total Births | Birth Rate* | Total Death | Death Rate* |
|---|---|---|---|---|
| 2009 | 31,512 | 14.7 | 13,747 | 6.4 |
| 2010 | 29,417 | 11.2 | 13,971 | 6.3 |
| 2011 | 30,609 | 13.9 | 14,638 | 6.6 |
| 2012 | 30,427 | 13.6 | 14,739 | 6.6 |

* Rates per 1,000 population

**2013 Voter Registration (*6)**

| | Number | Percent |
|---|---|---|
| Democrat | 340,932 | 35.9% |
| Republican | 377,774 | 41.7% |
| Other | 45,466 | 4.6% |
| No Party Preference | 169,784 | 17.7% |
| Total Registered | 933,956 | 100.0% |

**2013 Population by Age (*4)**

| | Number | Percent |
|---|---|---|
| < 5 | 170,643 | 7.6% |
| 5-9 | 172,958 | 7.7% |
| 10-14 | 184,825 | 8.2% |
| 15-19 | 191,278 | 8.5% |
| 20-24 | 157,741 | 7.0% |
| 25-34 | 291,743 | 12.9% |
| 35-44 | 308,615 | 13.7% |
| 45-54 | 298,117 | 13.2% |
| 55-59 | 116,524 | 5.2% |
| 60-64 | 98,312 | 4.4% |
| 65-74 | 142,726 | 6.3% |
| 75-84 | 90,836 | 4.0% |
| 85+ | 30,740 | 1.4% |
| Total | 2,255,059 | 100.0% |
| Median Age: | | 33.5 |

**2013 Population by Sex (*4)**

| | Number | Percent |
|---|---|---|
| Male | 1,123,019 | 49.8% |
| Female | 1,132,040 | 50.2% |
| Total | 2,255,059 | 100.0% |

Sources: (*1) Decennial Census, US Census Bureau
(*2) January Estimate, CA State Department of Finance
(*3) Riverside County Projections 2010 (RCP10)
(*4) American Community Survey 2007-2011 5-Year Estimates and CA State Department of Finance
(*5) Riverside County Department of Public Health
(*6) California Secretary of State, February 2013
Note: Totals might not add up due to rounding.

*Chart was developed by Riverside County GIS in 2013 and is the most current information available

Source:
http://gis.rivcoit.org/Portals/0/Documents/rcd/progress_reports/pr_2013/riverside_county.pdf





**Figure 5**: Historical Population Estimates for Riverside County Cities

RIVERSIDE COUNTY CENTER FOR DEMOGRAPHICS

**Riverside County Economic Development Agency**
P.O. Box 1180 * Riverside, CA 92502 * (951) 955-8916

**RIVERSIDE COUNTY**
**Historical Population Estimates, with 2010 Census Counts**

| City | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|
| Banning | 29,603 | 29,818 | 30,133 | 30,332 | 30,483 | 30,659 | 30,834 | | | |
| Beaumont | 36,877 | 38,201 | 39,359 | 40,666 | 41,864 | 43,601 | 45,118 | | | |
| Blythe | 20,817 | 20,121 | 20,570 | 19,894 | 19,305 | 19,254 | 19,813 | | | |
| Calimesa | 7,879 | 7,923 | 7,956 | 7,932 | 8,040 | 8,138 | 8,289 | | | |
| Canyon Lake | 10,561 | 10,623 | 10,629 | 10,543 | 10,564 | 10,608 | 10,681 | | | |
| Cathedral City | 51,200 | 51,604 | 52,485 | 53,163 | 53,480 | 53,859 | 54,261 | | | |
| Coachella | 40,704 | 41,517 | 42,426 | 43,676 | 44,614 | 45,001 | 45,407 | | | |
| Corona | 152,374 | 153,665 | 156,178 | 159,469 | 162,000 | 163,317 | 164,659 | | | |
| Desert Hot Springs | 25,938 | 27,393 | 27,973 | 28,385 | 28,605 | 28,794 | 29,048 | | | |
| Eastvale | * | 54,263 | 55,881 | 57,458 | 59,375 | 60,825 | 63,162 | | | |
| Hemet | 78,657 | 79,412 | 79,489 | 78,842 | 79,176 | 79,548 | 80,070 | | | |
| Indian Wells | 4,958 | 5,012 | 5,103 | 5,199 | 5,265 | 5,336 | 5,412 | | | |
| Indio | 76,036 | 77,168 | 79,185 | 83,450 | 84,655 | 86,683 | 88,058 | | | |
| Jurupa Valley | * | * | 95,970 | 95,731 | 96,025 | 96,898 | 98,177 | | | |
| Lake Elsinore | 51,821 | 52,484 | 53,457 | 56,039 | 57,368 | 59,142 | 61,006 | | | |
| La Quinta | 37,467 | 37,784 | 38,100 | 38,156 | 38,720 | 39,311 | 39,977 | | | |
| Menifee | 77,519 | 79,472 | 81,540 | 83,885 | 85,455 | 87,286 | 89,004 | | | |
| Moreno Valley | 193,365 | 195,200 | 198,353 | 200,889 | 202,191 | 203,696 | 205,383 | | | |
| Murrieta | 103,466 | 104,636 | 107,214 | 110,183 | 111,226 | 112,576 | 113,795 | | | |
| Norco | 27,063 | 27,062 | 27,314 | 27,048 | 27,037 | 26,392 | 26,896 | | | |
| Palm Desert | 48,445 | 48,957 | 48,924 | 48,282 | 48,494 | 48,835 | 49,335 | | | |
| Palm Springs | 44,552 | 44,943 | 45,326 | 45,465 | 45,818 | 46,204 | 46,654 | | | |
| Perris | 68,386 | 69,693 | 70,307 | 70,700 | 71,743 | 72,476 | 73,722 | | | |
| Rancho Mirage | 17,218 | 17,454 | 17,583 | 17,685 | 17,783 | 17,920 | 18,070 | | | |
| Riverside | 303,871 | 307,207 | 311,332 | 316,162 | 318,511 | 321,655 | 324,696 | | | |
| San Jacinto | 44,199 | 44,616 | 45,385 | 46,216 | 46,649 | 47,087 | 47,656 | | | |
| Temecula | 100,097 | 101,507 | 103,133 | 104,145 | 105,368 | 107,794 | 109,064 | | | |
| Wildomar | 32,176 | 32,543 | 33,050 | 33,685 | 34,271 | 34,758 | 35,168 | | | |
| Incorporated | 1,685,249 | 1,760,278 | 1,884,355 | 1,913,280 | 1,934,085 | 1,957,653 | 1,983,415 | | | |
| Unincorporated | 504,392 | 452,596 | 355,360 | 353,269 | 357,008 | 360,271 | 364,413 | | | |
| County Total | 2,189,641 | 2,212,874 | 2,239,715 | 2,266,549 | 2,291,093 | 2,317,924 | 2,347,828 | | | |

Source: California Department of Finance

*Current as of May 2017

**Figure 6:** Riverside County Population Growth - 2009 – 2019

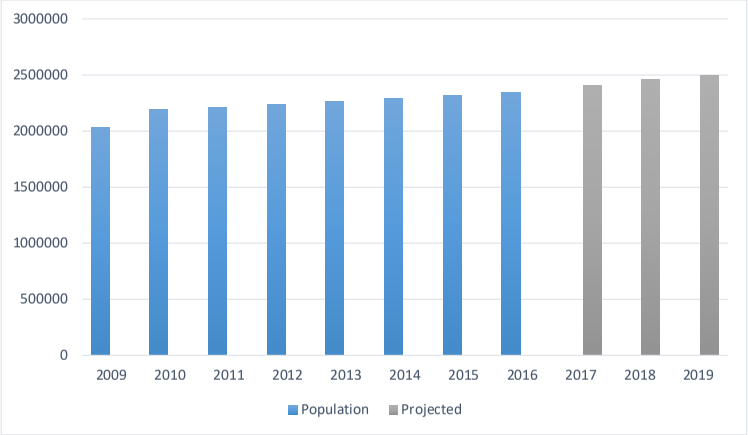


Source: Riverside County Center for Demographics 2017





Table 3 below displays Riverside County's population change and the components of this population change from 1971 through a projection of 2020. Net migration (in-migration minus out-migration) has accounted for the majority of the of the population growth for Riverside County for the past four (4) decades.

Population growth has slowed in recent years, but remained relatively high in 2016 at roughly 1.3 percent. Migration continues to be positive in the County, though at slower rates than early in the decade. Population growth will accelerate over the forecast, but does not approach the previous peak levels.

**Table 3**: Riverside County Population Change (1971-2020)

**RIVERSIDE COUNTY**

**AVERAGE ANNUAL COMPONENTS OF POPULATION CHANGE**

**YEAR 1971 - 2010**

| Years | Change | Births | Deaths | Natural Increase | Net Migration | Net Migration % of Change |
|---|---|---|---|---|---|---|
| **1971-75** | 14580 | 7602 | 4960 | 2642 | 11938 | 82% |
| **1976-80** | 27060 | 9657 | 5844 | 3812 | 23248 | 86% |
| **1981-85** | 33320 | 13436 | 7001 | 6435 | 26885 | 81% |
| **1986-90** | 70380 | 19310 | 8691 | 10679 | 59761 | 85% |
| **1991-95** | 38108 | 25154 | 10205 | 14949 | 23159 | 61% |
| **1996-00** | 36055 | 23597 | 11538 | 12060 | 23995 | 67% |
| **2001-05** | 72862 | 27475 | 13088 | 14387 | 58475 | 80% |
| **2006-10** | 47529 | 32969 | 14145 | 18824 | 28705 | 60% |
| **2011-15** | 23460 | 30538 | 15777 | 14761 | 22530 | 96% |
| **2016-20** | 31471 | 30303 | 16474 | 13829 | 24883 | 79% |

**Source: CA Department of Finance 2016**

## 2.4 Economy

*California Department of Transportation Long-Term Social-Economic Forecast: Riverside*

Riverside County is the fourth largest county in California in terms of total land area. Riverside County has a population of 2.3 million people and a total of 649,700 wage and salary jobs. The income per capita is $35,495, and the average salary per worker is $52,144.

In 2015, total employment increased by 2.6 percent across Southern California. Riverside County added a total of 27,200 jobs, representing a growth rate of 4.4 percent. The unemployment rate improved rapidly, falling from 8.3 percent in 2014 to 6.7 percent in 2015.

In 2015, job growth was strongest in construction (+4,600 jobs), education and healthcare (+4,500 jobs), leisure and hospitality (+3,800 jobs), and transportation and warehousing (+3,300 jobs). Job losses were not observed in any major sector.

Over the past five years, the population has increased at an average annual rate of 1.2 percent. A substantial portion of this growth was the result of net migration, as an average of 12,200 each year.

*Forecast Highlights*

- In 2016, total wage and salary employment will increase by 3.0 percent. From 2016 to 2021, total employment will grow at an annual average rate of 1.6 percent.
- Average salaries are currently below the California state average, and will remain so over the foreseeable future. In Riverside County, inflation-adjusted salaries are forecasted to rise by an average of 1.0 percent per year between 2016 and 2021.
- From 2016 to 2021, employment growth will be broad-based, as most sectors will increase by at least 1.5 percent per year. The strongest growth will be observed in education and healthcare, retail trade, and professional services. Combined, these industries will account for 54 percent of net job growth.
- The population is expected to increase by 1.3 percent in 2016. Annual growth in the 2016-2021 period is expected to average 1.5 percent.
- Net migration will gradually increase. An average of 24,883 net migrants are projected to enter the county each year between 2016 and 2021.





- Real per capita income is expected to rise by 2.0 percent in 2016, and increase by an average of 0.9 percent per year between 2016 and 2021.
- Total taxable sales are projected to increase by an average of 2.6 percent per year over the next five years.
- Industrial production will rise by 3.3 percent in 2016. From 2016 to 2021, the growth rate of industrial production is expected to average 2.5 percent per year.

Source: http://www.dot.ca.gov/hq/tpp/offices/eab/index_files/2016/Riverside2016.pdf

**Figure 7:** Riverside County Economic and Labor Force Characteristics

# RIVERSIDE COUNTY

## ECONOMIC AND LABOR FORCE CHARACTERISTICS

**Labor Force Participation (*1)**

| Year | Labor Force | Employed | Unemployed | Unemployment Rate |
|---|---|---|---|---|
| 2007 | 903,800 | 849,400 | 54,300 | 6.0% |
| 2008 | 912,100 | 834,700 | 77,400 | 8.5% |
| 2009 | 916,600 | 793,600 | 123,000 | 13.4% |
| 2010 | 913,800 | 779,500 | 134,300 | 14.7% |
| 2011 | 938,400 | 810,600 | 127,800 | 13.6% |
| 2012 | 937,300 | 824,500 | 112,700 | 12.0% |
| 2013* | 944,500 | 828,800 | 115,600 | 12.2% |

* Preliminary, August 2013

**Employment/Jobs Projections (*3)**

| | |
|---|---|
| 2020 | 927,300 |
| 2035 | 1,285,284 |

* Jobs within county

**2011 Employment/Jobs by Industry Sector (*2)**

| | |
|---|---|
| Agriculture, Forestry, Fishing and Hunting | 13,783 |
| Mining, Quarrying, and Oil and Gas Extraction | 405 |
| Utilities | 4,488 |
| Construction | 33,602 |
| Manufacturing | 39,733 |
| Wholesale Trade | 22,625 |
| Retail Trade | 82,169 |
| Transportation and Warehousing | 20,453 |
| Information | 7,105 |
| Finance and Insurance | 10,944 |
| Real Estate and Rental and Leasing | 7,613 |
| Professional, Scientific, and Technical Services | 18,789 |
| Management of Companies and Enterprises | 2,937 |
| Administration & Support, Waste Mngt and Remediation | 35,130 |
| Educational Services | 67,761 |
| Health Care and Social Assistance | 61,087 |
| Arts, Entertainment, and Recreation | 19,543 |
| Accommodation and Food Services | 68,997 |
| Other Services (excluding Public Administration) | 29,384 |
| Public Administration | 34,922 |
| **Total All Jobs** | **581,470** |

*Jobs within county

**Median Household Income**

| | |
|---|---|
| 2000 | $ 42,887 (*4) |
| 2011 | $ 58,365 (*5) |

**Taxable Sales in 1,000s of Dollars (*6)**

| Year | Total |
|---|---|
| 2003 | $21,709,135 |
| 2004 | $25,237,148 |
| 2005 | $28,256,491 |
| 2006 | $29,816,237 |
| 2007 | $29,023,609 |
| 2008 | $26,003,595 |
| 2009 | $22,227,877 |
| 2010 | $23,152,780 |
| 2011 | $25,641,497 |

Sources: (*1) CA Employment Development Department (County residents working anywhere. Data are not seasonally adjusted)
(*2) U.S. Census Bureau Local Employment Dynamics
(*3) Riverside County Projections 2010 (RCP10)
(*4) Decennial Census, US Census Bureau (in 1999 inflation-adjusted dollars)
(*5) 2007-2011 American Community Survey 5-Year Estimates (in 2011 inflation-adjusted dollars)
(*6) State Board of Equalization
Note: Totals might not add up due to rounding.

*Chart was developed by Riverside County GIS in 2013 and is the most current information available
Source:
http://gis.rivcoit.org/Portals/0/Documents/rcd/progress_reports/pr_2013/riverside_county.pdf





**Figure 8:** Annual Labor Force and Employment Averages

**Riverside County Economic Development Agency**
P.O. Box 1180 * Riverside, CA 92502 * (951) 955-8916

**ANNUAL LABOR FORCE AND EMPLOYMENT AVERAGES**
**County of Riverside**

| Year | Civilian Labor Force | Employment | Unemployment Number | Unemployment Percent |
|---|---|---|---|---|
| 1999 | 691,500 | 653,600 | 37,900 | 5.5 |
| 2000 | 680,700 | 644,200 | 36,500 | 5.4 |
| 2001 | 711,100 | 672,000 | 39,100 | 5.5 |
| 2002 | 750,400 | 701,800 | 48,600 | 6.5 |
| 2003 | 781,700 | 730,700 | 51,100 | 6.5 |
| 2004 | 820,900 | 771,600 | 49,300 | 6 |
| 2005 | 854,300 | 808,100 | 46,100 | 5.4 |
| 2006 | 886,300 | 841,700 | 44,600 | 5 |
| 2007 | 907,400 | 852,900 | 54,500 | 6.0 |
| 2008 | 916,700 | 838,800 | 77,900 | 8.5 |
| 2009 | 916,600 | 793,600 | 123,000 | 13.4 |
| 2010 | 913,400 | 779,100 | 134,300 | 14.7 |
| 2011 | 938,400 | 810,600 | 127,800 | 13.6 |
| 2012 | 944,500 | 828,800 | 115,600 | 12.2 |
| 2013 | 953,200 | 855,300 | 97,900 | 10.3 |
| 2014 | 1,011,500 | 928,200 | 83,400 | 8.2 |
| 2015 | 1,035,200 | 965,500 | 69,600 | 6.7 |
| 2016 | 1,047,800 | 983,800 | 64,000 | 6.1 |

**2016 Monthly Labor Force and Employment Data ****
**County of Riverside**

| Month | Civilian Labor Force | Employment | Unemployment Number | Unemployment Percent |
|---|---|---|---|---|
| January | 1,041,000 | 979,400 | 61,600 | 5.9 |
| February | 1,041,100 | 979,600 | 61,400 | 5.9 |
| March | 1,041,400 | 980,000 | 61,400 | 5.9 |
| April | 1,036,500 | 977,300 | 59,300 | 5.7 |
| May | 1,033,500 | 978,000 | 55,500 | 5.4 |
| June | 1,044,300 | 974,500 | 69,800 | 6.7 |
| July | 1,049,600 | 974,600 | 75,000 | 7.1 |
| August | 1,050,500 | 978,300 | 72,200 | 6.9 |
| September | 1,053,800 | 985,800 | 68,000 | 6.5 |
| October | 1,059,800 | 993,200 | 66,600 | 6.3 |
| November | 1,062,500 | 1,002,300 | 60,200 | 5.7 |
| December* | 1,059,400 | 1,002,900 | 56,500 | 5.3 |

* Preliminary data

** Labor force data for all geographic areas now reflect the March 2012 benchmark and Census 2010 population controls at the state level.

Source: State of California Employment Development Department.

https://www.rivcoeda.org/LinkClick.aspx?fileticket=POJLaM6rSMQ%3d&tabid=1110

**Figure 9:** County of Riverside Major Employers

**Riverside County Economic Development Agency**
P.O. Box 1180 * Riverside, CA 92502 * (951) 955-8916

| Major Employers<br>County of Riverside | | | |
|---|---|---|---|
| **Employer** | **Number of Employees** | **Location** | **Description** |
| County of Riverside | 21,984 | Countywide | County Government |
| March Air Reserve Base | 8,500 | March ARB | Military Reserve Base |
| University of California, Riverside | 8,306 | Riverside | University |
| Amazon | 7,500 | Moreno Valley | E-retalier |
| Stater Bros. Markets | 6,900 | Countywide | Supermarkets |
| Kaiser Permanente Riverside Medical Center | 5,300 | Riverside | Hospital |
| Corona-Norco Unified School District | 5,098 | Corona | School District |
| Desert Sands Unified School District | 4,202 | La Quinta | School District |
| Riverside Unified School District | 3,973 | Riverside | School District |
| Pechanga Resort & Casino | 3,931 | Temecula | Resort Casino |
| Riverside University Health System - Medical Center | 3,600 | Moreno Valley | Hospital |
| Hemet Unified School District | 3,468 | Hemet | School District |
| Moreno Valley Unified School District | 3,454 | Moreno Valley | School District |
| Eisenhower Medical Center | 3,365 | Rancho Mirage | Hospital |
| Morongo Casino, Resort & Spa | 3,359 | Cabazon | Resort Casino |
| Temecula Valley Unified School District | 2,951 | Temecula | School District |
| Lake Elsinore Unified School District | 2,539 | Lake Elsinore | School District |
| City of Riverside | 2,500 | Riverside | City Government |
| JW Marriott Desert Springs Resort & Spa | 2,304 | Palm Desert | Resort & Spa |
| Palm Springs Unified School District | 2,243 | Palm Springs | School District |
| Coachella Valley Unified School District | 2,209 | Thermal | School District |
| Agua Caliente Band of Cahuilla Indians | 2,152 | Palm Springs | Tribal Government/Casinos |
| Jurupa Unified School District | 2,144 | Jurupa Valley | School District |
| Murrieta Valley Unified School District | 2,128 | Murrieta | School District |
| Alvord Unified School District | 2,113 | Riverside | School District |
| Riverside Community Hospital | 2,017 | Riverside | Hospital |
| Abbot Vascular | 2,000 | Temecula | Medical & Surgical Instruments Manufacturer |
| Riverside Community College District | 1,965 | Riverside | Community College District |
| Desert Regional Medical Center | 1,906 | Palm Springs | Hospital |
| Riverside County Office of Education | 1,555 | Riverside | Education |
| Naval Surface Warfare Center | 1,450 | Norco | Naval Weapons Research |
| Parkview Community Hospital Medical Center | 1,439 | Riverside | Hospital |
| Professional Hospital Supply | 1,300 | Temecula | Medical & Surgical Supplies Distributor |
| La Quinta Resort & Club | 1,233 | La Quinta | Resort |
| Ironwood State Prison | 1,150 | Blythe | Level I & III Prison |
| California Rehabilitation Center | 1,139 | Norco | Level II Prison |
| Fantasy Springs Resort Casino | 1,100 | Indio | Resort Casino |
| Corona Regional Medical Center | 1,059 | Corona | Hospital |
| Mt. San Jacinto College | 1,016 | San Jacinto | Community College District |

Source: Employers Listed, Websites & Public Records, 2015





**Figure 10:** Employment Growth Projections

| Industry sector | Thousands of jobs | | | Change | | Percent distribution | | | Annual rate of change | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2002 | 2012 | 2022 | 2002–2012 | 2012–2022 | 2002 | 2012 | 2022 | 2002 – 2012 | 2012 – 2022 |
| Total[1] | 142,294.9 | 145,355.8 | 160,983.7 | 3,060.9 | 15,627.9 | 100.0 | 100.0 | 100.0 | 0.2 | 1.0 |
| Nonagriculture wage and salary[2] | 131,028.3 | 134,427.6 | 149,751.3 | 3,399.3 | 15,323.7 | 92.1 | 92.5 | 93.0 | .3 | 1.1 |
| Goods producing, excluding agriculture | 22,486.7 | 18,360.3 | 19,554.2 | –4,126.4 | 1,193.9 | 15.8 | 12.6 | 12.1 | –2.0 | .6 |
| Mining | 512.3 | 800.5 | 921.7 | 288.2 | 121.2 | .4 | .6 | .6 | 4.6 | 1.4 |
| Construction | 6,715.7 | 5,640.9 | 7,263.0 | –1,074.8 | 1,622.1 | 4.7 | 3.9 | 4.5 | –1.7 | 2.6 |
| Manufacturing | 15,258.7 | 11,918.9 | 11,369.4 | –3,339.8 | –549.5 | 10.7 | 8.2 | 7.1 | –2.4 | –.5 |
| Service providing | 108,541.6 | 116,067.3 | 130,197.1 | 7,525.7 | 14,129.8 | 76.3 | 79.9 | 80.9 | .7 | 1.2 |
| Utilities | 596.3 | 554.2 | 497.8 | –42.1 | –56.4 | .4 | .4 | .3 | –.7 | –1.1 |
| Wholesale trade | 5,652.4 | 5,672.8 | 6,143.2 | 20.4 | 470.4 | 4.0 | 3.9 | 3.8 | .0 | .8 |
| Retail trade | 15,025.1 | 14,875.3 | 15,966.2 | –149.8 | 1,090.9 | 10.6 | 10.2 | 9.9 | –.1 | .7 |
| Transportation and warehousing | 4,223.8 | 4,414.7 | 4,742.0 | 190.9 | 327.3 | 3.0 | 3.0 | 2.9 | .4 | .7 |
| Information | 3,394.6 | 2,677.6 | 2,612.4 | –717.0 | –65.2 | 2.4 | 1.8 | 1.6 | –2.3 | –.2 |
| Financial activities | 7,847.1 | 7,786.3 | 8,537.3 | –60.8 | 751.0 | 5.5 | 5.4 | 5.3 | –.1 | .9 |
| Professional and business services | 15,976.2 | 17,930.2 | 21,413.0 | 1,954.0 | 3,482.8 | 11.2 | 12.3 | 13.3 | 1.2 | 1.8 |
| Educational services | 2,642.8 | 3,346.9 | 4,022.2 | 704.1 | 675.3 | 1.9 | 2.3 | 2.5 | 2.4 | 1.9 |
| Health care and social assistance | 13,555.6 | 16,971.8 | 21,965.9 | 3,416.2 | 4,994.1 | 9.5 | 11.7 | 13.6 | 2.3 | 2.6 |
| Leisure and hospitality | 11,986.0 | 13,745.8 | 15,035.0 | 1,759.8 | 1,289.2 | 8.4 | 9.5 | 9.3 | 1.4 | .9 |
| Other services | 6,129.0 | 6,174.5 | 6,823.4 | 45.5 | 648.9 | 4.3 | 4.2 | 4.2 | .1 | 1.0 |
| Federal government | 2,766.0 | 2,814.0 | 2,406.5 | 48.0 | –407.5 | 1.9 | 1.9 | 1.5 | .2 | –1.6 |
| State and local government | 18,746.7 | 19,103.2 | 20,032.2 | 356.5 | 929.0 | 13.2 | 13.1 | 12.4 | .2 | .5 |
| Agriculture, forestry, fishing, and hunting[3] | 2,245.4 | 2,112.7 | 1,889.2 | –132.7 | –223.5 | 1.6 | 1.5 | 1.2 | –.6 | –1.1 |
| Agriculture wage and salary | 1,217.4 | 1,306.9 | 1,281.8 | 89.5 | –25.1 | .9 | .9 | .8 | .7 | –.2 |
| Agriculture self-employed and unpaid family workers | 1,028.0 | 805.8 | 607.4 | –222.2 | –198.4 | .7 | .6 | .4 | –2.4 | –2.8 |
| Nonagriculture self-employed and unpaid family workers | 9,021.2 | 8,815.5 | 9,343.2 | –205.7 | 527.7 | 6.3 | 6.1 | 5.8 | –.2 | .6 |

Source: U.S. Bureau of Labor Statistics, Employment Projections Program.

*Governing Body*

Riverside County is governed by a five-member Board of Supervisors. By law, Supervisorial district boundaries are adjusted every ten years based on population changes reported by the U.S. Census Bureau. Map 1 outlines the current Supervisorial Districts.

In 2016, the population by districts is the following:

- District 1 (Kevin Jeffries): 458,407
- District 2 (John Tavaglione): 458,372
- District 3 (Chuck Washington): 477,763
- District 4 (Manuel Perez): 467,430
- District 5 (Marion Ashley): 480,820

**Map 1:** Riverside County Supervisor Districts

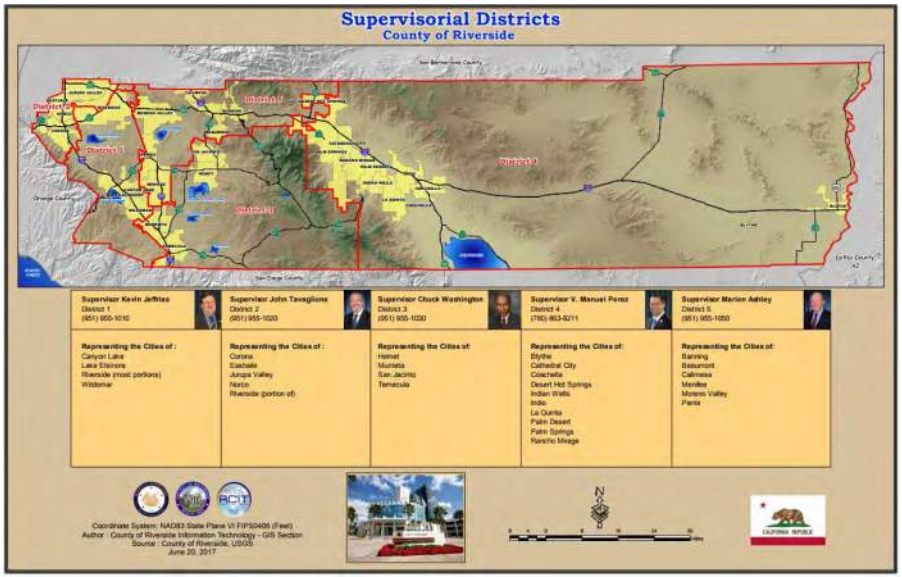






## 2.5 Land Use and Development Trends

Existing land use within Riverside County is a mosaic of varying types of uses, ownership, character, and intensity. Uses include:

- Rural residential
- Single family detached
- Single family attached
- High-density residential (apartments)
- Mobile homes
- Recreational open space
- Other open space
- Heavy industrial
- Warehouse
- Vacant
- Agriculture
- Water
- Utilities
- Public facilities
- Schools
- Retail / Office
- Tourism / Commercial recreation
- Light industrial /Business Park
- Mineral extraction

While population growth continues, so does the need for further development. There are Land Use policies and elements within the Riverside County General Plan to help assure orderly development.

In addition, the Local Agency Formation Commission (LAFCO) of Riverside County is tasked with the mission to provide an orderly pattern of growth that reconciles the varied needs of the County. One of the fundamental principles of LAFCO is to ensure the

establishment of an appropriate and logical municipal government structure for the distribution of efficient and appropriate public services.

LAFCO Land Use Objectives include:

- Discouragement of urban sprawl;
- Preservation of the physical and economic integrity of agricultural lands;
- Preservation of open space within urban development patterns;
- Orderly formation and development of agencies by shaping local agency boundaries;
- Minimization of agencies providing services to a given area; and
- Utilization of Spheres of Influence to guide future development of agency boundaries.

Examples of development in Riverside County are:

Keller Crossing was approved on October 9, 2013. This “Green Concept” environment set to create a mixed-use pedestrian-friendly community that is based on sustainability. This 200-acre property is located in western Riverside County, near Murrieta.

Completed in July 2013, Temecula added a new hospital with in its city limits to accommodate the needs of its residents. The medical facility sits on a 35-acre parcel and holds a total of 320 beds.

Belle Terre is a 342.3- acre residential community located in Riverside’s French Valley. This development proposed a community of up to 1,282 homes. The Zoning Ordinance was approved on December 1, 2014.

The Wine Country on the outskirts of Temecula is continuing to see a lot of development activity. Recognizing this, the Board of Supervisors adopted the Wine Country Community Plan in 2014, which consisted of revisions to the County General Plan, new design guidelines, and new zone classifications. The area has been classified as a Wine County Zone with the purpose of encourage agricultural cultivation, vineyards, wineries, equestrian uses, preserve the wine-making atmosphere, estate living, equestrian life-style and protect this area and its residents from incompatible uses which could result in reduced agricultural productivity and increased urbanization within the policy area.

The Cabazon Outlet Mall in has expanded to add an additional 50 stores, an increase of 30%. The expansion was completed in 2014 and it included: 50 new retail stores, a 1,100 parking space structure, wider walkways and improved landscaping. The Cabazon Outlet





Mall is now a 650,000 square foot complex with a total of 180 stores, making it one of the largest outlet centers in the state.

In February 2015, the Colina del Oro housing plan was initiated and approved by Riverside County Local Agency Formation Commission (LAFCO). It is a master-planned community consisting of both single and multi-family residential units. Within the community an array of recreational facilities would be built such as a community park, community center, trails, and an open space park. 490 dwellings were planned within the 11.4 acre community.

A new Kaiser Permanente health care facility is expected to open in 2023 in Murrieta. The plan is set to develop a 37-acre parcel of land. A press release from Kaiser Permanente, dated April 29, 2016, stated that they have broken ground for the new medical center.

**Figure 11:** Housing and Household Characteristics

# RIVERSIDE COUNTY

## HOUSING & HOUSEHOLD CHARACTERISTICS

**Housing Units**

| | | |
|---|---|---|
| 1970 | 169,757 | (*1) |
| 1980 | 295,069 | (*1) |
| 1990 | 483,847 | (*1) |
| 2000 | 584,674 | (*1) |
| 2001 | 595,606 | (*2) |
| 2002 | 613,338 | (*2) |
| 2003 | 633,749 | (*2) |
| 2004 | 659,388 | (*2) |
| 2005 | 689,340 | (*2) |
| 2006 | 721,699 | (*2) |
| 2007 | 753,286 | (*2) |
| 2008 | 772,480 | (*2) |
| 2009 | 779,077 | (*2) |
| 2010 | 800,707 | (*1) |
| 2011 | 804,913 | (*2) |
| 2012 | 807,970 | (*2) |
| 2013 | 812,234 | (*2) |
| **Projections** | | |
| 2020 | 955,853 | (*3) |
| 2035 | 1,228,188 | (*3) |

**Housing Units by Type**

| | 2010 (*1) | Percent | 2013 (*2) | Percent |
|---|---|---|---|---|
| Single Detached | 543,209 | 67.8% | 551,857 | 67.9% |
| Single Attached | 50,784 | 6.3% | 51,041 | 6.3% |
| Multi-Family: 2 to 4 | 38,409 | 4.8% | 38,530 | 4.7% |
| Multi-Family: 5 Plus | 89,577 | 11.2% | 91,784 | 11.3% |
| Mobile Homes | 78,728 | 9.8% | 79,022 | 9.7% |
| Total Units | 800,707 | 100.0% | 812,234 | 100.0% |
| Occupancy | 686,260 | 85.7% | 696,290 | 85.7% |
| Vacancy | 114,447 | 14.3% | 115,944 | 14.3% |

**Median Home Price (*4)**

| | |
|---|---|
| 2002 | $202,914 |
| 2003 | $248,780 |
| 2004 | $331,106 |
| 2005 | $400,000 |
| 2006 | $420,000 |
| 2007 | $395,000 |
| 2008 | $260,000 |
| 2009 | $190,000 |
| 2010 | $200,000 |
| 2011 | $195,000 |
| 2012 | $210,000 |
| 2013* | $264,750 |

*August 2013

**Persons Per Household**

| | | |
|---|---|---|
| 2000 | 2.98 | (*1) |
| 2010 | 3.14 | (*1) |
| 2013 | 3.19 | (*2) |

**Housing Unit Building Permits (*5)**

| Year | Single-Family Structure | All Multi-Family Structure | Total Units |
|---|---|---|---|
| 1995 | 7,378 | 182 | 7,560 |
| 1996 | 7,127 | 472 | 7,599 |
| 1997 | 8,042 | 938 | 8,980 |
| 1998 | 9,671 | 1,868 | 11,539 |
| 1999 | 11,823 | 1,472 | 13,295 |
| 2000 | 13,323 | 1,702 | 15,025 |
| 2001 | 16,778 | 2,234 | 19,012 |
| 2002 | 20,912 | 1,343 | 22,255 |
| 2003 | 25,424 | 4,929 | 30,353 |
| 2004 | 29,182 | 4,264 | 33,446 |
| 2005 | 30,350 | 4,023 | 34,373 |
| 2006 | 20,882 | 3,883 | 24,765 |
| 2007 | 9,717 | 2,617 | 12,334 |
| 2008 | 3,820 | 1,943 | 5,763 |
| 2009 | 3,406 | 666 | 4,072 |
| 2010 | 4,027 | 520 | 4,547 |
| 2011 | 2,275 | 989 | 3,264 |
| 2012 | 3,107 | 945 | 4,052 |
| 2013* | 2,840 | 858 | 3,698 |

* Preliminary August 2013

Sources: (*1) Decennial Census, US Census Bureau
(*2) January Estimate, CA State Dept. of Finance.
(*3) Riverside County Projections 2010 (RCP10)
(*4) DataQuick Reports
(*5) US Department of Housing & Urban Development, State of the Cities Data Systems
Note: Totals might not add up due to rounding.

*Chart was developed by Riverside County GIS in 2013 and is the most current information available
Source:http://gis.rivcoit.org/Portals/0/Documents/rcd/progress_reports/pr_2013/riverside_county.pdf





**Table 4:** Housing Projections by City

| Housing Units | | | | | |
|---|---|---|---|---|---|
| **Jurisdiction** | **2015** | **2020** | **2025** | **2030** | **2035** |
| Banning | 14,611 | 17,260 | 20,416 | 23,177 | 25,202 |
| Beaumont | 17,267 | 20,787 | 24,276 | 27,982 | 28,958 |
| Blythe | 5,947 | 6,537 | 6,798 | 7,046 | 7,303 |
| Calimesa | 5,300 | 6,804 | 8,135 | 9,984 | 11,858 |
| Canyon Lake | 4,549 | 4,641 | 4,733 | 4,825 | 4,917 |
| Cathedral City | 23,627 | 25,127 | 26,627 | 28,127 | 29,627 |
| Coachella | 13,200 | 19,010 | 25,200 | 31,349 | 36,542 |
| Corona | 47,368 | 48,162 | 48,974 | 49,894 | 50,891 |
| Desert Hot Springs | 18,149 | 20,229 | 22,251 | 24,341 | 26,501 |
| Hemet | 45,313 | 50,507 | 55,211 | 60,724 | 66,199 |
| Indian Wells | 5,296 | 5,450 | 5,603 | 5,653 | 5,706 |
| Indio | 32,027 | 34,321 | 36,552 | 38,857 | 41,240 |
| La Quinta | 22,719 | 23,353 | 23,913 | 24,462 | 24,978 |
| Lake Elsinore | 20,833 | 24,141 | 27,240 | 30,092 | 32,663 |
| Menifee | 35,226 | 40,259 | 43,870 | 47,442 | 51,461 |
| Moreno Valley | 59,797 | 64,427 | 69,011 | 74,467 | 78,065 |
| Murrieta | 36,162 | 37,512 | 38,861 | 40,210 | 41,560 |
| Norco | 7,849 | 8,362 | 8,719 | 8,888 | 9,083 |
| Palm Desert | 35,867 | 37,011 | 37,954 | 39,113 | 40,143 |
| Palm Springs | 35,190 | 36,381 | 37,671 | 38,912 | 40,153 |
| Perris | 20,816 | 24,468 | 27,845 | 31,220 | 34,747 |
| Rancho Mirage | 13,834 | 14,922 | 16,010 | 17,098 | 18,186 |
| Riverside | 107,325 | 113,000 | 116,883 | 122,659 | 126,968 |
| San Jacinto | 21,055 | 26,422 | 30,142 | 32,775 | 35,053 |
| Temecula | 35,270 | 36,321 | 37,979 | 38,690 | 39,400 |
| Wildomar | 12,722 | 14,537 | 15,837 | 17,124 | 18,573 |
| Unincorporated County | 186,938 | 221,346 | 255,534 | 286,562 | 324,571 |
| Riverside County Total | 884,258 | 981,297 | 1,072,247 | 1,161,671 | 1,250,549 |

Source: Western Riverside Council of Government Council (WRCOG)

## 2.6 Cities of Riverside County

Riverside County has 28 cities and multiple special districts. All cities, with the exception of Moreno Valley and Menifee are participants in the 2017 LHMP. The City of Jurupa Valley is our newest city and the Planning Commission held its inaugural meeting January 23, 2012.

All of the participating cities, tribes, special districts and school districts attended the workshops, several meetings and assisted with the hazard analysis for the region. The cities and special districts cooperated during the LHMP process, sharing information and discussing the issues that impacted their areas. The discussions increased the knowledge base of all participants in regards to hazards in their areas and across Riverside County. The participants provided insight on additional hazards and concerns their jurisdictions face, but are not “disasters” and are not common across the county.

Participating jurisdictions in the Riverside County LHMP have their own governing bodies (e.g., city councils, tribal councils, water district boards, hospital boards, etc.) and upon Cal OES and FEMA approval they will formally adopt the plan via resolution through their governing body.

### 2.6.1 Banning

The City of Banning is a corporate city in Riverside County in the San Gorgonio Pass area of California. It is approximately twenty-three (23) square miles in area and is 30 miles east of the County seat in the City of Riverside. Banning is 80 miles east of Los Angeles, 23 miles west of Palm Springs, 25 miles north of the resort mountain community of Idyllwild, and is immediately adjacent to Beaumont to the west and the Morongo Indian Reservation to the east.

The Union Pacific Railroad and California State Highway 10 both run through the middle of the City. Smith Creek, a waterway that starts in the mountains and runs through the lower part of the valley, is close to Banning’s southern and eastern boundaries.

Banning enjoys a yearly average daily temperature of approximately 79 degrees. Average temperatures are in the high 90’s during the summer and low 40’s during the winter. The average rainfall for Banning is about 3 inches per year.

Incorporated in 1913, the City of Banning has a rich and colorful history. Initially, Banning served as a stagecoach and railroad stop between the Arizona territories and Los Angeles. Today, Banning is home to nearly 30,000 residents and features clean air, ample water supplies and the memorable and inspiring scenic vistas of Mt. San Gorgonio





and Mt. San Jacinto. Its signature community event is Stagecoach Days, an annual rodeo and parade that celebrates Banning’s Western heritage.

### 2.6.2 Beaumont

The City of Beaumont is located in the westernmost portion of Riverside County and is bounded by City of Calimesa and unincorporated County areas, on the north by the unincorporated County areas (Cherry Valley), on the south by unincorporated County areas and the City of San Jacinto, and on the east by the City of Banning. The City straddles the San Gorgonio Pass, the only easterly link with the greater Los Angeles Metropolitan area. Beaumont is located approximately 70 miles northeast of Los Angeles, 21 miles northeast of Riverside, and 21 miles southeast of San Bernardino. The geographic area governed by the Beaumont General Plan includes the City's corporate boundaries as the existed in 2005 and the City's established Sphere of Influence. Because there is considerable variation within the area governed by the General Plan, the larger Beaumont Planning Area has been subdivided into eight smaller planning areas: 1) Town Center Planning Area, 2) Oak Valley Planning Area, 3) North Beaumont Planning Area, 4) East Beaumont Planning Area, 5) 6th Street Corridor Planning Area, 6) Southeast Beaumont Planning Area, Southwest Planning Area, 8) West Beaumont Planning Areas.

The City of Beaumont was incorporated in November 1912. Founded at the turn of the twentieth century, Beaumont is proud of its rich history and rural charm. The town served as a welcome “stopping-off point” for early travelers making their way from the Mohave desert to Los Angeles, and later for L.A. residents eager to vacation in Palm Springs. Some, however, set down roots, drawn by the beautiful mountain vistas, clean, crisp air, and the abundance of cherry and apple orchards. Beaumont is proud of these early settlers and their families, many of whom continue to live and thrive in Beaumont.

Population- City of Beaumont is estimated to have 45,118. (2015) The City of Beaumont provided specific information regarding extreme wind events, and the public notices that are sent during a wind event.

### 2.6.3 Blythe

The City of Blythe is a corporate city in Riverside County in the Palo Verde Valley of California. The City of Blythe comprises approximately 16,400 acres (approximately 27 square miles) in area and is 145 miles east of the County seat, the City of Riverside. The City’s sphere of influence (SOI) surrounds the incorporated city limits and comprises approximately 12,800 acres (approximately 20 square miles). The jurisdiction sits directly adjacent to La Paz County, Arizona on its eastern boundary and Imperial County along its southern boundary. The Colorado River is a waterway that forms the eastern boundary

of the City. Regional access to the City is provided by Interstate-10 (I-10), State Highway 78 (SR-78), and State Route 95 (US 95). The Greyhound bus line also provides access to and from Blythe.

Jurisdiction's climate can be described as moderate. Temperatures and rainfall for jurisdiction are typical of that of the rest of Riverside County.

The City of Blythe is a General Law city which was incorporated in 1916. It is located 225 miles east of Los Angeles and 150 miles west of Phoenix Arizona. The Colorado River embraces the east side of the Palo Verde Valley. The City has a Council-Manager form of municipal government. The City Council appoints the City Manager who is responsible for the day to day administration of City business and the coordination of all departments. The City Council is composed of five members elected biannually to alternating four-year terms. The City of Blythe encompasses an area of approximately 26.8 square miles and is situated 265 feet above sea level. Blythe enjoys a comfortable California desert climate with winter temperatures averaging 55-75 degrees, and summer temperatures averaging 85-110 degrees. Annual rainfall is approximately 3 inches per year.

### 2.6.4 Calimesa

The City is located in the northwestern portion of Riverside County, between the cities of Yucaipa and Beaumont, between San Bernardino and Palm Springs. Calimesa is located in the region known as the Inland Empire, which covers all of San Bernardino and Riverside Counties and is between the foothills of the San Bernardino and San Jacinto Mountains. The city's elevation ranges between 2,300 to 3,500 feet above sea level. According to the United States Census Bureau, the city has a total area of 14.8 square miles, all of it land.

Climatic Conditions: Generally, Calimesa has an arid climate. Annual rainfall varies from ten (10) to twenty three (23) inches within the San Gorgonio Pass area of Riverside County and the City. Hot, dry Santa Ana winds are common to areas within the City. These winds constitute a contributing factor, which causes small fires originating in rural and urban development to spread quickly and create the need for an increased level of fire protection.

The City of Calimesa was incorporated on December 1, 1990, soon after the incorporation of its northern neighbor, the City of Yucaipa. Prior to its incorporation, the City of Calimesa existed as an unincorporated town that straddled the Riverside–San Bernardino County line at the location where Interstate 10 climbs the San Gorgonio Pass going eastward from Redlands, California.

Historically, Calimesa is divided from the City of Yucaipa by the Wildwood Canyon Wash; but politically, "County Line Road" divides the two towns. Much of what was originally





known as "Calimesa" actually lies within the city boundaries of Yucaipa, including "I-Street" (Calimesa) Park, and Calimesa Elementary School. Because State of California law prohibits the incorporation or annexation of cities over county lines, the City was unable to adjoin what was considered the town of Calimesa when it finally incorporated. When Yucaipa incorporated, they included the area outside of the Yucaipa Valley on the "hilltop" or "mesa" that was traditionally known as Calimesa within its city boundaries, so as not to leave a gap of unincorporated area between the two towns. And although the two cities are in separate counties, both Yucaipa and Calimesa share same basic street grid system and addressing, including many named and alphabetical street which extend from Yucaipa well into Calimesa. The general boundary between the two cities is County Line Road, which ironically does not follow the exact county line in some places due to the alignment of Calimesa Creek, which meanders in and out of both Yucaipa and Calimesa.

The City Limits of Calimesa also extend southwest to the City of Beaumont, California. Although much less refined, the boundaries between Beaumont and Calimesa fall generally along the Southern California Edison (SCE) right-of-way that extends from the El Casco electrical sub-station facility near Moreno Valley, eastward. Near the I-10 freeway, Champions Drive is the common boundary between the two Cities. The City of Calimesa has an estimated population of 8,173.

### 2.6.5 Canyon Lake

The City of Canyon Lake is an incorporated city in Riverside County. It is approximately four and a half square miles in area and is 31 miles south of the County seat, the City of Riverside. The City of Canyon Lake sits directly adjacent to the City of Menifee on its eastern boundary, City of Lake Elsinore on its Western and southern boundaries. The City of Canyon Lake lies between the I-15 and I-215. Railroad Canyon Road, an arterial highway, bisects the community and provides the major connection to these freeways. The San Jacinto River, a waterway that starts in the Mountains and runs over 75 miles through the County, feeds into Canyon Lake and flows into Lake Elsinore.

The City of Canyon Lake climate in winter is rarely extreme, low temperatures almost never go below freezing. In the summer the high temperatures will hover in the high 90's but during heat waves can exceed 100 degrees. Rainfall is typical of that of the rest of Riverside County.

The City of Canyon Lake was established in March of 1968 as a relaxed private gated community offering recreational opportunities. Canyon Lake is primarily a bedroom community of mature and newer homes. As a private gated community, Canyon Lake has an equestrian center, campground, and many other amenities. The City of Canyon Lake incorporated on December 1, 1990 to become more responsive to its residents.

### 2.6.6 Cathedral City

The City of Cathedral City is a corporate city in Riverside County in the Coachella Valley of California. It is approximately 20 square miles in area and is 64 miles east of the County seat, the City of Riverside. All borders of Cathedral City are within Riverside County. The Union Pacific Railroad and Interstate Highway 10 both run through the northern-most portion of the City. The Santa Rosa Mountains border the southern-most portion of the city.

Cathedral City's climate can be described as arid most of the year, with summer heat in excess of 110 degrees Fahrenheit anytime from June through September, and colder winter evening temperatures as low as 25 degrees Fahrenheit from December through February.

The average rainfall is less than three inches per year. Temperatures and rainfall for Cathedral City are typical of the rest of the Coachella Valley (eastern Riverside County).

Cathedral City was established in 1925 and incorporated in 1981. Strategically located, with city limits on both sides of Interstate 10, Cathedral City is a haven for expanding and relocating businesses. Cathedral City's population ranks in the top three cities in the Coachella Valley.

Businesses view the region as a triangle of opportunity between Los Angeles and San Diego. Coachella Valley is situated inland, approximately equal distances from each metropolitan area. This triangle of commercial businesses, light industry, and professional services is expanding and becoming one metropolis of continued growth.

### 2.6.7 Coachella

Coachella is a city in Riverside County, California; it is the easternmost city in the region collectively known as the Coachella Valley. It is located 28 miles east of Palm Springs, 72 miles east of Riverside, and 130 miles east of Los Angeles.

The eastern half of the Coachella valley is below sea level, and the area's average elevation is 68 feet (35 m) below sea level. The Salton Sea, a saltwater lake located about 10 miles (16 km) South of Coachella, lies 227 feet (69 m) below sea level.

The city also lends its name to the Coachella grapefruit; the town's stretch of State Route 111 is named Grapefruit Boulevard in its honor. Harrison Street or State Route 86 is declared historic U.S. Route 99, the major thoroughfare that connects with Interstate 10 a few miles north of town.

Known as the "City of Eternal Sunshine", Coachella is largely a rural, agricultural, family-oriented community in the desert and one of the state's fastest growing cities in the late





20th century. When it first incorporated back in 1946, it had 1,000 residents, but the population was 45,407 at the 2010 census.

The city was originally founded as Woodspur in 1876, when the Southern Pacific Railroad built a rail siding on the site. In the 1880s the indigenous Cahuilla tribe sold their land plots to the railroads for new lands east of the current town site, and in the 1890s, a few hundred traqueros took up settlement along the tracks.

The origin of the name Coachella is unclear, but in 1901 the citizens of Woodspur voted on a new name for their community; at their town hall meeting, the homeowners settled on "Coachella". Some locals believe it was a misspelling of Conchilla, a Spanish word for the small white snail shells found in the valley's sandy soil, vestiges of a lake which dried up over 3,000 years ago.

Coachella began as a 2.5-square-mile (6.5 km2) territory gridded out on the mesquite covered desert floor. Not until the 1950s did Coachella begin to expand into its present range, about 32 square miles (83 km2), an area which contained large year-round agricultural corporate farms and fruit groves, particularly of citrus (lemons, oranges, grapefruit) and date palms.

Coachella became a city in 1946. During the incorporation voting process, the first city council was tentatively elected: Lester C. Cox, T. E. Reyes, John W. Westerfield, Lester True, and Paul S. Atkinson. Also elected on November 26, 1946, were City Clerk Marie L. Johnson and City Treasurer John C. Skene. John Westerfield was appointed mayor at the first meeting.

### 2.6.8 Corona

The City of Corona is located approximately 45 miles southeast of Los Angeles in western Riverside County. It is located in a valley, framed by mountains and the Prado Basin. Original settlements focused development in an area within and adjacent to Grand Boulevard. As the City grew, the geographic limitations imposed by the Cleveland National Forest to the south and the Prado Basin to the northeast created natural barriers that confined the City. The City is bordered by the City of Norco to the north, the City of Riverside to the east, and Riverside County to the west and south.

The City limits encompass 39.2 square miles and the population is approximately 159,132. A city whose heritage spans more than a century, Corona has emerged as an ethnically diverse community, where a significant percentage of the population is made up of young, well-educated families. The Corona community boasts many amenities that provide a first-rate quality of life for residents. The City has more than 394 acres of parks, with sports fields, basketball courts, playgrounds, tennis courts, two skate parks and an outdoor pool.

Two major freeways and one railroad transect Corona. The Riverside Freeway (SR-91) runs east/west directly north of the City's center, Interstate 15 (I-15) runs north/south near the eastern edge of the City, and the railroad parallels SR-91. These corridors are major transportation routes to the economic center of Orange County from the Inland Empire. Two geographical areas are considered to be within the boundaries of the City of Corona General Plan Planning area: lands within the City's corporate limits, and lands within its Sphere of Influence (SOI). .

The SOI was defined by the City, the Southern California Association of Governments (SCAG), and the Riverside County Local Agency Formation Commission (LAFCO). It represents the areas likely to be served by and potentially annexed to the City. The SOI includes three geographically distinct areas including the West, East and South Spheres. The West Sphere encompasses three geographic areas: the Prado Basin, Coronita and the Foothill area. The East Sphere includes the areas of Home Gardens, Eagle Valley East, and El Cerrito. Temescal Canyon makes up the South Sphere.

The City of Corona Planning area is within the South Coast Air Basin of California. The air basin is a 6,600-square mile area encompassing the non-desert portions of Riverside, Los Angeles, and San Bernardino Counties and all of Orange County. Bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, the South Coast Air Basin is an area of high air pollution poten0tial.

The climate of the South Coast Air Basin is dominated by the strength and position of the semi-permanent high-pressure center over the Pacific Ocean near Hawaii. It creates the climate conditions typical of Southern California, (i.e., relatively cool summers, mild winters, infrequent rainfall, cool daytime sea breezes, comfortable humidity, and ample sunshine). Periods of extremely hot weather, winter storms, or Santa Ana wind conditions interrupt this pattern. Unfortunately, the same atmospheric processes that create the desirable living climate combine to restrict the ability of the atmosphere to disperse the air pollution generated by the region's population.

The location of the Planning Area, east of the Chino Hills and Santa Ana Mountains, insulates it from the moderating effect of the ocean. Temperatures and precipitation in Corona varies more dramatically than coastal areas of the basin. Average summertime high temperatures range between about 85 to 92 degrees Fahrenheit from June through September, and average wintertime low temperatures are generally near 40 degrees in December and January. Rainfall is highly variable and confined almost exclusively to the winter months. Rainfall in Corona averages about 12.6 inches annually.

Predominating winds travel from the ocean, across the urbanized coastal areas of Orange and Los Angeles Counties, to Corona through the Santa Ana River Canyon. The canyon





acts as a funnel for air masses moving across the basin. Daytime winds are typically channeled through the canyon to create steady, abnormally high (greater than 12mph) wind velocities from the west. Typical nighttime conditions reverse, and light winds (less than 1 mph) drift back towards the ocean. Exceptions to this pattern occur when a high-pressure center forms over the western United States and creates the strong, hot, dry, gusty Santa Ana winds, which move through Corona from the eastern deserts into the canyon.

Corona's historic resources are those physical elements, both structural and natural, which define Corona's past. They help give the City its unique identity, charm, and orientation. These resources, when well preserved and maintained, provide the community with a sense of permanence, which fosters civic pride and stewardship among its residents and businesses. Information describing the historic and cultural resources were derived from the California Environmental Resources Evaluation Systems (CERES) website, as well as the Riverside County Integrated Project (RCIP) (March 2000) existing setting conditions. Corona's history is an evolution of Native American inhabitation, Missionary influence, agricultural development, and eventual rapid urbanization. The City's growth and development is typical of many other areas in Southern California.

In the early 1700s, prior to the arrival of the Spanish, the Gabrieleno and Luiseno Indians occupied the Corona area. These Native Americans used the hot waters in Temescal Canyon for bathing and religious ceremonies. Current residents and visitors still enjoy the rejuvenating mud baths and hot springs at the Glen Ivy Springs resort. Luiseno religious ceremonies were strictly followed, and remnants of some of their artistic pictographs and petroglyphs can still be found on rocks in undeveloped areas.

In the early 1800s, the agricultural and cattle ranching base developed and portions of Corona became part of the Mexican land grants (Rancho La Sierra Yorba, Rancho Jurupa, Rancho El Rincon, and Rancho El Sobrante de San Jacinto). With the Treaty of Guadalupe Hidalgo (1846), Mexico ceded the Corona area as part of California to the United States. The Yorba, Serrano, Sepulveda, Cot, and Botiller families' ranched sheep and cattle on the original ranchos in the area. Remnants of the Serrano tanning vats are still found on Old Temescal Canyon Road. In 1849, the California gold rush brought prospectors, settlers, and new development to southern California. The Butterfield Stage stops and the Serrano adobes are found along this road.

In 1886, developer Robert Taylor persuaded his partners: Rimpau, Joy, Garretson and Merrill to form the South Riverside Land and Water Company. Together they raised approximately $110,000 to purchase approximately 12,000 acres of good agricultural land. Taylor realized the importance of water for the soon to be developed community, and additional funds were used to ensure that sufficient water rights were obtained. Taylor hired Anaheim engineer H. C. Kellogg to design a circular Grand Boulevard three miles

round. Early residents used to parade their fancy buggies on this circular street that enclosed the main functions of the community: schools, churches, residences and stores. To the north along the railroad tracks were the manufacturing plants and packing houses. The southern end of town was left to the citrus industry, and the mining companies were established just outside the city's southeastern and eastern city limits.

The town's founders initially named their development South Riverside after the successful citrus community of Riverside, just a few miles away. Almost all of the new settlers planted orange and lemon trees in hopes of gaining future profits. New groves continued to spring up and, by 1912, there were 5,000 acres of established lemon and orange groves. By 1913, Corona shipped more fruit than any other town in Southern California. In 1961, citrus was still considered the backbone of Corona's economy and the largest source of revenue. In that year, citrus covered 7,500 acres. The labor force fluctuated between 400 and 1,800 workers at the peak of the harvest. An additional 500 people worked at the Exchange Lemon Products plant. By 1982, Corona's agricultural industry faced a bleak future as production costs made the economics of farming financially unsuccessful. Plans were begun to replace the groves with approximately 12,500 dwelling units.

On July 13, 1896 residents voted to incorporate and change the name of the community to Corona, which is Spanish for crown, in honor of the City's circular Grand Boulevard. By 1900, the population had reached 1,434 people. On September 9, 1913, in observance of California's Admission's Day, Corona residents celebrated with an international automobile race on the Boulevard. The event attracted such auto racing greats as: Ralph DePalma, Barney Oldfield, Terrible Teddy Tetzlaff and Earl Cooper. More than 100,000 people came to the town of 4,000 to watch Cooper win the race and a prize of $8,250. It was so successful that races were held again in 1914 and 1916. The demise of the Corona road races was due not only to tragic deaths, which occurred in 1916, but also because of the cost and local effort needed to continually stage such an extravagant event.

### 2.6.9 Desert Hot Springs

Desert Hot Springs is located approximately 112 miles from Los Angeles, in the center of Riverside County. The City sits in the foothills of the San Bernardino Mountains, and overlooks the entire Coachella Valley. The southern city boundaries are adjacent to Palm Springs and Cathedral City, divided by Interstate 10. To the east of the city is the unincorporated community of Sky Valley. To the west are the unincorporated areas of North Palm Springs and White Water. To the north of the city is predominately Joshua Tree National Park and lands governed by the Department of Interior, Bureau of Land





Management (BLM). The City also sits at two entry points of the recently recognized, Sand to Snow National Monument.

The area has sparse vegetation, which is consistent with the Southern California lower desert. Annual grass and desert flowers are dependent on annual precipitation averaging just over 5 inches a year. Temperatures during the summer can reach 115 degrees during the peak day and the high 80's during the night. Winter temperatures are in the high 70's to low 80's and lows at night average in the 50's. Summers tend to produce occasional monsoonal thunder storms, while the winter tends to be windy, depending on the low pressures systems reacting with the local mountain ranges.

In 1913 Cabot Yerxa arrived in the City. He was the first Homesteader and discovered hot water on Miracle Hill. Due to the San Andreas Fault bisecting the hill, one side has cold water, the other has hot. His large adobe, hand built by Yerxa, is one of the oldest adobe structures in Riverside County and is listed on the Nation Register of Historic Places.

The town was founded by L. W. Coffee on July 12, 1941. The original site was centered on the intersection of Palm Drive and Pierson Blvd. and was only a square mile in area. He named it Desert Hot Springs in honor of the waters Yerxa had discovered.

The City of Desert Hot Springs incorporated in 1963, with 1,000 residents.

Since that time, Desert Hot Springs has solidified itself as a tourist destination through its small spa hotels. In its early days the city's seclusion appealed to urban "escapees".

Desert Hot Springs experienced periods of dizzying growth in the 1980s and 1990s when most of the vacant lots were filled with new houses and duplex apartments. The city's population doubled in the 1980s and increased by another 5,000 in the 2000 census. Between 2000 and 2010 the population grew by 9000 residents resulting in a final population count of 25,938 full time residents following the 2010 census.

With much of the City's land undeveloped, development in the city and population is expected to steadily grow for many years to come.

The City is the home to (5) Elementary Schools, (2) Middle Schools and (1) High School, (3) Parks and a Health and Wellness Center serving residents of the Community.

In 2014 the City Council adopted Ordinances allowing for Medical Marijuana Dispensaries and the large scale Cultivation of Medical Marijuana. Development of this rapidly growing industry is permitted in the Industrial Zone of the City.

### 2.6.10 Eastvale

Eastvale is one of the newest cities in Western Riverside County. Eastvale incorporated on October 1, 2010 since then it has grown to a population of over 63,162 residents. Eastvale is 13.2 square miles strategically poised between Interstate 15 and California State Routes 91, 60, and 71, making access easy for residents, visitors and businesses alike. Residents and visitors find the close proximity of Ontario International Airport to be a metropolitan advantage yet enjoy the small-town, neighborly charm of our young community.

### 2.6.11 Hemet

The City of Hemet is located in the San Jacinto Valley in Riverside County, approximately 80 miles southeast of Downtown Los Angeles. The city covers about half of the valley, which it shares with the neighboring City of San Jacinto to the north and Diamond Valley Lake to the south. The San Jacinto Mountains to north provide a beautiful natural backdrop to the City.

The average annual rainfall in Hemet is approximately 12 inches. The annual high temperature is 82 degrees while the annual low is 46 degrees. Average temperature in Hemet is 65 degrees. During the 19th century the land in Hemet was used for cattle ranching by Mission San Luis Rey. On January 20, 1910 the City of Hemet was incorporated and maintains a Council-Manager form of government. The incorporation helped to serve the growing city which also became a trading center for the San Jacinto Valley agriculture of citrus, apricots, peaches, olives and walnuts. During WWII the City of Hemet hosted the Ryan School of Aeronautics, training over 6,000 fliers for the Army Air Force. Hemet-Ryan Airport still exists today in the same location.

### 2.6.12 Indian Wells

Indian Wells is a small-scale residential-resort community located within the Coachella Valley in Riverside County. The City of La Quinta and the City of Palm Desert, along with unincorporated areas of Riverside County, adjoin the City. The current City limits encompass approximately 9,240 acres, or 14.4 square miles. Primary access to the City is from State Highway 111. Primary access to the region is by Interstate 10. State Route 74 also provides access to the Coachella Valley region from the south. Unincorporated lands to the northeast of the City are included within the Indian Wells sphere of influence.

Indian Wells is best known for its world class resorts, catering to golf and tennis enthusiasts, and quality residential lifestyle. Residents of the City enjoy an ideal climate, with over 330 days of sunshine each year. The City's beautiful surroundings include views of the Santa Rosa and San Jacinto Mountains.





Indian Wells officially became a city on July 14, 1967. At that time, Indian Wells was the 16th city to incorporate in Riverside County and the 400th in California. It was the fourth city, after Indio, Coachella, and Palm Springs, to incorporate in the Coachella Valley. The election for incorporation was held on June 27, 1967 and, according to the League of California Cities, had the largest percentage of approval for incorporation of any city in California. The voter turnout was 87 percent of the 285 registered voters with 93 percent in favor of becoming a city. At incorporation, there were an estimated 855 legal residents and 585 homes. The Indian Wells area was inhabited long before incorporation, however. The name Indian Wells originated from a Cahuilla Indian hand-dug well, documented on the earliest maps of California prior to 1850. The original well was generally located north of present day Highway 111 and east of Miles Avenue. The well serves as a stage station until a public well was established around 1870, and remained in use until 1910. Like most communities that were established in the Coachella Valley, Indian Wells' origins are based on travelers' needs for water and a place to rest. Both wells were destroyed by a massive flood in 1916.

### 2.6.13 Indio

The City of Indio is a corporate city located in Riverside County, within the Coachella Valley of Southern California's Colorado Desert region, approximately 70 miles east of the County seat (City of Riverside), and 125 miles east of Los Angeles. The City limits encompass approximately 29.2 square miles in area. The City of Indio sits directly adjacent to the City of La Quinta, the City of Coachella and the unincorporated areas of Riverside County. The Union Pacific Railroad, State Highway 111, and Interstate 10 run through the length of the City. The Coachella Valley Water District operates an aqueduct which conveys water from the Colorado River into the Coachella Valley and bisects the City from east to west and north to south.

The climate of the City of Indio is influenced by the surrounding mountain ranges that contribute to the unique year-round warm and dry climate, with some of the warmest winters west of the Rocky Mountains. Indio experiences warm winters and hot summer climates with average annual high temperatures of 89.5 degrees Fahrenheit, and average annual low of 62.1 Fahrenheit. Summer highs above 110 degrees Fahrenheit are common while summer night lows often stay above 90 degrees Fahrenheit. The City of Indio is adjacent to the geologic Salton Sink and within the site of historic Lake Cahuilla. Indio is an official National Bird Sanctuary, as seasonal bird migration flight routes cross the city en route to and from the Salton Sea.

Indio began as an Indian Village and winter home for Native Americans who regularly migrated from the surrounding mountains in the winter to the palm oases along the San Andreas Fault zone and other locations providing water, vegetation and shelter. The

Villages were located throughout the Coachella Valley and along the shores of ancient Lake Cahuilla. The discovery of gold in California in 1848 and the resulting Gold Rush brought a stream of miners and settlers through the Coachella Valley, providing a southern route to California less hazardous than crossing the Sierras. In 1872, Indio was selected as a division point for the Southern Pacific Railroad with the first train arriving in 1876 from Los Angeles and the completed southern transcontinental route in 1877. Indio's first settlers were mainly railroad employees and local shopkeepers. By 1909, the Indio School census indicated that the school district had 43 families and 82 children within its boundaries. In 1914 the Southern Sierras Power Company completed an electric power line to the Coachella Valley to provide power for pumping water and powering homes. In 1930, Indio became the Coachella Valley's first incorporated city.

### 2.6.14 Jurupa Valley

The City of Jurupa Valley is the newest city to incorporate within the State of California, in the County of Riverside, with an incorporation date of July 1, 2011. Jurupa Valley is approximately 44 square miles in area and is approximately 5 miles west of the County seat, the City of Riverside. Jurupa Valley is approximately 60 miles east of the City of Los Angeles and approximately 90 miles north of San Diego. It covers the area north and west of the Santa Ana River, south of the Riverside-San Bernardino County line, and east of Interstate 15 with CA Hwy 60 intersecting the length of the city from the east to the west.

The City of Jurupa Valley has a moderate climate with annual rainfall at approximately 2 – 3.5 inches per year. Vegetation is green and bountiful in the winter but can become dry and dense during the summer months. Summers are warm and can reach temperatures above 109 degrees during the peak of the day and remain in the high 80's during the evenings. Winter weather is mild averaging 65 – 76 degrees during the day and dropping down into the mid 30's or 40's in the evenings. Throughout most of the year, you can usually count on warm sunny days, with occasional mild to gusty winds throughout the late summer, fall, and early winter seasons. The population of Jurupa Valley was incorporated after the 2010 US State Census. Currently, the city's population is 100,314 according to the 2015 US State Census.

### 2.6.15 Lake Elsinore

The City of Lake Elsinore is a corporate city nestled at the foot of the Cleveland National Forest, within the southwest portion of Riverside County. The City boasts that Lake Elsinore is the largest natural recreational lake in Southern California and is bounded by wetlands. City of Lake Elsinore is located on the I-15 corridor at the intersection of State Route 74, 20 miles south of State Route 91. We are approximately a one-hour drive east from metropolitan Orange County and forty-five minutes southwest from Riverside. San





Diego is approximately a one-hour-and-fifteen-minute drive south on I-15. Highway 74 connects westward over the Ortega Mountains to Orange County beach communities and eastward to mountain and desert cities in Riverside County. Lake Elsinore is 73 miles southeast of Los Angeles and 74 miles northeast of San Diego. The average rainfall per year is less than 12 inches total. The average winter low temperature is 35.8 degrees, while the average summer high is 98.4 degrees. The community enjoys a yearly average daily temperature of 78.5 degrees.

The City of City of Lake Elsinore was organized, formed and incorporated under the laws of the State of California on April 9, 1888. From earliest times, the 300 natural Sulphur springs that fed Lake Elsinore were believed to have curative and magical properties by its Native American Indian inhabitants. These first inhabitants were called the Lake Entengvo Wumoma, which meant "Hot Springs by the Little Sea."

Joining the Native American Indian inhabitants, the Spanish missionaries, soldiers, ranchers and American trappers came to the valley. The Spanish padres renamed the lake "Laguna Grande."

Early settlers established a town site around the lake, which they renamed Elsinore, representing the immortality given the town of Elsinore in Denmark by Shakespeare in "Hamlet." In the 1920s and 1930s, the City became a playground for movie stars and the lake a destination for world-record-setting boat races and Olympic swim team training. Sportsmen hunted duck on the lake and deer in the hills.

Lake Elsinore has a "Council-Manager" general law form of government where the City Manager is appointed by the City Council and is the Chief Executive Officer of the Municipal Corporation. The Council acts as the board of directors of the municipal corporation and meets in a public forum where citizens may participate in the governmental process. The City Council consists of five members elected at-large, on a non-partisan basis. Residents elect the Mayor and four Council members, making each accountable to the entire citizenry.

### 2.6.16 La Quinta

The City of La Quinta is a corporate city in Riverside County. La Quinta is situated approximately 150 miles northeast of San Diego and 130 miles east of Los Angeles on the desert floor of the Coachella Valley. The valley is flanked on three sides by the Little San Bernardino, Santa Rosa, and San Jacinto Mountains. The protection afforded by the mountains contributes to the arid climate. Average rainfall per year is less than 5 inches total. Low temperatures rarely drop below freezing, while highs during the summer are usually in the triple digits and can reach into the 120 F degrees; however, it's a "dry" heat. Visitors from colder climates flock to La Quinta and surrounding cities in the Coachella

Valley from November to May because of our extremely mild winters. La Quinta's climate can be described as Lower California desert.

The City of La Quinta was organized, formed and incorporated under the laws of the State of California on May 1, 1982. It has a "Council-Manager" general law form of government where the City Manager is appointed by the City Council and is the Chief Executive Officer of the Municipal Corporation. The Council acts as the board of directors of the municipal corporation and meets in a public forum where citizens may participate in the governmental process. The City Council consists of five members elected at-large, on a non-partisan basis. Residents elect the Mayor and four Council members, making each accountable to the entire citizenry.

### 2.6.17 Menifee (Not Participating)

The City of Menifee is located in southwestern Riverside County approximately 30 miles southeast of the City of Riverside, California. The City encompasses approximately 50 square miles with an overall population of 83,447.

On June 3, 2008, the residents of the communities encompassing the City of Menifee voted to incorporate Menifee into Riverside County's twenty-sixth city. The new City of Menifee was officially established on October 1, 2008.

Interstate 215 traverses north and south through the center of Menifee, with existing community commercial areas located primarily along Newport, Bradley, and McCall Roads off of I-215.

### 2.6.18 Moreno Valley (Not Participating)

The City of Moreno Valley was officially incorporated on December 3, 1984 as a California general law municipality. Moreno Valley is comprised of three once-rural communities (Sunnymead, Edgemont and Moreno) and is located in the northwestern portion of Riverside County, approximately 66 miles east of Los Angeles, 42 miles west of Palm Springs and 100 miles north of San Diego. Moreno Valley is situated in a crescent of land bounded by the Box Springs Mountains to the north, the hills of the Badlands to the east and the mountains of Lake Perris State Recreation Area. The surrounding jurisdictions include the City of Riverside, the City of Perris, March Air Reserve Base, the San Jacinto Wildlife Area and Lake Perris State Recreation Area. The population of Moreno Valley is estimated at 201,175.

### 2.6.19 Murrieta

The City of Murrieta is an incorporated city in Riverside County. It is approximately 34 square miles in area and is 50 miles south of the County seat, the City of Riverside. The





City of Murrieta sits directly adjacent to the City of Temecula on the south, City of Menifee on the east, and the City of Wildomar on the northern boundaries. Murrieta is served by two major interstate freeways. I-215 runs through the eastern portion of the city, and I-15 runs through the western portion of the city. The Santa Margarita Watershed runs through the southwest portion of the City. Storm water runoff from portions of Lake Elsinore and Murrieta collects in the Murrieta & Temecula creeks and forms the Santa Margarita River south of the City.

The City of Murrieta's winters are almost never extreme, low temperatures rarely go below freezing. In the summer the high temperatures will hover in the 90's, but some days may go over 100 during heat waves. Rainfall for City of Murrieta is typical of that of the rest of Riverside County.

In 1980, Murrieta population was estimated to be 2,200. When Murrieta officially became a city on July 1, 1991, it was already home to more than 24,000 residents. By 2016, more than 113,000 people had moved into the City of Murrieta community, making it one of the five largest in Riverside County. The natural scenic beauty of the area and what is still by California standards reasonably priced housing continues to attract significant numbers of residents and businesses who are finding Murrieta a great place to grow. Those living in the community find distinguished schools, abundant recreation, excellent medical facilities, expanding employment opportunities and one of the lowest crime rates in Southern California. Entrepreneurs find a market growing larger by the day, above average household incomes, a skilled labor force and a business-friendly City Hall. It's a community with a past and vision for its future. One that welcomes challenges embraces opportunity. More and more people are discovering what the Murrieta fathers envisioned more than a century ago: Murrieta is, indeed, a great place to grow.

### 2.6.20 Norco

The City of Norco is located in the northwestern portion of Riverside County, near the convergence of Los Angeles, Orange, and Riverside Counties, approximately 45 miles southeast of the City of Los Angeles. It is located in a valley, framed by mountains and the Prado Basin. Original Settlements focused development in an area within and adjacent to Hamner Avenue, Highway. As the City grew, the geographic limitations imposed by the Norco Hills to the east and the Santa Ana River and the Prado Basin to the north and west created natural barriers that confined the City. The City is bordered by the City of Corona to the south and southwest, the City of Riverside to the east, and the cities of Eastvale and Jurupa Valley to the north and northeast.

One major freeway transects Norco with no railroads. Interstate 15 (I-15) runs north/south through the middle of the City. This corridor is the major north-south transportation route in Southern California between Las Vegas and San Diego with nearby direct freeway

interconnects to Los Angeles and Orange counties and the rest of the Inland Empire. The current City corporate limits are fairly congruous with the City's Sphere of Influence (SOI). The City currently includes 15 square miles, with less than 50 acres currently in Riverside County remaining within the SOI.

The SOI was defined by the City, the Southern California Association of Governments (SCAG), and the Riverside County Local Agency Formation Commission (LAFCO). It represents those areas likely to be served by and potentially annexed to the City. The SOI includes two small geographically distinct areas including a single row of mostly developed single-family homes along Bluff Street at the City's southwestern edge along the river bluffs and undeveloped property largely in the river floodplain in the northeast corner of the City. The City currently manages approximately 690 acres of open space within its Park Lands and an internal trail system throughout the City and its public right away of approximately 120 miles.

The City of Norco Planning area is within the South Coast Air Basin of California. The air basin is a 6,600-square mile area encompassing the non-desert portions of Riverside, Los Angeles, and San Bernardino Counties and all of Orange County. Bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east, the South Coast Air Basin is an area of high air pollution potential. The climate of the South Coast Air Basin is dominated by the strength and position of the semi-permanent high-pressure center over the Pacific Ocean near Hawaii. It creates the climate conditions typical of Southern California, (i.e., relatively cool summers, mild winters, infrequent rainfall, cool daytime sea breezes, comfortable humidity, and ample sunshine). Periods of extremely hot weather, winter storms, or Santa Ana wind conditions interrupt this pattern. Unfortunately, the same atmospheric processes that create the desirable living climate combines to restrict the ability of the atmosphere to disperse the air pollution generated by the region's population.

The location of the Planning Area, east of the Chino Hills and Santa Ana Mountains farther south, insulates it from the moderating effect of the ocean. Temperatures and precipitation in Norco vary more dramatically than coastal areas of the basin. Average summertime high temperatures range between about 85 to 92 degrees Fahrenheit from June through September, and average wintertime low temperatures are generally near 40 degrees in December and January. Rainfall is highly variable and confined almost exclusively to the winter months. Rainfall in Norco averages about 12.6 inches annually. Predominating winds travel from the ocean, across the urbanized coastal areas of Orange and Los Angeles Counties, to Norco through the Santa Ana River Canyon. The canyon acts as a funnel for air masses moving across the basin. Daytime winds are typically channeled through the canyon to create steady, abnormally high (greater than 12mph) wind velocities from the west. Typical nighttime conditions reverse, and light winds (less





than 1 mph) drift back towards the ocean. Exceptions to this pattern occur when a high-pressure center forms over the western United States and creates the strong, hot, dry, gusty Santa Ana winds, which move through Norco from the eastern deserts into the canyon.

The pre-European history of Norco is much like the rest of Southern California where various tribes of Indians occupied the different portions of the region. The Luiseno Indians used and occupied a region that included the Norco-Corona area. The main village was in Temescal Canyon, and the Norco area was used as a hunting-gathering location. In 1846 the Norco area became part of the Mexican land grant, part of which was eventually purchased for the purposed of growing orange trees. That was not successful and the land was sold and subdivided as part of the Riverside Orange Heights Tract.

The concept of "Norco" began as a subdivision of the North Corona Land Company in 1910, which again attempted to develop the area with orchard citrus crops, avocados, olives, etc. Years of experimentation showed the area was not suited to that purpose due to high winds, frost, and poor soil conditions. In 1921 the property was sold to the North Corona Land Company. At that time, fewer than 100 families resided in the area which was mainly a small farming community. The farmers gradually ventured into animal raising, especially poultry and rabbits, some of which are still active today.

By the mid-1920's, the North Corona Land Company owned 5,409 acres in the area. When the first school and the Norconian Club were constructed, the Norconian Club was constructed at hot sulfur well discovered while digging for irrigation water. It occupied a 700- acre site and was for years a favorite of Hollywood celebrities. Its use declined during the 1930's and in 1941 the U.S. Navy bought the hotel and expanded it into a premier World War II-era hospital. Today, its grounds are divided between a weapons research facility and a state prison. Most of the resort remains intact, and its history and architecture have earned it a listing on the National Register of Historic Places. Today local leaders and organizations are working to ensure its recognition and preservation.

The community's first public recreational facility was developed in 1948 when the old Norco School was acquired as a community center. The Norco Recreation and Park District was then formed to maintain and operate the property. During the 1950's and 1960's Norco began to experience more growth, resulting from the population explosion occurring throughout the Southern California metropolitan area. The San Bernardino and Riverside freeways made the area more accessible from Los Angeles and Orange Counties, and Norco's animal keeping lifestyle came within commuting distance from major centers of employment. Because of rapid growth in surrounding communities, and the previous loss of other animal keeping communities in the Los Angeles and Orange Counties when development pressures increased there, the City of Norco was

incorporated in 1964 to preserve the animal keeping community that had established roots here.

The development of the 130 acres of Silverlakes Equestrian and Sports Park along Hamner Avenue, between Norco and Eastvale, is currently attracting over 1 million visitors annually to the city and the region. The dominant activities in the park is soccer supplemented by equestrian horse competition.

City of Norco is located in the northwestern portion of Riverside County. The City of Norco is surrounded by the City of Eastvale, Corona and Riverside. During the late 50's and early 60's, southern California experienced rapid growth and due to the previous loss of other animal keeping communities in the Los Angeles and Orange Counties areas, the City of Norco was incorporated in 1964 to preserve the animal keeping community. The City of Norco currently includes 14.3 square miles. The current population is approximately 27,336.

### 2.6.21 Palm Desert

The City of Palm Desert is a charter city in Riverside County. The City of Palm Desert is a business, resort, and residential community centrally located in the heart of the Coachella Valley, in southeastern Riverside County, California. Known as the cultural and retail center of the desert communities, the City is 125 miles east of Los Angeles and just 15 miles east of Palm Springs. The valley is flanked on three sides by the Little San Bernardino, Santa Rosa, and San Jacinto Mountains. The protection afforded by the mountains contributes to the arid climate. Average rainfall per year is less than four inches. Low temperatures rarely drop below freezing, while highs during the summer are usually in the triple digits and can reach 115-120 degrees Fahrenheit; however, it's a "dry" heat, with occasional periods of high humidity in the late summer months. Visitors from colder climates flock to Palm Desert and surrounding cities in the Coachella Valley from November to May because of the extremely mild winters.

The City of Palm Desert incorporated as a charter city on November 26, 1973. It has a "Council-Manager" charter city form of government where the City Manager is appointed by the City Council and is the Chief Executive Officer of the Municipal Corporation. The Council acts as the board of directors of the municipal corporation and meets in a public forum where citizens may participate in the governmental process. The City Council consists of five members elected at-large, on a non-partisan basis.

### 2.6.22 Palm Springs

The City of Palm Springs is a charter city in Riverside County located in the State of California. The City is nestled at the base of the San Jacinto and Santa Rosa Mountains,





approximately 60 miles east of Riverside. Serving as the "gateway city" for the Coachella Valley, the City of Palm Springs comprises an incorporated area that encompasses 60,440 acres, or nearly 95 square miles. Palm Springs has a residential population of approximately 47,371 and an estimated seasonal population of over a 100,000 residents and guests.

The City of Palm Springs is located within Riverside County Region VI Southern Administrative Region of the California Office of Emergency Services Agency (Cal OES). Primary access to the City is provided by Interstate 10 and California State Highway 111; north–south access to the City is provided via Indian Canyon Drive and Gene Autry Trail. The Southern Pacific Railroad and Kinder Morgan natural gas pipeline run through the Coachella Valley and specifically through the City's northern boundary.

Palm Springs has an arid desert climate with annual rainfall of less than six inches. There are more than one hundred days a year when temperatures are 100°F or more. Hot, dry winds during the summer months along with seasonal Santa Ana winds are common to Palm Springs.

The San Andreas Fault is a major earthquake fault located only a few miles north of Palm Springs. In addition, there are numerous minor faults located throughout Riverside County which are subject to earthquakes.

The area encompassing the present City of Palm Springs was discovered centuries ago by the Agua Caliente Band of Cahuilla Indians, who established their village around the natural hot mineral springs (current site of the Spa Resort Casino) known for their medicinal and healing capabilities. Throughout the 19th century, many explorers, colonizers, and soldiers came through the desert, but it wasn't until 1853 that United States Topographical Engineers described the combination of palm trees and warm springs they encountered as "Palm Springs." The name became more commonly used several years later.

In 1877, the Southern Pacific Railroad completed its line through the desert to the Pacific Ocean. A Congressional policy established that every odd section of land for 10 miles on either side if the track become the property of the railroad. Early development in Palm Springs was associated with attempts to establish agricultural activity in the area and in the southern portions of the Coachella Valley.

In the 1920s, the region became a retreat for successful business and movie personalities, who took advantage of the warm weather, the remote location, and the hot water spas. The tourist and resort community of Palm Springs developed over the following decades and dramatically changed the character and economy of the Coachella Valley. In 1938, the City of Palm Springs was officially incorporated.

In the 1950s, about 3000 sections of land were transferred to the Agua Caliente Band of Cahuilla Indians in a checkerboard pattern. The checkerboard pattern is divided into Indian and non-Indian property holdings, based upon a grid pattern of square-mile sections of alternating ownerships. Indian land which has been subdivided into sections, half sections, and sometimes even smaller areas—is controlled by the Tribal Council or by individual allottees of the Agua Caliente Band of Cahuilla Indians (the Tribe). Over time, this checkerboard land-ownership pattern has led to inconsistent patterns of development, since the majority of development has occurred on non-Indian and non-Tribal owned lands.

The City has one hospital and the only trauma center for the Coachella Valley, Desert Regional Medical Center. The Medical Center is a 385-bed full service acute care facility that includes a Level II trauma center. There are four public full service elementary schools, one middle school, one high school, and one alternative school within the City of Palm Springs that are administered by the Palm Springs Unified School District. The city has a regional airport (Palm Springs International Airport), numerous large and small hotels, shopping centers, and commercial/industrial zones. Interstate 10 and State Highway 111 traverse the City as well as several main arterial roadways.

The City operates its own police and fire departments and also relies on local volunteer organizations for assistance in emergency response, communications, and other necessary emergency services.

### 2.6.23 Perris

The Jurisdiction is a corporate city in Riverside County in the Coachella Valley of California. The City of Perris is 35 Square Miles in size with a population of 77,000 people and is 10 miles southeast of the County seat, the City of Riverside. Jurisdiction sits directly adjacent to San Bernardino County on its southern boundaries, and San Bernardino County is ten miles to the north. The Burlington Northern and Santa Fe Railway Railroad and California State Highway 215 both run through the middle of the City. State Highway 74 is runs through 4th Street, continues as part of CA State Highway 215 then continues along Pincante Rd through Romoland on the west. Lake Perris is located on the northeast outside City of Perris. Perris Valley Airport is privately owned. It lies in the lower center of the city off Goetz Road. March Air Force Base is located just north of the city and its jurisdiction connects to City of Perris.

Jurisdiction's climate can be described as sunny, mild Mediterranean climate. On average, Perris gets only 10 inches of rain per year. The humidity is quite low all year. The July high temperatures average 97 degrees, while January low temperatures average 35 degrees. There are 275 sunny days per year.





City of Perris was incorporated in 1911. The California Southern Railroad connected through the city in the 1880s to build a rail connection between the present day cities of Barstow and San Diego. This is how the City of Perris began to form. While the railroad had played an important part in establishing the new town, the people now turned to agriculture for their future development. Because of limited groundwater, dry grain farming was the main crop before water was brought to the valley by the Eastern Municipal Water district in the early 1950's. Alfalfa, the King potato (which would produce two crops a year), and still later, sugar beets became the mainstay of farming the Perris Valley.

With the construction of Lake Perris in the late 60's and early 70's - Perris once again became attractive - this time as a recreational area. In addition to the lake's activities Perris' hot air ballooning, Orange Empire Railway Museum and skydiving activities attract international recognition.

### 2.6.24 Rancho Mirage

The City of Rancho Mirage is located in Riverside County in the Coachella Valley of California. Rancho Mirage is approximately 24.8 square miles in area and is 70 miles east of the County seat, the City of Riverside. Riverside County covers 7,208 square miles (approximately the same size as the state of New Jersey) and stretches from Orange County to the Colorado River which forms the border with the state of Arizona. Adjacent counties include San Bernardino County to the north, La Paz county Arizona to the east, Imperial and San Diego counties to the south and Orange County to the west.

Rancho Mirage is located within the Coachella Valley, which extends for approximately 45 miles (72 km) in Riverside County southeast from the San Bernardino Mountains to the saltwater Salton Sea, the largest lake in California. The Valley is approximately 15 miles (24 km) wide along most of its length, bounded on the west by the San Jacinto Mountains, the south by the Santa Rosa Mountains and on the north and east by the Little San Bernardino Mountains. These mountains peak at around 11,000 feet (3,400 m) and tend to average between three to five thousand feet. This effectively blocks the marine layer familiar to most other Southern Californian areas. The Salton Sea is located to the southeast of the Coachella Valley with a surface elevation of 227 feet below sea level.

Regional geomorphology is largely due to the San Andreas Fault which enters the valley at the Chocolate Mountains and Salton Sea in the southeast corner and then follows the centerline of the Little San Bernardino Mountains on the north side of the Coachella Valley. The fault is easily visible along its northern length as a strip of intermittent green against an otherwise bare mountain.

Geographically, the county is mostly desert in the central and eastern portions of the county which includes the Coachella Valley and the City of Rancho Mirage. The Coachella Valley is considered the northwestern portion of the Sonoran Desert. In the summer months daytime temperatures range from 104 °F (40 °C) to 118 °F (48 °C) and nighttime lows from 77 °F (25 °C) to 86 °F (30 °C). During winter, the daytime temperatures range from 70 °F (21 °C) to 90 °F (32 °C) and corresponding nights range from 46 °F (8 °C) to 68 °F (20 °C) making it a popular winter resort destination. Due to its warm year-round climate, the region is well known for the production of tropical fruits such as mangoes, figs and dates. According to the Coachella Valley Water District, average annual rainfall is approximately three inches. The mountains that flank the west and south sides of the Valley are often covered in snow during the winter months, and it is not uncommon for snow levels to dip to 2000'.

The primary arterial to the Coachella Valley is Interstate 10, which runs east-west; while State Route 111 runs for about 30 miles along the southwestern rim of the valley and serves as the main arterial highway between almost all Coachella Valley cities. A four-lane expressway, State Highway 86S opened in the early 1990s as a "special" bypass (hence the "S" designation) of two-lane Highway 86 and connects with Imperial and San Diego counties. The rail right-of-way that parallels the I-10 freeway between San Bernardino and Indio is operated by the Union Pacific Railroad (UPRR). There are no surface roads crossing the railroad tracks within the City. One older two lane bridge (Ramon Road) and one newly constructed six lane bridge crosses the railroad and Interstate 10.

Currently the only passenger rail service in the Coachella Valley is a three times per week long distance train operated by Amtrak between Los Angeles and Florida. This train is known as the "Sunset Limited". The Sunset Limited train operates through this area in the very early hours of the morning in both directions and primarily serves the leisure and tourism market. The Riverside County Transportation Commission (RCTC) and the State of California have been evaluating the feasibility of establishing an intercity passenger rail route between Los Angeles, Fullerton, Riverside, Palm Springs, and Indio. The Union Pacific Railroad (UPRR) continues its firm opposition to any new passenger service on its tracks through this area. Notwithstanding this opposition, the California Department of Transportation (Caltrans) continues to propose such service in the California State Rail Plan. Caltrans has no unilateral powers to compel the UPRR to permit the operation of this train. Nevertheless, for intercity trains (as opposed to a commuter or Metrolink train), there are certain federal processes in place that can ultimately lead to an order compelling the railroad to operate the service.

The public agencies requesting the intercity service may be required to invest large sums in the physical infrastructure of the railroad. Some estimates place the capital investment





requirement at a minimum of $500 million for a new set of tracks. RCTC is working closely with the Coachella Valley and the Pass Areas on this issue and supports the expansion of rail service to additional areas of Riverside County.

Public transportation in the valley, including Rancho Mirage, is provided by the SunLine Transit Agency based in Thousand Palms, which was among the country's first transit agencies to totally convert to alternate fuel vehicles, including full-sized buses powered by fuel cells.

Aviation in the area is served by the Palm Springs International Airport in Palm Springs, Jacqueline Cochran Regional Airport in Thermal and Bermuda Dunes Municipal Airport in Bermuda Dunes. Palm Springs International airport (PSP) is currently served by ten airlines. In 2015, there were a total of 1,888,657 passengers embarking or disembarking at PSP. Although Alaska, SkyWest and American have the largest share of passenger travel; WestJet has grown significantly with the influx of Canadians purchasing vacation homes in the valley. Currently, WestJet serves Vancouver, Calgary, Edmonton, Winnipeg and Toronto (seasonally). Seasonal flights from PSP to New York (Virgin), San Jose (Horizon), Stockton (Allegiant), Denver (Frontier) and Houston (Continental).

The City of Rancho Mirage is a well-known desert resort and residential community in the Coachella Valley. With major regional medical facilities, the Valley's most vibrant and attractive commercial centers, and world-class resort hotels, Rancho Mirage is a desirable destination for residents and visitors alike.

The City has taken shape in a beautiful valley setting surrounded by dramatic views of the Santa Rosa and San Jacinto Mountains to the south and west and the Little San Bernardino Mountains to the north. Lushly landscaped golf course communities and broad arterial streets on the Coachella Valley floor have created a "garden in the desert".

The City of Rancho Mirage was incorporated on August 3, 1973, bringing autonomy to residents and businesses over land use and development on approximately 15.6 square miles of land. Since City incorporation, expansion has occurred without sacrificing the quality of life that originally attracted residents and the City now comprises approximately 16,070 acres or 25 square miles. Its Sphere of Influence (SOI) – County managed lands over which the City has an advisory role – total another 1,202 acres or 1.9 square miles. The City of Rancho Mirage has a Council/Manager form of government and became a Charter City in 1997.

From the beginning, Rancho Mirage was primarily a residential community. Succeeding decades brought new assets and resources. In the 1960s, commercial businesses expanded and "Restaurant Row" developed. The 1970s saw the introduction of the Eisenhower Medical Center as well as five of the City's country clubs. Residential construction boomed in the 1970s and 1980s and that period also saw the addition of

world class destination resorts – Marriott's Rancho Las Palmas (now KSL's Rancho Las Palmas Resort & Spa), the Westin Mission Hills and The Lodge (now the Ritz Carlton Rancho Mirage).

Development in past years has focused along Highway 111 with the majority of future development expected to be near Interstate 10. From the 1990s to present day, the City has added entertainment and shopping venues such as The River (a 250,000 square foot mixed use entertainment/commercial development) and Monterey Marketplace (a 400,000 square foot "big-box" retail center); worked with the Annenberg Trust to transform the Sunnylands Estate and Visitors Center into a world class educational/conference facility, and completed the state-of-the-art Rancho Mirage Public Library. In addition, the recent completion of the Section 19 Specific Plan will permit a large scale mixed use development adjacent to the 16 story Agua Caliente Casino Resort and proposed multi-modal transit station.

### 2.6.25 Riverside

The City of Riverside is located in Riverside County, California, United States, and is the county seat. Named for its location beside the Santa Ana River, it is located at the center of the Inland Empire and is the largest city in the Riverside-San Bernardino-Ontario metropolitan area of Southern California, the 4th largest inland California City and is located approximately 60 miles (97 km) east of Los Angeles. Riverside is the 59th most populous City in the United States and the 12th most populous city in California. The City of Riverside is currently 81 square miles according to the 2015 U.S. Census Quick Facts, and has an estimated population of 322,424.

### 2.6.26 San Jacinto

The City of San Jacinto is a corporate city in Riverside County in the San Jacinto Valley of California. It is approximately 27 square miles in area and is approximately 30 miles east of the County seat, the City of Riverside. San Jacinto is approximately 90 miles east of the City of Los Angeles and approximately 90 miles north of San Diego. The City of San Jacinto sits directly north of City of Hemet on its southern boundary and approximately 10 miles southeasterly of City of Moreno Valley. California State Highway 79 runs north and south through the City. The San Jacinto River, normally a dry riverbed that begins in the San Jacinto Mountains, runs through the northern part of the San Jacinto Valley in a north westerly direction, sitting on the north-easterly boundary of the City. The Soboba Band of Luiseño Indians Tribe is also located northeasterly and adjacent to the City of San Jacinto.

The climate in San Jacinto is considered moderate. Summers are warm and winters are mild. You can usually count on a nice sunny day since San Jacinto averages 342 days of





sunshine each year, and are typical of that of the rest of Riverside County. Winter weather is mild averaging 70-75 degrees daytime, and summers are typically warm with highs averaging 90-95 degrees. The average rainfall is approx. 12.5 inches per year.

Founded in 1870, and incorporated in April 1888, San Jacinto is one of Riverside County's oldest communities, with roots that stretch back to the earliest days of California. Because of its mild climate and fertile land, the region became home to Native Peoples, Spaniards, Mexicans and Americans - all of whom have made a unique and indelible imprint on the character of the valley. Tourism also had an impact on the Valley, beginning around 1900.

Natural hot springs along the north side of the Valley stimulated the development of several tourist resorts with hotels, guest cabins and bath houses. Gilman Hot Springs was the best-known resort. It was originally developed in the 1880s, and was acquired in 1913 by the Gilman family, who ran the resort for 65 years. Soboba Hot Springs was also popular, with its Indian-style cottages scattered along the hillside. Further west was Eden Hot Springs.

The Estudillo Mansion is currently owned by the City of San Jacinto. The City of San Jacinto successfully completed the interior and exterior Estudillo Mansion Restoration project. There has also been the addition of a Water Conservation Garden, parking lot and landscape improvements with a dedication event on May 16, 2009

The City of San Jacinto is a general-law form of government with Council-Manager administration. Council members are elected, with the City Manager appointed by the five council-members elected at-large. The City of San Jacinto is not a participant in the Riverside County Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan. The city has an estimated population of 45,563.

### 2.6.27 Temecula

The City of Temecula is an incorporated city in Riverside County in the Southwestern portion of the County. It has a population of approximately 106,780. Since incorporation in 1989, as a General Law City, the City has created a desirable community with exceptional public safety, community services, recreational amenities, and a robust commerce.

It is 30.17 square miles and is 30 miles south of the County seat, the City of Riverside. Temecula sits north of and adjacent to San Diego County. The City's eastern and western boundaries are with Riverside County Jurisdictions and to the north is the City of Murrieta. Interstate Highway 15 travels north and south through the western portion of the City. State Highway 79 travels east from the City on both the southern and northern portions of the city. Murrieta Creek which is a pathway from Lake Skinner Reservoir is on the western portion of the City and Temecula Creek which is a pathway from the Vail Lake

Reservoir is on the southern portion of the City. They combine to form the Santa Margarita River in the extreme southwest portion of the jurisdiction. The Santa Margarita Mountains run along the western portion of the jurisdiction.

The City of Temecula's mean yearly temperature 64.7°F with an average high temperature of 76.5°F and an average low of 52.9°F. The average annual rainfall is 11.11 inches.

### 2.6.28 Wildomar

The City of Wildomar is a corporate city in Riverside County in the Southwest County of California. It is approximately 24 square miles in area and is 41 miles south of the County seat, the City of Riverside. City of Wildomar sits directly adjacent to the City of Murrieta on the south, City of Menifee on the east, and the City of Lake Elsinore on the northern boundaries. The 15 freeway runs through the middle of the City. The Santa Margarita Watershed runs through the southwest portion of the City. Stormwater runoff from portions of Lake Elsinore and Wildomar collects in the Murrieta & Temecula creeks and forms the Santa Margarita River south of the City.

City of Wildomar's climate in winter is almost never extreme, low temperatures rarely go below freezing. In the summer the high temperatures will hover in the 90's, but some days may go over 100 during heat waves. Rainfall for City of Wildomar is typical of that of the rest of Riverside County.

Wildomar is a community of old and new, more mature homes and acreages with horses and other animals mixed with more modern housing tracts. Nestled between the cities of Murrieta and Lake Elsinore, Wildomar officially became a city on July 1, 2008, at that time home to about 28,000 residents.

The name Wildomar was coined from the names of its three founders -- the WIL from William Collier, the DO from Donald Graham and the MAR from Margaret Collier Graham.





## 2.7 Tribes of Riverside County

Riverside County has 12 Indian Tribes within or bordering the County.

### 2.7.1 Agua Caliente Indian Reservation

The Agua Caliente Band of Cahuilla Indians is a federally-recognized Indian Tribe located in Palm Springs, Calif., with 32,000 acres of reservation lands that spread across Palm Springs, Cathedral City, Rancho Mirage, and into the Santa Rosa and San Jacinto mountains. The Tribe's developments include two Palm Springs golf courses, the Spa Resort Casino in downtown Palm Springs, and the Agua Caliente Casino Resort Spa in Rancho Mirage, which includes the 2,000 seat concert venue, The Show. It also operates the Indian Canyon and Tahquitz Canyon parks, both open to the public.

The Tribal Government employs approximately 200 employees, in addition to over 2,000 employees directly associated with its gaming and hospitality operations. The majority of these employees do not live on the Reservation, but commute from outlying communities, such as, Banning, Palm Desert, Desert Hot Springs, and the high desert mountains, increasing the population on the Reservation during the normal business hours.

Tribal employees work in Tribal offices or in the field. Normal business hours are between the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday. It is common for certain employees (Rangers, Maintenance Crew) to work in remote areas of the Reservation where communications may prove difficult.

### 2.7.2 Augustine Indian Reservation

The Augustine Band of Cahuilla Indians (Tribe) is a federally recognized Indian tribe located in the County of Riverside, California. It was established by Executive Order in 1891. The Augustine Reservation is part of an area occupied for the last 1,000 years by the Cahuilla Indians. The Reservation consists of approximately 602 acres located in the Coachella Valley in southern California, adjacent to the City of Coachella and approximately thirty miles from the City of Palm Springs.

### 2.7.3 Cabazon Indian Reservation

The members of the Cabazon Band of Mission Indians (Tribe), a federally recognized Native American Indian tribe, are descendants of the Cahuilla Indians who have occupied the desert region of southern California for 2,500 to 3,000 years. As one of approximately a dozen independent clans of the Cahuilla, the Tribe claims its own name, territory and common ancestry. Although the Tribe numbered 600 in the mid-1800s, the population had dwindled to less than 50 by the start of the 1980's. Since that time, under a

reorganized tribal government, the Tribe had increased their economic base by taking advantage of opportunities in the "Desert Resorts" area of California's Coachella Valley.

The Tribe is a sovereign nation under the laws of the United States of America and is operated under a democratic form of government. As a sovereign nation, the entire Cabazon community consists of tribal members. Tribal authority resides in the General Council, which meets every three months to confer and make decisions on tribal issues. All tribal members, age eighteen or older, sit on the General Council, which elects a Business Committee every four years. The Business Committee manages the day-to-day operations of the tribe, including making decisions about new business ventures. As Cabazon is a relatively small tribe, this organizational strategy assures that all viewpoints of the tribal community are considered and that the skills and resources of all community members are incorporated into all facets of formulation and implementation of tribal decision making.

The Cabazon Band of Mission Indians' Reservation was established by an act of Congress in 1876 and occupies three separate areas of land consisting of 1,701 acres in the eastern end of the Coachella Valley. This land is held in trust by the federal government for the benefit of the tribe under the jurisdiction of the tribal government.

### 2.7.4 Cahuilla Indian Reservation

The Cahuilla Reservation is located in Riverside County near the town of Anza. It is 18,884 acres in total, but 16,884 acres of the reservation belongs to individual members of the tribe. 2,000 acres belong to the entire tribe in common. It was founded in 1875. The Cahuilla Band of Mission Indians is headquartered in Anza, California. They are governed by a democratically elected tribal council. Their current tribal chairman is Daniel Salgado and the Vice-Chairwoman is Andrea Candelaria.

### 2.7.5 Colorado River Indian Reservation

The Colorado River Indian Tribes include four distinct Tribes - the Mohave, Chemehuevi, Hopi and Navajo. There are currently about 4,277 active Tribal members.

The CRIT Reservation was created in 1865 by the Federal Government for "Indians of the Colorado River and its tributaries," originally for the Mohave and Chemehuevi, who had inhabited the area for centuries. People of the Hopi and Navajo Tribes were relocated to the reservation in later years.

The reservation stretches along the Colorado River on both the Arizona and California side. It includes almost 300,000 acres of land, with the river serving as the focal point and lifeblood of the area.





The primary community in the CRIT Reservation is Parker, Arizona, which is located on a combination of Tribal land, leased land that is owned by CRIT and land owned by non-Native Americans. There are other, smaller communities on the reservation, including Poston, located 10 miles south of Parker.

### 2.7.6 Morongo

The Morongo Reservation is located in the northern and western half of Riverside County, California, approximately 90 miles east of Los Angeles. The Reservation, with an area of approximately 54 square miles, covers portions of the southern flank of the San Gorgonio Mountains, the northern flank of the San Jacinto Mountains, and the valley floor of the San Gorgonio River. It has contiguous boundaries with the City of Banning and the unincorporated community of Cabazon (the only city in California to unincorporated) in the San Gorgonio Pass Area.

The Tribe is one of 107 federally recognized Indian tribes in California. The Tribla Hazard Mitigation Plan (THMP) addresses all the property, infrastructure, and natural environment of the Reservation and under the authority and control of the Tribe. The plan is purposely exclusive of specific sites in its address to protected historical, religious, and cultural resources outside of the Reservation, as the interest in their protection is greater than the potential benefit of identifying their location in this plan.

The Morongo Tribal Council functions as legislative body of the Tribe and additionally manages tribal economic enterprise functions that are normally outside the scope of other governmental agencies. The Tribe provides full municipal like services to its residents including, security, fire, public work functions, water and wastewater treatment, environmental protection, waste management and recycling, natural and cultural resource preservation, emergency management, and other functions typical of a functioning community. According to the United States Census Bureau's "Profile of General Demographic Characteristics: 2010 the population on the Reservation is 1,353 persons.

### 2.7.7 Pechanga Indian Reservation

The Pechanga Indian Reservation borders the City of Temecula to the northwest, the Town of Rainbow to the southwest, and the Cleveland National Forest to the south and east. The General Council of the Tribe is made up of the adult voting members of the band and elects the Pechanga Tribal Council. The Pechanga Indian Reservation encompasses over 6,700 acres with the most recent lands added in 2008. The current land use is mostly rural residential, with homes generally located along the central portion of the reservation along Pechanga Creek.

### 2.7.8 Ramona Band of Cahuilla

The Ramona Band of Cahuilla is a southern California Indian tribe whose reservation is located approximately thirty miles east of Temecula and four miles north of the unincorporated town of Anza, off Highway 371 in Riverside County. The Ramona Reservation was set aside by Executive Order in 1891 and a trust patent for the Reservation was issued in 1893.

The Ramona Reservation encompasses approximately 560 acres. The Reservation is situated at the southwestern base of Thomas Mountain in the southern San Jacinto Mountains. Hog Lake Road provides the only access to the Ramona Reservation.

There are 3 homes on the Reservation and seven residents. There are also several additional buildings, including a maintenance yard, a power house and 5 yurts associated with the Band's Eco-tourism project. All electricity for the homes/buildings is provided by hybrid electrical systems consisting of solar and wind generation with generator back-ups. None of the homes/buildings on the reservation are connected to the "grid".

In early 2017, approximately 82 acres of land were transferred from fee simple into trust status by the Ramona Band of Cahuilla. Thus, the lands are now tribal lands under the jurisdiction of the Ramona Band of Cahuilla. The lands transferred include approximately 75 acres along Bautista Road just south of the Ramona Reservation and approximately 6.73 acres along SR 371 in Anza.

There are three (3) buildings located on the lands in Anza. The buildings included the Ramona Band's administrative offices and library. Each of the buildings has access to the power grid. Water is provided to the buildings via wells located on the property, and each of the buildings has a septic system. Moreover, a tiger tank of 5000 gallons provides water storage for use, if needed, for fire suppression.

The lands located along Bautista Road are all unimproved. One of the parcels lies at the junction of Bautista Road and Hog Lake Road and is the access point to the Ramona Reservation. The other parcels are covered with vegetation.

### 2.7.9 Santa Rosa Indian Reservation

The Santa Rosa Band of Cahuilla Indians Reservation is part of an area, which has been occupied by the Cahuilla for the past 1,000 years. The Reservation consists of 11,021 acres in four separate parcels and is located in the Santa Rosa Mountains near the community of Anza in Riverside California.

They are descendants from the Mountain Cahuilla Band, which historically occupied the mountains south of San Jacinto Peak. The largest parcel is called the Santa Rosa Parcel





and is located 1.25 miles east of the junction of SR –74 and SR – 371. Three separate parcels completely occupy Sections 32, 34, and 36 of T7S, R5E and are one-mile southeast of the main Santa Rosa Parcel. The parcel in Section 34 is called the Old Village Parcel, where their ancestors first settled and the parcel in section 36 is called the Toro Parcel, which is leased out as a microwave relay communications site.

The Santa Rosa Reservation was established on February 2, 1907, under authority of the Act of 1891 as amended. The Act of April 17, 1937 authorized the Secretary of the interior to purchase 640 acres to be held in trust for the Tribe. All reservation land is tribally owned and un-allotted, though some of the land is under assignment and has been passed from generation to generation.

Currently there are approximately 70 people living on the reservation. They are a customs and traditions tribe with a total of 118 members. A tribal council governs with members elected to two-year terms. Because of the very limited size of the band, the Tribal Council also acts as the Planning Committee.

### 2.7.10 Soboba Band of Mission Indians

The Soboba Band of Luiseno Indians ancestral home is the Soboba Reservation located on the San Jacinto River at the base of the western foothills of the San Jacinto Mountains in Riverside County, California. The Tribal trust lands consist of approximately 7,877 acres of reservation including a large parcel of adjoining undeveloped property called the "Jones Ranch". The current population on the Soboba Reservation is approximately 1,200.

### 2.7.11 Torres-Martinez Indian Reservation (partly in Imperial County, California)

The Torres Martinez Desert Cahuilla Indians (Tribe) is a Sovereign Indian Nation and a federally recognized Indian Tribe located in Southern California. Its Tribal land base was established by Executive Order of the United States Federal government on May 15, 1876 as the Torres Martinez Reservation. The Tribal land base consists of 24,822 acres of harsh rugged desert terrain in a checkerboard pattern located in the most rural parts of the Coachella Valley in Southern California. A portion of the Tribal area is submerged under the Salton Sea. The Reservation lands straddle Imperial and Riverside Counties and lie about 50 miles north of the US – Mexico International Border. Temperatures reach 120 degrees Fahrenheit in the summer.

The majority of those living on the reservation live in the Tribe's housing development project which was funded by HUD (36 homes) located about 6 miles away from the Tribe's headquarters (boundaries: Avenue 62 North, Avenue 64 South, Monroe St./Wilma Jean Way West, and Jackson St. East).

The Tribal school-age children who live on the reservation for primarily attend public schools (Grades K-12th) administered by the Coachella Valley School Unified District (CVUSD) or the Desert Sands Unified School District (DSUSD). Several public schools are located within or near the reservation boundaries of the Tribe.

### 2.7.12 Twenty-Nine Palms Indian Reservation (partly in San Bernardino County)

The Twenty-Nine Palms Band of Mission Indians is a United States federally recognized Tribe located in Southern California. The Tribe's members are descendants of the Chemehuevi, who are indigenous people that migrated from the Colorado River area. Geographically, the Tribe has two Reservation sections located near the City of Twenty-nine Palms in San Bernardino County and near the City of Coachella in Riverside County. The San Bernardino County section contains 150 acres of undeveloped land which is adjacent to the Joshua Tree National Park. The Riverside County section contains 242 acres, which has rights-of-way for the Interstate 10 freeway and State Highway 86. On this section, the Tribe has an operating Class 3 Gaming Facility, Tribal Administrative Offices, and Tribal Environmental Protection Agency, which accounts for more than 700 employees. Currently, there is no residential development on either Reservation section.





## 2.8 Special Districts

### 2.8.1 Participating School Districts

***Beaumont Unified School District***

The Beaumont Unified School District is located in the westernmost portion of Riverside County and is located at the intersection of Interstate 10 and Interstate 60. The District is west of the city of the Banning, North of the city San Jacinto, east of the city of Calimesa and unincorporated areas of Riverside lie to the north and east. The student population of the school district is 9,719.

***Desert Sands Unified School District***

The Desert Sands Unified School District is a pre K-12 grade school district located in the heart of Riverside County's Coachella Valley. DSUSD currently has 34 school sites. Included here are 20 elementary schools, 7 middle schools, 6 high schools, and 1 Early Childhood Education Center. Alternative education and continuation programs are offered at two of the district's high schools, Summit/Horizon and Amistad. DSUSD serves the communities of La Quinta, Palm Desert, Indio, Indian Wells, Bermuda Dunes, and portions of Rancho Mirage and Coachella, California. The combined student population of DSUSD is approximately 30,000 students. In addition to the schools, DSUSD also has a District Education Center complex, and Maintenance and Transportation facilities located in the City of La Quinta.

***Hemet Unified School District***

The HUSD is a public school district in Riverside County in the San Jacinto Valley of California. Broken down into 3 categories of schools, with it is approximately 1,250 certificated staff are employed by the district, along with approximately 1,480 classified employees plus approximately 960 substitutes, the district employs over 3,690. These employees work from our 28 sites and district offices to serve our student enrollment of over 21,700. The District serves the cities of Hemet, Anza, Aguanga, Winchester, and Idyllwild.

***Lake Elsinore Unified School District***

The Lake Elsinore Unified School District (LEUSD) was formed in 1989 when Elsinore Union High and Elsinore Elementary merged and unified. It covers 140 square miles including the city of Lake Elsinore, Canyon Lake, Wildomar, as well as a portion of North Murrieta including the communities in and around Ortega Highway and Horsethief

Canyon. Lake Elsinore Unified serves several communities with a combined population of approximately 100,000 and specifically educates 22,000 students.

***Moreno Valley Unified School District***

The Moreno Valley Unified School District is located in the western portion of Riverside County. The District is bound by the City of Perris to the south, and the City of Riverside to west. The District is bounded by the unincorporated areas to the north and east. The student population of the school district is 34,000.

***Perris High Unified School District***

The Perris Union High School District (PUHSD) is located in the City of Perris, a community fifteen miles southeast of the City of Riverside. PUHSD covers approximately 184 square miles and includes the City of Perris, City of Menifee and the unincorporated communities of Romoland as well as a portion of Nuview.

PUHSD currently educates approximately 9,000 students residing through (1) 7-8 middle school, (3) comprehensive high schools, (2) alternative high school programs and (1) dependent charter military school. The school district also provides adult educational services.

***Riverside Community College District (RCCD)***

Riverside Community College District is a three-college higher education system serving residents of Riverside and surrounding counties in California. It is the seventh oldest community college in the state and the fifth largest. RCCD colleges are located in the cities for Riverside, Moreno Valley and Norco. The District's service area is over 450 square miles with a wide range of social, economic, and ethnic diversity in one of the most rapidly growing counties in the nation. Colleges and Annex sites sit within 1/2 mile of major California Freeways and Railroad tracks. Riverside Community College District's average enrollment exceeded 35,000.

***Riverside County Office of Education (RCOE)***

RCOE directly serves over 8,368 students; over 2,100 of those students are classified as special needs students.

RCOE has a total of 138 sites: (4) School of Career Education campuses (Accredited post-secondary occupational training programs); (14) Career Technical Education sites at district school locations; (40) RCOE Alternative Education program sites on school district sites, independent RCOE sites, and detentions; (40) Special Education program sites located on school districts sites, RCOE sites as well as youth/adult Jails/detention





centers; and (22) Head Start / Migrant Head Start sites. Three of which are located in Imperial County with one site approximately 1-mile from the Mexico border.

RCOE provides support and professional development opportunities to (23) school districts comprised of (4) Elementary Districts; (1) High School District; and (18) Unified school districts (totaling over 407 K-12 school sites and representing over 427,000 students, 30,000 of those students are classified as special needs students). In addition to providing services to county school districts, RCOE provides support to: one (1) Tribal school; one (1) California School for the Deaf; four (4) community colleges; and twenty-seven (27) charter schools.

***Riverside Unified School District***

Riverside Unified School District (RUSD) covers just over 92 square miles and encompasses most of the City of Riverside from Van Buren Blvd. and La Sierra Ave. to the west, the Santa River and County line to the north, the city limits to the east and the unincorporated areas of Lake Mathews and Woodcrest to the south.

Riverside Unified is currently the 15th largest school district in the state serving approximately 42,300 K-12 students. The district has 30 elementary schools, 7 middle schools, 5 comprehensive high schools, two continuation schools, one virtual school, and one special education school. The school district also provides pre-school and adult educational services.

***San Jacinto School District***

San Jacinto School District is in the City of San Jacinto that encompasses seven (7) elementary schools, three (3) middle schools, one (1) traditional high school, one (1) continuation high school and two (2) pre-schools for a total of 14 schools. The jurisdiction also includes a District Office, Facilities and Operations Department, and Nutrition Services. The San Jacinto Unified School District has a staff number of 1,522 and student population of 9,825. San Jacinto School District has a total population of 11,347.

### 2.8.2 Fire Protection

***Idyllwild Fire District***

The Jurisdiction is a Special Fire District located in the unincorporated mountain community of Idyllwild, located in Riverside County. It is approximately 5 square miles in area located about 60 miles east of the county seat, the City of Riverside. The community of Idyllwild is surrounded on all sides by the San Bernardino National Forest and is transected from NE to SW by Strawberry Creek. Even though there is a creek running through the community, there is no land that would be considered "flood plain".

The "District" is in mountainous terrain running from 5,000' to 6,500' elevation in a mixed conifer forest fuel type. The Clark section of the San Jacinto Fault runs NW to SE and is SW of the community approximately 7 miles at the closest point. The San Jacinto Fault is considered to be the most active fault in Southern California (D.M. Morton and J.C. Matti, USGS 2005, revised 2008)

Idyllwild averages 26 inches of rain per year with some of that falling as snow in three to four storms per winter. Summer thunderstorms also contribute to the rainfall total as well as wildland fires from lightning.

### 2.8.3 Health Care Facilities

***Kaiser***

Kaiser Permanente, as a whole, had 10.2 million health plan members, 186,497 employees, 18,652 physicians, 51,010 nurses, 38 medical centers, and 622 medical offices reported in 2015. The non-profit Kaiser Foundation Health Plan and Kaiser Foundation Hospitals entities reported a combined $1.9 billion in net income on $60.7 billion in operating revenues. Each Permanente Medical Group operates as a separate for-profit partnership or professional corporation in its individual territory, and while none publicly reports its financial results, each is primarily funded by reimbursements from its respective regional Kaiser Foundation Health Plan entity. KFHP is one of the largest not for profit organizations in the United States.

Kaiser Permanente Riverside Medical Center is a general medical and surgical hospital in Riverside, CA. Kaiser Permanente Riverside Medical Center has 226 beds and was opened in 1989. Currently, we provide care for over 500,000 members throughout Riverside County.

### 2.8.4 Water Districts

***Eastern Municipal Water District***

Eastern Municipal Water District (EMWD), headquartered in Perris, California provides water, wastewater and recycled water service to nearly 800,000 people across a 555 square mile service area from Moreno Valley to Temecula and east to the San Jacinto Valley. EMWD is California's sixth largest water provider and the largest in Riverside County and was established in 1950 through a public vote. It is one of 26 member agencies of The Metropolitan Water District of Southern California. EMWD owns and operates two potable water filtration plants, two groundwater desalination facilities, four regional water reclamation facilities, more than 2,400 miles of potable water pipeline, 1,800 miles of sewer pipeline and 200 miles of recycled water pipeline. EMWD's water





supply sources include local groundwater (potable and desalinated), imported water from the Colorado River and State Water Project systems and recycled water. EMWD also wholesales to seven water agencies within or adjacent to its service area boundaries.

***Imperial Irrigation District***

Imperial Irrigation District (IID) was formed under the State Water Code and is considered a Special District under the governance structure of the State of California. IID is the energy provider to all of Imperial County and portions of Riverside and San Diego Counties, and is also the raw water provider to all municipalities and agricultural users in Imperial County. Throughout the past several years, the district's water and energy operations have been impacted by severe storms (micro bursts), floods and earthquakes varying in magnitude, with the largest being 7.2 on the Richter scale. Imperial Irrigation District provides service to 100,000 customers in the County of Riverside.

***Rancho California Water District***

The Rancho California Water District (RCWD) serves the area known as Temecula/Rancho California, which includes the City of Temecula, portions of the City of Murrieta and unincorporated areas of southwest Riverside County. The area served is approximately 156 square miles in area and is 42 miles east of the County seat, the City of Riverside. The population of the RCWD service area was estimated 108,920 in 2015.

***High Valleys Water District***

The High Valleys Water District, Banning, CA, is located in an unincorporated area known as Twin Pines/Poppet Flats, in Riverside County in the Coachella Valley of California. It is approximately 5 square miles in area and is 44 miles east of the County seat, the City of Riverside. The High Valleys Water District was founded in 1971 and serves the Poppet Flats, Twin Pines and Mt. Edna communities. Since they do not have any natural water resources, they purchase our water (which is already treated) from the City of Banning. The water is pumped up eight (8) miles to the mountain through three separate booster stations, into three storage tanks and 40 miles of pipe and delivered to approximately 225 customers. They have five (5) elected Board members, a Board Secretary, Office Administrative Assistant, a General Manager, two Field Techs, and an on-call/as-needed office assistant. There is no sewer service as the communities are all on septic tanks. Some residents have well-systems, which annual backflow testing is done at those locations.

***Santa Ana Watershed***

The Santa Ana Watershed Project Authority is a Joint Powers Authority formed in 1969 by Eastern Municipal Water District, Inland Empire Utilities Agency, Orange County Water District, San Bernardino Valley Municipal Water District and the Western Municipal Water District. One of SAWPA's main functions is to operate the Inland Empire Brine Line, a 73-mile large diameter regional brine disposal system created to protect water quality in the Santa Ana River and its tributaries. The Brine Line is located in both San Bernardino and Riverside Counties. The Brine Line collects high salt discharges from municipal groundwater treatment plants, power plants, various industries and it serves as an emergency connection to several municipal wastewater treatment plants. Currently, there are a total of 32 active facilities discharging to the Brine Line. All flows collected by the Inland Empire Brine Line are conveyed to Orange County Sanitation District Facilities for treatment and disposal.

The Inland Empire Brine Line serves the portion of the Santa Ana River Watershed within Riverside (1,244 sq. miles) and San Bernardino (1,014 sq. miles) Counties. According to the 2010 U.S. Census, the total population within the Inland Empire Brine Line service area is 3,415,953 inhabitants: 1,686,024 in Riverside County and 1,729,929 in San Bernardino County.

***Western Municipal Water District***

Western Municipal Water District is a Special District in Riverside County in the Inland Empire of California. It services approximately 510 square miles in area and serves portions of the Cities of Riverside, Corona, Perris, Murrieta, and Norco, as well as unincorporated areas of Western Riverside County. The District has areas adjacent to Orange County on its western boundary, San Bernardino County on its north and eastern boundaries, and San Diego County to the south. The Burlington Northern & Santa Fe Railroad and California State Highways 90 and 215 both run alongside sections of the perimeter of the District in Riverside and Perris. Interstate Highway 15 runs along a section of the District's service areas near Murrieta and Corona. The Santa Ana River, a waterway that starts in the Mountains and runs through the cities of Riverside, Corona and Norco, is close to the District's northern boundary. Murrieta Creek runs through the District's service area in Murrieta.

Western Municipal Water District was established on January 19, 1954. On November 12, 1954 Western was annexed to and became a member of Metropolitan Water District of Southern California providing water for mostly agricultural use. In the early 1960's Western began retail water service to domestic water customers. Western originally depended on Colorado River water and in 1979 it changed its primary source of water to





the State Water Project drawing water from Northern California. Today the District serves over 25,000 retail and eight wholesale customers.

# Section 3.0 - The Planning Process

While the Disaster Mitigation Act of 2000 ("DMA 2000") requires that local communities address only natural hazards, the Federal Emergency Management Agency (FEMA) recommends that local comprehensive mitigation plans address man-made and technological hazards to the extent possible. In the 2012 Multi-Jurisdictional Local Hazard Mitigation Plan, the Riverside County Operational Area (RCOA) addressed an expansive set of hazards. Upon review of the hazards since 2012 and the number of incidents that had man-made causes, the Riverside County OA will continue to address the large set of man-made and technological hazards.

The 2017 Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan update review process initially started August 2016.

## 3.1 Planning Process Overview

The Riverside County Emergency Management Department (EMD) formed an internal EMD Planning Team, a Local Hazard Mitigation Plan Steering Committee and continued to utilize the Operational Area Planning Committee (OAPC) as an external planning committee.

Each Planning Team was comprised of various EMD personnel, Riverside County Department leaders, emergency managers and key personnel to discuss the most practical methodology to review and update Riverside County's 2017 plan.

A plan template and other various tools were developed and sent to participants to assist them with creating a new plan or to review and update their existing plan. The County held multiple meetings, workshops and conference calls to assist participants with drafting or updating plans.

(See Appendix B for Participants).





## 3.2 Hazard Mitigation 2017 Planning

Riverside County recognizes the importance of involving all of the stakeholders and utilized the following planning methodologies:

- Reviewed the process of risk assessments and hazard identification with all submitting participants
- Reviewed mitigation actions that are proposed, pending and completed
- Encouraged participation with the planning process by holding community meetings, individual workshops and conference calls
- Coordinated staffing resources to cities and special districts to assist with plan development and provided pertinent detailed information specific to jurisdictions
- Posted information on official Riverside County Emergency Management Department websites
    - RivCoEMD.org
    - RivCoReady.org
- Provided a list of upcoming mitigation training information on Riverside County Public Health Emergency Preparedness and Response (PHEPR) website
    - RivCoPHEPR.org

Project Pre-Plan Research:

- Reviewed the 2012 LHMP, Crosswalk and Comments from Reviewer
- Reviewed the 2013 Local Mitigation Planning Handbook (FEMA)
- Reviewed the 2011 Local Mitigation Plan Review Guide
- Reviewed the 2013 State of California Multi-Hazard Mitigation Plan
- Identified gaps and discuss findings with management team
- Determined resolutions for gaps and discuss what updates are necessary

Project Plan

- Continually update the Operational Area Plan
- Perpetual maintenance of Local Hazard Mitigation Plan
- Engage all participants through outreach efforts
- Submittal of participant annex and worksheets

## 3.3 2012 LHMP Tools

The LHMP Steering Committee determined the best approach was to use the tools that were developed in 2009 to assist in updating the LHMP. The following worksheets and

tools were utilized as a reference for each jurisdiction to evaluate its capabilities, determine its need and to assist in developing goals and strategies:

- Local Jurisdiction Contact Information worksheet
- Hazard Identification Questionnaire
- Specific Hazards Summary Worksheet
- Jurisdiction Vulnerability Worksheet/ Severity Table
- Local Jurisdiction Proposed Mitigation Action and Strategy Proposal
- Local Development Trends Questionnaire
- Provided website: http://myplan.calema.ca.gov
- EMD personnel assigned to assist with the development of the plan and provide additional information when necessary
- Hosted and provided facilities for workshops
- Developed and provided step by step instruction guides
- Provided assistance via email, phone calls and one-on-one meetings
- Assisted jurisdictions obtain/create maps
- Provided maps for individual jurisdictions
- Provided incident information for their jurisdiction or authority
- Provided information on mitigation trainings and seminars

## 3.4 Participating Jurisdictions Planning Process

The 2017 LHMP has a variety of participants and parties with vested interest across the County. The submitting participants include cities, education, fire protection, hospital, and water districts.

The Participants List is found in Section 1.4 or Appendix B: Participants.

The goals of the Operational Area are to ensure the plan is comprehensive and easy to utilize and implement. The final 2017 Multi-Jurisdictional Local Hazard Mitigation Plan consists of the Riverside County Operational Area Plan and the individual Annexes. Each annex is designed to be a stand-alone Local Hazard Mitigation Plan for the cities and special districts, yet clearly show a linkage to the Operational Area Plan, other County Plans (e.g. County General Plan) and the State Hazard Mitigation Plan. (See Annexes A1-46)

The 2017 LHMP outreach presentations were given in 12 community outreach meetings, 12 LHMP workshops and 32 meetings were held with individual cities or special districts. (See Appendix D)





During the LHMP process, participants were provided directions on how to complete the "Annex" and other templates. Resources provided to participants included: worksheets, templates, examples, websites, mapping sites and other resources to assist in the process. Riverside County Emergency Management Department personnel were available to assist each participating jurisdiction during the LHMP process.

Additional information and resources were emailed to the participants as they became available through "E-Blasts" (mass email sent to every participant). An example is the "My Plan" mapping website on the Hazard Mitigation Portal for Cal OES.

A flexible timeline was presented in the meetings, and sent out via email as changes occurred. The review process of the draft annexes is outlined as follows:

- Participants submitted draft LHMP via email to EMD for review and comments.
- EMD reviewed plans, crosswalks and inventory worksheet to ensure completeness
- Checklists were utilized to document all components of the plans were complete and accompanied with all worksheets and attachments referenced in the plan
- Acknowledgement and checklists were sent back to the participants noting identified gap findings and comments. We requested additional information as necessary
- After revisions were completed by participants, the draft was resubmitted to EMD for adoption into the Multi-Jurisdictional Local Hazard Mitigation Plan
- All correspondence, meetings, and conference calls were recorded in a database to track status of plan

## 3.5 Regional Planning Process (Riverside County Operational Area)

The Operational Area began the regional planning process by creating the EMD Planning Team who has extensive experience in Emergency Management and vast knowledge of the hazards and mitigation efforts in Riverside County.

EMD's external LHMP Steering Committee included EMD Management and the Operational Area Planning Committee (OAPC). The committee includes representatives from EMD, the Board of Supervisors, city emergency managers, city elected officials, tribal representatives, school districts and special districts. The initial coordination of the LHMP update process was presented to the OAPC attendees and letters of commitment and participation were sent via email to reginal stakeholders through the Operational Area Planning Committee distribution list.

The quarterly Operational Area Planning Committee (OAPC) meetings are intended to engage:

- local jurisdictions
- businesses
- non-profit organizations
- faith-based organizations
- governmental agencies
- tribal communities
- special districts
- educational institutions
- utility companies
- public transportation
- healthcare facilities

The Operational Area Planning Committee (OAPC) Mission:

- To provide facilities, systems, and emergency management training for the officials of the Riverside County Operational Area, including County and City government personnel and participating special districts.
- To effectively and efficiently manage a disaster affecting jurisdictions within the Riverside County Operational Area (Govt. Code 8550 et. seq.).

The Riverside County Operational Area is governed by the Board of Supervisors and the Operational Area Planning Committee (OAPC). OAPC meets quarterly.

OAPC has several subcommittees who are responsible for determining the use and distribution of funds from grants channeled directly through the Operational Area, i.e., Homeland Security, Buffer Zone Protection Plan grant programs, Local Hazard Mitigation Steering Committee, Mass Care and Shelter Task Force and Community Emergency Response Team (CERT) Program Manager Committee.

Please see Appendix D: Meetings for list of OAPC attendees and sign-in sheets.

## 3.6 EMD Planning Team

The internal EMD Planning Team consists of the EMD Management and key personnel of EMD. The job classifications of the committee included:

- Director
- Deputy Director
- Program Chief II





- Emergency Services Manager
- Program Coordinator II
- Emergency Services Coordinators (7)
- Emergency Medical Services Specialist (3)
- Senior Health Educator
- Health Education Assistant
- Volunteer Services Program Manager
- Grants Personnel (Administrative Services Analyst II, Contracts and Grants Analyst and Account Technician II)
- Office Assistant III
- Secretary

EMD as a whole department is structured to resemble the Incident Command System (ISC) Organizational Chart. There are four divisions; Preparedness, Operations, Business and Finance, and Emergency Medical Services. The Department is able to expand or contact similarly to ICS and places an importance on Span of Control. The following pages have figures of the Emergency Management Department Organizational Chart.

**Figure 12:** Riverside County Emergency Management Department Organizational Chart:

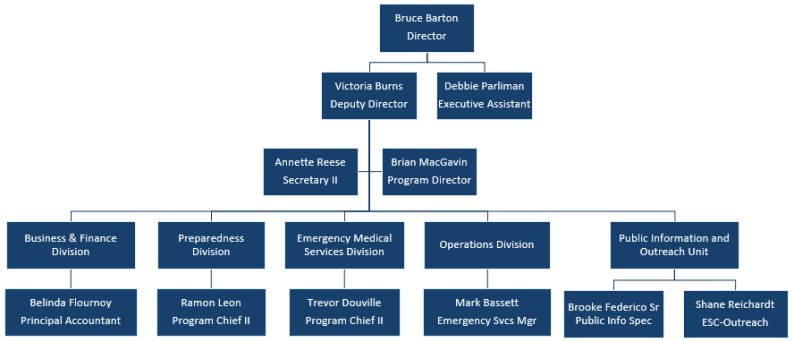

**Figure 13:** EMD Preparedness Division

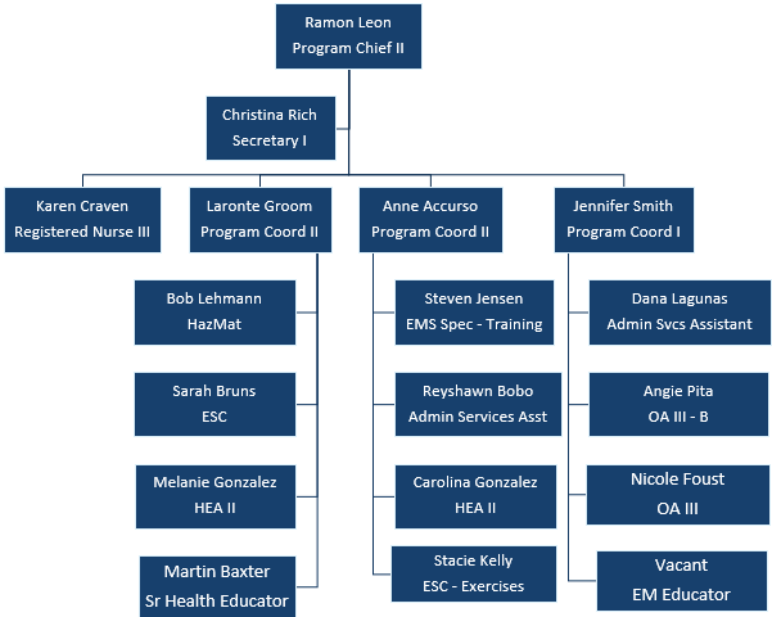




**Riverside Operational Area**
**Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP)**

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**Figure 14:** EMD Operations Division

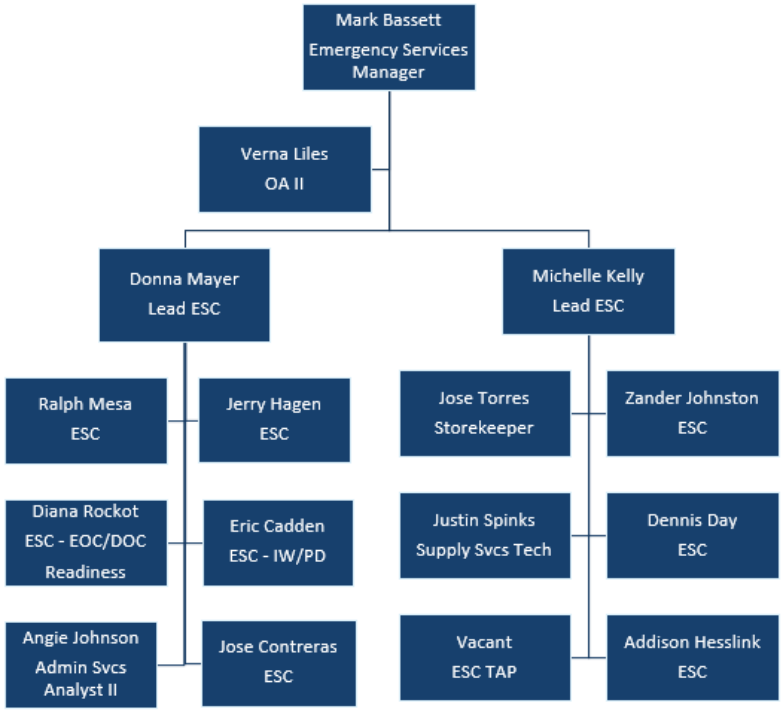

**Figure 15:** EMD Riverside Emergency Medical Services Agency Division

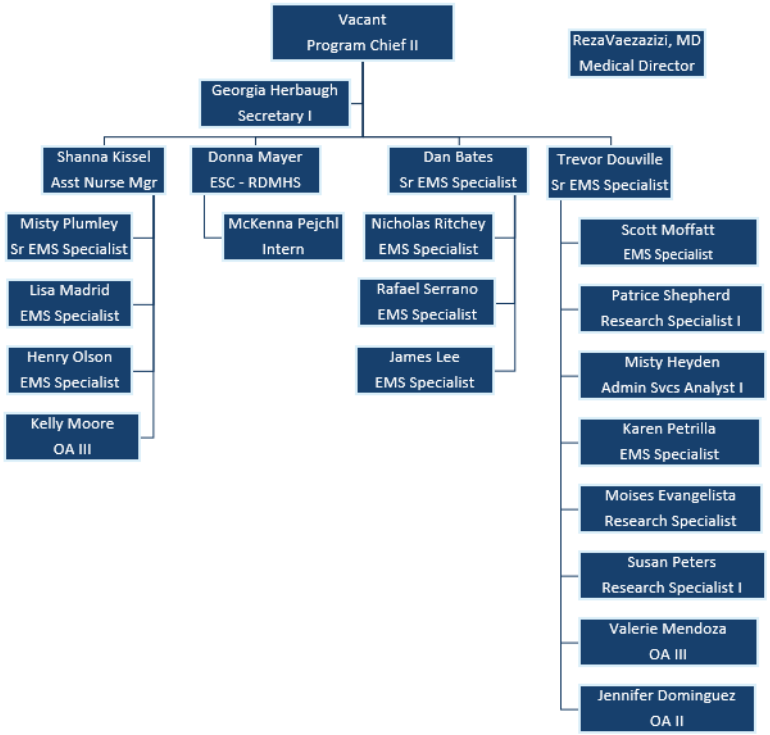






**Figure 16:** EMD Business and Finance Division

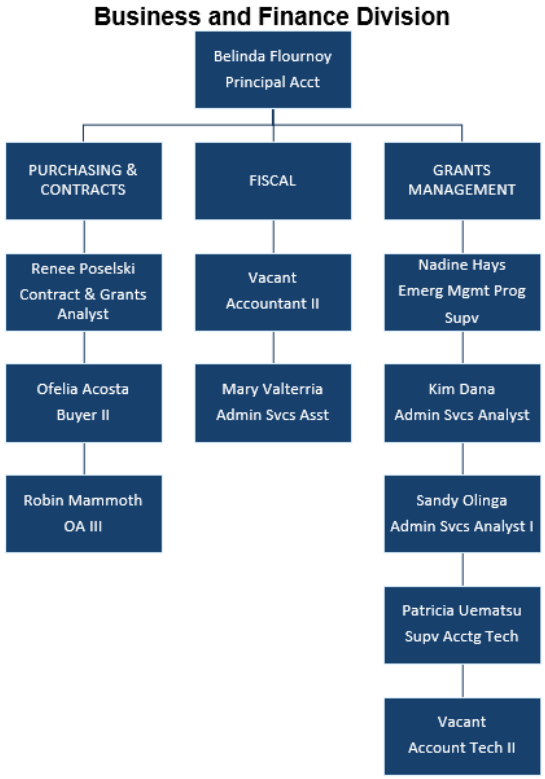

## 3.7 LHMP Steering Committee Partners

Riverside County recognizes that any successful planning activity, such as the development of a comprehensive plan, involves bringing together a cross-section of the public to reach consensus on how to achieve a desired outcome or resolve a community problem. Using this inclusive process, the public gains a better understanding of the problem or issue and strives to develop a vision along with goals, priorities, and actions.

The result is a common set of community values and widespread support for directing financial, technical, and human resources to an agreed upon course of action, usually identified in a plan. The same is true for mitigation planning. An effective and open public involvement process ensures that all citizens understand risks and vulnerability so that they will work with the jurisdiction and support policies, actions and tools that over the long-term will lead to reduction and/or eliminate long-term risk to human life and property in the event of a disaster or hazard.

An introductory meeting was held with County Department leaders and a presentation given to develop a planning and review process. The following table identifies the agencies that were represented.

**Table 5**: Internal Steering Committee Partnering Agencies

| DEPARTMENTS | POSITION | TOPIC |
|---|---|---|
| Agricultural Commissioner's Office | Deputy Ag Commissioner | Insect Infestation, Drought |
| Animal Services | Commissioner of Field Services, Lieutenant of Field Services | Animals affected |
| Assessor's Office | Secretary | Population and Building Data |
| Cal OES | Emergency Services Coordinator | Drought, Earthquake, Insect Infestation, State Representative |
| Economic Development Agency | Aviation Facilities Specialist/Grants, Aviation Secretary, Assistant Director, Facilities Management Division | Population and Demographics |





| | | |
|---|---|---|
| Emergency Management Department | Program Director, Program Coordinator II, Emergency Services Coordinator, Health Education Assistant, Office Assistant | Goals and Objectives, Nuclear, Power Outage, Pipeline, Communication Failure, Cyber Attack, Extreme Weather, Landslides, Aqueduct |
| Environmental Health | Deputy Director | Hazardous Materials, Earthquake |
| Flood Control | Principle Engineer | Dam failure, Flood Hazard |
| Imperial Irrigation Water District | Emergency Services Coordinator | Aqueduct, Power Outage |
| NOAA | Acting Meteorologist In Charge | Extreme Weather, Drought |
| Public Health | Branch Chief | Pandemic and Disease/Contamination, |
| RC-HR / County Hospitals | Safety Coordinator | Health Care Facilities, Health Impact, Behavior Health |
| Riverside County Fire | Chief, Division Chief | Wildfire, Pipeline, Transportation and Hazardous Materials |
| Riverside County IT | Deputy Chief Information Security Officer, Chief Information Security Officer, Information Technology Officer II, Supervising Communications Analyst | Communication Failure and Cyber Attack |
| Riverside County Office of Education | Safety, Emergency Preparedness Coordinator | Schools, Shelters, Critical Facilities |
| Sheriff's Office | Sergeant | Civil unrest, Jails, Terrorism |
| SoCal Edison | Local Public Affairs Officer | Power Outages |
| SoCal Gas | Public Affairs Manager | Pipeline |
| Transportation and Land Management Agency | Chief Engineering Geologist, Admin Services Manager | Earthquake, Landslide, GIS, General plan references |

Various portions of the 2012 plan included information that was provided by internal county departments. These sections were highlighted and given to the originating departments for review, comments, and updates by utilizing the following methodology:

- Review information provided and identify necessary corrections for updates
- Review definition for hazards to ensure accuracy
- Provide any additional incidents that occurred between 2012 to present
- For revisions or updates, provide supporting documentation with credible sources including but not limited to, studies (planning, safety, mitigation, etc.) maps, charts, tables, photos, surveys, cost-benefit analysis or technical guidance
- Facilitate discussions for each hazard prioritization and mitigation measure
- Develop a group or team from your department to review the document and changes prior to sending the information back to EMD
- Contact EMD to answer any questions or to provide additional comments
- Provide updated maps
- Return all revisions to EMD

The Transportation and Land Management Agency (TLMA) provided updated county-wide maps that had been included in the 2012 Multi-Jurisdictional Plan and the County's 2015 General Plan.

As part of the planning process, a review of the unincorporated area was conducted to assess existing and new hazards through utilization of MyPlan though Cal OES.

Emergency Management Agencies in the neighboring and surrounding counties were contacted to discuss their mitigation efforts and plans, inclusive of:

- Orange County
- San Bernardino County
- San Diego County
- La Paz County (Arizona)

Outreach was conducted with tribal communities in Riverside County. Most of the tribes have completed Tribal Hazard Mitigation Plans. The participating tribe that joined the County in the 2017 update expressed their intent to build a stronger partnership with the County.

(See Section 2.7 for all tribes located in Riverside County)





## 3.8 Public Outreach

Public notice of the LHMP update was posted on the Emergency Management Department Website (RivCoEMD.org), Twitter and announced at various community meetings throughout the County. All meetings were open to the public and allowed public comment. The audience represented various vested individuals who provided input, insight, and concerns regarding the hazards affecting their specific communities. Comments made were regarding the incorporation of particular hazards that the plan already addresses.

(Please see Appendix D for all outreach and meeting information)

In an attempt to seek public comment postcards with LHMP and National Flood Insurance Program (NFIP) information was distributed thought the County. The post cards will be presented at County owned Fire stations as well as community events. Every year during National Preparedness Month the postcards will be distributed again to continue to seek comments throughout the plan cycle. English and Spanish versions were available. For 2017 National Preparedness Month locations where postcards were distributed, please see Appendix D.

**Figure 17:** EMD LHMP Website

LHMP URL: http://www.rivcoemd.org/LHMP

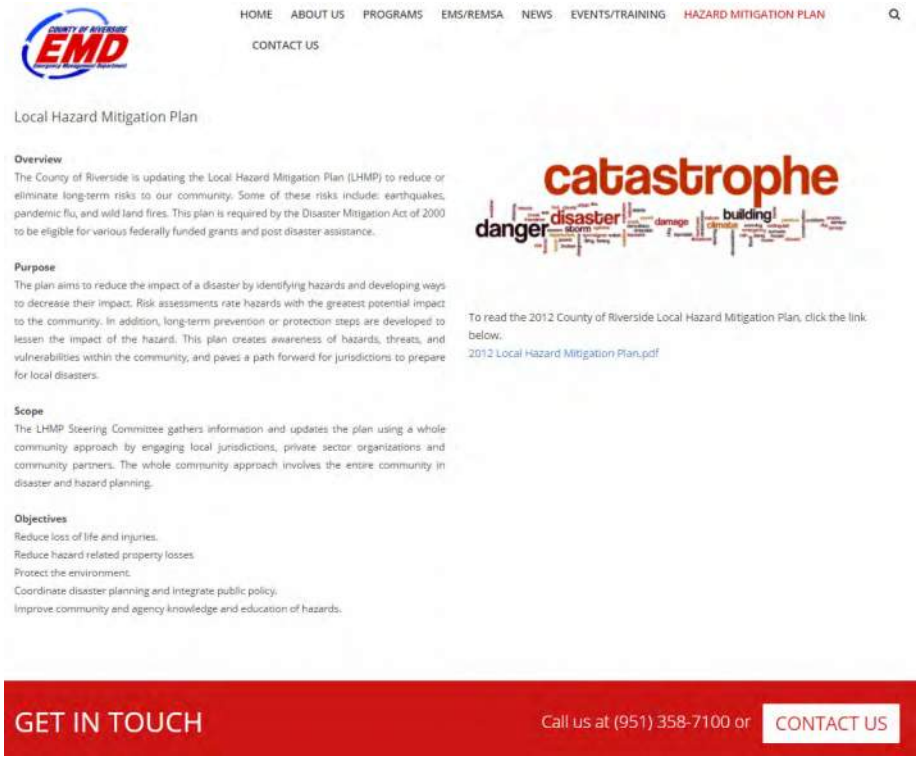






**Figure 18:** Twitter Post

Twitter URL:
https://twitter.com/RivCoReady?ref_src=twsrc%5Etfw&ref_url=http%3A%2F%2Frivcoemd.org%2Frivcoready%2F

**Figure 19** LHMP Postcard Side 1

**Figure 20** LHMP Postcard Side 2

**Riverside Operational Area**
**Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP)**

July 2018

**Figure 21:** LHMP Spanish Postcard Side 1

**Figure 22: LHMP Spanish Postcard Side 2**

### 3.8.1 Hazard Mitigation Meetings

Internal EMD Planning meetings were held to discuss review findings and the process was planned as explained in Section 3.1. The EMD Planning Team met regularly to discuss plan progress, participant status and any other matters as necessary.

Organizational efforts were initiated with the County and participating jurisdictions to inform and educate the plan participants of the purpose and need for updating the countywide hazard mitigation plan. An initial meeting was held with key community representatives to discuss the plan update process. The initial jurisdiction kick-off meetings were held on December 6th, 8th, 13th and 15th in 2016. In 2017 workshops were then held the first two weeks of February and June. FEMA's two day course G-318 (Mitigation Planning for Local and Tribal Communities) was hosted by EMD on April 3rd and 4th.

**Table 6:** Table of Presentations and Meetings

The following table documents public outreach efforts and community meetings:

| Public Outreach Presentations and Updates | | | | |
|---|---|---|---|---|
| **Date** | **Name of Meeting, Location** | **Type of Presentation** | **Number Attending** | **Hours** |
| 6/22/2016 | Western Riverside Emergency Council (WREC) Meeting, Riverside | Informed Council of upcoming Plan update and encouraged participation | 19 | 20 mins. |
| 7/14/2016 | Operational Area Planning Committee (OAPC) Meeting, Beaumont | Informed OA on upcoming Plan to update | 163 | 15 mins |
| 9/19/2016 | Palo Verde COMM. Meeting, Blythe, CA. | LHMP discussion, Local Hazard Mitigation Plan update process, encouraged East County participation and Public Outreach | 16 | 1 |
| 9/29/2016 | Email Distribution #1 | Email blast, Distributed contact verification emails for partnering jurisdictions and agencies. Provided LHMP informational guides and resources. | _ | _ |





| | | | | |
|---|---|---|---|---|
| 10/6/2016 | Local Hazard Mitigation Plan Steering Committee Kick-Off for County Departments | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>Update Process<br>County Inventory Checklist<br>County Risk Assessment<br>Participants, New, Returning, and Not Participating | 19 | 2 |
| 10/11/2016 | Emergency Management Project Committee | Project Overview, LHMP introduction, planning process | 34 | 10 mins. |
| 10/13/2016 | Operational Area Planning Committee (OAPC) Meeting, Beaumont | Updated OA on progress of update, offered participants opportunity to reach out to county for technical support, offered public opportunity to ask questions and provide comment (no comments made) | 64 | 2 |
| 10/19/2016 | Steering Committee Email Distribution #1 | Informed the members of the google drive that contains LHMP documentation for additional support<br>Informed about the next steps and what about the next meeting date<br>Provided contact information for EMD LHMP staff | _ | _ |
| 12/1/2016 | Email Distribution #2 | Invitation to LHMP Template workshop, update on county hazard identification/ranking, and general information on where they should be in the update process | _ | _ |
| 12/6/2016 | Tribal Workshop, Riverside | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>County Update Process and Progress<br>Mitigation Websites and Resources<br>Technical Support | 7 | 1 |
| 12/8/2016 | City Workshop, Riverside | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>County Update Process and Progress<br>Mitigation Websites and | 15 | 2 |

| | | | | |
|---|---|---|---|---|
| | | Resources<br>Technical Support | | |
| 12/8/2016 | Mountain Emergency Communications COMM. Meeting, Idyllwild, CA | LHMP discussion, Local Hazard Mitigation Plan update process | 7 | 2 |
| 12/13/2016 | Special District Workshop, Riverside | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>County Update Process and Progress<br>Mitigation Websites and Resources<br>Technical Support | 8 | 1 |
| 12/15/2016 | School District Workshop, Riverside | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>County Update Process and Progress<br>Mitigation Websites and Resources<br>Technical Support | 7 | 2.5 |
| 12/15/2016 | Northwest COMM. Meeting, Jurupa Valley, CA | LHMP discussion, Local Hazard Mitigation Plan update process | 12 | 2 |
| 12/20/2016 | Southwest COMM. Meeting, Murrieta, CA | LHMP discussion, Local Hazard Mitigation Plan update process | 6 | 2 |
| 12/29/2016 | Steering Committee Email Distribution #2 | Sent each member questions about specific hazards that pertained to the department they work for | _ | _ |
| 1/4/2017 | Email Distribution #3 | Informed LHMP participants of additional LHMP workshops that will be hosted to provide further assistance | _ | _ |
| 1/11/2017 | Local Hazard Mitigation Plan Steering Committee, Riverside | Group Discussion, Hazard Identification/Ranking Final Review, Mitigation Actions and Strategies Brainstorm | 16 | 2 |





| | | | | |
|---|---|---|---|---|
| 1/12/2017 | Operational Area Planning Committee (OAPC) Meeting, Beaumont | Updated OA on progress of update, offered participants opportunity to reach out to county for technical support, offered public opportunity to ask questions and provide comment (no comments made) | 74 | 2 |
| 1/19/2016 | Steering Committee Email Distribution #3 | Thanked all members for participating in the previous meeting. Provided the risk scores of the hazards that were discussed at the previous meeting. Provided the most current updates for the mitigation actions from 2012 & asked for each of them to provide new actions for current county hazards. Informed about the next meeting date | _ | _ |
| 2/7/2017 | City Workshop, Riverside | Answered LHMP questions & concerns. Provided additional assistance if needed Reviewed LHMP drafts if needed | 10 | 1 |
| 2/8/2017 | School District Workshop, Riverside | Answered LHMP questions & concerns. Provided additional assistance if needed. Reviewed LHMP drafts if needed | 2 | 1 |
| 2/9/2017 | Special District Workshop, Riverside | Answered LHMP questions & concerns Provided additional assistance if needed Reviewed LHMP drafts if needed | 4 | 1 |
| 2/14/2017 | Email Distribution #4 | Informed LHMP participants about the final 2017 LHMP County Hazard Ranking. Talked about a possible LHMP Training that EMD is deciding on hosting Informed about the Senate Bills 1000 & 379. Provided a link to help participants obtain maps for their jurisdiction if they are having trouble with Hazus | _ | _ |

| | | | | |
|---|---|---|---|---|
| 2/23/2017 | Email Distribution #5 | Informed LHMP participants about the cancellation of the April workshops due to the substation of having the LHMP FEMA Training. Informed about the confirmation of the FEMA G-318 Training that will be hosted April 3-4 and provided the sign-up link. Informed that the June workshops are still going to be held to provide any additional assistance on the plan | _ | _ |
| 2/27/2017 | Riverside County Emergency Managers Committee | Provided Cities and various County Departments information on the status of the update. Offered information on how committee participants could become involved in the planning process | | 2 |
| 3/1/2017 | Steering Committee Reminder Email | Reminded members that the date for submitting new mitigation actions for the current top 10 county hazards was approaching | _ | _ |
| 3/15/2017 | Palo Verde COMM. Meeting, Blythe, CA | LHMP discussion, Local Hazard Mitigation Plan update process | 18 | 1.5 |
| 4/5/17 | Operational Area Planning Committee and Annual Disaster Council Meeting | Updated OA on progress of update, offered participants opportunity to reach out to county for technical support, offered public opportunity to ask questions and provide comment | | 2 |
| 4/21/2017 | Steering Committee Email Distribution #4 | Provided minutes from previous meeting, informed about reviewing LHMP mitigation actions and goals/objectives, sent calendar invite for next meeting | _ | _ |
| 4/24/2017 | Steering Committee Email | Sent selected committee members to provide input on LHMP hazard profiles depending on the hazard that corresponds to the department they represent | _ | _ |





| | | | | |
|---|---|---|---|---|
| 6/5/2017 | Tribal Workshop, Riverside | Answered LHMP questions & concerns. Provided additional assistance if needed Reviewed LHMP drafts if needed | 4 | 1 |
| 6/6/2017 | City Workshop, Riverside | Answered LHMP questions & concerns. Provided additional assistance if needed Reviewed LHMP drafts if needed | 8 | 1 |
| 6/7/2017 | School District Workshop, Riverside | Answered LHMP questions & concerns. Provided additional assistance if needed Reviewed LHMP drafts if needed | 6 | 1 |
| 6/8/2017 | Special District Workshop, Riverside | Answered LHMP questions & concerns, Provided additional assistance if needed Reviewed LHMP drafts if needed | 6 | 1 |
| 7/13/2017 | Operational Area Planning Committee (OAPC) Meeting, Beaumont | Updated OA on progress of update, offered participants opportunity to reach out to county for technical support, offered public opportunity to ask questions and provide comment (no comments made) | | 2 |
| 8/17/2017 | Local Hazard Mitigation Plan Steering Committee, Riverside | Review completed sections for finalization | 10 | 1 |
| 9/2/2017 | Indio Preparedness Month Booth, Home Depot, at 42100 Jackson Street from 9 a.m. - 12 p.m. | Personal preparedness and mitigation information | | 3 |
| 9/5/2017 | Twitter Post | LHMP and NFIP information | | |
| 9/9/2017 | Riverside Preparedness Month Booth, Galleria at Tyler, 1299 Galleria at Tyler from 11 a.m. - 3 p.m. | Personal preparedness and mitigation information | | 4 |
| 9/9/2017 | Farm Barn, Wildomar Preparedness and Mitigation Presentation | Personal preparedness and mitigation information | | 1 |
| 9/12/2017 | County Preparedness Month Booth, County of Riverside Administration Center, 4080 Lemon Street, from 10:30 a.m. - 1:30 p.m. | Personal preparedness and mitigation information | | 5 |

| | | | | |
|---|---|---|---|---|
| 9/16/2017 | Lake Elsinore Preparedness Month Booth, 710 W. Graham Ave., Lake Elsinore, CA | Personal preparedness and mitigation information | | 4 |
| 9/16/2017 | Perris Preparedness Month Booth, Walmart, 1800 N. Perris Blvd from 8 a.m. - 12 p.m. | Personal preparedness and mitigation information | | 4 |
| 9/23/2017 | Jurupa Valley Preparedness Month Booth, K-Mart, 7840 Limonite Avenue from 8 a.m. - 12 p.m. | Personal preparedness and mitigation information | | 4 |
| 9/30/2017 | Hemet Preparedness Month Booth, Hemet Valley Mall, 2200 W. Florida Ave. from 8 a.m. - 12 p.m. | Personal preparedness and mitigation information | | 4 |

**Table 7:** Participant Meetings

The following table documents participant facilitated meetings:

| LHMP Meetings Attended | | | | |
|---|---|---|---|---|
| **Date** | **Location** | **Type of Meeting** | **Number Attending** | **Hours** |
| 8/24/2016 | City Emergency Operations Center, Riverside | One to One Assistance LHMP Process Familiarity and HAZUS/GIS information | 3 | 1 |
| 11/10/2016 | Hemet Fire Administration Building, Hemet | Plan review, update process and clarification assistance | 3 | 2.5 |
| 11/15/2016 | Riverside EMD | Plan review, update process and clarification assistance | 2 | 1 |
| 12/13/2016 | Conference call to Mather | CA SHMPT Quarterly Meeting | N/A | 4.5 |
| 12/14/2016 | Hemet | Plan review, update process and clarification assistance | 3 | 2 |
| 12/15/2016 | Moreno Valley | Plan review, update process and clarification assistance | 6 | 1 |
| 2/7/2017 | Riverside EMD | Plan review, update process and clarification assistance | 2 | 1 |
| 3/14/2017 | Perris | Participation with Eastern Municipal Water Districts Planning Committee | 10 | 2.5 |
| 3/15/2017 | Riverside EMD | Plan review, update process and clarification assistance | 3 | 5 |





| | | | | |
|---|---|---|---|---|
| 3/28/2017 | Riverside EMD | Plan review, update process and clarification assistance | 3 | 2 |
| 3/29/2017 | Beaumont Police Department | Plan review, update process and clarification assistance | 4 | 2 |
| 4/11/2017 | Mather | CA SHMPT Quarterly Meeting | N/A | 4.5 |
| 4/11/2017 | Murrieta Fire Administration | Plan review, update process and clarification assistance | 4 | 1.15 |
| 4/13/2017 | Cathedral City Fire Station | Plan review, update process and clarification assistance | 2 | 2 |
| 4/20/2017 | Banning City Hall | Plan review, update process and clarification assistance | 3 | 1.5 |
| 4/20/2017 | Desert Sands USD | Plan review, update process and clarification assistance | 4 | 2 |
| 4/25/2017 | Calimesa City Hall | Plan review, update process and clarification assistance | | |
| 4/25/2017 | Temecula City Hall | Plan review, update process and clarification assistance | 4 | 1.15 |
| 4/26/2017 | Perris | Participation with Eastern Municipal Water Districts Planning Committee | 6 | 2 |
| 4/27/2017 | San Jacinto City Hall | Meeting with City Manager and staff to discuss joining the County LHMP | 5 | |
| 5/1/2017 | Moreno Valley USD | Plan review, update process and clarification assistance | 3 | 1.5 |
| 5/1/2017 | Lake Elsinore USD | Plan review, update process and clarification assistance | 2 | 1.15 |
| 5/2/2017 | Banning - High Valley Water District | Plan review, update process and clarification assistance | 3 | 2 |
| 5/3/2017 | Indian Wells & Palm Desert | Plan review, update process and clarification assistance | 2 | 7 |
| 5/9/2017 | La Quinta City Hall | Plan review, update process and clarification assistance | 2 | 1.5 |
| 5/17/2017 | Beaumont Police Department | Plan review, update process and clarification assistance | 5 | 1.5 |
| 5/18/2017 | Desert Hot Springs | Plan review, update process and clarification assistance | 3 | 3 |
| 5/24/2017 | Riverside EOC | Participation in Riversides LHMP planning meeting | 6 | 1 |
| 5/25/2017 | Wildomar City Hall | Plan review, update process and clarification assistance | 3 | 2 |
| 5/25/2017 | San Jacinto City Hall | Plan review, update process and clarification assistance | 2 | 2.5 |
| 5/31/2017 | Murrieta Fire Administration | Plan review, update process and clarification assistance | 3 | 3 |
| 6/19/2017 | Riverside EMD | LHMP and HMGP assistance for La Quinta | 2 | 1 |

For complete meeting lists, sign-in sheets, and agendas please see Appendix D.

The public outreach meetings for the LHMP process were conducted in multiple venues. The meetings outlined a brief history of previous hazards, mitigation actions, and the benefits of a multi-jurisdictional hazard mitigation plan in Riverside County.

As part of the public outreach and the regional outreach and planning, the audience was asked at different times during the presentations if there are any hazards they were concerned about, not addressed or problem that has occurred in their living or working areas in the county.

The documented concerns are the following:

- High Winds
- Wildfire
- Earthquake
- Flooding
- Communication Failures
- Lack of trained volunteers
- Information on Jurisdictional Hazards

All of these concerns are being addressed in the hazard profiles located in Section 5, as well as current and future mitigation actions.

For a complete list of actions please see Appendix C

## 3.9 Existing Plans and Studies

Coordination with other community planning efforts is also paramount to the success of this plan. Hazard mitigation planning involves identifying existing policies, tools and actions that will reduce a community's risk and vulnerability to hazards. Riverside County uses a variety of comprehensive planning mechanisms, such as general plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this plan establishes a credible and comprehensive plan that ties into and supports other community programs. The development of this plan incorporated information from the following existing plans,





ordinances, studies, reports and initiatives as well as other relevant data from neighboring communities and other jurisdictions.

- General Plan
- Zoning Ordinances
- Subdivision Ordinances
- Water Conservation
- Wildfire Ordinance
- California Building Codes
- Riverside County Flood Control Master Drainage Plan
- Safety Element General Plan
- Community Wildfire Protection Plan(s)
- Riverside County Flood Insurance Studies
- Riverside County General Plan and Background Report
- Riverside County Multi-Hazard Mitigation Plan, 2012
- Riverside Operational Area Emergency Operations Plan
- State of California Multi-Hazard Mitigation Plan

# Section 4.0 – Updates and Mitigation Actions

## 4.1 Updates to 2012 Plan

In the 2012 plan cycle, Riverside County identified Pandemic Influenza as a hazard because populations worldwide are at risk for infection and illness. In the past influenza has spread worldwide within months and is expected to spread even more quickly today with air travel. In the 2012 plan Pandemic was ranked fairly low in the list of County hazards. In the 2017 plan Pandemic ranked in our top 3 hazards with earthquakes and wildfires.

The LHMP Steering Committee felt Communication Failure should be added to the 2017 plan because it has the potential to affect response capabilities in both small and large events. In 2016 a 911 failure impacted the EMS system. This had the potential to lead to loss of life in the Coachella Valley. During disasters, communication failures can have a detrimental effect on the operation of the County Emergency Operation Center (EOC) ultimately hindering the OA's agencies ability to return to normal operations.

Dependence on computer systems has opened up vulnerabilities. Sensitive security information stored along with personal information is now stored on networks. For those reasons, computer networks have become a target for hackers and organizations with the intent to do harm. In 2016 the County of Riverside was a target for Ransom Ware.

The maps that are in the 2017 plan are current maps from County Transportation GIS Division and Cal OES's MyPlan Program.

Some revisions to the 2012 plan mitigation actions included:

- Revised Risk Assessment, concerning updated hazard information
- Changed jurisdictional and Special Districts participants.
- Incorporation of existing plans, ordinances and studies.

New Goals and Mitigation Strategies were added that reflect our top ten (10) hazards and risks for Riverside County.

1. Earthquake
2. Pandemic Flu
3. Wildland Fire
4. Electrical Failure
5. Emergent Disease/Contamination
6. Cyber Attack
7. Terrorist Event
8. Communications Failure





9. Flood
10. Civil Disorder

## 4.2 Hazard Updates

The hazards identified in the 2012 LHMP remain fairly similar in 2017, however the 2017 LHMP Steering Committee added Communication Failure and Cyber Attack as additional hazards. The overall ranking of the hazards has changed as well.

**Table 8:** Hazard Identification Table

| Hazard | Reason Hazard Identified |
|---|---|
| **Earthquake** | • History of events<br>• Presence of fault lines and geologic activity |
| **Pandemic Flu** | • Due to air travel and urban expansion there is increasing probability of health related emergencies |
| **Wildland Fire** | • History of events<br>• Presence of a large amount of timber and brush |
| **Electrical Failure** | • History of events |
| **Emergent Disease/Contamination** | • History of events |
| **Cyber Attack** | • History of events and danger to sensitive security information for Health Care Facilities |
| **Terrorist Event** | • Heightened sense of awareness since September 2001<br>• History of event in December 2015 |
| **Communications Failure** | • History of events<br>• Impact level of events |
| **Flood** | • History of events and the presence of a large number of rivers and channels |
| **Civil Disorder** | • Vulnerability due to number of public venues |
| **Drought** | • History of events<br>• Potential to drastically increase wildfire hazard |





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| **Nuclear/Radiological Incident** | • Vulnerability due to transportation routes and relative proximity of San Onofre Nuclear Generating Station (SONGS) |
| **Extreme Weather** | • History of events |
| **Transportation Failure** | • History of events and the presence of a large number of transportation corridors and airport flight paths |
| **Dam Failure** | • Vulnerability of dams |
| **Aqueduct** | • Presence of aqueducts serving multiple counties |
| **Tornado** | • History of events |
| **Insect Infestation** | • History of events |
| **Jail/Prison Event** | • Vulnerability of State and County correctional facilities |
| **Pipeline Disruption** | • History of events<br>• Multiple pipelines within the OA |
| **Landslide** | • History of events |
| **HazMat Incident** | • History of events<br>• Many transportation corridors and Hazardous Materials Facilities |
| **Water Supply Disruption/Contamination** | • History of events<br>• Potential disruption to the OA |

## 4.3 Mitigation Actions and Updates

### 4.3.1 2012 Plan Updated Mitigation Actions

2012 mitigation strategies and projects are summarized in the following table to show progress made:

**Table 9:** Mitigation Actions and Updates

| Mitigation Actions Table | | | |
|---|---|---|---|
| **Type of Hazard** | **Mitigation Actions** | **Departments/ Jurisdictions** | **Status Update** |
| **ALL** | Incorporate Updated Local Hazard Mitigation Plan into Riverside County General Plan | Transportation, Land Management Agency and Riverside Office of Emergency Services | Recently updated and approved on December 2015 by Board of Supervisors. Adopted 2015, which includes a new reference to implement the Local Hazard Mitigation Plan within the Safety Element. |
| **DROUGHT** | Construct reservoirs and water tanks to increase water storage | Water Conservation, Agriculture and County Fire | On-going, no update has been made |
| **EARTHQUAKE** | CREWS Earthquake Mitigation Project | County-wide | Ongoing process of recruiting non-participating cities in the Coachella Valley area into the early earthquake warning program. |
| **FIRE** | Purchase Masticator to remove vegetation and brush in heavily populated areas prone to fires. | Riverside County Fire | No change. Project still on hold due to lack of funding. Potential future purchase |





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| **FIRE** | Shake Shingle Roof Replacement Project | Idyllwild | In 2013 Mountain Communities Fire Safe Council was awarded a FEMA grant to replace hazardous shake/wood shingle roofs in the San Jacinto WUI (Wildland Urban Interface) One hundred homes were reroofed with Class A roofing material. The grant was completed in October 2016. |
| **FIRE** | Single Tree Removal – removed dying and dead trees. | Idyllwild | Ongoing: dead and dying trees are continuously monitored and removed as needed. |
| **FIRE** | Hazard Abatement- Fuel treatment program to remove 1120 acres of natural fuel | Mountain Communities Fire Safe Council Program - Idyllwild | Reducing fuels on private property in the San Jacinto WUI is an on-going activity of Mountain Fire Safe Council. To date, more than 1,600 acres have been treated with the financial help of grant funds awarded to MCFSC |
| **FLOOD** | Norco Storm Drain This project is an underground storm drain which will address flooding along Pedley Avenue/Sixth Street. | Riverside County Flood Control | Project completed on 04/05/2011. |
| **FLOOD** | Santa Ana River, Norco Bluffs [Corps Project] –Stabilization Project is a Corps of Engineers project that consists of a soil cement structure constructed to the 100-year flood level at the base of the bluff. | Riverside County Flood, Transportation Land Management Agency and Riverside County Fire | The bluff stabilization work was completed in 2004. The District is continuing to work with the Corps on wrapping up the project, including completion of a Project Operation and Maintenance Manual. Once the Corps approves the O&M Manual, the project can be transferred to the District for ownership, operation and maintenance. |
| **FLOOD** | Temescal Creek-Foster Road Storm Drain (2-8-00493-01) - This project is an underground storm drain in Foster Road extending from Interstate 15 to Temescal Creek. | Riverside-Corona Resource Conservation District Riverside County Flood Control | Project completed on 09/01/2015 |
| **FLOOD** | Dillon Road – State Hwy 62 Road Project to clear debris. Road has 25 dips that cause flooding during storms. | Transportation, Land, Management Agency Riverside County Fire | Ongoing; The current action plan is to barricade the low dip sections when they are flooded and remove the storm debris when the water recedes. |

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| **FLOOD** | Underground storm drain which will extend approximately 1,300 feet south on Pedley Avenue from Norco MDP Line NA on Sixth Street. This project will address localized flooding along Pedley Avenue. | Flood Control and City of Norco | Finished Spring 2011 |
| **FLOOD** | Restore 100 yr level flood protection to the three million residents within the floodplain downstream from Prado Dam. The Corps proposes to increase both the storage capacity of Prado Dam and its outlet discharge capacity. The embankment will be raised 30 feet, while the spillway sill will be raised 20 feet and the gated discharge capacity will be tripled. | Flood Control | **Part 1** of this project involving Riverside County Flood Control and TLMA was completed<br><br>**Part 2** of this project involving only Riverside County Flood Control is still pending approval |
| **FLOOD** | Ultimate channel improvements for the existing interim channel from 6th Street to the terminus near Rose Court. | City of Norco | Project has not started with no estimation on start date. The District is currently working on 60% design plans and anticipates 90% design plans will be completed in 2017. FEMA processing will be necessary to revise the currently mapped floodplain once the construction is completed. |
| **FLOOD** | Improvements to the existing channel between Parkridge Avenue and River Road. The channel is planned as a concrete lined open channel | City of Norco and Riverside County Transportation Land Management Agency | Project began Circa 7/2013 and was finished Circa 2/2014. Lead Agency was RCFC & WCD |
| **FLOOD** | Underground storm drain extending from the existing Stage 1 near Pedley Avenue, east on 7th Street to California Avenue then south on California approximately 800 feet to a sump. | Transportation, Land, & Management Agency and Flood Control | Project completed on 04/05/2011 |
| **FLOOD** | Collection of "mitigation" charges from builders in Mockingbird Canyon with the intention of providing relief to flood prone properties in the lower canyon | Mockingbird Canyon | In process of collecting funds. Charging investors $500 per lot. Talks about whether to keep this project or abandon it. Considered a “mini” ADP (Area Drainage Project) |
| **FLOOD** | Storm Drain Last portion will be constructed as part of the same | City of Corona | Project completed on 04/24/2012, Project revised on 04/25/2012. |





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| | contract as the Ontario Avenue Storm Drain project | | |
| **FLOOD** | A 1,050-foot drain to de-water a sump in Frank Avenue in the south Mira Loma area | Riverside County Flood Control and City of Eastvale | Project completed on 01/31/2012 |
| **FLOOD** | The original project consisted of a 54 acre-foot debris basin at the southerly end of Smith Road and a concrete rectangular channel extending northerly to Cajalco Road. Mitigation required for the basin project includes removal of non-native vegetation, debris and remnants of abandoned structures as well as re-grading and establishment of native vegetation. | Riverside County Flood Control | Project completed on 01/10/2006 |
| **FLOOD** | Underground storm drain in the City of Corona extending from East Grand Boulevard north in Joy Street to Temescal Creek Channel. Design began on this project in 2003 at which time it was discovered during a field check of the preliminary drawings that a recently installed Edison conduit in Joy Street overlapped the only viable alignment for the storm drain. The street is so heavily laden with utilities here is no longer room to install a drain. | City of Corona | Design Phase Schedule for advertisement in March 2017 |
| **FLOOD** | Underground storm drain in Ontario Avenue extending upstream from the District's existing El Cerrito Channel at El Cerrito Road about 3,000 feet to State Street just west of Interstate 15. | Riverside County Flood Control and Transportation Land & Management Agency | Project revised on 04/25/2012 |
| **FLOOD** | Underground storm drain in Foster Road extending from Interstate 15 to Temescal Creek | Temescal Creek-Foster Road Storm Drain | Construction began in January 2015 and was completed in September 2015. |

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| **FLOOD** | Multi-year plan to construct a levee system (approximately 1,200 feet river bottom width) between the existing Corps of Engineers' levee 9,500 feet upstream of State Street, and a point about 8,200 feet downstream of Sanderson Avenue, a distance of about 5 miles. Floodwalls are required to be constructed over the Metropolitan Water District facilities just east of State Street. | San Jacinto and Transportation and Land Management | Funding was received in November 2015 - the levee was included in a suite of projects that received Proposition 84 grant funding from the California Department of Water Resources. The Prop 84 contribution is anticipated to be about $3.5 million. |
| **FLOOD** | Project to build MDP extending from South W. Esplanade to east Midway Street to South San Jacinto Street to collect flows from the larger Park Hill basin watershed | City of San Jacinto | Construction for the project began on April 25, 2014 and was completed on July 2, 2015. |
| **FLOOD** | Construction of an underground storm drain that extends from a proposed detention basin at the intersection of Potter Road and De Anza Drive then southwest in De Anza to Young Street. The City of San Jacinto is administering the project. | City of San Jacinto and Transportation and Land Management | Project still pending |
| **FLOOD** | Underground storm drain from an outlet north of Holland Road southerly in Hawthorne Avenue to a collection system south of Craig Avenue | City of Menifee and Transportation and Land Management | Project Completed 3/01/2011 |
| **FLOOD** | Project is an underground storm drain that extends from near Yale Street east on Stetson Avenue approximately 1 mile to Dartmouth Street | City of Hemet | Project completed on 09/04/2007 |
| **FLOOD** | Project is an underground storm drain on Whittier Boulevard extending from the existing storm drain at Palm Avenue east to San Jacinto Street | Riverside County Flood Control and City of Hemet | Project completed on 08/23/2016 |
| **FLOOD** | Underground storm drain extending from an existing storm drain in Meridian Street near Berkeley venue south in Meridian Street to Whittier Avenue. | Riverside County Flood Control and City of Hemet | Stage 1 completed on 06/21/2016. Stage 2 still pending approval. |





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| **FLOOD** | Project is for major flood control project to extend from the San Jacinto River near Goetz Road east approximately 6 miles to Juniper Flats Road and incorporates both lined and unlined open channel, underground storm drains and two major detention basins. | City of Menifee and Transportation, Land and Management Agency | Project built in 4 stages. Some stages have been completed, but others still not finished. |
| **FLOOD** | Open channel along Nuevo Road from Dunlap Drive to Perris Valley Channel | City of Perris, Riverside County Transportation and Flood Control | Under new contract: Starting Jan. 2017 and will range about 2.5 yrs. for this entire project to be completed; first part will take about 180 days to complete, but time frame will be extended. |
| **FLOOD** | East Ironwood Avenue to Petit Street. Part of the work the City of Moreno Valley is doing in association with improvements to the Moreno Beach Drive & 60 freeway interchange. | City of Moreno Valley and Transportation and Land Management | Storm Drain Line K-1 – City completed design in 2014. Currently seeing construction funding of approximately $2.5m. |
| **FLOOD** | Project is an open channel extending from Nason Basin northeasterly approximately 2,500 feet to Ironwood Avenue | City of Moreno Valley and Transportation and Land Management Agency | Storm Drain Line K from Ironwood to the Nason Basin – RCFC&WCD secured an easement in 2014 to receive flows from Line K-1 noted above. Action completed in 2014. |
| **FLOOD**<br>**EARTHQUAKE** | Norco Streambank Stabilization. Project consists of a soil cement toe protection structure constructed to the 100-year flood level at the base of the bluff, and a stable earthen buttress fill constructed to the top of the bluff from I-15 Bridge to Center Avenue | Riverside County Flood Control and Transportation Land & Management Agency | Project Completed |
| **FLOOD**<br>**EARTHQUAKE** | Stabilization of Interstate 15 near Alhambra Street, as a part of the Prado Dam enlargement feature of the Santa Ana River Mainstream Project at no cost to the District. The project involves the construction of a toe-protection-only structure from Hamner Avenue downstream to approximately 5th Street | Transportation Land Management Agency | Project still pending |

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| **LANDSLIDE EARTHQUAKE FLOOD** | Proposed improvements include installation of slope protection along the Green River Mobile Home Park, as well as the exposed slopes adjacent to the Green River Homeowners Association and Highway 91 just downstream of Highway 71. | Transportation and Land Management Agency | **Phase 2A-**The District has completed its acquisition of the necessary easements and fee interests from Riverside County, private lands, and Caltrans. Construction of Phase 2A was completed in Fiscal Year 2015/2016.<br>**Phase 2B-Construction** of this segment was completed in Fiscal Year 2014/2015. |





### 4.3.2 2017 New Mitigation Actions

The 2017 LHMP Steering Committee identified the following Mitigation Actions since the completion of the 2012 plan update. These mitigation actions were prioritized based on the top ten high priority county hazards. This was determined using the county risk assessment that is shown on section 5.2 page 195 "**Figure 23:** 2017 County Hazard Ranking and Risk Scores." The actions below list ways that "all hazards" can be mitigated following the county's top ten hazards starting from the highest. The financial impact of each action does not affect the ranking.

**Table 10:** 2017 New Mitigation Actions Table

## 2017 Mitigation Actions Table

| Type of Hazard | Mitigation Actions | Departments/ Jurisdictions | Status Update/Timeframe | Potential Funding Source |
|---|---|---|---|---|
| **All Hazards** | CERT Training and retention | Riverside County Emergency Management Department | July 2018 – Ongoing<br>On-going for the life of the current plan (yrs. 2018-2023). There will be one training in each of the county districts per year to ensure community members throughout the county get the opportunity to refresh and reinforce their CERT skills. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Homeland Security Program (SHSP) |
| **All Hazards** | Continue to utilize the Safety Element of the Riverside County General Plan and the Riverside County FD Master Plan as base documents to implement goals, objectives, and mitigation actions | All Riverside County Departments | On-going for the life of the current plan (yrs. 2018-2023). The Safety Element in the General Plan is continuously updated as new information and changes arise. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Earthquake** | Working with CalOES & FEMA to revise the Southern California Catastrophic | All Cities in Riverside County | On-going for the life of the current plan (yrs. 2018-2023). Riverside County will continue to collaborate with Cal OES/ FEMA to improve and update | County General Fund |

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| | Earthquake Response Plan | | this plan as needed. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | |
| **Earthquake** | Reviewed Office of Statewide Health Planning and Development (OSHPD), Structural Performance Categories and Nonstructural Performance Categories (SPC/NPC) Ratings of Acute Care Hospital Buildings and reported the findings at EM Healthcare Coalition | Riverside County Emergency Management Department & Riverside County Hospitals | On-going for the life of the current plan (yrs. 2018-2023).These reports will continuously be reviewed to make sure they are up to date and consistent with any changes. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | Hospital Preparedness Program (HPP) Grant |
| **Earthquake** | Worked with local City Emergency Manager (EM) to address '08 Golden Guardian Riverside County Shake Out Scenario/Assumptions | Riverside County Emergency Management Department | On-going for the life of the current plan (yrs. 2018-2023). County will continuously work with City EM to update and inform of changes or thoughts to improve the annual Shake Out Scenario and help the community increase their preparedness skills. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Earthquake** | Mitigate potential seismic hazards through adoption and strict enforcement of current building codes | Riverside County Transportation, Land, Management Agency | On-going for the life of the current plan (yrs. 2018-2023). The codes will be revised and updated to be consistent with emergency measures that can help prevent earthquake impacts in county buildings. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |





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| **Pandemic Flu** | Provide training on immunization techniques | Riverside University Health System-Public Health | On-going for the life of the current plan (yrs. 2018-2023). Continue training to teach any new techniques, strategies, and to ensure all staff are proficient. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | Public Health Emergency Preparedness Grant (PHEP) |
| **Pandemic Flu** | Participated and conducted a Non-Medical Intervention Tabletop Exercise | Riverside County Emergency Management Department & Riverside University Health System-Public Health | Completed on 09/28/2015 | Pan Flu Grant PHEP Grant |
| **Pandemic Flu** | Participated and conducted a Flu vaccination exercise | Riverside County Emergency Management Department & Riverside University Health System-Public Health | Completed on 11/10/2016 | Pan Flu Grant PHEP Grant |
| **Pandemic Flu** | Generate a draft Crisis Care Plan | Riverside County Emergency Management Department & Riverside University Health System-Public Health | Completed 08/30/2016 | Pan Flu Grant PHEP Grant HPP Grant |
| **Pandemic Flu** | Training Medical Reserve Corp (MRC) in hospital surge exercises | Riverside County Emergency Management Department | Started in 2011 and is on-going for the life of the current plan (yrs. 2018-2023). Continue training to keep updating and informing volunteers to increase their skills. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | HPP Grant State Homeland Security Program (SHSP) |
| **Pandemic Flu** | Training Medical Reserve Corp. (MRC) volunteers in Alternate Care Site | Riverside County Emergency Management Department | Completed in 2014 | HPP Grant State Homeland Security Program (SHSP)Pan Flu Grant |

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|---|---|---|---|---|
| **Wildland Fire** | Create wildfire protection zones that reduce the risks to citizens and firefighters from fire dangers | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously update and develop protection zones that can help decrease wildfire risks in the community. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Strengthen defensible space inspections in fire prone areas | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continue inspections in locations that are susceptible to fires. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State and County General Funds & Structural Fire Taxes |
| **Wildland Fire** | Continue maintenance of existing fire roads throughout the county to provide fire department access | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continue keeping the roads well paved and easy to have fire trucks be able to drive on. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Fuel reduction projects throughout the county to reduce fire potential | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously improve and develop projects to lower the impact of fires in the county. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Develop and enforce construction and design standards that ensure the development incorporates fire prevention features | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously enforce and update measures to prevent fire hazards. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | Developer Fees |
| **Wildland Fire** | Conduct and implement long range fire safe planning through code adoption/policies | Riverside County Fire Department & CAL Fire & Riverside County Transportation, | On-going for the life of the current plan (yrs. 2018-2023). Continuously implement code policies to integrate them into the Safety Element as they are developed/updated and | County General Fund and Fire Marshal Fees |





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| | consistent with the Safety Element of the General Plan | Land, Management Agency (Planning Division) | approved. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | |
| **Wildland Fire** | Ben Clark Training Center to provide wildland fire protection related classes to fire personnel | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously make sure that this center is available to provide wildland fire protection classes to fire staff to improve their skills on fire mitigation and preparedness. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund, private colleges fees, and State Mission Grant funding |
| **Wildland Fire** | Continue wildland fire suppression/preparedness to maintain a state of readiness throughout the year | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide skills training to the community to be prepared for disasters. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Rapid intervention, identification and mitigation of Goldspot Oak Bore Beetle (GSOB) trees at various infestation levels on State Responsibility Area (SRA) lands throughout the county. Herbicide or tree removal if necessary | CAL Fire Unit Forester | On-going for the life of the current plan (yrs. 2018-2023).Continuously monitor infestation levels of GSOB trees to continue removing infested trees if necessary. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Rapid intervention, identification and mitigation of Pine Bark Beetle infestation, epidemic during times of drought. Removal of trees that are symptomatic or the | CAL Fire Unit Forester | On-Going for the life of the current plan (yrs. 2018-2023).Continuously monitor infestation levels of Pine Bark Beetle to continue removing infested trees or to continue using pesticides if necessary. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |

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| | use of pesticide when applicable | | | |
| **Wildland Fire** | Continue Truck Trail and road maintenance to provide access for fire suppression vehicles and personnel. | CAL Fire<br><br>Unit Forester | On-Going for the life of the current plan (yrs. 2018-2023). Continuously preserve and improve Truck Trail and roads, if needed, for rapid available access to fire suppression vehicles. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Continue Fire Road maintenance of culverts and road prisms in open space areas on SRA land to allow for adequate drainage. | CAL Fire<br><br>Unit Forester | On-Going for the life of the current plan (yrs. 2018-2023). Continuously preserve and improve culverts and road prisms, if needed, for sufficient drainage. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Electrical Failure** | Coordinated with Southern California Edison to be included in their power outage notifications | Riverside County Emergency Management Department | On-going for the life of the current plan (yrs. 2018-2023). EMD joined SoCal Edison's recipient list as of Dec. 2016 to continuously be informed of any emergency notifications to help prevent electrical failure impacts. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Emergent Disease/ Contamination** | Drafted a Region VI Highly Contagious Disease Transportation Plan | Riverside County Emergency Management Department | Completed on 12/08/2016 | HPP Grant<br>Ebola Grant |
| **Emergent Disease/ Contamination** | Facilitated a Region VI Highly Contagious Disease Transportation Tabletop Exercise | Riverside County Emergency Management Department | Completed on 09/29/2016<br><br>The situation manual for this was completed on 11/14/2016 | HPP Grant<br>Ebola Grant |





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| **Emergent Disease/ Contamination** | Drafted a Riverside County Viral Hemorrhagic Fever Preparedness and Response Plan (VHF Plan) | Riverside County Emergency Management Department & Riverside University Health System-Public Health | Completed on 11/2016 | HPP Grant<br>Ebola Grant |
| **Cyber Attack** | **Enterprise Intrusion Prevention System (IPS)**<br>Protects the county network from Internet-based threats and attacks (~140,000 attacks/day on average) | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continue to update and maintain the IPS network to protect the county from any form of cyber-attacks or threats. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Cyber Attack** | **Enterprise Breach Detection System**<br>Inspects all internal/lateral county network traffic for indicators of compromise (IOCs) enabling the ISO to rapidly detect, respond to, contain, and prevent cyber-attacks, malware outbreaks, network reconnaissance, data exfiltration, and C2 (command & control) and botnet activities | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously inspect the county network to detect forms of threats or attacks. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Cyber Attack** | **Albert Sensor**<br>Monitors and reports to the Center for Internet Security (CIS) Multi-State Information Sharing and Analysis Center (MS-ISAC) all Domain Name | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously maintain the Albert Sensor in order keep having the association with the Department of Homeland Security's database on alerting network threats for the county. This action will be reassessed during the monitoring and | County General Fund |

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| | System (DNS) and NetFlow traffic for correlation with the Department of Homeland Security's threat intelligence database for real-time alerting of malicious network connections to blacklisted IP address on the Internet | | update phase of the County's 2017 LHMP. | |
| **Cyber Attack** | **Countywide Security Awareness Training** SANS Securing The Human information security and privacy training modules deployed on county learning management system (LMS) Educates our workforce on how to be extra vigilant and things to look out for to avoid falling victim to a targeted attack | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to the county's workforce on signs of cyber-attacks and prevent them from being a victim of these attacks. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Cyber Attack** | **Enterprise Security Information Event Management (SIEM)** Serves as the county's centralized security event log management repository and correlation engine | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continue to maintain the SIEM to monitor and prevent security threats. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |





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| **Cyber Attack** | **Enterprise Internet Proxy (Web Filter)** Prevents county employees and malware from accessing compromised/malicious websites and C2 (command & control) servers, in addition to non-county authorized websites based on category/content filtration policies/rules | Riverside County Technology Information | May 2017 – December 2018<br><br>Product (Blue Coat Proxy Advance Secure Gateway (ASG)) has been procured and is in the process of being deployed. | County General Fund |
| **Cyber Attack** | **Governance, Risk, & Compliance (GRC) Software Suite** Platform on which our security operations (active network monitoring, breach detection, incident response, business impact analysis, threat containment/eradication, alerting/reporting, process workflow automation, security audits, risk assessments/register, regulatory compliance checks) will be carried out | Riverside County Technology Information | Implementation estimated to begin in June 2017 – July 2018.<br><br>Product (RSA Archer GRC) has been procured and is in the process of being deployed. | County General Fund |
| **Cyber Attack** | **Security Operations Center (SOC)** Planning phase completed, construction estimated to begin in September 2017 | Riverside County Information Technology | September 2017 – September 2018.<br><br>The County's Cyber Security Operations Center (SOC) is under construction. | County General Fund |

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| **Cyber Attack** | **Information Security Forum (ISF)**<br>Convene on a quarterly basis with department information security officers/liaisons to discuss key security topics, risk trends, and other related matters, including:<br><br>Formation of a Critical Security Incident Response Team (CSIRT)<br><br>Conducting security incident/breach simulations and tabletop exercises | Riverside County Information Technology | October 2018 – ongoing<br><br>This forum will be on-going for the life of the current plan (yrs. 2018-2023). Will continue to conduct constant security incident/breach simulations and tabletop exercises that can help prevent cyber-attacks in the future. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP.<br><br>The ISO is in the process of identifying members to serve on the Critical Security Incident Response Team (CSIRT). Estimated timeline for formation and initial kickoff meeting is October 2018. | County General Fund |
| **Terrorist Event** | SWAT team trained to respond to terrorism events | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to reflect personnel attrition and train on new tactics. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Terrorist Event** | Hazard Device Team trained to respond to terrorism events | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to reflect personnel attrition and train on new tactics and trends. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Terrorist Event** | Sheriff Emergency Response Team trained to respond to terrorism events | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to reflect personnel attrition and train on new trends. This action will be reassessed during the | County General Fund |





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| | | | monitoring and update phase of the County's 2017 LHMP. | |
| **Terrorist Event** | Sheriff personnel are assigned to the Joint Terrorism Task Force | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously integrate new sheriff personnel to improve this group's structure and capabilities. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Terrorist Event** | Ben Clark Training Center provides terrorism related classes for Law Enforcement and First Responders. | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Classes are funded each year through the State Homeland Security Program (SHSP) to continuously educate and train personnel on new skills and improve their abilities. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Terrorist Event** | Tactical response training | Riverside County Sheriff & Riverside County Fire Department | On-going for the life of the current plan (yrs. 2018-2023). Continuously train and improve on tactical response. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Communications Failure** | **County of Riverside Network (CORNET)**<br>Redundant Internet connections<br><br>Backbone links are configured with a mesh topology to provide full redundancy | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously configure links to prevent the termination of internet connections. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Communications Failure** | **Enterprise Voice Network (VoIP)**<br>Centralized SIP trunking for | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide accessibility to phone carrier | County General Fund |

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| | ingress/egress PSTN access via 8 geographically separated locations<br><br>Carrier failover protection for inbound voice traffic<br><br>Enterprise call processing for VoIP Endpoints are logically and physically separated into 3 datacenters ensuring a High-Availability solution<br><br>Remote site routers configured for SRST; in times of WAN outages, local IP Phones will re-register to local equipment, providing inter-site calling and access to the PSAP via carrier provided analog circuits | | connection and call processing. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | |
| **Communications Failure** | **Enterprise Best Practices**<br>Internal escalation contact list for all essential personal readily available<br><br>24x7 On-Call staffing availability for both Voice and Data Networks<br><br>Vendor support available at 24x7x4 for all critical | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continue to update contact list when staff support is needed in case of emergencies. Continue to train staff on technologies that arise and equip facilities with power backup supplies. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |





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| | Network and Voice equipment<br><br>Regular professional staff training on emerging technologies<br><br>Frequent equipment configuration backups to SAN Critical Enterprise level equipment is located at facilities with full battery and generator backup power | | | |
| **Communications Failure** | **Enterprise Emergency Notification System**<br>InformaCast Advanced on-premise notification solution for immediate reach to the County's 20,000+ VoIP endpoints<br><br>InformaCast Mobile cloud-based notification solution to extend the County's reach off-network to mobile devices such as cellular phones and tablets | Riverside County Technology Information | On-Premise solution has been rolled out to all County VoIP endpoints.<br><br>Mobile Solution has been rolled out to EMD.<br><br>Mobile solution is ready to be rolled out to other departments as requested.<br><br>On-going for the life of the current plan (yrs. 2018-2023). Continue to have a notification system to be able to have the ability to connect with off-network devices in case of a communications failure, including Wi-Fi. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund<br><br>Department Funds; departments who wish to take advantage of this service will be billed back to the departments based on how many users |

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| **Communications Failure** | **Network Connectivity**<br>Use of Cellular based redundant WAN links for critical county locations.<br><br>Introduction of MPLS technologies to provide alternate network paths for County locations | Riverside County Technology Information | Several locations have purchased a Cellular based redundant WAN link .<br><br>Solution can be purchased by other departments. Installation can take up to 6 weeks to install, based on equipment availability.<br><br>On-going for the life of the current plan (yrs. 2018-2023). Continue to provide alternate network paths for County locations in the case of a communication failure. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund<br><br>Department Funds; billable by the cellular carrier to requesting departments |
| **Flood** | **University Wash Channel, Stage 3 Project No. 221-1-8-00120-03-12**<br>This project will increase public safety and improve local economics by retrofitting an older, built-out commercial/industrial area with drainage infrastructure to alleviate repeated flood damage to existing businesses. The project will also address street and intersection flooding | Riverside County Flood Control and Water Conservation District | Notice To Proceed 2/21/17<br><br>Completed 11/14/17 | Riverside County Flood Control funds<br><br>Cost: $3,044,500 |
| **Flood** | **Monroe MDP – Monroe Channel Project No. 1-8-00071 Stage 4**<br>At request of the City of Riverside, replacement of | Riverside County Flood Control and Water Conservation District | Expected to be advertise in 4th Quarter 2016<br><br>Notice to Proceed 8/30/17<br><br>Completed 5/01/18 | Riverside County Flood Control funds<br><br>Cost:$2,489,067 |





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| | City's existing open channel with underground reinforced concrete box with 10-year storm capacity. Project limits are from California Avenue upstream to Magnolia Avenue | | | |
| **Flood** | **Jurupa – Pyrite MDP Line A-2 Project No. 1-8-00234 Stage 1**<br>Master planned lateral stormdrain to Jurupa Channel. Project is east-west drain crossing Agate Street about 1,000 feet south of Jurupa Road. Outlet point at Jurupa Channel is unimproved and likely to remain so | Riverside County Flood Control and Water Conservation District | 30% Plans & R/W Acquisition as of 1/10/17<br><br>Projected Start: 9/2018<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $338,332 |
| **Flood** | **University MDP Line 3 Project No. 1-8-09020 Stage 1**<br>The MDP proposes Line 3 as approximately 2,900 feet of 30" RCP east in Blaine Street then northeast to Blaine Street Retention Basin. The Blaine Street Retention Basin is located 600 feet north of Blaine Street between Valencia Hill Drive and Mt. Vernon Avenue. | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>Projected Start: 12/2020<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $2,926,028 |

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| | Budgeted for scoping study and evaluation of FEMA map floodplain limits only | | | |
| **Flood** | **Santa Ana River Stabilization Project No. 1-8-00010 Stg. 90** The USACE is expected to initiate restoration of the federally constructed reach of the Santa Ana River Levee system downstream of San Bernardino County line to Tequesquite. Exact form of project not set. Work will likely include repair of groins and toe protection | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $10,685,000 |
| **Flood** | **Box Springs Dam – Outlet Modification Project No. 1-8-00041** Reconstruct outlet structure to prevent blockage from sediment accumulation | Riverside County Flood Control and Water Conservation District | Pending until Woodcrest Dam is complete<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $981,842 |
| **Flood** | **Sycamore Dam – Outlet Structure Modifications Project No. 1-8-00042** This project will upgrade the level of safety and serviceability. Initial project components include the repair/reinforcement of the existing outlet channel; construction of a new debris rack structure; erosion controls on the embankment of the dam; construction of a safer access road into the facility; design for a safer routing of flood waters from the emergency spillway to Central Avenue; and the installation of a control section to measure outflow from the outlet pipe of the dam. Completion of this project is planned to follow the Woodcrest Dam Outlet Modification project. | Riverside County Flood Control and Water Conservation District | Pending until Woodcrest Dam is complete<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $1,854,991 |





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| **Flood** | **Alessandro Dam Outlet Modification Project No. 1-8-00043**<br><br>Reconstruct outlet structure to prevent blockage from sediment accumulation | Riverside County Flood Control and Water Conservation District | Pending until Woodcrest Dam is complete<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $907,682 |
| **Flood** | **Prenda Dam Outlet Modification Project No. 1-8-00044** | Riverside County Flood Control and Water Conservation District | Pending until Woodcrest Dam is complete<br><br>5 year CIP (Capital Improvement Plan) | Riverside County Flood Control funds<br><br>Cost: $1,238,312 |

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| | Reconstruct outlet structure to prevent blockage from sediment accumulation | | Projected start and end: during the life of the plan (2018-2023) | |
| **Flood** | **Woodcrest Dam Outlet Modification Project No. 1-8-00045**<br>This project will upgrade the level of safety and serviceability. The approved Project Charter identifies the primary scope of work for the project as follows: design and construction of a new inlet structure to reduce potential for clogging of the outlet works; rehabilitation of the existing outlet gate assembly and control stem; implementation of an automated gate control system; rehabilitation of the outlet pipe; restoration of the outlet channel; and installation of surficial erosion controls on the surface of the dam embankment. Once completed, this project will serve as an example for performing similar upgrades to the remaining | Riverside County Flood Control and Water Conservation District | Development of design plans and specifications on hold until latest Geotechnical investigation is complete<br><br>Projected Start: March 2019<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $2,216,529 |





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| | Riverside Reservoirs | | | |
| **Flood** | **North Norco Channel Stage 10 Project No. 222-2-8-00140-10-12**<br>The project is located just upstream of River Road within the city of Norco in Riverside County, California. This project consists of approximately 550 lineal feet of triple cell reinforced concrete box and 125 lineal feet of open concrete channel transition, will replace the existing interim dirt channel. The project remedies ongoing flooding problems in the area thus resulting in positive impacts to residents and businesses | Riverside County Flood Control and Water Conservation District | Completed 9/9/14 | Riverside County Flood Control funds |
| **Flood** | **Corona MDP Line 5 Stage 1 Project No. 2-8-00280**<br>This project includes the construction of an underground storm drain beginning in Sherman Avenue south of Railroad Street and | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $1,397,201 |

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| | extending down Railroad Street westerly to Smith Street. The City is willing to undertake the design and construction of this project using District funding. | | | |
| **Flood** | **Corona MDP Line 52 Stage 1 Project No. 2-8-00350**<br>An underground storm drain extending north from Third Street along E. Grand Boulevard then under the 91 Freeway to Temescal Creek Channel | City Of Corona | Notice to Proceed 7/29/17<br><br>Expected Completion: Summer 2018 | Riverside County Flood Control funds<br><br>City of Corona Funds<br><br>Cost: $4,522,000 |
| **Flood** | **Coldwater Canyon Structural Improvements Project 2-8-00505**<br>Proposed conceptual improvements include 1) reducing flood risk and nuisance to traveling public on Temescal Canyon Road at the intersection of Glen Ivy Road; and 2) an armored berm along the east bank of Coldwater Wash downstream of the intersection of Temescal Canyon Road and Glen Ivy Road. The armored berm would | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $6,005,806 |





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| | prevent the migration of the active Coldwater Wash Channel, thereby protecting the west side of the Mountain Cove Development. Conceptual improvements are pending friendly acquisition of the underlying parcels needed for the project | | | |
| **Flood** | **Coldwater Canyon Floodplain Acquisition Project No. 2-8-00505**<br>Funded portion of project includes a hydrologic and geomorphologic assessment of Coldwater Canyon Wash from Glen Ivy Road to Temescal Wash. Study will evaluate the stability of Coldwater Canyon Wash and recommend potential minimalist interventions, if necessary, to protect Squaw Mountain Bridge and prevent erosion of Painted Hills development canyon slopes along Coldwater Canyon Wash. Balance of funds | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: included in the $6,005,806 amount for Coldwater Canyon Structural Improvement project listed above |

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| | would support potential interventions recommended by the report including floodplain buyout | | | |
| **Flood** | **Southeast Compton Wash At Corona Sanitary landfill Project No. 2-8-09054** Riverside County Waste Management District has requested assistance solving ongoing flooding and erosion problems along the southeast side of the landfill | Riverside County Waste Management District** | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $500,000 |
| **Flood** | **Lake Mathews Estates Water Quality Pond Project No. 2-8-09058** Proposed in the "Drainage Water Quality Management Plan for the Lake Matthews Watershed", this roughly 10-acre project is to be located on the south side of Cajalco Road about ¾-mile west of Wood Road. The project will capture first flush runoff from Cajalco Creek and carry it to an off-channel pond to | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $2,794,983 |





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| | be treated and/or infiltrated | | | |
| **Flood** | **Temescal Wash Floodplain Project No. 2-8-00052** Acquisition of floodplain area for flood protection, water conservation and habitat mitigation banking | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $23,534,000 |
| **Flood** | **Arroyo Del Toro Channel Stage 1 Project No. 223-3-8-00170-01-12** This project collects flows that pass under Interstate 15, flow through the cemetery and flood the intersection of Riverside Drive and Collier Avenue. The flows will now be collected in a channel and conveyed via an underground storm drain system to the Collier Marsh area | Riverside County Flood Control and Water Conservation District | Completed 6/16/15 | Riverside County Flood Control funds |

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| **Flood** | **Ortega Channel Retrofit Project No. 3-8-00070** Project will replace a portion of the clog-prone storm drain with a more easily accessible and maintainable open channel | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $1,628,761 |
| **Flood** | **LITTLE LAKE MDP LINE B, STG 1 STETSON AVENUE CHANNEL, STG 7 aka HEMET MDP LINE D Project Nos. 224-4-8-00265-01-12 224-4-8-00211-07-12** The District constructed a segment of the District's Little Lake MOP Line B. This infrastructure will diminish neighborhood flooding and damage to private property and businesses and improve the safety of the traveling public during storm events. This new drain will also permanently reduce flood-related street maintenance and repair costs for the City of Hemet. Little Lake MDP Line B Stage 1 is located primarily within the City of | Riverside County Flood Control and Water Conservation District | Stage 1 Completed 06/21/16<br><br>Stage 2 Pending approval Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $6,398,777 |





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| | Hemet, with small portions extending into the City of San Jacinto and unincorporated Riverside County beginning approximate 300 feet north of Berkley Ave and terminating approximately 200 feet south of Florida | | | |
| **Flood** | **Homeland MDP Line 2, Stage 2 Project No. 224-4-8-00337-02-12** The District constructed a segment of drainage infrastructure described in the District's Romoland Master Drainage Plan as Romoland MOP Line A, Stages 4, 5 and 6, Romoland MOP Lines A-2 and A-3, Stage 1, and Briggs Basin. In conjunction with the District's Homeland MDP Line 1, Stage 1, completion of this drainage infrastructure will reduce the floodplain by approximately 1, 762 acres and enable revisions to the FEMA Flood Insurance Rate Maps that result in | Riverside County Flood Control and Water Conservation District | Completed 6/5/12 | Riverside County Flood Control funds |

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| | a significant reduction in flood insurance premiums. The District's Homeland MDP Line 1, Stage 1 project is currently ongoing with an anticipated completion in February 2017 | | | |
| **Flood** | **Sunnymead MDP Line P-6 Stage 2 Project No. 224-4-8-00716-02-12** The District constructed a segment of drainage infrastructure described in the District's Sunnymead Master Drainage Plan which remedies ongoing flooding problems in the area thus resulting in positive impacts toresidents and businesses. | Riverside County Flood Control and Water Conservation District | Completed 3/25/2014 | Riverside County Flood Control funds |
| **Flood** | **San Jacinto MDP Line C, Stage 2, Lines C-4, C-5 & B Project No. 224-4-8-00124-02-12** The District constructed a segment of drainage infrastructure described in the District's San Jacinto Master Drainage Plan, which remedies the | Riverside County Flood Control and Water Conservation District | Completed 6/30/15 | Riverside County Flood Control funds |





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| | ongoing flooding problems at the intersections of San Jacinto Avenue and Menlo Avenue, San Jacinto Avenue and Midway Street, and Santa Fe Street and Midway Street. Consequently, the removal of ponding water at these intersections during storm events improves traffic and pedestrian safety and public access to the businesses along San Jacinto and Menlo Avenues. The District partnered with the City of San Jacinto to further improve normal residential traffic safety by replacing and reconstructing Midway Street between San Jacinto Avenue and Santa Fe Street | | | |
| **Flood** | **West End Moreno MDP Line LL Project No. 224-4-8-00783-01-12** The District constructed a segment of drainage infrastructure described in the District's West End Moreno MDP which remedies ongoing flooding problems in the | Riverside County Flood Control and Water Conservation District | Completed 5/12/15 | Riverside County Flood Control funds |

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| | area, thus resulting in positive impacts to residents and businesses | | | |
| **Flood** | **Romoland MDP Line A, STGS 4,5,6, Homeland MDP Line 1 Briggs Basin, Romoland MDP Lines A-2 and A-3 Project No. 224-4-8-00310-04-12** The District constructed a segment of drainage infrastructure described in the District's Romoland Master Drainage Plan as Romoland MOP Line A, Stages 4, 5 and 6, Romoland MOP Lines A-2 and A-3, Stage 1, and Briggs Basin. In conjunction with the District's Homeland MDP Line 1, Stage 1, completion of this drainage infrastructure will reduce the floodplain by approximately 1, 762 acres and enable revisions to the FEMA Flood Insurance Rate Maps that result in a significant reduction in flood insurance premiums. The District's | Riverside County Flood Control and Water Conservation District | Completed 8/23/16 | Riverside County Flood Control funds |





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| | Homeland MDP Line 1, Stage 1 project is currently ongoing with an anticipated completion in February 2017 | | | |
| **Flood** | **Little Lake MDP Line B Stage 2 Project No. 4-8-00265** An underground storm drain from just south of Florida Avenue, southerly in Meridian Street to Whittier Avenue. | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $6,804,257 |
| **Flood** | **San Jacinto River Stage 3 Project No. 4-8-00020** "Stage 3" covers the nearly 10-mile river reach beginning at the entrance to Railroad Canyon and ending upstream at the Ramona Expressway crossing near the Bernasconi Hills. This environmentally and fiscally challenged project has been through several evolutions and has been essentially dormant for nearly a decade. Funding shown is for intensive planning/engineering study of options for managing future development. Goal | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>Projected Start: 11/2019<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>ADP (Area Drainage Plan) Funds<br><br>Cost: $70,000,000 |

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| | is to develop a viable project for the San Jacinto River from Ramona Expressway to Railroad Canyon considering flood management, transportation, environmental and other opportunities and constraints | | | |
| **Flood** | **Gilman Home Channel Lateral A Stage 3 Gilman Home Channel Stage 90 Project No. 225-5-8-00171-03-12** The District constructed a segment of drainage infrastructure described in the District's Banning Master Drainage Plan which remedies ongoing flooding problems in the area, thus resulting in positive impacts to residents and businesses. Moreover, this project will enable revision of the FEMA Flood Insurance Rate Maps in the impacted area resulting in a significant reduction in flood insurance premiums. Many owners with federally insured | Riverside County Flood Control and Water Conservation District | Completed 9/22/15 | Riverside County Flood Control funds |





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| | home loans will realize savings of several thousands of dollars per year | | | |
| **Flood** | **Beaumont MDP Line 16 Stage 1 Project No. 5-8-00201** Project would build MDP Line 16 in Grand Avenue from Beaumont Cherry Valley Water District (BCVWD) infiltration ponds easterly to Bellflower Avenue as an element of a cooperative project with the BCVWD to provide both flood control and storm water capture to recharge groundwater | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>Projected Start: 12/2020<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $5,353,074 |
| **Flood** | **Eagle Canyon Dam Stage 1 Project No. 6-8-00190** The District constructed a segment of drainage infrastructure described in the District's Palm Springs Master Drainage Plan. Construction of this project also includes remediation of potentially hazardous and nonhazardous illegally dumped materials and | Riverside County Flood Control and Water Conservation District | Completed 11/17/15 | Riverside County Flood Control funds |

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| | remedies ongoing flooding problems in the area, thus resulting in positive impacts to residents and businesses. Additionally, Palm Springs MDP Line 43 and Lateral 43A, the underground dam outlet, is currently under construction and completion is anticipated for February 2016. Completion of the underground infrastructure will enable revisions to the FEMA Flood Insurance Rate Maps in the impacted area immediately downstream of Eagle Canyon and will result in a significant reduction in flood insurance premiums | | | |
| **Flood** | **Palm Springs MDP Line 43 and Lateral 43A Project No. 226-6-8-00163-01-12** The District constructed a segment of drainage infrastructure described in the District's Palm Springs Master Drainage Plan as Palm Springs MOP Line 43 and Lateral | Riverside County Flood Control and Water Conservation District | Completed 3/15/16 | Riverside County Flood Control funds |





| | | | | |
|---|---|---|---|---|
| | 43A. Construction of this project serves as the underground outlet to the District's Eagle Canyon Dam facility that was completed on September 21, 2015 with the Notice of Completion accepted by the Board as Agenda Item Number 11-1 on November 17, 2015. Completion of both District facilities will enable revisions to the FEMA Flood Insurance Rate Maps in the impacted area immediately downstream of Eagle Canyon Dam and will result in a significant reduction in flood insurance premiums | | | |
| **Flood** | **Murrieta Creek Channel (Phase II & III) Project No. 7-8-00021** Murrieta Creek Flood Control Project from Old Town Temecula to Elm Street in Murrieta | Riverside County Flood Control and Water Conservation District/United States Army Corps of Engineers* | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $82,000,000 |

| | | | | |
|---|---|---|---|---|
| **Flood** | **Whitewater River Levee Restoration Project No. 6-8-00250** Restoration work to increase freeboard and bring levee adjacent to Cimarron Golf Resort into compliance with FEMA certification guidelines | Riverside County Flood Control and Water Conservation District | Pending – Full scope of restoration work not yet established but funding figure shown is based on preliminary engineer's estimate<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost:1,260,000 |
| **Flood** | **Palm Canyon Wash – Cherley Creek Levee Restoration Stage 90 Project No. 6-8-00040** Major construction to bring levee serving small tributary upstream of South Palm Canyon Wash into compliance with FEMA certification guidelines. Project will be combination of RSP and soil-cement lined channel and levee | Riverside County Flood Control and Water Conservation District | Expected Advertise Date: 2nd Quarter 2018<br><br>Projected Start: 08/2019<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $6,187,021 |
| **Flood** | **Banning MDP Line D-2 Stage 1 Project No. 5-8-00169** This project is over one mile of underground storm drain that connects to the existing Ramsey Street Storm Drain at the intersection of Hargrave Street and Ramsey Street. It includes Line D-2, Stage 1 which will | RCFC/City of Banning | Notice to Proceed: 5/15/17<br><br>Completed: 2/27/18 | Riverside County Flood Control funds |





| | | | | |
|---|---|---|---|---|
| | continue northerly along Hargrave Street for approximately 5,250 feet before terminating at Indian School Lane. Line D-2A, Stage 1 will tie into Line D-2 at the intersection of Hargrave Street and Theodore Street. Line D-2A will continue westerly along Theodore Street for approximately 600 feet before terminating at Florida Street. | | | |
| **Civil Disorder** | Trained and equipped Mobile Field Force Teams throughout the county | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to reflect personnel attrition; Less-lethal equipment acquired. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |

Note: Please refer to individual annexes for a full listing of jurisdictional Mitigation Actions

**Figure 24:** Riverside County FY Capital Assets

Capital asset activity for the year ended June 30, 2016 was as follows (in thousands):

**COUNTY OF RIVERSIDE**
**Notes to the Basic Financial Statements (Continued)**
**June 30, 2016**

**NOTE 8 – CAPITAL ASSETS**

Capital asset activity for the year ended June 30, 2016 was as follows (In thousands):

| | Balance July 1, 2015 | Additions | Retirements | Transfers | Balance June 30, 2016 |
|---|---|---|---|---|---|
| **Governmental activities:** | | | | | |
| *Capital assets, not being depreciated:* | | | | | |
| Land & easements | $ 529,885 | $ 7,889 | $ (188) | $ - | $ 537,586 |
| Construction in progress | 757,220 | 295,880 | (221) | (343,280) | 709,599 |
| Total capital assets, not being depreciated | 1,287,105 | 303,769 | (409) | (343,280) | 1,247,185 |
| *Capital assets, being depreciated:* | | | | | |
| Infrastructure | | | | | |
| Flood channels | 266,840 | - | - | 1,656 | 268,496 |
| Flood storm drains | 423,741 | 1,094 | - | 27,064 | 451,899 |
| Flood dams and basins | 33,968 | - | - | 10,559 | 44,527 |
| Roads | 1,886,995 | 29,398 | - | 217,937 | 2,134,330 |
| Traffic signals | 38,113 | 197 | - | 4,496 | 42,806 |
| Bridges | 202,814 | 2,285 | - | 5,191 | 210,290 |
| Runways | 24,179 | - | - | - | 24,179 |
| Sewer systems | - | - | - | 2,924 | 2,924 |
| Communication towers | 16,146 | - | - | - | 16,146 |
| Parks trails and improvements | 15,562 | - | - | 1,578 | 17,140 |
| Land improvements | 110 | - | - | - | 110 |
| Structures and improvements | 1,592,498 | 22,642 | (1,089) | 67,735 | 1,681,786 |
| Equipment | 524,781 | 54,434 | (26,963) | 4,116 | 556,368 |
| Total capital assets, being depreciated | 5,025,747 | 110,050 | (28,052) | 343,256 | 5,451,001 |
| Less accumulated depreciation for: | | | | | |
| Infrastructure | (1,221,481) | (121,966) | - | - | (1,343,447) |
| Land improvements | (25) | (1) | - | - | (26) |
| Structures and improvements | (424,466) | (39,587) | 882 | 300 | (462,871) |
| Equipment | (311,223) | (37,550) | 25,725 | (276) | (323,324) |
| Total accumulated depreciation | (1,957,195) | (199,104) | 26,607 | 24 | (2,129,668) |
| Total capital assets, being depreciated, net | 3,068,552 | (89,054) | (1,445) | 343,280 | 3,321,333 |
| Governmental activities capital assets, net | $ 4,355,657 | $ 214,715 | $ (1,854) | $ - | $ 4,568,518 |

Source: (Riverside County Comprehensive Annual Financial Report 2016)





## 4.4 Critical Facilities and Infrastructures

Critical facilities are facilities that pose unacceptable risks to public safety if severely damaged or non-operational. In Riverside County, critical facilities include schools, hospitals, fire stations, police stations, emergency operation centers, communication centers, dams, and industrial sites that use or store explosives, toxic materials. It is essential that critical facilities have no structural weaknesses that can lead to collapse.

Critical facilities may provide only limited services if lifelines are disrupted. Seismic hazard mitigation for lifeline structures is complex given the diversity of lifeline facilities. Earthquake ground motion could affect a variety of lifeline structures such as the control tower in an airport or the buildings that house computers and telephone circuits that are central to communications networks. Strong ground motion can also result in damage to freeway interchanges and bridges that are essential for successful transportation of goods and services. Buried pipelines are generally not damaged by strong ground motions, but can be severely disrupted in areas of surface rupture, liquefaction, or landslides.

**Figure 25:** Riverside County Capital Assets

**COUNTY OF RIVERSIDE**
**Capital Asset Statistics by Function**
**Last Ten Fiscal Years**
**June 30, 2016**

| | Fiscal Year Ending June 30 | | | | |
|---|---|---|---|---|---|
| **Function/Program** | **2016** | **2015** | **2014** | **2013** | **2012** |
| **County Libraries** | | | | | |
| Branch libraries | 35 | 35 | 35 | 35 | 33 |
| Book mobiles | 2 | 2 | 2 | 2 | 2 |
| Books in collection | 1,168,364 | 1,382,932 | 1,393,689 | 1,657,925 | 1,570,834 |
| Museum | 1 | - | - | - | - |
| **Riverside University Health Systems - Medical Center** | | | | | |
| Major clinics | 4 | 4 | 4 | 4 | 4 |
| Routine and specialty clinics | 44 | 44 | 44 | 37 | |
| Beds licensed | 439 | 439 | 439 | 439 | 439 |
| **Fire** | | | | | |
| Stations | 37 | 37 | 37 | 38 | 42 |
| Trucks | 158 | 158 | 145 | 142 | 145 |
| **Parks and Recreation** | | | | | |
| Regional parks | 11 | 14 | 11 | 11 | 11 |
| Historic sites | 5 | 5 | 5 | 5 | 5 |
| Nature centers | 4 | 4 | 4 | 4 | 4 |
| Archaeological sites | 6 | 5 | 6 | 6 | 6 |
| Wildlife reserves | 9 | 7 | 9 | 9 | 9 |
| RV and mobile home parks | 2 | 2 | 3 | 3 | 3 |
| Managed areas | 5 | 5 | 5 | 5 | 5 |
| Recreational facilities | 3 | 1 | 3 | 2 | 2 |
| Community centers | 1 | 1 | - | - | - |
| **Sheriff** | | | | | |
| Patrol stations | 10 | 10 | 10 | 10 | 10 |
| Patrol vehicles | 930 | 932 | 928 | 916 | 915 |
| **Waste Resources** | | | | | |
| Landfills | 6 | 6 | 6 | 6 | 6 |
| Capacity in tons | 62,191,202 | 54,232,021 | 54,230,474 | 54,230,474 | 54,189,339 |

Source: (Riverside County Comprehensive Annual Financial Report, 2016)

*Note: this data reflects the asset statistics for the unincorporated portions of Riverside County. Please refer to individual annexes for participating jurisdiction data.





### 4.4.1 Mitigation Goals and Strategies Relating to Critical Facilities

From approximately 2011 to 2013 the Riverside County General Plan is/was undergoing an update. It was approved and adopted in 2015. The Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan was included in the Safety Element of the 2015 General Plan. Upon completion of the LHMP plan update and FEMA approval, EMD will coordinate an update with the Riverside County Transportation and Land Management Agency to the Safety Element of the General Plan in accordance with Senate Bill 1000.

The General Plan identified the following policies relating to critical facilities.

S 7.7 Strengthen the project permit and review process to ensure that proper actions are taken to reduce hazard impacts and to encourage structural and nonstructural design and construction. Damage must be minimized for critical facilities, and susceptibility to structural collapse must be minimized, if not eliminated

A. Ensure that special development standards, designs, and construction practices reduce risk to tolerable levels for projects involving critical facilities, large-scale residential development, and major commercial or industrial development through conditional use permits and the subdivision review process. If appropriate, impact fees should be assessed to finance required actions.

B. Require mitigation measures to reduce potential damage caused by ground failure for sites determined to have potential for liquefaction. Such measures shall apply to critical facilities, utilities, and large commercial and industrial projects as a condition of project approval.

C. Require that planned lifeline utilities, as a condition of project approval, be designed, located, structurally upgraded, fit with safety shutoff valves, be designed for easy maintenance, and have redundant back up lines where unstable slopes, earth cracks, active faults, or areas of liquefaction cannot be avoided.

D. Review proposed uses of fault setback areas closely to ensure that county infrastructure (roads, utilities, and drains) are not unduly placed at risk by the developer. Insurance, bonding, or compensation plans should be used to compensate the County of Riverside for the potential costs of repair.

S 7.8 Promote strengthening of planned and existing utilities and lifelines, the retrofit and rehabilitation of existing weak structures, and the relocation of certain critical facilities. S 7.9 Find alternatives that improve site safety for the protection of critical facilities. Property acquisition for open space, change in building use or occupancy, or other appropriate measures can be employed to reduce risks posed by hazards. (AI 101)

S 7.10 Discourage development of critical facilities that are proposed in dam failure inundation areas, and apply hazardous materials safety guidelines within such zones

S 7.11 Coordinate with the Public Utilities Commission (PUC) and/or utilize the Capital Improvement Program, to strengthen, relocate, or take other appropriate measures to safeguard high-voltage lines, water, sewer, natural gas and petroleum pipelines, and trunk electrical and telephone conduits that (AI 4):

- Extend through areas of high liquefaction potential.
- Cross active faults.
- Traverse earth cracks or landslides.

S 7.12 Require extra design considerations for lifelines across subsidence areas

Source: (All from Safety Element S-7: Critical Facilities and Lifelines)

Note: The Mitigation Goals and Strategies related to each hazard are found in Section 5 of the 2017 LHMP.





### 4.4.2 Loss Factors

The loss estimates provided in this LHMP are based on data currently available and result in an approximation of risk used to understand relative risk from various hazards and potential losses. There are uncertainties inherent in any loss estimation methodology, in part from incomplete knowledge concerning the different hazards, as well as approximations and simplifications used in the analysis. You can see from the map below that the region of Riverside County has the highest number of declared disasters since 1950.

**Figure 26:** 2013 California State Hazard Mitigation Plan, Primary Sources of Disaster Losses

Table 4.F from the 2013 SHMP Chapter 4, identifies disaster incidents, casualties, and Cal OES costs by type. Cal OES has revised the database during the preparation of the 2013 State Hazard Mitigation Plan (SHMP).

**Table 11:** Disaster Incidents, Casualties, and Cost by Type

**Table 4.F: Disaster Incidents, Casualties, and Cost by Type, 1950 - 2012**

| Disaster Type | Emergencies Through 2012 | State Emergency Proclamations Though 2012 | Federal Disaster Declarations Though 2012 | Deaths Through 2012* | Injuries Through 2012* | Cal OES-Administered Costs Though 2012* |
|---|---|---|---|---|---|---|
| Fire | 178 | 75 | 122 | 129 | 2,139 | $2,735,466,734 |
| Flood | 129 | 116 | 47 | 294 | 759 | $4,548,964,020 |
| Earthquake | 23 | 21 | 13 | 193 | 18,962 | $8,110,772,990 |
| Agricultural | 18 | 17 | 0 | 0 | 0 | $389,895,974 |
| Freeze | 9 | 8 | 4 | 0 | 0 | $1,017,890,620 |
| Landslide | 9 | 8 | 1 | 24 | 0 | $126,172,037 |
| Economic | 6 | 6 | 1 | 0 | 0 | $32,823,425 |
| Civil Unrest | 6 | 6 | 1 | 85 | 3,331 | $167,722,732 |
| Drought | 8 | 8 | 0 | 0 | 0 | $2,686,858,480 |
| Hazardous Material | 5 | 3 | 0 | 0 | 0 | 0 |
| Wind | 3 | 3 | 0 | 0 | 0 | $82,100 |
| Air Disaster | 2 | 2 | 0 | 232 | 2 | 0 |
| Facility | 2 | 2 | 0 | 0 | 0 | $654,897 |
| Road Damage | 3 | 3 | 0 | 0 | 0 | $462,986 |
| Tsunami | 3 | 3 | 2 | 13 | 1 | $49,617,379 |
| Invasive Species | 1 | 1 | 0 | 0 | 0 | 0 |
| Storms | 6 | 6 | 1 | 0 | 0 | $69,392,668 |
| Tornado | 1 | 1 | 0 | 0 | 0 | 0 |
| Other | 5 | 5 | 0 | 0 | 0 | $10,660,320 |
| ***Total*** | ***417*** | ***294*** | ***192*** | ***970*** | ***25,194*** | ***$19,947,437,362*** |

*Source: Cal OES database*

Table 4.F from the SHMP, which shows the pattern of statewide emergencies, disasters and associated losses by hazard types since 1950, when coupled with seismic knowledge, suggests the following findings:

- Earthquakes occur less frequently than the other primary hazards causing disasters but account for the greatest combined losses (deaths, injuries, and damage costs).





- Wildfires are the most frequent source of declared disasters and account for the third highest combined losses.
- Floods are the second most frequent disaster source and account for the second highest combined losses.
- Earthquake costs exceeded wildfire costs by four times, using limited measures identified in these tables.
- Although floods have resulted in a greater number of total deaths during this period, earthquakes have accounted for the highest number of combined deaths and injuries.
- Earthquakes represent by far the greatest long term catastrophic disaster threat.

From this analysis it is clear that these three hazards – earthquakes, fires, and floods – are the predominant disasters in California since 1950. For this reason these hazards are being addressed in the 2017 Mitigation Strategies and are among the top ten hazards for the County.

For Riverside County, fires occur more often, but there have been more declarations for Flooding. The Earthquake hazard for Riverside County is compounded by the three major faults that traverse the county: San Andreas, Elsinore and San Jacinto Faults.

Earthquake hazard mitigation is particularly relevant to SHMP Goal 1 (Significantly reduce life loss and injuries) and SHMP Goal 2 (Minimize damage to structures and property), set forth in Chapter 2 of the SHMP. In light of both the social and economic disruption caused by moderate-sized earthquakes, together with the significant potential for catastrophic earthquakes greater in magnitude than those experienced since 1950, heightened attention is needed for mitigation strategies relating to this particular hazard. Earthquake mitigation actions often involve expensive projects that will be considered as funding becomes available.

The 2013 State Hazard Mitigation Plan (SHMP) is the data source contained in Figure 26 "2013 California State Hazard Mitigation Plan, Primary Sources of Disaster Losses" and Table 14 "Disaster Incidents, Casualties, and Cost by Type." Once the 2018 SHMP is completed and approved, Figure 26 and Table 14 will be updated to include the most recent maps and new information.

### 4.4.3 2015 General Plan Policies on High Risk Facilities

Many essential public facilities and hazardous materials sites are located within the 100-year flood zones of Riverside County making them a high risk facility. These facilities include: 14 of Riverside County's 39 airports; 4 of 18 hospitals; 47 of 109 police stations, fire stations and emergency operation centers; 92 of 380 schools; 446 of 1,306 highway bridges; and 695 of 1,978 hazardous materials sites.

In attempts to mitigate future damages from hazards Riverside County has adopted the following policies related to high risk facilities:

S 4.12 Require certain existing essential, dependent care, and high-risk facilities that are not in conformance with provisions of the County zoning to upgrade or modify building use to a level of safety consistent with the inundation risk.

S 4.13 Require that facilities storing substantial quantities of hazardous materials within inundation zones shall be adequately flood-proofed and hazardous materials containers shall be anchored and secured to prevent flotation and contamination.

S 4.14 Require that dependent care facilities have all flood-vulnerable electrical circuitry flood-proofed.

S 4.15 Require that high-risk facilities maintain and rehearse inundation response plans.

S 4.16 Utilize power of public land acquisition and other land use measures to create open space zoning of inundation zones in areas that are destined for redevelopment; when this is not feasible, low density land uses should be employed.

S 4.17 Continue to assess and upgrade inundation risk and protection in the County.

S 4.18 Require that the design and upgrade of street storm drains be based on the depth of inundation, relative risk to public health and safety, the potential for hindrance of emergency access and regress from excessive flood depth, and the threat of contamination of the storm drain system with sewage effluent. In general, the 10-year flood flows shall be contained within the top of curbs and the 100-year flood flows within the street right-of-way.

S 4.19 Encourage periodic reevaluation of the 500-year, 100-year and 10-year flood hazard in the county by state, federal, county, and other sources, and use such





studies to improve existing protection, to review protection standards proposed for new development and redevelopment, and to update emergency response plans.

S 4.20 Balance flood control mitigation with open space and environmental protection.

S 4.21 Encourage the use of specific plans to allow increased densities in certain areas of a proposed development; or apply Transfer of Development Credits to encourage the placement of appropriate land uses in natural hazard areas, including open space, passive recreational uses, or other development capable of tolerating these hazards.

S 4.22 Take an active role in acquiring property in high-risk flood zones and designating the land as open space for public use or wildlife habitat.

Source: (All from Safety Element S-4: High Risk Facilities)

## 4.5 Estimated Property Loss

**Table 12:** Riverside County Property Values by City

**RIVERSIDE COUNTY ASSESSOR**
**ASSESSED VALUE FOR CITIES**
**2016/2017**

| CITY | TOTAL 2016/2017 LOCAL ROLL | LESS NON-REIMBURSED EXEMPTIONS | NET TANGIBLE VALUE | LESS HOMEOWNER'S EXEMPTIONS | 2016/2017 NET TAXABLE VALUE | 2015/2016 NET TAXABLE VALUE | ASSESSED VALUE CHANGE | PERCENTAGE CHANGE |
|---|---|---|---|---|---|---|---|---|
| BANNING | 2,045,247,539 | 45,871,853 | 1,999,375,686 | 37,881,836 | 1,961,493,850 | 1,882,818,554 | 78,675,296 | 4.18% |
| BEAUMONT | 4,033,833,512 | 72,476,220 | 3,961,357,292 | 45,964,609 | 3,915,392,683 | 3,643,317,362 | 272,075,321 | 7.47% |
| BLYTHE | 761,613,603 | 63,004,403 | 698,609,200 | 10,157,238 | 688,451,962 | 650,422,651 | 38,029,311 | 5.85% |
| CALIMESA | 777,715,662 | 23,367,990 | 754,347,672 | 11,668,290 | 742,679,382 | 688,503,238 | 54,176,144 | 7.87% |
| CANYON LAKE | 1,652,995,284 | 7,904,074 | 1,645,091,210 | 15,499,400 | 1,629,591,810 | 1,576,999,192 | 52,592,618 | 3.33% |
| CATHEDRAL CITY | 4,283,435,909 | 138,609,909 | 4,144,826,000 | 45,685,725 | 4,099,140,275 | 3,895,539,688 | 203,600,587 | 5.23% |
| COACHELLA | 1,830,946,311 | 145,800,821 | 1,685,145,490 | 20,232,061 | 1,664,913,429 | 1,568,941,117 | 95,972,312 | 6.12% |
| CORONA | 19,089,817,282 | 295,245,447 | 18,794,571,835 | 137,765,442 | 18,656,806,393 | 17,908,062,535 | 748,743,858 | 4.18% |
| DESERT HOT SPRINGS | 1,551,338,227 | 50,664,372 | 1,500,673,855 | 18,806,180 | 1,481,867,675 | 1,387,764,103 | 94,103,572 | 6.78% |
| EASTVALE | 8,480,220,118 | 24,367,500 | 8,455,852,618 | 52,006,677 | 8,403,845,941 | 7,985,398,302 | 418,447,639 | 5.24% |
| HEMET | 5,462,283,087 | 160,726,514 | 5,301,556,573 | 83,700,458 | 5,217,856,115 | 4,910,865,826 | 306,990,289 | 6.25% |
| INDIAN WELLS | 5,405,900,297 | 44,360,931 | 5,361,539,366 | 8,750,000 | 5,352,789,366 | 5,199,720,372 | 153,068,994 | 2.94% |
| INDIO | 7,833,242,426 | 166,041,389 | 7,667,201,037 | 67,986,440 | 7,599,214,597 | 7,227,358,677 | 371,855,920 | 5.15% |
| JURUPA VALLEY | 8,549,381,868 | 73,158,280 | 8,476,223,588 | 71,144,081 | 8,405,079,507 | 7,759,097,935 | 645,981,572 | 8.33% |
| LA QUINTA | 12,656,728,074 | 153,105,942 | 12,503,622,132 | 49,049,000 | 12,454,573,132 | 11,928,886,312 | 525,686,820 | 4.41% |
| LAKE ELSINORE | 5,307,465,580 | 51,072,923 | 5,256,392,657 | 44,361,317 | 5,212,031,340 | 4,804,948,961 | 407,082,379 | 8.47% |
| MENIFEE | 8,298,729,553 | 144,682,408 | 8,154,047,145 | 104,886,464 | 8,049,160,681 | 7,546,039,225 | 503,121,456 | 6.67% |
| MORENO VALLEY | 14,312,770,759 | 265,286,262 | 14,047,484,497 | 137,670,247 | 13,909,814,250 | 13,082,108,737 | 827,705,513 | 6.33% |
| MURRIETA | 12,399,753,873 | 427,027,712 | 11,972,726,161 | 106,791,901 | 11,865,934,260 | 11,517,794,187 | 348,140,073 | 3.02% |
| NORCO | 3,070,099,530 | 56,750,389 | 3,013,349,141 | 28,081,200 | 2,985,267,941 | 2,869,322,737 | 115,945,204 | 4.04% |
| PALM DESERT | 14,272,341,711 | 177,182,717 | 14,095,158,994 | 67,417,332 | 14,027,741,662 | 13,676,360,170 | 351,381,492 | 2.57% |
| PALM SPRINGS | 11,645,678,225 | 248,294,657 | 11,397,383,568 | 60,181,033 | 11,337,202,535 | 10,611,925,311 | 725,277,224 | 6.83% |
| PERRIS | 5,260,169,698 | 62,427,955 | 5,197,741,743 | 42,537,361 | 5,155,204,382 | 4,701,427,764 | 453,776,618 | 9.65% |
| RANCHO MIRAGE | 8,800,691,414 | 547,774,373 | 8,252,917,041 | 29,367,800 | 8,223,549,241 | 7,902,324,250 | 321,224,991 | 4.06% |
| RIVERSIDE | 28,238,701,299 | 1,258,881,996 | 26,979,819,303 | 240,204,427 | 26,739,614,876 | 25,457,203,551 | 1,282,411,325 | 5.04% |
| SAN JACINTO | 2,686,709,160 | 53,470,350 | 2,633,238,810 | 37,396,030 | 2,595,842,780 | 2,450,518,477 | 145,324,303 | 5.93% |
| TEMECULA | 14,978,634,970 | 211,399,196 | 14,767,235,774 | 107,238,640 | 14,659,997,134 | 13,956,583,981 | 703,413,153 | 5.04% |
| WILDOMAR | 3,076,506,781 | 78,932,764 | 2,997,574,017 | 34,419,940 | 2,963,154,077 | 2,792,309,928 | 170,844,149 | 6.12% |
| CITY TOTALS | 216,762,951,752 | 5,047,889,347 | 211,715,062,405 | 1,716,851,129 | 209,998,211,276 | 199,582,563,143 | 10,415,648,133 | 5.22% |





**Table 13:** Unincorporated Riverside County Property Values

**RIVERSIDE COUNTY ASSESSOR**
**ASSESSED VALUE FOR UNINCORPORATED AREAS**
**2016/2017**

| AREA | TOTAL 2016/2017 LOCAL ROLL | LESS NON-REIMBURSED EXEMPTIONS | NET TANGIBLE VALUE | LESS HOMEOWNER'S EXEMPTIONS | 2016/2017 NET TAXABLE VALUE | 2015/2016 NET TAXABLE VALUE | ASSESSED VALUE CHANGE | PERCENTAGE CHANGE |
|---|---|---|---|---|---|---|---|---|
| Alvord | 1,230,054,315 | 4,293,168 | 1,225,761,147 | 13,185,200 | 1,212,575,947 | 1,168,289,865 | 44,286,082 | 3.79% |
| Banning | 857,212,468 | 6,125,583 | 851,086,885 | 4,479,983 | 846,606,902 | 852,236,383 | (5,629,481) | -0.66% |
| Beaumont | 648,297,773 | 15,075,109 | 633,222,664 | 10,993,484 | 622,229,180 | 586,683,054 | 35,546,126 | 6.06% |
| Coachella | 1,671,093,056 | 80,010,632 | 1,591,082,424 | 8,069,138 | 1,583,013,286 | 1,510,147,344 | 72,865,942 | 4.83% |
| Colton | 116,664,357 | 2,395,678 | 114,268,679 | 1,022,000 | 113,246,679 | 109,632,339 | 3,614,340 | 3.30% |
| Corona-Norco | 3,875,856,489 | 25,066,596 | 3,850,789,893 | 37,439,128 | 3,813,350,765 | 3,662,399,145 | 150,951,620 | 4.12% |
| Desert Center | 225,135,919 | 268,078 | 224,867,841 | 286,731 | 224,581,110 | 230,368,870 | (5,787,760) | -2.51% |
| Desert Sands | 3,278,845,921 | 24,635,707 | 3,254,210,214 | 29,894,896 | 3,224,315,318 | 3,160,090,327 | 64,224,991 | 2.03% |
| Elsinore | 1,751,940,102 | 26,941,744 | 1,724,998,358 | 20,938,252 | 1,704,060,106 | 1,619,779,503 | 84,280,603 | 5.20% |
| Hemet | 4,630,913,679 | 178,713,683 | 4,452,199,996 | 60,345,499 | 4,391,854,497 | 4,219,200,805 | 172,653,692 | 4.09% |
| Menifee | 723,454,268 | 4,564,864 | 718,889,404 | 5,084,800 | 713,804,604 | 633,826,810 | 79,977,794 | 12.62% |
| Moreno | 675,058,135 | 6,544,761 | 668,513,374 | 1,183,000 | 667,330,374 | 667,642,315 | (311,941) | -0.05% |
| Murrieta | 2,324,077,841 | 6,592,272 | 2,317,485,569 | 11,002,600 | 2,306,482,969 | 2,232,361,878 | 74,121,091 | 3.32% |
| Nuview | 748,064,054 | 5,474,709 | 742,589,345 | 9,152,982 | 733,436,363 | 684,809,351 | 48,627,012 | 7.10% |
| Palm Springs | 2,056,242,569 | 80,765,934 | 1,975,476,635 | 25,297,200 | 1,950,179,435 | 1,901,356,909 | 48,822,526 | 2.57% |
| Palo Verde | 632,543,996 | 2,784,631 | 629,759,365 | 2,604,106 | 627,155,259 | 595,860,635 | 31,294,624 | 5.25% |
| Perris | 690,091,152 | 2,975,783 | 687,115,369 | 7,771,056 | 679,344,313 | 639,320,863 | 40,023,450 | 6.26% |
| Riverside | 3,199,609,739 | 36,371,239 | 3,163,238,500 | 33,399,108 | 3,129,839,392 | 2,912,917,501 | 216,921,891 | 7.45% |
| Romoland | 477,974,775 | 4,577,213 | 473,397,562 | 9,274,571 | 464,122,991 | 429,229,956 | 34,893,035 | 8.13% |
| San Jacinto | 253,872,969 | 124,842,772 | 129,030,197 | 1,572,281 | 127,457,916 | 122,212,421 | 5,245,495 | 4.29% |
| Temecula | 6,526,157,456 | 97,664,677 | 6,428,492,779 | 48,139,000 | 6,380,353,779 | 5,988,694,048 | 391,659,731 | 6.54% |
| Val Verde | 1,597,610,712 | 148,031,619 | 1,449,579,093 | 14,465,706 | 1,435,113,387 | 1,369,550,576 | 65,562,811 | 4.79% |
| Yucaipa | 99,434,526 | 135,778 | 99,298,748 | 917,000 | 98,381,748 | 94,389,584 | 3,992,164 | 4.23% |
| TOTALS | 38,290,206,271 | 884,852,230 | 37,405,354,041 | 356,517,721 | 37,048,836,320 | 35,391,000,482 | 1,657,835,838 | 4.68% |

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# Section 5.0 – Risk Assessment

## 5.1 Overview and Risk Assessment Process

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The Risk is measured by hazard, vulnerability and exposure probability.

The Riverside County Multi-Jurisdiction Hazard Mitigation Plan's risk assessment follows the methodology described in the FEMA publication *Understanding Your Risks—Identifying Hazards and Estimating Losses* (FEMA 386-2, 2002), which breaks the assessment down to a four-step process:

- Identify Hazards
- Profile Hazard Events
- Inventory Assets
- Estimate Losses

This risk assessment covers the entire geographical extent of Riverside County, including the incorporated communities and other participating jurisdictions. Since this plan is a multi-jurisdictional plan, participating jurisdictions completed their own hazard analysis and risk assessment and many have ranked their hazards differently than the County to match the needs of their jurisdiction. The County Local Hazard Mitigation Steering Committee has evaluated how these identified hazards and risks vary from jurisdiction to jurisdiction. These individual hazards and assessments are briefly outlined in this chapter with more details found in the jurisdiction's annex. If no additional data is provided in an annex, it should be assumed that the risk and potential impacts to the affected jurisdiction are similar to those described here for the entire Riverside County Operational Area LHMP.

The Riverside County Operational Area LHMP update involved a comprehensive review and update of each section of the risk assessment with new data, where available, and new analyses.

### 5.1.1 Results and Methodology

The County Local Hazard Mitigation Steering Committee utilized the existing 2012 Local Hazard Mitigation Plan identified hazards. Using existing hazard data and input gained through planning meetings, the Hazard Mitigation Steering Committee agreed upon a list of natural, man-made and technological hazards that could affect Riverside County.

Hazard data from the California Office of Emergency Services (Cal OES), FEMA, and many other sources were examined to assess the significance of these hazards to the planning area. Significance was measured in general terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage. The natural hazards evaluated as part of this plan include those that have occurred historically or have the potential to cause significant human and/or monetary losses in the future. Man-made and technological hazards were evaluated in the same manner. During the assessment of the identified County hazards the Steering Committee realized the need to add Cyber Attack and Communication Failure to the Local Hazard Mitigation Plan. The Committee based this decision off of the history of events and probability of future occurrences.

Please see table 4.1 Hazard Identification Table for justification of each hazards ranking.





**Table 14:** 2017 LHMP Top 5 Identified Hazards

| **Riverside County Multi-Jurisdictional Local Hazard Mitigation Plan Risk Assessment Chart** | | | | | | |
|---|---|---|---|---|---|---|
| Jurisdiction | Priority Risk/ Hazards | | | | | Differs from County Priorities? |
| **County** | **#1** | **#2** | **#3** | **#4** | **#5** | |
| **Riverside OA** | Earthquake | Pan Flu | Wildfire | Electrical Failure | Emergent. Disease | See Section 5.3 |
| **Cities** | | | | | | |
| Banning | Earthquake | Fire | Transportation | HazMat | Flood | Yes |
| Beaumont | Earthquake | Fire | Flood | HazMat | Transportation | Yes |
| Blythe | Extreme Weather | Wind | Power Failure | Transportation | HazMat | Yes |
| Calimesa | Fire | Earthquake | Flood | Extreme Weather | Drought | Yes |
| Canyon Lake | Flood | Earthquake | Fire | Transportation | Nuclear Incident | Yes |
| Cathedral City | Earthquake | Flood | Wind | Landslide | Extreme Weather | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| Coachella | Earthquake | Extreme Weather | HazMat | Power Failure | Wind | Yes |
| Corona | Earthquake | Fire | Power Failure | Terrorism | Flood | Yes |
| Desert Hot Springs | Earthquake | Flood | Fire | Extreme Weather | Wind | Yes |
| Eastvale | Earth | Flood | Fire | Pipeline | Insect Infestation | Yes |
| Hemet | Earthquake | Pan Flu | Fire | Electrical Failure | Emergent Disease | No |
| Indian Wells | Earthquake | Flood | Extreme Weather | Power Failure | Wind | Yes |
| Indio | Earthquake | Extreme Weather | Emergent Disease | Pan Flu | Drought | Yes |
| Jurupa Valley | Earthquake | Pan Flu | Fire | Power Failure | Emergency Disease | No |
| La Quinta | Earthquake | Flood | Power Failure | Extreme Weather | Drought | Yes |
| Lake Elsinore | Fire | Flood | Power Failure | Extreme Weather | Drought | Yes |
| Murrieta | Earthquake | Pan Flu | Fire | Power Failure | Emergent Disease | No |
| Norco | Flood | Fire | Earthquake | Extreme Weather | Agricultural Hazard | Yes |
| Palm Desert | Earthquake | Flood | Extreme Weather | Power Failure | Drought | Yes |
| Palm Springs | Earthquake | Power Failure | Transportation | Extreme Weather | Wind | Yes |





| | | | | | | |
|---|---|---|---|---|---|---|
| Perris | Fire | Flood | Earthquake | HazMat | Power Failure | Yes |
| Rancho Mirage | Earthquake | Flood | Fire | Drought | Civil Unrest | Yes |
| Riverside | Earthquake | Flood | Drought | Terrorism | Fire | Yes |
| San Jacinto | Earthquake | Extreme Weather | Flood | Landslide | Drought | Yes |
| Temecula | Transportation | Earthquake | Flood | Terrorism | Fire | Yes |
| Wildomar | Earthquake | Fire | Drought | Flood | Extreme Weather | Yes |
| **Tribes** | | | | | | |
| Morongo | Wildfire | Severe Wind Event | Earthquake | Electrical Failure | Transportation | Yes |
| **Special Districts** | | | | | | |
| Eastern Municipal Water | N/A | N/A | N/A | N/A | N/A | See Annex |
| High Valleys Water | Extreme Weather | Drought | Fire | Wind | Power Failure | Yes |
| Idyllwild Fire Protection | Fire | Drought | Insect Infestation | Earthquake | Pan Flu | Yes |
| Imperial Irrigation District | Earthquake | Extreme Weather | Terrorism | N/A | N/A | Yes |
| Kaiser | Earthquake | Fire | Extreme Weather | Drought | Wind | Yes |

| | | | | | | |
|---|---|---|---|---|---|---|
| Rancho California Water | Earthquake | Drought | Flood | Fire | N/A | Yes |
| Santa Ana Watershed | Earthquake | Wind | N/A | N/A | N/A | Yes |
| Western Municipal Water | Pipeline | Power | Extreme Weather | Drought | Wind | Yes |
| **School Districts** | | | | | | |
| Beaumont Unified | Earthquake | Wind | Drought | Fire | Flood | Yes |
| Desert Sands Unified | Earthquake | Flood | Extreme Weather | HazMat | Drought | Yes |
| Hemet Unified | Civil Disorder | Extreme Weather | Wind | Flood | Fire | Yes |
| Lake Elsinore Unified | Earthquake | Pan Flu | Extreme Weather | Flood | Nuclear | Yes |
| Moreno Valley Unified | Earthquake | Fire | Extreme Weather | Power Failure | Wind | Yes |
| Perris Union High School | Earthquake | Fire | Wind | Pan Flu | Flood | Yes |
| Riverside Community College | Insect Infestation | Jail/Prison Event | Civil Disorder | Nuclear | Terrorism | Yes |
| Riverside County Office of Education | Earthquake | Wildland Fire | Pandemic | Flood | Severe Wind | Yes |
| Riverside Unified | Earthquake | Power Failure | Pipeline | HazMat | Extreme Weather | Yes |
| San Jacinto Unified | Earthquake | Fire | Flood | Wind | Extreme Weather | Yes |

Please refer to individual annexes for additional hazard priorities for participating jurisdictions.





## 5.2 Agency Inventory Description

All participants were asked to evaluate the potential for an event to occur in their jurisdiction by hazard and the potential impact based on:

1. Economic loss and recovery
2. Physical loss of structures (residential, commercial, and critical facilities)
3. Infrastructure loss or damage
4. Continuity of operations for a normal daily governmental activities
5. Ability to quickly recover from the event and return to normal daily activities
6. Loss of life and potential injuries from the event.

The participants were then asked to rate the potential and severity using a scale of between 0 and 4 (4 being the most severe). The jurisdictions were also asked to rank the listed hazards as they relate to their jurisdiction from 1 to 20 (1 being the highest overall threat to their jurisdiction).

The following table was given to participants during the 2012 plan update and again for the 2017 update. Participants were informed that the county hazards were likely to be re-ranked and Communication Failure and Cyber-attack would be added.

**Figure 27:** 2012 and 2017 Participant Ranking Chart

| NAME: | AGENCY: | DATE : |
|---|---|---|

| | COUNTY | | LOCAL JURISDICTION | | |
|---|---|---|---|---|---|
| HAZARD | SEVERITY 0 - 4 | PROBABILITY 0 - 4 | SEVERITY 0 - 4 | PROBABILITY 0 - 4 | RANKING 1 - 20 |
| 1. EARTHQUAKE | | | | | |
| 2. WILDLAND FIRE | | | | | |
| 3. FLOOD | | | | | |
| **OTHER NATURAL HAZARDS** | | | | | |
| 4. DROUGHT | | | | | |
| 5. LANDSLIDES | | | | | |
| 6. INSECT INFESTATION | | | | | |
| 7. EXTREME SUMMER/WINTER WEATHER | | | | | |
| 8. SEVERE WIND EVENT | | | | | |
| **AGRICULTURAL** | | | | | |
| 9. DISEASE/CONTAMINATION | | | | | |
| 10. TERRORISM | | | | | |
| **OTHER MAN-MADE** | | | | | |
| 11. PIPELINE | | | | | |
| 12. AQUEDUCT | | | | | |
| 13. TRANSPORTATION | | | | | |
| 14. POWER OUTAGE | | | | | |
| 15. HAZMAT ACCIDENTS | | | | | |
| 16. NUCLEAR ACCIDENT | | | | | |
| 17. TERRORISM | | | | | |
| 18. CIVIL UNREST | | | | | |
| 19. JAIL/PRISON EVENT | | | | | |
| **MEDICAL** | | | | | |
| 20. PANDEMIC | | | | | |

Note: Please refer to the individual Local Hazard Mitigation Plans for participating jurisdiction

Please See Appendix E for the Inventory Worksheet template provided to participants.

The County Ranking used a similar format when looking at the probability and severity of a potential hazard but also included information on Healthcare Impact and Mitigation Capabilities. The following chart was used by the Local Hazard Mitigation Steering Committee while ranking the 2017 Hazards.



**Riverside Operational Area**
**Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP)**

July 2018

**Figure 28:** 2017 County Hazard Ranking and Risk Scores

| *HAZARD* | PROBABILITY | SEVERITY | HEALTHCARE | EMS | BEHAVIORAL / MENTAL HEALTH | RESPONDER AGENCIES | COMMUNITY AGENCIES | *RISK SCORE* |
|---|---|---|---|---|---|---|---|---|
| | Improbable: 0<br>Remote: 1<br>Occasional: 2<br>Probable: 3<br>Frequent: 4 | NA: 0<br>Negligible: 1<br>Marginal: 2<br>Critical: 3<br>Catastrophic: 4 | NA: 0<br>Negligible: 1<br>Marginal: 2<br>Critical: 3<br>Catastrophic: 4 | NA: 0<br>Negligible: 1<br>Marginal: 2<br>Critical: 3<br>Catastrophic: 4 | NA: 0<br>Negligible: 1<br>Marginal: 2<br>Critical: 3<br>Catastrophic: 4 | NA: 0<br>Low: 1<br>Moderate: 2<br>High: 3<br>Extreme: 4 | NA: 0<br>Low: 1<br>Moderate: 2<br>High: 3<br>Extreme: 4 | |
| Aqueduct | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 0.38 |
| Drought | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1.13 |
| Earthquake | 2 | 4 | 4 | 4 | 3 | 2 | 2 | 3.50 |
| Extreme Weather | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 0.75 |
| Flood | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 1.13 |
| Insect Infestation | 3 | 2 | 2 | 1 | 1 | 2 | 2 | 0.00 |
| Landslide | 3 | 3 | 1 | 1 | 1 | 2 | 2 | -0.56 |
| Tornado | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 0.25 |
| Wildland Fire | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2.25 |
| Civil Disorder | 2 | 3 | 3 | 3 | 1 | 4 | 0 | 1.13 |
| Communications Failure | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 1.13 |
| Cyber Attack | 4 | 2 | 3 | 2 | 2 | 3 | 1 | 1.50 |
| Dam Failure | 1 | 3 | 2 | 3 | 2 | 2 | 3 | 0.38 |
| Electrical Failure | 4 | 4 | 2 | 2 | 2 | 2 | 2 | 2.00 |
| HazMat Incident | 4 | 3 | 2 | 2 | 1 | 3 | 3 | -0.75 |
| Jail/Prison Event | 1 | 2 | 1 | 1 | 1 | 4 | 0 | -0.13 |
| Nuclear/Radiological Incident | 1 | 4 | 2 | 3 | 3 | 2 | 2 | 1.00 |
| Pipeline Disruption | 2 | 3 | 2 | 2 | 1 | 3 | 3 | -0.38 |
| Terrorist Event - MCI | 1 | 3 | 3 | 3 | 4 | 3 | 1 | 1.13 |
| Transportation Failure | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 0.38 |
| Water Supply Disruption/Contamination | 3 | 2 | 0 | 0 | 0 | 2 | 2 | -1.50 |
| Emergent Disease/Contamination | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 1.69 |
| Pandemic Flu | 2 | 4 | 4 | 4 | 4 | 3 | 2 | 3.50 |

## 5.3 Hazard Profiles and Descriptions

### *Hazard Assessment and Identification*

The County utilized the tools described in Section 3.3 for the hazard identification process and provided them to the individual cities and special districts. Cal OES MyPlan was used for information about floods, earthquake, fire and some critical facilities locations. Additionally, Riverside County Transportation and Land Management Agency provided maps detailing where hazards and critical facilities are located.

All participating jurisdictions and special districts conducted a risk assessment and identified hazards specific to their jurisdiction, document the impact of those hazards, and develop specific goals and strategies to address the risks and hazards.

The probability of each hazard in Riverside County was determined by rating their occurrence level from 0 - 4, in which each level or number represented a specific descriptor. For example, improbable = (0), remote = (1), occasional = (2), probable = (3), and frequent = (4). Each descriptor was defined according to how often each hazard occurs in Riverside County.

- *Improbable* means it is not likely to happen in more than ten years
- *Remote* means it happens once in ten years
- *Occasional* means it happens once in five years
- *Probable* means it happens once every two years (biannual)
- *Frequent* means it happens at least once a year (annually)

### *Identification of Hazards*

With its varying topography; a mix of urban and rural areas and rapidly growing permanent, transient, and recreational populations, the Riverside County Operational Area is subject to potential negative impacts from a broad range of hazards and threats. There are three broad categories of hazards that threaten the OA:

- Natural hazards
- Technological hazards
- Man-Made hazards





### 5.3.1 Earthquake

**Severity: 4**

**Probability: 2**

**Risk Score: 3.50**

**OA Jurisdictions Affected by Earthquakes**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

### *Hazard Definition*

An earthquake is a sudden, rapid shaking of the ground caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

Where earthquakes have struck before, they can strike again, often without warning. The major form of direct damage from most earthquakes is damage to construction. Bridges are particularly vulnerable to collapse and dam failure may generate major downstream flooding. Buildings vary in susceptibility depending on their construction and the types of soils on which they are built. Earthquakes destroy utility infrastructure which, in turn, may set off fires, hinder rescue efforts, and impact normal functions for an extended period of time. The hazard of earthquakes varies from place to place depending on the regional and local geology. Ground shaking may occur 65 miles or more from the epicenter (the point on the ground surface above the focus). Ground shaking can change the mechanical properties of some fine grained, saturated soils, where upon the soils liquefy and act as a fluid (liquefaction).

Most earthquake-related injuries result from collapsing walls, flying glass, and falling objects as a result of the ground shaking.

**Figure 29:** Historical Earthquakes in the Riverside County Area - 5.0 and Above

| Year | Richter Scale Magnitude | Description |
|---|---|---|
| 1812 | 7.0 | Occurred on the southern section of the San Andreas fault near Wrightwood. |
| 1857 | 7.9 | Occurred 60 miles northwest of Fort Tejon and ruptured 225 miles of the San Andreas fault. |
| 1890 | 6.5 | Occurred in the "San Jacinto or Elsinore Fault region" on the Rockhorse Truck Trail, north of the Borrego Valley Airport. |
| 1890 | 6.5 | Occurred in the same region as the 1890 earthquake. |
| 1899 | 6.4 | San Jacinto earthquake destroys San Jacinto and Hemet |
| 1910 | 5.0 | Occurred on the Elsinore fault northwest of the City of Lake Elsinore. |
| 1918 | 6.9 | San Jacinto earthquake strikes the same area that was damaged by an earthquake 19 years earlier. |
| 1923 | 6.3 | North San Jacinto Fault earthquake damaged the San Bernardino and Redlands area. This the last known time that this fault, which runs under the I-215/I-10 interchange, ruptured in this area. |
| 1937 | 6.0 | Terwilliger Valley earthquake was in the same general area as the 1890 earthquake. |
| 1942 | 6.3 | Fish Creek Mountains earthquake was south of the Ocotillo airport. |
| 1954 | 6.2 | Arroyo Salada earthquake was west of the Salton Sea. |
| 1968 | 6.5 | Borrego Mountain Earthquake was northeast of Ocotillo Wells |
| 1987 | 6.6 | Superstition Hills earthquake near the Salton Sea |
| 1992 | 7.2 | Occurred near Landers, California and caused the rupture of five different faults. Those faults were: Johnson Valley, Landers, Homestead Valley, Emerson, and Camp Rock. |
| 1992 | 7.3 | Occurred 3 hours after the Landers Earthquake with an epicenter near Big Bear, CA |
| 1994 | 6.8 | Northridge Earthquake |
| 1999 | 7.4 | Hector Mine Earthquake |
| 2010 | 5.4 | Borrego Springs earthquake believed by seismologists to have been possibly triggered by the strong earthquake which occurred near Calexico in 2010. |

Located within Riverside County are several known active and potentially active earthquake faults, including the San Andreas Fault, San Jacinto Fault, and Elsinore Fault In the event of an earthquake, the location of the epicenter, as well as the time of day and season of the year, would have a profound effect on the number of deaths and casualties, as well as property damage.





Research centers devoted to the detection and logging of earthquake events record the ongoing weekly activity of small magnitude in Riverside County faults. The most recent earthquake in Riverside County was located in Banning on July 7, 2017, and had a magnitude of 1.1. There are a number of small scale earthquakes that happen weekly but larger scale or catastrophe shaking is less likely.

A **moderate** earthquake occurring in or near Riverside County could result in deaths, casualties, property damage, environmental damage, and disruption of normal government and community services. The effects could be aggravated by collateral emergencies such as fires, flooding, hazardous material spills, utility disruptions, landslides, transportation emergencies, and the possible failure of several dams in Riverside County. The community needs would most likely exceed the response capability of the County's emergency management organizations, requiring mutual assistance from volunteer and private agencies, the California Office of Emergency Services (Cal OES), and the Federal Emergency Support Functions.

A **catastrophic** earthquake in Riverside County could cause thousands of casualties, extensive major property damage, disruption in communications and utility systems, disruption in supply and distribution systems, and general panic. An earthquake of this magnitude could directly affect all of Riverside County and most of southern California, causing a critical demand on mutual aid resources and competition for national relief.

Key effects and response considerations:

- **Effects on people and housing.** In any earthquake, the primary consideration is saving lives. Time and effort must also be dedicated to providing for mental health for reuniting families, providing shelter to displaced persons, and restoring basic needs and services. Major efforts will be required to remove debris and clear roadways, demolish unsafe structures, assist in re-establishing public services and utilities, and provide continuing care and temporary housing for affected citizens.

  A survey of local, State, and Federal government emergency plans indicate that although there is a general capacity to respond to small and intermediate-sized earthquakes, it is unlikely that any of these governmental units will be able to cope with the immediate impact of a great quake, such as a Magnitude (M) 8.3 event on the south-central San Andreas fault. The general public must realize that the assistance that they have been used to expecting simply will not be immediately available. In fact, in the event of an earthquake of such magnitude, citizens must be prepared to wait for up to 72 hours or more for any type of organized response.

- **Effects on commercial and industrial structures.** After any earthquake, individuals are likely to lose wages due to the inability of businesses to function because of damaged goods and/or facilities. With business losses, the County of Riverside and the cities in the Riverside County Operational Area will lose revenue. Economic recovery from even a minor earthquake will be critical to the communities involved.

- **Effects on infrastructure.** The damage caused by an earthquake can lead to the paralysis of the local infrastructure: police, fire, medical and governmental services.

- **Effects on Critical Facilities.** A large number of critical facilities have been identified as being adjacent to the various faults in the County and surrounding counties. The list of facilities includes hospitals, fire stations, law enforcement facilities, and schools.

  **Effects on agriculture.** Earthquakes can cause loss of human life, loss of animal life, and property damage to structures and land dedicated to agricultural uses. The most significant long-term impacts on agriculture from earthquakes are those that arise from the cascading effects of fire and flood.

Historically, the San Andreas Fault is the most active among the fault network that cuts through rocks of the California coastal region. The entire San Andreas Fault system is more than 800 miles long and extends to depths of at least 10 miles within the earth. The San Andreas Fault in California forms a continuous, narrow break in the earth's crust that extends from northern California southward to Cajon Pass near San Bernardino; southeastward from Cajon Pass. Several branching faults, including the San Jacinto and Banning faults, share the movement of the crustal plates as the fault continues to the south east, on to the Salton Sea and on to Baja California Sea of Cortez.

Recent studies of the eastern section of the San Andreas near San Gorgonio Pass reveal that this area is more advanced in the cycle of strain accumulation than the western area at the Cajon Pass. Earthquake activity around the Southern San Andreas, including the June 1992 Landers-Big Bear earthquakes, has prompted scientists to increase their studies of this area.

The San Jacinto fault has had a higher level of moderate-to- large earthquakes during the past 50 to 100 years, although the rate of slip is not as high. Geodetic data indicates there is an "appreciable" strain accumulation across both faults, implying that either one or both may be primed for release. One of the larger and more active fault segments of





the San Jacinto fault, the Casa Loma Faults, runs from near Perris Reservoir to just north of Anza. Also, another large and active named segment is the Clark Fault, which runs from near Hemet to just 9 miles southwest of the shore of the Salton Sea. Historically, this section of the San Jacinto Fault produced a series of large earthquakes starting in 1899 on average every 14 years with the longest interval being 19 years. The last slip occurred on the Superstition Hills and Elmore Ranch sequence in1987. In 2015, the Working Group on California Earthquake Probabilities (WGCEP) estimated 30-year probabilities of 19 percent for an M 6.7 and larger event on the Southern San Jacinto Fault.

A third major fault zone that traverses Riverside County is the Elsinore Fault. The Elsinore Fault Zone is one of the largest in southern California. The main trace of the Elsinore fault zone has only seen one historical event greater than magnitude 5.2 – the earthquake of 1910, a magnitude 6 shock near Temescal Valley.

***Risk Assessment Conclusion.***

Riverside County is at risk for a significant earthquake causing catastrophic damage and strains on response and mitigation resources. Both property and human life are at high risk. The County experiences hundreds of minor quakes and tremblers each month from the myriad of faults in the area. Studies indicate that stress is building up in major faults like the San Andreas. A major quake could happen at any time.

Earthquake risk is very high in the most heavily populated western portion of the County and the Coachella Valley, due to the presence of two of California's most active faults, the San Andreas and San Jacinto. The risk is moderate in the eastern portion of the County beyond the Coachella Valley.

The following maps have been provided by the Riverside County Transportation and Land Management Agency and developed using Cal OES MyPlan.

**Map 2:** Riverside County Faults and Zones

**Map 3:** Fault Activity

**Map 4:** Ground Shaking Potential

### *Relationship to Other Hazards – Cascading Effects*

Earthquakes can cause many cascading effects such as fires, flooding, hazardous material spills, utility disruptions, landslides, transportation emergencies, electrical failure and the possible failure of several dams in Riverside County.

### *Hazus Assessment*

HAZUS®MH was used to generate general building stock and essential facility loss estimates for five different natural hazard scenarios. Two of the scenarios were large scenario earthquakes. The earthquakes chosen for analysis were an M6.8 Elsinore Fault Scenario Earthquake, and the M7.8 "ShakeOut" Scenario Earthquake on the Southern San Andreas Fault.

Risk assessment results were generated using the following HAZUS®MH analysis options:

- **General Buildings**
  - Ground Motion
  - Damage State Probabilities
  - Damage
  - Direct Economic Loss
- **Essential Facilities**
  - Medical Care
  - Police Stations
  - Fire Stations
  - Emergency Response
  - Schools
- **Transportation Systems**
  - Highways
  - Railways
  - Light Rail
  - Bus System
  - Port and Harbor
  - Ferry System
  - Airport Transportation
- **Utility Systems**
  - Potable Water
  - Waste Water
  - Oil
  - Natural Gas

- Electric Power
- Communication

- **Induced Physical Damage**
  - Fire following
  - Debris
- **Direct Social Losses**
  - Casualties
  - Shelter

Table 18 (ES-2) provides a summary of HAZUS®MH-estimated regional impacts for Riverside County for the two earthquake scenarios. As shown in the tables, the total estimated direct economic loss related to building damage ranges from $1.8B to $9.8B in the two scenario events. It should be noted that these totals are for Riverside County only. Both earthquake scenarios have the potential to cause additional damage in adjacent counties (for example, the Elsinore scenario would also significantly impact San Diego and Orange counties), whose losses are not tabulated here.

**Table 15:** Summary of HAZUS estimated Impacts on Riverside County for Two Earthquake Scenarios

Table ES-2. Summary of HAZUS®MH-estimated Impacts on Riverside County for Two Earthquake Scenarios

| Impact Category | M6.8Elsinore | M7.8"ShakeOut" San Andreas* |
|---|---|---|
| Economic Loss due to Building Damage<br>Total Building-related Direct Economic Loss | $1.2B<br>$1.8B | $6.9 B<br>$9.8 B |
| # Buildings in Complete Damage State | 100 | 25,000* (many MH) |
| Debris Generated (million tons) | 0.3 | 3.5 |
| Displaced Households<br>People Needing Short-term Shelter | 110 Households<br>90 People | 19,000 Households*<br>8,600 People* |
| Fatalities (2 am, 2 pm, 5 pm)<br>Total Injuries (2 am, 2 pm, 5 pm) | <10,<10,<10<br>200, 200, 220 | 60 bldg (70 all causes)*<br>11,600 bldg (11,900 all)* |
| % of Households without Water | <1% | 99% |
| # Highway Bridges w/ at least Moderate Damage (potentially closed) | None expected | 100 |

*Note: selected custom estimates for the "ShakeOut" scenario have been taken from the full USGS technical report, "*The ShakeOut Scenario*". http://pubs.usgs.gov/of/2008/1150





Table 19 summarizes expected essential facility performance in the two earthquake events. Estimated building damages to essential facilities in Riverside County ranges from about $64M - $351M. These loss totals should not be considered all-inclusive, as replacement cost data was not available for many hospitals, and a small number of schools and police facilities.

**Table 16:** Summary of HAZUS – estimated Impacts for Riverside County Essential Facilities in Two Earthquake Scenarios

| Essential Facility | Category | M6.8 Elsinore | | M7.8 "ShakeOut" San Andreas | |
|---|---|---|---|---|---|
| | | Mean Damage | Economic Loss ($1,000) | Mean Damage | Economic Loss ($1,000) |
| Hospitals* | Medium | 2% | $4,858 | 14% | $3,842 |
| | Large | 0% | $899 | 26% | $5,180 |
| Schools | K-12 (default data) | 1% | $2,375 | 2% | $3,708 |
| | K-12 (providing data) | 1% | $54,774 | 6% | $314,182 |
| | CCD (providing data) | 0% | $706 | 5% | $24,465 |
| EOCs | | 1% | $3 | 6% | $20 |
| Police Stations | | 0% | $3 | 7% | $35 |
| Fire Stations | | 1% | $3 | 4% | $14 |
| **TOTALS** | | | **$63,620** | | **$351,446** |

*Note: In Riverside County, there are no hospitals which would be categorized by HAZUS as "Small" (<50 licensed acute care beds)

### *Elsinore Earthquake Scenario – Regional Impacts*

The M6.8 Elsinore scenario earthquake will impact the western-most communities and infrastructure of Riverside County. A summary of regional impacts is provided in Figure 29. These impacts are described below.

Of the approximately 647,000 buildings modeled within the improved general building stock data for Riverside County, less than 1% (approximately 100) are expected to suffer "complete" damage in the Elsinore scenario earthquake. These buildings would be considered "red-tagged" or unsafe for continued occupancy. A small percentage of these buildings (15% or less) have the potential for collapse, suggesting the need for Urban

Search & Rescue (USAR). Approximately 2,200 buildings (0.3%) are expected to suffer "extensive" damage, and would be considered "yellow-tagged", with restrictions on continued use. While the remainder of buildings would be considered "green-tagged" (safe for occupancy, although some damage may have occurred), as many as 3% (20,500) would be expected to suffer "moderate" damage, and an additional 13% (82,700) would suffer "slight" damage.

As much as 0.3 million tons of debris may result from these damaged buildings – 47% is expected to be heavy debris (concrete and steel), requiring heavy equipment to break down and remove, while 53% is expected to be light debris (wood, brick and other debris).

The number of people killed as a result of shaking-induced and transportation system damage is expected to be less than 10, regardless of the time of day that the earthquake occurs.

Total injuries, including the range of injuries from minor injuries treated with basic medical care to mortal injuries (deaths), are expected to be on the order of 200-220. Transportation of the injured for treatment is not expected to be impacted by transportation system damage, as no bridge in the County is expected to suffer "moderate" damage or greater.

**Figure 30:** Direct Building Economic Loss

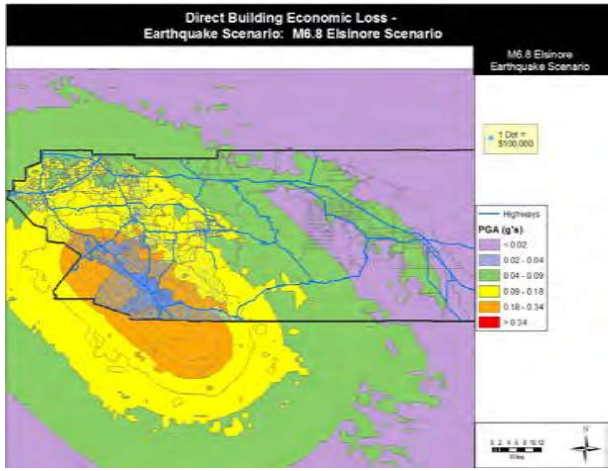






### *"ShakeOut" San Andreas Earthquake Scenario Regional Impacts*

The M7.8 "ShakeOut" San Andreas scenario earthquake will impact most of the populated portions of Riverside County. A summary of impacts is provided in Table 19. It should be noted, however, that some impact estimates have been taken from the improved estimates developed by the extensive community modeling effort (Jones, et al., 2008) conducted for the "ShakeOut" exercise. The use of these estimates is noted where appropriate.

**Table 17:** Summary of HAZUS – Estimated Impacts for Riverside County Due to an M7.8 Scenario Earthquake on the "ShakeOut" San Andreas Fault

| | |
|---|---|
| Economic Loss due to Building Damage<br>Total Building-related Direct Economic Loss | $6.9 B<br>$9.8 B |
| # Buildings in Complete Damage State | 25,000* (many MH) |
| Debris Generated (million tons) | 3.5 |
| Displaced Households<br>People Needing Short-term Shelter | 19,000 Households*<br>8,600 People* |
| Fatalities (2 am, 2 pm, 5 pm)<br>Total Injuries (2 am, 2 pm, 5 pm) | 60 in buildings (70 all causes)*<br>11,600 in buildings (11,900 all)* |
| % of Households without Water | 99% |
| # Highway Bridges w/ at least Moderate Damage (potentially closed) | 100 |

*Note: selected custom estimates for the "ShakeOut" scenario have been taken from: http://pubs.usgs.gov/of/2008/1150

In the M7.8 "ShakeOut" Scenario earthquake on the San Andreas Fault, dollar losses related to shaking-induced building damage are estimated to reach $6.9 billion, while total direct economic losses are expected to be approximately $9.8 billion. The geographic distribution of total direct economic loss is mapped in Figure 4-9.

**Figure 31:** Direct Economic Loss in Riverside County Resulting from an M7.8 Scenario Earthquake on the "ShakeOut" San Andreas Fault

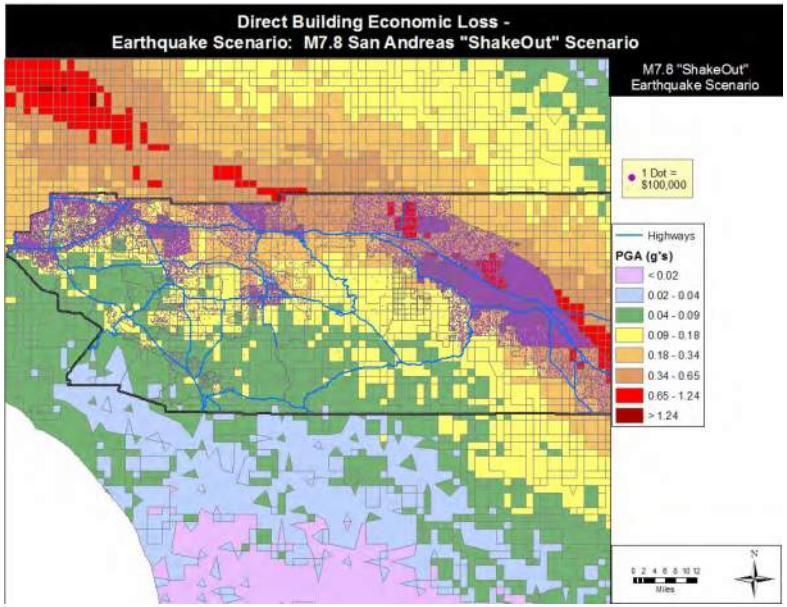


According to the published "ShakeOut" scenario (Jones, et al., 2008), approximately 25,000 buildings would be expected to suffer "Complete" damage in the scenario earthquake. These building, predominantly residential mobile homes, would be considered "red-tagged" or unsafe for continued occupancy. A small percentage of these buildings (15% or less) have the potential for collapse, suggesting the need for Urban Search & Rescue. More than 18,000 buildings are expected to suffer "Extensive" damage in this scenario earthquake and would be considered "yellow-tagged", with restrictions on continued use. While the remainder of buildings would be considered "green-tagged" (safe for occupancy, although some damage may have occurred), approximately 63,000 would be expected to suffer "Moderate" damage, and an additional 137,000 would suffer "Slight" damage.





Almost 3.5 million tons of debris may result from these damaged buildings – 58% is expected to be heavy debris (concrete and steel), requiring heavy equipment to break down and remove, while 42% is expected to be light debris (wood, brick and other debris).

In the "ShakeOut" scenario (Jones, et al., 2008), damage to single family and multi-family dwellings is expected to result in the displacement of approximately 19,000 households. Immediately after the earthquake, significant disruption to the water supply and distribution system is expected, essentially impacting the entire county. While many of the displaced may find shelter with friends and family, or in available hotels, approximately 8,600 people are expected to seek public shelter.

The number of people killed as a result of shaking-induced building, transportation system damage, and post-earthquake fire may be on the order of 60 to 70 people. Total injuries, including the range of injuries from minor injuries treated with basic medical care to mortal injuries (deaths) from all causes, are estimated to reach 11,900 within the County.

Transportation of the injured for treatment could be impacted by transportation system damage with as many as 100 bridges in the County suffering at least "Moderate" damage.

### *Essential Facility Impacts*

Table 19 provides an overview of essential facility performance in the "ShakeOut" San Andreas Scenario earthquake. The table lists the number of essential facility sites and buildings (these numbers will differ for multi-building campuses, such as schools and hospitals). The table also provides the total building replacement value and the number of buildings for which value data was available. As can be seen in the table, replacement cost data for hospitals was generally not available, unlike most other essential facility types. Expected building performance in this earthquake event is on the order of 7% damage or less for EOCs, fire stations, police stations, and schools, but as much as 26% damage for large hospitals. The total economic loss for essential facilities has been estimated to exceed $351 million, with 97% of the total loss occurring in schools. It should be noted that although cost data is only available for 31 hospital buildings (out of 77), these 31 buildings suffer more than $9 million in loss, indicating that the actual total economic loss for hospitals would be significant, but can't be estimated at this time because of the lack of replacement value data.

**Table 18:** Riverside County Essential Facility Loss Estimates – M7.8 "ShakeOut" San Andreas Fault Scenario Earthquake

| Essential Facility | Category | No. of Facilities/ Sites | No. of Buildings | No. of Beds | Replacement Cost ($1,000) | # Buildings w/ replacement cost data | Functionality Day 1 (%) | Mean Damage | Economic Loss ($1,000) |
|---|---|---|---|---|---|---|---|---|---|
| Hospitals* | Medium | 8 | 28 | 793 | $162,827 | 21 | 64 | 14% | $3,842 |
| | Large | 8 | 49 | 2,467 | $200,792 | 10 | 26 | 26% | $5,180 |
| Schools | K-12 (default data) | 152 | 152 | | $219,600 | 152 | 74 | 2% | $3,708 |
| | K-12 (providing data) | 689 | 9,981 | | $6,049,534 | 9,213 | 64 | 6% | $314,182 |
| | CCD (providing data) | 12 | 258 | | $356,708 | 257 | 54 | 5% | $24,465 |
| EOCs | | 43 | 43 | | $310,273 | 43 | 60 | 6% | $20 |
| Police Stations | | 51 | 51 | | $675,299 | 48 | 57 | 7% | $35 |
| Fire Stations | | 156 | 156 | | $366,493 | 156 | 72 | 4% | $14 |
| **TOTALS** | | **1,119** | **10,718** | **3,260** | **$8,341,525** | **9,900** | | | **$351,446** |

*Note: In Riverside County, there are no hospitals which would be categorized by HAZUS as "Small" (<50 licensed acute care beds)

The following three maps are from the Fault Activity Map of California, California Geologic Survey, Data Map





**Map 5:** Fault Activity Map of California, Western Riverside County

**Map 6:** Fault Activity Map of California, Central Riverside County

**Map 7:** Fault Activity Map of California, Eastern Riverside County

### 5.3.2 Pandemic Flu

**Severity: 4**

**Probability: 2**

**Risk Score: 3.50**

**OA Jurisdictions Affected by Pandemic and Epidemic**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

#### *Hazard Definition*

A disease outbreak can cause illness and result in significant casualties. Since 1900, there have been four influenza pandemics that killed approximately 600,000 people in the United States. In 2009 the H1N1 flu was first identified in Imperial and San Diego counties, killing more than 550 Californians, sent thousands more to hospitals, caused widespread fear and anxiety and the declaration of a public health emergency. H1N1 in 2009 tested the State's medical infrastructure as never before. H1N1 quickly spread nationwide and then around the globe, taking a heavy toll on people not usually susceptible to serious influenza.

#### *History*

**2009** - Rise of H1N1, popularly referred to as the Swine Flu. According to the California Center for Infectious Diseases, the H1N1 flu (2009 H1N1 influenza virus) is a type of influenza virus that causes respiratory disease that can spread between people. While most people who have been sick have recovered without needing medical treatment, hospitalizations and deaths from infection with this virus has occurred. The spread of H1N1 flu occurs in the same way that seasonal flu spreads. Flu viruses are spread mainly from person to person through coughing or sneezing by people with influenza. As a result of preparation and mitigation strategies such as vaccinations and public education, the threat of a full-blown H1N1 pandemic in the U.S. is receding. However, the possibility of another pandemic still exists.

**2003** - A previous pandemic flu threat that still looms is the avian flu. Birds can contract avian flu and pass it along to humans. Some strains of the avian flu are more virulent than others. Public health experts continue to be alert to the risk of a possible re-emergence of a 2003 epidemic of avian flu among people primarily in Asia. People who had been very close contact with infected birds (for example, people who lived with chickens in their houses) contracted a virulent form of avian





flu and there was a significant death rate from this disease. Thus far, the avian flu virus has not mutated and has not demonstrated easy transmission from person to person. However, were the virus to mutate in a highly virulent form and become easily transmissible from person to person, the public health community would be very concerned about the potential for a pandemic influenza outbreak. Such a pandemic could disrupt all aspects of society and severely affect the economy.

#### *Risk Assessment*

Influenza, also known as the flu, is a disease that attacks the respiratory system (nose, throat, and lungs) in humans. Although mild cases may be similar to a viral "cold," influenza is typically much more severe. It usually comes on suddenly; may include fever, headache, tiredness, dry cough, sore throat, nasal congestion, and body aches; and more often results in complications such as pneumonia. Seasonal influenza is a yearly occurrence that causes serious flu-related complications primarily for persons aged 65 and older and those with chronic health conditions (such as asthma, diabetes, or heart disease), pregnant women, and young children. Those who are exposed but do not succumb develop immunity to the strain circulating that year. Worldwide pandemics of influenza occur when a novel virus emerges to which the population has little immunity. The 20th century saw three such pandemics, the most notable of which was the 1918 Spanish influenza pandemic that was responsible for 20 million deaths throughout the world. Secondary impacts include significant economic disruption that can occur due to loss of employee work time and costs of treating or preventing spread of the flu.

Source: https://archive.cdph.ca.gov/HealthInfo/discond/Pages/Influenza(Flu).aspx

#### *California Department of Public Health*

The 2009 H1N1 influenza (flu) pandemic occurred against a backdrop of pandemic response planning at all levels of government including years of developing, refining and regularly exercising response plans at the international, federal, state, local, and community levels. At the time, experts believed that avian influenza A (H5N1) viruses posed the greatest pandemic threat. H5N1 viruses were endemic in poultry in parts of the world and were infecting people sporadically, often with deadly results. Given that reality, pandemic preparedness efforts were largely based on a scenario of severe human illness caused by an H5N1 virus. Despite differences in planning scenarios and the actual 2009 H1N1 pandemic, many of the systems established through pandemic planning were used and useful for the 2009 H1N1 pandemic response.

http://www.cdc.gov/h1n1flu/cdcresponse.htm (see attachment for complete document report)

The California Department of Public Health (CDPH) monitors flu conditions on an annual bases, including all virologic, case based and syndromic surveillance. CDPH works with Riverside County to help the community prepare and mitigate the effects of Pandemic Flu.

- **Effects on people and housing.** The risk to people can be severe, leading to hospitalization and possibly loss of life. Damage to housing as a result of Pandemic Flu is not likely.
- **Effects on commercial and industrial structures**. The risks are minimal to structures.
- **Effects on infrastructure.** The risks are minimal, but if there is a pandemic the risk will decrease the numbers of workers that go to work, which can have economic and functional effects to the organizations in a community. Continuity of Business and Continuity of Government planning goes into action in these cases.
- **Effects on agriculture.** The risk of animals borne disease can be great in a pandemic, depending on the disease. The impact to agriculture can be great, again depending on the disease.





The following charts are from the CDPH Influenza and Other Respiratory Diseases

**Figure 32:** Surveillance Report for the 2015–2016 Flu Season.

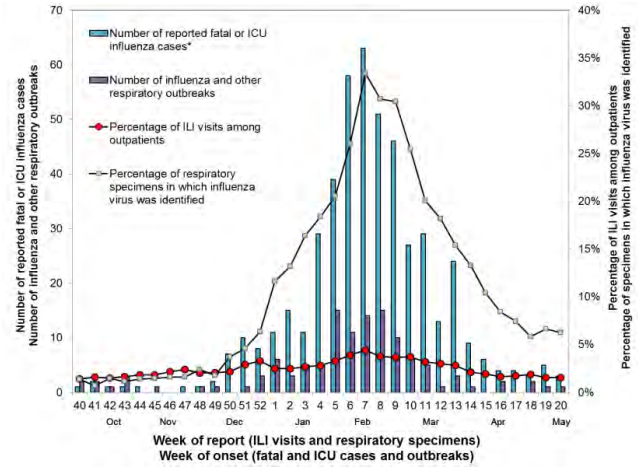


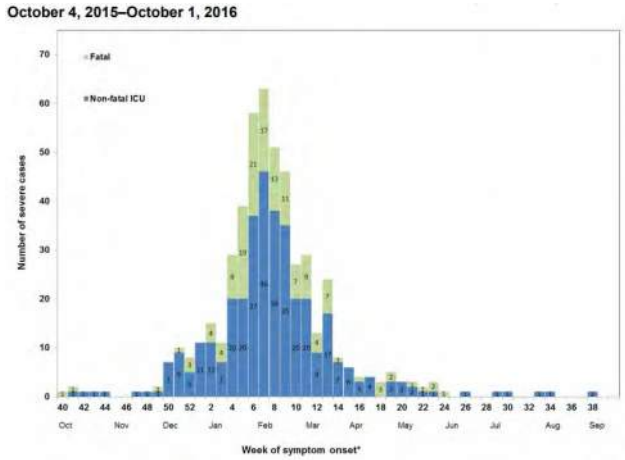

**Table 19:** Statewide 2011-2016 Influenza Cases0

**Appendix I. Number of fatal and non-fatal ICU cases of laboratory-confirmed influenza in persons <65 years of age reported to the California Department of Public Health, by local health jurisdiction, 2011–2012 influenza season through 2015–2016 influenza season**

| | 2011-2012* | | 2012-2013* | | 2013-2014* | | 2014-2015* | | 2015-2016* | |
|---|---|---|---|---|---|---|---|---|---|---|
| Jurisdiction | Fatal | Non-fatal ICU | Fatal | Non-fatal ICU | Fatal | Non-fatal ICU | Fatal | Non-fatal ICU | Fatal | Non-fatal ICU |
| CALIFORNIA | 51 | 166 | 116 | 241 | 416 | 837 | 79 | 290 | 144 | 355 |
| Alameda† | 6 | 9 | 3 | 3 | 12 | 26 | 2 | 12 | 5 | 19 |
| Berkeley City | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Alpine | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Amador | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 1 |
| Butte | 0 | 2 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 1 |
| Calaveras | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 |
| Colusa | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Contra Costa | 0 | 9 | 1 | 12 | 9 | 40 | 1 | 8 | 1 | 11 |
| Del Norte | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| El Dorado | 0 | 0 | 0 | 0 | 3 | 8 | 0 | 1 | 0 | 3 |
| Fresno | 3 | 10 | 7 | 14 | 22 | 18 | 4 | 14 | 5 | 8 |
| Glenn | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Humboldt | 0 | 0 | 0 | 3 | 1 | 6 | 1 | 1 | 1 | 1 |
| Imperial | 0 | 0 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 1 |
| Inyo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Kern | 1 | 2 | 2 | 0 | 11 | 23 | 0 | 5 | 1 | 1 |
| Kings | 0 | 0 | 0 | 0 | 7 | 5 | 0 | 2 | 1 | 2 |
| Lake | 0 | 2 | 0 | 0 | 1 | 5 | 0 | 3 | 0 | 1 |
| Lassen | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Los Angeles† | 12 | 0 | 32 | 0 | 75 | 22 | 16 | 7 | 36 | 0 |
| Long Beach City | 1 | 2 | 1 | 0 | 8 | 4 | 1 | 5 | 1 | 10 |
| Pasadena City | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Madera | 0 | 0 | 2 | 1 | 3 | 6 | 1 | 1 | 1 | 1 |
| Marin | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 2 | 0 | 0 |
| Mariposa | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Mendocino | 0 | 1 | 0 | 1 | 4 | 12 | 0 | 0 | 0 | 1 |
| Merced | 0 | 1 | 0 | 0 | 5 | 6 | 0 | 0 | 0 | 1 |
| Modoc | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mono | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Monterey | 0 | 1 | 0 | 4 | 7 | 12 | 2 | 6 | 1 | 2 |
| Napa | 0 | 0 | 0 | 0 | 0 | 7 | 1 | 1 | 0 | 3 |
| Nevada | 1 | 0 | 0 | 0 | 1 | 4 | 0 | 2 | 0 | 0 |
| Orange | 2 | 18 | 6 | 31 | 22 | 35 | 11 | 23 | 14 | 40 |
| Placer | 0 | 0 | 0 | 2 | 1 | 9 | 1 | 3 | 1 | 3 |
| Plumas | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Riverside | 0 | 16 | 6 | 14 | 23 | 43 | 2 | 14 | 9 | 22 |
| Sacramento | 3 | 25 | 10 | 40 | 29 | 96 | 4 | 27 | 8 | 42 |
| San Benito | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| San Bernardino | 5 | 15 | 7 | 13 | 31 | 52 | 4 | 15 | 6 | 32 |
| San Diego | 5 | 10 | 17 | 43 | 44 | 112 | 8 | 59 | 28 | 64 |
| San Francisco | 0 | 1 | 2 | 1 | 4 | 28 | 1 | 0 | 0 | 0 |
| San Joaquin | 2 | 5 | 0 | 8 | 8 | 23 | 3 | 8 | 2 | 9 |
| San Luis Obispo | 0 | 0 | 2 | 2 | 1 | 7 | 0 | 3 | 0 | 3 |
| San Mateo | 2 | 10 | 1 | 3 | 6 | 18 | 5 | 12 | 2 | 6 |
| Santa Barbara | 0 | 2 | 1 | 4 | 3 | 9 | 2 | 6 | 4 | 10 |
| Santa Clara | 1 | 8 | 9 | 10 | 20 | 45 | 2 | 14 | 6 | 17 |
| Santa Cruz | 0 | 1 | 0 | 4 | 5 | 6 | 0 | 6 | 0 | 4 |
| Shasta | 0 | 0 | 0 | 0 | 3 | 10 | 0 | 1 | 0 | 5 |
| Sierra | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Siskiyou | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 |
| Solano | 0 | 1 | 0 | 7 | 3 | 14 | 2 | 10 | 2 | 6 |
| Sonoma | 0 | 0 | 0 | 1 | 7 | 19 | 1 | 2 | 5 | 4 |
| Stanislaus | 2 | 6 | 1 | 3 | 13 | 31 | 2 | 2 | 1 | 2 |
| Sutter | 0 | 0 | 0 | 1 | 1 | 3 | 0 | 0 | 0 | 0 |
| Tehama | 0 | 0 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 1 |
| Trinity | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Tulare | 1 | 1 | 1 | 2 | 5 | 25 | 0 | 2 | 0 | 3 |
| Tuolumne | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| Ventura | 4 | 7 | 3 | 6 | 3 | 11 | 1 | 9 | 3 | 7 |
| Yolo | 0 | 1 | 0 | 3 | 1 | 10 | 0 | 1 | 0 | 4 |
| Yuba | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |

* 2011–2012: October 2, 2011–September 29, 2012; 2012–2013: September 30, 2012–September 28, 2013; 2013–2014: September 29, 2013–September 27, 2014; 2014-2015: September 28, 2014-October 3, 2015; 2015-2016: October 4, 2015-October 2, 2016

† Does not include city counts

Source:Https://archive.cdph.ca.gov/HealthInfo/discond/Documents/CA%20Year%20End%20Flu%20Summary_2015-2016_final.pdf





### 5.3.3 Wildland Fire

**Severity: 3**

**Probability: 4**

**Risk Score: 2.25**

**OA Jurisdictions Affected by Wildfire**

- Fern Valley Water District
- Idyllwild Fire Protection District
- Idyllwild Water District
- Menifee Union School District
- Temecula Valley Unified School District
- Riverside County Office of Education
- Riverside Unified School District
- San Jacinto Unified School District

Cities in which CAL FIRE has made recommendations on Very High Fire Hazard Severity Zones (VHFHSZ) in Riverside County (22 cities)

- Banning
- Beaumont
- Calimesa
- Canyon Lake
- Cathedral City
- Corona
- Desert Hot Springs
- Hemet
- Jurupa Valley
- Lake Elsinore
- Menifee
- Moreno Valley
- Murrieta
- Norco
- Palm Desert
- Palm Springs
- Perris
- Rancho Mirage
- Riverside
- San Jacinto
- Temecula
- Wildomar

**Map 8:** Riverside County Wildland Fire Threat

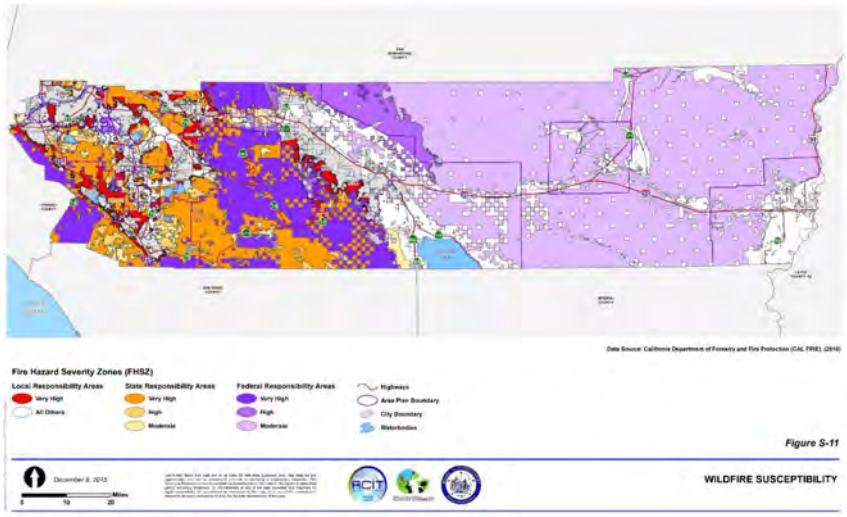






### *Hazard Definition*

A wildfire is an uncontrolled fire spreading through vegetative fuels, posing danger and destruction to property. Wildfires can occur in undeveloped areas and spread to urban areas.

Public Resources Code §4114 and §4130 authorize the State Board of Forestry and Fire Protection (Board) to establish a fire plan which, among other things, establishes the levels of statewide fire protection services for State Responsibility Area (SRA) lands. These levels of service recognize other fire protection resources at the federal and local level that collectively provide a regional and statewide emergency response capability. In addition, California's integrated mutual aid fire protection system provides fire protection services through automatic and mutual aid agreements for fire incidents across all ownerships where structures and other human development are more concentrated.

The California Fire Plan is the state's road map for reducing the risk of wildfire. The Fire Plan is a cooperative effort between the State Board of Forestry and Fire Protection and the California Department of Forestry and Fire Protection. By placing the emphasis on what needs to be done long before a fire starts, the Fire Plan looks to reduce firefighting costs and property losses, increase firefighter safety, and to contribute to ecosystem health.

### *State Responsibility Areas (SRAs)*

State Responsibility Areas (SRAs) are those lands within California that meet specific geographic and environmental criteria. These are areas where CAL FIRE has legal and financial responsibility for wildland fire protection and where CAL FIRE administers fire hazard classifications and building standard regulations. SRAs are defined as lands that 1) are county unincorporated areas, 2) are not federally owned, 3) have wildland vegetation cover rather than agricultural or ornamental plants, 4) have watershed and/or range/forage value, and 5) have housing densities not exceeding three units per acre.60 Similar to the Federal Responsibility Areas (FRAs), where SRAs contain built environment or development, the responsibility for fire protection of those improvements (non-wildland) is that of a local government agency.

### *Local Responsibility Areas (LRAs)*

Local Responsibility Areas (LRAs) include land within incorporated cities, cultivated agriculture lands and non-flammable areas in unincorporated areas and those lands that do not meet the criteria for SRA or FRA. LRA fire protection is typically provided by city fire departments, fire protection districts, and counties, and by CAL FIRE under contract

to local governments. LRAs may include flammable vegetation and Wildland-Urban Interface (WUI) areas where the financial and jurisdictional responsibility for improvement and wildland fire protection is that of a local government agency.

### *Homes in Wildland-Urban Interface (WUI) Areas*

Wildfire poses a significant risk to the people of California and their homes, as evidenced by an increasing trend in structural losses from wildland fires. The risk is predominantly associated with wildland-urban interface (WUI) areas. WUI is a general term that applies to development interspersed within or adjacent to landscapes that support wildland fire.

### *Housing Unit Density Classes:*

Class Description

- Rural/Outlying: From one housing unit per five acres to one housing unit per twenty acres.
- Urban: Dwelling unit density of 2 to 8 units per acre.
- Wildland Urban Interface: The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.
- Wildland Intermix Interface is a condition where homes and other structures are scattered throughout a wildland area.

Managing the human/wildfire conflict requires a commitment of resources and a focused mitigation plan over the long term. The approach must be system-wide and include the following:

- An informed, educated public that takes responsibility for its own decisions relating to wildfire protection
- An effective wildfire suppression program
- An aggressive hazardous fuels management program





- Land use policies and standards that protect life, property, and natural resources
- Building and fire codes that reduce structural ignitions from windblown embers and flame contact from WUI fires and impede or halt fire spread within the structure once ignited
- Construction and property standards that provide defensible space

While some wildfires start by natural causes, humans cause four out of every five wildfires. Wildfires started by humans are usually the result of debris burns, arson, or carelessness. As a natural hazard, a wildfire is often the direct result of a lightning strike that may destroy personal property and public land areas, especially on state and national forest lands. The predominate dangers from wildfires are:

1. Injury or loss of life to people living in the affected area or using the area for recreational facilities.
2. Injury or loss of life to first responders.
3. The destruction of timber, property, wildlife

### *History*

There is a long history of wildfires in Riverside County. The table below represents Wildland Fires of 100 acres or greater from 2001 to 2017. The source of the information is the California Department of Forestry and Fire Protection.

**Table 20:** Riverside County Large Fires 300 Acres and Greater (2001-2017)

Wildland Incidents within Riverside to include Local and State Incidents.

| YEAR | NUMBER OF LARGE FIRES |
|---|---|
| 2017 | 6 (as of July 2017) |
| 2016 | 3 |
| 2015 | 5 |
| 2014 | 1 |
| 2013 | 5 |
| 2012 | 7 |
| 2011 | 1 |
| 2010 | 4 |
| 2009 | 3 |
| 2008 | 3 |
| 2007 | 6 |
| 2006 | 12 |
| 2005 | 7 |
| 2004 | 6 |
| 2003 | 9 |
| 2002 | 5 |
| 2001 | 5 |

Source: http://cdfdata.fire.ca.gov/incidents/incidents_search_results?search=riverside

Interestingly, the preceding Riverside County Wildland Fire Threat map points out the distinct bi-lateral character of Riverside County. The western end of the County is more





urban, densely populated, and covered with vegetation that is susceptible to wildfires. The eastern end of the County is primarily desert, with far less population and far less vegetation than the western end of the County.

The categories are:

- Little or No Threat
- Moderate
- High
- Very High
- Extreme

The following two maps are maps of Fire Hazard Severity Zones. They show the wildfire susceptibility Risks and the local responsibility area, and the state or federal responsibility areas.

**Map 9:** Western Riverside County Wildfire Susceptibility Risks Map

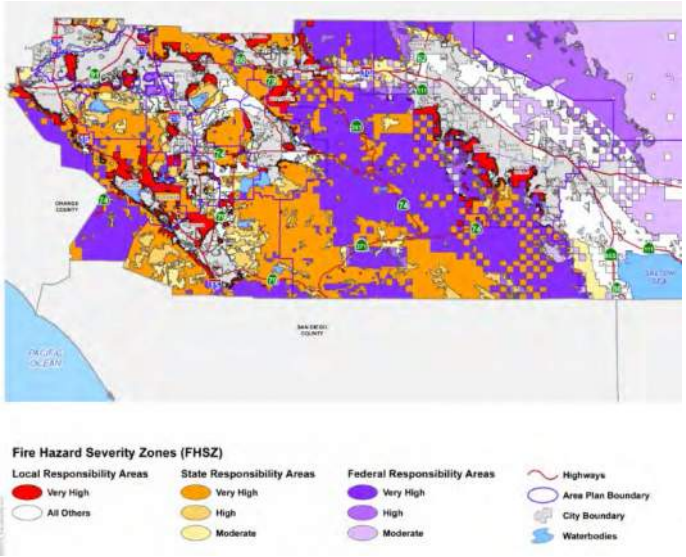






**Map 10:** Eastern Riverside County Wildfire Susceptibility Risks Map

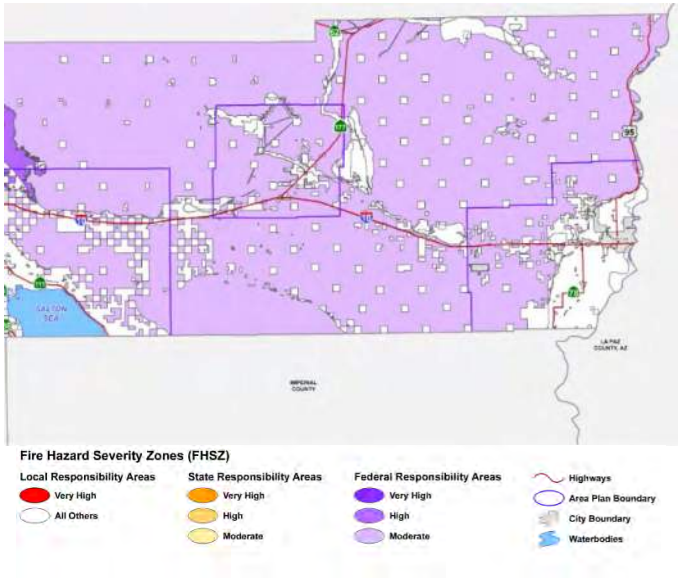

### *Risk Assessment*

Fire is a continuous threat in Southern California, particularly in Riverside County. The major areas of concern are the wildland and urban interfaces. Hundreds of homes now border major forests and brush areas. With thousands of people living near and visiting wildland areas, the probability of human-caused fires is growing. Although occurring with less frequency, the threat of fire from lightning strikes also exists. The Idyllwild area, San Jacinto Mountains is heavily forested and high hazard area.

Generally, the dry seasons are a major time for an increase in the number of forest fires and structure fires. The standard "shake roof" is a particular hazard, as is the poor control of flammable growth around structures. During times of the strong "Santa Ana" winds, fire danger is particularly high.

The increase of industrial complexes, transportation networks, and utility networks pose a threat that is not seasonal, but rather year-round. Associated with industry and transportation networks is the ever present problem of hazardous materials. Although not necessarily a wildland threat, a fire occurring in an urban area involving hazardous materials could have serious consequences.

Due to the undeveloped and rugged terrain in parts of Riverside County, highly flammable brush- covered land, and long, dry summers, many portions of the County have experienced numerous wildland fires in the recent past.

- **Effects on people and structures.** The effects on people and housing can be significant. Many fires shown in the table above resulted in the evacuation of homes. Wildfires have the potential to destroy residential and commercial buildings, as well as critical infrastructure.

- **Effects on infrastructure.** Due to destroyed powerlines, wildfires often result in power outages. These outages can be extensive in geographic area and numbers of persons affected.

- **Effects on Critical Facilities.** There are approximately 15 fire stations that are in potential direct risk from wildland fires. There are additional critical locations within the Idyllwild area that are at a high danger risk from wildland fires. In many cases (i.e. fire stations and schools) these facilities cannot be relocated into a safer area.





- **Effects on agriculture.** Effects on agriculture can be devastating. In addition to the obvious impacts on animals and crops, wildfire can have deleterious effects on soil and water that will affect agriculture for an extended period of time.

### *Relationship to Other Hazards – Cascading Effects*

Major wildfires can completely destroy ground cover causing flooding and erosion. If heavy rains follow a major fire, flash floods, heavy erosion, landslides and mudflows can occur. These cascading effects can have ruinous impacts on people, structures, infrastructure, and agriculture.

### *Risk Assessment Conclusion.*

The western end of Riverside County is far more susceptible to wildfire than the eastern end of the County. The effects can be far-reaching in terms of the number of acres involved, the toll on human life, and the economic consequences. Wildfire will continue to be a high-risk hazard for Riverside County.

### 5.3.4 Electrical Failure – Power Outage

**Severity: 4**

**Probability: 4**

**Risk Score: 2.00**

**OA Jurisdictions Affected by Power Outage Incidents**

- Cathedral City
- City of La Quinta
- City of Palm Springs
- Desert Water Agency
- Imperial Irrigation District
- Western Municipal Water District

#### *Hazard Definition*

##### *Identifying Energy Shortage Hazards*

California continues to experience both population growth and weather cycles that contribute to a heavy demand for power. Climate change may also increase California's vulnerability to energy shortage hazards. Predicted increases in heat waves, as well as increasingly severe winter storms, will put ever greater strain on California's electricity system.

Hydro-generation provides approximately 20 percent of California's electric power, with the balance coming from fossil fuels, nuclear, and renewable sources. Rotating outages and/or blackouts such as those experienced in 2000 and 2001 can occur due to losses in transmission or generation and/or extremely severe temperatures that lead to heavy electric power consumption.

The electric power industry does not have a universal agreement for classifying disruptions.





Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. Electric power disruptions can be generally grouped into two categories: intentional and unintentional.

There are four types of intentional disruptions:

1. Planned (Maintenance): Some disruptions are intentional and can be scheduled. For example, a disruption may be necessary when components of the power system are taken out of service for maintenance or upgrading. Scheduled intentional disruptions can last from several minutes to several hours, and customers are usually notified in advance.

2. Unscheduled (Repair): Some intentional disruptions must be done "on the spot." As a result, advance notice cannot be provided. For example, a fire department or a police department may request a disruption in service during a fire or an accident.

3. Demand-Side Management: Some customers (i.e., on the demand side) have entered into an agreement with their utility provider to curtail their demand for electricity during periods of peak system loads. In return for agreeing to these disruptions, these customers receive a lower electric rate and/or a rebate.

4. Load Shedding (Rotating): When the power system is under extreme stress due to heavy demand and/or failure of critical components, it is sometimes necessary to intentionally interrupt the service to selected customers to prevent the entire system from collapsing. In such cases, customer service (or load) is cut, sometimes with little or no warning. One form of load shedding called a "rotating blackout" involves cutting service to selected customers for a predetermined period (usually not more than two hours). As power is restored to one block of customers, the power to another block of customers is interrupted to reduce the overall load on the system.

Unintentional or unplanned disruptions are outages that come with essentially no advance notice. This type of disruption is the most problematic. The following are categories of unplanned disruptions:

- Accident by the utility, utility contractor, or others.
- Malfunction or equipment failure due, for example, to age, improper operation, excessive operation, or manufacturing defect; special subcategories cover broken fuse links and underground cable, joint, or termination failures.
- Equipment overload (utility company or customer).

- Reduced capability (equipment that cannot operate within its design criteria).
- Tree contact other than from storms.
- Vandalism or intentional damage.
- Weather, including ice/snow, lightning, wind, earthquake, flood, and broken tree limbs taking down power lines.
- A wildfire that damages transmission lines.





**Table 21:** Riverside County Power Outages (1993-2017)

| Location | Date | Incident Description |
|---|---|---|
| Riverside County | 10/28/1993 | Variety of fires. 129 structures destroyed. Power outages. 6 injuries. |
| Greater Jurupa Area | 1/6/1996 | Property damage, power disruption, road damage. |
| Beaumont | 2/17/1999 | 60mph winds damaged roofs, downed trees and power lines, and created a dense dust storm. A plume of dust penetrated homes and covered all surfaces and filled closets and cupboards. Yards had 3" to 6" of silt. 1128 homes damaged. 27 vehicles. |
| Hector Mine Earthquake | 10/16/1999 | Minor damage to buildings, power interruption, communication interruption, gas line break causing a leak. |
| Blythe | 8/23/2000 | Power outage from storms. Provided shelter for 24 people. |
| Desert Cities | 8/27/2000 | Thunderstorm and wildfires caused power interruption. 2,800 customers without power. |
| Eastern Coachella Valley | 7/3/2001 | Power failure. Several thousand people affected. |
| Riverside County | 2/9/2002 | High wind. Damage throughout the County. Roof damage, structure fires, wildfires started but were contained before 15 acre point. Power outages from the wind. |
| Moreno Valley | 7/22/2002 | 51 home blackout. Transformer fire. Illegal dumping of used motor oil into the transformer vault. |
| Mira Loma, Jurupa, Rubidoux, Pedley, Sky Country | 1/6/2003 | High wind caused road closures, downed trees and power lines. Semi-truck overturns. Power outages affecting 10,000. Fire. |
| Riverside County | 1/14/2003 | Power lines down with 936,569 people affected, trees felled, homes damaged, fire triggered from downed lines, |

| | | |
|---|---|---|
| Elsinore, Hemet, Moreno Valley, Perris, San Jacinto and Temecula in the southeastern area of Riverside County | 4/23/2009 | Substation load interruption led to loss of power to 280.000 residents |
| Riverside County, Orange County, parts of Arizona and Mexico | 9/8/2011 | Cascading outages led to approximately 2.7 million customers without power due to an 11-minute system disturbance. Power loss lasted as long as 12 hours for some affected. Riverside County's Imperial Irrigation District was directly affected. |
| Thousand Palms, Indio and Desert Hot Springs | 4/30/2014 | A cut fiber ring led to communication failure for 261 residents. Power outages for 10,500 residents due to windy conditions. |
| Riverside | 3/11/2016 | Micro-burst caused down powerlines and power outages, 3,000 people affected. |
| Riverside | 4/29/2016 | Power outage led to 20,020 SoCal Edison customers affected. |
| Moreno Valley | 2/10/2017 | 8,137 residents lost power due to substation malfunction |
| Riverside University Health System | 5/11/2017 | Scheduled maintenance required the hospital to switch to partial generator power for 16 hours. |
| Desert Reginal Hospital | 5/17/2017 | Experience power outage and ran off generators for |
| Riverside | 10/26/2017 | Load shedding caused loss of power to 104,000 residents |

### *Risk Assessment*

The possibility of catastrophic damage to property or loss of life due directly to power failure is slight. An individual could lose their life if they come into contact with a downed power line. Although the risk of a power outage is high, the direct damage potential is low.

Power outages or interrupted service often occur during electrical storms and high winds. Wildfires also cause power outages in Riverside County. There is a very real possibility of a widespread blackout due to the earthquake.





- **Effects on people and housing**. Impacts due directly to power failure are slight. If the persons require electric powered medical equipment, they will be at greater risk. In the areas of the county that can be impacted by high temperatures, or very cold temperatures, a power outage can have an on the heating or cooling abilities.
- **Effects on commercial and industrial structures**. Impacts due directly to power failure are slight. If the outage lasts many days, the impact would be of a greater severity.
- **Effects on infrastructure.** Impacts to the ability of infrastructure in the area of failure to support emergency response may be significant, although not permanent.
- **Effect on Critical Facilities.** Most critical facilities are required to have a back- up generator, but there is no official list of "all" critical having and maintain working back- up generators. Depending on the facility, the power outage can have strong effects on parts of the population that need medical devices, also for cooling and heating purposes.
- **Effects on agriculture.** Impacts due directly to power failure are slight.

### *Relationship to Other Hazards – Cascading Effects*

As noted, other hazards such as an earthquake, wildfire, electrical storms, and high winds may be causes of blackouts.

### *Risk Assessment Conclusion*

The County needs to be prepared to restore power should there be a failure due to downed lines caused by another hazardous condition or any other reason.

### 5.3.5 Emergent Disease/Contamination

**Severity: 3**

**Probability: 3**

**Risk Score: 1.69**

**OA Jurisdictions Affected by Emergent Disease/Contamination**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

#### *Hazard Definition*

According to the Center for Disease Control, the term "emerging infectious diseases" refers to diseases of infectious origin whose incidence in humans has either increased within the past two decades or threatens to increase in the near future. Emergent diseases are new, new to the area, reappearing in the area after being fairly dormant, or a strain has become resistant to antibiotics. These illnesses are caused by bacteria, viruses or fungi that have entered into the body and began to multiply. Infectious diseases can be spread throughout the County population in a number of different ways:

- Vector (Bug bites)
- Person to person
- Contaminated food water or soil

#### *Zika*

Zika is a virus that is predominantly transmitted through the vector. Female Aedes ageypti are more dangerous than males. This is due to the fact that females have blood meals and males do not. They also spread the infection through laying eggs in standing water. Riverside County has detected Aedes ageypti, however, the ones that have been tested do not carry the virus. The reported cases in Riverside County have all been travel related illnesses. The threat of transmission is still present due to the potential sexual transmission of the virus.





**Figure 33:** Zika Risk Map by County

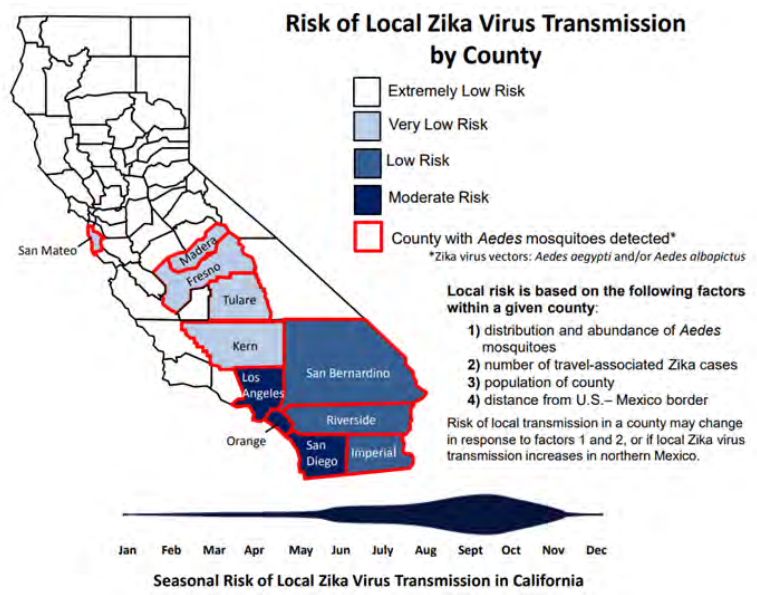


Source:https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/LocalZikaRiskMap.pdf

#### *Ebola*

Ebola is dominant in African countries, though with the ease of travel it has the potential to make its way to California. It is transmitted through blood, bodily fluids, direct contact with broken skin, contaminated needles and infected primates. When infected it can be fatal. Ebola can spread rapidly within Health Care Facilities when staff are not properly trained of not wearing adequate personal protective gear.

### *Risk Assessment*

- **Effects on people and housing.** The risk to people can be severe, leading to hospitalization and possibly loss of life. Damages to housing as a result of Pandemic Flu are not likely.

- **Effects on commercial and industrial structures.** The risks are minimal to structures.

- **Effects on infrastructure.** The risks are minimal, but if there is an emergent outbreak the risk to people will lessen the numbers of workers that can go to their regular employment, which can strain the maintaining the infrastructure. Continuity of Business and of Government may become an issue. Outbreaks also but a strain on schools, hospitals, doctor offices and businesses.

- **Effects on agriculture:** Agriculture can be devastatingly affected by emergency diseases. There are a number of vector borne illnesses that can affect livestock such as Lyme disease, Salmonella and rabies. Plant pests or viruses can cause huge losses in crops that can threaten food safety and farmer livelihood stability.

### *History of Events*

**2015/17 –** Zika was confirmed in Riverside County in 2015 with 14 infections. In 2017, there were 2 confirmed cases. All cases were travel related. Report accuracy reflects confirmed cases. Due to the symptoms mirroring a cold, the number could be higher but the mortality rate for this disease is very low. Its greatest impact is on a pregnant woman. 153 cases were reported within the state of California as of August 2016. Sexual transmission is a possibility with this virus. Transmitting mosquitos, Aedes ageypti, are present within the County.

**2014/16 –** Riverside County was alerted of the 2014 West Africa Ebola Outbreak in West African countries. Worldwide, a total of 1,975 cases where confirmed and 1,069 deaths were reported in August 2014. In 2016 the numbers had grown to 15,261 confirmed cases and 11,325 fatalities, It was the largest outbreak in history. Infection Control Measures were released from the Riverside Department of Public Health to first responders and EMS professionals. Though Riverside did not experience an outbreak or confirm a case, they were on high alert of the potential spread of the disease.





**2015 –** West Nile was contracted by 737 people within the county and there were 45 reported deaths.

**2013** – Large scale Tuberculosis testing. 2 cases were confirmed and 72 were treated for latent TB infections.

**2004** – Botulism Type A was detected in four inmates with in Riverside County.

**2003** – West Nile Virus was detected in birds in the City of Riverside and the Coachella Valley. There was one reported human case within the County. Imperial and Los Angeles Counties also reported human cases.

### *Relationship to Other Hazards – Cascading Effects*

This hazard has the potential to impact EMS first responders and Health Care Facilities. In the event that the timing of an outbreak coincided with another hazard, the healthcare impact could be extensive.

### *Risk Assessment Conclusion*

Public Health Departments for the County, State, nation and the world constantly monitor all emerging diseases. This gives medical personnel the necessary time to prepare or mitigate possible effects of an emerging disease.

As a result of the Ebola and Zika outbreaks, Riverside County EMS Agency released Policy 3307, Emerging Viruses. Its purpose is to specify procedures to be followed when highly pathogenic emerging viruses are suspected during emergency call taking and response, or confirmed prior to interfaculty transport.

### 5.3.6 Cyber Attack

**Severity: 2**

**Probability: 4**

**Risk Score: 1.50**

**OA Jurisdictions Affected by Cyber Attack**

- All incorporated cities of Riverside County

#### *Hazard Definition*

Cyber-terrorism is the use of computer network tools to shut down critical government infrastructures such as energy, transportation, and government operations, or to coerce or intimidate a government or civilian population. The premise of cyber terrorism is that as nations and critical infrastructure became more dependent on computer networks for their operation, new vulnerabilities are created. A hostile nation or group could exploit these vulnerabilities to penetrate a poorly secured computer network and disrupt or even shut down critical public or business operations.

The goal of cyber terrorism is believed to be aimed at hurting the economy of a region or country, and to amplify the effects of a traditional physical terrorist attack by causing additional confusion and panic.

**Cyber-terrorism**. Recent incidents illustrate the County's vulnerability to cyber- terrorism.

- **Effects on people and housing**. If a Cyber-attack were to happen at a Healthcare Facility the effects could be detrimental to patients. Sensitive Security Information could be obtained and the hackers could release patient files, payment information and other personal data that could harm individuals and employees.
- **Effects on commercial and industrial structures**. Depending on levels of contamination and exposure, effects could range from minimal to devastating.
- **Effects on infrastructure**. Cyber-terrorism can have profound effects on infrastructure. If an attack were to happen in a critical facility it could potentially make it inoperable.
- **Effects on agriculture.** Depending on levels of contamination and exposure, effects could range from minimal to devastating.





#### *History of Events*

In 2016 the County of Riverside Emergency Management Department was targeted for a ransomware attack that resulted in a disruption of work. It also affected the DOC shared drive, which could have hindered response to a disaster.

#### *Relationship to Other Hazards – Cascading Effects*

Cyber-attacks have the ability to shut down entire facilities. If an attack were to happen during a disaster it could greatly affect the response of first responders and EOC personnel.

#### *Risk Assessment Conclusion*

Cyber-attacks happen within the County on a daily basis. The Riverside County Information Technology Department (RCIT) has multiple prevention systems in place that protect County servers and network systems. RCIT monitors County systems 24 hours a day and has the Albert Sensor that will report to the Center for Internet Security (CIS), Multi-State Information Sharing and Analysis Center (MS-ISAC) all Domain Name System (DNS) and NetFlow traffic for correlation with the Department of Homeland Security's threat intelligence database for real-time alerting of malicious network connections to blacklisted IP address on the Internet. Another implemented system is the Enterprise Breach Detection System that inspects all internal/lateral county network traffic for indicators of compromise (IOCs) enabling the ISO to rapidly detect, respond to, contain, and prevent cyber-attacks, malware outbreaks, network reconnaissance, data exfiltration, and C2 (command & control) and botnet activities.

RCIT is also in the process of implementing more programs for the safety of the County's networks. Due to the level of security, the threat of a Cyber-attack is fairly low, but the potential damages could be very damaging.

### 5.3.7 Terrorist Event

**Severity: 3**

**Probability: 1**

**Risk Score: 1.13**

**OA Jurisdictions Affected by Terrorism**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

***Hazard Definition***

Terrorism is the use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives. Terrorist acts or and acts of war may cause casualties, extensive property damage, fires, flooding, and other ensuing hazards.

Terrorism takes many forms, including:

- Chemical
- Biological
- Radiological
- Nuclear
- Explosive
- Cyber-terrorism
- Active shooters
- Vehicle Ramming

**Chemical:** Chemical weapons have been used primarily to terrorize an unprotected civilian population and not as a weapon of war. This is because of fear of retaliation and the likelihood that the agent would contaminate the battlefield for a long period of time.

Some analysts suggest that the possibility of a chemical attack would appear far more likely than either the use of nuclear or biological materials, largely due to the easy availability of many of the necessary precursor substances needed to construct chemical weapons. Additionally, the rudimentary technical knowledge needed to build a working chemical device is taught in every college level chemistry course in the world.





Some chemical agents are odorless and tasteless and are difficult to detect. They can have an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days).

**Biological:** Biological weapons are defined as any infectious agent such as a bacteria or virus used to produce illness or death in people, animals, or plants. This definition is often expanded to include biologically-derived toxins and poisons. Biological agents can be dispersed as aerosols or airborne particles. Terrorists may use biological agents to contaminate food or water because the agents are extremely difficult to detect.

**Radiological:** A radioactive material is a material made up of unstable atoms which give off excess energy in the form of radiation through the process of radioactive decay.

**Radiation** cannot be detected by human senses. Wherever radioactive materials are used, transported, or stored there is a potential for a radiological accident to occur. Some of their most common uses include:

- By doctors to detect and treat serious diseases.
- By educational institutions and companies for research.
- By the military to power large ships and submarines.
- By companies in the manufacture of products.
- As a critical base material to help produce the commercial electrical power that is generated by a nuclear power plant.
- As one of the critical components in nuclear weapons, which are relied upon to help deter the threat of war.

**Nuclear:** The possibility exists that a terrorist organization might acquire the capability of creating a small nuclear detonation. A single nuclear detonation in the United States would likely produce fallout affecting an area many times greater than that of the blast itself. There is also the possibility that a terrorist will construct a “dirty bomb”, a bomb that is used to distribute nuclear-contaminated materials. It would have less of an effect than a “traditional” nuclear bomb, but the terror effect on the population would be great.

**Explosive:** The possibility exists that a terrorist may attack with conventional explosives, particular in a public setting. Innumerable incidents have occurred around the world involving car bombs, truck bombs, and bombs attached directly to terrorist individuals.

**Cyber Terrorism:** Please see Section 5.3.6

**Active shooters:** Active shooter events in the nation have increased dramatically over the last 17 years. According to the report "a Study of Active Shooter Incidents in the United States Between 2000 and 2013" produced by the Department of Justice, it states that there have been 160 Active Shooter incidents from 2000-2013. Furthermore, in the updated version of that report for 2014-2015, it states that there has been an additional 40 Active Shooter incidents spanning 26 states. These attacks have led to 92 casualties and 139 wounded.

**Vehicle Ramming:** The use of vehicle ramming has steadily increased and it is likely that this tactic will continue to rise. This attack style required little specialized training or skill and poses little risk to the assailant. It is seen as an effective style due to its minimal detection when acquiring the weapon and overall flexibility when planning target location and targets. Known terrorist organizations encourage ramming and have even released tips on maximizing casualties.

### *History*

Fortunately, Riverside County has little history of incidents of terrorism. However, threats and incidents have been on the rise over the last 17 years.

Riverside County has also been impacted by terrorist acts in surrounding counties. On December 2nd, 2015 a disgruntled employee shot and killed many former coworkers in San Bernardino County. The "Waterman Incident" affected Riverside County in the following ways:

- Activation of the Riverside County Medical Health Operational Area Coordinator (MHOAC) for outreach to Riverside Environmental Health and Riverside Behavioral Health representatives.
- The MHOAC completed a comprehensive list of available Riverside resources (to include name, contact info, and wrap around service requirements).
- The MHOAC provided the resource list to the Regional Disaster Medical Health Specialist (RDMHS).
- Riverside Environmental Health sent 63 employees and Behavioral Health sent 89 employees to San Bernardino County to support the initial response and re-establishment of the San Bernardino County Environmental Health Division from December 2015 through June 2016.





### *Risk Assessment*

**Chemical**. A terrorist would not have to build a complicated chemical release device. During favorable weather conditions, an already existing chemical plant could be sabotaged or bombed releasing a toxic cloud to drift into a populated area. The result could be just as dangerous as having placed a smaller chemical device in a more confined space. This type of incident would cause the maximum amount of fear, trepidation, and potential panic among the civilian population, and thus achieve a major terrorist objective.

**Biological.** The agents are cheap, easy to make, and simple to conceal. Even small amounts, if effectively deployed, could cause massive injuries and overwhelm emergency rooms. The production of biological weapons can be carried out virtually anywhere — in simple laboratories, on a farm, or even in a home.

However, experts say it remains very difficult to transform a deadly virus or bacterium into a weapon that can be effectively dispersed. A bomb carrying a biological agent would likely destroy the germ as it explodes. Dispersing the agents with aerosols is challenging because biomaterials are often wet and can clog sprayers. Most agree that, while a biological attack could be devastating in theory, in reality, the logistical challenges of developing effective agents and then dispersing them makes it less likely a terrorist could carry out a successful widespread assault.

**Radiological/Nuclear**. Under extreme circumstances an accident or intentional explosion involving radiological materials can cause very serious problems. Consequences may include death, severe health risks to the public, damage to the environment, and an extraordinary loss of, or damage to, property.

**Explosive**. While generally more limited in the extent of the damage inflicted, explosive terrorist attacks may have consequences including death and damage to property. Targets would include county fairs, music festivals, critical facilities and sporting events.

**Active shooters:** The increase of violent crimes throughout the nation has increased awareness within Riverside County. The possibility of an attack has increased. Though the threat to infrastructure is fairly limited this hazard could result in loss of life, injury and economic disruption. Targets could include public events, government facilities, schools and shopping centers.

**Vehicle Ramming:** This terrorist tactic has been increasing over the last five years. Riverside County has a very low history of this event but moderate probabilities of it happening again. This tactic is very hard to detect and mitigation is extremely difficult to

carry out. Riverside County Sheriff's Department has increased their awareness of this terrorist style in an attempt to foil any attempted ramming incident.

Extremists, especially in European countries have moved towards filling the vehicles with explosives to increase the number of fatalities in an attack. Though this approach has not yet made it to Riverside County, the potential threat has increased.

***Relationship to Other Hazards – Cascading Effects***

Terrorism has the potential to cause a cascading event. After a terrorist incident people may display signs of civil disorder driven by fear.

***Risk Assessment Conclusion.***

The western end of Riverside County is far more susceptible to terrorism than the eastern end of the County. The effects can be far-reaching in terms of the number of buildings involved, the toll on human life, and the economic consequences.





### 5.3.8 Communications Failure

**Severity: 3**

**Probability: 2**

**Risk Score: 1.13**

**<u>OA Jurisdictions Affected by Network Communications Failure</u>**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

***Hazard Definition***

*CoRNet*

The County of Riverside Network (CoRNet) provides Voice and Data communication for most County departments and facilities. CoRNet is a distributed design consisting of Regional Hub locations to which sites in each region have their point to point circuits connected. Each of these Hub locations is then connected to its adjacent Hub locations via high bandwidth circuits.

Voice Services are controlled from the County Administration Center Hub with redundancy provided by the Indio Hub location. Application Services and Internet Services for the County are delivered via the County Administration Center Hub location and soon from the RC3 Data Center.

With the completion of the Converged Network Project in 2016, CoRNet now provides both Voice and Data over the same network infrastructure. The same network connection that provided a data connection for the customers hardwired PC's now provides the connectivity for all phone communications and wireless devices.

A loss of Network connectivity now impacts both Voice and Data and wireless (Wi-Fi) communications. In the event of a Communication Failure, the entire County would be affected.

There are multiple hazards that could result in a "Network" failure such as Earthquake, Power Outage and other Natural Disasters.

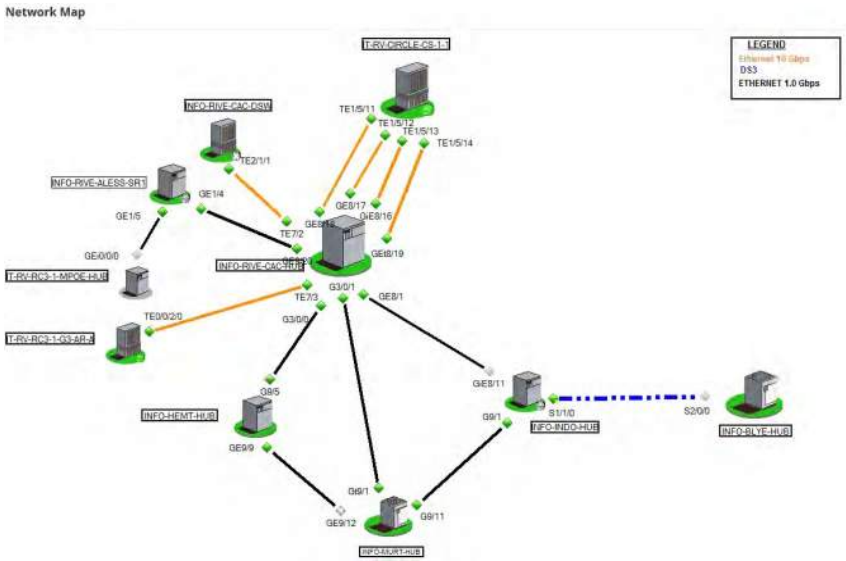


Indio Hub Failure

- Sites impacted
  - All CoRNet connected Desert locations
- Services impacted
  - All Voice, Data and Wifi services for this region.

Murrieta (SWJC) Hub Failure

- Sites impacted
  - All CoRNet connected South County locations
- Services impacted
  - All Voice, Data and Wifi services for this region.

Hemet Hub Failure

- Sites impacted
  - All CoRNet connected Hemet area County locations
- Services impacted





  - All Voice, Data and Wifi services for this region.

Riverside Hub Failure

- Sites impacted
  - All Central Riverside locations (Voice, Data and Wifi)
  - All County Hubs will lose all application and Internet based services
  - All State and Vendor provided application services.
- Services impacted
  - All Voice communications for Central Riverside locations.
  - All other Hubs would fail over to the Indio Hub for Voice.
  - All County Hubs will lose all application, Internet and Wifi based services.

### *PSEC*

The Riverside County Information Technology/Public Safety Enterprise Communications (RCIT/PSEC) Division provides public safety communications for all participating City and County law enforcement, fire service, public works, and allied agencies in Riverside County. In January of 2014, RCIT/PSEC replaced an aging countywide Enhanced Digital Access Communications System (EDACS) system with a Motorola 7.x APCO P25 Phase 2 high availability and Dynamic System Resilience voice radio system and a High-Performance Data system with a mobile VPN client for multiple network access. PSEC provides and manages all aspects of Public Safety Radio Services and mobile data for participating agencies which include almost all County agencies and the city police departments of Banning, Murrieta, Riverside, and Corona.

Thirty plus full-time staff provide 24/7/365 Public Safety Communications for over 6,800 voice and data mobile users who operate over a 7,303 square mile area. The PSEC radio system provides all levels of government communications for the 2,189,641* residents of Riverside County including first responder dispatch for Law Enforcement 9-1-1 Dispatch Centers. The staff maintains:

- 76 radio and microwave remote sites
- 75 PSEC radio Voice and Data transmitter Sites
- 1 – Primary Motorola (M)- Core Site
- 1 Motorola (M) Core Dynamic System Resilience (DSR) Site
- 86 licensed Microwave Hops
- Approximately 5500 Voice Users
- Approximately 1300 Mobile and Tablet Data Users
- 8 Dispatch Centers

The PSEC Division of RCIT processed 24,421,574.0 Public Safety Transmissions for FY16/17

**Figure 34:** PSEC System Architecture

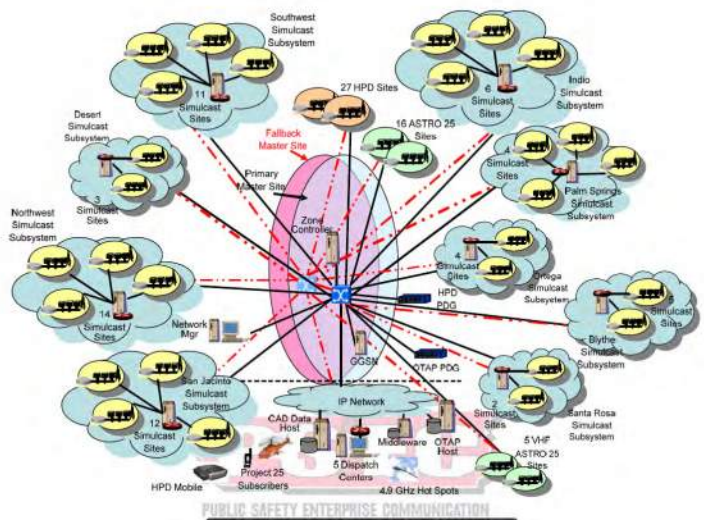


System Redundancy

A significant and material attribute of the System is how it performs during various failure conditions. The PSEC ASTRO 25 Radio System is designed with multiple levels of redundancy and the ability to provide continued communications should failures occur. Because the System can be a lifeline to County users and citizens, there is no tolerance for System failure. The System can withstand multiple failures and still provide full-featured trunked communications.

At each remote site, dispatch location and Master site, components that have the potential to interrupt communications have been backed up with redundant components. The system is designed such that multiple component failures must occur before users will notice a degradation in performance (other than a brief period during the switch over to a redundant component).





Master Sites

There are two Master sites. In the event of a catastrophic failure of the one Master site, the second Master site will take over operation of the entire system. In the event of a loss of microwave communications links between the east side and the west side of the county, one Master site can take over system operations in the east county, while the second will continue to control the west county. In this scenario, dispatchers at either location of the Master sites would not be able to reach units operating on the east side of the county, nor the west.

### *History of Events*

#### *CoRNet*

Riverside County has not experienced a large scale Communication Failure with CoRNet.

#### *PSEC*

In early 2017 the PSEC radio system had a technical issue that led to the temporary disruption of 911 services in the Indio/Palm Springs area.

### *Risk Assessment Conclusion*

#### *CoRNet*

As RCIT continues working toward redundancy in many areas (Data Center, MPLS, Redundant Internet Connections etc.), it is important to understand the scope of an outage depending on where it occurs on CoRNet under the current design.

While a single Hub failure would only impact the locations serviced through that Hub. Other hub locations would not be affected. A failure of the Riverside Hub would have a widespread impact. A failure at the Riverside Hub would result in the loss of all Application, Internet and Wi-Fi services for the entire county.

#### *PSEC*

The RCIT/PSEC Division has developed hardened sites to maintain Public Safety two-way communications to support first responders during natural disasters and civil disturbance. All of the microwave and core sites are hardened with towers that are rated

to either 85 or 120 mph wind, Seismic Zone 4, and are maintained by professionals dedicated to Public Safety Communications.

The PSEC system is highly redundant with several layers of fault tolerance. There are multiple routing paths for routers, switches, trunked repeaters, overlapping coverage and core roaming services. Although individual sites may be affected by a major earthquake or another disaster, the PSEC system has been designed to offer a high level of operability overall.

Restoration of downed infrastructure could take hours to a month(s) depending on the severity of the damage with the worst case being a loss of physical infrastructure.

The PSEC system has already performed well in minor earthquakes and major fires. The system has also been highly available on a day to day basis. The probability of the system working to support first responders is high if the PSEC Division properly maintains the system and is funded to do so.

The Core and Radio Network Interface (RNI) has intrusion detection and is isolated from the outside with multiple layers of firewalls to protected from Cyber Attacks. A comprehensive assessment by RCIT ISO and the manufacturer Motorola was performed when the PSEC radio system was deployed. RCIT ISO can be contacted to provide more details on how the RCIT network is protected

***Relationship to Other Hazards – Cascading Effects***

Any loss of The RCIT/PSEC Public Safety Voice and Data system would affect first responder performance during emergencies of all types in Riverside County for Law, Fire, EMS and local government entities like Public Works.





### 5.3.9 Flood

**Severity: 3**

**Probability: 3**

**Risk Score: 1.13**

**OA Jurisdictions Affected by Flooding**

- City of Blythe
- City of Calimesa
- City of Canyon Lake
- City of Cathedral City
- City of Desert Hot Springs
- City of Eastvale
- City of Indian Wells
- City of Jurupa Valley
- City of La Quinta
- City of Lake Elsinore
- City of Norco
- City of Palm Desert
- City of Perris
- City of San Jacinto
- City of Temecula
- City of Wildomar
- Rancho California Water District
- Riverside County Office of Education
- Riverside Unified School District

**Map 11:** Riverside County 100 Year Flood Plain Risks

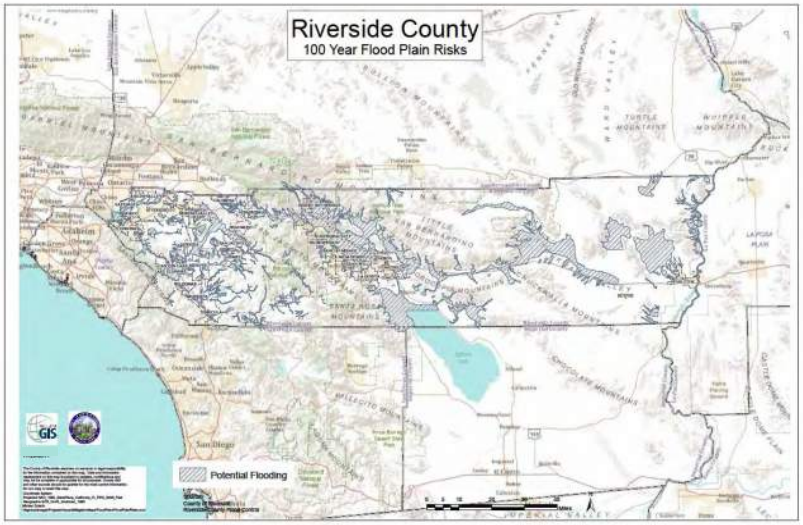






### *Hazard Definition*

A flood is defined as an overflowing of water onto an area of land that is normally dry. Floods generally occur from natural causes, usually weather-related, often in conjunction with a prolonged period of seasonal precipitation or with sudden and very heavy rain falls. Floods can, however, result from human causes as a dam impoundment bursting. Dam break floods are usually associated with intense rainfall or prolonged flood conditions. In the Riverside County area, a major earthquake could cause a dam failure. In a dam failure scenario, the greatest threat to life and property typically occurs in those areas located immediately below the dam since flood depths and discharges generally decrease as the flood wave moves downstream.

Floods are generally classed as either slow-rise or flash floods. Slow-rise floods may be preceded by a warning time lasting from hours to days, or possibly weeks. Evacuation and sandbagging for a slow rise flood may lessen the flood-related damage. Conversely, flash floods are characterized by extremely short warning times.

### *Hydrologic Regions*

Although Riverside County occasionally experiences periods of significant drought, the County can also experience periods of substantial rainfall. When Riverside County does experience heavy rain, or rain over a period of days or weeks, many areas of the County are subject to flooding. Runoff from rain drains either naturally into rivers, washes, and creeks or into flood control facilities. Flash flooding is also a common problem, especially in the Coachella Valley and the easterly portions of the county. Flash flooding is typically associated with short duration, high-intensity precipitation events often associated with summer thunderstorms. Such events can occur even during a drought.

The topography of the County varies from mountainous areas several thousand feet above sea level to low desert areas that are actually below sea level. Riverside County falls within two distinct Natural Hydrologic Regions as described in the State of California Multi-Hazard Mitigation Plan (SHMP):

### *South Coast Region*

The South Coast hydrologic region extends up from the U.S. - Mexico border to the Tehachapi, San Bernardino, San Gabriel, and San Jacinto mountains. Nearly one-third of the area is coastal plain. This region contains major urban centers, including the counties of Los Angeles, Orange, and San Diego. Much of the flooding is sudden and severe, resulting in massive slides, debris flows, and mudflows. The western portion of

Riverside County falls within the South Coast Region and contains portions of the Santa Ana River, San Jacinto River and Santa Margarita River watersheds.

### *Colorado River – Desert Region*

The dominant hydrologic features of this region are the Colorado River, which forms its eastern boundary, and the Salton Sea, which lies just shy of its western boundary. The region is marked by the San Bernardino and San Jacinto mountains. The region is also bounded by the U.S.- Mexico border to the south and the South Lahontan region to the north. This is generally a sparsely populated agricultural region that experiences sporadic flooding; however, the upper Coachella Valley has a much higher population density. Both common winter storm events and summertime monsoonal flows from Mexico's Pacific Coast can spawn massive rainstorms, general flooding and flash floods. The Eastern portion of Riverside County falls within the Desert Region and contains portions of the Whitewater River and Colorado River watersheds.

### *Characteristic Weather Patterns*

In Riverside County, various weather patterns are associated with flood events such as El Niño conditions, La Niña conditions, Summer Monsoons, and "Pineapple Express".

Floods that affect Riverside County can be attributed to three different types of storm events:

1. A general winter storm that combines high-intensity rainfall and a rapid melting of the mountain snow pack.
2. A tropical storm out of the southern Pacific Ocean.
3. A summer thunderstorm, particularly in the desert areas.

There are three principal types of flood hazards:

1. Stream flooding (including bridge scour and stream erosion)
2. Flash flooding (including debris and mud flows)
3. Sheet flow flooding (including alluvial fan flooding)

The major rivers in the South Coast hydrologic region of Riverside County are dry most of the year and pose flood threats to developments within the floodplain during general storms of long duration. When a major storm moves into the area, the excess precipitation becomes surface runoff. Resultant flood flows have predominantly short durations and





sharp peaks. Increased urbanization increases flood potential by increasing the percentage of impervious surfaces.

In the Desert hydrologic region, high-intensity rainfall from the period of July to August can produce severe flash flooding. Winter rains are generally more widespread in the desert and flash flood potential is less due to the lower intensity of rainfall. Winter rains are nonetheless capable of producing flooding but are somewhat more predictable. There is a severe danger to motorists who may attempt to drive through flooded washes which are typically dry.

Storms with high volumes of precipitation in a short period of time have occurred in the County causing flash floods, contaminated drinking water, disrupted electrical service, and damaged homes and contents. In addition, land that has been denuded of foliage and trees due to fire or human activity has experienced serious erosion from the rainfall.

Excessive precipitation can inundate soil in slopes causing mudslides and landslides. These events can destroy homes, block highways, and destroy power lines. The County is vulnerable to this type of flood damage. Heavy storms also can strand individuals playing near or crossing streams, rivers, flood control channels and intersections.

Riverside County has several major river systems, dams, and reservoirs. Excessive rainfall can stress these systems causing serious damage to property and potential loss of life. Rivers can overflow their banks, destroying bridges and washing out roads and highways during major flood events. Dam failure is discussed in a separate section of this LHMP on that specific hazard.

### *History*

**Table 22:** Riverside County Flood History

| Location | Date of Incident | Reported Damage | Number Injured | Incident Description |
|---|---|---|---|---|
| Riverside County | 1/17/1993 | $12,629,191 | 0 | Flooding |
| Idyllwild | 3/5/1995 | $1,000,000 | Not Avail. | Flooding caused by rains. 3,000 acres of farmland flooded. Portions of Highway 74 washed away |
| Mecca | 3/6/1995 | $1,000,000 | 2 | Flooding caused by rains. |
| Riverside County | 2/6/1998 | 12,629,191 | 0 | El Nino storms flooding, debris, road damage water damage to homes |

| | | | | |
|---|---|---|---|---|
| Cherry Valley, Calimesa, Yucaipa-Oak Glen Conservation Camp, Banning | 7/11-12/1999 | $750,000 | 3 | Flash flood. Camp and property damaged. |
| Desert Hot Springs | 3/5/2000 | $300,000 | 1 | Flooding caused by rain and snow |
| Moreno Valley | 3/7/2000 | $1,500,000 | Not Avail. | Flooding caused by rain. Mudslides. Homes and property destroyed. |
| Eastern Riverside County | 8/29/2000 | Not Avail. | 0 | Flash flood due to severe thunderstorm, hail, heavy rain. |
| Eastern Riverside County | 7/6/2001 | $3,383,000 | 0 | Flash flood. Road damage, farmland damage, crop damage. |
| County Areas & Riverside City | 11/24/2001 | Not Avail. | Not Avail. | Flood channel blocked. Homes flooded. |
| Moreno Valley, Cathedral City | 8/18/2003 | $500,000 | Not Avail. | Flash flood Government buildings flooded |
| Anza, Banning | 9/4/2003 | $150,000 | Not Avail. | Flash flood. |
| Corona, Palm Springs | 11/12/2003 | $10,000 | 0 | Flash flood. |
| Mira Loma, Moreno Valley | 2/2/2004 | $10,000 | Not Avail. | Flash flood. |
| Temecula, Riverside, Mira | 2/18/2004 | $55,000 | Not Avail. | Flash flood. |
| Mira Loma, Moreno Valley, Perris, Sun City, Lake Elsinore | 10/20/2004 | $500,000 | 0 | Flash flood. |
| Riverside County FEMA DR -1577 | 12/27/2004 | Not Avail | Not Avail | Severe Storms, Flooding, Debris Flows and mud slides |
| Riverside County FEMA DR -1585 | 2/16/2005 | Not Avail | Not Avail | Severe Storms, Flooding, Debris Flows and mud slides |
| Riverside County FEMA DR -1884 | 3/8/2010 | Not Avail | Not Avail | Severe Storms, Flooding, Debris Flows and mud slides |
| Riverside County FEMA DR -1952 | 12/17/2010 | Not Avail | Not Avail | Severe Storms, Flooding, Debris Flows and mud slides |





| | | | | |
|---|---|---|---|---|
| Hemet, Coachella Valley and Thousand Palms | 9/7-8/2014 | Not Avail | Not Avail | Flash flooding in Coachella Valley. Mud and water closed roads and stranded vehicles in La Quinta, Palm Desert, and Thousand Palms. Homes in La Quinta were surrounded by water. Moving water was 3 feet deep on roads and 4 to 5 feet of standing water submerged vehicles. |
| Throughout County | 12/3-4/2014 | Not Avail | 1 | Flooding resulted, with mud, debris and water closing several roadways and stranding vehicles. Mud with debris 10 feet high piled up on Soboba Rd. north of San Jacinto. A swift water rescue was needed. |
| Throughout County | 7/19/2015 | Not Avail | 1 | Flooding in the county lead to the need for a swift water rescue, the washout of Interstate-10 near Desert Center, and neighborhood in and near Moreno Valley flooded causing damage to resident's homes and property. |
| Menifee | 9/8/2015 | Not Avail | Not Avail | Flooding |
| Temecula | 1/5-7/2016 | Not Avail | Not Avail | Flooding |
| Throughout County | 2/27/2017 | Not Avail | 1 | Flooding resulted from the storm. A swift water rescue was needed in Temecula. Heavy road damage disrupted traffic. |

Source: https://www.weather.gov/media/sgx/documents/weatherhistory.pdf
http://www.cnrfc.noaa.gov/storm_summaries/dec2010storms.php
http://ks.water.usgs.gov/pubs/reports/wsp.2499.sumca0193.html
http://www.floodcontrol.co.riverside.ca.us/Downloads/AnnualReports/DistrictAnnualReport15-16.pdf

### *Flood Hazard Mapping*

For floodplain management purposes, the following discussion describes the Federal Emergency Management Agency (FEMA) definition of "100-year flood." The term "100-

year flood" is misleading. It is not a flood that will occur once every 100 years. Rather, the flood elevation has a 1 percent chance of being equaled or exceeded each year. Thus, a 100-year flood could occur more than once in a relatively short period of time. The one percent chance flood is used by the National Flood Insurance Program (NFIP) as the minimum standard for floodplain management regulation and, in most cases, triggers the need for mandatory flood insurance coverage. A structure located within a FEMA Special Flood Hazard Area has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage.

Riverside County utilizes several sources to determine local flood hazards: FEMA Flood Insurance Rate Maps, DWR Awareness Maps, and local flood zone delineation maps as identified in Riverside County Ordinance 458 (updated 6/9/2017). For floodplain management purposes, the County regulates unincorporated development within each of the above maps. Each of the incorporated Cities administers its own floodplain management program and may or may not utilize floodplain information beyond that provided by FEMA's Flood Insurance Rate Maps.

### *FEMA Flood Insurance Rate Mapping*

FEMA updated the Digital Flood Insurance Rate Maps (DFIRMS) effective range from August 28, 2008, to April 19, 2017, depending on when jurisdictions requested maps to be updated. The DFIRMS are available for public viewing from FEMA's website:

Source: http://msc.fema.gov/portal/advanceSearch#searchresultsanchor





**Map 12:** FEMA FIRM Map 2017 – West County

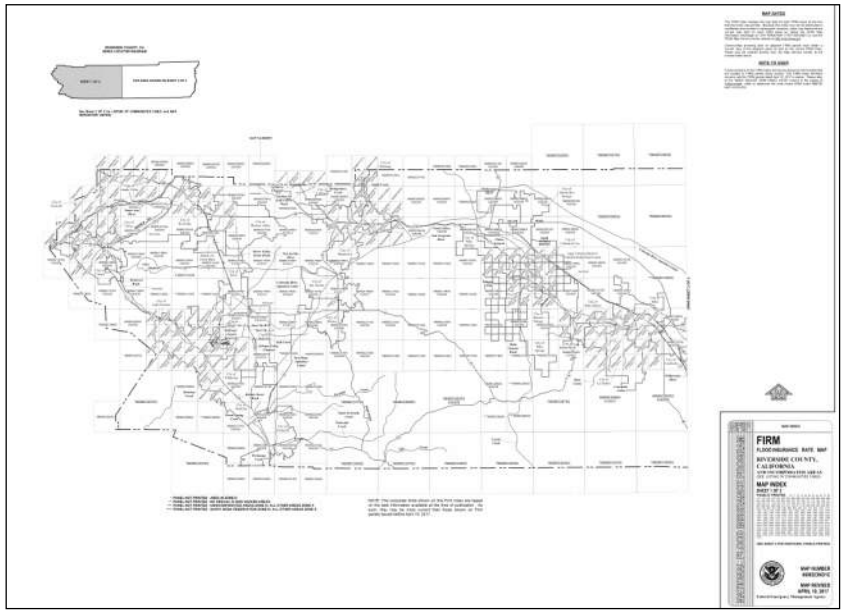


Source: http://msc.fema.gov/portal/advanceSearch#searchresultsanchor

**Map 13:** FEMA FIRM Map 2017 – East County

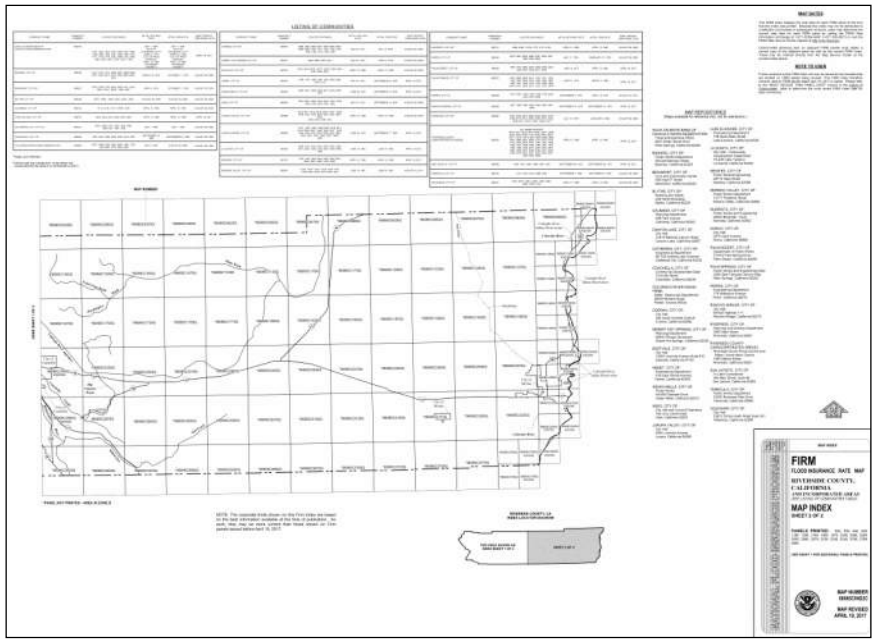


Source: http://msc.fema.gov/portal/advanceSearch#searchresultsanchor





**Table 23:** FIRM Flood Zones

| Zone | Description |
|---|---|
| **A** | Area with a 1% annual chance of flooding. No depths or Base Flood Elevations (BFEs) are shown. |
| **AE** | Base floodplain where BFEs are provided. AE Zones are now used on digital FIRMs instead of A1 - A30 Zones. |
| **A1 through 30** | Known as numbered A Zones, these are the base floodplains in the old FIRM format where a BFE is shown. |
| **AH** | Area with a 1% annual chance of shallow flooding with an average depth ranging from 1 to 3 feet. BFEs are shown at selected intervals. |
| **AO** | River or stream flood hazard area, or area with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow with an average depth ranging from 1 to 3 feet. Average flood depths derived from detailed analyses are shown. |
| **AR** | Area with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). |
| **A99** | Area with a 1% annual chance of flooding protected by a federal flood control system where construction has reached specified legal requirements. No depths or BFEs are shown. |
| **V** | Coastal area with a 1% or greater chance of flooding and an additional hazard associated with storm waves. No BFEs are shown within these zones. |
| **VE or V1 through 30** | Coastal area with a 1% or greater chance of flooding and an additional hazard associated with storm waves. BFEs are shown at selected intervals. |
| **B, C, X** | Zones considered having moderate to low risk of flooding, although flood insurance is available to property owners and renters in communities that participate in the NFIP. |
| **D** | Area with possible but undetermined flood hazards, where no flood hazard analysis has been conducted. |

FEMA also conducted a Flood Insurance Study and determined that the following areas have the potential to flood.

**Figure 24:** Flood Insurance Study Areas

| Water Source Studied | Water Source Studied | Water Source Studied |
|---|---|---|
| Acacia Creek Drain | Lincoln Avenue Drain | San Sevaine Channel |
| Alessandro Wash | Little Morongo Wash | Santa Ana River |
| All American Canal | Long Canyon Wash | Sheet Flow along Ocotillo Road |
| Arlington Canal | Macomber Palms Channel | Smith Creek |
| Arroyo Del Toro | Magnesia Falls Road | Smith Creek West Tributary |
| Bear Creek | Magnesia Springs Channel | South Norco Channel and Trib.s A and B |
| Beaumont Chanel | Main Street Drain | Spring Brook |
| Bedford Canyon Wash | Mangular Channel | Spring Brook Wash |
| Big Morongo Wash | Marshall Creek | Stetson Avenue Channel |
| Biskra Palms Channel | McVicker Canyon Wash | Stovepipe Canyon Creek |
| Blind Canyon Channel | Metz Road Basin | Stream A (Vicinity of Des. Hot Springs) |
| Bly Channel | Mirage Indian Trail Wash | Sun City Channels A-A, C-C, H-H and X-X |
| Box Springs Wash | Mission Creek | Sun City Southeast Tributary |
| Calimesa Channel | Mockingbird Canyon Wash | Sunny Slope Channel |
| Carrizo Alluvial Fan | Montgomery Creek | Sunnymead Storm Channel |
| Channel H | Mountain Avenue Wash | Taylor Avenue Drain |
| Cherry Avenue Channel | Murrieta Creek | Temecula Creek |
| Coachella Valley Stormwater Channel | North Cathedral Channel | Temescal Wash |
| Country Club Creek and North Tributary | North Norco Channel and Trib.s A, B and C | Tequesquite Arroyo |
| Day Creek Santa Ana River | North Palm Springs Wash | The Veldt |
| Dead Indian Alluvial Fan | North Side Wolf Valley Creek | Third Street Basin |
| Deep Canyon Alluvial Fan | Oak Street Channel | Thousand Palms Canyon Wash |
| Deep Canyon Storm Water Channel | Ocotillo Drive Wash | Thousand Palms Main Channel |
| Desert Hot Springs Channel | Orange Lateral | Thousand Palms Tributaries A, B and C |
| Dunes View Road Channel | Ortega Wash | Thunderbird Wash |
| Dry Morongo Wash | Ortega Channel | Tramview Wash |
| East Cathedral Channel | Palm Canyon Wash | Tramview Wash Tributary |
| East Gilman Home Channel | Palm Valley Drain | University Wash |
| East Rancho Mirage Storm Channel | Park Hill Drain | Wash G |
| El Cerrito Channel | Pechanga Creek | Wash I |
| Elsinore Spillway Channel | Perris Valley Storm Drain | Wasson Canyon Creek |
| Garden Air Gold Course Wash | Pigeon Pass Channel | West Cathedral Channel |
| Gilman Home Channel | Prenda Wash | West Norco Channel |
| Harrison Wash | Pushawalla Canyon Wash | West Pershing Channel |
| Hemet Storm Channel | Pyrite Channel | Whitewater River |
| Highland Springs Channel | Rache Channel | Whitewater River (C.V.S.C.) |
| Interstate-10 Wash | Ramsey Street Drain | Whittier Avenue Channel |
| Kalmia Street Wash | Rice Canyon Wash | Woodcrest Wash |
| Lake Elsinore | Salt Creek and Tributary | Unnamed Stream A |
| Lakeland Village Channel | Salt Creek Overflow | Unnamed Stream B |
| Lakeview Wash | San Gorgonio River | Unnamed Stream C |
| Leach Canyon Channel | San Jacinto River | 1001 Ranch Drain |
| Lime Street Channel | San Jacinto Lateral | 1001 Ranch Drain West Tributary |





### *DWR Awareness Floodplain Mapping*

The intent of the California Department of Water Resources (DWR) Awareness Floodplain Mapping project was to identify all pertinent flood hazard areas by 2015 for areas that are not mapped under the FEMA National Flood Insurance Program (NFIP) and to provide the community and residents an additional tool in understanding potential flood hazards currently not mapped as a regulated floodplain. The awareness maps identify the 100-year flood hazard areas using approximate assessment procedures. These floodplains are shown as flood-prone areas without specific depths and other flood hazard data. Awareness Floodplain Maps were incorporated into County Ordinance 458.

The maps that were originally adopted are available on the DWR website. DWR will not be modifying these maps since it was a one-time project. As development occurs and the floodplains change due to channelization, the floodplain limits of the Awareness floodplains are being updated by Riverside County Flood Control (RCFC) and will be reflected on the RCFC interactive maps found at:

http://rcflood.org/FloodDetermination/FloodDetermination_V09.aspx

California Department of Water Resources Awareness Floodplain Maps can be found at http://www.water.ca.gov/floodmgmt/lrafmo/fmb/fes/awareness_floodplain_maps/

**Map 14:** FEMA Flood Insurance Rate Map

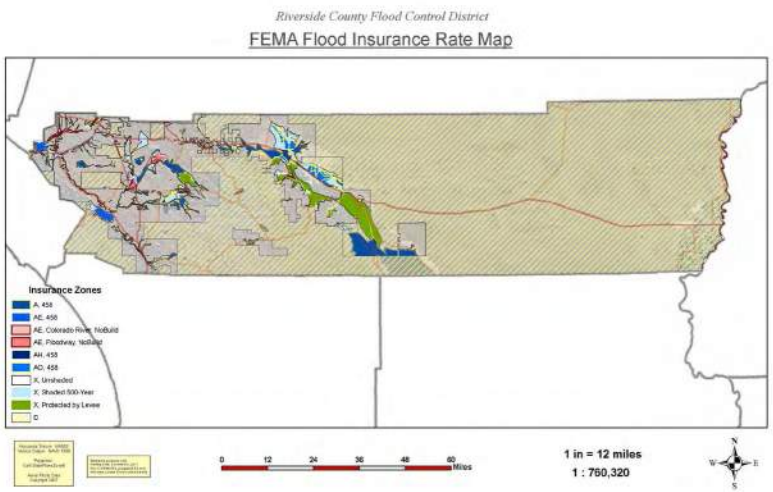






**Map 15:** DWR Awareness Floodplain Map

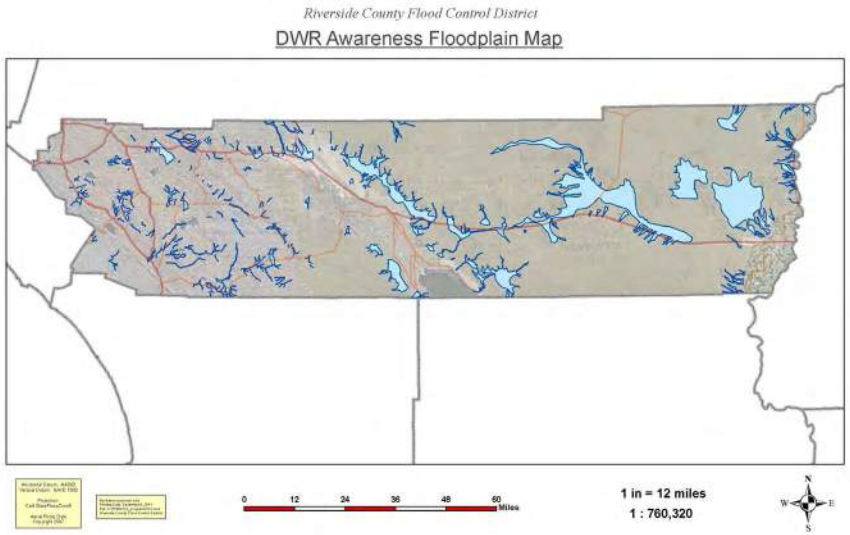

**Map 16: Local Studies Floodplain Map**

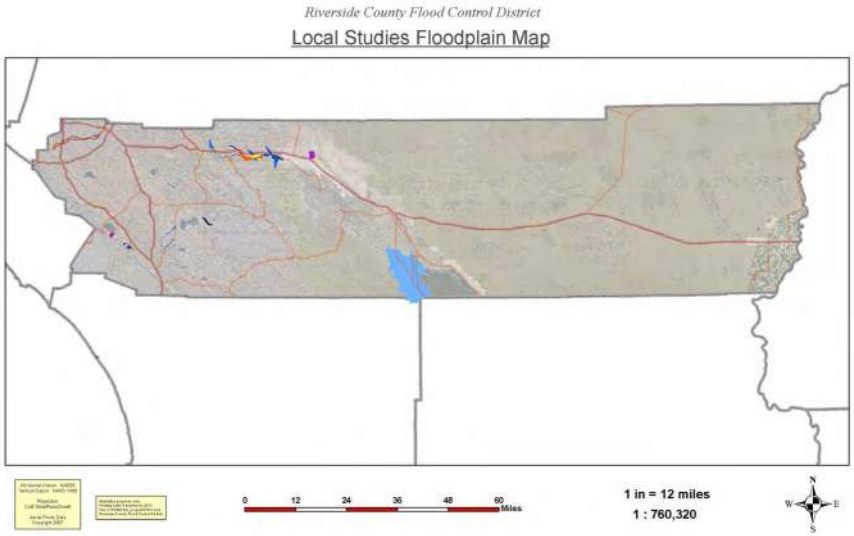






### *Risk Assessment*

As stated in the State of California Multi-Hazard Mitigation Plan, Riverside County has 27 declared flood disasters from the period of 1950 – December 2012. The total can be updated to 29 when adding the two flood disaster declarations in 2015 and 2017. The State's plan also shows Riverside County has a population of 295,081 living within FIRM-Designated Floodplains (based on 2000 Census Data). According to the 2017 Southern California Association of Governments (SCAG) Unincorporated Area of Riverside County Report, the number of residents living in the unincorporated area has increased to 364,413.

HAZUS was used to generate general building stock and essential facility loss estimates for three different floods in the County – a 1% annual chance flood event (100-year flood) with the existing certified levee system in the County intact, a 1% annual chance flood event without consideration of these levees, and a 500-year (0.2% chance per year) flood. Flood hazard data from DFIRM maps available at FEMA's Map Service Center were used to develop the flood scenarios.

**Table 24:** Summary of HAZUS – Estimated Impacts on Riverside County for Three Flood Scenarios

| Impact Category | 100-Year | 100-Year w/o Levee | 500-Year |
|---|---|---|---|
| Economic Loss due to Building Damage, Total Building-related Direct | $0.81 B<br>$1.7 B | $2.3 B<br>$4.9 B | $3.6 B<br>$7.8 B |
| # Buildings in Complete Damage State | 1,356 | 3,655 | 6,262 |
| Debris Generated (million tons) | 0.20 | 0.50 | 0.78 |
| Displaced Households, People Needing Short- term Shelter | 16,896<br>41,846 | 79,078<br>223,787 | 125,887<br>357,092 |
| # Highway Bridges w/ at least Moderate Damage (potentially closed) | 0 (of 4 damaged) | 0 (of 4 damaged) | 0 (of 4 damaged) |

**Table 25:** Summary of HAZUS – Estimated Impacts for Riverside County Essential Facilities in Three Flood Scenarios

| Essential Facility | Category | 100-Year | | 100-Year w/o Levee | | 500-Year | |
|---|---|---|---|---|---|---|---|
| | | Time to Restore (Days) | Economic Loss ($1,000) | Time to Restore (Days) | Economic Loss ($1,000) | Time to Restore (Days) | Economic Loss ($1,000) |
| Hospitals* | Medium | 0 | $0 | 540 | $0 | 540 | $0 |
| | Large | 0 | $0 | 540 | $0 | 360-540 | $0 |
| Schools | K-12 (default data) | 480 | $115 | 480 | $865 | 480 | $2,232 |
| | K-12 (providing data) | 360-720 | $12,482 | 360-720 | $38,838 | 360-720 | $66,911 |
| | CCD (providing data) | 0 | $0 | 360-480 | $6,285 | 360-480 | $6,285 |
| EOCs | | 0 | $0 | 480 | $560 | 360-480 | $5,113 |
| Police Stations | | 480 | $0 | 360-480 | $0 | 360-480 | $796 |
| Fire Stations | | 480 | $692 | 360-480 | $692 | 360-630 | $1,994 |
| **TOTALS** | | **360-720** | **$13,289** | **360-720** | **$47,240** | **360-720** | **$83,331** |

*Note: In Riverside County, there are no hospitals which would be categorized by HAZUS as "Small" (<50 licensed acute care beds)

- **Effects on People and Housing:** Of the approximately 647,000 buildings modeled within the general building stock for Riverside County, about 1% (6,262) are expected to suffer "complete" damage in the 0.2% annual chance flood event (500-year flood) scenario. These building would be considered "red-tagged" or unsafe for continued occupancy. About 94% of the 6,262 buildings are manufactured housing (i.e., mobile homes). Approximately 43,000 buildings (6.6%) are expected to suffer more than 20% damage or more while about 18,000 buildings are estimated to suffer flood damage of less than 20%. As much as 0.78 million tons of debris may result from these damaged buildings – 21% is expected to be heavy debris (concrete and steel), requiring heavy equipment to break down and remove, while 79% is expected to be light debris (wood, brick, drywall and other debris).





Damage to single family and multi-family dwellings is expected to result in the displacement of almost 126,000 households. While many of the displaced may find shelter with friends and family, or in available hotels, as many as 357,000 people are expected to seek short-term public shelter. This large number of people would likely overwhelm the emergency sheltering capacity of the county. The displaced populace should be able to move to safe locations without too much difficulty. While four (4) bridges in the county's transportation system are expected to suffer minor flood damage, the bridges are expected to remain functional.

- **Essential Facility Impacts:** Table 29 provides an overview of essential facility performance in the 0.2% annual chance flood event (500-year flood) with levees scenario. The table lists the number of essential facility sites and buildings (these numbers will differ for multi-building campuses, such as schools and hospitals). The table also provides the total building replacement value, and the number of buildings for which value data was available. As can be seen in the table, replacement cost data for hospitals was generally not available, unlike most other essential facility types. Expected building damage in this flooding event ranges from 0% damage for numerous essential facility types with some, but minimal, flooding, to as much as 7.1% mean damage for one school district. The total economic loss for essential facilities has been estimated to reach about $83 million, almost 91% of which ($75 million) will occur in schools and about 6% of which will occur in EOCs ($5.1 million). It should be noted that no hospital losses were estimated since all hospitals impacted by this flooding scenario did not provide replacement value data. (The full economic impact on hospitals can't be estimated at this time because of the lack of comprehensive replacement value data).

**Table 26:** Riverside County Essential Facility Loss Estimates – 0.2% Annual Chance Flood Scenario

| Essential Facility | Category | No. of Facilities/Sites | No. of Buildings | No. of Beds | Replacement Cost ($1,000) | # Buildings w/ replacement | # Non-Functional Buildings | Time to Restore (Days) | Economic Loss ($1,000) |
|---|---|---|---|---|---|---|---|---|---|
| Hospitals* | Medium | 8 | 28 | 793 | $162,827 | 21 | 0 | 540 | $0 |
| | Large | 8 | 49 | 2,467 | $200,792 | 10 | 0 | 360-540 | $0 |
| Schools | K-12 (default data) | 152 | 152 | | $219,600 | 152 | 31 | 480 | $2,232 |
| | K-12 (providing data) | 689 | 9,981 | | $6,049,534 | 9,213 | 1,111 | 360-720 | $66,911 |
| | CCD (providing data) | 12 | 258 | | $356,708 | 257 | 92 | 360-480 | $6,285 |
| EOCs | | 43 | 43 | | $310,273 | 43 | 4 | 360-480 | $5,113 |
| Police Stations | | 51 | 51 | | $675,299 | 48 | 2 | 360-480 | $796 |
| Fire Stations | | 156 | 156 | | $366,493 | 156 | 8 | 360-630 | $1,994 |
| **TOTALS** | | **1,119** | **10,718** | **3,260** | **$8,341,525** | **9,900** | **1,248** | **360-720** | **$83,331** |

Note: In Riverside County, there are no hospitals which would be categorized by HAZUS as "Small" (<50 licensed acute care beds)





**Table 27:** Estimated Impacts on Riverside County Fire Stations in a 1% Annual Chance Flood Scenario

| Agency | Number of Buildings | Replacement Cost ($1,000) | # Buildings w/ replacement cost data | No. Non-Functional Buildings | Restoration Time (Days) | Mean Building Damage | Economic Loss ($1,000) |
|---|---|---|---|---|---|---|---|
| Cathedral City FD | 3 | $10,500 | 3 | 0 | 360-480 | 0.0% | $0 |
| Corona FD | 7 | $23,170 | 7 | 2 | 480 | 7.0% | $385 |
| Hemet FD | 5 | $15,360 | 5 | 1 | 480-630 | 6.2% | $604 |
| Murrieta FD | 4 | $9,530 | 4 | 0 | 0 | 0.0% | $0 |
| Norco FD | 2 | $4,750 | 2 | 0 | 480 | 0.0% | $0 |
| Palm Springs FD | 5 | $6,115 | 5 | 0 | 360-480 | 0.0% | $0 |
| Pechanga FD | 2 | $5,430 | 2 | 0 | 0 | 0.0% | $0 |
| Riverside County FD | 95 | $249,411 | 95 | 3 | 360-480 | 1.0% | $740 |
| Riverside FD | 17 | $11,875 | 17 | 1 | 480 | 4.5% | $60 |
| Other Agencies | 4 | $10,600 | 4 | 0 | 0 | 0.0% | $0 |
| USFS | 12 | $19,752 | 12 | 1 | 480 | 4.4% | $205 |
| **TOTALS** | **156** | **$366,493** | **156** | **8** | **360-630** | **2.9%** | **$1,994** |

**Table 28:** Estimated Impacts on Riverside County EOCs in a 0.2% Annual Chance Flood (Levees Intact) Scenario

| County | No. of Buildings | Replacement Cost ($1,000) | No. Non-Functional Buildings | Restoration Time (Days) | Mean Damage | Economic Loss ($1,000) |
|---|---|---|---|---|---|---|
| Riverside | 43 | $310,273 | 4 | 360-480 | 1.7% | $5,113 |

**Table 29:** Estimated Impacts on Riverside County Police Facilities in a 0.2% Annual Chance Flood (Levees Intact) Scenario

| Agency | Number of Buildings | Replacement Cost ($1,000) | # Non-Functional Buildings | Time to Restore (Days) | Mean Damage | Economic Loss ($1,000) |
|---|---|---|---|---|---|---|
| Riverside County Sheriff | 30 | $491,973 | 2 | 360-480 | 1.2% | $796 |
| Other Agencies | 21 | $183,326 | 0 | 360-480 | 0.0% | $0 |
| **TOTALS** | **51** | **$675,299** | **2** | **360-480** | **0.2%** | **$796** |





**Table 30:** Estimated Impacts on Riverside School Districts in a 0.2% Annual Chance Flood Scenario

| Category | District Name | Number of Facilities/ Sites* | No. of Buildings | Replacement Cost ($1,000) | # Buildings w/ replacement cost data | # Non-Functional Buildings | Restoration Time (Days) | Mean Damage | Economic Loss ($1,000) |
|---|---|---|---|---|---|---|---|---|---|
| K-12 (default data) | | 151 | **152** | $219,600 | 152 | 31 | 480 | 5.2% | $2,232 |
| K-12 (providing data) | Alvord USD | 26 | **525** | $274,026 | 525 | 8 | 360-480 | 1.4% | $583 |
| | Banning USD | 11 | 186 | $92,169 | 180 | 30 | 360-480 | 2.7% | $892 |
| | Beaumont USD | 20 | 209 | $179,231 | 208 | 36 | 360-480 | 4.7% | $6,424 |
| | Coachella Valley USD | 30 | 707 | $271,777 | 691 | 128 | 360-480 | 2.3% | $4,392 |
| | Corona-Norco USD | 49 | 855 | $718,384 | 855 | 128 | 360-480 | 2.0% | $6,792 |
| | Desert Center USD | 2 | 25 | $13,438 | 25 | 0 | 0 | 0.0% | $0 |
| | Desert Sands USD | 33 | 681 | $519,732 | 655 | 212 | 360-480 | 2.0% | $16,475 |
| | Hemet USD | 29 | 621 | $294,809 | 620 | 81 | 360-480 | 2.0% | $5,681 |
| | Jurupa USD | 29 | 547 | $285,015 | 547 | 8 | 360-480 | 1.3% | $330 |
| | Lake Elsinore USD | 29 | 539 | $0 | 0 | 116 | 360-720 | 7.1% | $0 |
| | Menifee Union SD | 13 | 213 | $116,628 | 211 | 0 | 0 | 0.0% | $0 |
| | Moreno Valley USD | 36 | 639 | $361,250 | 639 | 31 | 480 | 6.0% | $1,451 |
| | Murrieta Valley USD | 18 | 470 | $299,250 | 470 | 0 | 0 | 0.0% | $0 |
| | Nuview Union SD | 5 | 79 | $38,186 | 79 | 7 | 360-480 | 1.2% | $901 |
| | Palm Springs USD | 31 | 493 | $414,806 | 492 | 150 | 360-360 | 3.3% | $7,922 |
| | Palo Verde USD | 9 | 121 | $83,907 | 121 | 0 | 0 | 0.0% | $0 |
| | Perris SD | 12 | 175 | $98,885 | 174 | 13 | 360-480 | 3.1% | $1,315 |
| | Perris Union High SD | 13 | 226 | $202,431 | 221 | 12 | 360-480 | 2.6% | $5,405 |
| | Riverside Co Office of | 167 | 326 | $149,923 | 159 | 66 | 360-480 | 4.4% | $2,013 |
| | Riverside USD | 47 | 1,015 | $497,272 | 1,015 | 22 | 360-480 | 1.8% | $941 |
| | Romoland SD | 5 | 63 | $46,793 | 63 | 0 | 0 | 0.0% | $0 |
| | San Jacinto USD | 16 | 213 | $130,375 | 213 | 62 | 360-480 | 1.6% | $5,380 |
| | San Jacinto Valley | 1 | 13 | $1,105 | 13 | 1 | 360-480 | 0.4% | $14 |
| | Temecula Valley USD | 32 | 643 | $548,085 | 642 | 0 | 0 | 0.0% | $0 |
| | Val Verde USD | 25 | 386 | $388,179 | 384 | 0 | 0 | 0.0% | $0 |
| | Yucaipa-Calimesa | 1 | 11 | $23,878 | 11 | 0 | 0 | 0.0% | $0 |
| CCD (providing data) | Desert CCD | 1 | 75 | $84,687 | 74 | 62 | 360-480 | 4.1% | $4,130 |
| | Mt. San Jacinto CCD | 2 | 73 | $96,439 | 73 | 30 | 360-480 | 4.5% | $2,155 |
| | **Palo Verde CCD** | 5 | 12 | $37,440 | 12 | 0 | 0 | 0.0% | $0 |
| | **Riverside CCD** | 4 | 98 | $138,142 | 98 | 0 | 0 | 0.0% | $0 |
| **TOTALS** | | **852** | **10,39** | **$6,625,842** | **9,622** | **1,234** | **360-720** | **3.3%** | **$75,428** |

**Table 31:** Estimated Impacts on Riverside County Hospitals in a 0.2% Annual Chance Flood Scenario

| Hospital Size[20] | Supervisorial District | No. of Hospital Sites | Number of Buildings | Number of Licensed Beds | Replacement Cost ($1,000) | No. Buildings w/ replacement cost data | # Non-Functional Buildings | Restoration Time (Days) | Mean Damage | Economic Loss ($1,000) |
|---|---|---|---|---|---|---|---|---|---|---|
| Medium | 1st | 1 | 7 | 122 | $36,575 | 7 | 0 | 0 | 0.0% | $0 |
| Large | | 2 | 5 | 406 | $0 | 0 | 0 | 360-540 | 0.0% | $0 |
| Medium | 2nd | 0 | | | | | | | | |
| Large | | 2 | 8 | 533 | $0 | 0 | 0 | 0 | 0.0% | $0 |
| Medium | 3rd | 3 | 5 | 297 | $98,000 | 5 | 0 | 540 | 0.0% | $0 |
| Large | | 1 | 10 | 433 | $200,792 | 10 | 0 | 0 | 0.0% | $0 |
| Medium | 4th | 2 | 11 | 196 | $7,474 | 5 | 0 | 540 | 0.0% | $0 |
| Large | | 2 | 25 | 656 | $0 | 0 | 0 | 540 | 0.0% | $0 |
| Medium | 5th | 2 | 5 | 178 | $20,778 | 4 | 0 | 0 | 0.0% | $0 |
| Large | | 1 | 1 | 439 | $0 | 0 | 0 | 0 | 0.0% | $0 |
| **TOTALS** | | **16** | **77** | **3,260** | **$363,619** | **31** | **0** | **360-540** | **0.0%** | **$0** |

Note: In Riverside County, there are no hospitals which would be categorized by HAZUS as "Small" (<50 Licensed acute care beds)





- **Effects on Infrastructure:** A slow-rising flood situation will progress through a series of stages, beginning with minor rainfall and evolving to a major event such as substantial flooding. Once flooding begins, personnel will be needed to assist in rescuing persons trapped by floodwaters, securing utilities, cordoning off flood areas, and controlling traffic. These actions may overtax local agencies, and additional personnel and resources may be required. It is anticipated that existing mutual aid resources would be used as necessary to augment local resources.

  Many essential public and quasi-public facilities and hazardous materials sites are located within the 100- or 500-year flood zones of Riverside County. As of the writing of the Safety Element of the County's General Plan, these included 14 of the County's 39 airports; 4 of 18 hospitals; 47 of 109 police stations, fire stations, and emergency operation centers; 92 of 380 schools; 446 of 1,306 highway bridges; and 695 of 1,978 hazardous materials sites.

- **Effects on Agriculture:** As the historical events in Riverside County show, effects on agriculture can be devastating. Flooding can damage crops, livestock, and dairy stock. In addition to the obvious impacts on animals and crops, flooding can have deleterious effects on soil and the ability to reinvigorate the agricultural activities affected once the flood waters recede.

### *Risk Assessment Conclusion*

Flooding due to heavy precipitation or dam failure is a potential hazard in Riverside County, with the resultant possibilities for damage to property and loss of life. Severe flooding can be particularly costly. In a relative sense, flooding due to precipitation does not present the degree of danger posed by other hazards such as major earthquakes. If there is flooding due to dam failure, the danger could be cataclysmic.

### *Relationship to Other Hazards – Cascading Effects*

Fire can breakout because of dysfunctional electrical goods. Hazardous materials can also get into floodways, causing health concerns and polluted water supplies.

### 5.3.10 Civil Disorder

**Severity: 3**

**Probability: 2**

**Risk Score: 1.13**

**OA Jurisdictions Affected by Civil Disorder**

- All incorporated cities of Riverside County

#### *Hazard Definition*

Civil disorder or unrest is usually triggered by dramatic political or social events. Every major metropolitan area in California has experienced and is at risk for, civil disorder. The most significant civil unrest incident in the State was the 1992 Los Angeles Civil Disturbance that resulted in 53 deaths, over 2,300 injuries and over $800 million in damages. This event also precipitated simultaneous, but smaller, incidents throughout California and the country.

Civil disorder is an incident intended to disrupt community affairs and threaten the public safety. Civil disorder includes riots, mob violence, and any unlawful demonstration resulting in police intervention and arrests. Civil Unrest is generally associated with controversial political, judicial, and/or economic issues and events.

#### *History*

Riverside County is not a place where there has been a lot of historic civil disturbance events of noticeable magnitude. There are locations within Riverside County where large public gatherings take place. These locations have the potential for unstable conditions, possibly affecting the ability of a jurisdiction in the County to provide sufficient law enforcement and fire protective services.

**May 1, 2017** – "May Day" protest in Riverside to oppose President Trump's actions against undocumented workers, LGBT rights, fair wages, Black Lives Matter, refugees and immigrants.

**January 31, 2017** – Protests held in Riverside to protest President Trumps Travel restrictions from seven primarily Muslim countries.

**January 21, 2017** – Thousands marched in Downtown Riverside for Woman's rights.

**November 10, 2016** – UC Riverside students marched in an anti-Trump rally.





**May 7, 2016** – Trump supporters rally in Temecula approximately 350 people attended.

**July 13, 2012** – Rally against violent crimes at the Riverside Public Library.

**January 31, 2012** – Union Strike at various locations in Riverside County.

**December 2, 2011** - Protests at all of the main entrances to the Mission Inn where Buster was holding a re-election fundraiser.

**November 6, 2011** - There was an "Occupy" protest near City Hall, and 8 protesters were arrested.

**November 22, 2011** - 200 to 300 students gathered at UCR's bell tower at the center of campus to protest. (Occupy UC Riverside).

**April 15, 2010** - Riverside County Tax Day Tea Parties' Protest Rally (Tea Party).

**January 13, 2009** - The Riverside County Board of Supervisors today temporarily suspended an ordinance it passed last week to limit protests outside a large Church of Scientology compound near Hemet. Protesters show up about once a month outside Golden Era Productions, home to 500 Scientologists, on Gilman Springs Road.

**December 2004** - A demonstration at county administrative buildings that was part of a nationwide protest sponsored by the American Family Rights Association.

#### *Risk Assessment*

During a Civil Unrest incident that affects Riverside County, there are certain critical facilities within the County that may be more at risk than others. These critical facilities include venues for musical concerts and sporting events, facilities where legal and illegal demonstrations are held, and any other facilities with events that attract large numbers of people. All of these situations create significant traffic congestion and the potential for disruptive behavior.

- **Effects on people and housing.** The effects of a Civil Unrest are varied and usually based on the type, severity, scope, and duration of the disturbance. Effects may include illegal assemblies, injuries, and even loss of life.
- **Effects on commercial and industrial structures**. Effects may include traffic congestion or gridlock, illegal assemblies, disruption of utility service, and property damage.

- **Effects on infrastructure.** Effects may include traffic congestion or gridlock, disruption of utility service, and property damage.
- **Effects on agriculture.** Effects may include traffic congestion or gridlock, disruption of goods transportation services, and property damage.

***Risk Assessment Conclusion***

The overall risk of civil unrest in Riverside County is low.

***Relationship to Other Hazards – Cascading Effects***

Civil Unrest may lead to a fire, destruction of property, disruption of power, injury to persons, and even loss of life. It also has the potential to affect first responder response times by traffic blocking protesting techniques.





### 5.3.11 Drought

**Severity: 3**

**Probability: 3**

**Risk Score: 1.13**

**OA Jurisdictions Affected by Drought**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

***Hazard Definition***

A drought is a long period of extremely dry weather when there is not enough rain for the successful growing of crops or the replenishment of water supplies.

Drought is a gradual phenomenon. Normally, one dry year does not constitute a drought in California but rather serves as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure (reservoirs, groundwater basins, and interregional conveyance facilities) generally mitigates the effects of short-term dry periods for most water users.

Drought can have secondary impacts. For example, drought is a major determinant of wildfire hazard, in that it creates greater propensity for fire starts and larger, more prolonged conflagrations fueled by excessively dry vegetation, along with reduced water supply for firefighting purposes. Drought is also an economic hazard. Significant economic impacts on California's agriculture industry can occur as a result of short and long term drought conditions; these include hardships to farmers, farm workers, packers, and shippers of agricultural products. In some cases, droughts can also cause significant increases in food prices to the consumer due to shortages.

Past experience with California droughts tells us that drought impacts are felt first by those most dependent on or affected by annual rainfall – agencies fighting forest fires, ranchers engaged in dryland grazing, rural residents relying on wells in low yield rock formations, or small water systems lacking a reliable water source.

The driest single year in California's measured hydrologic history is 1977.

California's last major statewide drought was 2014-2017. On April 17, 2017, Governor Jerry Brown issues EO B-40, officially ending the drought state of emergency.

Climate scientists studying California weather patterns find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies.

### *California Progress as of 2017:*

In January 2014, with California facing one of the most severe droughts on record, Governor Brown proclaimed a State of Emergency due to drought conditions beginning in 2012 through 2016. An interagency Drought Task Force was convened to monitor drought impacts and advise on actions to be taken if drought conditions worsened. The Drought Task Force also developed a plan for the provision of emergency food supplies, financial assistance and unemployment services in communities that suffer high levels of unemployment due to drought conditions.

In September 2014, Governor Brown issued an Executive Order authorizing Cal OES to provide California Disaster Assistance Act (CDAA) funding for local government assistance to provide emergency water supplies to households without water for drinking and/or sanitation purposes.

In April 2017, Governor Brown lifted the Executive Order Proclaiming a drought, however, he retained prohibition on wasteful practices.

The Drought Contingency Plan (DCP) contains strategies and actions that state agencies have taken or may take to prepare for, respond to, and recover from droughts. Its purpose is to minimize drought impacts by improving agency coordination and enhancing monitoring and early warning capabilities, water shortage impact assessments, and preparedness, response, and recovery programs. The DCP identifies an integrated, regional approach to addressing drought, drought action levels, and appropriate agency responses as drought conditions change. It calls for coordination and clearly defined roles and responsibilities of federal, state, and local agencies, and timely dissemination of information to decision-makers.

Five levels of drought response are identified. These range from Level 1, representing an: Abnormally Dry period (calling for raising awareness), to Level 3, a Severe Drought (requiring mandatory conservation in some communities and emergency actions), to Level 5, an Exceptional Drought (water supplies may be cut off and maximum response). A Governor's emergency drought proclamation may be initiated at Level 3.

Drought can be defined according to meteorological, hydrological, or agricultural criteria.





Meteorological drought is usually based on long-term precipitation departures from normal, but there is no consensus regarding the threshold of the deficit or the minimum duration of the lack of precipitation that makes a dry spell an official drought.

Hydrological drought refers to deficiencies in surface and subsurface water supplies. It is measured as stream flow, as well as lake, reservoir, and ground water levels.

Agricultural drought occurs when there is insufficient soil moisture to meet the needs of a particular crop at a particular time. A deficit of rainfall over cropped areas during critical periods of the growth cycle can result in destroyed or underdeveloped crops with greatly depleted yields. Agricultural drought is typically evident after meteorological drought but before a hydrological drought.

Socioeconomic drought associates the supply and demand of economic goods or services with elements of meteorological, hydrologic, and agricultural drought. Socioeconomic drought occurs when the demand for water exceeds the supply as a result of weather- related supply shortfall. This may also be called a water management drought.

### *History*

Riverside County chronically experiences drought cycles. Drought causes stress on the County's ability to provide water to the community. In addition, drought conditions can cause extensive weakening of trees in forested areas causing them to become highly vulnerable to disease and insect infestation. Many trees have weakened and died, creating a severe fire hazard. Furthermore, wildland brush areas were dry, presenting wildfire risk.

**Figure 35:** California's drought level first week of March 2011-2015

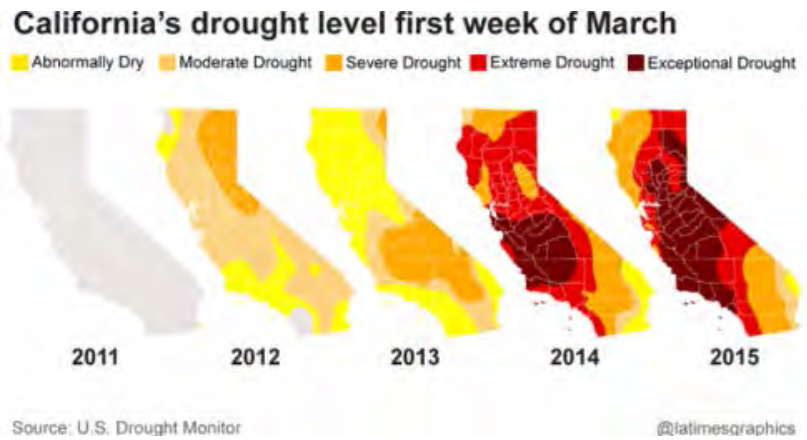


**Figure 36:** California's drought level March 2016-2017

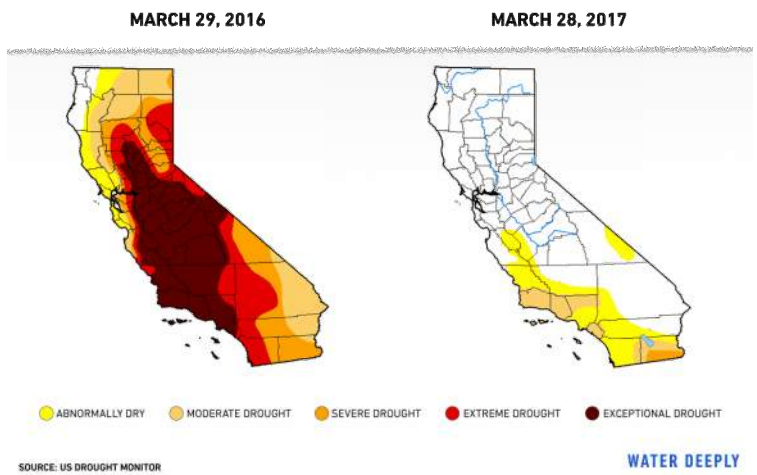






### *Drought Risk Assessment*

The Department of Water Resources produces a California Water Plan every five years that not only includes a statewide water budget but also regional watershed water budgets. These water budgets are based on California Department of Finance population projections and indicate clearly that demand for water will exceed supply in 2020 whether or not a drought condition exists at that time. The largest average-year shortages are forecasted for the South Coast Region, which heavily relies on imported water. Future average-year shortages in the South Coast Region reflect forecasted population growth plus lower Colorado River supplies as California reduces its use of Colorado River water to the State's basic apportionment.

Although a drought in and of itself is not a direct threat to property and life, the impact on the County's agricultural industry and home development can be monumental. The costs to the County for the current drought in terms of fire damage and forest management have been in the millions. This is a chronic problem for Riverside County and accounts for significant indirect costs, loss of property and threat to human life.

### *Relationship to Other Hazards – Cascading Effects*

Drought can increase the severity of other hazards. For example, drought can lead to an increase in dead vegetation when can increase fire hazards. It can also lead to increased insect infestations.

**Figure 37:** U.S Drought Monitor – California

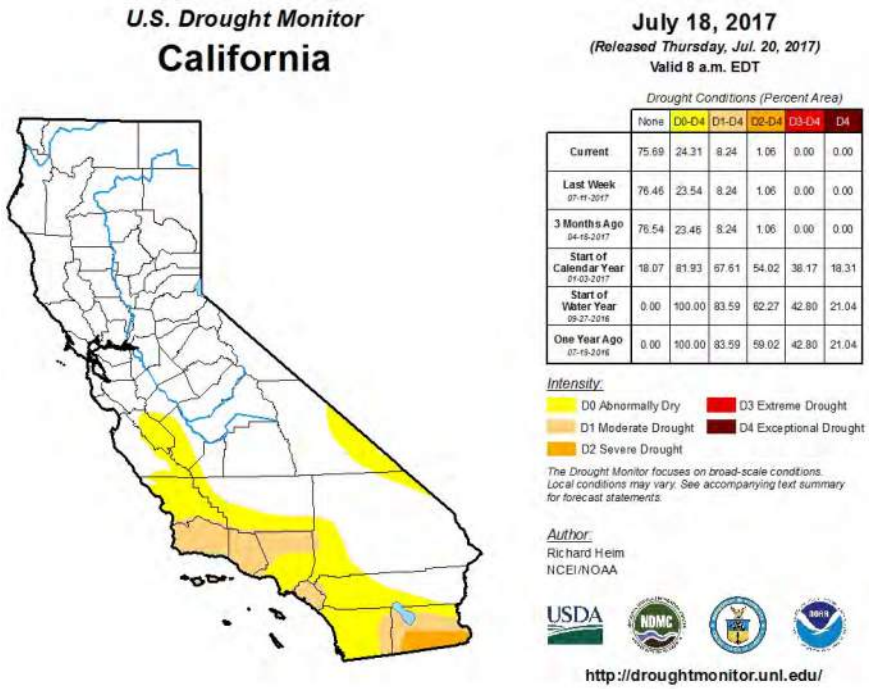


| | None | D0-D4 | D1-D4 | D2-D4 | D3-D4 | D4 |
|---|---|---|---|---|---|---|
| Current | 75.69 | 24.31 | 8.24 | 1.06 | 0.00 | 0.00 |
| Last Week 07-11-2017 | 76.46 | 23.54 | 8.24 | 1.06 | 0.00 | 0.00 |
| 3 Months Ago 04-18-2017 | 76.54 | 23.46 | 8.24 | 1.06 | 0.00 | 0.00 |
| Start of Calendar Year 01-03-2017 | 18.07 | 81.93 | 67.61 | 54.02 | 38.17 | 18.31 |
| Start of Water Year 09-27-2016 | 0.00 | 100.00 | 83.59 | 62.27 | 42.80 | 21.04 |
| One Year Ago 07-19-2016 | 0.00 | 100.00 | 83.59 | 59.02 | 42.80 | 21.04 |





### 5.3.12 Nuclear/Radiological Incident

**Severity: 4**

**Probability: 1**

**Risk Score: 1.00**

**OA Jurisdictions Affected by Nuclear Incidents**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

#### *Hazard Definition*

##### *Radiological Accidents*

Radioactive materials are routinely transported in California. These materials include the medical and industrial sources described below, as well as wastes that have radioactive components. Many of the radioactive waste shipments come from research and cleanup efforts at national laboratories.

Radiological accidents that result in the release of radioactive materials may result in long-term health risks and contamination of the state resources, including air, water supply, groundwater, and agricultural lands.

##### *Profiling Radiological Accident Hazards*

Due to strict regulation of nuclear power plants in the United States, significant nuclear power incidents that can cause harm to the public have a low probability of occurrence, and none have occurred in California. Even though the probability of a catastrophic event involving a nuclear power plant is extremely low and these plants are extremely well protected, the consequences of a severe accident or a successful terrorist attack on a nuclear power plant that results in a release of radioactive materials could be very significant.

State and local governments having jurisdiction within ten miles of an operating nuclear power plant must plan, train, and conduct emergency exercises annually in accordance with federal regulations. Detailed emergency plans are maintained by each affected agency. Four Emergency Classification Levels (ECLs) have been established in federal regulations to characterize the severity of the emergency and the response actions

required. The ECLs must be used as the foundation for emergency response planning, training and exercises.

### *Planning Zones*

A series of zones have been established around each nuclear power plant to clearly identify the required activities in the event of an accident. Although three specific zones are identified, efforts to protect public health and safety and the environment are made without regard to whether particular areas are inside or outside of these zones:

- The Emergency Planning Zone is an approximate 10-mile radius around the plants. Plans for this zone are in place to protect people, property, and the environment from the effects of exposure to a radioactively contaminated plume.
- The Ingestion Pathway Zone covers an approximate 50-mile radius around the plant. In this zone, plans are in place to mitigate the effects of radioactive contamination to agriculture, and food processing and distribution.

There are three general situations that could affect Riverside County, namely:

1. A situation involving nuclear weapons, which is discussed in the Terrorism section of this LHMP (Section 5.3.7);
2. A situation involving the transportation of nuclear materials; and
3. An incident involving the San Onofre Nuclear Generating Station (SONGS).

As will be discussed in the Terrorism section of this LHMP, the possibility exists that a terrorist organization might acquire the capability of creating a small nuclear detonation. A single nuclear detonation in the United States would likely produce fallout affecting an area many times greater than that of the blast itself. There is also the possibility that a terrorist will construct a “dirty bomb”, a bomb that is used to distribute nuclear-contaminated materials. It would have less of an effect than a “traditional” nuclear bomb, but the terror effect on the population would be great.

A nuclear incident could be initiated by a transportation emergency, either accidental or intentional. See the Transportation Emergencies section of this LHMP (Section 5.3.14).

SONGS is located on the Pacific Coast in northwestern San Diego County, approximately 4 miles southeast of the City of San Clemente. Surrounding San Onofre is a Basic Emergency Planning Zone, approximately 10 miles in radius within which certain precautionary actions must be taken and specific precautionary plans must be prepared.





This zone does not include any portion of Riverside County. Beyond this zone is an area that could be affected by radioactive fallout being deposited in such a manner as to detrimentally affect the human food chain, which includes all of Riverside County. This area is identified as the Ingestion Pathway Zone. Specifically, the primary threat is that of radioactive iodine 131 being deposited upon fodder consumed by dairy cows and subsequently appearing in milk in the public marketplace.

### *History of Events*

Fortunately, Riverside County has not experienced a nuclear accident.

### *Risk Assessment*

Transportation of nuclear and/or irradiated materials is of growing concern. A severe transportation incident could require the evacuation of a large number of people, major rerouting of traffic systems, and an expensive decontamination process for the area involved. Ancillary problems associated with such an incident are discussed in the sections of this LHMP dealing with Hazardous Materials and with Transportation Incidents.

### *Radiological Waste Transportation*

Since 1989, the staff of the Energy Commission has represented California on two western state groups: the Western Governors' Association WIPP Transportation Advisory Group and the Western Interstate Energy Board's High-Level Radioactive Waste Committee. Both groups work with the U.S. Department of Energy and other state regional groups to develop accident prevention and emergency response plans for major federal non-classified shipments of radioactive waste. Staff also coordinates the California Nuclear Transport Working Group that develops and updates accident prevention and emergency response plans for federal shipments of transuranic waste to the Waste Isolation Pilot Plant (WIPP) in New Mexico.

To mitigate disaster, federal regulations require that:

- radiological materials transported by train use special packaging based on the hazard of the shipment
- there are extensive worker training and documentation
- vehicle and packages of radioactive materials are inspected
- The waste travels via specific, controlled routes.

*More information about radiological waste transportation can be found on Cal OES's* radiological *transportation website.*

A detailed discussion of radiation hazards and their effects on humans along with a description of the operation of a nuclear power generating facility and the hazards posed thereby are contained in the State of California Nuclear Power Plant Emergency Response Plan and in other documents.

The State Nuclear Power Plant Emergency Response Plan assigns to the County of Riverside responsibility for certain actions to protect the public and the environment within Riverside County from the effects of an accident. The plan also lists the support and assistance available from various State and Federal organizations.

- **Effects on people and housing.** Depending on levels of radiation exposure, the effects could range from minimal to devastating.
- **Effects on commercial and industrial structures.** Depending on levels of radiation exposure, the effects could range from minimal to devastating.
- **Effects on infrastructure.** Depending on levels of radiation exposure, the effects could range from minimal to devastating.
- **Effects on agriculture.** Depending on levels of radiation exposure, the effects could range from minimal to devastating.

#### *Risk Assessment Conclusion*

The nearest plant to Riverside County is San Onofre, which is a three tower facility in San Diego County. In 1992 the site retired Tower 1. Towers 2 and 3 remained operational until 2012. In March of 2015 SoCal Edison was granted permission to decommission towers 2 and 3 and permanently close the site. The estimated date for full closure of the power plan is December 31, 2031.

The County is far enough away from nuclear power plants that cataclysmic exposure is not likely. There is the possibility of Riverside County being used as a major evacuation route from a nuclear plant accident. This would tax the County's response resources. The radiation from an accident would, of course, negatively affect the area.

#### *Relationship to Other Hazards – Cascading Effects*

Cascading effects of a nuclear incident could include contaminated water, air, and soil. It could also impact first responders and the 911 system.





### 5.3.13 Extreme Weather

**Severity: 3**

**Probability: 2**

**Risk Score: 0.75**

**OA Jurisdictions Affected by Extreme Weather**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

#### *Hazard Definition*

Extreme weather hazards in Riverside County include:

- Extreme Heat
- Severe Cold
- Wind Event
- Fog Event
- Agricultural Event

Climate Change can impact weather patterns within the County. Climate changes can increase or change effects of weather. Some changes may include reduced water supply, increased temperatures, decreased precipitation and increased wildfire risks.

The National Climate Data Center (NCDC) receives Storm Data from the National Weather Service. The National Weather service receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, SKYWARN spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public.

Storm Data Disclaimer:

Storm Data is an official publication of the National Oceanic and Atmospheric Administration (NOAA) which documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. In addition, it is a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in

Storm Data may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. Therefore, when using information from Storm Data, customers should be cautious as the NWS does not guarantee the accuracy or validity of the information.

**Table 32:** Storm Data Table (4/30/1950 to 8/7/2017)

| Type | # of Events | Property Loss | Crop Loss | Deaths | Injuries |
|---|---|---|---|---|---|
| Drought | 26 | N/A | N/A | N/A | N/A |
| Dust Storm | 26 | 405 K | 100 K | 0 | 77 |
| Flood | 246 | 88.405 M | 5.200 M | 7 | 26 |
| Fog | 18 | 25K | 0 | 0 | 21 |
| Funnel Cloud | 26 | 0 | 0 | 0 | 0 |
| Hail | 30 | 131.5 K | 10 K | 0 | 2 |
| High Winds | 227 | 65.579 M | 36.705 M | 8 | 71 |
| Lightning | 30 | 254.5 K | 10.1K | 1 | 6 |
| Precipitation | 25 | 40.400 M | 0 | 0 | 26 |
| Snow and Ice | 57 | 1.386 M | 0 | 4 | 102 |
| Strong Winds | 19 | 999 K | 0 | 1 | 2 |
| Temp Extremes | 25 | 1.330 M | 1.175 M | 31 | 39 |
| Thunderstorm Winds | 119 | 4.980 M | 10 K | 0 | 0 |
| Tornado | 24 | 21.537 M | 0 | 0 | 4 |





| Type | # of Events | Property Loss | Crop Loss | Deaths | Injuries |
|---|---|---|---|---|---|
| Wild and Forest Fire | 161 | 190.892 M | 1.247 M | 1 | 131 |
| **Totals** | **1,329** | **2.229 B** | **174.429 M** | **53** | **507** |

Note: Figures in the chart above were gathered from NOAA's Storm Event Database and may not be a complete listing of previous hazard occurrences.

Riverside County's weather has a history of extremes. There are basically three weather regions in the County, each with its own type of weather and each with a different impact on the County. In some cases, the high temperatures in the desert are harmful to the public, but beneficial to agriculture. In other cases, a steady rainfall that raises the water table can be good for the County, yet too much rain will cause flooding and a disruption in the production of agricultural goods.

### *Average Climates across the County*

The Weather Tables portray the averages for several areas across the County of Riverside. The cities included are Riverside, Idyllwild and Blythe. These cover the Desert, Mountain and Valley Regions, and are clear examples of the weather extremes within the county.

#### Riverside Climate

**Climate Riverside - California** °C | °F

| | Jan | Feb | Mar | Apr | May | Jun |
|---|---|---|---|---|---|---|
| Average high in °F: | 68 | 68 | 71 | 76 | 80 | 87 |
| Average low in °F: | 43 | 44 | 46 | 49 | 54 | 57 |
| Av. precipitation in inch: | 2.32 | 2.4 | 1.69 | 0.67 | 0.2 | 0.08 |
| Days with precipitation: | - | - | - | - | - | - |
| Hours of sunshine: | - | - | - | - | - | - |

| | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|
| Average high in °F: | 94 | 95 | 91 | 83 | 74 | 67 |
| Average low in °F: | 62 | 62 | 59 | 53 | 46 | 42 |
| Av. precipitation in inch: | 0.04 | 0.08 | 0.16 | 0.47 | 0.83 | 1.38 |
| Days with precipitation: | - | - | - | - | - | - |
| Hours of sunshine: | - | - | - | - | - | - |

Source: http://www.usclimatedata.com/climate/riverside/california/united-states/usca1695

## Idyllwild Climate

**Climate Idyllwild - California** °C | °F

| | Jan | Feb | Mar | Apr | May | Jun |
|---|---|---|---|---|---|---|
| Average high in °F: | 56 | 56 | 59 | 64 | 72 | 80 |
| Average low in °F: | 30 | 30 | 31 | 35 | 41 | 47 |
| Av. precipitation in inch: | 4.88 | 5.35 | 3.78 | 1.81 | 0.43 | 0.16 |
| Days with precipitation: | - | - | - | - | - | - |
| Hours of sunshine: | - | - | - | - | - | - |
| Average snowfall in inch: | 8 | 8 | 6 | 3 | 1 | 0 |

| | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|
| Average high in °F: | 86 | 86 | 81 | 71 | 62 | 55 |
| Average low in °F: | 54 | 54 | 49 | 41 | 34 | 29 |
| Av. precipitation in inch: | 0.67 | 0.79 | 0.83 | 1.22 | 2.52 | 3.7 |
| Days with precipitation: | - | - | - | - | - | - |
| Hours of sunshine: | - | - | - | - | - | - |
| Average snowfall in inch: | 0 | 0 | 0 | 0 | 2 | 4 |

Source: http://www.usclimatedata.com/climate/idyllwild/california/united-states/usca0506

## Blythe Climate

**Climate Blythe - California** °C | °F

| | Jan | Feb | Mar | Apr | May | Jun |
|---|---|---|---|---|---|---|
| Average high in °F: | 68 | 73 | 80 | 88 | 97 | 105 |
| Average low in °F: | 40 | 44 | 49 | 55 | 63 | 69 |
| Av. precipitation in inch: | 0.55 | 0.59 | 0.39 | 0.08 | 0.04 | 0.04 |
| Days with precipitation: | - | - | - | - | - | - |
| Hours of sunshine: | - | - | - | - | - | - |

| | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|
| Average high in °F: | 109 | 108 | 102 | 90 | 76 | 66 |
| Average low in °F: | 78 | 77 | 69 | 57 | 46 | 39 |
| Av. precipitation in inch: | 0.24 | 0.43 | 0.43 | 0.2 | 0.24 | 0.59 |
| Days with precipitation: | - | - | - | - | - | - |
| Hours of sunshine: | - | - | - | - | - | - |

Source: http://www.usclimatedata.com/climate/idyllwild/california/united-states/usca0506





### 5.3.13.1 Extreme Heat

***Overview***

Extreme heat can be described as overly hot temperatures that are sustained to the extent that human and animal overexposure can cause heat illness and death. Heat illness is a major cause of preventable morbidity in regions characterized by high ambient temperatures.

Riverside County has a wide range of temperatures, from freezing in some areas during the winter months to extremely hot temperatures for long periods of time during the summer in the deserts and other areas. In 2011 Riverside County and several other counties were impacted by a power outage during a period of high temperatures. The State Hazard Mitigation Plan addresses the issue of Extreme Heat Hazards, and this information has been included in this LHMP.

The figure on the next page illustrates the Heat Index (HI) as a function of heat and relative humidity. The Heat Index describes how hot the heat-humidity combination makes the air feel. As relative humidity increases, the air seems warmer than it actually is because the body is less able to cool itself via evaporation of perspiration. As the Heat Index rises, so do health risks.

Specifically:

- When the Heat Index is 90°F, heat exhaustion is possible with prolonged exposure and/or physical activity.
- When it is 90° to 105°F, heat exhaustion is probable with the possibility of sunstroke or heat cramps with prolonged exposure and/or physical activity.
- When it is 105° to 129°F, sunstroke, heat cramps or heat exhaustion is likely, and heatstroke is possible with prolonged exposure and/or physical activity.
- When it is 130°F and higher, heatstroke and sunstroke are extremely likely with continued exposure. Physical activity and prolonged exposure to the heat increase the risks.

**Figure 38:** The National Weather Service (NWS) Heat Index

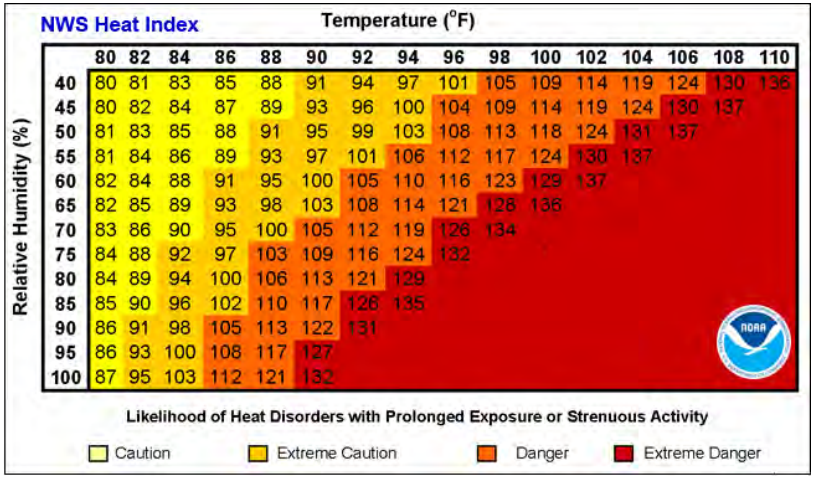


| Relative Humidity (%) | 80 | 82 | 84 | 86 | 88 | 90 | 92 | 94 | 96 | 98 | 100 | 102 | 104 | 106 | 108 | 110 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 | 80 | 81 | 83 | 85 | 88 | 91 | 94 | 97 | 101 | 105 | 109 | 114 | 119 | 124 | 130 | 136 |
| 45 | 80 | 82 | 84 | 87 | 89 | 93 | 96 | 100 | 104 | 109 | 114 | 119 | 124 | 130 | 137 | |
| 50 | 81 | 83 | 85 | 88 | 91 | 95 | 99 | 103 | 108 | 113 | 118 | 124 | 131 | 137 | | |
| 55 | 81 | 84 | 86 | 89 | 93 | 97 | 101 | 106 | 112 | 117 | 124 | 130 | 137 | | | |
| 60 | 82 | 84 | 88 | 91 | 95 | 100 | 105 | 110 | 116 | 123 | 129 | 137 | | | | |
| 65 | 82 | 85 | 89 | 93 | 98 | 103 | 108 | 114 | 121 | 128 | 136 | | | | | |
| 70 | 83 | 86 | 90 | 95 | 100 | 105 | 112 | 119 | 126 | 134 | | | | | | |
| 75 | 84 | 88 | 92 | 97 | 103 | 109 | 116 | 124 | 132 | | | | | | | |
| 80 | 84 | 89 | 94 | 100 | 106 | 113 | 121 | 129 | | | | | | | | |
| 85 | 85 | 90 | 96 | 102 | 110 | 117 | 126 | 135 | | | | | | | | |
| 90 | 86 | 91 | 98 | 105 | 113 | 122 | 131 | | | | | | | | | |
| 95 | 86 | 93 | 100 | 108 | 117 | 127 | | | | | | | | | | |
| 100 | 87 | 95 | 103 | 112 | 121 | 132 | | | | | | | | | | |

Source: http://www.nws.noaa.gov/os/heat/heat_index.shtml

The National Weather Service (NWS) will initiate its Heat Index Program Alert procedures when the high temperature is expected to exceed 105° to 110° (depending on local climate) for at least two consecutive days.

### *Extreme Heat and infrastructure*

Extreme heat can not only result in loss of life and injury but it can also cause damages to infrastructures. According to the 2017 update Draft of the Safeguarding California Plan, highway systems can be affected by extreme heat by roads buckling and rutting.

### *Profiling Extreme Heat Hazards (from the 2013 SHMP)*

"Heat waves do not cause damage or elicit the immediate response that floods, fires, earthquakes, and other disasters do. They have, however, claimed many lives in comparison with other disasters. For example, the 1989 Loma Prieta Earthquake resulted in 63 deaths while the 1992 Northridge Earthquake was responsible for the loss of 55 lives. The catastrophic 2003 Southern California Firestorms resulted in 24





deaths. However, according to the 2013 SHMP, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave is said to have resulted in 946 deaths. The 2013 SHMP also states that the July 2006 heat wave in California caused the deaths of at least 136 people over a 13-day period (6 deaths were still under investigation in 2007). Another source, the Spatial Hazard Events and Loss Data for the United States (SHELDUS), estimates that approximately 47 heat events occurred in California between the years 1960 and 2008. Adjusted to 2008 dollars, SHELDUS reports that severe heat events in California caused roughly $1.8 million in property damage and $531.7 million in crop damage. From 2012 to 2014 there were 159 fatalities related to extreme Heat events within California.

The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." Despite this history, however, not a single heat emergency was formally proclaimed at the state level or declared as a federal disaster between 1960 and 2008. Though no formal explanation exists for this seeming contradiction, scholars have written about the exclusion of heat events as declared disasters. For example, Eric Klinenberg, author of an account of a heat wave which killed 739 people in the City of Chicago in July 1995, suggests that the hidden nature of social vulnerability combined with the inconspicuous nature of heat events (unlike earthquakes, floods, wildfires, tornados, etc.) prevent them from being declared as legitimate disasters.61 Further, although heat events can have a devastating effect on agriculture, heat-caused property damage over the last 48 years has been relatively small.

### *Treating Heat as a "Legitimate Disaster" (from the 2013 SHMP)*

These facts raise several issues. First, since the primary goal of the SHMP is to significantly reduce the loss of life and injuries in the state of California, heat is considered a legitimate disaster type. Though heat does not cause much economic damage or damage to the built environment, the number of people it has killed underscores the importance of mitigating its impacts. Second, heat events highlight the importance of thoughtful social vulnerability analyses. While changes to the built environment can greatly alter vulnerability to different hazards, social vulnerability and resiliency are especially important during heat events. For example, socially isolated elderly persons are especially vulnerable. Any mitigation efforts aimed at reducing heat losses will focus on ways to reduce social isolation as well as changes to the built environment. Third, heat events illustrate how seemingly unrelated phenomena combine to create a disaster. For example, the increased use of air conditioners during heat waves can lead to power outages, which makes the events even more deadly. Upgrading water and power infrastructure, then, is a form of heat disaster mitigation.

Situational and physical characteristics help to identify vulnerable populations that may not comfortably or safely access and use disaster resources. Specifically, when discussing heat related emergency preparedness, the following groups could be considered vulnerable or at greater risk in a heat emergency:

- Infants and small children under age three
- Women who are pregnant
- Elderly people (age 65 and older)
- Homeless
- The obese
- The bedridden
- Mentally ill
- Those with cognitive disorders
- Those with medical conditions (e.g., heart disease, diabetes, high blood pressure)
- Those requiring life-saving medications (e.g., for high blood pressure, depression, insomnia)
- Individuals with drug or alcohol addictions
- Those with mobility constraints
- People who are non-ambulatory
- Those under extreme working conditions
- The poor
- People who are socially isolated
- Non-English speakers who may not have access to information

Animals, including domestic pets, livestock, and poultry are also susceptible to extreme heat. For example, dogs and cats are in danger of heat stroke in temperatures of 110°F. The heat wave of 2006 resulted in 15 reported pet deaths and more than 25,000 cattle, and 700,000 fowl heat-related deaths.





**Table 33:** 1991 -2013 Heat Deaths in California

| | < 1 | 1-4 | 5-9 | 10-14 | 15-19 | 20-24 | 25-44 | 45-64 | 65-84 | 85+ | *Total* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1991** | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 5 | 5 | 0 | ***17*** |
| **1992** | 0 | 0 | 0 | 1 | 2 | 0 | 8 | 3 | 2 | 1 | ***17*** |
| **1993** | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 3 | 6 | 0 | ***12*** |
| **1994** | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 7 | 9 | 0 | ***23*** |
| **1995** | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 5 | 3 | 2 | ***17*** |
| **1996** | 0 | 1 | 0 | 0 | 0 | 0 | 5 | 8 | 7 | 0 | ***21*** |
| **1997** | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 1 | ***7*** |
| **1998** | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 2 | 2 | 0 | ***9*** |
| **1999** | 0 | 2 | 0 | 0 | 0 | 0 | 5 | 3 | 8 | 1 | ***19*** |
| **2000** | 2 | 0 | 1 | 0 | 0 | 2 | 10 | 9 | 8 | 3 | ***35*** |
| **2001** | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 8 | 4 | 1 | ***19*** |
| **2002** | 2 | 1 | 0 | 0 | 0 | 1 | 12 | 4 | 3 | 1 | ***24*** |
| **2003** | 1 | 0 | 0 | 0 | 1 | 3 | 12 | 6 | 6 | 0 | ***29*** |
| **2004** | 1 | 2 | 0 | 0 | 0 | 1 | 9 | 8 | 6 | 1 | ***28*** |
| **2005** | 0 | 1 | 1 | 2 | 0 | 2 | 13 | 7 | 5 | 5 | ***36*** |
| **2006** | 1 | 0 | 0 | 0 | 0 | 3 | 22 | 48 | 38 | 10 | ***122*** |
| **2007** | 2 | 1 | 0 | 0 | 2 | 2 | 14 | 13 | 4 | 4 | ***42*** |
| **2008** | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 15 | 3 | 4 | ***29*** |
| **2009** | 1 | 0 | 0 | 0 | 1 | 2 | 8 | 15 | 7 | 5 | ***39*** |
| **2010** | 1 | 0 | 0 | 0 | 1 | 1 | 5 | 9 | 4 | 1 | ***22*** |
| **2011** | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 8 | 4 | 1 | ***17*** |
| **2012** | 0 | 0 | 0 | 0 | 1 | 2 | 17 | 13 | 7 | 4 | ***44*** |
| **2013** | 1 | 0 | 0 | 1 | 2 | 2 | 10 | 14 | 11 | 2 | ***43*** |
| *Total* | ***12*** | ***12*** | ***2*** | ***4*** | ***11*** | ***28*** | ***187*** | ***213*** | ***155*** | ***47*** | ***671*** |

*Current as of June 2017
Source: CDPH Vital Statistics Death Statistical Master Files
Prepared by: California Department of Public Health, Safe and Active Communities Branch
Report generated from http://epicenter.cdph.ca.gov on: August 07, 2017

#### 5.3.13.2 Severe Cold

***Overview***

Riverside County generally experiences a Mediterranean or Desert climate. When temperatures suddenly drop it can potentially lead to loss of life in humans and livestock, as well as severely damage crops.

When temperatures drop below freezing that is the most dangerous time for crops. When water freezes it expands, this effect causes damage to a plants structure and may cause it to die.

*Identifying Freeze Hazards (2013 SHMP)*

Sustained temperatures below freezing in California's generally mild weather regions can cause life loss and health risks to vulnerable populations. Although infrequent, freezes can severely affect California agriculture. Freezing temperatures occurring during winter and spring growing seasons can cause extensive crop damage.

Secondary impacts of freeze disasters can include major economic impacts on farmers, farm workers, packers, and shippers of agricultural products. Freezes can also cause significant increases in food prices to the consumer due to shortages.

Freezing spells are likely to become less frequent in California as climate temperatures increase. If emissions follow higher pathways, freezing events could occur only once per decade in a sizable portion of the state by the second half of the 21st century. While fewer freezing spells would decrease cold-related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off (CNRA 2009).





#### 5.3.13.3 Wind Event

***Overview***

Windstorms are a hazard for many of the participating.

Santa Ana Winds have caused large amounts of damage and increased the fire damage level dramatically. Santa Ana Winds are generally defined as warm, dry winds that blow from the east or northeast (offshore). These winds occur below the passes and canyons of the coastal ranges of Southern California and in the Los Angeles basin. Santa Ana winds often blow with exceptional speed in the Santa Ana Canyon (the canyon from which it derives its name). Forecasters at the NWS in Oxnard and San Diego usually place speed minimums on these winds and reserve the use of "Santa Ana" for winds greater than 25 knots.

The complex topography of Southern California combined with various atmospheric conditions creates numerous scenarios that may cause widespread or isolated Santa Ana events. Commonly, Santa Ana winds develop when a region of high pressure builds over the Great Basin (the high plateau east of the Sierra Mountains and west of the Rocky Mountains including most of Nevada and Utah). The clockwise circulation around the center of this high pressure area forces air downslope from the high plateau. The air warms as it descends toward the California coast at the rate of 5 degrees F per 1000 feet due to compressional heating. Thus, compressional heating provides the primary source of warming. The air is dry since it originated in the desert, and it dries out even more as it is heated.

Santa Ana winds commonly occur between October and February with December having the highest frequency of events. Summer events are rare. Wind speeds are typically north to east at 35 knots through and below passes and canyons with gusts to 50 knots. Stronger Santa Ana winds can have gusts greater than 60 knots over widespread areas and gusts greater than 100 knots in favored areas. Frequently, the strongest winds in the basin occur during the night and morning hours due to the absence of a sea breeze. The sea breeze which typically blows onshore daily can moderate the Santa Ana winds during the late morning and afternoon hours.

The following maps and photos show the direction of the Santa Ana winds as they travel from the stable, high-pressure weather system called the Great Basin High through the canyons and towards the low-pressure system off the Pacific. Riverside County is in the direct path of the ocean-bound Santa Ana winds.

**Figure 39:** Direction of Santa Ana Wind Patterns

Source: http://www.theweatherprediction.com/weatherpapers/049/

### *Risk Assessment*

The Santa Ana Winds pose several different types of threats.

1. By themselves, the winds pose a threat to the health of the people and to structures in the County.
   a. Health risks relate primarily to breathing problems caused by the blowing dust and plant pollen.

   b. Structural issues relating to the winds range from roofs being blown off to trees falling onto buildings.

2. The winds increase the threat and/or severity of fires in the urban areas





   a. Wind-blown flames will spread more rapidly when pushed by high Santa Ana Winds.

3. Santa Ana Winds dry out brush and forest areas and increase the speed of a fire.

4. Santa Ana Winds cause power lines to arc, resulting in fires
5. Santa Ana Winds can either cause trees to fall on power lines or power lines to break, causing power outages.

### *Wind Erosion*

Soil erosion is also a natural on-going process that transports, erodes and displaces soil particles through a transport mechanism, such as flowing water or the wind. Loose texture and steep slopes primarily result in high wind erosion potential in soils. Wind erosion is most severe in arid regions, where sandy or loamy sediments are un-vegetated and exposed to severe wind conditions.

In addition to the problems caused by the Santa Ana Winds, wind erosion is a serious environmental problem attracting global attention. Soil movement is initiated as a result of wind forces exerted against the surface of the ground. Dust particles in the air create major health problems. Atmospheric dust causes respiratory discomfort, may carry pathogens that cause eye infections and skin disorders and reduces highway and air traffic visibility. Dust storms can cause additional problems. Buildings, fences, roads, crops, trees and shrubs can all be damaged by abrasive blowing soil.

The wind and wind-blown sand are an environmentally-limiting factor throughout much of Riverside County. Approximately 20 percent of the land area of Riverside County is vulnerable to "high" and "very high" wind erosion susceptibility. The Coachella Valley, the Santa Ana River Channel in northwestern Riverside County, and areas in and around the Cities of Hemet and San Jacinto are zones of high wind erosion susceptibility. Human intervention can accelerate the natural erosion process. For instance, typical consequences of development increase erosion potential from the removal of vegetative cover and reduction of overall permeable area. These activities can lead to increased water runoff rates and concentrated flows that have greater potential to erode exposed soils. The effects of excessive erosion range from nuisance problems that require additional maintenance, such as increased siltation in storm drains, to instances of more severe damage, where water courses are down-cut and gullies develop. These processes can eventually undermine adjacent structures or topography. Human activities that disturb soils in arid regions increase wind erosion potential. Many of the desert areas are also susceptible to blowing sand, a severe

form of wind erosion that damages property and accumulates soil on roadways. The majority of the soils within the district exhibit moderate to high erosion potential, which can be compounded by development.





**Map 17:** Riverside County Wind Erosion Map

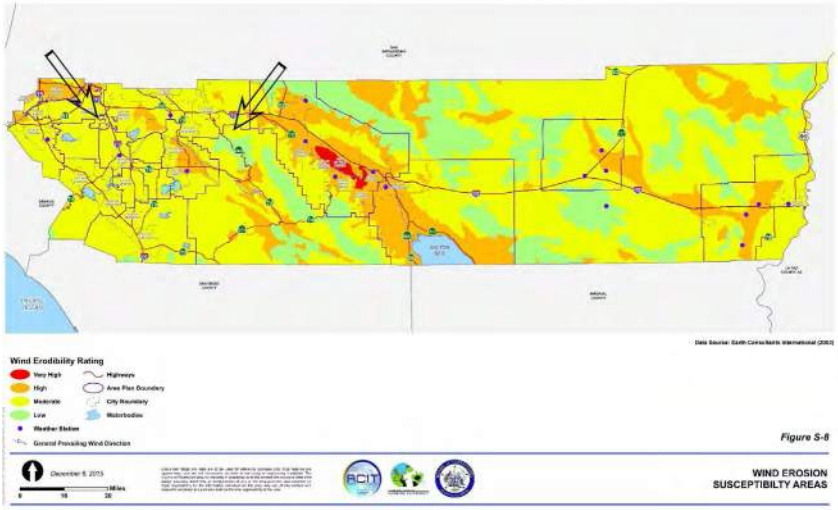

#### 5.3.13.4 Fog Event

***Overview***

Fog forms from air being cooled to the point where it can no longer hold all of the water vapor it contains. For example, rain can cool and moisten the air near the surface until fog forms. A cloud-free, humid air mass at night can lead to fog formation, where land and water surfaces that have warmed up during the summer are still evaporating water into the atmosphere. This is called radiation fog. A warm moist air mass blowing over a cold surface also can cause fog to form, called advection fog.

Fog can have a devastating effect on transportation. Nighttime driving in the fog is dangerous and multi-car pileups have resulted from drivers using excessive speed for the conditions and visibility. Fog contributes to transportation accidents and is a life safety hazard. These accidents can cause multiple injuries and deaths and could have serious implications for human health and the environment if a hazardous or nuclear waste shipment were involved. Dense fog may also delay emergency response vehicles.

This hazard does not occur regularly but has had an impact on the highways.

#### 5.3.13.5 Agricultural Event

***Overview***

Agriculture in Riverside County must be considered from two standpoints, namely, both as a product producer/exporter and a major economic provider to the County of Riverside. In 2014, Riverside County ranked in the top fourteen leading agricultural counties in California, with an agricultural production value of $1.36 billion. Major agricultural industries include milk, nursery products, citrus and avocado, grapes, vegetables and hay.

Riverside County is divided into two general agriculture regions (Desert and Western Riverside County), with the San Bernardino National Forest acting as a natural dividing line.

*Desert - Coachella Valley & Palo Verde Valley*

Agriculture is the second largest industry in the Desert Valleys and is primarily crop- related. Over 61% of Riverside County's crop production is grown in the Coachella and Palo Verde Valleys. In addition to crop production, many supporting industries, such as packing and distribution, are located in the desert





area. The Coachella Valley produces 95% of all dates grown in the United States and the annual fruit crop exceeds 40 million pounds. The Desert's list of agriculture-related products includes:

- Vegetable & Melon Crops (Bell Peppers, Lettuce, Corn, Watermelon, etc.)
- Nursery Stock
- Turf/Sod Producers
- Field Crops (Hay, Cotton, Wheat, etc.)
- Citrus
- Tree & Vine Crops (Table Grapes, Dates)

*Western Riverside County (WR)*

Agriculture in the Western Riverside County region is an ever-changing industry. With the large increase in housing in this area of the County over the past few years, there has been a reduction of several agriculture-related industries. This reduction is primarily in the poultry and dairy industries. The Western Riverside County list of agriculture-related products includes:

- Dairy Cattle
- Nursery Stock
- Beef Cattle
- Poultry and Eggs
- Citrus Crops
- Tree and Vine Crops (Avocado, Wine Grapes)
- Field Crops (Wheat, Hay, Green Chop)
- Vegetable Crops (Potatoes, etc.)
- Fish Hatcheries (for domestic and international distribution)

Statistics for Riverside County Agriculture

**Table 11:** USDA statistics for Riverside County Agriculture for 2012 show the following:

| | |
|---|---|
| Payroll | $16 million |
| Farms | 3,440 |
| Farm Acreage | 344,044 |
| Crop Value Production | $1.03 billion + |
| Livestock, poultry value including production | $146 million + |
| Dairy cows | 42,954 |
| Sheep and Lambs | 36,846 |
| 20 week old and older layers | 4,127,452 |
| Wheat for Grain Acreage | 6,400 |

United States Department of Agriculture, National Agricultural Statistics Service reports listed the following as the Top 5 commodities in 2015.

**Table 12:** Top 5 Commodities

| | |
|---|---|
| Milk Products | $165,124 million |
| Table Grapes | $143,988 million |
| Nursery Stock | $137,707 million |
| Lemons | $120,557 million |
| Hay | $81,760 million |





***History***

**Table 13:** Agriculture-related disasters in Riverside County:

| Riverside County Agriculture Disasters | | | | |
|---|---|---|---|---|
| **Year** | **Disaster** | **Commodity** | **Damages** | **Region** |
| 1979-80 | Wind | Avocado and Citrus | $40,000.00 | |
| 1979-80 | Rain/Floods (El Nino) | Olive Trees (4,200) | $319,494.00 | WR. |
| 1979-80 | Rain/Floods | Sugar beets, Barley & | $182,711.00 | WR. |
| 1979- | Rain/Floods | Potato Crop | $2,000,000.00 | WR. |
| 1979-80 | Rain/Floods | Dairy and Livestock | $211,900.00 | WR. |
| 1982-1983 | Rain/Floods (El Nino) | All agriculture | | Countywide |
| 1990 * | Insect Infestation-Med- fly | Fruit | | Countywide |
| 1990-91 | Freezing temperatures | Citrus, avocados, | $15,450,000.00 | Countywide |
| 1990- | Drought | | | WR |
| 1991 | Insect Infestation-white fly | Melons, squash, cucumbers, | | WR, Desert |
| 1992- | Rain/Flood | | | |
| 1993-94 | Insect Infestation-Med- Fly | Fruit | | WR |
| 1996 | Plant disease-Karnel Blunt | Wheat | | WR/Blythe |
| 1997-98 | Rain/Flood (El Nino) | Wheat | $167,000.00 | WR |
| 1997-98 | Rain/Flood (El Nino) | Livestock & Dairy | $4,100,000.00 | WR |

| | | | | |
|---|---|---|---|---|
| 1999 | Freezing temperatures | Citrus | $1,630,000.00 | Countywide |
| *1999-2002 ** | *Insect spread disease - (Pierce's Disease)* | *Wine Grapes* | *$16,000,000.00* | *WR* |
| *2001-July ** | *Rain/Floods-Desert Storm* | *Misc. land & irrigation damage* | *~ $1,000,000.00* | *CV* |
| 2002-2003 | Drought | Dairy farms, dry land crops, etc. | | Countywide |
| 2002 | High Winds/Freeze | Avocado & Citrus Crops | $8,586,000.00 | WR |
| 2002-03 | Animal Disease-END | Poultry - 300,000 birds in So. Calif. | | WR |
| 2003-04 | Wildfire | Nursery, various | | WR |
| 2004-05 | Severe Storms – Excessive Moisture | All Agricultural Commodities | | Countywide |
| 2005 | Severe Storms – Excessive Moisture | All Agricultural Commodities | | Countywide |
| 2006 | Excessive | Livestock | | WR |
| 2007 | Winter Storms | All Agricultural | | Countywide |
| 2007 | Wildfires | Avocados | | WR |
| 2007 | Below Normal Temperatures, Winter Storms | All Agricultural Commodities | | Countywide |





| | | | | |
|---|---|---|---|---|
| 2007 | Hail | All Agricultural | | Countywide |
| 2007 | Drought | Grain Crops, Livestock | $3.8 Million + | WR |
| 2008 | Wildfires | All Agricultural | | WR |
| 2009 | Drought | Grain Crops, Livestock | $5.0 Million + | WR |
| 2010 | Earthquake | Agricultural Buildings | | Coachella Valley |
| 2010 | Winter Storms – Flooding, Debris Flow, | All Agricultural Commodities | | Countywide |
| 2013-2016 | Drought | Crops damaged due to | | County Wide |

*Denotes a locally declared disaster

### Risk *Assessment*

When considering Agriculture the County factored in both crops and animals/livestock. Both groups have a three day window before serious damages occur (aside from physical damages that may happen due to earthquake or floods).

#### *Animals*

Most beef and dairy ranches, chicken ranches, swine farms, and other agricultural animal facilities usually only have a 2-to-3 day supply of feed on-site. Most of the large feed providers in the County do not have more than a 3-to-5 day supply. Restocking of feed supplies is done primarily by rail to the feed providers and then by truck to the local ranches.

In addition to providing feed for the animals, the impact on the dairy farms would be immense. The time factor for the dairy farms would be almost immediate. Not being able to move milk to the milk house was a major concern. Dairy cows have to be milked and without the ability to transport the milk off property, that milk has to be disposed of in some way so as not to contaminate the soil or create a positive host for insects.

#### *Crops*

Although many crops are time sensitive and there is a limited amount of storage space in local packing houses, transportation issues vary based on the time of year and crop season.

### *Water Related Hazards*

Many crops are not as water-dependent as animals are, though some ground and vine crops have a very short lifespan without an adequate supply. Short-term water supplies can be provided to animals through the use of water trucks; however, water trucks cannot support large crop areas with an adequate level of water.

Water-related issues included:

1. Local water supply (wells, holding ponds, etc.) contamination occurring either naturally or from man-made causes
2. Loss of water supply due to pipeline or aqueduct damage from an earthquake.

### *Hazmat Incidents – On-Property and Off-Property*

The definition for an On-Property Hazmat incident relates to the improper use of chemicals, crop-dusting accidents or errors, accidental chemical spills into the ground, and other similar incidents. Off-Property Hazmat events relate to the typical transportation Hazmat incident. Both groups (animal-related and crop-related) were very concerned about the impact of an On-Property event. There was a higher level of concern about the impact of an Off-Property event for animals than for crops. Both groups rated the probability of either type of event occurring as low.

### *Transportation Events*

Transportation events were listed as either short-term (less than 3 days) or long-term (over 3 days) and included:

1. Railroad accidents interrupting the delivery of products into the County;
2. Railroad accidents interrupting the movement of products out of the County;
3. A railroad or trucking strike; and





4. A disruption in transportation lines due to an earthquake, flood, fire, or another event.

Both animals and crops viewed the 3-day point as critical from both an economic and operational standpoint, with the crop group indicating that the 3-day window could be reduced based on whether or not it was picking season.

### *Insect infestation and Disease to Crops and Vines*

There is an ever-changing potential for damage to local crops and vines from disease and insect infestation. The County has been attacked by a wide variety of pests, insects, and diseases, and because of the diversity of the types of crops in the County, maintaining a pro-active approach has been difficult. Studies and history show that should there be a disease outbreak or contamination of crops/vines, the economic impact would be enormous. Recent events in other states have shown the potential for bans on importation of cattle/dairy products from affected states.

One of the primary concerns of the producers in the County is the illegal or uninspected importation of plants into this region. The majority of insect, pest, and disease issues in the County can be attributed to this problem.

**Table 37:** Primary Crop-related Insect Infestations for Riverside County

The table below shows the primary crop-related insect infestations in the County over the past twenty years:

| NAME |
|---|
| AFRICANIZED HONEY BEE |
| BARK BEETLE |
| CITRUS LEAFMINER |
| GLASSY-WINGED SHARPSHOOTER |
| GYPSY MOTH |
| HONEY BEE TRACHEAL MITE |
| JAPANESE BEETLE |
| LESSER SNOW SCALE |
| MAGNOLIA WHITE SCALE |
| MEDITERRANEAN FRUIT FLY |
| ORIENTAL FRUIT FLY |
| PIERCE'S DISEASE |
| RED IMPORTED FIRE ANT |
| STING NEMATODE |
| TROPICAL PALM SCALE |
| VARROA MITE/HONEY BEE |
| ASIAN CITRUS PSYLLID |
| SILVERLEAF WHITEFLY |
| POLYPHAGOUS SHOT-HOLE BORER |





**Figure 40:** 2015 Pest Interceptions Chart

PEST INTERCEPTIONS - 2015

| Scientific Name | Common Name | Pest Rating | Interceptions |
|---|---|---|---|
| *Solenopsis invicta* | Red Imported Fire Ant | A | 30 |
| *Maconellicoccus hirsutus* | Pink Hibiscus Mealybug | A | 8 |
| *Lopholeacaspsis cockerelli* | Cockerell Scale | A | 3 |
| *Pseudaulacaspis cockerelli* | Magnolia White Scale | A | 1 |
| *Ceroplastes floridensis* | Florida Wax Scale | A | 1 |
| *Paropeas achatinaceum* | Land Snail | A | 1 |
| *Aspidiotus destructor* | Coconut Scale | A | 1 |
| *Homalodisca vitripennis* | Glassy-Winged Sharpshooter | B | 2 |
| *Aonideilla aurantii* | California Red Scale | B | 1 |
| *Pulvinaria urbicola* | Urban Soft Scale | B | 1 |
| *Bradybaena similaris* | Asian Tramp Snail | B | 1 |
| *Fatoua villosa* | Crabweed | B | 1 |
| *Nipaecoccus sp.* | Mealybug | Q | 2 |
| *Paracoccus sp.* | Mealybug | Q | 2 |
| *Aspindiella sacchari* | Armored Scale | Q | 1 |
| *Phenacoccus peruvianus* | Mealybug | Q | 1 |
| *Ferriasia sp.* | Mealybug | Q | 1 |
| *Milviscutulus sp.* | Scale | Q | 1 |
| *Ophelimus mastielli* | Gall Wasp | Q | 1 |
| *Bambusaspis miliaris* | Bamboo Pit Scale | Q | 1 |

### *Animal Diseases*

There have not been recent incidents of catastrophic outbreaks of disease in the cattle/dairy industry. This is due in part to excellent precluding efforts on behalf of the cattle/dairy industry. Studies and history show that if there is an outbreak of cattle/dairy- related disease, the economic impact would be enormous. Recent events in other states have shown the potential for bans on importation of cattle/dairy products from affected states. In a short period of time, the inability to export products from the County would have wide-ranging economic effects.

The poultry industry is particularly vulnerable to the spread of disease because many fowl are kept in residential back yards and are therefore hard to monitor. Diseases can be spread by mosquitoes and/or ranch service operations that often serve more than one farm, increasing the odds of infection being spread. Outbreaks of the Exotic Newcastle Disease in the poultry industry in 2003 have resulted in the necessary depopulation of 3.16 million chickens in the County. This disease required the quarantine of a large area of Southern California, including all of Riverside County. The economic loss to the ranchers and County as a whole was estimated to be 161 million.

Diseases of primary concern to the area are:

- Avian Influenza
- Exotic Newcastle Disease
- Fowl Pox
- Hoof-and-Mouth Disease
- Transmissible Spongiform Encephalopathies

#### *Loss of Electrical Power*

The loss of electrical power is becoming more of a concern to all areas of agriculture. Depending on the season, the loss of electrical supply to a poultry ranch can be devastating within 2-to-4 hours because of the inability to keep the chickens cool. The loss of electrical power for over a 12 hour period can be devastating to a dairy farmer who cannot milk dairy cows.





### 5.3.14 Transportation Failure

**Severity: 3**

**Probability: 2**

**Risk Score: 0.38**

**OA Jurisdictions Affected by Transportation Hazard Incidents**

- Riverside Community College District
- San Gorgonio Memorial Hospital
- Banning
- Beaumont
- Blythe
- Calimesa
- Canyon Lake
- Cathedral City
- Coachella
- Corona
- Desert Hot Springs
- Eastvale
- Hemet Indian Wells
- Indio
- Jurupa Valley
- La Quinta
- Lake Elsinore
- Menifee
- Moreno Valley
- Murrieta
- Norco
- Palm Desert
- Palm Springs
- Perris
- Rancho Mirage
- Riverside
- San Jacinto
- Temecula
- Wildomar

### *Hazard Definition*

Transportation hazards are incidents involving air, rail, or highway transport of goods or passenger travel resulting in property damage, death, or serious injury. The incidents can be caused by transportation of hazardous materials, earthquake, hazardous weather, or other hazardous conditions affecting the uninterrupted flow of transportation and/or public safety.

Five major transportation systems operate within Riverside County.

1. Highways
2. Railroads
3. Air traffic
4. High-pressure petroleum and gas lines
5. Aqueducts.

Pipelines and aqueducts are treated separately in following sections of this LHMP.

### *History*

Highways. The traffic density on the freeway and highway systems in the western part of the County is of particular concern. The population and economic growth in this area have caused increased demand on these networks.

Although the seasons do not have a large impact on Riverside County, there is the threat of poor visibility due to winter fog. Adding to this problem is the fact that one out of every ten trucks on the freeway carries some sort of hazardous materials. (In addition, California Highway Patrol statistics show that 20 – 25 percent of them are usually driven in an unsafe mechanical condition.)

Rail Lines. Major rail transport lines through Riverside County include Union Pacific and the Burlington Northern Santa Fe (BNSF) Railway Companies. Rails, cars, supporting bridges, overpasses, and electrically-operated switching mechanisms are susceptible to damage.

Union Pacific and the BNSF Railway Companies lines enter the Coachella Valley from Imperial County along the eastern shore of the Salton Sea.





Major population centers affected by railroad transportation are vulnerable to the impact of a wide variety of hazardous materials transported by these carriers. Additionally, there are lines running east and west that carry significant tonnage daily. Some of these lines are in remote areas, but that does not lessen the overall seriousness of their impact.

### *Airlines / Airports.*

The western part of Riverside County has some of the busiest air traffic areas in the United States. Commercial, as well as military traffic, is very heavy. The number of near misses reported by pilots underscores the increasing possibility of a mid-air collision over the County.

There are two major airports in Riverside County: March Air Reserve Base and Palm Springs International. There are also numerous smaller municipal and commercial airports and private air strips:

- Banning Airport
- Bermuda Dunes Airport
- Blythe Airport
- Chiriaco Summit Airport
- Corona Municipal Airport
- Desert Center Airport
- Flabob Airport
- French Valley Airport
- Hemet- Ryan Airport
- Lake Elsinore/Skylark Airport
- Perris Valley Airport
- Rancho California Airport
- Riverside Municipal Airport
- Jacqueline Cochran Regional Airport





In addition, there are five major out-of-county airports operating in the vicinity of Riverside County with significant flight-paths over the County:

1. John Wayne Airport (Orange County)
2. Long Beach Airport (Los Angeles County)
3. Los Angeles International (LAX) Airport
4. Ontario Airport (San Bernardino County)
5. Chino Airport (Airport Influence Area extends into Riverside County)
6. San Diego International Airport (SAN) San Diego County

### *Risk Assessment*

The possibility for a transportation hazard to occur is ongoing. There have been railway incidents in the recent past, although they have not been numerous and have not caused extensive damage. Semi-trucking incidents are not uncommon and could result in a hazardous spill at any time, although notable events have not occurred in recent history. There has not been a serious airline accident in the area in the recent past.

- **Effects on people and housing.** As the historical events in Riverside County show, people may be evacuated when a transportation emergency occurs. Relative to some of the other natural hazards assessed earlier in this LHMP, the numbers of people affected by transportation emergencies are usually less. However, a transportation accident on Interstate 10 during a period of high heat can result in hundreds (or more) of commuters being stranded on the highway with little resources for an extended period of time.

- **Effects on commercial and industrial structures**. There may be economic consequences due to transportation emergencies, but the damage is generally limited to clean-up of facilities and grounds or simply interruption of business due to evacuation.

- **Effects on infrastructure.** Transportation emergencies may result in downed power lines. Also, Hazmat materials released in a transportation emergency may impact waterways and drainage systems, and incidents can lead to the evacuation of schools, business districts, and residential areas.

- **Effects on agriculture**. Transportation is essential to the agricultural industry.

For all elements of agriculture other than those that are dairy-related, any incident that affects transportation for more than three days is "major." For the dairy segment of the agricultural industry, any incident that affects the ability to transport product by more than 12 hours is considered "major."

***Risk Assessment Conclusion.***

In general, transportation hazards are not cataclysmic in terms of widespread property damage and loss of life. Existing emergency operations should be equipped to handle almost of any transportation hazard that may occur.

However, because Riverside County has an agricultural production value of over $1 billion, any transportation emergency that affects the ability of agriculture to conduct its routine business (importing supplies and exporting production) can have severe economic consequences for the County.

***Relationship to Other Hazards – Cascading Effects***

Depending on the location of the incident, the cascading effects of transportation emergencies are generally limited to those of Hazmat incidents, Fires or Extreme Weather (if the incident occurs in the desert when the temperatures are very high, citizens in vehicles stopped for several hours can suffer from the heat and lack of conveniences). In all cases, health and life may be threatened.





### 5.3.15 Dam Failure

**Severity: 3**

**Probability: 1**

**Risk Score: 0.38**

**OA Jurisdictions Affected by Dam Failure**

- Norco
- Eastvale
- Corona
- Lake Elsinore
- Wildomar
- Murrieta
- Temecula
- Perris
- Menifee
- Riverside
- Jurupa Valley
- Hemet
- Moreno Valley
- San Jacinto
- Various Portions of unincorporated areas in the West County

***Hazard Definition***

The term "dam failure" encompasses a wide variety of circumstances. Potential causes of a dam failure are numerous and can be attributed to deficiencies in the original design of the dam, the quality of construction, the maintenance of the dam and operation of the appurtenances while the dam is in operation, and acts of nature including precipitation in excess of the design, flood, and damage from earthquakes. Water over topping the dam crest is a common cause of failure in earth dams.

Overtopping will cause erosion of the dam crest and eventual dam breach. Piping of earth dams is another common form of failure. Piping is a form of erosion that occurs underground caused by rodent burrowing and the presence of extensive root systems from vegetation growing on and around the dam.

Flooding of the area below the dam may occur as the result of structural failure of the dam, overtopping, or a seiche. The primary danger associated with a dam failure is the swift, unpredictable flooding of those areas immediately downstream of the dam.

There are three general types of dams: earth and rock fill, concrete arch or hydraulic fill, and concrete gravity. Each of these types of dams has different failure characteristics. The earth/rock fill dam will fail gradually due to the erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete arch or hydraulic fill dam will fail almost instantaneously; with a very rapid build-up to a peak and then a gradual decline. A concrete gravity dam will fail somewhere in between instantaneous and gradual, with the corresponding build-up of flood wave.

### *History*

Historically, Riverside County has not experienced any significant dam failure incidents, although there are several major dams in the County of both the earthen and steel reinforced concrete type

### *Risk Assessment*

The County of Riverside is subject to potential flooding from several local dams, reservoirs, streams, rivers, and washes. These include but are not limited to, Lake Elsinore, the Colorado River, and the San Jacinto River. Seasonal flooding with the failure of run-off storage reservoirs, canals, and levees could seriously compound the situation, particularly in or near urban population centers. From the time of complete failure to inundation could be as little as 5-to-10 minutes.

Portions of Riverside County along the Colorado River corridor could suffer from a catastrophic failure of dams that are located far outside the borders of Riverside County. These dams include Palo Verde Diversion Dam, Headgate Rock Dam, Parker Dam, Davis Dam, and Hoover Dam. If there were a catastrophic dam failure, it is estimated that it would take a minimum of 23 hours before the flood waters reach the City of Blythe.

With major disruptions in power and communications systems, a warning may not be received from dam or reservoir sites in time to initiate an organized evacuation or broadcast warnings via emergency radio stations. If a credible prediction is initiated, then preparation for a damaging earthquake could begin and residents and business owners within dam inundation areas could be directed to assembly areas to wait for official word regarding safe re-entry. This method of direction and control could substantially reduce potential loss of life, if enough warning were available.





- **Effects on Agriculture** can be catastrophic, both for crops and for animals. Loss of property is a real risk, as well.

### *Risk Assessment Conclusion.*

Although dam failure incidents have not historically been a problem in Riverside County, the County's location with respect to earthquake fault lines presents the very real danger of dam failure due to quakes. If this were to occur, the effects could be catastrophic. Also, as noted above, seasonal flooding with the failure of run-off storage reservoirs, canals, and levees could seriously compound the risks of dam failure and additional flooding.

### *Relationship to Other Hazards – Cascading Effects*

Dam failure obviously causes downstream flooding. It may also lead to power failures and downed power lines. The secondary effects of dam failure can include the disruption of the local and state economies by damage to buildings and roads, the severance of communications, the disruption of supply and delivery mechanisms, additional welfare, and emergency aid to the recovering economy.

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**Table 38:** Dams within the County of Riverside

Listed Alphabetically By County

| Dam No. | National ID No. | Name | Owner | County | Stream | Year Built | Capacity (Ac-ft) | Res. Area (Acres) | Drainage Area ($mi^2$) | Crest Elev. (ft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1003-003 | CA00798 | Alessandro | Riverside County Flood Control And Water Conservation | Riverside | Alessandro Cr | 1956 | 370 | 17 | 4.63 | 1146 |
| 1003-007 | CA00802 | Boxsprings | Riverside County Flood Control And Water Conservation | Riverside | Box Springs Cr | 1960 | 405 | 29 | 4 | 1139 |
| 35-021 | CA01441 | Cajalco Creek | Metropolitan Water Dist | Riverside | Cajalco Creek | 2001 | 889 | 74.4 | 22.7 | 1512 |
| 87-008 | CA01204 | Declez Retention | San Bernardino County Flood Control District | Riverside | San Sevaine Cr | 1984 | 331 | 21 | 10.7 | 849 |
| 35-018 | CA01410 | Diamond Valley Lake | Metropolitan Water District | Riverside | Domenigoni Valley Cr | 2000 | 800000 | 4860 | 13 | 1769 |
| 35-019 | CA01413 | Diamond Valley Lake Forebay | Metropolitan Water District | Riverside | Domenigoni Val Can | 1999 | 500 | 31 | 0.13 | 1497.5 |
| 1812-000 | CA01302 | Dunn Ranch | Agri-Empire,A Calif Corp | Riverside | Hamilton Cr | 1987 | 90 | 7 | 0.2 | 142.5 |
| 1003.02 | CA10503 | Eagle Canyon Debris Basin | Riverside County Flood Control And Water Conservation | Riverside | Eagle Canyon | 2015 | 222 | 7.1 | - | 405 |
| 822-000 | CA00767 | El Casco | Riverside Land Conservancy | Riverside | San Timoteo Creek | 1879 | 143 | 15 | 0.09 | 116 |
| 81-000 | CA00304 | Fairmount Park | City Of Riverside | Riverside | Santa Ana River | 1923 | 200 | 40 | 22 | 793 |
| 827-000 | CA00769 | Foster | Idyllwild Water District | Riverside | Lily Creek | 1945 | 56 | 6 | 0.85 | 5812 |
| 35-020 | CA01424 | Goodhart Canyon Detention Basin | Metropolitan Water Dist | Riverside | Goodhart Canyon | 1999 | 1026 | 98 | 3.8 | 1627.2 |





| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1003 | CA00787 | Harrison Street | Riverside County Flood Control And Water Conservation | Riverside | Harrison Creek | 1954 | 208 | 14 | 2.03 | 1123.5 |
| 35-016 | CA01349 | Henry J Mills No 2 | Metropolitan Water Dist | Riverside | Offstream | 1996 | 92 | 5 | 0.1 | 1651.2 |
| 35-014 | CA01085 | Henry J Mills Reservoir | Metropolitan Water Dist | Riverside | Offstream | 1979 | 83 | 6 | 0 | 1651 |
| 35-017 | CA01374 | Hj Mills Reclamation | Metropolitan Water District | Riverside | Offstream | 1996 | 98 | 16 | 0.03 | 1593 |
| 1003-014 | CA01212 | Jurupa Basin | Riverside County Flood Control And Water Conservation | Riverside | Jurupa Wash | 1983 | 167 | 17 | 1.69 | 855 |
| 817-000 | CA00763 | Lake Hemet | Lake Hemet Municipal Water District | Riverside | San Jacinto Riv | 1895 | 14000 | 470 | 67 | 4341.5 |
| 1003-016 | CA01392 | Lakeview | Riverside County Flood Control And Water Conservation | Riverside | San Jacinto Riv | 1994 | 530 | 39 | 7.6 | 1621 |
| 818-002 | CA00766 | Lee Lake | Elsinore Valley Mun Wd | Riverside | Temescal Creek | 1919 | 1100 | 70 | 53 | 1153 |
| 1003-009 | CA01103 | Mabey Canyon | Riverside County Flood Control And Water Conservation | Riverside | Mabey Creek | 1974 | 68 | 5 | 1.5 | 1146 |
| 1003-011 | CA01211 | Mary Street | Riverside County Flood Control And Water Conservation | Riverside | Alessandro Wash | 1981 | 320 | 19 | 6.7 | 1009 |
| 35-000 | CA00212 | Mathews | Metropolitan Water District of Southern California | Riverside | Cajalco Creek | 1938 | 182000 | 2750 | 40 | 1404 |
| 1003-015 | CA01197 | Metz Road Debris Basin | Riverside County Flood Control And Water Conservation | Riverside | San Jacinto Riv | 1981 | 88 | 20 | 1 | 1470.5 |
| 81-003 | CA00305 | Mockingbird Canyon | City Of Riverside | Riverside | Mockingbird Can | 1914 | 1250 | 64 | 13.13 | 1015 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1003-010 | CA01179 | Oak Street | Riverside County Flood Control And Water Conservation | Riverside | Oak Street Cr | 1979 | 138 | 36 | 6.02 | 1034 |
| 1-068 | CA00054 | Perris | California Department Of Water Resources | Riverside | Bernasconi Pass | 1973 | 131452 | 2340 | 10 | 1600 |
| 1003-006 | CA00801 | Pigeon Pass | Riverside County Flood Control And Water Conservation | Riverside | Pigeon Pass | 1958 | 900 | 86 | 8.71 | 1702.5 |
| 1003-004 | CA00799 | Prenda | Riverside County Flood Control And Water Conservation | Riverside | Prenda Creek | 1954 | 192 | 15 | 1.93 | 1242 |
| 829-000 | CA00771 | Quail Valley | Forecast Homes | Riverside | San Jacinto Riv | 1959 | 103 | 10 | 1.6 | 1490 |
| 818-000 | CA00765 | Railroad Canyon | Elsinore Valley Mun Wd | Riverside | San Jacinto River | 1928 | 11586 | 525 | 664 | 1410 |
| 35-012 | CA00223 | Robert A Skinner | Metropolitan Water Dist | Riverside | Tucalota Creek | 1973 | 43800 | 860 | 51.5 | 1493 |
| 35-015 | CA01271 | Skinner Clearwell | Metropolitan Water District | Riverside | Offstream | 1991 | 356 | 14 | 0 | 1433 |
| 1811-000 | CA01237 | Sunnymead Ranch | Sunnymead Ranch Comm Assoc | Riverside | Reche Canyon | 1985 | 400 | 35 | 2 | 1770 |
| 1003-005 | CA00800 | Sycamore | Riverside County Flood Control And Water Conservation | Riverside | Sycamore Canyon | 1956 | 860 | 57 | 10.7 | 1013 |
| 1003-013 | CA01170 | Tahchevah | Riverside County Flood Control And Water Conservation | Riverside | Tachevah Creek | 1964 | 650 | 60 | 3.2 | 582 |
| 1003-012 | CA01242 | Tahquitz Creek Debris | Riverside County Flood Control And Water Conservation | Riverside | Tahquitz Creek | 1991 | 75 | 5 | 18 | 562 |
| 2028-000 | CA00770 | Vail | Rancho Calif Water District | Riverside | Temecula Creek | 1949 | 51000 | 1078 | 306 | 1482.6 |
| 1003-008 | CA00803 | Wide Canyon | Riverside County Flood Control And Water Conservation | Riverside | West Wide Canyon | 1968 | 1490 | 57 | 33.5 | 1560 |





| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1003-000 | CA00796 | Woodcrest | Riverside County Flood Control And Water Conservation | Riverside | Woodcrest Creek | 1954 | 420 | 24 | 5.32 | 1122.5 |

The most recent damn built was Eagle Canyon Debris Basin in 2015

Descriptions of the dams, their inundation impact on the County, and a delineation of response efforts are outlined in the 2015 Draft version of the Flood and Dam Inundation Plan, maintained by Riverside County Transportation and Land Management Agency.

**Map 18:** Riverside County Dam Inundation Risks

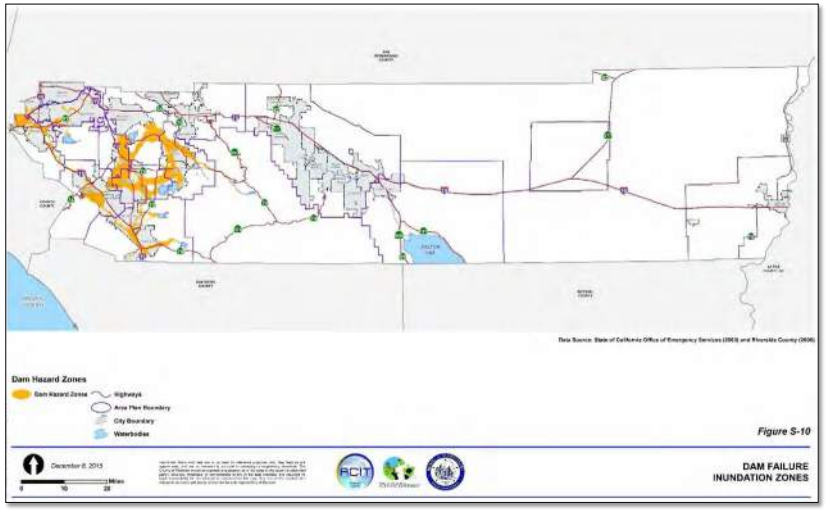






### 5.3.16 Aqueduct

**Severity: 3**

**Probability: 2**

**Risk Score: 0.38**

**OA Jurisdictions Affected by Aqueduct Failure**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

#### *Hazard Definition*

An Aqueducts is an artificial channel to transport water. There are two major Aqueducts that traverse Riverside County:

- California Aqueduct
- Colorado River Aqueduct.

The California Aqueduct is a 444-mile long, artificially river shaped facility that is a crucial component of the State Water Project. The California Department of Water Resources states that the Project includes 34 storage facilities, reservoirs and lakes; 20 pumping plants; 4 pumping-generating plants; 5 hydroelectric power plants; and about 701 miles of open canals and pipelines. It travels from Sacramento into San Bernardino County and finally ends in western Riverside County. The East Branch is the portion of the Aqueduct that transports water for storage into Lake Perris.

The Colorado River Aqueduct stretches 242 miles across Arizona and California. According to the American Society of Civil Engineers, it consists of more than 90 miles of tunnels, nearly 55 miles of cut-and-cover conduit, almost 30 miles of siphons, and five pumping stations. More than a billion gallons of water travel through it a day. It travels from Arizona into San Bernardino County, enters the eastern portion of Riverside County and travels the length of the County until it ends near the City of Riverside. It was built and is currently maintained by the Metropolitan Water District of Southern California.

**Figure 41:** California Aqueducts

Source: 2013 (SHMP)





### *History of Events*

Riverside County has not experienced a large scale Aqueduct incident.

### *Risk Assessment*

An earthquake or landslide could severely damage the two main aqueducts that travel through the county, possibly render them out of service. In this event the water supply to the County would be greatly affected.

Long periods of droughts have been known to damage aqueduct infrastructure. Wells have needed to work harder to pump low levels of water. This has resulted in many irrigation districts to raise the sides of canals to encourage gravitational water flow. However, this tactic can negatively affect bridges.

- **Effects on people and housing.** There is a low impact on housing unless the aqueduct was to flood a residential area. The impact to people can range from minor to disastrous. A failure could greatly impact the County's water supply leaving the County to source water elsewhere until the damages to the aqueduct can be remedied. It can also impact the economy in the event that crops are damaged and farmers lose valuable product.

- **Effects on commercial and industrial structures**. There is a low impact on commercial and industrial structures.

- **Effects on infrastructure.** There is a low impact on infrastructure.

- **Effects on agriculture.** In the event of an aqueduct failure crops could be devastatingly impacted.

### *Risk Assessment Conclusion*

This hazard has a low probability but has the potential to have catastrophic impacts to the county.

### *Relationship to Other Hazards – Cascading Effects*

An Aqueduct failure could lead to water supply contamination or disruption and flooding. It could also increase the effects of a drought.

### 5.3.17 Tornado

**Severity: 2**

**Probability: 1**

**Risk Score: 0.25**

**OA Jurisdictions Affected by Tornados**

- Hemet
- Perris
- Desert Center
- Coachella Valley
- Mecca
- Homeland

#### *Hazard Definition*

*Tornados*

Tornadoes are spawned when there is warm, moist air near the ground, cool air aloft, and winds that speed up and change direction. An obstruction, such as a house, in the path of the wind, causes it to change direction. This change increases pressure on parts of the house, and the combination of increased pressures and fluctuating wind speeds creates stresses that frequently cause structural failures.

In order to measure the intensity and wind strength of a tornado, Dr. T. Theodore Fujita developed the Fujita Tornado Damage Scale. This scale compares the estimated wind velocity with the corresponding amount of suspected damage. The scale measures six classifications of tornadoes with increasing magnitude from an "F0" tornado to an "F6+" tornado.

Tornados, like those that occur every year in the Midwest and Southeast parts of the United States, are a rare phenomenon in most of California, with most tornado-like activity coming from micro-bursts.





The chart below depicts the Fujita Tornado Damage Scale:

**Table 39:** Fujita Tornado Damage Scale

| Scale | Wind Estimate (mph) | Typical Damage |
|---|---|---|
| F0 | < 73 | **Light damage.** Some damage to chimneys and TV antennas; breaks twigs off trees; pushes over shallow-rooted trees. |
| F1 | 73-112 | **Moderate damage.** Peels surface off roofs; windows broken; light trailer houses pushed or overturned; some trees uprooted or snapped; moving automobiles pushed off the road. 74 mph is the beginning of hurricane wind speed. |
| F2 | 113-157 | **Considerable damage.** Roofs torn off frame houses leaving strong upright walls; weak buildings in rural areas demolished; trailer houses destroyed; large trees snapped or uprooted; railroad boxcars pushed over; light object missiles generated; cars blown off highway. |
| F3 | 158-206 | **Severe damage.** Roofs and some walls torn off frame houses; some rural buildings completely demolished; trains overturned; steel-framed hangar-warehouse-type structures torn; cars lifted off the ground; most trees in a forest uprooted snapped, or leveled. |
| F4 | 207-260 | **Devastating damage.** Whole frame houses leveled, leaving piles of debris; steel structures badly damaged; trees debarked by small flying debris; cars and trains thrown some distances or rolled considerable distances; large missiles generated. |
| F5 | 261-318 | **Incredible damage.** Whole frame houses tossed off foundations; steel-reinforced concrete structures badly damaged; automobile-sized missiles generated; trees debarked; incredible phenomena can occur. |
| F6-F12 | 319 to sonic | **Inconceivable damage.** Should a tornado with the maximum wind speed in excess of F5 occur, the extent and types of damage may not be conceived. A number of missiles such as iceboxes, water heaters, storage tanks, automobiles, etc. will create serious secondary damage on structures. |
| Source: http://weather.latimes.com/tornadoFAQ.asp | | |

### *Microbursts*

Unlike tornados, microbursts are strong, damaging winds that strike the ground and often give the impression a tornado has struck. They frequently occur during intense thunderstorms. The origin of a microburst is downward moving air from a thunderstorm's core. But unlike a tornado, they affect only a rather small area.

University of Chicago storm researcher Dr. Ted Fujita first coined the term “downburst” to describe strong, downdraft winds flowing out of a thunderstorm cell that he believed were responsible for the crash of Eastern Airlines Flight 66 in June of 1975.

A downburst is a straight-direction surface wind in excess of 39 mph caused by a small-scale, strong downdraft from the base of convective thundershowers and thunderstorms. In later investigations into the phenomena, he defined two sub-categories of downbursts: the larger macro bursts and small microbursts.

Macro bursts are downbursts with winds up to 117 mph that spread across a path greater than 2.5 miles wide at the surface and which last from 5 to 30 minutes. The microburst, on the other hand, is confined to an even smaller area, less than 2.5 miles in diameter from the initial point of downdraft impact. An intense microburst can result in damaging winds near 270 km/hr (170 mph) and often last for less than five minutes.

“Downbursts of all sizes descend from the upper regions of severe thunderstorms when the air accelerates downward through either exceptionally strong evaporative cooling or by very heavy rain which drags dry air down with it. When the rapidly descending air strikes the ground, it spreads outward in all directions, like a fast-running faucet stream hitting the sink bottom.

When the microburst wind hits an object on the ground such as a house, garage or tree, it can flatten the buildings and strip limbs and branches from the tree. After striking the ground, the powerful outward running gust can wreak further havoc along its path. Damage associated with a microburst is often mistaken for the work of a tornado, particularly directly under the microburst. However, damage patterns away from the impact area are characteristic of straight-line winds rather than the twisted pattern of tornado damage.”

### *History*

The history table demonstrates the high number of tornados and microbursts that have occurred in the County.





**Figure 42:** Historical Tornados Statistics for Riverside

| DATE ↑ | FORCE | DEATH(S) | INJURED | DISTANCE |
|---|---|---|---|---|
| 10/17/2015 | 0 | 0 | 0 | 22 |
| 09/09/2012 | 0 | 0 | 0 | 14 |
| 08/12/2012 | 0 | 0 | 0 | 16 |
| 05/22/2008 | 0 | 0 | 0 | 11 |
| 05/22/2008 | 2 | 0 | 1 | 8 |
| 05/22/2008 | 0 | 0 | 0 | 8 |
| 05/22/2008 | 0 | 0 | 0 | 10 |
| 07/23/2006 | 0 | 0 | 0 | 20 |
| 07/23/2005 | 0 | 0 | 0 | 27 |
| 03/04/2005 | 0 | 0 | 0 | 11 |
| 02/26/2005 | 0 | 0 | 0 | 17 |
| 01/09/2005 | 0 | 0 | 0 | 29 |
| 12/21/2001 | 0 | 0 | 0 | 28 |
| 02/24/2001 | 0 | 0 | 0 | 27 |
| 02/16/2000 | 0 | 0 | 0 | 30 |
| 05/13/1998 | 0 | 0 | 0 | 21 |
| 02/07/1994 | 0 | 0 | 0 | 28 |
| 02/08/1993 | 0 | 0 | 0 | 28 |
| 01/17/1993 | 0 | 0 | 1 | 28 |
| 03/20/1991 | 0 | 0 | 0 | 1 |
| 03/20/1991 | 0 | 0 | 0 | 16 |
| 02/28/1991 | 0 | 0 | 0 | 27 |
| 01/18/1988 | 0 | 0 | 0 | 27 |

Source:http://www.homefacts.com/tornadoes/California/Riverside-County/Riverside.html

**Map 19:** Past Riverside Count Tornadoes

Source: http://www.tornadohistoryproject.com/tornado/California/Riverside/map

### *Risk Assessment*

- **Effects on people and housing.** Tornadoes are very dangerous and can destroy homes and injure or kill Riverside County residents. The county has been fortunate in the past because we have not experienced loss of life and very few injuries caused by tornadoes or airborne debris.

- **Effects on commercial and industrial structures.** Industrial structures could house Hazardous Materials that have to potential to be released if the facility is damaged. Workers could be trapped under debris if the tornado hits during business hours.

- **Effects on infrastructure.** Infrastructures could be damaged by high winds at building failure points such as rook joist or wall stud- bottom plate intersections. Flying debris can also cause damages.

- **Effects on agriculture.** Tornadoes have the power to destroy crops or tools/structures needed by the farmer to tend his crops. It can also lead to the death of livestock.

### *Risk Assessment Conclusion*

Riverside County's "Tornado Alley" spans from the 15 Corridor to desert center and is highly susceptible to microburst and tornados that result is high dollar recovery costs.

### *Relationship to Other Hazards – Cascading Effects*

Tornados can destroy powerlines causing disruption in power to residents and commercial properties. They can damage critical facilities and devastate homes.





### 5.3.18 Insect Infestation

**Severity: 2**

**Probability: 3**

**Risk Score: 0.00**

**OA Jurisdictions Affected by Insect Infestation**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

**(Bark Beetle)**

- Idyllwild Fire Protection District

**(Red Imported Fire Ant Quarantine)**

- Alvord Unified School District
- Cathedral City
- City of Banning
- City of Blythe
- City of Calimesa
- City of Canyon Lake
- City of Coachella
- City of Corona
- City of Desert Hot Springs
- City of Hemet
- City of Indian Wells
- City of Indio -- only portions of the city are within the boundaries of the Red Imported Fire Ant Quarantine area
- City of La Quinta
- City of Lake Elsinore
- City of Moreno Valley – only portions of the city are within the boundaries of the Red Imported Fire Ant Quarantine area
- City of Murrieta
- City of Norco
- City of Palm Desert -- only portions of the city are within the boundaries of the Red Imported Fire Ant Quarantine area
- City of Palm Springs -- only portions of the city are within the boundaries of the Red Imported Fire Ant Quarantine area
- City of Perris
- City of Rancho Mirage -- only portions of the city are within the boundaries of the Red Imported Fire Ant Quarantine area
- City of Riverside
- City of Temecula
- Home Gardens County Water District
- Idyllwild Water District
- Lake Elsinore Unified School District
- Menifee Unified School District
- Moreno Valley Unified School District
- Rancho California Water District
- Riverside Community Hospital
- Riverside County Office of Education, Children, and Family Services
- Riverside County Transportation

and Land Management Agency
- Riverside Unified School District
- San Gorgonio Pass Water Agency
- Valley Sanitation District
- Western Municipal Water District

### *Hazard Definition*

Insect infestation occurs when an undesirable type of insect inhabits an area in a manner that causes serious harm to: cash crops, livestock, or poultry; wild land trees, plants, or animals; or humans. Countless insects live on, in, and around plants, animals, and humans in all environments. Many are harmless, while others can cause fatal damage. Under some conditions, insects that have been present and relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks.

The major forms of insects are:

- **Chewing insects** are defoliating insects. They generally strip plants of green matter such as leaves. Caterpillars and beetles make up the largest proportion of chewing insects. Under normal conditions, trees can usually bounce back from an attack of these defoliators, though repeat infestation will weaken a tree and can eventually kill it by starving it of energy.

- **Boring, or tunneling, insects** cause damage by boring into the stem, roots, or twigs of a tree. Some lay eggs that then hatch and the larvae burrow more deeply into the wood, blocking off the water-conducting tissues of the tree. Boring insects generally feed on the vascular tissues of the tree. If the infestation is serious, the upper leaves are starved of nutrients and moisture, and the tree can die. Signs of borer infestation include entry/exit holes in the bark, small mounds of sawdust at the base, and sections of the crown wilting and dying.

- **Sucking insects** do their damage by sucking out the liquid from leaves and twigs. Many sucking insects are relatively immobile, living on the outside of a plant and forming a hard protective outer coating while they feed on the plant's juices. Quite often they will excrete a sweet, sticky substance known as honeydew which contains unprocessed plant material. Honeydew can cause sooty mold to form on leaves and can become a nuisance. Signs of infestation include scaly formations on branches, dieback of leaves, and honeydew production.





**Table 40:** Example Insect Species

| NAME |
|---|
| AFRICANIZED HONEY BEE |
| BARK BEETLE |
| CITRUS LEAFMINER |
| GLASSY-WINGED SHARPSHOOTER |
| GYPSY MOTH |
| HONEY BEE TRACHEAL MITE |
| JAPANESE BEETLE |
| LESSER SNOW SCALE |
| MAGNOLIA WHITE SCALE |
| MEDITERRANEAN FRUIT FLY |
| ORIENTAL FRUIT FLY |
| RED IMPORTED FIRE ANT |
| STING NEMATODE |
| TROPICAL PALM SCALE |
| VARROA MITE/HONEY BEE |
| ASIAN CITRUS PSYLLID |
| SILVERLEAF WHITEFLY |
| POLYPHAGOUS SHOT-HOLE BORER |
| ASIAN CITRUS PSYLLID |
| GOLDSPOT OAK BORE BEETLE, (GSOB ) |
| PINE BARK BEETLE |
| SHOT HOLE BORER BEETLE |
| KUROSHIO SHOT HOLE BORERS |

In conjunction with the above outlined problems, insects can carry and spread or vector disease to plants, animals, and people.

### *Definition of Vector Control*

Vector Control Programs are responsible for providing services that reduce the risk of illness caused by any organism transporting a pathogen. Some examples of these organisms and some of the pathogens they can carry are:

- Mosquito - West Nile Virus, St. Louis Encephalitis, Western Equine Encephalitis
- Rodent Fleas - Plague

- Western Black Legged Tick - Lyme Disease
- Rodents - Hantavirus

Riverside County actually has three vector control agencies. There are two Vector Control Districts and the County Vector Control Program operating through the Department of Environmental Health. The Coachella Valley Mosquito and Vector Control District manages these services for a portion of the desert community around the Coachella Valley. The Northwest Mosquito and Vector Control District provides services in the northwest portion of the county. The County Vector Control program covers the unincorporated areas of the County and other areas such as contracted cities that may fall outside of the two other vector district boundaries.

### *History*

**Presently** - Parts of Riverside County (Moreno Valley, Indio, Rancho Mirage, Palm Desert, Bermuda Dunes, and Palm Springs) are under quarantine by state and federal officials to stop the spread of Red Imported Fire Ants. The quarantine limits the movement of plants and soil and requires commercial nursery growers to take steps to ensure their products are free of Red Imported Fire Ants. It is believed that the infestations in Southern California may stem from the shipment of infested nursery stock from the southeastern states.

**2012** - Polyphagous Shot-Hole Borer, an insect pest that attacks over 200 types of agricultural and landscape trees, became widespread in Southern California. By 2015, this insect pest was established in Western Riverside County. This insect pest is detrimental to the avocado industry and landscape ornamental trees in California.

**2009** - A portion of Riverside County (Coachella Valley) was placed under quarantine for Asian Citrus Psyllid (ACP). In 2011, the quarantine area was expanded to include Western Riverside County. The quarantine limits the movement of nursery stock and citrus from the quarantine area. Growers must take steps to ensure their products are free from ACP prior to movement.

**2003** -Governor Gray Davis proclaimed a State of Emergency in Riverside, San Bernardino, and San Diego Counties where hundreds of thousands of trees were dead and dying after being weakened by drought and attacked by an infestation of bark beetles. Trees on more than 150,000 acres died and an estimated 75,000 residents were threatened by catastrophic wildfire, injury, and property damage from falling trees.

**1999-2000**, an insect-spread disease (Pierce's Disease spread by Glassy-winged Sharpshooter) caused over $16 million damage to wine grapes in the west County area. Riverside County is under quarantine by state officials to stop the spread of





Glassy-winged Sharpshooter and Pierce's Disease. The quarantine limits the movement of nursery stock, bulk grapes, bulk citrus and requires inspection and certification of these commodities by the local Agricultural Commissioner prior to movement from the infested area.

**1991-1994** - Africanized Honey Bees entered California near Blythe. Since 1994, they have spread to all counties in Southern California (Imperial, San Diego, Orange, Los Angeles, Riverside, San Bernardino, Ventura and Kern). In 1993-94 and 1990, Med-fly infestations damaged fruit Countywide. In 1991, a whitefly infestation damaged melons, squash, and cucumbers Countywide.

### *Risk Assessment*

Riverside County has a demonstrated vulnerability to insect infestation. The climate makes it possible for insects to reproduce with little natural hindrance to their proliferation.

Programs for monitoring Encephalitis in Riverside County have been in effect for more than two decades in a cooperative effort with the California Department of Public Health (CDPH), the University of California, the Mosquito and Vector Control Association of California, and the Riverside County Public Health Department. Since its introduction to Southern California in 2003, West Nile Virus surveillance has been a primary focus. This type of surveillance is driven by live mosquito trapping and processing for virus detection. The dead bird surveillance program is also headed up by CDPH where the public can report dead birds via their website (www.westnile.ca.gov) or a telephone hotline (1-877-WNV-BIRD). If CDPH staff determines that a dead bird is deemed acceptable for testing, Vector Control offices are notified for collection and testing. Another aspect of this program consists of sentinel chicken flocks being placed in areas where high populations of Culex tarsalis, the western encephalitis mosquito, are known to exist and where such areas infringe on local communities. Blood samples are sent to the CDPH Viral & Rickettsial Disease Laboratory where they are analyzed for the antibodies to the viruses. All of these disease indicators allow programs to focus their vector control efforts. Since 2006, at least seventy three cases of West Nile virus human infections have been reported within Riverside County with ten fatalities. Horses have also been infected and succumbed to this disease.

In Riverside County, Plague is associated with animal disease outbreaks in populations of California Ground Squirrels. The vector is the Squirrel Flea. In 1979 during a disease outbreak among California ground squirrels in Silent Valley, located south of the City of Banning, a boy contracted Plague. It was properly diagnosed and he recovered. This incident provided impetus to start the Plague Surveillance Program and eventually establish the County's Vector Control Program. Over the course of the past several

decades surveillance activities have isolated Plague endemic areas in the San Jacinto Mountain range.

- **Effects on people and housing.** In the case of the Bark Beetle, the fire hazard it creates can cause the loss of homes and life as demonstrated in the fall fires of 2003. In the case of certain mosquitoes, West Nile Virus has infected humans and horses.

- **Effects on agriculture, and commercial and industrial structures.** If a given insect is particularly hazardous to forests, crops, or property, it can cost the County millions of dollars in lost revenue and eradication and replacement.

#### *Risk Assessment Conclusion.*

Insect infestation is an ongoing threat to agriculture and public health in Riverside County. The effects on people and property can be disastrous and costly.

The County and independent vector control special districts have aggressive programs utilizing:

- Disease surveillance such as certified personnel, insect/rodent traps, lab testing capacities, and Sentinel chicken flocks.
- Vector control equipment and approved pesticides.
- Public outreach.

#### *Relationship to Other Hazards – Cascading Effects*

The Bark Beetle infestation is a classic example of cascading effects. The insect killed hundreds of thousands of trees, increasing the wildfire hazard, which resulted in the unfortunate devastation of the fall fires of 2003.





### 5.3.19 Jail/Prison Event

**Severity: 2**

**Probability: 1**

**Risk Score: -0.13**
**OA Jurisdictions Affected by Jail or Prison Events**

- Blythe
- Riverside
- Norco
- Banning
- Indio
- Murrieta

#### *Hazard Definition*

There are numerous State of California Correctional Institutions and County correctional facilities in Riverside County. Law enforcement is tasked with maintaining order in the facilities and preventing inmates from escaping into the community.

Chuckawalla Valley State Prison in Blythe provides long-term housing and services for male felons classified as medium and low-medium custody inmates.

Ironwood State Prison in Blythe provides services for minimum and medium custody inmates through academic education, vocational instruction, and support services. The prison also has the Institutional Hearing Program (IHP) which prepares inmates who are illegal immigrants for release to United States Immigration and Naturalization Service custody and the return to their native country.

The California Rehabilitation Center (CRC) in Norco is a medium Level II correctional facility and that only accommodates male inmates since April 2007. The CRC inmate population consists of felon commitments as well as Civil Addicts.

The California Institution for Woman (CIW) in Chino accommodates all custody levels of female inmates and functions as a reception/processing center for incoming female inmates. In addition to its large general population, CIW houses inmates with special

needs such as pregnancy, psychiatric care, methadone, and medical problems such as HIV infection.

The California Institution for Men in Chino consists of four separate facilities under the administration of one warden. Located three miles south of the city of Chino, the facilities provide housing for minimum through medium custody inmates. The reception centers receive and process newly committed male felons from several southern California counties. The California Youth Authority operates a facility in Chino. While all of these facilities are in the County of San Bernardino, their close proximity to Riverside County and the City of Corona necessitate their inclusion here as facilities of concern to Riverside County.

In addition, there are five correctional facilities within the County, namely:

1. Robert Pressley Detention Center
2. Blythe Jail
3. Indio Jail
4. Southwest County Jail (Murrieta)
5. Larry D. Smith Correctional Facility

### *History*

Historically, the threat to society has been low. Law enforcement has demonstrated an overall capability to maintain the incarcerated population in a manner that does not pose an immediate threat to the general population.

### *Risk Assessment*

It is important that law enforcement remains in a state of readiness for any incidents that could precipitate a threatening situation.

The passing of Assembly Bill 109 (2011) has shifted state prison populations back into the county jail populations as a way to stop state prison overcrowding. The effects of this change are just now being seen. Time will tell what the overall impact to Riverside County and its citizens will actually be.

Riots within the facilities generally do not pose a direct threat to the public on the outside. Occasionally an inmate has escaped correctional facilities. The danger involved in their escape is predicated on the escapee's criminal characteristics.





Riverside County Regional Medical Center provides medical care to both state and local inmates in an area designated as a prison ward, which could have a severe impact on health care delivery at the facility during and immediately after a prison ward incident. The degree of disruption would, of course, depend on the extent of the incident.

- **Effects on people and housing.** Relatively speaking, the risks are minimal. However, violent offenders escaping custody in a disaster could lead to residents in the surrounding areas being at risk of harm.
- **Effects on commercial and industrial structures**. The risks are minimal.
- **Effects on infrastructure.** The risks are minimal.
- **Effects on agriculture.** The risks are minimal.

### *Risk Assessment Conclusion.*

Relatively speaking, the risks of jail and prison incidents will remain a minimal threat to the County. It is important that law enforcement remains in a state of readiness for any incidents that could precipitate a threatening situation.

### *Relationship to Other Hazards – Cascading Effects*

In the event that Interstate 10 becomes damaged, it could affect evaluation routes and essential supplies from getting into the prison or jail.

Risks are minimal but have the potential to decrease responder availability during disasters if a facility is damaged. Another possible drain on resources would be in the event of inmate relocation due to damaged facilities or the potential damage to a facility.

### 5.3.20 Pipeline Disruption

**Severity: 3**

**Probability: 2**

**Risk Score: -0.38**

**OA Jurisdictions Affected by Pipeline Incidents**

- Desert Water Agency
- Western Municipal Water District
- City of Banning
- City of Beaumont
- City of Corona
- City of Palm Springs
- City of Temecula
- Riverside Community College District
- San Gorgonio Memorial Hospital

***Hazard Definition***

There are many pipeline distribution systems that transit Riverside County, including systems for water, natural gas, and petroleum products.

*Identifying Natural Gas Pipeline Hazards (SHMP)*

The United States is heavily dependent on transmission pipelines to distribute energy and fuel sources. Virtually all natural gas, which accounts for about 28 percent of the energy consumed annually, is transported by transmission pipelines. Energy demand in the United States continues to increase. Although California is a leader in exploring and implementing alternative energy sources such as the wind and solar, the expansion of traditional energy sources, such as natural gas, continues. Increased urbanization is resulting in more people living and working close to existing gas transmission pipelines that were placed prior to government agencies adopting and implementing land use and other pipeline safety regulations.





Compounding the potential risk is the age and gradual deteriorating of the gas transmission system due to natural causes. Significant failure, including pipe breaks and explosions, can result in loss of life, injury, property damage, and environmental impacts. Causes of and contributors to pipeline failures include construction errors, material defects, internal and external corrosion, operational errors, control system malfunctions, outside force damage, subsidence, and seismicity. Growth in population, urbanization, and land development near transmission pipelines, together with the addition of new facilities to meet new demands, may increase the likelihood of pipeline damage due to human activity and the exposure of people and property to pipeline failures.

**Figure 43:** California Gas Lines

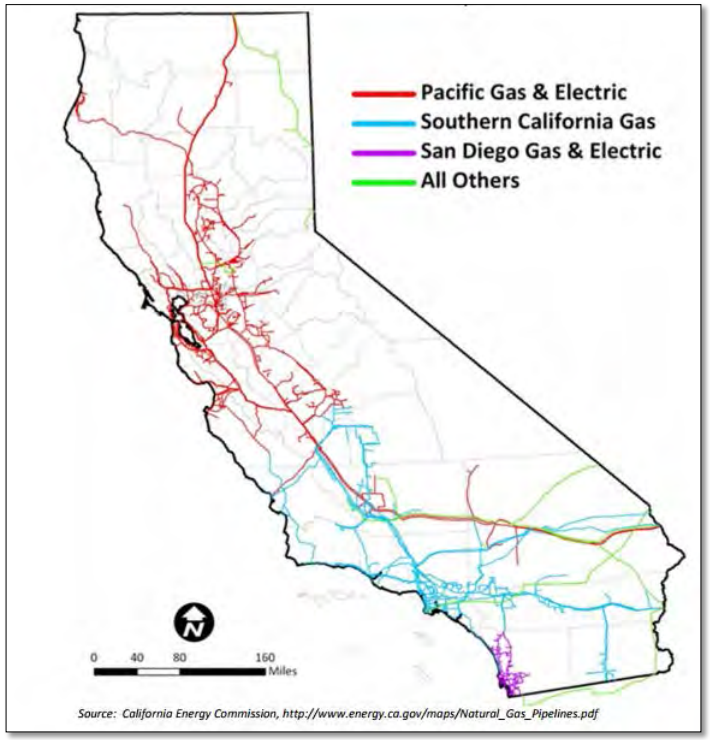

Major water conveyance systems consist of the Colorado River Aqueduct operated by Metropolitan Water District (MWD) of Southern California, the California Aqueduct operated by the State Department of Water Resources (DWR), and water distribution lines operated by MWD.

A major pipeline carrying natural gas parallels Interstate 10 and Highway 60 throughout the County. This pipeline brings gas from the southwestern states into Southern California.

Petroleum products are stored and distributed at many major areas throughout the County. Of particular interest are the aviation fuel tanks and pipelines located at March Air Reserve Base. Although under the control of the U.S. Government, their potential for impact on the surrounding area is of interest to the County.

### *History*

Fortunately, Riverside County has not experienced a large scale pipeline disruption. However, there are multiple small incidents on a yearly basis that are handled by the respective resource provider.

### *Risk Assessment*

A rupture of the main line with a major release could have serious effects in terms of flooding and property damage. A gas line rupture could explode causing serious property damage and loss of life.

- **Effects on people and housing.** The consequences to people and housing from pipeline disruption can range from flooding to explosion, both could be quite severe.
- **Effects on commercial and industrial structures.** Similarly, the effects on commercial and industrial structures from flooding or explosion could be severe.
- **Effects on agriculture.** In the same way, the effects on agriculture from flooding or explosion could be severe.

### *Risk Assessment Conclusion.*

Pipelines are vulnerable to especially with the possibility of an earthquake, causing significant breakage. The degree of damage county-wide for a given rupture would be minimal, even though there might be significant injuries, loss of life and property in the





immediate area of the incident, depending on what kind of pipe ruptures and where the rupture occurs.

### *Relationship to Other Hazards – Cascading Effects*

Pipeline incidents may lead to flooding, fires and air, water and land contamination. Incidents with natural gas or petroleum product pipelines may lead to explosion and fire.

### 5.3.21 Landslide

**Severity: 3**

**Probability: 3**

**Risk Score: -0.58**

**OA Jurisdictions Affected by Landslide Incidents**

- Most mountain areas within the County

***Hazard Definition***

Like its earthquake-generating faults, California's mountainous terrain is also a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. More than one-third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone.

A landslide is the breaking away and gravity-driven downward movement of hill slope materials, which can travel at speeds ranging from fractions of an inch per year to tens of miles per hour depending on the slope steepness and water content of the rock/soil mass.

Landslides range from the size of an automobile to a mile or more in length and width and, due to their sheer weight and speed, can cause serious damage and loss of life. Their secondary effects can be far reaching; for example, catastrophic flooding can result from the sudden release of river water impounded by landslide debris or slope failure of an earthen dam.

Although the area affected by a single landslide is less than that of earthquakes, landslides are pervasive in California's mountainous terrain and occur far more often, resulting in cumulative losses approaching $200 million in a given year. Average annual landslide losses in California are estimated at about $100 million. Because landslides occur as isolated events in both time and location, and there is presently no systematic means in place for documenting their losses, landslide hazard is often underestimated or goes unrecognized in the policy arena, even though landslides continue to cause millions of dollars in cumulative damage to California's homes, businesses, and infrastructure.

A landslide is a geologic hazard where the force of gravity combines with other factors to cause earth material to move or slide down an incline. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Slopes with the greatest potential for sliding





are between 34 degrees and 37 degrees. Although steep slopes are commonly present where landslides occur, it is not necessary for the slopes to be long.

Landslides, rock falls, and debris flows occur continuously on all slopes; some processes act very slowly, while others occur very suddenly, often with disastrous results. As human populations expand over more of the land surface, these processes become an increasing concern.

The most common types of landslides are (U.S. Department of the Interior, U.S. Geological Survey, Fact Sheet 2004-3072, July 2004):

**Slides** - Although many types of mass movements are included in the general term "landslide," the more restrictive use of the term refers only to mass movements, where there is a distinct zone of weakness that separates the slide material from the more stable underlying material.

**Falls** - Abrupt movements of masses of geologic materials, such as rocks and boulders that become detached from steep slopes or cliffs.

**Topples** - Toppling failures are distinguished by the forward rotation of a unit or units about some pivotal point, below or low in the unit, under the actions of gravity and forces exerted by adjacent units or by fluids in cracks.

**Flows** – There are five basic categories of flows that differ from one another in fundamental ways.

a. Debris flows: A debris flow is a form of rapid mass movement in which a combination of loose soil, rock, organic matter, air, and water mobilize as a slurry that flows downslope.
b. Debris avalanche: This is a variety of very rapid to extremely rapid debris flow.
c. Earthflow: The slope material liquefies and runs out, forming a bowl or depression at the head. The flow itself is elongate and usually occurs in fine-grained materials or clay-bearing rocks on moderate slopes and under saturated conditions. However, dry flows of granular material are also possible.
d. Mudflow: A mudflow is an earthflow consisting of material that is wet enough to flow rapidly and that contains at least 50 percent sand-, silt-, and clay-sized particles. In some instances, for example in many newspaper reports, mudflows and debris flows are commonly referred to as "mudslides."
e. Creep: Creep is the imperceptibly slow, steady, downward movement of slope-forming soil or rock.

**Lateral Spreads** - Lateral spreads are distinctive because they usually occur on very gentle slopes or flat terrain. The dominant mode of movement is lateral extension accompanied by shear or tensile fractures. The failure is caused by liquefaction, the process whereby saturated, loose, cohesionless sediments (usually sands and silts) are transformed from a solid into a liquefied state.

The geologic setting of southern California locally is conducive to slope failures and slope-failure deposits (landslides) that can be a hazard to human life and property. These hazards are created when geologic materials are displaced down a topographic slope under the influence of gravity. Factors that determine slope-failure occurrence include:

1. Slope angle
2. Geologic materials (substrate)
3. Climatic conditions
4. Earthquake shaking
5. Debris Flows

Sudden "mudslides" gushing down rain-sodden slopes and gullies are widely recognized by geologists as a hazard to human life and property. Most "mudslides" are localized in small gullies, threatening only those buildings and roadways in their direct path. They can burst out of the soil on almost any rain-saturated hill when rainfall is heavy enough. Often they occur without warning in localities where they have never been seen before.

There are predictable relationships between local geology and landslides, rockfalls and debris flows. Knowledge of these relationships can improve planning and reduce vulnerability. Slope stability is dependent on many factors and their interrelationships, including rock type, pore water pressure, slope steepness, and natural or man-made undercutting.

Riverside County has a history of landslides during seasons of high precipitation.

### *History*

**January, 2016** – Landslides near Banning resulted from a low 4.3 magnitude earthquake.

**December, 2014** – Mud Flow in Gilman Springs, San Jacinto.

**2002** – Landslide on Highway 60 in San Timoteo Badlands





### *Risk Assessment*

There is a continuing risk of landslides during seasons of high precipitation. In addition, earthquakes could also cause significant landslides. The County has a great deal of hilly and mountainous terrain increasing the likelihood of a landslide incident.

- **Effects on people and structures**. Landslides constitute a threat to property, road safety, and life. Small landslides would not pose a serious risk. However, there is a possibility that a severe landslide in a populated area could cause significant damage and risk to life.
- **Effects on infrastructure**. Landslides can cause disruptions in power supply pipelines, power and telephone poles, and County roads and highways.
- **Effect on Critical Facilities**. An initial review of known landslide locations and the location of critical facilities indicates that there does not appear to be any of these facilities in close proximity to a Landslide Management Zone.
- **Effects on agriculture**. Similar to the threats to people and structures, small landslides would not pose a serious risk. However, there is the possibility that a severe landslide could cause significant damage and risk of life to elements of the agricultural industry.

### *Risk Assessment Conclusion*

Landslides are a continuing risk in Riverside County, especially during seasons of high precipitation. History has shown also that many landslides occur in areas where landslides have not been predicted.

### *Relationship to Other Hazards – Cascading Effects*

As noted, landslides can be the result of an earthquake or severe weather. The starting mechanism for a landslide will determine some of the cascading events. The end result is if a landslide occurs in a populated area, or area used by people, earth materials can cover or impede the area as described above. If a landslide were to impact power lines or other utility systems a cascading effect could be power, utility or sewer loss.

**Map 20:** Riverside County Surface Materials

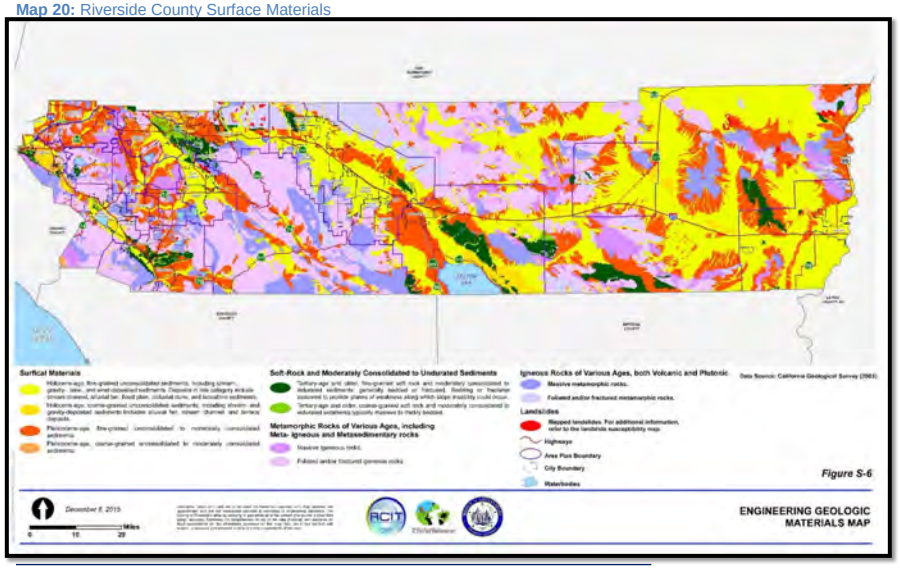






**Map 21:** Riverside County Slope Instability Map

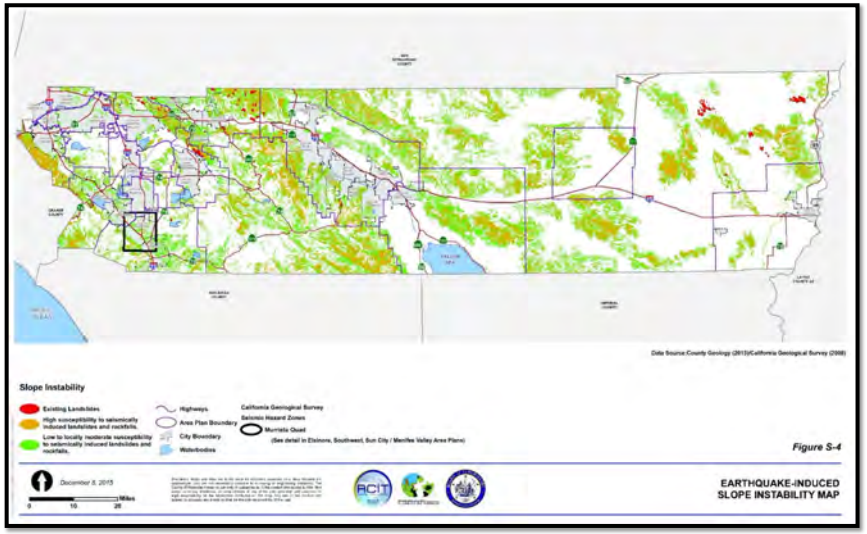

### 5.3.22 Hazardous Materials Incident

**Severity: 3**

**Probability: 4**

**Risk Score: -0.75**

**OA Jurisdictions Affected by Hazardous Materials Incidents**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

#### *Hazard Definition*

Hazardous materials (Hazmat), consist of substances that by their nature, lack of containment, and reactivity, have the capability for inflicting harm. Hazmat poses a threat to health and the environment when improperly managed. Hazmat can be toxic, corrosive, flammable, explosive, reactive, an irritant, or a strong sensitizer. Hazmat substances also include certain infectious agents, radiological materials, oxidizers, oil, used oil, petroleum products, and industrial solid waste substances.

Hazardous materials can pose a threat where they are manufactured, stored, transported or used. They are used in almost every manufacturing operation and by retailers, service industries, and homeowners.

Hazardous material incidents are one of the most common threats to public health and the environment. Incidents may occur as the result of natural disasters, human error, terrorism, and/or accident.

Hazmat incidents typically take five forms:

1. Fixed facility incidents
   - Laws require those facilities to notify state and local authorities about what is being used or produced there and incidents with the materials can be planned for.
2. Transportation incidents
   - Transportation incidents are more difficult to prepare for because it is impossible to know what material(s) could be involved until an accident actually happens.





3. Pipeline incidents
   - Pipelines carry natural gas and petroleum. Breakages in pipelines carry differing amounts of danger, depending on where and how the break occurs, and what is in the pipe.
4. Terrorism incidents (or suspected Terrorism)
   - Intentional acts involving violence and/ or the threat of violence. Similar to transportation incidents, these occurrences are more difficult to prepare for due to unknown locations and substances.
5. Illegal Disposal / Abandonment
   - Similar to transportation incidents, these occurrences are more difficult to prepare for due to unknown locations and substances.

#### *History*

Many forms of hazardous materials are present in both the rural and urban areas of Riverside County. They are present in permanent storage locations, roadway and railway transport mediums, long-distance pipelines, and at various industrial and agricultural application sites. The County's location, with its rail and highway transportation routes, and various industries, has a growing potential for serious hazardous materials incidents. Interstates 10, 15 and 215, and State Highways 60 and 91 are all heavily traveled by trucks. Those trucks carry a wide variety of hazardous materials including gasoline, corrosives, oxidizers, pesticides, and radioactive materials.

The railroad lines traveling throughout the County also carry some extremely hazardous cargoes. Fortunately, the railroads have a good safety record with regard to the transportation of hazardous materials.

Traffic on railroads is not as prevalent as on truck routes in Riverside County, but poses a much greater problem when an accident is involved due to the volumes of hazardous materials on board.

There is a great deal of air traffic along the airways above Riverside County with the March Air Reserve Base Palm Springs International Airport, French Valley Airport, Hemet-Ryan Airport, Riverside Municipal Airport, Jacqueline Cochran Regional Airport and Bermuda Dunes Airport all operating within the County. The potential for a hazardous materials incident exists, especially with respect to military operations.

There are many pipeline distribution systems that traverse the County. These are discussed in Section 5.3.20.

**Table 41:** History of Hazmat Incidents in 2016

| Riverside County Department of Environmental Health Hazmat Incidents July 1, 2015 to June 30, 2016 | |
|---|---|
| HAZARDOUS MATERIALS INCIDENT TYPE | TOTAL NUMBER |
| General Emergency Response (do not fit other categories) | 28 |
| Drug Labs | 23 |
| Drug Dumps | 3 |
| Facility Incidents | 122 |
| Roadway Incidents | 119 |
| Aircraft Incidents | 3 |
| Railroad Incidents | 7 |
| Mercury Incidents | 5 |
| Dielectric Fluid Incidents | 40 |
| Radiological Incidents | 0 |
| Pesticide Incidents | 2 |
| Medical Waste Incidents | 9 |
| Noxious Odor Incidents | 39 |
| Illegal Disposal of Substances | 207 |
| Transportation/Manifesting Violations | 0 |
| Suspected Terrorism | 4 |
| **TOTAL Hazardous Materials Incidents:** | **611** |

The Riverside County Department of Environmental Health Hazardous Materials Emergency Response Program handled over 611 incidents in fiscal year (FY15/16) often in conjunction with Cal Fire countywide except for a few cities that handled Haz Mat incidents within their jurisdiction. The incidents cover all areas described in the definition section.

In 2016 The Riverside County Fire department responded to 613 Hazardous Materials Incidents.

The administering agencies within Riverside County are responsible for the control of fixed hazardous materials facilities, including the Participating Agencies of Riverside Fire Department and Corona Fire Department.





### *Risk Assessment*

The amount of hazardous materials transported over rail and roadways on a daily basis is unknown, but estimated to be steadily increasing as our economy grows. There is the potential for a hazardous materials incident almost anywhere on the numerous highways and roads that crisscross Riverside County. The greatest concern focuses on the 10, 15, 60, 91, and 215 freeways. The most vulnerable areas along these routes are considered to be the on/off ramps and interchanges.

A major concern with the trucking industry is the safe operation of their trucks. With the deregulation of the trucking industry, spot checks of trucks in many states, including California, have shown that a large percentage of trucks currently in service are not in safe enough condition to be operated on public highways.

Many industries are moving into the County. Many facilities exist today, with more construction forecast. To support these industries, the County is likely to realize a large increase in the transportation of toxic, flammable, and corrosive materials into and out of the County. With the increased use of hazardous materials, there is an increased need for safe hazardous waste management and disposal. There will be the increased transportation of hazardous materials waste to proper disposal sites located outside of Riverside County.

Illegal dumping and clandestine drug labs are also a hazardous materials problem. Although not exclusive to Riverside County, the County is a target for these activities due to its accessibility in the outlying areas and the open living conditions in the mountain and desert areas.

No Class I landfills are operated in Riverside County. Seven Class III landfills are active in Riverside County. All accept only non-hazardous solid wastes and are located in unincorporated areas. Six of these landfills are operated by the Riverside County Waste Resources Department, while one (El Sobrante) is privately owned and operated. The El Sobrante, Badlands, Lamb Canyon, and Blythe landfills currently accept waste from outside of Riverside County. Blythe however, only takes small loads or may refuse to accept waste because it is a relatively small facility.

Hazardous waste generators include food and beverage processors as well as battery, semi- conductor, and metal container manufacturers, as well as automobile repair facilities, munition manufacturers, utility districts, and other industries. Although hazardous waste generators are scattered throughout Riverside County, most of the large generators of hazardous waste are located in the western portion of the County, including in the cities of Corona, Jurupa Valley, Riverside, and Temecula.

Nearly all of Riverside County residents have some type of hazardous materials in their homes. Examples include motor oil, paints, cleaners, aerosols, and pesticides. Household hazardous materials pose serious health issues for people who improperly use or dispose of these materials. Adverse environmental impacts can occur when household hazardous materials are disposed of in unlined sanitary landfills, where these materials may leach through the soil and contaminate groundwater.

Medical facilities, including clinics, hospitals, professional offices, blood and plasma centers, and medical research facilities generate a wide variety of hazardous substances. These substances may include contaminated medical equipment or supplies, infectious biological matter, prescription medicines, and radioactive materials used in medical procedures. The disposal of medical waste is achieved by on-site autoclaving of red-bagged waste (any medical waste that could possibly transmit a pathogen) and subsequently transported to a Class III landfill, or to a permitted incinerator. The Riverside County Department of Environmental Health has regulatory control over the disposal of medical and biological waste.

- **Effects on people and housing.** Historical events in Riverside County have necessitated evacuations when a Hazmat incident occurs. Relative to some of the other natural hazards assessed earlier in this LHMP, the numbers of people affected by Hazmat incidents are usually less.

- **Effects on commercial and industrial structures.** There may be economic consequences due to Hazmat incidents, but the damage is generally limited to clean-up of facilities and grounds, or simply an interruption of business due to evacuation.

- **Effects on infrastructure.** Hazmat incidents involving transportation may result in downed power lines. Also, Hazmat materials may impact waterways and drainage systems, and incidents can lead to the evacuation of schools, business districts, and residential areas.

- **Effects on agriculture.** As noted previously, there is a long history of agricultural production in Riverside County. Agricultural activities typically include the storage and periodic application of pesticides, herbicides, and fertilizers, as well as the storage and use of toxic fuels and solvents. The infiltration of these substances may leach into local groundwater supplies, presenting an elevated risk of groundwater contamination.





### *Risk Assessment Conclusion*

Although Hazmat incidents can have serious property damage and even loss of life, Hazmat accidents do not generally affect extremely large areas. Hazmat incidents present a real danger and are highly unpredictable in terms of determining when or where they will occur, but generally do not pose a serious threat to the ability of Riverside County to respond. Reasonable preparation by law enforcement, fire department, and medical community enables the County to deal with the majority of likely events. Many emergency workers prepare for Hazmat events as part of their ongoing training. Agencies and facilities are also routinely equipped to deal with most events that might occur.

### *Relationship to Other Hazards – Cascading Effects*

Besides the immediate effect of a hazardous materials incident at the scene of the emergency, there are ancillary effects as well. For instance, there may be impacts on waterways and drainage systems, and the evacuation of schools, business districts, and residential areas.

### 5.3.23 Water Supply Disruption/Contamination

**Severity: 2**

**Probability: 3**

**Risk Score: -1.50**

**OA Jurisdictions Affected by Hazardous Materials Incidents**

- All incorporated cities of Riverside County
- Unincorporated areas of Riverside County

#### *Hazard Definition*

People exposed to water supply disruption or toxic pollutants caused by contaminations may be threatened by a number of health risks:

- Dehydration, hepatitis, and cancer
- Eating contaminated food products, such as fish from contaminated waters; meat, milk, or eggs from animals that fed on contaminated plants; and fruits and vegetables grown in contaminated soil
- Drinking water contaminated by toxic pollutants
- Ingesting contaminated soil. Young children are especially vulnerable because they often ingest soil from their hands or from objects they place in their mouths
- Touching (making skin contact with) contaminated soil, dust, or water (for example, during recreational use of contaminated water bodies)

#### *Risk Assessment*

According to the Environmental Protection Agency, there are four major types of drinking water contamination; physical, chemical, biological, and radiological.

**Physical** contaminants primarily impact the physical appearance or other physical properties of water. Examples of physical contaminants are sediment or organic material suspended in the water of lakes, rivers and streams from soil erosion.

**Chemical** contaminants are elements or compounds. These contaminants may be naturally occurring or man-made. Examples of chemical contaminants include nitrogen,





bleach, salts, pesticides, metals, toxins produced by bacteria, and human or animal drugs.

**Biological** contaminants are organisms in water. They are also referred to as microbes or microbiological contaminants. Examples of biological or microbial contaminants include bacteria, viruses, protozoan, and parasites.

**Radiological** contaminants are chemical elements with an unbalanced number of protons and neutrons resulting in unstable atoms that can emit ionizing radiation. Examples of radiological contaminants include cesium, plutonium and uranium.

Source: https://www.epa.gov/ccl/types-drinking-water-contaminants

Ground water contamination is also a major threat because of its use for drinking water and irrigation. Potential groundwater contaminants include; storage tanks, septic systems, hazardous waste, landfills, chemicals and road salts, and littering.

Source: waterboards.maps.arcgis.com

Map illustrated water systems in Riverside County. Blue stars represent in compliance water systems, red stars are systems out of compliance as of July 2017.

- **Effects on people and housing.** The effect on housing is relatively low, but the effect on people may be devastating. Though the County encourages residents to store at least 72 hours of water for their household, the reality is only a small percentage actual partake in that practice. This means that in the event of disruption or contamination that renders usable water sources limited, people may become dehydrated and suffer from other serious health issues such as cancer. In the event that contamination happens during the summer months when temperatures reach 90-105, the population is at an even higher risk.

- **Effects on commercial and industrial structures.** The effect to structures is relatively low.
- **Effects on infrastructure.** The effect to structures is relatively low.
- **Effects on agriculture.** Water contamination could devastate agriculture in Riverside County. The contaminant could be poisonous to crops and livestock. Depending on the level of exposure, entire field could be damaged to the point of total loss.

### *History*

**March 2, 2017** – 198 residents were exposed to water contaminated with uranium in the unincorporated area of Pinyon Pines.

### *Risk Assessment Conclusion*

Due to high levels of monitoring and preparedness within water agencies, the threat of water contamination is fairly low. However, it could greatly impact the county if it is caused by a cascading event such as an earthquake.

### *Relationship to Other Hazards – Cascading Effects*

The loss of water could drastically affect other man-made and natural hazards. In the event of an earthquake and pipelines are damaged, it could greatly reduce the amount of water available to fight fires. The amount of water available to residents would also be drastically reduced.





# Section 6.0 – Community Rating System

The County of Riverside and all cities within the County participate in the National Flood Insurance Program (NFIP). Riverside County Ordinance NO. 458 Regulating Special Flood Hazard Areas and Implementing the National Flood Insurance Program was last updated on August 14, 2014.

Riverside County also participates in the Community Rating System (CRS). The rating system is a voluntary NFIP program that aims to reduce flood damages to insurable property, strengthen and support the insurance aspects of the NFIP, and encourage a comprehensive approach to floodplain management. In addition to the county, four cities participate in CRS: Lake Elsinore, Moreno Valley, Murrieta, and Palm Springs.

The most active in the Community Rating System within the County is Palm Springs. Their high scores in the system allow the city to offer the highest discount off of flood insurance (20% for SFHA and 10% for Non-SFHA).

| Community Number | Community Name | CRS Entry Date | Current Effective Date | Current Class | % Discount for SFHA | % Discount for Non-SFHA | Status |
|---|---|---|---|---|---|---|---|
| 060245 | Riverside County* | 10/01/10 | 05/01/16 | 7 | 15 | 5 | C |
| 060636 | Lake Elsinore | 10/01/09 | 05/01/14 | 8 | 10 | 5 | C |
| 065074 | Moreno Valley | 10/01/91 | 10/01/96 | 8 | 10 | 5 | C |
| 060751 | Murrieta | 10/01/97 | 10/01/97 | 9 | 5 | 5 | C |
| 060257 | Palm Springs | 10/01/92 | 05/01/11 | 6 | 20 | 10 | C |

Note: SFHA, Special Flood Hazard Areas

## 6.1 Repetitive Loss Properties

Areas which have flooded in the past are highly likely to experience recurring flooding. The repetitive nature of flood damage is cause for concern. FEMA, in coordination with the state, identifies California's top Repetitive Loss (RL) Communities. Riverside County is not a top Repetitive Loss community. Riverside County unincorporated areas only have eleven identified repetitive loss properties. That is an increase of four properties since the 2012 plan. Two of the eleven repetitive loss properties have been mitigated and the Riverside County Flood Control District is investigating ways to mitigate the remaining five properties so as to avoid future flooding incidents. Options being considered are both structural and non-structural mitigation measures.

**Table 42:** Riverside County Repetitive Loss Properties

| City | Mitigated? | Insured? | Date of Loss | Date of Loss | Total Paid |
|---|---|---|---|---|---|
| LAKE ELSINORE | YES | NO | 02/14/1980 | 01/05/1979 | $91,618.83 |
| LAKE ELSINORE | NO | NO | 12/04/1982 | 03/15/1980 | $21,052.64 |
| LAKE ELSINORE | NO | NO | 04/15/1983 | 08/11/1980 | $ 6,436.09 |
| HEMET | YES | NO | 03/02/1983 | 09/06/1981 | $ 2,684.06 |
| RIPLEY | NO | NO | 09/23/1983 | 07/23/1983 | $ 6,602.15 |
| CORONA | NO | NO | 01/04/1995 | 12/04/1987 | $ 70,282.69 |
| THOUSAND PALMS | NO | NO | 12/22/2010 | 10/17/2005 | $ 26,331.18 |
| THOUSAND PALMS | NO | YES | 09/08/2014 | 02/25/2005 | $ 44,272.25 |
| THOUSAND PALMS | NO | YES | 09/08/2014 | 12/22/2010 | $ 29,896.05 |





| | | | | | |
|---|---|---|---|---|---|
| THOUSAND PALMS | NO | YES | 09/08/2014 | 12/22/2010 | $ 33,345.35 |
| THOUSAND PALMS | NO | YES | 09/08/2014 | 01/22/2010 | $ 119,638.09 |

## 6.2 National Flood Insurance Program

Public Law 90-448 of 1968, known as the National Flood Insurance Act, established the National Flood Insurance Program (NFIP) which provides for federal government underwriting of flood insurance policies sold by private companies. Supported by a national mapping system showing boundaries for 100- and 500-year floodplains, the NFIP encourages local governments to direct development away from floodplain areas or mitigate flood risks through local floodplain management regulations. Through the Community Rating Service (CRS), the NFIP provides for financial incentives in the form of lower insurance rates for local communities encouraging mitigation of flood hazards in a manner parallel to rate incentives related to private fire insurance and enforced by the mortgage industry. The National Flood Insurance Act was modified in 1994 to provide for flood hazard mitigation planning and project grants.

The unincorporated community of Riverside County joined the NFIP on April 15, 1980. Currently, unincorporated Riverside County is one of 30 local communities that participate in the NFIP. Please refer to the table on the following page for participating jurisdictions.





**Table 43:** Jurisdictions and authorities participating with National Flood Insurance Program

| CID | COMMUNITY NAME | INIT FHBM | INIT FIRM IDENTIFIED | CURR EFF MAP DATE | REG-EMER DATE | IDENTIFIED TRIBAL |
|---|---|---|---|---|---|---|
| 060763C | AGUA CALIENTE BAND OF CAHUILLA INDIANS TRIBE | 06/21/74 | 03/02/83 | 04/19/17 | 06/21/96 | Yes |
| 060246# | BANNING | 03/15/74 | 10/17/78 | 08/28/08 | 10/17/78 | No |
| 060247# | BEAUMONT | 04/05/74 | 10/17/78 | 08/18/14 | 10/17/78 | No |
| 060248# | BLYTHE | 05/10/74 | 06/30/76 | (NSFHA) | 06/30/76 | No |
| 060740# | CALIMESA | - | 08/28/08 | 08/28/08 | 05/01/91 | No |
| 060753C | CANYON LAKE | - | 11/20/96 | 04/19/17 | 09/15/98 | No |
| 060704# | CATHEDRAL CITY | - | 05/01/85 | 08/28/08 | 11/12/82 | No |
| 060249# | COACHELLA | 05/17/74 | 09/30/80 | (NSFHA) | 09/30/80 | No |
| 060250# | CORONA | 05/24/74 | 05/15/78 | 08/28/08 | 05/15/78 | No |
| 060251# | DESERT HOT SPRINGS | 05/24/74 | 04/02/79 | 08/28/08 | 04/02/79 | No |
| 060155# | EASTVALE | - | 08/28/08 | 08/28/08 | 06/05/13 | No |
| 060253C | HEMET | 05/24/74 | 09/29/78 | 04/19/17 | 09/29/78 | No |
| 060254C | INDIAN WELLS | 06/28/74 | 09/14/79 | 04/19/17 | 09/14/79 | No |
| 060255# | INDIO | 05/31/74 | 09/14/79 | 08/28/08 | 09/14/79 | No |
| 060286# | JURUPA VALLEY | - | 08/18/14 | 08/18/14 | 09/23/13 | No |

| | | | | | | |
|---|---|---|---|---|---|---|
| 060709C | LA QUINTA | - | 06/19/85 | 04/19/17 | 07/01/85 | No |
| 060636C | LAKE ELSINORE | 06/28/74 | 09/17/80 | 04/19/17 | 09/17/80 | No |
| 060176C | MENIFEE | - | 08/28/08 | 04/19/17 | 05/03/12 | No |
| 065074# | MORENO VALLEY | - | 06/18/87 | 08/18/14 | 06/18/87 | No |
| 060751# | MURRIETA | - | 04/15/80 | 08/28/08 | 06/09/93 | No |
| 060256# | NORCO | 05/17/74 | 02/15/79 | 08/28/08 | 02/15/79 | No |
| 060629C | PALM DESERT | 06/14/77 | 04/15/80 | 04/19/17 | 04/15/80 | No |
| 060257C | PALM SPRINGS | 06/21/74 | 03/02/83 | 04/19/17 | 03/02/83 | No |
| 060258# | PERRIS | 09/06/74 | 04/16/79 | 08/18/14 | 04/16/79 | No |
| 060259C | RANCHO MIRAGE | - | 09/14/79 | 04/19/17 | 09/14/79 | No |
| 060245C | RIVERSIDE COUNTY * | - | 04/15/80 | 04/19/17 | 04/15/80 | No |
| 060260# | RIVERSIDE | 07/19/74 | 01/06/83 | 08/28/08 | 01/06/83 | No |
| 065056C | SAN JACINTO | - | 09/28/73 | 04/19/17 | 09/28/73 | No |
| 060742# | TEMECULA | - | 09/02/93 | 08/28/08 | 08/28/91 | No |
| 060221# | WILDOMAR | - | 08/28/08 | 08/28/08 | 01/20/11 | No |





# Section 7.0 – Capabilities Assessment

## 7.1 Regulatory Mitigation Table

**Table 44:** Regulatory Tools

| Regulatory Tool | Yes/No | Comments |
|---|---|---|
| General Plan | Yes | General Plan December 15, 2015 |
| Zoning Ordinance | Yes | Adopted updates to General Plan on December 15, 2015, Ordinance No. 348: Providing For Land Use Planning And Zoning Regulations and Related Functions of the County of Riverside effective 1/05/17 |
| Subdivision Ordinance | Yes | Adopted updates to General Plan on December 15, 2015, Riverside County Ordinance No. 460: Subdivision Regulations, Riverside County Code of Ordinances, Title 16 |
| Site Plan Review Requirements | Yes | Adopted updates to General Plan on December 15, 2015, Building and Safety Department submission requirements |
| Growth Management Ordinance | Yes | Adopted updates to General Plan on December 15, 2015, |
| Floodplain Ordinance | Yes | Adopted updates to General Plan on December 15, 2015, Riverside County Ordinance No. 458: Regulating Flood Hazards and Implementing the National Flood Insurance Program, last amended 8/28/08 |
| Other special purpose ordinance (storm water, water conservation, wildfire) | Yes | Adopted updates to General Plan on December 15, 2015, Riverside County Ordinance No. 754: Establishing Stormwater/Urban Runoff Management and Discharge Controls, Ordinance No. 859: The Water Efficient Landscaping Requirements, Ordinance No, 787: Adopting the 2016 California Fire Code as Amended 1/1/17. |
| Building Code | Yes | Riverside County Ordinance 457: Building Codes and Fees, California Building Code, 2016 |

| | | |
|---|---|---|
| Fire Department ISO rating | Yes | Rating: 4 (Under reevaluation, expected update in October 2017) |
| Erosion or sediment control program | | Adopted updates to General Plan on December 15, 2015 |
| Storm Water Management Program | Yes | Riverside County Ordinance No. 754: Establishing Stormwater/Urban Runoff Management and Discharge Controls, Riverside County Flood Control Storm Water Protection Program |
| Capital Improvements Plan | Yes | CIP Budget and proposals updated in November 2015 |
| Economic Development Plan | Yes | Riverside County Economic Development Strategic Action Plan – 2013-2016, Riverside County Economic Development Strategy (CEDS) 2015/2016 Annual Update |
| Local Emergency Operations Plan | Yes | Riverside County Emergency Operations Plan updated in February 2006 |
| Flood Insurance Study or other engineering study for streams | Yes | County of Riverside Environmental Impact Report No. 521, Section 4.11 March 2014, Riverside County Unincorporated Areas Flood Insurance Study, 2008 |
| Master Drainage Plan | Yes | Last Report, Lakeland Village in March 2015 |





## 7.2 Administrative/Technical Mitigation Table

**Table 45:** Administrative/Technical Mitigation Tools

| Department/Position | Yes/No | Personnel/Resources |
|---|---|---|
| Agricultural Commissioner's Office | Yes | Agricultural Biologist, EOC Responders |
| Assessor's Office | Yes | Parcels information, Loss Estimates, Planners |
| Environmental Health | Yes | Program Chief, Hazmat and Environmental Specialist, EOC Responder's |
| Public Health | Yes | Nurses, Program Managers, EOC Responder's, Behavioral Health programs that provide resources and information for community members and mentally ill individuals. |
| Emergency Management Department | Yes | Division Chiefs, Program Coordinators, Emergency Services Coordinators, Administrative Services Personnel |
| Emergency Medical | Yes | EMS Specialist, Agency Chief, EOC Responder's |
| Animal Services | Yes | Chief Operations, Executive Management, Animal Control Officers, Administrative Personnel, EOC Responder's, Riverside Emergency Animal Rescue System (R.E.A.R.S.) |
| Riverside County Fire | Yes | Firefighters I/II, Engineers, Captains, Battalion Chiefs, Division Chiefs, Deputy Chiefs, County Fire Chief, Prevention Specialists, Forester's , Emergency Services Coordinators, Emergency Services program Supervisor, Deputy Director, Incident Management Teams, Administrative Services Personnel |

| | | |
|---|---|---|
| Flood Control | Yes | Flood Control Specialist and Managers, Engineers, GIS Specialists, EOC Responder's |
| Sheriff's Office | Yes | Sherriff's Emergency Response Team (SERT) members, EOC Responder's |
| Roads | Yes | Engineers, EOC Responder's, Highway Operations Superintendent |
| Building and Safety Planning Dept. | Yes | Planners, Principle Building Inspectors, Engineers, EOC Responder's |
| Geographic Information System | Yes | GIS Specialist, CIS Supervisors, GIS Analysts, EOC Responder's |
| Information Technology | Yes | Chief Information Officer, IT Officers, EOC Responder's, Communication, Field assets, IT Support |
| Air Quality Management District | Yes | Air Monitoring |
| Waste Management | Yes | Operations Supervisor, Hazardous Waste Supervisor, Specialist, Engineers |
| Disaster Corps | Yes | Trained Volunteers, Deployment Capabilities both in the Operational Area and Statewide. |
| Radio Amateur Civil Emergency Services (R.A.C.E.S.) | Yes | Radio Operators, EOC Responders |





## 7.3 Fiscal Mitigation Capabilities

**Table 46:** Fiscal Mitigation Capabilities

| Financial Resources | Accessible/Eligible to Use (Yes/No) | Comments |
|---|---|---|
| Community Development Block Grants | Yes | Must meet eligibility requirements |
| Capital improvements project funding | Yes | Funds set aside for fiscal year 11/12 per Board of Supervisor's district |
| Authority to levy taxes for specific purposes | Yes | With voter approval |
| Impact fees for new development | Yes | Planning, Fire, Building & Safety |
| Incur debt through general obligation bonds | Yes | With voter approval |
| Incur debt through special tax bonds | Yes | With voter approval |
| Pre-Hazard Mitigation Grants | Yes | |
| Post-Mitigation Grants | Yes | |

## 7.4 Funding Opportunities

**The Hazard Mitigation Grant Program (HMGP)** is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended (the Stafford Act), Title 42, United States Code (U.S.C.) 5170c. The key purpose of HMGP is to take critical mitigation measures to reduce the risk of loss of life and property from future disasters during the reconstruction process following a disaster. HMGP is available, when authorized under a Presidential major disaster declaration, in the areas requested by the California Governor. The amount of HMGP funding available to the Applicant is based upon the total Federal assistance to be provided by FEMA for disaster recovery under the Presidential major disaster declaration.

**The Flood Mitigation Assistance (FMA)** program is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

**The Pre-Disaster Mitigation (PDM)** program is authorized by Section 203 of the Stafford Act, 42 U.S.C. 5133. The PDM program is designed to assist States, Territories, Tribal governments, and local communities in implementing a sustained pre-disaster hazard mitigation program to reduce the overall risk to the population and structures from future hazard events, while also reducing Federal disaster response expense.





**Table 47:** Grant Funding Opportunities for Mitigation

| Grant Name | Agency | Purpose | Contact |
|---|---|---|---|
| **Pre-Disaster Mitigation Program**<br><br>**(PDM)** | U.S. Department of Homeland Security, Federal Emergency Management Agency | To provide funding for States, and communities for cost-effective hazard mitigation activities which complement a comprehensive hazard mitigation program to reduce injuries, loss of life, property damage, and reconstruction of property. | FEMA<br>500 C. Street, SW<br>Washington, DC 20472<br>Phone: (202) 646-4621<br>www.fema.gov |
| **Hazard Mitigation Grant Program** | U.S. Department of Homeland Security, Federal Emergency Management Agency | To prevent future losses of lives property due to disasters; to implement State of local hazard mitigation plans; to enable mitigation measures to be implemented during immediate recovery from a disaster; and to provide funding for previously identified mitigation measures to benefit the disaster area. | FEMA<br>500 C Street S.W.<br>Washington, DC 20472<br>Phone (202) 646-4621<br>www.fema.gov |
| **Flood Mitigation Assistance (FMA)** | U.S. Department of Homeland Security, Federal Emergency Management Agency | To help States and communities plan and carry out activities designed to reduce the risk of flood damage to structures insurable under the NFIP. | FEMA<br>500 C Street S.W.<br>Washington, DC 20472<br>Phone (202) 646-4621<br>www.fema.gov |

| | | | |
|---|---|---|---|
| **Emergency Management Performance Grants (EMPG)** | U. S. Department of Homeland Security; Federal Emergency Management Agency | To encourage the development of comprehensive emergency management at the State and local level and to improve emergency management planning, preparedness, mitigation, response and recovery capabilities. | FEMA<br>500 C Street S.W.<br>Washington, DC 20472<br>Phone (202) 646-4621<br>www.fema.gov |
| **Community Development Grant Program (CDBG)** | U.S. Department of Housing and Urban Development | To develop viable urban communities by providing decent housing and a suitable living environment. Principally for low-to-moderate income individuals. | HUD<br>451 7th Street, S. W.<br>Washington, DC 20410-7000<br>Phone: (202) 708-3587<br>www.hud.gov |
| **Public Assistance Program (PA)** | U.S. Department of Homeland Security, Federal Emergency Management Agency | To provide supplemental assistance to States, local governments, and certain private nonprofit organizations to alleviate suffering and hardship resulting from major disasters or emergencies declared by the President. Under Section 406, Public Assistance funds may be used to mitigate the impact of future disasters. | FEMA<br>500 C Street S.W.<br>Washington, DC 20472<br>Phone (202) 646-4621<br>www.fema.gov |





| | | | |
|---|---|---|---|
| **Emergency Watershed Protection** | U.S. Department of Agriculture, Natural Resource Conservation Service | To provide emergency technical and financial assistance to install or repair structures that reduce runoff and prevent soil erosion to safeguard life and property. | NRCS<br>PO BOX 2890<br>Washington, DC 20013<br>Phone: (202) 720-3527<br>www.nrcs.usda.gov |
| **Land and Water Conservation Fund Grants** | U. S. Department of the Interior, National Park Service | To acquire and develop outdoor recreation areas and facilities for the general public, to meet current and future needs. | NPS<br>PO Box 37217<br>Washington, DC 20013-7127<br>Phone: (202) 565-1200<br>www.nps.gov |
| **Disaster Mitigation and Technical Assistance Grants** | U.S. Department of Commerce, Economic Development Administration | To help States and localities to develop and /or implement a variety of disaster mitigation strategies. | EDA<br>Herbert C. Hoover Building<br>Washington, DC 20230<br>Phone: (800) 345-1222<br>www.eda.gov |
| **Watershed Surveys and Planning** | U.S. Department of Agriculture, Natural Resource Conservation Service | To provide planning assistance to Federal, State, and local agencies for the development of coordination water and related land resources programs in watersheds and river basins | NRCS<br>PO Box 2890<br>Washington, DC 20013<br>Phone: (202) 720-3527<br>www.nrcs.usda.gov |

| | | | |
|---|---|---|---|
| **National Earthquake Hazards Reduction Program (NEHRP)** | U.S. Department of Homeland Security, Federal Emergency Management Agency | To mitigate earthquake losses that can occur in many parts of the nation providing earth science data and assessments essential for warning of imminent damaging earthquakes, land-use planning, engineering design, and emergency preparedness decisions. | FEMA<br>500 C Street S.W.<br>Washington, DC 20472<br>Phone (202) 646-4621<br>www.fema.gov |
| **Assistance to Firefighters Grant** | U. S. Department of Homeland Security, Federal Emergency Management Agency | Competitively awarded project grants to provide direct assistance, on a competitive basis, to fire departments for the purpose of protecting the health and safety of the public and firefighting personnel against fire and fire-related hazards | FEMA<br>500 C Street S.W.<br>Washington, DC 20472<br>Phone (202) 646-4621<br>www.fema.gov |
| **Fire Management Assistance Grants** | U. S. Department of Homeland Security, Federal Emergency Management Agency | To provide project grants and the provision of specialized services for the mitigation, management, and control of fires that would constitute a major disaster. | FEMA<br>500 C Street S.W.<br>Washington, DC 20472<br>Phone (202) 646-4621<br>www.fema.gov |





| | | | |
|---|---|---|---|
| **Engineering for Natural Hazards** | National Science Foundation | Supports fundamental research that advances knowledge for understanding and mitigating the impact of natural hazards on constructed civil infrastructure | National Science Foundation<br>Phone: (703) 292-7024<br>https://www.nsf.gov |

## 7.5 Mitigation Outreach and Partnerships

In addition to the capabilities and funding sources listed in sections 7.1 – 7.4, Riverside County provides training, exercises, workshops and volunteer management to non-profit organizations, faith-based organizations, businesses, and other local municipalities and programs to better accomplish mitigation.

Various communities as well as County of Riverside Emergency Management Department provides Community Emergency Response Team (CERT) training to the public and county employees. Following a major disaster, first responders who provide fire and medical assistance will not be able to immediately meet all of the demands for their services. The Community Emergency Response Team (CERT) Program provides for community and employee self-sufficiency in order to meet the general public's urgent life-saving and sustenance needs until emergency personnel arrive. The Community Emergency Response Team (CERT) Program educates people about disaster preparedness and trains them in basic response skills, such as fire safety, light search and rescue, and disaster medial operations. CERT members assist their fellow citizens/coworkers in their community or workplace following a disaster. CERT members take an active role in their community by preparing for a disaster, thus reducing their own impact risk.

There are currently Twenty (22) jurisdictions supporting CERT Programs within the County: Riverside County EMD, Beaumont, Corona, Indio, La Quinta, Lake Elsinore, Cathedral City, Moreno Valley, Murrieta, Palm Springs, Perris, Riverside, Temecula, San Jacinto, Menifee, Wildomar, Canyon Lake, Rancho Mirage, Desert Hot Springs, Palm Desert, Blythe and the town of Idyllwild.

In addition to the volunteer program, EMD coordinates the Radio Amateur Civil Emergency Service (RACES), a group of licensed radio amateurs who operate during declared emergencies. Once activated by local, county or State jurisdictions, RACES may assist any agency to provide emergency communications support as requested by the County of Riverside. RACES members trains volunteers how to operate amateur radios to mitigate communication failures. RACES members conduct radio tests to ensure critical facilities, including hospitals, maintain redundant communications in case of a failure. The County manages the Medical Reserve Corps (MRC) which coordinates the skills of practicing and retired physicians, nurses and other health professionals as well as other citizens interested in health issues. MRC focuses on these specific personnel who are eager to volunteer in order to address their community's ongoing public health needs and to help their community during large-scale emergency situations. MRC volunteers may also serve a vital role by assisting their communities with ongoing public





health needs through public awareness of disease outbreaks, immunizations, screenings, health and nutrition education and volunteering in community health centers and local hospitals.

EMD joins forces with the Riverside University Health System – Public Health (RUHS-PH) by providing a flu clinic for community members to receive their flu shot free of charge. This clinic provides a means for the County to mitigate pandemic flu as a hazard by vaccinating more people, reducing the impact or risk of a pandemic flu outbreak.

EMD coordinates with RUHS-PH, the Riverside Emergency Medical Services Agency (REMSA), hospitals, local health care facilities, and other disciplines to develop the annual Statewide Medical Health Exercise (SWMHE). Each year the state selects a scenario focusing on testing objectives designed to improve understanding of response procedures, building collaborative relationships, and identify areas of improvement. The SWMHE plays a critical role in the on-going support to Public Health and Medical preparedness and mitigation efforts by local, regional, and State agencies. Participation in the exercise allows hospitals, ambulance providers, law enforcement, and fire to test and validate policies, plans, procedures, training, equipment, and agreements. In addition, it helps clarify and train personnel in roles and responsibilities, improve interagency coordination, identify gaps in resources and response plans, strengthen relationships among all participating agencies, meet various requirements from regulatory and accreditation agencies.

EMD provides a Healthcare Operations Decontamination (HCO-D) course to train hospital staff and county first responders to improve their abilities, mitigating hazmat incidents. This course allows healthcare workers to improve their response capabilities, reducing the impact of the hazmat incident on patients, community members and their facilities.

Workshops and trainings on plan developing are offered by EMD staff to assist jurisdictions create plans that can address mitigation actions for affecting hazards. For example, Point of Dispensing (POD) trainings and workshops are provided to cities and other disciplines in Riverside County to allow them to be prepared and diminish the effect of a disease outbreak. With the help of EMD, the jurisdictions can create an approved plan that will list some of the actions they have or would like to have in place to prevent their community members from being affected by emergent diseases.

EMD administers the Hospital Preparedness Program (HPP) grant. The grant provides funds to purchase emergency equipment, ensuring hospitals, clinics, and long-term facilities throughout the county are equipped with the proper supplies to help prevent and

mitigate the effects of disasters. The grant also funds training for healthcare workers to increase their skills and abilities in mitigating hazards.

Citizen Corps Councils have additionally been established in the Temecula, Lake Elsinore, Wildomar and Jurupa Valley. These provide a cadre of credentialed volunteers for the jurisdiction to utilize during a disaster response.

Riverside County has an established General Plan that was updated and adopted in December 2015. According to the County's Transportation & Land Management Agency (TLMA), the plan is designed to ensure that the County retains its core identity by guiding future growth. This growth should respect the diversity of the region and configure development in relation to the land it occupies and ensures that its various parts relate. It is the County's over-arching policy to document for land use matters. It also determines housing needs, need for roads, and locations for commercial and industrial use will be better suited throughout the County for the next 20 years and beyond. The overall implementation process of the LHMP can be supported by the General Plan through the incorporation of mitigation actions, goals, or polices.

The Zoning Ordinance for Riverside County administers the County's General Plan. TLMA states that while the General Plan identifies land use designations in the long-term, the Zoning Ordinance identifies specific and immediate uses for land. The General Plan's successful implementation can only occur if the County of Riverside Zoning Ordinance is updated and consistent with the plan as state law mandates General Plan-Zoning consistency and is able to implement the long-term intent of the Plan. Implementation of mitigation actions that include improving structures can be accomplished by adopting them into this Ordinance.

The Subdivision Ordinance for Riverside County is mandated by State law to conduct a local approval of land subdivision via the Subdivision Map Act. TLMA implies that local review of proposed subdivisions and parcel maps includes assessment of consistency with, and implementation of, the County's General Plan. This ordinance can have the ability to support the implementation of mitigation objectives and policies stated in the LHMP.





# Section 8.0 – Goals and Strategies

## 8.1 Goals and Objectives

**Goal 1: Reduce Loss of Life and Injuries**

Objective 1.1: Provide timely notification and direction to the public in preparation for imminent and potential hazards.

Objective 1.2: Protect public health and safety through mitigation, preparing for, responding to, and recovering from the effects of natural, technological or man-made disasters.

Objective 1.3: Reduce hazard impacts and protect life, property and the environment from damages.

Objective 1.4: Improve understanding of the type, location and effects of hazards and vulnerabilities, as well as measures needed to protect life.

**Goal 2: Reduce Hazard Related Property Losses**

Objective 2.1: Encourage new development to occur in locations that avoid or minimize exposure to hazards. Continue to utilize County Ordinance 458, in concerns to NFIP and flood hazard areas and County Ordinance 460, in concerns to land use.

Objective 2.2: Reduce hazard related property losses by enforcing strong building codes.

Objective 2.3: Reduce repetitive losses for fire, flood, and earthquakes by encouraging protective measures and by anticipating future events.

Objective 2.4: Reduce hazard impacts to critical facilities, utilities and services through the implementation of low cost mitigation strategies.

Objective 2.5: Continue to strengthen land use regulations in high hazard areas.

**Goal 3: Protect the Environment**

Objective 3.1: Mitigate the impact of recurring drought conditions that impact both ground water supply and the agricultural industry.

Objective 3.2: Reduce hazards that adversely impact habitats, especially in regions with endangered species.

**Goal 4: Maintain Coordination of Disaster Planning and Integrated Public Policy**

Objective 4.1: Incorporate changes within Cal OES and FEMA that may affect public policy and planning.

Objective 4.2: Incorporate mitigation related activities into other disaster planning mechanisms, such as the Riverside County General Plan and Capital Improvement Plan.

**Goal 5: Improve Community and Agency Awareness**

Objective 5.1: Increase public threat awareness in concerns to the nature and extent of hazards they may be exposed to and where they can occur.

Objective 5.2: Improve mitigation and hazard related outreach to businesses, county departments, and stakeholders to increase their understanding of the threats within the county and actions they can take to reduce those hazard impacts.

## 8.2 Prioritizing Strategies

For the 2017 LHMP, the County assessed each strategy based on the goals and objectives in the LHMP and the General Plan. The process used by the County to prioritize goals and their respective objectives consisted of an evaluation of the hazards and their threat from the 2012 LHMP reviewing any events that occurred 2012 to 2017, and evaluating these against potential impacts. The participating Cities and Special Districts have identified their mitigation strategies in their stand-alone Annexes that are specific to their area of authority or jurisdiction.

## 8.3 Future and Current Mitigation Strategies

The Riverside County General Plan, adopted in December 2015, includes the following policies and recommendations for new construction and proposals in Safety Element 4:





*Earthquake Hazards:*

S 1.1 Mitigate hazard impacts through adoption and strict enforcement of current building codes, which will be amended as necessary when local deficiencies are identified.

S 1.2 Enforce state laws aimed at identification, inventory, and retrofit of existing vulnerable structures.

S 2.1 Minimize fault rupture hazards through enforcement of Alquist-Priolo Earthquake Fault Zoning Act provisions and the following policies: (AI 80, 91)

a. Require geologic studies or analyses for critical structures, lifeline, high-occupancy, schools, and high-risk structures within 0.5 miles of all Quaternary historic faults shown on the Earthquake Fault Studies Zones map.
b. Require geologic trenching studies within all designated Earthquake Fault Studies Zones, unless adequate evidence, as determined and accepted by the Riverside County Engineering Geologist, is presented. The County of Riverside may require geologic trenching of non-zoned faults for especially critical or vulnerable structures or lifelines.
c. Require that lifelines be designed to resist, without failure, their crossing of a fault, should fault rupture occur.
d. Support efforts by the California Department of Conservation, California Geological Survey to develop geologic and engineering solutions in areas of ground deformation due to faulting and seismic activity, in those areas where a through-going fault cannot be reliably located.

S 2.2 Require geological and geotechnical investigations in areas with potential for earthquake-induced liquefaction, landsliding or settlement, for any building proposed for human occupancy and any structure whose damage would cause harm, except for accessory buildings.

S 2.5 Require that engineered slopes be designed to resist seismically- induced failure. For lower-risk projects, slope design could be based on pseudo-static stability analyses using soil engineering parameters that are established on a site-specific basis. For higher-risk projects, the stability analyses should factor in the intensity of expected ground shaking, using a Newmark-type deformation analysis.

S 2.6 Require that cut and fill transition lots be over-excavated to mitigate the potential of seismically-induced differential settlement.

S 2.7 Require a 100% maximum variation of fill depths beneath structures to mitigate the potential of seismically-induced differential settlement.

*Flood Hazards:*

S 4.1 For new construction and proposals for substantial improvements to residential and nonresidential development within 100-year floodplains as mapped by FEMA or as determined by site specific hydrologic studies for areas not mapped by FEMA, Riverside County shall apply a minimum level of acceptable risk; and disapprove projects that cannot mitigate the hazard to the satisfaction of the Building Official or other responsible agency.

S 4.2 The County shall enforce provisions of the Building Code in conjunction with the following guidelines: (AI 25)

a. All residential, commercial and industrial structures shall be flood-proofed from the mapped 100-year storm flow. This may require that the finished floor elevation be constructed at such a height as to meet this requirement. Non-residential (commercial or industrial) structures may be allowed with a "flood-proofed" finished floor below the Base Flood Elevation (i.e., 100-year flood surface) to the extent permitted by state, federal and local regulations. New critical facilities shall be constructed above grade to the satisfaction of the Building Official, based on federal, state, or other reliable hydrologic studies. To the extent that residential, commercial, or industrial structures cannot meet these standards, they shall not be approved.
b. Critical facilities shall not be permitted in floodplains unless the project design ensures that there are two routes for emergency egress and regress, and minimizes the potential for debris or flooding to block emergency routes, either through the construction of dikes, bridges, or large-diameter storm drains under roads used for primary access.
c. Development using, storing, or otherwise involved with substantial quantities of onsite hazardous materials shall not be permitted within a 100-year floodplain or dam inundation zone, unless all standards for evaluation, anchoring, and flood-proofing have been satisfied; and hazardous materials are stored in watertight containers, not capable of floating, to the extent required by state and federal laws and regulations.
d. Specific flood-proofing measures may require: use of paints, membranes, or mortar to reduce water seepage through walls; installation of water tight doors, bulkheads, and shutters; installation of flood water pumps in structures; and proper modification and protection of all electrical equipment, circuits, and





appliances so that the risk of electrocution or fire is eliminated. However, fully enclosed areas that are below finished floors shall require openings to equalize the forces on both sides of the walls.

S 4.3 Prohibit construction of permanent structures for human housing or employment to the extent necessary to convey floodwaters without property damage or risk to public safety. Agricultural, recreational, or other low intensity uses are allowable if flood control and groundwater recharge functions are maintained.

S 4.4 Prohibit alteration of floodways and channelization unless alternative methods of flood control are not technically feasible or unless alternative methods are utilized to the maximum extent practicable. The intent is to balance the need for protection with prudent land use solutions, recreation needs, and habitat requirements, and as applicable to provide incentives for natural watercourse preservation, including density transfer programs as may be adopted. (AI 25, 60) a. Prohibit the construction, location, or substantial improvement of structures in areas designated as floodways, except upon approval of a plan which provides that the proposed development will not result in any significant increase in flood levels during the occurrence of a 100-year flood discharge. b. Prohibit the filling or grading of land for nonagricultural purposes and for non-authorized flood control purposes in areas designated as floodways, except upon approval of a plan which provides that the proposed development will not result in any significant increase in flood levels during the occurrence of a 100-year flood discharge.

S 4.5 Prohibit substantial modification to watercourses, unless modification does not increase erosion or adjacent sedimentation, or increase water velocities, so as to be detrimental to adjacent property, nor adversely affect adjacent wetlands or riparian habitat.

S 4.6 Direct flood control improvement measures toward the protection of existing and planned development.

S 4.7 Any substantial modification to a watercourse shall be done in the least environmentally damaging manner practicable in order to maintain adequate wildlife corridors and linkages and maximize groundwater recharge.

S 4.8 Allow development within the floodway fringe, if the proposed structures can be adequately flood-proofed and will not contribute to property damage or risks to public safety.

S 4.9 Within the floodway fringe of a floodplain as mapped by FEMA or as determined by site specific hydrologic studies for areas not mapped by FEMA, require development to be capable of withstanding flooding and to minimize use of fill. However, some development may be compatible within flood plains and floodways, as may some other land uses. In such cases, flood proofing would not be required. Compatible uses shall not, however, obstruct flows or adversely affect upstream or downstream properties with increased velocities, erosion backwater effects, or concentrations of flows.

S 4.10 Require all proposed projects anywhere in the county to address and mitigate any adverse impacts that it may have on the carrying capacity of local and regional storm drain systems.

S 4.11 Encourage neighboring jurisdictions to require development occurring adjacent to the County to consider the impact of flooding and flood control measures on properties within unincorporated Riverside County.

*Fire Hazards:*

S 5.1 Develop and enforce construction and design standards that ensure that proposed development incorporates fire prevention features through the following:

a. All proposed development and construction within Fire Hazard Severity Zones shall be reviewed by the Riverside County Fire and Building and Safety departments.
b. All proposed development and construction shall meet minimum standards for fire safety as defined in the Riverside County Building or County Fire Codes, or by County zoning, or as dictated by the Building Official or the Transportation Land Management Agency based on building type, design, occupancy, and use.
c. In addition to the standards and guidelines of the California Building Code and California Fire Code fire safety provisions, continue to implement additional standards for high-risk, high occupancy, dependent, and essential facilities where appropriate under the Riverside County Fire Code (Ordinance No. 787) Protection Ordinance. These shall include assurance that structural and nonstructural architectural elements of the building will not impede emergency egress for fire safety staffing/personnel, equipment, and apparatus; nor hinder evacuation from fire, including potential blockage of stairways or fire doors
d. Proposed development and construction in Fire Hazard Severity Zones shall provide secondary public access, in accordance with Riverside County Ordinances.





e. Proposed development and construction in Fire Hazard Severity Zones shall use single loaded roads to enhance fuel modification areas, unless otherwise determined by the Riverside County Fire Chief.
f. Proposed development and construction in Fire Hazard Severity Zones shall provide a defensible space or fuel modification zones to be located, designed, and constructed that provide adequate defensibility from wildfires.

S 5.2 Encourage continued operation of programs for fuel breaks, brush management, controlled burning, revegetation and fire roads.

S 5.3 Monitor fire-prevention measures (such as fuel reduction) through a site specific fire-prevention plan to reduce long-term fire risks in the Fire Hazard Severity Zones.

S 5.4 Limit or prohibit development or activities in areas lacking water and access roads.

S 5.5 Encourage proposed development in Fire Hazard Severity Zones to develop where fire and emergency services are available or planned.

S 5.6 Demonstrate that the proposed development can provide fire services that meet the minimum travel times identified in Riverside County Fire Department Fire Protection and EMS Strategic Master Plan.

S 5.7 Minimize pockets of flammable vegetation that increase likelihood of fire spread through conceptual landscaping plans to be reviewed by Planning and Fire Departments in the Fire Hazard Severity Zones. The conceptual landscaping plan of the proposed development shall at a minimum include:

a. Plant palette suitable for high fire hazard areas to reduce the risk of fire hazards.
b. Retention of existing natural vegetation to the maximum extent feasible.
c. Removal of onsite combustible plants.

S 5.8 Design to account for topography of a site and reduce the increased risk from fires in the Fire Hazard Severity Zones located near ridgelines, plateau escarpments, saddles, hillsides, peaks, or other areas where the terrain or topography affect its susceptibility to wildfires by:

a. Providing fuel modification zones with removal of combustible vegetation, but minimizing visual impacts and limiting soil erosion.
b. Replacing combustible vegetation with fire resistant vegetation to stabilize slopes.
c. Submitting topographic map with site specific slope analysis.

d. Submitting erosion and sedimentation control plans.
e. Providing a minimum 30 foot of setback from the edge of the fuel modification zones.
f. Minimizing disturbance of 25% or greater natural slopes.

S 5.9 Reduce fire threat and strengthen fire-fighting capability so that the County could successfully respond to multiple fires. (AI 88)

S 5.10 Require automatic natural gas shutoff earthquake sensors in high-occupancy industrial and commercial facilities, and encourage them for all residences.

S 5.11 Utilize ongoing brush clearance fire inspections to educate homeowners on fire prevention tips by implementing annual countywide weed abatement program

S 5.12 Conduct and implement long-range fire safety planning, including stringent building, fire, subdivision, and municipal code standards, improved infrastructure, and improved mutual aid agreements with the private and public sector.

S 5.13 Develop a program to utilize existing reservoirs, tanks, and water wells in the county for emergency fire suppression water sources.

S 5.14 Periodically review inter-jurisdictional fire response agreements, and improve firefighting resources as recommended in the Riverside County Fire Department Fire Protection Plan and EMS Strategic Master Plan to keep pace with development, including construction of additional high-rises, mid-rise business parks, increasing numbers of facilities housing immobile populations, and the risk posed by multiple ignitions, to ensure that (AI 4, AI 88):

- Fire reporting and response times do not exceed the goals listed in the Riverside County Fire Department Fire Protection Plan and EMS Strategic Master Plan identified for each of the development densities described.
- Fire flow requirements (water for fire protection) are consistent with Riverside County Ordinance 787.
- The planned deployment and height of aerial ladders and other specialized equipment and apparatus are sufficient for the intensity of development desired.

S 5.15 Continue to utilize the Riverside County Fire Department Fire Protection Plan and EMS Strategic Master Plan as the base document to implement the goals and objectives of the Safety Element.





S 5.16 Encourage property owners to utilize clustering and Transfer of Development Rights (TDR) program when developing lands within Fire Hazard Severity Zones by:

- Restricting the development of a property through placement of conservation easement.
- Acquiring the conservation easements similar to that of MSHCP Program.

S 5.17 Identify, map, and update on an as-needed continual basis, the Fire Hazard Severity Zone maps.

S 5.18 Ensure that the Fire Department has appropriate municipal staffing and fire protection planning staff that meet the needs of development pressure and adequately respond to long range fire safety planning.

S 5.19 Implement a coordination program with fire protection and emergency service providers to reassess fire hazards after wildfire events and to adjust fire prevention and suppression needs, as necessary.

S 5.20 Implement a regional coordination program to increase support for coordination among fire protection and emergency service providers.

S 5.21 Implement a long-term training and education program among government agencies and communities about fire protection.

*Wind Hazards:*

S 3.11 Require studies that address the potential of this hazard on proposed development within “High” and “Very High” wind erosion hazard zones as shown on Figure S-8, Wind Erosion Susceptibility Map.

S 3.12 Include a disclosure about wind erosion susceptibility on property title for those properties located within “High” and “Very High” wind erosion hazard zones as shown on Figure S-8, Wind Erosion Susceptibility Map.

S 3.13 Require buildings to be designed to resist wind loads.

S 3.14 Educate builders about the wind environment and encourage them to design projects accordingly

## 8.4 Ongoing Mitigation Strategies

### 8.4.1 Earthquake Strategies

***Retrofitting Against Earthquake:***

Earthquake retrofitting measures include removing masonry overhangs that will fall onto the street during shaking. Bracing the building provides structural stability, but can be very expensive. Less expensive approaches may be more cost effective for an area like that faces a relatively low earthquake threat. These include tying down appliances, water heaters, bookcases and fragile furniture so they won't fall over during a quake and installing flexible utility connections that will not break when shaken.

### 8.4.2 Flood Strategies

Generally, natural, man-made, and technological hazards impact people and improved property the most. Vacant space may incur damages as well, but the threat to life and property is greatly decreased. In some cases, properties can be modified so the hazard does not reach the damage-prone improvements. Flooding is the one of those hazards that can be kept away from a structure. There are five common methods to do this:

- Retrofit the building
- Create a barrier between the building and the source of flooding
- Move the building out of the flood-prone area
- Elevate the building above the flood level
- Demolish the building.

***Retrofitting Against Flooding:***

Flood retrofitting measures include dry flood proofing where all areas below the flood protection level are made watertight. Walls are coated with waterproofing compounds or plastic sheeting. Openings (doors, windows, and vents) are closed, either permanently, with removable shields, or with sandbags. Dry flood proofing of new and existing nonresidential buildings in the regulatory floodplain is permitted under State, FEMA and local regulations. Dry flood proofing of existing residential buildings in the floodplain is also permitted as long as the building is not substantially damaged or being substantially improved. Owners of buildings located outside the regulatory floodplain can always use dry flood proofing techniques.

The alternative to dry flood proofing is wet flood proofing: water is let in and everything that could be damaged by a flood is removed or elevated above the flood level. Structural components below the flood level are replaced with materials that are not subject to water





damage. This is the approach used for the first floor of the elevated homes. For example, concrete block walls are used instead of wooden studs and gypsum wallboard. The furnace, water heater, and laundry facilities are permanently relocated to a higher floor. Where the flooding is not deep, these appliances can be raised on blocks or platforms.

***Barriers:***

An effective way of keeping flood water away from a structure is to construct a barrier. This barrier can be built of dirt or soil, berms, concrete, steel, a floodwall or through a simple sand-bagging operation. In areas subject to flash flooding, deep waters, or other high hazard, relocation and evacuation is often the only safe and responsible approach.

Careful design is needed so as not to create flooding or drainage problems on neighboring properties. Depending on how porous the ground is, if floodwaters will stay up for more than an hour or two, the design needs to account for leaks, seepage of water underneath, and rainwater that falls inside the perimeter. This is usually done with a sump and/or drain to collect the internal groundwater and surface water and a pump and pipe to pump the internal drainage over the barrier.

Barriers can only be built so high. They can be overtopped by higher than expected flood waters. Barriers made of earth are susceptible to erosion from rain and floodwaters if not properly sloped, covered with grass, and maintained. A berm can settle over time, lowering its protection level. A floodwall can crack, weaken, and lose its watertight seal. Therefore, barriers need careful design and maintenance (and insurance on the building, in case of failure).

***Relocation:***

Moving a structure to higher ground is the surest and safest way to protect it from flooding. While almost any building can be moved, the cost goes up for heavier structures, such as those with exterior brick and stone walls, and for large or irregularly shaped buildings. However, experienced building movers can handle most job.

In areas subject to flash flooding, deep waters, or other high hazard, relocation is often the only safe approach. Relocation is also preferred for large lots that include buildable areas outside the floodplain or where the owner has a new flood-free lot (or portion of the existing lot) available.

***Elevation:***

Raising a building above the flood level can be almost as effective as moving it out of the floodplain. Water flows under the building, causing little or no damage to the structure or its contents.

Raising a building above the flood level is cheaper than moving it and can be less disruptive to a neighborhood. Elevation has proven to be an acceptable and reasonable means of complying with floodplain regulations that require new, substantially improved, and substantially damaged buildings to be elevated above the base flood elevation.

One concern with elevation is that it may expose the structure to greater impacts from other hazards. If not braced and anchored properly, an elevated building may have less resistance to the shaking of an earthquake and the pressures of high winds.

***Demolition:***

Some buildings, especially heavily damaged or repetitively flooded ones, are not worth the expense to protect them from future damage. It is cheaper to demolish them and either replace them with new, flood protected structures ("pilot reconstruction"), or relocate the occupants to a safer site. Demolition is also appropriate for buildings that are difficult to move—such as larger, slab foundation, or masonry structures—and for dilapidated structures that are not worth protecting. Generally, demolition projects are undertaken by a government agency, so the cost is not borne by the property owner, and the land is converted to public open space use, such as a park.

One potential problem is sometimes an acquisition and demolition project is a "checkerboard" pattern in which nonadjacent properties are acquired. This can occur when some owners, especially those who have and prefer a waterfront location, prove reluctant to leave. Creating such an acquisition pattern in a community simply adds to the maintenance costs that taxpayers must support.

### 8.4.3 Fire Strategies

***Wildfire:***

One way to lessen the threat of a fire is by keeping fuel away from buildings. This is called the concept of "defensible space." Defensible space involves providing sufficient space between the structure and flammable vegetation.

Within this space, the fire service has room to battle the wildfire before it reaches the structure or to stop a structural fire before it ignites the wildland vegetation. With sufficient





defensible space, the structure even has a chance to survive on its own when fire service personnel and equipment are not available, as often happens during a significant wildfire.

The 2003 Fire Siege was perhaps the worst fire disaster in Southern California history. The firestorm that raged through the region consisted of 14 major fires that quickly exhausted resources and lasted for multiple weeks. The lessons from that fire season served as a warning for everyone living in areas prone to fire danger and resulted in stronger fire prevention and mitigation efforts.

In January 2005 a new state law became effective that extended the defensible space clearance around homes and structures from 30 feet to 100 feet. Proper clearance to 100 feet dramatically increases the chance of your house surviving a wildfire. This defensible space also provides for firefighter safety when protecting homes during a wildland fire. Riverside County Ordinance No. 859 Water Efficient Landscape Requirements mentions the use of defensible space and avoiding the use of fire-prone plant materials. Ordinance No. 695 Abatement of Hazardous Vegetation effective July 16, 2009 states "a one hundred (100) foot wide strip of land around structure(s) located on an adjacent improved parcel"

Riverside County has a Fire Protection contract with Cal Fire and utilizes many of their materials to educate individuals on why they should maintain a proper defensible space.

***Public Fire Education:***

Family Escape Plan:

In a County as fire prone as Riverside, you can never be too fire safe. Throughout Southern California, wildfire danger is a year-around threat. Our goal is to make each and every home more fire safe. We ask residents to make sure they have a fire escape plan, and that they practice what to do in an emergency.

Smoke Alarms:

Over ninety-three percent of all homes in the United States have at least one smoke alarm. The bad news is that one third of them are not working. The County encourages residents to make sure their smoke alarms are operating correctly by testing them regularly.

### 8.4.4 All Hazard Strategies

***Facility Audits:***

One of the first things we can do to reduce loss of structures within the County of Riverside is to evaluate all critical facilities' that are exposed to potential damage from the hazards. We should include a review of insurance coverage and identify where more information can be found on the property protection measure(s) recommended by the audit. Typically property protection measures are used to modify buildings or property that has a greater potential to damage. Property protection measures fall under three approaches:

- Modify the site to keep the hazard from reaching the building
- Modify the building so it can withstand the impacts of the hazard
- Insure the property owner receives the opportunity for financial relief after the damage has occurred, This is usually received under the owners insurance policies or technical and financial assistance can be provided by a government agency

**Other measures:**

- Burying utility lines is a retrofitting measure that addresses earthquakes, winds from tornadoes, thunderstorms, and the ice that accompanies winter storms.
- Installing or incorporating backup power supplies minimizes the effects of power losses caused by downed lines.
- Roofs can be replaced with materials less susceptible to damage by hazards, such as modified asphalt or formed steel shingles and other fireproof materials
- Wildfire mitigation in residential properties can include installing spark arrestors on chimneys.
- Winter storm retrofitting measures include improving insulation on older buildings, relocating water lines from outside walls to interior spaces, and insulating water lines in crawlspaces and under elevated buildings.
- Windows can be sealed or covered with an extra layer of glass (storm windows) or plastic sheeting.

## 8.5 Mitigation Actions

County Hazard Mitigation Goals and Actions:

The Agency Inventory Document and Mitigation Strategies and Goals, were used by the county and each participating city and special district to review the possible mitigation





actions that would be appropriate for that agency to work on. This is based on how the Riverside County planning area can reduce the vulnerability of people, property, infrastructure, and natural and cultural resources to future disaster losses. Only those actions where the County is the lead jurisdiction are detailed further in Section 4.3. Actions specific to other participating jurisdictions are detailed in the jurisdictional annexes.

It is important to note that Riverside County and the participating jurisdictions have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as the General Plan, community wildfire protection plans and capital improvement budgets and reports. These actions are considered to be part of this plan, and the details, to avoid duplication, should be referenced in their original source document. The Riverside County planning area also realizes that new needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this plan.

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# Section 9.0 Plan Implementation and Maintenance Process

Implementation and maintenance of the plan is critical to the overall success of hazard mitigation planning. This section provides an overview of the overall strategy for plan implementation and maintenance. It also outlines the method and proposed schedule for monitoring, updating, and evaluating the plan. The chapter will discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

## 9.1 Implementation

The Riverside County Operational Area Multi-Jurisdiction Local Hazard Mitigation Plan is a partnership between the jurisdictions involved. Implementation prioritization is determined during the planning process and after taking funding into consideration. Economic constraints make low or no-cost actions most easily accomplished in plan implementation.

A highly effective and low cost implementation mechanism is the incorporation of our hazard mitigation plan recommendations into Operational Area and other planning efforts discussed in more detail below. Another strategy is for participating jurisdictions to assimilate mitigation strategies into their day-to-day functions and priorities. This effort will be achieved by monitoring agenda, attending stakeholder meetings, and review of programs and policies for coordination and opportunities to implement mitigation strategies. Riverside County Operational Area will also monitor funding opportunities to facilitate the implementation of more costly recommended actions. The County will assist in the identification of specialized pre- and post- disaster funds, state and federal earmarked funds, and other grant programs for opportunities to implement mitigation actions and identified projects.

The primary duty of the participating jurisdictions is to participate in reporting to their community governing boards and the public on the status of their plan implantation and mitigation opportunities and keep the County of Riverside EMD updated of changes to the status of their recommended actions or priorities. The primary duty of the County will be to promote mitigation action funding opportunities, organize Steering Committee meetings for plan evaluation and potential updates on a yearly basis and post any relevant information on the County website and others as appropriate.

## 9.2 Role of Hazard Mitigation Steering Committee

With the adoption of this plan, the participating jurisdictions will be responsible for the plan implementation and maintenance. The participating jurisdictions, led by County of Riverside Emergency Management Department will work to maintain a Hazard Mitigation Steering Committee to:

- Disseminate hazard mitigation activities and opportunities to all participants;
- Pursue the implementation of high-priority, low-cost mitigation actions;
- Monitor and identify cost-share and funding opportunities to support the community and recommended actions;
- Monitor and assist in implementation and evaluate updates of this plan;
- Support and assist ALL jurisdictions not included in the Multi-Jurisdictional Plan to develop their own stand-alone local hazard mitigation plans;
- Report on plan progress and changes to participating jurisdictions

## 9.3 Incorporation into Existing Planning Mechanisms

Incorporation of the hazard mitigation plan recommendations into other County and jurisdictional plans and policies is part of our implementation plan.

Plans include:

- County and City General Plans
- County and City Emergency Operations Plans
- County and City Ordinances
- Flood and Storm-water Management Master Plans
- Wildfire Protection Plans
- Capital Improvement Plans and Budgets





- Other plans and policies outlined in the capability assessments in the jurisdictional annexes
- Other plans, regulation, and practices with a mitigation focus.

## 9.4 Maintenance

Plan maintenance will be an annual process by both the County and participating jurisdictions to monitor and evaluate the plans' implementation and to update the plan as progress, changes in actions or priorities, or changing circumstances are recognized. The County will notify Cal OES and FEMA with plan updates to ensure they have the most current version of a participating jurisdiction's plan.

County of Riverside Emergency Management Department, Preparedness Division, is responsible for initiating plan reviews, consulting and organizing a Hazard Mitigation Steering Committee Meeting and facilitating coordination with participating jurisdictions. In order to evaluate progress and update mitigation strategies identified in the plan, the County of Riverside EMD and the participating jurisdictions will review the plan annually and following a large scale event. County of Riverside EMD and participating jurisdictions will submit a five-year written update to Cal OES and FEMA Region IX, unless disaster or other circumstance (e.g., changing regulations) require a change to this schedule.

### *Maintenance Evaluation Process*

The yearly review of the plan will be presented and discussed at our annual Operational Area Planning Committee, Disaster Council Meeting held in January. The assessment will address whether:

- The goals and objectives address current and expected conditions.
- The nature, magnitude, and/or type of risks have changed.
- The current resources are appropriate for implementing the plan.
- There are implementation problems, such as technical, political, legal, or coordination issues with other agencies.
- The outcomes have occurred as expected (a demonstration of progress).
- The agencies and other partners participated as originally proposed.

Updates to this plan will:

- Consider changes in vulnerability due to action implementation;
- Document and highlight instances where mitigation efforts have proven effective;
- Document new hazards and identify any hazards that were previously overlooked;
- Incorporate any new data or studies on identified hazards and risks;
- Incorporate growth and development-related changes to infrastructure inventories; and
- Incorporate any new action recommendations or changes in action or risk prioritization.

County of Riverside Emergency Management Department, Preparedness Division, will conduct a plan update 18 months prior to plan expiration. In addition, Riverside County EMD will seek grant funding to support the coordination and development of the plan update. Upon notice of the HMPG funding opportunity, Riverside will apply for any available HMGP funding. After plan adoption, the LHMP Steering Committee in coordination with the EMD Planning team will conduct an annual review of the plan, flagging any sections in the plan that will require further updates. The sections flagged for revision will be included in the next LHMP update. Additional meetings will occur annually throughout the five-year cycle. Changes will be made to the plan to accommodate for actions that are no longer relevant due to shifting agendas, funding or no longer considered feasible.





# 10.0 Continued Public Involvement

The Riverside County Operational Area Multi-Jurisdiction Hazard Mitigation Plan update process has provided an opportunity to solicit participation from new and existing stakeholders, publicize successful mitigation strategies and actions, and seek public comments.

The County will continue its efforts to involve the public during the annual maintenance process and after any major events that lead to revisions in the plan.

The Riverside County Emergency Management Department and participating jurisdictions will be responsible for facilitating continued public and stakeholder involvement for their plan updates. They will do this through: input from the Hazard Mitigation Steering Committee, public outreach meetings, web and social media postings, press releases and public hearings for the plan's maintenance.

There are also opportunities for participating jurisdictions to obtain and share information with their stakeholders by participating in the Operational Area Planning Committee and the Disaster Council meetings.

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# APPENDIX A – Resolution

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# APPENDIX B – Participating Jurisdictions and Letters of Commitment

Continue to Next Page.

# LHMP Participant Database

| Agency Title | In, Out, or New | Agency Type | Agency Discipline |
|---|---|---|---|
| Agua Caliente Band of Cahuilla Indians | DROPPED | Tribe | Tribe |
| Beaumont Unified | IN | School District | Education |
| City of Banning | IN | City | N/A |
| City of Beaumont | IN | City | N/A |
| City of Blythe | IN | City | N/A |
| City of Calimesa | IN | City | N/A |
| City of Canyon Lake | IN | City | N/A |
| City of Cathedral | IN | City | N/A |
| City of Coachella | IN | City | N/A |
| City of Corona | IN | City | N/A |
| City of Desert Hot Springs | IN | City | N/A |
| City of Eastvale | IN | City | N/A |
| City of Hemet | IN | City | N/A |
| City of Indian Wells | IN | City | N/A |
| City of Indio | IN | City | N/A |
| City of Jurupa Valley | IN | City | N/A |
| City of La Quinta | IN | City | N/A |
| City of Lake Elsinore | IN | City | N/A |





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|---|---|---|---|
| City of Murrieta | IN | City | N/A |
| City of Norco | IN | City | N/A |
| City of Palm Desert | IN | City | N/A |
| City of Palm Spring | IN | City | N/A |
| City of Perris | IN | City | N/A |
| City of Rancho Mirage | IN | City | N/A |
| City of Riverside | IN | City | N/A |
| City of San Jacinto | IN | City | N/A |
| City of Temecula | IN | City | N/A |
| City of Wildomar | IN | City | N/A |
| Desert Sands USD | NEW | School District | Education |
| Eastern Municipal Water | IN | Utilities | Water |
| Fern Valley Water | OUT | Utilities | Water |
| Hemet Unified School District | IN | School District | Education |
| High Valley Water | IN | Utilities | Water |
| Home Gardens County Water | OUT | Utilities | Water |
| Idyllwild Fire Protection | IN | Special District | Fire Protection |
| Idyllwild Water | OUT | Utilities | Water |
| Imperial Irrigation District | IN | Utilities | Water |
| Kaiser Hospital - Riverside | NEW | Hospital | Health Care |

| | | | |
|---|---|---|---|
| Lake Elsinore USD | IN | School District | Education |
| March Air Force Base | DROPPED | Military | Airforce |
| Menifee Union | OUT | School District | Education |
| Moreno Valley USD | NEW | School District | Education |
| Morongo Band of Mission Indians | NEW | Tribe | Tribe |
| Nuview Union | OUT | School District | Education |
| Palm Springs Unified | OUT | School District | Education |
| Perris Elementary | OUT | School District | Education |
| Perris Union HSD | IN | School District | Education |
| Pine Cove Water | OUT | Utilities | Water |
| Ramona Band of Indians | DROPPED | Tribe | Tribe |
| Rancho California Water | IN | Utilities | Water |
| Riverside Community Colleges | IN | School District | Education |
| Riverside County Office of Education | IN | County | Education |
| Riverside Unified School District | IN | School District | Education |
| San Gorgonio Memorial Healthcare | OUT | Special District | Healthcare |
| San Jacinto USD | IN | School District | Education |
| Santa Ana Watershed | IN | Utilities | Water |
| Val Verde Unified | OUT | School District | Education |
| Western Municipal Water | IN | Utilities | Water |





## Participant Contact Information

**Local Hazard Mitigation Plan Contacts**

| Company | Last Name | First Name | Email Address | Job Title | Business Phone | Mobile Phone | Fax Number | Address | City | ZIP |
|---|---|---|---|---|---|---|---|---|---|---|
| Agua Caliente Band of Cahuilla Indians | Canales | Victoria | vcanales@aguacaliente.net | Emergency Services Coordinator | 760.285.9271 | 760.699.6852 | | 5401 Dinal Shore Dr. | Palm Springs | 92264 |
| Beaumont Unified | Evens | Mareesa | mevans@beaumontusd.k12.ca.us | Director of Risk Management | 951.797.5366 | | 951.797.6521 | | | |
| City of Banning | Diaz | Alex | adiaz@ci.banning.ca.us | Chief of Police | 951-849-1194 | 951-840-8563 | | 125 E. Ramsey Street, P.O. Box 998 | Banning | 92220 |
| City of Beaumont | Keyser | Mark | mkeyser@beaumontpd.org | Lieutenant | 951-769-8500 | 951-529-7878 | 951.769.8506 | 660 Orange Avenue | Beaumont | 92223 |
| City of Blythe | Thomas | Kelly | KThomas@cityofblythe.ca.gov | Community Service Officer | 760-922-6111.2241 | | 760-922-3652 | 240 N Spring Street | Blythe | 92225 |
| City of Calimesa | Monson | Margaret | pworks@cityofcalimesa.net | Interim Public Works Director | (909) 795-9801 ext.235 | (951) 538-4748 | | 908 Park Avenue | Calimesa | 92320 |
| | Johnson | Bonnie | BJohnson@cityofcalimesa.net | City Manager | 909.795.9801 ext.239 | | 909.795.4399 | 908 Park Avenue | Calimesa | 92320 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| City of Canyon Lake | A. Borja | Mark | mborja@cityofcanyonlake.com | Administrative Services Manager | (951)246-2024 | | | 31516 Railroad Canyon Road | Canyon Lake | 92587 |
| City of Cathedral | Hauser | Eric | ehauser@cathedralcity.gov | Chief | (760) 770-8200 | | | 32100 Desert Vista Rd. | Cathedral City | 92234 |
| | Wilson | Paul | pwilson@cathedralcity.gov | Fire Chief | 760-770-8200 | | | 32100 Desert Vista Rd. | Cathedral | 92234 |
| City of Coachella | R. Torres | George | gtorres@coachella.org | Emergency Services Coordinator | | (760) 501-8122 | (760) 398-1630 | 53462 Enterprise Way | Coachella | 92236 |
| City of Corona | Moran-McGough | Gina | Gina.Moran-McGough@ci.corona.ca.us | Emergency Services Coordinator | (951) 736-2458 | 951-415-8071 | (951) 270-2737 | 400 South Vicentia Avenue | Corona | 92882 |
| City of Desert Hot Springs | Brooks | Mark | mark.brooks@fire.ca.gov | Battalion Chief | 760-343-3510 | 951-366-9295 | | | | |
| | Wilms | Doria | dwilms@cityofdhs.org | Deputy City Clerk | (760) 329-6411 ext. 260 | | | | | |
| City of Eastvale | A. Rodriguez | Alia | Arodriguez@eastvaleca.gov | Senior Admin Analyst | 951.703.4412 | | 9517034760 | 12363 Limonite Ave., Suite 910 | Eastvale | 91752 |
| City of Hemet | Mills | Jennifer | Jmills@cityofhemet.org | Emergency Services Coordinator | 9517652451 | | 9517652328 | 510 East Florida Avenue | Hemet | 92543 |
| City of Indian Wells and | Cadden | Eric | Eric.Cadden@rivco.org | Emergency Services Coordinator | | 760.578.2088 | 760.863.8882 | 4210 Riverwalk | Riverside | 92505 |





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|---|---|---|---|---|---|---|---|---|---|---|
| Palm Desert | | | | | | | | Pkwy, Suite 300 | | |
| City of Indio | Kelly | Michelle | mkelly@indio.org | Emergency Services Coordinator | | | | | | |
| | | | Michelle.Caldwell@rivco.org | | | 760.766.5802 | | | | |
| City of Jurupa Valley | Rollings | Terri | trollings@jurupavalley.org | Assistant to the City Manager | 951.332.6464 | 951.332.6995 | | 8930 Limonite Ave. | Jurupa Valley | 92509 |
| City of La Quinta | Johnston | Zander | zjohnston@la-quinta.org | ESC | 760.777.7044 | 7605016221 | | 78495 Calle Tampico | La Quinta | 92253 |
| City of Lake Elsinore | DeSantiago | Rick | rdsantiago@lake-elsinore.org | Emergency Services Coordinator | 951.674.3124 | | 951.471.1251 | 130 S. Main Street | lake Elsinore | 92530 |
| | George Eakins | Catherine | ceakins@lake-elsinore.org | Administrative Assistant | 951.674.5170 ext.241 | | 951.471.1251 | 521 North Langstaff St. | Lake Elsinore | 92530 |
| City of Menifee | Glynn | Steven | sglynn@cityofmenifee.us | PW Manager | (951) 723-3719 | (951) 775-6691 | 951.679.3843 | 29714 Haun Road | Menifee | 92586 |
| City of Moreno Valley | Wilkinson | Steve | stevew@moval.org | Management Analyst | 951.486.6788 | | | 22870 Calle San Juan De Los Lagos - PO Box 88005 | Moreno Valley | 92552 |
| | Bricker | Zuzzette | zuzzetteb@moval.org | City OEM | 951.413.3809 | 951.337.0485 | | 22870 Calle San Juan De Los Lagos - PO Box 88005 | Moreno Valley | 92552 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| City of Murrieta | Shuck | Ken | kshuck@MurrietaCA.gov. | Fire Marshal | 951.461.6158 | | 951.677.6799 | 41825 Juniper Street | Murrieta | 92562 |
| | Aylward | Terri | Taylward@MurrietaCA.gov | Fire Prevention Coordinator | 951.461.6158 | | 951.677.6799 | 41825 Juniper Street | Murrieta | 92562 |
| City of Norco | Lane | Scott | scott.lane@fire.ca.gov | Battalion Chief | (951) 737-8097 | | | | Norco | |
| | Schuchard | Gina | gschuchard@ci.norco.ca.us | Finance Officer | 951.270.5650 | | | | Norco | |
| | Okoro | Andy | aokoro@ci.norco.ca.us | City Manager | 951.570.5611 | 951.545.2017 | | 3902 Hillside Avenue | Norco | 92860 |
| City of Palm Spring | Lebsock | Anjila | Anjila.lebsock@palmspringsca.gov | Emergency Service Coordinator | 760-323-8185 | | 760-778-8430 | 300 N. El Cielo Road | Palm Springs | 92262 |
| City of Perris | Martinez | David | dmartinez@cityofperris.org | Interim Building Official/Fire Marshal | 951.443.1029 ext.228 | | 951.943.3293 | 135 N. D Street | Perris | 92570 |
| City of Rancho Mirage | Kopp | Bud | budk@ranchomirageca.gov | Planning Manager | 760.328.2266 | | | | | |
| | Wilson | Britt | brittw@RanchoMirageCA.gov | Management Analyst | 760.324.4511-230 | | (760) 324-9851 | 69825 Highway 111 | Rancho Mirage | 92270 |
| City of Riverside | Annas | Mark | mannas@riversideca.gov | Emergency Operations Coordinator | 951-320-8103 | 951-320-5321 | 951-320-8102 | 3085 St. Lawrence Street | Riverside | 92504 |





| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| City of Temecula | Cardenas | Roberto | roberto.cardenas@cityoftemecula.org | Fiscal Services Manager | 951-693-3944 | | 951-302-4159 | 41000 Main Street | Temecula | 92590 |
| City of Wildomar | Morales | Janet | jmorales@cityofwildomar.org | Senior Admin Analyst | 951-677-7751.210 | | 951.698.1463 | 23873 Clinton Keith Rd Ste. 201 | Wildomar | 92595 |
| | Chapman | Les | lchapman@cityofwildomar.org | Public Works Superintendent | 9 51-677-7751.205 | | 951.698.1463 | 23873 Clinton Keith Rd Ste. 201 | Wildomar | 92595 |
| Desert Sands USD | Nacua | Edward | edward.nacua@desertsands.us | Director of Security & Safety Services | 760.771.8646 | 760.644.2269 | 760.771-8713 | 47950 Dune Palms Dr. | La Quinta | 92253 |
| Eastern Munic. Water | Hefley | Doug | hefleyd@emwd.org | Director of Safety, Risk and Emergency Management | 951.928.377.4218 | 951.287.8627 | | P.O. Box 8300 2270 Trumble Road | Perris | 92572 |
| | Bray | Ryan | ryan.bray@rmpcorp.com | Technical Insulant, Risk and Emergency Management | 949.282.0123 ext. 238 | | | P.O. Box 8300 2270 Trumble Road | Perris | 92572 |
| Hemet Unified School District | Radford | Lyle | lradford@hemetusd.org | Safety and Security Technician | (951)765-5100 -2301 | | | 1791 West Acacia Ave | Hemet | 92545 |
| High Valley Water | Thornton | Nera | nthornton@highvalleywater.com | Office Administrator | 951.849.2612 | | 951.922.9667 | 47781 Twin Pines Rd. | Banning | 92220 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Idyllwild Fire Protection | Reitz | Patrick | chief@idyllwildfire.com | Chief | 951-659-2153 | | | | | |
| Imperial Irrigation District | Contreras | Jose | jscontreras@iid.com | Emergency Services Coordinator | | 760.604.5242 | | 333 E Barioni Blvd | Imperial | 92251 |
| Kaiser Hospital - Riverside | Sankey | Corrie | Corrie.L.Sankey@KP.Org | Dir. Of EH&S | 951.353.5513 | 951.595.3825 | 951.353.5159 | 10800 Magnolia Ave. | Riverside | 92505 |
| Lake Elsinore USD | Scranton | Julie | julie.scranton@leusd.k12.ca.us | Safety & Risk Services Supervisor | 951.253.7181 | | 951.245.6609 | 545 Chaney St. | Riverside | 92530 |
| March Air Force Base | Tucker | Marvin | marvin.tucker@us.af.mil | Chief, Emergency Management | 951.655.4766 | | | 2991 Graeber St Bldg 1214 | Riverside | 92518 |
| Moreno Valley USD | Evangelista | Tracy | tevangelista@mvusd.net | | 951.571.7500.17565 | | | | | |
| Morongo Band of Mission Indians | Ellsworth | David | dellsworth@morongo-nsn.gov | EOC Deputy | 951.755.5277 | 951.768.3311 | 951.572.6017 | 11581 Portrero Road | Banning | 92220 |
| | Velasquez Sr. | Floyd W. | fvelasquez@morongo-nsn.gov | Emergency Services Manager | 951.572.6141 | 951.392.9828 | | 12700 Pumarra Road | Banning | 92220 |
| | Johnson | Jesse | jjohnson@morongo-nsn.gov | Emergency Service Analyst | 951-572-6071 | 951-392-4129 | | | | |
| Perris Union HSD | Miller | Judy | judy.miller@puhsd.org | Director of Risk Management | 951.529.4691 | | 951.943.5356 | 155 E. 4th St. | Perris | 92570 |





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|---|---|---|---|---|---|---|---|---|---|---|
| | Smiderly | Christine | christine.smiderly@puhsd.org | Risk Management Secretary | (951) 943-6369 ext. 80282 | | | 155 E. 4th St. | Perris | 92570 |
| Ramona | Gomez | John | jgomez@ramona-nsn.gov | Project Manager | 951.763.4105 | 951.941.4943 | | 5610 Hwy 371, Ste. B P.O. Box 391670 | Anza | 92539 |
| Rancho California Water | Morrison | Dave | morrisond@ranchowater.com | Safety Officer | 951.296.6949 | 951.538.4398 | | | | |
| Riverside Community Colleges | W. Simmons | Michael | michael.simmons@rccd.edu | Director, Risk Management, Safety & Police | (951) 222-8128 | (951) 206-8605 | (951) 328-3502 | 3801 Market Street, 3rd Floor | Riverside | 92501 |
| Riverside County Office of Education | D'Amico | Michael | MDAMICO@rcoe.us | Safety, Emergency Preparedness Coordinator | 951-826-6530 | 951-609-5537 | | 3939 Thirteenth Street | Riverside | 92501 |
| Riverside Unified School District | Mueller | Ken | kmueller@rusd.k12.ca.us | Director of Maintenance and Operations | (951)788-7496 ext. 84001 | | | 3070 Washington Street | Riverside | 92504 |
| San Jacinto USD | Lawrence | Dawn | dlawrence@SanJacinto.k12.ca.us | Prep Coordinator | 951.929.7700.4411 | 253.249.6282 | | 2045 S. San Jacinto Ave. | San Jacinto | 92583 |
| Santa Ana Watershed | Quintero | Carlos | cquintero@sawpa.org | Senior Project Manager | 951.354.4234 | 951.941.7611 | | 11615 Sterling Avenue | Riverside | 92503 |
| Western Municipal | McMillien | Tom | tmcmillen@wmwd.com | Safety Officer | 951.571.7252 | | | 14205 Meridian Parkway | Riverside | 92518 |

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|---|---|---|---|---|---|---|---|---|---|---|
| Water District | | | | | | | | | | |





# LETTERS OF COMMITMENT

## Cities

City of Banning
City of Beaumont
City of Blythe
City of Calimesa
City of Canyon Lake
City of Cathedral
City of Coachella
City of Corona
City of Desert Hot Springs
City of Eastvale
City of Hemet
City of Indian Wells
City of Indio
City of Jurupa Valley
City of La Quinta
City of Lake Elsinore
City of Murrieta
City of Norco
City of Palm Desert
City of Palm Spring
City of Perris
City of Rancho Mirage
City of Riverside
City of San Jacinto
City of Temecula
City of Wildomar

## Tribes

Agua Caliente Band of Cahuilla Indians – DROPPED
Morongo Band of Mission Indians
Ramona Band of Indians

## Special Districts

Beaumont Unified
Desert Sands USD
Eastern Municipal Water
Hemet Unified School District
High Valley Water
Idyllwild Fire Protection
Imperial Irrigation District
Kaiser Hospital - Riverside
Lake Elsinore USD
March Air Force Base – DROPPED OUT
Moreno Valley USD
Perris Union HSD
Rancho California Water
Riverside Community Colleges
Riverside County Office of Education
Riverside Unified School District
San Jacinto USD
Santa Ana Watershed
Western Municipal Water

City of Banning
Office of the City Manager

September 27, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

**Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning**

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Banning is submitting this letter of commitment to confirm that the City of Banning has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Banning agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Banning understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

99 E. Ramsey St. • P.O. Box 998 • Banning, CA 92220-0998 • (951) 922-3101 • Fax (951) 922-3128





Letter of Commitment
September 27, 2016
Page 2 of 2

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Michael Rock, City Manager, commit the City of Banning to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 27th day of September, 2016

Michael Rock, City Manager

# CITY OF BEAUMONT

**August 2, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Beaumont is submitting this letter of commitment to confirm that the City of Beaumont has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Beaumont agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Beaumont understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

550 E. 6th Street • Beaumont • CA • 92223 • Phone: (951) 769-8520 • Fax: (951) 769-8526
www.ci.beaumont.ca.us





Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Richard Warne, commit the City of Beaumont to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 2nd day of August

Interim City Manager

# CITY OF BLYTHE

235 North Broadway • Blythe, California 92225
Phone (760) 922-6161 • Fax (760) 922-4938

**October 19, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Blythe is submitting this letter of commitment to confirm that The City of Blythe has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; The City of Blythe agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Blythe understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,





- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Peter Cosentini, City Manager, commit the City of Blythe to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 19th Day of October, 2016

Peter Cosentini, City Manager

# CITY OF CALIMESA

908 Park Avenue, Calimesa, California 92320
Telephone 909.795.9801 Facsimile 909.795.4399
www.cityofcalimesa.net

May 1, 2017

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Calimesa is submitting this letter of commitment to confirm that the City of Calimesa has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Calimesa agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Calimesa understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement





in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I ***Bonnie Johnson, City Manager*** commit the City of Calimesa to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 1st day of May, 2017

Bonnie Johnson, City Manager
City of Calimesa

# CITY OF CANYON LAKE

June 24, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Canyon Lake is submitting this letter of commitment to confirm that the City of Canyon Lake has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Canyon Lake agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Canyon Lake understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process,

31516 Railroad Canyon Road, Canyon Lake, CA 92587 · 951/244-2955 · FAX 951/246-2022
admin@cityofcanyonlake.com · www.cityofcanyonlake.com





# CITY OF CANYON LAKE

attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Aaron Palmer, City Manager, commit the City of Canyon Lake to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 24 day of June, 2016

Aaron D Palmer

31516 Railroad Canyon Road, Canyon Lake, CA 92587 · 951/244-2955 · FAX 951/246-2022
admin@cityofcanyonlake.com · www.cityofcanyonlake.com

Cathedral City
**Office of the City Manager**

June 1, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Cathedral City is submitting this letter of commitment to confirm that the City of Cathedral City has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Cathedral City agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Cathedral City understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction;
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.);
- Documentation of an effective process to maintain and implement the plan; and

68-700 Avenida Lalo Guerrero • Cathedral City • California • 92234
www.cathedralcity.gov





- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process and as a participant in a multi-jurisdictional plan; I, Charles P. McClendon, City Manager commit the City of Cathedral City to the County of Riverside's Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 1st day of June, 2016

Charles P. McClendon, City Manager

68-700 Avenida Lalo Guerrero • Cathedral City • California • 92234
www.cathedralcity.gov

CITY OF COACHELLA
1515 SIXTH STREET, COACHELLA, CALIFORNIA 92236
PHONE (760) 398-3502 • FAX (760) 398-8117 • WWW.COACHELLA.ORG

**June 13, 2016**

## PARTICIPATING JURISDICTION

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, City of Coachella is submitting this letter of commitment to confirm that City of Coachella has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; City of Coachella agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

City of Coachella understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,

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CITY OF COACHELLA
1515 SIXTH STREET, COACHELLA, CALIFORNIA 92236
PHONE (760) 398-3502 • FAX (760) 398-8117 • WWW.COACHELLA.ORG

- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I George R. Torres Emergency Services Coordinator, commit City of Coachella to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13th day of June 2016

*An Affirmative Action/Equal Opportunity Employer*

**CITY OF CORONA FIRE DEPARTMENT**
735 PUBLIC SAFETY WAY • CORONA, CA 92880 • (951) 736-2220 • FAX (951) 736-2497
WWW.DISCOVERCORONA.COM

June 13, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Corona is submitting this letter of commitment to confirm that the City of Corona has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Corona agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Corona understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;

*"SERVING OUR CITY WITH PRIDE"*





- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I David Duffy, Fire Chief commit the City of Corona to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13th day of June 2016.

David Duffy, Fire Chief

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**City of Desert Hot Springs**
*65-950 Pierson Blvd. • Desert Hot Springs • CA • 92240*
*(760) 329-6411*
*www.cityofdhs.org*

**June 8, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Desert Hot Springs is submitting this letter of commitment to confirm that Desert Hot Springs has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Desert Hot Springs agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Desert Hot Springs understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).





Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Martín Magaña, City Manager, commit the City of Desert Hot Springs to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 8th day of June, 2016.

City of Eastvale
12363 Limonite Avenue, Suite #910 • Eastvale, CA 91752
(951) 361-0900 • Fax: (951) 361-0888 • www.EastvaleCA.gov

May 31, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Eastvale is submitting this letter of commitment to confirm that the City of Eastvale has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning, the City of Eastvale agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Eastvale understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.);
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).





City of Eastvale
12363 Limonite Avenue, Suite #910 • Eastvale, CA 91752
(951) 361-0900 • Fax: (951) 361-0888 • www.EastvaleCA.gov

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, *Michele Nissen*, commit the *City of Eastvale* to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 31st day of May, 2016

Michele Nissen
City Manager

City of Hemet

445 E. FLORIDA AVE • HEMET, CALIFORNIA 92543 • (951) 765-2301

From the Office of the
CITY MANAGER
Alexander P. Meyerhoff

June 13, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

***Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning***

Dear Riverside County Emergency Management Department:

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Hemet is submitting this letter of commitment to confirm that City of Hemet has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Hemet agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Hemet understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process; attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and





Riverside County Emergency Management Department
Kim Saruwatari, Director
Page 2
June 13, 2016

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Alexander P. Meyerhoff, commit the City of Hemet to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13th day of June, 2016

Alexander P. Meyerhoff
City Manager

INDIAN WELLS
CALIFORNIA

**April 1, 2016**

## PARTICIPATING JURISDICTION

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, Indian Wells submitting this letter of commitment to confirm that Indian Wells has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Indian Wells agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Indian Wells understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).





Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Eric W. Cadden commit Indian Wells the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this June day of 3rd, 2016.

Eric W. Cadden

44-950 Eldorado Drive – Indian Wells, California 92210-7497- (V) 760.2489 (F) 346.0407
www.IndianWells.com

June 1, 2016

Attn: Kim Saruwatari, Director
Riverside County Emergency Management Department
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment of Participating Jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Director Saruwatari:

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Indio is submitting this letter of commitment to confirm that the City of Indio has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Indio agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department to complete the plan in conformance with FEMA requirements.

The City of Indio understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.

p: 760.391.4000 f: 760.391.4008 100 Civic Center Mall Indio, CA 92201 www.INDIO.org





- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I *Dan Martinez*, commit the City of Indio to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Sincerely,

Dan Martinez

DAN MARTINEZ
City Manager, City of Indio

Executed this 1st day of June, 2016

p: 760.391.4000 f: 760.391.4008 100 Civic Center Mall Indio, CA 92201 www.INDIO.org

# City of Jurupa Valley

Laura Roughton, Mayor . Verne Lauritzen, Mayor Pro Tem .
Brian Berkson, Council Member . Frank Johnston, Council Member . Brad Hancock, Council Member

June 8, 2016

**City of Jurupa Valley**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Jurupa Valley is submitting this letter of commitment to confirm that Jurupa Valley has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning, the City of Jurupa Valley agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Jurupa Valley understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

8930 Limonite Ave., Jurupa Valley, CA 92509-5183, (951) 332-6464
www.jurupavalley.org





Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Gary Thompson, City Manager, commit the City of Jurupa Valley to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 8th day of June, 2016

Gary S. Thompson, City Manager

8304 Limonite Avenue, Suite M, Jurupa Valley, CA 92509-5183, (951) 332-6464
www.jurupavalley.org

City of La Quinta

June 9, 2016

Ms. Kim Saruwatari, Director
Riverside County Emergency Management Department
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

**Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning**

Dear Ms. Saruwatari:

Per the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements for multi-jurisdictional mitigation plans, the City of La Quinta is submitting this letter of commitment to confirm that the City has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning, the City agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County to complete the plan in conformance with FEMA requirements.

The City understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identify hazards unique to the jurisdiction and not addressed in the master planning document;
- Conduct a vulnerability analysis and identify of risks, where they differ from the general planning area;
- Formulate mitigation goals responsive to public input and develop mitigation actions complementary to those goals. A range of actions will be identified specific for each jurisdiction;
- Demonstrate that there has been proactive participation in the planning process by all community stakeholders.
- Document an effective process to maintain and implement the plan;
- Adopt the Multi-Jurisdictional Hazard Mitigation Plan.

Please do not hesitate to contact me with questions or concerns.

Sincerely,

Frank J. Spevacek
City Manager

78-495 Calle Tampico | La Quinta | California 92253 | 760.777.7000 | www.La-Quinta.org





CITY OF LAKE ELSINORE
DREAM EXTREME

June 8, 2016

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Lake Elsinore is submitting this letter of commitment to confirm that City of Lake Elsinore has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; City of Lake Elsinore agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

City of Lake Elsinore understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.

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June 8, 2016

- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan: I Grant Yates, City Manager, commit City of Lake Elsinore to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 8th day of June, 2016

Grant Yates, City Manager





CITY OF MURRIETA

**June 16, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Murrieta Fire Department is submitting this letter of commitment to confirm that Murrieta Fire Department has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Murrieta Fire Department agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Murrieta Fire Department understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

FIRE DEPARTMENT • 41825 Juniper Street • Murrieta, California 92562
phone: 951.304.FIRE (3473) • fax: 951.677.6799 • web: murrieta.org

- Documentation of an effective process to maintain and implement the plan; and.
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Jason Briley commit the Murrieta Fire Department to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed June 16, 2016

Jason Briley, Fire Marshal
City of Murrieta Fire Department





**CITY of NORCO**

CITY HALL • 2870 CLARK AVENUE • NORCO CA 92860 • (951) 735-3900 • www.norco.ca.us •

June 13, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

**Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning**

Dear Director Saruwatari,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Norco is submitting this letter of commitment to confirm that the city has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Norco understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document.
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area.
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.).
- Documentation of an effective process to maintain and implement the plan.
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

**CITY COUNCIL**

| KEVIN BASH | GREG NEWTON | ROBIN GRUNDMEYER | BERWIN HANNA | TED HOFFMAN |
|---|---|---|---|---|
| Mayor | Mayor Pro Tem | Council Member | Council Member | Council Member |

Riverside County Operational Area Multi-Jurisdictional
Hazard Mitigation Planning
Page 2
June 13, 2016

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Andy Okoro commit the City of Norco to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13th day of June 2016

Andy Okoro, City Manager
City of Norco

Attest:

Cheryl L. Link, City Clerk
City of Norco





City of Palm Springs
David H. Ready, Esq., Ph.D.
City Manager
3200 E. Tahquitz Canyon Way, Palm Springs, CA 92262
Tel 760.322.8350 • Fax 760.323.8207 • TDD 760.864.9527
David.Ready@palmspringsca.gov • www.palmspingsca.gov

June 1, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department:

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Palm Springs is submitting this letter of commitment to confirm that the City of Palm Springs has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning, the City of Palm Springs agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department to complete the plan in conformance with FEMA requirements.

The City of Palm Springs understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction;
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.);
- Documentation of an effective process to maintain and implement the plan; and,

PO Box 2743, Palm Springs, California 92263

Page Two
June 1, 2016
Riverside County Emergency Management

- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan, I, David H. Ready, Esq., Ph.D., commit the City of Palm Springs to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13 day of June 2016

David H. Ready, Esq., Ph.D.





**CITY OF PERRIS**
**DEPARTMENT OF DEVELOPMENT SERVICES**
**Building and Safety Division**
135 N. 'D' STREET, PERRIS, CA 92570-2200
TEL.: (951) 943-1029 FAX: (951) 657-9685

**June 13, 2016**

**RE: City of Perris letter of commitment**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Perris is submitting this letter of commitment to confirm that the City of Perris has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Perris agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Perris understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any

planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Clara Miramontes, commit the City of Perris to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13th day of June 2016

Sincerely

Clara Miramontes
Development Services Director
City of Perris





CITY OF RANCHO MIRAGE

July 14, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Rancho Mirage is submitting this letter of commitment to confirm that the City of Rancho Mirage has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Rancho Mirage agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Rancho Mirage understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Britt W. Wilson commit the City of Rancho Mirage to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 14th day of July 2016

Britt W. Wilson
Emergency Services Coordinator, City of Rancho Mirage
Brittw@ranchomirageca.gov
760-324-4511

c. Bud Kopp, City of Rancho Mirage Planning Manager

Fire Department

City of Arts & Innovation

**June 15, 2016**

## PARTICIPATING JURISDICTION

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Riverside Fire Department – Office of Emergency Management is submitting this letter of commitment to confirm that the Riverside Fire Department – Office of Emergency Management has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the Riverside Fire Department – Office of Emergency Management agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

City of Riverside understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,

*Office of Emergency Management*
3085 St Lawrence Street, Riverside, CA 92504 | **Phone:** (951) 320-8100 | **RiversideCA.gov/Fire**





- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Mark Annas, Emergency Operations Coordinator, commit Riverside Fire Department – Office of Emergency Management to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 15 day of June, 2016

Mark D. Annas
Emergency Operations Coordinator
Riverside Fire Department
Office of Emergency Management

SAN JACINTO

**Scott Miller**
Mayor

**Alonso Ledezma**
Mayor Pro Tem

**Crystal Ruiz**
Councilmember

**Andrew Kotyuk**
Councilmember

**Russ Utz**
Councilmember

May 16, 2017

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of San Jacinto is submitting this letter of commitment to confirm that the City of San Jacinto has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; The City of San Jacinto agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of San Jacinto understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Robert Johnson, commit the City of San Jacinto to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 5/16 day of 2017

Robert A. Johnson
City Manager

595 S. San Jacinto Ave. | San Jacinto, CA 92583 | Ph 951-487-7330 | Fax 951-654-3728 | www.ci.san-jacinto.ca.us





City of Temecula

**City Manager's Office**
41000 Main Street • Temecula, CA 92590
Phone (951) 506-5100 • Fax (951) 694-6499 • www.cityoftemecula.org

**June 9, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the City of Temecula is submitting this letter of commitment to confirm that the City of Temecula has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the City of Temecula agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The City of Temecula understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I *Aaron Adams*, commit the City of Temecula to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 9 day of June 2016.

X

Aaron Adams, City Manager





Bridgette Moore, Mayor
Timothy Walker, Mayor Pro Tem
Ben Benoit, Council Member
Bob Cashman, Council Member
Marsha Swanson, Council Member

23873 Clinton Keith Rd, Ste 201
Wildomar, CA 92595
951/677-7751 Phone
951/698-1463 Fax
www.CityofWildomar.org

June 13, 2016

**CITY OF WILDOMAR**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level. The City of Wildomar is submitting this letter of commitment to confirm that City of Wildomar has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; City of Wildomar agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

City of Wildomar understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Page 1 of 2

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Dan York, Assist City Manager, commits City of Wildomar to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13th day of June 2016

Dan York
Assistant City Manager
City of Wildomar

Page 2 of 2





**DROPPED OUT**

AGUA CALIENTE BAND OF CAHUILLA INDIANS

EMERGENCY SERVICES & RISK MANAGEMENT

**June 13, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Agua Caliente Band of Cahuilla Indians is submitting this letter of commitment to confirm that the Agua Caliente Band of Cahuilla Indians has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning, the Agua Caliente Band of Cahuilla Indians agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The Agua Caliente Band of Cahuilla Indians understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

5401 DINAH SHORE DRIVE, PALM SPRINGS, CA 92264
WWW.AGUACALIENTE-NSN.GOV

AGUA CALIENTE BAND OF CAHUILLA INDIANS

EMERGENCY SERVICES & RISK MANAGEMENT

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I *John Lavallee* commit *Agua Caliente Band of Cahuilla Indians* to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13 day of June

5401 DINAH SHORE DRIVE, PALM SPRINGS, CA 92264
WWW.AGUACALIENTE-NSN.GOV





MORONGO BAND OF MISSION INDIANS

A SOVEREIGN NATION

**Morongo Band of Mission Indians**

**June 2, 2016**
Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Morongo Band of Mission Indians is submitting this letter of commitment to confirm that Morongo Band Of Mission Indians has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; [Morongo Band Of Mission Indians agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

[Morongo Band of Mission Indians] understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (Examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I G. Michael Milhiser, commit Morongo Band of Mission Indians to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 3 day of 2016.





**DROPPED OUT**

RAMONA BAND OF CAHUILLA

56310 Highway 371, Suite B
Post Office Box 391670
Anza, California 92539

Tel: (951) 763-4105
Fax: (951) 763-4325
Website: www.ramona-nsn.gov
Email: admin@ramona-nsn.gov

"A SOVEREIGN NATION"

August 23, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

The Ramona Band of Cahuilla ("Band"), a federally recognized tribe, is submitting this letter of commitment to confirm that the Band has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

The Federal Emergency Management Agency's ("FEMA") Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans, and the Band's participation will allow for a more comprehensive evaluation of hazards and proposed mitigation measures through the coordination at the county, regional, or watershed level.

The Band agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The Band understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Band's Multi-Jurisdictional Hazard Mitigation Plan by the Band's governing body.

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Joseph D. Hamilton, Chairman, commit the Ramona Band of Cahuilla to participation in the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Please feel free to contact the Band's administrative offices at (951)763-4105 if you have any questions or wish to discuss this matter further.

Respectfully,

Joseph D. Hamilton
Chairman, Ramona Band of Cahuilla





QUALITY EDUCATION
A Shared Commitment

**BEAUMONT UNIFIED SCHOOL DISTRICT**

BOARD OF TRUSTEES

ADMINISTRATION

**June 15, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, Beaumont Unified School District is submitting this letter of commitment to confirm that Beaumont Unified School District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Beaumont Unified School District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Beaumont Unified School District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

550 W. Brookside Avenue • PO Box 187 • Beaumont • California • 92223-0187 • Tel: (951) 845-1631

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I *Terrence Davis*, commit *Beaumont Unified School District* to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13th day of July, 2016

*(Jurisdiction official's signature)*

350 W. Brookside Avenue • PO Box 187 • Beaumont • California • 92223-0187 • Tele: (951) 845-1631





Desert Sands Unified School District
47-950 Dune Palms Road • La Quinta, California 92253 • (760) 777-8567 • FAX: (760) 771-8574
BOARD OF EDUCATION: Michael Duran, Donald B. Griffith, Wendy Jonathan, Matteo Monica III, Gary Tomak
SUPERINTENDENT: Dr. Gary Rutherford
Security Services • (760) 771-8046 • FAX: (760) 771-8713
Jeff Kaye, Director of Security & Safety Services

**June 14, 2016**

**Desert Sands Unified School District**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Desert Sands Unified School District is submitting this letter of commitment to confirm that The Desert Sands Unified School District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; The Desert Sands Unified School District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The Desert Sands Unified School District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.

- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Jeff Kaye, Director of Security and Safety, commit the Desert Sands Unified School District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 14 day of June 2016

Jeff Kaye

Director of Security and Safety Services
Desert Sands Unified School District





June 13, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

**Subject: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning**

Dear Riverside County Emergency Management Department:

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Eastern Municipal Water District is submitting this letter of commitment to confirm that Eastern Municipal Water District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Eastern Municipal Water District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Eastern Municipal Water District understands that it must engage in the following planning process, as described in FEMA's Local Multi-Hazard Mitigation Planning Guidance dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;

2270 Trumble Road • P.O. Box 8300 • Perris, CA 92572-8300
T 951.928.3777 • F 951.928.6177 emwd.org

Kim Saruwatari
June 13, 2016
Page 2

- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and.
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Douglas Hefley, commit Eastern Municipal Water District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 13th day of June, 2016.

Sincerely,

Douglas Hefley
Director of Safety, Risk and Emergency Management

DH:sr

EASTERN MUNICIPAL WATER DISTRICT





HEMET UNIFIED SCHOOL DISTRICT

Dr. Barry L. Kayrell
Superintendent

Dr. LaFaye Platter
Deputy Superintendent
Dr. David Horton
Assistant Superintendent
Vince Christakos
Assistant Superintendent

Professional Development Service Center
1791 W. Acacia Avenue
Hemet, CA 92545
(951) 765-5100
Fax: (951) 765-5115

Professional Development Academy
2085 W. Acacia Avenue
Hemet, CA 92545
(951) 765-5100
Fax: (951) 765-6421

www.hemetusd.org

Governing Board
Marilyn Forst
Megan Haley
Vic Scavarda
Patrick Scarl
James Smith
Ross Valenzuela
Joe Wojcik

Hemet Unified School District
Lucy M. Dressel, Director of Safety/Risk Management/Benefits
1791 West Acacia Avenue
Hemet, CA 92545

May 26th, 2016

Hemet Unified School District

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level. Hemet Unified School District is submitting this letter of commitment to confirm that Hemet Unified School District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Hemet Unified School District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Hemet Unified School District understands that it must engage in the following planning process, as described in FEMA's Local Multi-Hazard Mitigation Planning Guidance dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant

Dr. Barry L. Kayrell
Superintendent

Dr. LaFaye Platter
Deputy Superintendent
Dr. David Horton
Assistant Superintendent
Vince Christakos
Assistant Superintendent

Professional Development Service Center
1791 W. Acacia Avenue
Hemet, CA 92545
(951) 765-5100
Fax (951) 765-5115

Professional Development Academy
2085 W. Acacia Avenue
Hemet, CA 92545
(951) 765-5100
Fax (951) 765-6421

www.hemetusd.org

Governing Board
Marilyn Forst
Megan Haley
Vic Scavarda
Patrick Scarl
James Smith
Ross Valenzuela
Joe Wojcik

involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Lucy M. Dressel, commit Hemet Unified School District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 26th day of May 2016

Lucy M. Dressel, Director of Safety/Risk Management/Benefits





**June 8, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the High Valleys Water District is submitting this letter of commitment to confirm that the High Valleys Water District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the High Valleys Water District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The High Valleys Water District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Ernest B. Wright, commit the High Valleys Water District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 8th day of June, 2016

Ernest B Wright

*Ernest B. Wright*





**Idyllwild Fire Protection District**
PO Box 656
Idyllwild, CA 92549
(951) 659-2153

Thursday, June 09, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Idyllwild Fire Protection District (IFPD) is submitting this letter of commitment to confirm that the IFPD has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; the IFPD agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The IFPD understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings,

Page 1 of 2

contributing research, data, or other information, commenting on drafts of the plan, etc.); and

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Patrick Reitz, Fire Chief, commit the Idyllwild Fire Protection District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 9th day of June, 2016.

Patrick Reitz
Fire Chief

Page 2 of 2





IID

www.iid.com

*A century of service.*

**June 8, 2016**

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Imperial Irrigation District is submitting this letter of commitment to confirm that Imperial Irrigation District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Imperial Irrigation District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Imperial Irrigation District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,

- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Gary D. Hatfield, Jr , commit Imperial Irrigation District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 8th day of June





KAISER PERMANENTE
Riverside Service Area
10800 Magnolia Ave.
Riverside, CA. 92505

**August 3, 2016**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, Kaiser Permanente Riverside Service Area is submitting this letter of commitment to confirm that Kaiser Permanente Riverside Service Area has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Kaiser Permanente Riverside Service Area agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Kaiser Permanente Riverside Service Area understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

KAISER PERMANENTE
Riverside Service Area
10800 Magnolia Ave.
Riverside, CA. 92505

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan: I, Corrie Sankey, commit Kaiser Permanente Riverside Service Area to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 2 day of August 2016

Corrie Sankey
Director, Environmental Health and Safety
Emergency Management





# Lake Elsinore Unified School District

**Governing Board**

Stan Crippen
**Trustee Area 1**

Susan E. Scott
**Trustee Area 2**

Heidi Matthies Dodd
**Trustee Area 3**

Juan Saucedo
**Trustee Area 4**

Harold E. Stryker
**Trustee Area 5**

**Administration**

Dr. Doug Kimberly
**Superintendent**

Dr. George Landon
**Deputy Superintendent Administrative & Fiscal Support Services**

Dr. Gregory J. Bowers
**Assistant Superintendent Facilities & Operations Support Services**

Dr. Alain Guevara
**Assistant Superintendent Administrative & Educational Support Services**

Dr. Kip Meyer
**Assistant Superintendent Personnel Support Services**

Sam Wenzel
**Executive Director Personnel Support Services**

**(951) 253-7000**

545 Chaney Street
Lake Elsinore, CA 92530

www.leusd.k12.ca.us

June 8, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Lake Elsinore Unified School District (LEUSD) is submitting this letter of commitment to confirm that LEUSD has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; LEUSD agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

LEUSD understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Dr. Gregory J. Bowers, commit Lake Elsinore Unified School District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 8th day of June 2016

Dr. Gregory J. Bowers, Assistant Superintendent
Facilities & Operations Division





**DROPPED OUT**

**DEPARTMENT OF THE AIR FORCE**

**AIR FORCE RESERVE COMMAND**

13 June 2016

Riverside County Emergency Management Department

Kim Saruwatari, Director

4210 Riverwalk Pkwy, Ste. 300

Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, March ARB is submitting this letter of commitment to confirm that March ARB has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; March ARB agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

March ARB understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;

- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Marvin J. Tucker, commit March ARB to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

MARVIN J. TUCKER, GS-11, DAF

Chief, Emergency Management





**Board of Education**
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Gary S. Baugh, Ed.D.
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**Superintendent of Schools**
Judy D. White, Ed.D.

***Moreno Valley Unified School District***

*25634 Alessandro Boulevard*
*Moreno Valley, California 92553*
*951-571-7500*
*www.mvusd.net*

*The mission of Moreno Valley Unified School District is to ensure all students graduate high school prepared to successfully enter into higher education and/or pursue a viable career path.*

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Moreno Valley Unified School District is submitting this letter of commitment to confirm that Moreno Valley Unified School District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Moreno Valley Unified School District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Moreno Valley Unified School District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I *Darryl Scott*, commit *Moreno Valley Unified School District* to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 14 day of June

Signature of Director of Safety and Security, Darryl Scott

PERRIS UNION
HIGH SCHOOL DISTRICT
155 E. Fourth Street, Perris, CA 92570
951-943-6369
puhsd.org @puhsd PerrisUnionHSD

**Superintendent:** Jonathan L. Greenberg, Ed.D.

**Grant Bennett**
Assistant Superintendent
Educational Services

**Candace Reines**
Assistant Superintendent
Business Services

**Tonya Davis**
Chief Human
Resources Officer

**Joseph Williams**
Executive Director
Technology

April 1, 2016

**PARTICIPATING JURISDICTION**

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, Perris Union High School District is submitting this letter of commitment to confirm that Perris Union High School District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Perris Union High School District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Perris Union High School District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.

Board of Trustees: Edward Agundez - Dr. Jose Luis Araux - Joan D. Cooley - David C. Nelissen - Carolyn A. Twyman





- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I *Judy Miller, Director of Risk Management and Environmental Safety*, commit Perris Union High School District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 31st day of May

Board of Trustees: Edward Agundez - Dr. Jose Luis Araux - Joan D. Cooley - David C. Nelissen - Carolyn A. Twyman

**Rancho Water**

Board of Directors

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Interim Director of Operations & Maintenance

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District Secretary

**James B. Gilpin**
**Best Best & Krieger LLP**
General Counsel

June 30, 2016

**RIVERSIDE COUNTY EMERGENCY MANAGEMENT DEPARTMENT**
Ms. Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

**SUBJECT: LETTER OF COMMITMENT AS PARTICIPATING JURISDICTION IN RIVERSIDE COUNTY OPERATIONAL AREA MULTI-JURISDICTIONAL HAZARD MITIGATION PLANNING**

Dear Ms. Saruwatari:

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Rancho California Water District (RCWD/District) is submitting this letter of commitment to confirm that RCWD has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; RCWD agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and

**Rancho California Water District**
42135 Winchester Road • Post Office Box 9017 • Temecula, California 92589-9017 • (951) 296-6900 • FAX (951) 296-6860 • www.ranchowater.com





Riverside County Emergency Management Department
June 30, 2016
Page 2

- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I *Dave Morrison Safety Officer*, commit *Rancho California Water District* to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 30th day of June

Should you have any questions regarding this matter, please contact me at the District office at (951) 296-6900.

Sincerely,

**RANCHO CALIFORNIA WATER DISTRICT**

Dave Morrison
Safety Officer

090\DT

**Rancho California Water District**
42135 Winchester Road • Post Office Box 9017 • Temecula, California 92589-9017 • (951) 296-6900 • FAX (951) 296-6860 • www.ranchowater.com

RCCD | RIVERSIDE COMMUNITY COLLEGE DISTRICT

OFFICE OF THE CHANCELLOR

MORENO VALLEY COLLEGE | NORCO COLLEGE | RIVERSIDE CITY COLLEGE

**June 1, 2016**

## PARTICIPATING JURISDICTION

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Riverside Community College District is submitting this letter of commitment to confirm that Riverside Community College District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; The Riverside Community College District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The Riverside Community College District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.

3801 Market Street
Riverside, CA 92501
(951) 222-8800
Fax (951) 682-5339
www.rccd.edu





Riverside County Emergency Management Department
June 1, 2016
Page 2

- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I *Michael L Burke, Ph.D.*, commit *Riverside Community College District* to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 1st day of June

Michael L. Burke

Michael L. Burke, Ph.D.

RIVERSIDE COUNTY OFFICE OF EDUCATION
KENNETH M. YOUNG
Riverside County Superintendent of Schools

3939 Thirteenth Street
P.O. Box 868
Riverside, California
92502-0868
(951) 826-6530

47-110 Calhoun Street
Indio, California
92201-4779
(760) 863-3000

24980 Las Brisas Road
Murrieta, California
92562-4008
(951) 600-5651

**Riverside County Board of Education**

Jeanie B. Corral
Bruce N. Dennis
Jay N. Hoffman, Ed.D.
Susan J. Rainey, Ed.D.
Elizabeth F. Romero
Wendel W. Tucker, Ph.D.
Ralph R. Villani, Ed.D.

May 26, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy., Ste. 300
Riverside, CA 92505

Re: **Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning**

Dear Riverside County Emergency Management Department:

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level. The Riverside County Office of Education is submitting this letter of commitment to confirm that Riverside County Office of Education has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Riverside County Office of Education agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Riverside County Office of Education understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;





Riverside County Emergency Management Department
May 26, 2016
Page 2

- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and,
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Teresa Hyden, Chief Business Official, commit Riverside County Office of Education to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 1st day of June, 2016

Teresa Hyden
Chief Business Official
Division of Administration and Business Services
(951) 826-6790 / FAX [951] 826-6974

MD:amn
c: Michael D'Amico, Coordinator, Safety and Emergency Preparedness

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Dr. I. Angelov Farooq

**Riverside Unified School District**

ADMINISTRATION BUILDING
3380 14TH STREET - P. O. BOX 2800
RIVERSIDE, CALIFORNIA 92516

OFFICE OF THE ASSISTANT SUPERINTENDENT
OPERATIONS DIVISION
951-788-7135, Extension 80413
FAX: 951-778-5668

David C. Hansen
District Superintendent

RUSD
Innovation in Education

Riverside County Emergency Management Department
Kim Saruwatari
Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Ms. Saruwatari,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Riverside Unified School District is submitting this letter of commitment to confirm that the Riverside Unified School District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning, the Riverside Unified School District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

The Riverside Unified School District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction;





Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning
June 8, 2016
Page 2

- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and,
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I Kirk R. Lewis, commit the Riverside Unified School District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 8th day of June, 2016.

Kirk R. Lewis
Assistant Superintendent, Operations

August 10, 2016

Riverside County Emergency Management Department

Kim Saruwatari, Director

4210 Riverwalk Pkwy, Ste. 300

Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department:

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the San Jacinto Unified School District (SJUSD) is submitting this letter of commitment to confirm that SJUSD has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; SJUSD agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department to complete the plan in conformance with FEMA requirements.

SJUSD understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area





- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.)
- Documentation of an effective process to maintain and implement the plan
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan and by adoption of resolution from the Board of Trustees (attached), I commit San Jacinto Unified School District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Sincerely,

Diane Perez

Superintendent

# Santa Ana Watershed Project Authority

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SAWPA

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Celeste Cantú
General
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Orange
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Western
Municipal
Water District

Eastern
Municipal
Water
District

San
Bernardino
Valley
Municipal
Water
District

Inland
Empire
Utilities
Agency

June 14, 2016

Kim Saruwatari, Director
Riverside County Emergency Management Department
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

**Re: Letter of Commitment as Participating Jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning**

Dear Ms. Saruwatari:

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, the Santa Ana Watershed Project Authority (SAWPA) is submitting this letter of commitment to confirm that SAWPA has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; SAWPA agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

SAWPA understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction;
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.);
- Documentation of an effective process to maintain and implement the plan; and
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

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www.sawpa.org • www.sawpa.org/OWOW







Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I, Celeste Cantú, General Manager, commit SAWPA to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

You may contact Richard Haller at 951.354.4240 or rhaller@sawpa.org with any questions.

Sincerely,

Celeste Cantú
General Manager

John V. Rossi
General Manager

Robert Stockton
Division 1

Thomas R. Evans
Division 2

Brenda Dennstedt
Division 3

Gerard D. Delaney
Division 4

S. R. "Al" Lopez
Division 5

Securing Your Water Supply

May 31, 2016

Riverside County Emergency Management Department
Kim Saruwatari, Director
4210 Riverwalk Pkwy, Ste. 300
Riverside, CA 92505

Re: Letter of Commitment as participating jurisdiction in Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Planning

Dear Riverside County Emergency Management Department,

As the Federal Emergency Management Agency's (FEMA) Local Mitigation Plan requirements under 44 CFR §201.6 specifically identify criteria that allow for multi-jurisdictional mitigation plans and that many issues are better resolved by evaluating hazards more comprehensively by coordinating at the county, regional, or watershed level, Western Municipal Water District is submitting this letter of commitment to confirm that Western Municipal Water District has agreed to participate in the County of Riverside Emergency Management Department's Multi-Jurisdictional Hazard Mitigation Planning.

Further, as a condition to participating in the mitigation planning; Western Municipal Water District agrees to meet the requirements for mitigation plans identified in 44 CFR §201.6 and to provide such cooperation as necessary and in a timely manner to the County of Riverside Emergency Management Department's to complete the plan in conformance with FEMA requirements.

Western Municipal Water District understands that it must engage in the following planning process, as described in FEMA's *Local Multi-Hazard Mitigation Planning Guidance* dated July 1, 2008, including, but not limited to:

- Identification of hazards unique to the jurisdiction and not addressed in the master planning document;
- The conduct of a vulnerability analysis and an identification of risks, where they differ from the general planning area;
- The formulation of mitigation goals responsive to public input and development of mitigation actions complementary to those goals. A range of actions must be identified specific for each jurisdiction.
- Demonstration that there has been proactive participation in the planning process by all community stakeholders (examples of participation include relevant involvement in any

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planning process, attending meetings, contributing research, data, or other information, commenting on drafts of the plan, etc.); and
- Documentation of an effective process to maintain and implement the plan; and,
- Formal adoption of the Multi-Jurisdictional Hazard Mitigation Plan by the jurisdiction's governing body (each jurisdiction must officially adopt the plan).

Therefore, with a full understanding of the obligations incurred by participating in the FEMA hazard mitigation planning process as a participant in a multi-jurisdictional plan; I John V. Rossi, commit Western Municipal Water District to the County of Riverside Emergency Management Department Multi-Jurisdictional Hazard Mitigation Planning effort.

Executed this 4th day of June 2016,

John V. Rossi, General Manager

JVR:tm

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# APPENDIX C – Mitigation Action Table

## 2012 Plan Strategies Updated Status

### Mitigation Actions Table

| Type of Hazard | Mitigation Actions | Departments/ Jurisdictions | Status Update |
|---|---|---|---|
| **ALL** | Incorporate Updated Local Hazard Mitigation Plan into Riverside County General Plan | Transportation, Land Management Agency and Riverside Office of Emergency Services | Recently updated and approved on December 2015 by Board of Supervisors. Adopted 2015, which includes a new reference to implement the Local Hazard Mitigation Plan within the Safety Element. |
| **DROUGHT** | Construct reservoirs and water tanks to increase water storage | Water Conservation, Agriculture and County Fire | On-going, no update has been made |
| **EARTHQUAKE** | CREWS Earthquake Mitigation Project | County-wide | Ongoing process of recruiting non-participating cities in the Coachella Valley area into the early earthquake warning program. |
| **FIRE** | Purchase Masticator to remove vegetation and brush in heavily populated areas prone to fires. | Riverside County Fire | No change. Project still on hold due to lack of funding during budget cuts. Potential future purchase |
| **FIRE** | Shake Shingle Roof Replacement Project | Idyllwild | In 2013 Mountain Communities Fire Safe Council was awarded a FEMA grant to replace hazardous shake/wood shingle roofs in the San Jacinto WUI (Wildland Urban Interface) One hundred homes were reroofed with Class A roofing material. The grant was completed in October 2016. |

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| **FIRE** | Single Tree Removal – removed dying and dead trees. | Idyllwild | Ongoing - Nearing Closeout: dead and dying trees are continuously monitored and removed as needed. |
| **FIRE** | Hazard Abatement- Fuel treatment program to remove 1120 acres of natural fuel | Mountain Communities Fire Safe Council Program - Idyllwild | Reducing fuels on private property in the San Jacinto WUI is an on-going activity of Mountain Fire Safe Council. To date, more than 1,600 acres have been treated with the financial help of grant funds awarded to MCFSC |
| **FLOOD** | Norco Storm Drain This project is an underground storm drain which will address flooding along Pedley Avenue/Sixth Street. | Riverside County Flood Control | Project completed on 04/05/2011. |
| **FLOOD** | Santa Ana River, Norco Bluffs [Corps Project] – Stabilization Project is a Corps of Engineers project that consists of a soil cement to protection structure constructed to the 100-year flood level at the base of the bluff. | Riverside County Flood, Transportation Land Management Agency and Riverside County Fire | The bluff stabilization work was completed in 2004. The District is continuing to work with the Corps on wrapping up the project, including completion of a Project Operation and Maintenance Manual. Once the Corps approves the O&M Manual, the project can be transferred to the District for ownership, operation and maintenance. |
| **FLOOD** | Temescal Creek-Foster Road Storm Drain (2-8-00493-01) - This project is an underground storm drain in Foster Road extending from Interstate 15 to Temescal Creek. | Riverside-Corona Resource Conservation District Riverside County Flood Control | Project completed on 09/01/2015 |
| **FLOOD** | Dillon Road – State Hwy 62 Road Project to clear debris. Road has 25 dips that cause flooding during storms. | Transportation, Land, Management Agency Riverside County Fire | Ongoing; The current action plan is to barricade the low dip sections when they are flooded and remove the storm debris when the water recedes. |
| **FLOOD** | Underground storm drain which will extend | Flood Control and City of Norco | Finished approximately in Spring 2011 |





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| | approximately 1,300 feet south in Pedley Avenue from Norco MDP Line NA in Sixth Street. This project will address localized flooding along Pedley Avenue. | | |
| **FLOOD** | Restore 100 yr level flood protection to the three million residents within the floodplain downstream, the Corps proposes to increase both the storage capacity of Prado Dam, and its outlet discharge capacity. The embankment will be raised 30 feet, while the spillway sill will be raised 20 feet and the gated discharge capacity will be tripled. | Flood Control | **Part 1** of this project involving Riverside County Flood Control and TLMA was completed<br><br>**Part 2** of this project involving only Riverside County Flood Control is still pending approval |
| **FLOOD** | Ultimate channel improvements for the existing interim channel from 6th Street to the terminus near Rose Court. | City of Norco | Project has not started. No estimation on start date. The District is currently working on 60% design plans and anticipates 90% design plans will be completed by next year (2017). FEMA processing will be necessary to revise the currently mapped floodplain once the construction is completed. |
| **FLOOD** | Ultimate improvements to the existing channel between Parkridge Avenue and River Road. The channel is planned as a concrete lined open channel | City of Norco and Riverside County Transportation Land Management Agency | Project began Circa 7/2013 and was finished Circa 2/2014. Lead Agency was RCFC & WCD |
| **FLOOD** | Underground storm drain extending from the existing Stage 1 near Pedley Avenue, east in 7th Street to California Avenue then south in California approximately 800 feet to a sump. | Transportation, Land, & Management Agency and Flood Control | Project completed on 04/05/2011 |

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| **FLOOD** | Collection of "mitigation" charges from builders in Mockingbird Canyon with the intention of providing relief to flood prone properties in the lower canyon | Mockingbird Canyon | In process of collecting funds. Charging investors $500 per lot. Talks about whether to keep this project or abandon it. Considered a “mini” ADP (Area Drainage Project) |
| **FLOOD** | Storm Drain Last portion will be constructed as part of the same contract as the Ontario Avenue Storm Drain project | City of Corona | Project completed on 04/24/2012, Project revised on 04/25/2012. |
| **FLOOD** | A 1,050-foot drain to de-water a sump in Frank Avenue in the south Mira Loma area | Riverside County Flood Control and City of Eastvale | Project completed on 01/31/2012 |
| **FLOOD** | The original project consisted of a 54 acre-foot debris basin at the southerly end of Smith Road and a concrete rectangular channel extending northerly to Cajalco Road. Mitigation required for the basin project includes removal of non-native vegetation, debris and remnants of abandoned structures as well as re-grading and establishment of native vegetation. | Riverside County Flood Control | Project completed on 01/10/2006 |
| **FLOOD** | Underground storm drain in the City of Corona extending from East Grand Boulevard north in Joy Street to Temescal Creek Channel. Design began on this project in 2003 at which time it was discovered during a field check of the preliminary drawings that a recently installed Edison conduit in Joy Street overlapped the only viable alignment for the storm drain. The street is so heavily laden with utilities here is no longer room to install a drain. | City of Corona | Designed Phase Schedule for advertisement in March 2017 |





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| **FLOOD** | Underground storm drain in Ontario Avenue extending upstream from the District's existing El Cerrito Channel at El Cerrito Road about 3,000 feet to State Street just west of Interstate 15. | Riverside County Flood Control and Transportation Land & Management Agency | Project revised on 04/25/2012 |
| **FLOOD** | Underground storm drain in Foster Road extending from Interstate 15 to Temescal Creek | Temescal Creek-Foster Road Storm Drain | Construction began in January 2015 and was completed in September 2015. |
| **FLOOD** | Multi-year plan to construct the ultimate levee system (approximately 1,200 feet river bottom width) between the existing Corps of Engineers' levee 9,500 feet upstream of State Street, and a point about 8,200 feet downstream of Sanderson Avenue, a distance of about 5 miles. Floodwalls on piles are required to be constructed over the Metropolitan Water District facilities just east of State Street. | San Jacinto and Transportation and Land Management | Funding was received in November 2015 - the levee was included in a suite of projects that received Proposition 84 grant funding from the California Department of Water Resources. The Prop 84 contribution is anticipated to be about $3.5 million. |
| **FLOOD** | Project to build MDP extending from South W. Esplanade to east Midway Street to South San Jacinto Street to collect flows from the larger Park Hill basin watershed | City of San Jacinto | Construction for the project began on April 25, 2014 and was completed on July 2, 2015. |
| **FLOOD** | Construction of an underground storm drain that extends from a proposed detention basin at the intersection of Potter Road and De Anza Drive then southwest in De Anza to Young Street. The City of San Jacinto is administering the project. | City of San Jacinto and Transportation and Land Management | Project still pending |

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| **FLOOD** | Underground storm drain from an outlet north of Holland Road southerly in Hawthorne Avenue to a collection system south of Craig Avenue | City of Menifee and Transportation and Land Management | Project Completed 3/01/2011 |
| **FLOOD** | Project is an underground storm drain that extends from near Yale Street east on Stetson Avenue approximately 1 mile to Dartmouth Street | City of Hemet | Project completed on 09/04/2007 |
| **FLOOD** | Project is an underground storm drain on Whittier Boulevard extending from the existing storm drain at Palm Avenue east to San Jacinto Street | Riverside County Flood Control and City of Hemet | Project completed on 08/23/2016 |
| **FLOOD** | Underground storm drain extending from an existing storm drain in Meridian Street near Berkeley venue south in Meridian Street to Whittier Avenue. | Riverside County Flood Control and City of Hemet | Stage 1 completed on 06/21/2016. Stage 2 still pending approval. |
| **FLOOD** | Project is for major flood control project to extend from the San Jacinto River near Goetz Road east approximately 6 miles to Juniper Flats Road and incorporates both lined and unlined open channel, underground storm drains and two major detention basins. | City of Menifee and Transportation, Land and Management Agency | Project built in 4 stages. Some stages have been completed, but others still not finished. |
| **FLOOD** | Open channel along Nuevo Road from Dunlap Drive to Perris Valley Channel | City of Perris, Riverside County Transportation and Flood Control | Under new contract: Starting Jan. 2017 and will range about 2.5 yrs. for this entire project to be completed; first part will take about 180 days to complete, but time frame will be extended. |





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| **FLOOD** | East Ironwood Avenue to Petit Street. Part of the work the City of Moreno Valley is doing in association with improvements to the Moreno Beach Drive & 60 freeway interchange. | City of Moreno Valley and Transportation and Land Management | Storm Drain Line K-1 – City completed design in 2014. Currently seeing construction funding of approximately $2.5m. |
| **FLOOD** | Project is an open channel extending from Nason Basin northeasterly approximately 2,500 feet to Ironwood Avenue | City of Moreno Valley and Transportation and Land Management Agency | Storm Drain Line K from Ironwood to the Nason Basin – RCFC&WCD secured an easement in 2014 to receive flows from Line K-1 noted above. Action completed in 2014. |
| **FLOOD**<br>**EARTHQUAKE** | Norco Streambank Stabilization. Project consists of a soil cement toe protection structure constructed to the 100-year flood level at the base of the bluff, and a stable earthen buttress fill constructed to the top of the bluff from I-15 Bridge to Center Avenue | Riverside County Flood Control and Transportation Land & Management Agency | Project Completed |
| **FLOOD**<br>**EARTHQUAKE** | Stabilization of Interstate 15 near Alhambra Street, as a part of the Prado Dam enlargement feature of the Santa Ana River Mainstream Project at no cost to the District. The project involves the construction of a toe-protection-only structure from Hamner Avenue downstream to approximately 5th Street | Transportation Land Management Agency | Project still pending |
| **LANDSLIDE**<br>**EARTHQUAKE**<br>**FLOOD** | Proposed improvements include installation of slope protection along the Green River Mobile Home Park, as well as the exposed slopes adjacent to the Green River Homeowners Association and Highway 91 just downstream of Highway 71. | Transportation and Land Management Agency | **Phase 2A-The** District has completed its acquisition of the necessary easements and fee interests from Riverside County and private lands. Acquisition of the necessary easements and fee interests from Caltrans is ongoing. Construction of Phase 2A was completed in Fiscal Year |

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| | | | 2015/2016.**Phase 2B-Construction** of this segment was completed in Fiscal Year 2014/2015. |





## 2017 New Mitigation Strategies

### 2017 Mitigation Actions Table

| Type of Hazard | Mitigation Actions | Departments/ Jurisdictions | Status Update/Timeframe | Potential Funding Source |
|---|---|---|---|---|
| **All Hazards** | CERT Training and retention | Riverside County Emergency Management Department | July 2018 – Ongoing<br>On-going for the life of the current plan (yrs. 2018-2023). There will be one training in each of the county districts per year to ensure community members throughout the county get the opportunity to refresh and reinforce their CERT skills. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Homeland Security Program (SHSP) |
| **All Hazards** | Continue to utilize the Safety Element of the Riverside County General Plan and the Riverside County FD Master Plan as base documents to implement goals, objectives, and mitigation actions | All Riverside County Departments | On-going for the life of the current plan (yrs. 2018-2023). The Safety Element in the General Plan is continuously updated as new information and changes arise. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Earthquake** | Working with CalOES & FEMA to revise the Southern California Catastrophic Earthquake Response Plan | All Cities in Riverside County | On-going for the life of the current plan (yrs. 2018-2023). Riverside County will continue to collaborate with Cal OES/ FEMA to improve and update this plan as needed. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |

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| **Earthquake** | Reviewed Office of Statewide Health Planning and Development (OSHPD), Structural Performance Categories and Nonstructural Performance Categories (SPC/NPC) Ratings of Acute Care Hospital Buildings and reported the findings at EM Healthcare Coalition | Riverside County Emergency Management Department & Riverside County Hospitals | On-going for the life of the current plan (yrs. 2018-2023).These reports will continuously be reviewed to make sure they are up to date and consistent with any changes. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | Hospital Preparedness Program (HPP) Grant |
| **Earthquake** | Worked with local City Emergency Manager (EM) to address '08 Golden Guardian Riverside County Shake Out Scenario/Assumptions | Riverside County Emergency Management Department | On-going for the life of the current plan (yrs. 2018-2023). County will continuously work with City EM to update and inform of changes or thoughts to improve the annual Shake Out Scenario and help the community increase their preparedness skills. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Earthquake** | Mitigate potential seismic hazards through adoption and strict enforcement of current building codes | Riverside County Transportation, Land, Management Agency | On-going for the life of the current plan (yrs. 2018-2023). The codes will be revised and updated to be consistent with emergency measures that can help prevent earthquake impacts in county buildings. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Pandemic Flu** | Provide training on immunization techniques | Riverside University Health System-Public Health | On-going for the life of the current plan (yrs. 2018-2023). Continue training to teach any new techniques, strategies, and to ensure all staff are proficient. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | Public Health Emergency Preparedness Grant (PHEP) |





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| **Pandemic Flu** | Participated and conducted a Non-Medical Intervention Tabletop Exercise | Riverside County Emergency Management Department & Riverside University Health System-Public Health | Completed on 09/28/2015 | Pan Flu Grant PHEP Grant |
| **Pandemic Flu** | Participated and conducted a Flu vaccination exercise | Riverside County Emergency Management Department & Riverside University Health System-Public Health | Completed on 11/10/2016 | Pan Flu Grant PHEP Grant |
| **Pandemic Flu** | Generate a draft Crisis Care Plan | Riverside County Emergency Management Department & Riverside University Health System-Public Health | Completed 08/30/2016 | Pan Flu Grant PHEP Grant HPP Grant |
| **Pandemic Flu** | Training Medical Reserve Corp (MRC) in hospital surge exercises | Riverside County Emergency Management Department | Started in 2011 and is on-going for the life of the current plan (yrs. 2018-2023). Continue training to keep updating and informing volunteers to increase their skills. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | HPP Grant State Homeland Security Program (SHSP) |
| **Pandemic Flu** | Training Medical Reserve Corp. (MRC) volunteers in Alternate Care Site | Riverside County Emergency Management Department | Completed in 2014 | HPP Grant State Homeland Security Program (SHSP)Pan Flu Grant |
| **Wildland Fire** | Create wildfire protection zones that reduce the risks to citizens and firefighters from fire dangers | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously update and develop protection zones that can help decrease wildfire risks in the community. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Strengthen defensible space inspections in fire prone areas | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continue inspections in locations that are susceptible to fires. This action will be reassessed during | State Mission and/or Grant funding |

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| | | | the monitoring and update phase of the County's 2017 LHMP. | |
| **Wildland Fire** | Continue maintenance of existing fire roads throughout the county to provide fire department access | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continue keeping the roads well paved and easy to have fire trucks be able to drive on. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Fuel reduction projects throughout the county to reduce fire potential | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously improve and develop projects to lower the impact of fires in the county. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Develop and enforce construction and design standards that ensure the development incorporates fire prevention features | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously enforce and update measures to prevent fire hazards. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Conduct and implement long range fire safe planning through code adoption/policies consistent with the Safety Element of the General Plan | Riverside County Fire Department & CAL Fire & Riverside County Transportation, Land, Management Agency (Planning Division) | On-going for the life of the current plan (yrs. 2018-2023). Continuously implement code policies to integrate them into the Safety Element as they are developed/updated and approved. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Ben Clark Training Center to provide wildland fire protection related classes to fire personnel | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously make sure that this center is available to provide wildland fire protection classes to fire staff to improve their skills on fire mitigation and preparedness. This action will be reassessed during the monitoring | State Mission and/or Grant funding |





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| | | | and update phase of the County's 2017 LHMP. | |
| **Wildland Fire** | Continue wildland fire suppression/preparedness to maintain a state of readiness throughout the year | Riverside County Fire Department & CAL Fire | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide skills training to the community to be prepared for disasters. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Rapid intervention, identification and mitigation of Goldspot Oak Bore Beetle (GSOB) trees at various infestation levels on State Responsibility Area (SRA) lands throughout the county. Herbicide or tree removal if necessary | CAL Fire Unit Forester | On-going for the life of the current plan (yrs. 2018-2023).Continuously monitor infestation levels of GSOB trees to continue removing infested trees if necessary. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Rapid intervention, identification and mitigation of Pine Bark Beetle infestation, epidemic during times of drought. Removal of trees that are symptomatic or the use of pesticide when applicable | CAL Fire Unit Forester | On-Going for the life of the current plan (yrs. 2018-2023).Continuously monitor infestation levels of Pine Bark Beetle to continue removing infested trees or to continue using pesticides if necessary. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Wildland Fire** | Continue Truck Trail and road maintenance to provide access for fire suppression vehicles and personnel. | CAL Fire Unit Forester | On-Going for the life of the current plan (yrs. 2018-2023). Continuously preserve and improve Truck Trail and roads, if needed, for rapid available access to fire suppression vehicles. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |

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| **Wildland Fire** | Continue Fire Road maintenance of culverts and road prisms in open space areas on SRA land to allow for adequate drainage. | CAL Fire<br><br>Unit Forester | On-Going for the life of the current plan (yrs. 2018-2023). Continuously preserve and improve culverts and road prisms, if needed, for sufficient drainage. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | State Mission and/or Grant funding |
| **Electrical Failure** | Coordinated with Southern California Edison to be included in their power outage notifications | Riverside County Emergency Management Department | On-going for the life of the current plan (yrs. 2018-2023). EMD joined SoCal Edison's recipient list as of Dec. 2016 to continuously be informed of any emergency notifications to help prevent electrical failure impacts. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Emergent Disease/ Contamination** | Drafted a Region VI Highly Contagious Disease Transportation Plan | Riverside County Emergency Management Department | Completed on 12/08/2016 | HPP Grant<br>Ebola Grant |
| **Emergent Disease/ Contamination** | Facilitated a Region VI Highly Contagious Disease Transportation Tabletop Exercise | Riverside County Emergency Management Department | Completed on 09/29/2016<br><br>The situation manual for this was completed on 11/14/2016 | HPP Grant<br>Ebola Grant |
| **Emergent Disease/ Contamination** | Drafted a Riverside County Viral Hemorrhagic Fever Preparedness and Response Plan (VHF Plan) | Riverside County Emergency Management Department & Riverside University Health System-Public Health | Completed on 11/2016 | HPP Grant<br>Ebola Grant |
| **Cyber Attack** | **Enterprise Intrusion Prevention System (IPS)**<br>Protects the county network from Internet-based threats and attacks (~140,000 attacks/day on average) | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continue to update and maintain the IPS network to protect the county from any form of cyber-attacks or threats. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |





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| **Cyber Attack** | **Enterprise Breach Detection System**<br>Inspects all internal/lateral county network traffic for indicators of compromise (IOCs) enabling the ISO to rapidly detect, respond to, contain, and prevent cyber-attacks, malware outbreaks, network reconnaissance, data exfiltration, and C2 (command & control) and botnet activities | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously inspect the county network to detect forms of threats or attacks. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Cyber Attack** | **Albert Sensor**<br>Monitors and reports to the Center for Internet Security (CIS) Multi-State Information Sharing and Analysis Center (MS-ISAC) all Domain Name System (DNS) and NetFlow traffic for correlation with the Department of Homeland Security's threat intelligence database for real-time alerting of malicious network connections to blacklisted IP address on the Internet | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously maintain the Albert Sensor in order keep having the association with the Department of Homeland Security's database on alerting network threats for the county. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |

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| **Cyber Attack** | **Countywide Security Awareness Training**<br>SANS Securing The Human information security and privacy training modules deployed on county learning management system (LMS) Educates our workforce on how to be extra vigilant and things to look out for to avoid falling victim to a targeted attack | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to the county's workforce on signs of cyber-attacks and prevent them from being a victim of these attacks. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Cyber Attack** | **Enterprise Security Information Event Management (SIEM)**<br>Serves as the county's centralized security event log management repository and correlation engine | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continue to maintain the SIEM to monitor and prevent security threats. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Cyber Attack** | **Enterprise Internet Proxy (Web Filter)**<br>Prevents county employees and malware from accessing compromised/malicious websites and C2 (command & control) servers, in addition to non-county authorized websites based on category/content filtration policies/rules | Riverside County Technology Information | May 2017 – December 2018<br><br>Product (Blue Coat Proxy Advance Secure Gateway (ASG)) has been procured and is in the process of being deployed. | County General Fund |





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| **Cyber Attack** | **Governance, Risk, & Compliance (GRC) Software Suite**<br>Platform on which our security operations (active network monitoring, breach detection, incident response, business impact analysis, threat containment/eradication, alerting/reporting, process workflow automation, security audits, risk assessments/register, regulatory compliance checks) will be carried out | Riverside County Technology Information | Implementation estimated to begin in June 2017 – July 2018.<br><br>Product (RSA Archer GRC) has been procured and is in the process of being deployed. | County General Fund |
| **Cyber Attack** | **Security Operations Center (SOC)**<br>Planning phase completed, construction estimated to begin in September 2017 | Riverside County Information Technology | September 2017 – September 2018.<br><br>The County's Cyber Security Operations Center (SOC) is under construction. | County General Fund |
| **Cyber Attack** | **Information Security Forum (ISF)**<br>Convene on a quarterly basis with department information security officers/liaisons to discuss key security topics, risk trends, and other related matters, including:<br><br>Formation of a Critical Security Incident Response Team (CSIRT) | Riverside County Information Technology | October 2018 – ongoing<br><br>This forum will be on-going for the life of the current plan (yrs. 2018-2023). Will continue to conduct constant security incident/breach simulations and tabletop exercises that can help prevent cyber-attacks in the future. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP.<br><br>The ISO is in the process of identifying members to serve on the Critical Security Incident | County General Fund |

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| | Conducting security incident/breach simulations and tabletop exercises | | Response Team (CSIRT). Estimated timeline for formation and initial kickoff meeting is October 2018. | |
| **Terrorist Event** | SWAT team trained to respond to terrorism events | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to reflect personnel attrition and train on new tactics. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Terrorist Event** | Hazard Device Team trained to respond to terrorism events | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to reflect personnel attrition and train on new tactics and trends. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Terrorist Event** | Sheriff Emergency Response Team trained to respond to terrorism events | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to reflect personnel attrition and train on new trends. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Terrorist Event** | Sheriff personnel are assigned to the Joint Terrorism Task Force | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously integrate new sheriff personnel to improve this group's structure and capabilities. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Terrorist Event** | Ben Clark Training Center provides terrorism related classes for Law | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Classes are funded each year through the State Homeland Security Program (SHSP) to | County General Fund |





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| | Enforcement and First Responders. | | continuously educate and train personnel on new skills and improve their abilities. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | |
| **Terrorist Event** | Tactical response training | Riverside County Sheriff & Riverside County Fire Department | On-going for the life of the current plan (yrs. 2018-2023). Continuously train and improve on tactical response. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Communications Failure** | **County of Riverside Network (CORNET)**<br>Redundant Internet connections<br><br>Backbone links are configured with a mesh topology to provide full redundancy | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously configure links to prevent the termination of internet connections. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |
| **Communications Failure** | **Enterprise Voice Network (VoIP)**<br>Centralized SIP trunking for ingress/egress PSTN access via 8 geographically separated locations<br><br>Carrier failover protection for inbound voice traffic<br><br>Enterprise call processing for VoIP Endpoints are logically and physically separated into 3 datacenters ensuring a High- | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide accessibility to phone carrier connection and call processing. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |

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| | Availability solution<br><br>Remote site routers configured for SRST; in times of WAN outages, local IP Phones will re-register to local equipment, providing inter-site calling and access to the PSAP via carrier provided analog circuits | | | |
| **Communications Failure** | **Enterprise Best Practices**<br>Internal escalation contact list for all essential personal readily available<br><br>24x7 On-Call staffing availability for both Voice and Data Networks<br><br>Vendor support available at 24x7x4 for all critical Network and Voice equipment<br><br>Regular professional staff training on emerging technologies<br><br>Frequent equipment configuration backups to SAN Critical Enterprise level equipment is located at facilities with full battery and generator backup power | Riverside County Technology Information | On-going for the life of the current plan (yrs. 2018-2023). Continue to update contact list when staff support is needed in case of emergencies. Continue to train staff on technologies that arise and equip facilities with power backup supplies. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |





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| **Communications Failure** | **Enterprise Emergency Notification System**<br>InformaCast Advanced on-premise notification solution for immediate reach to the County's 20,000+ VoIP endpoints<br><br>InformaCast Mobile cloud-based notification solution to extend the County's reach off-network to mobile devices such as cellular phones and tablets | Riverside County Technology Information | On-Premise solution has been rolled out to all County VoIP endpoints.<br><br>Mobile Solution has been rolled out to EMD.<br><br>Mobile solution is ready to be rolled out to other departments as requested.<br><br>On-going for the life of the current plan (yrs. 2018-2023). Continue to have a notification system to be able to have the ability to connect with off-network devices in case of a communications failure, including Wi-Fi. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund<br><br>Department Funds; departments who wish to take advantage of this service will be billed back to the departments based on how many users |
| **Communications Failure** | **Network Connectivity**<br>Use of Cellular based redundant WAN links for critical county locations.<br><br>Introduction of MPLS technologies to provide alternate network paths for County locations | Riverside County Technology Information | Several locations have purchased a Cellular based redundant WAN link .<br><br>Solution can be purchased by other departments. Installation can take up to 6 weeks to install, based on equipment availability.<br><br>On-going for the life of the current plan (yrs. 2018-2023). Continue to provide alternate network paths for County locations in the case of a communication failure. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund<br><br>Department Funds; billable by the cellular carrier to requesting departments |

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| **Flood** | **University Wash Channel, Stage 3 Project No. 221-1-8-00120-03-12** This project will increase public safety and improve local economics by retrofitting an older, built-out commercial/industrial area with drainage infrastructure to alleviate repeated flood damage to existing businesses. The project will also address street and intersection flooding | Riverside County Flood Control and Water Conservation District | Notice To Proceed 2/21/17<br><br>Completed 11/14/17 | Riverside County Flood Control funds<br><br>Cost: $3,044,500 |
| **Flood** | **Monroe MDP – Monroe Channel Project No. 1-8-00071 Stage 4** At request of the City of Riverside, replacement of City's existing open channel with underground reinforced concrete box with 10-year storm capacity. Project limits are from California Avenue upstream to Magnolia Avenue | Riverside County Flood Control and Water Conservation District | Expected to be advertise in 4th Quarter 2016<br><br>Notice to Proceed 8/30/17<br><br>Completed 5/01/18 | Riverside County Flood Control funds<br><br>Cost:$2,489,067 |
| **Flood** | **Jurupa – Pyrite MDP Line A-2 Project No. 1-8-00234 Stage 1** Master planned lateral stormdrain to Jurupa Channel. Project is east-west drain crossing | Riverside County Flood Control and Water Conservation District | 30% Plans & R/W Acquisition as of 1/10/17<br><br>Projected Start: 9/2018<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $338,332 |





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| | Agate Street about 1,000 feet south of Jurupa Road. Outlet point at Jurupa Channel is unimproved and likely to remain so | | | |
| **Flood** | **University MDP Line 3 Project No. 1-8-09020 Stage 1** The MDP proposes Line 3 as approximately 2,900 feet of 30" RCP east in Blaine Street then northeast to Blaine Street Retention Basin. The Blaine Street Retention Basin is located 600 feet north of Blaine Street between Valencia Hill Drive and Mt. Vernon Avenue. Budgeted for scoping study and evaluation of FEMA map floodplain limits only | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>Projected Start: 12/2020<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $2,926,028 |
| **Flood** | **Santa Ana River Stabilization Project No. 1-8-00010 Stg. 90** The USACE is expected to initiate restoration of the federally constructed reach of the Santa Ana River Levee system downstream of San Bernardino County line to Tequesquite. Exact form of | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $10,685,000 |

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| | project not set. Work will likely include repair of groins and toe protection | | | |
| **Flood** | **Box Springs Dam – Outlet Modification Project No. 1-8-00041** Reconstruct outlet structure to prevent blockage from sediment accumulation | Riverside County Flood Control and Water Conservation District | Pending until Woodcrest Dam is complete<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $981,842 |
| **Flood** | **Sycamore Dam – Outlet Structure Modifications Project No. 1-8-00042** This project will upgrade the level of safety and serviceability. Initial project components include the repair/reinforcement of the existing outlet channel; construction of a new debris rack structure; erosion controls on the embankment of the dam; construction of a safer access road into the facility; design for a safer routing of flood waters from the emergency spillway to Central Avenue; and the installation of a control section to measure outflow from the outlet pipe | Riverside County Flood Control and Water Conservation District | Pending until Woodcrest Dam is complete<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $1,854,991 |





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| | of the dam. Completion of this project is planned to follow the Woodcrest Dam Outlet Modification project. | | | |
| **Flood** | **Alessandro Dam Outlet Modification Project No. 1-8-00043**<br><br>Reconstruct outlet structure to prevent blockage from sediment accumulation | Riverside County Flood Control and Water Conservation District | Pending until Woodcrest Dam is complete<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $907,682 |
| **Flood** | **Prenda Dam Outlet Modification Project No. 1-8-00044** Reconstruct outlet structure to prevent blockage from sediment accumulation | Riverside County Flood Control and Water Conservation District | Pending until Woodcrest Dam is complete<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $1,238,312 |
| **Flood** | **Woodcrest Dam Outlet Modification Project No. 1-8-00045** This project will upgrade the level of safety and serviceability. The approved Project Charter identifies the primary scope of work for the project as follows: design and construction of a new inlet structure to reduce potential for clogging of the outlet works; | Riverside County Flood Control and Water Conservation District | Development of design plans and specifications on hold until latest Geotechnical investigation is complete<br><br>Projected Start: March 2019<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $2,216,529 |

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| | rehabilitation of the existing outlet gate assembly and control stem; implementation of an automated gate control system; rehabilitation of the outlet pipe; restoration of the outlet channel; and installation of surficial erosion controls on the surface of the dam embankment. Once completed, this project will serve as an example for performing similar upgrades to the remaining Riverside Reservoirs | | | |
| **Flood** | **North Norco Channel Stage 10 Project No. 222-2-8-00140-10-12** The project is located just upstream of River Road within the city of Norco in Riverside County, California. This project consists of approximately 550 lineal feet of triple cell reinforced concrete box and 125 lineal feet of open concrete channel transition, will replace the existing interim dirt channel. The project remedies ongoing flooding | Riverside County Flood Control and Water Conservation District | Completed 9/9/14 | Riverside County Flood Control funds |





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| | problems in the area thus resulting in positive impacts to residents and businesses | | | |
| **Flood** | **Corona MDP Line 5 Stage 1 Project No. 2-8-00280** This project includes the construction of an underground storm drain beginning in Sherman Avenue south of Railroad Street and extending down Railroad Street westerly to Smith Street. The City is willing to undertake the design and construction of this project using District funding. | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $1,397,201 |
| **Flood** | **Corona MDP Line 52 Stage 1 Project No. 2-8-00350** An underground storm drain extending north from Third Street along E. Grand Boulevard then under the 91 Freeway to Temescal Creek Channel | City Of Corona | Notice to Proceed 7/29/17<br><br>Expected Completion: Summer 2018 | Riverside County Flood Control funds<br><br>City of Corona Funds<br><br>Cost: $4,522,000 |
| **Flood** | **Coldwater Canyon Structural Improvements Project 2-8-00505** Proposed conceptual improvements include 1) reducing | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $6,005,806 |

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| | flood risk and nuisance to traveling public on Temescal Canyon Road at the intersection of Glen Ivy Road; and 2) an armored berm along the east bank of Coldwater Wash downstream of the intersection of Temescal Canyon Road and Glen Ivy Road. The armored berm would prevent the migration of the active Coldwater Wash Channel, thereby protecting the west side of the Mountain Cove Development. Conceptual improvements are pending friendly acquisition of the underlying parcels needed for the project | | | |
| **Flood** | **Coldwater Canyon Floodplain Acquisition Project No. 2-8-00505**<br>Funded portion of project includes a hydrologic and geomorphologic assessment of Coldwater Canyon Wash from Glen Ivy Road to Temescal Wash. Study will evaluate the stability of Coldwater Canyon | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: included in the $6,005,806 amount for Coldwater Canyon Structural Improvement project listed above |





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| | Wash and recommend potential minimalist interventions, if necessary, to protect Squaw Mountain Bridge and prevent erosion of Painted Hills development canyon slopes along Coldwater Canyon Wash. Balance of funds would support potential interventions recommended by the report including floodplain buyout | | | |
| **Flood** | **Southeast Compton Wash At Corona Sanitary landfill Project No. 2-8-09054**<br>Riverside County Waste Management District has requested assistance solving ongoing flooding and erosion problems along the southeast side of the landfill | Riverside County Waste Management District** | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $500,000 |

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| **Flood** | **Lake Mathews Estates Water Quality Pond Project No. 2-8-09058** Proposed in the "Drainage Water Quality Management Plan for the Lake Matthews Watershed", this roughly 10-acre project is to be located on the south side of Cajalco Road about ¾-mile west of Wood Road. The project will capture first flush runoff from Cajalco Creek and carry it to an off-channel pond to be treated and/or infiltrated | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $2,794,983 |
| **Flood** | **Temescal Wash Floodplain Project No. 2-8-00052** Acquisition of floodplain area for flood protection, water conservation and habitat mitigation banking | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $23,534,000 |
| **Flood** | **Arroyo Del Toro Channel Stage 1 Project No. 223-3-8-00170-01-12** This project collects flows that pass under Interstate 15, flow through the cemetery and flood the intersection of Riverside Drive | Riverside County Flood Control and Water Conservation District | Completed 6/16/15 | Riverside County Flood Control funds |





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| | and Collier Avenue. The flows will now be collected in a channel and conveyed via an underground storm drain system to the Collier Marsh area | | | |
| **Flood** | **Ortega Channel Retrofit Project No. 3-8-00070** Project will replace a portion of the clog-prone storm drain with a more easily accessible and maintainable open channel | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $1,628,761 |
| **Flood** | **LITTLE LAKE MDP LINE B, STG 1 STETSON AVENUE CHANNEL, STG 7 aka HEMET MDP LINE D Project Nos. 224-4-8-00265-01-12 224-4-8-00211-07-12** The District constructed a segment of the District's Little Lake MOP Line B. This infrastructure will diminish neighborhood flooding and damage to private property and businesses and improve the safety of the traveling public during storm events. This new drain will also permanently reduce | Riverside County Flood Control and Water Conservation District | Stage 1 Completed 06/21/16<br><br>Stage 2 Pending approval Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $6,398,777 |

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| | flood-related street maintenance and repair costs for the City of Hemet. Little Lake MDP Line B Stage 1 is located primarily within the City of Hemet, with small portions extending into the City of San Jacinto and unincorporated Riverside County beginning approximate 300 feet north of Berkley Ave and terminating approximately 200 feet south of Florida | | | |
| **Flood** | **Homeland MDP Line 2, Stage 2 Project No. 224-4-8-00337-02-12** The District constructed a segment of drainage infrastructure described in the District's Romoland Master Drainage Plan as Romoland MOP Line A, Stages 4, 5 and 6, Romoland MOP Lines A-2 and A-3, Stage 1, and Briggs Basin. In conjunction with the District's Homeland MDP Line 1, Stage 1, completion of this drainage infrastructure will reduce the | Riverside County Flood Control and Water Conservation District | Completed 6/5/12 | Riverside County Flood Control funds |





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| | floodplain by approximately 1, 762 acres and enable revisions to the FEMA Flood Insurance Rate Maps that result in a significant reduction in flood insurance premiums. The District's Homeland MDP Line 1, Stage 1 project is currently ongoing with an anticipated completion in February 2017 | | | |
| **Flood** | **Sunnymead MDP Line P-6 Stage 2 Project No. 224-4-8-00716-02-12** The District constructed a segment of drainage infrastructure described in the District's Sunnymead Master Drainage Plan which remedies ongoing flooding problems in the area thus resulting in positive impacts toresidents and businesses. | Riverside County Flood Control and Water Conservation District | Completed 3/25/2014 | Riverside County Flood Control funds |
| **Flood** | **San Jacinto MDP Line C, Stage 2, Lines C-4, C-5 & B Project No. 224-4-8-00124-02-12** The District constructed a segment of drainage | Riverside County Flood Control and Water Conservation District | Completed 6/30/15 | Riverside County Flood Control funds |

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| | infrastructure described in the District's San Jacinto Master Drainage Plan, which remedies the ongoing flooding problems at the intersections of San Jacinto Avenue and Menlo Avenue, San Jacinto Avenue and Midway Street, and Santa Fe Street and Midway Street. Consequently, the removal of ponding water at these intersections during storm events improves traffic and pedestrian safety and public access to the businesses along San Jacinto and Menlo Avenues. The District partnered with the City of San Jacinto to further improve normal residential traffic safety by replacing and reconstructing Midway Street between San Jacinto Avenue and Santa Fe Street | | | |
| **Flood** | **West End Moreno MDP Line LL Project No. 224-4-8-00783-01-12** The District constructed a segment of drainage infrastructure described in the | Riverside County Flood Control and Water Conservation District | Completed 5/12/15 | Riverside County Flood Control funds |





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| | District's West End Moreno MDP which remedies ongoing flooding problems in the area, thus resulting in positive impacts to residents and businesses | | | |
| **Flood** | **Romoland MDP Line A, STGS 4,5,6, Homeland MDP Line 1 Briggs Basin, Romoland MDP Lines A-2 and A-3 Project No. 224-4-8-00310-04-12** The District constructed a segment of drainage infrastructure described in the District's Romoland Master Drainage Plan as Romoland MOP Line A, Stages 4, 5 and 6, Romoland MOP Lines A-2 and A-3, Stage 1, and Briggs Basin. In conjunction with the District's Homeland MDP Line 1, Stage 1, completion of this drainage infrastructure will reduce the floodplain by approximately 1, 762 acres and enable revisions to the FEMA Flood Insurance Rate Maps that result in a significant | Riverside County Flood Control and Water Conservation District | Completed 8/23/16 | Riverside County Flood Control funds |

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| | reduction in flood insurance premiums. The District's Homeland MDP Line 1, Stage 1 project is currently ongoing with an anticipated completion in February 2017 | | | |
| **Flood** | **Little Lake MDP Line B Stage 2 Project No. 4-8-00265**<br>An underground storm drain from just south of Florida Avenue, southerly in Meridian Street to Whittier Avenue. | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $6,804,257 |
| **Flood** | **San Jacinto River Stage 3 Project No. 4-8-00020**<br>"Stage 3" covers the nearly 10-mile river reach beginning at the entrance to Railroad Canyon and ending upstream at the Ramona Expressway crossing near the Bernasconi Hills. This environmentally and fiscally challenged project has been through several evolutions and has been essentially dormant for nearly a decade. Funding shown is for intensive planning/engineerin | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>Projected Start: 11/2019<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>ADP (Area Drainage Plan) Funds<br><br>Cost: $70,000,000 |





| | | | | |
|---|---|---|---|---|
| | g study of options for managing future development. Goal is to develop a viable project for the San Jacinto River from Ramona Expressway to Railroad Canyon considering flood management, transportation, environmental and other opportunities and constraints | | | |
| **Flood** | **Gilman Home Channel Lateral A Stage 3 Gilman Home Channel Stage 90 Project No. 225-5-8-00171-03-12**<br>The District constructed a segment of drainage infrastructure described in the District's Banning Master Drainage Plan which remedies ongoing flooding problems in the area, thus resulting in positive impacts to residents and businesses. Moreover, this project will enable revision of the FEMA Flood Insurance Rate Maps in the impacted area resulting in a significant reduction in flood insurance premiums. Many | Riverside County Flood Control and Water Conservation District | Completed 9/22/15 | Riverside County Flood Control funds |

| | | | | |
|---|---|---|---|---|
| | owners with federally insured home loans will realize savings of several thousands of dollars per year | | | |
| **Flood** | **Beaumont MDP Line 16 Stage 1 Project No. 5-8-00201** Project would build MDP Line 16 in Grand Avenue from Beaumont Cherry Valley Water District (BCVWD) infiltration ponds easterly to Bellflower Avenue as an element of a cooperative project with the BCVWD to provide both flood control and storm water capture to recharge groundwater | Riverside County Flood Control and Water Conservation District | Pending approval<br><br>Projected Start: 12/2020<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $5,353,074 |
| **Flood** | **Eagle Canyon Dam Stage 1 Project No. 6-8-00190** The District constructed a segment of drainage infrastructure described in the District's Palm Springs Master Drainage Plan. Construction of this project also includes remediation of potentially hazardous and nonhazardous illegally dumped | Riverside County Flood Control and Water Conservation District | Completed 11/17/15 | Riverside County Flood Control funds |





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|---|---|---|---|---|
| | materials and remedies ongoing flooding problems in the area, thus resulting in positive impacts to residents and businesses. Additionally, Palm Springs MDP Line 43 and Lateral 43A, the underground dam outlet, is currently under construction and completion is anticipated for February 2016. Completion of the underground infrastructure will enable revisions to the FEMA Flood Insurance Rate Maps in the impacted area immediately downstream of Eagle Canyon and will result in a significant reduction in flood insurance premiums | | | |
| **Flood** | **Palm Springs MDP Line 43 and Lateral 43A Project No. 226-6-8-00163-01-12** The District constructed a segment of drainage infrastructure described in the District's Palm Springs Master Drainage Plan as Palm Springs MOP Line 43 and Lateral | Riverside County Flood Control and Water Conservation District | Completed 3/15/16 | Riverside County Flood Control funds |

| | | | | |
|---|---|---|---|---|
| | 43A. Construction of this project serves as the underground outlet to the District's Eagle Canyon Dam facility that was completed on September 21, 2015 with the Notice of Completion accepted by the Board as Agenda Item Number 11-1 on November 17, 2015. Completion of both District facilities will enable revisions to the FEMA Flood Insurance Rate Maps in the impacted area immediately downstream of Eagle Canyon Dam and will result in a significant reduction in flood insurance premiums | | | |
| **Flood** | **Murrieta Creek Channel (Phase II & III) Project No. 7-8-00021** Murrieta Creek Flood Control Project from Old Town Temecula to Elm Street in Murrieta | Riverside County Flood Control and Water Conservation District/United States Army Corps of Engineers* | Pending approval<br><br>5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $82,000,000 |
| **Flood** | **Whitewater River Levee Restoration Project No. 6-8-00250** Restoration work to increase freeboard and bring levee | Riverside County Flood Control and Water Conservation District | Pending – Full scope of restoration work not yet established but funding figure shown is based on preliminary engineer's estimate | Riverside County Flood Control funds<br><br>Cost:1,260,000 |





| | | | | |
|---|---|---|---|---|
| | adjacent to Cimarron Golf Resort into compliance with FEMA certification guidelines | | 5 year CIP (Capital Improvement Plan)<br><br>Projected start and end: during the life of the plan (2018-2023) | |
| **Flood** | **Palm Canyon Wash – Cherley Creek Levee Restoration Stage 90 Project No. 6-8-00040** Major construction to bring levee serving small tributary upstream of South Palm Canyon Wash into compliance with FEMA certification guidelines. Project will be combination of RSP and soil-cement lined channel and levee | Riverside County Flood Control and Water Conservation District | Expected Advertise Date: 2nd Quarter 2018<br><br>Projected Start: 08/2019<br><br>Projected End: during the life of the plan (2018-2023) | Riverside County Flood Control funds<br><br>Cost: $6,187,021 |
| **Flood** | **Banning MDP Line D-2 Stage 1 Project No. 5-8-00169** This project is over one mile of underground storm drain that connects to the existing Ramsey Street Storm Drain at the intersection of Hargrave Street and Ramsey Street. It includes Line D-2, Stage 1 which will continue northerly along Hargrave Street for approximately 5,250 feet before terminating at Indian School | RCFC/City of Banning | Notice to Proceed: 5/15/17<br><br>Completed: 2/27/18 | Riverside County Flood Control funds |

| | | | | |
|---|---|---|---|---|
| | Lane. Line D-2A, Stage 1 will tie into Line D-2 at the intersection of Hargrave Street and Theodore Street. Line D-2A will continue westerly along Theodore Street for approximately 600 feet before terminating at Florida Street. | | | |
| **Civil Disorder** | Trained and equipped Mobile Field Force Teams throughout the county | Riverside County Sheriff | On-going for the life of the current plan (yrs. 2018-2023). Continuously provide training to reflect personnel attrition; Less-lethal equipment acquired. This action will be reassessed during the monitoring and update phase of the County's 2017 LHMP. | County General Fund |





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# APPENDIX D – Public Outreach Presentations and Meetings

Please see Attachment D: Agendas and Sign-ins for supporting documentation.

Continue to Next Page.





## Public Outreach Presentations and Updates

| Date | Name of Meeting, Location | Type of Presentation | Number Attending | Hours |
|---|---|---|---|---|
| 6/22/2016 | Western Riverside Emergency Council (WREC) Meeting, Riverside | Informed Council of upcoming Plan update and encouraged participation | 19 | 20 mins. |
| 7/14/2016 | Operational Area Planning Committee (OAPC) Meeting, Beaumont | Informed OA on upcoming Plan to update | 163 | 15 mins |
| 9/19/2016 | Palo Verde COMM. Meeting, Blythe, CA. | LHMP discussion, Local Hazard Mitigation Plan update process, encouraged East County participation and Public Outreach | 16 | 1 |
| 9/29/2016 | Email Distribution #1 | Email blast, Distributed contact verification emails for partnering jurisdictions and agencies. Provided LHMP informational guides and resources. | – | – |
| 10/6/2016 | Local Hazard Mitigation Plan Steering Committee Kick-Off for County Departments | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>Update Process<br>County Inventory Checklist<br>County Risk Assessment<br>Participants, New, Returning, and Not Participating | 19 | 2 |
| 10/11/2016 | Emergency Management Project Committee | Project Overview, LHMP introduction, planning process | 34 | 10 mins. |
| 10/13/2016 | Operational Area Planning Committee (OAPC) Meeting, Beaumont | Updated OA on progress of update, offered participants opportunity to reach out to county for technical support, offered public opportunity to ask questions and provide comment (no comments made) | 64 | 2 |

| | | | | |
|---|---|---|---|---|
| 10/19/2016 | Steering Committee Email Distribution #1 | Informed the members of the google drive that contains LHMP documentation for additional support<br>Informed about the next steps and what about the next meeting date<br>Provided contact information for EMD LHMP staff | – | – |
| 12/1/2016 | Email Distribution #2 | Invitation to LHMP Template workshop, update on county hazard identification/ranking, and general information on where they should be in the update process | – | – |
| 12/6/2016 | Tribal Workshop, Riverside | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>County Update Process and Progress<br>Mitigation Websites and Resources<br>Technical Support | 7 | 1 |
| 12/8/2016 | City Workshop, Riverside | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>County Update Process and Progress<br>Mitigation Websites and Resources<br>Technical Support | 15 | 2 |
| 12/8/2016 | Mountain Emergency Communications COMM. Meeting, Idyllwild, CA | LHMP discussion, Local Hazard Mitigation Plan update process | 7 | 2 |
| 12/13/2016 | Special District Workshop, Riverside | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>County Update Process and Progress<br>Mitigation Websites and Resources<br>Technical Support | 8 | 1 |
| 12/15/2016 | School District Workshop, Riverside | Overview of Hazard Mitigation<br>FEMA 2011 LHMP Review Guide<br>County Update Process and Progress<br>Mitigation Websites and Resources<br>Technical Support | 7 | 2.5 |
| 12/15/2016 | Northwest COMM. Meeting, Jurupa Valley, CA | LHMP discussion, Local Hazard Mitigation Plan update process | 12 | 2 |





| | | | | |
|---|---|---|---|---|
| 12/20/2016 | Southwest COMM. Meeting, Murrieta, CA | LHMP discussion, Local Hazard Mitigation Plan update process | 6 | 2 |
| 12/29/2016 | Steering Committee Email Distribution #2 | Sent each member questions about specific hazards that pertained to the department they work for | – | – |
| 1/4/2017 | Email Distribution #3 | Informed LHMP participants of additional LHMP workshops that will be hosted to provide further assistance | – | – |
| 1/11/2017 | Local Hazard Mitigation Plan Steering Committee, Riverside | Group Discussion, Hazard Identification/Ranking Final Review, Mitigation Actions and Strategies Brainstorm | 16 | 2 |
| 1/12/2017 | Operational Area Planning Committee (OAPC) Meeting, Beaumont | Updated OA on progress of update, offered participants opportunity to reach out to county for technical support, offered public opportunity to ask questions and provide comment (no comments made) | 74 | 2 |
| 1/19/2016 | Steering Committee Email Distribution #3 | Thanked all members for participating in the previous meeting<br>Provided the risk scores of the hazards that were discussed at the previous meeting<br>Provided the most current updates for the mitigation actions from 2012 & asked for each of them to provide new actions for current county hazards<br>Informed about the next meeting date | – | – |
| 2/7/2017 | City Workshop, Riverside | Answered LHMP questions & concerns<br>Provided additional assistance if needed Reviewed LHMP drafts if needed | 10 | 1 |
| 2/8/2017 | School District Workshop, Riverside | Answered LHMP questions & concerns<br>Provided additional assistance if needed Reviewed LHMP drafts if needed | 2 | 1 |
| 2/9/2017 | Special District Workshop, Riverside | Answered LHMP questions & concerns<br>Provided additional assistance if needed Reviewed LHMP drafts if needed | 4 | 1 |

| | | | | |
|---|---|---|---|---|
| 2/14/2017 | Email Distribution #4 | Informed LHMP participants about the final 2017 LHMP County Hazard Ranking. Talked about a possible LHMP Training that EMD is deciding on hosting. Informed about the Senate Bills 1000 & 379. Provided a link to help participants obtain maps for their jurisdiction if they are having trouble with Hazus | – | – |
| 2/23/2017 | Email Distribution #5 | Informed LHMP participants about the cancellation of the April workshops due to the substation of having the LHMP FEMA Training Informed about the confirmation of the FEMA G-318 Training that will be hosted April 3-4 and provided the sign-up link Informed that the June workshops are still going to be held to provide any additional assistance on the plan | – | – |
| 3/1/2017 | Steering Committee Reminder Email | Reminded members that the date for submitting new mitigation actions for the current top 10 county hazards was approaching | – | – |
| 3/15/2017 | Palo Verde COMM. Meeting, Blythe, CA | LHMP discussion, Local Hazard Mitigation Plan update process | 18 | 1.5 |
| 4/21/2017 | Steering Committee Email Blast #4 | Provided minutes from previous meeting, informed about reviewing LHMP mitigation actions and goals/objectives, sent calendar invite for next meeting | – | – |
| 4/24/2017 | Steering Committee Email | Sent selected committee members to provide input on LHMP hazard profiles depending on the hazard that corresponds to the department they represent | – | – |
| 6/5/2017 | Tribal Workshop, Riverside | Answered LHMP questions & concerns Provided additional assistance if needed Reviewed LHMP drafts if needed | 4 | 1 |





| | | | | |
|---|---|---|---|---|
| 6/6/2017 | City Workshop, Riverside | Answered LHMP questions & concerns Provided additional assistance if needed Reviewed LHMP drafts if needed | 8 | 1 |
| 6/7/2017 | School District Workshop, Riverside | Answered LHMP questions & concerns Provided additional assistance if needed Reviewed LHMP drafts if needed | 6 | 1 |
| 6/8/2017 | Special District Workshop, Riverside | Answered LHMP questions & concerns Provided additional assistance if needed Reviewed LHMP drafts if needed | 6 | 1 |
| 7/13/2017 | Operational Area Planning Committee (OAPC) Meeting, Beaumont | Updated OA on progress of update, offered participants opportunity to reach out to county for technical support, offered public opportunity to ask questions and provide comment (no comments made) | | 2 |
| 8/17/2017 | Local Hazard Mitigation Plan Steering Committee, Riverside | Review completed sections for finalization | 10 | 1 |
| 9/2/2017 | Indio Preparedness Month Booth, Home Depot, at 42100 Jackson Street from 9 a.m. - 12 p.m. | Personal preparedness and mitigation information | | 3 |
| 9/5/2017 | Twitter Post | LHMP and NFIP information | | |
| 9/9/2017 | Riverside Preparedness Month Booth, Galleria at Tyler, 1299 Galleria at Tyler from 11 a.m. - 3 p.m. | Personal preparedness and mitigation information | | 4 |
| 9/9/2017 | Farm Barn, Wildomar Preparedness and Mitigation Presentation | Personal preparedness and mitigation information | | 1 |
| 9/12/2017 | County Preparedness Month Booth, County of Riverside Administration Center, 4080 Lemon | Personal preparedness and mitigation information | | 5 |

| | | | | |
|---|---|---|---|---|
| | Street, from 10:30 a.m. - 1:30 p.m. | | | |
| 9/16/2017 | Lake Elsinore Preparedness Month Booth, 710 W. Graham Ave., Lake Elsinore, CA | Personal preparedness and mitigation information | | 4 |
| 9/16/2017 | Perris Preparedness Month Booth, Walmart, 1800 N. Perris Blvd from 8 a.m. - 12 p.m. | Personal preparedness and mitigation information | | 4 |
| 9/23/2017 | Jurupa Valley Preparedness Month Booth, K-Mart, 7840 Limonite Avenue from 8 a.m. - 12 p.m. | Personal preparedness and mitigation information | | 4 |
| 9/30/2017 | Hemet Preparedness Month Booth, Hemet Valley Mall, 2200 W. Florida Ave. from 8 a.m. - 12 p.m. | Personal preparedness and mitigation information | | 4 |





## LHMP Private Meetings Attended

| Date | Location | Type of Meeting | Number Attending | Hours |
|---|---|---|---|---|
| 8/24/2016 | City Emergency Operations Center, Riverside | One to One Assistance LHMP Process Familiarity and HAZUS/GIS information | 3 | 1 |
| 11/10/2016 | Hemet Fire Administration Building, Hemet | Plan review, update process and clarification assistance | 3 | 2.5 |
| 11/15/2016 | Riverside EMD | Plan review, update process and clarification assistance | 2 | 1 |
| 12/13/2016 | Conference call to Mather | CA SHMPT Quarterly Meeting | N/A | 4.5 |
| 12/14/2016 | Hemet | Plan review, update process and clarification assistance | 3 | 2 |
| 12/15/2016 | Moreno Valley | Plan review, update process and clarification assistance | 6 | 1 |
| 2/7/2017 | Riverside EMD | Plan review, update process and clarification assistance | 2 | 1 |
| 3/14/2017 | Perris | Participation with Eastern Municipal Water Districts Planning Committee | 10 | 2.5 |
| 3/15/2017 | Riverside EMD | Plan review, update process and clarification assistance | 3 | 5 |
| 3/28/2017 | Riverside EMD | Plan review, update process and clarification assistance | 3 | 2 |
| 3/29/2017 | Beaumont Police Department | Plan review, update process and clarification assistance | 4 | 2 |
| 4/11/2017 | Mather | CA SHMPT Quarterly Meeting | N/A | 4.5 |
| 4/11/2017 | Murrieta Fire Administration | Plan review, update process and clarification assistance | 4 | 1.15 |
| 4/13/2017 | Cathedral City Fire Station | Plan review, update process and clarification assistance | 2 | 2 |
| 4/20/2017 | Banning City Hall | Plan review, update process and clarification assistance | 3 | 1.5 |
| 4/20/2017 | Desert Sands USD | Plan review, update process and clarification assistance | 4 | 2 |
| 4/25/2017 | Calimesa City Hall | Plan review, update process and clarification assistance | | |

| | | | | |
|---|---|---|---|---|
| 4/25/2017 | Temecula City Hall | Plan review, update process and clarification assistance | 4 | 1.15 |
| 4/26/2017 | Perris | Participation with Eastern Municipal Water Districts Planning Committee | 6 | 2 |
| 4/27/2017 | San Jacinto City Hall | Meeting with City Manager and staff to discuss joining the County LHMP | 5 | |
| 5/1/2017 | Moreno Valley USD | Plan review, update process and clarification assistance | 3 | 1.5 |
| 5/1/2017 | Lake Elsinore USD | Plan review, update process and clarification assistance | 2 | 1.15 |
| 5/2/2017 | Banning - High Valley Water District | Plan review, update process and clarification assistance | 3 | 2 |
| 5/3/2017 | Indian Wells & Palm Desert | Plan review, update process and clarification assistance | 2 | 7 |
| 5/9/2017 | La Quinta City Hall | Plan review, update process and clarification assistance | 2 | 1.5 |
| 5/17/2017 | Beaumont Police Department | Plan review, update process and clarification assistance | 5 | 1.5 |
| 5/18/2017 | Desert Hot Springs | Plan review, update process and clarification assistance | 3 | 3 |
| 5/24/2017 | Riverside EOC | Participation in Riversides LHMP planning meeting | 6 | 1 |
| 5/25/2017 | Wildomar City Hall | Plan review, update process and clarification assistance | 3 | 2 |
| 5/25/2017 | San Jacinto City Hall | Plan review, update process and clarification assistance | 2 | 2.5 |
| 5/31/2017 | Murrieta Fire Administration | Plan review, update process and clarification assistance | 3 | 3 |
| 6/19/2017 | Riverside EMD | LHMP and HMGP assistance for La Quinta | 2 | 1 |
| 9/18/2017 | Riverside Flood Control | LHMP and HMGP information presentation/meeting with Riverside County Flood Control Staff for potential Mitigation Action Project | 5 | 2 |





# APPENDIX E – Inventory Template

RIVERSIDE COUNTY MULTI-JURISDICTIONAL

LOCAL HAZARD MITIGATION AGENCY

2016 INVENTORY WORKSHEETS

Insert Jurisdiction/Agency Name
Insert Date

# TABLE OF CONTENTS

Introduction: These documents are meant to be discussed, used and reviewed by a multi-disciplinary team. The Participation by a wide range of stakeholders who play a role in identifying and implementing mitigation actions is required.

*SPECIAL CONCERNS:*

1. *Has the completed Letter of Commitment been returned to EMD? EMD must forward this completed Letter of Commitment to CAL OES.*
2. *Has the completed Letter of Participation been returned to EMD?*

| | |
|---|---|
| 1. Local Jurisdiction Contact Information | Page 3 |
| 2. Hazard Identification Questionnaire | Pages 4-6 |
| 3. Specific Hazards Summary | Page 7 |
| 4. Jurisdiction Vulnerability Worksheet | Pages 8-9 |
| 5. Jurisdiction Mitigation Strategies and Goals | Pages 10-14 |
| 6. Local Jurisdiction Proposed Mitigation Action and Strategy Proposal | Pages 14-16 |
| 7. Local Jurisdiction Development Trends | Pages 17-18 |
| 8. Appendix A-Plan Review Tool | Pages A1-10 |

Appendix A the Plan Review Tool for your reference. This is the document Cal OES and FEMA will utilize to verify that all of the required information is in the submitted documents. Please refer to the document for information.





## 1. LOCAL JURISDICTION CONTACT INFORMATION

The information on this page identifies:

- Jurisdiction and the contact person
- Jurisdiction's service area size and population
- EOP Plan and a Safety Element of their General Plan

PLEASE PROVIDE THE FOLLOWING INFORMATION:

| | | | | |
|---|---|---|---|---|
| Agency/Jurisdiction: | | | | |
| Type Agency/Jurisdiction: | | | | |
| Contact Person: | Title: | | | |
| First Name: | | Last Name: | | |
| Agency Address: | Street: | | | |
| | City: | | | |
| | State: | | | |
| | Zip: | | | |
| Contact Phone | | | FAX | |
| E-mail | | | | |
| Population Served | | Square Miles Served | | |

| | |
|---|---|
| Does your organization have a general plan? | |
| Does your organization have a safety component to the general plan? | |
| What year was your plan last updated? | |

| | |
|---|---|
| Does your organization have a disaster/emergency operations plan? | |
| What year was your plan last updated? | |
| Do you have a recovery annex or section in your plan? | |
| Do you have a terrorism/WMD annex or section in your plan? | |

**2. Hazard Identification Questionnaire**

The purpose of the questionnaire is to help identify the hazards within your service area. The list was developed from the first round of meetings with the various working groups in the 2012 plan creation, and from the hazards listed in the County's General Plan. Each hazard is discussed in detail in the 2012 LHMP. The information will be used as the basis for each jurisdiction to evaluate its capabilities, determine its needs, and to assist in developing goals and strategies. The information identifies:

a) What hazards can be identified within or adjacent to the service area of the jurisdiction.
b) Which of those hazards have had reoccurring events
c) What specific hazards and risks are considered by the jurisdiction to be a threat specifically to the jurisdiction? ( These locations should be identified by name and location for inclusion in the Specific Hazard Summary Table).
    a. Specific types of facilities owned and operated by the jurisdiction.
    b. Locations damaged from prior disasters or hazard causing events.
d) Information about the jurisdiction's EOC

With your Multi-Disciplinary Planning Team:

a. Instructions for Updating Jurisdictions, with your planning team: Review your old Questionnaire for accuracy and relevance, mark changes.

b. Instructions for New Jurisdictions and Special Districts, with your planning team, meet and go over the questionnaire. Fill in YES, NO or NA on the Questionnaire.





## HAZARD IDENTIFICATION QUESTIONNAIRE

| DOES YOUR ORGANIZATION HAVE: | |
|---|---|
| AIRPORT IN JURISDICTION | |
| AIRPORT NEXT TO JURISDICTION | |
| DAIRY INDUSTRY | |
| POULTRY INDUSTRY | |
| CROPS/ORCHARDS | |
| DAMS IN JURISDICTION | |
| DAMS NEXT TO JURISDICTION | |
| LAKE/RESERVOIR IN JURISDICTION | |
| LAKE/RESERVOIR NEAR JURISDICTION | |
| JURISDICTION IN FLOOD PLAIN | |
| CONTROLLED FLOOD CONTROL CHANNEL | |
| UNCONTROLLED FLOOD CONTROL CHANNEL | |
| EARTHQUAKE FAULTS IN JURISDICTION | |
| EARTHQUAKE FAULTS NEXT TO JURISDICTION | |
| MOBILE HOME PARKS | |
| NON-REINFORCED FREEWAY BRIDGES | |
| NON-REINFORCED BRIDGES | |
| BRIDGES IN FLOOD PLAIN | |
| BRIDGES OVER OR ACROSS RIVER/STREAM | |
| ROADWAY CROSSING RIVER/STREAM | |
| NON REINFORCED BUILDINGS | |
| FREEWAY/MAJOR HIGHWAY IN JURISDICTION | |
| FREEWAY/MAJOR HIGHWAY NEXT TO JURISDICTION | |
| FOREST AREA IN JURISDICTION | |
| FOREST AREA NEXT TO JURISDICTION | |
| WITHIN THE 50 MILES SAN ONOFRE EVACUATION ZONE | |
| MAJOR GAS/OIL PIPELINES IN JURISDICTION | |
| MAJOR GAS/OIL PIPELINES NEXT TO JURISDICTION | |
| RAILROAD TRACKS IN JURISDICTION | |
| RAILROAD TRACKS NEXT TO JURISDICTION | |
| HAZARDOUS WASTE FACILITIES IN JURISDICTION | |
| HAZARDOUS WASTE FACILITIES NEXT TO JURISDICTION | |
| HAZARDOUS STORAGE FACILITIES IN JURISDICTION | |
| HAZARDOUS STORAGE FACILITIES NEXT TO JURISDICTION | |
| **DOES YOUR ORGANIZATION OWN OR OPERATE A FACILITY** | |
| IN A FLOOD PLAIN | |
| NEAR FLOOD PLAIN | |
| NEAR RAILROAD TRACKS | |
| NEAR A DAM | |
| UPSTREAM FROM A DAM | |
| DOWNSTREAM FROM A DAM | |
| DOWNSTREAM OF A LAKE | |
| DOWNSTREAM FROM A RESERVOIR | |
| NEAR A CONTROLLED FLOOD CONTROL CHANNEL | |
| NEAR UNCONTROLLED FLOOD CONTROL CHANNEL | |
| ON AN EARTHQUAKE FAULT | |
| NEAR AN EARTHQUAKE FAULT | |
| WITHIN THE 50 MILE SAN ONOFRE EVACUATION ZONE | |
| IN A FOREST AREA | |
| NEAR A FOREST AREA | |
| NEAR A MAJOR HIGHWAY | |





| | |
|---|---|
| A HAZARDOUS WASTE FACILITY | |
| NEAR A HAZARDOUS WASTE FACILITY | |
| A HAZARDOUS STORAGE FACILITY | |
| NEAR A HAZARDOUS STORAGE FACILITY | |
| NON REINFORCED BUILDINGS | |
| A MAJOR GAS/OIL PIPELINE | |
| NEAR A MAJOR GAS/OIL PIPELINE | |
| **DOES YOUR ORGANIZATION HAVE ANY LOCATIONS THAT:** | |
| HAVE BEEN DAMAGED BY EARTHQUAKE AND NOT REPAIRED | |
| HAVE BEEN DAMAGED BY FLOOD | |
| HAVE BEEN DAMAGED BY FLOOD MORE THAN ONCE | |
| HAVE BEEN DAMAGED BY FOREST FIRE | |
| HAVE BEEN DAMAGED BY FOREST FIRE MORE THAN ONCE | |
| HAVE BEEN IMPACTED BY A TRANSPORTATION ACCIDENT | |
| HAVE BEEN IMPACTED BY A PIPELINE EVENT | |
| **EMERGENCY OPERATIONS INFORMATION** | |
| DOES YOUR ORGANIZATION HAVE AN EOC | |
| IS YOUR EOC LOCATED IN A FLOOD PLAIN | |
| NEAR FLOOD PLAIN | |
| NEAR RAILROAD TRACKS | |
| NEAR A DAM | |
| UPSTREAM FROM A DAM | |
| DOWNSTREAM FROM A DAM | |
| DOWNSTREAM OF A LAKE | |
| DOWNSTREAM FROM A RESERVOIR | |
| NEAR A CONTROLLED FLOOD CONTROL CHANNEL | |
| NEAR UNCONTROLLED FLOOD CONTROL CHANNEL | |
| ON AN EARTHQUAKE FAULT | |
| NEAR AN EARTHQUAKE FAULT | |
| WITHIN THE 50 MILE SAN ONOFRE EVACUATION ZONE | |
| IN A FOREST AREA | |
| NEAR A FOREST AREA | |
| NEAR A MAJOR HIGHWAY | |
| A HAZARDOUS WASTE FACILITY | |
| NEAR A HAZARDOUS WASTE FACILITY | |
| A HAZARDOUS STORAGE FACILITY | |
| NEAR A HAZARDOUS STORAGE FACILITY | |
| NON REINFORCED BUILDINGS | |
| A MAJOR GAS/OIL PIPELINE | |
| NEAR A MAJOR GAS/OIL PIPELINE | |
| **OTHER FACILITY INFORMATION ARE THERE LOCATIONS WITHIN YOUR JURISDICTION THAT:** | |
| COULD BE CONSIDERED A TERRORIST TARGET | |
| COULD BE CONSIDERED A BIO-HAZARD RISK | |

With your planning team, list the “Yes” answers and discuss. Use the information as a group to summarize your jurisdiction's hazards and vulnerabilities.

## 3. SPECIFIC HAZARDS SUMMARY

This table helps to identify the information (name, owner, location, etc.) about the specific hazards identified in the Hazard Questionnaire.

In the Summary Table, list the basic information of the hazards identified by the jurisdiction in the Hazard Identification Questionnaire as a potential threat. These specific hazards were used in the development of response plans, maps, and other analysis data.

a. Instructions for Updating Jurisdictions and Special Districts: With your planning team, review the "Yes" answers and see if there were any changes, if so summarize why there is a difference from the 2012.

b. Instructions for New Jurisdictions and Special Districts: With your planning team, review the "Yes" answers and discuss. Use the information as a group to summarize your jurisdiction's hazards and vulnerabilities.

### SPECIFIC HAZARDS SUMMARY

| Jurisdiction | Hazard Type | Hazard Name | In Jurisdiction? | Adjacent to Jurisdiction? |
|---|---|---|---|---|
| | | | | |





## 4. JURISDICTION VULNERABILITY WORKSHEET

This table is a listing of the primary hazards identified by the 2012 LHMP working groups. Each jurisdiction was asked to evaluate the potential for an event to occur in their jurisdiction by hazard. They were also asked to evaluate the potential impact of that event by hazard on their jurisdiction. The impact potential was determined based on:

1. Economic loss and recovery
2. Physical loss to structures (residential, commercial, and critical facilities)
3. The loss or damage to the jurisdictions infrastructure
4. Their ability to continue with normal daily governmental activities
5. Their ability to quickly recover from the event and return to normal daily activities
6. The loss of life and potential injuries from the event.

The jurisdictions were asked to rate the potential and severity using a scale of between 0 and 4 (4 being the most severe). The jurisdictions were also asked to rank the listed hazards as they relate to their jurisdiction from 1 to 20 (1 being the highest overall threat to their jurisdiction).

With the assistance of the RCIP Plan and County Departments, Riverside County OES conducted an extensive evaluation of the severity and probability potential for the county as a whole. The hazards were also ranked for the County. These numbers and rankings were provided to the jurisdictions as a comparison guide.

A separate table was created to address the hazards relating to agriculture and was assessed by the agriculture working group.

a. Instructions for Updating Jurisdictions and Special Districts: Please review the table, determine if your ranking from the 2012 LHMP remains the same.
b. Instructions for New Jurisdictions and Special Districts: Please evaluate the potential for an event to occur in your jurisdiction by hazard. Then, evaluate the potential impact of that event by hazard on your jurisdiction according to #1-6 from the potential impact list above.

**NOTE:** Under Medical, Pandemic was added. This was a result of the H1N1 and other incidents.

| NAME: | AGENCY: | DATE : |
|---|---|---|

| | COUNTY | | LOCAL JURISDICTION | | |
|---|---|---|---|---|---|
| **HAZARD** | **SEVERITY 0 - 4** | **PROBABILITY 0 - 4** | **SEVERITY 0 - 4** | **PROBABILITY 0 - 4** | **RANKING 1 - 20** |
| 1. EARTHQUAKE | | | | | |
| 2. WILDLAND FIRE | | | | | |
| 3. FLOOD | | | | | |
| **OTHER NATURAL HAZARDS** | | | | | |
| 4. DROUGHT | | | | | |
| 5. LANDSLIDES | | | | | |
| 6. INSECT INFESTATION | | | | | |
| 7. EXTREME SUMMER/WINTER WEATHER | | | | | |
| 8. SEVERE WIND EVENT | | | | | |
| **AGRICULTURAL** | | | | | |
| 9. DISEASE/CONTAMINATION | | | | | |
| 10. TERRORISM | | | | | |
| **OTHER MAN-MADE** | | | | | |
| 11. PIPELINE | | | | | |
| 12. AQUEDUCT | | | | | |
| 13. TRANSPORTATION | | | | | |
| 14. POWER OUTAGE | | | | | |
| 15. HAZMAT ACCIDENTS | | | | | |
| 16. NUCLEAR ACCIDENT | | | | | |
| 17. TERRORISM | | | | | |
| 18. CIVIL UNREST | | | | | |
| 19. JAIL/PRISON EVENT | | | | | |
| **MEDICAL** | | | | | |
| 20. PANDEMIC | | | | | |





## 5. JURISDICTION MITIGATION STRATEGIES AND GOALS

This comprehensive table is a listing of the various mitigation strategies, goals, and objectives developed by the 2012 LHMP working groups. The jurisdictions were also given the opportunity to list additional strategies, goals, and objectives specific to either their jurisdiction or their workgroup (i.e. the hospitals, agriculture, etc.).

### LOCAL JURISDICTION MITIGATION STRATEGIES AND GOALS

With your Planning Team

a. Instructions for Updating Jurisdictions and Special Districts: please review the table; determine if your ranking from the 2012 LHMP remains the same.

b. Instructions for New Jurisdictions and Special Districts: please follow below:

Please evaluate the priority level for each listed mitigation goal identified below as it relates to your jurisdiction or facility. If you have any additional mitigation goals or recommendations, please list them at the end of this document.

Place an H (High), M (Medium), L (Low), or N/A (Not Applicable) for your priority level for each mitigation goal in the box next to the activity.





| | **EARTHQUAKE** |
|---|---|
| | Aggressive public education campaign in light of predictions |
| | Generate new literature for dissemination to: |
| | ◊ Government employees |
| | ◊ Businesses |
| | ◊ Hotel/motel literature |
| | ◊ Local radio stations for education |
| | ◊ Public education via utilities |
| | ◊ Identify/create television documentary content |
| | Improve the Emergency Alert System (EAS) |
| | ◊ Consider integration with radio notification systems |
| | ◊ Upgrade alerting and warning systems for hearing impaired |
| | ◊ Training and maintenance |
| | Procure earthquake-warning devices for critical facilities |
| | Reinforce emergency response facilities |
| | Provide training to hospital staffs |
| | Require earthquake gas shutoffs on remodels/new construction |
| | Evaluate re-enforcing reservoir concrete bases |
| | Evaluate EOCs for seismic stability |
| | Install earthquake cutoffs at reservoirs |
| | Install earthquake-warning devices at critical facilities |
| | Develop a dam inundation plan for new Diamond Valley Reservoir |
| | Earthquake retrofitting |
| | ◊ Bridges/dams/pipelines |
| | ◊ Government buildings/schools |
| | ◊ Mobile home parks |
| | Develop educational materials on structural reinforcement and home inspections **(ALREADY DEVELOPED)** |
| | Ensure Uniform Building Code compliance |
| | ◊ Update to current compliance when retrofitting |
| | Insurance coverage on public facilities |
| | Funding for non-structural abatement (Earthquake kits, etc.) |
| | Pre - identify empty commercial space for seismic re-location |
| | Electrical co-generation facilities need retrofitting/reinforcement (Palm Springs, others?) |
| | Mapping of liquefaction zones |
| | Incorporate County geologist data into planning |
| | Backup water supplies for hospitals |
| | Evaluate pipeline seismic resiliency |
| | Pre-positioning of temporary response structures |
| | Fire sprinkler ordinance for all structures |

| | |
|---|---|
| | Evaluate adequacy of reservoir capacity for sprinkler systems |
| | Training/standardization for contractors performing retrofitting |
| | Website with mitigation/contractor/retrofitting information |
| | ◊ Links to jurisdictions |
| | ◊ Alerting information |
| | ◊ Volunteer information |
| | Evaluate depths of aquifers/wells for adequacy during quakes |
| | Evaluate hazmat storage regulations near faults |
| **COMMUNICATIONS IN DISASTER ISSUES** | |
| | Communications Interoperability |
| | Harden repeater sites |
| | Continue existing interoperability project |
| | Strengthen/harden |
| | Relocate |
| | Redundancy |
| | Mobile repeaters |
| **FLOODS** | |
| | Update development policies for flood plains |
| | Public education on locations of flood plains |
| | Develop multi-jurisdictional working group on floodplain management |
| | Develop greenbelt requirements in new developments |
| | Update weather pattern/flood plain maps |
| | Conduct countywide study of flood barriers/channels/gates/water dispersal systems |
| | Required water flow/runoff plans for new development |
| | Perform GIS mapping of flood channels, etc. |
| | Install vehicular crossing gates/physical barriers for road closure |
| | Maintenance of storm sewers/flood channels |
| | Create map of flood channels/diversions/water systems etc. |
| | Require digital floor plans on new non-residential construction |
| | Upgrade dirt embankments to concrete |
| | Conduct countywide needs study on drainage capabilities |
| | Increase number of pumping stations |
| | Increase sandbag distribution capacities |
| | Develop pre-planned response plan for floods |
| | ◊ Evacuation documentation |
| | ◊ Re-examine historical flooding data for potential street re-design |
| | Training for city/county PIOs about flood issues |
| | Warning systems - ensure accurate information provided |
| | ◊ Publicize flood plain information (website?) |
| | ◊ Install warning/water level signage |





| | |
|---|---|
| | ◊ Enhanced public information |
| | ◊ Road closure compliance |
| | ◊ Shelter locations |
| | ◊ Pre-event communications |
| | Look at County requirements for neighborhood access |
| | ◊ Secondary means of ingress/egress |
| | Vegetation restoration programs |
| | Ensure critical facilities are hardened/backed up |
| | Hardening water towers |
| | Terrorism Surveillance - cameras at reservoirs/dams |
| | Riverbed maintenance |
| | Evaluate existing lift stations for adequacy |
| | Acquisition of property for on-site retention |
| | Evaluate regulations on roof drainage mechanism |
| | Erosion-resistant plants |
| | Traffic light protection |
| | Upkeep of diversionary devices |
| | Install more turn-off valves on pipelines |
| | Backup generation facilities |
| | Identify swift water rescue capabilities across County |
| **WILDFIRES** | |
| | Aggressive weed abatement program |
| | ◊ Networking of agencies for weed abatement |
| | Develop strategic plan for forest management |
| | Public education on wildfire defense |
| | Encourage citizen surveillance and reporting |
| | Identify hydrants with equipment ownership information |
| | Enhanced firefighting equipment |
| | Fire spotter program/red flag program |
| | ◊ Expand to other utilities |
| | Research on insect/pest mitigation technologies |
| | Volunteer home inspection program |
| | Public education program |
| | ◊ Weather reporting/alerting |
| | ◊ Building protection |
| | ◊ Respiration |
| | Pre-identify shelters/recovery centers/other resources |
| | Roofing materials/defensive spacing regulations |
| | Community task forces for planning and education |
| | Fuel/dead tree removal |

| | |
|---|---|
| | Strategic pre-placement of firefighting equipment |
| | Establish FEMA coordination processes based on ICS |
| | Brush clearings around repeaters |
| | Research new technologies for identifying/tracking fires |
| | Procure/deploy backup communications equipment |
| | "Red Tag" homes in advance of event |
| | Provide fire-resistant gel to homeowners |
| | Involve insurance agencies in mitigation programs |
| | Clear out abandoned vehicles from oases |
| | Code enforcement |
| | Codes prohibiting fireworks |
| | Fuel modification/removal |
| | Evaluate building codes |
| | Maintaining catch basins |
| | **OTHER HAZARDS** |
| | Improve pipeline maintenance |
| | Wetlands mosquito mitigation (West Nile Virus) |
| | Insect control study |
| | Increase County Vector Control capacities |
| | General public drought awareness |
| | ◊ Lawn watering rotation |
| | Develop County drought plan |
| | Mitigation of landslide-prone areas |
| | Develop winter storm sheltering plan |
| | Ease permitting process for building transmission lines |
| | Evaluate restrictions on dust/dirt/generating activities during wind seasons |
| | Rotational crop planning/soil stabilization |
| | Enhance agricultural checkpoint enforcement |
| | Agriculture - funding of detection programs |
| | Communications of pipeline maps (based on need to know) |
| | Improved notification plan on runaway trains |
| | Improve/maintain blackout notification plan. |
| | Support business continuity planning for utility outages |
| | Terrorism training/equipment for first responders |
| | ◊ Terrorism planning/coordination |
| | ◊ Staffing for terrorism mitigation |
| | Create a SONGS regional planning group |
| | ◊ Include dirty bomb planning |
| | Cooling stations - MOUs in place |
| | Fire Ant eradication program |





| | |
|---|---|
| | White Fly infestation abatement/eradication program |
| | Develop plan for supplemental water sources |
| | Public education on low water landscaping |
| | Salton Sea desalinization |
| | Establish agriculture security standards (focus on water supply) |
| | ID mutual aid agreements |
| | Vulnerability assessment on fiber-optic cable |
| | Upgrade valves on California aqueduct |
| | Public education |
| | ◊ Bi-lingual signs |
| | ◊ Power Outage information |
| | Notification system for rail traffic - container contents |
| | Control and release of terrorism intelligence |
| | Develop prison evacuation plan (shelter in place?) |

Use the list and rankings to narrow down or identify "your" strategies. The mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy includes the development of goals, objectives, and prioritized mitigation actions.

**Goals** are general guidelines that explain what you want to achieve. They are broad policy statements and are usually long-term and represent global visions, such as "Protect Existing Property."

**Objectives** define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific, measurable, and may have a defined completion date. Objectives are more specific, such as "Increase the number of buildings protected from flooding."
The development of effective goals and objectives enables the planning team to evaluate the merits of alternative mitigation actions and the local conditions in which these activities would be pursued. A potential mitigation action that would support the goal and objective goal example above is "Acquire repetitive flood loss properties in the Acadia Woods Subdivision."

In the 2012 LHMP, each jurisdiction was required to develop a Mitigation Strategy Proposal based on one of the following:

1. The strategy, goal, or objective rating "High Priority" on the Local Jurisdiction Mitigation Strategies and Goals (WORKSHEET ABOVE)
2. A specifically identified strategy, goal, or objective that was developed as part of one of the working groups planning sessions such as the hospitals or agriculture
3. A specifically identified strategy, goal, or objective that was developed as part of one of the jurisdiction's internal working group planning sessions

## 6. LOCAL JURISDICTION PROPOSED MITIGATION ACTION AND STRATEGY PROPOSAL

a. Instructions for Updating Jurisdictions and Special Districts: With your planning team, please review the table from # 5, and determine if your ranking from the 2012 LHMP remains the same.

Review the chosen Mitigation Strategy that your jurisdiction submitted. The updated plan **must** identify the completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress.

If the mitigation actions or activities remain unchanged from the previously approved plan, the updated plan **must** indicate why changes are not necessary. Further, the updated plan **shall** include in its prioritization any new mitigation actions identified since the previous plan was approved or through the plan update process.

b. Instructions for New Jurisdictions and Special Districts: With your planning team, Use the "High Priority" rated strategy, goal or objective as a starting point to determine your Mitigation Strategy Proposal.





**LOCAL JURISDICTION PROPOSED MITIGATION ACTION AND STRATEGY PROPOSAL**

| |
|---|
| Jurisdiction: |
| Contact: |
| Phone: |

**MITIGATION STRATEGY INFORMATION**

Proposal Name:

Proposal Location:

Proposal Type

Place an "X" by the type of mitigation strategy (one or more may apply)

- [ ] Flood and mud flow mitigation
- [ ] Fire mitigation
- [ ] Elevation or acquisition of repetitively damaged structures or structures in high hazard areas
- [ ] Mitigation Planning (i.e. update building codes, planning develop guidelines, etc.)
- [ ] Development and implementation of mitigation education programs
- [ ] Development or improvement of warning systems
- [ ] Additional Hazard identification and analysis in support of the local hazard mitigation plan
- [ ] Drinking and/or irrigation water mitigation
- [ ] Earthquake mitigation
- [ ] Agriculture - crop related mitigation
- [ ] Agriculture - animal related mitigation
- [ ] Flood inundation/Dam failure
- [ ] Weather/Temperature event mitigation

**DESCRIPTION OF THE PROPOSED MITIGATION STRATEGY**

| | |
|---|---|
| Proposal/Event History | List any previous disaster related events (dates, costs, etc.) |
| Description of Mitigation Goal Narrative: | Give a detailed description of the need for the proposal, any history related to the proposal. List the activities necessary for its completion in the narrative section below, including estimated timeline. (how long will it take) |

Does your jurisdiction have primary responsibility for the proposal? If not, what agency does?

| | | | | |
|---|---|---|---|---|
| Yes | X | No | | Responsible Agency: |

**FUNDING INFORMATION**

Place an "X" by the proposed source of funding for this proposal

- [ ] Unfunded proposal - funds are not available for the proposal at this time
- [ ] Local jurisdiction General Fund
- [ ] Local jurisdiction Special Fund (road tax, assessment fees, etc.)
- [ ] Non-FEMA Hazard Mitigation Funds
- [ ] Local Hazard Mitigation Grant Funds - Future Request
- [ ] Hazard Mitigation Funds

- [ ] Has your jurisdiction evaluated this mitigation strategy to determine its cost benefits? (i.e. has the cost of the mitigation proposal been determined to be beneficial in relationship to the potential damage or loss using the attached Cost/Benefit Analysis Sheet or another internal method)

As part of this process, each Submitting Jurisdiction is required to perform a cost-benefit analysis. They were required to answer the question at the bottom of the Proposal page that asks if they had conducted a Cost-Benefit Analysis of some type. This analysis was conducted either by completing a Cost Benefit form or by some other approved method. Many of the jurisdictions used the cost-effective analysis approach outlined in the FEMA publication, *Cost and Benefits of Natural Hazards Mitigation.* This cost-benefit analysis was not restricted to natural hazards.

In some cases, the jurisdiction or working group identified a proposal that highlighted a life- safety issue over a standard hazard proposal. This was done when there was either historical data or other sources of information indicating that the life-safety issue needed to be emphasized or brought to the public's attention.





## 7. LOCAL JURISDICTION DEVELOPMENT TRENDS QUESTIONNAIRE

**LAND USE ISSUES - COMPLETE THE INFORMATION BELOW**

This questionnaire identifies a comparison of specific land use issues between 2012, 2017 and 2022. The questionnaire also identifies the specific threat potential to the jurisdiction in relationship to residential and commercial structures along with critical facilities. This threat potential is focused on structural loss rather than dollar-value loss as it relates to the three main natural hazards – earthquakes, floods, and wildland fires. The determination of dollar-value loss relating to commercial and critical facilities was found to be very limited and a difficult task to establish. This issue will be addressed in future updates of the Plan.

The questionnaire also requires the jurisdiction to identify the process it will use to maintain their portion of the Plan.

**LOCAL JURISDICTION DEVELOPMENT TRENDS QUESTIONNAIRE 2011**

**LAND USE ISSUES - COMPLETE THE INFORMATION BELOW**

| **JURISDICTION:** | **DOES YOUR AGENCY HAVE RESPONSIBILITY FOR LAND USE AND/OR DEVELOPMENT ISSUES WITHIN YOUR JURISDICTIONAL BOUNDARIES? YES NO** | | | |
|---|---|---|---|---|
| | **2012 DATA** | **2017 DATA** | | **2022** |
| Current Population in Jurisdiction or Served | | | Projected Population in Jurisdiction or Served - in 2022 | |
| Current Sq Miles in Jurisdiction or Served | | | Projected Sq Miles in Jurisdiction or Served - in 2022 | |
| Does Your Jurisdiction have any ordinances or regulations dealing with disaster mitigation, disaster preparation, or disaster response? | | | If yes, please list ordinance or regulation number. | |
| *What is the number one land issue your agency will face in the next five years* | | | | |
| Approximate Number of Homes/Apts/etc. | | | Projected Number of Homes/Apts/etc.- in 2022 | |
| Approximate Total Residential Value | | | Projected Residential Total Value - in 2022 | |
| Approximate Number of Commercial Businesses | | | Projected Number of Commercial Businesses - in 2022 | |
| Approximate Percentage of Homes/Apts/etc in flood hazard zones | | | Approximate Percentage of Homes/Apts/etc in flood hazard zones - in 2022 | |
| Approximate Percentage of Homes/Apts/etc in earthquake hazard zones | | | Approximate Percentage of Homes/Apts/etc in earthquake hazard zones - in 2022 | |
| Approximate Percentage of Homes/Apts/etc in wildland fire hazard zones | | | Approximate Percentage of Homes/Apts/etc in wildland fire hazard zones - in 2022 | |
| Approximate Percentage of Commercial Businesses in flood hazard zones | | | Approximate Percentage of Commercial Businesses in flood hazard zones - in 2022 | |
| Approximate Percentage of Commercial Businesses in earthquake hazard zones | | | Approximate Percentage of Commercial Businesses in earthquake hazard zones - in 2022 | |
| Approximate Percentage of Commercial Businesses in wildland fire hazard zones | | | Approximate Percentage of Commercial Businesses in wildland fire hazard zones - in 2022 | |
| Number of Critical Facilities in your Jurisdiction that are in flood hazard zones | | | Projected Number of Critical Facilities in your Jurisdiction that are in flood hazard zones - in 2022 | |
| Number of Critical Facilities in your Jurisdiction that are in earthquake hazard zones | | | Number of Critical Facilities in your Jurisdiction that are in earthquake hazard zones - in 2022 | |
| Number of Critical Facilities in your Jurisdiction that are in wildland fire hazard zones. | | | Number of Critical Facilities in your Jurisdiction that are in wildland fire hazard zones - in 2022 | |
| Does your jurisdiction plan on participating in the County's on-going plan maintenance program every two years as described in Part I of the plan? | | | If not, how will your jurisdiction do plan maintenance? | |
| Will a copy of this plan be available for the various planning groups within your jurisdiction for use in future planning and budgeting purposes? | | | | Yes or No |





# APPENDIX A: LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

| **Jurisdiction:** | **Title of Plan: Local Hazard Mitigation Plan** | **Date of Plan:** |
|---|---|---|
| **Local Point of Contact:** | **Address:** | |
| **Title:** | | |
| **Agency:** | | |
| **Phone Number:** | **E-Mail:** | |

| **State Reviewer:** | **Title:** | **Date:** |
|---|---|---|
| | | |

| **FEMA Reviewer:** | **Title:** | **Date:** |
|---|---|---|
| | | |
| **Date Received in FEMA Region** ***(insert #)*** | | |
| **Plan Not Approved** | | |
| **Plan Approvable Pending Adoption** | | |
| **Plan Approved** | | |

## SECTION 1:
## REGULATION CHECKLIST

**INSTRUCTIONS:** The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met.' The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

| **1. REGULATION CHECKLIST**<br>**Regulation** (44 CFR 201.6 Local Mitigation Plans) | **Location in Plan** (section and/or | **Met** | **Not Met** |
|---|---|---|---|
| **ELEMENT A. PLANNING PROCESS** | | | |
| A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement §201.6(c)(1)) | | | |
| A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2)) | | | |
| A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1)) | | | |
| A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3)) | | | |
| A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii)) | | | |





| **1. REGULATION CHECKLIST**<br>**Regulation** (44 CFR 201.6 Local Mitigation Plans) | **Location in Plan** (section and/or | **Met** | **Not Met** |
|---|---|---|---|
| A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i)) | | | |
| **ELEMENT A: REQUIRED REVISIONS** | | | |
| **ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT** | | | |
| B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction(s)? (Requirement §201.6(c)(2)(i)) | | | |
| B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i)) | | | |
| B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii)) | | | |
| B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii)) | | | |
| **ELEMENT B: REQUIRED REVISIONS** | | | |
| **ELEMENT C. MITIGATION STRATEGY** | | | |
| C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement §201.6(c)(3)) | | | |
| C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement §201.6(c)(3)(ii)) | | | |
| C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i)) | | | |

| 1. REGULATION CHECKLIST<br>**Regulation** (44 CFR 201.6 Local Mitigation Plans) | Location in Plan (section and/or | Met | Not Met |
|---|---|---|---|
| C4. Does the Plan identify and analyze a comprehensive range of specific mitigation actions and projects for each jurisdiction being considered to reduce the effects of hazards, with emphasis on new and existing buildings and infrastructure? (Requirement §201.6(c)(3)(ii)) | | | |
| C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement §201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii)) | | | |
| C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii)) | | | |
| **ELEMENT C: REQUIRED REVISIONS** | | | |
| **ELEMENT D. PLAN REVIEW, EVALUATION, AND IMPLEMENTATION** (applicable to plan updates only) | | | |
| D1. Was the plan revised to reflect changes in development? (Requirement §201.6(d)(3)) | | | |
| D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3)) | | | |
| D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3)) | | | |
| **ELEMENT D: REQUIRED REVISIONS** | | | |
| **ELEMENT E. PLAN ADOPTION** | | | |
| E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5)) | Plan Adoption/ Resolution Page 4 all plans | | |
| E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5)) | Plan Adoption/ Resolution Page 4 all plans | | |
| **ELEMENT E: REQUIRED REVISIONS** | | | |
| **ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)** | | | |
| F1. | | | |





| 1. REGULATION CHECKLIST<br>**Regulation** (44 CFR 201.6 Local Mitigation Plans) | Location in Plan (section and/or | Met | Not Met |
|---|---|---|---|
| F2. | | | |
| **ELEMENT F: REQUIRED REVISIONS** | | | |

## SECTION 2:
## PLAN ASSESSMENT

**INSTRUCTIONS**: The purpose of the Plan Assessment is to offer the local community more comprehensive feedback to the community on the quality and utility of the plan in a narrative format. The audience for the Plan Assessment is not only the plan developer/local community planner, but also elected officials, local departments and agencies, and others involved in implementing the Local Mitigation Plan. The Plan Assessment must be completed by FEMA. The Assessment is an opportunity for FEMA to provide feedback and information to the community on: 1) suggested improvements to the Plan; 2) specific sections in the Plan where the community has gone above and beyond minimum requirements; 3) recommendations for plan implementation; and 4) ongoing partnership(s) and information on other FEMA programs, specifically RiskMAP and Hazard Mitigation Assistance programs. The Plan Assessment is divided into two sections:

1. Plan Strengths and Opportunities for Improvement
2. Resources for Implementing Your Approved Plan

***Plan Strengths and Opportunities for Improvement*** is organized according to the plan Elements listed in the Regulation Checklist. Each Element includes a series of italicized bulleted items that are suggested topics for consideration while evaluating plans, but it is not intended to be a comprehensive list. FEMA Mitigation Planners are not required to answer each bullet item, and should use them as a guide to paraphrase their own written assessment (2-3 sentences) of each Element.

The Plan Assessment must not reiterate the required revisions from the Regulation Checklist or be regulatory in nature, and should be open-ended and to provide the community with suggestions for improvements or recommended revisions. The recommended revisions are suggestions for improvement and are not required to be made for the Plan to meet Federal regulatory requirements. The italicized text should be deleted once FEMA has added comments regarding strengths of the plan and potential improvements for future plan revisions. It is recommended that the Plan Assessment be a short synopsis of the overall strengths and weaknesses of the Plan (no longer than two pages), rather than a complete recap section by section.

***Resources for Implementing Your Approved Plan*** provides a place for FEMA to offer information, data sources and general suggestions on the overall plan implementation and maintenance process. Information on other possible sources of assistance including, but not limited to, existing publications, grant funding or training opportunities, can be provided. States may add state and local resources, if available.





### A. Plan Strengths and Opportunities for Improvement

This section provides a discussion of the strengths of the plan document and identifies areas where these could be improved beyond minimum requirements.

#### Element A: Planning Process

*How does the Plan go above and beyond minimum requirements to document the planning process with respect to:*

- *Involvement of stakeholders (elected officials/decision makers, plan implementers, business owners, academic institutions, utility companies, water/sanitation districts, etc.);*
- *Involvement of Planning, Emergency Management, Public Works Departments or other planning agencies (i.e., regional planning councils);*
- *Diverse methods of participation (meetings, surveys, online, etc.); and*
- *Reflective of an open and inclusive public involvement process.*

#### Element B: Hazard Identification and Risk Assessment

*In addition to the requirements listed in the Regulation Checklist, 44 CFR 201.6 Local Mitigation Plans identifies additional elements that should be included as part of a plan's risk assessment. The plan should describe vulnerability in terms of:*

1) *A general description of land uses and future development trends within the community so that mitigation options can be considered in future land use decisions;*
2) *The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas; and*
3) *A description of potential dollar losses to vulnerable structures, and a description of the methodology used to prepare the estimate.*

*How does the Plan go above and beyond minimum requirements to document the Hazard Identification and Risk Assessment with respect to:*

- *Use of best available data (flood maps, HAZUS, flood studies) to describe significant hazards;*
- *Communication of risk on people, property, and infrastructure to the public (through tables, charts, maps, photos, etc.);*
- *Incorporation of techniques and methodologies to estimate dollar losses to vulnerable structures;*
- *Incorporation of Risk MAP products (i.e., depth grids, Flood Risk Report, Changes Since Last FIRM, Areas of Mitigation Interest, etc.); and*
- *Identification of any data gaps that can be filled as new data became available.*

### Element C: Mitigation Strategy

*How does the Plan go above and beyond minimum requirements to document the Mitigation Strategy with respect to:*

- *Key problems identified in, and linkages to, the vulnerability assessment;*
- *Serving as a blueprint for reducing potential losses identified in the Hazard Identification and Risk Assessment;*
- *Plan content flow from the risk assessment (problem identification) to goal setting to mitigation action development;*
- *An understanding of mitigation principles (diversity of actions that include structural projects, preventative measures, outreach activities, property protection measures, post-disaster actions, etc);*
- *Specific mitigation actions for each participating jurisdictions that reflects their unique risks and capabilities;*
- *Integration of mitigation actions with existing local authorities, policies, programs, and resources; and*
- *Discussion of existing programs (including the NFIP), plans, and policies that could be used to implement mitigation, as well as document past projects.*

### Element D: Plan Update, Evaluation, and Implementation (*Plan Updates Only*)

*How does the Plan go above and beyond minimum requirements to document the 5-year Evaluation and Implementation measures with respect to:*

- *Status of previously recommended mitigation actions;*
- *Identification of barriers or obstacles to successful implementation or completion of mitigation actions, along with possible solutions for overcoming risk;*
- *Documentation of annual reviews and committee involvement;*
- *Identification of a lead person to take ownership of, and champion the Plan;*
- *Reducing risks from natural hazards and serving as a guide for decisions makers as they commit resources to reducing the effects of natural hazards;*
- *An approach to evaluating future conditions (i.e. socio-economic, environmental, demographic, change in built environment etc.);*
- *Discussion of how changing conditions and opportunities could impact community resilience in the long term; and*
- *Discussion of how the mitigation goals and actions support the long-term community vision for increased resilience.*





### B. Resources for Implementing Your Approved Plan

*Ideas may be offered on moving the mitigation plan forward and continuing the relationship with key mitigation stakeholders such as the following:*

- *What FEMA assistance (funding) programs are available (for example, Hazard Mitigation Assistance (HMA)) to the jurisdiction(s) to assist with implementing the mitigation actions?*
- *What other Federal programs (National Flood Insurance Program (NFIP), Community Rating System (CRS), Risk MAP, etc.) may provide assistance for mitigation activities?*
- *What publications, technical guidance or other resources are available to the jurisdiction(s) relevant to the identified mitigation actions?*
- *Are there upcoming trainings/workshops (Benefit-Cost Analysis (BCA), HMA, etc.) to assist the jurisdictions(s)?*
- *What mitigation actions can be funded by other Federal agencies (for example, U.S. Forest Service, National Oceanic and Atmospheric Administration (NOAA), Environmental Protection Agency (EPA) Smart Growth, Housing and Urban Development (HUD) Sustainable Communities, etc.) and/or state and local agencies?*

## SECTION 3:
## MULTI-JURISDICTION SUMMARY SHEET (OPTIONAL)

**INSTRUCTIONS**: For multi-jurisdictional plans, a Multi-jurisdiction Summary Spreadsheet may be completed by listing each participating jurisdiction, which required Elements for each jurisdiction were 'Met' or 'Not Met,' and when the adoption resolutions were received. This Summary Sheet does not imply that a mini-plan be developed for each jurisdiction; it should be used as an optional worksheet to





ensure that each jurisdiction participating in the Plan has been documented and has met the requirements for those Elements (A through E).

| MULTI-JURISDICTION SUMMARY SHEET | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Requirements Met (Y/N) | | | | | |
| # | Jurisdiction Name | Jurisdiction Type (city/borough/ township/ village, etc.) | Plan POC | Mailing Address | Email | Phone | A. Planning Process | B. Hazard Identification & Risk Assessment | C. Mitigation Strategy | D. Plan Review, Evaluation & Implementation | E. Plan Adoption | F. State Requirements |
| 1 | | | | | | | | | | | | |
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| MULTI-JURISDICTION SUMMARY SHEET | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Requirements Met (Y/N) | | | | | |
| # | Jurisdiction Name | Jurisdiction Type (city/borough/ township/ village, etc.) | Plan POC | Mailing Address | Email | Phone | A. Planning Process | B. Hazard Identification & Risk Assessment | C. Mitigation Strategy | D. Plan Review, Evaluation & Implementation | E. Plan Adoption | F. State Requirements |
| 20 | | | | | | | | | | | | |

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# APPENDIX F – Historical Landmarks

Continue to next page.

| Name (Landmark Plaque Number) | National Register | California State Historical Landmar | California Register of | Point of Interest | Date Listed | City (County) |
|---|---|---|---|---|---|---|
| ADMINISTRATION BUILDING, SHERMAN INSTITUTE (N851) | Yes | | | | 1/9/1980 | Riverside (Riverside) |
| AGENTS HOME (P231) | | | | Yes | 10/5/1971 | Thermal (Riverside) |
| ALL SOULS UNIVERSALIST CHURCH (N666) | Yes | | | | 9/18/1978 | Riverside (Riverside) |
| ANDREAS CANYON (N201) | Yes | | | | 1/8/1973 | Palm Springs (Riverside) |
| ARCHEOLOGICAL SITES CA-RIV-504 AND CA-RIV 773 (N2195) | Yes | | | | 3/12/2003 | Blythe (Riverside) |
| ARLINGTON BRANCH LIBRARY AND FIRE HALL (N1839) | Yes | | | | 7/22/1993 | Riverside (Riverside) |
| ARMORY HALL (N1748) | Yes | | | | 1/29/1992 | Lake Elsinore (Riverside) |
| ARMORY HALL, GRAND ARMY OF THE REPUBLIC BUILDING (P822) | | | | Yes | 5/15/1996 | Lake Elsinore (Riverside) |
| ATCHISON, TOPEKA, AND SANTA FE RAILWAY DEPOT AT BLYTHE (P735) | | | | Yes | 2/11/1991 | Blythe (Riverside) |
| BANDINI ADOBE SITE (P120) | | | | Yes | 6/6/1969 | Norco (Riverside) |
| BANDINI-COTA ADOBE SITE (P122) | | | | Yes | 6/6/1969 | Corona (Riverside) |
| BANNING WOMEN'S CLUB (P725) | | | | Yes | 11/20/1989 | Banning (Riverside) |
| BARKER DAM (N394) | Yes | | | | 10/29/1975 | Twentynine Palms (Riverside) |
| BEAUMONT CARNEGIE LIBRARY (P807) | | | | Yes | 12/4/1994 | Beaumont (Riverside) |
| BLYTHE FERRY CROSSING (P195) | | | | Yes | 5/19/1971 | Blythe (Riverside) |
| BLYTHE INTAGLIOS (N384) | Yes | | | | 8/22/1975 | Blythe (Riverside) |
| BOGART HOUSE (P808) | | | | Yes | 12/4/1994 | Beaumont (Riverside) |
| BUTTERCUP FARMS PICTOGRAPH (N411) | Yes | | | | 5/3/1976 | Perris (Riverside) |
| BUTTERFIELD STAGE STATION (188) | | Yes | | | 6/20/1935 | Corona (Riverside) |
| CAMP EMERSON (P147) | | | | Yes | 11/3/1969 | Idyllwild (Riverside) |
| CAMP YOUNG--DESERT TRAINING CENTER, CAMA (P87) | | | | Yes | 6/2/1968 | Desert Center (Riverside) |
| CANTU RANCH/GALLEANO WINERY (P773) | | | | Yes | 8/21/1992 | Mira Loma (Riverside) |
| CARNEGIE, ANDREW, LIBRARY (N502) | Yes | | | | 6/29/1977 | Corona (Riverside) |
| CARVED ROCK (187) | | Yes | | | 6/20/1935 | Corona (Riverside) |
| CHILDS, WILLIAM, HOUSE (N2063) | Yes | | | | 7/28/1999 | Riverside (Riverside) |





| | | | | | | |
|---|---|---|---|---|---|---|
| CHINATOWN (P74) | Yes | | | Yes | 1/24/1968 | Riverside (Riverside) |
| CITRUS EXPERIMENT STATION (P121) | | | | Yes | 6/6/1969 | Riverside (Riverside) |
| CITRUS MACHINERY PIONEERING (P123) | | | | Yes | 6/6/1969 | Riverside (Riverside) |
| COACHELLA VALLEY COUNTY WATER DISTRICT (P141) | | | | Yes | 8/29/1969 | Coachella (Riverside) |
| COACHELLA VALLEY FISH TRAPS (N175) | Yes | | | | 6/13/1972 | Valerie (Riverside) |
| COPLIN HOUSE SPOKANE HOTEL PLUEGER REALTY (P759) | | | | Yes | 11/8/1991 | Banning (Riverside) |
| CORN SPRINGS (N2038) | Yes | | | | 10/30/1998 | Desert Center (Riverside) |
| CORN SPRINGS (P80) | | | | Yes | 1/24/1968 | Desert Center (Riverside) |
| CORNELIUS AND MERCEDES JENSON RANCH (943) | | Yes | | | 6/12/1981 | Rubidoux (Riverside) |
| CORONA FOUNDERS MONUMENT (738) | | Yes | | | 6/6/1960 | Corona (Riverside) |
| CORONA HIGH SCHOOL (N2297) | Yes | | | | 8/3/2005 | Corona (Riverside) |
| COTTONWOOD SCHOOL (P520) | | | | Yes | 2/1/1978 | Sage (Riverside) |
| CRESCENT BATHHOUSE (N380) | Yes | | | | 7/30/1975 | Lake Elsinore (Riverside) |
| DE ANZA CROSSING OF THE SANTA ANA RIVER, 1775 AND 1776 (787) | | Yes | | | 9/18/1963 | Riverside (Riverside) |
| DESERT INN (P307) | | | | Yes | 7/13/1973 | Palm Springs (Riverside) |
| DESERT QUEEN MINE (N402) | Yes | | | | 1/17/1976 | Twentynine Palms (Riverside) |
| DOS PALMAS (P78) | | | | Yes | 1/24/1968 | Mecca (Riverside) |
| EAGLE MOUNTAIN IRON (P229) | | | | Yes | 10/5/1971 | Desert Center (Riverside) |
| EL MIRADOR HOTEL AND TOWER (P570) | | | | Yes | 6/12/1981 | Palm Springs (Riverside) |
| ELSINORE WOMEN'S CLUB (P832) | | | | Yes | 2/5/1998 | Lake Elsinore (Riverside) |
| ELSINORE'S HOTTEST SULPHUR SPRINGS (P97) | | | | Yes | 6/7/1968 | Lake Elsinore (Riverside) |
| ESTUDILLO MANSION (N2146) | Yes | | | | 10/25/2001 | San Jacinto (Riverside) |
| FEDERAL POST OFFICE (N705) | Yes | | | | 11/20/1978 | Riverside (Riverside) |
| FIRST CHURCH OF CHRIST, SCIENTIST (N1794) | Yes | | | | 9/22/1992 | Riverside (Riverside) |
| FIRST CONGREGATIONAL CHURCH OF RIVERSIDE (N1975) | Yes | | | | 4/3/1997 | Riverside (Riverside) |
| FIRST POST OFFICE (P174) | | | | Yes | 3/19/1970 | Temecula (Riverside) |
| FRINK RANCH (P94) | | | | Yes | 6/7/1968 | Beaumont (Riverside) |
| GALLEANO WINERY (N2207) | Yes | | | | 6/22/2003 | Mira Loma (Riverside) |
| GARBANI, ROCCO, HOMESTEAD (N2079) | Yes | | | | 12/22/1999 | Winchester (Riverside) |

| | | | | | | |
|---|---|---|---|---|---|---|
| GIANT DESERT FIGURES (101) | | Yes | | | 3/29/1933 | Blythe (Riverside) |
| GILMAN RANCH (P41) | Yes | | | Yes | 6/2/1967 | Banning (Riverside) |
| HALL CITY AND HALL'S GRADE (P124) | | | | Yes | 6/6/1969 | Cabazon (Riverside) |
| HAMILTON SCHOOL (#1), LITTLE RED SCHOOL HOUSE (P746) | | | | Yes | 8/2/1991 | Anza (Riverside) |
| HARADA HOUSE (N517) | Yes | | | | 9/15/1977 | Riverside (Riverside) |
| HEMET DAM AND LAKE HEMET (P95) | | | | Yes | 6/7/1968 | Hemet (Riverside) |
| HEMET MAZE STONE (557) | | Yes | | | 8/24/1956 | Hemet (Riverside) |
| HENDERSON/REID BUILDING (P774) | | | | Yes | 8/21/1992 | Banning (Riverside) |
| HERITAGE HOUSE (N205) | Yes | | | | 2/28/1973 | Riverside (Riverside) |
| HIGHGROVE HYDROELECTRIC PLANT (P108) | | | | Yes | 12/11/1968 | Riverside (Riverside) |
| HIGHLAND SPRINGS (P38) | | | | Yes | 6/2/1967 | Banning (Riverside) |
| IDYLLWILD (P335) | | | | Yes | 7/12/1974 | Idyllwild (Riverside) |
| INDIAN SCHOOL AGENCY OFFICE, INDIAN SCHOOL AGENCY (P233) | | | | Yes | 10/5/1971 | Thermal (Riverside) |
| INDIAN WELLS (P83) | | | | Yes | 1/24/1968 | Palm Desert (Riverside) |
| JENSEN, CORNELIUS, RANCH (N815) | Yes | | | | 9/6/1979 | Rubidoux (Riverside) |
| JOHN W. NORTH PARK / SEVENTH STREET HISTORIC DISTRICT (P308) | | | | Yes | 7/13/1973 | Riverside (Riverside) |
| LAKE NORCONIAN CLUB (N2083) | Yes | | | | 2/4/2000 | Norco (Riverside) |
| LEDERER, GUS, SITE (N2196) | Yes | | | | 3/12/2003 | Desert Center (Riverside) |
| LORING OPERA HOUSE, GOLDEN STATE THEATER (P64) | | | | Yes | 9/22/1967 | Riverside (Riverside) |
| MARCH FIELD HISTORIC DISTRICT (P93) | | | | Yes | 6/7/1968 | Moreno Valley (Riverside) |
| MARCH FIELD HISTORIC DISTRICT (N1893) | Yes | | | | 12/6/1994 | Riverside (Riverside) |
| MARTINEZ CANYON ROCKHOUSE (N2074) | Yes | | | | 12/14/1999 | North Palm Springs (Riverside) |
| MARTINEZ HISTORICAL DISTRICT (N236) | Yes | | | | 5/17/1973 | Torres-Martinez Indian Reservation (Riverside) |
| MARTINEZ HISTORICAL DISTRICT/MARTINEZ INDIAN AGENCY (P232) | | | | Yes | 10/5/1971 | Thermal (Riverside) |
| MASONIC TEMPLE (N872) | Yes | | | | 6/6/1980 | Riverside (Riverside) |
| MCCOY SPRING ARCHEOLOGICAL SITE (N1103) | Yes | | | | 5/10/1982 | Blythe (Riverside) |
| MISSION COURT BUNGALOWS (N1835) | Yes | | | | 7/8/1993 | Riverside (Riverside) |





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|---|---|---|---|---|---|---|
| MISSION INN (761) | Yes | Yes | | | 4/28/1961 | Riverside (Riverside) |
| MOROVIAN CHURCH AND INDIAN SCHOOL, INDIAN SCHOOL (P230) | | | | Yes | 10/5/1971 | Thermal (Riverside) |
| MOUNT RUBIDOUX (P65) | | | | Yes | 9/22/1967 | Riverside (Riverside) |
| MURRIETA CREEK ARCHEOLOGICAL AREA (N229) | Yes | | | | 4/24/1973 | Temecula (Riverside) |
| NOBLE'S RANCH (P82) | | | | Yes | 1/24/1968 | Beaumont (Riverside) |
| NORTH CHUCKWALLA MOUNTAIN QUARRY DISTRICT (N966) | Yes | | | | 8/24/1981 | Desert Center (Riverside) |
| NORTH CHUCKWALLA MOUNTAINS PETROGLYPH DISTRICT CA-RIV 1383 (N969) | Yes | | | | 9/3/1981 | Desert Center (Riverside) |
| OLD MORENO SCHOOL (P702) | | | | Yes | 8/23/1988 | Moreno Valley (Riverside) |
| OLD TEMESCAL ROAD (638) | | Yes | | | 3/31/1958 | Corona (Riverside) |
| OLD YWCA BUILDING (N1009) | Yes | | | | 1/28/1982 | Riverside (Riverside) |
| ORIGINAL PALM SPRINGS, THE (P118) | | | | Yes | 6/6/1969 | Palm Springs (Riverside) |
| PAINTED ROCK (190) | | Yes | | | 6/20/1935 | Corona (Riverside) |
| PALM CANYON THEATER / STEVENS, FRANCES S., SCHOOL (C21) | | | Yes | | 11/7/2003 | Palm Springs (Riverside) |
| PALMDALE RAILROAD SITE / RAILROAD THAT FAILED (P146) | | | | Yes | 11/3/1969 | Palm Springs (Riverside) |
| PARENT WASHINGTON NAVEL ORANGE TREE (20) | | Yes | | | 6/1/1932 | Riverside (Riverside) |
| PEDLEY-TYPE DAM (P337) | | | | Yes | 7/12/1974 | Banning (Riverside) |
| PERRIS DEPOT (N1871) | Yes | | | | 8/5/1994 | Perris (Riverside) |
| PINACATE MINING DISTRICT (P553) | | | | Yes | 6/6/1980 | Good Hope (Riverside) |
| PINACATE, PINACATE MINING DISTRICT (P554) | | | | Yes | 6/6/1980 | Perris (Riverside) |
| RAMONA BOWL, SITE OF THE RAMONA PAGEANT (1009) | | Yes | | | 2/16/1993 | Hemet (Riverside) |
| RANCHO SANTA ROSA (P719) | | | | Yes | 11/3/1989 | Murrieta (Riverside) |
| RIVERSIDE CEMENT COMPANY (P336) | | | | Yes | 7/12/1974 | Riverside (Riverside) |
| RIVERSIDE COUNTY COURTHOUSE (P96) | | | | Yes | 6/7/1968 | Riverside (Riverside) |
| RIVERSIDE FIRST CONGREGATIONAL CHURCH (P76) | | | | Yes | 1/24/1968 | Riverside (Riverside) |

| | | | | | | |
|---|---|---|---|---|---|---|
| RIVERSIDE MUNICIPAL AUDITORIUM AND SOLDIER'S MEMORIAL BUILDING (N576) | Yes | | | | 3/31/1978 | Riverside (Riverside) |
| RIVERSIDE-ARLINGTON HEIGHTS FRUIT EXCHANGE (N877) | Yes | | | | 6/9/1980 | Riverside (Riverside) |
| RUINS OF THIRD SERRANO ADOBE (224) | | Yes | | | 6/20/1935 | Corona (Riverside) |
| RYAN HOUSE AND LOST HORSE WELL (N368) | Yes | | | | 6/5/1975 | Twentynine Palms (Riverside) |
| SAAHATPA (749) | | Yes | | | 8/17/1960 | (Riverside) |
| SAN PEDRO, LOS ANGELES, & SALT LAKE RR DEPOT (N491) | Yes | | | | 4/18/1977 | Riverside (Riverside) |
| SAN TIMOTEO CANYON SCHOOLHOUSE (P125) | Yes | | | Yes | 6/6/1969 | Calimesa (Riverside) |
| SANTA FE RAILWAY DEPOT (P711) | | | | Yes | 11/22/1988 | Hemet (Riverside) |
| SANTA ROSA RANCHO (1005) | | Yes | | | 2/18/1992 | Murrieta (Riverside) |
| SERRANO BOULDER (185) | | Yes | | | 6/20/1935 | Corona (Riverside) |
| SERRANO TANNING VATS (186) | | Yes | | | 6/20/1935 | Corona (Riverside) |
| SHAVER'S WELL (P148) | | | | Yes | 11/3/1969 | Mecca (Riverside) |
| SIMON'S, M. H., UNDERTAKING CHAPEL (N878) | Yes | | | | 6/9/1980 | Riverside (Riverside) |
| SITE OF BLYTHE INTAKE (948) | | Yes | | | 3/1/1982 | Blythe (Riverside) |
| SITE OF BLYTHE INTAKE (P63) | | | | Yes | 9/22/1967 | Blythe (Riverside) |
| SITE OF CONTRACTOR'S GENERAL HOSPITAL (992) | | Yes | | | 8/17/1990 | (Riverside) |
| SITE OF DE ANZA CAMP, MARCH 1774 (103) | | Yes | | | 3/29/1933 | Anza (Riverside) |
| SITE OF INDIAN VILLAGE OF POCHEA (104) | | Yes | | | 3/29/1933 | Hemet, (Riverside) |
| SITE OF LOUIS RUBIDOUX HOUSE (102) | | Yes | | | 3/29/1933 | Rubidoux (Riverside) |
| SITE OF OLD RUBIDOUX GRIST MILL (303) | | Yes | | | 7/12/1939 | Rubidoux (Riverside) |
| SMILEY PLACE (P760) | | | | Yes | 11/8/1991 | Indio (Riverside) |
| SOUTHERN HOTEL (N1803) | Yes | | | | 10/15/1992 | Perris (Riverside) |
| SPEED OF LIGHT EXPERIMENT SITE (P119) | | | | Yes | 6/6/1969 | Idyllwild (Riverside) |
| ST. BONIFACE SCHOOL (P415) | | | | Yes | 8/7/1975 | Beaumont (Riverside) |
| SUTHERLAND FRUIT COMPANY (N1439) | Yes | | | | 4/11/1986 | Riverside (Riverside) |
| TAHQUITZ CANYON (N189) | Yes | | | | 10/31/1972 | Palm Springs (Riverside) |
| TEMECULA QUARRIES (P175) | | | | Yes | 3/19/1970 | Temecula (Riverside) |
| TEMESCAL TIN MINES (P79) | | | | Yes | 1/24/1968 | Corona (Riverside) |
| THOMAS-GARNER RANCH (P176) | | | | Yes | 3/19/1970 | Idyllwild (Riverside) |
| TORO VILLAGE (P81) | | | | Yes | 1/24/1968 | Indio (Riverside) |





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|---|---|---|---|---|---|---|
| TRUJILLO ADOBE (P75) | | | | Yes | 1/24/1968 | Riverside (Riverside) |
| U.S. EXPERIMENTAL DATE STATION, DATE INDUSTRY BIRTHPLACE (P306) | | | | Yes | 7/13/1973 | Mecca (Riverside) |
| UNIVERSITY HEIGHTS JUNIOR HIGH SCHOOL (N1832) | Yes | | | | 6/24/1993 | Riverside (Riverside) |
| VALERIE JEAN'S DATE SHOP,RUSSELL NICOLL HOME/OL KING SOLO (P736) | | | | Yes | 2/11/1991 | Thermal (Riverside) |
| VICTORIA AVENUE (N2108) | Yes | | | | 10/26/2000 | Riverside (Riverside) |
| WEAVER ADOBE (P39) | | | | Yes | 6/2/1967 | Banning (Riverside) |
| WHITEWATER (P40) | | | | Yes | 6/2/1967 | Banning (Riverside) |
| WILEY'S WELL (P77) | | | | Yes | 1/24/1968 | Blythe (Riverside) |
| WOMAN'S IMPROVEMENT CLUB CLUBHOUSE (N1579) | Yes | | | | 11/3/1988 | Corona (Riverside) |
| YERXA'S DISCOVERY (P560) | | | | Yes | 12/19/1980 | Desert Hot Springs (Riverside) |

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# APPENDIX G – Trends Questionnaire

Continue to Next Page

| JURISDICTION: | DOES YOUR AGENCY HAVE RESPONSIBILITY FOR LAND USE AND/OR DEVELOPMENT ISSUES WITHIN YOUR JURISDICTIONAL BOUNDARIES? YES | | | |
|---|---|---|---|---|
| | 2012 DATA | 2017 DATA | | 2022 |
| Current Population in Jurisdiction or Served | 2,196,137 | 2,329,256 | Projected Population in Jurisdiction or Served - in 2022 | 2,506,739 |
| Current Sq Miles in Jurisdiction or Served | 6,375 | 7,295.6 | Projected Sq Miles in Jurisdiction or Served - in 2022 | 7,295.6 |
| Does Your Jurisdiction have any ordinances or regulations dealing with disaster mitigation, disaster preparation, or disaster response? | Yes | Yes | If yes, please list ordinance or regulation number. | |
| *What is the number one land issue your agency will face in the next five years* | N/A | | | |
| Approximate Number of Homes/Apts/etc. | 696,290 | 700,413 | Projected Number of Homes/Apts/etc.- in 2022 | 955,853 |
| Approximate Total Residential Value | N/A | 362,066 | Projected Residential Total Value - in 2022 | |
| Approximate Number of Commercial Businesses | N/A | N/A | Projected Number of Commercial Businesses - in 2022 | N/A |
| Approximate Percentage of Homes/Apts/etc. in flood hazard zones | 12% | | Approximate Percentage of Homes/Apts/etc. in flood hazard zones - in 2022 | N/A |
| Approximate Percentage of Homes/Apts/etc. in earthquake hazard zones | 5% | | Approximate Percentage of Homes/Apts/etc. in earthquake hazard zones - in 2022 | N/A |
| Approximate Percentage of Homes/Apts/etc. in wildland fire hazard zones | 34% | | Approximate Percentage of Homes/Apts/etc. in wildland fire hazard zones - in 2022 | N/A |
| Approximate Percentage of Commercial Businesses in flood hazard zones | N/A | N/A | Approximate Percentage of Commercial Businesses in flood hazard zones - in 2022 | N/A |
| Approximate Percentage of Commercial Businesses in earthquake hazard zones | N/A | N/A | Approximate Percentage of Commercial Businesses in earthquake hazard zones - in 2022 | N/A |
| Approximate Percentage of Commercial Businesses in wildland fire hazard zones | N/A | N/A | Approximate Percentage of Commercial Businesses in wildland fire hazard zones - in 2022 | N/A |
| Number of Critical Facilities in your Jurisdiction that are in flood hazard zones | 41 | 1,298 | Projected Number of Critical Facilities in your Jurisdiction that are in flood hazard zones - in 2022 | N/A |
| Number of Critical Facilities in your Jurisdiction that are in earthquake hazard zones | 21 | | Number of Critical Facilities in your Jurisdiction that are in earthquake hazard zones - in 2022 | N/A |
| Number of Critical Facilities in your Jurisdiction that are in wildland fire hazard zones. | 69 | | Number of Critical Facilities in your Jurisdiction that are in wildland fire hazard zones - in 2022 | N/A |
| Does your jurisdiction plan on participating in the County's on-going plan maintenance program every year as described in Part I of the plan? | N/A | N/A | If not, how will your jurisdiction do plan maintenance. | |
| Will a copy of this plan be available for the various planning groups within your jurisdiction for use in future planning and budgeting purposes? | | | | Yes |





# APPENDIX H – Mitigation Cost Analysis Guidelines

Continue to next page.

COUNTY OF RIVERSIDE
OFFICE OF THE
AUDITOR-CONTROLLER

**County Administrative Center**
**4080 Lemon Street, 11th Floor**
**P.O. Box 1326**
**Riverside, CA 92502-1326**
**(951) 955-3800**
**Fax (951) 955-3802**

AUDITOR CONTROLLER
COUNTY OF RIVERSIDE
**Paul Angulo, CPA**
**Auditor-Controller**

Auditor-Controller Review of Rates/Fees

Pursuant to Board of Supervisors Policy B-4 and B-28, County departments wishing to establish a rate/fee, or revise an existing rate/fee for service provided to other County departments, other public agencies, organizations, or individuals, are required to obtain approval by the County Executive Office and be reviewed by the (ACO) Auditor-Controller's Office prior to submitting their rate/fee request to the Board of Supervisors.

Federal (OMB) Office of Management and Budget Circular A-87 provides guidance for determining costs that may be recovered in rates/fees.

Rate/Fee packages submitted for review to the ACO must include the following:

1. A narrative fully explaining the methodology used (i.e., the purpose of the rate/fee, how it was developed, how each rate/fee was calculated, and who will be charged the rate/fee).

2. Electronic copies of spreadsheets created to calculate the rate/fee. Please provide notes to explain where the information was derived and clearly identify if changes have been made to the original data. Ensure multiple tabs are correctly linked and pertinent data is highlighted.

3. Supporting documentation validating all expenditure and revenue amounts used, full disclosure of all calculations, and clear identification of overhead calculations and application of the overhead to all the department's divisions/functions.

ACO Documentation Requirements

1. Direct salary/benefits costs by classification; including hourly rate of pay & benefits rate;
2. Direct costs by line item included in the rate/fee (non-salary/benefit);
3. Departmental administrative overhead costs included in rate/fee, as well as the total administrative cost applied to all divisions/functions;
4. Departmental indirect costs by line item included in rate;
5. Countywide overhead costs;
6. Schedule of fixed asset amortization;
7. Copy of (ICRP) Indirect Cost Rate Proposal, if applicable;
8. Copy of last year's budget for the function;







9. Time studies, if applicable;
10. Methodology for Productive hourly rate computations, if applicable;
11. Government Code reference for statutorily set rates/fees;
12. Related off-setting revenues;
13. County Ordinance reference, if applicable;
14. ISF retained earnings information;
15. Summary showing current rates/fees and revised rates/fees;
16. Completed Form 11; and
17. Copy of the annual productivity and efficiency report.

The above list is not all inclusive and additional documentation may be required in support of submitted rates/fees.

If you have any questions in regards to the rate/fee review process or the required documentation, please contact Principal Accountant, Russell Dominski at 955-8136.

Thank you in advance for your cooperation.

Cc: Jay Orr, County Executive Officer
Ivan Chand, Deputy County Executive Officer
Karen Johnson, Senior Management Analyst

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# APPENDIX I – Acronyms

This list contains acronyms commonly used in Emergency Management and those specific to Riverside County.

| | |
|---|---|
| AC | Area Command |
| ADA | Americans with Disabilities Act |
| ALS | Advanced Life Support |
| ARC | American Red Cross |
| ARES | Amateur Radio Emergency Services |
| CALDAP | California Disaster Assistance Program |
| CAL FIRE | California Department of Forestry and Fire Protection |
| CAL-TRANS | California Department of Transportation |
| CALWAS | California Warning System |
| CAR | Corrective Action Report |
| CBO | Community Based Organization |
| CBRNE | Chemical, Biological, Radiological, Nuclear or High-Yield Explosive |
| CCC | California Conservation Corps |
| CDC | Centers for Disease Control, U.S. Public Health Service |
| CDF | California Department of Forestry |
| CEPEC | California Earthquake Prediction Evaluation Council |
| CERCLA | Comprehensive Environmental Response Compensation and Liability Act |
| CERT | Community Emergency Response Team |
| CESFRS | California Emergency Service Fire Radio System |
| CESRS | California Emergency Services Radio System |
| CFR | Code of Federal Regulations |
| CHP | California Highway Patrol |
| CLEMARS | California Law Enforcement Mutual Aid Radio System |
| CLERS | California Law Enforcement Radio System |

| | |
|---|---|
| CLETS | California Law Enforcement Telecommunications System |
| COG | Continuity of Government |
| DA | Damage Assessment |
| DAP | Disaster Assistance Programs |
| DCS | Disaster Communications Service |
| DFCO | Deputy Federal Coordinating Officer |
| DFO | Disaster Field Office |
| DHA | Disaster Housing Assistance |
| DHS | Department of Homeland Security |
| DMAT | Disaster Medical Assistance Team |
| DMORT | Disaster Mortuary Operational Response Team |
| DOC | Department Operations Center |
| DOD | Department of Defense |
| DOI | Department of Interior |
| DOJ | Department of Justice |
| DOL | Department of Labor |
| DOS | Department of State |
| DOT | Department of Transportation |
| DRC | Disaster Recovery Center |
| DRC | Disaster Resource Center |
| DSA | Division of the State Architect (California) |
| DWR | California Department of Water Resources |
| EAS | Emergency Alert System |
| EDD | Employment Development Department |
| EDIS | Emergency Digital Information System |
| EMAC | Emergency Management Assistance Compact |
| EMD | Emergency Management Department |
| EMI | Emergency Management Institute |
| EMIS | Emergency Management Information System (Los Angeles County) |





| | |
|---|---|
| EMMA | Emergency Managers Mutual Aid |
| EMP | Electromagnetic Pulse |
| EMPG | Emergency Management Performance Grant |
| EMS | Emergency Medical Services |
| EMSA | Emergency Medical Services Authority |
| EMT | Emergency Medical Technician |
| EOC | Emergency Operations Center |
| EOP | Emergency Operations Plan |
| EPA | Environmental Protection Agency |
| EPI | Emergency Public Information |
| EPIC | Emergency Public Information Center |
| ERT | Emergency Response Team |
| ESA | California Emergency Services Act |
| ESC | Emergency Services Coordinator |
| ESF | Emergency Support Functions |
| EST | Emergency Support Team |
| FAA | Federal Aviation Administration |
| FBI | Federal Bureau of Investigation |
| FCC | Federal Communications Commission |
| FCO | Federal Coordinating Officer |
| FEMA | Federal Emergency Management Agency |
| FFY | Federal Fiscal Year |
| FHWA | Federal Highway Administration |
| FIA | Federal Insurance Administration |
| FIRESCOPE | Firefighting Resources of Calif. Organized for Potential Emergencies |
| FOG | Field Operations Guide |
| FTS | Field Treatment Sites |
| GAR | Governor's Authorized Representative |
| GSA | General Services Administration |

| | |
|---|---|
| HAZMAT | Hazardous Materials |
| HEW | U.S. Department of Health, Education and Welfare |
| HHS | Department of Health and Human Services |
| HMC | Hazard Mitigation Coordinator |
| HMDA | Hazard Mitigation and Disaster Assistance |
| HMGP | Hazard Mitigation Grant Program |
| HMO | Hazard Mitigation Officer |
| HMT | Hazard Mitigation Team |
| HSAS | Homeland Security Advisory System |
| HSC | Homeland Security Council |
| HSEEP | Homeland Security Exercise Evaluation Program |
| HSOC | Homeland Security Operations Center |
| HSPD | Homeland Security Presidential Directive |
| HSPD-5 | Homeland Security Presidential Directive-5 |
| HUD | Housing and Urban Development Program |
| IA | Individual Assistance |
| IAC | Incident Advisory Council |
| IAP | Incident Action Plan |
| IC | Incident Commander |
| IC | Incident Command |
| ICP | Incident Command Post |
| ICS | Incident Command System |
| IDE | Initial Damage Estimate |
| IID | Imperial Irrigation District |
| IMT | Incident Management Team |
| IRS | U.S. Internal Revenue Service |
| JDIC | Justice Data Interface Controller |
| JFO | Joint Field Office |
| JIC | Joint Information Center |





| | |
|---|---|
| JIS | Joint Information System |
| JOC | Joint Operations Center |
| JPA | Joint Powers Agreement |
| JTTF | Joint Terrorism Task Force |
| LNO | Liaison Officer |
| MACS | Multi-Agency Coordination System |
| MARAC | Mutual Aid Regional Advisory Committee |
| MMRS | Metropolitan Medical Response Team |
| MOA | Memorandum of Agreement |
| MOU | Memorandum of Understanding |
| MTA | Metropolitan Transit Authority |
| NAWAS | National Warning System |
| NDAA | California Natural Disaster Assistance Act |
| NDMS | National Disaster Medical System |
| NEP | National Exercise Program |
| NFA | National Fire Academy |
| NFIP | National Flood Insurance Program |
| NGO | Nongovernmental Organization (See PNP, NVOAD, VOAD) |
| NHC | National Hurricane Center |
| NHPA | National Historic Preservation Act |
| NIMS | National Incident Management System |
| NOAA | National Oceanic and Atmospheric Administration |
| NOC | National Operations Center |
| NOI | Notice of Interest |
| NRC | Nuclear Regulatory Commission |
| NRF | National Response Framework |
| NSC | National Security Council |
| NVOAD | National Voluntary Organizations Active in Disaster (See NGO, PNP, VOAD) |
| NWS | National Weather Service |

| | |
|---|---|
| OA | Operational Area |
| OASIS | Operational Area Satellite Information System |
| OEM | Office of Emergency Management |
| OES | Office of Emergency Services |
| OSA | California Office of the State Architect |
| OSHA | Occupational Safety and Health Administration |
| PA | Public Assistance |
| PA/O | Public Assistance Officer |
| PDD | Presidential Decision Directive |
| PFO | Principal Federal Officer |
| PFO | Principal Federal Official |
| PIO | Public Information Officer |
| PIS | Public Information System |
| PNP | Private Nonprofit Organization (see NGO, NVOAD, VOAD) |
| POC | Point of Contact |
| POLREP | Pollution Report |
| PUC | California Public Utilities Commission |
| PVO | Private Voluntary Organizations |
| PW | Project Worksheet |
| R&D | Research and Development |
| RACES | Radio Amateur Civil Emergency Services |
| RCOE | Riverside County Office of Education |
| RCSD | Riverside County Sheriff's Department |
| REOC | Regional Emergency Operations Center (State OES Region) |
| RESTAT | Resources Status |
| RIMS | Response Information Management System (State OES) |
| RIMS | Resources Inventory Management System (federal) |
| ROSS | Resource Ordering and Status System |
| RRCC | Regional Response Coordination Center |





| | |
|---|---|
| RRCC | Regional Response Coordinating Center |
| SAP | State Assistance Program |
| SAR | Search and Rescue |
| SARA | Superfund Amendment Reauthorization Act (Title III) |
| SBA | Small Business Administration |
| SCAQMD | South Coast Air Quality Management District |
| SCC | Sheriff's Communications Center (Los Angeles County) |
| SCO | State Coordinating Officer |
| SDO | Standards Development Organizations |
| SEMS | Standardized Emergency Management System |
| SFLEO | Senior Federal Law Enforcement Official |
| SFO | Senior Federal Official |
| SHMO | State Hazard Mitigation Officer |
| SIOC | Strategic Information and Operations Center |
| SITREP | Situation Report |
| SO | Safety Officer |
| SOC | State Operations Center |
| SOP | Standard Operating Procedure |
| STO | State Training Officer |
| TEW | Terrorism Early Warning group |
| TLMA | Transportation and Land Management Agency |
| UC | Unified Command |
| USACE | United States Army Corps of Engineers |
| USAR | Urban Search and Rescue |
| USDA | U.S. Department of Agriculture |
| USFA | United States Fire Administration |
| USGS | United States Geological Survey |
| VOAD | Volunteer Organizations Active in Disaster (See NGO, PNP, NVOAD) |
| WMD | Weapons of Mass Destruction |

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# APPENDIX J – References

References for the Updated LHMP included information from many websites, FEMA and Cal EMA guidance documents and resources from the County of Riverside Departments.

| Guidance and other Documents: |
|---|
| 2012 Riverside County Operational Area Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) |
| FEMA Local Mitigation Plan Review Guide |
| 2010 State of California Hazard Mitigation Plan (SHMP) |
| Disaster Mitigation Act of 2000 |
| County of Riverside General Plan, multiple Elements |
| Riverside County Operational Area Emergency Operations Plan |
| FEMA Hazard Mitigation Planning |
| FEMA How To Guide #1, Getting Started: Building Support for Mitigation Planning |
| FEMA How To Guide #2, Understanding Your Risks: Identifying Hazards and Estimating Losses |
| FEMA How To Guide #3, Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies |
| FEMA How To Guide #4, Bringing the Plan to Life: Implementing the Hazard Mitigation Plan |
| FEMA How To Guide #5, Using Benefit-Cost Review in Mitigation Planning |
| FEMA How To Guide #6, Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning |
| FEMA How To Guide #7, Integrating Manmade Hazards into Mitigation Planning |
| FEMA How To Guide #8, Multi-Jurisdictional Mitigation Planning |
| FEMA How To Guide #9, Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects |
| Freeway Closure Plan |
| Joint Information System (JIS) Plan |
| Mass Care & Shelter Guidance and Standard Operating Procedures |
| Natural Hazard Mapping, Analysis, and Mitigation: a Technical Background Report in Support of the Safety Element of the New Riverside County 2000 General Plan |
| Riverside County Essential Facilities Risk Assessment (RCEFRA) Project Report June 2009 |
| 2015 Riverside County SCAG Repot – Profile of Riverside County |
| Southern California Catastrophic Earthquake Response Plan |

| Website Links: | |
|---|---|
| Cal OES Hazard Mitigation Portal | http://hazardmitigation.calema.ca.gov/ |
| Cal OES Local Mitigation Planning | http://www.caloes.ca.gov/for-individuals-families/hazard-mitigation-planning/local-hazard-mitigation-program |
| My Hazards Mapping Website | http://myhazards.calema.ca.gov/ |
| My Plan Mapping Site | http://myplan.calema.ca.gov/ |
| Distressed and Abandoned Properties | http://www.foreclosureregistration.org/ |
| Query for fires, used to find details on 63 large fires for Riverside County | http://cdfdata.fire.ca.gov/incidents/incidents_search_results?search=riverside |
| Data query to find heat data, health related stats | http://epicenter.cdph.ca.gov/ReportMenus/InjuryDataByTopic.aspx |
| Seismic landslide zones | http://gmw.consrv.ca.gov/shmp/html/pdf_maps_so.html |
| Landslide Alerts | http://www.usgs.gov/hazard_alert/alerts/landslides.rss |
| Kinder Morgan Public Information | http://www.kindermorgan.com/public_awareness/ |
| | http://www.kindermorgan.com/public_awareness/AdditionalInformation/KMSafetyBrochures.cfm |
| Riverside County Ordinances Link | http://www.rctlma.org/admin/content/ordinance_ |
| Riverside County Building and Safety Link | http://www.rctlma.org/building/default.aspx |
| Riverside County Auditor Controller | http://www.auditorcontroller.org/ReportsPublications.aspx |
| Riverside Flood Control | http://www.floodcontrol.co.riverside.ca.us/AnnualReports.aspx |
| Riverside County Transportation & Land Management Agency | http://planning.rctlma.org/Portals/0/genplan/general_Plan_2017/elements/OCT17/Ch01_Intro_120815.pdf?ver=2017-10-11-102103-380 |
| | http://planning.rctlma.org/ZoningInformation/GeneralPlan/RiversideCountyGeneralPlan2015.aspx |
| | http://planning.rctlma.org/ |
| Ready.Gov Website | http://www.ready.gov/pandemic |
| | http://www.ready.gov/terrorism |
| Disability Planning Data for Planners From Pooled 2005-2007 ACS PUMS Data. | www.DisabilityPlanningData.com |
| The Spatial Hazard Events and Losses Database for the United States. Version 7.0 Database. | http://www.sheldus.org. |





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|---|---|
| Columbia, SC: University of South Carolina. 2009. | |
| Water Plan information | http://www.water.ca.gov/publications/forms/ |
| Flood Risk Maps | http://www.water.ca.gov/myfloodrisk/ |
| Dam Safety Website | www.water.ca.gov/damsafety/index.cfm |
| Source: California Energy Commission, Natural Gas Pipelines | http://www.energy.ca.gov/maps/Natural_Gas_Pipelines.pdf |
| 75 Gas Transmission Pipeline Long Range Planning | http://www.pge.com/myhome/customerservice/response/pipelineplanning/ |
| Source: U.S. Department of Transportation's Office of Pipeline Safety | http://osfm.fire.ca.gov/pipelineregulation.html |
| Recent Earthquakes in California and Nevada | http://scedc.caltech.edu/recent/Quakes/quakes0.html |
| Data: Explore 15 Years of Power Outages | http://insideenergy.org/2014/08/18/data-explore-15-years-of-power-outages/ |
| Thousands without power in unincorporated Riverside County | http://abc7.com/news/thousands-without-power-in-unincorporated-riverside-county/1315149/ |
| Power and phone outages reported across Riverside/San Bernardino counties | http://www.kesq.com/news/power-and-phone-outages-reported-across-riverside_san-bernardino-counties/62501575 |
| Arizona-Southern California Outages on September 8, 2011 | cascading outages and leaving approximately 2.7 million customers without power |
| A Study of Active Shooter Incidents in the United States Between 2000 and 2013 | file:///C:/Users/sbruns/Downloads/(U)_ActiveShooter021317_17B_WEB%20(1).PDF |
| Active Shooter Incidents in the United States in 2014 and 2015 | file:///C:/Users/sbruns/Downloads/ActiveShooterIncidentsUS_2014-2015.pdf |
| U.S. Drought Monitor – California | http://droughtmonitor.unl.edu/data/jpg/20170718/20170718_CA_trd.jpg |
| Riverside County Flood Control and Water Conservation District ANNUAL REPORT FY 2015/2016 | http://www.floodcontrol.co.riverside.ca.us/Downloads/AnnualReports/DistrictAnnualReport15-16.pdf |
| San Onofre - Units 2 and 3 | https://www.nrc.gov/info-finder/decommissioning/power-reactor/san-onofre-units-2-3.html |
| Cal OES - San Onofre Nuclear Generating Station | http://www.caloes.ca.gov/cal-oes-divisions/planning-preparedness/nuclear-power-plant-program |
| Colorado River Aqueduct | http://www.asce.org/project/colorado-river-aqueduct/ |
| California State Water Project Overview | http://www.water.ca.gov/swp/ |

| | |
|---|---|
| Addressing Emerging Infectious Disease Threats: A Prevention Strategy for the United States Executive Summary | https://www.cdc.gov/mmwr/preview/mmwrhtml/00031393.htm |
| National Center for Emerging and Zoonotic Infectious Diseases (NCEZID) | https://www.cdc.gov/ncezid/who-we-are/index.html |
| Botulism from Drinking Pruno | https://wwwnc.cdc.gov/eid/article/15/1/08-1024_article |
| West Nile Virus in California | https://wwwnc.cdc.gov/eid/article/10/8/04-0077_article |
| Risk of Local Zika Virus Transmission by County | https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/LocalZikaRiskMap.pdf |
| Ebola (Ebola Virus Disease) | https://www.cdc.gov/vhf/ebola/transmission/index.html |
| **Mapping Site Links:** | |
| Cal OES Hazard Mapping | http://www.caloes.ca.gov/cal-oes-divisions/geographic-information-systems |
| Cal OES My Plan | http://myplan.calema.ca.gov/ |
| Faults Mapping | http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html |
| California Department of Water Resources | http://gis.bam.water.ca.gov/bam/ |
| **Handouts and Documents Distributed to Participants:** | |
| FEMA Local Mitigation Planning Handbook | |
| FEMA How To Guide #1, Getting Started: Building Support for Mitigation Planning | |
| FEMA How To Guide #2, Understanding Your Risks: Identifying Hazards and Estimating Losses | |
| FEMA How To Guide #3, Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies | |
| FEMA How To Guide #4, Bringing the Plan to Life: Implementing the Hazard Mitigation Plan | |
| FEMA How To Guide #5, Using Benefit-Cost Review in Mitigation Planning | |
| FEMA How To Guide #6, Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning | |
| FEMA How To Guide #7, Integrating Manmade Hazards into Mitigation Planning | |
| FEMA How To Guide #8, Multi-Jurisdictional Mitigation Planning | |





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|---|
| FEMA How To Guide #9, Using the Hazard Mitigation Plan to Prepare Successful Mitigation Projects |
| FEMA Mitigation Ideas |
| 2016 Riverside County SCAG Repot – Profile of Riverside County |
| Community Rating System |
| FEMA Local Mitigation Plan Review Guide |
| 2016 Inventory Worksheet |
| 2017 LHMP Template |
| Senate Bill 1000 |
| Senate Bill 379 |
| FEMA Mitigation Grant Information |

# APPENDIX G

# RESOLUTION ADOPTING 2020 UWMP AND WSCP

# RESOLUTION NO. 2021-04

## A RESOLUTION OF THE BOARD OF DIRECTORS OF THE CHINO BASIN DESALTER AUTHORITY ADOPTING THE CHINO BASIN DESALTER AUTHORITY URBAN WATER MANAGEMENT PLAN 2020

**WHEREAS**, the Chino Basin Desalter Authority ("CDA") prepared that certain draft Chino Basin Desalter Authority Urban Water Management Plan 2020, dated June 2021 ("2020 UWMP"), in accordance with the requirements of the Urban Water Management Planning Act, California Water Code Section 10610, *et seq.*; and

**WHEREAS**, in accordance with California Water Code Section 10642, CDA encouraged public participation with respect to the preparation of the 2020 UWMP by making the 2020 UWMP available for review by the public online, at *www.chinodesalter.org*, on May 20, 2021; and

**WHEREAS**, on June 3, 2021, the CDA Board of Directors held a public hearing to receive public testimony and comments regarding the 2020 UWMP; and

**WHEREAS**, notice of the time and place of the June 3, 2021 public hearing was published on May 11, 2021 and May 18, 2021 in the Inland Valley Daily Bulletin and May 12, 2021 and May 19, 2021 in the Riverside Press Enterprise, in accordance with California Government Code Section 6066; and

**WHEREAS**, the CDA Board of Directors considered all public comments and testimony presented at the public hearing relating to the 2020 UWMP; and

**WHEREAS**, the CDA Board of Directors now desires to adopt the 2020 UWMP.

**NOW, THEREFORE, BE IT RESOLVED**, the Board of Directors of the Chino Basin Desalter Authority hereby declares, finds, and determines as follows:

1. The recitals set forth above are true and correct.

2. The 2020 UWMP is hereby approved and adopted.

3. The Chairperson or the Chairperson's designee, the General Manager or the General Manager's designee, and any other proper officer of CDA, are each hereby authorized and directed to execute and deliver any and all documents and instruments and to do and cause to be done any and all acts and things necessary or proper to implement the 2020 UWMP.

4. The 2020 UWMP shall be placed on file with the General Manager or another officer of CDA, as directed from time to time by the General Manager. The General Manager is hereby directed to transmit copies of the 2020 UWMP to the California Department of Water Resources, the California State Library, and each city and county within which CDA provides water supplies, all within thirty (30) days following the date of adoption of this Resolution.

5. The CDA Board of Directors hereby finds and determines that, pursuant to California Water Code Section 10652, the adoption of the 2020 UWMP does not constitute a "project" within the meaning of the California Environmental Quality Act, Public Resources Code Section 21000, *et seq.*

6. This Resolution shall take effect immediately upon adoption.

**PASSED AND ADOPTED** this 3rd day of June, 2021.

Kenneth McLaughlin
Chairperson

ATTEST:

Casey Costa
Secretary

STATE OF CALIFORNIA )
) ss
COUNTY OF SAN BERNARDINO)

I, Casey Costa, Secretary of the Chino Basin Desalter Authority, do hereby certify that the foregoing Resolution, being No. 2021-04, was duly adopted by the Board of Directors of the Chino Basin Desalter Authority on the 3rd day of June, 2021, by the following vote:

AYES: Ken McLaughlin, Jurupa Community Services District
Jim Bowman, City of Ontario
Eunice Ulloa, City of Chino
Peter Rogers, City of Chino Hills
Greg Newton, City of Norco
Vicki Rupe, Santa Ana River Water Company
Gracie Torres, Western Municipal Water District

NOES: None

ABSENT: None

ABSTAIN: None

By:

Casey Costa
Secretary

# RESOLUTION NO. 2021-05

## A RESOLUTION OF THE BOARD OF DIRECTORS OF THE CHINO BASIN DESALTER AUTHORITY ADOPTING THE CHINO BASIN DESALTER AUTHORITY WATER SHORTAGE CONTINGENCY PLAN 2020

**WHEREAS**, the Chino Basin Desalter Authority ("CDA") is an urban water supplier that is required to adopt an Urban Water Management Plan pursuant to Water Code Sections 10620 et seq.; and

**WHEREAS**, CDA adopted the Chino Basin Desalter Authority Urban Water Management Plan 2020 ("2020 UWMP") on June 3, 2021 in accordance with the requirements of the Urban Water Management Planning Act, California Water Code Section 10610, *et seq.*; and

**WHEREAS**, CDA is also required to prepare and adopt a Water Shortage Contingency Plan (2020 WSCP) that consists of certain elements prescribed by Water Code Section 10632, and to make the Plan available to the California State Library, the California Department of Water Resources, and to any city or county within which CDA supplies water no later than 30 days after adoption of the Plan and no later than July 1, 2021, as a required component of the Urban Water Management Plan; and

**NOW, THEREFORE, BE IT RESOLVED**, the Board of Directors of the Chino Basin Desalter Authority hereby declares, finds, and determines as follows:

1. The recitals set forth above are true and correct.

2. The 2020 Water Shortage Contingency Plan for the Chino Basin Desalter Authority is hereby approved and adopted.

3. This Resolution shall take effect immediately upon adoption.

**PASSED AND ADOPTED** this 1st day of July 2021.

Kenneth McLaughlin
Chairperson

ATTEST:

Casey Costa
Secretary

STATE OF CALIFORNIA )
) ss
COUNTY OF SAN BERNARDINO)

I, Casey Costa, Secretary of the Chino Basin Desalter Authority, do hereby certify that the foregoing Resolution, being No. 2021-05, was duly adopted by the Board of Directors of the Chino Basin Desalter Authority on the 1st day of July 2021, by the following vote:

AYES: Ken McLaughlin, Jurupa Community Services District
Jim Bowman, City of Ontario
Eunice Ulloa, City of Chino
Peter Rogers, City of Chino Hills
Greg Newton, City of Norco,
Vicki Rupe, Santa Ana River Water Company
Gracie Torres, Western Municpal Water District

NOES: None

ABSENT: None

ABSTAIN: None

By:

Casey Costa
Secretary

# Urban Water Management Plan

SEPTEMBER 2021

SAN ANTONIO WATER COMPANY

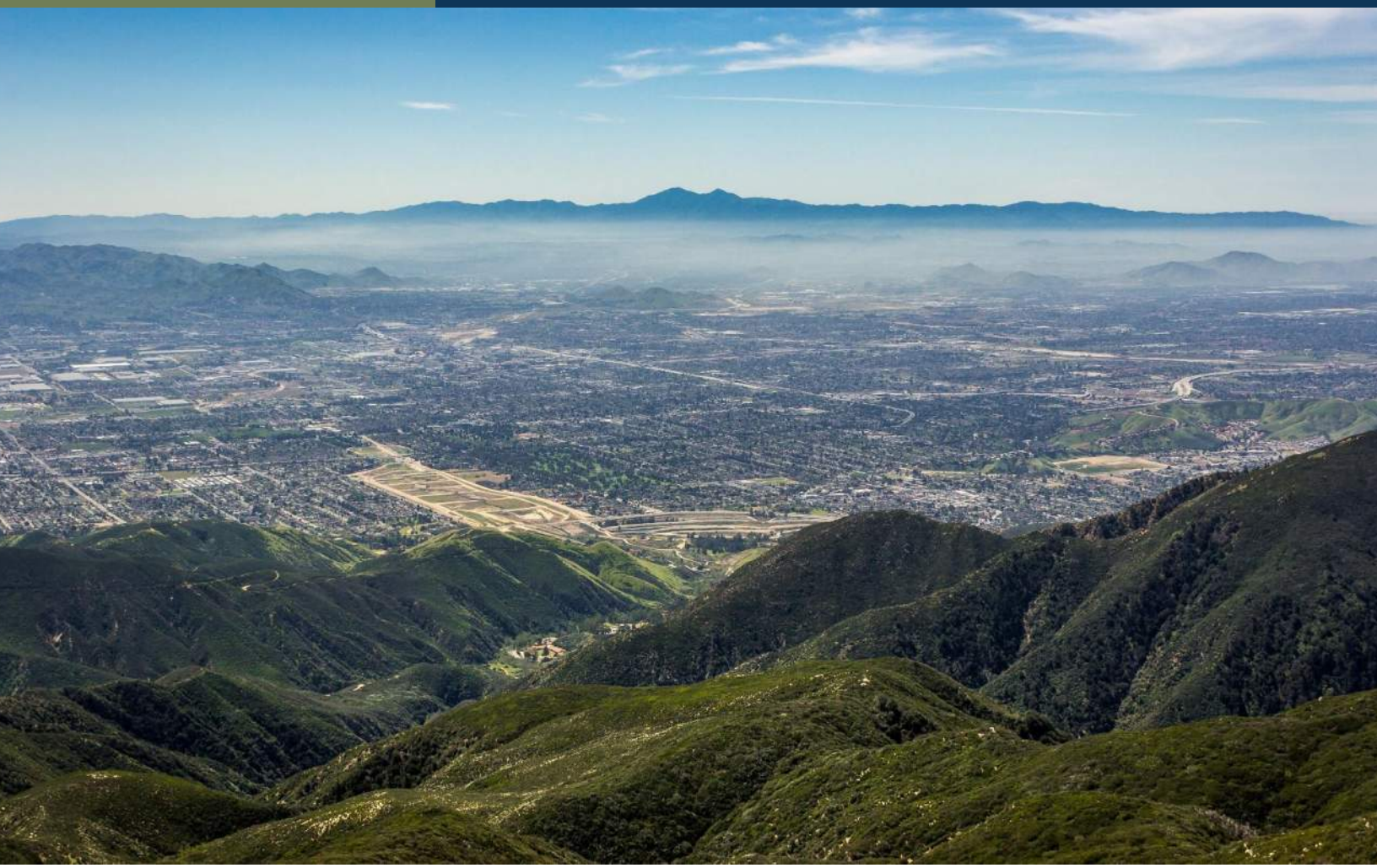

WSC

SAN ANTONIO WATER COMPANY

# Urban Water Management Plan

SEPTEMBER 2021

Prepared by Water Systems Consulting, Inc.

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# ACRONYMS & ABBREVIATIONS

| | |
|---|---|
| °C | Degrees Celsius |
| °F | Degrees Fahrenheit |
| AB | Assembly Bill |
| AF | Acre Foot |
| AFY | Acre Feet per Year |
| AHHG | Area of Historic High Groundwater |
| AMR | Automatic Meter Reader |
| APA | Administrative Procedures Act |
| AWWA | American Water Works Association |
| BMP | Best Management Practice |
| CALWARN | California Water/Wastewater Agency Response Network |
| CAT | Climate Action Team |
| CCF | Hundred Cubic Feet |
| CCR | California Code of Regulations |
| CEQA | California Environmental Quality Act |
| CFS | Cubic Feet per Second |
| CII | Commercial, Industrial, and Institutional |
| CIMIS | California Irrigation Management Irrigation System |
| CUWCC | California Urban Water Conservation Council |
| DCR | DWR SWP Delivery Capacity Report |
| DDW | SWRCB Division of Drinking Water |
| DFW | California Department of Fish and Wildlife |
| DIP | Ductile Iron Pipe |
| DMM | Demand Management Measure |
| DWR | California Department of Water Resources |
| EIR | Environmental Impact Report |
| EPA | United States Environmental Protection Agency |
| ERNIE | Emergency Response Network of the Inland Empire |
| ESA | Endangered Species Act |
| ET | Evapotranspiration |
| ETo | Reference Evapotranspiration |

| | |
|---|---|
| GAC | Granulated Activated Carbon |
| GIS | Geographic Information System |
| GPCD | Gallons per Capita per Day |
| GPM | Gallons per Minute |
| HECW | High Efficiency Clothes Washer |
| HET | High Efficiency Toilet |
| IX | Ion Exchange |
| KAF | Thousand Acre Feet |
| KAFY | Thousand Acre Feet per Year |
| LAFCO | Local Agency Formation Commission |
| MAF | Million Acre-Feet |
| MCL | Maximum Contaminant Level |
| MF | Multi-family |
| MG | Million Gallons |
| MGD | Million Gallons per Day |
| MOU | Memorandum of Understanding |
| MSL | Mean Sea Level |
| MTBE | Methyl Tertiary Butyl Ether |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| NPDES | National Pollutant Discharge Elimination System |
| PCE | Perchloroethylene |
| PVC | Polyvinyl Chloride |
| QWEZ | Qualified Water Efficient Landscaper |
| RIX | Rapid Infiltration and Extraction |
| RPA | Reasonable and Prudent Alternative |
| RUWMP | Regional Urban Water Management Plan |
| RWQCB | Regional Water Quality Control Board |
| SAWCo | San Antonio Water Company |
| SBX7-7 | Senate Bill 7 of Special Extended Session 7 |
| SF | Single Family |
| SOI | Sphere of Influence |
| SWRCB | State Water Resources Control Board |
| TDS | Total Dissolved Solids |
| TCE | Trichloroethylene |
| ULFT | Ultra-Low Flush Toilet |

| | |
|---|---|
| UV | Ultraviolet |
| UWMP | Urban Water Management Plan |
| UWMP Act | Urban Water Management Planning Act |
| VOC | Volatile Organic Compound |
| WBIC | Weather Based Irrigation Controller |
| WSCP | Water Shortage Contingency Plan |
| WFF | Water Filtration Facility |
| WSS | Water Sense Specification |
| WTP | Water Treatment Plant |
| WWTP | Wastewater Treatment Plant |

1

2020 URBAN WATER MANAGEMENT PLAN

# Introduction and Lay Description

**This chapter provides a brief overview of the San Antonio Water Company (SAWCo) and the purpose of this Urban Water Management Plan (UWMP).**

SAWCo is a private non-profit Mutual Water Company formed in 1882 under the General Corporation Laws of the United States with the purpose to furnish, lease, or sell water for irrigation, milling, manufacturing and other purposes to the newly established Ontario irrigation colony. Land for the irrigation colony was sold primarily for the booming citrus industry at the time, and a share in SAWCo was included with every acre of land purchased. Each shareholder was entitled to a portion of available local water, distributed equally by SAWCo amongst shareholders on a non-profit basis. Today SAWCo retains the same purpose of providing beneficial water service to all shareholders based on established monthly entitlements and a fixed number of shares.

IN THIS SECTION

- California Water Code
- UWMP Organization
- UWMP Relation to Other Efforts

## 1.1 The California Water Code

In 1983, the State of California Legislature (Legislature) enacted the Urban Water Management Planning Act (UWMP Act). The law required an urban water supplier, providing water for municipal purposes to more than 3,000 customers or serving more than 3,000 acre-feet (AF) annually, to adopt an UWMP every five years demonstrating water supply reliability under normal as well as drought conditions.

Since the original UWMP Act was passed, it has undergone significant expansion, particularly since the completion of the 2015 UWMP. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions affect the reliability of water suppliers as well as the statewide water reliability overseen by California Department of Water Resources (DWR), the State Water Resources Control Board (State Water Board), and the Legislature. Accordingly, the UWMP Act has grown to address changing conditions and the current requirements are found in Sections 10610-10656 and 10608 of the California Water Code.

DWR provides guidance for urban water suppliers by preparing an Urban Water Management Plan Guidebook 2020 (Guidebook) (California Department of Water Resources, 2021), conducting workshops, developing tools, and providing program staff to help water suppliers prepare comprehensive and useful UWMPs, implement water conservation programs, and understand the requirements in the California Water Code. Suppliers prepare their own UWMPs in accordance with the requirements and submit them to DWR. DWR then reviews the plans to make sure they have addressed the requirements identified in the California Water Code and submits a report to the Legislature summarizing the status of the plans for each five-year cycle.

The purpose of the UWMP is for water suppliers to evaluate their long-term resource planning and establish management measures to ensure adequate water supplies are available to meet existing and future demands. The UWMP provides a framework to help water suppliers maintain efficient use of urban water supplies, continue to promote conservation programs and policies, ensure that sufficient water supplies are available for future beneficial use, and provide a mechanism for response during drought conditions or other water supply interruptions.

**The UWMP is a valuable planning tool used for multiple purposes including:**

- Provides a standardized methodology for water utilities to assess their water resource needs and availability.
- Serves as a resource to the community and other interested parties regarding water supply and demand, conservation and other water related information.
- Provides a key source of information for cities and counties when considering approval of proposed new developments and preparing regional long-range planning documents such as city and county General Plans.
- Informs other regional water planning efforts.

This plan, which was prepared in compliance with the California Water Code, and as set forth in the Guidebook and format established by the DWR, constitutes the 2020 UWMP for SAWCo.

## 1.2 UWMP Organization and Lay Description

**This UWMP is organized as follows:**

### Chapter 1 – Introduction

The introduction provides a description of SAWCo and background on the UWMP and California Water Code. Water suppliers that serve more than 3,000 customers or 3,000 acre-feet-per-year (AFY) are required to prepare a UWMP. The UWMP is an important tool that details SAWCo's system and service area, estimates supply and demand over a twenty-five-year period, and analyzes reliability in terms of drought.

### Chapter 2 – Plan Preparation

The UWMP is prepared based on guidance from DWR. This UWMP provides information in terms of calendar year (January 1st – December 31st) and in units of AFY. While preparing this UWMP, SAWCo coordinated with other local agencies and sent notifications that the UWMP was being developed, available for review, and details pertaining to the public hearing and plan adoption meeting.

### Chapter 3 – System Description

This chapter summarizes SAWCo's service area, climate, demographics, and land use. SAWCo provides domestic service to the San Antonio Heights community with an estimated population of 3,000 people. SAWCo provides water based on entitlement and the number of shares. There are 6,389 shares in SAWCo. In 2020, only 6,178 shares were active.

### Chapter 4 – Water Use Characterization

This chapter summarizes historical and future water use. SAWCo provides water for domestic, municipal, and miscellaneous uses. In addition, SAWCo spreads water in the Chino, Cucamonga, and Six Basins groundwater basins for groundwater recharge. In 2020, the largest customer was the City of Upland's purchases for irrigation water, which accounted for 50% of the total water sales.

SAWCo's Basic Area is nearly built out. SAWCo's ongoing Master Plan effort identified seven parcels as possible future development and corresponding water demand factors. Using the information developed in the Master Plan, it is estimated that should these seven parcels develop, future demands on SAWCo will increase by approximately 30 AFY.

### Chapter 5 – Water Supply Characterization

SAWCo uses local groundwater from several groundwater basins and surface water to meet customer demands. Local groundwater is extracted from the Chino Basin, Cucamonga Basin, and Six Basins. The three groundwater basins are each adjudicated, and SAWCo's has water rights as defined by the various legal Judgements in place to protect and manage each basin. SAWCo also participates in groundwater recharge operations that enhance groundwater supply. Surface water from San Antonio Creek are pre-1914 water rights, and annual water availability is influenced by rainfall. The San Antonio Tunnel is a deep rock tunnel 100 feet below ground surface that collects naturally percolated groundwater.

### Chapter 6 – Water Service Reliability and Drought Risk Assessment

Future demand and supply were analyzed to evaluate supply reliability over the planning period. The UWMP analyzed conditions for normal, or average, single-dry, and five-year consecutive dry periods. SAWCo aims to provide shareholders full entitlement, but in periods of drought, allocations per share may be reduced, depending on supply availability. In all scenarios, SAWCo expects to meet customer

demands based on shareholders full entitlement. In addition, a Drought Risk Assessment was performed to analyze anticipated supply and demand for the next five years (2021-2025). The Drought Risk Assessment analysis determines that SAWCo's supplies are able to reliably meet customer demands.

### Chapter 7 – Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP) provides guidance on declaring a water shortage stage and how to mitigate supply deficits. The WSCP defines four stages of water shortage and outlines the actions that will be required of customers during each stage. The complete WSCP is available in Appendix H.

### Chapter 8 – Demand Management Measures

This chapter summarizes the various demand management measures used to implement water conservation throughout SAWCo. To participate in any of the rebate programs, interested customers should contact SAWCo directly.

### Chapter 9 – Plan Adoption, Submittal, and Implementation

This chapter summarizes the various requirements to adopt and submit a UWMP and WSCP. Details on public hearing dates, notification letters to local agencies, and how to submit or amend a plan are discussed.

## 1.3 UWMP Relation to Other Efforts

The UWMP characterizes water use, estimates future demands and supply sources, and evaluates supply reliability for normal, single-dry, and consecutive dry years. The UWMP Act also requires reevaluation of SAWCo's Water Shortage Contingency Plan (WSCP). Details on the WSCP are provided in Chapter 7.

Documents that were leveraged in preparation of this UWMP and how they overlap with the primary topics included in the UWMP are shown in Figure 1-1.

| | | | | PLAN TOPICS | | | | |
|---|---|---|---|---|---|---|---|---|
| **PLANNING DOCUMENT** | **PREPARED BY** | **DOCUMENT STATUS** | | **SUPPLIES / RELIABILITY** | **DEMANDS / WATER USE EFFICIENCY** | **INFRASTRUCTURE** | **RISK & MITIGATION** | **EMERGENCY RESPONSE** |
| Water Master Plan | WSC for SAWCo | ■■■□□ | Under development | ✓ | ✓ | ✓ | | |
| AWIA Risk and Resilience Assessment and Emergency Response Plan | WSC for SAWCo | ■■■■■ | Complete | ✓ | | ✓ | ✓ | ✓ |
| 2017 Water Master Plan | Civiltec Engineering, Inc for SAWCo | ■■■■■ | Complete | ✓ | ✓ | ✓ | | |
| 2017 Water Rate and Fee Study | Carollo Engineers for SAWCo | ■■■■■ | Complete | | ✓ | | | |
| 2015 Urban Water Management Plan | Civiltec Engineering, Inc for SAWCo | ■■■■■ | Complete | ✓ | ✓ | | ✓ | ✓ |

**Figure 1-1. UWMP Relation to Other Planning Efforts.**

2020 URBAN WATER MANAGEMENT PLAN

# 2 Plan Preparation

**This plan was prepared using guidance from the Department of Water Resources' (DWR) Urban Water Management Plan Guidebook 2020 (2020 UWMP Guidebook). This chapter provides details regarding SAWCo's UWMP preparation and the coordination and outreach efforts conducted.**

A DWR review sheet checklist is provided in Appendix A.

IN THIS SECTION

- Basis for Preparing a Plan
- Coordination and Outreach

## 2.1 Basis for Preparing a Plan

As mentioned in Chapter 1, the Water Code requires Suppliers with 3,000 or more service connections or water deliveries in excess of 3,000 AFY to prepare an UWMP every five years. Details pertaining to SAWCo's water system, such as public water system number, 2020 number of connections and volume of water supplied are provided in Table 2-1. In 2020, SAWCo delivered 16,345 AFY of water to nearly 1,210 service connections and in a wholesale capacity; therefore, SAWCo is required to prepare an UWMP. SAWCo included all 2020 data in the development of this UWMP.

**Table 2-1. DWR 2-2 Plan Identification**

| TYPE OF PLAN | MEMBER OF RUWMP | MEMBER OF REGIONAL ALLIANCE | NAME OF RUWMP OR REGIONAL ALLIANCE |
|---|---|---|---|
| Individual UWMP | No | No | |

**Table 2-2. DWR 2-3 Agency Identification**

| TYPE OF SUPPLIER | YEAR TYPE | FIRST DAY OF YEAR | | UNIT TYPE |
|---|---|---|---|---|
| Wholesaler | Calendar Years | DD | MM | Acre Feet (AF) |
| | | 01 | 01 | |

## 2.2 Coordination and Outreach

The UWMP Act requires a water purveyor to coordinate the preparation of its UWMP with other appropriate agencies in and around its service area. This includes other water suppliers that share a common source, water management agencies, and relevant public agencies. All relevant entities, including the County of San Bernardino, were sent 60-day notices of preparation and consideration for adoption at a public hearing prior to the adoption of the 2020 UWMP. Copies of the letters and other correspondence are provided in Appendix B. Public hearing notices are also provided in Appendix B.

### 2.2.1 Wholesale and Retail Coordination

SAWCo provides water based on a fixed number of shares. Several local water suppliers own shares in SAWCo and are listed in Table 2-3.

**Table 2-3. DWR 2-4W Water Supplier Information Exchange**

Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631. Complete the table below.

| WHOLESALE WATER SUPPLIER NAME |
|---|
| Cucamonga Valley Water District |
| Monte Vista Water District |
| City of Ontario |
| City of Upland |

### 2.2.2 Coordination with Other Agencies and the Community

CWC Section 10621 requires that suppliers notify cities and counties to which they serve water that the UWMP and WSCP are being updated. Notices should be provided at least 60 days prior to a public hearing. To fulfill this requirement, SAWCo notified local and regional agencies of preparation of its 2020 UWMP and WSCP, inviting these agencies to submit any comments. SAWCo provided notices to the agencies listed in Table 2-4.

**Table 2-4. Agency Coordination.**

| AGENCY/ORGANIZATION | WAS NOTIFIED OF PLAN AVAILABILITY[1] | WAS SENT A NOTICE OF INTENTION TO ADOPT 60 DAYS PRIOR TO PUBLIC HEARING |
|---|---|---|
| **Water Suppliers** | | |
| Cucamonga Valley Water District | X | X |
| Monte Vista Water District | X | X |
| **Public Agencies** | | |
| City of Upland | X | X |
| City of Ontario | X | X |
| City of Pomona | X | X |
| County of San Bernardino | X | X |
| **Others** | | |
| Chino Basin Watermaster | X | X |

[1]Was notified of availability of Draft UWMP and directed to an electronic copy of the draft plan on SAWCo's website.

2020 URBAN WATER MANAGMENET PLAN

# 3 System Description

**This section will describe SAWCo's service area, climate, population, demographics, and land uses.**

IN THIS SECTION

- Service Area
- Climate
- Population and Demographics
- Land Uses

SAWCo is governed by a seven-person Board of Directors elected to four-year terms. Daily operations are overseen by the General Manager with support by the Assistant General Manager and Water Utility Superintendent. SAWCo employs approximately 10 staff members to manage operational and administrative services.

SAWCo is governed by bylaws. The purpose of SAWCo is to develop, distribute, supply, and deliver water to its shareholders for irrigation, domestic, and all other useful purposes, in proportion to the number of shares of stock held by them respectively, at actual cost, and is not organized for the private gain of any person (San Antonio Water Company).

SAWCo contains a fixed number of shares at 6,389 shares. In 2020, 6,178 shares were actively taking water. Water is provided based on entitlement and the number of shares a customer holds. Shares may be divided or sold. In 2020, the total yearly entitlement was 13,000 AF; the yearly entitlement per share was equal to 2.03 AF/share.

## 3.1 Service Area

SAWCo's bylaws specify the service area is made up of a Basic Area and an Extended Area. The Basic Area generally coincides with the incorporated community of San Antonio Heights located north of the City of Upland in San Bernardino County, as shown in Figure 3-1. The Basic Area is bounded to the south by the City of Upland, to the north by the San Bernardino Mountains, to the west by the Los Angeles County Line and to the east by Cucamonga Creek. SAWCo provides retail service to all end users who reside in the Basic Area.

The Extended Area is identified as all lands not included in the Basic Area. Customers within the Extended Area are considered wholesale shareholders. There are however a limited number of retail customers in the Extended Area including the Upland Hills Golf course, the Red Hill Golf Course, Holliday Rock Company, and several grove irrigators.

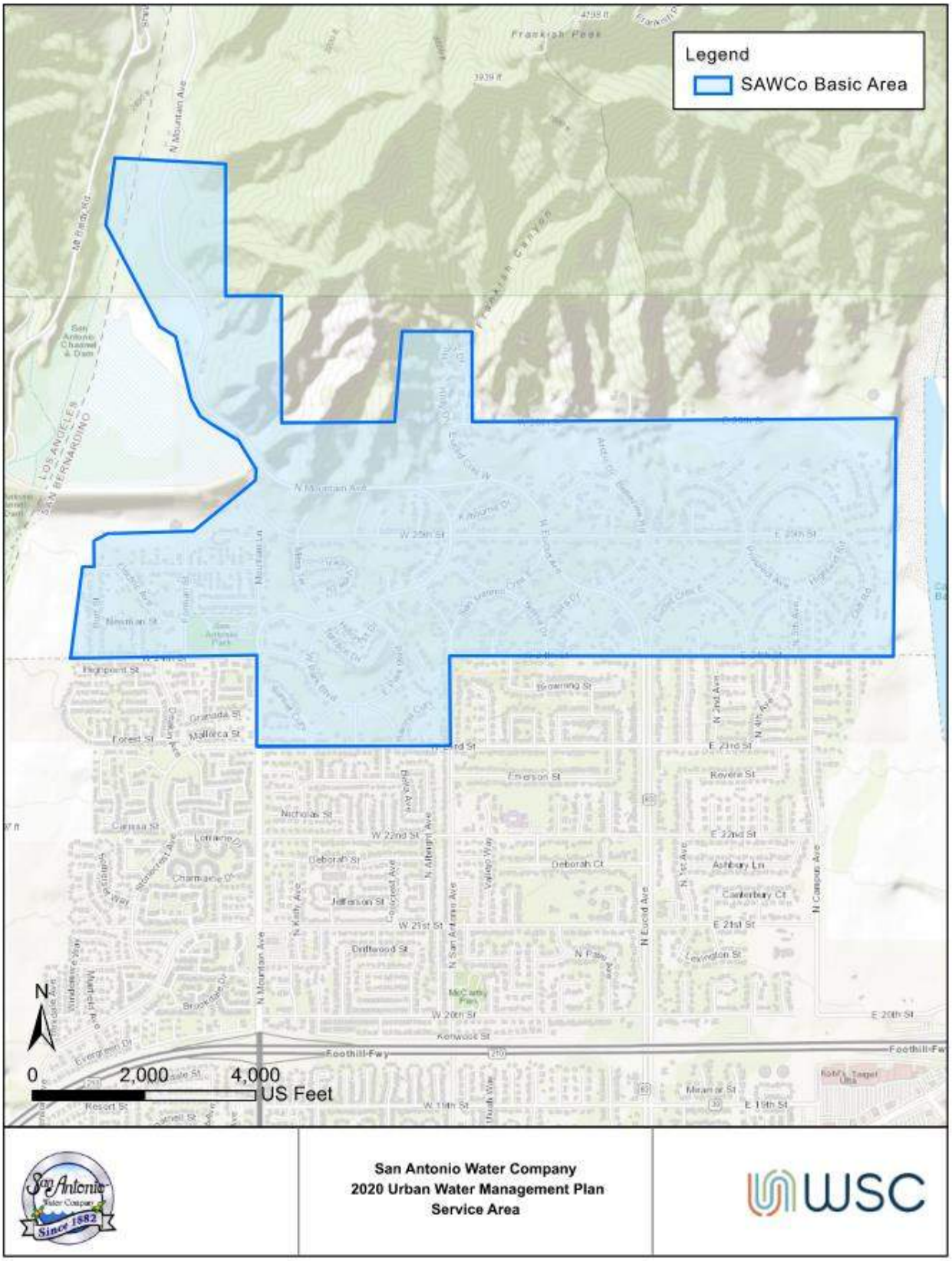


**Figure 3-1. Service Area**

## 3.2 Service Area Climate

Table 3-1 presents average climate data for the service area, including temperature, rainfall, and reference evapotranspiration (ETo) from the California Irrigation Management Information System (CIMIS). CIMIS data was used as it provided the most recent data pertaining to temperature, rainfall, and ETo. As shown in

**Table** 3-1, the warmest month of the year is typically August with an average temperature of 82.4 degrees Fahrenheit (°F), while the coldest month of the year is December with an average temperature of 58.5°F.

The annual average precipitation within SAWCo's service area is about 15.6 inches. As shown in

Table 3-1, the majority of rainfall occurs in the months of October through March. December is typically the wettest month with an average rainfall of approximately 3.9 inches.

**Table 3-1. Average Climate** [1]

| MONTH | AVERAGE TEMPERATURE (°F) | AVERAGE RAINFALL (INCH) | AVERAGE STANDARD ETO (INCH) |
|---|---|---|---|
| January | 59.9 | 2.8 | 2.2 |
| February | 60.5 | 2.1 | 2.8 |
| March | 63.8 | 1.9 | 4.3 |
| April | 67.0 | 0.9 | 5.4 |
| May | 69.8 | 0.4 | 5.8 |
| June | 75.8 | 0.1 | 6.6 |
| July | 81.2 | 0.2 | 7.5 |
| August | 82.4 | 0.0 | 7.3 |
| September | 80.1 | 0.5 | 5.6 |
| October | 73.5 | 1.3 | 4.0 |
| November | 65.0 | 1.6 | 2.7 |
| December | 58.5 | 3.9 | 2.0 |
| **ANNUAL AVERAGE** | **69.8** | **15.6** [2] | **4.7** |

[1] Data based on CIMIS weather station 78 Pomona; https://cimis.water.ca.gov/. Averages calculated from 2010-2020 data.

[2] Annual total rainfall.

# 3.3 Service Area Population and Demographics

## 3.3.1 Service Area Population

SAWCo's Basic Service Area closely follows the boundaries of the census designated place of San Antonio Heights, which had a population of 3,092 in 2017, down from 3,371 in 2010 per the US Census (Datausa.io, 2017). To identify the population for 2020, the DWR population tool was used. Using a persons per connection factor of 2.73, it was estimated that the population within the Basic Area is 3,303 people.

San Antonio Heights is primarily residential and nearly built out. SAWCo has identified seven parcels that could potentially be developed and require water service. For this UWMP, it was assumed development would occur between 2025 and 2030. Therefore, future population was determined to increase to 3,322 people and remain constant throughout the planning horizon.

$$Future\ population = 2020\ population + 2.73\frac{persons}{connection} * 7\ future\ connections = 3{,}322\ people$$

SAWCo also provides water for irrigation, industrial, agricultural, and wholesale in the Extended Area. Land use and planning in the extended area is under the jurisdiction of numerous cities and San Bernardino County and is addressed in their respective UWMPs.

**Table 3-2. DWR 3-1W Current and Projected Population**

| POPULATION SERVED | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| Basic Area - San Antonio Heights | 3,303 | 3,303 | 3,322 | 3,322 | 3,322 | 3,322 |

## 3.3.2 Other Social, Economic, and Demographic Factors

Based on 2015-2019 data, the United States Census Bureau (Census) estimates that households within the San Antonio Heights are composed of 2.69 people per household and approximately 64% of households are composed of married-couples with families. The median age of a resident within the San Antonio Heights is approximately 48 years old. Based on 2015-2019 Census data, 95% of people 25 years or older had at least graduated from high school and 42% obtained a bachelor's degree or higher. It was estimated that 5% of people did not complete high school.

Throughout the San Antonio Heights, approximately 58% of the working population (people ages 16 and over) were employed. Approximately 75% held a private wage or salary position, and 16% were employed by the federal, state, or local government. Educational services, health care and social assistance (30%) is the most common industry that San Antonio Heights residents work in, followed by a retail trade (14%). The median household income was $91,897, while the median earnings for a full-time, year-round worker was $78,071 (United States Census Bureau, n.d.).

It was estimated that 5.2% of people within the San Antonio Heights were in poverty. 1.8% of households participated in government programs, such as the Supplemental Nutrition Assistance Program (SNAP). Of the households that received SNAP, 100% had children under the age of 18 within the household (United States Census Bureau, n.d.).

Census data reported that of the people identifying as one race alone, 79.7% were White. Approximately 4.5% identified as two or more races. Of the total population, an estimated 60.3% identified as White non-Hispanic and 27.8% as Hispanic. It was estimated that 18.9% of people at least

5 years or older spoke a language other than English at home. In addition to English, Asian and Pacific Islander languages were the most common languages spoken by San Antonio Heights residents. 7.4% of people stated that they did not speak English “very well” (United States Census Bureau, n.d.).

## 3.4 Land Uses within Service Area

As mentioned, SAWCo provides potable water service to the Basic Area, which incorporates the community of San Antonio Heights. This area consists of residential users only. There are only seven parcels currently identified as undeveloped. If they are developed, single-family residences will be established. Therefore, both current and future land uses within SAWCo’s Basic Area is residential only.

2020 URBAN WATER MANAGEMENT PLAN

# 4 Water Use Characterization

**SAWCo provides potable and non-potable water to customers within its service area.**

IN THIS SECTION

- Non-Potable vs. Potable Water Use
- Water Use by Sector

SAWCo provides potable water to residents within the San Antonio Heights and on occasion, to the City of Upland. SAWCo provides non-potable water for irrigation to various local irrigators and other agencies, including the Cities of Upland and Ontario, Monte Vista Water District, and Cucamonga Valley Water District. Other large irrigation accounts include the Holiday Rock Company and Red Hill Golf Course and Homeowners Association.

SAWCo's bylaws outline the various water services provided, which include domestic, municipal, and miscellaneous uses, defined below (San Antonio Water Company):

**Domestic:** water treated by SAWCo and directly delivered to shareholders through SAWCo's distribution system.

**Municipal:** untreated water and delivered to shareholders who in turn treat the water for delivery of domestic, commercial, and other users through their delivery systems.

**Miscellaneous:** untreated water directly delivered to shareholders through SAWCo's distribution system for a variety of legal permissible uses, including farm irrigation, golf course watering, and rock company operations.

## 4.1 Non-Potable Versus Potable Water Use

As mentioned, SAWCo serves both potable and non-potable water. Potable water is provided to residents within the San Antonio Heights and to the City of Upland. Non-potable water used for irrigation is also provided to several local irrigators and other nearby agencies, as mentioned above. Based on data for 2016 through 2020, SAWCo's average non-potable deliveries account for 84% of the total water provided by SAWCo.

## 4.2 Past, Current, and Projected Water Use by Sector

SAWCo has provided potable and non-potable water to its customers and will continue to do so in the future. Past deliveries are shown in Figure 4-1.

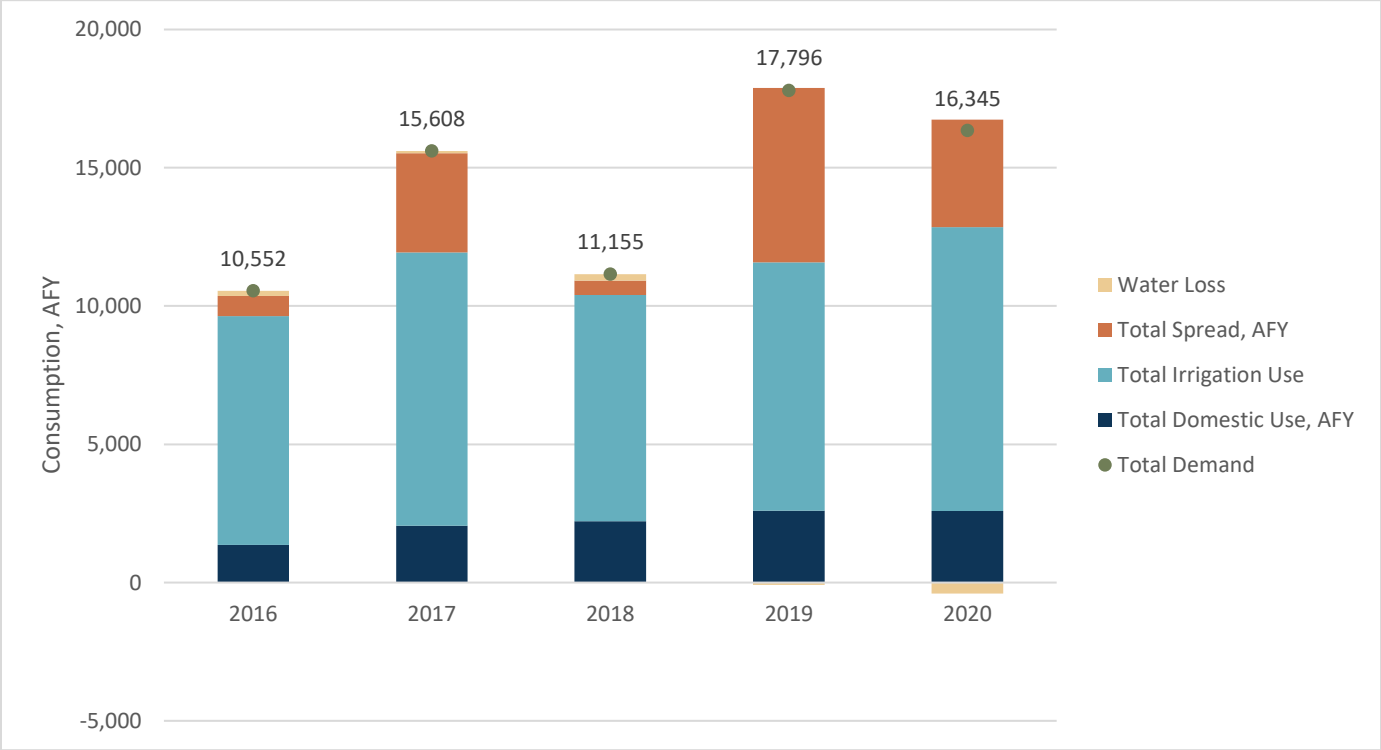


**Figure 4-1. Water Demand for 2016-2020, AFY**

### 4.2.1 Distribution System Water Losses

Over the last few years, SAWCo has focused on mitigating water losses. Based on historical data, it was clear that SAWCo experienced meter inaccuracies throughout the system. As shown above in Figure 4-1, SAWCo experienced negative water losses, meaning SAWCo sold more water than produced. As a result, the volume of 2020 actual water use shown in Table 4-1 differs from the total supply shown in Table 5-6.

Investigation helped SAWCo identify a substantial area of water losses, located at a flow meter at the Basin 6 settling ponds. In early 2021, SAWCo fixed this meter, and since then, water losses have

remained consistent. Based on data for January through April 2021, water losses have been recorded as 0.9% within the domestic system and 1% within the irrigation system.

In addition, SAWCo has replaced customer meters with Automated Meter Reading (AMR) to improve data collection and response.

### 4.2.2 Current Water Use

In 2020, SAWCo provided 16,746 AF of water to its customers or spread into groundwater storage. The City of Upland's irrigation system consumed 50% of SAWCo's total water produced. The second largest water use was for spreading, accounting for 23% of the total water produced. Potable deliveries for SAWCo's domestic system within the San Antonio Heights accounted for 8%. A breakdown of water used in 2020 is provided in Figure 4-2.

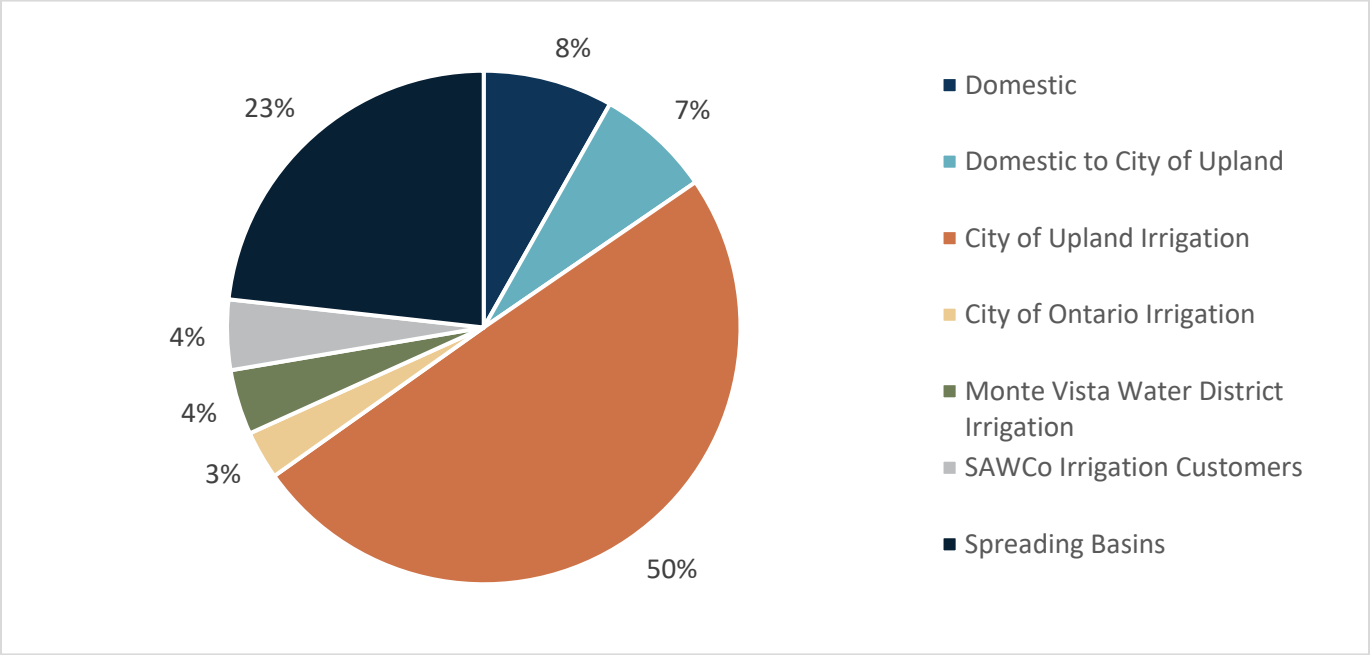


**Figure 4-2. 2020 Water Use**

**Table 4-1. DWR 4-1W Actual Demands for Water, AFY**

| USE TYPE | ADDITIONAL DESCRIPTION | LEVEL OF TREATMENT WHEN DELIVERED | 2020 VOLUME |
|---|---|---|---|
| Single Family | SAWCo Domestic Customers | Drinking Water | 1,371 |
| Sales/Transfers/Exchanges to Other Agencies | City of Upland | Drinking Water | 1,213 |
| Sales/Transfers/Exchanges to Other Agencies | City of Upland | Raw Water | 8,332 |
| Sales/Transfers/Exchanges to Other Agencies | Monte Vista Water District | Raw Water | 687 |
| Sales/Transfers/Exchanges to Other Agencies | City of Ontario | Raw Water | 511 |
| Landscape | Minor Irrigators | Raw Water | 740 |
| Groundwater Recharge | Spreading Basins | Raw Water | 3,893 |
| - | | **TOTAL:** | **16,747** |

## 4.2.3 Projected Water Use

SAWCo's system is very close to buildout and therefore, demands are expected to increase minimally. The majority of the San Antonio Heights area is already developed and any new development, should it occur, is expected along Holly Drive. These developments are anticipated to be single family residential and require potable service only.

Future demands were estimated as part of SAWCo's 2020 Master Plan, using a factor calculated from 2019 consumption and parcel acreage. This factor was applied to areas identified as possible development within the 2017 Water Master Plan and added to current demand to determine the total future demand for SAWCo's potable system. Areas for possible development are identified in Figure 4-3 below and corresponding demand for each parcel is summarized in Table 4-2.

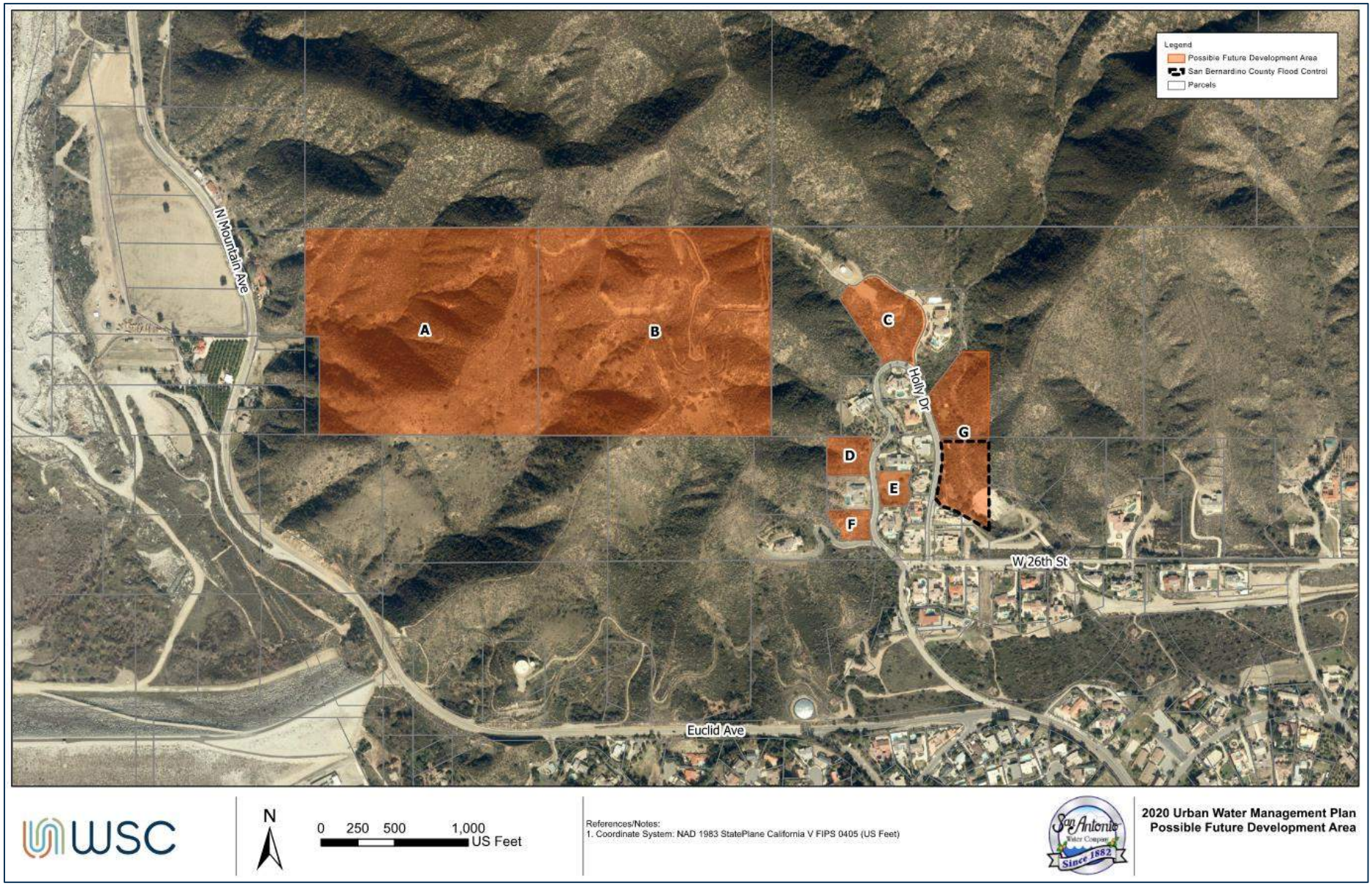


**Figure 4-3. Areas Identified as Possible for Future Development**

**Table 4-2. Future Potable Demand from Future Development**

| AREA | ACRES | WATER DEMAND FACTOR (GPM/ACRE) | WATER DEMAND (GPM) | WATER DEMAND (AFY) |
|---|---|---|---|---|
| A[1] | 33.8 | 1.036 | 17.53 | 10.9 |
| B[1] | 35.2 | 1.036 | 18.23 | 11.3 |
| C | 3.4 | 1.036 | 3.54 | 2.2 |
| D | 1.2 | 1.036 | 1.28 | 0.8 |
| E | 0.8 | 1.036 | 0.81 | 0.5 |
| F | 0.8 | 1.036 | 0.82 | 0.5 |
| G[2] | 5.9 | 1.036 | 6.09 | 3.8 |
| | | | **ADDITIONAL FUTURE DEMAND, AFY** | **29.9** |

Notes:

[1]If developed, parcel expected to be half developed. Half of total parcel acreage used to determine future demand.

[2]Half of area identified as future development is highly unlikely to be developed. Southern portion of Area G owned by San Bernardino County Flood Control. Dashed lines in Figure 4-3 delineate area owned by San Bernardino County Flood Control.

## 4.2.4 Characteristic Five-Year Water Use

As outlined in SAWCo's Bylaws, SAWCo provides water to its shareholders and expects its customers to maximize their shares. Therefore, SAWCo projects future water uses based on total shares and entitlement for each customer.

**Table 4-3. DWR 4-2W Projected Demands for Water**

| | ADDITIONAL DESCRIPTION | PROJECTED WATER USE | | | | |
|---|---|---|---|---|---|---|
| USE TYPE | | 2025 | 2030 | 2035 | 2040 | 2045 |
| Single Family | SAWCo Domestic Customers | 1,270 | 1,270 | 1,270 | 1,270 | 1,270 |
| Sales/Transfers/Exchanges to Other Agencies | City of Upland | 9,186 | 9,186 | 9,186 | 9,186 | 9,186 |
| Sales/Transfers/Exchanges to Other Agencies | Monte Vista Water District | 671 | 671 | 671 | 671 | 671 |
| Sales/Transfers/Exchanges to Other Agencies | Cucamonga Valley Water District | 8 | 8 | 8 | 8 | 8 |
| Sales/Transfers/Exchanges to Other Agencies | City of Ontario | 601 | 601 | 601 | 601 | 601 |
| Industrial | Holiday Rock Company | 269 | 269 | 269 | 269 | 269 |
| Landscape | Red Hills Golf Course | 444 | 444 | 444 | 444 | 444 |
| Other | Red Hill HOA | 20 | 20 | 20 | 20 | 20 |
| Other | Minor Irrigators | 102 | 102 | 102 | 102 | 102 |
| Groundwater Recharge | Spreading Basins | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| **-** | **TOTAL:** | **14,571** | **14,571** | **14,571** | **14,571** | **14,571** |

**Table 4-4. DWR 4-3W Total Gross Water Use**

| | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| **Potable and Raw Water**<br>From Table 4-1W and 4-2W | 16,747 | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| **Recycled Water Demand***<br>From Table 6-4W | - | - | - | - | - | - |
| **Total Water Demand:** | **16,747** | **14,571** | **14,571** | **14,571** | **14,571** | **14,571** |

## 4.3 Climate Change Considerations

It is anticipated that SAWCo's shareholders will continue to use water based on their share's entitlement. Demands may decrease as the result of water supply shortage and drought messaging, as discussed in SAWCo's Water Shortage Contingency Plan.

2020 URBAN WATER MANAGEMENT PLAN

# 5 Water Supply Characterization

**This section describes the existing and projected supplies for SAWCo. SAWCo currently receives all its water supply from local sources including the San Antonio Creek, groundwater from the San Antonio Tunnel, and three groundwater basins: Chino Basin, Cucamonga Basin, and Six Basins.**

Surface water from San Antonio Creek are pre-1914 water rights, and annual water availability is influenced by rainfall. The San Antonio Tunnel is a deep rock tunnel 100 feet below ground surface that collects naturally percolated groundwater. The three groundwater basins are each adjudicated, and SAWCo's water rights are defined by the various legal Judgements in place to protect and manage each basin. SAWCo also participates in groundwater recharge operations that enhance groundwater supply.

SAWCo provides water from the San Antonio Tunnel (Tunnel), the Chino Basin, and the Cucamonga Basin to its domestic customers. During times of large flows from the Tunnel, potable water overflows into the irrigation system through the Forebay Pump Station. This provides SAWCo with the opportunity to avoid large water losses within the domestic system and decrease groundwater extraction for the irrigation system.

IN THIS SECTION

- Purchased Water
- Groundwater
- Wastewater and Recycled Water
- Future Projects
- Summary of Existing and Planned Supplies
- Energy Intensity

# 5.1 Water Supply Analysis Overview

SAWCo currently relies on local supply sources to meet its shareholder needs. Supplies include local surface water from the San Antonio Creek and groundwater from several basins. SAWCo expects to continue using these local sources throughout the future.

**Surface Water:** SAWCo may obtain up to 13,864 AFY of surface water from the San Antonio Creek. However, the actual volume received depends on minimum stream flowrates and can vary significantly based on rainfall. Water from the San Antonio Creek is used to meet irrigation demands and also conveyed to the City of Upland's water treatment plant for treatment and subsequent distribution by the City of Upland.

**Tunnel Water:** SAWCo may obtain all the volume of water in the San Antonio Tunnel (Tunnel). The Tunnel is supplied by naturally percolated groundwater, which can vary year to year based on rainfall and snowpack. SAWCo may also divert water from the San Antonio Creek spreading grounds north of the San Antonio Tunnel, where it is percolates into the tunnel and is conveyed to SAWCo's Forebay Tank and can be used in either the domestic or irrigation system.

**Groundwater:** SAWCo has groundwater rights in the Chino, Cucamonga, and Six Basins, as summarized in Table 5-1 below.

**Table 5-1. SAWCo's Groundwater Rights**

| GROUNDWATER BASIN | SAWCO RIGHTS, AFY | NOTES |
|---|---|---|
| Chino Basin | 1,234 | |
| Cucamonga Basin | 4,500 – 8,500 | SAWCo may obtain up to 6,500 AFY of groundwater from the Cucamonga Basin, provided 2,000 AF is spread each year. If SAWCo spreads less than 2,000 AFY, SAWCo may only extract 4,500 AFY. If SAWCo spreads an excess of 2,000 AFY, SAWCo may extract up to 95% of the total spreading surplus amount, but not more than 8,500 AFY. |
| Six Basins | 932 | |

# 5.2 UWMP Water Supply Characterization

Details on SAWCo's various supply sources are described in this section.

## 5.2.1 Purchased or Imported Water

SAWCo does not currently purchase or import water.

## 5.2.2 Groundwater

SAWCo obtains groundwater from the Chino, Cucamonga, and Six Basins groundwater basins. Groundwater extracted from the Chino Basin is used for potable demands only. Groundwater from the Cucamonga Basin and Six Basins is used within SAWCo's irrigation system. Figure 5-1 shows the various groundwater basins SAWCo utilizes and their boundaries.

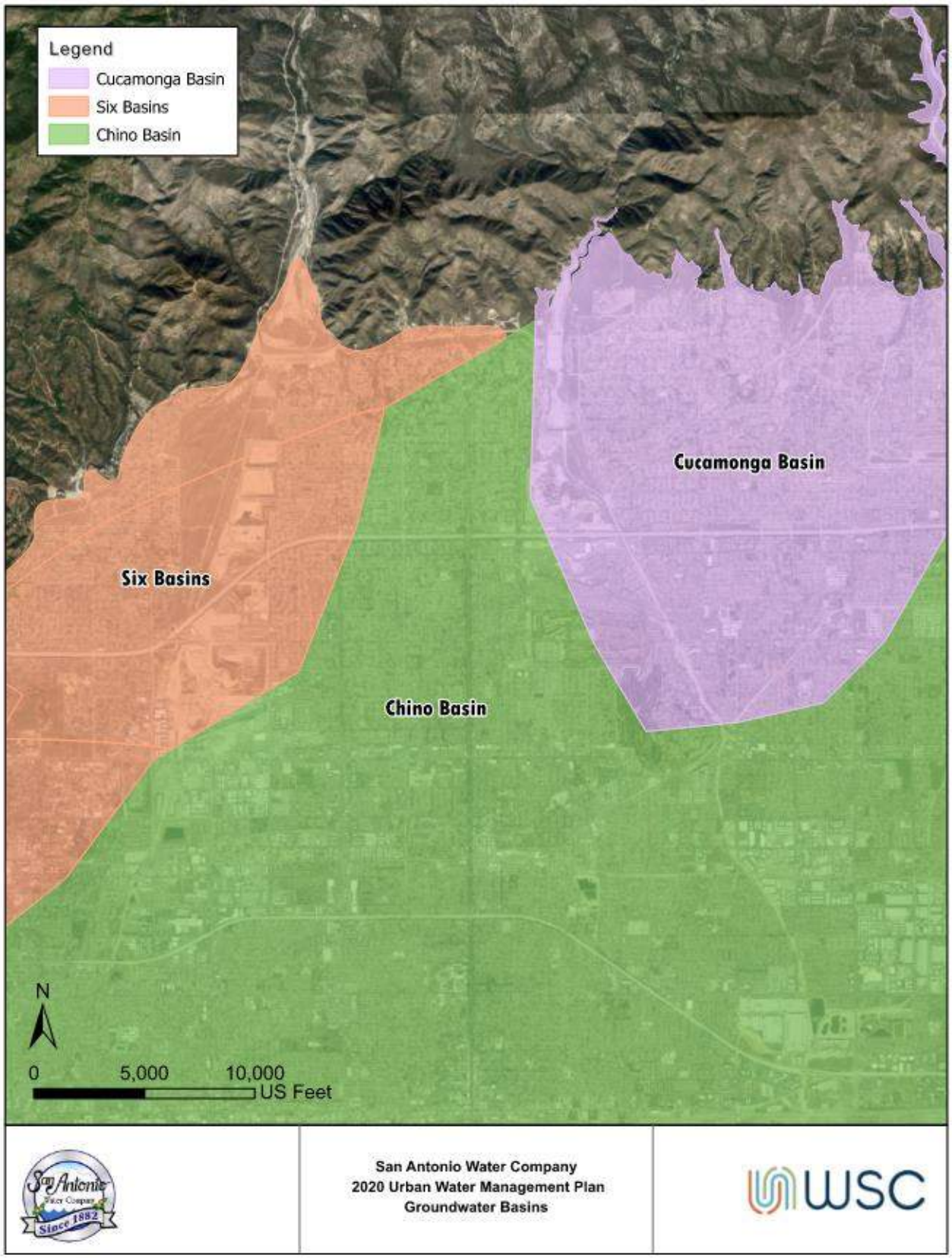


**Figure 5-1. Groundwater Basins**

#### 5.2.2.1 Chino Basin

The Chino Basin is a subbasin to the Upper Santa Ana Valley Groundwater Basin and is designated by DWR as Basin 8-002.01. The Chino Basin underlies southeast Los Angeles County, northwest Riverside County, and southwest San Bernardino County. It is bound to the northwest by the San Jose fault, to the north by the Cucamonga fault and impermeable rocks that make up the San Gabriel Mountains. To the east, the Chino Basin is bounded by the Rialto-Colton fault, to the southeast by the Jurupa, Pedley, La Sierra Hills as well as the Santa Ana River. It is bounded to the southwest by the Chino and Puente Hills (California Department of Water Resources, 2016). The Chino Basin is considered a very-low-priority basin under the Sustainable Groundwater Management Act (SGMA).

The Chino Basin is governed by the Chino Basin Watermaster. The Chino Basin Watermaster serves to enforce the provisions of the 1978 Judgment in Chino Basin Municipal Water District vs. City of Chino et al (Judgment) and any other orders from the Court, as well as develops an Optimum Basin Management Program. Under the 1978 Judgment, the Chino Basin's safe yield was established as 140,000 AFY. The safe yield is defined in the Chino Basin Judgment as "the long-term average annual quantity of groundwater (excluding replenishment of stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Chino Basin under conditions of a particular year without causing an undesirable result" (Chino Basin Municipal Water District v. City of Chino, et al., 1978). The 1978 Chino Basin Judgment's allocation of the safe yield of the Chino Basin includes three separate Pools: The Overlying Agricultural Pool, Overlying Non-Agricultural Pool, and the Appropriative Pool. SAWCo is a member of the Appropriative Pool and has an appropriative right of 2.748 percent of the total appropriative rights in the Chino Basin. Under the 1978 Judgment, SAWCo was entitled to 1,506.888 AF. A copy of the 1978 Judgement is provided in Appendix D.

In 2020, the Safe Yield was recalculated to better manage the Basin and ensure sustainability. As established in the 2000 Optimum Basin Management Program (OBMP), the safe yield of the Chino Basin must be recalculated every 10 years, commencing in 2011. The Watermaster evaluated the safe yield recalculation using a groundwater flow model to redetermine the net recharge into the Chino Basin and identify any factors that could create undesirable results. The resulting Safe Yield was estimated at 135,000 AF (Chino Basin Watermaster, 2020). As a result, starting on June 30, 2020, SAWCo is entitled to 1,232.038 AF.

The Chino Basin Watermaster has also developed an updated 2020 OBMP that outlines how the Chino Basin should be managed over the next 20 years. The 2020 OBMP, provided as Appendix E, also includes the storage management plan that encompasses the recalculated safe yield.

The Chino Basin Watermaster also reallocates the unused portion of the Chino Basin safe yield from to the Overlying Agricultural Pool to the Appropriative Pool members as a supplement to the Appropriative Pool share of OSY rights in any year. These transfers are permanent if agricultural land has been converted to non-agricultural use, or temporary if agricultural pool extractions are less than their share of the safe yield. As agricultural production declines within the Chino Basin, the reallocation of water to the Appropriative Pool is expected to increase. Appropriators, like SAWCo, who are party to the Chino Basin Judgment are authorized to continue to produce groundwater while exceeding their water rights. Such extractions result in assessments by the Chino Basin Watermaster to pay for water to replenish the basin, through imported surface water recharge. Water to replenish the Chino Basin is purchased from Metropolitan Water District of Southern California (Metropolitan) by Chino Basin Watermaster in coordination with the Inland Empire Utilities Agency (IEUA) or from Appropriation Pool participants (Civiltec Engineering Inc. for San Antonio Water Company, June 2016).

#### 5.2.2.2 Cucamonga Basin

The Cucamonga Basin is a subbasin to the Upper Santa Ana Valley Groundwater Basin and is designated by DWR as Basin 8-002.02. The Cucamonga Basin is bounded to the north by the San Gabriel Mountains and bounded by the Red Hill fault to the west, east and south (California Department of Water Resources, 2016). The Cucamonga Basin is considered a very-low-priority basin under the Sustainable Groundwater Management Act (SGMA).

In 1958, the Cucamonga Judgement was established and outlined water rights for individual groundwater producers, how much can be exported to non-overlaying areas, and specific requirements for spreading (San Antonio Water Company vs Others, 1958). The Cucamonga Judgment stipulates production for all stakeholders of 22,721 AFY, with SAWCo's water production right of 6,500 AFY, provided SAWCo spreads 2,000 AFY of water from the San Antonio Canyon. If the annual spreading is less than 2,000 AFY, SAWCo's water rights may be reduced to a minimum amount of 4,500 AFY. However, if the spreading exceeds 2,000 AFY, SAWCo can credit 95% of the excess up to a maximum of 8,500 AFY production. From 2010-2019, SAWCo spread an average of 1,500 AFY; however, spreading between 2012 through 2018 were less than 2,000 AFY. As a result, SAWCo's 2020 production right from the Cucamonga Basin was limited to approximately 6,000 AF (4,500 AF plus the 10-year average spread). A copy of the Cucamonga Judgement is provided in Appendix F.

#### 5.2.2.3 Six Basins

The Six Basins are a part of the Main San Gabriel Basin, designated by DWR as Basin 4-013 and as a very low priority basin. The Six Basins area consists of six interconnected groundwater basins: Canyon, Upper Claremont Heights, Lower Claremont Heights, Live Oak, Ganesha, and the Pomona Basins. The Six Basins area is bounded by the San Jose Hills to the south, the Chino Basin to the east, the San Gabriel Mountains to the to the north, and the Main San Gabriel Basin to the west.

The Six Basins are further broken down into the Four Basins and Two Basins. The Four Basins include the Canyon, Upper Claremont Heights, Lower Claremont Heights and Pomona Basins. The Two Basins refer to the Live Oak and Ganesha Basins. Water within the Two Basins is used solely by the City of La Verne (Jericho Systems, Inc. and Tom Dodson & Associates for Three Valley Municipal Water District, May 2021). SAWCo is entitled up to 7.166 percent of the OSY of the Four Basins. For 2020, SAWCo was entitled to 932.10 AFY with 2,643.30 AFY available from storage.

The Six Basins is managed by the Six Basins Watermaster. The Six Basins were adjudicated in 1998 through the stipulated judgement "Southern California Water Company vs. City of La Verne et al." known as the Six Basins Judgement, provided in Appendix G. The Six Basins Judgement specified a safe yield of 19,300 AFY and the Six Basins Watermaster establishes operating safe yields (OSY) annually. In additions, water users within the Six Basins may obtain "carryover rights" for unused production (Southern California Water Company vs. Others, 1998).

The Six Basins Watermaster is currently developing a Six Basins Strategic Plan (Strategic Plan). The Strategic Plan's Draft Program Environmental Impact Report (PEIR) is currently in a public review period. This Strategic Plan will become the conjunctive water management program utilized by the Six Basins Watermaster to implement water supply and conservation projects in coordination with others and to optimize conjunctive water management activities within the Six Basins (Jericho Systems, Inc. and Tom Dodson & Associates for Three Valley Municipal Water District, May 2021). Specifically, the Strategic Plan aims to:

- Enhance water supplies
- Enhance basin management
- Protect and enhance water quality
- Equitably finance the Strategic Plan implementation

#### 5.2.2.4 Past Five Years

Groundwater extractions by basin over the past five years are provided in Table 5-2.

**Table 5-2. DWR 6-1W Groundwater Volume Pumped**

All or part of the groundwater described below is desalinated.

| GROUNDWATER TYPE | LOCATION OR BASIN NAME | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Alluvial Basin | Chino Basin | 897 | 393 | 487 | 477 | 738 |
| Alluvial Basin | Cucamonga Basin | 6,281 | 5,761 | 6,407 | 5,340 | 4,945 |
| Alluvial Basin | Six Basins | 757 | 884 | 969 | 1,180 | 1,252 |
| - | **TOTAL:** | **7,935** | **7,038** | **7,863** | **6,997** | **6,935** |

**Table 5-3. DWR 6-1W Groundwater Volume Pumped: Potable**

All or part of the groundwater described below is desalinated.

| GROUNDWATER TYPE | LOCATION OR BASIN NAME | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Alluvial Basin | Chino Basin | 897 | 393 | 487 | 477 | 738 |
| Alluvial Basin | Cucamonga Basin | 116 | 42 | 1 | - | 13 |
| - | **TOTAL:** | **1,013** | **435** | **488** | **477** | **751** |

**Table 5-4. DWR 6-1W Groundwater Volume Pumped: Non-Potable**

All or part of the groundwater described below is desalinated.

| GROUNDWATER TYPE | LOCATION OR BASIN NAME | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Alluvial Basin | Cucamonga Basin | 6,165 | 5,720 | 6,406 | 5,340 | 4,933 |
| Alluvial Basin | Six Basins | 757 | 884 | 969 | 1,180 | 1,252 |
| - | **TOTAL:** | **6,922** | **6,604** | **7,375** | **6,520** | **6,185** |

#### 5.2.2.5 San Antonio Tunnel

SAWCo is entitled to all water supplied through the San Antonio Tunnel (Tunnel). The Tunnel is a deep rock tunnel located 100 feet below ground surface and is supported by redwood beams and solid rock. Groundwater naturally percolates into the Tunnel and can vary year to year based on rainfall and snowpack. SAWCo may also divert water from the San Antonio Creek spreading grounds north of the Tunnel, where it is percolates into the tunnel and used primarily as a potable supply. The Tunnel deliveries this supply at SAWCo's Forebay station. In times of high Tunnel flows and low domestic demand, Tunnel water overflows into the irrigation system to avoid water losses. The average supply from the Tunnel since 1999 is 2,443 AFY and ranged from only 727 AF in 2015 to 3,682 AF in 1996.

### 5.2.3 Surface Water

SAWCo has rights for up to 13,864 AFY of surface water from the San Antonio Creek. However, the actual volume received depends on minimum stream flowrates and can vary significantly based on rainfall. SAWCo's supply from the San Antonio Creek since 1999 ranged from a low of 1,181 AF in

2018 to a high of 9,072 AF in 2005. The average volume from San Antonio Creek during years with average rainfall years is 4,042 AFY.

### 5.2.4 Stormwater

SAWCo's water sources are limited to groundwater from the basins that underlie SAWCo's service area and local surface water runoff.

### 5.2.5 Wastewater and Recycled Water

SAWCo does not own or operate wastewater or recycled water facilities and therefore does not have any current nor planned recycled water use. SAWCo encourages the use of recycled water as a regional resource through its affiliation with the Inland Empire Utilities Agency (IEUA). In the event that a SAWCo customer were to acquire recycled water as a supply, the customer may choose to lease, sell, or inactivate their shares within SAWCo.

#### 5.2.5.1 Wastewater Collection, Treatment, and Disposal

SAWCo's domestic customers utilize septic tanks to dispose of their wastewater.

### 5.2.6 Desalinated Water Opportunities

SAWCo does not currently nor plan to use desalinated water as a supply source.

### 5.2.7 Water Exchanges and Transfers

SAWCo maintains interconnections with the City of Upland. Two of these connections have been identified for emergency use. However, SAWCo has not provided or purchased any emergency sales through the emergency interconnections over the last five years. In addition, several water suppliers own shares in SAWCo; therefore, they are considered SAWCo customers or shareholders and are discussed in Chapter 4.

### 5.2.8 Future Water Projects

SAWCo is currently updating its Water Master Plan. As part of the Water Master Plan, future projects that may increase SAWCo's supply and reliability may be identified. The Water Master Plan is anticipated to be complete by the end of 2021.

SAWCo is currently constructing several projects to increase storage and capture all raw water released through the Frankish Tunnel. Both projects are anticipated to be complete in early 2021.

**Table 5-5. DWR 6-7W Expected Future Water Supply Projects or Programs**

The supplier will complete the table.

| NAME OF FUTURE PROJECTS OR PROGRAMS | JOINT PROJECT WITH OTHER SUPPLIERS | AGENCY NAME | DESCRIPTION | PLANNED IMPLEMENTATION YEAR | PLANNED FOR USE IN YEAR TYPE | EXPECTED INCREASE IN WATER SUPPLY TO SUPPLIER, AF |
|---|---|---|---|---|---|---|
| Frankish Tunnel Outfall Improvements | No | N/A | Improve the Frankish Tunnel outfall to capture all water released through the Frankish Tunnel for storage into various groundwater basins for future use. | 2021 | All Year Types | |
| Holly Drive Reservoir Upgrades | No | N/A | Installation of two 100,000-gallon tanks for additional fire and operations water storage. | 2022 | All Year Types | 0.55 |
| Well 19 | No | N/A | Construction of new well for domestic use. | 2022-2023 | All Year Types | 2,400 |

## 5.2.9 Summary of Existing and Planned Sources of Water

SAWCo currently utilizes local surface water and groundwater sources to meet its customers' demands. SAWCo will continue to efficiently utilize existing sources to meet future needs. Future supply projections reflect 20-year average supply from the San Antonio Creek and San Antonio Tunnel, while groundwater sources reflect SAWCo's total water right by basin.

**Table 5-6. DWR 6-8W Actual Water Supplies**

| | | 2020 | |
|---|---|---|---|
| WATER SUPPLY | ADDITIONAL DETAIL ON WATER SUPPLY | ACTUAL VOLUME | WATER QUALITY |
| Groundwater (not desalinated) | Chino Basin | 738 | Drinking Water |
| Groundwater (not desalinated) | Cucamonga Basin | 13 | Drinking Water |
| Groundwater (not desalinated) | Cucamonga Basin | 4,933 | Other Non-Potable Water |
| Groundwater (not desalinated) | Six Basins | 1,252 | Other Non-Potable Water |
| Surface water (not desalinated) | San Antonio Creek | 6,901 | Other Non-Potable Water |
| Groundwater (not desalinated) | San Antonio Tunnel | 1,833 | Drinking Water |
| Groundwater (not desalinated) | San Antonio Tunnel | 676 | Other Non-Potable Water |
| - | **TOTAL:** | **16,346** | |

**Table 5-7. DWR 6-9W Projected Water Supplies**

| | | PROJECTED WATER SUPPLY | | | | |
|---|---|---|---|---|---|---|
| | | 2025 | 2030 | 2035 | 2040 | 2045 |
| WATER SUPPLY | ADDITIONAL DETAIL ON WATER SUPPLY | REASONABLY AVAILABLE VOLUME | REASONABLY AVAILABLE VOLUME | REASONABLY AVAILABLE VOLUME | REASONABLY AVAILABLE VOLUME | REASONABLY AVAILABLE VOLUME |
| Surface water (not desalinated) | San Antonio Creek | 4,416 | 4,416 | 4,416 | 4,416 | 4,416 |
| Groundwater (not desalinated) | San Antonio Tunnel | 2,178 | 2,178 | 2,178 | 2,178 | 2,178 |
| Groundwater (not desalinated) | Chino Basin | 1,234 | 1,234 | 1,234 | 1,234 | 1,234 |
| Groundwater (not desalinated) | Cucamonga Basin | 6,500 | 6,500 | 6,500 | 6,500 | 6,500 |
| Groundwater (not desalinated) | Six Basins | 932 | 932 | 932 | 932 | 932 |
| - | **TOTAL:** | **15,260** | **15,260** | **15,260** | **15,260** | **15,260** |

Supply from the San Antonio Creek and San Antonio Tunnel reflect 20-year average supply from 2000 through 2020. Supply from various groundwater basins reflect SAWCo's total water rights from each basin.

## 5.2.10 Special Conditions

As mentioned previously, SAWCo is currently developing a Water Master Plan. The master planning effort also includes a supply risk and resilience analysis that addresses both the domestic and irrigation systems. Existing supply sources were analyzed, the top risks to their supplies evaluated, and the impacts these risks would have on SAWCo's ability to continue to provide a reliable and high-quality water to its shareholders quantified.

### 5.2.10.1 Climate Change Effects

Climate change is expected to result in more extreme droughts, shifting rainfall patterns, more intense rainfall and flooding, and higher variability from surface water supplies. Climate change is occurring and the best mitigation SAWCo can take is to plan and prepare for climate change related impacts. The Cal-Adapt Climate Projections for the Desert Region of San Bernardino County, of which SAWCo overlies, estimates a 2- to 4-inch decline in annual average rainfall by 2050 due to climate change. However, all models predict shifting rainfall patterns with wetter winters and drier summers (2021 California Energy Commission, 2021).

# 5.3 Energy Intensity

SAWCo monitors funds spent on energy at its facilities. In 2020, SAWCo spent approximately $629,000 on energy. It was assumed that energy is billed at $0.23 per kilo-Watt hour (kWh). Therefore, it was estimated that SAWCo consumed 2.7 million kWh to provide service to its customers, yielding an energy intensity of 167.3 kWh/AF.

**Table 5-8. DWR O-1B Recommended Energy Reporting - Total Utility Approach**

| | | | | |
|---|---|---|---|---|
| **URBAN WATER SUPPLIER:** | San Antonio Water Company | | | |
| **Water Delivery Product (If delivering more than one type of product use Table O-1C):** Multiple Products (unable to use table O-1C) | | | | |
| **ENTER START DATE FOR REPORTING PERIOD** | 1/1/2020 | **URBAN WATER SUPPLIER OPERATIONAL CONTROL** | | |
| **END DATE** | 12/30/2020 | | | |
| | | **SUM OF ALL WATER MANAGEMENT PROCESSES** | **NON-CONSEQUENTIAL HYDROPOWER** | |
| **Water Volume Units Used:** AF | | **TOTAL UTILITY** | **HYDROPOWER** | **NET UTILITY** |
| | Volume of Water Entering Process (AF) | 16,345 | 0 | 16,345 |
| | Energy Consumed (kWh) | 2,734,416 | 0 | 2,734,416 |
| | **ENERGY INTENSITY (KWH/AF)** | **167.3** | **0.0** | **167.3** |
| **Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data):** Estimate | | | | |
| **Data Quality Narrative:** Energy usage assumed based on a factor of $0.23/kWH and applied to the total amount SAWCo paid in 2020. | | | | |

2020 URBAN WATER MANAGEMENT PLAN

# 6 Water Service Reliability and Drought Risk Assessment

**This section considers SAWCo's water supply reliability during normal, single dry, and multiple dry water years over the planning horizon. A Drought Risk Assessment of the next five years is also included.**

The supply reliability assessment discusses factors (i.e. climatic, environmental, water quality, and legal) that could potentially limit the expected quantity of water available to SAWCo through 2045. Multiple drought scenarios are considered and the quantitative impacts of the aforementioned factors on water supply and demand are discussed, as well as possible methods for addressing these issues. The management tools that SAWCo has implemented to maximize current resources is also discussed.

IN THIS SECTION

- Water Service Reliability Assessment
- Drought Risk Assessment

# 6.1 Water Service Reliability Assessment

## 6.1.1 Constraints on Water Sources

As described in the previous section, SAWCo relies on surface water from the San Antonio Creek, naturally percolated water through the San Antonio Tunnel, and groundwater from several local basins.

### Climatic Factors

Water available from the San Antonio Creek and Tunnel are highly susceptible to climate change and increased drought periods. The San Antonio Creek relies on rainfall and the snowpack in the local mountains. In periods of dry weather, the San Antonio Creek may cease to flow, resulting in decreased supply to SAWCo's irrigation system. The Tunnel also relies on naturally percolated groundwater from rainfall.

Groundwater within the Chino, Cucamonga, and Six Basins may be impacted by climate change. As other sources are negatively impacted, basin users may need to extract additional groundwater to meet their needs. Since the Chino, Cucamonga, and Six Basins are adjudicated, SAWCo obtains water rights within these basins. Should severe conditions occur, SAWCo's allocation may be reduced to avoid over-extraction and harm to the basins. In the event that SAWCo's water allocations are reduced, SAWCo's shareholders may also receive a reduction in allocation.

### Environmental Factors

Local groundwater basins may be impacted by water quality. Groundwater management agencies, like the Chino Basin Watermaster, has and continues to focus on sustainable basin management to ensure local sources remain and that stakeholders can fully utilize their water rights. The Chino Basin Watermaster continues to monitor contaminants that may impact supply and publishes water quality data in the State of the Basin report every two years.

Similarly, the Six Basins Watermaster publishes an annual report that addresses the status of the Six Basins, including details on groundwater levels and the operating safe yield determination.

### Other Factors

In times of severe drought, total entitlement to SAWCo and its shareholders has been adjusted to mitigate supply shortages. Entitlement has been reduced equally among all shareholders, based on a percentage. Should future severe dry periods occur, it is possible that entitlement may need to be reduced to align with supply available and in coordination with other supply management agencies and users, like Watermasters and other groundwater basin users.

## 6.1.1 Year Type Characterization

As required, the water service reliability assessment and Drought Risk Assessment (DRA) analyze supply over several water years: normal, single dry, and multiple dry years.

DWR defines these years as:

- **Normal Year:** this condition represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.

- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the supplier, which may be the lowest average water supply available for five years in a row.

#### 6.1.1.1 Sources for Water Data

SAWCo provides water service based on the number of shares a customer holds. To determine the amount of supply available, the 20-year average volume was determined, as shown in Figure 6-1. SAWCo will only produce what is required to meet shareholder's demands; therefore, it assumed that the total supply available will equal the Company-wide shareholder entitlement of 14,571 AFY.

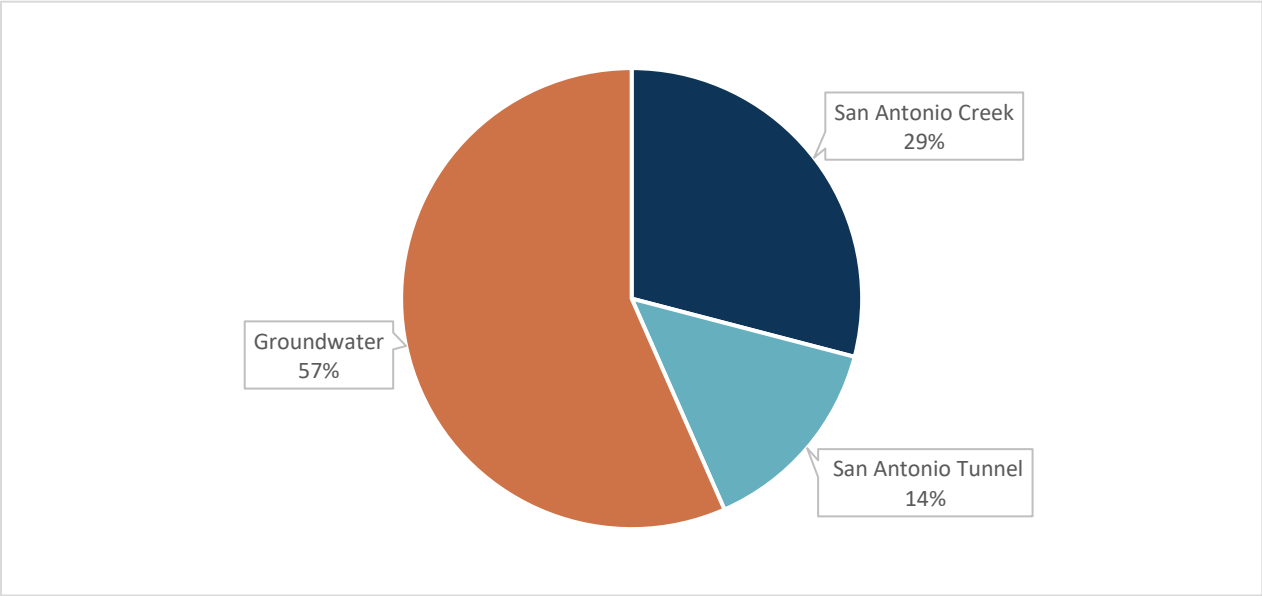


**Figure 6-1. Average Supply**

**Table 6-1. DWR 7-1W Basis for Water Year Data**

Quantification of available supplies is provided in this table as either volume only, percent only, or both.

| - | | AVAILABLE SUPPLY IF YEAR TYPE REPEATS | |
|---|---|---|---|
| YEAR TYPE | BASE YEAR | VOLUME AVAILABLE | PERCENT OF AVERAGE SUPPLY |
| Average Year | | 14,571 | 100% |
| Single-Dry Year | | 14,571 | 100% |
| Consecutive Dry Years 1st Year | | 14,571 | 100% |
| Consecutive Dry Years 2nd Year | | 14,571 | 100% |
| Consecutive Dry Years 3rd Year | | 14,571 | 100% |
| Consecutive Dry Years 4th Year | | 14,571 | 100% |
| Consecutive Dry Years 5th Year | | 14,571 | 100% |

## 6.1.2 Water Service Reliability

Results of the water supply and demand analysis for normal, single dry, and five-year consecutive dry droughts are shown in the following tables. SAWCo expects to meet demands under all water year scenarios with existing supply sources.

Depending on rainfall and other local factors, the amount of water available from the San Antonio Creek and Tunnel may be reduced. The variability of water utilized from each source is illustrated in Figure 6-2. SAWCo plans to mitigate reductions from San Antonio Creek by increased groundwater pumping in drier years.

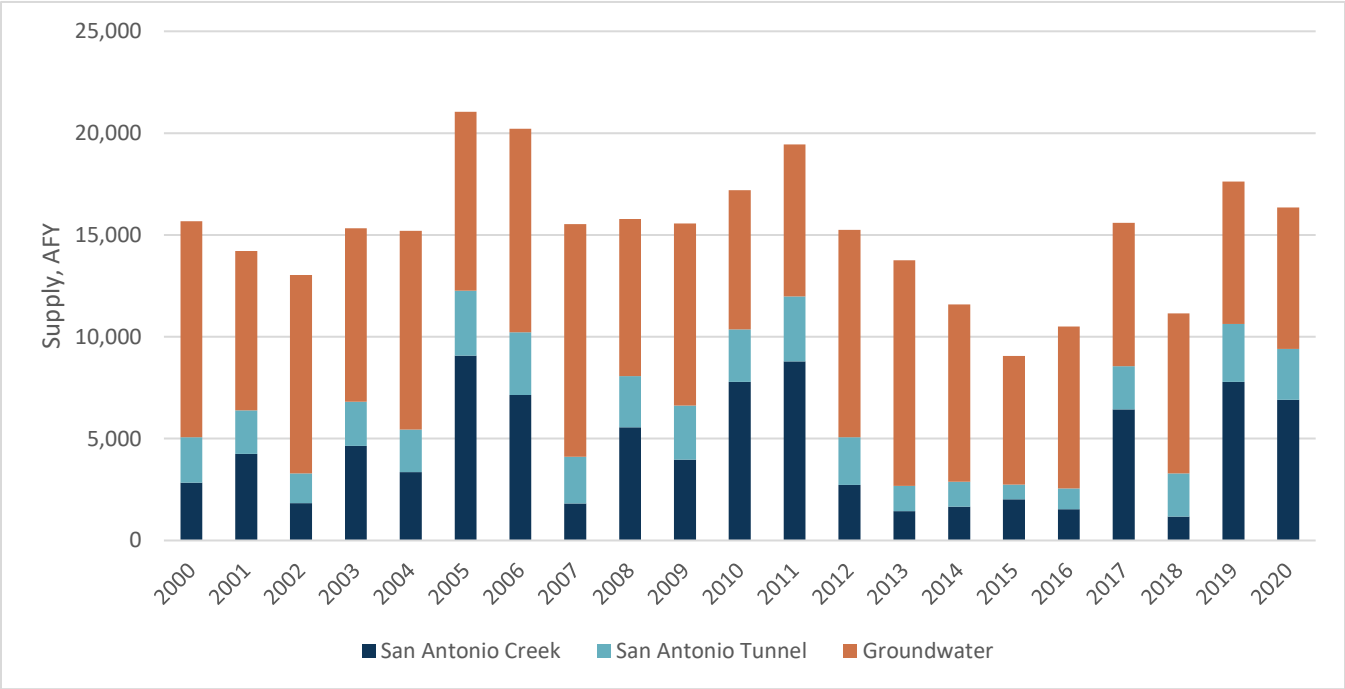


**Figure 6-2. Historical Supply Variability**

**Table 6-2. DWR 7-2W Normal Year Supply and Demand Comparison**

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| **Supply Totals**<br>From Table 6-9W | 15,260 | 15,260 | 15,260 | 15,260 | 15,260 |
| **Demand Totals**<br>From Table 4-3W | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| **DIFFERENCE:** | **689** | **689** | **689** | **689** | **689** |

Supply totals reflect 20-year average supply from the San Antonio Creek and Tunnel, and total SAWCo allocation rights for groundwater.

**Table 6-3. DWR 7-3W Single Dry Year Supply and Demand Comparison**

| | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|
| **Supply Totals** | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| **Demand Totals** | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| **DIFFERENCE:** | **0** | **0** | **0** | **0** | **0** |

**Table 6-4. DWR 7-4W Multiple Dry Years Supply and Demand Comparison**

| | | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|
| First | Supply Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| Year | Demand Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| - | **DIFFERENCE:** | **0** | **0** | **0** | **0** | **0** |
| Second | Supply Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| Year | Demand Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| - | **DIFFERENCE:** | **0** | **0** | **0** | **0** | **0** |
| Third | Supply Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| Year | Demand Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| - | **DIFFERENCE:** | **0** | **0** | **0** | **0** | **0** |
| Fourth | Supply Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| Year | Demand Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| - | **DIFFERENCE:** | **0** | **0** | **0** | **0** | **0** |
| Fifth | Supply Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| Year | Demand Totals | 14,571 | 14,571 | 14,571 | 14,571 | 14,571 |
| - | **DIFFERENCE:** | **0** | **0** | **0** | **0** | **0** |

### 6.1.3 Descriptions of Management Tools and Options

SAWCo relies on local sources to meet demands and intends to continue to utilize existing sources well into the future. SAWCo is proactive in ensuring these resources, such as the San Antonio Tunnel, is cared for and continues to evaluate its condition to ensure long-term reliability.

## 6.2 Drought Risk Assessment

The Drought Risk Assessment (DRA) is based on an analysis of historical drought data forecasted into the future under various drought conditions, with a focus on the five-year consecutive drought scenario. The DRA analyzes historical data to assess patterns and more reliably determine if there could be any water shortages in the next five years. If demands cannot be met by the expected supply available, shortage response actions from SAWCo's WSCP may be implemented. Details on SAWCo's WSCP are provided in Appendix H.

### 6.2.1 Data, Methods, and Basis for Water Shortage Condition

The data, methods, and basis for a water shortage condition were identified using typical normal year supply and total possible system demand (total entitlement based on all SAWCo shares). Since the total number of shares within SAWCo is fixed, the total demand is also fixed, and therefore constant over the next five years.

### 6.2.2 DRA Water Source Reliability

The DRA provides a snapshot of the anticipated surplus or deficit if a drought were to occur in the next five years. As described previously, SAWCo provides water based on total number of shares a stakeholder possesses. SAWCo will provide the water entitled to its shareholder, or only what is needed, to meet shareholder demands. SAWCo anticipates meeting all demands over the next five years.

**Table 6-5. DWR 7-5 Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635(b)**

| | | |
|---|---|---|
| 2021 | Gross Water Use | 14,571 |
| | Total Supplies | 14,571 |
| | Surplus/Shortfall without WSCP Action | 0 |
| | **Planned WSCP Actions (Use Reduction and Supply Augmentation)** | |
| | WSCP (Supply Augmentation Benefit) | |
| | WSCP (Use Reduction Savings Benefit) | |
| | Revised Surplus/Shortfall | 0 |
| | Resulting Percent Use Reduction from WSCP Action | 0% |
| 2022 | Gross Water Use | 14,571 |
| | Total Supplies | 14,571 |
| | Surplus/Shortfall without WSCP Action | 0 |
| | **Planned WSCP Actions (Use Reduction and Supply Augmentation)** | |
| | WSCP (Supply Augmentation Benefit) | |
| | WSCP (Use Reduction Savings Benefit) | |
| | Revised Surplus/Shortfall | 0 |
| | Resulting Percent Use Reduction from WSCP Action | 0% |
| 2023 | Gross Water Use | 14,571 |
| | Total Supplies | 14,571 |
| | Surplus/Shortfall without WSCP Action | 0 |
| | **Planned WSCP Actions (Use Reduction and Supply Augmentation)** | |
| | WSCP (Supply Augmentation Benefit) | |
| | WSCP (Use Reduction Savings Benefit) | |
| | Revised Surplus/Shortfall | 0 |
| | Resulting Percent Use Reduction from WSCP Action | 0% |
| 2024 | Gross Water Use | 14,571 |
| | Total Supplies | 14,571 |
| | Surplus/Shortfall without WSCP Action | 0 |
| | **Planned WSCP Actions (Use Reduction and Supply Augmentation)** | |
| | WSCP (Supply Augmentation Benefit) | |
| | WSCP (Use Reduction Savings Benefit) | |
| | Revised Surplus/Shortfall | 0 |
| | Resulting Percent Use Reduction from WSCP Action | 0% |
| 2025 | Gross Water Use | 14,571 |
| | Total Supplies | 14,571 |
| | Surplus/Shortfall without WSCP Action | 0 |
| | **Planned WSCP Actions (Use Reduction and Supply Augmentation)** | |
| | WSCP (Supply Augmentation Benefit) | |
| | WSCP (Use Reduction Savings Benefit) | |
| | Revised Surplus/Shortfall | 0 |
| | Resulting Percent Use Reduction from WSCP Action | 0% |

7

2020 URBAN WATER MANAGEMENT PLAN

# Water Shortage Contingency Plan Summary

**The Water Shortage Contingency Plan (WSCP) is a strategic plan that SAWCo uses to prepare for and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when the water supply available is not sufficient to meet the normally expected customer water use at a given time. A shortage may occur for many reasons, such as an extended drought, water pollution, power outage, or a catastrophic event.**

The WSCP provides guidance to SAWCo's Board of Directors, staff, and the public by identifying anticipated water shortages and response actions to manage any water shortage with predictability and accountability in an efficient manner. This WSCP is intended to provide a working framework and options to guide SAWCo's response to water shortages.

IN THIS SECTION

- WSCP Overview

## 7.1 WSCP Overview

The WSCP is composed of the following elements:

### Water Supply Reliability Analysis

Summarizes SAWCo's water supply analysis and reliability and identifies any key issues that may trigger a shortage condition. Details on the water supply reliability analysis are provided in Chapter 7.

### Annual Water Supply and Demand Assessment

Describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare a water shortage.

### Shortage Stages

Establishes water shortage levels to clearly identify and respond to a water shortage emergency.

### Shortage Response Actions

Describes the response actions that may be implemented or considered for each shortage stage to reduce gaps between available supply and demand.

### Communication Protocols

Describes communication protocols SAWCo follows to ensure that its stakeholders are well-informed of shortage conditions and requirements.

### Compliance and Enforcement

Defines compliance and enforcement actions available to implement the WSCP.

### Legal Authority

Summarizes the legal documents that provide SAWCo with the authority to declare a water shortage emergency and implement and enforce response actions.

### Financial Consequences of WSCP Implementation

Describes the anticipated financial impact of a water shortage and identifies mitigation strategies to offset financial burdens.

### Monitoring and Reporting

Summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation. Results will be used to determine whether additional shortage response actions should be implemented and if current actions are successful.

### WSCP Refinement Procedures

Describes the factors that may trigger updates to the WSCP and outlines how to complete an update.

### Special Water Features Distinctions

Defines considerations and definitions for water use for decorative features versus pools and spas. Decorative features include ornamental fountains, ponds, and other aesthetic features.

### Plan Adoption, Submittal, and Availability

Describes the WSCP adoption process, submittal, and availability after revision.

The WSCP is a stand-alone document that can be modified as needed, and included as Appendix H.

2020 URBAN WATER MANAGEMENT PLAN

# 8 Demand Management Measures

**This section provides a comprehensive description of the water conservation programs that SAWCo has implemented for the past five years, is currently implementing, and plans to implement in the future.**

IN THIS SECTION

- Demand Management Measures for Wholesalers
- Other Demand Management Measures
- Reporting Implementation

## 8.1 Demand Management Measures for Wholesale Suppliers

### 8.1.1 Metering

In September 2020, SAWCo's Board approved a $740,000 project to replace all meters with new automated meters. The new meters will be Automated Meter Reading (AMR) cellular meters and will record water use daily. In addition, SAWCo is developing an online portal so that all shareholders can access their water consumption and receive alerts directly. All meters were replaced in early 2021. Previously, SAWCo staff visited meters once a month and manually read and logged meters.

### 8.1.2 Public Education and Outreach

SAWCo provides updated information on its website, Facebook account, through quarterly newsletters, bill inserts, and other outreach materials. SAWCo may also participate in local events such as The Water Fair and Pancake Breakfast.

### 8.1.3 Water Conservation Program Coordination and Staffing

SAWCo does not have a dedicated water conservation coordinator, but employs administrative staff devoted to commit part time as SAWCo's water conservation representative.

### 8.1.4 Asset Management

SAWCo uses an "Asset Depreciation Schedule" that provides equipment service life for different types of water distributions facilities. A straight-line depreciation method is used to determine remaining service life estimates of existing equipment for the purposes of making replacement recommendations. SAWCo is currently developing an updated Water Master Plan that will identify replacement projects. SAWCo also maintains an annual maintenance budget to respond to needed repairs and perform routine preventive maintenance.

### 8.1.5 Wholesale Supplier Assistance Programs

SAWCo's wholesale agencies are provided toilets with installation for their customers. Agencies will provide name and contact information and contractor Bottomline Solutions will contact to set up appointment to remove old toilet and install new UHET toilets. Old toilets are also hauled away and disposed of.

## 8.2 Other Demand Management Measures - Rebates

SAWCo currently administers the following rebate programs through the Metropolitan Water District of Southern California. More information on each of these rebates can be found on SAWCo's website, https://www.sawaterco.com/rebates, or at https://socalwatersmart.com.

#### High-Efficiency Clothes Washers

Using high-efficiency washers can reduce water and energy usage in the home. The high-efficiency washers only use about 20-60% of water compared to traditional washers, which translate to energy savings as it uses as little as 20-50% of energy because there is less water to heat. SAWCo offers rebate starting at $85 for purchase of a high-efficiency washers. A listing of high-efficiency washers can be found at SoCal WaterSmart web site.

#### Weather-Based Irrigation Controllers

The Weather-Based Irrigation Controllers (WBICs) help reduce overwatering by applying water only when plants need it. It provides the appropriate watering schedule, adjusts for weather changes and irrigates based on the needs of the landscape and soil conditions. SAWCo offers rebates starting at $80 per controller for less than one acre of landscape and $35 per station for more than one acre of landscape.

### Rotating Sprinkler Nozzles

Rotating sprinkler nozzles use less water than traditional sprinklers because it operates with lower precipitation rates, have greater uniform distribution and coverage. Rotating nozzles are a great water conservation tool as it applies water more slowly and uniformly than conventional sprays, especially when adjusted for specific site conditions. To help with wasteful water runoff, check out SoCal WaterSmart for recommended rotating nozzles. SAWCo offers $2 per nozzle rebates with a minimum quantity of 30 nozzles.

### Turf Removal

SAWCo offers a turf removal rebate. Interested stakeholders can apply through SoCal Water$mart at https://socalwatersmart.com.

### Rain Barrels and Cisterns

Rain barrels and cisterns can be installed to capture stormwater and runoff from rooftops and stored for later use. SAWCo offers a $35 rebate for the purchase of a rain barrel and a rebates for cisterns start at $250.

### Single Family/Multi Family High Efficiency Toilet

SAWCo offers single family or multifamily premium high efficiency toilet rebates, starting at $40 for a 1.08 gallons per flush (GPF) toilet.

### Soil Moisture Sensor Systems

Soil moisture sensor systems helps to save water by sensing the moister in the soil and regulate the irrigation system for watering in response to changes of the weather for large residential sites.

## 8.3 Reporting Implementation

SAWCo provided an update to its Board on April 20, 2021 summarizing the various conservation efforts implemented during 2020 and summarized below.

## 8.3.1 Local Assistance in meeting Best Management Practices

**Table 8-1. Conservation Rebates**

| RESIDENTIAL REBATE PROGRAMS (FISCAL YEAR) THRU METROPOLITAN WATER DISTRICT | DEVICES/REBATES | EST. GALLONS SAVED/ DEVICE/YEAR | TOTAL EST. GALLONS SAVED PER YEAR |
|---|---|---|---|
| High Efficiency Clothes Washers | 2 | 11,243 | **22,486** |
| Rotating Nozzles | 0 | | |
| Weather Based Irrigation Controllers | 1 | 105,917 | **105,917** |
| High Efficiency Toilets (premium) | 1 | 13,851 | 13,851 |
| Rain Barrels | 0 | 619 | |
| Turf Removal | 0 | | |
| Landscape Audit | 1 | 3,485 | 3,485 |
| **Total Savings for calendar year – thru 12/31/2020** | *5* | | **145,739** |

## 8.3.2 SAWCo's efforts in meeting Best Management Practices as of 3/31/2021

**Table 8-2. DMM Efforts**

| SAWCO PROGRAMS | TOTAL BUDGET | DEVICES/REBATES | ESTIMATED GALLONS SAVED PER DEVICE PER YEAR | TOTAL ESTIMATED GALLONS SAVED PER YEAR |
|---|---|---|---|---|
| Toilet Direct Installation for SAWCo Customers | $5,000<br>Cost to date:<br>$1,035<br>4 toilets | 4 | 15,600 | 62,400 |
| SAWCo Wholesale Agencies Assistance-Toilet Direct Installation | $15,000<br>Cost to date:<br>$3,860<br>14 toilets | 14 | 15,600 | 218,400 |
| **TOTAL** | **$20,000** | **18** | | **280,800** |

2020 URBAN WATER MANAGEMENT PLAN

# 9 Plan Adoption, Submittal, and Implementation

**This section describes steps taken to adopt and submit the and to make it publicly available.**

IN THIS SECTION

- Public Hearing and Notices
- Public Hearing and Adoption
- Plan Submittal
- Public Availability

## 9.1 Notice of Public Hearing

Before the public hearing, SAWCo made a draft WSCP and draft UWMP available for public inspection at SAWCo's office and website. Pursuant to CWC Section 10642, general notice of the public hearing was provided through publication of the hearing date and time and posting of the hearing at SAWCo's office.

Table 9-1 provides a summary of the notifications that were issued as a part of SAWCo's development of the UWMP. SAWCo notified the public within its service area of the opportunity to provide input regarding the UWMP. A copy of the public outreach materials, including newspaper notices and invitation letters, are included in Appendix B.

**Table 9-1. DWR 10-1W Notification to Cities and Counties**

Supplier has not notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. Completion of the table is required.

| CITY | 60 DAY NOTICE | NOTICE OF PUBLIC HEARING | OTHER |
|---|---|---|---|
| City of Upland | Yes | Yes | |
| City of Ontario | Yes | Yes | |
| City of Pomona | Yes | Yes | |
| **COUNTY** | **60 DAY NOTICE** | **NOTICE OF PUBLIC HEARING** | **OTHER** |
| County of San Bernardino | Yes | Yes | |
| **OTHER** | **60 DAY NOTICE** | **NOTICE OF PUBLIC HEARING** | **OTHER** |
| Cucamonga Valley Water District | Yes | Yes | |
| Monte Vista Water District | Yes | Yes | |
| Chino Basin Watermaster | Yes | Yes | |

## 9.2 Public Hearing and Adoption

Prior to adoption of the WSCP and 2020 UWMP, SAWCo held a public hearing regarding its WSCP and UWMP on September 21, 2021.

The WSCP and UWMP were publicly reviewed during the September 21, 2021 public hearing. This hearing provided the cities and counties and other members of the public a chance to review the staff report and attend the hearing to provide comment. The public hearing took place before the adoption allowing opportunity for the report to be modified in response to public input. Following the public hearing, the WSCP and UWMP were adopted by SAWCo on September 21, 2021.

A copy of the Resolution of Plan Adoption signed by the SAWCo Board is included as Appendix C of the UWMP. The UWMP includes all applicable information necessary to meet the requirements of CWC. The 2020 UWMP and WSCP were submitted to the DWR within 30 days of adoption.

## 9.3 Plan Submittal

A hard copy of the Final 2020 UWMP and WSCP were sent to the California State Library and electronical copies to DWR (electronically using the WUEdata reporting tool), and electronical copies to all cities and counties within SAWCo's service area within 30 days of adoption.

## 9.4 Public Availability

To fulfill the requirements of CWC Section 10642 of the UWMP Act, SAWCo made the 2020 UWMP and WSCP available online and at the main SAWCo office located at 139 N. Euclid Avenue, Upland, CA 91786-6036 between the hours of 8:00 am and 4:00 pm, Monday – Thursday, and on alternating Fridays between 8:00 am and 3 pm, for public review within 30 days of adoption.

## 9.5 Amending an Adopted UWMP or WSCP

Amendments to the SAWCo's 2020 UWMP and WSCP will be made on an as needed basis. Should SAWCo need to amend the adopted 2020 UWMP or WSCP in the future, SAWCo will hold a public hearing for review of the proposed amendments to the document and send a 60-day notification letter to all cities and counties within their service area and notify the public in same manner as set forth in this UWMP. Once the amended document is adopted, a copy of the finalized version will be distributed to the California State Library, DWR (electronically using the WUEdata reporting tool), and all cities and counties within SAWCo's service area within 30 days of adoption. The finalized version will also be made available to the public both online on SAWCo's website and in person at SAWCo's office during normal business hours.

# 10 References

(2017). (San Anonio Heights, CA) Retrieved from Datausa.io: https://datausa.io/profile/geo/san-antonio-heights-ca/

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# A

# Appendix A. DWR Review Checklist

| 2020 Guidebook Location | Water Code Section | Summary as Applies to UWMP | Subject | 2020 UWMP Location |
|---|---|---|---|---|
| Chapter 1 | 10615 | A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. | Introduction and Overview | Section 1 Introduction and Lay Description |
| Chapter 1 | 10630.5 | Each plan shall include a simple description of the supplier's plan including water availability, future requirements, a strategy for meeting needs, and other pertinent information. Additionally, a supplier may also choose to include a simple description at the beginning of each chapter. | Summary | 1.2 UWMP Organization and Lay Description |
| Section 2.2 | 10620(b) | Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier. | Plan Preparation | 1.1 The California Water Code |
| Section 2.6 | 10620(d)(2) | Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. | Plan Preparation | 2.2 Coordination and Outreach |
| Section 2.6.2 | 10642 | Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan and contingency plan. | Plan Preparation | 2.2.2 Coordination with Other Agencies and the Community, Table 2-4 |
| Section 2.6, Section 6.1 | 10631(h) | Retail suppliers will include documentation that they have provided their wholesale supplier(s) - if any - with water use projections from that source. | System Supplies | N/A |
| Section 2.6 | 10631(h) | Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types. | System Supplies | 2.2.1 Wholesale and Retail Coordination, Table 2-3 |
| Section 3.1 | 10631(a) | Describe the water supplier service area. | System Description | 3.1 Service Area |
| Section 3.3 | 10631(a) | Describe the climate of the service area of the supplier. | System Description | 3.2 Service Area Climate |
| Section 3.4 | 10631(a) | Provide population projections for 2025, 2030, 2035, 2040 and optionally 2045. | System Description | 3.3.1 Service Area Population |
| Section 3.4.2 | 10631(a) | Describe other social, economic, and demographic factors affecting the supplier's water management planning. | System Description | 3.3.2 Other Social, Economic, and Demographic Factors |
| Sections 3.4 and 5.4 | 10631(a) | Indicate the current population of the service area. | System Description and Baselines and Targets | 3.3.1 Service Area Population, Table 3-2 |
| Section 3.5 | 10631(a) | Describe the land uses within the service area. | System Description | 3.4 Land Uses within Service Area |
| Section 4.2 | 10631(d)(1) | Quantify past, current, and projected water use, identifying the uses among water use sectors. | System Water Use | 4.2 Past, Current, and Projected Water Use by Sector |
| Section 4.2.4 | 10631(d)(3)(C) | Retail suppliers shall provide data to show the distribution loss standards were met. | System Water Use | 4.2.1 Distribution System Water Losses |
| Section 4.2.6 | 10631(d)(4)(A) | In projected water use, include estimates of water savings from adopted codes, plans and other policies or laws. | System Water Use | 4.2.3 Projected Water Use |
| Section 4.2.6 | 10631(d)(4)(B) | Provide citations of codes, standards, ordinances, or plans used to make water use projections. | System Water Use | 4.2.3 Projected Water Use |
| Section 4.3.2.4 | 10631(d)(3)(A) | Report the distribution system water loss for each of the 5 years preceding the plan update. | System Water Use | N/A |
| Section 4.4 | 10631.1(a) | Include projected water use needed for lower income housing projected in the service area of the supplier. | System Water Use | N/A |
| Section 4.5 | 10635(b) | Demands under climate change considerations must be included as part of the drought risk assessment. | System Water Use | 4.3 Climate Change Considerations |
| Chapter 5 | 10608.20(e) | Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. | Baselines and Targets | N/A |
| Chapter 5 | 10608.24(a) | Retail suppliers shall meet their water use target by December 31, 2020. | Baselines and Targets | N/A |
| Section 5.1 | 10608.36 | Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions. | Baselines and Targets | N/A |
| Section 5.2 | 10608.24(d)(2) | If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment. | Baselines and Targets | N/A |

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| Section 5.5 | 10608.22 | Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100. | Baselines and Targets | N/A |
| Section 5.5 and Appendix E | 10608.4 | Retail suppliers shall report on their compliance in meeting their water use targets. The data shall be reported using a standardized form in the SBX7-7 2020 Compliance Form. | Baselines and Targets | N/A |
| Sections 6.1 and 6.2 | 10631(b)(1) | Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought. | System Supplies | Section 5 Water Supply Characterization |
| Sections 6.1 | 10631(b)(1) | Provide a discussion of anticipated supply availability under a normal, single dry year, and a drought lasting five years, as well as more frequent and severe periods of drought, *including changes in supply due to climate change.* | System Supplies | Section 5 Water Supply Characterization and Section 6 Water Service Reliability and Drought Risk Assessment |
| Section 6.1 | 10631(b)(2) | When multiple sources of water supply are identified, describe the management of each supply in relationship to other identified supplies. | System Supplies | 5.2 UWMP Water Supply Characterization |
| Section 6.1.1 | 10631(b)(3) | Describe measures taken to acquire and develop planned sources of water. | System Supplies | 5.2.8 Future Water Projects and 5.2.9 Summary of Existing and Planned Sources of Water |
| Section 6.2.8 | 10631(b) | Identify and quantify the existing and planned sources of water available for 2020, 2025, 2030, 2035, 2040 and optionally 2045. | System Supplies | 5.2.9 Summary of Existing and Planned Sources of Water, Table 5-7 |
| Section 6.2 | 10631(b) | Indicate whether groundwater is an existing or planned source of water available to the supplier. | System Supplies | 5.2.2 Groundwater |
| Section 6.2.2 | 10631(b)(4)(A) | Indicate whether a groundwater sustainability plan or groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization. | System Supplies | 5.2.2 Groundwater, Appendix D, Appendix E |
| Section 6.2.2 | 10631(b)(4)(B) | Describe the groundwater basin. | System Supplies | 5.2.2.1 Chino Basin, 5.2.2.2 Cucamonga Basin, 5.2.2.3 Six Basins |
| Section 6.2.2 | 10631(b)(4)(B) | Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump. | System Supplies | 5.2.2 Groundwater, Appendix D |
| Section 6.2.2.1 | 10631(b)(4)(B) | For unadjudicated basins, indicate whether or not the department has identified the basin as a high or medium priority. Describe efforts by the supplier to coordinate with sustainability or groundwater agencies to achieve sustainable groundwater conditions. | System Supplies | 5.2.2 Groundwater |
| Section 6.2.2.4 | 10631(b)(4)(C) | Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years | System Supplies | 5.2.2.4 Past Five Years |
| Section 6.2.2 | 10631(b)(4)(D) | Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped. | System Supplies | 5.2.9 Summary of Existing and Planned Sources of Water, Table 5-7 |
| Section 6.2.7 | 10631(c) | Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis. | System Supplies | 5.2.7 Water Exchanges and Transfers |
| Section 6.2.5 | 10633(b) | Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. | System Supplies (Recycled Water) | 5.2.5 Wastewater and Recycled Water |
| Section 6.2.5 | 10633(c) | Describe the recycled water currently being used in the supplier's service area. | System Supplies (Recycled Water) | 5.2.5 Wastewater and Recycled Water |
| Section 6.2.5 | 10633(d) | Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses. | System Supplies (Recycled Water) | 5.2.5 Wastewater and Recycled Water |
| Section 6.2.5 | 10633(e) | Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected. | System Supplies (Recycled Water) | 5.2.5 Wastewater and Recycled Water |

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| Section 6.2.5 | 10633(f) | Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year. | System Supplies (Recycled Water) | 5.2.5 Wastewater and Recycled Water |
| Section 6.2.5 | 10633(g) | Provide a plan for optimizing the use of recycled water in the supplier's service area. | System Supplies (Recycled Water) | 5.2.5 Wastewater and Recycled Water |
| Section 6.2.6 | 10631(g) | Describe desalinated water project opportunities for long-term supply. | System Supplies | 5.2.6 Desalinated Water Opportunities |
| Section 6.2.5 | 10633(a) | Describe the wastewater collection and treatment systems in the supplier's service area with quantified amount of collection and treatment and the disposal methods. | System Supplies (Recycled Water) | 5.2.5 Wastewater and Recycled Water |
| Section 6.2.8, Section 6.3.7 | 10631(f) | Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and for a period of drought lasting 5 consecutive water years. | System Supplies | 5.2.8 Future Water Projects |
| Section 6.4 and Appendix O | 10631.2(a) | The UWMP must include energy information, as stated in the code, that a supplier can readily obtain. | System Suppliers, Energy Intensity | 5.3 Energy Intensity |
| Section 7.2 | 10634 | Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability | Water Supply Reliability Assessment | Section 6 Water Service Reliability and Drought Risk Assessment |
| Section 7.2.4 | 10620(f) | Describe water management tools and options to maximize resources and minimize the need to import water from other regions. | Water Supply Reliability Assessment | 6.1.3 Descriptions of Management Tools and Options |
| Section 7.3 | 10635(a) | Service Reliability Assessment: Assess the water supply reliability during normal, dry, and a drought lasting five consecutive water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years. | Water Supply Reliability Assessment | 6.1.2 Water Service Reliability |
| Section 7.3 | 10635(b) | Provide a drought risk assessment as part of information considered in developing the demand management measures and water supply projects. | Water Supply Reliability Assessment | 6.2 Drought Risk Assessment |
| Section 7.3 | 10635(b)(1) | Include a description of the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a drought period that lasts 5 consecutive years. | Water Supply Reliability Assessment | 6.2.1 Data, Methods, and Basis for Water Shortage Condition |
| Section 7.3 | 10635(b)(2) | Include a determination of the reliability of each source of supply under a variety of water shortage conditions. | Water Supply Reliability Assessment | 6.2.2 DRA Water Source Reliability |
| Section 7.3 | 10635(b)(3) | Include a comparison of the total water supply sources available to the water supplier with the total projected water use for the drought period. | Water Supply Reliability Assessment | 6.2.2 DRA Water Source Reliability, Table 6-5 |
| Section 7.3 | 10635(b)(4) | Include considerations of the historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria. | Water Supply Reliability Assessment | Section 6 Water Service Reliability and Drought Risk Assessment |
| Chapter 8 | 10632(a) | Provide a water shortage contingency plan (WSCP) with specified elements below. | Water Shortage Contingency Planning | Appendix F Water Shortage Contingency Plan |
| Chapter 8 | 10632(a)(1) | Provide the analysis of water supply reliability (from Chapter 7 of Guidebook) in the WSCP | Water Shortage Contingency Planning | Appendix F, 1.1 Water Supply Reliability Analysis |
| Section 8.10 | 10632(a)(10) | Describe reevaluation and improvement procedures for monitoring and evaluation the water shortage contingency plan to ensure risk tolerance is adequate and appropriate water shortage mitigation strategies are implemented. | Water Shortage Contingency Planning | Appendix F, 1.9 Monitoring and Reporting |
| Section 8.2 | 10632(a)(2)(A) | Provide the written decision-making process and other methods that the supplier will use each year to determine its water reliability. | Water Shortage Contingency Planning | Appendix F, 1.2 Annual Water Supply and Demand Assessment |
| Section 8.2 | 10632(a)(2)(B) | Provide data and methodology to evaluate the supplier's water reliability for the current year and one dry year pursuant to factors in the code. | Water Shortage Contingency Planning | Appendix F, 1.2 Annual Water Supply and Demand Assessment |
| Section 8.3 | 10632(a)(3)(A) | Define six standard water shortage levels of 10, 20, 30, 40, 50 percent shortage and greater than 50 percent shortage. These levels shall be based on supply conditions, including percent reductions in supply, changes in groundwater levels, changes in surface elevation, or other conditions. The shortage levels shall also apply to a catastrophic interruption of supply. | Water Shortage Contingency Planning | Appendix F, 1.3 Water Shortage Levels |

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| Section 8.3 | 10632(a)(3)(B) | Suppliers with an existing water shortage contingency plan that uses different water shortage levels must cross reference their categories with the six standard categories. | Water Shortage Contingency Planning | Appendix F, 1.3 Water Shortage Levels, Figure 1 |
| Section 8.4 | 10632(a)(4)(A) | Suppliers with water shortage contingency plans that align with the defined shortage levels must specify locally appropriate supply augmentation actions. | Water Shortage Contingency Planning | Appendix F, 1.4.2 Supply Augmentation |
| Section 8.4 | 10632(a)(4)(B) | Specify locally appropriate demand reduction actions to adequately respond to shortages. | Water Shortage Contingency Planning | Appendix F, 1.4.1 Demand Reduction |
| Section 8.4 | 10632(a)(4)(C) | Specify locally appropriate operational changes. | Water Shortage Contingency Planning | Appendix F, 1.4.3 Operational Changes |
| Section 8.4 | 10632(a)(4)(D) | Specify additional mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions are appropriate to local conditions. | Water Shortage Contingency Planning | Appendix F, 1.4.4 Additional Mandatory Restrictions |
| Section 8.4 | 10632(a)(4)(E) | Estimate the extent to which the gap between supplies and demand will be reduced by implementation of the action. | Water Shortage Contingency Planning | Appendix F, Table 3 and Table 4 |
| Section 8.4.6 | 10632.5 | The plan shall include a seismic risk assessment and mitigation plan. | Water Shortage Contingency Plan | Appendix F, 1.4.5 Seismic Risk Assessment, Mitigation Plan, and Emergency Response Plan |
| Section 8.5 | 10632(a)(5)(A) | Suppliers must describe that they will inform customers, the public and others regarding any current or predicted water shortages. | Water Shortage Contingency Planning | Appendix F, 1.5 Communication Protocols |
| Section 8.5 and 8.6 | 10632(a)(5)(B)<br>10632(a)(5)(C) | Suppliers must describe that they will inform customers, the public and others regarding any shortage response actions triggered or anticipated to be triggered and other relevant communications. | Water Shortage Contingency Planning | Appendix F, 1.5 Communication Protocols |
| Section 8.6 | 10632(a)(6) | Retail supplier must describe how it will ensure compliance with and enforce provisions of the WSCP. | Water Shortage Contingency Planning | Appendix F, 1.6 Compliance and Enforcement |
| Section 8.7 | 10632(a)(7)(A) | Describe the legal authority that empowers the supplier to enforce shortage response actions. | Water Shortage Contingency Planning | Appendix F, 1.7 Legal Authorities |
| Section 8.7 | 10632(a)(7)(B) | Provide a statement that the supplier will declare a water shortage emergency Water Code Chapter 3. | Water Shortage Contingency Planning | Appendix F, 1.2 Annual Water Supply and Demand Assessment |
| Section 8.7 | 10632(a)(7)(C) | Provide a statement that the supplier will coordinate with any city or county within which it provides water for the possible proclamation of a local emergency. | Water Shortage Contingency Planning | Appendix F, 1.2 Annual Water Supply and Demand Assessment |
| Section 8.8 | 10632(a)(8)(A) | Describe the potential revenue reductions and expense increases associated with activated shortage response actions. | Water Shortage Contingency Planning | Appendix F, 1.8 Financial Consequences of WSCP |
| Section 8.8 | 10632(a)(8)(B) | Provide a description of mitigation actions needed to address revenue reductions and expense increases associated with activated shortage response actions. | Water Shortage Contingency Planning | Appendix F, 1.8 Financial Consequences of WSCP |
| Section 8.8 | 10632(a)(8)(C) | Retail suppliers must describe the cost of compliance with Water Code Chapter 3.3: Excessive Residential Water Use During Drought | Water Shortage Contingency Planning | N/A |
| Section 8.9 | 10632(a)(9) | Retail suppliers must describe the monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance. | Water Shortage Contingency Planning | N/A |
| Section 8.11 | 10632(b) | Analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas. | Water Shortage Contingency Planning | Appendix F, 1.11 Special Water Feature Distinction |
| Sections 8.12 and 10.4 | 10635(c) | Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 30 days after the submission of the plan to DWR. | Plan Adoption, Submittal, and Implementation | Appendix F, 1.12 Plan Adoption, Submittal, and Availability |
| Section 8.14 | 10632(c) | Make available the Water Shortage Contingency Plan to customers and any city or county where it provides water within 30 after adopted the plan. | Water Shortage Contingency Planning | Appendix F, 1.12 Plan Adoption, Submittal, and Availability |

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| Sections 9.1 and 9.3 | 10631(e)(2) | Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program. | Demand Management Measures | 8.1 Demand Management Measures for Wholesale Suppliers |
| Sections 9.2 and 9.3 | 10631(e)(1) | Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code. | Demand Management Measures | N/A |
| Chapter 10 | 10608.26(a) | Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets (recommended to discuss compliance). | Plan Adoption, Submittal, and Implementation | N/A |
| Section 10.2.1 | 10621(b) | Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Reported in Table 10-1. | Plan Adoption, Submittal, and Implementation | 9.1 Notice of Public Hearing, Table 9-1 |
| Section 10.4 | 10621(f) | Each urban water supplier shall update and submit its 2020 plan to the department by July 1, 2021. | Plan Adoption, Submittal, and Implementation | 9.3 Plan Submittal |
| Sections 10.2.2, 10.3, and 10.5 | 10642 | Provide supporting documentation that the urban water supplier made the plan and contingency plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan and contingency plan. | Plan Adoption, Submittal, and Implementation | 9.4 Public Availability |
| Section 10.2.2 | 10642 | The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. | Plan Adoption, Submittal, and Implementation | 9.1 Notice of Public Hearing |
| Section 10.3.2 | 10642 | Provide supporting documentation that the plan and contingency plan has been adopted as prepared or modified. | Plan Adoption, Submittal, and Implementation | Appendix C, Adoption Resolutions |
| Section 10.4 | 10644(a) | Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library. | Plan Adoption, Submittal, and Implementation | 9.3 Plan Submittal |
| Section 10.4 | 10644(a)(1) | Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption. | Plan Adoption, Submittal, and Implementation | 9.4 Public Availability |
| Sections 10.4.1 and 10.4.2 | 10644(a)(2) | The plan, or amendments to the plan, submitted to the department shall be submitted electronically. | Plan Adoption, Submittal, and Implementation | 9.3 Plan Submittal |
| Section 10.5 | 10645(a) | Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | 9.4 Public Availability |
| Section 10.5 | 10645(b) | Provide supporting documentation that, not later than 30 days after filing a copy of its water shortage contingency plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | 9.4 Public Availability |
| Section 10.6 | 10621(c) | If supplier is regulated by the Public Utilities Commission, include its plan and contingency plan as part of its general rate case filings. | Plan Adoption, Submittal, and Implementation | N/A |
| Section 10.7.2 | 10644(b) | If revised, submit a copy of the water shortage contingency plan to DWR within 30 days of adoption. | Plan Adoption, Submittal, and Implementation | 9.5 Amending an Adopted UWMP or WSCP |

# B

# Appendix B. Letters of Notification and Public Hearing Notices

# San Antonio Water Company

Incorporated October 25, 1882
Serving the original Ontario Colony lands

April 28, 2021

**Subject**: San Antonio Water Company 2020 Urban Water Management Plan Update

Dear SAWCO Stakeholder,

The San Antonio Water Company is currently preparing an update to its Urban Water Management Plan (UWMP) in compliance with the California Urban Water Management Planning Act and the Water Conservation Act of 2009.

Pursuant to Water Code section 10620 SAWCO encourages your agency's coordination as we prepare our plan update. Additionally, pursuant to Water Code 10621 this letter shall serve as notice to cities and counties within our service area that we are preparing an update to our UWMP.

SAWCO anticipates holding an open comment period ending with a public hearing in June 2021.

If you would like to continue receiving notifications and/or participate in the update of our UWMP, please contact me by phone or email (blee@sawaterco.com).

Sincerely,

Brian C. Lee

Brian Lee, PE
General Manager

*139 North Euclid Avenue ● Upland, California 91786 ● 909.982.4107 ● Fax 909.920.3047 ● Website: sawaterco.com*

Legal Notice | Legal Notice | Legal Notice | Legal Notice

## NOTICE INVITING BIDS

**Project No. 801 0076**

**Heacock Street Pedestrian and Bicycle Enhancements / Gregory Lane to 680 Ft South**

Bids shall be received electronically prior to 2:00 p.m., September 24, 2021 only in the City of Moreno Valley Bid Portal through PlanetBids. The link to register to become a prospective bidder and electronically bid on this project can be found at the following address:

http://www.planetbids.com/portal/portal.cfm?CompanyID=24660

The cost for downloading is $50.00. The bid results will be available on the above website immediately following the time of bid deadline.

The project consists of the roadway excavation and construction of missing curb, gutter, and sidewalk on the east side of Heacock Street from Gregory Lane to approximately 680 feet south. The project also includes the reconstruction of the curb return with a new ADA access ramp, the relocations of affected utility facilities, and new and reestablished traffic striping and signing within the project limits.

All work must be completed within Eighty (80) Working Days after the date of commencement specified in the Notice to Proceed to Fulfill Preconstruction Requirements.

All bidding documents shall be downloaded electronically on the City of Moreno Valley Bid Portal through PlanetBids at the address shown above.

For technical information relating to the details of this Project and bidding requirements, please submit all Requests for Information (RFI) via the "Questions and Answer" tab within the City of Moreno Valley Vendor Portal in PlanetBids. All RFI's shall be submitted no later than September 17, 2021, by 2:00 p.m. Any RFI received after the date and time specified herein will not be considered.

The bidder is solely responsible for on time submission of their electronic bid. The City will only consider bids that have been transmitted successfully and have been issued an ebid confirmation number with a time stamp from the Bid Management System indicating that the bid was submitted successfully. Transmission of bids by any other means will not be accepted. Bidder shall be solely responsible for informing itself with respect to the proper utilization of the bid management system, for ensuring the capability of their computer system to upload the required documents, and for the stability of their internet service. Failure of the bidder to successfully submit an electronic bid shall be at the bidder's sole risk and no relief will be given for late and/or improperly submitted bids. Bidders experiencing any technical difficulties with the bid submission process may contact PlanetBids at (818) 992-1771. Neither the City, nor PlanetBids, makes any guarantee as to the timely availability of assistance, or assurance that any given problem will be resolved by the bid submission deadline.

**Dated: September 1, 2021** Press-Enterprise: 9/07

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CITY OF PERRIS PLANNING DIVISION

## NOTICE OF PUBLIC HEARING

**PROPOSED PROJECT**

The proposed project consist of two requests. The first request is for a Major Certificate of Appropriateness (MAJCOA 19588-2021) to demolish a Colonial Revival single family dwelling built in 1895. The second request is a Major Certificate of Appropriateness (MAJCOA 19589-2021) to demolish an English Tudor Revival single family structure built in 1924. The two structures are located on the same lot, another and have been submitted by the same applicant. These will be two separate hearings and actions on these projects.

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| **Applicant:** | Jennifer Tadeo |
| **Location:** | 1552 & 1554 N. Park Avenue (APNs: 0280-015-004, 0280-015-002) |
| **Hearing Body:** | Historic Preservation Commission |
| **Case Files:** | MAJCOA 19588-2021 & MAJCOA 19589-2021 |

**Environmental Determination**

The City of Perris, as lead agency, has conducted an environmental review on the proposed project per the California Environmental Quality Act (CEQA). Pursuant to the provisions of CEQA (Public Resources Code, Section 21084 et. seq.), the guidelines include a list of classes of projects which have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA. The Planning Commission will consider adopting a Categorical Exemption in compliance with Article 19, Section 15300, (Class 1 – Existing Facilities). The proposed project described above hereby meets the guidelines for a Categorical Exemption. Therefore, no further environmental review is required.

**PUBLIC HEARING INFORMATION**

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| **Time & Date:** | Historic Preservation Commission Meeting, Wednesday, October 6, 2021, 6:30 p.m. |
| **Location:** | Available via Zoom Video Conferencing |
| **Questions:** | Geoffrey Starns, Historic Preservation Supervisor, (909) 620-2445,geoffrey.starns@cityofperris.org.gov |

On March 16, 2020, the City Council declared a local emergency in response to the global COVID-19 outbreak. Preserving the health and safety of our employees and the public is our top priority.

In accordance with California Governor's Executive Order N-25-20 regarding the Brown Act and guidance from the California Department of Public Health on gathrerings, please note the following:

The Historic Preservation Commission meeting will occur via video conference only, **there will be no in-person public meeting location.**

**To participate by video conference:** Visit https://zoom.us/join (Webinar ID 839 4937 0458; Passcode 775848). Public comment may be made using the "Raise Hand" button for audio comments (limited to three minutes per speaker), or the "Q/A" button for written comments (limited to 275 words).

**To participate by telephone:** Dial (669) 900-9128 (Webinar ID 839 4937 0458 followed by #. For Participant ID, press #. Enter Passcode: 775848 followed by #). You can indicate you would like to make a public comment by dialing *9.

**Written Comments:** May be submitted to OnlineServiceCenter@cityofperris.org.gov, by 5:00 p.m. the day of the hearing. Comments must be limited to 200 words. Please title your email "HPC Public Comment 10-6-2021". Comments received via email will be read into the record by staff.

Additional information regarding this Planning Commission meeting is available at: https://www.cityofperris.org/index.php/government/lifedepartments/community-development/planning

The staff report on this matter will be available on or about October 1, 2021 on the City of Perris website, which may be accessed at https://perris.legistar.com/Calendar.aspx or by emailing the case planner, Laura Lara.

**PLEASE NOTE:** If you challenge this matter in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Perris, Planning Division at, or prior to, the public hearing.

**Published: September 7, 2021** **Inland Valley Daily Bulletin**
**Ad#11485511**

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Legal Notice | Legal Notice | Legal Notice | Legal Notice

## PUBLIC NOTICE OF INTRODUCTION OF ORDINANCE

### VALLEY-WIDE RECREATION AND PARK DISTRICT

### ORDINANCE NO. 2021-6

NOTICE IS HEREBY GIVEN that on August 23, 2021, the Board of Directors of the Valley-Wide Recreation and Park District introduced Ordinance No. 2021-6, entitled:

**AN ORDINANCE OF THE BOARD OF DIRECTORS OF VALLEY-WIDE RECREATION AND PARK DISTRICT, AUTHORIZING THE LEVY OF SPECIAL TAXES IN A COMMUNITY FACILITIES DISTRICT**

If adopted, this ordinance will authorize the levy of a special tax within the French Valley Community Facilities District Zone 22 (Tierra Del Sol) (the "District"), at the rate and in accordance with the rate and method of apportionment of special tax set forth in the Resolution of Formation approved by the Board of Directors on August 23, 2021, by Resolution No. 1213-21. The special tax levy would commence in fiscal year 2022/23 and each fiscal year thereafter to pay for the costs of services and administering the District. The special tax shall be collected in the same manner as ordinary ad valorem taxes are collected and shall have the same lien priority, and be subject to the same penalties and the same procedure and sale in cases of delinquency as provided for ad valorem taxes. This ordinance will be considered for adoption at the Regular Meeting of the Board of Directors on Monday, September 20, 2021, at 5:30 p.m.

A certified copy of the full text of Ordinance No. 2021-6 is available for review in the Office of the Clerk of the Board, 901 W Esplanade, San Jacinto, California 92581.

Valerie Florez, Clerk of the Board
Valley-Wide Recreation and Park District
Press-Enterprise: 9/07

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## CITY OF TEMECULA
## BOARDS AND COMMISSIONS

### POSITIONS AVAILABLE

The City of Temecula invites interested residents to apply for the following positions:

Old Town Local Review Board – 3 Positions
Community Services Commission – 2 Positions
Public/Traffic Safety Commission – 1 Position
Race, Equity, Diversity and Inclusion Commission – 2 Positions

The City Council will make appointments to these positions at a public meeting in November 2021. The term of each position will be January 1, 2022 through December 31, 2024.

The recruitment period for these positions is September 1, 2021 – October 31, 2021. Applicants may apply online through the City's website at TemeculaCA.gov. Supporting documents, if any, must be submitted together with the application. Qualified applicants must be a resident of the City of Temecula at the time the application is submitted.

Please contact the City Clerk's office at (951) 694-6444 for additional information.

Press-Enterprise: 9/07

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## Public Hearing Notice

### Urban Water Management Plan
### And
### Water Shortage Contingency Plan - 2020 Update

The California Urban Water Management Planning Act requires the San Antonio Water Company (SAWCO) to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years.

The Company will hold a public hearing on September 21, 2021, at 5:00 p.m. to receive public comments and consider adoption of the 2020 UWMP and associated WSCP. The Public Hearing will be held at the City of Upland City Hall (460 N. Euclid Avenue Upland, CA 91786).

We invite your participation in the process. The draft UWMP and associated WSCP are available for public review on the Company's website (www.sawaterco.com). The meeting's agenda will also be posted to our website at least three days prior to the meeting.

If you have any questions about the 2020 UWMP or WSCP or the process for updating these documents, please contact Brian Lee at blee@sawaterco.com or at 909.982.4107.

**Published: September 7 & 14, 2021** **Inland Valley Daily Bulletin**
**Ad#11485973**



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**CITY OF RANCHO CUCAMONGA - NOTICE INVITING SEALED BIDS**

Notice is hereby given that the City of Rancho Cucamonga ("City") will receive sealed bids for the materials, supplies, equipment and - or services set forth herein, subject to all conditions outlined in the Bid Package, Plans and Specifications. 1. PROJECT NAME – **FY21-22 Local Overlay Pavement Rehabilitations** . The scope of work consists of, but not limited to, full width and variable pavement edge cold plane; weed killing and crack sealing; pavement overlay; grind and patch; subgrade preparation; installing and compacting aggregate base; adjusting existing manholes, water meter, and valves to new grade; constructing PCC curb and gutter, sidewalk, retaining curb, spandrel, and access curb ramps; and traffic striping, pavement markings and markers; and related items of work per plans. Engineer's Estimate is $2,090,000. A total of forty-five (45) working days to complete the project. 2. OBTAINING BID DOCUMENTS: In an effort to go green and paperless, digital copies of the plans, specifications, and bid proposal, including any future addenda or revisions to the bid documents, are available by going to www.ciplist.com and signing up, by going to Member Login or Member Signup (its free), then choose California, then scroll down to San Bernardino County and click on Browse Cities, then scroll down to Rancho Cucamonga -and click on City Projects, then click on the Project of interest under the Title and follow directions for download. Note, copies of the plans, specifications, bid proposal, addendums and revisions will not be provided, digital copies must be downloaded from the above website then printed. Prospective bidders must register for an account on www.ciplist.com to be included on the prospective bidder's list(s) and to receive email updates of any addenda or revisions to the bid documents. Be advised that the information contained on this site may change over time and without notice to prospective bidders or registered users. While effort is made to keep information current and accurate and to notify registered prospective bidders of any changes to the bid documents, it is the responsibility of each prospective bidder to register with www.ciplist.com and to check this website on a daily basis through the close of bids for any applicable addenda or updates. No proposal will be considered from a Contractor to whom a proposal form has not been issued by the City of Rancho Cucamonga to registered prospective bidders from www.ciplist.com. 3. SEALED BIDS: will be received at all times during normal business hours prior to the Bid Opening, at the Office of the City Clerk, City Hall, 10500 Civic Center Drive, Rancho Cucamonga, CA 91730-3801. The outside of the Sealed Bid shall be clearly marked with the Project Name. It is the responsibility of the Bidder - Contractor to confirm receipt of the Bid Package in the City Clerk's Office prior to the date and time of the BID OPENING at 2:00 p.m. on Tuesday, September 21, 2021. 4. CONTRACTOR LICENSE: In accordance with provisions of Section 3300 of the California Public Contract Code, the City has determined that Contractor shall possess any and all contractors licenses, in form and class as required by any and all applicable laws with respect to any and all of the work to be performed under this contract including, a "Class-A" (General Engineering Contractor) or Class "C-12" License (Earthwork and Paving Contractor) in accordance with the provisions of the Contractor's License Law (California Business and Professions Code, Section 7000 et. seq.). 5. PREVAILI NG WAGES: In accordance with the provisions of Section 1770, et seq., of the Labor Code, the Director of the Industrial Relations of the State of California has determined the general prevailing rate of wages applicable to the work to be done. The Contractor will be required to pay to all persons employed on the project by the Contractor sums not less than the sums set forth in the documents entitled "General Prevailing Wage Determination made by the Director of Industrial Relations pursuant to California Labor Code, Part 7, Chapter 1, Article 2, Sections 1770, 1773, 1773.1. "These documents can be reviewed in the Engineering Department or may be obtained from the State (go to: www.dir.ca.gov, "Statistics and Research"). 6. BID SECURITY: Each bid shall be accompanied by bid security in the form and amount specified in Public Contract Code Sections 20170 and 20171. See Bid Package for details. 7. PAYMENT BOND AND COMPLETION BOND: A Payment Bond and a Completion Bond, each in the amount of 100% of the contract amount, will be required of the Contractor. 8. CONTACT - Questions regarding this Notice Inviting Sealed Bids shall be submitted five (5) calendar days prior to bid opening and shall be directed to Project Manager: Romeo M. David, Associate Engineer (909) 774-4070. The City of Rancho Cucamonga reserves the right to reject any bid or all bids and to waive any informality or irregularity in any bid. Any contract awarded will be let to the lowest responsive and responsible bidder. Attest: Janice C. Reynolds, City Clerk, City of Rancho Cucamonga; Publish: Thursday(s) September 9, 2021 and September 14, 2021.

**Inland Valley Daily Bulletin** **AD#11486616**

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**City of Wildomar**
**REQUEST FOR CONSTRUCTION BIDS**

**NOTICE IS HEREBY GIVEN** that sealed bids will be received at the office of the City Clerk, located at 23873 Clinton Keith Road, Suite 201, Wildomar, California, 92595 until **3:00 pm** local time on **Wednesday, September 29, 2021,** for furnishing all labor, material, tax, transportation, equipment, and services necessary for the:

**HOUSE DEMOLITION FOR THE BUNDY CANYON ROAD IMPROVEMENT PROJECT, SEGMENT 2**
**CIP 0216-2A**

Bids received after **3:00 pm** local time on **Wednesday, September 29, 2021,** shall be returned unopened. Bids will be opened and tabulated immediately after the time bids are due in the City Council Chambers located at 23873 Clinton Keith Rd., Suite 106, Wildomar, California, 92595. The bid opening will also be broadcasted live via the Zoom Meeting platform and recorded in its entirety. The public can observe the bid opening via the following weblink: **https://us02web.zoom.us/j/89825711110,** or by dialing over the phone to 1-669 900 6833 and entering in the Meeting ID: 898 2571 1110 . Bidders, their representatives and other interested parties are invited to watch the bid opening in-person or via Zoom, or call-in to the bid opening via Zoom.

**Description of Work**

**Remove and dispose of existing structures (including lead and asbestos abatement), surface improvements, and certain vegetation; abandon utilities including septic systems and wells; install chain link fencing and gates at designated locations shown on the plans at 23302 Bundy Canyon Rd., 23400 Bundy Canyon Rd., and 23456 Bundy Canyon Rd., Wildomar, CA 92595; and all items not mentioned but indicated in the Plans, Specifications, and the Technical Specifications within the Contract Documents.**

The proposed work shall be performed in accordance with the Project Description, Scope of Work, and other specifications listed in the Request for Proposal.

**Obtaining Documents**
Project documents may be downloaded from the City of Wildomar Website at
http://www.cityofwildomar.org/business/bid_opportunities/rfps_rfqs or purchased from the City for $50.00.

**Construction License**
The successful bidder must possess a current Class C-21 Contractor's License issued by the State of CA.

**For more information, contact:** **Jason Farag (951) 677-7751 x219**
**Warren Repke (951) 677-7751**
**Press-Enterprise: 9/14/2021**

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**Public Hearing Notice**

**Urban Water Management Plan**
**And**
**Water Shortage Contingency Plan - 2020 Update**

The California Urban Water Management Planning Act requires the San Antonio Water Company (SAWCO) to update its Urban Water Management Plan (UWMP) and associated Water Shortage Contingency Plan (WSCP) every 5 years.

The Company will hold a public hearing on September 21, 2021, at 5:00 p.m. to receive public comments and consider adoption of the 2020 UWMP and associated WSCP. The Public Hearing will be held at the City of Upland City Hall (460 N. Euclid Avenue Upland, CA 91786).

We invite your participation in the process. The draft UWMP and associated WSCP are available for public review on the Company's website (**www.sawaterco.com**). The meeting's agenda will also be posted to our website at least three days prior to the meeting.

If you have any questions about the 2020 UWMP or WSCP or the process for updating these documents, please contact Brian Lee at **blee@sawaterco.com** or at 909.982.4107.

**Published: September 7 & 14, 2021** **Inland Valley Daily Bulletin**
**Ad#11485973**

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**NOTICE OF PUBLIC SALE OF PERSONAL PROPERTY**
Notice is hereby given that pursuant to Sections 21700-21716 of the Business and Professions Code, Extra Storage Riverside 2, 2680 E. La Cadena., Riverside ca 92505, County of Riverside, State of California, at the above address will sell, to satisfy lien of the owner, at Public Sale. Unit will be sold by competitive bidding at Public Auction with bids opening on or after September 15, 2021, At 12:00 AM. The personal goods stored therein by the following may include, but are not limited to general household items, furniture, boxes, clothes, and appliances.
NAME: Sahara L. Shepherd, Jordan Wazai, Patrick Obanion, Frank Martinez, DeJainee Armstrong, Estanislao Luvian
Purchases must be made with cash and paid at time of sale. All goods are sold as is and must be removed within 24 hours from the time of purchase. Extra Storage Riverside 2 reserves the right to retract bids. Sale is subject to adjournment and/or cancellation in the event of settlement between owner and obligated party.
Location conducted by Storage Treasures Auctions, Bond # 8434104, 760-384-8483

**To be published:** **Tuesday, September 7, 2021**
**Tuesday, September 14, 2021** **Press-Enterprise**


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C

# Appendix C. Adoption Resolutions

RESOLUTION No. 2021-09-01
A RESOLUTION OF THE BOARD OF DIRECTORS OF THE SAN ANTONIO WATER COMPANY ADOPTING THE 2020 URBAN WATER MANAGEMENT PLAN

WHEREAS, the California Legislature enacted Assembly bill 797 (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act) during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan, the primary objectives of which are to verify the adequacy and reliability of existing and planned sources of water supply and to plan for the conservation and efficient use of water; and

WHEREAS, the San Antonio Water Company (Water Company) supplies domestic and irrigation shareholders;

WHEREAS, the Water Company provides 10% of its supply to domestic shareholders in the San Antonio Heights; 7% to shareholders outside of San Antonio Heights for irrigation, agricultural and industrial purposes; and 80% to Municipal water districts at wholesale. Inactive shareholders represent approximately 3%;

WHEREAS, the 2020 Urban Water Management Plan (UWMP) identifies the Water Company as a wholesaler; and

WHEREAS, the Board recognizes that this document is a useful planning document that will be periodically reviewed at least once every five years in conjunction with the update of the Water Master Plan and shall make amendments or changes to its plan indicated by the review; and

WHEREAS, the plan must be adopted after public review and hearing, and filed with the California State Library and the California Department of Water Resources within thirty days of adoption; and

WHEREAS, the Water Company has therefore, prepared and circulated for public review a draft of the UWMP, and a properly noticed public hearing regarding said Plan was held by the Board of Directors of the Water Company on September 21, 2021.

WHEREAS, SAWCo did prepare and shall file said Plan with the California State Library and the California Department of Water Resources; and

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of the San Antonio Water Company that the 2020 Urban Water management Plan is hereby adopted and the General Manager is hereby authorized and directed to file the 2020 Urban Water Management Plan with the California State Library and the California Department of Water Resources within 30 days of this date.

This Resolution was passed and adopted on the 21st day of September 2021.

Tom Thomas

Tom Thomas, President
San Antonio Water Company

Attest:

Martha Goss

Martha Goss, Secretary
San Antonio Water Company

RESOLUTION No. 2021-10-01
A RESOLUTION OF THE BOARD OF DIRECTORS OF THE
SAN ANTONIO WATER COMPANY ADOPTING THE 2020 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the California Legislature enacted Assembly bill 797 (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act)during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan including a Water Shortage Contingency Plan (WSCP); and

WHEREAS, the San Antonio Water Company (Water Company) supplies domestic and irrigation shareholders;

WHEREAS, the Water Company provides 10% of its supply to domestic shareholders in the San Antonio Heights; 7% to shareholders outside of San Antonio Heights for irrigation, agricultural and industrial purposes; and 80% to Municipal water districts at wholesale. Inactive shareholders represent approximately 3%;

WHEREAS, the Board recognizes that a Water Shortage Contingency Plan is a useful planning document that will be periodically reviewed at least once every five years in conjunction with the update of the Urban Water Management Plan and shall make amendments or changes to its plan indicated by the review; and

WHEREAS, the plan must be adopted after public review and hearing, and filed with the California State Library and the California Department of Water Resources within thirty days of adoption; and

WHEREAS, the Water Company has therefore, prepared and circulated for public review a draft of the Water Shortage Contingency Plan, and a properly noticed public hearing regarding said Plan was held by the Board of Directors of the Water Company on September 21, 2021.

WHEREAS, SAWCO did prepare and shall file said Plan with the California State Library and the California Department of Water Resources; and

NOW THEREFORE, BE IT RESOLVED by the Board of Directors of the San Antonio Water Company that the 2020 Water Shortage Contingency Plan is hereby adopted and the General Manager is hereby authorized and directed to file the 2020 Urban Water Management Plan, including the Water Shortage Contingency Plan with the California State Library and the California Department of Water Resources within 30 days of this date.

This Resolution was passed and adopted on the 19th day of October, 2021.

Tom Thomas

Tom Thomas, President
San Antonio Water Company

Attest:

Martha Goss

Martha Goss, Secretary
San Antonio Water Company

# D

# Appendix D. 1978 Chino Basin Judgment

DONALD D. STARK
A Professional Corporation
Suite 201 Airport Plaza
2061 Business Center Drive
Irvine, California 92715
Telephone: (714) 752-8971

CLAYSON, ROTHROCK & MANN
601 South Main Street
Corona, California 91720
Telephone: (714) 737-1910

Attorneys for Plaintiff

FILED
'78 JAN 30 AM 11 41

FILED - West District
San Bernardino County Clerk
OCT 25 1989

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

MICROFILMED

| | |
|---|---|
| CHINO BASIN MUNICIPAL WATER DISTRICT,<br><br>Plaintiff,<br><br>v.<br><br>CITY OF CHINO, et al.<br><br>Defendants. | No. 164327 |

JUDGMENT

LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971
Routing ..... Date ..... Appeal Date ..... Exhibits ..... Supervisor ..... Asst. Co. Clerk ..... Secretary ..... Other ..... Index .....

JUDGMENT

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LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971

LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971

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(714) 752-8971

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(714) 752-8971

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DONALD D. STARK
A Professional Corporation
Suite 201 Airport Plaza
2061 Business Center Drive
Irvine, California 92715
Telephone: (714) 752-8971

CLAYSON, ROTHROCK & MANN
601 South Main Street
Corona, California 91720
Telephone: (714) 737-1910

Attorneys for Plaintiff

LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

| | |
|---|---|
| CHINO BASIN MUNICIPAL WATER DISTRICT,<br>Plaintiff,<br>v.<br>CITY OF CHINO, et al.<br>Defendants. | No. 164327<br>JUDGMENT |

## I. INTRODUCTION

1. Pleadings, Parties and Jurisdiction. The complaint herein was filed on January 2, 1975, seeking an adjudication of water rights, injunctive relief and the imposition of a physical solution. A first amended complaint was filed on July 16, 1976. The defaults of certain defendants have been entered, and certain other defendants dismissed. Other than defendants who have been dismissed or whose defaults have been entered, all defendants have appeared herein. By answers and order of this Court, the issues have been made those of a full inter se adjudication between the

parties. This Court has jurisdiction of the subject matter of this action and of the parties herein.

2. Stipulation For Judgment. Stipulation for entry of judgment has been filed by and on behalf of a majority of the parties, representing a majority of the quantitative rights herein adjudicated.

3. Trial; Findings and Conclusions. Trial was commenced on December 16, 1977, as to the non-stipulating parties, and findings of fact and conclusions of law have been entered disposing of the issues in the case.

4. Definitions. As used in this Judgment, the following terms shall have the meanings herein set forth:

(a) Active Parties. All parties other than those who have filed with Watermaster a written waiver of service of notices, pursuant to Paragraph 58.

(b) Annual or Year -- A fiscal year, July 1 through June 30, following, unless the context shall clearly indicate a contrary meaning.

(c) Appropriative Right -- The annual production right of a producer from the Chino Basin other than pursuant to an overlying right.

(d) Basin Water -- Ground water within Chino Basin which is part of the Safe Yield, Operating Safe Yield, or replenishment water in the Basin as a result of operations under the Physical Solution decreed herein. Said term does not include Stored Water.

(e) CBMWD -- Plaintiff Chino Basin Municipal Water District.

LAW OFFICES
DONALD D. STARK
A PROFESSIONAL CORPORATION
SUITE 201
2061 BUSINESS CENTER DRIVE
IRVINE, CALIFORNIA 92715
(714) 752-8971

(f) Chino Basin or Basin -- The ground water basin underlying the area shown as such on Exhibit "B" and within the boundaries described in Exhibit "K".

(g) Chino Basin Watershed -- The surface drainage area tributary to and overlying Chino Basin.

(h) Ground Water -- Water beneath the surface of the ground and within the zone of saturation, i.e., below the existing water table.

(i) Ground Water Basin -- An area underlain by one or more permeable formations capable of furnishing substantial water storage.

(j) Minimal Producer -- Any producer whose production does not exceed five acre-feet per year.

(k) MWD -- The Metropolitan Water District of Southern California.

(l) Operating Safe Yield -- The annual amount of ground water which Watermaster shall determine, pursuant to criteria specified in Exhibit "I", can be produced from Chino Basin by the Appropriative Pool parties free of replenishment obligation under the Physical Solution herein.

(m) Overdraft -- A condition wherein the total annual production from the Basin exceeds the Safe Yield thereof.

(n) Overlying Right -- The appurtenant right of an owner of lands overlying Chino Basin to produce water from the Basin for overlying beneficial use on such lands.

(o) Person. Any individual, partnership, association, corporation, governmental entity or agency, or other organization.

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(p) PVMWD -- Defendant Pomona Valley Municipal Water District.

(q) Produce or Produced -- To pump or extract ground water from Chino Basin.

(r) Producer -- Any person who produces water from Chino Basin.

(s) Production -- Annual quantity, stated in acre feet, of water produced.

(t) Public Hearing -- A hearing after notice to all parties and to any other person legally entitled to notice.

(u) Reclaimed Water -- Water which, as a result of processing of waste water, is suitable for a controlled use.

(v) Replenishment Water -- Supplemental water used to recharge the Basin pursuant to the Physical Solution, either directly by percolating the water into the Basin or indirectly by delivering the water for use in lieu of production and use of safe yield or Operating Safe Yield.

(w) Responsible Party -- The owner, co-owner, lessee or other person designated by multiple parties interested in a well as the person responsible for purposes of filing reports hereunder.

(x) Safe Yield -- The long-term average annual quantity of ground water (excluding replenishment or stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Basin under cultural conditions of a particular year without causing an undesirable result.

(y) SBVMWD -- San Bernardino Valley Municipal Water

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District.

(z) State Water -- Supplemental Water imported through the State Water Resources Development System, pursuant to Chapter 8, Division 6, Part 6 of the Water Code.

(aa) Stored Water -- Supplemental water held in storage, as a result of direct spreading, in lieu delivery, or otherwise, for subsequent withdrawal and use pursuant to agreement with Watermaster.

(bb) Supplemental Water -- Includes both water imported to Chino Basin from outside Chino Basin Watershed, and reclaimed water.

(cc) WMWD -- Defendant Western Municipal Water District of Riverside County.

5. List of Exhibits. The following exhibits are attached to this Judgment and made a part hereof:

"A" -- "Location Map of Chino Basin" showing boundaries of Chino Basin Municipal Water District, and other geographic and political features.

"B" -- "Hydrologic Map of Chino Basin" showing hydrologic features of Chino Basin.

"C" -- Table Showing Parties in Overlying (Agricultural) Pool.

"D" -- Table Showing Parties in Overlying (Non-agricultural Pool and Their Rights.

"E" -- Table Showing Appropriators and Their Rights.

"F" -- Overlying (Agricultural) Pool Pooling Plan.

"G" -- Overlying (Non-agricultural) Pool Pooling Plan.

"H" -- Appropriative Pool Pooling Plan.

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"I" -- Engineering Appendix.

"J" -- Map of In Lieu Area No. 1.

"K" -- Legal Description of Chino Basin.

## II. DECLARATION OF RIGHTS

### A. HYDROLOGY

6. Safe Yield. The Safe Yield of Chino Basin is 140,000 acre feet per year.

7. Overdraft and Prescriptive Circumstances. In each year for a period in excess of five years prior to filing of the First Amended Complaint herein, the Safe Yield of the Basin has been exceeded by the annual production therefrom, and Chino Basin is and has been for more than five years in a continuous state of overdraft. The production constituting said overdraft has been open, notorious, continuous, adverse, hostile and under claim of right. The circumstances of said overdraft have given notice to all parties of the adverse nature of such aggregate over-production.

### B. WATER RIGHTS IN SAFE YIELD

8. Overlying Rights. The parties listed in Exhibits "C" and "D" are the owners or in possession of lands which overlie Chino Basin. As such, said parties have exercised overlying water rights in Chino Basin. All overlying rights owned or exercised by parties listed in Exhibits "C" and "D" have, in the aggregate, been limited by prescription except to the extent such rights have been preserved by self-help by said parties. Aggregate preserved overlying rights in the Safe Yield for agricultural pool use, including the rights of the State of California, total 82,800 acre feet per year. Overlying rights for non-agricultural pool use

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total 7,366 acre feet per year and are individually decreed for each affected party in Exhibit "D". No portion of the Safe Yield of Chino Basin exists to satisfy unexercised overlying rights, and such rights have all been lost by prescription. However, uses may be made of Basin Water on overlying lands which have no preserved overlying rights pursuant to the Physical Solution herein. All overlying rights are appurtenant to the land and cannot be assigned or conveyed separate or apart therefrom.

9. Appropriative Rights. The parties listed in Exhibit "E" are the owners of appropriative rights, including rights by prescription, in the unadjusted amounts therein set forth, and by reason thereof are entitled under the Physical Solution to share in the remaining Safe Yield, after satisfaction of overlying rights and rights of the State of California, and in the Operating Safe Yield in Chino Basin, in the annual shares set forth in Exhibit "E".

(a) Loss of Priorities. By reason of the long continued overdraft in Chino Basin, and in light of the complexity of determining appropriative priorities and the need for conserving and making maximum beneficial use of the water resources of the State, each and all of the parties listed in Exhibit "E" are estopped and barred from asserting special priorities or preferences, inter se. All of said appropriative rights are accordingly deemed and considered of equal priority.

(b) Nature and Quantity. All rights listed in Exhibit "E" are appropriative and prescriptive in nature. By reason of the status of the parties, and the provisions of Section

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1007 of the Civil Code, said rights are immune from reduction or limitation by prescription.

10. Rights of the State of California. The State of California, by and through its Department of Corrections, Youth Authority and Department of Fish and Game, is a significant producer of ground water from and the State is the largest owner of land overlying Chino Basin. The precise nature and scope of the claims and rights of the State need not be, and are not, defined herein. The State, through said departments, has accepted the Physical Solution herein decreed, in the interests of implementing the mandate of Section 2 of Article X of the California Constitution. For all purposes of this Judgment, all future production by the State or its departments or agencies for overlying use on State-owned lands shall be considered as agricultural pool use.

C. RIGHTS TO AVAILABLE GROUND WATER STORAGE CAPACITY

11. Available Ground Water Storage Capacity. There exists in Chino Basin a substantial amount of available ground water storage capacity which is not utilized for storage or regulation of Basin Waters. Said reservoir capacity can appropriately be utilized for storage and conjunctive use of supplemental water with Basin Waters. It is essential that said reservoir capacity utilization for storage and conjunctive use of supplemental water be undertaken only under Watermaster control and regulation, in order to protect the integrity of both such Stored Water and Basin Water in storage and the Safe Yield of Chino Basin.

12. Utilization of Available Ground Water Capacity. Any person or public entity, whether a party to this action or not, may make reasonable beneficial use of the available ground water

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storage capacity of Chino Basin for storage of supplemental water; provided that no such use shall be made except pursuant to written agreement with Watermaster, as authorized by Paragraph 28. In the allocation of such storage capacity, the needs and requirements of lands overlying Chino Basin and the owners of rights in the Safe Yield or Operating Safe Yield of the Basin shall have priority and preference over storage for export.

## III. INJUNCTION

13. Injunction Against Unauthorized Production of Basin Water. Each party in each of the respective pools is enjoined, as follows:

(a) Overlying (Agricultural) Pool. Each party in the Overlying (Agricultural) Pool, its officers, agents, employees, successors and assigns, is and they each are ENJOINED AND RESTRAINED from producing ground water from Chino Basin in any year hereafter in excess of such party's correlative share of the aggregate of 82,800 acre feet allocated to said Pool, except pursuant to the Physical Solution or a storage water agreement.

(b) Overlying (Non-Agricultural) Pool. Each party in the Overlying (Non-agricultural) Pool, its officers, agents, employees, successors and assigns, is and they each are ENJOINED AND RESTRAINED from producing ground water of Chino Basin in any year hereafter in excess of such party's decreed rights in the Safe Yield, except pursuant to the provisions of the Physical Solution or a storage water agreement.

(c) Appropriative Pool. Each party in the

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Appropriative Pool, its officers, agents, employees, successors and assigns, is and they are each ENJOINED AND RESTRAINED from producing ground water of Chino Basin in any year hereafter in excess of such party's decreed share of Operating Safe Yield, except pursuant to the provisions of the Physical Solution or a storage water agreement.

14. Injunction Against Unauthorized Storage or Withdrawal of Stored Water. Each party, its officers, agents, employees, successors and assigns is and they each are ENJOINED AND RESTRAINED from storing supplemental water in Chino Basin for withdrawal, or causing withdrawal of, water stored by that party, except pursuant to the terms of a written agreement with Watermaster and in accordance with Watermaster regulations. Any supplemental water stored or recharged in the Basin, except pursuant to such a Watermaster agreement, shall be deemed abandoned and not classified as Stored Water. This paragraph has no application, as such, to supplemental water spread or provided in lieu by Watermaster pursuant to the Physical Solution.

## IV. CONTINUING JURISDICTION

15. Continuing Jurisdiction. Full jurisdiction, power and authority are retained and reserved to the Court as to all matters contained in this judgment, except:

(a) The redetermination of Safe Yield, as set forth in Paragraph 6, during the first ten (10) years of operation of the Physical Solution;

(b) The allocation of Safe Yield as between the several pools as set forth in Paragraph 44 of the Physical Solution;

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(c) The determination of specific quantitative rights and shares in the declared Safe Yield or Operating Safe Yield herein declared in Exhibits "D" and "E"; and

(d) The amendment or modification of Paragraphs 7(a) and (b) of Exhibit "H", during the first ten (10) years of operation of the Physical Solution, and thereafter only upon affirmative recommendation of at least 67% of the voting power (determined pursuant to the formula described in Paragraph 3 of Exhibit "H"), but not less than one-third of the members of the Appropriative Pool Committee representatives of parties who produce water within CBMWD or WMWD; after said tenth year the formula set forth in said Paragraph 7(a) and 7(b) of Exhibit "H" for payment of the costs of replenishment water may be changed to 100% gross or net, or any percentage split thereof, but only in response to recommendation to the Court by affirmative vote of at least 67% of said voting power of the Appropriative Pool representatives of parties who produce ground water within CBMWD or WMWD, but not less than one-third of their number. In such event, the Court shall act in conformance with such recommendation unless there are compelling reasons to the contrary; and provided, further, that the fact that the allocation of Safe Yield or Operating Safe Yield shares may be rendered moot by a recommended change in the formula for replenishment assessments shall not be deemed to be such a "compelling reason."

Said continuing jurisdiction is provided for the purpose of enabling the Court, upon application of any party, the Watermaster, the Advisory Committee or any Pool Committee, by motion and, upon

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at least 30 days' notice thereof, and after hearing thereon, to make such further or supplemental orders or directions as may be necessary or appropriate for interpretation, enforcement or carrying out of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment.

## V. WATERMASTER

### A. APPOINTMENT

16. Watermaster Appointment. CBMWD, acting by and through a majority of its board of directors, is hereby appointed Watermaster, to administer and enforce the provisions of this Judgment and any subsequent instructions or orders of the Court hereunder. The term of appointment of Watermaster shall be for five (5) years. The Court will by subsequent orders provide for successive terms or for a successor Watermaster. Watermaster may be changed at any time by subsequent order of the Court, on its own motion, or on the motion of any party after notice and hearing. Unless there are compelling reasons to the contrary, the Court shall act in conformance with a motion requesting the Watermaster be changed if such motion is supported by a majority of the voting power of the Advisory Committee.

### B. POWERS AND DUTIES

17. Powers and Duties. Subject to the continuing supervision and control of the Court, Watermaster shall have and may exercise the express powers, and shall perform the duties, as provided in this Judgment or hereafter ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction.

18. Rules and Regulations. Upon recommendation by the

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Advisory Committee, Watermaster shall make and adopt, after public hearing, appropriate rules and regulations for conduct of Watermaster affairs, including meeting schedules and procedures, and compensation of members of Watermaster at not to exceed $25 per member per meeting, or $300 per member per year, whichever is less, plus reasonable expenses related to activities within the Basin. Thereafter, Watermaster may amend said rules from time to time upon recommendation, or with approval of the Advisory Committee after hearing noticed to all active parties. A copy of said rules and regulations, and of any amendments thereof, shall be mailed to each active party.

19. Acquisition of Facilities. Watermaster may purchase, lease, acquire and hold all necessary facilities and equipment; provided, that it is not the intent of the Court that Watermaster acquire any interest in real property or substantial capital assets.

20. Employment of Experts and Agents. Watermaster may employ or retain such administrative, engineering, geologic, accounting, legal or other specialized personnel and consultants as may be deemed appropriate in the carrying out of its powers and shall require appropriate bonds from all officers and employees handling Watermaster funds. Watermaster shall maintain records for purposes of allocation of costs of such services as well as of all other expenses of Watermaster administration as between the several pools established by the Physical Solution.

21. Measuring Devices. Watermaster shall cause parties, pursuant to uniform rules, to install and maintain in good operating condition, at the cost of each party, such necessary measuring

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devices or meters as Watermaster may deem appropriate. Such measuring devices shall be inspected and tested as deemed necessary by Watermaster, and the cost thereof shall constitute an expense of Watermaster.

22. Assessments. Watermaster is empowered to levy and collect all assessments provided for in the pooling plans and Physical Solution.

23. Investment of Funds. Watermaster may hold and invest any and all Watermaster funds in investments authorized from time to time for public agencies of the State of California.

24. Borrowing. Watermaster may borrow from time to time amounts not exceeding the annual anticipated receipts of Watermaster during such year.

25. Contracts. Watermaster may enter into contracts for the performance of any powers herein granted; provided, however, that Watermaster may not contract with or purchase materials, supplies or services from CBMWD, except upon the prior recommendation and approval of the Advisory Committee and pursuant to written order of the Court.

26. Cooperation With Other Agencies. Subject to prior recommendation or approval of the Advisory Committee, Watermaster may act jointly or cooperate with agencies of the United States and the State of California or any political subdivisions, municipalities or districts or any person to the end that the purpose of the Physical Solution may be fully and economically carried out.

27. Studies. Watermaster may, with concurrence of the Advisory Committee or affected Pool Committee and in accordance with Paragraph 54(b), undertake relevant studies of hydrologic

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conditions, both quantitative and qualitative, and operating aspects of implementation of the management program for Chino Basin.

28. Ground Water Storage Agreements. Watermaster shall adopt, with the approval of the Advisory Committee, uniformly applicable rules and a standard form of agreement for storage of supplemental water, pursuant to criteria therefor set forth in Exhibit "I". Upon appropriate application by any person, Watermaster shall enter into such a storage agreement; provided that all such storage agreements shall first be approved by written order of the Court, and shall by their terms preclude operations which will have a substantial adverse impact on other producers.

29. Accounting for Stored Water. Watermaster shall calculate additions, extractions and losses and maintain an annual account of all Stored Water in Chino Basin, and any losses of water supplies or Safe Yield of Chino Basin resulting from such Stored Water.

30. Annual Administrative Budget. Watermaster shall submit to Advisory Committee an administrative budget and recommendation for each fiscal year on or before March 1. The Advisory Committee shall review and submit said budget and their recommendations to Watermaster on or before April 1, following. Watermaster shall hold a public hearing on said budget at its April quarterly meeting and adopt the annual administrative budget which shall include the administrative items for each pool committee. The administrative budget shall set forth budgeted items in sufficient detail as necessary to make a proper allocation of the expense among the several pools, together with Watermaster's proposed allocation. The budget shall contain such additional comparative information

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or explanation as the Advisory Committee may recommend from time to time. Expenditures within budgeted items may thereafter be made by Watermaster in the exercise of powers herein granted, as a matter of course. Any budget transfer in excess of 20% of a budget category during any budget year or modification of such administrative budget during any year shall be first submitted to the Advisory Committee for review and recommendation.

31. Review Procedures. All actions, decisions or rules of Watermaster shall be subject to review by the Court on its own motion or on timely motion by any party, the Watermaster (in the case of a mandated action), the Advisory Committee, or any Pool Committee, as follows:

(a) Effective Date of Watermaster Action. Any action, decision or rule of Watermaster shall be deemed to have occurred or been enacted on the date on which written notice thereof is mailed. Mailing of copies of approved Watermaster minutes to the active parties shall constitute such notice to all parties.

(b) Noticed Motion. Any party, the Watermaster (as to any mandated action), the Advisory Committee, or any Pool Committee may, by a regularly noticed motion, apply to the Court for review of any Watermaster's action, decision or rule. Notice of such motion shall be served personally or mailed to Watermaster and to all active parties. Unless otherwise ordered by the Court, such motion shall not operate to stay the effect of such Watermaster action, decision or rule.

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(c) Time for Motion. Notice of motion to review any Watermaster action, decision or rule shall be served and filed within ninety (90) days after such Watermaster action, decision or rule, except for budget actions, in which event said notice period shall be sixty (60) days.

(d) De Novo Nature of Proceedings. Upon the filing of any such motion, the Court shall require the moving party to notify the active parties, the Watermaster, the Advisory Committee and each Pool Committee, of a date for taking evidence and argument, and on the date so designated shall review de novo the question at issue. Watermaster's findings or decision, if any, may be received in evidence at said hearing, but shall not constitute presumptive or prima facie proof of any fact in issue.

(e) Decision. The decision of the Court in such proceeding shall be an appealable supplemental order in this case. When the same is final, it shall be binding upon the Watermaster and all parties.

C. ADVISORY AND POOL COMMITTEES

32. Authorization. Watermaster is authorized and directed to cause committees of producer representatives to be organized to act as Pool Committees for each of the several pools created under the Physical Solution. Said Pool Committees shall, in turn, jointly form an Advisory Committee to assist Watermaster in performance of its functions under this judgment. Pool Committees shall be composed as specified in the respective pooling plans, and the Advisory Committee shall be composed of not to exceed ten (10) voting representatives from each pool, as designated by the

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respective Pool Committee. WMWD, PVMWD and SBVMWD shall each be entitled to one non-voting representative on said Advisory Committee.

33. Term and Vacancies. Members of any Pool Committee, shall serve for the term, and vacancies shall be filled, as specified in the respective pooling plan. Members of the Advisory Committee shall serve at the will of their respective Pool Committee.

34. Voting Power. The voting power on each Pool Committee shall be allocated as provided in the respective pooling plan. The voting power on the Advisory Committee shall be one hundred (100) votes allocated among the three pools in proportion to the total assessments paid to Watermaster during the preceding year; provided, that the minimum voting power of each pool shall be

(a) Overlying (Agricultural) Pool 20,

(b) Overlying (Non-agricultural) Pool 5, and

(c) Appropriative Pool 20.

In the event any pool is reduced to its said minimum vote, the remaining votes shall be allocated between the remaining pools on said basis of assessments paid to Watermaster by each such remaining pool during the preceding year. The method of exercise of each pool's voting power on the Advisory Committee shall be as determined by the respective pool committees.

35. Quorum. A majority of the voting power of the Advisory Committee or any Pool Committee shall constitute a quorum for the transaction of affairs of such Advisory or Pool Committee; provided, that at least one representative of each Pool Committee shall be required to constitute a quorum of the Advisory Committee. No Pool Committee representative may purposely absent himself or

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herself, without good cause, from an Advisory Committee meeting to deprive it of a quorum. Action by affirmative vote of a majority of the entire voting power of any Pool Committee or the Advisory Committee shall constitute action by such committee. Any action or recommendation of a Pool Committee or the Advisory Committee shall be transmitted to Watermaster in writing, together with a report of any dissenting vote or opinion.

36. Compensation. Pool or Advisory Committee members may receive compensation, to be established by the respective pooling plan, but not to exceed twenty-five dollars ($25.00) for each meeting of such Pool or Advisory Committee attended, and provided that no member of a Pool or Advisory Committee shall receive compensation of more than three hundred ($300.00) dollars for service on any such committee during any one year. All such compensation shall be a part of Watermaster administrative expense. No member of any Pool or Advisory Committee shall be employed by Watermaster or compensated by Watermaster for professional or other services rendered to such Pool or Advisory Committee or to Watermaster, other than the fee for attendance at meetings herein provided, plus reimbursement of reasonable expenses related to activities within the Basin.

37. Organization.

(a) Organizational Meeting. At its first meeting in each year, each Pool Committee and the Advisory Committee shall elect a chairperson and a vice chairperson from its membership. It shall also select a secretary, a treasurer and such assistant secretaries and treasurers as may be appropriate, any of whom may, but need not, be members of

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such Pool or Advisory Committee.

(b) Regular Meetings. All Pool Committees and the Advisory Committee shall hold regular meetings at a place and time to be specified in the rules to be adopted by each Pool and Advisory Committee. Notice of regular meetings of any Pool or Advisory Committee, and of any change in time or place thereof, shall be mailed to all active parties in said pool or pools.

(c) Special Meetings. Special meetings of any Pool or Advisory Committee may be called at any time by the Chairperson or by any three (3) members of such Pool or Advisory Committee by delivering notice personally or by mail to each member of such Pool or Advisory Committee and to each active party at least 24 hours before the time of each such meeting in the case of personal delivery, and 96 hours in the case of mail. The calling notice shall specify the time and place of the special meeting and the business to be transacted. No other business shall be considered at such meeting.

(d) Minutes. Minutes of all Pool Committee, Advisory Committee and Watermaster meetings shall be kept at Watermaster's offices. Copies thereof shall be mailed or otherwise furnished to all active parties in the pool or pools concerned. Said copies of minutes shall constitute notice of any Pool or Advisory Committee action therein reported, and shall be available for inspection by any party.

(e) Adjournments. Any meeting of any Pool or Advisory Committee may be adjourned to a time and place specified in the order of adjournment. Less than a quorum may so adjourn

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from time to time. A copy of the order or notice of adjournment shall be conspicuously posted forthwith on or near the door of the place where the meeting was held.

38. Powers and Functions. The powers and functions of the respective Pool Committees and the Advisory Committee shall be as follows:

(a) Pool Committees. Each Pool Committee shall have the power and responsibility for developing policy recommendations for administration of its particular pool, as created under the Physical Solution. All actions and recommendations of any Pool Committee which require Watermaster implementation shall first be noticed to the other two pools. If no objection is received in writing within thirty (30) days, such action or recommendation shall be transmitted directly to Watermaster for action. If any such objection is received, such action or recommendation shall be reported to the Advisory Committee before being transmitted to Watermaster.

(b) Advisory Committee. The Advisory Committee shall have the duty to study, and the power to recommend, review and act upon all discretionary determinations made or to be made hereunder by Watermaster.

[1] Committee Initiative. When any recommendation or advice of the Advisory Committee is received by Watermaster, action consistent therewith may be taken by Watermaster; provided, that any recommendation approved by 80 votes or more in the Advisory Committee shall constitute a mandate for action by Watermaster consistent therewith. If Watermaster is unwilling or unable to act

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pursuant to recommendation or advice from the Advisory Committee (other than such mandatory recommendations), Watermaster shall hold a public hearing, which shall be followed by written findings and decision. Thereafter, Watermaster may act in accordance with said decision, whether consistent with or contrary to said Advisory Committee recommendation. Such action shall be subject to review by the Court, as in the case of all other Watermaster determinations.

[2] Committee Review. In the event Watermaster proposes to take any discretionary action, other than approval or disapproval of a Pool Committee action or recommendation properly transmitted, or execute any agreement not theretofore within the scope of an Advisory Committee recommendation, notice of such intended action shall be served on the Advisory Committee and its members at least thirty (30) days before the Watermaster meeting at which such action is finally authorized.

(c) Review of Watermaster Actions. Watermaster (as to mandated action), the Advisory Committee or any Pool Committee shall be entitled to employ counsel and expert assistance in the event Watermaster or such Pool or Advisory Committee seeks Court review of any Watermaster action or failure to act. The cost of such counsel and expert assistance shall be Watermaster expense to be allocated to the affected pool or pools.

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## VI. PHYSICAL SOLUTION

### A. GENERAL

39. Purpose and Objective. Pursuant to the mandate of Section 2 of Article X of the California Constitution, the Court hereby adopts and orders the parties to comply with a Physical Solution. The purpose of these provisions is to establish a legal and practical means for making the maximum reasonable beneficial use of the waters of Chino Basin by providing the optimum economic, long-term, conjunctive utilization of surface waters, ground waters and supplemental water, to meet the requirements of water users having rights in or dependent upon Chino Basin.

40. Need for Flexibility. It is essential that this Physical Solution provide maximum flexibility and adaptability in order that Watermaster and the Court may be free to use existing and future technological, social, institutional and economic options, in order to maximize beneficial use of the waters of Chino Basin. To that end, the Court's retained jurisdiction will be utilized, where appropriate, to supplement the discretion herein granted to the Wastermaster.

41. Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations. Withdrawals and supplemental water replenishment of Basin Water, and the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees composed of the affected producers. Both the

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quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized.

42. General Pattern of Operations. It is contemplated that the rights herein decreed will be divided into three (3) operating pools for purposes of Watermaster administration. A fundamental premise of the Physical Solution is that all water users dependent upon Chino Basin will be allowed to pump sufficient waters from the Basin to meet their requirements. To the extent that pumping exceeds the share of the Safe Yield assigned to the Overlying Pools, or the Operating Safe Yield in the case of the Appropriative Pool, each pool will provide funds to enable Watermaster to replace such overproduction. The method of assessment in each pool shall be as set forth in the applicable pooling plan.

B. POOLING

43. Multiple Pools Established. There are hereby established three (3) pools for Watermaster administration of, and for the allocation of responsibility for, and payment of, costs of replenishment water and other aspects of this Physical Solution.

(a) Overlying (Agricultural) Pool. The first pool shall consist of the State of California and all overlying producers who produce water for other than industrial or commercial purposes. The initial members of the pool are listed in Exhibit "C".

(b) Overlying (Non-agricultural) Pool. The second pool shall consist of overlying producers who produce water for industrial or commercial purposes. The initial members of this pool are listed in Exhibit "D".

(c) Appropriative Pool. A third and separate pool shall

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consist of owners of appropriative rights. The initial members of the pool are listed in Exhibit "E".

Any party who changes the character of his use may, by subsequent order of the Court, be reassigned to the proper pool; but the allocation of Safe Yield under Paragraph 44 hereof shall not be changed. Any non-party producer or any person who may hereafter commence production of water from Chino Basin, and who may become a party to this physical solution by intervention, shall be assigned to the proper pool by the order of the Court authorizing such intervention.

44. Determination and Allocation of Rights to Safe Yield of Chino Basin. The declared Safe Yield of Chino Basin is hereby allocated as follows:

| Pool | Allocation |
|---|---|
| Overlying (Agricultural) Pool | 414,000 acre feet in any five (5) consecutive years. |
| Overlying (Non-agricultural) Pool. | 7,366 acre feet per year. |
| Appropriative Pool | 49,834 acre feet per year. |

The foregoing acre foot allocations to the overlying pools are fixed. Any subsequent change in the Safe Yield shall be debited or credited to the Appropriative Pool. Basin Water available to the Appropriative Pool without replenishment obligation may vary from year to year as the Operating Safe Yield is determined by Watermaster pursuant to the criteria set forth in Exhibit "I".

45. Annual Replenishment. Watermaster shall levy and collect assessments in each year, pursuant to the respective pooling plans, in amounts sufficient to purchase replenishment water to replace production by any pool during the preceding year which exceeds that

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pool's allocated share of Safe Yield in the case of the overlying pools, or Operating Safe Yield in the case of the Appropriative Pool. It is anticipated that supplemental water for replenishment of Chino Basin may be available at different rates to the various pools to meet their replenishment obligations. If such is the case, each pool will be assessed only that amount necessary for the cost of replenishment water to that pool, at the rate available to the pool, to meet its replenishment obligation.

46. Initial Pooling Plans. The initial pooling plans, which are hereby adopted, are set forth in Exhibits "F", "G" and "H", respectively. Unless and until modified by amendment of the judgment pursuant to the Court's continuing jurisdiction, each such plan shall control operation of the subject pool.

C. REPORTS AND ACCOUNTING

47. Production Reports. Each party or responsible party shall file periodically with Watermaster, pursuant to Watermaster rules, a report on a form to be prescribed by Watermaster showing the total production of such party during the preceding reportage period, and such additional information as Watermaster may require, including any information specified by the affected Pool Committee.

48. Watermaster Reports and Accounting. Watermaster's annual report, which shall be filed on or before November 15 of each year and shall apply to the preceding year's operation, shall contain details as to operation of each of the pools and a certified audit of all assessments and expenditures pursuant to this Physical Solution and a review of Watermaster activities.

- - - - - - - - - - - - -

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D. REPLENISHMENT

49. Sources of Supplemental Water. Supplemental water may be obtained by Watermaster from any available source. Watermaster shall seek to obtain the best available quality of supplemental water at the most reasonable cost for recharge in the Basin. To the extent that costs of replenishment water may vary between pools, each pool shall be liable only for the costs attributable to its required replenishment. Available sources may include, but are not limited to:

(a) Reclaimed Water. There exist a series of agreements generally denominated the Regional Waste Water Agreements between CBMWD and owners of the major municipal sewer systems within the basin. Under those agreements, which are recognized hereby but shall be unaffected and unimpaired by this judgment, substantial quantities of reclaimed water may be made available for replenishment purposes. There are additional sources of reclaimed water which are, or may become, available to Watermaster for said purposes. Maximum beneficial use of reclaimed water shall be given high priority by Watermaster.

(b) State Water. State water constitutes a major available supply of supplemental water. In the case of State Water, Watermaster purchases shall comply with the water service provisions of the State's water service contracts. More specifically, Watermaster shall purchase State Water from MWD for replenishment of excess production within CBMWD, WMWD and PVMWD, and from SBVMWD to replenish excess production within SBVMWD's boundaries in Chino Basin, except to the

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extent that MWD and SBVMWD give their consent as required by such State water service contracts.

(c) Local Import. There exist facilities and methods for importation of surface and ground water supplies from adjacent basins and watersheds.

(d) Colorado River Supplies. MWD has water supplies available from its Colorado River Aqueduct.

50. Methods of Replenishment. Watermaster may accomplish replenishment of overproduction from the Basin by any reasonable method, including:

(a) Spreading and percolation or Injection of water in existing or new facilities, subject to the provisions of Paragraphs 19, 25 and 26 hereof.

(b) In Lieu Procedures. Watermaster may make, or cause to be made, deliveries of water for direct surface use, in lieu of ground water production.

E. REVENUES

51. Production Assessment. Production assessments, on whatever basis, may be levied by Watermaster pursuant to the pooling plan adopted for the applicable pool.

52. Minimal Producers. Minimal Producers shall be exempted from payment of production assessments, upon filing of production reports as provided in Paragraph 47 of this Judgment, and payment of an annual five dollar ($5.00) administrative fee as specified by Watermaster rules.

53. Assessment Proceeds -- Purposes. Watermaster shall have the power to levy assessments against the parties (other than minimal pumpers) based upon production during the preceding period

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of assessable production, whether quarterly, semi-annually or annually, as may be determined most practical by Watermaster or the affected Pool Committee.

54. Administrative Expenses. The expenses of administration of this Physical Solution shall be categorized as either (a) general Watermaster administrative expense, or (b) special project expense.

(a) General Watermaster Administrative Expense shall include office rental, general personnel expense, supplies and office equipment, and related incidental expense and general overhead.

(b) Special Project Expense shall consist of special engineering, economic or other studies, litigation expense, meter testing or other major operating expenses. Each such project shall be assigned a Task Order number and shall be separately budgeted and accounted for.

General Watermaster administrative expense shall be allocated and assessed against the respective pools based upon allocations made by the Watermaster, who shall make such allocations based upon generally accepted cost accounting methods. Special Project Expense shall be allocated to a specific pool, or any portion thereof, only upon the basis of prior express assent and finding of benefit by the Pool Committee, or pursuant to written order of the Court.

55. Assessments -- Procedure. Assessments herein provided for shall be levied and collected as follows:

(a) Notice of Assessment. Watermaster shall give written notice of all applicable assessments to each party on

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or before ninety (90) days after the end of the production period to which such assessment is applicable.

(b) Payment. Each assessment shall be payable on or before thirty (30) days after notice, and shall be the obligation of the party or successor owning the water production facility at the time written notice of assessment is given, unless prior arrangement for payment by others has been made in writing and filed with Watermaster.

(c) Delinquency. Any delinquent assessment shall bear interest at 10% per annum (or such greater rate as shall equal the average current cost of borrowed funds to the Watermaster) from the due date thereof. Such delinquent assessment and interest may be collected in a show-cause proceeding herein instituted by the Watermaster, in which case the Court may allow Watermaster its reasonable costs of collection, including attorney's fees.

56. Accumulation of Replenishment Water Assessment Proceeds. In order to minimize fluctuation in assessment and to give Watermaster flexibility in purchase and spreading of replenishment water, Watermaster may make reasonable accumulations of replenishment water assessment proceeds. Interest earned on such retained funds shall be added to the account of the pool from which the funds were collected and shall be applied only to the purchase of replenishment water.

57. Effective Date. The effective date for accounting and operation under this Physical Solution shall be July 1, 1977, and the first production assessments hereunder shall be due after July 1, 1978. Watermaster shall, however, require installation of

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meters or measuring devices and establish operating procedures immediately, and the costs of such Watermaster activity (not including the cost of such meters and measuring devices) may be recovered in the first administrative assessment in 1978.

## VII. MISCELLANEOUS PROVISIONS

58. Designation of Address for Notice and Service. Each party shall designate the name and address to be used for purposes of all subsequent notices and service herein, either by its endorsement on the Stipulation for Judgment or by a separate designation to be filed within thirty (30) days after Judgment has been served. Said designation may be changed from time to time by filing a written notice of such change with the Watermaster. Any party desiring to be relieved of receiving notices of Watermaster or committee activity may file a waiver of notice on a form to be provided by Watermaster. Thereafter such party shall be removed from the Active Party list. Watermaster shall maintain at all times a current list of active parties and their addresses for purposes of service. Watermaster shall also maintain a full current list of names and addresses of all parties or their successors, as filed herein. Copies of such lists shall be available, without cost, to any party, the Advisory Committee or any Pool Committee upon written request therefor.

59. Service of Documents. Delivery to or service upon any party or active party by the Watermaster, by any other party, or by the Court, of any item required to be served upon or delivered to such party or active party under or pursuant to the Judgment shall be made personally or by deposit in the United States mail, first

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class, postage prepaid, addressed to the designee and at the address in the latest designation filed by such party or active party.

60. Intervention After Judgment. Any non-party assignee of the adjudicated appropriative rights of any appropriator, or any other person newly proposing to produce water from Chino Basin, may become a party to this judgment upon filing a petition in intervention. Said intervention must be confirmed by order of this Court. Such intervenor shall thereafter be a party bound by this judgment and entitled to the rights and privileges accorded under the Physical Solution herein, through the pool to which the Court shall assign such intervenor.

61. Loss of Rights. Loss, whether by abandonment, forfeiture or otherwise, of any right herein adjudicated shall be accomplished only (1) by a written election by the owner of the right filed with Watermaster, or (2) by order of the Court upon noticed motion and after hearing.

62. Scope of Judgment. Nothing in this Judgment shall be deemed to preclude or limit any party in the assertion against a neighboring party of any cause of action now existing or hereafter arising based upon injury, damage or depletion of water supply available to such party, proximately caused by nearby pumping which constitutes an unreasonable interference with such complaining party's ability to extract ground water.

63. Judgment Binding on Successors. This Judgment and all provisions thereof are applicable to and binding upon not only the parties to this action, but also upon their respective heirs, executors, administrators, successors, assigns, lessees and

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licensees and upon the agents, employees and attorneys in fact of all such persons.

64. Costs. No party shall recover any costs in this proceeding from any other party.

Dated: JAN 27 1978.

Judge

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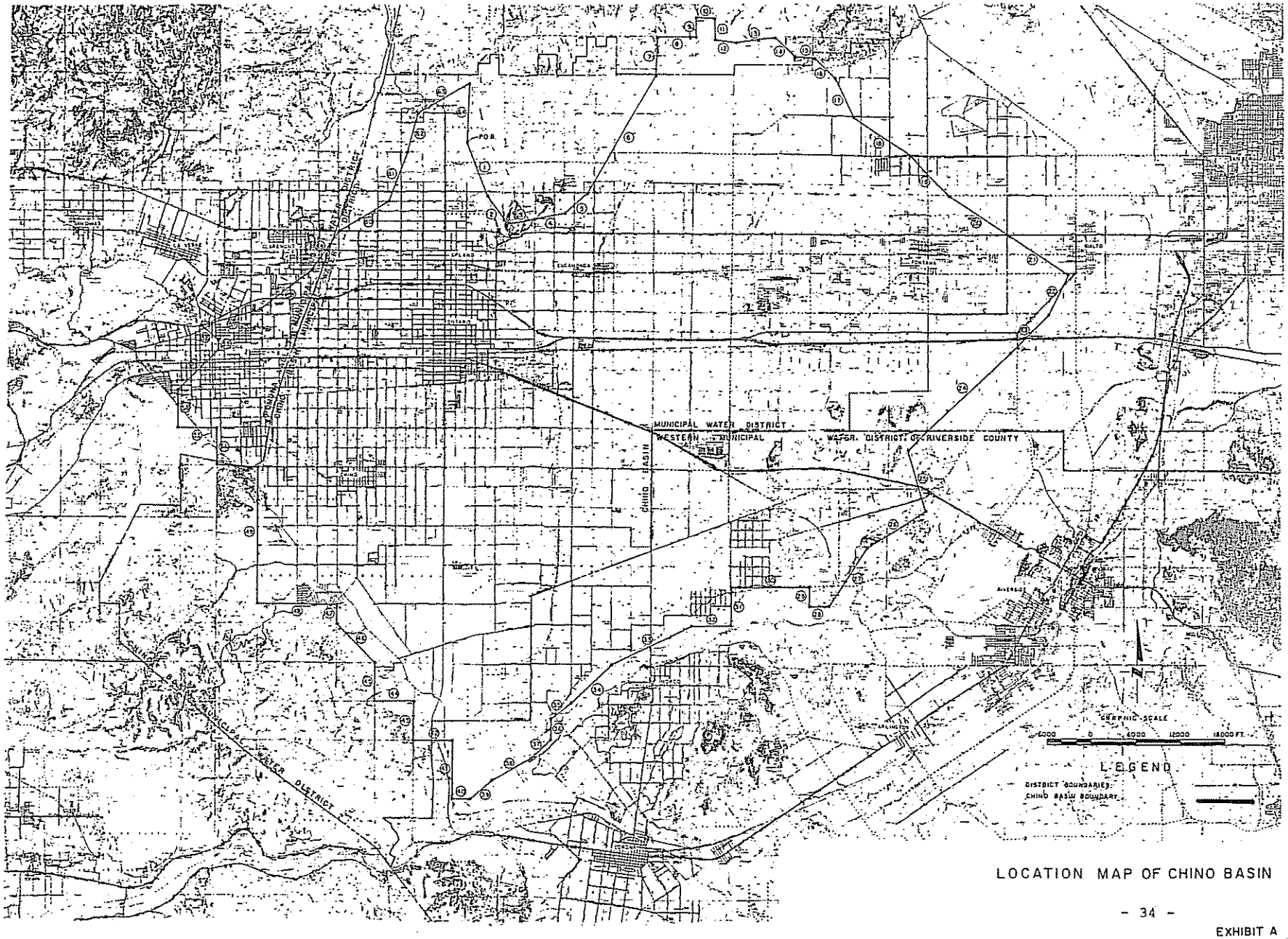


LOCATION MAP OF CHINO BASIN



EXHIBIT A

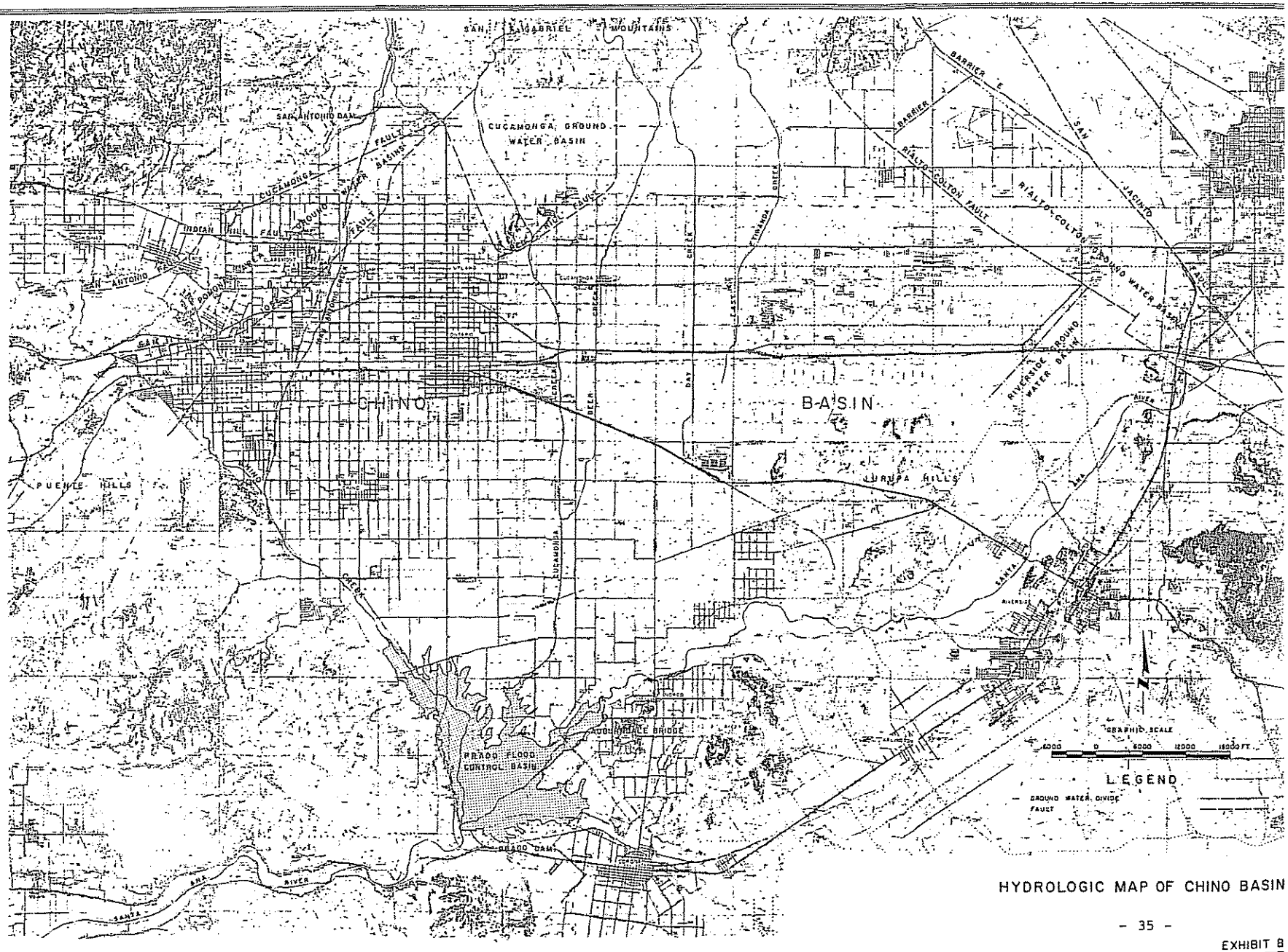


HYDROLOGIC MAP OF CHINO BASIN



EXHIBIT B

STIPULATING OVERLYING AGRICULTURAL PRODUCERS

STATE OF CALIFORNIA
COUNTY OF SAN BERNARDINO
Abacherli Dairy, Inc.
Abacherli, Frank
Abacherli, Shirley
Abbona, Anna
Abbona, James
Abbona, Jim
Abbona, Mary
Agliani, Amelia H.
Agman, Inc.
Aguerre, Louis B.
Ahmanson Trust Co.
Akiyama, Shizuye
Akiyama, Tomoo
Akkerman, Dave
Albers, J. N.
Albers, Nellie
Alewyn, Jake J.
Alewyn, Normalee
Alger, Mary D.
Alger, Raymond
Allen, Ben F.
Allen, Jane F.
Alta-Dena Dairy
Anderson Farms
Anguiano, Sarah L. S.
Anker, Gus
Aphessetche, Xavier
Arena Mutual Water Assn.
Armstrong Nurseries, Inc.
Arretche, Frank
Arretche, Jean Pierre
Arvidson, Clarence F.
Arvidson, Florence
Ashley, George W.
Ashley, Pearl E.
Atlas Farms
Atlas Ornamental Iron Works, Inc.
Aukeman, Carol
Aukeman, Lewis
Ayers, Kenneth C., aka Kelley Ayers
Bachoc, Raymond
Baldwin, Edgar A.
Baldwin, Lester
Banbury, Carolyn
Bangma Dairy
Bangma, Arthur
Bangma, Ida
Bangma, Martin
Bangma, Sam
Barba, Anthony B.
Barba, Frank
Barcellos, Joseph
Barnhill, Maurine W.

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| | | |
|---|---|---|
| 1 | Barnhill, Paul | Boersma, Angie |
| 2 | Bartel, Dale | Boersma, Berdina |
| 3 | Bartel, Ursula | Boersma, Frank |
| 4 | Bartel, Willard | Boersma, Harry |
| 5 | Barthelemy, Henry | Boersma, Paul |
| 6 | Barthelemy, Roland | Boersma, Sam |
| 7 | Bassler, Donald V., M.D. | Boersma, William L. |
| 8 | Bates, Lowell R. | Bohlander & Holmes, Inc. |
| 9 | Bates, Mildred L. | Bokma, Peter |
| 10 | Beahm, James W. | Bollema, Jacob |
| 11 | Beahm, Joan M. | Boonstoo, Edward |
| 12 | Bekendam, Hank | Bootsma, Jim |
| 13 | Bekendam, Pete | Borba, Dolene |
| 14 | Bello, Eugene | Borba, Dolores |
| 15 | Bello, Olga | Borba, Emily |
| 16 | Beltman, Evelyn | Borba, George |
| 17 | Beltman, Tony | Borba, John |
| 18 | Bergquist Properties, Inc. | Borba, John & Sons |
| 19 | Bevacqua, Joel A. | Borba, John Jr. |
| 20 | Bevacqua, Marie B. | Borba, Joseph A. |
| 21 | Bidart, Bernard | Borba, Karen E. |
| 22 | Bidart, Michael J. | Borba, Karen M. |
| 23 | Binnell, Wesley | Borba, Pete, Estate of |
| 24 | Black, Patricia E. | Borba, Ricci |
| 25 | Black, Victor | Borba, Steve |
| 26 | Bodger, John & Sons Co. | Borba, Tom |
| 27 | Boer, Adrian | Bordisso, Alleck |
| 28 | Boersma and Wind Dairy | Borges, Angelica M. |

EXHIBIT "C"

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Borges, Bernadette
Borges, John O.
Borges, Linda L.
Borges, Manual Jr.
Borges, Tony
Bos, Aleid
Bos, Gerrit
Bos, John
Bos, John
Bos, Margaret
Bos, Mary
Bos, Mary Beth
Bos, Tony
Bosch, Henrietta
Bosch, Peter T.
Boschma, Betty
Boschma, Frank
Boschma, Greta
Boschma, Henry
Bosma, Dick
Bosma, Florence G.
Bosma, Gerrit
Bosma, Jacob J.
Bosma, Jeanette Thea
Bosman, Frank
Bosman, Nellie
Bosnyak, Goldie M.
Bosnyak, Martin
Bothof, Roger W.
Bouma, Cornie
Bouma, Emma
Bouma, Henry P.
Bouma, Martin
Bouma, Peter G. & Sons Dairy
Bouma, Ted
Bouman, Helen
Bouman, Sam
Bower, Mabel E.
Boys Republic
Breedyk, Arie
Breedyk, Jessie
Briano Brothers
Briano, Albert
Briano, Albert Trustee for
Briano, Albert Frank
Briano, Lena
Brink, Russell N.
Brinkerhoff, Margaret
Brinkerhoff, Robert L.
Britschgi, Florence
Britschgi, Magdalena Garetto
Britschgi, Walter P.
Brommer, Marvin
Brookside Enterprizes, dba
Brookside Vineyard Co.
Brothers Three Dairy

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Brown, Eugene
Brun, Martha M.
Brun, Peter Robert
Buma, Duke
Buma, Martha
Bunse, Nancy
Bunse, Ronnie L.
Caballero, Bonnie L.
Caballero, Richard F.
Cable Airport Inc.
Cadlini, Donald
Cadlini, Jesse R.
Cadlini, Marie Edna
Cambio, Anna
Cambio, Charles, Estate of
Cambio, William V.
Cardoza, Florence
Cardoza, Olivi
Cardoza, Tony
Carnesi, Tom
Carver, Robt M., Trustee
Cauffman, John R.
Chacon Bros.
Chacon, Elvera P.
Chacon, Joe M.
Chacon, Robert M.
Chacon, Virginia L.
Chez, Joseph C.
Chino Corona Investment
Chino Water Co.
Christensen, Leslie
Christensen, Richard G.
Christian, Ada R.
Christian, Harold F.
Christy, Ella J.
Christy, Ronald S.
Cihigoyenetche, Jean
Cihigoyenetche, Leona
Cihigoyenetche, Martin
Clarke, Arthur B.
Clarke, Nancy L.
Clarke, Phyllis J.
Coelho, Isabel
Coelho, Joe A. Jr.
Collins, Howard E.
Collins, Judith F.
Collinsworth, Ester L.
Collinsworth, John E.
Collinsworth, Shelby
Cone Estate (05-2-00648/649)
Consolidated Freightways Corp. of Delaware
Corona Farms Co.
Corra, Rose
Costa, Dimas S.
Costa, Laura

EXHIBIT "C"

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1 Costa, Myrtle
2 Costamagna, Antonio
3 Costamagna, Joseph
4 Cousyn, Claus B.
5 Cramer, Carole F.
6 Cramer, William R.
7 Crossroads Auto Dismantlers, Inc.
8 Crouse, Beatrice I.
9 Crouse, Roger
10 Crowley, Juanita C.
11 Crowley, Ralph
12 Cucamonga Vintners
13 D'Astici, Teresa
14 Da Costa, Cecilia B.
15 Da Costa, Joaquim F.
16 Daloisio, Norman
17 De Berard Bros.
18 De Berard, Arthur, Trustee
19 De Berard, Charles
20 De Berard, Chas., Trustee
21 De Berard, Helan J.
22 De Berard, Robert
23 De Berard, Robert, Trustee
24 De Bie, Adrian
25 De Bie, Henry
26 De Bie, Margaret M.
27 De Bie, Marvin
28 De Boer, Fred

De Boer, L. H.
De Boer, Sidney
De Bos, Andrew
De Graaf, Anna Mae
De Graaf, Gerrit
De Groot, Dick
De Groot, Dorothy
De Groot, Ernest
De Groot, Henrietta
De Groot, Jake
De Groot, Pete Jr.
De Haan, Bernadena
De Haan, Henry
De Hoog, Adriana
De Hoog, Joe
De Hoog, Martin
De Hoog, Martin L.
De Hoog, Mitch
De Hoog, Tryntje
De Jager, Cobi
De Jager, Edward D.
De Jong Brothers Dairy
De Jong, Cornelis
De Jong, Cornelius
De Jong, Grace
De Jong, Jake
De Jong, Lena
De Leeuw, Alice

EXHIBIT "C"

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1 De Leeuw, Sam
2 De Soete, Agnes
3 De Soete, Andre
4 De Vries, Abraham
5 De Vries, Case
6 De Vries, Dick
7 De Vries, Evelyn
8 De Vries, Henry, Estate of
9 De Vries, Hermina
10 De Vries, Jack H.
11 De Vries, Jane
12 De Vries, Janice
13 De Vries, John
14 De Vries, John J.
15 De Vries, Neil
16 De Vries, Ruth
17 De Vries, Theresa
18 De Wit, Gladys
19 De Wit, Peter S.
20 De Wyn, Evert
21 De Zoete, Hattie V.
22 De Zoete, Leo A.
23 Decker, Hallie
24 Decker, Henry A.
25 Demmer, Ernest
26 Di Carlo, Marie
27 Di Carlo, Victor
28 Di Tommaso, Frank

Dirkse, Catherine
Dirkse, Charles C.
Dixon, Charles E.
Dixon, Geraldine A.
Doesberg, Hendrica
Doesburg, Theodorus P.
Dolan, Marion
Dolan, Michael H.
Dominguez, Helen
Dominguez, Manual
Donkers, Henry A.
Donkers, Nellie G.
Dotta Bros.
Douma Brothers Dairy
Douma, Betty A.
Douma, Fred A.
Douma, Hendrika
Douma, Herman G.
Douma, Narleen J.
Douma, Phillip M.
Dow Chemical Co.
Dragt, Rheta
Dragt, William
Driftwood Dairy Farm
Droogh, Case
Duhalde, Marian
Duhalde, Lauren
Duits, Henrietta

EXHIBIT "C"

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1 Duits, John
2 Dunlap, Edna Kraemer,
3 Estate of
4 Durrington, Glen
5 Durrington, William F.
6 Dusi, John, Sr.
7 Dykstra, Dick
8 Dykstra, John
9 Dykstra, John & Sons
10 Dykstra, Wilma
11 Dyt, Cor
12 Dyt, Johanna
13 E and S Grape Growers
14 Eaton, Thomas, Estate of
15 Echeverria, Juan
16 Echeverria, Carlos
17 Echeverria, Pablo
18 Eilers, E. Myrle
19 Eilers, Henry W.
20 El Prado Golf Course
21 Ellsworth, Rex C.
22 Engelsma, Jake
23 Engelsma, Susan
24 Escojeda, Henry
25 Etiwanda Grape Products Co.
26 Euclid Ave. Investment One
27 Euclid Ave. Investment Four
28 Euclid Ave. Three Investment

Excelsior Farms
F.D.I.C.
Fagundes, Frank M.
Fagundes, Mary
Fernandes, Joseph Jr.
Fernandes, Velma C.
Ferraro, Ann
Ferreira, Frank J.
Ferreira, Joe C. Jr.
Ferreira, Narcie
Filippi, J. Vintage Co.
Filippi, Joseph
Filippi, Joseph A.
Filippi, Mary E.
Fitzgerald, John R.
Flameling Dairy Inc.
Flamingo Dairy
Foss, Douglas E.
Foss, Gerald R.
Foss, Russel
Fred & John Troost No. 1 Inc.
Fred & Maynard Troost No. 2 Inc.
Freitas, Beatriz
Freitas, Tony T.
Gakle, Louis L.
Galleano Winery, Inc.
Galleano, Bernard D.
Galleano, D.
Galleano, Mary M.

EXHIBIT "C"

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1 Garcia, Pete
2 Gardner, Leland V.
3 Gardner, Lola M.
4 Garrett, Leonard E.
5 Garrett, Patricia T.
6 Gastelluberry, Catherine
7 Gastelluberry, Jean
8 Gilstrap, Glen E.
9 Gilstrap, Marjorie J.
10 Godinho, John
11 Godinho, June
12 Gonsalves, Evelyn
13 Gonsalves, John
14 Gorzeman, Geraldine
15 Gorzeman, Henry A.
16 Gorzeman, Joe
17 Govea, Julia
18 Goyenetche, Albert
19 Grace, Caroline E.
20 Grace, David J.
21 Gravatt, Glenn W.
22 Gravatt, Sally Mae
23 Greydanus Dairy, Inc.
24 Greydanus, Rena
25 Griffin Development Co.
26 Haagsma, Dave
27 Haagsma, John
28 Hansen, Mary D.

Hansen, Raymond F.
Hanson, Ardeth W.
Harada, James T.
Harada, Violet A.
Haringa, Earl and Sons
Haringa, Herman
Haringa, Rudy
Haringa, William
Harper, Cecilia de Mille
Harrington, Winona
Harrison, Jacqueline A.
Hatanaka, Kenichi
Heida, Annie
Heida, Don
Heida, Jim
Heida, Sam
Helms, Addison D.
Helms, Irma A.
Hermans, Alma I.
Hermans, Harry
Hettinga, Arthur
Hettinga, Ida
Hettinga, Judy
Hettinga, Mary
Hettinga, Wilbur
Heublein, Inc., Grocery Products Group
Hibma, Catherine M.

EXHIBIT "C"

Hibma, Sidney
Hicks, Kenneth I.
Hicks, Minnie M.
Higgins Brick Co.
Highstreet, Alfred V.
Highstreet, Evada V.
Hilarides, Bertha as Trustee
Hilarides, Frank
Hilarides, John as Trustee
Hindelang, Tillie
Hindelang, William
Hobbs, Bonnie C.
Hobbs, Charles W.
Hobbs, Hazel I.
Hobbs, Orlo M.
Hoekstra, Edward
Hoekstra, George
Hoekstra, Grace
Hoekstra, Louie
Hofer, Paul B.
Hofer, Phillip F.
Hofstra, Marie
Hogeboom, Jo Ann M.
Hogeboom, Maurice D.
Hogg, David V.
Hogg, Gene P.
Hogg, Warren G.
Hohberg, Edith J.
Hohberg, Harold C.
Hohberg, Harold W.
Holder, Arthur B.
Holder, Dorothy F.
Holmes, A. Lee
Holmes, Frances P.
Hoogeboom, Gertrude
Hoogeboom, Pete
Hoogendam, John
Hoogendam, Tena
Houssels, J. K. Thoroughbred Farm
Hunt Industries
Idsinga, Ann
Idsinga, William W.
Imbach Ranch, Inc.
Imbach, Kenneth E.
Imbach, Leonard K.
Imbach, Oscar K.
Imbach, Ruth M.
Indaburu, Jean
Indaburu, Marceline
Iseli, Kurt H.
Ito, Kow
J & B Dairy Inc.
Jaques, Johnny C. Jr.
Jaques, Mary
Jaques, Mary Lou

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| | |
|---|---|
| Jay Em Bee Farms | Knevelbaard, John |
| Johnson Bro's Egg Ranches, Inc. | Knudsen, Ejnar |
| Johnston, Ellwood W. | Knudsen, Karen M. |
| Johnston, George F. Co. | Knudsen, Kenneth |
| Johnston, Judith H. | Knudson, Robert |
| Jones, Leonard P. | Knudson, Darlene |
| Jongsma & Sons Dairy | Koel, Helen S. |
| Jongsma, Diana A. | Koetsier, Gerard |
| Jongsma, Dorothy | Koetsier, Gerrit J. |
| Jongsma, George | Koetsier, Jake |
| Jongsma, Harold | Koning, Fred W. |
| Jongsma, Henry | Koning, Gloria |
| Jongsma, John | Koning, J. W. Estate |
| Jongsma, Nadine | Koning, James A. |
| Jongsma, Tillie | Koning, Jane |
| Jordan, Marjorie G. | Koning, Jane C. |
| Jordan, Troy O. | Koning, Jennie |
| Jorritsma, Dorothy | Koning, John |
| Juliano, Albert | Koning, Victor A. |
| Kamper, Cornelis | Kooi Holstein Corporation |
| Kamstra, Wilbert | Koolhaas, Kenneth E. |
| Kaplan, Lawrence J. | Koolhaas, Simon |
| Kasbergen, Martha | Koolhaas, Sophie Grace |
| Kasbergen, Neil | Koopal, Grace |
| Kazian, Angelen Estate of | Koopal, Silas |
| Kingsway Const. Corp. | Koopman, Eka |
| Klapps Market | Koopman, Gene T. |
| Kline, James K. | Koopman, Henry G. |

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Koopman, Ted
Koopman, Tena
Koot, Nick
Koster, Aart
Koster, Frances
Koster, Henry B.
Koster, Nellie
Kroes, Jake R.
Kroeze, Bros
Kroeze, Calvin E.
Kroeze, John
Kroeze, Wesley
Kruckenberg, Naomi
Kruckenberg, Perry
L. D. S. Welfare Ranch
Labrucherie, Mary Jane
Labrucherie, Raymond F.
Lako, Samuel
Landman Corp.
Lanting, Broer
Lanting, Myer
Lass, Jack
Lass, Sandra L.
Lawrence, Cecelia, Estate of
Lawrence, Joe H., Estate of
Leal, Bradley W.
Leal, John C.
Leal, John Craig
Leck, Arthur A.
Leck, Evelyn M.
Lee, Harold E.
Lee, Helen J.
Lee, Henrietta C.
Lee, R. T. Construction Co.
Lekkerkerk, Adriana
Lekkerkerk, L. M.
Lekkerkerker, Nellie
Lekkerkerker, Walt
Lewis Homes of California
Livingston, Dorothy M.
Livingston, Rex E.
Lokey, Rosemary Kraemer
Lopes, Candida A.
Lopes, Antonio S.
Lopez, Joe D.
Lourenco, Carlos, Jr.
Lourenco, Carmelina P.
Lourenco, Jack C.
Lourenco, Manual H.
Lourenco, Mary
Lourenco, Mary
Luiten, Jack
Luiz, John M.
Luna, Christine I.
Luna, Ruben T.
Lusk, John D. and Son
a California corporation

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Lyon, Gregory E.
Lyon, Paula E.
M & W Co. #2
Madole, Betty M.
Madole, Larry B.
Marquez, Arthur
Marquine, Jean
Martin, Lelon O.
Martin, Leon O.
Martin, Maria D.
Martin, Tony J.
Martins, Frank
Mathias, Antonio
Mc Cune, Robert M.
Mc Masters, Gertrude
Mc Neill, J. A.
Mc Neill, May F.
Mees, Leon
Mello and Silva Dairy
Mello and Sousa Dairy
Mello, Emilia
Mello, Enos C.
Mello, Mercedes
Mendiondo, Catherine
Mendiondo, Dominique
Meth. Hosp. - Sacramento
Metzger, R. S.
Metzger, Winifred
Mickel, Louise
Miersma, Dorothy
Meirsma, Harry C.
Minaberry, Arnaud
Minaberry, Marie
Mistretta, Frank J.
Mocho and Plaa Inc.
Mocho, Jean
Mocho, Noeline
Modica, Josephine
Montes, Elizabeth
Montes, Joe
Moons, Beatrice
Moons, Jack
Moramarco, John A. Enterprises
Moreno, Louis W.
Moss, John R.
Motion Pictures Associates, Inc.
Moynier, Joe
Murphy, Frances V.
Murphy, Myrl L.
Murphy, Naomi
Nanne, Martin Estate of
Nederend, Betty
Nederend, Hans
Norfolk, James
Norfolk, Martha
Notrica, Louis

EXHIBIT "C"

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Nyberg, Lillian N.
Nyenhuis, Annie
Nyenhuis, Jim
Occidental Land Research
Okumura, Marion
Okumura, Yuiche
Oldengarm, Effie
Oldengarm, Egbert
Oldengarm, Henry
Oliviera, Manuel L.
Oliviera, Mary M.
Olson, Albert
Oltmans Construction Co.
Omlin, Anton
Omlin, Elsie L.
Ontario Christian School Assn.
Oord, John
Oostdam, Jacoba
Oostdam, Pete
Oosten, Agnes
Oosten, Anthonia
Oosten, Caroline
Oosten, John
Oosten, Marinus
Oosten, Ralph
Orange County Water District
Ormonde, Manuel
Ormonde, Pete, Jr.
Ormonde, Viva
Ortega, Adeline B.
Ortega, Bernard Dino
Osterkamp, Joseph S.
Osterkamp, Margaret A.
P I E Water Co.
Palmer, Eva E.
Palmer, Walter E.
Parente, Luis S.
Parente, Mary Borba
Parks, Jack B.
Parks, Laura M.
Patterson, Lawrence E. Estate of
Payne, Clyde H.
Payne, Margo
Pearson, Athelia K.
Pearson, William C.
Pearson, William G.
Pene, Robert
Perian, Miller
Perian, Ona E.
Petrissans, Deanna
Petrissans, George
Petrissans, Jean P.
Petrissans, Marie T.
Pickering, Dora M.
(Mrs. A. L. Pickering)
Pierce, John

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1 Pierce, Sadie
2 Pietszak, Sally
3 Pine, Joe
4 Pine, Virginia
5 Pires, Frank
6 Pires, Marie
7 Plaa, Jeanne
8 Plaa, Michel
9 Plantenga, Agnes
10 Plantenga, George
11 Poe, Arlo D.
12 Pomona Cemetery Assn.
13 Porte, Cecelia, Estate of
14 Porte, Garritt, Estate of
15 Portsmouth, Vera McCarty
16 Ramella, Mary M.
17 Ramirez, Concha
18 Rearick, Hildegard H.
19 Rearick, Richard R.
20 Reinalda, Clarence
21 Reitsma, Greta
22 Reitsma, Louis
23 Rice, Bernice
24 Rice, Charlie E.
25 Richards, Karin
26 (Mrs. Ronnie Richards)
27 Richards, Ronald L.
28 Ridder, Jennie Wassenaar

Righetti, A. T.
Riley, George A.
Riley, Helen C.
Robbins, Jack K.
Rocha, John M.
Rocha, Jose C.
Rodrigues, John
Rodrigues, Manuel
Rodrigues, Manuel, Jr.
Rodrigues, Mary L.
Rodriquez, Daniel
Rogers, Jack D.
Rohrer, John A.
Rohrer, Theresa D.
Rohrs, Elizabeth H.
Rossetti, M. S.
Roukema, Angeline
Roukema, Ed.
Roukema, Nancy
Roukema, Siebren
Ruderian, Max J.
Russell, Fred J.
Rusticus, Ann
Rusticus, Charles
Rynsburger, Arie
Rynsburger, Berdena, Trust
Rynsburger, Joan Adele
Rynsburger, Thomas

EXHIBIT "C"

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1 S. P. Annex, Inc.
2 Salisbury, Elinor J.
3 Sanchez, Edmundo
4 Sanchez, Margarita O.
5 Santana, Joe Sr.
6 Santana, Palmira
7 Satragni, John B. Jr.
8 Scaramella, George P.
9 Schaafsma Bros.
10 Schaafsma, Jennie
11 Schaafsma, Peter
12 Schaafsma, Tom
13 Schaap, Andy
14 Schaap, Ids
15 Schaap, Maria
16 Schacht, Sharon C.
17 Schakel, Audrey
18 Schakel, Fred
19 Schmid, Olga
20 Schmidt, Madeleine
21 Schoneveld, Evert
22 Schoneveld, Henrietta
23 Schoneveld, John
24 Schoneveld, John Allen
25 Schug, Donald E.
26 Schug, Shirley A.
27 Schuh, Bernatta M.
28 Schuh, Harold H.

Scott, Frances M.
Scott, Linda F.
Scott, Stanley A.
Scritsmier, Lester J.
Serl, Charles A.
Serl, Rosalie P.
Shady Grove Dairy, Inc.
Shamel, Burt A.
Shelby, Harold E.
Shelby, John A.
Shelby, Velma M.
Shelton, Alice A.
Sherwood, Robert W.
Sherwood, Sheila J.
Shue, Eva
Shue, Gilbert
Sieperda, Anne
Sieperda, James
Sigrist, Hans
Sigrist, Rita
Silveira, Arline L.
Silveira, Frank
Silveira, Jack
Silveira, Jack P. Jr.
Simas, Dolores
Simas, Joe
Singleton, Dean
Singleton, Elsie R.

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| | |
|---|---|
| Sinnott, Jim | Staal, John |
| Sinnott, Mildred B. | Stahl, Zippora P. |
| Slegers, Dorothy | Stampfl, Berta |
| Slegers, Hubert J. | Stampfl, William |
| Slegers, Jake | Stanley, Robert E. |
| Slegers, Jim | Stark, Everett |
| Slegers, Lenwood M. | Stellingwerf, Andrew |
| Slegers, Martha | Stellingwerf, Henry |
| Slegers, Tesse J. | Stellingwerf, Jenette |
| Smith, Edward S. | Stellingwerf, Shana |
| Smith, Helen D. | Stellingwerf, Stan |
| Smith, James E. | Stelzer, Mike C. |
| Smith, Keith J. | Sterk, Henry |
| Smith, Lester W. | Stiefel, Winifred |
| Smith, Lois Maxine | Stiefel, Jack D. |
| Smith, Marjorie W. | Stigall, Richard L. |
| Soares, Eva | Stigall, Vita |
| Sogioka, Mitsuyoshi | Stockman's Inn |
| Sogioka, Yoshimato | Stouder, Charlotte A. |
| Sousa, Sam | Stouder, William C. |
| Southern Pacific Land Co. | Struikmans, Barbara |
| Southfield, Eddie | Struikmans, Gertie |
| Souza, Frank M. | Struikmans, Henry Jr. |
| Souza, Mary T. | Struikmans, Henry Sr. |
| Spickerman, Alberta | Struikmans, Nellie |
| Spickerman, Florence | Swager, Edward |
| Spickerman, Rudolph | Swager, Gerben |
| Spyksma, John | Swager, Johanna |

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1 Swager, Marion
2 Swierstra, Donald
3 Swierstra, Fanny
4 Sybrandy, Ida
5 Sybrandy, Simon
6 Sytsma, Albert
7 Sytsma, Edith
8 Sytsma, Jennie
9 Sytsma, Louie
10 Te Velde, Agnes
11 Te Velde, Bay
12 Te Velde, Bernard A.
13 Te Velde, Bonnie
14 Te Velde, Bonnie G.
15 Te Velde, George
16 Te Velde, George, Jr.
17 Te Velde, Harm
18 Te Velde, Harriet
19 Te Velde, Henry J.
20 Te Velde, Jay
21 Te Velde, Johanna
22 Te Velde, John H.
23 Te Velde, Ralph A.
24 Te Velde, Zwaantina, Trustee
25 Ter Maaten, Case
26 Ter Maaten, Cleone
27 Ter Maaten, Steve
28 Terpstra, Carol

Terpstra, Theodore G.
Teune, Tony
Teunissen, Bernard
Teunissen, Jane
Thomas, Ethel M.
Thommen, Alice
Thommen, Fritz
Tillema, Allie
Tillema, Harold
Tillema, Klaas D.
Timmons, William R.
Tollerup, Barbara
Tollerup, Harold
Trapani, Louis A.
Trimlett, Arlene R.
Trimlett, George E.
Tristant, Pierre
Tuinhout, Ale
Tuinhout, Harry
Tuinhout, Hilda
Tuls, Elizabeth
Tuls, Jack S.
Tuls, Jake
Union Oil Company of California
United Dairyman's Co-op.
Urquhart, James G.
Usle, Cathryn
Usle, Faustino

EXHIBIT "C"

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1 V & Y Properties
2 Vaile, Beryl M.
3 Valley Hay Co.
4 Van Beek Dairy Inc.
5 Van Canneyt Dairy
6 Van Canneyt, Maurice
7 Van Canneyt, Wilmer
8 Van Dam, Bas
9 Van Dam, Isabelle
10 Van Dam, Nellie
11 Van Den Berg, Gertrude
12 Van Den Berg, Joyce
13 Van Den Berg, Marinus
14 Van Den Berg, Marvin
15 Van Der Linden, Ardith
16 Van Der Linden, John
17 Van Der Linden, Stanley
18 Van Der Veen, Kenneth
19 Van Diest, Anna T.
20 Van Diest, Cornelius
21 Van Diest, Ernest
22 Van Diest, Rena
23 Van Dyk, Bart
24 Van Dyk, Jeanette
25 Van Foeken, Martha
26 Van Foeken, William
27 Van Hofwegan, Steve
28 Van Hofwegen, Adrian A.

Van Hofwegen, Clara
Van Hofwegen, Jessie
Van Klaveren, A.
Van Klaveren, Arie
Van Klaveren, Wilhelmina
Van Klaveren, William
Van Leeuwen, Arie C.
Van Leeuwen, Arie C.
Van Leeuwen, Arlan
Van Leeuwen, Clara G.
Van Leeuwen, Cornelia L.
Van Leeuwen, Harriet
Van Leeuwen, Jack
Van Leeuwen, John
Van Leeuwen, Letie
Van Leeuwen, Margie
Van Leeuwen, Paul
Van Leeuwen, William A.
Van Ravenswaay, Donald
Van Ryn Dairy
Van Ryn, Dick
Van Surksum, Anthonetta
Van Surksum, John
Van Veen, John
Van Vliet, Effie
Van Vliet, Hendrika
Van Vliet, Hugo
Van Vliet, Klaas

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| | |
|---|---|
| Vande Witte, George | Vander Laan, Katie |
| Vanden Berge, Gertie | Vander Laan, Martin Jr. |
| Vanden Berge, Gertie | Vander Laan, Tillie |
| Vanden Berge, Jack | Vander Leest, Anna |
| Vanden Berge, Jake | Vander Leest, Ann |
| Vanden Brink, Stanley | Vander Meer, Alice |
| Vander Dussen, Agnes | Vander Meer, Dick |
| Vander Dussen, Cor | Vander Poel, Hank |
| Vander Dussen, Cornelius | Vander Poel, Pete |
| Vander Dussen, Edward | Vander Pol, Irene |
| Vander Dussen, Geraldine Marie | Vander Pol, Margie |
| Vander Dussen, James | Vander Pol, Marines |
| Vander Dussen, John | Vander Pol, William P. |
| Vander Dussen, Nelvina | Vander Schaaf, Earl |
| Vander Dussen, Rene | Vander Schaaf, Elizabeth |
| Vander Dussen, Sybrand Jr. | Vander Schaaf, Henrietta |
| Vander Dussen, Sybrand Sr. | Vander Schaaf, John |
| Vander Dussen Trustees | Vander Schaaf, Ted |
| Vander Eyk, Case Jr. | Vander Stelt, Catherine |
| Vander Eyk, Case Sr. | Vander Stelt, Clarence |
| Vander Feer, Peter | Vander Tuig, Arlene |
| Vander Feer, Rieka | Vander Tuig, Sylvester |
| Vander Laan, Ann | Vander Veen, Joe A. |
| Vander Laan, Ben | Vandervlag, Robert |
| Vander Laan, Bill | Vander Zwan, Peter |
| Vander Laan, Corrie | Vanderford, Betty W. |
| Vander Laan, Henry | Vanderford, Claud R. |
| Vander Laan, James | Vanderham, Adrian |

EXHIBIT "C"

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1 Vanderham, Cornelius
2 Vanderham, Cornelius P.
3 Vanderham, Cory
4 Vanderham, E. Jane
5 Vanderham, Marian
6 Vanderham, Martin
7 Vanderham, Pete C.
8 Vanderham, Wilma
9 Vasquez, Eleanor
10 Veenendaal, Evert
11 Veenendaal, John H.
12 Veiga, Dominick Sr.
13 Verbree, Jack
14 Verbree, Tillie
15 Verger, Bert
16 Verger, Betty
17 Verhoeven, Leona
18 Verhoeven, Martin
19 Verhoeven, Wesley
20 Vermeer, Dick
21 Vermeer, Jantina
22 Vernola Ranch
23 Vernola, Anthonietta
24 Vernola, Anthony
25 Vernola, Frank
26 Vernola, Mary Ann
27 Vernola, Pat F.
28 Vestal, Frances Lorraine

Vestal, J. Howard
Visser, Gerrit
Visser, Grace
Visser, Henry
Visser, Jess
Visser, Louie
Visser, Neil
Visser, Sam
Visser, Stanley
Visser, Tony D.
Visser, Walter G.
Von Der Ahe, Fredric T.
Von Euw, George
Von Euw, Marjorie
Von Lusk, a limited partnership
Voortman, Anna Marie
Voortman, Edward
Voortman, Edwin J.
Voortman, Gertrude Dena
Wagner, Richard H.
Walker, Carole R.
Walker, Donald E.
Walker, Wallace W.
Wardle, Donald M.
Warner, Dillon B.
Warner, Minnie
Wassenaar, Peter W.
Waters, Michael

EXHIBIT "C"

Weeda, Adriana
Weeda, Daniel
Weeks, O. L.
Weeks, Verona E.
Weidman, Maurice
Weidman, Virginia
Weiland, Adaline I.
Weiland, Peter J.
Wesselink, Jules
West, Katharine R.
West, Russel
West, Sharon Ann
Western Horse Property
Westra, Alice
Westra, Henry
Westra, Hilda
Westra, Jake J.
Weststeyn, Freida
Weststeyn, Pete
Whitehurst, Louis G.
Whitehurst, Pearl L.
Whitmore, David L.
Whitmore, Mary A.
Whitney, Adolph M.
Wiersema, Harm
Wiersema, Harry
Wiersma, Ellen H.
Wiersma, Gladys J.
Wiersma, Jake
Wiersma, Otto
Wiersma, Pete
Winchell, Verne H., Trustee
Wind, Frank
Wind, Fred
Wind, Hilda
Wind, Johanna
Woo, Frank
Woo, Sem Gee
Wybenga, Clarence
Wybenga, Gus
Wybenga, Gus K.
Wybenga, Sylvia
Wynja, Andy
Wynja, Iona F.
Yellis, Mildred
Yellis, Thomas E.
Ykema-Harmsen Dairy
Ykema, Floris
Ykema, Harriet
Yokley, Betty Jo
Yokley, Darrell A.
Zak, Zan
Zivelonghi, George
Zivelonghi, Margaret
Zwaagstra, Jake
Zwaagstra, Jessie M.
Zwart, Case

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NON-PRODUCER WATER DISTRICTS

Chino Basin Municipal Water District

Chino Basin Water Conservation District

Pomona Valley Municipal Water District

Western Municipal Water District of Riverside County

EXHIBIT "C"

LAW OFFICES
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DEFAULTING OVERLYING AGRICULTURAL PRODUCERS

Cheryl L. Bain
Warren Bain
John M. Barcelona
Letty Bassler
John Brazil
John S. Briano
Lupe Briano
Paul A. Briano
Tillie Briano
Arnie B. Carlson
John Henry Fikse
Phyllis S. Fikse
Lewellyn Flory
Mary I. Flory
L. H. Glazer
Dorothy Goodman
Sidney D. Goodman
Frank Grossi
Harada Brothers
Ellen Hettinga
Hein Hettinga
Dick Hofstra, Jr.
Benjamin M. Hughey
Frieda L. Hughey
Guillaume Indart
Ellwood B. Johnston, Trustee
Perry Kruckenberg, Jr.
Roy W. Lantis
Sharon I. Lantis
Frank Lorenz
Dagney H. MacDonald
Frank E. Martin
Ruth C. Martin
Connie S. Mello
Naldiro J. Mello
Felice Miller
Ted Miller
Masao Nerio
Tom K. Nerio
Toyo Nerio
Yuriko Nerio
Harold L. Rees
Alden G. Rose
Claude Rouleau, Jr.
Patricia M. Rouleau
Schultz Enterprises
Albert Shaw
Lila Shaw
Cathy M. Stewart
Marvin C. Stewart
Betty Ann Stone
John B. Stone
Vantoll Cattle Co., Inc.
Catherene Verburg

EXHIBIT "C"

Martin Verburg

Donna Vincent

Larry Vincent

Cliff Wolfe & Associates

Ada M. Woll

Zarubica Co.

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EXHIBIT "D"

OVERLYING NON-AGRICULTURAL RIGHTS

| Party | Total Overlying Non-Agricultural Rights (Acre Feet) | Share of Safe Yield (Acre Feet) |
|---|---|---|
| Ameron Steel Producers, Inc. | 125 | 97.858 |
| County of San Bernardino | 171 | 133.870 |
| Conrock Company | 406 | 317.844 |
| Kaiser Steel Corporation | 3,743 | 2,930.274 |
| Red Star Fertilizer | 20 | 15.657 |
| Southern California Edison Co. | 1,255 | 982.499 |
| Space Center, Mira Loma | 133 | 104.121 |
| Southern Service Co., dba Blue Seal Linen | 24 | 18.789 |
| Sunkist, Orange Products Division | 2,393 | 1,873.402 |
| Carlsberg Mobile Home Properties, Ltd. '73 | 593 | 464.240 |
| Union Carbide Corporation | 546 | 427.446 |
| Quaker Chemical Co. | 0 | 0 |
| Totals | 9,409 | 7,366.000 |

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EXHIBIT "E"
APPROPRIATIVE RIGHTS

| Party | Appropriative Right (Acre Feet) | Share of Initial Operating Safe Yield (Acre Feet) | Share of Operating Safe Yield (Percent) |
|---|---|---|---|
| City of Chino | 5,271.7 | 3,670.067 | 6.693 |
| City of Norco | 289.5 | 201.545 | 0.368 |
| City of Ontario | 16,337.4 | 11,373.816 | 20.742 |
| City of Pomona | 16,110.5 | 11,215.852 | 20.454 |
| City of Upland | 4,097.2 | 2,852.401 | 5.202 |
| Cucamonga County Water District | 4,431.0 | 3,084.786 | 5.626 |
| Jurupa Community Services District | 1,104.1 | 768.655 | 1.402 |
| Monte Vista County Water District | 5,958.7 | 4,148.344 | 7.565 |
| West San Bernardino County Water District | 925.5 | 644.317 | 1.175 |
| Etiwanda Water Company | 768.0 | 534.668 | 0.975 |
| Felspar Gardens Mutual Water Company | 68.3 | 47.549 | 0.087 |
| Fontana Union Water Co. | 9,188.3 | 6,396.736 | 11.666 |
| Marygold Mutual Water Co. | 941.3 | 655.317 | 1.195 |
| Mira Loma Water Co. | 1,116.0 | 776.940 | 1.417 |
| Monta Vista Irr. Co. | 972.1 | 676.759 | 1.234 |
| Mutual Water Company of Glen Avon Heights | 672.2 | 467.974 | 0.853 |
| Park Water Company | 236.1 | 164.369 | 0.300 |
| Pomona Valley Water Co. | 3,106.3 | 2,162.553 | 3.944 |
| San Antonio Water Co. | 2,164.5 | 1,506.888 | 2.748 |
| Santa Ana River Water Company | 1,869.3 | 1,301.374 | 2.373 |
| Southern California Water Company | 1,774.5 | 1,235.376 | 2.253 |
| West End Consolidated Water Company | 1,361.3 | 947.714 | 1.728 |
| TOTAL | 78,763.8 | 54,834.000 | 100.000 |

EXHIBIT "F"
OVERLYING (AGRICULTURAL) POOL
POOLING PLAN

1. Membership in Pool. The State of California and all producers listed in Exhibit "C" shall be the initial members of this pool, which shall include all producers of water for overlying uses other than industrial or commercial purposes.

2. Pool Meetings. The members of the pool shall meet annually, in person or by proxy, at a place and time to be designated by Watermaster for purposes of electing members of the Pool Committee and conducting any other business of the pool. Special meetings of the membership of the pool may be called and held as provided in the rules of the pool.

3. Voting. All voting at meetings of pool members shall be on the basis of one vote for each 100 acre feet or any portion thereof of production from Chino Basin during the preceding year, as shown by the records of Watermaster.

4. Pool Committee. The Pool Committee for this pool shall consist of not less than nine (9) representatives selected at large by members of the pool. The exact number of members of the Pool Committee in any year shall be as determined by majority vote of the voting power of members of the pool in attendance at the annual pool meeting. Each member of the Pool Committee shall have one vote and shall serve for a two-year term. The members first elected shall classify themselves by lot so that approximately one-half serve an initial one-year term. Vacancies during any term shall be filled by a majority of the remaining members of the Pool Committee.

5. Advisory Committee Representatives. The number of

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representatives of the Pool Committee on the Advisory Committee shall be as provided in the rules of the pool from time to time but not exceeding ten (10). The voting power of the pool on the Advisory Committee shall be apportioned and exercised as determined from time to time by the Pool Committee.

6. Replenishment Obligation. The pool shall provide funds for replenishment of any production by persons other than members of the Overlying (Non-agricultural) Pool or Appropriator Pool, in excess of the pool's share of Safe Yield. During the first five (5) years of operations of the Physical Solution, reasonable efforts shall be made by the Pool Committee to equalize annual assessments.

7. Assessments. All assessments in this pool (whether for replenishment water cost or for pool administration or the allocated share of Watermaster administration) shall be in an amount uniformly applicable to all production in the pool during the preceding year or calendar quarter. Provided, however, that the Agricultural Pool Committee, may recommend to the Court modification of the method of assessing pool members, inter se, if the same is necessary to attain legitimate basin management objectives, including water conservation and avoidance of undesirable socio-economic consequences. Any such modification shall be initiated and ratified by one of the following methods:

(a) Excess Production. In the event total pool production exceeds 100,000 acre feet in any year, the Pool Committee shall call and hold a meeting, after notice to all pool members, to consider remedial modification of the assessment formula.

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(b) Producer Petition. At any time after the fifth full year of operation under the Physical Solution, a petition by ten percent (10%) of the voting power or membership of the Pool shall compel the holding of a noticed meeting to consider revision of said formula of assessment for replenishment water.

In either event, a majority action of the voting power in attendance at such pool members' meeting shall be binding on the Pool Committee.

8. Rules. The Pool Committee shall adopt rules for conducting meetings and affairs of the committee and for administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

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EXHIBIT "G"
OVERLYING (NON-AGRICULTURAL) POOL
POOLING PLAN

1. Membership in Pool. The initial members of the pool, together with the decreed share of the Safe Yield of each, are listed in Exhibit "D". Said pool includes producers of water for overlying industrial or commercial (non-agricultural) purposes, or such producers within the Pool who may hereafter take water pursuant to Paragraph 8 hereof.

2. Pool Committee. The Pool Committee for this pool shall consist of one representative designated by each member of the pool. Voting on the committee shall be on the basis of one vote for each member, unless a volume vote is demanded, in which case votes shall be allocated as follows:

> The volume voting power on the Pool Committee shall be 1,484 votes. Of these, 742 votes shall be allocated on the basis of one vote for each ten (10) acre feet or fraction thereof of decreed shares in Safe Yield. (See Exhibit "D".) The remaining 742 votes shall be allocated proportionally on the basis of assessments paid to Watermaster during the preceding year.*

3. Advisory Committee Representatives. At least three (3) members of the Pool Committee shall be designated by said committee to serve on the Advisory Committee. The exact number of such representatives at any time shall be as determined by the Pool Committee. The voting power of the pool shall be exercised in the

*Or production assessments paid under Water Code Section 72140 et seq., as to years prior to the second year of operation under the Physical Solution hereunder.

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Advisory Committee as a unit, based upon the vote of a majority of said representatives.

4. Replenishment Obligation. The pool shall provide funds for replenishment of any production in excess of the pool's share of Safe Yield in the preceding year.

5. Assessment. Each member of this pool shall pay an assessment equal to the cost of replenishment water times the number of acre feet of production by such producer during the preceding year in excess of (a) his decreed share of the Safe Yield, plus (b) any carry-over credit under Paragraph 7 hereof. In addition, the cost of the allocated share of Watermaster administration expense shall be recovered on an equal assessment against each acre foot of production in the pool during such preceding fiscal year or calendar quarter; and in the case of Pool members who take substitute ground water as set forth in Paragraph 8 hereof, such producer shall be liable for its share of administration assessment, as if the water so taken were produced, up to the limit of its decreed share of Safe Yield.

6. Assignment. Rights herein decreed are appurtenant to the land and are only assignable with the land for overlying use thereon; provided, however, that any appropriator who may, directly or indirectly, undertake to provide water service to such overlying lands may, by an appropriate agency agreement on a form approved by Watermaster, exercise said overlying right to the extent, but only to the extent necessary to provide water service to said overlying lands.

7. Carry-over. Any member of the pool who produces less than its assigned water share of Safe Yield may carry such unexercised

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right forward for exercise in subsequent years. The first water produced during any such subsequent year shall be deemed to be an exercise of such carry-over right. In the event the aggregate carry-over by any pool member exceeds its share of Safe Yield, such member shall, as a condition of preserving such surplus carry-over, execute a storage agreement with Watermaster.

8. Substitute Supplies. To the extent that any Pool member, at the request of Watermaster and with the consent of the Advisory Committee, takes substitute surface water in lieu of producing ground water otherwise subject to production as an allocated share of Safe Yield, said party shall nonetheless remain a member of this Pool.

9. Rules. The Pool Committee shall adopt rules for administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

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EXHIBIT "H"
APPROPRIATIVE POOL
POOLING PLAN

1. Qualification for Pool. Any city, district or other public entity and public utility -- either regulated under Public Utilities Commission jurisdiction, or exempt therefrom as a non-profit mutual water company (other than those assigned to the Overlying [Agricultural] Pool) -- shall be a member of this pool. All initial members of the pool are listed in Exhibit "E", together with their respective appropriative rights and acre foot allocation and percentage shares of the initial and subsequent Operating Safe Yield.

2. Pool Committee. The Pool Committee shall consist of one (1) representative appointed by each member of the Pool.

3. Voting. The total voting power on the Pool Committee shall be 1,000 votes. Of these, 500 votes shall be allocated in proportion to decreed percentage shares in Operating Safe Yield. The remaining 500 votes shall be allocated proportionally on the basis of assessments paid to Watermaster during the preceding year.* Routine business of the Pool Committee may be conducted on the basis of one vote per member, but upon demand of any member a weighted vote shall be taken. Affirmative action of the Committee shall require a majority of the voting power of members in attendance, provided that it includes concurrence by at least one-third of its total members.

4. Advisory Committee Representatives. Ten (10) members of

*Or production assessments paid under Water Code Section 72140 et seq., as to years prior to the second year of operation under the Physical Solution hereunder.

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the Pool Committee shall be designated to represent this pool on the Advisory Committee. Each major appropriator, i.e., the owner of an adjudicated appropriative right in excess of 3,000 acre feet, shall be entitled to one representative. The remaining members representing the Appropriative Pool on the Advisory Committee shall be elected at large by the remaining members of the pool. The voting power of the Appropriative Pool on the Advisory Committee shall be apportioned between the major appropriator representatives in proportion to their respective voting power in the Pool Committee. The remaining two representatives shall exercise equally the voting power proportional to the Pool Committee voting power of all remaining appropriators; provided, however, that if any representative fails to attend an Advisory Committee meeting, the voting power of that representative shall be allocated among the representatives of the Appropriator Pool in attendance in the same proportion as their own respective voting powers.

5. Replenishment Obligation. The pool shall provide funds for purchase of replenishment water to replace any production by the pool in excess of Operating Safe Yield during the preceding year.

6. Administrative Assessment. Costs of administration of this pool and its share of general Watermaster expense shall be recovered by a uniform assessment applicable to all production during the preceding year.

7. Replenishment Assessment. The cost of replenishment water required to replace production from Chino Basin in excess of Operating Safe Yield in the preceding year shall be allocated and recovered as follows:

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(a) For production, other than for increased export, within CBMWD or WMWD:

(1) Gross Assessment. 15% of such replenishment water costs shall be recovered by a uniform assessment against all production of each appropriator producing in said area during the preceding year.

(2) Net Assessment. The remaining 85% of said costs shall be recovered by a uniform assessment on each acre foot of production from said area by each such appropriator in excess of his allocated share of Operating Safe Yield during said preceding year.

(b) For production which is exported for use outside Chino Basin in excess of maximum export in any year through 1976, such increased export production shall be assessed against the exporting appropriator in an amount sufficient to purchase replenishment water from CBMWD or WMWD in the amount of such excess.

(c) For production within SBVMWD or PVMWD:

By an assessment on all production in excess of an appropriator's share of Operating Safe Yield in an amount sufficient to purchase replenishment water through SBVMWD or MWD in the amount of such excess.

8. Socio-Economic Impact Review. The parties have conducted certain preliminary socio-economic impact studies. Further and more detailed socio-economic impact studies of the assessment formula and its possible modification shall be undertaken for the Appropriator Pool by Watermaster no later than ten (10) years from the effective date of this Physical Solution, or whenever total

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production by this pool has increased by 30% or more over the decreed appropriative rights, whichever is first.

9. Facilities Equity Assessment. Watermaster may, upon recommendation of the Pool Committee, institute proceedings for levy and collection of a Facilities Equity Assessment for the purposes and in accordance with the procedures which follow:

(a) Implementing Circumstances. There exist several sources of supplemental water available to Chino Basin, each of which has a differential cost and quantity available. The optimum management of the entire Chino Basin water resource favors the maximum use of the lowest cost supplemental water to balance the supplies of the Basin, in accordance with the Physical Solution. The varying sources of supplemental water include importations from MWD and SBVMWD, importation of surface and ground water supplies from other basins in the immediate vicinity of Chino Basin, and utilization of reclaimed water. In order to fully utilize any of such alternate sources of supply, it will be essential for particular appropriators having access to one or more of such supplies to have invested, or in the future to invest, directly or indirectly, substantial funds in facilities to obtain and deliver such water to an appropriate point of use. To the extent that the use of less expensive alternate sources of supplemental water can be maximized by the inducement of a Facilities Equity Assessment, as herein provided, it is to the long-term benefit of the entire basin that such assessment be authorized and levied by Watermaster.

(b) Study and Report. At the request of the Pool

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Committee, Watermaster shall undertake a survey study of the utilization of alternate supplemental supplies by members of the Appropriative Pool which would not otherwise be utilized and shall prepare a report setting forth the amount of such alternative supplies being currently utilized, the amount of such supplies which could be generated by activity within the pool, and the level of cost required to increase such uses and to optimize the total supplies available to the basin. Said report shall contain an analysis and recommendation for the levy of a necessary Facilities Equity Assessment to accomplish said purpose.

(c) Hearing. If the said report by Watermaster contains a recommendation for imposition of a Facilities Equity Assessment, and the Pool Committee so requests, Watermaster shall notice and hold a hearing not less than 60 days after distribution of a copy of said report to each member of the pool, together with a notice of the hearing date. At such hearing, evidence shall be taken with regard to the necessity and propriety of the levy of a Facilities Equity Assessment and full findings and decision shall be issued by Watermaster.

(d) Operation of Assessment. If Watermaster determines that it is appropriate that a Facilities Equity Assessment be levied in a particular year, the amount of additional supplemental supplies which should be generated by such assessment shall be estimated. The cost of obtaining such supplies, taking into consideration the investment in necessary facilities shall then be determined and spread equitably among the producers within the pool in a manner so that those

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producers not providing such additional lower cost supplemental water, and to whom a financial benefit will result, may bear a proportionate share of said costs, not exceeding said benefit; provided that any producer furnishing such supplemental water shall not thereby have its average cost of water in such year reduced below such producer's average cost of pumping from the Basin. In so doing, Watermaster shall establish a percentage of the total production by each party which may be produced without imposition of a Facilities Equity Assessment. Any member of the pool producing more water than said percentage shall pay such Facilities Equity Assessment on any such excess production. Watermaster is authorized to transmit and pay the proceeds of such Facilities Equity Assessment to those producers who take less than their share of Basin water by reason of furnishing a higher percentage of their requirements through use of supplemental water.

10. Unallocated Safe Yield Water. To the extent that, in any five years, any portion of the share of Safe Yield allocated to the Overlying (Agricultural) Pool is not produced, such water shall be available for reallocation to members of the Appropriative Pool, as follows:

(a) Priorities. Such allocation shall be made in the following sequence:

(1) to supplement, in the particular year, water available from Operating Safe Yield to compensate for any reduction in the Safe Yield by reason of recalculation thereof after the tenth year of operation hereunder.

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(2) pursuant to conversion claims as defined in Subparagraph (b) hereof.

(3) as a supplement to Operating Safe Yield, without regard to reductions in Safe Yield.

(b) Conversion Claims. The following procedures may be utilized by any appropriator:

(1) Record of Land Use Conversion. Any appropriator who undertakes, directly or indirectly, during any year, to permanently provide water service to lands which during the immediate preceding five (5) consecutive years was devoted to irrigated agriculture may report such change in land use or water service to Watermaster. Watermaster shall thereupon verify such change in water service and shall maintain a record and account for each appropriator of the total acreage involved and the average annual water use during said five-year period.

(2) Establishment of Allocation Percentage. In any year in which unallocated Safe Yield water from the Overlying (Agricultural) Pool is available for such conversion claims, Watermaster shall establish allocable percentages for each appropriator based upon the total of such converted acreage recorded to each such appropriator's account.

(3) Allocation and Notice. Watermaster shall thereafter apply the allocated percentage to the total unallocated Safe Yield water available for special allocation to derive the amount thereof allocable to

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each appropriator; provided that in no event shall the allocation to any appropriator as a result of such conversion claim exceed 50% of the average annual amount of water actually applied to the areas converted by such appropriator prior to such conversion. Any excess water by reason of such limitation on any appropriator's right shall be added to Operating Safe Yield. Notice of such special allocation shall be given to each appropriator and shall be treated for purposes of this Physical Solution as an addition to such appropriator's share of the Operating Safe Yield for the particular year only.

(4) Administrative Costs. Any costs of Watermaster attributable to administration of such special allocations and conversion claims shall be assessed against appropriators participating in such reporting.

11. In Lieu Procedures. There are, or may develop, certain areas within Chino Basin where good management practices dictate that recharge of the basin be accomplished, to the extent practical, by taking surface supplies of supplemental water in lieu of ground water otherwise subject to production as an allocated share of Operating Safe Yield.

(a) Method of Operation. Any appropriator producing water within such designated in lieu area who is willing to abstain for any reason from producing any portion of such producer's share of Operating Safe Yield in any year may offer such unpumped water to Watermaster. In such event, Watermaster shall purchase said water in place, in lieu of spreading replenishment water, which is otherwise required to

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make up for over production. The purchase price for in lieu water shall be the lesser of:

(1) Watermaster's current cost of replenishment water, whether or not replenishment water is currently then obtainable, plus the cost of spreading; or

(2) The cost of supplemental surface supplies to the appropriator, less

a. said appropriator's average cost of ground water production, and

b. the applicable production assessment were the water produced.

Where supplemental surface supplies consist of MWD or SBVMWD supplies, the cost of treated, filtered State water from such source shall be deemed the cost of supplemental surface supplies to the appropriator for purposes of such calculation.

In any given year in which payments may be made pursuant to a Facilities Equity Assessment, as to any given quantity of water the party will be entitled to payment under this section or pursuant to the Facilities Equity Assessment, as the party elects, but not under both.

(b) Designation of In Lieu Areas. The first in lieu area is designated as the "In Lieu Area No. 1" and consists of an area wherein nitrate levels in the ground water generally exceed 45 mg/l, and is shown on Exhibit "J" hereto. Other in lieu areas may be designated by subsequent order of Watermaster upon recommendation or approval by Advisory Committee. Said in lieu areas may be enlarged, reduced or

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eliminated by subsequent orders; provided, however, that designation of In Lieu Areas shall be for a minimum fixed term sufficient to justify necessary capital investment. In Lieu Area No. 1 may be enlarged, reduced or eliminated in the same manner, except that any reduction of its original size or elimination thereof shall require the prior order of Court.

12. Carry-over. Any appropriator who produces less than his assigned share of Operating Safe Yield may carry such unexercised right forward for exercise in subsequent years. The first water produced during any such subsequent year shall be deemed to be an exercise of such carry-over right. In the event the aggregate carry-over by any appropriator exceeds its share of Operating Safe Yield, such appropriator shall, as a condition of preserving such surplus carry-over, execute a storage agreement with Watermaster. Such appropriator shall have the option to pay the gross assessment applicable to such carry-over in the year in which it accrued.

13. Assignment, Transfer and Lease. Appropriative rights, and corresponding shares of Operating Safe Yield, may be assigned or may be leased or licensed to another appropriator for exercise in a given year. Any transfer, lease or license shall be ineffective until written notice thereof is furnished to and approved as to form by Watermaster, in compliance with applicable Watermaster rules. Watermaster shall not approve transfer, lease or license of a right for exercise in an area or under conditions where such production would be contrary to sound basin management or detrimental to the rights or operations of other producers.

14. Rules. The Pool Committee shall adopt rules for

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administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

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EXHIBIT "I"

ENGINEERING APPENDIX

1. Basin Management Parameters. In the process of implementing the physical solution for Chino Basin, Watermaster shall consider the following parameters:

(a) Pumping Patterns. Chino Basin is a common supply for all persons and agencies utilizing its waters. It is an objective in management of the Basin's waters that no producer be deprived of access to said waters by reason of unreasonable pumping patterns, nor by regional or localized recharge of replenishment water, insofar as such result may be practically avoided.

(b) Water Quality. Maintenance and improvement of water quality is a prime consideration and function of management decisions by Watermaster.

(c) Economic Considerations. Financial feasibility, ecnomic impact and the cost and optimum utilization of the Basin's resources and the physical facilities of the parties are objectives and concerns equal in importance to water quantity and quality parameters.

2. Operating Safe Yield. Operating Safe Yield in any year shall consist of the Appropriative Pool's share of Safe Yield of the Basin, plus any controlled overdraft of the Basin which Watermaster may authorize. In adopting the Operating Safe Yield for any year, Watermaster shall be limited as follows:

(a) Accumulated Overdraft. During the operation of this Judgment and Physical Solution, the overdraft accumulated from and after the effective date of the Physical

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Solution and resulting from an excess of Operating Safe Yield over Safe Yield shall not exceed 200,000 acre feet.

(b) Quantitative Limits. In no event shall Operating Safe Yield in any year be less than the Appropriative Pool's share of Safe Yield, nor shall it exceed such share of Safe Yield by more than 10,000 acre feet. The initial Operating Safe Yield is hereby set at 54,834 acre feet per year. Operating Safe Yield shall not be changed upon less than five (5) years' notice by Watermaster.

Nothing contained in this paragraph shall be deemed to authorize, directly or indirectly, any modification of the allocation of shares in Safe Yield to the overlying pools, as set forth in Paragraph 44 of the Judgment.

3. Ground Water Storage Agreements. Any agreements authorized by Watermaster for storage of supplemental water in the available ground water storage capacity of Chino Basin shall include, but not be limited to:

(a) The quantities and term of the storage right.

(b) A statement of the priority or relation of said right, as against overlying or Safe Yield uses, and other storage rights.

(c) The procedure for establishing delivery rates, schedules and procedures which may include

[1] spreading or injection, or

[2] in lieu deliveries of supplemental water for direct use.

(d) The procedures for calculation of losses and annual accounting for water in storage by Watermaster.

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(e) The procedures for establishment and administration of withdrawal schedules, locations and methods.

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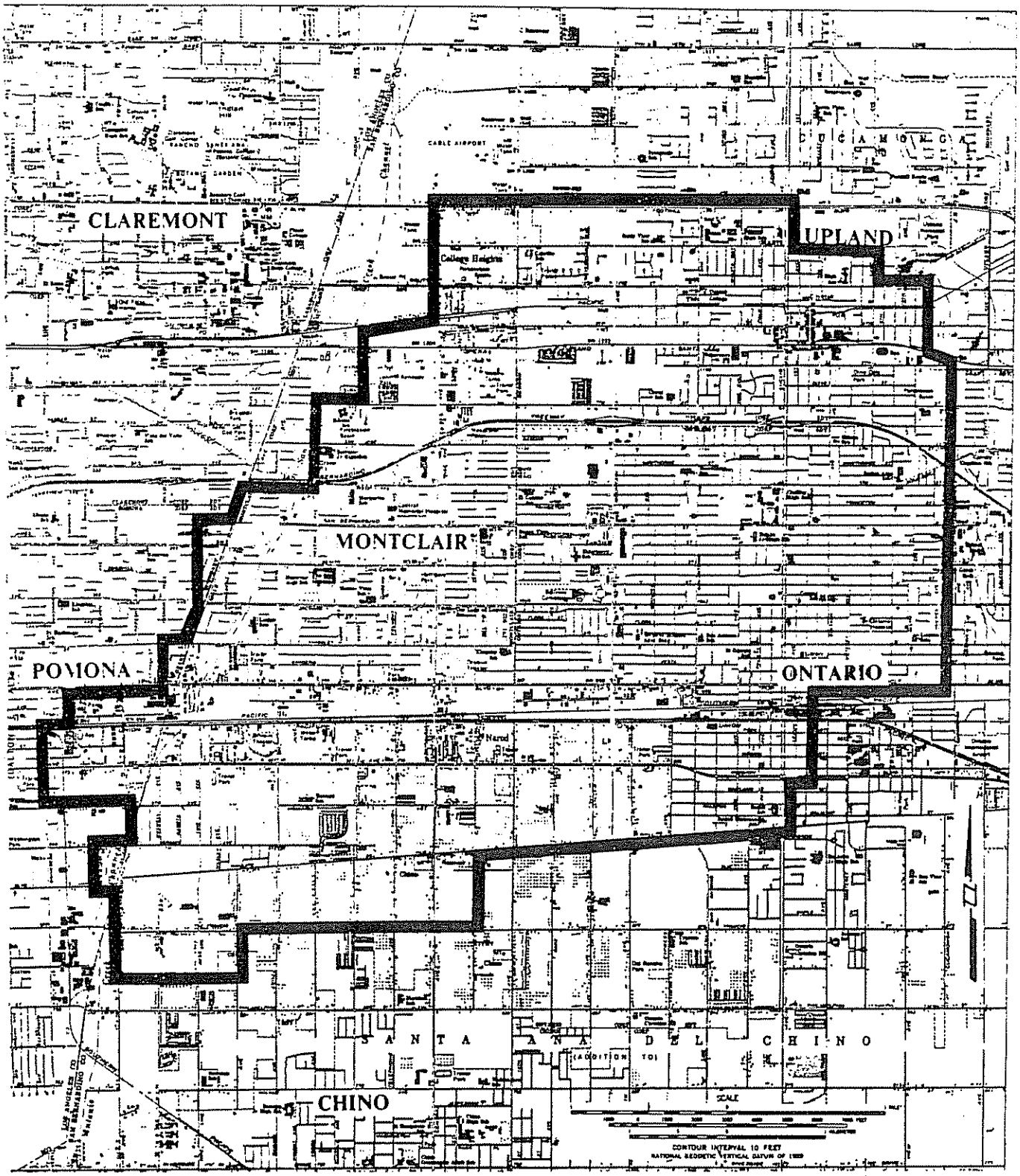


# CHINO BASIN

## IN LIEU AREA NO. 1

**EXHIBIT "J"**

LEGAL DESCRIPTION

OF CHINO BASIN

## Preamble

All of the townships and ranges referred to in the following legal description are the San Bernardino Base and Meridian. Certain designated sections are implied as the System of Government Surveys may be extended where not established. Said sections are identified as follows:

Section 20, T1N, R8W is extended across Rancho Cucamonga;

Section 36, T1N, R8W is extended across the City of Upland;

Sections 2, 3, and 4, T1S, R7W are extended across Rancho Cucamonga;

Section 10, T1S, R8W is extended across the City of Claremont;

Sections 19, 20, 21, 30, 31 and 32, T1S, R8W are extended across the City of Pomona;

Sections 4, 5, and 28, T2S, R8W are extended across Rancho Santa Ana Del Chino;

Sections 15 and 16, T3S, R7W are extended across Rancho La Sierra; and

Sections 17 and 20, T3S, R7W are extended across Rancho El Rincon.

## Description

Chino Basin is included within portions of the Counties of San Bernardino, Riverside and Los Angeles, State of California, bounded by a continuous line described as follows:

BEGINNING at the Southwest corner of Lot 241 as shown on Map of Ontario Colony Lands, recorded in Map Book 11, page 6, Office of the County Recorder of San Bernardino County, said corner being the Point of Beginning;

1. Thence Southeasterly to the Southeast corner

of Lot 419 of said Ontario Colony Lands;

2. Thence Southeasterly to a point 1300 feet North of the South line and 1300 feet East of the West line of Section 4, T1S, R7W;

3. Thence Easterly to a point on the East line of Section 4, 1800 feet North of the Southeast corner of said Section 4;

4. Thence Easterly to the Southeast corner of the Southwest quarter of the Northeast quarter of Section 3, T1S, R7W;

5. Thence Northeasterly to a point on the North line of Section 2, T1S, R7W, 1400 feet East of the West line of said Section 2;

6. Thence Northeasterly to the Southwest corner of Section 18, T1N, R6W;

7. Thence Northerly to the Northwest corner of said Section 18;

8. Thence Easterly to the Northeast corner of said Section 18;

9. Thence Northerly to the Northwest corner of the Southwest quarter of Section 8, T1N, R6W;

10. Thence Easterly to the Northeast corner of said Southwest quarter of said Section 8;

11. Thence Southerly to the Southeast corner of said Southwest quarter of said Section 8;

12. Thence Easterly to the Northeast corner of Section 17, T1N, R6W;

13. Thence Easterly to the Northeast corner of Section 16, T1N, R6W;

14. Thence Southeasterly to the Northwest corner of the Southeast quarter of Section 15, T1N, R6W;

15. Thence Easterly to the Northeast corner of said Southeast quarter of said Section 15;

16. Thence Southeasterly to the Northwest corner of the Northeast quarter of Section 23, T1N, R6W;

17. Thence Southeasterly to the Northwest corner

of Section 25, T1N, R6W;

18. Thence Southeasterly to the Northwest corner of the Northeast quarter of Section 31, T1N, R5W;

19. Thence Southeasterly to the Northeast corner of the Northwest quarter of Section 5, T1S, R5W;

20. Thence Southeasterly to the Southeast corner of Section 4, T1S, R5W;

21. Thence Southeasterly to the Southeast corner of the Southwest quarter of Section 11, T1S, R5W;

22. Thence Southwesterly to the Southwest corner of Section 14, T1S, R5W;

23. Thence Southwest to the Southwest corner of Section 22, T1S, R5W;

24. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 6, T2S, R5W;

25. Thence Southeasterly to the Northeast corner of Section 18 T2S, R5W;

26. Thence Southwesterly to the Southwest corner of the Southeast quarter of Section 13, T2S, R6W;

27. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 26, T2S, R6W;

28. Thence Westerly to the Southwest corner of the Northwest quarter of said Section 26;

29. Thence Northerly to the Northwest corner of said Section 26;

30. Thence Westerly to the Southwest corner of Section 21, T2S, R6w:

31. Thence Southerly to the Southeast corner of Section 29, T2S, R6W;

32. Thence Westerly to the Southeast corner of Section 30, T2S, R6W;

33. Thence Southwesterly to the Southwest corner of Section 36, T 2 S, R 7 W;

34. Thence Southwesterly to the Southeast corner

of Section 3, T3S, R7W;

35. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 10, T3S, R7W;

36. Thence Southerly to the Northeast corner of the Northwest quarter of Section 15, T3S, R7W;

37. Thence Southwesterly to the Southeast corner of the Northeast quarter of Section 16, T3S, R7W;

38. Thence Southwesterly to the Southwest corner of said Section 16;

39. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 20, T3S, R7W;

40. Thence Westerly to the Southwest corner of the Northwest quarter of said Section 20;

41. Thence Northerly to the Northwest corner of Section 17, T3S, R7W;

42. Thence Westerly to the Southwest corner of Section 7, T3S, R7W;

43. Thence Northerly to the Southwest corner of Section 6, T3S, R7W;

44. Thence Westerly to the Southwest corner of Section 1, T3S, R8W;

45. Thence Northerly to the Southeast corner of Section 35, T2S, R8W;

46. Thence Northwesterly to the Northwest corner of said Section 35;

47. Thence Northerly to the Southeast corner of Lot 33, as shown on Map of Tract 3193, recorded in Map Book 43, pages 46 and 47, Office of the County Recorder of San Bernardino County;

48. Thence Westerly to the Northwest corner of the Southwest quarter of Section 28, T2S, R8W;

49. Thence Northerly to the Southwest corner of Section 4, T2S, R8W;

50. Thence Westerly to the Southwest corner of Section 5, T2S, R8W;

51. Thence Northerly to the Southwest corner of Section 32, T1S, R8W;

52. Thence Westerly to the Southwest corner of Section 31, T1S, R8W;

53. Thence Northerly to the Southwest corner of Section 30, T1S, R8W;

54. Thence Northeasterly to the Southwest corner of Section 20, T1S, R8W;

55. Thence Northerly to the Northwest corner of the Southwest quarter of the Southwest quarter of said Section 20;

56. Thence Northwesterly to the Northeast corner of the Southeast quarter of the Southeast quarter of the Northwest quarter of Section 19, T1S, R8W;

57. Thence Easterly to the Northwest corner of Section 21, T1S, R8W;

58. Thence Northeasterly to the Southeast corner of the Southwest quarter of the Southwest quarter of Section 10, T1S, R8W;

59. Thence Northeasterly to the Southwest corner of Section 2, T1S, R8W;

60. Thence Northeasterly to the Southeast corner of the Northwest quarter of the Northwest quarter of Section 1, T1S, R8W;

61. Thence Northerly to the Northeast corner of the Northwest quarter of the Northeast quarter of Section 36, T1N, R8W;

62. Thence Northerly to the Southeast corner of Section 24, T1N, R8W;

63. Thence Northeasterly to the Southeast corner of the Northwest quarter of the Northwest quarter of Section 20, T1N, R7W; and

64. Thence Southerly to the Point of Beginning.

## Sections Included

Said perimeter description includes all or portions of the following Townships, Ranges and Sections of San Bernardino Base and Meridian:

| | |
|---|---|
| T1N, R5W - Sections: | 30, 31 and 32 |
| T1N, R6W - Sections: | 8, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 |
| T1N, R7W - Sections: | 19, 20, 24, 25, 26, 29, 30, 31, 32, 35 and 36 |
| T1N, R8W - Sections: | 25 and 36 |
| T1S, R5W - Sections: | 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 28, 29, 30, 31 and 32. |
| T1S, R6W - Sections: | 1 through 36, inclusive |
| T1S, R7W - Sections: | 1 through 36, inclusive |
| T1S, R8W - Sections: | 1, 2, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 |
| T2S, R5W - Sections: | 6, 7 and 18 |
| T2S, R6W - Sections: | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 29, 30 and 31 |
| T2S, R7W - Sections: | 1 through 36, inclusive |
| T2S, R8W - Sections: | 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 35 and 36 |
| T3S, R7W - Sections: | 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17 and 20 |
| T3S, R8W - Section: | 1. |

THE DOCUMENT TO WHICH THIS CERTIFICATION IS ATTACHED IS A FULL, TRUE AND CORRECT COPY OF THE ORIGINAL ON FILE AND OF RECORD IN MY OFFICE.

ATTEST OCT 2 9 2002

Clerk of the Superior Court of the State of California, in and for the County of San Bernardino

By _____ Deputy

Terry Wittenborn

92 pages

# E

# Appendix E. Chino Basin 2020 Optimum Basin Management Program

# 2020

# Optimum Basin Management Program Update Report

Prepared for:

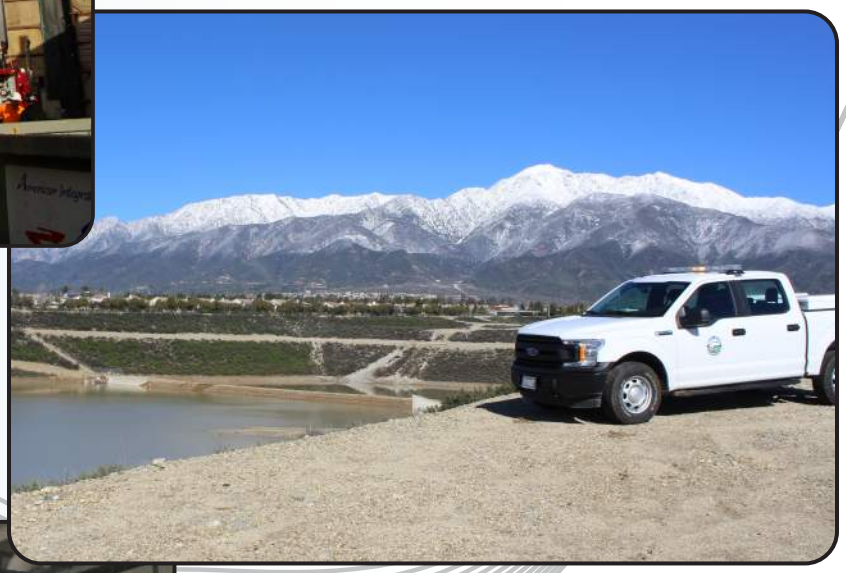

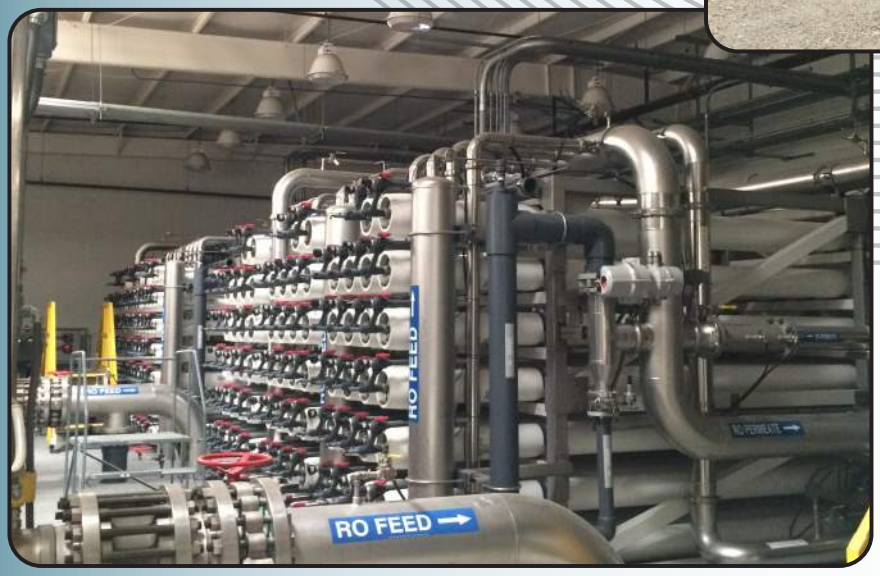


January 2020

WEI
Wildermuth Environmental, Inc.

**To:** Chino Basin Watermaster Stakeholders

**From:** Watermaster 2020 OBMP Update Team

**Subject:** 2020 Optimum Basin Management Program Update Report

**Date:** Draft November 22, 2019; Final January 24, 2020

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**Appendix D – *Stakeholder Participation Log***

**Appendix E – *2020 Storage Management Plan***

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Exhibit 17 – Implementation Actions for the 2020 Optimum Basin Management Program Update by Program Element

# 1.0 Introduction and Background

In September 2018, the Chino Basin Watermaster (Watermaster) initiated the process to update its Optimum Basin Management Program (OBMP) and the associated Implementation Plan. A detailed description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update was described in a white paper prepared for the stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper is included herein as Appendix A.

The purpose of this *2020 Optimum Basin Management Program Update Report* (2020 OBMP Update Report) is to document the stakeholder process to update the OBMP and describe the recommended 2020 OBMP management plan. The management plan will form the foundation for Watermaster and the Chino Basin Judgment Parties (hereafter, Parties[1]) to develop a final implementation plan (the 2020 OBMP Implementation Plan) and the agreements necessary to implement it. The draft 2020 OBMP Update Report was released for stakeholder review and comment on November 22, 2019. This version reflects changes made in response to comments received. A record of the comments received and the responses provided by Watermaster are included herein as Appendix B.

## 1.1 History of the OBMP and its Implementation

The Chino Basin Judgment invested Watermaster with the discretionary authority to develop an OBMP for the Chino Basin, including both water quantity and quality considerations. Paragraph 41 (within the Physical Solution), states:

> 41. Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations. Withdrawals and supplemental water replenishment of Basin Water, and the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees composed of the affected producers. Both the quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized.[2]

### 1.1.1 The OBMP and the Peace Agreement

Watermaster, at the direction of the Court, began developing the OBMP in 1998 and completed it in July 2000. The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders, described the physical state of the groundwater basin, defined a set of management goals, characterized impediments to those goals, and developed a series of actions that could be taken to remove the impediments and achieve the management goals. This work was documented in the *Optimum Basin Management Program – Phase I Report* (OBMP Phase 1 Report).[3]

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[1] Defined terms in the Court Approved Management Agreements will appear with the first letter of each word capitalized.

[2] See Restated Judgment, ¶ 41

[3] WEI. (1999). *Optimum Basin Management Program – Phase I Report*. Prepared for the Chino Basin Watermaster. August 19, 1999. http://www.cbwm.org/docs/engdocs/OBMP%20-%20Phase%20I%20(Revised%20DigDoc).pdf

The four goals of the 2000 OBMP included:

*Goal 1 – Enhance Basin Water Supplies*

*Goal 2 – Protect and Enhance Water Quality*

*Goal 3 – Enhance Management of the Basin*

*Goal 4 – Equitably Finance the OBMP*

The actions defined by the stakeholders to remove impediments to the OBMP goals were logically grouped into sets of coordinated activities called Program Elements (PEs), each of which included a list of implementation actions and an implementation schedule. The nine PEs defined in the 2000 OBMP included:

*PE 1 – Develop and Implement Comprehensive Monitoring Program*. The objectives of the comprehensive monitoring program are to collect the data necessary to support the implementation of the other eight PEs and periodic updates to the *State of the Basin Report*.[4]

*PE 2 – Develop and Implement Comprehensive Recharge Program*. The objectives of the comprehensive recharge program include increasing stormwater recharge to offset the recharge lost due to channel lining, to increase Safe Yield, and to ensure that there will be enough supplemental water recharge capacity available to Watermaster to meet its Replenishment Obligations.

*PE 3 – Develop and Implement a Water Supply Plan for Impaired Areas*. The objective of this program is to maintain and enhance Safe Yield with a groundwater desalting program that is designed to replace declining agricultural groundwater pumping in the southern part of the basin with new pumping to meet increasing municipal water demands in the same area, to minimize groundwater outflow to the Santa Ana River, and to increase Santa Ana River recharge into the basin.

*PE 4 – Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1*. The objectives of this land subsidence management program are to characterize the spatial and temporal occurrence of land subsidence, to identify its causes, and, where appropriate, to develop and implement a program to minimize or stop land subsidence.

*PE 5 – Develop and Implement Regional Supplemental Water Program*. The objective of this program is to improve the regional conveyance and availability of imported and recycled waters throughout the basin.

*PE 6 – Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management*. The objectives of this water quality management program are to identify water quality trends in the basin and the impact of the OBMP implementation on them, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water-quality regulators to identify and facilitate the cleanup of soil and groundwater contamination.

[4] See for example: WEI (2019). *Optimum Basin Management Program 2018 State of the Basin Report*. Prepared for the Chino Basin Watermaster. June 2018.

*PE 7 – Develop and Implement Salt Management Plan*. The objectives of this salinity management program are to characterize current and future salt and nutrient conditions in the basin and to develop and implement a plan to manage them.

*PE 8 – Develop and Implement Groundwater Storage Management Program*. The objectives of this storage program are to implement and periodically update a storage management plan that prevents overdraft, protects water quality, and ensures equity among the Parties, and to periodically recalculate Safe Yield. This PE explicitly defined the storage management plan, including a "Safe Storage Capacity" for the managed storage of 500,000 acre-feet (af)–inclusive of Local and Supplemental Storage and Storage and Recovery Programs.

*PE 9 – Develop and Implement Storage and Recovery Programs*. The objectives of this conjunctive use program are to develop Storage and Recovery Programs that will provide broad mutual benefit to the Parties and ensure that Basin Water and storage capacity are put to maximum beneficial use while causing no Material Physical Injury (MPI).

The PEs and their associated implementation actions were incorporated into a recommended management plan. The Parties used the management plan as the basis for developing the OBMP Implementation Plan and an agreement (the Peace Agreement) to implement it. The OBMP Implementation Plan is Exhibit B to the Peace Agreement. The Peace Agreement was reviewed in a programmatic environmental impact report (PEIR) that was certified by the Inland Empire Utilities Agency (IEUA) in July 2000.

The Parties entered into the Peace Agreement in June 2000. Under Resolution 2000-05,[5] Watermaster adopted the goals and plans of the OBMP Phase 1 Report and agreed to proceed in accordance with the Peace Agreement and the OBMP Implementation Plan. Following a July 2000 hearing, the Court directed Watermaster to proceed in a manner consistent with the Peace Agreement in order to implement the OBMP and received and filed the PEIR.

For the purposes of the discussions in this report, the term "OBMP" refers to the collective programs implemented by Watermaster and others (e.g. IEUA, Chino Basin Desalter Authority [CDA], etc.) pursuant to the Peace Agreements, the OBMP Implementation Plan, the PEIR, and any amendments to these documents.

### 1.1.2 2007 Supplement to the OBMP Implementation Plan and the Peace II Agreement

The work to develop the OBMP determined that the groundwater production of the Chino Basin Desalters would ultimately need to be 40,000 acre-feet per year (afy) to accomplish the goals of the OBMP. The Chino I Desalter production capacity prior to the Peace Agreement was 8 million gallons per day (mgd; 9,000 afy). The Peace Agreement provided for the expansion of the Chino I Desalter to up to 14 mgd (15,700 afy) and the construction of the Chino II Desalter, with a production capacity of 10 mgd. The Peace Agreement required a minimum combined Desalter production capacity of 20 mgd (22,400 afy) and it committed the Parties to developing expansion and funding plans for the remaining capacity within five years of approval of the Peace Agreement. The Parties developed the Peace II Agreement, which included provisions to expand the desalting capacity such that groundwater production reaches

[5] Chino Basin Watermaster. (2002). *Twenty Fourth Annual Report Fiscal Year 2000-2001*; Appendix O http://www.cbwm.org/docs/annualrep/24th%20Annual%20Report%20-%20Approved.pdf

40,000 afy. The Peace II Agreement introduced Re-operation[6] to achieve Hydraulic Control[7] of the Chino Basin and maintain Safe Yield. Hydraulic Control is both a goal of the OBMP and a requirement of the maximum-benefit salt-and-nutrient management plan (maximum benefit SNMP) that was developed by Watermaster and the IEUA under PE 7 to enable the expansion of recycled water recharge and reuse throughout the basin under PEs 2 and 5.

The Parties executed the Peace II Agreement in 2007, which included a supplement to the OBMP Implementation Plan to expand the Chino Basin Desalters to 40,000 afy of groundwater pumping, to incorporate Re-operation and Hydraulic Control, and to resolve other issues. There were no changes to the storage management plan in the OBMP Implementation Plan.

The IEUA Board certified a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010.

### 1.1.3 2017 Addendum to the 2010 Peace II SEIR

In 2016, Watermaster identified the need to update the storage management plan in the OBMP Implementation Plan because the total amount of water in managed storage accounts was projected to exceed the Safe Storage Capacity (SSC) limit of 500,000 af defined in the 2000 OBMP. In 2017, the IEUA adopted an addendum to the SEIR to provide a "temporary increase in the Safe Storage Capacity from 500,000 af to 600,000 af for the period of July 1, 2017 through June 30, 2021 […] until a comprehensive re-evaluation of the Safe Storage Capacity value/concept can be completed before June 30, 2021."[8] The addendum was supported with engineering work that demonstrated that this temporary increase in SSC would not cause MPI or loss of Hydraulic Control.

### 1.1.4 Grant Funding for OBMP Implementation

The OBMP provided the certainty necessary for Watermaster, the IEUA, the Parties, and regulators to mobilize for rapid implementation of the OBMP PEs as well as to attract significant outside funding for the design and construction of facilities. The following are a few examples:

- Under PE 2, having recharge master plans (RMPs) that clearly defined the financial and water-supply benefits of the projects enabled the IEUA to obtain about $40 million in grant funding and $16 million in low-interest loans to construct the recharge improvements recommended in the 2001 RMP and 2013 RMP Update, covering about 70 percent of the total capital costs.
- In support of PE 3, Watermaster, the IEUA and Western Municipal Water District successfully obtained about $148 million in grants for the design and construction of the Chino Basin Desalters, including Desalter I expansion, Desalter II, the Chino Creek wellfield, and the current

[6] Re-operation is the controlled overdraft of the basin by the managed withdrawal of groundwater pumping for the Chino Basin Desalters and the potential increase in the cumulative un-replenished pumping from the 200,000 acre-feet authorized by paragraph 3 of the Engineering Appendix Exhibit I to the Restated Judgment, to 600,000 acre-feet for the express purpose of securing and maintaining Hydraulic Control as a component of the Physical Solution.

[7] Hydraulic Control is the elimination of groundwater discharge from the Chino-North Groundwater Management Zone to the Santa Ana River or its reduction to less than 1,000 afy.

[8] Tom Dodson & Associates. (2017). *Addendum No. 1 to the Optimum Basin Management Program Project*. Page 2.

Desalter II expansion to incorporate treatment of point-source contamination associated with the South Archibald trichloroethene (TCE) plume. This funding has covered about 45 percent of the total capital costs of these facilities.

- In support of PEs 2 and 5, the IEUA successfully obtained about $64 million in grants and $115 million in low-interest loans for the construction of the recycled water distribution system, covering about 70 percent of the total capital costs.

In total, Watermaster and the IEUA have obtained over $230 million in grant funding and over $130 million in low-interest loans to implement the OBMP.

## 1.2 Need for the 2020 OBMP Update

The current OBMP contains a set of management programs that improve the reliability and long-term sustainability of the Chino Basin and the water supply reliability of the Judgment Parties. The framework for developing the OBMP—including the goals of the Parties, the hydrologic understanding of the basin, the institutional and regulatory environment, an assessment of the impediments to achieving the Parties' goals, and the actions required to remove the impediments and achieve the goals—were all based on 1998-1999 conditions.

As of 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented; though some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified. The strategic drivers and trends that shaped the goals and activities of the OBMP in the late 1990s have since changed. And, there are several drivers and trends in today's water management space that may challenge the ability of the Parties to protect their collective interests in the Chino Basin and their water supply reliability.

Exhibit 1 characterizes the drivers and trends shaping water management and their basin management implications for the Parties. "Drivers" are external forces that cause changes in the Chino Basin water space, such as climate change, regulations, and funding. Grouped under each driver are expected trends that emanate from that driver. For example, trends associated with climate change include reduced groundwater recharge, increased evaporation, and reduced imported water supply. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications. For example, a management implication of reduced groundwater recharge is the reduction of the Chino Basin Safe Yield.

The drivers, trends, and implications were first identified in the OBMP White Paper and served as the initial rationale for recommending an update to the OBMP. Exhibit 1 represents the final characterization of the drivers, trends, and implications, based on stakeholder input during the process to update the OBMP. The basin management implications that form the stakeholders' rationale for the 2020 OBMP Update are:

- Reductions in Chino Basin Safe Yield
- Reduced imported water availability and increased cost
- Imported water quality degradation
- Chino Basin water quality degradation
- Inability to pump groundwater with existing infrastructure
- Increased cost of groundwater use
- Recycled water quality degradation
- Reduced recycled water availability and increased cost

- Increased cost of Basin Plan compliance

Additionally, the PEIR and SEIR for the OBMP are nineteen and nine years old, respectively. Knowledge of the basin's characteristics has improved since these documents were adopted, water management challenges have intensified, and environmental considerations have changed. An updated PEIR will better support decision-making, investment, and grant applications for ongoing and new management actions under the OBMP.

Finally, it is anticipated that it will become increasingly difficult to secure grants and low-interest loans due to increased competition in the future. Most grant and low-interest loan programs require, or heavily favor, projects that are within watersheds and groundwater basins with adopted integrated regional management plans, groundwater sustainability plans, or their equivalents. The 2020 OBMP Update is equivalent to a regional water resources and groundwater management plan that, in addition to allowing the implementation of the Physical Solution, will enable the stakeholders to be competitive in applying for grants and low-interest loans.

For these reasons, Watermaster and the Parties need to update the OBMP and its Implementation Plan, and perform the CEQA process, to set the framework for the next 20 years of basin-management activities.

## 1.3 Stakeholder Process for the 2020 OBMP Update

The 2020 OBMP Update was facilitated using a collaborative stakeholder process like that employed for the development of the 2000 OBMP. Throughout 2019, Watermaster held a series of public listening sessions to support the development of the 2020 OBMP Update. The purpose of the listening sessions was to obtain information, ideas, and feedback from the stakeholders to define their issues, needs, and wants; their collective goals for the 2020 OBMP Update; impediments to achieving the goals; the management actions required to remove the impediments; and a proposed plan to implement the management actions.

Watermaster established an OBMP Update Team to facilitate the stakeholder process, composed of Watermaster staff, Watermaster legal counsel, engineers and scientists from Wildermuth Environmental Inc. (WEI; Watermaster's engineering consultant), and IEUA staff. The OBMP Update Team provided key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objectives were to communicate the process for updating the OBMP, to ensure that the ideas and opinions of every stakeholder were heard, to present the information that will be considered for inclusion in the OBMP Update, and to ensure the stakeholder feedback is captured correctly.

The OBMP Update Team held eight listening sessions on the following dates:

- Listening Session 1: January 15, 2019
- Listening Session 2: February 12, 2019
- Listening Session 3: March 21, 2019
- Listening Session 4: May 16, 2019
- Listening Session 5: July 31, 2019
- Listening Session 6: September 11, 2019
- Listening Session 7: October 17, 2019
- Listening Session 8: December 11, 2019

The objectives of the first four listening sessions were (1) to confirm the need to update the OBMP; (2) to identify the issues, needs, and wants of the stakeholders; (3) to define goals for the 2020 OBMP

Update; and (4) to identify new and revised activities that could be included in the 2020 OBMP Update to remove impediments to achieving the 2020 OBMP Update goals. The *2020 OBMP Scoping Report* (Scoping Report) summarized and integrated the work products of these four listening sessions and described the recommended scope of work to implement each of the "2020 OBMP Update Activities" defined by the stakeholders. The final Scoping Report, including responses to stakeholder comments, is included herein as Appendix C and is discussed further in Section 2.2 of this report.

The objectives of Listening Sessions 5 and 6 were to present and obtain feedback on the scopes of work described in Section 3 of the Scoping Report. The objective of Listening Session 7 was to present and obtain feedback on the integration of the 2020 OBMP Update Activities defined in the Scoping Report with the 2000 OBMP PEs. The objectives of Listening Session 8 were to present and obtain feedback on the recommended 2020 OBMP management plan documented in the *Draft 2020 OBMP Update Report* and to begin discussions on the 2020 OBMP Implementation Plan and implementation agreements.

Appendix D to this report documents the stakeholder attendance at the listening sessions. All documents related to the 2020 OBMP Update, including meeting materials from the listening sessions and report deliverables, are available on the Watermaster's website.[9]

## 1.4 Organization and Use of this Report

This *2020 OBMP Update Report* describes the 2020 OBMP Update process (Section 1), the OBMP goals and new activities for the 2020 OBMP Update (Section 2), the status of the OBMP PEs and ongoing activities within them (Section 3), and the recommended 2020 OBMP management plan – inclusive of ongoing and new activities (Section 4). The management plan in Section 4 will form the foundation for the Parties to develop a final implementation plan (2020 OBMP Implementation Plan) and the agreements necessary to implement it. Exhibit 2 shows the parallels between the 2000 and 2020 documentation and the subsequent processes to develop implementation plans and agreements for approval by the Court and environmental review under CEQA.

Implementation of the management plan described in Section 4 may or may not result in the construction of new facilities, and nothing in this document obligates Watermaster or the Parties to implement the optimization recommendations. However, some of the implementation actions included in the management plan are required by Watermaster to administer the Physical Solution or comply with other Watermaster or regulatory requirements. These required implementation actions may or may not result in the development and implementation of projects.

[9] http://www.cbwm.org/OBMPU.htm

# 2.0 2020 OBMP Goals and Activities

## 2.1 OBMP Goals

The issues, needs, and wants of the stakeholders form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the goals as well as the action items to remove the impediments. Through the listening session process, 57 unique needs and wants were identified by the stakeholders. The classes of identified issues were effectively the same as the implications for basin management defined in Exhibit 1. Exhibit 3 is a matrix, summarizing the needs and wants of the stakeholders, organized by basin management issue (rows) and showing attribution to stakeholders that share each need/want (columns).

Through the assessment of basin management issues, needs, and wants, the stakeholders concluded that the goals defined in the 2000 OBMP are still relevant today. The Parties' intent for each goal of the 2020 OBMP Update, as documented in the Scoping Report, are:

> ***Goal No. 1 - Enhance Basin Water Supplies.*** The intent of this goal is to increase the water supplies available for Chino Basin Parties and improve water supply reliability. This goal applies to Chino Basin groundwater and all other sources of water available for beneficial use.
>
> ***Goal No.2 - Protect and Enhance Water Quality.*** The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.
>
> ***Goal No.3 - Enhance Management of the Basin.*** The intent of this goal is to encourage sustainable management of the Chino Basin to avoid Material Physical Injury, promote local control, and improve water-supply reliability for the benefit of all Chino Basin Parties.
>
> ***Goal No. 4 - Equitably Finance the OBMP***. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

The far right-hand column in Exhibit 3 illustrates the nexus of the OBMP goals to the needs and wants of the Parties.

## 2.2 New Activities to Achieve the Goals of the 2020 OBMP Update

There are physical, institutional, and financial impediments to achieving the 2020 OBMP goals. The issues, needs, and wants of the stakeholders shown in Exhibit 3 recognize these impediments. The stakeholders identified and described 12 activities that, if implemented, would address their issues, needs, and wants. The 12 activities, as initially defined by the stakeholders, are listed in Exhibit 4 (the activities are identified by the letters A through L). Exhibit 3 illustrates which of the 12 activities the stakeholders believe have the potential to address each of their needs and wants. 55 of the 57 needs and wants were identified as addressed by one or more of the proposed activities.

Exhibit 5 illustrates the nexus of the OBMP goals, the impediments to achieving these goals, the stakeholder-defined activities to remove the impediments, and the potential outcomes (i.e. the implications) of implementing each activity. Exhibit 5 also shows the nexus of each activity to addressing the issues, needs, and wants of the stakeholders, categorized by basin management issues. In the process of describing the nexus of the goals and activities shown in Exhibit 5, it was identified that some of the activities in Exhibit 4 are related enough to be combined into a single management activity. Nine of the activities (A, B, C, D, E, F, G, K, and L) were combined into seven basin management activities. The

remaining three activities (H, I, and J) were identified as actions that could either be accomplished by incorporating them into the scopes of work of every activity or were more appropriate for inclusion within an implementation agreement.[10]

The seven basin management activities described in the Scoping Report are:[11]

*Activity A – Increase the capacity to store and recharge storm and supplemental water*

*Activity B – Develop, implement, and optimize Storage and Recovery Programs*

*Activity CG – Identify and implement regional conveyance and treatment projects/programs and optimize the use of all water supply sources*

*Activity D – Maximize the reuse of recycled water produced by the IEUA and others*

*Activity EF – Develop and implement a groundwater-quality management plan to address contaminants of emerging concern*

*Activity K – Develop a management strategy within the maximum-benefit salt and nutrient management plan to ensure compliance with recycled water recharge dilution requirements.*

*Activity L – Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance requirements*

The Scoping Report described each of the seven activities at the detail required to define a scope of work to implement them. The potential outcomes described in Exhibit 5 provided the basis for the scope of each activity. For each activity, the Scoping Report includes: a description of the activity, the need and function of the activity—including supporting technical demonstrations, the activity's relationship to the OBMP PEs, a recommended scope of work to perform the activity to achieve the desired outcomes, a preliminary schedule for implementing the tasks that comprise the scopes of work, and a budget-level cost estimate to implement the initial tasks that could reasonably be estimated on currently available information.

Each activity is a management process to optimize some aspect of basin management, such as water quality (EF, K) or managed recharge (A). Thus, the scope of work for each activity represents the methodical process to characterize and analyze the basin management challenge (including technical data and institutional information), to define potential management alternatives, and to select the optimum management solution(s). Each management process is generally composed of four phases:

(1) Scoping (S) – In this phase, the stakeholders convene to precisely articulate the objectives of the management process and refine the scope of work, cost, and schedule to execute it.

(2) Evaluate the need for projects or other management solutions (PN) – In this phase, available and/or new data and information are compiled and analyzed to characterize and demonstrate the need for management programs or projects to achieve the stakeholder objectives defined in the scoping phase.

[10] See the *2020 OBMP Scoping Report* (included herein as Appendix C) for more details on how Activities H, I, and J can be incorporated in the activity scopes of work and/or the 2020 OBMP Implementation Plan agreement(s).

[11] The activity names listed here have been simplified from the original descriptions defined by the stakeholders and shown in Exhibit 4.

(3) Define and evaluate management alternatives (PE) – The evaluation phase includes the following generalized steps: develop planning, screening, and evaluation criteria; identify the potential program or project alternatives; develop reconnaissance-level engineering design and operating plans for project alternatives; develop an engineering cost opinion for each alternative; describe how each alternative could be implemented and financed; evaluate alternatives based on the evaluation criteria; and select the preferred program or project alternative.

(4) Implementation (I) – In this phase, the preferred program or project alternative is implemented subject to developing the necessary agreements between participating Parties. If a project is identified, implementation also includes: preparing the preliminary design of the recommended alternative, preparing the environmental documentation that will tier-off the 2020 OBMP Update PEIR, preparing a financial plan for constructing the recommended alternative, preparing final design of the recommended alternative, acquiring permits for constructing and operating the recommended alternative, and constructing the recommended alternative.

The end of each phase represents a check in point where the scope of work can be adapted to deal with changed conditions or an off-ramp where a go/no-go decision can be made to continue with the next phase of the management process. Thus, activities may or may not result in the design and implementation of management plans or facilities.

Exhibits 6 through 12 summarize the key features of each of the seven activities described in detail in the Scoping Report. For each activity, the exhibit summarizes the need and objectives, the scope of work, and a general implementation schedule with go/no-go decision points identified. The scopes of work are divided into tasks, and for each task, the following are identified: the corresponding management process phase (S, PN, PE, I), the expected outcomes, Watermaster's role in implementing the task (if any), and whether Watermaster deems the outcomes as required to administer the Physical Solution or comply with other Watermaster or regulatory requirements.

Implementation of the management processes characterized in Exhibits 6 through 12 may or may not result in the construction of new facilities, and nothing in this document obligates Watermaster or the Parties to implement the scopes as described. In activity implementation, for those outcomes that are deemed necessary to administer the Physical Solution or comply with other requirements, Watermaster will provide for the opportunity to revise the scopes of work and cost in the scoping phase. Any revisions will be subject to the discretion of Watermaster to ensure that the final scope of work achieves the required outcomes.

The following sections summarize the seven 2020 OBMP Update Activities identified by the Parties and describes the new implementation actions for inclusion in the 2020 OBMP Update Management Plan (in Section 4) to accomplish the objectives of the activities.

### 2.2.1 Activity A – Increase the capacity to store and recharge storm and supplemental water

The stakeholders have identified a lost opportunity for stormwater recharge in the basin and a limitation of Watermaster and the IEUA's existing economic selection criteria for new recharge projects. The use of the existing criteria resulted in a recommendation in the 2018 RMP Update (RMPU) that no new recharge projects be implemented. Thus, the Activity A objectives are (1) to maximize stormwater

capture pursuant to Watermaster's diversion permits,[12] (2) to promote the long-term balance of recharge and discharge, (3) to ensure sufficient supplemental water recharge capacity for future replenishment, (4) to reduce dependence on imported water by maintaining or enhancing Safe Yield, (5) to improve water quality, and (6) to ensure a supply of dilution water to comply with recycled water recharge permit requirements. For the remainder of this report, the term "recharge" is inclusive of diverting, storing, and recharging storm and supplemental waters.

The Scoping Report identified that based on the alignment of the scope of work to achieve the outcomes of Activity A with those of the RMPU process, implemented through OBMP PE 2, the outcomes of Activity A can be accomplished as part of the existing RMPU process, which is updated at least every five years as required by the Court. Thus, implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 6 will result in the completion of the required 2023 RMPU, including obtaining consensus on its objectives, developing an implementation and financing plan, preparing the report, and implementing recharge projects. These outcomes are required by Watermaster to ensure that the yield of the basin is maintained and that the supplemental recharge capacity is sufficient to meet Replenishment Obligations. Although not required, the next (or a future) RMPU process could accomplish the objectives of Activity A by updating the project selection criteria and considering projects that will meet other needs of the Parties, such as providing additional recharge capacity for Storage and Recovery Programs or addressing pumping sustainability issues.

Based on the scope of work and alignment with the existing PE 2 implementation actions, there are no new implementation actions required for inclusion in the 2020 OBMP Update to accomplish Activity A.

### 2.2.2 Activity B - Develop, implement, and optimize Storage and Recovery Programs

The Peace Agreement states that "Watermaster shall prioritize its efforts to regulate and condition the storage and recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits."[13] For this and other reasons, the Parties desire to develop "optimized" Storage and Recovery Programs that avoid potential MPI and provide broad benefits, such as increased water-supply reliability, protected or enhanced Safe Yield, improvements to water quality, and reduced cost of OBMP implementation.

The objective of Activity B is to prepare a Storage and Recovery Program guidance document in a collaborative setting that clearly articulates the specific objectives of the Parties and the required benefits to be realized from Storage and Recovery Programs. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 7 will result in: (1) consensus on the objectives and desired benefits of Storage and Recovery programs, (2) conceptual descriptions of various types of Storage and Recovery programs that achieve the defined objectives and benefits and are consistent with the *2020 Storage Management Plan*, (3) reconnaissance-level project designs and

[12] Watermaster holds three permits with the State Water Resources Control Board (State Board) for the diversion and recharge of stormwater in trust for the Parties. The San Bernardino County Flood Control District (SBCFCD) is a co-permittee for two of these permits, 19895 and 20753. Each permit defines a maximum diversion limit and the period over which diversions are allowed to occur each year (diversion season): (1) Permit 19895 has a diversion limit of 15,000 acre-feet (af) from November 1 to April 30, (2) Permit 20753 has a diversion limit of 27,000 af from October 1 to May 1, and (3) Permit 21225 has a diversion limit of 68,500 af from January 1 to December 31.

[13] See Peace Agreement, § 5.2(c)

operating plans and the costs of the Storage and Recovery Program alternatives, and (4) the development of a *Storage and Recovery Program Master Plan* that will support the design of Storage and Recovery Programs that are consistent with the *2020 Storage Management Plan* and the Peace Agreement. Watermaster deems the development of a *Storage and Recovery Program Master Plan* a necessary outcome so that Watermaster is able to review, condition, and approve Storage and Recovery Program applications in a manner that is uniform, predictable, and consistent with the Peace Agreement.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity B are:

- Develop a *Storage and Recovery Master Plan* to support the design of optimized Storage and Recovery Programs that are consistent with the 2020 Storage Management Plan and to provide the Watermaster with criteria to review, condition, and approve applications in a manner that is consistent with the Judgment and the Peace Agreement.

### 2.2.3 Activity CG - Identify and implement regional conveyance and treatment projects/programs and optimize the use of all water supply sources

The stakeholders have identified basin management challenges, such as land subsidence and poor water quality, that could limit their ability to fully exercise their pumping rights using existing infrastructure. Thus, the Activity CG objectives are to optimize the use of all sources of water available to the Parties to meet their demands despite these basin management challenges and to potentially help mitigate these challenges. Implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 8 will result in (1) a plan that describes the universe of water reliability concerns of the Parties, the opportunities and limitations of existing/planned infrastructure to meet the reliability goals, conceptual project designs and operating plans, and the costs of the reliability alternatives; and (2) implementation of the selected reliability project(s). As identified in the Scoping Report, the Activity CG scope of work is effectively the same as the IEUA's existing Integrated Water Resources Plan (IRP) process that addresses water supply reliability for its member agencies. Activity CG is an expansion that would address the water supply reliability concerns of all Parties to the Judgment. Currently, IEUA is preparing its 2020 IRP and other related planning efforts with its member agencies. This effort, or future IRP updates could be expanded by others to include neighboring agencies, including Three Valleys Municipal Water District (TVMWD), Western Municipal Water District (WMWD), or others. To create a coordinated planning effort, any of these agencies could lead and coordinate the collaborative regional effort on behalf of the Parties.

Although this activity optimizes the management of all water supplies in the Chino Basin, Watermaster does not deem these outcomes necessary for administration of the Physical Solution or compliance with other Watermaster or regulatory requirements.

Based on the scope of work, and considering its overlap with IEUA planning efforts, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity CG are:

- The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish and/or expand integrated water resources planning efforts to address water supply reliability for all Watermaster Parties.
- Watermaster will support the IEUA, TVMWD, WMWD, and/or others in their efforts to improve water supply reliability to ensure those efforts are integrated with Watermaster's groundwater management efforts.

These implementation actions are included as part of the 2020 OBMP Update to complement existing regional planning efforts, not to duplicate them.

### 2.2.4 Activity D - Maximize the reuse of recycled water produced by the IEUA and others

The objective of Activity D is to maximize the reuse of recycled water produced by the IEUA and other publicly owned treatment works (POTWs) in proximity to the Chino Basin to meet future demands and improve local water-supply reliability, especially during dry periods. Expanded reuse activities could include direct non-potable reuse (landscape irrigation or industrial uses), artificial recharge by spreading and/or injection (indirect potable reuse), and direct potable reuse. Increasing recycled water reuse is an integral part of the OBMP goal to enhance water supplies. The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses. And, the Judgment states that Watermaster shall give high priority to maximizing the beneficial use of recycled water for replenishment purposes.[14] Implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 9 will result in (1) a plan that describes the objectives for optimizing and maximizing recycled water reuse, the demand and opportunities for increased recycled water reuse, the impacts of recycled water reuse and required mitigation, conceptual project designs and operating plans, and the costs of the reuse project alternatives; and (2) implementation of the selected recycled water reuse project(s).

As identified in the Scoping Report, the scope of work is similar to the IEUA's existing planning efforts for the IRP and Chino Basin Program (CBP) on behalf of its member agencies. These efforts, or similar future efforts, could be expanded by others to include neighboring agencies, including the TVMWD, the WMWD, or others. To create a coordinated planning effort, any of these agencies could lead and coordinate the collaborative regional effort to maximize recycled water reuse on behalf of the Parties.

Although this activity maximizes the management of recycled water supplies in the Chino Basin, Watermaster does not deem these outcomes necessary for administration of the Physical Solution or compliance with other Watermaster or regulatory requirements. However, any expansion of recycled water reuse would be subject to Watermaster review to ensure compliance with the maximum benefit SNMP.

Based on the scope of work, and considering its overlap with IEUA planning efforts, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity D are:

- IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will expand future recycled water reuse planning efforts to maximize the reuse of all available sources of recycled water.
- Watermaster will support the IEUA, TVMWD, WMWD, and/or others in their efforts to maximize recycled water reuse to ensure these efforts are integrated with Watermaster's groundwater and salinity management efforts.

These implementation actions are included as part of the 2020 OBMP Update to complement existing regional planning efforts, not to duplicate them.

[14] See Restated Judgment, ¶ 49(a)

### 2.2.5 Activity EF - Develop and implement a groundwater-quality management plan to address contaminants of emerging concern

Groundwater contaminants are present across the Chino Basin, new contaminants are being discovered, and water-quality regulations are evolving and becoming more restrictive. These trends threaten to limit the beneficial use of groundwater and increase the cost of the water supply. The objectives of Activity EF are to characterize the water-quality challenges across the Chino Basin and identify the most efficient means to address these challenges, including the potential for multi-benefit collaborative projects to ensure that groundwater is put to beneficial use. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 10 will result in (1) the development and implementation of initial and long-term emerging contaminants monitoring plans, (2) a water-quality assessment of the Chino Basin that characterizes the need for a groundwater-quality management plan, and (3) the development and implementation of a *Groundwater-Quality Management Plan*. The *Groundwater-Quality Management Plan* would document the most current water-quality assessment, the long-term monitoring and analysis plan, the reconnaissance-level engineering designs and operating plans for alternative water quality improvement projects, the selected project(s) for implementation, and an implementation plan.

As previously noted, Paragraph 41 of the Judgment provides Watermaster the discretion to develop an OBMP that includes both water quantity and water quality considerations. If water quality is not effectively managed, the Parties may not be able to utilize their water rights, which could result in negative impacts to the basin, such as reductions in net recharge, loss of hydraulic control, and movement of contaminant plumes. Effective management of water quality in the Basin to preserve maximum beneficial use can only be accomplished through a systematic assessment of the emerging contaminant threats to the use of groundwater resources, and thoughtfully preparing a plan to respond to those threats. A *Groundwater-Quality Management Plan* would provide the Parties with the comprehensive data and information, including best practices for monitoring, required to understand and manage the future water-quality challenges that could impact the Parties' ability to fully utilize their pumping rights. Hence, Watermaster deems the outcomes of Activity EF as required for administration of the Physical Solution.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity EF are:

- Develop and implement an initial emerging contaminants monitoring plan.
- Prepare a water quality assessment of the Chino Basin to evaluate the need for a Groundwater Quality Management Plan.
- Develop and implement a long-term emerging contaminants monitoring plan.
- Develop and implement a Groundwater Quality Management Plan.

### 2.2.6 Activity K - Develop a management strategy within the maximum-benefit salt and nutrient management plan to ensure compliance with recycled water recharge dilution requirements

Watermaster and the IEUA are co-permittees for the Chino Basin maximum-benefit SNMP incorporated in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan). The maximum-benefit SNMP was developed pursuant to PE 7 (see Section 3.2.7 for additional details) to enable the recharge and reuse of recycled water planned in PEs 2 and 5. It defines the management actions that Watermaster and IEUA must take to manage total dissolved solids (TDS) and nitrate concentrations in Chino Basin groundwater and in the IEUA's recycled water and the TDS and nitrate concentration limitations for recycled water reuse activities. The objective of Activity K is to determine if compliance

with the recycled water recharge dilution requirements defined in Watermaster and the IEUA's maximum-benefit SNMP can be achieved under existing management plans and, if not, to develop a plan to achieve compliance. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 11 will result in (1) the periodic characterization and understanding of the ability to comply with the TDS and nitrate dilution requirements in the short- and long-term; and if non-compliance is projected, (2) a plan that describes the conceptual designs, operating plans, and costs of alternative salt-offset programs or projects, and (3) implementation of the selected salt-offset program or projects. Because the maximum-benefit SNMP is an explicit requirement of Basin Plan, these are required outcomes for Watermaster and the IEUA to continue the recycled water recharge program.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity K are:

- Periodically prepare TDS and nitrate concentration projections to evaluate compliance with the maximum benefit SNMP dilution requirements, and, if necessary, based on the outcome of the evaluation, prepare a plan and schedule to implement a salt-offset compliance strategy.

### 2.2.7 Activity L – Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance requirements

Watermaster conducts data-collection programs and prepares reports and data deliverables to comply with regulations, to fulfill its obligations under its agreements and Court orders, to comply with its requirements under CEQA, and to assess the performance of OBMP Implementation. The objective of Activity L is to refine the monitoring and reporting requirements of Watermaster to ensure that the objectives of each requirement are being met efficiently at a minimum cost. Implementation of the Activity L scope of work described in the Scoping Report and summarized in Exhibit 12 will result in (1) the comprehensive review of all monitoring/reporting programs in an open stakeholder process, (2) the development and periodic update of an *OBMP Monitoring and Reporting Work Plan*, and (3) potential revisions to Watermaster's non-discretionary monitoring and reporting programs. Watermaster is required to implement the monitoring and reporting programs to comply with the Judgment and other regulations and obligations; however, these specific outcomes are not required. This activity will allow the Parties to offer more direct input in the implementation of the required monitoring programs, but Watermaster does not deem this outcome necessary to comply with the monitoring requirements.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity L are:

- Perform review and update of Watermaster's regulatory and Court-ordered monitoring and reporting programs and document them in a work plan: *OBMP Monitoring and Reporting Work Plan*.
- Perform periodic review and update of *the OBMP Monitoring and Reporting Work Plan* and modify the monitoring and reporting programs, as appropriate.

If the above implementation actions are not initiated by the Parties, Watermaster staff and the Watermaster engineer would continue their existing process to periodically review and refine Watermaster's monitoring and reporting efforts to meet all requirements and achieve efficiencies.

# 3.0 Integration of the 2020 OBMP Update Activities with the 2000 OBMP Program Elements

## 3.1 Nexus of the 2020 OBMP Update Activities to the 2000 OBMP Program Elements

Through the process of defining the scopes of work to achieve the desired outcomes of the 2020 OBMP Update Activities, it became apparent that the PEs defined in the 2000 OBMP are still relevant today as the overarching program elements of a basin management program. Each of the seven activities in the Scoping Report had objectives and tasks that were directly related to one or more of the 2000 OBMP PEs. Exhibit 13 is a matrix that demonstrates the nexus between the PEs (rows) and the activities (columns) based the PE objectives (listed in Section 1.1 herein) and the objectives of the 2020 OBMP Update Activities (described in Section 2.2 herein). The matrix is symbolized with anchors and dots. Anchors indicate a direct relationship between an activity and a PE (i.e. the activity and the PE have similar or identical objectives and thus the activity can be integrated into the existing PE). Dots indicate an indirect relationship between an activity and a PE (i.e. the activity has the potential to provide benefits to PEs).

Based on this finding, the nine PEs defined in the 2000 OBMP will be retained for the 2020 OBMP Update. Each of the seven activities, and the associated implementation actions, was mapped to the PE to which it is anchored in Exhibit 13. Based on the need for ongoing activities under the existing PE and the new activities defined by the stakeholders, the implementation actions were modernized and updated.

## 3.2 OBMP Program Elements – Progress and Ongoing Management Actions

For each of the nine PEs, this section describes the objectives and implementation actions of the PE as established in 2000, implementation progress since 2000, and ongoing management activities, including the new actions to be incorporated in the 2020 OBMP, as identified in Section 2.2 of this report.

### 3.2.1 Program Element 1. Develop and Implement Comprehensive Monitoring Program

The 2000 OBMP included PE 1—*Develop and Implement Comprehensive Monitoring Program* —to provide the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance. The types of monitoring programs called for by PE 1 in the OBMP included:

- Groundwater-level monitoring
- Groundwater-quality monitoring
- Groundwater-production monitoring
- Surface-water discharge and quality monitoring (including managed artificial recharge)
- Ground-level monitoring
- Well construction, abandonment, and destruction

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 1 below. Each implementation action in Table 1 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

**Table 1. Program Element 1 – Implementation Actions Defined in the 2000 OBMP***

| Implementation Actions and Schedule | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 1 through 3 | | |
| *Perform initial tasks to survey sites and design and set up all long-term monitoring programs for groundwater level, groundwater quality, ground level, surface water, and recharge monitoring programs. | One-time | ✓ |
| Complete initial meter installation program for overlying agricultural pool. | One-time | ✓ |
| Develop agreements with county and state agencies regarding notification of new well drilling. Well construction and related information will be requested as new wells are constructed. Prepare and update a list of abandoned wells and coordinate with the counties to ensure that abandoned wells are destroyed properly. | One-time | ✓ |
| Years 4 through 50 | | |
| *Start and continue all groundwater level, groundwater production, groundwater quality, ground level (including remote sensing), surface water, and well construction/destruction monitoring programs. Key wells should be relocated as necessary. | Ongoing | ✓ |

**Note: Actions marked with "*" are combined from multiple actions in the OBMP Implementation Plan.*

#### *3.2.1.1 Implementation Progress since 2000*

Watermaster began implementing its monitoring programs as part of the development of the OBMP. Pursuant to the OBMP Implementation Plan, long-term plans for monitoring groundwater production, groundwater level, groundwater quality, ground level (including remote sensing), surface water, and well construction/destruction monitoring programs have been developed, implemented, and updated as necessary.

The monitoring programs have evolved over time to ensure that the data and information acquired not only meet the OBMP requirements, but also other regulatory requirements and Watermaster obligations under agreements, Court orders, and CEQA. In some instances, the monitoring programs were expanded to satisfy new basin-management initiatives and regulations. In other instances, the scope of the monitoring programs has been reduced with periodic reevaluation and redesign to achieve the monitoring objectives at reduced cost. Table 2 below is a list of each Watermaster monitoring and reporting requirement and the entities that require the monitoring and reporting. The Scoping Report provides a comprehensive overview of the status of the monitoring programs as of 2018.

Watermaster developed a centralized environmental database to store, manage, and visualize its datasets. Data management includes a detailed quality assurance and quality control protocol. The database and the database-management procedures ensure the quality and accuracy of the data, allow for efficient data exploration and analysis, and include standardized reports and data exports in formats for regulatory data deliverables or further analysis (e.g. creation of model input files).

**Table 2. Watermaster Monitoring and Reporting Requirements**

| Monitoring and Reporting Requirement | Requiring Entity | | | | | |
|---|---|---|---|---|---|---|
| | Court | State Board | Regional Board | California DFW | California DWR | CEQA |
| Water Rights Compliance Annual Reports | | X | | X | | |
| SGMA Annual Report for Adjudicated Basins | | | | | X | |
| Biannual Evaluation of the Cumulative Effect of Transfers | X | | | | | |
| Biannual Evaluation of the Balance of Recharge and Discharge | X | | | | | |
| Annual Finding of Substantial Compliance with the Recharge Master Plan | X | | | | | |
| Annual Report of Compliance with SB 88 and SWRCB Regulations for Measurement and Reporting of Diverted Surface Water | | X | | | | |
| Safe Yield Recalculation | X | | | | | |
| Recharge Master Plan Update (RMPU) | X | | | | | |
| State of the Basin Report | X | | | | | |
| California Statewide Groundwater Elevation Monitoring Program (CASGEM) | | | | | X | |
| Chino Basin Maximum Benefit Annual Report | | | X | | | |
| Annual Report of the Prado Basin Habitat Sustainability Committee | | | | | | X |
| Water Recycling Requirements for the Chino Basin Recycled Water Groundwater Recharge Program | | | X | | | |
| Annual Report of the Ground-Level Monitoring Committee | X | | | | | |
| OBMP Semi-Annual Status Reports | X | | | | | |

### *3.2.1.2 Ongoing implementation actions for the 2020 OBMP*

The following summarizes each of the Watermaster's monitoring and data-collection programs that need to continue to be implemented to satisfy the requirements of the OBMP and the other requirements summarized in Table 2 above. Section 4.1 of this report summarizes the 2020 OBMP Management Plan for PE 1.

***Groundwater-production monitoring***. Watermaster uses groundwater-production data to quantify and levy assessments pursuant to the Judgment. Estimates of production are also essential inputs to recalibrate Watermaster's groundwater flow model, which is used to inform the recalculation of Safe

Yield, evaluate the state of Hydraulic Control, perform MPI evaluations, and support many other Watermaster initiatives. Members of the Appropriative and Overlying Non-Agricultural Pools and CDA record their own meter data and submit them to Watermaster. For Agricultural Pool wells, Watermaster performs a field program to install totalizing flow meters, repair or replace broken meters, and visit the wells quarterly to record the metered data. Watermaster has determined that for some Agricultural Pool wells it is not practical to repair, replace or install new meters. In these cases, Watermaster applies a water-duty based method to estimate production on an annual basis.

***Groundwater-level monitoring***. Watermaster's groundwater-level monitoring program supports many Watermaster management functions, including: groundwater model development and recalibration, periodic recalculations of Safe Yield, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, subsidence management, MPI evaluations, estimation of storage change, other scientific demonstrations required for groundwater management, and many regulatory requirements, such as the demonstration of Hydraulic Control, the triennial recomputation of ambient water quality, and Prado Basin habitat sustainability. The monitoring program includes field monitoring programs implemented by Watermaster staff at private wells and monitoring wells, and cooperative programs to compile and store data from well owners and other entities managing monitoring programs, including municipal water agencies, private water companies, the California Department of Toxic Substance Control (DTSC), the County of San Bernardino, and various private consulting firms. To continue to support assessments of Hydraulic Control, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

***Groundwater-quality monitoring***. Watermaster's groundwater-quality monitoring program supports many Watermaster management and regulatory-compliance functions, including: compliance with the maximum benefit SNMP, characterization of non-point source contamination and plumes associated with point-source discharges, support for ground-water modeling, characterization of groundwater/surface-water interactions in the Prado Basin area, and characterization of basin-wide trends in groundwater quality as part of the Watermaster's biennial State of the Basin report. The monitoring program includes field monitoring programs implemented by Watermaster staff at private wells and monitoring wells, and cooperative programs to compile and store data from well owners and other entities managing monitoring programs (see examples noted for groundwater-level monitoring). To continue to support the triennial ambient water quality recomputation, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

***Surface-water and climate monitoring***. Watermaster's surface-water and climate monitoring program supports many Watermaster management functions, including: groundwater model development and recalibration, periodic recalculations of Safe Yield, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, MPI evaluations, recharge master planning, evaluating Prado Basin habitat sustainability, and evaluating compliance with the SWRCB diversion permits, the maximum benefit SNMP, and the recycled-water recharge permits. Most of the datasets are collected from publicly available sources, including POTW discharge data, USGS stream gaging station data, and precipitation and temperature data measured at public weather stations or downloaded from spatially gridded datasets. Chino Basin stormwater, imported water, and recycled water recharge data are collected by the IEUA and shared with Watermaster. Watermaster staff also performs field surface water monitoring of the Santa Ana River in compliance with the maximum-benefit SNMP.

***Ground-level monitoring***. Watermaster's ground-level monitoring program is conducted pursuant to the *Chino Basin Subsidence Management Plan*. The ground-level monitoring program consists of high-

frequency, groundwater level monitoring at wells, monitoring of the vertical component of aquifer system compression and expansion at Watermaster extensometer facilities, and measurement of horizontal ground-surface deformation across areas that are experiencing differential land subsidence by electronic distance measurements (EDMs) to understand the potential threats and locations of ground fissuring.

***Biological monitoring***. Watermaster's biological monitoring program is conducted pursuant to the adaptive monitoring program (AMP) for the Prado Basin Habitat Sustainability Program (PBHSP). The objective of the PBHSP is to ensure that the groundwater-dependent ecosystem in Prado Basin will not incur unforeseeable significant adverse impacts due to implementation of the Peace II Agreement. The monitoring program produces a time series of data and information on the extent and quality of the riparian habitat in the Prado Basin over a historical period that includes both pre- and post-Peace II implementation. Two types of monitoring and assessment are performed: regional and site-specific. Regional monitoring and assessment of the riparian habitat is performed by mapping the extent and quality of riparian habitat over time using multi-spectral remote-sensing data and air photos. Site-specific monitoring performed in the Prado Basin includes field vegetation surveys and seasonal ground-based photo monitoring.

***Water-supply and water-use monitoring***. Watermaster compiles water supply and water-use data from the Parties to support two required reporting efforts: the Watermaster Annual Report to the Court and annual reporting requirements for adjudicated basins pursuant to the Sustainable Groundwater Management Act (SGMA). The data are also used to support calibration of Watermaster's surface water and groundwater models. Monthly water use volumes for supply sources other than Chino Basin groundwater are collected from the Parties; this includes groundwater from other basins, recycled water, imported water, and native surface water.

***Planning information***. Watermaster periodically collects and compiles information on the Parties' best estimates of their future demands and associated water supply plans. The data are used for future planning investigations that require the use of Watermaster's surface and groundwater models, such as Safe Yield recalculations and RMP updates. These data include:

- Water demands and water-supply plans of the Watermaster Parties:
    - i. Projected total water demand
    - ii. Projected amount of each water supply by source to meet the projected water demand
    - iii. Monthly distribution of water supplies used to meet the demand
    - iv. Projected groundwater pumping at each existing well and future planned wells
    - v. Groundwater pumping schedules (i.e. well use priorities and capacities)
    - vi. Pumping capacities, required pumping combinations, and sustainable pumping levels (pumping sustainability metric) at each well
- Assumptions for how:
    - i. Managed storage will be used to meet Replenishment Obligations
    - ii. Lands currently in agricultural uses will be converted to urban uses
    - iii. Additional potential conservation above that currently required for new land development
- Future projections of location and magnitude of stormwater and supplemental water recharge

***Well construction, abandonment, and destruction***. Watermaster maintains a database on wells in the basin and performs periodic well inspections. Sometimes, Watermaster staff identifies a new well while

implementing its monitoring programs. Well owners must obtain permits from the appropriate county and state agencies to drill a well and to put the well in use. Watermaster has developed cooperative agreements with the State Water Board's Division of Drinking Water (DDW) and the Counties of Los Angeles, Orange, Riverside, and San Bernardino to ensure that the appropriate entities know that a new well has been constructed. Watermaster staff makes best efforts to obtain well design information, lithologic and geophysical logs, groundwater level and quality data, and aquifer stress test data.

The presence of abandoned wells is a threat to groundwater supply and a physical hazard. Watermaster staff periodically reviews its database, makes appropriate inspections, consults with well owners, maintains a list of abandoned wells in the Chino Basin, and provides this list to the counties for follow-up and enforcement. The owners of the abandoned wells are requested to properly destroy their wells following the ordinances developed by the county in which they are located.

### 3.2.2 Program Element 2. Develop and Implement Comprehensive Recharge Program

The 2000 OBMP included PE 2–*Develop and Implement Comprehensive Recharge Program*—to reverse the loss of yield caused by urbanization and the concrete lining of natural streams overlying the Chino Basin. PE 2 is also meant to ensure that there will be enough supplemental water recharge capacity available to Watermaster to meet Replenishment Obligations.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 3 below. Each implementation action in Table 3 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

**Table 3. Program Element 2 – Implementation Actions Defined in the 2000 OBMP**

| Implementation Action | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 1 through 3 | | |
| Watermaster advisory committee will form an ad-hoc committee to coordinate with CBWCD and SBCFCD. | One-time | ✓ |
| Implement all high priority recharge projects that involve only re-operation of existing recharge/flood control facilities. | One-time | ✓ |
| Complete the RMP. | One-time | ✓ |
| Complete design and construction of early action recharge projects identified in the first year of the implementation of the OBMP. | One-time | ✓ |
| Years 4 through 50 | | |
| By year 5 implement all high priority projects that involve construction and re-operation at existing facilities. | One-time | ✓ |
| Implement all other recharge projects based on need and available resources. | Ongoing | ✓ |
| Update the comprehensive recharge program every five years. | Ongoing | ✓ |

#### *3.2.2.1 Implementation Progress since 2000*

The scope of work defined under PE 2 was to continue the recharge master plan study initiated by Watermaster and the Chino Basin Water Conservation District (CBWCD) in 1998. The implementation plan for PE 2 includes the preparation of a recharge master plan update (RMPU) at least every five years. The objectives and scope of each RMPU are defined at the beginning of each update and are derived from several guiding documents: the Peace Agreement, the Peace II Agreement, and the Special Referee's December 2007 Report. Pursuant to these guiding documents, the general objectives of the RMPU are to ensure there is enough recharge capacity and supplemental water available to meet future replenishment requirements, to balance the recharge and discharge in every area and subarea, to maximize the recharge of recycled and storm waters where feasible, and to protect or enhance Safe Yield. To meet these objectives, the RMPUs must consider and address recharge requirement projections, the availability of storm and supplemental waters for recharge and replenishment, and the physical means to satisfy these recharge projections. To the extent that new or modified facilities are required to meet the objectives, the RMPUs include a schedule for the planning, design, and construction of recharge improvements. The 2001 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) were developed in open and transparent planning processes that were convened by Watermaster through an ad-hoc committee. As part of the *2013 Amendment to the 2010 RMPU* (2013 RMPU), the RMPU Steering Committee, now referred to as the Recharge Investigations and Projects Committee (RIPComm), was created to assist Watermaster and the IEUA in preparing RMPUs. The RIPComm is open to all interested stakeholders and meets regularly through the development of RMPUs. The outcomes of the 2001 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) are summarized below:

- 2001 Recharge Master Plan: Watermaster, in collaboration with the IEUA, constructed the first set of recharge facilities to exercise its rights pursuant to its diversion permits, increasing average annual stormwater recharge by about 9,500 afy. As part of this work, Watermaster and the IEUA modified seventeen existing flood retention facilities to increase diversion rates, conservation storage, and recharge, and constructed two new recharge facilities. The cost of these recharge improvements was about $60 million. The IEUA and Watermaster paid for about half of this cost, while the other half was funded through Proposition 13 grants and other grant programs.
- 2010 RMPU and 2013 Update: As of this writing, Watermaster and the IEUA are completing the final design/construction of five of the recommended 2013 RMPU facilities, and they should be online in 2021. These facilities are expected to increase stormwater recharge by about 4,700 afy.
- 2018 RMPU: The 2018 RMPU did not recommend any new recharge projects. One of the findings of the 2018 recharge master plan update was that Watermaster has enough supplemental water recharge capacity to it meet its Replenishment Obligations via wet-water recharge through 2050.

Upon completion of the 2013 RMPU facilities, the annual average stormwater recharge performed pursuant its diversion permits is expected to be about 14,950 afy.[15] Thus, in the first 20 years of OBMP

[15] WEI (2018). Recharge Master Plan Update. September 2018. http://www.cbwm.org/docs/engdocs/2018%20RMPU/20180914_2018_RMPU_final.pdf

implementation, stormwater recharge will have increased by about 14,150 afy, and supplemental water recharge capacity will have increased by 27,600 afy. And, the IEUA has increased the recharge of recycled water from about 500 afy in 2000 to about 16,000 afy in 2018. The next RMPU must be completed and submitted to the Court by October 2023.

#### *3.2.2.2 Ongoing implementation actions for the 2020 OBMP*

The RMPU process is an ongoing requirement of the 2000 OBMP Implementation Plan. The next RMPU is due to the Court by October 2023 and must be updated no less frequently than every five years thereafter. As identified in Activity A, the Parties have expressed interest in maximizing the recharge of recycled, imported, and storm waters where feasible. Although meeting these objectives is not a requirement for the RMPU, the next (or a future) RMP process could accomplish the objectives of Activity A by considering projects that will meet other needs of the Parties, such as providing additional recharge capacity for Storage and Recovery Programs or addressing pumping sustainability issues. As summarized below and described in further detail in the Scoping Report, there are opportunities and challenges for increasing these efforts in the future:

- The theoretical average annual stormwater discharge available for diversion under the existing water rights permits is about 74,000 afy (ranging from 21,400 to 110,500 afy for the combined permitted diversions) and the annual average stormwater recharge performed pursuant to these permits is expected to be about 14,950 afy. The difference between these two values, about 60,000 afy, is a lost opportunity for stormwater recharge. Improvements to existing facilities and operations and/or new facilities are required to achieve the stormwater recharge potential.
- New recharge facilities and/or improvements to existing facilities may be needed if Parties want to increase supplemental water recharge.
- Based on Watermaster and the IEUA's existing economic selection criteria (projects are selected for implementation only if the melded unit cost of stormwater recharge resulting from the projects is less than the avoided unit cost of purchasing imported water from the Metropolitan Water District of Southern California [Metropolitan]), no new recharge projects were recommended for implementation in the 2018 RMPU. If the Parties desire to develop a list of projects that will increase recharge in the basin, the economic criteria for selecting projects needs to be reevaluated.
- Finally, the criteria on how and where to conduct recharge needs to be updated to more effectively address existing basin management issues, including: land subsidence, maintaining Hydraulic Control, and pumping sustainability. Historically, Watermaster has attempted to manage the recharge of storm and supplemental water to promote the balance of recharge and discharge. This method of managing recharge does not specifically address current basin management issues, such as existing land subsidence in Management Zone 1 (MZ-1) and parts of MZ-2 and pumping sustainability issues in the Jurupa Community Services District (JCSD) and CDA well fields. There is a need to define additional criteria on how and where to conduct recharge to better address existing basin management issues.

Thus, during the scoping phase of the next RMPU, the Parties should determine if the economic and physical criteria for project evaluation should be revaluated to accomplish Activity A.

Section 4.2 of this report summarizes the 2020 OBMP Management Plan for PE 2.

### 3.2.3 Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas

The 2000 OBMP included PE 3—*Develop and Implement a Water Supply Plan for Impaired Areas*—to maintain and enhance Safe Yield and maximize beneficial uses of groundwater. The OBMP recognized that urban land uses would ultimately replace agricultural land uses, which had been the primary land use in the southern portion of the basin throughout the 20th century, and that if municipal pumping did not replace agricultural pumping, groundwater levels would rise and discharge to the Santa Ana River. The potential consequences would be the loss of Safe Yield and the outflow of high-TDS and -nitrate groundwater from the Chino Basin to the Santa Ana River—the latter of which could impair downstream beneficial uses in Orange County. The OBMP estimated that to maintain the Safe Yield, approximately 40,000 afy of groundwater would need to be produced to replace Agricultural Pool pumping in the southern part of the basin. The Chino Basin Desalters were identified as the optimal multi-benefit project to replace the expected decrease in agricultural production to maintain or enhance Safe Yield, to pump and treat high-salinity groundwater in support of PE 7, to meet growing municipal demands in support of PE 5, and to protect the beneficial uses of the Santa Ana River. Additionally, PE 6 envisioned that the Chino Basin Desalters could also be used to clean up the volatile organic compound (VOC) plumes that would eventually be intercepted by the Desalter wells.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 4 below. Each implementation action in Table 4 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

**Table 4. Program Element 3 – Implementation Actions Defined in the 2000 OBMP**

| Implementation Action | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 1 through 3 | | |
| Complete the Water Facilities Plan Report for the Expansion of the Chino I Desalter and the construction of the Chino II Desalter. It should be noted that this action is entirely consistent with the OBMP, and is being taken prior to completion of the OBMP. | One-time | ✓ |
| Start expansion of the Chino I Desalter and the construction of the Chino II Desalter in early 2001. | One-time | ✓ |
| Years 4 through 50 | | |
| Complete construction and start up of the expanded Chino I and new Chino II Desalters. | One-time | ✓ |
| Watermaster, IEUA and WMWD will periodically review the Regional Water Supply Plan and the need for new Desalter capacity in the southern water-quality impaired part of the Basin, and initiate the construction of new Desalter capacity as determined by Watermaster. Expansion of the Desalter capacity will occur as agricultural production in the southern water-quality impaired part of the basin declines. | Ongoing | ✓ |

#### *3.2.3.1 Implementation Progress since 2000*

The OBMP established that desalter production would ultimately need to be increased to 40,000 afy to protect Safe Yield. The Peace Agreement provided for the expansion of the Chino I Desalter to a design capacity of up to 14 mgd (15,700 afy) and the construction of the Chino II Desalter, with a capacity of 10 mgd. The Parties executed the Peace II Agreement in 2007, which included a supplement to the OBMP Implementation Plan to expand the Chino Desalter pumping to 40,000 afy (36 mgd) and introduce Re-operation.

The construction and operation of the Chino Basin Desalters also became a fundamental component of the Chino Basin maximum-benefit SNMP developed pursuant to PE 7.[16] Watermaster and the IEUA are jointly responsible for the implementation of the maximum benefit SNMP, which enables the recycled-water reuse and recharge programs in the Chino Basin in support of PEs 2 and 5. The SNMP includes nine "maximum-benefit commitments." One commitment is the achievement and attainment of Hydraulic Control to limit groundwater outflow from the Chino-North Groundwater Management Zone (GMZ) to *de minimis* levels to protect downstream beneficial uses. Hydraulic Control is also necessary to maximize the Safe Yield. The operation of the Chino Basin Desalters is necessary to attain Hydraulic Control. Three of the nine maximum-benefit commitments are related to the design and construction of the Chino Basin Desalters.

As of the writing of this report, there are 31 Chino Desalter wells with the capacity to pump about 34 mgd (37,600 afy) of groundwater from the southern portion of the Chino Basin, though not all wells are currently in operation. Pumped groundwater is conveyed to two treatment facilities (the Chino-I and Chino-II Desalters) that treat the groundwater with reverse osmosis and ion exchange to reduce TDS and nitrate concentrations. The treated water is then delivered to a conveyance system that serves the CDA's member agencies. The brine created in the treatment process is discharged to the Inland Empire Brine Line. Over the last five years, total desalter production has ranged from about 28,100 to 30,000 afy, averaging 29,200 afy. The following describes the history of the expansion of the Chino Basin Desalters:

- The Chino-I Desalter, which included 11 production wells, began operating in 2000 with a design capacity of 8 million gallons per day (mgd; about 9,000 afy).
- In 2005, the Chino-I Desalter capacity was expanded to 14 mgd (about 16,000 afy) with the construction of three additional wells.
- The Chino-II Desalter, which included eight production wells, began operating in June 2006 with a design capacity of 15 mgd (about 17,000 afy).
- In 2012, the CDA completed construction of the Chino Creek Well Field (CCWF) in the western portion of the basin which added five wells and additional capacity of about 1.3 mgd (1,500 afy) to the Chino-I Desalter; four of these wells began pumping between 2014 and 2016.
- In 2015, two additional Chino-II Desalter wells were constructed, and pumping began in 2018. These two wells, plus one additional well that is planned for construction, are part of the final expansion of the Chino Basin Desalters to meet the 40,000 afy pumping requirement of the OBMP, Peace Agreements, and maximum benefit SNMP. This final expansion is expected to be completed by 2021.

[16] Refer to Section 3.2.7 of this report for a complete overview of the maximum-benefit SNMP.

The Chino Basin Desalters are also being used to support the clean-up of point-source contamination in the southern Chino Basin:

- Two of the Chino-II Desalter expansion wells and CDA Well I-11 will be pumped to capture groundwater contaminants from the South Archibald plume. The Chino-II Desalter, which will be modified to treat the volatile organic compounds (VOCs) associated with the plume (see Section 3.2.6).
- The use of two of the CCWF wells is being evaluated for use as part of the remediation solution for the Chino Airport plume; however, the evaluation of the remediation alternatives is ongoing (see Section 3.2.6).

#### *3.2.3.2 Ongoing implementation actions for the 2020 OBMP*

The capacity to pump the Chino Basin Desalter goal of 40,000 afy is expected to be achieved by 2021. Operation at this capacity, once all agricultural land uses have converted to urban uses, would fulfill the objectives of PE 3. As previously noted, the operation of the Chino Basin Desalters is necessary to attain Hydraulic Control, which is a regulatory requirement of the maximum benefit SNMP. Thus, the ongoing implementation actions for the 2020 OBMP related to the operation of the Chino Basin Desalters are included under PE 7 (see Sections 3.2.7 and 4.7).

### 3.2.4 Program Element 4. Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1

The 2000 OBMP included PE 4—*Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1*—to characterize land subsidence spatially and temporarily, identify its causes, and, where appropriate, develop and implement a program to manage it. The 2000 OBMP identified pumping-induced decline of groundwater levels and subsequent aquifer-system compaction as the most likely cause of the land subsidence and ground fissuring observed in the southwestern portion of MZ-1 in the early 1990s. PE 4 recognized that the occurrence of land subsidence and ground fissuring in MZ-1 is not acceptable and should be reduced to tolerable levels or stopped.

PE 4 called for the development and implementation of an interim management plan for MZ-1 that would: minimize subsidence and fissuring in the short-term, collect the information necessary to understand the extent, rate, and mechanisms of subsidence and fissuring, and formulate a long-term management plan to prevent future subsidence and fissuring or reduce it to tolerable levels.

The implementation actions for PE 4 that were incorporated into the 2000 OBMP Implementation Plan are summarized in Table 5 below. Each implementation action in Table 5 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

**Table 5. Program Element 4 – Implementation Actions Defined in the 2000 OBMP**

| Implementation Action | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 1 through 5 | | |
| Arrange for the physical recharge of 6,500 afy of Supplemental Water at MZ1 spreading facilities. Evaluate for the continued need after FY2004-05. | Ongoing | ✓ |
| Convene a MZ1 technical committee to develop a recommended interim management plan to minimize subsidence while data is collected and a long-term subsidence management plan is developed. | One time | ✓ |
| Implement the interim management plan, including appropriate monitoring, annual assessment of data from monitoring programs, and modification of monitoring programs, if necessary. | One time | ✓ |
| Develop a long-term subsidence management plan. | One time | ✓ |
| Implement the long-term subsidence management plan and adapt if necessary. | Ongoing | ✓ |
| Years 6 through 50 | | |
| Assess data from the monitoring program every three years and modify the subsidence management plan, if necessary. | Ongoing | ✓ |
| Implement the long-term subsidence management plan and adapt if necessary. | Ongoing | ✓ |

#### *3.2.4.1 Implementation Progress since 2000*

##### Supplemental Water Recharge

Since the development of the OBMP, Watermaster has exercised best efforts to arrange for the physical recharge of 6,500 afy of supplemental water at the MZ-1 spreading facilities. And, pursuant to the Peace II Agreement, Watermaster committed to continue the physical recharge of at least 6,500 afy of supplemental water as an annual average through the term of the Peace Agreement.

##### Subsidence Management Plan

From 2001 to 2005, Watermaster developed, coordinated, and conducted the *MZ-1 Interim Monitoring Program* (IMP)[17] under the guidance of the MZ-1 Technical Committee. The MZ-1 Technical Committee was comprised of representatives from all major MZ-1 producers and their technical consultants, including the Agricultural Pool; the Cities of Chino, Chino Hills, Ontario, Pomona, and Upland; the Monte Vista Water District; the Golden State Water Company; and the California Institution for Men (CIM).

The IMP consisted of three main monitoring elements for use in analyzing subsidence: ground-level surveys, remote-sensing (InSAR), and aquifer-system monitoring. The ground-level surveys and InSAR

[17] Chino Basin Watermaster. (2003). *Optimum Basin Management Program, Management Zone 1 Interim Monitoring Program*. Prepared by Wildermuth Environmental, Inc. January 8, 2003.

analyses were used to characterize vertical ground motion. Aquifer-system monitoring of hydraulic and mechanical changes within the aquifer-system was used to characterize the causes of aquifer-system deformation.

The IMP was implemented in two phases: the Reconnaissance Phase and the Comprehensive Phase.

1. The Reconnaissance Phase consisted of constructing 11 piezometers screened at various depths at Rubin S. Ayala Park (Ayala Park) in the City of Chino and installing pressure transducer data-loggers in nearby pumping wells and monitoring wells to measure hydraulic head. Following installation of the monitoring network, several months of aquifer-system monitoring and testing were conducted. Testing included aquifer-system stress tests at pumping wells in the area.
2. The Comprehensive Phase consisted of constructing a dual-borehole pipe extensometer at Ayala Park (Ayala Park Extensometer), near the area of historical fissuring. Following installation of the Ayala Park Extensometer, two aquifer-system stress tests were conducted, followed by passive aquifer-system monitoring.

The IMP provided enough information for Watermaster to develop "Guidance Criteria" for the MZ-1 Parties that, if followed, would minimize the potential for subsidence and fissuring in the investigation area. The methods, results, and conclusions of the IMP, including the Guidance Criteria, were described in detail in the *MZ-1 Summary Report*.[18] The Guidance Criteria formed the basis for the long-term management plan, documented as the *MZ-1 Subsidence Management Plan* (MZ-1 Plan),[19] which was prepared under the guidance of the MZ-1 Technical Committee. To minimize the potential for future subsidence and fissuring in the Managed Area, the MZ-1 Plan recommended that the MZ-1 Parties manage their groundwater pumping pursuant to the Guidance Criteria. The MZ-1 Plan was approved by the Watermaster Board in October 2007 and the Court in November 2007.

Implementation of the MZ-1 Plan began in 2008. The MZ-1 Plan called for the continuation of monitoring, data analysis, annual reporting, and adjustments to the MZ-1 Plan, as warranted by the data. Additionally, the MZ-1 Plan expanded monitoring of the aquifer-system and land subsidence into other areas of the Chino Basin where the IMP indicated concerns for future subsidence and ground fissuring. These so-called "Areas of Subsidence Concern" are: Central MZ-1, Northwest MZ-1, Northeast Area, and Southeast Area.

The MZ-1 Plan described the following potential expanded investigation: (1) more intensive monitoring of horizontal strain across the zone of historical ground fissuring to assist in developing management strategies related to fissuring, (2) injection feasibility studies within the Managed Area, (3) additional pumping tests to refine the Guidance Criteria, (4) computer-simulation modeling of groundwater flow and subsidence, and (5) the development of alternative pumping plans for the MZ-1 Parties affected by the MZ-1 Plan. The MZ-1 Technical Committee (now called the Ground-Level Monitoring Committee or GLMC) discussed these potential future efforts, and if deemed prudent and necessary, they were

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[18] Chino Basin Watermaster. (2006). *Optimum Basin Management Program, Management Zone 1 Interim Monitoring Program, MZ-1 Summary Report*. Prepared by Wildermuth Environmental, Inc. February 2006. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20071017_MZ1_Plan%20--%20Appendix_A_MZ1_SummaryReport_20060226.pdf

[19] Chino Basin Watermaster. (2007). *Chino Basin Optimum Basin Management Program, Management Zone 1 Subsidence Management Plan*. October 2007. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20071017_MZ1_Plan.pdf

recommended to Watermaster for implementation. Watermaster and the MZ-1 Parties have performed work to implement (1), (2), and (4) above, but have not performed work on (3) and (5).

The MZ-1 Plan stated that if data from existing monitoring efforts in the Areas of Subsidence Concern indicate the potential for adverse impacts due to subsidence, Watermaster would revise the plan to avoid those adverse impacts. The 2014 Annual Report of the GLMC[20] recommended that the MZ-1 Plan be updated to better describe Watermaster's land subsidence efforts and obligations, including areas outside of MZ-1. As such, the update included a name change to the *2015 Chino Basin Subsidence Management Plan* (Subsidence Management Plan)[21] and a recommendation to develop a subsidence management plan for Northwest MZ-1. Land subsidence in Northwest MZ-1 was first identified as a concern in 2006 in the MZ-1 Summary Report and again in 2007 in the MZ-1 Plan. Since then, Watermaster has been monitoring vertical ground motion in this area via InSAR and groundwater levels with pressure transducers at selected wells.

Of particular concern is that subsidence across the San Jose Fault in Northwest MZ-1 has occurred in a pattern of concentrated differential subsidence—the same pattern of differential subsidence that occurred in the Managed Area during the time of ground fissuring. Ground fissuring is the main subsidence-related threat to infrastructure. Because of the threat for ground fissuring, Watermaster increased monitoring efforts in Northwest MZ-1 beginning in FY 2012/13 to include ground elevation surveys and EDMs to monitor ground motion and the potential for fissuring.

In 2015, the GLMC developed the *Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area* (Work Plan).[22] The Work Plan is an ongoing Watermaster effort and includes a description of a multi-year scope-of-work, a cost estimate, and an implementation schedule. The Work Plan was included in the Subsidence Management Plan as Appendix B. Implementation of the Work Plan began in 2015.

Pursuant to the Subsidence Management Plan, each year, Watermaster has produced the *Annual Report of the GLMC* that contains the results of ongoing monitoring efforts, interpretations of the data, and recommended adjustments to the Subsidence Management Plan, if any. The annual report includes the results and interpretations for the data collected during the prior year as well as recommendations for Watermaster's ground-level monitoring program for the subsequent fiscal year. The Watermaster publishes the annual reports on its website. The most recent annual report was finalized in October 2019.

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[20] WEI. (2015). *2014 Annual Report of the Ground-Level Monitoring Committee*. July 2015. http://www.cbwm.org/docs/engdocs/2014%20Final%20Report%20-%20Ground%20Level%20Monitoring%20Committee/Final_2014_Annual%20Report_July2015.pdf

[21] Chino Basin Watermaster. (2015). *Chino Basin Subsidence Management Plan.* July 23, 2015. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20150724%20-%20Chino%20Basin%20Subsidence%20Management%20Plan%202015/FINAL_2015_CBSMP.pdf

[22] Chino Basin Watermaster. (2015). *Work Plan, Develop a Subsidence-Management Plan for the Northwest MZ-1 Area.* July 23, 2015. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20150724%20-%20Chino%20Basin%20Subsidence%20Management%20Plan%202015/FINAL_CBSMP_Appendix_B.pdf

#### *3.2.4.2 Ongoing implementation actions for the 2020 OBMP*

##### Supplemental Water Recharge

Pursuant to the Peace II Agreement, Watermaster will continue to arrange for the physical recharge of at least 6,500 afy of Supplemental Water in MZ-1 as an annual average through the term of the Peace Agreement.

##### Subsidence Management Plan

The Chino Basin will always be susceptible to the future occurrence of land subsidence and ground fissuring, so Watermaster will continue to implement the Subsidence Management Plan pursuant to PE 4, which includes:

- Conducting the ground-level monitoring program pursuant to the Subsidence Management Plan and the recommendations of the GLMC (The monitoring program includes the monitoring of groundwater pumping, recharge, groundwater levels, aquifer-system deformation, and vertical and horizontal ground motion across the western portion of the Chino Basin. The then-current description of the ground-level monitoring program is always included in each Annual Report of the GLMC [third bullet below]).
- Convening the GLMC annually to review and interpret the data from the ground-level monitoring program.
- Preparing annual reports of the GLMC that include recommendations for changes to the monitoring program (The annual report describes recommended activities for the monitoring program for the future fiscal year[s] in the form of a proposed scope-of-work, schedule, and budget. The recommended scope-of-work, schedule, and budget is run through Watermaster's budgeting process for revisions [if needed] and approval. The final scope-of-work, schedule, and budget for the upcoming fiscal year is included in the final annual report.)
- A key element of the Subsidence Management Plan is the verification of its protective nature against land subsidence and ground fissuring in the Chino Basin. This verification is accomplished through continued monitoring, testing, and reporting by the GLMC (as described above), and revision of the Subsidence Management Plan when appropriate. In this sense, the Subsidence Management Plan is adaptive. (The process of annual data analysis and reporting includes the evaluation of the effectiveness of the Subsidence Management Plan to minimize or stop land subsidence and ground fissuring and, if warranted by the data, a recommendation to update the Subsidence Management Plan. The GLMC will make these recommendations within its annual reports and prepare a draft revised Subsidence Management Plan that will be run through the Watermaster process for revisions and/or approval. Upon Watermaster Board approval, the revised Subsidence Management Plan will be submitted to the Court.)

### 3.2.5 Program Element 5. Develop and Implement Regional Supplemental Water Program

The 2000 OBMP included PE 5—*Develop and Implement Regional Supplemental Water Program*—to improve regional conveyance and the availability of imported and recycled waters throughout the basin. The OBMP recognized that water demands of the Parties would increase. The demand projections at the time estimated that water demands would reach 348,000 afy by 2000 and increase to 418,000 afy by 2020. The increase was assumed to be driven by municipal and industrial demands. Agriculture demands were expected to decrease from about 48,000 afy in 2000 to 8,000 afy by 2020. The OBMP also recognized the limitations to the traditional supplies, such as imported water from Metropolitan, and the need to find alternative supplies such as recycled water.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 6 below. Each implementation action in Table 6 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

**Table 6. Program Element 5 – Implementation Actions Defined in the 2000 OBMP**

| Implementation Action | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 4 through 50 | | |
| IEUA will construct recycled water facilities to meet the demand for recycled water and for replenishment. | Ongoing | ✓ |

It should be noted that early in the development of the PE 5 implementation plan, the stakeholders discussed the development of a regional water facilities plan that, when implemented, would enable the Parties to maximize the use of imported water in years when Metropolitan has surplus water and to be able to rely completely on local supplies during years when Metropolitan supplies are low or completely interrupted due to planned or catastrophic outages. This plan involved the construction of new wells and groundwater treatment and regional conveyance improvements; the water produced in this plan would be used exclusively by the Parties. The stakeholders ultimately did not include this plan in the 2000 OBMP Implementation Plan, preferring at that time to focus on expanding groundwater desalting in the lower Chino Basin (PE 3), increasing stormwater recharge (PE 2), and implementing a large-scale recycled water program to maximize its reuse (PEs 2 and 5).

#### *3.2.5.1 Implementation Progress since 2000*

Although the water demands of the Parties increased at a slower rate than projected when the OBMP was developed, Watermaster and the IEUA have aggressively pursued programs to improve water supply reliability through the implementation of PEs 2, 3, and 5. Since 2000, the IEUA has constructed and operated a recycled water conveyance system throughout the basin, enabling it to provide recycled water to its member agencies. The IEUA owns and operates four wastewater treatment facilities: Regional Plant No. 1 (RP-1), Regional Plant No. 4 (RP-4), Regional Plant No. 5 (RP-5), and the Carbon Canyon Water Reclamation Facility (CCWRF). Recycled water produced by these plants is used for direct uses, groundwater recharge, and discharged to Chino Creek or Cucamonga Creek, which are tributaries to the Santa Ana River. Historically, the IEUA's operating plan has prioritized the use of recycled water as follows: (1) to meet the IEUA's discharge obligation to the Santa Ana River (17,000 afy), (2) to meet direct reuse demands for recycled water, and (3) to recharge the remaining recycled water.

Although recycled water had been reused since the 1970s, the growth of the IEUA's recycled water reuse programs started in 1997, and in 2005 the OBMP enabled the IEUA's recycled water reuse program to be aggressively expanded. When the OBMP was completed in 2000, the IEUA was recharging about 500 afy of recycled water and utilizing about 3,200 afy for non-potable direct uses. The incorporation of Watermaster and the IEUA's maximum benefit SNMP into the Basin Plan in 2004 triggered the ability to rapidly increase recycled water reuse. Over the last five years, the annual direct reuse of recycled water ranged from 17,000 afy to 24,600 afy and averaged 20,600 afy. And, the annual recycled water recharge ranged from 10,800 to 13,900 afy and averaged 13,000 afy.

The recycled water provided by the IEUA has replaced a like amount of groundwater and imported water that would have otherwise been used for non-potable purposes. Much of the post-2000 increase

in supplemental water storage in the Chino Basin is attributable to the increased availability and recharge of recycled water.

#### *3.2.5.2 Ongoing implementation actions for the 2020 OBMP*

##### Recycled Water Reuse

The IEUA is continuing to expand its recycled-water distribution system and recharge facilities throughout the Chino Basin for direct non-potable uses and recharge. Growth is still occurring in the Chino Basin and will result in additional wastewater flows to the IEUA's treatment plants. Much of this supply will be used to meet increasing non-potable demands as the currently remaining agricultural land uses convert to urban uses.

The IEUA is currently performing planning efforts for the CBP, which is a large Storage and Recovery Program to provide for regional, dry-year water supplies and associated infrastructure. The CBP was conditionally awarded approximately $207 million of Proposition 1 Water Storage Investment Program funding. Over its 25-year project life, the CBP would increase recycled water recharge in the Chino Basin by 15,000 afy, and during dry years, the water in storage would subsequently be recovered and pumped into Metropolitan's system for use in Southern California in lieu of imported water from the State Water Project. The planned sources of recycled water for the CBP are currently being evaluated by the IEUA, but it is certain additional supplies beyond those produced by the IEUA will be needed. Thus, the objective to maximize the reuse of recycled water produced by the IEUA and others as envisioned by Activity D is currently being pursued by the IEUA on behalf of the Parties and with the support of Watermaster and other regional entities.

As part of the CBP, the IEUA, together with regional agencies, is developing a significant body of work to evaluate opportunities to acquire the surplus recycled water supplies needed for the CBP. The CBP is still undergoing planning and evaluation, and its implementation is not certain. If the CBP is not implemented, the significant body of work developed by the IEUA can be leveraged to support future planning efforts to maximize recycled water reuse in a manner that is consistent with the Judgment and the maximum-benefit SNMP.

##### Water Reliability

In addition to the efforts to maximize recycled water reuse, the IEUA and its member agencies are currently preparing the 2020 IRP, which will serve as a regional implementation strategy for long-term water resources management within the IEUA's service area. The objective of the IRP is to identify the facilities needed to ensure that the IEUA's water supplies over the next 25 years are reliable, cost-effective, and environmentally responsible.

As described in the Scoping Report, the total water demand of the Chino Basin Parties is projected to grow from about 290,000 afy in 2015 to about 420,000 afy by 2040, an increase of about 130,000 afy. The projected growth in water demand by the Appropriative Pool Parties drives the increase in aggregate water demand as some Appropriative Pool Parties are projected to serve new urban water demands created by the conversion of agricultural and vacant land uses to urban uses, a similar challenge observed during the development of PEs 3 and 5 in the 2000 OBMP. Table 7 below shows the historical (2015) and projected aggregate water demand and supply plan for all Parties by water source.

**Table 7. Aggregate Water Supply Plan for Watermaster Parties: 2015 to 2040[23]**

| Water Source | 2015 (Actual) | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Volume (af) | | | | | | |
| Chino Basin Groundwater | 147,238 | 145,904 | 153,804 | 157,716 | 168,987 | 176,652 |
| Non-Chino Basin Groundwater | 51,398 | 55,755 | 63,441 | 64,999 | 66,691 | 68,483 |
| Local Surface Water | 8,108 | 15,932 | 15,932 | 18,953 | 18,953 | 18,953 |
| Imported Water from Metropolitan | 53,784 | 86,524 | 93,738 | 100,196 | 102,166 | 109,492 |
| Other Imported Water | 8,861 | 9,484 | 10,095 | 10,975 | 11,000 | 11,000 |
| Recycled Water for Direct Reuse | 20,903 | 24,008 | 24,285 | 26,583 | 29,836 | 33,223 |
| **Total** | **290,292** | **337,607** | **361,295** | **379,422** | **397,633** | **417,803** |
| Percentage | | | | | | |
| Chino Basin Groundwater | 51% | 43% | 43% | 42% | 42% | 42% |
| Non-Chino Basin Groundwater | 18% | 17% | 18% | 17% | 17% | 16% |
| Local Surface Water | 3% | 5% | 4% | 5% | 5% | 5% |
| Imported Water from Metropolitan | 19% | 26% | 26% | 26% | 26% | 26% |
| Other Imported Water | 3% | 3% | 3% | 3% | 3% | 3% |
| Recycled Water for Direct Reuse | 7% | 7% | 7% | 7% | 8% | 8% |
| **Total** | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** |

Each of the water sources available to the Chino Basin Parties listed has its limitations:

- The ability to produce groundwater from the Chino Basin is limited by current basin management issues, such as ongoing land subsidence in MZ-1 and parts of MZ-2, pumping sustainability issues in the JCSD and CDA well field areas, and water quality.
- The challenges to imported water include reliability of its supply and infrastructure and the local capacity to treat it for municipal supply.
- The reliability of non-Chino Basin groundwater depends on water quality, water rights, and infrastructure to convey it to Parties' water systems.
- The reliability of local surface water depends on the hydrologic characteristics of the individual supplies, water quality, water rights, and infrastructure to convey it from points of diversion to a Party's water system.
- The challenges to maximizing the reuse of recycled water include: the timing of recycled water availability and complying with the maximum benefit SNMP and water quality regulations.

[23] Sourced from: WEI. (2018). *Storage Framework Investigation*. October 2018; revised January 2019. This document is available on Watermaster's FTP site at http://www.cbwm.org/

In addition to the challenges to specific water sources, climate change is likely to result in higher temperatures, longer dry periods, and shorter more intense wet periods, which can ultimately affect the availability and management of all water supply sources. For example, shorter more intense precipitation periods are expected to result in reduced recharge, and longer dry periods are expected to result in reduced imported water supplies (as occurred with State Water Project supplies in the recent drought from 2013 to 2016). And, many of the challenges are interrelated and compounding. For example, the reliability of imported water (and other non-groundwater supplies) not only affects the imported water supply but also the groundwater supplies that are dependent on imported water for blending.

As previously mentioned, the IEUA is currently developing the 2020 IRP, which will serve as a foundational regional implementation strategy for long-term water resources management within IEUA's service area and can be expanded by the Chino Basin Parties for the benefit of the region. Although the TVMWD and WMWD member agencies and Watermaster are participants in the development in the 2020 IRP, the current planning effort could be expanded to address regional reliability and to enhance integration with Watermaster's groundwater management efforts.

### 3.2.6 Program Element 6. Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management

The 2000 OBMP included PE 6—*Develop and Implement Cooperative Programs with the Regional Board and other Agencies to Improve Basin Management*—to assess water quality trends in the basin, to evaluate the impact of OBMP implementation on water quality, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water quality regulators to identify and facilitate the cleanup of soil and groundwater contamination.

The implementation actions for PE 6 incorporated into the 2000 OBMP Implementation Plan are summarized in Table 8 below. Each implementation action in Table 8 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

**Table 8. Program Element 6 – Implementation Actions Defined in the 2000 OBMP**

| Implementation Action | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 1 through 3 | | |
| Watermaster will form an ad hoc committee, hereafter water quality committee. The schedule and frequency of the meeting will be developed with the Regional Board during the first year of OBMP implementation. | Both | ✓ |
| Watermaster will refine its monitoring efforts to support the detection and quantification of water quality anomalies. This may require additional budgeting for analytical staff/support. | One-time | ✓ |
| If necessary, Watermaster will conduct investigation to assist the Regional Board in accomplishing mutually beneficial objectives. | Ongoing | ✓ |
| Watermaster will seek funding from outside sources to accelerate detection and cleanup efforts. | Ongoing | ✓ |

| Implementation Action | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 4 through 50 | | |
| Continue monitoring coordination efforts with the Regional Board. | Ongoing | ✓ |
| Annually update priority list and schedule for cleaning up known water quality anomalies. | Ongoing | |
| Continue to seek funding from outside sources to accelerate cleanup efforts. | Ongoing | ✓ |
| Implement projects of mutual interest. | Ongoing | ✓ |

#### *3.2.6.1 Implementation Progress since 2000*

During the development of the OBMP, Watermaster was conducting a multi-year comprehensive basin-wide water quality monitoring program (from 1999-2001) to sample every well possible to support the development and implementation of the OBMP. The comprehensive water quality monitoring program included collecting data from all Appropriators and cooperators in the Chino Basin and adjacent basins and performing monitoring at all private wells in the southern portion of the basin. During this time, Watermaster performed monitoring at 602 private wells. Data from this comprehensive water quality monitoring program established a baseline on the state of groundwater quality at the start of OBMP implementation. These data also became the foundation for achieving the objectives of PE 6: to assess water quality trends in the basin, to evaluate the impact of OBMP implementation on water quality, and to determine whether point and non-point contamination sources are being addressed by water quality regulators. Since 2000, Watermaster's groundwater quality monitoring efforts have continued in alignment with the Groundwater Quality Monitoring Program described in PE 1 and have been periodically refined as needed to support the detection and quantification of water quality anomalies and contaminants of concern, such as perchlorate, hexavalent chromium, and 1,2,3-trichloroethene (1,2,3-TCP). Watermaster has regularly assessed groundwater quality in the Chino Basin using data compiled through its own monitoring at private production wells and dedicated monitoring wells and the monitoring efforts of others. Watermaster reports on water quality trends and findings in several reports, including the State of the Basin Reports, which are prepared and submitted to the Court every two years.

In 2003, the Water Quality Committee was convened to coordinate many of the activities performed under PE 6. The Committee met intermittently through 2010. The main activities of the Water Quality Committee included investigations to characterize and address point and non-point sources of groundwater contamination in the Chino Basin and collaboration with the Santa Ana Regional Water Quality Control Board (Regional Board) in its efforts to facilitate the cleanup of groundwater contamination. Some of the significant groundwater quality investigations performed under the guidance of the committee included: the characterization of groundwater contamination in MZ-3 near the former Kaiser Steel Mill and Alumax facilities, tracking studies on the source and extent of the Chino Airport plume, the identification of sources and responsible Parties for the South Archibald plumes, and the identification of the sources of legacy perchlorate contamination in groundwater throughout the basin. The investigations were coordinated through the Water Quality Committee for the Chino Airport and South Archibald plumes and contributed to the definitive identification of responsible Parties and the issuance of cleanup and abatement orders by the Regional Board.

Since 2010, Watermaster has continued to perform monitoring for contaminants related to point-source and non-point source contamination, to assist the Regional Board with the investigation and regulation of point source contaminant sites in the Chino Basin, and to prepare status reports on the monitoring and remediation of point-source contaminant sites in the basin. Periodic status reports have been prepared for: the Chino Airport and South Archibald plumes[24] and the General Electric (GE) Test Cell plume, the GE Flatiron plume, the former Kaiser Steel Mill Facility plume, the CIM plume, the Stringfellow plume, and the Milliken Landfill plume. Updated delineations of the spatial extent of the plumes in the Chino Basin are prepared every two years by Watermaster and are included in the plume status reports and biennial State of the Basin Reports.

Currently, the responsible Parties for the Chino Airport plume and South Archibald plume are initiating remedial strategies that include the use of the Chino Basin Desalters for pumping and treating the contaminated groundwater associated with these plumes. This use of the Chino Basin Desalters as a mutually beneficial project was recognized in the OBMP Implementation Plan as a potential management strategy and provides cost sharing benefits to all involved Parties. Additionally, the CDA and IEUA have acquired over $85 million in federal and state grant funds for the Chino Basin Desalter Phase III expansion project that is planned to be used for portions of the remediation of the Chino Airport and South Archibald plumes.

#### *3.2.6.2 Ongoing implementation actions for the 2020 OBMP*

Pursuant to the PE 6 implementation plan, Watermaster will continue to perform the following to ensure that point-source contamination is being adequately addressed: monitor water quality at monitoring wells and private wells within the basin and collect data from others to support the quantification of point-source contaminant plumes, prepare updated delineations of the plume extents for the biennial State of the Basin Reports, and track and report on the status of remediation in the recurrent plume status reports and other ad-hoc investigations as needed to support the Regional Board in their efforts to address groundwater contamination. Watermaster will also continue to support the Regional Board or other Parties to identify and implement mutually beneficial projects for addressing groundwater contamination cleanup and identify outside sources to finance the cleanup efforts, such as the funds awarded for the Chino Desalter expansion project. Watermaster will continue to characterize and report on water-quality since OBMP implementation in the biennial State of the Basin Reports using data collected for the PE 1 Groundwater Quality Monitoring Program.

While PE 6 in the 2000 OBMP Implementation Plan provides a strategy to support the Regional Board in its efforts to address groundwater contamination cleanup in the Chino Basin, there are emerging contaminants with regulatory water quality standards set by the DDW that can impact the beneficial uses of groundwater. As described in the Scoping Report for Activity EF, there are contaminants in groundwater that limit its direct use for drinking water supply and reductions in pumping due to water quality challenges can result in negative impacts to the basin, such as reductions in net recharge, loss of hydraulic control, and movement of contaminant plumes. The enforceable drinking water standards developed by the DDW are continuously evolving and becoming more stringent as laboratory analytical technologies to detect contaminants are advancing. Hence, it is likely that new contaminants will be identified and regulated. The *Groundwater Quality Management Plan* envisioned for Activity EF is a

[24] Status reports for the Chino Airport and South Archibald plumes were prepared monthly in 2013; quarterly from 2014-2017; and semi-annually effective in 2018. Status reports for the other plumes and sites are prepared annually effective 2018.

refinement on PE 6 from the 2000 OBMP in that it is a proactive and basin-wide approach to address emerging contaminants to prepare the Parties for addressing compliance with new and increasingly stringent drinking water regulations defined by the DDW and ensure the long-term maximum beneficial use of the Basin.

### 3.2.7 Program Element 7. Develop and Implement Salt Management Plan

The 2000 OBMP included PE 7—*Develop and Implement Salt Management Plan*—to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. Such a management strategy was necessary to address historical salt and nutrient accumulation from agricultural operations and to support the aggressive expansion of recycled water recharge and reuse envisioned in PEs 2 and 5.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 9 below. Each implementation action in Table 9 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

**Table 9. Program Element 7 – Implementation Actions Defined in the 2000 OBMP**

| Implementation Action | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 1 through 3 | | |
| Develop salt budget goals, develop the salt budget tool and review all the OBMP actions. | One-time | ✓ |
| Watermaster will continue to monitor the nitrogen and salt management activities within the basin. | Ongoing | ✓ |
| Years 4 through 50 | | |
| As part of periodic updates of the OBMP, re-compute the salt budget using the salt budget tool. The salt budget tool will be used to reassess future OBMP actions to ensure the salt management goals are attained. | Ongoing | ✓ |
| Watermaster will continue to monitor the nitrogen and salt management activities within the basin. | Ongoing | ✓ |

#### *3.2.7.1 Implementation Progress since 2000*

In 2002, recognizing that implementing the recycled water reuse program would require large-scale treatment and mitigation of salt loading under the then-current antidegradation objectives for TDS and nitrate defined in the Basin Plan, Watermaster and the IEUA petitioned the Regional Board to establish a maximum-benefit-based SNMP that involved (1) increasing the TDS and nitrate objectives for the Chino-North GMZ[25] to numerically higher values to enable maximization of recycled water reuse and (2) committing to a program of salt and nutrient management activities and projects ("maximum benefit

[25] The Chino-North GMZ has a maximum-benefit TDS objective of 420 mgl and is a combination of the Chino-1, Chino-2, and Chino-3 antidegradation GMZs that have lower TDS objectives, ranging from 250 to 280 mgl.

commitments") that ensure the protection of beneficial uses of the Chino-North GMZ and downgradient waters (the Santa Ana River and the Orange County GMZ). The technical work performed to support the maximum-benefit SNMP proposal included the development and use of an analytical salt budget tool to project future TDS and nitrate concentrations in the Chino-North GMZ with and without the maximum-benefit SNMP. The maximum-benefit SNMP was incorporated into the Basin Plan by the Regional Board in January 2004.

Implementation of the maximum-benefit SNMP is a regulatory requirement of the Basin Plan. The requirement is also incorporated into Watermaster and the IEUA's recycled water recharge program permit (R8-2007-0039) and the IEUA's recycled water discharge and direct reuse permit (R8-2015-0021; NPDES No. CA 8000409). There are nine maximum-benefit commitments included in the Basin Plan and recycled water permits:

1. The development and implementation of a surface-water monitoring program
2. The development and implementation of a groundwater monitoring program
3. The expansion of the Chino-I Desalter to 10 mgd and the construction of the Chino-II Desalter with a design capacity of 10 mgd
4. The additional expansion of desalter capacity to a total capacity of 40 mgd pursuant to the OBMP and the Peace Agreement
5. The construction of the recharge facilities included in the Chino Basin Facilities Improvement Program
6. The management of recycled water quality to ensure that the IEUA agency-wide, 12-month running average wastewater effluent quality does not exceed 550 milligrams per liter (mgl) for TDS and 8 mgl for total inorganic nitrogen (TIN)
7. The management of the basin-wide, volume-weighted TDS and nitrate concentrations of artificial recycled, storm, and imported waters to concentrations that are less than or equal to the maximum-benefit objectives as a five-year rolling average
8. The achievement and maintenance of the Hydraulic Control of groundwater outflow from the Chino Basin, specifically from the Chino-North GMZ, to protect the water quality of the Santa Ana River and downstream beneficial uses
9. The triennial recalculation of ambient TDS and nitrate concentrations of the Chino Basin GMZs

These commitments are all activities that were planned to be implemented under the OBMP through implementation actions within PEs 1, 2, 3, 5, and 7.

Watermaster and the IEUA are also required to prepare an annual report to the Regional Board on the status of implementation of the maximum-benefit commitments, including reporting of annual data collected through the monitoring program and assessments of compliance with the groundwater and recycled water-quality limits defined in the SNMP. If the maximum-benefit commitments are not implemented to the Regional Board's satisfaction, the antidegradation objectives would apply for regulatory purposes. The application of the antidegradation objectives would result in a finding of no assimilative capacity for TDS and nitrate in the Chino-North GMZ, and the Regional Board would require mitigation for all recycled water discharges to Chino-North that exceeded the antidegradation objectives retroactively to January 1, 2004. The retroactive mitigation for past discharges would be required to be completed within a ten-year period, following the Regional Board's finding that the maximum-benefit commitments were not met.

Watermaster has prepared and submitted annual reports to the Regional Board every year since 2005. As of the most recent annual report for CY 2018, Watermaster and the IEUA remain in compliance with all requirements of the maximum-benefit commitments.[26] A more detailed summary of the commitments and progress towards implementation is provided in Exhibit 14.

#### *3.2.7.2 Ongoing implementation actions for the 2020 OBMP*

Compliance with the maximum benefit commitments is an ongoing requirement of the Basin Plan. The ongoing actions to implement the maximum-benefit SNMP as currently defined in the basin, and thus PE 7, will include:

- Continue implementation of the surface and groundwater monitoring programs.
- Complete the expansion of the Chino Basin Desalter pumping capacity to 40,000 afy (expected in 2020).
- Maintain Hydraulic Control of the Chino-North GMZ through operation of the Chino Basin Desalters and other means, as necessary.
- Continue the storm and imported water recharge program to comply with recycled water recharge dilution requirements.
- Periodically analyze and report groundwater, surface water, and recycled water quality data to assess compliance with the metrics established in the maximum-benefit SNMP.
- Construct treatment and/or salt-offset facilities *if* one or more of the compliance metrics is exceeded.

There are three water-quality limitations and associated compliance metrics established in the maximum-benefit SNMP. When these metrics are exceeded, Watermaster and the IEUA must develop a plan and schedule to achieve compliance. The limitations, compliance metrics, and compliance actions are summarized in Exhibit 15.

The management actions for achieving compliance with the metrics once they are exceeded could include, but are not limited to: desalting recycled water to reduce TDS concentrations, increasing the recharge of low-TDS supply sources (storm or imported waters), or additional desalting of high-TDS groundwater as a salt offset.

With the exception of the ambient nitrate concentration of the Chino-North GMZ, which has exceeded the objective of 5.0 mgl since it was established in 2004, none of the other TDS and nitrate limitations have been exceeded. That said, the ambient TDS and nitrate concentrations in the Chino-North GMZ continue to increase due to legacy agricultural activities, recycled water reuse, and current irrigation practices. The current ambient TDS and nitrate concentrations are 360 and 10.3 mgl, respectively. Based on the rate of increase of the ambient TDS concentration since 1997, which has been about three mgl per year, the maximum-benefit objective of 420 mgl is not expected to be exceeded until about 2035.

More recently, the TDS concentration of recycled water has approached the compliance metric defined in commitment number 6. During the 2012 to 2016 drought, the 12-month running-average IEUA agency-wide TDS concentration in recycled water approached the 545 mgl action limit that would require the IEUA and Watermaster to submit a water-quality improvement plan and schedule. In analyzing the available data, the IEUA determined that the primary drivers for the increasing recycled

[26] WEI. (2019). *Optimum Basin Management Program Chino Basin Maximum Benefit Annual Report 2018*. April 2019.

water TDS concentration were the increase in the TDS concentration of the water supplies used by its member agencies and an increase of the TDS waste increment due to indoor water conservation. Similarly, drought conditions also threaten the ability to comply with the recycled water recharge dilution requirements. During drought conditions there is: a reduction in the amount of high-quality stormwater recharge, limited or no availability of imported water for recharge, an increase in the TDS concentrations of imported water, and a concomitant increase in the TDS concentrations of the recycled water. Not only are the two primary sources of low-TDS recharge water less available during drought periods, but the source water quality of municipal water supplies is also higher in TDS due to increases in imported water TDS and indoor water conservation practices. A more detailed discussion of this issue is provided in the Scoping Report. The Scoping Report discussion demonstrated the meaningful impact that drought has on compliance with the various recycled water quality metrics and indicates that climate change, which is expected to result in longer drier droughts, could potentially threaten future compliance with the limits.

Although the 12-month running-average IEUA agency-wide TDS concentration declined from the 2015 peak before reaching the 545 mgl action limit, it was an important indicator that the TDS concentration of recycled water is likely to approach or exceed the recycled water action limit during the next prolonged dry period and trigger the planning for recycled water quality improvements. In May 2017, recognizing the potential cost of implementing recycled water quality improvements for what might be only short-term exceedances of the action limit, Watermaster and the IEUA petitioned the Regional Board to consider updating the maximum-benefit SNMP to incorporate a revised compliance metric for recycled water TDS and nitrate specifically to allow a longer-term averaging period. The Regional Board agreed that an evaluation of the recycled water compliance metric is warranted and directed Watermaster and the IEUA to develop a technical scope of work to demonstrate the potential impacts of the revised compliance metric.

The primary objectives of the technical work to support the maximum-benefit SNMP and permit updates are: to develop and use an updated groundwater solute-transport model to evaluate the TDS and nitrate concentrations of the Chino Basin (e.g. a new salt-budget tool), to define alternative salinity management scenarios, and to project the future TDS and nitrate concentrations in the Chino Basin for each scenario. The results will be used to work with the Regional Board to develop a regulatory compliance strategy that potentially includes a new compliance metric based on a longer-term averaging period for recycled water TDS, contingent on the ongoing modeling and analysis efforts. The regulatory compliance strategy can also address any projected challenges in complying with the recycled water dilution requirements. The work began in September 2017 and is expected to be completed in 2020.

The Regional Board has indicated that in accepting any proposal to modify the recycled water compliance metrics, it will require Watermaster and the IEUA to add a new maximum-benefit commitment to the Basin Plan that involves updating the TDS and nitrate projections every five years. Thus, the need for the proactive planning to achieve compliance, as envisioned by Activity K, is a required ongoing activity under PE 7 and the maximum-benefit SNMP.

### 3.2.8 Program Element 8. Develop and Implement Groundwater Storage Management Program *and* Program Element 9. Develop and Implement Storage and Recovery Programs

The Judgment recognized the existence of unused storage space within the Chino Basin that could be used to store water for subsequent beneficial use. The Judgment requires that the use of such storage capacity be undertaken only under Watermaster control and regulation to protect all stored water, to

protect Safe Yield, and to avoid adverse impacts to groundwater pumpers. The Judgment prioritizes the use of storage space by the Parties over the use of storage space for the export of stored water.

The 2000 OBMP included two PEs to address the management and use of storage space:

*Program Element 8. Develop and Implement Groundwater Storage Management Program*

*Program Element 9. Develop and Implement Storage and Recovery Programs*

The objectives of PE 8 are (1) to develop and implement a storage management plan that prevents overdraft, protects water quality, and ensures equity among the Parties, and (2) to periodically recalculate Safe Yield. The objective of PE 9 is to develop Storage and Recovery Programs that benefit all Parties in the basin and ensure that basin waters and storage capacity are put to maximum beneficial use without causing MPI to any producer or the basin.

The 2000 OBMP storage management plan in PE 8 consists of managing groundwater production, replenishment, recharge, and storage such that total storage within the basin ranges from a low of 5,300,000 af to a high of 5,800,000 af. The following definitions are included in the OBMP Implementation Plan to describe the storage management plan:

- Operational Storage Requirement (OSR) is the storage or volume in the Chino Basin that is necessary to maintain the Safe Yield. The OSR was estimated in the development of the OBMP to be about 5.3 million af.[27]
- Safe Storage is an estimate of the maximum amount of storage space in the basin that can be used and not cause significant water-quality and/or high-groundwater related problems. Safe Storage was estimated in the development of the OBMP to be about 5.8 million af.
- SSC is the difference between Safe Storage and the OSR and is the storage space that can be safely used by producers and Watermaster for storage programs. Based on the above, the SSC is about 500,000 af, including water in existing storage accounts. The allocation and use of storage space in excess of the SSC will preemptively require mitigation; that is, mitigation must be defined and resources committed to mitigation prior to its allocation and use.

The Peace Agreement describes the actions, programs, and procedures Watermaster will take in performance of Storage and Recovery Programs.[28]

The implementation plan for PEs 8 and 9 were combined in the OBMP Implementation Plan. The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 10 below. Each implementation action is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

[27] This storage value was set as the estimated storage in the basin in 1997. See Page 2-11 of the OBMP Phase 1 Report.

[28] See Peace Agreement, § 5.2

**Table 10. Program Elements 8 and 9 – Implementation Actions Defined in the 2000 OBMP**

| Implementation Action | One-time/ Ongoing | Implemented? |
|---|---|---|
| Years 1 through 3 | | |
| Evaluate the need to modify Watermaster UGRR* regarding storage management plans and procedures. | One-time | ✓ |
| Determine the operational storage requirement and safe storage. | One-time | ✓ |
| Years 4 through 50 | | |
| Start assessing losses at 2% per year in year 2005. This amount will be subject to modification in future years. | Ongoing | ✓ |
| In year 2010/11 and every ten years thereafter, compute Safe Yield and storage loss rate for prior ten-year period, and reset Safe Yield and storage loss rates for the next ten-year period. Reassess storage management plan and modify Watermaster UGRR, if needed. | Ongoing | ✓ |

*UGRR stands for Uniform Groundwater Rules and Regulations. The UGRR was incorporated in the Watermaster's Rules and Regulations and is no longer a stand along document.

#### *3.2.8.1 Implementation progress since 2000 and ongoing implementation actions for the 2020 OBMP*

A final SSC of 500,000 af was established in the OBMP Implementation Plan. The water occupying the SSC includes Carryover, Excess Carryover, Local Storage, and Supplemental Waters stored by the Parties, including water stored for Storage and Recovery Programs. Carryover, Excess Carryover, Local Storage, and Supplemental Waters in storage accounts are referred to collectively as "managed storage."

##### Storage Agreements and Existing Managed Storage

The Restated Judgment provides that the Basin's groundwater storage capacity may be utilized for the storage and conjunctive use of supplemental water only under Watermaster control and regulation and that no use of such capacity be made except pursuant to written agreement with Watermaster.[29] The Pooling Plans of the Overlying (Non-Agricultural) Pool[30] and the Appropriative Pool[31] each require a Party to have an agreement with Watermaster as a condition of storing Excess Carryover water within the Basin. Watermaster has developed rules and regulations, standard storage agreements, and related forms pursuant to the Judgment and Peace Agreement.

There are three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool Parties) and Basin Water acquired from other Parties. A Local Supplemental Water account includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes Supplemental Water and the

[29] See Restated Judgment, ¶ 11, 12 and Peace Agreement, § 5.2(a)

[30] See Restated Judgment Exhibit "G"

[31] See Restated Judgment Exhibit "H"

Peace Agreement requires that Watermaster shall give first priority to Storage and Recovery Programs that produce a "broad and mutual benefit to the Parties to the Judgment."[32]

In evaluating applications for storage agreements, Watermaster conducts an investigation to determine if the water stored and recovered under a proposed storage agreement has the potential to cause MPI to a Party or the basin. If Watermaster determines that implementation of the proposed storage agreement has the potential to cause MPI, the applicant must revise its application and demonstrate that there will be no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that has the potential to cause MPI.

The Parties, amongst themselves, are also actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the Parties recover water held in storage accounts.

The only active Storage and Recovery Program in the basin is the Metropolitan Dry-Year Yield Program (DYYP). The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. The DYYP Storage and Recovery agreement provides that puts and takes can exceed these values if agreed to by Watermaster (as was done in fiscal years 2018 and 2009, respectively). The agreement that authorizes the DYYP will expire in 2028.

Watermaster tracks the puts, takes, losses, transfers, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process. Starting in 2005, pursuant to the Peace Agreement and OBMP IP, Watermaster began assessing losses in stored water at a rate of 2.0 percent per year. In February 2016, Watermaster changed the loss rate to 0.07 percent per year, based on the estimated groundwater discharge from the Chino-North GMZ to the Santa Ana River (a finding of the Safe Yield recalculation).

Exhibit 16 summarizes the amount of water in managed storage by the Parties and for the DYYP. The total volume of water in managed storage as of June 30, 2019 was about 549,200 af, which includes about 46,000 af stored in the DYYP account. As previously stated, and described below, in 2017, the IEUA adopted an addendum to the Peace II SEIR that provided a temporary increase in the SSC to 600,000 af through June 30, 2021 and required Watermaster to update the storage management plan.

### Safe Yield Reset

Starting in 2011, Watermaster began the technical effort to recalculate the Safe Yield of the basin, which at that time was set at 140,000 afy. This work involved updating the hydrogeologic conceptual model of the basin, updating the historical hydrology, updating and recalibrating numerical models that simulate the surface and groundwater hydrology of the Chino Basin area, and projecting the surface and groundwater response of the basin to future management plans that included storage management. Watermaster's methodology for calculating Safe Yield was approved by the Court in April 2017.

This work is documented in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement*[33] (hereafter, Safe Yield report). The results of that work yielded a

[32] See Peace Agreement, §5.2(c)(iv)(b)

[33] WEI. (2015). *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement.* October 2015. http://www.cbwm.org/docs/engdocs/WEI%202013%20CBWM%20Recalculation%20Model%20Update/20151005_WEI_2013_CBWM_Recal_Model_Final_low.pdf

reassessment of the hydrology of the basin from 1961 through 2011 and projections of basin hydrology through 2050, based on the best available planning information. And, based on the investigation results in the Safe Yield report, the Safe Yield was estimated to be 135,000 afy for the period FY 2010/11 to FY 2019/20.

The conclusions of the Safe Yield report related to storage management were:

- On July 1, 2000, the total water in storage in the basin was about 5,935,000 af, inclusive of about 236,000 af of managed storage. This is about 635,000 af greater than the OSR of 5,300,000 af that was established in the OBMP Implementation Plan.
- Managed storage was projected to increase from 487,000 af in 2016 to about 663,000 af by 2030 (exceeding the SSC by 163,000 af) and decline thereafter to zero af by 2051. Managed storage was projected to be used to meet future Replenishment Obligations.
- Total storage was projected to fall below the OSR of 5.3 million af in 2041.

Based on these findings, Watermaster conducted an investigation to determine if the use of managed storage up to 663,000 af would cause potential MPI and concluded it would not. Subsequently, the IEUA adopted an addendum to the Peace II SEIR to temporarily increase the SSC to 600,000 through June 30, 2021 to enable Watermaster and the Judgment Parties to update the OBMP storage management plan.

The next effort to recalculate Safe Yield is currently underway, and Watermaster is using the same Court-approved methodology used in the Safe Yield report to recalculate Safe Yield for the period FY 2020/21 to FY 2029/30.

### 2020 Storage Management Plan

The 2000 OBMP storage management plan is based on fixed storage volumes (e.g. the OSR, the SSC, and the Safe Storage), and its technical basis is not supported by new information available after the storage management plan was first developed. Review of the new information developed pursuant to the OBMP since 1999 indicated that it is possible to use more storage space than contemplated in the 2000 OBMP. This new information includes: an updated hydrogeologic conceptual model; 20 years of intensive monitoring of basin operations (not available in 1999), including monitoring the basin response as the total volume of managed storage approached 500,000 af; and groundwater model-based projections of the basin response to future management plans where the managed storage exceeded 500,000 af. The new information developed since 1999 also suggests that the use of managed storage to satisfy future desalter and other Replenishment Obligations could cause potential MPI and other adverse impacts: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF and cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. Thus, Watermaster initiated a process to update the OBMP storage management plan to enable increased storage by the Parties and to include features that will ensure there is no MPI to a Party or the basin caused by the conjunctive-use activities of the Parties and Storage and Recovery Programs.

The *Storage Framework Investigation* (SFI) was completed in 2018 to the provide the technical information required to update the storage management plan.[34] In the SFI, future projections of the use of managed storage were estimated and evaluated for potential MPI. The SFI projected that for the

[34] WEI. (2018). *Storage Framework Investigation – Final Report*. Prepared for the Chino Basin Watermaster. October 2018.

planned use of up to 700,000 af of managed storage by the Parties that Hydraulic Control would be maintained, that there would be no MPI, and that there would be an adverse impact from the reduction of net recharge and Safe Yield attributable to the use of managed storage. The 2018 SFI also projected that for Storage and Recovery Programs that would operate in an identical manner to the existing Metropolitan DYYP and using the managed storage space between 700,000 af and 800,000 af. The SFI also evaluated the impacts of prospective Storage and Recovery Programs that would use up to an additional 200,000 af of storage space (total storage of 1,000,000 af) and projected that MPI and other adverse impacts could occur and described the potential facilities and operating concepts that, if implemented, would minimize potential MPI. The results of the SFI, together with the *Final 2020 Storage Management Plan White Paper,*[35] were used to inform the development of the *2020 Storage Management Plan* (SMP).

The Watermaster completed the 2020 SMP in December 2019, and it is included herein as Appendix E. The 2020 SMP no longer includes the management concepts of Safe Storage, OSR, and SSC that were a part of the 2000 OBMP storage management plan. The provisions of the 2020 SMP are described below.

The 2020 SMP includes the following provisions regarding the use of storage space in the basin:

- An aggregate amount of 800,000 af is reserved for the Parties' conjunctive-use activities (includes Carryover, Excess Carryover, and Supplemental Accounts) and Metropolitan's DYYP. This amount is referred to as the "First Managed Storage Band" (FMSB).
- An aggregate amount of 800,000 af is reserved for the Parties' conjunctive-use activities (includes Carryover, Excess Carryover, and Supplemental Accounts) and Metropolitan's DYYP. This amount is referred to as the "First Managed Storage Band" (FMSB).
- The managed storage space between 800,000 and 1,000,000 af is reserved for Storage and Recovery Programs.
    - Storage and Recovery Programs that utilize the managed storage space above 800,000 af will be required to mitigate potential MPI and other adverse impacts as if the 800,000 af in the FMSB is fully used.
    - Renewal or extension of the DYYP agreement will require the DYYP to use storage space above the 800,000 af of the FMSB.
- The allocation of storage space for use by Parties and for Storage and Recovery Programs may be revised in subsequent updates of the SMP.
- The use of managed storage greater than 1,000,000 af may be possible provided the storing entity submits a Storage and Recovery Program application, demonstrates that the program has broad mutual benefit, demonstrates that the program's mitigation measures will meet the mitigation requirements of the Watermaster to ensure there will be no MPI and other adverse impacts[36], complies with CEQA, and obtains approval from the Watermaster.

The 2020 SMP includes the following provisions regarding the use of spreading basin facilities for storage programs:

[35] WEI. (2019). *Final 2020 Storage Management Plan White Paper*. Prepared for the Chino Basin Watermaster. July 2019.

[36] Adverse impacts include reductions in net recharge and Safe Yield; and an increase in the groundwater discharge from the Chino North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control.

- Watermaster will prioritize the use of spreading basins to satisfy Watermaster's recharge and Replenishment Obligations over the use of spreading basins for other uses subject to limitations provided in existing agreements with the owners of the facilities.

The 2020 SMP includes the following provisions specific to the Parties and Storage and Recovery Program:

- With regard to the storage management activities of the Parties:
    - Watermaster acknowledges transfers or leases of water rights and water held in managed storage (hereafter transfers) from Parties that are situated such that they pump groundwater outside of MZ-1 to Parties that pump in MZ-1 have the potential to cause potential MPI.
    - Any reduction in net recharge caused by storage in the FMSB is an adverse impact, and Watermaster considers this adverse impact to be mitigated by the prospective calculation of Safe Yield.
- With regard to the Storage and Recovery Programs:
    - Puts and takes should be prioritized to occur in MZ-2 and MZ-3 to avoid new land subsidence and interfering with land subsidence management in MZ-1, to minimize pumping sustainability challenges, to minimize the impact of Storage and Recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful storage space in MZ-2 and MZ-3.
    - Watermaster will review each Storage and Recovery Program application, estimate the surface and ground water systems response, prepare a report that describes the response and potential MPI, and develop mitigation requirements to mitigate MPI caused by the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement.
    - Adverse impacts due to a Storage and Recovery Program must be mitigated. Adverse impacts include but are not limited to reductions in net recharge and Safe Yield and an increase in the groundwater discharge from the Chino-North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control.
        - As part of the Storage and Recovery Program application review process, Watermaster will: make a projection of the program's expected impact on net recharge and Safe Yield and on the state of Hydraulic Control and review these impacts and develop mitigation requirements for the proposed Storage and Recovery Program.
        - The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement.

        - Watermaster will estimate the reduction in net recharge and Safe Yield for each Storage and Recovery Program and deduct it from water stored in each Storage and Recovery Program storage account to compensate for its impact on net recharge and Safe Yield.

    - Watermaster will periodically review current and projected basin conditions and compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program applications; compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations; make findings regarding the efficacy of related mitigation of MPI and other adverse impact requirements and measures in the Storage and Recovery Program storage agreements; and based on its review and findings, require changes in the Storage and Recovery Program agreements to mitigate MPI and adverse impacts.

The 2020 SMP includes the following provisions regarding the Storage Agreement Application Process:

- Watermaster will modify the existing Form 8 Local Storage Agreements to be consistent with an "evergreen agreement" paradigm and establish that the evergreen agreements will be valid for the duration of the Peace Agreement and will be automatically adjusted upon Watermaster's approval of each subsequent Assessment Package so long as the cumulative amount of water in storage is less than the quantity reserved for the Parties' conjunctive-use operations and Metropolitan's DYYP (cumulatively, the FMSB) and Watermaster has made no finding that MPI is threatened to occur as a result of the increase in the quantity of water in storage.

The 2020 SMP includes the following provisions regarding the update of the SMP:

- Watermaster will periodically review and update the SMP at a frequency of no less than a once every five years, when the Safe Yield is recalculated, when it determines a review and update is warranted based new information and/or the needs of the Parties or the basin, and at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af.

# 4.0 2020 OBMP Update Management Plan

This section describes the recommended 2020 OBMP management plan for each of the nine PEs. The management plan is based on the ongoing 2000 OBMP implementation actions of each PE described in Section 3 and includes the new implementation actions listed in Section 2 for each of the 2020 OBMP Update Activities. For each management plan, the implementation action items are assigned a general schedule over a 20-year implementation period, and the actions are characterized as one-time or ongoing. Additionally, for each PE, the entities responsible for implementation of the PE management actions are identified.

The complete 2020 OBMP Update management plan, inclusive of all PEs, is summarized in Exhibit 17. Exhibit 17 lists each implementation action and characterizes if they originated from the 2000 OBMP or the 2020 OBMP Update and whether Watermaster deems their implementation required to administer the Physical Solution of the Judgment or comply with other regulatory or Watermaster requirements, including the basis for the requirements.

## 4.1 Program Element 1. Develop and Implement Comprehensive Monitoring Program

The objective of PE 1 is to collect the data and information necessary to support the implementation of all other OBMP PEs and to satisfy other regulations and Watermaster's obligations under its agreements, Court orders, and CEQA. Watermaster is responsible for the implementation of PE 1. The implementation actions and general schedule for implementation are summarized in Table 11 below.

**Table 11. Program Element 1 – 2020 OBMP Management Plan**

| Implementation Action | One-time/ Ongoing |
|---|---|
| Years 1 through 3 | |
| Watermaster will continue to conduct the required monitoring and reporting programs, including collection of: groundwater production, groundwater level, groundwater quality, ground level, surface water, climate, water supply planning, biological, and well construction/destruction monitoring data. | Ongoing |
| Perform review and update of Watermaster's regulatory and Court-ordered monitoring and reporting programs and document in a work plan: *OBMP Monitoring and Reporting Work Plan.* | One-time |
| Years 4 through 20 | |
| Watermaster will continue to conduct the required monitoring and reporting programs pursuant to the *OBMP Monitoring and Reporting Work Plan* (or other guidance documents developed by Watermaster). | Ongoing |
| Perform periodic review and update of the *OBMP Monitoring and Reporting Work Plan* (or other guidance documents developed by Watermaster) and modify the monitoring and reporting programs, as appropriate. | Ongoing |

## 4.2 Program Element 2. Develop and Implement Comprehensive Recharge Program

The objectives of PE 2 are to increase stormwater recharge to offset the recharge lost due to channel lining, to ensure there will be enough supplemental water recharge capacity available to Watermaster to replenish overdraft, and to maximize the recharge of recycled and supplemental waters to protect or enhance Safe Yield.

Watermaster, the IEUA, the CBWCD, and the SBCFCD are partners in conducting recharge in the Chino Basin and are jointly responsible for the implementation of PE 2. The implementation actions and general schedule for implementation are summarized in Table 12 below.

**Table 12. Program Element 2 – 2020 OBMP Management Plan**

| Implementation Action | One-time/ Ongoing |
|---|---|
| Years 1 through 3 | |
| Continue to convene the Recharge Investigations and Projects Committee. | Ongoing |
| Complete the 2023 Recharge Master Plan Update (RMPU). | One-time |
| Years 4 through 20 | |
| Implement recharge projects based on need and available resources. | Ongoing |
| Continue to convene the Recharge Investigations and Projects Committee. | Ongoing |
| Update the RMPU no less than every five years (2028, 2033, 2038). | Ongoing |

## 4.3 Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas

The objectives of PE 3 in the 2000 OBMP were to maintain and enhance Safe Yield and maximize beneficial uses of groundwater by constructing and operating the Chino Basin Desalters at an ultimate capacity of 40,000 afy. As described in Section 3.2.3, the final facilities to reach the ultimate capacity of 40,000 afy are under construction and are expected to be completed by 2021. Operation at this capacity, once all agricultural land uses have converted to urban uses, will fulfill the objectives of PE 3. Because the operation of the Chino Basin Desalters is necessary to attain Hydraulic Control, which is a regulatory requirement of the maximum benefit SNMP under PE 7, the implementation actions related to the ongoing operation of the Chino Basin Desalters are contained in PE 7. Thus, there are no separate implementation actions for PE 3 for the 2020 OBMP Update.

## 4.4 Program Element 4. Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1

The objective of PE 4 is to reduce or stop the occurrence of land subsidence and prevent ground fissuring in the Chino Basin or reduce it to tolerable levels. PE 4 achieves this objective by implementing the Watermaster's Subsidence Management Plan and updating the plan as warranted by data, analyses, and interpretations. Watermaster is responsible for the implementation of PE 4 with guidance from the GLMC.

The implementation actions for PE 4 and the general schedule for implementation are summarized in Table 13 below.

**Table 13. Program Element 4 – 2020 OBMP Management Plan**

| Implementation Action | One-time/ Ongoing |
|---|---|
| Years 1 through 20 | |
| Implement Watermaster's Subsidence Management Plan, and adapt it as necessary. | Ongoing |
| Watermaster will arrange for the physical recharge of at least 6,500 afy of Supplemental Water in MZ-1 as an annual average. Watermaster may re-evaluate the minimum annual quantity of Supplemental Water recharge in MZ-1 and may increase this quantity through the term of the Peace Agreement. | Ongoing |

## 4.5 Program Element 5. Develop and Implement Regional Supplemental Water Program

The objective of this PE is to improve the regional conveyance and availability of imported and recycled waters throughout the basin. This is a basin-wide activity that involves the Parties, the IEUA, the TVMWD, and the WMWD. IEUA will continue to lead the efforts to maximize the reuse of IEUA recycled water in the Chino Basin. There are other current and forthcoming water supply reliability planning efforts by the IEUA, the Parties, and neighboring agencies that provide a prime opportunity to expand coordination and leverage the efforts for broad, regional benefit. Currently, the IEUA is preparing the 2020 IRP and conducting other related planning efforts with its member agencies. This effort could be expanded by neighboring agencies, including the TVMWD, the WMWD, or other Parties. Any of these agencies could lead and coordinate the collaborative, regional planning effort on behalf of the Parties. Watermaster would participate in the planning efforts, to ensure that any water supply or recycled water projects that are recommended for implementation are integrated with its groundwater management planning efforts and are consistent with the Judgment, Peace Agreements and other agreements, the Watermaster Rules and Regulations.

The implementation actions and general schedule for implementation are summarized in Table 14 below. Each action is categorized as one-time or ongoing.

**Table 14. Program Element 5 – 2020 OBMP Management Plan**

| Implementation Action | One-time/ Ongoing |
|---|---|
| Years 1 through 20 | |
| The IEUA will maximize the reuse of its recycled water in the Chino Basin. | Ongoing |
| The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future recycled water planning efforts to maximize the reuse of all available sources of recycled water. | Ongoing |
| Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to maximize recycled water reuse to ensure these efforts are integrated with Watermaster's groundwater and salinity management efforts. | Ongoing |
| The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future integrated water resources planning efforts to address water supply reliability for all Watermaster Parties. | Ongoing |
| Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to improve water supply reliability to ensure those efforts are integrated with Watermaster's groundwater management efforts. | Ongoing |

## 4.6 Program Element 6. Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management

The objectives of PE 6 are to perform routine and coordinated water quality monitoring to characterize water quality in the Chino Basin so that there is adequate information to ensure that contamination sources are being addressed by water quality regulators and to help address compliance with new and increasingly stringent drinking water regulations for emerging contaminants established by the DDW.

The implementation actions and general schedule for implementation are summarized in Table 15 below.

**Table 15. Program Element 6 – 2020 OBMP Management Plan**

| Implementation Action | One-time/ Ongoing |
|---|---|
| Years 1 through 3 | |
| Re-convene the water quality committee and meet periodically to update groundwater quality management priorities. | Ongoing |
| Develop and implement an initial emerging contaminants monitoring plan. | One-time |
| Prepare a water quality assessment of the Chino Basin to evaluate the need for a Groundwater Quality Management Plan and prepare a long-term emerging contaminants monitoring plan. | One-time |
| Continue to support the Parties in identifying funding from outside sources to finance cleanup efforts. | Ongoing |
| Years 4 through 20 | |
| Develop and implement a Groundwater Quality Management Plan and periodically update it. | Ongoing |
| Implement long-term emerging contaminants monitoring plan. | One-time |
| Continue to conduct investigations to assist the Parties and/or the Regional Board in accomplishing mutually beneficial objectives as needed. | Ongoing |
| Implement projects of mutual interest. | Ongoing |

Watermaster will convene the Water Quality Committee and lead the stakeholder process to achieve the implementation actions for PE 6, including the development and implementation of a Groundwater Quality Management Plan and perform the initial and long-term water-quality monitoring at the monitoring and private wells sampled by Watermaster pursuant to PE 1.

Projects of mutual interest will be implemented pursuant to agreements among the implementing Parties with Watermaster support, as needed.

## 4.7 Program Element 7. Develop and Implement Salt Management Plan

The objective of PE 7 is to implement, and periodically update, the maximum-benefit SNMP. The SNMP is a management program to monitor, characterize, and manage current and future salt and nutrient conditions in the Chino Basin. The maximum-benefit SNMP enables the implementation of the recycled water recharge program in PE 2 and the direct reuse of recycled water in PE 5.

Watermaster and the IEUA are co-permittees for the maximum-benefit SNMP and the recycled water recharge program and will be jointly responsible for implementation of PE 7. The implementation actions and general schedule for implementation are summarized in Table 16 below.

**Table 16. Program Element 7 – 2020 OBMP Management Plan**

| Implementation Action | One-time/ Ongoing |
|---|---|
| Years 1 through 3 | |
| Complete the 2020 update of TDS and nitrate projections to evaluate compliance with maximum benefit salt and nutrient management plan, and, if necessary, based on the outcome, prepare a plan and schedule to implement a salt offset compliance strategy. | One-time |
| Continue to implement the maximum-benefit salt and nutrient management plan pursuant to the Basin Plan, including:<br>• Implement monitoring program and reporting requirements<br>• Maintain Hydraulic Control through operation of the Chino Basin Desalters and other means, as necessary<br>• Increase and maintain desalter pumping at 40,000 afy<br>• Continue storm and imported water recharge program to comply with recycled water recharge dilution requirements<br>• Comply with recycled water TDS and TIN limitations<br>• Compute ambient water quality every three years<br>• Construct treatment and/or salt-offset facilities *if* one or more of the compliance limits are exceeded | Ongoing |
| Years 4 through 20 | |
| Continue to implement the maximum-benefit salt and nutrient management plan pursuant to the Basin Plan, and any amendments thereto. | Ongoing |
| Starting in 2025 and every five years thereafter, update water quality projections to evaluate compliance with the maximum-benefit salt and nutrient management plan. | Ongoing |

## 4.8 Program Element 8. Develop and Implement Groundwater Storage Program *and* Program Element 9. Develop and Implement Storage and Recovery Programs

The objectives of PEs 8 and 9 are to:

- Implement, and periodically update, a storage management plan that: (1) is based on the most current information and knowledge of the basin, (2) prevents unauthorized overdraft, (3) prioritizes the use of storage space to meet the needs and requirements of the lands overlying the Chino Basin and of the Parties over the use of storage space to store water for export.
- Support the development and implementation of Storage and Recovery Programs in the Chino Basin that provide defined benefits to the Parties and the basin.

Watermaster is responsible for the implementation of PEs 8 and 9. The implementation actions and general schedule for implementation are summarized in Table 17 below.

**Table 17. Program Elements 8 and 9 – 2020 OBMP Management Plan**

| Implementation Action | One-time/ Ongoing |
|---|---|
| Years 1 through 3 | |
| Complete and submit to the Court the 2020 Safe Yield Recalculation. | One-time |
| Complete and submit to the Court the 2020 Storage Management Plan. | One-time |
| Develop a *Storage and Recovery Master Plan* to support the design of optimized Storage and Recovery Programs that are consistent with the 2020 Storage Management Plan and provide the Watermaster with criteria to review, condition, and approve applications in a manner that is consistent with the Judgment and the Peace Agreement. | One-time |
| Assess losses from storage accounts based on the findings of the 2020 Safe Yield Recalculation. | Ongoing |
| Years 4 through 20 | |
| Update the Storage Management Plan in 2025 and every five years thereafter and when:<br>• the Safe Yield is recalculated,<br>• Watermaster determines a review and update is warranted based new information and/or the needs of the Parties or the basin, and<br>• at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af | Ongoing |
| Perform Safe Yield recalculation every 10 years (2030, 2040). | Ongoing |
| Update the storage loss rate following each recalculation of Safe Yield (2030, 2040) and during periodic updates of the SMP. | Ongoing |

# Exhibit 1 – Drivers and Trends and Their Implications
## 2020 OBMP Update

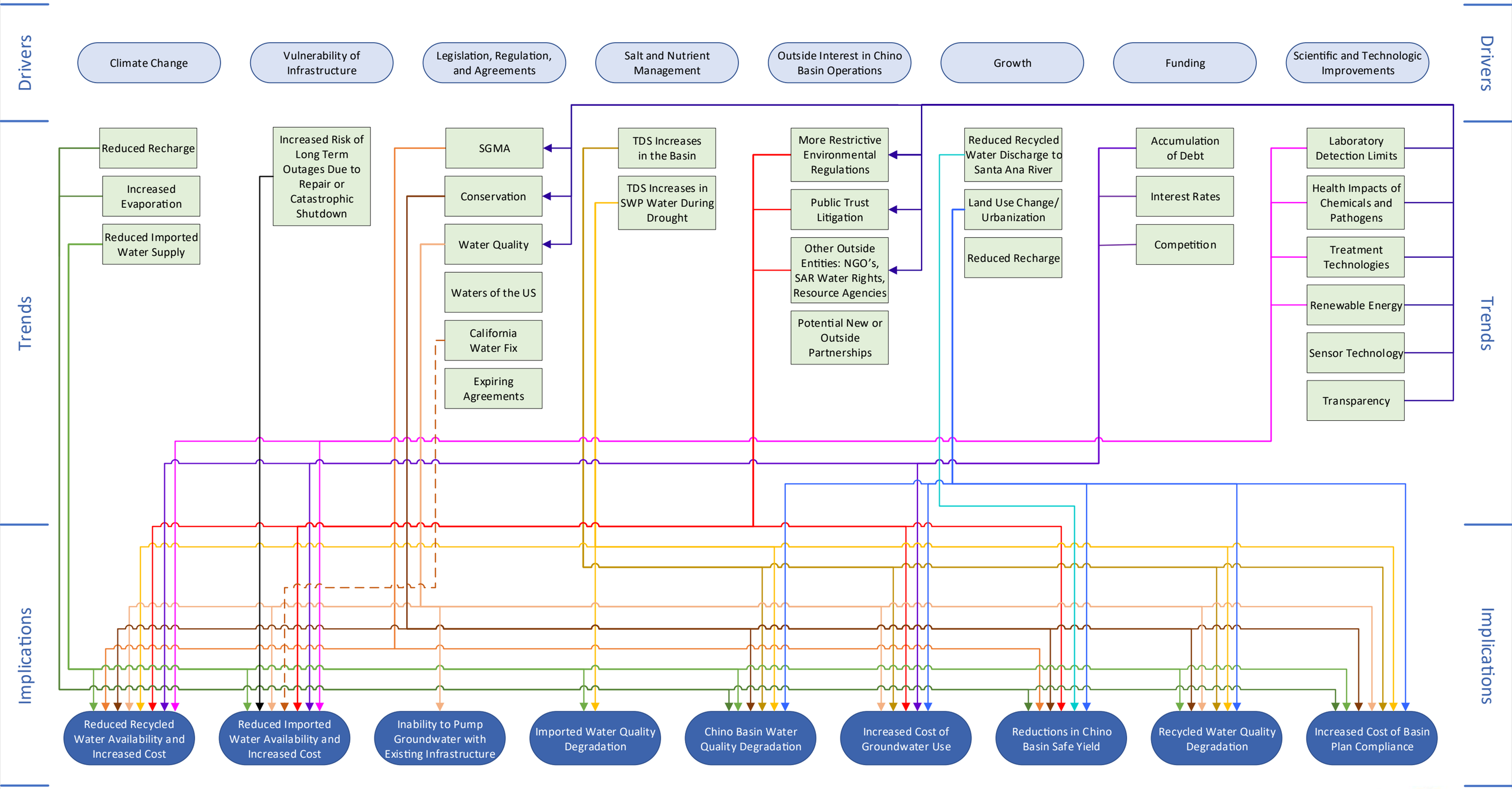

# Exhibit 2
# Comparison of the 2000 and 2020 OBMP Process

## 2000 OBMP

### OBMP Phase 1 Report

1. Introduction
2. State of the Basin
3. OBMP Goals
4. Management Plan

### OBMP Implementation Plan Program Elements (PEs)

1. Monitoring
2. Recharge Program
3. Water Supply Plan for Impaired Areas
4. Subsidence Management
5. Regional Supplemental Water Program
6. Cooperative Program with Regulators
7. Salt Management Plan
8. Storage Management Plan
9. Storage and Recovery Programs

**Peace Agreement**

**OBMP PEIR**

## 2020 OBMP Update

### 2020 OBMPU Scoping Report (TM1)

1. Introduction
2. Development of Activities
3. Scope of Work to Perform Proposed 2020 OBMP Update Activities.
   - Activity A: Increase the capacity to store and recharge storm and supplemental water
   - Activity B: Develop, implement and optimize Storage and Recovery Programs
   - Activity D: Maximize use of recycled water
   - Activity E/F: WQ Management Plan and Strategic Compliance Solutions
   - Activity C/G: Regional conveyance and treatment
   - Activity K: Salt and Nutrient Management Plan compliance
   - Activity L: Appropriate Monitoring

Integrate 2000 OBMP PEs with 2020 OBMP Update Activities

### 2020 OBMP Update Report (TM2)

1. Introduction
2. 2020 OMBP Goals and Activities
3. Integration of the 2020 OBMP Update Activities to the 2000 OBMP Program Elements.
4. 2020 OBMP Update Management Plan

### 2020 OBMP Implementation Plan

**Implementation Agreement**

**2020 OBMP PEIR**

## Exhibit 3
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reductions in Chino Basin Safe Yield*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage Storage and Recovery Programs | ● | ● | | ● | ● | | | ● | ● | ● | ● | | ● | | ● | | ● | | | | B, C | 1, 2, 3 |
| Design storage management and storage & recovery programs that maintain or enhance Safe Yield | ● | ● | | | | | | ● | ● | ● | | | ● | | ● | | ● | | | ● | B, C | 1, 3 |
| Maintain or enhance the Safe Yield of the basin without causing undesirable results | ● | ● | | ● | ● | | | ● | ● | ● | ● | | | | ● | | ● | | | ● | B, D | 1, 3 |
| Manage the basin Safe Yield for the long-term viability and reliability of groundwater supply | ● | ● | | | | | | ● | ● | ● | ● | | | ● | | | ● | ● | | ● | A, B, C | 1, 3 |
| Reassess the frequency of the Safe Yield recalculation | ● | | | | ● | | | | | | | | | | | | ● | | | | I | 3 |
| Continue to model and track Safe Yield, but utilize other management strategies to address a decline. | | | | | | | | | | | | | | | | | ● | | | | B | 1, 3 |
| Develop recharge programs that maintain or enhance Safe Yield | ● | ● | | | | | ● | ● | ● | ● | | | | | ● | | ● | | | ● | A, B | 1, 3 |
| Develop more facilities to capture, store, and recharge water | ● | ● | | | | | ● | | | ● | ● | | | | ● | | ● | | | | A, B, D | 1, 2 |
| Enhance recharge in northeast MZ-3 | ● | | ● | | | | | | ● | | | | | | | | ● | | | | A, C | 1, 3 |
| Maximize use of existing recharge facilities | ● | ● | | | | | | ● | ● | ● | | | | | | | | | | | A, C, F, G | 3 |
| Establish incentives to encourage recharge of high-quality imported water | ● | | ● | | | | | | | | | | | | | | | | | | H, I | 2, 3 |
| Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements | ● | ● | | | | ● | | ● | | | | | | | | | | | | | C, E | 3 |
| Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or Safe Yield | ● | | | | | | | | | | | | | | ● | | ● | | | ● | I, D | 3 |

## Exhibit 3
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Inability to Pump Groundwater with Existing Infrastructure*** | | | | | | | | | | | | | | | | | | | | | | |
| Pursue collaborative, regional partnerships to implement regional solutions to water management challenges | ● | | | ● | ● | | | ● | | | | | | | ● | ● | ● | ● | ● | ● | B, E, F, G, I | 3 |
| Ensure that sufficient, reliable water supplies will be available to meet current and future water demands | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | ● | | A, B, D, G | 1, 3 |
| Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program | ● | | | | | | ● | ● | ● | | | | | | ● | | ● | ● | | | B, G, I | 1, 2, 3 |
| Develop management strategies that enable the Parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality | ● | | | | | | ● | ● | | | | | | | ● | | ● | | | | A, C, D, E, F, G, I | 3 |
| Design storage management and storage & recovery programs to raise funding to build infrastructure | ● | | | ● | | | | | | | | | | | ● | | ● | | | | B, D, I, J | 3, 4 |
| Develop process to support/facilitate project implementation | ● | | | | | | | | | | | | | | | | | | | | F, H, J | 4 |
| Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2 | ● | | | | | | ● | ● | | ● | | | | ● | ● | | | | | | A, C, G | 3 |

**Exhibit 3**

**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

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| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Increased Cost of Groundwater Use*** | | | | | | | | | | | | | | | | | | | | | | |
| Seek supplemental financial resources to support the implementation of the OBMP Update | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | | ● | | D, F, G, I, J | 4 |
| Develop regional partnerships to help reduce costs | ● | | | ● | | | ● | ● | ● | | | | | | ● | ● | ● | | | ● | F, G, I, J | 4 |
| Monetize agencies' unused water rights for equitable balance of basin assets | | | ● | | | | | | | | | | | | | | | | | | G, H | 4 |
| Decrease Watermaster assessment costs | ● | | | | ● | | | ● | | | | | | | | | | | | | I, J | 4 |
| Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure | ● | ● | | | | | | | ● | | | | | | | | ● | | | | F, G, H | |
| Develop an equitable distribution of costs/benefits of the OBMP | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | ● | ● | | | | | | H, J | 4 |
| Watermaster assessments for implementation of the OBMP should be allocated based on benefits received | ● | | | | ● | | | | | | | | | | | | | | | | H | 4 |
| Continue or enhance incentives to pump groundwater from the Chino Basin | | | ● | | | | | | | | | | | | | | | | | | G, I | 3, 4 |
| Improve flexibility for Parties to execute water rights transfers | | | | | | | | | | | | | | ● | | | | | | | G, I | 4 |

## Exhibit 3
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

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| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Chino Basin Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop a water quality management plan to ensure ability to produce groundwater rights | ● | ● | | ● | | | ● | ● | ● | ● | | | | ● | ● | | ● | ● | | | E, F, G, J | 2, 3 |
| Develop regional infrastructure to address water quality contamination and treatment | | | | ● | ● | | | ● | | | | | | | | | | | | | A, B, C, E, F, G, I, J | 2 |
| Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | ● | | ● | | | | E, F | 2 |
| Be more proactive and engaged in the process to develop new drinking water quality regulations | | | | | | | | ● | | | | | | | | | | | | | A, B, D, E, G, J | 2 |
| ***Recycled Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | | | | |
| Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit | | ● | | | | | ● | ● | ● | ● | | | | ● | ● | | | | | | A, B, D, E, G, J | 2 |
| ***Increased Cost of Basin Plan Compliance*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan | ● | ● | | | | | | | | | ● | | | | ● | | ● | | | | G, K | 2 |
| Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance | ● | | | ● | | | ● | ● | | | | | | | | | | | | | L | 3, 4 |

## Exhibit 3
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

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| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reduced Recycled Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | | | | |
| Fully utilize IEUA recycled water resources | | ● | | ● | | | ● | ● | | ● | | | | | ● | | | | | | A, D, E, F, G | 1 |
| Maximize the use of recycled water for direct use or recharge | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | | | | | | A, D, E, F, G | 1 |
| Evaluate the potential for direct potable reuse of recycled water | ● | | | | | | | | ● | | | | | | ● | | | | | | D, E, F | 1 |
| Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River | ● | ● | | ● | | | ● | ● | | ● | | | | | ● | | ● | | | | D, E, F | 1, 3 |
| Utilize non-IEUA sources of recycled water that are not being put to beneficial use | ● | ● | | | | | ● | ● | ● | ● | | | | | ● | | ● | | | | D, E, F | 1 |
| ***Other*** | | | | | | | | | | | | | | | | | | | | | | |
| Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update | ● | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | F, G, H, I, J | |
| Improve communication between the Parties | ● | | | ● | | | | ● | | | | | | ● | ● | | ● | | | | F, H, I | |
| Educate elected officials and decision makers on the need and urgency to address the water management challenges | ● | ● | | | | | | | ● | | | | | | ● | ● | ● | | | | F, G, H, I, J | |
| Consider a long-term planning horizon of up to 50 years | ● | | | | | | | | ● | ● | | | | | ● | | | | | | F, G, H, I, J | 3 |

## Exhibit 3
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

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| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reduced Imported Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | | | | |
| Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | ● | | | B, C, G | 1, 3 |
| Identify and utilize new sources of supplemental water | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | | | | A, B | 1, 3 |
| Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use | ● | ● | | ● | | | ● | ● | ● | | | ● | | | ● | ● | ● | ● | | | C, G | 1, 3 |
| Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix | ● | | | | | | | ● | ● | | | | | | ● | ● | ● | | | | - | 1, 3 |
| Develop management strategies that ensure Parties will meet future Chino Basin Desalter Replenishment Obligation and have the money to fund it | ● | ● | | ● | | | ● | | ● | | | | | | | | ● | | | ● | H, I, J | 3 |
| Increase water-supply reliability at the lowest possible cost | ● | | | ● | | | ● | ● | | | | ● | | ● | ● | | ● | | | | A, B, D, J | 3 |
| Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply | ● | | | ● | | | | | ● | | | ● | | | ● | ● | ● | ● | | | A | 3 |
| Analyze water management scenarios that plan for unexpected challenges and emergencies | ● | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | E, G | 3 |
| Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements | | | | | | | ● | | ● | ● | | ● | | | ● | | | | | ● | A | 1, 3 |
| Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase | ● | | | | | | | | | | | | | | | | | | | | - | 3 |
| Use more recycled water for Replenishment Obligation | ● | | | ● | | | ● | | ● | | | | | | | | ● | | | | A, D, E, F | 3 |
| Continue to build collaborative programs between the Metropolitan Water District and Chino Basin | ● | | | | | | ● | ● | ● | | | | | | ● | | ● | ● | | | B, I | 3 |

**Exhibit 4**

**Activities for Consideration in the 2020 OBMP Update**

| ID | Activity |
|---|---|
| A | Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge |
| B | Develop, implement, and optimize Storage-and-Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality. |
| C | Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence. |
| D | Maximize the reuse of recycled water produced by IEUA and others |
| E | Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses |
| F | Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality |
| G | Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure. |
| H | Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements |
| I | Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement |
| J | Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update |
| K | Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge |
| L | Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance |

**Exhibit 5**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reductions in Chino Basin Safe Yield | Inability to Pump Groundwater with Existing Infrastructure | Increased Cost of Groundwater Use | Chino Basin Water Quality Degradation | Recycled Water Quality Degradation | Increased Cost of Basin Plan Compliance | Reduced Recycled Water Availability and Increased Cost | Reduced Imported Water Availability and Increased Cost |
| ***Goal 1 - Enhance Basin Water Supplies*** | | | | | | | | | | |
| 1a • Not all of the stormwater runoff available to the Chino Basin is diverted and recharged; failure to divert and recharge stormwater is a permanently lost opportunity.<br><br>• The existing methodology to select recharge projects for implementation is based on the cost of imported water. There are currently no known projects with a unit cost lower than the cost of imported water, hindering expansion of stormwater capture and recharge<br><br>• Pumping capacity in some areas of the basin is limited due to low groundwater levels, land subsidence, and water quality | A Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge | • Increases recharge of high-quality stormwater that will:<br>• protect/enhance the Safe Yield,<br>• improve water quality,<br>• reduce dependence on imported water,<br>• increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and<br>• provide new supply of blending water to support the recycled-water recharge program.<br><br>• Provides additional supplemental-water recharge capacity for replenishment and implementation of Storage and Recovery Programs.<br><br>• Provides additional surface water storage capacity.<br><br>• Revised economic criteria for selecting recharge projects for implementation. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |

**Exhibit 5**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reductions in Chino Basin Safe Yield | Inability to Pump Groundwater with Existing Infrastructure | Increased Cost of Groundwater Use | Chino Basin Water Quality Degradation | Recycled Water Quality Degradation | Increased Cost of Basin Plan Compliance | Reduced Recycled Water Availability and Increased Cost | Reduced Imported Water Availability and Increased Cost |
| ***Goal 1 - Enhance Basin Water Supplies*** | | | | | | | | | | |
| 1b • There is a surplus of recycled water potentially available to the Chino Basin Parties that is not being put to beneficial use.<br><br>• Existing infrastructure limits the expansion or reuse and recharge of recycled water in the Chino Basin.<br><br>• Existing requirements to discharge recycled water to the Santa Ana River limit the amount of IEUA recycled water available for reuse and recharge<br><br>•The Department of Drinking Water and the Regional Board blending requirements for recycled water recharge could limit expanded recharge opportunities | D Maximize the reuse of recycled water produced by IEUA and others | • Results in a new, consistent volume of in-lieu and/or wet water recharge that will:<br>• protect/enhance the Safe Yield,<br>• reduce dependence on imported water,<br>• improve water-supply reliability, especially during dry periods, and<br>• increase pumping capacity in areas of low groundwater levels and areas of subsidence concern.<br><br>• Identify additional sources of water to satisfy IEUA discharge requirements pursuant to the Santa Ana River Judgment. | ✓ | ✓ | | | | | ✓ | ✓ |

**Exhibit 5**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reductions in Chino Basin Safe Yield | Inability to Pump Groundwater with Existing Infrastructure | Increased Cost of Groundwater Use | Chino Basin Water Quality Degradation | Recycled Water Quality Degradation | Increased Cost of Basin Plan Compliance | Reduced Recycled Water Availability and Increased Cost | Reduced Imported Water Availability and Increased Cost |
| ***Goal 2 - Protect and Enhance Water Quality*** | | | | | | | | | | |
| 2a • Areas of the basin are contaminated with VOCs, nitrate, perchlorate and other contaminants of emerging concern (CECs).<br><br>• Water-quality regulations are evolving and becoming more restrictive, which limits the beneficial uses of groundwater.<br><br>• Groundwater treatment may be necessary to meet beneficial uses, but can be expensive to build and operate.<br><br>• The basin is hydrologically closed, which causes accumulation and concentration of salts, nutrients, and other contaminants.<br><br>• Some stored water in the Chino Basin cannot be used due to water quality and insufficient treatment capacity<br><br>• Recharge sources may contribute CECs to the groundwater basin | E Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses<br><br>F Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality | • Proactively addresses new and near-future drinking water regulations.<br><br>• Enables the Parties to make informed decisions on infrastructure improvements for water-quality management and regulatory compliance.<br><br>• Removes groundwater contaminants from the Chino Basin and thereby improves groundwater quality.<br><br>• Enables the Parties to produce or leverage their water rights that may be constrained by water quality.<br><br>• Ensures that groundwater is pumped and thereby protects/enhances the Safe Yield. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| 2b • Water-quality regulations are evolving and generally becoming more stringent, which could limit the reuse and recharge of recycled water. | K Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge | • Enables the continued and expanded recharge of recycled water, which will:<br>• protect water quality,<br>• improve water-supply reliability, especially during dry periods, and<br>• protect/enhance the Safe Yield. | ✓ | | | ✓ | ✓ | ✓ | | ✓ |

**Exhibit 5**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reductions in Chino Basin Safe Yield | Inability to Pump Groundwater with Existing Infrastructure | Increased Cost of Groundwater Use | Chino Basin Water Quality Degradation | Recycled Water Quality Degradation | Increased Cost of Basin Plan Compliance | Reduced Recycled Water Availability and Increased Cost | Reduced Imported Water Availability and Increased Cost |
| ***Goal 3 - Enhance Management of the Basin*** | | | | | | | | | | |
| 3a • Existing infrastructure (pumping and treatment capacity and conveyance) is insufficient to conduct puts and takes under proposed storage programs.<br><br>• There is unused storage space in the Basin the use of which is constrained by the storage limits defined in existing CEQA documentation.<br><br>• Watermaster's current storage management plan is not optimized to protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc.<br><br>• Storage and recovery operations could be limited by contaminant plumes or other CECs in groundwater | B Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality. | • Storage programs that protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc.<br><br>• New regional infrastructure to optimize put and take operations<br><br>• Leverages unused storage space in the Basin.<br><br>• Reduces reliance on imported water, especially during dry periods.<br><br>• Potentially provides outside funding sources to implement the OBMP Update.<br><br>• Improves water quality through the recharge of high quality water. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |

**Exhibit 5**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reductions in Chino Basin Safe Yield | Inability to Pump Groundwater with Existing Infrastructure | Increased Cost of Groundwater Use | Chino Basin Water Quality Degradation | Recycled Water Quality Degradation | Increased Cost of Basin Plan Compliance | Reduced Recycled Water Availability and Increased Cost | Reduced Imported Water Availability and Increased Cost |
| ***Goal 3 - Enhance Management of the Basin*** | | | | | | | | | | |
| 3b • Land subsidence in northwest MZ1 may limit the ability for Parties to pump their respective rights in this area.<br><br>• Poor water quality and increasingly restricting water quality regulations limits the ability for some Parties to pump their respective rights.<br><br>• Low groundwater levels impact pumping capacity | C Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.<br><br>G Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure. | • Enables producers in MZ1 and MZ2 to obtain water through regional conveyance, which supports management of groundwater levels to reduce the potential for subsidence and ground fissuring.<br><br>• Enables the Parties to increase production in areas currently constrained by poor water quality.<br><br>• Removes groundwater contaminants from the Chino Basin and thereby improves water quality.<br><br>• Protects/enhances the Safe Yield.<br><br>• Maximizes the use of existing infrastructure, which will minimize costs.<br><br>• Provides infrastructure that can also be used to implement Storage and Recovery Programs. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| 3c • Watermaster needs information to comply with regulations and its obligations under its agreements and Court orders, yet financial resources to collect this information are limited. | L Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance | • Ensures full compliance with regulatory requirements.<br><br>• Ensures full support of basin management initiatives.<br><br>• Enables Parties to monitor the performance of the OBMP Update.<br><br>• Continual review and revision of requirements and monitoring program to ensure cost efficiency | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Exhibit 5**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reductions in Chino Basin Safe Yield | Inability to Pump Groundwater with Existing Infrastructure | Increased Cost of Groundwater Use | Chino Basin Water Quality Degradation | Recycled Water Quality Degradation | Increased Cost of Basin Plan Compliance | Reduced Recycled Water Availability and Increased Cost | Reduced Imported Water Availability and Increased Cost |
| ***Goal 4 - Equitably Finance the OBMP*** | | | | | | | | | | |
| 4a • The distribution of benefits associated with the OBMP Update is not defined.<br><br>• Funding needed for the OBMP implementation activities of the Watermaster is not projected beyond the current year budget, which limits Parties ability to plan required funding for the future.<br><br>• There is currently no formal process to evaluate and adapt the OBMP implementation plan, schedule and cost. | H Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements | • Provides transparency as to the benefits of the OBMP Update activities<br><br>• Identifies Watermaster roles and costs to the Parties<br><br>• Formal process to revisit implementation plan and adjust priorities and schedule as necessary to address changed conditions<br><br>• Periodic updates of cost projections for OBMP implementation needed to plan financial resources.<br><br>• Improves readiness to apply for grants as they become available<br><br>• Improves the likelihood that the OBMP will be implemented. | | | ✓ | | | ✓ | ✓ | ✓ |
| 4b • Limited financial resources constraint the implementation of the OBMP.<br><br>• Future reliability of grant funding is uncertain | I Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement | • Lowers the cost of OBMP implementation.<br><br>• Improves the likelihood that the OBMP will be implemented. | | | ✓ | | | ✓ | ✓ | ✓ |
| | J Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update | | | | ✓ | | | ✓ | ✓ | ✓ |

**Exhibit 6**

**2020 OBMP Update - Activity A:**

*Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental waters, particularly in areas of the basin that will promote the long-term balance of recharge and discharge*

**Need and Objectives**: The objectives of Activity A are (1) to maximize stormwater capture pursuant to Watermaster's diversion permits, (2) to promote the long-term balance of recharge and discharge, (3) to ensure sufficient supplemental water recharge capacity for future replenishment, (4) to reduce dependence on imported water by maintaining or enhancing Safe Yield, (5) to improve water quality, and (6) to ensure a supply of dilution water to comply with recycled water recharge permit requirements. Based on the alignment of the objectives of Activity A with those of the RMPU, Activity A can be accomplished through the existing RMPU process.

| Phase | Task | Outcomes | Watermaster Role | Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ? |
|---|---|---|---|---|
| S | 1 – Define objectives and refine scope of work | Consensus on objectives of 2023 RMPU | Convene the Recharge Investigations and Projects Committee | The process to perform these steps is required to the extent that additional recharge capacity is needed to meet replenishment obligations. If, in scoping the committee does not establish the additional need to evaluate projects beyond replenishment capacity, those projects are not required to be evaluated. |
| PN | 2 – Develop planning, screening, and evaluation criteria | New criteria for selecting projects | Technical support role | |
| PAE | 3 – Describe recharge enhancement opportunities<br><br>4 – Develop reconnaissance-level engineering design and operating plan | Conceptual design, operating plans, and costs of recharge alternatives<br><br>Project implementation and financing plan | Technical support role | |
| I | 5 – Plan, design, and construct selected recharge projects | New recharge projects | Technical support role | Yes, to the extent that additional recharge capacity is needed for replenishment. |

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

**Activity Implementation Schedule and Go/No-Go Decision Points**

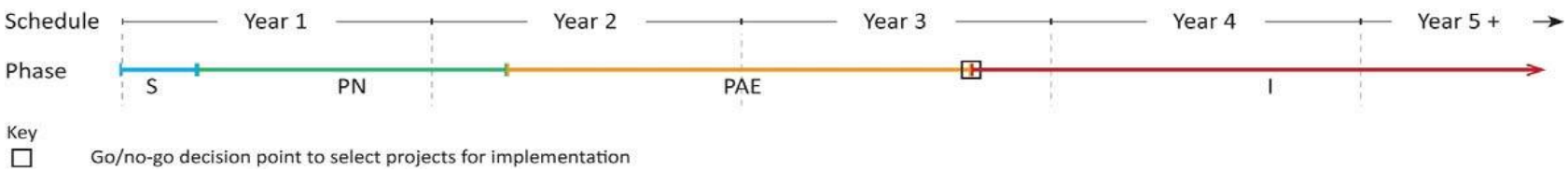

## Exhibit 7
## 2020 OBMP Update - Activity B

*Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality*

**Need and Objectives**: The parties desire to develop and implement "optimized" Storage and Recovery Programs that avoid potential MPI and provide broad benefits, such as increased water-supply reliability, protected or enhanced Safe Yield, improvements to water quality, and reduced cost for OBMP implementation. The objectives of Activity B are to prepare a *Storage and Recovery Master Plan* in a collaborative setting that clearly articulates the specific objectives of the parties and the required benefits to be realized from storage and recovery programs. The master plan will assist the parties and their storing partners to select and implement Storage and Recovery Programs that achieve the their objectives and the desired benefits.

| Phase* | Task | Outcomes | Watermaster Role | Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ? |
|---|---|---|---|---|
| S | 1 – Convene the Storage and Recovery Program Committee, define objectives, and refine scope of work | Consensus on objectives and desired benefits of Storage and Recovery Programs | Convene committee | Section 5.2.c.iv.(b) of the Peace Agreement states that "Watermaster shall prioritize its efforts to regulate and condition the storage and recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits." Watermaster must document the basis by which it will review, condition, and approve applications in a manner that is predictable, uniform, and consistent with the Peace Agreement and the 2020 SMP. A master plan is the most efficient process to do this. |
| PN | 2 – Develop conceptual alternatives for Storage and Recovery Programs at various scales | Conceptual descriptions of various types of Storage and Recovery Programs that achieve the objectives defined in Task 1 | Assist in the development and documentation of conceptual alternatives | |
| PAE | 3 – Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives | Conceptual design, operating plans, and costs for various Storage and Recovery Program alternatives | Assist in development of alternatives<br><br>Groundwater modeling to estimate basin response | |
| I | 4 – Prepare *Storage and Recovery Program Master Plan* | *Storage and Recovery Program Master Plan* that will support Storage and Recovery Program selection, solicitation of storing partners, applications for funding, and Watermaster approvals | Prepare draft and final master plan | |

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

**Activity Implementation Schedule and Go/No-Go Decision Points**

**Exhibit 8**

**2020 OBMP Update - Activity CG:**

*Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence AND Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure*

**Need and Objectives**: The parties have identified that there are basin management challenges, such as land subsidence and poor water quality, that could limit their ability to exercise their pumping rights using existing infrastructure. Additionally, there are numerous challenges to the reliability of the non-Chino Basin groundwater water supplies available to the Chino Basin parties and the infrastructure that deliver them. The objectives of Activity CG is to optimize the use of all sources of water available to the parties to meet their demands despite these challenges and potentially help mitigate them.

| Phase | Task | Outcomes | Watermaster Role | Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ? |
|---|---|---|---|---|
| S | 1 - Form the Water Supply Reliability Committee, define objectives, and refine scope | Mutual understanding of the universe of water reliability concerns of parties | Work with IEUA or other activity lead | Although these actions optimize the management of all available water supplies to achieve water supply reliability, they are not required outcomes. |
| PN | 2 - Characterize water demands, water supply plans, and existing/planned infrastructure and its limitations | Identify opportunities and limitations in the existing/planned infrastructure to meet reliability goals defined in Task 1 | Work with IEUA or other activity lead | |
| PAE | 3 – Develop planning, screening, and evaluation criteria<br><br>4 – Identify and describe water supply reliability opportunities<br><br>5 – Develop reconnaissance-level engineering design and operating plan | Conceptual design, operating plans, and costs of reliability alternatives<br><br>Project implementation and financing plan | Work with IEUA or other activity lead | |
| I | 6 – Plan, design, and build water reliability projects | New water reliability projects | None | |

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

**Activity Implementation Schedule and Go/No-Go Decision Points**

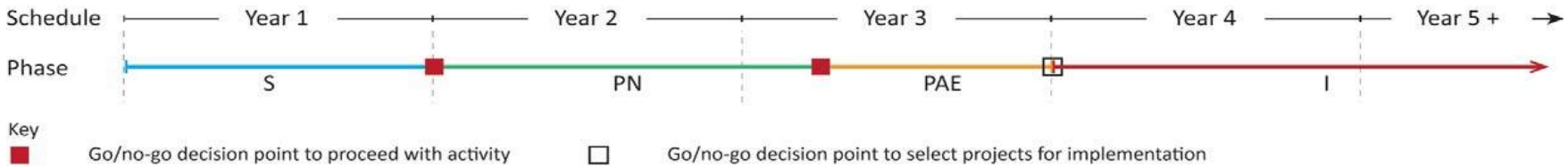

**Exhibit 9**

**2020 OBMP Update - Activity D:**

*Maximize the reuse of recycled water produced by IEUA and others*

**Need and Objectives**: The objective is to maximize the reuse of recycled water produced by the IEUA and other publicly owned treatment works (POTWs) in proximity to the Chino Basin to meet future demands and improve local water-supply reliability, especially during dry periods. Expanded reuse activities could include direct non-potable reuse (landscape irrigation or industrial uses), groundwater recharge (indirect potable reuse), and direct potable reuse. Increasing recycled water reuse is an integral part of the OBMP's goal to enhance water supplies. The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses.

| Phase | Task | Outcomes | Watermaster Role | Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ? |
|---|---|---|---|---|
| S | 1 – Convene Recycled Water Projects Committee, define objectives and refine scope of work | Consensus on the objectives for optimizing and maximizing recycled water reuse | Work with IEUA or other activity lead | Although these actions optimize the management of all available recycled water supplies to achieve water supply reliability, they are not required outcomes. |
| PN | 2 – Characterize the availability of all recycled water supplies and demands | Understanding of demand and opportunities for increased recycled water reuse | Work with IEUA or other activity lead | |
| PAE | 3 – Develop planning, screening, and evaluation criteria<br><br>4 – Identify and describe potential projects for evaluation<br><br>5 – Conduct a reconnaissance-level study for the proposed projects | Conceptual design, operating plans, and costs of reuse projects<br><br>Characterization of SNMP impacts of reuse projects<br><br>Project implementation and financing plan | Work with IEUA or other activity lead | |
| I | 6 – Plan, design, and construct selected projects | New recycled water reuse projects | None | |

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

**Activity Implementation Schedule and Go/No-Go Decision Points**

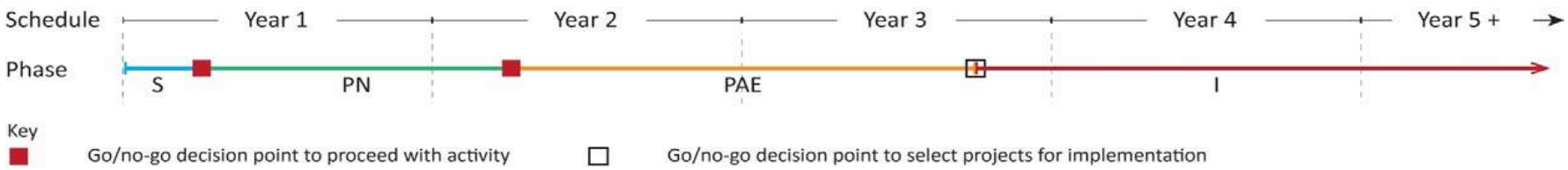

## Exhibit 10

## 2020 OBMP Update - Activity EF

*Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses AND*
*Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality*

**Need and Objectives**: Groundwater contaminants are present across the Chino Basin, new contaminants are being discovered, and water-quality regulations are evolving and becoming more restrictive. These trends are limiting the beneficial use of groundwater and increasing the cost of the water supply. The objectives of Activity EF are to characterize the water-quality challenges across the Chino Basin and identify the most efficient means to address the water-quality challenges, including the potential for multi-benefit collaborative projects, to ensure that groundwater can be put to beneficial use.

| Phase* | Task | Outcomes | Watermaster Role | Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ? |
|---|---|---|---|---|
| S | 1 - Convene the Water Quality Committee, define objectives, and refine scope of work | Mutual understanding of the universe of water quality concerns of parties | Convene committee | Paragraph 41 of the Judgement provides for both water quantity and quality considerations to maximize the beneficial utilization of the Basin. If water quality is not effectively managed, the Parties may not be able to utilize their water rights, which could result in negative impacts to the basin. Effective management of water quality can only be accomplished through a systematic assessment of the emerging contaminant threats to the use of groundwater resource and a development of a plan to respond to those threats. |
| PN | 2 - Develop and implement an initial emerging-contaminants monitoring plan | Data | Prepare monitoring plan; collect and compile data | |
| PN | 3 – Perform a water quality assessment and prepare a scope to develop and implement a *Groundwater Quality Management Plan* | Understanding of scale of problem; scope/cost to evaluate project alternatives; long-term monitoring plan | Perform characterization | |
| PAE | 4 – Develop planning, screening, and evaluation criteria<br><br>5 – Identify and describe potential projects for evaluation<br><br>6 – Conduct a reconnaissance-level study for the proposed projects<br><br>7 – Prepare the *Groundwater Quality Management Plan* | Conceptual design and operating plans for project alternatives<br><br>Understanding of cost to manage Chino Basin groundwater quality with and without collaborative projects<br><br>Management plan to document project implementation plan and supporting info | Technical support role to evaluate project alternatives and characterize potential for MPI (if necessary)<br><br>Technical support role to prepare the *Groundwater Quality Management Plan* | |
| I | 8 – Plan, design, and build water quality management projects | New groundwater quality improvement projects | None | No |

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

**Activity Implementation Schedule and Go/No-Go Decision Points**

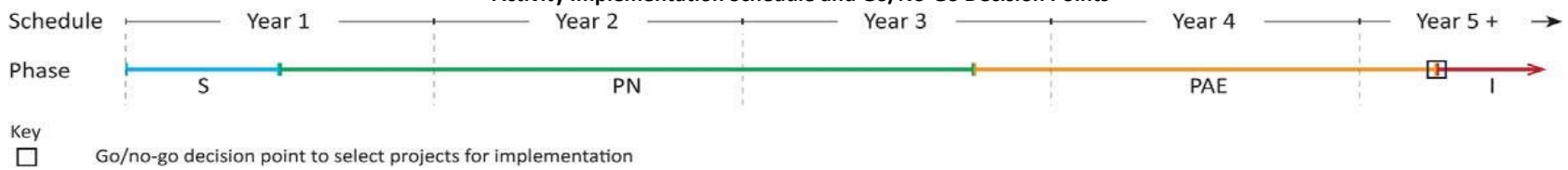

**Exhibit 11**

**2020 OBMP Update - Activity K:**

*Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge*

**Need and Objectives**: The Watermaster and IEUA implement a recycled water recharge program to improve supply reliability. The Maximum Benefit SNMP requires that the recharge be diluted with other sources of low-salinity water to comply with Basin Plan Objectives. If sufficient dilution supplies are not available to comply with the dilution metric, treatment of recycled water, or other salt offset program will be required by the Regional Board. The objective of this activity is to determine if compliance with the Maximum Benefit SNMP recycled water recharge dilution requirements can be achieved under existing management plans, and if not, to develop a plan to achieve compliance.

| Phase | Task | Outcomes | Watermaster Role | Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ? |
|---|---|---|---|---|
| S/PN | 1 – Prepare projection to evaluate compliance with recycled water dilution requirements<br><br>5 – Periodically reevaluate compliance with dilution requirements | Understanding of ability to comply with the TDS and nitrate dilution requirements in the SNMP (near-term and long-term) | Perform technical work in collaboration with IEUA | Yes. Watermaster and IEUA have already begun this project and are required to complete it by the Regional Board to obtain a revised recycled water compliance program related to total dissolved solids concentrations. If approved, the Regional Board will require the study to be updated every five years to re-evaluate the need for revised compliance strategies. |
| PAE | 2 – Identify alternative compliance strategies<br><br>3 – Evaluate alternative compliance strategies | Conceptual design, operating plans, and costs of project alternatives<br><br>Report to document compliance plan and supporting info | Technical support role to IEUA to evaluate hydrogeologic impacts of project alternatives | |
| I | 4 – Implement the selected compliance strategy | Compliance project (or other compliance action) | Level of support depends on the compliance action | |

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

**Activity Implementation Schedule and Go/No-Go Decision Points**

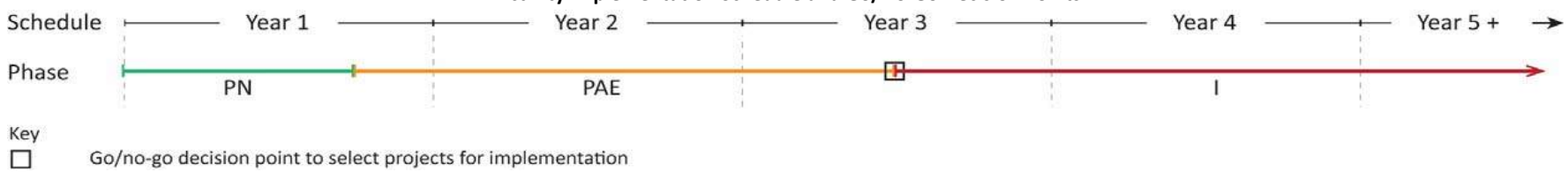

## Exhibit 12

## 2020 OBMP Update - Activity L

*Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance*

**Need and Objectives**: Watermaster conducts data-collection programs and prepares reports and data deliverables to comply with regulations, to fulfill its obligations under its agreements and Court orders, to comply with its requirements under CEQA, and to assess the performance of the evolving OBMP IP, including the 2020 OBMP Update. These monitoring and reporting efforts are described in the Scoping Report, and will need to continue. The objective of Activity L is to refine the monitoring and reporting requirements of Watermaster to ensure that the objectives of each requirement are being met efficiently at a minimum cost.

| Phase* | Task | Outcomes | Watermaster Role | Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements? |
|---|---|---|---|---|
| S, PN | 1 – Convene Monitoring and Reporting Committee and prepare the *Monitoring and Reporting Work Plan* | Understanding of all monitoring/reporting programs<br><br>*Monitoring and Reporting Work Plan*<br><br>*Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs* | Convene committee<br><br>Prepare work plan | No, however, monitoring and reporting are required to implement the Judgment and comply with regulations and Watermaster obligations. Since the beginning of OBMP implementation, Watermaster staff and engineer have continually refined the monitoring and reporting efforts to meet all requirements and achieve efficiencies and will continue to do so. This activity continues these refinement efforts in closer collaboration with the parties. |
| I | 2 – Implement recommendations in *Monitoring and Reporting Work Plan* | Revisions to Watermaster's non-discretionary monitoring and reporting programs<br><br>Future updates to the *Monitoring and Reporting Work Plan* | Perform technical demonstrations to gain approval for revisions to the monitoring/reporting program<br><br>Update work plan, when necessary | |
| PN, I | 3 – (recurring future task) – Bi-Annual review of scope of work and cost to implement the *Monitoring and Reporting Work Plan* in the subsequent fiscal year | Update to *Monitoring and Reporting Work Plan*<br><br>A scope of work and budget for the subsequent fiscal year | Update the work plan<br><br>Prepare scope and budget recommendation for subsequent year | |

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

**Activity Implementation Schedule and Go/No-Go Decision Points**

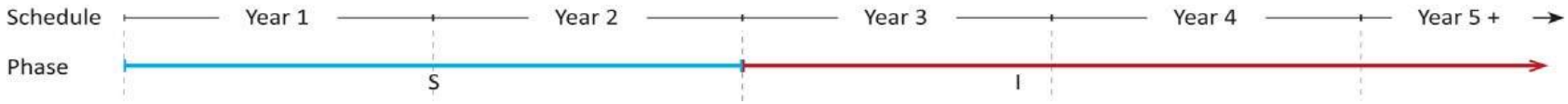

**Exhibit 13**

**Nexus of the 2020 OBMP Update Activities to the 2000 OBMP Program Elements**

| **2000 OBMP Program Elements (PEs)** | **2020 OBMP Update Activities** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **A** - Increase Recharge | **B** - Optimize Storage and Recovery | **CG** - Regional Conveyance | **D** - Maximize RW Reuse | **EF** - Water Quality Mgmt. | **K** - Plan for SNMP Dilution Compliance | **L** - Monitoring |
| 1 - Monitoring | | | | | | | ⚓ |
| 2 - Recharge Program | ⚓ | ● | | | | | ● |
| 3 - Impaired Areas | | ● | | | ● | ● | ● |
| 4 - Subsidence Mgmt. | ● | ● | ● | | | | ● |
| 5 - Supplemental Water | | ● | ⚓ | ⚓ | ● | | ● |
| 6 - Water Quality | ● | ● | ● | ● | ⚓ | ● | ● |
| 7 - SNMP | | | | ● | | ⚓ | ● |
| 8 – Storage Mgmt. Plan | | ● | | | | | ● |
| 9 – S&R Programs | ● | ⚓ | ● | | | | ● |

⚓ Direct relationship between an activity and a PE (i.e. the activity and the PE have similar or identical objectives and thus the activity can be integrated into the existing PE)

● Indirect relationship between an activity and a PE (i.e. the activity has the potential to provide benefits to PEs)

**Exhibit 14**
**Status of Compliance with the Chino Basin Maximum-Benefit Commitments**

| Description of Commitment | Compliance Date – as soon as possible, but no later than | Status of Compliance |
|---|---|---|
| 1. Surface Water Monitoring Program[1]<br>a. Submit draft Monitoring Program to Regional Board<br>b. Implement Monitoring Program<br>c. Submit Draft Revised Monitoring Program to Regional Board<br>d. Implement Revised Monitoring Program<br>e. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "c", above) to Regional Board<br>f. Implement Revised Monitoring Program(s)<br>g. Annual data report submittal | a. January 23, 2005<br>b. Within 30 days from the date of Regional Board approval of the monitoring plan<br>c. 15 days from 2012 Basin Plan Amendment (BPA) approval<br>d. Upon Regional Board approval<br>e. Upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer<br>f. Upon Regional Board approval<br>g. April 15th | a. Draft work plan submitted to the Regional Board on January 23, 2005<br>b. Monitoring plan initiated prior to Regional Board approval<br>c. Draft work plan submitted to the Regional Board on February 16, 2012, six days after 2012 BPA approval<br>d. Revised monitoring program began in December 2012 after the BPA was approved by the Office of Administrative Law on December 6, 2012<br>e. No revisions requested by the Regional Board<br>f. n/a<br>g. All annual reports submitted by April 15 of each year since 2006 |
| 2. Groundwater Monitoring Program[1]<br>a. Submit Draft Monitoring Program to Regional Board<br>b. Implement Monitoring Program<br>c. Plan and schedule for demonstrating Hydraulic Control | a. January 23, 2005<br>b. Within 30 days from the date of Regional Board approval of the monitoring plan<br>c. By December 31, 2013 | a. Draft monitoring plan submitted to Regional Board on January 23, 2005<br>b. Monitoring program initiated prior to Regional Board approval<br>c. Plan and schedule for demonstrating Hydraulic Control submitted in the 2014 Work Plan to the Regional Board on December 23, 2013 |

[1] The commitments related to surface water and groundwater monitoring were revised by a Basin Plan amendment approved by the Regional Board on February 10, 2012. The commitments and status of compliance shown in this table reflect the amended commitments for surface water and groundwater monitoring.

**Exhibit 14**
**Status of Compliance with the Chino Basin Maximum-Benefit Commitments**

| Description of Commitment | Compliance Date – as soon as possible, but no later than | Status of Compliance |
|---|---|---|
| d. Implement Hydraulic Control demonstration<br>e. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "a", above) to Regional Board<br>f. Implement revised monitoring plans (s)<br>g. Annual data report submittal | d. Upon Regional Board approval<br>e. Upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer<br>f. Upon Regional Board approval<br>g. April 15th | d. Hydraulic Control demonstration reported in all annual reports<br>e. No revisions requested by Regional Board<br>f. n/a<br>g. All annual reports submitted by April 15 of each year |
| 3. Chino Desalters<br>a. Chino-I Desalter expansion to 10 mgd<br>b. Chino-II Desalter construction to 10 mgd capacity | a. Prior to the recharge of recycled water<br>b. Recharge of recycled water allowed once award of contract and notice to proceed issued for construction of desalter treatment plant | a. Chino-I Desalter expansion to about 14 mgd was completed in April 2005 and operation began in October 2005; recycled water recharge began in July 2005.<br>b. Contract for Chino-II Desalter awarded in early 2005; construction was completed to a capacity of 15 mgd, and the facility went online in June 2006. |
| 4. Submittal of future desalters plan and schedule | October 1, 2005<br>Implement plan and schedule upon Regional Board approval | Several plans for desalter expansion have been submitted to the Regional Board since 2005. The capacity of the constructed desalter wells in 2015 was about 27 mgd (about 30,000 afy). Watermaster and the IEUA submitted a plan to the Regional Board on June 30, 2015 to construct three additional wells to achieve the ultimate capacity of 36 mgd (40,000 afy), per the Peace and Peace II Agreements. The first two wells are constructed and began operating in 2018. The construction of the the third well is anticipated to begin in late 2019. |

**Exhibit 14**
**Status of Compliance with the Chino Basin Maximum-Benefit Commitments**

| Description of Commitment | Compliance Date – as soon as possible, but no later than | Status of Compliance |
|---|---|---|
| 5. Recharge facilities (17) built and in operation | June 30, 2005 | Watermaster and the IEUA partnered with the San Bernardino County Flood Control District and the Chino Basin Water Conservation District for completion of the Chino Basin Facilities Improvement Program to construct and/or improve eighteen recharge sites. There are currently 17 basins in the Chino Basin Groundwater Recharge Program. |
| 6. Submittal of IEUA wastewater quality improvement plan and schedule | 60 days after agency-wide, 12-month running average effluent TDS quality equals or exceeds 545 mgl for 3 consecutive months, or after agency-wide, 12-month running average TIN equals or exceeds 8 mgl in any month<br>Implement plan and schedule upon approval by Regional Board | These threshold events have not occurred; therefore, a wastewater quality improvement plan has not been submitted |
| 7. Recycled water will be blended with other recharge sources such that the volume-weighted, 5-year running average TDS and nitrate-nitrogen concentrations of recharge are equal to or less than the maximum benefit water quality objectives.<br>a. Submit a report that documents the location, amount of recharge, and TDS and nitrogen quality of storm water recharge before the OBMP recharge improvements were constructed and what is projected to occur after the recharge improvements are completed. | Compliance must be achieved by the end of the 5th year after initiation of recycled water recharge operations.<br>a. Prior to initiation of recycled water recharge | a. No documentation of water quality data or quantity for storm water prior to OBMP initiation exists. Storm water has been monitored for flow, TDS, and nitrogen since 2005. |

**Exhibit 14**
**Status of Compliance with the Chino Basin Maximum-Benefit Commitments**

| Description of Commitment | Compliance Date – as soon as possible, but no later than | Status of Compliance |
|---|---|---|
| b. Submit documentation of the amount and TDS and nitrogen quality of all sources of recharge and recharge locations. For storm water recharge used for blending, submit documentation that the recharge is the result of OBMP enhanced recharge facilities. | b. Annually, by April 15th, after initiation of construction of basins/other facilities to support enhanced storm water recharge | b. The volume-weighted, 5-year running average TDS and nitrate-nitrogen concentrations of Chino Basin recharge are less than the maximum-benefit water quality objectives |
| 8. Hydraulic Control Failure<br>a. Plan and schedule to correct loss of Hydraulic Control<br>b. Achievement and maintenance of Hydraulic Control<br>c. Mitigation plan for temporary failure to achieve/maintain Hydraulic Control | a. 60 days from Regional Board finding that Hydraulic Control is not being maintained<br>b. In accordance with plan and schedule approved by the Regional Board<br>c. By January 23, 2005 | a. No mitigation plan and schedule for the loss of Hydraulic Control has been requested.<br>b. Hydraulic Control has been achieved to the east of Chino-I Desalter Well 20.<br>Groundwater model estimates published in 2015 indicate that production at the CCWF will achieve Hydraulic Control in the west to *de minimis* levels (<1,000 afy of groundwater flow past the CCWF well field to the Prado Basin Management Zone). Full production at the CCWF was achieved in 2016.<br>Watermaster and the IEUA submitted a plan on June 30, 2015 to the Regional Board to construct three additional wells to achieve the ultimate Desalter capacity of 40,000 afy. Construction of two wells is completed and they began operating in 2018. Construction of the third well is anticipated to begin in late 2019. |

**Exhibit 14**
**Status of Compliance with the Chino Basin Maximum-Benefit Commitments**

| Description of Commitment | Compliance Date – as soon as possible, but no later than | Status of Compliance |
|---|---|---|
| | | c. Plan submitted to the Regional Board on March 3, 2005. No mitigation action has been triggered. |
| 9. Ambient groundwater quality determination | July 1, 2005 and every three years thereafter | Watermaster and the IEUA have participated in the regional triennial ambient water quality determinations coordinated through Basin Monitoring Program Task Force, administered through the Santa Ana Watershed Project Authority. Watermaster and the IEUA provide their fair share of funds and substantial groundwater data for this effort. |

**Exhibit 15**
**Limitations, Compliance Metrics, and Compliance Actions for the Chino Basin Maximum-Benefit Commitments**

| Source Waters with Water Quality Limitations in the Chino Basin SNMP | Water Quality Limitation | Compliance Metric | Action Limit | Required Compliance Action when Compliance Metric Exceeds the Action Limit |
|---|---|---|---|---|
| IEUA Recycled Water (Commitment 6) | TDS: 550 mgl | The agency-wide, 12-month running-average concentration | When the compliance metric exceeds 545 mgl for three consecutive months | Submit to the Regional Board for approval a plan and schedule to comply with the water quality limitations within 60 days. |
| | TIN: 8 mgl | | When the compliance metric exceeds 8 mgl in any month | |
| Combined water sources used for managed recharge: storm, imported and recycled waters (Commitment 7) | TDS: 420 mgl<br>Nitrate: 5 mgl | The five-year, volume-weighted running-average concentration of all sources of managed recharge | TDS: 420 mgl<br>Nitrate: 5 mgl | Prepare a salt offset plan to mitigate salt loading from recharge greater than 420 mgl. Offsets could include desalting of recycled water or groundwater, or increased recharge of low-TDS waters. |
| Groundwater (Commitment 9) | TDS: 420 mgl | The volume-weighted concentration of groundwater in the Chino North GMZ (computed every three years) | TDS: 420 mgl | Reduce the TDS concentration of IEUA recycled water to comply with the maximum-benefit TDS objective or prepare a salt offset plan to mitigate loading from the use of recycled water than 420 mgl. |
| | Nitrate: 5 mgl | | n/a | This action limit was already exceeded when the objective was established. So long as all other maximum benefit commitments are met, no compliance action is required. |

## Exhibit 16

## Ending Balances in Managed Storage in the Chino Basin[1]

## (af)

| Fiscal Year ending June 30 | Appropriative Pool | | | | Overlying Non-Agricultural Pool | | | Total Managed Storage by Parties | Dry Year Yield Program Storage | Total Managed Storage |
|---|---|---|---|---|---|---|---|---|---|---|
| | Carryover (1) | Excess Carryover (2) | Local Supplemental Storage (3) | Subtotal (4) | Carryover (5) | Excess Carryover (6) | Subtotal (7) | (8) = (7) + (4) | (9) | (10) = (9) + (8) |
| 2000 | 28,911 | 170,342 | | 199,253 | 6,541 | 31,031 | 37,572 | 236,825 | 0 | 236,825 |
| 2001 | 15,940 | 77,907 | 92,813 | 186,660 | 5,301 | 32,330 | 37,631 | 224,291 | 0 | 224,291 |
| 2002 | 13,521 | 70,103 | 87,801 | 171,425 | 5,285 | 33,727 | 39,012 | 210,437 | 0 | 210,437 |
| 2003 | 18,656 | 71,329 | 81,180 | 171,165 | 6,743 | 36,850 | 43,593 | 214,758 | 7,738 | 222,496 |
| 2004 | 21,204 | 70,503 | 80,963 | 172,670 | 7,177 | 40,881 | 48,058 | 220,728 | 26,300 | 247,028 |
| 2005 | 21,289 | 76,080 | 88,849 | 186,218 | 7,227 | 45,888 | 53,115 | 239,333 | 38,754 | 278,087 |
| 2006 | 32,062 | 56,062 | 86,170 | 174,294 | 7,227 | 49,178 | 56,405 | 230,699 | 58,653 | 289,352 |
| 2007 | 34,552 | 50,895 | 83,184 | 168,631 | 7,084 | 51,476 | 58,560 | 227,191 | 77,116 | 304,307 |
| 2008 | 41,626 | 83,962 | 81,520 | 207,108 | 6,819 | 45,248 | 52,067 | 259,175 | 74,877 | 334,052 |
| 2009 | 42,795 | 101,908 | 79,890 | 224,593 | 6,672 | 46,600 | 53,272 | 277,865 | 34,494 | 312,359 |
| 2010 | 41,263 | 120,897 | 90,133 | 252,293 | 6,934 | 47,732 | 54,666 | 306,959 | 8,543 | 315,502 |
| 2011 | 41,412 | 146,074 | 98,080 | 285,566 | 6,959 | 49,343 | 56,302 | 341,868 | 0 | 341,868 |
| 2012 | 42,614 | 209,981 | 116,138 | 368,733 | 6,914 | 13,993 | 20,907 | 389,640 | 0 | 389,640 |
| 2013 | 39,413 | 225,068 | 116,378 | 380,859 | 7,073 | 15,473 | 22,546 | 403,405 | 0 | 403,405 |
| 2014 | 41,708 | 224,496 | 123,484 | 389,688 | 6,478 | 12,812 | 19,290 | 408,978 | 0 | 408,978 |
| 2015 | 40,092 | 239,517 | 127,994 | 407,603 | 6,823 | 12,225 | 19,048 | 426,651 | 0 | 426,651 |
| 2016 | 39,733 | 248,013 | 131,522 | 419,267 | 7,195 | 9,949 | 17,144 | 436,411 | 0 | 436,411 |
| 2017 | 38,340 | 260,682 | 143,552 | 442,575 | 7,226 | 8,292 | 15,519 | 458,093 | 6,315 | 464,408 |
| 2018 | 34,582 | 254,221 | 155,018 | 443,821 | 7,198 | 10,775 | 17,973 | 461,795 | 41,380 | 503,174 |
| 2019 | 38,605 | 279,033 | 166,406 | 484,044 | 7,227 | 12,004 | 19,231 | 503,275 | 45,969 | 549,244 |

1 -- WEI. (2019). Draft Storage Management Plan.

## Exhibit 17
## Implementation Actions for the 2020 Optimum Basin Management Program Update by Program Element

| Implementation Actions for the Next 20 Years by Program Element | Action Added in 2000* or 2020? | Schedule (Yr 1-3, 4-20, or 1-20) | Is the Action Required by Watermaster to Administer the Physical Solution or Comply with Other Regulatory or Court Requirements? | |
|---|---|---|---|---|
| | | | Yes/No | Basis |
| **Program Element 1 - Develop and Implement Comprehensive Monitoring Program** | | | | |
| Watermaster will continue to conduct the required monitoring and reporting programs, including collection of: groundwater production, groundwater level, groundwater quality, ground level, surface water, climate, water supply planning, biological, and well construction/destruction monitoring data. | 2000* | Years 1-20 | Yes | This action included in the 2000 OBMP IP is required by the July 2000 Court Order to implement the Peace Agreement. The monitoring requirements have evolved over time. The requirements are described in Table 2 of the OBMP Update Report, which lists each Watermaster monitoring and reporting program and the associated entity (e.g. Court, Regional Board, etc.) requiring each program. |
| Perform review and update of Watermaster's regulatory and Court-ordered monitoring and reporting programs and document in a work plan: *OBMP Monitoring and Reporting Work Plan.* | 2020 | Years 1-3 | No | These actions will allow the Parties to offer more direct input in the implementation of the required monitoring programs, but it is not necessary for Watermaster to convene this process to comply with the monitoring requirements. Watermaster annually reviews ongoing monitoring to achieve efficiency. |
| Perform periodic review and update of the *OBMP Monitoring and Reporting Work Plan* (or other guidance documents developed by Watermaster) and modify the monitoring and reporting programs, as appropriate. | 2020 | Years 4-20 | No | |
| **Program Element 2 - Develop and Implement Comprehensive Recharge Program** | | | | |
| Continue to convene the Recharge Investigations and Projects Committee. | 2000 | Years 1-20 | Yes | These actions included in the 2000 OBMP IP are required by the July 2000 Court Order to implement the Peace Agreement. The Peace II Agreement and the Special Referee's December 2007 Report further establish the requirement and need for the recharge program. In its December 2007 Order, the Court ordered the implementation of the Peace II Agreement. |
| Complete the 2023 Recharge Master Plan Update (RMPU). | 2000* | Years 1-3 | Yes | |
| Implement recharge projects based on need and available resources. | 2000 | Years 1-20 | Yes | |
| Update the RMPU no less than every five years (2028, 2033, 2038). | 2000 | Years 4-20 | Yes | |
| **Program Element 3 - Develop and Implement a Water Supply Plan for Impaired Areas** | | | | |
| n/a | | | | As described in Section 3.2.3.2 of the 2020 OBMP Update report, there are no separate implementation actions for PE3 in the 2020 OBMP. The ongoing operation of the Chino Basin Desalters, which were the subject of the implementation actions of PE 3 in the 2000 OBMP is now part of PE 7 to Develop and Implement a Salt Management Program. |
| **Program Element 4 - Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1** | | | | |
| Implement Watermaster's Subsidence Management Plan, and adapt it as necessary. | 2000* | Years 1-20 | Yes | These actions included in the 2000 OBMP are required by the July 2000 Court Order to implement the Peace Agreement. The Peace II Agreement established further requirements for the continued recharge in MZ-1 through the term of the Peace Agreement. |
| Watermaster will arrange for the physical recharge of at least 6,500 any of Supplemental Water in MZ-1 as an annual average. Watermaster may re-evaluate the minimum annual quantity of Supplemental Water recharge in MZ-1 and may increase this quantity through the term of the Peace Agreement. | 2000* | Years 1-20 | Yes | |

## Exhibit 17
## Implementation Actions for the 2020 Optimum Basin Management Program Update by Program Element

| Implementation Actions for the Next 20 Years by Program Element | Action Added in 2000* or 2020? | Schedule (Yr 1-3, 4-20, or 1-20) | Is the Action Required by Watermaster to Administer the Physical Solution or Comply with Other Regulatory or Court Requirements? | |
|---|---|---|---|---|
| | | | Yes/No | Basis |
| **Program Element 5 - Develop and Implement Regional Supplemental Water Program** | | | | |
| The IEUA will maximize the reuse of its recycled water in the Chino Basin. | 2000* | Years 1-20 | Yes | Pursuant to the Basin Plan, IEUA and Watermaster are required to maximize recycled water reuse in the Chino-North GMZ consistent with the Maximum Benefit SNMP. |
| The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future recycled water planning efforts to maximize the reuse of all available sources of recycled water. | 2020 | Years 1-20 | No | Although these actions optimize the management of all available recycled water supplies to achieve water supply reliability, they are not required by Watermaster to administer the Physical Solution or other regulatory requirements. These implementation actions are included as part of the 2020 OBMP Update to complement regional planning efforts, not to duplicate them. |
| Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to maximize recycled water reuse to ensure these efforts are integrated with Watermaster's groundwater and salinity management efforts. | 2020 | Years 1-20 | No | |
| The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future integrated water resources planning efforts to address water supply reliability for all Watermaster Parties. | 2020 | Years 1-20 | No | Although these actions optimize the management of all available water supplies to achieve water supply reliability, they are not required by Watermaster to administer the Physical Solution or other regulatory requirements. These implementation actions are included as part of the 2020 OBMP Update to complement regional planning efforts, not to duplicate them. |
| Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to improve water supply reliability to ensure those efforts are integrated with Watermaster's groundwater management efforts. | 2020 | Years 1-20 | No | |
| **Program Element 6 - Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management** | | | | |
| Re-convene the water quality committee and meet periodically to update groundwater quality management priorities. | 2000* | Years 1-3 | Yes | Paragraph 41 of the Judgment states: "Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations. Withdrawals and supplemental water replenishment of Basin Water, and the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees composed of the affected producers. Both the quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized." (Pgs. 19-20 of the Restated Judgment) If water quality is not considered and effectively managed, the Parties may not be able to utilize their water rights, which could result in negative impacts to the basin, such as reductions in net recharge, loss of hydraulic control, and movement of contaminant plumes. Effective management of water quality in the Basin to preserve maximum beneficial use can only be accomplished through a systematic assessment of the emerging contaminant threats to the use of groundwater resources, and thoughtfully preparing a plan to respond to those threats. |
| Develop and implement an initial emerging contaminants monitoring plan. | 2020 | Years 1-3 | Yes | |
| Prepare a water quality assessment of the Chino Basin to evaluate the need for a *Groundwater Quality Management Plan* and prepare a long-term emerging contaminants monitoring plan. | 2020 | Years 1-3 | Yes | |
| Develop and implement a *Groundwater Quality Management Plan* and periodically update it. | 2020 | Years 4-20 | Yes | |
| Implement long-term emerging contaminants monitoring plan. | 2020 | Years 4-20 | Yes | |
| Continue to conduct investigations to assist the parties and/or the Regional Board in accomplishing mutually beneficial objectives as needed. | 2000 | Years 1-20 | Yes | This action included in the 2000 OBMP is required by the July 2000 Court Order to implement the Peace Agreement. Recommendations for investigations will be made to Watermaster by the Water Quality Committee. |
| Continue to support the Parties in identifying funding from outside sources to finance cleanup efforts. | 2000 | Years 1-20 | Yes | This action included in the 2000 OBMP is required by the July 2000 Court Order to implement the Peace Agreement. Requests for support will be made to Watermaster by the Water Quality Committee. |
| Implement projects of mutual interest. | 2000 | Years 1-20 | No | The implementation of projects is not required by the 2000 OBMP IP, however Watermaster is required to support the Parties, as requested by the Committee, and as appropriate. |

## Exhibit 17
## Implementation Actions for the 2020 Optimum Basin Management Program Update by Program Element

| Implementation Actions for the Next 20 Years by Program Element | Action Added in 2000* or 2020? | Schedule (Yr 1-3, 4-20, or 1-20) | Is the Action Required by Watermaster to Administer the Physical Solution or Comply with Other Regulatory or Court Requirements? | |
|---|---|---|---|---|
| | | | Yes/No | Basis |
| **Program Element 7 - Develop and Implement Salt Management Plan** | | | | |
| Continue to implement the maximum benefit salt and nutrient management plan pursuant to the Basin Plan. | 2000* | Years 1-20 | Yes | Watermaster and IEUA must perform these actions pursuant to the maximum benefit SNMP in the Basin Plan. |
| Complete the 2020 update of TDS and nitrate projections to evaluate compliance with maximum benefit salt and nutrient management plan, and, if necessary, based on the outcome, prepare a plan and schedule to implement a salt offset compliance strategy. | 2020 | Years 1-3 | Yes | Watermaster and IEUA have already begun this project and are required to complete it by the Regional Board to obtain a revised recycled water compliance program related to total dissolved solids concentrations. |
| Starting in 2025 and every five years thereafter, update water quality projections to evaluate compliance with the maximum benefit salt and nutrient management plan. | 2020 | Years 4-20 | Yes | Watermaster and IEUA will be required to perform these actions pursuant to an anticipated amendment to the maximum benefit SNMP in the Basin Plan. |
| **Program Element 8/9 - Develop and Implement Groundwater Storage Program *and* Develop and Implement Storage and Recovery Programs** | | | | |
| Complete and submit to the Court the 2020 Safe Yield Recalculation. | 2000* | Years 1-3 | Yes | The 2000 OBMP IP identified the ten-year recalculation requirement, which is binding on Watermaster through the 2000 Court Order. Additionally, section 4.2 of the April 2017 Court Order that followed the 2015 Safe Yield Reset further establishes the date by which the next 10-year updates must occur (2020) and affirms the 10-year update frequency. |
| Complete and submit to the Court the 2020 Storage Management Plan (SMP). | 2020 | Years 1-3 | Yes | Paragraph 41 of the Judgment requires "...procedures to be established and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees for the withdrawals and supplemental water replenishment of Basin water..." The SMP in the 2000 OBMP is insufficient to meet the needs of the Parties as storage already exceeds the limits in the established procedures. A new SMP is required to issue storage agreements as of July 1, 2020. And, the CEQA coverage for the existing SMP expires in July 2021. |
| Develop a *Storage and Recovery Master Plan* to support the design of optimized storage and recovery programs that are consistent with the 2020 Storage Management Plan and provide the Watermaster with criteria to review, condition, and approve applications in a manner that is consistent with the Judgment and the Peace Agreement. | 2020 | Years 1-3 | Yes | Section 5.2.c.iv.(b) of the Peace Agreement states that "Watermaster shall prioritize its efforts to regulate and condition the storage and recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits." Watermaster must document the basis by which it will review, condition, and approve applications in a manner that is predictable, uniform, and consistent with the Peace Agreement and the 2020 SMP. A master plan is the most efficient process to do this. |
| Assess losses from storage accounts based on the findings of the 2020 Safe Yield Recalculation. | 2000* | Years 1-3 | Yes | Section 5.2.b.xii of the Peace Agreement requires that Watermaster shall set the annual rate of loss from Local Storage for parties to the Judgment at zero through 2005. Thereafter, the rate of loss from Local Storage for parties to the Judgment will be 2% until recalculated based upon the based available scientific information. Losses will be deducted annually from each party to the Judgment's storage account. The loss rate is assessed as part of the Safe Yield recalculation. |
| Update the Storage Management Plan in 2025 and every five years thereafter, and when: the Safe Yield is recalculated, Watermaster determines a review and update is warranted based new information and/or the needs of the parties or the basin, and at least five years before the aggregate amount of managed storage by the parties is projected to fall below 340,000 af. | 2020 | Years 4-20 | Yes | The 2020 SMP is based on present planning projections and technical understanding of the basin. This information can change over time and the limits established in the 2020 SMP must be revisited from time to time to ensure it meets the needs of the Parties. These triggers for updating the SMP are defined in the 2020 SMP. |
| Perform Safe Yield recalculation every 10 years. | 2000 | Years 4-20 | Yes | See above basis for the 2020 Safe Yield recalculation. |
| Update the storage loss rate following each recalculation of Safe Yield and during periodic updates of the SMP. | 2020 | Years 4-20 | Yes | See above basis for assessing losses based on the 2020 Safe Yield recalculation. The loss rate may also be evaluated in future SMP updates. |

*For the 2000 OBMP implementation actions annotated with a "*", the description of the action has been modernized to reflect current terminology, reports, and requirements established after the 2000 OBMP was finalized.

# Appendix A

White Paper – 2020 Update to the Chino Basin
Optimum Basin Management Program

# White Paper – 2020 Update to the Chino Basin Optimum Basin Management Program

## Introduction

This white paper describes the Optimum Basin Management Program (OBMP) that was developed in 2000 and updated in 2007, the efficacy of the OBMP, and the need to update it. This paper is organized as follows:

- Existing OBMP – this section describes the history and accomplishments of the OBMP that was developed in 2000 and updated in 2007.
- Need to Update the OBMP – this section summarizes the need to update the OBMP.
- Benefits from Updating the OBMP – this section summarizes the benefits from updating the OBMP.
- Process to Update the OBMP – this section summarizes the process to update the OBMP.

## Existing OBMP

The Chino Basin Judgment gave Watermaster the authority to develop an OBMP for the Chino Basin, including both water quantity and quality considerations. Watermaster, with direction from the Court, began the development of the OBMP in 1998 and completed it in July 2000. The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders, described the physical state of the groundwater basin, developed a set of management goals, identified impediments to those goals, developed a series of actions that could be taken to remove those impediments and achieve the management goals, and developed agreements to implement the OBMP. The OBMP goals and the activities to achieve them were stated in the OBMP Phase I report as follows[1]:

- "Goal 1 - Enhance Basin Water Supplies. This goal applies not only to local groundwater but also to all sources of water available for the enhancement of the Chino Groundwater Basin. The following activities enhance basin water supplies:
    - Enhance recharge of storm water runoff. Increasing the recharge of storm water in the basin will increase the water supplies in the Chino Basin. The relatively low TDS and nitrate concentrations of storm flow will improve groundwater quality.
    - Increase the recharge of recycled water. The recharge of recycled water above that required for replenishment obligations can be used for safe yield augmentation and/or conjunctive use.
    - Develop new sources of supplemental water. New sources of supplemental water, including surface and groundwater from other basins, can be used to meet Chino Basin area demands, reduce dependency on Metropolitan supplies, and improve drought reliability.

[1] See Optimum Basin Management Program, Phase 1 Report, August 1999, pages 3-2 to 3-4. Document is located here: http://www.cbwm.org/docs/engdocs/OBMP%20-%20Phase%20I%20(Revised%20DigDoc).pdf

- Promote the direct use of recycled water. Promoting the direct use of recycled water for non-potable uses will make more native groundwater available for higher-priority beneficial uses.
- Promote the treatment and use of contaminated groundwater. In some parts of the basin, groundwater is not produced because of contamination problems and thus the yield of the basin may be reduced. The yield of the basin can be maintained and enhanced by the production and treatment of these contaminated waters.
- Reduce groundwater outflow. Increasing groundwater production near the Santa Ana River will increase the streambed percolation of the Santa Ana River into the groundwater basin and reduce groundwater outflow from the basin and thereby increase the supply of groundwater in the basin.
- Re-determine safe yield. Recent studies suggest that the safe yield may be greater than the 140,000 acre-ft as stated in the Judgment. The activities listed above will cause the yield to increase further. Continuing to operate the basin at 140,000 acre- ft/yr will cause groundwater in the basin to be lost to the Santa Ana River. The safe yield will be re-determined on an as-needed basis to maximize the current yield and to cause future increases in yield.

- Goal 2 - Protect and Enhance Water Quality. This goal will be accomplished by implementing activities that capture and dispose of contaminated groundwater, treat contaminated groundwater for direct high-priority beneficial uses, and encourage better management of waste discharges that impact groundwater. The following activities will protect and enhance water quality:
    - Treat contaminated groundwater to meet beneficial uses. Groundwater in some parts of the basins is not produced because of contamination problems. Groundwater quality can be protected by intercepting contaminants before they spread. Intercepted groundwater could be treated and used directly for high priority beneficial uses or injected back into the aquifer.
    - Monitor and manage the basin to reduce contaminants and to improve water quality. Actively assisting and coordinating with the Regional Board, the EPA, and other regulatory agencies in water quality management activities would help improve water quality in the basin.
    - Manage salt accumulation through dilution or blending and the export of salt.
    - Address problems posed by specific contaminants.

- Goal 3 - Enhance Management of the Basin. This goal will be accomplished by implementing activities that will lead to the optimal management of the Chino Basin. The following activities will protect and enhance the management of the basin:
    - Develop policies and procedures that will encourage stable, creative, and fair water resources management in the basin.
    - Optimize the use of local groundwater storage. Policies and procedures for local storage, cyclic storage, and other types of storage accounts will be created to maximize drought protection and improve water quality, and to create an

efficient system to transfer water from producers with surplus water to producers that need water.
    - Develop and/or encourage production patterns, well fields, treatment and water transmission facilities, and alternative water supply sources to ensure maximum and equitable availability of groundwater and to minimize land subsidence. Develop conjunctive-use programs with others to optimize the use of the Chino Basin for in-basin producers and the people

- Goal 4 - Equitably Finance the OBMP. This goal is based on the following principles:
    - The primary source of revenue to finance the implementation will be consumers of Chino Basin groundwater.
    - Consumers in the Chino Basin must be treated equitably by passing the cost of the OBMP on a per acre-foot basis or by other methods, based on formulas to be determined.
    - Financial incentives and disincentives will be established to assure that existing groundwater is pumped out of the basin and a higher quality of water is used to replenish the basin.
    - Opportunities for creativity will be provided to the producers so that they are motivated to use their assets and abilities in the implementation of the OBMP.
    - Recover value from utilization of storage of supplemental water and from rising water outflow."

The actions to remove the impediments to the OBMP goals were logically grouped into sets of coordinated activities called Program Elements. Each Program Element contains a list of definitive actions and an implementation schedule. The OBMP Implementation Plan consists of nine Program Elements. The relationship of the goals to the Program Elements is shown in the following table.

### Relationship of Goals and Program Elements in the 2000 OBMP

| Program Element | Goal 1 - Enhance Basin Water Supplies | Goal 2 - Protect and Enhance Water Quality | Goal 3 - Enhance Management of the Basin | Goal 4 - Equitably Finance the OBMP |
|---|---|---|---|---|
| Program Element 1. Develop and Implement Comprehensive Monitoring Program (Comprehensive Monitoring Program) | X | X | X | X |
| Program Element 2. Develop and Implement Comprehensive Recharge Program (Comprehensive Recharge) | X | X | X | X |
| Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas (Groundwater Desalting) | X | X | X | X |
| Program Element 4. Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1 (Land Subsidence Management) | | | X | X |
| Program Element 5. Develop and Implement Regional Supplemental Water Program (Recycled Water Reuse) | X | X | X | X |
| Program Element 6. Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management (Water Quality Management) | X | X | X | X |
| Program Element 7. Develop and Implement Salt Management Plan (Salt and Nutrient Management Plan) | X | X | X | X |
| Program Element 8. Develop and Implement Groundwater Storage Program (Groundwater Storage Management) | X | X | X | X |
| Program Element 9. Develop and Implement Conjunctive Use Program (Conjunctive Use) | X | X | X | X |

Since October 2000, Watermaster, the Judgment parties, the IEUA, the TVMWD, and the WMWD have implemented most of the actions described in the Program Elements and the OBMP goals have been partially achieved. Some of the requirements and scope of the Program Elements have changed over time as impediments to the goals have been refined by new

information, evolving technological and institutional challenges, and funding opportunities. The accomplishments from the implementation of the 2000 OBMP are summarized below.

### Program Element 1. Develop and Implement Comprehensive Monitoring Program (Comprehensive Monitoring Program)

The objectives of this Program Element are to collect the data necessary to support the implementation of the other eight Program Elements and periodic updates to the state of the basin. The types of data collected include: groundwater data from wells (location, construction, lithology, pumping, water level and water quality); surface water (measuring location, discharge, recharge and water quality); ground level (vertical displacement from remote sensing, ground survey and extensometers, horizontal displacement from ground surveys); climatic data (precipitation from terrestrial stations, PRISM, NEXRAD, bias corrected and spatially disaggregated projections of future precipitation, evaporation, ET and temperature); land use and vegetation maps; normalized difference vegetation index mapping; facilities information (drainage maps, sewershed, water systems and facilities details); aerial photography; and LIDAR surveys. All these data are in stored in a relational database, GIS or other digital formats. The monitoring requirements have been reviewed annually and modified to ensure that the monitoring program delivered the minimum data required for OBMP implementation.

### Program Element 2. Develop and Implement Comprehensive Recharge Program (Comprehensive Recharge)

The objectives of this Program Element include increasing stormwater recharge to offset the recharge lost due to channel lining, increase Safe Yield and to ensure that there will be enough supplemental water recharge capacity available to Watermaster to replenish overdraft. Recharge master plans were completed in 2001, 2013, and 2018. Watermaster and the IEUA implemented the 2001 recharge master plan and constructed recharge improvements that increased storm water recharge by about 9,000 afy. Watermaster and the IEUA completed a recharge master plan update in 2013 (2013 RMPU), and they are currently in the process of designing and constructing the recommended 2013 RMPU recharge projects. When completed in 2021, the 2013 RMPU projects will increase stormwater recharge by another 4,800 afy and recycled water recharge capacity by 7,100 afy. Finally, Watermaster and the IEUA completed a recharge master plan update in 2018 that recommended no new recharge projects. In the first 20 years of OBMP implementation, stormwater recharge will have increased about 13,800 afy, and supplemental water recharge capacity will have increased by 27,600 afy. One of the findings of the 2018 recharge master plan update is that Watermaster has enough supplemental water recharge capacity to it meet its replenishment obligations through wet-water recharge through 2050. The IEUA has increased the recharge of recycled water from about 500 afy in 2000 to about 16,000 afy in 2018.

### Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas (Groundwater Desalting)

The objectives of this Program Element are to maintain and enhance the Safe Yield of the basin. The groundwater desalting program was designed to replace declining agricultural groundwater

pumping in the southern part of the basin with new groundwater pumping to meet increasing municipal water demands in the same area. The new wells used in the groundwater desalting program were constructed in strategic locations to minimize groundwater outflow to the Santa Ana River and to increase the Santa Ana River recharge into the basin. In 2000, the groundwater desalting program included a 6,000 afy treatment plant and a series of wells constructed in the southern part of the Chino Basin near the Chino Airport. Under the OBMP, as of 2018, the desalting program has grown to two treatment plants and additional wells that in aggregate pump and treat about 30,000 afy degraded groundwater, and the program will reach the OBMP objective of 40,000 afy in 2019. The groundwater desalting program facilities are owned by the Chino Basin Desalter Authority (CDA) whose members include the Cities of Chino, Chino Hills, Ontario, and Norco; the Jurupa Community Services District; the Santa Ana River Water Company; the IEUA; and the WMWD.

### Program Element 4 Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1 (Land Subsidence Management)

The objectives of this Program Element include the spatial and temporal characterization of land subsidence, identification of its causes, and, where appropriate, the development and implementation of a program to minimize or abate land subsidence. In the early 2000s, Watermaster constructed specialized monitoring wells to characterize land subsidence in the City of Chino. This work yielded two things: a successful voluntary management plan specific to certain wells located within a designated "Managed Area in the City of Chino; and a monitoring and investigative plan to characterize land subsidence throughout MZ1 and a part of MZ2. As of 2018, land subsidence monitoring is ongoing, and a focused effort is underway to develop a land subsidence management plan for the northwestern part of MZ1.

### Program Element 5 Develop and Implement Regional Supplemental Water Program (Recycled Water Reuse)

The objective of this Program Element is to improve the regional conveyance and availability of imported and recycled waters throughout the basin. Since 2000, the IEUA has constructed and operated a recycled water conveyance system throughout the basin enabling it to provide recycled water to its member agencies. Recycled water deliveries grew from about 3,400 afy in 2000 to about 34,000 afy in 2017. The recycled water provided by the IEUA has replaced a like amount of groundwater and imported water that would have otherwise been used for non-potable purposes. Much of the post-2000 increase in supplemental water storage in the Chino Basin is attributable to the increased availability of recycled water. Recycled water is more reliable than imported water, and thus using it in lieu of imported water has improved the sustainability of the Chino Basin and water supply reliability. Improvements in the regional conveyance and availability of imported water were not achieved.

### Program Element 6 Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management (Water Quality Management)

The objectives of this Program Element are the identification of water quality trends in the basin and the impact of the OBMP implementation on them, the determination of whether point and non-point contamination sources are being addressed by water quality regulators,

and to collaborate with water quality regulators to identify and facilitate the cleanup of soil and groundwater contamination. Since 2000, Watermaster, through its own monitoring activities and the efforts of cooperating entities, has compiled surface and ground water quality and related data, assessed water quality trends, and periodically reported its findings to the Judgment parties. Watermaster has collaborated with the Regional Board in its efforts to work with dischargers to facilitate the cleanup of soil and groundwater contamination in the basin. The 2000 OBMP Implementation Plan identified the opportunities to use the Chino Desalters to assist in the remediation of the Chino Airport and South Archibald plumes, which, as of this writing, is coming to fruition.

### Program Element 7 Develop and Implement Salt Management Plan (Salt and Nutrient Management Plan)

The objectives of this Program Element are to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. Watermaster and the IEUA developed an innovative salt and nutrient management plan (SNMP) for the Chino Basin that created assimilative capacity for total dissolved solids (TDS) and that when combined with the planned new recharge of stormwater and imported water, groundwater desalting, achievement of Hydraulic Control, and monitoring, enabled the use of recycled water without treatment to reduce the TDS concentration in recycled water. The SNMP was initiated in 2004. Ambient TDS and nitrate concentrations continue to increase in the Chino Basin due to legacy agricultural activities and current irrigation practices.

### Program Element 8 Develop and Implement Groundwater Storage Program (Groundwater Storage Management)

The objectives of this Program Element are to develop and implement a storage management program that is protective of water quality, prevents overdraft, and ensures equity among the Judgment parties. This Program Element also includes the recalculation of Safe Yield. The storage management plan in the OBMP implementation plan was implemented in 2000 and revised in 2016, raising the Safe Storage Capacity for managed storage from 500,000 af to 600,000 af through June 2021. Safe yield was recalculated in 2015 and, as of this writing, has not been approved by the Court. Losses from storage were initially assigned to zero through 2005, estimated at 2 percent from 2006 through 2017, and reduced to 0.07 percent thereafter with the achievement of Hydraulic Control. Watermaster conducted a Storage Framework Investigation in 2017 and 2018 to provide technical information to support the development of a new storage management plan in 2019. Technical work has commenced to recalculate the Safe Yield in 2020.

### Program Element 9 Develop and Implement Conjunctive Use Program (Conjunctive Use)

The objective of this Program Element is to develop Storage and Recovery programs that will provide broad mutual benefit to the Judgment parties and reduce the cost of OBMP implementation. Watermaster, the IEUA, the TVMWD, the WMWD, and the Metropolitan Water District of Southern California (Metropolitan) implemented a 100,000 af storage program called the Dry-Year Yield Program (DYYP) in 2005. This program runs through 2028. Other than the DYYP, no Storage and Recovery programs have been implemented since 2000. IEUA is

currently working to obtain a $207 million grant to develop and implement a Storage and Recovery program that will provide broad mutual benefit to the Judgment parties and state.

The 2000 OBMP Program Elements are highly related as is shown in the figure below. For example, the management activities associated with groundwater recharge impact land subsidence (a possible land subsidence management tool), groundwater storage and conjunctive use (recharge as a means to get water into storage), recycled water reuse (recharge as a means to get recycled and dilution water into the basin), and the salt and nutrient management plan (managed recharge must be blended to meet SNMP requirements). Furthermore, recharge impacts water quality directly, it has the potential to displace contaminant plumes, and future recharge increases with high quality storm and imported waters will be used to increase pumping rights and reduce future desalting requirements.

Relationship of the 2000 OBMP management activities

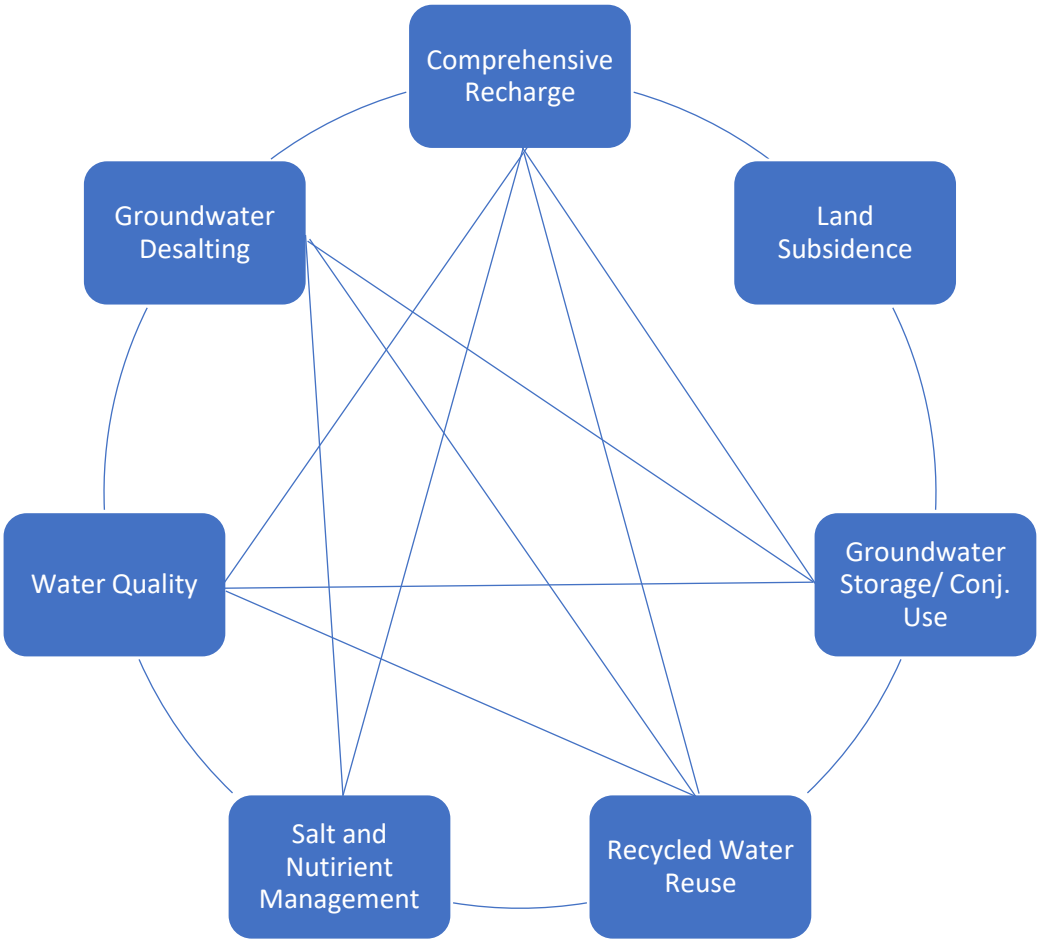

## Peace Agreements and CEQA

The 2000 OBMP and the Peace Agreement were completed in 1999 and 2000, respectively. The operable features of the OBMP were incorporated into the OBMP Implementation Plan. The OBMP Implementation Plan is Exhibit B to the Peace Agreement. The Peace Agreement was reviewed in a programmatic environmental impact report (PEIR), completed by the IEUA in July 2000.

Subsequent to the PEIR, Watermaster and the Judgment parties developed revisions to the OBMP based on the need to expand the desalting capacity to the 40,000 afy of groundwater pumping required in the OBMP Implementation Plan. Concurrently, the IEUA and Watermaster worked with the Santa Ana Regional Water Quality Control Board (Regional Board) to revise the total dissolved solids (TDS) and nitrate objectives for the Chino North Management Zone to enable the reuse of the IEUA's recycled water without desalting it for a period estimated to be at least 30 years and without impairing the beneficial use of groundwaters in the Chino and Orange County Basins (Program Element 7). One of the Regional Board's conditions for raising the TDS and nitrate objectives was the achievement of Hydraulic Control. Hydraulic Control is the elimination of groundwater discharge from the Chino North Management Zone to the Santa Ana River or its reduction to less than 1,000 afy. Hydraulic Control is a goal of the OBMP with the intent of maintaining and enhancing the Safe Yield of the basin by ensuring that agricultural groundwater pumping in the southern half of the basin will be replaced by groundwater pumping for municipal uses as the land use in that area transitions from agricultural uses to urban uses. Through extensive investigations, the expansion of desalter groundwater pumping to 40,000 afy and Reoperation were determined necessary to achieve Hydraulic Control and maintain the Safe Yield.

The Peace II Agreement was developed to implement the changes in the OBMP required to expand the desalters to 40,000 afy of groundwater pumping, to incorporate Reoperation and Hydraulic Control, and to resolve other issues. There was no change to the storage management plan in the OBMP Implementation Plan to address the implications of the reduction in storage of basin water by 400,000 af as provided for by Reoperation.

The IEUA completed and subsequently adopted a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010. The technical investigations conducted to support the expansion of desalter groundwater pumping to 40,000 afy and Reoperation also indicated that the Safe Yield of the Chino Basin had become less than that stated in the Chino Basin Judgment due to changes in cultural conditions in the watershed overlying and tributary to the Chino Basin.

Starting in 2011, Watermaster began the technical effort to recalculate the Safe Yield. This work involved updating the hydrogeologic conceptual model of the basin, updating the historical hydrology, updating and recalibrating numerical models that simulate the surface and ground water hydrology of the Chino Basin area, and projecting the surface and groundwater response of the basin to future management plans that included storage management. This work is

documented in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement* (WEI, 2015; hereafter, Safe Yield report)[2].

In 2017, the IEUA adopted an addendum to the Peace II SEIR to revise the storage management plan in the OBMP through June 30, 2021. The addendum was supported with engineering work that demonstrated that the Safe Storage Capacity could be safely increased from 500,000 af to 600,000 af with the commitment that Watermaster would update the OBMP storage management plan by June 30, 2021.

## Need to Update the OBMP

Understanding of the basin hydrogeology and hydrology has improved since 2000, and new water management challenges have been identified that need to be addressed to ensure long-term groundwater pumping sustainability. The strategic drivers/trends that shaped the OBMP in the late 1990s have since changed. There are several drivers and trends that will challenge the ability of the Judgment parties to rely on the OBMP environmental documentation and court approved management agreements (CAMA) to protect their collective interests in the Chino Basin and their water supply reliability. Exhibit 1 graphically illustrates these drivers, associated trends, and their basin management implications. The term "driver" as used herein corresponds to external forces that cause changes in the Chino Basin water space. Grouped under each driver are expected trends that emanate from each driver. The management implications of the drivers/trends on the present and future Chino Basin management are located on the bottom of Exhibit 1. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications. There may be other important drivers/trends and they will be identified in the OBMP update process. The text below summarizes the drivers, trends and management implication shown in Exhibit 1.

### Climate Change

*Reduced recharge.* Present predictions of future precipitation indicate that precipitation patterns will change with more precipitation falling over shorter periods of time and that future droughts will be longer in duration and occur more frequently. This translates into a reduction in precipitation-based recharge to the basin and, if not mitigated, a decline in Safe Yield.

*Reduced availability of imported water.* Imported water supplies from the State Water Project and surface water sources in the Santa Ana River Watershed will become less reliable with climate change. The availability of imported groundwater from adjacent basins will be reduced for the same reason the Safe Yield of the Chino Basin will likely be reduced.

### Legislation and Regulation

Climate science is advancing and generally reporting that the impacts of anthropogenic climate change will occur faster and be more severe than previously anticipated. New laws and regulations will be enacted to reduce greenhouse gas emissions and to mitigate climate change

[2] This report is located here: http://www.cbwm.org/docs/engdocs/WEI%202013%20CBWM%20Recalculation%20Model%20Update/20151005_WEI_2013_CBWM_Recal_Model_Final_low.pdf

impacts. These new laws and regulations will likely place additional restrictions on water use to extend existing water supplies and to protect habitat.

*Sustainable Groundwater Management Act (SGMA).* Pursuant to SGMA, the Chino Basin is exempt from the development of a Groundwater Sustainability Plan (GSP). Currently, Watermaster is required to annually provide limited information to the state. In the near future, it is likely that adjudicated basins will come under greater scrutiny and be required to demonstrate sustainable groundwater management like that required for non-adjudicated basins.

*Conservation.* New laws and regulations to increase water conservation will reduce the deep infiltration of precipitation and applied water to the basin and, unless mitigated, will decrease the Safe Yield. Conservation may also impact a party's ability to make use of it pumping rights.

*Water quality.* Drinking water regulations will continue to become more stringent in the future due to new information on the health effects of various chemical and pathogenic constituents and the ability to measure constituents at increasingly lower detection levels.

### Salt and Nutrient Management

*TDS Increases in the Basin.* Watermaster and the IEUA are co-permitees for the use of recycled water in the Chino Basin. The use of recycled water could become more difficult in the future because the ambient TDS concentration in the Chino Basin is increasing and thereby reducing assimilative capacity. Increases in ambient TDS concentrations in the future will cause an increase in the TDS concentration in recycled water produced by the IEUA and will eventually cause the IEUA to desalt its' recycled water when assimilative capacity for TDS is lost in the Chino North Management Zone. When assimilative capacity for TDS is lost under the current SNMP, the IEUA will be required to desalt its recycled water to the TDS groundwater objective of 420 mgl prior to reuse in the Chino Basin.

*TDS Increases in SWP Water during Droughts.* The TDS concentration in the IEUA's recycled water increased during the recent drought due to concurrent increases in TDS concentration in SWP water and almost triggered a requirement, pursuant to the current SNMP in the Basin Plan, to start the planning process to desalt recycled water. Future droughts will likely be longer in duration and occur more frequently. Unless the SNMP is updated, the requirement to implement recycled water desalting could start with the next drought.

### Outside Interest in Chino Basin Operations

There is increasing interest from outside entities in how the regional water agencies and Judgment parties operate the Chino Basin. The State of California consistently enacts more restrictive laws and regulations to protect the environment and to improve habitat sustainability. Public Trust related litigation has been used to halt project development and limit water rights. The Resource Agencies, non-governmental organizations, and Santa Ana River parties are showing renewed interest in Santa Ana River discharges for habitat, water supply, and water rights.

### Grant and Low-Interest Loan Project Funding

California voters have a recent history of passing bond initiatives to support water resources projects. The accumulating debt at the national and state level will make it more difficult in the future to obtain grant and low-interest loan funding for water projects. Competition for available funding will increase. Projects approved and constructed in the next few years are more likely to obtain grants and low-interest loans over projects that are deferred into the future.

### Improvements in Science and Technology

*Laboratory Detection Limits.* Improvements in laboratory methods will reduce the detection limits for water quality constituents.

*Health Impacts of Chemicals and Pathogens.* The number of regulated chemicals will increase, and regulatory standards, based on new research, will become more stringent.

*Treatment Technologies.* Water treatment technology will improve, enabling water agencies to treat water to more restrictive drinking water standards.

*Renewable Energy.* The amount of renewable energy available will increase as will the need/requirement to incorporate renewable energy into new projects.

*Sensor Technology.* There is an increasing trend in the development, cost-efficient availability, and deployment of new terrestrial, aircraft-borne and space-borne sensors that enable the monitoring of the basin and assessment of hydrologic and ecological trends; this will result in improved hydrologic understanding of the basin.

*Transparency.* Federal and state agencies are requiring that water agencies submit monitoring and other data to them and that these data be made available to the public. The proliferation of these and other publicly available data sources will lead to greater regulatory scrutiny and interest by environmental organizations

The water resource management implications of these drivers and trends for the Judgment parties include:

- reductions in Chino Basin safe yield,
- Chino Basin water quality degradation,
- increased cost of groundwater use,
- reduced imported water availability,
- imported water quality degradation,
- reduced recycled water availability and increased cost,
- recycled water quality degradation, and
- increased cost of Basin Plan compliance.

Mitigation of these implications requires a proactive integrated approach to updating the OBMP.

## The OBMP CEQA Document Needs to Be Updated

The PEIR and SEIR for the OBMP are eighteen and eight years old, respectively: knowledge of the basin's characteristics has improved since these documents were adopted, water management challenges have intensified, and environmental considerations have changed. The PEIR and SEIR are not sufficiently current to support present decision-making and further investment. The existing environmental clearance is too old to be relied upon for receiving state grant and low interest loan funding and render Watermaster and the IEUA to make decisions relying on the earlier environmental evaluations that are vulnerable to collateral attack.

Accordingly, Watermaster needs to review and update (if necessary) its groundwater management goals, articulate impediments to those goals, update the OBMP and its implementation agreement as required by Paragraph 41 of the Judgment, and complete a new CEQA process.

## Benefits from Updating the OBMP

The current OBMP contains a set of management activities that improve the reliability and long-term sustainability of the Chino Basin and the water supply reliability of the Judgment parties. The OBMP was developed in 1998 and 1999, based on the goals of the Judgment parties, the hydrologic understanding of the basin, the institutional and regulatory environment, an assessment of the impediments to achieving the Judgment parties' goals, and the actions required to remove the impediments and achieve the goals.

The Judgment parties need to consider whether the OBMP goals have changed, update them, and define the impediments to achieving the goals based on the present and expected hydrologic conditions in the basin, and current and projected trends in the institutional, regulatory, and financing spaces. The parties can then develop an action plan to overcome impediments to achieve the updated OBMP goals. In the absence of an updated OBMP, it will grow increasingly difficult to maintain current and projected groundwater pumping and recycled water reuse and to utilize the unused storage capacity in the basin. An updated OBMP will provide the Judgment parties with: a program-level water resources management plan that maximizes their pumping rights, use of recycled water, use of storage space, and an updated CEQA document to provide certainty for implementation.

## Process to Update the OBMP

The process for the development of the 2000 OBMP involved the description of the state of the Chino Basin, the articulation of the Judgment parties' "issues, needs and wants," the Judgment parties' development of OBMP management goals, the articulation of the impediments to achieving the goals, the description of the actions required to remove the impediments, the development of an implementation plan and an agreement among the Judgment parties to fund and implement the OBMP, and the preparation of CEQA documentation. The table below summarizes the effort for the 2000 OBMP and the OBMP update. The text that follows summarizes the update process.

Steps involved in OBMP development

| | OBMP Development Step | 2000 | 2020 |
|---|---|---|---|
| 1 | Prepare state of the basin assessment | X | |
| 2 | Articulate "issues, needs and wants" and management goals | X | X |
| 3 | Describe impediments to management goals | X | X |
| 4 | Develop actions to remove impediments | X | X |
| 5 | Develop implementation plan | X | X |
| 6 | Develop implementation agreement | X | X |
| 7 | Prepare CEQA documentation | X | X |
| 8 | Court approval | X | X |
| 9 | Prepare financing plan | | X |

1. The combination of the existing 2016 State of the Basin Report, annual report of the Ground Level Monitoring Committee, 2018 Recharge Master Plan Update report, and 2018 Storage Framework report are sufficient to understand the current state of the basin. Also, the 2018 State of Basin report is currently in preparation and will be available to the Judgment parties during the OBMP update process.

2. One to two listening sessions will be held to enable the Judgment parties to articulate their "issues, needs and wants" and their recommended goals for basin management. Watermaster staff will prepare documents that combine and systematize these items and obtain concurrence from the parties that their concerns and goals expressed at these listening sessions have been captured in the planning documents.

3. One to two listening sessions will be held to describe the impediments to achieving the goals. Watermaster staff will prepare documents that combine and systematize the impediments and obtain concurrence from the parties that the impediments expressed at these workshops have been captured in the planning documents.

4. Watermaster staff will develop an initial set of actions that if taken will remove the impediments to the OBMP goals, prepare reconnaissance-level cost estimates to implement the actions, and document this work in a draft TM. Up to three listening sessions will be held to present the actions to the Judgment parties, obtain their comments and suggestions, revise the actions, and subsequently finalize the TM.

5. Watermaster staff will create a draft implementation plan for the OBMP update and document it in a draft TM. One or two listening sessions will be held to present the implementation plan to the Judgment parties, obtain their comments and suggestions, and subsequently incorporate them into the draft TM.

6. Watermaster will provide a facilitated process for the Judgment parties to develop an agreement to implement the OBMP update.

7. The IEUA will prepare the appropriate CEQA documentation for the OBMP update.

8. Upon completion of the implementation agreement and CEQA, Watermaster and the Judgment parties will seek Court approval of the OBMP update.

9. After the CEQA document is adopted by the IEUA, the Judgment parties, the IEUA, and interested entities will prepare a financing plan.

## OBMP Update Schedule

Steps 1 through 5, ending with the development of the OBMP implementation plan, will be completed in the period of January 2019 through December 2019. The development of the OBMP implementation agreement and CEQA will be completed in the period of January 2020 through June 2020. Court approval and the development of a financing plan will occur thereafter.

# Appendix B

Response to Comments on the November 22, 2019
Draft 2020 OBMP Update Report

**NOTE: In addition to any changes made to the 2020 OBMP Update Report based on the following comments, the text of Section 3.2.8.1 was edited to align with the final 2020 SMP published on December 11, 2019.**

# 2020 OBMP Update Report Comments

## Overlying Non-Agricultural Pool – Comments reported out of 12/12/19 Confidential Session

1. ***The Pool requests further clarification on its comment #2 regarding conjunctive use and its definitions in the Storage Management Plan:***
   ***Page 1-4 and Page 2-1 – Conjunctive-Use. Section 1.2 and Section 2.1 talk about conjunctive-use. How is conjunctive-use defined? What is included and excluded?***

   RESPONSE: Page 1-4 of the final 2020 Storage Management Plan describes the conjunctive use activities of the Parties as "storing Basin and Supplemental Waters that are in excess of their demands and subsequently recover that water as their individual needs arise". More generally speaking, conjunctive use is the coordinated use of surface and groundwater resources such that surface water is used to augment groundwater storage (direct or in-lieu) in wet years and groundwater is used in dry years. For the SMP, this term is being used as a descriptive term, and not a term that requires definition.

## City of Chino – Comments Provided by Dave Crosley (via email 12/19/19)

1. ***Typos are noted on scanned copies of pages 4, 8, 19, 24, and 35 (attached).***

   RESPONSE: Typos have been noted and corrected.

2. ***The draft OBMP Update indicates that some of the described implementation actions are required for Watermaster to properly administer the Judgment. Stakeholder agreement that these actions are "required" may be the subject of some continuing discussion. We suggest the OBMP Update remain in draft form designation until such discussion has concluded.***

   RESPONSE: The rationale for identifying implementation actions associated with the OBMP Update activities as "required" is described in part in Section 2 of the 2020 OBMP Update Report. During the forthcoming drafting sessions for the Implementation Plan Update, Watermaster will respond to questions about the basis for any specific action. To provide additional clarity, a new table (Exhibit 17) has been added to Section 4 of the final report that includes a description of the rationale for each required action in the management plan.

3. ***It would be helpful to expand Program Element tables 11 -17, describing proposed 2020 OBMP Implementation Actions, to include an additional column describing anticipated/estimated annual expense associated with the implementation of each activity (e.g. as presented in various tables included in the scoping report).***

   RESPONSE: The cost estimates for the activity scopes of work in the 2020 OBMP Update Scoping Report (TM1) were developed based on many assumptions, and should be used as very general guidance as to potential costs based a specific scope of work. These estimates have been provided only to describe a concept, i.e. the conceptual phases envisioned by Watermaster staff/consultants in developing the Implementation Actions' scope, and are not a fixed number or a budgetary commitment. The Committees envisioned to oversee the management processes will ultimately guide the actual efforts (i.e. scope, expense, schedule) similar to the GLMC. Estimated cost ranges have been described in TM1, which are included in the OBMP Update Report (TM2) as Appendix B. The draft OBMP IP Update (under preparation by Watermaster staff, to be released late January) will include a consolidated listing of the proposed new Implementation Actions and their associated cost estimates to assist the parties.

4. ***To the extent that information obtained from technical analyses performed in support of, and described in, the 2000 OBMP have been updated by more recent technical analyses, the more recently developed and updated information should be included in the draft 2020 OBMP Update to clarify the current understanding of basin circumstances.***

   RESPONSE: We understand that your question is in regard to the concept of the Safe Storage Capacity (SSC). The SSC was part of the storage management construct in the 2000 OBMP. As described in the 2018 Storage Framework Investigation, and summarized in the 2020 OBMP Update Report, the new hydrogeologic understanding of the basin developed through implementation of the OBMP has indicated that the management construct in the 2000 OBMP is no longer valid and the concept of SSC is not included in the new 2020 Storage Management Plan. The text of Section 3.2.8.1 of the 2020 OBMP Update Report has been modified to more

clearly articulate this. This section was also edited to align with the final 2020 SMP published on December 11, 2019.

5. ***The draft 2020 Storage Management Plan (SMP) indicates a reduction in net recharge is believed (based on modeling) to be caused by storage, and that Watermaster considers this impact to be mitigated by the prospective calculation of Safe Yield. [a] Related to this circumstance, the SMP indicates that storage accounts may be adjusted based on findings of the 2020 Safe Yield recalculation. As the 2020 Safe Yield recalculation is currently a work-in-progress, the suggestion that storage accounts may be adjusted is premature at this time. [b] Additionally, the OBMP Update should clarify that storage is only one of several contributing factors (cultural conditions) that may have an effect on net recharge.***

   RESPONSE: 5(a) The final 2020 SMP does not state that Watermaster will adjust the storage accounts of the Parties based their water in managed storage. It does say that it will debit the storage accounts for each Storage and Recovery Program for its storage impact on net recharge and Safe Yield caused by the Storage and Recovery Program. The loss rate (reduction in net recharge caused by storage) will be established uniquely for each Storage and Recovery Program and is independent of the 2020 Safe Yield recalculation.

   5(b) Comment noted. Please see the final 2020 SMP, Appendix B2, City of Chino comment number 3 and Watermaster staff response.

6. ***The draft OBMP Update describes, pertinent to various Activities, the formation of new, or re-convening of past/existing, specific committees for the purpose of focusing attention on matters related to the subject Activity. These committees should have responsibility for recommending the scope and frequency of tasks pertinent to Activity implementation.***

   REPONSE: Comment noted. This is the intent for implementation of each management process, as articulated in Section 2, page 12, in the last paragraph, sub-bullet (1).

## Overlying (Agricultural) Pool – Comments Provided by Robert Feenstra (12/20/19 letter)

7. ***Watermaster staff have requested comments on the draft 2020 OBMP Update Report (Technical Memorandum 2) (Update Report) by close of business on Friday, December 20, 2019. The Overlying (Agricultural) Pool (Ag Pool) has reviewed the draft Update Report, which incorporates the 2020 Storage Management Plan. The Ag Pool has consistently expressed concern regarding water storage that has been accumulating and used without adequate storage management, including contesting the Watermaster's continued approval of water storage and transfer/sale agreements of the Appropriative Pool. The 2020 Storage Management Plan is not complete as it must still be finalized and approved as part of the 2020 OBMP Update. The Ag Pool urges Watermaster to move forward expeditiously with the final adoption and approval of the OBMP Update including storage management.***

   RESPONSE: Comment noted

8. ***Section 1.2 of the Update Report (at page 8) uses two new terms, "water management space" and "Chino Basin water space." These new terms should be defined.***

   RESPONSE: The terms are being used as descriptive terms, and not terms that require definition.

9. ***Section 2.1. Page 11 in the Updated Report describes the attached Exhibit 3 as "a matrix, summarizing the needs and wants of the stakeholders..." But the attached Exhibit 3 does not accurately represent the Ag Pool's needs and wants as a Pool or as Pool subgroups of "Crops, Dairy, and State." The items shown in Exhibit 3 represent comments made by individuals in an early OBMP listening session/workshop that included comments from most of the other Basin stakeholders. After the initial meeting/listening session, the Ag Pool indicated to Watermaster that it preferred to report out its needs and wants as a Pool rather than as subgroups, but the Ag Pool did not complete the matrix after seeing the progress and direction of the OBMP Update process in subsequent listening sessions/workshops. Consequently, Exhibit 3 for the Ag Pool's "needs and wants" should be considered incomplete because not all needs and wants are represented and there is also mutual support between each Ag Pool subgroup (i.e., Crops, Dairy, and State) for the needs and wants indicated by the other subgroups.***

   RESPONSE: Comment noted; the OAP has been invited to offer edits to Exhibit 3 that would fully represent its Issues/Needs/Wants.

10. ***Section 3.2.3.1. At page 28 in the draft Updated Report, the first sentence of the first full paragraph uses the term "brackish." However, the term "brackish" covers a wide range of total dissolved solids (TDS), from freshwater to sea water (500 to 30,000 milligrams per Liter). We suggest being more specific or defining the general range of TDS concentrations.***

    COMMENT: The text will be adjusted for clarity.

## Monte Vista Water District – Comments Provided by Justin Scott-Coe (12/23/19 letter)

11. ***If a subsequent and new OBMP Implementation Plan is agreed to by the Peace Agreement parties, will all parties initially be required to pay for the planning and management efforts (not including CEQA costs) envisioned in the OBMPU Update? If so, how will future project participants reimburse non-participants for their share of associated CEQA coverage and OBMPU planning and management costs (i.e., beneficiary pays)?***

    RESPONSE: The development of the OBMP Update to date has assumed that the existing methodology for sharing OBMP expenses will continue. Should the parties wish to share costs differently in the future, Watermaster will assess the parties accordingly.

12. ***As part of Program Element No.6, the implementation action of "develop and implement an initial emerging contaminants monitoring plan and prepare a water quality assessment of the Chino Basin to evaluate the need for a Groundwater Quality Management Plan and prepare a long-term emerging contaminants monitoring plan" has been identified as a required Watermaster action. The language of Judgment paragraph 41 does not seem to require Watermaster to perform this action. Please identify what court approved document and its language make the said implementation action a requirement.***

    RESPONSE: Paragraph 41 of the Judgment states: *"Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin,* ***including both water quantity and quality considerations****. Withdrawals and supplemental water replenishment of Basin Water, and* ***the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees*** *composed of the affected producers.* ***Both the quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized****."* (Pgs. 19-20 of the Restated Judgment)

    Paragraph 41 states that maximization of the beneficial use of the Basin requires consideration of both water quantity and water quality considerations. The Judgment could not and does not prescribe every conceivable water quality management action necessary to address every potential contaminant. It does recognize that If water quality is not effectively managed, Parties may not be able to utilize their water rights, which could result in negative impacts to the basin, such as reductions in net recharge, loss of hydraulic control, and movement of contaminant plumes. Program Element 7 of the 2000 OBMP, the salt and nutrient management plan, is an example of a water quality management program not specifically named in the Judgment that has been a successfully implemented to avoid the negative impacts of reduced/re-located pumping to avoid high-TDS and high-nitrate groundwater. Effective management of water quality in the Basin to preserve maximum beneficial use can only be accomplished through a systematic assessment of the emerging contaminant threats to the use of groundwater resources, and thoughtfully preparing a plan to respond to those threats.

13. ***The Storage and Recovery Master Plan, found in Program Elements 8/9, should not be considered required by Watermaster, and request that the "required" label be removed from this proposed activity in the final version of the OBMP Update and associated documentation.***

    RESPONSE: Please refer to the response to City of Chino comment #2.

14. ***MVWD encourages the Watermaster to pursue the CEQA process which will allow the up to 1 million acre-feet of storage within the basin, premised in part on the completed Storage Framework Investigation.***

    RESPONSE: Comment Noted. Watermaster is proceeding with the analysis of storage of up to 1 million acre-feet, consistent with the Appropriative Pool recommendation.

15. ***Our understanding is that, while Watermaster has discretion in managing storage through agreements, the current Storage Management Plan that Watermaster has agreed and been ordered by the Court to follow is part of the OBMP Implementation Plan, which is a component of a negotiated settlement and agreement among the parties to the Peace Agreement. Therefore, adoption of a new Storage Management Plan should be seen as an amendment to this negotiated settlement/agreement and follow the process for amending the Peace Agreement. Please confirm if this understanding is correct.***

    RESPONSE: Updating the Storage Management Plan, an element of the 2000 OBMP IP that is an Exhibit to the Peace Agreement, is an update of the OBMP IP. Other thanthe Peace Agreement's requirement of unanimous approval for amendments, as have been done on two past occasions, Watermaster is not aware of any specific procedures for amending the Peace Agreement.

16. ***Before drafting and publishing the Draft OBMP Implementation Plan, MVWD encourages Watermaster to have dialog with Peace Agreement parties to determine what elements those parties would want included in such plan.***

    RESPONSE: The implementation actions arising from the parties identification of their issues, needs, and wants have been publicly available and were last distributed during the December Advisory Committee meeting. The planned process of developing a draft Implementation Plan, as has been discussed during the Listening Sessions, and Committee meetingss , includes the initiation of drafting sessions (as needed) in early February where all concerns related to the implementation plan can be openly discussed amongst all stakeholders.

## City of Ontario – Comments Provided by Scott Burton (12/20/19 letter)

17. ***The draft Optimum Basin Management Plan (OBMP) Update report represents a comprehensive set of ideas related to water management in the region including topics such as water resources, water infrastructure, emerging water quality requirements and protecting the groundwater basin. The listening sessions and guided input have provided ample opportunity for participating stakeholders to share their ideas. It is important to note that while stakeholders have had the opportunity to comment, the disposition, vetting and deliberation of varying stakeholder views was largely deferred to a later date. Currently, the draft OBMP Update report reflects the recommendations of Watermaster staff planned for the Watermaster Board.***

    RESPONSE: The OBMP Update reflects stakeholder input received by Watermaster during Listening Sessions held in 2019. The document is a compilation of all input and Watermaster staff and consultants believes it represents a collective view of what could be done to manage the Basin. The document reflects Watermaster staff conclusions of which implementation actions (management processes) are required for Watermaster to perform its duties, and captures all the suggestions offered by stakeholders.

18. ***The draft OBMP Update report includes a list of activities whose outcomes are identified as either optional or necessary for Watermaster. A number of these activities are already underway in various retail and regional forums peripheral to Watermaster. Examples include storage and recovery, movement of water between retail agencies, regional water treatment and conveyance, water supply reliability and water quality management. While the City of Ontario (Ontario) agrees that there are necessary activities in managing this critical water resource, there are some activities defined by Watermaster staff as necessary which we think may be more at the option of the stakeholders. It is highly recommended that this definitional distinction be vetted and deliberated with the stakeholders prior to the Watermaster Board acting on the OBMP Update report.***

    RESPONSE: Please refer to the response to the City of Chino comment #2.

19. ***Ontario supports the effort to consider and update the OBMP implementation with some of these new and continued ideas and believes that, consistent with the Peace Agreement, it is a step toward the meet and confer process in the 25th year of the agreement to discuss any new or modified terms. While Watermaster staff seems to consider the draft OBMP Update report substantially complete, the most critical and in-depth phase of the OBMP implementation update is just beginning. The next step is for the stakeholders to develop an Implementation Plan and Implementing Agreement(s) that reflect the common interests of the parties to the Judgement. This may differ from what is envisioned by Watermaster staff. It is Ontario's hope that to the extent there are differences, they can be reconciled prior to Watermaster Board action on the OBMP Update report.***

    RESPONSE: As with prior amendments to the Peace Agreement, Watermaster staff understands that an update of the 2000 OBMP IP can be undertaken through a focused effort as to this narrow set of issues, without addressing unrelated portions of the Peace Agreement.

Watermaster staff envisions the same next steps of creating an IP Update and crafting an amendment to the Peace Agreement to move forward. The process will begin in early February, during which all the stakeholders can weigh in on their interests and concerns on each component of the implementation plan.

20. ***As we have discussed, there are activities within the draft OBMP Update report that Ontario believes are either not necessary, already underway or may be more appropriately stakeholder managed outside of the Watermaster forum. As part of determining the OBMP implementation scope, Ontario intends to consider things such as cost-benefit analysis, prioritizing available financial resources in the context of other retail agency needs, the optimal forum for various activities to occur, avoidance of redundant efforts, determination of appropriate stakeholder funding, impact on the cost to produce groundwater, and assurance towards a reliable and sustainable groundwater basin. For activities currently required by the Peace Agreements, the Stakeholders may decide to modify or otherwise update the requirement. In addition, Ontario will need to complete its internal review process and timeline to facilitate Ontario's City Council making an informed decision on behalf of the public they represent.***

    RESPONSE: Comment noted.

21. ***The very important work ahead includes decisions still to be discussed, deliberated, and formalized in an amended Peace Agreement. Taking the technical ideas from draft report to a completed Implementation Plan and Implementing Agreement(s) requires flexibility, finesse and collaboration. Ontario is concerned that prioritizing the schedule above all else may compromise the result. As a next step, Ontario requests that the stakeholders be provided the opportunity to collaborate with Watermaster staff in setting a reasonable and realistic schedule and approach to enhance a successful outcome for this effort and the investments that will follow.***

    RESPONSE: Watermaster has engaged the stakeholders in a process designed to meet the short term needs as well as enable long term management of the Basin for the interest of the stakeholders. The City, as all stakeholders, is encouraged to provide feedback on the schedule and approach necessary to achieve a successful outcome for this effort.

## Appropriative Pool – Comments provided by Tom Harder (01/22/2020 letter)

22. ***Section 3.2.8 Program Element 8. Develop and Implement a Storage Management Program and Program Element 9. Develop and Implement Storage and Recovery Programs:***
***In Table 10 or preceding text, please define UGRR***

    RESPONSE: The term means "Uniform Groundwater Rules and Regulations". The UGRR is now part of the Watermaster Rules and Regulations. A footnote will be added to the table for clarification.

23. ***Section 3.2.8.1 Implementation Progress Since 2000 and Ongoing Implementation Actions for the 2020 OBMP:***

    ***Pg. 47, section that starts, "The 2020 SMP includes the following provisions specific to the Parties and Storage and Recovery Program:" Second minor bullet under second major bullet:***
    - ***With regard to the storage management activities of the Parties:***

    ***o ~~The~~ Any reduction in net recharge caused by storage in the FMSB is an adverse impact, and Watermaster considers this adverse impact to be mitigated by the prospective calculation of Safe Yield.***

    ***As written, this sentence makes it sound like reduction in net recharge is a given if the volume of groundwater in storage changes. Groundwater pumping patterns also impact net recharge. This is why the change indicated in red above is recommended.***

    RESPONSE: The text has been modified to reflect this suggested change.

24. ***Pg. 47, last bulleted item, "Watermaster will periodically review current and projected basin conditions and compare this information to the projected basin conditions…"***

    ***It is recommended that future reviews of the impact of storage and recovery projects be done on an annual basis.***

    RESPONSE: Comment noted

25. ***Section 4 2020 OBMP Update Management Plan***
***In general, it is noted multiple places in Section 4 reference the preparation of work plans and management plans. Program Element 1 (Table 11) describes the need to prepare an OBMP Monitoring and Reporting Work Plan. Elsewhere in the document, there are other water quality and monitoring/management work plans identified under Program Element 6, including:***
    - ***Emerging Contaminants Monitoring Plan (Table 15 – 2nd and 3rd Row)***
    - ***Groundwater Quality Management Plan (Table 15 – 5th Row).***

    ***In addition, the Salt and Nutrient Management Plan (SNMP) under Program Element 7 includes monitoring and reporting of groundwater quality data. [A] Is it possible to combine the monitoring and reporting work plans into one comprehensive document instead of multiple individual plans? [B] Are there any negative consequences of doing so? [C] Would the***

***existing OBMP Maximum Benefit Monitoring Program 2014 Work Plan be replaced by the OBMP Monitoring and Reporting Work Plan?***

RESPONSE:
[A] and [B] The intent is to have one single monitoring program work plan, the OBMP Monitoring and Reporting Work Plan, that covers all of the Watermaster programs listed in Table 2 of the OBMP Update Report, with the exception of the initial emerging contaminant (EC) monitoring program included in PE 6. The initial EC monitoring program is envisioned as a stand-alone work plan as it is intended to be a short-term, one-time effort to collect the data needed to evaluate ECs in the Chino Basin. PE 6 also provides for the development of a long-term EC monitoring plan as part of the development of the Groundwater Quality Management Plan. This long-term EC monitoring plan, once developed, would be incorporated into the OBMP Monitoring and Reporting Work Plan.

[C] Yes, if the Parties elect to prepare the OBMP Monitoring and Reporting Work Plan, the existing 2014 OBMP Maximum Benefit Monitoring Program Work Plan would be incorporated as part of the new work plan. Note that Watermaster and IEUA are currently working on an update to the Chino Basin maximum benefit SNMP commitments, which could result in changes to the monitoring plan described in the 2014 OBMP Maximum Benefit Monitoring Program Work Plan. Once the SNMP update work is completed and any recommended changes are approved by the Regional Board, these changes would be documented in the governing work plan.

# Appendix C

2020 Optimum Basin Management Program Scoping Report

**To:** Chino Basin Watermaster Stakeholders

**From:** Watermaster 2020 OBMP Update Team

**Subject:** 2020 OBMP Update: Scoping Report – Development of Activities for Consideration

**Date:** Draft Part 1, July 24, 2019; Draft Part 2, August 22, 2019;
Final November 22, 2019

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# 1. Introduction and Background

## Objectives and Purpose of the Scoping Report

The Chino Basin Watermaster (Watermaster) is in the process of updating its Optimum Basin Management Program (OBMP) and its implementation plan. The objectives of this first Technical Memorandum, *2020 OBMP Update: Scoping Report – Development of Activities for Consideration* (Scoping Report), are: (1) to describe the stakeholder process to develop the 2020 OBMP Update, (2) to document the key outcomes of the stakeholder process to date, and (3) to describe the proposed scope of work, implementation actions, schedule, and cost to perform the following eight activities developed by the stakeholders for consideration for inclusion in the 2020 OBMP Update:

1. Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water—particularly in areas of the basin that will promote the long-term balance of recharge and discharge (Activity A).
2. Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality (Activity B)
3. Maximize the reuse of recycled water produced by IEUA and others (Activity D).
4. Develop and implement a water-quality management plan to address current and future water-quality issues, protect beneficial uses, and develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits (Activity E/F).
5. Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge (Activity K).
6. Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence and optimize the use of all water supply sources (Activity C/G).
7. Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance (Activity L).
8. Develop a process to provide for the equitable distribution of the costs and benefits of the OBMP Update, to encourage regional partnerships for implementation to reduce costs, and to identify and pursue low-interest loans, grants, or other external funding sources to support the implementation of the OBMP Update (Activity H/I/J).

The purpose of the Scoping Report is to provide the Parties with an understanding of the work that would need to be performed to accomplish the desired outcomes of each of the 2020 OBMP Update activities. To the extent that the scopes of work described herein are already being partly or completely performed by Watermaster or others, this Scoping Report acknowledges such. The next steps in the process to prepare the 2020 OBMP Update will focus on the review and revision of the activities scoped herein and the integration of the ongoing activities with the existing OBMP. The recommended 2020 OBMP Implementation Plan, inclusive of ongoing and new activities will be documented in a subsequent report, *2020 Optimum Basin Management Program Update Report*, and will form the foundation for the Parties to develop a final implementation plan and agreements to implement the OBMP Update.

## History of the OBMP

The Chino Basin Judgment gave Watermaster the discretionary authority to develop an OBMP for the Chino Basin, including both water quantity and quality considerations. Watermaster, with direction from the Court, began developing the OBMP in 1998 and completed it in July 2000. The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders, described the physical state of the groundwater basin, defined a set of management goals, characterized impediments to those goals, and developed a series of actions that could be taken to remove the impediments and achieve the management goals. This work was documented in the *Optimum Basin Management Program – Phase I Report*.[1]

The four goals of the 2000 OBMP included:

*Goal 1 – Enhance Basin Water Supplies*

*Goal 2 – Protect and Enhance Water Quality*

*Goal 3 – Enhance Management of the Basin*

*Goal 4 – Equitably Finance the OBMP*

The actions defined by the stakeholders to remove impediments to the OBMP goals were logically grouped into sets of coordinated activities called Program Elements (PEs), each of which included a list of implementation actions and an implementation schedule. The nine PEs defined in the 2000 OBMP included:

*PE 1 – Develop and Implement Comprehensive Monitoring Program*. The objectives of the comprehensive monitoring program are to collect the data necessary to support the implementation of the other eight PEs and periodic updates to the *State of the Basin Report*[2].

*PE 2 – Develop and Implement Comprehensive Recharge Program*. The objectives of the comprehensive recharge program include increasing stormwater recharge to offset the recharge lost due to channel lining, to increase Safe Yield, and to ensure that there will be enough supplemental water recharge capacity available to Watermaster to meet its Replenishment Obligations.

*PE 3 – Develop and Implement a Water Supply Plan for Impaired Areas*. The objective of this program is to maintain and enhance Safe Yield with a groundwater desalting program that is designed (1) to replace declining agricultural groundwater pumping in the southern part of the basin with new pumping to meet increasing municipal water demands in the same area (2) to minimize groundwater outflow to the Santa Ana River, and (3) to increase the Santa Ana River recharge into the basin.

*PE 4 – Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1*. The objectives of this land subsidence management program are to characterize the

[1] WEI. (1999). *Optimum Basin Management Program – Phase I Report*. Prepared for the Chino Basin Watermaster. August 19, 1999. http://www.cbwm.org/docs/engdocs/OBMP%20-%20Phase%20I%20(Revised%20DigDoc).pdf

[2] See for example: WEI (2019). *Optimum Basin Management Program 2018 State of the Basin Report*. Prepared for the Chino Basin Watermaster. June 2018. This document is available on Watermaster's website at http://www.cbwm.org/

spatial and temporal occurrence of land subsidence, to identify its causes, and, where appropriate, to develop and implement a program to minimize or stop land subsidence.

*PE 5 – Develop and Implement Regional Supplemental Water Program*. The objective of this program is to improve the regional conveyance and availability of imported and recycled waters throughout the basin.

*PE 6 – Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management*. The objectives of this water quality management program are to identify water quality trends in the basin and the impact of the OBMP implementation on them, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water-quality regulators to identify and facilitate the cleanup of soil and groundwater contamination.

*PE 7 – Develop and Implement Salt Management Plan*. The objectives of this salinity management program are to characterize current and future salt and nutrient conditions in the basin and to develop and implement a plan to manage them.

*PE 8 – Develop and Implement Groundwater Storage Management Program*. The objectives of this storage program are (1) to implement, and periodically update, a storage management plan that prevents overdraft, protects water quality, and ensures equity among the Parties and (2) to periodically recalculate Safe Yield. This PE explicitly defined the storage management plan, including a "Safe Storage Capacity" for managed storage of 500,000 acre-feet (af) – inclusive of local and supplemental storage and Storage and Recovery Programs.

*PE 9 – Develop and Implement Storage and Recovery Programs*. The objectives of the conjunctive use program are to develop Storage and Recovery Programs that will provide broad mutual benefit to the Parties and ensure that basin water and storage capacity are put to maximum beneficial use while causing no Material Physical Injury (MPI).

The PEs and their associated implementation actions were incorporated into the OBMP Implementation Plan (OBMP IP). The Chino Basin Judgment Parties (Parties) then developed an agreement—the Peace Agreement—to implement it. The OBMP IP is Exhibit B to the Peace Agreement. The Peace Agreement was reviewed in a programmatic environmental impact report (PEIR), completed by the Inland Empire Utilities Agency (IEUA) in July 2000.

For purposes of the discussions in this report, the term OBMP refers to the collective programs implemented by Watermaster and others (e.g. IEUA, the Chino Basin Desalter Authority, etc.) pursuant to the Peace Agreements, the OBMP Implementation Plan, the PEIR, and any amendments to these documents.

### 2007 Supplement to the OBMP IP and the Peace II Agreement

The work to develop the OBMP determined that the groundwater pumping capacity of the Chino Basin Desalters would ultimately need to be 40,000 acre-feet per year (afy) to accomplish the goals of the OBMP; however the Peace Agreement only provided for the development of the first 20,000 afy of this capacity and the Parties committed to developing expansion and funding plans the remaining capacity within five years of approval of the Peace Agreement. The Parties developed the Peace II Agreement that included provisions to expand the desalting capacity to 40,000 afy. The Peace II agreement introduced Re-

operation[3] to achieve Hydraulic Control[4] of the Chino Basin and maintain Safe Yield. Hydraulic Control is both a goal of the OBMP and a requirement of the maximum benefit salt-and-nutrient management plan (SNMP) that was developed by Watermaster and IEUA under PE 7 to enable the expansion of recycled water recharge and reuse throughout the basin under PEs 2 and 5.

The Parties executed the Peace II Agreement in 2007, which included a supplement to the OBMP Implementation Plan to expand the Chino Basin Desalters to 40,000 afy of groundwater pumping, to incorporate Re-operation and Hydraulic Control, and to resolve other issues. There were no changes to the storage management plan in the OBMP Implementation Plan to address the implications of the reduction in storage of basin water by 400,000 af as provided for by Re-operation.

The IEUA completed and adopted a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010.

### 2017 Addendum to the 2010 Peace II SEIR

In 2016, Watermaster identified the need to update the OBMP storage management plan because the total amount of water in managed storage accounts was projected to exceed the Safe Storage Capacity limit of 500,000 af defined in the 2000 OBMP. In 2017, the IEUA adopted an addendum to the Peace II SEIR to revise the storage management plan in the OBMP through June 30, 2021. The addendum was supported with engineering work that demonstrated that the Safe Storage Capacity could be safely increased to 600,000 af with the commitment that Watermaster would update the OBMP storage management plan by June 30, 2021.

## Need for the 2020 OBMP Update

As of 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented, while some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that need to be addressed to protect the collective interests of the Parties and their water supply reliability. For these reasons, the Parties are updating the OBMP to set the framework for the next 20 years of basin-management activities.

A more detailed description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update is included in a white paper prepared for the stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper, and all documents relevant to the 2020 OBMP Update, are available on the Watermaster's website.[5]

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[3] Re-operation is the controlled overdraft of the Basin by the managed withdrawal of groundwater pumping for the Desalters and the potential increase in the cumulative un-replenished pumping from the 200,000 acre-feet authorized by paragraph 3 of the Engineering Appendix Exhibit I to the Judgment, to 600,000 acre-feet for the express purpose of securing and maintaining Hydraulic Control as a component of the Physical Solution.

[4] Hydraulic Control is the elimination of groundwater discharge from the Chino North Management Zone to the Santa Ana River or its reduction to less than 1,000 afy.

[5] http://www.cbwm.org/OBMPU.htm

## Stakeholder Process for the 2020 OBMP Update

The 2020 OBMP Update is being conducted using a collaborative stakeholder process like that employed for the development of the 2000 OBMP. A series of public listening sessions are being held by the Watermaster throughout 2019 to support the 2020 OBMP Update. The purpose of the listening sessions is to obtain information, ideas, and feedback from the stakeholders to define their issues needs and wants, their collective goals for the 2020 OBMP Update, the impediments to achieving the goals, the management actions required to remove the impediments, and an implementation plan for the management actions.

The Watermaster has established an OBMP Update Team to facilitate the stakeholder process. The OBMP Update Team is composed of Watermaster staff, Watermaster legal counsel, engineers and scientists from Wildermuth Environmental Inc. ([WEI] Watermaster's engineering consultant), and staff from the IEUA. The OBMP Update Team is providing key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objective is for the ideas and opinions of every stakeholder to be heard. Participation in the listening sessions is critical to the development of the 2020 OBMP Update.

The work documented in this Scoping Report is based on the discussions and feedback from the first four listening sessions, which were held on the following dates:

- Listening Session #1: January 15, 2019
- Listening Session #2: February 12, 2019
- Listening Session #3: March 21, 2019
- Listening Session #4: May 16, 2019

The objectives of the first four listening sessions were (1) to confirm the need to update the OBMP, (2) to identify the issues, needs, and wants of the stakeholders, (3) to define goals for the 2020 OBMP Update, and (4) to identify the new and revised activities that could be included in the 2020 OBMP Update to remove impediments to achieving the 2020 OBMP Update goals. Listening Session memorandums were prepared to document the outcomes of Listening Sessions 1, 2, and 3. The listening session memorandums are included as appendices herein. This Scoping Report summarizes and integrates the work products of the first four listening sessions and provides new information on the recommended scope of work to implement the 2020 OBMP Update activities defined by the stakeholders.

The next series of listening sessions will focus on the review and revision of the activities scoped herein and the integration of those activities with the existing OBMP. The outcomes will be integrated into a recommended implementation plan for the 2020 OBMP Update. The second TM, *2020 Optimum Basin Management Program Update Report*, will form the foundation for the Parties to develop a final implementation plan and agreements to implement the OBMP Update.

# 2. Development of Activities for Consideration in the 2020 OBMP Update

## Drivers, Trends and Implications for Basin Management

The strategic drivers and trends that shaped the goals and activities of the OBMP in the late 1990s have since changed. There a several drivers and trends in today's water management space that will challenge the ability of the Parties to protect their collective interests in the Chino Basin and their water supply reliability. Figure 1 characterizes the drivers and trends shaping water management, and their basin management implications for the Parties. "Drivers" are external forces that cause changes in the Chino Basin water space, such as climate change, regulations, and funding. Grouped under each driver are expected trends that emanate from that driver. For example, trends associated with climate change include reduced groundwater recharge, increased evaporation, and reduced imported water supply. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications. For example, a management implication of reduced groundwater recharge is the reduction of the Chino Basin Safe Yield.

The drivers, trends, and implications were first identified in the OBMP White Paper and served as the initial rationale for recommending an update to the OBMP. Figure 1 represents the final characterization of the drivers, trends, and implications, based on stakeholder input. The basin management implications that form the stakeholders' rationale for the 2020 OBMP Update are:

- Reductions in Chino Basin Safe Yield
- Reduced imported water availability and increased cost
- Imported water quality degradation
- Chino Basin water quality degradation
- Inability to pump groundwater with existing infrastructure
- Increased cost of groundwater use
- Recycled water quality degradation
- Reduced recycled water availability and increased cost
- Increased cost of Basin Plan compliance

## Issues, Needs, and Wants of the Chino Basin Stakeholders

The issues, needs, and wants of the stakeholders form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the goals as well as the action items to remove the impediments. Through the listening session process, 57 unique needs and wants were identified by the stakeholders. The classes of issues identified were effectively the same as the implications for basin management defined in Figure 1 and listed above. Table 1 is a matrix that summarizes: the needs and wants of the Parties, organized by basin management issue (rows) and attribution to stakeholders that share each need/want (columns).

## 2020 OBMP Goals

Through the assessment of the basin management issues, needs, and wants, the stakeholders concluded that the goals defined in the 2000 OBMP are still relevant today. The following is the statement of intent developed for each goal in the 2020 OBMP Update:

> ***Goal No. 1 - Enhance Basin Water Supplies.*** The intent of this goal is to increase the water supplies available for Chino Basin Parties and improve water supply reliability. This goal applies to Chino Basin groundwater and all other sources of water available for beneficial use.

***Goal No.2 - Protect and Enhance Water Quality.*** The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.

***Goal No.3 - Enhance Management of the Basin.*** The intent of this goal is to encourage sustainable management of the Chino Basin to avoid Material Physical Injury, promote local control, and improve water-supply reliability for the benefit of all Chino Basin Parties.

***Goal No. 4 - Equitably Finance the OBMP***. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

The far right-hand column of Table 1 (issues, needs, and wants) illustrates the nexus of the goals to the needs and wants of the Parties.

## Activities for Consideration in the 2020 OBMP Update

There are physical, institutional, and financial impediments to achieving the 2020 OBMP's goals. The issues, needs, and wants of the stakeholders shown in Table 1 recognize these impediments. The stakeholders identified and described 12 new and revised activities that will be considered for inclusion in the 2020 OBMP Update. The 12 activities are listed in Table 2. Table 1 illustrates which of the 12 activities (identified by the letters A through L, as characterized in Table 2) the stakeholders believe have the potential to address each of their needs and wants. 55 of the 57 needs and wants were identified as addressed by one or more of the proposed activities.

## Nexus Between the 2020 OBMP Update Goals, Their Impediments, and the Activities Recommended for Consideration

Table 3 illustrates the nexus of the OBMP goals, the impediments to achieving these goals, the activities to remove the impediments, and the potential outcomes (i.e. the implications) of implementing each activity. Table 3 also shows the nexus of each activity to addressing the issues needs and wants of the stakeholders, categorized by basin management issues. In the process of developing Table 3, it was identified that some of the activities defined in Table 2 are related enough to be combined into single activities. The 12 activities were condensed into eight activities. The statements of impediments, expected outcomes, and grouping of the activities were initially proposed by the 2020 OBMP Update Team, based on stakeholder input in Listening Sessions #1 through #3, and were subsequently revised, based on the feedback obtained from stakeholders during Listening Session #4.

The eight activity groups scoped out herein are:

1. Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge (Activity A).
2. Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, to protect or enhance Safe Yield, and to improve water quality (Activity B)
3. Maximize the reuse of recycled water produced by the IEUA and others (Activity D).
4. Develop and implement a water-quality management plan to address current and future water-quality issues, protect beneficial uses, and develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits (Activity EF).
5. Develop a management strategy within the salt and nutrient management plan to ensure ability to comply with dilution requirements for recycled water recharge (Activity K).

6. Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence and to optimize the use of all water supply sources (Activity CG).
7. Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance (Activity L).
8. Develop a process to provide for the equitable distribution of the costs and benefits of the OBMP Update, to encourage regional partnerships for implementation to reduce costs, and to identify and pursue low-interest loans, grants, or other external funding sources to support the implementation of the OBMP Update (Activity HIJ).

# 3. Scope of Work to Perform Proposed 2020 OBMP Update Activities

In this section, each of the eight activities identified by the stakeholders will be described in detail. The potential outcomes Table 3 provide the basis for intended scope of each activity. For each activity the following is described:

- Description of the activity
- Need and function of the activity
- Relationship to the PEs in the 2000 OBMP and OBMP IP
- Scope of work to perform the activity
- Schedule of the implementation actions
- Budget-level cost estimate to implement the initial implementation actions

## Assumptions Applied in Defining the Scope of Work, Schedule, and Cost of the OBMP Activities

In order to develop the scope of work, schedule, and cost of the activities, the following assumptions were made:

**Basis for scope of work and cost.** The scopes of work and associated costs to perform the 2020 OBMP Update activities are based on the current understanding of the stakeholders' desired outcomes as articulated during the 2020 OBMP Update listening sessions and described in Section 2 in this TM1. The precise scopes of work and costs defined in this section are preliminary and will likely change during implementation. Each scope of work includes an introductory process to refine the objectives of the activity and to refine the scope of work, schedule, and costs, as necessary. The scopes of work will be performed by engineers hired by Watermaster, the IEUA or others responsible for implementing the OBMPU.

**Estimated costs of engineering services.** The estimated engineering services costs are based on 2019 WEI rates and rounded to the nearest $1,000. The estimated costs will need to be adjusted in implementation based on the final recommended scope and schedule.

**Participating agency costs are not included.** The staff labor costs and other direct costs incurred by agencies participating in the activities are not included in the implementation cost estimates contained herein.

**Stand-alone costs.** The recommended scope of work and cost for each OBMP activity were developed assuming that the activities were unrelated, or that they could be implemented independently. Once the final set of activities and scopes are selected for inclusion in the 2020 OBMP Update, the scopes will be reviewed to identify overlapping tasks among the activities and will be refined to integrate the work and reduce costs.

**Existing OBMP activities.** The recommended scopes of work assume that the ongoing activities of the 2000 OBMP and the 2007 supplement to the OBMP IP will continue unless otherwise specified, including, the Recharge Master Plan updates, the ongoing monitoring program under PE1, the Ground Level Monitoring Program, the maximum benefit salt and nutrient management plan, and the Prado Basin Habitat Sustainability Program.

**Leveraging existing work.** The recommended scopes of work and costs were assumed to leverage existing work being performed by Watermaster, such as the Safe Yield recalculation. There may be opportunities to leverage work done by other agencies to reduce the cost of implementing the recommended scope of

work. In implementation, when the activity objectives and scopes of work are being refined, the ability to leverage the work of others would need to be identified and considered to eliminate redundancies and reduce cost.

**Schedule.** Unless otherwise stated, the schedule to implement the activities is provided in a general context (Year 1, Year 2, Year 5, etc.) and not assigned to a specific start or end date.

## Activity A

### Description of Activity A

Activity A defined by the stakeholders is:

> *Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental waters, particularly in areas of the basin that will promote the long-term balance of recharge and discharge.*

Activity A has the following objectives: (1) to maximize stormwater capture pursuant to Watermaster's diversion permits, (2) to promote the long-term balance of recharge and discharge, (3) to ensure sufficient supplemental water recharge capacity for future replenishment, (4) to reduce dependence on imported water by maintaining or enhancing Safe Yield, (5) to improve water quality, and (6) to ensure a supply of dilution water to comply with recycled water recharge permit requirements. For the remainder of this section, the use of the term "recharge" is inclusive of diverting, storing, and recharging storm and supplemental waters.

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activity A:

- Increase recharge of high-quality stormwater that will:
  - protect/enhance Safe Yield,
  - improve water quality,
  - reduce dependence on imported water,
  - increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and
  - provide new supply of blending water to support the recycled-water recharge program.
- Provide additional supplemental-water recharge capacity for replenishment and the implementation of Storage and Recovery Programs.
- Provide additional surface water storage capacity.

Activity A has similar objectives to those of PE 2 of the 2000 OBMP – *Develop and Implement Comprehensive Recharge Program*. PE2 was included in the 2000 OBMP to reverse the loss of yield caused by urbanization and the concrete lining of natural streams overlying the Chino Basin. The scope of work defined under PE2 was to continue the recharge master plan study initiated by Watermaster and the Chino Basin Water Conservation District (CBWCD) in 1998. The implementation plan for PE2, as defined in the Peace Agreement, requires the preparation of a recharge master plan update (RMPU) at least every five years.

The objectives and scope of each RMPU are defined at the beginning of each update and are derived from several guiding documents: the Peace Agreement, the Peace II Agreement, and the Special Referee's December 2007 Report. Pursuant to these guiding documents, the general objectives of the RMPU include:

- Ensure there is enough recharge capacity and supplemental water available to meet future replenishment requirements. Pursuant to the Judgment, there must be enough wet-water recharge capacity available to Watermaster to ensure it can replenish the basin with supplemental water to offset overproduction. The wet-water recharge capacity for replenishment must include consideration of the availability of supplemental water supplies, competing uses for the recharge facilities, and the need to balance recharge and discharge in every area and subarea.

- Maximize the recharge of recycled and storm waters where feasible. Both of these supplies are reliable: they are under local control and are less costly when compared to imported water supplies.
- Balance the recharge and discharge in every area and subarea. This provision in the Peace Agreement was included to enable Watermaster to use its discretion when conducting recharge and replenishment operations to prioritize the location and magnitude of recharge and replenishment to improve the Hydrologic Balance, to ensure pumping sustainability, and to help manage land subsidence.

To meet these objectives, the RMPUs must consider and address recharge requirement projections, the availability of storm and supplemental waters for recharge and replenishment, and the physical means to satisfy these recharge projections. To the extent that new or modified facilities are required to meet the objectives, the RMPUs include a schedule for planning, design, and construction of recharge improvements. The 2002 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) were developed in open and transparent planning processes that were convened by Watermaster. As part of the *2013 Amendment to the 2010 RMPU* (2013 RMPU), the RMPU Steering Committee was created to assist Watermaster and the IEUA in preparing RMPUs. The Steering Committee is open to all interested stakeholders and meets regularly through the development of RMPUs. Since the implementation of the OBMP began, Watermaster has achieved the following through the RMPU process:

- Modified seventeen existing flood retention facilities to increase diversion rates, conservation storage, and recharge, and constructed two new recharge facilities. These improvements increased average annual stormwater recharge by about 9,500 acre-feet per year (afy). The cost of these recharge improvements was about $60 million, IEUA and Watermaster paid for about half of this cost, while the other half was funded through Proposition 13 grants and other grant programs.
- Completed the design of five recharge improvement projects, expected be completed and in operation by 2021. These projects are expected to increase average annual stormwater recharge by an additional 4,700 afy.
- Ensured sufficient supplemental water recharge capacity is available to meet its Replenishment Obligations through 2050.

The next RMPU must be completed and submitted to the Court by October 2023. Based on the alignment of the objectives of Activity A with those of the RMPU, Activity A can be accomplished through the existing RMPU process. The sections below describe the limitations of the existing RMPU process to fully achieve the objectives of Activity A and the recommended scope to refine the RMPU process to accomplish the objectives.

### Need and Function of Activity A

Watermaster holds three permits with the State Water Resources Control Board (State Board) for the diversion and recharge of stormwater in trust for the Parties. The San Bernardino County Flood Control District (SBCFCD) is a co-permittee for two of these permits, 19895 and 20753. Each permit defines a maximum diversion limit and the period over which diversions are allowed to occur each year (diversion season):

- Permit 19895 has a diversion limit of 15,000 acre-feet (af) from November 1 to April 30,
- Permit 20753 has a diversion limit of 27,000 af from October 1 to May 1, and
- Permit 21225 has a diversion limit of 68,500 af from January 1 to December 31.

When combined, these permits allow up to 110,500 af per year (afy) of diversion and recharge. Exhibit A-1 shows the locations where stormwater may be diverted from the stream systems (points of diversion [PODs]) as defined in Permits 19895, 20753, and 21225. The PODs for Permit 19895 are located on the Day Creek system, the PODs for Permit 20753 are located on the San Sevaine Creek system, and the PODs for Permit 21225 are located on the San Antonio/Chino Creek, Cucamonga Creek, Day Creek, and San Sevaine Creek systems. Permit 21225 includes PODs that are also listed in Permits 19895 and 20753, but expands the allowable diversion season.

From 2003 to 2005, Watermaster, working in collaboration with the IEUA, constructed the first set of recharge facilities to exercise its rights pursuant to these permits, increasing average annual stormwater recharge by about 9,500 afy. In 2013, Watermaster and the IEUA completed the 2013 RMPU, which included five new recharge facility improvement projects. As of this writing and as stated above, Watermaster and the IEUA are completing the final design/construction of the 2013 RMPU facilities, and they should be online in 2021. These facilities are expected to increase stormwater recharge by about 4,700 afy.[6] Upon completion of the 2013 RMPU facilities, the annual average stormwater recharge performed pursuant to these three permits is expected to be about 14,950 afy.[7] Exhibit A-2 shows the locations of the existing and planned facilities.

Exhibit A-3 lists the existing recharge facilities and shows the historical average stormwater recharge from 2005 to 2018, the theoretical maximum supplemental water recharge capacity, and the total theoretical maximum recharge capacity for each facility. As shown in Exhibit A-3, actual stormwater recharge has averaged about 10,150 afy which is about 10 percent of the combined diversion limit and 15 percent of the total theoretical maximum recharge capacity. The differences between the historical average stormwater recharge and the diversion limit and total theoretical maximum recharge capacity suggests lost opportunity for stormwater recharge. Because the existing diversion structures are used at their instantaneous capacities, the limitations to increasing the capture and recharge of stormwater are diversion capacity and storage capacity. Hence, Activity A has been identified to increase the capacity to divert, store, and recharge additional surface water.

### *Availability of Additional Stormwater for Recharge*

To better understand the lost opportunity for recharge, Watermaster used its Wasteload Allocation Model (WLAM) to estimate the daily stormwater discharge available for diversion over each permit's respective diversion season, based on the historical hydrology for the 63-year period of 1950 to 2012.[8] The WLAM uses daily precipitation, evapotranspiration, evaporation, and land use data to estimate stormwater discharge entering the stream systems. The WLAM then uses hydraulic design data for channels and stormwater management facilities to computationally route the stormwater discharge through the channels, diversion works, and recharge facilities. The stormwater discharge available for diversion was determined to be the flow at the most downstream PODs on each stream system.

Exhibits A-4 and A-5 show comparisons of stormwater discharge available for diversion, model-estimated stormwater recharge, and permitted diversion limits. Exhibit A-4 presents a direct comparison of the annual time series of stormwater discharge—divided into stormwater diverted for recharge and

[6] Note that Watermaster completed its 2018 RMPU in October 2018, but no projects were selected for implementation.

[7] 2018 Recharge Master Plan Update. WEI. September 2018.

[8] WEI. (2018). *Support for Watermaster's response to State Board request for information for petition for extensions of time.* Prepared for Chino Basin Watermaster. March 7, 2018.

stormwater not diverted for recharge—and the total annual diversion limit. Exhibit A-5 presents a cumulative frequency plot that shows: (1) the probability that stormwater discharge is equal to or greater than a specified value, (2) the probability that stormwater recharge for existing and projected 2013 RMPU facilities is equal to or greater than a specified value, and (3) the permitted diversion limit. Based on Exhibit A-5, the theoretical average annual stormwater discharge is estimated to be about 74,000 afy and the projected average annual stormwater recharge with existing and projected 2013 RMPU facilities is about 14,500 afy. The difference between these two values, 60,000 afy, is the lost opportunity for stormwater recharge.

Through the RMPU process, the Steering Committee analyzes and recommends projects that can increase stormwater diversion and storage capacity and increase stormwater recharge, up to the permit limit, for Watermaster approval. Historically, Watermaster and the IEUA have selected projects for implementation only if the melded unit cost of stormwater recharge resulting from the projects was less than the avoided unit cost of purchasing imported water from the Metropolitan Water District of Southern California (Metropolitan). Over time, more expensive stormwater recharge projects will meet the criteria as the unit cost of imported water increases in the future. The use of this economic criterion alone ignores the economic value of the greater reliability of stormwater relative to imported water.

Exhibit A-6 lists the potential new stormwater recharge projects evaluated in the 2018 RMPU. The locations of these potential projects are shown in Exhibit A-7. The projects listed in Exhibit A-6 were reviewed, and their capital and unit stormwater recharge costs were projected to 2023 costs, which is the year when the next RMPU is due to be completed. The unit cost of new stormwater recharge for the projects listed in Exhibit A-6 ranges from $2,000 to $6,000 per af, and the estimated new stormwater recharge from these projects ranges from 7 to 5,000 afy. Exhibit A-8 is a time history chart showing the historical and projected cost of imported water purchased from Metropolitan compared to the projected unit stormwater recharge cost of the projects shown in Exhibit A-6. In all cases, the projected unit cost of new stormwater recharge projects listed in Exhibit A-6 exceeds the projected cost of imported water that could be supplied by Metropolitan in 2023 (about $900 per af[9]) and through the foreseeable future. Based on Watermaster and the IEUA's historical selection process, no project in Exhibit A-6 was recommended for implementation in the 2018 RMPU. To accomplish the goals of Activity A, the economic criteria for selecting projects would have to be reevaluated.

### *Supplemental Recharge Capacity*

As part of the RMPU process, Watermaster also needs to ensure that there is sufficient supplemental water recharge capacity in the basin to meet Replenishment Obligations. As shown in Exhibit A-3, the theoretical maximum supplemental water recharge capacity under the current IEUA maintenance operations averages about 56,000 afy.[10] For comparison, during FY 2017/18, about 47,000 af of supplemental water was recharged in spreading basins, using about 85 percent of the existing supplemental water recharge capacity. This suggests that new recharge facilities and/or improvements to existing facilities may be needed if Parties want to increase supplemental water recharge.

### *Balance of Recharge and Discharge*

Historically, Watermaster has attempted to manage the recharge of storm and supplemental water to promote the balance of recharge and discharge. This method of managing recharge does not specifically

[9] WEI. (2018). *2018 Recharge Master Plan Update*. Prepared for the Chino Basin Watermaster. September 2018.

[10] This estimate corresponds to continuous use between maintenance periods and is less than the recharge capacity that would occur if the recharge basins were used less frequently.

address current basin management issues, such as existing land subsidence in Management Zone 1 (MZ1) and parts of MZ2 and pumping sustainability issues in the Jurupa Community Services District (JCSD) and Chino Basin Desalter Authority (CDA) well fields. There is a need to define additional criteria on how and where to conduct recharge to better address existing basin management issues.

*Summary*

Based on the information summarized herein, the opportunities and challenges in conducting Activity A are:

- The theoretical average annual stormwater discharge available for diversion under the existing water rights permits is about 74,000 afy ranging from 21,400 to 110,500 afy (combined permitted diversion), and existing facilities divert about 14,500 afy. The difference between these two values, about 60,000 afy, is a lost opportunity for stormwater recharge. Improvements to existing facilities and/or new facilities are required to achieve the stormwater recharge potential.
- Based on Watermaster and the IEUA's existing economic selection criteria, no new recharge projects were recommended for implementation in the 2018 RMPU. To accomplish the goals of Activity A, the economic criteria for selecting projects needs to be reevaluated.
- The criteria on how and where to conduct recharge needs to be updated to more effectively address the existing basin management issues, including: land subsidence, maintaining Hydraulic Control, and pumping sustainability.

These challenges can be addressed through the existing RMPU process. The section below describes the recommended scope for developing the 2023 RMPU, refined from past RMPU scopes, to better meet the current needs of the Parties defined for Activity A.

## Scope of Work for Activity A

Activity A—*Construct new facilities and improve existing facilities to increase the capacity to store and recharge surface water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge*—will be accomplished through the RMPU implementation process. The scope of work summarized below is for developing the 2023 RMPU and conducting the necessary work to achieve the objectives of Activity A. The scope of work consists of five tasks:

- Task 1 – Define objectives and refine scope of work
- Task 2 – Develop planning, screening, and evaluation criteria
- Task 3 – Describe recharge enhancement opportunities
- Task 4 – Develop reconnaissance-level engineering design and operating plan
- Task 5 – Plan, design, and construct selected recharge projects

*Task 1 – Define objectives and refine scope of work.* The objective of this task is to obtain consensus on the objectives of Activity A and the impediments this activity is meant to overcome. During this process, the Steering Committee will address questions raised by stakeholders during the OBMP Update, such as:

(1) Should Watermaster have a process in Activity A to identify vacant land for purchase even if there is no specified project or it becomes available outside the "call for projects" window of the RMPU process?
(2) Should Watermaster have a process to encourage developers to utilize infiltration to manage on-site runoff pursuant to the Municipal Storm (MS4) permit?

A detailed scope, cost, and schedule will be prepared to meet the defined objectives. Two meetings will be conducted (1) to define the objectives and impediments and (2) to define the scope, cost, and schedule.

*Task 2 – Develop planning, screening, and evaluation criteria.* The objectives of this task are to develop criteria to determine how and where new recharge capacity can be constructed and to evaluate and select a subset of projects to evaluate. The criteria developed to evaluate potential projects in Task 4 will include qualitative criteria, such as reliability, and quantitative criteria that include business case evaluations, expressed as net present value, unit cost, and others. The recharge projects with the best cost-benefit ratio at the time were constructed in earlier recharge improvement efforts in the 2000 OBMP implementation. The types of new stormwater projects required to meet the objectives described herein and subsequently refined in Task 1 will likely be more expensive than the avoided cost of purchasing imported water from Metropolitan. The Steering Committee will (1) review and refine criteria used in past RMPUs and (2) review the current projected basin management challenges to develop "smart" recharge criteria. The smart recharge criteria will ensure that project designs and operations are complementary to other Watermaster management activities, such as protecting and enhancing Safe Yield, management of land subsidence, promoting pumping sustainability, ensuring dilution supplies to comply with recycled water recharge permits, water quality improvement, maintenance of Hydraulic Control, and others.

Included in this scope is estimating future Replenishment Obligations, updating the estimated supplemental water recharge capacity, and characterizing the availability of imported and recycled water. Future Replenishment Obligations will be estimated in the 2020 Safe Yield recalculation effort and will be subsequently used as a criterion for planning supplemental water recharge. Two meetings will be scheduled to review and refine the criteria with the stakeholders.

*Task 3 – Describe recharge enhancement opportunities.* The objectives of this task are to identify potential projects, to screen them using the criteria developed in Task 2, and to subsequently develop a set of stormwater and supplemental water recharge projects for detailed evaluation. Two meetings will be conducted: (1) to develop a list of potential projects that can be implemented and (2) to review the screening of the projects defined during the first meeting and select projects to evaluate in Task 4.

*Task 4 – Develop reconnaissance-level engineering design and operating plan.* The objective of this task is to characterize the performance and costs of new recharge projects—individually and as a group/system. A reconnaissance-level engineering design and operating plan will be developed for each project. Each project design will include the approximate size, location, and alignment of major stormwater utilities, and will describe any potential implementation barriers. A cost opinion, stormwater recharge performance, and supplemental water recharge capacity will be determined for each project. The task includes evaluating the projects based on the criteria developed in Task 2 and recommending a set of projects for implementation. The deliverable of this task will be the *2023 Recharge Master Plan Update* report, summarizing the work performed under Tasks 1 through 4, and it will include an implementation plan and a plan to finance the preliminary design and CEQA documentation. Four meetings will be conducted: (1) to review the designs and estimated benefits of the projects, (2) to review the evaluation of the projects based on the criteria developed in Task 2 and the recommended list of projects for implementation, (3) to review the implementation plan, and (4) to review the 2023 RMPU report.

*Task 5 – Plan, design, and construct selected recharge projects.* The objective of this task is to implement the recommendations from the 2023 RMPU report. This task includes (1) developing and implementing necessary agreements between participating Parties, (2) preparing the preliminary design of the recommended recharge projects, (3) preparing the environmental documentation for the recommended recharge projects that will tier off the 2020 OBMP Update PEIR, (4) preparing a financial plan for constructing the recommended recharge projects, (5) preparing final designs of the recommended recharge projects, (6) acquiring necessary permits for constructing and operating the recommended recharge projects, and (7) constructing the recommended recharge projects.

*Future Tasks – Repeat Tasks 1 through 5 every five years as required by the Court*

## Cooperative Efforts with Appropriate Entities to Implement Activity A

The IEUA, Watermaster, the CBWCD, and the SBCFCD are partners in conducting recharge in the Chino Basin. The four agencies have an agreement to implement the existing recharge program. They also collaborate to update the recharge master plan at least every five years with the guidance of the Steering Committee. Activity A will be achieved within the existing RMPU process and will maintain the existing institutional organization as follows:

- ***Watermaster***: Leads the stakeholder process to define the objectives in Task 1, to develop the criteria in Task 2, and to estimate the recharge benefit of the projects using the its existing modeling tools in Task 4.
- ***IEUA***: Leads the development of the list of projects for evaluation in Task 3 and preparing cost opinions for the projects in Task 4. Additionally, the IEUA will collaborate with Watermaster in leading Tasks 1 and 2.
- ***CBWCD***: Collaborates with Watermaster in leading Tasks 1 and 2. The CBWCD is responsible for reviewing and permitting all of the engineering designs developed under Task 5 for their facilities.
- ***SBCFCD***: Collaborates with Watermaster in leading Tasks 1 and 2. The SBCFCD is responsible for reviewing and permitting all of the engineering designs developed under Task 5 for their facilities.

The four Parties will continue to collaborate in the RMPU process and in conducting recharge in the Chino Basin.

## Implementation Actions, Schedule, and Costs for Activity A

The recommended schedule to complete the scope of work described herein is described below:

**Year one (FY 2020/21):**

- Convene Steering Committee.
- Conduct a meeting regarding "current conditions" of groundwater recharge.
- Define objectives of Activity A and the RMP update (Task 1):
    - Define scope and schedule of RMP update.
- Develop criteria on how and where to conduct recharge (Task 2).
- Develop new criteria for evaluation and selection of recharge projects (Task 2).

**Year two (FY 2021/22):**

- Develop list of projects for evaluation (Task 3).
- Conduct a reconnaissance-level engineering study for the proposed projects (Task 4).

**Year three (FY 2022/23):**

- Select project(s) for implementation (Task 4).
- Prepare 2023 RMPU Report (Task 4).

**Year four (FY 2023/24):**

- Watermaster approves the 2023 RMPU Report by October 2023.
- Watermaster and the IEUA project implementation agreement. The objective of this agreement is to define the roles of Watermaster and the IEUA in the planning, permitting, design, and implementation of the projects, and the financing plan.

- SBCFCD and CBWCD Agreement. The Parties to this agreement include the SBCFCD, Watermaster, and the IEUA and potentially others. The objectives of this agreement are to define the terms and conditions to jointly explore and construct new conservation works on SBCFCD and IEUA properties and to conduct flood control and water conservation activities utilizing those same conservation works. The agreement will define the project sites, facility improvements, construction and maintenance cost allocations, user or license fees, operating criteria (with flood control purposes taking priority over conservation for joint use facilities), and other conditions. The SBCFCD will require Watermaster and the IEUA to fund SBCFCD engineering studies and analyses to demonstrate that all conservation improvements at flood control facilities will not negatively impact the operation and maintenance of SBCFCD facilities or reduce the level of the designed flood protection. All engineering studies and analyses shall be done and provided to SBCFCD for review and approval, and an encroachment permit shall be obtained from SBCFCD before the construction of any conservation improvements can commence. The SBCFCD will require that all applicable Environmental Agencies' permits and approvals be obtained and submitted to the SBCFCD before an encroachment permit can be issued.
- Agreement with property owners. Develop an agreement among a property owner, the IEUA, and Watermaster on the terms for use of land where land is required for a recharge project.
- In addition to these agreements, Watermaster will determine whether it is necessary to submit a Petition for Change with the State Board for selected projects that are not included in the Watermaster's current diversion permits. The duration of the Petition for Change process is unknown but would likely be more than one year.

**Years five and six (FY 2024/25 and FY 2025/2026):**

- Preliminary design of recommended projects. The level of design will be such that it enables the preparation of environmental documentation pursuant to CEQA, provides information for identifying and acquiring construction and related permits, and produces updated New Yield and cost estimates.
- Prepare environmental documentation for recommended projects. CEQA will cover the recommended projects at the project level and the deferred projects at a programmatic level, based on the project descriptions developed in Task 5. This documentation will tier off from the 2020 OBMP Update programmatic environmental impact report. Watermaster will conduct a MPI analysis in parallel with the CEQA process.
- Begin 2028 RMPU process (first year of the 2028 RMP update).

**Years seven and eight (FY 2026/27 and FY 2027/28):**

- Prepare Final Designs and Acquire Necessary Permits for the Selected Projects.

**Years nine and ten (FY 2028/29 and FY 2029/30):**

- Construct 2023 RMPU Selected Projects.

Exhibit A-9 shows the estimated budget-level engineering cost to complete Tasks 1 through 4, which is about $575,000. The cost of Task 5 cannot be estimated until the completion of Task 4. Exhibit A-9 also shows how Tasks 1 through 4 and their associated costs will be scheduled over the first three years of implementation. Note that because Watermaster and the IEUA are required to complete the RMPU at least every five years, the cost to perform the Activity A scope of work is not a new cost to the Parties.

## Activity B

### Description of Activity B

Activity B defined by the stakeholders is:

> *Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.*

The objective of Activity B is to develop and implement Storage and Recovery Programs in the Chino Basin that provide defined benefits to the Parties and the basin.

Through the listening session process, the stakeholders identified the following desired outcomes from Activity B:

- Storage and Recovery Programs that are optimized: to protect/enhance Safe Yield, to improve water quality, to avoid land subsidence, to ensure balance of recharge and discharge, and to maintain Hydraulic Control.
- Leverage unused storage space in the basin.
- Reduce reliance on imported water, especially during dry periods.
- Potentially provide opportunity for outside funding sources to implement the OBMP Update.

The Judgment recognized the existence of unused storage space within the Chino Basin that could be used by a person or a public entity to store water for subsequent beneficial use. The Judgment requires that the use of such storage capacity be undertaken only under Watermaster control and regulation to protect all stored water, to protect Safe Yield, and to avoid adverse impacts to groundwater pumpers. The Judgment prioritizes the use of storage space by the Parties over the use of storage space for the export of stored water.

The Peace Agreement defined a " Storage and Recovery Program" as the use of available storage capacity in the Chino Basin by any person to store supplemental water in the basin pursuant to a Groundwater Storage Agreement with Watermaster, including the right to export that water for use outside the basin.

Activity B has similar objectives and desired outcomes to those of PE 9 of the 2000 OBMP—*Develop and Implement Storage and Recovery Programs*. PE 9 was included in the 2000 OBMP to implement Storage and Recovery Programs to “benefit all Parties in the basin and ensure that basin waters and storage capacity are put to maximum beneficial use while causing no MPI to any producer or the basin.” The implementation plan for PE 9 was combined with PE 8—*Develop and Implement Groundwater Storage Management Program*—in the OBMP IP and Peace Agreement.

The OBMP IP included a storage management plan that allowed the Parties to utilize a 500,000 af band of storage space in the basin and requires them to mitigate adverse impacts from its use. In 2017, the IEUA adopted an addendum to the 2010 Peace II SEIR that provided a temporary increase in the useable storage space to 600,000 af through June 30, 2021. Pursuant to the OBMP IP, Watermaster shall: (1) prioritize its efforts to regulate and condition Storage and Recovery Programs for the mutual benefit of the Parties and (2) give first priority to proposed Storage and Recovery Programs that provide broad mutual benefits to the Parties.

In 2018, Watermaster conducted a *Storage Framework Investigation*,[11] where future projections of the use of storage were estimated and evaluated for potential MPI. The *Storage Framework Investigation* projected that MPI could occur due to the implementation of prospective Storage and Recovery Programs and described potential facilities and operating concepts that, if implemented, would minimize potential MPI. The *Storage Framework Investigation* is being used to inform the development of the *2020 Storage Management Plan*. The *2020 Storage Management Plan* is in preparation, and when completed, it will inform the development of future Storage and Recovery Programs.

### Need and Function of Activity B

Activity B describes the Parties' desires to implement "optimized" Storage and Recovery Programs that avoid potential MPI and provide benefits, such as:

- *Increased water-supply reliability*. Imported water is stored in the basin during times of imported-water surplus and can be recovered during times of water-supply shortage (e.g. prolonged drought, imported water shortages/outages, etc.) to supplement local supplies.
- *Protected or enhanced Safe Yield*. The operation of Storage and Recovery Programs needs to be implemented to minimize reductions in net recharge and potentially increase net recharge to the basin.
- *Improvements to water quality.* Recovery operations could be programmed to occur in areas of impaired water quality, thereby removing groundwater contaminants. This would require groundwater treatment facilities. Supplemental water recharge may provide a slight water quality improvement.
- *Reduced cost of OBMP implementation.* Leave behind water, revenue, credits, investment in facilities, external funding, or other contributions produced by a Storage and Recovery Program can be used to offset Watermaster assessments and provide other benefits.

Watermaster, the IEUA, and the Parties have tried to develop and implement Storage and Recovery Programs since the Peace Agreement came into effect in 2000. The first attempt included the issuance of a request for proposals, declaring that the Chino Basin was ready to develop Storage and Recovery Programs with water agencies outside the basin. Very few proposals were received, and the proposals that were submitted did not provide the benefits desired by the Parties.

Metropolitan developed a program called the Dry-Year Yield Program (DYYP) and offered it to its member agencies in the Metropolitan service area. As key feature of the DYYP, Metropolitan offered funding to construct and operate new facilities that would enable Metropolitan to store imported water in a groundwater basin and recover it when needed. In 2003, Metropolitan, the IEUA, Watermaster, and the TVMWD entered into an agreement to implement a 100,000 af DYYP in the Chino Basin that was consistent with the DYYP parameters required by Metropolitan. The DYYP is the only Storage and Recovery Program that has been implemented within the Chino Basin since 2000, and the DYYP agreement expires in 2028. As part of the DYYP, the Parties received compensation from Metropolitan for the construction and operation of numerous facilities across Chino Basin that are used for recovery operations during "take" cycles of the DYYP. The Parties can use these facilities for their own purposes at all other times. In 2010, Metropolitan, the IEUA, Watermaster, and the TVMWD began discussions to expand the DYYP to 150,000 af of storage but decided against expansion. The Parties have expressed that the DYYP presented an opportunity to fund certain capital improvement projects that added groundwater

[11] WEI. (2019). *Storage Framework Investigation – Final Report*. Prepared for the Chino Basin Watermaster. October 2018, revised January 2019.

pumping capacity; however, the anticipated long-term benefits, such as improved water-supply reliability through dry periods, were not sufficiently planned for and agreed upon during the development of DYYP and ultimately were not realized by the Parties.

Currently, there are two new efforts underway to develop Storage and Recovery Programs: (1) the Chino Basin Water Bank being developed by some of the Parties and the IEUA and (2) the Chino Basin Program (CBP) being led by the IEUA. The latter is in response to a $207 million conditional funding opportunity awarded to IEUA under Proposition 1 for the construction and operation of storage programs that create environmental benefits in the Sacramento-San Joaquin Delta, while providing local water quality benefits.

*Summary*

What is common to all past efforts to develop and implement Storage and Recovery Programs is the belief that Chino Basin storage is a valuable resource that can and should be leveraged to benefit the Parties. What was missing in past efforts was an initial effort to clearly articulate the objectives of the Parties and the required benefits to be realized from Storage and Recovery Programs.

Activity B should follow a more deliberate planning process that will enable the Parties and their storing partners to select and implement Storage and Recovery Programs that achieve the objectives of the Parties and the desired benefits. To do this, the planning process should answer the following questions:

(1) Why do the Parties want to conduct Storage and Recovery Programs? And, what are the Parties' objectives for Storage and Recovery Programs?

(2) What were the obstacles to implementing Storage and Recovery Programs in the past? How do we avoid or overcome them in the future?

(3) What are the benefits desired by the Parties? How can such benefits be quantified?

(4) What are the potential source waters for Storage and Recovery Programs in the Chino Basin? What is the availability and what are the volumes of these potential source waters?

(5) Who are the entities that would be interested in obtaining water from a Storage and Recovery Programs? How would they take delivery of the stored water?

(6) How could put and take operations be performed to match the availability of the source waters with the demand for the stored water and be consistent with the *2020 Storage Management Plan*?

(7) How can existing infrastructure be used to perform put and take operations? Are new facilities required? What are the capital and O&M costs associated with the use of existing and new facilities?

(8) What are the practical alternatives for implementing Storage and Recovery Programs?

(9) What institutional arrangements are necessary to implement Storage and Recovery Programs?

The Watermaster should convene a Storage and Recovery Program Committee for the purposes of answering these questions and ultimately developing and implementing a *Storage and Recovery Program Master Plan*. The *Storage and Recovery Program Master Plan* will enable the Parties and other potential storing partners: (1) to reference a common set of objectives for Storage and Recovery Programs and align the objectives with requirements in grant applications and other funding opportunities, (2) to assess the potential for implementing Storage and Recovery Programs in the Chino Basin at various scales, (3) to solicit interest in participation in Storage and Recovery Programs, and (4) to develop Storage and Recovery Programs that are consistent with the *2020 Storage Management Plan*.

## Scope of Work for Activity B

The scope of work to achieve the objectives of Activity B—*Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality*—is designed to answer the questions listed above and will consist of the following four tasks:

- Task 1 – Convene the Storage and Recovery Program Committee and articulate the program objectives
- Task 2 – Develop conceptual alternatives for Storage and Recovery Programs at various scales
- Task 3 – Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives
- Task 4 – Prepare *Storage and Recovery Program Master Plan*

Prior work has been performed for the *Storage Framework Investigation*, the Chino Basin Water Bank, and the Chino Basin Program. These past efforts can be leveraged after Watermaster completes Task 1. At the end of Task 4, Watermaster and the Parties will have a master plan for Storage and Recovery Programs, know what is reasonably possible, know what is a "stretch" program, and know how to subsequently implement the master plan.

The scope of work described below for Task 1 is a necessary first step. If the Parties cannot agree upon the objectives for Storage and Recovery Programs, Tasks 2 through 4 will not be executed. If the process moves beyond Task 1, the precise scope and level of effort required to perform Tasks 2 through 4 will greatly depend on the outcomes of Task 1. Tasks 2 through 4 are generally described below, but the cost to perform these tasks is not estimated herein. The precise scope of work for Tasks 2 through 4 will be developed in detail as part of Task 1.

*Task 1 – Convene the Storage and Recovery Program Committee, define objectives, and refine scope of work.* In this task, the Storage and Recovery Program Committee will be convened. The Committee's initial task is to obtain consensus on the objectives and desired benefits of Storage and Recovery Programs and, if consensus is achieved, scope the effort to prepare a *Storage and Recovery Program Master Plan*. To execute this task, the Committee will address the following questions:

(1) Why do the Parties want to conduct Storage and Recovery Programs and what should be their objectives?

(2) What were the obstacles to implementing Storage and Recovery Programs in the past, what are the current objectives, and how we can overcome them in the future?

(3) What are the benefits desired by the Parties and how should they be quantified?

Four Committee meetings will be conducted (1) to define the objectives and impediments, (2) to define a set of mutual benefits that are expected/required from Storage and Recovery Programs, and (3) to develop the preliminary scope, cost, and schedule for the work (Tasks 2 through 4 below) to develop the *Storage and Recovery Program Master Plan*.

*Task 2 – Develop conceptual alternatives for Storage and Recovery Programs at various scales.* The objective of this task is to describe a set of conceptual alternatives for Storage and Recovery Programs at various scales that will achieve the objectives defined in Task 1. The set of conceptual alternatives will be described and evaluated in greater detail in Task 3.

To execute this task, the Committee will address the following questions:

(4) What are the potential source waters for Storage and Recovery Programs in the Chino Basin? What is the availability and what are the volumes of these potential source waters?

(5) What entities are interested in obtaining water from a Storage and Recovery Program? How would they take delivery of the stored water?

(6) How could put and take operations be performed to match the availability of the source waters with the demand for the stored water and be consistent with the 2020 Storage Management Plan?

Five to six Committee meetings will be needed to answer these questions, describe various conceptual alternatives for Storage and Recovery Programs, and evaluate and select a set of these alternatives for further development, evaluation, and ranking in Task 3.

Work involved in this task will likely include: (1) collecting, compiling, and reviewing existing and new information; (2) identifying potential source waters for Storage and Recovery Programs in the Chino Basin; (3) characterizing the availability and volumes of these potential source waters; (4) identifying the entities that would be interested in obtaining water from a Storage and Recovery Programs; (5) characterizing how the entities would take delivery of the stored water; (6) identifying and characterizing institutional challenges to program implementation; (7) developing planning criteria to formulate and rank the conceptual Storage and Recovery Program alternatives; (8) describing several conceptual alternatives for Storage and Recovery Programs of various scales; and (9) selecting a set of alternatives for further development, evaluation, and ranking in Task 3.

Each alternative will describe, at a conceptual level, the operating parameters for put and take operations in the Chino Basin that match the available source waters with the demand for stored water. The alternatives must be consistent with the Watermaster's 2020 Storage Management Plan and the objectives for Storage and Recovery Programs defined in Task 1.

*Task 3 – Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives.* The objective of this task is to describe and evaluate reconnaissance-level facility plans, operational plans, and cost opinions to implement the various Storage and Recovery Program alternatives described in Task 2.

To execute this task, the Committee will need to answer the following questions:

(7) How can existing infrastructure be used to perform put and take operations? Are new facilities required? What are the capital and O&M costs associated with the use of existing and new facilities?

(8) What are the practical alternatives for implementing Storage and Recovery Programs?

Three to four Committee meetings will be needed to answer these questions and to describe, evaluate, and rank the various Storage and Recovery Program alternatives.

For each alternative, two sub-alternatives will be developed: one alternative that uses both existing and new facilities and one that is based only on new facilities. Potential implementation barriers will be described. Capital and O&M cost opinions will be prepared for each alternative, utilizing criteria developed in Task 2.

To characterize the performance of the Storage and Recovery Program alternatives: (1) the Watermaster's groundwater model will be utilized to estimate the physical response of the basin and to assess the potential for MPI, and (2) the benefits of the Storage and Recovery Program will be quantified and assessed. Each alternative will be ranked using this and any other criteria developed in Task 2.

*Task 4 – Prepare Storage and Recovery Program Master Plan.* The objective of this task is to prepare a *Storage and Recovery Program Master Plan* that will enable the Parties and other potential storing

partners: (1) to reference a common set of objectives for Storage and Recovery Programs and align the objectives with requirements in grant applications and other funding opportunities, (2) to assess the potential for implementing Storage and Recovery Programs in the Chino Basin at various scales, (3) to solicit interest in participation in Storage and Recovery Programs, and (4) to develop storage and recovery programs that are consistent with the *2020 Storage Management Plan*.

The plan will describe the results and recommendations of Tasks 1 through 3 and will include a discussion of the institutional arrangements required to implement Storage and Recovery Programs in the Chino Basin. Three to four Committee meetings will be needed (1) to finalize the discussion on what was learned in prior tasks, (2) to gain consensus on the recommendations, and (3) to review, revise, and finalize the *Storage and Recovery Program Master Plan*.

### Cooperative Efforts with Appropriate Entities to Implement Activity B

This is a basin-wide activity that involves the Parties, IEUA, TVMWD, and WMWD. Potential storing partners located outside of the Chino Basin will need to be consulted but need not participate on the Storage and Recovery Program Committee. Watermaster's role will be to convene the Storage and Recovery Program Committee, coordinate and administer its activities and meetings, and ensure that the recommendations derived from this effort are consistent with the Judgment, Peace Agreements and other agreements, the 2020 Storage Management Plan, and the Watermaster Rules and Regulations.

### Implementation Actions, Schedule, and Costs for Activity B

The recommended schedule to complete the scope of work described herein is described below:

**Year one:**

- Convene Storage and Recovery Program Committee and articulate the program objectives (Task 1).

**Year two:**

- Develop conceptual alternatives for Storage and Recovery Program s at various scales (Task 2).

**Year three:**

- Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives (Task 3).
- Prepare *Storage and Recovery Program Master Plan* (Task 4).

**Year four and thereafter:**

- Develop and implement Storage and Recovery Program with guidance and assistance from the *Storage and Recovery Program Master Plan*.
- Update the *Storage and Recovery Program Master Plan* as needed to be consistent with periodic updates to the Storage Management Plan.

Exhibit B-1 shows the estimated budget-level cost opinion to complete Task 1, which is about $105,000. The cost of Tasks 2 through 4 cannot be estimated until the completion of Task 1. Exhibit B-1 also shows how Tasks 1 through 4 will be scheduled over the first three years of implementation.

## Activity D

### Description of Activity D

Activity D defined by the stakeholders is:

> *Maximize the reuse of recycled water produced by IEUA and others.*

The objective of Activity D is to maximize the reuse of recycled water produced by the IEUA and other publicly owned treatment works (POTWs) in proximity to the Chino Basin to meet future demands and improve local water-supply reliability, especially during dry periods. Expanded reuse activities could include direct non-potable reuse (landscape irrigation or industrial uses), artificial recharge by spreading or injection (indirect potable reuse), and direct potable reuse. Increasing recycled water reuse is an integral part of the OBMP's goal to enhance water supplies, and, the Judgment states that Watermaster shall give high priority to maximizing the beneficial use of recycled water for replenishment purposes (Judgment ¶ 49(a)). The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses.

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activity D:

- Provide a new, reliable volume of in-lieu and/or wet water recharge that could:
  - Protect or enhance Safe Yield,
  - reduce dependence on imported water,
  - improve water-supply reliability, especially during dry periods, and
  - increase pumping capacity in areas of low groundwater levels and areas of subsidence concern.
- Provide for alternative sources of recycled water that can be used to satisfy the IEUA's requirement to discharge a minimum of 17,000 afy of water to the Santa Ana River pursuant to the Santa Ana River Judgment and associated agreements with the Western Municipal Water District (WMWD).

Activity D has similar objectives to those of PE 5 of the 2000 OBMP—*Develop and Implement Regional Supplemental Water Program*. Recognizing that growth in the Chino Basin was going to result in a more than 30 percent increase in then-current water demands, PE 5 was included in the 2000 OBMP to improve regional conveyance and availability of imported and recycled waters throughout the basin. Recycled water is more reliable than imported water, and using it in lieu of imported water improves the sustainability of Chino Basin and water supply reliability. The implementation plan for PE 5 was combined with PE 3—*Develop and Implement Water Supply Plan for the Impaired Areas of the Basin* in the OBMP and Peace Agreement.

The PE 3/PE 5 implementation action defined in the Peace Agreement related to recycled water reuse was for the IEUA to construct recycled water facilities to meet recycled water demands for direct use and for groundwater recharge. Since 2000, the IEUA has constructed and operated a recycled water conveyance system throughout the basin, enabling it to provide recycled water to its member agencies. Recycled water deliveries grew from about 3,400 afy in 2000 to about 34,000 afy in 2017 and have replaced a like amount of groundwater and imported water that would have otherwise been used for non-potable purposes.

The expansion of the recycled water reuse program was made possible—and economically feasible—through the SNMP activities performed pursuant to PE 7—*Develop and Implement Salt Management Plan*.

The SNMP, discussed as part of Activity K, will be an integral management tool to enable the maximization of recycled water reuse pursuant to Activity D.

## Need and Function of Activity D

### *History of Recycled Water Discharge and Reuse in the Chino Basin*

The IEUA owns and operates four wastewater treatment facilities: Regional Plant No. 1 (RP-1), Regional Plant No. 4 (RP-4), Regional Plant No. 5 (RP-5), and the Carbon Canyon Water Reclamation Facility (CCWRF). Recycled water produced by these plants is reused for direct uses, groundwater recharge, and discharged to Chino Creek or Cucamonga Creek, which are tributaries to the Santa Ana River. Exhibit D-1 shows the location of the IEUA's treatment plants, discharge points to surface water, recharge facilities receiving recycled water, and recycled water distribution pipelines for direct use deliveries. Historically, the IEUA's operating plan has prioritized the use of recycled water as follows: (1) to meet the IEUA's discharge obligation to the Santa Ana River (17,000 afy), (2) to meet direct reuse demands for recycled water, and (3) to recharge the remaining recycled water.

Exhibit D-2 shows the time history of the IEUA's annual discharges to the Santa Ana River since FY 1977/78. The increase in recycled water discharges from 20,000 afy in FY 1977/78 to about 60,000 afy by FY 1996/97 is illustrative of the population growth in the Chino Basin over this period. Although recycled water had been reused since the 1970s, the growth of IEUA's recycled water reuse programs started in 1997. Total recycled water discharge remained at 60,000 afy through 2005 after which it declined as a result of OBMP implementation. Specifically, the incorporation of Watermaster and the IEUA's maximum benefit SNMP into the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) in 2004, triggered the ability to rapidly increase recycled water reuse. Since 2014, recycled water discharge has been less than 20,000 afy and has averaged about 18,600 afy over the last five years.

Exhibit D-3 characterizes the total reuse of recycled water for direct use and recharge in the Chino Basin from FY 1996/97 through FY 2017/18. When the OBMP was completed in 2000, the IEUA was recharging about 500 afy of recycled water and utilizing about 3,200 afy for non-potable direct uses. Recycled water reuse peaked at about 38,200 af in FY 2013/14. Total recycled water reuse in the Chino Basin declined about 5,600 to 32,700 af in FY 2017/18.

Direct Reuse. Recycled water from the IEUA's facilities is reused directly for: irrigation of crops, animal pastures, freeway landscape, parks, schools, and golf courses; commercial laundry and car washes; outdoor cleaning and construction; toilet plumbing; and industrial processes. The direct use of recycled water increased from about 3,500 af in FY 1999/00 to about 24,600 af in FY 2013/2014 and has since declined to about 19,400 af as of FY 2017/18. The recent decline is due to the mindful reduction in use by the City of Chino to accommodate changes in IEUA policy related to the use of recycled water base entitlements and conversions of land from agricultural to urban uses. Exhibit D-4 is a map of IEUA's recycled water deliveries for direct use in FY 2017/18.

Recharge. In 2005, the IEUA initiated its recycled water recharge program and recycled water has since become an important component of annual recharge to the Chino Basin. In FY 2017/18, recycled water recharge was 13,200 af and has averaged about 13,000 afy over the past five years. The locations of the recharge facilities receiving recycled water are shown in Exhibit D-4.

### *Recycled Water Reuse Projections and the Availability of Additional Recycled Water for Reuse*

The IEUA is continuing to expand its recycled-water distribution system and recharge facilities throughout the Chino Basin for direct non-potable uses and recharge. Growth is still occurring in the Chino Basin and will result in additional wastewater flows to the IEUA's treatment plants. Much of this supply will be used

to meet increasing non-potable demands as the currently remaining agricultural land uses convert to urban uses. The increasing demand for recycled water reuse will constrain the IEUA's ability to continue to use recycled water to meet its discharge obligations pursuant to the Santa Ana River Judgment.

Projected Recycled Water Supplies and Demands. Exhibit D-5 shows the IEUA's latest projections of recycled water production, expressed as a range (low and high) and projections of direct reuse and recharge through 2040.[12] Also shown in Exhibit D-5 is the calculation of surplus supply available for expanded reuse and/or discharge. Under the "high" recycled water production projections, there is sufficient surplus supply to meet the Santa Ana River discharge obligations and expand recycled water reuse. Under the "low" recycled water production projections, there is insufficient supply to meet the Santa Ana River discharge obligations through at least 2025, suggesting that the IEUA may need to find supplemental supplies to meet both recycled water demands and its discharge obligations.

Supplemental recycled water supply. In addition to the recycled water available from the IEUA, other nearby POTWs are not currently reusing recycled water and may have surplus recycled water that could be acquired and conveyed to the Chino Basin. The surplus recycled water from these POTWs could be utilized to increase reuse in the Chino Basin if it is economical to convey the water to the desired end uses or used to meet discharge obligations. The nearby POTWs with potential surplus supply include the Pomona Water Reclamation Facility (WRF), the Western Riverside County Regional Wastewater Authority (WRCRWA), the City of Rialto, RIX, and the City of Riverside. The locations of these facilities are shown in Exhibit D-1. Currently, the availability of recycled water from these or other POTWs is not precisely known.

Capacity for Expanded Recycled Water Recharge at Existing Facilities. As described for Activity A, Watermaster and the IEUA operate a set of recharge facilities in the Chino Basin to conduct storm, recycled, and imported water recharge. The IEUA and Watermaster prioritize[13] the use of these facilities as follows: (1) maximize stormwater capture and recharge, (2) meet Watermaster's replenishment and recharge obligations as required by the Judgment and Peace Agreements, and (3) recharge other supplemental water for groundwater storage and management. Exhibit D-6 shows the theoretical maximum supplemental water recharge capacity[14] that can be used for recycled water recharge, subject to Watermaster's priority need for recharge and replenishment.[15] The table also shows actual FY 2017/18 recycled water recharge (13,200 af) and planned recycled water recharge for FY 2019/20 through FY 2029/30.[16] As the table shows, the planned volume of recycled water recharge of 16,400 af is less than one-half of the theoretical maximum supplemental water recharge capacity. This suggests that there is sufficient capacity to recharge future surplus recycled water supply that will not be used for direct non-potable uses, subject to Watermaster's need for recharge and replenishment and the ability to comply with the dilution requirements defined in Watermaster and the IEUA's maximum benefit SNMP.

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[12] These projections are based on information published by the IEUA to support the development of the Chino Basin Program: *Sources of Water Supply for the Chino Basin Program.* Memo to Member Agencies. February 20, 2019. These projections differ slightly from the latest water supply planning projections published in Watermaster's *Storage Framework Investigation* and the *2018 RMPU*, both of which were published in 2018.

[13] Note that the primary goal of multipurpose facilities is to attenuate flood peak discharge.

[14] There are two estimates of theoretical supplemental water recharge capacity. The first is corresponds to the 10-month period directly after a cleaning. The second corresponds to continuous use between maintenance periods and is less than the recharge capacity that would occur if the recharge basins are used less frequently.

[15] WEI, (2019). *2018 Recharge Master Plan Update*. Prepared for the Chino Basin Watermaster. September 2018.

[16] The projection cited here is based on the recycled water projection included in the 2018 RMPU, which was published before the CBP planning memo projection of 18,700 afy.

*Considerations and Challenges for Maximizing Recycled Water Reuse*

There are various factors that should be considered in determining how to maximize the reuse of recycled water produced by the IEUA and other POTWs. These are summarized as follows.

Existing Planning Efforts. The IEUA is currently performing planning efforts for the CBP, which is a large Storage and Recovery Program to provide for regional, dry-year water supplies and associated infrastructure. The CBP was conditionally awarded approximately $207 million of Proposition 1 Water Storage Investment Program funding. Over its 25-year project life, the CBP would increase recycled water recharge in the Chino Basin by 15,000 afy, and during dry years, the water in storage would subsequently be recovered and pumped into Metropolitan's system for use in Southern California in lieu of imported water from the State Water Project. The planned sources of recycled water for the CBP are currently being evaluated by the IEUA, but it is certain additional supplies beyond those produced by the IEUA will be needed. The CBP is still undergoing planning and evaluation, and its implementation is not certain. Regardless of whether the CBP is implemented, the significant body of work being led by the IEUA together with regional agencies can be leveraged to accomplish Activity D.

Timing of Recycled Water Availability. A common challenge with maximizing recycled water reuse is the mismatch in the timing of non-potable water demands and recycled water supply availability. It will be important to characterize in detail the seasonality of outdoor water demands and availability of recharge capacity given that surplus recycled water may only be available in winter months when outdoor demand is low and recharge capacity is otherwise being utilized for stormwater recharge. These relationships will also vary based on climate conditions (wet versus dry periods). Fully maximizing recycled water supplies will require an understanding of these complex relationships to optimize the design and operation of projects. Fully maximizing recycled water reuse may require storage facilities.

Salt and Nutrient Management. Watermaster and the IEUA have an existing maximum benefit SNMP that enables the reuse and recharge of IEUA recycled water in the Chino Basin (refer to Activity K for more details). This SNMP, which is incorporated into the Basin Plan for the Santa Ana Region, did not contemplate the use of non-IEUA sources of recycled water in the Chino Basin. Some of the available recycled water sources have TDS and/or nitrate concentrations that are numerically higher than those of IEUA's current or permitted TDS and nitrate limits, which could impact compliance with the SNMP or trigger additional mitigation measures to protect beneficial uses. Detailed water quality projections would be required to demonstrate the impacts of reuse of non-IEUA sources of recycled water in the Chino Basin. The existing SNMP contains provisions for mitigation at such time that the TDS and/or nitrate concentration of recycled water or groundwater exceeds the regulatory limits defined in the Basin Plan.

Water Quality. Water quality regulations are constantly evolving as new contaminants of potential concern are identified and studied. In recent years, the presence of pharmaceutical and personal care products (PPCPs) in recycled water has been an area of focused research to determine potential health impacts that could result from reuse of recycled water for recharge in groundwater basins. A new set of emerging contaminants of concern is a group of chemicals known as poly- and per-fluorinated compounds (PFAS). PFAS are known to be present in recycled water, and any new regulatory standards for PFAS in drinking water could impact the ability to reuse recycled water without treatment (see discussion in Activity EF for additional details on PFAS).

Direct Potable Reuse (DPR). The direct potable reuse of recycled water, although only currently being done at a very limited pilot scale in California, is emerging as a potential future municipal water supply. The State Board has released a framework for regulating DPR through reservoir and raw water augmentation, but regulatory criteria for DPR projects will not be adopted for many years. The State Board will prioritize developing regulations for reservoir augmentation and will follow with raw water augmentation in the

future after more research is completed to determine the criteria necessary to ensure protection of public health. DPR will require advanced treatment of any recycled water source used.

Santa Ana River Judgment. Historically the IEUA has used recycled water to meet its obligations under the Santa Ana River Judgment. As demand for recycled water increases, the IEUA will have to rely on other sources of water to meet this obligation. If the IEUA were able to obtain access to additional water supplies (recycled or other supplemental), alternative plans should be evaluated to optimize which sources are used to ensure that the IEUA meets its annual discharge volume and water quality requirements pursuant to the Judgment.

*Summary*

The process to achieve the objective of Activity D to maximize the reuse of recycled water produced by IEUA and others should include: (1) a characterization of the availability of all recycled water supplies, (2) a characterization of the direct recycled water demands of the Parties, (3) identification of project opportunities and the planning and screening criteria to evaluate them, and (4) development of reconnaissance-level engineering design and operating plans. This information could then be used to evaluate, prioritize, and select projects for implementation. To optimize the expansion of recycled water reuse, the Parties should convene a Recycled Water Projects Committee for the purposes of evaluating project opportunities and developing a plan to implement them. The Committee could be comprised of representatives from all interested stakeholders and could be led by IEUA, Watermaster, and/or others. The scope of work to implement such a process is described below.

## Scope of Work for Activity D

The scope of work to achieve the objectives of Activity D—*Maximize the reuse of recycled water produced by IEUA and others*—consists of six tasks:

- Task 1 – Convene Recycled Water Projects Committee, define objectives and refine scope of work
- Task 2 – Characterize the availability of all recycled water supplies and demands
- Task 3 – Develop planning, screening, and evaluation criteria
- Task 4 – Describe recycled water reuse project opportunities
- Task 5 – Develop reconnaissance-level engineering design and operating plan
- Task 6 – Plan, design, and construct selected recycled water projects

The IEUA already performs various efforts to characterize recycled water supply and demand within its service area, including the periodic update of its Integrated Resources Plan (IRP). And, as previously noted, the IEUA is performing a significant amount of work to evaluate opportunities to acquire surplus recycled water supplies for recharge as part of the CBP, and this work could be leveraged to reduce the effort required to implement the scope of work for Activity D.

*Task 1 – Convene Recycled Water Projects Committee, define objectives and refine scope of work.* In this task, a Recycled Water Projects Committee will be convened. The Committee's initial tasks are (1) to obtain consensus on the objectives for maximizing recycled water reuse, (2) to refine the preliminary scope of work defined in the 2020 OBMP Update (Tasks 2-7 below), and (3) to update the schedule and cost to perform the work. Two Committee meetings will be conducted to accomplish these tasks.

*Task 2 – Characterize the availability of all recycled water supplies and demands.* The objectives of this task are: (1) to characterize the future water demands of the Parties to estimate the IEUA's recycled water production, (2) to prepare updated projections of the direct recycled water reuse demands of the Parties, (3) to identify other available sources of recycled water, (4) to characterize the use and potential availability of each recycled water supply (IEUA and others), and (5) to identify the institutional and

physical challenges for acquiring each source of surplus supply. The recycled water availability and direct reuse demands will be characterized on a monthly basis for various climate conditions to enable the characterization of potential storage needs to fully maximize recycled water reuse. One meeting will be conducted to review the characterization of recycled water availability.

*Task 3 – Develop planning, screening, and evaluation criteria.* The objective of this task is to develop the criteria that will be used to evaluate recycled water reuse projects in Tasks 4 and 5. The types of criteria developed to evaluate potential projects will include:

- Watermaster criteria that include no potential MPI, balance of recharge and discharge; and others;
- regulatory criteria that include compliance with salt and nutrient management plans, DDW regulations, and others;
- qualitative criteria that include institutional complexity, reliability of non-IEUA recycled water sources, overall water supply reliability and others; and
- quantitative criteria that include business case evaluations expressed as net present value, unit cost, and others.

Two meetings will be conducted to review and refine the criteria with the Recycled Water Projects Committee.

*Task 4 – Describe recycled water reuse project opportunities.* The objectives of this task include identifying potential recycled water project alternatives, screening them using the criteria developed in Task 3, and selecting a set of projects for detailed evaluation. Three meetings will be conducted to develop the list of potential projects that can be implemented, to review the screening of the projects, and to select the projects to evaluate in Task 5.

*Task 5 – Develop reconnaissance-level engineering design and operating plan.* The objective of this task is to characterize the performance and costs of new recycled water projects for reuse, individually and as a group/system. A reconnaissance-level engineering design and operating plan will be developed for each project. Each project design will include the approximate size, location, and alignment of major recycled water utilities, and will describe any potential implementation barriers for the project. A cost opinion will be determined for each project. This task includes evaluating projects based on the criteria developed in Task 2 and recommending a set of projects for implementation. The deliverable of this task will be a technical report that summarizes the work performed under Tasks 1 through 4, and it will include an implementation plan as well as a plan to finance the preliminary design and CEQA documentation. Five meetings will be conducted to review the design and estimated benefit of the projects; review the evaluation of the projects, based on the criteria developed in Task 2, and review the recommended list of projects for implementation; review the implementation plan; and review the technical report.

*Task 6 – Plan, design, and construct selected recycled water projects.* The objective of this task is to implement the recommendations of the technical report. This task includes (1) developing and implementing necessary agreements between participating Parties, (2) preparing the preliminary design of the recommended projects, (3) preparing the environmental documentation for the recommended projects that will tier-off the 2020 OBMP Update PEIR, (4) preparing a financial plan for constructing the recommended projects, (5) preparing final designs of the recommended projects, (6) acquiring necessary permits for constructing and operating the recommended projects, and (7) constructing the recommended projects.

*Task 7 – Periodically re-evaluate availability of recycled water supplies for reuse.* As agencies update water supply and demand projections, project economics change, and other changes occur in the Basin, the

ability to maximize the reuse of recycled water may also change. As such, Task 2 should be updated periodically. A first step in this task would be to scope out a process to periodically update the characterization of recycled water supply and demands. Following each future assessment, the Recycled Water Projects Committee would determine the need to perform the steps in Tasks 3 through 6 again.

### Cooperative Efforts with Appropriate Entities to Implement Activity D

This is a basin-wide activity that involves the Parties in the IEUA, TVMWD, and WMWD service areas. Given its current efforts, the IEUA would be the logical entity to lead the implementation of Activity D on behalf of all Parties in these service areas, but the process could be led by others. In this role, the agency leading the project on behalf of the Parties would: convene the Recycled Water Projects Committee, characterize recycled water demands, identify additional recycled water supplies and conduct discussions with the owners of those supplies, and contract for planning and engineering services as required. Watermaster's role would be to work with project lead, on the implementation of Activity D (1) to review and evaluate the basin management implications of the recycled water projects, including but not limited to compliance with the maximum benefit SNMP and (2) to ensure that its implementation is consistent with the Judgment, Peace Agreements and other agreements, and the Watermaster Rules and Regulations.

### Implementation Actions, Schedule, and Costs for Activity D

The recommended schedule to complete the scope of work described herein is described below:

**Year one:**

- Convene Recycled Water Projects Committee and refine scope of work, schedule and budget (Task 1).
- Characterize the availability of all recycled water supplies (Task 2).
- Develop planning, screening, and evaluation criteria for recycled water projects (Task 3).
- Conduct five committee meetings to review and refine the work products of Tasks 1 through 3.

**Year two:**

- Develop list of recycled water projects for evaluation (Task 4).
- Begin reconnaissance-level engineering study for the proposed projects (Task 5).
- Conduct four workshops to review and refine work products of Tasks 4 and 5.

**Year three:**

- Complete reconnaissance-level engineering study for the proposed projects (Task 5).
- Select project(s) for implementation.
- Prepare final report documenting work performed in Tasks 1 through 5.

**Years four through six:**

- Watermaster, the IEUA, and other potential partners develop a project implementation agreement. The objective of this agreement is to define the roles of each partner in the planning, permitting, design, and implementation of the projects, and the cost allocations.
- Preliminary design of recommended projects. The level of design will be such that it enables the preparation of environmental documentation pursuant to CEQA, provides information for identifying and acquiring construction and related permits, and produces an updated recycled water capacity benefit.

- Prepare environmental documentation for projects. CEQA will cover the recommended projects at the project level and the deferred projects at a programmatic level (PEIR), based on the project descriptions developed in Task 5. This documentation will tier-off from the 2020 OBMP Update PEIR. Watermaster will conduct an MPI analysis in parallel with the CEQA process.

**Years seven and eight:**

- Prepare final designs and acquire necessary permits for the selected projects.

**Years nine and beyond:**

- Construct selected Projects.

Exhibit D-7 shows the estimated budget-level engineering cost to complete Tasks 1 through 5, which is about $620,000. The cost of Tasks 6 and 7 cannot be estimated until the completion of Task 5. Exhibit D-7 also shows how Tasks 1 through 5 and their associated costs will be scheduled over the first three years of implementation.

As previously discussed, because the IEUA performs various efforts to estimate the recycled water supply and demands of its member agencies and is currently developing estimates of recycled water availability in the region and developing a list of project concepts for recycled water reuse as part of the CBP, the cost to perform Activity D may be lower than estimated herein.

## Activity EF

### Description of Activity EF

Activities E and F defined by the stakeholders are both are intended to address impediments to groundwater management that are related to groundwater quality, specifically contaminants of emerging concern. Activity E of the OBMP Update is:

> *Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses.*

Activity F of the OBMP Update is:

> *Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality.*

The objective of the management plan envisioned for Activity E is to collect and analyze the data and information needed to characterize and proactively plan for the water quality challenges to pumping groundwater for municipal supply in a constantly evolving regulatory environment. The objective of Activity F is to evaluate the treatment and related infrastructure improvements, including the potential for multi-benefit collaborative projects, that can be implemented to ensure groundwater can be pumped for beneficial use as new drinking water regulations are adopted by the State Board's Division of Drinking Water (DDW[17]).

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activities E and F:

- Proactively address challenges and solutions to comply with new and potential future drinking water regulations.
- Enable the Parties to make informed decisions on infrastructure improvements for water-quality management and regulatory compliance.
- Remove groundwater contaminants from the Chino Basin and thereby improve groundwater quality.
- Enable the Parties to produce or leverage their water rights that may be constrained by water quality.
- Ensure that groundwater is pumped and thereby protect/enhance Safe Yield.

The 2000 OBMP included multiple PEs to protect and enhance water quality. PE 6—*Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management*—was included to assess water quality trends in the basin, to evaluate the impact of OBMP implementation on water quality, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water quality regulators to identify and facilitate the cleanup of soil and groundwater contamination. PE 7—*Develop and Implement Salt Management Plan*—was included to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. PE 3—*Develop and Implement a Water Supply Plan for Impaired Areas*—provided for the construction and operation of regional groundwater desalters, the Chino Basin Desalters (Desalters), to pump and treat high-salinity

[17] The DDW regulates public drinking water systems in California; prior to June 2014 it was the California Department of Public Health which was formally known as the Department of Health Services. All references to the actions of DDW herein include its predecessors.

groundwater in the southern part of the basin to maintain and enhance Safe Yield and meet increasing municipal water demands. The 2000 OBMP also recognized that the Desalters would intercept VOC contaminants associated with the Chino Airport and South Archibald plumes and that the Desalters could be used in the future to treat these contaminants (at some additional cost).

Since 2000, under PE 6, Watermaster has assessed groundwater quality in the Chino Basin using data compiled through their own monitoring activities and the efforts of other cooperating entities, reported on the water quality trends and findings, and collaborated with the Regional Board in its efforts to work with dischargers to facilitate the cleanup of groundwater contamination. Watermaster formed the Water Quality Committee to coordinate many of these activities. The Water Quality Committee convened from 2003 through 2010 and reported on its findings, work products, and recommendations to the Watermaster Pools, Advisory Committee, and Board. Since 2009, Watermaster has continued to perform ad-hoc monitoring for contaminants of emerging concern at its monitoring wells and some private agricultural wells and prepares annual or more frequent reports on the status of monitoring and remediation of point-source contamination sites. The opportunities to use the Desalters to assist in the remediation of the Chino Airport and South Archibald plumes envisioned in the 2000 OBMP IP are coming to fruition.

The objectives of Activity E and PE 6 are similar in that they address the management of groundwater quality contaminants from point and non-point sources that threaten the use of groundwater for drinking water supply. Activity E is a refinement on PE 6 in that it seeks a more proactive and basin-wide approach to address contaminants of emerging concern to better prepare the Parties for addressing compliance with new and increasingly stringent drinking water regulations defined by the DDW.

The objective of Activity F is similar to PE 3 in that it seeks to evaluate the feasibility of regional solutions for the treatment of impaired areas that can provide multiple benefits in the management of the basin to achieve the goals of the OBMP. The areas and contaminants that need to and can be addressed with regional, multi-benefit solutions can be determined as part of the process to develop and implement the groundwater quality management plan envisioned in Activity E.

The scope of work defined herein for developing and implementing a *Groundwater Quality Management Plan* will address both Activities E and F and, when implemented, will provide information that will enable municipal water agencies to make informed decisions on how to manage groundwater quality for beneficial uses. The scope of the *Groundwater Quality Management Plan* does not address salinity, which is managed separately under Watermaster and IEUA maximum benefit SNMP.

### Need and Function of Activity EF

Throughout most of the Chino Basin, there are contaminants in groundwater that can limit its direct use for drinking water supply if treatment is not implemented. Drinking water is regulated by the DDW. The enforceable drinking water standards to protect the public from potential negative health effects are Primary Maximum Contaminant Levels (MCLs) set by the DDW. Water supplies that exceed MCLs cannot be used for drinking water without treatment (blending is the most common treatment). In addition, the DDW sets Notification Levels (NLs), which are health-based advisory levels for potential contaminants of concern that do not have MCLs established. The level at which DDW recommends removal of a drinking water source from service is called the "Response Level," where the Response Level ranges between ten to 100 times the NL, depending on the toxicological endpoint that is the basis for establishing the NL. Since the 1980s, the DDW has established NLs for 93 contaminants, 40 of which now have MCLs.

Since the implementation of the 2000 OBMP, the DDW has adopted new Primary MCLs that have changed or restricted how and where groundwater is pumped by municipal water agencies. As laboratory

analytical technologies to detect contaminants in water advance over time, it can be expected that new contaminants of concern will be identified, and some will ultimately become regulated. In response, municipal water agencies will need to construct treatment facilities or implement changes in existing pumping operations to address the newly regulated contaminants. With each new regulation there are increasing constraints on existing water supply infrastructure that can limit a Parties' ability to pump their groundwater rights and stored water and conflict with other basin management issues that include, but are not limited to, groundwater recharge, maintaining Safe Yield, and maintaining Hydraulic Control.

### *Occurrence of Contaminants in the Chino Basin*

Exhibit EF-1 summarizes the occurrence of drinking water contaminants with a Primary MCL in groundwater pumped from active municipal supply wells in the Chino Basin for the five-year period of 2014 to 2018. For this discussion, "active municipal supply wells" includes the 141 municipal supply wells that pumped groundwater anytime within the two-year period of 2017 to 2018. For comparison, this table also summarizes the number of wells with exceedances of the MCL for: all existing municipal supply wells whether they are recently active or not and all existing wells in the basin, including private agricultural, non-agricultural, municipal supply, and monitoring wells, whether they are recently active or not. The three most common contaminants that exceed a primary MCL in the Chino Basin at active municipal supply wells are nitrate (71 wells), 1,2,3-trichloropropane (1,2,3-TCP) (33 wells), and perchlorate (27 wells).

Exhibit EF-2 shows the locations of active municipal supply wells and symbolizes them based on the number of regulated drinking water contaminants that have been detected in exceedance of their respective primary MCLs. Of the 141 recently active municipal supply wells, 45 have at least one drinking water contaminant, 17 wells have two contaminants, 14 have three contaminants, five have four contaminants, and five have five contaminants. The wells with regulated drinking water contaminants are primarily located in the southern (south of the 60 freeway) and western (west of Euclid Avenue) areas of the Basin. Exhibits EF-3, EF-4, and EF-5 show the spatial distribution of the maximum observed nitrate, 1,2,3-TCP, and perchlorate concentrations at all wells in the Chino Basin for the five-year period of 2014 to 2018.

The occurrence of 1,2,3-TCP in nearly 25 percent of active municipal supply wells is noteworthy. The MCL for 1,2,3-TCP is 0.005 micrograms per liter (µgl), which is 5 parts per trillion (ppt). This is the lowest numerical value for a MCL established to date in the State of California. And, unlike past newly adopted MCLs, the MCL for 1,2,3-TCP became immediately effective upon its adoption in December 2017. As a result, municipal water agencies were immediately required to either cease using active wells that pump groundwater with 1,2,3-TCP concentrations in excess of the new MCL or implement treatment (typically blending) to ensure their water supplies have a 1,2,3-TCP concentration below the MCL. Prior to 2018, municipal water supplies were not routinely tested for 1,2,3-TCP even though there was an existing NL for 1,2,3-TCP of 0.005 µgl. And, when testing occurred it was not always done using the lowest available detection limit that was equal to the NL. For this reason, upon adoption of the MCL, the DDW also required municipal water agencies to perform quarterly compliance monitoring in 2018 using laboratory detection limits low enough to test for concentrations equivalent to the MCL of 0.005 µgl. Exhibit EF-4 includes the quarterly monitoring results from 2018 and represents the most comprehensive characterization of the occurrence of 1,2,3-TCP in the Chino Basin to date. The wells producing groundwater with 1,2,3-TCP concentrations equal to or greater than the MCL are primarily located in the western half of the Basin. The following agencies have had to shut down supply wells or modify operations as a result of the new MCL: the City of Chino Hills, CDA, City of Chino, City of Pomona, Monte Vista Water District (MVWD), and JCSD.

Exhibit EF-6 summarizes the occurrence of drinking water contaminants with a California NL in groundwater pumped from active municipal supply wells in the Chino Basin for the five-year period of 2014 to 2018. For comparison, this table also summarizes the number of wells with exceedances of the NLs for: all existing municipal supply wells whether recently active or not and all existing wells in the basin, including private agricultural, non-agricultural, municipal supply, and monitoring wells whether they are recently active or not. Exhibit EF-7 shows the location of the active municipal supply wells and symbolizes them based on the number of contaminants that have been detected in exceedance of a NL. Of the 141 recently active municipal supply wells, only two wells show an exceedance of an NL for one contaminant: groundwater sampled from both wells exceed the NL for 1,4-dioxane. It is likely there are more occurrences of NL exceedances for 1,4- dioxane and other contaminants in the Chino Basin, but because the DDW does not require monitoring for contaminants with an NL and/or testing is not performed using analytical methods with the numerically lowest detection limits that are equal to or lower than the NLs, the potential impact to the Parties posed by the adoption of MCLs based on existing NLs cannot be characterized.

### *Readiness to Address Future Drinking Water Regulations*

Since the implementation of the 2000 OBMP, the DDW has adopted three new Primary MCLs that have impacted municipal water agencies the Chino Basin, including perchlorate, hexavalent chromium, and 1,2,3-TCP. And, as demonstrated by the newest MCL for 1,2,3-TCP, the timeline for complying with new drinking water quality regulations is becoming more restrictive. To prepare for the challenges of complying with potential future MCLs, it will be increasingly important for municipal supply agencies to understand which emerging contaminants of concern are candidates for regulation, potential regulatory limits, and the occurrence of those contaminants in local and regional water supplies. Tracking emerging contaminants that are being considered for regulation and performing monitoring to characterize their occurrence in the Chino Basin will help to identify and plan for optimal solutions to manage groundwater quality for drinking water supply.

Since 2000, under PE 6, Watermaster has assessed groundwater quality in the Chino Basin using data compiled through its own monitoring activities and the efforts of other cooperating entities, and has reported on the water quality trends and findings related to regulated contaminants and contaminants of emerging concern in its biannual State of the Basin reports. For the municipal water agencies, monitoring groundwater for emerging contaminants is, for the most part, a voluntary activity. There are periodic monitoring requirements under the Federal Environmental Protection Agency's (EPA) Unregulated Contaminant Monitoring Rule (UCMR), which is implemented to collect occurrence data for selected contaminants of emerging concern that have documented potential public health effects. Monitoring under the UCMR program is performed every five years and the results are used, in part, to support determinations of whether or not to regulate a contaminant in drinking water to protect public health. For each UCMR cycle, the EPA defines the municipal water agencies that must perform monitoring and the analytical methods and detection limits that should be used for each contaminant on the UCMR list. Generally, the UCMR does not require municipal water agencies to test all of their water supply sources and, as to groundwater, may only require a subset of wells be sampled. And, the UCMR does not always require the use of analytical methods with the numerically lowest detection limits, which in some cases means that analysis is done using detection limits for reporting (DLR) that are above potential regulatory limits, as was the case for UCMR monitoring of 1,2,3-TCP. Once a UCMR monitoring event is over, no additional requirements for testing for the contaminants of emerging concern are required. In the State of California, the monitoring of unregulated contaminants with established NLs is recommended but not required. And as with UCMR monitoring, the use of analytical methods with the numerically lowest detection limits are often not used. Because monitoring for unregulated contaminants is voluntary and

there are various analytical methods used, it is generally difficult to characterize the basin-wide occurrence of contaminants of emerging concern.

The occurrence of three contaminants in the Chino Basin that are subject to revised or new drinking water regulations are discussed below.

*Perchlorate and Hexavalent Chromium*

Currently, in the State of California, there are two drinking water contaminants with primary MCLs that are well characterized in the Chino Basin that are undergoing review and consideration by the DDW for an MCL revision: perchlorate and hexavalent chromium.

Perchlorate. As previously described, perchlorate is one of the top three drinking water contaminants in the Chino Basin. An MCL of 6 µgl was established in 2007. In 2015, the Office of Environmental Health Hazard Assessment (OEHHA) revised the Public Health Goal (PHG[18]) for perchlorate from 6 µgl to 1 µgl, based on new scientific literature that indicates possible health effects to infants from exposure to perchlorate in drinking water. This revision prompted the DDW to review the current MCL and determine if it should be lowered to a value closer to the revised PHG. To support its review and decision, the DDW has recommended that the required DLR for analysis of municipal drinking water supplies be lowered from the current DLR of 4 µgl to equal to or less than 1 µgl and occurrence data be collected across the state.

Exhibit EF-8 shows the spatial distribution of the maximum observed perchlorate concentration for all wells in the Chino Basin for the five-year period of 2014 through 2018 along with the locations of the 141 active municipal supply wells. Exhibit EF-8 differs from Exhibit EF-5 in that the symbology of the perchlorate concentration at wells is based on the PHG of 1 µgl and not the MCL of 6 µgl. Exhibit EF-8 also indicates which of the wells in the basin characterized as having "non-detect" concentrations have not been tested using detection limits that are less than or equal to the PHG of 1 µgl (DLR = 4 µgl). Most of the wells that have not been tested at the lower DLR are private wells south of the 60 freeway. Exhibit EF-8 shows that 95 percent of the of the detectable concentrations of perchlorate in the basin are above the PHG of 1 µgl and that perchlorate is prevalent throughout the entire Chino Basin. As such, compliance with the drinking water standard could require treatment facilities across most of the Chino Basin if the MCL is lowered from 6 µgl.

Hexavalent Chromium. The PHG for hexavalent chromium is 0.02 µgl. In 2014, the DDW established an MCL of 10 µgl, which was subsequently challenged in court. In 2017, the Superior Court of Sacramento County issued a judgment invalidating the Primary MCL for drinking water because the DDW failed to properly consider the economic feasibility of complying with it. The court ordered the DDW to conduct an economic evaluation and establish and adopt a new MCL, which could be the same or different from the prior and now invalidated MCL of 10 µgl. Exhibit EF-9 shows the spatial distribution of the maximum observed hexavalent chromium concentration for all wells in the Chino Basin for the five-year period of 2014 through 2018. The symbology of the observed hexavalent chromium concentrations is based on the prior MCL of 10 µgl. Seven percent of all wells sampled have a concentration above 10 µgl: 127 of the 141 active municipal supply wells have a detectable concentration of hexavalent chromium, and nine of the 141 active municipal wells exceeded 10 µgl. Hexavalent chromium is not a widespread compliance issue

[18] A PHG is the level of a chemical contaminant in drinking water that does not pose a significant risk to health. PHGs are not regulatory standards, but State of California law requires the DDW to set MCLs for a contaminant as close as technologically and economically possible to the PHG.

based on the old 10 µgl MCL, but compliance could be problematic in the future if the DDW establishes a new MCL less than 10 µgl.

Poly- and Per-fluorinated Compounds. An example of emerging contaminants that were part of the UCMR and are currently receiving notable regulatory attention on both State and Federal levels include two PFAS compounds: — perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). In 2009, the EPA published provisional Health Advisory Levels (HAL) for PFOA and PFOS of 400 nanograms per liter (ngl) and 200 ngl, respectively (or 400 and 200 parts per trillion [ppt]). The 2012 UCMR 3 contaminant monitoring list included six PFAS, including PFOA and PFOS. The required DLRs for PFOA and PFOS were 20 and 40 ngl, respectively. In 2016, following the UCMR 3 monitoring, the EPA significantly lowered the HAL for PFOA and PFOS to a combined 70 ngl, a 90 percent reduction. And, in 2018, the DDW established NLs for PFOA and PFOS of 14 and 13 ngl, respectively. That same year, laboratory methods with detection limits numerically less than these NLs became available. As part of the NL guidelines, the DDW established an interim Response Level of 70 ngl for PFOA and PFOS combined, consistent with the EPA's interim HAL. If the DDW recommends that the water source be removed from service or that treatment be implemented to get levels below the Response Level. The PFOA and PFOS Response Level is five times the NL for one of them individually; this is more stringent than other Response Levels established by the DDW, which as previously noted are typically ten to 100 times the NL.

Exhibit EF-10 shows the occurrence of PFOA and PFOS in groundwater and some blending sources for the recycled water recharge in the Chino Basin as of March 2019, based on all monitoring performed since 1998. The exhibit shows that the majority of wells in the Chino Basin have not been sampled for PFOA and/or PFOS. The 30 wells in the Chino Basin that have been sampled for PFOA and PFOS were tested during UCMR 3 using the laboratory detection limits of 20 and 40 ngl, which are higher than the current NLs. Monitoring of recycled water recharge blending sources shows that many of the sources sampled have detectable concentrations of PFOA and PFOS, and some are above the NLs. The EPA and the DDW have both indicated that they are moving forward with the process to adopt MCLs for PFOA and PFOS in the near future. The occurrence of PFOA and PFOS in Chino Basin groundwater as of March 2019 is not well characterized at concentrations equivalent to or below the current NLs, and there are recharge water sources with concentrations of PFOA and PFOS above the NLs. Widespread monitoring for PFOA and PFOS using lower-detection limit laboratory methods is necessary to understand the occurrence of PFOA and PFOS in the basin in order to plan for compliance with potential new drinking water regulations.

### *Basin Management and Water Rights Implications of More Stringent Water Quality Regulations*

To maintain yield and limit losses to the Santa Ana River, the Chino Basin is managed as hydrologically closed: the primary discharge of groundwater from the Chino Basin is groundwater pumping. Maintaining Hydraulic Control in this way is also a requirement of the maximum benefit SNMP. Operating the Chino Basin as a closed system contributes to the accumulation of salts, nutrients, and other contaminants in groundwater, which are primarily removed by groundwater pumping. The constantly evolving regulatory environment described above threatens the ability of the Parties to pump groundwater, and some Parties are not or will not be able to pump their groundwater rights due to the presence of contaminants and the lack of treatment facilities to comply with drinking water quality standards.

As is currently occurring in response to the immediate enforcement of the new MCL for 1,2,3-TCP, it is likely that the initial response actions for compliance with new MCLs will be to shut-down pumping at wells with concentrations that exceed the MCL until a treatment plan is developed and implemented, which for some agencies could take years. Prolonged reductions in groundwater pumping due to groundwater contamination have the effect of reducing Safe Yield and potentially contributing to the loss of Hydraulic Control and the spread of contamination. Therefore, it will become increasingly necessary to

pump and treat groundwater to comply with drinking water standards and maintain Safe Yield and Hydraulic Control of the Chino Basin.

With the exception of the Desalters, groundwater treatment facilities in the Chino Basin have been constructed and operated by individual municipal water supply agencies, and the construction and operations and maintenance costs are borne by the agency alone. There is potential for cost savings and other benefits to basin management, such as protecting Safe Yield, and maintaining Hydraulic Control, if regional groundwater treatment and conveyance systems are implemented to address groundwater contamination.

### *Summary*

In order to achieve the objectives of Activities E and F to effectively plan for compliance with future water quality regulations, a *Groundwater Quality Management Plan* should be developed (1) to continually track the UCMR monitoring program, DDW regulatory activities, and others to stay informed of which groundwater contaminants are potential candidates for future MCLs; (2) to implement a long-term basin-wide monitoring plan—including protocols for the use of consistent laboratory methods by all agencies—to collect data on the occurrence of the contaminants of emerging concern; (3) to periodically characterize the potential for compliance challenges on a basin-wide scale; and (4) to develop and evaluate individual and regional compliance solutions to address these challenges. Such a process will enable the Parties to prioritize the most cost-effective compliance solutions that provide for multiple benefits in achieving the goals of the OBMP. The *Groundwater Quality Management Plan* could be developed and implemented by reconvening the Water Quality Committee. The scope of work to develop the *Groundwater Quality Management Plan* is described below.

## Scope of Work for Activity EF

The scope of work to develop and implement a *Groundwater Quality Management Plan* consistent with the objectives of Activity EF consists of eight tasks.

- Task 1 – Convene the Water Quality Committee, define objectives, and refine scope of work
- Task 2 – Develop and implement an initial emerging-contaminants monitoring plan
- Task 3 – Perform a water quality assessment and prepare a scope to develop and implement a Groundwater Quality Management Plan
- Task 4 – Develop planning, screening, and evaluation criteria
- Task 5 – Identify and describe potential projects for evaluation
- Task 6 – Conduct a reconnaissance-level study for the proposed projects
- Task 7 – Prepare the *Groundwater Quality Management Plan*
- Task 8 – Plan, design, and build water quality management projects

Task 1 will develop the administrative and stakeholder process and refine the objectives and scope for developing the *Groundwater Quality Management Plan*. Tasks 2 and 3 will include an initial monitoring program and the characterization of current water quality conditions to determine the appropriate long-term monitoring and assessment program and to support the development and implementation of the groundwater quality management plan. Tasks 4 through 8 contain the efforts to fully develop and implement a groundwater quality management plan. The precise scope and level of effort required to perform Tasks 4 through 8 will greatly depend on the assessment in Task 3. At present, there is not enough information to fully scope out these later tasks. The activities for Tasks 4 through 8 are generally described below, but the cost estimate to perform these tasks is not estimated herein. For completeness, a scoping effort to perform Tasks 4 through 7 will be included as a work-product of Task 3. The scoping effort for Task 8 cannot be completed until Task 7 is completed.

*Task 1 – Convene the Water Quality Committee, define objectives, and refine scope of work.* The objective of this task is to reestablish the Water Quality Committee, which will be comprised of representatives from all interested stakeholders for the purposes of developing and implementing a groundwater quality management plan. The Committee will precisely articulate the objectives of a groundwater quality management plan and refine the scope of work described below in Tasks 2 and 3 to develop and implement an initial monitoring plan, to perform an assessment of the current water quality condition, and to scope the remaining tasks to develop a groundwater quality management plan. After the scope of work has been refined, the cost and implementation schedule will be updated. Four Committee meetings will be conducted to obtain consensus on the objectives and scope of work.

*Task 2 – Develop and implement an initial emerging-contaminants monitoring plan.* The objective of this task is to develop a monitoring plan to support the initial assessment of water quality conditions related to contaminants of emerging concern in the Chino Basin. The intent is to conduct monitoring using consistent laboratory methods and detection limits at all wells (including those sampled by Watermaster and municipal water agencies) and to use methods with detection limits that are capable of quantifying concentrations at levels equal to relevant regulatory criteria such as PHGs, NLs, or MCLs.

The initial emerging contaminants monitoring plan will include: a list of wells to be sampled, the list of contaminants to analyze, and a quality assurance project plan (QAPP) that defines the monitoring procedures, quality assurance and quality control (QAQC) protocols for data collection and review, and other requirements. The list of wells will include all municipal supply wells and all monitoring and private wells that are in the capture zone of the municipal supply wells. The QAPP will ensure that Watermaster and each municipal water agency that tests its own wells will collect and analyze samples in a consistent manner. The monitoring plan may include the collection and analysis of groundwater in adjacent groundwater basins that are tributary to the Chino Basin and other sources of recharge to the groundwater basin. At a minimum, the initial emerging contaminants monitoring plan should consist of a one-time sampling event at each well identified in the plan. Two Committee meetings will be conducted to obtain consensus on the scope, cost, and schedule to perform the initial monitoring.

Once consensus is achieved, the initial emerging contaminants monitoring plan will be executed by Watermaster and all participating agencies at the selected wells. The labor and laboratory costs to conduct the initial monitoring at municipal wells will be incurred by the well owners. The labor and laboratory cost to conduct the initial monitoring at monitoring wells or private wells in the capture zone of municipal supply wells will be incurred by Watermaster.[19] All monitoring data will be collected, processed, reviewed for QA/QC, and uploaded to a centralized database maintained by Watermaster for the Chino Basin. The Committee will use the data collected for the initial emerging contaminants monitoring plan, along with other groundwater quality data collected and maintained by Watermaster for the basin-wide groundwater quality monitoring program, to perform the initial water quality assessment in Task 3.

*Task 3 – Perform a water quality assessment and prepare a scope to develop and implement a Groundwater Quality Management Plan.* The objectives of this task are to prepare a comprehensive assessment of current water quality conditions related to contaminants of emerging concern in the Chino Basin and perform a scoping effort to develop and implement a groundwater quality management plan. Task 3 will begin once the initial emerging contaminants monitoring plan developed in Task 2 has been completed.

The water quality assessment will characterize:

[19] This scope of work assumes 40 monitoring and private wells will be sampled by Watermaster.

- basin-wide concentrations of constituents analyzed pursuant to the initial emerging contaminants monitoring plan;
- current and foreseeable challenges to pumping groundwater for municipal supply based on the results of initial monitoring and other data;
- actions currently being implemented by the Parties to mitigate and/or adapt to current or foreseeable water quality challenges; and
- areas where there are no actions being implemented or planned to mitigate and/or adapt to current or foreseeable water quality challenges.

The water quality assessment will support the scoping effort (1) to implement a long-term monitoring and assessment program and (2) to complete the *Groundwater Quality Management Plan* (e.g. perform Tasks 4 through 7 to identify, evaluate, and select projects to address groundwater quality).

The long-term monitoring and assessment program should be adaptive and include a process to update it at a selected frequency and/or when triggered, based on the needs of the Water Quality Committee, observed trends in water quality, or new or potential regulations.

The deliverable of this task will be a technical report that documents the initial monitoring program, the basin-wide characterization of water quality, the recommended scope of work, schedule and cost to implement a long-term monitoring and assessment program, and the scope of work, schedule, and cost to complete the groundwater quality management plan (Tasks 4 through 7). Four Committee meetings will be conducted to complete the work necessary for Task 3.

*Task 4 – Develop planning, screening, and evaluation criteria.* The objectives of this task are to develop criteria to evaluate water quality improvement projects. The types of criteria developed to evaluate potential projects in Task 4 will include:

- Watermaster criteria that include no potential MPI, balance of recharge and discharge, and others;
- regulatory criteria that include compliance with DDW regulations and others;
- qualitative criteria that include institutional complexity, overall water supply reliability, and others; and
- quantitative criteria that include business case evaluations expressed as net present value, unit cost, and others.

*Task 5 – Identify and describe potential projects for evaluation.* The objectives of this task are to identify groundwater quality treatment projects using existing and new facilities, to screen them using the criteria developed in Task 4, and to select a final list of projects for detailed evaluation in Task 6. The list of potential projects should include concepts using existing infrastructure and new infrastructure, solutions for individual agencies, and collaborative solutions.

*Task 6 – Conduct a reconnaissance-level study for the proposed projects.* The objective of this task is to characterize the performance and the groundwater treatment projects selected for evaluation in Task 5, individually and as a group/system. A reconnaissance-level engineering design and operating plan will be developed for each project. Each project design will include the approximate location, target contaminants, treated volumes, and conveyance systems, and will describe any potential implementation barriers. A cost opinion will be determined for each project. The cost opinion will include a comparison of the cost to implement treatment projects by individual municipal agencies to those of collaborative projects. This task will include a recommended set of projects for implementation, based on the criteria developed under Task 4. The final deliverable of this task will be an implementation plan that includes a

schedule and plan to finance preliminary design and CEQA documentation of the projects selected for implementation.

*Task 7 – Prepare the Groundwater Quality Management Plan.* The objective of this task is to prepare the *Groundwater Quality Management Plan*, which will document the most current water quality assessment, the long-term monitoring and analysis plan, the reconnaissance-level engineering design plan, the selected projects for implementation, and an implementation plan. New regulatory requirements and the compliance challenges that result can occur at random, so the groundwater quality management plan should include a strategy to trigger an update to address pending or newly adopted regulations. Water quality results reported out of the long-term monitoring and assessment program could also trigger the need to update the management plan. The implementation plan will include a process to initiate the development and implementation of an update to the *Groundwater Quality Management Plan*.

*Task 8 – Plan, design, and build water quality management projects.* The objective of this task is to implement the recommended projects in the *Groundwater Quality Management Plan*. This task includes (1) developing and implementing necessary agreements between participating Parties, (2) preparing preliminary designs of the recommended projects, (3) preparing the environmental documentation for the recommended projects (this will tier-off from the 2020 OBMP Update PEIR), (4) preparing financial plans to construct the recommended projects, (5) preparing final designs of the recommended projects, (6) acquiring necessary permits for constructing and operating the recommended projects, and (7) constructing the recommended projects.

### Cooperative Efforts with Appropriate Entities to Implement Activity EF

Watermaster and the IEUA will collaborate to support the development of the *Groundwater Quality Management Plan*. Based on the scope of work described above, the following is a description of the recommended roles of each agency:

- ***Watermaster.*** Convenes the Water Quality Committee, leads the stakeholder process to define the initial emerging contaminants monitoring plan, performs monitoring at Watermaster monitoring wells and private wells pursuant to the initial and long-term monitoring plans, collects and maintains the data collected by the municipal agencies and other stakeholders as part of the initial and long-term monitoring plans, performs water quality assessments of the Chino Basin, and prepares the final groundwater quality management plan.
- ***IEUA.*** Leads stakeholders in the process of identifying and describing potential projects, conducting a reconnaissance-level engineering study for the proposed projects, and project implementation.

### Implementation Actions, Schedule, and Costs for Activity EF

The recommended schedule to complete the scope of work described herein is described below:

**Year one:**

- Convene the Water Quality Committee, define objectives, and refine scope of work for Tasks 2 and 3 (Task 1).
- Develop initial emerging contaminants monitoring plan (Task 2).

**Year two:**

- Implement initial emerging contaminants monitoring plan (Task 2).
- Begin preparing the water quality assessment of the Chino Basin (Task 3).

**Year three:**

- Complete the water quality assessment of the Chino Basin, recommendations for a long-term monitoring and assessment program, and the scoping effort for Tasks 4 through 7 (Task 3).

**Year four:**

- Implement long-term monitoring and assessment program (continues every year thereafter, subject to periodic modifications).
- Develop planning, screening, and evaluation criteria to review potential projects (Task 4).
- Identify and describe potential projects for evaluation (Task 5).
- Begin the reconnaissance-level study of selected projects (Task 6).

**Year five:**

- Complete the reconnaissance-level study of selected projects (Task 6).
- Select project/s for implementation (Task 6).
- Begin to prepare the *Groundwater Quality Management Plan* (Task 7).
- Conduct the long-term monitoring and assessment plan as defined in Task 3.

**Years six and seven:**

- Complete the final *Groundwater Quality Management Plan* (Task 7).
- Prepare necessary agreements to implement selected projects.
- Prepare preliminary design reports for the recommended projects. The level of design will be such that it enables the preparation of environmental documentation pursuant to CEQA, provides information for identifying and acquiring construction and related permits, and produces updated cost estimates (Task 8).
- Conduct the long-term monitoring and assessment plan as defined in Task 3.

**Years eight to ten:**

- Prepare final designs and acquire necessary permits for the selected projects (Task 8).
- Construct selected projects.
- Conduct the long-term monitoring and assessment plan as defined in Task 3.

Exhibit EF-11 shows the estimated budget-level engineering cost to complete Tasks 1 through 3, which is about $295,000. The cost of Tasks 4 through 7 cannot be estimated until the completion of Task 3, and the cost of Task 8 cannot be estimated until the completion of Task 7. Exhibit EF-11 also shows how Tasks 1 through 3 and their associated costs will be scheduled over the first three years of implementation.

## Activity CG

### Description of Activity CG

Activities C and G, defined by the stakeholders, are both intended to address the need for infrastructure to optimize the use of water supplies. Activity C defined by the stakeholders is:

> *Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.*

Activity G defined by the stakeholders is:

> *Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.*

The two activities were combined into Activity CG.

The Parties have identified that there are basin management challenges, such as land subsidence and poor water quality, that could limit the ability to fully exercise their pumping rights using existing infrastructure. The intent of Activity CG is to optimize the use of all sources of water available to the Parties to meet their demands despite these basin management challenges and potentially help to mitigate them.

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activity CG:

- Enable producers with infrastructure in MZ1 and MZ2 to obtain water through regional conveyance, which supports the management of groundwater levels to reduce the potential for land subsidence and ground fissuring.
- Enable the Parties to increase pumping in areas currently constrained by poor water quality.
- Remove groundwater contaminants from the Chino Basin and thereby improve water quality.
- Protect and/or enhance Safe Yield.
- Maximize the use of existing infrastructure, which will minimize investments in new facilities.
- Provide infrastructure that can also be used to implement Storage and Recovery Programs.

Activity CG has similar objectives to those of PE 5 of the 2000 OBMP – *Develop and Implement Regional Supplemental Water Program*. Recognizing that growth in the Chino Basin was going to result in a more than 30 percent increase in then-current water demands, PE 5 was included in the 2000 OBMP to improve regional conveyance and the availability of imported and recycled waters throughout the basin. The implementation plan for PE 5 was combined with PE 3 – *Develop and Implement Water Supply Plan for the Impaired Areas of the Basin* in the OBMP and Peace Agreement.

Early in the development of the PE 3/5 implementation plan, the stakeholders discussed the development of a regional water facilities plan that, when implemented, would enable the Parties to maximize the use of imported water in years when Metropolitan has surplus water and to be able to rely completely on local supplies during years when Metropolitan supplies are low or completely interrupted due to planned or catastrophic outages. This plan involved the construction of new wells and groundwater treatment and regional conveyance improvements; the water produced in this plan would be used exclusively by the Parties. The stakeholders ultimately did not include this plan in the 2000 OBMP IP, preferring at that time to focus on expanding groundwater desalting in the lower Chino Basin, increasing stormwater recharge, and implementing a large-scale recycled water program to maximize its reuse.

The IEUA and its member agencies are currently preparing the *2020 Integrated Water Resources Plan* (IRP), which will serve as a regional implementation strategy for long-term water resources management

within IEUA's service area. The objective of the IRP is to ensure that the IEUA's water supplies over the next 25 years are reliable, cost-effective, and environmentally responsible. The 2020 IRP is in development, and there is a significant body of engineering planning being performed that can be leveraged to accomplish the objectives of Activity CG for all Chino Basin Parties.

## Need and Function of Activity CG

In addition to Chino Basin groundwater, the sources of water available to the Parties include:

- Imported water purchased from Metropolitan (through the IEUA and TVMWD) and the San Bernardino Valley Municipal Water District (Valley District).
- Non-Chino Basin groundwater from adjacent groundwater basins, including the Six, Spadra, Cucamonga, Rialto, Lytle, and Riverside Basins.
- Local surface water from San Antonio, Cucamonga, Day, Etiwanda, East Canyon, and Lytle Creeks, and some tunnels and springs located in the San Gabriel Mountains.
- Recycled water from the IEUA and the Los Angeles Sanitation District.

Watermaster periodically compiles the Parties' future water supply plans. The data collected as part of that process represent the Parties' best estimates of their demands and associated water supply plans. The most recent effort by Watermaster to characterize the water supply plans was during the development of the *Storage Framework Investigation.*[20,21] Exhibit CG-1 shows the historical (2015) and projected aggregate water demand and supply plan for all Parties. Total water demand is projected to grow from about 290,000 afy in 2015 to about 420,000 afy by 2040, and increase of about 130,000 afy. The projected growth in water demand by the Appropriative Pool Parties drives the increase in aggregate water demand as some Appropriative Pool Parties are projected to serve new urban water demands created by the conversion of agricultural and vacant land uses to urban uses. Chino Basin groundwater and imported water together make up about 70 percent of the aggregate water supplies of the Parties.

Each of the water sources shown in Exhibit CG-1 has its limitations; they are described below.

### *Chino Basin groundwater and basin management issues*

Chino Basin groundwater is the largest source of supply used to meet the demands of the Watermaster Parties. Exhibit CG-1 shows that Chino Basin groundwater makes up about 40 to 50 percent of the total aggregate supply. Groundwater pumping was about 147,000 afy in 2015 and is projected to increase to about 177,000 afy by 2040, an increase of about 30,000 afy. The ability to produce groundwater from the Chino Basin is limited by current basin management issues, such as ongoing land subsidence in MZ1 and parts of MZ2, pumping sustainability issues in the JCSD and CDA well field areas, and water quality.

*Land subsidence.* One of the earliest indications of land subsidence in the Chino Basin was the appearance of ground fissures within the City of Chino in MZ1. These fissures appeared as early as 1973, but an accelerated occurrence of ground fissuring ensued after 1991 and resulted in damage to existing infrastructure. The OBMP IP called for a management plan to reduce or abate the subsidence and fissuring problems to the extent that it may be caused by pumping in MZ1. Watermaster has been conducting land

[20] The water demand and supply plans developed in 2017 were based in part on 2015 Urban Water Management Plans and updated to 2017 conditions. The Storage Framework Investigation can be found on Watermaster's website. This document is available on Watermaster's FTP site at http://www.cbwm.org/

[21] Watermaster is currently compiling future water supply plans for the Safe Yield Recalculation.

subsidence investigations in the Chino Basin since September 2000 to implement PE 4 of the OBMP IP.[22] The results of the investigations have indicated that the potential occurrence of pumping-induced land subsidence and ground fissuring is confined to MZ1 and MZ2. Watermaster has defined five specific Areas of Subsidence Concern within MZ1 and MZ2: the Managed Area, Northwest MZ1, Central MZ1, the Northeast Area, and the Southeast Area. Exhibit CG-2 shows the locations of the Areas of Subsidence Concern and recent measurements of land subsidence from 2011 to 2019.

For the Managed Area, Watermaster utilized the results of the land subsidence investigations to develop and implement a Subsidence Management Plan (SMP)[23] to minimize the potential for future subsidence and ground fissuring. The SMP established a specific groundwater level at a monitoring well in the Managed Area (the "Guidance Level" at well PA-7 at the Ayala Park Extensometer facility) and recommended that the pumpers with wells in the Managed Area manage their groundwater production such that the groundwater levels at PA-7 remain above the Guidance Level. The main pumpers in the Managed Area are the City of Chino Hills, City of Chino, and State of California. They have voluntarily managed their pumping as recommended in the SMP, and as a result, the rate of land subsidence has declined to de minimis levels within the Managed Area.

Exhibit CG-2 shows that the maximum rate of recent land subsidence from 2011-2019 has occurred in Northwest MZ1. Of particular concern is that the subsidence in Northwest MZ1 has occurred in a pattern of concentrated differential subsidence across the San Jose Fault—the same pattern of differential subsidence that occurred in the Managed Area during the time of ground fissuring in the 1990s. Ground fissuring is the main subsidence-related threat to infrastructure. Exhibit CG-2 also shows the occurrence of subsidence across broad areas in Central MZ1 and the Northeast Area during 2011-2019. Watermaster is monitoring and investigating the relationships between pumping, recharge, groundwater levels and land subsidence in Northwest MZ1, and investigating pumping and recharge strategies to minimize or abate the occurrence of the differential land subsidence. These efforts are being implemented pursuant to the *Work Plan to Develop a Subsidence-Management Plan for the Northwest MZ-1 Area*,[24] which is an appendix to the SMP.

The main groundwater producers in Northwest MZ1, Central MZ1, and the Northeast Area are the City of Pomona, the MVWD, Golden State Water Company (GSWC), the City of Chino, and the City of Ontario. Interim work performed in Northwest MZ1 to support the development of a subsidence management plan for this area suggests that land subsidence could be reduced or abated if recharge in Northwest MZ1 is increased by at least 20,000 afy, pumping is decreased by at least 20,000 afy, or some combination of both totaling about 20,000 afy.[25] Exhibit CG-3 is a time-series chart of groundwater pumping, wet-water recharge, and land subsidence (represented as negative vertical ground motion) in Northwest MZ1 from

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[2] Detailed information on Watermaster's land subsidence investigations, the causes of subsidence and ground fissuring, Watermaster's subsidence management plan for the so-called "Managed Area" in the City of Chino, annual monitoring reports, and ongoing investigations to develop a subsidence management plan for Northwest MZ1 can be found on Watermaster's website at: http://www.cbwm.org/

[23] Chino Basin Watermaster. 2015. *Chino Basin Subsidence Management Plan*. July 2015. This document is available on Watermaster's FTP site at http://www.cbwm.org/

[24] Chino Basin Watermaster. 2015. *Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area*. This document is available on Watermaster's FTP site at http://www.cbwm.org/

[25] Chino Basin Watermaster. 2017. *Task 3 and Task 4 of the Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area: Development and Evaluation of Baseline and Initial Subsidence-Management Alternatives*.

1978-2019. Recent pumping in Northwest MZ1 has decreased significantly: 2017-2019 pumping averaged about 12,000 afy compared to about 19,000 afy since the implementation of the OBMP (2001-2016), a reduction of about 7,000 afy. The reduced pumping is mainly due to water quality issues. Additionally, recent wet-water recharge in Northwest MZ1 has increased: 2017-2019 recharge averaged about 15,000 afy compared to about 9,000 afy since the implementation of the OBMP (2001-2016), an increase of about 6,000 afy. Exhibit CG-3 shows that these recent decreases in pumping and increases in recharge, totaling about 13,000 afy, appear to coincide with reduced rates of land subsidence in Northwest MZ1. This suggests that reduced pumping and/or increased recharge can abate land subsidence in Northwest MZ1. If the subsidence management plan for the Northwest MZ1 area recommends a combination of reduced pumping and wet-water recharge to minimize and abate the ongoing land subsidence, the pumpers in this area who elect to reduce pumping in accordance with the plan may have difficulty in fully utilizing their water rights with existing infrastructure.

Pursuant to the Peace Agreement, new land subsidence is considered MPI and would require mitigation. New land subsidence refers to additional land subsidence caused by the reduction of pressure head in the coarse-grain sediments to levels lower than historical lows. Through the Watermaster's recent *Storage Framework Investigation*, a groundwater-elevation metric was defined as a minimum threshold for the occurrence of new land subsidence in MZ1.[26] Based on the modeling results of the *Storage Framework Investigation*, new land subsidence is not projected to occur through 2050 in MZ1 under Scenario 1A, which is based on the Parties' best estimates of how future supplies would be used to meet demands. However, the investigation is limited to new land subsidence and does not address ongoing land subsidence in Northwest MZ1.

*Pumping sustainability.* The term *pumping sustainability*, as used herein, refers specifically to the ability to pump water from a specific well at a desired pumping rate, given the groundwater level at that well and its specific well construction and equipment details. The pumping sustainability metrics for all Appropriator wells were recently updated as part of the *Storage Framework Investigation*. Groundwater pumping at a well is presumed to be sustainable if the groundwater level at that well is greater than the sustainability metric. If the groundwater level falls below the sustainability metric, the owner will either need to lower the pumping equipment in their well or reduce the well's pumping rate. Groundwater levels at wells in the JCSD and CDA well fields and a part of the FWC service area are currently below the pumping sustainability metric and therefore have limited pumping capacity. Exhibit CG-4 shows the projected difference between the groundwater levels and the pumping sustainability metric in FY 2030 for Scenario 1A. Groundwater levels in Scenario 1A are projected to be above the pumping sustainability metric in 2030 over the entire basin except for the areas with existing pumping sustainability issues, identified by the red circles in Exhibit CG-4. This suggests that projected basin operations will not improve nor exacerbate pumping sustainability issues that currently exist in these areas and that the JCSD and CDA well fields and one well in the FWC service area will continue to have limitations on pumping due to groundwater levels.

*Water quality.* As described for Activity EF, throughout most of the Chino Basin, there are contaminants in groundwater that can limit its direct use for drinking water supply in the absence of treatment. The constantly evolving regulatory environment described under Activity EF, threatens the ability of the

[26] The metric is based on historical groundwater levels and is represented as a groundwater level control surface throughout MZ1 that defines the likelihood of initiating new subsidence: if groundwater levels are higher than the metric, then new land subsidence would not occur; if groundwater levels fall below the metric, then new land subsidence could occur and cause MPI.

Parties to pump groundwater. Some Parties are not, or will not be, able to pump their groundwater rights due to the presence of contaminants and the lack of treatment facilities to comply with drinking water standards. For example, the regulatory-required response action for compliance with the new MCL for 1,2,3-TCP is to shut-down pumping at wells with concentrations that exceed the MCL until a treatment plan is implemented.

Exhibit EF-2 shows the locations of active municipal supply wells, symbolized by the number of regulated drinking water contaminants that have been detected in exceedance of their respective primary MCLs. A subset of these wells is currently offline due to these exceedances. According to the interim results from Based on the 2020 IRP, the Parties in the IEUA service area that are impacted by water quality such that some of their production capacity is offline or requires blending are the Cities of Chino, Chino Hills, Upland, and Ontario; the CVWD; the MWVD; and Fontana Water Company. Based on Exhibit EF-2, other Parties that are impacted by water quality and have wells with one or more constituents that exceed an MCL are the City of Pomona, GSWC, JCSD, and Marygold Mutual Water Company. As new drinking water regulations come into effect, additional wells and/or Parties will be impacted if there is no plan to address the contaminants.

*Imported water.*

Imported water is projected to account for about 20 to 30 percent of the aggregate water supplies of the Parties, as shown in Exhibit CG-1. Imported water demand was about 63,000 afy in 2015 and is projected to increase to about 120,000 afy by 2040, an increase of about 58,000 af. The challenges to imported water include reliability of its supply and infrastructure and the local capacity to treat it for municipal supply.

*Supply reliability.* In January 2016, Metropolitan completed its *2015 Integrated Resources Plan Update* (2015 IRP)[27], which reported that, if the plan is fully implemented, shortages of imported water supplies will occur about nine percent of the time under 2020 conditions, four percent of the time under 2025 conditions, and zero percent under 2030 conditions. "Shortage" is defined herein as Metropolitan's inability to fully meet its demands. If Metropolitan does not fully implement its 2015 IRP, shortages in Metropolitan supplies are projected to occur about 12 percent of the time under 2020 conditions, and the occurrence of a shortage is projected to increase to 80 percent under 2040 conditions. Therefore, by 2040, Metropolitan is assumed to be able to fully meet its demands 90 percent of the time (nine out of ten years) with the full implementation of its 2015 IRP and 20 percent of the time (one out five years) without it. As of this writing, the implementation of some projects identified in the 2015 IRP, such as the California WaterFix tunnel project, are uncertain. Failure to fully implement the 2015 IRP in a timely manner will result in less imported water available to the Parties.

*Infrastructure reliability.* Metropolitan is planning to rehabilitate the Rialto Feeder pipeline, and according to its draft schedule, construction will occur from 2029 to 2033. During construction, continuous six- to nine-month shutdowns are planned to occur. Because the Rialto Feeder pipeline is the main source of imported water deliveries to the IEUA and TVMWD, long-term shutdowns will cause significant reductions in water supplies to the Parties and will require them to rely more heavily on Chino Basin groundwater or other supplies during this period.

In addition to planned infrastructure shutdowns, catastrophic events, such as earthquakes, can cause unplanned outages. Metropolitan recently published its three primary goals to contribute to seismic

[27] Metropolitan. (2016). *Integrated Water Resources Plan: 2015 Update*. January 2016.

resilience: (1) conducting a Rialto Feeder pipeline alternative supply needs study, (2) completing a re-evaluation of its emergency storage needs, and (3) completing a comprehensive evaluation of its storage programs.[28] According to Metropolitan, the latest projections for the worst case scenario under a seismic catastrophic event suggest that the Metropolitan's East Branch of the SWP, which includes the Rialto Feeder pipeline, can be repaired within 12 to 24 months. This means, that under such an event, the Parties would be required to find alternative sources of water to meet 20 to 30 percent of their total demands for up to two consecutive years.

*Capacity limitations.* The capacity to treat imported water to meet future municipal supply demands is limited for some Parties in the Chino Basin. The Water Facilities Authority (WFA) treats imported water purchased from the IEUA at the Agua de Lejos treatment plant (WFA plant) and delivers it to the Cities of Chino, Chino Hills, Ontario, and Upland, and the MVWD. Each of these WFA member agencies has a contracted share of the plant's total capacity of 81 million gallons per day (mgd), which is equivalent to 90,700 afy. The WFA plant's current capacity is less than its rated capacity of 81 mgd due to solids handling limitations.[29] According to the WFA, the current capacity of the WFA plant is about 40 mgd in the summer months and about 20 mgd in the winter months. This suggests that even when imported water is available to the WFA, there is a limitation in the ability to treat the water and deliver it for municipal use.

### *Other supply reliability issues*

Other reliability issues that can affect the Parties include:

- Non-Chino-Basin groundwater supplies. Non-Chino-Basin groundwater is projected to account for 16 to 18 percent of the Parties' aggregate water supplies. This source of water is not available to all the Parties. The reliability of non-Chino-Basin groundwater depends on water quality, water rights, and infrastructure to convey it to a Parties' water systems.
- Local surface water supplies. Local surface water is projected to account for 3 to 5 percent of the aggregate water supplies of the Parties. This water source is not available to all Parties. The reliability of local surface water depends on the hydrologic characteristics of the individual supplies, water quality, water rights, and infrastructure to convey it from points of diversion to a Party's water system.
- Recycled water supply. Recycled water is projected to account for about 7 to 8 percent of the aggregate water supplies of the Parties. The challenges to maximizing the reuse of recycled water are described under Activity D and include: timing of recycled water availability, salt and nutrient management, water quality regulations, and the Santa Ana River Judgment.
- Climate change. Climate change is likely to result in higher temperatures, longer dry periods, and shorter more intense wet periods, which can ultimately affect the availability and management of all water supply sources. For example, shorter more intense precipitation periods are expected to result in reduced recharge, and longer dry periods are expected to result in reduced imported water supplies (as occurred with SWP supplies in the recent drought from 2013 to 2016).

### *Summary*

The water demands of the Chino Basin Parties are expected to increase by 44 percent by 2040, and as illustrated above, there are numerous challenges to the reliability of the supplies and the infrastructure that deliver them. Many of the challenges are interrelated and compounding. And, the impacts to individual Parties and associated costs to manage them are not equal. For example, the reliability of

[28] Metropolitan. (2018). *Seismic Resilience, First Biennial Report*. February 2018.
[29] Email from Terry Catlin, April 10, 2018.

imported water (and other non-groundwater supplies) not only affects the imported water supply but also the groundwater supplies that are dependent on imported water for blending. According to draft results from IEUA's 2020 IRP, the Parties that require blending are: the MVWD, CVWD, FWC, and the Cities of Pomona, Upland, Chino, Chino Hills, Ontario.

In the Chino Basin, prolonged reductions in groundwater pumping due to land subsidence, groundwater sustainability, or groundwater contamination have the effect of reducing Safe Yield, potentially contributing to the loss of Hydraulic Control and the spread of contamination. The ability to convey water from areas that are not subject to these limitations to areas that may provide flexibility to the Parties to pump their respective Chino Basin groundwater rights.

Activity CG will require a planning process that will ensure that the recommended infrastructure that results from it will meet the Parties' needs. To do this, the planning process should answer the following questions:

1) How do the Parties define reliability? How can this be quantified?
2) What is the desired level of reliability? How is it articulated at the regional and individual Party levels? For example, the level of reliability could be articulated as: the ability to meet all or a percentage of the potable water demands of the Parties under a full interruption of SWP supplies delivered by Metropolitan.
3) What are the other benefits of optimization desired by the Parties? How can such benefits be quantified?
4) What existing/planned infrastructure could be used to optimize the use of all sources of water and how would it be used?
5) What new infrastructure would be required to achieve the desired level of reliability and other benefits?
6) How would the existing/planned/new infrastructure be operated to achieve the desired level of reliability and other benefits?
7) Are the capital and O&M costs of optimization less than the cost to agencies to manage the supply and infrastructure challenges on their own?
8) What institutional arrangements are necessary to operate the facilities to achieve the benefits?

As previously mentioned, the IEUA is currently developing the 2020 IRP, which will serve as a regional implementation strategy for long-term water resources management within IEUA's service area. As part of this work, the IEUA retained INTERA to model the existing major infrastructure of the IEUA's service area and develop scenarios to identify opportunities and vulnerabilities in the existing infrastructure of its member agencies. The IRP is in development, and there is a significant body of work being performed by the IEUA and its member agencies that can be leveraged to accomplish the objectives of Activity CG for all of the Parties. The IEUA is also currently conducting preliminary engineering and planning for the CBP, which is a large Storage and Recovery Program to provide regional, dry-year water supplies and associated infrastructure. The project concepts envisioned in the CBP could meet, at least in part, the objectives of Activity CG. Regardless, the work currently in development can be leveraged to reduce the cost of implementing Activity CG.

In order to optimize the use of all sources of water and identify and implement water supply reliability projects, the Parties should convene a Water Supply Reliability Committee for the purposes of accomplishing the objectives of Activity CG for all Parties. The scope of work is described below.

### Scope of Work for Activity CG

The scope of work to develop and implement Activity CG consists of six tasks.

- Task 1 – Form the Water Supply Reliability Committee, define objectives, and refine scope
- Task 2 – Characterize water demands, water supply plans, and existing/planned infrastructure and its limitations
- Task 3 – Develop planning, screening, and evaluation criteria
- Task 4 – Describe water supply reliability opportunities
- Task 5 – Develop reconnaissance-level engineering design and operating plan
- Task 6 – Plan, design, build water reliability alternatives

The tasks are described below.

*Task 1 – Form the Water Supply Reliability Committee, define objectives, and refine scope.* In this task, a Water Supply Reliability Committee will be convened. The Committee's initial tasks are: (1) to clearly articulate and obtain consensus on the objectives for optimizing the use of all sources of water; (2) to define reliability, benefits, and performance criteria for the Parties; and (3) to refine the preliminary scope of work, schedule, and cost defined for Tasks 2 through 6 to fully leverage the existing data and planning efforts of Watermaster, the IEUA, and others. Four Committee meetings will be conducted to accomplish these tasks. In step (2), the Committee will address the following questions:

1) How do the Parties define reliability? How can this be quantified?
2) What is the desired level of reliability? How is it articulated at the regional and the individual Party levels?
3) What are the other benefits of optimization desired by the Parties? How can such benefits be quantified?

*Task 2 – Characterize water demands, water supply plans, and existing/planned infrastructure and their limitations.* The objectives of this task are: (1) to characterize the water demands and supply plans of the Parties; (2) to characterize existing/planned infrastructure to convey, treat, and distribute the supplies to meet demands; and (3) to identify opportunities and limitations in the existing/planned infrastructure consistent with the objectives of Activity CG defined in Task 1. The water demands and supply plans will be characterized on a monthly basis for various climate conditions. One committee meeting and one individual meeting with each participating Party will be conducted to review the characterization of water demands and supply plans and existing/planned infrastructure. Two additional meetings will be conducted to identify opportunities and limitations in the existing/planned infrastructure consistent with the objectives of Activity CG defined in Task 1.

*Task 3 – Develop planning, screening, and evaluation criteria.* The objective of this task is to develop the criteria that will be used to evaluate water reliability projects in Tasks 4 and 5. Criteria to evaluate potential projects will include:

- Watermaster criteria that include no potential MPI, balance of recharge and discharge, and others;
- qualitative criteria that include institutional complexity and others; and
- quantitative criteria that include business case evaluations, expressed as net present value, unit cost, and others.

*Task 4 – Describe water supply reliability opportunities.* The objectives of this task include identifying potential water supply reliability project alternatives, screening them using the screening criteria developed in Task 3, and developing project alternatives for detailed evaluation. Three meetings will be conducted to develop a list of potential projects that can be implemented, to review the screening of these projects, and to select projects to evaluate in Task 5. In executing this task, the Committee will address the following questions:

4) What existing/planned infrastructure could be used to optimize the use of all sources of water and how would it be used?
5) What new infrastructure would be required to achieve the desired level of reliability and other benefits?

*Task 5 – Develop reconnaissance-level engineering design and operating plan.* The objective of this task is to characterize the performance and costs of the water supply reliability alternatives developed in Task 4. A reconnaissance-level engineering design and operating plan will be developed for each alternative. Each alternative design will include the approximate size, location, and alignment of major infrastructure, and will describe any potential implementation barriers for the project. A cost opinion will be determined for each alternative. This task includes evaluating alternatives based on the alternative evaluation criteria developed in Task 3, describing how the alternative could be implemented and financed, and recommending an alternative for implementation. The deliverable of this task will be a technical report that summarizes the work performed under Tasks 1 through 5, and it will include a plan to pay for the preliminary design and CEQA documentation of the recommended alternative. Five meetings will be conducted to review the design and estimated benefit of the recommended alternative; review the evaluation of the projects, based on the criteria developed in Task 3; and review the recommended list of projects for implementation; review the implementation plan; and review the technical report. In executing this task, the Committee will address the following questions:

6) How would the existing/planned/new infrastructure be operated to achieve the desired level of reliability and other benefits?
7) Are the capital and O&M costs of optimization less than the cost to agencies to manage supply and infrastructure challenges on their own?
8) What institutional arrangements are necessary to operate the facilities to achieve the benefits?

*Task 6 – Plan, design, build water reliability alternatives.* The objective of this task is to implement the recommendations of the technical report. This task includes (1) developing and implementing necessary agreements between participating Parties, (2) preparing the preliminary design of the recommended alternative, (3) preparing the environmental documentation for the recommended alternative and other alternatives that will tier-off the 2020 OBMP Update PEIR, (4) preparing a financial plan for constructing the recommended alternative, (5) preparing final design of the recommended alternative, (6) acquiring permits for constructing and operating the recommended alternative, and (7) constructing the recommended alternative.

### Cooperative Efforts with Appropriate Entities to Implement Activity CG

This is a basin-wide activity that involves the Parties, the IEUA, the TVMWD, and the WMWD. Given its current efforts, the IEUA would be the logical entity to lead the implementation of Activity D on behalf of all Parties in these service areas, but the process could be led by others. In this role, the agency leading the project on behalf of the Parties would contract for planning and engineering services as required. Watermaster, TVMWD and WMWD would work with IEUA as needed to support the expansion of the planning efforts to cover non-IEUA member agencies. Watermaster would also participate in the process to ensure that Activity CG implementation is consistent with the Judgment, Peace Agreements and other agreements, and the Watermaster Rules and Regulations.

### Implementation Actions, Schedule, and Costs for Activity CG

The recommended schedule to complete the scope of work described herein is described below:

**Year one:**

- Convene Water Supply Reliability Committee, define reliability and other benefits, and refine scope of work, schedule, and budget (Task 1).

**Year two:**

- Characterize the water demand, water supply plans, and existing/planned infrastructure and its limitations; and identify conceptual facilities and operational improvements that achieve reliability and other benefits defined in Task 1 (Task 2).
- Develop planning, screening, and evaluation criteria for water supply reliability projects (Task 3).
- Develop water reliability alternatives for evaluation (Task 4).

**Year three:**

- Conduct reconnaissance-level engineering study for the alternatives (Task 5).

**Years four through seven:**

- Recommend alternative for implementation (Task 5).
- Prepare final report, documenting work performed in Tasks 1 through 5 (Task 5).
- Watermaster, the IEUA, and other potential partners develop a project implementation agreement. The objective of this agreement is to define the roles of each partner in the planning, permitting, design, and implementation of the projects, and the cost allocations.
- Preliminary design of recommended projects. The level of design will be such that it enables the preparation of environmental documentation pursuant to CEQA and provides information for identifying the permits required for construction and operation.
- Prepare environmental documentation for alternatives. CEQA will cover the recommended alternative and other alternatives at the project level, based on the project descriptions developed in Task 5. This documentation will tier-off from the 2020 OBMP Update PEIR. Watermaster will conduct an MPI analysis in parallel with the CEQA process.

**Years eight and nine:**

- Prepare final designs and acquire permits for the selected alternative.

**Years ten and beyond:**

- Construct recommended alternative.

Exhibit CG-5 shows the estimated budget-level engineering cost to complete Tasks 1 and 2 which is about $305,000. The cost of Tasks 3 through 6 cannot be estimated until the completion of Task 2. And, because the IEUA is currently conducting its 2020 IRP (the scope of work for which overlaps with scope recommended herein), the cost may be lower than estimated if its work is leveraged.

Some of the facilities and associated operating plans identified under this activity may overlap with those envisioned in Activity EF and/or Activity B. If Activity EF and/or B and CG move forward, there will be cost savings related to facilities planning.

## Activity K

### Description of Activity K

Activity K defined by the stakeholders is:

> *Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge.*

The objective of Activity K is to determine if compliance with recycled water recharge dilution requirements, defined in Watermaster and the IEUA's maximum benefit SNMP, can be achieved under existing management plans, and if not, to develop a plan to achieve compliance.

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activity K:

- Enable the continued and expanded recharge of recycled water, which will:
  - protect water quality,
  - improve water-supply reliability, especially during dry periods, and
  - protect/enhance Safe Yield.

The 2000 OBMP included PE 7—*Develop and Implement Salt Management Plan*—to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. Such a management strategy was necessary to address historical salt and nutrient accumulation from agricultural operations and to support the aggressive expansion of recycled water recharge and reuse envisioned in PE 2 and PE 3/5. Recognizing that implementing the recycled water reuse program would require large scale treatment and mitigation of salt loading under the then-current antidegradation objectives for total dissolved solids (TDS) and nitrate, defined in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), Watermaster and the IEUA petitioned the Regional Board to establish a maximum benefit-based salt and nutrient management plan (maximum benefit SNMP) that involved (1) increasing the TDS and nitrate objectives for the Chino-North groundwater management zone[30] (GMZ) to numerically higher values to enable recycled water reuse without mitigation or treatment and (2) committing to a program of salt and nutrient management activities and projects ("maximum benefit commitments") that ensure the protection of the beneficial uses of the Chino-North GMZ and downgradient water resources (the Santa Ana River and the Orange County GMZ). The maximum benefit commitments included the implementation of a monitoring, analysis, and reporting program to track TDS and nitrate trends; the construction and future expansion of the Chino Basin Desalters to attain Hydraulic Control of the Chino-North GMZ to protect the Santa Ana River; the construction of recharge facilities to increase storm and recycled water recharge; and a commitment to future treatment of recycled water and/or groundwater, as needed, to protect beneficial uses and comply with the maximum benefit TDS and nitrate objectives. These are all activities that were planned to be implemented under the OBMP. The maximum benefit SNMP was incorporated into the Basin Plan in January 2004.

Activity K, as envisioned by the stakeholders, would entail an expansion on the existing analysis requirements in the maximum benefit SNMP to incorporate a forward-looking assessment of the ability to comply with the maximum benefit commitments. It would set up Watermaster and the IEUA to more

[30] The Chino-North GMZ has a maximum-benefit TDS objective of 420 mgl and is a combination of the Chino-1, Chino-2, and Chino-3 antidegradation GMZs that have lower TDS objectives ranging from 250 to 280 mgl.

proactively prepare a compliance plan as opposed to reacting to a trigger event that requires short-term, time-certain response actions.

## Need and Function of Activity K

### *Maximum benefit SNMP commitments*

Implementation of the maximum benefit SNMP is a regulatory requirement of the Basin Plan. It's also incorporated into Watermaster and the IEUA's recycled water recharge program permit (R8-2007-0039) and the IEUA's recycled water discharge and direct reuse permit (R8-2015-0021; NPDES No. CA 8000409). There are nine maximum benefit commitments included in the Basin Plan and recycled water permits:

1. The development and implementation of a surface-water monitoring program
2. The development and implementation of a groundwater monitoring program
3. The expansion of the Chino-I Desalter to 10 million gallons per day (mgd) and the construction of the Chino-II Desalter with a design capacity of 10 mgd
4. The additional expansion of desalter capacity to a total capacity of 40 mgd pursuant to the OBMP and the Peace Agreement
5. The construction of the recharge facilities included in the Chino Basin Facilities Improvement Program
6. The management of recycled water quality to ensure that the IEUA agency-wide, 12-month running average wastewater effluent quality does not exceed 550 mgl for TDS and 8 mgl for total inorganic nitrogen (TIN)
7. The management of the basin-wide, volume-weighted TDS and nitrate concentrations of artificial recycled, storm, and imported waters to concentrations that are less than or equal to the maximum benefit objectives as a five-year rolling average
8. The achievement and maintenance of Hydraulic Control of groundwater outflow from the Chino Basin, specifically from the Chino-North GMZ, to protect the water quality of the Santa Ana River and downstream beneficial uses
9. The periodic redetermination of "current" ambient TDS and nitrate concentrations of the Chino Basin GMZs (every three years).

Additionally, Watermaster and the IEUA are required to prepare an annual report to the Regional Board on the status of compliance with the maximum benefit commitments. If the maximum benefit commitments are not met to the Regional Board's satisfaction, the antidegradation objectives would apply for regulatory purposes. The application of the antidegradation objectives would result in a finding of no assimilative capacity for TDS and nitrate in the Chino-North GMZ, and the Regional Board would require mitigation for recycled water discharges to Chino-North that exceed the antidegradation objectives. Furthermore, the Regional Board would require that Watermaster and the IEUA mitigate the effects of discharges of recycled water that took place in excess of the antidegradation objectives under the maximum benefit objectives retroactively to January 2004. The mitigation for past discharges would be required to be completed within a ten-year period following the Regional Board's finding that the maximum benefit commitments were not met.

### *Current compliance with the recycled water dilution requirements of the maximum benefit SNMP*

Commitment number 7 of the maximum benefit SNMP is the stakeholders' stated focus of Activity K. This commitment defines a compliance limit that if met, allows for the continued recharge of recycled water without mitigation. Hereafter, the limit will be referred to as the "dilution limit." Commitment number 7 requires that recycled water recharge be limited to the amount that can be blended, on a basin-wide, volume-weighted basis, with other sources of supplemental recharge to achieve five-year running-average concentrations that are less than or equal to the dilution limits. The dilution limits are the maximum benefit objectives: 420 mgl for TDS and 5 mgl for nitrate (as nitrogen). If the five-year, volume-weighted TDS or nitrate concentrations (hereafter, dilution metrics) exceeds the dilution limits, then Watermaster and the IEUA must develop a plan to come into compliance. Compliance options could include, but are not limited to, increasing the recharge of low-salinity supply sources (storm or imported waters), desalting recycled water to reduce salinity, or desalting groundwater as a salt offset.

Watermaster and the IEUA annually analyze and report on "current" compliance with the dilution limit as part of the *Chino Basin Maximum Benefit Annual Report*. The most recent annual report was submitted to the Regional Board in April 2019 and reported on compliance through December 2018.[31] Exhibits K-1 and K-2 are time-series charts that characterize compliance with the dilution limit since the recycled water recharge program began in 2005. The exhibits show the monthly recharge volumes and TDS and nitrate concentrations of each recharge source, the dilution metrics, and the dilution limits. Note that because recycled water recharge began in July 2005, the first five-year period for which the dilution metric was computed was July 2005 through June 2010.

Exhibits K-1 and K-2 illustrate that the TDS and nitrate dilution limits have never been exceeded. From June 2010 to December 2016, the TDS dilution metric increased from about 203 to 354 mgl. During the same period the nitrate dilution metric increased from 1.1 to 3.0 mgl. After December 2016, the TDS and nitrate dilution metrics decreased to 281 mgl and 2.0 mgl, respectively. As of 2018, the five-year, volume-weighted TDS dilution metric was 139 mgl less than the dilution limit, and the nitrate dilution metric was 3 mgl below the dilution limit.

### *Threats to compliance with the dilution limits*

As suggested by Exhibit K-1, the primary threats to compliance with the TDS dilution limit are the availability of imported and storm waters for recharge. Increases in the TDS concentration of recycled water are also a threat to compliance. The threat of exceeding the nitrate dilution limit is far less given that the nitrate concentration of the recycled water recharge is typically less than the nitrate dilution limit of 5 mgl.

Imported water is a low-TDS source of recharge and has an important influence on the dilution metric. As shown in Exhibit K-1, the TDS concentration of imported water used for recharge ranged from 87 to 367 mgl. In mid-2016, the rate of increase of the TDS dilution metric rose significantly from about 1.3 mgl per month to 12 mgl per month through October 2016 when the metric peaked at 354 mgl. In October 2016, the five-year dilution metric calculation included almost no imported water recharge: the last significant period of imported water recharge occurred in May through September of 2011 (3,700 to 7,800 af). After peaking in October 2016, the dilution metric for TDS began to decrease and stabilize due to a large imported water recharge event that occurred from October 2016 through January 2018 (46,000 total af).

[31] WEI. (2019). *Optimum Basin Management Program Chino Basin Maximum Benefit Annual Report 2018*. April 2019.

A similar trend was observed for the dilution metric for nitrate, as shown in Exhibit K-2. These observations demonstrate the importance of imported water recharge to compliance with the dilution metric.

Stormwater is a more consistent source of recharge, but it occurs in smaller volumes than imported water recharge. Over the most recent five-year period (January 2014 to December 2018), the total volume of stormwater recharge was 39,000 af compared to 47,000 af of imported water. And, while stormwater TDS concentrations are typically low in the wet winter months (50 to 150 mgl), the TDS of dry-weather flows diverted to recharge in summer months are typically greater than 300 mgl. The implementation of the 2013 RMPU is expected to increase the annual average stormwater recharge volume, but even with increased recharge capacity, multiyear drought conditions with limited stormwater recharge opportunities could lead to compliance challenges.

During drought conditions there is: a reduction in the amount of high-quality stormwater recharge; limited or no availability of imported water for recharge; an increase in the TDS concentrations of imported water, if it is available for recharge; and a concomitant increase in the TDS concentrations of the recycled water. Not only are the two primary sources of low-TDS water less available during drought periods, but the source water quality of municipal water supplies is also higher in TDS due to increases in imported water TDS and indoor water conservation practices. Exhibit K-1 shows the influence of the most recent statewide drought, which occurred over 2013 to 2016, on the dilution metric. During this time the dilution metric for TDS steadily increased from about 210 mgl to 350 mgl. This analysis demonstrates the meaningful impact that drought has on compliance with the dilution metric and indicates that climate change, which is expected to result in longer, drier droughts, could potentially threaten future compliance with the dilution limit.

### *Other maximum benefit SNMP compliance challenges*

There are other metrics in the maximum benefit SNMP commitments that would require the evaluation of potential salt offset projects to achieve compliance. Commitment number 6 requires that when the IEUA's agency-wide, 12-month, running-average recycled water effluent TDS concentrations exceeds 545 mgl for three consecutive months or the TIN concentrations exceeds 8 mgl in any one month, Watermaster and the IEUA must submit a water quality improvement plan and schedule to the Regional Board. The plan must demonstrate how the 12-month running-average IEUA agency-wide recycled water effluent will remain in compliance with its discharge permit limits of 550 mgl and 8 mgl for TDS and TIN, respectively.

Exhibit K-3 shows the monthly and 12-month running-average IEUA agency-wide effluent TDS and TIN concentrations for 2005 through 2018. In 2015, the 12-month running-average IEUA agency-wide TDS concentration in recycled water approached the 545 mgl action limit that would require the IEUA and Watermaster to submit a water quality improvement plan and schedule. In analyzing the available data, the IEUA determined that the primary drivers for the increasing recycled water TDS concentration were the increase in the TDS concentration of the water supplies used by its member agencies and an increase of the TDS waste increment from indoor water conservation.

Although the 12-month running-average IEUA agency-wide TDS concentration declined from the 2015 peak before reaching the 545 mgl action limit, it was an important indicator that the TDS concentration of recycled water is likely to approach or exceed the recycled water compliance limit during the next prolonged dry period and require the planning for recycled water quality improvements. In May 2017, recognizing the potential cost of implementing recycled water quality improvements for what might be only short-term exceedances of the 545 mgl action limit, Watermaster and the IEUA petitioned the Regional Board to consider updating the maximum benefit SNMP to incorporate a revised 12-month compliance metric for recycled water effluent (commitment number 6) specifically to allow a longer-term

averaging period. The Regional Board agreed that an evaluation of the recycled water compliance metric is warranted and directed Watermaster and the IEUA to develop a technical scope of work to demonstrate the potential impacts of the revised compliance metric. The work began in September 2017 and is ongoing as of the writing of this Scoping Report. If the investigation finds that changing the recycled water compliance metric will not impact beneficial uses in the Chino Basin or cause downgradient water supplies to exceed water quality objectives, then it is likely that the alternative recycled water compliance metric will be approved. If approved, the Regional Board would amend the Basin Plan and the IEUA's permits to incorporate the revised maximum benefit commitments.

The primary objectives of the technical work to support the maximum benefit SNMP and permit updates are: to develop and use an updated groundwater solute transport model to evaluate the TDS and nitrate concentrations of the Chino Basin, to define alternative salinity management scenarios, and to project the future TDS and nitrate concentrations of the Chino Basin for each scenario. The results will be used to develop a regulatory compliance strategy that includes a longer-term average period for recycled water TDS concentrations that is acceptable to the Regional Board. The Regional Board has indicated that in accepting a proposal to modify the recycled water compliance limit, it will require Watermaster and the IEUA to add a new maximum benefit commitment to the Basin Plan that involves updating the TDS and nitrate projections every five years.

The compliance approach being pursued by Watermaster, the IEUA, and the Regional Board illustrates that the Regional Board may be willing to consider adopting an alternative dilution metric—e.g. a longer averaging period—for recycled and supplemental water recharge so long as there are no unmitigated impacts to beneficial uses. The work that is being performed to support the maximum benefit SNMP update can be directly leveraged to achieve the objective of Activity K.

*Process required to evaluate potential future dilution compliance challenges*

To achieve the objective of Activity K, it is necessary to prepare projections of the dilution metric to evaluate potential compliance challenges and to determine if and when it will be necessary to develop a plan to achieve compliance. The table below summarizes the planning data that are needed to prepare such projections and the existing Watermaster or IEUA programs that produce the planning data.[32]

| Planning Data | Existing Watermaster and IEUA Efforts that Compile or Produce the Required Planning Data |
|---|---|
| Recycled water recharge volumes | Projections prepared through the RMPU process, the Recycled Water Program Strategy, and other efforts. |
| Recycled water quality | There is no current effort to prepare this projection at the requisite level of detail on a regular basis, but it can be calculated from projections of water supply quality; such a projection was just completed to support the maximum benefit SNMP update. |
| Imported water recharge volumes | Projections prepared through the RMPU process. |

[32] Some additional planning data not listed here would also be required to run the Chino Basin Groundwater Model, which is updated and recalibrated at least every five years.

| Planning Data | Existing Watermaster and IEUA Efforts that Compile or Produce the Required Planning Data |
|---|---|
| Imported water recharge quality | There is no current effort to prepare this projection at the requisite level of detail, but it can be estimated based on historical data; such a projection was just completed to support the maximum benefit SNMP update. |
| Stormwater recharge volumes | Projections prepared through the RMPU process. |
| Stormwater recharge quality | Estimates can easily be produced based on historical data. |
| Groundwater supply volumes | Water supply plans of the Parties are compiled at least once every five years for various Watermaster and IEUA efforts. |
| Groundwater supply quality | There is no current effort to prepare this projection at the requisite level of detail, which requires the use of a numerical groundwater solute transport model; such a model was just built to support the maximum benefit SNMP update and is being used to prepare groundwater quality projections. |
| Other water supply volumes | Water supply plans of the Parties are compiled at least once every five years for various Watermaster and IEUA efforts. |
| Other water supply quality | There is no current effort to prepare this projection at the requisite level of detail, but it can be estimated based on historical data; such a projection was just completed to support the maximum benefit SNMP update. |

The planning data would be used to prepare projections of: municipal water supply and quality, imported water quality, recycled water quality, groundwater quality, and ultimately the TDS and nitrate dilution metrics. The projections would be done assuming a range of future cultural conditions (land use changes, population growth, etc.) and climate conditions. These projections would be analyzed to produce best-case and worst-case five-year, ten-year, 15-year, and 20-year recharge projections for imported and storm waters. The best- and worst-case projections of the dilution metric would be appended to the historical record to produce a bracketed series of dilution metric time histories to evaluate the risk of exceeding the dilution metric over a range of potential climate conditions in the short (5-year) and long (20-year) term.

If there is no projected compliance challenge in the next five to ten years, then no additional work would be needed to develop a compliance plan. It would be necessary to update the planning data and modeling tools to evaluate projections at a minimum of every five years. A five-year frequency is consistent with the State Board's 2018 amendments to the SNMP guidelines within its Recycled Water Policy.[33]

If a compliance challenge is projected, then it will be necessary to develop a plan to ensure compliance with the blending metric in the future. As previously noted, the compliance plan could include treatment

[33] The *Water Quality Control Policy for Recycled Water* is available at: https://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/

of the recycled water, increased recharge of high-quality imported water and/or stormwater, increase in groundwater desalting as a salt offset, or an update to the maximum benefit SNMP to change the compliance metric to a longer averaging period. For the latter, it would first be necessary to demonstrate to the Regional Board that a change to the compliance metric will not harm beneficial uses.

#### *Alignment of Activity K with the current investigation to support the update to the* maximum benefit *SNMP*

All of the above steps to analyze compliance challenges with the dilution metric are currently being performed in support of the update to the maximum benefit SNMP. Watermaster and the IEUA anticipate that the compliance strategy for the SNMP update will be finalized during FY 2020/2021. When completed the potential compliance challenges with the dilution limit will be known and a range of compliance plans will have been evaluated at a conceptual level. Thus, it may not be necessary to perform any work pursuant to Activity K, unless it is determined that some form salt offset is required. If no compliance challenges arise, or remain at the completion of the SNMP update, no significant work would need to be performed pursuant to Activity K for at least five years. If a salt offset is required, Watermaster and the IEUA would need to begin reconnaissance-level engineering planning in FY 2021/22.

#### *Summary*

In order to achieve the objectives of Activity K to ensure the ability to comply with the maximum benefit SNMP dilution metric in the future, Watermaster and the IEUA should expand the existing analysis and reporting efforts to periodically (every five-years), prepare future projections of recharge volumes and quality to determine if there is a compliance challenge, and if necessary, evaluate compliance alternatives. Projections of the dilution metric and an evaluation of compliance challenges in the future are currently being developed for the investigation to support the update to the maximum benefit SNMP described above. The scope of work to implement Activity K can leverage that work.

### Scope of Work for Activity K

The scope of work to achieve the objectives of Activity K—*Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge*—consists of five tasks:

- Task 1 – Prepare projection to evaluate compliance with recycled water dilution requirements
- Task 2 – Identify alternative compliance strategies
- Task 3 – Evaluate alternative compliance strategies
- Task 4 – Implement the alternative compliance strategy
- Task 5 – Periodically reevaluate compliance with dilution requirements

*Task 1 – Prepare projection to evaluate compliance with recycled water recharge dilution requirements.* The objective of this task is to prepare projections of compliance with the dilution metric for TDS and nitrate in the maximum benefit SNMP and determine if there is a compliance challenge in the future. In this task, all planning data will be compiled, Watermaster's groundwater solute transport model will be updated and used to estimate future groundwater and recycled water quality, and projections of the dilution metric will be prepared. The planning data will be used to evaluate the dilution metric for best-case and worst-case recharge conditions over a twenty-year period. If there are no projected compliance challenges within the next five years, then Tasks 2 through 4 will not need to be performed. If there is a compliance challenge within the next five years, then Tasks 2 through 4 will need to be performed. Task 5 would be performed regardless of the outcome.

*Task 2 – Identify alternative compliance strategies.* The objective of this task is to identify potential alternative compliance strategies to address foreseeable challenges with complying with the dilution limit in the future. This task includes the following subtasks:

- Develop planning, screening, and evaluation criteria for projects to comply with the maximum benefit SNMP dilution limit.
- Identify potential alternative compliance strategies.
- Perform initial screening of the alternative compliance strategies based on the evaluation criteria.
- Select alternative compliance strategies to evaluate in Task 3.

*Task 3 – Evaluate alternative compliance strategies.* The objective of this task is to characterize the performance and costs of the alternative compliance strategies defined in Task 2. A reconnaissance-level engineering design and operations will be developed for each alternative. The reconnaissance-level engineering work will include a description of the activity, description of facilities (if required), its ability to comply with the dilution limits, its impact on the TDS and nitrate concentrations of the Chino Basin, and the estimated cost to implement the project alternatives. The projects will be evaluated and ranked based on the criteria developed in Task 2, and an alternative compliance strategy will be selected. The deliverable for this task will include a technical document that describes the reconnaissance-level engineering design and operations, the selected alternative compliance strategy, and the scope of work and cost estimate to implement the selected alternative compliance strategy.

*Task 4 – Implement the alternative compliance strategy.* The objective of this task is to implement the selected alternative compliance strategy. This task includes (1) developing and implementing necessary agreements between participating Parties; (2) preparing a Basin Plan amendment, if necessary; (3) preparing preliminary designs of the recommended projects; (4) preparing the environmental documentation for the recommended projects (this will tier-off from the 2020 OBMP Update PEIR); (5) preparing financial plans to construct the recommended projects; (6) preparing final designs of the recommended projects; (7) acquiring necessary permits for constructing and operating the recommended projects; and (8) constructing the recommended projects.

*Task 5 – Periodically re-evaluate compliance with dilution requirements.* The objective of this task is to proactively evaluate future compliance with the maximum benefit SNMP recycled water dilution limit to address any foreseen compliance challenges. The task includes two efforts:

(1) Prepare projections of the dilution metric on a five-year frequency. This includes updating the model, collecting planning data, preparing the requisite projections (see Task 1), and evaluating if there is a compliance challenge. If it is determined that there is a compliance challenge, then Tasks 2 through 4 will be performed. If it is determined that there is not a compliance challenge, this evaluation will be redone in another five years.
(2) Annually report on current and future compliance with the dilution limit. Annual reporting of current compliance with the dilution metric is already done in the Chino Basin Maximum Benefit Annual Reports. This task would simply involve expanding that reporting discussion to include a comparison of the current dilution metric to the bracketed projections of the dilution metric prepared in Task 1. If the current dilution metric suggests there is a potential compliance challenge that was not predicted by Task 1, Watermaster and the IEUA would initiate a process to determine if additional evaluation of compliance alternatives is warranted.

### Cooperative Efforts with Appropriate Entities to Implement Activity K

As co-permittees to the maximum benefit SNMP and recycled water recharge program, this activity involves Watermaster and the IEUA. Similar to the existing implementation of the maximum benefit

SNMP, Watermaster would lead the technical and reporting efforts, and any engineering planning work would be led by IEUA.

### Implementation Actions, Schedule, and Costs for Activity K

As previously described, all the work required in Task 1 is currently being performed as part of Watermaster and the IEUA's investigation to support an update to the maximum benefit SNMP to change the recycled water TDS compliance metric to a longer averaging period. Watermaster and the IEUA anticipate that the work to update the compliance strategy for the maximum benefit SNMP will be completed during FY 2020/21. When completed the potential compliance challenges with the dilution limit will be known, and a range of compliance plans will have been evaluated at a conceptual level. Thus, it may not be necessary to perform any work pursuant to Activity K unless it is determined that some form salt offset project is required to address near-term compliance challenges. If no compliance challenges are identified or are resolved through the completion of the SNMP update, no significant work would need to be performed pursuant to Activity K for at least five years. If a salt offset project is required to address anticipated near-term compliance challenges, Watermaster and the IEUA will need to begin reconnaissance-level engineering planning in FY 2021/22 (Tasks 2 through 4).

The recommended schedule to complete the scope of work described herein is described below:

**Year one:**

- Wait for Watermaster and the IEUA to complete the maximum benefit SNMP update.

**Year two:**

- Identify alternative compliance strategies, if needed (Task 2).
- Start the evaluation of alternative compliance strategies, if needed (Task 3).
- Report the annual dilution metric compared to dilution limits and projections (Task 5).

**Year three:**

- Complete the evaluation of alternative compliance strategies, if needed (Task 3).
- Select preferred compliance plan and begin preparing implementation agreements, if needed (Task 4).
- Report the annual dilution metric compared to dilution limits and projections (Task 5).

**Year four:**

- Begin implementation the of compliance plan, if needed (Task 4).
- Report the annual dilution metric compared to dilution limits and projections (Task 5).

**Year five and beyond:**

- Reevaluate compliance with dilution requirements every five years (Task 5).

Exhibit K-4 shows the estimated budget-level engineering cost to complete Tasks 1 through 5. Given the ability to leverage the existing work being performed by Watermaster and the IEUA, there is no cost ($0) to perform Task 1. A cost estimate for Task 2 through 4 cannot be prepared because the outcome of the SNMP update is not yet known. It is premature to estimate the cost for performing the five-year update of the projections in Task 5, and there is no increased cost to performing the additional recommended annual reporting.

# Activity L

## Description of Activity L

Activity L defined by the stakeholders is:

> *Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance.*

The objective of Activity L is to refine the monitoring and reporting requirements of Watermaster to ensure that the objectives of each requirement are being met efficiently at a minimum cost. Through the listening session process, the stakeholders identified the following desired outcomes for Activity L:

- Ensure full compliance with regulatory requirements.
- Ensure full support of basin management initiatives.
- Enable the Parties to monitor the performance of the OBMP IP and related Court orders and regulatory obligations.
- Ensure cost efficiency.

The OBMP IP included PE 1 – *Develop and Implement Comprehensive Monitoring Program*. PE 1 was included in the OBMP to provide the information necessary to support the implementation of all other OBMP program elements and to evaluate their performance. The types of monitoring programs called for by PE 1 in the OBMP IP included:

- Groundwater-level monitoring
- Groundwater-quality monitoring
- Groundwater-production monitoring
- Surface-water discharge and quality monitoring (including managed artificial recharge)
- Ground-level monitoring
- Well construction, abandonment, and destruction

Activity L has identical objectives and desired outcomes to those of PE 1 because Watermaster continues to need data and information to comply with regulations, to fulfill its obligations under its agreements and Court orders, to comply with its requirements under CEQA, and to assess the performance of the evolving OBMP IP, including the 2020 OBMP Update. Financial resources to conduct these monitoring and reporting programs are limited, so through Activity L, the Parties desire to ensure cost efficiency in Watermaster's monitoring and reporting programs.

## Need and Function of Activity L

### *Watermaster monitoring and reporting programs*

Data and information acquired in Watermaster's monitoring and data-collection programs are used to prepare reports and data deliverables that are required by regulations and Watermaster's obligations under its agreements, Court orders, and CEQA. The table below is a list of each Watermaster monitoring and reporting requirement and the regulatory entities that require the monitoring and reporting.

| Monitoring and Reporting Requirement | Regulatory Entity | | | | | |
|---|---|---|---|---|---|---|
| | Court | State Board | Regional Board | California DFW | California DWR | CEQA |
| Water Rights Compliance Annual Report | | X | | X | | |
| SGMA Annual Report for Adjudicated Basins | | | | | X | |
| Biannual Evaluation of the Cumulative Effect of Transfers | X | | | | | |
| Biannual Evaluation of the Balance of Recharge and Discharge | X | | | | | |
| Annual Finding of Substantial Compliance with the Recharge Master Plan | X | | | | | |
| Annual Report of Compliance with SB 88 and SWRCB Regulations for Measurement and Reporting of Diverted Surface Water | | X | | | | |
| Safe Yield Recalculation | X | | | | | |
| Recharge Master Plan Update (RMPU) | X | | | | | |
| State of the Basin Report | X | | | | | |
| California Statewide Groundwater Elevation Monitoring Program (CASGEM) | | | | | X | |
| Chino Basin Maximum Benefit Annual Report | | | X | | | |
| Annual Report of the Prado Basin Habitat Sustainability Committee | | | | | | X |
| Water Recycling Requirements for the Chino Basin Recycled Water Groundwater Recharge Program | | | X | | | |
| Annual Report of the Ground-Level Monitoring Committee | X | | | | | |
| OBMP Semi-Annual Status Reports | X | | | | | |

Exhibit L-1 is a comprehensive description of each monitoring and reporting requirement listed in the table above, the associated data types required to meet the reporting requirement, the data analyses performed, the reporting content, and past efforts by Watermaster to reduce the scope and cost of the monitoring and/or reporting requirements.

The scope of the monitoring programs under PE 1 have evolved over time to satisfy new requirements associated with regulations and Watermaster obligations under its agreements, Court orders, and CEQA. In some instances, the monitoring programs have expanded to satisfy new basin-management initiatives and regulations. In some instances, the scope of the monitoring programs has been reduced with periodic reevaluation and redesign to achieve the monitoring objectives with reduced cost.

The following summarizes each of Watermaster's existing monitoring and data-collection programs. Watermaster compiles, checks, and stores the data collected under most of these programs in a centralized environmental database. The database and the database-management procedures ensure the quality and accuracy of the data, allow for efficient data exploration and analysis, and include standardized reports and data exports in formats for regulatory data deliverables or further analysis (e.g. creation of model input files).

***Groundwater-production monitoring***. Since 1978, Watermaster has collected information to estimate total groundwater production from the Chino Basin. Watermaster uses groundwater-production data to quantify and levy assessments pursuant to the Judgment. Estimates of production are also essential inputs to recalibrate Watermaster's groundwater flow model, which is used to inform redeterminations of the Safe Yield of the Chino Basin, evaluate the state of Hydraulic Control, perform MPI assessments, and support many other Watermaster initiatives. The Watermaster Rules and Regulations require groundwater producers that produce in excess of 10 afy to install and maintain meters on their well(s). Well owners that pump less than 10 afy are considered "Minimal Producers" and are not required to meter or report to the Watermaster. Exhibit L-2 depicts the groundwater-production monitoring program as of 2018. Members of the Appropriative and Overlying Non-Agricultural Pools and CDA record their own meter data and submit them to Watermaster staff on a quarterly basis. For Agricultural Pool wells, Watermaster performed a well-metering program to equip Agricultural Pool wells with in-line flow meters, where feasible. Watermaster staff visit and record production data from the meters at these wells on a quarterly basis. For the remaining unmetered Agricultural Pool wells, including Minimal Producer wells, Watermaster applies a "water duty" method to estimate their production on an annual basis. Watermaster continues its efforts to implement the well-metering program and improve its methods to estimate pumping at un-metered wells.

***Groundwater-level monitoring***. Watermaster's groundwater-level monitoring program supports many Watermaster management functions, including: the periodic assessment of Safe Yield, groundwater model development and recalibration, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, subsidence management, MPI assessments, estimation of storage change, other scientific demonstrations required for groundwater management, and many regulatory requirements, such as the demonstration of Hydraulic Control and the triennial recomputation of ambient water quality. The wells within the southern portion of the basin were selected for inclusion in the monitoring program to assist in Watermaster's analyses of Hydraulic Control, land subsidence, desalter impacts to private well owners, and riparian vegetation in the Prado Basin. The density of groundwater-level monitoring near the CDA well fields is greater than in outlying areas because hydraulic gradients are expected to be steeper near the CDA well fields, and these data are needed to assess the state of Hydraulic Control. In FY 2017/2018, about 1,300 wells comprised Watermaster's groundwater-level monitoring program. Exhibit L-3 depicts the groundwater-level monitoring network of wells. At about 1,050 of these wells, well owners measure water levels and provide data to Watermaster. These well owners include municipal water agencies, private water companies, the California Department of Toxic Substance Control (DTSC), the County of San Bernardino, and various private consulting firms. The remaining 250 wells are private or dedicated monitoring wells that are mostly located in the southern portion of the Basin. Watermaster staff measures water levels at these wells once a month or with pressure transducers that record water levels once every 15 minutes. Wells monitored by transducers were preferentially selected to support Watermaster's monitoring programs for Hydraulic Control, Prado Basin habitat sustainability, land subsidence, and others where such high-frequency data are necessary to fulfill program objectives. To continue to support assessments of Hydraulic Control, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

***Groundwater-quality monitoring***. The Watermaster's groundwater-quality monitoring program supports compliance for two maximum benefit commitments: the triennial ambient water quality recomputation and the analysis of Hydraulic Control. Groundwater-quality data are also used for Watermaster's biennial State of the Basin report, to support ground-water modeling, to characterize non-point source contamination and plumes associated with point-source discharges, to characterize groundwater/surface-water interactions in the Prado Basin area, and to characterize basin-wide trends in groundwater quality. Exhibit L-4 depicts the groundwater-quality monitoring network of wells. The groundwater-quality monitoring program relies on municipal producers, government agencies, and others to supply groundwater-quality data on a cooperative basis. Watermaster supplements these data through its own sampling and analysis program at private wells and monitoring wells in the area generally south of State Route 60. These wells include:

- *Private Wells*: Watermaster collects groundwater quality samples at about 85 private wells, located predominantly in the southern portion of the Basin. The wells are sampled at various frequencies based on their proximity to known point-source contamination plumes. 77 wells are sampled on a triennial basis, and eight wells near contaminant plumes are sampled on an annual basis.
- *Watermaster/IEUA Monitoring Wells*: Watermaster collects groundwater quality samples at 22 multi-nested monitoring sites located throughout the southern Chino Basin. There is a total of 53 well casings at these sites. These include nine HCMP monitoring sites constructed to support the demonstration of Hydraulic Control, nine sites constructed to support the Prado Basin Habitat Sustainability Program (PBHSP), and four sites that fill spatial data gaps near contamination plumes in MZ3. Each nested well site contains up to three wells in the borehole. The HCMP and MZ3 wells are sampled annually. The PBHSP wells are sampled quarterly to triennially.
- *Other Wells*: Watermaster collects samples from four near-river wells quarterly. The data are used to characterize the interaction of the Santa Ana River and groundwater in this area. These shallow monitoring wells along the Santa Ana River consist of two former USGS wells and two Santa Ana River Water Company wells.

For the period 2013 to 2018, water quality data were obtained from a total of 1,357 wells within and adjacent to the Chino Basin. Of those, 650 wells were sampled during FY 2017/2018. To continue to support the triennial ambient water quality recomputation, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

***Surface-water and climate monitoring***. Watermaster's surface-water and climate monitoring program supports many Watermaster management functions, including: groundwater model development and recalibration, the periodic assessment of Safe Yield, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, MPI assessments, recharge master planning, the PBHSP, compliance with the recycled-water recharge permit, and the maximum benefit program, among others. Exhibit L-5 depicts the surface-water and climate monitoring network of surface-water discharge sites and atmospheric monitoring stations. Much of these data are collected from publicly available datasets, including POTW discharge data, USGS stream gaging station data, and precipitation and temperature data measured at public weather stations or downloaded from spatially gridded datasets. Watermaster collects stormwater, imported water, and recycled water recharge data from the IEUA. Watermaster also collects quarterly surface-water quality samples from two sites along the Santa Ana River to support the Maximum Benefit program.

***Ground level monitoring***. The Watermaster's ground-level monitoring program is conducted pursuant to the Chino Basin Subsidence Management Plan. The objective of the plan is to minimize or abate the occurrence of land subsidence and groundwater fissuring within the Chino Basin. Exhibit L-6 depicts the ground-level monitoring program, which is focused across the western portion of Chino Basin within defined Areas of Subsidence Concern—areas of Chino Basin that are susceptible to land subsidence. The ground-level monitoring program consists of the following:

- Watermaster conducts high-frequency, piezometric level monitoring at about 60 wells as part of its ground-level monitoring program. A pressure-transducer/data-logger is installed at each of these wells and records one water-level measurement every 15 minutes. Data loggers also record depth-specific piezometric levels at the piezometers located at Watermaster's Ayala Park Extensometer and Chino Creek Extensometer facilities once every 15 minutes.
- Watermaster installed two extensometers in the MZ1 Managed Area to support the MZ1 Interim Monitoring Program and two extensometers in the Southeast Area understand the effects of pumping at the newly constructed Chino Creek Well Field. Both extensometer facilities record the vertical component of aquifer system compression and expansion once every 15 minutes, synchronized with the piezometric measurements, to understand the relationships between piezometric changes and aquifer-system deformation.
- Watermaster monitors vertical ground-motion via traditional elevation surveys at benchmark monuments and via remote sensing (InSAR) techniques established during the IMP. Elevation surveys are typically conducted in the MZ1 Managed Area, Northwest MZ1 Area, Northeast Area, and Southeast Area once per year. Vertical ground-motion data, based on InSAR, are collected about every two months and analyzed once per year.
- Watermaster monitors horizontal ground-surface deformation across areas that are experiencing differential land subsidence to understand the potential threats and locations of ground fissuring. These data are obtained by electronic distance measurements (EDMs) between benchmark monuments in two areas: across the historical zone of ground fissuring in the MZ1 Managed Area and across the San Jose Fault Zone in Northwest MZ1.

Watermaster convenes a Ground-Level Monitoring Committee (GLMC) annually to review and interpret data from the ground-level monitoring program. The GLMC prepares annual reports that include recommendations for changes to the monitoring program and/or the Subsidence Management Plan, if such changes are demonstrated to be necessary to achieve the objectives of the plan.

***Biological monitoring***. The Watermaster's biological monitoring program is conducted pursuant to the adaptive monitoring program (AMP) for the Prado Basin Habitat Sustainability Program (PBHSP). The objective of the PBHSP is to ensure that groundwater-dependent riparian habitat in Prado Basin will not incur unforeseeable significant adverse effects due to implementation of the Peace II Agreement. Exhibit L-7 depicts the Riparian Habitat Monitoring Program (RHMP) for the PBHSP. It produces a time series of data and information on the extent and quality of the riparian habitat in the Prado Basin over a historical period that includes both pre- and post-Peace II implementation. Two types of monitoring and assessment are performed: regional and site-specific. Regional monitoring and assessment are appropriate because the main potential stress associated with Peace II activities is the regional drawdown of groundwater levels. The intent of site-specific monitoring and assessment is to verify and complement the results of the regional monitoring.

- Regional monitoring of riparian habitat: Regional monitoring and assessment of the riparian habitat is performed by mapping the extent and quality of riparian habitat over time using: (i)

multi-spectral remote-sensing data, Normalized Difference Vegetation Index (NDVI), and (ii) air photos.

- Site-specific monitoring of riparian habitat: Site-specific monitoring performed in the Prado Basin includes field vegetation surveys and seasonal ground-based photo monitoring. The most current vegetation survey conducted for the PBHSP was performed by the United State Bureau of Reclamation (USBR) in 2016, consisting of 38 sites in the Prado Basin: 24 previously established USBR sites and 14 new sites primarily located near the PBHSP monitoring wells.

Watermaster convenes the Prado Basin Habitat Suitability Committee (PBHSC) annually to review and interpret data from the RHMP. The PBHSC prepares annual reports that include recommendations for RHMP and other monitoring for the PBHSP, if such changes are demonstrated to be necessary to achieve the objectives of the PBHSP.

***Water-supply and water-use monitoring***. Watermaster compiles water supply and use data from the Parties to support two required reporting efforts: the Watermaster Annual Report to the Court and annual reporting requirements for adjudicated basins pursuant to the Sustainable Groundwater Management Act (SGMA). Monthly water use volumes for supply sources other than Chino Basin groundwater are collected from the Parties; this includes groundwater from other basins, recycled water, imported water, and native surface water. This data is collected and compiled twice per year to support fiscal year reporting for the Annual Report and water year reporting for the SGMA.

***Planning information***. Watermaster periodically compiles future water supply plans from the Parties. The data collected as part of that process represents the Parties' best estimates of their demands and associated water supply plans and are used for future planning investigations (e.g. Safe Yield recalculations and recharge master plan updates). The data collected includes:

- Water supply plans of the Watermaster Parties, including:
    - i. Projected total water demand
    - ii. Projected amount of each water supply by source to meet the projected water demand
    - iii. Monthly distribution of demand and water supplies used to meet the demand
    - iv. Projected groundwater pumping at each currently active well and future planned wells
    - v. Groundwater pumping schedules (well use priorities and capacities)
    - vi. Pumping capacities, required pumping combinations, and sustainable pumping levels (pumping sustainability metric) at each well
- Assumptions for how:
    - vii. Managed storage will be used to meet Replenishment Obligations.
    - viii. Lands currently in agricultural uses will be converted to urban uses.
    - ix. Additional potential conservation above that currently required for new land development will occur.
- Future projections of location and magnitude of storm and Supplemental Water recharge

***Well construction, abandonment, and destruction***. Watermaster maintains a database on wells in the basin and Watermaster staff makes periodic well inspections. Watermaster staff sometimes finds a new well while implementing its monitoring programs. Watermaster needs to know when new wells are constructed as part of its administration of the Judgment. Valuable information for use in managing the Chino Basin is developed when wells are constructed, including: well design, lithologic and geophysical logs, groundwater level and quality data, and aquifer stress test data. Well owners must obtain permits from the appropriate county and state agencies to drill a well and to put the well in use. Watermaster has

developed cooperative agreements with the Counties of Los Angeles, Orange, Riverside, and San Bernardino, and DDW to ensure that the appropriate entities know that a new well has been constructed. Watermaster staff makes best efforts to obtain well design, lithologic and geophysical logs, groundwater level and quality data, and aquifer stress test data. The presence of abandoned wells is a threat to groundwater supply and a physical hazard. Watermaster staff periodically reviews its database, makes appropriate inspections, consults with well owners, maintains a list of abandoned wells in the Chino Basin, and provides this list to the counties for follow-up and enforcement. The owners of the abandoned wells are requested to properly destroy their wells following the ordinances developed by the county in which the abandoned well is located.

#### *Considerations for updating the monitoring and reporting programs*

Financial resources are limited, and the Parties desire to conduct these monitoring and reporting programs to satisfy each requirement efficiently at minimum cost. As documented in Exhibit L-1, the scope of Watermaster's monitoring and reporting programs has evolved over time with new or changing regulations, obligations, and management initiatives.

Watermaster staff and its engineer continually review and revise the monitoring programs to collect the minimum data necessary to meet the objectives of the monitoring and reporting requirements. In some instances, Watermaster convenes special committees to analyze monitoring data and develop recommendations for revisions to the programs. What has not been performed by Watermaster in the recent past is a comprehensive review of all monitoring and reporting programs in an open stakeholder process.

To achieve the Parties' desire to satisfy all monitoring and reporting requirements at minimum cost, Activity L should begin with a comprehensive review of each of Watermaster's requirements for monitoring and reporting and a discussion of if and how the programs could be revised. The review should be performed in an open stakeholder process should consider:

- the objectives of the monitoring and reporting program,
- the minimum datasets required to meet the objectives,
- the prospective loss of private (or other) wells that are currently used in the Watermaster's monitoring programs and how they can be cost-effectively replaced over time,
- the methods used to analyze the data, and
- the reporting frequency and content.

In some cases, revision of the monitoring and reporting programs will require Court approvals, regulatory approvals, or modification/amendment to CEQA documents.

Ultimately, Activity L will produce a *Monitoring and Reporting Work Plan* that documents the programs and will be used to define the Watermaster's annual monitoring scope and budget. The *Monitoring and Reporting Work Plan* will be updated as needed to respond to changed conditions within any of the programs with opportunity for input and feedback from the Parties.

### Scope of Work for Activity L

The scope of work for Activity L – *Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance* consists of the following tasks:

- Task 1 – Convene Monitoring and Reporting Committee and prepare the *Monitoring and Reporting Work Plan*
- Task 2 – Implement recommendations in *Monitoring and Reporting Work Plan*

- Task 3 (recurring future task) – Conduct monitoring and reporting programs and prepare annual updates to Monitoring and Reporting Work Plan

*Task 1 – Convene Monitoring and Reporting Committee and prepare the Monitoring and Reporting Work Plan.* The objectives of this task are to:

- Update the Parties on all Watermaster monitoring and reporting requirements associated with regulations and obligations under its agreements, Court orders, and CEQA.
- Review the current monitoring and reporting programs that are designed to satisfy all Watermaster requirements.
- Develop recommendations for a revised monitoring and reporting program, including a scope of work and cost estimates to implement the recommendations.
- Document all Watermaster monitoring and reporting programs in a *Monitoring and Reporting Work Plan*. For each monitoring program, the work plan will include: a statement of objectives/requirements, the monitoring program to satisfy the requirements, the methods for evaluating data, the frequency for data analysis and reporting, and a schedule for initiating future updates to the plan, including construction of new monitoring wells (if needed).
- Prepare a technical memorandum to document the recommendations and a proposed process to revise the monitoring and reporting programs that require specific regulatory and/or Court approvals for modification. The memorandum will describe the anticipated cost savings that the Parties will realize if the revisions to the monitoring and reporting programs are approved. The memorandum will be titled: *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*.

A series of six committee meetings will be conducted over an 18-month period to achieve these objectives.

*Task 2 – Implement recommended revisions to Watermaster's non-discretionary monitoring and reporting programs.* In this task, the plan described in the *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs* will be implemented. This task will likely require technical demonstrations to the appropriate regulatory body (e.g. Regional Board, the Court, etc.) to gain approval for revisions to the monitoring program, report content, and/or report frequency. This task may be a multi-step, multi-year process to implement all recommended revisions. The results of this task will result in future updates to the *Monitoring and Reporting Work Plan*. Updates will be incorporated as they are approved.

*Task 3 (recurring future task) – Bi-Annual review of scope of work and cost to implement the Monitoring and Reporting Work Plan in the subsequent fiscal year.* In the first quarter of every other calendar year, the Monitoring and Reporting Committee will meet to review any changes to the *Monitoring and Reporting Work Plan* and the scope of work and budget for the subsequent fiscal year. The work plan updates and subsequent fiscal year budget will incorporate the recommendations made by special committees (such as the Ground-Level Monitoring Committee), any approved changes resulting from work performed in Task 2, and other changed conditions of the monitoring and reporting programs. The annual review can also include discussion and consideration of additional recommendations for efficiencies suggested by the Parties.

### Cooperative Efforts with Appropriate Entities to Implement Activity L

This is a basin-wide activity that involves the Parties. Watermaster's role will be to convene the Monitoring and Reporting Committee; to coordinate and administer its activities and meetings; to ensure that the recommendations derived from this effort are consistent with the Judgment, Peace Agreements and other

agreements, Court orders, state and federal regulations, and CEQA requirements; and to execute the *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*.

### Implementation Actions, Schedule, and Costs for Activity L

The recommended schedule to complete the scope of work is described below:

**Year one and two:**

- Convene Monitoring and Reporting Committee and prepare the *Monitoring and Reporting Work Plan*.
- Prepare memorandum: *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*.

**Year three and beyond:**

- Implement *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*.
- Perform bi-annual review of scope of work and cost to implement the *Monitoring and Reporting Work Plan*.

Exhibit L-8 shows the estimated budget-level cost opinion to complete Task 1, which is about $165,000. The cost of Tasks 2 and 3 cannot be estimated until the completion of Task 1.

## Activities H, I, and J

### Description of Activities H, I, and J

Activities H, I, and J as defined by the stakeholders are intended to equitably allocate and minimize the cost of OBMP implementation. The fourth goal of the 2000 OBMP and the 2020 OBMP Update is to *Equitably Finance the OBMP*. As described in Section 3 of this Scoping Report, the intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation. Three of the activities defined by the stakeholders address equity and cost.

Activity H is to:

> *Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP Update agreements*

Activity I is to:

> *Develop regional partnerships to implement the OBMP Update and reduce costs and include in the OBMP Update agreements*

Activity J is to:

> *Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update*

Through the listening session process, the stakeholders identified the following desired outcomes from Activities H, I, and J:

- Provide transparency as to the benefits of the OBMP Update activities, including identification of who benefits.
- Clearly identify Watermaster's roles in OBMP implementation and the associated future assessment costs to the Parties.
- Provide information needed to plan financial resources, such as cost projections similar to a Master Plan process.
- A formal process to revisit the OBMP implementation plan and adjust priorities and schedules as necessary to address changed conditions.
- Improve readiness to apply for grants as they become available.
- Increase the likelihood that the OBMP will be implemented.
- Keep the cost of OBMP implementation as low as possible by obtaining grants and low-interest loans.

As noted above, the fourth goal of the 2000 OBMP is to equitably finance the OBMP, however there were no PEs in the OBMP IP related to this goal. The Peace and Peace II Agreements and OBMP project implementation agreements established cost allocations for certain activities. The benefit and cost allocations included in these agreements were based on negotiations among the Parties and encouraged the use of grant funding to build projects. These funding agreements were deemed equitable when they were developed, and they are in use today.

Together, the management framework of the OBMP IP and implementation agreements enabled the Parties to obtain tens of millions of dollars in grants and other outside funding to implement the 2000 OBMP, including for the Chino Basin Desalters, RMPU recharge facilities, and the recycled water recharge program. In 2018, a contingent grant in the amount of $200 million was awarded to IEUA for the regional CBP Storage and Recovery Program.

## Need and Function of Activities of H, I, and J

### *Benefits of the OBMP*

To support the Parties' consideration of the Peace II Agreement, Watermaster contracted with Dr. David L. Sunding to prepare the *Report on the Distribution of Benefits to Basin Agencies from the Major Program Elements Encompassed by the Peace Agreement and Non-Binding Term Sheet*. The economic analysis estimated the costs and benefits of the implementation of the PEs encompassed by the Peace I and Peace II Agreements to the ten Chino Basin appropriator Parties with the largest water rights in the Judgment (they are listed in the table below). These ten Parties account for 91.2 percent of the Operating Safe Yield. The allocation of aggregate costs and benefits to the individual agencies in the basin was computed based on a complex set of legal rules (such as share of Operating Safe Yield), cost-sharing arrangements for implementation, and market forces. The estimated net present value benefits, expressed in 2007 dollars (2007$), to the Parties were primarily based on the value of (1) the gains in pumping created by implementation of the agreements and (2) the offset of the purchase of Tier 2 supplies from Metropolitan for replenishment. The study estimated that together the Peace I and Peace II Agreements would provide over $904 million dollars in net present value benefits to the Parties (2007$) for the implementation period of 2007 to 2030. The following table summarizes the net benefits to the ten agencies, as reported by Sunding:

| Party | Net Benefit (2007$) |
|---|---|
| Chino | $95,966,000 |
| Chino Hills | $73,537,000 |
| Ontario | $232,271,000 |
| Upland | $44,086,000 |
| CVWD | $278,128,000 |
| Fontana | $30,268,000 |
| MVWD | $40,480,000 |
| SAWCo | $7,136,000 |
| Jurupa | $35,254,000 |
| Pomona | $67,537,000 |
| Total | $904,663,000 |
| Average | $90,466,300 |

Based, at least in part, on these expected benefits, the Parties executed the Peace II Agreement.

During the listening session process, some stakeholders expressed opinions that the distribution of benefits projected by the Sunding work had not come to fruition, that there is a lack of clarity as to the distribution of benefits of the various PEs in the OBMP IP, and that the allocation of the cost of OBMP implementation may not be equitable. And, some stakeholders have expressed concern about participating in new or expanded efforts without first understanding the benefits received to date,

performing an analysis of potential future benefits, and assessing the equitable allocation of benefits and costs.

Since the Sunding report was published, no additional work has been done to quantify the benefits that have resulted from OBMP implementation or to update the projection of benefits based on changed conditions. In 2013, the Appropriative Pool Parties discussed performing an updated economic analysis, but ultimately, they elected not to do it.

*Costs of the OBMP*

The costs of OBMP implementation include, among others:

- Watermaster expenses for engineering work to implement the OBMP IP, including implementation costs of certain projects (e.g. monitoring/reporting and construction of extensometers and monitoring wells)
- Watermaster expenses for other project costs, including recharge debt payments, improvement projects, recharge operations and maintenance costs, recharge, and the Pomona Credit
- Desalter replenishment and related monitoring expenses
- IEUA recycled water recharge costs
- Individual agency costs for water management activities impacted by the OBMP

As previously noted, the Peace and Peace II Agreements and OBMP project implementation agreements established cost allocations for certain activities. Watermaster-related costs for OBMP implementation are assessed annually as part of the Assessment Package. No calculation of the total OBMP costs incurred to date has been performed.

*Benefits and costs of the 2020 OBMP Update*

Some of the tasks within the 2020 OBMP Update activities provide broad benefit to the Parties and are essential to the Watermaster to do its job to implement the Physical Solution. Some 2020 OBMP Update activities could result in the construction of projects that will provide benefits to all stakeholders or may only provide benefits to a subset of stakeholders.

Based on the scopes of work described herein for the 2020 OBMP Update activities (A, B, CG, D, EF, K and L), there are at least 2-4 years of scoping and preliminary engineering work that would need to be performed to evaluate and select projects envisioned by the 2020 OBMP Update activities and to develop the level of detail required to quantify the benefits and costs from project implementation. Exhibit HIJ-1 illustrates the four phases of work and associated schedule for each of the 2020 OBMP Update activities, assuming that all activities would be initiated in July 2020.[34] The phases shown are: (1) scoping, (2) evaluation of the need for projects, (3) project alternatives evaluation, and (4) project implementation. The exhibit also illustrates the go-no-go decision points to proceed with the activity.

The detail required to quantify the benefits and costs of projects (including ongoing needs for monitoring and assessment) would be developed during the project alternatives evaluation phase. Once the benefits and costs for projects are quantified, the Parties will be able to review them, consider whether or not they want to participate in projects that provide benefits to participants only, and establish equitable cost allocations for the implementation actions that provide specific benefits.

[34] This exhibit is for demonstrative purposes as the parties have yet to finalize the activities for inclusion in the OBMP Update or define a scheduled to implement them.

*Grant funding and regional partnerships to minimize the costs of OBMP implementation*

In the future, it is anticipated that it will become increasingly difficult to secure grants and low-interest loans due to increased competition. Most grant and low-interest loan programs require, or heavily favor, projects that are within watersheds and groundwater basins with adopted integrated regional management plans, groundwater sustainability plans, or their equivalents. The 2020 OBMP Update is equivalent to a regional water resources and groundwater management plan. The first three phases of each activity described in the prior subsection and shown in Exhibit HIJ-1 should be completed to maximize the ability to be competitive when applying for grants and low-interest loans, or in securing regional funding partners. Assessing cost/benefit at a level of detail appropriate to meet the needs of the stakeholders in establishing equitable cost allocations during the project alternatives evaluation phase will enable the Parties (1) to evaluate projects in a manner that is comprehensive and clear and (2) to enter into regional partnerships and apply for grant opportunities with greater certainty as to the expected benefits and costs.

## Scope of Work for Activities H, I, and J

The objectives for Activities H, I, and J can be efficiently met by incorporating tasks within the other activities to characterize the benefits and costs of the projects produced by the activities. This section describes how the scopes of work of the other 2020 OBMP Update activities can accomplish the objectives of Activities H, I, and J.

As described throughout this Scoping Report, each activity has tasks related to identifying and evaluating project alternatives to achieve the activity's objectives (e.g. project evaluation). The project evaluation phase includes the following generalized steps:

1. Develop planning, screening, and evaluation criteria for projects
2. Identify the potential project alternatives
3. Develop reconnaissance-level engineering design and operating plans for each alternative
4. Develop an engineering cost opinion for each alternative
5. Describe how each alternative could be implemented and financed
6. Evaluate project alternatives based on the evaluation criteria
7. Select the preferred project alternative

At such time that each activity reaches the project evaluation phase, the scope of work for project evaluation should include a process to articulate and value the benefits of interest to the stakeholders in establishing equitable cost allocations, considering whether a project has broad basin management benefits and the benefits to specific Parties. Examples of benefits include new yield, water supply reliability, and water quality improvements. The project benefits to analyze and value would be defined during the first step to develop criteria for selecting projects. In step five, the alternative evaluation would include a characterization of implementation benefits and costs (Watermaster expenses and other costs) and their allocation to participants under various levels of participation and cost allocation methods. The benefit and cost projections, together with the other engineering analyses, could then be used by the Parties to select a cost allocation method, prepare projections of costs to support planning of financial resources for implementation, and develop a project implementation agreement that will clearly establish the allocation of benefits and costs to each Party. With regard to the identification and valuation of benefits, the Parties could address this on a case-by-case (project-by-project) basis, or by developing and agreeing to a standard set of benefits to analyze and quantify for every project to achieve equitable cost allocations.

The steps to achieve an equitable allocation of benefits and costs should be addressed in the agreement that will be developed by the Parties to implement the 2020 OBMP Update. The 2020 OBMP implementation agreement could be designed to ensure that the desired extent of cost/benefit assessments are performed to support equitable cost allocations in the implementation of activity scopes of work, to anticipate and accommodate the development of project implementation agreements that define the project-specific cost/benefit allocation, and to periodically update cost projections for implementation of the 2020 OBMP Update activities and associated projects to support planning of financial resources.

### Cooperative Efforts with Appropriate Entities to Implement Activities H, I, and J

The Parties that will participate in projects developed through the implementation of the 2020 OBMP Update activities would need to agree to an allocation of costs for the implementation of the projects and document the allocation in the project implementation agreements. Watermaster's role will be to assess certain costs associated with implementation. Watermaster will continue to assess the costs of ongoing OBMP implementation efforts that provide broad benefits to the Parties pursuant to existing agreements and would allocate costs of the implementation of new activities/projects based on the new implementation agreements developed for the 2020 OBMP Update.

### Implementation Actions, Schedule, and Costs for Activities H, I, J

Other than the performance of tasks associated with the assessment of benefits and costs within each 2020OBMP Update activity, there are no separate implementation actions associated with this activity as the future implementation agreements will make such considerations. Depending on the types of benefits that need to be quantified and valued to define equitable cost allocations, the project evaluation costs estimated herein for Activities A and D could be higher. (Note that these are the only two activities that have budget-level cost-estimates for project evaluation).

The *2020 OBMP Update: Implementation Plan Report*, which is the next work product of the 2020 Update, will include an implementation plan and schedule for each of the 2020 OBMP Update activities selected for implementation by the stakeholders and a projection of associated Watermaster costs to support the planning of financial resources for implementation.

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reductions in Chino Basin Safe Yield*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage Storage and Recovery Programs | ● | ● | | ● | ● | | | ● | ● | ● | ● | | ● | | ● | | ● | | | | B, C | 1, 2, 3 |
| Design storage management and storage & recovery programs that maintain or enhance Safe Yield | ● | ● | | | | | | ● | ● | ● | | | ● | | ● | | ● | | | ● | B, C | 1, 3 |
| Maintain or enhance the Safe Yield of the basin without causing undesirable results | ● | ● | | ● | ● | | | ● | ● | ● | ● | | | | ● | | ● | | | ● | B, D | 1, 3 |
| Manage the basin Safe Yield for the long-term viability and reliability of groundwater supply | ● | ● | | | | | | ● | ● | ● | ● | | | ● | | | ● | ● | | ● | A, B, C | 1, 3 |
| Reassess the frequency of the Safe Yield recalculation | ● | | | | ● | | | | | | | | | | | | ● | | | | I | 3 |
| Continue to model and track Safe Yield, but utilize other management strategies to address a decline. | | | | | | | | | | | | | | | | | ● | | | | B | 1, 3 |
| Develop recharge programs that maintain or enhance Safe Yield | ● | ● | | | | | ● | ● | ● | ● | | | | | ● | | ● | | | ● | A, B | 1, 3 |
| Develop more facilities to capture, store, and recharge water | ● | ● | | | | | ● | | | ● | ● | | | | ● | | ● | | | | A, B, D | 1, 2 |
| Enhance recharge in northeast MZ-3 | ● | | ● | | | | | | ● | | | | | | | | ● | | | | A, C | 1, 3 |
| Maximize use of existing recharge facilities | ● | ● | | | | | | ● | ● | ● | | | | | | | | | | | A, C, F, G | 3 |
| Establish incentives to encourage recharge of high-quality imported water | ● | | ● | | | | | | | | | | | | | | | | | | H, I | 2, 3 |
| Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements | ● | ● | | | | ● | | ● | | | | | | | | | | | | | C, E | 3 |
| Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or Safe Yield | ● | | | | | | | | | | | | | | ● | | ● | | | ● | I, D | 3 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Inability to Pump Groundwater with Existing Infrastructure*** | | | | | | | | | | | | | | | | | | | | | | |
| Pursue collaborative, regional partnerships to implement regional solutions to water management challenges | ● | | | ● | ● | | | ● | | | | | | | ● | ● | ● | ● | ● | ● | B, E, F, G, I | 3 |
| Ensure that sufficient, reliable water supplies will be available to meet current and future water demands | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | ● | | A, B, D, G | 1, 3 |
| Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program | ● | | | | | | ● | ● | ● | | | | | | ● | | ● | ● | | | B, G, I | 1, 2, 3 |
| Develop management strategies that enable the Parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality | ● | | | | | | ● | ● | | | | | | | ● | | ● | | | | A, C, D, E, F, G, I | 3 |
| Design storage management and storage & recovery programs to raise funding to build infrastructure | ● | | | ● | | | | | | | | | | | ● | | ● | | | | B, D, I, J | 3, 4 |
| Develop process to support/facilitate project implementation | ● | | | | | | | | | | | | | | | | | | | | F, H, J | 4 |
| Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2 | ● | | | | | | ● | ● | | ● | | | | ● | ● | | | | | | A, C, G | 3 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Increased Cost of Groundwater Use*** | | | | | | | | | | | | | | | | | | | | | | |
| Seek supplemental financial resources to support the implementation of the OBMP Update | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | | ● | | D, F, G, I, J | 4 |
| Develop regional partnerships to help reduce costs | ● | | | ● | | | ● | ● | ● | | | | | | ● | ● | ● | | | ● | F, G, I, J | 4 |
| Monetize agencies' unused water rights for equitable balance of basin assets | | | ● | | | | | | | | | | | | | | | | | | G, H | 4 |
| Decrease Watermaster assessment costs | ● | | | | ● | | | ● | | | | | | | | | | | | | I, J | 4 |
| Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure | ● | ● | | | | | | | ● | | | | | | | | ● | | | | F, G, H | |
| Develop an equitable distribution of costs/benefits of the OBMP | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | ● | ● | | | | | | H, J | 4 |
| Watermaster assessments for implementation of the OBMP should be allocated based on benefits received | ● | | | | ● | | | | | | | | | | | | | | | | H | 4 |
| Continue or enhance incentives to pump groundwater from the Chino Basin | | | ● | | | | | | | | | | | | | | | | | | G, I | 3, 4 |
| Improve flexibility for Parties to execute water rights transfers | | | | | | | | | | | | | | ● | | | | | | | G, I | 4 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Chino Basin Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop a water quality management plan to ensure ability to produce groundwater rights | ● | ● | | ● | | | ● | ● | ● | ● | | | | ● | ● | | ● | ● | | | E, F, G, J | 2, 3 |
| Develop regional infrastructure to address water quality contamination and treatment | | | | ● | ● | | | ● | | | | | | | | | | | | | A, B, C, E, F, G, I, J | 2 |
| Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | ● | | ● | | | | E, F | 2 |
| Be more proactive and engaged in the process to develop new drinking water quality regulations | | | | | | | | ● | | | | | | | | | | | | | A, B, D, E, G, J | 2 |
| ***Recycled Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | | | | |
| Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit | | ● | | | | | ● | ● | ● | ● | | | | ● | ● | | | | | | A, B, D, E, G, J | 2 |
| ***Increased Cost of Basin Plan Compliance*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan | ● | ● | | | | | | | | | ● | | | | ● | | ● | | | | G, K | 2 |
| Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance | ● | | | ● | | | ● | ● | | | | | | | | | | | | | L | 3, 4 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reduced Recycled Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | | | | |
| Fully utilize IEUA recycled water resources | | ● | | ● | | | ● | ● | | ● | | | | | ● | | | | | | A, D, E, F, G | 1 |
| Maximize the use of recycled water for direct use or recharge | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | | | | | | A, D, E, F, G | 1 |
| Evaluate the potential for direct potable reuse of recycled water | ● | | | | | | | | ● | | | | | | ● | | | | | | D, E, F | 1 |
| Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River | ● | ● | | ● | | | ● | ● | | ● | | | | | ● | | ● | | | | D, E, F | 1, 3 |
| Utilize non-IEUA sources of recycled water that are not being put to beneficial use | ● | ● | | | | | ● | ● | ● | ● | | | | | ● | | ● | | | | D, E, F | 1 |
| ***Other*** | | | | | | | | | | | | | | | | | | | | | | |
| Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update | ● | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | F, G, H, I, J | |
| Improve communication between the Parties | ● | | | ● | | | | ● | | | | | | ● | ● | | ● | | | | F, H, I | |
| Educate elected officials and decision makers on the need and urgency to address the water management challenges | ● | ● | | | | | | | ● | | | | | | ● | ● | ● | | | | F, G, H, I, J | |
| Consider a long-term planning horizon of up to 50 years | ● | | | | | | | | ● | ● | | | | | ● | | | | | | F, G, H, I, J | 3 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reduced Imported Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | | | | |
| Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | ● | | | B, C, G | 1, 3 |
| Identify and utilize new sources of supplemental water | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | | | | A, B | 1, 3 |
| Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use | ● | ● | | ● | | | ● | ● | ● | | | ● | | | ● | ● | ● | ● | | | C, G | 1, 3 |
| Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix | ● | | | | | | | ● | ● | | | | | | ● | ● | ● | | | | - | 1, 3 |
| Develop management strategies that ensure Parties will meet future Chino Basin Desalter Replenishment Obligation and have the money to fund it | ● | ● | | ● | | | ● | | ● | | | | | | | | ● | | | ● | H, I, J | 3 |
| Increase water-supply reliability at the lowest possible cost | ● | | | ● | | | ● | ● | | | | ● | | ● | ● | | ● | | | | A, B, D, J | 3 |
| Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply | ● | | | ● | | | | | ● | | | ● | | | ● | ● | ● | ● | | | A | 3 |
| Analyze water management scenarios that plan for unexpected challenges and emergencies | ● | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | E, G | 3 |
| Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements | | | | | | | ● | | ● | ● | | ● | | | ● | | | | | ● | A | 1, 3 |
| Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase | ● | | | | | | | | | | | | | | | | | | | | - | 3 |
| Use more recycled water for Replenishment Obligation | ● | | | ● | | | ● | | ● | | | | | | | | ● | | | | A, D, E, F | 3 |
| Continue to build collaborative programs between the Metropolitan Water District and Chino Basin | ● | | | | | | ● | ● | ● | | | | | | ● | | ● | ● | | | B, I | 3 |

**Table 2**
**Activities for Consideration in the 2020 OBMP Update**

| ID | Activity |
|---|---|
| A | Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge |
| B | Develop, implement, and optimize Storage-and-Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality. |
| C | Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence. |
| D | Maximize the reuse of recycled water produced by IEUA and others |
| E | Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses |
| F | Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality |
| G | Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure. |
| H | Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements |
| I | Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement |
| J | Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update |
| K | Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge |
| L | Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance |

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reductions in Chino Basin Safe Yield | Inability to Pump Groundwater with Existing Infrastructure | Increased Cost of Groundwater Use | Chino Basin Water Quality Degradation | Recycled Water Quality Degradation | Increased Cost of Basin Plan Compliance | Reduced Recycled Water Availability and Increased Cost | Reduced Imported Water Availability and Increased Cost |
| ***Goal 1 - Enhance Basin Water Supplies*** | | | | | | | | | | |
| 1a • Not all of the stormwater runoff available to the Chino Basin is diverted and recharged; failure to divert and recharge stormwater is a permanently lost opportunity.<br><br>• The existing methodology to select recharge projects for implementation is based on the cost of imported water. There are currently no known projects with a unit cost lower than the cost of imported water, hindering expansion of stormwater capture and recharge<br><br>• Pumping capacity in some areas of the basin is limited due to low groundwater levels, land subsidence, and water quality | A Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge | • Increases recharge of high-quality stormwater that will:<br>• protect/enhance the Safe Yield,<br>• improve water quality,<br>• reduce dependence on imported water,<br>• increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and<br>• provide new supply of blending water to support the recycled-water recharge program.<br><br>• Provides additional supplemental-water recharge capacity for replenishment and implementation of Storage and Recovery Programs.<br><br>• Provides additional surface water storage capacity.<br><br>• Revised economic criteria for selecting recharge projects for implementation. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
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| ***Goal 1 - Enhance Basin Water Supplies*** | | | | | | | | | | |
| 1b • There is a surplus of recycled water potentially available to the Chino Basin Parties that is not being put to beneficial use.<br><br>• Existing infrastructure limits the expansion or reuse and recharge of recycled water in the Chino Basin.<br><br>• Existing requirements to discharge recycled water to the Santa Ana River limit the amount of IEUA recycled water available for reuse and recharge<br><br>•The Department of Drinking Water and the Regional Board blending requirements for recycled water recharge could limit expanded recharge opportunities | D Maximize the reuse of recycled water produced by IEUA and others | • Results in a new, consistent volume of in-lieu and/or wet water recharge that will:<br>• protect/enhance the Safe Yield,<br>• reduce dependence on imported water,<br>• improve water-supply reliability, especially during dry periods, and<br>• increase pumping capacity in areas of low groundwater levels and areas of subsidence concern.<br><br>• Identify additional sources of water to satisfy IEUA discharge requirements pursuant to the Santa Ana River Judgment. | ✓ | ✓ | | | | | ✓ | ✓ |

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

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| ***Goal 2 - Protect and Enhance Water Quality*** | | | | | | | | | | |
| 2a • Areas of the basin are contaminated with VOCs, nitrate, perchlorate and other contaminants of emerging concern (CECs).<br><br>• Water-quality regulations are evolving and becoming more restrictive, which limits the beneficial uses of groundwater.<br><br>• Groundwater treatment may be necessary to meet beneficial uses, but can be expensive to build and operate.<br><br>• The basin is hydrologically closed, which causes accumulation and concentration of salts, nutrients, and other contaminants.<br><br>• Some stored water in the Chino Basin cannot be used due to water quality and insufficient treatment capacity<br><br>• Recharge sources may contribute CECs to the groundwater basin | E Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses<br><br>F Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality | • Proactively addresses new and near-future drinking water regulations.<br><br>• Enables the Parties to make informed decisions on infrastructure improvements for water-quality management and regulatory compliance.<br><br>• Removes groundwater contaminants from the Chino Basin and thereby improves groundwater quality.<br><br>• Enables the Parties to produce or leverage their water rights that may be constrained by water quality.<br><br>• Ensures that groundwater is pumped and thereby protects/enhances the Safe Yield. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| 2b • Water-quality regulations are evolving and generally becoming more stringent, which could limit the reuse and recharge of recycled water. | K Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge | • Enables the continued and expanded recharge of recycled water, which will:<br>• protect water quality,<br>• improve water-supply reliability, especially during dry periods, and<br>• protect/enhance the Safe Yield. | ✓ | | | ✓ | ✓ | ✓ | | ✓ |

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

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| ***Goal 3 - Enhance Management of the Basin*** | | | | | | | | | | |
| 3a • Existing infrastructure (pumping and treatment capacity and conveyance) is insufficient to conduct puts and takes under proposed storage programs.<br><br>• There is unused storage space in the Basin the use of which is constrained by the storage limits defined in existing CEQA documentation.<br><br>• Watermaster's current storage management plan is not optimized to protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc.<br><br>• Storage and recovery operations could be limited by contaminant plumes or other CECs in groundwater | B Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality. | • Storage programs that protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc.<br><br>• New regional infrastructure to optimize put and take operations<br><br>• Leverages unused storage space in the Basin.<br><br>• Reduces reliance on imported water, especially during dry periods.<br><br>• Potentially provides outside funding sources to implement the OBMP Update.<br><br>• Improves water quality through the recharge of high quality water. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

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| ***Goal 3 - Enhance Management of the Basin*** | | | | | | | | | | |
| 3b • Land subsidence in northwest MZ1 may limit the ability for Parties to pump their respective rights in this area.<br><br>• Poor water quality and increasingly restricting water quality regulations limits the ability for some Parties to pump their respective rights.<br><br>• Low groundwater levels impact pumping capacity | C Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.<br><br>G Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure. | • Enables producers in MZ1 and MZ2 to obtain water through regional conveyance, which supports management of groundwater levels to reduce the potential for subsidence and ground fissuring.<br><br>• Enables the Parties to increase production in areas currently constrained by poor water quality.<br><br>• Removes groundwater contaminants from the Chino Basin and thereby improves water quality.<br><br>• Protects/enhances the Safe Yield.<br><br>• Maximizes the use of existing infrastructure, which will minimize costs.<br><br>• Provides infrastructure that can also be used to implement Storage and Recovery Programs. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| 3c • Watermaster needs information to comply with regulations and its obligations under its agreements and Court orders, yet financial resources to collect this information are limited. | L Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance | • Ensures full compliance with regulatory requirements.<br><br>• Ensures full support of basin management initiatives.<br><br>• Enables Parties to monitor the performance of the OBMP Update.<br><br>• Continual review and revision of requirements and monitoring program to ensure cost efficiency | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

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| ***Goal 4 - Equitably Finance the OBMP*** | | | | | | | | | | |
| 4a • The distribution of benefits associated with the OBMP Update is not defined.<br><br>• Funding needed for the OBMP implementation activities of the Watermaster is not projected beyond the current year budget, which limits Parties ability to plan required funding for the future.<br><br>• There is currently no formal process to evaluate and adapt the OBMP implementation plan, schedule and cost. | H Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements | • Provides transparency as to the benefits of the OBMP Update activities<br><br>• Identifies Watermaster roles and costs to the Parties<br><br>• Formal process to revisit implementation plan and adjust priorities and schedule as necessary to address changed conditions<br><br>• Periodic updates of cost projections for OBMP implementation needed to plan financial resources.<br><br>• Improves readiness to apply for grants as they become available<br><br>• Improves the likelihood that the OBMP will be implemented. | | | ✓ | | | ✓ | ✓ | ✓ |
| 4b • Limited financial resources constraint the implementation of the OBMP.<br><br>• Future reliability of grant funding is uncertain | I Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement | • Lowers the cost of OBMP implementation.<br><br>• Improves the likelihood that the OBMP will be implemented. | | | ✓ | | | ✓ | ✓ | ✓ |
| | J Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update | | | | ✓ | | | ✓ | ✓ | ✓ |

Appendix C

## Figure 1 – Drivers and Trends and Their Implications
## 2020 OBMP Update

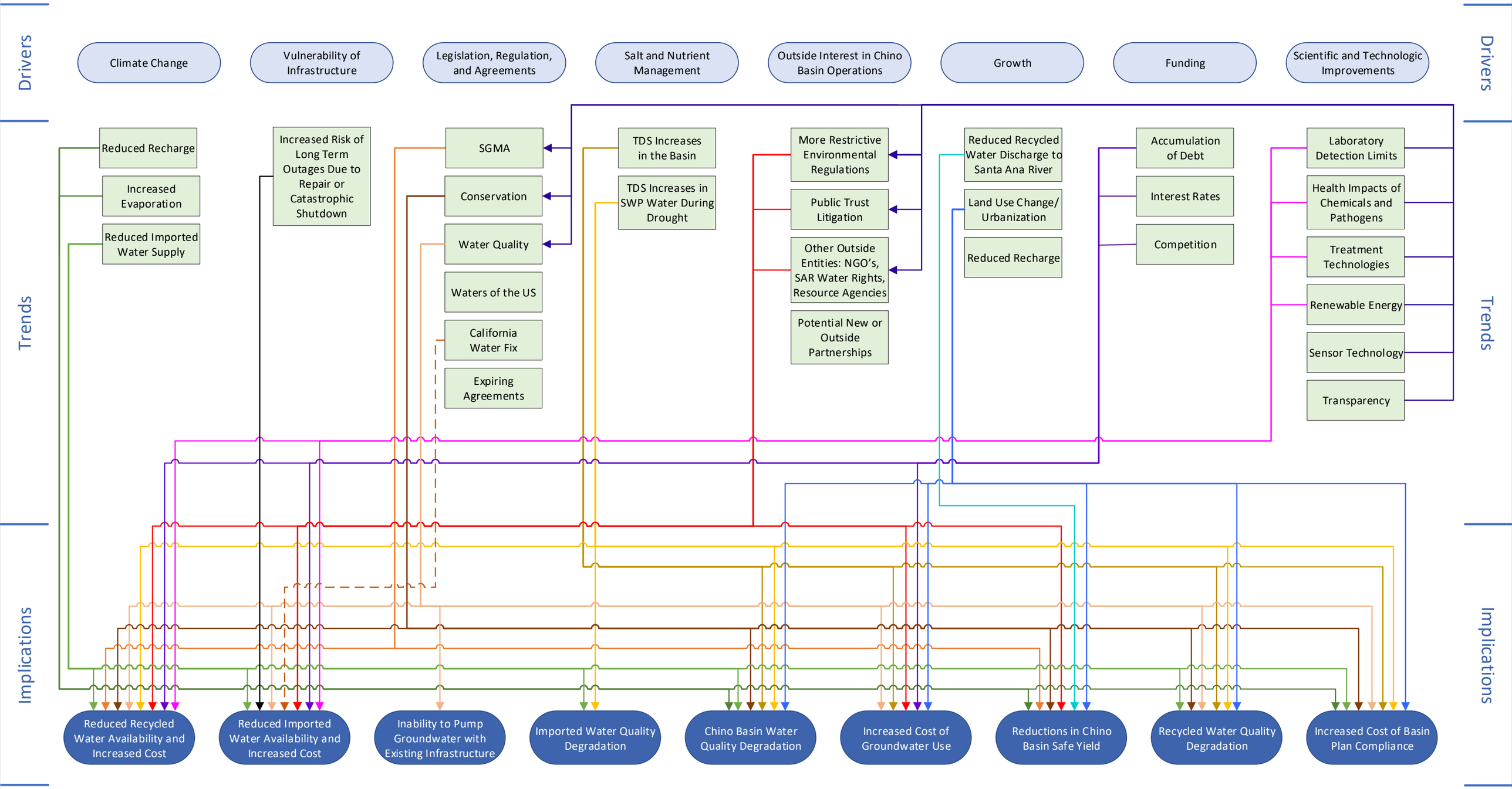

Appendix C

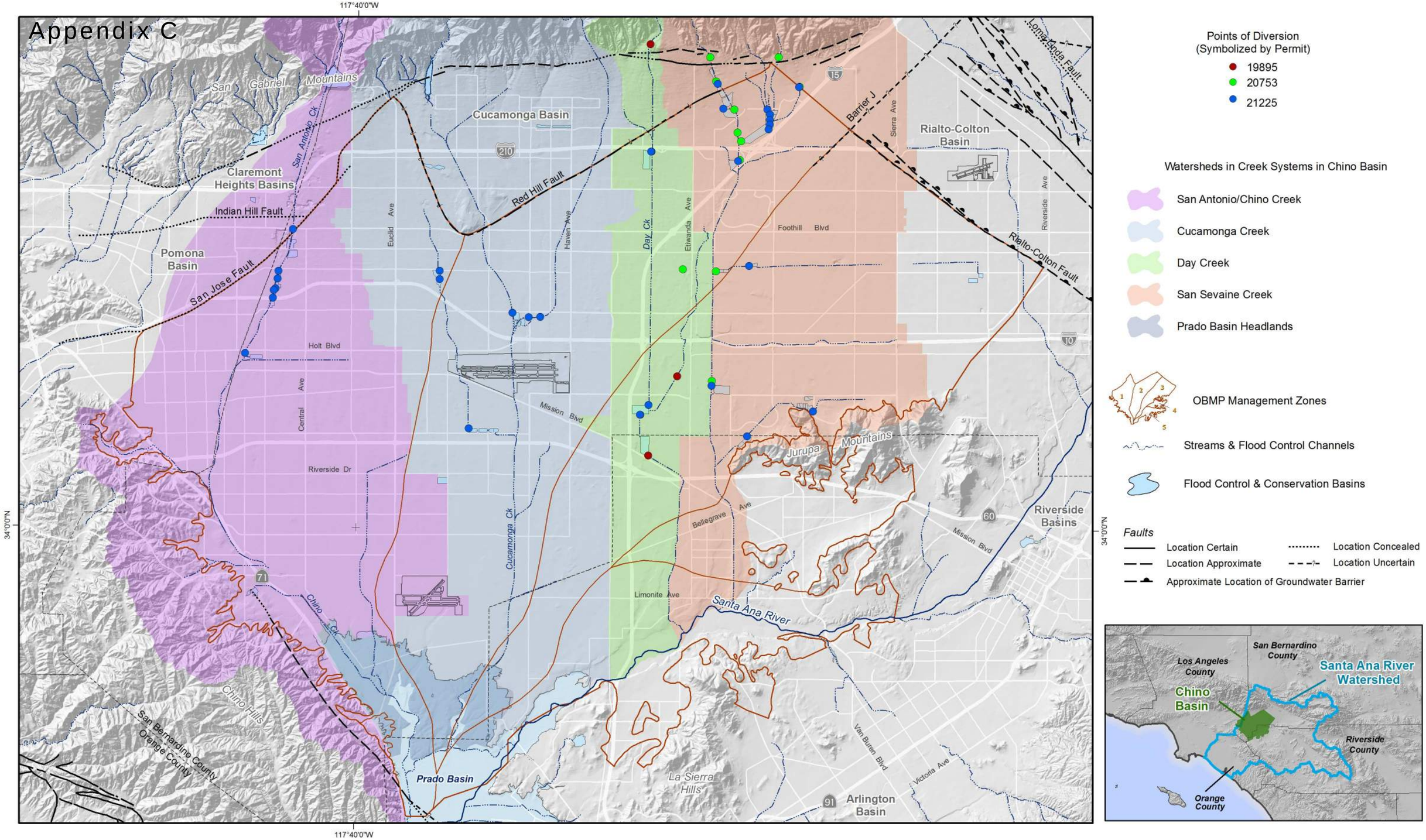


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_A-1_PODs.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster
Partners in Basin Management

**Watermaster Points of Diversion**
*Permits 19895, 20753, 21225*

**Exhibit A-1**

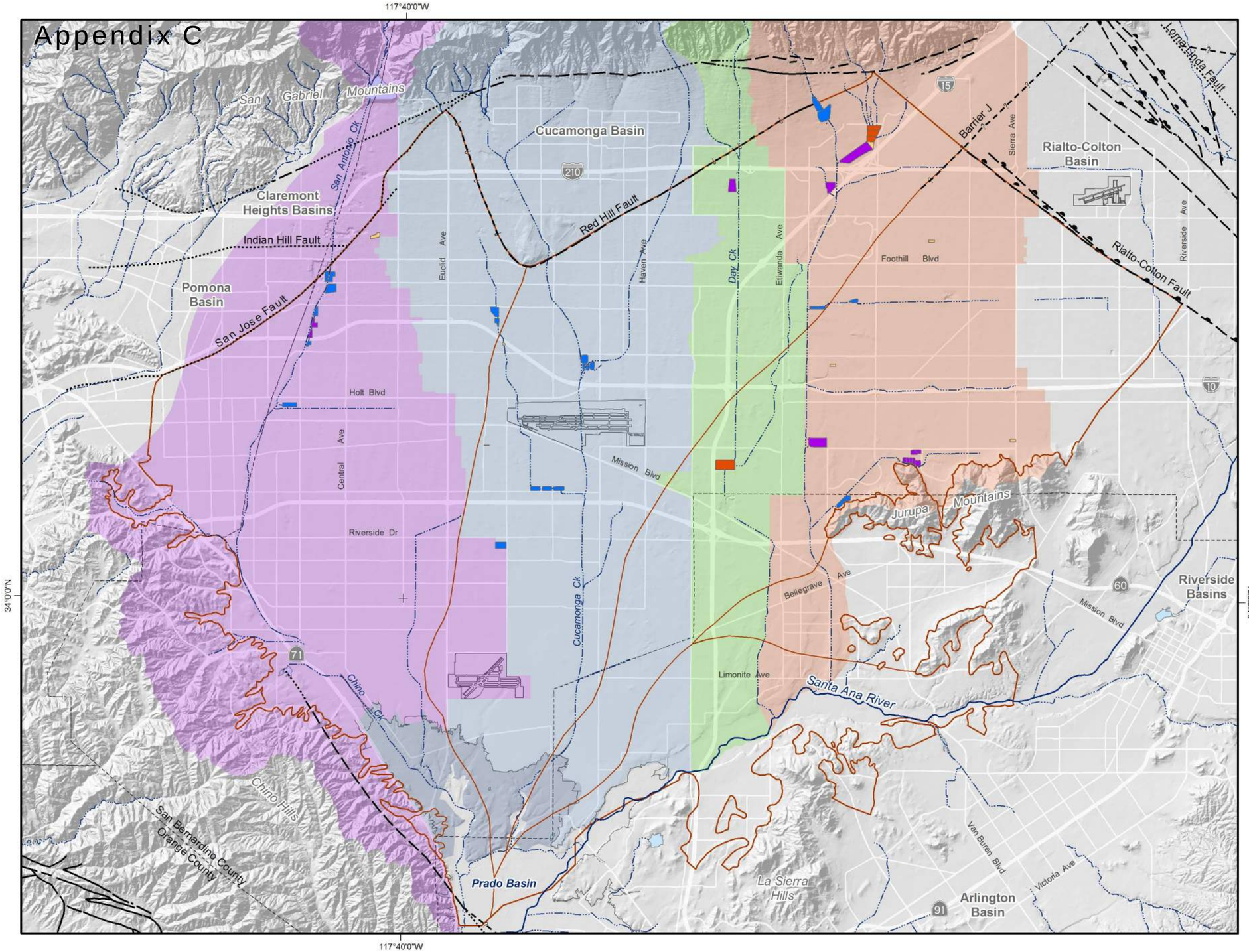


Watersheds in Creek Systems in Chino Basin

- San Antonio/Chino Creek
- Cucamonga Creek
- Day Creek
- San Sevaine Creek
- Prado Basin Headlands

Recharge Facilities in the Chino Basin and Associated Projects

- Projects in the 2002 Recharge Master Plan (2002 RMP)
- Projects in 2013 Amendment to the 2010 Recharge Master Plan Update (2013 RMPU)
- Projects in both 2002 RMP and 2013 RMPU
- Projects considered in 2013 RMPU and deferred to a future RMPU

OBMP Management Zones

Streams & Flood Control Channels

*Faults*

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_A-2_RMPUprojects.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Recharge Improvements in the Chino Basin Since Implementation of the OBMP**

**Exhibit A-2**

**Exhibit A-3**
**Average Stormwater Recharge and Supplemental Water Recharge Capacity Estimates**

| Recharge Facility | Average Stormwater Recharge FY 2004/05 through FY 2016/17 (afy) | Theoretical Maximum Supplemental Water Recharge Capacity (afy) | Theoretical Maximum Recharge Capacity (afy) |
|---|---|---|---|
| Brooks Street Basin | 489 | 1,658 | 2,147 |
| College Heights Basin - East | 78 | 5,816 | 7,958 |
| College Heights Basin - West | | 2,064 | |
| Montclair Basin 1 | 953 | 409 | 5,617 |
| Montclair Basin 2 | | 2,940 | |
| Montclair Basin 3 | | 400 | |
| Montclair Basin 4 | | 915 | |
| Eighth Street Basin | 1,069 | 3,426 | 5,665 |
| Seventh Street Basin | | 1,170 | |
| Upland Basin | 430 | 891 | 1,321 |
| *Subtotal Management Zone 1* | *3,019* | *19,689* | *22,708* |
| Ely | 1,120 | 4,501 | 5,621 |
| Grove Basin | 305 | - | 305 |
| Etiwanda Debris Basin | 212 | 2,908 | 3,120 |
| Hickory Basin East | 361 | 856 | 2,637 |
| Hickory Basin West | | 1,420 | |
| Lower Day Basin Cell 1 | 513 | 983 | 1,496 |
| Lower Day Basin Cell 2 | | | |
| Lower Day Basin Cell 3 | | | |
| San Sevaine No. 1 | 816 | 114 | 6,025 |
| San Sevaine No. 2 | | 2,869 | |
| San Sevaine No. 3 | | 2,226 | |
| Turner Basin No. 1 | 1,527 | 577 | 4,084 |
| Turner Basin No. 2 | | 227 | |
| Turner Basin No. 3 | | 418 | |
| Turner Basin No. 4A | | 981 | |
| Turner Basin No. 4B | | 164 | |
| Turner Basin No. 4C | | 191 | |
| Victoria Basin | 309 | 2,279 | 2,588 |
| *Subtotal Management Zone 2* | *5,163* | *20,713* | *25,876* |
| Banana Basin | 258 | 1,790 | 2,048 |
| Declez Basin Cell 1 | 582 | 1,235 | 3,409 |
| Declez Basin Cell 2 | | 823 | |
| Declez Basin Cell 3 | | 770 | |
| IEUA RP3 Basin Cell 1 | 1,129 | 4,653 | 12,716 |
| IEUA RP3 Basin Cell 3 | | 3,266 | |
| IEUA RP3 Basin Cell 4 | | 3,669 | |
| *Subtotal Management Zone 3* | *1,969* | *16,204* | *18,173* |
| **Total** | **10,151** | **56,606** | **66,757** |

Source: 2018 Recharge Master Plan (WEI 2018)

**Exhibit A-4**
**Model-Projected Estimates of Total Stormwater Discharge and Recharge in the Chino Basin for the Hydrologic Period of 1950 to 2012**

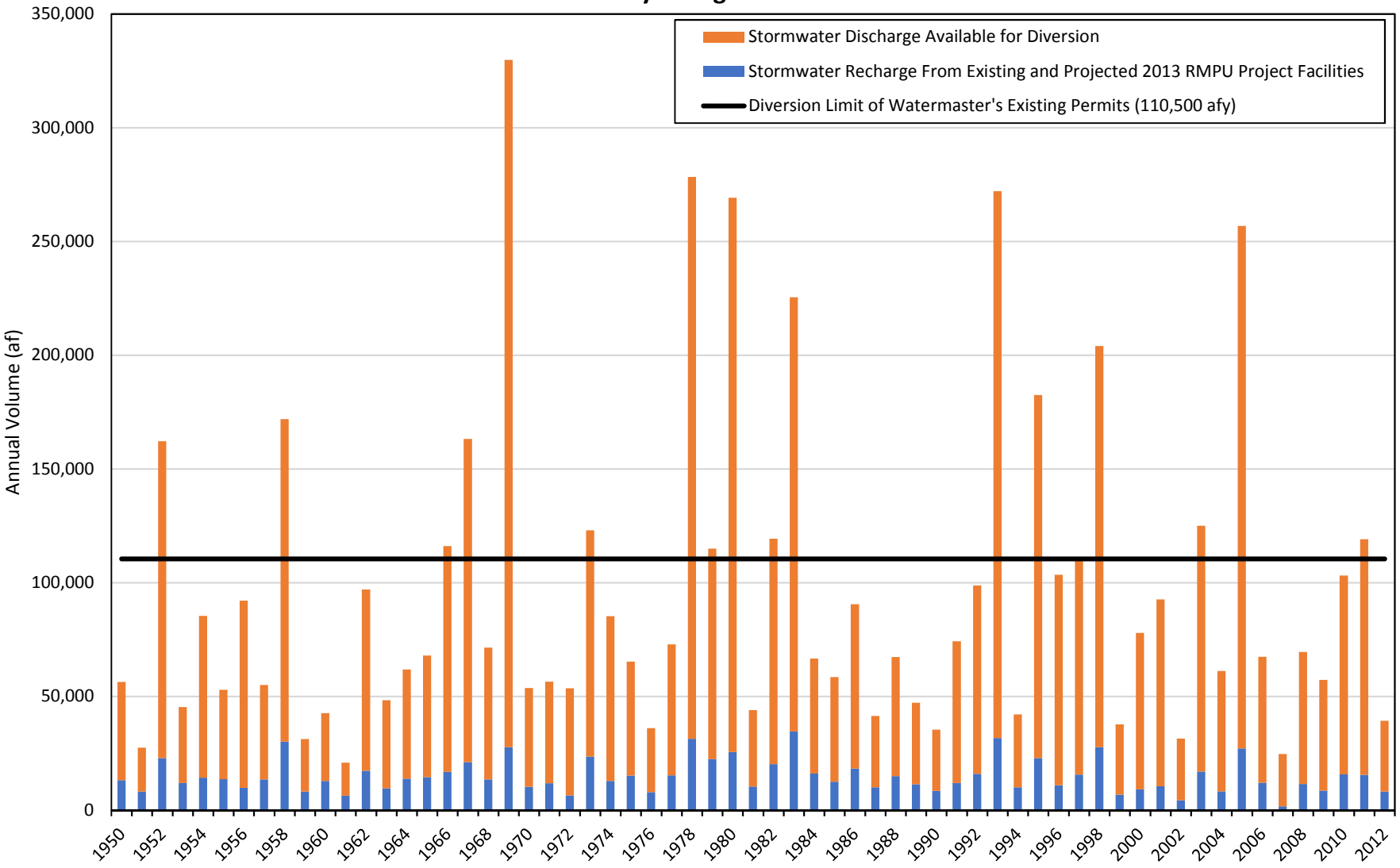


Exhibit_A-4_A-5_Annual_Flow_Available--Figure_3-3
Created on 6/11/2019
Printed on 7/5/2019

**Exhibit A-5**
**Exceedance Frequency Curve of Stormwater Discharge Available for Diversion in the Chino Basin for the Hydrologic Period of 1950-2012**

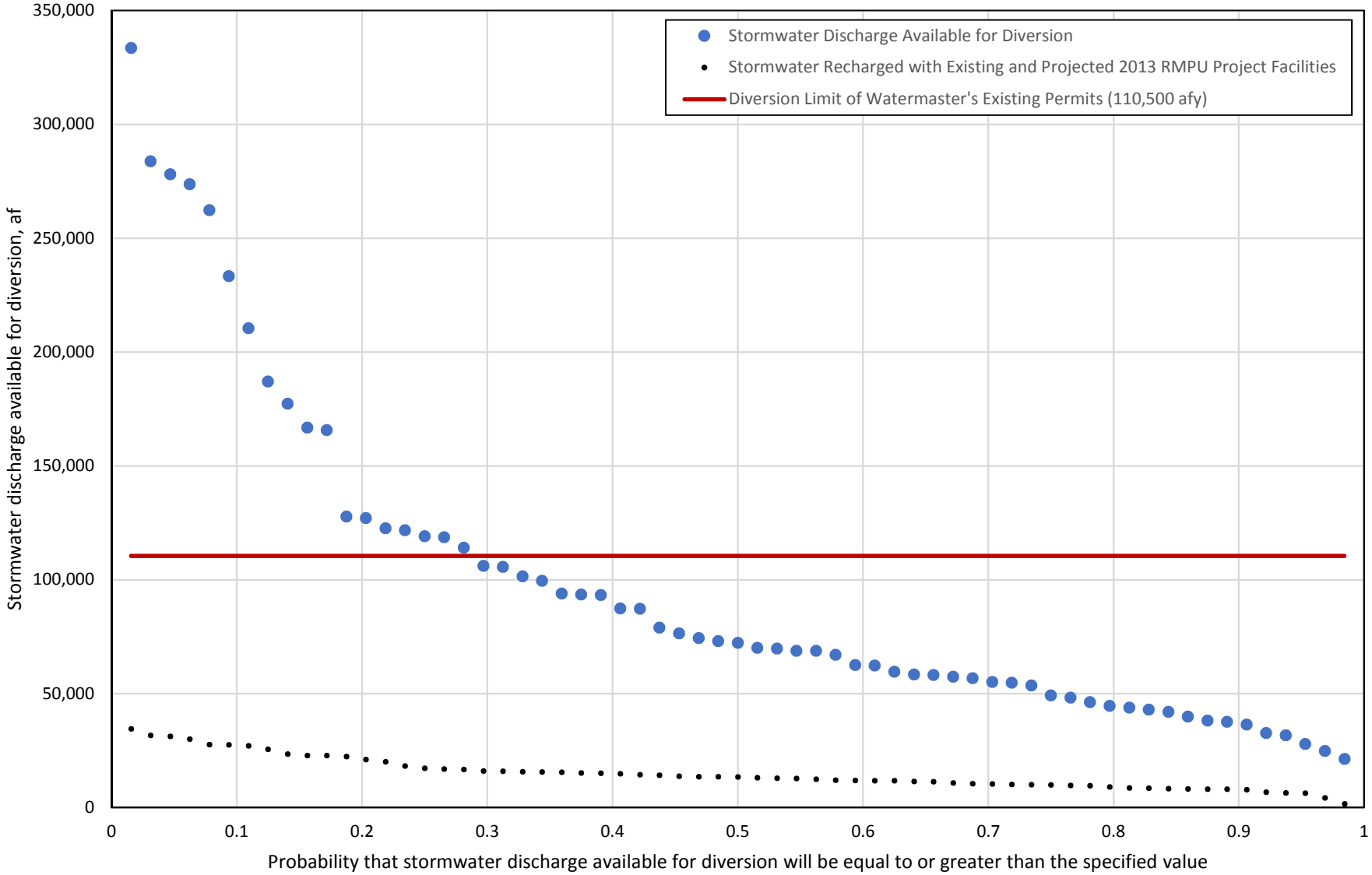


Exhibit_A-4_A-5_Annual_Flow_Available--Figure_3-4
Created on 6/11/2019
Printed on 7/5/2019

## Exhibit A-6

## Projects Considered and Not Recommended Due to Cost in the 2013 RMPU and New Conceptual Recharge Projects Considered and Not Recommended in the 2018 RMPU[1]

| PID[2] | Project | Source | New Stormwater Recharge (afy) | Projected Costs in 2023 | |
|---|---|---|---|---|---|
| | | | | 2018 RMPU Estimated Unit Stormwater Recharge Cost ($/af) | 2018 RMPU Estimated Capital Cost |
| 1a | Montclair Basins - Transfer water between Montclair Basins and deepen MC 4 | 2013 RMPU | 71 | $5,980 | $6,526,000 |
| 5 | North West Upland Basin - Increase drainage area and basin enlargement | 2013 RMPU | 93 | $4,620 | $6,574,000 |
| 15 | Ely Basin - Basin enlargement and increased drainage area | 2013 RMPU | 101 | $1,990 | $3,017,000 |
| 24 | Vulcan Basin - Construct new inflow and outflow structures | 2013 RMPU | 857 | $2,560 | $33 million |
| 26 | Sultana Avenue - Deepen basin by 10 feet | 2013 RMPU | 7 | $5,620 | $601,000 |
| n/a | Regional Recharge Distribution System | 2013 RMPU | 5,000 | $2,810 | $184 million |
| n/a | Vineyard Managed Aquifer Recharge | 2018 RMPU | n/a | n/a | n/a |
| n/a | CBWCD Confluence Project[3] | 2018 RMPU | n/a | n/a | n/a |

[1] With the exception of the last two projects listed, projects in this table were included in the 2013 RMPU and were considered in the 2018 RMPU based on the following criteria: projected yield is greater than zero (excluding projects for which yield was not quantified); project was not already implemented; project was determined to be technically and institutionally feasible; project was not recommended for final implementation in the 2013 RMPU

[2] 2013 Project Identification (PID) number; n/a - No PID assigned.

[3] Per an email from Steve Sentes at CBWCD dated August 16, 2018, the potential new stormwater recharge for the Confluence Project is 2,940 afy at a cost of about $17 million (excluding land acquisition costs). The estimated unit stormwater recharge cost is $650/af. This information was not vetted through the CBWM Steering Committee process during the development of the 2018 RMPU.

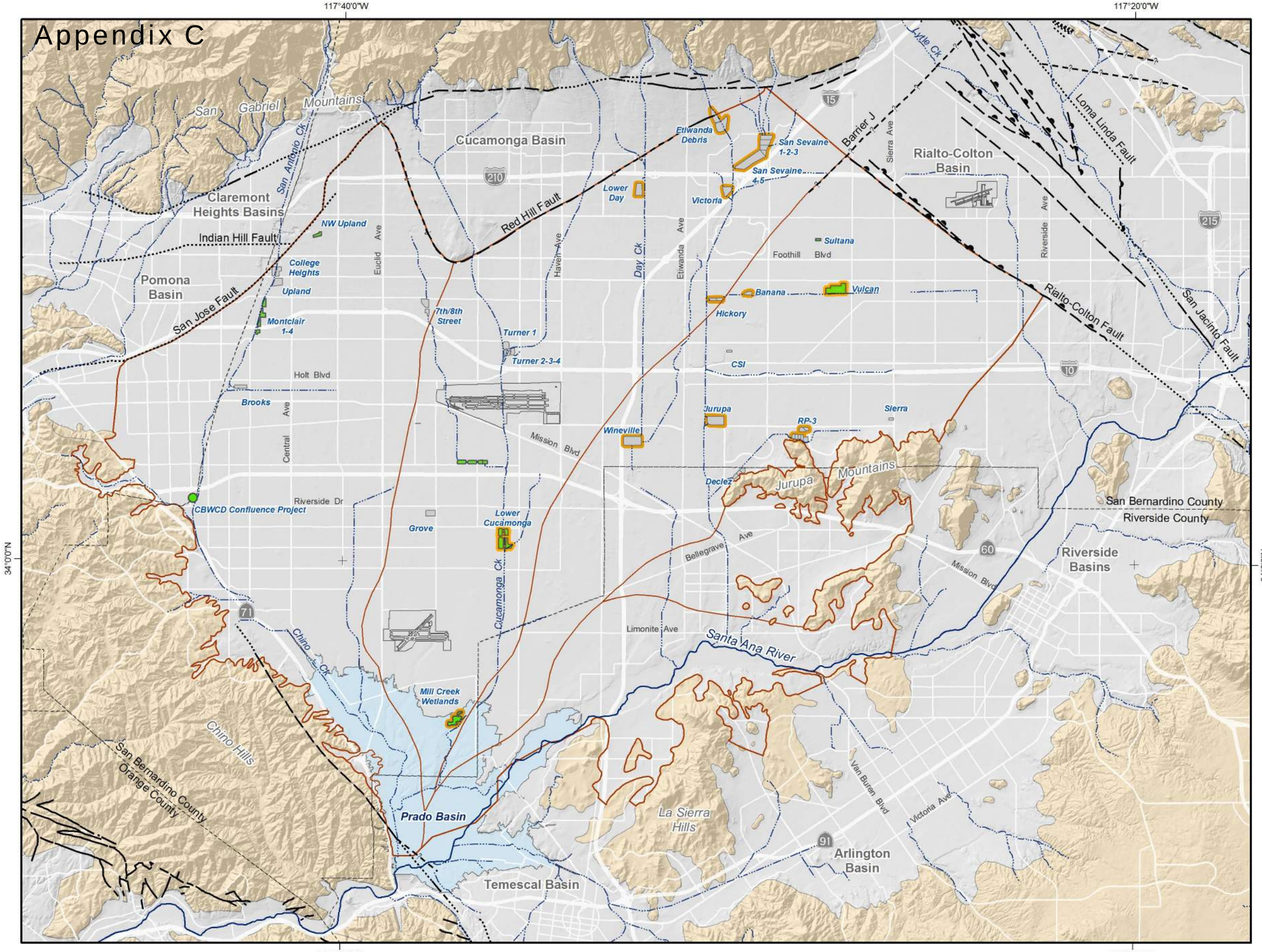


Recharge Facilities in the Chino Basin and Associated Projects

Potential New Stormwater Recharge Projects That Were Evaluated in the 2018 RMPU and Not Recommended Due to Cost

Other Existing Stormwater Management Facilities

Stormwater Management Facility in the Regional Recharge Distribution System Project

OBMP Management Zones

Streams & Flood Control Channels

*Geology*

*Water-Bearing Sediments*

Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_A-7_Potential new facilities.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Potential New Stormwater Recharge Projects Considered in the 2018 RMPU**

**Exhibit A-7**

**Exhbit A-8**
**Projected Imported Water Rates**
**Compared to Estimated Unit Cost of New Stormwater Recharge Projects**

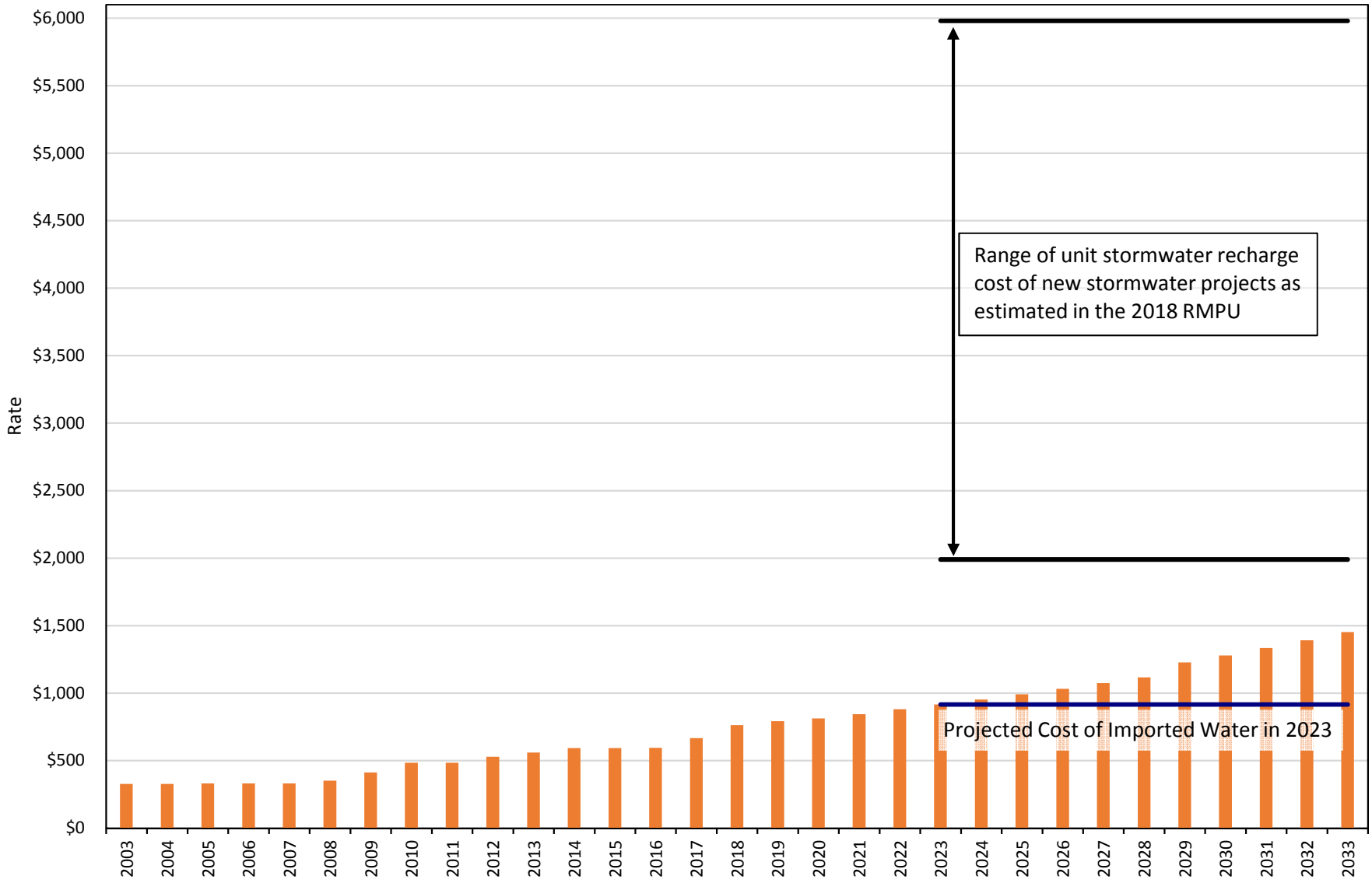


Exhibit_A-8_IW_Costs--Exhibit A-8
Created on 3/15/2019
Printed on 7/5/2019

**Exhibit A-9**
**Cost-Estimate and Schedule to Implement Activity A**

| Task and Subtask Description | Engineering Cost | FY 2020/21 | | | | FY 2021/22 | | | | FY 2022/23 | | | | FY 2023/24 and beyond |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Task 1 Define objectives and refine scope of work<br>· Define objectives of Activity A<br>· Refine scope described in TM1<br>· Refine detailed cost and schedule | $45,000 | $45,000 | | | | | | | | | | | | |
| Task 2 Develop planning, screening, and evaluation criteria<br>· Develop criteria on how and where to conduct recharge<br>· Develop criteria to evaluate project cost and benefit<br>· Review and finalize criteria | $125,000 | | $125,000 | | | | | | | | | | | |
| Task 3 Describe recharge enhancement opportunities<br>· Identify potential stormwater recharge projects<br>· Select projects for reconnaissance level recharge study | $80,000 | | | | | $80,000 | | | | | | | | |
| Task 4 Develop reconnaissance-level engineering design and operating plan<br>· Characterize potential recharge alternatives<br>· Rank Alternatives<br>· Prepare finance plan for soft-costs<br>· Prepare report | $325,000 | | | | | | $220,000 | | | $105,000 | | | | |
| Task 5 Plan, design, and construct selected recharge projects<br>· Prepare preliminary design report and CEQA documentation<br>· Prepare finance plan for project implementation<br>· Obtain permits and agreements and prepare final design<br>· Construct selected projects | $ TBD | | | | | | | | | | | | | $ TBD |
| **Total Cost and Cost by FY** | **$575,000** | **$170,000** | | | | **$300,000** | | | | **$105,000** | | | | **$ TBD** |

TBD -- To be determined

# Appendix C

**Exhibit B-1**
**Cost-Estimate and Schedule to Implement Activity B**

| Task and Subtask Description | Engineering Cost | FY 2020/21 | | | | FY 2021/22 | | | | FY 2022/23 | | | | FY 2023/24 and beyond |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Task 1 Convene the Storage and Recovery Program Committee, define objectives, and refine scope of work<br>· Convene Storage and Recovery Program Committee<br>· Define objectives and impediments for developing Storage and Recovery Programs<br>· Define mutual benefits expected from Storage and Recovery Programs<br>· Develop scope, schedule, and cost to prepare a *Storage and Recovery Program Master Plan* | $105,000 | $105,000 | | | | | | | | | | | | |
| Task 2 Develop conceptual alternatives for Storage and Recovery Programs at various scales<br>· Identify and characterize potential source waters<br>· Identify potential storing partners and delivery methods<br>· Identify and characterize institutional challenges<br>· Develop planning criteria<br>· Describe several conceptual Storage and Recovery Programs alternatives<br>· Evaluate and select alternatives for Task 3 | $ TBD | | | | | $ TBD | | | | | | | | |
| Task 3 Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives<br>· Describe alternative facility plans, operations, and costs<br>· Characterize basin response, potential MPI, benefits<br>· Describe potential implementation barriers<br>· Assess feasibility and rank alternatives | $ TBD | | | | | | | | | $ TBD | | | | |
| Task 4 Prepare *Storage and Recovery Program Master Plan*<br>· Describe results and recommendations of Tasks 1 through 3<br>· Achieve consensus on the recommendations<br>· Prepare *Storage and Recovery Program Master Plan* | $ TBD | | | | | | | | | | | | $ TBD | $ TBD |
| **Total Cost and Cost by FY** | **$105,000** | **$105,000** | | | | **$ TBD** | | | | **$ TBD** | | | | **$ TBD** |

TBD -- To be determined

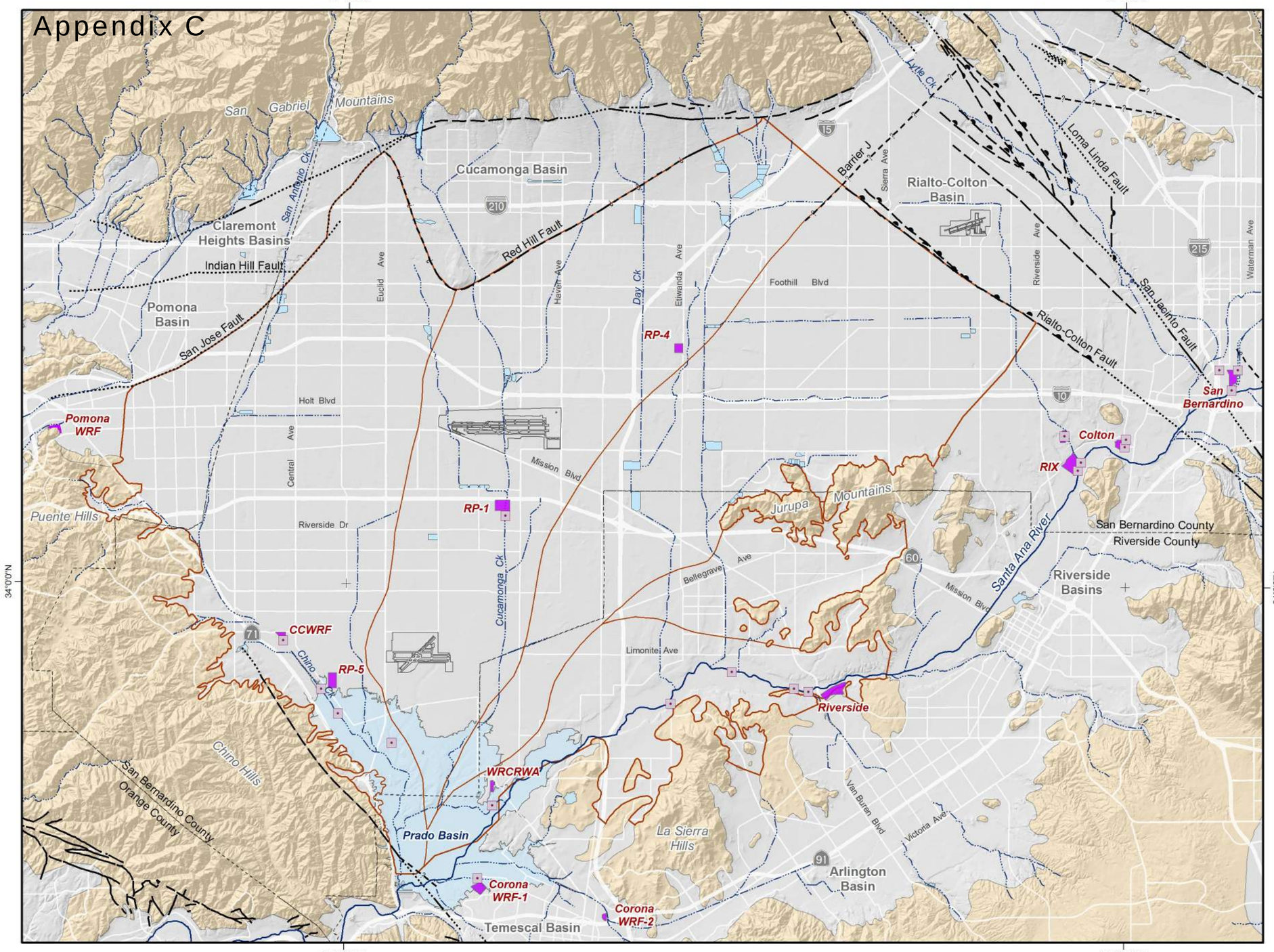


Recycled Water Treatment Plant

Recycled Water Discharge Point

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

*Faults*

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

*Geology*

*Water-Bearing Sediments*

- Quaternary Alluvium

*Consolidated Bedrock*

- Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 11/22/2019
File: Exhibit D-1_RW Treatment Plants.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Recycled Water Treatment Plants and Discharge Points**

**Exhibit D-1**

**Exhibit D-2**
**IEUA Recycled Water Discharge to Santa Ana River FY 1977/78 to 2017/18**

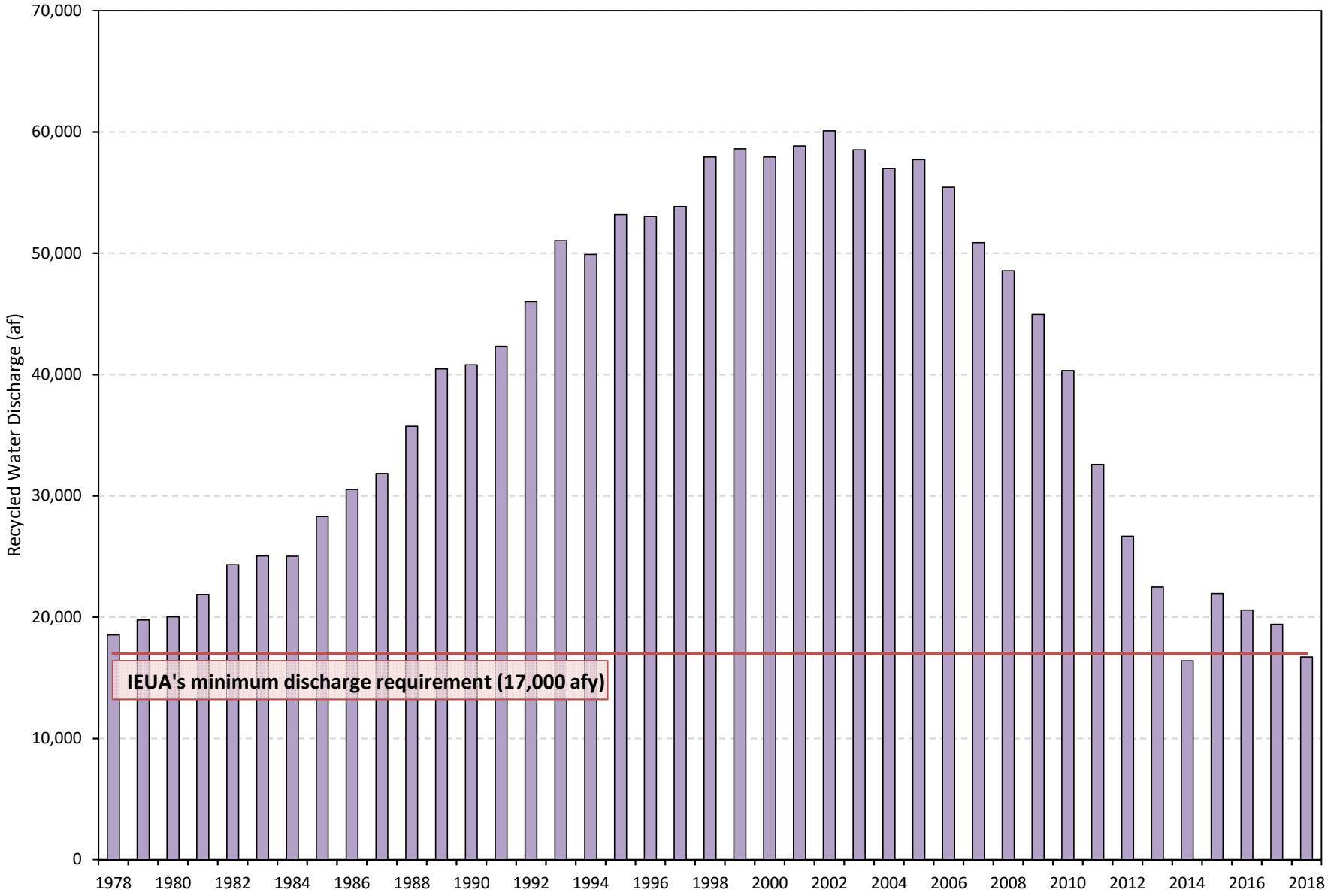

**Exhibit D-3**
**Recycled Water Recharge and Direct Recycled Water Reuse FY 1996/97 to 2017/18**

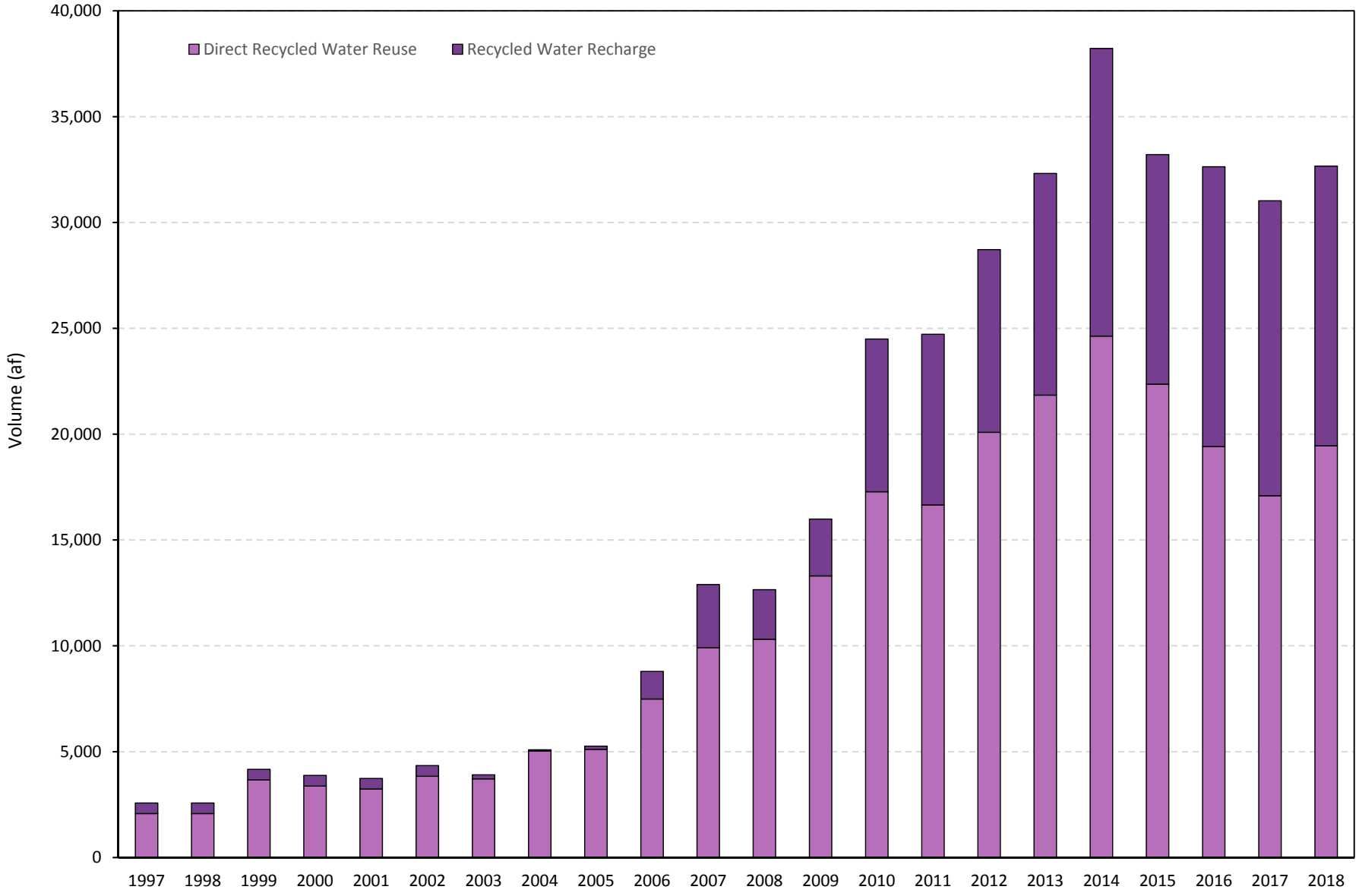

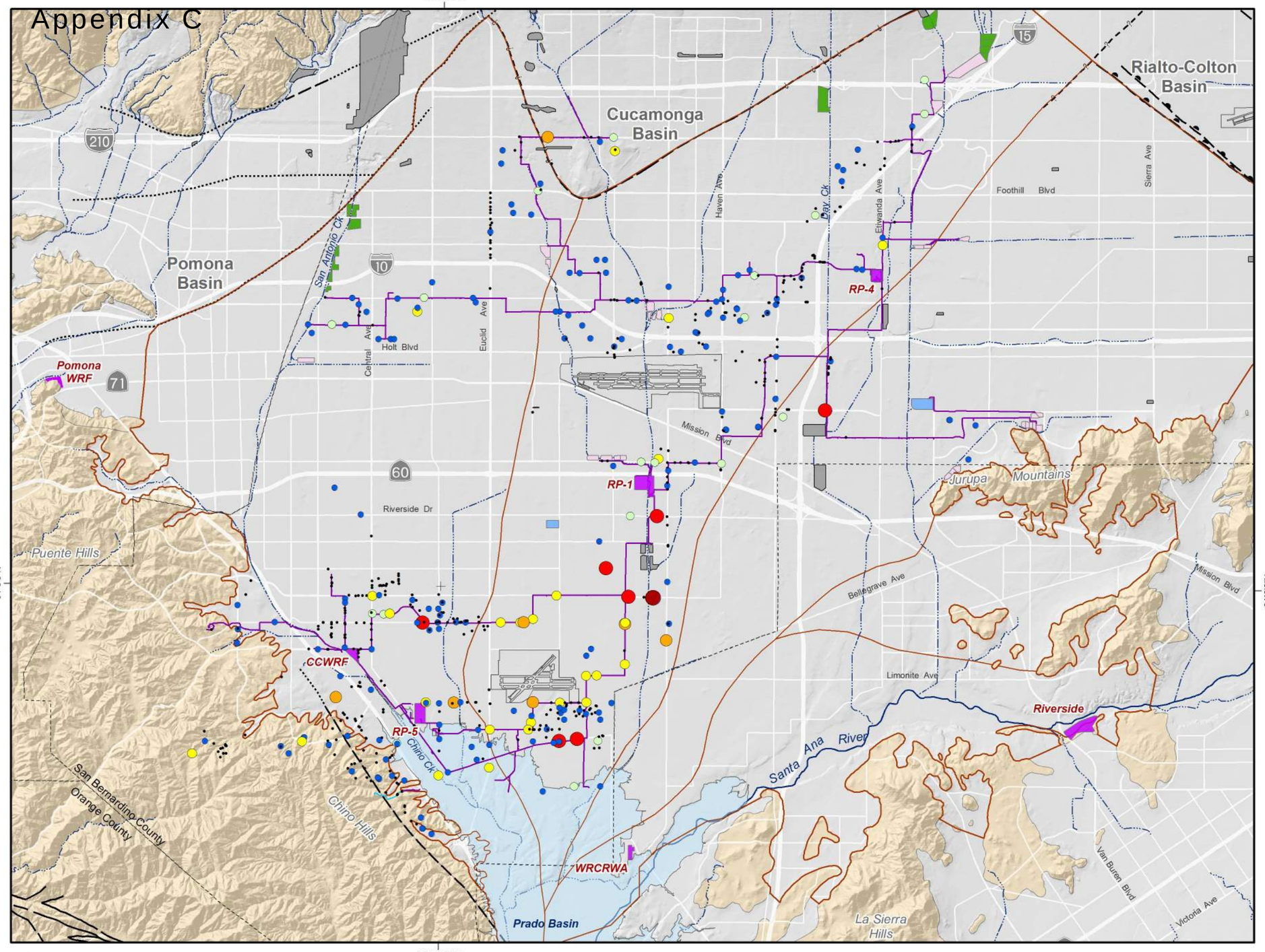


Recycled Water Deliveries for Direct Non-Potable Use
Fiscal Year 2017/18 (af)

- < 10
- 10 - 50
- 50 - 100
- 100 - 250
- 250 - 500
- 500 - 1,000
- > 1,000

Recycled Water Pipelines (Symbolized by Status)

- Existing
- In Construction
- Treatment Plant

Recharge Basins

- Storm, Imported and Recycled Water
- Storm and Imported Water
- Stormwater
- Stormwater Facilities Not Managed Under the OBMP Recharge. Incidental Recharge Only

- Streams & Flood Control Channels
- Flood Control & Conservation Basins

*Faults*

- Location Certain
- Location Concealed
- Location Approximate
- Location Uncertain
- Approximate Location of Groundwater Barrier

*Geology*

*Water-Bearing Sediments*

- Quaternary Alluvium

*Consolidated Bedrock*

- Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 20170215
File: Exhibit D-4_RW Deliveries

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

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Chino Basin Watermaster — Partners in Basin Management

**IEUA Recycled Water Delivery System for Direct Reuse**
*FY 2017/18*

**Exhibit D-4**

**Exhibit D-5**
**IEUA Projections of Recycled Water Production and Reuse through 2040**

| Recycled Water (af) | | FY 2017/18 (Actual) | 2020 | 2025 | 2030 | 2040 |
|---|---|---|---|---|---|---|
| Production - High* | a | 49,369 | 64,400 | 70,400 | 75,200 | 83,000 |
| Production - Low* | | | 54,400 | 61,000 | 67,700 | 74,700 |
| Direct Reuse* | b | 19,450 | 24,000 | 27,500 | 30,000 | 30,000 |
| Recharge* | c | 13,212 | 16,900 | 18,700 | 18,700 | 18,700 |
| Surplus Supply Available for Reuse and/or Discharge - High | d = a - (b + c) | 16,708 | 23,500 | 24,200 | 26,500 | 34,300 |
| Surplus Supply Available for Reuse and/or Discharge - Low | | | 13,500 | 14,800 | 19,000 | 26,000 |

* Source: Inland Empire Utilities Agency. *Sources of Water Supply for the Chino Basin Program* . Memo to Member Agencies. February 20, 2019.

**Exhibit D-6**

**Actual and Projected[1] Annual Recycled Water Recharge**

(afy)

| Basin Permitted for Recycled Water Recharge | Theoretical Maximum Supplemental Water Recharge Capacity[2] | | Actual FY 2017/18 Recharge | Projected Annual Recharge for FY 2019/20 to FY 2029/30 |
|---|---|---|---|---|
| | Directly After Cleaning[3] | Average Between Maintenance Periods[4] | | |
| Brooks Street Basin | 2,825 | 1,658 | 1,268 | 2,000 [5] |
| Seventh and Eighth Street Basins | 5,045 | 4,596 | 1,037 | 1,490 |
| *Subtotal Management Zone 1* | | | *2,305* | *3,490* |
| Ely Basins | 7,375 | 4,501 | 1,511 | 1,100 |
| Hickory Basin | 2,433 | 2,276 | 1,399 | 1,650 |
| San Sevaine Basins 1-5 | 9,637 | 5,209 | 0 | 840 |
| Turner Basins 1-4 | 3,674 | 2,557 | 1,526 | 1,110 |
| Victoria Basin | 2,436 | 2,279 | 793 | 1,530 |
| *Subtotal Management Zone 2* | | | *5,228* | *6,230* |
| Banana Basin | 1,913 | 1,790 | 2,131 | 1,050 |
| Declez Basin | 3,032 | 2,827 | 588 | 1,250 |
| IEUA RP3 Ponds | 12,389 | 11,587 | 2,960 | 4,400 |
| *Subtotal Management Zone 3* | | | *5,679* | *6,700* |
| **Total** | **50,760** | **39,280** | **13,212** | **16,420** |

n/a - not applicable

[1] Source - Andy Campbell, IEUA, June 2016

[2] Subject to Watermaster needs for recharge and replenishment

[3] Total recharge from the 10-month period directly after a cleaning.

[4] Average annual recharge over the span between maintenance. The average cleaning frequency of each recharge facility was provided by the IEUA. This estimate corresponds to continuous use between maintenance periods and is less than the recharge capacity that would occur if the recharge basins are used less frequently.

[5] The projected recharge at Brooks Basin is larger than the theoretical maximum average supplemental water recharge capacity between maintenance periods, but the capacity can increase up to 2,825 afy if the maintenance frequency is increased.

**Exhibit D-7**
**Cost-Estimate and Schedule to Implement Activity D**

| Task and Subtask Description | Engineering Cost | FY 2020/21 | | | | FY 2021/22 | | | | FY 2022/23 | | | | FY 2023/24 and beyond |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Task 1 Convene Recycled Water Projects Committee, define objectives and refine scope of work<br>· Convene Recycled Water Projects Committee<br>· Define objectives of Activity D<br>· Refine scope described in TM1<br>· Refine detailed cost and schedule | $50,000 | $50,000 | | | | | | | | | | | | |
| Task 2 Characterize the availability of all recycled water supplies and demands<br>· Review 2020 Urban Water Management Plans<br>· Develop water supply and demand projections<br>· Characterize timing and magnitude of recycled water available | $135,000 | | $135,000 | | | | | | | | | | | |
| Task 3 Develop planning, screening, and evaluation criteria<br>· Develop Watermaster criteria<br>· Develop regulatory criteria<br>· Develop criteria to evaluate project cost and benefit<br>· Review and finalize criteria | $40,000 | | | | $40,000 | | | | | | | | | |
| Task 4 Describe recycled water reuse project opportunities<br>· Identify potential recycled water reuse projects<br>· Select projects for reconnaissance level recharge study | $85,000 | | | | | $85,000 | | | | | | | | |
| Task 5 Develop reconnaissance-level engineering design and operating plan<br>· Characterize potential project alternatives<br>· Rank alternatives<br>· Prepare finance plan for soft-costs<br>· Prepare report | $310,000 | | | | | | $130,000 | | | $180,000 | | | | |
| Task 6 Plan, design, and construct selected recycled water projects<br>· Prepare preliminary design report and CEQA documentation<br>· Prepare finance plan for project implementation<br>· Obtain permits and agreements and prepare final design<br>· Construct selected projects | $ TBD | | | | | | | | | | | | | $ TBD |
| **Total Cost and Cost by FY** | **$620,000** | **$225,000** | | | | **$215,000** | | | | **$180,000** | | | | **$ TBD** |

TBD -- To be determined

**Exhibit EF-1**

**Summary of Drinking Water Contaminants with Primary MCLs in Municipal Supply Wells**

**FY 2013/14 - 2017/18**

| Analyte | Primary CA MCL | Number of Active Municipal Supply Wells with Exceedance of MCL | Number of Municipal Supply Wells with Exceedance of MCL | Number of Total Wells in the Chino Basin with Exceedance of MCL |
|---|---|---|---|---|
| Nitrate-Nitrogen | 10 mgl | 71 | 80 | 555 |
| 1,2,3-Trichloropropane | 0.005 µgl | 33 | 36 | 111 |
| Perchlorate | 6 µgl | 27 | 30 | 387 |
| Trichloroethylene (TCE) | 5 µgl | 11 | 14 | 269 |
| Gross Alpha | 15 pCi/L | 6 | 7 | 14 |
| Chromium | 50 µgl | 4 | 4 | 4 |
| Arsenic | 0.01 mgl | 3 | 5 | 74 |
| 1,2-Dibromo-3-chloropropane | 0.2 µgl | 3 | 3 | 4 |
| Tetrachloroethene (PCE) | 5 µgl | 3 | 3 | 96 |
| Trihalomethanes | 10 µgl | 2 | 3 | 2 |
| Nitrite-Nitrogen | 1 mgl | 2 | 2 | 17 |
| 1,1-Dichloroethene (1,1-DCE) | 5 µgl | 1 | 1 | 13 |
| Dichloromethane (Freon 30) | 5 µgl | 1 | 1 | 91 |
| Uranium | 20 pCi/L | 1 | 1 | 1 |

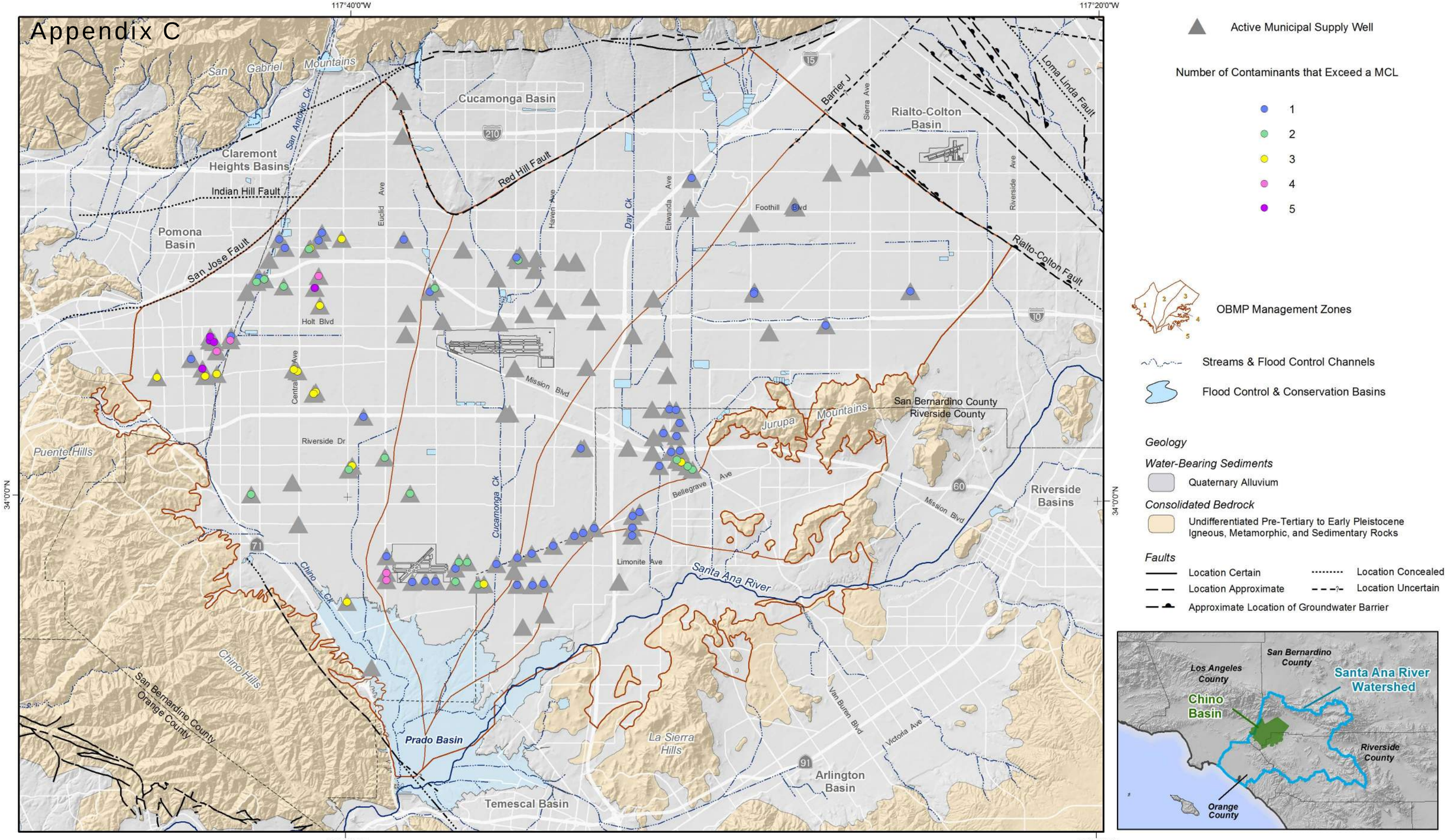


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-2_Exceedance_Count.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

**Occurrence of Drinking Water Contaminants in Active Municipal Supply Wells in Chino Basin**
*2014-2018*

**Exhibit EF-2**

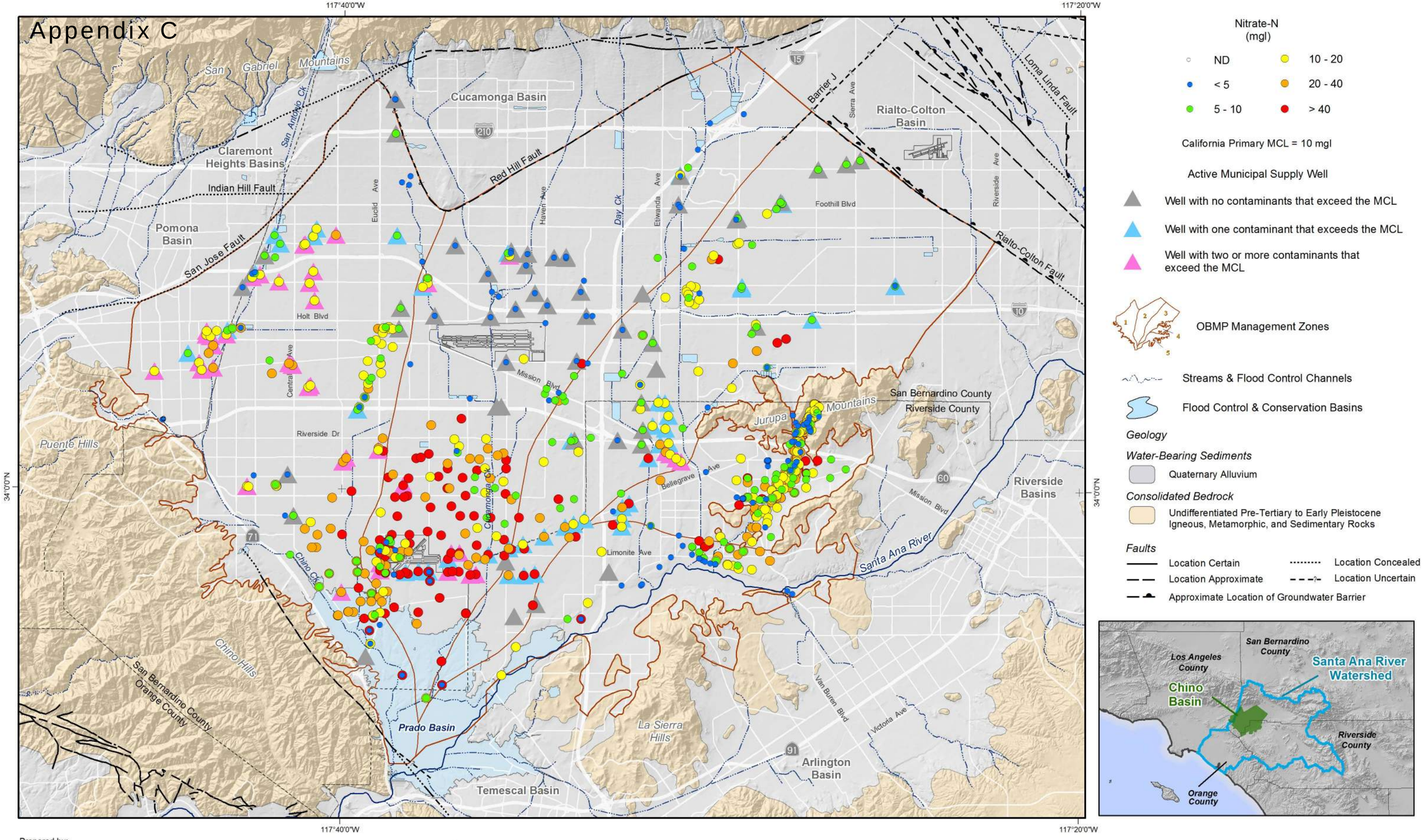


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-3_NO3_2014-2018.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Maximum Nitrate Concentration**
*2014-2018*

**Exhibit EF-3**

Appendix C

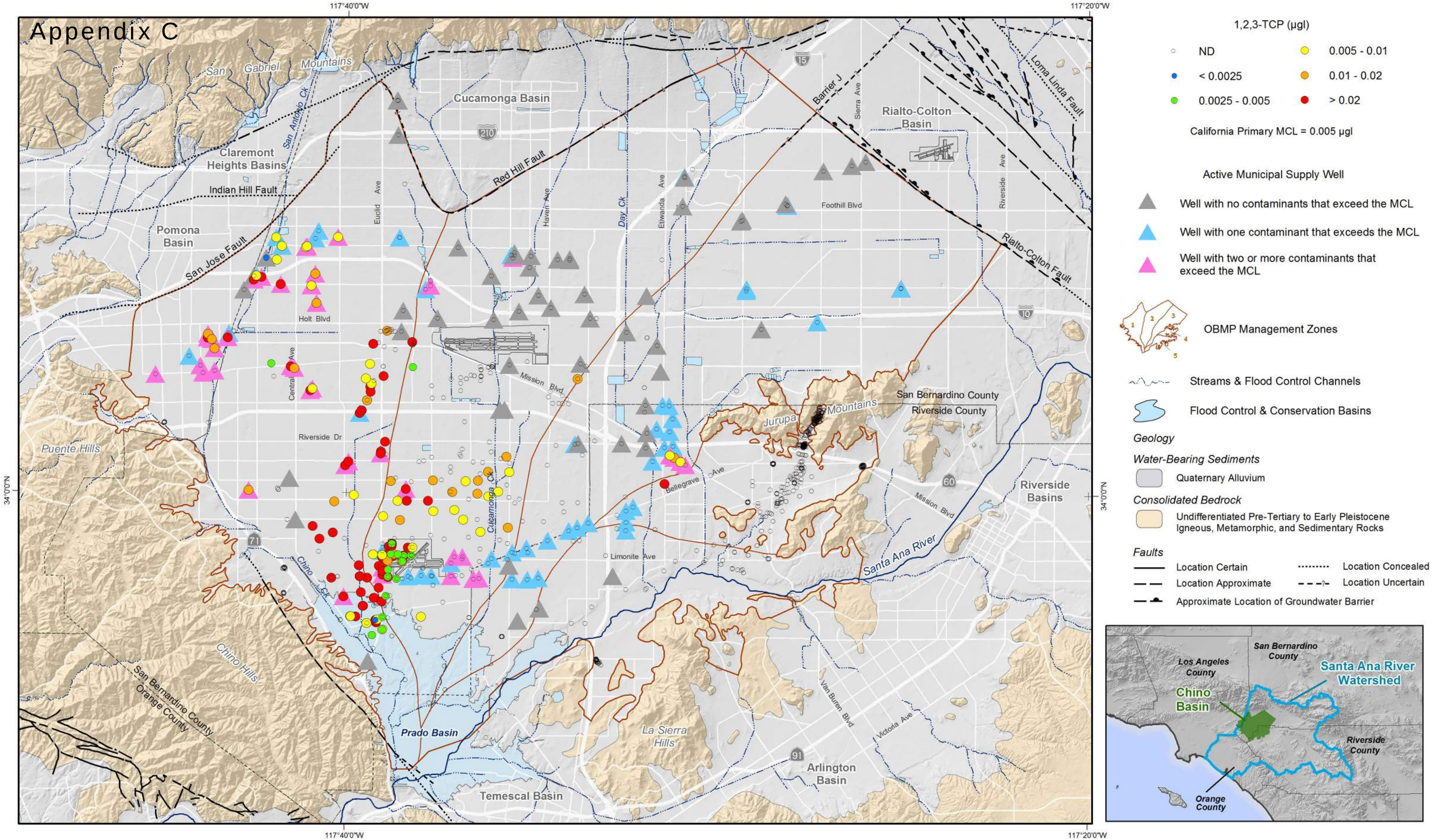


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-4_1,2,3-TCP_2014-2018.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
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Chino Basin Watermaster — Partners in Basin Management

**Maximum 1,2,3-Trichloropropane (1,2,3-TCP) Concentration**
*2014-2018*

**Exhibit EF-4**

Appendix C

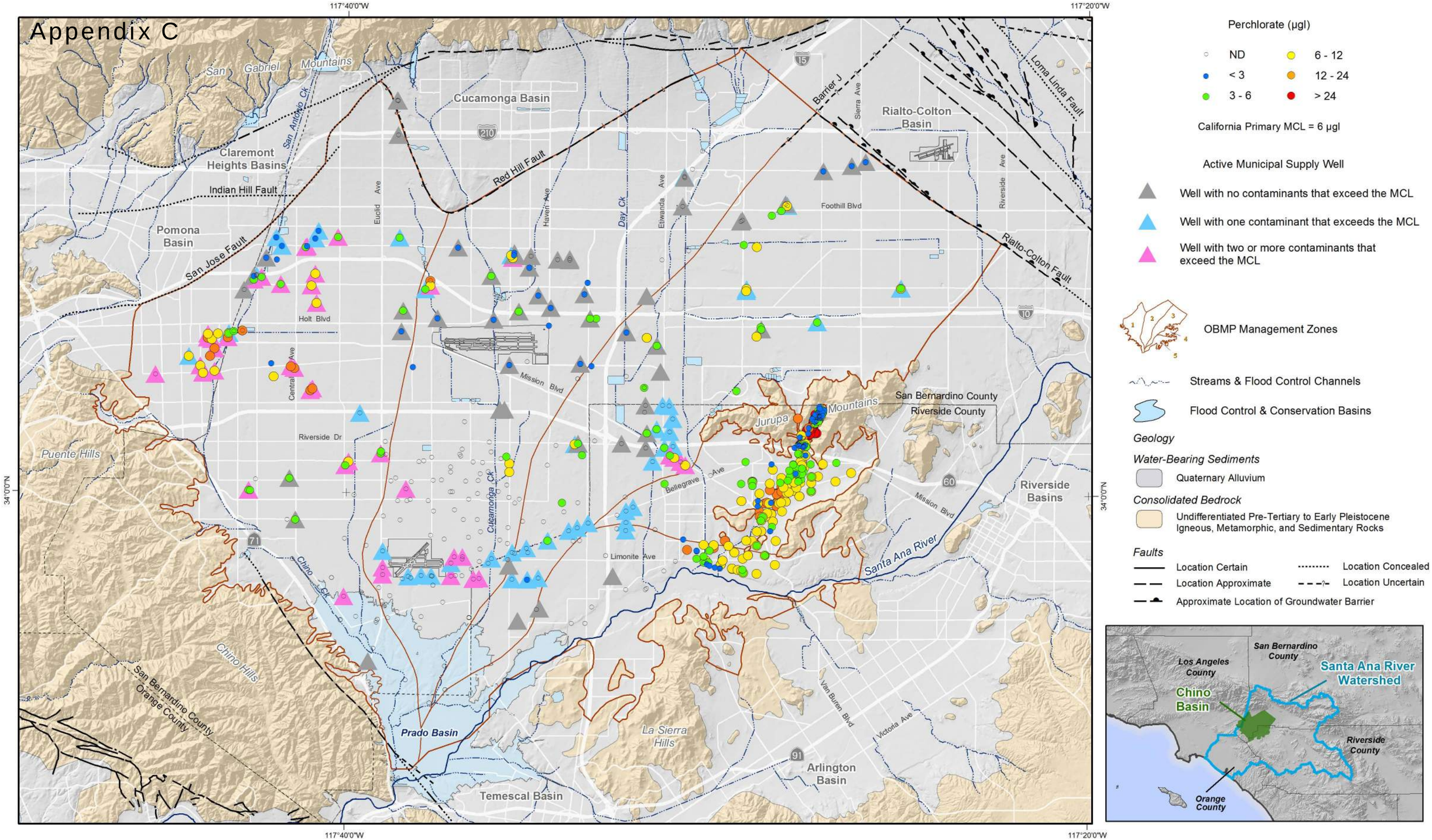


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-5_CLO4_MCL_2014-2018.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

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**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster
Partners in Basin Management

**Maximum Perchlorate Concentration**
*2014-2018*

**Exhibit EF-5**

**Exhibit EF-6**

**Summary of Drinking Water Contaminants with Notification Levels in Municipal Supply Wells**

**FY 2013/14 - 2017/18**

| Analyte | CA Drinking Water NL | Number of Active Municipal Supply Wells with Exceedance of NL | Number of Municipal Supply Wells with Exceedance of NL | Number of Total Wells in the Chino Basin with Exceedance of NL |
|---|---|---|---|---|
| 1,4-Dioxane | 1 µgl | 2 | 2 | 133 |
| Manganese | 0.5 mgl | 0 | 0 | 118 |
| N-Nitrosodimethylamine (NDMA) | 0.01 µgl | 0 | 0 | 60 |
| Vanadium | 0.05 mgl | 0 | 0 | 55 |
| Naphthalene | 0.017 mgl | 0 | 0 | 48 |
| 1,2,4-Trimethylbenzene | 0.33 mgl | 0 | 0 | 26 |
| 1,3,5-Trimethylbenzene | 0.33 mgl | 0 | 0 | 19 |
| Methyl Isobutyl Ketone | 0.12 mgl | 0 | 0 | 11 |
| n-Propylbenzene | 0.26 mgl | 0 | 0 | 11 |
| HMX (Octogen) | 0.35 mgl | 0 | 0 | 11 |
| Chlorate | 0.8 mgl | 0 | 0 | 4 |
| Formaldehyde | 0.1 mgl | 0 | 0 | 3 |
| N-Nitrosodiethylamine (NDEA) | 0.01 µgl | 0 | 0 | 3 |
| Ethylene Glycol | 14 mgl | 0 | 0 | 1 |
| n-Butylbenzene | 0.26 mgl | 0 | 0 | 1 |

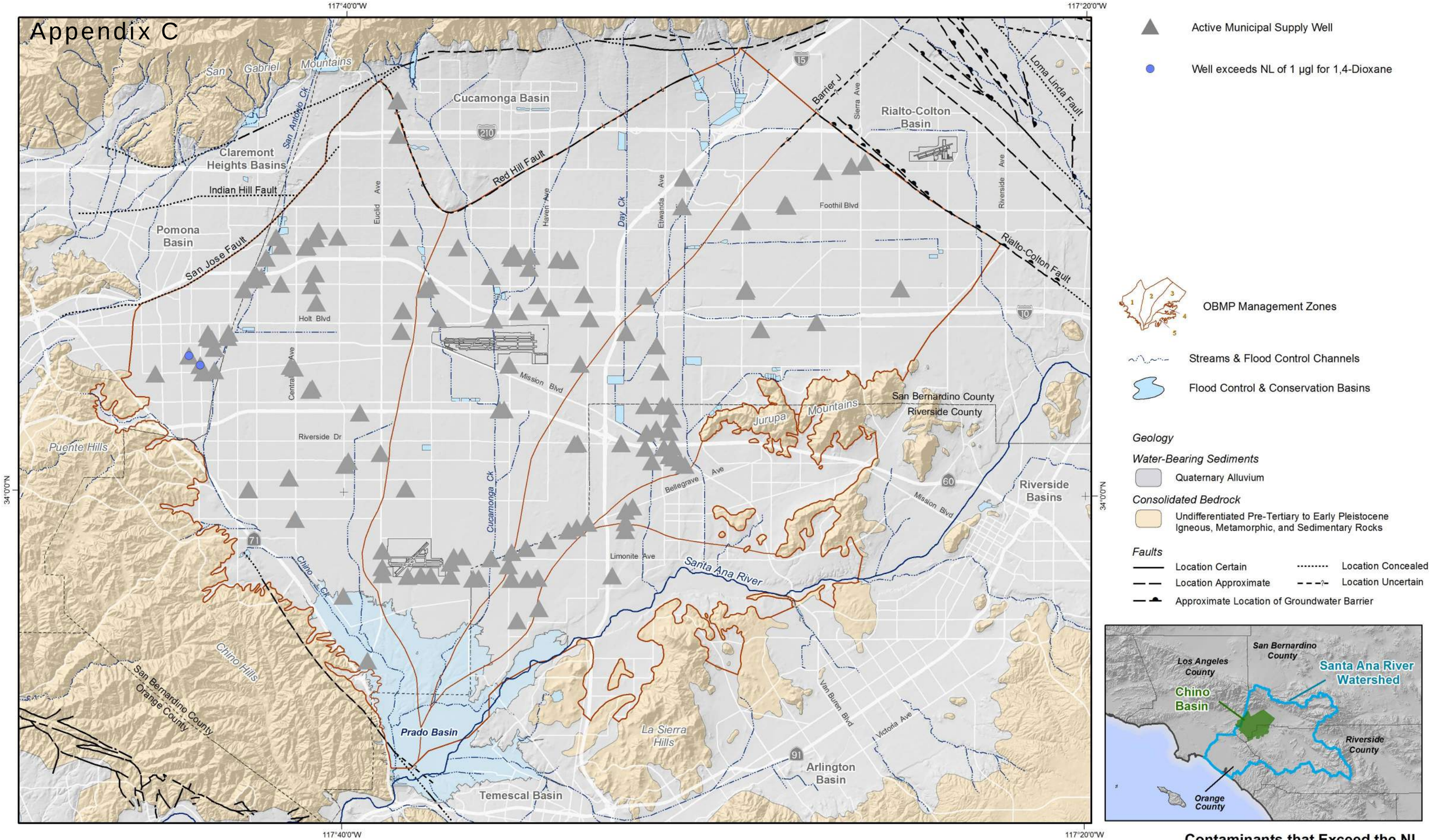


Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-7_Exceedance_Count_NL.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

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CHINO BASIN WATERMASTER
Partners in Basin Management

**Contaminants that Exceed the NL in Active Municipal Supply Wells in Chino Basin**
*2014-2018*

**Exhibit EF-7**

117°40'0"W

117°20'0"W

34°0'0"N

Cucamonga Basin

Claremont Heights Basins

Pomona Basin

Rialto-Colton Basin

Riverside Basins

Prado Basin

Temescal Basin

Arlington Basin

Indian Hill Fault

Red Hill Fault

San Jose Fault

Barrier J

Rialto-Colton Fault

Loma Linda Fault

San Antonio Ck

Day Ck

Cucamonga Ck

Chino Ck

Santa Ana River

San Gabriel Mountains

Jurupa Mountains

Puente Hills

Chino Hills

La Sierra Hills

San Bernardino County

Riverside County

Orange County

Euclid Ave

Haven Ave

Etiwanda Ave

Sierra Ave

Riverside Ave

Foothill Blvd

Holt Blvd

Central Ave

Mission Blvd

Riverside Dr

Bellegrave Ave

Limonite Ave

Van Buren Blvd

Victoria Ave

15

210

10

60

71

91

Perchlorate (µgl)

- ND
- < 0.5
- 0.5 - 1
- 1 - 2
- 2 - 4
- > 4

California MCL = 6 µgl

California PHG = 1 µgl

Well Sampled for Perchlorate but the Method Detection Limit was Greater than the PHG of 1 µgl

Active Municipal Supply Well

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

*Geology*

*Water-Bearing Sediments*

Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-8_CLO4_PHG_2014-2018.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 Km

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**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster
Partners in Basin Management

**Maximum Perchlorate Concentration**
*2014-2018*

**Exhibit EF-8**

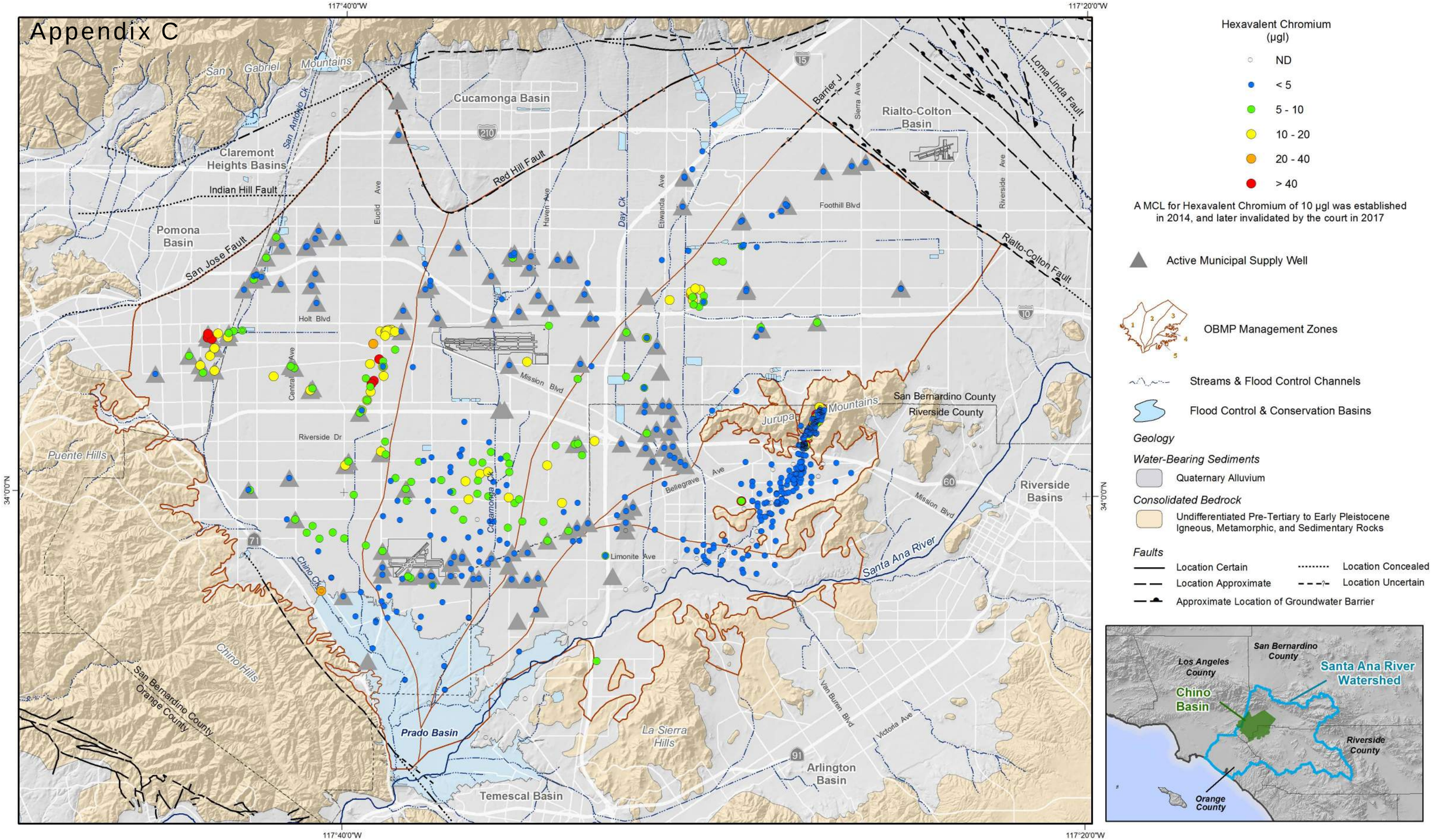


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-9_HexCr_2014-2018.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

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Chino Basin Watermaster — Partners in Basin Management

**Maximum Hexavalent Chromium**
*2014-2018*

**Exhibit EF-9**

Appendix C

Occurance of PFOA and PFOS in Groundwater

- Well not Sampled for PFOA or PFOS
- Well Sampled for UCMR3 between 2013-2015 Using Detection Limits of 20 and 40 ngl, higher than the Current Notification Levels (NL) of 13 and 14 ngl

Occurence of PFOA and PFOS in Blending Sources for Recycled Water Recharge

- Source Non-Detect for PFOA and PFOS
- Source with Detected Concentration Below the NLs of 13 and 14 ngl
- Source exceeding the NLs of 13 and 14 ngl
- Active Municipal Supply Well

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

*Geology*

*Water-Bearing Sediments*

Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-10_PFAS_1998-2019.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

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**PFOA and PFOS Concentrations**
*Through March 2019*

**Exhibit EF-10**

**Exhibit EF-11**
**Cost-Estimate and Schedule to Implement Activity EF**

| Task and Subtask Description | Engineering Cost | FY 2020/21 | | | | FY 2021/22 | | | | FY 2022/23 | | | | FY 2023/24 and beyond |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Task 1 Convene the Water Quality Committee, define objectives, and refine scope of work<br>· Convene Water Quality Committee<br>· Define objectives of Activity EF<br>· Refine scope described in TM1<br>· Refine detailed cost and schedule | $65,000 | $65,000 | | | | | | | | | | | | |
| Task 2 Develop and implement an initial emerging-contaminants monitoring plan<br>· Determine contaminants of interest<br>· Develop initial monitoring plan<br>· Implement initial monitoring plan | $95,000 | | | $50,000 | | $45,000 | | | | | | | | |
| Task 3 Perform a water quality assessment and prepare a scope to develop and implement a Groundwater Quality Management Plan<br>· Describe current and future challenges and solutions<br>· Develop recommendations for long-term monitoring and assessment<br>· Prepare scope to develop and implement a groundwater quality management plan<br>· Prepare final assessment | $135,000 | | | | | | $80,000 | | | $55,000 | | | | |
| Task 4 Develop planning, screening, and evaluation criteria<br>· Develop criteria to evaluate project cost and benefit<br>· Review and finalize criteria | $ TBD | | | | | | | | | | | | $ TBD | $ TBD |
| Task 5 Identify and describe potential projects for evaluation<br>· Identify potential projects<br>· Select projects for reconnaissance level study | $ TBD | | | | | | | | | | | | | $ TBD |
| Task 6 Conduct a reconnaissance-level study for the proposed projects<br>· Characterize potential treatment projects<br>· Evaluate Projects<br>· Prepare finance plan for soft-costs<br>· Prepare implementation plan | $ TBD | | | | | | | | | | | | | $ TBD |
| Task 7 Prepare the *Groundwater Quality Management Plan*<br>· Prepare draft plan<br>· Prepare final plan | $ TBD | | | | | | | | | | | | | $ TBD |
| Task 8 Plan, design, and build water quality management projects<br>· Prepare preliminary design report and CEQA documentation<br>· Prepare finance plan for project implementation<br>· Obtain permits and agreements and prepare final design<br>· Construct selected projects | $ TBD | | | | | | | | | | | | | $ TBD |
| **Total Cost and Cost by FY** | **$295,000** | **$115,000** | | | | **$125,000** | | | | **$55,000** | | | | **$ TBD** |

TBD -- To be determined

**Exhibit CG-1**
**Aggregate Water Supply Plan for Watermaster Parties**

| Water Source | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| Volume (af) | | | | | | |
| Chino Basin Groundwater | 147,238 | 145,904 | 153,804 | 157,716 | 168,987 | 176,652 |
| Non-Chino Basin Groundwater | 51,398 | 55,755 | 63,441 | 64,999 | 66,691 | 68,483 |
| Local Surface Water | 8,108 | 15,932 | 15,932 | 18,953 | 18,953 | 18,953 |
| Imported Water from Metropolitan | 53,784 | 86,524 | 93,738 | 100,196 | 102,166 | 109,492 |
| Other Imported Water | 8,861 | 9,484 | 10,095 | 10,975 | 11,000 | 11,000 |
| Recycled Water for Direct Reuse | 20,903 | 24,008 | 24,285 | 26,583 | 29,836 | 33,223 |
| Total | 290,292 | 337,607 | 361,295 | 379,422 | 397,633 | 417,803 |
| Percentage | | | | | | |
| Chino Basin Groundwater | 51% | 43% | 43% | 42% | 42% | 42% |
| Non-Chino Basin Groundwater | 18% | 17% | 18% | 17% | 17% | 16% |
| Local Surface Water | 3% | 5% | 4% | 5% | 5% | 5% |
| Imported Water from Metropolitan | 19% | 26% | 26% | 26% | 26% | 26% |
| Other Imported Water | 3% | 3% | 3% | 3% | 3% | 3% |
| Recycled Water for Direct Reuse | 7% | 7% | 7% | 7% | 8% | 8% |
| Total | **100%** | **100%** | **100%** | **100%** | **100%** | **100%** |

Source: Storage Framework Investigation - WEI, 2018

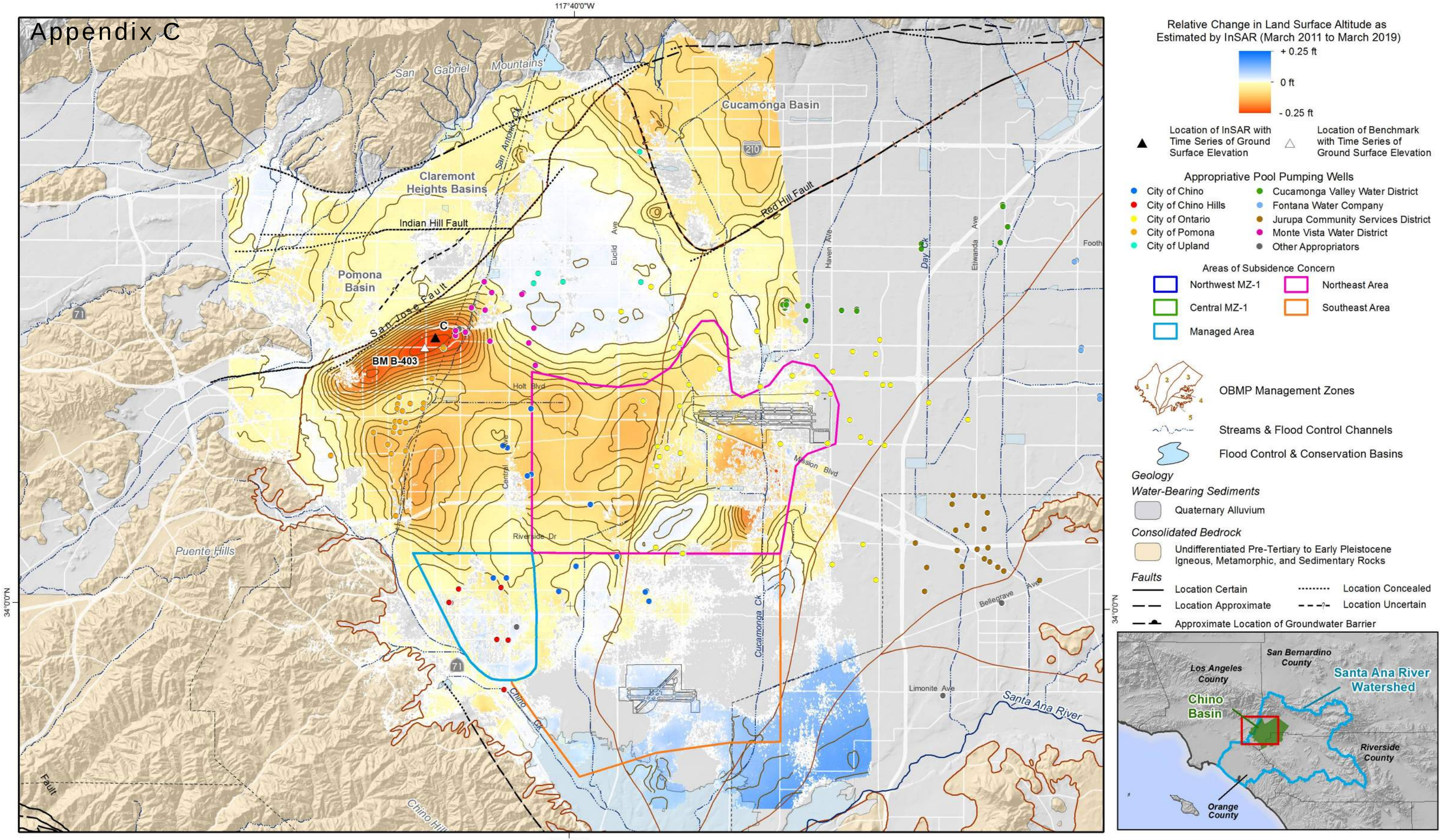


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 8/20/2019
File: Exhibit_CG-2_Land_Subsidence.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Areas of Land Subsidence**
*2011-2019*

**Exhibit CG-2**

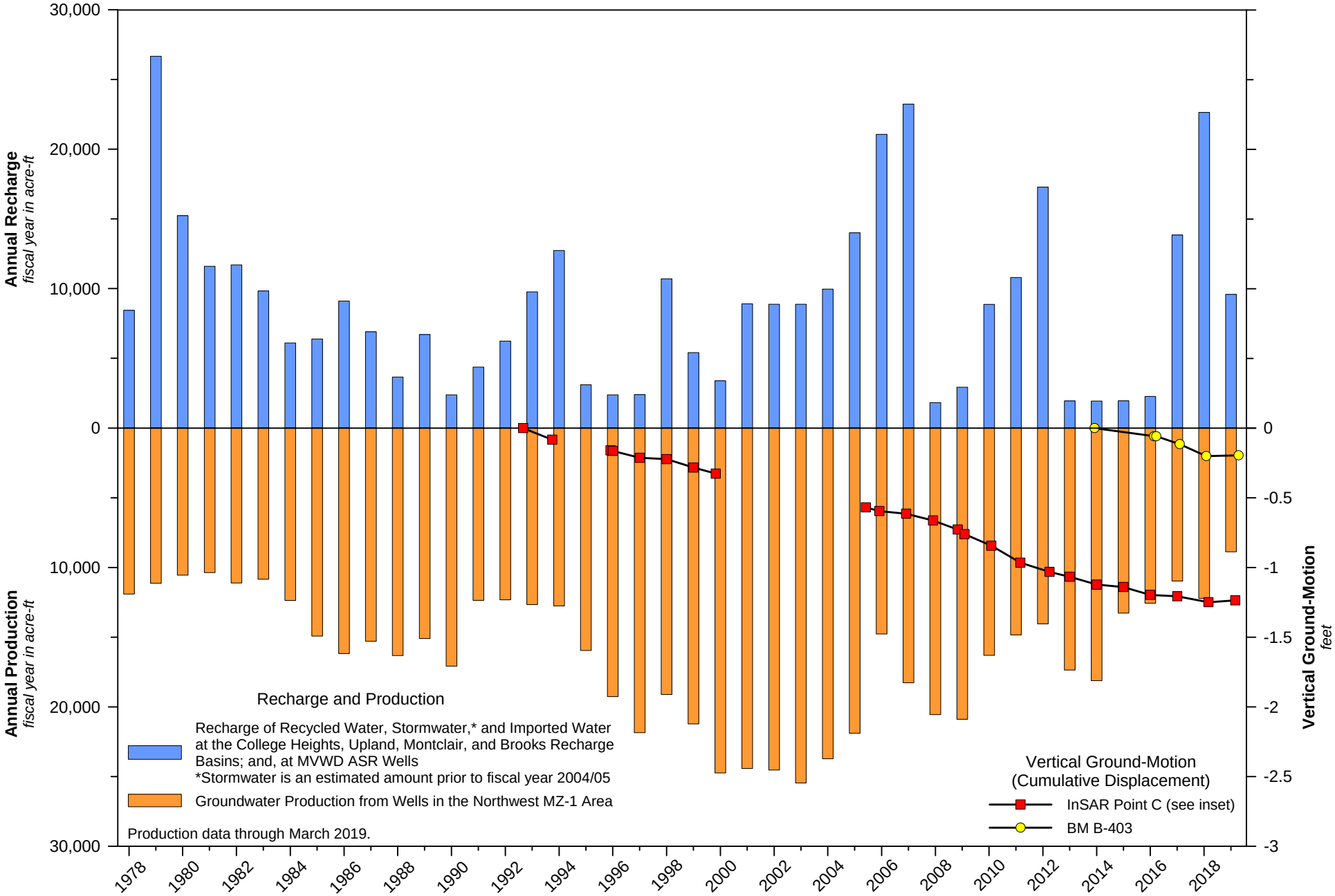


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WILDERMUTH ENVIRONMENTAL, INC.

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**OBMP 2020 Update**
*Scoping Report*

**Pumping, Recharge and Land Subsidence in the Northwest MZ-1 Area**

**Exhibit CG-3**

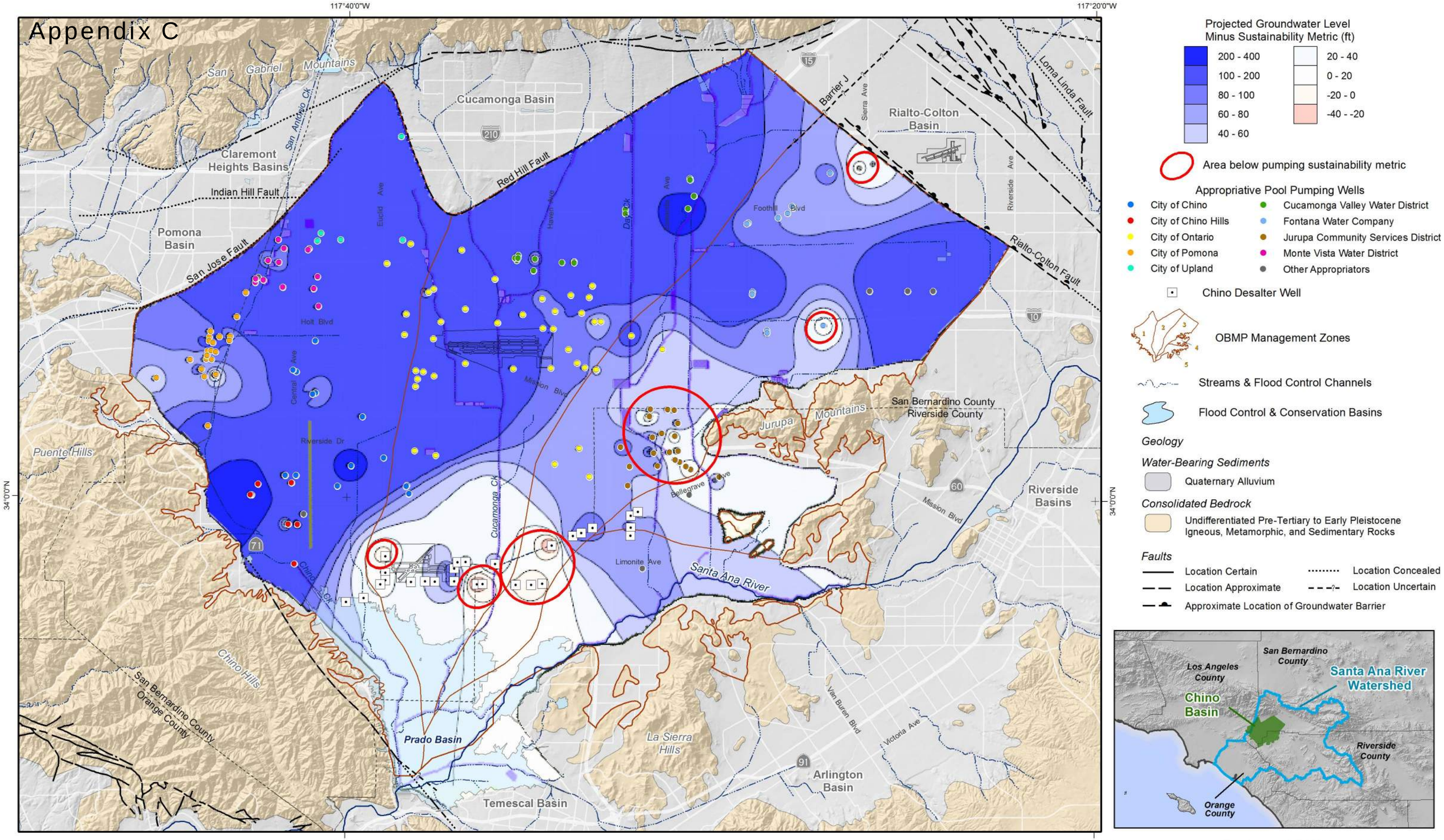


Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 8/20/2019
File: Exhibit_CG-4_Prj_Difference_in_GWLs.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

CHINO BASIN WATERMASTER
Partners in Basin Management

**Projected Difference between Groundwater Levels and the Pumping Sustainability Metric**

*Scenario 1A - FY 2029/30*

**Exhibit CG-4**

**Exhibit CG-5**
**Cost-Estimate and Schedule to Implement Activity CG**

| Task and Subtask Description | Engineering Cost | FY 2020/21 | | | | FY 2021/22 | | | | FY 2022/23 | | | | FY 2023/24 and beyond |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Task 1 Convene the Water Supply Reliability Committee, define objectives, and refine scope of<br>· Convene Water Supply Reliability Committee<br>· Define objectives of Activity CG<br>· Define reliability and other benefits expected from Activity CG<br>· Refine scope described in TM1<br>· Refine detailed cost and schedule | $95,000 | $95,000 | | | | | | | | | | | | |
| Task 2 Characterize water demands, water supply plans and existing/planned infrastructure and their<br>· Characterize the water supplies and future water demands<br>· Characterize exiting infrastructure to convey, treat, and distribute the supplies to meet the demands<br>· Identify limitations to the existing infrastructure | $210,000 | | | | $70,000 | $140,000 | | | | | | | | |
| Task 3 Develop planning, screening, and evaluation<br>· Develop criteria to evaluate project cost and benefit<br>· Review and finalize criteria | $ TBD | | | | | | | $ TBD | | | | | | |
| Task 4 Describe water supply reliability opportunities<br>· Identify potential projects<br>· Select projects for reconnaissance level study | $ TBD | | | | | | | | $ TBD | | | | | |
| Task 5 Develop reconnaissance-level engineering design and operating plan<br>· Characterize potential water supply reliability projects<br>· Evaluate Projects<br>· Prepare finance plan for soft-costs<br>· Prepare implementation plan | $ TBD | | | | | | | | | $ TBD | | | | $ TBD |
| Task 6 Plan, design, and build water supply reliability alternatives<br>· Prepare preliminary design report and CEQA documentation<br>· Prepare finance plan for project implementation<br>· Obtain permits and agreements and prepare final design<br>· Construct selected projects | $ TBD | | | | | | | | | | | | | $ TBD |
| **Total Cost and Cost by FY** | **$305,000** | **$165,000** | | | | **$140,000** | | | | **$TBD** | | | | **$ TBD** |

TBD -- To be determined

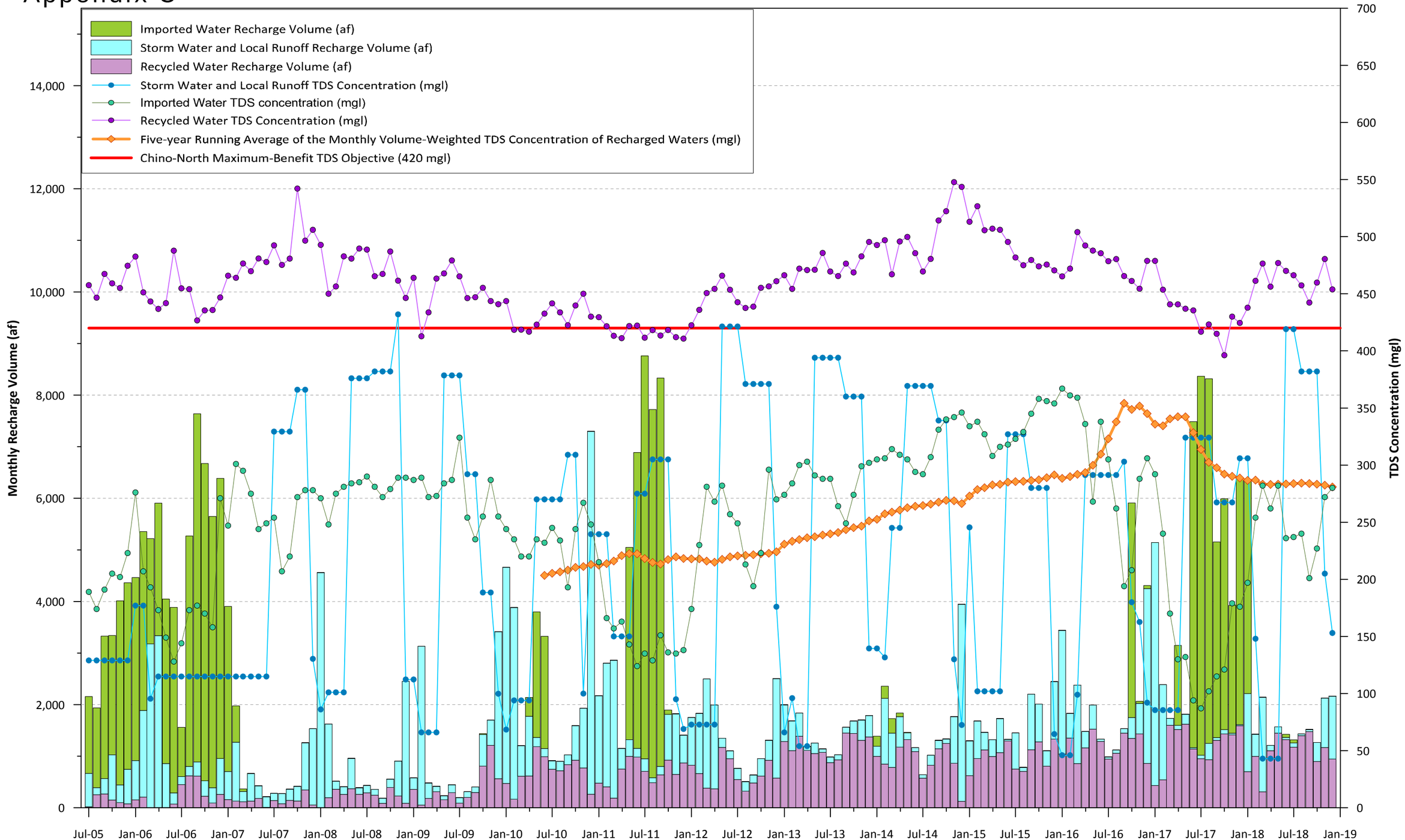


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**OBMP 2020 Update**
*Scoping Report*

**Volume and Total Dissolved Solids (TDS) Concentrations of Recharge Water Sources in the Chino Basin**
*2005-2018*

**Exhibit K-1**

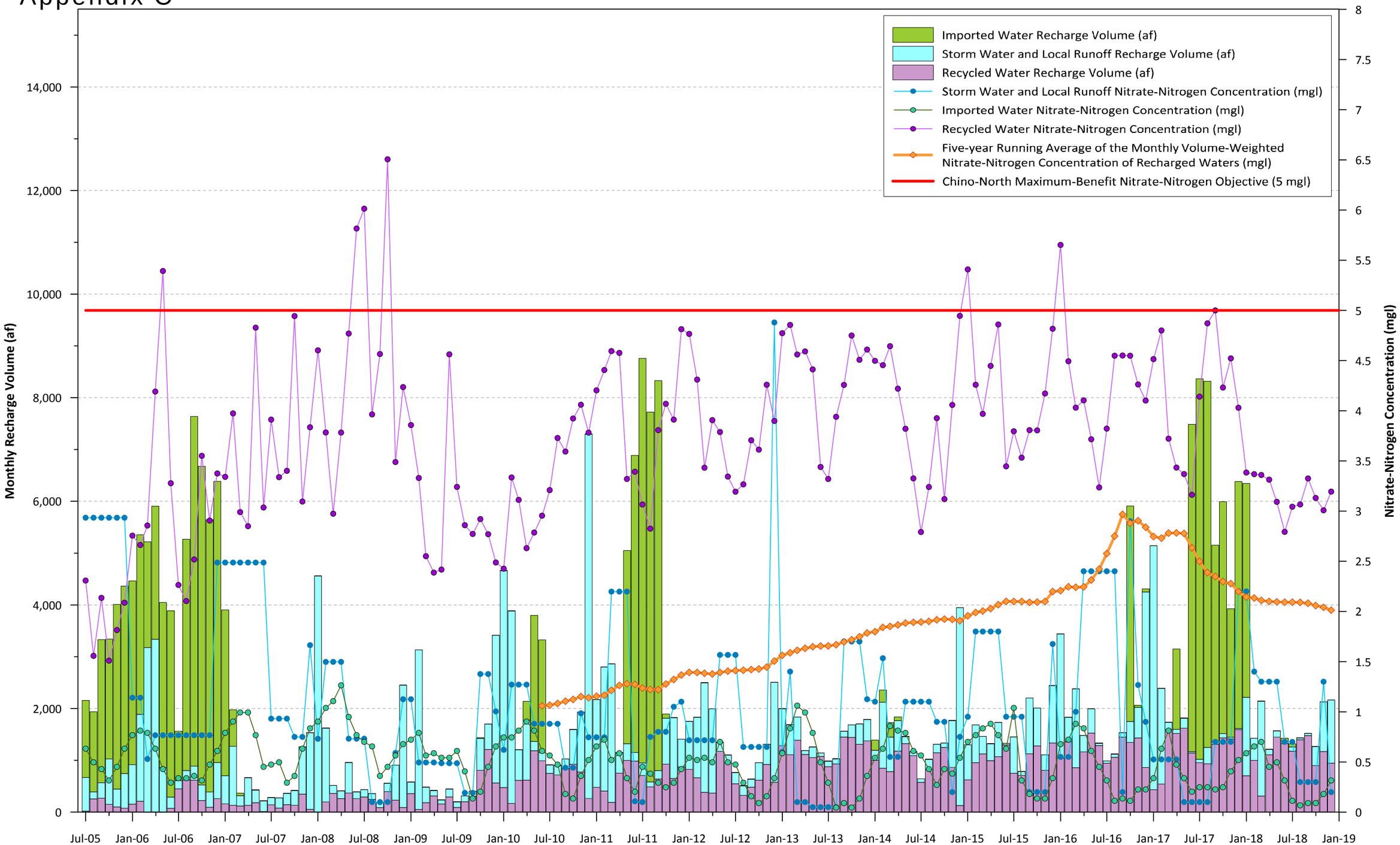


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**OBMP 2020 Update**
*Scoping Report*

**Volume and Nitrate-Nitrogen Concentrations of Recharge Water Sources in the Chino Basin**
*2005-2018*

**Exhibit K-2**

# Appendix C

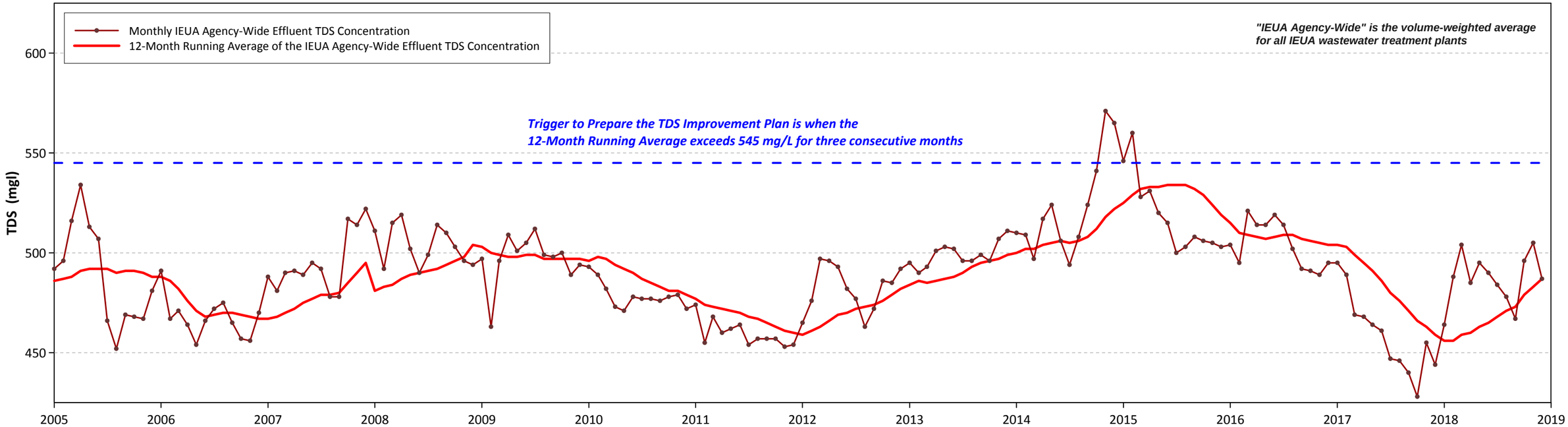


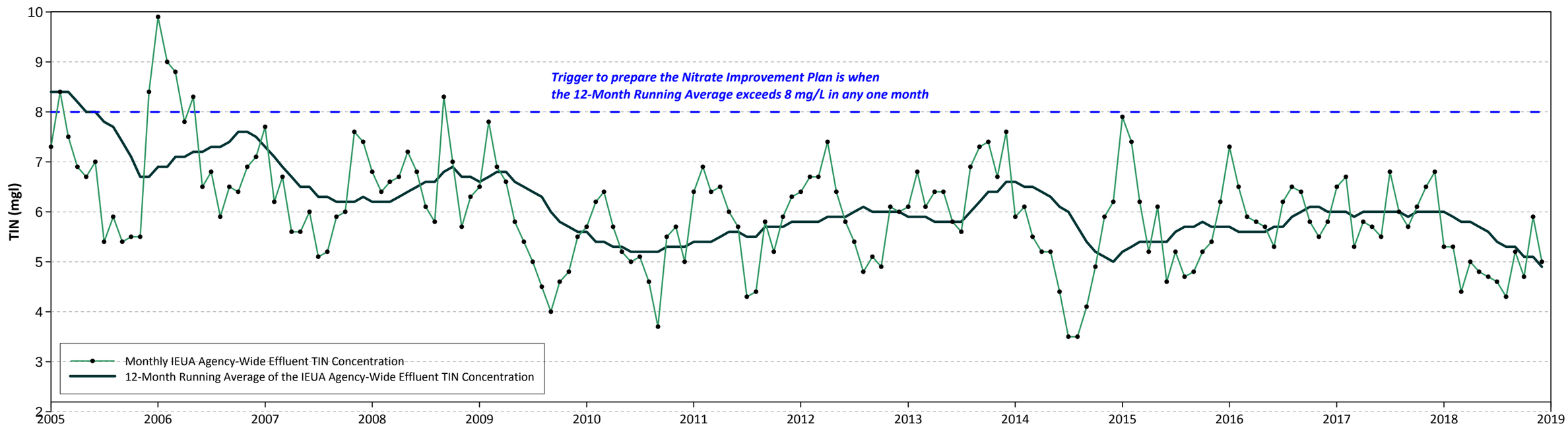


WEI
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Prepared for:
**OBMP 2020 Update**
*Scoping Report*

**Monthly and 12-Month Running Average of the IEUA Agency-Wide Effluent Total Dissolved Solids (TDS) and Total Inorganic Nitrogen (TIN) Concentrations**
*2005-2018*

**Exhibit K-3**

**Exhibit K-4**
**Cost Estimate and Schedule to Implement Activity K**

| Task and Subtask Description | Engineering Cost | FY 2020/21 | | | | FY 2021/22 | | | | FY 2022/23 | | | | FY 2023/24 and beyond |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Task 1 Prepare projection to evaluate compliance with recycled water recharge dilution requirements.<br>· Prepare projections<br>· Evaluate projections for future wet and dry periods within 5 and 10 years<br>· Determine the if there is a compliance challenge | $0 | $0 | | | | | | | | | | | | |
| Task 2 Identify alternative compliance strategies<br>· Identify potential compliance strategies<br>· Select projects for reconnaissance level study | $ TBD | | | | | $ TBD | | | | | | | | |
| Task 3 Evaluate alternative compliance strategies<br>· Characterize alternative compliance startegies<br>· Rank alternatives<br>· Prepare finance plan for soft-costs<br>· Prepare report | $ TBD | | | | | | | | $ TBD | $ TBD | | | | $ TBD |
| Task 4 Implement the alternative compliance strategy<br>· Prepare preliminary design report and CEQA documentation<br>· Prepare finance plan for project implementation<br>· Obtain permits and agreements and prepare final design<br>· Construct selected projects | $ TBD | | | | | | | | | | | | | $ TBD |
| Task 5 Periodically re-evaluate compliance with dilution requirements<br>· Prepare projections of the dilution metric on a five-year frequency<br>· Annually report current and future compliance with the dilution limit | $ TBD | | | | | | | | | | | | | $ TBD |
| **Total Cost and Cost by FY** | **$0** | **$0** | | | | **$ TBD** | | | | **$ TBD** | | | | **$ TBD** |

TBD -- To be determined

# Appendix C

**Exhibit L-1**

**Chino Basin Watermaster -- Monitoring and Reporting Requirements, Data Types, Analyses Performed, Report Contents, and Past Efforts to Reduce Scope/Cost**

| Purpose/Requirement/Schedule | Data Types | | | | | | | | | Analyses Performed | Report Content | Past Efforts to Reduce Scope and Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GWP | GWL | GWQ | SW | GL | GEOL | BIO | WS/WU | PLAN | | | |
| **Water Rights Compliance Monitoring.** Pursuant to Term 20 of Watermaster's Water Rights Permit 21225 and an agreement with the California Department of Fish and Wildlife (DFW), Watermaster must prepare an annual report of estimates of monthly changes in discharge in each tributary to the Santa Ana River that resulted from diversions of storm water and dry-weather flow for recharge in the Chino Basin. The annual report covers the 12-month period of July 1 through June 30, and is submitted to the DFW by October 1 of each year. | | | | X | | | | | | Watermaster Engineer prepares the report with review and input from Watermaster Counsel, which includes the following efforts:<br><br>1. Measured data and Watermaster's surface-water model are used to estimate the discharge in flood control channels that cross the Chino Basin and the diversions for recharge.<br>2. To compute the differences in discharge caused by the diversions for recharge, the discharge from the tributaries to the Santa Ana River is estimated with and without the Watermaster diversions. | A letter report is prepared, including text and exhibits, that describes the data, methods, and results of the analysis. | This report has become standardized and the scope has been reduced to the minimum required for compliance. The cost to complete this work has not increased over the last four years. |
| **Sustainable Groundwater Management Act (SGMA).** The SGMA requires that the Watermaster of an adjudicated basin identified in WC Section 10720.8(a) submit specific data, information, and annual reports for the previous water year to the California Department of Water Resources (DWR) by April 1.<br><br>Pursuant to SGMA WC Section 10720.8(f), Watermaster is required to submit:<br>(A) Groundwater elevation data unless otherwise submitted pursuant to WC Section 10932<br>(B) Annual aggregated data identifying groundwater extraction<br>(C) Surface water supply used for or available for use for groundwater recharge or in-lieu use<br>(D) Total water use<br>(E) Change in groundwater storage<br>(F) The annual report submitted to the court | X | X | | X | | | | X | | Watermaster Engineer prepares a technical memorandum, which includes the following efforts:<br><br>Item (A) is already submitted for the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, so no further data is reported pursuant to SGMA.<br>Items (B), (C), (D) and (F) are compiled from the appropriators, the IEUA, and Watermaster.<br>Item (E) is completed using the Chino Basin groundwater model to simulate storage change over the past water year. | A technical memorandum explicitly documenting the information for required items (A) through (F). The memorandum is included in the agenda packets for review by the Watermaster Pools, Advisory Committee, and Board. The memorandum and its contents are then submitted to the DWR via its online Adjudicated Basin Annual Reporting System. | Watermaster provides the minimum information required by DWR |
| **Biannual Evaluation of the Cumulative Effect of Transfers.** Pursuant to the Peace Agreement, page 20, Section 5.1 (e) (iv); the OBMP Implementation Plan, page 21, paragraph 11 (d); and the Rules and Regulations, page 51, Section 9.3, Watermaster will evaluate for the potential for any Material Physical Injury that may result from the cumulative effects of transfers of water in storage or any water rights proposed in place of physical recharge of water to the Chino Basin. The purpose of this evaluation is to provide guidance to Watermaster for future recharge activities. Reporting on this evaluation is required biannually beginning on July 1, 2003. | X | X | | X | | | | X | | Watermaster Engineer performs this evaluation:<br><br>1. If necessary, re-calibrate the Chino Basin groundwater-flow model for the prior two years.<br>2. Evaluate Watermaster assessment packages to determine which transfers resulted in an avoided wet-water replenishment and prepare a hypothetical historical model scenario that replaces transfers with wet-water replenishment.<br>3. Simulate the hypothetical historical model scenario with the groundwater-flow model over the period of the Peace Agreement (since 2000).<br>4. Compare the results of the new model simulation with the calibrated model results to characterize the cumulative effects of transfers since the Peace Agreement. | Watermaster's Engineer prepares one report that documents: (i) any model updates that were performed, (ii) the evaluation of the Balance of Recharge and Discharge, and (iii) the evaluation of the Cumulative Effects of Transfers. The evaluation of the Cumulative Effects of Transfers characterizes the differences in: water levels (especially in areas where low water levels and subsidence are a concern); storage; the achievement and maintenance of Hydraulic Control; Santa Ana River discharge at Prado Dam; and the developed yield of the Chino Basin. | |
| **Biannual Evaluation of the Balance of Recharge and Discharge.** Pursuant to Section 7 of the Rules and Regulations, page 35, 7.1 (b) (iii) and (iv) and the Peace Agreement, page 20, Section 5.1 (e) (iii), Watermaster will conduct an evaluation of the Hydrologic Balance of recharge and discharge in the Chino Basin. The purpose of this evaluation is to provide guidance to Watermaster for future recharge activities to promote the goal of equal access to groundwater in each area and sub-area of the Chino Basin. Reporting on this evaluation is required biannually beginning on July 1, 2003. | | | | | | | | | X | Watermaster Engineer performs this evaluation:<br><br>1. Use the same version of the groundwater-flow model that is used for the evaluate of the Cumulative Effect of Transfers.<br>2. Prepare an updated planning scenario that includes groundwater production projections to comport with the latest Urban Water Management Plans, the IEUA-TVMWD-WMWD planning projections, state mandated water conservation, and climate change projections.<br>3. Simulate the updated planning scenario with the groundwater-flow model over long-term future period.<br>4. Evaluate the model results with respect to changes in water levels, the areal balance of recharge and discharge and provide Watermaster with recommendations on the future locations and magnitudes of supplemental water recharge necessary to improve the balance of recharge and discharge. | Watermaster's Engineer prepares one report that documents: (i) any model updates that were performed, (ii) the evaluation of the Balance of Recharge and Discharge, and (iii) the evaluation of the Cumulative Effects of Transfers. The evaluation of the Balance of Recharge and Discharge characterizes long-term changes in water levels across the Chino Basin under the plans of the Parties and the Watermaster, and characterizes the balance of recharge and discharge. | Watermaster completed this work in 2003, 2005 and 2015 -- four reports were skipped. Watermaster evaluates the balance of recharge and discharge in other efforts that include 2007 Peace II engineering work, 2009 Production Optimization investigation, 2013 RMPU, Safe Yield reset, Storage Framework Investigation and the forthcoming 2020 Safe Yield reset. |

# Appendix C

**Exhibit L-1**

**Chino Basin Watermaster -- Monitoring and Reporting Requirements, Data Types, Analyses Performed, Report Contents, and Past Efforts to Reduce Scope/Cost**

| Purpose/Requirement/Schedule | Data Types | | | | | | | | | Analyses Performed | Report Content | Past Efforts to Reduce Scope and Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GWP | GWL | GWQ | SW | GL | GEOL | BIO | WS/WU | PLAN | | | |
| **Annual Finding of Substantial Compliance with the Recharge Master Plan.** Pursuant to Sections 7.3 and 8.1 of the Peace II Agreement, Watermaster must make an annual finding that it is in substantial compliance with a Court-approved Recharge Master Plan, particularly regarding the sufficiency of Replenishment capability to satisfy reasonable projections of future Desalter Replenishment Obligations following the completion of Basin Re-Operation and its associated forgiveness of Desalter Replenishment Obligations. | | | | X | | | | | X | Watermaster Engineer performs this work:<br><br>1. Describe Watermaster's projections of future Replenishment Obligations based on the most recent production plans of the Parties. These production plans are typically extracted from Watermaster's most current groundwater modeling efforts.<br>2. Describe Watermaster's projections of future Replenishment capacity as documented in the Recharge Master Plan and/or current RMP implementation efforts.<br>3. Compare the projections of Replenishment Obligations vs. Replenishment capacity to assess compliance with the Recharge Master Plan. | A letter report is prepared to document the data, methods, and findings of the evaluation of substantial compliance with the Recharge Master Plan. | This report has become standardized, updated content derived from other Watermaster work resulting in reduced scope and reduced cost. |
| **Annual Report of Compliance with SB 88 and SWRCB Regulations for Measurement and Reporting of Diverted Surface Water**. Watermaster holds three diversion permits, issued by the SWRCB, that provide authorization to Watermaster to divert and recharge storm and dry-weather discharge. Watermaster reports annually on the amount of water diverted for recharged to the SWRCB pursuant to its permits and SWRCB regulations in Title 23, Chapter 2.7.<br><br>SB 88 was signed into law by Governor Brown on June 24, 2015. Sections 15 through 18 of that law add new measurement and reporting requirements for a substantial number of diverters, including the Chino Basin Watermaster. Watermaster must demonstrate to the SWRCB its compliance with SB88. Reports are due annually by April 1, the reporting period is calendar year. | | | | X | | | | | | Watermaster Engineer performs this work:<br><br>1. Collect, compile, and summarize estimates of diversion and recharge volumes for the calendar year for each point of diversion for each permit. Much of these data and information are borrowed from the data collected and analyzed for Watermaster's *Water Rights Compliance Reporting* report.<br>2. Collect information from IEUA on the measurement scheme for each point of diversion (device, accuracy, methods of measurement and calculation, recording frequency). Evaluate each point of diversion for compliance with SB88. If any point of diversion is not in compliance with SB88, develop and document a plan to comply. | 1. Prepare a progress report of the estimates of diversion and recharge volumes for the calendar year for each point of diversion, and submit the estimates to the SWRCB electronically on its website.<br><br>2. To comply with SB 88, Watermaster must annually report the following in addition to (1.) above:<br>• Information on the device or method used to calculate the amount of water diverted.<br>• Water diversion measurement, either direct diversion or diversion to storage, including the type of device(s) used, additional technology used, who installed the device(s), and any alternative method(s) used in measuring water diversion. | As to the progress report, this work has been reduced to filling out a form on SWRCB water rights portal. As to SB88 compliance, this is a new regulation and Watermaster staff has approached regulations in a way to minimize compliance cost. |
| **Safe Yield Recalculation.** Pursuant to the OBMP Implementation Plan and Section 6.5 of Watermaster's Rules and Regulations, Watermaster is required to recalculate and reset the Safe Yield of the Chino Basin in fiscal year 2010/11 and every ten years thereafter. The purpose of the recalculation and reset is to prevent Overdraft, and continue to operate the Chino Basin pursuant to the Physical Solution of the Judgment. | X | X | X | X | X | X | | X | X | Watermaster Engineer performs the analysis, and prepares the report. Pursuant to the Safe Yield Reset Technical Memorandum, the methodology to recalculate Safe Yield is:<br><br>1. Collect new hydrogeologic information collected since the last model calibration and all the historical hydrologic and water use data, revise conceptual and numerical models and recalibrate groundwater model.<br>2. Update existing and projected cultural conditions and determine if future projections will based on: (a) long-term historical record of precipitation falling or (b) precipitation projections based on Global System Models to estimate the long-term average net recharge to the Basin.<br>3. Update pumping projections and all recharge and discharge components that are input to the models.<br>4. With the information generated in [1] through [3] above, use the groundwater-flow model to project the net recharge for existing current and projected future cultural conditions.<br>5. Qualitatively evaluate whether the groundwater production at the net recharge rate estimated in [4] above will cause or threaten to cause "undesirable results" or "Material Physical Injury". If so, identify mitigation measures or an alternative Safe Yield to prevent "undesirable results" or "Material Physical Injury." | The report documents the data collected, the model re-calibration, and the analyses performed to calculate net recharge and Safe Yield. | Watermaster developed a task memorandum in 2015 entitled Methodology to Reset Safe Yield Using Long-Term Average Hydrology and Current and Projected Future Cultural Conditions that defines the methodology for the recently approved Safe Yield. This methodology was used to develop the scope and budget for the 2020 Safe Yield reset work and reduces the cost of the 2020 Safe Yield reset relative to the past effort. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GWP | GWL | GWQ | SW | GL | GEOL | BIO | WS/WU | PLAN | | | |
| **Recharge Master Plan Update (RMPU).** The 2010 RMPU was prepared pursuant to requirements of the Peace II Agreement and the December 2007 Court Order that approved and directed Watermaster to implement the Peace II Agreement. The Court directed Watermaster to amend the 2010 RMPU to include updated information on water demands and future replenishment projections. Watermaster completed this amendment on time in September 2013. In approving the 2013 RMPU amendment, the Court directed Watermaster to prepare recharge master plan updates on a five-year cycle. Subsequently, the 2018 RMPU was completed in October 2018 and the next report due in 2023 and every five years thereafter. | | | | X | | | | | X | The requirements of the work to be performed in the RMPU are defined in the Peace Agreements and the 2007 report of the Special Referee (see the introduction to the 2013 RMPU amendment) Watermaster Engineer conducts the assessment, which includes:<br><br>1. Collect data related to basin management including future groundwater pumping plans, stormwater management, planned supplemental water recharge, legislation and regulations that affect recharge and prepare an assessment of how the water management has changed since the last RMP.<br>2. Prepare an assessment of the future Replenishment Obligations.<br>3. Inventory all existing recharge facilities, update their performance information, estimate the supplemental water recharge capacity of each facility and assess: (a) the adequacy of existing recharge facilities to meet future Replenishment Obligations and recharge goals and (b) the adequacy of existing recharge facilities to enable Watermaster to balance recharge and discharge.<br>4. Develop and analyze new projects to mitigate deficits identified in 3 above and identify new stormwater projects to increase basin yield.<br>5. Develop and apply criteria to screen and prioritize the recharge projects identified in 4 above and make recommendations for their implementation.<br>6. Prepare implementation plan. | The report documents the RMPU requirements, the data collected and planning assumption, the existing recharge capabilities, the need for additional supplemental water recharge capacity, project alternatives, screening and prioritization of alternatives and recommendations on project implementation.. | This report has become standardized and the scope has been reduced to the minimum required for compliance, resulting in reduced cost relative to the 2010 and 2013 reports. |
| **State of the Basin Report.** Pursuant to Section 2.21 of the Rules and Regulations and the November 15, 2001 Court Order, Watermaster prepares a State of the Basin report every two years to describe the status of individual OBMP related activities and document how the basin has physically responded during OBMP implementation (i.e. since September 2000). The report is typically finalized by June 30. | X | X | X | X | X | | | X | | Watermaster Engineer prepares this report. Most of the data and information utilized to prepare the report are acquired from other Watermaster monitoring and reporting efforts. Text, tables, charts, and maps are prepared to characterize: hydrology, production, recharge (replenishment and other recharge), groundwater levels and quality, point-source groundwater contamination, land subsidence, Hydraulic Control, desalter planning and engineering, and production meter installation. | The report includes annotated maps, charts, and tables that characterize the physical state of the basin and how it has changed since 2000. The report is published as a tabloid-sized map atlas and a PDF file for online viewing. | This report has evolved over time from a complex engineering report to simpler, graphically-intense and more readable report. In this process the scope and cost to produce the report was reduced. |
| **California Statewide Groundwater Elevation Monitoring Program (CASGEM).** Pursuant to Water Code section 10920, Watermaster must measure and report groundwater-elevation data from a subset of wells to the Department of Water Resources' CASGEM website twice per year (January 1 and July 1) for the Chino (8-2.01) and Cucamonga (8-2.02) Groundwater Subbasins of the Upper Santa Ana Valley Groundwater Basin (8-2). | | X | | | | | | | | Watermaster Engineer reviews time-series charts of groundwater elevations from a defined set of 37 wells in the Chino Basin and nine (9) wells in the Cucamonga Basin, and selects and compiles monthly measurements for a six-month period (summer/fall and winter/spring) that are representative of non-pumping water levels. This effort is performed in HydroDaVE Explorer. The selected data is exported from HydroDaVE in a file format for seamless upload to the CASGEM website. | The selected groundwater elevations for summer/fall and winter/spring are uploaded to the CASGEM website twice per year. | Watermaster staff reports the required groundwater-elevation data directly from its database to minimize effort and cost. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GWP | GWL | GWQ | SW | GL | GEOL | BIO | WS/WU | PLAN | | | |
| **Chino Basin Maximum Benefit Annual Report.** This annual report is required by the Regional Board pursuant to Chapter 5 of the Basin Plan and Order No R8-2012-0026. There are a total of nine (9) maximum benefit commitments required of the Watermaster and IEUA in exchange for obtaining elevated TDS and nitrate objectives for the Chino-North Groundwater Management Zone. The Maximum Benefit commitments are:<br>1. The implementation of a surface-water monitoring program.<br>2. The implementation of a groundwater monitoring program.<br>3. The expansion of the Chino-I Desalter to 10 million gallons per day (mgd) and the construction of the Chino-II Desalter with a design capacity of 10 mgd.<br>4. The additional expansion of desalter capacity (20 mgd) pursuant to the OBMP and the Peace Agreement.<br>5. The completion of the recharge facilities included in the Chino Basin Facilities Improvement Program.<br>6. The management of recycled water quality to ensure that the agency-wide, 12-month running average wastewater effluent quality does not exceed 550 mg/L and 8 mg/L for TDS and total inorganic nitrogen (TIN), respectively.<br>7. The management of basin-wide, volume-weighted TDS and nitrogen concentrations in artificial recharge to less than or equal to the maximum-benefit objectives.<br>8. The achievement and maintenance of the "Hydraulic Control" of groundwater outflow from the Chino Basin to protect Santa Ana River water quality.<br>9. The determination of ambient TDS and nitrogen concentrations of Chino Basin groundwater every three years.<br>The purpose of the annual report is to describe and document compliance with the Maximum Benefit commitments. The report is due by April 15th, and the reporting period is the calendar year. | X | X | X | X | | | | | X | Watermaster Engineer prepares the report, including the following efforts:<br>1. Collect, check, and upload groundwater-level, groundwater-quality, and surface water-quality data to Watermaster databases. These data are used in the analyses required to demonstrate Hydraulic Control and compute ambient water quality.<br>2. Review and summarize CDA progress reports on completion of the desalter well fields to achieve 40,000 afy of groundwater-production.<br>3. Calculate: (i) the 12-month running average of IEUA's effluent TDS concentration to determine whether it has exceeded 545 mg/L for 3 consecutive months, and (ii) the 12-month running average of IEUA's effluent TIN concentration to determine whether it has exceeded 8 mg/L in any one month.<br>4. Calculate: the 5-year running volume-weighted concentration of TDS and nitrate in recharged recycled water, supplemental water, and new storm water, and determine if the average is less than the TDS and nitrate Maximum Benefit objectives of the Chino-North GMZ.<br>5. Use groundwater-elevation contours prepared in the State of the Basin Report (every 2 years) to show the extent of Hydraulic Control.<br>6. Use Watermaster's groundwater-flow model (updated and recalibrated every five years) to determine if the volume of groundwater flowing past the desalter well field is *de minimis* (<1,000 afy).<br>7. Report on the status of the Recomputation of ambient groundwater quality for the Chino Basin groundwater management zones, which is performed once every three years (for TDS and nitrate-nitrogen).<br>8. Utilize data from the Santa Ana River Watermaster's Annual Reports to characterize the influence of rising groundwater from the Chino Basin on the flow and quality of the Santa Ana River. | Text and exhibits that describe the status of compliance with the Maximum Benefit commitments.<br><br>The data collected each calendar year are submitted to the Regional Board as an attachment to the report. | In 2012 Watermaster staff took the lead to substantially reduce the monitoring and reporting effort required under Maximum Benefit. In particular, the surface-water monitoring and quarterly reporting components of the program were virtually eliminated and the scope of annual reporting was reduced to eliminate redundancies. These efforts resulted in an estimated $250,000 per year in cost savings (2012$). |
| **Annual Report of the Prado Basin Habitat Sustainability Committee.** The monitoring and mitigation requirements of the Peace II CEQA SEIR (Biological Resources/Land Use & Planning—Section 4.4-3) call for the IEUA, Watermaster, and the Orange County Water District to form the Prado Basin Habitat Sustainability Committee (PBHSC) to ensure that the Peace II Agreement actions will not significantly or adversely impact the Prado Basin riparian habitat. One of the responsibilities of the PBHSC is to prepare annual reports by June 30 of each year. | X | X | X | X | | X | X | | X | Watermaster Engineer prepares the annual report, which includes the following efforts:<br><br>1. Preparation of maps and data graphics that characterize the extent and quality of the riparian habitat in Prado Basin.<br>2. Preparation of maps and data graphics that characterize the trends in groundwater levels, climate and weather, surface water, and other factors that can affect the riparian habitat. This information is compared to the changes in the extent and quality of the riparian habitat to identity cause-and-effect relationships.<br>3. Groundwater-level change maps from existing results of Watermaster's groundwater-flow modeling are used to identify prospective areas of concern for the riparian habitat. | Summary of activities conducted for the PBHSC.<br><br>Documentation of measured loss or prospective loss of riparian habitat (if any) with attribution of cause.<br><br>Recommendations for ongoing monitoring and a scope of work and budget for the following fiscal year.<br><br>Recommended adaptive management actions, if any, required to mitigate any measured loss or prospective loss of riparian habitat that is attributable to the Peace II activities. | After the completion of the first report in 2016, Watermaster identified efficiencies in monitoring and reporting, reducing the cost by almost 50 percent. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | GWP | GWL | GWQ | SW | GL | GEOL | BIO | WS/WU | PLAN | | | |
| **Water Recycling Requirements for the Chino Basin Recycled Water Groundwater Recharge Program.** IEUA and Watermaster have a permit from the Regional Water Quality Control Board (Order R8-2007-0039, amended as R8-2009-0057) for recycled water recharge at 13 sites in the Chino Basin (Phase I and Phase II). The permit requires implementation of a monitoring and reporting program, and the submittal of the following reports: Quarterly and Annual Groundwater Recharge (GWR) Monitoring Reports, five-year Engineering Reports, and Basin Start-up Period Reports. | X | X | X | X | | | | | | IEUA staff performs the analyses and prepares the reports. The analyses include the following efforts:<br><br>Collect recycled water, diluent water, and groundwater data and compare to regulatory limits and specifications in the permit; report on recharge operations and any non-compliance events due to water quality, including records of any operational problems, plant upset and equipment breakdowns or malfunctions, and any diversions of off specification recycled water and the locations of final disposal; report of corrective or preventive action(s) taken; certification that no groundwater has been pumped for domestic water supply use from the buffer zone that extends 500 feet and 6-months underground travel time from the recharge basin(s) where recycled water is applied; mass balance calculations to ensure bleeding is occurring in the aquifer; and estimates of approximate travel times of recharged recycled water in the aquifer at each basin.<br><br>Watermaster, as the co-permittee, has its Engineer provide technical support and review and comment on all reports before they are submitted to the permitting agencies. | Quarterly GWR Monitoring Reports: Summaries of the data in tabular form to demonstrate compliance with permit limits and specifications. Summary of recharge operations and any operational problems and preventive and/or corrective actions taken.<br><br>Annual GWR Reports: Summaries of recycled water and groundwater monitoring efforts for the year. Demonstration of recycled water recharge and diluent water in-aquifer blending by 120-month mass-balance calculations presented in Recycled Water Contribution (RWC) Management Plans and analysis of monitoring well water quality data. Estimates of approximate travel times of recharged recycled water in the aquifer.<br><br>Five-year Engineering Reports: Address all project changes over the last five years.<br><br>Basin Start-up Period Reports: Determination of percolation rates, soil aquifer treatment efficiency, lysimeter monitoring program, and initial maximum average RWC limits. | This report has become standardized and the scope has been reduced to the minimum require for compliance, resulting in reduced cost. |
| **Annual Report of the Ground-Level Monitoring Committee.** The MZ-1 Subsidence Management Plan (MZ-1 Plan) was developed by the MZ-1 Technical Committee (now named the Ground-Level Monitoring Committee) and approved by Watermaster in October 2007. In November 2007, the Court approved the MZ-1 Plan and ordered its implementation. The MZ-1 Plan was updated in 2015 and is now called the Chino Basin Subsidence Management Plan (SMP). Pursuant to the SMP, Watermaster prepares an annual report that includes the results of ongoing monitoring efforts, interpretations of the data, and recommended adjustment to the SMP, if any. | X | X | | X | X | X | | | X | Watermaster Engineer prepares the annual report, which includes the following efforts:<br><br>Preparation and interpretation of maps and graphics of data generated from the Ground-Level Monitoring Program including: the basin stresses of groundwater pumping and recharge, and the basin responses of changes in groundwater levels, aquifer-system deformation, and ground motion. | Background information on the program.<br><br>Summary of activities conducted for the Ground-Level Monitoring Program.<br><br>Analysis and interpretation of data.<br><br>Conclusions and recommendations for ongoing monitoring and a scope of work and budget for the following fiscal year.<br><br>Recommended updates to the SMP, if any. | The GLMC meets annually to review data and develop an appropriate scope of work for the monitoring program for the subsequent year. The monitoring program has continually evolved to identify and implement efficiencies, address the concerns of the GLMC, and meet the requirements of the SMP. |
| **OBMP Semi-Annual Status Reports.** Pursuant to the July 13, 2000 Court Order that approves Watermaster's adoption of the Peace Agreement and the OBMP Implementation Plan, Watermaster is required to prepare semi-annual status reports to the Court on OBMP implementation. The purpose of the report is to provide the Court with updates on progress in implementing the OBMP. | X | X | X | X | X | X | X | X | X | Watermaster staff, with the assistance of Watermaster Engineer and Counsel, prepare text descriptions of activities that were conducted to implement the OBMP for the prior six months. | Descriptions of activities that implement the OBMP program elements for the prior six months. | This report has become standardized and the scope has been reduced to the minimum required for compliance, resulting in reduced cost. |
| **Semi-Annual Reports to the Watermaster Pools, Advisory Committee, and Board meetings.** The Parties have requested semi-annual reports that summarize the status of: (i) the groundwater contaminant plumes in the Chino Basin and (ii) the activities of the Ground-Level Monitoring Committee. | X | X | X | | X | | | | | Watermaster Engineer prepares text descriptions of activities performed during the previous quarter. | A text description of status of each of the known plumes within the Chino Basin and the activities of the Ground-Level Monitoring Committee. | This report has become standardized and the scope has been reduced to the minimum required for compliance, resulting in reduced cost. |

Key for Data Types:

GWP -- Groundwater-production monitoring
GWL -- Groundwater-level monitoring
GWQ -- Groundwater-quality monitoring
SW -- Surface-water and climate monitoring
GL -- Ground-level (subsidence) monitoring
GEOL -- Well construction, abandonment, and destruction monitoring
BIO -- Biological monitoring
WS/WU -- Water-supply and water use monitoring
PLAN -- Planning information

Appendix C

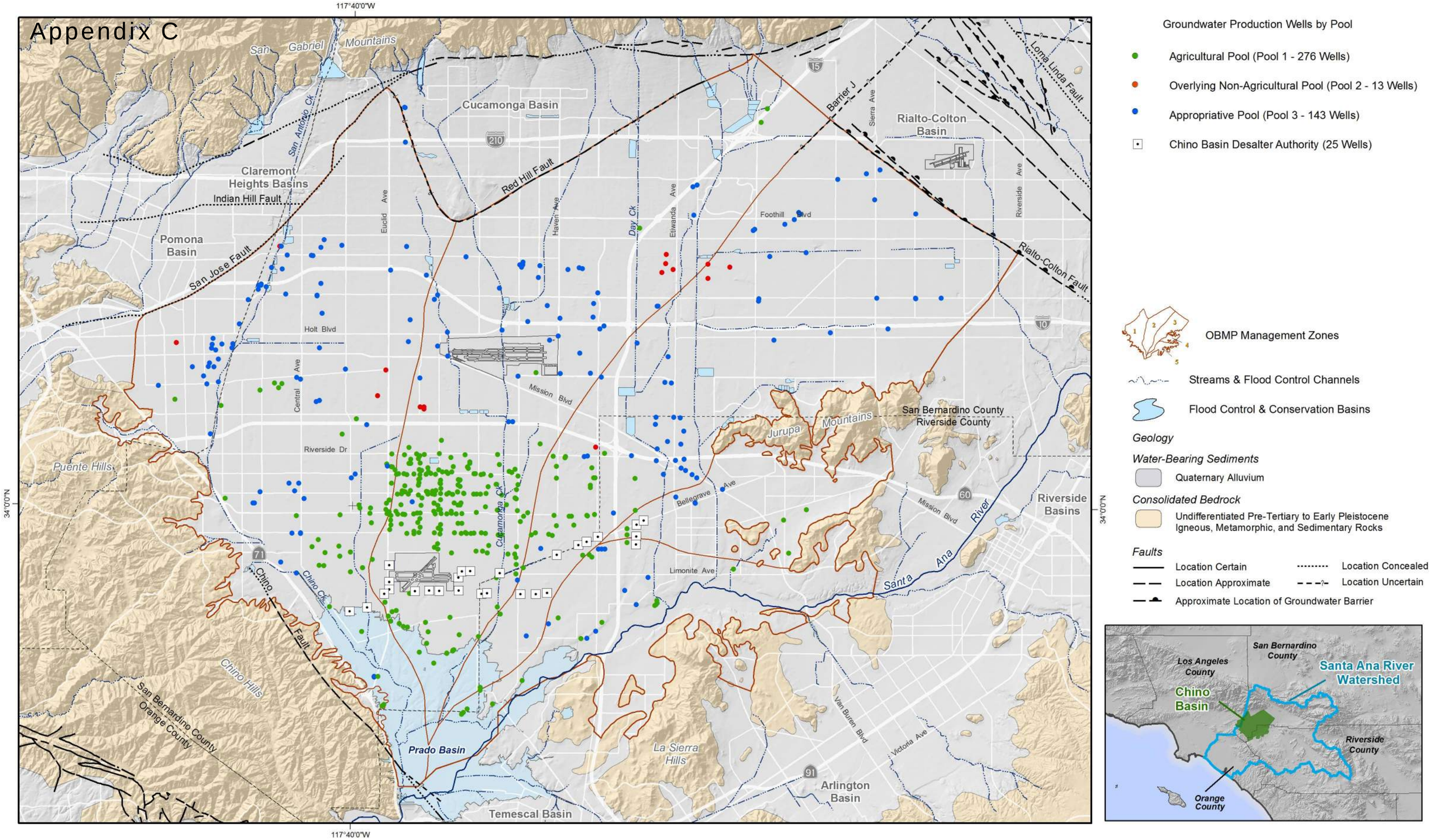


Groundwater Production Wells by Pool

- Agricultural Pool (Pool 1 - 276 Wells)
- Overlying Non-Agricultural Pool (Pool 2 - 13 Wells)
- Appropriative Pool (Pool 3 - 143 Wells)
- Chino Basin Desalter Authority (25 Wells)

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

*Geology*

*Water-Bearing Sediments*

Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

Location Certain

Location Approximate

Approximate Location of Groundwater Barrier

Location Concealed

Location Uncertain




Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 11/21/2019
File: Exhibit_L2_Groundwater Prod_.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Groundwater-Production Monitoring**

*Fiscal Year 2017/18*

**Exhibit L-2**

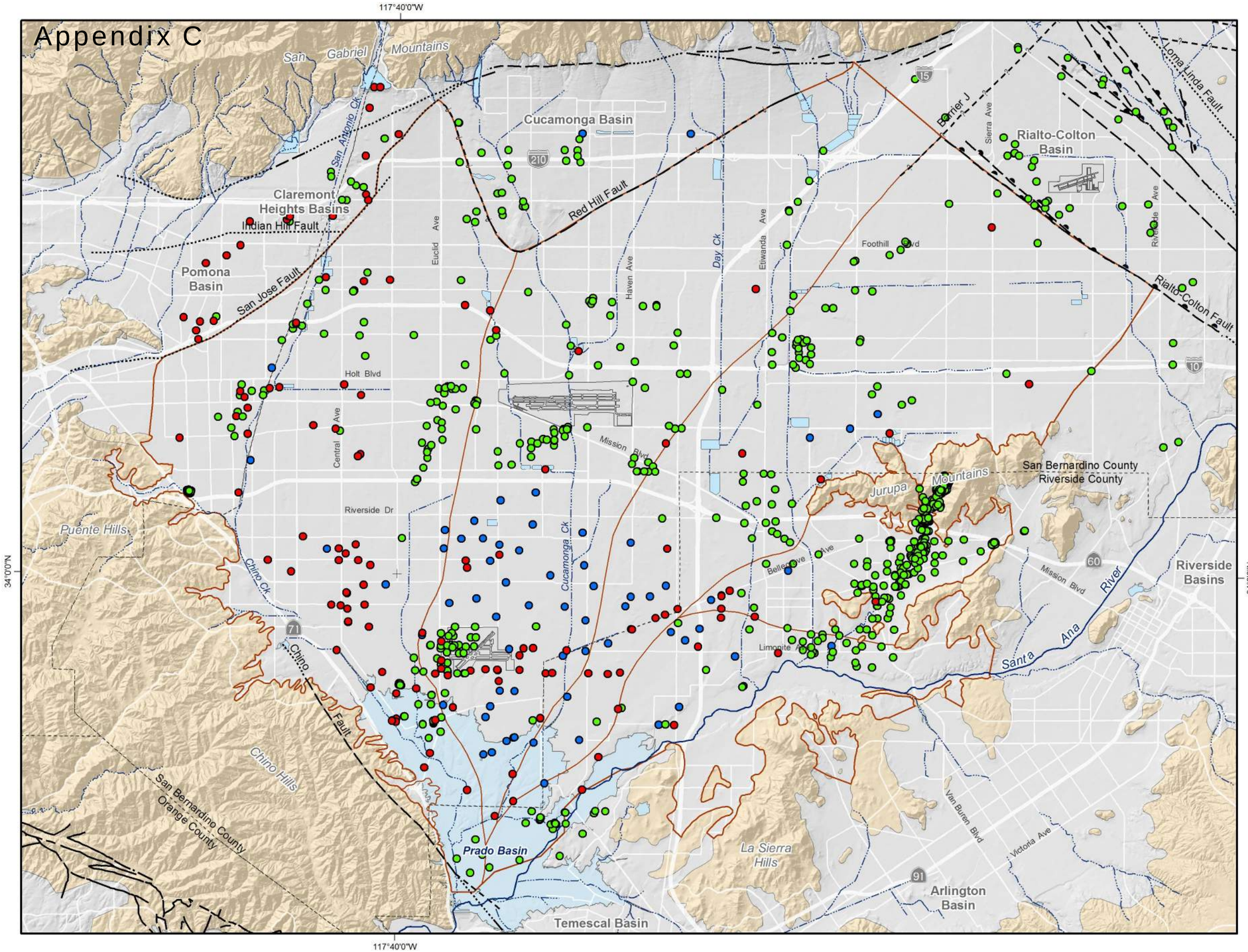


Groundwater-Level Monitoring Program
*Wells symbolized by Measurement Frequency*

- Measurement by CBWM Staff - Monthly (69 wells)
- Measurement by Transducer - Every 15 Minutes (177 wells)
- Measurement by Owner at Various Frequencies (1,077 wells)

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

*Geology*

*Water-Bearing Sediments*

Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

Location Certain
Location Approximate
Approximate Location of Groundwater Barrier
Location Concealed
Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 11/21/2019
File: Exhibit_L3_GWL.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Groundwater-Level Monitoring**

*Well Location and Measurement Frequency*
*Fiscal Year 2017/18*

**Exhibit L-3**

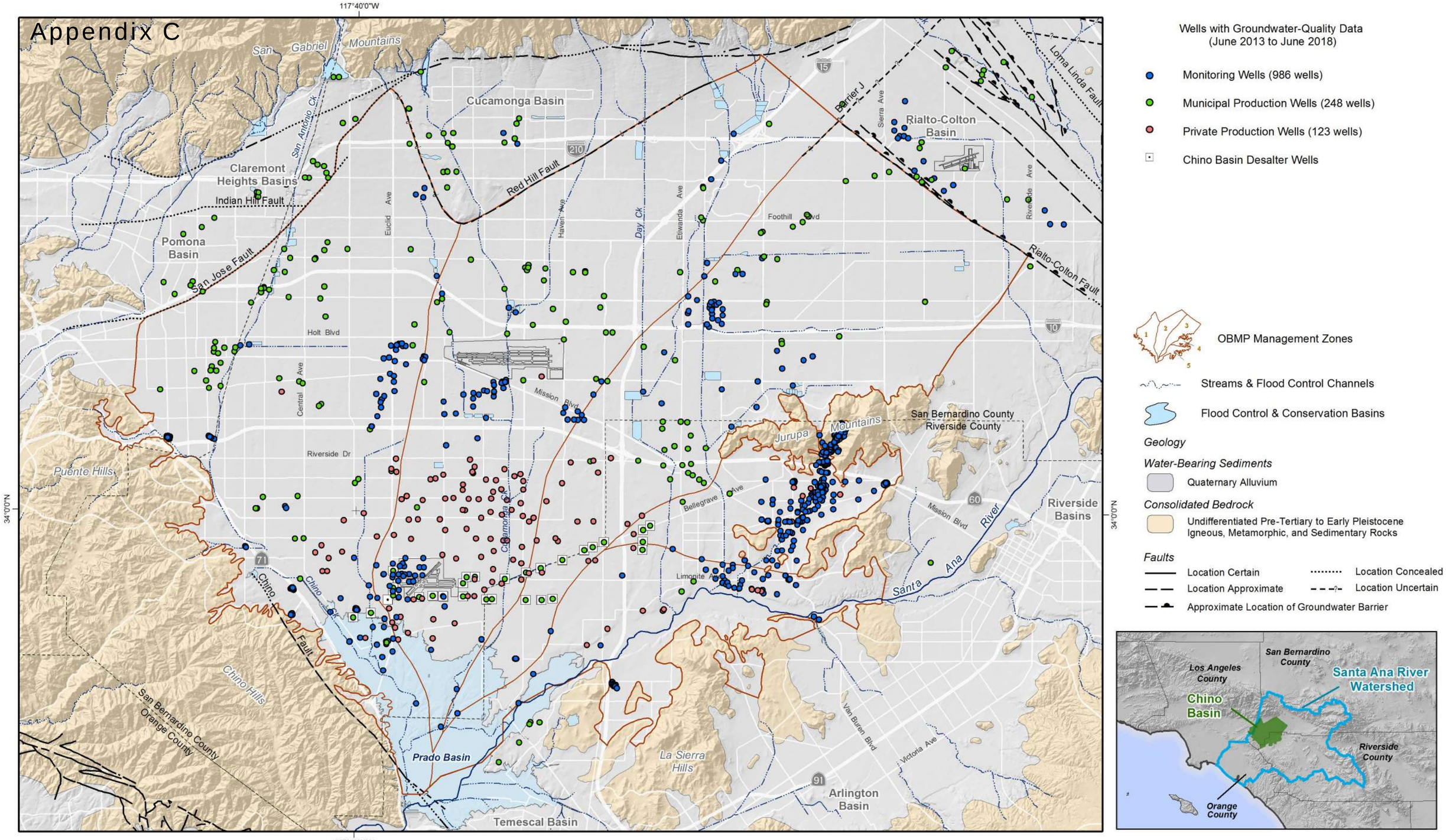


Wells with Groundwater-Quality Data
(June 2013 to June 2018)

- Monitoring Wells (986 wells)
- Municipal Production Wells (248 wells)
- Private Production Wells (123 wells)
- Chino Basin Desalter Wells

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

*Geology*

*Water-Bearing Sediments*

Quaternary Alluvium

*Consolidated Bedrock*

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

*Faults*

Location Certain
Location Approximate
Approximate Location of Groundwater Barrier
Location Concealed
Location Uncertain




Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 8/22/2019
File: Exhibit_L4_GWQ.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
**OBMP 2020 Update**
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Groundwater-Quality Monitoring**
*July 2013 to June 2018*

**Exhibit L-4**

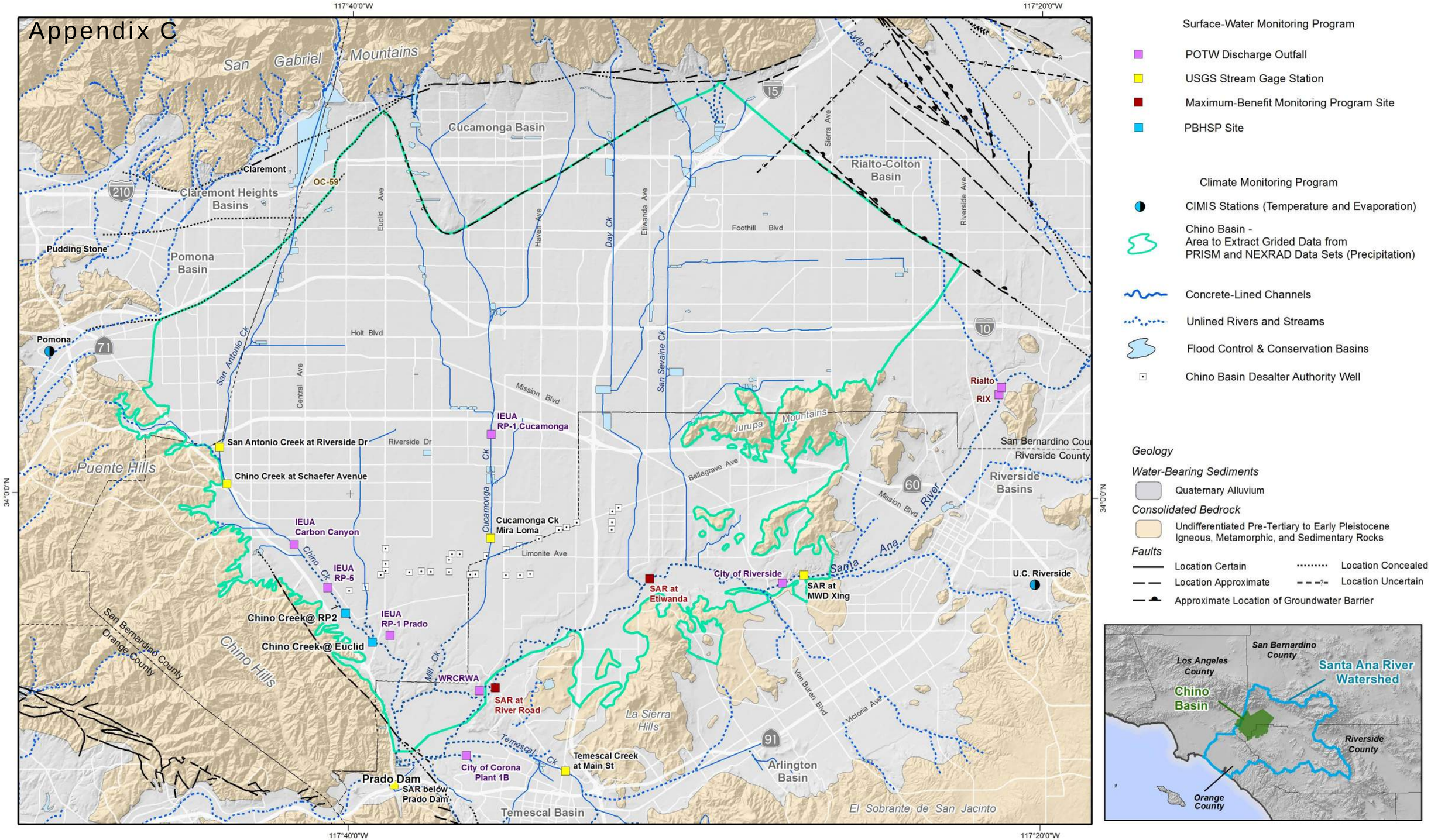


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 8/22/2019
File: Exhibit_L5_SW and Climate Mon

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Surface-Water and Climate Monitoring**

**Exhibit L-5**

Appendix C

117°40'0"W

34°0'0"N

San Jose Fault
San Antonio Ck
Central Ave
10
San Bernardino Ave
Euclid Ave
Haven Ave
Kingsley Ave
Holt Blvd
Ontario Airport
Mission Blvd
Day Ck
Pipeline Ave
Ramona Ave
Philadelphia St
Northeast Area
60
Riverside Dr
Chino Ave
Schaefer Ave
Edison Ave
San Bernardino County
Riverside County
15
71
Los Angeles County
San Bernardino County
Eucalyptus Ave
Southeast Area
Merrill Ave
Cucamonga Ck
Chino Airport
Chino Ck
Chino Fault
Limonite Ave
Santa Ana River

Ground-Level Monitoring Network Facilities

- Ayala Park Extensometer
- Chino Creek Extensometer
- Pomona Extensometer
- Well Equipped with Pressure Transducer (2018/19)
- Ground-Level Survey Benchmark
- Ground-Level Survey Benchmark (Measured in April 15, 2019)

Ground-Level Survey Areas

- Managed Area
- Fissure Zone Area
- Central Area
- Northwest Area
- San Jose Fault Zone Area
- Northeast Area
- Southeast Area

- Areas of Subsidence Concern
- Flood Control and Conservation Basins
- Fault (solid where accurately located; dashed where approximately located or inferred; dotted where concealed)
- Ground Fissures
- Approximate Location of the Riley Barrier

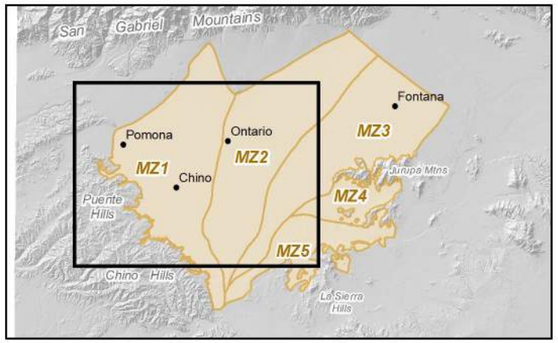


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: NWS
Date: 8/22/2019
File: Exhibit_L6_Ground-Level Mon..mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Ground-Level Monitoring Network**
*Western Chino Basin*

**Exhibit L-6**

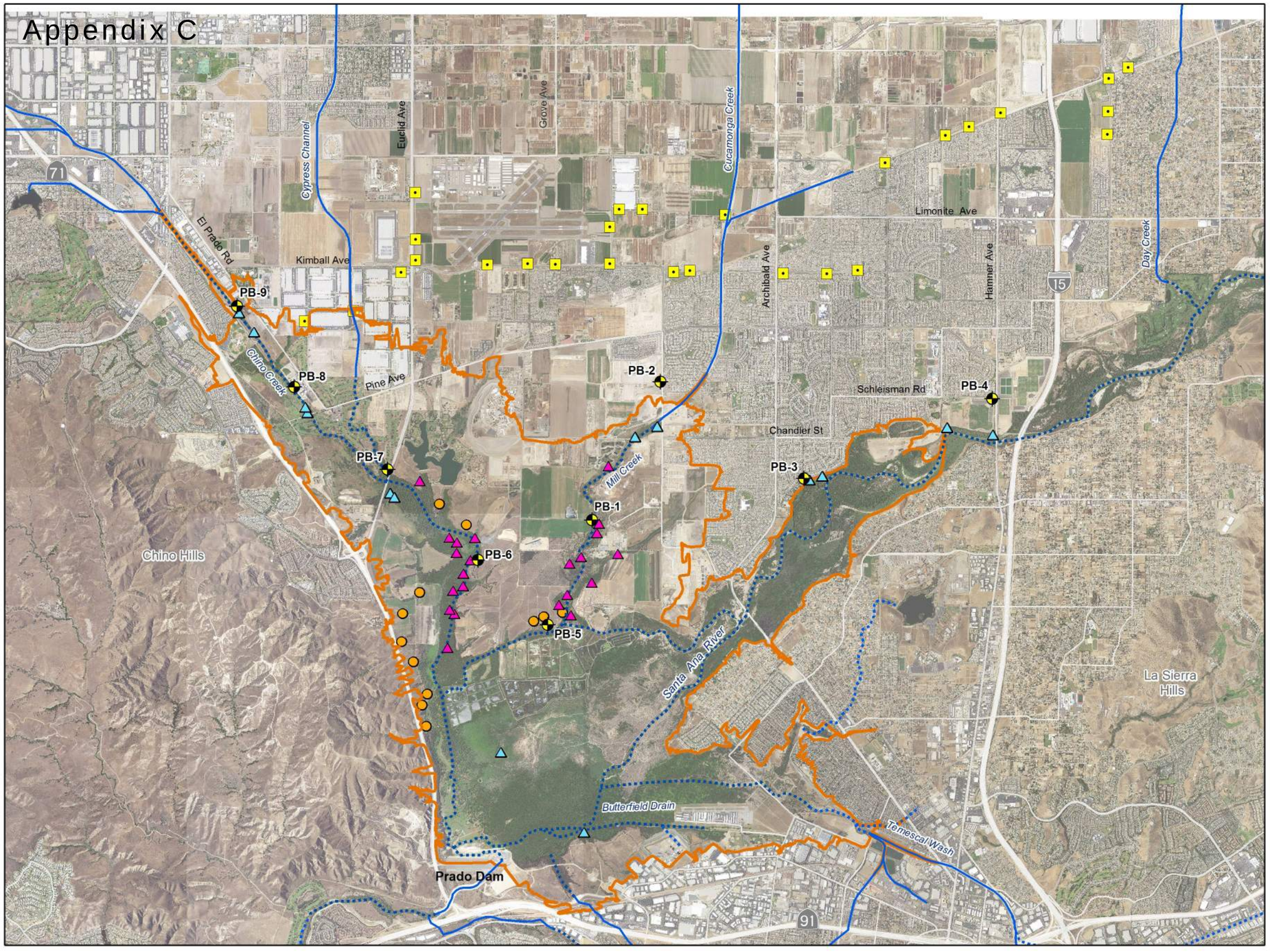


Riparian Habitat Monitoring Program

Site-Specific Monitoring

- USBR Vegetation Surveys 2007, 2013, and 2016
- USBR Vegetation Surveys 2016
- OCWD Photo Stations (2010 - 2016)

Regional Monitoring

Prado Basin Management Zone (Prado Basin) - Area of Interest for Analysis of NDVI and Air Photos.

- Chino Basin Desalter Authority Well
- PBHSP Monitoring Well
- Concrete-Lined Channels
- Unlined Rivers and Streams

Aerial Photo: USDA, 2016. Mosaic of photos from June 2, 2016 to June14, 2016

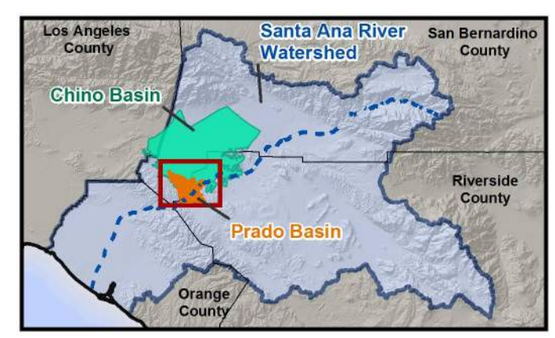


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 8/22/2019
File: Exhibit_L7_Bio. Monitoring

0 1 2 Miles
0 1 2 3 Km

Prepared for:
OBMP 2020 Update
*Scoping Report*

Chino Basin Watermaster — Partners in Basin Management

**Biological Monitoring**

**Exhibit L-7**

**Exhibit L-8**
**Cost Estimate and Schedule to Implement Activity L**

| Task and Subtask Description | Engineering Cost | FY 2020/21 | | | | FY 2021/22 | | | | FY 2022/23 | | | | FY 2023/24 and beyond |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | |
| Task 1 Convene Monitoring and Reporting Committee and prepare the Monitoring and Reporting Work Plan<br>· Convene Monitoring and Reporting Committee<br>· Conduct (5) meetings to prepare Work Plan and develop recommended revisions<br>· Prepare Monitoring and Reporting Work Plan<br>· Prepare memorandum: Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs | $125,000 | $60,000 | | | | $65,000 | | | | | | | | |
| Task 2 Implement Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs | $ TBD | | | | | | | | | $ TBD | | | | $ TBD |
| Task 3 Annual review of scope of work and cost to implement the Monitoring and Reporting Work Plan in the Subsequent Fiscal Year | $ TBD | | | | | | | | | $ TBD | | | | $ TBD |
| **Total Cost and Cost by FY** | **$125,000** | **$60,000** | | | | **$65,000** | | | | **$ TBD** | | | | **$ TBD** |

TBD -- To be determined

Exhibit HIJ-1
Process and Schedule to Implement the OBMP Update Activities

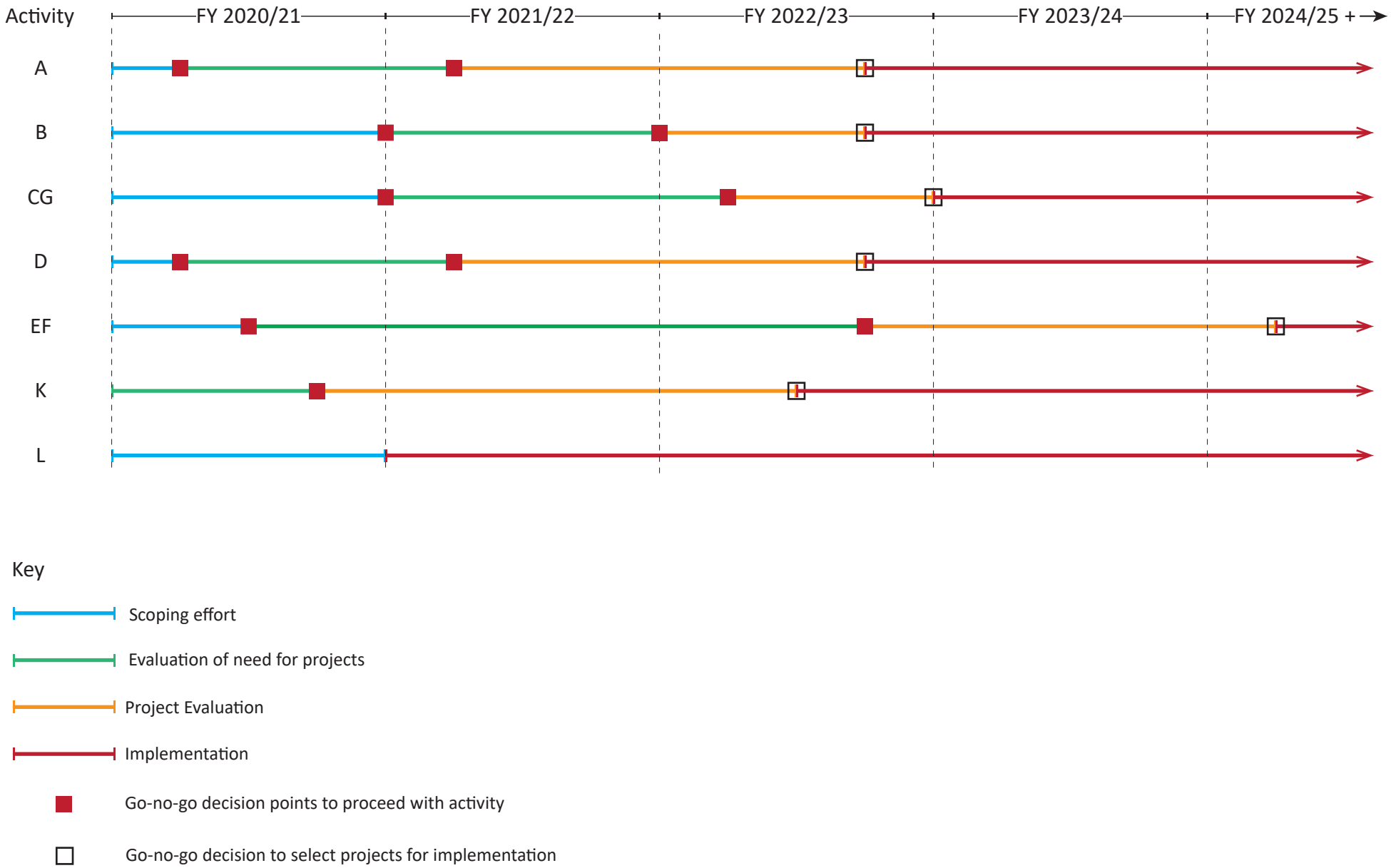

# Appendix A

A1. 2020 OBMP Update -- Listening Session #1 Memorandum

A2. 2020 OBMP Update -- Listening Session #2 Memorandum

A2. 2020 OBMP Update -- Listening Session #3 Memorandum

**To:** Chino Basin Watermaster Stakeholders
**From:** Watermaster 2020 OBMP Update Team
**Subject:** 2020 OBMP Update -- Listening Session #1 Memorandum
**Date:** February 5, 2019

The objectives of this memorandum are to summarize the information provided by the stakeholders during Listening Session #1 and provide information that will assist the stakeholders in reviewing the work products of Listening Session #1 and preparing for Listening Session #2.

## Background

During 1998-2000, the Chino Basin Watermaster (Watermaster) conducted a process to develop the Chino Basin Optimum Basin Management Program (OBMP). The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders; described the physical state of the groundwater basin; developed a set of management goals; identified impediments to those goals; described a series of actions that could be taken to remove those impediments and achieve the management goals; developed and executed agreements to implement the OBMP; and certified a programmatic Environmental Impact Report (PEIR) pursuant to CEQA.

By 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented, while some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that necessitate that the plan be adapted to protect the collective interests of the Chino Basin parties and their water supply reliability. For these reasons, the Watermaster parties are updating the 2000 OBMP (2020 OBMP Update) to set the framework for the next 20 to 30 years of basin-management activities.

The 2020 OBMP Update will be conducted using a collaborative process like that employed for the development of the 2000 OBMP. A description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update is included in a white paper prepared for the Chino Basin stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper, and all documents relevant to the 2020 OBMP Update, are available on the Watermaster's ftp site.[1]

A series of eight public listening sessions are being held by the Watermaster throughout 2019 to support the 2020 OBMP Update. The purpose of the listening sessions is to obtain information and feedback from the parties and other Chino Basin stakeholders to define the collective goals of the parties, the impediments to achieving the goals, the management actions required to remove the impediments, and an implementation plan for the management actions. Watermaster staff will provide key information prior to and during each listening session to help the parties and other stakeholders provide their input on each topic discussed. The objective is for the ideas and opinions of every stakeholder to be heard. Participation in the listening sessions is critical to the development of the 2020 OBMP Update. Watermaster held Listening Session #1 on January 15, 2019.

## Summary of Listening Session #1

Listening Session #1 was a four-hour workshop broken down into three main agenda topics:

[1] https://cbwm.syncedtool.com/shares/folder/9abb162877b999/?folder_id=670

- History of the 2000 OBMP
- Rationale for the 2020 OBMP Update – Drivers, Trends, and Implications (Breakout Session)
- Rationale for the 2020 OBMP Update – Issues, Needs, and Wants (Group Participation Session)

Prior to Listening Session #1 the following materials were distributed:

- Meeting agenda
- The OBMP White Paper
- An explanation of the assignment to prepare for Listening Session #1

These materials and a copy of the presentation given during Listening Session #1 are available on the Watermaster's ftp site.

## History of the 2000 OBMP

The history of the 2000 OBMP and its implementation was provided by Watermaster staff and its legal, engineering, and environmental consultants. The presentation provided detail on why the OBMP was created; the process to develop it and the associated implementation agreements and environmental review documents; the OBMP Program Elements; and the progress and accomplishments in implementing each of the OBMP Program Elements, including a discussion on what was not accomplished.

## Rationale for the 2020 OBMP Update – Drivers, Trends, and Implications

As described in the OBMP White Paper, the strategic drivers and trends that shaped the OBMP in the late 1990s have since changed. Exhibit 1 in the OBMP White Paper was a first attempt to summarize the current drivers and trends shaping water management, and their basin management implications for the Chino Basin parties. "Drivers" are external forces that cause changes in the Chino Basin water space. Grouped under each driver are expected trends that emanate from that driver. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications.

A breakout session was held to obtain input on the proposed drivers, trends and implications in Exhibit 1. The listening session attendees were divided into four groups to discuss changes and additions to the drivers, trends and implications. Each group documented its discussion and one member of each group reported out a summary of the group discussion to all attendees. The input provided by each breakout group was used to revise Exhibit 1 (attached to this memorandum). The following are the revised implications for Basin management that form a rationale for the 2020 OBMP Update:

- Reduced recycled water availability and increased cost
- Reduced imported water availability and increased cost
- Inability to pump groundwater with existing infrastructure
- Imported water quality degradation
- Chino Basin water quality degradation
- Increased cost of groundwater use
- Reductions in Chino Basin Safe Yield
- Recycled water quality degradation
- Increased cost of Basin Plan compliance

The final version of Exhibit 1 will be included as a final deliverable of the 2020 OBMP Update. Additional comments on Exhibit 1 can be submitted in writing to Edgar Tellez-Foster (etellezfoster@cbwm.org).

## Rationale for the 2020 OBMP Update – Issues, Needs, and Wants

As described in the OBMP White Paper, the issues, needs and wants of the parties will form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the

goals and action items to remove the impediments. A full group participation session was led by Watermaster staff to obtain feedback from the listening session attendees on their individual issues, needs and wants related to basin management. The listening session attendees articulated the issues, needs, and wants of their associated party in writing and then verbally shared with the full group. The feedback provided by the attendees was transcribed by Watermaster staff and then the needs and wants were organized into similar classes of issues. The classes of issues identified were effectively the same as the implications for basin management defined in Exhibit 1. Table 1 is a summary of the needs and wants of the parties, organized by the basin management issues. Attribution by party was assigned to each need and want.

## Next Steps

The next steps in the process to develop the 2020 OBMP Update are:

1. Finalize the descriptions of issues, needs, and wants for basin management in Table 1.
2. Describe the goals for the 2020 OBMP Update, and impediments to achieving the goals.

### OBMP Goals and Impediments

For the 2000 OBMP, the Chino Basin stakeholders established four management goals for the OBMP that addressed the issues, needs, and wants of the parties:

***Enhance Basin Water Supplies***. The intent of the goal was to increase the volumes and variety of available water supplies. This goal applied not only to local groundwater, but also to all sources of water available to the parties (*e.g.,* recycled, imported).

***Protect and Enhance Water Quality***. The intent of the goal was to ensure the protection of the long-term beneficial uses of the groundwater basin.

***Enhance Management of the Basin***. The intent of the goal was to encourage stable, creative, sustainable and fair water resources management for broad mutual benefit to all stakeholders and avoidance of undesirable results.

***Equitably Finance the OBMP***. The intent of the goal was to identify and use efficient and equitable methods to fund OBMP implementation.

While these general goals are as valid today as they were in 2000, it was apparent from the discussions of issues, needs, and wants at Listening Session #1 that the impediments to achieving the goals have changed and that the stakeholders have more focused goals for basin management. The focus of the next two listening sessions will be to identify the issues/needs/wants that are common to most stakeholders and to define focused goal statements and the impediments to achieving the goals. Listed below are four example goals, based on common issues/needs/wants, for the 2020 OBMP Update. Below each goal are some examples of the impediments to achieving the goals, and actions to remove the impediments. The impediments listed are not exhaustive.

**Goal #1**: Be able to rely on local supplies to meet potable demands for a [6, 12, 18, 24-month] period in the event of a [short-term, long-term] outage of imported water supply.

**Impediments to achieving the goal**:

- The current capacity to rely on groundwater during these periods is constrained by insufficient pumping capacity, insufficient conveyance, poor quality, and subsidence.
- Exercising storage in the Chino Basin as a way of enhancing local water-supply reliability can cause undesirable results such as subsidence and loss of yield.

**Actions to remove impediments and achieve the goal**:

- Develop a Storage Management Plan (SMP) to define how to utilize storage without causing undesirable results.
- Build the production, conveyance and treatment facilities necessary to meet demands and operate in accordance with the SMP.

**Goal #2**: Avoid shutdown of groundwater production facilities due to existing or potential new water-quality regulations.

**Impediment to achieving the goal**: Insufficient treatment and brine disposal capacity.

**Action to remove impediment and achieve the goal**: Build conveyance and regional treatment facilities (with ability to expand, if necessary) to treat current and potential future contaminants of concern.

**Goal #3**: Optimize the use of unused storage space in the Basin by implementing storage and recovery programs.

**Impediment to achieving the goal**: Exercising storage in the Chino Basin can cause undesirable results such as subsidence and loss of yield.

**Action to remove impediment and achieve the goal**: Develop a Storage Management Plan (SMP) to define how to utilize storage without causing undesirable results.

**Goal #4**: Fund [X%] of the implementation of the OBMP Update with supplemental resources, such as grants, low-interest loans, or outside funding partners.

**Impediment to achieving the goal**: Competition for future grant funding will be fierce; success in obtaining grant funding is uncertain.

## Recommended Preparation for Listening Session #2

1. Review the Issues, Needs, and Wants matrix in Table 1. Ensure that the feedback you reported at Listening Session #1 was accurately captured. Come to Listening Session #2 prepared to provide your feedback and add your party's attribution to the needs or wants identified by others, if you deem appropriate. The intent is to finalize Table 1 and use it to identify the specific concerns shared by most stakeholders. These common concerns will serve as that starting point for defining goals for the 2020 OBMP Update.
2. Based on your review of this memo and Table 1, come prepared to suggest and formulate goals for the 2020 OBMP Update and the impediments to achieving those goals.

## Table 1
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want **x** Unspecified

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD |
| ***Reductions in Chino Basin Safe Yield*** | | | | | | | | | | | | | | | | | | | |
| Manage the basin safe yield for the long-term viability and reliability of groundwater supply | | | | | | | | | | | ● | | | | | | | x | |
| Develop an OBMP Update that is consistent with the Physical Solution and enables the Parties to leverage their respective water rights | | | | | | x | | | | | | | | | | | | | |
| Maintain or enhance the safe yield of the basin without causing undesirable results | | | | ● | ● | | | | | ● | x | | | | x | | | | |
| Reassess the frequency of the safe yield recalculation | | | | | x | | | | | | | | | | | | x | | |
| Develop recharge programs that maintain or enhance safe yield | | | | | | | | | | | | | | | | | x | | |
| Design storage management and storage & recovery programs that maintain or enhance safe yield | | | | | | | | | | | | | ● | | ● | | | | |
| Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or safe yield | x | | | | | | | | | | | | | | | | x | | |
| Develop more facilities to capture, store, and recharge stormwater | ● | ● | | | | | | | | | ● | | | | | | | | |
| Enhance recharge in northeast MZ-3 | | | ● | | | | | | | | | | | | | | | | |
| Maximize use of existing recharge facilities | ● | | | | | | | | | | | | | | | | | | |
| Establish incentives to encourage recharge of high-quality imported water | | | ● | | | | | | | | | | | | | | | | |
| Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage storage and recovery programs | | ● | | ● | ● | | | | | | ● | | ● | | x | | ● | | |

## Table 1
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want **x** Unspecified

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD |
| ***Inability to Pump Groundwater with Existing Infrastructure*** | | | | | | | | | | | | | | | | | | | |
| Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2 | x | | | | | x | x | | | ● | | | | | x | | | | |
| Develop management strategies that enable the parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality | | | | | | x | x | | | | | | | | | | | | |
| Ensure that sufficient, reliable water supplies will be available to meet current and future water demands | | | ● | ● | | | | ● | | x | x | | | | | | | ● | ● |
| Design storage management and storage & recovery programs to raise funding to build infrastructure | | | | | | | | | | | | | | | ● | | | | |
| Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program. | x | | | | | | | | | | | | | | | | | x | |
| Develop process to support/facilitate project implementation | | | | | | | | | | | | | | | | ● | | | |
| Pursue collaborative, regional partnerships to implement regional solutions to water management challenges | | | | | ● | | | | | | | | | | | | ● | ● | ● |

## Table 1
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want **x** Unspecified

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD |
| ***Increased Cost of Groundwater Use*** | | | | | | | | | | | | | | | | | | | |
| Develop an equitable distribution of costs/benefits of the OBMP | | | | | | x | | | | | | | | | x | | | | |
| Watermaster assessments for implementation of the OBMP should be allocated based on benefits received | | | | | x | | | | | | | | | | | | | | |
| Decrease Watermaster assessment costs | ● | | | | ● | | | | | | | | | | | | | | |
| Seek supplemental financial resources to support the implementation of the OBMP Update | | ● | | ● | | | | | ● | | | | | | x | ● | | | ● |
| Monetize agencies unused water rights for equitable balance of basin assets | | | ● | | | | | | | | | | | | | | | | |
| Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure | ● | x | | | | | | | | | | | | | | | x | | |
| Develop regional partnerships to help reduce costs | | | | | | | | | | | | | | | ● | | | | |
| Continue or enhance incentives to pump groundwater from the Chino Basin | | | ● | | | | | | | | | | | | | | | | |
| ***Chino Basin Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | |
| Develop a water quality management plan to ensure ability to produce groundwater rights | | | | x | | | | | | | | | | | x | | | x | |
| Address existing and new drinking water quality regulations that may result in an increase in groundwater treatment and costs | x | x | ● | | | | | x | | | | | | | | | x | | |
| Develop regional infrastructure to address water quality contamination and treatment | | | | | ● | | | | | | | | | | | | | | |
| ***Recycled Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | |
| Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit | | | | | | | | | | | | | | | ● | | | | |

## Table 1
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want **x** Unspecified

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD |
| ***Increased Cost of Basin Plan Compliance*** | | | | | | | | | | | | | | | | | | | |
| Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance | | | | | | | ● | | | | | | | | | | | | |
| Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan | | | | | | | | | | | ● | | | | | | | | |
| ***Reduced Recycled Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | |
| Maximize the use of recycled water for direct use or recharge | ● | | | ● | | | | | ● | | | | | | ● | | | | |
| Utilize non-IEUA sources of recycled water that are not being put to beneficial use | ● | | | | | | | | ● | | | | | | | | | | |
| Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River | | | | | | | | | | | | | | | x | | ● | | |
| Evaluate the potential for direct potable reuse of recycled water | | | | | | | | | | | | | | | ● | | | | |
| Fully utilize IEUA recycled water resources | | | | | | | | ● | | ● | | | | | | | | | |
| ***Reduced Imported Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | |
| Increase water-supply reliability at the lowest possible cost | | | | | | | | ● | | | | | | | | | | | |
| Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase | x | | | | | | | | | | | | | | | | | | |
| Continue to build collaborative programs between the Metropolitan Water District and Chino Basin | | | | | | | | | | | | | | | | | | x | |
| Identify and utilize new sources of supplemental water | | | | | | | | | | | | | | | ● | | | | |
| Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements | | | | | | | x | | | | | | | | | | | | |

## Table 1
## Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want **x** Unspecified

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD |
| ***Reduced Imported Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | |
| Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix | | | | | | | | | | | | | | | x | | | | |
| Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply | | | | | | | | | | | | | | | | | | ● | |
| Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use | | ● | | ● | | | | ● | | | | | | | ● | | ● | ● | |
| Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages | ● | | x | ● | | | x | ● | x | | | | | | x | | | ● | |
| Analyze water management scenarios that plan for unexpected challenges and emergencies | | | | | | | | | | | | | | | x | | | | |
| Use more recycled water for replenishment obligation | | | | ● | | | | | | | | | | | | | | | |
| Develop management strategies that ensure parties will meet future desalter replenishment obligation and have the money to fund it | | | | ● | | | | | | | | | | | | | x | | |
| ***Other*** | | | | | | | | | | | | | | | | | | | |
| Improve communication between the parties | ● | | | | | | | | | | | | | | | | | | |
| Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update | | | | | | | | | | | | | | | x | | | | |
| Consider a long-term planning horizon of up to 50 years | | | | | | | | | | | | | | | ● | | | | |
| Educate elected officials and decision makers on the need and urgency to address the water management challenges | | ● | | | | | | | | | | | | | | | | | |

Appendix C

## Exhibit 1 – Drivers and Trends and Their Implications
## 2020 OBMP Update

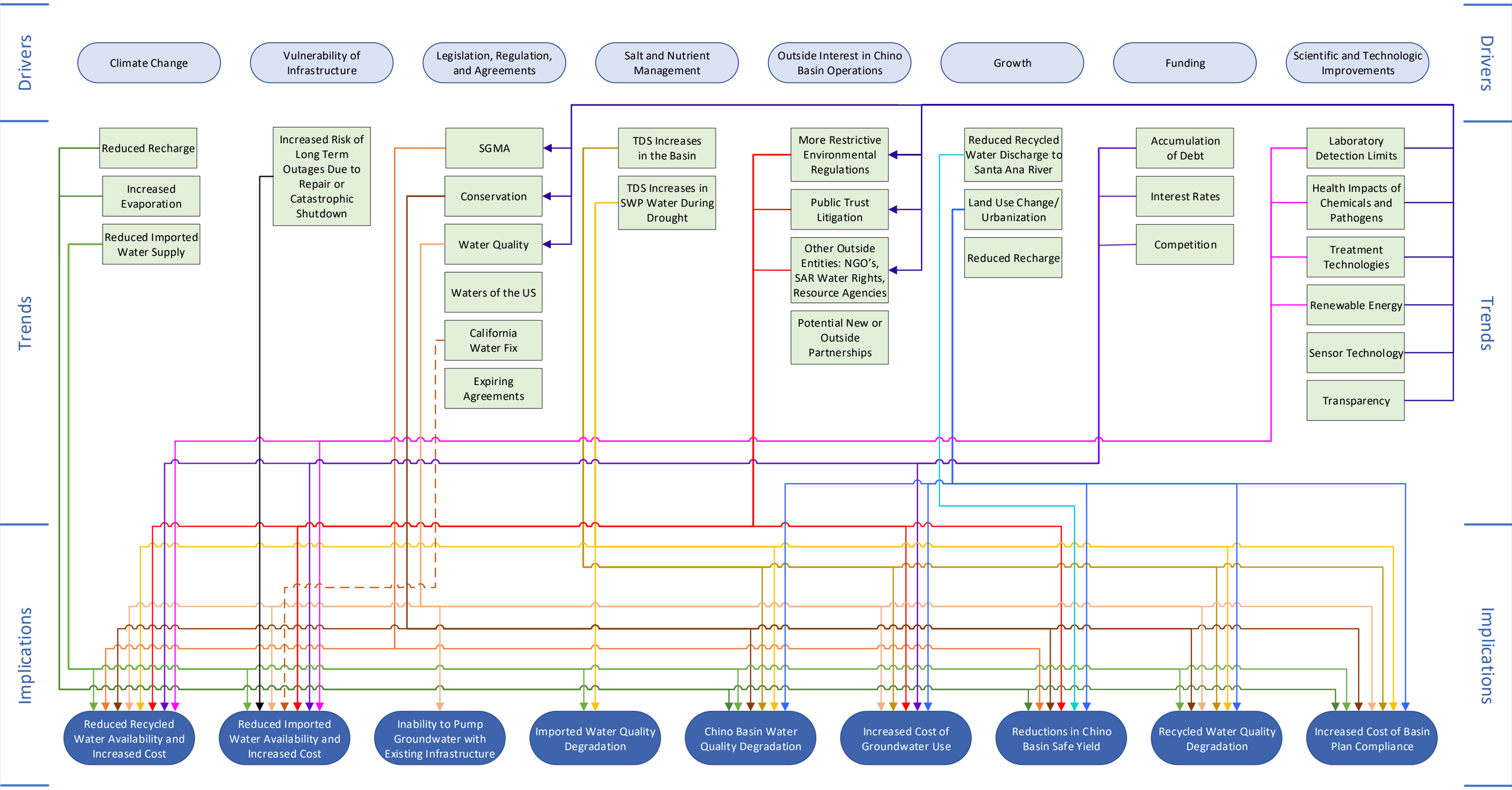

**To:** Chino Basin Watermaster Stakeholders
**From:** Watermaster 2020 OBMP Update Team
**Subject:** 2020 OBMP Update -- Listening Session #2 Memorandum
**Date:** March 14, 2019

The objectives of this memorandum are to summarize the information provided by the stakeholders during Listening Session #2 and provide information that will assist the stakeholders in reviewing the work products of Listening Session #2 and preparing for Listening Session #3.

## Background

During 1998-2000, the Chino Basin Watermaster (Watermaster) conducted a process to develop the Chino Basin Optimum Basin Management Program (OBMP). The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders; described the physical state of the groundwater basin; developed a set of management goals; identified impediments to those goals; described a series of actions that could be taken to remove those impediments and achieve the management goals; developed and executed agreements to implement the OBMP; and certified a programmatic Environmental Impact Report (PEIR) pursuant to CEQA.

By 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented, while some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that necessitate that the OBMP be updated to protect the collective interests of the Chino Basin stakeholders and their water supply reliability. For these reasons, the Watermaster parties are updating the 2000 OBMP (2020 OBMP Update) to set the framework for the next 20 to 30 years of basin-management activities.

The 2020 OBMP Update is being conducted using a collaborative process like that employed for the development of the 2000 OBMP. A description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update is included in a white paper prepared for the Chino Basin stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper, and all documents relevant to the 2020 OBMP Update, are available on the Watermaster's ftp site.[1]

A series of public listening sessions are being held by the Watermaster throughout 2019 to support the 2020 OBMP Update. The purpose of the listening sessions is to obtain information, ideas, and feedback from the Chino Basin stakeholders to define their collective goals, the impediments to achieving the goals, the management actions required to remove the impediments, and an implementation plan for the management actions. Watermaster staff is providing key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objective is for the ideas and opinions of every stakeholder to be heard. Participation in the listening sessions is critical to the development of the 2020 OBMP Update.

Watermaster held Listening Session #2 on February 12, 2019. Prior to Listening Session #2, the *Listening Session #1 Memorandum* was distributed which summarized: the feedback received during Listening Session #1, how the feedback will be used for 2020 OBMP Update, and the recommended preparation for Listening Session #2.

[1] https://cbwm.syncedtool.com/shares/folder/9abb162877b999/?folder_id=670

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## Summary of Listening Session #2

Listening Session #2 was a three-hour workshop broken down into two main agenda topics:

- Update and refinement of the issues, needs, and wants of the Chino Basin stakeholders (individual breakout activity)
- Development of draft goals for the 2020 OBMP Update (group breakout session)

### Update and refinement of the Issues, Needs, and Wants of the Chino Basin Stakeholders

As described in the OBMP White Paper, the issues, needs and wants of the stakeholders form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the goals and action items to remove the impediments. The issues, needs and wants were first discussed in Listening Session #1: the listening session attendees articulated the issues, needs, and wants of their associated party in writing and then verbally shared with the full group. Following Listening Session #1, the 167 individual issues, needs and wants provided by the attendees were transcribed by Watermaster staff and then combined into a list of 55 unique needs and wants. The needs and wants were then reviewed and categorized into nine classes of basin management issues:

- Reductions in Chino Basin Safe Yield
- Inability to pump groundwater with existing infrastructure
- Increased cost of groundwater use
- Chino Basin water quality degradation
- Recycled water quality degradation
- Increased cost of Basin Plan compliance
- Reduced recycled water availability and increased cost
- Reduced imported water availability and increased cost
- Other

A draft matrix was then developed to show attribution of the needs and wants by party/stakeholder. This matrix was circulated for review, editing, and comment as part of the *Listening Session #1 Memorandum*.

The OBMP Update Team gave a presentation to explain the process to develop the draft matrix and explained that the next step is to identify the needs and wants that are common to most stakeholders. These common needs and wants will serve as the starting point for defining goals for the 2020 OBMP Update. Following the presentation, the participants at Listening Session #2 were asked to circulate the room to review poster-sized versions of the matrix to: (1) confirm that attribution for their party's needs and wants were appropriately assigned, (2) revise the needs and want statements as needed to accurately describe their needs and wants, and (3) add their party's attribution to the needs and wants identified by others. Members participating by phone were asked to email their comments and input.

Table 1 (attached) is the revised matrix of the issues, needs and wants of the Chino Basin Stakeholders, inclusive of all feedback provided by stakeholders prior to, during, and following Listening Session #2. Additional edits to the matrix can be submitted via email to Edgar Tellez-Foster (etellezfoster@cbwm.org).

### Discussion of Goals for the 2020 OBMP Update

The OBMP Update Team provided an overview of the goals of the 2000 OBMP, which were:

1. ***Enhance Basin Water Supplies***
2. ***Protect and Enhance Water Quality***
3. ***Enhance Management of the Basin***

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4. ***Equitably Finance the OBMP***

These goals were based on the then-current issues, needs and wants of the Chino Basin stakeholders and included associated activities that would be needed to achieve the goals. Using a similar transparent process as is being employed now for the 2020 OMPU Update, the stakeholders defined the impediments to the goals and activities and the specific actions required to remove the impediments and achieve the goals. The actions were formed into the 2000 OBMP implementation plan.

During Listening Session #2, a group breakout session was held to obtain input on defining goals for the 2020 OBMP Update based on the issues, needs, and wants of the stakeholders. The meeting attendees were divided into six groups. Each group was assigned to one or multiple of the nine "basin management issues" and their associated needs and wants. Each group was asked to:

1. Identify the needs and wants that are common to most stakeholders.
2. Define one or more goals or activities for the 2020 OBMP Update to address the most common needs and wants.

Following the group breakout session, one member from each group reported on the group's discussions and ideas for goals and activities. Table 2 (attached) lists the stakeholder input presented by the breakout groups for goals and activities, categorized by basin management issues.

## Proposed Goals for the 2020 OBMP Update

The feedback and input provided by the stakeholders during Listening Session #2 was used by The OBMP Update Team to develop proposed goals and their associated activities for the 2020 OBMP Update for review and discussion at Listening Session #3. The process followed to develop the proposed goals and activities included:

- An assessment of alignment of the stakeholder input in Tables 1 and 2 with the goals of the 2000 OBMP.
- An assessment of alignment of the basin management goals and activities in Table 2 with the needs and wants in Table 1.

The stakeholder input shown in Tables 1 and 2 indicates that the 2000 OBMP goals are still relevant today. To illustrate, Tables 1 and 2 each contain a column entitled "Alignment with 2000 OBMP Goal(s)." In both tables, the column indicates which of the four goals from the 2000 OBMP is in alignment with each line item of input provided, if applicable. Every need and want listed in Table 1 can be addressed through activities that are consistent with the 2000 OBMP goals. And, every activity described in Table 2 is in alignment with one or more of the 2000 OBMP goals. For this reason, we recommend that the goals for the 2020 OBMP Update are the same as the goals for the 2000 OBMP. While we propose that the goals for the 2020 OBMP Update are unchanged, the activities and implementation plan defined in 2000 need to be refined for the 2020 OBMP Update.

Our assessment of the stakeholder input for basin management goals and activities in Table 2 indicates that most of the issues, needs and wants described in Table 1 would be addressed by the activities. To illustrate, a column entitled "Addressed by Activities in Table 2" was added to Table 1. This column indicates which of the 17 activities listed in Table 2 have the potential to address each need and want. There are seven needs and wants in Table 1 that may not be addressed by the activities in Table 2 – additional activities may need to be considered to address these needs.

Based on our assessment, we propose the following set of goals and associated activities for the 2020 OBMP Update. For each goal, the following information is described: a statement of intent (relevant to

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2000 and 2020), what has been accomplished to achieve the goal during the last 19 years of OBMP implementation, and a list of the proposed new or modified activities for to achieve the goals. The list of activities is based on the input in Table 2 (the number in parentheses following the activity description matches with the identification number shown in the first column the stakeholder input in Table 2).

***Goal No. 1 - Enhance Basin Water Supplies***. The intent of this goal is to increase available water supplies for all the stakeholders that rely on the Chino Basin and to improve supply reliability. This goal applies to Chino Basin groundwater, to other sources of water available to the OBMP stakeholders, and to the optimized use of Chino Basin storage to regulate the variability of the available water supplies and improve supply reliability.

Since the implementation of the 2000 OBMP, Watermaster and the OBMP stakeholders have completed or are currently implementing the following activities that enhance basin water supplies:

- constructed recharge projects to offset the stormwater recharge lost due to channel lining, increase Safe Yield, and ensure that there will be enough supplemental water recharge capacity to satisfy replenishment obligations;
- expanded the recharge and direct reuse of recycled water;
- constructed the Chino Basin desalters to recover contaminated groundwater in the southern part of the basin and to maintain the Safe Yield that would have otherwise been reduced due to the land use transition from agricultural to urban uses;
- recalculated the Safe Yield for the period 2011 through 2020; and
- started the process to recalculate the Safe Yield for 2021 through 2030.

The proposed new or modified activities to enhance basin water supplies to address the issues, needs and wants identified by the stakeholders in Listening Sessions 1 and 2 are based on the input in Table 2 and include:

- Construct new recharge facilities to increase the capacity for stormwater and recycled water recharge and provide recharge capacity in areas of the basin necessary to ensure long-term balance of recharge and discharge (1, 4 and 9).
- Develop and implement storage-and-recovery programs to increase water supply reliability, increase Safe Yield, and improve water quality (1, 2 and 3).
- Develop and implement regional conveyance and treatment programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence (7, 12 and 13).
- Maximize the reuse of recycled water produced by IEUA and others (10 and 11).

***Goal No. 2 - Protect and Enhance Water Quality***. The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.

Since the implementation of the 2000 OBMP, Watermaster and the OBMP stakeholders have completed or are currently implementing the following activities to protect and enhance water quality:

- initiated a comprehensive basin-wide water-quality monitoring program;
- collaborated with the Regional Board in its efforts to facilitate the cleanup of groundwater contamination in the basin;
- developed an innovative salt and nutrient management plan to enable the use of recycled water that reduced treatment requirements without adversely impacting beneficial uses;
- constructed and operated the Chino Basin desalters to recover high-TDS and high-nitrate groundwater in the southern part of the basin and put it to beneficial use;

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- identified opportunities to use the Chino Basin desalters to assist in the remediation of the Chino Airport and South Archibald plumes; and
- constructed new recharge facilities to enhance the recharge of high-quality storm and imported waters.

The proposed new or modified activities to protect and enhance water quality to address the issues, needs and wants identified by the stakeholders in Listening Sessions 1 and 2 are based on the input in Table 2 and include:

- Develop a water-quality management plan to address current and future water-quality issues and ensure the protection of beneficial uses, now and into the future (5).
- Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality (6).

***Goal No. 3 - Enhance Management of the Basin***. The intent of this goal is to encourage stable, creative, sustainable and fair water-resources management for broad mutual benefit to all stakeholders and avoid undesirable results.

Since the implementation of the 2000 OBMP, Watermaster and the OBMP stakeholders have completed or are currently implementing the following activities to enhance management of the basin:

- initiated a comprehensive basin-wide monitoring program for groundwater levels, recharge and land subsidence;
- developed a subsidence management plan to minimize or abate the occurrence of land subsidence and ground fissuring;
- implemented the OBMP storage management plan and more recently initiated the process to update it;
- developed methods to estimate storage losses;
- entered into the Dry-Year Yield program with Metropolitan; and
- became eligible for a $207 million grant to develop and implement a storage and recovery program.

The proposed new or modified activities to enhance management of the basin to address the issues, needs and wants identified by the stakeholders in Listening Sessions 1 and 2 are based on the input in Table 2 and include:

- Develop and implement storage-and-recovery programs that increase Safe Yield, improve water quality, and provide increased water supply reliability (1, 2, 3).
- Optimize the use of all sources of water supply by developing the ability to move water across the basin and between stakeholders (8 and 12).

***Goal No. 4 - Equitably Finance the OBMP***. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

Since 2000, Watermaster and the OBMP stakeholders have completed or are currently implementing the following activities to equitably finance the OBMP:

- completed the Peace Agreement, Peace II Agreement, and other agreements to provide incentives and funding plans to construct and operate the Chino Basin desalters and recharge improvements;

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- entered into an agreement with Metropolitan for a Dry-Year Yield Program to store imported water and provided funding for the construction of new wells and wellhead treatment to produce degraded water when Metropolitan made a call for the water in storage; and
- obtained low-interest loans and grants to construct groundwater treatment, recycled water treatment, conveyance, and recharge facilities to enable the cost-efficient implementation of the OBMP.

The proposed new or modified activities to equitably finance the OBMP to address the issues, needs and wants identified by the stakeholders in Listening Sessions 1 and 2 are based on the input in Table 2 and include:

- Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements (14).
- Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement (16).
- Continue to identify and pursue low-interest loans and grants to support the implementation of the OBMP Update. An example of such an effort is the Chino Basin Project (15).

## Next Steps

The next steps in the process to develop the 2020 OBMP Update are:

1. Obtain feedback on the proposal that the goals of the 2020 OBMP Update are the same goals defined in the 2000 OBMP but that continued progress toward these goals requires consideration of new or modified activities in an updated OBMP implementation plan.
2. For each goal, obtain feedback on the proposed list of activities for consideration in the development of the 2020 OBMP Update implementation plan.
3. Identify and describe the impediments to implementing the activities and achieving the goals.
4. Develop an initial set of actions to remove the impediments, including reconnaissance-level cost estimates, for consideration by the stakeholders.

## Recommended Preparation for Listening Session #3

1. Review Table 1 and confirm that the feedback you provided at Listening Session #2 was accurately captured in the issues, needs and wants matrix. Please send any edits to Edgar Tellez-Foster (etellezfoster@cbwm.org).
2. Review the assessments of the nexus of the 2000 OBMP Goals with the needs and wants and activities in Tables 1 and 2; and the nexus of the activities in Table 2 to the needs and wants in Table 1. Be prepared to provide feedback (e.g. do the activities in Table 2 address all of the needs and wants? Are there any activities that could be added to the activities in Table 2?).
3. Review the proposed goal statements and associated new/modified activities for the 2020 OBMP Update. Be prepared to provide your feedback on these goals and activities. The intent is to (i) finalize the goals and (ii) have a complete list of potential new or modified activities for consideration as part the 2020 OBMP Update implementation plan.
4. Be prepared to identify impediments to implementing the goals and their associated activities.

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**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The number in this column matches with the identification number of the stakeholder input in Table 2 (first column)

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 2* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reductions in Chino Basin Safe Yield*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage storage and recovery programs | ● | ● | | ● | ● | | | ● | ● | ● | ● | | ● | | ● | | ● | | | | 1, 2 | 1, 2, 3 |
| Design storage management and storage & recovery programs that maintain or enhance safe yield | ● | ● | | | | | | ● | ● | ● | | | ● | | ● | | ● | | | ● | 2, 3 | 1, 3 |
| Maintain or enhance the safe yield of the basin without causing undesirable results | ● | ● | | ● | ● | | | ● | ● | ● | ● | | | | ● | | ● | | | ● | 2, 3 | 1, 3 |
| Manage the basin safe yield for the long-term viability and reliability of groundwater supply | ● | ● | | | | | | ● | ● | ● | ● | | | ● | | | ● | ● | | ● | 2, 3 | 1, 3 |
| Reassess the frequency of the safe yield recalculation | ● | | | | ● | | | | | | | | | | | | ● | | | | 2, 3 | 3 |
| Continue to model and track safe yield, but utilize other management strategies to address a decline. | | | | | | | | | | | | | | | | | ● | | | | 2, 3 | 1, 3 |
| Develop recharge programs that maintain or enhance safe yield | ● | ● | | | | | ● | ● | ● | ● | | | | | ● | | ● | | | ● | 3, 4, 9 | 1, 3 |
| Develop more facilities to capture, store, and recharge water | ● | ● | | | | | ● | | | ● | ● | | | | ● | | ● | | | | 4, 9 | 1, 2 |
| Enhance recharge in northeast MZ-3 | ● | | ● | | | | | | ● | | | | | | | | ● | | | | 4, 9 | 1, 3 |
| Maximize use of existing recharge facilities | ● | ● | | | | | | | ● | ● | | | | | | | | | | | 4, 9 | 3 |
| Establish incentives to encourage recharge of high-quality imported water | ● | | ● | | | | | | | | | | | | | | | | | | 1, 4, 9 | 2, 3 |
| Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements | ● | ● | | | | ● | | ● | | | | | | | | | | | | | | 3 |
| Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or safe yield | ● | | | | | | | | | | | | | | ● | | ● | | | ● | | 3 |

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**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

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| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 2* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Inability to Pump Groundwater with Existing Infrastructure*** | | | | | | | | | | | | | | | | | | | | | | |
| Pursue collaborative, regional partnerships to implement regional solutions to water management challenges | ● | | | ● | ● | | | ● | | | | | | | ● | ● | ● | ● | ● | ● | 6, 7,12 13,16 | 3 |
| Ensure that sufficient, reliable water supplies will be available to meet current and future water demands | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | ● | | 7, 9, 12, 13 | 1, 3 |
| Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program | ● | | | | | | ● | | ● | | | | | | ● | | ● | ● | | | 1, 2 | 1, 2, 3 |
| Develop management strategies that enable the parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality | ● | | | | | | ● | ● | | | | | | | ● | | ● | | | | 1, 2, 8, 13 | 3 |
| Design storage management and storage & recovery programs to raise funding to build infrastructure | ● | | | ● | | | | | | | | | | | ● | | ● | | | | 1, 15 | 3, 4 |
| Develop process to support/facilitate project implementation | ● | | | | | | | | | | | | | | | | | | | | | 4 |
| Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2 | ● | | | | | | ● | ● | | ● | | | | ● | ● | | | | | | | 3 |

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| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | Overlying Non-Ag | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Increased Cost of Groundwater Use*** | | | | | | | | | | | | | | | | | | | | | | |
| Seek supplemental financial resources to support the implementation of the OBMP Update | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | | ● | | 15, 16 | 4 |
| Develop regional partnerships to help reduce costs | ● | | | ● | | | ● | | ● | | | | | | ● | ● | ● | | | ● | 15, 16 | 4 |
| Monetize agencies' unused water rights for equitable balance of basin assets | | | ● | | | | | | | | | | | | | | | | | | 15, 16 | 4 |
| Decrease Watermaster assessment costs | ● | | | | ● | | | ● | | | | | | | | | | | | | 15, 16 | 4 |
| Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure | ● | ● | | | | | | | ● | | | | | | | | ● | | | | 14, 15 | |
| Develop an equitable distribution of costs/benefits of the OBMP | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | ● | ● | | | | | | 14 | 4 |
| Watermaster assessments for implementation of the OBMP should be allocated based on benefits received | ● | | | | ● | | | | | | | | | | | | | | | | 14 | 4 |
| Continue or enhance incentives to pump groundwater from the Chino Basin | | | ● | | | | | | | | | | | | | | | | | | 1, 2, 12 | 3, 4 |
| Improve flexibility for parties to execute water rights transfers | | | | | | | | | | | | | | ● | | | | | | | | 4 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

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| | Appropriative | | | | | | | | | | Agricultural | | | | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | Overlying Non-Ag | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Chino Basin Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop a water quality management plan to ensure ability to produce groundwater rights | ● | ● | | ● | | | ● | ● | ● | ● | | | | ● | ● | | ● | ● | | | 5, 6 | 2, 3 |
| Develop regional infrastructure to address water quality contamination and treatment | | | | ● | ● | | | ● | | | | | | | | | | | | | 5, 6 | 2 |
| Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | ● | | ● | | | | 5, 6 | 2 |
| Be more proactive and engaged in the process to develop new drinking water quality regulations | | | | | | | | ● | | | | | | | | | | | | | 5, 6 | 2 |
| ***Recycled Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | | | | |
| Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit | | ● | | | | | ● | | ● | ● | | | | ● | ● | | | | | | 1, 6, 9 | 2 |
| ***Increased Cost of Basin Plan Compliance*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan | ● | ● | | | | | | | | | ● | | | | ● | | ● | | | | 1, 6, 9 | 2 |
| Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance | ● | | | ● | | | ● | ● | | | | | | | | | | | | | | 3, 4 |

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**Table 1**
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Key: ● Need ● Want/Unspecified

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| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | Overlying Non-Ag | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reduced Recycled Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | | | | |
| Fully utilize IEUA recycled water resources | | ● | | ● | | | ● | ● | | ● | | | | | ● | | | | | | 10 | 1 |
| Maximize the use of recycled water for direct use or recharge | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | | | | | | 10, 11 | 1 |
| Evaluate the potential for direct potable reuse of recycled water | ● | | | | | | | | ● | | | | | | ● | | | | | | 10, 11 | 1 |
| Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River | ● | ● | | ● | | | ● | ● | | ● | | | | | ● | | ● | | | | 10, 11 | 1, 3 |
| Utilize non-IEUA sources of recycled water that are not being put to beneficial use | ● | ● | | | | | ● | ● | ● | ● | | | | | ● | | ● | | | | 11 | 1 |
| ***Other*** | | | | | | | | | | | | | | | | | | | | | | |
| Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update | ● | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | 17 | |
| Improve communication between the parties | ● | | | ● | | | | | | | | | | ● | ● | | ● | | | | 17 | |
| Educate elected officials and decision makers on the need and urgency to address the water management challenges | ● | ● | | | | | | | ● | | | | | | ● | ● | ● | | | | 17 | |
| Consider a long-term planning horizon of up to 50 years | ● | | | | | | | | ● | ● | | | | | ● | | | | | | | 3 |

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**Table 1**
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| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reduced Imported Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | | | | |
| Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | ● | | | 7, 12, 13 | 1, 3 |
| Identify and utilize new sources of supplemental water | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | | | | 7, 8, 11, 13 | 1, 3 |
| Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use | ● | ● | | ● | | | ● | ● | ● | | | ● | | | ● | ● | ● | ● | | | 7, 8 | 1, 3 |
| Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix | ● | | | | | | | | ● | | | | | | ● | ● | ● | | | | 8, 13, 16 | 1, 3 |
| Develop management strategies that ensure parties will meet future desalter replenishment obligation and have the money to fund it | ● | ● | | ● | | | ● | | ● | | | | | | | | ● | | | ● | 8, 13, 14 | 3 |
| Increase water-supply reliability at the lowest possible cost | ● | | | ● | | | ● | ● | | | | ● | | ● | ● | | ● | | | | 8, 9, 13, 14 | 3 |
| Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply | ● | | | ● | | | | | ● | | | ● | | | ● | ● | ● | ● | | | 8, 9, 13 | 3 |
| Analyze water management scenarios that plan for unexpected challenges and emergencies | ● | | | | | | | | ● | ● | | | | | ● | ● | ● | | | | 8, 9, 13 | 3 |
| Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements | | | | | | | ● | | ● | ● | | ● | | ? | ● | | | | | ● | 7, 8, 9, 13 | 1, 3 |
| Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase | ● | | | | | | | | | | | | | | | | | | | | 7, 8, 9, 15, 16 | 3 |
| Use more recycled water for replenishment obligation | ● | | | ● | | | ● | | ● | | | | | | | | ● | | | | 10,11 | 3 |
| Continue to build collaborative programs between the Metropolitan Water District and Chino Basin | ● | | | | | | ● | ● | ● | | | | | | ● | | ● | ● | | | 13, 16 | 3 |

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**Table 2**
**Stakeholder Input on Goals and Activities for the 2020 OBMP Update**

| | Stakeholder Input by Basin Management Issue | Alignment with 2000 OBMP Goal(s)* |
|---|---|---|
| **Reductions in Chino Basin Safe Yield** | | |
| 1 | Design storage and recovery programs that augment safe yield, improve water quality and enhance recharge | 1, 2, 3 |
| 2 | Optimize management of groundwater storage to enhance/protect safe yield | 1, 3 |
| 3 | Increase safe yield [by 10,000 af by 2030] | 1 |
| 4 | Capture and store all permitted water [by 2040] | 1, 2 |
| **Chino Basin Water Quality Degradation** | | |
| 5 | Develop a water quality management plan [to address current and future water quality issues] to ensure ability to produce high-quality groundwater [by 2022]. (high quality = readily useable) | 2 |
| 6 | Develop strategic compliance solutions that achieve multiple benefits in managing water quality (OBMP Update, Built in) | 2, 3 |
| **Reduced Imported Water Availability and Cost** | | |
| 7 | Increase wet-water supplies to meet parties' demands without the need of imported water from Metropolitan | 1, 3 |
| 8 | Optimize [efficient] use of all water supplies sources, with ability to move water across basins/amongst stakeholders | 1, 3 |
| 9 | Enhance ability to capture and store water when it is available [enough to satisfy imported water demands for 3 years (100 - 200k af)] | 1, 2 |
| **Reduced Recycled Water Availability and Increased Cost** | | |
| 10 | Put 100% of IEUA recycled water to beneficial use in the Chino Basin [x% by 2025; x% by 2030] | 1 |
| 11 | Utilize available non-IEUA sources of recycled water for beneficial use in the Chino Basin [8,000 afy by 2025] | 1 |
| **Inability to Pump Groundwater with Existing Infrastructure** | | |
| 12 | Leverage existing local infrastructure for the benefit of the region | 3 |
| 13 | Ensure sufficient, reliable water supplies (local, regional, imported) to meet future water demands, without MPI | 1, 3 |
| **Increased Cost of Groundwater Use** | | |
| 14 | Develop an equitable distribution of costs/benefits of the OBMP and include in the OBMP Update agreements | 4 |
| 15 | Develop a plan to obtain supplemental financial resources to support the implementation of the OBMP Update | 4 |
| 16 | Develop regional partnerships to implement the OBMP Update and reduce costs -- (The "O" in OBMP); include in the OBMP update agreement | 3, 4 |
| **Other** | | |
| 17 | Approve OBMP update with full support from all stakeholders and elected officials by June 2020 | |

*The 2000 OBMP Goals are:
(1) - Enhance basin water supplies
(2) - Protect and enhance water quality
(3) - Enhance management of the basin
(4) - Equitably finance the OBMP



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**To:** Chino Basin Watermaster Stakeholders
**From:** Watermaster 2020 OBMP Update Team
**Subject:** 2020 OBMP Update -- Listening Session #3 Memorandum
**Date:** May 9, 2019

The objectives of this memorandum are to summarize the information provided by the stakeholders during Listening Session #3 and provide information that will assist the stakeholders in reviewing the work products of Listening Session #3 and preparing for Listening Session #4.

## Background

During 1998-2000, the Chino Basin Watermaster (Watermaster) conducted a process to develop the Chino Basin Optimum Basin Management Program (OBMP). The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders; described the physical state of the groundwater basin; developed a set of management goals; identified impediments to those goals; described a series of actions that could be taken to remove those impediments and achieve the management goals; developed and executed agreements to implement the OBMP; and certified a programmatic Environmental Impact Report (PEIR) pursuant to CEQA.

By 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented, while some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that necessitate that the OBMP be updated to protect the collective interests of the Chino Basin stakeholders and their water supply reliability. For these reasons, the Watermaster parties are updating the 2000 OBMP (2020 OBMP Update) to set the framework for the next 20 to 30 years of basin-management activities.

The 2020 OBMP Update is being conducted using a collaborative process like that employed for the development of the 2000 OBMP. A description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update is included in a white paper prepared for the Chino Basin stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper, and all documents relevant to the 2020 OBMP Update, are available on the Watermaster's ftp site.[1]

A series of public listening sessions are being held by the Watermaster throughout 2019 to support the 2020 OBMP Update. The purpose of the listening sessions is to obtain information, ideas, and feedback from the Chino Basin stakeholders to define their collective goals, the impediments to achieving the goals, the management actions required to remove the impediments, and an implementation plan for the management actions. Watermaster staff is providing key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objective is for the ideas and opinions of every stakeholder to be heard. Participation in the listening sessions is critical to the development of the 2020 OBMP Update.

Watermaster held Listening Session #3 on March 21, 2019. Prior to Listening Session #3, the *Listening Session #2 Memorandum* was distributed which summarized: the feedback received during Listening Session #2, how the feedback will be used for 2020 OBMP Update, and the recommended preparation for Listening Session #3. The PowerPoint presentation given at the meeting is available on the Watermaster's ftp site.[1]

[1] https://cbwm.syncedtool.com/shares/folder/9abb162877b999/?folder_id=670

## Summary of Listening Session #3

Listening Session #3 was a three-hour workshop broken down into two main agenda topics:

- Discussion and feedback on the observation that the 2020 OBMP Update goals are the same as the 2000 OBMP goals
- Update and refinement of the types of activities that will be considered for inclusion in the 2020 OBMP Update

### 2020 OBMP goals

As discussed in the *Listening Session #2 Memorandum*, the stakeholder input provided in Listening Sessions #1 and #2 indicated that the goals defined in the 2000 OBMP are still relevant today. Based on the assessment of stakeholder input, the 2020 OBMP Update Team proposed maintaining the 2000 OBMP goals in the 2020 OBMP Update and drafted a statement of intent for each goal. During Listening Session #3, the 2020 OBMP Update Team gave a presentation to explain how the stakeholder input was used to conclude the goals remain the same and explained that the next step was to obtain feedback on these recommended goals and intents. The goals and intents presented during Listening Session #3 were:

> ***Goal No. 1 - Enhance Basin Water Supplies.*** The intent of this goal is to increase available water supplies for all the stakeholders that rely on the Chino Basin and to improve supply reliability.
>
> This goal applies to Chino Basin groundwater, to other sources of water available to the OBMP stakeholders, and to the optimized use of Chino Basin storage to regulate the variability of the available water supplies and improve supply reliability.
>
> ***Goal No. 2 - Protect and Enhance Water Quality.*** The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.
>
> ***Goal No. 3 - Enhance Management of the Basin.*** The intent of this goal is to encourage stable, creative, sustainable and fair water resources management for broad mutual benefit to all stakeholders and avoidance of undesirable results.
>
> ***Goal No. 4 - Equitably Finance the OBMP***. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

Following the presentation, the participants at Listening Session #3 participated in a live web-supported survey on the goals and their intents. There was a total of five questions on the survey. For each of the four goals, the participants were presented the following question and multiple-choice answers:

> Do you think this goal is still relevant?
>
> A) Yes B) Yes, with modifications C) No D) I don't understand this activity

The fifth survey question asked:

> Are there more goals that should be added?
>
> A) Yes B) No

#### *Survey Results*

The results of the survey for the first four questions are shown in the bar chart below.

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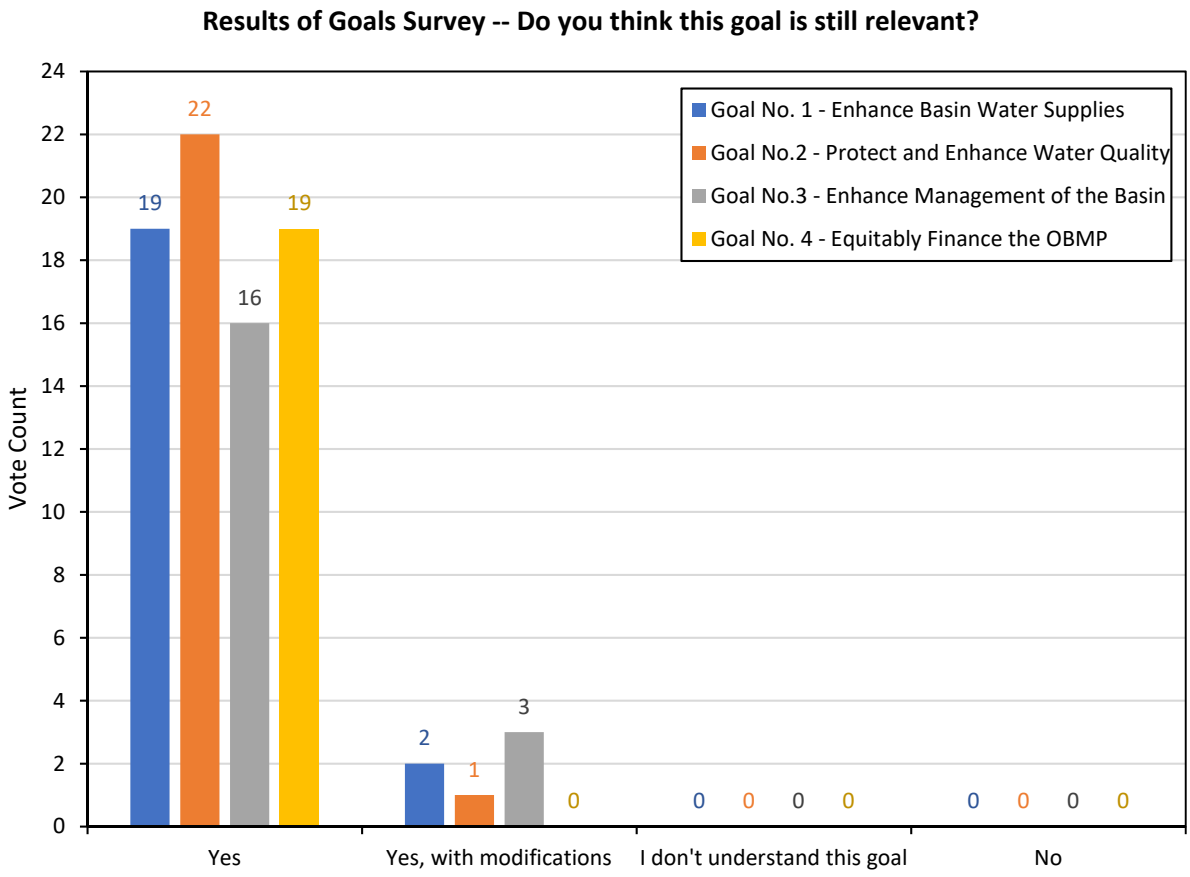


As shown in the chart, all survey respondents indicated that the goals are still relevant today, and some respondents thought that Goals No. 1, 2 and 3 were still relevant but should be modified. The latter respondents were asked to explain their suggested modifications, resulting in a group discussion on the goal, the intent statement, and the respondents' concern. A summary of the discussion for each goal is summarized below:

***Goal No. 1 - Enhance Basin Water Supplies.*** The meeting participants that spoke about potential modifications to Goal No. 1 voiced the following suggestions/concerns/questions:

- The goal could be construed as Watermaster attempting to manage water supplies outside Chino Basin groundwater, and therefore acting outside its purview.

Following explanation by two participants as to the consistency of the Watermaster's role in enhancing water supplies in the context of the Judgment and the 2000 OBMP, Watermaster legal counsel explained that Watermaster is responsible for ensuring that (1) the parties are able to meet their demands using Chino Basin groundwater and (2) sufficient water is available for replenishment if these demands result in overproduction; therefore, it is within Watermaster's purview to enhance water supplies outside Chino Basin groundwater. Another participant indicated that the implementation agreement will identify roles and responsibilities for implementing the OBMP activities and that through this agreement it could/will be made clear that Watermaster is not taking on a role that is beyond its purview.

- Should storage be listed as source of supply in the intent goal? It seems management of storage is a function of Goal No. 3.

There was no discussion about this question. Upon reflection and review of the 2000 OBMP, the OBMP Update Team agreed that storage was best highlighted as part of Goal No. 3 for consistency with the 2000 OBMP.

***Goal No. 2 - Protect and Enhance Water Quality.*** The meeting participants who spoke about potential modifications to Goal No. 2 voiced the following suggestions/concerns/questions:

- Should the word "enhance" be added to the intent statement?

During the discussion, participants who spoke indicated that "enhance" was already explicitly used in the goal statement and it did not need to be added to the intent.

***Goal No. 3 - Enhance Management of the Basin.*** The meeting participants who spoke about potential modifications to Goal No. 3 voiced the following suggestions/concerns/questions:

- The descriptors used in the intent statement, such as "fair" and "broad mutual benefit" were unclear and unnecessary.

During the discussion, the participants who spoke suggested: that words with imprecise meaning should not be used; that keeping the goals broader in scope by removing these qualifiers is the best approach; and that the specificity of "benefits" will be addressed in the activities or implementation plans.

***Goal No. 4 - Equitably Finance the OBMP.*** The meeting participants who spoke about potential modifications to Goal No. 4 voiced the following suggestions/concerns/questions:

- Are the terms "efficient" and "equitable" in the intent statement at odds with each other? What is the definition of efficient?

The OBMP Update Team explained that an example of "efficient" method to fund OBMP implementation is partnering with IEUA to obtain grant funding to implement projects, and that this was done successfully in implementing the 2000 OBMP.

***Consideration of Additional OBMP Goals.*** For the survey question regarding addition of new goals for the 2020 OBMP Update, two out of 19 survey respondents voted "Yes." The meeting participants who spoke offered the following input:

- Should we consider integrating the Sustainable Groundwater Management Act (SGMA) regulations with the 2020 OBMP Update goals?

  During the discussion, the participants who spoke suggested that Goal No. 3 is encompassing of the SGMA regulations, but that it may be helpful to include language about "maintaining local control" of the groundwater basin in the intent of Goal No. 3.

- Should there be a goal related to regional collaboration?

  During the discussion, the participants who spoke pointed out that regional collaboration is implied within Goals No. 1 and No. 3, so a separate goal is not needed.

- Participants also provided additional thoughts that should be considered by the stakeholders in the development of the 2020 OBMP Update, but not explicitly written as goals or intents of goals:

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- The OBMP Update activities should ensure Watermaster's engagement on issues related to the Santa Ana River, which is a significant source of supply to the Basin.
- The participants should strive for collaboration and openness to avoid conflict.

*Recommended 2020 OBMP Update goals*

Based on the feedback from the goals survey during Listening Session #3, the recommended 2020 OBMP Update goals and intents are:

***Goal No. 1 - Enhance Basin Water Supplies.*** The intent of this goal is to increase the water supplies available for Chino Basin parties and improve water supply reliability. This goal applies to Chino Basin groundwater and all other sources of water available for beneficial use.

***Goal No.2 - Protect and Enhance Water Quality.*** The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.

***Goal No.3 - Enhance Management of the Basin.*** The intent of this goal is to encourage sustainable management of the Chino Basin to avoid material physical injury, promote local control, and improve water-supply reliability for the benefit of all Chino Basin parties.

***Goal No. 4 - Equitably Finance the OBMP***. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

## 2020 OBMP Update activities

During Listening Session #3, the meeting attendees participated in a breakout activity to review and provide feedback on the list of 10 new and revised activities for potential inclusion in the 2020 OBMP Update. The activities are shown in Table 2b, attached. These activities are based on the input provided by breakout groups during Listening Session #2, as documented in the Listening Session #2 memo. The Listening Session #3 participants were divided into six groups and each group was asked to:

1. Review a subset of the 10 activities (A through J) and suggest modifications to better address the needs and wants of the Chino Basin stakeholders, if necessary.
2. Review a subset of the issues, needs and wants (INWs) of the Chino Basin stakeholders to assess which of the ten activities address each need and want, and if any are not addressed by the activities, to suggest additional activities for consideration in the 2020 OBMP Update.

Table 1 shows the participants' assessment of which activities address each INW. Two new activities were defined by one of the breakout groups:

K. Develop a management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge.

L. Perform the appropriate amount of monitoring and reporting required for basin management and regulatory compliance.

The 2020 OBMP Update Team compiled the feedback from the breakout session and revised the list of activities for consideration in the 2020 OBMP Update. The revised list of activities was distributed to the Chino Basin stakeholders in the form of a survey to obtain additional feedback. The results of the survey and the complete list of activities is described below.

## Follow-up survey on 2020 OBMP activities

The objective of this survey was to obtain feedback on the revised list of activities for consideration in the 2020 OBMP Update. For each activity, the survey asked:

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(1) Do you think this activity should be considered for inclusion in the 2020 OBMP Update?

A) Yes B) Yes, with modifications C) No D) I don't understand this activity

(2) If you answered C or D, please explain

Based on the feedback from the survey as of May 3, 2019, six out of six survey respondents answered "A) Yes" for all activities except Activity F: *Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality.*

For Activity F, five out of six survey respondents thought that it should be included in the 2020 OBMP Update, and one participant responded that they did not understand the meaning of "strategic regulatory compliance solution." Based on the input provided by the parties, the 2020 OBMP Update Team's understanding of the scope of Activity F is to develop solutions to comply with evolving and more stringent drinking-water standards. Specifically, that the 2020 OBMP Update should explore regional, collaborative solutions that have the potential to address multiple water-quality and water-supply issues.

Based on the feedback from the survey as of May 3, 2019, the recommended list of activities is:

A. Construct new facilities and improve existing facilities to increase the capacity to store and recharge surface water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge

B. Develop, implement, and optimize storage-and-recovery programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality

C. Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence

D. Maximize the reuse of recycled water produced by IEUA and others

E. Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses

F. Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality

G. Optimize the use of all sources of water supply by improving the ability to move water across the basin and among stakeholders, prioritizing the use of existing infrastructure

H. Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements

I. Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement

J. Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update. An example of such an effort is the Chino Basin Project

K. Develop a management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge

L. Perform the appropriate amount of monitoring and reporting required for basin management and regulatory compliance

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## Nexus between the 2020 OBMP Update goals, their impediments, and the activities recommended for consideration

Thus far through the Listening Session process, the following has been completed:

- Defined the drivers, trends and implications for Basin management that identify the need for the 2020 OBMP Update (see attached Exhibit 1).
- Defined the needs and wants of the Chino Basin stakeholders, categorized by the Basin management issues derived from the drivers and trends analysis (see attached Table 1).
- Defined the goals of the 2020 OBMP Update, which are the same as the goals of the 2000 OBMP (refer to discussion above in this memo).
- Defined a set of activities for consideration in the 2020 OBMP Update that address the common needs and wants of the Chino Basin stakeholders (refer to discussion above in this memo).

There are physical, institutional, and financial impediments to achieving the goals of the 2020 OBMP. The issues, needs, and wants of the stakeholders shown in Table 1 explicitly recognize these impediments to achieving the goals and the stakeholders have identified the activities that could remove these impediments to achieve the goals.

Based on the feedback obtained from Listening Sessions #1 through #3, the 2020 OBMP Update Team drafted an exhibit to show the nexus of all this information. Table 3 lists the goals, the impediments to achieving these goals, the activities to remove the impediments, and the expected outcome or the implications of implementing those activities. Table 3 also shows the nexus of each activity to the Basin management issues defined in Exhibit 1. The statements of impediments and expected outcomes of the activities were developed by the 2020 OBMP Update Team and are based on the feedback obtained from stakeholders over the last three listening sessions.

## Next Steps

The next step in the process to develop the 2020 OBMP Update is to (1) define the action plans required to perform the activities and (2) prepare reconnaissance-level engineering cost estimates of the action plans. This information will be documented in a technical memorandum (OBMP Update Technical Memorandum #1 [OBMP TM1]). OBMP TM1 will be circulated for review and subsequently refined and formulated into a recommended implementation plan (OBMP TM2) over a series of listening sessions with the stakeholders. The draft outline of OBMP TM1 and TM2 is attached herein.

## Recommended Preparation for Listening Session #4

1. Review Table 3 and be prepared to provide feedback, specifically to suggest any changes or additions to the articulation of the impediments and expected outcomes of the 2020 OBMP Update activities. There will be a breakout session during Listening Session #4 to document all the feedback. The intent is to ensure that the feedback from the stakeholders over the last three Listening Sessions has been captured and is complete enough to prepare OBMP TM1.

2. Review the draft outline of OBMP TM1/TM2. The 2020 OBMP Update Team will provide an overview of the outline at Listening Session #4 and will provide an example of how the activities will be characterized in OBMP TM1.

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**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reductions in Chino Basin Safe Yield*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage storage and recovery programs | ● | ● | | ● | ● | | | ● | ● | ● | ● | | ● | | ● | | ● | | | | B, C | 1, 2, 3 |
| Design storage management and storage & recovery programs that maintain or enhance safe yield | ● | ● | | | | | | ● | ● | ● | | | ● | | ● | | ● | | | ● | B, C | 1, 3 |
| Maintain or enhance the safe yield of the basin without causing undesirable results | ● | ● | | ● | ● | | | ● | ● | ● | ● | | | | ● | | ● | | | ● | B, D | 1, 3 |
| Manage the basin safe yield for the long-term viability and reliability of groundwater supply | ● | ● | | | | | | ● | ● | ● | ● | | | ● | | | ● | ● | | ● | A, B, C | 1, 3 |
| Reassess the frequency of the safe yield recalculation | ● | | | | ● | | | | | | | | | | | | ● | | | | I | 3 |
| Continue to model and track safe yield, but utilize other management strategies to address a decline. | | | | | | | | | | | | | | | | | ● | | | | B | 1, 3 |
| Develop recharge programs that maintain or enhance safe yield | ● | ● | | | | | ● | ● | ● | ● | | | | | ● | | ● | | | ● | A, B | 1, 3 |
| Develop more facilities to capture, store, and recharge water | ● | ● | | | | | ● | | | ● | ● | | | | ● | | ● | | | | A, B, D | 1, 2 |
| Enhance recharge in northeast MZ-3 | ● | | ● | | | | | | ● | | | | | | | | ● | | | | A, C | 1, 3 |
| Maximize use of existing recharge facilities | ● | ● | | | | | | ● | ● | ● | | | | | | | | | | | A, C, F, G | 3 |
| Establish incentives to encourage recharge of high-quality imported water | ● | | ● | | | | | | | | | | | | | | | | | | H, I | 2, 3 |
| Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements | ● | ● | | | | ● | | ● | | | | | | | | | | | | | C, E | 3 |
| Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or safe yield | ● | | | | | | | | | | | | | | ● | | ● | | | ● | I, D | 3 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Inability to Pump Groundwater with Existing Infrastructure*** | | | | | | | | | | | | | | | | | | | | | | |
| Pursue collaborative, regional partnerships to implement regional solutions to water management challenges | ● | | | ● | ● | | | ● | | | | | | | ● | ● | ● | ● | ● | ● | B, E, F, G, I | 3 |
| Ensure that sufficient, reliable water supplies will be available to meet current and future water demands | ● | ● | ● | ● | | | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | ● | | A, B, D, G | 1, 3 |
| Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program | ● | | | | | | ● | ● | ● | | | | | | ● | | ● | ● | | | B, G, I | 1, 2, 3 |
| Develop management strategies that enable the parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality | ● | | | | | | ● | ● | | | | | | | ● | | ● | | | | A, C, D, E, F, G, I | 3 |
| Design storage management and storage & recovery programs to raise funding to build infrastructure | ● | | | ● | | | | | | | | | | | ● | | ● | | | | B, D, I, J | 3, 4 |
| Develop process to support/facilitate project implementation | ● | | | | | | | | | | | | | | | | | | | | F, H, J | 4 |
| Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2 | ● | | | | | | ● | ● | | ● | | | | ● | ● | | | | | | A, C, G | 3 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Increased Cost of Groundwater Use*** | | | | | | | | | | | | | | | | | | | | | | |
| Seek supplemental financial resources to support the implementation of the OBMP Update | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | | ● | | D, F, G, I, J | 4 |
| Develop regional partnerships to help reduce costs | ● | | | ● | | | ● | ● | ● | | | | | | ● | ● | ● | | | ● | F, G, I, J | 4 |
| Monetize agencies' unused water rights for equitable balance of basin assets | | | ● | | | | | | | | | | | | | | | | | | G, H | 4 |
| Decrease Watermaster assessment costs | ● | | | | ● | | | ● | | | | | | | | | | | | | I, J | 4 |
| Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure | ● | ● | | | | | | | ● | | | | | | | | ● | | | | F, G, H | |
| Develop an equitable distribution of costs/benefits of the OBMP | ● | ● | | ● | | ● | ● | ● | ● | ● | | | | ● | ● | | | | | | H, J | 4 |
| Watermaster assessments for implementation of the OBMP should be allocated based on benefits received | ● | | | | ● | | | | | | | | | | | | | | | | H | 4 |
| Continue or enhance incentives to pump groundwater from the Chino Basin | | | ● | | | | | | | | | | | | | | | | | | G, I | 3, 4 |
| Improve flexibility for parties to execute water rights transfers | | | | | | | | | | | | | | ● | | | | | | | G, I | 4 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Chino Basin Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop a water quality management plan to ensure ability to produce groundwater rights | ● | ● | | ● | | | ● | ● | ● | ● | | | | ● | ● | | ● | ● | | | E, F, G, J | 2, 3 |
| Develop regional infrastructure to address water quality contamination and treatment | | | | ● | ● | | | ● | | | | | | | | | | | | | A, B, C, E, F, G, I, J | 2 |
| Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | ● | | ● | | | | E, F | 2 |
| Be more proactive and engaged in the process to develop new drinking water quality regulations | | | | | | | | ● | | | | | | | | | | | | | A, B, D, E, G, J | 2 |
| ***Recycled Water Quality Degradation*** | | | | | | | | | | | | | | | | | | | | | | |
| Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit | | ● | | | | | ● | ● | ● | ● | | | | ● | ● | | | | | | A, B, D, E, G, J | 2 |
| ***Increased Cost of Basin Plan Compliance*** | | | | | | | | | | | | | | | | | | | | | | |
| Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan | ● | ● | | | | | | | | | ● | | | | ● | | ● | | | | G, K | 2 |
| Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance | ● | | | ● | | | ● | ● | | | | | | | | | | | | | L | 3, 4 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reduced Recycled Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | | | | |
| Fully utilize IEUA recycled water resources | | ● | | ● | | | ● | ● | | ● | | | | | ● | | | | | | A, D, E, F, G | 1 |
| Maximize the use of recycled water for direct use or recharge | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | | | | | | A, D, E, F, G | 1 |
| Evaluate the potential for direct potable reuse of recycled water | ● | | | | | | | | ● | | | | | | ● | | | | | | D, E, F | 1 |
| Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River | ● | ● | | ● | | | ● | ● | | ● | | | | | ● | | ● | | | | D, E, F | 1, 3 |
| Utilize non-IEUA sources of recycled water that are not being put to beneficial use | ● | ● | | | | | ● | ● | ● | ● | | | | | ● | | ● | | | | D, E, F | 1 |
| ***Other*** | | | | | | | | | | | | | | | | | | | | | | |
| Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update | ● | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | F, G, H, I, J | |
| Improve communication between the parties | ● | | | ● | | | | ● | | | | | | ● | ● | | ● | | | | F, H, I | |
| Educate elected officials and decision makers on the need and urgency to address the water management challenges | ● | ● | | | | | | | ● | | | | | | ● | ● | ● | | | | F, G, H, I, J | |
| Consider a long-term planning horizon of up to 50 years | ● | | | | | | | | ● | ● | | | | | ● | | | | | | F, G, H, I, J | 3 |

**Table 1**
**Issues, Needs and Wants of the Chino Basin Stakeholders**

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

| Needs and Wants Categorized by Basin Management Issues | Pool Parties | | | | | | | | | | | | | | Others | | | | | | Addressed by Activities in Table 3* | Alignment with 2000 OBMP Goals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Appropriative | | | | | | | | | | Agricultural | | | Overlying Non-Ag | | | | | | | | |
| | Pomona | Chino | Fontana | CVWD | SAWCO | MVWD | Chino Hills | Upland | JCSD | Ontario | Crops | Dairy | State of CA | | IEUA | TVMWD | WMWD | Metropolitan | CBWCD | CDA | | |
| ***Reduced Imported Water Availability and Increased Cost*** | | | | | | | | | | | | | | | | | | | | | | |
| Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages | ● | ● | ● | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | ● | | | B, C, G | 1, 3 |
| Identify and utilize new sources of supplemental water | ● | ● | | ● | | | ● | ● | ● | ● | | | | | ● | ● | ● | | | | A, B | 1, 3 |
| Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use | ● | ● | | ● | | | ● | ● | ● | | | ● | | | ● | ● | ● | ● | | | C, G | 1, 3 |
| Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix | ● | | | | | | | ● | ● | | | | | | ● | ● | ● | | | | - | 1, 3 |
| Develop management strategies that ensure parties will meet future desalter replenishment obligation and have the money to fund it | ● | ● | | ● | | | ● | | ● | | | | | | | | ● | | | ● | H, I, J | 3 |
| Increase water-supply reliability at the lowest possible cost | ● | | | ● | | | ● | ● | | | | ● | | ● | ● | | ● | | | | A, B, D, J | 3 |
| Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply | ● | | | ● | | | | | ● | | | ● | | | ● | ● | ● | ● | | | A | 3 |
| Analyze water management scenarios that plan for unexpected challenges and emergencies | ● | | | | | | | ● | ● | ● | | | | | ● | ● | ● | | | | E, G | 3 |
| Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements | | | | | | | ● | | ● | ● | | ● | | ? | ● | | | | | ● | A | 1, 3 |
| Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase | ● | | | | | | | | | | | | | | | | | | | | - | 3 |
| Use more recycled water for replenishment obligation | ● | | | ● | | | ● | | ● | | | | | | | | ● | | | | A, D, E, F | 3 |
| Continue to build collaborative programs between the Metropolitan Water District and Chino Basin | ● | | | | | | ● | ● | ● | | | | | | ● | | ● | ● | | | B, I | 3 |

**Table 2b**
**Draft Activities for Consideration in the 2020 OBMP Update,**
**Derived from the Activities Defined by Stakeholders in Listening Session #2****

| ID | Activity |
|---|---|
| A | Construct new recharge facilities to increase the capacity for stormwater and recycled water recharge and provide recharge capacity in areas of the basin necessary to ensure long-term balance of recharge and discharge. |
| B | Develop and implement storage-and-recovery programs to increase water supply reliability, increase Safe Yield, and improve water quality. |
| C | Develop and implement regional conveyance and treatment programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence. |
| D | Maximize the reuse of recycled water produced by IEUA and others. |
| E | Develop a water-quality management plan to address current and future water-quality issues and ensure the protection of beneficial uses, now and into the future. |
| F | Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality. |
| G | Optimize the use of all sources of water supply by developing the ability to move water across the basin and between stakeholders. |
| H | Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements. |
| I | Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement. |
| J | Continue to identify and pursue low-interest loans and grants to support the implementation of the OBMP Update. An example of such an effort is the Chino Basin Project. |

***Note: See Table 2 of Listening Session #2 Memo*

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Reductions in Chino Basin Safe Yield | Inability to Pump Groundwater with Existing Infrastructure | Increased Cost of Groundwater Use | Chino Basin Water Quality Degradation | Recycled Water Quality Degradation | Increased Cost of Basin Plan Compliance | Reduced Recycled Water Availability and Increased Cost | Reduced Imported Water Availability and Increased Cost |
| ***Goal 1 - Enhance Basin Water Supplies*** | | | | | | | | | | |
| 1a • Not all of the stormwater runoff available to the Chino Basin is diverted and recharged. Failure to divert and recharge stormwater is a permanently lost opportunity.<br><br>• The existing methodology to select recharge projects for implementation is based on the cost of imported water. There are currently no known projects with a unit cost lower than the cost of imported water, hindering expansion of stormwater capture and recharge<br><br>• Pumping capacity in some areas of the basin is limited due to low groundwater levels and land subsidence. | A Construct new facilities and improve existing facilities to increase the capacity to store and recharge surface water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge | • Increases recharge of high-quality stormwater that will:<br>• protect/enhance the Safe Yield,<br>• improve water quality,<br>• reduce dependence on imported water,<br>• increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and<br>• provide new supply of blending water to support the recycled-water recharge program.<br><br>• Provides additional supplemental-water recharge capacity for replenishment and implementation of storage and recovery programs.<br><br>• Provides additional surface water storage capacity. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| 1b • There is a surplus of recycled water available to the Chino Basin parties that is not being put to beneficial use, which is a loss of a low-cost, local water supply.<br><br>• Existing infrastructure limits the reuse and recharge of recycled water in the Chino Basin.<br><br>• Existing requirements to discharge recycled water to the Santa Ana River limit the amount of water available for reuse and recharge | D Maximize the reuse of recycled water produced by IEUA and others | • Results in a new, consistent volume of in-lieu and/or wet water recharge that will:<br>• protect/enhance the Safe Yield,<br>• reduce dependence on imported water,<br>• improve water-supply reliability, especially during dry periods, and<br>• increase pumping capacity in areas of low groundwater levels and areas of subsidence concern. | ✓ | ✓ | | | | | ✓ | ✓ |

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

| Impediments | Activities to Remove Impediments | Potential Outcomes of Activities | Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities | | | | | | | |
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| ***Goal 2 - Protect and Enhance Water Quality*** | | | | | | | | | | |
| 2a • Areas of the basin are contaminated with VOCs and constituents of emerging constituents (CECs).<br><br>• Water-quality regulations are evolving and becoming more restrictive, which limits the beneficial uses of groundwater.<br><br>• Groundwater treatment may be necessary to meet beneficial uses, but can be expensive to build and operate.<br><br>• The basin is hydrologically closed, which causes accumulation and concentration of salts, nutrients, and other contaminants.<br><br>• Some stored water in the Chino Basin cannot be used due to water quality and insufficient treatment capacity | E Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses<br><br>F Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality | • Proactively addresses new and near-future regulations.<br><br>• Enables the parties to make informed decisions on infrastructure improvements for water-quality management.<br><br>• Removes groundwater contaminants from the Chino Basin and thereby improves groundwater quality.<br><br>• Enables the parties to produce or leverage their water rights that may be constrained by water quality.<br><br>• Ensures that groundwater is pumped and thereby protects/enhances the Safe Yield. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| 2b • Water-quality regulations are evolving and generally becoming more stringent, which could limit the reuse and recharge of recycled water. | K Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge | • Enables the continued and expanded recharge of recycled water, which will:<br>• protect water quality,<br>• improve water-supply reliability, especially during dry periods, and<br>• protect/enhance the Safe Yield. | ✓ | | | ✓ | ✓ | ✓ | | ✓ |

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| ***Goal 3 - Enhance Management of the Basin*** | | | | | | | | | | |
| 3a • Existing infrastructure (pumping and treatment capacity and conveyance) is insufficient to conduct puts and takes under proposed storage programs.<br><br>• There is unused storage space in the Basin the use of which is constrained by the storage limits defined in existing CEQA documentation.<br><br>• Watermaster's current storage management plan is not optimized to protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain hydraulic control, etc. | B Develop, implement, and optimize storage-and-recovery programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality. | • Storage programs that protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain hydraulic control, etc.<br><br>• Leverages unused storage space in the Basin.<br><br>• Reduces reliance on imported water, especially during dry periods.<br><br>• Potentially provides outside funding sources to implement the OBMP Update.<br><br>• Improves water quality through the recharge of high quality water. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |

**Table 3**
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| 3b • Land subsidence in northwest MZ1 may limit the ability for parties to pump their respective rights in this area.<br><br>• Poor water quality and increasingly restricting water quality regulations limits the ability for some parties to pump their respective rights. | C Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.<br><br>G Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure. | • Enables producers in MZ1 to obtain water through regional conveyance, which supports management of groundwater levels to reduce the potential for subsidence and ground fissuring.<br><br>• Enables the parties to increase production in areas currently constrained by poor water quality.<br><br>• Removes groundwater contaminants from the Chino Basin and thereby improves water quality.<br><br>• Protects/enhances the Safe Yield.<br><br>• Maximizes the use of existing infrastructure, which will minimize costs.<br><br>• Provides infrastructure that can also be used to implement storage and recovery programs. | ✓ | ✓ | ✓ | ✓ | | | | ✓ |
| 3d • Watermaster needs information to comply with regulations and its obligations under its agreements and Court orders, yet financial resources to collect this information are limited. | L Perform the appropriate amount of monitoring and reporting required for basin management and regulatory compliance | • Ensures full compliance with regulatory requirements.<br><br>• Ensures full support of basin management initiatives.<br><br>• Enables parties to monitor the performance of the OBMP Update. | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

**Table 3**
**OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders**

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| ***Goal 4 - Equitably Finance the OBMP*** | | | | | | | | | | |
| 4a • The distribution of benefits associated with the OBMP Update is not defined.<br><br>• Funding needed for the OBMP implementation activities of the Watermaster is not projected beyond the current year budget, which limits parties ability to plan required funding for the future.<br><br>• There is currently no formal process to evaluate and adapt the OBMP implementation plan, schedule and cost. | H Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements. | • Provides transparency as to the benefits of the OBMP Update activities.<br><br>• Provides information needed to plan financial resources.<br><br>• Improves the likelihood that the OBMP will be implemented. | | | ✓ | | | | | |
| 4b • Limited financial resources constraint the implementation of the OBMP. | I Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement | • Lowers the cost of OBMP implementation.<br><br>• Improves the likelihood that the OBMP will be implemented. | | | ✓ | | | | | |
| | J Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update. An example of such an effort is the Chino Basin Project. | | | | ✓ | | | | | |

# Appendix B

Response to Comments

# Scoping Report Comments[1]

## City of Chino – Comments on Scoping Report Part 1 Provided by Dave Crosley

1. ***Page 12, last paragraph, 1st sentence ends with a reference to footnote "3" which seems misplaced.***

   The reference to footnote 3 has been removed.

2. ***Page 31, Activity D. The described scope pertaining to Activity D could be reshaped to reflect a reduced level of effort by Watermaster.***

   The objectives of Activity D are to maximize recycled water reuse. As described in the Scoping Report, the IEUA would be the appropriate entity to lead the implementation of Activity D on behalf of all parties in the IEUA, TVMWD, and WMWD service areas. The draft report suggested that part of Watermaster's role would be to convene and lead a committee that could guide the process, however such a role is not required to implement the activity. Watermaster's role could be to team with the IEUA or other coordinating agency in the implementation of Activity D to ensuring its implementation is consistent with the Judgment, the Peace Agreements and other agreements, the maximum benefit SNMP, and the Watermaster Rules and Regulations. Specifically, Watermaster should ensure that the process to maximize recycled water is integrated with the goals of the OBMP and that the process includes projects to maximize the use of recycled water for replenishment purposes (Judgment ¶ 49(a)). Accordingly, the text has been modified to reflect this revised role. Note that this is consistent with the 2000 OBMP Implementation Plan for Program Element 5 - *Develop and Implement Regional Supplemental Water Program* in the 2000 OBMP, for which IEUA was the agency responsible for implementation of expanded recycled water reuse. The revised text can be found on page 36 of the final report.

3. ***Page 25, last paragraph, 3rd sentence states "[T]he recent decline in the direct use of recycled water is a result of reduced water use due to drought and state-mandated water conservation programs that required significant reductions in water use." What data supports this statement? The last sentence of the preceding paragraph describes conservation-related causation of reduced recycled water availability, but just because there is a reduced supply it does not necessarily follow that conservation caused less recycled water demand. We suggest clarification.***

   The text has been updated per discussions with the IEUA. Per the IEUA, the recent decline is due to the mindful reduction in use by the City of Chino to accommodate changes in IEUA policy related to the use of recycled water base entitlements and conversions of land from agricultural to urban uses. The new text appears on page 31, fourth full paragraph, third sentence.

4. ***Page 26, 2nd paragraph, 1st sentence states "…the IEUA is maximizing the reuse of recycled water given the constraint of meeting its obligations to discharge a minimum of 17,000 AFY to***

[1] Comments and questions about the OBMP process were addressed in a separate document that is available on Watermaster's website at: http://www.cbwm.org/docs/OBMP%20Update/20191017%20Watermaster%20Responses%20to%20comments%20on%20Process.pdf.

***comply with the Santa Ana River Judgment and associated agreements with WMWD." This statement is misleading, as the IEUA discharge of recycled water to the river has generally exceeded the minimum 17,000 AFY flow requirement instead of directing excess supplies of recycled water to satisfy significant potential direct reuse demands throughout the IEUA service area. The 4th paragraph appearing on page 27 describes some of the circumstances that contribute to the challenge of maximizing reuse.***

The text of this paragraph has been updated to more clearly articulate the challenge that the availability of recycled water poses for IEUA in meeting its obligations of the Santa Ana River Judgment, specifically that the increasing demand for recycled water for reuse will constrain the IEUA's ability to continue to use recycled water to meet its discharge obligations. The revised text is on page 34, first full paragraph of the final Scoping Report.

5. ***Page 28, 3rd full paragraph under the subheading Santa Ana River Judgment states "… discharge requirements of the Judgment preclude the IEUA from reusing 100 percent of its recycled water supply." This is an oversimplified and misleading characterization of the Judgment requirement. The subject Judgment (OC Judgment) describes an obligation of entities located upstream of Prado to provide for a minimum flow of water to downstream of Prado. IEUA and WMWD, as upstream entities, have a joint obligation. IEUA has utilized unclaimed recycled water produced via the treatment of wastewater generated within the service areas of its members in order to satisfy its share of the joint IEUA/WMWD obligation. However, the minimum flow need not necessarily be supplied from recycled water generated from wastewater treatment, and the agencies within whose jurisdictions the wastewater is generated possess a contractual entitlement to the recycled water. If those agencies claim their entitlement then IEUA, as a regional (Chino Basin) water supply agency (not a wastewater treatment service provider), still has a joint (along with WMWD) obligation to provide a minimum flow downstream of Prado. The OC Judgment does not preclude the recycled water entitlement holders from using 100 percent of the recycled water.***

The text of this paragraph has been updated to eliminate the statement that "… discharge requirements of the Judgment preclude the IEUA from reusing 100 percent of its recycled water supply." It was also modified to more clearly articulate the challenge that the availability of recycled water poses for IEUA in meetings its obligations of the Santa Ana River Judgment. The revised text is on page 34, first full paragraph of the final Scoping Report.

6. ***Page 30, Task 7 paragraph, 2nd sentence which states "ensure that Watermaster is maximizing the reuse of recycled water…" should probably be refined to indicate that Watermaster is enabling/accommodating/facilitating the reuse of recycled water.***

The text has been updated to reflect a reduction of Watermaster's role, as discussed in the response to comment number 2 above.

## City of Ontario – Comments Provided by Katie Gienger

7. ***Activity B – Storage and Recovery Programs. The tasks of this activity are a duplication of efforts already underway by the Chino Basin Water Bank (CBWB). It is unclear what Watermaster will do above and beyond the activities already performed by the CBWB. The focus of this activity in***

***the OBMP should be Watermaster's role in administering the Judgment, such as evaluating proposed Storage & Recovery programs for MPI.***

The purpose of the Scoping Report is to provide the parties with an understanding of the work that would need to be performed to accomplish the desired outcomes of each of the 2020 OBMP Update activities. To the extent that the scopes of work described herein are already being partly or completely performed by Watermaster or others, the Scoping Report acknowledges such. The next steps in the process to prepare the 2020 OBMP Update will focus on the review and revision of the activities scoped herein and the integration of the ongoing activities with the existing OBMP. The recommended 2020 OBMP Implementation Plan, inclusive of ongoing and new activities will be documented in a subsequent report, *2020 Optimum Basin Management Program Update Report*, and will form the foundation for the parties to develop a final implementation plan and agreements to implement the OBMP Update. This purpose has been clarified in the report introduction on page 6, last paragraph.

Activity B is designed to obtain agreement on the specific objectives and desired benefits for Storage and Recovery (S&R) Programs, to identify "optimized" S&R programs that achieve the benefits while causing no material physical injury, and to help guide the development of future applications for S&R Programs. These outcomes are required for Watermaster to implement the Physical Solution of the Judgment and will support Watermaster approval of S&R applications. As such, Activity B is deemed necessary by Watermaster.

The second paragraph of the introduction to the Activity B scope of work (Page 27) acknowledges that prior work has been performed to describe and/or evaluate S&R programs for the Storage Framework Investigation, the Chino Basin Water Bank, and the Chino Basin Program. At such time that Activity B will be performed, the scope of work to will be updated to leverage this work.

8. ***Activity D – Maximize Reuse of Recycled Water. The tasks of this activity are a duplication of the IEUA recycled water efforts as described in our first general comment. It is unclear what Watermaster will do above and beyond the activities already performed by IEUA. For this reason, we recommend the parties discuss the best approach in scoping this activity to avoid a duplication of effort.***

As to the first part of our comment on duplication, the introduction of Activity D scope of work acknowledges that the IEUA is performing a significant amount of work to evaluate opportunities to acquire surplus recycled water supplies for recharge as part of the CBP, and recommends that this work be leveraged to simplify the scope of Activity D. The description of IEUA's work has been expanded to reflect its various other efforts to analyze recycled water supply and demands.

In the Scoping Report, the scope of work and costs to implement each OBMP Update activity were designed to achieve the desired outcomes defined by the stakeholders assuming that the activities could be implemented independently and that the planning efforts of others are not leveraged. The purpose of this assumption in the Scoping Report is to describe in detail the precise work required to achieve the outcomes. Additionally, the scopes of work and costs described in the Scoping Work leverage existing work being performed by Watermaster, but not by others. These assumptions are described on pages 14 and 15 of the Scoping Report under "Assumptions Applied in Defining the Scope of Work, Schedule, and Cost of the OBMP activities." There will be

opportunities to leverage work done by other agencies to avoid duplication of effort and to reduce the costs.

As to the second part of your comment on Watermaster's role, please see the response to Comment 2 above. Additionally, it is important to note that not all aspects of the OBMP require direct involvement by the Watermaster. For example, in the 2000 OBMP Implementation Plan, there are several implementation actions in Program Elements 3 and 5 that were the responsibility of the Chino Desalter Authority or the IEUA.

9. ***Activity D – Maximize Reuse of Recycled Water, Page 28 – Santa Ana River Judgment – The TM states "The discharge requirements of the Judgment preclude the IEUA from reusing 100 percent of its recycled water supply." This statement is not accurate and should be revised to reflect that the SAR obligation is not required to be met with recycled water. The Santa Ana River Judgment states on page 9 "(1) At Prado. Base Flow shall: (i) include any water caused to be delivered by CBMWD or WMWD directly to OCWD, pursuant to its direction and control and not measured at the gages at Prado;" The Judgment anticipated using recycled water, but also allows for supplemental water to meet the SAR obligation, which was undertaken by Chino Basin Municipal Water District (now IEUA) on behalf of the Chino Basin producers***

   Please refer to the responses to Comments 4 and 5 above.

10. ***Activity EF – Each water purveyor tracks and monitors current and emerging constituents on its own behalf, including engaging in formal and informal discussions with other water purveyors facing similar challenges. Watermaster has historically provided an arena for data sharing and compilation as well as ideas on best practices which has been a valuable resource. Agencies are already required to perform the necessary monitoring for compliance of water systems permits; therefore a Groundwater Quality Management Plan (and the proposed monitoring program) may be a redundant effort. It is not clear what regulatory compliance Watermaster is subject to aside from its involvement in the Salt & Nutrient Management Plan related to hydraulic control.***

    The Judgment provides Watermaster the discretion to develop an OBMP, including both water quantity and water quality considerations. A groundwater quality management plan like the one scoped in the Scoping Report provides the parties with the comprehensive data and information, including best practices for monitoring, that are needed to understand and manage the future water quality challenges that could impact the parties' ability to fully utilize their pumping rights.

    Currently, water purveyors are not required by the State to perform monitoring of contaminants with State notification levels or other emerging contaminants of concern; the monitoring of these contaminants is voluntary until there is an established drinking water regulation or a mandated monitoring order. In the past monitoring of emerging contaminants in the Chino Basin was not prevalent, and often did not use the laboratory method detection limits low enough to understand the occurrence in relation to State notification levels, and the occurrence was not characterized well enough to prepare for compliance with potential drinking water regulations. As described in the Scoping Report, a recent example of this is 1,2,3-trichloropropane, which became regulated in late 2017. A groundwater quality management plan and associated monitoring program would not be a redundant effort as it will include strategies to investigate and analyze emerging contaminates in the Basin in a comprehensive and consistent way and that

would leverage all existing groundwater monitoring performed by Watermaster and others. A groundwater quality management plan will ensure there is consistent and adequate monitoring of emerging contaminants as they are being identified to plan for potential water quality regulations, and if needed identify the most efficient means to address regional water-quality challenges.

As to concerns of duplication, please also refer to responses to Comments 7 and 8 above.

## Inland Empire Utilities Agency – Comments on Scoping Report Part 1 Provided by Sylvie Lee and Joshua Aguilar

11. ***Page 1, regarding the title of Activity D, suggested edit to add direct use in the title, or does it not take into account direct use of recycled water?***

    The maximization of recycled water reuse in Activity D is meant to encompass all forms of recycled water reuse including: direct non-potable reuse (landscape irrigation or industrial uses), groundwater recharge or injection (indirect potable reuse), and direct potable reuse. See page 30 for description of Activity D's objective.

12. ***Page 2, regarding the title of Activity HIJ, should it reference subsequent implementation plan instead of the OBMP Update?***

    The term OBMP Update is not exclusive of the implementation plan or the agreements to implement it.

13. ***Page 14, in the summary of Activity A, third bullet. Can we say something to the effect of minimizing losses or is that covered under pumping sustainability?***

    The text of the bullet was expanded to include reference to the need to maintain hydraulic control. The revised text is on page 20, third bullet of the final Scoping Report.

14. ***Page 19, fourth bullet. External funding should be listed [as something that the Storage and Recovery Program Master Plan will enable the parties to do] as this has been very successful for the region in reducing the cost of successful programs (GWR, Desalter, RW, etc.).***

    Concur. As, described under the "Summary" section for Activity B, the Storage and Recovery Master Plan can provide support in the application for external funding (grants and low-interest loans). The term "external funding" has been added to the list of things that can offset Watermaster assessments and reduce OBMP assessments. The revised text is on page 24, first bullet of the final Scoping Report.

15. ***Page 21, first paragraph. Is this [Storage and Recovery Program Master Plan] a new one that needs to be created or is it the Storage Management Plan? What is the purpose and shelf life in addition to the SMP?***

    The 2020 Storage Management Plan is a set of rules by which to manage all storage in the Chino Basin, including the parties' local storage accounts and S&R Programs—it does not define how S&R programs should be designed to achieve the benefits desired by the parties. Activity B is designed to obtain agreement on the specific objectives and desired benefits for S&R Programs, to identify "optimized" S&R programs that achieve the benefits, to help guide the development

of future applications for S&R Programs, and to help apply for grants and low-interest loans to implement S&R Programs. This work will be documented as the Storage and Recovery Master Plan, which may need to be updated to be consistent with periodic updates to the Storage Management Plan.

16. ***Page 21, first paragraph. Is that our goal, "to reference a common set of objectives for storage and recovery programs and align the objectives with requirements in grant applications and other funding opportunities"? Seems like "Master Plan" should be broader than individual S&R requirements.***

    Please refer to the response to Comment 15.

17. ***Page 38, under "Scope of Work for Activity EF." Are there recommendations for the "centralized" treatment options as suggested in the "needs"?***

    As described in the "Scope of Work for Activity EF" section, Task 5 of the scope of work for Activity EF is to identify groundwater quality treatment projects using existing and new facilities, to screen them using agreed upon criteria developed in Task 4, and to select a final list of projects for detailed evaluation in Task 6. The groundwater quality treatment projects can range from individual well-head treatment to regional treatment plants. Under Task 6, cost opinions for these projects will be developed and will include a comparison of the cost to implement treatment projects by individual municipal agencies to those of collaborative projects.

## San Antonio Water Company – Comments Provided by Brian Lee

## Monte Vista Water District – Comments Provided by Mark Kinsey (reiterative of SAWCo comments)

18. ***General Note of Duplication. A majority of the proposed activities duplicate existing planning efforts, as outlined in the below chart and further discussed per activity below:***

| Proposed Activity | Existing Planning Efforts |
|---|---|
| Activity A | Recharge Master Plan; Recharge Investigations & Projects Committee |
| Activity B | Chino Basin Water Bank; Inland Empire Utilities Agency |
| Activity D | Inland Empire Utilities Agency and Contracting/Member Agencies; Jurupa Community Services District; City of Pomona |
| Activity E/F | Local Agencies; Water Quality Committee (existing authority to reconvene) |
| Activity K | Maximum Benefit Salt and Nutrient Management Plan |
| Activity C/G | Integrated Resource Plan |

Please refer to the responses to Comments 7, 8, and 10. Please also note that in the next step of the 2020 OBMP Update process the OBMP Update activities described in the Scoping Report will be integrated with the 2000 OBMP Program Elements. If the implementation actions that arise from the OBMP Update activities are already encompassed by the existing actions in the 2000

OBMP IP, then no new implementation actions will be included in the 2020 OBMP Update. See responses to comments 19 through 24 for more detail about specific activities.

19. ***Activity A. We disagree with this activity and its implementation schedule because it duplicates an existing and active planning effort, the Recharge Master Plan (RMP). The RMP has been developed and updated consistent with the Peace Agreements. Watermaster's Recharge Investigations and Projects Committee (RIPCom)- open to all parties- meets quarterly to review the ongoing implementation of the latest RMP. The process of updating the RMP includes an exhaustive review of opportunities to improve Basin recharge, and each RIP Com meeting agenda includes a standing item for discussion and consideration of new recharge projects.***

    ***Watermaster staff has verbally confirmed with certain parties that there is no intent to duplicate the RMP process, and that this activity proposes instead to continue the existing process. However, the current draft of the technical memorandum lacks clarity on how newly proposed activities enhance existing activities. Overall, we believe there is no need to create a new process (with associated costs) that duplicates an existing, successfully implemented ongoing process.***

    As described in the report on pages 16 and 17, based on the alignment of the objectives of Activity A with those of the RMPU, Activity A can be accomplished through the existing RMPU process. The scope of work summarized in the report is for developing the 2023 RMPU, not in addition to it. Please also refer to responses to Comments 7, 8, 10, and 18 regarding duplication of efforts.

20. ***Activity B. We disagree with this activity and its implementation schedule because it duplicates existing and active planning efforts to develop Storage and Recovery Programs. The Peace Agreement provides criteria for Watermaster to facilitate and regulate the development of Storage and Recovery Programs that "provide broad mutual benefits" to the Judgment parties (¶5.2(c)). We are aware of two entities, the Chino Basin Water Bank and the Inland Empire Utilities Agency (IEUA), that are actively engaged with Watermaster and their partners in developing Storage and Recovery Program proposals. We believe that these and other potential applicants should cover the cost of demonstrating how their proposed Storage and Recovery Programs may provide broad mutual benefits to the parties. Additionally, Watermaster's role in facilitating Storage and Recovery Programs necessitates a healthy division between the evaluating and approving entity (Watermaster) and the Program applicant(s).***

    The Peace Agreement assigns Watermaster as the evaluating and approving entity for S&R Programs. As such, Watermaster must have criteria upon which to define and evaluate “broad mutual benefits” of S&R Programs. Activity B includes a process for the parties and Watermaster to build and achieve consensus on the definition(s) of broad mutual benefits and the objectives of S&R Programs. These definitions are key to Watermaster’s ability to evaluate and rank S&R Programs when presented with applications. Activity B also helps guide the parties (or others) in the development of S&R Programs, so that the application and evaluation process is most efficient.

    As to duplication of efforts, the intention of Activity B is to leverage past and current work to the maximum extent. The description in Activity B states that: “Prior work has been performed for the Storage Framework Investigation, the Chino Basin Water Bank, and the Chino Basin Program.

These past efforts can be leveraged…" in the execution of Activity B. See also the responses to Comments 7, 10, and 18.

21. ***Activity D. We disagree with this activity and its implementation schedule because it duplicates existing and active planning efforts by IEUA, IEUA member agencies, Jurupa Community Service District, and the City of Pomona. These planning efforts seek to address the full and beneficial utilization of recycled water supplies available in the Chino Basin. We believe parallel planning processes are neither advisable nor cost-effective.***

    Please refer to the responses to Comments 8 and 18.

22. ***Activity E/F. We disagree with this activity and its implementation schedule because it proposes activities that are either outside of Watermaster's authority or already authorized under the existing OBMP Implementation Plan. Water quality compliance is the responsibility of water providers under their respective operating permits. Watermaster' s role under the OBMP Implementation Plan is to monitor water quality to ensure that parties' use of the basin meet Basin Plan objectives and do not cause material physical injury. The existing OBMP Implementation Plan already directs Watermaster to form a "water quality committee" to oversee and provide input on these activities; we see no reason why Watermaster cannot reconvene such a committee under its existing authority.***

    Please refer to the responses to Comments 10 and 18.

23. ***Activity K. We disagree with this activity and its implementation schedule because the Maximum Benefit Salt and Nutrient Management Plan already contains dilution compliance requirements that Basin parties must meet in order to continue recharging recycled water. As stated in the sixth listening session, Watermaster and IEUA are already implementing this activity through their work in developing a Basin Plan amendment proposal, and that the activity simply proposes to "do what we are doing."***

    Activity K will ensure that the evaluation of a future compliance challenge with the recycled water dilution requirements will be done on a routine basis hereafter and not just during the current investigation to support the Basin Plan amendment proposal – such a routine assessment will also be required by the Regional Board, as described in the discussion of Activity K. Please also refer to response to Comments 7, 8, 10, 18, and 21.

24. ***Activity C/G. We disagree with this activity and its implementation schedule because it duplicates IEUA's ongoing integrated resource planning process. All parties and Watermaster staff are participating in this planning process, which is focused on identifying projects to improve the reliability and resiliency of regional water supplies.***

    Please refer to the response Comments 7, 8, 10, and 18.

25. ***Activity L. This is a proposed review of Watermaster's current monitoring and reporting processes to ensure they are as efficient and cost-effective as possible. We consider this review an essential administrative best practice and fully support its immediate implementation and incorporation into Watermaster's Rules and Regulations and other procedural documents, as appropriate.***

Comment noted. Watermaster proposes that it be implemented in Fiscal Year 2020/21 and will present if for consideration in the budget at the appropriate time.

26. ***Activity H/I/J. The Chino Basin Judgment establishes the following requirement for basin management, inclusive of the OBMP: "In the process of implementing the physical solution for Chino Basin, Watermaster shall consider the following parameters: ... (c) Economic Considerations. - Financial feasibility, economic impact and the cost and optimum utilization of the Basin's resources and the physical facilities of the parties are objectives and concerns in equal importance to water quantity and quality parameters" (Exhibit "I" ¶(c), emphasis in original).***

    ***Here and elsewhere in the Court-approved management agreements, Watermaster is directed to consider economics - inclusive of equitable distribution of costs and benefits, reductions in costs, and funding opportunities - for all basin management activities tied to implementation of the Physical Solution. Therefore, we respectfully request that Watermaster fulfill this requirement to incorporate economic considerations into any agreed-upon activity in this and any other basin management process.***

    Comment noted. As stated on pages 80 and 81 regarding economic considerations:

    "The objectives for Activities H, I, and J can be efficiently met by incorporating tasks within the other activities to characterize the benefits and costs of the projects produced by the activities."

    and

    "The steps to achieve an equitable allocation of benefits and costs should be addressed by in the agreement that will be developed by the parties to implement the 2020 OBMP Update. The 2020 OBMP implementation agreement could be designed to ensure that the desired extent of cost/benefit assessments are performed to support equitable cost allocations in the implementation of activity scopes of work, to anticipate and accommodate the development of project implementation agreements that define the project-specific cost/benefit allocation, and to periodically update cost projections for implementation of the 2020 OBMP Update activities and associated projects to support planning of financial resources."

# Appendix D

Stakeholder Participation Log

## Appendix D

## Stakeholder Attendance at the OBMPU Listening Sessions

| Name | Agency/Stakeholder | LS1 | LS2 | LS3 | LS4 | LS5 | LS6 | LS7 | LS8 |
|---|---|---|---|---|---|---|---|---|---|
| Bob Feenstra | Agricultural Pool | | X | X | | | | X | X |
| Jeff Pierson | Agricultural Pool | X | X | X | | | | X | |
| Diana Frederick | Agricultural Pool - State of CA | | X | | | | | | |
| Craig Stewart | Agricultural Pool - State of CA/CIM | | | | X | | | | |
| Pete Hall | Agricultural Pool - State of CA/CIM | | X | X | | | | | |
| John Schatz | Appropriative Pool | | X | | X | | | | X |
| John Thornton | Arcadis (consultant to the Chino Basin Water Bank) | | | | | X | X | X | X |
| Brian Geye | Auto Club Speedway | X | X | | | | X | X | X |
| Andrew Lazenby | Brown and Caldwell (consultant to IEUA) | | | X | | | | | |
| Tom O'Neill | Chino Basin Desalter Authority | | X | X | | | | | |
| Elizabeth Skrzat | Chino Basin Water Conservation District | | | | | | | X | |
| Kristen Wegner | Chino Basin Water Conservation District | X | | X | X | | | | |
| Don Galeano | Chino Basin Watermaster Board | | | X | | | | | |
| Ron Craig | Chino Hills, City of | X | X | X | X | X | X | X | X |
| Amanda Coker | Chino, City of | X | X | X | | X | | X | X |
| Dave Crosley | Chino, City of | X | X | | | X | X | | X |
| Eunice Ulloa | Chino, City of | X | | X | X | X | | X | |
| Bob Page | County of San Bernardino | | X | | | | | | |
| Eduardo Espinoza | Cucamonga Valley Water District | X | X | X | X | X | | X | X |
| John Bosler | Cucamonga Valley Water District | | | | | | X | | |
| Praseetha Krishnan | Cucamonga Valley Water District | X | X | | | X | X | X | |
| Tracy Egoscue | EIG (representing the Agricultural Pool) | X | X | X | | X | X | X | X |
| Shawnda Grady | Ellison, Schneider & Harris (representing JCSD) | | X | | | | | | |
| Eric Tarango | Fontana Union Water Company | X | | X | | | | X | |
| Josh Swift | Fontana Union Water Company | | | | X | X | | X | |
| Cris Fealy | Fontana Water Company | X | | X | X | X | X | | |
| Roger Putty | GEI (consultant to IEUA) | | | | X | | | | |
| Chris Berch | Inland Empire Utilities Agency | X | X | X | X | | | | |
| Christiana Daisy | Inland Empire Utilities Agency | | | | | | | X | |
| Joshua Aguilar | Inland Empire Utilities Agency | | X | | X | X | | X | X |
| Kirby Brill | Inland Empire Utilities Agency | X | | | | | | | |
| Liz Hurst | Inland Empire Utilities Agency | | | X | X | | | | |
| Liza Muñoz | Inland Empire Utilities Agency | | | | | X | X | X | |
| Sylvie Lee | Inland Empire Utilities Agency | X | X | X | X | | X | X | X |
| Abhi Singh | Intera (consultant to IEUA) | | X | | | | | | |
| Betty Anderson | Jurupa Community Services District | | | | X | | | | |
| Chris Berch | Jurupa Community Services District | | | | | X | X | X | X |
| Eldon Horst | Jurupa Community Services District | | | X | X | | | | |
| Steven Popelar | Jurupa Community Services District | | X | | | | | | |
| Ed Means | MC (consultant to Chino Water Bank) | | | | | X | | | |
| Brandon Goshi | Metropolitan Water District | X | | X | X | | | X | X |
| Justin Scott-Coe | Monte Vista Water District | | | | | X | X | X | |
| Van Jew | Monte Vista Water District | | X | | | X | | | |

## Appendix D

## Stakeholder Attendance at the OBMPU Listening Sessions

| Name | Agency/Stakeholder | LS1 | LS2 | LS3 | LS4 | LS5 | LS6 | LS7 | LS8 |
|---|---|---|---|---|---|---|---|---|---|
| Bob Bowcock | Non-Agricultural Pool | X | X | | X | | | | |
| Wendy Sanders | NRG/ERM | X | | | | | | | |
| Courtney Jones | Ontario, City of | X | X | X | X | X | | | |
| Katie Gienger | Ontario, City of | | | X | X | X | X | X | X |
| Scott Burton | Ontario, City of | | X | | | | | | |
| Marsha Westropp | Orange County Water District | X | | | | | X | | |
| Chris Diggs | Pomona, City of | X | X | | X | X | X | X | X |
| Darron Poulsen | Pomona, City of | X | X | | | X | X | X | |
| Raul Garibay | Pomona, City of | X | X | X | | | | | |
| Brian Lee | San Antonio Water Company | X | | | | X | | | |
| Teri Layton | San Antonio Water Company | X | | | X | X | | | X |
| James McKenzie | San Bernardino County Flood Control District | | | | X | X | | X | |
| Jorge Vela | San Bernardino County Flood Control District | | | | | X | | | |
| Marty Zvirbulis | San Gabriel Valley Water Company | | | | | | | X | |
| Tom Harder | TH&Co (representing the Appropriative Pool) | X | | X | X | | X | X | X |
| John Mendoza | Three Valleys Municipal Water District | X | X | X | | X | X | | X |
| Matt Litchfield | Three Valleys Municipal Water District | | X | X | | X | | | |
| Tim Kellett | Three Valleys Municipal Water District | | | | | X | | X | X |
| Harrison Nguyen | Upland, City of | X | | | | | | | |
| Rosemary Hoerning | Upland, City of | X | X | X | X | | | | |
| Steve Ledbetter | Upland, City of | | | | | | | X | |
| Steve Nix | Upland, City of | | | | | X | X | | |
| Nadia Loukeh | West Valley Water District | | | X | | | | | |
| Jason Pivovaroff | Western Municipal Water District | | | | X | X | | | X |
| Ryan Shaw | Western Municipal Water District | X | X | X | | | X | X | |
| Rick Rees | Wood (representing State of CA) | X | X | X | | X | X | X | X |
| Individual Count | | 31 | 32 | 29 | 25 | 30 | 21 | 30 | 21 |
| Stakeholder Count | | 19 | 17 | 19 | 18 | 17 | 17 | 21 | 16 |

# Appendix E

2020 Storage Management Plan

# 2020 Storage Management Plan
# Final Report

*December 11, 2019*

Prepared for:

Prepared by:

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## Acronyms, Abbreviations, and Initialisms

| | |
|---|---|
| af | acre-feet |
| afy | acre-feet per year |
| DYYP | Dry Year Yield Program |
| IEUA | Inland Empire Utilities Agency |
| MPI | Material Physical Injury |
| MZ1 | Management Zone 1 |
| MZ2 | Management Zone 2 |
| MZ3 | Management Zone 3 |
| OBMP | Optimum Basin Management Program |
| OBMPU | Optimum Basin Management Program Update |
| SFI | Storage Framework Investigation |
| SMP | Storage Management Plan |

# Section 1 – Background

The objective of this report is to describe the 2020 Storage Management Plan (SMP).[1] The basis of the 2020 SMP was described in the *Final 2020 Storage Management Plan White Paper*,[2] which has been incorporated into this document as Appendix A. The Watermaster stakeholders reviewed and commented on the draft White Paper and participated in two workshops that occurred in June and July 2019. The final technical requirements of the 2020 SMP were developed in part from the work conducted in the 2018 *Storage Framework Investigation*[3] (SFI), the White Paper, and discussions with the Watermaster stakeholders. The draft versions 1 and 2 of the 2020 SMP were distributed to the Watermaster stakeholders on September 6, 2019 and October 24, 2019, respectively. The Watermaster stakeholders provided comments on these drafts and the complete set of comments and Watermaster staff responses are included in Appendices B1 and B2. Some of the comments resulted in updates to the to the 2020 SMP and they are included herein.

Groundwater pumping rights in the Chino Basin were adjudicated in the 1970s and settled in the 1978 stipulated agreement (Judgment). The Judgment[4] established a Watermaster to administer the decree under the court's continuing jurisdiction and empowered it to manage and control available storage capacity and to enter into agreements for the storage of water. As a prerequisite to implementing the Optimum Basin Management Program (OBMP) the Parties[5] executed the Peace Agreement, providing direction and guidance to Watermaster on how storage should be prioritized and managed. The OBMP addresses the management of groundwater pumping, recharge, storage and recovery, and the transfer of water. The prevailing standard for all operations is the avoidance of "Material Physical Injury" (MPI)[6,7] under Court-Approved Management Agreements executed contemporaneously.

---

[1] The abbreviation "SMP" means Storage Management Plan. When referring specifically to the 2020 Storage Management Plan the year "2020" precedes SMP (i.e. 2020 SMP).

[2] Wildermuth Environmental, Inc. (2019). *Final 2020 Storage Management Program White Paper*. This report can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1847

[3] Wildermuth Environmental, Inc. (2018). *Storage Framework Investigation, Final Report*. This report can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1429

[4] Original Judgment in Chino Basin Municipal Water District vs. City of Chino, et al., signed by Judge Howard B. Weiner, Case No. 164327. File transferred August 1989, by order of the Court, and assigned new case number RCV51010. The Restated Judgment can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=247

[5] The terms Party and Parties refer to a party to the Judgment, party to the Peace and or Peace II Agreement, or a party to all three.

[6] Defined terms in the Court Approved Management Agreements will appear with the first letter of each word capitalized; a footnote with their definitions is included at the first use of the defined term.

[7] "Material Physical Injury" means material injury that is attributable to the Recharge, Transfer, storage and recovery, management, movement or Production of water, or implementation of the OBMP, including, but not limited to, degradation of water quality, liquefaction, land subsidence, increases in pump lift (lower water levels), and adverse impacts associated with rising Groundwater. Material Physical Injury does not include "economic

Given the passage of twenty years since its approval, Watermaster has revisited the OBMP goals and objectives and plans to update the OBMP by June 2020 (hereafter, 2020 OBMPU). Updating the SMP is integral to the 2020 OBMPU. The 2020 SMP will be incorporated into the 2020 OBMPU and its implementation plan.

The term "managed storage" as used herein (and consistent with the 2018 SFI) refers to water stored by the Parties and other entities and includes Carryover,[8,9] Local Storage,[10] and Supplemental Water[11] held in storage accounts by the Parties and Storage and Recovery Programs.[12] Local Storage includes Excess Carryover[13] for the Overlying Non-Agricultural Pool Parties and Excess Carryover and Supplemental Waters for the Appropriative Pool and Overlying Non-Agricultural Pool Parties.

## 1.1 Storage Agreements and Transfers from Storage Accounts

Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. There are three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool

injury" that results from other than physical causes. Once fully mitigated, physical injury shall no longer be considered material. [Peace Agreement § 1.1(y).]

[8] Defined terms in the Court Approved Management Agreements will appear with the first letter of each word capitalized and a footnote with their definitions is included at the first use of the defined term.

[9] "Carry-Over Water" means the un-Produced water in any year that may accrue to a member of the Overlying Non-Agricultural Pool or the Appropriative Pool and that is Produced first each subsequent Fiscal Year or stored as Excess Carry-Over. (Judgment Exhibit H ¶ 12.)

[10] "Local Storage" means water held in a storage account pursuant to a Local Storage Agreement between a party to the Judgment and Watermaster. Local Storage accounts may consist of: (i) a Producer's unproduced Excess Carry-Over Water or (ii) a party to the Judgment's Supplemental Water, up to a cumulative maximum of one hundred thousand (100,000) acre-feet for all Parties to the Judgment stored in the Basin on or after July 1, 2000 or (iii) that amount of Supplemental Water previously stored in the Basin on or before July 1, 2000 and quantified in accordance with the provisions and procedures set forth in Section 7.2 of these Rules and Regulations, or (iv) that amount of water which is or may be stored in the Basin pursuant to a Storage Agreement with Watermaster which exists and has not expired before July 1, 2010. [Peace Agreement § 1.1(x).]

[11] "Supplemental Water" means water imported to Chino Basin from outside the Chino Basin Watershed and Recycled Water. [Judgment ¶ 4(bb) and Peace Agreement § 1.1(ww).]

[12] "Storage and Recovery Program" means the use of the available storage capacity of the Basin by any person under the direction and control of Watermaster pursuant to a Court approved Groundwater Storage Agreement but excluding "Local Storage," including the right to export water for use outside the Chino Basin and typically of broad and mutual benefit to the Parties to the Judgment. [Peace Agreement §1.1(uu).]

[13] "Excess Carry-Over Water" means Carry-Over Water which in aggregate quantities exceeds a party's share of Safe Yield in the case of the Non-Agricultural Pool, or the assigned share of Operating Safe Yield in the case of the Appropriative Pool, in any year.

Parties) and Basin Water acquired from other Parties. A Local Supplemental Water account includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes Supplemental Water and the Peace Agreement requires that Watermaster shall give first priority to Storage and Recovery Programs that produce a "broad and mutual benefit to the Parties to the Judgment."[14] Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process. The losses assessed by Watermaster are based on the amount of water in managed storage (excluding Carryover) and they offset the increase in groundwater discharge to the Santa Ana River from the Chino Basin attributable to managed storage (excluding Carryover). Watermaster also assesses losses due to evaporation on the puts when water is recharged in spreading basins.

In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement has the potential to cause MPI to a Party or the basin. If Watermaster determines that implementation of the proposed storage agreement has the potential to cause MPI, the applicant must revise its application and demonstrate that there will be no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that has the potential to cause MPI.

The Restated Judgment provides that the Basin's groundwater storage capacity may be utilized for the storage and conjunctive use of supplemental water only under Watermaster control and regulation and that no use of such capacity be made except pursuant to written agreement with Watermaster (Restated Judgment, ¶ 11, 12; see also Peace Agreement, § 5.2(a)). The Pooling Plans of the Overlying (Non-Agricultural) Pool (Restated Judgment Exhibit "G") and the Appropriative Pool (Restated Judgment Exhibit "H") each require agreement with Watermaster as a condition of storing Excess Carryover water within the Basin.

Consistent with ¶'s 14 and 28 of the Restated Judgment and the Chino Basin Watermaster Rules and Regulations ("Rules and Regulations"), storage of water within the Basin has been accomplished pursuant to Watermaster's existing Form 1 (Application for a Local Storage Agreement) and Form 8 (Standard Local Storage Agreement). The Board enters into storage agreements only after an application is noticed and considered by the Pool Committees, Advisory Committee, and Watermaster Board (see Rules and Regulations, Article X), and when a finding is made that storage will not result in MPI to any Party to the Judgment or the Basin. (Peace Agreement, § 5.2(b)(iv).)

The Form 1 Application for Local Storage Agreement was approved in 2001 and has not been amended since that time; it is the mechanism through which Parties may apply to enter into a Local Storage Agreement.

The Form 8 Local Storage Agreement, as it was similarly approved by the Court in 2001 and still exists today, provides for the storage of a set quantity of water for the duration of the Peace Agreement. While Watermaster tracks production on a quarterly basis and accounts for unproduced water and water entering storage annually, in the event that a Party wishes to increase its quantity of water in storage—either via recharge of Supplemental Water or the

[14] See §5.2(c)(iv)(b) of the Peace Agreement

accrual of Excess Carryover water—in order to ensure that that the additional quantity of water is stored in compliance with the provisions of the Restated Judgment, Peace Agreement, and Rules and Regulations, it must enter into a new storage agreement. In practice, this means that each of the members of the Overlying (Non-Agricultural) and Appropriative Pools must go through the application process each year in which their balances of stored water increase.

The Parties, amongst themselves, are actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the Parties recover water held in storage accounts.

## 1.2 Existing Managed Storage and Proposed Storage and Recovery Programs

The Parties engage in conjunctive-use activities individually by storing Basin and Supplemental Waters that are in excess of their demands and subsequently recover that water as their individual needs arise. These activities collectively cause a temporary increase in managed storage. Table 1-1 summarizes the amount of water in managed storage by the Parties. Table 1-1 also shows the amount of water stored by the Metropolitan Water District of Southern California (Metropolitan) Dry-Year Yield Program (DYYP). The total volume of water in managed storage as of June 30, 2019 was 549,244 af.

**Table 1-1 Ending balances in managed storage in the Chino Basin (af)**

| Fiscal Year ending June 30 | Appropriative Pool | | | | Overlying Non-Agricultural Pool | | | Total Managed Storage by Parties | Dry Year Yield Program Storage | Total Managed Storage |
|---|---|---|---|---|---|---|---|---|---|---|
| | Carryover | Excess Carryover | Local Supplemental Storage | Subtotal | Carryover | Excess Carryover | Subtotal | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) = (7) + (4) | (9) | 10) = (9) + (8 |
| 2000 | 28,911 | 170,342 | | 199,253 | 6,541 | 31,031 | 37,572 | 236,825 | 0 | 236,825 |
| 2001 | 15,940 | 77,907 | 92,813 | 186,660 | 5,301 | 32,330 | 37,631 | 224,291 | 0 | 224,291 |
| 2002 | 13,521 | 70,103 | 87,801 | 171,425 | 5,285 | 33,727 | 39,012 | 210,437 | 0 | 210,437 |
| 2003 | 18,656 | 71,329 | 81,180 | 171,165 | 6,743 | 36,850 | 43,593 | 214,758 | 7,738 | 222,496 |
| 2004 | 21,204 | 70,503 | 80,963 | 172,670 | 7,177 | 40,881 | 48,058 | 220,728 | 26,300 | 247,028 |
| 2005 | 21,289 | 76,080 | 88,849 | 186,218 | 7,227 | 45,888 | 53,115 | 239,333 | 38,754 | 278,087 |
| 2006 | 32,062 | 56,062 | 86,170 | 174,294 | 7,227 | 49,178 | 56,405 | 230,699 | 58,653 | 289,352 |
| 2007 | 34,552 | 50,895 | 83,184 | 168,631 | 7,084 | 51,476 | 58,560 | 227,191 | 77,116 | 304,307 |
| 2008 | 41,626 | 83,962 | 81,520 | 207,108 | 6,819 | 45,248 | 52,067 | 259,175 | 74,877 | 334,052 |
| 2009 | 42,795 | 101,908 | 79,890 | 224,593 | 6,672 | 46,600 | 53,272 | 277,865 | 34,494 | 312,359 |
| 2010 | 41,263 | 120,897 | 90,133 | 252,293 | 6,934 | 47,732 | 54,666 | 306,959 | 8,543 | 315,502 |
| 2011 | 41,412 | 146,074 | 98,080 | 285,566 | 6,959 | 49,343 | 56,302 | 341,868 | 0 | 341,868 |
| 2012 | 42,614 | 209,981 | 116,138 | 368,733 | 6,914 | 13,993 | 20,907 | 389,640 | 0 | 389,640 |
| 2013 | 39,413 | 225,068 | 116,378 | 380,859 | 7,073 | 15,473 | 22,546 | 403,405 | 0 | 403,405 |
| 2014 | 41,708 | 224,496 | 123,484 | 389,688 | 6,478 | 12,812 | 19,290 | 408,978 | 0 | 408,978 |
| 2015 | 40,092 | 239,517 | 127,994 | 407,603 | 6,823 | 12,225 | 19,048 | 426,651 | 0 | 426,651 |
| 2016 | 39,733 | 248,013 | 131,522 | 419,267 | 7,195 | 9,949 | 17,144 | 436,411 | 0 | 436,411 |
| 2017 | 38,340 | 260,682 | 143,552 | 442,575 | 7,226 | 8,292 | 15,519 | 458,093 | 6,315 | 464,408 |
| 2018 | 34,582 | 254,221 | 155,018 | 443,821 | 7,198 | 10,775 | 17,973 | 461,795 | 41,380 | 503,174 |
| 2019 | 38,605 | 279,033 | 166,406 | 484,044 | 7,227 | 12,004 | 19,231 | 503,275 | 45,969 | 549,244 |

The 2018 SFI projected that for the planned use of managed storage by the Parties up to 700,000 af that Hydraulic Control would be maintained, that there would be no MPI, and that there would be an adverse impact from the reduction of net recharge and Safe Yield attributable to the use of managed storage. The 2018 SFI made an identical finding for Storage and Recovery

Programs that would operate in an identical manner to the existing Metropolitan DYYP and using the managed storage space between 700,000 af and 800,000 af.

As of June 30, 2019, the Parties' aggregate amount of water in managed storage was 503,275 af (see Table 1.1). The Parties are projected to use in aggregate about 720,000 af of managed storage for their individual conjunctive-use operations based on the most recent planning information provided by them (See Appendix C). The projected average annual increase in managed storage by the Parties is about 21,600 afy through 2030, after which the aggregate amount of managed storage space used by the Parties is projected to decline through about 2070.

Metropolitan's DYYP is the only active Storage and Recovery Program in the basin. The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. The DYYP Storage and Recovery Program agreement provides that puts and takes can exceed these values if agreed to by Watermaster (as was done in fiscal years 2018 and 2009, respectively). As of June 30, 2019, there was 45,969 af stored in the DYYP account. The agreement that authorizes the DYYP will expire in 2028.

The combined use of managed storage by the Parties and Metropolitan's DYYP is projected to reach a maximum of about 790,000 af assuming that the DYYP has 100,000 af in storage in 2028 and that subsequent to 2028 Metropolitan removes that water from managed storage at the contract rate of 33,300 afy starting in 2029.

Figure 1-1 compares the current amount of water in managed storage to the managed storage space available and the projected use of storage space by the Parties. The managed storage space used is 549,244 af. The amount of managed storage space available for use by the Parties pursuant the 2010 Peace II Project Subsequent Environmental Impact Report and its 2017 Addendum is 600,000 af. The storage space used by the Parties will exceed this 600,000 af limit by 120,000 af by 2030.[15]

[15] See Appendix C for updated groundwater pumping and managed storage projections.

**Figure 1-1 Comparison of managed storage space used, managed storage space available, and projected maximum use of managed storage by the Parties**

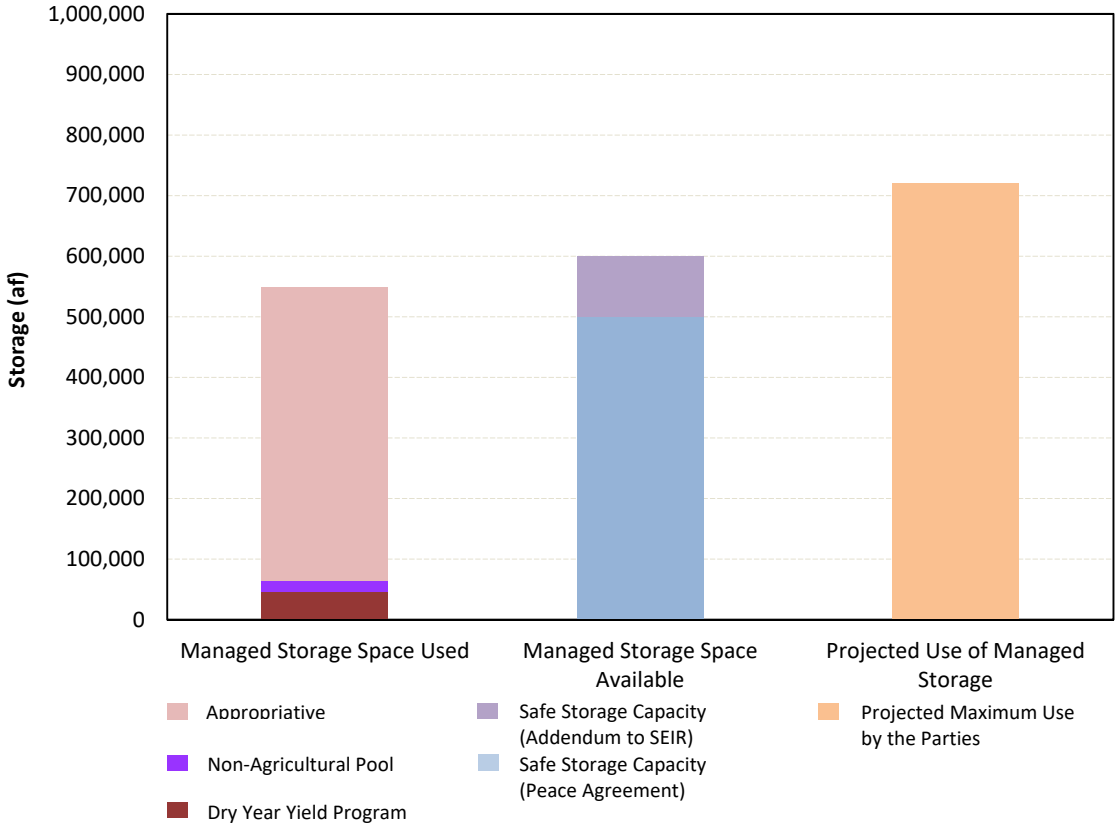


The IEUA and some of the Parties are considering Storage and Recovery Programs with yet-to-be proposed operational parameters. According to the discussions in the development of the 2018 SFI, the amount of storage space required in aggregate for all contemplated Storage and Recovery Programs, including the DYYP, is projected to range between 200,000 and 300,000 af.

# Section 2 – Storage Management Plan Description

This section describes the 2020 SMP based on the requirements of the Judgment, the Peace Agreement, the conclusions of the 2018 SFI, the 2020 SMP White Paper, and Watermaster stakeholder input from the 2020 SMP workshop process during the period of June through December 2019.

## 2.1 Use of Storage Space by the Parties for Their Individual Conjunctive-Use Activities and by Entities Engaged in Storage and Storage and Recovery Programs

An aggregate amount of 800,000 af is reserved for the Parties' conjunctive-use activities (includes Carryover, Excess Carryover, and Supplemental Accounts) and Metropolitan's DYYP. This amount is referred to as the "First Managed Storage Band" (FMSB).

The managed storage space between 800,000 and 1,000,000 af is reserved for Storage and Recovery Programs. Storage and Recovery Programs that utilize the managed storage space above 800,000 af will be required to mitigate potential MPI as if the 800,000 af were fully used. Renewal or extension of the DYYP agreement will require the DYYP to use storage space above 800,000 af.

The allocation of storage space for use by Parties and for Storage and Recovery Programs may be revised in subsequent updates of the SMP.

Note that the use of managed storage greater than 1,000,000 af may be possible provided the storing entity submits a Storage and Recovery Program application, demonstrates that the program has broad mutual benefit, demonstrates that program's mitigation measures will meet the mitigation requirements of the Watermaster to ensure there will be no MPI and other adverse impacts[16], complies with CEQA, and obtains approval from the Watermaster.

## 2.2 Reservation of Existing Spreading Basin Facilities to Satisfy Watermaster Recharge and Replenishment Obligations

The Parties and IEUA, through the OBMP, have substantially increased storm and supplemental water recharge capacity in the Chino Basin. The increase in supplemental water recharge capacity was done to ensure that Watermaster could meet its future recharge and replenishment obligations pursuant to Court and Regional Board orders. Watermaster will include provisions in storage agreements to prioritize the use of spreading basins to satisfy Watermaster's recharge and replenishment obligations over the use of spreading basins for other uses subject to limitations provided in existing agreements with the owners of the facilities.

[16] Adverse impacts include reductions in net recharge and Safe Yield; and an increase in the groundwater discharge from the Chino North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control.

## 2.3 Storage Management Activities of the Parties

### 2.3.1 Limitation of Transfers or Leases of Water Rights and Water Held in Managed Storage

Early in the OBMP implementation period, Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from Parties that are situated such that they pump groundwater outside of MZ1 to Parties that pump in MZ1 for *the purpose of replenishment* have the potential to cause MPI.[17]

This limitation on transfers should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan.

### 2.3.2 Mitigation of Reduced Net Recharge and Safe Yield

The 2018 SFI demonstrated that storing water has the effect of reducing net recharge and Safe Yield. The reduction in net recharge caused by storage is an adverse impact. The Safe Yield, a prospective calculation, is based on projected estimates of net recharge that include the effects of managed storage on net recharge[18]. The reduction in Safe Yield due to projected storage management by the Parties is thus incorporated into the Safe Yield estimate. Watermaster considers this adverse impact to be mitigated by the prospective calculation of the Safe Yield.

## 2.4 Storage and Recovery Programs

### 2.4.1 Prioritization of Put and Take Operations in MZ2 and MZ3

Storage and Recovery programs are implemented through a series of "puts" and "takes" where water goes into storage during a put and is recovered from storage during a take. Based on the results of the 2018 SFI, these puts and takes should be prioritized to occur in MZ2 and MZ3 to avoid new land subsidence and interfering with land subsidence management in MZ1, to minimize pumping sustainability challenges, to minimize the impact of storage and recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful groundwater storage space in MZ2 and MZ3.

This spatial prioritization on puts and takes should be reconsidered if the land subsidence management plan for MZ1 includes consideration for Storage and Recovery programs, the land subsidence management plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan.

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[17] See the report entitled: Material Physical Injury analysis – Monte Vista Water District lease of West Valley Water District production rights in the Chino Basin for fiscal year 2006/07. Prepared by WEI in April 2007.

[18] Refer to the 2015 Reset Technical Memorandum and the April 2017 Court Order for additional information on the Safe Yield reset methodology. These documents can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1595.

### 2.4.2 Evaluation of Storage and Recovery Program Impacts, MPI, and Mitigation

The intent of this provision is to reaffirm the requirements of ¶ 12 of the Judgment and §5.2(c)(xiii) and 5.2(c)(ix) of the Peace Agreement, as to the review and approval of Storage and Recovery Program applications, and to require Storage and Recovery Program storage agreements to provide provisions that require Storage and Recovery Program participants to cease or modify their operations if Watermaster determines, subsequent to Watermaster and Court approval of a Storage and Recovery Program storage agreement, that the participant's storage and recovery operations are causing or threaten to cause MPI. The types of MPI to be addressed include but are not limited to land subsidence, pumping sustainability, water quality, shallow groundwater, and liquefaction.

Watermaster will review each Storage and Recovery Program application, estimate the surface and ground water systems response, prepare a report that describes the response and potential MPI, and develop mitigation requirements to mitigate MPI caused by the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement.

Watermaster will periodically review current and projected basin conditions, compare this information to the projected basin conditions assumed in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of related MPI mitigation requirements and measures in the Storage and Recovery Program storage agreements. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program storage agreements to mitigate MPI.

### 2.4.3 Adverse Impacts Due to a Storage and Recovery Program Must Be Mitigated

Adverse impacts include but are not limited to reductions in net recharge and Safe Yield and an increase in the groundwater discharge from the Chino North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control. Watermaster will, as part of the Storage and Recovery Program application review process, make a projection of the program's expected impact on net recharge and Safe Yield and on the state of Hydraulic Control.

The 2018 SFI concluded the that the net recharge and Safe Yield of the basin would be reduced annually by about 2.0 percent (ranged from 1.5 to 2.4 percent) of the volume of water stored in a Storage and Recovery Program storage account. Watermaster will estimate the reduction in net recharge and Safe Yield for each Storage and Recovery Program and deduct it from water stored in each Storage and Recovery Program storage account to compensate for its impact on net recharge and Safe Yield.

Watermaster will review these impacts and develop mitigation requirements for the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage

and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement.

Watermaster will periodically review the current and projected net recharge loss rate and the state of Hydraulic Control, compare this information to the projected basin conditions assumed in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of the related mitigation measures and requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program storage agreements to mitigate impacts on net recharge and Safe Yield and on the state of Hydraulic Control.

## 2.5 Storage Agreement Application Process

As part of the development of an updated Storage Management Plan, environmental review will be conducted as to the impacts of a planned quantity of storage space reserved for the Parties' conjunctive-use activities and Metropolitan's DYYP. As a means of streamlining the process through which Parties apply for, receive approval of, and enter into storage agreements with Watermaster, the existing Form 8 Local Storage Agreements will be modified to be consistent with an "evergreen agreement" paradigm.

Within an "evergreen agreement" paradigm, the forms of the agreements, as revised, will allow for the quantities stored pursuant to the agreements to increase, during the term of the agreements, to cover the amount of water that each Party to an agreement places into storage, as shown in each Watermaster-approved annual Assessment Package. The evergreen agreements will be valid for the duration of the Peace Agreement and will be automatically adjusted upon Watermaster's approval of each subsequent Assessment Package so long as the cumulative amount of water in storage is less than the quantity reserved for the Parties' conjunctive-use operations and Metropolitan's DYYP (cumulatively, the FMSB) and Watermaster has made no finding that MPI is threatened to occur as a result of the increase in the quantity of water in storage.

## 2.6 Storage Management Plan Update

Watermaster will periodically review and update the SMP based on monitoring information obtained since the previous SMP was adopted, technology changes, and the "needs and requirements of the lands overlying the Chino Basin and the owners of the rights in the Safe Yield or Operating Safe Yield of the Basin."[19] The periodic review and update of the SMP will require the use of updated planning and hydrologic data and models, and it should be completed: at no less than a five-year frequency, when the Safe Yield is recalculated, or when Watermaster determines a review and update is warranted based new information and/or the needs of the Parties or the Basin.

The projected aggregate amount of water in managed storage by the Parties in 2056 (planning horizon of the 2018 SFI) is about 340,000 af. The impacts to the Basin and the Parties from

[19] Judgment, ¶12.

reducing managed storage below 340,000 af has not been estimated. Notwithstanding the SMP update frequency stated above, Watermaster should update the SMP at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af.

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# Appendix A

## 2020 Storage Management Plan White Paper

# Final 2020 Storage Management Plan White Paper

The objective of the 2020 Storage Management Plan white paper is to provide a concise compilation of technical storage management issues developed from the Storage Framework Investigation that should be considered in the 2020 Storage Management Plan. The draft 2020 Storage Management Plan white paper was distributed by the Chino Basin Watermaster on June 8, 2019 and it was reviewed at the June 20, 2019 Storage Management Plan workshop. The stakeholders were asked to provide comments on the draft white paper by July 5, 2019. These comments and Watermaster staff responses to them are included in Exhibit A attached herein. Some of those responses resulted in changes in the final white paper.

# Background

Groundwater pumping rights in the Chino Basin were adjudicated in the 1970s and settled in the 1978 stipulated agreement (Judgment). The Judgment established a Watermaster to administer the decree under the court's continuing jurisdiction and empowered it to manage and control available storage capacity and to enter into agreements for the storage of water. As a prerequisite to implementing the Optimum Basin Management Program ("OBMP") the parties executed the Peace Agreement providing direction and guidance to the Watermaster on how storage should be prioritized and managed. The OBMP addresses the management of extraction, recharge, storage, recovery, and transfer of water. The prevailing standard for all operations is the avoidance of "undesirable results"—defined as "material physical injury"—under court approved management agreements executed contemporaneously and subsequent to the adoption of the OBMP Update in June 2020.[1]

Given the passage of twenty years since its approval, Watermaster has revisited the OBMP goals and objectives and plans to update the OBMP by June 2020. Updating the OBMP storage management plan is integral to the OBMP update. This background section provides the historical and institutional background for Watermaster's storage management activities, managed storage conditions, and groundwater management challenges impacted by managed storage activities.

## Judgment

There is a significant amount of unused storage space in the Chino Basin. Groundwater in storage was estimated to have declined by about 1,600,000 af over the period 1922 through 1978, the starting point of the Judgment implementation. This decline of groundwater in storage was recognized in the Judgment,[2] and it requires that the use of this space be undertaken only under Watermaster control and regulation. Specifically, Judgment paragraphs 11 and 12 state:

[1] The Optimum Basin Management Program can be found here: http://www.cbwm.org/rep_engineering.htm.

[2] Original judgment in Chino Basin Municipal Water District vs. City of Chino, et al., signed by Judge Howard B. Weiner, Case No. 164327. File transferred August 1989, by order of the Court, and assigned new case number RCV51010. The Restated Judgment can be found here:

> "11. Available Ground Water Storage Capacity. There exists in Chino Basin a substantial amount of available ground water storage capacity which is not utilized for storage or regulation of Basin Waters[3]. Said reservoir capacity can appropriately be utilized for storage and conjunctive use of Supplemental Water[4] with Basin Waters. It is essential that said reservoir capacity utilization for storage and conjunctive use of Supplemental Water be undertaken only under Watermaster control and regulation, in order to protect the integrity of both such Stored Water[5] and Basin Water in storage and the Safe Yield[6] of Chino Basin.
>
> 12. Utilization of Available Ground Water Capacity. Any person or public entity, whether a party to this action or not, may make reasonable beneficial use of the available ground water storage capacity of Chino Basin for storage of Supplemental Water; provided that no such use shall be made except pursuant to written agreement with Watermaster, as authorized by Paragraph 28. In the allocation of such storage capacity, the needs and requirements of lands overlying Chino Basin and the owners of rights in the Safe Yield or Operating Safe Yield[7] of the Basin shall have priority and preference over storage for export."

These paragraphs establish Watermaster's control over the use of the storage space in the basin, require the accounting of Stored Water and Basin Water in storage, require accounting for the impacts of managed storage on Safe Yield and the prevention of unauthorized overdraft, require storing entities to obtain a storage agreement from Watermaster, and prioritize the use of storage space to meet the needs and requirements of the lands overlying the Chino Basin and of the Judgment parties over the use storage space to store water for export.

Judgment paragraphs 28 and 29 state:

> "28. Ground Water Storage Agreements. Watermaster shall adopt, with the approval of the Advisory Committee, uniformly applicable rules and a standard form of agreement for storage of Supplemental Water, pursuant to criteria therefore set forth in Exhibit "I". Upon appropriate application by any person, Watermaster shall enter into such a storage agreement; provided that all such storage agreements shall first be approved by written order of the Court, and shall by their terms preclude operations which will have a substantial adverse impact on other producers.
>
> 29. Accounting for Stored Water. Watermaster shall calculate additions, extractions and losses and maintain an annual account of all Stored Water in Chino

https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=247

[3] Basin Water is a defined term. Please see Storage Framework Appendix D for its definition.

[4] Supplemental Water is a defined term. Please see Storage Framework Appendix D for its definition.

[5] Stored Water is a defined term. Please see Storage Framework Appendix D for its definition.

[6] Safe Yield is defined term. Please see Storage Framework Appendix D for its definition.

[7] Operating Safe Yield is a defined term. Please see Storage Framework Appendix D for its definition.

Basin, and any losses of water supplies or Safe Yield of Chino Basin resulting from such Stored Water."

These paragraphs require that Watermaster develop storage agreements for entities (Judgment parties and others) to store supplemental water in the basin, have the storage agreements approved by the Court, include terms in the storage agreements to ensure that storage "operations" do not cause "substantial adverse impact on other producers," and collect information to enable it to account for "all Stored Water in Chino Basin, and any losses of water supplies or Safe Yield of Chino Basin resulting from such Stored Water." Losses of water supplies or Safe Yield refer to storage losses and changes in Safe Yield caused by the management of storage.

## Optimum Basin Management Program and the Peace Agreements

The Chino Basin OBMP[8] set forth agreed goals and objectives in 1999. A year later, the Peace Agreement[9] and the OBMP Implementation were approved by the Court in 2000. Many of the operable features of the OBMP were incorporated into the OBMP Implementation Plan,[10] conditioned on compliance with the Peace Agreement. The OBMP Implementation Plan is Exhibit B to the Peace Agreement. The Peace Agreement is an agreement among the Judgment parties to implement the OBMP and was reviewed in a programmatic environmental impact report (PEIR), certified by the Inland Empire Utilities Agency (IEUA) in July 2000. The OBMP Implementation Plan contains a storage management plan that was developed to allow the parties and other entities to utilize the unused storage space in the basin and mitigate potential Material Physical Injury[11] (MPI) from its use.

The OBMP storage management plan consists of managing groundwater production, replenishment, recharge, and storage such that total storage within the basin ranges from a low of 5,300,000 af to a high of 5,800,000 af. The following definitions are included in the OBMP Implementation Plan:

- Operational storage requirement (OSR) is the storage or volume in the Chino Basin that is necessary to maintain the Safe Yield. The OSR was estimated in the development of the OBMP to be about 5.3 million af. This storage value was set as the estimated storage in the basin in 1997.[12]
- Safe storage is an estimate of the maximum amount of storage space in the basin that can be used and not cause significant water-quality and/or high-groundwater related

[8] The OBMP report is located here: http://www.cbwm.org/docs/engdocs/obmpphas1rep/Text/OBMP_Ph1_Report.pdf

[9] The Peace Agreement is located here: http://www.cbwm.org/docs/legaldocs/Peace_Agreement.pdf

[10] The OBMP Implementation Plan is Appendix B to the Peace Agreement, and it is located here: http://www.cbwm.org/docs/legaldocs/Implementation_Plan.pdf

[11] Material Physical Injury is a defined term. Please see Storage Framework Appendix D for its definition.

[12] Page 2-11, Optimum Basin Management Program, Phase I Report.

problems. Safe storage was estimated in the development of the OBMP to be about 5.8 million af.

- Safe storage capacity (SSC) is the difference between safe storage and the OSR. The allocation and use of storage space in excess of the SSC will preemptively require mitigation; that is, mitigation must be defined and resources committed to mitigation prior to its allocation and use.

Safe storage is equal to the OSR plus the SSC. The SSC was estimated during the development of the OBMP to be equal to the calculated decline in storage (400,000 af) during the base period (1965 through 1974) used to estimate the Safe Yield[13] in the Judgment plus an assumed additional decline in storage (100,000 af) in the intervening period up to the filing of the Judgment (1974 to 1978). The assumption underlying SSC was that it would be safe to store water in storage space that was recently created prior to implementing the Judgment.

Water occupying the SSC includes Carryover,[14] Excess Carryover,[15] Local Storage,[16] and Supplemental Waters stored by the parties. Water stored for Storage and Recovery Programs is also included in the SSC.[17] Carryover, Excess Carryover, Local Storage, and Supplemental Waters are referred to herein collectively as managed storage.

Subsequent to the approval of the PEIR in 2000, Watermaster and the Judgment parties developed revisions to the OBMP based on: new monitoring and borehole data collected since 1998, an improved hydrogeologic conceptualization of the basin and new numerical models that have improved the understanding of basin hydrology since 2000, and the need to expand the Chino Basin Desalters' (desalters) capacity to the 40,000 afy of groundwater pumping required in the OBMP Implementation Plan. Concurrently, the IEUA and Watermaster worked with the Santa Ana Regional Water Quality Control Board (Regional Board) to revise the total dissolved solids (TDS) and nitrate objectives for the Chino North Management Zone[18] to enable the reuse of the IEUA's recycled water without desalting it for a period estimated to be at least 30 years and without impairing the beneficial use of Chino Basin groundwater. One of the Regional Board's conditions for raising the TDS and nitrate objectives was the achievement of Hydraulic Control.[19]

Hydraulic Control is the reduction of groundwater discharge from the Chino North Management Zone to the Santa Ana River to less than 1,000 afy. Hydraulic Control is a goal of the OBMP with the intent of maintaining and enhancing the Safe Yield of the basin by ensuring that agricultural

[13] Ibid, page 2-28 and Table 2-13

[14] Carryover Water is a defined term. Please see Storage Framework Appendix D for its definition.

[15] Excess Carryover Water is a defined term. Please see Storage Framework Appendix D for its definition.

[16] Local Storage Water is a defined term. Please see Storage Framework Appendix D for its definition.

[17] Storage and Recovery Program is a defined term. Please see Storage Framework Appendix D for its definition.

[18] The Chino North Management Zone consists of the combination of OBMP Management Zones 1, 2, and 3, exclusive the Prado Basin flood pool area.

[19] Hydraulic Control is a defined term. Please see Storage Framework Appendix D for its definition.

groundwater production in the southern half of the basin would be replaced by groundwater production for municipal uses as the land use in that area transitions from agricultural uses to urban uses. Through extensive investigations, it was determined that Hydraulic Control and the maintenance of Safe Yield required the expansion of desalter groundwater production to 40,000 afy and the reduction of basin water in storage by 400,000 af. These investigations included a recalculation of the total water in storage in the basin, based on the improved hydrogeologic understanding. The total storage in the Chino Basin for 2000 was estimated to be about 5,935,000 af, which is 635,000 af greater than that estimated for the OSR and 135,000 af greater than safe storage.[20]

The OBMP Implementation Plan was amended in 2007, and the Peace II Agreement enabled the expansion of the Chino Desalter pumping capacity from 20,000 afy to 40,000 afy. The technical investigations conducted to support the expansion of desalter groundwater production to 40,000 afy and the use of 400,000 af[21] of groundwater to partially meet the Replenishment Obligation for desalter production also indicated that the Safe Yield of the Chino Basin, at that time, was likely less than that stated in the Chino Basin Judgment and that it was projected to decline further in the future due to changes in cultural conditions in the watersheds overlying and tributary to the Chino Basin. The IEUA completed and subsequently certified a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010.

Starting in 2011, Watermaster began the technical effort to recalculate the Safe Yield. This work involved updating the hydrogeologic conceptual model of the basin, updating the historical hydrology, updating and recalibrating numerical models that simulate the surface and ground water hydrology of the Chino Basin area, and projecting the surface and groundwater response of the basin to future management plans that included storage management. This work is documented in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement* (WEI, 2015; hereafter, Safe Yield report). The results of that work yielded a reassessment of the hydrology of the basin from 1961 through 2011 and projections of basin hydrology through 2050, based on the best available planning information. The conclusions of the Safe Yield report, related to storage management, are:

- On July 1, 2000, the total water in storage in the basin was about 5,935,000 af, inclusive of the 236,000 af of managed storage. This is about 635,000 af greater than the OSR of 5,300,000 af that was established in the OBMP Implementation Plan.

- Managed storage was projected to increase from 487,000 af in 2016 to about 663,000 af by 2030 (exceeding the SSC by 163,000 af) and decline thereafter to zero af by 2051. Managed storage was projected to be used to meet future replenishment obligations.

[20] Wildermuth Environmental, Inc., 2007. 2007 CBWM Groundwater Model Documentation and Evaluation of the Peace II Project Description.

[21] The 400,000 af of groundwater used for desalter replenishment is referred to as Re-Operation.

- Total storage was projected to fall below the OSR of 5.3 million af in 2041.

In 2017, the IEUA adopted an addendum to the Peace II SEIR, that provided a temporary increase in the SSC to 600,000 af through June 30, 2021 to provide time for Watermaster and the Judgment parties to update the OBMP storage management plan. The Storage Framework Investigation (2018) was conducted to provide technical support to update the storage management plan. In the absence of developing and adopting a new storage management plan by June 30, 2021, the SSC would again be limited to 500,000 af.

## Storage Agreements

Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. There are three types of storage agreements that result in several types of storage accounts: Excess Carryover, Local Supplemental, Local Storage and Storage and Recovery. An Excess Carryover account includes a party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool[22] parties and Operating Safe Yield for Appropriative Pool[23] parties) and Basin Water acquired from other parties. A Local Supplemental Water account includes imported and recycled water that is recharged by a party and similar water acquired from other parties. A Storage and Recovery account includes Supplemental Water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment." Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process.

In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement will cause potential MPI to a party or the basin. If Watermaster determines that implementation of the proposed storage agreement will cause potential MPI, the applicant must revise its application so there is no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that will result in MPI.

The parties, amongst themselves, are actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the parties recover water held in storage accounts.

## Existing Managed Storage and Proposed Storage and Recovery Programs

The Watermaster parties engage in conjunctive-use activities individually by storing Basin and Supplemental Waters that are in excess of their demands and subsequently recover that water as their individual needs arise. These activities collectively cause a temporary increase in managed storage. Table 1 summarizes the amount of water in managed storage by the Parties. Table 2-1 also shows the amount of water stored by the Metropolitan Water District of Southern California (Metropolitan) Dry-Year Yield Program (DYYP). The total volume of water in managed

[22] Overlying Non-Agricultural Pool is a defined term. Please see Storage Framework Appendix D for its definition.

[23] Appropriative Pool is a defined term. Please see Storage Framework Appendix D for its definition.

storage as of June 30, 2018 was about 581,100 af. Table 1 does not reflect the anticipated reductions in managed storage that will occur to offset unassessed desalter replenishment obligations.[24]

[24] The reconciliation of the water held in managed storage and the desalter replenishment obligation should be complete by the end of calendar year 2019, and the final Storage Management Plan report will include an updated version of this table that reflects these changes.

**Table 1 Ending Balances in Managed Storage in the Chino Basin[1]**

(af)

| Fiscal Year Ending June 30 | Appropriative Pool | | | | Overlying Non-Agricultural Pool | | | Total Managed Storage by Parties | Dry Year Yield Program Storage[6] | Total Managed Storage |
|---|---|---|---|---|---|---|---|---|---|---|
| | Carryover[2] (1) | Excess Carryover (ECO)[3] (2) | Local Supplemental Storage[4] (3) | Subtotal (4) | Carryover[2] (5) | Local Storage[5] (6) | Subtotal (7) | (8) = (7) + (4) | (9) | (10) = (9) + (8) |
| 2000 | 28,911 | 170,342 | | 199,253 | 6,541 | 31,031 | 37,572 | 236,825 | 0 | 236,825 |
| 2001 | 15,940 | 77,907 | 92,813 | 186,660 | 5,301 | 32,330 | 37,631 | 224,291 | 0 | 224,291 |
| 2002 | 13,521 | 70,103 | 87,801 | 171,425 | 5,285 | 33,727 | 39,012 | 210,437 | 0 | 210,437 |
| 2003 | 18,656 | 71,329 | 81,180 | 171,165 | 6,743 | 36,850 | 43,593 | 214,758 | 7,738 | 222,496 |
| 2004 | 21,204 | 70,503 | 80,963 | 172,670 | 7,177 | 40,881 | 48,058 | 220,728 | 26,300 | 247,028 |
| 2005 | 21,289 | 76,080 | 88,849 | 186,218 | 7,227 | 45,888 | 53,115 | 239,333 | 38,754 | 278,087 |
| 2006 | 32,062 | 56,062 | 86,170 | 174,294 | 7,227 | 49,178 | 56,405 | 230,699 | 58,653 | 289,352 |
| 2007 | 34,552 | 50,895 | 83,184 | 168,631 | 7,084 | 51,476 | 58,560 | 227,191 | 77,116 | 304,307 |
| 2008 | 41,626 | 83,962 | 81,520 | 207,108 | 6,819 | 45,248 | 52,067 | 259,175 | 74,877 | 334,052 |
| 2009 | 42,795 | 101,908 | 79,890 | 224,593 | 6,672 | 46,600 | 53,272 | 277,865 | 34,494 | 312,359 |
| 2010 | 41,263 | 120,897 | 90,133 | 252,293 | 6,934 | 47,732 | 54,666 | 306,959 | 8,543 | 315,502 |
| 2011 | 41,412 | 146,074 | 98,080 | 285,566 | 6,959 | 49,343 | 56,302 | 341,868 | 0 | 341,868 |
| 2012 | 42,614 | 209,981 | 116,138 | 368,733 | 6,914 | 13,993 | 20,907 | 389,640 | 0 | 389,640 |
| 2013 | 39,413 | 225,068 | 116,378 | 380,859 | 7,073 | 15,473 | 22,546 | 403,405 | 0 | 403,405 |
| 2014 | 41,708 | 231,679 | 125,052 | 398,439 | 6,478 | 12,812 | 19,290 | 417,729 | 0 | 417,729 |
| 2015 | 44,437 | 254,643 | 132,791 | 431,871 | 6,823 | 12,225 | 19,048 | 450,919 | 0 | 450,919 |
| 2016 | 45,683 | 279,757 | 144,012 | 469,452 | 7,195 | 9,949 | 17,144 | 486,596 | 0 | 486,596 |
| 2017 | 43,314 | 308,100 | 157,628 | 509,043 | 7,226 | 11,343 | 18,569 | 527,612 | 6,315 | 533,927 |
| 2018 | 40,390 | 308,056 | 170,168 | 518,614 | 7,198 | 13,894 | 21,092 | 539,706 | 41,380 | 581,086 |

1. Account balances are from Watermaster Assessment Packages and do not account for the desalter replenishment obligation or the change in Safe Yield.
2. The un-produced water in any year that may accrue to a member of the Non-Agricultural Pool or the Appropriative Pool and that is produced first each subsequent Fiscal Year or stored as Excess Carryover
3. Carryover Water which in aggregate quantities exceeds a party's share of Safe Yield in the case of the Non-Agricultural Pool, or the assigned share of Operating Safe Yield in the case of the Appropriative Pool, in any year.
4. Water imported to Chino Basin from outside the Chino Basin Watershed and recycled water.
5. Water held in a storage account pursuant to a Local Storage Agreement between a party to the Judgement and Watermaster. "Local Storage Agreement" means a Groundwater Storage Agreement for Local Storage.
6. Ending balance in the Dry Year Yield Program storage account.

Metropolitan's DYYP is the only active Storage and Recovery Program in the basin. The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. As of July 1, 2018, there were 41,380 af stored in the DYYP account. The agreement that authorizes the DYYP will expire in 2028.

The IEUA and some of the parties are proposing the implementation of Storage and Recovery Programs, including the Chino Basin Water Bank and the Chino Basin Program (CBP). The operational parameters of these proposed programs are not yet defined; that said, the amount of storage space required has been identified to range between 200,000 and 300,000 af.

## Current Groundwater Management Challenges and Their Relationship to Current Storage Management

The results of the groundwater modeling work reported in the Safe Yield report projected, based on the best planning information available at that time, that the total storage in the basin will likely be relatively stable through the mid to late 2020s, and by 2050, groundwater levels were projected to decline over a broad area ranging from about 65 feet in the Pomona area to 50 feet

in the Jurupa Community Services District (JCSD) and Desalter II well field areas.[25] This decline in groundwater levels was projected to occur because managed storage was used to replenish desalter production and over-production by Appropriative Pool parties.

During the development of the *2013 Amendment to the 2010 Recharge Master Plan Update* (2013 RMPU), the JCSD asserted that declining groundwater levels in the areas around and in the JCSD and Chino Basin Desalter Authority (CDA) well fields contributed to declining groundwater pumping capacity at JCSD and CDA wells. Loss in production capacity in this area is likely due to hydraulic interference among the wells and could be mitigated by reducing pumping at these wells, spreading out production over a greater area, and/or by increased recharge located proximate and tributary to the JCSD and CDA well fields. The projected decline in groundwater levels after the mid to late 2020s is projected to further exacerbate pumping sustainability challenges in this part of the basin.

The existing storage management plan is based on fixed amounts of water in storage, and its technical basis is not supported by new information available after the storage management plan was first developed (1999). Review of this new information (developed since 1999), indicates that it is possible to expand the SSC to enable greater use of storage space. This new information includes an updated hydrogeologic conceptual model; 20 years of intensive monitoring of basin operations (not available in 1999), including monitoring the basin response as managed storage approached the SSC of 500,000 af; and groundwater model-based projections of the basin response to future management plans where the managed storage exceeded 500,000 af. Re-Operation will reduce the amount of Basin Water in storage by 400,000 af. The current storage management plan does not account for Re-Operation.

The new information developed since 1999 suggests that the unanticipated use of managed storage to meet future desalter and other replenishment obligations could cause potential MPI: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF, cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. The OBMP storage management plan needs to be updated to include features that will ensure there is no MPI to a party or the basin caused by the conjunctive-use activities of the parties and Storage and Recovery Programs.

## Storage Management Plan Requirements

This section describes the technical features of the recommended storage management plan, based on the requirements of the Judgment, the Peace Agreement, and the conclusions of the Storage Framework Investigation.

[25] See Figure 2-2 in the Storage Framework Investigation or Figure 7-5d from the Safe Yield report.

## Allocation of Storage Space to the Parties Use of Managed Storage and Storage and Recovery Programs

The stakeholders desire to reserve storage space for the parties' individual uses and for Storage and Recovery Programs to provide certainty to their water supply planning and operations.

Based on the best available planning information provided by the parties in the Storage Framework Investigation, the parties' use of managed storage was projected to reach about 700,000 af in 2030 and decline monotonically thereafter. Therefore, it is logical to consider starting discussions for the parties use of managed storage with a limit of 700,000 af in the Storage Management Plan, and this will be adjusted in accordance with stakeholder input. Therefore, it is logical to consider establishing a limit for the parties' use of managed storage at 700,000 af in the Storage Management Plan. Figure 1 below compares the current use of managed storage to the storage space permitted per the Peace Agreement and the expected maximum use of managed storage by the parties.

Figure 1 Comparison of Managed Storage Space Used, Managed Storage Space Available and Projected Maximum Use of Managed Storage by the Parties

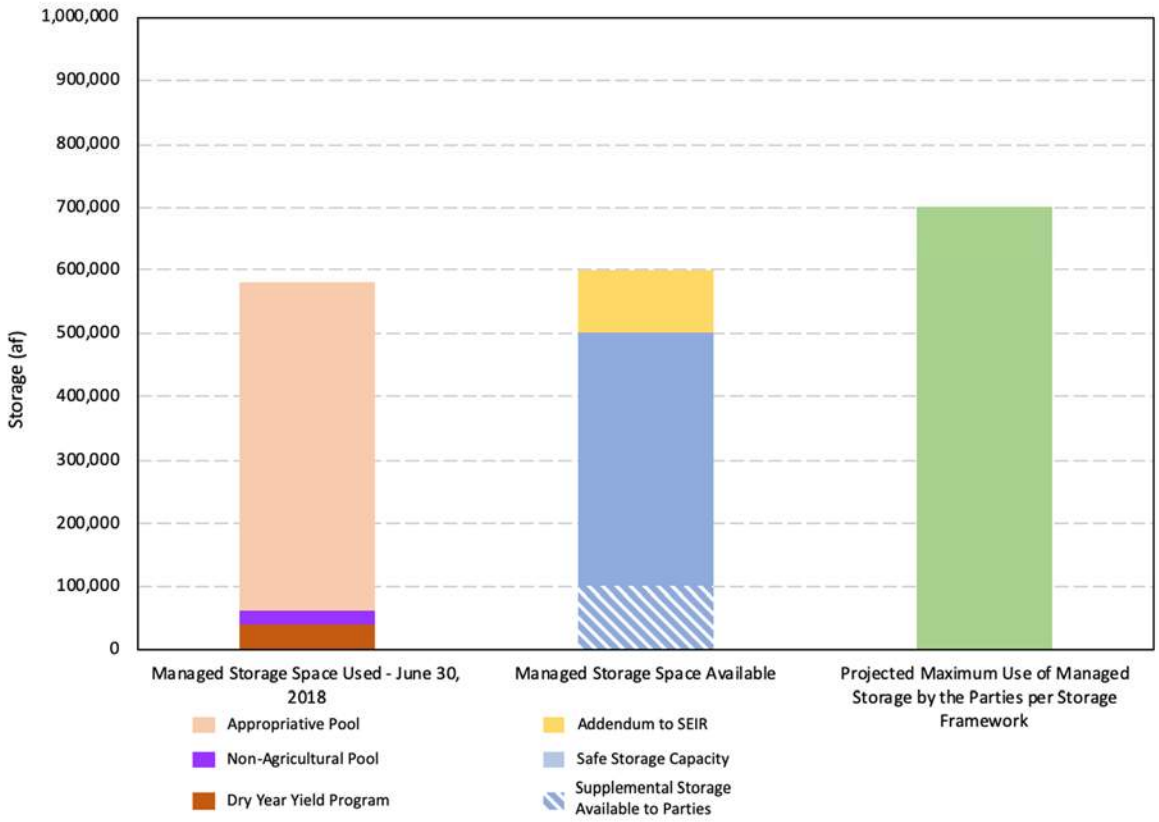


Alternatively, the Watermaster and the parties could establish a lower or higher limit, but additional engineering work will be required to assess the basin response and potential MPI for a higher limit.

The Storage Framework Investigation evaluated the use of 300,000 af of storage for Storage and Recovery Programs that was superimposed on the storage management activities of the parties. Therefore, it is logical to consider establishing an aggregate limit for all Storage and Recovery Programs at 300,000 af in the Storage Management Plan, and this limit will be adjusted in accordance with stakeholder input.

## Reservation of Existing Spreading Basin Facilities to Satisfy Watermaster Recharge and Replenishment Obligations

The Judgment parties and IEUA, through the OBMP, have substantially increased the storm and supplemental water recharge capacity in the Chino Basin. The increase in supplemental water recharge capacity was done to ensure that Watermaster could meet its future recharge and replenishment obligations. Watermaster will include provisions in storage agreements that Watermaster will prioritize the use of spreading basins to satisfy Watermaster's recharge and replenishment obligations over the use of spreading basins for other uses.

## Storage Management Activities of the Parties

### Limitation of Transfers or Leases of Water Rights and Water Held in Managed Storage

Early in the OBMP implementation period Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from parties that are situated such that they pump groundwater outside of MZ1 to parties that pump in MZ1 for *the purpose of replenishment* have the potential to cause MPI.

This limitation on transfers should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan.

### Mitigation of Reduced Net Recharge and Safe Yield

Currently, Watermaster assesses a 0.07 percent loss to storage accounts based on the estimated groundwater discharge from the Chino North Management Zone to the Santa Ana River. The Storage Framework Investigation demonstrated that storing water has the effect of reducing net recharge and Safe Yield. The Storage Framework Investigation estimate of reduced net recharge is inclusive of discharge from the Chino North Management Zone to the Santa Ana River. The reduction in net recharge caused by storage is an adverse impact.

There are two fundamental approaches to mitigate the reduction in net recharge caused by the parties' storage management activities:

- In the first approach, the reduction net recharge would be embedded in Safe Yield, and it would be implicitly allocated to Appropriative Pool parties, based on their pro rata share of Operating Safe Yield.

- In the second approach, the reduction in net recharge would be debited to the storage accounts of the storing parties in the Appropriative and Overlying Non-agricultural pools, based on each parties' amount of water in storage.

Watermaster and the parties need to determine which of the above approaches or variant of them to include in the storage management plan to ensure that the impact from the parties' storage management activities are considered and addressed.

## Storage and Recovery Programs

### Prioritization of Put and Take Operations in MZ2 and MZ3

Storage and Recovery programs are implemented through a series of "puts" and "takes" where water goes into storage during a put and is recovered from storage during a take. Based on the results of the Storage Framework Investigation, these put and takes should be prioritized to occur in MZ2 and MZ3 to avoid new land subsidence and interfering with land subsidence management in MZ1, to minimize pumping sustainability challenges, to minimize the impact of storage and recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful groundwater storage space in MZ2 and MZ3.

This spatial prioritization on puts and takes should be reconsidered if the land subsidence management plan for MZ1 includes consideration for Storage and Recovery programs, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan.

### Evaluation of Storage and Recovery Program Impacts, MPI, and Mitigation

The intent of this provision is to reaffirm the requirements of Paragraph 12 of the Judgment and the Peace Agreement, as to the review of Storage and Recovery Program applications, and to require Storage and Recovery Program agreements to provide provisions that require Storage and Recovery Program proponents to cease or modify their operations if Watermaster determines, subsequent to Watermaster and Court approval of a Storage and Recovery Program storage agreement, that the proponent's storage and recovery operations are causing or threaten to cause potential MPI. The potential MPIs to be addressed include but are not limited to: land subsidence, pumping sustainability, reductions in net recharge and safe yield, water quality impacts, shallow groundwater, and liquefaction.

Watermaster will review each Storage and Recovery Program application, estimate the surface and groundwater system response, prepare a report that documents the response and potential MPI, and develop mitigation measures to mitigate MPI caused by the proposed Storage and Recovery Program. Watermaster will incorporate these mitigation measures into the Storage and Recovery Program storage agreement.

Watermaster will periodically review current basin conditions, compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of related MPI mitigation requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program operations to mitigate MPI.

### Hydraulic Control Impacts Due to a Storage and Recovery Program Must Be Mitigated

Watermaster will, as part of the Storage and Recovery Program application review process, make a projection of the program's expected impact on the state of Hydraulic Control. Watermaster will review these impacts and develop mitigation requirements for the proposed Storage and

Recovery Program. These mitigation requirements will be incorporated into the Storage and Recovery Program storage agreement.

Watermaster should periodically review the state of Hydraulic Control and update projections of the state of Hydraulic Control, compare this information to the projected Hydraulic Control assessment prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of the related mitigation requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program operations to mitigate impacts on the state of Hydraulic Control.

## Storage Agreement Application Process

Watermaster and the parties should consider updating the storage agreement application process to incorporate changes in the technical features of storage management and to improve the efficiency of the application process.

## Storage Management Plan Update

Watermaster should periodically review and update the storage management plan based on: monitoring information obtained since the previous storage management plan was adopted, technology changes, and the "needs and requirements of the lands overlying the Chino Basin and the owners of the rights in the Safe Yield or Operating Safe Yield of the Basin." The assessment of technical storage management concerns and opportunities requires the use of updated hydrologic data and models and can be completed efficiently with the recalculation of Safe Yield on a ten-year frequency or more frequently.

The projected aggregate amount of managed storage by the parties in 2050 (planning horizon of the Storage Framework Investigation) is about 340,000 af. Notwithstanding the update frequency recommended above, Watermaster should consider updating the storage management plan before the aggregate amount of managed storage by the parties falls below 340,000 af if not done earlier in a periodic update of the storage management plan.

# Exhibit A

# Comments and Responses on the June 8, 2019 Storage Management Plan White Paper

## Monte Vista Water District

**Comment No. 1**. Page 1, first full paragraph, text that reads: "As a prerequisite to implementing the Optimum Basin Management Program ("OBMP") the parties executed an *agreement* providing direction and guidance to the Watermaster on how storage should be prioritized and managed." Emphasis added. ***MVWD comment reads: "please state agreement and year."***

Response. The agreement referred to is the 2000 Peace Agreement. Text modified to refer to the Peace Agreement.

**Comment No. 2.** Page 1, third full paragraph, , text that reads: "*Groundwater storage* was estimated to have declined by about 1,600,000 af over the period 1922 through 1978, the starting point of the Judgment implementation. This decline in *groundwater storage* was recognized in the Judgment, and it requires that the use of this space be undertaken only under Watermaster control and regulation." Emphasis added. ***MVWD comment reads: Storage did not decline, groundwater in storage declined" and "change to "groundwater in storage", respectively.***

Response. Text changed as requested.

**Comment No. 3**. Page 7, second full paragraph, text that reads: "The IEUA and some of the parties are proposing the implementation of Storage and Recovery Programs, including the Chino Basin Water Bank, the Santa Ana River Conservation and Conjunctive-Use Program (SARCCUP), and the Chino Basin Program (CBP). ***MVWD comment reads: " It may be more contemporary to now delete the reference to SARCCUP."***

Response. Text changed as requested.

**Comment No. 4.** Page 7, last paragraph continuing to top of page 8, text that reads: "The results of the groundwater modeling work reported in the Safe Yield report projected, based on the best planning information available at that time, that the total storage in the basin will likely be relatively stable through the mid to late 2020s, and by 2050, groundwater levels were projected to decline over a broad area ranging from about -65 feet in the Pomona area to -50 feet in the Jurupa Community Services District (JCSD) and Desalter II well field areas." ***MVWD comment reads: "Described as a decline, the negative signs cause a double negative."***

Response. Text changed to remove the negative signs.

**Comment No. 5**. Page 8, third full paragraph, text that reads: "The new information developed since 1999 suggests that the unanticipated use of managed storage to meet future desalter and other replenishment obligations could cause potential MPI: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield,

increase groundwater discharge through the CCWF, cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes." ***MVWD comment reads: "Based on my 6/20 discussion with Andy I think he understands that it may be more clear if the phrase 'to meet future desalter and other replenishment obligations' is removed".***

Response. The text was not changed.

**Comment No. 6.** Page 9, last paragraph, text that reads: "Therefore, it is logical to consider establishing a limit for the parties' use of managed storage at 700,000 af in the Storage Management Plan." ***MVWD comment reads: "Change 'logical' to "conducive". 'Logical' seems to give an 700k an aura of certainty higher that it deserves."***

Response. The text was changed to read: "Therefore, it is logical to consider starting discussions for the parties use of managed storage with a limit of 700,000 af in the Storage Management Plan, and this will be adjusted in accordance with stakeholder input."

**Comment No. 7.** Page 10, second full paragraph, text that reads: "Therefore, it is logical to consider establishing an aggregate limit for all Storage and Recovery Programs at 300,000 af, provided that the aggregate storage limit for parties does not exceed 700,000 af." ***MVWD comment reads: "This sentence/conclusion should probably be put on hold pending on how Watermaster stakeholders decide to be addressed, including mitigation measures."***

Response: Note that the subsequent sentence in the text reads: "Watermaster and the parties could establish a lower or higher aggregate storage limit for Storage and Recovery Programs, but additional engineering work will be required to assess the basin response and MPI for a higher aggregated storage limit." This sentence responds to the comment. That said, the text was changed to read: "Therefore, it is logical to consider establishing an aggregate limit for all Storage and Recovery Programs at 300,000 af in the Storage Management Plan, and this limit will be adjusted in accordance with stakeholder input."

**Comment No. 8.** Page 11, first paragraph, text that reads: "Watermaster has the right to the use existing spreading basins to meet its recharge and replenishment obligations over the use of these facilities by any party or person to accomplish supplemental water recharge." ***MVWD comment reads: "Is it WM or WM stakeholders who have invested into the basins that have this right?"***

Response: The OBMP identified that there was not enough supplemental water recharge capacity to meet future replenishment obligations. OBMP implementation led to the construction of recharge improvements that increased supplemental water recharge capacity for replenishment. The intent of constructing the recharge improvements is specific to increasing storm water recharge and providing Watermaster recharge capacity for replenishment. The text has been changed to read that Watermaster will include provisions in storage agreements that Watermaster will prioritize the use of spreading basins to satisfy Watermaster's recharge and replenishment obligations over the use of spreading basins for other uses.

**Comment No. 9.** Page 11, second paragraph, text that reads: "Early in the OBMP implementation period Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from parties that are situated such that they pump groundwater outside of MZ1 to parties that pump in MZ1 have the potential to cause MPI." ***MVWD comment reads: "Transfers/leases into MZ1 do not have the potential to cause MPI. It can be said that physical pumping/production to some level has the potential to cause MPI. Transfer/leases and pumping/production are not one in the same."***

Response: The text will be revised to improve clarity and will read: "Early in the OBMP implementation period Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from parties that are situated such that they pump groundwater outside of MZ1 to parties that pump in MZ1 *for the purpose of replenishment* have the potential to cause MPI."

## San Antonio Water Company

**Comment No. 1.** Page 1, first full paragraph, text that reads: "As a prerequisite to implementing the Optimum Basin Management Program ("OBMP") the parties executed an *agreement* providing direction and guidance to the Watermaster on how storage should be prioritized and managed." Emphasis added. ***SAWC comment reads: "Would you please direct me to document and page where this is referenced?"***

Response. The agreement referred to is the 2000 Peace Agreement. Text will be modified to refer to the Peace Agreement.

**Comment No. 2.** Page 2, citation to Judgment Paragraph 28. ***SAWC comment reads: "Storage agreements are currently not going to court...correct? Are there concerns at this time because of that?"***

Response: There are no concerns at time. The present storage agreement, procedures, and forms have been approved by the Court through the approval of the Peace Agreement and Watermaster Rules and Regulations.

**Comment No. 3.** Page 8, third full paragraph, text that reads: "The new information developed since 1999 suggests that the unanticipated use of managed storage to meet future desalter and other replenishment obligations could cause potential MPI: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF, cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. The OBMP storage management plan needs to be updated to include features that will ensure there is no MPI to a party or the basin caused by the conjunctive-use activities of the parties and Storage and Recovery Programs. ***" SAWC comment reads: "I need further understanding. If the parties are not pumping the water and utilizing it as a transfer, why is there a problem? Wasn't this thought about when the desalter replenishment obligation was discussed? Didn't WEI do a study on the impact of this decision? Is it because the re-op schedule was changed?***

Response: The original storage management plan was developed for the OBMP in 1999, based on the best available information available to Watermaster. The overlying land and water use practices have evolved over time, and we have continued to refine our understanding of the Basin and its responsiveness to all known variables. Even since Re-Operation was approved by the Court in 2007, the collection and analysis of new data and the application of technology improvements have provided Watermaster and the parties the ability to develop a more refined evaluation of the potential the impacts to the basin from specific recharge, pumping, and storage activities. It is true, the length of time water is held in storage and the rate and location of its withdrawal have implications. Potential impacts attributable to proposed changes in the current baseline will be addressed using our improved knowledge and analytical tools and incorporated into the 2020 Storage Management Plan.

**Comment No. 4.** Page 11 first full paragraph, text that reads: "Watermaster has the right to the use existing spreading basins to meet its recharge and replenishment obligations over the use of these facilities by any party or person to accomplish supplemental water recharge." ***SAWC comment reads: "Why does Watermaster get first use of basin? Didn't the parties pay for the basin. Why is SAWCo's water not given priority over someone pumping rights they don't have?"***

Response: As to priority of use of the recharge basins, please see response to MVWD Comment No. 8. As to the question: "*Why is SAWCo's water not given priority over someone pumping rights they don't have?"* This is not a storage management plan question

**Comment No. 5.** Page 11, first bulleted item following the fifth paragraph, text that reads: "In the first approach, the reduction net recharge would be embedded in Safe Yield, and it would be implicitly allocated to Appropriative Pool parties, based on their pro rata share of Operating Safe Yield." SAWC's comment reads : ***"Other options need to be considered such as time frame for storage if it makes sense."***

Response: The white paper refers to bookends on the approach to identify and mitigate a reduction in Safe Yield caused by the use of managed storage. The impact on Safe Yield from the duration that water is held in managed storage is included the bookend approaches and any variants of them.

## Overlying Agricultural Pool

**Comment No. 1.** Page 1, first paragraph, text that reads: " The prevailing standard for all operations is the avoidance of "undesirable results"—defined as "material physical injury"—under court approved management agreements executed contemporaneously and subsequent to the adoption of the OBMP Update in June 2020. " ***Ag pool comment reads: "MPI is legally defined by Watermaster legal documents (court approved management agreements) and it does not include "undesirable results." Ag Pool supports this concept however and recommends that WM bolster this in light of the defined term."***

No response required.

**Comment No. 2.** Page 3, first bullet after the second full paragraph, text that reads: "Operational storage requirement (OSR) is the storage or volume in the Chino Basin that is necessary to maintain the Safe Yield. The OSR was estimated in the development of the OBMP to be about 5.3 million af. This storage value was set as the estimated storage in the basin in 1997. " ***Ag Pool comment reads: "Should there be a discussion on the relevance of OSR and SSC for the OBMP Update?"***

Response: The relevancy of the original OBMP storage management plan will be described in the 2020 Storage Management Plan. The 2020 Storage Management Plan will be incorporated into the OBMP update.

**Comment No. 3.** Page 4, first full paragraph, text that reads: "Water occupying the SSC includes Carryover, Excess Carryover, Local Storage, and Supplemental Waters stored by the parties. Water stored for Storage and Recovery Programs is also included in the SSC. Carryover, Excess Carryover, Local Storage, and Supplemental Waters are referred to herein collectively as managed storage. " ***Ag Pool comment reads: "Why is this (managed storage) defined that way?"***

Response: Managed storage refers to all water that is stored by virtue of the management activities of the parties and Storage and Recovery Program entities, and it includes carryover water.

**Comment No. 4.** Page 4 last paragraph continuing onto Page 5, text that reads: "These investigations included a recalculation of the total water in storage in the basin, based on the improved hydrogeologic understanding. The total storage in the Chino Basin for 2000 was estimated to be about 5,935,000 af, which is 635,000 af greater than that estimated for the OSR and 135,000 af greater than safe storage." ***Ag Pool Comment reads: "This should be explained. Consider adding a technical rationale for the revised total storage and reference where this rationale was developed."***

Response: The engineering work for the Peace II Agreement produced a new hydrogeologic conceptual model that resulted in an updated estimate of the water in storage in 2000. A footnote will be added to state this and provide a reference to the documentation for it.

**Comment No. 5.** Page 5, second bullet after the second full paragraph, text that reads: "Managed storage was projected to increase from 487,000 af in 2016 to about 663,000 af by 2030 (exceeding the SSC by 163,000 af) and decline thereafter to zero af by 2051. Managed storage was projected to be used to meet future replenishment obligations." ***Ag Pool comment: "When and how will the storage be used? Should there be a schedule?"***

Response. The cited text refers to description of how managed storage is projected to change based on the work done to recalculate the Safe Yield and reported in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement* (WEI, 2015). The water in managed storage was assumed to be used for replenishment purposes based on the projected aggregate replenishment obligation. No schedule was recommended for

the use of managed storage in the report. The concept of a schedule should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 6.** Page 6, first paragraph, text that reads: "Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. There are three types of storage agreements that result in several types of storage accounts: Excess Carryover, Local Supplemental, Local Storage and Storage and Recovery. An Excess Carryover account includes a party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool parties and Operating Safe Yield for Appropriative Pool parties) and Basin Water acquired from other parties. A Local Supplemental Water account includes imported and recycled water that is recharged by a party and similar water acquired from other parties. A Storage and Recovery account includes Supplemental Water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment." Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process." ***Ag Pool comment reads: "Should the different storage accounts be valued and used appropriately?"***

Response: This question should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 7**. Page 6, second paragraph, text that reads: "In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement will cause MPI to a party or the basin. If Watermaster determines that implementation of the proposed storage agreement will cause MPI, the applicant must revise its application so there is no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that will result in MPI." ***Ag Pool comment reads: "What about storage absent agreements? Is it assumed that is MPI?"***

Response: The paragraph describes an agreement approval process. Currently, all storage accounts have agreements in place.

**Comment No. 8**. Page 6, third paragraph, text reads: "The parties, amongst themselves, are actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the parties recover water held in storage accounts." ***Ag Pool comment reads: "Should the management plan curtail these? Should the parties be on notice that the ability to use a transfer is conditional on Watermaster's continued finding that removal of water held in storage will not cause MPI?"***

Response: Watermaster has an application and review process for transfers that is similar to the storage agreement application process. If Watermaster determines that a proposed transfer will cause MPI, the applicant must revise its application so there is no MPI, or Watermaster must impose conditions on the transfer to ensure there is no MPI. Watermaster cannot approve a

transfer that will result in MPI. These questions should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 9.** Page 6, fourth paragraph, text that reads: "Table 1 does not reflect the anticipated reductions in managed storage that will occur to offset unassessed desalter replenishment obligations.[23]" ***Ag Pool comment reads: "Why not? Where is that analysis?"***

Response. See footnote 23 in the June 8th initial draft of the 2020 Storage Management Plan White Paper (footnote 24 in the July 18th final draft). Watermaster is the process of updating assessment packages from prior years pursuant to the Court order that approved the Safe Yield for the period 2011 through 2020. It is anticipated that the assessment package update will be completed within the calendar year. Table 1 will be updated after the assessment packages are updated.

**Comment No. 10**. Page 7, first paragraph, text that reads: "Metropolitan's DYYP is the only active Storage and Recovery Program in the basin. The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. As of July 1, 2018, there were 41,380 af stored in the DYYP account. The agreement that authorizes the DYYP will expire in 2028." ***Ag Pool comment reads: "Should all storage be managed like this one? Why or why not?"***

Response: These questions should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 11.** Page 7, second paragraph, text that reads: "The IEUA and some of the parties are proposing the implementation of Storage and Recovery Programs, including the Chino Basin Water Bank, the Santa Ana River Conservation and Conjunctive-Use Program (SARCCUP), and the Chino Basin Program (CBP). The operational parameters of these proposed programs are not yet defined; that said, the amount of storage space required has been identified to range between 200,000 and 300,000 af." ***Ag Pool comment reads: "What would be the impact. What are the proposed best management practices for this type of use?"***

Response: Absent specific proposals for these proposed Storage and Recovery Programs, the Ag Pool questions cannot be answered. The CBP is currently being formulated, and the Ag Pool questions will be answered in detail in early 2020.

**Comment No. 12.** Page 8, first full paragraph, text that reads: "During the development of the 2013 Amendment to the 2010 Recharge Master Plan Update (2013 RMPU), the JCSD asserted that declining groundwater levels in the areas around and in the JCSD and Chino Basin Desalter Authority (CDA) well fields contributed to declining groundwater pumping capacity at JCSD and CDA wells. Loss in production capacity in this area is likely due to hydraulic interference among the wells and could be mitigated by reducing pumping at these wells, spreading out production over a greater area, and/or by increased recharge located proximate and tributary to the JCSD and CDA well fields. The projected decline in groundwater levels after the mid to late 2020s is projected to further exacerbate pumping sustainability challenges in this part of the basin." ***Ag Pool comment: "Will these types of techniques be required in the plan?"***

Response. This question should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 12.** Page 8, second full paragraph that reads: "The existing storage management plan is based on fixed amounts of water in storage, and its technical basis is not supported by new information available after the storage management plan was first developed (1999). Review of this new information (developed since 1999), indicates that it is possible to expand the SSC to enable greater use of storage space. This new information includes an updated hydrogeologic conceptual model; 20 years of intensive monitoring of basin operations (not available in 1999), including monitoring the basin response as managed storage approached the SSC of 500,000 af; and groundwater model-based projections of the basin response to future management plans where the managed storage exceeded 500,000 af. Re-Operation will reduce the amount of Basin Water in storage by 400,000 af. The current storage management plan does not account for Re-Operation. ***Ag Pool comment reads: "Detail of this is warranted."***

Response: Additional detail will be provided in draft Storage Management Plan document when it is prepared.

**Comment No. 13.** Page 8, third full paragraph that reads: "The new information developed since 1999 suggests that the unanticipated use of managed storage to meet future desalter and other replenishment obligations could cause potential MPI: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF, cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. The OBMP storage management plan needs to be updated to include features that will ensure there is no MPI to a party or the basin caused by the conjunctive-use activities of the parties and Storage and Recovery Programs." ***Ag Pool comment reads: "What are the proposed management techniques to avoid this?"***

Response: The management features/requirements to avoid MPI are described in the 2020 Storage Management Plan White Paper, following the cited text, and they will be included in the Storage Management Plan.

**Comment No. 14.** Page 9, second paragraph that reads: "Based on the best available planning information provided by the parties in the Storage Framework Investigation, the parties' use of managed storage was projected to reach about 700,000 af in 2030 and decline monotonically thereafter. Therefore, it is logical to consider establishing a limit for the parties' use of managed storage at 700,000 af in the Storage Management Plan." ***Ag Pool comment reads: "This seems a bit high and not specific enough to each pumper. An itemized list of each parties desire for storage would be useful. What the parties lay claim to cannot be used by water bankers including IEUA for their grant funding. Water bankers are going to want absolute certainty in what they can bank.***

Response: These comments should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 15.** Page 10, first paragraph that reads: "Alternatively, the Watermaster and the parties could establish a lower or higher limit, but additional engineering work will be required to assess the basin response and MPI for a higher limit." ***Ag Pool comment reads: "Why wouldn't we do that now?"***

Response: This question should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 16.** Page 10, second paragraph, text that reads: "The Storage Framework Investigation evaluated the use of 300,000 af of storage for Storage and Recovery Programs that was superimposed on the storage management activities of the parties. Therefore, it is logical to consider establishing an aggregate limit for all Storage and Recovery Programs at 300,000 af, provided that the aggregate storage limit for parties does not exceed 700,000 af. Watermaster and the parties could establish a lower or higher aggregate storage limit for Storage and Recovery Programs, but additional engineering work will be required to assess the basin response and MPI for a higher aggregated storage limit." ***Ag Pool comment reads: "Again, should we do pumper and location specific analysis?"***

Response: An MPI analysis is required for each Storage and Recovery Program proposal, and they will include a "pumper and location-specific analysis."

**Comment No. 17.** Page 11, first paragraph, text that reads: "The Judgment parties and IEUA, through the OBMP, have substantially increased the storm and supplemental water recharge capacity in the Chino Basin. The increase in supplemental water recharge capacity was done to ensure that Watermaster could meet its future recharge and replenishment obligations. Watermaster has the right to the use existing spreading basins to meet its recharge and replenishment obligations over the use of these facilities by any party or person to accomplish supplemental water recharge." ***Ag Pool comment reads: "Why is this important and should it be developed further?"***

Response: This is important because Storage and Recovery Program agreements need to specify that Watermaster has priority use of the existing spreading basins for its recharge and replenishment obligations over the use of these facilities for storage and recovery operations. The intent is to avoid conflicts between the recharge capacity required by Watermaster to fulfill its obligations under the Judgment and the desire of Storage and Recovery Program proponents to use the same existing recharge facilities to conduct recharge for their storage and recovery programs. The need to develop this further should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 18.** Page 11, Second and third paragraphs, text that reads: "Early in the OBMP implementation period Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from parties that are situated such that they pump groundwater outside of MZ1 to parties that pump in MZ1 have the potential to cause MPI. No such transfers have occurred since the OBMP was implemented in 2000. This limitation on transfers should be reconsidered if the land subsidence management plan for MZ1 includes

consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan." ***Ag Pool comment reads: "Why not include these requirements and potential uses in this plan? Additional details, analyses and monitoring would be needed to evaluate."***

Response: This requirement will be included in the 2020 Storage Management Plan. The ongoing monitoring and analysis for land subsidence and the implementation of future land subsidence plans will provide the information necessary to update the requirement.

**Comment No. 19.** Page 11, last paragraph, text that reads: "Watermaster and the parties need to determine which of the above approaches or variant of them to include in the storage management plan to ensure their storage management activities do not cause MPI." ***Ag Pool comment reads: "What does Wildermuth (the expert) recommend? Should those that benefit the most pay the most?***

Response: The specific approach in allocating mitigation liability for storage induced changes in net recharge and Safe Yield should be discussed and addressed by the parties.

**Comment No. 20.** Page 12, second paragraph, text that reads: "This limitation on puts and takes should be reconsidered if the land subsidence management plan for MZ1 includes consideration for Storage and Recovery programs, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan." ***Ag Pool comment reads: "What does Wildermuth recommend as the tool to accomplish this? This needs further evaluation during development of the plan and continued validation and adjustment during operations on annual basis."***

Response: This management requirement will be described in greater detail in the draft 2020 Storage Management Plan.

**Comment No. 21.** Page 12, third paragraph, text that reads: "The intent of this provision is to reaffirm the requirements of Paragraph 12 of the Judgment and the Peace Agreement, as to the review of Storage and Recovery Program applications, and to require Storage and Recovery Program agreements to provide provisions that require Storage and Recovery Program proponents to cease or modify their operations if Watermaster determines, subsequent to Watermaster and Court approval of a Storage and Recovery Program storage agreement, that the proponent's storage and recovery operations are causing or threaten to cause MPI. The potential MPI to be addressed include but are not limited to: land subsidence, pumping sustainability, reductions in net recharge and safe yield, water quality impacts, shallow groundwater, and liquefaction." ***Ag Pool comment reads: "Propose abandonment of the Watermaster rebuttable presumption of no MPI."***

Response: This comment should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 22.** Page 12, third paragraph, text that reads: "Watermaster will review each Storage and Recovery Program application, estimate the surface and groundwater system response, prepare a report that documents the response and potential MPI, and develop mitigation measures to mitigate MPI caused by the proposed Storage and Recovery Program. Watermaster will incorporate these mitigation measures into the Storage and Recovery Program storage agreement." ***Ag Pool comment reads: "How will this requirement be reflected in the plan?"***

Response: It will be explicitly stated. This requirement is in the Peace Agreement.

**Comment No. 23.** Page 12, fifth paragraph, text that reads: "Watermaster will periodically review current basin conditions, compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of related MPI mitigation requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program operations to mitigate MPI." ***Ag Pool comment reads: Will this be required by the plan?***

Response: Yes.

**Comment No. 24.** Page 13, first full paragraph, text that reads: "Watermaster should periodically review the state of Hydraulic Control and update projections of the state of Hydraulic Control, compare this information to the projected Hydraulic Control assessment prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of the related mitigation requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program operations to mitigate impacts on the state of Hydraulic Control." ***Ag Pool comment: "Define "periodically." The Ag Pool proposes that this be done on an annual basis and no less than every two years.***

Response: This management requirement will be described in greater detail in the draft 2020 Storage Management Plan.

**Comment No. 25**. Page 13, second full paragraph, text that reads: "Watermaster and the parties should consider updating the storage agreement application process to incorporate changes in the technical features of storage management and to improve the efficiency of the application process." ***Ag Pool comment reads: "Why not require it now and include it in the plan?"***

Response: This comment should be addressed by the parties in the development of the 2020 Storage Management Plan.

**Comment No. 26**. Page 13, third full paragraph, text that reads: "Watermaster should periodically review and update the storage management plan based on: monitoring information obtained

since the previous storage management plan was adopted, technology changes, and the "needs and requirements of the lands overlying the Chino Basin and the owners of the rights in the Safe Yield or Operating Safe Yield of the Basin." The assessment of technical storage management concerns and opportunities requires the use of updated hydrologic data and models and can be completed efficiently with the recalculation of Safe Yield on a ten-year frequency or more frequently." ***Ag Pool comment reads: "Propose that Wildermuth define when this would be necessary and provide advice. Define "periodically."***

Response: This management requirement will be described in greater detail in the draft 2020 Storage Management Plan.

**Comment No. 27**. Page 13, fourth full paragraph, text that reads: "The projected aggregate amount of managed storage by the parties in 2050 (planning horizon of the Storage Framework Investigation) is about 340,000 af. Notwithstanding the update frequency recommended above, Watermaster should consider updating the storage management plan before the aggregate amount of managed storage by the parties falls below 340,000 af if not done earlier in a periodic update of the storage management plan." ***Ag Pool comment reads: "Consider adding a buffer of additional AF to provide time to adjust. Consider other potential factors as well, such a rate of decline and projected time of reaching this untested threshold. Repeat that the periodic update should be conducted on an annual basis. not on a regular basis to ensure that it does not fall below. How will storage be allocated among the parties. What happens if everyone wants 100k AF? Where is the substance of the plan?***

Response: As to the direct comment, the intent of the periodic review and update of the Storage Management Plan is to track the amount of water in managed storage, update the plan as necessary to avoid MPI, and to test the efficacy of the 340,000 af threshold. The frequency of the Storage Management Plan review and update will be established to ensure no MPI from the use of managed storage. This management requirement will be described in greater detail in the draft 2020 Storage Management Plan. The answers to the questions "How will storage be allocated among the parties. What happens if everyone wants 100k AF?" and "Where is the substance of the plan?" should be addressed by the parties in the development of the 2020 Storage Management Plan.

## Overlying Non-Agricultural Pool

**Comment No. 1.** Background section, ***Overlying Non-ag Pool comment reads: "In this section, the report says that as a prerequisite to implementing the OBMP, "the parties executed an agreement." Which agreement does this refer to? Which parties executed it?***

Response. The agreement referred to is the 2000 Peace Agreement. Text will be modified to refer to the Peace Agreement.

**Comment No. 2**. Judgment section, ***Overlying Non-ag Pool comment reads: "In this section, the draft says that groundwater storage "was estimated" to have declined by about 1,600,000 af over the period from 1922 through 1978. Who made this estimate? When? What is the source for this statement?***

Response: The change in storage was reported in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement* (WEI, 2015).

**Comment No. 3.** Judgment section, ***Overlying Non-ag Pool comment reads: "In this section, the draft says that Section 11 and Section 12 of the Judgment require that use of storage be undertaken only under Watermaster control and regulation. Section 11 and Section 12 apply only to Supplemental Water. Is there a basis in the Judgment* for control or regulation by Watermaster of carryover water? What is the basis?**

Response: Watermaster does not require agreements for carryover. Paragraph 7 of Exhibit "G" (Overlying (Non-Agricultural) Pool Pooling Plan) and Paragraph 12 of Exhibit "H" (Appropriative Pool Pooling Plan) to the Restated Judgment both require a storage agreement with Watermaster as a condition of storing excess carryover.

**Comment No. 4.** Judgment section, **Overlying Non-ag Pool comment reads: "In this section, the draft says that Section 28 requires Watermaster to develop and administer storage agreements for Supplemental Water. Section 28 requires Watermaster to administer Supplemental Water, but does not require or authorize Watermaster to develop or administer storage agreements for carryover water. Is there a basis in the Judgment for storage agreements for carryover water? What is the basis?**

Response: See response to Comment No. 3 above.

**Comment No. 5.** Storage Agreement section, **Overlying Non-ag Pool comment reads: "In this section, the report says that an Excess Carryover account includes a party's unproduced rights in the Safe Yield *"and Basin Water acquired from other parties."* What is intended by the words in italics? Should the italicized words be replaced with "and Excess Carryover acquired from other parties"?**

Response: It includes a party's unproduced safe yield rights and the unproduced rights acquired from other parties.

**Comment No. 6**. Storage Agreement section, **Overlying Non-ag Pool comment reads: "In this section, the report says that, in evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement will cause MPI to a party or the basin. As stated above, the Judgment appears to authorize control and regulation by Watermaster of Supplemental Water, but not carryover water. Is there a basis in the Judgment for investigations of MPI for storage of excess carryover? What is the basis?**

Response: Paragraph 7 of Exhibit "G" (Overlying (Non-Agricultural) Pool Pooling Plan) and Paragraph 12 of Exhibit "H" (Appropriative Pool Pooling Plan) to the Restated Judgment both require a storage agreement with Watermaster as a condition of storing excess carryover.

**Comment No. 7.** Existing Managed Storage and Proposed Storage and Recovery Programs section. ***Overlying Non-ag comment reads: "In this section, the report introduces the term "managed storage" for the first time. Prior to this section, all storage was referred to as "storage." The implication is that "managed storage" is a subset of "storage." What is the difference between "storage" and "managed storage"?***

Response: Managed storage is the aggregate of Carryover, Excess Carryover, Local Storage, and Supplemental Waters. This term was used throughout the Storage Framework Investigation presentations and report.

**Comment No. 8.** Storage Management Plan Requirements section. ***Overlying Non-ag comment reads: "In this section, the report says that it is "logical" to consider establishing an aggregate limit for all storage at 700,000 af. As stated above, the Judgment appears to authorize control and regulation by Watermaster of Supplemental Water, but not carryover water. Should limits on storage apply to Supplemental Water and perhaps other water, but not apply to carryover water?"***

Response: The limits suggested in this section are intended to apply to all water held in managed storage, which includes carryover water.

**Comment No. 9.** Mitigation of Reduced Net Recharge and Safe Yield section***. Overlying Non-ag comment reads: "In this Section, the report says that Watermaster assesses a 0.07 percent loss to storage accounts based on estimated losses of water in the Basin to the Santa Ana River. As stated above, the Judgment appears to authorize control and regulation by Watermaster of Supplemental Water, but not carryover water. Should such losses be assessed on Supplemental Water and perhaps other water, but not on carryover water?***

Response: Watermaster assesses these losses on excess carryover and supplemental water in storage.

**Comment No. 10.** Mitigation of Reduced Net Recharge and Safe Yield section. ***Overlying Non-ag comment reads: "In this Section, the report says that the "Storage Framework Investigation" demonstrated that storing water has the effect of reducing net recharge and Safe Yield. Where on Watermaster's website can the Storage Framework Investigation currently be found? Where in the report is this effect "demonstrated." If storage has this effect, should such reduction be attributed to Supplemental Water and perhaps other water, but not to carryover water?***

Response. Please see the Storage Framework Investigation Report located here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1429

The effect of managed storage on net recharge was presented and discussed at several workshops that were conducted during the preparation of the Storage Framework Investigation and pdfs of the PowerPoint presentation from these workshops are located here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1406

**Comment No. 11.** Mitigation of Reduced Net Recharge and Safe Yield section. ***Overlying Non-ag comment reads: "In this Section, the report says that reduction in net recharge caused by storage is an MPI. Carryover water is unproduced water, and unproduced water is a natural condition pre-dating existing development of the basin. How can a natural condition be an MPI?***

Response: In a truly natural condition, basin storage will be maximized and all recharge to the basin is lost to rising groundwater and evapotranspiration by riparian vegetation. In a truly natural condition, net recharge is zero. Increasing the volume of water in managed storage has the effect of suppressing net recharge regardless of how you label the water that is included in the managed storage. That said, the text has been changed substituting the term "adverse impact" for MPI.

## City of Ontario

***Comment No. 1.*** Page 10, second paragraph. ***The City's comment reads: "Paragraph 2 contemplates establishing an aggregate limit of 300kaf for all Storage & Recovery (S&R) programs, "provided that the aggregate storage limit for parties does not exceed" 700kaf. This is different from establishing an aggregate limit equal to the total space (1M af) less the volume used by parties (700kaf or less). In the case that parties use less than 700kaf, while S&R programs remain limited to 300kaf, how will the difference between the actual volume of stored water and 1M af be addressed?"***

Response: The suggested aggregate allocation of 700 kaf to the parties for their individual conjunctive-use activities and the 300 kaf for Storage and Recovery Programs is based on the results of the Storage Framework Investigation. The allocation of managed storage space for these two types of uses should be discussed and agreed upon by the parties for inclusion in the 2020 Storage Management Plan.

**Comment No. 2**. Page 11, "Limitation of Transfers or Leases of Water Rights and Water Held in Managed Storage section." ***The City's comment reads: " The second paragraph in this section states that the limit on certain transfers "should be reconsidered" under certain conditions. It seems logical that these conditions could also include mitigation such as may be required for S&R programs. In addition, S&R programs may be designed such that puts and takes aid in addressing land subsidence, plumes, etc."***

Response: This management requirement will be described in greater detail in the draft 2020 Storage Management Plan

**Comment No. 3.** Page 11, Mitigation of Reduced Net Recharge and Safe Yield section***. City's comment reads: "This section identifies "two fundamental approaches to mitigate the reduction in net recharge" caused by stored water. Are there additional approaches that can be explored? One such approach may be preemptive mitigation rather than allocation of effects."***

Response: The white paper refers to bookends on the approach to identify and mitigate a reduction in Safe Yield caused by the use of managed storage. The specific approach in allocating mitigation liability for storage induced changes in net recharge and Safe Yield should be discussed and addressed by the parties.

**Comment No. 4.** Page 12, Evaluation of Storage and Recovery Program Impacts, MPI, and Mitigation section. ***City's comment reads: "The second paragraph in this section states that "Watermaster will review each Storage and Recovery Program application, estimate the surface and groundwater system response...." (emphasis added) It is unclear why it is necessary for Watermaster to evaluate surface water system responses."***

Response: The use of existing recharge facilities for Storage and Recovery Programs may conflict with the use of the same facilities for stormwater recharge and may reduce net recharge. The intent to is characterize this conflict and to subsequently develop conditions on the Storage and Recovery Program to mitigate it.

**Comment No. 5.** ***The City's comment reads: "General: Please provide citations for all references to guidance documents, particularly when quotation marks are used. Example: Page 13, 1st paragraph under "Storage Management Plan Update."***

Response: This request will be incorporated into the final version of the White Paper.

# Appendix B1

**Comments and Responses on the draft 2020 Storage Management Plan Report, Version 1**

# Appendix B1 -- Comments and Responses on the Draft 2020 Storage Management Plan Report, Version 1

## October 1, 2019 letter from the Overlying Agricultural Pool

Comment No. 1**.** Page 1, fourth paragraph. Ag pool comment reads: ***"In regard to use of storage space by the Parties and other entities, the Ag Pool proposes that a schedule be developed to dictate when, how and by whom storage will be used. The Ag Pool also proposes that different storage accounts be valued and used appropriately."***

Response. Please see Section 2.1 of the draft 2020 SMP, Version 2.

Comment No. 2. Page 1, fifth paragraph. Ag pool comment reads: ***"The Draft 2020 SMP introduces "three types of storage agreements that result in four types of storage accounts," but only describes three of those four types of storage accounts. (Draft 2020 SMP, Section 1.1.) It also does not explain which type(s) of accounts are available to which Parties or Pools. Although this information is available in other documents, adding this information to the SMP would make for a more complete description of the types and ownerships of current and potential future accounts and would make this section more consistent with Table 1-1."***

Response. In Table 1-1, the column heading in the Overlying Non-Agricultural accounts for "Local Storage" has been changed to "Excess Carryover."

Comment No. 3. Page 1, fifth paragraph. Ag pool comment reads: ***"This paragraph also states that the Watermaster tracks "losses" and reports its accounting in the annual assessment process. Would it be helpful to expand on the types of "losses" that Watermaster tracks? Are there losses other than storage losses?***

Response. The text has been revised to include a description of the losses referred to in Section 1.1.

Comment No. 4. Page 1, sixth paragraph. Ag pool comment reads: ***"The Draft 2020 SMP also states that Watermaster must conduct an investigation to determine if the water stored and recovered under the proposed storage agreement will cause "potential MPI," and that the Watermaster cannot approve a storage agreement that will "result in MPI." (Draft 2020 SMP, Section 1.1.) Is the difference in wording intentional? If so, it would be helpful to explain the***

***difference in meaning/use and maybe add this clarification to Note 7 on page 1-1. "Potential MPI" is also used in the first paragraph of Section 2.3.3.2."***

Response The text was updated and now reads:

> "In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement has the potential to cause MPI to a Party or the basin. If Watermaster determines that implementation of the proposed storage agreement has the potential to cause potential MPI, the applicant must revise its application and demonstrate that there will be no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that has the potential to cause MPI. "

Comment No. 5. Page 2 first full paragraph. Ag pool comment reads: ***"The Draft 2020 SMP recommends that the Watermaster's current limitation on transfers or leases of water rights and water held in managed storage from Parties that are situated such that they pump groundwater outside of MZ1 to Parties that pump in MZ1 for the purpose of replenishment "should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan." (Draft 2020 SMP, Section 2.3.1.) The Watermaster has indicated that "[t]he ongoing monitoring and analysis for land subsidence and the implementation of future land subsidence plans will provide the information necessary to update the requirement." (Comments and Responses on the June 8, 2019 Storage Management Plan White Paper, p. 10) However, the Draft 2020 SMP does not identify or discuss any parameters that will be used to determine whether the subsequent monitoring demonstrates the sufficiency of the land subsidence management plan. The Draft 2020 SMP also does not identify when such an evaluation would be made or if the limitation would be reinstated if conditions change in the future. Accordingly, the Draft 2020 SMP should be revised to include more detail on when and how the "sufficiency" of the plan will be determined."***

Response. Consider the timeline to reach a point where a land subsidence management plan for MZ1 has been functioning and monitoring and analysis can provide reliable information to assess the ability to allow transfers from Parties outside of MZ1 to Parties inside MZ1 that will not cause land subsidence. Given the present state of knowledge, it could take at least ten years to develop this plan and an agreement to implement it. It could take ten or more years of implementation and monitoring to assess the efficacy of the land subsidence management plan and additional investigations after that to determine if transfers from Parties outside of MZ1 to Parties inside MZ1 could be done without contributing to land subsidence. In sum, more than 20 years. Given this timeline, it is not appropriate to *"identify or discuss any parameters that will be used to determine whether the subsequent monitoring demonstrates the sufficiency of the land*

*subsidence management plan."* Rather, the land subsidence management plan should include monitoring and analysis to demonstrate whether or not these transfers could occur and the conditions under which transfers could occur pursuant to the Peace Agreement. The land subsidence management plan should include monitoring and analysis that will provide information to determine if Storage and Recovery Programs can be operated in MZ1 without causing land subsidence.

Comment No. 6. Page 2 second paragraph. Ag pool comment reads***: "The Draft 2020 SMP identifies the two potential approaches to mitigate the reduction in net recharge caused by the Parties' storage management activities but does not further discuss the approaches. Regarding the second identified potential approach, the Ag Pool maintains that working through this issue will require consideration of factors that may/may not be known at the time a storage agreement is proposed or executed, versus uncertainties that could affect the availability, quantity, or cost of water under future continued storage or take conditions. For example, might a Party's interest in executing a storage agreement be affected if the debit associated with reduction in net recharge could not be quantified in advance?"***

Response. A proposed approach has been incorporated into the draft 2020 SMP, Version 2.

Comment No. 7. Page 2 third paragraph. Ag pool comment reads: ***"The Draft 2020 SMP states that storage "put" and "takes" should be prioritized to occur in MZ2 and MZ3 to avoid new land subsidence and interfering with land subsidence management in MZ1, to minimize pumping sustainability challenges, to minimize the impact of storage and recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful groundwater storage space in MZ2 and MZ3. Nonetheless, the Draft 2020 SMP again recommends that such prioritization "should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan" without further detail. (Draft 2020 SMP, Section 2.3.3.1.) The Draft 2020 SMP should be revised to include more detail on when and how the "sufficiency" of the plan will be determined."***

Response. See response to comment No. 5.

Comment No. 8. Page 2 fourth paragraph. Ag pool comment reads***: "Section 1.2, paragraph 1 identifies MWD's "Dry-Year Yield Program (DYYP)." The Ag Pool suggests adding a definition for MWD's DYYP that is more robust than the brief description contained in the paragraph under Table 1-1. Additionally, the paragraph indicates a maximum put of 25,000 afy and a maximum take of 33,000 afy under the DYYP. However, Table 1-1 shows the maximums were***

***exceeded twice, in 2009 (40,383 take) and 2018 (35,065 put). An explanation of these apparent exceedances would be helpful."***

Response. The text has been modified to explain the put exceeding 25,000 afy in fiscal year 2018 and the take exceeding 33,000 af in fiscal year 2009.

Comment No. 9. Page 2 fifth paragraph. Ag pool comment reads***: "Section 1.2, paragraph 4 refers to "managed storage space available." The Ag Pool suggests that Watermaster consider clarifying whether this is physical space available (without resulting in MPI), space available through existing approvals, both, or something else."***

Response. It's physical space available to the Parties and it was authorized in the 2010 Peace II Project Subsequent Environmental Impact Report and its 2017 Addendum. Other than the impact from the use of managed storage on net recharge and Safe Yield, no MPI is projected to occur.

Comment No. 10. Page 2 sixth paragraph. Ag pool comment reads: ***"The Draft 2020 SMP states that the "Watermaster will periodically review current and projected basin conditions, compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of related MPI mitigation measures and requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program agreements to mitigate MPI." (Draft 2020 SMP, Section 2.3.3.2.) The Ag Pool proposes that Watermaster's review of Hydraulic Control be conducted on an annual basis and no less than every two years."***

Response. Presently Watermaster evaluates the state of hydraulic control on a one- to two-year frequency and reports the results of the evaluation to the Regional Board pursuant to its Maximum Benefit commitments.

Comment No. 11. Page 3 first full paragraph. Ag pool comment reads: ***"Sections 2.3.3.2 and 2.3.3.3 refer to Watermaster developing mitigation measures and incorporating such measures into a storage agreement. Is it appropriate that Watermaster develop the mitigation measures (given that doing so might affect the feasibility or cost of a Party's storage program) or should Watermaster simply identify the potential MPI that must be mitigated and leave it to the Party to develop and propose mitigation measures that Watermaster finds sufficient and acceptable?"***

Response. The text in Section 2.3.3.2 was modified to read:

> "Watermaster will review each Storage and Recovery Program application, estimate the surface and groundwater system response, prepare a report that describes the response and potential MPI, and develop mitigation requirements to mitigate MPI caused by the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement."

The text in Section 2.3.3.3 was modified to read:

> "Watermaster will, as part of the Storage and Recovery Program application review process, make a projection of the program's expected impact on the state of Hydraulic Control. Watermaster will review these impacts and develop mitigation requirements for the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement."

Comment No. 12. Page 3 second paragraph. Ag pool comment reads***: "The Draft 2020 SMP states that the Watermaster will "periodically" update the SMP and suggests "it can be completed efficiently with the recalculation of Safe Yield on a ten-year frequency." The Draft 2020 SMP also suggests that Watermaster should consider updating the SMP at least five years before the aggregate amount of managed storage by the Parties falls below 340,000 af if not done earlier in a periodic update of the SMP. The Ag Pool proposes that a projection of anticipated managed storage should be made at least every 5 years if the SMP is updated every 10 years. This will facilitate identification of an interim trigger to update the SMP based on managed storage falling below the 340,000 af threshold."***

Response. The text was modified to read:

> "Watermaster will periodically review and update the SMP based on: monitoring information obtained since the previous SMP was adopted, technology changes, and the "needs and requirements of the lands overlying the Chino Basin and the owners of the rights in the Safe Yield or Operating Safe Yield of the Basin." The periodic review and update of the SMP will require the use of updated planning and hydrologic data and models, and it should be completed: at no less than a five-year frequency; when the Safe Yield is recalculated; or when Watermaster determines a review and update is warranted based new information and/or the needs of the Parties or the Basin.

The projected aggregate amount of water in managed storage by the Parties in 2056 (planning horizon of the 2018 SFI) is about 340,000 af. The impacts to the Basin and the Parties from reducing managed storage below 340,000 af has not been estimated. Notwithstanding the SMP update frequency stated above, Watermaster should update the SMP at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af."

Comment No. 13. Page 3 third paragraph. Ag pool comment reads: ***"The storage agreement application process section of the Draft 2020 SMP was left blank to be filled by Watermaster staff in the next draft. The Ag Pool proposes that the storage agreements include limits for the parties' use of managed storage. The storage agreements should also include a provision that places applicants on notice that water transfers between parties and its storage and extraction are subject to the continued finding of no MPI by Watermaster. The pumping sustainability issues should also be addressed in the storage agreements by including identification and analysis of production locations. The Draft 2020 SMP also did not address Ag Pool's proposed abandonment of the Watermaster rebuttable presumption of no MPI. Accordingly, Ag Pool restates its proposal to abandon the Watermaster's rebuttable presumption of no MPI."***

Response. Watermaster will present its proposed storage application process in the draft 2020 SMP Report, Version 3 in November.

## October 1, 2019 annotated version of the draft 2020 SMP, Version 1 provided by the Inland Empire Utilities Agency

Comment No. 1. Comment refers to Section 2.2 referenced immediately above. IEUA comment reads: ***"Will there be a prioritization of Basins and resulting operation scheme?"***

Response. There is an existing hierarchal scheme for the use of spreading basins that includes the following: (1) flood control, (2) maximizing storm water recharge, (3) Watermaster replenishment and recharge, (4) IEUA recycled water recharge, and (5) maintenance. Use of spreading basins by Storage and Recovery Programs would come after the five higher priority uses have been satisfied.

Comment No. 2. Comment refers to Section 2.3.2 on page 2-2: "Two potential approaches were identified in the 2019 SFI and 2020 SMP White Paper to mitigate the reduction in net recharge caused by the Parties storage management activities." IEUA comment reads: ***"Should this include S&R programs or is it implicit?"***

Response. Section 2.3.2 refers to mitigation of the reduction in net recharge and Safe Yield due to the use of managed storage by the Parties. Mitigation for the reduction of net recharge and Safe Yield due to the use of managed storage by a Storage and Recovery Program is explicitly described in Section 2.3.3.2 of the draft 2020 SMP Report, Version 2.

Comment No. 3. Comment refers to Section 2.3.4 on page 2-3 and refers to a future section of the 2020 SMP that is not yet written. IEUA comment reads: ***"A flow chart may be helpful for this section once it is prepared?"***

Response. A flow chart may be included in the draft 2020 SMP, Version 3.

Comment No. 4. Comment refers to Section 2.3.4 on page 2-3 and refers to a future section of the 2020 SMP that is not yet written. IEUA comment reads: ***So are the S&R Programs going to be analyzed with boundary conditions of managed storage between 720kaf and 340kaf? Or based on annual projections as provided herein?"***

Response. No. Storage and Recovery Programs will be evaluated for their use of storage space in excess of that used by the Parties. Presently, the managed storage use by the Parties is projected to reach a maximum value of 720,000.

# Appendix B2

**Comments and Responses on the draft 2020 Storage Management Plan Report, Version 2**

# Appendix B2 – Comments and Responses on the October 24, Draft 2019 Storage Management Plan Report, Version 2

## November 19, 2019 comment letter from the Overlying Agricultural Pool (OAP)

Comment No. 1**.** Section 1.1. OAP comment reads: ***"The introduction and descriptions of storage agreements and accounts remain unclear. The text refers to three types of agreements and four types of accounts. The text names four types of accounts, but only describes three. The relationship between types of accounts and their corresponding agreements should be clarified."***

Response. The text of SMP document was revised and it now reads:

> "Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. <u>There are three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery.</u> An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool Parties) and Basin Water acquired from other Parties. Local Supplemental Water accounts includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes Supplemental Water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment." Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process. <u>The losses assessed by Watermaster are based on the amount of water in managed storage (excluding Carryover) and they offset the increase in groundwater discharge to the Santa Ana River from the Chino Basin attributable to managed storage (excluding Carryover). Watermaster also assesses losses due to evaporation on the puts when water is recharged in spreading basins</u>." (emphasis added)

Comment No. 2**.** Section 1.1. OAP comment reads: ***"The response to OAP Comment No.3 indicates the "text has been revised to include a description of the losses referred to in Section 1.1." (Appendix B Response to Comments on 2020 SMP V1, p. B-1.) The noted revisions and description are not apparent. Where in the text can they be found? There is a storage loss factor***

***for flow out of the Chino North Management Zone (described in the White Paper). Are other losses calculated and tracked?"***

Response. See text revision in the response to Comment No. 1 above.

Comment No. 3**.** Section 1.1. OAP comment reads: ***Details, such as the date it was approved by the court and its purpose, are provided for Form 8, however, corresponding information about Form 1 is not provided. Consider adding such information or explaining why the information is not relevant for Form 1."***

Response. The text of SMP document was revised to include the following paragraph in Section 1.1:

> "The Form 1 Application for Local Storage Agreement was approved in 2001 and has not been amended since that time; it is the mechanism through which Parties may apply to enter into a Local Storage Agreement."

Comment No. 4. Section 2.1. OAP comment reads: ***"This section does not describe how storage may be allocated among the Parties. Watermaster counsel has indicated Watermaster has no priority for allocation of storage but what will happen if it becomes a limited resource? Is it first come first serve until fully allocated with the hope that it will not be fully allocated?"***

Response. Watermaster anticipates, based on the Parties' projections, that 800,000 AF would be adequate to satisfy the Parties' storage activities and the DYYP until 2030. Watermaster plans to evaluate projections periodically and update the SMP no less frequently than every 5 years having the opportunity to adjust and avoid limiting the Parties use.

Comment No. 5. Section 2.1. OAP comment reads: ***"It is clear that a storing entity must prepare an evaluation of managed storage above 1,000,000 acre-feet (af) "to ensure that there will be no material injury." The OAP suggests making it clear (as we understand from the workshops) that the evaluation will be both a technical evaluation in addition to CEQA compliance. The OAP suggests including clarification that the evaluation needs to address potential Material Physical Injury (MPI) as well as adverse impacts (Safe Yield reduction and loss of hydraulic control)."***

Response: The text of SMP document was revised and it now reads:

> "Note that the use of managed storage greater than 1,000,000 af may be possible provided the storing entity submits a bona fide Storage and Recovery Program application, demonstrates that the program has broad mutual benefit,

> demonstrates that program's mitigation measures will meet the mitigation requirements of the Watermaster to ensure there will be no MPI and other adverse impacts, complies with CEQA and obtains approval from the Watermaster." (emphasis added)

Comment No. 6. Section 2.3.2. *OAP comment reads:* ***"Future evaluations of storage impacts to Safe Yield will be done in the Safe Yield reset or interim corrections. It may be helpful in this section to reference the 2015 Reset Technical Memorandum and the April 2017 Court order for additional information on the Safe Yield reset methodology."***

Response. A footnote was added to this section that reads:

> "Refer to the 2015 Reset Technical Memorandum and the April 2017 Court Order for additional information on the Safe Yield reset methodology. These documents can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1595."

Comment No. 7. Section 2.4.2. OAP comment reads: ***"The Draft SMP Version 2 states, "…recharge loss rate… may be adjusted from time-to time…" What is the mechanism for developing and approving this adjustment, and can it only be done under the condition of additional evaluation of Safe Yield?"***

Response. Watermaster may adopt uniform rules to address triggers, notice, opportunity to respond and to implement corrective actions. Moreover, as part of the Storage and Recovery application and approval process, each Storage and Recovery application may have customized conditions responsive to the characteristics of the specific project.

Comment No. 8. Section 2.4.2. OAP comment reads: ***"The Draft SMP Version 2 states, "Watermaster will periodically review current and projected basin conditions…" Periodically is subject to interpretation. Will this review be done at a minimum frequency, based on threshold changes in amounts of water in storage, or combined with other reviews (e.g., SMP updates, additional Safe Yield evaluations"***

Response. Watermaster will periodically review current and projected basin conditions when it updates the SMP as described in Section 2.6. Watermaster could conduct additional reviews if routine assessments of monitoring and planning data indicate changed conditions from that which was assumed in the evaluation of existing Storage and Recovery Program, when the Safe Yield is recalculated and when new Storage and Recovery Program applications are submitted to Watermaster.

Comment No. 9. Section 2.4.3. OAP comment reads: ***"The Draft SMP Version 2 states, "Watermaster will periodically review current and projected state of Hydraulic Control…" Periodically is subject to interpretation. Will this review be done at a minimum frequency, based on threshold changes in amounts of water in storage, or combined with other reviews (e.g., SMP updates, additional Safe Yield evaluations)?"***

Response. Hydraulic Control is evaluated annually in the Max Benefit Report to the Regional Board.

Comment No. 10. Section 2.4.3. OAP comment reads: ***"Please clarify that loss of Hydraulic Control is not an MPI, if that is what is intended. Loss of Hydraulic Control appears to have a higher threshold of impact than impacts to Safe Yield in the SMP because loss of Hydraulic Control "must be mitigated" as indicated in the section heading. The OAP suggests additional discussion of this need for a higher level of mitigation in the text of this section."***

Response. The text of SMP document was revised in multiple locations to state that loss of Hydraulic Control is an adverse impact and not MPI.

Comment No. 11. Section 2.6. OAP comment reads: ***"This section identifies the need for Watermaster to "update the SMP at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af." Watermaster has indicated in its response to comments that this threshold of 340,000 af includes Storage and Recovery programs. The 340,000 af threshold was established because impacts to the basin (e.g. subsidence induced by groundwater withdrawal) due to reducing managed storage below this threshold have not been evaluated. It could be termed "the band of storage management untested for MPI." We suggest that it may be appropriate to discuss this issue in Section 2.4.2 because there is additional risk in any storage and recovery program that relies on this untested band of storage management."***

Response. The 340,000 af threshold includes managed storage by the Parties and does not include Storage and Recovery programs.

## November 21, 2019 comment email from the Overlying Non- Agricultural Pool (ONAP)

Comment No. 1. Page 1-2 – Last sentence of Background section. ONAP comment reads: ***"This sentence omits that Non-Agricultural Pool Parties can have Supplemental Waters. Please make the correction."***

Response: The text of SMP document was revised and it now reads:

> "Local Storage includes Excess Carryover for the Overlying Non-Agricultural Pool Parties and Excess Carryover and Supplemental Waters for the Appropriative Pool and Overlying Non-Agricultural Pool Parties."

Comment No. 2. Page 1-4 and Page 2-1 – Conjunctive-Use. ONAP comment reads: ***"Section 1.2 and Section 2.1 talk about conjunctive-use. How is conjunctive-use defined? What is included and excluded?"***

Response: First sentence of Section 1.2 describes conjunctive use.

Comment No. 3. Page 2-3 & 2-4 – Local Storage Applications/Agreements. ONAP comment reads: ***"Section 2.5 addresses the evergreen concept and the need for a revised Form 8. Will a new Form 1 also be needed? Will input from the Pools be considered in crafting revised forms?"***

Response: Proposed revised Forms, to the extent desired, will be considered and approved through the Pool Committee, Advisory Committee, and Board process.

Comment No. 4. Section 2.5. ONAP comment reads: **"Section 2.5 also comments that the evergreen agreements would be valid for the duration of the Peace Agreement. What happens upon expiration and how much advance notice will Parties have?"**

Response: The expiration of the Peace Agreement will be known at least five years in advance. Accordingly, the effect of the expiration of the Peace Agreement and storage agreements can be considered and addressed at the time an intervening SMP update is undertaken.

Comment No. 5. Page 2-4 – MPI. ONAP comment reads: ***"The last sentence in Section 2.5 discusses MPI. Please provide a summary of what MPI may be caused by water in storage if***

***the Parties do not exceed the proposed First Managed Storage Band of 800,000 AF. What MPI could be caused over 800,000 AF?"***

Response: The Storage Framework Investigation indicated there is no MPI within the FMSB; storage used above 800,000 AF will need to be evaluated for MPI (land subsidence, water quality, and pumping sustainability) and other adverse effects (e.g. reduction in Safe Yield, loss of Hydraulic Control).

## November 19, 2019 comment letter from the City of Chino

Comment No. 1. Section 1.2 (Page 1-5 2nd paragraph) and Section 2.1 (page 2-1 paragraphs 1 and 2). City's comment reads: ***"Section 1.2 indicates the combined use of managed storage and the existing Dry Year Yield (DYY) conjunctive use program is projected to reach a maximum of ~790,000 AF, assuming there is 100,000 AF in the DYY in 2028. Section 2.1 paragraph 1 indicates the First Managed Storage Band (FMSB, upper threshold = 800,000 AF) includes the DYY. Section 2.1 paragraph 2 indicates that extension of the DYY (beyond 2028) will require the DYY to use storage space above the 800,000 AF band threshold.*** (a) ***Does this mean that if the DYY is extended (beyond 2028) that the 100,000 AF of space below the 800,000 AF threshold (within FMSB) previously reserved for DYY use prior to 2028 is immediately available for managed storage use in 2029 and no longer available for the DYY?*** (b) ***Does this mean that any extension of the DYY program beyond 2028 would likely be required to mitigate impacts in-advance?*** (c) ***Do the terms of the existing DYY agreement require that the water in the DYY account be entirely depleted (withdrawn) prior to 2028 agreement expiration?"***

Response. (a) – Yes. (b) – Any Storage and Recovery Program would be approved only if any projected MPI and adverse impacts are addressed such that the Program could be undertaken without MPI or adverse impacts. (c) – The storage agreement does not address this issue; the Operating Committee is currently reviewing. The SMP is planned to be updated at a frequency no less than every 5 years so any changes regarding the DYYP agreement could be addressed in later updates if necessary.

Comment No. 2. City's comment reads: ***"Expanding on Comment No. 1 (above), the possibility of adjusting the FMSB upper threshold up or down, based on the Parties' needs, was discussed at the November 6th SMP Workshop #3. Please expand on the timing of the modifications to the FMSB and what the process would be to make changes to the FM SB. For example, would changes to the FMSB upper threshold require consent from all three Pools and would unanimous consent be required from the Appropriative and Overlying Non-Agricultural Pool members?"***

Response. The Restated Judgment gives Watermaster control over storage; Watermaster plans to update the SMP as described in Section 2.6 and at that time will seek input including water demand and supply projections from the Parties. The FMSB was defined based on the Parties' input, which would be considered again at the time of any SMP update.

Comment No. 3. Section 2.3.2. City's comment reads: ***"Section 2.3.2 indicates that reduction in Safe Yield (SY) due to projected managed storage volume is incorporated into the SY estimate, and that this adverse impact (i.e. reduced Safe Yield) is mitigated by the prospective calculation***

***of SY.*** (a) ***Please provide a tabulation or other form of explanation that illustrates the impact/mitigation below the FMBS threshold of 800,000 AF. Presumably, other factors (besides managed storage) may also have the effect of reducing Safe Yield.*** (b) ***Can it be determined what portion of estimated SY reduction is due to storage management and what portion of estimated SY reduction is due to other factors?*** (c) ***If yes, then how can these factors (i.e. managed storage and other cultural condition factors) be described in separate quantitative terms to allow for a practical means to reconcile the associated impacts on an annual basis?***

***For example, if SY (net recharge) is reduced as a result of increasing storage volumes (assuming no corresponding implementation of a plan for optimizing production that would be necessary to maintain SY), can this cause & effect be expressed algebraically?*** (d) ***If yes, then what is the algebraic formula? If no, then what practical method(s) may be used to quantify the cause & effect on an annual basis as storage volumes fluctuate?"***

Response. (a) – This information has not been developed by Watermaster or its consultants. (b) – Theoretically, yes. (c) – Technical work could be done to develop methods to allocate the projected changes in net recharge and Safe Yield based on changes in cultural conditions and the individual Parties pumping, recharge and the storage activities. (d) – This would be determined in the work described in (c). This scope of work is highly impractical as there are many variables to consider and thus has not been considered or budgeted.

Comment No. 4. City's comment reads: ***"Expanding on Comment No. 3 (above), Storage Framework Investigation (SFI) Figure 5-7 depicts a projected inflection point at approximately Year 2040 when the net recharge begins to steadily increase. SFI Figure 6-3 describes managed storage volumes in Year 2040 to be well above 500,000 AF (depending on assumed operating scenario), and then dropping to approximately 340,000 AF in the Year 2056. Please provide an explanation of the circumstances depicted by these two figures, and how/why Safe Yield (net recharge) is projected to increase in the future when there is a significant amount of managed storage."***

Response. As to Figure 5-7, the following observations can be made from the review of 2018 SFI report Tables 3-4 and 3-5. In Scenario 1A, total groundwater pumping is projected to increase from about 146,000 afy in 2018 to about 154,000 afy in 2030 (~ 8,000 afy increase) and thereafter gradually increase to about 177,000 afy by 2040 (~23,000 afy increase). Projected pumping is less than pumping rights through 2030 and storage is projected to increase through 2030. After 2030, pumping exceeds pumping rights and storage is projected to decrease. The net recharge projection generally declines with increasing storage and increases with decreasing storage. There is a time lag between the onset of the decrease in storage and increase in net recharge that is attributable to the basin dynamics – in 2032 the rate of decline in net recharge declines and by about 2040 the net recharge starts to increase. Inspection of the water budget shown in Table 3-5 indicates that the total recharge during the 2018 through 2050 period is fairly consistent and averages about 200,000 afy; and that the total discharge increases gradually over the same period from about 190,000 afy to 218,000 afy tracking the projected pumping. Cultural

conditions have some effect in that the deep infiltration of precipitation and applied water decreased by about 5,000 afy from 2018 to 2050 and however this effect has been offset by a projected increase in storm water recharge in 2021.

As to Figure 6-3 the projected decline in managed storage occurs because 80 percent of the projected replenishment obligation, estimated to be about 17,000 afy after 2030, is satisfied from managed storage.

Comment No. 5. . Sections 2.4.2 and 2.4.3. City's comment reads: ***"Both discussions end with an indication that Watermaster may require changes in Storage and Recovery (S/R) agreements to mitigate impacts. What processes of Watermaster notification and S/R Party response are contemplated to allow S/R Parties to modify their behavior to avoid or minimize further mitigation after they have presumably already provided mitigation at the time their S/R agreements were initially approved?"***

Response. Watermaster may adopt uniform rules to address triggers, notice, opportunity to respond and to implement corrective actions. Moreover, as part of the Storage and Recovery application and approval process, each Storage and Recovery application may have customized conditions responsive to the characteristics of the specific project.

Comment No. 6. White Paper. City's comment reads: ***"The SFI (page 1-5) indicates the Chino Basin Groundwater Model and Recalculation of Safe Yield Pursuant to the Peace Agreement {Safe Yield report) assessed the hydrology of the Chino Basin, and concluded that managed storage was projected to increase from 487,000 AF in Year 2016 to approximately 663,000 AF by Year 2030 and then decline thereafter to zero (0.0) AF by Year 2051. This was restated in the White Paper at the bottom of page 5. However, as described in Comment No. 4 (above), the subsequent SFI analysis (Figure 6-3) indicates managed storage is projected to be approximately 340,000 AF in Year 2056.*** (a) ***Does the SFI analysis update/replace the conclusion of the Safe Yield report with respect to the projected volume of managed storage in future years? Please explain."***

***"The White Paper (page 3) indicates the Operational Storage Requirement (OSR) is the volume of storage necessary to maintain the Safe Yield (SY), and that during the development of the Optimum Basin Management Program (OBMP ~ Year 2000) the OSR was estimated to be 5.3 MAF. The White Paper also indicates the Safe Storage Capacity {SSC} in addition to the OSR was estimated (~ Year 2000) to be 500,000 AF (the SSC is the amount of storage for which it was believed significant water quality impacts would not be triggered by groundwater level). More recent Storage Framework Investigation (SFI) analyses seem to indicate that the SSC is~ 800,000 AF. SMP Section 2.6 indicates it is projected that the aggregate amount of managed storage by the Parties is approximately 340,000 AF in Year 2056 and that impacts resulting from an aggregate managed storage volume less than 340,000 AF has not been estimated.***

***However, recent SMP workshop discussions seem to suggest that if the aggregate managed storage volume is less than 340,000 AF, then it is believed that new land subsidence may result.*** (b) ***What relationships exist between the originally estimated 5.3 MAF OSR, the originally estimated 500,000 AF SSC, the 800,000 AF SFI FMSB, and the projected 340,000 AF managed storage volume?"***

Response. (a) – Yes. The 2018 SFI uses updated water demand and supply projections. (b) – The estimated 5,300,000 af OSR and 500,000 af SSC described in the Peace Agreement IP have no relationship to 800,000 af FMSB described in the 2020 SMP. The storage management plan in the 2020 SMP is a completely different management paradigm than that described in the Peace Agreement IP. The 2018 SFI and 2020 SMP are based on 20 years of monitoring, a significantly updated hydrogeologic understanding of the basin and improved modeling.

Comment No. 7. Section 2.3.2. City's comment reads: ***"Comment No. 3 (above), pertaining to Section 2.3.2, describes a circumstance that might generally be regarded as an adverse impact since SY is reduced. Maintenance of the 340,000 AF threshold described in Comment No. 6 (above) would seem to represent a positive impact i.e. prevents triggering the "onset of new land subsidence" that would likely occur when managed storage falls below that critical managed storage volume. If true, then how might this positive impact be quantified?"***

Response. Quantification of a benefit on preventing the occurrence of new land subsidence by maintaining managed storage in excess of 340,000 af is beyond the scope of the 2018 SFI.

## November 19, 2019 comment letter from the City of Ontario

**1. Storage Bands**

**a.** ***Section 1.2 describes end conditions for the volume of water in the DYYP account in 2028 and the subsequent extraction. This paragraph (the second paragraph on page 1-5) does not accurately characterize the agreement between Metropolitan Water District and the Parties to the DYYP. Parties are not obligated to perform (i.e. remove water from the DYYP storage account) after 2028.***

Response. The DYYP agreement does not address this issue; the Operating Committee is currently reviewing. The SMP is planned to be updated at a frequency no less than every 5 years so any changes regarding the DYYP agreement could be addressed at later updates if necessary.

***b. Section 2.1 states that "the managed storage space between 800,000 and 1,000,000 af is reserved for Storage and Recovery Programs" (emphasis added).***

***i. If, due to changing conditions or water resource management, Parties desire to store more than 800,000 af, will Watermaster authorize storage agreements for Parties to do so?***

Response. Yes, but this will require future technical evaluations and an SMP revision that would occur in periodic update of the SMP as described in Section 2.6.

***ii. Does this statement indicate that Watermaster intends to reserve space above 800,000 af for Storage and Recovery Programs which may never come to fruition?***

Response. No, Watermaster anticipates, based on Parties' projections, that 800,000 AF would be adequate to satisfy Parties' storage activities and the DYYP until 2030. Watermaster plans to evaluate projections periodically and update the SMP no less frequently than every 5 years having the opportunity to adjust and avoid limiting the Parties use.

***c. Section 2.1 states that "renewal or extension of the DYYP agreement will require the DYYP to use storage space above 800,000 af." It is unclear why this is required.***

Response. The FMSB for the 2020 SMP includes the projected managed storage requirement of the Parties and the DYYP. The DYYP is included in the FMSB because it is

an existing Storage and Recovery Program, it places contractual requirements on the Parties and it will terminate in 2028. Renewal or extension of the DYYP will trigger a new Storage and Recovery Program application process and the terms of the renewed or extended DYYP storage agreement will need to be consistent with the SMP at the time the new Storage and Recovery Program application is considered by Watermaster. Storage and Recovery Programs utilize storage above the FMSB. The 800,000 afy contained in the FMSB will be revised no later than 2025 and it may be increased or decreased based on the managed storage requirements of the Parties.

***d. In the last paragraph of Section 2.1, it is noted that "the use of managed storage greater than 1,000,000 af may be possible provided the storing entity…demonstrates that the program has broad mutual benefit."***

***i. What is the basis for this requirement? The Peace Agreement does not require all Storage and Recovery Programs provide broad mutual benefit. Broad mutual benefit is only necessary if Watermaster acts to condition, curtail or prohibit Local Storage to provide priority to Storage and Recovery Program(s).***

Response. Section 5.2(c)(iv)(b) of the Peace Agreement provides that Watermaster shall prioritize its efforts to regulate and condition the storage and recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits.

***ii. How is broad mutual benefit demonstrated and/or determined?***

Response. Broad mutual benefit will be determined at the time that application(s) for Storage and Recovery Program storage agreements are received, and it may be determined through Activity B as it is being contemplated in the 2020 OBMP Update.

**2. Use of Spreading Basins**

***a. In Appendix B, Watermaster's response to Inland Empire Utilities Agency's (IEUA) Comment No. 1 states that "there is an existing hierarchal scheme for the use of spreading basins." The listed "hierarchal scheme" includes first flood control, second stormwater recharge, third Watermaster replenishment and recharge, and fourth IEUA recycled water recharge. Who developed the hierarchal scheme for the use of spreading basins and where is this scheme documented? To which basins does it apply? Basins may be owned by San Bernardino County Flood Control District, Chino Basin Water Conservation District, or IEUA.***

Response. The priorities are established in Section III of the "Agreement for Operation

and Maintenance of Facilities to Implement the Chino Basin Recharge Master Plan". They are also specified by basin in the Operations Manual.

b. ***Additionally, basins and basin improvements in some cases were funded 50% by IEUA to increase recycled water recharge. How does the stated hierarchal scheme recognize the priority of the Parties that have invested financially in the basins?***

Response. See response to comment 2.a. above.

3. ***Mitigation***

a. ***What is the benchmark for mitigation impacts to net recharge and Safe Yield? In other words, is the demonstrated reduction compared against 140,000 afy, 135,000 afy, or another value, such as a theoretical Safe Yield absent stored water?***

Response. The benchmark is estimated net recharge and Safe Yield absent stored water.

b. ***The Storage Framework Investigation concluded that the reduction in Safe Yield (as a percentage of average annual storage space used) ranged from 1.50% to 2.41% for bands 2, 3 and 4. The Storage Management Plan states this value as 2.0 percent. Please clarify if the 2.0 percent is an average across the three bands or if Watermaster is using a different methodology to set the 2.0 percent impact.***

Response. It is an average. For clarity the text of SMP document was revised and it now reads:

> "The 2018 SFI concluded the that the net recharge and Safe Yield of the basin would be reduced annually by about 2.0 percent <u>(ranged from 1.5 to 2.4 percent) of</u> the volume of water stored in a Storage and Recovery Program." (emphasis added)

c. ***Section 2.4.1 suggests prioritizing puts and takes in MZ2 and MZ3, in part due to impacts on "solvent plumes." Solvent plumes are also present in MZ2 and could be impacted by puts and takes in that zone, as could pumping depressions. Each Storage and Recovery***

***Program should be individually analyzed to determine acceptable put and take locations.***

Response. Comment noted.

***d. For the process described in the second paragraph of Section 2.4.2, please describe if Watermaster will estimate lifetime reduction in net recharge at the onset of a Storage and Recovery Program, to be deducted annually similar to Local Storage losses, or if another method is envisioned.***

Response. Watermaster will prepare an initial estimate of "rate" of reduction in net recharge and Safe Yield attributable to a specific Storage and Recovery Program during the application process. Watermaster may update the rate periodically as described in the fourth paragraph of Section 2.4.2 (SMP version 2) and through periodic updates of the SMP as described in Section 2.6.

***4. Scope and Timing of Environmental Review***

***The Appropriative Pool formally requested that Watermaster proceed with the environmental review of storage management, including working with the Appropriative Pool's technical consultant. Watermaster has indicated that it intends to incorporate the Storage Management Plan into the current Optimum Basin Management Plan (OBMP) update effort, and then pursue environmental review on the package. However, the OBMP update effort is not subject to the same demonstrated time sensitivities as the Storage Management Plan, and negotiations have not yet begun on the activities to be included in an implementation plan. Ontario requests that Watermaster, responsive to the Pool's request, perform environmental review of the Storage Management Plan independent of and ahead of any environmental review that may be needed for the OBMP update.***

Response. Comment noted.

***5. Frequency of Updates***

***What is the basis for setting the minimum frequency at every five years? Performing the update every ten years concurrently with Safe Yield recalculations will provide a timelier and more comprehensive picture of storage projections. The five-year requirement is excessive and presents an unnecessary cost to the paying stakeholders. If conditions change or if the need arises, additional updates can be performed. Ontario recommends a minimum frequency of every ten years for updates.***

Response. Comment noted.

***6. Characterization of Material Physical Injury***

***a. In Footnote 7 defining Material Physical Injury, storage and recovery is incorrectly listed as "Storage, and Recovery." In the definition in Peace I, the term "storage and recovery" is not capitalized (in other words, is not a defined term) and is not separated into two actions by the placement of the comma.***

Response. The text of SMP document was revised and it now reads:

> "Material Physical Injury" means material injury that is attributable to the Recharge, Transfer, <u>storage and recovery,</u> management, movement or Production of water, or implementation of the OBMP, including, but not limited to, degradation of water quality, liquefaction, land subsidence, increases in pump lift (lower water levels), and adverse impacts associated with rising Groundwater." (emphasis added)

***b. Section 1.2 states that "for the planned use of managed storage by the Parties up to 700,000 af…there would be no MPI with the exception of a reduction of net recharge and Safe Yield…." A reduction of net recharge and Safe Yield is not included in the definition of Material Physical Injury.***

Response. The SMP document has been revised to characterize the reduction in net recharge and Safe Yield attributable to managed storage activities as an adverse impact. The text now reads:

> "The 2018 SFI projected that for the planned use of managed storage by the Parties up to 700,000 af that Hydraulic Control would be <u>maintained, that there would be no MPI and that there would be an adverse impact from the</u> reduction of net recharge and Safe Yield attributable to the use of managed storage." (emphasis added)

***c. Section 2.4.2 includes "reduction in Safe Yield" in the list of "MPIs to be addressed" in the first paragraph. A reduction in Safe Yield is not included in the definition of Material Physical Injury.***

Response. The SMP document has been revised to characterize the reduction in net recharge and Safe Yield attributable to managed storage activities as an adverse impact.

***7. Types of Storage Accounts Storage Agreements***

***a. Section 1.1 lists "four types of storage accounts" under "three types of storage agreements." It is unclear what the three types of storage agreements are, and the four types of storage accounts include "Local Storage" separate from "Local Supplemental" and "Excess Carryover." By definition, Local Storage includes Excess Carryover and Local Supplemental. Please clarify this statement.***

Response. The text of the SMP document was revised and now reads:

> "Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. <u>There are three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery.</u> An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool Parties) and Basin Water acquired from other Parties. Local Supplemental Water accounts includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes Supplemental Water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment. <u>Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process</u>." (emphasis added)

**b.** ***Please include a citation for the quotation at the top of page 1-3.***

Response. The SMP document was revised to include the citation. The citation reads: "See paragraph 5.2(c)(iv)(b) of the Peace Agreement"

## November 22, 2019 comment letter from the City of Upland

Comment No. 1. Section 1.2, Page 1-4. City's comment reads: **" Reduction of net recharge appears to be characterized herein as Material Physical Injury (MPI).** (a) **However, in Section 2.3.2 and at the November 6, 2019 2020 SMP workshop, reduction of net recharge is characterized as an adverse impact and mitigated for within the Safe Yield recalculation.** (b) **With the typical duration between Safe Yield recalculations being approximately 10-years, why isn't the mitigation for reduction of net recharge calculated annually to respond to the annual fluctuations in storage volume (as proposed in Section 2.4.2 for Storage and Recovery Programs)?** (c) **What are the advantages and disadvantages for mitigating for reduction in net recharge being embedded in Safe Yield versus on an annual basis?"**

Response. (a) – The text in the SMP has been modified to describe reductions in net recharge and Safe Yield as an adverse impact. (b) The Court's April 2017 order establishes the SY recalculation methodology; the recalculation considers the volume of wet water in Storage over the coming decade. (c) See part (b).

Comment No. 2. Section 1.2, Page 1-5. City's comment reads: **" Generally, what is the technical basis for allowing the Dry Year Yield Program (DYYP) to exceed puts and takes? What was the technical basis for allowing the DYYP takes to exceed 40,000 acre-feet (AF) in 2009? Is that approved by Watermaster as an administrative procedure or is that circulated through the Pools and board for approval?"**

Response. When MWD wants to exceed the 25,000 AF of annual put set forth in the DYYP agreement, the Parties consider the request through the regular Watermaster process.

Comment No. 3. Section 2.1, Page 2-1. City's comment reads: **" Regarding storage greater than 1,000,000 AF, consider revising and elaborating on that process. More specifically, what constitutes a "bona fide" application. In addition, please consider adding the required CEQA analysis to store above 1,000,000 AF."**

Response. The text in the SMP document was revised to include a footnote containing a definition of a bona fide Storage and Recovery Program application. The footnote reads:

> "A bona fide Storage and Recovery Program application includes the name of the person; the source, quantity and quality of the Supplemental Water; a description of the facilities proposed to be used, operating plan and duration of the proposed Storage and Recovery Program; CEQA documentation; and any other information Watermaster requires to evaluate the application."

The SMP text was also revised to include a requirement to complete a CEQA process for Storage and Recovery Program application that wish to use managed storage space in excess of 1,000,000 af.

Comment No. 4. Section 2.2, Page 2-1. City's comment reads: **" The City's "Upland Basin" is used by Watermaster and IEUA pursuant to an agreement between the three agencies. The agreement stipulates a specific quantity of storage space allocated to Watermaster and IEUA. To date, the agencies have worked cooperatively under said agreement to optimize basin usage, including storage above the dead storage quantity and allowing others to use the City's basin for recharge. The priority of additional recharge above the 200,000 AF in the agreement is subject to negotiation. This section needs to be clarified to recognize that use of some spreading basins is subject to separate agreement(s)."**

Response. The text of the SMP document was revised and it now reads:

> "Watermaster will include provisions in storage agreements to prioritize the use of spreading basins to satisfy Watermaster's recharge and replenishment obligations over the use of spreading basins for other uses <u>subject to limitations provided in existing agreements with the owners of the facilities</u>." (emphasis added)

Comment No. 5. Section 2.3.1, Pages 2-1 and 2-2 . City's comment reads: **" The limitations placed on agencies within MZ1 due to the potential to cause MPI will likely be in effect for "more than 20-years" according to Watermaster (Appendix B, Comment No. 5, Page B-2) appear to pose a long-term constraint on the ability of agencies within MZ1 to manage water. This limitation on transfers should also allow for a reconsideration on a case by case basis, over the next 20-years or more, by Watermaster to ensure there will be no MPI.**

**For example, if a proposed transfer or lease from a Party that pumps outside of MZ1 to a Party that pumps in MZ1 demonstrates groundwater levels remain greater than the new land subsidence metric (i.e. new land subsidence won't occur per 2018 SFI Section 2.2.1), then consideration should be given by Watermaster."**

Response. Comment noted.

Comment No. 6. Section 2.3.2, Page 2-2. City's comment reads: **" Same comments as above regarding mitigation for reduction of net recharge."**

Response. Comment noted.

Comment No. 7. Section 2.5, Page 2-4. City's comment reads: **" Define the term "evergreen agreement". Please provide clarification on the automatic adjustment (i.e. can be adjusted both up and down)."**

Response. Evergreen in this context signifies an agreement to store water that accommodates changes in the quantity of water in storage within FMSB, without requiring a new storage application.

## November 20, 2019 comment letter from the Monte Vista Water District

Comment No. 1. MVWD comment: **"The SMP should specify which portions are proposed for incorporation into the 2020 Optimum Basin Management Program (OBMP) Implementation Plan as an amendment to the Peace Agreement. It may make more sense for Peace Agreement Parties to negotiate an amendment to the Peace Agreement (OBMP Implementation Plan) prior to approving the SMP, as the SMP must be consistent with the Peace Agreement, whether or not it is amended and only through consent of the Peace Agreement Parties."**

Response. The entire document is planned to be included in the 2020 OBMP IP.

Comment No. 2. MVWD comment: **"The SMP should acknowledge the priority of storage for Storage and Recovery Programs to the extent that Local Storage may be curtailed or prohibited (Peace Agreement 5.2 (b)(xi))."**

Response. The SMP has been drafted to provide the Parties with the use of all necessary storage for Local and Storage and Recovery activities consistent with the Parties' preferences and needs.

Comment No. 3. MVWD comment: **"The SMP should direct Watermaster to fully mitigate any reduction in Safe Yield due to either historical or projected storage activities in a manner that is equitably applied to all applicable storage activities so that Safe Yield is kept whole in respect to these storage activities."**

Response. Watermaster considers that the effects of storage activities in Safe Yield are addressed by the recalculation of Safe Yield pursuant to the Technical Memorandum methodology approved by the Court's April 28, 2017 order. Watermaster staff has been informed that the Appropriative Pool has reached agreement among Parties on how to compensate for individual storage activity effects on Safe Yield reduction.

Comment No. 4. MVWD comment: **"The SMP should focus on water stored in the basin that is subject to an agreement with Watermaster under the Judgment. This includes Local Storage (Excess Carryover and Supplemental), Storage and Recovery, and Preemptive Replenishment. Carryover is part of a producing Party's annual production right and not subject to an agreement with Watermaster. If Carryover is in excess of a Party's annual share of safe yield, the Party may then store the excess Carryover in a Local Storage (Excess Carryover) account under agreement with Watermaster. In contrast, water under a preemptive replenishment agreement is water stored in the basin under agreement with Watermaster; therefore, its management should be included in the SMP."**

Response. The Safe Storage Capacity identified in the OBMP IP included Carryover, which is “wet water” in storage. Similarly, the SMP provides for management of water in storage regardless of whether an agreement with Watermaster is required.

Comment No. 5. MVWD comment: **“For purposes of brevity and to avoid any potential confusion, the SMP should avoid describing the process and requirements for determining material physical injury (MPI), and instead refer to relevant sections of the Peace Agreement and Rules and Regulations governing MPI determination.”**

Response. Comment noted.

Comment No. 6. MVWD comment: **“The SMP should, under the principle of "beneficiary pays," include the implementation of a storage assessment as a more equitable way to allocate Chino Basin Watermaster costs related to storage.”**

Response. The judgment provides for Watermaster costs to be recovered using production-based assessments.

**General response to MVWD redlined version of 2020 Draft Storage Management Plan, Version 2.**

MVWD prepared a redline version of the 2020 SMP Version 2 document. The document has been modified to reflect comments received from various parties, this includes MVWD’s edits consistent with the overall document philosophy. Watermaster’s staff general responses to the suggested redline document are listed below:

1. Information included in the Background section is considered useful to the reader.
2. Carryover is “wet water” in the basin and was included in the Safe Storage Capacity in the OBMP IP. While Carryover does not require a storage agreement with Watermaster it is within Watermaster’s management and control, thus it is included in managed storage.
3. Preemptive replenishment accounts will no longer be used after current balances have been depleted.
4. The rebuttable presumption of no MPI was eliminated as part of the Second Amendment to the Peace Agreement.
5. Watermaster estimates the amount of storage to be used by Parties based on their projections will be 800,000 af including DYYP and not 720,000 af.
6. Watermaster is tasked with evaluating transfers and put and take operations before approving them.
7. The SMP provides a high-level description of Storage and Recovery Program requirements including Hydraulic Control impacts, this is intended to be helpful to future Storage and

Recovery Program applications.

8. Watermaster considers it necessary that the SMP be updated at the indicated frequency.

## November 20, 2019 comment letter from the Chino Basin Water Bank

Comment No. 1. Comment reads: ***"Based on our understand that the storage space used by the Parties is projected to reach 720 KAF and the combined use of managed storage by the Parties and Metropolitan's DYYP is projected to reach a maximum of about 790 KAF, how was the 800 KAF for the S&R Program derived?"***

Response: Please see Appendix C of the final SMP report. The projected use of managed storage space by the Parties and Metropolitan is just under 800,000 af. The value of 800,000 af was arrived at by rounding up.

Comment No. 2. Comment reads: ***"Why are S&R required to mitigate MPI as if the 800 KAF were fully used, when it potentially is not?"***

Response: This is based on the Peace Agreement paragraph 5.2(c)(xiii) and (ix) that require Watermaster to condition Storage and Recovery Program storage agreements to protect the Parties and the basin from any potential MPI and to consider Broad Mutual Benefits.

Comment No. 3. Comment reads: ***"How do the estimated net recharge of 2.41% and 1.5% as average storage used translate to the annual loss percentages?"***

Response: See response to City of Ontario's comment No. 3.b.

Comment No. 4. Comment reads: ***"What process does Watermaster propose to adjust loss percentages in the future so that S&R Programs will have adequate time to prepare prior to changing conditions going into effect?"***

Response: Watermaster may adopt uniform rules to address triggers, notice, opportunity to respond and to implement corrective actions. Moreover, as part of the Storage and Recovery application and approval process, each Storage and Recovery application may have customized conditions responsive to the characteristics of the specific project.

# Appendix C

## 2019 Update of Water Demand, Water Supply and Managed Storage Projections through 2050

# Appendix C – 2019 Update of Water Demand, Water Supply and Managed Storage Projections through 2050

During the development of the 2020 SMP, Watermaster requested the Appropriative Pool Parties to review their water demand, associated water supply plan and their plans to use their stored water that were used in the 2018 SFI and update them if warranted. The planning period for the 2020 SMP is 2020 through 2050. Table C-1 shows the projected groundwater pumping by all Parties along with the recent historical pumping. The groundwater pumping projections for the Appropriative Pool Parties were unchanged from those used in the 2018 SFI except for three Parties: Cities of Chino and Pomona and the Monte Vista Water District (MVWD). The table below summarizes the differences between the pumping projections used in the 2018 SFI and the 2020 SMP. In summary the projected pumping in the 2020 SMP is less than that assumed in the 2018 SMP.

**Comparison of total projected pumping for the 2018 SFI and 2020 SMP (afy)**

| Year | 2018 SFI | 2020 SMP | 2020 SMP – 2018 SFI |
|---|---|---|---|
| 2020 | 144,527 | 139,519 | -5,008 |
| 2025 | 149,468 | 144,596 | -4,872 |
| 2030 | 154,302 | 151,808 | -2,494 |
| 2035 | 167,772 | 164,600 | -3,122 |
| 2040 | 176,765 | 173,805 | -2,969 |

Table C-2 lists the projected time series of managed storage by the Parties through 2050 based on the pumping projections in Table C-1. Table C-2 is constructed as follows.

- Column 1 lists the planning fiscal year ending on June 30.
- Column 2 list the projected total annual pumping based on the updated total pumping projections listed in Table C-1.
- Columns 3, 4 and 5 contain the projected annual Safe Yield from Scenario 1A of the 2018 SFI, Reoperation water used to partially offset annual Desalter replenishment obligation and the projected annual recycled water recharge.
- Column 6 lists the total annual pumping right which is equal to the sum of columns 3, 4 and 5.
- Column 7 lists the net annual replenishment obligation and is equal to the projected total annual groundwater pumping minus the projected total annual pumping rights. A negative value means that pumping is less than pumping rights and the difference results in an increase in managed storage. A positive value indicates that pumping exceeds pumping rights and a replenishment obligation has occurred that must offset through wet-water recharge and or from managed storage.

- Column 8 lists the annual amount of the replenishment obligation that is satisfied from storage. In the 2018 SFI it was determined that about 80 percent of the replenishment obligation would be satisfied from water in storage accounts and that assumption has not changed.
- Column 9 lists the annual amount of the replenishment obligation that is satisfied through wet-water recharge.
- Column 10 list the time history of end-of-year managed storage. The end-of-year managed storage is numerically equal to the end-of-year managed storage at the end of the prior year minus the net replenishment obligation (column 7) plus wet-water replenishment (column 9).

The maximum managed storage by the Parties is reached is 713,100 af in 2030. After 2030, the managed storage is projected to decline annually and reach about 484,000 af by 2050.

Metropolitan's Dry-Year Yield Program (DYYP) is the only active Storage and Recovery Program in the basin. The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. The DYYP storage and recovery agreement provides that puts and takes can exceed these values if agreed to by Watermaster (as was done in fiscal years 2018 and 2009, respectively). The agreement that authorizes the DYYP will expire in 2028.

The combined use of managed storage by the Parties and Metropolitan's DYYP is projected to reach a maximum of about 791,300 af assuming that the DYYP has 100,000 af in storage in 2028 and that subsequent to 2028 Metropolitan removes that water from managed storage at the contract rate of 33,300 afy starting in 2029. This is illustrated in the table below.

**Total potential combined end-of-year managed storage of the Parties and Metropolitan (af)**

| Year | Parties | Metropolitan | Total |
|---|---|---|---|
| 2026 | 664,842 | 100,000 | 764,842 |
| 2027 | 678,623 | 100,000 | 778,623 |
| 2028 | 691,254 | 100,000 | 791,254 |
| 2029 | 702,734 | 66,667 | 769,434 |
| 2030 | 713,063 | 33,333 | 746,463 |
| 2031 | 713,061 | 67 | 713,128 |

## Table C-1 Historical and Projected Groundwater Pumping in the Chino Basin

(af)

| Producer | Historical Pumping | | | | | | | | | | Pumping Projection (2019 Update) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Statistics (2013-2019) | | | | | | | |
| | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Min | Max | Mean | 2020 | 2025 | 2030 | 2035 | 2040 |
| **Overlying Agricultural Pool** | | | | | | | | | | | | | | | |
| Aggregate Agricultural Pool Pumping | 23,946 | 22,063 | 17,361 | 16,904 | 17,786 | 18,827 | 15,572 | 15,572 | 23,946 | *18,923* | 15,678 | 12,788 | 9,968 | 7,907 | 4,808 |
| **Overlying Non-Agricultural Pool** | | | | | | | | | | | | | | | |
| Ameron | 59 | 18 | 29 | 30 | 25 | - | - | 18 | 59 | *32* | - | - | - | - | - |
| Angelica Textile Service | 48 | 37 | 26 | 28 | 20 | - | - | 20 | 48 | *32* | - | - | - | - | - |
| California Speedway Corporation | 509 | 436 | 454 | 300 | 410 | 438 | 389 | 300 | 509 | *419* | 500 | 500 | 500 | 500 | 500 |
| California Steel Industries, Inc. | 1,303 | 1,417 | 1,279 | 1,187 | 1,298 | 1,266 | 1419 | 1,187 | 1,419 | *1,310* | 1,450 | 1,450 | 1,470 | 1,500 | 1,530 |
| General Electric Company | 1,285 | 1,626 | 1,355 | 917 | 1,667 | 957 | 1127 | 917 | 1,667 | *1,276* | 1,667 | 1,667 | 1,667 | 1,667 | 1,667 |
| NRG California South LP | 470 | 290 | 221 | 204 | 211 | 212 | 18 | 18 | 470 | *232* | 232 | 232 | 232 | 232 | 232 |
| Riboli Family and San Antonio Winery, Inc. | 10 | 10 | 7 | 4 | 5 | 6 | 26 | 4 | 26 | *10* | 10 | 10 | 10 | 10 | 10 |
| Southern Service Company | - | - | - | - | - | 21 | 23 | 21 | 23 | *22* | 32 | 32 | 32 | 32 | 32 |
| TAMCO | - | - | - | - | - | 18 | 10 | 10 | 18 | *14* | 32 | 32 | 32 | 32 | 32 |
| *Subtotal Overlying Non-Agricultural Pool Pumping* | *3,685* | *3,834* | *3,371* | *2,670* | *3,636* | *2,919* | *3,010* | *2,670* | 3,834 | *3,304* | *3,923* | *3,923* | *3,943* | *3,973* | *4,003* |
| **Appropriative Pool** | | | | | | | | | | | | | | | |
| Arrowhead Mountain Spring Water Company | 413 | 379 | 426 | 356 | 367 | 308 | 285 | 285 | 426 | 362 | 400 | 400 | 400 | 400 | 400 |
| City of Chino | 7,022 | 6,725 | 6,546 | 5,010 | 4,972 | 5,162 | 4,315 | 4,315 | 7,022 | 5,679 | 8,262 | 9,696 | 11,058 | 11,945 | 14,355 |
| City of Chino Hills | 3,039 | 2,163 | 3,745 | 1,633 | 2,246 | 2,839 | 1,608 | 1,608 | 3,745 | 2,468 | 2,570 | 3,600 | 3,600 | 3,600 | 3,600 |
| City of Ontario | 21,146 | 21,980 | 17,675 | 22,849 | 24,840 | 26,280 | 20,722 | 17,675 | 26,280 | 22,213 | 12,363 | 14,514 | 17,947 | 23,715 | 31,016 |
| City of Pomona | 12,227 | 12,909 | 12,520 | 9,964 | 8,067 | 9,286 | 10,840 | 8,067 | 12,909 | 10,830 | 11,309 | 11,395 | 11,481 | 11,568 | 11,568 |
| City of Upland | 2,358 | 2,822 | 3,416 | 2,601 | 1,260 | 1,764 | 2,381 | 1,260 | 3,416 | 2,372 | 2,800 | 2,800 | 2,800 | 2,800 | 2,800 |
| Cucamonga Valley Water District | 18,740 | 16,122 | 14,640 | 20,537 | 16,562 | 6,838 | 9,624 | 6,838 | 20,537 | 14,723 | 12,755 | 13,687 | 13,859 | 19,282 | 19,282 |
| Fontana Water Company | 11,752 | 15,377 | 13,344 | 15,317 | 13,250 | 11,392 | 9,961 | 9,961 | 15,377 | 12,913 | 9,920 | 10,416 | 13,153 | 15,591 | 17,942 |
| Jurupa Community Services District | 17,411 | 18,406 | 12,805 | 9,284 | 11,498 | 15,286 | 13,894 | 9,284 | 18,406 | 14,083 | 10,310 | 12,310 | 14,310 | 14,310 | 14,310 |
| Marygold Mutual Water Company | 1,250 | 1,315 | 1,250 | 753 | 619 | 944 | 950 | 619 | 1,315 | 1,011 | 1,241 | 1,322 | 1,403 | 1,484 | 1,565 |
| Monte Vista Water District | 10,324 | 12,522 | 7,402 | 8,371 | 7,086 | 6,483 | 6,631 | 6,483 | 12,522 | 8,403 | 6,500 | 6,257 | 6,397 | 6,537 | 6,668 |
| Niagara | 1,000 | 1,343 | 1,860 | 1,775 | 1,532 | 1,571 | 1,683 | 1,000 | 1,860 | 1,537 | 1,537 | 1,537 | 1,537 | 1,537 | 1,537 |
| San Antonio Water Company | 1,540 | 1,159 | 1,479 | 1,031 | 538 | 428 | 376 | 376 | 1,540 | 936 | 1,232 | 1,232 | 1,232 | 1,232 | 1,232 |
| San Bernardino County (Olympic Facility) | 12 | 16 | 11 | 9 | 13 | 11 | 11 | 9 | 16 | 12 | 12 | 12 | 12 | 12 | 12 |
| Golden State Water Company | 1,059 | 736 | 720 | 807 | 850 | 148 | 0 | 0 | 1,059 | 617 | 374 | 374 | 374 | 374 | 374 |
| *Subtotal Appropriative Pool Pumping* | *109,292* | *113,974* | *97,840* | *100,297* | *93,699* | *88,740* | *83,280* | *83,280* | *113,974* | *98,160* | *81,585* | *89,552* | *99,564* | *114,387* | *126,661* |
| **Chino Desalter Authority** | | | | | | | | | | | | | | | |
| Total Desalter Pumping | *27,098* | *29,282* | *30,022* | *28,191* | *28,284* | *30,088* | *31,233* | *27,098* | *31,233* | *29,171* | *40,000* | *40,000* | *40,000* | *40,000* | *40,000* |
| 2020 SMP Projected Total Pumping | 164,021 | 169,153 | 148,593 | 148,061 | 143,405 | 140,574 | 133,095 | *133,095* | *169,153* | *149,557* | 141,186 | 146,263 | 153,474 | 166,266 | 175,472 |
| Less GE Injection | | | | | | | | | | | -1,667 | -1,667 | -1,667 | -1,667 | -1,667 |
| 2020 SMP Projected Net Total Basin Pumping | | | | | | | | | | | 139,519 | 144,596 | 151,808 | 164,600 | 173,805 |
| 2018 SFI Projected Net Total Basin Pumping | | | | | | | | | | | 144,527 | 149,468 | 154,302 | 167,722 | 176,765 |
| Change in Projected Net Total Basin Pumping from the 2018 SFI Projection | | | | | | | | | | | -5,008 | -4,872 | -2,494 | -3,122 | -2,960 |

increase relative to 2018 SFI projection

decrease relative to 2018 SFI projection

## Table C-2 Projected Groundwater Pumping, Pumping Rights, Replenishment and End-of-Year Volume in Managed Storage – SFI Scenario 1A Revised

(af)

| Fiscal Year ending June 30 | Projected Groundwater Pumping per 2020 SMP Survey for Normal Year | Pumping Rights | | | | Net Replenishment Obligation[2] | Replenishment from Storage[3] | Replenishment with Wet-Water Recharge | End-of-Year Managed Storage |
|---|---|---|---|---|---|---|---|---|---|
| | | Safe Yield[1] | Reoperation Water Use to Offset the Desalter Replenishment Obligation | Recycled Water Recharge | Total | | | | |
| (1) | (2) | (3) | (4) | (5) | (6) = (3)+(4)+(5) | (7) = (2)-(6) | (8) | (9) | $(10)_t = (10)_{t-1} - (7)_t + (9)_t$ |
| 2019 | | | | | | | | | 503,275 |
| 2020 | 139,519 | 135,000 | 12,500 | 13,504 | 161,004 | -21,485 | 0 | 0 | 524,760 |
| 2021 | 140,534 | 140,717 | 12,500 | 13,795 | 167,012 | -26,478 | 0 | 0 | 551,237 |
| 2022 | 141,550 | 140,717 | 12,500 | 14,087 | 167,304 | -25,754 | 0 | 0 | 576,991 |
| 2023 | 142,565 | 140,717 | 12,500 | 14,379 | 167,595 | -25,030 | 0 | 0 | 602,021 |
| 2024 | 143,581 | 140,717 | 12,500 | 14,670 | 167,887 | -24,306 | 0 | 0 | 626,327 |
| 2025 | 144,596 | 140,717 | 12,500 | 14,962 | 168,179 | -23,583 | 0 | 0 | 649,910 |
| 2026 | 146,038 | 140,717 | 5,000 | 15,253 | 160,970 | -14,932 | 0 | 0 | 664,842 |
| 2027 | 147,481 | 140,717 | 5,000 | 15,545 | 161,262 | -13,781 | 0 | 0 | 678,623 |
| 2028 | 148,923 | 140,717 | 5,000 | 15,837 | 161,554 | -12,631 | 0 | 0 | 691,254 |
| 2029 | 150,365 | 140,717 | 5,000 | 16,128 | 161,845 | -11,480 | 0 | 0 | 702,734 |
| 2030 | 151,808 | 140,717 | 5,000 | 16,420 | 162,137 | -10,329 | 0 | 0 | 713,063 |
| 2031 | 154,366 | 137,943 | 0 | 16,420 | 154,363 | 3 | 2 | 1 | 713,061 |
| 2032 | 156,924 | 137,943 | 0 | 16,420 | 154,363 | 2,561 | 2,049 | 512 | 711,012 |
| 2033 | 159,483 | 137,943 | 0 | 16,420 | 154,363 | 5,119 | 4,096 | 1,024 | 706,917 |
| 2034 | 162,041 | 137,943 | 0 | 16,420 | 154,363 | 7,678 | 6,142 | 1,536 | 700,774 |
| 2035 | 164,600 | 137,943 | 0 | 16,420 | 154,363 | 10,236 | 8,189 | 2,047 | 692,585 |
| 2036 | 166,441 | 137,943 | 0 | 16,420 | 154,363 | 12,077 | 9,662 | 2,415 | 682,923 |
| 2037 | 168,282 | 137,943 | 0 | 16,420 | 154,363 | 13,918 | 11,135 | 2,784 | 671,789 |
| 2038 | 170,123 | 137,943 | 0 | 16,420 | 154,363 | 15,759 | 12,607 | 3,152 | 659,181 |
| 2039 | 171,964 | 137,943 | 0 | 16,420 | 154,363 | 17,600 | 14,080 | 3,520 | 645,101 |
| 2040 | 173,805 | 137,943 | 0 | 16,420 | 154,363 | 19,441 | 15,553 | 3,888 | 629,548 |
| 2041 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 614,971 |
| 2042 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 600,394 |
| 2043 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 585,818 |
| 2044 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 571,241 |
| 2045 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 556,664 |
| 2046 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 542,087 |
| 2047 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 527,510 |
| 2048 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 512,934 |
| 2049 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 498,357 |
| 2050 | 173,805 | 139,164 | 0 | 16,420 | 155,584 | 18,221 | 14,577 | 3,644 | 483,780 |

503,275 af is the estimated volume in managed storage on June 30, 2019

1 -- Safe yield estimate from net recharge estimated in Scenario 1A.

2 -- This is the annual net replenishment obligation based on the assumptions described in the 2018 SFI report; negative values mean aggregate underproduction and an increase in stored water accounts.

3 -- 80 percent of a positive replenishment obligation is satisfied from storage and 20 percent is satisfied by wet-water recharge.

# F

# Appendix F. Cucamonga Judgment

Recorded April 29,1958
Book 4495, page 331,
San Bernardino County
Official Records

WALKER, WRIGHT, TYLER & WARD
210 West 7th Street, Suite 631
Los Angeles 14, California
TRinity 8936

Attorneys for Plaintiff

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

IN AND FOR THE COUNTY OF SAN BERNARDINO

SAN ANTONIO WATER COMPANY, a corporation,

Plaintiff,

-vs-

FOOTHILL IRRIGATION COMPANY, a corporation; SUNSET WATER COMPANY, a corporation; IOAMOSA WATER COMPANY, a corporation; and OLD SETTLERS WATER COMPANY, a corporation; ALTA LOMA MUTUAL WATER COMPANY, a corporation; ARMSTRONG NURSERIES, a corporation; BANYAN HEIGHTS WATER COMPANY, a corporation; CARNELIAN WATER COMPANY, a corporation; CITRUS WATER COMPANY, a corporation; CUCAMONGA DEVELOPMENT COMPANY, a corporation; CUCAMONGA WATER COMPANY, a corporation; HEDGES WELL COMPANY, a corporation; HELLMAN WATER COMPANY, a corporation; HERMOSA WATER COMPANY, a corporation; JOYA MUTUAL WATER COMPANY, a corporation; REX MUTUAL WATER COMPANY, a corporation; SAPPHIRE MUTUAL WATER COMPANY, a corporation; CHARLES SNYDER; UPLAND WATER COMPANY, a corporation; HENRY G. BODKIN and BANK OF AMERICA NATIONAL TRUST AND SAVINGS ASSOCIATION, as Executors of the last will of Giovanni Vai, deceased; WESTERN FRUIT GROWERS, a corporation; HUGH P. CRAWFORD; G. N. HAMILTON RANCH, a partnership composed of Arthur Bridge, Helen Bridge, and Grace W. Burt; JOHN DOE ONE to THIRTY inclusive, MARY ROE ONE to THIRTY inclusive, JOHN DOE COMPANY ONE to TWENTY inclusive,

Defendants.

No. 92645

D E C R E E

WHEREAS, there has been filed in the above entitled action, a Stipulation for Judgment duly executed by and on the part of each and all of the following named parties to said action (who are collectively hereinafter referred to as the "stipulating parties"), to wit:

San Antonio Water Company, a corporation;
Foothill Irrigation Company, a corporation;
Ioamosa Water Company, a corporation;
Old Settlers Water Company, a corporation;
Sunset Water Company, a corporation;
Cucamonga Water Company, a corporation;
Alta Loma Mutual Water Company, a corporation;
Armstrong Nurseries, a corporation;
Banyan Heights Water Company, a corporation;
Carnelian Water Company, a corporation;
Citrus Water Company, a corporation;
Hedges Well Company, a corporation;
Hellman Water Company, a corporation;
Hermosa Water Company, a corporation;
Joya Mutual Water Company, a corporation;
Upland Water Company, a corporation;
Western Fruit Growers, a corporation;
Cucamonga Development Company, a corporation;
Sapphire Mutual Water Company, a corporation;
Charles Snyder;
Hugh P. Crawford;
Bank of America National Trust and Savings Association, a national banking association, and Henry G. Bodkin, as executors of the last Will of Giovanni Vai, deceased;
G. N. Hamilton Ranch, a partnership composed of Arthur Bridge, Helen Bridge, Grace W. Burt;

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and Rex Mutual Water Company.

and,

WHEREAS, the Court has heard and considered evidence on the part of various of the stipulating parties,

NOW, THEREFORE, IT IS HEREBY ORDERED, ADJUDGED AND DECREED by this Court that:

FIRST: As used herein, the terms listed below shall have the respective meanings next following them, viz:

(a) "Cucamonga Basin" or "Basin" shall mean that certain territory in the County of San Bernardino, State of California, which is more particularly described upon Exhibit 1, and shall also include all percolating water and underground water and water sources underlying said territory;

(b) "Imported water" shall mean water derived from a stream flow in an area outside of any water shed draining into the Cucamonga Basin. Specifically, water derived from San Antonio Canyon and/or Creek is "imported water".

(c) "Irrigation season" shall mean that portion of each year when irrigating is required by the users of the water sold by the Plaintiffs and Defendants hereto. While this period varies considerably from year to year, the irrigating season generally commences during any month in which the rainfall does not exceed two inches, and the season generally terminates after the first rainfall of two inches or more. The season usually approximates the period from May 1st to November 1st.

"Spreading season" is the balance of each year remaining after deducting the irrigation season for such year, and is usually approximately the period from November 1st of one year to May 1st of the succeeding year.

"Spread" with respect to water shall mean to conduct the same upon and sink the same into the gravels of Cucamonga Basin during a spreading season.



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(d) "Aggregate stipulated water" means the total number of acre feet of water set opposite the names of all stipulating parties in Exhibit 2.

(e) "Pro-rata" means, in each case, in the same proportion as the acre feet listed opposite the name or names of the party or respective parties in question bear to the aggregate stipulated water; and the verb "pro-rate" means to divide and share pro-rata among the stipulating parties.

(f) "Allocated water" of any stipulating party or parties in each case means the number of acre feet of water set out on Exhibit 2 opposite the name or names of such party or parties.

(g) "Ten preceding years" means the period of ten consecutive calendar years which immediately precedes or has preceded the year or event mentioned.

(h) "Five-sixths of the water users" shall mean stipulating parties having in the aggregate allocated water which is not less than five-sixths of the total allocated water of all stipulating parties.

(i) An "inch" of water or a "miner's inch" of water shall mean a flow of water equal to one-fiftieth (1/50th) of a cubic foot of water per second of time.

(j) Any party hereto the corporate name of which ends with "Water Company" or "Mutual Water Company" will be hereinafter referred to without such words. Thus "San Antonio" means herein "San Antonio Water Company" and similarly with the other parties using said words "Water Company" or "Mutual Water Company".

(k) "Canyon pipeline" shall mean the pipeline (varying in size between approximately 32 inches in inside diameter and about 18 inches) which extends Southerly from a point on the channel of Cucamonga Creek at an elevation of approximately 2350 feet above sea level (herein called "Northerly intake") to the "round weir" mentioned below.



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(l) "Round weir" shall mean that certain weir of Ioamosa marked on the map Exhibit 3 as "Round Weir"and located near the top of the bluff on the East side of Cucamonga Creek and just Northerly from the Westerly prolongation of Almond Street, said weir being the point from which (a) two ten-inch water lines marked on the map Exhibit 3 as "Ioamosa 10 inch" lead Easterly to Ioamosa's Carnelian Street Reservoir (at about elevation 2030 feet above sea level on the East side of Carnelian Street between Hillside Road and Almond Street);(b) a six-inch water line marked on the map Exhibit 3 as "Hamilton 6 inch"leads Southeasterly to the Hamilton Ranch(which lies South of Hillside Road,North of Banyan Street,East of Sapphire Street and West of Carnelian Street),and,(c) an eight-inch water line marked on the map Exhibit 3 as "Banyan 8 inch" runs Southerly down Topaz Street to connect with the water system of Banyan Heights.

(m) "Reservoir Weir" means the weir of Ioamosa located at the Carnelian Street Reservoir.

(n)"Ioamosa Southerly Intake" shall mean a line extending West across the channel of Cucamonga Creek from the existing"Canyon Weir" of Ioamosa marked on the map Exhibit 3 as "Canyon Weir",which weir is located in Cucamonga Canyon,is part of the Canyon pipeline, and is situated about midway (or somewhat Northerly thereof)between the round weir and the Northerly intake mentioned above.

(o) "Schulhof pipe-line" means that certain three-inch water pipe-line marked on the map Exhibit 3 as "Schulhof 3 inch" which connects with the Canyon pipe-line Northerly of the round weir, and which is mentioned in paragraph Second(h) of that certain decree dated April 12, 1937, in action No. 29,799 (Schulhof v. Cucamonga Development Company) in the above entitled Superior Court.

(p) The water to which Ioamosa is entitled as provided in paragraph "Third" hereof is herein called "Ioamosa gravity water", or "gravity water".

(q) "An overflow year"shall mean any calendar year for which



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the water level determined as hereinafter provided in the index well is at an elevation of 1345 feet or higher above sea level.

For the purposes of determination of elevation above sea level the United States Geological Survey bench mark on Baseline (also known as 16th Street) as it exists on the date this decree is entered, on or near the north boundary of Section 4, Township 1 South, Range 7 west, and approximately four-fifths of a mile west of Vineyard Avenue, shall be deemed to be at an elevation above sea level of 1454 feet. The elevation of the water level in such index well shall be determined by measuring the elevation of such water in such well on October 1st of each year (Provided that if any such day falls on a Sunday or a holiday, measurements shall be made on the next business day). The index well shall be the well known as Shaft No. 9-A of the San Antonio Water Company located approximately 154 feet Southerly of the Northwest corner of Lot 14 of Red Hill subdivision and shown on the map Exhibit 5. Wells No. 11 of Cucamonga Water Company and 20 and 22 of the San Antonio Water Company shall not be pumped within three days before such date of measurements, and the tunnel bulkhead adjacent to Red Hills Country Club will be kept closed for a like period before such date. If for any reason Shaft 9-A shall not be available for measurement, then the index well shall be Wells No. 11 of Cucamonga Water Company or 20 or 22 of the San Antonio Water Company, in the order herein listed. If for any reason none of said wells shall be available for such measurement, the identity and location of the index well may be determined by a written stipulation executed by five-sixths of the water users and filed in said action, or in default of said stipulation by order of the said court.

Annexed to this Decree and hereby incorporated herein are the following Exhibits:

Exhibit 1: A description of the territory under which lies the "Cucamonga Basin";



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Exhibit 2: A list of the "allocated water" of each party (Other than the stream flow mentioned in paragraph "Third");

Exhibit 3: A map of "Cucamonga Pipe Lines";

Exhibit 4: A map of "Cucamonga Spreading Works";

Exhibit 5: A map of "Well and Shaft Locations";

and said exhibits are herein respectively referred to as "Exhibit 1", "Exhibit 2", "Exhibit 3", "Exhibit 4" and "Exhibit 5".

SECOND: This paragraph deals with the right and quantity of water San Antonio may annually hereafter extract from the Cucamonga Basin as reduced by its failure to previously annually spread therein the minimum amount of water hereinafter set forth, or as increased by its previously annually spreading more imported water therein than said minimum, excepting, however, in both such situations the spreading of imported water during years in which such spread causes the Basin to overflow resulting in such year constituting an overflow year, as defined in Paragraph First, subdivision (q) thereof.

For the purpose of the computation in this Paragraph Second, it shall be assumed that San Antonio has spread in each of the ten years previous to 1957, 2,000 acre feet of imported water.

With respect to each calendar year after entry of this decree each preceding ten year period shall be divided into "included" and "Excluded" years. "Excluded years" are those calendar years which are defined as overflow years in Paragraph First, subdivision (q) thereof. All other calendar years are "included years".

If in the ten preceding years San Antonio shall have spread less than 2,000 acre feet of imported water in any of the included years, as modified by the assumption above set forth, the difference between (a) The amount of imported water which shall have been so spread in such included years, and (b) The quantity of 2,000 acre feet multiplied by the number of included years, shall be known as the "ten year deficit".

Any right of San Antonio to extract water from the Cucamonga



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Basin in any calendar year after the entry of this decree shall be reduced by the number of acre feet of water equal to the ten year deficit divided by the number of included years, if any such deficit shall have occurred, so that such right to extract water for such year shall not exceed 6,500 acre feet less the ten year deficit divided by the number of included years.

Correspondingly, with respect to each calendar year after the entry of this decree, if in the ten preceding years San Antonio shall have spread more than 2,000 acre feet of imported water in any of the included years, as modified by the assumption above set forth, the difference between (a) The amount of imported water which shall have been so spread in such included years, and (b) The quantity of 2,000 acre feet multiplied by the number of included years, shall be known as the "ten year surplus".

The right of San Antonio to extract water from the Cucamonga Basin in any calendar year after the entry of this decree, shall be increased by a number of acre feet of water equal to 95 percent of the ten year surplus divided by the number of included years, if any such surplus shall have occurred, so that there shall be added for such year to San Antonio's right to extract 6,500 acre feet of water a number of acre feet of water equal to 95 percent of the ten year surplus divided by the number of included years. Provided, however, that in no case shall such increased extraction exceed 2,000 acre feet of water for any one calendar year.

So long as the water level in the index well referred to in paragraph First, subdivision (q) herein is at an elevation below 1345 feet above sea level, and in the event San Antonio has available in any one calendar year after the year 1956 more than 2,000 acre feet of imported water, and desires to sell the same, it shall, before selling such imported water to others not parties to this Decree, annually offer to sell such imported water to the other stipulating parties hereto for spreading in the Cucamonga Basin and at a price to be fixed



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between the parties by negotiation, but in any event to be not greater than the price San Antonio can obtain from others not parties of this Decree.

In the event San Antonio and the other stipulating parties hereto do not agree by October 1st to the terms for the purchase of said imported water to be sold and spread during the next succeeding spreading season, then San Antonio is thereafter free to sell such imported water to other persons not parties hereto, or at its option, it may spread such imported water in the Cucamonga Basin and by so spreading will receive the credit for water spread as provided in this paragraph Second. If the stipulating parties and San Antonio agree to the purchase from San Antonio of any imported water, and such stipulating parties, other than San Antonio, purchase said water and the same is spread in the Cucamonga Basin, then during such year no credit shall be given to San Antonio toward estimating its ten year surplus or deficit for the amount of water so purchased and spread.

THIRD: Ioamosa and Hamilton Ranch, a partnership composed of Arthur Bridge, Helen Bridge and Grace W. Burt, are the owners of the paramount right to take and divert throughout each year at or Northerly from the Ioamosa Southerly intake all surface and subsurface flow of Cucamonga Creek, not exceeding however two hundred fifty (250) miner's inches of water, (measured at the round weir and the intake to the Schulhof pipeline), including any water which shall be supplied to the Schulhof pipeline under the terms of said decree in action No. 29,799 or otherwise. The right to said flow of Cucamonga Creek up to 250 miner's inches per year is subject to an obligation of Hamilton Ranch and Ioamosa to deliver water into the Schulhof pipeline, and the balance of said water is owned by Hamilton Ranch and Ioamosa in the following proportions:

(a) Hamilton Ranch 128/1200ths thereof;



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(b) Ioamosa 1072/1200ths thereof, subject to the right of Sapphire to the extent of one (1) inch from the weir box on Ioamosa's pipeline located approximately 1200 feet East of the "round weir".

The rights of Ioamosa to the Ioamosa gravity water are subject to the provisions hereof. Ioamosa may transport such gravity water to any location or locations whether within or without the basin, and use or deliver such water at any such location or location, provided, however, if any of the Ioamosa gravity water is used or conducted outside the Basin in any year, then the quantity of water which Ioamosa shall be entitled to develop or extract from the Basin by Paragraph Fourth and Exhibit 2 herein during the next succeeding year shall be reduced by an amount equal to the quantity of Ioamosa gravity water so used or conducted outside the Basin during such year.

The stipulating parties hereto shall within sixty (60) days after the date of this judgment, at their proportionate expense, construct in a manner which shall have been approved by San Antonio Water Company or by the above entitled Court a dividing weir located where Ioamosa now maintains the "round weir". Such dividing weir shall be so constructed that it will automatically limit to 249 inches the amount of water that will flow into the above mentioned four outgoing lines that are now connected with the round weir and are referred to in paragraph First (1) herein.

Within sixty (60) days after the date of this judgment the stipulating parties hereto shall also construct in a manner which shall have been approved by San Antonio Water Company or by the above entitled Court a dividing weir at the said Carnelian Street reservoir. The dividing weir at this point shall be so constructed as to permit Ioamosa to divert fifty inches of such Ioamosa gravity water to domestic use.

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During each spreading season, the remaining amount of Ioamosa gravity water over and above fifty (50) inches, shall be either:

(a) Used for irrigation purposes over Cucamonga Basin; or,

(b) Spread over Cucamonga Basin in the spreading grounds of Ioamosa or Banyan Heights Water Company; or

(c) Returned by Ioamosa to the channel of Cucamonga Creek.

During each spreading season all of the flow of Cucamonga Creek in excess of such 250 inches after passing through the debris basins numbered C1 to C12 inclusive on Exhibit 4 shall be spread in spreading grounds which now exist, or are now under construction, or which are proposed, as shown on Exhibit 4, including the channel or wash of Cucamonga Creek, and which overlie the Cucamonga Basin and are North of Baseline Road. Whenever such spreading grounds are all overflowing, or would overflow, the waters which do or would so overflow may be spread in the "15th St. Spreading Grounds" as shown on said map, and when the "15th St. Spreading Grounds" also do or would overflow, the waters which do or would so overflow the "15th St. Spreading Grounds" may be spread in what is known as the "8th Street Spreading Grounds", all as shown on Exhibit 4, even though all or part of such spreading grounds do not overlie the Cucamonga Basin.

Such spreading shall be done at one or more locations in said spreading grounds which shall be approved by San Antonio.

Such flow of Cucamonga Creek may be spread at other locations than above provided, and outside the area above described upon the written consent of 5/6th of the water users, as defined in paragraph First subdivision (k) of this Decree.

If any costs are incurred in such spreading by any party hereto, for which such party would not otherwise be reimbursed, such costs shall be pro-rated between the parties hereto.

FOURTH: The rights of all stipulating parties to take water from Cucamonga Basin, subject to the adjustments set forth in this decree and to the provisions of paragraphs Second and Third above,



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are hereby fixed at the quantities set forth in Exhibit 2. Such rights are correlative, and except as to quantity or as herein otherwise stated are equal. No stipulating party shall have any right to export water from the Cucamonga Basin or use water extracted from the Cucamonga Basin at any place other than over the Cucamonga Basin except as provided in paragraph Third and as follows:

(a) The following stipulating parties, or any of them, may use water which they are entitled to extract from Cucamonga Basin in any location whatsoever, namely, San Antonio, Cucamonga, Upland, Old Settlers, and Sunset.

(b) Hermosa, Foothill Irrigation Company and Alta Loma are entitled to export water from Cucamonga Basin only to the extent hereinafter set forth, and none of said parties shall ever export from the Basin more water than said "Export quantity" herein listed for it, to wit:

| Party | Export Quantity |
|---|---|
| HERMOSA | 343 Acre Feet |
| FOOTHILL IRRIGATION COMPANY | 483 Acre Feet |
| ALTA LOMA | 51 Acre Feet |

and if in any year water used outside the basin which has been extracted or developed from the basin by any of said parties exceeds the "Export Quantity" above listed for such party, the quantity of water which such party shall be entitled to develop or extract from the basin in the ensuing year shall be reduced by an amount equal to such excess.

FIFTH: Within sixty (60) days after the date of this judgment, San Antonio shall, in the event it has not already done so, install, at the following locations, suitable recording and measuring devises, by means of which all spread water passing through such devices may be accurately measured and the quantity of such water recorded. Said locations are as follows:

(1) On 23rd Street at the Northeast corner of Ontario



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Colony Lot No. 170

(2) On 20th Street at the Northwest corner of Ontario Colony Lot No. 282; and

(3) On the West line of Ontario Colony Lot No. 301, 400 feet North of 19th Street.

Such measuring and recording devices shall be of such design and construction as may be agreed upon by and between San Antonio and Cucamonga, or, if they fail to agree, as may be designated by the Chief Engineer of the San Bernardino County Flood Control District, or by the above entitled Court.

All imported water which is to be spread upon Cucamonga Basin, whether spread by San Antonio to earn its entitlement under paragraph Second hereof, or is spread after the purchase thereof by the parties hereto other than San Antonio, shall be conducted through said recording and measuring devices by San Antonio, unless otherwise agreed in writing by the stipulating parties, including San Antonio, having allocated water equal to at least five-sixths (5/6ths) of the aggregate stipulated water, and no water not so conducted through such devices and measured shall be counted as water spread under the terms of such paragraph Second, unless so agreed in writing by such parties.

Said devices shall be designed and operated so that they continuously record the amount of water passing therethrough between the start and finish of each spreading season. In case of failure of measuring devices, average of the preceding and succeeding measurements shall be used. Such records shall be open to the inspection of all other stipulating parties on reasonable notice.

Each stipulating party shall have the right to inspect such recording and measuring devices at any time, and, in the event that the same shall ever be locked, each of the stipulating parties shall be furnished by San Antonio with a key thereto so as to permit inspection thereof. Further, San Antonio shall grant to the other stipulating parties hereto, insofar as it can do so without being



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required to obtain the same from others, a non-exclusive right of ingress and egress from the nearest public street to said recording measuring devices. The stipulating parties hereto shall pro-rate the expense of the original installation of said recording measuring devices, and San Antonio shall thereafter operate and maintain and bear the expense of operating and maintaining such devices.

SIXTH: As between the stipulating parties only, no extraction of water from Cucamonga Basin by any party in excess of the amount herein provided to be taken by such party, shall be deemed adverse to any other stipulating party, and each stipulating party hereby waives as against each other stipulating party the right to plead any statute of limitations or laches with respect to any extraction of water by such party in excess of such amount.

SEVENTH: Except as provided in paragraph Second, if any stipulating party in any year shall fail to take or receive from the basin or transport beyond the confines of the basin, the full quantity of water which such party is entitled hereunder to take or receive or transport beyond said confines, as the case may be, such failure shall not entitle such party to take or receive or so transport from the basin in any succeeding year any greater quantity of water than if in each prior year such party had taken, received and so transported from the basin all water which such party was entitled hereunder to so take, receive and transport, and, subject to the provisions of Paragraph Fifteen, such failure shall not affect the rights of other parties to the decree to take the stipulated amounts of water they are entitled to receive by Exhibit 2 herein.

Likewise, except as provided in said paragraph Second, as between the stipulating parties, no right adjudged hereunder of any party to thereafter take water from the Basin or to thereafter transport such water beyond the confines of the Basin shall be lost, impaired or diminished by any failure to take or so transport from the Basin all or any of the water to which such party is entitled hereunder unless and only to the entent that for a period of at least fifteen



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consecutive years such right shall not be exercised.

EIGHTH: Each stipulating party shall always maintain records of all extractions of water from the Basin by such party such that it can be determined therefrom for each year what quantity of water was taken from each well, or combination of wells, or other water source within the Basin from which such party received water.

Upon written demand of any other stipulating party, the party keeping such records shall, within 30 days after receipt of such demand, supply to the party making such demand or to the person designated by such party in such demand a written statement of the amount of water (in acre feet) so taken from each such well or combination of wells, or other source, for each year after 1957, with respect to which no such statement has previously been supplied.

Within six months hereafter as to existing wells, or upon commencement of operation as to wells first hereafter operated, each such well or combination of wells shall be so equipped with measuring devices at the expense of stipulating party who operates the same, as to show the quantity of water used or extracted.

Likewise, if any stipulating party hereafter transports water beyond the confines of the Basin, such transporting party shall thereafter maintain such measuring box, meter, weir, or other measuring device as will show readily and accurately the quantity of water at the time being transported beyond the confines of the Basin. Measurements of the quantity of water being taken at each of said points shall be made by such transporting party at least daily by weir or weekly by meter throughout the entire period water is being taken at such point. A record of such measurements and hours of operation shall always be made and maintained by such party. In case of failure of measuring device, average of the preceding and succeeding measurements shall be used.

Each stipulating party and any agent of any such party shall at all reasonable hours be entitled to inspect all such meters, boxes,



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weirs and other measuring devices, and to inspect, check, and copy any record of extractions and measurements and of all data and computations pertaining to the same in the possession or under the control of any other stipulating party or parties.

NINTH: Every provision of this Judgment in favor of or applying to any party hereto shall also apply to and inure to the benefit of, and also bind each and all of the heirs, legal representatives, successors and assigns of such party.

TENTH: The maximum quantity of water which any stipulating party shall be entitled to take from the Basin or transport beyond its confines shall not be increased or affected by the future acquisition by such party of additional lands, unless there shall be appurtenant to such lands rights to take water, which rights are in this action adjudged to exist.

Nothing in this judgment contained shall prevent any stipulating party from selling or otherwise disposing, or from purchasing or otherwise acquiring, any rights to water or to transport the same which may be adjudged to belong to any party to this action; but any such rights so acquired or so disposed shall remain subject to any limitations or restrictions herein expressed. Any transfer of the rights of any party herein shall be in writing, and notice thereof shall be given to San Antonio Water Company and Cucamonga Basin Protective Association, a corporation, whose address is Cucamonga, California, before the transferee may exercise such transferred rights.

ELEVENTH: The stipulating parties shall pro-rate the expense incurred after the date of this Judgment in prosecuting this action to Judgment against any other parties to this action.

The stipulating parties will unite in opposing any new, wrongful or unlawful taking of water from the Basin hereafter made by any person or corporation other than a stipulating party or parties, and will prorate the expense of making such opposition, including any litigation or engineering expense, provided that:



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(a) The term "new taking" shall not include any water development in the Basin hereafter made for the sole purpose of maintaining but not increasing any quantity of water now being taken from the Basin by the person who may hereafter make such development.

(b) If any stipulating party does not join in prosecuting any future suit to prevent, enjoin or limit any such new, wrongful or unlawful taking, such stipulating party not so joining shall bear pro-rata the expense of such suit (including attorney's fees and engineering expense) only if final judgment is rendered in such suit preventing, enjoining or limiting such taking.

TWELFTH: Each stipulating party, and the agents and employees of each such party, is and are hereby perpetually enjoined and restrained from doing any act or thing in violation of any provision of this judgment, other than paragraph Eleventh hereof.

THIRTEENTH: No stipulating party shall be entitled to recover court costs from any other stipulating party.

FOURTEENTH: The above entitled action shall continue and may be prosecuted and tried against all defendants therein, other than the stipulating parties; and the stipulating parties shall share the expense of such prosecution pro-rata. The Court will retain jurisdiction to enter modifications of this decree pursuant to stipulations provided for hereunder.

FIFTEENTH: In the event that through inadequacy of the supply of water in the Cucamonga Basin, or by reason of adjudication in any subsequent action, the stipulating parties in the aggregate shall be unable to pump and extract from the Cucamonga Basin a quantity of water so great as the aggregate stipulated water as is set forth in Exhibit 2, the stipulating parties shall pro-rate the aggregate quantity of water available in the Basin as long as such inability shall continue.

In the event between October 1st of any year and June 15th of the succeeding calendar year, five-sixths of the water users



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shall agree in writing by a stipulation filed in said action that the supply of water in the Basin is inadequate to safely permit the stipulating parties to pump in such ensuing year the aggregate stipulated water and that the amount of water to be pumped by each stipulating party shall for such succeeding calendar year be limited to a specified percentage (uniform for all)of the allocated water, then for such succeeding calendar year, each stipulating party is hereby enjoined and restrained from pumping or extracting from the Basin more than such percentage of allocated water of such party (subject to the provisions of paragraphs Second and Third hereof).

SIXTEENTH: The listing upon Exhibit 2 of any number of acre feet for any party to this action other than a stipulating party, shall not be deemed an admission by any stipulating party that a non-stipulating party is entitled to any water whatsoever from Cucamonga Basin, nor as to the quantity which such non-stipulating party may take from said Basin, if any, but each such figure for any non-stipulating party is listed as a matter of convenience and as a possible basis of compromise only.

SEVENTEENTH: This judgment supersedes and controls all previous agreements and decrees between the stipulating parties, or any of them but only insofar as they are inconsistent herewith.

Done in open Court this 25 day of April, 1958.

CARL B. HILLIARD

Judge

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EXHIBIT 1

TERRITORY UNDER WHICH LIES THE "CUCAMONGA BASIN"

That certain territory in the County of San Bernardino, State of California, which is situated to the South of the Sierra Madre range of mountains and is bounded and described as follows, to wit:

> Beginning at the base of the hereinbefore mentioned Sierra Madre Mountains at a point situate 9000 feet due North of the Southwest corner of Lot 241, said lot being delineated on Map of Ontario Colony Lands, recorded in the Office of the County Recorder of said County in Book 11 of Maps, at page 6 thereof; thence running South to said Southwest corner of said Lot 241; thence running in a general Southeasterly direction to the Southeast corner of Lot 419, said lot being also delineated on said Map of said Ontario Colony Lands; thence continuing in a general Southeasterly direction to a point situate thirteen hundred feet North of the South line and thirteen hundred feet East of the West line of Section 4, Township 1 South, Range 7 West, S. B. B. & M., thence running in a general Easterly direction to a point situate on the East line of said Section 4, eighteen hundred feet North of the Southeast corner of said Section 4; thence running in a general Northeasterly direction to the Southeast corner of the Southwest quarter of the Northeast quarter of Section 3, Township 1 South, Range 7 West, S. B. B. & M., thence running Northeasterly to a point situate on the North line of Section 2, Township 1 South, Range 7 West, S. B. B. & M., fourteen hundred feet East of the West line of said Section 2; thence running in a general Northeasterly direction to the base of said mountains, to a point where the division line between ranges six and seven, S. B. B. & M. intersects the South base of said mountains; thence following the meandering line of the South base of said mountains, being curved northerly for canyons and southerly for ridges, in a westerly direction to the place of beginning.

SURR & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

EXHIBIT 2

STIPULATED WATER

| NAME | | ACRE FEET PER YEAR |
|---|---|---|
| San Antonio Water Company | 6500 | 6500 |
| Alta Loma Mutual Water Company | 571 | 600 |
| Armstrong Nurseries | | 200 |
| Banyan Heights Water Company | | 625 |
| Carnelian Water Company | | 600 |
| Citrus Water Company | | 450 |
| Cucamonga Water Company | 6500 | 6500 |
| Cucamonga Development Company (included under Ioamosa) | | None |
| Foothill Irrigation Company | 483 | 1600 |
| Hedges Well Company | | 732 |
| Hellman Water Company (included under Ioamosa) | | None |
| Hermosa Water Company | 343 | 600 |
| Ioamosa Water Company | | 920 |
| Joya Mutual Water Company | | 390 |
| Old Settlers Water Company | 400 | 400 |
| Rex Mutual Water Company | | 600 |
| Charles Snyder | | 114 |
| Sunset Water Company | 400 | 400 |
| Upland Water Company | 750 | 750 |
| Heirs and Devisees of Giovanni Vai, deceased | | 500 |
| Hugh P. Crawford | | 120 |
| Western Fruit Growers | | 120 |
| Sapphire Mutual Water Company | | None |
| G. N. Hamilton Ranch, a partnership | | None |
| AGGREGATE STIPULATED WATER | | 22,721 |

SUMNER & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

EXHIBIT 2

WALKER, WRIGHT, TYLER & WARD
210 W. 7th Street, Suite 631
Los Angeles, 14, California,
TRinity 8936

Attorneys for Plaintiff

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA

IN AND FOR THE COUNTY OF SAN BERNARDINO

| | |
|---|---|
| SAN ANTONIO WATER COMPANY, a corporation,<br>Plaintiff,<br>vs.<br>FOOTHILL IRRIGATION COMPANY, a corporation; SUNSET WATER COMPANY, a corporation; IOAMOSA WATER COMPANY, a corporation; and OLD SETTLERS WATER COMPANY, a corporation; ALTA LOMA MUTUAL WATER COMPANY, a corporation; ARMSTRONG NURSERIES, a corporation; BANYAN HEIGHTS WATER COMPANY, a corporation; CARNELIAN WATER COMPANY, a corporation; CITRUS WATER COMPANY, a corporation; CUCAMONGA DEVELOPMENT COMPANY, a corporation; CUCAMONGA WATER COMPANY, a corporation; HEDGES WELL COMPANY, a corporation; HELLMAN WATER COMPANY, a corporation; HERMOSA WATER COMPANY, a corporation; JOYA MUTUAL WATER COMPANY, a corporation; REX MUTUAL WATER COMPANY, a corporation; SAPPHIRE MUTUAL WATER COMPANY, a corporation; CHARLES SNYDER; UPLAND WATER COMPANY, a corporation; HENRY G. BODKIN and BANK OF AMERICA NATIONAL TRUST AND SAVINGS ASSOCIATION, as Executors of the last will of Giovanni Vai, deceased; WESTERN FRUIT GROWERS, a corporation; HUGH P. CRAWFORD; G. N. HAMILTON RANCH, a partnership composed of Arthur Bridge, Helen Bridge, and Grace W. Burt; JOHN DOE ONE to THIRTY, inclusive, MARY ROE ONE to THIRTY inclusive, JOHN DOE COMPANY ONE TO TWENTY inclusive,<br>Defendants. | No.<br>STIPULATION REGARDING TRIAL AND JUDGMENT |

IT IS HEREBY STIPULATED AND AGREED by and between plaintiff San Antonio Water Company and the undersigned defendants (said plaintiff and defendants being herein called "Stipulating parties")



SUNR & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

that:

FIRST: Each of the undersigned defendants hereby appears in the above entitled action. The allegations of the complaint on file in said action shall be deemed denied by the undersigned defendants, and they shall be and are deemed to have alleged in said action that they own such rights to the waters of Cucamonga Creek and of Cucamonga Basin (mentioned in said judgment) as may be supported by any evidence which may be introduced at the trial of said action.

SECOND: At any time after the filing of this stipulation said action may be tried as between the stipulating parties. Said trial may be held without notice if the undersigned counsel for the stipulating parties are present or represented at said trial, and in such case notice of said trial is hereby waived.

THIRD: The stipulating parties consent that a Decree in the form which precedes and is attached to this stipulation may be rendered and entered by the Court in said action, in the event the Court finds such judgment proper under the evidence which shall have been introduced.

FOURTH: The stipulating parties hereby waive the signing or filing of any Findings of Fact in said action in the event a decree in said form is to be rendered.

Dated: ~~November~~ april 25th, 1958.

SAN ANTONIO WATER COMPANY

BY T. C. Buffington President

AND C. A. Adams Secretary

WALKER, WRIGHT, TYLER and WARD

BY Arthur S. Partridge

Attorneys for Plaintiff

FOOTHILL IRRIGATION COMPANY

BY Herman Hilton V. President

AND Frank H. Van Alst Secretary

SURR & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

IOAMOSA WATER COMPANY

BY _____ President

AND _____ Secretary

OLD SETTLERS WATER COMPANY

BY _____ President

AND _____ Secretary

SUNSET WATER COMPANY

BY _____ President

AND _____ Secretary

CUCAMONGA WATER COMPANY

BY _____ President

AND _____ Secretary

ALTA LOMA MUTUAL WATER COMPANY

BY _____ President

AND _____ Secretary

ARMSTRONG NURSERIES, INC.

BY _____ President

AND _____ Secretary

BANYAN HEIGHTS WATER COMPANY

BY _____ President

AND _____ Secretary

CARNELIAN WATER COMPANY

BY _____ President

AND _____ Secretary

CITRUS WATER COMPANY

BY _____ President

AND _____ Secretary



LUCE & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

HEDGES WELL COMPANY,

BY _____ President

AND _____ Secretary

HELLMAN WATER COMPANY

BY _____ President

AND _____ Secretary

HERMOSA WATER COMPANY

BY _____ President

AND _____ Secretary

JOYA MUTUAL WATER COMPANY

BY _____ President

AND _____ Secretary

UPLAND WATER COMPANY

BY _____ President

AND _____ Secretary

WESTERN FRUIT GROWERS

BY _____ President

AND _____ Secretary

CUCAMONGA DEVELOPMENT COMPANY

BY _____ President

AND _____ Secretary

SAPPHIRE MUTUAL WATER COMPANY

BY _____ President

AND _____ Secretary

_____
(Charles Snyder)

_____
(Hugh P. Crawford)



SUNN & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

HENRY G. BODKIN and
BANK OF AMERICA NATIONAL TRUST AND
SAVINGS ASSOCIATION,
As Executors of the Last Will of
Giovanni Vai, deceased;

BY _____
ASSISTANT TRUST OFFICER

AND _____
(Henry G. Bodkin)

G. N. HAMILTON RANCH, a partnership,

BY _____
(Arthur Bridge)

BY _____
(Helen Bridge)

BY _____
(Grace W. Burt)

Partners

REX MUTUAL WATER COMPANY

BY _____ President

AND _____ Secretary

SURR & HELLYER

BY _____

Attorneys for Ioamosa, Cucamonga, Banyan Heights, Joya Mutual, Rex Mutual, and Sapphire Water Companies, and for Hedges Well Company and Cucamonga Development Company.

SURR & HELLYER
ATTORNEYS AT LAW
SAN BERNARDINO, CALIFORNIA

G

# Appendix G. Six Basins Judgment

SCOTT S. SLATER, ESQ. (State Bar No. 117317)
ROBERT J. SAPERSTEIN, ESQ. (State Bar No. 166051)
HATCH AND PARENT, PC
21 East Carrillo Street
Santa Barbara, CA 93101
Telephone: (805) 963-7000

Attorneys for Plaintiff,
Special Counsel for Southern California Water Company

FILED
LOS ANGELES SUPERIOR

DEC 18 1998

JOHN A. CLARKE, CLERK

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

| | |
|---|---|
| SOUTHERN CALIFORNIA WATER COMPANY<br><br>Plaintiff,<br><br>vs.<br><br>CITY OF LA VERNE, CITY OF CLAREMONT, CITY OF POMONA, CITY OF UPLAND, POMONA COLLEGE, POMONA VALLEY PROTECTIVE ASSOCIATION, SAN ANTONIO WATER COMPANY, SIMPSON PAPER COMPANY, THREE VALLEYS MUNICIPAL WATER DISTRICT, WEST END CONSOLIDATED WATER COMPANY, and DOES 1 through 1,000, Inclusive,<br><br>Respondents and Defendants. | CASE NO. KC029152<br><br>Assigned for All Purposes to Judge William O. McVittie<br><br>Department O<br><br>**(Complaint Filed, September 28, 1998)**<br><br>**JUDGMENT** |

THE DOCUMENT TO WHICH THIS CERTIFICATE IS ATTACHED IS A FULL, TRUE, AND CORRECT COPY OF THE ORIGINAL ON FILE AND OF RECORD IN MY OFFICE.

ATTEST DEC 18 1998

JOHN A. CLARKE

Executive Officer/Clerk of the Superior Court of California, County of Los Angeles

By _____, Deputy

C. MORALES

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21 EAST CARRILLO STREET
SANTA BARBARA, CA
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## PRELIMINARY FINDINGS

### A. Complaint.

The Southern California Water Company ("SCWC"), (or "Plaintiff"), and the City of La Verne ("La Verne"), City of Claremont ("Claremont"), City of Pomona ("Pomona"), City of Upland ("Upland"), Pomona College ("Pomona College"), Pomona Valley Protective Association ("PVPA"), San Antonio Water Company ("San Antonio"), Simpson Paper Company ("Simpson"), Three Valleys Municipal Water District ("TVMWD"), West End Consolidated Water Company ("West End"), collectively (Defendants) either:

i. account for essentially all of the current production of groundwater from or the replenishment to the Canyon Basin, the Upper Claremont Heights Basin, the Lower Claremont Heights Basin, the Pomona Basin, the Live Oak Basin and the Ganesha Basin ("Six Basins Area"), located in Los Angeles and San Bernardino Counties, and described in Exhibits "A,"and "B" attached hereto, and further defined in Judgment Section I(A) below; or

ii. are public agencies with an interest in the efficient and responsible management of groundwater resources within the Six Basins.

On or about September 28, 1998 the Plaintiff filed a complaint against Defendants and Does 1 through 1,000 requesting a declaration of their individual and collective rights to groundwater and a mandatory and prohibitory injunction requiring the reasonable use and equitable management of groundwater within the Six Basins pursuant to *Article X, Section 2 of the California Constitution*. The pleadings further allege that the Plaintiff and Defendants collectively claim substantially all rights of groundwater use, replenishment and storage within the Six Basins Area, that the available Safe Yield (as defined in Judgment Section I(A), below) is being exceeded and that the groundwater supply to the Six Basins Area is inadequate to meet the current and long term demands of Plaintiff and Defendants without the imposition of a physical solution. Plaintiff requests a determination of all groundwater rights, including replenishment and storage rights, of whatever nature within the boundaries of the Six Basins and request the imposition of an equitable physical solution.

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B. **Answers and Cross-Complaints.** On or before November 13, 1998, Plaintiff and Defendants filed a stipulation for entry of judgment.

C. **Jurisdiction.** This Court has jurisdiction to enter judgment declaring and adjudicating the Plaintiff's and Defendants' ("the Parties") rights to the reasonable and beneficial use of groundwater by the Parties in the Six Basins Area pursuant to *Article X, Section 2 of the California Constitution* and to impose a complete physical solution. All pre-existing rights to groundwater within the Basin held or claimed by any Party (as defined in Section I(A) of the Judgment below) are hereby settled and defined as the production allocations and the other rights and obligations set forth under this judgment ("Judgment"). The respective allocations for each Party are expressly set forth in Exhibit "D."

D. **Parties.**

1. SCWC is an investor-owned public utility incorporated under the laws of the State of California. (*See Public Utilities Code Section 1001 et seq. and 2701 et seq.*) SCWC produces groundwater from the Six Basins and delivers it for use on land within its certificated service area that predominantly overlies some portion of the Six Basins, and otherwise is within the Counties of Los Angeles and San Bernardino.

2. Pomona is a charter city situated in the County of Los Angeles. Pomona produces groundwater from the Six Basins and delivers it for use on land within its incorporated boundaries, on land lying outside its incorporated boundaries within the County of Los Angeles and on City owned lands that predominantly overlie some portion of the Six Basins. Pomona owns and controls land in the Six Basins Area upon which it has historically diverted, for direct use and spreading, surface water from San Antonio Creek and Evey Canyon.

3. La Verne is a general law city situated in the County of Los Angeles. La Verne produces groundwater from the Six Basins and delivers it for use on land within its incorporated boundaries, on land lying outside its incorporated boundaries within the County of Los Angeles and on City owned lands that predominantly overlie some portion of the Six Basins.

**4.** Upland is a general law city situated in the County of San Bernardino. Upland produces groundwater from the Six Basins and delivers it for use on land within its incorporated boundaries some portion of which overlie the Six Basins. It possesses a majority of the shares of stock in San Antonio and West End.

**5.** San Antonio is a mutual water corporation incorporated under the laws of the State of California, with its principal place of business in San Bernardino County. San Antonio produces groundwater from the Six Basins and delivers it for use by its shareholders.

**6.** West End is a mutual water corporation, incorporated under the laws of the State of California, with its principal place of business in San Bernardino County. West End produces groundwater from the Six Basins and delivers it for use by its shareholders.

**7.** Claremont is a general law city situated in the County of Los Angeles. Claremont's incorporated boundaries and City owned lands overlie a portion of the Six Basins. The City has executed an agreement with SCWC with respect to its groundwater rights.

**8.** Pomona College is a California corporation, with a principal place of business in the County of Los Angeles. Pomona College owns land and groundwater production facilities that overlie the Six Basins Area and it has executed operating leases with SCWC regarding these facilities. Pomona College has executed an agreement with SCWC with respect to its groundwater rights.

**9.** Simpson is a Washington corporation, which is doing business in the State of California and the County of Los Angeles. Simpson produces groundwater from the Six Basins for its own use and also purchases water service from Pomona.

**10.** PVPA is a California corporation, operating on a non-profit basis for the mutual benefit of its members with its principal place of business in the County of Los Angeles. Shareholders of PVPA include Pomona, Pomona College, San Antonio, SCWC, Simpson, Upland and West End. PVPA owns the primary spreading grounds and recharge facilities for the Six Basins and owns other lands which also overlie the Six Basins. PVPA has undertaken ongoing studies and evaluation of groundwater conditions in the Six Basins Area.

11. TVMWD is a California Municipal Water District formed pursuant to the provisions of the municipal water district act and with the power to acquire, control, distribute, store, and spread water for beneficial purposes within its boundaries.

E. **Settlement Negotiations.**

1. **Importance of Groundwater.** Groundwater is an important water supply source for businesses, individuals and public agencies that overlie or extract groundwater from the Six Basins. The Parties have a mutual and collective interest in the efficient and reasonable use of groundwater and the coordinated management of water resources to ensure the prudent use of the resource. The Parties have a further collective interest in furthering the efficient and reasonable use of groundwater and the coordinated and comprehensive management of water resources to ensure that the common resource may be sustained and enhanced.

2. **Coordinated Study.** PVPA has conducted and continues to conduct technical studies of the Six Basins and has developed groundwater models of the Six Basins. To achieve the goals of coordinated basin management and to ensure and promote the sustainable and enhanced use of the groundwater resources of the Six Basins, the Parties joined in a collaborative process, reviewed prior groundwater production reports and hydrologic studies, other historical data and engaged in new technical studies to supplement the previous work of PVPA. Substantial engineering, hydrologic and geologic data not previously known have been collected and jointly analyzed and verified by the Parties. Included therein are estimates of production and reported production from the Six Basins and further refinement of PVPA's groundwater models. The results of these efforts provide the technical foundation for this Judgment.

3. **Overdraft.**

a. **Native Safe Yield.** The Native Safe Yield (as defined in Judgment, Section I(A), below) of the Six Basins Area has historically been augmented generally by the spreading activities conducted by PVPA, Pomona and La Verne and from return flows from water imported to the Six Basins Area through TVMWD. There is no precise estimate of the Native Safe Yield; however, without augmentation comprised of the substantial spreading operations conducted

by PVPA and others, and the return flows from imported water, the amount of groundwater comprising the Native Safe Yield is substantially less than the Safe Yield which is allocated to the parties pursuant to this Judgment.

b. **Safe Yield.** Safe Yield (as defined in Judgment, Section I(A), below) for all groundwater supplies within the Six Basins, including the benefits of historic augmentation is nineteen thousand three hundred (19,300) acre feet per year.

c. **Groundwater Production**. Reports filed with the State of California pursuant to *Water Code Section 4999 et seq.*, production records reported to PVPA by its members, and independent verification by the Parties all demonstrate that the cumulative groundwater production of the Parties from the Six Basins Area annually has been greater than twenty thousand (20,000) acre feet in each of the five years immediately preceding the filing of this action. Therefore, groundwater production has exceeded the available Safe Yield and *a fortiori* the Native Safe Yield in each of the last five years.

F. **Stipulation.** The Parties, whose production from the Six Basins cumulatively comprise essentially all of the groundwater production in the Six Basins Area, which have engaged in long-standing groundwater replenishment activities or otherwise have an interest in the efficient and coordinated management of groundwater, have stipulated to the entry of this Judgment. Each of the Parties stipulate that this Judgment is a physical solution (as defined in Judgment, Section I(A), below) which provides due consideration to the environment, the respective groundwater rights of the Parties, and that this Judgment will not cause substantial material injury to any Party under these circumstances of a lengthy period of overdraft and the competing claims to groundwater. The Parties further stipulate that the Judgment is a fair and equitable allocation of water in accordance with the provisions of *Article X, Section 2 of the California Constitution*.

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## JUDGMENT

**IT IS HEREBY ORDERED, ADJUDGED AND DECREED:**

## I. INTRODUCTION

### A. Definitions.

1. **"Base Annual Production Right"** means the average annual production , in acre-feet, for each Party for the twelve year period beginning on January 1 of 1985 and ending on December 31 of 1996 as set forth in Exhibit "D".

2. **"Carryover Rights"** means the maximum percentage of a Party's annual allocation of Operating Safe Yield production of which may be deferred until the following Year free of any Replacement Water Assessment.

3. **"Effective Date"** means January 1, 1999.

4. **"Four Basins or Four Basins Area"** means the following groundwater basins and the area overlying them: Canyon, Upper Claremont Heights, Lower Claremont Heights and Pomona as shown on Exhibit "A" and further described in Exhibit "B".

5. **"Groundwater"** means all water beneath the ground surface and contained within any one of the Six Basins except as provided in Article IIIA Section 1.

6. **"Imported Water"** means water that is not naturally tributary to the Six Basins Area and which is delivered to the Six Basins Area.

7. **"In Lieu Procedures"** means a method of either providing Replacement Water or water to be stored under a Storage and Recovery Agreement whereby a Party receives direct deliveries of Imported Water or water other than Replenishment Water in exchange for foregoing the production of an equivalent amount of such Party's share of the Operating Safe Yield.

8. **"Minimal Producers"** means any producer whose production is less than 25 acre feet each Year.

9. **"Native Groundwater"** means groundwater within the Six Basins Area that originates from the deep percolation of rainfall, natural stream flow or subsurface inflow, and

expressly excluding groundwater which originates from (a) the Parties' replenishment activities and (b) return flows from both imported water and the Parties' replenishment activities, and water described in Article IIIA Section 1.

**10.** **"Native Safe Yield"** means the amount of Native Groundwater, in acre feet, that can be extracted from the Six Basins Area on an annual basis without causing an undesirable result. Expressed as a formula: Native Safe Annual Yield = Annually Available Groundwater - (Replenishment Water + return flows from Imported Water and Replenishment Water).

**11.** **"Native Water"** means water which is naturally tributary to the Six Basins Area.

**12.** **"Non-party"** means any person or entity which is not a party to this Judgment.

**13.** **"Operating Plan"** means the plan, developed by Watermaster (as defined in Judgment, Article V below) for the Four Basins Area, by which the purpose and objectives of the Physical Solution will be implemented and realized.

**14.** **"Operating Safe Yield"** means the amount of groundwater, in acre feet, which the Watermaster shall determine can be produced from the Four Basins Area by the Parties during any single year, free of any replacement obligation under the Physical Solution herein. Because of the benefits created by coordinated management of groundwater provided by the Physical Solution, the Operating Safe Yield set by Watermaster may exceed the Safe Yield that would otherwise be available for production by the Parties. The Two Basins Area is excluded from the Operating Safe Yield allocated pursuant to this Judgment with its annual Safe Yield being equivalent to the amount of groundwater La Verne may reasonably produce from the Two Basins Area on an annual basis without causing substantial injury to any other Party.

**15.** **"Overdraft"** means a condition wherein the total annual production from a groundwater basin exceeds the Safe Yield.

**16.** **"Party or Parties"** means any person(s) or entity(ies) named in this action, who has/have intervened in this case or has/have become subject to this Judgment through succession, stipulation, transfer, default, trial or otherwise.

17. **"Physical Solution"** means the efficient and equitable coordinated management of groundwater within the Six Basins Area to maximize the reasonable and beneficial use of groundwater resources in a manner that is consistent with the public interest, *Article X, Section 2 of the California Constitution,* and with due regard for the environment.

18. **"Producer"** means a person, firm, association, organization, joint venture, partnership, business, trust, corporation or public entity who, or which, produces or has a right to produce groundwater from the Six Basins Area.

19. **"Production"** means the process of pumping groundwater; also, the gross amount of groundwater pumped.

20. **"Replacement Water"** means imported water or water other than Replenishment Water supplied through in-lieu procedures that is acquired by the Watermaster or provided by a Party to replace production by such Party in excess of the amount of its share of the Operating Safe Yield, Carry-Over Rights and Storage and Recovery rights authorized by Watermaster.

21. **"Replacement Water Assessment"** means an assessment levied by Watermaster pursuant to Article XII A, Section 4 of this Judgment.

22. **"Replenishment"** means a program to spread or inject Replenishment Water into the Six Basins Area. A description of the current replenishment programs is attached hereto as Exhibit "E."

23. **"Replenishment Water"** means native water which augments the Native Safe Yield and thereby comprises a portion of the Operating Safe Yield pursuant to a historical replenishment program as described in Article VIB, Section 9 and Exhibit E.

24. **"Return Flows"** means water which percolates, infiltrates or seeps into the Six Basins after having been previously applied to some end use by one of the Parties or any user of water.

25. **"Safe Yield"** means the amount of groundwater, including Replenishment and return flows from Imported Water, that can be reasonably produced from the combined Two Basins

and the Four Basins Areas on an annual basis without causing an undesirable result, including but not limited to land subsidence, water quality degradation, and harm from high groundwater levels, i.e. 19,300 acre feet per year.

**26. "Six Basins or Six Basins Area"** means the Four Basins Area plus the Two Basins Area, as shown on Exhibit "A" and further described in Exhibit "B."

**27. "Spreading"** means a method of groundwater recharge whereby water is placed in permeable impoundments and allowed to percolate into a basin.

**28. "Storage and Recovery"** means a program administered under an agreement between the Watermaster and a Party to store water either directly by sinking, spreading or injecting or by in-lieu procedures, into the Four Basins, and subsequently recovering such water without regard to the limitations imposed by the Party's Base Annual Production Right.

**29. "Storage and Recovery Agreement"** means an agreement between Watermaster and a Party for Storage and Recovery of water by such Party. An acceptable pre-approved Storage and Recovery Agreement between Watermaster and Pomona is listed on Exhibit "F."

**30. "Transfer"** means temporary or permanent assignment, sale, contract or lease of any Party's Base Annual Production Right and its associated percentage of the Safe Yield, Carry-Over Rights or rights to recover water stored under a Storage and Recover Agreement to any other Party or a person that becomes a Party. A lease shall not be considered a "permanent transfer" unless both the Lessee and Lessor jointly agree to such characterization.

**31. "Two Basins or Two Basins Area"** means the Live Oak and Ganesha Basins and the areas overlying them, as shown on Exhibit "A" and further described in Exhibit "B."

**32. "Water Shortage Emergency"** means the substantial impairment, which cannot be promptly mitigated, of the ability of the Parties to provide sufficient water for human consumption, sanitation and fire protection because of: (a) a sudden occurrence such as storm, flood, fire, unexpected equipment outage; or (b) an extended period of drought.

**33. "Watermaster"** means the committee with the powers and duties defined in Article V of this Judgment.

34. **"Year"** means a calendar year.

B. **Exhibits.** Each exhibit is expressly incorporated herein and made part of this Judgment.

Exhibit A: Six Basin Map

Exhibit B: General Description of the Six Basins Area

Exhibit C: Memorandum of Agreement between Watermaster and PVPA

Exhibit D: Base Annual Production Rights of Parties

Exhibit E: Description of Replenishment Programs

Exhibit F: City of Pomona Storage and Recovery Agreement

Exhibit G: Initial Operating Plan

## II. FINDINGS AND HYDROLOGIC CONDITIONS

A. **Safe Yield.** Prior to the imposition of this Physical Solution, the Safe Yield of the Six Basins is historically found to be 19,300 acre feet per year.

B. **Overdraft and Prescriptive Circumstances.** For a period in excess of five consecutive Years prior to the filing of the complaint herein, the Native Safe Yield and the Safe Yield have been exceeded by the aggregate Production therefrom and the Six Basins have been in a continuous state of Overdraft. The court finds that the Production constituting such Overdraft has been open, notorious, continuous, adverse, hostile, and under claim of right. The court further finds that the groundwater Production has exceeded the Native Safe Yield and the Safe Yield in each of the last five years and thus all the required elements necessary to establish prescription have been satisfied.

1. **Adversity.** The Native Safe Yield of the Six Basins Area has been continuously exceeded for decades. It is only through the ongoing Replenishment undertaken by PVPA, Pomona and La Verne coupled with the availability of and return flows from Imported Water that a further decline in water levels has been averted. An unmanaged downward decline in water levels is known to have severe adverse impacts on the rights of groundwater producers and groundwater quality, to cause land subsidence and to cause increased pump-lifts. Moreover, the Court finds that presently

estimated Safe Yield of 19,300 acre feet, with the full benefit of the Replenishment carried on by the Parties has been exceeded and if Production is not managed pursuant to this Physical Solution, severe adverse impacts will result.

2. **Continuity.** The Native Safe Yield has been continuously exceeded for at least two decades. For each of the last five Years the Safe Yield has been exceeded. The Court finds that cumulative total Production from the Six Basins Area for the Years 1993 through 1997 is as follows:

| | |
|---|---|
| 1993 | 21,020 acre feet |
| 1994 | 20,313 acre feet |
| 1995 | 22,959 acre feet |
| 1996 | 23,584 acre feet |
| 1997 | 21,902 acre feet |

3. **Notice.** Each of the Parties with a Base Annual Production Right, or their agents, have filed groundwater production reports with the State Department of Water Resources pursuant to *Water Code Section 4999*. These reports are public records and are available for inspection by any member of the public. SCWC is an investor-owned public utility subject to regulation by the California Public Utilities Commission (PUC). Its records, reports and filings with the PUC regularly include information regarding the wells used and groundwater produced from the Six Basins Area. The PUC has held publicly noticed rate hearings which have been attended by the public and representatives from Claremont. Pomona, La Verne and Upland are all public entities and their groundwater production information are public records and open to public inspection upon reasonable notice. PVPA has frequently published reports which indicate the nature of its Replenishment and the volume of groundwater produced in the Six Basins Area. At least two settlement agreements have been entered between certain Parties on matters related to the adverse impacts of increased groundwater production. Both of these agreements were approved by a public entity and are public records. Moreover, the negotiations leading up to the entry of this Judgment were open to all persons claiming the right to produce groundwater by virtue of their owning overlying land or having corporate boundaries overlying the Six Basins Area. Regular meetings concerning these negotiations

have been held at the headquarters of TVMWD, a public agency, and were personally attended by representatives from each of the Parties. These meetings have taken place at regular intervals for more than twelve consecutive months and the contents of this Judgment and the status of groundwater conditions in the Six Basins Area has remained readily available. Accordingly, the Court finds that all persons claiming the right to produce had actual notice, constructive notice or could have easily determined upon reasonable diligence that the Six Basins Area was in Overdraft and of each Party's claim to groundwater. The circumstances of such Overdraft and water use are such that each of the Parties either: (i) had actual knowledge of such circumstances; or (ii) should have discovered such circumstances upon the exercise of reasonable diligence or (iii) received constructive notice of the adverse nature of such aggregate production through the public record filings with the State of California pursuant to *Water Code Section 4999* and through the various reports published by the Parties.

C. **High Groundwater Levels.** There are cienegas and springs in the Four Basins Area and there is a potential for groundwater to rise to the surface regardless of the replenishment, replacement or storage operations of the Watermaster and carried out by the Parties. Periodically, though not in the past twelve years, high groundwater levels have constituted an important causative factor, in creating damage in the Four Basins Area.

D. **Water Quality Problems.** Some of the Six Basins have experienced problems of high concentrations of nitrates and volatile organic compounds (VOC's) in groundwater. Potential sources of the nitrate are historical agricultural practices and individual wastewater disposal systems, most of which have been abandoned. The Two Basins Area and some of the Four Basins Area have been adversely impacted by high concentrations of nitrates and VOC's and may also require remediation.

## III. DECLARATION OF RIGHTS AND RESPONSIBILITIES

### A. General Provisions.

1. **Surface Water Rights.** Pomona and San Antonio have prior and paramount pre-1914 water rights, superior to the rights of any other party, to the surface water and supporting

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subsurface flows historically and presently diverted therefrom in San Antonio and Evey Canyon, except as provided in Article VIB Section 9 and as referenced in Article IIIA Section 1d.

**a.** Historically, Pomona and San Antonio have diverted, and presently are diverting, surface waters and supporting subsurface flows from San Antonio Canyon.

**b.** Historically, Pomona has diverted, and presently is diverting, surface water and supporting subsurface flows from Evey Canyon.

**c.** Pomona and San Antonio are under no obligation to spread such waters.

**d.** Surface waters and supporting subsurface flows diverted in San Antonio and Evey Canyons at existing diversion locations are excluded from (i) the operation of this Judgment and (ii) the determination of Operating Safe Yield, except to the extent of the portion of such waters which are spread by Pomona at its Pedley Treatment Plant, which portion is governed by the provisions of Article VIB, Section 9.

**e.** The diversion and the use of surface waters and supporting subsurface flows shall not be subject to this Judgment.

**f.** The above-referenced surface waters and supporting subsurface flows shall not be subject to allocation among the Parties pursuant to this Judgment.

**g.** Surface waters and supporting subsurface flows may be used by Pomona and San Antonio to satisfy Replacement Water obligations as provided in Article VIB, Section 5.

**2.** **Loss of Priorities.** By reason of the long continued overdraft in the Six Basins, and in light of the complexity of determining appropriative priorities and the need for conserving and making maximum beneficial use of the water resources of the State, each and all of the Parties listed in Exhibit "D" are estopped and barred from asserting special priorities or preferences *inter se* to groundwater except as expressly provided herein. All the Parties' rights to groundwater are accordingly deemed and considered to be of equal priority unless otherwise expressly stated herein.

**3.** **Limitations on Export.** Other than the limitation on Pomona's use of 109 acre feet as further described in Exhibit "D", any Party's share of the Operating Safe Yield, including Carryover Rights and Transfers, may be produced and exported for use outside the Six Basins Area.

However, groundwater stored and recovered pursuant to a Storage and Recovery Agreement may be produced and exported only in accordance with the terms and conditions of the Storage and Recovery Agreement.

4. **No Abandonment of Rights.** It is in the interest of reasonable beneficial use of the Six Basins Area and its water supply, that no Party be encouraged to take and use more water in any Year than is actually required. Failure to produce all of the water to which a Party is entitled hereunder shall, in and of itself, not be deemed to be, or constitute an abandonment of such Party's right, in whole or in part.

5. **Pre-Existing Rights.** This Judgment controls each Party's rights to the Production, Replenishment, Storage and Recovery of groundwater and expressly supersedes other rights, claims or defenses arising from agreement, operation of law, prior use or a prior judgment to the extent that they are inconsistent with this Judgment. However, nothing in this Judgment shall alter or affect any rights or remedies that any Party may have under any contract or agreement with any other Party on matters which are not inconsistent with or are unrelated to the provisions of this Judgment or as provided in Article IVC herein.

6. **Physical Solution.** This Judgment represents a total and complete Physical Solution for the Six Basins Area and all basins included therein. Although prior hydrologic and physical conditions limited the Safe Yield to 19,300 acre feet per year, through the coordinated and equitable management of the Four Basins and Two Basins Areas provided under this Judgment, an Operating Safe Yield, Operating Plan and Base Annual Production Rights shall be independently established for the Four Basins Area. However, La Verne shall be entitled to produce groundwater from the Two Basins Area in addition to its equitable share of the Four Basins Operating Safe Yield, as provided in accordance with the terms of this Judgment.

7. **Portability Between the Two Basins and Four Basins Areas.** A Party's right to produce, store or recover groundwater accruing under this Judgment in the Four Basins Area may not be transferred, exchanged or exercised in the Two Basins Area. A Party's right to produce, store or

recover groundwater accruing under this Judgment in the Two Basins Area may not be transferred, exchanged or exercised in the Four Basins Area.

B. **Rights of the Parties to Produce Groundwater from the Four Basins.**

1. **Declaration of Rights.** The Parties listed in Exhibit "D" are the owners of appropriative rights, including rights by prescription, and exercised and unexercised overlying rights of equal priority, and each Party shall be entitled to produce groundwater under the Physical Solution and to share in the Operating Safe Yield of the Four Basins according to the percentages set forth in Exhibit "D" as Base Annual Production Rights in a manner consistent with the provisions of this Judgment.

2. **Carryover Rights.** Any Party that produces less than its share of the Operating Safe Yield in any Year shall have the right to carry the unproduced portion forward to be produced in the following year subject to the following limitations: (a) the first water produced in any Year shall be deemed to be an exercise of any Carryover Right; (b) a Party's Carryover Right cannot exceed 25 (twenty-five) per cent of such Party's share of the current Operating Safe Yield for the prior Year; and (c) Carryover Rights may be lost in the event replenishment is discontinued or curtailed as provided below in Article IIIB, Section 7.

3. **Transferability of Rights.** Subject to the limitations set forth in this Judgment, a Base Annual Production Right and its associated percentage of the Operating Safe Yield, as well as any Carryover Rights and water stored under a Storage and Recovery Agreement, may be transferred, in whole or in part, among existing Parties or to any other person that becomes a Party on either a temporary or permanent basis provided that no Party is substantially injured by the Transfer. Production pursuant to any such Transfer shall be subject to the limitations on carryover and portability set forth in Article IIIB, Section 4. Any such Transfer shall become effective upon being recorded with Watermaster. Watermaster shall revise Exhibit "D" annually, to reflect any permanent Transfers. The permanent Transfer of any Party's full Base Annual Production Right shall require Watermaster approval. Upon Watermaster approval the permanent Transfer of a Party's full Base Annual Production Right may require an adjustment in the Party representatives to the Watermaster

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and the number of votes of the Party's representatives as provided in Article V. Notwithstanding the provision of this Article IIIB, Section 3, Pomona shall not be entitled to Transfer 109 acre feet of its Base Annual Production Right and its associated percentage of Operating Safe Yield.

4. **Portability of Rights Among the Four Basins.** Any Party with a Base Annual Production Right, shall have the right to produce its share of the Operating Safe Yield of the Four Basins, including any Carryover Rights or Transfers, from any or all of the Four Basins, subject to the following conditions.

a. **No Substantial Injury**. Any groundwater production from a "new" location shall not cause substantial injury to another Party.

b. **Advance Written Notice to Watermaster.** Any Party that intends to undertake any of the following actions shall provide thirty (30) days' advance written notice to the Watermaster: (i) acquire, construct or operate a "new" groundwater production facility in any one of the Four Basins in which it is then producing groundwater; (ii) change the point of extraction from an existing groundwater production facility to a "new" groundwater production facility where the old and the new groundwater production facilities are both within the Canyon or Upper Claremont Heights or Lower Claremont Heights Basins; (iii) change the point of extraction from an existing groundwater production facility on one side of the Indian Hill Fault to a "new" facility on the other side of the Indian Hill Fault.

c. **Prior Watermaster Approval.** Any Party that changes the point of extraction from an existing groundwater production facility on one side of the Indian Hill Fault to a "new" facility located on the other side of the Indian Hill Fault and increases the cumulative rate of annual extraction therefrom by more than 2,000 acre feet per year shall be required to obtain the prior written approval of the Watermaster.

d. **New Facility Defined.** "New" as used in this Section 4 means either (i) an increase or enlargement in the pre-existing design capacity of a groundwater production facility or (ii) a movement in the location of a groundwater extraction facility by more than three hundred (300) feet or from one legal parcel to another legal parcel.

e. **Procedure for Resolution of Disputes.** The Watermaster shall make all necessary determinations and resolve all disputes arising under this Article IIIB, Section 4 in accordance with the provisions of Article VIII.

5. **Rights to Unused Groundwater Storage Capacity.** From time to time there may exist in the Four Basins, unused storage capacity. Parties holding Base Annual Production Rights pursuant to this Judgment and TVMWD for the sole purpose of storing Imported Water, shall have the exclusive rights to use such storage capacity, and subject to the complete discretion of the Watermaster, may sink, spread or inject water into the Four Basins Area pursuant to a Storage and Recovery Agreement.

6. **Priorities for Use of Groundwater Storage Capacity.** In directing spreading and controlling the use of groundwater storage capacity, the Watermaster shall give first priority to Replenishment Water; second priority to Carryover Rights; third priority to Storage and Recovery of water which is naturally tributary to the Six Basins Area; fourth priority to Storage and Recovery of Imported Water, and fifth priority to Storage and Recovery of other water.

7. **Loss of Stored and Carryover Water.** After providing notice and opportunity to be heard to any affected Party pursuant to Article IXA, if the Watermaster reasonably determines that Replenishment had to be terminated or curtailed in any year, or that Replenishment Water was rejected because of insufficient storage capacity, some or all of a Party's unproduced Carryover Rights or Storage and Recovery rights may be deemed lost. The amount of water subject to loss shall be equal to that quantity of Replenishment Water which was curtailed or rejected solely because of insufficient storage capacity in the Four Basins.

The burden of a determination by Watermaster that rejected recharge has occurred and that there shall be a loss of stored and Carryover water, shall be shared proportionately by each Party to the extent the quantity of water held by each Party at the time of the loss bears to the total quantity of water within each of the classification. Any losses shall be charged first to the storage of other water, then to the storage of Imported Water, then to the storage of Native Water, then to Carryover Water as expressly set forth below.

a. Highest priority shall be given to Replenishment Water.

b. Second priority against loss shall be given to Carryover Water.

c. Third priority against loss shall be given to storage of Native Water.

d. Fourth priority against loss shall be given to storage of Imported Water.

e. Fifth priority against loss shall be given to storage of other water.

8. **Consideration of Groundwater Levels.** Watermaster shall make every reasonable effort to establish water operations limits so that the spreading of Replenishment or Replacement water, groundwater storage pursuant to a Storage and Recovery Agreement, or the determination of Operating Safe Yield shall not cause high groundwater levels that result in material damage to overlying property (not including sand and gravel excavations or operations) or cause groundwater to surface above the undisturbed natural terrain.

C. **The Parties' Rights to Groundwater and Storage in the Two Basins.**

1. **Declaration of Rights.** In recognition of the remediation efforts that are likely to be necessary to maximize groundwater production from the Two Basins; because of the detected high nitrate concentrations and in recognition that La Verne is uniquely situated to remedy these water quality conditions and exploit future opportunities; because of the minimal hydrologic communication between the Four Basins and Two Basins, and in furtherance of a complete and total physical solution for the Six Basins Area, La Verne shall have the right to produce as much groundwater as it may reasonably withdraw from the Two Basins Area on an annual basis so long as it does not substantially injure the rights of any other Party.

2. **Storage and Recovery.** La Verne has the sole right to use available storage capacity in the Two Basins in its complete discretion for the Storage and Recovery of groundwater so long as it does not cause substantial injury to any other Party. La Verne shall not be required to obtain a Storage and Recovery Agreement from the Watermaster for Storage and Recovery programs carried out within the Two Basins Area provided that (i) such production or use of storage capacity shall not cause substantial injury to any other Party and (ii) La Verne provides 60 (sixty) days' advance written notice to Watermaster before initiating such a Storage and Recovery program.

3. **Transferability of Rights.** Subject to the limitations set forth in Article III A, Section 7, La Verne's right to produce groundwater from the Two Basins Area may be transferred, in whole or in part, among existing Parties or to any other person that becomes a Party, on either a temporary or permanent basis provided that no Party is substantially injured by the Transfer. The permanent Transfer of the right to produce groundwater from the Two Basins Area shall not be effective until approved by Watermaster.

D. **Rights and Responsibilities of PVPA.**

1. **Spreading Operations.** PVPA and the other Parties have negotiated a Supplemental Memorandum of Agreement, attached hereto as Exhibit "C". This Supplemental Memorandum of Agreement and all modifications or amendments thereto shall include a provision for Watermaster's indemnity of PVPA for all Replenishment activities undertaken by PVPA at the direction of the Watermaster. Within sixty (60) days of entry of this Judgment, Watermaster and PVPA shall execute the Agreement. Upon execution, the Agreement shall become part of the Physical Solution. PVPA shall not be required to execute a Storage and Recovery Agreement with Watermaster for its Replenishment activities carried out under the direction of the Watermaster. The Spreading operations conducted by PVPA may result in incidental Replenishment to the Two Basins Area and none of the Parties have a right to object thereto. This Replenishment is authorized under the Judgment.

2. **Waiver of Claims Against PVPA.** The Parties expressly waive any and all claims against PVPA arising from facts, conditions or occurrences in existence before the Effective Date and arising from PVPA's spreading operations including but not limited to water quality degradation, subsurface infiltration, high groundwater or groundwater Overdraft within the Six Basins Area.

E. **Non-parties.**

1. **Minimal Producers.** Minimal producers are not bound or affected by this Judgment. No person may produce twenty-five acre feet or more in any Year without becoming a Party.

2. **Parties' Rights Versus Non-parties Reserved.** The Parties expressly reserve all rights, without limitation, concerning any and all claims raised by persons not a Party to this Judgment as provided in Article IV C Section 1.

## IV. REMEDIES

### A. Injunctions.

1. **Injunction Against Unauthorized Production.** Each and every Party, its officers, agents, employees, successors and assigns is enjoined and restrained from producing water from the Six Basins except as authorized herein.

2. **Injunction Against Unauthorized Storage.** Each and every Party, its officers, agents, employees, successors and assigns is enjoined and restrained from storing water in the Six Basin Area except as authorized herein.

3. **Injunction Against Unauthorized Replenishment.** Each and every Party, its officers, agents, employees, successors and assigns is enjoined and restrained from replenishing water in the Six Basin Area except as authorized herein.

### B. Continuing Jurisdiction

1. **Jurisdiction Reserved.** Full jurisdiction, power and authority are retained by and reserved to the Court upon the application of any Party, by a motion noticed in accordance with the review procedures of Article XIA, Section 6 hereof, to make such further or supplemental order or directions as may be necessary or appropriate for interpretation, enforcement or implementation of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment or to add to the provisions thereof consistent with the rights herein decreed; provided that nothing in this paragraph shall authorize a reduction of the Base Annual Production Right of any Party except pursuant to a Transfer.

2. **Intervention After Judgment.** Any Non-party who proposes to produce Groundwater from the Six Basins Area in an amount equal to or greater than 25 acre feet per Year, may seek to become a Party to this Judgment through (a) a stipulation for intervention entered into with Watermaster or (b) any Party or Watermaster filing a complaint against the Non-party requesting

that the Non-party be joined in and bound by this Judgment. Watermaster may execute said Stipulation on behalf of the other Parties herein, but such stipulation shall not preclude a Party from opposing such intervention at the time of the Court hearing thereon. A stipulation for intervention must thereupon be filed with the Court, which will consider an order confirming said intervention following thirty (30) days' notice to the Parties. Thereafter, if approved by the Court, such intervenor shall be a Party bound by this Judgment and entitled to the rights and privileges accorded under the Physical Solution herein, including a Base Annual Production Right in an amount equal to its average annual production in the twelve-year period beginning on January 1, of 1985 and ending on December 31, 1996, or any Base Annual Production Right it may obtain by a transfer.

C. **Reservation of Other Remedies.**

1. **Claims By and Against Non-parties.** Nothing in this Judgment shall expand or restrict the rights, remedies or defenses available to any Party in raising or defending against claims made by any Non-party. Any Party shall have the right to initiate an action against any Non-party to enforce or compel compliance with the provisions of this Judgment.

2. **Claims Between Parties on Matters Unrelated to the Judgment.** Nothing in this Judgment shall either expand or restrict the rights or remedies of the Parties concerning subject matter which is unrelated to the quantity and quality of groundwater allocated and equitably managed pursuant to this Judgment other than as provided in Article IIIA, Section 1.

3. **Groundwater Levels.** Except as expressly provided herein, nothing in this Judgment shall either expand or restrict the rights or remedies at law that any Party may have against any other Party for money damages to real or personal property resulting from high groundwater or defenses thereto for events or occurrences after the Effective Date.

## V. WATERMASTER

A. **Composition, Voting and Compensation.** The Watermaster shall be a committee composed of one representative of each of the following Parties, and each representative shall have the authority to cast the indicated number of votes on any question before the committee:

| | |
|---|---|
| City of La Verne | 5 votes |

| | |
|---|---|
| City of Pomona | 5 votes |
| City of Upland | 5 votes |
| Southern California Water Company | 5 votes |
| City of Claremont | 2 votes |
| TVMWD | 2 votes |
| PVPA | 2 votes |
| ~~Simpson Paper~~ | ~~1 vote~~ |
| Pomona College | 1 vote |
| San Antonio | 1 vote |

Committee representatives having the combined authority to cast twenty votes shall constitute a quorum for the transaction of affairs of Watermaster and seventeen affirmative votes shall be required to constitute action by Watermaster. Representatives shall be compensated for their services by their respective appointing authorities. Representatives may be reimbursed by Watermaster for out of pocket expenses incurred on authorized Watermaster business.

**B. <u>Nomination and Appointment Process</u>.** Each of the Parties named in Article VA, above, shall within thirty (30) days of entry of this Judgment submit to the Court its nominees for its representative member of the Watermaster Committee and one alternate and the Court shall in the ordinary course confirm the same by an appropriate order of appointment. Once appointed representatives and their alternates shall normally serve until a replacement is designated by the Party or until removed by the Court. If a representative or alternate is no longer willing or able to serve for any reason the Party represented by such member or alternate shall promptly submit a replacement for the member or their alternate. There shall be no need for replacement representative members or alternates to be approved by the Court. In its annual report to the Court, Watermaster shall update the list of its representative members and alternates.

**C. <u>Succession</u>.** For the purpose of determining whether a permanent Transfer of a Base Annual Production Right shall affect whether a Party shall have a Representative on the Watermaster Committee and the number of votes held by the representative, the following guidelines shall apply:

1. **Partial Succession.** The permanent Transfer of less than any Party's full Base Annual Production Right shall be considered a "partial" succession. A partial succession shall not create any new or additional voting rights in the successor Party or require any modifications to the rules and procedures under this Article V. The full Base Annual Production Right of any Party shall be equal to the entire quantity of the Base Annual Production Right for that Party set forth in Exhibit D on the Effective Date.

2. **Non-Party Successor.** A permanent Transfer of the full Base Annual Production Right of any Party to a Non-Party shall automatically include the authority to cast the number of votes held by the Party. In addition, the Non-Party shall succeed to all other rights and responsibilities of their predecessor Party under this Judgment.

3. **Party Successor.** A permanent Transfer of the full Base Annual Production Right between Parties shall automatically include the authority to cast a number of votes equal to the greater of: (a) the number of votes indicated for the acquiring Party on the Effective Date or (b) the number of votes indicated for the Party whose Base Annual Production Right has been acquired at the time the Transfer is approved by the Watermaster. The number of votes equal to the lesser of 3(a) or 3(b) shall be extinguished. The acquisition of one Party's full Base Annual Production Right by another Party shall not cause a change in the number of votes required to constitute a quorum or to take an action under this Article. However, in the event more than two votes are eliminated, any Party or the Watermaster upon its own motion, may petition the Court to revise the required number of votes to constitute a quorum or to take action under this Judgment.

**D. Powers and Duties.** Subject to the continuing supervision and control of the Court and the limitations set forth in this Judgment, Watermaster shall have and may exercise the following express powers, and shall perform the following duties, together with any specific powers, authority and duties granted or imposed elsewhere in this Judgment or hereafter ordered or authorized by the Court in the exercise of its continuing jurisdiction:

1. Developing, Maintaining and Implementing the Operating Plan.

2. Adopting Rules, Regulations, Procedures, Criteria and Time Schedules.

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3. Acquiring or Investing in Facilities or Facility Improvements.

4. Acquiring or Investing in Monitoring Facilities.

5. Inspecting and Testing Measuring Devices.

6. Levying Assessments

7. Requiring the Acquisition of and Recharge of Replacement Water.

8. Contracting for Necessary Services. (Including the execution of agreements regarding spreading and groundwater modeling.)

9. Employing Agents, Experts and Legal Counsel provided that Watermaster shall not contract with or otherwise engage a Party with a Base Annual Production Right to perform directly or indirectly, administrative services. However, this limitation shall not apply to spreading services under Exhibit C, and meter reading.

10. Adopting an annual budget for monitoring and reporting legal and administrative costs.

11. Managing Watermaster Funds.

12. Cooperating with Federal, State and Local Agencies.

13. Entering and Administering Storage and Recovery Agreements.

14. Maintaining a Notice List.

15. Reporting Annually to the Court.

16. Engaging in Dispute Resolution.

17. Prosecuting litigation against Non-parties in furtherance of the Judgment.

18. Limiting groundwater production to Operating Safe Yield during a Water Shortage Emergency.

**E.** **Organization and Meetings.** At its first meeting in each Year Watermaster shall elect a chair, vice chair, secretary and treasurer and such other officers as may be appropriate. Watermaster shall hold regular meetings at places and times specified in its rules and regulations, and may hold such special meetings as may be required. Watermaster shall provide notices of all regular and special meetings to all parties and any person requesting notice in writing. Any meeting may be adjourned

to a time and place specified in the order of adjournment. Meetings shall be conducted to the extent practicable in accordance with the provisions of the California Open Meetings Law ("Brown Act") *California Government Code Section 54950*, et seq as it may be amended from time to time.

F. **Limits on Assessments.** Watermaster shall not have the authority to levy assessments beyond those specifically described herein.

## VI. PHYSICAL SOLUTION FOR THE SIX BASINS AREA

### A. General Purposes and Objectives.

1. **Physical Solution is Consistent With the Public Interest.** The Physical Solution is consistent with each Party's full enjoyment and the reasonable exercise of its respective water rights will not materially injure the interests of any Parties and will promote coordinated groundwater management with due regard for the environment and it is therefore consistent with the public interest and the reasonable and beneficial use of water.

2. **Balance of Equities.** This Physical Solution constitutes a legal and practical means for balancing the needs of the Parties for a reliable water supply, providing an appropriate incentive for remediation of poor water quality conditions, managing the available groundwater storage capacity to protect against loss of available groundwater and against damage from high groundwater levels with due regard for the environment.

3. **Flexibility.** It is essential that this Physical Solution provides maximum flexibility so that the Watermaster and the Court may be free to adapt and accommodate future changed conditions or new institutional or technological considerations. To that end the Court's retained jurisdiction may be utilized to augment or adjust the Physical Solution without adjustment to a Party's Base Annual Production Right.

### B. Guidelines for Operation of Four Basins Area.

All production, replenishment, replacement, and Storage and Recovery of water in the Four Basins Area must be conducted pursuant to the Operating Plan adopted by Watermaster in accordance with the principles and procedures contained in this Judgment. The following general pattern of operations is contemplated:

1. **Replenishment.** Groundwater will be replenished pursuant to Exhibit "E" or under any other replenishment program or activity to the extent water which is naturally tributary to the Six Basin Area, is available for that purpose and can safely be spread.

2. **Storage and Recovery.** Other Native Water, imported water or other water may be stored and recovered pursuant to Storage and Recovery Agreements.

3. **Operating Safe Yield.** Watermaster will annually, not later than September 15, establish the Operating Safe Yield for the Four Basins for the following Year, taking into consideration the amount of water in storage and the need to control water table elevations. Watermaster shall review the condition of the Four Basins at least quarterly during the Year and may make any appropriate adjustments of the Operating Safe Yield.

4. **Production.** In any Year, each Party will be free to produce its share of the Operating Safe Yield, including any Carryover Rights or Transfers, plus any water authorized to be recovered pursuant to a Storage and Recovery Agreement. Except upon Transfer, no change shall be made to any Party's Base Annual Production Rights.

5. **Replacement Water.** Notwithstanding any limitation contained in this Judgment, a Party may produce and export water from the Four Basins in excess of its Base Annual Production Right and its share of the Operating Safe Yield, plus unused Carryover rights and recoverable groundwater pursuant to an approved Storage and Recovery Agreement, subject to the requirement to provide Replacement Water in the manner set forth herein.

a. **Obligation to Provide Replacement Water.** To the extent a Party's production in the Four Basins or in any basin exceeds that Party's share of the Operating Safe Yield, plus unused Carryover rights and recoverable groundwater pursuant to an approved Storage and Recovery Agreement, the Party shall arrange for delivery of Replacement Water in an amount equal to the Party's excess production by any of the following: (i) acquiring Replacement Water directly from TVMWD except Upland which may also acquire Replacement Water from the Inland Empire Utilities Agency ("the Empire"); (ii) arranging for delivery of a Native water supply other than Replenishment Water; or (iii) paying a Replacement Water Assessment to Watermaster for the

purpose of acquiring Replacement Water directly from TVMWD except as to Upland for which Watermaster may acquire replacement water from the Empire.

**b. In Lieu Procedures.** Replacement Water may be supplied through In-Lieu Procedures, spreading or other method at a place, time and manner, acceptable to Watermaster, for a price and upon terms to be determined by TVMWD except as to Upland for which the price and terms may be determined by the Empire.

**c. Replacement Water Assessment.** Watermaster will use Replacement Water Assessment proceeds to acquire Replacement Water from TVMWD, or as to Upland, the Empire.

**6. <u>Development, Maintenance and Implementation of the Operating Plan</u>.** Watermaster is directed to maintain and implement the Operating Plan such that Production, Replenishment and Storage and Recovery of water are consistent with and implement the purpose and objectives of the Physical Solution herein. The Operating Plan shall include rules, regulations, procedures, criteria, and time schedules, as appropriate, for at least the following elements:

a. Establishing and adjusting the Operating Safe Yield.

b. Replenishment.

c. Execution of supplemental agreements with PVPA regarding spreading grounds and the funding thereof.

d. Acquisition and delivery of Replacement Water.

e. Standard terms and conditions of Storage Agreements.

f. Replenishment, replacement and storage limits needed to protect against high groundwater levels.

g. Remediation of water quality problems.

h. Monitoring systems and protocols, including such for groundwater levels.

i. Monitoring, reporting and verification programs.

j. Transfers.

k. Annual budgets.

l. Financial management.

m. Reporting to the Court.

n. Levying Assessments.

7. **Initial Operating Plan.** Within six months of the effective date of this Judgment Watermaster shall submit to the Court for approval an initial Operating Plan. An outline of the Initial Operating Plan is attached as Exhibit "G."

8. **Annual Review of the Operating Plan.** Watermaster shall review the Operating Plan at least annually and, subsequent to each such review, submit to the Court for its approval any proposed amendments or revisions.

9. **Replenishment.** PVPA and Pomona historically augmented the Native Safe Yield within the Four Basins Area through replenishment programs or activities. For many years these replenishment programs or activities have resulted in the spreading and percolation of native waters originating in the San Antonio Canyon and Evey Canyon. To the extent such waters have been historically spread, they comprise a portion of the Safe Yield and Operating Safe Yield subject to management under this Physical Solution.

**a.** All Replenishment shall be at the direction of the Watermaster.

**b.** At the direction and sole discretion of the Watermaster PVPA shall, pursuant to the Memorandum of Agreement set forth in Exhibit "C" or any subsequent amendments thereto, continue to spread such native waters as it receives.

**c.** Unless it is acting for the benefit of another Party pursuant to a Storage and Recovery Agreement approved by the Watermaster, except for Replacement Water, all water PVPA spreads, sinks or injects shall be considered Replenishment and shall comprise a portion of the Operating Safe Yield.

**d.** Although Pomona has no continuing obligation to spread or replenish, all waters spread in excess of its "historical replenishment" shall not be considered Replenishment and a part of the Operating Safe Yield of the Four Basins Area. The "historical replenishment" of Pomona shall be equal to a twelve (12) year annual average for the twelve (12) years immediately preceding the filing of the complaint

(1985-1996), which is determined to be one-hundred and thirty) acre feet. All water Pomona spreads, sinks or injects, or causes to be spread, sunk or injected (collectively augmentation) in excess of the historical replenishment shall not be considered a portion of the Operating Safe Yield, and shall not be allocated among the Parties pursuant to their Base Annual Production Rights. Pomona shall be entitled to produce such excess quantity in addition to its Base Annual Production Right under a pre-approved Storage and Recovery Agreement as provided in Article VIA, Section 10 in a form substantially similar to Exhibit F hereto, which is ordered to be executed by Watermaster and Pomona within sixty (60) days from the Effective Date. Measurement of Pomona's rights to recover water under any Storage and Recovery Agreement shall be administered as follows:

i. Pomona shall be entitled to recover the amount by which its augmentation of water over the twelve (12) year period ending with the current year exceeds 1,560 acre feet.

ii. If less than twelve (12) years have elapsed since the effective date of this Judgment, Pomona shall have the right to recover the amount by which the total number of acre feet of groundwater augmented by Pomona exceeds one hundred thirty (130) acre feet times the number of years elapsed.

iii. The amount in excess of Pomona's historical replenishment may be recovered by Pomona as provided in the Storage and Recovery Agreement.

**10. <u>Storage and Recovery Pursuant to Storage and Recovery Agreements</u>.** Watermaster may enter a Storage and Recovery Agreement with any Party holding a Base Annual Production Right or TVMWD so long as the Storage and Recovery of groundwater will not cause an unreasonably high groundwater table and physical damage. A Storage and Recovery Agreement shall contain uniform terms and conditions as set forth in the Operating Plan and may also contain

special terms and conditions as deemed appropriate by Watermaster. Water that may be stored pursuant to a Storage Agreement includes any water other than Replenishment Water including augmentation in excess of historical replenishment as expressly set forth under Article VIB, Section 9.

11. **Special Projects.** Any Party may propose for Watermaster approval, special projects including projects for controlling water levels or for remediation of water quality problems. Any such proposal shall be accompanied by an analysis that identifies the benefits of the project as well as any potential adverse impacts on any Party and any proposed mitigation measures. After notice to all Parties, if any Party files a written objection to the proposed project, Watermaster shall hold a hearing to determine whether the objections to the proposed project can be resolved. If there are no objections or if objections are resolved to the satisfaction of the Parties or if Watermaster determines that the objections are without merit, then Watermaster shall approve the proposed project. Groundwater produced under authorization as a Special Project shall not be eligible for the accrual of Carryover Rights unless authorized by Watermaster.

12. **Temporary Surplus Groundwater.** From time to time it may be in the best interest of the Parties, for the control of high groundwater, water quality remediation or other reasons, to produce groundwater over and above the then declared Operating Safe Yield. Therefore, from time to time, the Watermaster may declare a Temporary Surplus of groundwater to be available for production. The Parties' rights to the Temporary Surplus shall be in the same percentages as the Base Annual Production Right bears to the Operating Safe Yield. A Party's rights to temporary surplus shall not be eligible for the accrual of Carryover Rights set forth in Article IIIB, Section 2.

C. **Guidelines for Operation of the Two Basins Area.** All Production, Replenishment and Storage and Recovery rights for groundwater in the Two Basins Area are reserved to La Verne. However, La Verne's Production, Replenishment and Storage and Recovery of groundwater must not substantially injure other Parties.

1. **Replenishment.** La Verne shall have sole and complete discretion in the operation of Replenishment programs in the Two Basins Area provided that no other Party is substantially

injured by the program. La Verne shall provide written notice to Watermaster sixty (60) days in advance of any Replenishment program being undertaken.

2. **Storage and Recovery.** La Verne shall have sole and complete discretion in the operation of a Storage and Recovery program in the Two Basins Area provided that no other Party is substantially injured by the program. La Verne shall provide written notice to Watermaster sixty (60) days in advance of any Storage and Recovery program being undertaken. La Verne shall annually report the quantity of groundwater stored pursuant to a Storage and Recovery Program in the Two Basins Area.

3. **Production.** La Verne shall have sole and complete discretion to produce groundwater from the Two Basins Area provided that no other Party is substantially injured by such production. La Verne shall report its groundwater production to the Watermaster on a monthly basis.

## VII. ASSESSMENTS

### A. Ground Rules

1. **Authorization.** Subject to the continuing supervision of the Court and the limitations set forth in the Judgment, Watermaster is authorized to levy assessments to fund Replacement Water acquisition costs, administrative costs and other costs determined by Watermaster to be necessary for the implementation of the physical solution.

2. **Assessment Spread.** Excluding Replacement Water Assessments, all assessments levied by the Watermaster shall be spread such that Claremont, Pomona College and TVMWD (collectively, the "Minor Parties") shall each individually be assessed three and one half (3.5) percent of the total assessment , and eighty-nine and one half (89.5) percent of the total assessment is spread among La Verne, Pomona, Upland, San Antonio, West End, ~~Simpson~~ and SCWC (collectively, the "Major Parties") in proportion to their then-current holdings of Base Annual Production Rights, provided that for assessments other than for Replacement Water or administration (a) the total amount spread among Minor Parties shall not exceed sixty-thousand $60,000, escalated, in any year without their unanimous consent and (b) the total amount spread among the Major Parties in any year shall not exceed ten dollars ($10.00), escalated, per acre foot of their Base Annual Production Rights

without their unanimous consent. "Escalated" shall mean an annual adjustment in the specified dollar value based upon the Consumer Price Index for Southern California in the immediately preceding Year. No escalation adjustment shall be made until the Judgment has been in effect for twelve consecutive calendar months. PVPA shall not have any obligation to pay any assessments.

3. **Administrative Assessment.** Watermaster is authorized to levy an annual assessment that is sufficient to fund the costs of administering the Judgment. The administrative assessment shall not exceed the cost of Watermaster's administrative budget and shall be due and payable according to a schedule established by Watermaster. The administrative assessment for the first Year following entry of Judgment shall be $8.00 per AF and shall be due and payable on January 15, 1999. Late payment shall bear an interest penalty to be established annually by Watermaster. (escalated?)

4. **Replacement Water Assessments.** To the extent Watermaster must acquire and recharge the groundwater with Replacement Water pursuant to the terms of this Judgment, in order to fund the costs thereof, Watermaster is authorized to levy Replacement Water Assessments. Replacement Water Assessments levied against any Party shall be sufficient to pay the costs to replace such Party's production in excess of the sum of such Party's share of the Operating Safe Yield, any Carryover Right or Transfers and any storage recovery, Production of Temporary Surplus or pursuant to Special Project authorization, during the prior Year, minus any Replacement Water provided to Watermaster by the Party. Any Replacement Water Assessment shall be paid within sixty (60) days from the date of the written invoice from Watermaster.

## VIII. DISPUTE RESOLUTION

A. **Entity for Resolution of Dispute.** All disputes arising under this Judgment initially shall be submitted to Watermaster for resolution in accordance with the provisions of this Article.

B. **Determination Regarding Substantial Injury.** Any Party having a right to be protected against "substantial injury" caused by any other Party; the right to proceed so long as not causing substantial injury to another party; or any other claim, right or remedy against any other Party arising under the provisions of this Judgment may file a written request with the Watermaster to hold a hearing.

C. **Notice and Hearing.** Upon receipt of the written request, Watermaster shall provide written notice to each Party which generally describes the nature of the dispute. Thereafter, Watermaster shall cause an item to be placed on the agenda for the next regularly scheduled meeting of the Watermaster or if requested by the moving Party, call a special meeting for the purpose of providing a full hearing of the dispute and providing the interested Parties with notice and opportunity to be heard. No later than 30 days following the conclusion of the hearing(s) Watermaster shall issue a written decision which is dispositive of the dispute and which is supported by written findings. Any Party may seek review of an adverse decision of the Watermaster in accordance with the provisions of Article IX.

## IX. ADDITIONAL PROVISIONS

### A. Procedure

1. **Designation of Address for Notice and Service.** Each Party shall designate the name and address to be used for purposes of all subsequent notices and service herein, either by its endorsement on the Stipulation for Judgment or by a separate designation to be filed within thirty (30) days after Judgment has been entered. Said designation may be changed from time to time by filing a written notice of such change with Watermaster. Any Party desiring to be relieved of receiving notices of Watermaster activity may file a waiver of notice on a form to be provided by Watermaster. Watermaster shall maintain at all times a current list of Parties to whom notices are to be sent and their address for purposes of service. Watermaster shall also maintain a full current list of names and addresses of all Parties or their successors, as filed herein. Copies of such lists shall be available to any person. If no designation is made, a Party's designee shall be deemed to be, in order of priority: (i) the Party's attorney of record; (ii) if the Party does not have an attorney of record, the Party itself at the address on the Watermaster list.

2. **Service of Documents.** Delivery to or service upon any Party by Watermaster, by any other Party, or by the Court, of any document required to be served upon or delivered to a Party under or pursuant to this Judgment shall be deemed made if made by deposit thereof (or by copy thereof)

in the mail, first class postage prepaid, addressed to the designee of the Party and at the address shown in the latest designation filed by that Party.

3. **Recordation of Notice.** Within sixty (60) days following entry of this Judgment, Watermaster shall record in the office of the County Recorder of the Los Angeles and San Bernardino Counties a notice substantially complying with the notice content requirements set forth in *Section 2529 of the California Water Code* as it exists on the Effective Date.

4. **Judgment Binding on Successors.** Subject to specific provisions hereinbefore contained, this Judgment and all provisions thereof are applicable to and binding upon and inure to the benefit of not only the Parties to this action, but also to their respective heirs, executors, administrators, successors, assigns, lessees, licensees and to the agents, employees and attorneys in fact of any such Persons.

5. **Costs.** No Party stipulating to this Judgment shall recover any costs or attorneys fees in this proceeding from another stipulating Party. In any future proceedings, the costs of notice or service, shall be levied in accordance with the provisions of Article XIA, Section 6.

6. **Review Procedures.** Any action, decision, rule or procedure of Watermaster pursuant to this Judgment shall be subject to review by the Court on its own motion or on timely motion by any Party, as follows:

a. **Effective Date of Watermaster Action.** Any order, decision or action of Watermaster pursuant to this Judgment on noticed specific agenda items shall be deemed to have occurred on the date of the order, decision or action.

b. **Notice of Motion.** Any Party may, by a regularly noticed motion, petition the Court for review of Watermaster's action or decision pursuant to this Judgment. The motion shall be deemed to be filed when a copy, conformed as filed with the Court, has been delivered to Watermaster together with the service fee established by Watermaster sufficient to cover the cost to photocopy and mail the motion to each Party. Watermaster shall prepare copies and mail a copy of the motion to each Party or its designee according to the official service list which shall be maintained by Watermaster according to Article XIA, Section 1, a Party's obligation to serve notice

of a motion upon the Parties is deemed to be satisfied by filing the motion as provided herein. Unless ordered by the Court, any such petition shall not operate to stay the effect of any Watermaster action or decision which is challenged.

c. **Time for Motion.** A motion to review any Watermaster action or decision shall be filed within ninety (90) days after such Watermaster action or decision, except that motions to review Watermaster Assessments hereunder shall be filed within thirty (30) days of mailing of notice of the Assessment.

d. **De Novo Nature of Proceeding.** Upon filing of a petition to review Watermaster action, the Watermaster shall notify the Parties of a date when the Court will take evidence and hear argument. The Court's review shall be de novo and the Watermaster decision or action shall have no evidentiary weight in such proceeding.

e. **Payment of Assessments.** Payment of Assessments levied by Watermaster hereunder shall be made when due, notwithstanding any motion for review of Watermaster action, decision, rules or procedures, including review of Watermaster Assessments.

B. **Entry of Judgment.** The Clerk shall enter this Judgment.

Dated: DEC 18 1998 1998.

Judge of the Superior Court

WILLIAM J. McVITTIE

HATCH AND PARENT
21 EAST CARRILLO STREET
SANTA BARBARA, CA
93101-2782

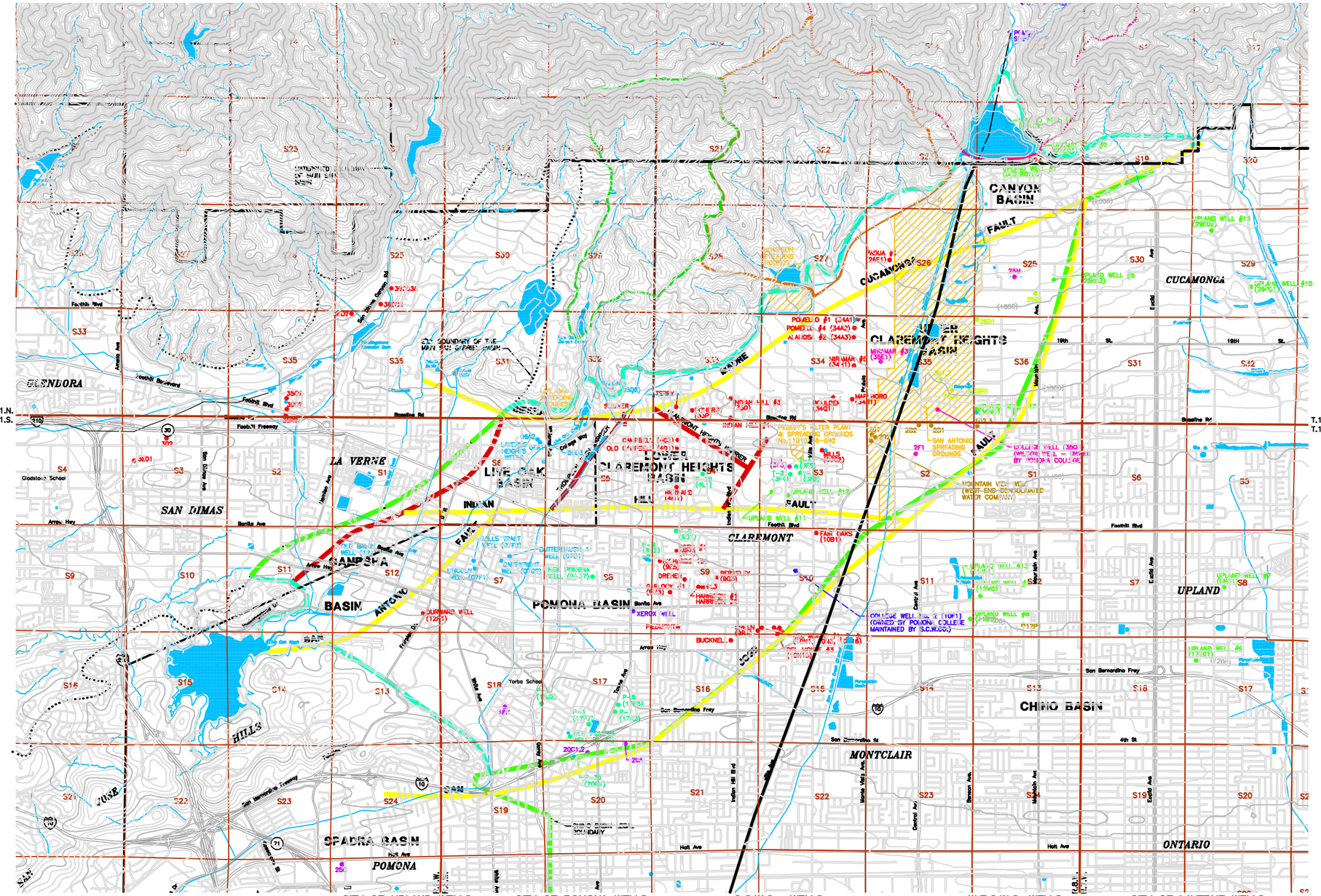


## LEGEND

- THOMPSON CREEK WATERSHED BOUNDARY
- LIVE OAK WATERSHED BOUNDARY
- SAN ANTONIO WATERSHED BOUNDARY
- FAULT LINE
- LEGAL BOUNDARY OF ADJACENT BASIN
- GEOLOGIC FEATURE
- ALLUVIUM BOUNDARY
- MAIN SAN GABRIEL BASIN WATERSHED BOUNDARY
- MAIN SAN GABRIEL BASIN
- GROUNDWATER RECHARGE FACILITY

## CITY OF UPLAND WELLS

18J02 WELL AND NUMBER

| STATE ID # | CITY ID # |
|---|---|
| 24L1 | UPLAND WELL #1 (DESTROYED) |
| 24E02 | UPLAND WELL #1A |
| 24E01 | UPLAND WELL #2 |
| 12M01 | UPLAND WELL #3 (INACTIVE) |
| 23K03 | UPLAND WELL #5 |
| 8N01 | UPLAND WELL #7 |
| 11R1 | UPLAND WELL #8 (INACTIVE) |
| 17E01 | UPLAND WELL #9 |
| 34J3 | UPLAND WELL #11 (DESTROYED) |
| 3MI | UPLAND WELL #12 (DESTROYED) |
| 11J01 | UPLAND WELL #13 (INACTIVE) |
| 29P01 | UPLAND WELL #15 |
| 29E02 | UPLAND WELL #16 |
| 36N01 | UPLAND WELL #17 |

## CITY OF POMONA WELLS

18J02 WELL AND NUMBER

| STATE ID # | CITY ID # |
|---|---|
| 17P7 | P-1 |
| 18J2 | P-3 |
| 17K2 | P-7 |
| 17P5 | P-8 |
| 8H2 | P-9 |
| 9D1 | P-13 |
| 4L1 | P-20 |
| 17P3 | P-32 |
| 20C1 | P-33 |
| 8F1 | P-37 |
| 3F2 | T-1 |
| 3F4 | T-2 |
| 3F3 | T-3 |
| 3F5 | T-4 |

## S.C.W.Co. WELLS

18J02 WELL AND NUMBER

| STATE ID # | COMPANY ID # |
|---|---|
| 34A3 | ALAMOSA #2 |
| 9G3 | BERKELEY |
| 4M1 | BERNARD |
| 34Q1 | BOULDER |
| 4C3 | CAMPBELL |
| 35Q1 | COLLEGE WELL |
| 10N1 | DEL MONTE #1 |
| 10N3 | DEL MONTE #2 |
| 10N15 | DEL MONTE #3 |
| 10N16 | DEL MONTE #4 |
| 9F | DREHER |
| 12R1 | DURWARD WELL |
| 10B1 | FAIR OAKS |
| 9E2 | FORD #1 |
| 9N3 | GARLOCK #1 |
| 9R1 | GREEN |
| 9L3 | HARRISON #1 |
| 9L2 | HARRISON #2 |
| 33Q | INDIAN HILL #3 |
| 34R1 | MARLBORO |
| 3G2 | MILLS #1 |
| 35E1 | MIRAMAR #3 |
| 34H1 | MIRAMAR #5 |
| 28E1 | PADUA #1 |
| 34A1 | POMELLO #1 |
| 34A2 | POMELLO #4 |
| 33P | POMEROY |
| 9E5 | RICHARDS 160 |

## W.E.C.W.C. WELLS

18J02 WELL AND NUMBER

| STATE ID # | COMPANY ID # |
|---|---|
| 25Q2 | CANYON RIDGE WELL (DESTROYED) |
| 1D2,3 | LEMON HEIGHTS #4 |
| 2D1 | ML VIEW #1 |
| 2D2 | ML VIEW #2 (DESTROYED) |
| 2F1 | ML VIEW #4 |
| 12P1 | WEST END WELL #1 (INACTIVE) |
| 2B1 | WEST END WELL #3 |
| 2B2 | WEST END WELL #4 |
| 25N1 | UPLAND–FOOTHILL #1 (DESTROYED) |
| 25L1,2 | UPLAND–FOOTHILL #3 |

## CITY OF LAVERNE WELLS

18J02 WELL AND NUMBER

| STATE ID # | CITY ID # |
|---|---|
| 07Q2 | CARTWRIGHT |
| 07F1 | LINCOLN |
| 05D2 | MALONE 2 (INACTIVE) |
| 07F2 | MILLS TRACT |
| 12A | OLD BALDY |
| 06A2 | LAVERNE HEIGHTS 1 |
| 06A1 | LAVERNE HEIGHTS 2 |
| 05D3 | LAVERNE HEIGHTS 3 |
| 07G1 | BUTTERBAUGH 1 (DESTROYED) |

## S.A.W.C. WELLS

18J02 WELL AND NUMBER

| STATE ID # | COMPANY ID # |
|---|---|
| 25Q1 | SAWC WELL #17 (INACTIVE) |
| 35R1 | SAWC WELL #25 (INACTIVE) |
| 35J3 | SAWC WELL #26 |
| 3K1,2 | SAWC WELL #27 (INACTIVE) |
| 38D1 | SAWC WELL #28 (INACTIVE) |

## SIMPSON PAPER CO.

18J02 WELL AND NUMBER

| STATE ID # | COMPANY ID # |
|---|---|
| 18K | WELL 5 |
| 20A | WELL 1 |
| 20C1 | WELL 2A |
| 20C2 | WELL 2B |
| 25C | WELL 3 |

## KEY MONITORING WELLS

18J02 WELL AND NUMBER

| STATE ID # | COMPANY ID # |
|---|---|
| 12M01 | UPLAND WELL #3 |
| 2F1 | ML VIEW #4 |
| 35E1 | MIRAMAR #3 |
| 35Q1 | COLLEGE WELL No. 1 |
| 3F3 | T-3 |

## POMONA COLLEGE

18J02 WELL AND NUMBER

| STATE ID # | COMPANY ID # |
|---|---|
| 35Q1 | COLLEGE WELL No. 1 |
| 10F1 | COLLEGE WELL No. 2 |

PREPARED BY:

CIVILTEC engineering inc.
(626) 357-0566

# SIX BASINS AREA

# FINAL BOUNDARY MAP

| | | |
|---|---|---|
| DESIGN: JM/MR | CHECKED: WDB | SCALE: 1" = 2000' |
| DRAWN: PWH | J.N. 97106 | SHEET 1 OF 1 |

"A" ATTACHMENT

EXHIBIT B

DESCRIPTION OF SIX BASINS AREA

The Six Basins Area lies between the San Jose Hills on the south, the Chino Basin on the east, the San Gabriel Mountains on the north and the Main San Gabriel Basin on the west. The boundaries of the Main San Gabriel Basin are set forth in the Judgment in the case of the *Upper San Gabriel Valley Municipal Water District vs. City of Alhambra, et al.*, Superior Court of the State of California, Los Angeles County, Case No. 924128, and the boundaries of the Chino Basin are set forth in the Judgment in the case of *Chino Basin Municipal Water District vs. City of Chino, et al, Superior Court for the State of California*, San Bernardino County, Case No. 164327. The Area consists of six interconnected groundwater basins. Each basin consists of all alluvium or other water-bearing formations lying beneath the surface of the basin. The approximate boundaries of the surface of each basin are shown on EXHIBIT A and are described generally as follows:

**Canyon Basin**. The surface of the Canyon Basin is bounded on the south and east by the surface trace of the Sierra Madre/Cucamonga Fault and on the north and west by the surface trace of the bedrock/alluvium interface between(a) the point of intersection in Township 1 North, Range 8 West, Section 31, SBB&M, of the Sierra Madre/Cucamonga Fault with easterly boundary of the Main San Gabriel Basin and (b) the point of intersection in Township 1 North, Range 8 West, Section 20, SBB&M, of the Sierra Madre/Cucamonga Fault with the San Gabriel Mountains. The northernmost extent of the bedrock/alluvium interface is assumed to be at the southern boundary of Township 1 North, Range 8 West, Section 13, SBB&M in San Antonio Canyon.

**Upper Claremont Heights Basin**. The surface of the Upper Claremont Heights Basin is bounded on the south by the surface trace of the Indian Hill Fault, on the east by the westerly boundary of the Chino Basin, on the north by the surface trace of the Sierra Madre/Cucamonga Fault and on the west by the surface trace of the Claremont Heights Barrier.

**Lower Claremont Heights Basin**. The surface of the Lower Claremont Heights Basin is bounded on the south by the surface trace of the Indian Hill Fault, on the east by the surface trace of the Claremont Heights Barrier, on the north by the surface trace of the Sierra Madre/Cucamonga Fault on the west by the surface trace of the Thompson Wash Barrier.

**Live Oak Basin**. The surface of the Live Oak Basin is bounded on the south by the surface trace of the Indian Hill Fault, on the east by the surface trace of the Thompson Wash Barrier, on the north by the surface trace of the Sierra Madre/Cucamonga Fault and on the west by the easterly boundary of the Main San Gabriel Basin.

**Ganesha Basin**. The surface of the Ganesha Basin is bounded on the south and east by the surface of the San Antonio Fault, on the north surface trace of the Indian Hill Fault, and on the west by easterly boundary of the Main San Gabriel Basin and by the surface trace of the bedrock/alluvium interface between (a) the point of intersection in Township 1 South, Range 9 West, Section 11, SBB&M, of the easterly boundary of the Main San Gabriel Basin with the San Jose Hills and (b)

the point of intersection in Township 1 South, Range 9 West, Section 14, SBB&M, of the surface trace of the San Antonio Fault with the San Jose Hills.

**Pomona Basin**. The surface of the Pomona Basin is bounded on the south by the surface trace of the bedrock/alluvium boundary between (a) the intersection in Township 1 South, Range 9 West, Section 14, SBB&M, of the surface trace of the San Antonio Fault with the San Jose Hills and (b) the intersection in Township 1 South, Range 8 West, Section 19, SBB&M, of the boundary of the Chino Basin, on the north by the surface trace of the Indian Hill Fault on the west by the surface of the San Antonio Fault.

MEMORANDUM OF AGREEMENT

BETWEEN THE POMONA VALLEY PROTECTIVE ASSOCIATION

AND WATERMASTER OF THE SIX BASINS RELATING TO

WATER SPREADING AND RELATED ACTIVITIES

THE AGREEMENT, made, entered into, and executed as of this ___ day of _____, 1999, by and between the Pomona Valley Protective Association ("PVPA"), and Watermaster of the Six Basins ("Watermaster"), relating to water spreading and related activities in connection with the Canyon Basin, the Upper Claremont Height Basin, the Lower Claremont Heights Basin, the Live Oak Basin, the Ganesha Basin and the Pomona Basin (collectively, the "Six Basins").

RECITALS

WHEREAS, the rights to groundwater in connection with the Six Basins were adjudicated by the court in an action entitled "*Southern California Water Company v. City of La Verne, et al,*" Case No. KC029152 in the Superior Court of the State of California, County of Los Angeles, (the "Judgment"); and

WHEREAS, the Judgment requires the Watermaster to determine annually an Operating Safe Yield of the Six Basins and to develop an Operating Plan, which will include the monitoring and direction of all production, replenishment, replacement and storage of groundwater in the Six Basins; and

WHEREAS, PVPA, a California corporation, formed in 1910 by various water interests in Pomona Valley, engages in water conservation activities for the benefit of its shareholders, which include the City of Upland, Southern California Water Company, the City of Pomona, Simpson Paper Co., Pomona College, the San Antonio Water Company, and the West End Water Company; and

WHEREAS, PVPA owns certain real property in and around the Six Basins area primarily consisting of two spreading grounds: the San Antonio Spreading Grounds and the Thompson Creek Spreading Grounds together with appurtenant diversion and conveyance facilities (the "Spreading Grounds" herein); and

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WHEREAS, in connection with its water conservation activities, PVPA has conducted several technical studies of the Six Basins including the development of a numerical groundwater model which assists in the prediction of the Six Basins' response to PVPA's spreading activities, and is used to control the groundwater resources for the Six Basins and to mitigate high groundwater in the Six Basins; and

WHEREAS, the parties to the Judgment have conducted additional studies including the enhancement and refinement of the PVPA groundwater model.

NOW, THEREFORE, in consideration of mutual promises, agreements, and covenants of Watermaster and PVPA collectively referred to herein as "the Parties" agree as follows:

## I. DEFINITIONS

A. The Judgment defines certain important terms. Except as to the definitions provided in this Agreement, the terms used in this Agreement which have been defined in the Judgment shall have the meaning set forth in the Judgment and the definitions set forth in the Judgment are incorporated herein by this reference

B. "Emergency" shall mean a sudden event which threatens life or property.

C. "Models" shall mean the spreadsheet and the basin wide models used by PVPA in development of an Operating Plan and any subsequent version or improvement thereof.

D. "Parties" written with an upper case P, refer to the Watermaster and to PVPA. Parties written with a lower case p, refer to the parties to the Judgment as defined therein.

## II. SPREADING GROUNDS AND SPREADING OPERATIONS

A. Watermaster Direction and PVPA Reservation. PVPA shall use and operate the Spreading Grounds primarily for the spreading of replenishment, replacement and storage water under the direction of the Watermaster Plan. PVPA reserves the right to use the Spreading Grounds for other lawful activities consistent with its water spreading activities so long as doing so does not impair PVPA's ability to spread replenishment water in quantities substantially comparable to historic quantities.

B. Impossibility and related defenses. PVPA shall not be liable, in breach or in default of the Agreement if PVPA is unable, either temporarily or permanently, to perform its obligations

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under the Agreement for reasons beyond PVPA's reasonable control, including but not limited to, acts of God, eminent domain, impossibility or impracticability of performance, interference of a third party and natural disasters, including without limitation, floods, earthquakes, and fires.

C. PVPA Discretion. PVPA shall have discretion to make operational decisions in discharging its obligation hereunder within the scope of Watermaster direction.

D. Common conditions of spreading. In addition to the direction of Watermaster PVPA shall spread replenishment, replacement or storage waters subject to the following conditions.

1. Cessation of Spreading for Emergencies. PVPA reserves the right to cease spreading at any time, without prior notice to Watermaster if, in the discretion of PVPA, such action shall be warranted by, and in connection with, any emergency condition. PVPA will give Watermaster immediate notice of any such cessation.

2. Water Quality. PVPA bears no responsibility for the quality of replenishment, replacement or storage water or the impacts of spreading such water upon water quality of the Six Basins.

3. High Groundwater. PVPA bears no responsibility for high groundwater due to any spreading of replenishment, replacement or storage water.

4. Rejected water. PVPA bears no responsibility for loss of replenishment, replacement or storage water which is rejected or otherwise lost.

5. Measurement and Reporting. Watermaster shall provide adequate measuring devices to measure the spreading of replenishment, replacement and storage waters and any such water rejected or lost. PVPA will keep, maintain and furnish to Watermaster on a monthly basis, records of the quantities of replenishment waters spread and rejected.

6. Record of Deliveries and Spreading. Watermaster shall keep, maintain and furnish to PVPA records of the quantities and quality of replacement or storage waters delivered within 30 days following delivery of such waters. PVPA shall keep, maintain, and furnish to Watermaster the quantities of replacement and storage waters spread within 30 days following delivery of such water together with an estimate of the quantities of water bypassing the spreading facilities, if any.

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7. Compensation. Subject to review by the court under its continuing jurisdiction in Case No. KC029152, Watermaster shall pay PVPA's actual, reasonable and necessary costs incurred by PVPA in spreading replenishment, replacement and storage water. PVPA will bill Watermaster such costs on a quarterly basis and such bill will include a reasonably detailed accounting of such costs under generally accepted accounting principles (GAAP). Payment is due upon billing. PVPA's costs may be subject to review or audit by an outside accounting firm selected and paid by Watermaster (within thirty days following billing). Within thirty (30) days following billing, Watermaster shall either contest the billing or accept said billing.

E. Replenishment water. In addition to the above, PVPA shall spread replenishment water as it becomes available. PVPA has no control over the availability of replenishment waters and is under no obligation to spread any specific quantity of replenishment water.

F. Replacement Water. In addition to the above, PVPA shall spread Replacement Water on the Spreading Grounds under the following terms and conditions. Pursuant to the Judgment, only qualified parties under the Judgment may store water in the Six Basins upon entry into a Storage and Recovery Agreement with Watermaster. Upon request, PVPA shall spread storage water under the following terms and conditions:

1. Terms of Delivery. Watermaster shall deliver and PVPA shall spread storage water under the same terms and conditions as replacement waters.

2. Replacement Water Flows. PVPA will assist Watermaster in determining the allowable daily rates and the duration of replacement water deliveries, based upon conditions existing from time to time, including any unused capacity available at and in PVPA spreading facilities.

3. Notice of New or Changed Replacement Water Flows. Watermaster, at least seven (7) days prior to any anticipated delivery of replacement water, shall notify PVPA that water will be available for transport and spreading and shall give PVPA at least forty-eight (48) hours notice of any anticipated change in previously established flow rates of delivery for such water.

4. Spreading Grounds Limitations. PVPA may require changes in delivery flow rates when, in PVPA's opinion, continued spreading (in whole or in part) cannot be carried out

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hereunder due to operational and/or maintenance problems, including, but not limited to, trespassing, insect infestations, scarification, weed abatement, and/or construction in or at PVPA's conveyance and spreading facilities. When it is reasonable to do so, PVPA will give Watermaster at least twenty-four (24) hours' notice of any such changes.

## III. OWNERSHIP AND IMPROVEMENTS OF SPREADING GROUNDS

A. No Dedication. Nothing in this Agreement shall be construed as a dedication of the PVPA Spreading Grounds or its facilities to Watermaster, the other parties to the Judgment, or to the public use or benefit. The spreading grounds and appurtenant facilities are, and remain, the sole property of PVPA. PVPA may sell, lease, or otherwise dispose of portions of its spreading grounds at its own discretion but not inconsistent with this Agreement.

B. Spreading Grounds Improvements. Nothing in this Agreement obligates or otherwise requires PVPA to construct new or additional facilities in connection with its spreading operations. PVPA may at its discretion construct new or additional facilities. Watermaster may propose improvements to PVPA's spreading grounds and facilities at its own expense.

C. Condemnation. Watermaster agrees to and does waive and disclaim any interest in any award or settlement which may be made in any proceeding in eminent domain concerning all or part of the Spreading Grounds whether the taking be total or partial, or for easement purposes. If the taking be such as to render the Spreading Grounds totally unfit and unsuitable for the above use, then, pursuant to Paragraph II,~~A~~ B, PVPA is not in default or breach.

## IV. GROUNDWATER MODEL

A. License for use. PVPA grants Watermaster a license to use its Spreadsheet Models pursuant to the terms and conditions of this agreement for the development of an Operating Plan. In developing the initial operating plan, Watermaster has used PVPA's Groundwater Models. In developing subsequent operating plans or revising such plans, Watermaster shall use PVPA's Groundwater Models and any subsequent version or improvement thereof, or other criteria at Watermaster's discretion.

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1. Custody of the PVPA's Groundwater Models. Watermaster shall have physical custody of a copy of the model. However, PVPA shall have the right to access the Models for any purpose which is not inconsistent with the Judgment or the direction of the Watermaster.

2. Updates to Model.

Said license shall include, following consultation with PVPA, the right to make changes, modifications, improvements, updates, or refinements in or to PVPA's Groundwater Model at the sole expense of Watermaster and without any contribution from PVPA.

B. Terms and Conditions. For daily operations, Watermaster shall be responsible for keeping, maintaining and reporting on the data base necessary for use of PVPA's Groundwater Models. Watermaster shall collect water level and quality data necessary, including key well levels and rainfall data, to use the Groundwater Models to implement the Physical Solution. Watermaster shall provide this data to PVPA by the fifteenth day of each month. PVPA shall provide Watermaster readings of replenishment water spread, on a daily basis. PVPA then shall provide Watermaster with a monthly report on available storage and water levels of monitoring wells.

1. Compensation. PVPA grants Watermaster this license at no cost other than the continuing costs which may be incurred by PVPA as a result of Watermaster operating the Models.

2. No Warranty. PVPA makes no warranty and disclaims all warranties regarding PVPA's Groundwater Model and its subsequent updates or improvements.

3. Field Conditions. PVPA shall report to Watermaster any field conditions that may have an impact on Spreading Operations.

## V. INDEMNIFICATION

A. Watermaster Obligations. To the extent which is allowed by law, Watermaster shall indemnify and hold harmless, PVPA, its officers, directors, employees, agents, and representatives against any and all claims, demands, costs, and/or liabilities due to, or arising from any act or omission by PVPA, its officers, directors, employees, or agents arising from any activities not connected with the spreading of water under the direction of Watermaster.

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## VI. INSURANCE

A. Subject to the above, PVPA shall obtain and maintain during the term of this Agreement the following insurance policies:

1. General Liability Insurance: PVPA shall maintain general liability insurance for bodily injury, property damage, personal injury, errors and omissions, and if practicable, flooding. The insurance shall be on an occurrence basis. The policy limits shall be at least $1,000,000.

2. Property: PVPA shall obtain insurance to provide for replacement of real and personal property owned by PVPA in the event of loss by fire, flood or vandalism. This insurance shall be provided on an occurrence basis and the policy limits shall be at least $1,000,000.

## VII. MISCELLANEOUS PROVISIONS

A. Effective Date. This Agreement shall not be effective until executed by the Parties and approved by the court upon motion of Watermaster in said action in Case No. KC029152.

B. Written Amendments. This Agreement may only be modified, amended, or supplemented by a subsequent writing executed by each Party hereto and approved by the Court with jurisdiction in Case No. KC029152.

C. Choice of Law. This Agreement shall be governed by and interpreted under the laws of the State of California.

D. Delivery of Notices. All notices permitted or required under this Agreement shall be addressed to the representative Parties at the following address, or such other address as the respective Parties may provide in writing for this purpose:

| | |
|---|---|
| PVPA: | President<br>Pomona Valley Protective Association<br>414 Yale Avenue, Suite H<br>Claremont, California 91711 |
| Six Basins Watermaster | As may be designated by Watermaster |

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Such Notices shall be deemed made when personally delivered or, when mailed, forty-eight (48) hours after deposit in the U.S. mail, first class postage pre-paid and addressed to the Party at its applicable address.

E. Successors and Assigns. This Agreement is binding on and shall inure to the benefit of the Parties, their respective successors in interest and assigns.

F. Assignment. No Party shall have the right to assign it rights or delegate any of its obligations hereunder without the express written consent of the other Party.

G. Construction. Each Party and/or its respective counsel has taken part in the negotiation, drafting, and preparation of this Agreement, and, therefore, any ambiguity or uncertainty in this Agreement shall not be construed against any Party. To ensure that this Agreement is not construed against any Party, the Parties expressly agree that any common law or statutory provision providing that an ambiguous or uncertain term will be construed against the drafter of an Agreement is waived and shall not apply to the construction of this Agreement.

H. Entire Agreement. This Agreement embodies the entire and final Agreement and understanding of the Parties pertaining to the subject matter of this Agreement, and supersedes all prior Agreements, understandings, negotiations, representations, and discussions pertaining to that subject matter, whether verbal or written, of the Parties. The Parties acknowledge that there are no representations, promises, warrantees, conditions, or obligations of any Party, or counsel (or any Party), pertaining to that subject matter other than is contained in this Agreement, and that no Party has executed this agreement in reliance on any representation, promise, warranty, condition, or obligation, other than is contained in this Agreement.

I. Execution. The Parties to this Agreement acknowledge that they have executed this Agreement voluntarily and without any duress or undue influence. The Parties further acknowledge that they (1) have been represented by counsel of their own choice in connection with the negotiation and execution of this Agreement, or have been advised to seek independent counsel of their own choice prior to executing this agreement; (2) have read this Agreement in its entirety; and (3) have entered into this Agreement of their own volition and not as a result of any representations or advice by other Party or counsel for any other Party.

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J. Counter Parts. This Agreement may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This agreement shall become effective and binding immediately upon its execution by both Parties. This Agreement consists of nine (9) pages, including the signature page.

K. Termination. Upon motion made by either Party to this Agreement in accordance with the procedures set forth in Article IX, Section A of the Judgment and approval of the Court, this Agreement shall be terminated.

DATED: _____ WATERMASTER

_____

By:

DATED: _____ POMONA VALLEY PROTECTIVE ASSOCIATION

_____

By:

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**EXHIBIT D**

BASE ANNUAL GROUNDWATER PRODUCTION IN EACH BASIN, 1985- 1996
AND TOTAL BASE ANNUAL GROUNDWATER PRODUCTION, 1985- 1996
FOR EACH PARTY, AND EACH PARTY'S PERCENTAGE OF THE AGGREGATE OPERATING SAFE
YIELD FOR THE CANYON, UPPER CLAREMONT HEIGHTS, LOWER CLAREMONT HEIGHTS AND POMONA BASINS

| Party | Base Annual Production, Acre Feet per Year | | | | | Percentage of Aggregate Operating Safe Yield |
|---|---|---|---|---|---|---|
| | Canyon Basin Basin | Upper Claremont Heights Basin | Lower Claremont Heights Basin | Pomona Basin | Total | |
| City of La Verne | 0 | 0 | 0 | 1,492 | 1,492 | 7.731 |
| City of Pomona* | 0 | 1,234 | 961 | 1,128 | 3,323 | 17.218 |
| Simpson Paper | 0 | 0 | 0 | 691 | 691 | 3.580 |
| Southern Cal. Water Co. | 56 | 2,895 | 107 | 3,647 | 6,705 | 34.741 |
| City of Claremont | 0 | 267 | 0 | 268 | 535 | 2.772 |
| Pomona College | 0 | 357 | 0 | 0 | 357 | 1.850 |
| City of Upland | 408 | 1,434 | 0 | 0 | 1,842 | 9.544 |
| West End Consolidated Water Company | 0 | 2,972 | 0 | 0 | 2,972 | 15.399 |
| San Antonio Water Company | 0 | 1,383 | 0 | 0 | 1,383 | 7.166 |
| TOTAL | 464 | 10,542 | 1,068 | 7,226 | 19,300 | 100.000% |

* Pomona shall have the right to produce an additional 109 acre feet of groundwater per year subject to the following:

(a) Pomona shall provide at least 436 acre feet of recycled water to the property presently designated by the Los Angeles County Assessor as Assessor's Parcel Nos. 834-800-8001, 834-800-8002, 834-800-8009, 834-800-5013 and 834-800-6001.

(b) Pomona's additional production right shall be added to its Base Annual Production Right and shall be subject to all provisions of the Judgment relating to Base Annual Production Rights; provided however, such additional right shall not be subject to transfer or the water produced delivered for use outside the Pomona service area.

(c) To the extent in any year Pomona provides less than 436 acre feet of recycled water to the above described property, the additional right of Pomona shall be reduced to an amount equal to one fourth (1/4) of the amount of recycled water provided. However, no reduction shall occur to the extent the failure to deliver recycled water is the result of sudden occurrences such as storms, floods, fires, earthquakes, accidents or unexpected equipment outage) or acts or omissions of the Los Angeles County Sanitation District which impair the ability of Pomona to make recycled water deliveries.

# EXHIBIT E

## DESCRIPTION OF REPLENISHMENT PROGRAMS

**San Antonio Spreading Grounds**

Owned and operated by the Pomona Valley Protective Association (PVPA), this private facility is comprised of 600 acres of spreading grounds on both the east and west sides of San Antonio channel. The grounds consist of ditches, check levees, gates, metering stations, shallow basins and deep basins. The primary source of water for this facility is from San Antonio Creek by way of controlled releases from San Antonio Dam which is owned and operated by the U.S. Army Corps of Engineers. Water is released from the dam directly into San Antonio Flood Control Channel. Upon entering the channel, water is diverted into an underground basin where control gates allow regulated flow onto the spreading grounds. Additional sources of water include uncontrolled surface flows from adjacent properties in San Bernardino and Los Angeles Counties. The Corps coordinates its releases with PVPA. Four metering stations are used for flow measurements, and a series of ditches, check levees, gates and appurtenances allow the water to be directed into shallow and deep basins. Since 1896, PVPA has regularly spread water at its facility.

**Thompson Creek Spreading Grounds**

Owned and maintained by PVPA, this private facility is comprised of approximately 53 acres of spreading grounds south of Thompson Creek Dam and east of Thompson Creek. PVPA operates this facility with the cooperation of the Los Angeles County Flood Control District. The grounds consist of ditches, check levees, gates, shallow and deep basins. The sources of water for this facility are Cobal, Williams, Palmer, and Padua Creeks which are diverted to the grounds by PVPA with the cooperation of the Los Angeles County Department of Public Works through the Palmer Diversion. Surface runoff is diverted onto the grounds by way of Chicken Creek through a diversion located directly north of the grounds. PVPA's facility can also receive water from Thompson Creek Dam when the reservoir exceeds the elevation of 1625 feet above sea level. Since 1918, PVPA has spread water at this facility.

**Pomona Spreading Grounds**

Owned and operated by the City of Pomona, this facility is comprised of 8 acres of spreading grounds adjacent to the City's Pedley Water Treatment Plant. The City acquired this property in October 1926. The present deep basin configuration of the facility was completed in 1957. The source of water for this facility is San Antonio Creek water delivered through the Loop Merserve Canyon Water Company pipeline and Evey Canyon water. This facility also receives some local runoff. Water has been spread in this vicinity on and off since about 1897.

**Live Oak Spreading Grounds**

Owned and operated by the Los Angeles County Department of Public Works, this facility consists of approximately 5 acres of spreading grounds. Approximately 1.5 acres north of Baseline Road and 3.5 acres south of route 30 freeway extension. The source of water for this facility is controlled releases from Live Oak Dam and Live Oak Debris Basin. This facility was first used in the 1961-62 water year.

# WATER STORAGE AND RECOVERY AGREEMENT

1. IDENTIFICATION

THIS AGREEMENT dated _____ by and between the CITY OF POMONA, a chartered municipal corporation (Pomona), and the SIX BASINS WATERMASTER, a court appointed entity established by the Los Angeles County Superior Court (Watermaster), and is based upon the following recitals.

2. RECITALS

2.1 Water rights have been adjudicated in the Six Basins Area according to the Judgment in Los Angeles County Superior Court Case No. KC 029152, entitled Southern California Water Company v. the City of La Verne.

2.2 Said Judgment establishes the Watermaster as the court empowered entity responsible for managing the Six Basins Area. Under the provisions of Paragraph VI.B.10 of the Judgment, Watermaster is authorized to enter into Storage and Recovery Agreements with any party holding a base annual production right.

2.3 Pomona is a party holding a base annual production right. In addition, Pomona has historically replenished the Six Basins Area. While Pomona is under no obligation to replenish the Six Basins Area, to the extent that it does augment groundwater supplies in excess of its historical replenishment as provided in Paragraph VI.B.9 of the Judgment, Pomona is authorized to recover such water.

2.4 Spreading and injecting or otherwise recharging groundwater in the Six Basins Area is restricted according to Paragraph IV.B of the Judgment; however, pursuant to Paragraph VI.B.10,

Watermaster is authorized to enter into storage and recovery agreements for the utilization of groundwater storage capacity and for subsequent recovery use or credit by the storing entity.

2.5 Pomona and Water master desire to enter into an agreement for the storage and recovery of water.

3. AGREEMENTS

In consideration for the mutual promises and conditions contained herein and for other valuable consideration, the parties agree as follows:

3.1 Pomona may, subject to the conditions hereinafter set forth, spread and cause to be spread water which would be stored for Pomona's account. The amount of water stored and recovered shall be all amounts it has spread or caused to be spread in the Six Basins Area in excess of 130 acre feet annually as specifically provided in Paragraph VI.B.9 of the Judgment. Without limitation on accumulations, Pomona shall acquire and retain ownership of all such storage in excess of the historical replenishment of 130 acre feet per year until such water is produced by Pomona or transferred as a credit toward any Replacement Water obligation.

3.2 Pomona shall issue a report to Watermaster on a quarterly basis indicating the amount of water which Pomona has spread. The report shall be due the last day of the month next following the end of the relevant quarter.

3.3 Recovery of water by Pomona shall be accounted for as follows:

3.3.1 The first water Pomona produces in a calendar year shall be the carryover of unused rights in accordance with Paragraph III.B.2.

3.3.2 The next such water produced shall be Pomona's Base Annual Production Right.

3.3.3 The next such water produced shall be water stored pursuant to this storage and Recovery Agreement.

3.4 This Agreement shall be effective upon court approval of the Judgment in the above-referenced case.

3.5 Any notices required hereunder may be given by mail postage prepaid and addressed as follows:

TO WATERMASTER:

TO CITY OF POMONA:

Henry Pepper, Director of Utilities
Public Works Department
City of Pomona
505 S. Garey Avenue
Pomona, CA 91769-0660

EXECUTED this _____ day of _____, 1998, at _____, CA.

CITY OF POMONA

By: _____

WATERMASTER

By: _____

# EXHIBIT G

## INITIAL OPERATING PLAN

1. **Replenishment.** PVPA shall continue to replenish the basin as it has historically done. PVPA shall curtail replenishment when the Index Water Level is at 1455 or higher, where the Index Water Level is the average of the water level elevations above Mean Sea Level for the following five Key Wells:

Upland-Foothill No. 3 (Owner: WECWC)
Mountain View No. 4 (Owner: WECWC)
Miramar No. 3 (Owner: SCWC)
College No. 1 (Owner: Pomona College)
Tunnel Well No. 3 (Owner: Pomona)

On the second Monday of each month owners of the Key Wells shall measure and report to Watermaster and to PVPA the water level elevations in the Key Wells. Water level elevations shall be measured using protocols specified by Watermaster.

2. **Production Measurement and Reporting.** Within 180 days following Entry of Judgment each producer shall have installed on all of its producing wells a calibrated device to measure production. Such devices shall conform to, and be regularly calibrated in accordance with, specifications developed by Watermaster. Each producer shall record the monthly production from each well in acre feet and shall report such monthly production for each well and the total for all wells for the month and for the year to date to Watermaster by not later than the third working day following the end of the month.

3. **Operating Safe Yield.** The initial Operating Safe Yield of the Four Basins is 24,000 acre feet per year.

## PROOF OF SERVICE

I am a resident of the State of California, over the age of eighteen years, and not a party to the within action. My business address is 21 East Carrillo Street, Santa Barbara, California 93101-2782. On December 21, 1998, I served the within document:

**NOTICE OF ENTRY OF JUDGMENT**

[ ] by transmitting via facsimile the document(s) listed above to the fax number(s) set forth below on this date before 5:00 p.m.

[x] by placing the document listed above in a sealed envelope with postage thereon fully prepaid, in the United States mail at Santa Barbara, California as set forth below.

[ ] by causing personal delivery by _____ of the document(s) listed above to the person(s) at the address(es) set forth below.

[ ] by personally delivering the document(s) listed above to the person(s) at the address(es) set forth below.

SEE ATTACHED LIST

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

[x] *(State)* I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on December 21, 1998, at Santa Barbara, California.

Gina Lane

GINA M. LANE

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EAST CARRILLO STREET
SANTA BARBARA, CA
93101-2782

Jess Senecal, Esq.
Lagerlof, Senecal, Bradley and Swift
301 North Lake Ave., 10th Floor
Pasadena, CA 91101

Art Littleworth, Esq.
Best, Best & Krieger
3750 University Ave.
Riverside, CA 92502-1028

Burt Gindler, Esq.
Morrison & Foerster
555 West Fifth St.
Los Angeles, CA 90013-1024

Steven Kennedy, Esq.
Three Valleys Mutual Water District
1839 Commercenter Way
Riverside, CA 92412

Robert Hawkins, Esq.
Law Offices of Robert C. Hawkins
110 Newport Center Drive, Suite 200
Newport Beach, CA 92660

James Markman, Esq.
Boyd Hill, Esq.
Markman, Arczynski, Hanson, Curley & Slough
One Civic Center Circle
Brea, CA 92822-1059

Arthur Kidman, Esq.
McCormick, Kidman & Behrens
695 Town Center Drive, Suite 1400
Costa Mesa, CA 92626-1924

Jerome Craig, Esq.
Morrison & Foerster, LLP
555 West Fifth St., Suite 3500
Los Angeles, CA 90013

Keith Johnson
Allard, Shelton & O'Connor
319 Harvard Ave.
Claremont, CA 91711

Tom McPeters, Esq.
San Antonio Water Company
Home Savings of Am. Building, 2nd Floor
4 West Redlands Blvd.
Redlands, CA 92378

Jeanne Verville, Esq.
Simpson Paper Company
1301 Fifth Ave., Suite 2800
Seattle, Washington 98101-2613

# H

# Appendix H. Water Shortage Contingency Plan

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SAN ANTONIO WATER COMPANY

# Water Shortage Contingency Plan

**SEPTEMBER 2021**

Prepared by Water Systems Consulting, Inc.

## 1.1 Water Supply Reliability Analysis

The San Antonio Water Company (SAWCo) analyzed future demand and supply in its 2020 Urban Water Management Plan (UWMP). The UWMP analyzed conditions for normal, or average, single-dry, and five-year consecutive dry periods. SAWCo aims to provide shareholders full entitlement, but in periods of drought, allocations per share may be reduced, depending on supply availability. In all scenarios, SAWCo expects to meet customer demands based on shareholders full entitlement. In addition, a Drought Risk Assessment was performed to analyze anticipated supply and demand for the next five years (2021-2025). The Drought Risk Assessment analysis determines that SAWCo's supplies are able to reliably meet customer demands. Details on this analysis as well as supply and demand estimates are discussed in the UWMP.

## 1.2 Annual Water Supply and Demand Assessment

As an urban water supplier, SAWCo must prepare and submit an Annual Water Supply and Demand Assessment (Annual Assessment). The Annual Assessment is a near-term outlook for supplies and demands. It is used to determine whether the potential for a supply shortage exists and whether there is a need to trigger a WSCP shortage level and response actions to maintain supply reliability. Starting in 2022, the Annual Assessment will be due by July 1st of every year, as indicated by CWC Section 10632.1. SAWCo's Annual Assessment procedure, including key data inputs, evaluation criteria and responsible staff is summarized in Table 1. Nearly all of SAWCo's staff will be involved in the Annual Assessment and implementation of this WSCP.

**Table 1. Annual Assessment Procedure**

| TIMING | ASSESSMENT ACTIVITIES | PROCEDURE, KEY DATA INPUTS, EVALUATION CRITERIA AND OTHER CONSIDERATIONS | SAWCO STAFF RESPONSIBLE |
|---|---|---|---|
| November–December | Estimate unconstrained demands for the coming year | SAWCo anticipates annual demands equal to that of the total active shares, based on yearly entitlement. | SAWCo Staff |
| November-December | Estimate available supplies for the coming year, considering the following year will be dry | SAWCo will analyze historical rainfall and other local groundwater conditions that may impact supply availability and warrant a reduction to shareholder's entitlement. SAWCo will also work with various groundwater management agencies, like the Chino Basin Watermaster, etc., to monitor groundwater conditions and stay informed of any impacts to SAWCo's ability to extract and provide local groundwater.<br>SAWCo will monitor groundwater levels provided through the Tunnel. The Tunnel serves as an indicator for conditions within the local mountains and available water for the San Antonio Creek/percolated surface water. | SAWCo Staff |
| December-January | Consider potential infrastructure constraints that may impact supply delivery | Identify any known infrastructure issues that may pertain to near-term water supply reliability, including repairs, construction, and environmental mitigation measures that may temporarily constrain capabilities, as well as any new projects that may add to system capacity. Identify any facilities out of service due to water quality problems, equipment failure, etc. that may impact normal water deliveries. | Operations Staff |
| February | Inform the Board of Annual Assessment findings | The General Manager shall inform the Board of the Annual Assessment and results and make a recommendation of which shortage stage to enter, if applicable, if the Board is in session. If the Board is not in session, the General Manager shall immediately request a special meeting of the Board. | SAWCo Board or General Manager |
| March | Notify the Public | The Board/SAWCo will make a public announcement published in the Inland Valley Daily Bulletin and become effective immediately upon publication.<br>SAWCo will coordinate with other agencies that it provides water to, in addition to other local agencies. | General Manager |
| Ongoing | Implement WSCP actions, if needed | Relevant members of SAWCo's staff will implement shortage response actions associated with the declared water shortage level. | SAWCo Staff |
| Prior to July 1st | Submit Annual Assessment | Send final Annual Assessment to DWR. | General Manager |

## 1.3 Water Shortage Levels

SAWCo uses four (4) water shortage stages to identify and response to water shortage emergencies. Stage 1 is implemented year-round to encourage water conservation and responsible water management, regardless of a shortage emergency.

The Water Code outlines six standard water shortage levels that correspond to a gap in supply compared to normal year availability. The six standard water shortage levels correspond to progressively increasing estimated shortage conditions (up to 10-, 20-, 30-, 40-, 50-percent and greater than 50-percent shortage compared to the normal reliability condition) and align with the response actions that a water supplier would implement to meet the severity of the impending shortages.

The Water Code allows suppliers with an existing WSCP that uses different water shortage levels to comply with the six standard levels by developing and including a cross-reference relating to its existing shortage categories to the six standard water shortage levels. SAWCo is maintaining its current four shortage stages for this WSCP, as shown in Table 2. A cross reference to the six standard stages is shown in Figure 1. SAWCo's existing stages and their relationship to the six standard stages.

**Table 2. DWR 8-1 Water Shortage Contingency Plan Levels**

| SHORTAGE LEVEL | PERCENT SHORTAGE RANGE | SHORTAGE RESPONSE ACTIONS |
|---|---|---|
| **1** | Up to 10% | Required savings may be met through a combination of quantifiable and unquantifiable actions. SAWCo will only implement measures to the extent necessary to mitigate a water shortage, although estimates may indicate a greater savings is obtainable. It is anticipated that some of the required savings will be met through quantifiable shortage response actions and the remaining amount savings will be met through other actions, including communication and outreach efforts. For a list of all SAWCo specific shortage response actions and their potential savings, please refer to DWR Table 8-2. |
| **2** | Up to 30% | Required savings may be met through a combination of quantifiable and unquantifiable actions. SAWCo will only implement measures to the extent necessary to mitigate a water shortage, although estimates may indicate a greater savings is obtainable. It is anticipated that some of the required savings will be met through quantifiable shortage response actions and the remaining amount savings will be met through other actions, including communication and outreach efforts. For a list of all SAWCo specific shortage response actions and their potential savings, please refer to DWR Table 8-2. |
| **3** | Up to 50% | Required savings may be met through a combination of quantifiable and unquantifiable actions. SAWCo will only implement measures to the extent necessary to mitigate a water shortage, although estimates may indicate a greater savings is obtainable. It is anticipated that some of the required savings will be met through quantifiable shortage response actions and the remaining amount savings will be met through other actions, including communication and outreach efforts. For a list of all SAWCo specific shortage response actions and their potential savings, please refer to DWR Table 8-2. |
| **4** | Greater than 50% | Required savings may be met through a combination of quantifiable and unquantifiable actions. SAWCo will only implement measures to the extent necessary to mitigate a water shortage, although estimates may indicate a greater savings is obtainable. It is anticipated that some of the required savings will be met through quantifiable shortage response actions and the remaining amount savings will be met through other actions, including communication and outreach efforts. For a list of all SAWCo specific shortage response actions and their potential savings, please refer to DWR Table 8-2. |

| SAWCo Shortage Stage | Supply Reduction (%) |
|---|---|
| 1 | 10% |
| 2 | 30% |
| 3 | 50% |
| 4 | Greater than 50% |

| Standard Shortage Stage | Standard Supply Shortage Level |
|---|---|
| 1 | Up to 10% |
| 2 | Up to 20% |
| 3 | Up to 30% |
| 4 | Up to 40% |
| 5 | Up to 50% |
| 6 | Greater than 50% |

**Figure 1. SAWCo's existing stages and their relationship to the six standard stages**

## 1.4 Shortage Response Actions

SAWCo expects to mitigate supply shortages through a variety of response actions, including various supply sources, demand reduction actions, conservation, outreach, and if necessary, mandatory prohibitions.

### 1.4.1 Demand Reduction

SAWCo has identified a variety of demand reduction actions to offset supply shortages. These actions include, but are not limited to, conservation and rebate programs, leak detection and repair, limitations on irrigation and other voluntary actions to reduce customer demand. Demand reduction actions are summarized in Table 3.

**Table 3. DWR 8-2 Demand Reduction Actions**

| SHORTAGE LEVEL | DEMAND REDUCTION ACTIONS | HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP? | ADDITIONAL EXPLANATION OR REFERENCE | PENALTY, CHARGE, OR OTHER ENFORCEMENT |
|---|---|---|---|---|
| Stage 1 | Landscape - Limit landscape irrigation to specific times | 0-5% | Watering restricted to between the hours of 10:00 am and 6:00 pm | Yes |
| Stage 1 | Other - Customers must repair leaks, breaks, and malfunctions in a timely manner | 0-5% | Leaks and misadjusted water fixtures shall be corrected within 72 hours of discovery or notification by SAWCo. | Yes |
| Stage 1 | Other | 0-5% | Runoff from irrigation or leaks prohibited. | Yes |
| Stage 1 | Other | 0-5% | Washing of automobiles, trucks, trailers, boats, airplanes, and other types of equipment (mobile or otherwise) unless done with a hand-held bucket or hand-held hose equipped with a positive shutoff nozzle for quick rinses. The nozzle shall be removed when the hose is not in use to ensure the water supply is shut off. | Yes |
| Stage 1 | CII - Restaurants may only serve water upon request | 0-5% | With respect to eating and drinking establishments of any kind, including but not limited to, any restaurant, hotel, café, cafeteria, bar or club, whether public or private, that benefits from the supply of water by SAWCo shall not provide drinking water to any person unless expressly requested. | Yes |
| Stage 2 | Other | 5-10% | The washing of sidewalks, walkways, driveways, public and private parking areas and all other impervious hard surfaced areas by direct hosing when runoff water directly flows to a gutter or storm drain, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety. | Yes |
| Stage 2 | Landscape - Limit landscape irrigation to specific days | 5-10% | Outdoor irrigation of landscape by sprinklers is permitted only on even days of the month for those locations having a street address with an even last digit. Outdoor irrigation by sprinklers is permitted only on odd days of the month for those locations having a street address with an odd last digit. No outdoor irrigation shall take, place between the hours of 10:00 a.m. and 6:00 p.m. | Yes |

| SHORTAGE LEVEL | DEMAND REDUCTION ACTIONS | HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP? | ADDITIONAL EXPLANATION OR REFERENCE | PENALTY, CHARGE, OR OTHER ENFORCEMENT |
|---|---|---|---|---|
| Stage 2 | Other | 5-10% | The washing of automobiles, trucks, trailers, boats, and other types of equipment (mobile or otherwise) is prohibited except on the designated outdoor water use days between the hours of 12:00 midnight to 12:00 noon and sundown to 12:00 midnight. Such washing, when allowed, shall be done with a hand held bucket or hand held hose equipped with a positive shutoff nozzle for quick rinses. The nozzle shall be removed when the hose is not in use to ensure the water supply is shutoff. | Yes |
| Stage 2 | Other - Prohibit vehicle washing except at facilities using recycled or recirculating water | 5-10% | No individual, firm or business that regularly washes vehicles for remuneration or provides facilities for customers to do so through coin operated machinery shall be permitted to operate such a business unless their place of business is equipped and operating to approved standards with equipment to recycle water for use within their facility. | Yes |
| Stage 2 | Other water feature or swimming pool restriction | 5-10% | The refilling or adding of water to swimming pools is prohibited except on designated outdoor water use days, which is restricted between the hours of 10am and 6 pm. | Yes |
| Stage 2 | Water Features - Restrict water use for decorative water features, such as fountains | 5-10% | Any non-business, operation related pond, ornamental fountain or other structure making similar use of water is prohibited. | Yes |
| Stage 2 | Landscape - Prohibit certain types of landscape irrigation | 5-10% | The irrigation of golf course fairways is prohibited. This section shall not apply to the irrigation of any golf course solely with available non-potable or reclaimed wastewater. | Yes |
| Stage 2 | Other | 5-10% | The use of water from fire hydrants shall be limited to firefighting and emergency related activities and/or other activities necessary to maintain the health, safety, and welfare of the citizens of the San Antonio Heights. This restriction shall not apply to businesses, which require the use of water for land development and building construction processes with prior written approval by the Water Company. | Yes |

| SHORTAGE LEVEL | DEMAND REDUCTION ACTIONS | HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP? | ADDITIONAL EXPLANATION OR REFERENCE | PENALTY, CHARGE, OR OTHER ENFORCEMENT |
|---|---|---|---|---|
| Stage 3 | Landscape - Limit landscape irrigation to specific days | 10-30% | Outdoor irrigation of landscape by sprinklers is permitted only on Wednesday and Sunday for those locations having street address with an even last digit. Outdoor irrigation by sprinklers is permitted only on Tuesday and Saturday for those locations having a street address with an odd last digit. Outdoor irrigation for locations not having a street address shall occur on Wednesday and Sunday if located west of San Antonio Avenue or only on Tuesday and Saturday if located east of San Antonio Avenue. | Yes |
| Stage 3 | Landscape - Other landscape restriction or prohibition | 10-30% | No outdoor irrigation shall take place between 6:00 a.m. until one (1) hour before sundown. | Yes |
| Stage 3 | Other | 10-30% | The washing of automobiles, trucks, trailers, boats, airplanes and other types of equipment (mobile or otherwise) is prohibited except on the designated outdoor water use days pursuant to section 7734.040 between the hours of 12:00 midnight to 12:00 noon and sundown to 12:00 midnight. Such washing, when allowed, shall be done with a hand held bucket or hand held hose equipped with a positive shutoff nozzle for quick rinses. The nozzle shall be removed when the hose is not in use to ensure the water supply is shutoff. | Yes |
| Stage 3 | Other | 10-30% | Trucks, trailers and other types of mobile equipment (such as garbage trucks and vehicles used to transport food and other perishables) when said washing is necessary in order to protect the health, safety and welfare of the public, shall be restricted to the hours of sundown to noon. Such washing, when allowed, shall be done with a hand held bucket or hand held hose equipped with a positive shutoff nozzle for quick rinses. The nozzle shall be removed when the hose is not in use. | Yes |
| Stage 3 | Water Features - Restrict water use for decorative water features, such as fountains | 10-30% | Any non-business, operation related pond, ornamental fountain or other structure making similar use of water is prohibited. | Yes |
| Stage 3 | Landscape - Other landscape restriction or prohibition | 10-30% | The waters of golf course tee areas and fairways is prohibited unless done with reclaimed wastewater. | Yes |

| SHORTAGE LEVEL | DEMAND REDUCTION ACTIONS | HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP? | ADDITIONAL EXPLANATION OR REFERENCE | PENALTY, CHARGE, OR OTHER ENFORCEMENT |
|---|---|---|---|---|
| Stage 3 | Other water feature or swimming pool restriction | 10-30% | The refilling or adding of water to existing swimming pools is prohibited except on designated outdoor water use days which shall be the same days as outdoor water is permitted pursuant to section 7734.040. New pool construction filling shall be by permit only | Yes |
| Stage 4 | Landscape - Limit landscape irrigation to specific days | 30-50% | Outdoor irrigation of landscape by sprinklers is permitted only on Sunday for those locations having street address with an even last digit. Outdoor irrigation by sprinklers is permitted only on Saturday for those locations having a street address with an odd last digit. Outdoor irrigation for locations not having a street address shall occur on Sunday if located west of San Antonio Avenue or only on Tuesday and Saturday if located east of San Antonio Avenue | Yes |
| Stage 4 | Landscape - Limit landscape irrigation to specific times | 30-50% | No outdoor irrigation shall take place between 6:00 a.m. until one (1) hour before sundown | Yes |
| Stage 4 | Other | 30-50% | The washing of automobiles, trucks, trailers, boats, airplanes, and other types of equipment (mobile or otherwise) is prohibited | Yes |
| Stage 4 | Other water feature or swimming pool restriction | 30-50% | Any non-business, operation related pond, ornamental fountain or other structure making similar use of water is prohibited | Yes |
| Stage 4 | Other | 30-50% | Washing sidewalks, driveways, public and private parking areas, tennis courts, patios, or other paved areas, except to alleviate an immediate health hazard is prohibited | Yes |

## 1.4.2 Supply Augmentation

SAWCo maintains interconnections with the City of Upland, as well as the Monte Vista Water District (MVWD) and the City of Ontario through the Water Facilities Authority (WFA). The WFA is a Joint Powers Authority composed of the cities of Chino, Chino Hills, Ontario, and Upland and the MVWD. The WFA owns and operates a surface water treatment plant within the City of Upland that primarily treats imported water supplies from Metropolitan Water District of Southern California (Metropolitan). SAWCo's interconnection with the City of Upland could potentially provide the ability to negotiate imported water deliveries via the WFA and wheeled through this existing interconnection.

**Table 4. DWR 8-3 Supply Augmentation and Other Actions**

| SHORTAGE LEVEL | SUPPLY AUGMENTATION METHODS AND OTHER ACTIONS BY WATER SUPPLIER | HOW MUCH IS THIS GOING TO REDUCE THE SHORTAGE GAP? | ADDITIONAL EXPLANATION OR REFERENCE |
|---|---|---|---|
| Stage 2 | Other purchases | 0-100% | Negotiate imported water deliveries through the Water Facilities Authority |
| Stage 3 | Other purchases | 0-100% | Negotiate imported water deliveries through the Water Facilities Authority |
| Stage 4 | Other purchases | 0-100% | Negotiate imported water deliveries through the Water Facilities Authority |

## 1.4.3 Operational Changes

SAWCo operates its system as efficiently as possible. In the event of a water shortage emergency, it is likely that surface water from the San Antonio Creek and percolated water from the San Antonio Tunnel would be vastly reduced. As a result, SAWCo would focus operations on well extractions to meet demands.

## 1.4.4 Additional Mandatory Restrictions

SAWCo also implements several measures at all times to avoid water waste, which include:

- Prohibit washing of sidewalks, driveways, public and private parking areas and all other impervious hard surfaced areas by direct hosing when runoff water directly flows to a gutter or storm drain, except as may be necessary to properly dispose of flammable or other dangerous liquids or substances, wash away spills that present a trip and fall hazard, or to prevent or eliminate materials dangerous to the public health and safety;
- Prohibit excessive or unreasonable run-off or unreasonable spray of the areas being watered;
- Prohibit outdoor irrigation by sprinklers between 10 AM and 6 PM. Shareholders are encouraged to avoid the use of sprinklers on windy days;
- Prohibit the washing of automobiles, trucks, trailers, boats, airplanes, and other types of equipment (mobile or otherwise) unless completed with a hand-held bucket or hand-held hose equipped with a positive shutoff nozzle for quick rinses.

## 1.4.5 Seismic Risk Assessment, Mitigation Plan, and Emergency Response Plan

In addition to responding to drought conditions, SAWCo's WSCP can be used to respond to emergency or catastrophic conditions that impact the availability of the SAWCo's water supplies and/or the ability to deliver water within the service area. Besides drought, water supply may experience a catastrophic interruption as a result of natural disasters, such as an earthquake, wildfire, mudslide, or a regional power outage.

**Planning and response measures in the event of an interruption to the water supply include the following:**

- In advance of a known threat to the water and distribution system, such as a wildfire, distribution reservoirs will be filled to capacity, and any reservoir out of service will be put back into service.
- Portable generators will be deployed to critical facilities lacking emergency backup power.
- Supervisory Control and Data Acquisition (SCADA) will be used throughout the distribution system to monitor system problems, whether they be minor day-to-day problems or major disruptions.
- Distribution system crews are trained in pipe repair and replacement as a part of their normal duties and will be continually ready to perform such work on an emergency basis as needed.
- In the occurrence of a catastrophic event, SAWCo staff will be prepared to mobilize to respond to emergent issues.
- Distribution system repairs will be prioritized to best meet critical needs, including water for firefighting, and health and safety needs.
- A portion of the available potable supply will be reserved for drinking-water purposes in the event of prolonged interruption.
- In the event of distribution system failure, a clear message for timely information dissemination to the public will be developed that includes the nature of the catastrophic event, status of the distribution system, water use prohibitions, allowable water uses, potential need to boil drinking water prior to consumption, and location and availability of emergency drinking water.

In 2021, SAWCo completed a Risk and Resilience Assessment (RRA) and Emergency Response Plan (ERP) in accordance with America's Water Infrastructure Act (AWIA) of 2018. The purpose of the RRA and ERP is to meet the AWIA compliance requirements and plan for long-term resilience of SAWCo's infrastructure. The RRA assesses SAWCo's water system to identify critical assets and processes that may be vulnerable to human and natural hazards and to identify measures that can be taken to reduce risk and enhance resilience from service disruption for the benefit of customers. The RRA identifies and characterizes both infrastructure-specific and system-wide vulnerabilities and threats and quantifies the consequences of disruption. The RRA also identifies various options (and constraints) in addressing and mitigating risk. The RRA, is conjunction with the ERP, charts a course for water system resilience. The RRA also provided various recommendations to increase the reliability of SAWCo's system. Since critical pieces of infrastructure and specific vulnerabilities are detailed in the RRA and ERP, the contents of the document are confidential and for use by SAWCo's staff only. However, SAWCo can confirm that these plans meet the requirements set forth by AWIA and evaluate seismic risks and mitigation actions to SAWCo's infrastructure.

SAWCo certified with the U.S. Environmental Protection Agency that their RRA was compliant with all AWIA requirements on June 30, 2021, and will certify their ERP by December 31, 2021, meeting all federal deadlines.

### 1.4.6 Shortage Response Action Effectiveness

SAWCo has estimated the effectiveness of shortage response actions when data pertaining to such actions is available. Estimates of the effectiveness for actions are included in Table 3. It is expected that response actions effectiveness is also a result of successful communication and outreach efforts.

## 1.5 Communication Protocols

SAWCo publishes seasonal newsletters to inform customers of SAWCo's work. During a water shortage, SAWCo may publish information such as shortage stage and demand reduction measures in these newsletters. In addition, SAWCo will inform customers through informational bill stuffers. In more severe shortage stages, SAWCo would implement additional communication outlets, such as local newspaper postings, Facebook postings and notifications, and postings through local homeowners' associations and the San Antonio Heights Association newsletters.

In addition, SAWCo's newly deployed Automated Meter Reading (AMR) system will include a web portal where shareholders can enable notifications for using water over entitlement.

## 1.6 Compliance and Enforcement

SAWCo may administer penalties for shareholders who are not in compliance with this WSCP and engage in knowingly water waste activities during any calendar year or declared shortage stage, whichever time period is shorter in duration:

- **First Violation:** guilty of an infraction offense and punished by a fine not less than twenty-five dollars ($25) but not exceeding fifty dollars ($50)
- **Second Violation:** guilty of an infraction offense and punished by a fine not less than fifty dollars ($50) but not exceeding one hundred dollars ($100)
- **Third Violation:** guilty of a misdemeanor offense and punished by a fine not less than five hundred dollars ($500) but not exceeded one thousand dollars ($1,000)

In addition, the General Manager may enact other penalties and restrictive measures that are intended to restrict further water waste of shareholders that continue to violate the policies and procedures outlined in this plan. The General Manager may select to implement any of the following measures, or others not listed here, such as the placement of a flow restricting device upon the water service, locking off of water meter, removal of water meter, and shutting off of the service line valve.

## 1.7 Legal Authorities

SAWCo first established its WSCP by Resolution No. 2006-06-03, adopted at a Board meeting on September 19, 2006. Resolution No. 2006-06-03 was created to ensure responsible water management of SAWCo and its customers and promote water conservation. This Resolution provides the Board with the legal authority to declare a water shortage emergency and implement appropriate measures to mitigate a supply shortage.

## 1.8 Financial Consequences of WSCP

SAWCo's Bylaws specify that "all water shall be supplied at cost"; therefore, SAWCo must supply the corresponding water associated with each customer's shares. SAWCo may apply reductions to

entitlement in extreme water shortages, which would decrease SAWCo's revenue. As a small water agency, SAWCo does not have the resources to hire additional staff to assist with implementation of this WSCP and various response actions.

SAWCo has developed reserves for Master Plan projects, emergency occurrences, and operating expenses, as outlined in Resolution No. 2007-01-01. This reserve was first established in July 1994 to mitigate impacts to SAWCo and ensure that with reduced deliveries, SAWCo could continue to provide services with a buffer for emergency situations. A portion of the reserve fund is allocated for emergency water purchases in the event SAWCo were to lose a water supply source.

## 1.9 Monitoring and Reporting

As mentioned, SAWCo has recently replaced all customer and system meters and upgraded to an AMR system. AMR meters provide daily readings that will allow SAWCo to quickly respond to large readings and correct any issues, such as system leaks or inform customers of demand reduction actions or rebates to limit water use. In addition, the AMR meters will be connected to a website where shareholders can track their own water use and enable notifications. Shareholders can be notified of excessive water use over their entitlement.

## 1.10 WSCP Refinement Procedures

The WSCP is best prepared and implemented as an adaptive management plan. SAWCo will use results obtained from its monitoring and reporting program to evaluate any needs for revisions. Potential changes to the WSCP that would warrant an update include, but are not limited to, any changes to trigger conditions, changes to the shortage stage structure, changes to entitlement, and/or changes to customer reduction actions.

Any prospective changes to the WSCP would need to be presented to SAWCo's Board of Directors (Board) for approval. SAWCo will hold a public hearing, obtain any comments, and formally adopt the updated WSCP. Notices for refinement and the public hearing date will be published in the local newspaper in advance of any public meetings.

## 1.11 Special Water Feature Distinction

Water Code Section 10623 (b) now requires that suppliers analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code. SAWCo prohibits water used for any non-business, operation related pond, ornamental fountain, or other similar structure for aesthetic use in shortage stages 2-4.

## 1.12 Plan Adoption, Submittal, and Availability

The WSCP will be presented for adoption to SAWCo's Board at a public meeting. The Board and members of the public may submit any comments prior to approval and adoption. The WSCP will be submitted to DWR at the same time as the 2020 Urban Water Management Plan.

The WSCP will be made available to all staff, customers, and any affected cities, counties, or other members of the public through SAWCo's website.

## 1.13 Resources and References

California Water Efficiency Partnership. (2021). *Jumpstart Water Shortage Toolkit Tool#1: Model Water Shortage Contingency Plans.* Sacramento: California Water Efficiency Partnership.

San Antonio Water Company. (n.d.). *Amended and Restated Bylaws of San Antonio Water Company.*

Texas Living Waters Project. (2018). *Water Conservation by the Yard: A Statewide Analysis of Outdoor Water Savings Potential.* Austin: Texas Living Waters Project, Sierra Club, National Wildlife Federation. Retrieved from Texas Living Waters Project.

United States Environmental Protection Agency. (2012). *Saving Water in Restaurants.* United States Environmental Protection Agency.

United States Environmental Protection Agency, Office of Water. (2002). *Cases in Water Conservation: How Efficiency Programs Help Water Utilities Save Water and Avoid Costs.* United States Environmental Protection Agency.

## PURCHASE ORDER FOR SYSTEM WATER TO BE PROVIDED BY THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

| | |
|---|---|
| **PURCHASER:**<br>INLAND EMPIRE UTILITIES AGENCY | **TERM**<br>10 years: January 1, 2015 – December 31, 2024 |
| **INITIAL BASE PERIOD DEMAND:**<br>103,648 acre-feet | **EFFECTIVE DATE:**<br>January 1, 2015 |
| **INITIAL TIER 1 MAXIMUM—Annual Average:**<br>93,283 acre-feet | **INITIAL TIER 1 MAXIMUM—Cumulative:**<br>932,830 acre-feet |
| **PURCHASE ORDER COMMITMENT—Annual Average:**<br>39,835 acre-feet | **PURCHASE ORDER COMMITMENT—Cumulative:**<br>398,350 acre-feet |

Definitions of capitalized terms used in this Purchase Order are provided in Attachment 1. Terms used in this Purchase Order and not defined in Attachment 1 are defined in Metropolitan's Administrative Code.

**COMMITMENT TO PURCHASE:**

In consideration of Purchaser's commitment to purchase System Water pursuant to this Purchase Order, Metropolitan agrees to sell such System Water to Purchaser during the Term at the Tier 1 Supply Rate in an amount up to the Tier 1 Maximum—Cumulative. All System Water sold to Purchaser during the Term in an amount greater than the Tier 1 Maximum—Cumulative shall be sold to the Purchaser at the Tier 2 Supply Rate. In connection with the purchase of System Water, the Purchaser also agrees to pay all other applicable rates and charges, as established by Metropolitan from time to time. The rates and charges applicable to System Water as of the Effective Date are shown in Attachment 2.

If Purchaser's applicable System Water purchases during the Term exceed Purchaser's Tier 1 Maximum, Purchaser may elect to:

a.) Subject to the provisions of paragraph c) below, pay any Tier 2 Supply Rate obligations at the end of the Term, in an amount equal to the difference between the Purchaser's applicable System Water purchases and the Tier 1 Maximum—Cumulative during the Term times the average of the Tier 2 Supply Rate in effect during the Term; or,

b.) Pay any Tier 2 Supply Rate obligations annually as purchases are incurred, in an amount equal to the difference between the Purchaser's applicable annual System Water purchases and the Tier 1 Maximum—Annual times the Tier 2 Supply Rate in effect during the calendar year. A true-up at the end of the Term will be performed to ensure that the Purchaser has received all Tier 1 Maximum—Cumulative purchases allowed by the Purchase Order.

c.) If, after the end of the first five years, Purchaser has accrued a cumulative Tier 2 Supply Rate obligation, Purchaser may elect to pay the initial five

year cumulative Tier 2 Supply Rate obligation (i) in full at the end of year five of the Term, (ii) amortize it in five equal installments over the remaining five calendar years of the Term, or (iii) pay it at the end of the Term. Commencing in year 6 of the Term, Purchaser shall pay any additional Tier 2 Supply Rate obligation annually.

Purchaser agrees to purchase System Water from Metropolitan during the Term in an amount not less than the Purchase Order Commitment. If Purchaser's applicable System Water purchases during the Term are less than the Purchase Order Commitment, each acre-foot of unmet commitment will be reduced by the amount of production from a local resource project, measured in acre-feet, that commences operation on or after January 1, 2014. A local resource project includes any project type as approved by the Board.

Purchaser agrees to pay Metropolitan an amount equal to the difference between the sum total in acre-feet of water of the Purchase Order Commitment (minus the amount reduced by the amount of production from a local resource project) and the sum total in acre-feet of water of Purchaser's applicable System Water purchases during the Term, times the average of the Tier 1 Supply Rate in effect during the Term.

Purchaser agrees to pay all amounts owing to Metropolitan, whether to satisfy a Purchase Order Commitment or a Tier 2 Supply Rate obligation, within the next regular billing cycle following the reconciliation of all certifications for special programs that the Purchaser may participate in. The Purchaser may elect to pay such amount in twelve equal monthly payments over the course of the next twelve months beginning with the first regular billing cycle following the reconciliation of all outstanding certifications for special programs. If the Purchaser elects to pay such amount over the course of the next twelve months following the regular billing cycle any outstanding balance shall bear interest at Metropolitan's then current investment portfolio average yield. All other amounts payable under this Purchase Order shall be billed and paid in accordance with the Administrative Code.

**WATER SERVICE:**

Conditions of water service by Metropolitan to the Purchaser, including but not limited to (i) delivery points, (ii) water delivery schedules, and (iii) water quality, will be determined in accordance with Chapter 5 (Section 4500 through 4514, inclusive, as applicable) of Metropolitan's Administrative Code.

In accordance with its Administrative Code, Metropolitan shall use its reasonable best efforts to supply System Water in the quantities requested by the Purchaser, but is not obligated to dedicate any portion of System capacity for the conveyance, distribution, storage or treatment of System Water for the benefit of the Purchaser or any other member agency. Metropolitan shall use its reasonable best efforts to deliver the System Water when needed by the Purchaser during the Term; provided however, there shall be no default under this Purchase Order if Metropolitan fails to deliver water to the Purchaser in accordance with any such schedule of deliveries during the Term.

By execution of this Purchase Order, the Purchaser recognizes and agrees that it acquires no interest in or to any portion of the System or any other Metropolitan facilities or supplies, or any right to receive water delivered through the System, excepting the right to purchase up to Purchaser's Tier 1 Maximum—Cumulative at the Tier 1 Supply Rate provided that System Water is available. This Purchase Order governs pricing of the System Water delivered to the Purchaser pursuant to this Purchase Order and does not confer any entitlement to receive System Water.

System Water provided to the Purchaser under the terms of this Purchase Order shall be subject to reduction in accordance with the shortage allocation provisions of the Water

Surplus and Drought Management Plan (the "WSDM Plan") or other such policies and principles governing the allocation of System Water as adopted by the Board.

In the event that Metropolitan's Board or General Manager determines to reduce, interrupt or suspend deliveries of System Water, any outstanding balance of the Purchase Order Commitment at the end of the Term shall be reduced by the Purchase Order Commitment—Annual Average for each and every fiscal or calendar year that a reduction, interruption or suspension occurred.

**MISCELLANEOUS:**

This Purchase Order will be interpreted, governed and enforced in accordance with the laws of the State of California.

This Purchase Order will apply to and bind the successors and assigns of the Purchaser and Metropolitan.

No assignment or transfer of the rights of the Purchaser under this Purchase Order will be valid and effective against Metropolitan or the Purchaser without the prior written consent of Metropolitan and the Purchaser.

If at any time during the Term, by reason of error in computation or other causes, there is an overpayment or underpayment to Metropolitan by the Purchaser of the charges provided for under this Purchase Order, which overpayment or underpayment is not accounted for and corrected in the annual re-determination or reconciliation of said charges, the amount of such overpayment or underpayment shall be credited or debited, as the case may be, to the Purchaser. Metropolitan will notify the Purchaser in writing regarding the amount of such credit or debit, as the case may be. In no case will credits or debits for charges provided for under this Purchase Order be administered beyond the limit for billing adjustments as specified in Metropolitan's Administrative Code.

IN WITNESS WHEREOF, this Purchase Order is executed by the duly authorized officers of the Metropolitan Water District of Southern California and Inland Empire Utilities Agency, as of December __, 2014.

| THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA | INLAND EMPIRE UTILITIES AGENCY |
|---|---|
| By: _____ | By: _____ |
| Jeffrey Kightlinger<br>General Manager | [Title] _____ |

APPROVED AS TO FORM AND CONTENT:

| | |
|---|---|
| _____ | _____ |
| General Counsel | General Counsel |
| By: _____ | By: _____ |

## Attachment 1
## Purchase Order for System Water
## DEFINITIONS

**"Act"** means the Metropolitan Water District Act, California Statutes 1969, Chapter 209, as amended and supplemented from time to time.

**"Demand"** means the Purchaser's purchases of System Water supplies, including full service, seasonal shift, Conjunctive Use Program, Surface Storage Operating Agreement water, Recharge and Recovery Operating Agreement water, or any other water program deemed to be a purchase of System Water.

**"Effective Date"** means the effective date of this Purchase Order as specified above.

**"Metropolitan"** means The Metropolitan Water District of Southern California.

**"Purchase Order Commitment"** means:

i). if the Purchaser elects option a) under the Base Period Demand as defined in section 4122 of the Administrative Code, then 60% of the Purchaser's Initial Base Firm Demand times 10; or

ii). if the Purchaser elects option b) under the Base Period Demand, then 60% of the Purchaser's highest fiscal year Demand during the period from fiscal year 2002/03 through fiscal year 2013/14, times 10.

**"Purchase Order"** means this Purchase Order for System Water.

**"Purchaser"** means the member public agency specified above, a duly organized [city/water district/county water authority] of the State of California.

**"System"** means the properties, works and facilities operated and/or financed by Metropolitan necessary for the supply, development, storage, conveyance, distribution, treatment or sale of water.

**"System Water"** means water supplies developed by Metropolitan and delivered to the Purchaser through the System or other means (e.g. conjunctive use storage).

**"Term"** means the term of this Purchase Order as specified above.

**"Tier 1 Maximum—Annual"** means an amount equal to 90% of the Base Period Demand.

**"Tier 1 Maximum—Cumulative"** means an amount equal to the sum of the Tier 1 Maximum—Annual amounts during the Term.

**"Tier 1 Supply Rate"** means Metropolitan's per-acre-foot Tier 1 Supply Rate, as determined from time to time by Metropolitan's Board of Directors. The Tier 1 Rate effective January 1, 2015, is $158/AF.

**"Tier 2 Supply Rate"** means Metropolitan's per-acre-foot Tier 2 Supply Rate, as determined from time to time by Metropolitan's Board of Directors. The Tier 2 Rate effective January 1, 2015, is $290/AF.

**"Water Surplus and Drought Management Plan (WSDM)"** means Metropolitan's policy and procedures for managing supplies and drought conditions as adopted by the Board from time to time.

## Attachment 2
## Purchase Order for System Water
## RATES AND CHARGES

| | Effective January 1, 2015 | Effective January 1, 2016 |
|---|---|---|
| Tier 1 Supply Rate ($/AF) | $158 | $156 |
| Tier 2 Supply Rate ($/AF) | $290 | $290 |
| System Access Rate ($/AF) | $257 | $259 |
| System Power Rate ($/AF) | $126 | $138 |
| Water Stewardship Rate ($/AF) | $41 | $41 |
| Full Service Untreated Rate ($/AF): | | |
| Tier 1 | $582 | $594 |
| Tier 2 | $714 | $728 |
| | | |
| Treatment Surcharge ($/AF) | $341 | $348 |
| Full Service Treated Rate ($/AF): | | |
| Tier 1 | $923 | $942 |
| Tier 2 | $1,055 | $1,076 |
| | | |
| Readiness-to-Serve Charge ($ millions) | $158 | $153 |
| Capacity Charge ($/cfs) | $11,100 | $10,900 |

**RESOLUTION NO. 2014-12-1**

**RESOLUTION OF THE BOARD OF DIRECTORS OF THE INLAND EMPIRE UTILITIES AGENCY* (IEUA), SAN BERNARDINO COUNTY, CALIFORNIA, ESTABLISHING ALLOCATIONS FOR THE PURCHASE OF IMPORTED WATER WITHIN IEUA SERVICE AREA**

**WHEREAS**, IEUA has Ordinance No. 100 which establishes classes of water services and regulates the sale and delivery of imported water within IEUA's service area; and

**WHEREAS**, IEUA has a long-term agreement with the Metropolitan Water District of Southern California (MWD) for the purchase of imported water at a Tier 1 rate; and,

**WHEREAS,** IEUA previously entered into agreements with its member agencies to purchase said allocation of IEUA's supply of MWD imported water at the Tier 1 rate; and

**WHEREAS**, these previous agreements are set to expire on December 31, 2014, and IEUA desires to establish the Tier 1 allocation limits by this Resolution.

**NOW, THEREFORE,** the Board of Directors hereby RESOLVES, DETERMINES AND ORDERS the following to be effective January 1, 2015:

**Section 1.** IEUA is able to purchase 93,283 acre-feet per year (AFY) of imported water from Metropolitan Water District (MWD) at the Tier 1 rate through December 31, 2024. IEUA's allocation from MWD may be periodically adjusted by MWD.

**Section 2.** Each member agency's Tier 1 allocation shall apply to water purchases in the aggregate for any Fiscal Year, and are less than or equal to the following allocations. The allocations below do not confer a contractual right to MWD imported water. Water purchases in excess of the Tier 1 allocation will be assessed at the Tier 2 rate.

Tier 1 allocation for the purchase of imported water:

| | |
|---|---|
| Water Facilities Authority | 31,384 AFY |
| Cucamonga Valley Water District | 28,368 AFY |
| Fontana Water Company | 10,000 AFY |

**Section 3.** The difference between IEUA's Tier 1 allocation per Section 1 and the member agency allocations per Section 2 will be available to IEUA and/or the Chino Basin Watermaster.

**Section 4.** MWD WATER SUPPLY ALLOCATION PLAN (WSAP) - Reduced imported water supplies caused by the adoption of a WSAP will reduce a member agencies Tier 1 imported water allocation as identified in Section 2 above. Revised allocations will be determined by historical deliveries taken during the base periods, as established by the WSAP.

**ADOPTED** this 17th day of December, 2014.

_____

Terry Catlin
President of the Inland Empire Utilities Agency* and of the Board of Directors thereof

ATTEST:

_____

Steven J. Elie
Secretary/ Treasurer of the Inland Empire Utilities Agency* and of the Board of Directors thereof

*a Municipal Water District

STATE OF CALIFORNIA )
)SS
COUNTY OF SAN BERNARDINO )

I, Steven J. Elie, Secretary/Treasurer of the Inland Empire Utilities Agency*, DO HEREBY CERTIFY that the foregoing Resolution being No. 2014-12-1, was adopted at a regular meeting on December 17, 2014, of said Agency* by the following vote:

AYES:

NOES:

ABSTAIN:

ABSENT:

Steven J. Elie
Secretary/Treasurer

(SEAL)

* A Municipal Water District

INSTALLMENT PURCHASE AGREEMENT RELATING TO
WATER FACILITIES AUTHORITY WATER TREATMENT PLANT

by and between

WATER FACILITIES AUTHORITY, as Seller

and

CITY OF ONTARIO, as Purchaser

Dated as of October 1, 1985

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# INSTALLMENT PURCHASE AGREEMENT
# RELATING TO WATER FACILITIES AUTHORITY
# WATER TREATMENT PLANT

THIS INSTALLMENT PURCHASE AGREEMENT RELATING TO WATER TREATMENT PLANT, made and entered into as of October 1, 1985, by and between the City of Ontario (herein called the "Purchaser"), a municipal corporation organized and existing under the laws of the State of California, and the Water Facilities Authority, a joint exercise of powers authority (herein called "Seller"):

W I T N E S S E T H :

In consideration of the mutual covenants hereinafter contained and for other valuable consideration, the parties hereto do agree as follows:

## ARTICLE I

## RECITALS

101. Status and Powers of Authority. Seller is a California joint exercise of powers authority organized and existing under the joint exercise of powers law, Chapter 5, Division 7, Title 1 (commencing at Section 6500) of the Government Code of the State of California, and is authorized to acquire and construct the Project, to sell capacity therein to the Purchaser and perform the actions and duties more particularly described herein. The member entities comprising Seller are the Cities of Chino, Ontario and Upland, San Bernardino County Waterworks District No. 8, the Monte Vista Water District, and the Cucamonga County Water District. The Cities of Chino, Ontario and Upland, San Bernardino County Waterworks District No. 8, and the Monte Vista Water District have formed Project Committee No. 1 of Seller (collectively, the "Purchasers"), each of which will purchase certain capacity rights in the Project to be constructed by Seller. Following completion of construction of the Project, the Project is to be owned, operated and maintained by Seller for the benefit of the Purchasers.

102. Status and Powers of Purchaser. Purchaser is a municipal corporation organized and existing under the laws of the State of California.

Purchaser is desirous of purchasing capacity in the Project in order to provide treated water to its customers and thereby to further its public purpose. Purchaser is authorized to purchase real and personal property for the common benefit in order to achieve its public purposes.

Pursuant to Resolution No. _____ of the City Council of Purchaser adopted on _____, 1985, Purchaser is authorized to enter into this Agreement.

103. Purpose of Agreement. Purchaser desires to purchase certain capacity in the Project from Seller and Seller desires to sell such capacity in the Project to Purchaser in consideration of the payment by Purchaser of installments of principal and interest on the unpaid purchase price therefor. The capacity to be acquired by the Purchaser in each portion of the Project, together with the capacities to be acquired by the other Purchasers, and a description of the Project, is set forth in Exhibit A attached hereto and by this reference incorporated herein. The purpose of this Agreement is to effectuate said transaction by setting forth the terms and conditions relating thereto.

104. Financing the Project. To provide Seller with the funds to finance the construction of the project, Seller will assign its right to secure the Installment Payments from the Purchasers to the Bank of America National Trust and Savings Association as Trustee and the Trustee will issue Certificates of Participation secured by the Installment Payments and the proceeds from the sale of the Certificates of Participation will be deposited with the Trustee for the payment of Costs. The Letter of Credit Bank will pay an amount equal to the Installment Payments due on any Interest Payment Date to the Trustee by draws on the Letter of Credit. The Purchaser agrees to pay the Installment Payments and other amounts due hereunder to Seller and the Seller agrees to pay the Installment Payments to the Letter of Credit Bank in satisfaction of the reimbursement obligations of Seller under the Reimbursement Agreement.

105. Acknowledgement of Assignment Agreement. Seller and Purchaser acknowledge that Seller on the date hereof is entering into an Assignment Agreement Relating to Water Facilities Authority Water Treatment Plant with the Letter of Credit Bank and with Bank of America National Trust and Savings Association, as Trustee (the "Trustee"); that pursuant to said Assignment Agreement, Seller is assigning and transferring to the Letter of Credit Bank and to the Trustee all of its rights under this Agreement, including, among others, its rights to exercise its remedies to enforce the receipt of such Installment Payments, as such rights and remedies are provided

by this Agreement; and that the Letter of Credit Bank and the Trustee as their interests appear constitute the assignees of Seller as described herein.

106. Acknowledgement of Status of Project. Seller and Purchaser acknowledge that Seller is the owner of the Property more particularly described in Exhibit B attached hereto and by this reference incorporated herein and will be the owner of the Project, which includes the Property, and will retain title to the Project and the Purchaser will hereunder acquire only capacity in the Project.

## ARTICLE II

## DEFINITIONS AND GENERAL PROVISIONS

201. Definitions in General. The terms defined in this Section shall, for all purposes of this Agreement and the Trust Agreement, have the meanings ascribed to them, unless the context clearly requires some other meaning.

Acceptance Certificate shall mean a certificate of an Authorized Representative of the Seller to the effect that the Project has been completed substantially in conformity with the plans and specifications therefor.

Adjusted Interest Rate shall mean the interest rate on the Certificates determined and established pursuant to Section 317 of the Trust Agreement.

Agreements shall mean, collectively, the Installment Purchase Agreements Relating to Water Facilities Authority Water Treatment Plant, each dated as of October 1, 1985, between the Seller and each of the Purchasers, and any and all modifications, alterations, amendments and supplements thereto made in accordance with the provisions of each Installment Purchase Agreement and the Trust Agreement, as assigned to the Trustee under the Assignment Agreement. The term Agreement shall individually refer to the Chino Installment Purchase Agreement, the Ontario Installment Purchase Agreement, the Upland Installment Purchase Agreement, the County Installment Purchase Agreement, or the Monte Vista Installment Purchase Agreement, depending on how the term is used in context.

Agreements Term shall mean the period during which the Agreements are in effect as specified in the Agreements.

Alternate Security means any guaranty agreement, surety agreement or letter of credit substituted for the Letter of Credit and securing the payment of the principal of, interest on and all other amounts with respect to the Certificates, issued by a financial institution, insurance company or banking institution which has been assigned by a major nationally recognized rating agency a credit rating equal to or higher than the then-current credit rating assigned to the Letter of Credit Bank, which must (or a commitment therefor must) be delivered to the Trustee at least ten (10) days prior to the beginning of the final 35 days of the term of the Letter of Credit, provided that the Alternate Security will not, by itself, result in reduction in the rating of the Certificates.

Assignment Agreement shall mean that certain Assignment Agreement by and among the Seller the Letter of Credit Bank and the Trustee dated as of October 1, 1985, pursuant to which the Seller assigns its rights under all the Agreements to the Letter of Credit Bank and to the Trustee on behalf of the holders of the Certificates.

Authorized Newspaper shall mean a newspaper customarily published at least once a day for at least five days (other than legal holidays) in each calendar week, printed in the English language, and of general circulation in Los Angeles, California and New York, New York.

Authorized Representative of the City of Chino shall mean the City Manager or Assistant City Manager or any person or persons designated by the City Council of the City of Chino to act on behalf of the City by a written certificate signed on behalf of the City by the Mayor and containing the specimen signature of each such person.

Authorized Representative of San Bernardino County Waterworks District No. 8 shall mean any person or persons designated by the Board of Supervisors of the County of San Bernardino acting as the Board of Directors of the San Bernardino County Waterworks District No. 8 and authorized to act on behalf of said Purchaser by a written certificate signed on behalf of said Purchaser by the Chairman of the Board and containing the specimen signature of each such person.

Authorized Representative of Monte Vista shall mean the General Manager or Assistant General Manager or any person or persons designated by the Board of Directors of the Purchaser to act on behalf of the Purchaser by a written certificate signed on behalf of the Purchaser by the President and containing the specimen signature of each such person.

Authorized Representative of the City of Ontario shall mean the City Manager or Assistant City Manager or any person or persons designated by the City Council of the City of Ontario to act on behalf of the City by a written certificate signed on behalf of the City by the Mayor and containing the specimen signature of each such person.

Authorized Representative of the Seller shall mean the Chairman of the Seller or any person or persons designated by the City Council of the Seller and authorized to act on behalf of the Seller as certified by a written certificate signed on behalf of the Seller by the Chairman of the Seller and containing the specimen signature of each such person.

Authorized Representative of the City of Upland shall mean the City Manager or Assistant City Manager or any person or persons designated by the City Council of the City of Upland to act on behalf of the City by a written certificate signed on behalf of the City by the Mayor and containing the specimen signature of each such person.

Available Moneys shall mean moneys (i) that have been on deposit with the Trustee for at least 124 days, during which period no petition by or against any Purchaser or the Seller has been filed in respect of bankruptcy, insolvency or the reorganization of such person (or has been filed but dismissed); (ii) that represent any proceeds of a draw under the Letter of Credit; (iii) that represent any proceeds of the sale of the Certificates; or (iv) Net Proceeds.

Bond Counsel shall mean a nationally recognized law firm specializing in the area of tax-exempt municipal finance.

Business Day shall mean any day other than (i) a Saturday or Sunday or legal holiday or a day on which banking institutions in any of the cities in which the principal office of the Paying Agent, the Trustee or the Letter of Credit Bank is located and authorized or required by law or regulation to close, or (ii) a day on which the New York Stock Exchange is closed.

Certificate or Certificates shall mean any certificate or certificates of participation executed and delivered by the Trustee pursuant to the Trust Agreement, each such certificate representing a proportionate interest in the principal portion of the Installment Payments payable on each Installment Payment Date and in the interest portion of the Installment Payment due and payable monthly (or payable semiannually on and after the Conversion Date), to and including such maturity date at the Adjusted Interest Rate.

Certificate holder or Holder of Certificates shall mean the registered owner of any Certificate or Certificates.

Certificate Year shall mean the twelve-month period which commences on October 1 in every year and ends on September 30 of the succeeding year.

Construction Fund shall mean the Construction Fund established in Section 501 of the Trust Agreement.

Conversion Date shall mean the date upon which the Certificates begin to bear interest at the Fixed Interest Rate as provided in Section 320 of the Trust Agreement.

Cost shall mean and be deemed to include, with respect to the Project, but on a pro-rata basis with respect thereto together with any other proper item of cost not specifically mentioned in the Agreements, whether incurred prior to or after the date of the Agreements, (a) costs of payment of, or reimbursement for, acquisition, design, construction, installation and financing of the Project, including, but not limited to, administrative costs and capital expenditures relating to acquisition, construction, installation and financing payments, inspection costs, filing and recording costs, printing costs, reproduction and binding costs, fees and charges of the Trustee pursuant to this Trust Agreement, financing documents, legal fees and charges, financial, accounting and other professional consultant fees, the cost of obtaining the Letter of Credit, fees of rating agencies or costs of obtaining credit ratings, fees for the execution, transportation and safekeeping of Certificates, and charges and expenses in connection with the foregoing; (b) all other costs which the Seller shall be required to pay under the terms of any contract or contracts for the acquisition, construction and installation of the Project, including, but not limited to the cost of any insurance required under the Agreements; (c) any sums required to reimburse the Purchasers for advances made for either of the above items, or for any other costs incurred and for work done, or property conveyed, which is properly chargeable to the Project; and (d) such other expenses not specified herein as may be necessary or incidental to the acquisition, construction, rehabilitation and installation of the Project, the financing thereof and the placing of the same in use and operation, including the Remarketing Agent's fee, the Paying Agent's fee, and the first annual fee for the Letter of Credit. Cost as defined herein shall be deemed to include the cost and expenses incurred by any agent of the Seller for any of the above-mentioned items.

Earliest Optional Payment Date shall mean the first Interest Payment Date which occurs at least seven years after the Conversion Date.

Enterprise shall mean the entire water system of each Purchaser and in the case of San Bernardino Waterworks District No. 8 its sewer system, including without limitation all improvements, works or facilities owned, controlled or operated by the Purchaser to provide water service as such improvements, works or facilities now exist, together with all additions to be acquired, constructed and financed with funds derived from the sale of the Certificates, together with all improvements and extensions to said water system later constructed or organized.

Fiscal Year shall mean the twelve-month fiscal period of the Seller which commences on July 1 in every year and ends on June 30 of the following year.

Fixed Interest Rate shall mean the fixed annual interest rate on the Certificates established in accordance with Section 320 of the Trust Agreement.

Gross Revenues of the Enterprise or Gross Revenues means all revenues, and all money secured or collected from or arising out of the use or operation of the Enterprise or arising from the Enterprise, including, without limitation, all charges, rentals, and fees required to be paid for services as permitted or required by law, resolution or order, to the Purchaser for operation of the Enterprise, excepting only all customer deposits.

Installment Payment Dates shall mean the respective dates on which Installment Payments are scheduled to be made, as set forth in Exhibit C to each Agreement.

Installment Payments shall mean the aggregate of amounts set forth in the respective Agreements corresponding to the Installment Payment Dates set forth therein and designated the principal components of such Installment Payments, plus the interest components of such Installment Payments, as such amounts may be adjusted from time to time pursuant to Sections 305 of the Agreements and all other amounts payable by the Purchasers pursuant to the terms of the respective Agreements.

Interest Payment Date shall mean (a) prior to the Conversion Date, the first Wednesday of each month or the following Business Day if said Wednesday is not a Business Day, and (b) after the Conversion Date, April 1 and October 1 of each year.

Interest Payment Fund shall mean the Interest Payment Fund of the Installment Payment Account established in Section 501 of the Trust Agreement.

Interest Period shall mean (a) prior to the Conversion Date, the period from and including Wednesday of one week through Tuesday of the following week, except that the interest period commencing on the Wednesday next preceding a Record Date shall be extended through the day immediately preceding the next Interest Payment Date, and the interest rate which would have commenced on the Wednesday on or next following the Record Date will commence on the next Interest Payment Date, and (b) on or after the Conversion Date, the period from and including the Conversion Date until the succeeding April 1st or October 1st and thereafter from said April 1st or October 1st to the following March 31st or October 30th, respectively.

Investment Securities shall mean and include any of the following securities, if and to the extent the same are at the time legal for investment of Authority funds: (1) direct obligations of the United States of America (including obligations issued or held in book-entry form on the books of the Department of the Treasury of the United States of America) or obligations the timely payment of the principal of and interest on which are fully guaranteed by the United States of America; (2) obligations, debentures, notes or other evidence of indebtedness issued or guaranteed by any of the following: Banks for Cooperatives, Federal Intermediate Credit Banks, Federal Home Loan Bank System, Export-Import Bank of the United States, Federal Financing Bank, Federal Land Banks, Government National Mortgage Association, Farmer's Home Administration, Federal Home Loan Mortgage Corporation or Federal Housing Administration; (3) interest-bearing demand or time deposits (including certificates of deposit) in banks (including the Trustee) and savings and loan associations, having combined capital and surplus of at least Seventy Five Million Dollars ($75,000,000); (4) repurchase agreements with financial institutions of the types described in (3), provided that the investments which are the subject of such agreements are permitted investments described in (1), (2) or (3) of this definition; and (5) the Local Agency Investment Fund.

Notwithstanding anything herein to the contrary, "Investment Securities" with respect to the investment of amounts representing draws under the Letter of Credit shall mean only direct obligations of the United States maturing not more than 30 days after the date on which they are acquired, and entry into a repurchase agreement with respect to such securities shall not be an allowable investment of such amounts.

Letter of Credit shall mean the irrevocable direct draw letter of credit issued by The Mitsubishi Bank, Ltd., Los Angeles Agency, in the stated amount of $_____.

Letter of Credit Bank shall mean The Mitsubishi Bank, Ltd., Los Angeles Agency, the issuer of the Letter of Credit.

Maximum Annual Debt Service shall mean as of any date of calculation the sum of (a) the interest coming due on the Outstanding Certificates at an assumed rate of 10% per annum, and (b) the amount of all sinking fund installments and principal maturities, all as computed for the Certificate Year in which such sum shall be largest; provided that on the Conversion Date the amount of the Maximum Annual Debt Service shall be reduced to reflect the actual Fixed Interest Rate.

Maximum Interest Rate shall mean 12% per annum.

Moody's shall mean Moody's Investors Service, a bond rating service with offices in New York, New York.

Maintenance and Operation Costs of the Enterprise includes the reasonable expenses of management and other expenses necessary to operate, maintain and preserve each respective Enterprise in good repair and working order, excluding depreciation.

Net Proceeds shall mean any insurance or condemnation proceeds paid with respect to the Project, remaining after payment therefrom of all expenses incurred in the collection thereof.

Net Revenues of the Enterprise shall mean the amounts of Gross Revenues of the Enterprise remaining after payment therefrom the Maintenance and Operation Costs of the Enterprise.

Outstanding, when used with reference to Certificates, shall mean, as of any date, Certificates theretofore or thereupon being authenticated and delivered under the Trust Agreement except:

(i) Certificates cancelled by the Paying Agent on or prior to such date;

(ii) Certificates (or portions of Certificates) for the payment or redemption of which moneys, equal to the principal amount or Redemption Price thereof, as the case may be, with interest to the date of maturity or redemption date, shall be held in trust under

the Trust Agreement and set aside for such payment or redemption, (whether at or prior to the maturity or redemption date), provided that if such Certificates (or portions of Certificates) are to be redeemed, notice of such redemption shall have been given as in Article III provided or provision satisfactory to the Trustee shall have been made for the giving of such notice; and

(iii) Certificates in lieu of or in substitution for which other Certificates shall have been executed and delivered pursuant to Article III of the Trust Agreement.

Participants Security Agreement shall mean the Agreement dated as of October 1, 1985 by and among the Letter of Credit Bank, the Trustee and each Purchaser.

Paying Agent shall mean BankAmerica Trust Company of New York or its successor or successors or any other corporation which may at anytime be substituted in its place pursuant to the provisions of this Trust Agreement, provided that any such successor's or substitute corporation's unsecured senior debt obligations must be rated "Baa-3" or higher by a nationally recognized rating agency, if such successor or substitute corporation is not a commercial bank or trust company.

Permitted Encumbrances shall mean as of any particular time:

(i) Liens for ad valorem taxes and assessments, if any, not delinquent or which Purchasers may, pursuant to Section 415 of the Agreements, permit to remain unpaid;

(ii) The Agreements;

(iii) The Assignment Agreement;

(iv) The Trust Agreement;

(v) Participants Security Agreement; and

(vi) Easements, rights of way and other rights, reservations, covenants, conditions or restrictions which do not impair or impede construction or operation of the Project as evidenced by the certificate of an Authorized Representative of Seller filed with the Trustee and the Letter of Credit Bank.

Prime Rate shall mean the rate of interest publicly announced by the Letter of Credit Bank in Los Angeles, California from time to time as its prime rate for unsecured

commercial borrowings, said rate to change effective on and as of any change in said Prime Rate.

Principal Payment Date shall mean the date on which a principal amount of the Certificates is paid as provided in Section 303(7) of the Trust Agreement.

Principal Payment Fund shall mean the Principal Payment Fund established in Section 501 of the Trust Agreement.

Project shall mean the the Water Treatment Plant and water transmission lines and energy recovery stations to be acquired and constructed more particularly described in Exhibit "A" hereof.

Purchase Date shall mean any Business Day upon which a Certificate, after receipt by the Remarketing Agent of a Tender Notice submitted in accordance with Section 401 of the Trust Agreement is purchased from the Holder thereof on behalf of a new Holder procured by the Remarketing Agent.

Purchase Payment Price shall mean as of each Installment Payment Date, the amount set forth in Exhibit C to each Agreement, minus amounts available in the Construction Fund, Principal Payment Fund, the Interest Payment Fund, and Reserve Fund, plus an amount equal to any other amounts then due and owing under that Agreement with respect to the Project or regarding that Agreement the amount due and owing under the Reimbursement Agreement with respect to the Letter of Credit.

Purchase Price shall mean as to each Purchaser, such Purchaser's share of the Cost to acquire its capacity in the Project, as set forth in Exhibit A to its Agreement.

Record Date shall mean (a) prior to the Conversion Date the second Business Day preceding the first Wednesday of each month and (b) on or after the Conversion Date the fifteeth day of the month immediately preceding an Interest Payment Date.

Redemption Fund shall mean the Redemption Fund established in Section 501 of the Trust Agreement.

Redemption Price shall mean, with respect to any Certificate, the principal amount thereof payable upon redemption thereof pursuant to such Certificate or the Trust Agreement, and following the Conversion Date, any premium payable in connection therewith.

Reimbursement Agreement shall mean the Reimbursement Agreement relating to the Letter of Credit, dated as of October 1, 1985 between the Seller and the Letter of Credit Bank.

Remarketing Agent shall mean Merrill Lynch Capital Markets, Merrill Lynch, Pierce, Fenner & Smith Incorporated, and its successor or successors and any corporation which may be substituted in its place pursuant to that certain Remarketing Agreement dated as of October 1, 1985, by and among the Seller, the Trustee, the Remarketing Agent and the Paying Agent, provided that any such successor's or substitute corporation's debt obligations must be rated "Baa" or higher by a nationally recognized rating agency if such successor or substitute corporation is not a commercial bank or trust company and is not a bond dealer then listed.

Reserve Fund shall mean the Reserve Fund established in Section 501 of the Trust Agreement.

Reserve Requirement shall mean the amount set aside in the Reserve Fund pursuant to Section 504.1 of the Trust Agreement.

Standard & Poor's shall mean Standard & Poor's Corporation, a bond rating service with offices in New York, New York.

State shall mean the State of California.

Supplemental Trust Agreement shall mean any agreement supplemental or amendatory of the Trust Agreement.

Tender Interest shall mean, for any period of time in which there is an unreimbursed drawing under the Letter of Credit, that amount which, when added to the interest component of any Installment Payment payable to the Letter of Credit Bank during such period, will result in the Letter of Credit Bank's receiving for the first 180 days after the draw a yield equivalent to the yield of 1/2% over the average interest charged for each day on reserves traded for overnight use by member banks of the Federal Reserve System as determined by the Letter of Credit Bank, and thereafter at a yield equal the Prime Rate for a similar advance for a similar period on such unreimbursed draw under the Letter of Credit.

Tender Notice shall mean the notice required to be submitted by an owner of a Certificate for receipt by the Paying Agent on the Business Day at least seven (7) days prior to a Purchase Date as provided in Section 318 of the Trust Agreement, demanding that such Certificate be purchased.

Trust Agreement shall mean the Trust Agreement entered into by and among, the Purchasers, the Trustee, the Seller and the Paying Agent dated as of October 1, 1985 Relating to the Water Facilities Authority Water Treatment

Plant and any and all amendments and supplements thereto made in accordance with the provisions of the Trust Agreement.

Trust Estate shall mean (i) all right, title and interest of the Trustee in and to the Installment Payments and the Agreements including, without limitation: (ii) all amounts from time to time deposited in the accounts and subaccounts created pursuant to the Trust Agreement in accordance with the provisions of Article III of the Agreements, including all investments and investment earnings thereon and (iii) amounts drawn under the Letter of Credit or under any Alternate Security.

Trustee shall mean Bank of America National Trust and Savings Association, or its successor or successors or any other corporation which may at any time be substituted in its place pursuant to the provisions of the Trust Agreement.

202. Rules of Construction. Words of the masculine gender shall be deemed and construed to include correlative words of the feminine and neuter genders. Unless the context otherwise indicates, words importing the singular number shall include the plural number and vice versa, and words importing persons shall include corporations and associations, including public bodies, as well as natural persons.

The terms "hereby," "hereof," "hereto," "herein," "hereunder" and any similar terms, as used in this Agreement, refer to this Agreement.

## ARTICLE III

## SALE OF CAPACITY IN THE PROJECT; PURCHASE PRICE

301. Deposit of Moneys. In order to induce Purchaser to purchase the stated capacity in the Project from Seller and to assure Purchaser that the moneys needed to pay the Project Cost will be available for this purpose without delay, Seller, immediately following recordation of this Agreement and the other Agreements with other Purchasers by Seller, shall deposit with the Trustee or cause to be deposited with the Trustee, the sum of $_____. Of this amount, $_____ is required to be deposited in the Construction Fund held by the Trustee pursuant to the Trust Agreement; $_____ is required to be deposited in the Reserve Fund, of which $_____ will be held in the Ontario Reserve Account held by the Trustee pursuant to the Trust Agreement for Purchaser; and $_____ is required to be deposited in the Ontario Interest Payment Account held by the Trustee pursuant to the Trust Agreement for Purchaser.

302. Construction of Project. Seller agrees to acquire and construct or cause the acquisition and construction of the Project pursuant to the plans and specifications on file in the office of the Seller. Seller shall cause contractors under any construction contracts to comply with workers' compensation insurance laws and to pay prevailing wages in accordance with the requirements of Article 2 (commencing with Section 1770) of Chapter 1, Part 7, Division 2 of the California Labor Code. Seller shall provide for supervision of construction of the Project until completion of construction of the Project. Seller shall cause the construction to be performed diligently to the end and covenants that the Project will be substantially completed by October 8, 1988. Purchaser and Seller agree that upon substantial completion of the Project, Seller will maintain and operate the Project under the terms and provisions of this Agreement and such other agreements to be made between the Seller and the Purchasers. No changes shall be made in such plans and specifications which increase the pro rata portion of Project Cost attributable to the Purchaser's capacity in the Project in excess of the funds available in the Construction Fund unless the Purchaser deposits or causes to be deposited in the Construction Fund monies in an amount deemed by the Seller and Purchaser to be sufficient to pay such increase.

Upon completion of construction of the Project, Seller shall deliver or cause to be delivered to the Trustee an Acceptance Certificate thereof executed by an Authorized Officer of the Seller.

Prior to the date of the filing of the Acceptance Certificate or prior to October 8, 1988, whichever is earlier, the Seller shall notify Purchaser of its pro rata share of excess funds then on deposit in the Construction Fund. All such excess funds shall be transferred to the Redemption Fund for the redemption of Certificates in the principal amount of $100,000 or intregal multiples thereof unless the Purchaser instructs the Seller to have its pro rata share transferred to the Purchasers Installment Payment Account as a credit against the principal portion of its Installment Payment on the next occurring Installment Payment Date. Seller (prior to the filing of the Acceptance Certificate or October 1, 1988), whichever is earlier.

303. Payment of Project Cost. Payment for the construction of the Project, as well as all other Project Cost, up to the total amount in the Construction Fund, shall be made from the monies held by the Trustee in the Construction Fund. The Purchaser may at any time during construction contribute cash or its equivalent (as agreed upon between Seller and the

Purchaser, with the consent of the Letter of Credit Bank) to the Project which amount will be credited against the Purchase Price to be paid by the Purchaser. As an alternative, if Seller, Purchaser and the Letter of Credit Bank agree, Purchaser may be reimbursed from the Construction Fund any Project Cost heretofore or hereafter advanced by Purchaser.

304. Sale of Capacity in the Project; Term.

(a) Sale of Capacity in the Project. In consideration of the payment, or the causing of the payment, of Installment Payments provided for in Section 305 of the Trust Agreement by Purchaser to Seller or its assignee, Seller hereby grants, conveys, bargains and sells to Purchaser, effective upon the date of the Trust Agreement, the capacity in the Project described in Exhibit A, upon the terms and conditions set forth in this Agreement and Purchaser hereby accepts said grant, conveyance, bargain and sale upon said terms and conditions.

(b) Term of Agreement. The term of this Agreement shall commence upon the date of the Trust Agreement and shall terminate upon the occurrence of either of the following events: (a) payment in full of the Installment Payments by Purchaser pursuant to the provisions of this Agreement; or (b) a default by Purchaser and termination pursuant to Article VI of the Trust Agreement.

305. Installment Payments. For the purchase of the stated capacity in the Project, Purchaser shall pay to Seller, its successors and assigns, the Installment Payments set forth in Exhibit B attached hereto and by this reference incorporated herein from, but only from, the Gross Revenues of the Purchaser's Enterprise. Installment Payments shall be made to the Seller, which Installment Payments shall be held by Seller in segregated principal and interest payment accounts to be established by Seller in the name of each Purchaser until paid to the Letter of Credit Bank as provided in the Reimbursement Agreement on each Interest Payment Date and/or Principal Payment Date, as the case may be. Installment Payments received by the Seller shall be invested in Investment Securities and any earnings thereon shall be credited pro rata to each Purchaser's Principal Payment Account.

Each Installment Payment shall constitute payment in part for the title to the stated capacity in the Project as described in Exhibit A. For each Certificate Year commencing with the date of the Trust Agreement, Purchaser shall make Installment Payments on Installment Payment Dates during said Certificate Years as more particularly set forth in Exhibit B. The Purchaser shall pay from the proceeds of the sale of the

Certificates advance Installment Payments in the aggregate amount of $_____, consisting of interest only for the period from the date of the delivery of the Certificates through and including January 1, 1986, on the Purchaser's portion of the principal amount of the Certificates calculated at an assumed interest rate of 10% per annum.

Installment Payments for each Installment Payment Date during the term of this Agreement shall constitute the total amount due for said payment period, and shall be paid by Purchaser for and in consideration of the Seller selling to the Purchaser the right to receive the capacity in the Project.

In determining the amount of each Installment Payment, the Seller shall give the Purchasers a credit against the amount due from and payable by the Purchaser specified in said Exhibit B by (i) an amount equal to the amounts on deposit in the Purchaser's Principal and Interest Payment Accounts held by Seller and similar accounts established pursuant to the Trust Agreement and held by the Trustee; (ii) the investment earnings received by the Trustee from the investment of money in the Purchaser's Reserve Account as reported to Purchaser pursuant to Section 508 of the Trust Agreement; and (iii) the amount in the Reserve Account equal to the amount paid to the Letter of Credit Bank for the last Installment Payments remaining prior to the expiration of the term of this Agreement and paid by the Letter of Credit Bank, as provided in Section 504 of the Trust Agreement.

(a) Prior to the Conversion Date, the interest portion of each Installment Payment shall be calculated and paid at a rate per annum of 8% per annum, unless the Adjusted Interest Rate of the Certificates is then greater than 8% in which event the interest rate on each Installment Payment shall be at a rate per annum equal to the Adjusted Interest Rate (which shall be determined as provided in Section 317 of the Trust Agreement). In no event shall the interest portion of Installment Payments be paid at less than 8% per annum.

(b) Purchaser agrees to deposit such amounts necessary to pay the interest and principal due on the Certificates on the next Interest Payment Date and Principal Payment Date.

(c) Prior to the Conversion Date the interest portion of each Installment Payment shall be adjusted upward or downward as provided in Exhibit B of the Trust Agreement. On the 25th day of each month the Trustee shall notify the Seller by telephone of the actual interest portion of the Installment Payments due on the next Installment Payment Date.

(d) At its election, the Seller may convert the interest rate component of the Installment Payments applicable to the Certificates from the Adjustable Interest Rate to the Fixed Interest Rate as provided for in Section 320 of the Trust Agreement.

(e) As additional consideration for the purchaser of Purchasers Capacity, the Purchaser agrees to pay Tender Interest applicable to the Purchaser on each Installment Payment Date in the event of an unreimbursed draw under the Letter of Credit in addition to the Installment Payments required hereinabove.

(f) In addition to the Installment Payments, the Purchaser agrees to pay 38.29976% (which percentage will change following completion of construction evidenced by a certificate of the Authority delivered to the Purchasers, the Trustee and the Letter of Credit Bank) of: (i) all fees and expenses of the Trustee incurred in connection with the performance of its duties under the Trust Agreement and (ii) all unremimbursed draws under the Letter of Credit and the fees of the Letter of Credit Bank.

306. Interest Component. Except for the Installment Payment due through and including January 1, 1986, which are to be comprised of interest only, a portion of each Installment Payment shall be paid as, and represents, the payment of a portion of the unpaid Purchase Price and interest on the unpaid Purchase Price. The interest component of each Installment Payment is set forth in Exhibit B.

307. Payment in Lawful Money; No Set-Off. Each Installment Payment shall be paid or caused to be paid by the Purchaser in lawful money of the United States of America, which at the time of payment is legal tender for the payment of public and private debts, to the Seller or its assignee at the Office of the Seller in Montclair, California, or such other place as Seller or its assignee shall designate. Any such Installment Payments accruing hereunder which shall not be paid on or prior to each Installment Payment Date shall bear interest at the rate of twelve percent (12%) per annum from the Installment Payment Date until the same shall be paid. Notwithstanding any dispute between Purchaser and Seller, Purchaser shall make or cause to be made each and all Installment Payments when due, whether or not Seller shall deliver to Purchasers any capacity in the Project and shall not withhold any Installment Payments pending the final resolution of such dispute nor shall Purchaser assert any right of set-off or counter-claim against its obligation to make Installment Payments as set forth herein.

308. Pledge of Revenues. Except for the payment of the Purchaser's 1976 Water Revenue Bonds which constitute a first lien on said Gross Revenues, the Installment Payments shall be equally secured by a pledge, charge and lien upon the Gross Revenues of the Enterprise, and all of the Gross Revenues of the Enterprise are hereby pledged, charged and assigned for the security of said Installment Payments and any obligations of the City on a parity with the Installment Payments, and such Gross Revenues and any interest earned on the Gross Revenues shall constitute a trust fund for the security and payment of the interest on and principal of said Installment Payments and so long as any of the Installment Payments thereon are unpaid said Gross Revenues and interest thereon shall not be used for any other purpose, and except as permitted by this Agreement, and shall be held in trust for the benefit of the Seller and shall be applied pursuant to this Agreement, or to this Agreement as modified pursuant to provisions herein. The Gross Revenues of the respective Enterprises of the other Purchasers are not pledged hereunder.

309. Title. From and after the date of the Trust Agreement, title to the Purchaser's stated capacity in the Project, and each and every portion thereof, shall vest in Purchaser, provided, however, that title to the Purchaser's stated capacity in the Project and each and every portion thereof shall be subject to the subsequent payment of Installment Payments as described in Section 305 of the Trust Agreement and to the remedies of Seller and its assignee in the event of default as provided in Article VI of the Trust Agreement and to Permitted Encumbrances.

310. Disclaimer of Warranties. THE SELLER MAKES NO WARRANTY OR REPRESENTATION, EITHER EXPRESS OR IMPLIED, AS TO THE VALUE, DESIGN, CONDITION, MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE OR FITNESS FOR USE OF THE PROJECT, OR WARRANTY WITH RESPECT THERETO. In no event shall Seller be liable for any incidental, indirect, special or consequential damage in connection with or arising out of this Agreement or the existence, furnishing, functioning or Purchaser's use of any item, product or service provided for in this Agreement.

311. Manufacturers' Warranties. The Seller appoints Purchaser its agent and attorney-in-fact during the Agreement Term, so long as Purchaser shall not be in default hereunder, to assert from time to time whatever claims and rights, including warranties concerning the Project, which Seller may have against the manufacturer or supplier of such portion of the Project. As between the Seller and the Purchaser, Purchaser's sole remedy for the breach of such warranty, indemnification or representation shall be against the manufacturer of or supplier for the Project, and not against

the Seller, nor shall such matter have any effect whatsoever on the rights of the Seller with respect to this Agreement, including the right to receive full and timely payments hereunder. Purchaser expressly acknowledges that neither Seller nor the Trustee makes, or has made, any representation or warranty whatsoever as to the existence or availability of such warranties of the manufacturer of or supplier for any part of the Project.

312. Purchaser's Option to Prepay the Installment Payments. Except as provided herein, Purchaser shall not have the option to prepay all remaining Installment Payments.

(a) The Purchaser, at its option, may prepay the principal component of Installment Payments, in whole or in part, on any Installment Payment Date prior to the Conversion Date, in any integral multiple of $100,000, at the principal amount thereof, together with accrued interest to the date on which Certificates will be redeemed with such payment.

(b) The Purchaser may also, at its option, prepay the principal component of Installment Payments, in whole or in part, on the first Interest Payment Date which occurs at least seven years after the Conversion Date and on any Interest Payment Date thereafter, with a redemption premium of three percent (3%) of the principal amount of Certificates redeemed on such date, such premimum to be reduced by one percent (1%) on each anniversary of the initial redemption date until it reaches zero together with accrued interest to the date on which Certificates will be redeemed with such payment.

The principal and interest on any Certificates to be redeemed due to option prepayments shall be paid by the Letter of Credit Bank from draws on the Letter of Credit. The premium to be paid on any Certificates called for redemption shall be deposited by the Purchaser with the Trustee at least 124 days prior to the date set for redemption of related Certificates.

313. Arbitrage Covenant. The Purchaser and the Seller hereby covenant with the Certificateholders that, notwithstanding any other provision of this Agreement, they will make no use of the proceeds of the Certificates which, if such use were made on the date of delivery of the Certificates to the Certificateholders, would have caused the obligations of the Purchaser under this Agreement to be "arbitrage bonds" subject to federal income taxation by reason of Section 103(c) of the Internal Revenue Code of 1954, as amended.



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## ARTICLE IV

## COVENANTS RELATING TO THE PROJECT

401. Maintenance and Operation of the Project. Seller shall maintain the Project or cause the Project to be maintained and operated on behalf of Purchaser and the other Purchasers of capacity in the Project. Notwithstanding the covenants hereunder made by Seller, it is understood that the Purchasers shall pay their proportionate shares of the cost of the maintenance and operation of the Project. The obligations of the Purchasers may be more fully set forth in further agreements among the Purchasers and Seller.

402. Utilities. Seller shall pay for, or otherwise arrange for the payment of, all utility services supplied to the Project (which services shall include power, gas, telphone and all other utility services), all cost of operation of the Project and all cost of repair and replacement of the Project resulting from ordinary wear and tear or want of care.

403. Public Liability Insurance. On or before the award of any construction contract Seller shall maintain or cause to be maintained public liability insurance against claims for bodily injury or death, or damage to property occurring upon, in or about the Project, such insurance to afford protection to a limit of not less than $5,000,000 combined single limit bodily injury and property damage. Such insurance may be maintained in conjunction with or separate from any other similar insurance carried by Purchaser.

404. Workers' Compensation Insurance. On or before the award of any construction contract Seller shall be responsible for the compliance, including all financial payments, with the State of California laws as regards Workers' Compensation and employee safety.

405. Fire and Special Extended Coverage Endorsement. Seller shall maintain or cause to be maintained, throughout the term of this Agreement, fire and lightning insurance, earthquake insurance, subject to deductible conditions not to exceed 10% of the full insurable value of the above ground structures, and special extended coverage endorsement which includes vandalism and malicious mischief endorsement, on all above-ground structures constituting any part of the Project in an amount equal to at least one hundred percent (100%) of the replacement cost of such structures (less a deductible amount of not more than $5,000). All insurance required to be maintained pursuant to this Section may be subject to deductible clauses as may be approved by the Purchaser, provided deductible amounts for fire extended coverage shall

not exceed $5,000 for any one loss. Each such policy of insurance shall contain an inflation cost endorsement, a standard replacement cost endorsement providing for no deduction for depreciation, and a stipulated amount endorsement. Such insurance may be maintained in conjunction with or separate from any other similar insurance carried by Purchaser.

In addition, the Seller shall maintain or cause to be maintained use and occupancy or business interruption or rental income insurance against the perils of fire, lightning, earthquake, vandalism and malicious mischief and such other perils ordinarily defined as "extended coverage" on the above-ground structures of the Project in an amount equal to not less than 18 months' aggregate Installment Payments due from Purchasers under all the Agreements.

Any insurance required by Sections 403, 404 and 405 hereof carried by the Seller shall name the Purchasers as additional named coinsured or if carried by the Purchasers shall name the Seller as additional coinsured. Seller, or Purchasers if the required insurance is carried by the Purchasers, may be self-insured up to $500,000 for any single event.

406. Form of Insurance Policies; Delivery.

(a) All policies of insurance required by Section 405 of this Agreement shall provide (or Seller shall separately agree) that all proceeds thereunder relating to that portion of the Project damaged or destroyed shall be payable to the Trustee pursuant to a lender's loss payable endorsement, substantially in accordance with the form approved by the California Bankers Association. The Trustee may adjust, collect and receive all monies relating to the Project which may become due and payable under any such policies, may compromise any and all claims thereunder and shall apply the Net Proceeds of such insurance as provided in this Agreement. All policies of insurance required by Section 405 of this Agreement shall be to the Letter of Credit Bank and shall provide that Seller or its assignee and Purchaser, shall be given thirty (30) days' notice of any intended cancellation thereof or reduction of the coverage provided thereby.

(b) Seller shall deliver, or cause to be delivered, to Purchaser the Letter of Credit Bank and the Trustee in the month of December in each year a schedule, in such detail as Purchaser or the Trustee may request, setting forth the insurance policies then in force pursuant to this Agreement, the names of the insurers which have issued the policies, the amounts thereof, the property and risks covered thereby and evidence of the payment of premiums due

thereunder. If so requested in writing by Purchaser or the Trustee or the Letter of Credit Bank, Seller shall also deliver, or cause to be delivered to Purchaser or the Trustee or the Letter of Credit Bank duplicate originals or certified copies of each insurance policy described in such schedule, provided, however, that delivery of the insurance policies under the provisions of this Section shall confer no responsibility upon Purchaser or the Trustee or the Letter of Credit Bank as to the sufficiency of coverage or amounts of said policies. In the event of failure of Seller to obtain or cause to be obtained the insurance required by Sections 403 through 405 of the Trust Agreement, Purchaser may obtain such insurance on behalf of Seller and may collect premiums thereof from Seller with interest at the rate of twelve percent (12%) on unpaid premiums.

407. Inability to Obtain Insurance. Notwithstanding the provisions of Sections 403 through 405, if at any time Seller shall be unable to obtain or maintain insurance to the extent required by such Sections on reasonable terms, as to amounts, costs or as to risks, the failure to maintain such insurance shall not constitute a default under this Agreement if Purchaser shall cause the employment of an independent insurance consultant having a favorable reputation for skill and experience in such matters, for the purpose of reviewing such insurance requirements and making recommendations respecting the types, amounts and provisions of reasonably obtainable insurance, including self-insurance, or the establishment of other generally accepted forms of alternative protection that should be carried in lieu thereof, or the infeasibility of obtaining insurance, and if Seller shall comply with the recommendations made in such report. A signed copy of the report of the insurance consultant shall be filed with the Trustee and the Letter of Credit Bank, and the insurance requirements specified in Sections 403 through 405 shall be deemed to be modified to conform with the recommendations in such report.

408. Application of Net Proceeds of Insurance. The Net Proceeds of any insurance required by this Agreement relating to the loss or destruction of any part of the Project which is received by the Seller shall be deposited in the Construction Fund and Seller shall assure that such Net Proceeds are and shall be applied and disbursed as set forth below:

(a) If Seller determines that such Net Proceeds are sufficient to repair, reconstruct or replace the damaged or destroyed portion of the Project, which determination shall be evidenced by a certificate executed by an Authorized Officer of Seller and filed with the Trustee as assignee of Seller, then Seller shall cause such portion of the Project to be repaired,

reconstructed or replaced to at least the same good order, repair and condition as it was in prior to the damage or destruction, insofar as the same may be accomplished by the use of said Net Proceeds, and Seller shall disburse said Net Proceeds for said purpose. Any balance of said Net Proceeds not required for such repair, reconstruction or replacement shall be transferred by the Trustee to the Redemption Fund to be applied as prepayment of Installment Payments and shall be used to redeem Certificates as provided in Section 606 of the Trust Agreement.

(b) In the event that such Net Proceeds are not sufficient to repair, reconstruct or replace the damaged or destroyed portion of the Project, as evidenced by a certificate executed by an Authorized Representative of Seller and filed with the Trustee, Seller shall deposit such Net Proceeds with the Trustee and direct the Trustee to apply such Net Proceeds to the prepayment in full, on the next succeeding Installment Payment Date, of Installment Payments, by paying the then-stipulated fair market value of the stated capacity in the Project as set forth in Exhibit B of this Agreement, or if such Net Proceeds are insufficient to prepay Installment Payments in full, then Seller shall direct the Trustee to apply such Net Proceeds to prepayment of a portion of the Installment Payments, except that no such prepayment shall be in an amount less than $5,000.

Unless the Purchaser's Installment Payments have been paid in full as provided in subsection (b) of this Section 408, Purchaser shall be obligated to continue to make Installment Payments required by this Agreement notwithstanding damage to or destruction of all or a portion of the Project.

409. Application of Net Proceeds of Condemnation. All Net Proceeds received in any condemnation proceeding undertaken by any governmental agency relating to all or a portion of the Project shall be paid by Purchasers, if received by Purchasers, to the Trustee for deposit in the Principal Payment Fund and deposited in the appropriate Principal Payment Accounts and Seller shall assure that such Net Proceeds are applied and disbursed as set forth below:

(a) If Seller determines that such condemnation has not materially adversely affected the operation of the Project as set forth in a certificate executed by an Authorized Representative of Seller and filed with the Trustee, as assignee of Seller, and if such Net Proceeds are insufficient to enable Seller to prepay Installment Payments in full by paying the stipulated value of the Project as set forth in Exhibit B of the Agreements on the next succeeding Installment Payment Date, Seller shall direct the Trustee to retain such

Net Proceeds in the Principal Payment Fund and to cause such Net Proceeds to be applied as a credit against the appropriate Purchaser's next succeeding Installment Payments.

(b) If Seller determines that such condemnation has materially adversely affected the operation of the Project as set forth in a certificate executed by an Authorized Representative of Seller and filed with the Trustee, as assignee of Seller, or if such Net Proceeds are sufficient to enable Purchasers to prepay the Installment Payments in full by paying the stipulated value of the Project on the next succeeding Installment Payment Date, Seller shall direct the Trustee to deposit the Net Proceeds in the Redemption Fund and to apply such Net Proceeds to the prepayment in full or (to the extent that such condemnation pertains only to a portion of the Project) in part on the next succeeding Installment Payment Date of Installment Payments.

Unless Installment Payments shall have been paid in full as provided in subsection (b) of this Section 409, Purchaser shall be obligated to continue to make Installment Payments required by this Agreement, notwithstanding condemnation of all or a portion of the Project.

410. Payment of Installment Payments. Purchaser shall duly and punctually pay or cause to be paid the Installment Payments and the other amounts due hereunder at the dates and places and in the manner provided in this Agreement according to the true intent and meaning hereof and of the Trust Agreement and shall not directly or indirectly extend or assent to the extension of the Installment Payment Dates for any Installment Payments.

411. Compliance with this Agreement. Seller and Purchaser will faithfully observe and perform or cause to be faithfully observed and performed all the covenants, conditions and requirements of this Agreement, and will not suffer or permit any default to occur hereunder, nor do or permit to be done in, upon or about the Project or any part thereof, anything that might in any way weaken, diminish or impair the operation thereof. Neither Seller nor Purchaser will do or permit anything to be done, or omit or refrain from doing anything, in any case where any such act done or permitted to be done, or any such omission of or refraining from action, would or might be a ground for cancellation or termination of this Agreement (other than by prepayment).

412. Payment of Taxes. Purchaser will pay or cause to be paid all taxes, assessments and other governmental charges, if any, that may be levied, assessed or charged upon the Purchasers' capacity in the Project promptly as and when the

same shall become due and payable; provided, however, that Purchaser shall not be required to pay any such tax, assessment, or charge, if the validity thereof shall concurrently be contested in good faith by appropriate proceedings, if Purchaser shall set aside, or cause to be set aside, reserves agreed by Purchaser and Seller or its assignee to be in a form and amount which is adequate with respect thereto and if Purchaser shall hold Seller and its assignee harmless as to any loss or forfeiture which might arise from the nonpayment of any such item; and provided further, that Purchaser, upon the commencement of any proceedings to foreclose the lien of any such tax, assessment, or charge, will forthwith pay, or cause to be paid, any such tax, assessment or charge, unless contested in good faith as aforesaid. Purchaser will not suffer the Purchaser's capacity in the Project or any part thereof, to be sold for any taxes, assessments or other charges whatsoever, or to be forfeited therefor. Nothing herein contained shall be deemed to impose any liability to pay taxes, assessments or charges where none is imposed by law.

413. Observance of Laws and Regulations. Seller and Purchaser will well and truly keep, observe and perform or cause to be kept, observed and performed all valid and lawful obligations or regulations now or hereafter imposed on either of them by contract, or prescribed by any law of the United States, or of the State of California, or by any officer, board or commission having jurisdiction or control, as a condition of the continued enjoyment of any and every right, privilege or franchise now owned or hereafter acquired by Purchaser and enjoyed by Seller, including Seller's and Purchaser's right to exist and carry on business as a public body, corporate and political, to the end that such rights, privileges and franchises shall be maintained and preserved, and shall not become abandoned, forfeited or in any manner impaired.

414. Maintain and Preserve the Project. Seller will operate, maintain and preserve, or will cause to be operated, maintained and preserved, the Project in good repair and working order and will operate or cause to be operated the Project, in an efficient and economical manner.

415. Other Liens. Seller and Purchaser shall keep, or cause to be kept, the Project and all parts thereof free from judgments, from mechanics and materialmen's liens (except those arising from construction of the Project) and free from all liens, claims, demands and encumbrances of whatsoever nature or character, other than Permitted Encumbrances, and Seller and Purchaser shall keep or cause to be kept the Project free from any claim or liability which might impair or impede the operations of the Project; provided, however, that Seller or Purchaser shall not be required to pay any such liens, claims

or demands if the validity thereof shall concurrently be contested in good faith by appropriate proceedings, and if Seller or Purchaser shall set aside, or cause to be set aside, reserves deemed by it to be adequate with respect thereto and provided further, that Seller or Purchaser upon the commencement of any proceedings to foreclose the lien of any such charge or claim, will forthwith pay, or cause to be paid, any such charge or claim unless contested in good faith as aforesaid. Seller, Purchaser or the Trustee, may, (after first giving the other parties ten (10) days' written notice to comply therewith and failure of party liable to so comply within said ten-day period) defend against any and all actions or proceedings in which the validity of this Agreement is or might be questioned, or may pay or compromise any claim or demand asserted in any such actions or proceedings; provided, however, that, in defending against such actions or proceedings or in paying or compromising such claims or demands, Seller shall not in any event be deemed to have waived or released Purchaser from liability for or on account of any of its covenants and warranties contained herein, or from its liability hereunder to defend the validity of this Agreement and the pledge herein made and to perform such covenants and warranties.

416. Against Encumbrances or Sales. Except for the emcumbrance created by Purchasers Resolution No. __ providing for the issuance of its 1976 Water Revenue Bonds neither Seller nor Purchaser shall create or suffer to be created any mortgage, pledge, lien, charge or encumbrance upon the Project, or upon any real or personal property essential to the operation of the Project except Permitted Encumbrances. Except as expressly provided in this Article IV, Purchaser shall promptly, at its own expense, take such action as may be necessary to discharge or remove any such mortgage, pledge, lien, charge or encumbrance for which it is responsible, if the same shall arise at any time. Neither Seller nor Purchaser shall sell or otherwise dispose of any property essential to the proper operation of the Project, except as otherwise permitted by this Agreement.

417. Prosecution and Defense of Suits. Purchaser shall, promptly upon request of Seller or its assignee, from time to time take such action, or cause such action to be taken, as may be necessary or proper to remedy or cure any defect in or cloud upon its interest in the Project whether now existing or hereafter developing and shall prosecute, or cause to be prosecuted, all such suits, actions and other proceedings as may be appropriate for such purpose and shall indemnify and save Seller and its assignee harmless from all loss, cost, damage and expense, including attorneys' fees, which they or any of them may incur by reason of any such defect, cloud, suit, action or proceedings.

418. Recordation and Filing. Purchaser shall record and file, or shall cause to be recorded and filed, this Agreement and all such documents as may be required by law (together with whatever else may be necessary or be reasonably required by Seller or its assignee), in such manner, at such times and in such places as may be required by law in order fully to preserve and protect the rights of Seller and its assignee under this Agreement.

419. Waiver of Laws. Purchaser shall not at any time insist upon or plead in any manner whatsoever, or claim or take the benefit or advantage of, or suffer, any stay or extension law now or at any time hereafter in force which may adversely affect the covenants and agreements contained in this Agreement and the benefit and advantage of any such law is hereby expressly waived by Seller to the extent that Seller may legally make such waiver.

420. Compliance with Conditions Precedent. Upon the date of delivery of this Agreement, all conditions, acts and things required by law or by this Agreement to have happened or to have been performed precedent to or in the execution of this Agreement shall exist, have happened and have been performed, and this Agreement shall be within every limit prescribed by law.

421. Power to Enter Into Agreements.

(a) Purchaser is duly authorized to enter into this Agreement and the Trust Agreement. The provisions of this Agreement are and will be the valid and legally enforceable obligations of Purchaser in accordance with their terms and the terms of this Agreement.

(b) Seller is duly authorized to enter into this Agreement, the Assignment Agreement and the Trust Agreement and to enter into the transactions contemplated by this Agreement, the Assignment Agreement and the Trust Agreement. Seller has duly authorized the execution and delivery of this Agreement, the Assignment Agreement and the Trust Agreement.

422. Further Assurances. Whenever and so often as requested so to do by Seller or its assignee, Purchaser will promptly execute and deliver or cause to be executed and delivered all such other and further instruments, documents or assurances, and promptly do or cause to be done all such other and further things, as may be necessary or reasonably required in order further and more fully to vest in Seller or its assignee all rights, interest, powers, benefits, privileges and advantages conferred or intended to be conferred upon Seller and its assignee by this Agreement.

423. Seller Not Liable. Neither Seller nor its assignee nor its members, officers, agents or employees shall be liable to the Purchasers or to any other person whomsoever for any death, injury or damage that may result to any person or property by or from any cause whatsoever in, on or about the Project. The Purchasers shall indemnify, or cause indemnification of, and hold Seller, its assignee, its and their members, officer, agents and employees harmless from, and defend each of them against, any and all claims, liens and judgments for death of or injury to any person or damage to property whatsoever occurring in, on or about the Project.

424. Indemnification Due to Trustee. Purchaser shall pay, or cause to be paid, to Seller or the Trustee as assignee of Seller, fees, compensation and expenses due under the Trust Agreement upon periodic billing therefor by Seller or the Trustee as assignee of Seller. In addition, Purchaser shall and hereby agrees to indemnify, or cause indemnification of, and hold, or cause to be held, Seller and the Trustee as assignee of Seller harmless from and against all claims, losses and damages, including legal fees and expenses, arising out of (i) the use, maintenance, condition or management of, or from any work or thing done on, the Project by Purchaser, (ii) any breach or default on the part of Purchaser in the performance of any of its obligations under this Agreement, (iii) any act of negligence of Purchaser, or of any of its agents, contractors, servants, employees or licensees with respect to the Project, (iv) the authorization of payment of the Cost of the Project by Purchaser, or (v) the defense (pursuant to Section 417 of the Installment Agreement or Section 611 of the Trust Agreement) against actions or proceedings in which the validity of this Agreement is or might by questioned and the payment or compromise of claims or demands asserted in any such actions or proceedings, all to the extent permitted by law. Indemnification for any tort mentioned in this Section shall be limited to the extent and in the amounts provided for by California law. No indemnification will be made under this Section or elsewhere in this Agreement for wilful misconduct, gross negligence or negligence by the Trustee, its officers, agents, employees, successors or assigns.

425. Authority to Operate the Project. The Seller shall assure that the Property including the Project is operated pursuant to complete and lawful authority. No permits, rights, franchises or privileges relating thereto shall be allowed to lapse or be forfeited so long as the same shall be necessary for the ownership or operation of the Project. Seller shall procure, or cause to be procured, the extension or renewal of each and every permit, right, franchise or privilege so expiring and necessary or desirable for the ownership or operation of the Project as such.

426. Operation and Equipping of the Project. The Seller shall continuously furnish and equip the Project, or cause the Project to be furnished and equipped, so that the Project shall at all times constitute complete and operational water treatment and distribution facilities which are conducted, operated and maintained in an efficient and economical manner. All costs of operating and maintaining the Project shall be borne by the Purchasers pro rata or as may otherwise be set forth in further agreements between the Seller and the Purchasers.

427. Furnishing Additional Information. Purchaser shall, from time to time, furnish or cause to be furnished to Seller or its assigneesuch data regarding the Project as shall be reasonably requested in order to enable Seller and the Trustee as assignee of Seller to determine whether there has been compliance with the covenants, terms and provisions of this Agreement and of the Trust Agreement.

428. Quiet Enjoyment. The parties hereto mutually covenant that Purchaser, so long as it shall keep and perform the covenants and agreements herein contained, shall at all times during the term of this Agreement peaceably and quietly, have, hold and enjoy its interest in the Project without suit, trouble or hindrance from Seller.

429. Restriction Against Pledge. Seller shall not pledge Installment Payments or other amounts derived from the Project or from rights of Seller under this Agreement nor shall Seller encumber or place any lien upon the Project, except as otherwise provided in this Agreement, the Reimbursement Agreement, Participants Security Agreements and the Trust Agreement.

430. Assignment by Seller. Except pursuant to the Assignment Agreement and except as otherwise set forth herein, Seller shall not assign this Agreement, its rights to receive Installment Payments or its duties and obligations hereunder.

431. No Violation of Other Agreements.

(a) Purchaser hereby represents that neither the execution and delivery of this Agreement and the Trust Agreement, nor the fulfillment of and compliance with the terms and conditions of the Trust Agreement and hereof, nor the consummation of the transactions contemplated hereby or thereby, conflicts with or results in a breach of terms or violation of any other agreement to which Purchaser is a party or by which Purchaser is bound, or constitutes a default under any of the foregoing.

(b) Seller hereby represents that neither the execution and delivery of this Agreement, the Assignment Agreement, the Trust Agreement or the Reimbursement Agreement, nor the fulfillment of and compliance with the terms and conditions of the Trust Agreement and thereof, nor the consummation of the transactions contemplated hereby or thereby, conflicts with or results in a breach of terms or violation of any other agreement to which Seller is a party or by which Seller is bound, or constitutes a default under any of the foregoing or is in violation of any law, regulation or ruling of the State of California.

## ARTICLE V

## WATER REVENUES, COVENANTS

501. Water Revenue Fund. The Purchaser has established a Water Revenue Fund in connection with Purchasers 1976 Water Revenue Bond issue which is held by the appropriate financial officer of the Purchaser. All Gross Revenues of the Enterprise shall be deposited with the Treasurer and credited to the Water Revenue Fund. After the payment of or the provision for the payment of the principal and interest on Purchasers 1976 Water Revenue Bond issue, the Treasurer shall transfer moneys from the Water Revenue Fund to pay the Installment Payments in accordance with Section 305. Any moneys in excess of that budgeted as required for the payment of the Installment Payments and any obligations on a parity with the Installment Payments and the Maintenance and Operation Cost of the Enterprise shall constitute are surplus revenues in the Water Revenue Fund. After all covenants contained herein have been duly performed, and provided that there are no amounts then owing to the Letter of Credit Bank, these surplus revenues may be used for: (1) extensions and betterments of the Enterprise; or (2) any lawful purpose of the Purchaser.

502. Covenants. So long as the Installment Payments are unpaid, the Purchaser makes the following covenants with the Seller and its assigns, which covenants are necessary, convenient and desirable to secure the payment of the Installment Payments; provided, however, that said covenants do not require the Purchaser to expend any funds other than the revenues received or receivable from the Enterprise.

Covenant 1. Discharge Claims. The Purchaser covenants that in order fully to preserve and protect the priority and security of the Installment Payments, the Purchaser shall pay from the Water Revenue Fund and discharge all lawful claims for labor, materials and supplies furnished for or in connection with the Enterprise which, if unpaid, may become a lien or

charge upon Gross Revenues of the Enterprise prior or superior to the lien of the Installment Payments and impair the security of the Installment Payments. The Purchaser shall also pay from the Water Revenue Fund all taxes and assessments or other governmental charges lawfully levied or assessed upon or in respect of the Enterprise or upon any part thereof or upon any of the Gross Revenues therefrom.

Covenant 2. Operate Works in Efficient and Economical Manner. The Purchaser covenants and agrees to operate the Enterprise in an efficient and economical manner and to operate, maintain and preserve the Enterprise in good repair and working order.

Covenant 3. Against Sale, Eminent Domain. The Purchaser covenants that the Enterprise shall not be mortgaged or otherwise encumbered, sold, leased, pledged, any charge placed thereon, or disposed of as a whole or substantially as a whole unless such sale or other disposition be so arranged as to provide for a continuance of payments into the Water Revenue Fund sufficient in amount to permit payment therefrom of the Installment Payments, payment of which is required to be made out of the Gross Revenues of the Enterprise. Provided that there is such continuance of payments into the Water Revenue Fund, the sale of a portion of the Enterprise to another Purchaser shall be permitted.The Gross Revenues of the Enterprise shall not be mortgaged, encumbered, sold, leased, pledged, any charge placed thereon, or disposed of or used except as authorized by the terms of this Agreement. The Purchaser further covenants that it will not enter any agreement which impairs the operation of the Enterprise or any part of it necessary to secure adequate revenues to pay the Installment Payments or which otherwise would impair the rights of the Purchaser with respect to the revenues or the operation of the Enterprise. If any substantial part of the Enterprise is sold, the payment therefor shall either be used for the acquisition and/or construction of improvements and extensions of the Enterprise or shall be placed in the appropriate funds and shall be used to pay the Installment Payments in the manner provided in this Agreement.

The Purchaser covenants that any amounts received as awards as a result of the taking of all or any part of the Enterprise by the lawful exercise of eminent domain, if any, either shall be used for the acquisition and/or construction of the improvements and extension of the Enterprise or shall be placed in the appropriate funds and shall be used to pay the Installment Payments in the manner provided in this Agreement.

Covenant 4. Insurance. The Purchaser covenants that it shall at all times maintain with responsible insurers all such insurance on the Enterprise as is customarily maintained with



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respect to facilities and properties of like character against accident to, loss of or damage to such Enterprise or properties. If any useful part of the Enterprise shall be damaged or destroyed, such part shall be restored to use. The money collected from insurance against accident to or destruction of the physical Enterprise shall be used for repairing or rebuilding the damaged or destroyed Enterprise, and to the extent not so applied, shall be applied to the prepayment of the Installment Payments.

The Purchaser shall also maintain with responsible insurers workmen's compensation insurance and insurance against public liability and property damage to the extent reasonably necessary to protect the Purchaser and the Gross Revenues.

The Purchaser mayy be self-insured up to $500,000 for any single event.

Covenant 5. Records and Accounts. The Purchaser covenants that it shall keep proper books of record and accounts of the Enterprise, separate from all other records and accounts, in which complete and correct entries shall be made of all transactions relating to the Enterprise. Said books shall at all reasonable times be subject to the inspection of the Seller or its assigns, and the Letter of Credit Bank.

Covenant 6. No Free Service. The Purchaser covenants that, except to the extent that the Purchaser is required under agreements and/or contracts existing on the effective date of this Agreement, no water or other service from the Enterprise may be furnished or rendered to the United States of America, the State of California, or any private corporation or person free of charge, and that, except to the extent that the Purchaser is required under agreements and/or contracts existing on the effective date of this Agreement, no such service shall be rendered to the United States of America, the State of California, or any private corporation or person at rates or for consideration lower than those charged other persons for similar service. The Purchaser covenants that it shall at all times during the period any of the Certificates are Outstanding maintain and enforce valid regulations for the payment of bills for water service and that such regulations shall at all times during such period provide that the Purchaser shall discontinue water service to any user whose water bill has not been paid within the time fixed by said regulations, which shall not be more than two months from the date the water bill became delinquent.

Covenant 7. Rates and Charges. The Purchaser shall and hereby covenants that it shall prescribe, revise and collect such rates and charges for the services and facilities of the

Enterprise which, after making allowances for contingencies and error in the estimates, shall in each Fiscal Year be at least sufficient, when added to funds on hand, to pay the following amounts in the order set forth:

(a) The Installment Payments and any parity obligations as they become due and payable;

(b) All current expenses for the Maintenance and Operation Cost of the Enterprise.

(c) All payments required to meet any other obligations of the Purchaser which are charges, liens, encumbrances upon or payable from the principal and interest on the Purchaser's 1976 Water Revenue Bonds, Gross Revenues of the Enterprise, including the, Trustee's fees, unreimbursed draws on the Letter of Credit, Letter of Credit Bank fees and Tender Interest;

and the charges shall be so fixed that the Gross Revenues of the Enterprise shall be at least 1.25 times the amounts payable under (a), assuming an interest rate on the Certificates of 8% per; and shall be 1.00 times the amounts payable under each of (b) and (c), if within six months after any increase in the interest rate on the Certificates above 8% per annum, the Purchaser shall increase its rates and charges to a level sufficient to maintain the foregoing coverage.

Covenant 8. No Priority for Additional Obligations. The Purchaser covenants that no additional bonds, notes or obligations shall be issued pursuant to any law of the State of California having any priority in payment of principal or interest out of the Gross Revenues of the Enterprise over the Installment Payments to be payable out of said revenues.

Covenant 9. Limits on Additional Debt. The Purchaser covenants that, except for obligations issued to refund the Certificates, no additional indebtedness evidenced by revenue bonds, revenue notes or any other evidences of indebtedness payable out of the Water Revenue Fund and ranking on a parity with the obligation to make the Installment Payments shall be created or incurred unless:

First: The Purchaser is not in default under the terms of this Agreement; and

Second: The Net Revenues of the Enterprise, calculated on sound accounting principles, as shown by the books of the Purchaser for the latest fiscal year or the last completed 12 month period ended at least 60 days prior to the adoption of the resolution of issuance for such

additional indebtedness as shown by an audit certificate or opinion of an independent certified public accountant or firm of certified public accountants employed by the Purchaser, plus, at the option of the Purchaser, any or all of the items hereinafter in this covenant designated (a) and (b), shall have amounted to at least 1.25 times the Installment Payments due and any additional debt due in the next fiscal year immediately subsequent to the incurring of such additional indebtedness.

The items any or all of which may be added to such Net Revenues of the Enterprise for the purpose of applying the restriction contained in this covenant are the following:

(a) An allowance for Net Revenues of the Enterprise from any additions to or improvements or extensions of the Enterprise to be made with the proceeds of such additional indebtedness, and also for net revenues of the Enterprise from any such additions, improvements or extensions which have been made from moneys from any source but which, during all or any part of such fiscal year or last completed 12-month period, were not in service, all in an amount equal to 75% of the estimated additional average annual net revenues of the Enterprise to be derived from such additions, improvements and extensions for the first 36-month period in which each addition, improvement or extension, respectively, is expected to be in operation, all as shown by the certificate or opinion of a qualified independent engineer employed by the Purchaser.

(b) An allowance for earnings arising from any increase in the charges made for service from the Enterprise which has become effective prior to the incurring of such additional indebtedness but which, during all or any part of such fiscal year or last completed 12-month period, was not in effect, in an amount equal to 75% of the amount by which the net revenues of the Enterprise would have been increased if such increase in charges had been in effect during the whole of such fiscal year or last completed 12-month period, as shown by the certificate or opinion of a qualified independent engineer employed by the Purchaser.

Nothing herein shall preclude the Purchaser from issuing obligations subordinate to the payment of the Installment Payments.

Covenant 10. Against Competing Utility. The Purchaser will not acquire, construct, operate or maintain, and will not, within the scope of its powers, permit any other private or public corporation, political subdivision, district or agency,



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or any person whomsoever to acquire, construct, operate or maintain within the Purchaser's boundaries or any part thereof, any system or utility in competition with the Enterprise.

Covenant 11. Financial Reports. Within one hundred and eighty (180) days after the close of each fiscal year of Purchaser, Purchaser will furnish, or cause to be furnished, to Seller or its assignee and to the Letter of Credit Bank detailed certified reports of audit, based on an examination sufficiently complete, prepared by an independent certified public accountant, covering the operations of Purchaser's Water Revenue Fund and the Enterprise for said fiscal year. Such audit report shall include statements of the status of each account pertaining to the Enterprise, showing the amount and source of deposits therein, the amount and purpose of the withdrawals therefrom and the balance therein at the beginning and end of said fiscal year.

Covenant 12. Purchase of Additional Capacity. In the event of default by another defaulting Purchaser and the capacity of that defaulting Purchaser has not been acquired by another Purchaser or entity, the Purchaser agrees to purchase a portion of said defaulting Purchaser's capacity on the following conditions:

1. The purchase price for said capacity shall be not less than the payment of the balance of the Installment Payments of the defaulting Purchaser attributable to the capacity being acquired.

2. The aggregate amount of the defaulting Purchaser's capacity acquired does not exceed 25% of the original capacity of the acquiring Purchaser in the Project.

Covenant 13. Purchase of Water. Should an event of default occur hereunder the Purchaser convenants that it will obtain and pay for water from the Authority up to the amount of its originally purchased capacity interest in the Project before it will obtain, purchase, rent, lease or otherwise acquire water, or an interest in water, from any public or private source other than the Authority.

503. Prior Lien Water Revenue Bonds. The payment of the Installment Payments and all covenants and provisions of this Agreement are subject to the prior first lien on the Gross Revenues of the Enterprise created by Resolution No. __ of the Purchaser providing for the issuance of Purchaser's 1976 Water Revenue Bonds and further subject to the rights and obligations of the Purchaser set forth in said Resolution.



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## ARTICLE VI

## EVENTS OF DEFAULT AND REMEDIES

601. Events of Default Defined. The following shall be "events of default" under this Agreement and the terms "events of default" and "default" shall mean, whenever they are used in this Agreement, with respect to the Purchaser, any one or more of the following events, namely:

(a) Failure by Purchaser to pay any Installment Payment or other payment required to be paid hereunder at the time specified herein;

(b) Failure by Purchaser to observe and perform any covenant, condition or agreement on its part to be observed or performed, other than as referred to in clause (a) of this Section, for a period of thirty (30) days after written notice specifying such failure and requesting that it be remedied has been given to Purchaser by Seller or its assignee; provided, however, that Seller or its assignee may, upon written request of Purchaser prior to the expiration of such thirty (30) day period, consent to an extension of such time in order to cure such failure if corrective action has been instituted by Purchaser and is being diligently pursued and will, in the judgment of Seller or its assignee, be diligently pursued until the default is corrected;

(c) A court having jurisdiction in the Project shall enter a decree or order for relief in respect of Purchaser in an involuntary case under any applicable bankruptcy, insolvency or other similar law now or hereafter in effect, or appointing a receiver, liquidator, assignee, custodian, trustee, sequestrator (or similar official) of Purchaser or for any substantial part of its property, or ordering the winding up or liquidation of its affairs, and such decree or order shall remain unstayed and in effect for a period of sixty (60) days;

(d) Purchaser shall commence a voluntary case under any applicable bankruptcy, insolvency or other similar law now or hereafter in effect, or shall consent to the entry of an order for relief in an involuntary case under any such law, or shall consent to the appointment of or taking possession by a receiver, liquidator, assignee, trustee, custodian, sequestrator (or similar official) of Purchaser for any substantial part of its property, or shall make any general assignment for the benefit of creditors, or shall fail generally to pay its debts as they become due or shall take any corporate action in furtherance of any of the foregoing; or

The Seller shall give written notice of a default by the Purchaser to the Trustee and the Letters of Credit Bank. The Letter of Credit Bank shall have the right to cure any default undfer (a) and (b) hereof within thirty (30) days of receipt of such written notice.

602. Remedies on Default. Upon the happening of any of the events of default specified in Section 601 hereof, which default has not been cured by the Letter of Credit Bank as provided in Section 601 hereof, Seller or its assignee may exercise any and all remedies available pursuant to law or granted pursuant to this Agreement. Seller or its assignee is expressly authorized hereby to take over for the benefit of Seller or its assigns the Purchaser's interest in the Project described in Exhibit A of the Trust Agreement, and, in addition, at its option, to terminate this Agreement. In the event of default and notwithstanding the take-over of the Purchaser's interest in the Project by Seller or its assignee, Purchaser shall, as herein expressly provided, continue to remain liable for the payment of Installment Payments and/or damages for breach of this Agreement and the performance of all conditions herein contained and, in any event, such Installment Payments and/or damages shall be payable to Seller or its assignee at the time and in the manner set forth in subsections (a) and (b) of this Section.

(a) In the event that Seller or its assignee does not elect to terminate this Agreement pursuant to subparagraph (b) below, Purchaser agrees to and shall remain liable for the payment of Installment Payments and the performance of all conditions herein contained and shall reimburse Seller or its assignee for any deficiency arising out of the sale or leasing of the Purchaser's interest in the Project, or, in the event that Seller or its assignee is unable to sell or lease the Purchaser's interest in the Project, then for the full amount of the Installment Payments to the end of the term of this Agreement, but said Installment Payments and/or deficiency shall be payable only at the same time and in the same manner as provided in Section 305, notwithstanding such take-over of the Purchaser's capacity in the Project by Seller or its assignee or any suit in unlawful detainer, or otherwise, brought by Seller or its assignee for the purpose of effecting such take-over of the Purchaser's capacity in the Project or the exercise of any other remedy by the Seller or its assignee. Purchaser hereby irrevocably appoints Seller or its assignee as the agent and attorney-in-fact of the Purchaser to sell or lease the Purchaser's capacity in the Project in the event of default by Purchaser. Purchaser hereby exempts and agrees to save harmless Seller and its assignee from any cost, loss or damage whatsoever arising or occasioned by any such entry upon and the sale or the letting of the Purchaser's

capacity in the Project. Purchaser hereby waives any and all claims for damages caused, or which may be caused, by Seller or its assignee in entering and taking possession of the Purchaser's capacity in the Project, for all claims for damages that may result from the destruction of or injury to the Project, and all claims for damges to or loss of any property belonging to Purchaser that may be in or upon the Project. Purchaser agrees that the terms of this Agreement constitute full and sufficient notice of the right of Seller or its assignee to sell or lease the Purchaser's capacity in the Project in the event of such taking of possession without effecting a surrender of this Agreement, and further agrees that no acts of Seller or its assignee in effecting such sale or leasing shall constitute a surrender or termination of this Agreement irrespective of the term for which such sale or leasing is made, or of the terms and conditions of such sale or leasing, or otherwise, but that, on the contrary, in the event of such default by Purchaser, the right to terminate this Agreement shall vest in Seller or its assignee to be effected in the sole and exclusive manner hereinafter provided for in subsection (b) below. Purchaser shall have the right to any sale proceeds or rental obtained by Seller or its assignee in excess of the full amount of the Installment Payments herein specified.

(b) In the event of default by Purchaser and consequent termination of this Agreement at the option of Seller or its assignee in the manner hereinafter provided (and notwithstanding the taking of possession of the Purchaser's capacity in the Project by Seller or its assignee in any manner whatsoever or the sale or leasing of the Project), Purchaser nevertheless agrees to pay to Seller or its assignee all cost, loss or damages howsoever arising or occurring payable at the same time and in the same manner as in the case of payment of Installment Payments pursuant to Section 305 of the Trust Agreement. Neither notice to pay the Installment Payments or to deliver up possession of the Project given pursuant to law nor any proceeding in unlawful detainer taken by Seller or its assignee shall of itself operate to terminate this Agreement, and no termination of this Agreement on account of default by Purchaser shall be or become effective by operation of law, or otherwise, unless and until Seller or its assignee shall have given written notice to the Purchaser of the election on the part of Purchaser or its assignee to terminate this Agreement.

Each and all of the remedies given to Seller and its assignee hereunder or by any law now or hereafter enacted are cumulative and the exercise of one right or remedy shall not impair the right to Seller or its assignee to exercise any or all other remedies.

Notwithstanding the foregoing, no action shall be taken by the Seller or its assignee under this Section without the prior written consent of the Letter of Credit Bank.

603. Suits at Law or in Equity and Mandamus. In addition to the remedies set forth in Section 602 of the Trust Agreement, in case one or more of the events of default shall happen, then and in every such case, Seller and its assignee shall be entitled to proceed to protect and enforce the rights vested in the Seller by this Agreement by such appropriate judicial proceeding as Seller or its assignee shall deem most effectual to protect and enforce any such right, either by suit in equity or by action at law, whether for the specific performance of any covenant or agreement contained in this Agreement or by law. The provisions of this Agreement and the duties of Purchaser and of the officers, agents and employees thereof shall be enforceable by Seller or its assignee by mandamus or other appropriate suit, action or proceeding in any court of competent jurisdiction.

(a) Without limiting the generality of the foregoing, Seller and its assignee shall have the right:

(i) Accounting. By action or suit in equity to require the Purchaser and its officers, agents and employees to provide an accounting as the trustee of an express trust.

(ii) Injunction. By action or suit in equity to enjoin any acts or things which may be unlawful or in violation of the rights of Seller or its assignee.

(iii) Mandamus. By mandamus or other suit, action or proceeding at law or equity to enforce its or their rights against Purchaser and its and any of its officers, agents, and employees, and to compel it or them to perform and carry out its and their duties and obligations under the law and its and their covenants and agreements with Purchaser as provided herein.

604. Non-Waiver. Nothing in this Article VI or in any other provision of this Agreement shall affect or impair the obligation of Purchaser, which is to pay the Installment Payments, as herein provided. No delay or omission of Seller or its assignee to exercise any right or power arising upon the happening of any event of default shall impair any such right or power or shall be construed to be a waiver of any such event of default or any acquiescence therein, and every power and remedy given by this Article VI to Seller and its assignee may be exercised from time to time and as often as shall be deemed expedient by Seller or its assignee.

605. Remedies Not Exclusive. No remedy herein or by law conferred upon or reserved to Seller or its assignee is intended to be exclusive of any other remedy, but each such remedy is cumulative and in addition to every other remedy, and every remedy given hereunder or now or hereafter existing, at law or in equity or by statute or otherwise may be exercised without exhausting and without regard to any other remedy conferred or by any law.

606. Status Quo. In case any suit, action or proceeding to enforce any right or exercise any remedy shall be brought or taken and then discontinued or abandoned, or shall be determined adversely to Seller and its assignee, then, and in every such case, Seller and its assignee shall be restored to its former position and rights and remedies as if no such suit, action or proceedings had been brought or taken.

## ARTICLE VII

## ADMINISTRATIVE PROVISIONS

701. Preservation and Inspection of Documents. All documents received by Seller or its assignee or Purchaser under the provisions of this Agreement shall be retained in their respective possessions and shall be subject at all reasonable times to the inspection of the other party hereto and its assigns, agents and representatives, any of whom may make copies thereof.

702. Parties in Interest. Nothing in this Agreement, expressed or implied, is intended to or shall be construed to confer upon or to give to any person or party other than Seller, its assignee the Letter of Credit Bank and Purchaser any rights, remedies or claims under or by reason of this Agreement or any covenants, condition or stipulation of the Trust Agreement; and all covenants, stipulations, promises and agreements in this Agreement made by or on behalf of Seller or Purchaser shall be for the sole and exclusive benefit of Seller and its assignee, the Trustee and the Letter of Credit Bank and Purchaser.

703. No Recourse Under Agreement. All covenants, stipulations, promises, agreements and obligations of the parties hereto contained in this Agreement shall be deemed to be the covenants, stipulations, promises, agreements and obligations of the parties hereto, respectively, and not of any member, officer, employee or agent of the parties hereto in an individual capacity, and no recourse shall be had under this Agreement for the payment of the Installment Payments or for any claim based thereon or under this Agreement against any member, officer, employee or agent of the parties hereto.

704. Notices. All notices, certificates or other communications hereunder shall be sufficiently given and shall be deemed given when delivered or deposited in the United States mail in registered form with postage fully prepaid:

If to the Seller:

Water Facilities Authority
P. O. Box 71
Montclair, California 91763
Attn: General Manager

If to the Trustee:

Bank of America National Trust and
Savings Association
555 South Flower, Fifth Floor
Los Angeles, California
Attn: Security Services Division-Trust (213) 228-4146

If to the Letter of Credit Bank:

The Mitsubishi Bank, Ltd., Los Angeles Agency
800 Wilshire Boulevard
Los Angeles, California 90017
Attn: Letter of Credit Department

If to the Remarketing Agent:

Merrill Lynch, Pierce, Fenner
& Smith, Incorporated
Tax-Exempt Money Markets
Department 43rd Floor
One Liberty Plaza 165 Broadway
New York, New York 10080 (212) 637-8862

If to the Paying Agent:

BankAmerica Trust Company of New York
Corporate Trust Department
40 Broad Street 4th Floor
New York, New York 10064 (212) 248-6992

If to Chino:

City of Chino
13220 Central Avenue
Chino, California 91710
Attn: City Manager (714) 627-7577

If to Ontario:

City of Ontario
303 East B Street
Ontario, California 91764
Attn: City Manager (714) 986-1151

If to Upland:

City of Upland
460 N. Euclid Avenue
Upland, California 91786
Attn: City Manager (714) 982-1352

If to County:

San Bernardino County Waterworks
District No. 8
13260 Central Avenue
Chino, California 91710
Attn: Chino Valley Manager (714) 627-7575

If to Monte Vista:

Monte Vista Water District
10575 Central Avenue
Montclair, California 91763
Attn: General Manager (714) 624-0035

The parties hereto, by notice given hereunder, may, respectively designate different addresses to which subsequent notices, certificates or other communications will be sent.

705. Binding Effect. This Agreement shall inure to the benefit of and shall be binding upon Seller and Purchaser and their respective successors and assigns.

706. Severability. If any one or more of the covenants, stipulations, promises, agreements or obligations provided in this Agreement on the part of Seller or Purchaser to be performed should be determined by a court of competent jurisdiction to be contrary to law, then such covenant, stipulation, promise, agreement or obligation shall be deemed and construed to be severable from the remaining covenants, stipulations, promises, agreements and obligations herein contained and shall in no way affect the validity of the other provisions of this Agreement.

707. Headings. Any headings preceding the text of the several Articles and Sections of the Trust Agreement, and any table of contents or marginal notes appended to copies of the



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Trust Agreement, shall be solely for convenience or reference and shall not constitute a part of this Agreement, nor shall they affect its meaning, construction or effect.

708. Applicable Law. This Agreement shall be governed by and construed in accordance with the laws of the State of California.

709. Seller and Purchaser Representatives. Whenever under the provisions of this Agreement the approval of Seller or its assignee or Purchaser is required, or Seller or its assignee or Purchaser are required to take some action at the request of the other, such approval of such request may be given for Seller by an Authorized Representative of Seller, for assignees of Seller by an authorized representative thereof, and for Purchaser by an Authorized Representative of City, and any party hereto shall be authorized to rely upon any such approval or request.

710. Form of Certificate of Officers. Every certificate with respect to compliance with a condition or covenant provided for in this Agreement and which is precedent to the taking of any action under this Agreement shall include:

(a) A statement that the person making or giving such certificate has read such covenant or condition and the definitions herein relating thereto;

(b) A brief statement as to the nature and scope of the examination or investigation upon which the statements or opinions contained in such certificate are based;

(c) A statement that, in the opinion of the signer, he has made or caused to be made such examination or investigation as is necessary to enable him to express an informed opinion as to whether or not such covenant or condition has been complied with; and

(d) A statement as to whether, in the opinion of the signer, such condition or covenant has been complied with.

A certificate may be based, insofar as its relates to legal matters, upon a certificate or opinion of or representations by counsel, unless the persons provided the certificate know that the certificate or representations with respect to the matters upon which the certificate may be based are erroneous, or in the exercise of reasonable care should have known that the same were erroneous.

711. Counterpart. This Installment Agreement may be executed in counterpart.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed in their respective names by their duly authorized officers as of the date first above written.

WATER FACILITIES AUTHORITY, as Seller

By: _____
Chairman

By: _____
Secretary

CITY OF ONTARIO, as Purchaser

By: Faye Myers / Dastrup
Mayor pro Tem

ATTEST:

_____
City Clerk

EXHIBIT A

| COMPONENT | UPLAND | MVWD | ONTARIO | CHINO | SBC#8 |
|---|---|---|---|---|---|
| Treatment Plant | 29.4118 | 14.7059 | 29.4118 | 11.7647 | 14.7059 |
| Pipeline to 8th Street | .0000 | 23.8095 | 47.6190 | 28.5714 | .0000 |
| Pipeline to 8th Street | .0000 | .0000 | 100.0000 | .0000 | .0000 |
| Pipeline to 8th Street | .0000 | .0000 | .0000 | 100.0000 | .0000 |
| Connections | 20.0000 | 20.0000 | 40.0000 | 20.0000 | .0000 |
| Energy R. S. Ontario | .0000 | .0000 | 100.0000 | .0000 | .0000 |
| Energy R.S. Chino | .0000 | .0000 | .0000 | 100.0000 | .0000 |
| Energy R.S. Ontario, Chino | .0000 | .0000 | 55.5555 | 44.4445 | .0000 |

Gulanto #4

# EXHIBIT B

## Installment Payments

| Payment Date | Principal Component | Interest* Component | Total Payment |
|---|---|---|---|
| 15-Dec-85 | $0.00 | $265,800.33 | $265,800.33 |
| 01-Apr-86 | 0.00 | 265,800.33 | 265,800.33 |
| 01-Jul-86 | 0.00 | 265,800.33 | 265,800.33 |
| 01-Oct-86 | 0.00 | 265,800.33 | 265,800.33 |
| 01-Jan-87 | 0.00 | 265,800.33 | 265,800.33 |
| 01-Apr-87 | 0.00 | 265,800.33 | 265,800.33 |
| 01-Jul-87 | 0.00 | 265,800.33 | 265,800.33 |
| 01-Oct-87 | 9,574.94 | 265,800.33 | 275,375.27 |
| 01-Jan-88 | 9,574.94 | 265,800.33 | 275,375.27 |
| 01-Apr-88 | 9,574.94 | 265,800.33 | 275,375.27 |
| 01-Jul-88 | 9,574.94 | 265,800.33 | 275,375.27 |
| 01-Oct-88 | 9,574.94 | 265,034.34 | 274,609.28 |
| 01-Jan-89 | 9,574.94 | 265,034.34 | 274,609.28 |
| 01-Apr-89 | 9,574.94 | 265,034.34 | 274,609.28 |
| 01-Jul-89 | 9,574.94 | 265,034.34 | 274,609.28 |
| 01-Oct-89 | 19,149.88 | 264,268.34 | 283,418.22 |
| 01-Jan-90 | 19,149.88 | 264,268.34 | 283,418.22 |
| 01-Apr-90 | 19,149.88 | 264,268.34 | 283,418.22 |
| 01-Jul-90 | 19,149.88 | 264,268.34 | 283,418.22 |
| 01-Oct-90 | 19,149.88 | 262,736.35 | 281,886.23 |
| 01-Jan-91 | 19,149.88 | 262,736.35 | 281,886.23 |
| 01-Apr-91 | 19,149.88 | 262,736.35 | 281,886.23 |
| 01-Jul-91 | 19,149.88 | 262,736.35 | 281,886.23 |
| 01-Oct-91 | 19,149.88 | 261,204.36 | 280,354.24 |
| 01-Jan-92 | 19,149.88 | 261,204.36 | 280,354.24 |
| 01-Apr-92 | 19,149.88 | 261,204.36 | 280,354.24 |
| 01-Jul-92 | 19,149.88 | 261,204.36 | 280,354.24 |
| 01-Oct-92 | 19,149.88 | 259,672.37 | 278,822.25 |
| 01-Jan-93 | 19,149.88 | 259,672.37 | 278,822.25 |
| 01-Apr-93 | 19,149.88 | 259,672.37 | 278,822.25 |
| 01-Jul-93 | 19,149.88 | 259,672.37 | 278,822.25 |
| 01-Oct-93 | 28,724.82 | 258,140.38 | 286,865.20 |
| 01-Jan-94 | 28,724.82 | 258,140.38 | 286,865.20 |
| 01-Apr-94 | 28,724.82 | 258,140.38 | 286,865.20 |
| 01-Jul-94 | 28,724.82 | 258,140.38 | 286,865.20 |
| 01-Oct-94 | 28,724.82 | 255,842.40 | 284,567.22 |
| 01-Jan-95 | 28,724.82 | 255,842.40 | 284,567.22 |
| 01-Apr-95 | 28,724.82 | 255,842.40 | 284,567.22 |
| 01-Jul-95 | 28,724.82 | 255,842.40 | 284,567.22 |
| 01-Oct-95 | 38,299.76 | 253,544.41 | 291,844.17 |
| 01-Jan-96 | 38,299.76 | 253,544.41 | 291,844.17 |
| 01-Apr-96 | 38,299.76 | 253,544.41 | 291,844.17 |
| 01-Jul-96 | 38,299.76 | 253,544.41 | 291,844.17 |

Outlaw #2

| | | | |
|---|---|---|---|
| 01-Oct-96 | 38,299.76 | 250,480.43 | 288,780.19 |
| 01-Jan-97 | 38,299.76 | 250,480.43 | 288,780.19 |
| 01-Apr-97 | 38,299.76 | 250,480.43 | 288,780.19 |
| 01-Jul-97 | 38,299.76 | 250,480.43 | 288,780.19 |
| 01-Oct-97 | 47,874.70 | 247,416.45 | 295,291.15 |
| 01-Jan-98 | 47,874.70 | 247,416.45 | 295,291.15 |
| 01-Apr-98 | 47,874.70 | 247,416.45 | 295,291.15 |
| 01-Jul-98 | 47,874.70 | 247,416.45 | 295,291.15 |
| 01-Oct-98 | 47,874.70 | 243,586.47 | 291,461.17 |
| 01-Jan-99 | 47,874.70 | 243,586.47 | 291,461.17 |
| 01-Apr-99 | 47,874.70 | 243,586.47 | 291,461.17 |
| 01-Jul-99 | 47,874.70 | 243,586.47 | 291,461.17 |
| 01-Oct-99 | 57,449.64 | 239,756.50 | 297,206.14 |
| 01-Jan-2000 | 57,449.64 | 239,756.50 | 297,206.14 |
| 01-Apr-2000 | 57,449.64 | 239,756.50 | 297,206.14 |
| 01-Jul-2000 | 57,449.64 | 239,756.50 | 297,206.14 |
| 01-Oct-2000 | 67,024.58 | 235,160.53 | 302,185.11 |
| 01-Jan-2001 | 67,024.58 | 235,160.53 | 302,185.11 |
| 01-Apr-2001 | 67,024.58 | 235,160.53 | 302,185.11 |
| 01-Jul-2001 | 67,024.58 | 235,160.53 | 302,185.11 |
| 01-Oct-2001 | 76,599.52 | 229,798.56 | 306,398.08 |
| 01-Jan-2002 | 76,599.52 | 229,798.56 | 306,398.08 |
| 01-Apr-2002 | 76,599.52 | 229,798.56 | 306,398.08 |
| 01-Jul-2002 | 76,599.52 | 229,798.56 | 306,398.08 |
| 01-Oct-2002 | 86,174.46 | 223,670.60 | 309,845.06 |
| 01-Jan-2003 | 86,174.46 | 223,670.60 | 309,845.06 |
| 01-Apr-2003 | 86,174.46 | 223,670.60 | 309,845.06 |
| 01-Jul-2003 | 86,174.46 | 223,670.60 | 309,845.06 |
| 01-Oct-2003 | 95,749.40 | 216,776.64 | 312,526.04 |
| 01-Jan-2004 | 95,749.40 | 216,776.64 | 312,526.04 |
| 01-Apr-2004 | 95,749.40 | 216,776.64 | 312,526.04 |
| 01-Jul-2004 | 95,749.40 | 216,776.64 | 312,526.04 |
| 01-Oct-2004 | 114,899.28 | 209,116.69 | 324,015.97 |
| 01-Jan-2005 | 114,899.28 | 209,116.69 | 324,015.97 |
| 01-Apr-2005 | 114,899.28 | 209,116.69 | 324,015.97 |
| 01-Jul-2005 | 114,899.28 | 209,116.69 | 324,015.97 |
| 01-Oct-2005 | 124,474.22 | 199,924.75 | 324,398.97 |
| 01-Jan-2006 | 124,474.22 | 199,924.75 | 324,398.97 |
| 01-Apr-2006 | 124,474.22 | 199,924.75 | 324,398.97 |
| 01-Jul-2006 | 124,474.22 | 199,924.75 | 324,398.97 |
| 01-Oct-2006 | 143,624.10 | 189,966.81 | 333,590.91 |
| 01-Jan-2007 | 143,624.10 | 189,966.81 | 333,590.91 |
| 01-Apr-2007 | 143,624.10 | 189,966.81 | 333,590.91 |
| 01-Jul-2007 | 143,624.10 | 189,966.81 | 333,590.91 |
| 01-Oct-2007 | 172,348.92 | 178,476.88 | 350,825.80 |
| 01-Jan-2008 | 172,348.92 | 178,476.88 | 350,825.80 |
| 01-Apr-2008 | 172,348.92 | 178,476.88 | 350,825.80 |
| 01-Jul-2008 | 172,348.92 | 178,476.88 | 350,825.80 |
| 01-Oct-2008 | 191,498.80 | 164,688.97 | 356,187.77 |
| 01-Jan-2009 | 191,498.80 | 164,688.97 | 356,187.77 |

Outento #3

| | | | |
|---|---|---|---|
| 01-Apr-2009 | 191,498.80 | 164,688.97 | 356,187.77 |
| 01-Jul-2009 | 191,498.80 | 164,688.97 | 356,187.77 |
| 01-Oct-2009 | 220,223.62 | 149,369.06 | 369,592.68 |
| 01-Jan-2010 | 220,223.62 | 149,369.06 | 369,592.68 |
| 01-Apr-2010 | 220,223.62 | 149,369.06 | 369,592.68 |
| 01-Jul-2010 | 220,223.62 | 149,369.06 | 369,592.68 |
| 01-Oct-2010 | 248,948.44 | 131,751.17 | 380,699.61 |
| 01-Jan-2011 | 248,948.44 | 131,751.17 | 380,699.61 |
| 01-Apr-2011 | 248,948.44 | 131,751.17 | 380,699.61 |
| 01-Jul-2011 | 248,948.44 | 131,751.17 | 380,699.61 |
| 01-Oct-2011 | 287,248.20 | 111,835.30 | 399,083.50 |
| 01-Jan-2012 | 287,248.20 | 111,835.30 | 399,083.50 |
| 01-Apr-2012 | 287,248.20 | 111,835.30 | 399,083.50 |
| 01-Jul-2012 | 287,248.20 | 111,835.30 | 399,083.50 |
| 01-Oct-2012 | 325,547.96 | 88,855.44 | 414,403.40 |
| 01-Jan-2013 | 325,547.96 | 88,855.44 | 414,403.40 |
| 01-Apr-2013 | 325,547.96 | 88,855.44 | 414,403.40 |
| 01-Jul-2013 | 325,547.96 | 88,855.44 | 414,403.40 |
| 01-Oct-2013 | 363,847.72 | 62,811.61 | 426,659.33 |
| 01-Jan-2014 | 363,847.72 | 62,811.61 | 426,659.33 |
| 01-Apr-2014 | 363,847.72 | 62,811.61 | 426,659.33 |
| 01-Jul-2014 | 363,847.72 | 62,811.61 | 426,659.33 |
| 01-Oct-2014 | 421,297.36 | 33,703.79 | 455,001.15 |
| 01-Jan-2015 | 421,297.36 | 33,703.79 | 455,001.15 |
| 01-Apr-2015 | 421,297.36 | 33,703.79 | 455,001.15 |
| 01-Jul-2015 | 421,297.36 | 33,703.79 | 455,001.15 |

* During the period that Certificates bear interest at an Adjusted Interest Rate, the Interest Component shall be computed at 8.0%, or at the highest Adjusted Interest Rate during the preceding three (3) months period, whichever is higher. Following conversion to a Fixed Rate of Interest, the Interest Component shall be the Fixed Rate of Interest.

ORDINANCE NO. 99-07-02
ORDINANCE OF THE WATER FACILITIES AUTHORITY-JPA
REPEALING ORDINANCE 96-09-01

WHEREAS, the Agua de Lejos Treatment Plant has been in service since 1988;

WHEREAS, in order to maintain a state of plant readiness and reliability a scheduled approach to replacement of capital equipment is needed;

WHEREAS, a need to stabilize the fiscal impacts incurred by each Member Agency is needed;

NOW, THEREFORE, be it ordained by the Board of Directors of the Water Facilities Authority - Joint Powers Agency ("WFA") that:

1. This Ordinance establishes nine charges that will be made to each Member Agency. Charges to the Member Agencies for the WFA COPs will still be governed by the installment payment agreements. These charges are set forth below.

2. <u>Definitions.</u>

a. "Plant Capability": The total capability of the plant, based upon the current physical limits of the treatment plant, the ability to produce water that meets all drinking water standards, and any other reason that may justify operating the treatment plant at more or less than design capacity.

b. "Design Capacity": The capacity of the Agua de Lejos Treatment Plant is 77 mgd.

c. "Member Agency": The agencies that are signatories to the WFA Joint Powers Agreement.

d. "IEUA": Inland Empire Utility Agency (formerly Chino Basin Municipal Water District).

e. "Capital Replacement Plan": The plan and time schedule for replacement of plant equipment as adopted by the Board of Directors.

f. "Capital Improvement Project": Projects that substantially increase the capability or value of the treatment plant and are not capital replacement projects.

g. "Capital Replacement Project": Projects and/or equipment that are identified in the Capital Replacement Plan.

h. "FY": The Fiscal Year of the WFA beginning July 1.

3. Payments for the Capital Investment Required for the Treatment Plant. The final cost of the treatment plant (land, Metropolitan Water District of Southern California ("MWD") connection, treatment plant, and treatment plant expansion) is to be allocated among the Member Agencies based on percent entitlement of the treatment plant. Payments on the Certificates of Participation ("COPs") will be made quarterly in advance. The percentage entitlement of design capacity of each Member Agency is:

| | |
|---|---|
| City of Upland | 23.0% of design capacity in mg |
| Monte Vista Water District | 24.0% of design capacity in mg |
| City of Ontario | 31.4% of design capacity in mg |
| City of Chino | 5.9% of design capacity in mg |
| City of Chino Hills | 15.7% of design capacity in mg |

4. Operations Issues.

a. If plant capability exceeds plant design capacity of 77 mgd, then each participating Member Agency's entitlement of plant capability is according to the

percentages described above for design capacity. Each Member Agency's share of the COPs is different from their capacity share of the treatment plant. The capacity share of the plant is determined by the cash contributions made by each Member Agency plus their share of the original COPs.

b. If a Member Agency does not request its full plant entitlement, the remaining water is "unsubscribed capacity". Any other Member Agency may utilize unsubscribed capacity upon request and approval by the Plant Manager. The Plant Manager may stop the use of unsubscribed capacity immediately if the unsubscribed capacity is needed to meet the percentage entitlement of another Member Agency.

c. If requests above percentage entitlement are received that exceed plant capability, each request will be reduced in proportion to the percent entitlement of each requesting Member Agency until the plant capability is no longer exceeded.

d. Any Member Agency utilizing unsubscribed capacity will pay the direct costs related to the delivery of the unsubscribed capacity water on an acre-foot basis. These costs include the cost of purchasing water (as defined in paragraph 9 below), the Direct Treatment and Delivery Costs (as described in paragraph 8 below), and the capital replacement fund charges associated with the increase in water deliveries.

5. Payments for the Capital Investment Required for Project Costs Not Related to the Treatment Plant. The final costs of the non-treatment plant components (e.g., pipelines, turnouts, energy recovery stations and feeders), when allocated among the Member Agencies in accordance with the percentage interests as referenced in WFA Resolution No. 97-05-01 or in any ordinance superseding that resolution, will produce a percentage of the total non-treatment plant costs for Member Agencies. Payments for these costs will be made quarterly in advance.

6. General and Administrative Costs for the Authority. This cost category include all items not directly related to the treatment of water. General and Administrative Costs include, but are not limited to, the cost of the manager, administrative assistant, and related training and benefit costs of these employees. Other specific costs to be included in this category are postage, advertising, dues and subscriptions, office supplies, telephone, legal, audit, data processing, accounting, janitorial services, heating/air conditioning, fire extinguisher service, insurance, building and ground maintenance, and any travel and training of administrative personnel. These costs shall be allocated based upon percent entitlement of the treatment plant of each Member Agency. General and administrative costs will be estimated at the beginning of each fiscal year as part of the regular budget.

7. Direct Operations Costs to Maintain Plant Readiness. This cost category includes, but is not limited to those costs that maintain a state of plant readiness

with the ability to serve any Member Agency upon demand and would be incurred if the plant was serving zero "0" c.f.s. or mgd. These costs include but are not limited to, the plant operations supervisor and the instrumentation technicians, laboratory supplies, uniforms, outside laboratory services, tools, and maintenance equipment consistent with the financial limits in the WFA purchasing policy, plant equipment maintenance, and the training of the plant operations supervisor and instrumentation technicians. Direct Operations costs will be estimated at the beginning of each fiscal year as part of the regular budget. Billing for Direct Operations Costs will be based on the estimated quarterly water sales to each Member Agency. Adjustments in billings will be made quarterly based upon actual water sales.

8. Direct Treatment and Delivery Costs. All costs directly related to the quantities of water treated are to be included in this category. These costs include, but are not limited to, plant operators, power, chemicals, sludge removal and treatment, and filter media replacement. At the beginning of each fiscal year an estimate of these costs will be made. Monthly charges will be based on this estimate. The account of each Member Agency will be adjusted as necessary to reflect the actual water treatment and delivery related expenditures at the end of each fiscal year.

9. The Cost of Purchasing Raw Water for Treatment. Each Member Agency will be charged for purchasing untreated water. It is the responsibility of each

Member Agency to establish its right with IEUA (formerly CBMWD) to receive water at the basic untreated water rate.

10. Component Maintenance. Maintenance expenses that are not capital replacement costs covered in Fund No. 4 of non-treatment plant components as identified in Resolution No. 97-05-01, or in any ordinance or resolution superceding that resolution, shall be charged to the Member Agencies in proportion to their interest in the component.

11. Capital Replacement Costs.

Capital Replacement Funds. Payments for capital replacement projects shall be made based upon the four funds identified below. The four funds shall be established to facilitate payments for the replacement of equipment at the treatment plant and related facilities. The components in each fund are identified on the lists attached as Exhibit "A". No component shall be moved from one list to another without Board action. As a part of the annual budget, the Capital Replacement Plan shall be revised to reflect replacements that were completed and the anticipated needs for the next seven years. The intent of the funds is to provide an equitable means of component replacement. The money that has already been collected for Capital Replacement will be retained as reserves for capital replacement projects. No additional funds will be collected under the prior funding method. If the reserves in the account fall below $200,000,

agencies will be assessed an amount sufficient to bring the balance back up to $200,000 by the end of the FY. If the reserves are used for an unscheduled project, agencies will be assessed an amount sufficient to reach a $200,000 balance by the end of the following FY. The assessment will be based on the methodology for the list on which the component that was replaced is located. Descriptions of the funds are as follows:

A. Fund 1 - Components that Wear with Flow Rate

Beginning in FY 1999-2000 the payments to this fund will be based upon actual water deliveries on a 10 year running average beginning FY 1990-1991. The annual dollar amount shall be in accordance with the Capital Replacement Plan-List No. 1 Items for that FY.

B. Fund 2 – Components that Experience Wear as a Result of the Treatment of Water but not Correlated to Flowrate

Payments for components in this fund are based upon a two part formula. Half of the payment is based upon the percentage of water used by each Member Agency, using a ten-year running average (starting with FY 1990-91). The remaining half of the payment is based upon percentage entitlement. The payments to the fund will be corrected to actual on an

annual basis. The annual dollar amount will be in accordance with the Capital Replacement Plan-List No. 2 Items for that FY.

C. Fund 3 – Components that Experience Wear Totally Independent of Treatment of Water

Annual payments to this fund are based solely upon percent entitlement. The annual dollar amount will be in accordance with the Capital Replacement Plan-List No. 3 Items for that FY.

D. Fund 4 – Components at Each Member Agency's Distribution Pipeline and Turnout System

Annual payments to this fund are based upon the percentages identified in Ordinance 97-05-01 including any additional individual items identified on Capital Replacement Plan-List No. 4. The annual dollar amount will be in accordance with the Capital Replacement Plan-List No. 4 Items.

The Plant Manager shall have the authority to purchase and install replacement components utilizing the appropriate fund. The Capital Replacement Plan shall be used as a guideline to schedule the component replacement process. In accordance with the

WFA purchasing policy, items in excess of $10,000 shall be subject to Board approval except in emergencies.

12. Capital Improvement Costs. Projects that substantially increase the capability or value of the treatment plant shall be referred to as Capital Improvement Projects. Funding for these projects shall be based upon entitlement unless otherwise specified by the Board of Directors. Projects other than the treatment plant or the components identified in 97-05-01 (attached as Exhibit "B") shall be funded in accordance with the 1980 Joint Exercise of Powers Agreement, as amended.

13. Relationship to Other Agreements. To the extent this Ordinance conflicts with any earlier agreements relating to cost allocation, this Ordinance supersedes those agreements and is intended to be fully controlling.

14. Recission. Ordinance 96-09-01 is hereby rescinded.

**ADOPTED** this 15th day of July, 1999.

Chairman of the
Board of Directors
Water Facilities Authority -
Joint Powers Agency

ATTEST:

Patrick King, Secretary
of the Board of Directors
Water Facilities Authority -
Joint Powers Agency

**AMENDMENT NUMBER 1 TO LOCAL AGENCY AGREEMENT**

**By and Between**

**INLAND EMPIRE UTILITIES AGENCY**

**And**

**CITY OF ONTARIO**

THIS AGREEMENT entered into on the 16th day of December 2014, by and among the Inland Empire Utilities Agency ("IEUA"), a municipal water district duly organized and existing under the laws of the State of California, and the City of Ontario, ("Local Agency"), of Ontario, California, encompassing all the terms and conditions in the Local Agency Agreement, shall be amended as follows:

**REPLACE EXHIBIT G WITH THE ATTACHED REVISED EXHIBIT G.**

When a call is made by MWD, and the safety-net condition of 40,000 AFY of imported water deliveries applies, the Operating parties will make a reduction in the imported water deliveries, based on their pro-rata share of the imported water baseline.

**ALL OTHER PROVISIONS OF THIS AGREEMENT REMAIN UNCHANGED.**

IN WITNESS WHEREOF, the parties hereby have caused this Amendment to be entered into as of the day and year written below.

| INLAND EMPIRE UTILITIES AGENCY: | CITY OF ONTARIO: |
|---|---|
| P. Joseph Grindstaff<br>General Manager | Al C. Boling<br>City Manager |

**AMENDMENT NUMBER 1 TO LOCAL AGENCY AGREEMENT**

**By and Among**

**INLAND EMPIRE UTILITIES AGENCY, THE CITY OF ONTARIO**

**And**

**JURUPA COMMUNITY SERVICES DISTRICT**

THIS AGREEMENT entered into on the _____ day of September 2014, by and among the Inland Empire Utilities Agency ("IEUA"), a municipal water district duly organized and existing under the laws of the State of California, and the City of Ontario and Jurupa Community Services District, (the latter two collectively the "Local Agencies"), a General Law City and a Community Services District.

## RECITALS

A. Currently, JCSD does not have direct access to imported water and in order for JCSD to comply with the DYY Program, Ontario shall reduce imported water deliveries on behalf of JCSD, up to JCSD's obligation of 2,000 acre-feet, when MWD makes a "call."

B. JCSD is responsible for producing MWD water from storage and delivering to Ontario, up to JCSD's obligation of 2,000 AF when MWD makes a "call."

C. Ontario and JCSD may develop other operating plans for JCSD compliance with the DYY Program, that differ from above, by way of separate agreement.

**IN WITNESS WHEREOF**, IEUA and the Local Agencies hereby have caused this Amendment to be entered into as of the day and year written above and shall be amended as follows:

**REPLACE EXHIBIT G WITH THE ATTACHED REVISED EXHIBIT G.**

When a call is made by MWD, and the safety-net condition of 40,000 AFY of imported water deliveries applies, the Operating parties will make a reduction in the imported water deliveries, based on their pro-rata share of the imported water baseline.

**ALL OTHER PROVISIONS OF THIS AGREEMENT REMAIN UNCHANGED.**

**INLAND EMPIRE UTILITIES AGENCY:**

P. Joseph Grindstaff
General Manager

**CITY OF ONTARIO:**

Al C. Boling
City Manager

**JURUPA COMMUNITY SERVICES DISTRICT:**

Todd Corbin
General Manager

# Exhibit G

## Chino Basin Conjunctive Use Program (CUP) "Dry Year" Storage Project Performance Criteria

The intent of the below Performance Criteria is to allow Metropolitan to reduce imported water deliveries to the Operating Parties and replace it with stored Chino Basin groundwater, making available additional imported water supply for delivery to other Metropolitan member agencies.

### Performance

Metropolitan may, on thirty (30) days' notice, require Program Agency to meet the objectives of the project as follows:

1) During the next 12 month period, IEUA and TVMWD through their agreements with Operating Parties will cause a reduction of imported water deliveries by 33,000 AF (+/- 10 percent), at the service connection, from the Imported Water Baseline.
2) At no time shall a Metropolitan call result in a reduction in imported water deliveries below 40,000 AF. As long as the imported water deliveries by the Operating Parties total less than or equal to 40,000 AF, performance will have been met.
3) If a Metropolitan CUP call is made during implementation of Metropolitan's Water Supply Allocation Plan (WSAP), the amount of the CUP call shall be adjusted for the purposes of the WSAP performance, such that the 40,000 AF performance objective for CUP is met. The Operating Parties will still be expected to comply with all provisions of the WSAP. For purposes of the CUP, the full call amount (without adjustment for WSAP performance) would be deducted from the Storage Account and billed for by Metropolitan.
4) Metropolitan will pay O&M, Power and Treatment credits only on Chino groundwater production over the Chino Groundwater Baseline.
5) Metropolitan will bill for, and the Storage Account will be reduced by 33,000 AF.
6) If Performance Criteria is not met, the Penalty Rate will be applied on any unmet reduction of imported water delivery at the service connection.
7) A partial call will be addressed through a pro rata performance.
8) Any Chino Basin Groundwater produced above the Chino Groundwater Baseline but below the 33,000 AF call amount will be moved to the Operating Parties' supplemental storage accounts.

### Chino Groundwater Baseline

For the purposes of Performance, an Operating Party's Chino Groundwater Baseline shall be set at the beginning of the performance period as the lesser of the following:

1) The average physical production adjusted upward for in-lieu CUP storage and downward for CUP extraction certified by Chino Basin Watermaster in the three (3) previous years beginning with the prior fiscal year (i.e. the baseline for a call during fiscal year 2014-15 would average years 2010-11, 2011-12 and 2012-13 and would not include 2013-14) ; or,
2) The average sum of the Operating Safe Yield and Net Ag Re-Allocation pumping rights, as reported in columns titled "Assigned Share of Operating Safe Yield" and "Net Ag Pool Reallocation" of the table titled "Pool 3 Water Production Summary," of the Chino Basin Watermaster Annual Report or Annual Assessment Package, less any rights utilized to meet Chino Basin Desalter replenishment obligations, as shown in the Chino Basin Watermaster Annual Report or Annual Assessment Package, in the three (3) previous years beginning with the prior fiscal year.

**Imported Water Baseline**

The Imported Baseline shall be equal to the average imported water deliveries in the three (3) previous years beginning with the prior fiscal year. The imported water deliveries in each year is adjusted downward for in-lieu CUP storage and adjusted upward for CUP extraction.

**In-Lieu Storage Guidelines**
For in-lieu storage, the following criteria shall apply:

1) Certification of in-lieu CUP storage by an Operating Party shall be the lesser of the following:
    a. Decrease in Chino groundwater production relative to the Chino Groundwater Baseline; or
    b. Increase in imported water deliveries to the Operating Parties above the Imported Water Baseline by at least the certified amount. In the event that the increase in imported water deliveries is less than the decrease in Chino Basin groundwater production, the certified amount shall be equal to the increase in imported water deliveries.
2) Participation in in-lieu storage is optional. Therefore, in-lieu storage is based upon individual Operating Party performance.
3) No Operating Party may certify in-lieu storage during any fiscal year in which that Operating Party incurs a replenishment obligation. .

**Operating Committee**

Baseline Adjustments
The Operating Committee may mutually agree to adjust the Chino Groundwater Baseline or the Imported Water Baseline to account for changed conditions. The Operating Committee may adjust the baselines due to factors such as new production wells, wells taken out of service, planned outages that would significantly affect ability to deliver supplies, significant retail conservation, and/or dramatic increase in local supplies (recycled water, desalted groundwater, etc). Increases or decreases in total demand shall not result in a baseline adjustment unless it can be shown that the change is a result of significant retail conservation. Normal demand variations due to hydrologic or economic factors are not eligible for baseline adjustments. Any request for baseline adjustment must accompany sufficient documentation to allow the Operating Committee to evaluate the request. All baseline adjustment requests must be submitted before the storage/call year with the Annual Operating Plan.

Performance Targets
The Operating Committee may mutually agree to modify performance targets due to severe and unexpected conditions. It should be generally agreed that additional use and production of all local supplies available to the Operating Parties should not be restricted or cause IEUA , TVMWD or the Operating Parties to be out of compliance of a performance target. The Operating Committee may agree to adjust the imported water performance target due to severe and unexpected conditions, such as but not limited to the following:

a. Significant loss in total local supply capacity (groundwater, desalter and recycled); and/or
   OR
b. Significant increase in total demand.

Any adjustment related to the performance targets does not apply to the requirements for receiving O&M, Power and Treatment credits or the amount deducted from the storage account. The full call amount would be deducted from the storage account and billed by Metropolitan regardless of any performance adjustment. Detailed documentation of the severe and unexpected conditions must be provided to allow the Operating Committee to evaluate the request.

**Examples**

The following examples demonstrate situations where non-performance penalties may be waived pursuant to Section XIII.B. of the Agreement.

**Example 1 - Base Example**

| | |
|---|---|
| Call Amount | 33,000 AF |
| | |
| Baseline Service Connection Deliveries | 70,000 AF |
| Call Year Service Connection Deliveries | **40,000 AF** |
| Reduction at Service Connection | 30,000 AF |
| | |
| Baseline Groundwater Production | 80,000 AF |
| Call Year Groundwater Production | 95,000 AF |
| Increase in Groundwater Production | **15,000 AF** |

Performance is met because the actual service connection deliveries were equal to 40,000 AF. 33,000 AF is billed for and deducted from account. O&M, Power and Treatment credits are given on 15,000 AF and the remaining 18,000 AF that was paid for, but not pumped, will be moved to the Operating Parties' supplemental storage accounts.

**Example 2 – Increase in Local Supply Capacity**

| | |
|---|---|
| Call Amount | 33,000 AF |
| | |
| Baseline Service Connection Deliveries (-5,000AF) | 65,000 AF |
| Call Year Service Connection Deliveries | **35,000 AF** |
| Reduction at Service Connection | 30,000 AF |
| | |
| Baseline Groundwater Production (+5,000AF) | 85,000 AF |
| Call Year Groundwater Production | 100,000 AF |
| Increase in Groundwater Production | **15,000 AF** |

*In this example, Agency A increases its local supply capacity by expanding a treatment plant by 5,000 AF. This would allow Agency A to increase its production. As a result, the Operating Committee agreed to increase the Baseline Groundwater Production by 5,000 AF and decrease the Imported Water Baseline by 5,000 AF.

Performance is met because the actual service connection deliveries reduction was 30,000 AF. 33,000 AF is billed for and deducted from account. O&M, Power and Treatment credits are given on 15,000 AF and the remaining 18,000 AF that was paid for, but not pumped, will be moved to the Operating Parties' supplemental storage accounts.

**Example 3– Reduced Demands (-5,000 AF)**

| | |
|---|---|
| Call Amount | 33,000 AF |
| | |
| Baseline Service Connection Deliveries (-3,000 AF) | 67,000 AF |
| Call Year Service Connection Deliveries | **40,000 AF** |
| Reduction at Service Connection | 27,000 AF |
| | |
| Baseline Groundwater Production (-2,000 AF) | 78,000 AF |
| Call Year Groundwater Production | 95,000 AF |
| Increase in Groundwater Production | **17,000 AF** |

*In this example, the Operating Committee determined that the installation of ultra-low flow toilets in Agency A's service area would result in a demand reduction of 5,000 AF. This reduction was expected to change both the imported and groundwater baselines. As a result, Agency A's imported water baseline was adjusted down by 3,000 AF and the groundwater baseline was adjusted down by 2,000 AF by the Operating Committee.

Performance is met because the actual service connection deliveries were 40,000 AF. 33,000 AF is billed for and deducted from account. O&M, Power and Treatment credits are given on 17,000 AF and the remaining 16,000 AF that was paid for, but not pumped, will be moved to the Operating Parties' supplemental storage accounts.

**Example 4 – Loss of Local Supply with Groundwater Baseline Adjustment of -5,000 AF and Imported Water +5,000 AF***

| | |
|---|---|
| Call Amount | 33,000 AF |
| | |
| Adjusted Baseline Service Connection Deliveries (+5,000 AF) | 75,000 AF |
| Call Year Service Connection Deliveries | **45,000 AF** |
| Reduction at Service Connection | 30,000 AF |
| | |
| Adjusted Baseline Groundwater Production (-5,000 AF) | 75,000 AF |
| Call Year Groundwater Production | 90,000 AF |
| Increase in Groundwater Production | **15,000 AF** |

*In this example, Agency A has had six wells go out of service permanently. It will take at least 12 months to drill new wells. As a result of the outage, Agency A's total well capacity has been reduced by 5,000 AF. The Operating Committee agrees to a 5,000 AF baseline reduction on ground water and increase baseline imported water deliveries by 5,000 AF.

Performance is met because the actual service connection deliveries were reduced by 30,000 AF. 33,000 AF is billed for and deducted from account. O&M, Power and Treatment credits are given on 15,000 AF and the remaining 18,000 AF that was paid for, but not pumped, will be moved to the Operating Parties' supplemental storage accounts.

**Example 5 – Water Supply Allocation Overlap**

| | |
|---|---|
| Call Amount | 33,000 AF |
| WSAP Level 2 | 10% |
| | |
| Baseline Service Connection Deliveries | 60,000 AF |
| WSAP Adjusted Baseline Service Connection Deliveries | 55,000 AF * |
| Call Year Service Connection Deliveries | **40,000 AF** |
| Reduction at Service Connection | 15,000 AF |
| | |
| Baseline Groundwater Production | 80,000 AF |
| Call Year Groundwater Production | 100,000 AF |
| Increase in Groundwater Production | **20,000 AF** |

**For illustrative purposes only.*
*Level 2 WSAP = (Total Demand –Local Supplies) x 90% + Adjustments*

Performance is met for CUP because the actual service connection deliveries were equal to 40,000 AF. 33,000 AF is billed for and deducted from account. Power and O&M credits are given on 20,000 AF and the remaining 13,000 AF that was paid for, but not pumped, will be moved to the Operating Parties' supplemental storage accounts. For the WSAP, it is assumed that the adjusted call amount is 15,000 AF.

**Example 6 – 10 Percent Performance Range**

| | |
|---|---|
| Call amount | 33,000 AF |
| | |
| Baseline Service Connection Deliveries | 80,000 AF |
| Call Year Service Connection Deliveries | **50,000 AF** |
| Reduction at Service Connection | 30,000 AF |
| | |
| Baseline Groundwater Production | 80,000 AF |
| Call Year Groundwater Production | 100,000 AF |
| Increase in Groundwater Production | **20,000 AF** |

Performance is met because the Operating Parties reduced service connection deliveries by 30,000 AF, which is within +/- 10 percent of 33,000. 33,000 AF is billed for and deducted from account. O&M, Power and Treatment credits are given on 20,000 AF and the remaining 13,000 AF that was paid for, but not pumped, will be moved to the Operating Parties' supplemental storage accounts.

**Example 7 – Non-Performance**

| | |
|---|---|
| Call amount | 33,000 AF |
| | |
| Baseline Service Connection Deliveries | 60,000 AF |
| Call Year Service Connection Deliveries | **45,000 AF** |
| Reduction at Service Connection | 15,000 AF |
| | |
| Baseline Groundwater Production | 80,000 AF |
| Call Year Groundwater Production | 95,000 AF |
| Increase in Groundwater Production | **15,000 AF** |

Performance is **not** met. The actual service connection deliveries are greater than 40,000 and the reduction in service connection deliveries are less than 33,000 +/- 10 percent. 33,000 AF is billed for and deducted from account. O&M, Power and Treatment credits are given on 15,000 AF and the remaining 18,000 AF that was paid for, but not pumped, will be moved to the Operating Parties' supplemental storage accounts. 5,000 AF is billed at the Penalty Rate of 2x Tier 2.

**Example 8 – "Agency A" In-lieu Storage**

| | |
|---|---|
| Baseline Service Connection Deliveries | 15,000 AF |
| Storage Year Service Connection Deliveries | 20,000 AF |
| Increase at Service Connection | **5,000 AF** |
| | |
| Baseline Groundwater Production | 20,000 AF |
| Storage Year Groundwater Production | 10,000 AF |
| Decrease in Groundwater Production | 10,000 AF |

In this example, "Agency A" would be eligible for 5,000 AF of in-lieu storage. The increase in service connection deliveries (5,000 AF) are less than the decrease in groundwater production (10,000 AF).

# Exhibit G

## Chino Basin Conjunctive Use "Dry Year" Storage Project Performance Criteria

Metropolitan may, on fifteen (15) days notice, require Program Agency to meet the objectives of the project as follows:

1) IEUA and TVMWD agree to reduce imported water deliveries by approximately 33,000 AF from the preceding 12 month period during the next 12 month period; and
2) IEUA, TVMWD and Chino Basin Watermaster through their agreements with Operating Parties will cause to be pumped during the next 12 months 33,000 AF from the Metropolitan Storage Account; and
3) Chino Basin pumping by the Operating Parties in the Dry Year program within the Chino Basin appropriative pool will increase over the previous year by 33,000 AF.

All three performance targets do not need to be met precisely ( + or – 10 percent.) As an example, IEUA and TVMWD would meet the objectives of the program if all three of the following occurred:

| | |
|---|---|
| 30,000 AF | Reduced imported full service deliveries when compared to the preceding 12 months. |
| 31,000 AF | Pump from Metropolitan Storage Account. |
| 34,000 AF | Increase pumping by Operating Parties, when compared to the preceding year. |

However, the Operating Committee may mutually agree that performance targets are met even though a performance target is not met(a scenario when retail conservation were to exceed 15 – 25 percent or if other local supplies were developed, e.g., dramatic increase in recycled water use, may reduce the opportunity for the retail agencies to pump 33,000 AF from the Metropolitan Storage Account.) In this case, the Operating Committee would need to agree on the variance procedures for accepting a modified performance target after the episode. It should be generally agreed that additional use and production of all local supplies native to the Chino Basin area should not be restricted or cause IEUA, TVMWD or Chino Basin Watermaster (or the Operating Parties) to be out of compliance of the performance target. It should also be agreed that if IEUA and TVMWD retailers demand firm water from Metropolitan over the twelve month period, the pumped water would come from the Metropolitan Storage Account up to 33,000AF.

The objective of the program is to provide 33,000 acre-feet of additional pumping capacity in the Chino Basin for dry year use, to allow Metropolitan, IEUA and TVMWD the flexibility to utilize the Facilities in the most efficient manner possible (including normal year and wet years) and to ensure that upon a call of Metropolitan's stored water, Facilities will be used to provide an additional supply of water to meet IEUA's and TVMWD's needs. A partial call will be addressed through a pro rata performance of all three objectives .

JUDGMENT

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DONALD D. STARK
A Professional Corporation
Suite 201 Airport Plaza
2061 Business Center Drive
Irvine, California 92715
Telephone: (714) 752-8971

CLAYSON, ROTHROCK & MANN
601 South Main Street
Corona, California 91720
Telephone: (714) 737-1910
Attorneys for Plaintiff

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

| | |
|---|---|
| CHINO BASIN MUNICIPAL WATER DISTRICT,<br><br>Plaintiff,<br><br>v.<br><br>CITY OF CHINO, et al.<br><br>Defendants. | No. 164327<br><br>JUDGMENT |

## I. INTRODUCTION

1. Pleadings, Parties and Jurisdiction. The complaint herein was filed on January 2, 1975, seeking an adjudication of water rights, injunctive relief and the imposition of a physical solution. A first amended complaint was filed on July 16, 1976. The defaults of certain defendants have been entered, and certain other defendants dismissed. Other than defendants who have been dismissed or whose defaults have been entered, all defendants have appeared herein. By answers and order of this Court, the issues have been made those of a full inter se adjudication between the

parties. This Court has jurisdiction of the subject matter of this action and of the parties herein.

2. Stipulation For Judgment. Stipulation for entry of judgment has been filed by and on behalf of a majority of the parties, representing a majority of the quantitative rights herein adjudicated.

3. Trial; Findings and Conclusions. Trial was commenced on December 16, 1977, as to the non-stipulating parties, and findings of fact and conclusions of law have been entered disposing of the issues in the case.

4. Definitions. As used in this Judgment, the following terms shall have the meanings herein set forth:

(a) Active Parties. All parties other than those who have filed with Watermaster a written waiver of service of notices, pursuant to Paragraph 58.

(b) Annual or Year -- A fiscal year, July 1 through June 30, following, unless the context shall clearly indicate a contrary meaning.

(c) Appropriative Right -- The annual production right of a producer from the Chino Basin other than pursuant to an overlying right.

(d) Basin Water -- Ground water within Chino Basin which is part of the Safe Yield, Operating Safe Yield, or replenishment water in the Basin as a result of operations under the Physical Solution decreed herein. Said term does not include Stored Water.

(e) CBMWD -- Plaintiff Chino Basin Municipal Water District.

(f) Chino Basin or Basin -- The ground water basin underlying the area shown as such on Exhibit "B" and within the boundaries described in Exhibit "K".

(g) Chino Basin Watershed -- The surface drainage area tributary to and overlying Chino Basin.

(h) Ground Water -- Water beneath the surface of the ground and within the zone of saturation, i.e., below the existing water table.

(i) Ground Water Basin -- An area underlain by one or more permeable formations capable of furnishing substantial water storage.

(j) Minimal Producer -- Any producer whose production does not exceed five acre-feet per year.

(k) MWD -- The Metropolitan Water District of Southern California.

(l) Operating Safe Yield -- The annual amount of ground water which Watermaster shall determine, pursuant to criteria specified in Exhibit "I", can be produced from Chino Basin by the Appropriative Pool parties free of replenishment obligation under the Physical Solution herein.

(m) Overdraft -- A condition wherein the total annual production from the Basin exceeds the Safe Yield thereof.

(n) Overlying Right -- The appurtenant right of an owner of lands overlying Chino Basin to produce water from the Basin for overlying beneficial use on such lands.

(o) Person. Any individual, partnership, association, corporation, governmental entity or agency, or other organization.

(p) PVMWD -- Defendant Pomona Valley Municipal Water District.

(q) Produce or Produced -- To pump or extract ground water from Chino Basin.

(r) Producer -- Any person who produces water from Chino Basin.

(s) Production -- Annual quantity, stated in acre feet, of water produced.

(t) Public Hearing -- A hearing after notice to all parties and to any other person legally entitled to notice.

(u) Reclaimed Water -- Water which, as a result of processing of waste water, is suitable for a controlled use.

(v) Replenishment Water -- Supplemental water used to recharge the Basin pursuant to the Physical Solution, either directly by percolating the water into the Basin or indirectly by delivering the water for use in lieu of production and use of safe yield or Operating Safe Yield.

(w) Responsible Party -- The owner, co-owner, lessee or other person designated by multiple parties interested in a well as the person responsible for purposes of filing reports hereunder.

(x) Safe Yield -- The long-term average annual quantity of ground water (excluding replenishment or stored water but including return flow to the Basin from use of replenishment or stored water) which can be produced from the Basin under cultural conditions of a particular year without causing an undesirable result.

(y) SBVMWD -- San Bernardino Valley Municipal Water

District.

(z) State Water -- Supplemental Water imported through the State Water Resources Development System, pursuant to Chapter 8, Division 6, Part 6 of the Water Code.

(aa) Stored Water -- Supplemental water held in storage, as a result of direct spreading, in lieu delivery, or otherwise, for subsequent withdrawal and use pursuant to agreement with Watermaster.

(bb) Supplemental Water -- Includes both water imported to Chino Basin from outside Chino Basin Watershed, and reclaimed water.

(cc) WMWD --Defendant Western Municipal Water District of Riverside County.

5. List of Exhibits. The following exhibits are attached to this Judgment and made a part hereof:

"A" -- "Location Map of Chino Basin" showing boundaries of Chino Basin Municipal Water District, and other geographic and political features.

"B" -- "Hydrologic Map of Chino Basin" showing hydrologic features of Chino Basin.

"C" -- Table Showing Parties in Overlying (Agricultural) Pool.

"D" -- Table Showing Parties in Overlying (Non-agricultural Pool and Their Rights.

"E" -- Table Showing Appropriators and Their Rights.

"F" -- Overlying (Agricultural) Pool Pooling Plan.

"G" -- Overlying (Non-agricultural) Pool Pooling Plan.

"H" -- Appropriative Pool Pooling Plan.

"I" -- Engineering Appendix.

"J" -- Map of In Lieu Area No. 1.

"K" -- Legal Description of Chino Basin.

## II. DECLARATION OF RIGHTS

### A. HYDROLOGY

6. Safe Yield. The Safe Yield of Chino Basin is 140,000 acre feet per year.

7. Overdraft and Prescriptive Circumstances. In each year for a period in excess of five years prior to filing of the First Amended Complaint herein, the Safe Yield of the Basin has been exceeded by the annual production therefrom, and Chino Basin is and has been for more than five years in a continuous state of overdraft. The production constituting said overdraft has been open, notorious, continuous, adverse, hostile and under claim of right. The circumstances of said overdraft have given notice to all parties of the adverse nature of such aggregate over-production.

### B. WATER RIGHTS IN SAFE YIELD

8. Overlying Rights. The parties listed in Exhibits "C" and "D" are the owners or in possession of lands which overlie Chino Basin. As such, said parties have exercised overlying water rights in Chino Basin. All overlying rights owned or exercised by parties listed in Exhibits "C" and "D" have, in the aggregate, been limited by prescription except to the extent such rights have been preserved by self-help by said parties. Aggregate preserved overlying rights in the Safe Yield for agricultural pool use, including the rights of the State of California, total 82,800 acre feet per year. Overlying rights for non-agricultural pool use

total 7,366 acre feet per year and are individually decreed for each affected party in Exhibit "D". No portion of the Safe Yield of Chino Basin exists to satisfy unexercised overlying rights, and such rights have all been lost by prescription. However, uses may be made of Basin Water on overlying lands which have no preserved overlying rights pursuant to the Physical Solution herein. All overlying rights are appurtenant to the land and cannot be assigned or conveyed separate or apart therefrom.

9. Appropriative Rights. The parties listed in Exhibit "E" are the owners of appropriative rights, including rights by prescription, in the unadjusted amounts therein set forth, and by reason thereof are entitled under the Physical Solution to share in the remaining Safe Yield, after satisfaction of overlying rights and rights of the State of California, and in the Operating Safe Yield in Chino Basin, in the annual shares set forth in Exhibit "E".

(a) Loss of Priorities. By reason of the long continued overdraft in Chino Basin, and in light of the complexity of determining appropriative priorities and the need for conserving and making maximum beneficial use of the water resources of the State, each and all of the parties listed in Exhibit "E" are estopped and barred from asserting special priorities or preferences, inter se. All of said appropriative rights are accordingly deemed and considered of equal priority.

(b) Nature and Quantity. All rights listed in Exhibit "E" are appropriative and prescriptive in nature. By reason of the status of the parties, and the provisions of Section

storage capacity of Chino Basin for storage of supplemental water; provided that no such use shall be made except pursuant to written agreement with Watermaster, as authorized by Paragraph 28. In the allocation of such storage capacity, the needs and requirements of lands overlying Chino Basin and the owners of rights in the Safe Yield or Operating Safe Yield of the Basin shall have priority and preference over storage for export.

## III. INJUNCTION

13. Injunction Against Unauthorized Production of Basin Water. Each party in each of the respective pools is enjoined, as follows:

(a) Overlying (Agricultural) Pool. Each party in the Overlying (Agricultural) Pool, its officers, agents, employees, successors and assigns, is and they each are ENJOINED AND RESTRAINED from producing ground water from Chino Basin in any year hereafter in excess of such party's correlative share of the aggregate of 82,800 acre feet allocated to said Pool, except pursuant to the Physical Solution or a storage water agreement.

(b) Overlying (Non-Agricultural) Pool. Each party in the Overlying (Non-agricultural) Pool, its officers, agents, employees, successors and assigns, is and they each are ENJOINED AND RESTRAINED from producing ground water of Chino Basin in any year hereafter in excess of such party's decreed rights in the Safe Yield, except pursuant to the provisions of the Physical Solution or a storage water agreement.

(c) Appropriative Pool. Each party in the

Appropriative Pool, its officers, agents, employees, successors and assigns, is and they are each ENJOINED AND RESTRAINED from producing ground water of Chino Basin in any year hereafter in excess of such party's decreed share of Operating Safe Yield, except pursuant to the provisions of the Physical Solution or a storage water agreement.

14. Injunction Against Unauthorized Storage or Withdrawal of Stored Water. Each party, its officers, agents, employees, successors and assigns is and they each are ENJOINED AND RESTRAINED from storing supplemental water in Chino Basin for withdrawal, or causing withdrawal of, water stored by that party, except pursuant to the terms of a written agreement with Watermaster and in accordance with Watermaster regulations. Any supplemental water stored or recharged in the Basin, except pursuant to such a Water-master agreement, shall be deemed abandoned and not classified as Stored Water. This paragraph has no application, as such, to supplemental water spread or provided in lieu by Watermaster pur-suant to the Physical Solution.

## IV. CONTINUING JURISDICTION

15. Continuing Jurisdiction. Full jurisdiction, power and authority are retained and reserved to the Court as to all matters contained in this judgment, except:

(a) The redetermination of Safe Yield, as set forth in Paragraph 6, during the first ten (10) years of operation of the Physical Solution;

(b) The allocation of Safe Yield as between the several pools as set forth in Paragraph 44 of the Physical Solution;

at least 30 days' notice thereof, and after hearing thereon, to make such further or supplemental orders or directions as may be necessary or appropriate for interpretation, enforcement or carrying out of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment.

## V. WATERMASTER

### A. APPOINTMENT

16. Watermaster Appointment. CBMWD, acting by and through a majority of its board of directors, is hereby appointed Watermaster, to administer and enforce the provisions of this Judgment and any subsequent instructions or orders of the Court hereunder. The term of appointment of Watermaster shall be for five (5) years. The Court will by subsequent orders provide for successive terms or for a successor Watermaster. Watermaster may be changed at any time by subsequent order of the Court, on its own motion, or on the motion of any party after notice and hearing. Unless there are compelling reasons to the contrary, the Court shall act in conformance with a motion requesting the Watermaster be changed if such motion is supported by a majority of the voting power of the Advisory Committee.

### B. POWERS AND DUTIES

17. Powers and Duties. Subject to the continuing supervision and control of the Court, Watermaster shall have and may exercise the express powers, and shall perform the duties, as provided in this Judgment or hereafter ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction.

18. Rules and Regulations. Upon recommendation by the

Advisory Committee, Watermaster shall make and adopt, after public hearing, appropriate rules and regulations for conduct of Watermaster affairs, including meeting schedules and procedures, and compensation of members of Watermaster at not to exceed $25 per member per meeting, or $300 per member per year, whichever is less, plus reasonable expenses related to activities within the Basin. Thereafter, Watermaster may amend said rules from time to time upon recommendation, or with approval of the Advisory Committee after hearing noticed to all active parties. A copy of said rules and regulations, and of any amendments thereof, shall be mailed to each active party.

19. Acquisition of Facilities. Watermaster may purchase, lease, acquire and hold all necessary facilities and equipment; provided, that it is not the intent of the Court that Watermaster acquire any interest in real property or substantial capital assets.

20. Employment of Experts and Agents. Watermaster may employ or retain such administrative, engineering, geologic, accounting, legal or other specialized personnel and consultants as may be deemed appropriate in the carrying out of its powers and shall require appropriate bonds from all officers and employees handling Watermaster funds. Watermaster shall maintain records for purposes of allocation of costs of such services as well as of all other expenses of Watermaster administration as between the several pools established by the Physical Solution.

21. Measuring Devices. Watermaster shall cause parties, pursuant to uniform rules, to install and maintain in good operating condition, at the cost of each party, such necessary measuring

devices or meters as Watermaster may deem appropriate. Such measuring devices shall be inspected and tested as deemed necessary by Watermaster, and the cost thereof shall constitute an expense of Watermaster.

22. Assessments. Watermaster is empowered to levy and collect all assessments provided for in the pooling plans and Physical Solution.

23. Investment of Funds. Watermaster may hold and invest any and all Watermaster funds in investments authorized from time to time for public agencies of the State of California.

24. Borrowing. Watermaster may borrow from time to time amounts not exceeding the annual anticipated receipts of Watermaster during such year.

25. Contracts. Watermaster may enter into contracts for the performance of any powers herein granted; provided, however, that Watermaster may not contract with or purchase materials, supplies or services from CBMWD, except upon the prior recommendation and approval of the Advisory Committee and pursuant to written order of the Court.

26. Cooperation With Other Agencies. Subject to prior recommendation or approval of the Advisory Committee, Watermaster may act jointly or cooperate with agencies of the United States and the State of California or any political subdivisions, municipalities or districts or any person to the end that the purpose of the Physical Solution may be fully and economically carried out.

27. Studies. Watermaster may, with concurrence of the Advisory Committee or affected Pool Committee and in accordance with Paragraph 54 (b), undertake relevant studies of hydrologic

conditions, both quantitative and qualitative, and operating aspects of implementation of the management program for Chino Basin.

28. Ground Water Storage Agreements. Watermaster shall adopt, with the approval of the Advisory Committee, uniformly applicable rules and a standard form of agreement for storage of supplemental water, pursuant to criteria therefore set forth in Exhibit "I". Upon appropriate application by any person, Watermaster shall enter into such a storage agreement; provided that all such storage agreements shall first be approved by written order of the Court, and shall by their terms preclude operations which will have a substantial adverse impact on other producers.

29. Accounting for Stored Water. Watermaster shall calculate additions, extractions and losses and maintain an annual account of all Stored Water in Chino Basin, and any losses of water supplies or Safe Yield of Chino Basin resulting from such Stored Water.

30. Annual Administrative Budget. Watermaster shall submit to Advisory Committee an administrative budget and recommendation for each fiscal year on or before March 1. The Advisory Committee shall review and submit said budget and their recommendations to Watermaster on or before April 1, following. Watermaster shall hold a public hearing on said budget at its April quarterly meeting and adopt the annual administrative budget which shall include the administrative items for each pool committee. The administrative budget shall set forth budgeted items in sufficient detail as necessary to make a proper allocation of the expense among the several pools, together with Watermaster's proposed allocation. The budget shall contain such additional comparative information

or explanation as the Advisory Committee may recommend from time to time. Expenditures within budgeted items may thereafter be made by Watermaster in the exercise of powers herein granted, as a matter of course. Any budget transfer in excess of 20% of a budget category during any budget year or modification of such administrative budget during any year shall be first submitted to the Advisory Committee for review and recommendation.

31. Review Procedures. All actions, decisions or rules of Watermaster shall be subject to review by the Court on its own motion or on timely motion by any party, the Watermaster (in the case of a mandated action), the Advisory Committee, or any Pool Committee, as follows:

(a) Effective Date of Watermaster Action. Any action, decision or rule of Watermaster shall be deemed to have occurred or been enacted on the date on which written notice thereof is mailed. Mailing of copies of approved Watermaster minutes to the active parties shall constitute such notice to all parties.

(b) Noticed Motion. Any party, the Watermaster (as to any mandated action), the Advisory Committee, or any Pool Committee may, by a regularly noticed motion, apply to the Court for review of any Watermaster's action, decision or rule. Notice of such motion shall be served personally or mailed to Watermaster and to all active parties. Unless otherwise ordered by the Court, such motion shall not operate to stay the effect of such Watermaster action, decision or rule.

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(c) Time for Motion. Notice of motion to review any Watermaster action, decision or rule shall be served and filed within ninety (90) days after such Watermaster action, decision or rule, except for budget actions, in which event said notice period shall be sixty (60) days.

(d) De Novo Nature of Proceedings. Upon the filing of any such motion, the Court shall require the moving party to notify the active parties, the Watermaster, the Advisory Committee, and each Pool Committee, of a date for taking evidence and argument, and on the date so designated shall review de novo the question at issue. Watermaster's findings or decision, if any, may be received in evidence at said hearing, but shall not constitute presumptive or prima facie proof of any fact in issue.

(e) Decision. The decision of the Court in such proceeding shall be an appealable supplemental order in this case. When the same is final, it shall be binding upon the Watermaster and all parties.

C. ADVISORY AND POOL COMMITTEES

32. Authorization. Watermaster is authorized and directed to cause committees of producer representatives to be organized to act as Pool Committees for each of the several pools created under the Physical Solution. Said Pool Committees shall, in turn, jointly form an Advisory Committee to assist Watermaster in performance of its functions under this judgment. Pool Committees shall be composed as specified in the respective pooling plans, and the Advisory Committee shall be composed of not to exceed ten (10) voting representatives from each pool, as designated by the

respective Pool Committee. WMWD, PVMWD and SBVMWD shall each be entitled to one non-voting representative on said Advisory Committee.

33. Term and Vacancies. Members of any Pool Committee, shall serve for the term, and vacancies shall be filled, as specified in the respective pooling plan. Members of the Advisory Committee shall serve at the will of their respective Pool Committee.

34. Voting Power. The voting power on each Pool Committee shall be allocated as provided in the respective pooling plan. The voting power on the Advisory Committee shall be one hundred (100) votes allocated among the three pools in proportion to the total assessments paid to Watermaster during the preceding year; provided, that the minimum voting power of each pool shall be

(a) Overlying (Agricultural) Pool 20,

(b) Overlying (Non-agricultural) Pool 5, and

(c) Appropriative Pool 20.

In the event any pool is reduced to its said minimum vote, the remaining votes shall be allocated between the remaining pools on said basis of assessments paid to Watermaster by each such remaining pool during the preceding year. The method of exercise of each pool's voting power on the Advisory Committee shall be as determined by the respective pool committees.

35. Quorum. A majority of the voting power of the Advisory Committee or any Pool Committee shall constitute a quorum for the transaction of affairs of such Advisory or Pool Committee; provided, that at least one representative of each Pool Committee shall be required to constitute a quorum of the Advisory Committee. No Pool Committee representative may purposely absent himself or

herself, without good cause, from an Advisory Committee meeting to deprive it of a quorum. Action by affirmative vote of a majority of the entire voting power of any Pool Committee or the Advisory Committee shall constitute action by such committee. Any action or recommendation of a Pool Committee or the Advisory Committee shall be transmitted to Watermaster in writing, together with a report of any dissenting vote or opinion.

36. Compensation. Pool or Advisory Committee members may receive compensation, to be established by the respective pooling plan, but not to exceed twenty-five dollars ($25.00) for each meeting of such Pool or Advisory Committee attended, and provided that no member of a Pool or Advisory Committee shall receive compensation of more than three hundred ($300.00) dollars for service on any such committee during any one year. All such compensation shall be a part of Watermaster administrative expense. No member of any Pool or Advisory Committee shall be employed by Watermaster or compensated by Watermaster for professional or other services rendered to such Pool or Advisory Committee or to Watermaster, other than the fee for attendance at meetings herein provided, plus reimbursement of reasonable expenses related to activities within the Basin.

37. Organization.

(a) Organizational Meeting. At its first meeting in each year, each Pool Committee and the Advisory Committee shall elect a chairperson and a vice chairperson from its membership. It shall also select a secretary, a treasurer and such assistant secretaries and treasurers as may be appropriate, any of whom may, but need not, be members of

such Pool or Advisory Committee.

(b) Regular Meetings. All Pool Committees and the Advisory Committee shall hold regular meetings at a place and time to be specified in the rules to be adopted by each Pool and Advisory Committee. Notice of regular meetings of any Pool or Advisory Committee, and of any change in time or place thereof, shall be mailed to all active parties in said pool or pools.

(c) Special Meetings. Special meetings of any Pool or Advisory Committee may be called at any time by the Chairperson or by any three (3) members of such Pool or Advisory Committee by delivering notice personally or by mail to each member of such Pool or Advisory Committee and to each active party at least 24 hours before the time of each such meeting in the case of personal delivery, and 96 hours in the case of mail. The calling notice shall specify the time and place of the special meeting and the business to be transacted. No other business shall be considered at such meeting.

(d) Minutes. Minutes of all Pool Committee, Advisory Committee and Watermaster meetings shall be kept at Watermaster's offices. Copies thereof shall be mailed or otherwise furnished to all active parties in the pool or pools concerned. Said copies of minutes shall constitute notice of any Pool or Advisory Committee action therein reported, and shall be available for inspection by any party.

(e) Adjournments. Any meeting of any Pool or Advisory Committee may be adjourned to a time and place specified in the order of adjournment. Less than a quorum may so adjourn

from time to time. A copy of the order or notice of adjournment shall be conspicuously posted forthwith on or near the door of the place where the meeting was held.

38. Powers and Functions. The powers and functions of the respective Pool Committees and the Advisory Committee shall be as follows:

(a) Pool Committees. Each Pool Committee shall have the power and responsibility for developing policy recommendations for administration of its particular pool, as created under the Physical Solution. All actions and recommendations of any Pool Committee which require Watermaster implementation shall first be noticed to the other two pools. If no objection is received in writing within thirty (30) days, such action or recommendation shall be transmitted directly to Watermaster for action. If any such objection is received, such action or recommendation shall be reported to the Advisory Committee before being transmitted to Watermaster.

(b) Advisory Committee. The Advisory Committee shall have the duty to study, and the power to recommend, review and act upon all discretionary determinations made or to be made hereunder by Watermaster.

[1] Committee Initiative. When any recommendation or advice of the Advisory Committee is received by Watermaster, action consistent therewith may be taken by Watermaster; provided, that any recommendation approved by 80 votes or more in the Advisory Committee shall constitute a mandate for action by Watermaster consistent therewith. If Watermaster is unwilling or unable to act

pursuant to recommendation or advice from the Advisory Committee (other than such mandatory recommendations), Watermaster shall hold a public hearing, which shall be followed by written findings and decision. Thereafter, Watermaster may act in accordance with said decision, whether consistent with or contrary to said Advisory Committee recommendation. Such action shall be subject to review by the Court, as in the case of all other Watermaster determinations.

[2]. Committee Review. In the event Watermaster proposes to take discretionary action, other than approval or disapproval of a Pool Committee action or recommendation properly transmitted, or execute any agreement not theretofore within the scope of an Advisory Committee recommendation, notice of such intended action shall be served on the Advisory Committee and its members at least thirty (30) days before the Watermaster meeting at which such action is finally authorized.

(c) Review of Watermaster Actions. Watermaster (as to mandated action), the Advisory Committee or any Pool Committee shall be entitled to employ counsel and expert assistance in the event Watermaster or such Pool or Advisory Committee seeks Court review of any Watermaster action or failure to act. The cost of such counsel and expert assistance shall be Watermaster expense to be allocated to the affected pool or pools.

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## VI. PHYSICAL SOLUTION

### A. GENERAL

39. Purpose and Objective. Pursuant to the mandate of Section 2 of Article X of the California Constitution, the Court hereby adopts and orders the parties to comply with a Physical Solution. The purpose of these provisions is to establish a legal and practical means for making the maximum reasonable beneficial use of the waters of Chino Basin by providing the optimum economic, long-term, conjunctive utilization of surface waters, ground waters and supplemental water, to meet the requirements of water users having rights in or dependent upon Chino Basin.

40. Need for Flexibility. It is essential that this Physical solution provide maximum flexibility and adaptability in order that Watermaster and the Court may be free to use existing and future technological, social, institutional and economic options, in order to maximize beneficial use of the waters of Chino Basin. To that end, the Court's retained jurisdiction will be utilized, where appropriate, to supplement the discretion herein granted to the Watermaster.

41. Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations. Withdrawals and supplemental water replenishment of Basin Water, and the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees composed of the affected producers. Both the

quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized.

42. General Pattern of Operations. It is contemplated that the rights herein decreed will be divided into three (3) operating pools for purposes of Watermaster administration. A fundamental premise of the Physical Solution is that all water users dependent upon Chino Basin will be allowed to pump sufficient waters from the Basin to meet their requirements. To the extent that pumping exceeds the share of the Safe Yield assigned to the Overlying Pools, or the Operating Safe Yield in the case of the Appropriative Pool, each pool will provide funds to enable Watermaster to replace such overproduction. The method of assessment in each pool shall be as set forth in the applicable pooling plan.

B. POOLING

43. Multiple Pools Established. There are hereby established three (3) pools for Watermaster administration of, and for the allocation of responsibility for, and payment of, costs of replenishment water and other aspects of this Physical Solution.

(a) Overlying (Agricultural) Pool. The first pool shall consist of the State of California and all overlying producers who produce water for other than industrial or commercial purposes. The initial members of the pool are listed in Exhibit "C".

(b) Overlying (Non-agricultural) Pool. The second pool shall consist of overlying producers who produce water for industrial or commercial purposes. The initial members of this pool are listed in Exhibit "D".

(c) Appropriative Pool. A third and separate pool shall

consist of owners of appropriative rights. The initial members of the pool are listed in Exhibit "E".

Any party who changes the character of his use may, by subsequent order of the Court, be reassigned to the proper pool; but the allocation of Safe Yield under Paragraph 44 hereof shall not be changed. Any non-party producer or any person who may hereafter commence production of water from Chino Basin, and who may become a party to this physical solution by intervention, shall be assigned to the proper pool by the order of the Court authorizing such intervention.

44. Determination and Allocation of Rights to Safe Yield of Chino Basin. The declared Safe Yield of Chino Basin is hereby allocated as follows:

| Pool | Allocation |
|---|---|
| Overlying (Agricultural) Pool | 414,000 acre feet in any five (5) consecutive years. |
| Overlying (Non-agricultural) Pool. | 7,366 acre feet per year. |
| Appropriative Pool | 49,834 acre feet per year. |

The foregoing acre foot allocations to the overlying pools are fixed. Any subsequent change in the Safe Yield shall be debited or credited to the Appropriative Pool. Basin Water available to the Appropriative Pool without replenishment obligation may vary from year to year as the Operating Safe Yield is determined by Watermaster pursuant to the criteria set forth in Exhibit "I".

45. Annual Replenishment. Watermaster shall levy and collect assessments in each year, pursuant to the respective pooling plans, in amounts sufficient to purchase replenishment water to replace production by any pool during the preceding year which exceeds that

pool's allocated share of Safe Yield in the case of the overlying pools, or Operating Safe Yield in the case of the Appropriative Pool. It is anticipated that supplemental water for replenishment of Chino Basin may be available at different rates to the various pools to meet their replenishment obligations. If such is the case, each pool will be assessed only that amount necessary for the cost of replenishment water to that pool, at the rate available to the pool, to meet its replenishment obligation.

46. Initial Pooling Plans. The initial pooling plans, which are hereby adopted, are set forth in Exhibits "F", "G" and "H", respectively. Unless and until modified by amendment of the judgment pursuant to the Court's continuing jurisdiction, each such plan shall control operation of the subject pool.

C. REPORTS AND ACCOUNTING

47. Production Reports. Each party or responsible party shall file periodically with Watermaster, pursuant to Watermaster rules, a report on a form to be prescribed by Watermaster showing the total production of such party during the preceding reportage period, and such additional information as Watermaster may require, including any information specified by the affected Pool Committee.

48. Watermaster Report and Accounting. Watermaster's annual report, which shall be filed on or before November 15 of each year and shall apply to the preceding year's operation, shall contain details as to operation of each of the pools and a certified audit of all assessments and expenditures pursuant to this Physical Solution and a review of Watermaster activities.

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D. REPLENISHMENT

49. Sources of Supplemental Water. Supplemental water may be obtained by Watermaster from any available source. Watermaster shall seek to obtain the best available quality of supplemental water at the most reasonable cost for recharge in the Basin. To the extent that costs of replenishment water may vary between pools, each pool shall be liable only for the costs attributable to its required replenishment. Available sources may include, but are not limited to:

(a) Reclaimed Water. There exist a series of agreements generally denominated the Regional Waste Water Agreements between CBMWD and owners of the major municipal sewer systems within the basin. Under those agreements, which are recognized hereby but shall be unaffected and unimpaired by this judgment, substantial quantities of reclaimed water may be made available for replenishment purposes. There are additional sources of reclaimed water which are, or may become, available to Watermaster for said purposes. Maximum beneficial use of reclaimed water shall be given high priority by Watermaster.

(b) State Water. State water constitutes a major available supply of supplemental water. In the case of State Water, Watermaster purchases shall comply with the water service provisions of the State's water service contracts. More specifically, Watermaster shall purchase State Water from MWD for replenishment of excess production within CBMWD, WMWD and PVMWD, and from SBVMWD to replenish excess production within SBVMWD's boundaries in Chino Basin, except to the

extent that MWD and SBVMWD give their consent as required by such State water service contracts.

(c) Local Import. There exists facilities and methods for importation of surface and ground water supplies from adjacent basins and watersheds.

(d) Colorado River Supplies. MWD has water supplies available from its Colorado River Aqueduct.

50. Methods of Replenishment. Watermaster may accomplish replenishment of overproduction from the Basin by any reasonable method, including:

(a) Spreading and percolation or Injection of water in existing or new facilities, subject to the provisions of Paragraphs 19, 25 and 26 hereof.

(b) In Lieu Procedures. Watermaster may make, or cause to be made, deliveries of water for direct surface use, in lieu of ground water production.

E. REVENUES

51. Production Assessment. Production assessments, on whatever basis, may be levied by Watermaster pursuant to the pooling plan adopted for the applicable pool.

52. Minimal Producers. Minimal Producers shall be exempted from payment of production assessments, upon filing of production reports as provided in Paragraph 47 of this Judgment, and payment of an annual five dollar ($5.00) administrative fee as specified by Watermaster rules.

53. Assessment Proceeds -- Purposes. Watermaster shall have the power to levy assessments against the parties (other than minimal pumpers) based upon production during the preceding period

of assessable production, whether quarterly, semi-annually or annually, as may be determined most practical by Watermaster or the affected Pool Committee.

54. Administrative Expenses. The expenses of administration of this Physical Solution shall be categorized as either (a) general Watermaster administrative expense, or (b) special project expense.

(a) General Watermaster Administrative Expense shall include office rental, general personnel expense, supplies and office equipment, and related incidental expense and general overhead.

(b) Special Project Expense shall consist of special engineering, economic or other studies, litigation expense, meter testing or other major operating expenses. Each such project shall be assigned a Task Order number and shall be separately budgeted and accounted for.

General Watermaster administrative expense shall be allocated and assessed against the respective pools based upon allocations made by the Watermaster, who shall make such allocations based upon generally accepted cost accounting methods. Special Project Expense shall be allocated to a specific pool, or any portion there of, only upon the basis of prior express assent and finding of benefit by the Pool Committee, or pursuant to written order of the Court.

55. Assessments -- Procedure. Assessments herein provided for shall be levied and collected as follows:

(a) Notice of Assessment. Watermaster shall give written notice of all applicable assessments to each party on

or before ninety (90) days after the end of the production period to which such assessment is applicable.

(b) Payment. Each assessment shall be payable on or before thirty (30) days after notice, and shall be the obligation of the party or successor owning the water production facility at the time written notice of assessment is given, unless prior arrangement for payment by others has been made in writing and filed with Watermaster.

(c) Delinquency. Any delinquent assessment shall bear interest at 10% per annum (or such greater rate as shall equal the average current cost of borrowed funds to the Watermaster) from the due date thereof. Such delinquent assessment and interest may be collected in a show-cause proceeding herein instituted by the Watermaster, in which case the Court may allow Watermaster its reasonable costs of collection, including attorney's fees.

56. Accumulation of Replenishment Water Assessment Proceeds. In order to minimize fluctuation in assessment and to give Watermaster flexibility in purchase and spreading of replenishment water, Watermaster may make reasonable accumulations of replenishment water assessment proceeds. Interest earned on such retained funds shall be added to the account of the pool from which the funds were collected and shall be applied only to the purchase of replenishment water.

57. Effective Date. The effective date for accounting and operation under this Physical Solution shall be July 1, 1977, and the first production assessments hereunder shall be due after July 1, 1978. Watermaster shall, however, require installation of

meters or measuring devices and establish operating procedures immediately, and the cost of such Watermaster activity (not including the cost of such meters and measuring devices) may be recovered in the first administrative assessment in 1978.

## VII. MISCELLANEOUS PROVISIONS

58. Designation of Address for Notice and Service. Each party shall designate the name and address to be used for purposes of all subsequent notices and service herein, either by its endorsement on the Stipulation for Judgment or by a separate designation to be filed within thirty (30) days after Judgment has been served. Said designation may be changed from time to time by filing a written notice of such change with the Watermaster. Any party desiring to be relieved of receiving notices of Watermaster or committee activity may file a waiver of notice on a form to be provided by Watermaster. Thereafter such party shall be removed from the Active Party list. Watermaster shall maintain at all times a current list of all active parties and their addresses for purposes of service. Watermaster shall also maintain a full current list of names and addresses of all parties or their successors, as filed herein. Copies of such lists shall be available, without cost, to any party, the Advisory Committee or any Pool Committee upon written request therefor.

59. Service of Documents. Delivery to or service upon any party or active party by the Watermaster, by any other party, or by the Court, of any item required to be served upon or delivered to such party or active party under or pursuant to the Judgment shall be made personally or by deposit in the United States mail, first

class, postage prepaid, addressed to the designee and at the address in the latest designation filed by such party or active party.

60. Intervention After Judgment. Any non-party assignee of the adjudicated appropriative rights of any appropriator, or any other person newly proposing to produce water from Chino Basin, may become a party to this judgment upon filing a petition in intervention. Said intervention must be confirmed by order of this Court. Such intervenor shall thereafter be a party bound by this judgment and entitled to the rights and privileges accorded under the Physical Solution herein, through the pool to which the Court shall assign such intervenor.

61. Loss of Rights. Loss, whether by abandonment, forfeiture or otherwise, of any right herein adjudicated shall be accomplished only (1) by a written election by the owner of the right filed with Watermaster, or (2) by order of the Court upon noticed motion and after hearing.

62. Scope of Judgment. Nothing in this Judgment shall be deemed to preclude or limit any party in the assertion against a neighboring party of any cause of action now existing or hereafter arising based upon injury, damage or depletion of water supply available to such party, proximately caused by nearby pumping which constitutes an unreasonable interference with such complaining party's ability to extract ground water.

63. Judgment Binding on Successors. This Judgment and all provisions thereof are applicable to and binding upon not only the parties to this action, but also upon their respective heirs, executors, administrators, successors, assigns, lessees and

licensees and upon the agents, employees and attorneys in fact of all such persons.

64. Costs. No party shall recover any costs in this proceeding from any other party.

Dated: 1/27/78.

/s/ Howard B. Wiener

Judge

DONALD D. STARK
A Professional Corporation
Suite 201 Airport Plaza
2061 Business Center Drive
Irvine, California 92715
Telephone: (714) 752-8971
CLAYSON, ROTHROCK & MANN
601 South Main Street
Corona, California 91720
Telephone: (714) 737-1910

Attorneys for Plaintiff

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO

| | | |
|---|---|---|
| CHINO BASIN MUNICIPAL WATER DISTRICT, | ) | |
| Plaintiff, | ) | No. 164327 |
| v. | ) | |
| CITY OF CHINO, et al. | ) | |
| Defendants. | ) | |

JUDGMENT

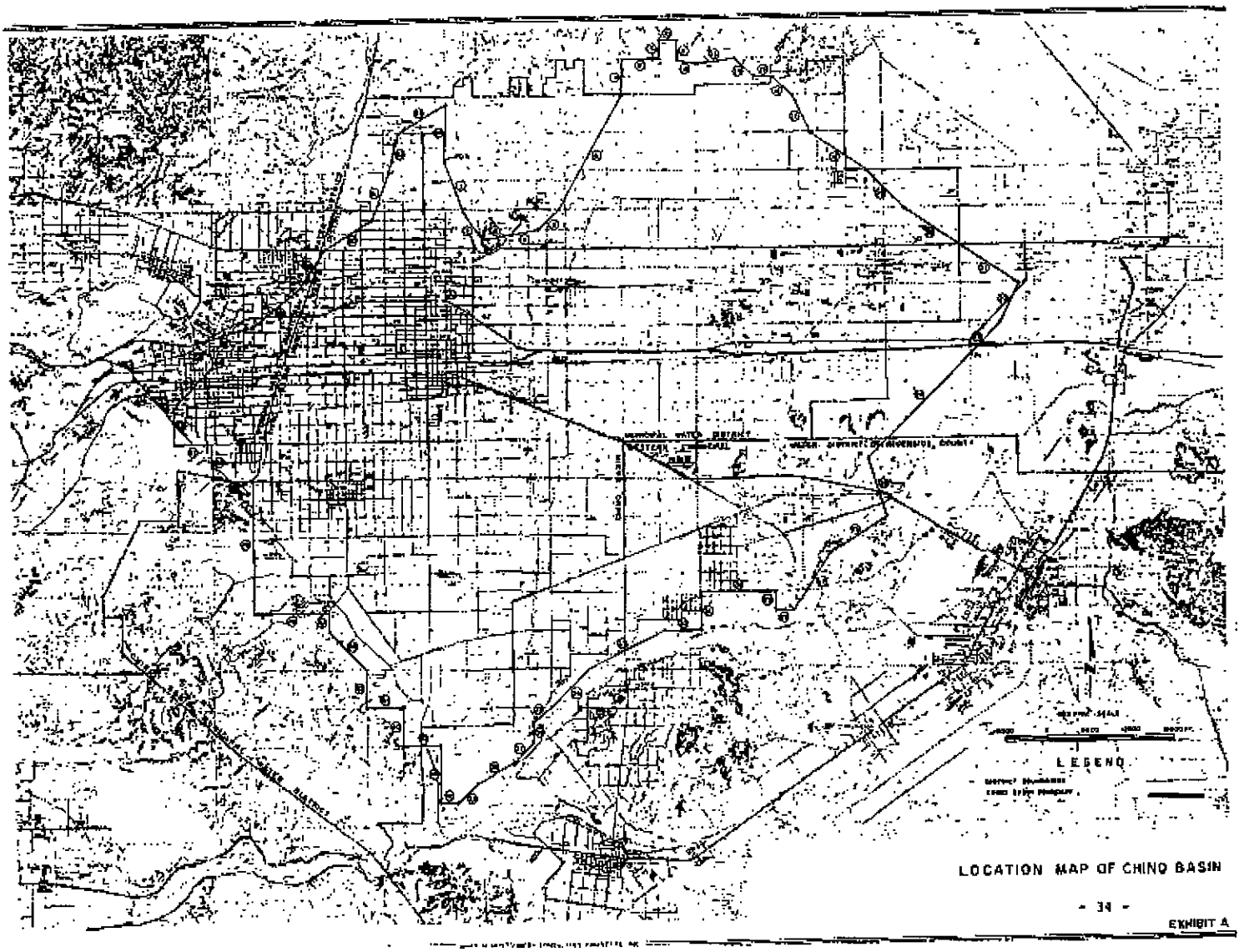


LOCATION MAP OF CHINO BASIN



EXHIBIT A

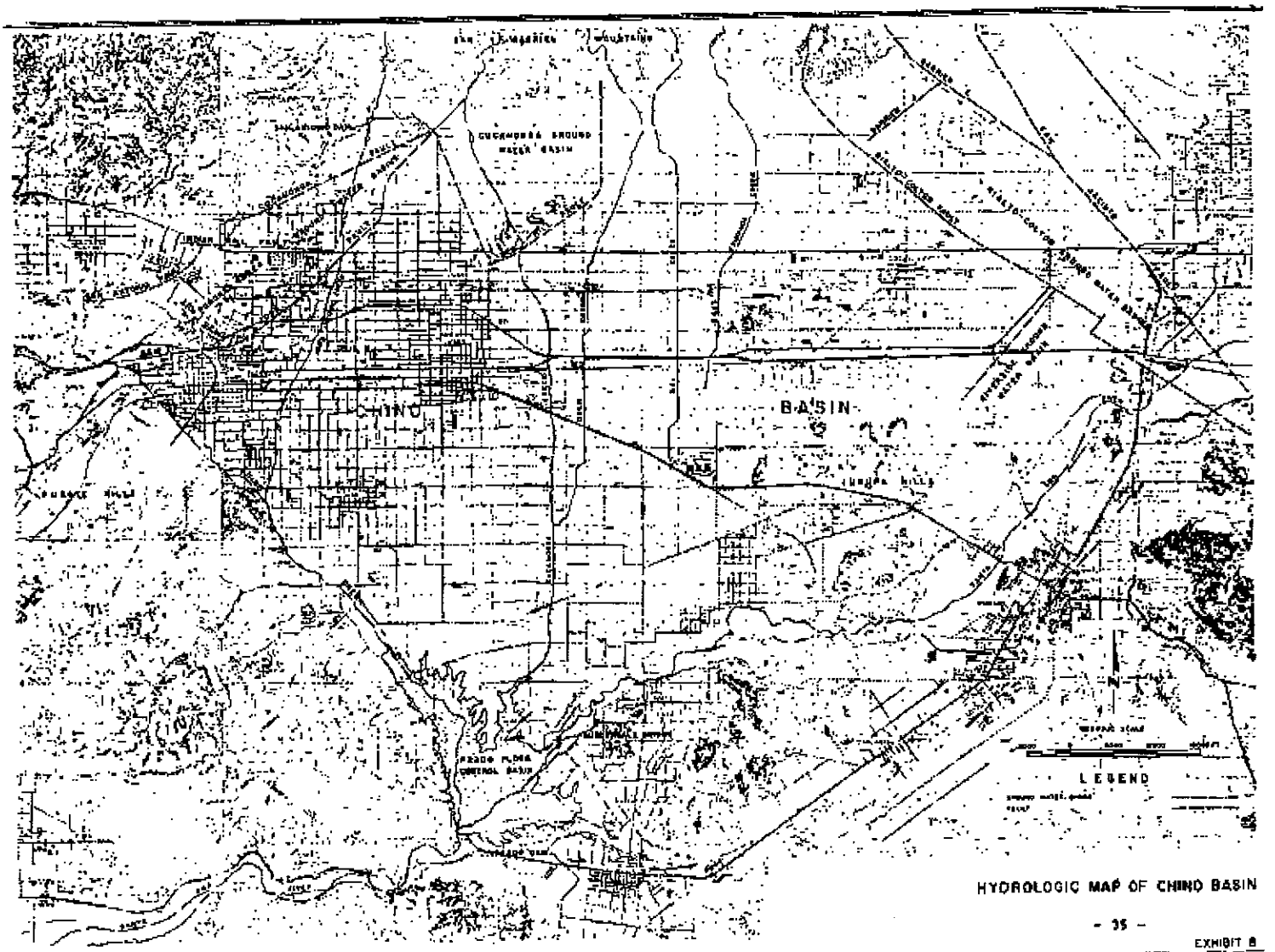


HYDROLOGIC MAP OF CHINO BASIN



EXHIBIT B

STIPULATING OVERLYING AGRICULTURAL PRODUCERS

STATE OF CALIFORNIA
COUNTY OF SAN BERNARDINO
Abacherli, Dairy, Inc.
Abacherli, Frank
Abacherli, Shirley
Abbona, Anna
Abbona, James
Abbona, Jim
Abbona, Mary
Agliani, Amelia H.
Agman, Inc.
Aguerre, Louis B.
Ahmanson Trust Co.
Akiyama, Shizuye
Akiyama, Tomoo
Akkerman, Dave
Albers, J.N.
Albers, Nellie
Alewyn, Jake J.
Alewyn, Normalee
Alger, Mary D.
Alger, Raymond
Allen, Ben F.
Allen, Jane F.
Alta-Dena Dairy
Anderson Farms
Anguiano, Sarah L.S.
Anker, Gus
Aphessetche, Xavier
Arena Mutual Water Assn.
Armstrong Nurseries, Inc.
Arretche, Frank
Arretche, Jean Pierre
Arvidson, Clarence F.
Arvidson, Florence
Ashley, George W.
Ashley, Pearl E.
Atlas Farms
Atlas Ornamental Iron Works, Inc.
Aukeman, Carol
Aukeman, Lewis
Ayers, Kenneth C., aka
Kelley Ayers
Bachoc, Raymond
Baldwin, Edgar A.
Baldwin, Lester
Banbury, Carolyn
Bangma Dairy
Bangma, Arthur
Bangma, Ida
Bangma, Martin
Bangma, Sam
Barba, Anthony B.
Barba, Frank
Barcellos, Joseph
Barnhill, Maurine W.

EXHIBIT "C"

1 Barnhill, Paul
2 Bartel, Dale
3 Bartel, Ursula
4 Bartel, Willard
5 Barthelemy, Henry
6 Barthelemy, Roland
7 Bassler, Donald V., M.D.
8 Bates, Lowell R.
9 Bates, Mildred L.
10 Beahm, James W.
11 Beahm, Joan M.
12 Bekendam, Hank
13 Bekendam, Pete
14 Bello, Eugene
15 Bello, Olga
16 Beltman, Evelyn
17 Beltman, Tony
18 Bergquist Properties, Inc.
19 Bevacqua, Joel A.
20 Bevacqua, Marie B.
21 Bidart, Bernard
22 Bidart, Michael J.
23 Binnell, Wesley
24 Black, Patricia E.
25 Black, Victor
26 Bodger, John & Sons Co.
27 Boer, Adrian
28 Boersma and Wind Dairy

Boersma, Angie
Boersma, Berdina
Boersma, Frank
Boersma, Harry
Boersma, Paul
Boersma, Sam
Boersma, William L.
Bohlander & Holmes, Inc.
Bokma, Peter
Bollema, Jacob
Boonstoo, Edward
Bootsma, Jim
Borba, Dolene
Borba, Dolores
Borba, Emily
Borba, George
Borba, John
Borba, John & Sons
Borba, John Jr.
Borba, Joseph A.
Borba, Karen E.
Borba, Karen M.
Borba, Pete, Estate of
Borba, Ricci
Borba, Steve
Borba, Tom
Bordisso, Alleck
Borges, Angelica M.

EXHIBIT "C"

Borges, Bernadette
Borges, John O.
Borges, Linda L.
Borges, Manual Jr.
Borges, Tony
Bos, Aleid
Bos, Gerrit
Bos, John
Bos, John
Bos, Margaret
Bos, Mary
Bos, Mary Beth
Bos, Tony
Bosch, Henrietta
Bosch, Peter T.
Boschma, Betty
Boschma, Frank
Boschma, Greta
Boschma, Henry
Bosma, Dick
Bosma, Florence G.
Bosma, Gerrit
Bosma, Jacob J.
Bosma, Jeanette Thea
Bosman, Frank
Bosman, Nellie
Bosnyak, Goldie M.
Bosnyak, Martin
Bothof, Roger W.
Bouma, Cornie
Bouma, Emma
Bouma, Henry P.
Bouma, Martin
Bouma, Peter G. & Sons Dairy
Bouma, Ted
Bouman, Helen
Bouman, Sam
Bower, Mabel E.
Boys Republic
Breedyk, Arie
Breedyk, Jessie
Briano Brothers
Briano, Albert
Briano, Albert Trustee for
Briano, Albert Frank
Briano, Lena
Brink, Russell N.
Brinkerhoff, Margaret
Brinkerhoff, Robert L.
Britschgi, Florence
Britschgi, Magdalena Garetto
Britschgi, Walter P.
Brommer, Marvin
Brookside Enterprizes, dba
Brookside Vineyard Co.
Brothers Three Dairy

EXHIBIT "C"

Brown, Eugene
Brun, Martha M.
Brun, Peter Robert
Buma, Duke
Buma, Martha
Bunse, Nancy
Bunse, Ronnie L.
Caballero, Bonnie L.
Caballero, Richard F.
Cable Airport Inc.
Cadlini, Donald
Cadlini, Jesse R.
Cadlini, Marie Edna
Cambio, Anna
Cambio, Charles, Estate of
Cambio, William V.
Cardoza, Florence
Cardoza, Olivi
Cardoza, Tony
Carnesi, Tom
Carver, Robt M., Trustee
Cauffman, John R.
Chacon Bros.
Chancon, Elvera P.
Chacon, Joe M.
Chacon, Robert M.
Chacon, Virginia L.
Chez, Joseph C.
Chino Corona Investment
Chino Water Co.
Christensen, Leslie
Christensen, Richard G.
Christian, Ada R.
Christian, Harold F.
Christy, Ella J.
Christy, Ronald S.
Cihigoyenetche, Jean
Cihigoyenetche, Leona
Cihigoyenetche, Martin
Clarke, Arthur B.
Clarke, Nancy L.
Clarke, Phyllis J.
Coelho, Isabel
Coelho, Joe A. Jr.
Collins, Howard E.
Collins, Judith F.
Collinsworth, Ester L.
Collinsworth, John E.
Collinsworth, Shelby
Cone Estate (05-2-00648/649)
Consolidated Freightways Corp. of Delaware
Corona Farms Co.
Corra, Rose
Costa, Dimas S.
Costa, Laura

EXHIBIT "C"

1 Costa, Myrtle
2 Costamagna, Antonio
3 Costamagna, Joseph
4 Cousyn, Claus B.
5 Cramer, Carole F.
6 Cramer, William R.
7 Crossroads Auto Dismantlers, Inc.
8 Crouse, Beatrice I.
9 Crouse, Roger
10 Crowley, Juanita C.
11 Crowley, Ralph
12 Cucamonga Vintners
13 D'Astici, Teresa
14 Da Costa, Cecilia B.
15 Da Costa, Joaquim F.
16 Daloisio, Norman
17 De Berard Bros.
18 De Berard, Arthur, Trustee
19 De Berard, Charles
20 De Berard, Chas., Trustee
21 De Berard, Helan J.
22 De Berard, Robert
23 De Berard, Robert Trustee
24 De Bie, Adrian
25 De Bie, Henry
26 De Bie, Margaret M.
27 De Bie, Marvin
28 De Boer, Fred

De Boer, L.H.
De Boer, Sidney
De Bos, Andrew
De Graaf, Anna Mae
De Graaf, Gerrit
De Groot, Dick
De Groot, Dorothy
De Groot, Ernest
De Groot, Henrietta
De Groot, Jake
De Groot, Pete Jr.
De Haan, Bernadena
De Haan, Henry
De Hoog, Adriana
De Hoog, Joe
De Hoog, Martin
De Hoog, Martin L.
De Hoog, Mitch
De Hoog, Tryntje
De Jager, Cobi
De Jager, Edward D.
De Jong Brothers Dairy
De Jong, Cornelis
De Jong, Cornelius
De Jong, Grace
De Jong, Jake
De Jong, Lena
De Leeuw, Alice

EXHIBIT "C"

1 De Leeuw, Sam
2 De Soete, Agnes
3 De Soete, Andre
4 De Vries, Abraham
5 De Vries, Case
6 De Vries, Dick
7 De Vries, Evelyn
8 De Vries, Henry, Estate of
9 De Vries, Hermina
10 De Vries, Jack H.
11 De Vries, Jane
12 De Vries, Janice
13 De Vries, John
14 De Vries, John J.
15 De Vries, Neil
16 De Vries, Ruth
17 De Vries, Theresa
18 De Wit, Gladys
19 De Wit, Peter S.
20 De Wyn, Evert
21 De Zoete, Hattie V.
22 Do Zoete, Leo A.
23 Decker, Hallie
24 Decker, Henry A.
25 Demmer, Ernest
26 Di Carlo, Marie
27 Di Carlo, Victor
28 Di Tommaso, Frank

Dirkse, Catherine
Dirkse, Charles C.
Dixon, Charles E.
Dixon, Geraldine A.
Doesberg, Hendrica
Doesburg, Theodorus, P.
Dolan, Marion
Dolan, Michael H.
Dominguez, Helen
Dominguez, Manual
Donkers, Henry A.
Donkers, Nellie G.
Dotta Bros.
Douma Brothers Dairy
Douma, Betty A.
Douma, Fred A.
Douma, Hendrika
Douma, Herman G.
Douma, Narleen J.
Douma, Phillip M.
Dow Chemical Co.
Dragt, Rheta
Dragt, William
Driftwood Dairy Farm
Droogh, Case
Duhalde, Marian
Duhalde, Lauren
Duits, Henrietta

EXHIBIT "C"

1 Duits, John

2 Dunlap, Edna Kraemer,

3 Estate of

4 Durrington, Glen

5 Durrington, William F.

6 Dusi, John Sr.

7 Dykstra, Dick

8 Dykstra, John

9 Dykstra, John & Sons

10 Dykstra, Wilma

11 Dyt, Cor

12 Dyt, Johanna

13 E and S Grape Growers

14 Eaton, Thomas, Estate of

15 Echeverria, Juan

16 Echeverria, Carlos

17 Echeverria, Pablo

18 Eilers, E. Myrle

19 Eilers, Henry W.

20 El Prado Golf Course

21 Ellsworth, Rex C.

22 Engelsma, Jake

23 Engelsma, Susan

24 Escojeda, Henry

25 Etiwanda Grape Products Co.

26 Euclid Ave. Investment One

27 Euclid Ave. Investment Four

28 Euclid Ave. Three Investment

Excelsior Farms
F.D.I.C.
Fagundes, Frank M.

Fagundes, Mary

Fernandes, Joseph Jr.

Fernandes, Velma C.

Ferraro, Ann

Ferreira, Frank J.

Ferreira, Joe C. Jr.

Ferreira, Narcie

Fillippi, J. Vintage Co.

Filippi, Joseph

Filippi, Joseph A.

Filippi, Mary E.

Fitzgerald, John R.

Flameling Dairy Inc.

Flamingo Dairy

Foss, Douglas E.

Foss, Gerald R.

Foss, Russel

Fred & John Troost No. 1 Inc.

Fred & Maynard Troost No. 2 Inc.

Freitas, Beatriz

Freitas, Tony T.

Gakle, Louis L.

Galleano Winery, Inc.

Galleano, Bernard D.

Galleano, D.

Galleano, Mary M.

EXHIBIT "C"

Garcia, Pete
Gardner, Leland V.
Gardner, Lola M.
Garrett, Leonard E.
Garrett, Patricia T.
Gastelluberry, Catherine
Gastelluberry, Jean
Gilstrap, Glen E.
Gilstrap, Marjorie J.
Godinho, John
Godinho, June
Gonsalves, Evelyn
Gonsalves, John
Gorzeman, Geraldine
Gorzeman, Henry A.
Gorzeman, Joe
Govea, Julia
Goyenetche, Albert
Grace, Caroline E.
Grace, David J.
Gravatt, Glenn W.
Gravatt, Sally Mae
Greydanus Dairy, Inc.
Greydanus, Rena
Griffin Development Co.
Haagsma, Dave
Haagsma, John
Hansen, Mary D.
Hansen, Raymond F.
Hanson, Ardeth W.
Harada, James T.
Harada, Violet A.
Haringa, Earl and Sons
Haringa, Herman
Haringa, Rudy
Haringa, William
Harper, Cecilia de Mille
Harrington, Winona
Harrison, Jacqueline A.
Hatanaka, Kenichi
Heida, Annie
Heida, Don
Heida, Jim
Heida, Sam
Helms, Addison D.
Helms, Irma A.
Hermans, Alma I.
Hermans, Harry
Hettinga, Arthur
Hettinga, Ida
Hettinga, Judy
Hettinga, Mary
Hettinga, Wilbur
Heublein, Inc., Grocery Products Group
Hibma, Catherine M.

EXHIBIT "C"

Hibma, Sidney
Hicks, Kenneth I.
Hicks, Minnie M.
Higgins Brick Co.
Highstreet, Alfred V.
Highstreet, Evada V.
Hilarides, Bertha as Trustee
Hilarides, Frank
Hilarides, John as Trustee
Hindelang, Tillie
Hindelang, William
Hobbs, Bonnie C.
Hobbs, Charles W.
Hobbs, Hazel I.
Hobbs, Orlo M.
Hoekstra, Edward
Hoekstra, George
Hoekstra, Grace
Hoekstra, Louie
Hofer, Paul B.
Hofer, Phillip F.
Hofstra, Marie
Hogeboom, Jo Ann M.
Hogeboom, Maurice D.
Hogg, David V.
Hogg, Gene P.
Hogg, Warren G.
Hohberg, Edith J.
Hohberg, Harold C.
Hohberg, Harold W.
Holder, Arthur B.
Holder, Dorothy F.
Holmes, A. Lee
Holmes, Frances P.
Hoogeboom, Gertrude
Hoogeboom, Pete
Hoogendam, John
Hoogendam, Tena
Houssels, J. K. Thoroughbred Farm
Hunt Industries
Idsinga, Ann
Idsinga, William W.
Imbach Ranch, Inc.
Imbach, Kenneth E.
Imbach, Leonard K.
Imbach, Oscar K.
Imbach, Ruth M.
Indaburu, Jean
Indaburu, Marceline
Iseli, Kurt H.
Ito, Kow
J & B Dairy Inc.
Jaques, Johnny C. Jr.
Jaques, Mary
Jaques, Mary Lou

EXHIBIT "C"

Jay Em Bee Farms
Johnson Bro's Egg Ranches, Inc.
Johnston, Ellwood W.
Johnston, George F. Co.
Johnston, Judith H.
Jones, Leonard P.
Jongsma & Sons Dairy
Jongsma, Diana A.
Jongsma, Dorothy
Jongsma, George
Jongsma, Harold
Jongsma, Henry
Jongsma, John
Jongsma, Nadine
Jongsma, Tillie
Jordan, Marjorie G.
Jordan, Troy O.
Jorritsma, Dorothy
Juliano, Albert
Kamper, Cornelis
Kamstra, Wilbert
Kaplan, Lawrence J.
Kasbergen, Martha
Kasbergen, Neil
Kazian, Angelen Estate of
Kingsway, Const. Corp.
Klapps Market
Kline, James K.
Knevelbaard, John
Knudsen, Ejnar
Knudsen, Karen M.
Knudsen, Kenneth
Knudson, Robert
Knudson, Darlene
Koel, Helen S.
Koetsier, Gerard
Koetsier, Gerrit J.
Koetsier, Jake
Koning, Fred W.
Koning, Gloria
Koning, J. W. Estate
Koning, James A.
Koning, Jane
Koning, Jane C.
Koning, Jennie
Koning, John
Koning, Victor A.
Kooi Holstein Corporation
Koolhaas, Kenneth E.
Koolhaas, Simon
Koolhaas, Sophie Grace
Koopal, Grace
Koopal, Silas
Koopman, Eka
Koopman, Gene T.
Koopman, Henry G.

EXHIBIT "C"

Koopman, Ted
Koopman, Tena
Koot, Nick
Koster, Aart
Koster, Frances
Koster, Henry B.
Koster, Nellie
Kroes, Jake R.
Kroeze, Bros
Kroeze, Calvin E.
Kroeze, John
Kroeze, Wesley
Kruckenberg, Naomi
Kruckenberg, Perry
L. D. S. Welfare Ranch
Labrucherie, Mary Jane
Labrucherie, Raymond F.
Lako, Samuel
Landman Corp.
Lanting, Broer
Lanting, Myer
Lass, Jack
Lass, Sandra L.
Lawrence, Cecelia, Estate of
Lawrence, Joe H., Estate of
Leal, Bradley W.
Leal, John C.
Leal, John Craig
Leck, Arthur A.
Leck, Evelyn M.
Lee, Harold E.
Lee, Helen J.
Lee, Henrietta C.
Lee, R. T. Construction Co.
Lekkerkerk, Adriana
Lekkerkerk, L. M.
Lekkerkerker, Nellie
Lekkerkerker, Walt
Lewis Homes of California
Livingston, Dorothy M.
Livingston, Rex E.
Lokey, Rosemary Kraemer
Lopes, Candida A.
Lopes, Antonio S.
Lopez, Joe D.
Lourenco, Carlos, Jr.
Lourenco, Carmelina P.
Lourenco, Jack C.
Lourenco, Manual H.
Lourenco, Mary
Lourenco, Mary
Luiten, Jack
Luiz, John M.
Luna, Christine I.
Luna, Ruben T.
Lusk, John D. and Sons
A California corporation

Lyon, Gregory E.
Lyon, Paula E.
M & W Co. #2
Madole, Betty M.
Madole, Larry B.
Marquez, Arthur
Marquine, Jean
Martin, Lelon O.
Martin, Leon O.
Martin, Maria D.
Martin, Tony J.
Martins, Frank
Mathias, Antonio
Mc Cune, Robert M.
Mc Masters, Gertrude
Mc Neill, J. A.
Mc Neill, May F.
Mees, Leon
Mello and Silva Dairy
Mello and Sousa Dairy
Mello, Emilia
Mello, Enos C.
Mello, Mercedes
Mendiondo, Catherine
Mendiondo, Dominique
Meth. Hosp. - Sacramento
Metzger, R. S.
Metzger, Winifred
Mickel, Louise
Miersma, Dorothy
Meirsma, Harry C.
Minaberry, Arnaud
Minaberry, Marie
Mistretta, Frank J.
Mocho and Plaa Inc.
Mocho, Jean
Mocho, Noeline
Modica, Josephine
Montes, Elizabeth
Montes, Joe
Moons, Beatrice
Moons, Jack
Moramarco, John A. Enterprise
Moreno, Louis W.
Moss, John R.
Motion Pictures Associates, Inc.
Moynier, Joe
Murphy, Frances V.
Murphy, Myrl L.
Murphy, Naomi
Nanne, Martin Estate of
Nederend, Betty
Nederend, Hans
Norfolk, James
Norfolk, Martha
Notrica, Louis

EXHIBIT "C"

Nyberg, Lillian N.
Nyenhuis, Annie
Nyenhuis, Jim
Occidental Land Research
Okumura, Marion
Okumura, Yuiche
Oldengarm, Effie
Oldengarm, Egbert
Oldengarm, Henry
Oliviera, Manuel L.
Oliviera, Mary M.
Olson, Albert
Oltmans Construction Co.
Omlin, Anton
Omlin, Elsie L.
Ontario Christian School Assn.
Oord, John
Oostdam, Jacoba
Oostdam, Pete
Oosten, Agnes
Oosten, Anthonia
Oosten, Caroline
Oosten, John
Oosten, Marinus
Oosten, Ralph
Orange County Water District
Ormonde, Manuel
Ormonde, Pete, Jr.
Ormonde, Viva
Ortega, Adeline B.
Ortega, Bernard Dino
Osterkamp, Joseph S.
Osterkamp, Margaret A.
P I E Water Co.
Palmer, Eva E.
Palmer, Walter E.
Parente, Luis S.
Parente, Mary Borba
Parks, Jack B.
Parks, Laura M.
Patterson, Lawrence E. Estate of
Payne, Clyde H.
Payne, Margo
Pearson, Athelia K.
Pearson, William C.
Pearson, William G.
Pene, Robert
Perian, Miller
Perian, Ona E.
Petrissans, Deanna
Petrissans, George
Petrissans, Jean P.
Petrissans, Marie T.
Pickering, Dora M.
(Mrs. A. L. Pickering)
Pierce, John

EXHIBIT "C"

Pierce, Sadie
Pietszak, Sally
Pine, Joe
Pine, Virginia
Pires, Frank
Pires, Marie
Plaa, Jeanne
Plaa, Michel
Plantenga, Agnes
Plantenga, George
Poe, Arlo D.
Pomona Cemetery Assn.
Porte, Cecelia, Estate of
Porte, Garritt, Estate of
Portsmouth, Vera McCarty
Ramella, Mary M.
Ramirez, Concha
Rearick, Hildegard H.
Rearick, Richard R.
Reinalda, Clarence
Reitsma, Greta
Reitsma, Louis
Rice, Bernice
Rice, Charlie E.
Richards, Karin
(Mrs. Ronnie Richards)
Richards, Ronald L.
Ridder, Jennie Wassenaar
Righetti, A. T.
Riley, George A.
Riley, Helen C.
Robbins, Jack K.
Rocha, John M.
Rocha, Jose C.
Rodrigues, John
Rodrigues, Manuel
Rodrigues, Manuel, Jr.
Rogrigues, Mary L.
Rodriquez, Daniel
Rogers, Jack D.
Rohrer, John A.
Rohrer, Theresa D.
Rohrs, Elizabeth H.
Rossetti, M. S.
Roukema, Angeline
Roukema, Ed.
Roukema, Nancy
Roukema, Siebren
Ruderian, Max J.
Russell, Fred J.
Rusticus, Ann
Rusticus, Charles
Rynsburger, Arie
Rynsburger, Berdena, Trust
Rynsburger, Joan Adele
Rynsburger, Thomas

EXHIBIT "C"

S. P. Annex, Inc.
Salisbury, Elinor J.
Sanchez, Edmundo
Sanchez, Margarita O.
Santana, Joe Sr.
Santana, Palmira
Satragni, John B. Jr.
Scaramella, George P.
Schaafsma Bros.
Schaafsma, Jennie
Schaafsma, Peter
Schaafsma, Tom
Schaap, Andy
Schaap, Ids
Schaap, Maria
Schacht, Sharon C.
Schakel, Audrey
Schakel, Fred
Schmid, Olga
Schmidt, Madeleine
Schoneveld, Evert
Schoneveld, Henrietta
Schoneveld, John
Schoneveld, John Allen
Schug, Donald E.
Schug, Shirley A.
Schuh, Bernatta M.
Schuh, Harold H.
Scott, Frances M.
Scott, Linda F.
Scott, Stanley A.
Scritsmier, Lester J.
Serl, Charles A.
Serl, Rosalie P.
Shady Grove Dairy, Inc.
Shamel, Burt A.
Shelby, Harold E.
Shelby, John A.
Shelby, Velma M.
Shelton, Alice A.
Sherwood, Robert W.
Sherwood, Sheila J.
Shue, Eva
Shue, Gilbert
Sieperda, Anne
Sieperda, James
Sigrist, Hans
Sigrist, Rita
Silveira, Arline L.
Silveira, Frank
Silveira, Jack
Silveira, Jack P. Jr.
Simas, Dolores
Simas, Joe
Singleton, Dean
Singleton, Elsie R.

EXHIBIT "C"

Sinnott, Jim
Sinnott, Mildred B.
Slegers, Dorothy
Slegers, Hubert J.
Slegers, Jake
Slegers, Jim
Slegers, Lenwood M.
Slegers, Martha
Slegers, Tesse J.
Smith, Edward S.
Smith, Helen D.
Smith, James E.
Smith, Keith J.
Smith, Lester W.
Smith, Lois Maxine
Smith, Marjorie W.
Soares, Eva
Sogioka, Mitsuyoshi
Sogioka, Yoshimato
Sousa, Sam
Southern Pacific Land Co.
Southfield, Eddie
Souza, Frank M.
Souza, Mary T.
Spickerman, Alberta
Spickerman, Florence
Spickerman, Rudolph
Spyksma, John
Staal, John
Stahl, Zippora P.
Stampfl, Berta
Stampfl, William
Stanley, Robert E.
Stark, Everett
Stellingwerf, Andrew
Stellingwerf, Henry
Stellingwerf, Jenette
Stellingwerf, Shana
Stellingwerf, Stan
Stelzer, Mike C.
Sterk, Henry
Stiefel, Winifred
Stiefel, Jack D.
Stigall, Richard L.
Stigall, Vita
Stockman's Inn
Stouder, Charlotte A.
Stouder, William C.
Struikmans, Barbara
Struikmans, Gertie
Struikmans, Henry Jr.
Struikmans, Henry Sr.
Struikmans, Nellie
Swager, Edward
Swager, Gerben
Swager, Johanna

EXHIBIT "C"

Swager, Marion
Swierstra, Donald
Swierstra, Fanny
Sybrandy, Ida
Sybrandy, Simon
Sytsma, Albert
Sytsma, Edith
Sytsma, Jennie
Sytsma, Louie
Te Velde, Agnes
Te Velde, Bay
Te Velde, Bernard A.
Te Velde, Bonnie
Te Velde, Bonnie G.
Te Velde, George
Te Velde, George, Jr.
Te Velde, Harm
Te Velde, Harriet
Te Velde, Henry J.
Te Velde, Jay
Te Velde, Johanna
Te Velde, John H.
Te Velde, Ralph A.
Te Velde, Zwaantina, Trustee
Ter Maaten, Case
Ter Maaten, Cleone
Ter Maaten, Steve
Terpstra, Carol
Terpstra, Theodore G.
Teune, Tony
Teunissen, Bernard
Teunissen, Jane
Thomas, Ethel M.
Thommen, Alice
Thommen, Fritz
Tillema, Allie
Tillema, Harold
Tillema, Klaas D.
Timmons, William R.
Tollerup, Barbara
Tollerup, Harold
Trapani, Louis A.
Trimlett, Arlene R.
Trimlett, George E.
Tristant, Pierre
Tuinhout, Ale
Tuinhout, Harry
Tuinhout, Hilda
Tuls, Elizabeth
Tuls, Jack S.
Tuls, Jake
Union Oil Company of California
United Dairyman's Co-op.
Urquhart, James G.
Usle, Cathryn
Usle, Faustino

EXHIBIT "C"

V & Y Properties
Vaile, Beryl M.
Valley Hay Co.
Van Beek Dairy Inc.
Van Canneyt Dairy
Van Canneyt, Maurice
Van Canneyt, Wilmer
Van Dam, Bas
Van Dam, Isabelle
Van Dam, Nellie
Van Den Berg, Gertrude
Van Den Berg, Joyce
Van Den Berg, Marinus
Van Den Berg, Marvin
Van Der Linden, Ardith
Van Der Linden, John
Van Der Linden, Stanley
Van Der Veen, Kenneth
Van Diest, Anna T.
Van Diest, Cornelius
Van Diest, Ernest
Van Diest, Rena
Van Dyk, Bart
Van Dyk, Jeanette
Van Foeken, Martha
Van Foeken, William
Van Hofwegen, Steve
Van Hofwegen, Adrian A.
Van Hofwegen, Clara
Van Hofwegen, Jessie
Van Klaveren, A.
Van Klaveren, Arie
Van Klaveren, Wilhelmina
Van Klaveren, William
Van Leeuwen, Arie C.
Van Leeuwen, Arie C.
Van Leeuwen, Arlan
Van Leeuwen, Clara G.
Van Leeuwen, Cornelia L.
Van Leeuwen, Harriet
Van Leeuwen, Jack
Van Leeuwen, John
Van Leeuwen, Letie
Van Leeuwen, Margie
Van Leeuwen, Paul
Van Leeuwen, William A.
Van Ravenswaay, Donald
Van Ryn Dairy
Van Ryn, Dick
Van Surksum, Anthonetta
Van Surksum, John
Van Veen, John
Van Vliet, Effie
Van Vliet, Hendrika
Van Vliet, Hugo
Van Vliet, Klaas

EXHIBIT "C"

1 Vande Witte, George
2 Vanden Berge, Gertie
3 Vanden Berge, Gertie
4 Vanden Berge, Jack
5 Vanden Berge, Jake
6 Vanden Brink, Stanley
7 Vander Dussen, Agnes
8 Vander Dussen, Cor
9 Vander Dussen, Cornelius
10 Vander Dussen, Edward
11 Vander Dussen, Geraldine Marie
12 Vander Dussen, James
13 Vander Dussen, John
14 Vander Dussen, Nelvina
15 Vander Dussen, Rene
16 Vander Dussen, Sybrand Jr.
17 Vander Dussen, Sybrand Sr.
18 Vander Dussen Trustees
19 Vander Eyk, Case Jr.
20 Vander Eyk, Case Sr.
21 Vander Feer, Peter
22 Vander Feer, Rieka
23 Vander Laan, Ann
24 Vander Laan, Ben
25 Vander Laan, Bill
26 Vander Laan, Corrie
27 Vander Laan, Henry
28 Vander Laan, James

Vander Laan, Katie
Vander Laan, Martin Jr.
Vander Laan, Tillie
Vander Leest, Anna
Vander Leest, Ann
Vander Meer, Alice
Vander Meer, Dick
Vander Poel, Hank
Vander Poel, Pete
Vander Pol, Irene
Vander Pol, Margie
Vander Pol, Marines
Vander Pol, William P.
Vander Schaaf, Earl
Vander Schaaf, Elizabeth
Vander Schaaf, Henrietta
Vander Schaaf, John
Vander Schaaf, Ted
Vander Stelt, Catherine
Vander Stelt, Clarence
Vander Tuig, Arlene
Vander Tuig, Sylvester
Vander Veen, Joe A.
Vandervlag, Robert
Vander Zwan, Peter
Vanderford, Betty W.
Vanderford, Claud R.
Vanderham, Adrian

EXHIBIT "C"

1 Vanderham, Cornelius
2 Vanderham, Cornelius P.
3 Vanderham, Cory
4 Vanderham, E. Jane
5 Vanderham, Marian
6 Vanderham, Martin
7 Vanderham, Pete C.
8 Vanderham, Wilma
9 Vasquez, Eleanor
10 Veenendaal, Evert
11 Veenendaal, John H.
12 Veiga, Dominick, Sr.
13 Verbree, Jack
14 Verbree, Tillie
15 Verger, Bert
16 Verger, Betty
17 Verhoeven, Leona
18 Verhoeven, Martin
19 Verhoeven, Wesley
20 Vermeer, Dick
21 Vermeer, Jantina
22 Vernola Ranch
23 Vernola, Anthonietta
24 Vernola, Anthony
25 Vernola, Frank
26 Vernola, Mary Ann
27 Vernola, Pat F.
28 Vestal, Frances Lorraine

Vestal, J. Howard
Visser, Gerrit
Visser, Grace
Visser, Henry
Visser, Jess
Visser, Louie
Visser, Neil
Visser, Sam
Visser, Stanley
Visser, Tony D.
Visser, Walter G.
Von Der Ahe, Fredric T.
Von Euw, George
Von Euw, Majorie
Von Lusk, a limited partnership
Voortman, Anna Marie
Voortman, Edward
Voortman, Edwin J.
Voortman, Gertrude Dena
Wagner, Richard H.
Walker, Carole R.
Walker, Donald E.
Walker, Wallace W.
Wardle, Donald M.
Warner, Dillon B.
Warner, Minnie
Wassenaar, Peter W.
Waters, Michael

EXHIBIT "C"

Weeda, Adriana
Weeda, Daniel
Weeks, O. L.
Weeks, Verona E.
Weidman, Maurice
Weidman, Virginia
Weiland, Adaline I.
Weiland, Peter J.
Wesselink, Jules
West, Katharine R.
West, Russel
West, Sharon Ann
Western Horse Property
Westra, Alice
Westra, Henry
Westra, Hilda
Westra, Jake J.
Weststeyn, Freida
Weststeyn, Pete
Whitehurst, Louis G.
Whitehurst, Pearl L.
Whitmore, David L.
Whitmore, Mary A.
Whitney, Adolph M.
Wiersema, Harm
Wiersema, Harry
Wiersma, Ellen H.
Wiersma, Gladys J.
Wiersma, Jake
Wiersma, Otto
Wiersma, Pete
Winchell, Verne H., Trustee
Wind, Frank
Wind, Fred
Wind, Hilda
Wind, Johanna
Woo, Frank
Woo, Sem Gee
Wybenga, Clarence
Wybenga, Gus
Wybenga, Gus K.
Wybenga, Sylvia
Wynja, Andy
Wynja, Iona F.
Yellis, Mildred
Yellis, Thomas E.
Ykema-Harmsen Dairy
Ykema, Floris
Ykema, Harriet
Yokley, Betty Jo
Yokley, Darrell A.
Zak, Zan
Zivelonghi, George
Zivelonghi, Margaret
Zwaagstra, Jake
Zwaagstra, Jessie M.
Zwart, Case

EXHIBIT "C"

NON-PRODUCER WATER DISTRICTS

Chino Basin Municipal Water District

Chino Basin Water Conservation District

Pomona Valley Municipal Water District

Western Municipal Water District of Riverside County

EXHIBIT "C"

DEFAULTING OVERLYING AGRICULTURAL PRODUCERS

Cheryl L. Bain
Warren Bain
John M. Barcelona
Letty Bassler
John Brazil
John S. Briano
Lupe Briano
Paul A. Briano
Tillie Briano
Arnie B. Carlson
John Henry Fikse
Phyllis S. Fikse
Lewellyn Flory
Mary I. Flory
L. H. Glazer
Dorothy Goodman
Sidney D. Goodman
Frank Grossi
Harada Brothers
Ellen Hettinga
Hein Hettinga
Dick Hofstra, Jr.
Benjamin M. Hughey
Frieda L. Hughey
Guillaume Indart
Ellwood B. Johnston, Trustee
Perry Kruckenberg, Jr.
Roy W. Lantis
Sharon I. Lantis
Frank Lorenz
Dagney H. MacDonald
Frank E. Martin
Ruth C. Martin
Connie S. Mello
Naldiro J. Mello
Felice Miller
Ted Miller
Masao Nerio
Tom K. Nerio
Toyo Nerio
Yuriko Nerio
Harold L. Rees
Alden G. Rose
Claude Rouleau, Jr.
Patricia M. Rouleau
Schultz Enterprises
Albert Shaw
Lila Shaw
Cathy M. Stewart
Marvin C. Stewart
Betty Ann Stone
John B. Stone
Vantoll Cattle Co., Inc.
Catherine Verburg

EXHIBIT "C"

Martin Verburg

Donna Vincent

Larry Vincent

Cliff Wolfe & Associates

Ada M. Woll

Zarubica Co.

EXHIBIT "C"

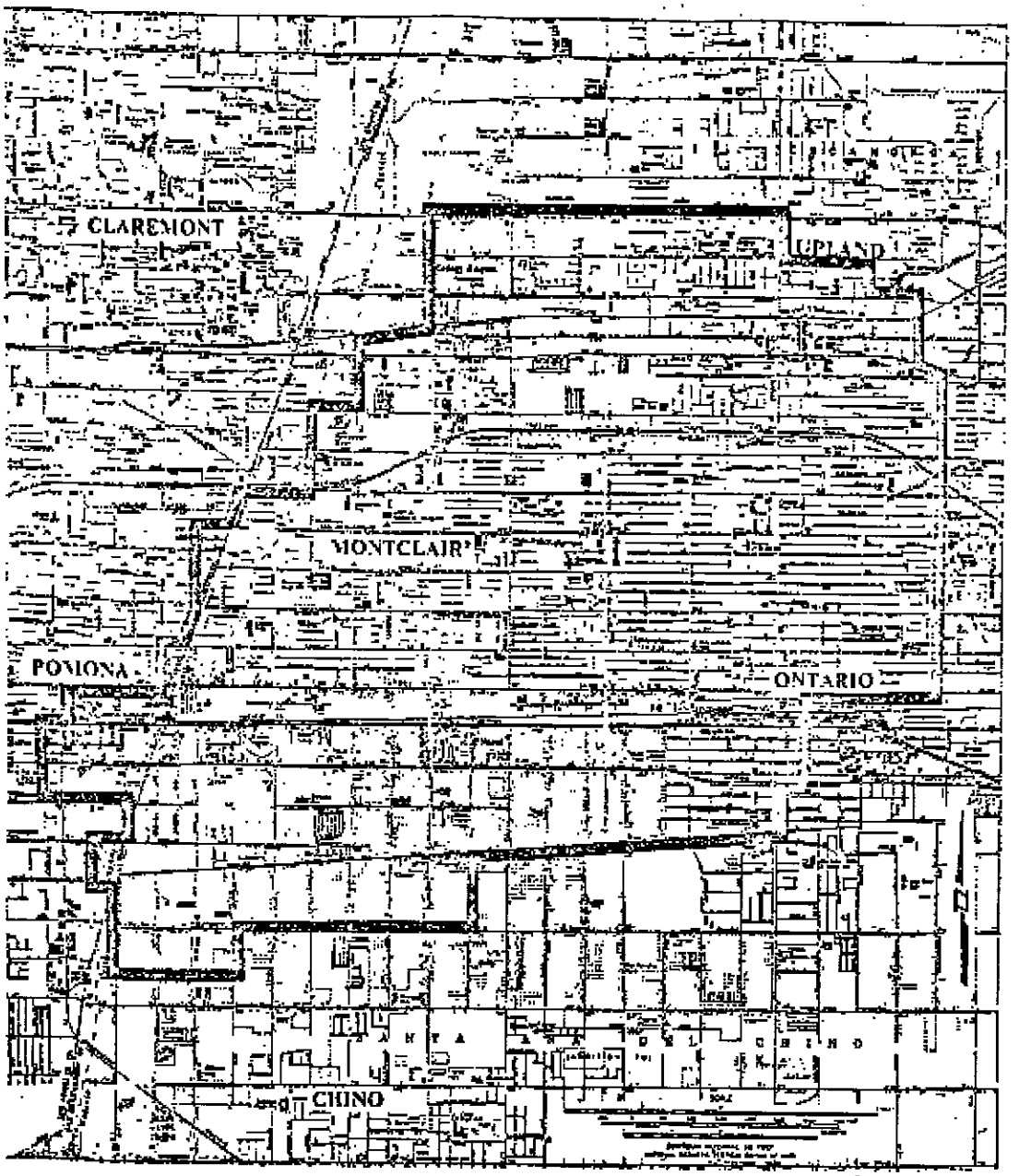


**CHINO BASIN**

**IN LIEU AREA NO. 1**

**EXHIBIT "J"**

EXHIBIT "D"

OVERLYING NON-AGRICULTURAL RIGHTS

| Party | Total Overlying Non-Agricultural Rights (Acre Feet) | Share of Safe Yield (Acre Feet) |
|---|---|---|
| Ameron Steel Producers | 125 | 97.858 |
| County Of San Bernardino | 171 | 133.870 |
| Conrock Company | 406 | 317.844 |
| Kaiser Steel Corporation | 3,743 | 2,930.274 |
| Red Star Fertilizer | 20 | 15.657 |
| Southern California Edison Co. | 1,255 | 982.499 |
| Space Center, Mira Loma | 133 | 104.121 |
| Southern Service Co., dba Blue Seal Linen | 24 | 18.789 |
| Sunkist, Orange Products Division | 2,393 | 1,873.402 |
| Carlsberg Mobile Home Properties, Ltd. '73 | 593 | 464.240 |
| Union Carbide Corporation | 546 | 427.446 |
| Quaker Chemical Co. | 0 | 0 |
| Totals | 9,409 | 7,366.00 |

EXHIBIT "E"

APPROPRIATIVE RIGHTS

| Party | Appropriative Right (Acre Feet) | Share of Initial Operating Safe Yield (Acre Feet) | Share of Operating Safe Yield (Percent) |
|---|---|---|---|
| City of Chino | 5,271.7 | 3,670.067 | 6.693 |
| City of Norco | 289.5 | 201.545 | 0.368 |
| City of Ontario | 16,337.4 | 11,373.816 | 20.742 |
| City of Pomona | 16,110.5 | 11,215.852 | 20.454 |
| City of Upland | 4,097.2 | 2,852.401 | 5.202 |
| Cucamonga County Water District | 4,431.0 | 3,084.786 | 5.626 |
| Jurupa Community Services District | 1,104.1 | 768.655 | 1.402 |
| Monte Vista County Water District | 5,958.7 | 4,148.344 | 7.565 |
| West San Bernardino County Water District | 925.5 | 644.317 | 1.175 |
| Etiwanda Water Company | 768.0 | 534.668 | 0.975 |
| Felspar Gardens Mutual Water Company | 68.3 | 47.549 | 0.087 |
| Fontana Union Water Co. | 9,188.3 | 6,396.736 | 11.666 |
| Marygold Mutual Water Co. | 941.3 | 655.317 | 1.195 |
| Mira Loma Water Co. | 1,116.0 | 776.940 | 1.417 |
| Monte Vista Irr. Co. | 972.1 | 676.759 | 1.234 |
| Mutual Water Company of Glen Avon Heights | 672.2 | 467.974 | 0.853 |
| Park Water Company | 236.1 | 164.369 | 0.300 |
| Pomona Valley Water Co. | 3,106.3 | 2,162.553 | 3.944 |
| San Antonio Water Co. | 2,164.5 | 2,506.888 | 2.748 |
| Santa Ana River Water Company | 1,869.3 | 1,301.374 | 2.373 |
| Southern California Water Company | 1,774.5 | 1,235.376 | 2.253 |
| West End Consolidated Water Company | 1,361.3 | 947.714 | 1.728 |
| TOTAL | 78,763.8 | 54,834.000 | 100.000 |

EXHIBIT 'E'

EXHIBIT "F"
OVERLYING (AGRICULTURAL) POOL
POOLING PLAN

1. Membership in Pool. The State of California and all producers listed in Exhibit "C" shall be the initial members of this pool, which shall include all producers of water for overlying uses other than industrial or commercial purposes.

2. Pool Meetings. The members of the pool shall meet annually, in person or by proxy, at a place and time to be designated by Watermaster for purposes of electing members of the Pool Committee and conducting any other business of the pool. Special meetings of the membership of the pool may be called and held as provided in the rules of the pool.

3. Voting. All voting at meetings of pool members shall be on the basis of one vote for each 100 acre feet or any portion thereof of production from Chino Basin during the preceding year, as shown by the records of Watermaster.

4. Pool Committee. The Pool Committee for this pool shall consist of not less than nine (9) representatives selected at large by members of the pool. The exact number of members of the Pool Committee in any year shall be as determined by majority vote of the voting power of members of the pool in attendance at the annual pool meeting. Each member of the Pool Committee shall have one vote and shall serve for a two-year term. The members first elected shall classify themselves by lot so that approximately one-half serve an initial one-year term. Vacancies during any term shall be filled by a majority of the remaining members of the Pool Committee.

5. Advisory Committee Representatives. The number of

representatives of the Pool Committee on the Advisory Committee shall be as provided in the rules of the pool from time to time but not exceeding ten (10). The voting power of the pool on the Advisory Committee shall be apportioned and exercised as determined from time to time by the Pool Committee.

6. Replenishment Obligation. The pool shall provide funds for replenishment of any production by persons other than members of the Overlying (Non-agricultural) Pool or Appropriator Pool, in excess of the pool's share of Safe Yield. During the first five (5) years of operations of the Physical Solution, reasonable efforts shall be made by the Pool Committee to equalize annual assessments.

7. Assessments. All assessments in this pool (whether for replenishment water cost or for pool administration or the allocated share of Watermaster administration) shall be in an amount uniformly applicable to all production in the pool during the preceding year or calendar quarter. Provided, however, that the Agricultural Pool Committee, may recommend to the Court modification of the method of assessing pool members, inter se, if the same is necessary to attain legitimate basin management objectives, including water conservation and avoidance of undesirable socio-economic consequences. Any such modification shall be initiated and ratified by one of the following methods:

(a) Excess Production. - In the event total pool production exceeds 100,000 acre feet in any year, the Pool Committee shall call and hold a meeting, after notice to all pool members, to consider remedial modification of the assessment formula.

(b) Producer Petition. - At any time after the fifth full year of operation under the Physical Solution, a petition by ten percent (10%) of the voting power or membership of the Pool shall compel the holding of a noticed meeting to consider revision of said formula of assessment for replenishment water.

In either event, a majority action of the voting power in attendance at such pool members' meeting shall be binding on the Pool Committee.

8. Rules. The Pool Committee shall adopt rules for conducting meetings and affairs of the committee and for administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

EXHIBIT "G"
OVERLYING (NON-AGRICULTURAL) POOL
POOLING PLAN

1. Membership in Pool. The initial members of the pool, together with the decreed share of the Safe Yield of each, are listed in Exhibit "D". Said pool includes producers of water for overlying industrial or commercial (non-agricultural) purposes, or such producers within the Pool who may hereafter take water pursuant to Paragraph 8 hereof.

2. Pool Committee. The Pool Committee for this pool shall consist of one representative designated by each member of the pool. Voting on the committee shall be on the basis of one vote for each member, unless a volume vote is demanded, in which case votes shall be allocated as follows:

The volume voting power on the Pool Committee shall be 1,484 votes. Of these, 742 votes shall be allocated on the basis of one vote for each ten (10) acre feet or fraction thereof of decreed shares in Safe Yield. (See Exhibit "D") The remaining 742 votes shall be allocated proportionally on the basis of assessments paid to Watermaster during the preceding year.*

3. Advisory Committee Representatives. At least three (3) members of the Pool Committee shall be designated by said committee to serve on the Advisory Committee. The exact number of such representatives at any time shall be as determined by the Pool Committee. The voting power of the pool shall be exercised in the

*Or production assessments paid under Water Code Section 72140 et seq., as to years prior to the second year of operation under the Physical Solution hereunder.

Advisory Committee as a unit, based upon the vote of a majority of said representatives.

4. Replenishment Obligation. The pool shall provide funds for replenishment of any production in excess of the pool's share of Safe Yield in the preceding year.

5. Assessment. Each member of this pool shall pay an assessment equal to the cost of replenishment water times the number of acre feet of production by such producer during the preceding year in excess of (a) his decreed share of the Safe Yield, plus (b) any carry-over credit under Paragraph 7 hereof. In addition, the cost of the allocated share of Watermaster administration expense shall be recovered on an equal assessment against each acre foot of production in the pool during such preceding fiscal year or calendar quarter; and in the case of Pool members who take substitute ground water as set forth in Paragraph 8 hereof, such producer shall be liable for its share of administration assessment, as if the water so taken were produced, up to the limit of its decreed share of Safe Yield.

6. Assignment. Rights herein decreed are appurtenant to the land and are only assignable with the land for overlying use thereon; provided, however, that any appropriator who may, directly or indirectly, undertake to provide water service to such overlying lands may, by an appropriate agency agreement on a form approved by Watermaster, exercise said overlying right to the extent, but only to the extent necessary to provide water service to said overlying lands.

7. Carry-over. Any member of the pool who produces less than its assigned water share of Safe Yield may carry such unexercised

right forward for exercise in subsequent years. The first water produced during any such subsequent year shall be deemed to be an exercise of such carry-over right. In the event the aggregate carry-over by any pool member exceeds its share of Safe Yield, such member shall, as a condition of preserving such surplus carry-over, execute a storage agreement with Watermaster.

8. Substitute Supplies. To the extent that any Pool member, at the request of Watermaster and with the consent of the Advisory Committee, takes substitute surface water in lieu of producing ground water otherwise subject to production as an allocated share of Safe Yield, said party shall nonetheless remain a member of this Pool.

9. Rules. The Pool Committee shall adopt rules for administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

EXHIBIT "G"

EXHIBIT "H"
APPROPRIATIVE POOL
POOLING PLAN

1. Qualification for Pool. Any city, district or other public entity and public utility -- either regulated under Public Utilities Commission jurisdiction, or exempt therefrom as a non-profit mutual water company (other than those assigned to the Overlying (Agricultural) Pool) -- shall be a member of this pool. All initial members of the pool are listed in Exhibit "E", together with their respective appropriative rights and acre foot allocation and percentage shares of the initial and subsequent Operating Safe Yield.

2. Pool Committee. The Pool Committee shall consist of one (1) representative appointed by each member of the Pool.

3. Voting. The total voting power on the Pool Committee shall be 1,000 votes. Of these, 500 votes shall be allocated in proportion to decreed percentage shares in Operating Safe Yield. The remaining 500 votes shall be allocated proportionally on the basis of assessments paid to Watermaster during the preceding year.* Routine business of the Pool Committee may be conducted on the basis of one vote per member, but upon demand of any member a weighted vote shall be taken. Affirmative action of the Committee shall require a majority of the voting power of members in attendance, provided that it includes concurrence by at least one-third of its total members.

4. Advisory Committee Representatives. Ten (10) members of

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*Or production assessments paid under Water Code Section 72140 et seq., as to years prior to the second year of operation under the Physical Solution hereunder.

the Pool Committee shall be designated to represent this pool on the Advisory Committee. Each major appropriator, i.e., the owner of an adjudicated appropriative right in excess of 3,000 acre feet, shall be entitled to one representative. The remaining members representing the Appropriative Pool on the Advisory Committee shall be elected at large by the remaining members of the pool. The voting power of the Appropriative Pool on the Advisory Committee shall be apportioned between the major appropriator representatives in proportion to their respective voting power in the Pool Committee. The remaining two representatives shall exercise equally the voting power proportional to the Pool Committee voting power of all remaining appropriators; provided, however, that if any representative fails to attend an Advisory Committee meeting, the voting power of that representative shall be allocated among the representatives of the Appropriator Pool in attendance in the same proportion as their own respective voting powers.

5. Replenishment Obligation. The pool shall provide funds for purchase of replenishment water to replace any production by the pool in excess of Operating Safe Yield during the preceding year.

6. Administrative Assessment. Costs of administration of this pool and its share of general Watermaster expense shall be recovered by a uniform assessment applicable to all production during the preceding year.

7. Replenishment Assessment. The cost of replenishment water required to replace production from Chino Basin in excess of Operating Safe Yield in the preceding year shall be allocated and recovered as follows:

(a) For production, other than for increased export, within CBMWD or WMWD:

(1) Gross Assessment. 15% of such replenishment water costs shall be recovered by a uniform assessment against all production of each appropriator producing in said area during the preceding year.

(2) Net Assessment. The remaining 85% of said costs shall be recovered by a uniform assessment on each acre foot of production from said area by each such appropriator in excess of his allocated share of Operating Safe Yield during said preceding year.

(b) For production which is exported for use outside Chino Basin in excess of maximum export in any year through 1976, such increased export production shall be assessed against the exporting appropriator in an amount sufficient to purchase replenishment water from CBMWD or WMWD in the amount of such excess.

(c) For production within SBVMWD or PVMWD:

By an assessment on all production in excess of an appropriator's share of Operating Safe Yield in an amount sufficient to purchase replenishment water through SBVMWD or MWD in the amount of such excess.

8. Socio-Economic Impact Review. The parties have conducted certain preliminary socio-economic impact studies. Further and more detailed socio-economic impact studies of the assessment formula and its possible modification shall be undertaken for the Appropriator Pool by Watermaster no later than ten (10) years from the effective date of this Physical Solution, or whenever total

production by this pool has increased by 30% or more over the decreed appropriative rights, whichever is first.

9. Facilities Equity Assessment. Watermaster may, upon recommendation of the Pool Committee, institute proceedings for levy and collection of a Facilities Equity Assessment for the purposes and in accordance with the procedures which follow:

(a) Implementing Circumstances. - There exist several sources of supplemental water available to chino Basin, each of which has a differential cost and quantity available. The optimum management of the entire Chino Basin water resource favors the maximum use of the lowest cost supplemental water to balance the supplies of the Basin, in accordance with the Physical Solution. The varying sources of supplemental water include importations from MWD and SBVMWD, importation of surface and ground water supplies from other basins in the immediate vicinity of Chino Basin, and utilization of reclaimed water. In order to fully utilize any of such alternate sources of supply, it will be essential for particular appropriators having access to one or more of such supplies to have invested, or in the future to invest, directly or indirectly, substantial funds in facilities to obtain and deliver such water to an appropriate point of use. To the extent that the use of less expensive alternative sources of supplemental water can be maximized by the inducement of a Facilities Equity Assessment, as herein provided, it is to the long-term benefit of the entire basin that such assessment be authorized and levied by Watermaster.

(b) Study and Report. - At the request of the Pool

Committee, Watermaster shall undertake a survey study of the utilization of alternate supplemental supplies by members of the Appropriative Pool which would not otherwise be utilized and shall prepare a report setting forth the amount of such alternative supplies being currently utilized, the amount of such supplies which could be generated by activity within the pool, and the level of cost required to increase such uses and to optimize the total supplies available to the basin. Said report shall contain an analysis and recommendation for the levy of a necessary Facilities Equity Assessment to accomplish said purpose.

(c) Hearing. - If the said report by Watermaster contains a recommendation for imposition of a Facilities Equity Assessment, and the Pool Committee so requests, Watermaster shall notice and hold a hearing not less than 60 days after distribution of a copy of said report to each member of the pool, together with a notice of the hearing date. At such hearing, evidence shall be taken with regard to the necessity and propriety of the levy of a Facilities Equity Assessment and full findings and decision shall be issued by Watermaster.

(d) Operation of Assessment. - If Watermaster determines that it is appropriate that a Facilities Equity Assessment be levied in a particular year, the amount of additional supplemental supplies which should be generated by such assessment shall be estimated. The cost of obtaining such supplies, taking into consideration the investment in necessary facilities shall then be determined and spread equitably among the producers within the pool in a manner so that those

producers not providing such additional lower cost supplemental water, and to whom a financial benefit will result, may bear a proportionate share of said costs, not exceeding said benefit; provided that any producer furnishing such supplemental water shall not thereby have its average cost of water in such year reduced below such producer's average cost of pumping from the Basin. In so doing, Watermaster shall establish a percentage of the total production by each party which may be produced without imposition of a Facilities Equity Assessment. Any member of the pool producing more water than said percentage shall pay such Facilities Equity Assessment on any such excess production. Watermaster is authorized to transmit and pay the proceeds of such Facilities Equity Assessment to those producers who take less than their share of Basin water by reason of furnishing a higher percentage of their requirements through use of supplemental water.

10. Unallocated Safe Yield Water. To the extent that, in any five years, any portion of the share of Safe Yield allocated to the Overlying (Agricultural) Pool is not produced, such water shall be available for reallocation to members of the Appropriative Pool, as follows:

(a) Priorities. - Such allocation shall be made in the following sequence:

(1) to supplement, in the particular year, water available from Operating Safe Yield to compensate for any reduction in the Safe Yield by reason of recalculation thereof after the tenth year of operation hereunder.

(2) pursuant to conversion claims as defined in Subparagraph (b) hereof.

(3) as a supplement to Operating Safe Yield, without regard to reductions in Safe Yield.

(b) Conversion Claims. - The following procedures may be utilized by any appropriator:

(1) Record of Land Use Conversion. Any appropriator who undertakes, directly or indirectly, during any year, to permanently provide water service to lands which during the immediate preceding five (5) consecutive years was devoted to irrigated agriculture may report such change in land use or water service to Watermaster. Watermaster shall thereupon verify such change in water service and shall maintain a record and account for each appropriator of the total acreage involved and the average annual water use during said five-year period.

(2) Establishment of Allocation Percentage. In any year in which unallocated Safe Yield water from the Overlying (Agricultural) Pool is available for such conversion claims, Watermaster shall establish allocable percentages for each appropriator based upon the total of such converted acreage recorded to each such appropriator's account.

(3) Allocation and Notice. Watermaster shall thereafter apply the allocated percentage to the total unallocated Safe Yield water available for special allocation to derive the amount thereof allocable to

each appropriator; provided that in no event shall the allocation to any appropriator as a result of such conversion claim exceed 50% of the average annual amount of water actually applied to the areas converted by such appropriator prior to such conversion. Any excess water by reason of such limitation on any appropriator's right shall be added to Operating Safe Yield. Notice of such special allocation shall be given to each appropriator and shall be treated for purposes of this Physical Solution as an addition to such appropriator's share of the Operating Safe Yield for the particular year only.

(4) Administrative Costs. Any costs of Watermaster attributable to administration of such special allocations and conversion claims shall be assessed against appropriators participating in such reporting.

11. In Lieu Procedures. There are, or any develop, certain areas within Chino Basin where good management practices dictate that recharge of the basin be accomplished, to the extent practical, by taking surface supplies of supplemental water in lieu of ground water otherwise subject to production as an allocated share of Operating Safe Yield.

(a) Method of Operation. - An appropriator producing water within such designated in lieu area who is willing to abstain for any reason from producing any portion of such producer's share of Operating Safe Yield in any year may offer such unpumped water to Watermaster. In such event, Watermaster shall purchase said water in place, in lieu of spreading replenishment water, which is otherwise required to

make up for over production. The purchase price for in lieu water shall be the lesser of:

(1) Watermaster's current cost of replenishment water, whether or not replenishment water is currently then obtainable, plus the cost of spreading; or

(2) The cost of supplemental surface supplies to the appropriator, less

a. said appropriator's average cost of ground water production, and

b. the applicable production assessment were the water produced.

Where supplemental surface supplies consist of MWD or SBVMWD supplies, the cost of treated, filtered State water from such source shall be deemed the cost of supplemental surface supplies to the appropriator for purposes of such calculation.

In any given year in which payments may be made pursuant to a Facilities Equity Assessment, as to any given quantity of water the party will be entitled to payment under this section or pursuant to the Facilities Equity Assessment, as the party elects, but not under both.

(b) Designation of In Lieu Areas. - The first in lieu area is designated as the "In Lieu Area No. 1" and consists of an area wherein nitrate levels in the ground water generally exceed 45 mg/l, and is shown on Exhibit "J" hereto. Other in lieu areas may be designated by subsequent order of Watermaster upon recommendation or approval by Advisory Committee. Said in lieu areas may be enlarged, reduced or

eliminated by subsequent orders; provided, however, that designation of In Lieu Areas shall be for a minimum fixed term sufficient to justify necessary capital investment. In Lieu Area No. 1 may be enlarged, reduced or eliminated in the same manner, except that any reduction of its original size or elimination thereof shall require the prior order of Court.

12. Carry-over. Any appropriator who produces less than his assigned share of Operating Safe Yield may carry such unexercised right forward for exercise in subsequent years. The first water produced during any such subsequent year shall be deemed to be an exercise of such carry-over right. In the event the aggregate carry-over by any appropriator exceeds its share of Operating Safe Yield, such appropriator shall, as a condition of preserving such surplus carry-over, execute a storage agreement with Watermaster. Such appropriator shall have the option to pay the gross assessment applicable to such carry-over in the year in which it accrued.

13. Assignment, Transfer and Lease. Appropriative rights, and corresponding shares of Operating Safe Yield, may be assigned or may be leased or licensed to another appropriator for exercise in a given year. Any transfer, lease or license shall be ineffective until written notice thereof is furnished to and approved as to form by Watermaster, in compliance with applicable Watermaster rules. Watermaster shall not approve transfer, lease or license of a right for exercise in an area or under conditions where such production would be contrary to sound basin management or detrimental to the rights or operations of other producers.

14. Rules. The Pool Committee shall adopt rules for

administering its program and in amplification of the provisions, but not inconsistent with, this pooling plan.

EXHIBIT "I"

ENGINEERING APPENDIX

1. Basin Management Parameters. In the process of implementing the physical solution for Chino Basin, Watermaster shall consider the following parameters:

(a) Pumping Patterns. - Chino Basin is a common supply for all persons and agencies utilizing its waters. It is an objective in management of the Basin's waters that no producer be deprived of access to said waters by reason of unreasonable pumping patterns, nor by regional or localized recharge of replenishment water, insofar as such result may be practically avoided.

(b) Water Quality. - Maintenance and improvement of water quality is a prime consideration and function of management decisions by Watermaster.

(c) Economic Considerations. - Financial feasibility, economic impact and the cost and optimum utilization of the Basin's resources and the physical facilities of the parties are objectives and concerns equal in importance to water quantity and quality parameters.

2. Operating Safe Yield. Operating Safe Yield in any year shall consist of the Appropriative Pool's hare of Safe Yield of the Basin, plus any controlled overdraft of the Basin which Watermaster may authorize. In adopting the Operating Safe Yield for any year, Watermaster shall be limited as follows:

(a) Accumulated Overdraft. - During the operation of this Judgment and Physical Solution, the overdraft accumulated from and after the effective date of the Physical

Solution and resulting from an excess of Operating Safe Yield over Safe Yield shall not exceed 200,000 acre feet.

(b) Quantitative Limits. - In no event shall Operating Safe Yield in any year be less than the Appropriative Pool's share of Safe Yield, nor shall it exceed such share of Safe Yield by more than 10,00 acre feet. The initial Operating Safe Yield is hereby set at 54,834 acre feet per year. Operating Safe Yield shall not be changed upon less than five (5) years' notice by Watermaster.

Nothing contained in this paragraph shall be deemed to authorize, directly or indirectly, any modification of the allocation of shares in Safe Yield to the overlying pools, as set forth in Paragraph 44 of the Judgment.

3. Ground Water Storage Agreements. Any agreements authorized by Watermaster for storage of supplemental water in the available ground water storage capacity of Chino Basin shall include, but not be limited to:

(a) The quantities and term of the storage right.

(b) A statement of the priority or relation of said right, as against overlying or Safe Yield uses, and other storage rights.

(c) The procedure for establishing delivery rates, schedules and procedures which may include:

[1] spreading or injection, or

[2] in lieu deliveries of supplemental water for direct use.

(d) The procedures for calculation of losses and annual accounting for water in storage by Watermaster.

(e) The procedures for establishment and administration of withdrawal schedules, locations and methods.

CHINO BASIN

IN LIEU ARE NO. 1 (MAP)

EXHIBIT "J"

LEGAL DESCRIPTION

OF CHINO BASIN

Preamble

All of the townships and ranges referred to in the following legal description are the San Bernardino Base and Meridian. Certain designated sections are implied as the System of Government Surveys may be extended where not established. Said sections are identified as follows:

Section 20, T1N, R8W is extended across Rancho Cucamonga;

Section 36, T1N, R8W is extended across the City of Upland;

Sections 2,3, and 4, T1S, R7W are extended across Rancho Cucamonga;

Section 10, T1S, R8W is extended across the City of Claremont;

Sections 19, 20, 21, 30, 31 and 32, T1S, R8W are extended across the City of Pomona;

Sections 4, 5, and 28, T2S, R8W are extended across Rancho Santa Ana Del Chino;

Sections 15 and 16, T3S, R7W are extended across Rancho La Sierra; and

Sections 17 and 20, T3S, R7W are extended across Rancho El Rincon.

Description

Chino Basin is included within portions of the Counties of San Bernardino, Riverside and Los Angeles, State of California, bounded by a continuous line described as follows:

BEGINNING at the Southwest corner of Lot 241 as shown on Map of Ontario Colony Lands, recorded in Map Book 11, page 6, Office of the County Recorder of San Bernardino County, said corner being the Point of Beginning;

1. Thence Southeasterly to the Southeast corner

of Lot 419 of said Ontario Colony Lands;

2. Thence Southeasterly to a point 1300 feet North of the South line and 1300 feet East of the West line of Section 4, T1S, R7W;

3. Thence Easterly to a point on the East line of Section 4, 1800 feet North of the Southeast corner of said Section 4;

4. Thence Easterly to the Southeast corner of the Southwest quarter of the Northeast quarter of Section 3, T1S, R7W;

5. Thence Northeasterly to a point on the North line of Section 2, T1S, R7W, 1400 feet East of the West line of said Section 2;

6. Thence Northeasterly to the Southwest corner of Section 18, T1N, R6W;

7. Thence Northerly to the Northwest corner of said Section 18;

8. Thence Easterly to the Northeast corner of said Section 18;

9. Thence Northerly to the Northwest corner of the Southwest Quarter of Section 8, T1N, R6W;

10. Thence Easterly to the Northeast corner of said Southwest quarter of said Section 8;

11. Thence Southerly to the Southeast corner of said Southwest Quarter of said Section 8;

12. Thence Easterly to the Northeast corner of Section 17, T1N, R6W;

13. Thence Easterly to the Northeast corner of Section 16, T1N, R6W;

14. Thence Southeasterly to the Northwest corner of the Southeast quarter of Section 15, T1N, R6W;

15. Thence Easterly to the Northeast corner of said Southeast quarter of said Section 15;

16. Thence Southeasterly to the Northwest corner of the Northeast quarter of Section 23, T1N, R6W;

17. Thence Southeasterly to the Northwest corner of Section 25, T1N, R6W;

EXHIBIT "K"

18. Thence Southeasterly to the Northwest corner of the Northeast quarter of Section 31, T1N, R5W;

19. Thence Southeasterly to the Northeast corner of the Northwest quarter of Section 5, T1S, R5W;

20. Thence Southeasterly to the Southeast corner of Section 4, T1S, R5W;

21. Thence Southeasterly to the Southeast corner of the Southwest quarter of Section 11, T1S, R5W;

22. Thence Southwesterly to the Southwest corner of Section 14, T1S, R5W;

23. Thence Southwest to the Southwest corner of Section 22, T1S, R5W;

24. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 6, T2S, R5W;

25. Thence Southeasterly to the Northeast corner of Section 18, T2S, R5W;

26. Thence Southwesterly to the Southwest corner of the Southeast quarter of Section 13, T2S, R6W;

27. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 26, T2S, R6W;

28. Thence Westerly to the Southwest corner of the Northwest quarter of said Section 26;

29. Thence Northerly to the Northwest corner of said Section 26;

30. Thence Westerly to the Southwest corner of Section 21, T2S, R6W;

31. Thence Southerly to the Southeast corner of Section 29, T2S, R6W;

32. Thence Westerly to the Southeast corner of Section 30, T2S, R6W;

33. Thence Southwesterly to the Southwest corner of Section 36, T2S, R7W;

34. Thence Southwesterly to the Southeast corner of Section 3, T3S, R7W;

35. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 10, T3S, R7W;

36. Thence Southerly to the Northeast corner of the Northwest quarter of Section 15, T3S, R7W;

37. Thence Southwesterly to the Southeast corner of the Northeast quarter of Section 16, T3S, R7W;

38. Thence Southwesterly to the Southwest corner of said Section 16;

39. Thence Southwesterly to the Southwest corner of the Northeast quarter of Section 20, T3S, R7W;

40. Thence Westerly to the Southwest corner of the Northwest quarter of said Section 20;

41. Thence Northerly to the Northwest corner of Section 17, T3S, R7W;

42. Thence Westerly to the Southwest corner of Section 7, T3S, R7W;

43. Thence Northerly to the Southwest corner of Section 6, T3S, R7W;

44. Thence Westerly to the Southwest corner of Section 1, T3S, R8W;

45. Thence Northerly to the Southeast corner of Section 35, T2S, R8W;

46. Thence Northwesterly to the Northwest corner of said Section 35;

47. Thence Northerly to the Southeast corner of Lot 33, as shown on Map of Tract 3193, recorded in Map Book 43, pages 46 and 47, Office of the County Recorder of San Bernardino County;

48. Thence Westerly to the Northwest corner of the Southwest quarter of Section 28, T2S, R8W;

49. Thence Northerly to the Southwest corner of Section 4, T2S, R8W;

50. Thence Westerly to the Southwest corner of Section 5, T2S, R8W;

51. Thence Northerly to the Southwest corner of Section 32, T1S, R8W;

52. Thence Westerly to the Southwest corner of Section 31, T1S, R8W;

53. Thence Northerly to the Southwest corner of Section 30, T1S, R8W;

54. Thence Northeasterly to the Southwest corner of Section 20, T1S, R8W;

55. Thence Northerly to the Northwest corner of the Southwest quarter of the Southwest quarter of said Section 20;

56. Thence Northwesterly to the Northeast corner of the Southeast quarter of the Southeast quarter of the Northwest quarter of Section 19, T1S, R8W;

57. Thence Easterly to the Northwest corner of Section 21, T1S, R8W;

58. Thence Northeasterly to the Southeast corner of the Southwest quarter of the Southwest quarter of Section 10, T1S, R8W;

59. Thence Northeasterly to the Southwest corner of Section 2, T1S, R8W;

60. Thence Northeasterly to the Southeast corner of the Northwest quarter of the Northwest quarter of Section 1, T1S, R8W;

61. Thence Northerly to the Northeast corner of the Northwest quarter of the Northeast quarter of Section 36, T1N, R8W;

62. Thence Northerly to the Southeast corner of Section 24, T1N, R8W;

63. Thence Northeasterly to the Southeast corner of the Northwest quarter of the Northwest quarter of Section 20, T1N, R7W; and

64. Thence Southerly to the Point of Beginning.

EXHIBIT "K"

## Sections Included

Said perimeter description includes all or portions of the following Townships, Ranges and Sections of San Bernardino Base and Meridian:

| | |
|---|---|
| T1N, R5W - Sections: | 30, 31 and 32 |
| T1N, R6W - Sections: | 8, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 |
| T1N, R7W - Sections: | 19, 20, 24, 25, 26, 29, 30, 31, 32, 35 and 36 |
| T1N, R8W - Sections: | 25 and 36 |
| T1S, R5W - Sections: | 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 28, 29, 30, 31 and 32 |
| T1S, R6W - Sections: | 1 through 36, inclusive |
| T1S, R7W - Sections: | 1 through 36, inclusive |
| T1S, R8W - Sections: | 1, 2, 10, 11, 12, 13, 14, 15, 16, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36 |
| T2S, R5W - Sections: | 6, 7 and 18 |
| T2S, R6W - Sections: | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 29, 30 and 31 |
| T2S, R7W - Sections: | 1 through 36, inclusive |
| T2S, R8W - Sections: | 1, 2, 3, 4, 5, 9, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27, 28, 35 and 36 |
| T3S, R7W - Sections: | 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17 and 20 |
| T3S, R8W - Sections: | 1. |

EXHIBIT "K"

NOSSAMAN, GUTHNER, KNOX & ELLIOT
FREDERIC A. FUDACZ, STATE BAR NO. 050546
JOHN OSSIFF, STATE BAR NO. 120149
445 South Figueroa Street
Thirty-First Floor
Los Angeles, California 90071
Telephone: (213) 612-7800
Facsimile: (213) 612-7801

Attorneys for
CHINO BASIN WATERMASTER

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO - WEST DISTRICT

| | |
|---|---|
| CHINO BASIN MUNICIPAL WATER DISTRICT,<br><br>Plaintiff,<br><br>v.<br><br>CITY OF CHINO,<br><br>Defendant. | Case No.: RCV 51010<br><br>ORDER APPROVING AMENDMENTS TO JUDGMENT<br><br>DATE: November 17, 1995<br>TIME: 2:00 p.m.<br>DEPT: WD-2<br><br>Specially assigned to the Honorable Judge Ben T. Kayashima |

On November 17, 1995, at 2:00 p.m., the petition and motion of the Chino Basin Watermaster for an order approving amendments to the judgment to simplify conversion claim procedures came on regularly for hearing, the Honorable Judge Ben T. Kayashima presiding.

Frederic A. Fudacz and John Ossiff, of Nossaman, Guthner, Knox & Elliot, appeared on behalf of Chino Basin Watermaster. No other appearances were made.

No opposition having been received and good cause appearing therefore

IT IS HEREBY ORDERED:

1. That the petition and motion of Watermaster is granted.

2. Paragraph 10(b), "Conversion Claims" of Exhibit "H" of the Judgment is hereby deleted and replaced with a new Paragraph 10(b), attached hereto as Exhibit 1.

Date: _____

_____
Ben T. Kayashima
Judge, San Bernardino County Superior Court

**EXHIBIT "1"**

# AMENDMENT TO JUDGMENT

## NEW PARAGRAPH 10(B) OF EXHIBIT "H"

(b) Conversion Claims. The following procedures may be utilized by any appropriator:

(1) Record of Uncoverted Agricultural Acreage.

Watermaster shall maintain on an ongoing basis a record, with appropriate related maps, of all agricultural acreage within the Chino Basin subject to being converted to appropriative water use pursuant to the provisions of this subparagraph. An initial identification of such acreage as of June 30, 1995 is attached hereto as Appendix 1.

(2) Record of Water Service Conversion. Any appropriator who undertakes to permanently provide water service to lands subject to conversion may report such intent to change water service to Watermaster. Watermaster should thereupon verify such change in water service and shall maintain a record and account for each appropriator of the total acreage involved. Should, at any time, converted acreage return to water service from the Overlying (Agricultural) Pool, Watermaster shall return such acreage to uncoverted status and correspondingly reduce or eliminate any allocation accorded to the appropriator involved.

(3) Allocation of Safe Yield Rights.

(i) In any year in which sufficient unallocated Safe Yield from the Overlying (Agricultural) Pool is available for such conversion claims, Watermaster shall allocate to each appropriator with a conversion claim 1.3 acre-

feet of unallocated Safe Yield water for each converted acre for which conversion has been approved and recorded by the Watermaster.

(ii) In any year in which the unallocated Safe Yield water from the Overlying (Agricultural) Pool is not sufficient to satisfy all outstanding conversion claims pursuant to subparagraph (i) herein above, Watermaster shall establish allocation percentages for each appropriator with conversion claims. The percentages shall be based upon the ratio of the total of such converted average approved and recorded for each appropriator's account in comparison to the total of converted acreage approved and recorded for all appropriators. Watermaster shall apply such allocation percentage for each appropriator to the total unallocated Safe Yield water available for conversion claims to derive the amount allocable to each appropriator.

(4) Notice and Allocation. Notice of the special allocation of Safe Yield water pursuant to conversion claims shall be given to each appropriator and shall be treated for purposes of this physical solution as an addition to such appropriator's share of the operating Safe Yield for the particular year only.

(5) Administrative Costs. Any costs of Watermaster attributable to the administration of such special allocations and conversion claims shall be assessed against the appropriators participating in such reporting, apportioned in accordance with the total amount of converted acreage held by each appropriator participating in the conversion program.

NOSSAMAN, GUTHNER, KNOX & ELLIOT
FREDERIC A. FUDACZ, STATE BAR NO. 050546
JOHN OSSIFF, STATE BAR NO. 120149
445 South Figueroa Street
Thirty-First Floor
Los Angeles, California 90071
Telephone: (213) 612-7800
Facsimile: (213) 612-7801

Attorneys for
CHINO BASIN WATERMASTER

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF SAN BERNARDINO - WEST DISTRICT

| | |
|---|---|
| CHINO BASIN MUNICIPAL WATER DISTRICT,<br><br>Plaintiff,<br><br>v.<br><br>CITY OF CHINO,<br><br>Defendant. | ) Case No.: RCV 51010<br>)<br>) ~~(Amended Proposed)~~<br>)<br>)<br>) ORDER FOR AMENDMENTS TO<br>) THE JUDGMENT REGARDING<br>) CHANGES IN POOLING PLANS<br>) AND APPROPRIATIVE POOL<br>) REPRESENTATION OF THE<br>) ADVISORY COMMITTEE<br>)<br>)<br>)<br>) DATE: September 18, 1996<br>) TIME: 10:00 a.m.<br>) DEPT: H<br>)<br>)<br>) Specially assigned to the Honorable<br>) Judge J. Michael Gunn |

On September 18, 1996, the motion for amendments to the Judgment to change Appropriative Pool representation on the Advisory Committee came on regularly for hearing in this matter, the Honorable J. Michael Gunn, Judge, Presiding.

The matter having been duly presented, all arguments having been heard

and good cause appearing therefore,

IT IS HEREBY ORDERED:

1. That the petition and motion of Watermaster is granted.

2. That Paragraph 4, "Advisory Committee Representatives," of Exhibit "H" to the Judgment is hereby deleted and replaced with a new Paragraph 4, attached hereto as Exhibit 1.

3. That Paragraph 32, "Authorization," to the Judgment is hereby deleted and replaced with a new Paragraph 32, attached hereto as Exhibit 1.

Date: _____

_____

J. Michael Gunn

Judge, San Bernardino County Superior Court

# AMENDMENT TO JUDGMENT

## New Exhibit "H" Paragraph 4 to Judgment

4. Advisory Committee Representatives. Members of the Pool Committee shall be designated to represent this pool on the Advisory Committee on the following basis: Each major appropriator, i.e. the owner of an adjudicated appropriative right in excess of 3,000 acre feet, or each appropriator that produces in excess of 3,000 acre feet based upon the prior year's production, shall be entitled to one representative. Two additional representatives of the Appropriative Pool on the Advisory Committee shall be elected at large by the remaining members of the pool. The voting power of the Appropriative Pool on the Advisory Committee shall be apportioned between the major appropriator representatives in proportion to their respective voting power in the Pool Committee. The two representatives of the remaining appropriators shall exercise equally the voting power proportional to the Pool Committee voting power of said remaining appropriators; provided, however, that if any representative fails to attend an Advisory Committee meeting, the voting power of that representative shall be allocated among the representatives of the Approporiative Pool in attendance in the same proportion as their own

respective voting powers.

**New Paragraph 32 to the Judgment:**

32. Authorization. Watermaster is authorized and directed to cause committees of producer representatives to be organized to act as Pool Committees for each of the several pools created under the Physical Solution. Said Pool Committees shall, in turn, jointly form an Advisory Committee to assist Watermaster in performance of its functions under this judgment. Pool Committees shall be composed as specified in the respective pooling plans, and the Advisory Committee shall be composed of voting representatives from each pool, as designated by the repective Pool Committee in accordance with each pool's pooling plan. WMWD, Three Valleys Municipal Water District (Successor to PVMWD) and SBVMWD shall each be entitled to one non-voting representative on said Advisory Committee.

SCOTT SLATER (State Bar No. 117317)

MICHAEL FIFE (State Bar No. 203025)

HATCH AND PARENT

21 East Carrillo Street

Santa Barbara, CA 93101-2782

Telephone: (805) 963-7000

Facsimile: (805) 965-4333

Attorneys for Chino Basin Watermaster

**SUPERIOR COURT OF THE STATE OF CALIFORNIA**

**COUNTY OF SAN BERNARDINO**

| | |
|---|---|
| | ) CASE NO. RCV 51010 |
| CHINO BASIN MUNICIPAL | ) |
| WATER DISTRICT, | ) Judge: Honorable J. MICHAEL GUNN |
| Plaintiff, | ) |
| vs. | ) |
| CITY OF CHINO, et al., | ) MOTION TO AMEND JUDGMENT |
| Defendants. | ) |
| | ) |
| | ) |
| | ) Date: September 28, 2000 |
| | ) Time: 2:00 pm. |
| | ) |
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I.

**BACKGROUND**

In 1978, judgment was entered in *Chino Basin Municipal Water District v. City of Chino,* a groundwater adjudication of the Chino Basin. This Judgment imposed a physical solution in order to halt the decline of the groundwater levels in the Basin. The Judgment also required the parties to develop an Optimum Basin Management Program ("OBMP") in order to provide a comprehensive program that would offer a long-term solution to the many issues facing the Basin. On June 29, 2000 a final OBMP for the Chino basin was submitted to the Court, and on

July 13, 2000 the Court approved the OBMP and ordered Watermaster to proceed in accordance with its terms.

In the final months prior to completion of the OBMP, the parties negotiated a Peace Agreement that resolved the issues inhibiting finalization of the OBMP. During these negotiations it was recognized that certain minor but necessary amendments would need to be made to the Judgment so that the final OBMP would be fully consistent with the Judgment. The negotiating parties consented to these modifications and they became a part of the Peace Agreement (Article IV, section 4).

In its July 13, Order approving the OBMP, the Court ordered that a hearing would be held on September 28, 2000 to, in part, hear arguments on proposed amendments to the Judgment. Part II of this brief describes Watermaster's recommended amendments to the Judgment in conformance with the Peace Agreement.

II

Proposed Amendments to the Judgment

Watermaster recommends the following amendments to the Judgment:

(a) The Judgment shall be amended so that the last sentence of Paragraph 8 of the Judgment reads:

All overlying rights are appurtenant to the land and cannot be assigned or conveyed separate of apart therefrom for the term of the Peace Agreement except that the members of the Overlying (Non-Agricultural) Pool shall have the right to Transfer or lease their quantified production rights within the Overlying (Non-Agricultural) Pool or to Watermaster in conformance with the procedures described in the Peace Agreement between the Parties therein, dated June 29, 2000.

(b) Paragraph 6 of Exhibit "G" to the Judgment regarding the Overlying Non- Agricultural Pool shall be amended to read:

Assignment. Rights herein decreed are appurtenant to that land and are

Only assignable with the land for overlying use thereon; provided, however, (a) that any appropriator who may, directly or indirectly, undertake to provide water service to such overlying lands may, by an appropriate agency agreement on a form approved by Watermaster, exercise said overlying right to the extent, but only to the extent necessary to provide water service to said overlying lands, and (b) the members of the pool shall have the right to Transfer or lease their quantified production rights within the pool or to Watermaster in conformance with the procedures described in the Peace Agreement between the Parties therein, dated June 29, 2000 for the term of the Peace Agreement.

(c) The 1995 Amendment to the Judgment shall be amended as follows: Section 10(b)(3)(i) shall now read:

"For the term of the Peace Agreement, in any year in which sufficient unallocated Safe Yield from the Overlying (Agricultural) Pool is available for such conversions claims, Watermaster shall allocate to each appropriator with a conversion claim, 2.0 acre-feet of unallocated Safe Yield water for each converted acre for which conversion has been approved and recorded by the Watermaster."

Appendix 1 to the Judgment shall be construed to be consistent with this amendment. All other parts of the 1995 Amendment shall remain the same.

III

Conclusion

The Peace Agreement is a carefully constructed balance of the various interests in the Basin that has enabled the OBMP to be finalized. One part of the negotiation of the Peace Agreement was an agreement on the necessary amendments to the Judgment in order to make the Peace Agreement and the Judgment fully consistent with one another. The signatories have agreed that the amendments described above are the only *necessary* amendments in order to

achieve consistency.

Neither the signatories to the Peace Agreement nor Watermaster believe any other proposed amendments are necessary at this time and accordingly urge this Court to make only those changes necessary so that the final OBMP is consistent with the Judgment. The Judgment has created a stable institutional framework in the Chino Basin that has made the development of the OBMP possible. Changes to this framework should be made only where absolutely necessary so as to cause minimal disruption to this stability. Watermaster has determined that the amendments proposed above are the only necessary changes that need to be made consistent with the Peace Agreement.

The parties have made a monumental effort to craft a solution that will fulfill the overriding goal of managing the Chino Basin on a sustainable basis for the benefit of all. Watermaster respectfully request that the Court approve the above referenced amendments in furtherance of the physical solution.

Dated: August __, 2000.

HATCH & PARENT

By: _____

Scott S. Slater

Michael Fife

Attorneys for Chino Basin Watermaster

**SUPERIOR COURT FOR THE STATE OF CALIFORNIA**

**FOR THE COUNTY OF SAN BERNARDINO**

| | | |
|---|---|---|
| | ) | CASE NO. RCV 51010 |
| CHINO BASIN MUNICIPAL WATER | ) | |
| DISTRICT, | ) | ORDER CONCERNING |
| Plaintiff, | ) | MOTION TO AMEND JUDGMENT |
| vs. | ) | |
| CITY OF CHINO, et al., | ) | |
| Defendants. | ) | Date: September 28, 2000 |
| | ) | Dept: 8 |
| | ) | Time: 2:00 p.m. |
| | ) | |
| | ) | |
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Background

On February 19, 1998, the Court directed Watermaster to prepare an optimum basin management program ("OBMP") for the Chino Basin. On July 13, 2000, the Court found, subject to certain conditions precedent, that Watermaster's support and approval of the Peace Agreement regarding the Chino Groundwater Basin, dated June 29, 2000, hereinafter "Peace Agreement," and Watermaster's commitment to implement the OBMP Phase I Report through the provisions of the OBMP Implementation Plan as expressly set forth in Article

V of the Peace Agreement satisfied Watermaster's obligation to prepare an OBMP. One of the conditions precedent to that finding is Court approval of all Judgment modifications in furtherance of the OBMP.

On August 15, 2000, Watermaster filed a Motion to Amend the Judgment. No other party has submitted proposed Judgment modifications in furtherance of the OBMP, nor has opposition been filed to Watermaster's motion. Watermaster asserts that the parties to the Peace Agreement have agreed that the proposed amendments are the only Judgment modifications necessary to achieve consistency between the OBMP and the Judgment. Consequently, the parties have not provided comprehensive briefing on Judgment modification issues.

Discussion

Special Referee Anne Schneider has provided the Court (and the parties) with a thoughtful

analysis of various provisions in the Peace Agreement that appear to be in conflict with the Judgment. Watermaster's motion recognizes some of these conflicts. However, the Special Referee's Report and Recommendation Regarding Watermaster's Motion to Amend Judgment notes several provisions in the Peace Agreement which appear to conflict with the Judgment, for which no modification is proposed. For example, Watermaster proposes to modify the amended Judgment Exhibit H conversion provisions to allow 2.0 acre-feet of unallocated Safe Yield water for each converted acre. However, no revision is proposed with respect to Appendix 1, which explains the basis for the existing 1.3 acre-feet per acre provision. Another example is the Peace Agreement provision which permits "Early Transfer" allocations of 32,800 acre-feet of water to occur annually, yet the Overlying (Agricultural) Pool is still entitled to pump 82,800 acre-feet per year without reduction. There are several other provisions of the Peace Agreement noted by the Special Referee which appear to conflict with the Judgment, for which no Judgment amendment is sought.

## Order

The Court has considered the Special Referee's Report and Recommendation Regarding Motion to Amend Judgment and hereby issues its ruling accepting the Report and adopting the Recommendation of Anne Schneider.

The Court incorporates herein by reference the entirety of the Special Referee's Report and Recommendation Regarding Motion to Amend Judgment. Watermaster's Motion to Amend the Judgment is granted subject to the following: the parties are directed to file a post-hearing brief (s) clarifying their intent with respect to the Peace Agreement provisions discussed in Sections IIB through IIF in the Special Referee's Report and Recommendation Regarding Watermaster's Motion to Amend Judgment. The post-hearing brief(s) shall be submitted no later than October 26, 2000.

Dated: September 28, 2000.

s/s J. Michael Gunn

J. MICHAEL GUNN, Judge

**SUPERIOR COURT FOR THE STATE OF CALIFORNIA**

**FOR THE COUNTY OF SAN BERNARDINO**

| | |
|---|---|
| | ) CASE NO. RCV 51010 |
| CHINO BASIN MUNICIPAL WATER | ) |
| DISTRICT, | ) ORDER CONCERNING |
| Plaintiff, | ) MOTION TO EXTEND NINE-MEMBER |
| vs. | ) BOARD |
| | ) |
| CITY OF CHINO, et al., | ) Date: September 28, 2000 |
| Defendants. | ) Dept: 8 |
| | ) Time: 2:00 p.m. |
| | ) |
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## Background

On February 19, 1998, the Court appointed a nine-member board consisting of representatives from the Overlying (Agricultural) Pool, the Overlying (Non-agricultural) Pool, the Appropriative Pool, and three municipal water districts to serve as Interim Watermaster for the Chino Groundwater Basin (hereinafter sometimes referred to as "Basin"). Watermaster was directed to notice a hearing on or before October 28, 1999, to consider all parties' input as to the continuance of the nine-member board. The Court informed the parties that one of the measures that would be used in determining the effectiveness of the nine-member board, in functioning as a steward of the Basin,

would be the progress made on the adoption of an optimum basin management program ("OBMP") for the Basin. The OBMP was to be submitted to the Court no later than September 30, 1999, and a hearing was set on October 28, 1999, to consider whether to approve and order full implementation of the

program. The deadline for approval of the OBMP was continued several times. The Court finally approved the OBMP, consisting of the Phase I Report and Implementation Plan, subject to certain conditions precedent, on July 13, 2000.

## Discussion

### Extension of Appointment of Nine-member Board

On August 30, 2000, Watermaster filed a Motion to Extend the Nine-Member Board for a Full Five-Year Term. The motion requests the Court to order that the current nine-member structure of the Watermaster board continue in effect for a full five-year term. Watermaster asserts that all of the conditions precedent set forth in the Court's July 13, 2000, Order have been satisfied. However, as noted in Special Referee Anne Schneider's Report and Recommendation Concerning Motion to Extend Nine-Member Board, there are several outstanding issues that must be resolved before it can be said that all of the conditions have been satisfied. First, it is not clear that unanimous approval of the Peace Agreement regarding the Chino Groundwater Basin, dated June 29, 2000, hereinafter "Peace Agreement," has been obtained. Western Municipal Water District's "ratification" of the Peace Agreement was conditional. Watermaster reports the need for further negotiations related to the purchase of desalted water. Second, Watermaster states that the California Legislature has appropriated $235,000,000 for the benefit of the Santa Ana Watershed Project Authority ("SAWPA") and allocated this sum to the state Water Resources Control Board ("SWRCB") for distribution. Watermaster further states that SAWPA has submitted an application to SWRCB for distribution of these funds, including $56,000,000 to be used to fund the Chino II desalter and an expansion of the Chino I desalter. However, Watermaster has not explained how the $121,000,000 condition precedent is satisfied when only $56,000,000 of the funds allocated to SAWPA are to be used for the Chino Basin desalter project. Third, while Watermaster has submitted a schedule and process for submission to the Court of detailed periodic reports regarding compliance with the Implementation Plan for the OBMP, the schedule has

some omissions. For example, Program Elements 3 and 5, which encompass the desalter project, are not included in the schedule.

It must be noted that the City of Chino has filed an Opposition to Motion to Extend the Nine-Member Board for a Full Five-Year Term. Although it supports the continuation of the current nine-member board structure, the City of Chino asserts that Court guidance is needed with respect to the establishment of "criteria, procedures and schedules for the rotation of Appropriative Pool members" serving on the nine-member board. Watermaster responds that several groups must determine a procedure for rotation: Overlying (Agricultural) Pool, Overlying (Non-agricultural) Pool, and the three municipal districts that hold seats on the board and the Appropriative Pool. Watermaster is hopeful that a complete consensus will emerge prior to October 31, 2000, and requests the Court to allow the consensus-building process to continue and give the parties until October 31, 2000, to resolve their differences. An inability to reach consensus on the rotation issue is of considerable concern to the Court. The Court is unwilling to extend the appointment of the board unless and until the rotation Issue is resolved.

## Periodic Reporting Requirements

In the exercise of its continuing jurisdiction, the Court shall require periodic progress reports regarding implementation of the OBMP to ensure that the Watermaster is performing its independent function and keeping to the schedule
adopted for OBMP implementation. The Court adopts the following schedule for

OBMP reporting:

| | |
|---|---|
| Report No. 1 | March 31, 2001 |
| Report No. 2 | September 30, 2001 |
| Report No. 3 | March 31, 2002 |

| | |
|---|---|
| Report No. 4 | September 30, 2002 |
| Report No. 5 | March 31, 2003 |
| Report No. 6 | September 30, 2003 |
| Report No. 7 | March 31, 2004 |
| Report No. 8 | September 30, 2004 |
| Report No. 9 | March 31, 2005 |
| Report No. 10 | September 30, 2005 |

Report No. 10 coincides with the end of the appointment of the Nine-Member Board. The OBMP progress reports, together with independent assessment of OBMP implementation status, including verification of data to be provided by the Special Referee and her technical expert, will be the basis for consideration of continuing the appointment. The Court may schedule hearings to coincide with some or all of these reports. Alternatively, the Court may, from time to time, direct the Special Referee to conduct a workshop in lieu of a court hearing. The reports should follow the format prescribed in Special Referee Anne Schneider's Report and Recommendation Concerning Motion to Extend Nine Member Board.

## Future Desalters

The Court wants to particularly note that the Peace Agreement predicates any future desalting capacity on a reevaluation of the need for additional desalting after the earlier of ten years or the conversion of 20,000 acres of agricultural land. The Court is mindful that while the parties to the Peace Agreement contemplate the construction of future desalters and/or expansion of Chino I and/or Chino II

Desalters, there are no provisions in the Peace Agreement that effectively ensure that they will be built. In effect, future desalters (and any expansions of the Chino I and II Desalters) will be built "if and only If' funding from sources other than the Parties can be secured. The OBMP (Phase I Report and Phase II Implementation Plan) calls for some 40,000 acre-feet per year of desalting capacity to be installed in the southern part of the Basin by 2020. The Court hereby gives notice to the parties that a primary concern of the Court in any future application for reappointment of the nine-member board will be the parties' continued commitment to provide for future desalters and preserve safe yield in accordance with the OBMP.

## Order

Watermaster seeks an order continuing the current nine-member structure of the Watermaster Board in effect for a full five-year term and authorizing it to perform all managerial and administrative functions as specified in the Judgment, including the execution of all administrative and employment contracts. Watermaster states that it will propose a schedule for rotation of its board members no later than October 31, 2000.

The Court is not inclined to extend unconditionally the reappointment of the nine-member board until both the rotation and the Western Municipal Water District issues have been resolved. Therefore, the appointment shall be made subject to certain conditions. The failure of any one of these conditions shall be considered by the Court as a compelling reason to reconsider the appointment of the nine member board. Therefore, subject to the continuing jurisdiction of the Court and satisfaction of conditions numbers 1 - 5 below, the Court hereby issues its order:

The Court has considered the Special Referee's Report and Recommendation Concerning Motion to Extend Nine-Member Board and hereby issues its ruling accepting the Report and adopting the Recommendation of Anne Schneider, except to the extent that it recommends continuation of the appointment for only three years. The Court incorporates herein by reference the entirety of the Special Referee's Report and Recommendation Concerning the Motion to Extend Nine-Member Board. The nine-member board is hereby appointed for an additional five-year term, until September 30, 2005, subject to the continuing jurisdiction of the Court to reconsider the appointment in the event Watermaster fails to timely comply with the following conditions:

1. Watermaster's report on the status of its efforts to resolve the terms and conditions applicable to the purchase of desalted water and to secure a recission of Western Municipal Water District's conditional execution of the Peace Agreement no later than December 31, 2000; and

2. Watermaster adoption and Court approval of Revised Rules and Regulations for Chino Basin by February 1, 2001; and

3. Submission of Reports Nos. 1 through 10 in accordance with the schedule set forth in the discussion above; and

4. Inclusion in such reports of schedule and budget information essentially in a form equivalent to Exhibit "E" and Table 4-14 of the Phase I Report; and

5. Watermaster cooperation in the independent assessment and verification of the data

included in Reports No. 1 through 10 to be provided to the Court by the Special Referee and her technical expert.

The parties are forewarned that any future application for reappointment of the nine-member board may be conditioned on the development of a detailed plan to reach the OBMP goal of 40,000 acre-feet per year of desalting capacity to be installed in southern part of the Basin by 2020.

Dated: September 28, 2000.

s/s J. Michael Gunn

J. MICHAEL GUNN, Judge

SCOTT SLATER (State Bar No. 117317)

MICHAEL FIFE (State Bar No. 203025)

HATCH AND PARENT

21 East Carrillo Street

Santa Barbara, CA 93101-2782

Telephone: (805) 963-7000

Facsimile: (805) 965-4333

Attorneys for Chino Basin Watermaster

**SUPERIOR COURT OF THE STATE OF CALIFORNIA**

**COUNTY OF SAN BERNARDINO**

| | |
|---|---|
| | ) CASE NO. RCV 51010 |
| CHINO BASIN MUNICIPAL | ) |
| WATER DISTRICT, | ) |
| Plaintiff, | ) |
| vs. | ) |
| CITY OF CHINO, et al., | ) NOTICE OF ENTRY OF ORDER |
| Defendants. | ) CONCERNING MOTION TO |
| | ) EXTEND NINE-MEMBER BOARD |
| | ) AND ORDER CONCERNING |
| | ) MOTION TO AMEND JUDGMENT |
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TO ALL PARTIES AND THEIR ATTORNEYS OF RECORD;

Please take notice that on September 28, 2000, the Court entered its Order Concerning Motion to Extend Nine-Member Board and Order Concerning Motion to Amend Judgment. A true and correct copy of these Orders are attached hereto and made a part hereof by this reference.

The Court also provided guidance on the factors that it will consider when deciding to reappoint the Nine-Member Watermaster Board in 2005. These factors are:

(1) All production meters will be installed;

(2) Basin Monitoring will be completely in place and will have been the basis for semi-annual reports specified in the Order;

(3) The Recharge Master Plan will be complete and appropriate recharge facilities will have been installed;

(4) The OBMP Desalter I Expansion and Desalter II will be installed and operational, with demonstrated delivery of desalter water for municipal use in the Basin.

In addition, the Court wishes to schedule a hearing on February 1, 2001 at 2:00 pm. The purpose of the hearing will be to:

(1) Approve the Revised Rules and Regulations for the Chino Basin;

(2) Approve the post-Order memorandum which will be filed on October 26, 2000;

(3) Receive a report on the status Western Municipal Water District's recission of its conditional execution of the Peace Agreement; and

(4) Receive Watermaster's Annual Report.

The Revised Rules and Regulations for the Chino Basin should be submitted to the Court by December 31, 2000.

Dated: September 28, 2000

HATCH & PARENT

By: s/s Michael Fife

Michael Fife

Attorneys for Chino Basin Watermaster

APPENDIX 1

To Chino Basin Watermaster
Amendment Regarding Land Use Conversions

The purpose of the amendment is to simplify the methodology and procedure for land use conversions under the 1978 Judgment. The basic nature of the commitment undertaken by the parties who negotiated the Judgment is not intended to be changed. The methodology used to develop the recommended 2.0 [1] per acre (af/ac) conversion factor can best be described as a gross water duty method. Essentially, the total water use was divided by the total acreage remaining to be converted to develop the gross average water use per acre.

At the Land Use Conversion Workshop held on January 10, 1995, there was a consensus among the parties to the Judgment that the large agricultural acreage within the purveyor service areas must still be converted. To depict the large southern area remaining to be converted, Watermaster staff proposed the establishment of Conversion Area No. 1 (see attached map). This area can generally be described as the area that is south of the 60 Freeway, outside the current city boundaries of Chino, Chino Hills and Ontario and for the most part, the portion of Jurupa Community Services District (JCSD) that is west of Etiwanda. The southernmost boundary of the area is taken as the Army Corps of Engineers' Prado Basin take line, unless a specific agricultural well exists inside the take line. To obtain the acreage for Conversion Area No. 1, the Santa Ana Watershed Project Authority (SAWPA), used its Geographic Information System (GIS) and determined the total acreage shown in Conversion Area No. 1 to be approximately 27,133 acres.

Also at the January 10 Land Use Conversion Workshop, the appropriators were asked to submit the proposed remaining convertible acreage inside their established service areas. Submissions of the parcels proposed as eligible for conversion, both inside and outside Conversion area No. 1 began arriving in early March 1995, and were received as late as June 29, 1995. Watermaster staff worked with each appropriator to identify the proposed acreage by assessor's parcel number. The lists of parcels and the approximate acreage of each parcel, by appropriator, are included with Appendix 1 as Tables 2A - 2G for reference. The maps corresponding to these lists are on file with the Watermaster. The eligibility of most of the parcels submitted has been determined; however, the specific eligibility of some parcels is still in question. The eligibility criteria utilized by staff requires that the land:

1. has not been receiving water provided by an appropriator;
2. was not already included in the establishment of the appropriator's production rights; and
3. has been used for irrigated agriculture within the last five years if it is located outside Conversion Area No. 1

[1] Amended from 1.3 af/ac by Order dated September 28, 2000.

The appropriators were also asked which parcels they were proposing to convert for the production year 1994/95. The parcels proposed for conversion in FY 94/95 are included with Appendix 1 as Tables 3A - 3C. Any parcels converted for production year 1994/95 will affect the assessments and available unallocated safe yield from that production year in fiscal year 1995/96. Table 1 is a summary of the total acreage submitted by each appropriator as being eligible for conversion and of the acreage requested by that appropriator for conversion in FY 94/95, if any. Staff has evaluated the parcels requested for conversion in FY 94/95 and finds that all of those requested, or a total of 2, 185 acres, are eligible for conversion based on the above criteria.

When the 27,133 acres in Conversion Area No. 1 is added to the 5,209 acres (Table 1) proposed for conversion that is outside Conversion Area No. 1, there is a total of 32,343 acres remaining to be converted in the Chino Basin.
The 1978 agricultural water use was 84,095 acre-feet. When this is divided by the 32,343 acres, it results in a use of 2.6 af/ac. The value is still approximately 2.6 af/ac if the average annual post-judgment allocation of 82,800 af is divided and all acres were able to be converted as currently prescribed in the judgment, 50% of this per acre use would be allocated to an appropriator, and the appropriator would receive 1.3 acre-feet per acre. This would be a maximum use per acre. In 1994, the agricultural water use was reported as 44,092 acre-feet per acre. If this use is divided by the 32, 343 acres, it results in a present average use of 1.36 acre-feet per acre.

There was a consensus at the workshops and at the pool committee meetings that many of the conversions that potentially could have taken place since 1978, were not submitted by the appropriators. This is probably because of a lack of the right type of information to make the appropriate use-per-parcel determinations and because of the time and money that would be required if they were pursued extensively. Because of this, there was a consensus that the 1.3 af/ac conversion water use determinations were based only on 50% of the current average use.

Watermaster staff anticipates that each appropriator with remaining convertible acreage will request conversion on that acreage each year that they undertake to serve the land. If the service is anticipated to be permanent, they can request permanent conversion. For the acreage outside Conversion Area No. 1, the above criteria will be applied annually to make an eligibility determination. Also, an appropriator will be required to certify that the land is not currently using water that is being reported as agricultural pool production and Watermaster staff will field verify that agricultural activities have ceased, or that the appropriator is actually satisfying the agricultural use.

## Chino Basin Watermaster

# Unconverted Acreage

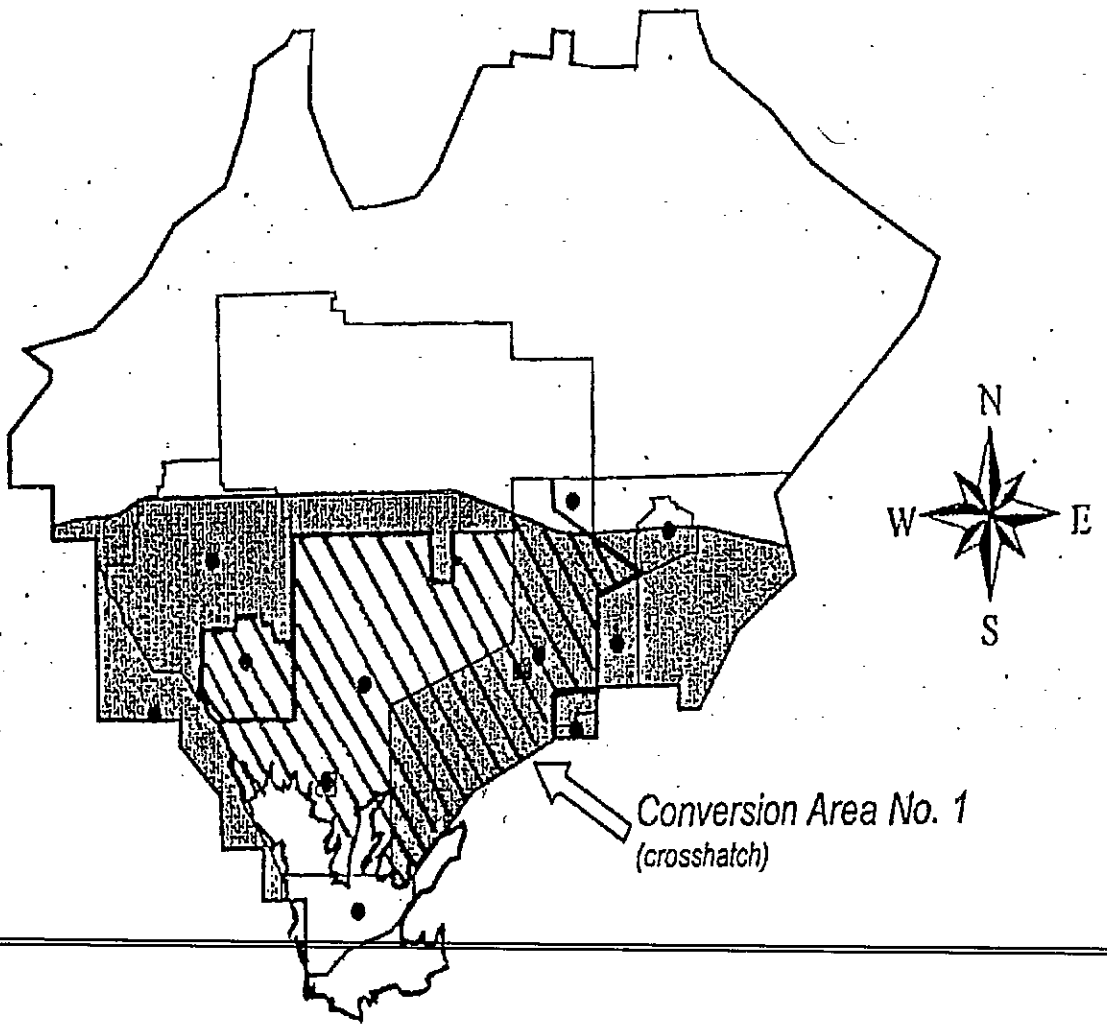

TABLE 1

Chino Basin Watermaster
Proposed Conversion Acres
Revised August 3, 1995

| Appropriator | Outside Conversion Area #1 | | Inside Conversion Area #1 | Total FY 94/95 Acres Proposed |
|---|---|---|---|---|
| | *Total Acres Submitted* | *Acres Proposed FY 94/95* | *Acres Proposed FY 94/95* | |
| Chino, City of | 1923 | 519 | 0 | 519 |
| Chino Hills, City of | 1053 | 0 | 0 | 0 |
| Cucamonga CWD | 460 | 0 | 0 | 0 |
| Fontana WC | 417 | 0 | 0 | 0 |
| Jurupa CSD | 835 | 327 | 758 | 1085 |
| Monte Vista WD | 43 | 0 | 0 | 0 |
| Ontario, City of | 544 | 544 | 37 | 581 |
| Total | 5209 | 1390 | 795 | 2185 |

Chino
AGRICULTURAL LAND - WATER SUPPLY STUDY
OUTSIDE CONVERSION AREA NO. 1 LIST B

| Property No. | Acreage | ADDRESS N/S - E/W | APN | GENERAL NOTES |
|---|---|---|---|---|
| 1 | 11 | 4800/12150 | 1016-121-4,5,6,7,8 | ROSES RESIDENCE ON CITY WATER |
| 2 | 16 | 4700/12200 | 1016-131-1,2,3 | ROSES CROP ACREAGE SUPPLIED BY PVT.WELL ON No.2 |
| 3 | 10 | 5350/11750 | 1014-381-1,2,3,4 | BERRY |
| 4 | 21 | 5600/12400 | 1015-261-2,3 | TRUCK FARMING MISCELLANEOUS VEGETABLES |
| | | | 1015-253-9 | |
| 5 | 6 | 5400/12450 | 1015-281-21 | BERRY |
| 6 | 7 | 4000/13000 | 1019-071-20,21 | CHRISTMAS TREE GROWER |
| | - | | 1019-081-2,11 | |
| 7 | 38 | 4800/13250 | 1019-191-1,2,5 | RANCHING DOMESTIC SERVICE ONLY - OTHER USES WELL |
| | | | 1019-201-1,3 | |
| 8 | 10 | 3600/13650 | 1019-611-28,39,40 | RANCHING DOMESTIC SERVIE ONLY UNDER DEVELOPMENT |
| | | | 1019-611-41,42,43,49 | |
| 9 | 21 | 3700/13750 | 1022-041-4 | LANDSCAPE NURSERY |
| | | | 1022-05-3,4 | |
| 10 | 31 | 3900/14000 | 1022-031-2 | GREEN FEED |
| | | | 1022-26-4 | |
| | | | 1022-27-4 | |
| | | | 1022-082-1,2,8,9,10 | |
| 11 | 58 | 4000/14200 | 1022-38-3 | GREEN FEED |
| | | | 1022-39-4 | |
| | | | 1022-40-3 | |
| | | | 1022-58-2 | |
| 12 | 54 | 4150/13900 | 1022-10-5,6,7,8 | DAIRY |
| | | | 1022-24-3 | |
| 13 | 142 | 4300/14300 | 1022-42-6,7,8 | GREEN FEED |
| | | | 1022-41-5 | |
| | | | 1022-58-2 | |
| | | | 1022-53-11,12,13 | |
| | | | 1022-431-8 | |
| | | | 1022-441-8 | |
| | | | 1022-541-3 | |
| 14 | 18 | 4200/14550 | 1022-55-3 | GREEN FEED |
| | | | 1025-10-5,7,8,9 | |
| 15 | 51 | 4350/14700 | 1025-09-1 | GREEN FEED |
| | | | 1025-12-1,2,5,6,7 | |
| | | | 1025-21-8,9,12 thru 23 | |
| 16 | 40 | 4800/14400 | 1022-50-1,2,3 | DAIRY DOMESTIC SERVICE ONLY |
| | | | 1022-49-1,3,4 | |
| 17 | 320 | 4900/14700 | 1025-13-1 thru 6 | DAIRY & FARMING GREEN FEED |
| | | | 1025-20-5,6 | |
| | | | 1025-19-6,7 | |
| | | | 1025-15-1 thru 8 | |
| | | | 1021-471-3,4,6,8 | |
| | | | 1021-461-2,3,4,6,7,8 | |
| | | | 1021-481-1,2,3 | |
| | | | 1024-491-1,2 | |
| | | | 1021-511-1,2,3 | |
| | | | 1021-501-1,2 | |
| | | | 1021-521-1,2,3,4 | |
| | | | 1021-531-1,2 | |
| 18 | 70 | 5300/15400 | 1028-201-13,17 | DOMESTIC SERVICE ONLY |
| | | | 1028-511-1 thru 20 | |
| | | | 1028-501-1 thru 25 | |
| | | | 1028-491-1 thru 9 | |
| 19 | 10 | 6200/12800 | 1015-511-27 | BERRY |
| 20 | 29 | 6200/13000 | 1020-131-1,2 | BERRY |
| | | | 1020-121-21,24 | |
| 21 | 18 | 6000/14050 | 1021-291-1,2 | GREEN FEED |
| 22 | 38 | 6200/14000 | 1021-261-1,2,3,4 | RANCHING DOMESTIC SERVICE ONLY |
| | | | 1021-231-2 | |
| | | | 1021-101-2,3,4 | |
| 23 | 26 | 6400/13900 | 1021-251-1,20 | DAIRY |
| | | | 1021-241-2,3 | |
| 24 | 17 | 6850/12850 | 1051-502-31 | CORN/BERRY |
| | | | 1051-631-2 | |

Chino
AGRICULTURAL LAND - WATER SUPPLY STUDY
OUTSIDE CONVERSION AREA NO. 1 - LIST B

| Property No. | Acreage | ADDRESS N/S - E/W | APN | GENERAL NOTES |
|---|---|---|---|---|
| 25 | 11 | 6800/13200 | 1052-301-1,3,4 | DAIRY |
| 26 | 64 | 6600/13500 | 1052-331-1,2,3 | DAIRY |
| | | | 1052-341-1,2,3,4 | |
| | | | 1052-631-1,2,3 | |
| 27 | 28 | 6800/13500 | 1052-611-1,2 | GREEN FEED |
| | | | 1052-601-2 | |
| 28 | 15 | 6800/13900 | 1053-261-3,4,41,71 | GREEN FEED |
| | | | 1053-231-4,31 | |
| 29 | 39.5 | 6600/13900 | 1053-251-1,2,3,4 | NURSERY |
| | | | 1053-241-68 | |
| | | | 1053-011-2 thru 5 | |
| 30 | 99 | 5700/14150 | 1021-351-1,2 | AYALA PARK |
| | | | 1021-321-1,2 | |
| | | | 1021-311-1,2 | |
| | | | 1021-281-1 | |
| | | | 1026-011-1 | |
| 31 | 80 | 6800/14300 | 1053-621-1,2 | DAIRY |
| | | | 1053-491-1 thru 11.13.14.17 | |
| | | | 1053-461-1,2,3 | |
| | | | 1053-451-1,2 | |
| 32 | 61 | 6950/13100 | 1052-051-1 thru 18 | DOMESTIC SERVICE ONLY |
| | | | 1052-051-20 thru 25 | |
| 33 | 61 | 6950/13500 | 1052-361-1,2,3,4 | DAIRY |
| | | | 1052-371-1,2,3 | |
| | | | 1052-591-1,2 | |
| | | | 1052-581-1,2 | |
| 34 | 61 | 6950/13900 | 1053-051-3,4 | DAIRY |
| | | | 1053-061-3,4 | |
| | | | 1053-221-1,2 | |
| | | | 1053-271-1 thru 8 | |
| 35 | 61 | 6950/14300 | 1053-441-1 thru 9,12,13 | DAIRY |
| | | | 1053-431-1,2 | |
| | | | 1053-501-1,2,3,4 | |
| | | | 1053-611-1,2,3 | |
| 36 | 10 | 5250/11550 | 1014-301-3,4,5 | NURSERY & CHRISTMAS TREES |
| 37 | 20 | 5350/11600 | 1014-271-1 | NURSERY & CHRISTMAS TREES |
| | | | 1014-281-4 | |
| 40 | 32 | 4400/13000 | 1019-111-27 thru 73 | RECENTLY CONVERTED BERRY FARMING TO RESIDENTIAL |
| | | | 1019-122-1 thru 48 | |
| | | | 1019-123-1 thru 54 | |
| 41 | 30 | 4600/13500 | 1019-441-3,4 | RANCHING |
| | | | 1019-511-6,7 | |
| | | | 1019-501-1 | |
| 42 | 10 | 5250/14150 | 1021-361-21,22 | NURSERY |
| 43 | 18 | 5350/13600 | 1020-571-3,4,6 | BERRY |
| | | | 1020-461-1,2,3 | |
| 44 | 80 | 5600/13900 | 1021-041-1 thru 4,6,9 | DAIRY DOMESTIC SERVICE ONLY - OTHER USES WELL |
| | | | 1021-131-1,2 | |
| | | | 1021-201-1,2 | |
| | | | 1021-331-1 | |
| | | | 1021-301-1 | |
| 45 | 10 | 5950/13750 | 1021-061-1,2 | DAIRY |
| 46 | 5 | 6450-13350 | 1021-381-5 | BERRY |
| | | | | |
| TOTAL | 1857.5 | | | |

Table 2B

*THE CITY OF CHINO HILLS*
*PROPOSED PARCELS FOR*
*LAND USE CONVERSION*

*THE CITY OF CHINO HILLS*
*PUBLIC WORKS DEPARTMENT*
*GEOGRAPHIC INFORMATION SYSTEM*
*101 GRAND AVENUE*
*CHINO HILLS CA 91711*
*(909)*

| ID | APN | OWNER | ACREAGE |
|---|---|---|---|
| 1 | 1022-291-09 | Boys Republic | 4.63 |
| 2 | 1022-291-10 | Boys Republic | 44.49 |
| 3 | 1022-291-05 | Boys Republic | 2.32 |
| 4 | 1022-591-02 | Boys Republic | 28.46 |
| 5 | 1022-291-08 | Boys Republic | 118.04 |
| 6 | 1025-461-01 | De Groot | 8.92 |
| 7 | 1025-461-02 | De Groot | 2.01 |
| 8 | 1025-461-03 | De Groot | 7.12 |
| 9 | 1025-481-02 | De Groot | 8.23 |
| 10 | 1025-471-04 | De Groot | 4.12 |
| 11 | 1025-471-03 | De Groot | 1.72 |
| 12 | 1025-481-01 | De Groot | 9.62 |
| 13 | 1025-511-01 | De Groot | 6.66 |
| 14 | 1025-471-01 | City of Chino Hills | 6.38 |
| 15 | 1025-471-02 | Greening | 1.00 |
| 16 | 1025-561-04 | Greening | 47.24 |
| 17 | 1028-471-01 | Greening | 66.82 |
| 18 | 1028-351-01 | Kramer | 1.54 |
| 20 | 1028-351-13 | Higgins | 4.04 |
| 21 | 1028-351-23 | Higgins | 38.24 |
| 22 | 1028-351-11 | Higgins | 7.64 |
| 23 | 1028-201-03 | Von Lusk | 1.91 |
| 24 | 1028-201-02 | Von Lusk | 77.57 |
| 25 | 1028-201-74 | Von Lusk | 54.77 |
| 26 | 1028-201-75 | Von Lusk | 37.57 |
| 27 | 1028-351-07 | Bahan | 28.27 |
| 28 | 1017-231-21 | Amato | 1.79 |
| 29 | 1017-231-22 | Trapani | 5.65 |
| 30 | 1017-241-14 | Richland Pinehurst LP | 82.37 |
| 31 | 1017-491-01 | Richland Pinehurst LP | 78.63 |
| 32 | 1027-492-01 | Richland Pinehurst LP | 43.31 |
| 33 | 1027-121-07 | Richland Pinehurst LP | 15.94 |
| 34 | 1057-261-06 | Abacherli | 128.26 |
| 35 | 1057-261-05 | Abercherli | 10.00 |
| 36 | 1021-561-01 | Van Klavern | 13.62 |
| | 1021-591-01 | Van Klavern | 9.50 |
| | 1021-591-03 | Van Klavern | 11.60 |
| | 1021-601-04 | Van Klavern | 8.28 |
| | 1021-601-01 | Van Klavern | 9.16 |
| 37 | 1028-351-16 | Higgins | 2.60 |
| 38 | 1028-351-14 | Higgins | 11.21 |
| 39 | 1028-351-18 | Weeda | 12.16 |
| | | **TOTAL:** | **1053.40** |

## CONVERSION

## CUCAMONGA COUNTY WATER DISTRICT
West gate specific plan property west of Cherry

| APN | Acreage | |
|---|---|---|
| 226-112-08 | 7.07 | |
| 228-012-05 | 108.62 | |
| 06 | 7.54 | |
| 00 (adjacent to Cherry) | 110.00 | (estimated) |
| 228-092-03 | 37.36 | |
| 14 | 9.61 | |
| 15 | 9.61 | |
| 16 | 9.61 | |
| 17 | 7.57 | |
| 20 | 11.54 | |
| 19 | 9.73 | |
| 22 | 25.40 | |
| 228-091-12 | 18.68 | |
| 24 | 5.43 | |
| 25 | 9.00 | |
| 28 | 35.51 | |
| 07 | 38.00 | (estimated) |
| Totals | 460.28 | |

APN maps attached

JT:dc(CCWDCOVS.DOC)
6/26/95

## CONVERSION

## FONTANA WATER COMPANY
West gate specific plan property east of Cherry

| APN | | Acreage |
|---|---|---|
| 228-021-28 | | 142.35 |
| 27 | | 8.50 |
| 226-121-21 | | 12.50 |
| 18 | | 137.83 |
| 226-091-46 | | 45.78 |
| 62 | | 70.04 |
| | Total | 417.00 |

JT:dc(FWCCONVR.DOC)
6/26/95

Jurupa Community Services District
LAND CONVERSION REQUESTS FY 94-95
OUTSIDE OF CONVERSION AREA NO. 1

| PARCEL NUMBER | PARCEL ADDRESS | | NUMBER OF ACRES | MAP NO | LOT NO |
|---|---|---|---|---|---|
| 156020026 | 12400 | PHILADELPHIA | 10.25 | A | 1 |
| 156020027 | 12350 | PHILADELPHIA | 15.41 | A | 2 |
| 156020030 | | | 8.79 | A | 3 |
| 156160018 | 3791 | DE FOREST | 10.75 | B | 1 |
| 156160035 | 3065 | DULLES | 5.21 | B | 2 |
| 156160036 | 3058 | DULLES | 9.42 | B | 3 |
| 156160037 | | | 7.31 | B | 4 |
| 156160038 | | | 5.03 | B | 5 |
| 156160039 | 3178 | DULLES | 5.11 | B | 6 |
| 156160046 | 3431 | DE FOREST | 5.10 | B | 7 |
| 156160058 | | | 2.45 | B | 8 |
| 156160059 | | | 1.60 | B | 9 |
| 156160060 | | | 0.19 | B | 10 |
| 156160061 | | | 0.22 | B | 11 |
| 156160065 | 3450 | DULLES | 5.50 | B | 12 |
| 156160066 | 3204 | DE FOREST | 5.20 | B | 13 |
| 156160067 | | | 5.37 | B | 14 |
| 156160068 | | | 5.00 | B | 15 |
| 156160069 | 3384 | DE FOREST | 5.00 | B | 16 |
| 156160070 | | | 5.21 | B | 17 |
| 156160071 | 3725 | NOBEL | 7.88 | B | 18 |
| 156160072 | | | 3.55 | B | 19 |
| 156160073 | 3444 | DE FOREST | 1.20 | B | 20 |
| 156160074 | 3590 | DE FOREST | 10.66 | B | 21 |
| 156160080 | | | 5.16 | B | 22 |
| 156160081 | | | 6.25 | B | 23 |
| 156160082 | 10885 | INLAND | 11.43 | B | 24 |
| 156160084 | 10980 | INLAND | 2.51 | B | 25 |
| 156160087 | 3305 | DULLES | 20.47 | B | 26 |
| 156160088 | 3305 | DULLES | 44.37 | B | 27 |
| 156160089 | 3305 | DULLES | 8.40 | B | 28 |
| 156160095 | 3038 | DEERE | 12.94 | B | 29 |
| 156160096 | 3371 | DE FOREST | 25.03 | B | 30 |
| 156160097 | | | 23.97 | B | 31 |
| 183030007 | 7545 | JURUPA | 9.90 | C | 3 |
| 183030008 | 7585 | JURUPA | 1.99 | C | 2 |
| 183030033 | 7491 | JURUPA | 5.69 | C | 1 |
| 183080010 | 7371 | JURUPA | 7.55 | D | 1 |
| | | TOTAL ACRES | 327.07 | | |

Jurupa Community Services District
LAND CONVERSION REQUESTS FY 95-96
AFTER WATERMASTER VERIFICATION

| PARCEL NUMBER | PARCEL ADDRESS | | NUMBER OF ACRES | MAP NO | LOT NO |
|---|---|---|---|---|---|
| 162200006 | 9894 | 60TH | 5.00 | A | 1 |
| 162200007 | | 60TH | 5.00 | A | 2 |
| 162200008 | | LIMONITE | 5.00 | A | 3 |
| 162200009 | | LIMONITE | 4.95 | A | 4 |
| 162200010 | 9951 | LIMONITE | 9.65 | A | 5 |
| 162210011 | 10001 | LIMONITE | 9.76 | A | 6 |
| 162210001 | 9709 | 60TH | 5.00 | B | 1 |
| 162210002 | 6067 | BEACH | 5.00 | B | 2 |
| 162210003 | | LIMONITE | 5.00 | B | 3 |
| 162210004 | | LIMONITE | 5.00 | B | 4 |
| 165050001 | 8618 | 54TH | 2.50 | C | 1 |
| 165050002 | 8646 | 54TH | 2.50 | C | 2 |
| 165050005 | 5424 | PEDLEY | 5.00 | C | 3 |
| 165050006 | 5494 | PEDLEY | 5.00 | C | 4 |
| 165060001 | 5419 | PEDLEY | 5.00 | D | 1 |
| 165060002 | 5455 | PEDLEY | 2.86 | D | 2 |
| 165060003 | 5489 | PEDLEY | 2.86 | D | 3 |
| 165060013 | 5511 | PEDLEY | 3.01 | D | 4 |
| 165080003 | 5723 | PEDLEY | 3.25 | E | 1 |
| 165080004 | 5733 | PEDLEY | 3.25 | E | 2 |
| 165080005 | 5793 | PEDLEY | 7.00 | E | 3 |
| 165080007 | 5760 | PEDLEY | 3.00 | E | 4 |
| 165080009 | 8705 | 58TH | 5.00 | E | 5 |
| 165080010 | 8695 | 58TH | 2.39 | E | 6 |
| 165080012 | 8696 | 56TH | 5.00 | E | 7 |
| 165091015 | 5685 | PEDLEY | 3.85 | F | 1 |
| 165092004 | 5690 | 5685 | 1.82 | F | 2 |
| 165140008 | 5935 | 5685 | 5.89 | G | 1 |
| 165140029 | 5831 | 5685 | 4.50 | G | 2 |
| 165140030 | 5853 | 5685 | 2.16 | G | 3 |
| 165160001 | 8626 | 58TH | 3.82 | H | 1 |
| 165160002 | 8662 | 58TH | 2.50 | H | 2 |
| 165160003 | 8710 | 58TH | 2.50 | H | 3 |
| 166030025 | 8238 | JURUPA | 9.22 | I | 1 |
| 166030023 | 4800 | STONE | 14.52 | I | 2 |
| 166030011 | 4992 | STONE | 4.63 | I | 3 |
| 166050008 | 4695 | TYROLITE | 3.36 | J | 1 |
| 166060005 | 4911 | TYROLITE | 8.93 | K | 1 |
| 166060006 | 4799 | TYROLITE | 6.19 | K | 2 |
| 166070001 | 5040 | AGATE | 4.85 | L | 1 |
| 166070030 | 5070 | AGATE | 2.33 | L | 2 |
| 166070009 | 5025 | STONE | 2.69 | L | 3 |
| 166070011 | 5065 | STONE | 3.63 | L | 4 |
| 166090001 | 5289 | STONE | 9.82 | M | 1 |
| 166090002 | 5250 | STONE | 5.28 | M | 2 |
| 166090004 | 5256 | AGATE | 12.88 | M | 3 |
| 166090023 | 8440 | 54TH | 2.26 | M | 4 |
| 166090026 | 5340 | AGATE | 4.67 | M | 5 |
| 166190017 | 8600 | 58TH | 10.00 | N | 1 |
| 167020002 | | GALENA | 33.71 | O | 1 |

Jurupa Community Services District
LAND USE CONVERSION REQUESTS FY 95-96
AFTER WATERMASTER VERIFICATION

| PARCEL NUMBER | PARCEL ADDRESS | | NUMBER OF ACRES | MAP NO | LOT NO |
|---|---|---|---|---|---|
| 167020006 | | GALENA | 9.70 | O | 2 |
| 167020007 | | GALENA | 29.20 | O | 3 |
| 167020008 | | GALENA | 33.70 | O | 4 |
| 167110008 | 9440 | GALENA | 10.93 | P | 1 |
| 167160042 | 4777 | FELSPAR | 9.37 | Q | 1 |
| 169070006 | 8705 | MISSION | 2.57 | R | 1 |
| 169210008 | 8721 | GALENA | 1.40 | S | 1 |
| 169270018 | 4930 | AGATE | 4.71 | T | 1 |
| 169280020 | 4945 | PEDLEY | 2.45 | U | 1 |
| 169280022 | 8864 | PEDLEY | 2.71 | U | 2 |
| 169290011 | 5015 | PEDLEY | 5.00 | V | 1 |
| 169290020 | 5071 | PEDLEY | 4.77 | V | 2 |
| 169290021 | 5151 | PEDLEY | 4.77 | V | 3 |
| 169300003 | 5339 | PEDLEY | 7.50 | W | 1 |
| 169300005 | 5355 | PEDLEY | 8.35 | W | 2 |
| 169300007 | 5335 | PEDLEY | 2.39 | W | 3 |
| 169300008 | 5261 | PEDLEY | 2.39 | W | 4 |
| 169300009 | 5235 | PEDLEY | 2.39 | W | 5 |
| 169300010 | 5205 | PEDLEY | 2.38 | W | 6 |
| 169310002 | 5074 | PEDLEY | 3.01 | X | 1 |
| 169310003 | 5071 | AGATE | 2.72 | X | 2 |
| 169310026 | 5329 | AGATE | 2.48 | X | 3 |
| 169310028 | 5271 | AGATE | 2.48 | X | 4 |
| 170310041 | 9200 | MISSION | 4.14 | X | 1 |
| 171040027 | 3851 | PYRITE | 15.41 | Y | 1 |
| 171050013 | 4100 | AGATE | 7.69 | Z | 1 |
| 171090011 | 8531 | MISSION | 3.22 | AA | 1 |
| 171190004 | 7868 | MISSION | 10.96 | BB | 1 |
| 171220002 | 7837 | GALENA | 9.64 | CC | 1 |
| 173160020 | 9150 | GRANITE HILL | 4.03 | DD | 1 |
| 173160024 | 8931 | GRANITE HILL | 2.06 | DD | 2 |
| 173160032 | 8951 | HIGHWAY | 4.13 | DD | 3 |
| 183030014 | 7586 | JURUPA | 6.92 | EE | 1 |
| | | TOTAL ACRES | 508.56 | | |

Monte Vista Water District
P.O. Box 71
Montclair, CA 91763-0071

Proposed Conversion Acres
Submitted by Gil Martinez, August 2, 1995

| Property No. | Approximate Acreage | APN (Lot No.) |
|---|---|---|
| A | 4.3 | 1013-131-15,17,19 |
| A1 | 2.4 | 1013-131-15,17,19 (Lot 1 & 6) |
| C | 8.0 | 1013-171-1 thru 5 |
| E | 9.6 | 1013-271-1 |
| | | 1013-531-5 |
| G | 9.0 | 1013-291- 6 & 7 |
| I | 10.0 | 1013-521-4 (Lot 1) |
| N | .5 | 1016-101-1 |
| | 43.66 | |

Prepared by J.R. Theirl
August 14, 1995
Based on information provided by Gil Martinez of MVWD on August 2, 1995.

**City of Ontario**
**Existing Agricultural Uses**
**Exhibit A**

| Identification | APN | Address | Acreage |
|---|---|---|---|
| 1 | 11335102 | 1348 S GROVE AV | 11.500 |
| 2 | 11336103 | 1550 S PARCO AV | 7.231 |
| 3 | 11336104 | 1460 S PARCO AV | 0.904 |
| 4 | 11336105 | 1442 S PARCO AV | 0.454 |
| 5 | 11336106 | 1436 S PARCO AV | 0.232 |
| 6 | 11336107 | 1410 S PARCO AV | 5.518 |
| 7 | 11336116 | 1551 S GROVE AV | 12.255 |
| 8 | 11336118 | 1405 S GROVE AV | 11.642 |
| 9 | 11341421 | 1704 S VINEYARD AV | 3.677 |
| 10 | 11343105 | 1160 S MILDRED AV | 51.026 |
| 11 | 11351208 | O E AIRPORT--OIA | 8.524 |
| 12 | 11351210 | O E AIRPORT --OIA | 7.400 |
| 13 | 21019210 | 572 N TURNER AV | 22.343 |
| 14 | 21121104 | 3000 E JURUPA ST | 20.039 |
| 15 | 21121109 | 1200 S ARCHIBALD AV | 19.395 |
| 16 | 21121111 | 2900 E JURUPA ST | 65.765 |
| 17 | 21131203 | O E MISSION BL | 4.020 |
| 18 | 21131204 | O E MISSION BL | 2.022 |
| 19 | 21134101 | O S SEAGULL AV | 0.615 |
| 20 | 21134102 | O E JURUPA ST | 0.782 |
| 21 | 21134103 | O E JURUPA ST | 0.534 |
| 22 | 21134104 | O E JURUPA ST | 0.530 |
| 23 | 21134105 | O E JURUPA ST | 0.532 |
| 24 | 21134106 | O S AVIATION DR | 0.786 |
| 25 | 21134107 | O S AVIATION DR | 1.016 |
| 26 | 21808103 | 2300 S MILLIKEN AV | 46.266 |
| 27 | 21808105 | O E MISSION BL | 0.263 |
| 28 | 21808108 | O E MISSION BL | 49.657 |
| 61 | 21809124 | O S MILLIKEN AV | 15.280 |
| 29 | 23801131 | 1000 N ROCHESTER AV | 2.270 |
| 30 | 23801219 | O E INLAND EMPIRE BL | 10.664 |
| 31 | 23801223 | O E FOURTH ST | 13.856 |
| 32 | 23808140 | O S WINEVILLE AV | 2.655 |
| 33 | 23824110 | 5010 E AIRPORT DR | 0.000 |
| 34 | 101120109 | 1241 W STATE ST | 0.000 |
| 35 | 101120110 | 1211 W STATE ST | 2.434 |
| 36 | 101120111 | 520 S MAGNOLIA AV | 2.409 |
| 37 | 101122102 | 616 OAKS AV | 0.000 |
| 38 | 101142109 | O S ELDERBERRY AV | 0.942 |
| 39 | 101142111 | O S ELDERBERRY AV | 1.942 |
| 40 | 101152112 | O S ELDERBERRY AV | 1.005 |
| 41 | 101153103 | O S BENSON AV | 2.566 |
| 42 | 101153104 | O S BENSON AV | 1.860 |
| 43 | 101143105 | O S BENSON AV | 4.781 |
| 44 | 101412103 | O S OAKS AV | 0.063 |
| 45 | 101412104 | O S OAKS AV | 1.705 |
| 46 | 101421112 | 1320 W FRANCIS ST | 7.281 |
| 47 | 104921105 | 720 E SUNKIST ST | 0.000 |
| 48 | 104930105 | 752 W PARK ST | 2.668 |
| 49 | 104930106 | 720 W PARKS ST | 2.685 |
| 50 | 104942104 | 1310 S CUCAMONGA AV | 4.694 |
| 51 | 104950102 | 1125 S SULTANA AV | 0.207 |

**City of Ontario**
**Existing Agricultural Uses**
**Exhibit A**

| Identification | APN | Address | Acreage |
|---|---|---|---|
| 52 | 105013102 | 1518 S CUCAMONGA AV | 0.000 |
| 53 | 105013103 | 1558 S CUCAMONGA AV | 6.028 |
| 53 | 105016103 | 1556 S GRPVE AV | 0.000 |
| 55 | 105017102 | 1642 S GROVE AV | 9.563 |
| 56 | 105018103 | 1743 S CUCAMONGA AV | 8.970 |
| 57 | 105020101 | 1687 S BON VIEW AV | 9.547 |
| 58 | 105036108 | 1844 S FERN AV | 0.000 |
| 59 | 105045104 | 1921 S BON VIEW AV | 4.740 |
| 60 | 105046109 | 1056 E FRANCIS ST | 9.064 |
| 61 | 011340102 | 1533 S PARCO AVE | 29.000 |
| 62 | 101121106 | 1300 W MISSION BLVD | 1.000 |
| 63 | 101138204 | 1055 W MISSION BLVD | 1.000 |
| 64 | 101446205 | 1951 S PALMETTO AVE | 1.000 |
| 65 | 105115103 | 1256 E PHILADELPHIA ST | 6.000 |
| 66 | 105157177 | NW CORNER GROVE AVE & RIVERSIDE DR | 1.000 |
| 67 | 104947204 | CAMPUS (N OF FRANCIS, S OF PHILLIPS) | 6.000 |
| 68 | 011008107 | 1633 E HOLT BLVD | 5.000 |
| 69 | 105144103 | NW CORNER EUCLID AVE & RIVERSIDE DR | 10.000 |
| | | Total | 544 Acres |

Table 3A

City of Chino
CHINO BASIN LAND USE CONVERSION
**PARCELS TO BE CONVERTED IN FY 94/95**

| PROPERTY No. | ACREAGE | ADDRESS N/S - E/S | APN | GENERAL NOTES |
|---|---|---|---|---|
| 8 | 10 | 3600/13650 | 1019-611-28,39,40 | IRRIGATED LANDSCAPE/UNDER DEVELOPMENT |
| | | | 1019-611-41,42,43,49 | |
| 10 | 31 | 3900/14000 | 1022-031-2 | ENTERTAINMENT COMPLEX |
| | | | 1022-26-4 | |
| | | | 1022-27-4 | |
| | | | 1022-082-1,2,8,9,10 | |
| 13 | 142 | 4300/14300 | 1022-42-6,7,8 | COMM/IND - WAREHOUSE |
| | | | 1022-41-5 | |
| | | | 1022-56-2 | |
| | | | 1022-53-11,12,13 | |
| | | | 1022-431-8 | |
| | | | 1022-441-8 | |
| | | | 1022-541-3 | |
| 18 | 70 | 5300-15400 | 1028-201-13,17 | COMM/IND (MISSION LAUNDRY) |
| | | | 1028-511-1 thru 20 | |
| | | | 1028-501-1 thru 25 | |
| | | | 1028-491-1 thru 9 | |
| 23 | 26 | 6400/13900 | 1021-251-1,20 | RESIDENTIAL DEVELOPMENT/COMMERCIAL PARK |
| | | | 1021-241-2,3 | |
| 29 | 39.5 | 6600/13900 | 1053-251-1,2,3,4 | RESIDENTIAL DEVELOPMENT |
| | | | 1053-241-68 | |
| | | | 1053-011-2 thru 5 | |
| 30 | 99 | 5700/14150 | 1021-351-1,2 | AYALA PARK |
| | | | 1021-321-1,2 | |
| | | | 1021-311-1,2 | |
| | | | 1021-281-1 | |
| | | | 1026-011-1 | |
| 32 | 61 | 6950/13100 | 1052-051-1 thru 18 | DOMESTIC SERVICE ONLY/RESIDENTIAL |
| | | | 1052-051-20 thru 25 | |
| * | 41 | 3950/13900 | 1022-082-1 thru 11 | COMMERCIAL DEVELOPMENT |
| | | | 1022-251-3 thru 14 | |
| TOTAL | 519.5 | | | |

*** acreage above property number 11 (MAJESTIC SPECTRUM POWER CENTER)**

Jurupa Community Services District
LAND CONVERSION REQUESTS FY 94-95
OUTSIDE OF CONVERSION AREA NO. 1

| PARCEL NUMBER | PARCEL ADDRESS | | NUMBER OF ACRES | MAP NO | LOT NO |
|---|---|---|---|---|---|
| 156020026 | 12400 | PHILADELPHIA | 10.25 | A | 1 |
| 156020027 | 12350 | PHILADELPHIA | 15.41 | A | 2 |
| 156020030 | | | 8.79 | A | 3 |
| 156160018 | 3791 | DE FOREST | 10.75 | B | 1 |
| 156160035 | 3065 | DULLES | 5.21 | B | 2 |
| 156160036 | 3058 | DULLES | 9.42 | B | 3 |
| 156160037 | | | 7.31 | B | 4 |
| 156160038 | | | 5.03 | B | 5 |
| 156160039 | 3178 | DULLES | 5.11 | B | 6 |
| 156160046 | 3431 | DE FOREST | 5.10 | B | 7 |
| 156160058 | | | 2.45 | B | 8 |
| 156160059 | | | 1.60 | B | 9 |
| 156160060 | | | 0.19 | B | 10 |
| 156160061 | | | 0.22 | B | 11 |
| 156160065 | 3450 | DULLES | 5.50 | B | 12 |
| 156160066 | 3204 | DE FOREST | 5.20 | B | 13 |
| 156160067 | | | 5.37 | B | 14 |
| 156160068 | | | 5.00 | B | 15 |
| 156160069 | 3384 | DE FOREST | 5.00 | B | 16 |
| 156160070 | | | 5.21 | B | 17 |
| 156160071 | 3725 | NOBEL | 7.88 | B | 18 |
| 156160072 | | | 3.55 | B | 19 |
| 156160073 | 3444 | DE FOREST | 1.20 | B | 20 |
| 156160074 | 3590 | DE FOREST | 10.66 | B | 21 |
| 156160080 | | | 5.16 | B | 22 |
| 156160081 | | | 6.25 | B | 23 |
| 156160082 | 10885 | INLAND | 11.43 | B | 24 |
| 156160084 | 10980 | INLAND | 2.51 | B | 25 |
| 156160087 | 3305 | DULLES | 20.47 | B | 26 |
| 156160088 | 3305 | DULLES | 44.37 | B | 27 |
| 156160089 | 3305 | DULLES | 8.40 | B | 28 |
| 156160095 | 3038 | DEERE | 12.94 | B | 29 |
| 156160096 | 3371 | DE FOREST | 25.03 | B | 30 |
| 156160097 | | | 23.97 | B | 31 |
| 183030007 | 7545 | JURUPA | 9.90 | C | 3 |
| 183030008 | 7585 | JURUPA | 1.99 | C | 2 |
| 183030033 | 7491 | JURUPA | 5.69 | C | 1 |
| 183080010 | 7371 | JURUPA | 7.55 | D | 1 |
| | | TOTAL ACRES | 327.07 | | |

City of Ontario
Existing Agricultural Uses
Exhibit A

| Identification | APN | Address | Acreage |
|---|---|---|---|
| 1 | 11335102 | 1348 S GROVE AV | 11.500 |
| 2 | 11336103 | 1550 S PARCO AV | 7.231 |
| 3 | 11336104 | 1460 S PARCO AV | 0.904 |
| 4 | 11336105 | 1442 S PARCO AV | 0.454 |
| 5 | 11336106 | 1436 S PARCO AV | 0.232 |
| 6 | 11336107 | 1410 S PARCO AV | 5.518 |
| 7 | 11336116 | 1551 S GROVE AV | 12.255 |
| 8 | 11336118 | 1405 S GROVE AV | 11.642 |
| 9 | 11341421 | 1704 S VINEYARD AV | 3.677 |
| 10 | 11343105 | 1160 S MILDRED AV | 51.026 |
| 11 | 11351208 | O E AIRPORT--OIA | 8.524 |
| 12 | 11351210 | O E AIRPORT --OIA | 7.400 |
| 13 | 21019210 | 572 N TURNER AV | 22.343 |
| 14 | 21121104 | 3000 E JURUPA ST | 20.039 |
| 15 | 21121109 | 1200 S ARCHIBALD AV | 19.395 |
| 16 | 21121111 | 2900 E JURUPA ST | 65.765 |
| 17 | 21131203 | O E MISSION BL | 4.020 |
| 18 | 21131204 | O E MISSION BL | 2.022 |
| 19 | 21134101 | O S SEAGULL AV | 0.615 |
| 20 | 21134102 | O E JURUPA ST | 0.782 |
| 21 | 21134103 | O E JURUPA ST | 0.534 |
| 22 | 21134104 | O E JURUPA ST | 0.530 |
| 23 | 21134105 | O E JURUPA ST | 0.532 |
| 24 | 21134106 | O S AVIATION DR | 0.786 |
| 25 | 21134107 | O S AVIATION DR | 1.016 |
| 26 | 21808103 | 2300 S MILLIKEN AV | 46.266 |
| 27 | 21808105 | O E MISSION BL | 0.263 |
| 28 | 21808108 | O E MISSION BL | 49.657 |
| 61 | 21809124 | O S MILLIKEN AV | 15.280 |
| 29 | 23801131 | 1000 N ROCHESTER AV | 2.270 |
| 30 | 23801219 | O E INLAND EMPIRE BL | 10.664 |
| 31 | 23801223 | O E FOURTH ST | 13.856 |
| 32 | 23808140 | O S WINEVILLE AV | 2.655 |
| 33 | 23824110 | 5010 E AIRPORT DR | 0.000 |
| 34 | 101120109 | 1241 W STATE ST | 0.000 |
| 35 | 101120110 | 1211 W STATE ST | 2.434 |
| 36 | 101120111 | 520 S MAGNOLIA AV | 2.409 |
| 37 | 101122102 | 616 OAKS AV | 0.000 |
| 38 | 101142109 | O S ELDERBERRY AV | 0.942 |
| 39 | 101142111 | O S ELDERBERRY AV | 1.942 |
| 40 | 101152112 | O S ELDERBERRY AV | 1.005 |
| 41 | 101153103 | O S BENSON AV | 2.566 |
| 42 | 101153104 | O S BENSON AV | 1.860 |
| 43 | 101143105 | O S BENSON AV | 4.781 |
| 44 | 101412103 | O S OAKS AV | 0.063 |
| 45 | 101412104 | O S OAKS AV | 1.705 |
| 46 | 101421112 | 1320 W FRANCIS ST | 7.281 |
| 47 | 104921105 | 720 E SUNKIST ST | 0.000 |
| 48 | 104930105 | 752 W PARK ST | 2.668 |
| 49 | 104930106 | 720 W PARKS ST | 2.685 |
| 50 | 104942104 | 1310 S CUCAMONGA AV | 4.694 |
| 51 | 104950102 | 1125 S SULTANA AV | 0.207 |

City of Ontario
Existing Agricultural Uses
Exhibit A

| Identification | APN | Address | Acreage |
|---|---|---|---|
| 52 | 105013102 | 1518 S CUCAMONGA AV | 0.000 |
| 53 | 105013103 | 1558 S CUCAMONGA AV | 6.028 |
| 53 | 105016103 | 1556 S GRPVE AV | 0.000 |
| 55 | 105017102 | 1642 S GROVE AV | 9.563 |
| 56 | 105018103 | 1743 S CUCAMONGA AV | 8.970 |
| 57 | 105020101 | 1687 S BON VIEW AV | 9.547 |
| 58 | 105036108 | 1844 S FERN AV | 0.000 |
| 59 | 105045104 | 1921 S BON VIEW AV | 4.740 |
| 60 | 105046109 | 1056 E FRANCIS ST | 9.064 |
| 61 | 011340102 | 1533 S PARCO AVE | 29.000 |
| 62 | 101121106 | 1300 W MISSION BLVD | 1.000 |
| 63 | 101138204 | 1055 W MISSION BLVD | 1.000 |
| 64 | 101446205 | 1951 S PALMETTO AVE | 1.000 |
| 65 | 105115103 | 1256 E PHILADELPHIA ST | 6.000 |
| 66 | 105157177 | NW CORNER GROVE AVE & RIVERSIDE DR | 1.000 |
| 67 | 104947204 | CAMPUS (N OF FRANCIS, S OF PHILLIPS) | 6.000 |
| 68 | 011008107 | 1633 E HOLT BLVD | 5.000 |
| 69 | 105144103 | NW CORNER EUCLID AVE & RIVERSIDE DR | 10.000 |
| | | Total | 544 Acres |

****** NOTICE OF HEARING ******

TO - ALL ACTIVE CHINO BASIN PARTIES, CASE NO. 164327

WHEN - JANUARY 5, 1979, 1:30 P.M.

WHERE - SAN BERNARDINO SUPERIOR COURT, DEPARTMENT 2
351 NORTH ARROWHEAD AVENUE, SAN BERNARDINO, CALIF.

WHAT - THE FOLLOWING ITEMS ARE FOR APPROVAL.

1. FIRST ANNUAL WATERMASTER REPORT.
2. 1977/78 PRODUCTION SUMMARY.
3. FORM OF LOCAL STORAGE AGREEMENT.
4. M.W.D. CYCLIC STORAGE AGREEMENT.
5. INTERVENTIONS AND ASSIGNMENTS.

YOUR PRESENCE AT THIS HEARING IS NOT REQUIRED, BUT YOUR ATTENDANCE IS WELCOME.

NOTE - FILING WITH THE DIVISION OF WATERRIGHTS IS NO LONGER NECESSARY, JUST RETURN THEIR FORMS INDICATING YOU REPORT TO THE CHINO BASIN WATERMASTER.

FRAN BROMMENSCHENKEL
987-1712

Exhibit A

CITY OF ONTARIO

)3 EAST "B" STREET, CIVIC CENTER ONTARIO CALIFORNIA 91764-4105

(909) 395-2000
FAX (909) 395-2070

PAUL S. LEON
MAYOR

JASON ANDERSON
MAYOR PRO TEM

ALAN D. WAPNER
SHEILA MAUTZ
JIM W. BOWMAN
COUNCIL MEMBERS

GREGORY C. DEVEREAUX
CITY MANAGER

MARY E. WIRTES, MMC
CITY CLERK

JAMES R. MILHISER
TREASURER

April 29, 2008

City of Fontana
Public Works Department
Attention: Kim Morris
16489 Orange Way
Fontana, CA 92335

**Subject: Recycled Water Agreement between the City of Fontana and the City of Ontario**

Dear Ms. Morris:

Enclosed you will find an original Recycled Water Agreement which has been fully executed. If you should have any questions, please do not hesitate to contact me at (909) 395-2165.

Sincerely,

Eva Frame

Eva Frame
Senior Records Specialist

Enclosures

c: Mohamed El-Amamy, Utilities & Solid Waste Director

Printed on recycled paper.

# AGREEMENT BY AND BETWEEN THE CITY OF ONTARIO AND THE CITY OF FONTANA REGARDING TRANSFER OF RIGHT OF FIRST PURCHASE OF RECHARGED RECLAIMED WATER

This Agreement is entered into as of the 15th day of January, 2008 by and between the CITY OF ONTARIO, California, a municipal corporation ("Ontario"), and the CITY OF FONTANA, California, a municipal corporation ("Fontana").

## RECITALS

**WHEREAS,** the supply of water to the Chino Basin region is limited and it is in the best interest of water and wastewater agencies in the Basin to maximize the reuse and recharge of reclaimed water where appropriate to lower the cost of future increases in basin replenishment, and which lowered cost is shared by water producers in the basin; and,

**WHEREAS,** Fontana and Ontario are both parties to the "Chino Basin Regional Sewage Service Contract (As Amended)," dated April 12, 1984 ("Regional Contract"), which is incorporated herein by reference, and are both "Contracting Agencies" as that term is defined in the Regional Contract; and,

**WHEREAS,** Sections 15 and 16 of the Regional Contract provide each Contracting Agency with the right of first purchase of reclaimed water up to the quantity of wastewater delivered to the treatment plant by that agency and Section 16.A.8 provides each Contracting Agency the authority to transfer such right; and,

**WHEREAS,** Fontana delivers wastewater to Inland Empire Utilities Agency Regional Treatment Plant No. 1 ("Regional Plant No. 1 ") and Regional Treatment Plant No. 4 ("Regional Plant No. 4"); and,

**WHEREAS,** Fontana does not operate a water delivery system for domestic water and this Agreement does not restrict Fontana's ability for direct use of reclaimed water; and,

**WHEREAS,** Ontario has the ability to use reclaimed water from Regional Treatment Plants which has been percolated for groundwater recharge; and,

**WHEREAS,** Fontana desires compensation for this assignment and transfer of its right of first purchase of recharged reclaimed water; and,

**WHEREAS,** this Agreement is consistent with the terms of the Regional Sewer Service Contract with Inland Empire Utilities Agency ("IEUA"), the IEUA Recycled Water Program, and the Chino Basin Judgment and Watermaster Agreements; and,

**WHEREAS,** Ontario and Fontana currently have an Agreement addressing assignment, transfer and compensation regarding recycled water; and,

**WHEREAS,** Ontario and Fontana desire to amend that Agreement regarding term, compensation and direct reuse of recycled water:

**NOW, THEREFORE,** for good and valuable consideration receipt of which is hereby acknowledged, and for the mutual covenants hereinafter contained, the parties agree as follows:

**Section 1. Assignment of First Purchase of Reclaimed Water**

Subject to the terms of this Agreement, Fontana hereby assigns and transfers its right of first purchase of up to three thousand (3,000) acre-feet per fiscal year (July 1st – June 30th) of treated effluent - reclaimed water recharged into the groundwater basin to Ontario pursuant to Section 16.A.8. of the Regional Contract. Ontario hereby accepts such assignment and transfer and agrees to accept the recharged reclaimed water. The parties further agree that: (1) the 3,000 acre-foot limitation may be increased at any time during the term of this Agreement by mutual, written consent of the parties; and (2) Fontana shall be under no obligation to deliver any minimum level of untreated effluent to Regional Plant No. 1 or to Regional Plant No. 4. (3) if during any given fiscal year, less than 3,000 acre-feet is available for recharge, the actual amount recharged shall be assigned. This Agreement does not pertain to direct reuse of reclaimed water and does not intend to place any restriction on Fontana's or Ontario's ability and rights to purchase reclaimed water for direct

reuse. This Agreement only pertains to reclaimed water that has been recharged into the groundwater basin.

**Section 2. Payment**

(a) On an annual basis, Ontario shall pay Fontana $ 169 per acre foot of recharged reclaimed water assigned under Section 1. This payment amount was calculated from the difference between 93.5% of the January 1, 2008 price of Metropolitan Water District of Southern California (MWD) Replenishment Untreated Water ($248/AF) and the price of reclaimed water paid by Ontario to IEUA under Section 2(a) of this Agreement ($63/AF). The price per acre foot ($/AF) paid by Ontario to Fontana shall be recalculated annually on July 1 using the then current price for MWD untreated replenishment water and for reclaimed water paid by Ontario to IEUA, using the same formula. Payment by Ontario to Fontana shall be due on October 31 of each year for the amount of reclaimed water rights Ontario had purchased during the previous fiscal year. Ontario shall initiate the payment to Fontana by mailing a check for the full amount due from Ontario to Fontana and a copy of the IEUA report showing the amount of reclaimed water recharged during the previous fiscal year. Any payment not received by Fontana from Ontario within 30 days from the due date will incur a late payment penalty of 10% of the total amount due from Ontario to Fontana. If payment is not received by Fontana within 90 days after Fontana gives Ontario written notice as provided in Section 20 that payment is delinquent, then Fontana shall have the option to terminate this agreement pursuant to Section7 of this Agreement.

(b) Ontario shall make all payments for reclaimed water required under Section 16.A.6. of the Regional Contract for treated effluent accepted by Ontario under this Agreement directly to IEUA. Such payments shall include delivery costs, charges for recharged reclaimed water imposed by IEUA in accordance with rates and policy set by the policy committee charged with overseeing the implementation of the Regional Contract.

**Section 3. Term and Effective Date**

This Agreement shall be effective when executed by both parties and shall have a term of twenty-three (23) years from the effective date. This Agreement may be renewed for an additional period of ten (10) years at the sole request and discretion of Ontario, provided Ontario gives Fontana written notice of its intention to renew at least twenty-four (24) months prior to the expiration date. The intent is to match these terms to the terms of the Chino Basin Watermaster Peace Agreement of 2000. In the event Ontario renews this

Agreement, at the conclusion of the initial 10-year renewal term, the Agreement may be renewed for successive ten (10) year periods subject to the option of Fontana not to extend the Agreement ("Right of Cancellation"). Ontario shall give Fontana written notice of its request to extend the Agreement for an additional ten-year term, at least twenty-four (24) months prior to any expiration date of the existing renewal term Agreement. Fontana shall give Ontario written notice confirming the renewal of the Agreement for an additional term or, if Fontana elects not to renew the Agreement, notice of its exercise of the Right of Cancellation within 60 days after Ontario's request to extend the term. If Fontana fails to provide written notice confirming the extension of the Agreement or exercising its Right of Cancellation within 60 days after written notice from Ontario, Ontario may give Fontana notice that the Agreement will be automatically extended unless Fontana exercises its Right of Cancellation within 30 days. If Fontana fails to respond within 30 days after the notice of automatic renewal, then the Agreement shall be automatically renewed for an additional 10 year term. All of the terms of this Agreement shall apply to each renewal term unless amended by mutual written agreement of the parties.

**Section 4. Notice**

(a) Pursuant to the Section 16.D. of the Regional Contract and Sections 1 and 5 of this Agreement, Ontario shall accept the assignment of up to three thousand (3,000) acre-feet per fiscal year (July 1st – June 30th) of treated effluent - reclaimed water recharged into the groundwater basin. Ontario shall notify Fontana and IEUA by the last day of July of each fiscal year regarding any increase or reduction of the amount of transferred reclaimed water rights of first purchase to be exercised by Ontario during the same fiscal year. Ontario shall give written notice if Ontario elects not to take any reclaimed water under this Agreement.

(b) After August 1 of each fiscal year, Fontana may on an annual basis exercise or transfer any rights which are not claimed by Ontario pursuant to Section 4(a) of this Agreement to any qualifying party, including subsequent transfer to Ontario of any rights previously unclaimed by Fontana.

**Section 5. Recordkeeping**

Ontario shall be responsible for preparing, maintaining, and delivering all records associated with and necessary pursuant to this Agreement and Section 16 of the Regional Contract. Ontario shall also file a certified copy of this Agreement, and notices confirming renewal of this Agreement for any additional terms, with IEUA. Ontario shall be

responsible for coordinating any action to be taken under this Agreement with, as well as preparing, maintaining and delivering all records or documentation required by, the Chino Basin Watermaster, including but not limited to any transfer of recharged reclaimed water rights pursuant to this Agreement.

**Section 6. Delivery**

Ontario shall be solely responsible for the construction of the facilities which will be necessary for Ontario to produce and take delivery of the recharged reclaimed water from the groundwater basin pursuant to this Agreement.

**Section 7. Termination**

This Agreement and the rights and obligation of the parties hereunder shall terminate and be of no further force or effect as to either party upon any of the following occurrences:

(a) if Fontana is permanently prohibited by an order, decree, or judgment of a court of competent jurisdiction from supplying water to Ontario pursuant to this Agreement,

(b) At the option of Fontana, if Ontario fails to take delivery of any recharged reclaimed water pursuant to this Agreement for a period of three (3) consecutive calendar years.

(c) If Ontario fails to make any payment to Fontana under Section 2 (a) of this Agreement within 90 days after written notice from Fontana to Ontario that the Agreement will be terminated for non-payment.

(d) Failure of Ontario to make the payments to IEUA required under Section 2 (a) of this Agreement, or any payments due to the Watermaster associated with Ontario's purchase of recycled water under this Agreement, provided that Ontario shall have the right to cure the default if permitted under the Regional Contract or rules established by the Watermaster.

(e) At the end of the term or a renewal term if Ontario elects not to renew this Agreement for another term or Fontana exercises its Right of Cancellation.

**Section 8. Representations and Warranties**

(a) Fontana represents and warrants to Ontario as follows:

(1) That Fontana, as of the date of this Agreement, has the right to transfer its right of first purchase of treated effluent to Ontario pursuant to this Agreement, and that Fontana will not take any action with respect to its right of first purchase of reclaimed water that would impair the transfer of the rights of first purchase to Ontario hereunder; and

(2) That the execution and delivery of this Agreement on behalf of Fontana has been duly authorized by the City of Fontana and the officers of Fontana who have signed this Agreement on behalf of Fontana are duly authorized to execute on behalf of Fontana.

(b) Ontario represents and warrants to Fontana that the execution and delivery of this Agreement on behalf of Ontario has been duly authorized by the City of Ontario and the officers who have signed this Agreement on behalf of Ontario are duly authorized to execute on behalf of Ontario.

(c) Fontana disclaims any representation or warranty that the quality of the water which may be taken by Ontario under this Agreement is suitable for Ontario's intended use or for any purpose, or that the water can be produced from the groundwater basin at any particular location or during any time period. The inability of Ontario to produce water from the groundwater basin in sufficient quantities or of sufficient quality to exercise all of the rights transferred from Fontana to Ontario hereunder shall not be grounds for a claim of refund of any monies paid by Ontario to Fontana for the rights transferred hereunder.

**Section 9. No Assignment**

Neither Fontana nor Ontario may assign this Agreement or any of its rights or obligations hereunder without the express written consent of the other party, which consent shall not be unreasonably withheld.

**Section 10. Entire Agreement**

This Agreement contains the entire agreement between the parties respecting the subject matter hereof and supersedes all prior understandings and agreements, whether oral

or in writing, between the parties respecting the subject matter of this Agreement.

**Section 11. Choice of Law**

This Agreement shall be governed by the laws of the State of California.

**Section 12. Severability**

If any term, covenant, condition or provision of this Agreement, or the application thereof to any person or circumstance, shall to any extent be held by a court of competent jurisdiction to be invalid, void or unenforceable, the remainder of the terms, covenants, conditions or provisions of this Agreement, or the application thereof to any other person or circumstance, shall remain in full force and effect and shall in no way be affected, impaired or invalidated thereby.

**Section 13. Waiver of Covenants, Conditions, and Remedies**

The waiver by one party of the performance of any covenant or condition under this Agreement shall not invalidate this Agreement nor shall it be considered a waiver by it of any other covenant or condition under this Agreement. The waiver by either or both parties of the time for performing any act under this Agreement shall not constitute a waiver of the time for performing any other act or an identical act required to be performed at a later time.

**Section 14. Amendment**

This Agreement may be amended at any time by the written agreement of both parties. All amendments and changes of this Agreement, in all or in part, and from time to time, shall be binding upon the parties despite any lack of legal consideration, so long as the same shall be in writing and executed by the parties hereto.

**Section 15. No Third Party Benefit**

This Agreement is intended to benefit only the parties hereto and no other person or entity has or shall acquire any rights hereunder.

**Section 16. Further Acts**

Each party hereby agrees that it shall, upon request of the other, execute and deliver

such further documents (in form and substance reasonably acceptable to the party to be charged) and do such other acts and things as are reasonably necessary and appropriate to effectuate the terms and conditions of this Agreement.

**Section 17. Estoppel Certificate**

At any time within ten (10) days after request by a party, the other party shall execute, acknowledge and deliver to the requesting party, without charge, a written statement certifying that this Agreement is unmodified and in full force, or if there have been modifications, that it is in full force as modified. The statement shall also contain the date of commencement of this Agreement, the dates to which the administrative charges and any other charges have been paid, and any other information the requesting party may reasonably request.

**Section 18. Attorneys' Fees**

In the event of any litigation involving the parties to this Agreement to enforce any provision of this Agreement, to enforce any remedy available upon default under this Agreement, or seeking a declaration of the rights of either party under this Agreement, the prevailing party shall be entitled to recover from the other such attorneys' fees and costs as may be reasonably incurred, including the costs of reasonable investigation, preparation and professional or expert consultation incurred by reason of such litigation. All other attorneys' fees and costs relating to this Agreement and the transactions contemplated hereby shall be borne by the party incurring the same.

**Section 19. Construction**

Headings at the beginning of each section hereof are solely for the convenience of the parties and are not a part of and shall not be used to interpret this Agreement. The singular form shall include the plural, and vice versa. This Agreement shall be construed as if both Fontana and Ontario have prepared it.

**Section 20. Notices**

All notices and demands that either party is required or desires to give to the other shall be given in writing by United States registered or certified mail, return receipt requested, by personal delivery, by facsimile with confirmation of receipt, by telegram, by express courier service or when by electronic mail to the street address or facsimile number set forth below for the respective party or any electronic mail address subsequently given, provided that if any party gives notice of a change of name or address, notices to that party shall thereafter be given as set forth in that notice. All notices and demands shall be effective upon receipt or upon refusal to accept delivery.

| | |
|---|---|
| To Ontario: | City of Ontario<br>303 East "B" Street<br>Ontario, CA 91764<br>Attn: Gregory C. Devereaux, City Manager<br>Facsimile: (909) 395-2189 |
| To Fontana: | City of Fontana<br>8353 Sierra Avenue<br>Fontana, CA 92335<br>Attn: Kenneth R. Hunt, City Manager<br>Facsimile: (909) 350-7653 |

**Section 21. Counterparts**

This Agreement may be executed in counterparts, each of which shall be deemed an original, but all of which, taken together, shall constitute one and the same instrument.

(SIGNATURES ON FOLLOWING PAGE)

IN WITNESS WHEREOF, the parties have executed this Agreement as of the day and year first above written.

**CITY OF ONTARIO**
A Municipal Corporation

By: _____
Gregory C. Devereaux, City Manager

**ATTEST:**

_____
City Clerk

**CITY OF FONTANA**
A Municipal Corporation

By: _____ C.H. for DB
Kenneth R. Hunt, City Manager

**ATTEST:**

_____
City Clerk – Deputy

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4/7/08 - 12:14